US Army Corps of Engineers
New England District
BUILDING STRONG®

Final Environmental Impact Statement/ Final Environmental Impact Report

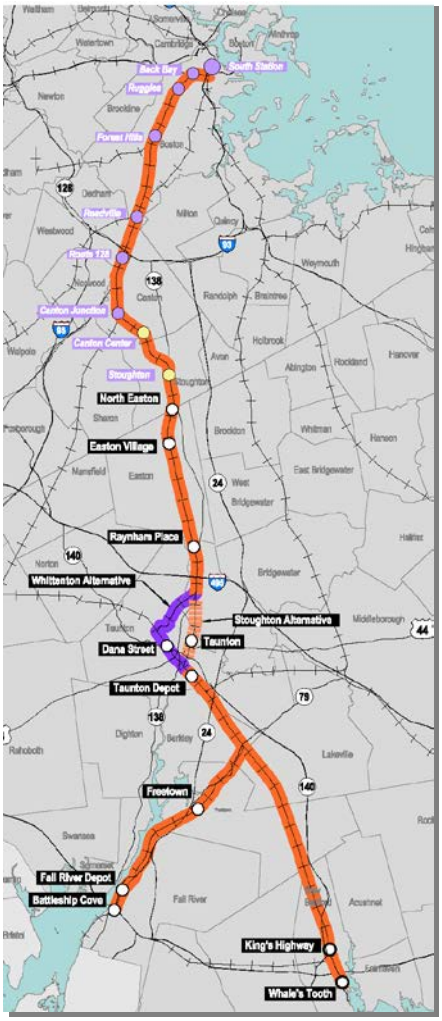
on the

South Coast Rail Project

proposed by the

Massachusetts Department of Transportation

Department of the Army Permit Application Number NAE–2007–00698
Executive Office of Energy and Environmental Affairs EEA No. 14346



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August 2013

Volume IV: Appendices

Volume IV: Appendices

List of Appendices

Appendix 2.2-A: CTPS Journey to Work Data Memoranda

Appendix 3.1-A: Analysis of South Coast Rail Alternatives: Phase 1 Report (April 2008)

Appendix 3.1-B: Evaluation of the Middleborough Simple/Rapid Bus Combination Alternative

Appendix 3.1-C: Station Siting Report

Appendix 3.1-D: Draft Network Simulation Analysis August 2009

Appendix 3.1-E: Modified Rapid Bus Alternative Technical Memorandum

Appendix 3.2-A: Feeder Bus Plan

Appendix 3.2-B: Bridge Summary

Appendix 3.2-C: Hockomock Trestle Memo

Appendix 3.2-D: Pine Swamp Trestle Memo

Appendix 3.2-E: Layover Facility Site Selection Report

Appendix 3.2-F: Construction Staging Memorandum

Appendix 3.2-G: Methodology and Assumptions of CTPS

Appendix 3.2-H: CTPS Updated Ridership Analyses for the FEIS/FEIR

Appendix 4.1-A: Route 24 Growth Projections

Appendix 4.1-B: Crash Data & Rates

Appendix 4.1-C: Intersection Inventory Data Sheets

Appendix 4.1-D: Intersection & Roadway Description

Appendix 4.1-E: Traffic Counts

Appendix 4.1-F: Signal Warrant Analysis

Appendix 4.1-G: Pedestrian Bicycle Distribution Analysis

Appendix 4.1-H: Ridership & Trip Generation (2030)

Appendix 4.1-I: Capacity Analysis

Appendix 4.1-J: Grade Crossing Analysis

Appendix 4.1-K: Relocated Stoughton Station Analyses

Appendix 4.1-L: Description of No-Build Projects

Appendix 4.2-A: MassGIS Generalized Land Use Data

Appendix 4.4-A: CTPS Environmental Justice Memo

Appendix 4.6-A: Noise Monitoring Field Notes

Appendix 4.6-B: Noise Impact Assessments

Appendix 4.6-C: Updated Noise Impact and Mitigation

Appendix 4.8-A: Draft Programmatic Agreement

Appendix 4.8-B: Historic Resources Survey and Addendum

Appendix 4.9-A: Air Quality Modeling Documentation

Appendix 4.10-A: Open Space Correspondence

Appendix 4.11-A: Farmland Conversion Impact Rating Forms

Appendix 4.12-A: Whittenton Branch Solid Waste Concern and Dana Street Station Memos

Appendix 4.12-B: Stoughton Station Phase I Environmental Site Assessment

Appendix 4.14-A: Detailed Bridge and Culvert Inventory

Appendix 4.14-B: University of Massachusetts, Amherst. Conservation Assessment and Prioritization System (CAPS) South Coast Rail Analysis

Appendix 4.14-C: Comprehensive Summary of Impacts to Vernal Pools

Appendix 4.15-A: Threatened and Endangered Species Agency Correspondence

Appendix 4.16-A: Secondary and/or Indirect Wetland Impact Assessment

Appendix 4.16-B: Potential Land Preservation Areas

Appendix 4.17-A: Hockomock Swamp Stormwater Report

Appendix 4.17-B: Station Stormwater Analyses

Appendix 4.17-C: Layover Facility Stormwater Analyses

Appendix 5.2-A: Economic Development Research Group, Inc. Net Change in Households in the South Coast Due to Development & Operation of the South Coast Rail

Appendix 5.3-A: Indirect and Cumulative Impacts Tables

Appendix 5.5-A: Smart Growth Literature Review

Appendix 9.3-A: Cooperating Agency Letters

Appendix 2.2-A

CTPS Journey to Work Data Memoranda

MEMORANDUM

TO: **South Coast Rail Group Files** **January 28, 2011**

FROM: **Scott Peterson**

RE: **South Coast Rail Work Trips to Boston**

CTPS was asked by the South Coast Rail (SCR) Project Team to examine work trip flows from the SCR study area into Boston using Journey-Work (JTW) data and from the CTPS South Coast Rail Regional Travel Demand Model (RTDM). The JTW data represented work trips reported in the 2000 census by place of residence from the SCR area to major Boston neighborhoods. The same geographic analysis of work trip flows that was done on the JTW data by was done for the RTDM base year 2007 and 2030 inputs. The RTDM trip generation model converts population, household, and employment into person trips by purpose. One of the trip purposes was Home-based-work (HBW) trips, which CTPS used as a proxy to estimate JTW trip growth in 2030.

The SCR study area consists of 28 communities, which are identified below:

Acushnet	Fairhaven	Middleborough	Rochester
Attleboro	Fall River	New Bedford	Seekonk
Berkley	Freetown	North Attleborough	Somerset
Bourne	Lakeville	Norton	Swansea
Carver	Mansfield	Plainville	Taunton
Dartmouth	Marion	Raynham	Wareham
Dighton	Mattapoisett	Rehoboth	Westport

The seven key Boston neighborhoods for destinations are Back Bay, Beacon Hill, Chinatown, Financial District, South Boston, and the South End.

The analysis shows that there were 8,000 work trips from the SCR study area into the major Boston employment destinations in 2000. The RTDM HBW trips between these two areas grow by 15% between 2000 and 2030. Using the 15% growth rate for HBW trips as a proxy for JTW trips, translates into 9,200 JTW trips from the SCR study area to the major Boston destinations in 2030.

MEMORANDUM

DATE **August 30, 2013**

TO **Jean Fox, South Coast Rail Project Manager**

FROM **Ben Dowling and Scott Peterson, CTPS**

RE **Comparison Between Year 2000 Census Journey to Work Data and 2006 Through 2010 American Community Survey Data, for the South Coast Study Area**

This memo briefly compares the year 2000 U.S. Census Journey to Work (JTW) data with U.S. Census American Community Survey (ACS) data for the years 2006 through 2010. This is in response to a comment received during the Final Environmental Impact Report (FEIR) submission, which asked about what census data was used to calibrate / validate the home-based work trips in the travel demand model that started in the South Coast Rail Study Area and were destined to markets in downtown Boston.

1.1 2000 Census Journey to Work and 2006-2010 American Community Survey

The 2000 U.S. Census Journey to Work (JTW) data was incorporated into the travel demand modeling work that was conducted for the South Coast Rail FEIR by the Central Transportation Planning Staff. This data set provided an important benchmark against which the South Coast Rail travel from the model was calibrated to.

The final round of travel demand modeling work for the South Coast Rail project was conducted after 2010, although at that time not all 2010 U.S. Census products were available. Recently, the Census Bureau has made American Community Survey (ACS) transportation data available, providing an opportunity to examine the travel patterns between Boston and the South Coast region over the last decade. The Census Bureau has discontinued the long form for JTW data set in favor of the ACS data set, so a perfect comparison between travel patterns from the 2010 Census and the 2000 Census, is not possible. Although a perfect apples-to-apples comparison is not possible, a certain level of comparison is possible.

There are several differences of note between the 2000 JTW data set and the 2006-2010 ACS data. The obvious difference between these two data sets is that they represent different years. The JTW data is a snapshot from March/April of 2000, whereas the 2006-2010 ACS data is a rolling snapshot taken over five years and thus is not subject to seasonal bias, like the JTW data. A major limitation of the ACS data is that it is not available below the

level of the municipality. During preliminary environmental permitting phase, prior to the FEIR, 2000 JTW data was used to identify 8,000 work trips from the South Coast area to select neighborhoods in Boston. This neighborhood level of analysis is not possible with the ACS data. The neighborhood analysis was important because the alternatives that were examined only served a portion of Boston and given the size of Boston, it didn't make sense to examine the JTW flows to all of Boston when only certain markets would likely benefit from the service improvements.

The SCR Study Area consists of 28 communities, which are identified below:

Acushnet	Fairhaven	Middleborough	Rochester
Attleboro	Fall River	New Bedford	Seekonk
Berkley	Freetown	North Attleborough	Somerset
Bourne	Lakeville	Norton	Swansea
Carver	Mansfield	Plainville	Taunton
Dartmouth	Marion	Raynham	Wareham
Dighton	Mattapoisett	Rehoboth	Westport

The seven key Boston neighborhoods for destinations are Back Bay, Beacon Hill, Chinatown, Financial District, South Boston, and the South End. An analysis of the 2000 JTW data shows that there were 8,000 work trips from the SCR study area into the major Boston employment destinations in 2000.

It is possible to compare town level flows using the ACS, based on samples conducted between 2000 and 2010. Table 1 below presents the number of people travelling from the South Coast study area to Boston for work purposes in 2000 and 2010.

TABLE 1
2000 Journey to Work and 2006-2010 American Community Survey

	Work Trips to all of Boston
2000 JTW	12,181
2006-2010 ACS	13,268

As the table shows there seems to have been an increase in work trip making activity between the South Coast region and Boston over the last decade. The

- *ACS data that currently has been released is limited to town level flows, does not include information regarding mode, and has a higher level of error associated with it due to data suppression and sample size.*

1.2 New ACS Data Release

It is expected that Census Transportation Planning Product (CTPP) data that will include information regarding mode, finer geographic detail on origins and destinations, along with other transportation specific kinds of data will be released this year, 2013, but as of the writing of this memo, that data has not yet been released. Although the release of the CTPP data will provide more transportation specific information, because it is based on ACS data, it is not expected to provide the same level of detail as the 2000 JTW data and will likely having a higher margin of error associated with it, due to the survey method.

BHD/bhd

cc: S. Peterson, CTPS
Y. Bao, CTPS
P. Reim, CTPS

Appendix 3.1-A

Analysis of South Coast Rail Alternatives: Phase 1 Report (April 2008)

SOUTH COAST RAIL

Analysis of South Coast Rail Alternatives: Phase 1 Report

Prepared for **Executive Office of Transportation and Public Works**
Boston, Massachusetts

Prepared by ***VHB*/Vanasse Hangen Brustlin, Inc.**
Boston, Massachusetts

April 30, 2008

FINAL

Contents

Acronyms **A-1**

1 Introduction **1-1**

1.1 Phase 1 Alternatives Analysis Overview 1-1
1.2 Study Background 1-2
1.3 Historical Perspective 1-2
1.4 Relationship to the Corps' Highway Methodology Process 1-3
1.5 Community Involvement 1-3

2 Purpose and Need **2-1**

2.1 Project Purpose 2-1
2.2 Need for the Project 2-1
2.3 Transportation Needs 2-3
2.4 Highway Congestion 2-5
2.5 Air Quality and Climate Change 2-11
2.6 Inadequate Regional Transit System Capacity 2-12
2.7 Access to Opportunity 2-20
2.8 Mode Choice and Connectivity 2-20
2.9 Smart Growth 2-21
2.10 Planning and Policy Context 2-22
2.11 Other Regional Transportation Projects 2-29
2.12 Information Sources 2-34

3 Phase 1 Alternatives **3-1**

3.1 Development of Phase 1 Alternatives 3-1
3.2 Description of Corridors 3-2
3.3 Description of Modes 3-8
3.4 Description of Phase 1 Alternatives 3-17

4 Phase 1 Screening Methodology **4-1**

4.1 Introduction 4-1
4.2 Screening Criteria 4-2

5 Step 1 Analysis 5-1

5.1 Introduction 5-1
5.2 Step 1 Results 5-3
5.3 Step 1 Recommendations 5-25

6 Step 2 Analysis 6-1

6.1 Introduction 6-1
6.2 Step 2 Results 6-6
6.3 Step 2 Recommendations 6-46

7 Step 3 Analysis 7-1

7.1 Introduction 7-1
7.2 Step 3 Results 7-9
7.3 Step 3 Recommendations 7-27

8 Step 4 Analysis 8-1

8.1 Introduction 8-1
8.2 Step 4 Results 8-2
8.3 Step 4 Recommendations 8-14

9 Phase 2 Process 9-1

9.1 Scoping 9-1
9.2 DEIR/DEIS-DEA 9-2
9.3 FEIR/FEIS-FEA 9-2

References

Figures

Appendices

Appendix A – Phase 1 Alternatives Descriptions
Appendix B – Step 3: Detailed Screening Tables
Appendix C – Interagency Coordinating Group Minutes
Appendix D – Civic Engagement Meeting Notes

List of Tables

Table No.	Description	Page
1-1	Interagency Coordinating Group Meetings to Date	1-4
1-2	Commuter Rail Task Force Meetings to Date	1-5
1-3	Civic Engagement Meetings to Date	1-5
2-1	Average Daily Traffic Volume Growth	2-9
2-2	Accidents on Primary Study Area Highways	2-10
2-3	Proximity of South Coast Communities to Commuter Rail Service	2-17
2-4	Ridership on Providence, Stoughton and Middleborough Lines	2-18
2-5	Parking Utliization at Providence, Stoughton, and Middleborough Lines Stations	2-18
2-6	Projects Funded in Regional Transportation Improvements Plans	2-29
2-7	Projects Not Yet Funded or Approved	2-30
3-1	Master List of Alternatives	3-13
3-2	Phase 1 Alternatives	3-17
5-1	Measures Used to Evaluate Step 1	5-2
5-2	Step 1 Matrix	5-5
5-3	Alternatives Dismissed in Step 1	5-26
6-1	Measures Used to Evaluate Criterion 2.1	6-2
6-2	Measures Used to Evaluate Criterion 2.2	6-3
6-3	Measures Used to Evaluate Criterion 2.3	6-4
6-4	Measures Used to Evaluate Criteria 2.4 and 2.5	6-6
6-5	Step 2 Matrix	6-7
6-6	Alternatives Dismissed in Step 2	6-46

Table No.	Description	Page
7-1	Measures Used to Evalaute Criterion 3.1	7-3
7-2	Measures Used to Evaluate Criterion 3.2	7-4
7-3	Measures Used to Evaluate Criterion 3.3	7-5
7-4	Measures Used to Evaluate Criterion 3.4	7-6
7-5	Measures Used to Evaluate Criterion 3.5	7-7
7-6	Measures Used to Evaluate Criterion 3.6	7-9
7-7	Step 3 Matrix	7-11
7-8	Alternatives Dismissed in Step 3	7-27
8-1	Alternatives Advanced into Step 4 Alternatives	8-2
8-2	Alternatives Advanced to Step 4 - Summary of Step 1-3	8-3
8-3	Alternatives Advanced to Step 4 – Rank by Criteria	8-5
8-4	Summary of Step 4 Analysis	8-14

List of Figures

Figure No.	Description
1-1	Alternatives Analysis Transportation Study Area Communities
2-1	Existing Highway Transportation System
2-2	Existing Rail Transportation System
2-3	Major Transportation Projects
Chapter 3	Phase 1 Alternatives
3-1	Corridors Under Consideration
3-2	Conventional/Diesel Multiple Unit Commuter Rail, Typical Cross Section
3-3	Electrified Commuter Rail, Typical Cross Section
3-4	Bus Rapid Transit, Typical Cross Section
3-5	Monorail Along Route 24, Typical Cross Section
3-6	Electrified Light Rail Along Route 24, Typical Cross Section
3-7	Heavy Rail Along Route 24, Typical Cross Section
7-1	Environmental Resources in the Vicinity of the Northeast Corridor (Readville to Canton Junction)
7-2	Environmental Resources in the Vicinity of the Attleboro Bypass (Northeast Corridor to Attleboro Secondary)
7-3	Environmental Resources in the Vicinity of the Stoughton Line (Stoughton Station to Cotley Junction)
7-4	Environmental Resources in the Vicinity of the Dartmouth Secondary (Fall River to New Bedford)
7-5	Environmental Resources in the Vicinity of the Fall River Line (Myricks Junction to downtown Fall River)
7-6	Environmental Resources in the Vicinity of the New Bedford Main Line (Cotley Junction to downtown New Bedford)
7-7	Environmental Resources in the Vicinity of the Route 128 (Route 128 Station to Braintree)

Acronyms

ACEC	Area of Critical Environmental Concern
CTPS	Central Transportation Planning Staff
DEIR	Draft Environmental Impact Report
DEP	Department of Environmental Protection
DMU	Diesel Multiple Units
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ENF	Environmental Notification Form
EOEEA	Executive Office of Energy and Environmental Affairs
EOT	Executive Office of Transportation and Public Works
EPA	United States Environmental Protection Agency
FEIR	Final Environmental Impact Report
HOV	High Occupancy Vehicles
LEDPA	Least Environmentally Damaging Practicable Alternative
MAPC	Metropolitan Area Planning Council
MBTA	Massachusetts Bay Transportation Authority
MEPA	Massachusetts Environmental Policy Act
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NHESP	Natural Heritage and Endangered Species Program
OCPC	Old Colony Planning Council
SRPEDD	Southeastern Regional Planning and Economic Development District
VMT	Vehicle miles travelled

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1 Introduction

The purpose of the Executive Office of Transportation and Public Works (EOT) and the Massachusetts Bay Transportation Authority's (MBTA's) South Coast Rail Project Alternatives Analysis is to define the most appropriate strategy to provide public transportation between Boston to the cities of Fall River and New Bedford within the South Coast region. The South Coast Rail Project investigates cost-effective transit solutions that will increase transit accessibility, ensure equitable distribution of transit services, increase transit ridership, improve regional air quality, and support opportunities for smart growth initiatives and sustainable development.

1.1 Phase 1 Alternatives Analysis Overview

The environmental review process for this Project will be conducted in two phases. The first phase of the Project, the Phase 1 Alternatives Analysis, determines which alternatives are capable of meeting the Project purpose and are initially considered practicable. This is also Phase 1 of the United States Army Corps of Engineers' (the Corps) *Highway Methodology.*[1] A Civic Engagement process, conducted in parallel to the Interagency Coordinating Group process, provided opportunities for stakeholders to participate in an open and collaborative planning process.

As discussed in Chapter 9, the second phase will further evaluate the alternatives brought forward from the Phase 1 Alternatives Analysis in Phase 2 of the *Highway Methodology,*[1] concurrent with the joint federal and state environmental review process. During this process the Project team, in cooperation with an Interagency Coordinating Group, will determine the Preferred Alternative, as well as

1 United States Army Corps of Engineers. NEDEP-360-1-30, *The Highway Methodology Workbook*. October 1993.

the Least Environmentally Damaging Practicable Alternative (LEDPA)[2] as determined by the Corps.

1.2 Study Background

The restoration of passenger rail service to the South Coast region has been extensively studied for almost twenty years. In 2000, the MBTA completed a Draft Environmental Impact Report (DEIR) that analyzed six alternative routes for providing improved transportation between downtown Boston and the cities of Fall River and New Bedford. The DEIR focused on what was viewed then as the three most viable alternatives: (1) extending the existing MBTA Stoughton Line, (2) extending the existing MBTA Middleborough Line, and (3) providing new service, branching off from the Providence Line near Attleboro. In 2002, the MBTA concluded that extending the Stoughton Line was the most practicable and feasible of the alternatives, and EOT received state-level approval from the Secretary of Environmental Affairs to proceed with planning for the South Coast Rail Project as an extension of the existing Stoughton Line. At that time, the Project did not undergo a federal environmental review process either under the Clean Water Act permit process or the National Environmental Policy Act (NEPA). Therefore, EOT and the MBTA are taking a fresh look at the alternatives, and conducting a robust public review process to determine the most viable transportation alternatives to and from New Bedford and Fall River, and Boston. A comprehensive federal and state environmental review process will occur concurrently in accordance with the Corps' *Highway Methodology*. This process will provide the public the opportunity to comment on the alternatives.

1.3 Historical Perspective

Prior to 1958, the Middleborough, Stoughton and Attleboro rail lines were part of the Old Colony Railroad System that provided service to Fall River and New Bedford from Boston's South Station, via Canton Junction, along the Stoughton Branch railroad. Since discontinuation of this service, commuter rail has only been available to southeastern Massachusetts along the Boston-Providence Shore Line, with stops in Attleboro and South Attleboro, and the Old Colony Middleborough Line, which terminates in Lakeville. However, none of these provide an opportunity for commuters from the Fall River or New Bedford areas to easily or efficiently access rail transportation to Boston.

[2] The Least Environmentally Damaging Practicable Alternative (LEDPA) is defined by United States Environmental Protection Agency regulations at 40 CFR 230 et seq.

1.4 Relationship to the Corps' Highway Methodology Process

Since the South Coast Rail Project may result in greater than one acre of wetland fill, an individual Section 404 permit may be required by the Corps. The Corps regulates the discharge of dredged or fill material into "waters of the United States," including wetlands, under Section 404 of the Clean Water Act.

The Corps, New England District, has developed a set of non-regulatory pre-application guidelines known as the *Highway Methodology* to screen alternatives and to ensure that the transportation agency's preferred alternative is consistent with federal wetlands regulations. This Phase 1 Alternatives Analysis was conducted in accordance with the *Highway Methodology* Phase 1 guidelines, and identifies a range of reasonable alternatives to advance into the state (Massachusetts Environmental Policy Act [MEPA]) and federal (NEPA) environmental review and appropriate permitting processes. This Phase 1 process is described in more detail in Chapter 4.

1.5 Community Involvement

To ensure effective and inclusive public outreach throughout the various stages of Project development, EOT has implemented a comprehensive community involvement process for the South Coast Rail Project that includes an Interagency Coordinating Group, the Southeastern Massachusetts Commuter Rail Task Force (Commuter Rail Task Force), Civic Engagement meetings and the Smart Growth Corridor Plan, as described below.

1.5.1 Interagency Coordinating Group

In cooperation with the Corps, EOT and the MBTA developed an Interagency Coordinating Group of federal and state regulatory agencies to guide the Phase 1 Alternatives Analysis process. The group consists of:

- United States Corps of Engineers (the Corps)
- United States Environmental Protection Agency (EPA)
- United States Fish and Wildlife Service
- National Marine Fisheries Service
- Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA)
- Massachusetts Environmental Policy Act Office (MEPA)

- Massachusetts Department of Environmental Protection (DEP)
- Massachusetts Office of Coastal Zone Management
- Massachusetts Department of Conservation and Recreation, Areas of Critical Environmental Concern
- Massachusetts Department of Fish and Game Natural Heritage and Endangered Species Program
- Massachusetts Historical Commission
- Southeastern Regional Planning and Economic Development District

The objective of this group in Phase 1 is, through consensus at key milestone points, to select a range of alternatives to analyze in the in-depth environmental review.

Table 1-1 Interagency Coordinating Group Meetings to Date

Meeting Topic	Date
Project Kickoff and Introduction	September 25, 2007
Project Purpose and Need – Draft	October 23, 2007
Project Purpose and Need – Draft: Phase 1 Screening Criteria	November 27, 2007
Project Purpose and Need – Draft: Phase 1 Screening Criteria; Review of Civic Engagement Input	December 19, 2007
Project Purpose and Need – Final: Phase 1 Screening Criteria	January 3, 2008
Phase 1 Screening Criteria – Final: Range of Phase 1 Alternatives	January 10, 2008
Phase 1 Analysis – Step 1 Screening Criteria Results	February 14, 2008
Phase 1 Analysis – Concurrence on Step 1 Screening Criteria Results; Review Step 2 Results	February 21, 2008
Phase 1 Analysis – Step 2 Concurrence; Review Step 3 Results and Conclusion of Phase 1	February 28, 2008
Phase 1 Analysis – Concurrence on Step 3 Results	March 4, 2008
Phase 1 Analysis – Draft Report; Review of Civic Engagement Input; Step 4 (Circling Back) Analysis	March 21, 2008
Phase 2 Alternatives – Concurrence on Advancing Alternatives	April 1, 2008

1.5.2 Commuter Rail Task Force

The 2000 MEPA Certificate for the New Bedford/Fall River Commuter Rail Extension DEIR recognized the induced growth that could result from the rail line construction and called for a growth management task force to be created. In 2004, the Commuter Rail Task Force was formed to help the region prepare for the impacts of the re-introduction of passenger rail to the South Coast. Its membership includes representatives from the MBTA, other regional transit authorities, municipal and

regional representatives, environmental groups, and business and economic development organizations.

The Commuter Rail Task Force provides a forum for state and local officials to review and discuss all aspects of the Project and to work toward consensus on the design and operational aspects of the Project, as well as provide assistance to EOT and the MBTA.

Table 1-2 Commuter Rail Task Force Meetings to Date

June 8, 2005	March 14, 2007	January 16, 2008
April 6, 2005	January 10, 2007	February 13, 2008
September 14, 2005	February 23, 2007	March 12, 2008
November 16, 2005	May 9, 2007	April 9, 2008
January 11, 2006	June 20, 2007	
March 8, 2006	September 11, 2007	
June 14, 2006	October 17, 2007	
September 19, 2006	November 14, 2007	
November 15, 2006	December 12, 2007	

1.5.3 Civic Engagement

The Civic Engagement process seeks to engage stakeholders in a manner that enables EOT and the MBTA to integrate and address concerns of all interested parties. The process intensively relies on the efforts of the stakeholder working group developed by the Commuter Rail Task Force. Efforts also include dialogue with corridor municipalities, area legislators, members of the public and interest and community groups throughout the corridor.

Table 1-3 Civic Engagement Meetings to Date

Meeting Topic	Date	Location
What new alternatives should we consider and how should we evaluate them?	November 28, 2007 December 5, 2007 December 6, 2007	Middle School, Berkley Town Hall, Stoughton Town Hall, Dartmouth
What do you think of the list of alternatives and evaluation criteria?	January 15, 2008 January 16, 2008 January 31, 2008	J.C. Solmonese (Gym), Norton Advanced Manufacturing and Technology Center, Fall River Southeastern Voc/Tech School, South Easton
What do you think of the draft findings?	March 10, 2008 March 11, 2008 March 12, 2008	City Hall, Attleboro Public Library, Lakeville Elementary School, Freetown

1.5.4 Smart Growth Corridor Plan

The Project is intended to result in strong economic development, transportation mobility for the region, and environmental benefits. However, transportation facilities may have major impacts on land use by controlling the ease of access to neighborhoods, communities, and commercial and industrial areas. Improved access to rural and undeveloped lands typically results in more rapid development of these areas, potentially resulting in suburban sprawl and reducing the amount of open space. With this in mind, the Commonwealth, through the EOT and Executive Office of Housing and Economic Development, is developing a comprehensive Economic Development and Land Use Corridor Plan (Plan), consistent with smart growth objectives, to accompany the construction of the South Coast Rail.

Implementation of the Plan will result in economic growth for the South Coast, enhanced quality of life and environmental resources for the people of the region, and new funding that can be captured to help finance the construction and operation of the rail line. The Plan will recommend ways to maximize the economic development potential in the corridor, create sustainable development through land use change, and generate new revenues for corridor communities and the Commonwealth. This effort seeks to coordinate transportation infrastructure investments with implementation of regional and local land use changes that will enable the Commonwealth to sustain and build ridership, and generate revenues critical to financing the rail line.

1.5.5 Contents of this Report

The remaining chapters of this Alternatives Analysis Technical Report provide details of the Phase 1 alternatives analysis with supporting materials provided in the appendices.

- **Chapter 2 –** This chapter provides information on the Project purpose, and the need for transportation improvements in the Massachusetts South Coast region. It includes a discussion of the planning and policy context, discusses state and regional policy goals and objectives, and defines and describes existing transportation conditions within the Alternatives Analysis Study Area (Figure 1-1).
- **Chapter 3 –** This chapter describes the initial set of alternatives that were proposed to address the Purpose and Need of the South Coast Rail project.
- **Chapter 4 –** This chapter describes the methodology that was developed to screen these alternatives.
- **Chapter 5 –** This chapter describes the Step 1 Analysis, which identifies those alternatives capable of achieving the objectives of the Project Purpose.
- **Chapter 6 –** This chapter describes the Step 2 Analysis, which identifies those alternatives that are practicable to construct and operate.
- **Chapter 7 –** This chapter describes the Step 3 Analysis, which identifies the relative magnitude of potential impacts that each alternative could have on the aquatic and natural environment, and the potential of each alternative to support smart growth principles.
- **Chapter 8 –** This chapter describes the Step 4 Analysis, which summarizes the results of the Steps 1, 2 and 3 analyses and describes how a reasonable range of practicable alternatives to proceed into the Phase 2 environmental review process was identified.
- **Chapter 9 –** This chapter describes the Phase 2 Alternatives Analysis Process and identifies the Phase 1 alternatives selected for further consideration.

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Purpose and Need

This chapter provides information on the Project purpose and the need for transportation improvements in the Massachusetts South Coast region. To support the purpose and need, this chapter describes the existing transportation system and identifies deficiencies/needs of the regional transportation system. It also includes a discussion of the planning and policy context, and discusses state and regional policy goals and objectives.

2.1 Project Purpose

The purpose of the South Coast Rail Project is to more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts to enhance regional mobility, while supporting smart growth planning and development strategies in affected communities.

The Basic Project Purpose that the Corps will use in evaluating alternatives in its Section 404 permit review is to more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts.

2.2 Need for the Project

As documented in the following sections, the current transportation system serving the South Coast region (Figure 2-1) is primarily a highway system composed of major, limited-access state routes, regional highways, and local roadways. This highway network is supplemented by private bus services, local bus and demand-response transit services operated by the two regional transit authorities, park-and-ride lots, and vanpool services. Few additional investments in the regional transportation facilities and services are programmed, which primarily address localized congestion or safety concerns, or repair aging infrastructure. The current

transportation system serving the South Coast region is inadequate to meet the current needs of the region and will not meet the future demand placed upon it, as indicated by increasing traffic congestion and accidents.

Major transportation needs and deficiencies include:

- Lack of transportation capacity to downtown Boston.
- Congestion on highway and transit facilities serving the region.
- Air quality that does not meet federal Clean Air Act standards.

New transportation solutions for the South Coast region must be developed within the context of regional transportation issues, national and local transportation policy, and the transportation goals and objectives for the region. There has been a repeated mandate from the Massachusetts Legislature to design and construct commuter rail extension to New Bedford and Fall River.[1] The long-term transportation plans for all three planning regions support the development and enhancement of transit services. The Old Colony Planning Council's Long Range Transportation Plan specifically identifies the extension of commuter rail service from Stoughton, south to Easton and beyond as a more efficient mode of transportation for the area.

Solutions to these regional transportation issues can be found within the context of local and national policy, goals, and objectives on transportation. Current policy indicates that a multimodal/intermodal transportation system is important in the solution to the region's transportation issues. This policy is outlined in the federal Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users of 2005, Transportation Equity Act for the 21st Century, Intermodal Surface Transportation Efficiency Act and the Clean Air Act Amendments. The need for a multimodal transportation system is further reinforced by local transportation policy regarding transportation projects beginning in the 1970s and continuing through today.

The solution to South Coast transportation issues must be in line with the transportation goals and objectives set forth in the regional transportation plans specifically created by the Metropolitan Planning Organizations (MPOs). The region hopes to develop transportation solutions that maintain downtown Boston as a strong economic hub and encourage transit-oriented development patterns. Progress toward these goals is measured in terms of several specific objectives.

1 *Transportation Bond Bill*, Chapter 273 of 1994; Chapter 205 of 1996, 1997.

The region's goals and objectives can be summarized as:

- Goal: Improve transportation service to improve mobility
- Objective: Increase transit accessibility
- Goal: Provide transit services which are cost-effective
- Objective: Increase transit ridership
- Goal: Provide a more equitable distribution of transportation services
- Objective: Increase transit service for regions now poorly or under-served.

Improving the transportation facilities and services in the region is necessary to address the transportation issues facing the region. These solutions must be in line with a transportation policy that encourages a multimodal transportation system and addresses the region's transportation goals and objectives. Because highway solutions are discouraged by policy, largely infeasible, and likely ineffective given the physical constraints of the metropolitan Boston area, public transit enhancements linking the region to downtown Boston are the only remaining practical solution.

2.3 Transportation Needs

Many different types of transportation facilities and services provide mobility throughout the South Coast area. These services also provide important links to the metropolitan Boston area and facilitate access to economic, recreational, and social opportunities located throughout the region. The transportation system providing mobility and accessibility in the South Coast area is composed of:

- Limited-access highways;
- Regional highways;
- Local roadways;
- Intercity, commuter, and local bus services;
- Demand responsive transit services; and
- Carpool and vanpool facilities.

Existing transportation in the South Coast region is overwhelmingly auto-oriented. Local bus public transit is provided in Taunton by Greater Attleboro Taunton Regional Transit Authority and in New Bedford and Fall River by Southeastern Regional Transportation Authority. Greater Attleboro Taunton Regional Transit Authority also operates intercity bus service between Taunton and Providence, Rhode Island. Other intercity bus service is provided by private carriers, connecting

Fall River, New Bedford, and Taunton with each other and with Boston, Providence, Newport, and points beyond.

Commuter rail service is available both to the northwest and northeast of the South Coast region, on the MBTA's Providence Line and Middleborough Line. The closest commuter rail stations to the South Coast region are Middleborough/Lakeville on the Middleborough Line, and Attleboro Station and Providence Station, both on the Providence Line. Although physically located outside the South Coast area, existing commuter rail service provides some mobility through connections in neighboring communities.

The main highway facilities in the South Coast region are Route 24, Route 140, I-195, and I-495. Together, Routes 24 and 140 link New Bedford and Fall River to the metropolitan Boston region, while I-195 provides east-west access connecting Cape Cod, Wareham, New Bedford, Fall River, and Providence. I-495 runs northwest-southeast, connecting Cape Cod, Wareham, and Taunton. Just west of the region, I-95 connects Providence with greater Boston.

Southeastern Massachusetts experienced a 4.5 percent population growth between 1990-2000. As the affordable housing market has moved further from the Boston metropolitan area, the region has become one of the fastest growing areas in the Commonwealth. Many of the people relocating to the area are retaining their jobs in the Boston market. Most of the commuter trips from the region to the Boston market are in single occupant vehicles and public transit accounts for a minor proportion of work trips in the service area. To a large extent, this can be attributed to the lack of public transit alternatives other than privately-operated bus service.

The transportation system serving the South Coast communities is inadequate to meet the current and projected needs of the region. An evaluation of transportation and demographic data and trends has identified the following principal needs for transportation improvements:

- Many communities in the South Coast Massachusetts Area lack public transit facilities other than private bus services. Major population centers are as much as 25 miles from existing commuter rail stations all of which are located outside the South Coast region. Those stations are currently at capacity.
- Highways linking the South Coast area with metropolitan Boston are inadequate to serve the current demand, and congestion, safety, and air quality are expected to continue to worsen as travel demand grows. Few additional transportation improvements are programmed.

- The South Coast region is classified as a Severe Non-Attainment Area for ozone.[2]
- State and federal transportation planning goals encourage the development of a multi-modal transportation system that is consistent with growth management and smart growth objectives. Currently, the region lacks access to the passenger/commuter rail mode and is dependent on private automobiles, which contributes to sprawl and uncontrolled growth.
- The long-term transportation plans of the region support the development of transportation improvements that enhance accessibility, increase mobility, encourage alternatives to automobiles, and provide a more equitable distribution of transit services. The extension of commuter rail service from Stoughton south to North Easton, New Bedford, and Fall River is identified in the long-range transportation plans of the local planning organizations.

The following sections provide additional details on these specific South Coast transportation needs, and the benefits of an improved transit system.

2.4 Highway Congestion

The South Coast area is served by a network of roadways varying from limited-access facilities to local roads. The primary highway facilities link the major urban areas of New Bedford, Fall River, and Taunton with each other and to the metropolitan Boston region. These facilities have different physical and operating characteristics, described below.

2.4.1 Physical and Operating Characteristics

There are six highways in the South Coast area. These major facilities, shown in Figure 2-1, provide the primary access routes within the South Coast area and to adjacent regions. The two interstate routes serving the South Coast area are not part of the primary highway access system to the metropolitan Boston region. The six regional highways are:

- The main north-south highway link between the South Coast area and the metropolitan Boston area is Route 24, which passes through Fall River, Freetown, Berkley, Taunton, and Raynham. This limited-access facility begins at the Rhode Island state line at Tiverton, connects with I-195 on the east side of Fall River,

2 A non-attainment area is defined by the EPA as an area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

and terminates at I- 93/Route 128.

- Route 140 is a limited-access facility connecting New Bedford and Taunton. It passes through the South Coast area communities of New Bedford, Freetown, Lakeville, and Taunton. The limited-access portion of Route 140 ends at Route 24 in Taunton, providing an important link between the South Coast cities and towns of New Bedford, Dartmouth, Mattapoisett, Acushnet, and Taunton. Route 140 continues north from Taunton, roughly paralleling I-495, but not as a limited-access facility.

- The limited-access segment of Route 79 is approximately four miles long, beginning at I-195 on the west side of downtown Fall River and ending at Route 24 in northern Fall River. Route 79 provides a link from downtown Fall River and the communities located along I-195 west of Fall River to Route 24.

- Route 138 is primarily a two-lane facility that passes through the South Coast area communities of Fall River, Somerset, Dighton, and Taunton, and provides access north to Raynham, Easton, and Stoughton. It connects with I- 195 and the limited-access segment of Route 79 in Fall River, the non-access controlled section of Route 140 in Taunton, and I-495. Route 138 also provides access to the MBTA's Stoughton Station.

- Although designated as a north-south route, I-495 runs primarily northwest/ southeast in the vicinity of the South Coast area, linking Route 24 to the I-90 and I- 95 corridors. This facility does not provide a direct link to the metropolitan Boston area. It does provide access for a portion of the region to MBTA commuter rail stations in Middleborough/Lakeville and Mansfield. I-495 passes through Wareham, Rochester, Middleborough, Raynham, Taunton, and Norton, connecting with I-95 near the Mansfield/Foxborough Line and Route 24 in Raynham.

- I-195 is an east-west limited-access highway linking the towns within the southern portion of the South Coast area to Providence, Rhode Island. The highway facilitates connections to Routes 79, 24, and 140 and among some South Coast communities. It does not provide an important link between the South Coast area communities and the metropolitan Boston area. I-195 passes through Seekonk, Rehoboth, Swansea, Somerset, Fall River, Westport, Dartmouth, New Bedford, Fairhaven, Mattapoisett, Marion, and Wareham.

Off-peak travel speeds on the major limited-access highways are typical of interstate roads, with traffic traveling at the posted speed limit of 55 or 65 mph. Travel speeds are reduced during peak periods as the traffic volumes increase. The highway

exhibiting the greatest peak period strain is Route 24, where some of the highest traffic volumes in the South Coast area are recorded. On Route 24, the major north-south corridor in the South Coast area, the average daily traffic ranges from 22,000 vehicles per day in Fall River to over 122,000 vehicles per day in Randolph. Traffic congestion and long delays are common on the northern segments of this highway during weekday peak commuting periods.

2.4.2 Access to Metropolitan Boston Area

Traffic generated within the South Coast area must travel on I-93/Route 128 and I-93/Route 3 (Southeast Expressway) to reach downtown Boston. Route 128 is Boston's inner circumferential highway that provides access to much of the metropolitan Boston region. Following I-93 north/Route 128 south from Route 24 leads to I-93/Route 3 (Southeast Expressway) and downtown Boston, approximately eight miles from the I-93/Route 128/Route 3 interchange in Braintree. Following I-93 south/Route 128 north from Route 24 leads to I-95 approximately three miles to the north, and to I-90 approximately 15 miles to the north. I-90 (Massachusetts Turnpike) provides the only limited-access highway to Boston from west of the city. Route 128 and the Southeast Expressway are heavily congested roadways, particularly during peak periods.

Traffic volumes on Route 128 are approximately 135,000 vehicles per day north of Route 24 (towards I-95) and 185,000 vehicles per day to the south (towards I-93/Route 3). I-93/Route 128 provides four general purpose travel lanes in each direction between Route 24 and I-93/Route 3. North of the I-93/Route 3 interchange in Braintree, four general-access lanes and one high occupancy vehicle (HOV) lane in the peak direction and three general access lanes in the non-peak direction are provided during peak periods. During off-peak periods, the roadway provides four lanes in each direction through Southampton Street Massachusetts Highway Department operates HOV lanes on I-93/Route 3 from just south of the Furnace Brook Parkway exit in Quincy to the Columbia Road exit in Dorchester. Currently, the HOV lanes are open to all two-person carpools. Traffic volumes on I-93/Route 3 are as high as approximately 191,000 vehicles per day.

2.4.3 Regional Traffic Volume Growth

As the population in the South Coast area and employment in the Boston area have grown, the demands on the roadway system linking Southeastern Massachusetts to the rest of the region have increased rapidly. Traffic volumes on the limited-access state routes linking the South Coast area to the employment centers of Boston have been growing steadily over the past decade, as shown in Table 2-1. Overall, traffic

volumes on the roadways in the South Coast area have grown at an annual rate of two to three percent over the past decade. However, traffic volumes have grown more rapidly in some areas.

The most dramatic increases in traffic volumes are on Route 24 in Raynham and Taunton, where traffic volumes have increased about 5 percent annually. Traffic volumes on Route 140 in Taunton have been increasing at the highest annual rate, 5.3 percent. In some cases, projected volumes for the year 2020 that were made in 1997 were already reached in 1999.

Only Route 128 and I-93 (the Southeast Expressway) exhibit relatively stable traffic volumes. These roadways are known as some of the most congested highways in the state and traffic volumes on these roadways are at or near capacity for long portions of the day, making further increases in average daily traffic volumes infeasible. Furthermore, the very slight decrease in traffic on portions of I-93 may reflect changes in motorist route choices due to Central Artery/Tunnel project construction, and demand reductions from the Route 3 corridor due to the restoration of the Old Colony Commuter Rail service.

The significant increases in traffic volumes on the principal highways linking the South Coast area to downtown Boston have led to deteriorating levels of service, especially during peak periods. Delays on these roadways are now common and have become much worse over the past decade. These delays are especially prevalent on Route 24 as it approaches Route 128/I-93 in Randolph. Furthermore, as discussed in greater detail later in this section, traffic accidents occur with increasing frequency along these corridors, indicating that these traffic volume increases may be resulting in increased risk of injury and property damage for the commuting public.

Southeastern Massachusetts is one of the fastest growing areas in the Commonwealth. Between 1960 and 2000, this area experienced a growth rate of 31 percent, and population growth projections indicate that in the next 25 years, over 100,000 additional people will reside in the area.

Between 1960 and 1990, this area had an annual growth of over 2,500 people per year from a base population of 343,353 to its 1990 population of 430,846. Growth slowed somewhat between 1990 and 2000, to an annual growth of approximately 1,950 people per year. These figures translate to a growth of 4.5 percent between 1990 and 2000, which is greater than the growth rate of the Commonwealth as a whole. Each 10,000 new residents coming into the area are expected to generate a need for 3,500 new residential units, and are predicted to generate 27,650 new vehicle trips per day, further degrading the level of service provided by the regional transportation system.

Table 2-1 Average Daily Traffic Volume Growth

	Average Daily Traffic (vehicles per day)			Growth Rate (percent)		
Count Location	Historic	Recent	Change	Total	Period	Annual
Route 24						
Randolph (south of Route 128)	96,601	122,400	25,799	27.0%	1989-2005	1.7%
Avon (south of Pond Street)	90,196	97,100	6,904	8.0%	1989-2004	0.5%
Raynham (north of Route 44)	42,168	74,300	32,132	76.0%	1989-2004	5.1%
Taunton (north of Route 140)	37,734	68,109	30,375	80.0%	1989-2005	5.0%
Freetown (at Fall River City Line)	29,822	52,300	22,478	75.0%	1989-2005	4.7%
Fall River (south of Wilson Road)	19,000	26,700	7,700	41.0%	1989-2003	2.9%
Route 140						
Taunton (south of Route 24)	23,133	41,400	18,267	79.0%	1989-2004	5.3%
Freetown (north of New Bedford City Line)	25,250	32,447	7,197	22.0%	1989-2004	1.5%
New Bedford (north of Phillips Road)	23,449	32,400	8,951	38.0%	1989-2005	2.4%
New Bedford (north of Hathaway Road)	35,631	49,700	14,069	39.0%	1989-2005	2.5%
Route 79						
Fall River (north of Hermon Street)	16,460	25,400	8,940	54.0%	1989-2004	3.6%
I-95						
Foxborough (north of I-495)	57,800	93,200	35,400	61.0%	1997-2003	10.2%
Canton (south of I-93 / Route 128 / Route 1)	80,800	98,700	17,900	22.0%	1997-2004	3.2%
I-495						
Mansfield (south of Route 140)	37,400	69,900	32,500	46.0%	1996-2005	5.2%
Taunton (south of Bay Street)	40,400	69,100	28,700	42.0%	1996-2005	4.6%
Raynham (north of Route 24)	48,277	67,098	18,821	39.0%	1996-2005	4.3%
Middleborough (between Route 44 and Route 18)	35,100	56,100	21,000	60.0%	1996-2005	6.6%
I-195						
Fall River (west of Route 24)	66,053	81,339	15,286	23.0%	1996-2005	2.6%
New Bedford (east of Route 140)	55,300	73,500	18,200	33.0%	1996-2005	3.7%
Route 3						
Braintree (north of Union Street)	130,000	133,600	3,600	2.8%	1996-1997	2.8%
Route 128 / I-93 / I-95						
Quincy (north of Route 28, east of Route 24)	168,955	184,900	15,945	9.0%	1989-2004	0.6%
Canton (at Dedham townline, west of Route 24 / I-95	128,537	134,684	6,147	5.0%	1989-2004	0.3%
Route 3 / I-93 (S.E. Expressway)						
Boston (north of Granite Avenue)	174,612	190,993	16,381	9.0%	1999-2004	1.9%
Boston (north of Southampton Street)	176,322	174,284	-2,038	-1.0%	1989-2006	-0.1%

ADT Average Daily Traffic (vehicles per day)
Source: Massachusetts Highway Department

Access from South Coast area communities to Boston is primarily via Route 24 to Interstate 93/Route 128. These principal, limited-access highways currently operate at or over capacity, with peak-hour volumes of up to 2,600 vehicles per hour and level-of-service F on Route 24 in Raynham, and 3,500 vehicles per hour and level-of-service F on I-93/Route 128 in Braintree. Although several mitigation measures have been implemented on I -93 to reduce congestion (high-occupancy vehicle lanes, improved MBTA Red Line service, and Old Colony Commuter Rail service), this highway continues to operate at unacceptable levels of service, resulting in substantial congestion and decreased safety. There are no alternatives to the use of Route 24 and I-93, and no proposed mitigation measures to reduce congestion.

2.4.4 Safety

The number of accidents on the primary travel routes within the South Coast area has generally been increasing over the past years, as shown in Table 2-2. Not only has the number of accidents increased, but the number of injuries has also increased substantially, with annual growth rates of 20 percent per year on Route 24 and 10 percent on Route 140. In contrast, there has been a decrease in the number of accidents on Route 79, but little change in the number of injuries.

Table 2-2 Accidents on Primary Study Area Highways

Route	2003	2004	2005	Annual Percent Change
Accidents				
Route 24	876	1053	1259	19.9%
Route 140	327	395	390	9.2%
Route 79	155	140	121	-11.7%
Total	1,358	1,588	1,770	14.2%
Injuries				
Route 24	416	519	599	20.0%
Route 140	150	207	183	10.5%
Route 79	46	57	45	-1.1%
Total	612	783	827	16.3%
Fatalities				
Route 24	11	8	9	-9.6%
Route 140	4	4	4	0.0%
Route 79	1	2	0	N/A
Total	16	14	13	-9.9%

Massachusetts Highway Department, Accident Database, 2006.

Projected future growth in traffic volume on the principal South Coast area roadways cannot be sustained by the current regional transportation system. Recurrent traffic congestion is becoming a more significant problem for the region, as is the increasing frequency of traffic accidents (Table 2-2). Not only has the number of accidents increased, but also the number of injuries has increased substantially with annual growth rates of 20 percent per year on Route 24 and 10.5 percent on Route 140.

Although increasing the capacity of the region's highways might improve safety, highway capacity expansions are not in line with national and local transportation policy and physical expansion of the highway links is likely to be infeasible. As noted in Section 2.10, widening the southern portion of Route 24 is being considered (but is not currently part of the Transportation Improvement Program), and there are no plans to widen the northern section of Route 24.

2.5 Air Quality and Climate Change

Motor vehicles are the predominant sources of ozone precursor emissions within the South Coast area, which has been designated as a severe non-attainment area for ozone by the EPA.[3] Ozone at the earth's surface is a health concern, as high concentrations can harm lung function. Motor vehicles are the predominant sources of ozone precursor emissions within the South Coast area. Automobiles also emit carbon monoxide through the partial combustion of carbon-containing compounds in gasoline.

Reducing greenhouse gas emissions is a priority for the Commonwealth. State agencies, particularly DEP, are working to cut greenhouse gas emissions from motor vehicles and fuels through several initiatives, including efforts to promote transit-oriented development.

As documented in previous sections, the highways serving the South Coast region convey high volumes of automobile traffic, and have high levels of congestion (which increases vehicle emissions). There are currently no alternatives for South Coast commuters that would reduce the emissions of greenhouse gases. A shift in travel from automobiles to rail could reduce vehicle emissions and improve regional air quality.

3 A non-attainment area is defined by the EPA as an area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

2.6 Inadequate Regional Transit System Capacity

Transit services within the South Coast area include bus and demand-response services operated by regional transit authorities and private carriers. Park-and-ride facilities and carpool/vanpool services are offered along the primary travel corridors in the South Coast area. Outside of the South Coast area, the MBTA operates commuter rail service.

2.6.1 Bus and Demand-responsive Services

Two public transit authorities provide local bus service in the South Coast area, including some feeder service to commuter rail stations:

- The Greater Attleboro Taunton Regional Transit Authority provides local fixed-route bus service in the Attleboro/Taunton area and demand-response transportation in the South Coast area communities of Berkley, Dighton, Lakeville, Norton, Raynham, and Taunton. The Greater Attleboro Taunton Regional Transit Authority operates 14 fixed routes and two intercity routes with service Monday through Friday from 6:00 AM to 6:30 PM and Saturday from 9:00 AM to 5:00 PM. Seven routes serve the city of Attleboro, six routes serve Taunton, and one connects Attleboro and Pawtucket, Rhode Island. One of the intercity routes connects Taunton and Attleboro via Norton, and the other connects Taunton and Providence, Rhode Island. There is also a shuttle service in downtown Middleborough and a connector route from Mansfield to Norton.

- The Southeastern Regional Transportation Authority serves the communities of Fall River, New Bedford, and Somerset with fixed-route and demand-response service. The Southeastern Regional Transportation Authority offers ten routes in the New Bedford area, eleven routes in the Fall River area, and one route between New Bedford and Fall River. The weekday service spans from 5:30 AM to 6:30 PM in New Bedford and 6:00 AM to 6:00 PM in Fall River. Saturday service runs from 7:00 AM to 6:00 PM in New Bedford and 6:30 AM to 6:00 PM in Fall River.

Four private carriers currently provide service from the South Coast area to South Station in Boston:

- H&L Bloom provides service from Taunton and Raynham to Boston via Route 138 and Route 24. Service is offered on 30-minute headways during the peak periods and 120-minute headways during off-peak hours. The scheduled travel time is 70 to 75 minutes during peak periods and 60 to 75 minutes during off-peak periods. Bus stops are located at the Bloom Terminal in downtown Taunton and the Raynham-Taunton Greyhound Park Park-and-Ride in Raynham. The buses also will make unscheduled stops on request at several designated locations along Route 138 between the Bloom Terminal and the Raynham Park-and-Ride lot. On weekdays, H&L Bloom also provides one morning and one evening trip each way between Taunton and Fall River.

- Peter Pan Bonanza provides service from Fall River to Boston via Route 24. During the morning peak period, three buses are scheduled to operate from Fall River to Boston, departing at 6:10 AM, 6:40 AM, and 8:40 AM. In the evening, three buses are scheduled to leave Boston between 4:30 PM and 6:30 PM on 60-minute headways. The scheduled peak period travel time is 60 to 75 minutes. During off-peak periods, the scheduled travel time is 60 minutes. The only bus stop on the route is the Southeastern Regional Transportation Authority terminal in downtown Fall River.

- DATTCO provides service from Fairhaven, New Bedford, and East Taunton to Boston via Route 140 and Route 24. Trips depart on 25 to 35 minute headways during the peak periods and every two hours during off-peak times. The scheduled peak period travel time is 95 minutes from New Bedford and 65 minutes from East Taunton. Bus stops are located at the DATTCO garage in Fairhaven, the Southeastern Regional Transportation Authority terminal in downtown New Bedford, the Mount Pleasant Street Park-and-Ride lot in New Bedford, and the Silver City Galleria Park-and-Ride lot in East Taunton.

- Interstate Coach provides service from Middleborough servicing Easton and Stoughton via Route 138 and Route 24.

All four services terminate at South Station in Boston. None of the private carriers offer service to the Back Bay area. Round trip fares range from $18 for Taunton, $27 for Fall River and $23 for New Bedford. Multi-ride tickets are available at a lower cost per trip.

2.6.2 Carpools and Vanpools

CARAVAN for Commuters, Inc. is a private non-profit corporation providing vanpool organizational and management services. Caravan has established vanpools in all communities of the South Coast area. As with buses, vanpool and carpool travel times are severely impacted by slow travel speeds on the expressway and secondary roads.

2.6.3 Existing Park-and-Ride Facilities

Currently, there are nine park-and-ride lots located in the South Coast area. Five facilities are located along the primary access routes from the region to the Boston metropolitan area. The locations of these five park-and-rides, the service provided, and usage is summarized below. There are no data on the destinations of commuters who use these facilities.

- The park-and-ride facility in New Bedford is located on Mount Pleasant Street at Exit 4 from Route 140. This lot provides 202 free parking spaces for commuters. Utilization of this lot has been fairly steady from 1996 to 2006, increasing slightly from 79 percent to 81 percent. Carpool, vanpool, and bus patrons use this lot. DATTCO provides bus service to this facility.

- A park-and-ride lot is located adjacent to Route 24 at Exit 10 (Gramp Deane Road) in Freetown. There are 32 parking spaces provided at no charge. Utilization of this facility increased from 27 percent in 1996 to 88 percent in 2006. Carpool and vanpool patrons use this facility. No bus service is provided.

- In Raynham, a park-and-ride lot is located on Route 138 at the Raynham-Taunton Greyhound Park. The facility is located within the track's customer parking field. There are no specific spaces identified for park-and-ride patrons, but Southeastern Regional Planning and Economic Development District (SRPEDD) estimates capacity at 150 spaces. Utilization was 16 percent in 2006, down from 41 percent in 1996. Carpool, vanpool, and bus patrons use this lot. H&L Bloom provides bus service to this facility.

- A second park-and-ride lot is located in Raynham at the intersection of Route 138 and Carver Street. Use of the 80 free spaces available increased from 20 percent to 29 percent between 1996 and 2006.

- Park-and-ride space is designated at the Silver City Galleria Mall near Exit 11 on Route 140 in Taunton. This lot contains 187 spaces, with utilization increasing from 34 percent to 82 percent between 1996 and 2006. This lot is serviced by DATTCO and the Greater Attleboro Taunton Regional Transit Authority.

In addition to these five lots, there are four park-and-ride facilities located in the South Coast area but not in the immediate vicinity of the primary access routes to Boston. The locations of the four park-and-rides, the service provided, the daily fees, and usage are summarized below:

- The Somerset park-and-ride facility is located at the intersection of Routes 6 and 138. The facility is located within a larger parking lot at a shopping mall. There are currently 80 spaces designated for commuter parking. Between 1996 and 2006, utilization rates at this site decreased from 98 percent to 79 percent. The lot is used only by carpool and vanpool patrons. There is no charge for parking.

- A second park-and-ride lot is located in Somerset on Route 103 at the I-195 Exit 4 interchange. This lot primarily serves commuters to the Providence area. Usage at the lot increased between 1996 and 2006, rising from 54 percent to 103 percent. There is no charge for parking at the 67 spaces provided.

- The Mattapoisett park-and-ride facility is located on Route 6 near I-195 Exit 19. This lot provides 80 free spaces, with utilization increasing from nine percent to 20 percent between 1996 and 2006.

- The Westport park-and-ride lot provides free parking for 20 vehicles at the intersection of Route 88 and Briggs Road. Use of this lot decreased from 45 percent to zero percent between 1996 and 2006.

Several park-and-ride lots are outside the South Coast area, but still along the Route 24 access corridor to Boston:

- The West Bridgewater park-and-ride lot is located at the Route 24 interchange with Route 106 (Exit 16). The lot contains free parking for 140 cars. Average utilization of this lot is near 100 percent. Vanpool, carpool, and bus patrons use this facility. H&L Bloom and Interstate Coach stop at this park-and-ride lot.

- A second West Bridgewater park-and-ride lot is located on Route 106 in Elm Square, approximately three miles east of Route 24 and the Exit 16 interchange. Approximately 65 spaces are available in this unpaved lot at no charge. Average daily usage is very light, under 10 percent. The Elm Square lot is used primarily as an overflow lot for the Exit 16 lot. It is used by vanpool and

carpool patrons.

- The Bridgewater park-and-ride lot is located on Route 104 at the Route 24 Exit 15 interchange. The lot currently provides 60 free spaces. The utilization rate at this location is about 77 percent. Interstate Coach provides bus service to this facility. Vanpools and carpools also use the lot.

There are also three private park-and-ride lots in the South Coast area:

- A private park-and-ride lot is operated by DATTCO in Fairhaven. The capacity of this lot is 80 vehicles. There is a $1 charge, and the lot is restricted to DATTCO customers. In 2006, utilization was 12 spaces or 15 percent.

- A private park-and-ride lot is operated by H&L Bloom at the company's Taunton Terminal. It contains 160 spaces with a 2006 utilization rate of 44 percent.

- Peter Pan Bonanza operates a private park-and-ride lot in Fall River. There is an hourly fee for parking.

2.6.4 Commuter Rail Service

No commuter rail service is offered within the South Coast area. Although commuter rail service is offered outside of the South Coast area by the MBTA (Figure 2-2), this service is difficult for residents to access and is at or over capacity under existing conditions.

The Attleboro/Providence Line has stations in Providence, Attleboro, Mansfield, and Sharon. The Stoughton Line has a station in Stoughton and the Middleborough Line has stations in Brockton, Bridgewater, and Middleborough/Lakeville. Several communities located on the fringes of the South Coast area, including Easton, Raynham, Norton, and Lakeville, are near existing commuter rail stations.

Communities in the heart of the South Coast area, however, are outside a six-mile access radius of these stations, and some are more than 20 miles from the nearest commuter rail station.[4] Commuter rail is currently not a practical alternative for most South Coast area residents traveling to Boston, especially from the communities of Taunton, Berkley, Freetown, Fall River, and New Bedford, due to distance from the nearest station. The proximity of commuter rail service to the population centroid of each South Coast area community is shown in Table 2-3.

4 According to CTPS, most commuters live within a 6- to 8-mile radius of a commuter rail station. This distance is generally used for estimating ridership.

Table 2-3 Proximity of South Coast Communities to Commuter Rail Service

Community	Closest Station	Proximity[1] (mile)
Acushnet	Middleborough/Lakeville	15.7
Attleboro	Attleboro	0.0
Berkley	Middleborough/Lakeville	10.7
Bridgewater	Bridgewater	0.7
Canton	Canton Center	0.0
Dartmouth	Middleborough/Lakeville	20.9
Dighton	Middleborough/Lakeville	13.7
Easton	Stoughton	5.1
Fairhaven	Middleborough/Lakeville	22.5
Fall River	Middleborough/Lakeville	19.6
Foxborough	Mansfield	3.4
Freetown	Middleborough/Lakeville	10.8
Lakeville	Middleborough/Lakeville	3.3
Mansfield	Mansfield	0.0
Marion	Middleborough/Lakeville	19.8
Mattapoisett	Middleborough/Lakeville	19.4
Middleborough	Middleborough/Lakeville	1.5
New Bedford	Middleborough/Lakeville	20.8
North Attleborough	Attleboro	4.8
Norton	Mansfield	5.7
Raynham	Bridgewater	7.5
Rehoboth	Attleboro	8.8
Rochester	Middleborough/Lakeville	13.7
Seekonk	Providence	7.5
Sharon	Sharon	0.3
Somerset	Providence	19.4
Stoughton	Stoughton	0.0
Swansea	Providence	15.5
Taunton	Middleborough/Lakeville	9.7
Wareham	Middleborough/Lakeville	15.8
Westport	Middleborough/Lakeville	28.3

Source: Google Maps
1 Proximity measured to population centroid

While residents from Lakeville are able to use commuter rail to commute to Boston, system capacity is limited due to the lack of adequate parking. Commuter rail parking lots in Attleboro, Mansfield, Stoughton, and on the Middleborough Line are either unable or will not be able to handle any more growth, and communities are reluctant to increase parking lot capacity. In addition, some peak hour trains experience heavy passenger loads. Therefore, the existing commuter rail service, although within reach of some communities in the South Coast area, will not be sufficient to handle the anticipated growth in ridership. Parking utilization rates for the Providence, Stoughton, and Middleborough Lines and ridership are provided in Tables 2-4 and 2-5.

Table 2-4 Ridership on Providence, Stoughton and Middleborough Lines

Line	AM Peak Passengers	AM Peak Seating Capacity	AM Peak Utilization*
Providence	11,017	8,532	129%
Stoughton	2,771	3,558	78%
Middleborough	3,743	3,696	101%

Sources: MBCR Ride Check December 2006, MBTA South Side Equipment Schedule

* Assumes all passengers continue to South Station, Stoughton, Providence/Stoughton and Middleborough/Lakeville Lines.

Table 2-5 Parking Utilization at Providence, Stoughton and Middleborough Lines Stations

Station	Occupied Spaces	Total Spaces	Utilization
Providence Line+			
Providence	N/A	330	N/A
South Attleboro	918	992	93%
Attleboro	756	770	98%
Mansfield	812	805	101%
*Stoughton Line**			
Stoughton	350	441	79%
*Middleborough Line**			
Middleborough/Lakeville	595	852	70%
Bridgewater	430	500	86%

\+ MBTA, 2000

* OCPC 2004

Currently, there are limited regional transit services provided in the South Coast area and they provide inadequate links between centers of activity in the region; specifically, between Taunton, Fall River, New Bedford, and Boston. The only regional transit services currently provided in the South Coast area are private express bus services to South Station in Boston and local bus services operated by the Greater Attleboro Taunton Regional Transit Authority and the Southeastern Regional Transit Authority. The private express bus service is subject to the same congestion and safety problems on the highway system as other vehicles. The local bus routes provide services only within (not between) the three urban areas of New Bedford, Fall River, and Taunton.

Commuter rail service currently does not extend into the South Coast area, making access to commuter rail difficult for area residents. The Middleborough Line serves areas east of the South Coast region and southeast of Boston, with stations in Lakeville and Bridgewater, while the Attleboro/Providence and Stoughton lines serve communities to the north and west of the South Coast region. The Attleboro and Mansfield stations are the primary access points on the Attleboro/ Providence Line. The Stoughton Station serves as the primary access point on the Stoughton Line. The major population centers of the communities in the southern half of the South Coast area are as much as 25 miles from existing commuter rail stations, with access over local secondary roads. Parking lots at most existing stations are regularly filled to capacity on weekdays prior to 7 AM, which also limits access to rail service.

2.6.5 Freight Rail Service

Freight railroad service in the South Coast area is provided by CSX and Mass Coastal. Regular freight service is provided on the New Bedford Secondary, the Fall River Secondary, and the Middleborough Secondary, which connect to the Northeast Corridor via the Attleboro Secondary. CSX also operates freight service on the existing Stoughton Line between Canton and Stoughton. Mass Coastal serves customers on the southern portion of the old Stoughton Line between Weir Junction and Winter Street in Taunton, on the Dartmouth Secondary, and on the Buzzards Bay Secondary. Mass Coastal connects with CSX to move freight in and out of the region. Freight service operated on commuter rail lines constrains the potential movement and operations of commuter rail.

2.7 Access to Opportunity

Poor or limited transportation opportunities also constrain access by South Coast area residents to important Boston destinations, including education opportunities provided by numerous private and public colleges and universities, the highest concentration of medical facilities and specialties in the Commonwealth, cultural facilities, and sporting events. Existing highway congestion, extended travel times, and limited (and often expensive) parking affect the ability of many area residents to access these destinations.

The City of Boston continues to provide substantial employment opportunities at all levels, and also contains a substantial employment labor force. Many of the South Coast area communities, particularly in the towns of Easton, Raynham and Taunton, have a substantial work orientation to Boston. Access between South Coast area communities and downtown Boston is constrained by the limited, overtaxed highway system and the lack of alternative transit modes. The ability to park in Boston is constrained by the limited space available to provide parking, high demand for parking resulting from new development, the high cost of parking, and the metropolitan area parking freeze. Residents of South Coast area communities would benefit substantially from improved employment access and reduced cost of commuting and parking.

2.8 Mode Choice and Connectivity

Travel options within the region and to the metropolitan Boston area are currently limited to the automobile and limited bus service, as the infrastructure of the region consists only of highways. The proposed Project, which is consistent with the current transportation policy both at the federal and state levels, would introduce a fixed-guideway transit option to a region currently under-served by all modes of transit. Introduction of commuter rail service would increase mode choice for area residents and offer a new mode option to travelers to the region. The proposed Project would also increase opportunities for multimodal connections by creating a major intermodal transportation center in New Bedford that provides commuter rail, freight, bus, and waterfront trolley connections with links to the water terminal for ferry and water taxi services.

2.9 Smart Growth

The South Coast Region also has identified economic development and environmental preservation as two key needs that are related to transportation. Southeastern Massachusetts has been the fastest growing region in the Commonwealth for many years both in terms of population and housing units. At the same time, population and housing growth has been inequitably distributed, and the historic cities of Fall River and New Bedford are experiencing a decline in population. The South Coast has also been characterized by exurban sprawl, the decline of gateway cities, and the consumption of natural areas at a rate that far exceeds the population growth rate. This type of uncontrolled growth results in the loss of farms, fields and forests and damages the character of the historic villages and cities within the region.

At the same time, growth is needed. The poor connectivity to the metropolitan Boston area may constrain economic activity in the urban areas of New Bedford and Fall River. These two cities currently have higher unemployment rates than the state average. In 2006, the New Bedford metropolitan area had an unemployment rate of 8.2 percent, while Fall River had an unemployment rate of 8.6 percent. The state average is 5.0 percent.[5]

Improved access to employment markets in Boston would provide employment opportunities for the New Bedford and Fall River labor force that would provide economic benefits for these communities. Commuter rail service could also allow limited "reverse commutes" from area communities like Taunton to New Bedford and Fall River, which would thereby gain access to a larger labor pool within the Southeastern Massachusetts region. Economic benefits are predicted based on data from other regions, which demonstrates that the introduction of commuter rail into previously unserved areas typically has a significant positive impact on residential property values.

Improved transportation access via commuter rail would likely increase attendance at tourism attractions proposed in the New Bedford – Fairhaven Master Plan. It would also alleviate some of the parking constraints at these attractions.[6] The New Bedford Harbor Master Plan provides a comprehensive plan for redevelopment and revitalization of the harbor area, which has recently been designated as the New Bedford Whaling National Historic Park. Attractions at this park, which include the Department of Conservation and Recreation's Schooner Ernestina, the proposed New Bedford Oceanarium, festivals, tours, and a new waterfront visitor destination at the

5 Massachusetts Executive Office of Labor and Workforce Development website. viewed December 2007.
6 RKG Associates, 1999. Task 2 Research Findings: Existing Conditions Analysis. New Bedford Harbor Today.

State Pier, are estimated to attract an additional 120,000 visitors a year and generate $4 Million in gross revenues. The annual waterfront Summerfest currently attracts 100,000 people.[7]

The scale and geographic reach of the South Coast Rail project offer an unprecedented opportunity to generate new economic development and to shape this growth so that the project helps preserve environmental resources. By partnering with municipalities to jointly plan the transportation project along with local land-use, the project can help cluster people and jobs near train stations, opening up new economic development opportunities, while directing growth away from natural areas. This approach curbs sprawl.

2.10 Planning and Policy Context

Public transportation policy has evolved over the past decades as society has become more aware of the consequences of increased traffic congestion. This awareness has resulted in significant changes in transportation policy and the types of solutions proposed to address transportation needs. The interstate highway program was the driving force in transportation policy from the 1950s through the 1980s. This system of limited access highways greatly increased the nation's mobility and allowed people to live further from their jobs located in the urban core. It also encouraged businesses to locate outside the urban core away from much of the public transit system's infrastructure and services.

Several events over the past 35 years on both the federal and state levels helped to shape the current transportation system and the transportation policies of the Commonwealth. The first of these events occurred during the 1970s. On a national level, the gasoline crisis of 1973 and stronger opposition to new highway projects led to an evolution in transportation policy. The focus of public policy began to shift from the single occupant vehicle toward obtaining the greatest efficiency from the existing transportation infrastructure and providing a balanced transportation system.

In early 1970, Massachusetts Governor Francis Sargent signed legislation that removed the construction of the I-95 Southwest Expressway and the Inner Beltway from the state's transportation program. This legislation particularly impacted the Southeastern Massachusetts region as it removed the final link of I-95 between Route 128 in Canton and downtown Boston. This left commuters in the region with limited highway access choices to the metropolitan job core.

7 *FXM Associates, New Bedford/Fairhaven Harbor Master Plan. Technical Memorandum: Expanded Economic Analysis*. 1999.

The next significant change in transportation policy was the passage of the Clean Air Act Amendments in 1990. The Clean Air Act Amendments established stringent requirements for attaining and maintaining national air quality standards. One approach to achieving these air quality goals is to reduce the number of vehicle miles traveled on the nation's roadways. Providing and promoting alternate travel modes are one way to achieve the vehicle miles traveled reduction goal.

The final major policy change was reflected in the Intermodal Surface Transportation Efficiency Act enacted in 1991 and subsequently, the Transportation Equity Act for the 21st Century enacted in 1998. This federal legislation established a national goal of a balanced intermodal transportation system. For the first time, the policy component of the federal transportation funding legislation considered the interaction of the various modes. It encouraged solutions that made intermodal transfers easier and more convenient and attractive to the consumer. The act required coordinated transportation planning between the regions and the state, and mandated that transportation improvements be consistent with and contribute to attaining and maintaining national air quality standards. The Transportation Equity Act for the 21st Century continues many of the integrated goals established under Intermodal Surface Transportation Efficiency Act and provides higher funding levels for transit projects. Although federal funding is not being sought for the South Coast Commuter Rail Extension, these goals are shared by the Commonwealth and establish the basis of its transportation policy.

2.10.1 Anticipated Investment in Transportation Facilities and Services

Each metropolitan area in the Commonwealth must prepare a Long Range Transportation Plan and a Transportation Improvement Program for their region. These two documents define the programmed transportation improvements to be implemented for that specific metropolitan area. The transportation policy and plan developments of three MPOs impact the South Coast area. The three MPOs are:

- SRPEDD represents the Taunton, New Bedford and Fall River metropolitan areas;
- The Old Colony Planning Council (OCPC) represents the Brockton metropolitan area; and
- The Metropolitan Area Planning Council (MAPC) is the regional planning agency for the Boston metropolitan area. The Boston Metropolitan Planning Organization is the regional MPO.

Two of the regions, SRPEDD and OCPC, represent South Coast communities. The third region, MAPC, represents communities along the primary transportation access routes from the South Coast communities.

The following is a summary of transportation system changes that have occurred or are programmed to occur within the South Coast area by these three MPOs. In addition, changes to the primary access routes to the Boston metropolitan area are included.

New Bedford/Fall River Region (SRPEDD)

A number of small and medium sized transportation improvement projects are programmed for the SRPEDD region; however, major transportation improvement projects that would increase peak period capacity on the region's major highways are not included. Projects included in SRPEDD's Transportation Improvement Plan and Long Range Transportation Plan that affect the South Coast communities and/or the primary access routes to the Boston metropolitan area include:

- Corridor improvements to Route 18 in New Bedford.
- Reconstruct Route 24/Route 140 interchange in Taunton.
- Relocate Route 79 in Lakeville.
- Reconstruct Route 79 in Fall River.
- New interchange on Route 24 in Fall River and Freetown.
- Expand parking at South Attleboro and Mansfield commuter rail stations.
- Study Route 24 between Route 140 and I-495 (corridor and interchange improvements).
- Reconstruct Route 140 and Route 6 in New Bedford.
- Study the cost to convert Route 24 to interstate highway design standards (completed in 2003).

Brockton Region (OCPC)

Several small and medium sized transportation improvement projects are programmed for the OCPC region, but none are major transportation improvement projects that would increase peak period capacity on the region's major highways. Projects included in OCPC's TIP and LRTP that impact the South Coast communities and/or the primary access routes to the Boston metropolitan area include:

- Developing a comprehensive Route 24 major investment study as described under SRPEDD.
- Studying creating HOV lanes on highways to Boston.
- Studying to provide additional parking capacity at the Stoughton Commuter Rail Station.

Boston Region (MAPC)

Although no South Coast communities fall within the Boston region, the primary corridor from the South Coast – Route 24 to I-93/Route 128 to I-93/Route 3 – is included in the region. Planned and programmed improvements to the highway, commuter rail, and transit systems within the Boston region that could impact access from the South Coast area include:

- Modifications to the Route 128/Route 24 Interchange.
- Providing additional parking capacity at the Quincy Adams Red Line station located at the junction of I-93/Route 128 and I-93/Route 3 in Quincy.
- Reconstructing Columbia Junction on the Red Line.
- Studying extending commuter rail service along the Middleborough Line to Wareham.

2.10.2 Transportation Goals and Objectives

The South Coast Rail Study is part of a comprehensive effort to achieve a series of broad study area transportation and development goals, as well as specific objectives for improving the quality of transportation services and the equity of the distribution of services within the South Coast area. These goals and objectives have been developed as part of both broad-based policies and specific regional documents. The following two sections summarize the relevant studies and policies and their applicability to this Project.

Statewide Policy Documents and Studies

A number of important studies, reports, and policy statements have helped to document the development of transportation policy in eastern Massachusetts. Among these are:

- The MBTA's Program for Mass Transportation. The Program for Mass Transportation is the mass transit plan for the Boston region and was updated in 1978, 1994, and 2003. The objective of the Program for Mass Transportation is to identify and recommend projects that will result in a cost-effective transit system that serves the greatest number of people in a way that respects the environment and enhances responsible economic development. The 2003 update identified mass transit needs through the year 2030 that would require capital expenditures. Commuter rail service to New Bedford and Fall River was included as a transit project in the 1994 and 2003 updates of the Program for Mass Transportation.[8]
- The Boston Transportation Planning Review (1970-1973) re-examined the highway construction program in the Boston area following Governor Sargent's cancellation of the I-95 Southwest Expressway and Inner Beltway highway projects in 1970. The results of the Boston Transportation Planning Review established a new transportation strategy with a strong emphasis on transit as a means to provide additional transportation capacity into Boston. This document helped define the Central Artery Project as well as the highway system that connects the Boston core with Southeastern Massachusetts.
- Toward a New Growth Policy for Massachusetts (1977), a state cabinet-level report, documented the need to maintain downtown Boston as a strong and healthy economic and employment core for the eastern Massachusetts region, and encouraged redevelopment of the older urban areas across the state. This document is related to the South Coast communities in two ways. First, it encourages redevelopment of older urban areas across the state. Both New Bedford and Fall River are older urban areas seeking economic development opportunities. The two cities are designated as both federal and state economic target zones. Second, the Southeastern Massachusetts area provides affordable housing opportunities for professionals working in the metropolitan Boston area.
- South Coast Rail Plan for Action (2007) identified the South Coast of Massachusetts as one of the fastest growing regions in the state, and stated that restoration of passenger rail service could be a catalyst for economic development and job growth in the region. The plan also stated that the Project would reach under-served populations and promote smart growth.

8 *Commuting Into a New Century:* The New Program for Mass Transportation, Executive Office of Transportation and Construction, March 1, 1994.

Goals and Objectives for Each Metropolitan Planning Region

Regional transportation goals provide the basis for evaluating options for improvement of transportation services and facilities in the South Coast area. They support improvements to transportation services, increase mobility, provide transit services that are cost effective, and provide a more equitable distribution of transportation benefits. The objectives have been utilized, in part, for evaluating the alternatives described in this document. These locally adopted goals and objectives support the broad, long-term study area development and transportation strategy.

New Bedford/Fall River/Taunton Region

The SRPEDD has adopted a multi-level set of transportation goals and objectives in the region's 2007 Regional Transportation Plan.[9] This planning document includes eight goals and objectives in support of the region's overall goal of developing and maintaining an effective, safe, and accessible transportation system that promotes sustainable economic development and preserves the region's quality of life. Those relevant to the Purpose and Need of this Project include:

- Support the economic vitality of the metropolitan area, especially enabling global competitiveness, productivity, and efficiency.
- Increase the accessibility and mobility options available to all people and freight.
- Protect and enhance the environment, promote energy conservation, and improve quality of life.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and for freight.
- Emphasize preservation of the existing transportation system.

The plan specifically states that continued support for extending commuter rail service to Taunton, Fall River, and New Bedford helps achieve these goals.

Brockton Region

The OCPC has adopted a multi-level set of transportation goals and objectives in the region's 2007 Regional Transportation Plan.[10] This planning document includes 14 goals and objectives in support of community vision.

9 *2007 Regional Transportation Plan*, Southeastern Regional Planning and Economic Development District, 2007.
10 *2007 Regional Transportation Plan*, Old Colony Planning Council, March 31, 2007.

Those relevant to the Purpose and Need of this Project include:

- Provide an aesthetic transportation system that supports the economic vitality of the region and enables global competitiveness, productivity, and efficiency.
- Increase the accessibility and mobility options available to all people and freight.
- Promote a transportation system that protects and enhances the environment, conserves scenery, and improves quality of life in the region.
- Enhance the integration and connectivity of the transportation system, across and between a well-balanced network of modes, for people and freight.
- Emphasize preservation and modernization of the existing transportation system.
- Support smart growth principles and provide a transportation system that is regionally coordinated and based on effective transportation and land use planning.

Boston Region

The MAPC adopted eight visions and corresponding policies in their 2007 Regional Transportation Plan.[11] These goals and policies are based on a vision for the region that emphasizes the maintenance, management, and operation of a multimodal transportation system that provides a high degree of mobility for all people. The visions of the Boston area's transportation program relevant to the Purpose and Need of this Project include:

- Emphasize preservation, modernization, and efficiency of the existing transportation system.
- Provide a coordinated mix of transportation modes and services to give users increased opportunities for convenient, reliable, speedy, affordable, and accessible travel.
- Reduce air quality degradation and other environmental degradations caused by transportation.
- Ensure that low-income and minority residents share equally in access to the transportation network and its mobility benefits.
- Integrate transportation planning with land-use and economic-development planning, and use transportation rights-of-way to maximize public benefits.

11 *2007 Transportation Plan of the Boston Region Metropolitan Planning Organization*, Boston Metropolitan Planning Organization, 2007.

2.11 Other Regional Transportation Projects

The communities, regional planning agencies, and state transportation agencies are pursuing a number of transportation and development projects within the study area. The key features of these undertakings are described below and shown in Figure 2-3. As the information provided in this section demonstrates, the projects currently included in regional transportation planning will not meet the transportation needs of the region, identified in the previous sections.

Projects included in the Transportation Improvement Plans are projects under design for which funding has been allocated (Table 2-6). The projects below are listed in the Transportation Improvement Plan for the Boston MAPC, OCPC, and SRPEDD. Only projects of significance to South Coast Rail are included. Other projects under consideration, but not currently funded, are listed in Table 2-7.

Table 2-6 Projects Funded in Regional Transportation Improvement Plans

Project	Year Programmed
Reconstruct Route 106 Underpass, Mansfield	2008
Replace Brightman Street Bridge, Fall River/Somerset	2008-2011
Replace Southeastern Regional Transportation Authority Terminal, Fall River	2008
Attleboro Intermodal Center, Engineering and Construction	2008-2009
Route 128 Add-A-Lane Project, Randoph-Wellesley	2008-2011
Relocate Route 79, Lakeville	2009
Reconstruct Route 18, New Bedford	2009
Wareham Intermodal Center, Wareham	2009-2011
Reconstruct Columbia Junction, Red Line	2009-2011
New Route 24 Interchange, Fall River/Freetown, Design and Study	2010
Relocate Route 6 Bridge, Acushnet River New Bedford/Fairhaven, Feasibility Study, Design and Environmental Study	2010
Multi-Modal Center Improvements and Facilities, New Bedford	2010
Southeastern Massachusetts Freight Rail Corridor Improvements	2010
MBTA/GATRA Improvements, South Attleboro/Attleboro/Mansfield	2010
New Route 24 Interchange, Fall River/Freetown, Construction	2011
Freight Rail Improvements, New Bedford	2011

Table 2-7 Projects Not Yet Funded or Approved

Project	Notes
Reconstruct Route 24-Route 140 Interchange, Taunton	FY 2006 "earmark"
Relocate Route 79, Fall River	FY 2003-2006
Construct Attleboro Intermodal Center ($200M)	TIP Future Element
Reconstruct Route 24 to Interstate Standards, Fall River – Raynham ($84M)	TIP Future Element
Widen Route 24 between Route 140 and I-495 ($50M)	TIP Future Element
Reconstruct Route 24 – Route 140 Interchange ($50M)	TIP Future Element

2.11.1 Route 24 Corridor Study

Over the last decade, there has been considerable interest in improving Route 24 to meet modern interstate safety and geometric standards, in order that the highway might receive an interstate number. In 2003, SRPEDD produced a Special Report on Route 24, summarizing studies on this and other initiatives along the Route 24 Corridor.

The study recommends upgrading Route 24 to an interstate by increasing bridge clearances, widening shoulders, and lengthening substandard acceleration and deceleration lanes. To distribute the cost, the work is proposed to occur over a twelve-year period. The study also recommends for reconstructing substandard interchange ramps, constructing an additional travel lane between I-495 and Route 140, and studying the need for an additional travel lane between Route 140 and Airport Road in New Bedford.

To date, these proposals have not advanced beyond the study level, and no funds for improvements to Route 24 have been allocated. Other initiatives discussed in the report have advanced, and are discussed in more detail in sections below.

2.11.2 Route 24 – Route 140 Interchange

Although Route 140 is a limited-access facility south of Route 24, which is limited-access throughout, the interchange between the two in Taunton is a simple partial cloverleaf interchange, with ramps in the northeast and southwest quadrants (traffic exiting Route 24 on the inner loop) and an additional slip ramp from Route 24 north to Route 140 south. Major traffic movements between the two limited-access

roadways are not directly subject to delays at the ramp intersections, but regular congestion occurs due to the tight geometry, substandard acceleration and deceleration lanes, and proximity of at-grade intersections. It is not unusual for traffic to back up onto Route 24 at the southbound exit.

Long-range SRPEDD plans have recommended that this interchange be reconstructed into a more standard freeway to freeway interchange. Short-term improvements, including extending acceleration and deceleration lanes, were recently completed. Long-term improvements have been moved through the Functional Design Report stage, but no preferred alternative has been selected. Congress has earmarked funds for this Project.

2.11.3 Route 24 – Route 128/I-93 Interchange

A major source of congestion on the primary access route from the South Coast region to the Boston metropolitan area is the interchange of Route 24 and Route 128/I-93 in Randolph. Problems include a center lane merges on Route 24 south and Route 128 south/I-93 north, a two-lane merge into the high speed lane on Route 128 north/I-93 south, a left exit on Route 128 north/I-93 south, and short weaving distances to the exits on Route 128/I-93.

Central Transportation Planning Staff (CTPS) has recently completed a study evaluating a range of potential improvements to the interchange. These options include reconstructing the direct ramps as semi-direct ramps to eliminate left exits and merges, auxiliary lanes to eliminate center lane merges, and modifying Exit 3 (Ponkapoag Trail) and Exit 5 (Route 28) on Route 128/I-93 to ease congestion caused by weaving movements. These proposals have not advanced beyond study, and no funds have been allocated.

2.11.4 Braintree Split Study

Another major source of congestion on the primary access route from the South Coast region to the Boston metropolitan area is the interchange of Route 128/I-93, Route 3, and the Southeast Expressway in Braintree. This interchange suffers many of the same problems as the Route 24 – Route 128/I-93 interchange, including left exits and merges, and short weaving distances to the next interchange on all approaches. The Southeast Expressway HOV lane begins/terminates just north of the interchange, resulting in heavy weaving for vehicles entering or exiting HOV lane. Problems further from the interchange, including the Route 24 – Route 128/I-93 interchange, the Granite Avenue and Neponset Circle interchanges on the Southeast Expressway, the Union Street and Route 18 interchanges on Route 3, and the lane drop on Route 3 also caused congestion.

CTPS has recently completed a study on this interchange, offering two potential packages of improvements, one to improve traffic safety only and one to improve traffic flow. The proposed traffic safety improvements include lengthening deceleration lanes, prohibiting some movements to eliminate the worst weaves, and relocating one on-ramp to increase weaving distance. The proposed traffic flow improvements include extending the HOV lane through the interchange, adding a fourth lane on Route 3 south, adding a fifth lane to Route 128/I-93 between the split and Route 24, and improving ramps at Exit 6 (Route 37) on Route 128/I-93. These proposals have not advanced beyond study, and no funds have been allocated.

2.11.5 Route 18 Reconstruction

Route 18 is a major, partially access-controlled, north-south arterial in New Bedford, connecting the city's core with I-195. However, it also effectively separates the urban core of the city from the waterfront. Between I-195 and Cove Street, a distance of 2.8 miles, there are only eight locations where pedestrians can cross the highway. Three of these are at pedestrian bridges, while several others are at busy intersections. The highway makes it especially difficult to access the central waterfront, including commercial and tourist destinations, such as New Bedford Whaling National Historic Park, the New Bedford Oceanarium, and State Pier.

As part of efforts to promote economic development downtown, plans have been developed to reconstruct Route 18 by Massachusetts Highway Department, especially near the urban core. The plan includes new "gateway" intersections, more at-grade intersections, and design elements to transform Route 18 from an expressway into an urban boulevard. Plans are currently at the 25% Review stage of the Massachusetts Highway Department design process.

2.11.6 New Bedford/Fairhaven Harbor Plan

In August 2002, New Bedford and Fairhaven partnered to develop the New Bedford/Fairhaven Harbor Master Plan, with assistance from the Coastal Zone Management Office at EOEEA. This plan includes a wide range of goals, reflecting the wide variety of harbor uses. New Bedford remains one of the country's most important seaports, especially for the fishing industry. The New Bedford waterfront includes many commercial and industrial enterprises dependent on a quality harbor for trade. The harbor is also important for transportation services, including ferry service to Vineyard Haven and Cuttyhunk. There are also proposals to expand service to Martha's Vineyard and introduce passenger and freight service to Nantucket.

The Harbor Plan proposes improvements to Fish Island, Popes Island, North Terminal, South Terminal, and a new terminal adjacent to North Terminal. It also recommends integrating transportation services at the new terminal, including bus, ferry, and future commuter rail. The plan also recommends relocating the Route 6 Bridge to the north between Popes Island and the New Bedford mainland. The existing bridge is a swinging truss that must open for large vessels to reach Popes Island, Fish Island, North Terminal, and points north. The aging span is a significant barrier to commercial and industrial development along the harbor to the north; mechanical failures on the bridge could cripple a venture dependent on access to ocean shipping. The proposed span would run north along Popes Island, and then cross the harbor at the proposed terminal north of North Terminal. This would directly connect Route 6 to the proposed intermodal transportation facility and would be consistent with plans to reconstruct Route 18 downtown by freeing up land at the Route 18/Route 6 interchange. Funds for study, design, and environmental review have been appropriated for 2010.

2.11.7 Route 24 – New Fall River/Freetown Interchange

Several parties have expressed interest in developing a new office, commercial, and industrial area near the border of Fall River and Freetown. This Project, known as Fall River Executive Park, would contain up to 9 million square feet of new development. Other developments in the area include Fall River Industrial Park, Riverside Business Park, and Campanelli Industrial Park. The vehicular traffic generated by these developments is expected to overload existing interchanges connecting local roads to Route 24.

A new interchange on Route 24 near the city line is required to support this development, and is supported by Fall River and SRPEDD. This interchange would connect with a new roadway, linking the proposed development and South Main Street. A Final Environmental Impact Report (FEIR) was submitted to EOEA in January 2008. The Secretary issued a Certificate for the Fall River Executive Park (EEA# 12902A) on February 15, 2008, which requested a Supplemental FEIR.

2.11.8 Route 79 Relocation – Fall River

Route 79 in Fall River is a major, limited-access, north-south arterial, connecting with I-195. It separates the urban core from the waterfront, in Fall River the Taunton River separates the city from commercial and industrial enterprises, and forms a pedestrian barrier to the waterfront and tourist attractions, such as Battleship Cove. Between Columbia Street and North Main Street, a distance of 2.8 miles, there are only five

locations where pedestrians can cross the highway. Several of these are underpasses, and another is at a very busy intersection.

In order to reconnect the city with the waterfront, Fall River has proposed to eliminate the Route 79 freeway south of the Brightman Street Bridge, and replace it with an at-grade urban boulevard. A study of potential impacts on adjacent neighborhoods and traffic began in early 2007.

2.11.9 Kings Highway Corridor Study

The Kings Highway – Tarkiln Hill Road corridor is a major arterial in New Bedford, and experiences considerable congestion due to nearby large retail development. As part of a 2005 study, SRPEDD recommended widening the corridor to five lanes, making traffic signal and intersection improvements, and reconstructing the Route 140 interchange. This Project has been designed, and the contractor was given notice to proceed in September 2007. Signal improvements at Mount Pleasant and Kings Highway began construction in summer 2007 and completion is expected in summer 2008.

2.11.10 Route 128 Add-a-Lane Project, Randolph to Wellesley

This Project consists of adding a fourth general purpose travel lane in each direction to Route 128 between Route 24 in Randolph and Route 9 in Wellesley. Construction is underway on several Project elements, but the Project is not expected to be complete for several years. This Project will have an indirect impact on access from the South Coast region to Boston, because changes to traffic patterns on Route 128 could affect traffic on Route 24 in the vicinity of the Route 24/Route 128 interchange.

2.12 Information Sources

Information in this document was obtained from the following sources:

- *United States Census*, 1990 and 2000
- *Journey-to-Work*, 1990 and 2000
- SRPEDD planning documents, reports, and studies
- OCPC planning documents, reports, and studies
- MAPC planning documents, reports, and studies
- CTPS planning documents, reports, and studies

- Executive Office of Labor and Workforce Development
- EOT
- Massachusetts Highway Department Accident Database
- Massachusetts Highway Department Traffic Volume Database
- Massachusetts Highway Department record right-of-way plans
- MBTA
- Southeastern Regional Transportation Authority
- Greater Attleboro Taunton Regional Transit Authority
- Brockton Area Transit Authority
- *New Bedford/Fall River Commuter Rail Extension Final Environmental Impact Report*, MBTA, 2002
- *New Bedford/Fall River Commuter Rail Extension Supplemental Draft Environmental Impact Report*, MBTA, 2000
- *New Bedford/Fall River Commuter Rail Extension Draft Environmental Impact Report*, MBTA, 1999
- *New Bedford/Fall River Commuter Rail Project Expanded Alternatives Analysis*, MBTA, 1997
- *New Bedford/Fall River Commuter Rail Project Environmental Notification Form*, MBTA, 1995
- *New Bedford/Fall River Commuter Rail Extension Feasibility Study*, MBTA, 1990
- *South Station Operations Analysis Report*, MBTA, 1999
- *Commuter Rail Infrastructure Needs Assessment*, MBTA, 2004
- Community master plans, housing plans, transportation plans, open space plans, and community development plans
- *New Bedford/Fairhaven Harbor Master Plan*, 2002
- MBTA and CSX existing track charts
- New York, New Haven, and Hartford Railroad historic track charts; and
- Peter Pan Bonanza, DATTCO Inc., and Bloom bus schedules.

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4

Phase 1 Screening Methodology

This chapter describes the Phase 1 screening process. This Phase 1 screening analysis is intended to provide the information needed for the Corps (in consultation with other Interagency Coordinating Group federal and state agencies) to agree on the range of alternatives that will be carried forward to the Phase 2 MEPA and NEPA processes, and follows the process described in the *Highway Methodology* [1] Phase 1 screening.

4.1 Introduction

As stated in the *Highway Methodology*, Phase 1 is intended to identify a limited number (usually one to six) of practicable alternatives to carry forward to Phase 2 environmental review. It is important to note that the Phase 1 alternatives are preliminary and conceptual station locations will be identified at later stages of the South Coast Rail study. The intent of this evaluation was to identify those alternative concepts that meet or exceed the Project evaluation criteria, then to narrow the initial broad range of alternatives to a reasonable number of practicable options that can be carried forward to a more detailed level of analysis in Phase 2 (Phase 2 of the *Highway Methodology*).

The Interagency Coordinating Group, composed of federal and state agencies with purview over the Project, oversaw the three-step screening process. In each step, the group assessed whether each alternative met the criteria and recommended poor-performing alternatives be dismissed from further analysis. The public were also consulted in mid-March in a series of regional Civic Engagement Meetings, and the Interagency Coordinating Group considered comments and opinions presented before finalizing the list of alternatives that will be advanced to an in-depth environmental

1 United States Army Corps of Engineers. NEDEP-360-1-30, *The Highway Methodology.* October 1993.

analysis. This screening process dismissed alternatives that:

- Did not meet the Project Purpose (Step 1)
- Were not practicable to construct or operate (Step 2)
- Were likely to result in substantially higher environmental impacts than other practicable alternatives (Step 3)

4.2 Screening Criteria

Specific screening criteria were developed for Step 1, Step 2, and Step 3 after taking into account input received during the January 2008 Civic Engagement Meetings. These criteria were reviewed and accepted by the Interagency Coordinating Group on January 10, 2008. Chapters 5, 6, and 7 of this report provide detailed explanations of the screening criteria used in each step of the analysis.

Each alternative was rated for each criterion on a scale ranging from Highly Favorable to Highly Unfavorable.

Highly Favorable – highly positive impact and/or substantially exceeding the intent of the criterion

Favorable – small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion

Neutral – neutral or no impact and/or partial failure to meet the criterion

Unfavorable – small or marginal negative impact and/or partial failure to meet the criterion

Highly Unfavorable – highly negative impact and/or complete failure to meet the criterion

3

Phase 1 Alternatives

This chapter describes how the Phase 1 alternatives were developed and provides descriptions of the Phase 1 Alternatives.

3.1 Development of Phase 1 Alternatives

EOT identified a broad range of 65 potential alternatives by reviewing previous studies and soliciting ideas from the MBTA, the Interagency Coordinating Group, the Commuter Rail Task Force, and the interested stakeholders through the Civic Engagement process. Table 3-1, *Master List of Alternatives*, presents the full list of potential alternatives.

The 65 alternatives included various mode types, including commuter rail (conventional, diesel multiple unit, and electrified), heavy rail, light rail, monorail, bus rapid transit, and enhanced bus service. They included several different components along four main corridors – the Attleboro route, Stoughton route, Middleborough route and the Highway route. These routes include active heavy rail lines, active commuter rail lines, active freight rail lines, abandoned and inactive rail lines, highway corridors, and new transportation alignments (Figure 3-1).

These 65 alternatives were combined into 38 alternatives by grouping similar alternatives together. For example, Alternative 5, *Diesel Multiple Units Commuter Rail to Attleboro Station*, and Alternative 8, *Light Rail to Attleboro Station*, use the same route. Both of these alternatives would be capable of providing a relatively high-frequency service along that route, and both would require a transfer at Attleboro Station to access Boston. These alternatives provide the same transportation benefits to the region using different modes. Because DMU commuter rail can operate on the same track as freight trains, while light rail cannot, DMU was determined to be the more reasonable of the two. Alternative 8 was considered to be sufficiently similar to Alternative 5 and was absorbed into it. The detailed information on how the list of

65 alternatives was reduced to 38 is included in Appendix A and B. At the January 10 meeting, the Interagency Coordinating Group concurred on this list of the 38 Phase 1 Alternatives.

It is important to note that these alternatives are preliminary and conceptual and that specific aspects such as station locations will be identified at later stages of the South Coast Rail study. The intent of the Phase 1 evaluation was to identify those alternative concepts that meet or exceed the Project evaluation criteria, then to narrow the initial broad range of alternatives to a reasonable number of practicable options that can be carried forward to a more detailed level of analysis in Phase 2 of the alternatives analysis.

3.2 Description of Corridors

The following sections describe the corridors under consideration as part of the 38 alternatives (Figure 3-1). The first section describes the transportation corridors, including location, current conditions, constraints, issues, and ownership.

3.2.1 Through Attleboro and Mansfield

This section provides an overview of four components of the transportation corridor through Attleboro and Mansfield that are under consideration. These components include the Northeast Corridor, the Attleboro Bypass, the Attleboro Secondary, and the Mansfield Line.

Northeast Corridor

The Northeast Corridor is an active rail line running between New York and South Station in Boston. The portion of interest for this Project runs from Attleboro to Boston (Figure 3-1). The corridor experiences heavy use, including Amtrak Regional and Acela service, MBTA commuter rail service, and freight rail service. The MBTA Providence Line uses the entire length of this portion of the corridor; the Stoughton Line, Franklin Line, and Needham Line join further north at Canton Junction, Readville, and Forest Hills, respectively.

The corridor has at least two tracks on this section, with three tracks from Readville to Boston. There are also two station siding tracks at Attleboro Station. The corridor is electrified, meaning that both diesel and electric trains can operate, and is designed and signaled for high-speed rail operations. The corridor is owned by the MBTA. Train operations are controlled by Amtrak.

Attleboro Bypass

The Attleboro Bypass would be a new rail corridor connecting the Northeast Corridor and the Attleboro Secondary (described in the following section). The line would follow an existing National Grid electric transmission line right-of-way from the Northeast Corridor near the Attleboro/Norton/Mansfield town line to the Attleboro Secondary near Chartley Pond at the Attleboro/Norton town line. The line would be owned by the MBTA.

The number of tracks would be determined in the next phase of the Project, as this would be an entirely new facility. The line would pass through some wetlands, and could potentially impact Chartley Pond. Modifications to the transmission lines might be required.

Attleboro Secondary

The Attleboro Secondary is an active rail line running from the Northeast Corridor in Attleboro through Norton to the Stoughton Line and New Bedford Secondary at Weir Junction in Taunton. The line is in service for freight only at the present time. The line is mostly one track, with a two track section just east of the Northeast Corridor in Attleboro. The line is currently owned by CSX.

The line runs through some environmentally sensitive areas, including Chartley Pond and the proposed Three Mile River Area of Critical Environmental Concern (ACEC). It also has many grade crossings in downtown Taunton, because it runs directly through the densely developed core of the city.

Mansfield Line

The Mansfield Line is an abandoned rail line running from the Northeast Corridor in Mansfield to the Attleboro Secondary in Taunton. The line is not in service, and tracks have been removed. Ownership of the line is uncertain, and may vary.

The line runs through some environmentally sensitive areas, including the proposed Three Mile River ACEC. Other constraints include I-495, which was constructed at the same grade as the former railroad, a regional sewer interceptor within the right-of-way and a bike path along the route in Mansfield. The former right-of-way was converted to a local street in downtown Mansfield. The route is also constrained because it crosses Route 106 at-grade, immediately adjacent to where Route 106 passes under the Northeast Corridor just west of where it crosses the Mansfield Line.

3.2.2 Through Middleborough

This section provides an overview of two components of the transportation corridor through Middleborough that are under consideration. These components include the Old Colony Main Line and the Middleborough Line, and the Middleborough Secondary.

Old Colony Main Line and Middleborough Line

The Old Colony Main Line and Middleborough Line are active rail lines running from South Station in Boston to Middleborough/Lakeville Station. The Old Colony Main Line runs from South Station to Braintree, and serves all three branches of the Old Colony commuter rail lines (Greenbush, Kingston, and Middleborough). The Middleborough Line runs from Braintree to the Middleborough/Lakeville Station. In addition to commuter trains, there is limited freight service on the lines. The lines are owned by the MBTA.

The Old Colony Main Line is a single-track route, with a passing siding in the middle. The Middleborough Line is also mostly single-track, with three passing sidings, including a long section of double-track in Brockton. The capacity of the Old Colony Main Line is a severely constrained, because there is little space for additional trains to run through the so-called Braintree "bottleneck", a single-track section which runs through the densely developed area from Braintree north to Boston.

Middleborough Secondary

The Middleborough Secondary is an active rail line running from the Middleborough Line north of the Middleborough/Lakeville Station to the New Bedford Secondary at Cotley Junction in Taunton (Figure 3-1). The line is in service for freight only at the present time. The line is mostly single-track, with a two-track section approaching the Middleborough Line. The line is owned by CSX.

3.2.3 Through Stoughton

This section provides an overview of two components of the transportation corridor through Stoughton that are under consideration. These components include the Stoughton Main Line and the Whittenton Branch. Alternatives through Stoughton would also use the Northeast Corridor north of Canton Junction (for a description of the Northeast Corridor, see Section 3.2.1).

Stoughton Main Line

The Stoughton Line is a rail line running from the Northeast Corridor at Canton Junction to the Attleboro Secondary and New Bedford Secondary at Weir Junction in Taunton (Figure 3-1). The line is active between Canton Junction and Stoughton Station serving commuter rail on the MBTA Stoughton Line and freight rail to customers in Canton and Stoughton. A short piece of the line north of Weir Junction is active, serving freight only. The remainder of the line, from Stoughton Station to Taunton, is abandoned, and tracks were removed. The active sections of the corridor are single-track, except at the approach to Canton Junction, where there are two tracks. The corridor is owned by the MBTA, north of Britton Street in Raynham. Parts of the right-of-way south of Longmeadow Road in Taunton were sold and in various public/private ownership. The active rail segment north of Weir Junction is operated by the MassCoastal Railroad.

The corridor runs through some environmentally sensitive areas, including the Pine Swamp in Raynham and the Hockomock Swamp ACEC Easton. The Hockomock Swamp is one of the most important wetlands in the state for rare species habitat and protects regional water quality.

Whittenton Branch

The Whittenton Branch is an abandoned rail line in Raynham and Taunton, running around the northwest edge of the core of the City of Taunton and connecting the Stoughton Line with the Attleboro Secondary. The line is not in service, and is not explicitly included in any of the 38 alternatives, but is considered as a possible variant to any option using the Stoughton Line.

3.2.4 Through the "Southern Triangle"

This section provides an overview of three components of the transportation system south of Cotley Junction, referred to as the "Southern Triangle." These components include the New Bedford Secondary, the Fall River Secondary and the Dartmouth Secondary. The New Bedford Secondary and the Fall River Secondary are included in all of the rail alternatives.

New Bedford Secondary

The New Bedford Secondary is an active rail line running from the Attleboro Secondary at Weir Junction in Taunton to the waterfront piers in New Bedford. The line connects with the Middleborough Secondary at Cotley Junction and to the Fall River Secondary at Myricks Junction. The line is in service for freight only at the present time. The line is mostly single track (but was constructed to carry two tracks), with a two-track section north of Cotley Junction. The line is owned by CSX.

The line passes through some environmentally sensitive areas, including the Assonet Cedar Swamp in Berkley and Lakeville and is adjacent to the Acushnet Cedar Swamp State Reservation in New Bedford. Other constraints include dense development along the line in New Bedford.

Fall River Secondary

The Fall River Secondary is an active rail line running between the New Bedford Secondary at Myricks Junction in Berkley to the waterfront in Fall River. The line is in service for freight only at the present time. The line is all single-track, and is owned by CSX.

The line passes through some environmentally sensitive areas, including the Assonet Cedar Swamp in Berkley. Other constraints include dense development along the line in Fall River, and large slopes above and below the line in Fall River along the Taunton River.

Dartmouth Secondary

The Dartmouth Secondary is a rail line running between the New Bedford Secondary in New Bedford and the east side of Fall River, passing through Dartmouth and Westport. The line is active for freight service between the New Bedford Secondary and a point near the Dartmouth/Westport town line. From there to Fall River, the line is abandoned. The line is owned by the state (although ownership of the

abandoned segment west of I-195 may have been transferred), with freight service provided by Massachusetts Coastal Railroad.

The line passes through some environmentally sensitive areas, including many wetlands in Dartmouth and Westport. In Fall River, the line is adjacent to South Watuppa Pond, and runs along an embankment in the middle of the Quequechan River. In Fall River, the line is separated from the Fall River Secondary by dense development and a grade difference of over 100 feet.

3.2.5 Using the Highway System

This section provides an overview of four components of the highway transportation system. These components include using Route 24, Route 140, Route 128 (Interstate 95/Interstate 93) and the Southeast Expressway (Interstate 93/Route 3) (Figure 3-1).

Route 24

Route 24 is a major north-south freeway, providing the primary link between the South Coast region and the Boston region. The highway is two lanes in each direction between I-195 and I-495, and three lanes in each direction between I-495 and Route 128. The median width varies, but is generally less than 20 feet wide.

The highway runs through some environmentally sensitive areas, including the Hockomock Swamp ACEC in West Bridgewater and the Fowl Meadow – Ponkapoag Bog ACECs in Randolph. It also borders portions of the Blue Hills State Reservation in Randolph. The highway experiences congestion during the peak periods, especially between Route 140 in Taunton and Route 128 in Randolph.

Route 140

Route 140 is a major north-south freeway connecting New Bedford to Route 24 in Taunton. The highway is two lanes in each direction throughout. The median width varies, but outside of New Bedford it is generally at least 40 feet wide.

Route 128 (I-95/I-93)

Route 128 is the beltway running around the City of Boston, from Braintree to Gloucester. The portion of concern for this Project runs from the Braintree Split (the Route 3/I-93/I-128 Interchange) to University Avenue in Westwood. This section is three lanes in each direction between University Avenue and Route 24, and four lanes in each direction from Route 24 to the Braintree Split. The median varies, and is widest near Route 24, but is generally less than 30 feet wide. East of the I-95 Interchange, Route 128 is designated as I-93, while west of the interchange it is designated as I-95.

The highway runs through some environmentally sensitive areas, including the Fowl Meadow – Ponkapoag Bog ACECs in Randolph, Milton, Canton, Dedham, and Westwood. It also borders the Blue Hills State Reservation on both sides in Quincy, Randolph, Milton, and Canton. The highway experiences severe congestion in both directions during peak periods.

Southeast Expressway (I-93/Route 3)

The Southeast Expressway is the only freeway connecting the downtown core of Boston to points south and the Route 128 beltway. It runs from the Braintree Split to downtown. It is four lanes in each direction throughout, with one lane from the off-peak direction used to make an HOV lane for the peak direction during rush hours between the Braintree Split and Columbia Road in Boston.

The highway runs through very densely developed areas in Quincy, Milton, and Boston. It experiences severe congestion in both directions, often even during off-peak hours.

3.3 Description of Modes

The following sections describe the modes used by the 38 Phase 1 alternatives and the operating assumptions used to evaluate each mode.

3.3.1 Commuter Rail

Commuter rail refers to a fixed-guideway system with steel wheels operating on steel rails, with one or two locomotives pulling a number of passenger coaches; on the MBTA system, trains are generally six to nine coaches. Coaches may be single level or bi-level, to increase capacity. Commuter rail locomotives are powered by diesel engines. Figure 3-2 depicts a typical cross-section of a conventional commuter rail.

For commuter rail, the maximum speed was assumed to be 79 mph, the maximum currently operated on the MBTA system. For purposes of comparing alternatives, headways for commuter rail alternatives were set at 40 minutes on the branches and 20 minutes on the trunk, during the peak period in the peak direction. Scheduled travel times on existing services were not altered.

3.3.2 Diesel Multiple Units Commuter Rail

DMU commuter rail refers to a fixed-guideway system with steel wheels operating on steel rails, with trains consisting of up to three self-propelled cars. Cars were assumed to be single-level, because there are no bi-level DMU systems currently in operation. DMU trains are propelled by on-board diesel engines. Figure 3-2 depicts a typical cross-section of a DMU commuter rail.

For DMU, the maximum speed was assumed to be 70 mph, the maximum speed per a prominent manufacturer's specifications. For purposes of comparing alternatives, headways for DMU alternatives were set at 15 minutes on the branches and 7.5 minutes on the trunk, during the peak period in both directions. Because of these short headways, DMUs require double-track throughout.

3.3.3 Electrified Commuter Rail

Electrified commuter rail refers to a fixed-guideway system with steel wheels operating on steel rails, with one or two locomotives pulling a number of passenger coaches. For consistency with the MBTA system, trains are assumed to be six to nine coaches. Coaches may be single level or bi-level, to increase capacity. Commuter rail locomotives are powered by an overhead electrical contact system. Figure 3-3 depicts a typical cross-section of an electrified commuter rail.

For electric commuter rail, the maximum speed was assumed to be 110 mph, the maximum speed that can be operated without incurring significant signal costs because of the need to signal civil restrictions. For purposes of comparing alternatives, headways for electric commuter rail alternatives were set at 40 minutes on the branches and 20 minutes on the trunk, during the peak period in the peak direction. Travel times on existing tracks were based on Amtrak schedules for the Attleboro and Stoughton corridors where possible or on track geometry.

3.3.4 Bus Rapid Transit

Bus rapid transit is a bus system designed to provide the quality and reliability of rail and the flexibility of bus. Buses operate in mixed traffic, exclusive lanes, or exclusive roadways. Vehicles have a capacity similar to a standard 40-foot bus, and are usually diesel powered. Figure 3-4 depicts a typical cross-section of a bus rapid transit.

For bus rapid transit, travel times were based on existing auto travel times, less a travel time savings for using exclusive lanes or HOV lanes. For purposes of comparing alternatives, headways for bus rapid transit were set at 30 minutes for services to Taunton and 15 minutes for services to New Bedford and Fall River, since these cities are larger. Because of the short headways, bus rapid transit would require two lanes where it uses a dedicated right-of-way.

3.3.5 Monorail

Monorail is a fixed-guideway system, with rubber-tired vehicles operating on a single concrete straddle beam. Monorail requires a separate right-of-way and full grade separation. Monorail vehicles are powered by an overhead electrical contact system or a third rail system, usually the latter. Figure 3-5 depicts a typical cross-section of a monorail.

For monorail, the maximum speed was assumed to be 50 mph, based on existing systems and previous studies. For purposes of comparing alternatives, headways for monorail were set at 40 minutes on the branches and 20 minutes on the trunk, during the peak period in the peak direction.

3.3.6 Light Rail

Light rail is a fixed-guideway system with steel wheels operating on steel rails, with trains consisting of up to three self-propelled cars. Light rail vehicles are propelled by an overhead electrical contact system or a third rail. Figure 3-6 depicts a typical cross-section of light rail.

For light rail, the maximum speed was assumed to be 55 mph, based on existing MBTA light rail service vehicles (Green Line). For purposes of comparing alternatives, headways for light rail alternatives were set at 20 minutes on the branches and 10 minutes on the trunk, during the peak period.

3.3.7 Heavy Rail

Heavy rail is a fixed-guideway system with steel wheels operating on steel rails, with trains consisting of up to six self-propelled cars. Train length was based on the maximum operated in current MBTA heavy rail services (Red Line or Orange Line). Heavy rail vehicles are propelled by an overhead electrical contact system or a third rail. Figure 3-7 depicts a typical cross-section of heavy rail.

For heavy rail, the maximum speed was assumed to be 55 mph, based on existing MBTA heavy rail service vehicles. For purposes of comparing alternatives, headways for heavy rail alternatives were set at 20 minutes on the branches and 10 minutes on the trunk, during the peak period.

Table 3-1
South Coast Rail
Master List of Alternatives

Route	Alt #	Name	Description	How we Propose to Address Alternative	Origin
THROUGH ATTLEBORO	***ATTLEBORO SECONDARY***				
	1	Commuter Rail to South Station via Attleboro Bypass	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then west along Attleboro Secondary; new track bypass along National Grid right-of-way to tie into Northeast Corridor north of Attleboro station	Advanced for further consideration	Executive Office of Transportation
	2	Commuter Rail to South Station via Attleboro Station with Reverse Move	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then west along Attleboro Secondary to Northeast Corridor; reverse move at Attleboro Station to merge onto Northeast Corridor	Advanced for further consideration	Executive Office of Transportation
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	Commuter rail along Dartmouth Secondary and New Bedford Mainline north to Cotley Junction, then west along Attleboro Secondary; new track bypass along National Grid right-of-way to tie into Northeast Corridor near Mansfield/Attleboro/Norton town line	Advanced for further consideration	Civic Engagement Process
	4	Bus Rapid Transit to Attleboro Station	Bus Rapid Transit adjacent to New Bedford Main Line track and Fall River Secondary track north to Cotley Junction, then adjacent to Attleboro Secondary west; transfer to Northeast Corridor at Attleboro Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	5	Diesel Multiple Units Commuter Rail to Attleboro Station	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then west along Attleboro Secondary; transfer to Attleboro Station	Advanced for further consideration	Civic Engagement Process
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then west along Attleboro Secondary; transfer to Attleboro Station; additional line along Dartmouth Secondary between New Bedford and Fall River	Advanced for further consideration	Civic Engagement Process
	7	Electrified Commuter Rail to South Station via Attleboro Bypass	Electrified commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then west along Attleboro Secondary; new track bypass along National Grid right-of-way to tie into Northeast Corridor near Mansfield/Attleboro/Norton town line	Advanced for further consideration	Civic Engagement Process
	8	Light Rail to Attleboro	Light rail transit along New Bedford Main Line and Fall River Secondary north to Cotley Junction then west along Attleboro Secondary; transfer to Commuter Rail at Attleboro Station	Similar operational benefits to Alternative 5 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process
	9	Light Rail to Attleboro w/ New Bedford to Fall River connection	Light rail transit along New Bedford Main Line and Fall River Secondary north to Cotley Junction then west along Attleboro Secondary; transfer to Attleboro Station; additional line along Interstate 195 or Dartmouth Secondary between New Bedford and Fall River	Similar operational benefits to Alternative 6 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process
	10	Combination Connection to Boston and Providence via Northeast Corridor	Combination of commuter rail on Attleboro Secondary to Boston and commuter bus to connect to Providence, using Interstate 195 corridor	Boston service covered by other alternatives. Providence service does not meet basic Project Purpose	Civic Engagement Process
	MANSFIELD FORMER RIGHT-OF-WAY				
	11	Commuter Rail to South Station via Mansfield	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, northwest along Attleboro Secondary, then northwest along former right-of-way through Taunton, Norton, and Mansfield to tie into Northeast Corridor near Mansfield Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	12	Bus Rapid Transit to Mansfield Station	Bus Rapid Transit adjacent to New Bedford Main Line track and Fall River Secondary track north to Cotley Junction, then adjacent to Attleboro Secondary track, then northwest along former right-of-way through Taunton, Norton, and Mansfield; transfer to Northeast Corridor at Mansfield Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	13	Diesel Multiple Units Commuter Rail to Mansfield Station	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then northwest along Attleboro Secondary, then northwest along former right-of-way through Taunton, Norton, and Mansfield; then transfer to Mansfield Commuter Rail	Advanced for further consideration	Civic Engagement Process
	14	Diesel Multiple Units to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then northwest along Attleboro Secondary to Whittenton Junction, then northwest along former right-of-way through Taunton, Norton, and Mansfield; then transfer to Mansfield Commuter Rail Station; additional line along Dartmouth Secondary between New Bedford and Fall River	Advanced for further consideration	Civic Engagement Process
	15	Electrified Commuter Rail to South Station via Mansfield	Electrified commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then northwest along Attleboro Secondary to Whittenton Junction, then northwest along former right-of-way through Taunton, Norton, and Mansfield to tie into Northeast Corridor near Mansfield Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	16	Light Rail to Mansfield	Light rail transit along New Bedford Main Line and Fall River Secondary north to Cotley Junction then northwest along Attleboro Secondary to Whittenton Junction, then northwest along former right-of-way through Taunton, Norton, and Mansfield; then transfer to Mansfield Commuter Rail Station	Similar operational benefits to Alternative 13 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process

Table 3-1
South Coast Rail
Master List of Alternatives

Route	Alt #	Name	Description	How we Propose to Address Alternative	Origin
THROUGH MIDDLEBOROUGH	***MIDDLEBOROUGH SECONDARY***				
	17	Commuter Rail to South Station via Middleborough	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary to tie into Middleborough Line	Advanced for further consideration	Executive Office of Transportation
	18	Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary to tie into Middleborough Line at new Middleborough/Lakeville Commuter Rail Station relocated north; convert Red Line Braintree Branch to commuter rail	Advanced for further consideration	Civic Engagement Process
	19	Heavy Rail to Middleborough	Extend the Red Line to Middleborough/Lakeville Station via the Middleborough Commuter Rail Line with feeder bus from New Bedford and Fall River	Variation of Alternative 61 (greater infrastructure requirements with no transportation benefits)	Civic Engagement Process
	20	Bus Rapid Transit to Middleborough/Lakeville Station	Bus Rapid Transit adjacent to New Bedford Main Line track and Fall River Secondary track north to Cotley Junction, then east adjacent to Middleborough Secondary; transfer to Middleborough Line at Middleborough/Lakeville Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	21	Diesel Multiple Units Commuter Rail to Middleborough/Lakeville Station	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary; transfer to Middleborough/Lakeville Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	22	Diesel Multiple Units to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary; transfer to Middleborough/Lakeville Commuter Rail Station; additional line along Dartmouth Secondary between New Bedford and Fall River	Advanced for further consideration	Civic Engagement Process
	23	Commuter Rail to South Station via Middleborough (via Cotley) - w/ reverse move	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary to tie into Middleborough Line just north of Middleborough/Lakeville Commuter Rail Station w/ reverse move to serve Middleborough/Lakeville Station	Variation of Alternative 17 (similar infrastructure requirements with no transportation benefits)	Executive Office of Transportation
	24	Light Rail to Middleborough (via Cotley)	Light rail transit along New Bedford Main Line and Fall River Secondary north to Cotley Junction then east along Middleborough Secondary; transfer to Middleborough/Lakeville Commuter Rail Station	Similar operational benefits to Alternative 21 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process
	63	Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary to tie into Middleborough Line; then extend Middleborough Commuter Rail Line to Wareham and/or Buzzards Bay	Advanced for further consideration	Civic Engagement Process
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along Middleborough Secondary to tie into Middleborough Line; no improvements to Old Colony Main Line	Advanced for further consideration	Interagency Coordinating Group
	MIDDLEBOROUGH FORMER RIGHT-OF-WAY				
	25	Commuter Rail to South Station via Middleborough (via Myricks)	Commuter rail along New Bedford Main Line and Fall River Secondary north to Myricks Junction then northeast along former right-of-way parallel to Route 79 through Berkley and Lakeville to tie into Middleborough Line at new Middleborough/Lakeville Commuter Rail Station relocated north	Variation of Alternative 17 with minimal transportation improvements and significant environmental impacts (right-of-way takings)	Civic Engagement Process
	26	Commuter Rail to South Station via Middleborough (via Myricks) - w/ reverse move	Commuter rail along New Bedford Main Line and Fall River Secondary north to Myricks Junction then northeast along former right-of-way parallel to Route 79 through Berkley and Lakeville to tie into Middleborough Line just north of Middleborough/Lakeville Commuter Rail Station w/ reverse move to serve Middleborough/Lakeville Station	Variation of Alternative 17 with minimal transportation improvements and significant environmental impacts (right-of-way takings)	Civic Engagement Process
	27	Light Rail to Middleborough (via Myricks)	Light rail transit along New Bedford Main Line and Fall River Secondary north to Myricks Junction, then northeast along former right-of-way parallel to Route 79 through Berkley and Lakeville; transfer to Middleborough/Lakeville Commuter Rail Station	Similar operational benefits to Alternative 21 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process
	28	Bus Rapid Transit to Middleborough (via Myricks)	Bus Rapid Transit adjacent to New Bedford Main Line track and Fall River Secondary track north to Myricks Junction, then northeast along former right-of-way parallel to Route 79 through Berkley and Lakeville; transfer to Middleborough Line at Middleborough/Lakeville Commuter Rail Station	Variation of Alternative 20 with minimal transportation improvements and significant environmental impacts (right-of-way takings)	Civic Engagement Process
	29	Diesel Multiple Units Commuter Rail to Middleborough (via Myricks)	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Myricks Junction, then northeast along former right-of-way parallel to Route 79 through Berkley and Lakeville; transfer to Middleborough/Lakeville Commuter Rail Station	Variation of Alternative 21 with minimal transportation improvements and significant environmental impacts (right-of-way takings)	Civic Engagement Process

Table 3-1
South Coast Rail
Master List of Alternatives

Route	Alt #	Name	Description	How we Propose to Address Alternative	Origin
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then north along existing right-of-way through Raynham, Easton, and Stoughton to tie into Stoughton Line at Stoughton Commuter Rail Station	Advanced for further consideration	Executive Office of Transportation
	31	Bus Rapid Transit to Stoughton Station	Bus Rapid Transit adjacent to New Bedford Main Line track and Fall River Secondary track north to Cotley Junction, then north along existing right-of-way through Raynham, Easton, and Stoughton; transfer to Stoughton Line at Stoughton Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then north along existing right-of-way through Raynham, Easton, and Stoughton; transfer to Stoughton Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	Diesel Multiple Units commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then north along existing right-of-way through Raynham, Easton, and Stoughton; transfer to Stoughton Commuter Rail Station; additional line along Dartmouth Secondary between New Bedford and Fall River	Advanced for further consideration	Civic Engagement Process
	34	Electrified Commuter Rail to South Station via Stoughton	Electrified commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction, then north along existing right-of-way through Raynham, Easton, and Stoughton to tie into Stoughton Line at Stoughton Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	35	Commuter Rail to South Station via Stoughton (Whittenton Branch)	then northwest along Attleboro Secondary to Whittenton Junction, northeast along Whittenton Branch, and north along existing right-of-way through Raynham, Easton, and Stoughton to tie into Stoughton Line at Stoughton Commuter Rail Station	Variation of Alternative 30 with similar transportation benefits (could be evaluated in Phase 2 as option to Alternative 30)	Civic Engagement Process
	36	Light Rail to Stoughton	Light rail transit along New Bedford Main Line and Fall River Secondary north to Cotley Junction then north along existing right-of-way through Raynham, Easton, and Stoughton; transfer to Stoughton Commuter Rail Station	Similar operational benefits to Alternative 32 but requires additional infrastructure due to incompatibility of light rail vehicles operating on national rail network	Civic Engagement Process
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via Attleboro Bypass and Middleborough Line	Commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction; then one branch west along Attleboro Secondary with new track bypass along National Grid right-of-way to tie into Northeast Corridor north of Attleboro station; second branch along Middleborough Secondary to tie into Middleborough Line just north of Middleborough/Lakeville	Advanced for further consideration	Executive Office of Transportation
	65	Electrified Commuter Rail to South Station via Attleboro and Middleborough	Diesel and electric commuter rail along New Bedford Main Line and Fall River Secondary north to Cotley Junction; then one electric branch west along Attleboro Secondary with new track bypass along National Grid right-of-way to tie into Northeast Corridor north of Attleboro station; one diesel branch along Middleborough Secondary to tie into Middleborough Line just north of Middleborough/Lakeville Station (Middleborough Line not electrified)	Advanced for further consideration	Interagency Coordinating Group
USING HIGHWAY SYSTEM	37	Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway	Monorail along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east and Southeast Expressway right-of-way north to South Station	Advanced for further consideration	Civic Engagement Process
	38	Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128	Monorail along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east; transfer to Quincy Adams Red Line Station	Advanced for further consideration	Civic Engagement Process
	39	Monorail to Route 128 Station via Route 140, Route 24, and Route 128	Monorail along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128 right-of-way west; transfer to Route 128 Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	40	Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor	Commuter rail along New Bedford Main Line and Fall River Secondary north to just south of Cotley Junction, then new track along Route 24 right-of-way north to Randolph and along Route 128/I-93 right-of-way west; tie into Northeast Corridor north of Route 128 Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	Heavy or light rail transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128 right-of-way west; transfer to Route 128 Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	42	Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line	Heavy rail transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east; tie into Red Line at Quincy Adams Red Line Station	Advanced for further consideration	Civic Engagement Process
	43	Express Bus in Dedicated Lane to Route 128 Station via Route 24 and Route 128	Add HOV lanes on Route 24 from Interstate 495 north to Randolph, then on Route 128 west; transfer to Route 128 Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	44	Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast	Add HOV lanes on Route 24 from Interstate 495 north to Randolph, then on Route 128/93 east to Southeast Expressway HOV Lane to South Station	Advanced for further consideration	Civic Engagement Process
	45	Enhanced Bus Service on Existing Private Carrier Routes	Increased bus service and increased parking for bus commuters along existing private bus carrier lines from Fall River, New Bedford, and Taunton to South Station	Advanced for further consideration	Executive Office of Transportation

Table 3-1
South Coast Rail
Master List of Alternatives

Route	Alt #	Name	Description	How we Propose to Address Alternative	Origin
USING HIGHWAY SYSTEM (cont'd)	46	Light Rail to Route 128 Station	Light rail transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128 right-of-way west; transfer to Route 128 Commuter Rail Station	Included in Alternative 41	Civic Engagement Process
	47	Light Rail to Quincy Adams Station	Light rail transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east; transfer to Quincy Adams Red Line Station	Provides fewer transportation benefits (requires transfer) than Alternative 42 with similar environmental impacts/benefits	Civic Engagement Process
	48	Light Rail to South Station	Light rail transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east and Southeast Expressway right-of-way north to South Station	Provides similar transportation benefits to HOV lane and similar environmental impacts than Alternative 43	Civic Engagement Process
	49	Bus Lane to Route 128	Bus lanes on Route 24 from 495 north to Randolph, then on Route 128 west; transfer to Route 128 Commuter Rail Station	Same transportation and environmental benefits as Alternative 43	Civic Engagement Process
	50	Bus Lane to South Station	Bus lanes on Route 24 from 495 north to Randolph, then on Route 128/93 east to Southeast Expressway HOV Lane to South Station	Same transportation and environmental benefits as Alternative 44	Civic Engagement Process
	51	Combination Connection to Boston and Providence via Route 24	Combination of commuter bus services along I-195 and Routes 24/140 to connect South Coast cities with Providence and Boston	Boston service covered by other alternatives . Providence service does not meet basic Project Purpose	Civic Engagement Process
	52	Park-and-Ride Improvements	Improve the Park-and-Ride system serving the South Coast	Not a public transit alternative. Does not meet basic project purpose	Civic Engagement Process
	53	Advanced Rapid Transit to Route 128 Station	Advanced rapid transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128 right-of-way west; transfer to Route 128 Commuter Rail Station	Provides same transportation and environmental benefits/impacts as Alternative 37 (could be evaluated in Phase 2 as option to Alternative 37)	Civic Engagement Process
	54	Advanced Rapid Transit to Quincy Adams Station	Advanced rapid transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east; transfer to Quincy Adams Red Line Station	Provides same transportation and environmental benefits/impacts as Alternative 38 (could be evaluated in Phase 2 as option to Alternative 38)	Civic Engagement Process
	55	Advanced Rapid Transit to South Station	Advanced rapid transit along Routes 24/140 right-of-way from Fall River/New Bedford north to Randolph, then along Route 128/93 right-of-way east and Southeast Expressway right-of-way north to South Station	Provides same transportation and environmental benefits/impacts as Alternative 39 (could be evaluated in Phase 2 as option to Alternative 39)	Civic Engagement Process
Other	56	Commuter Rail to South Station via Providence	Commuter rail along Dartmouth Secondary and old right-of-way through Rhode Island to Providence; tie into Northeast Corridor just north of Providence Commuter Rail Station	Advanced for further consideration	Civic Engagement Process
	57	Enhanced bus on Interstate 195	Public transit service along Interstate 195 between Wareham and Providence	Advanced for further consideration	Civic Engagement Process
	58	Commuter Rail to Wareham via Middleborough	Extend the Middleborough Commuter Rail Line to Wareham and/or Buzzards Bay	Advanced for further consideration	Civic Engagement Process
	59	Appoint a czar		Not a public transportation alternative	Civic Engagement Process
	60	Encourage Telecommuting/Video Conferencing		Not a public transportation alternative	Civic Engagement Process
	61	Feeder Bus Network to Middleborough/Lakeville Station	Feeder bus network from New Bedford/Fall River area feeding into existing commuter rail network (may require new station)	Advanced for further consideration	Interagency Coordinating Group

3.4 Description of Phase 1 Alternatives

The following section describes and graphically depicts the 38 Phase 1 alternatives, organized by route, evaluated in the Phase 1 evaluation (Table 3-2). The figures following this table illustrate the route of each alternative, and provide the locations of required infrastructure improvements for that alternative.

Table 3-2 Phase 1 Alternatives

Name
Through Attleboro
Attleboro Secondary
1 Commuter Rail to South Station via Attleboro Bypass
2 Commuter Rail to South Station via Attleboro Station with Reverse Move
3 Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass
4 Bus Rapid Transit to Attleboro Station
5 Diesel Multiple Unit Commuter Rail to Attleboro Station
6 Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary
7 Electrified Commuter Rail to South Station via Attleboro Bypass
Mansfield Former Right-of-Way
11 Commuter Rail to South Station via Mansfield
12 Bus Rapid Transit to Mansfield Station
13 Diesel Multiple Unit Commuter Rail to Mansfield Station
14 Diesel Multiple Unit Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary
15 Electrified Commuter Rail to South Station via Mansfield
Through Middleborough
Middleborough Secondary
17 Commuter Rail to South Station via Middleborough
18 Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail
20 Bus Rapid Transit to Middleborough/Lakeville Station
21 Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station
22 Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary
63 Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham
64 Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

Table 3-2 Phase 1 Alternatives (continued)

Name
Through Attleboro and Middleborough
62 Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line
Through Stoughton
30 Commuter Rail to South Station via Stoughton
31 Bus Rapid Transit to Stoughton Station
32 Diesel Multiple Unit Commuter Rail to Stoughton Station
33 Diesel Multiple Unit Commuter Rail to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary
34 Electrified Commuter Rail to South Station via Stoughton
Using Highway System
37 Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway
38 Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128
39 Monorail to Route 128 Station via Route 140, Route 24, and Route 128
40 Commuter Rail to South Station via Route 24 and route 128 to Northeast Corridor
41 Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route128
42 Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line
43 Express Bus in Dedicated Lane to Route 128 Station via Route 24 and Route 128
44 Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane
45 Enhanced Bus Service on Existing Private Carrier Routes
Other Routes
56 Commuter Rail to South Station via Providence
57 Enhanced Bus on Interstate 195
58 Commuter Rail to Wareham via Middleborough
61 Feeder Bus Network to Middleborough/Lakeville Station

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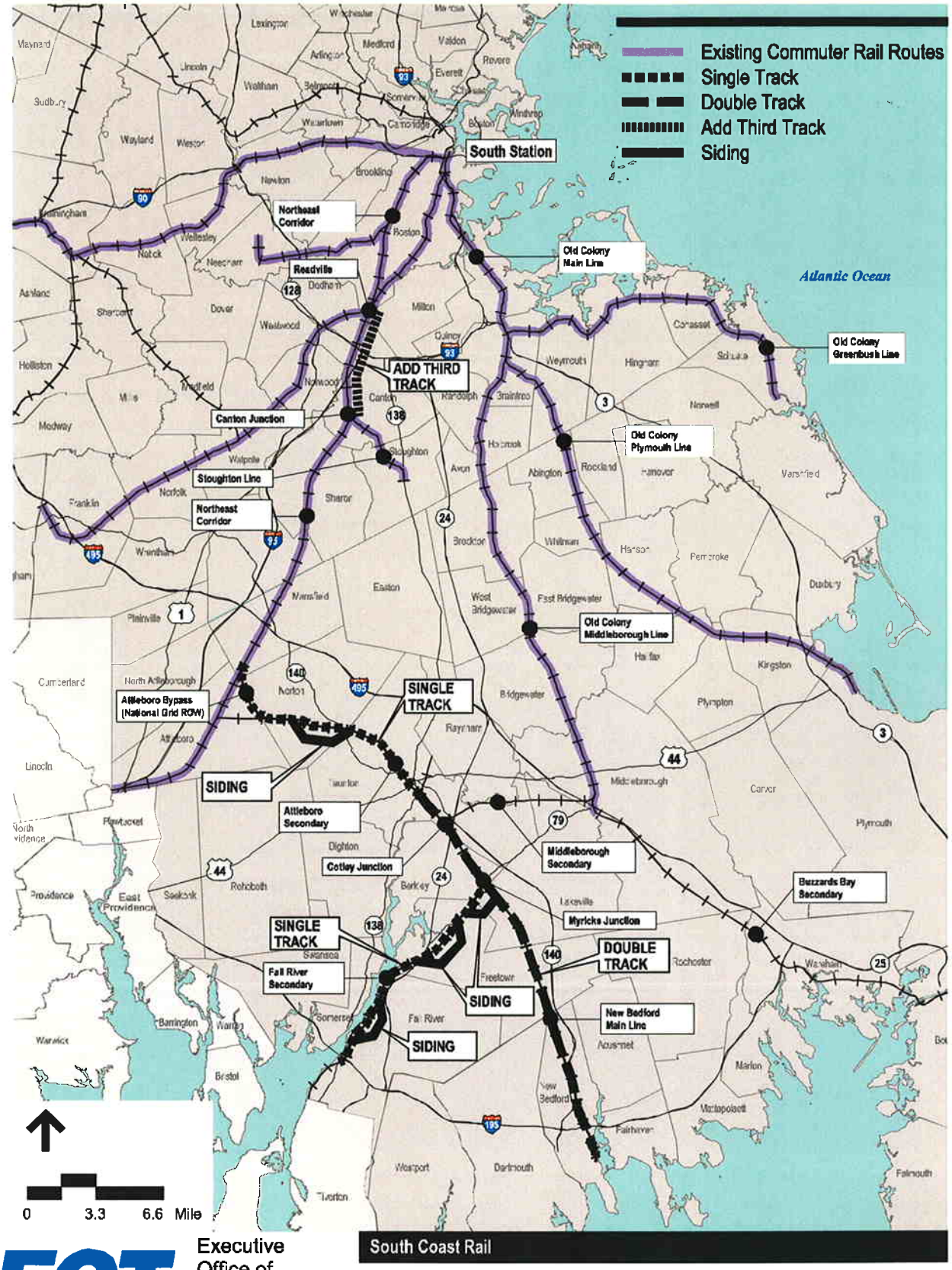

Executive Office of Transportation & Public Works

Alternative 1
Commuter Rail to South Station via Attleboro Bypass

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then west along the Attleboro Secondary. A new track bypass approximately 2.5 miles long would be needed from the Attleboro Secondary along a National Grid electric transmission easement to tie into the Northeast Corridor north of the Attleboro Station near the Mansfield, Attleboro, and Norton town lines.

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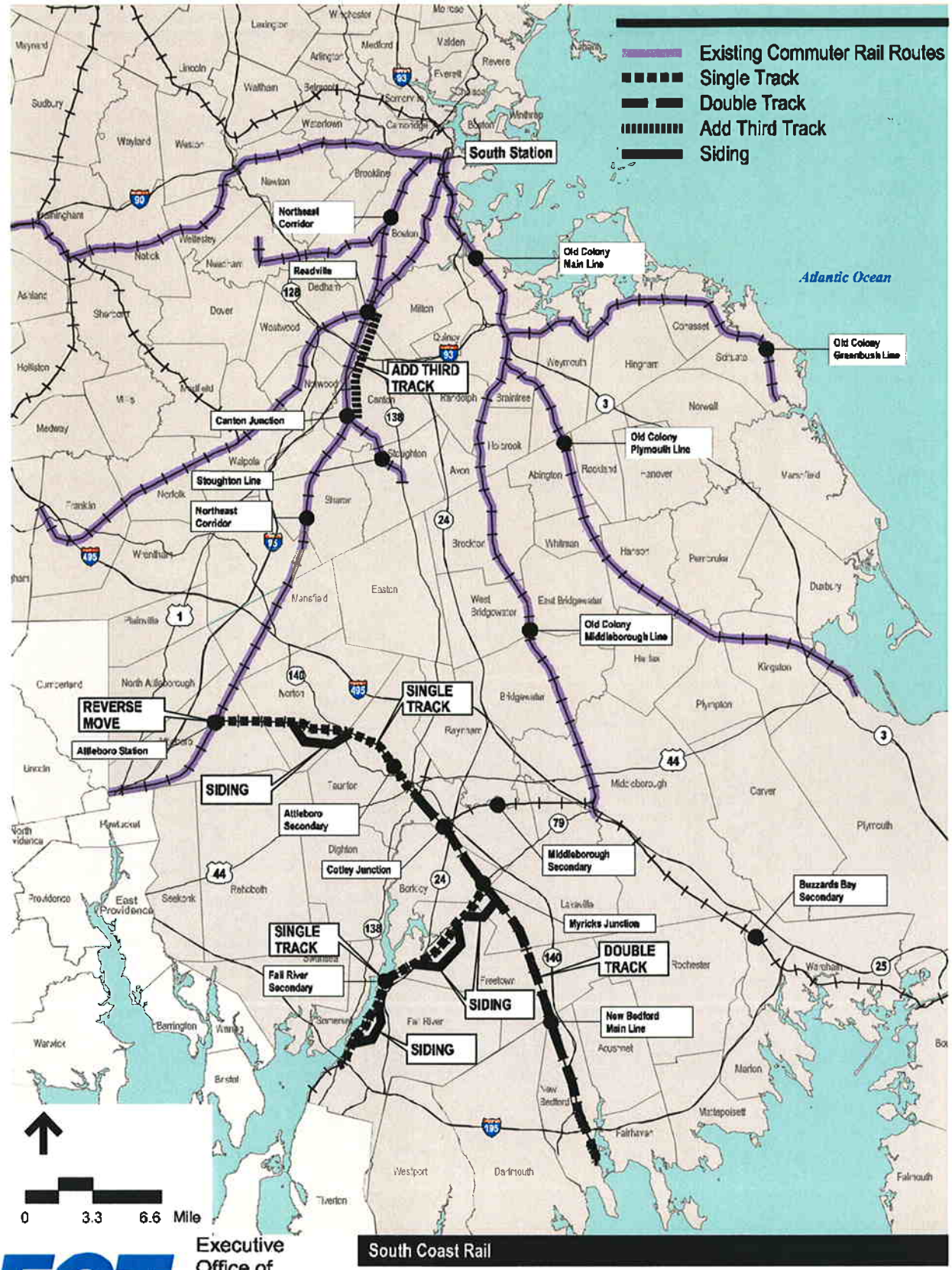

Executive Office of Transportation & Public Works

Alternative 2
Commuter Rail to South Station via Attleboro Station with Reverse Move

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then west along the Attleboro Secondary to the Northeast Corridor. Trains would have to perform a reverse move at the Attleboro Station when traveling in either direction. A reverse move is a maneuver in which the train pulls into a station, the engineer gets out, walks to the other end of the train, and performs a brake test, and the train departs in the opposite direction. This move requires 10 minutes to perform.

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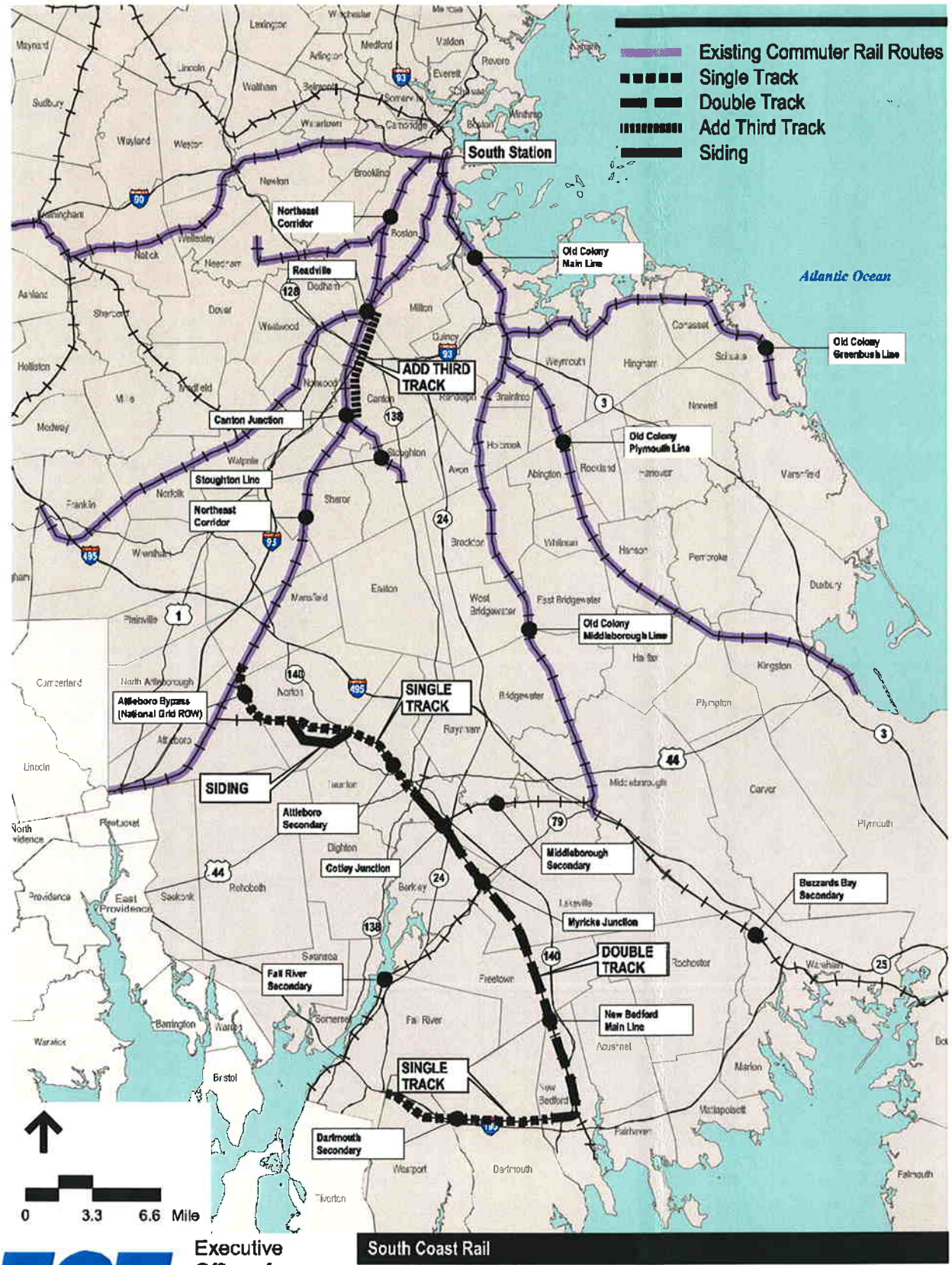

Executive Office of Transportation & Public Works

Alternative 3
Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass

This alternative would provide commuter rail service along the Dartmouth Secondary and the New Bedford Main Line north to Cotley Junction, then west along the Attleboro Secondary. A new track bypass would be needed along a National Grid electric transmission easement to tie into the Northeast Corridor north of Attleboro Station near the Mansfield, Attleboro, and Norton town line. This alternative would not provide service on the Fall River line.

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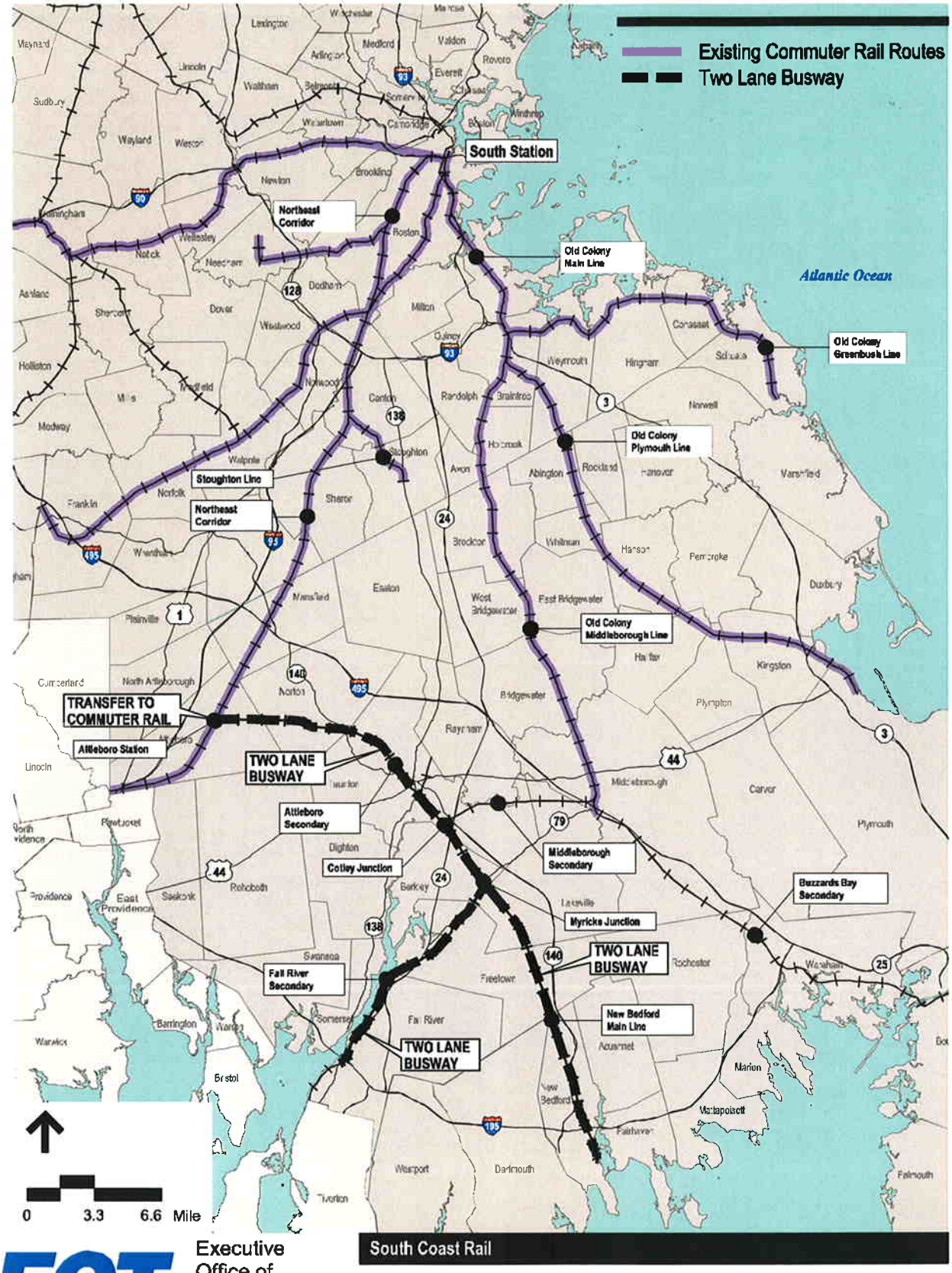

Executive Office of Transportation & Public Works

Alternative 4
Bus Rapid Transit to Attleboro Station

This alternative would provide bus rapid transit service on a new bus roadway adjacent to the New Bedford Main Line track and the Fall River Secondary track north to Cotley Junction, and then run adjacent to the Attleboro Secondary west. A transfer would be needed to access the existing Providence Line commuter rail service at Attleboro Station. A new station would be needed with a transfer connection.

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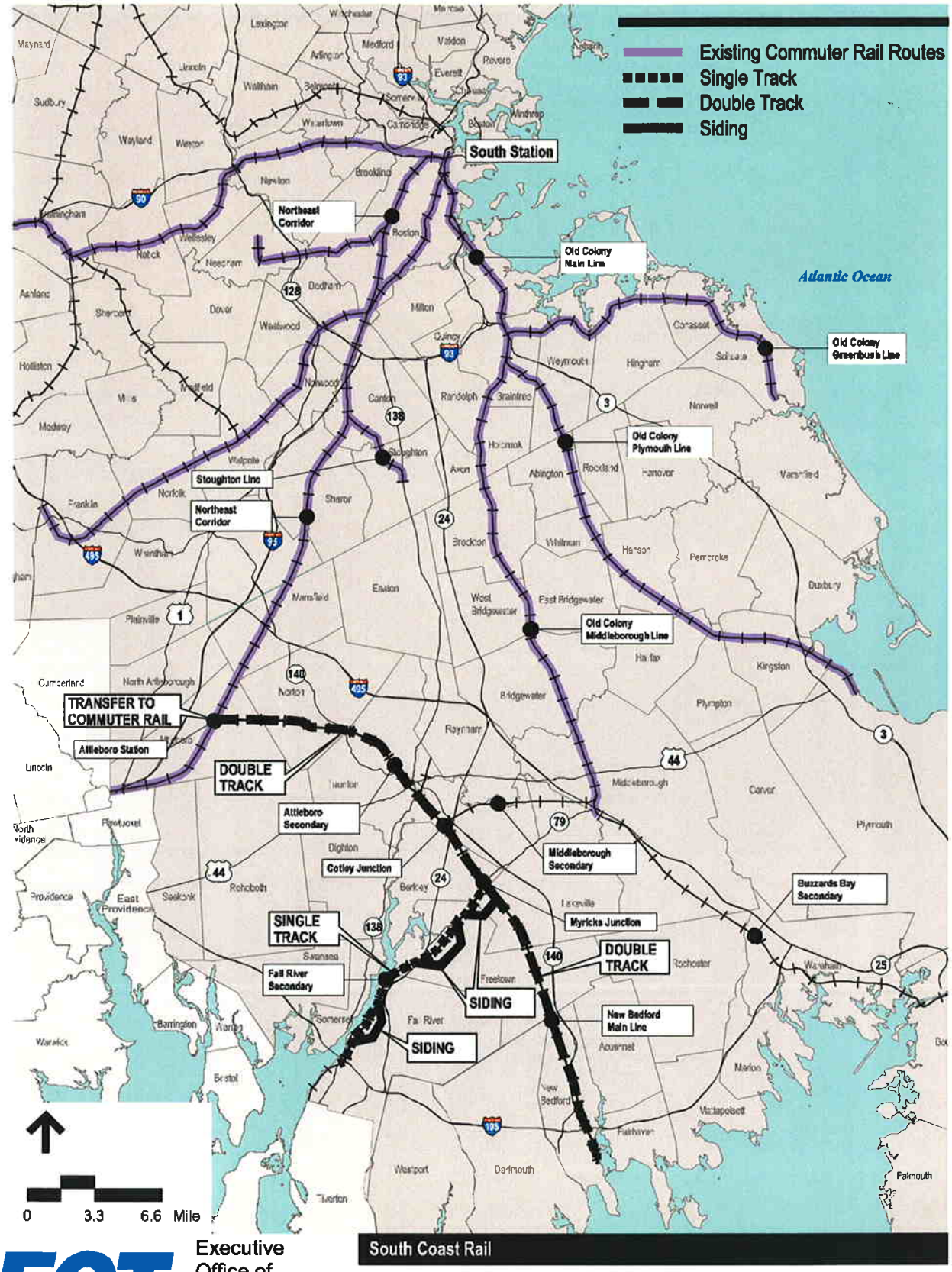

Executive Office of Transportation & Public Works

Alternative 5
Diesel Multiple Units Commuter Rail to Attleboro Station

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then west along the Attleboro Secondary. A transfer would be needed to connect to the existing Providence Line commuter rail service at Attleboro Station. A new station would be needed with a transfer connection.

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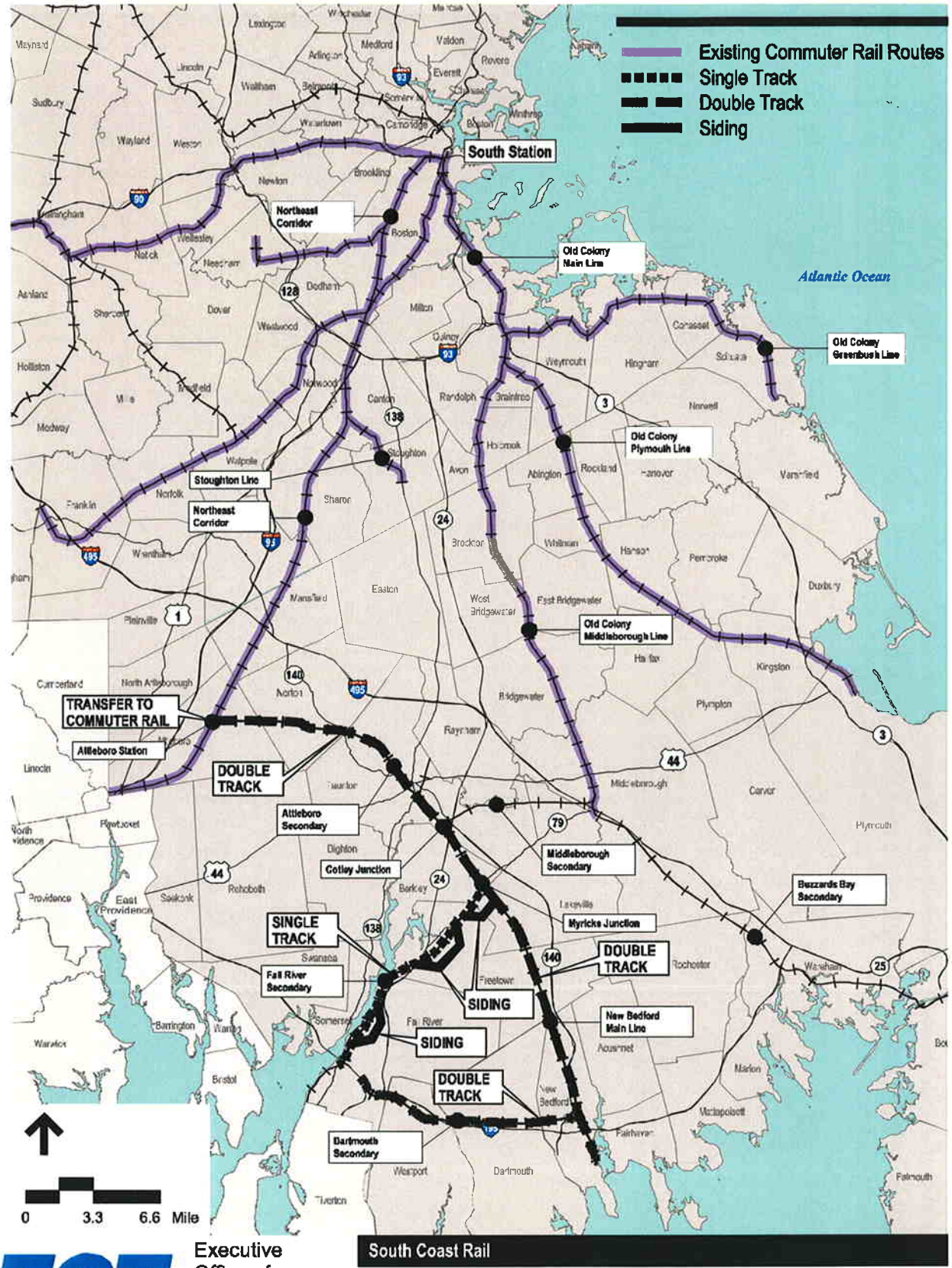

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Alternative 6
Diesel Multiple Units to Attleboro Station with
New Bedford to Fall River Connection via Dartmouth Secondary

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary. A transfer would be needed to connect to the existing Providence Line commuter rail service at Attleboro Station with a new transfer station platform. An additional service would be provided along the Dartmouth Secondary between New Bedford and Fall River.

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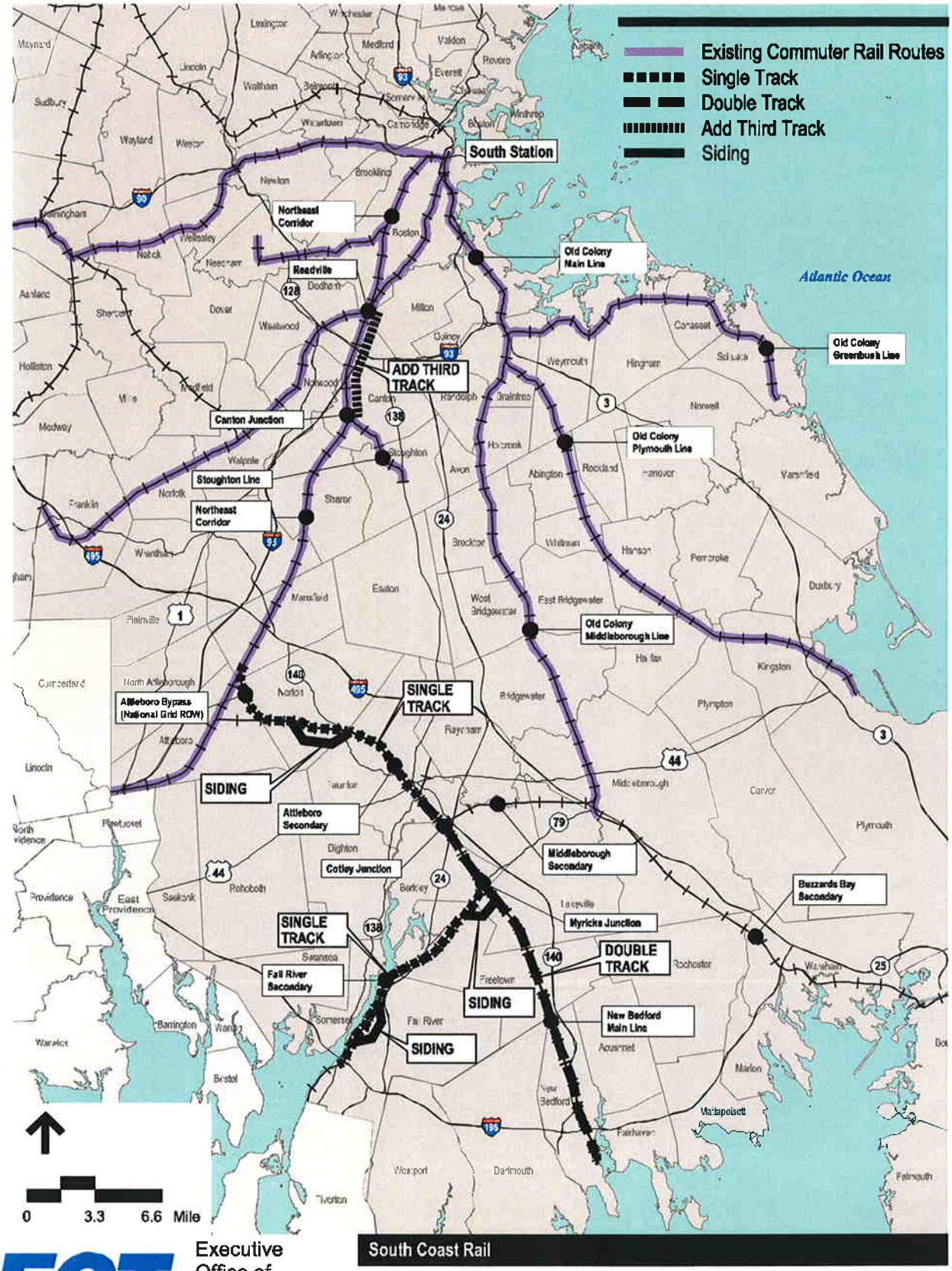

Executive Office of Transportation & Public Works

Alternative 7
Electrified Commuter Rail to South Station via Attleboro Bypass

This alternative would provide electrified commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, west along the Attleboro Secondary. A new track bypass would be necessary along a National Grid electric transmission line easement to tie into the Northeast Corridor north of the Attleboro Station near the Mansfield, Attleboro, and Norton town lines.

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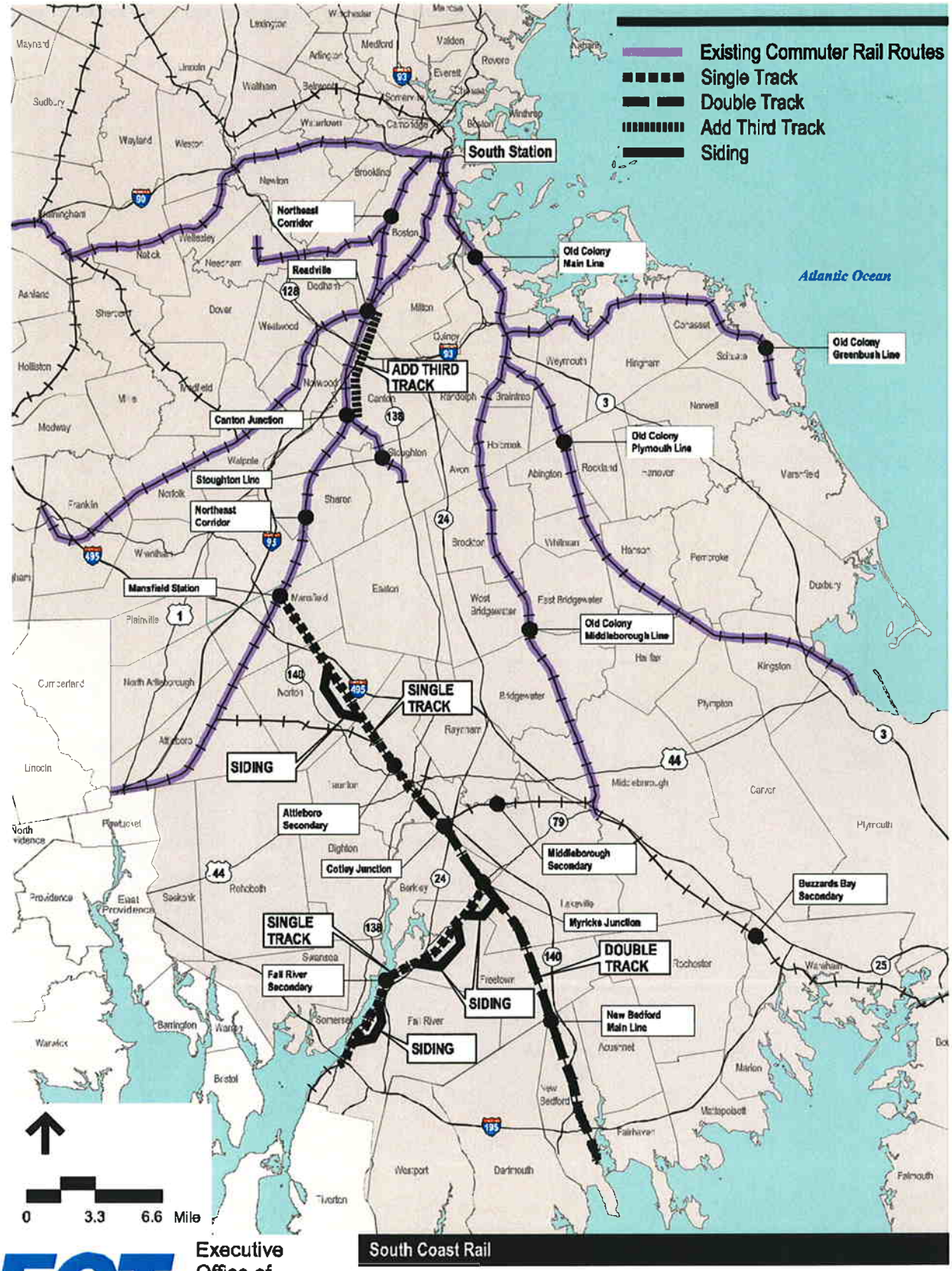

Executive Office of Transportation & Public Works

Alternative 11
Commuter Rail to South Station via Mansfield

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, northwest along the Attleboro Secondary, then northwest along the former Mansfield Secondary right-of-way through Taunton, Norton, and Mansfield. It would tie into the Northeast Corridor near Mansfield Station.

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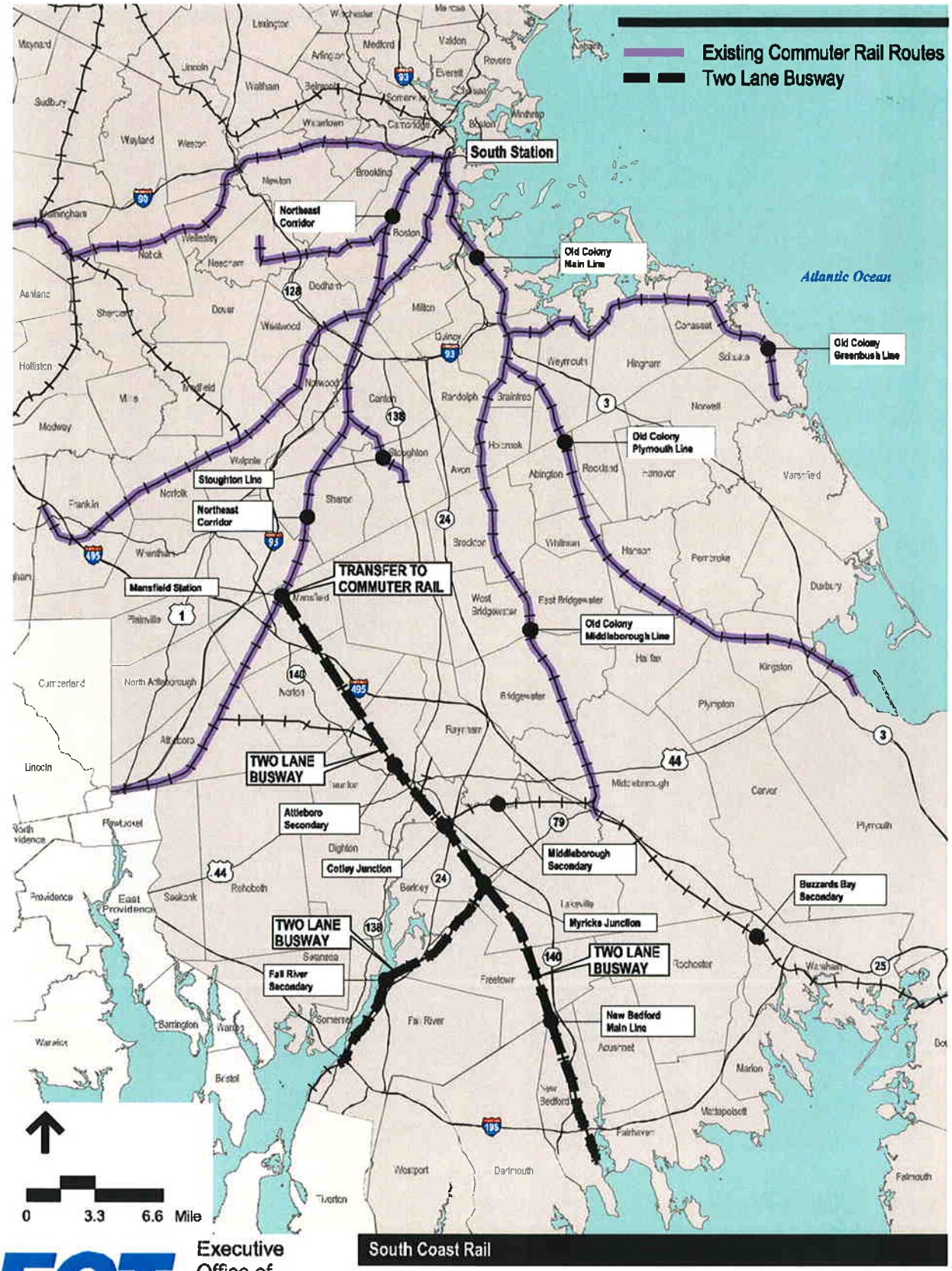

Executive Office of Transportation & Public Works

Alternative 12
Bus Rapid Transit to Mansfield Station

This alternative would provide bus rapid transit service on a new bus roadway adjacent to the New Bedford Main Line track and the Fall River Secondary track north to Cotley Junction, adjacent to the Attleboro Secondary track, then northwest along the former right-of-way through Taunton, Norton, and Mansfield. A transfer would be needed to connect to the existing Providence Line commuter rail service at Mansfield Station.

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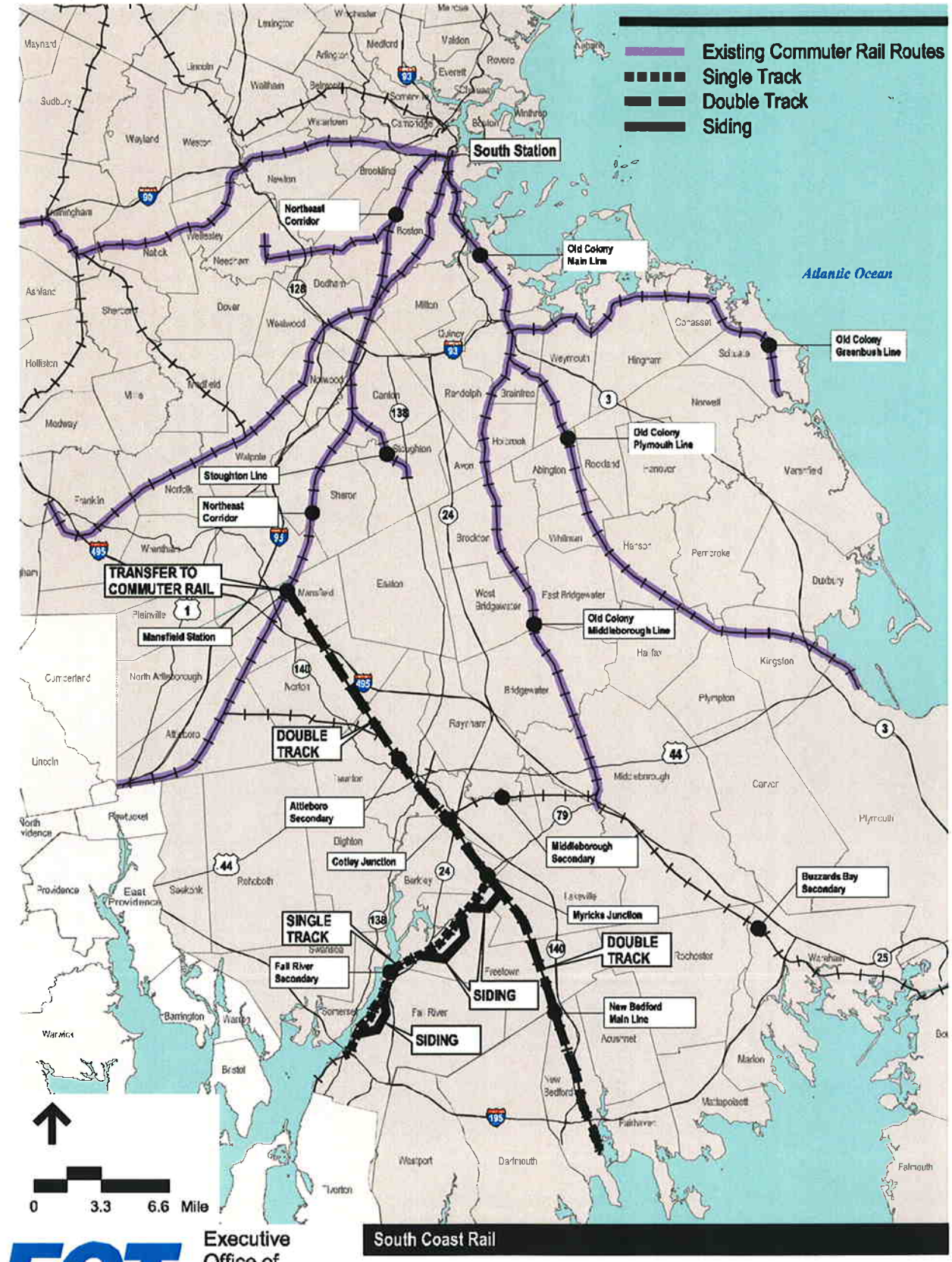

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Alternative 13
Diesel Multiple Units Commuter Rail to Mansfield Station

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, along the Attleboro Secondary, then northwest along the former right-of-way through Taunton, Norton, and Mansfield. A transfer would be needed to connect to the existing Providence Line commuter rail service at Mansfield Station.

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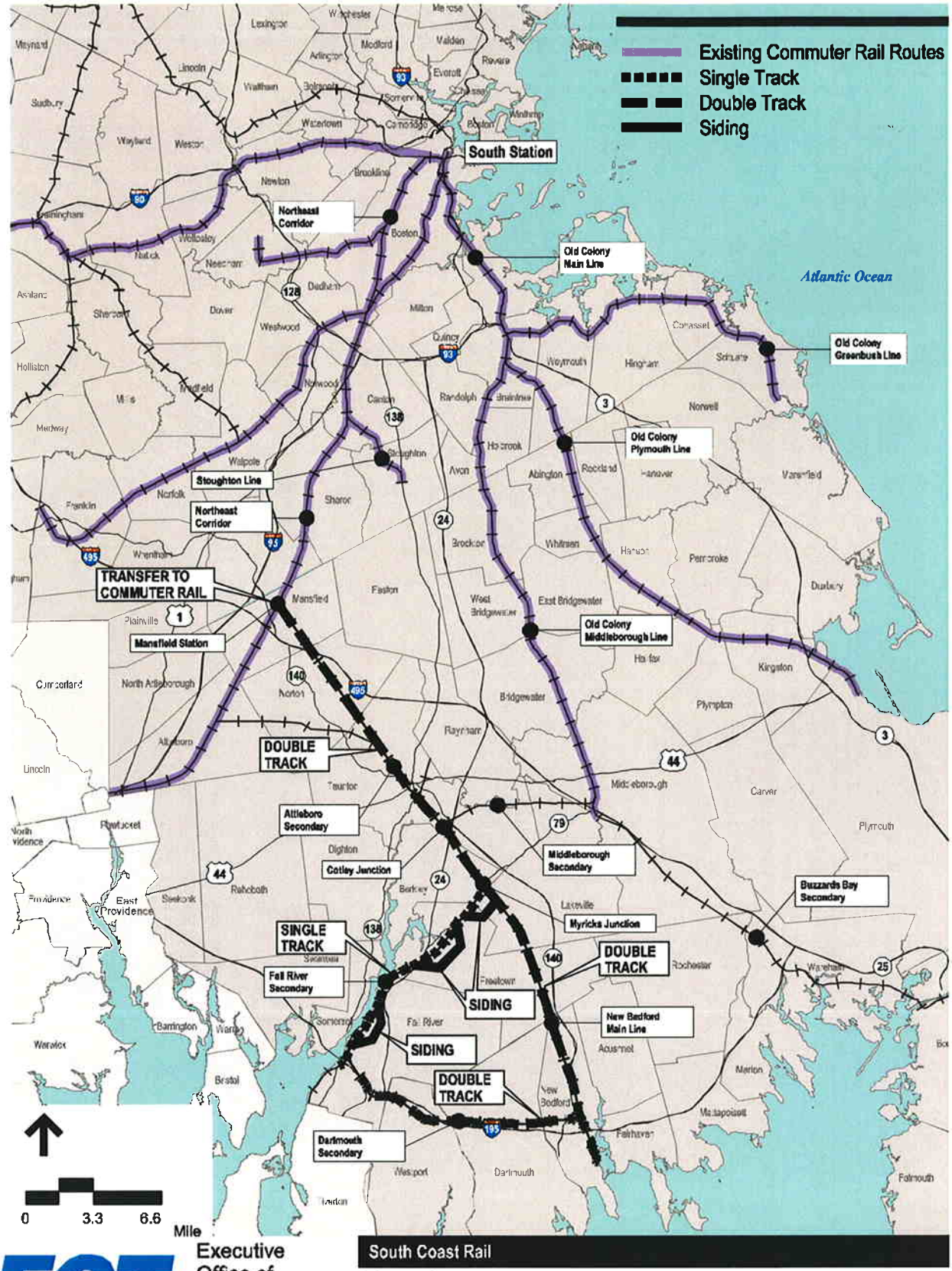

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Alternative 14
Diesel Multiple Units Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, along the Attleboro Secondary to Whittenton Junction in Taunton, then northwest along the former Mansfield Secondary right-of-way through Taunton, Norton, and Mansfield. A transfer would be needed to connect to the existing Providence Line commuter rail service at Mansfield Station. An additional service would be provided between New Bedford and Fall River along the Dartmouth Secondary.

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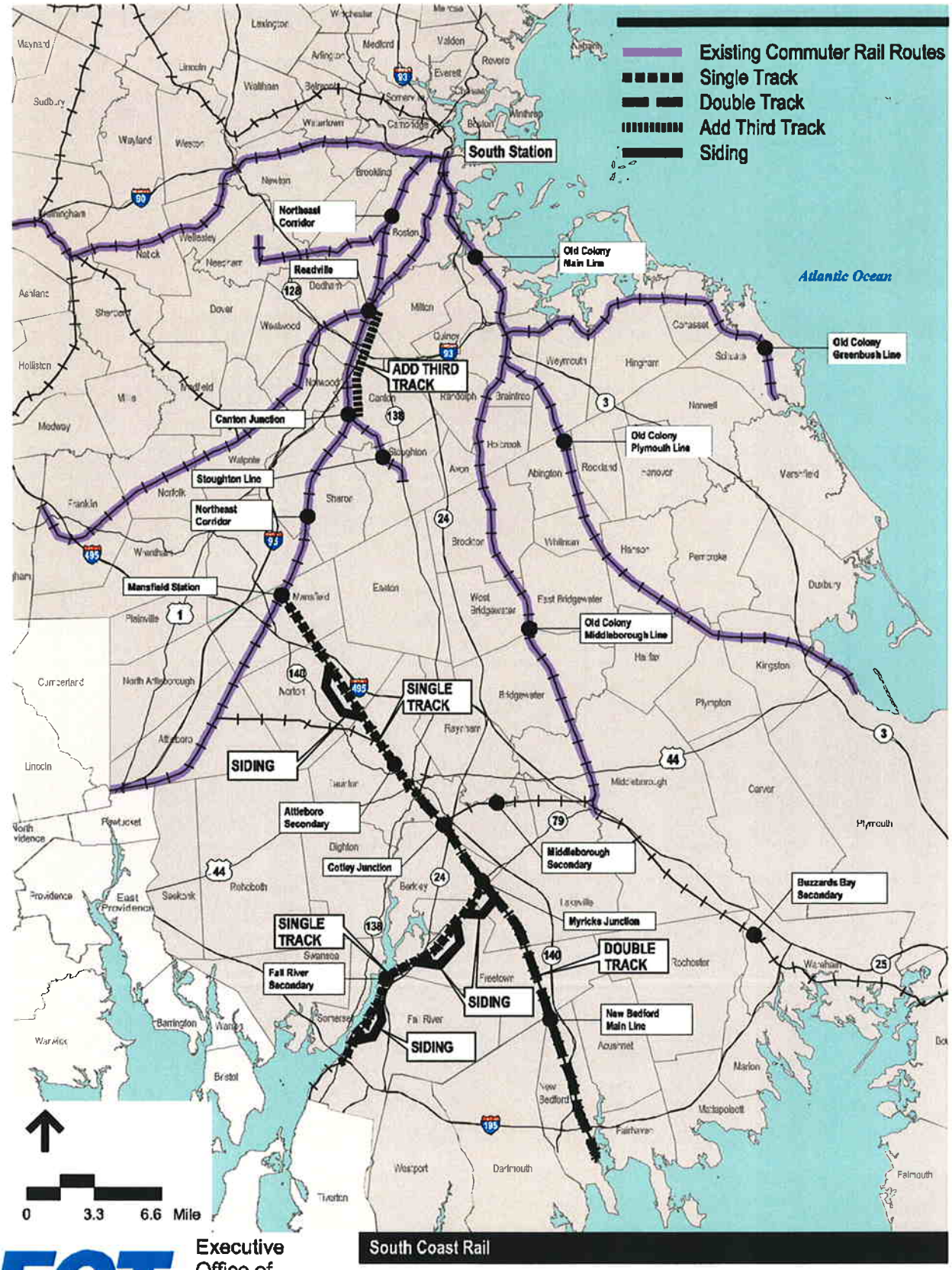

Executive Office of Transportation & Public Works

Alternative 15
Electrified Commuter Rail to South Station via Mansfield

This alternative would provide electrified commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, northwest along the Attleboro Secondary to Whittenton Junction in Taunton, then northwest along the former Mansfield Secondary right-of-way through Taunton, Norton, and Mansfield. It would tie into the Northeast Corridor near Mansfield Station.

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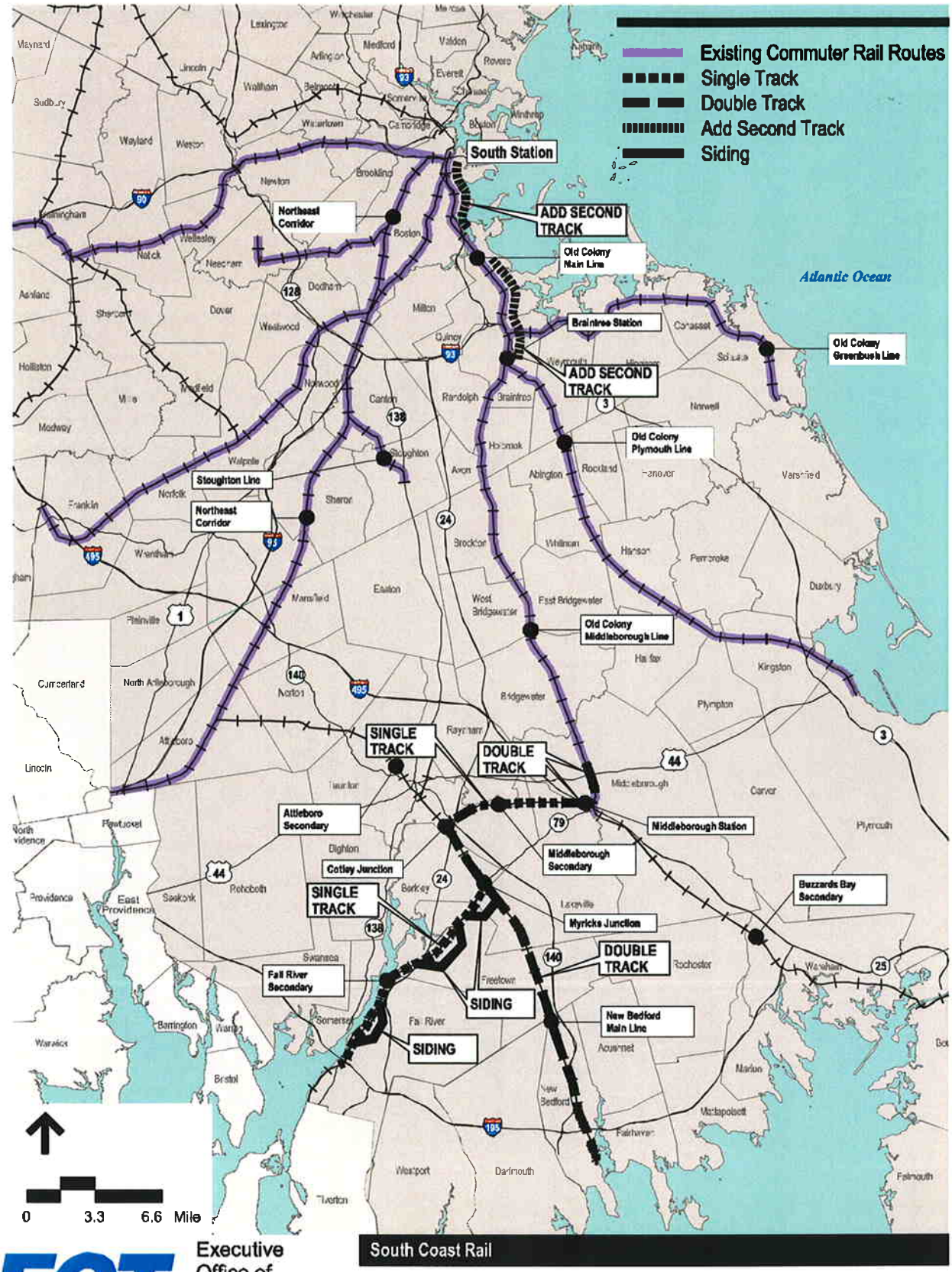

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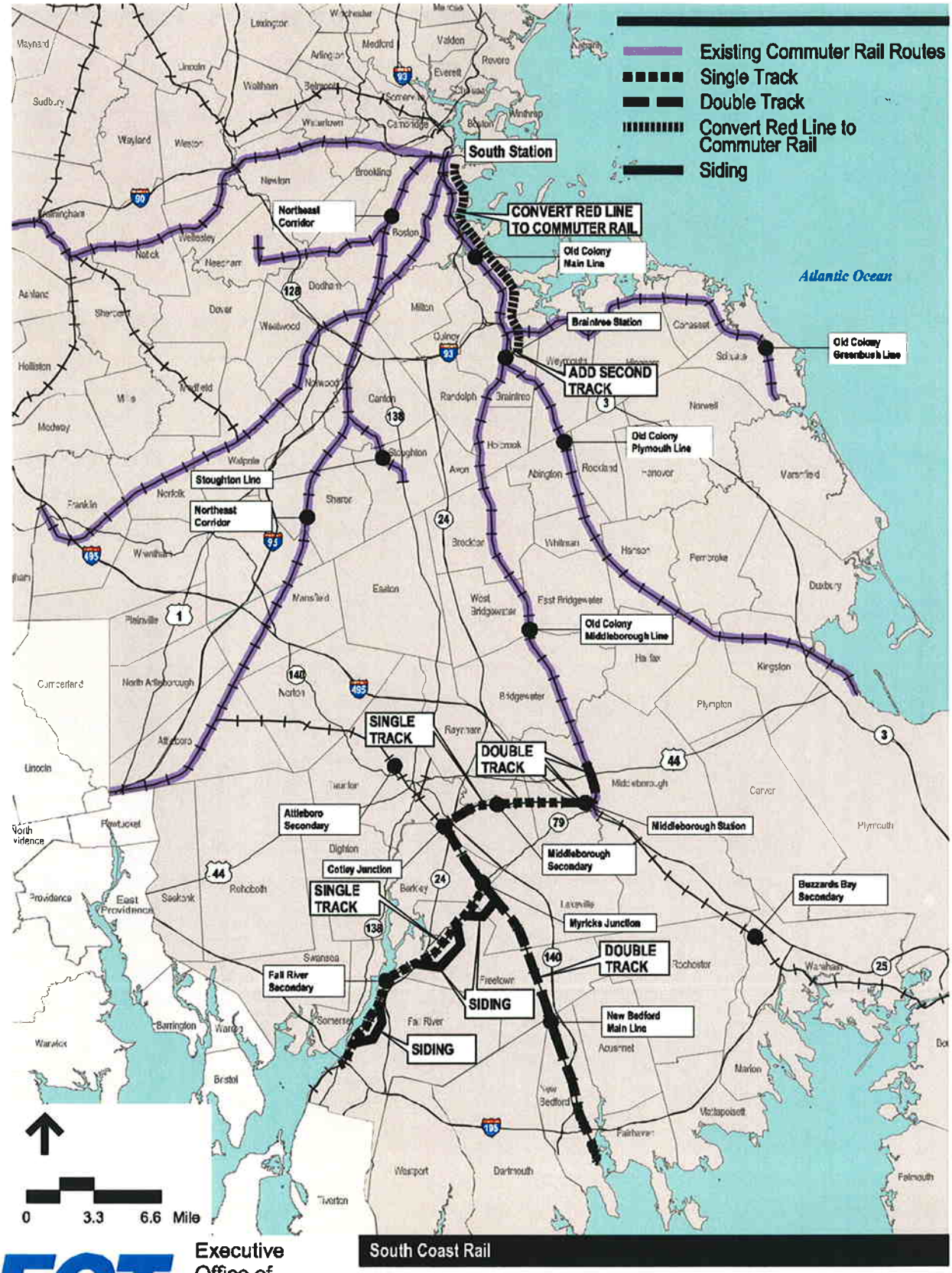
Alternative 17
Commuter Rail to South Station via Middleborough

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary to tie into the Middleborough Line at a new Middleborough/Lakeville Station, located north of the existing station. This alternative would require massive improvements to add a second track along the Old Colony Main Line through Braintree and Quincy.

\\Mabas\projects\10111.00\graphics\FIGURES\Tier 1 Alternatives\Rev Alts 041608\10111A2L.dwg



Executive Office of Transportation & Public Works

Alternative 18
Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary to tie into the Middleborough Line at a new Middleborough/Lakeville Station, located north of the existing station. The Red Line Braintree Branch would be converted to commuter rail to provide additional tracks for the Old Colony Main Line. This would increase the Old Colony Main Line from one track with a siding to three full tracks and eliminate the Red Line Braintree Branch.

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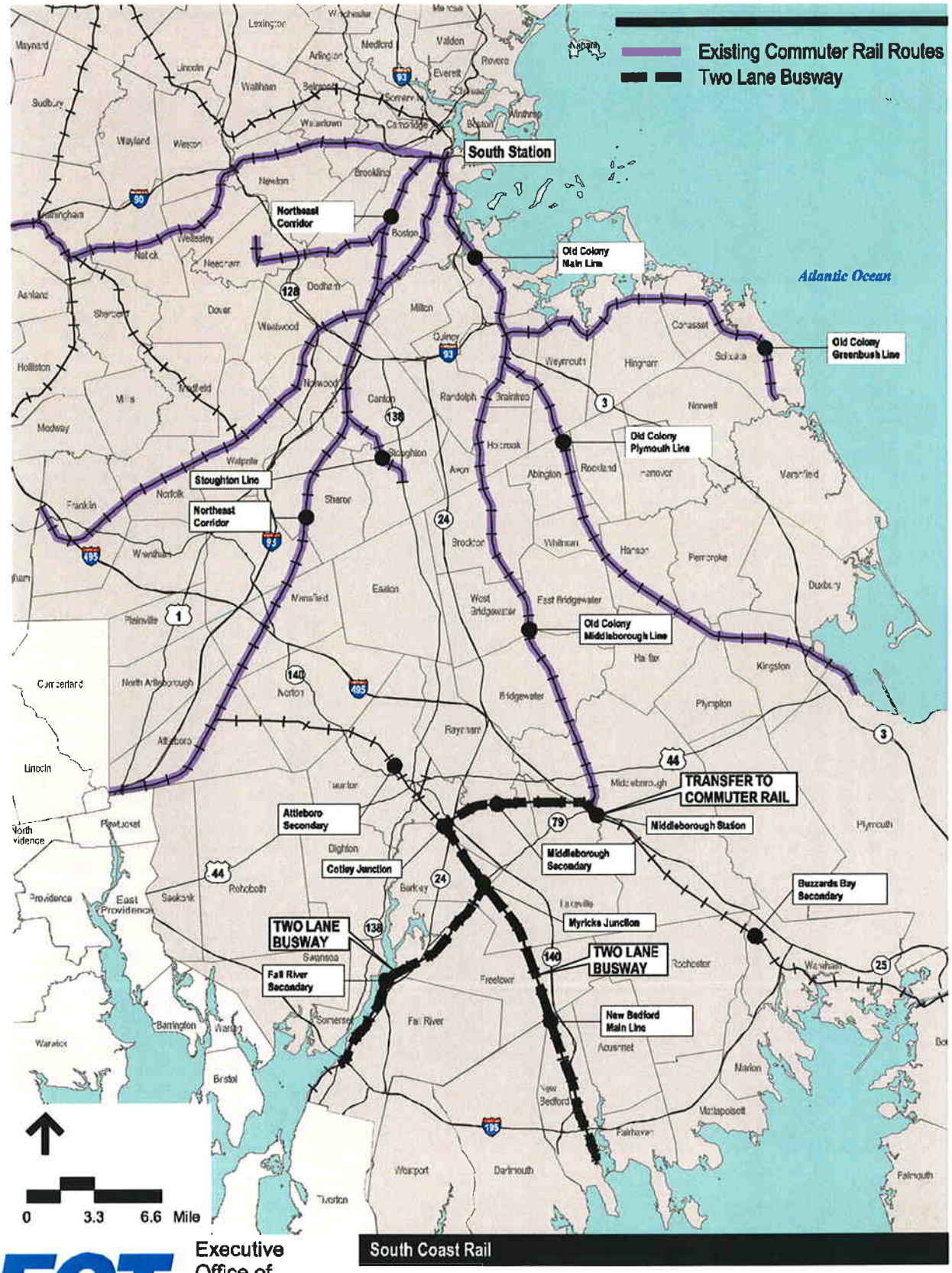

Executive Office of Transportation & Public Works

Alternative 20
Bus Rapid Transit to Middleborough/Lakeville Station

This alternative would provide bus rapid transit service on a new bus roadway adjacent to the New Bedford Main Line track and the Fall River Secondary track north to Cotley Junction, then east adjacent to the Middleborough Secondary. A transfer would be needed to connect to the existing Middleborough Line commuter rail service at Middleborough/Lakeville Station.

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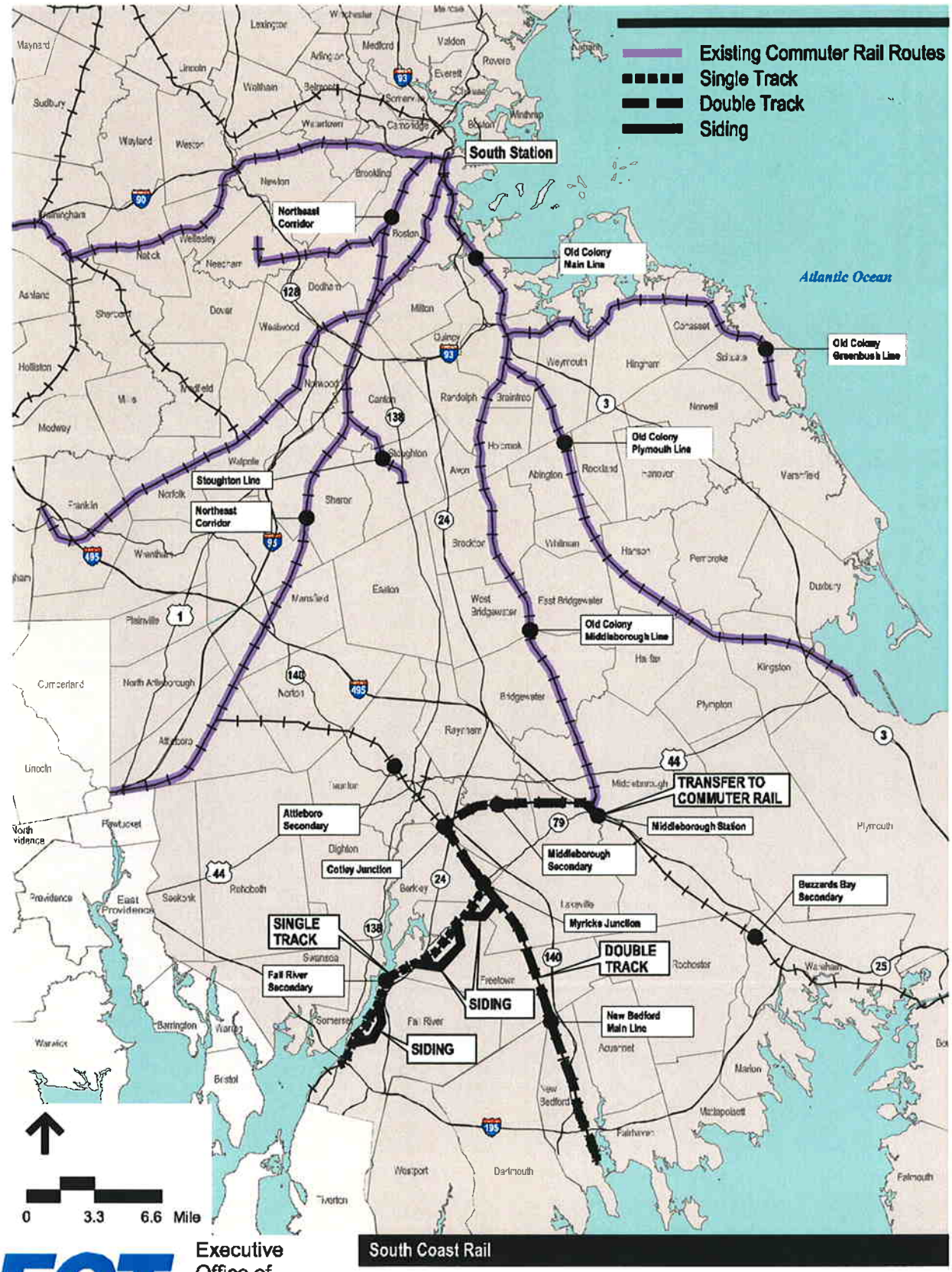

Executive Office of Transportation & Public Works

Alternative 21
Diesel Multiple Units Commuter Rail to Middleborough/Lakeville Station

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary. A transfer would be needed to connect to the existing Middleborough Line commuter rail service at Middleborough/Lakeville Station.

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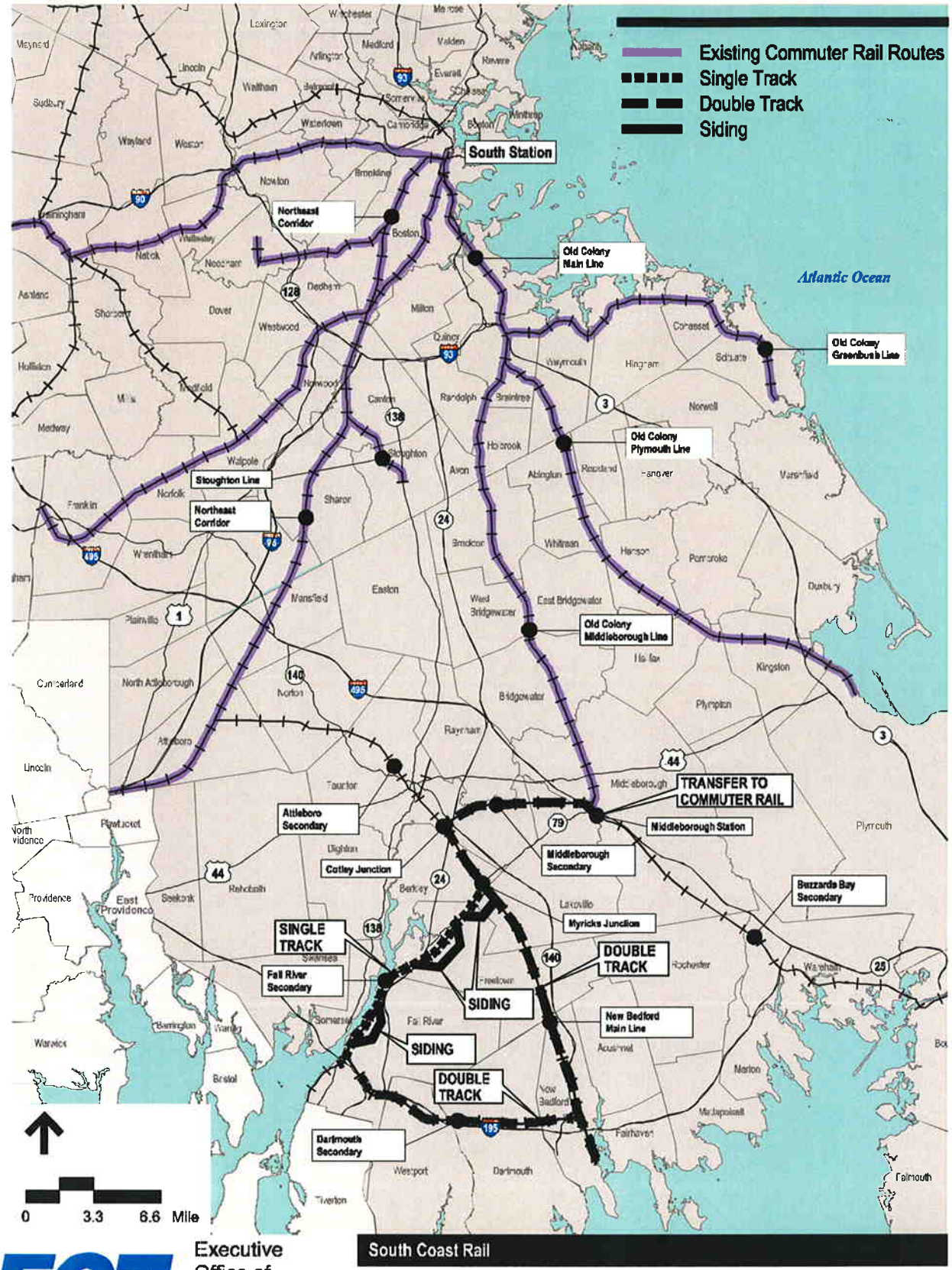

South Coast Rail

Executive Office of Transportation & Public Works

Alternative 22
Diesel Multiple Units to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Darthmouth Secondary

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary. A transfer would be needed to connect to the existing Middleborough Line commuter rail service at the Middleborough/Lakeville Station. An additional service would be provided along the Dartmouth Secondary between New Bedford and Fall River.

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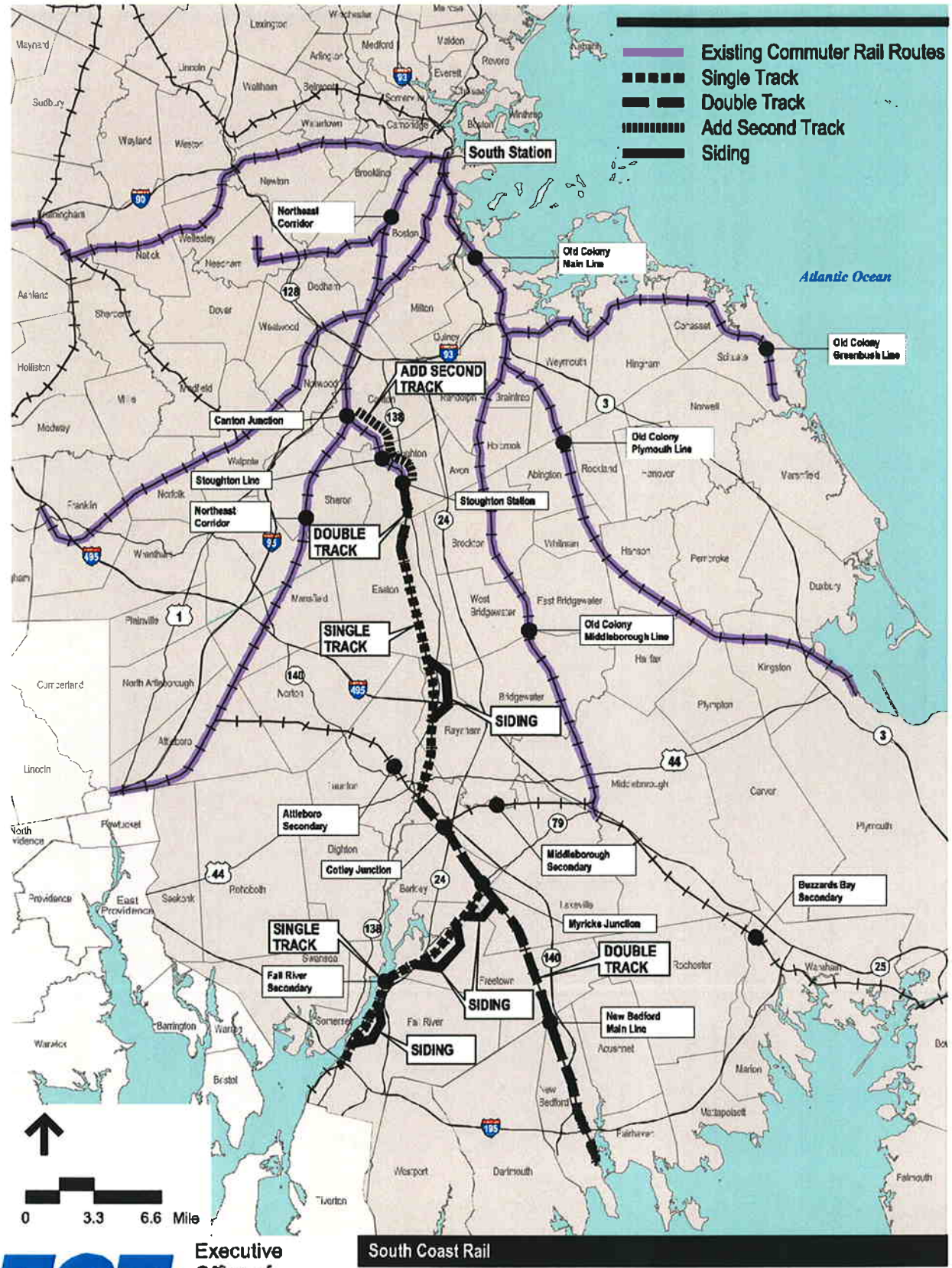

Executive Office of Transportation & Public Works

Alternative 30
Commuter Rail to South Station via Stoughton

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then north along the existing right-of-way through Raynham, Easton, and Stoughton to tie into the Stoughton Line at Stoughton Station.

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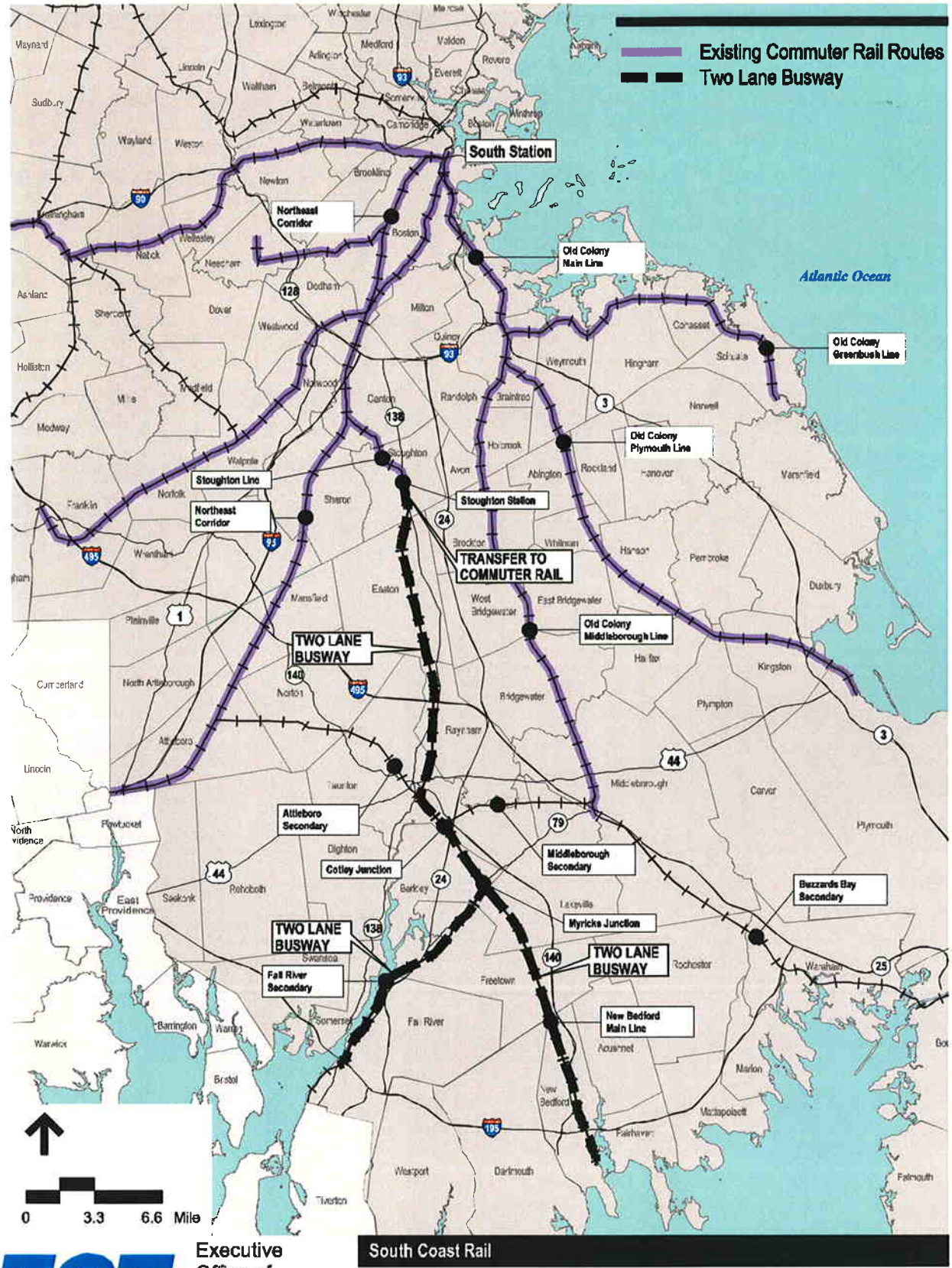

Executive Office of Transportation & Public Works

Alternative 31
Bus Rapid Transit to Stoughton Station

This alternative would provide bus rapid transit service on a new bus roadway adjacent to the New Bedford Main Line track and the Fall River Secondary track north to Cotley Junction, then north along the exising right-of-way through Raynham, Easton, and Stoughton. A transfer would be needed to connect to the existing Stoughton Line commuter rail service at Stoughton Station.

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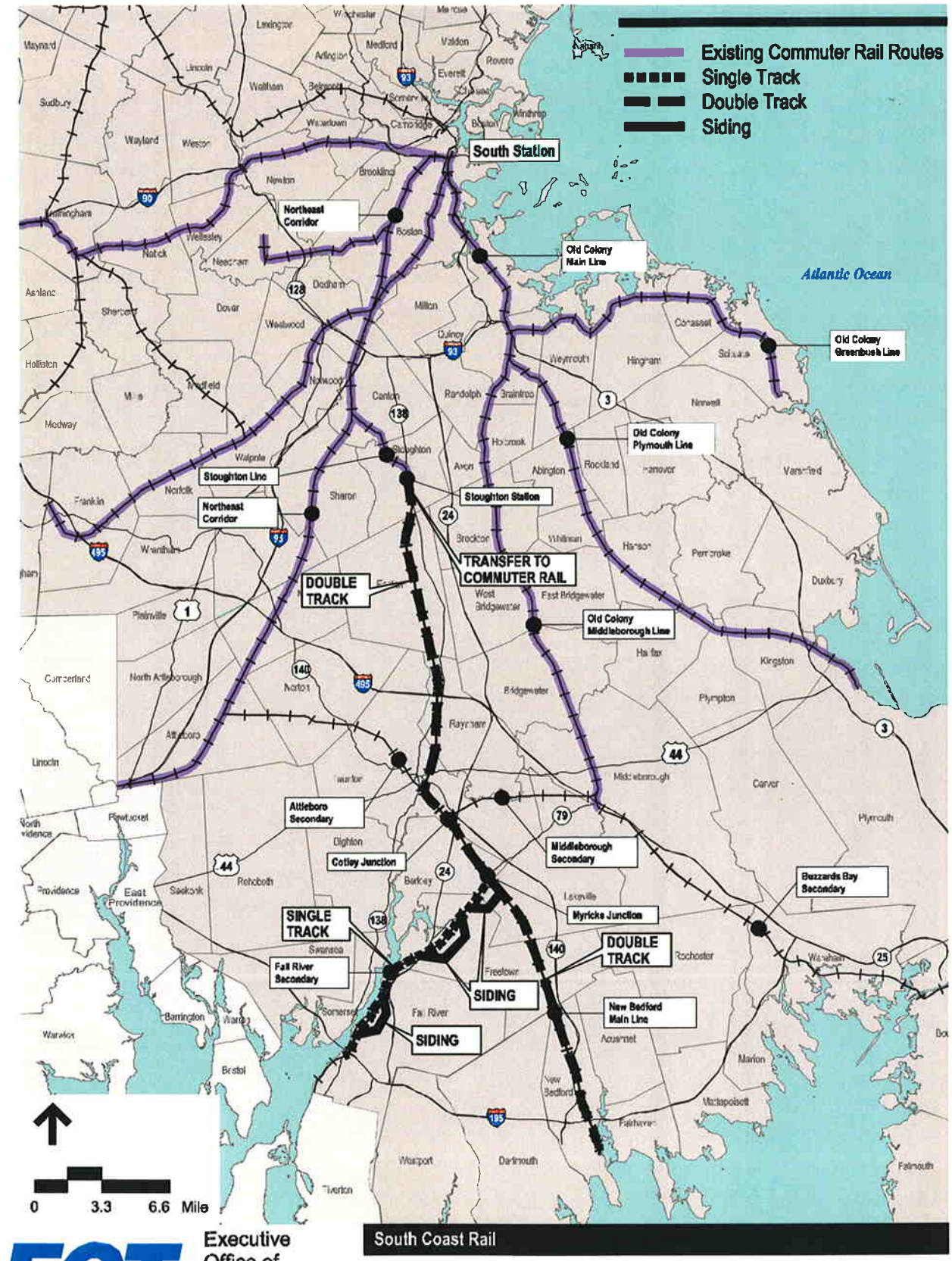

Executive Office of Transportation & Public Works

Alternative 32
Diesel Multiple Units Commuter Rail to Stoughton Station

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then north along the existing right-of-way through Raynham, Easton, and Stoughton. A transfer would be needed to connect to the existing Stoughton Line commuter rail service at Stoughton Station.

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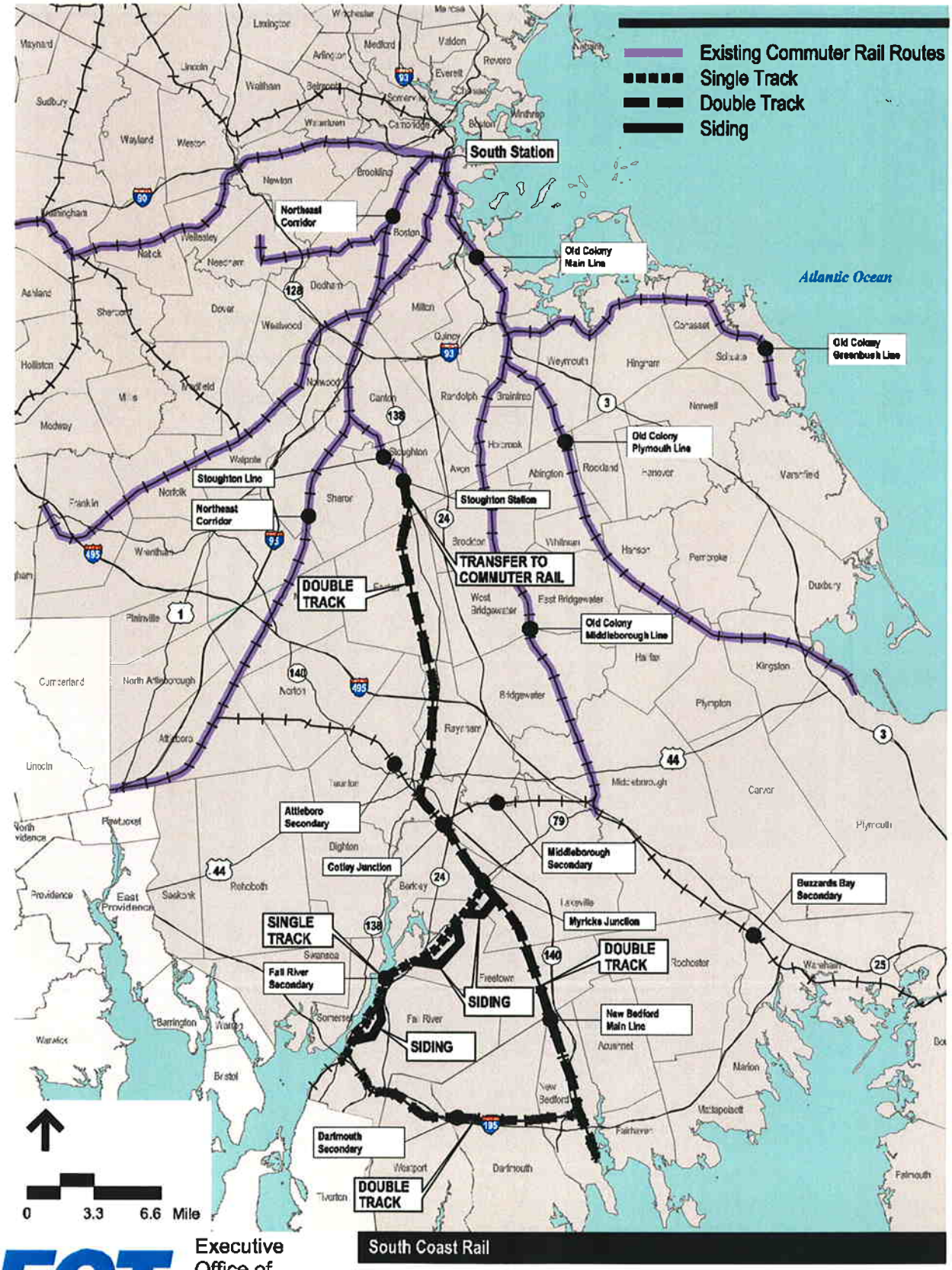

Executive Office of Transportation & Public Works

Alternative 33
Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Darthmouth Secondary

This alternative would provide commuter rail service using diesel multiple units along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then north along the existing right-of-way through Raynham, Easton, and Stoughton. A transfer would be needed to connect to the existing Stoughton Line commuter rail service at Stoughton Station. An additional service would be provided along the Dartmouth Secondary between Fall River and New Bedford.

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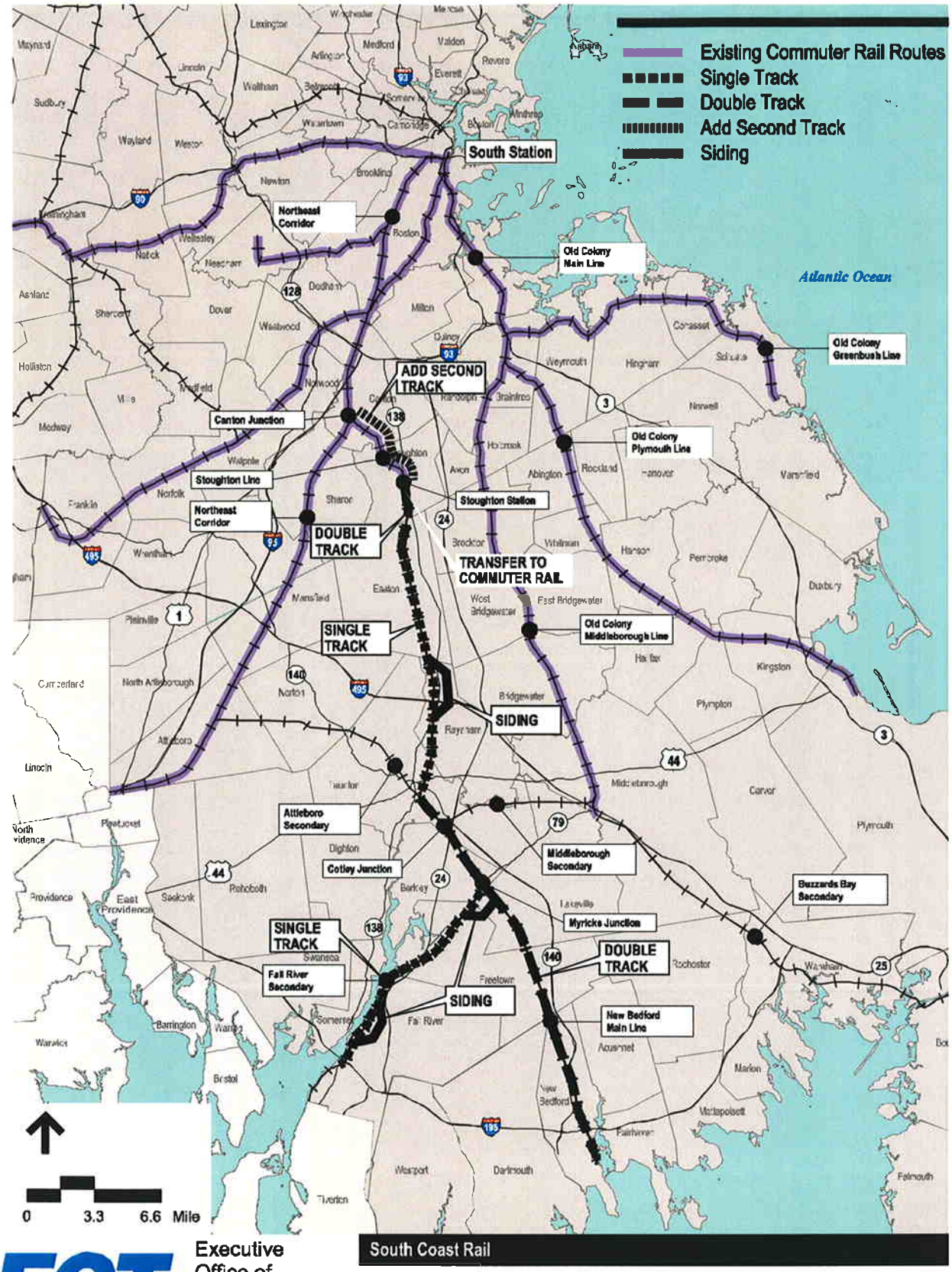

Executive Office of Transportation & Public Works

Alternative 34
Electrified Commuter Rail to South Station via Stoughton

This alternative would provide electrified commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then north along the existing rights-of-way through Raynham, Easton, and Stoughton to tie into the Stoughton Line at Stoughton Station.

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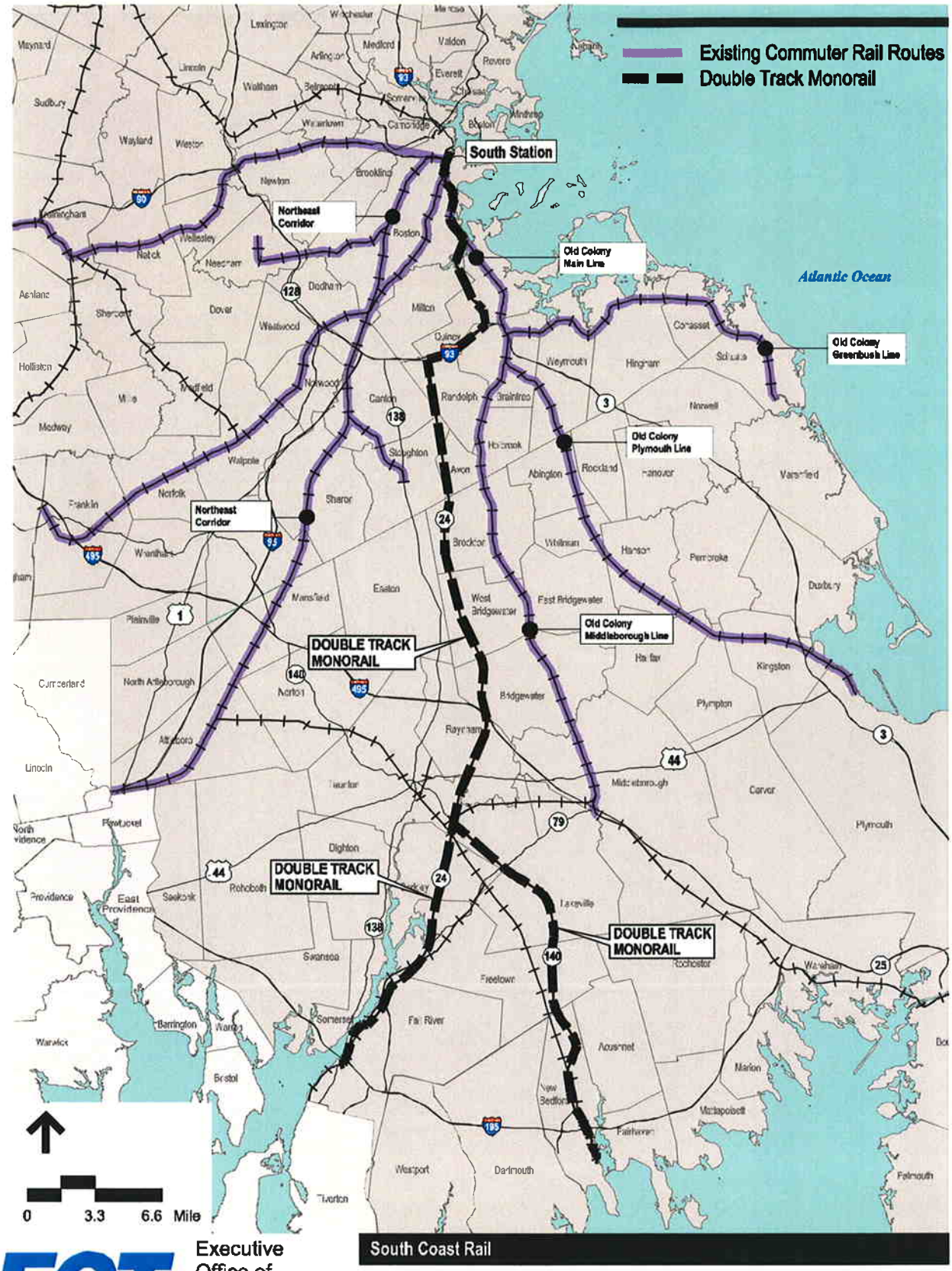

Executive Office of Transportation & Public Works

Alternative 37
Monorail to South Station via Route 140, Route 24, Route 128 and Southeast Expressway

This alternative would provide monorail service along the Route 24 and Route 140 rights-of-way from Fall River/New Bedford north to Randolph, then along the Route 128/I-93 right-of-way, and north along the Southeast Expressway right-of-way to South Station.

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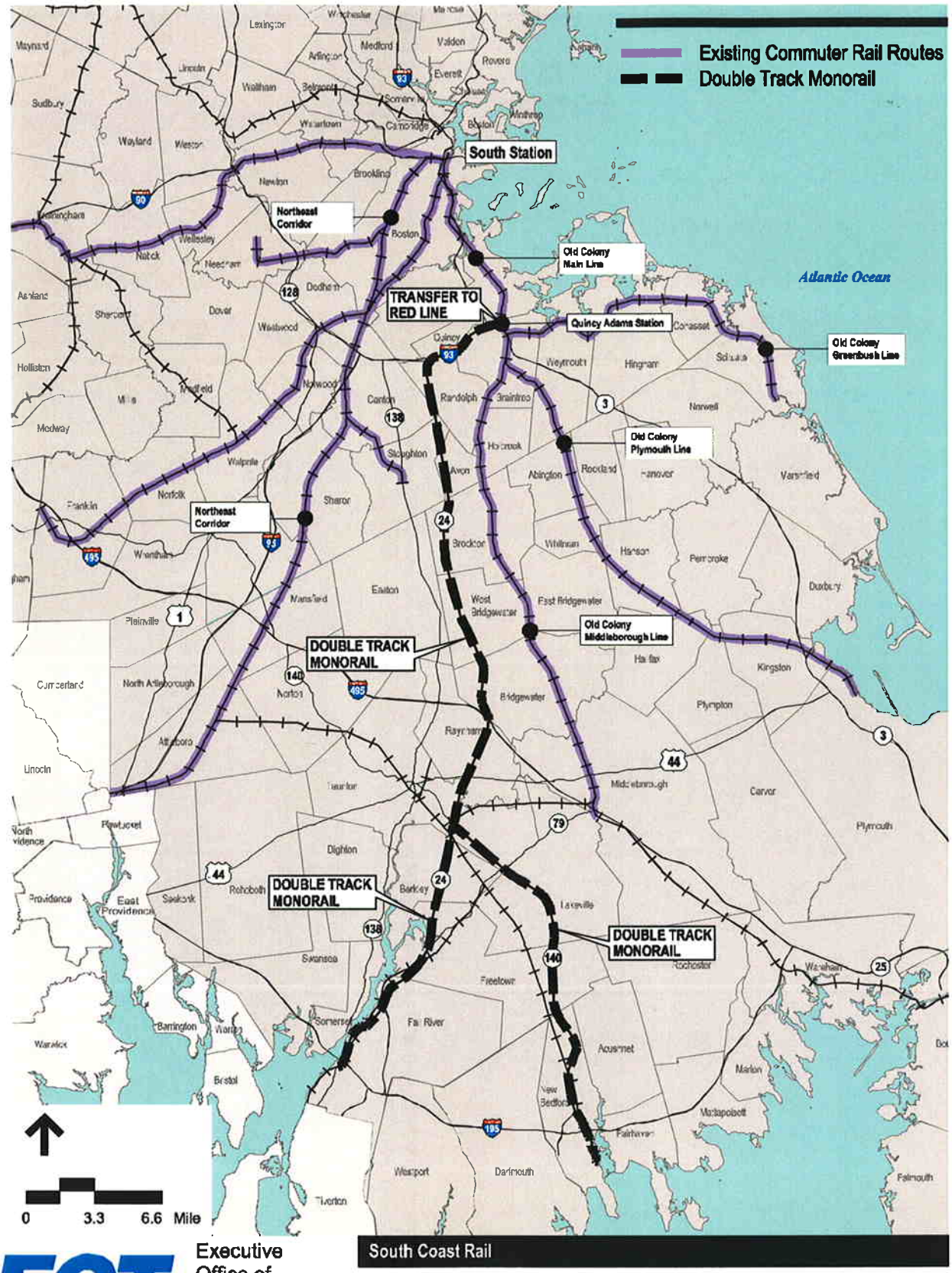

Executive Office of Transportation & Public Works

Alternative 38
Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128

This alternative would provide monorail service along the Route 24 and Route 140 rights-of-way from Fall River/New Bedford north to Randolph, then east along the Route 128/I-93 right-of-way. A transfer would be needed to connect to the existing Red Line rapid transit service at Quincy Adams Station.

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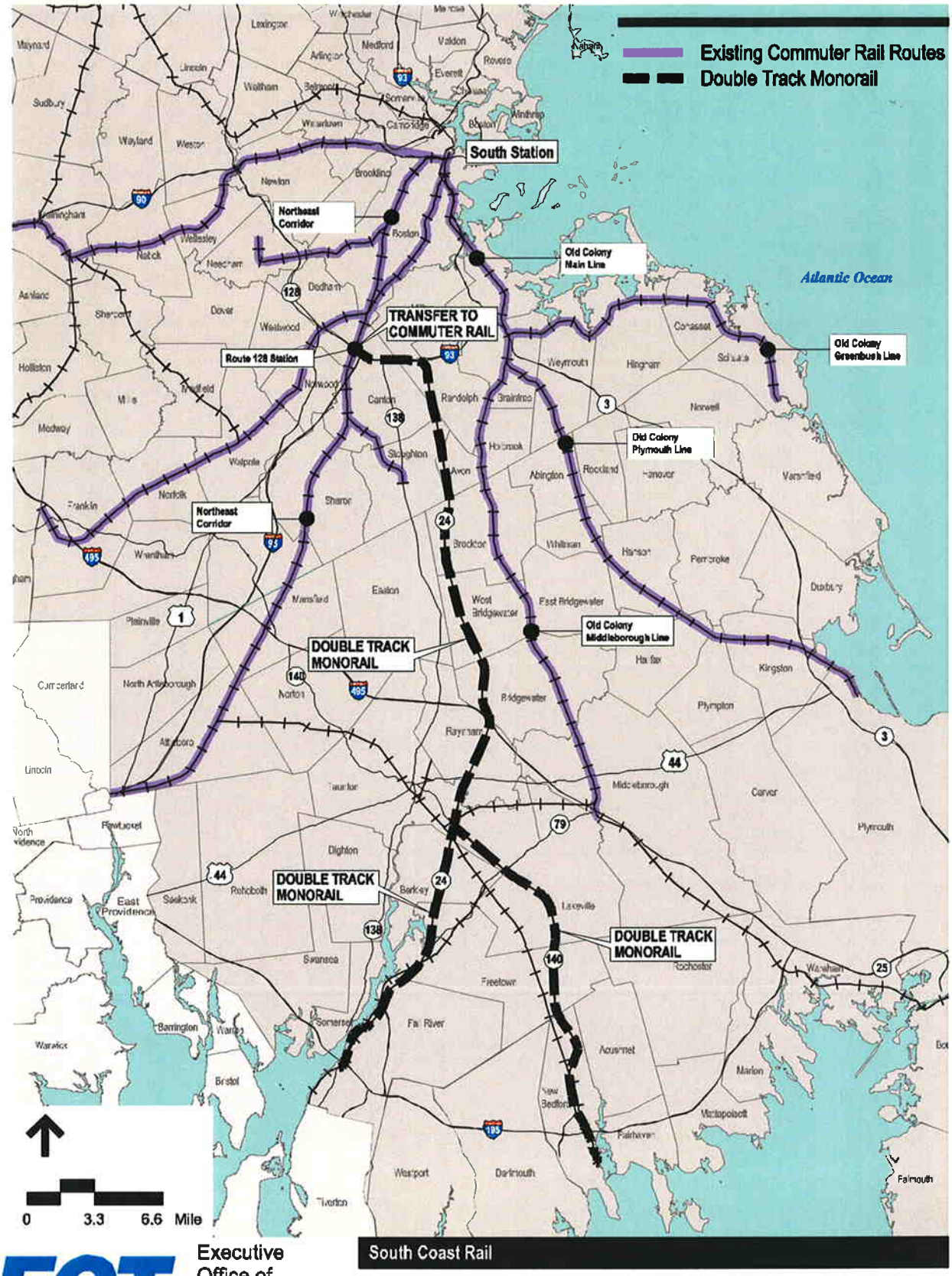

Executive Office of Transportation & Public Works

Alternative 39
Monorail to Route 128 Station via Route 140, Route 24, and Route 128

This alternative would provide monorail service along the Route 24 and Route 140 rights-of-way from Fall River/New Bedford north to Randolph, then west along the Route 128/I-93/I-95 right-of-way. A transfer would be needed to connect to the existing Providence Line and Stoughton Line commuter rail service at the Route 128 Station.

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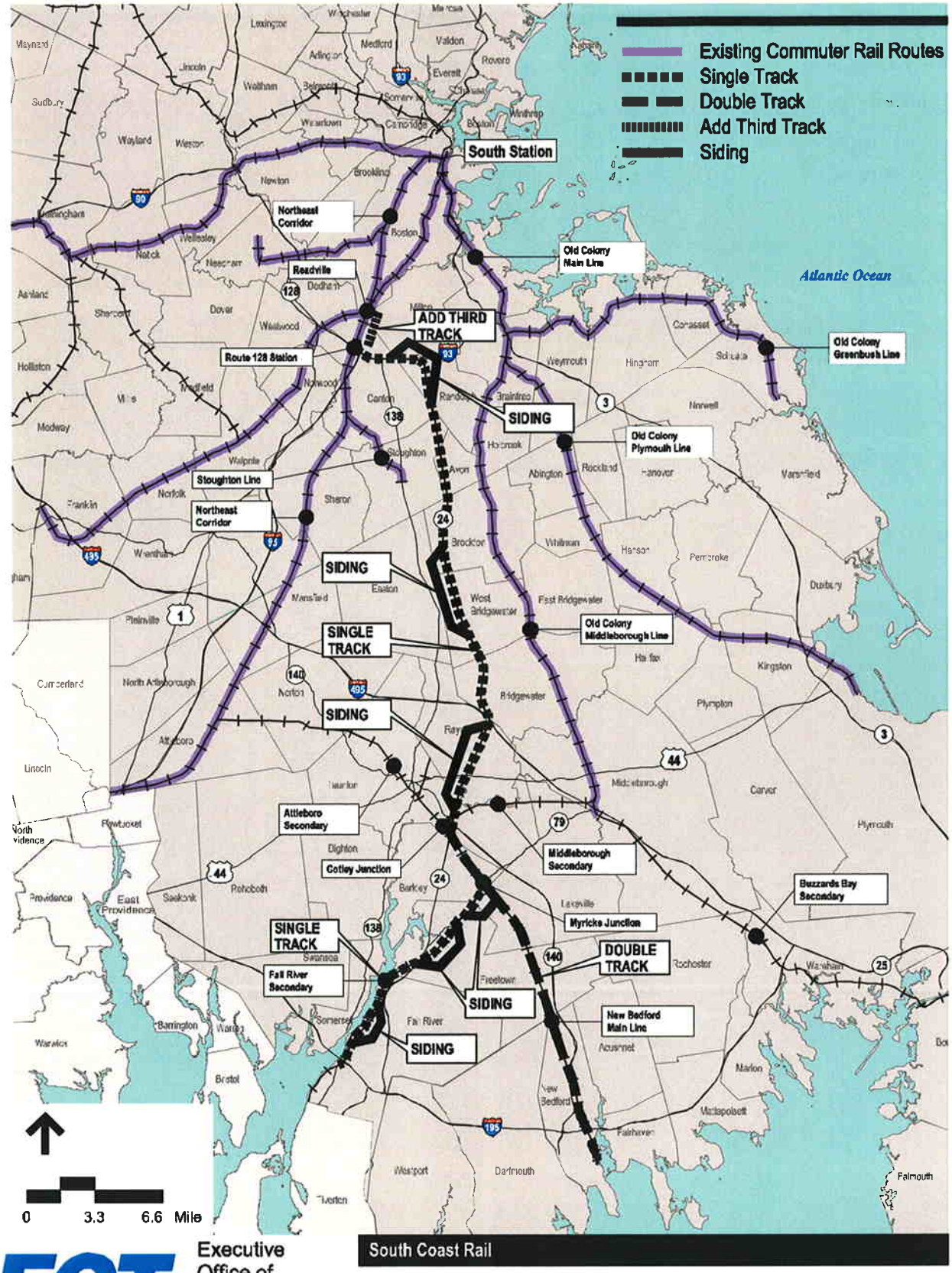

Executive Office of Transportation & Public Works

Alternative 40
Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then on new track along the Route 24 right-of-way north to Randolph, and west along the Route 128/I-93 right-of-way. This alternative would tie into the Northeast Corridor near the Route 128 Station.

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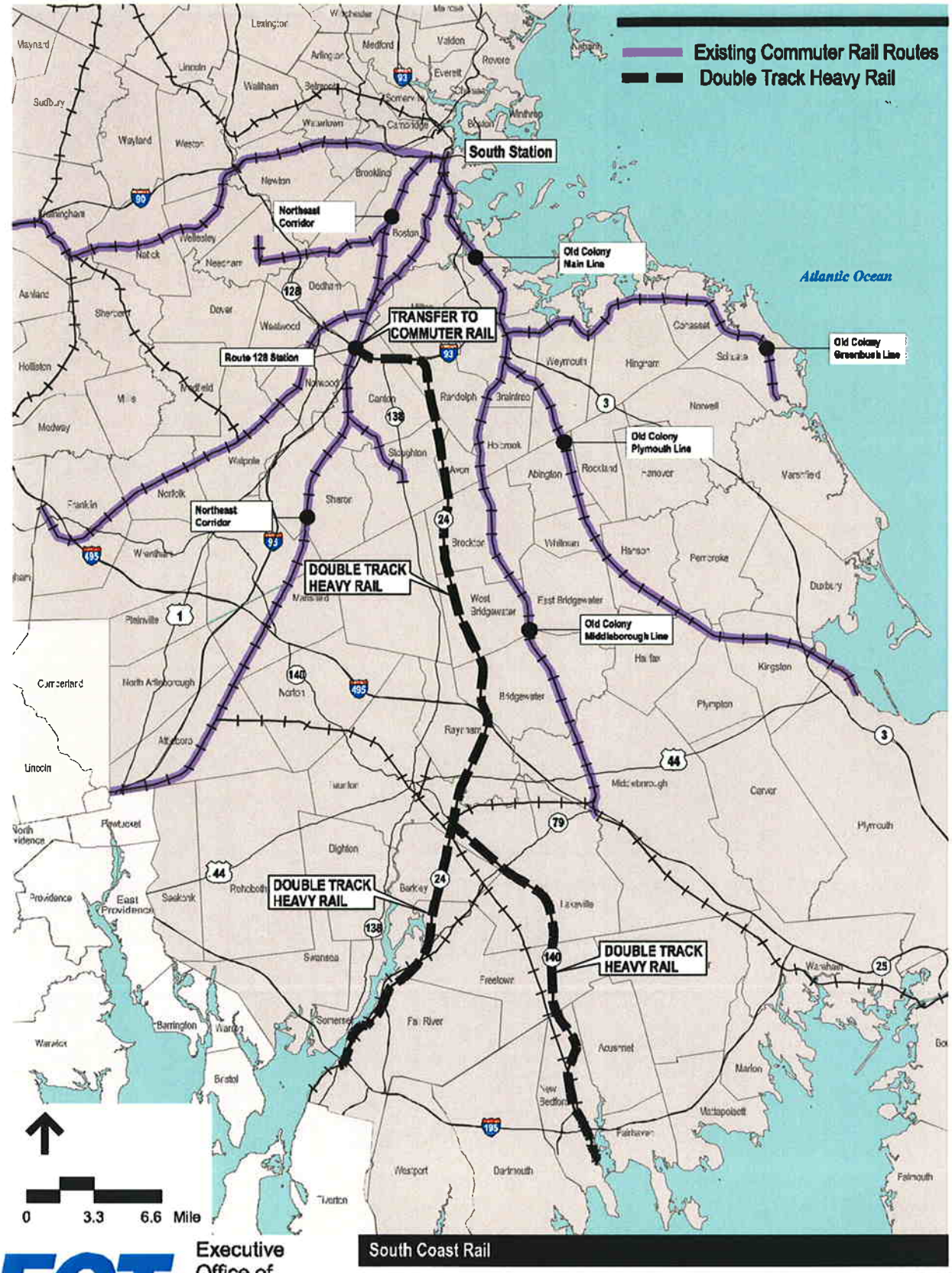

Executive Office of Transportation & Public Works

Alternative 41
Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128

This alternative would provide heavy or light rail transit service along the Route 24 and Route 140 rights-of-way from Fall River/New Bedford north to Randolph, then west along the Route 128/I-93/I-95 rights-of-way. A transfer would be needed to connect to the existing Providence Line and Stoughton Line commuter rail service at the Route 128 Station.

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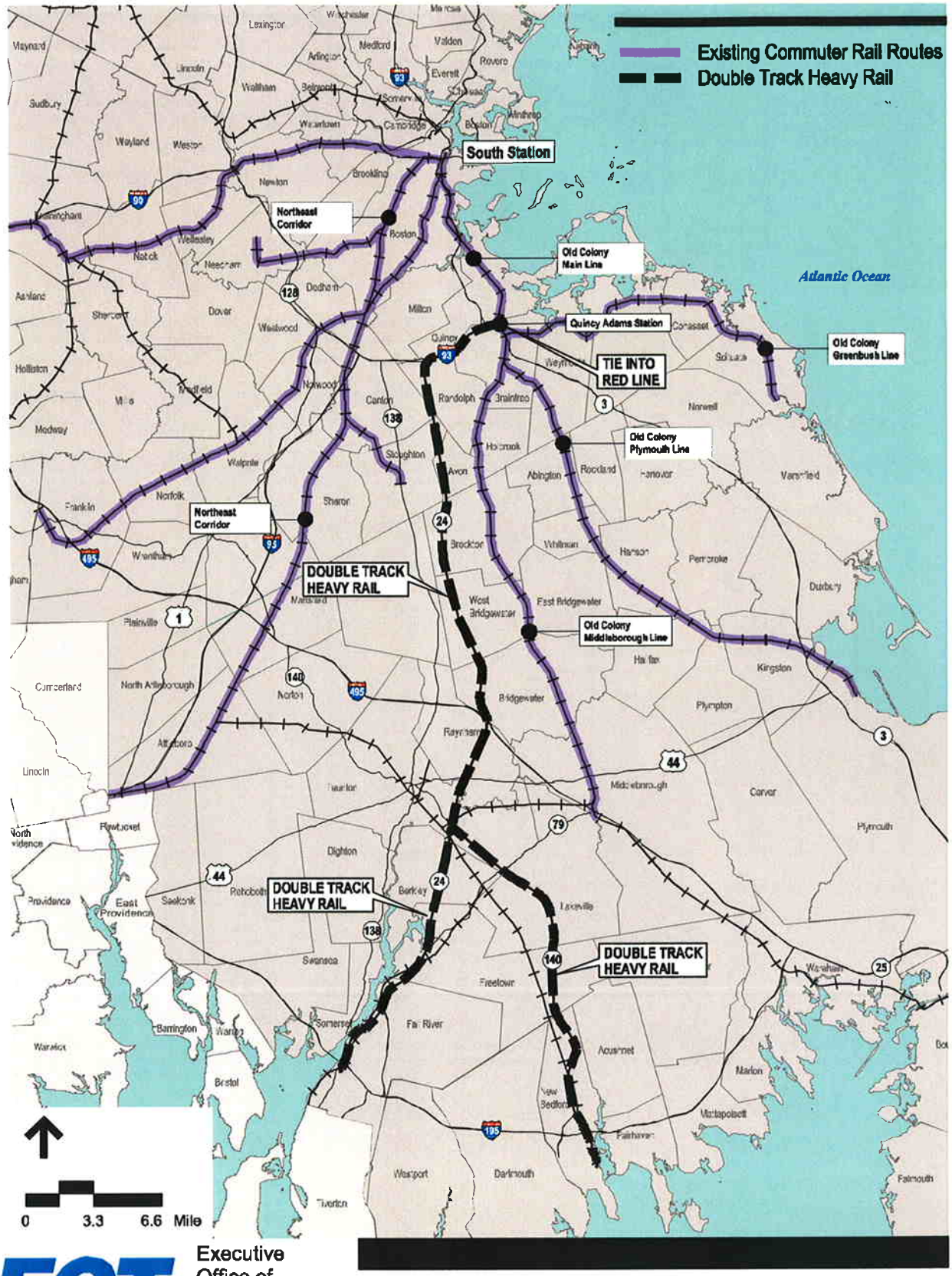

Executive Office of Transportation & Public Works

Alternative 42
Heavy Rail to South Station ia Route 140, Route 24, Route 128, and Red Line

This alternative would provide heavy rail transit service along the Route 24 and Route 140 rights-of-way from Fall River/New Bedford north to Randolph, then east along the Route 128/I-93 right-of-way. This alternative would tie into the Red Line at the Quincy Adams Red Line Station.

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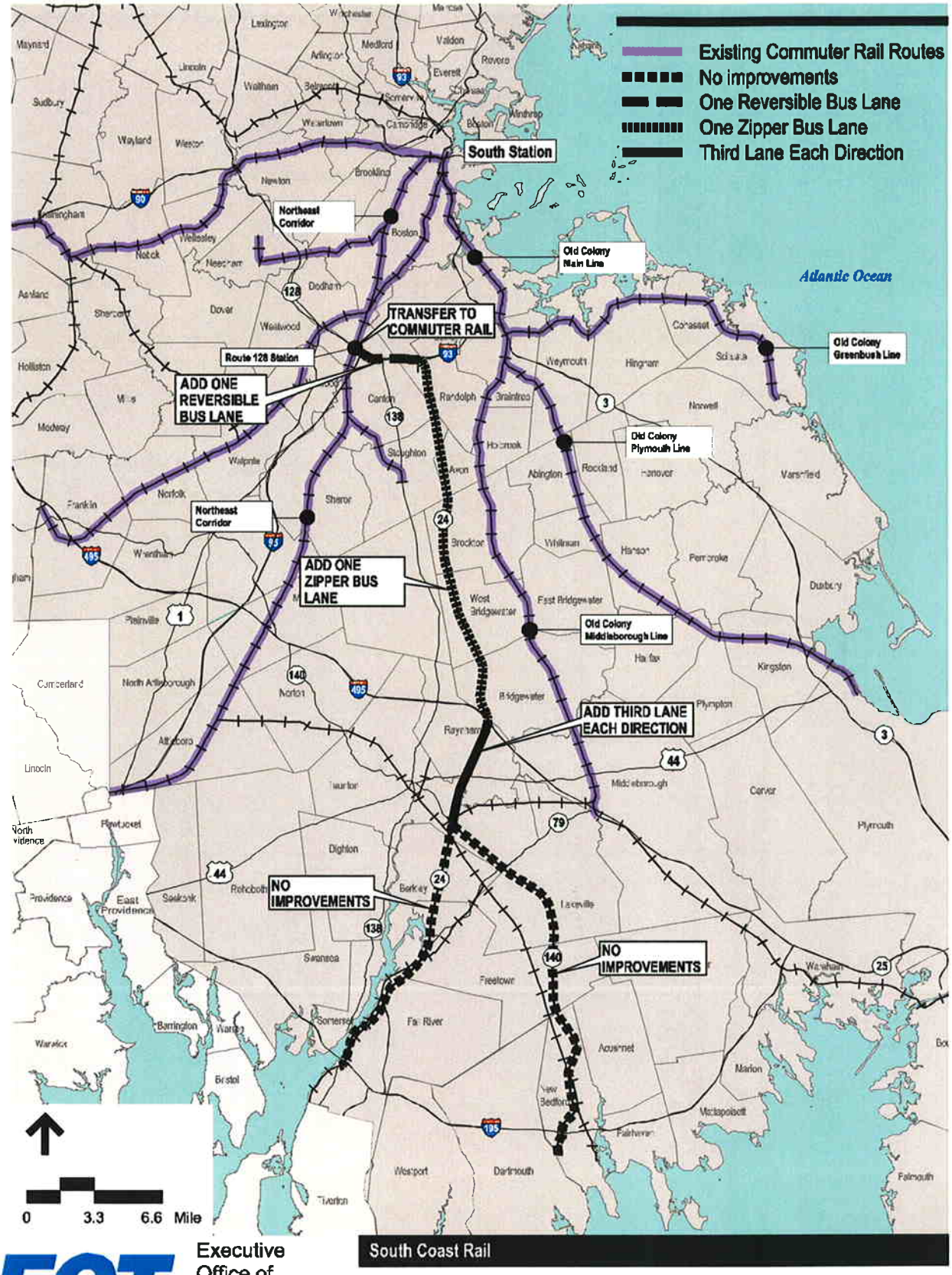

Executive Office of Transportation & Public Works

Alternative 43
Express Bus in Dedicated Lane to Route 128 Station via Route 24 and Route 128

This alternative would provide an exclusive bus lane on Route 24 from I-495 north to Randolph, then west on Route 128. A transfer would be needed to connect to the existing Providence Line and Stoughton Line commuter rail service at the Route 128 Station.

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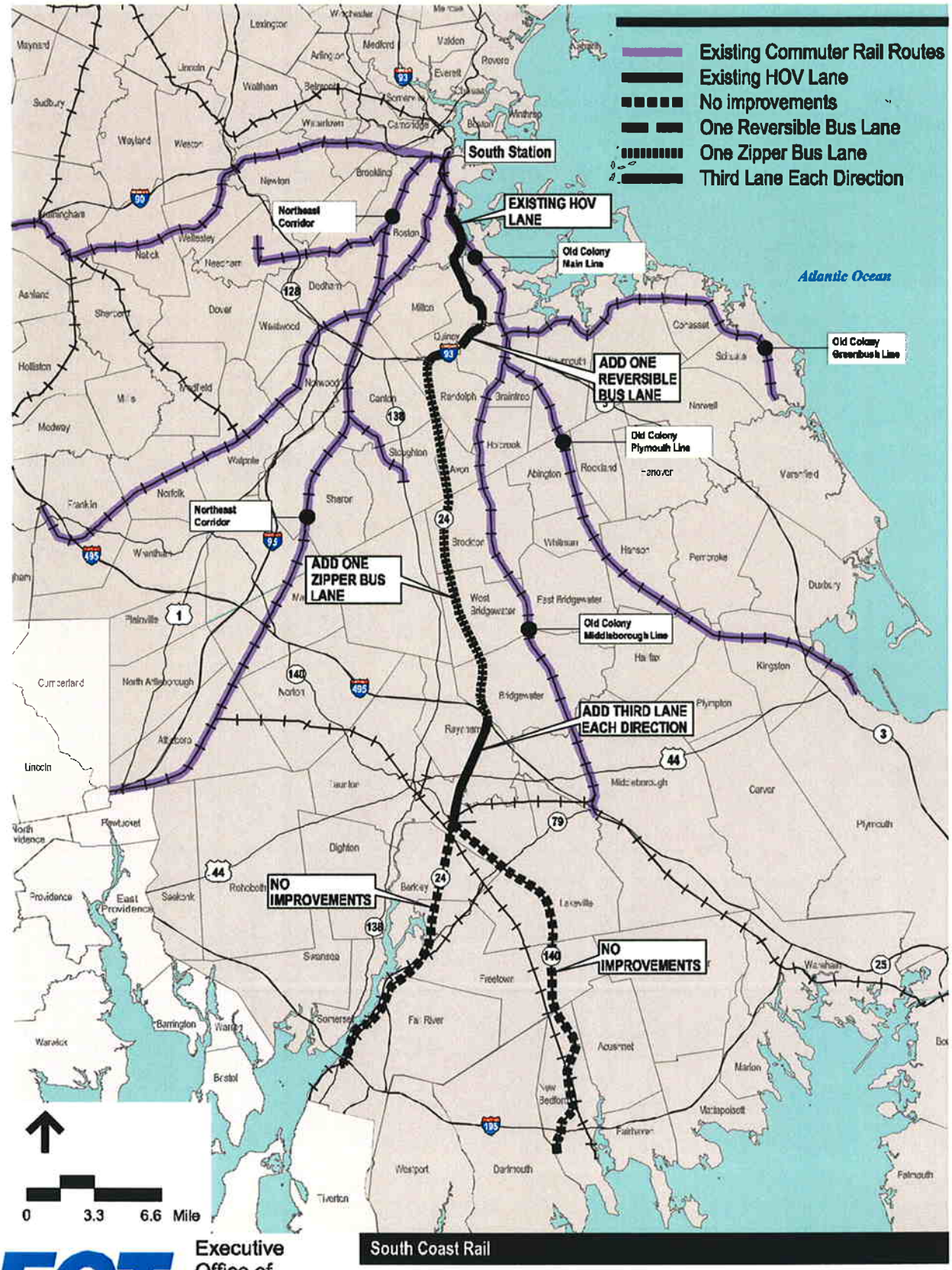

Executive Office of Transportation & Public Works

Alternative 44
Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway

This alternative would provide an exclusive bus lane on Route 24 from I-495 north to Randolph, then east on Route 128/I-93 to connect to the existing Southeast Expressway HOV Lane to South Station.

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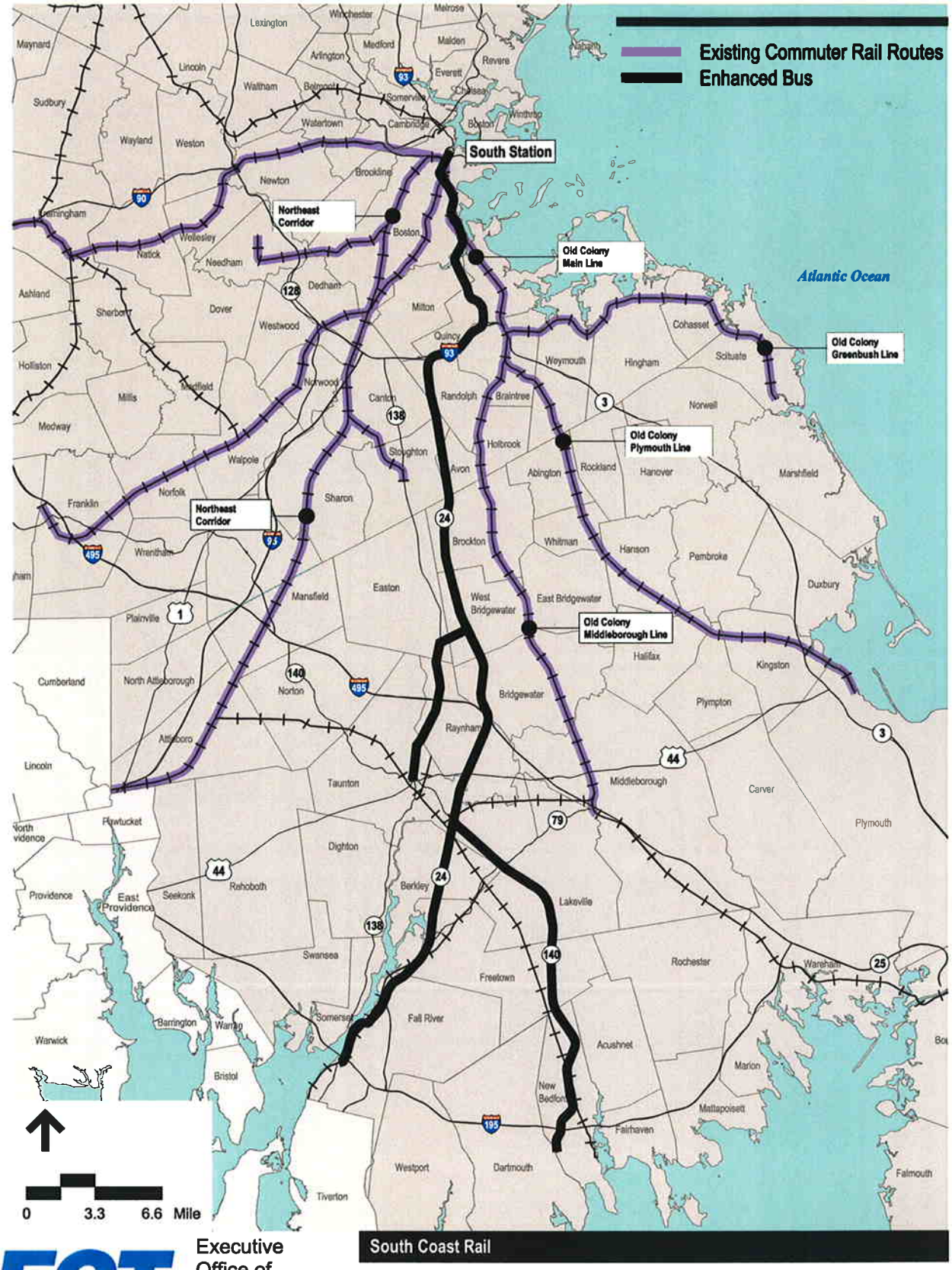

Executive Office of Transportation & Public Works

Alternative 45
Enhanced Bus Service on Existing Private Carrier Routes

This alternative would provide increased bus service and increased parking for bus commuters along the existing private bus carrier lines from Fall River, New Bedford, and Taunton to South Station.

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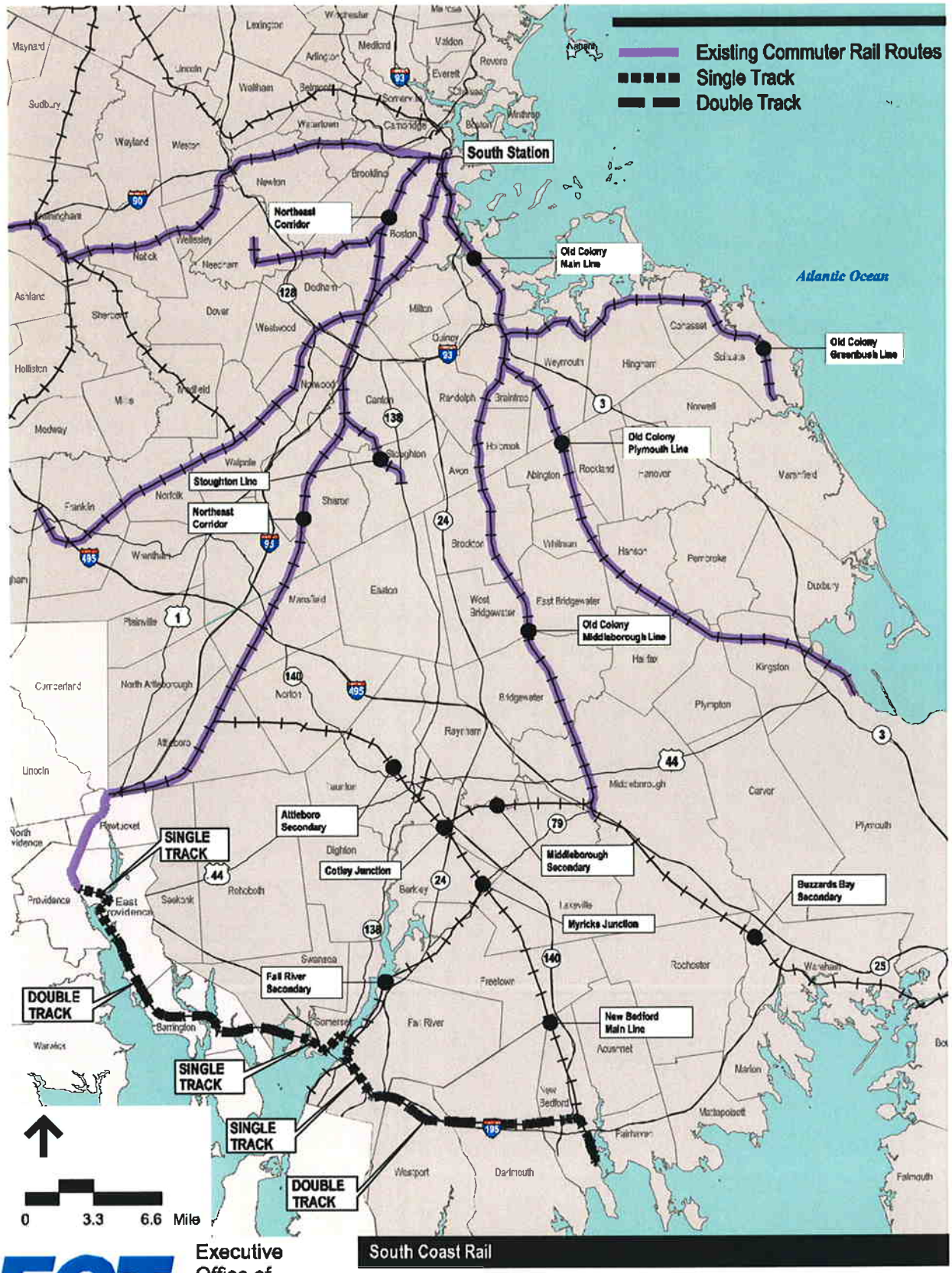

Executive Office of Transportation & Public Works

Alternative 56
Commuter Rail to South Station via Providence

This alternative would provide commuter rail service along the Dartmouth Secondary and an old right-of-way through Rhode Island between New Bedford, Fall River, and Providence, Rhode Island. It would tie into the Northeast Corridor just north of Providence Station, and trains would continue north to South Station.

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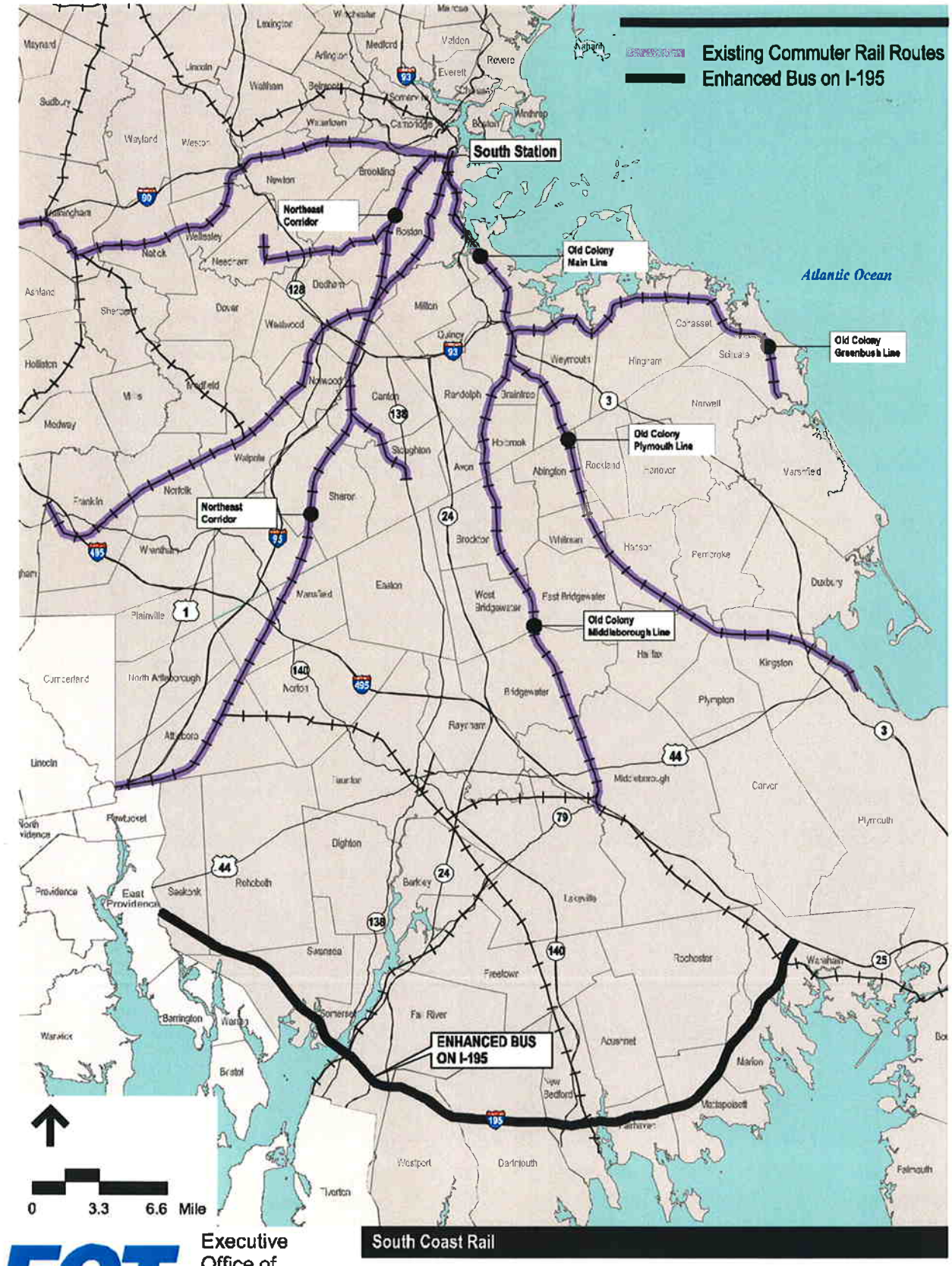

Executive Office of Transportation & Public Works

Alternative 57
Enhanced Bus on Interstate 195

This alternative would provide increased bus service along Interstate 195 between Wareham and Providence.

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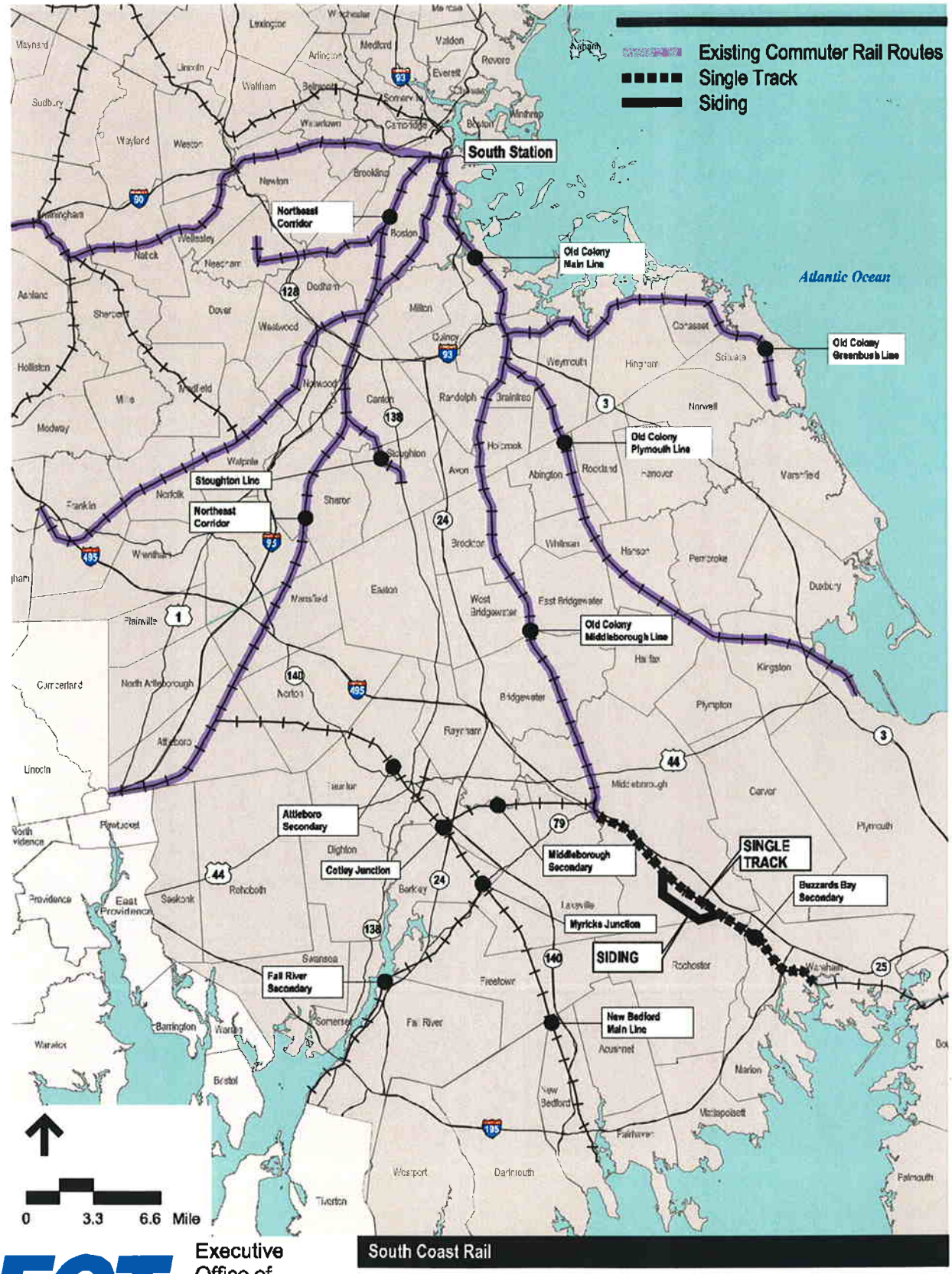

South Coast Rail

Executive Office of Transportation & Public Works

Alternative 58
Commuter Rail to Wareham

This alternative would extend the existing Middleborough Line commuter rail service to Wareham and/or Buzzards Bay.

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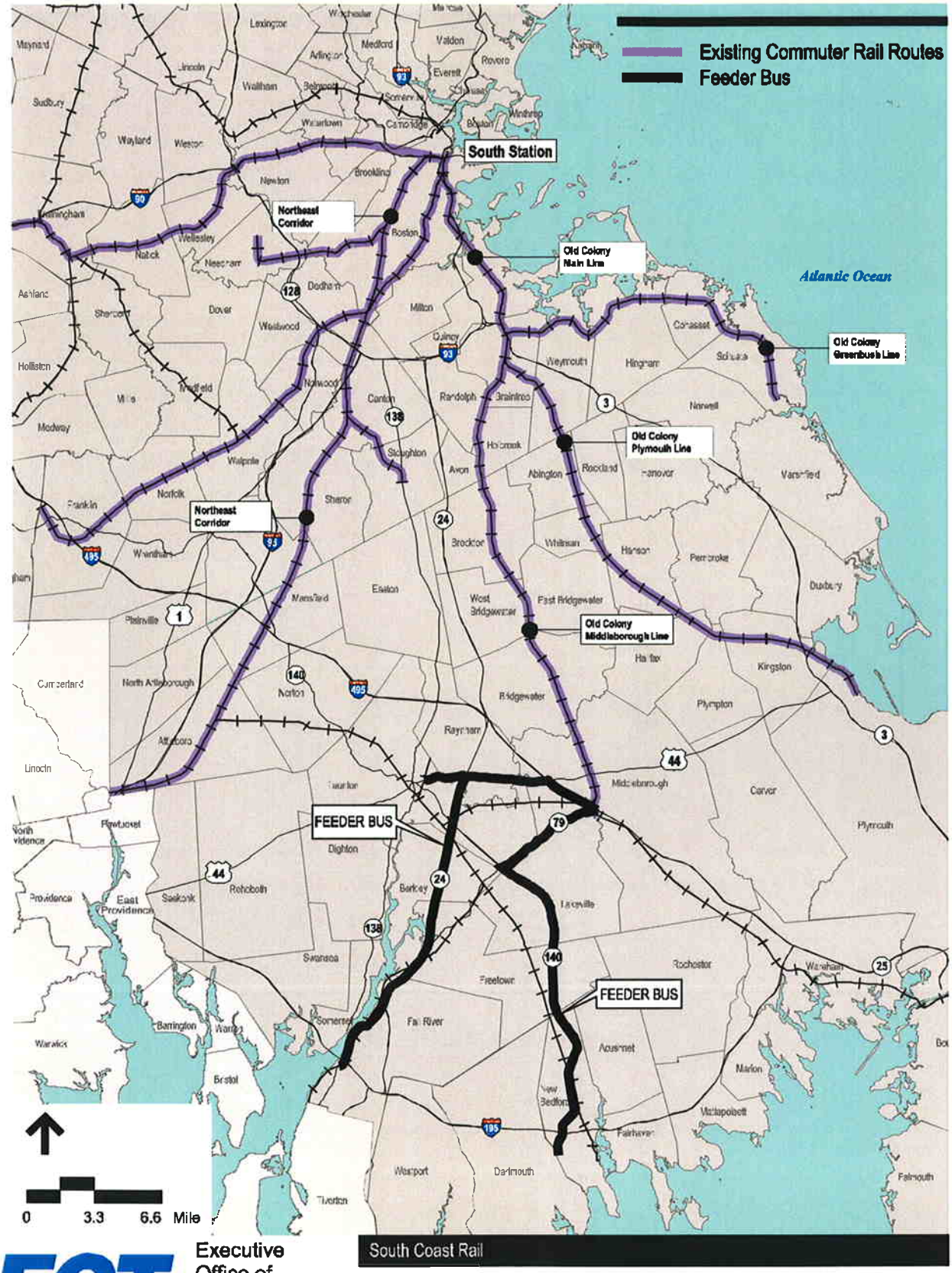

Executive Office of Transportation & Public Works

Alternative 61
Feeder Bus Network to Middleborough/Lakeville Station

This alternative would provide feeder bus network service from the New Bedford /Fall River area to transfer to the Middleborough Line commuter rail service at the Middleborough/Lakeville Station.

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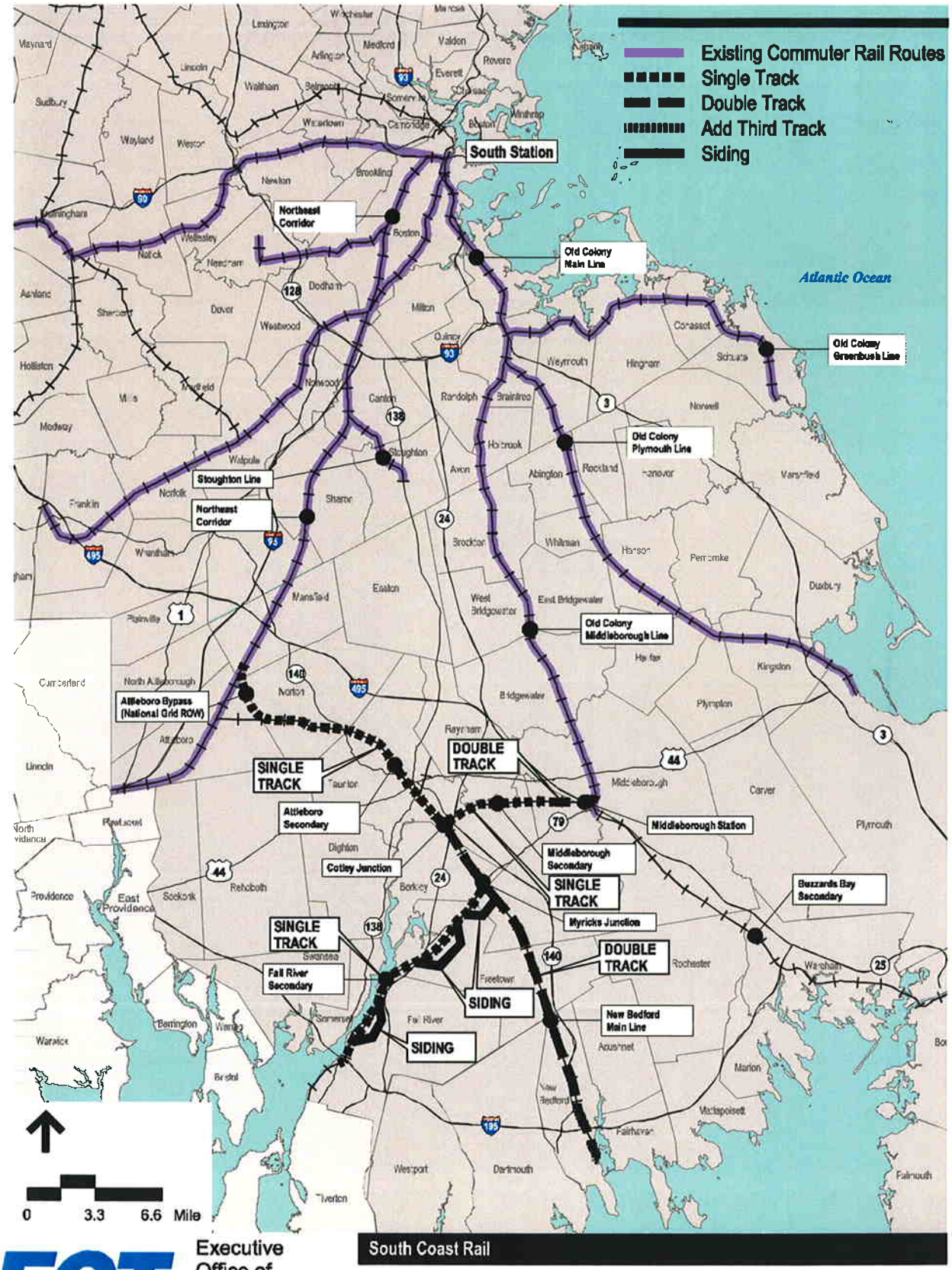

Executive Office of Transportation & Public Works

Alternative 62
Commuter Rail to South Station via Attleboro Bypass and Middleborough Line

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction. One branch would go west along the Attleboro Secondary with a new track bypass along the National Grid electric transmission right-of-way to tie into the Northeast Corridor near the Mansfield, Attleboro, and Norton town lines. A second branch would go east along the Middleborough Secondary and tie into the Middleborough Line at a new relocated Middleborough/Lakeville Station, located north of the existing station.

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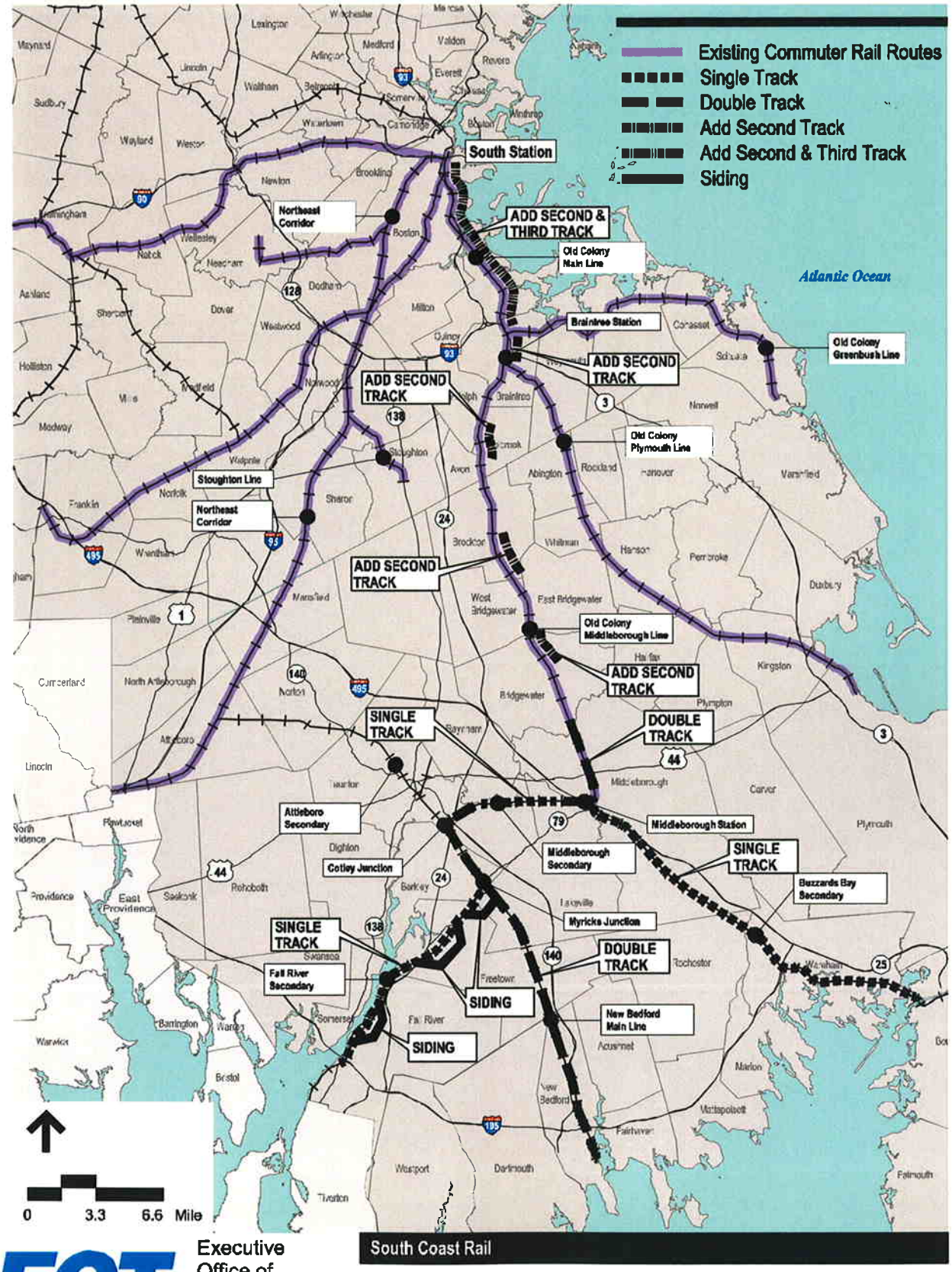

Executive Office of Transportation & Public Works

Alternative 63
Commuter Rail to South Station via Middleborough, also extend Middleborough Line to Wareham

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary to tie into the Middleborough Line just north of Middleborough/Lakeville Station. It would also extend the existing Middleborough Line commuter rail service to Wareham and/or Buzzards Bay.

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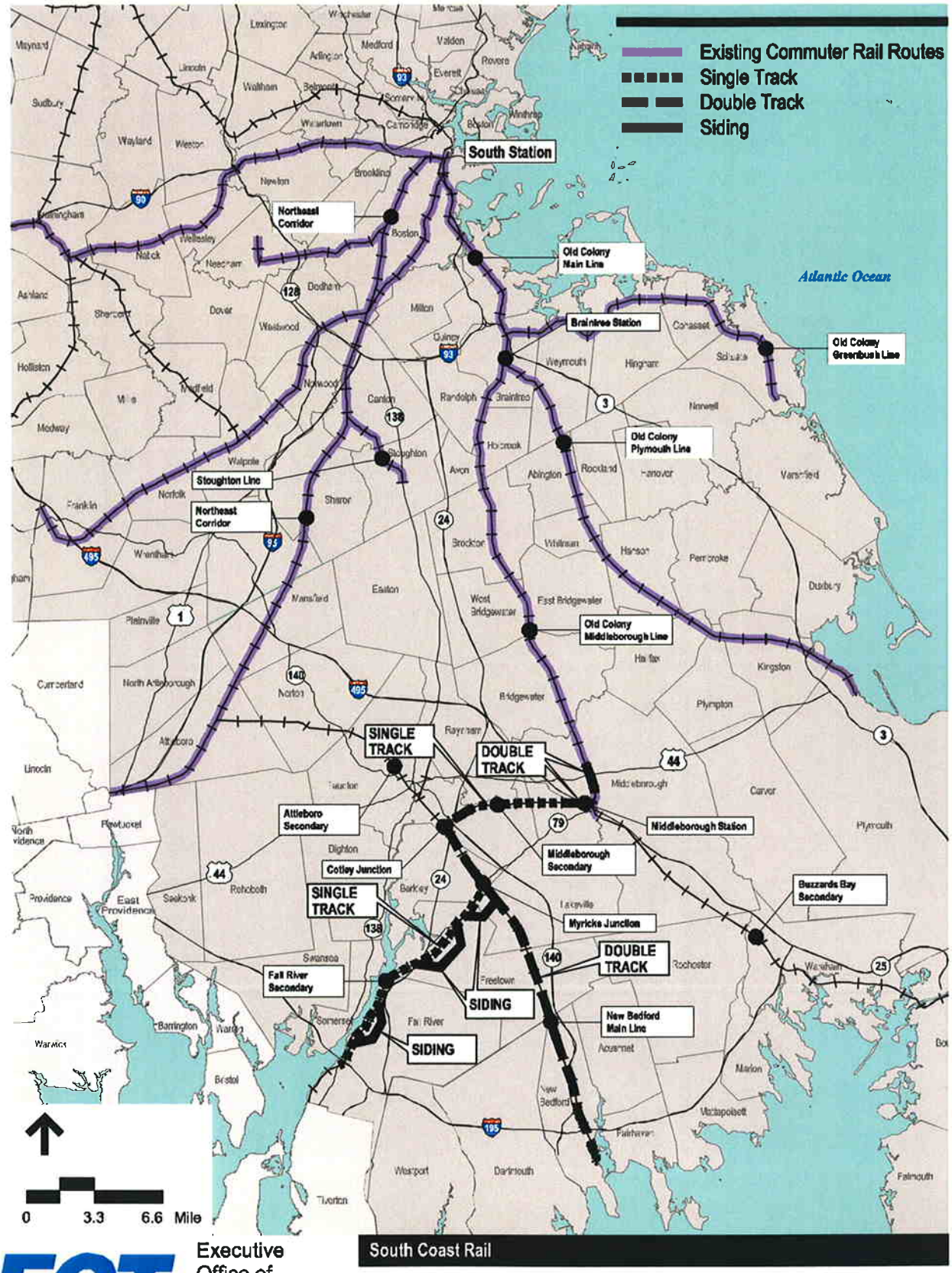

Executive Office of Transportation & Public Works

Alternative 64
Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

This alternative would provide commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction, then east along the Middleborough Secondary to tie into the Middleborough Line at a new Middleborough/Lakeville Station, located north of the existing station.

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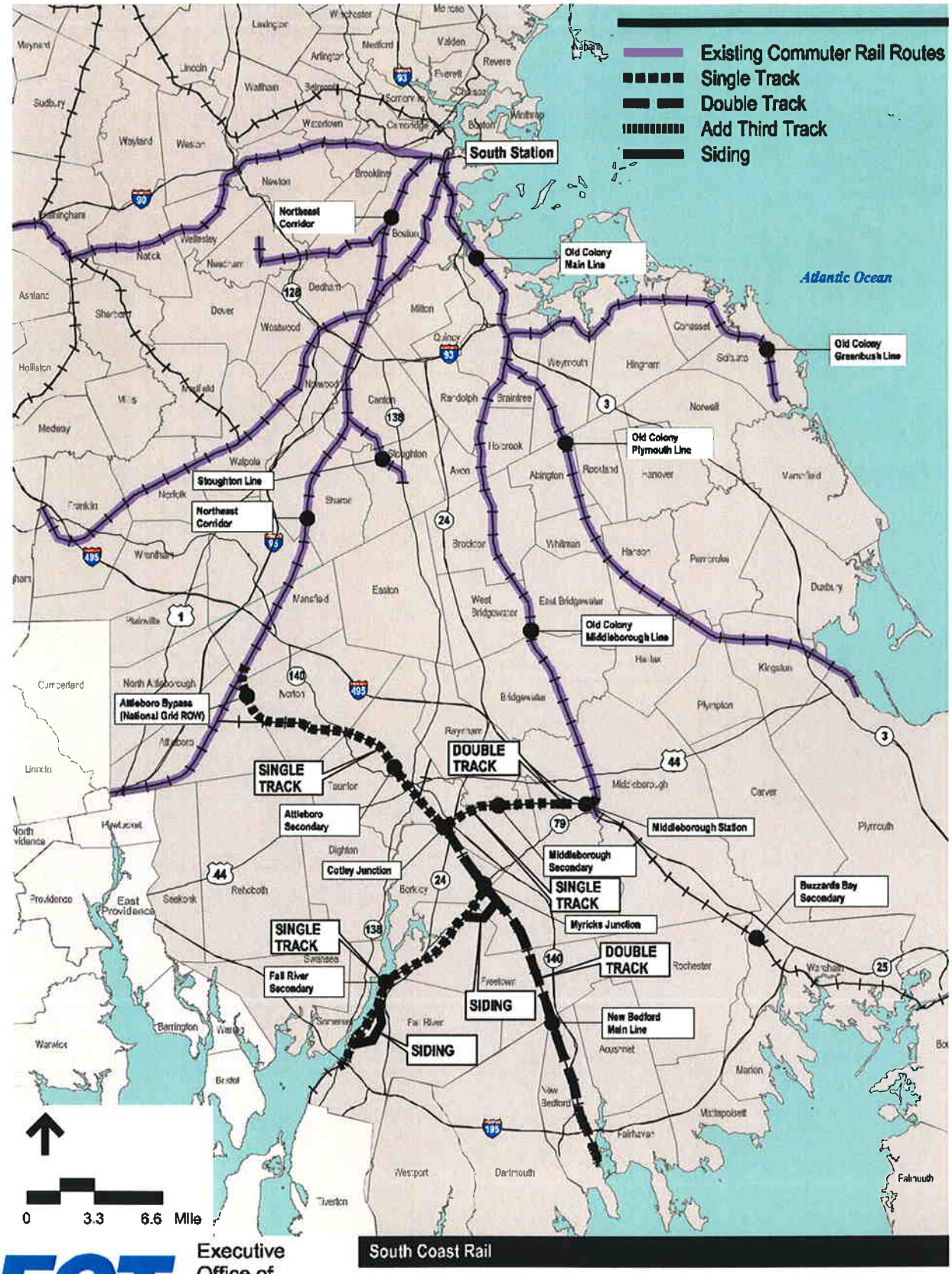

Executive Office of Transportation & Public Works

Alternative 65
Electrified Commuter Rail to South Station via Attleboro Bypass and Middleborough

This alternative would provide diesel and electric commuter rail service along the New Bedford Main Line and the Fall River Secondary north to Cotley Junction. One electric branch would head west along the Attleboro Secondary with a new track bypass along the National Grid right-of-way to tie into the Northeast Corridor north of the Attleboro station. One diesel branch would travel along the Middleborough Secondary to tie into the Middleborough Line just north of the Middleborough/Lakeville Station. The Middleborough Line would not be electrified.

5

Step 1 Analysis

This chapter describes the first screening step to determine if a proposed alternative was capable of achieving the Project purpose.

5.1 Introduction

Step 1 evaluated whether an alternative meets the Project purpose, "to more fully meet the existing and future demand for public transportation between Fall River/ New Bedford and Boston, Massachusetts to enhance regional mobility, while supporting smart growth planning and development strategies in affected communities." Two sub-criteria were used to evaluate the 38 Phase 1 alternatives.[1]

- 1.1 – Improve regional mobility
- 1.2 – Improve quality of service

The Step 1 screening criteria were applied to the entire range of potential alternatives, and relied on easily identifiable attributes of the conceptual alternatives. Alternatives that do not meet the Step 1 criteria were dismissed from further consideration. Alternatives which were not dismissed at this stage were advanced to Step 2, which will evaluate whether they are practicable to construct and operate. The specific measures for each criterion are described below.

Table 5-1 provides the measures used to evaluate the Step 1 Criteria.

[1] One other alternative was added to the analysis in Step 4 (Alternative 65, the Attleboro-Middleborough combination with both diesel and electric service).

Table 5-1 Measures Used to Evaluate Step 1

Criterion	Measure	Rating	
1.1 Improve Regional Mobility	Provide public transit connections between New Bedford/Fall River and Boston and provide public transit connections between South Coast cities (New Bedford, Fall River, Taunton, and others)	●	Connects New Bedford and Fall River to Boston, and provides connections between New Bedford and Fall River as well as other local destinations
		◑	Connects New Bedford and Fall River to Boston
		⊘	Doesn't connect New Bedford and Fall River to Boston
1.2 Improve Quality of Service	Provide a transit trip that is competitive to (or better than) travel by car (existing travel time by car to New Bedford during peak commuting periods is 90 minutes)	●	Trip time less than 65 minutes
		◑	Trip time between 65 and 90 minutes
		○	Trip time between 91 and 98 minutes (assumes commuters will accept a transit trip that is 10 minutes longer than by car)
		⊘	Trip time between 99 and 105 minutes
		⊗	Trip time more than 105 minutes
	Provide a transit trip that is reliable (travel times are consistent, scheduled arrival/departure times are consistently met) with minimal unanticipated delays	◑	Highly reliable because there is an exclusive right-of-way not shared with another mode or service
		○	Medium reliability because requires a transfer between modes (for example, between high frequency DMUs and low-frequency commuter rail)
		⊘	Low reliability because right-of-way is shared with another mode (freight and commuter rail) or with another commuter rail service, or because transfers are required between modes
	Provide a transit trip that is comfortable and minimizes transfers	◑	Comfortable - no transfers, "one-seat ride"
		⊘	Less comfortable - one transfer (commuter comfort decreased by waiting on platform, changing seats)

5.1.1 Criterion 1.1 — Improve Regional Mobility

Criterion: *Does the Alternative Improve Regional Mobility?*

To meet the Project purpose, an alternative must improve regional mobility between Fall River/New Bedford and downtown Boston by providing options for travel between New Bedford/Fall River and downtown Boston other than automobiles. An alternative will be rated more favorably if it enhances mobility between points within the region as well.

5.1.2 Criterion 1.2 — Improve Quality of Service

Criterion: *Does the Alternative Improve Quality of Service?*

An alternative that does not improve the quality of transit services over the existing services provided in the region provides no functional benefit to the communities. Quality of service is assessed based on commuting time, reliability, comfort, convenience, and safety. For the purposes of the screening process, EOT is only considering travel time, reliability, and the number of transfers as subcriteria. Since New Bedford/Fall River commuters currently rely on cars and private bus services, an improved quality of service would provide a comparable or competitive travel time and improved reliability with respect to existing commuter options during peak commuting periods. The average commuting time by car is 90 minutes during rush hour. For the Step 1 evaluation, it was assumed that commuters will accept a transit trip that is 10 minutes longer than by car (90 minutes). The travel time of the different alternatives is based on the typical operating speed of each mode (monorail, light rail, bus, commuter rail, electric commuter rail, etc.) as well as the transfer times if an alternative requires a transfer between modes. Reliability is evaluated by the potential for a service to be delayed by external factors, such as congestion on an alternative running in mixed traffic (such as a bus on a highway).

Detailed information on typical operating speeds is provided in Chapter 3 and transfer times for each alternative is provided in Appendix A. These trip times are for comparative purposes in this step of the Phase 1 analysis. When operating plans are developed for the alternatives in Phase 2, and station locations are identified, the estimated trip times are likely to change and may be longer than estimated in this Phase 1 comparison.

5.2 Step 1 Results

The following sections describe the results of the Step 1 evaluation. Table 5-2 shows the Step 1 ratings and recommendations for each alternative. If an alternative was ranked "Highly Unfavorable" for any criterion, EOT recommended that it be dismissed from further consideration.

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Table 5-2
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 1

FINAL
04/30/08

Number of Alternatives for Step 1 = 38

Route	Alt #	Name	CRITERION 1.1 - Improves Regional Mobility? RANK	CRITERION 1.2 - Improves Quality of Service? Trip Time (minutes)	# of Transfers	Reliability (High, Medium, Low)	RANK	Step 1 Rationale	Recommend to Advance to Step 2
THROUGH ATTLEBORO OR MANSFIELD		***ATTLEBORO SECONDARY***							
	1	Commuter Rail to South Station via Attleboro Bypass		74	0	High		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	2	Commuter Rail to South Station via Attleboro Station with Reverse Move		94	0	Medium		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, no transfer, and medium reliability	YES
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass		87	0	High		1.1) HIGHLY FAVORABLE = Connects New Bedford/Fall River to Boston and provides mobility within the South Coast region 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	4	Bus Rapid Transit to Attleboro Station		106	1	Medium		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY UNFAVORABLE = Does not improve quality of service since trip time is 16 minutes longer than auto drive time and affects passenger comfort and convenience (requires a transfer)	**NO**
	5	Diesel Multiple Units Commuter Rail to Attleboro Station		97	1	Medium		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive drive time but affects passenger comfort and convenience (requires a transfer and has medium reliability)	YES
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary		96	1	Medium		1.1) HIGHLY FAVORABLE = Connects New Bedford/Fall River to Boston and provides mobility within the South Coast region 1.2) NEUTRAL = Competitive drive time but affects passenger comfort and convenience (requires a transfer and has medium reliability)	YES
	7	Electrified Commuter Rail to South Station via Attleboro Bypass		56	0	High		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
		MANSFIELD FORMER RIGHT-OF-WAY							
	11	Commuter Rail to South Station via Mansfield		70	0	High		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	12	Bus Rapid Transit to Mansfield Station		97	1	Medium		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive drive time but affects passenger comfort and convenience (requires a transfer and has medium reliability)	YES
	13	Diesel Multiple Units Commuter Rail to Mansfield Station		87	1	Medium		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	14	Diesel Multiple Units to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary		87	1	Medium		1.1) HIGHLY FAVORABLE = Connects New Bedford/Fall River to Boston and provides mobility within the South Coast region 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	15	Electrified Commuter Rail to South Station via Mansfield		51	0	High		1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY FAVORABLE = Competitive trip time, no transfer, and high reliability	YES

LEGEND

- **Highly Favorable**
- **Favorable**
- **Neutral**
- **Unfavorable**
- **Highly Unfavorable**

Trip Times (minutes)*

≤ 64 = Highly Favorable (Level of Service = A)

65 -90 = Favorable (Level of Service = A)

90 = Existing auto drive time

91-98 = Neutral (Level of Service = B)

99-105 = Unfavorable (Level of Service = C)

≥ 106 = Highly Unfavorable (Level of Service = D)

Trip Time Assumptions

1. No speed restrictions, except for road/track geometry. Phase 2 travel times may be larger due to civil speed restrictions.

2. Dwell time at station stops is 1 minute, not including acceleration/deceleration.

3. Maximum speeds (mph): Monorail/Light Rail/Heavy Rail 50; Bus 55; Diesel Multiple Unit 70; Commuter Rail 79; Electric Commuter Rail 110.

# of Transfers

0 = Favorable

1 = Unfavorable

Reliability

High = Favorable; Has exclusive right-of-way and no transfers

Medium = Neutral; Has exclusive right-of-way but requires transfer

Low = Unfavorable; Subject to delays from traffic congestion

Source: *Transit Capacity and Quality of Service Manual - 2nd Edition.* Transit Cooperative Research Program. Part 3, Chapter 3, pp. 3-49 to 3-50.

* These trip times are for comparative purposes in this step of the Phase 1 analysis. When operating plans are developed for the alternatives in Phase 2, and station locations are identified, the estimated trip times are likely to change and may be longer than estimated in this Phase 1 comparison.

Table 5-2
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 1

FINAL
04/30/08

Number of Alternatives for Step 1 = 38

Route	Alt #	Name	CRITERION 1.1 - Improves Regional Mobility? RANK	CRITERION 1.2 - Improves Quality of Service? Trip Time (minutes)		# of Transfers		Reliability (High, Medium, Low)	RANK	Step 1 Rationale	Recommend to Advance to Step 2
	MIDDLEBOROUGH SECONDARY										
THROUGH MIDDLEBOROUGH	17	Commuter Rail to South Station via Middleborough	◑	82	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	18	Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail	◑	82	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	20	Bus Rapid Transit to Middleborough/Lakeville Station	◑	110	⊗	1	⊘	Medium	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY UNFAVORABLE = Does not improve quality of service since trip time is 20 minutes longer than auto drive time and affects passenger comfort and convenience (requires a transfer)	**NO**
	21	Diesel Multiple Units Commuter Rail to Middleborough/Lakeville Station	◑	100	⊘	1	⊘	Medium	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) UNFAVORABLE = Does not improve quality of service since trip time is 10 minutes longer than auto drive time and affects passenger comfort and convenience (requires a transfer)	**NO**
	22	Diesel Multiple Units to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary	●	100	⊘	1	⊘	Medium	○	1.1) HIGHLY FAVORABLE = Connects New Bedford/Fall River to Boston and provides mobility within the South Coast region 1.2) UNFAVORABLE = Does not improve quality of service since trip time is 10 minutes longer than auto drive time and affects passenger comfort and convenience (requires a transfer)	**NO**
	63	Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham	◑	82	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	◑	82	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line	◑	82	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton	◑	70	◑	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	31	Bus Rapid Transit to Stoughton Station	◑	101	⊘	1	⊘	Medium	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) UNFAVORABLE = Does not improve quality of service since trip time is 11 minutes longer than auto drive time and affects passenger comfort and convenience (requires a transfer)	**NO**
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	◑	90	◑	1	⊘	Medium	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	●	90	◑	1	⊘	Medium	○	1.1) HIGHLY FAVORABLE = Connects New Bedford/Fall River to Boston and provides mobility within the South Coast region 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	34	Electrified Commuter Rail to South Station via Stoughton	◑	53	●	0	◑	High	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY FAVORABLE = Competitive trip time, no transfer, and high reliability	YES

LEGEND

- ● **Highly Favorable**
- ◑ **Favorable**
- ○ **Neutral**
- ⊘ **Unfavorable**
- ⊗ **Highly Unfavorable**

Trip Times (minutes)*

≤ 64 = Highly Favorable (Level of Service = A)

65 -90 = Favorable (Level of Service = A)

90 = Existing auto drive time

91-98 = Neutral (Level of Service = B)

99-105 = Unfavorable (Level of Service = C)

≥ 106 = Highly Unfavorable (Level of Service = D)

Trip Time Assumptions

1. No speed restrictions, except for road/track geometry. Phase 2 travel times may be larger due to civil speed restrictions.

2. Dwell time at station stops is 1 minute, not including acceleration/deceleration.

3. Maximum speeds (mph): Monorail/Light Rail/Heavy Rail 50; Bus 55; Diesel Multiple Unit 70; Commuter Rail 79; Electric Commuter Rail 110.

# of Transfers

0 = Favorable

1 = Unfavorable

Reliability

High = Favorable; Has exclusive right-of-way and no transfers

Medium = Neutral; Has exclusive right-of-way but requires transfer

Low = Unfavorable; Subject to delays from traffic congestion

Table 5-2
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 1

FINAL
04/30/08

Number of Alternatives for Step 1 = 38

Route	Alt #	Name	CRITERION 1.1 - Improves Regional Mobility? RANK	CRITERION 1.2 - Improves Quality of Service? Trip Time (minutes)		# of Transfers		Reliability (High, Medium, Low)	RANK	Step 1 Rationale	Recommend to Advance to Step 2
USING HIGHWAY SYSTEM	37	Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway	◑	73	◑	0	◑	High	◑	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	38	Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128	◑	92	○	1	⊘	Medium	○	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	39	Monorail to Route 128 Station via Route 140, Route 24, and Route 128	◑	86	◑	1	⊘	Medium	○	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	40	Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor	◑	60	●	0	◑	High	◑	●	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	◑	94	○	1	⊘	Medium	○	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	42	Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line	◑	89	◑	0	◑	High	◑	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and high reliability	YES
	43	Express Bus in Dedicated Lane to Route 128 Station via Route 24 and Route 128	◑	67	◑	1	⊘	Medium	○	○	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) NEUTRAL = Competitive trip time, requires a transfer, and medium reliability	YES
	44	Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane	◑	70	◑	0	◑	Low	⊘	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and low reliability	YES
	45	Enhanced Bus Service on Existing Private Carrier Routes	◑	80	◑	0	◑	Low	⊘	◑	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) FAVORABLE = Competitive trip time, no transfer, and low reliability	YES
Other	56	Commuter Rail to South Station via Providence	◑	111	⊗	0	◑	High	◑	⊗	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) HIGHLY UNFAVORABLE = Does not improve quality of service since trip time is 21 minutes longer than auto drive time	**NO**
	57	Enhanced bus on Interstate 195	⊗								1.1) HIGHLY UNFAVORABLE = Does not provide service to Boston	**NO**
	58	Commuter Rail to Wareham via Middleborough	⊗								1.1) HIGHLY UNFAVORABLE = Does not provide service to Fall River/New Bedford	**NO**
	61	Feeder Bus Network to Middleborough/Lakeville Station	◑	94	○	1	⊘	Low	⊘	⊘	1.1) FAVORABLE = Connects New Bedford/Fall River to Boston 1.2) UNFAVORABLE = Does not improve quality of service with respect to passenger comfort and convenience because of transfer and low reliability	**NO**

Number of Alternatives Advancing to Step 2 = 29

LEGEND

- ● **Highly Favorable**
- ◑ **Favorable**
- ○ **Neutral**
- ⊘ **Unfavorable**
- ⊗ **Highly Unfavorable**

Trip Times (minutes)*

≤ 64 = Highly Favorable (Level of Service = A)

65 -90 = Favorable (Level of Service = A)

90 = Existing auto drive time

91-98 = Neutral (Level of Service = B)

99-105 = Unfavorable (Level of Service = C)

≥ 106 = Highly Unfavorable (Level of Service = D)

Trip Time Assumptions

1. No speed restrictions, except for road/track geometry. Phase 2 travel times may be larger due to civil speed restrictions.

2. Dwell time at station stops is 1 minute, not including acceleration/deceleration.

3. Maximum speeds (mph): Monorail/Light Rail/Heavy Rail 50; Bus 55; Diesel Multiple Unit 70; Commuter Rail 79; Electric Commuter Rail 110.

# of Transfers

0 = Favorable

1 = Unfavorable

Reliability

High = Favorable; Has exclusive right-of-way and no transfers

Medium = Neutral; Has exclusive right-of-way but requires transfer

Low = Unfavorable; Subject to delays from traffic congestion

* *Transit Capacity and Quality of Service Manual - 2nd Edition.* Transit Cooperative Research Program. Part 3, Chapter 3, pp. 3-49 to 3-50.

* These trip times are for comparative purposes in this step of the Phase 1 analysis. When operating plans are developed for the alternatives in Phase 2, and station locations are identified, the estimated trip times are likely to change and may be longer than estimated in this Phase 1 comparison.

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Alternative 1 – Commuter Rail to South Station via Attleboro Bypass

Alternative 1, *Commuter Rail to South Station via Attleboro Bypass*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 16 minutes faster (74 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 1 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.
- Recommend: Advance to the Step 2 evaluation.

Alternative 2 – Commuter Rail to South Station via Attleboro Station with Reverse Move

Alternative 2, *Commuter Rail to South Station via Attleboro Station with Reverse Move,*[2] meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip of 94 minutes; would provide medium reliable service, due to the potential for problems with the reverse move; but would be comfortable and not require any transfers.

Recommend: Advance to the Step 2 evaluation.

[2] A reverse move is a maneuver in which a train pulls into a station, the engineer exits the train, walks to the other end of the train, performs a brake test, and the train departs in the opposite direction.

Alternative 3 – Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass

Alternative 3, *Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston and provides connections between New Bedford and Fall River as well as other local destinations.
- *Criterion 1.2* – it would provide a transit trip that would be three minutes faster (87 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 3 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 4 – Bus Rapid Transit to Attleboro Station

Alternative 4, *Bus Rapid Transit to Attleboro Station*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would not improve quality of service since the trip time would be 16 minutes longer (106 minutes) than the auto drive time (90 minutes); would offer medium reliability because of the transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Dismiss from further consideration.

Alternative 5 – Diesel Multiple Unit Commuter Rail to Attleboro Station

Alternative 5, *Diesel Multiple Unit Commuter Rail to Attleboro Station*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip of 97 minutes; would offer medium reliability because of the transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 6 – Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 6, *Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford and Fall River to Boston and provide connections between New Bedford and Fall River as well as other local destinations.
- *Criterion 1.2* – it would provide a transit trip of 96 minutes; would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 7 – Electrified Commuter Rail to South Station via Attleboro Bypass

Alternative 7, *Electrified Commuter Rail to South Station via Attleboro Bypass*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – it would provide a transit trip that would be 34 minutes faster (56 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 7 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 11 – Commuter Rail to South Station via Mansfield

Alternative 11, *Commuter Rail to South Station via Mansfield*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 20 minutes faster (70 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 11 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 12 – Bus Rapid Transit to Mansfield Station

Alternative 12, *Bus Rapid Transit to Mansfield Station*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip of 97 minutes; would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 13 – Diesel Multiple Unit Commuter Rail to Mansfield Station

Alternative 13, *Diesel Multiple Unit Commuter Rail to Mansfield Station*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be three minutes faster (87 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 14 – Diesel Multiple Unit Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 14, *Diesel Multiple Unit Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston and provide connections between New Bedford and Fall River as well as other local destinations.
- *Criterion 1.2* – it would provide a transit trip that would be three minutes faster (87 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 15 – Electrified Commuter Rail to South Station via Mansfield

Alternative 15, *Electrified Commuter Rail to South Station via Mansfield*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – it would provide a transit trip that would be 39 minutes faster (51 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 15 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 17 – Commuter Rail to South Station via Middleborough

Alternative 17, *Commuter Rail to South Station via Middleborough*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be eight minutes faster (82 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 17 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 18 – Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail

Alternative 18, *Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be eight minutes faster (82 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 18 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 20 – Bus Rapid Transit to Middleborough/Lakeville Station

Alternative 20, *Bus Rapid Transit to Middleborough/Lakeville Station*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would not improve quality of service since trip time is 20 minutes longer (110 minutes) than auto drive time (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Dismiss from further consideration.

Alternative 21 – Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station

Alternative 21, *Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be ten minutes longer (100 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Dismiss from further consideration.

Alternative 22 – Diesel Multiple Units to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 22, *Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston and provide connections between New Bedford and Fall River as well as other local destinations.
- *Criterion 1.2* – it would provide a transit trip that would be ten minutes longer (100 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Dismiss from further consideration.

Alternative 30 – Commuter Rail to South Station via Stoughton

Alternative 30, *Commuter Rail to South Station via Stoughton*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 20 minutes faster (70 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 30 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 31 – Bus Rapid Transit to Stoughton Station

Alternative 31, *Bus Rapid Transit to Stoughton Station*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – would not improve quality of service since trip time is 11 minutes longer (101 minutes) than auto drive time (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Dismiss from further consideration.

Alternative 32 – Diesel Multiple Unit Commuter Rail to Stoughton Station

Alternative 32, *Diesel Multiple Unit Commuter Rail to Stoughton Station*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be the same as travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 33 – Diesel Multiple Unit to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 33, *Diesel Multiple Unit Commuter Rail to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston and provide connections between New Bedford and Fall River as well as other local destinations.
- *Criterion 1.2* – it would provide a transit trip that would be the same as travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 34 – Electrified Commuter Rail to South Station via Stoughton

Alternative 34, *Electrified Commuter Rail to South Station via Stoughton*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 37 minutes faster (53 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 34 would provide a comfortable transit trip with no transfers, and also would provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 37 – Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway

Alternative 37, *Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 17 minutes faster (73 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 37 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 38 – Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128

Alternative 38, *Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip of 92 minutes would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 39 – Monorail to Route 128 Station via Route 140, Route 24, and Route 128

Alternative 39, *Monorail to Route 128 Station via Route 140, Route 24, and Route 128*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – it would provide a transit trip that would be four minutes faster (86 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 40 – Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor

Alternative 40, *Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 30 minutes faster (60 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 40 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 41 – Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128

Alternative 41, *Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip of 94 minutes; would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 42 – Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line

Alternative 42, *Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line,* meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be one minute faster (89 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 42 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 43 – Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128

Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 23 minutes faster (67 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would offer medium reliability because of transfer between modes; and would affect passenger comfort and convenience by requiring a transfer.

Recommend: Advance to the Step 2 evaluation.

Alternative 44 – Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane

Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway High Occupancy Vehicle (HOV) Lane,* meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – it would provide a transit trip that would be 20 minutes faster (70 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 44 would provide a comfortable transit trip with no transfers, but would provide low reliability service because this portion of the route on the Southeast Expressway is shared with mixed HOV lane traffic and general purpose traffic.

Recommend: Advance to the Step 2 evaluation.

Alternative 45 – Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane

Alternative 45, *Express Bus in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane,* meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be 10 minutes faster (80 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 45 would provide a comfortable transit trip with no transfers, but would provide low reliability service because this portion of the route on the Southeast Expressway is shared with mixed HOV lane traffic and general purpose traffic.

Recommend: Advance to the Step 2 evaluation.

Alternative 56 – Commuter Rail to South Station via Providence

Alternative 56, *Commuter Rail to South Station via Providence*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service*.

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – would not improve quality of service since trip time is 21 minutes longer (111 minutes) than auto drive time (90 minutes); would offer high reliability because of exclusive right-of-way not shared with another mode of service; provides a comfortable transit trip with no transfers.

Recommend: Dismiss from further consideration.

Alternative 57 – Enhanced Bus on Interstate 195

Alternative 57, *Enhanced Bus on Interstate 195*, does not meet the Basic Project Purpose because it fails to meet Criterion 1.1, *Improve Regional Mobility.*

- *Criterion 1.1* – it does not connect New Bedford/Fall River and Boston.

Recommend: Dismiss from further consideration.

Alternative 58 – Commuter Rail to Wareham via Middleborough

Alternative 58, *Commuter Rail to Wareham via Middleborough*, does not meet the Basic Project Purpose because it fails to meet Criterion 1.1, *Improve Regional Mobility.*

- *Criterion 1.1* – it does not connect New Bedford/Fall River and Boston.

Recommend: Dismiss from further consideration.

Alternative 61 – Feeder Bus Network to Middleborough/Lakeville Station

Alternative 61, *Feeder Bus Network to Middleborough/Lakeville Station*, does not meet the Basic Project Purpose because, although it meets Criterion 1.1, *Improve Regional Mobility*, this alternative fails to meet Criterion 1.2, *Improve Quality of Service.*

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.

- *Criterion 1.2* – it would provide a transit trip of 94 minutes; but would provide low reliability service because buses would operate in mixed traffic and therefore be subject to delays from congestion, and because it requires a transfer.

Recommend: Dismiss from further consideration. However, the Interagency Coordinating Group, at the February 14, 2008 meeting, requested that Alternative 61 be retained and incorporated into a baseline or Transportation System Management Alternative.

Alternative 62 – Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line

Alternative 62, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be eight minutes faster (82 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 62 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 63 – Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham

Alternative 63, *Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham*, meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be eight minutes faster (82 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes); would provide a comfortable transit trip with no transfers; provides highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

Alternative 64 – Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements,* meets the Basic Project Purpose because:

- *Criterion 1.1* – it would provide public transit connections between New Bedford/Fall River and Boston.
- *Criterion 1.2* – it would provide a transit trip that would be eight minutes faster (82 minutes) than travel by car to New Bedford during peak commuting periods (90 minutes). Alternative 64 would provide a comfortable transit trip with no transfers, and also provide highly reliable service by traveling within an exclusive right-of-way not shared with another mode of service.

Recommend: Advance to the Step 2 evaluation.

5.3 Step 1 Recommendations

Nine alternatives were recommended to be dismissed based on the results of the Step 1 Screening Evaluation (Table 5-3). The Interagency Coordinating Group, at the February 14, 2008 meeting, requested that Alternative 61 be retained and incorporated into a baseline or Transportation System Management Alternative. At the meeting on February 14, 2008, the Interagency Coordinating Group agreed to dismiss the alternatives listed in Table 5-3.

Table 5-3 Alternatives Dismissed in Step 1

Number	Alternative	Reason(s) Why Alternative was Dismissed *(by Criterion)*
4	Bus Rapid Transit to Attleboro Station	1.2 Does not improve quality of service since trip time is 16 minutes longer than auto drive time and is unfavorable for passenger comfort and convenience (requires a transfer)
20	Bus Rapid Transit to Middleborough/Lakeville Station	1.2 Does not improve quality of service since trip time is 20 minutes longer than auto drive time and is unfavorable for passenger comfort and convenience (requires a transfer)
21	Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station	1.2 Does not improve quality of service since trip time is 10 minutes longer than auto drive time and is unfavorable for passenger comfort and convenience (requires a transfer)
22	Diesel Multiple Unit Commuter Rail to Middleborough/Lakeville Station with New Bedford to Fall River Connection via Dartmouth Secondary	1.2 Does not improve quality of service since trip time is 10 minutes longer than auto drive time and is unfavorable for passenger comfort and convenience (requires a transfer)
31	Bus Rapid Transit to Stoughton Station	1.2 Does not improve quality of service since trip time is 11 minutes longer than auto drive time and is unfavorable for passenger comfort and convenience (requires a transfer)
56	Commuter Rail to South Station via Providence	1.2 Does not improve quality of service since trip time is 21 minutes longer than auto drive time
57	Enhanced Bus on Interstate 195	1.1 Does not provide service to Boston
58	Commuter Rail to Wareham to Middleborough	1.1 Does not provide service to Fall River/New Bedford
61	Feeder Bus Network to Middleborough/Lakeville Station	1.2 Does not improve quality of service with respect to passenger comfort and convenience because it requires a transfer and would have low reliability *The Interagency Coordinating Group, at the February 14, 2008 meeting requested Alternative 61 be retained as the baseline or Transportation System Management Alternative*

6

Step 2 Analysis

This chapter describes the second screening step used to determine if a proposed alternative is not practicable to construct or operate.

6.1 Introduction

Step 2 evaluated those alternatives that met the Project Purpose as determined in Step 1. In Step 2, "practicable" was defined as capable of being constructed and operated after taking into consideration cost, existing technology and logistics in light of the overall Project purpose. Alternatives that are not practicable were preliminarily dismissed from further consideration. An alternative rated "highly unfavorable" for any of the five Step 2 criteria would not be practicable and EOT recommended that it be dismissed from further consideration.

For the Step 2 analysis, EOT developed a quantitative and qualitative assessment of each alternative, based on information on the route, typical cross-section of each mode, likely infrastructure improvements, and conceptual operating assumptions for each alternative. Descriptions of the concepts and infrastructure improvements for each alternative can be found in Appendix A. Assumptions were made to ensure that each alternative provided the same level of service to the terminal stations, for an "apples-to-apples" comparison in this Phase 1 analysis. For those alternatives that advance to Phase 2, the operating assumptions will be refined and may change from those used in Phase 1.

6.1.1 Criterion 2.1 — Is operationally compatible with the existing transportation infrastructure

A practicable alternative must be compatible with the existing transportation infrastructure. An alternative that would introduce a new mode of transportation

that does not fit with existing infrastructure would present challenges that other modes would not. For example, running light rail cars on the same tracks as freight rail might violate safety laws because the light rail vehicle would be more compromised in a collision. This criterion was qualitatively judged by the compatibility of an alternative with the existing infrastructure.

Table 6-1 Measures Used to Evaluate Criterion 2.1

Criterion	Measure	Rating
2.1	Operationally compatible with existing infrastructure. This measure takes into account whether the MBTA has the facilities to maintain and store the different type of equipment required by the alternative and whether the existing physical infrastructure can accommodate the new mode or service.	● Extends existing service and mode using compatible equipment; utilizes existing active transportation corridors; no changes to existing infrastructure required ◑ Utilizes existing active and/or inactive transportation corridors; compatible with existing services, modes, and equipment; minor changes to existing infrastructure ○ Utilizes existing active and/or inactive transportation corridors; compatible with existing services, modes, and equipment but facilities expansion likely required; moderate changes to existing infrastructure ⊘ Utilizes inactive or requires new transportation corridor and: • Compatible with existing services, modes, and equipment but facilities expansion likely required • Requires major changes to existing right of way or tracks to support mode or increase capacity • Existing topography not compatible with transit mode requirements ⊗ Incompatible with existing services, modes, and equipment; new facilities required; major changes to existing infrastructure

6.1.2 Criterion 2.2 — Does not significantly adversely affect the existing or future capacity, reliability, and quality of the regional transportation system

While an alternative might offer large benefits for the transit system in the South Coast region, it may have adverse consequences for the rest of the transportation network within the region or on the transportation system in other regions, such as the Old Colony Commuter Rail Lines, the Northeast Corridor, or South Station. For example, adding trains to the Old Colony line might have an adverse impact on the ability to expand or maintain existing levels of service for other branches. It is undesirable to improve options for one part of the transportation network or for one region at the expense of another, and transportation choices made today will have a lasting impact on future transportation system flexibility. Alternatives were

qualitatively judged on both their positive and negative impacts on existing, planned or proposed capacity, reliability, and quality of transportation services in southeastern Massachusetts[1].

Table 6-2 Measures Used to Evaluate Criterion 2.2

Criterion	Measure	Rating
2.2	Affects existing or planned future capacity, reliability, and quality of transportation system.	● Increases capacity, safety, and reliability of existing, planned or proposedr future services and system ◑ No adverse effects on existing, planned or proposed future services and system ○ Adds some service to existing routes; minor decrease in overall capacity of the existing system ⊘ There are several ways that an alternative could be rated unfavorable: • Adds new service (branch) to existing route, decreasing capacity and affecting reliability • Extends the end points of existing service, decreasing reliability • Restricts freight operations • Likely to overcrowd trains on existing lines • Restricts future planned or proposed expansion of service ⊗ There two ways that an alternative could be rated highly unfavorable: • Significantly reduces capacity and reliability of existing services and system • Replaces an existing high-frequency transit service with lower-frequency service (reduces reliability and quality)

6.1.3 Criterion 2.3 — Could be constructed without substantial impacts to the existing transportation system and within a reasonable timeframe

The constructability of an alternative was assessed using two sub-criteria – the potential for adverse short-term construction impacts to the existing transportation

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[1] Planned transportation improvements are included in the approved regional Transportation Improvement Plan (TIP) are are reasonably forseeable. Proposed transportation improvements are currently being considered, but have not been incorporated into the TIP.

system and the duration of construction. An alternative might not present engineering or construction challenges in and of itself, but the proximity of the alignment to existing transportation facilities and construction duration are important considerations. An alternative that requires modifying an existing facility will be more difficult to construct, and it will cause larger impacts and delays to existing system users. Examples include an alternative that requires reconstructing an existing highway, which would impact current highway users during construction, or adding railroad tracks adjacent to existing tracks, which would impact existing commuter or freight rail services. Alternatives were judged qualitatively on the potential for construction operations to affect existing transportation facilities and services, and on the magnitude of those potential impacts.

The time required for construction affects the length of time that these short-term impacts would occur and it affects the startup date for new transit services. The time required for construction also affects construction costs, which typically escalate over time (particularly with regard to the cost of materials such as steel or concrete). Alternatives were evaluated to determine whether they are capable of being constructed within a reasonable, four-year, timeframe in order to achieve the transportation and smart growth benefits.

Table 6-3 Measures Used to Evaluate Criterion 2.3

Criterion	Measure	Rating
2.3	Could be constructed without substantial impacts to the existing system and in a reasonable (four-year) timeframe. This measure evaluates the temporary construction impacts of each alternative to the existing system – the extent to which construction would disrupt service. It also identifies extraordinary construction measures that would be required (tunnels, interchange reconstruction) and their ability to affect construction timeframes.	● Minimal or no impacts to existing transportation system during construction; no construction elements that would extend construction time ◑ Some temporary impacts to existing transportation system; no construction elements that would extend construction time ○ Some temporary impacts to existing transportation system; some construction elements would extend construction time ⊘ There are several ways that an alternative could be rated unfavorable: • Moderate temporary impacts to traffic on Route 24; increased construction timeframes for highway reconstruction • Extensive reconstruction of tracks along the Northeast Corridor • Requires constructing new grade-separated roadway crossing or special structure through sensitive area ⊗ There are several ways that an alternative could be rated highly unfavorable: • Major temporary impacts to traffic on Route 24; substantially increased construction timeframes for reconstruction of bridges and overpasses • Extensive reconstruction of tracks along the Old Colony Line • Extensive property acquisition required that would delay construction

6.1.4 Criterion 2.4 — Provides transportation system benefits at a reasonable capital cost

This criterion evaluated whether an alternative was practicable based on cost effectiveness. Prohibitively high capital cost could increase the difficulty of advancing an alternative. Therefore, an important consideration in determining the feasibility of an alternative was the approximate cost effectiveness, including preliminary cost estimates for rights-of-way acquisition. These approximate capital cost estimates were based on the conceptual design and used readily available information. The capital cost estimates can be found in the detailed descriptions of each alternative in Appendix A.

More detailed cost estimates - including costs of land acquisition, environmental mitigation, brownfields site remediation, and other construction elements - will be developed for the alternatives in Phase 2 based on a more refined preliminary engineering design.

A measure of 2030 ridership for each alternative was evaluated using a simplified version of the CTPS regional model. Inputs to the model include 2000 Journey-to-Work data, travel time, transfer time, fare structure, and headways (the time between trains/buses). To provide a fair basis of comparison, the service plan for each alternative was designed to provide similar capacities, and the fare structure was assumed to be the same.

For each alternative, the approximate capital cost was converted into a score. The Cost Score ranged from a minimum of 0 for the most expensive alternative to a theoretical maximum of 100 for a zero cost alternative. Higher scores indicate the more favorable alternatives. The equation for calculating the score was:

$$\textit{Cost Score} = 100 - (\textit{cost} \times 100) / \textit{maximum cost}$$

Ridership estimates provided by CTPS were also converted into a score. The Ridership Score ranged from a minimum of 0 for an alternative that would attract no riders to a maximum of 100 for the highest ridership alternative. Again, the higher the score, the more favorable the alternative. The equation for calculating the score was:

$$\textit{Ridership Score} = (\textit{ridership} \times 100) / \textit{maximum ridership}$$

The Cost Effectiveness Score was calculated by averaging the Cost and Ridership Scores.

6.1.5 Criterion 2.5 — Provides sufficient capacity to meet demand

This criterion evaluated whether an alternative has the capacity to meet the existing and future demand for public transportation between Fall River/New Bedford and Boston. While the current demand for transit services from the South Coast communities has not been quantified, an alternative measure was available to evaluate the ability of an alternative to provide transit services. Demand was measured in terms of the number of daily work-related trips between South Coast communities and Boston.

For this screening analysis, the latent demand for transit, based on 2000 Journey-to-Work (JTW) data, was compared to the maximum ridership capacity of each alternative. According to the JTW, the number of daily work trips from the South Coast region to Boston is approximately 8,000. The maximum capacity of each alternative was determined based on vehicle headways and vehicle capacities. The ability of the alternative to meet possible future ridership potential was calculated as the percent of latent demand that could be served by the alternative's capacity.

Table 6-4 Measures Used to Evaluate Criteria 2.4 and 2.5

Criterion	Measure	Rating
2.4	Provides transportation system benefits at reasonable cost.	● Highest ridership/lowest cost (cost effectiveness score greater than 70)
		◑ Higher ridership/lower cost (cost effectiveness score between 65 and 70)
		○ Moderate ridership/moderate cost (cost effectiveness score between 46 and 64)
		⊘ Low ridership/high cost (cost effectiveness score between 40 and 45)
		⊗ Lowest ridership/highest cost (cost effectiveness score less than 40)
2.5	Provides sufficient capacity to meet demand.	◑ Provides sufficient capacity to meet the total transit demand of the region
		○ Provides sufficient capacity to meet approximately 50% of the demand
		⊘ Provides sufficient capacity to meet less than 50% of the demand

6.2 Step 2 Results

The following sections describe the results for the 29 alternatives evaluated in the Step 2 evaluation (Table 6-5). As noted in Section 6.1, alternatives that are not practicable were preliminarily dismissed from further consideration. An alternative rated "highly unfavorable" for any of the five Step 2 criteria would not be practicable and EOT recommended that it be dismissed from further consideration.

Table 6-5
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 2 SUMMARY

FINAL
04/30/08

Number of Alternatives for **Step 2 = 29**

Route	#	Name	CRITERION 2.1 - IS OPERATIONALLY COMPATIBLE WITH THE EXISTING TRANSPORTATION INFRASTRUCTURE	CRITERION 2.2 - DOES NOT SIGNIFICANTLY ADVERSELY AFFECT EXISTING AND PLANNED FUTURE CAPACITY, RELIABILITY, AND QUALITY OF THE REGIONAL TRANSPORTATION SYSTEM	CRITERION 2.3 - COULD BE CONSTRUCTED WITHOUT SUBSTANTIAL IMPACTS TO THE EXISTING TRANSPORTATION SYSTEM AND WITHIN A REASONABLE TIME FRAME	CRITERION 2.4 - PROVIDES TRANSPORTATION SYSTEM BENEFITS AT A REASONABLE CAPITAL COST	CRITERION 2.5 - PROVIDES SUFFICIENT CAPACITY TO MEET DEMAND	Recommend to Advance to Step 3
THROUGH ATTLEBORO		***ATTLEBORO SECONDARY***						
	1	Commuter Rail to South Station via Attleboro Bypass	○	⊘	⊘	○	◑	YES
	2	Commuter Rail to South Station via Attleboro Station with Reverse Move	○	⊗				**NO**
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	○	⊘	⊘	◑	◑	YES
	5	Diesel Multiple Units Commuter Rail to Attleboro Station	○	⊘	◑	⊘	○	YES
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	⊘	○	⊘	○	YES
	7	Electrified Commuter Rail to South Station via Attleboro Bypass	⊘	⊘	⊘	◑	◑	YES
		MANSFIELD FORMER RIGHT-OF-WAY						
	11	Commuter Rail to South Station via Mansfield	○	⊘	⊗			**NO**
	12	Bus Rapid Transit to Mansfield Station	⊘	⊘	⊗			**NO**
	13	Diesel Multiple Units Commuter Rail to Mansfield Station	○	⊘	⊗			**NO**
	14	Diesel Multiple Units to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	⊘	⊗			**NO**
	15	Electrified Commuter Rail to South Station via Mansfield	⊘	⊘	⊗			**NO**
THROUGH MIDDLEBOROUGH		***MIDDLEBOROUGH SECONDARY***						
	17	Commuter Rail to South Station via Middleborough	○	⊘	⊗	○	◑	**YES***
	18	Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail	○	⊗				**NO**
	63	Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham	○	○	⊗			**NO**
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	○	⊘	◑	○	○	YES

LEGEND

- ● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion
- ◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion
- ○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion
- ⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion
- ⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion
- ▭ **Remove from Further Consideration (In Step 2, Highly Unfavorable causes alternative to be dismissed)**
- * **Removed from Further Consideration but was carried forward to Step 2, Part 2 for comparison purposes at the request of the Interagency Group**

Table 6-5
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 2 SUMMARY

FINAL
04/30/08

Number of Alternatives for Step 2 = 29

Route	#	Name	CRITERION 2.1 - IS OPERATIONALLY COMPATIBLE WITH THE EXISTING TRANSPORTATION INFRASTRUCTURE	CRITERION 2.2 - DOES NOT SIGNIFICANTLY ADVERSELY AFFECT EXISTING AND PLANNED FUTURE CAPACITY, RELIABILITY, AND QUALITY OF THE REGIONAL TRANSPORTATION SYSTEM	CRITERION 2.3 - COULD BE CONSTRUCTED WITHOUT SUBSTANTIAL IMPACTS TO THE EXISTING TRANSPORTATION SYSTEM AND WITHIN A REASONABLE TIME FRAME	CRITERION 2.4 - PROVIDES TRANSPORTATION SYSTEM BENEFITS AT A REASONABLE CAPITAL COST	CRITERION 2.5 - PROVIDES SUFFICIENT CAPACITY TO MEET DEMAND	Recommend to Advance to Step 3
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line	◑	⊘	◑	○	◑	YES
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton	◑	◑	◑	◑	◑	YES
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	○	⊘	◑	○	○	YES
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	⊘	○	⊘	○	YES
	34	Electrified Commuter Rail to South Station via Stoughton	⊘	◑	○	◑	◑	YES
HIGHWAY SYSTEM	37	Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway	⊘	●	⊗			**NO**
	38	Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128	⊘	⊘	⊗			**NO**
	39	Monorail to Route 128 Station via Route 140, Route 24, and Route 128	⊘	⊘	⊗			**NO**
	40	Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor	⊘	⊘	⊗			**NO**
	41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	⊘	⊘	⊘	⊗		**NO**
	42	Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line	⊘	⊗				**NO**
	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128	◑	⊘	○	○	⊘	YES
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway High Occupancy Vehicle (HOV) Lane	◑	○	○	◑	⊘	YES
	45	Enhanced Bus Service on Existing Private Carrier Routes	●	○	●	●	⊘	YES

LEGEND

Number of Alternatives for Step 3 = 15

- ● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion
- ◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion
- ○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion
- ⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion
- ⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion
- ▭ **Remove from Further Consideration (In Step 2, Highly Unfavorable causes alternative to be dismissed)**
- * **Removed from Further Consideration but was carried forward to Step 2, Part 2 for comparison purposes at the request of the Interagency Group**

Table 6-5
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 2, Part 1

FINAL
04/30/08

Number of Alternatives for Step 2 = 29

Route	#	Name	CRITERION 2.1 - IS OPERATIONALLY COMPATIBLE WITH THE EXISTING TRANSPORTATION INFRASTRUCTURE		CRITERION 2.2 - DOES NOT SIGNIFICANTLY ADVERSELY AFFECT EXISTING AND PLANNED FUTURE CAPACITY, RELIABILITY, AND QUALITY OF THE REGIONAL TRANSPORTATION SYSTEM		CRITERION 2.3 - COULD BE CONSTRUCTED WITHOUT SUBSTANTIAL IMPACTS TO THE EXISTING TRANSPORTATION SYSTEM AND WITHIN A REASONABLE TIME FRAME		Recommend to Advance to Criterion 2.4 and 2.5
			RANK	*Rationale*	*RANK*	*Rationale*	*RANK*	*Rationale*	
THROUGH ATTLEBORO	***ATTLEBORO SECONDARY***								
	1	Commuter Rail to South Station via Attleboro Bypass	○	Utilizes existing transportation corridors; compatible with existing services, modes and equipment; moderate level of capacity improvements; may require expansion of existing maintenance facility	⊘	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion	⊘	High level of construction impacts to Northeast Corridor; moderate impacts to existing passenger service; minimal impact to existing freight service; can be constructed within 4-years; property acquisition required	
	2	Commuter Rail to South Station via Attleboro Station with Reverse Move	○	Utilizes existing transportation corridors; compatible with existing services, modes and equipment; moderate level of capacity improvements; may require expansion of existing maintenance facility	⊗	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion; reverse move at Attleboro station reduces capacity and reliability of existing service more than other Attleboro alternatives			**NO**
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	○	Utilizes existing transportation corridors; compatible with existing services, modes and equipment; moderate level of capacity improvements; may require expansion of existing maintenance facility	⊘	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion	⊘	High level of construction impacts to Northeast Corridor; moderate impacts to existing passenger service; minimal impact to existing freight service; can be constructed within 4-years; property acquisition required	
	5	Diesel Multiple Units Commuter Rail to Attleboro Station	○	Addition of new mode; moderate capacity improvements required; may require expansion of existing maintenance facility	⊘	No adverse affect on existing or planned future transportation system; restricts freight operations; may require additional trains on Northeast Corridor due to overcrowding	◑	Minimal impact to existing freight service; can be constructed within 4-years	
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	Addition of new mode; moderate capacity improvements required; may require expansion of existing maintenance facility	⊘	No adverse affect on existing or planned future transportation system; restricts freight operations; may require additional trains on Northeast Corridor due to overcrowding	○	Minimal impact to existing freight service; can be constructed within 4-years; property acquisition required	
	7	Electrified Commuter Rail to South Station via Attleboro Bypass	⊘	Utilizes existing transportation corridors; moderate capacity improvements required; requires electrification of some corridors; new maintenance facility required	⊘	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion	⊘	High level of construction impacts to Northeast Corridor; high level of construction impacts for electrification; moderate impacts to existing passenger service; minimal impact to existing freight service; difficult to construct within 4-years; property acquisition required	
	MANSFIELD FORMER RIGHT-OF-WAY								
	11	Commuter Rail to South Station via Mansfield	○	Utilizes existing transportation corridors; impacts downtown Mansfield streets; compatible with existing services, modes and equipment; moderate level of capacity improvements; may require expansion of existing maintenance facility	⊘	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion	⊗	High level of construction impacts to Northeast Corridor; moderate impacts to existing passenger service; minimal impact to existing freight service; can be constructed within 4-years; property acquisition required; high level of impact to downtown Mansfield area	**NO**
	12	Bus Rapid Transit to Mansfield Station	⊘	Addition of new mode; moderate capacity improvements required; new maintenance and storage facility required; high level of impact to city street systems	⊘	No adverse affect on existing or planned future transportation system; restricts freight operations; may require additional trains on Northeast Corridor due to overcrowding	⊗	Minimal impact to existing freight service; can be constructed within 4-years; property acquisition required; high level of impact to downtown Mansfield area	**NO**
	13	Diesel Multiple Units Commuter Rail to Mansfield Station	○	Addition of new mode; impacts downtown Mansfield streets; moderate capacity improvements required; may require expansion of existing maintenance and storage facility	⊘	No adverse affect on existing or planned future transportation system; restricts freight operations; may require additional trains on Northeast Corridor due to overcrowding	⊗	Minimal impact to existing freight service; can be constructed within 4-years; property acquisition required; high level of impact to downtown Mansfield area	**NO**
	14	Diesel Multiple Units to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	Addition of new mode; impacts downtown Mansfield streets; moderate capacity improvements required; may require expansion of existing maintenance and storage facility	⊘	No adverse affect on existing or planned future transportation system; restricts freight operations; may require additional trains on Northeast Corridor due to overcrowding	⊗	Minimal impact to existing freight service; can be constructed within 4-years; property acquisition required; high level of impact to downtown Mansfield area	**NO**
	15	Electrified Commuter Rail to South Station via Mansfield	⊘	Addition of new mode; impacts downtown Mansfield streets; moderate capacity improvements required; requires electrification of existing corridors; requires new maintenance and storage facility	⊘	Adds new service to existing Northeast Corridor decreasing capacity and affecting reliability; restricts freight operations; restricts future expansion	⊗	High level of construction impacts to Northeast Corridor; high level of impacts to construct electrification; moderate impacts to existing passenger service; minimal impact to existing freight service; difficult to construct within 4-years; property acquisition required; high level of impact to downtown Mansfield area	**NO**
THROUGH MIDDLEBOROUGH	***MIDDLEBOROUGH SECONDARY***								
	17	Commuter Rail to South Station via Middleborough	○	Compatible extension of an existing mode	⊘	Improves reliability of Old Colony Main Line service; limits future planned or proposed expansion to Wareham/Buzzards Bay; reduces reliability of Middleborough line	⊗	High level of construction impacts to Old Colony Main Line; possible impact to Red Line service; minimal impacts to existing passenger service; minimal impact to existing freight service; cannot be constructed within 4-years	**YES***
	18	Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail	○	Compatible extension of an existing mode	⊗	Extension of existing service improves reliability of Old Colony Main Line; limits future planned expansions; reduces reliability of Middleborough line; replaces rapid transit with low frequency service			**NO**
	63	Commuter rail to South Station via Middleborough, also extend Middleborough line to Wareham	○ N	Uses existing Right-of-way and Lines; High level of capacity improvements; Utilize existing maintenance facilities but expansion may be required	○	Does not impact Northeast Corridor; Increases capacity and reliability of Old Colony Main Line; Decreases reliability of existing Middleborough Line Service	⊗	Minor impacts on existing passenger and freight rail service; Major impact on Red Line and Old Colony Main Line service; Cannot be constructed within 4-years	**NO**
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	○	Compatible extension of an existing mode	⊘	Reliability reduces on Middleborough Line and Old Colony Main Line; limits future planned or proposed expansion to Wareham/Buzzards Bay	◑	Minor impacts to rail traffic; minor impacts to automotive traffic; Can be built within 4-year timeframe	

LEGEND

- ● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion
- ◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion
- ○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion
- ⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion
- ⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion

Table 6-5
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 2, Part 1

FINAL
04/30/08

Number of Alternatives for Step 2 = 29

Route	#	Name	CRITERION 2.1 - IS OPERATIONALLY COMPATIBLE WITH THE EXISTING TRANSPORTATION INFRASTRUCTURE		CRITERION 2.2 - DOES NOT SIGNIFICANTLY ADVERSELY AFFECT EXISTING AND PLANNED FUTURE CAPACITY, RELIABILITY, AND QUALITY OF THE REGIONAL TRANSPORTATION SYSTEM		CRITERION 2.3 - COULD BE CONSTRUCTED WITHOUT SUBSTANTIAL IMPACTS TO THE EXISTING TRANSPORTATION SYSTEM AND WITHIN A REASONABLE TIME FRAME		Recommend to Advance to Criterion 2.4 and 2.5
			RANK	*Rationale*	*RANK*	*Rationale*	*RANK*	*Rationale*	
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line	◑	Uses existing Right-of-way and Lines; Moderate level of capacity improvements; Utilize existing maintenance facilities but expansion may be required	⊘	Reduces Northeast Corridor capacity; Reliability impacts on Middleborough Line and Old Colony Main Line	◑	Minor impacts to rail traffic; minor impacts to automotive traffic; Can be built within 4-year timeframe	
		STOUGHTON LINE							
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton	◑	Uses existing Right-of-way and Lines; Moderate level of capacity improvement; Utilize existing maintenance facilities	◑	Minimizes Northeast Corridor Impacts - Extension of Existing Service; Service Reliability Impacts	◑	Moderate impacts to rail traffic; minor impacts to auto traffic; Can be built within 4-year timeframe	
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	○	Uses existing Right-of-way and Lines; Moderate level of capacity improvements; Utilize existing maintenance facilities but expansion may be required	⊘	May require additional trains on Northeast Corridor; Restricts freight operations	◑	Moderate impacts to rail traffic; minor impacts to automotive traffic; Can be built within 4-year timeframe	
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	○	Uses existing Right-of-way and Lines; Moderate level of capacity improvements; Utilize existing maintenance facilities but expansion may be required	⊘	May require additional trains on Northeast Corridor; Restricts freight operations	○	Moderate impacts to rail traffic; moderate impacts to automotive traffic; Can be built within 4-year timeframe	
	34	Electrified Commuter Rail to South Station via Stoughton	⊘	Uses existing Right-of-way and Lines; Moderate level of capacity improvements; New maintenance facilities required	◑	Minimizes Northeast Corridor Impacts - Extension of Existing Service; Service Reliability Impacts	○	Moderate impacts to rail traffic; minor impacts to automotive traffic; difficult to construct within 4-year timeframe	
HIGHWAY SYSTEM	37	Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway	⊘	New guideway system required within existing transportation corridor; new maintenance and storage facility required	●	No adverse affect on existing or planned future transportation system; no adverse impact on reliability of existing transportation system; limits future expansion of Route 24	⊗	Cannot be constructed within 4-year time frame; high level of construction impacts in Boston area	**NO**
	38	Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128	⊘	New guideway system required within existing transportation corridor; new maintenance and storage facility required	⊘	May require additional trains on Red Line that could impact existing operations and ridership; limits future expansion of Route 24	⊗	Cannot be constructed within 4-year time frame; high level of construction impacts within Quincy Adams area	**NO**
	39	Monorail to Route 128 Station via Route 140, Route 24, and Route 128	⊘	New guideway system required within existing transportation corridor; new maintenance and storage facility required	⊘	May require additional trains on Red Line that could impact existing operations and reliability; limits future expansion of Route 24	⊗	Cannot be constructed within 4-year time frame; high level of construction impacts along Route 128	**NO**
	40	Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor	⊘	New guideway system required within existing transportation corridor; expanding existing maintenance facility may be required	⊘	Improves reliability of Northeast Corridor services with extension of third track; will affect Northeast Corridor operations with new train trips; limits future expansion of Route 24	⊗	High level of impacts to construct major structures, reconstruct 20 interchanges and third track on Northeast Corridor	**NO**
	41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	⊘	New guideway system required within existing transportation corridor; new maintenance and storage facility required	⊘	May require additional trains on Northeast Corridor that could impact existing operations and ridership; limits future expansion of Route 24	⊘	High level of impacts to construct major structures, reconstruct 20 interchanges	
	42	Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line	⊘	New guideway system required within existing transportation corridor; new maintenance and storage facility required	⊗	Reduces reliability of existing Red Line by extending existing service; eliminates existing Braintree station; limits future expansion of Route 24			**NO**
	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128	◑	Utilizes existing transportation corridors; new bus lane on Route 128, park & ride and storage facility required	⊘	May require additional trains on Northeast Corridor that could impact existing operations and reliability	○	Impacts to Route 128 to construct bus lane; utilizes existing Route 24 travel lanes (zipper lane)	
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway High Occupancy Vehicle (HOV) Lane	◑	Utilizes existing transportation corridors; new bus lane on Route 128, park & ride and storage facility required	○	Decreases non-peak direction capacity on Route 24; Decrease user capacity of existing Southeast Corridor High Occupancy Vehicle (HOV) lane	○	Impacts to Route 128 to construct bus lane; utilizes existing Route 24 travel lanes (zipper lane)	
	45	Enhanced Bus Service on Existing Private Carrier Routes	●	Enhances existing service and utilizes existing infrastructure	○	Increases capacity of existing bus service; does not improve the reliability or quality of service	●	No construction impacts to existing facilities	

LEGEND

● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion

◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion

○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion

⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion

⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion

Remove from Further Consideration (In Step 2, Highly Unfavorable causes alternative to be dismissed)

Table 6-5
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 2, Part 2

FINAL
04/30/08

Number of Alternatives for Step 2, Part 2 = 15

Route	#	Name	CRITERION 2.4 - PROVIDES TRANSPORTATION SYSTEM BENEFITS AT A REASONABLE CAPITAL COST				CRITERION 2.5 - PROVIDES SUFFICIENT CAPACITY TO MEET DEMAND			Recommend to Advance to Step 3
			COST SCORE	*RIDERSHIP SCORE*	*COST EFFECTIVENESS SCORE*	*RANKING*	*CAPACITY*	*PERCENT OF TRAVEL DEMAND MET BY CAPACITY*	*RANKING*	
THROUGH ATTLEBORO		***ATTLEBORO SECONDARY***								
	1	Commuter Rail to South Station via Attleboro Bypass	53%	72%	63%	◑	8,640	106%	◑	YES
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	53%	76%	65%	◑	8,640	106%	◑	YES
	5	Diesel Multiple Units Commuter Rail to Attleboro Station	63%	28%	45%	⊘	4,416	54%	○	YES
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	50%	40%	45%	⊘	4,416	54%	○	YES
	7	Electrified Commuter Rail to South Station via Attleboro Bypass	44%	86%	65%	◑	8,640	106%	◑	YES
THROUGH MIDDLEBOROUGH	17	Commuter Rail to South Station via Middleborough	38%	59%	48%	○	8,640	106%	◑	**YES***
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	63%	41%	52%	○	4,320	53%	○	YES
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line	56%	61%	59%	○	8,640	106%	◑	YES
THROUGH STOUGHTON		***STOUGHTON LINE***								
	30	Commuter Rail to South Station via Stoughton	53%	84%	69%	◑	8,640	106%	◑	YES
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	53%	40%	47%	○	4,416	54%	○	YES
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	41%	49%	45%	⊘	4,416	54%	○	YES
	34	Electrified Commuter Rail to South Station via Stoughton	38%	100%	69%	◑	8,640	106%	◑	YES
HIGHWAY SYSTEM	41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	0%	37%	19%	⊗				**NO**
	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128	88%	29%	58%	○	2,700	33%	⊘	YES
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway High Occupancy Vehicle (HOV) Lane	88%	49%	68%	◑	2,700	33%	⊘	YES
	45	Enhanced Bus Service on Existing Private Carrier Routes	97%	53%	75%	●	2,700	33%	⊘	YES

LEGEND

Number of Alternatives for Step 3 = 15

- ● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion
- ◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent
- ○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion
- ⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion
- ⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion
- ▭ **Remove from Further Consideration (In Step 2, Highly Unfavorable causes alternative to be dismissed)**

* **Removed from Further Consideration but was carried forward to Step 2, Part 2 for comparison purposes at the request of the Interagency Group**

COST EFFECTIVENESS SCORE

- ● Highest Ridership/Lowest Cost (≥ 70%)
- ◑ Higher Ridership/Lower Cost (65-70%)
- ○ Moderate Ridership/Moderate Cost (46-64%)
- ⊘ Lower Ridership/Higher Cost (40-45%)
- ⊗ Lowest Ridership/Highest Cost (≤ 40%)

PERCENT OF TRAVEL DEMAND MET BY CAPACITY

- ◑ Provides sufficient capacity to meet the total transit demand of the region
- ○ Provides sufficient capacity to meet approximately 50% of the demand
- ⊘ Provides sufficient capacity to meet less than 50% of the demand

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Alternative 1 – Commuter Rail to South Station via Attleboro Bypass

Alternative 1, *Commuter Rail to South Station via Attleboro Bypass*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Except for the Attleboro Bypass, it utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track in order to accommodate additional trains.
  - May require expanding the existing maintenance facility to accommodate additional commuter rail vehicles.
- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
- *Criterion 2.3* - Unfavorable
  - High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - Moderate level of property acquisition required for the Attleboro Bypass.

- *Criterion 2.4* – Neutral
  - Combined cost effectiveness score of 63 percent.
- *Criterion 2.5* – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 2 – Commuter Rail to South Station via Attleboro Station with Reverse Move

Alternative 2, *Commuter Rail to South Station via Attleboro Station with Reverse Move*, is not practicable to construct and operate due to its failure to meet Criterion 2.2.

- *Criterion 2.1* – Neutral
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track in order to accommodate additional trains.
  - May require expanding the existing maintenance facility to accommodate additional commuter rail vehicles.
- *Criterion 2.2* – Highly Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and the Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
  - Reverse move at Attleboro Station severely reduces capacity of the Northeast Corridor and reliability of service, because the move takes at least 10 minutes and increases the chances of mechanical failures. This uses almost all the capacity of one track; there is no space for additional tracks.
- *Criteria 2.3 – 2.5* not evaluated because Alternative 2 failed to meet Criterion 2.2.

Recommend: Dismiss from further consideration. This alternative would significantly impact the existing and planned capacity of the Northeast Corridor for Amtrak service, freight service and for MBTA commuter rail service to Providence. It would restrict windows for freight service, affect the reliability of existing commuter and passenger rail service, and restrict future expansion of these services. In addition, the reverse move at the Attleboro Station would occupy the station platform for 60 to 80 minutes during each 2-hour "peak period", severely reducing the ability of the station to serve the Providence line.

Alternative 3 – Commuter Rail to South Station via Dartmouth Secondary, the New Bedford Main Line, and Attleboro Bypass

Alternative 3, *Commuter Rail to South Station via Dartmouth Secondary, the New Bedford Main Line, and Attleboro Bypass*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Except for the Attleboro Bypass, utilizes existing transportation corridors on the New Bedford Main Line, the Dartmouth Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track to accommodate additional trains.
  - May require expanding the existing maintenance facility to accommodate additional commuter rail vehicles.
- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.

- *Criterion 2.3* – Unfavorable
  - High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
  - Can be constructed within four-year timeframe.
  - High level of property acquisition required for the Attleboro Bypass and restoration of Dartmouth Secondary in Westport and Fall River.
- *Criterion 2.4* – Favorable
  - Combined cost effectiveness score of 65 percent.
- *Criterion 2.5* – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 5 – Diesel Multiple Unit Commuter Rail to Attleboro Station

Alternative 5, *Diesel Multiple Unit Commuter Rail to Attleboro Station*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, and Fall River Secondary.
  - May require expanding existing maintenance facility
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future transportation system because trains do not enter existing public transportation system.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Attleboro Station.

- *Criterion* 2.3 – Favorable
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
- *Criterion* 2.4 – Unfavorable
  - Combined cost effectiveness score of 45 percent.
- *Criterion* 2.5 – Neutral
  - Capacity of operating plan is 4,416 passengers, 55% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 6 – Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 6, *Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary.
  - May require expanding the existing maintenance facility.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future transportation system because trains do not enter existing public transportation system.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Attleboro Station.

- *Criterion* 2.3 – Neutral
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - Moderate level of property acquisition required for restoration of Dartmouth Secondary in Westport and Fall River.
- *Criterion* 2.4 – Unfavorable
  - Combined cost effectiveness score of 45 percent.
- *Criterion* 2.5 – Neutral
  - Capacity of operating plan is 4,416 passengers, 55% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 7 – Electrified Commuter Rail to South Station via Attleboro Bypass

Alternative 7, *Electrified Commuter Rail to South Station via Attleboro Bypass*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Unfavorable
  - Addition of new mode not currently operated by the MBTA, reducing the ability of the operator to switch equipment and crews between branches.
  - Except for the Attleboro Bypass, utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track to accommodate additional trains.
  - Requires electrification of the Attleboro Secondary, the New Bedford Main Line, the Fall River Secondary, and third track on the Northeast Corridor from Back Bay to Readville.
  - Requires new maintenance facility or maintenance agreement with an operator with an appropriate facility.

- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
- *Criterion 2.3* – Unfavorable
  - High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
  - High level of construction impacts for electrification result from erecting catenary wire above tracks.
  - Minimal impact to existing freight service.
  - Difficult to construct within four-year timeframe.
  - Moderate level of property acquisition required for the Attleboro Bypass.
- *Criterion 2.4* – Favorable
  - Combined cost effectiveness score of 65 percent.
- *Criterion 2.5* – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 11 – Commuter Rail to South Station via Mansfield

Alternative 11, *Commuter Rail to South Station via Mansfield*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Neutral
  - Except for the Mansfield Line, utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track to accommodate additional trains.
  - May require expanding the existing maintenance facility to accommodate additional commuter rail vehicles.
  - Reduces street network function in downtown Mansfield by eliminating streets.
- *Criterion 2.2* - Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
- *Criterion 2.3* – Highly Unfavorable
  - High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
  - Minimal impact to existing freight service.
  - Can be constructed within a four-year timeframe.
  - High level of property acquisition required in Mansfield to restore abandoned right-of-way on Mansfield Line.

- High level of impacts in downtown Mansfield result from the need to restore a rail corridor currently used as a local street and bike path, and the need to significantly modify the existing grade-separated structure at Route 106.
- High level of impacts to I-495 result from the need to construct a new grade-separated structure. At this location, the highway and rail bed are at approximately the same elevation, making separation difficult.

- *Criteria 2.4 – 2.5* not evaluated because Alternative 11 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because the infrastructure improvements required to restore the commuter rail line through downtown Mansfield would have significant adverse effects to the downtown, resulting in permanent street closures and the loss of a bike path. The required grade-separated crossings at I-495 and Route 106 would not be practicable to build, and the rail line may be within the runway safety areas/object free areas of the Mansfield Airport, which would be incompatible with airport safety.

Alternative 12 – Bus Rapid Transit to Mansfield Station

Alternative 12, *Bus Rapid Transit to Mansfield Station*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - New maintenance and storage facility required.
  - High level of impact to city street systems in New Bedford, Fall River, and Mansfield due to number of buses needed to operate the service.
  - Reduces street network function in downtown Mansfield by eliminating streets.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because vehicles will not enter the system.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches
- *Criterion 2.3* – Highly Unfavorable
  - Minimal impact to existing freight service
  - Can be constructed within four-year timeframe.

- High level of property acquisition required in Mansfield to restore abandoned right-of-way on Mansfield Line.
- High level of impacts in downtown Mansfield results from creating a busway along a corridor currently used as a local street and bike path, and the need to significantly modify existing grade-separated structure at Route 106.
- High level of impacts to I-495 results from the need to construct a new grade-separated structure. At this location, the highway and rail bed are at approximately the same elevation, making separation difficult.

- *Criteria 2.4 – 2.5* not evaluated because Alternative 12 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because the infrastructure improvements required to construct a dedicated busway on the former rail right-of-way through downtown Mansfield would have significant adverse effects to the downtown, resulting in permanent street closures and the loss of a bike path. The required grade-separated crossings at I-495 and Route 106 would not be practicable to build, and the bus rapid transit line may be within the runway safety areas/object free areas of the Mansfield Airport, which would be incompatible with airport safety.

Alternative 13 – Diesel Multiple Unit Commuter Rail to Mansfield Station

Alternative 13, *Diesel Multiple Unit Commuter Rail to Mansfield Station*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, and Fall River Secondary.
  - May require expanding existing maintenance facility to accommodate additional DMU vehicles.
  - Reduces street network function in downtown Mansfield by eliminating streets.

- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because trains do not enter system.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Mansfield Station.
- *Criterion 2.3* – Highly Unfavorable
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - High level of property acquisition required in Mansfield to restore abandoned right-of-way on Mansfield Line.
  - High level of impacts in downtown Mansfield result from the need to restore a rail corridor currently used as a local street and bike path, and the need to significantly modify existing grade-separated structure at Route 106.
  - High level of impacts to I-495 results from the need to construct a new grade-separated structure.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 13 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because the infrastructure improvements required to restore the commuter rail line through downtown Mansfield would have significant adverse effects to the downtown, resulting in permanent street closures and the loss of a bike path. The required grade-separated crossings at I-495 and Route 106 would not be practicable to build, and the rail line may be within the runway safety areas/object free areas of the Mansfield Airport, which would be incompatible with airport safety.

Alternative 14 – Diesel Multiple Unit Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 14, *Diesel Multiple Unit Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary.
  - May require expanding existing maintenance facility to accommodate additional DMU vehicles.
  - Reduces street network function in downtown Mansfield by eliminating streets.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because trains do not enter system.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Mansfield Station.
- *Criterion 2.3* – Highly Unfavorable
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - High level of property acquisition required in Mansfield to restore abandoned right-of-way on Mansfield Line and to restore the Dartmouth Secondary in Westport and Fall River.
  - High level of impacts in downtown Mansfield result from the need to restore a rail corridor currently used as a local street and bike path, and the need to significantly modify existing grade-separated structure at Route 106.

  - High level of impacts to I-495 results from the need to construct a new grade-separated structure. At this location, the highway and rail bed are at approximately the same elevation, making separation difficult.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 14 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because the infrastructure improvements required to restore the commuter rail line through downtown Mansfield would have significant adverse effects to the downtown, resulting in permanent street closures and the loss of a bike path. The required grade-separated crossings at I-495 and Route 106 would not be practicable to build, and the rail line may be within the runway safety areas/object free areas of the Mansfield Airport, which would be incompatible with airport safety.

Alternative 15 – Electrified Commuter Rail to South Station via Mansfield

Alternative 15, *Electrified Commuter Rail to South Station via Mansfield*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - Addition of new mode not currently operated by the MBTA, reducing the ability of the operator to switch equipment and crews between branches.
  - Except for the Mansfield Line, utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Northeast Corridor between Canton Junction and Readville by adding third track to accommodate additional trains.
  - Requires electrification of the Attleboro Secondary, the New Bedford Main Line, the Fall River Secondary, and third track on the Northeast Corridor from Back Bay to Readville.
  - Requires new maintenance facility or maintenance agreement with an operator with an appropriate facility.
  - Reduces street network function in downtown Mansfield by eliminating streets.

- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Attleboro Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
- *Criterion 2.3* – Highly Unfavorable
  - High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
  - High level of construction impacts for electrification result from erecting catenary wire above tracks.
  - Minimal impact to existing freight service.
  - Difficult to construct within four-year timeframe.
  - High level of impacts in downtown Mansfield result from the need to restore a rail corridor currently used as a local street and bike path, and the need to significantly modify existing grade-separated structure at Route 106.
  - High level of impacts to I-495 results from the need to construct a new grade-separated structure. At this location, the highway and rail bed are at approximately the same elevation, making separation difficult.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 15 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because the infrastructure improvements required to restore the commuter rail line through downtown Mansfield would have significant adverse effects to the downtown, resulting in permanent street closures and the loss of a bike path. The required grade-separated crossings at I-495 and Route 106 would not be practicable to build, and the rail line may be within the runway safety areas/object free areas of the Mansfield Airport, which would be incompatible with airport safety.

Alternative 17 – Commuter Rail to South Station via Middleborough

Alternative 17, *Commuter Rail to South Station via Middleborough*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Neutral
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Middleborough Secondary, and the Middleborough Line.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires capacity improvements on the Old Colony Main Line between Braintree and South Station by adding second track to accommodate additional trains.
- *Criterion 2.2* – Unfavorable
  - Improves reliability of the Old Colony Main Line service by adding second track between Braintree and South Station.
  - Restricts windows for freight operations on the Middleborough Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Limits future expansion of service to Wareham and Buzzards Bay without further infrastructure improvements to the Old Colony Main Line.
  - Reduces reliability of Middleborough Line by increasing the number of trains.
- *Criterion 2.3* – Highly Unfavorable
  - High level of construction impacts to the Old Colony Main Line result from constructing a second track in a densely developed area while maintaining existing MBTA service.
  - High level of construction impacts to Red Line between South Station and Braintree result from construction on the Old Colony Main Line.
  - Minimal impact to existing freight service.
  - Cannot be constructed within four-year timeframe because of the difficult construction in Quincy, including construction adjacent to and under active tracks.

  - High level of property acquisition required along Old Colony Main Line.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 17 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration because of the difficulty and cost of construction on the Old Colony Main Line through Braintree and Quincy. Note: Although Alternative 17 was recommended to be eliminated in Step 2, in Step 4 EOT recommended that this alternative be retained. Although difficult to construct, it may provide long-term transportation benefits by increasing future capacity on the Old Colony Line, and may provide rail access to the casino proposed in Middleborough.

Alternative 18 – Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail

Alternative 18, *Commuter Rail to South Station via Middleborough, convert Red Line Braintree Branch to Commuter Rail*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.2.

- *Criterion 2.1* – Neutral
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Middleborough Secondary, and the Middleborough Line.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires high level of capacity improvements on the Old Colony Main Line between Braintree and South Station by adding second and third track to accommodate additional trains.
- *Criterion 2.2* – Highly Unfavorable
  - Improves reliability of the Old Colony Main Line service by adding second and third track between Braintree and South Station.
  - Restricts windows for freight operations on the Middleborough Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Reduces reliability of Middleborough Line by increasing the number of trains.
  - Replaces the Red Line rapid transit service with a low-frequency commuter rail service. This reduces the capacity of the transit system and provides existing users with a service that is inferior to that which they currently use.

- *Criteria 2.3 – 2.5* not evaluated because Alternative 18 failed to meet Criterion 2.2.

Recommend: Dismiss from further consideration. This alternative was determined not practicable because it would have a significant adverse impact on the Red Line transit service, reducing the capacity of the transit system and degrading the quality of service. In addition, the increased number of trains on the Old Colony Main Line would adversely affect the capacity and reliability of the Middleborough Line.

Alternative 30 – Commuter Rail to South Station via Stoughton

Alternative 30, *Commuter Rail to South Station via Stoughton*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Favorable
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, and the Stoughton Line.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Stoughton Line between Canton Junction and Stoughton by adding second track to accommodate additional trains.
- *Criterion 2.2* – Favorable
  - Fewer Northeast Corridor impacts than Attleboro alternatives, because some trains are an extension of existing service rather than new service.
  - Restricts windows for freight operations on the Stoughton Line, the New Bedford Main Line, and Fall River Secondary.
  - Impacts reliability of service on the Northeast Corridor due to increased number of trains.
- *Criterion 2.3* – Favorable
  - Moderate construction impacts to Stoughton Line result from constructing a second track while maintaining existing MBTA service.
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - Low level of property acquisition required to restore Stoughton Line in Raynham and Stoughton.

  - Trestle increases construction cost.
- *Criterion 2.4* – Favorable
  - Combined cost effectiveness score of 69 percent.
- *Criterion 2.5* – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to the Step 3 evaluation.

Alternative 32 – Diesel Multiple Unit Commuter Rail to Stoughton Station

Alternative 32, *Diesel Multiple Unit Commuter Rail to Stoughton Station*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, and Fall River Secondary.
  - May require expanding existing maintenance facility to accommodate additional DMU vehicles.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future transportation system because trains do not enter existing public transportation system.
  - Restricts windows for freight operations on the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Stoughton Line, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Stoughton Station.
- *Criterion 2.3* – Favorable
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - Low level of property acquisition required to restore Stoughton Line in Raynham and Stoughton.

- *Criterion* 2.4 – Neutral
  - Combined cost effectiveness score of 47 percent.
- *Criterion* 2.5 – Neutral
  - Capacity of operating plan is 4,416 passengers, 55% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 33 – Diesel Multiple Unit to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 33, *Diesel Multiple Unit to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - Moderate capacity improvements required on Attleboro Secondary, New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary.
  - May require expanding existing maintenance facility to accommodate additional DMU vehicles.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future transportation system because trains do not enter existing public transportation system.
  - Restricts windows for freight operations on the New Bedford Main Line, and Fall River Secondary.
  - May result in overcrowding on existing trains on the Stoughton Line, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Stoughton Station.
- *Criterion 2.3* – Neutral
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.

- High level of property acquisition required to restore Stoughton Line in Raynham and Stoughton and to restore Dartmouth Secondary in Westport and Fall River.

- *Criterion 2.4* – Unfavorable
  - Combined cost effectiveness score of 45 percent.
- *Criterion 2.5* – Neutral
  - Capacity of operating plan is 4,416 passengers, 55% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 34 – Electrified Commuter Rail to South Station via Stoughton

Alternative 34, *Electrified Commuter Rail to South Station via Stoughton*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Unfavorable
  - Addition of new mode not currently operated by the MBTA, reducing the ability of the operator to switch equipment and crews between branches.
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires electrification of the Stoughton Line, the New Bedford Main Line, the Fall River Secondary, and third track on the Northeast Corridor from Back Bay to Readville.
  - Requires moderate level of capacity improvements on the Stoughton Line between Canton Junction and Stoughton by adding second track to accommodate additional trains.
  - Requires new maintenance facility or maintenance agreement with an operator with an appropriate facility.

- *Criterion 2.2* – Favorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the Stoughton Line, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
- *Criterion 2.3* – Neutral
  - High level of construction impacts for electrification result from erecting catenary wire above tracks.
  - Minimal impact to existing freight service.
  - Difficult to construct within four-year timeframe.
  - Low level of property acquisition required to restore Stoughton Line in Raynham and Stoughton.
- *Criterion 2.4* – Favorable
  - Combined cost effectiveness score of 69 percent.
- *Criterion 2.5* – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 37 – Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway

Alternative 37, *Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - New guideway system required within existing transportation corridor.
  - New maintenance and storage facility required.

- *Criterion 2.2* – Highly Favorable
  - No adverse effect on existing or planned future public transportation system because vehicles would not enter the existing public transportation system.
  - Limits future expansion of Route 24 by using a portion of the highway right-of-way.
- *Criterion 2.3* – Highly Unfavorable
  - Cannot be constructed within four-year timeframe due to length and complexity of system. At over 70 miles, this would be the longest monorail in the world.
  - High level of construction impacts from monorail being constructed through heavily developed areas along Route 128 and the Southeast Expressway in Braintree, Quincy, Milton, and Boston.
  - High level of impacts in the vicinity of South Station from constructing new monorail terminal station and layover facility.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 37 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. Alternative 37 is the least practicable of the monorail alternatives because of the difficulty of siting and constructing a new monorail between Braintree and Boston. Constructing an elevated monorail would entail widening the median or rebuilding retaining walls to support the structure. Along the Southeast Expressway, the monorail would need to be elevated above the existing bridges and over the plaza in East Milton Square.

Upon reaching South Bay, the monorail route would encounter a maze of highway ramps and rail yards. The monorail guideway would need to be elevated above all of these existing facilities, increasing cost and further impacting this heavily built-up area. North of South Bay, the monorail would terminate at South Station, requiring an entirely new major transit terminal in downtown Boston or major modifications to the existing South Station Transportation Center.

Although Alternative 37 was not evaluated in Criterion 2.4, construction costs would average $150 million per mile. The Braintree – South Station segment would cost greater than $1.5 billion, which is not cost effective.

Alternative 38 – Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128

Alternative 38, *Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - New guideway system required within existing transportation corridor.
  - New maintenance and storage facility required.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because vehicles would not enter the existing public transportation system.
  - Limits future expansion of Route 24 by using a portion of the highway right-of-way.
  - May result in overcrowding on Red Line trains due to volume of transferring passengers at Quincy Adams Station, requiring additional subway trains.
- *Criterion 2.3* – Highly Unfavorable
  - Cannot be constructed within four-year timeframe due to length and complexity of system. At over 60 miles, this would be the longest monorail in the world.
  - High level of construction impacts result from monorail being constructed through heavily developed areas along Route 128 and Route 3 in Braintree and Quincy.
  - High level of impacts in the vicinity of Quincy Adams Station results from constructing new monorail terminal station and layover facility.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 38 failed to meet Criteria 2.3.

Recommend: Dismiss from further consideration. Alternative 38 avoids the impacts and costs of Alternative 37 by placing the northern monorail terminus at Quincy Adams Station. While this eliminates complications to the north, it would increase travel time and reduce passenger comfort and convenience by requiring a transfer. It could increase the demand for service on the Red Line Braintree Branch by several thousand riders because of transferring passengers, resulting in overcrowding on the Red Line. Additional trains on the Red Line during rush hour would be difficult due to constraints on the signal system. Overcrowding would be especially severe on the

first Red Line train to arrive after a monorail train, because the monorail would operate at a lower frequency and discharge a large number of passengers all at once. It would also require complicated construction around and above active highways and railroads at Quincy Adams Station.

Alternative 39 – Monorail to Route 128 Station via Route 140, Route 24, and Route 128

Alternative 39, *Monorail to Route 128 Station via Route 140, Route 24, and Route 128*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - Addition of mode not currently operated in Massachusetts, reducing ability of operator to switch equipment and crews between branches.
  - New guideway system required within existing transportation corridor.
  - New maintenance and storage facility required.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because vehicles would not enter the existing public transportation system.
  - Limits future expansion of Route 24 by using a portion of the highway right-of-way.
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at the Route 128 Station.
- *Criterion 2.3* – Highly Unfavorable
  - Cannot be constructed within four-year timeframe due to length and complexity of system. At over 60 miles, this would be the longest monorail in the world.
  - High level of construction impacts because the monorail would need to be constructed along Route 128 in Canton, Milton, and Randolph.
  - High level of impacts in the vicinity of Route 128 Station from constructing new monorail terminal station and layover facility.
- *Criteria 2.4 – 2.5* not evaluated because Alternative 39 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. Alternative 39 avoids many of the impacts of Alternative 37, but would reduce passenger comfort and convenience

compared to Alternative 37 by requiring a transfer. It could increase the demand for service on the Northeast Corridor by several thousand riders because of transferring passengers, resulting in overcrowding on the Providence Line and Stoughton Line commuter rail services. It would also require complicated construction around and above active highways and railroads at Route 128 Station.

Alternative 40 – Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor

Alternative 40, *Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Unfavorable
  - New guideway system required within existing transportation corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires moderate level of capacity improvements on the Northeast Corridor between Route 128 and Readville by adding third track to accommodate additional trains.
  - May require expanding existing maintenance facility to accommodate additional commuter rail vehicles.
- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability in areas where no improvements would be made.
  - Restricts windows for freight operations on the New Bedford Main Line and the Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor because of reduced capacity.
  - Limits future expansion of Route 24 by using a portion of the highway right-of-way.
- *Criterion 2.3* – Highly Unfavorable
  - Difficult to construct within four-year timeframe because of extensive earthworks and construction along Route 24 and Route 128. Earthworks and structure are unavoidable because commuter rail cannot achieve the same profile grades and horizontal curvature as highways.

- High level of construction impacts to Route 24 and Route 128 result from reconstructing 12 interchanges. Interchange reconstruction is unavoidable because it is impractical to elevate the commuter rail above or below the existing highways, ramps, and bridges, due to the long transition grades required.
- High level of construction impacts to the Northeast Corridor result from constructing a third track while maintaining existing MBTA and Amtrak service.
- Minimal impact to existing freight service.
- Moderate level of property acquisition required along Route 24 near interchanges and near Route 128 Station.

- *Criteria 2.4 – 2.5* not evaluated because Alternative 40 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration. It was determined not practicable to construct a commuter rail line along Route 24 because of the difficulty, cost, and duration of construction. Because commuter rail requires that the track be flat, with extremely low slopes, extensive regrading or structures (viaduct) would be needed along the rolling terrain of Route 24. The commuter rail line would require that every interchange and bridge along Route 24 be reconstructed so that the bridge would be wide and high enough for the commuter rail train, and so that the on- and off-ramps did not cross the track at-grade. Because significant portions of Route 24 do not have a median, constructing commuter rail along Route 24 would require that the highway embankment be widened from Avon south to I-495.

Alternative 41 – Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128

Alternative 41, *Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.4.

- *Criterion 2.1* – Unfavorable
  - Addition of mode not currently operated in the area, reducing ability of operator to switch equipment and crews between branches.
  - New guideway system required within existing transportation corridor.
  - New maintenance and storage facility required.
- *Criterion 2.2* – Unfavorable
  - No adverse effect on existing or planned future public transportation system because vehicles would not enter the existing public transportation system.

- Limits future expansion of Route 24 by using a portion of the highway right-of-way.
- May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Route 128 Station.

- *Criterion 2.3* – Unfavorable
  - Difficult to construct within four-year timeframe.
  - High level of construction impacts to Route 24 and Route 128 result from reconstructing 20 interchanges.
  - High level of impacts in the vicinity of Route 128 Station results from constructing new terminal station and layover facility.
- *Criterion 2.4* – Highly Unfavorable
  - Combined cost effectiveness score of 19 percent.
- *Criterion 2.5* not evaluated because Alternative 41 failed to meet Criterion 2.4.

Recommend: Dismiss from further consideration. It was determined not practicable to construct a commuter rail line along Route 24 because of the difficulty, cost, and duration of construction. Because commuter rail requires that the track be flat, with extremely low slopes, extensive regrading or structures (viaduct) would be needed along the rolling terrain of Route 24. The commuter rail line would require that every interchange along Route 24 be reconstructed so that the bridge was wide and high enough for the commuter rail engine, and/or so that the on- and off-ramps did not cross the track. Because significant portions of Route 24 do not have a median, constructing commuter rail along Route 24 would require that the highway right-of-way be widened, particularly though the Hockomock Swamp ACEC.

Alternative 42 – Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line

Alternative 42, *Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line*, was determined not practicable to construct and operate due to its failure to meet Criterion 2.2.

- *Criterion 2.1* – Unfavorable
  - New guideway system required within existing transportation corridor.
  - New maintenance and storage facility required.

- *Criterion 2.2* – Highly Unfavorable
  - Reduces reliability of Red Line by extending an existing service 50 miles. It would be difficult to maintain headways on a rapid transit line of this length.
  - Limits future expansion of Route 24 by using a portion of the highway right-of-way.
  - May result in overcrowding on Red Line because of long distance and dual function of line as a rapid transit line and a commuter line.
  - Eliminates existing Braintree Station on the Red Line, greatly reducing service for residents and commuters currently using this station.
- *Criteria 2.3 – 2.5* not evaluated because Alternative 42 failed to meet Criterion 2.2.

Recommend: Dismiss from further consideration. This alternative is not practicable because of the significant adverse impacts to Red Line service. By adding trains to the existing Red Line infrastructure and extending the Red Line by 50 miles, this alternative would adversely affect reliability of the system, result in overcrowding of trains, and degrade the level of service.

Alternative 43 – Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128

Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Favorable
  - Utilizes existing transportation corridor on Route 24.
  - Improves operations on Route 128 with new bus lane.
  - Park & Ride and storage/maintenance facility required.
- *Criterion 2.2* – Unfavorable
  - May result in overcrowding on existing trains on the Northeast Corridor, requiring additional trains, longer trains, and/or more bi-level coaches, because of passengers transferring at Route 128 Station.
  - Decreases non-peak-direction capacity on Route 24 by taking a lane for use in the peak direction as the zipper lane.

- *Criterion 2.3* – Neutral
  - Impacts to Route 128 because of temporary traffic shifts needed to construct bus lane.
  - Minimal impacts to Route 24 because zipper lane would use existing travel lanes.
- *Criterion 2.4* – Neutral
  - Cost effectiveness score of 58 percent.
- *Criterion 2.5* – Unfavorable
  - Capacity of operating plan is 2,700 passengers, 34% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 44 – Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane

Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Favorable
  - Utilizes existing transportation corridor on Route 24.
  - Improves operations on Route 128 with new bus lane.
  - Park & Ride and storage/maintenance facility required.
- *Criterion 2.2* – Neutral
  - Decreases non-peak-direction capacity on Route 24 by taking a lane for use in the peak direction as the zipper lane.
  - Decreases user capacity of existing Southeast Expressway HOV lane by increasing traffic volume in the lane.
- *Criterion 2.3* – Neutral
  - Impacts to Route 128 because of temporary traffic shifts needed to construct bus lane.
  - Minor impacts to Route 3 at Braintree Split to construct bus lane.

  - Minimal impacts to Route 24 because zipper lane utilizes existing travel lanes.
- *Criterion* 2.4 – Favorable
  - Combined cost effectiveness score of 68 percent.
- *Criterion* 2.5 – Unfavorable
  - Capacity of operating plan is 2,700 passengers, 34% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 45 – Enhanced Bus on Existing Private Carrier Lines

Alternative 45, *Enhanced Bus on Existing Private Carrier Lines*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Highly Favorable
  - Utilizes existing infrastructure.
- *Criterion 2.2* – Neutral
  - Increases capacity of existing bus service by providing more frequent service.
  - Does not improve the reliability or quality of existing service because no infrastructure improvements are included.
  - Decreases user capacity of existing Southeast Expressway HOV lane by increasing traffic volume in the lane.
- *Criterion* 2.3 – Highly Favorable
  - No construction impacts to existing facilities.
- *Criterion* 2.4 – Highly Favorable
  - Combined cost effectiveness score of 75 percent.
- *Criterion* 2.5 – Unfavorable
  - Capacity of operating plan is 2,700 passengers, 34% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 62 – Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line

Alternative 62, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Favorable
  - Except for the Attleboro Bypass, utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Attleboro Secondary, the Middleborough Secondary, the Middleborough Line, and the Northeast Corridor.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - May require expanding existing maintenance facility to accommodate additional commuter rail vehicles.
- *Criterion 2.2* – Unfavorable
  - Adds new service to the Northeast Corridor, decreasing capacity and affecting reliability.
  - Restricts windows for freight operations on the Attleboro Secondary, the Middleborough Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of services on the Northeast Corridor and on the Old Colony Main Line because of reduced capacity.
  - Limits future expansion of service to Wareham and Buzzards Bay without infrastructure improvements to the Old Colony Main Line.
  - Reduces reliability of the Middleborough Line by increasing the number of trains.
- *Criterion 2.3* – Favorable
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
  - Moderate level of property acquisition required for the Attleboro Bypass.
- *Criterion 2.4* – Neutral
  - Combined cost effectiveness score of 59 percent.

- *Criterion* 2.5 – Favorable
  - Capacity of operating plan is 8,640 passengers, more than the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

Alternative 63 – Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham

Alternative 63, *Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham*, is not practicable to construct and operate due to its failure to meet Criterion 2.3.

- *Criterion 2.1* – Neutral
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Middleborough Secondary, and the Middleborough Line.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
  - Requires high level of capacity improvements on the Middleborough Line by adding a second track and on the Old Colony Main Line by adding second and third tracks.
- *Criterion 2.2* – Neutral
  - Improves reliability of the Middleborough Line and the Old Colony Main Line service by adding second and third track.
  - Restricts windows for freight operations on the Middleborough Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Reduces reliability of the Middleborough Line by increasing the number of trains.
- *Criterion* 2.3 – Highly Unfavorable
  - High level of construction impacts to the Old Colony Main Line result from constructing second and third tracks in a densely developed area while maintaining existing MBTA service.
  - High level of construction impacts to the Red Line between South Station and Braintree result from construction on the Old Colony Main Line.
  - Minimal impact to existing freight service.

- Cannot be constructed within four-year timeframe because of construction adjacent to and under active tracks.
- High level of property acquisition required along the Old Colony Main Line.

- *Criteria 2.4 – 2.5* not evaluated because Alternative 42 failed to meet Criterion 2.3.

Recommend: Dismiss from further consideration because of the difficulty and cost of construction on the Old Colony Main Line through Braintree and Quincy.

Alternative 64 – Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements*, was determined practicable to construct and operate based on the following ratings:

- *Criterion 2.1* – Neutral
  - Utilizes existing transportation corridors on the New Bedford Main Line, the Fall River Secondary, the Middleborough Secondary, and the Middleborough Line.
  - Commuter rail is compatible with existing freight and passenger services, modes, and equipment.
- *Criterion 2.2* – Unfavorable
  - Reduces reliability of the Middleborough Line and the Old Colony Main Line service by increasing the number of trains and using all available capacity.
  - Restricts windows for freight operations on the Middleborough Secondary, the New Bedford Main Line, and Fall River Secondary.
  - Restricts future expansion of service to Wareham and Buzzards Bay without infrastructure improvements to the Old Colony Main Line.
- *Criterion 2.3* – Favorable
  - Minimal impact to existing passenger service.
  - Minimal impact to existing freight service.
  - Can be constructed within four-year timeframe.
- *Criterion 2.4* – Neutral
  - Combined cost effectiveness score of 52 percent.

- *Criterion* 2.5 – Neutral
  - Capacity of operating plan is 4,320 passengers, 54% of the regional demand of 8,000 work trips.

Recommend: Advance to Step 3.

6.3 Step 2 Recommendations

The following 15 Alternatives were recommended to the Interagency Coordinating Group to be dismissed based on the results of the Step 2 Screening Evaluation. On February 28, 2008, the Interagency Coordinating Group agreed to this list (Table 6-6).

Table 6-6 Alternatives Dismissed in Step 2

Number	Alternative	Reason(s) Why Alternative was Dismissed (by Criterion)
2	Commuter Rail to South Station via Attleboro Station with Reverse Move	2.2 Would decrease capacity and affect reliability; restricts freight operations; restricts future expansion; reverse move at Attleboro Station severely reduces capacity and reliability of existing service
11	Commuter Rail to South Station via Mansfield	2.2 Would decrease capacity and affect reliability; restricts freight operations; restricts future expansion 2.3 High level of construction impacts to Northeast Corridor; moderate impacts to existing passenger rail service; high level of property acquisition required; not practicable to restore track through downtown Mansfield
12	Bus Rapid Transit to Mansfield Station	2.1 Addition of new mode; moderate capacity improvements required; new maintenance and storage facility required; high level of impact to city street systems 2.2 Would restrict freight operations; may require additional trains on Northeast Corridor due to overcrowding 2.3 High level of property acquisition required; not practicable to restore right-of-way through downtown Mansfield
13	Diesel Multiple Units Commuter Rail to Mansfield Station	2.2 Would restrict freight operations; may require additional trains on Northeast Corridor due to overcrowding 2.3 High level of property acquisition required; not practicable to restore track through downtown Mansfield
14	Diesel Multiple Units Commuter Rail to Mansfield Station with New Bedford to Fall River Connection via Dartmouth Secondary	2.2 Would restrict freight operations; may require additional trains on Northeast Corridor due to overcrowding 2.3 High level of property acquisition required; not practicable to restore track through downtown Mansfield

Table 6-6 Alternatives Dismissed in Step 2 (continued)

Number	Alternative	Reason(s) Why Alternative was Dismissed (by Criterion)
15	Electrified Commuter Rail to South Station via Mansfield	2.1 Would require the addition of a new mode; impacts to downtown Mansfield streets; moderate capacity improvements required; requires electrification of existing corridors; requires new maintenance and storage facility 2.2 Would restrict freight operations; may require additional trains on Northeast Corridor due to overcrowding 2.3 High level of construction impacts to Northeast Corridor; moderate impacts to existing passenger rail service; high level of property acquisition required; not practicable to restore track through downtown Mansfield
17	Commuter Rail to South Station via Middleborough	2.2 Would limit future planned or proposed expansion to Wareham/Buzzards Bay; reduced reliability of Middleborough Line 2.3 High level of construction impacts to Old Colony Main Line, especially in Quincy; possible impact to Red Line service; cannot be constructed within four-year timeframe
18	Commuter Rail to South Station via Middleborough, Convert Red Line Braintree Branch to Commuter Rail	2.2 Would limit future planned expansions; reduced reliability of Middleborough Line; replace rapid transit with low frequency service
37	Monorail to South Station via Route 140, Route 24, Route 128, and Southeast Expressway	2.1 Would require a new guideway system within existing transportation corridor and new maintenance and storage facility 2.2 Limits future expansion of Route 24 2.3 Cannot be constructed within four-year timeframe; high level of construction impacts to Boston area
38	Monorail to Quincy Adams Station via Route 140, Route 24, and Route 128	2.1 Would require a new guideway system within existing transportation corridor and new maintenance and storage facility 2.2 May require additional trains on Red Line that could impact existing operations and ridership; limits future expansion of Route 24 2.3 Cannot be constructed within four-year timeframe; high level of construction impacts within Quincy Adams area
39	Monorail to Route 128 Station via Route 140, Route 24, and Route 128	2.1 Would require a new guideway system within existing transportation corridor and new maintenance and storage facility 2.2 May require additional trains on Red Line that could impact existing operations and reliability; limits future expansion of Route 24 2.3 Cannot be constructed within four-year timeframe; high level of construction impacts along Route 128
40	Commuter Rail to South Station via Route 24 and Route 128 to Northeast Corridor	2.1 Would require a new guideway system within existing transportation corridor and expanding existing maintenance facility 2.2 Would affect Northeast Corridor operations with new train trips; limits future expansion of Route 24 2.3 High level of impacts to construct major structures; reconstruct 20 interchanges and third track on Northeast Corridor

Table 6-6 Alternatives Dismissed in Step 2 (continued)

Number	Alternative	Reason(s) Why Alternative was Dismissed (by Criterion)
41	Light Rail/Heavy Rail to Route 128 Station via Route 140, Route 24, and Route 128	2.1 Would require a new guideway system within existing transportation corridor and new maintenance and storage facility 2.2 May require additional trains on Northeast Corridor that could impact existing operations and ridership; limits future expansion of Route 24 2.3 High level of impacts to construct major structures, reconstruct 20 interchanges 2.4 Lowest ridership and highest cost when compared to other practicable alternatives
42	Heavy Rail to South Station via Route 140, Route 24, Route 128, and Red Line	2.1 Would require a new guideway system within existing transportation corridor and new maintenance and storage facility 2.2 Reduces reliability of existing Red Line by extending existing service; eliminates existing Braintree station; limits future expansion of Route 24
63	Commuter Rail to South Station via Middleborough, also extend Middleborough line to Wareham	2.3 Minor impacts to existing passenger and freight rail service; major impact on Red Line and Old Colony Main Line service; cannot be constructed within four-year timeframe

7

Step 3 Analysis

This chapter describes the third screening step used to determine the relative magnitude of each alternative's potential impacts on the aquatic and natural environment and consistency with smart growth strategies.

7.1 Introduction

The third step of screening determined if any of the reasonable alternatives should be dismissed based on potential impacts to the aquatic or natural environment and consistency with smart growth strategies. Step 3 considers the potential for other significant adverse environmental consequences to occur as a result of each alternative, particularly to wetlands, federal- and state-listed rare species, public water supplies, and protected open space.

As stated in the EPA Guidelines at 40 Code of Federal Regulations 230.10(a), "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." Therefore, this third step of screening assessed impacts to the aquatic environment under the Clean Water Act, but also assessed other potential impacts to the overall natural environment, as is required under the EPA guidelines. The specific measures for each criterion are listed below.

Because of the large size of the Alternatives Analysis Study Area, and the large number of alternatives being evaluated, this analysis is based on available GIS-level information (a coarse-filter approach at this stage) and will provide comparable results for each alternative. More detailed analysis, based on field investigations and preliminary engineering designs, will be done in the Phase 2 environmental impact analysis.

Step 3 compared the alternatives that were advanced to this step based on six criteria:

- 3.1 – The approximate level of wetland loss (in acres) and relative indirect impacts to wetlands.
- 3.2 – The number of new stream or river crossings.
- 3.3 – The number of acres of mapped Priority Habitat (state-listed rare species) that would be lost.
- 3.4 – The number of acres of protected public open space that would be directly impacted. These are lands that are protected under Massachusetts' State Constitution, Article 97 (parks, conservation lands, recreation areas, wildlife refuges).
- 3.5 – The number of acres of protected public water supply lands (Mapped Wellhead Zone 1, Mapped Surface Water Supply Zone A) that would be directly impacted.
- 3.6 – Consistency with smart growth strategies.

7.1.1 Criterion 3.1 – The approximate level of wetland loss (in acres) and relative indirect impacts to wetlands

Wetland impacts are the principal category of environmental impacts that must be considered for Section 404 permits and variances under the Massachusetts Wetlands Protection Act. Wetland fill quantities will be estimated using available GIS-mapped wetland boundaries within the Alternatives Analysis Study Area. The available GIS mapping does not specify whether the mapped wetlands are subject to Federal jurisdiction (Waters of the United States, as defined at 33 CFR 328.3, which include waters, including adjacent wetlands, that are part of a surface tributary system to navigable waters of the United States) or whether these wetlands are subject to jurisdiction under the Massachusetts Wetlands Protection Act as land under a waterbody, bordering vegetated wetlands or isolated land subject to flooding. This preliminary, comparative analysis assumes that all wetlands are subject to both Federal and state jurisdiction.

The amount of fill will be calculated using GIS. Based on GIS information, the analysis will also calculate the amount of each type of wetland (e.g., forested, shrub, emergent) that would be lost for each alternative. The number of potentially-affected Certified Vernal Pools and potential vernal pools will also be identified using GIS data. This analysis will also evaluate the amount of wetland fill within an ACEC, as wetlands within ACECs receive a higher level of regulatory protection. This analysis included the amount of wetland fill within the proposed Three Mile River ACEC.

Wetland resource area boundaries along the Fall River Secondary, the New Bedford Main Line, and the Stoughton Line were field-delineated and surveyed during preparation of the 2002 FEIR, and impacts to resource areas along those lines were calculated based on a 30 percent engineering design. These more accurate wetland impact numbers have been used in this analysis, where the transit mode did not require widening the railbed.

Relative indirect impacts to wetlands will be evaluated based on the length of each alternative that would cross a wetland on new alignment. While indirect impacts to wetland functions and values (particularly wildlife habitat functions in proximity to the transportation corridor, or fragmentation of wildlife habitat) could occur as a result of reconstruction of an existing rail line or highway, assessing indirect impacts requires detailed analysis of the existing wetland's plant community and functions, as well as detailed analysis of the lateral extent of indirect impacts. Such analyses are not feasible at this preliminary, comparative level of analysis. Because indirect impacts are likely to be more severe along new or abandoned rail or road corridors, and because this metric is easily quantified using GIS analysis, the length of the new or abandoned rail or road corridor was used to estimate the magnitude of potential indirect impacts to wetland functions in this preliminary comparative analysis. Results for this criterion are provided in Appendix B.

Table 7-1 Measures Used to Evaluate Criterion 3.1

Criterion	Measure	Rating
3.1	*Loss of wetlands and indirect impacts to wetlands*	
	➤ Amount of wetland fill (by habitat type) ➤ Amount of wetland fill in an ACEC ➤ Number of vernal pools potentially impacted (certified and potential) ➤ Potential indirect impacts – the length of an alternative crossing wetland on a new alignment	◑ No wetland loss, no loss of wetland in an ACEC, no vernal pools in close proximity, no or minimal indirect impacts ⊘ Minor wetland loss, minor loss of wetland in an ACEC, some vernal pools in close proximity, moderate indirect impacts ⊗ High wetland loss, high loss of wetlands in an ACEC, more vernal pools in close proximity, higher indirect impacts

7.1.2 Criterion 3.2 - The number of stream or river crossings

New crossings of streams or rivers have the potential to result in the loss of aquatic habitat. The amount of aquatic habitat loss will be estimated based on the number of new river/stream crossings.

Although the Interagency Coordinating Group requested that the number of existing bridges or culverts requiring or not requiring widening be provided for

informational purposes but not used to rate the alternatives, this information was not developed in Phase 1. This information will be included in the Phase 2 analysis, and will provide an estimate of locations where construction of the alternative could result in improved fish or wildlife passage by reconstructing an existing culvert or bridge. This minimization or mitigation would be considered in a later phase of analysis.

Table 7-2 Measures Used to Evaluate Criterion 3.2

Criterion	Measure	Rating
3.2	*Impacts to Streams and Rivers*	
	➤ Number of new crossings	◑ No impact (No new crossings)
		◯ Minor impact (Fewer than 5 new crossings)
		⊘ Moderate impact (Five to 15 new crossings)
		⊗ Substantial impact (More than 15 new crossings)

7.1.3 Criterion 3.3 - The number of acres of mapped Priority Habitat (state-listed rare species) that would be lost

Rare species habitat impacts are considered at this step because rare species are considered an important environmental resource, protected under the Massachusetts Endangered Species Act. Obtaining a permit for work within rare species habitat requires an alternatives analysis and the demonstration that the applicant has adequately assessed alternatives to both temporary and permanent impacts to state-listed species.

Potential impacts to rare species habitat will be evaluated based on available GIS mapping. Potential direct impacts to habitat (loss) for both new or abandoned right-of-ways and segments of existing active rail lines requiring track improvements will be estimated using available GIS-mapped polygon boundaries. Relative indirect impacts will be evaluated based on whether the alternative would cross a polygon on new alignment or would cross a polygon on an existing right-of-way. While indirect impacts to rare species habitat (particularly in proximity to the transportation corridor, or fragmentation of wildlife habitat) could occur as a result of reconstruction of an existing rail line or highway, assessing indirect impacts requires detailed analysis of the existing habitat and requirements of the specific species at each location, as well as detailed analysis of the lateral extent of indirect impacts. Such analyses are not feasible at this preliminary, comparative level of analysis.

Because indirect impacts are likely to be more severe along new or abandoned rail or road corridors, and because this metric is easily quantified using GIS analysis, the length of the new or abandoned rail or road corridor was used to estimate the magnitude of potential indirect impacts to rare species in this preliminary comparative analysis.

The NHESP provided an analysis of potential impacts to rare species habitat using two measures: the length of new or abandoned right-of-way within mapped Priority Habitats, and the number of state-listed species within these priority habitats that would potentially be affected by constructing or restoring track. Raw scores in each category were ranked from 1 to 4, and added together to develop a composite index. NHESP then adjusted the scores for four alternatives using more detailed available information. The scores for Alternatives 3, 6, and 33 were reduced because they would impact Priority Habitat near I-195 that is already fragmented. The scores for Alternatives 30 and 34 were reduced because these alternatives incorporate a trestle that would reduce fragmentation and other habitat impacts.

The NHESP combined these scores (which measure impacts on the new and abandoned segments of right-of-way with the total scores for work within mapped Priority Habitat for each alternative. This combined score takes into account the impacts of track improvements/widening on active rail lines as well as the new impacts. While the outcome of the NHESP's application of the above criteria to the Stoughton alternatives resulted in the same combined score range for the at-grade and trestle alternatives ("highly unfavorable" in terms of impacts), the NHESP still regards the trestle alternatives as being significantly better than the at-grade alternatives. This is because, as noted above, the use of a trestle would reduce habitat fragmentation and impacts and facilitate the continued movement of state-listed species across the right-of-way. For these reasons, NHESP does not object to the trestle alternatives (30 and 34) being retained at this early stage in the planning process.

Table 7-3 Measures Used to Evaluate Criterion 3.3

Criterion	Measure	Rating
3.3	*Impacts to state-listed rare species habitat* ➤ Acres of priority habitat within the footprint of the alternative ➤ Length of new or abandoned right-of-way within Priority Habitat ➤ Number of potentially affected state-listed species	◑ Combined score 0-2 ◯ Combined score 4-6 ⊗ Combined score 9-11 [NOTE: the NHESP does not object to Alternatives 30 and 34 (the "trestle" alternatives) being retained at this early stage in the planning process.]

7.1.4 Criterion 3.4 - The number of acres of protected public open space which are protected under Massachusetts' State Constitution, Article 97 (parks, conservation lands, recreation areas, wildlife refuges), that would be directly impacted

The Phase 1 analysis evaluates potential direct impacts to public open space (parks, conservation lands, recreation lands, conservation land, and wildlife refuges) which are protected under Article 97 of the Massachusetts Constitution, and to publicly-owned wildlife sanctuaries and refuges which are considered "special aquatic sites" under the federal 404(b)(1) Clean Water Act Guidelines. Although this Project is not anticipated to require review or funding by a federal transportation agency, this criterion also includes those properties protected under Section 4(f) of the federal Department of Transportation Act.

Potential, approximate impacts to public open space will be evaluated based on available state and local GIS mapping. The amount of land acquisition of each alternative from a public open space parcel will be calculated using GIS, and the area of potential loss will be estimated using the typical cross-section for each alternative. This Phase 1 analysis will not identify indirect effects to public open space that may occur as a result of the location of the alternative (fragmentation), proximity (noise), or other secondary effects that will be evaluated in detail in the Phase 2 environmental impact analysis.

Table 7-4 Measures Used to Evaluate Criterion 3.4

Criterion	Measure	Rating
3.4	*Impacts to Protected Open Space*	
	➢ Amount of land acquisition from protected public open space	◑ No land acquisition from protected open space
		○ Less than 1 acre of acquisition
		⊘ More than 1 acre of acquisition

7.1.5 Criterion 3.5 - The number of acres of protected public water supply lands (Mapped Wellhead Zone 1, Mapped Surface Water Supply Zone A) that would be directly impacted

Public drinking water supplies (wells and surface reservoirs) are important public resources that are protected under Massachusetts and federal regulations. Potential impacts to public drinking water supplies will be evaluated by determining the area of protected Wellhead Zone 1 (the area within a 400-foot radius of an existing well) or Surface Water Supply Zone A (the area within 400 feet of the bank of a Class A surface water, or within 200 feet of a tributary) that would be within the footprint of an alternative that uses a new or abandoned railroad right-of-way, or that would be within the footprint of a highway alternative (outside of the existing highway footprint).

Table 7-5 Measures Used to Evaluate Criterion 3.5

Criterion	Measure	Rating
3.5	*Impacts to Public Drinking Water Supplies* ➤ Amount of loss of land within Wellhead Zone 1 (along a new or abandoned right-of-way) ➤ Amount of loss of land within Surface Water Supply Zone A (along a new or abandoned right-of-way)	◑ No construction within a Zone A or Zone 1 ⊘ Less than 0.5 acre of construction within a Zone A or Zone 1

7.1.6 Criterion 3.6 - Consistent with smart growth strategies

Transportation infrastructure impacts land development patterns by controlling the ease of access to neighborhoods, communities, and commercial and industrial areas, which in turn affects both built and natural environments. The Commonwealth can support smart growth strategies for any alternative by providing technical assistance to communities to zone for homes and jobs in places already well-served by public infrastructure, providing tools to support open space and natural resource conservation, promoting renewable energy technologies and energy efficiency, and ensuring the Project meets social equity objectives. (For more detail on the Commonwealth's smart growth goals, see the Commonwealth's Sustainable Development Principles.[1]) Even though any alternative can promote some level of smart growth with the right policy choices, alternatives are not all created equal. EOT will evaluate an alternative's potential to support smart growth based on the extent to which an alternative:

- Serves historic population and job centers, such as downtowns and village centers;
- Has the potential to promote brownfields and grayfields redevelopment;
- Protects land and ecosystems, as assessed in Criteria 3.1-3.4;
- Preserves existing agricultural lands, drinking water supplies, forests, and wildlife habitat;
- Preserves historic and archaeological resources; and
- Avoids or minimizes siting stations or parking in undeveloped areas.

Detailed results for this criterion are provided in Appendix B.

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[1] Commonwealth's Sustainable Development Principles (http://www.mass.gov/Agov3/docs/smart_growth/patrick-principles.pdf)

Table 7-6 Measures Used to Evaluate Criterion 3.6

Criterion	Measure	Rating
3.6	*Consistency with Smart Growth Strategies* ➤ Service to population and job centers ➤ Potential to promote brownfields and grayfields redevelopment ➤ Impacts to historic and archaeological resources (number of known historic and archaeological resources within the footprint) ➤ Potential to locate stations within developed areas	● Meets all criteria – Provides service to the most population or job centers; substantial amount of potentially redevelopable brownfields sites close to the population centers; no impacts to historic resources; all stations can be located within developed areas with potential for stations near highways to reach a larger population ◑ Meets most criteria – provides service to fewer population or job centers; smaller number of potentially developable brownfields sites; no impacts to historic resources; all stations can be located within developed areas with potential for stations near highways to reach a larger population ○ Meets some criteria – provides service to fewer population or job centers; few potentially developable brownfields sites; no impacts to historic resources; all stations can be located within developed areas with potential for stations near highways to reach a larger population ⊘ Meets few criteria – provides service to two population or job centers; negligible number of potentially developable brownfields sites; minor impacts to historic resources; two stations can be located within developed areas, all other stations can only be located near developed areas ⊗ Does not provide service to population or job centers; negligible potential for brownfields redevelopment; substantial impacts to historic resources; no stations could be located in developed areas

7.2 Step 3 Results

The following sections describe the results of the 14 alternatives evaluated in the Step 3 evaluation. Table 7-7 provides a summary of the results of this analysis. Figures 7-1 through 7-7 provide environmental resource information for each of the corridors under consideration. The rankings were developed for comparative purposes, and rank each alternative with respect to each criterion in relationship to the other alternatives. EOT generally recommended that any alternative with a "highly unfavorable" ranking be dismissed from further consideration.

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Table 7-7
SOUTH COAST RAIL
Phase 1 Alternatives Analysis - Step 3

FINAL
04/30/08

Number of Alternatives for Step 3 = 15

Route	Alt #	Name	CRITERION 3.1 - The approximate level of wetland loss (in acres)					CRITERION 3.2 - The number of stream or river crossings with impact		CRITERION 3.3 - Potential Impacts to Priority Habitats (State-Listed Species Habitats)		CRITERION 3.4 - The number of acres of protected public open space that would be directly impacted		CRITERION 3.5 - The number of acres of protected public water supply lands that would be directly impacted		CRITERION 3.6 - Consistent with smart growth strategies	RETAINED FOR FURTHER CONSIDERATION
			Acres	Acres in ACEC	Number of Vernal Pools - *Certified (Potential)*	Length of Wetland *(feet)* (Indirect Impact)	***RANK***	Number	***RANK***	Score	***RANK***	Acres	***RANK***	Acres	***RANK***	***RANK***	
THROUGH ATTLEBORO	1	Commuter Rail to South Station via Attleboro Bypass	7.82	0.46	2 (7)	6,300	⊘	4	○	4	○	0.65	○	0	◑	◑	YES
	3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	9.74	0.46	2 (6)	15,800	⊗	12	⊘	6	○	2.21	⊘	0.09	⊘	◑	**NO**
	5	Diesel Multiple Units Commuter Rail to Attleboro Station	5.32	0	2 (8)	0	◑	0	◑	2	◑	0	◑	0	◑	●	YES
	6	Diesel Multiple Units to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	10.89	0	3 (11)	9,500	⊗	8	⊘	5	○	2.25	⊘	0.14	⊘	●	**NO**
	7	Electrified Commuter Rail to South Station via Attleboro Bypass	8.46	0.46	2 (10)	6,300	⊘	4	○	4	○	0.65	○	0	◑	◑	YES
THROUGH MIDDLEBOROUGH	17	Commuter Rail to South Station via Middleborough	3.61	0	0(4)	0	◑	1	○	2	◑	0	◑	0	◑	◑	**YES***
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements	3.61	0	0 (4)	0	◑	0	◑	2	◑	0	◑	0	◑	◑	YES
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line	7.92	0	2 (11)	6,300	⊘	4	○	5	○	0.65	○	0	◑	◑	YES
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton	6.74	0.76	9 (17)	6,400	⊘	10	⊘	9 **	⊗	3.06	⊘	0	◑	◑	YES
	32	Diesel Multiple Units Commuter Rail to Stoughton Station	8.95	1.41	9 (17)	6,400	⊘	10	⊘	10	⊗	4.4	⊘	0	◑	◑	**NO**
	33	Diesel Multiple Units to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	14.52	1.41	10 (20)	15,900	⊗	18	⊗	11	⊗	6.96	⊘	0.14	⊘	◑	**NO**
	34	Electrified Commuter Rail to South Station via Stoughton	7.25	0.83	9 (17)	6,400	⊘	10	⊘	9**	⊗	3.3	⊘	0	◑	◑	YES
HIGHWAY SYSTEM	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128	0.31	0.25	0	0	◑	0	◑	1	◑	7.33	⊘	0	◑	⊘	YES
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway High Occupancy Vehicle (HOV) Lane	0.1	0	0	0	◑	0	◑	1	◑	4.03	⊘	0	◑	⊘	YES
	45	Enhanced Bus Service on Existing Private Carrier Routes	0	0	0	0	◑	0	◑	1	◑	0	◑	0	◑	⊘	YES

LEGEND

- ● **Highly Favorable** = highly positive impact and/or substantially exceeding the intent of the criterion
- ◑ **Favorable** = small or marginally positive impact and/or complete satisfaction or marginally exceeding the intent of the criterion
- ○ **Neutral** = neutral impact or no impact and/or minimal satisfaction of the criterion
- ⊘ **Unfavorable** = small or marginally negative impact and/or partial failure to meet the criterion
- ⊗ **Highly Unfavorable** = highly negative impact and/or complete failure to meet the criterion

Remove from Further Consideration (In Step 3, Highly Unfavorable causes alternative to be dismissed)

Ac = **Acres**

* **Although Alternative 17 was recommended to be dismissed in Step 2, EOT requested that this alternative be retained for further analysis.**

Criterion 3.1	Criterion 3.2	Criterion 3.3	Criterion 3.4	Criterion 3.5	Criterion 3.6
See detailed memorandum	0 = ◑ < 5 = ○ 5 -1 5 = ⊘ ≥15 = ⊗	0-2 ◑ 4-6 ○ 9-11 ⊗ ** The NHESP does not object to Alternatives 30 and 34 (the Trestle Alternatives) being retained at this early stage in the planning process	0 = ◑ ≤ 1 Ac = ○ > 1 Ac = ⊘	0 = ◑ < 0.5 Ac = ⊘	See detailed memorandum

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Alternative 1 – Commuter Rail to South Station via Attleboro Bypass

Alternative 1, *Commuter Rail to South Station via Attleboro Bypass*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 7.82 acres of wetland fill (1.65 acres of marsh, 1.95 acres of shrub wetlands, 3.48 acres of forested wetland, and 0.74 acres of open water)
  - 0.46 acres of wetland fill in the Fowl Meadow ACEC
  - Work in proximity to two certified vernal pools (seven potential vernal pools)
  - Moderate indirect impacts to wetlands - 6,300 feet of new railroad construction crossing wetlands
- *Criterion 3.2* – Would require four new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 4 (neutral) based on 52 acres of total work within Priority Habitat, 21,628 feet of work through Priority Habitat, and work on new/abandoned railbed in one Priority Habitat (369 feet)
- *Criterion 3.4* – Would impact 0.65 acres of protected open space (Town of Attleboro at Chartley Pond)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 1 for further study

Alternative 3 – Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass

Alternative 3, *Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass*, was determined likely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Highly Unfavorable for wetland impacts:
  - Would require an estimated 9.74 acres of wetland fill (2.6 acres of marsh, 1.96 acres of shrub wetlands, 4.03 acres of forested wetland, and 1.15 acres of open water)
  - 0.46 acres of wetland fill in the Fowl Meadow ACEC
  - Work in proximity to two certified vernal pools (six potential vernal pools)
  - High indirect impacts to wetlands – 15,800 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Would require 12 new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 6 (neutral) based on 64 acres of total work within Priority Habitat, 27,222 feet of work through Priority Habitat, and work on new/abandoned railbed in two Priority Habitats (3,162 feet)
- *Criterion 3.4* – Would require acquisition of 2.21 acres of protected open space (Town of Attleboro at Chartley Pond, and the Westport Land Trust)
- *Criterion 3.5* – Would impact 0.09 acres of protected public water supply lands (Zone A of South Watuppa Pond)
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Dismiss Alternative 3 from further evaluation due to its failure to meet Criterion 3.1. Alternative 3 would have a high level of direct impacts to wetlands,

including wetlands within an ACEC, and a high level of indirect impacts to wetlands resulting from construction adjacent to and fragmenting wetlands.

Alternative 5 – Diesel Multiple Unit Commuter Rail to Attleboro Station

Alternative 5, *Diesel Multiple Unit Commuter Rail to Attleboro Station*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Favorable for wetland impacts:
  - Would require an estimated 5.32 acres of wetland fill (0.61 acres of marsh, 0.3 acres of shrub wetlands, 3.03 acres of forested wetland, 0.67 acres of salt marsh, and 0.67 acres of open water)
  - No wetland fill in an ACEC
  - Work in proximity to two certified vernal pools (eight potential vernal pools)
  - No indirect impacts to wetlands - no new railroad construction crossing wetlands
- *Criterion 3.2* – No new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 2 (favorable) based on 51 acres of total work within Priority Habitat, 15,246 feet of work through Priority Habitat, and no work on new/abandoned railbed in Priority Habitats
- *Criterion 3.4* – No land acquisition from public open space
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 5 for further study

Alternative 6 – Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 6, *Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary*, was determined likely to result in higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Highly Unfavorable for wetland impacts:
  - Would require an estimated 10.89 acres of wetland fill (2.08 acres of marsh, 0.34 acres of shrub wetlands, 6.06 acres of forested wetland, 0.67 acres of salt marsh, and 1.74 acres of open water)
  - No wetland fill in an ACEC
  - Work in proximity to three certified vernal pools (11 potential vernal pools)
  - High indirect impacts to wetlands – 9,500 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Eight new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 5 (neutral) based on 77 acres of total work within Priority Habitat, 22,721 feet of work through Priority Habitat, and work on new/abandoned railbed in one Priority Habitat (2,793 feet)
- *Criterion 3.4* – Would require acquisition of 2.25 acres of public open space (Westport Land Trust)
- *Criterion 3.5* – Would impact 0.14 acres of protected water supply lands (Zone A of South Watuppa Pond)
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Dismiss Alternative 6 from further evaluation due to its failure to meet Criterion 3.1

Alternative 7 – Electrified Commuter Rail to South Station via Attleboro Bypass

Alternative 7, *Electrified Commuter Rail to South Station via Attleboro Bypass*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 8.46 acres of wetland fill (1.7 acres of marsh, 1.99 acres of shrub wetlands, 3.52 acres of forested wetland, 0.51 acres of salt marsh, and 0.74 acres of open water)
  - 0.46 acres of wetland fill in the Fowl Meadow ACEC
  - Work in proximity to two certified vernal pools (10 potential vernal pools)
  - High indirect impacts to wetlands – 6,300 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Four new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 4 (neutral) based on 64 acres of total work within Priority Habitat, 27,222 feet of work through Priority Habitat, and work on new/abandoned railbed in two Priority Habitats (3,162 feet)
- *Criterion 3.4* – Would require acquisition of 0.65 acres of public open space (Town of Attleboro, Chartley Pond)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 7 for further study

Alternative 30 – Commuter Rail to South Station via Stoughton

Alternative 30, *Commuter Rail to South Station via Stoughton*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 6.74 acres of wetland fill (0.07 acres of marsh, 0.88 acres of shrub wetlands, 5.11 acres of forested wetland, and 0.68 acres of open water)
  - 0.78 acres of wetland fill in the Hockomock Swamp ACEC
  - Work in proximity to nine certified vernal pools (17 potential vernal pools)
  - High indirect impacts to wetlands – 6,400 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Ten new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 9 (highly unfavorable) based on 71 acres of total work within Priority Habitat, 22,796 feet of work through Priority Habitat, and work on new/abandoned railbed in three Priority Habitats (7,994 feet). [NOTE: the NHESP does not object to Alternatives 30 and 34 (the "trestle" alternatives) being retained at this early stage in the planning process.]
- *Criterion 3.4* – Would require acquisition of 3.06 acres of public open space (Town of Raynham, Pine Swamp)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves four historic population centers (New Bedford, Fall River, Taunton, Easton)
  - Could promote redevelopment in five clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 30 for further study

Alternative 32 – Diesel Multiple Unit Commuter Rail to Stoughton Station

Alternative 32, *Diesel Multiple Unit Commuter Rail to Stoughton Station*, was determined likely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 8.95 acres of wetland fill (0.13 acres of marsh, 1.08 acres of shrub wetlands, 6.17 acres of forested wetland, 0.67 acres of salt marsh, and 0.9 of open water)
  - 1.41 acres of wetland fill in the Hockomock Swamp ACEC
  - Work in proximity to nine certified vernal pools (17 potential vernal pools)
  - High indirect impacts to wetlands – 6,400 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Ten new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 10 (highly unfavorable) based on 76 acres of total work within Priority Habitat, 22,796 feet of work through Priority Habitat, and work on new/abandoned railbed in three Priority Habitats (7,994 feet)
- *Criterion 3.4* – Would require acquisition of 4.4 acres of public open space (Town of Raynham, Pine Swamp)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves four historic population centers (New Bedford, Fall River, Taunton, Easton)
  - Could promote redevelopment in five clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Dismiss Alternative 32 from further evaluation due to its failure to meet Criterion 3.3

Alternative 33 – Diesel Multiple Unit to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary

Alternative 33, *Diesel Multiple Unit to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary*, was determined likely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Highly Unfavorable for wetland impacts:
  - Would require an estimated 14.52 acres of wetland fill (1.6 acres of marsh, 1.12 acres of shrub wetlands, 9.2 acres of forested wetland, 0.67 acres of salt marsh, and 1.93 acres of open water)
  - 1.41 acres of wetland fill in the Hockomock Swamp ACEC
  - Work in proximity to ten certified vernal pools (20 potential vernal pools)
  - High indirect impacts to wetlands – 15,900 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – 18 new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 11 (highly unfavorable) based on 102 acres of total work within Priority Habitat, 30,271 feet of work through Priority Habitat, and work on new/abandoned railbed in four Priority Habitats (10,787 feet)
- *Criterion 3.4* – Would require acquisition of 6.96 acres of public open space (Town of Raynham, Pine Swamp)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves four historic population centers (New Bedford, Fall River, Taunton, Easton)
  - Could promote redevelopment in five clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Dismiss Alternative 33 from further evaluation due to its failure to meet Criteria 3.1, 3.3, and 3.4. This alternative would have a high level of both direct and indirect wetland impacts, the largest amount of wetland fill within an ACEC,

and would have unacceptable adverse impacts to the priority habitat of state-listed species as a result of constructing two at-grade tracks through the Hockomock Swamp.

Alternative 34 – Electrified Commuter Rail to South Station via Stoughton

Alternative 34, *Electrified Commuter Rail to South Station via Stoughton*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 7.25 acres of wetland fill (0.07 acres of marsh, 0.88 acres of shrub wetlands, 5.11 acres of forested wetland, 0.51 acres of salt marsh, and 0.68 acres of open water)
  - 0.83 acres of wetland fill in the Hockomock Swamp ACEC
  - Work in proximity to nine certified vernal pools (17 potential vernal pools)
  - High indirect impacts to wetlands – 6,400 feet of new/abandoned railroad construction crossing wetlands
- *Criterion 3.2* – Ten new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 9 (highly unfavorable) based on 71 acres of total work within Priority Habitat, 22,796 feet of work through Priority Habitat, and work on new/abandoned railbed in three Priority Habitats (7,994 feet). [NOTE: the NHESP does not object to Alternatives 30 and 34 (the "trestle" alternatives) being retained at this early stage in the planning process.]
- *Criterion 3.4* – Would require acquisition of 3.3 acres of public open space (Town of Raynham, Pine Swamp)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves four historic population centers (New Bedford, Fall River, Taunton, Easton)
  - Could promote redevelopment in five clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources

- All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 34 for further study

Alternative 43 – Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128

Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Favorable for wetland impacts:
  - Would require an estimated 0.31 acres of wetland fill (0.05 acres of marsh, 0.01 acres of forested wetland, and 0.25 acres of open water)
  - 0.25 acres of wetland fill in the Fowl Meadow ACEC
  - No work in proximity to certified or potential vernal pools
  - No indirect impacts to wetlands
- *Criterion 3.2 – No new stream/river crossings*
- *Criterion 3.*3 – NHESP assigned a combined score of 1 (favorable) based on 9 acres of total work within Priority Habitat, 4,218 feet of work through Priority Habitat, and no work on new/abandoned railbed in Priority Habitats
- *Criterion 3.*4 – Would require acquisition of 7.33 acres of public open space (Blue Hills State Reservation)
- *Criterion 3.*5 – No impact to protected water supply lands
- *Criterion 3.*6 – Consistent with smart growth principles:
  - Serves two historic population centers (New Bedford, Fall River)
  - Could promote redevelopment in four clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - Fall River and New Bedford stations could be located in developed areas, all other stations would be located in undeveloped areas near highways

Recommend: Retain Alternative 43 for further study

Alternative 44 – Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane

Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Favorable for wetland impacts:
  - Would require an estimated 0.1 acres of wetland fill (0.08 acres of marsh and 0.02 acres of forested wetland)
  - No wetland fill in the Fowl Meadow ACEC
  - No work in proximity to certified or potential vernal pools
  - No indirect impacts to wetlands
- *Criterion 3.2* – No new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 1 (favorable) based on 23 acres of total work within Priority Habitat, 5,468 feet of work through Priority Habitat, and no work on new/abandoned railbed in Priority Habitats
- *Criterion 3.4* – Would require acquisition of 4.03 acres of public open space (Blue Hills State Reservation)
- *Criterion 3.5* – No impacts to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves two historic population centers (New Bedford, Fall River)
  - Could promote redevelopment in four clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - Fall River and New Bedford stations could be located in developed areas, all other stations would be located in undeveloped areas near highways

Recommend: Retain Alternative 44 for further study

Alternative 45 – Enhanced Bus

Alternative 45, *Enhanced Bus*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Favorable for wetland impacts:
  - Would require no wetland fill
  - No wetland fill in an ACEC
  - No work in proximity to certified or potential vernal pools
  - No indirect impacts to wetlands
- *Criterion 3.2* – No new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 1 (favorable) based on no work within Priority Habitat
- *Criterion 3.4* – Would not require land acquisition from public open space
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in five clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - Taunton, Fall River and New Bedford stations could be located in developed areas, all other stations would be located in undeveloped areas near highways

Recommend: Retain Alternative 45 for further study

Alternative 62 – Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line

Alternative 62, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Unfavorable for wetland impacts:
  - Would require an estimated 7.52 acres of wetland fill (1.55 acres of marsh, 1.84 acres of shrub wetlands, 3.57 acres of forested wetland, and 0.56 acres of open water)
  - No wetland fill in an ACEC
  - Work in proximity to two certified vernal pools (11 potential vernal pools)
  - Moderate indirect impacts to wetlands - 6,300 feet of new railroad construction crossing wetlands
- *Criterion 3.2* – Would require four new stream/river crossings
- *Criterion 3.3* – NHESP assigned a combined score of 5 (neutral) based on 67 acres of total work within Priority Habitat, 21,695 feet of work through Priority Habitat, and work on new/abandoned railbed in one Priority Habitat (369 feet)
- *Criterion 3.4* – Would impact 0.65 acres of protected open space (Town of Attleboro at Chartley Pond)
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves three historic population centers (New Bedford, Fall River, Taunton)
  - Could promote redevelopment in six clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 62 for further study

Alternative 64 – Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements*, was determined unlikely to result in substantially higher environmental impacts than other practicable alternatives.

- *Criterion 3.1* – Favorable for wetland impacts:
  - Would require an estimated 3.61 acres of wetland fill (0.25 acres of marsh, 0.33 acres of shrub wetlands, 2.67 acres of forested wetland, and 0.36 acres of open water)
  - No wetland fill in an ACEC
  - Work in proximity to no certified vernal pools (four potential vernal pools)
  - Low indirect impacts to wetlands – no new railroad construction crossing wetlands
- *Criterion 3.2* – No new stream/river crossings
- *Criterion 3.3* – NHESP did not assign a score to Alternative 64, which was added to the Step 3 evaluation after NHESP completed their evaluation. Since this alternative does not include work on a new or abandoned right-of-way through Priority Habitat, it would have a score of favorable.
- *Criterion 3.4* – No land acquisition from protected open space
- *Criterion 3.5* – No impact to protected water supply lands
- *Criterion 3.6* – Consistent with smart growth principles:
  - Serves two historic population centers (New Bedford, Fall River)
  - Could promote redevelopment in two clusters of brownfields sites
  - No loss of farmland; smart growth strategies could be implemented to protect farmland from sprawl
  - No impact to historic or archaeological resources
  - All stations could be located in developed areas, with the potential for highway-accessible stations to serve larger populations

Recommend: Retain Alternative 64 for further study

7.3 Step 3 Recommendations

Based on the Step 3 Screening Evaluation described above, EOT recommended that the four Alternatives listed in Table 7-8 be dismissed. The Interagency Coordinating Group concurred with this evaluation on March 4, 3008.

Table 7-8 Alternatives Dismissed in Step 3

Number	Alternative	Reason(s) Why Alternative was Dismissed *(by Criterion)*
3	Commuter Rail to South Station via Dartmouth Secondary, New Bedford Secondary, and Attleboro Bypass	➤ 3.1 – Would require 9.74 acres of wetland fill; 0.46 acres of wetland fill in an ACEC; 15,800 feet of indirect impact to wetlands ➤ 3.2 – Would require 12 new stream/river crossings ➤ 3.3 – NHESP ranked Highly Unfavorable ➤ 3.4 – Would impact 2.21 acres of protected open space ➤ 3.5 – Would impact 0.09 acres of protected public water supply lands
6	Diesel Multiple Unit Commuter Rail to Attleboro Station with New Bedford to Fall River Connection via Dartmouth Secondary	➤ 3.1 – Would require 10.89 acres of wetland fill; work in proximity to 3 certified vernal pools (11 potential vernal pools); 9,500 feet of indirect impact to wetlands ➤ 3.2 – Would require 8 new stream/river crossings ➤ 3.3 – NHESP ranked Unfavorable ➤ 3.4 – Would impact 2.25 acres of protected open space ➤ 3.5 – Would impact 0.14 acres of protected public water supply lands
32	Diesel Multiple Unit Commuter Rail to Stoughton Station	➤ 3.1 – Would require 8.95 acres of wetland fill; 1.41 acres of wetland fill in an ACEC; work in proximity to 9 certified vernal pools (17 potential vernal pools); 6,400 feet of indirect impact to wetlands ➤ 3.2 – Would require 10 new stream/river crossings ➤ 3.3 – NHESP ranked Highly Unfavorable ➤ 3.4 – Would impact 4.4 acres of protected open space
33	Diesel Multiple Unit Commuter Rail to Stoughton Station with New Bedford to Fall River Connection via Dartmouth Secondary	➤ 3.1 – Would require 14.52 acres of wetland fill; 1.41 acres of wetland fill in an ACEC; work in proximity to 10 certified vernal pools (20 potential vernal pools);15,900 feet of indirect impact to wetlands ➤ 3.2 – Would require 18 new stream/river crossings ➤ 3.3 – NHESP ranked Highly Unfavorable ➤ 3.4 – Would impact 6.96 acres of protected open space ➤ 3.5 – Would impact 0.14 acres of protected public water supply lands

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8

Step 4 Analysis

This chapter describes the fourth screening step used to identify the alternatives recommended to advance to Phase 2.

8.1 Introduction

The purpose of the Phase 1 Alternatives Analysis was to identify a reasonable range of alternatives to advance into the *Highway Methodology* Phase 2 and MEPA/NEPA processes. However, at the conclusion of Step 3 in the Phase 1 Screening process, eleven alternatives remained. These eleven included ten that passed through the screening process and one eliminated in a previous step for which further analysis was requested. In order to reduce the list of alternatives to a reasonable yet comprehensive number and range for the next phase of the Project, it was necessary to "circle back" and look at the remaining alternatives in the context of the Project purpose and all three steps in the Phase 1 Screening. In addition, a new alternative was developed at the request of the Interagency Coordinating Group, bringing the total number of alternatives for this Step 4 analysis to twelve.

The twelve alternatives recommended to advance at the conclusion of Step 3 were re-evaluated to determine if there were other reasonable criteria by which additional alternatives could be dismissed or consolidated with other similar alternatives. Alternatives with similar transportation services were compared to each other, considering environmental impacts, transportation benefits, and available infrastructure.

This process took into account input received from the South Coast Commuter Rail Task Force, the Interagency Coordinating Group, and three Civic Engagement meetings held on March 10, 11 and 12, 2008. The recommendations of Step 4 were reviewed with the Interagency Coordinating Group on March 21 and April 1, 2008, which resulted in expanding the list of alternatives recommended by EOT.

8.2 Step 4 Results

The following section provides a summary of the evaluation process for the 12 alternatives shown in Table 8-1 that was used to dismiss and/or consolidate alternatives to reach the final recommendations by EOT to advance to Phase 2. Tables 8-2 and 8-3 summarize the results of Steps 1-3 for those alternatives.

Table 8-1 Alternatives Advanced into Step 4 Alternatives

#	Alternative Description
1	Commuter Rail to South Station via Attleboro Bypass
5	Diesel Multiple Units to Attleboro Station
7	Electric Commuter Rail to South Station via Attleboro Bypass
17	Commuter Rail to South Station via Middleboro (with Old Colony Main Line Alternatives)
30	Commuter Rail to South Station via Stoughton
34	Electrified Commuter Rail to South Station via Stoughton
43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128
44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane
45	Enhanced Bus Service on Existing Private Carrier Lines
62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line
64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements
65	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line (Hybrid Modes)*

*Alternative 65 was developed and added during the Step 4 Process at the request of the Interagency Coordinating Group.

Table 8-2
SOUTH COAST RAIL
Alternatives Advanced to Step 4 - Summary of Steps 1-3

FINAL
04/30/08

			STEP 1 - Would the Proposed Alternative Achieve the Project Purpose?	STEP 2 - Is the Proposed Alternative Practicable?	STEP 3 - Compare the Magnitude of Impacts to the Natural Environment and Consistency with Smart Growth
Route	**Alt #**	**Name**	***RANK***	***RANK***	***RANK***
THROUGH ATTLEBORO	1	Commuter Rail to South Station via Attleboro Bypass			
	5	Diesel Multiple Units Commuter Rail to Attleboro Station			
	7	Electrified Commuter Rail to South Station via Attleboro Bypass			
THROUGH MIDDLEBOROUGH	17	Commuter Rail to South Station via Middleborough			
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements			
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line			
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton			
	34	Electrified Commuter Rail to South Station via Stoughton			
HIGHWAY SYSTEM	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128			
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane			
	45	Enhanced Bus Service on Existing Private Carrier Routes			

LEGEND

Highly Favorable

Favorable

Neutral

Unfavorable

Highly Unfavorable

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Table 8-3
SOUTH COAST RAIL
Alternatives Advanced to Step 4 - Rank by Criteria

FINAL
04/30/08

Route	Alt #	Name	CRITERION 1.1 RANK	CRITERION 1.2 RANK	CRITERION 2.1 RANK	CRITERION 2.2 RANK	CRITERION 2.3 RANK	CRITERION 2.4 RANK	CRITERION 2.5 RANK	CRITERION 3.1 RANK	CRITERION 3.2 RANK	CRITERION 3.3 RANK	CRITERION 3.4 RANK	CRITERION 3.5 RANK	CRITERION 3.6 RANK
THROUGH ATTLEBORO	1	Commuter Rail to South Station via Attleboro Bypass													
	5	Diesel Multiple Units Commuter Rail to Attleboro Station													
	7	Electrified Commuter Rail to South Station via Attleboro Bypass													
THROUGH MIDDLEBOROUGH	17*	Commuter Rail to South Station via Middleborough													
	64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements													
THROUGH ATTLEBORO AND MIDDLEBOROUGH	62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line													
THROUGH STOUGHTON	30	Commuter Rail to South Station via Stoughton										**			
	34	Electrified Commuter Rail to South Station via Stoughton										**			
HIGHWAY SYSTEM	43	Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128													
	44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane													
	45	Enhanced Bus Service on Existing Private Carrier Routes													

LEGEND

- **Highly Favorable**
- **Favorable**
- **Neutral**
- **Unfavorable**
- **Highly Unfavorable**

*Although Alternative 17 was recommended to be dismissed in Step 2, EOT requested that this alternative be retained for further analysis.

** The NHESP does not object to Alternatives 30 and 34 (the Trestle Alternatives) being retained at this early stage in the planning process

CRITERION 1.1 - Improves Regional Mobility

CRITERION 1.2 - Improves Quality of Service

CRITERION 2.1 - Is Operationally Compatible with the Existing Transportation Infrastructure

CRITERION 2.2 - Does Not Significantly Adversely Affect Existing and Planned Future Capability, Reliability, and Quality of the Regional Transportation System

CRITERION 2.3 - Could be Constructed Without Substantial Impacts to the Existing Transportation System and Within a Reasonable Time Frame

CRITERION 2.4 - Provides Transportation System Benefits at a Reasonable Capital Cost

CRITERION 2.5 - Provides Sufficient Capacity to Meet Demand

CRITERION 3.1 - The approximate level of wetland loss (in acres)

CRITERION 3.2 - The number of stream or river crossings with impact

CRITERION 3.3 - The number of acres of mapped Priority Habitat that would be within the Right-of-Way

CRITERION 3.4 - The number of acres of protected public open space that would be directly impacted

CRITERION 3.5 - The number of acres of protected public water supply lands that would be directly impacted

CRITERION 3.6 - Consistent with smart growth strategies

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Alternative 1 – Commuter Rail to South Station via Attleboro Bypass

Alternative 1, *Commuter Rail to South Station via Attleboro Bypass*, was compared to Alternative 7, *Electric Commuter Rail to South Station via Attleboro Bypass,* since they provide similar service and run along the same corridor. The comparison showed that Alternative 1 and Alternative 7 would have the similar environmental impacts resulting from the track infrastructure and that Alternative 7 provides a better service due to the increased speeds associated with electric commuter rail. The following describes the comparison of alternatives:

- Track infrastructure requirements for Alternative 1 are similar to Alternative 7, so environmental impacts would be similar.
- Alternative 1 operates over the same route as Alternative 7, but provides a slower service. It would attract a lower ridership.
- Electric infrastructure is already available on the Northeast Corridor, facilitating implementation of Alternative 7.
- Alternative 7, which uses electric trains, would result in less noise, vibration, and potential for contamination than Alternative 1.

Recommend: EOT recommended that this be dismissed from further consideration. The Interagency Coordinating Group requested that this alternative be retained because it has the potential to be the LEDPA.

Alternative 5 – Diesel Multiple Units Commuter Rail to Attleboro Station

Alternative 5, *Diesel Multiple Unit Commuter Rail to Attleboro Station*, was compared to Alternative 1, *Commuter Rail Service to South Station via Attleboro Bypass*, and Alternative 7, *Electric Commuter Rail to South Station via Attleboro Bypass*. These alternatives run along the same corridor but provide different service characteristics. The comparison showed that Alternative 5 has a higher environmental impact resulting from the track infrastructure, but Alternatives 1 and 7 provide a better service since they do not require a transfer. The following describes the comparison of alternatives:

- The DMUs provide a much slower service than commuter rail service provided in Alternatives 1 and 7.

- Alternative 5 requires a transfer to existing commuter rail at Attleboro Station which would overcrowd existing Providence Line commuter trains that are currently at capacity.
- The slower service and transfer would also result in a lower ridership than Alternatives 1 and 7.
- Infrastructure requirements on Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are considerably greater than Alternative 1 and Alternative 7, so environmental impact would be larger.

Recommend: Dismiss from further consideration because this alternative would have lower ridership and larger environmental impacts than Alternatives 1 and 7.

Alternative 7 – Electrified Commuter Rail to South Station via Attleboro Bypass

Alternative 7, *Electrified Commuter Rail to South Station via Attleboro Bypass*, was compared to Alternative 1, *Commuter Rail to South Station via Attleboro Bypass,* since they provide similar service and run along the same corridor. The comparison showed that Alternative 1 and Alternative 7 would have the similar impacts resulting from the track infrastructure and that Alternative 7 provides a better service due to the increased speeds associated with electric commuter rail. The following describes the comparison of alternatives:

- Track infrastructure requirements for Alternative 7 are similar to Alternative 1, so environmental impacts would be similar.
- Alternative 7 operates over the same route as Alternative 1, but provides a faster service, attracting a higher ridership.
- Electric infrastructure is already available on the Northeast Corridor, facilitating implementation of Alternative 7.
- The electric trains used in Alternative 7 would result in less noise, vibration, and potential for contamination than Alternative 1.

Recommend: Advance to the Phase 2 Highway Methodology and MEPA/NEPA process.

Alternative 17 – Commuter Rail to South Station via Middleborough

Alternative 17, *Commuter Rail to South Station via Middleborough*, was compared to Alternative 62, *Commuter Rail to South Station via Attleboro Bypass and the Middleborough Line,* and Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Mainline Improvements,* since they run along the Middleborough corridor and provide a comparable service. Though Alternative 17 was dismissed during the Step 2 evaluation due to constructability issues and long construction schedule, the Secretaries of Transportation, Environmental Affairs, and Economic Development have requested that this alternative advance to the next phase of the Project to allow further evaluation of given the long term benefits to Old Colony service and the higher ridership potential that may result from planned developments along the corridor.

Recommend: Advance to the Phase 2 Highway Methodology and MEPA/NEPA process.

Alternative 30 – Commuter Rail to South Station via Stoughton

Alternative 30, *Commuter Rail to South Station via Stoughton,* was compared to Alternative 34, *Electrified Commuter Rail to South Station via Stoughton,* since they provide similar service and run along the same corridor. The comparison showed that Alternative 30 and Alternative 34 would have the similar impacts resulting from the track infrastructure and that Alternative 34 provides a better service due to the increased speeds associated with electric commuter rail. However, since Alternative 34 requires electrification infrastructure through an ACEC (the Hockomock Swamp) it would increase the amount of impact to environmental resources within the ACEC. The analysis completed in Step 2 of this Phase 1 analysis showed that Alternatives 30 and 34 best met the criteria used to measure practicability, especially those related to the transportation system. The following describes the comparison of alternatives:

- Operates over the same route as Alternative 34, but does not require construction of new electrification infrastructure along the new commuter rail corridor and existing Stoughton Line corridor.
- Environmental impacts for Alternative 34 would be greater due to the construction of the new electrification infrastructure and the need for a longer track passing sidings. Electrification may not be feasible to construct within the Hockomock Swamp ACEC due to impacts to this environmental resource.

Recommend: Advance to the Phase 2 Highway Methodology and MEPA/NEPA process.

Alternative 34 – Electrified Commuter Rail to South Station via Stoughton

Alternative 34, *Electrified Commuter Rail to South Station via Stoughton* was compared to Alternative 30, *Commuter Rail to South Station via Stoughton,* since they provide similar service and run along the same corridor. The comparison showed that Alternative 30 and Alternative 34 would have the similar impacts resulting from the track infrastructure and that Alternative 34 provides a better service due to the increased speeds associated with electric commuter rail. However, since Alternative 34 requires electrification infrastructure through an ACEC (the Hockomock Swamp) it would increase the amount of impact in this environmental resource. The following describes the comparison of alternatives:

- Operates over the same route as Alternative 30, but requires construction of new electrification infrastructure along the new commuter rail corridor and existing Stoughton Line corridor.
- Environmental impacts for Alternative 34 would be greater due to the construction of the new electrification infrastructure and the need for a longer track passing sidings. Electrification may not be feasible to construct within the Hockomock Swamp ACEC due to impacts to this environmental resource.
- The existing Stoughton Line does not have existing electric infrastructure.

Recommend: EOT recommended that this be dismissed from further consideration on the basis of the required new infrastructure and greater environmental impacts. The Interagency Coordinating Group requested that it be retained because of potentially higher ridership and reduced air quality impacts.

Alternative 43 – Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128

Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128,* was compared to Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane,* and Alternative 45, *Enhanced Bus Service on Existing Private Carrier Lines*, since they would provide similar service and all would utilize the highway corridors. The comparison showed that Alternative 43 would provide a poorer service because a transfer would be required to crowded trains on the Northeast Corridor. The following describes the comparison of alternatives:

- Alternative 43 would provide poorer quality of service than the other bus options because it would require a transfer.
- Existing commuter rail service on the Northeast Corridor would be negatively impacted, because trains would become overcrowded.
- The need to transfer would result in lower ridership.

Recommend: Dismiss from further consideration because this alternative would have lower ridership and fewer transportation benefits than Alternatives 44 and 45.

Alternative 44 – Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane

Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane*, was compared to Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128,* and Alternative 45, *Enhanced Bus Service on Existing Private Carrier Lines*, since they provide similar service and all would utilize the highway corridors. The comparison showed that Alternative 44 provides a better service since the buses would operate in an exclusive bus lane and HOV lane for the majority of the trip. Alternative 45 operates within the congested existing highway system, while Alternative 43 would require a transfer. The following describes the comparison of alternatives:

- Low capital cost alternative with moderate level of ridership potential.
- Makes good use of existing transportation infrastructure, minimizing potential environmental impacts.
- Would not require a transfer.
- May improve existing highway connections to the existing HOV lanes.

Recommend: Advance to the Phase 2 Highway Methodology and MEPA/NEPA process.

Alternative 45 – Enhanced Bus Service on Existing Private Carrier Lines

Alternative 45, *Enhanced Bus Service on Existing Private Carrier Lines*, was compared to Alternative 43, *Bus Rapid Transit in Dedicated Lane to Route 128 Station via Route 24 and Route 128,* and Alternative 44, *Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane*, since they provide similar

service and all would utilize the highway corridors. The comparison showed that Alternative 44 provides a better service since the buses would operate in a new exclusive bus lane and existing HOV lane for the majority of the trip. Alternative 45 operates within the congested existing highway system, while Alternative 43 requires a transfer.

Although this alternative would increase capacity by adding additional bus service, no improvement in trip times are expected since this alternative utilizes the existing highway system.

Recommend: Dismiss from further consideration as a stand-alone alternative. It is recommended, however, to further consider enhanced bus service in the next phase as part of the No-Build alternative (also known as the Transportation System Management alternative) for comparison to the recommended alternatives.

Alternative 62 – Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line (Diesel)

Alternative 62, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, was compared to Alternative 7, *Electric Commuter Rail to South Station via Attleboro Bypass*, Alternative 17, *Commuter Rail to South Station via Middleborough*, and Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Mainline Improvements*, since they run along the Middleborough corridor and provide a comparable service. Since the service provided and corridors used by Alternative 62 are similar and represented by other alternatives that are advancing (Alternatives 7 and 17), this alternative could be dismissed as a stand-alone alternative. This alternative could be included later in the Phase 2 analysis since much of the environmental analysis will be documented by Alternatives 7 and 17.

- Similar service and infrastructure needs that are already included in the Alternatives 7 and 17.
- Alternative can be returned for further consideration during the Phase 2 analysis.

Recommend: EOT recommended that this be dismissed from further consideration as a stand-alone alternative. The Interagency Coordinating Group recommended that this be retained.

Alternative 64 – Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements

Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements*, was compared to Alternative 17, *Commuter Rail to South Station via Middleborough*, and Alternative 62, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, since they run along the Middleborough corridor. The comparison showed that:

- Alternative 64 uses the same infrastructure and would have similar constructability to Alternative 17 (south of Braintree).
- Alternative 64 would provide poor quality of service because of limited number of trains due to capacity constraints, and therefore would have a lower ridership than Alternative 17

Recommend: EOT recommended that this be dismissed from further consideration as a stand-alone alternative. This alternative could be included later in the Phase 2 analysis since much of the environmental analysis will be documented by other alternatives, but is not necessary to advance as a stand-alone alternative. The Interagency Coordinating Group requested that this alternative be retained, despite the lower level of service.

Alternative 65 – Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line (Hybrid Modes)

Alternative 65, *Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line*, was identified by the Interagency Coordinating Group at the April 1 meeting. It had not been previously identified or evaluated. This alternative would use the same route and service as Alternative 7, *Electric Commuter Rail to South Station via Attleboro Bypass*, and Alternative 64, *Commuter Rail to South Station via Middleborough without Old Colony Mainline Improvements*. The Interagency Group suggested that the Attleboro, New Bedford, and Fall River Lines be constructed to provide electric service. Trains would run on the Attleboro Line using electric service. Hybrid vehicles would run on the Middleborough Line using electric service south of Cotley Junction and diesel power from Cotley Junction to South Station. This alternative has not been evaluated using the Phase 1 Step 1, Step 2, or Step 3 criteria. It would provide similar service to Alternative 62.

Recommend: The Interagency Coordinating Group recommended that this be retained.

8.3 Step 4 Recommendations

As shown in Table 8-4 below, 9 Alternatives, encompassing four routes and three modes, are recommended to be advanced to the Phase 2 of the Highway Methodology and MEPA/NEPA review in addition to the No-Build Alternative:

Table 8-4 Summary of Step 4 Analysis

#	Alternative Description	Recommendation to Advance to Phase 2
1	Commuter Rail to South Station via Attleboro Bypass	Yes
5	Diesel Multiple Units to Attleboro Station	No
7	Electric Commuter Rail to South Station via Attleboro Bypass	Yes
17	Commuter Rail to South Station via Middleboro ("Full Middleborough)	Yes
30	Commuter Rail to South Station via Stoughton	Yes
34	Electrified Commuter Rail to South Station via Stoughton	Yes
44	Bus Rapid Transit in Dedicated Lane to South Station via Route 24, Route 128, and Southeast Expressway HOV Lane	Yes
45	Enhanced Bus Service on Existing Private Carrier Lines	No
62	Commuter Rail to South Station via both Attleboro Bypass and Middleborough Line (Diesel)	Yes
64	Commuter Rail to South Station via Middleborough without Old Colony Main Line Improvements ("Simple Middleborough")	Yes
65	Commuter Rail to South Station via both Attleboro Bypass (Electric) and Middleborough Line (Diesel)	Yes

8.4 Summary of Alternatives Advancing to Phase 2

These alternatives will enter Phase 2, which will include a detailed analysis of operational issues and a full environmental review:

- Through Attleboro: Electric or diesel commuter rail through Attleboro
- Through Middleborough: Commuter rail through Middleborough, with no major infrastructure improvements or the full version, which would add a track to the Old Colony Main Line between Braintree and Quincy
- Through Attleboro and Middleborough: Hybrid option with electric or diesel commuter rail, with some trains going through Attleboro and the some through Middleborough
- Through Stoughton: Electric or diesel commuter rail through Stoughton
- Bus Rapid Transit using the highway system
- Transportation System Management option, also called the No-Build Alternative

8.4.1 Through Attleboro: Electric or Diesel Commuter Rail to South Station via Attleboro Bypass

The Attleboro alternative would offer commuter rail service from Fall River and New Bedford through Attleboro and up the Northeast Corridor, which serves Amtrak, other commuter rail, and freight, to Back Bay and South Station. It offers good, fast service to Boston, but could adversely affect existing transportation infrastructure. The alternative would require constructing a bypass between an existing freight line and the Northeast Corridor and adding a third track through Canton, Westwood, Dedham and the Readville section of Boston. The alternative would have wetland impacts in the south, along the bypass in Norton and Attleboro and in an Area of Critical Environmental Concern in Canton. There would be multiple grade crossings closely spaced together in Taunton. The electric option would provide better service due to the better operating characteristics of these trains. Electric trains would potentially have fewer noise, vibration and air/water quality impacts. Because the Northeast Corridor is already electrified, this option would not require building overhead catenary lines along the entire route. The capital cost of electric service is higher than other options, but it has the potential to attract higher ridership and offer a better travel time.

8.4.2 Through Middleborough: Commuter Rail to South Station via the Middleborough Line with and without Old Colony Main Line Improvements

The Middleborough alternative would offer commuter rail service from Fall River and New Bedford through Middleborough and up to South Station. The full version, which requires significant infrastructure improvements, provides good quality service and could have fewer environmental impacts than other routes because trains would use existing lines for a greater part of the route. Providing full peak service to meet peak demand would have a high capital cost because the Old Colony Main Line, which this alternative joins at Braintree, would have to be double tracked up to South Station, a process called "breaking the bottleneck."

There would be some wetland impacts in the south. The simple version would use the existing Middleborough line, but it would not add capacity to the north on the Old Colony Main Line. As a result, it would provide about half the estimated service of the commuter rail alternatives. It would also foreclose an extension of commuter rail to Wareham. However, the simple version would reduce impacts on the northern communities since the trains would be limited to existing tracks.

8.4.3 Through Attleboro/Middleborough: Hybrid Option with Electric or Diesel Commuter Rail to South Station via Attleboro and Middleborough

This alternative is a combination (hybrid) of the Attleboro and Middleborough simple options. It would send half the trains up one line and half up the other. This alternative offers good quality of service. One advantage of this option is that the infrastructure improvements to break the Braintree bottleneck and to add the third track in Canton would not be necessary. It would have impacts similar to the Attleboro alternative, including the multiple grade crossings in Taunton and the environmental impacts for the bypass and to the south. On the Middleborough side, it would foreclose Wareham commuter rail without added improvements.

Under the diesel option, all trains would be diesel. Under the electric option, all lines south of the Attleboro Bypass would be electrified, so trains operating on the Attleboro route would be electric. Trains on the Middleborough route would be diesel.

8.4.4 Through Stoughton: Electric or Diesel Commuter Rail to South Station via Stoughton

The Stoughton alternative would offer commuter rail service from Fall River and New Bedford through Stoughton and up to Back Bay and South Station. It offers good, fast service to Boston with some impact on existing transportation infrastructure. The alternative would have wetland impacts in the south, the Pine Swamp in Raynham, and in the Hockomock Swamp, an ACEC.

The electric option would provide better service due to the better operating characteristics of these trains. Electric trains would potentially have fewer noise, vibration and air/water quality impacts. Providing electric commuter rail would require building overhead catenary lines along the entire route, however, including through sensitive environmental resources. The capital cost of electric service is higher than other options, but it has potential to attract higher ridership and offer a better travel time.

8.4.5 Bus Rapid Transit Using Highway System: Express Bus in Dedicated Lane to South Station via Routes 24, 128 and the Southeast Expressway HOV Lane

This highway alternative would have buses leaving from Fall River and New Bedford, traveling in mixed traffic until reaching 495 on Route 24. Then this alternative would use a "zipper lane" up Route 24 (in an off-peak direction); would build a new lane along Route 128; and would use the existing zipper lane with mixed HOV traffic along I-93. Express buses would offer a good quality of service using existing infrastructure at a lower capital cost with little direct environmental impact, but they could only handle about one-quarter of the riders commuter rail can transport. Route 128 construction could disturb part of the Blue Hills Reservation. This option would not encourage smart growth as well as the commuter rail options because it would not run through existing villages and town centers.

9

Next Steps

This chapter describes the next steps of the South Coast Rail project, which include Phase 2 of the *Highway Methodology*[1] and the MEPA/NEPA process.

During the Phase 2 evaluation, conceptual operating plans, capital improvement requirements, capital costs, and operating and maintenance costs will be developed for each alternative. Phase 2 alternatives will be modeled by the CTPS using the statewide transportation model, providing quantitative results on the performance of each alternative in terms of ridership, highway/vehicular travel, air quality, environmental justice, and user benefit. Detailed analyses of environmental impacts (to natural resources, air quality, noise and vibration, historic resources, as well as social and economic impacts) will be conducted and documented as will the mitigation measures and smart growth strategies recommended for each alternative.

The steps in this process, and opportunities for public review and comment, are listed below.

9.1 Scoping

Scoping is the initial process conducted under both MEPA and NEPA. Under MEPA, EOT will prepare an Environmental Notification Form (ENF) that describes the range of alternatives proposed to be evaluated in detail, identifies the environmental resources likely to be affected, and identifies the regulatory reviews and permits likely to be required for each alternative. This ENF will be circulated for review by the public and the environmental resource agencies. At the conclusion of the ENF review process, the Secretary of EOEEA will issue a Certificate that specifies the analysis, studies, and information that must be included in a DEIR.

1 United States Army Corps of Engineers. NEDEP-360-1-30, The Highway Methodology Workbook. October 1993.

Under NEPA, the Corps of Engineers will seek public and agency input on the range of alternatives and on the analyses, studies, and information that must be included in either a Draft Environmental Impact Statement (DEIS) or Draft Environmental Assessment (DEA).

EOT anticipates that joint scoping meetings will be held under the MEPA and NEPA processes.

9.2 DEIR/DEIS-DEA

EOT anticipates that a single detailed environmental document, the joint DEIR/DEIS (or DEA) will be prepared by EOT and the Corps. This document will be circulated for public and agency review and comment. A joint public hearing would be held during the public comment period. The document will present detailed descriptions of the alternatives, descriptions of existing environmental conditions (for all natural resources as well as social, economic, land use, air quality, etc.) and analyses of the environmental impacts of each alternative for each resource category. In accordance with Phase 2 of the Highway Methodology, EOT would also file a draft Section 404 Permit Application and the Corps would issue a Public Notice, allowing the public to comment on the permit application.

Based on the review of the alternatives in the MEPA document and public comments on the Section 404 application, EOT will identify a Preferred Alternative. The Corps, at the same time, will identify the LEDPA.

Following the public review and comment period, the Secretary of EOEEA will issue a Certificate that identifies additional analyses, modifications to the preferred alternative, or other information that must be provided in the Final EIR.

9.3 FEIR/FEIS-FEA

EOT anticipates that a single detailed environmental document, the joint FEIR/FEIS (or FEA) will be prepared by EOT and the Corps. This document will be circulated for public and agency review and comment. The document will present detailed descriptions of the Preferred Alternative (LEDPA), descriptions of existing environmental conditions (for all natural resources as well as social, economic, land use, air quality, etc.) and analyses of the environmental impacts alternative for each resource category. This document will also provide detailed information on proposed mitigation measures that would be incorporated into the Preferred Alternative.

Following the public review and comment period, the Secretary of EOEEA will issue a Certificate that finds the FEIR to be "adequate". This final certificate allows the state resource agencies to issue permits for the proposed project, and allows the expenditure of state funds.

The Corps, at the same time, would issue either a Record of Decision (ROD) or Finding of No Significant Impact (FONSI). After an opportunity for further public comment, the Corps could then issue a Section 404 permit for the Preferred Alternative (LEDPA) with specific mitigation requirements and timetables.

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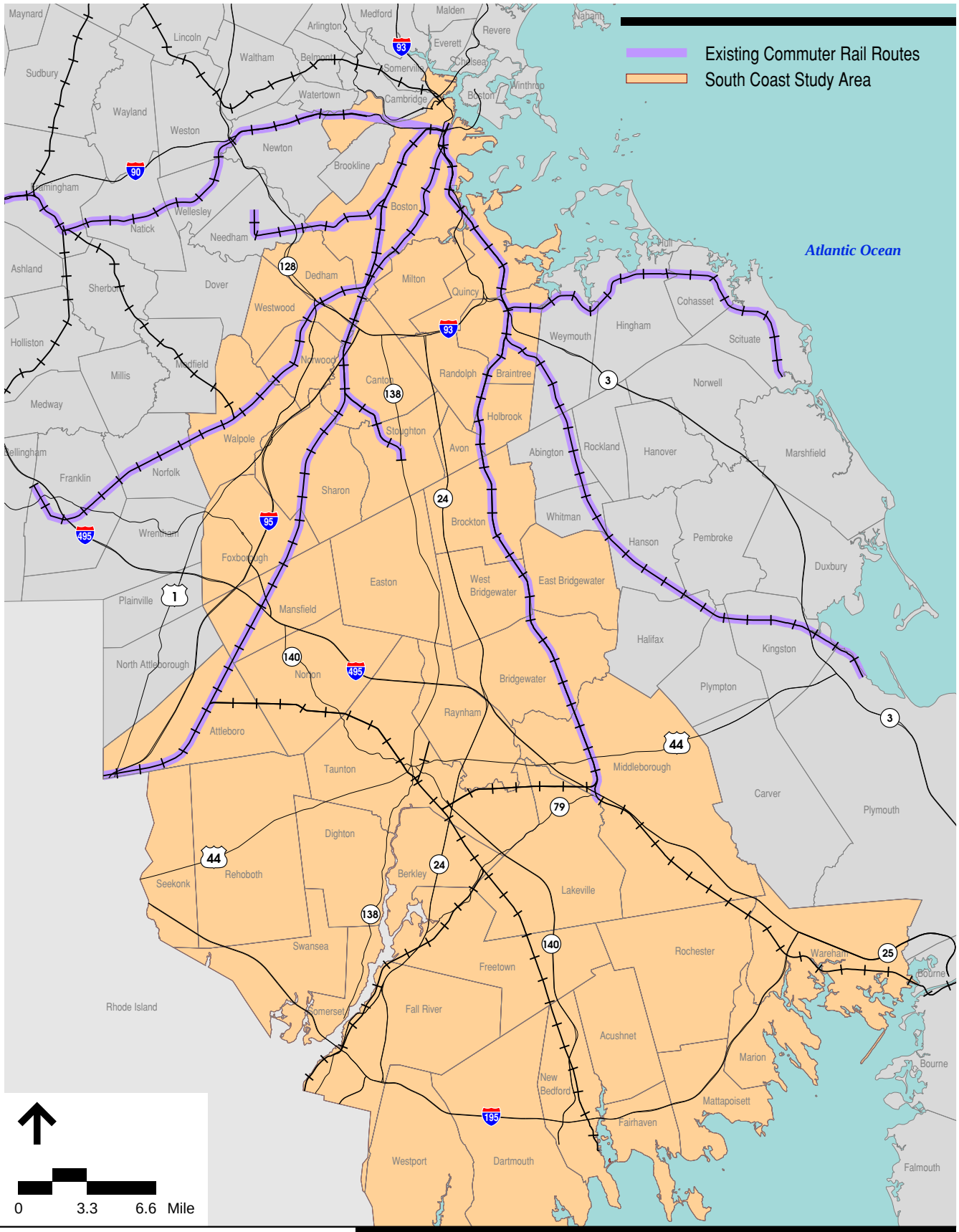
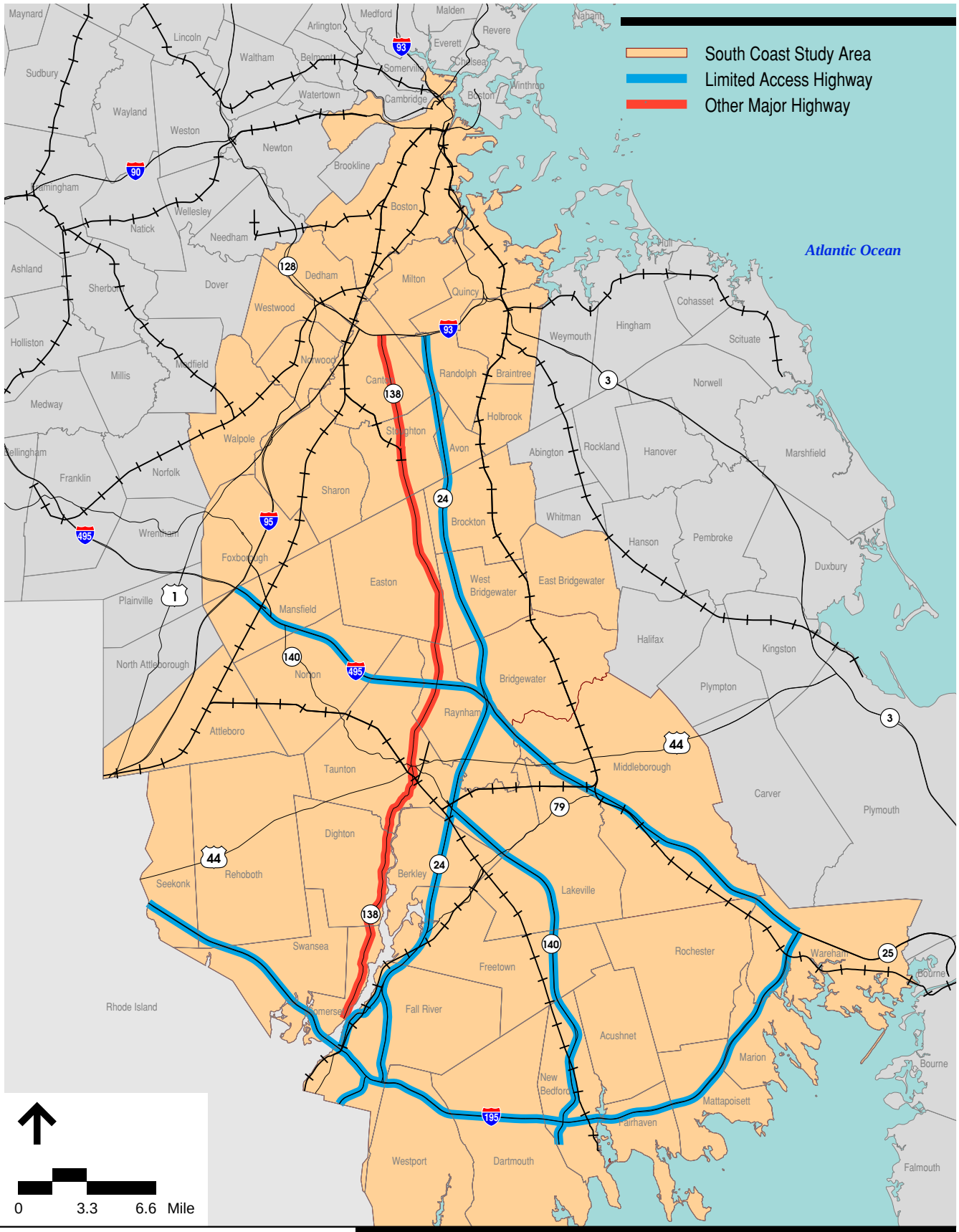
Figures



South Coast Rail

Executive Office of Transportation & Public Works

Figure 1-1
Alternatives Analysis Transportation Study Area Communities



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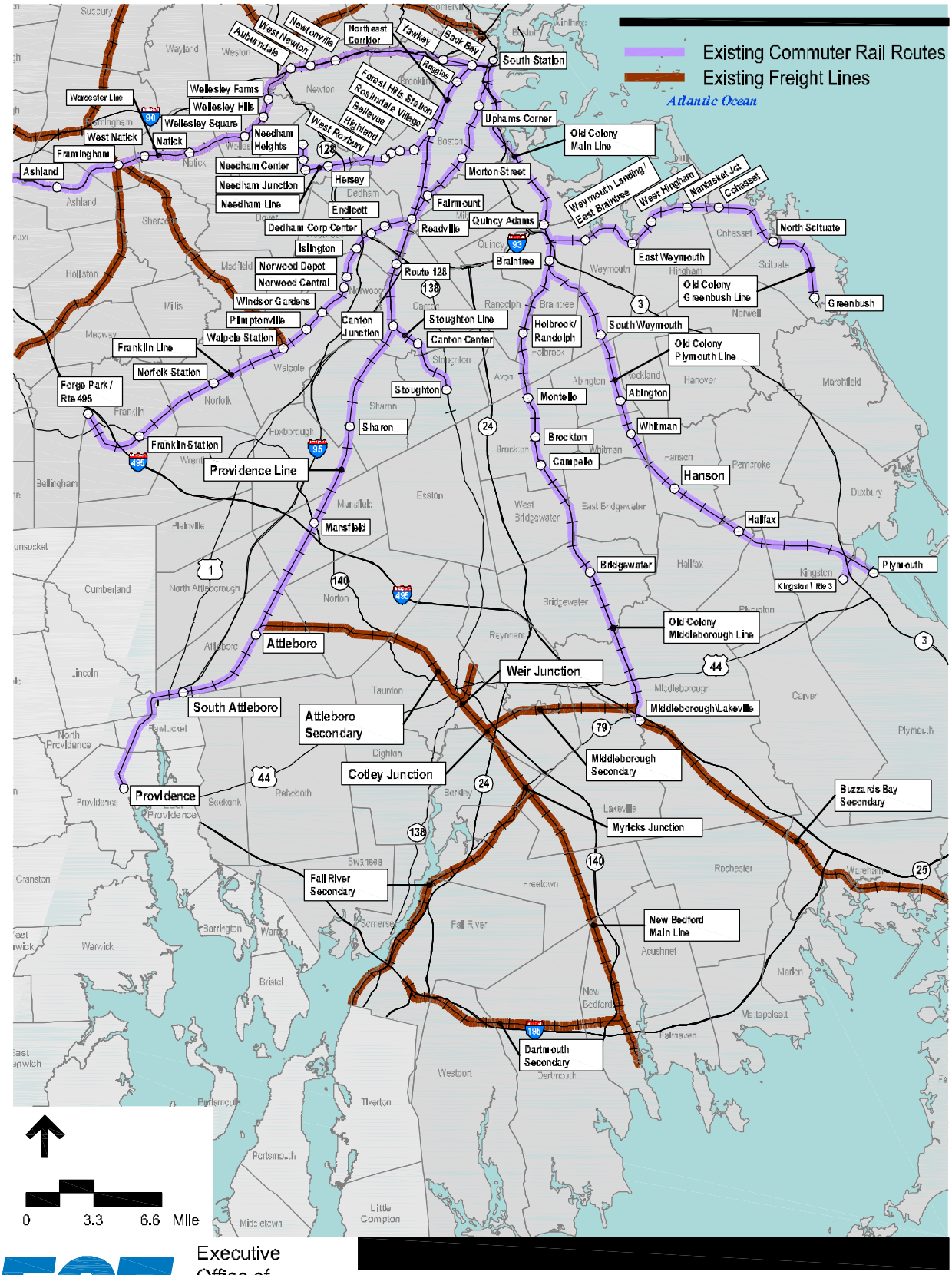
South Coast Rail

Figure 2-1
Existing Highway Transportation System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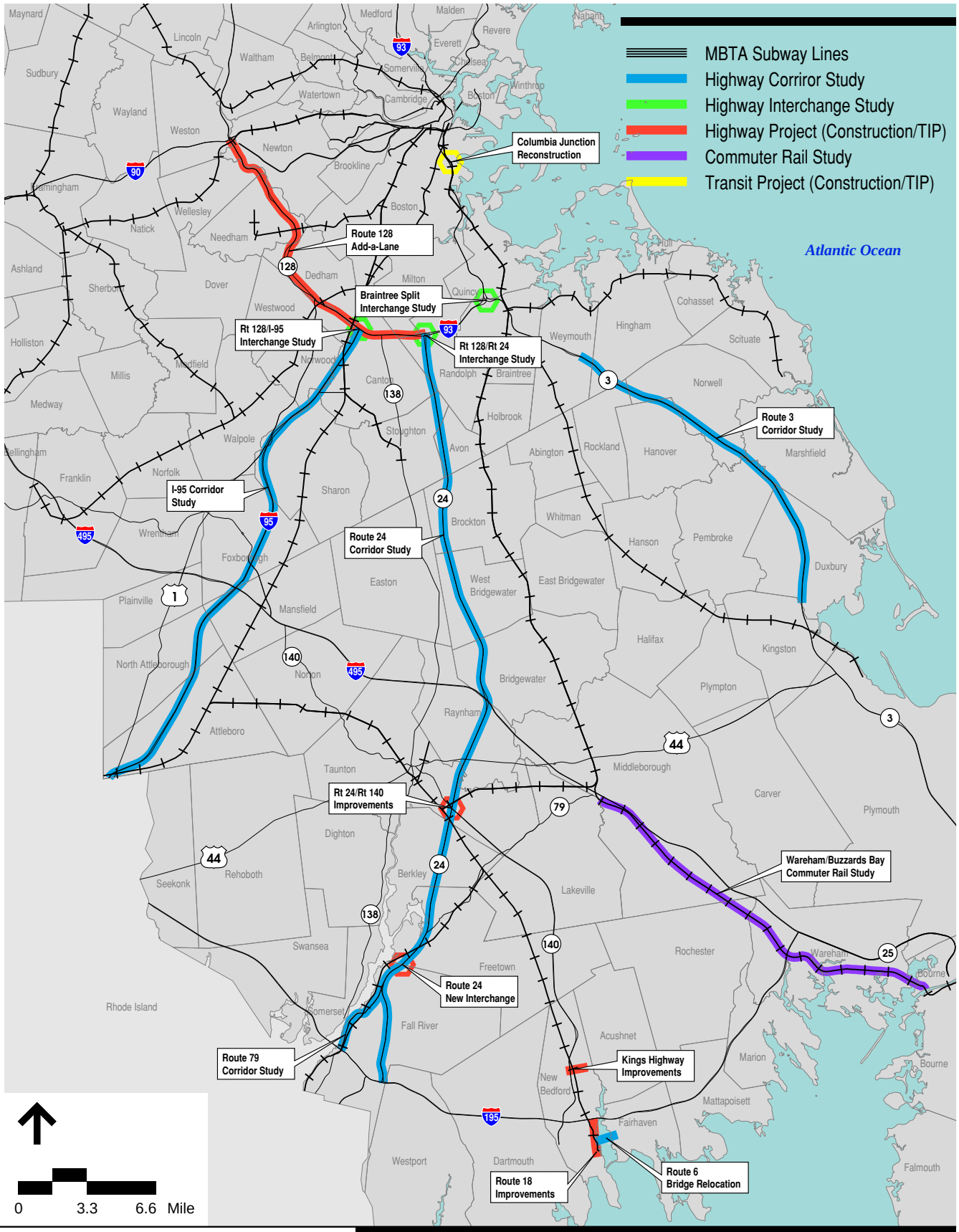
Existing Commuter Rail Routes
Existing Freight Lines
Atlantic Ocean
South Station
Back Bay
Ruggles
Northeast Corridor
Yawkey
Newtonville
West Newton
Auburndale
Forest Hills Station
Roslindale Village
Bellevue
Highland
West Roxbury
Worcester Line
Wellesley Farms
Wellesley Hills
Wellesley Square
West Natick
Natick
Framingham
Ashland
Needham Heights
Needham Center
Needham Junction
Needham Line
Hersey
Endicott
Dedham Corp Center
Islington
Norwood Depot
Norwood Central
Windsor Gardens
Plimptonville
Walpole Station
Franklin Line
Norfolk Station
Forge Park / Rte 495
Franklin Station
Providence Line
Mansfield
Attleboro
South Attleboro
Attleboro Secondary
Providence
Cotley Junction
Fall River Secondary
Dartmouth Secondary
Myricks Junction
Buzzards Bay Secondary
New Bedford Main Line
Middleborough Secondary
Middleborough\Lakeville
Weir Junction
Old Colony Middleborough Line
Bridgewater
Brockton
Montello
Stoughton
Stoughton Line
Canton Junction
Canton Center
Route 128
Braintree
Quincy Adams
Fairmount
Readville
Morton Street
Uphams Corner
Old Colony Main Line
Weymouth Landing / East Braintree
West Hingham
Nantasket Jct
Cohasset
North Scituate
Greenbush
Old Colony Greenbush Line
East Weymouth
South Weymouth
Holbrook/ Randolph
Old Colony Plymouth Line
Abington
Whitman
Hanson
Halifax
Plymouth
Kingston
Kingston\ Rte 3
Campello
Sharon
Foxboro
Mansfield
Easton
West Bridgewater
East Bridgewater
Norton
Taunton
Raynham
Middleborough
Lakeville
Rochester
Wareham
Fall River
Swansea
Somerset
Freetown
Acushnet
Marion
Mattapoisett
Westport
Dartmouth
Tiverton
Little Compton
Portsmouth
Middletown
Newport
Barrington
Warren
Bristol
Warwick
Cranston
Providence
North Providence
Pawtucket
Seekonk
Rehoboth
Berkley
Dighton
Lincoln
North Attleborough
Cumberland
Bellingham
Millville
Franklin
Norfolk
Walpole
Medway
Millis
Medfield
Hollston
Sherborn
Dover
Natick
Wellesley
Needham
Dedham
Ashland
Framingham
Weston
Wayland
Newton
Brookline
Boston
Quincy
Weymouth
Hingham
Scituate
Norwell
Hanover
Pembroke
Duxbury
Marshfield
Abington
Rockland
Braintree
Randolph
Avon
Stoughton
Sharon
Foxboro
Mansfield
Easton
Norton
Attleboro
Taunton
Raynham
Middleborough
Lakeville
Carver
Plymouth
Kingston
Halifax
Hanson
Pembroke
Duxbury
Marshfield
Hanover
Norwell
Scituate
Cohasset
Hingham
Weymouth
Braintree
Randolph
Quincy
Milton
Dedham
Needham
Wellesley
Natick
Framingham
Ashland
Sherborn
Dover
Medfield
Norwood
Canton
Stoughton
Foxboro
Mansfield
Easton
Bridgewater
West Bridgewater
East Bridgewater
Brockton
Abington
Whitman
Hanson
Halifax
Plymouth
Kingston
Duxbury
Marshfield



Executive Office of Transportation & Public Works

South Coast Rail

Figure 2-3
Major Transportation Projects

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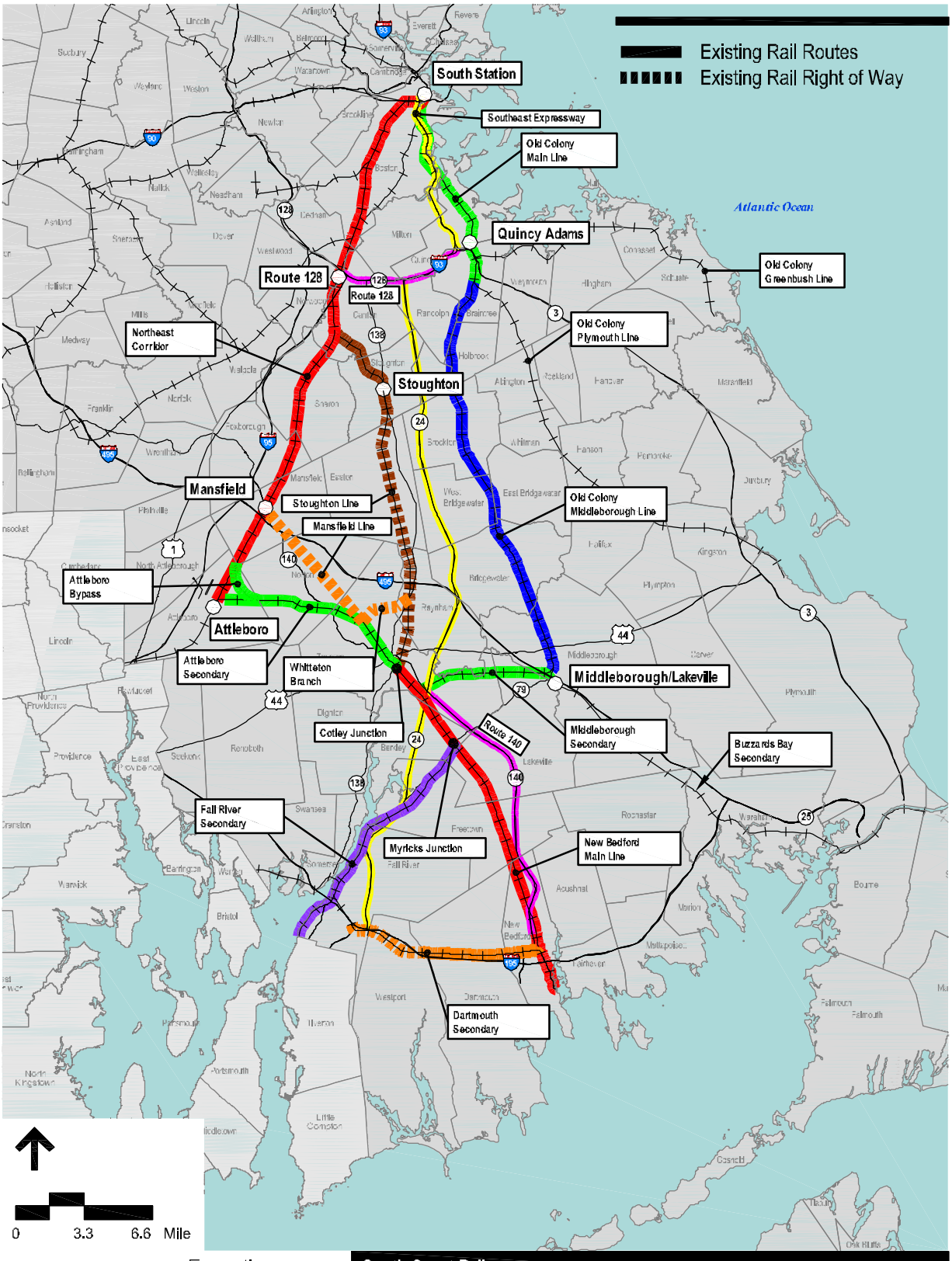
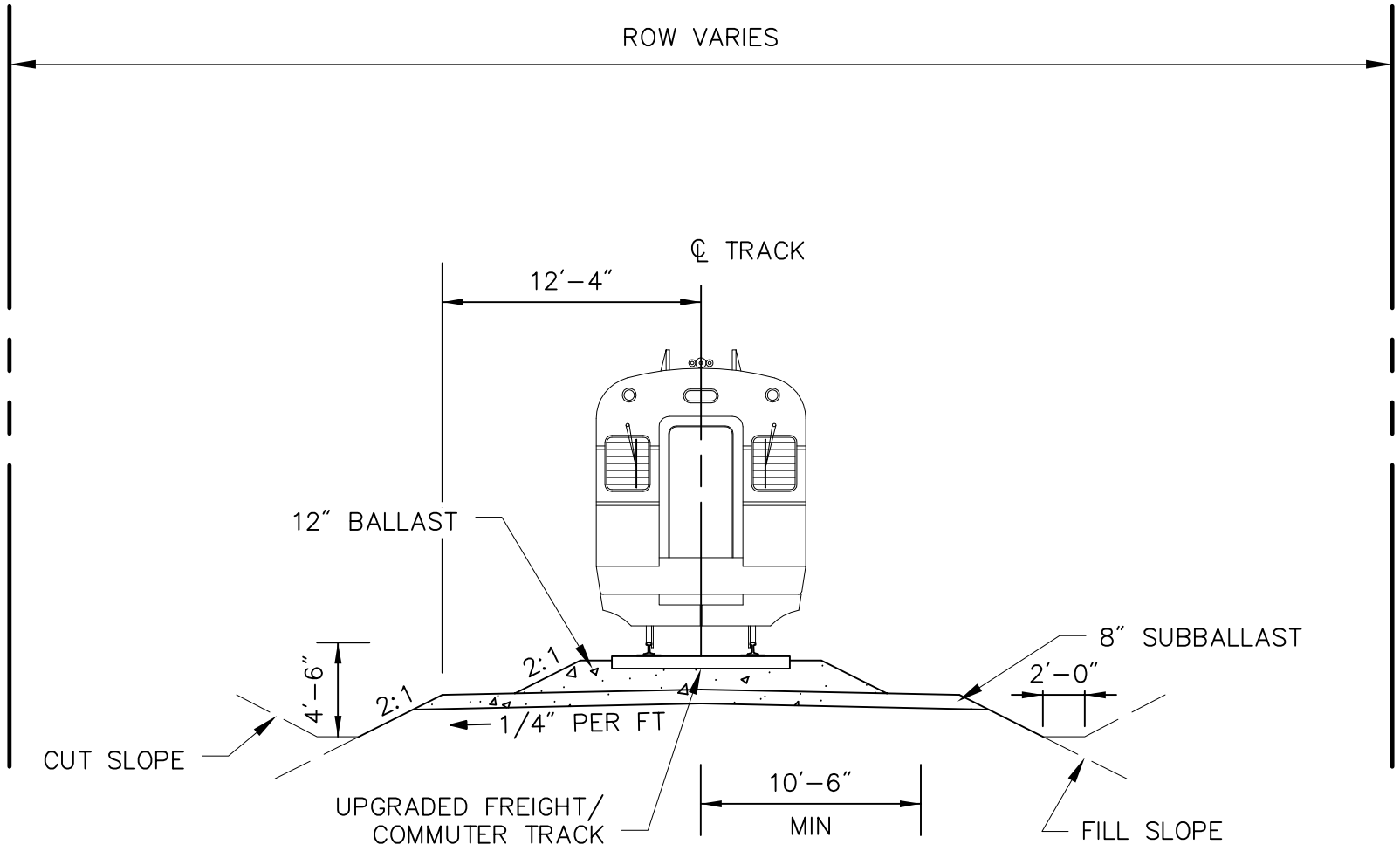


South Coast Rail

Executive Office of Transportation & Public Works

Figure 3-1
Corridors Under Consideration



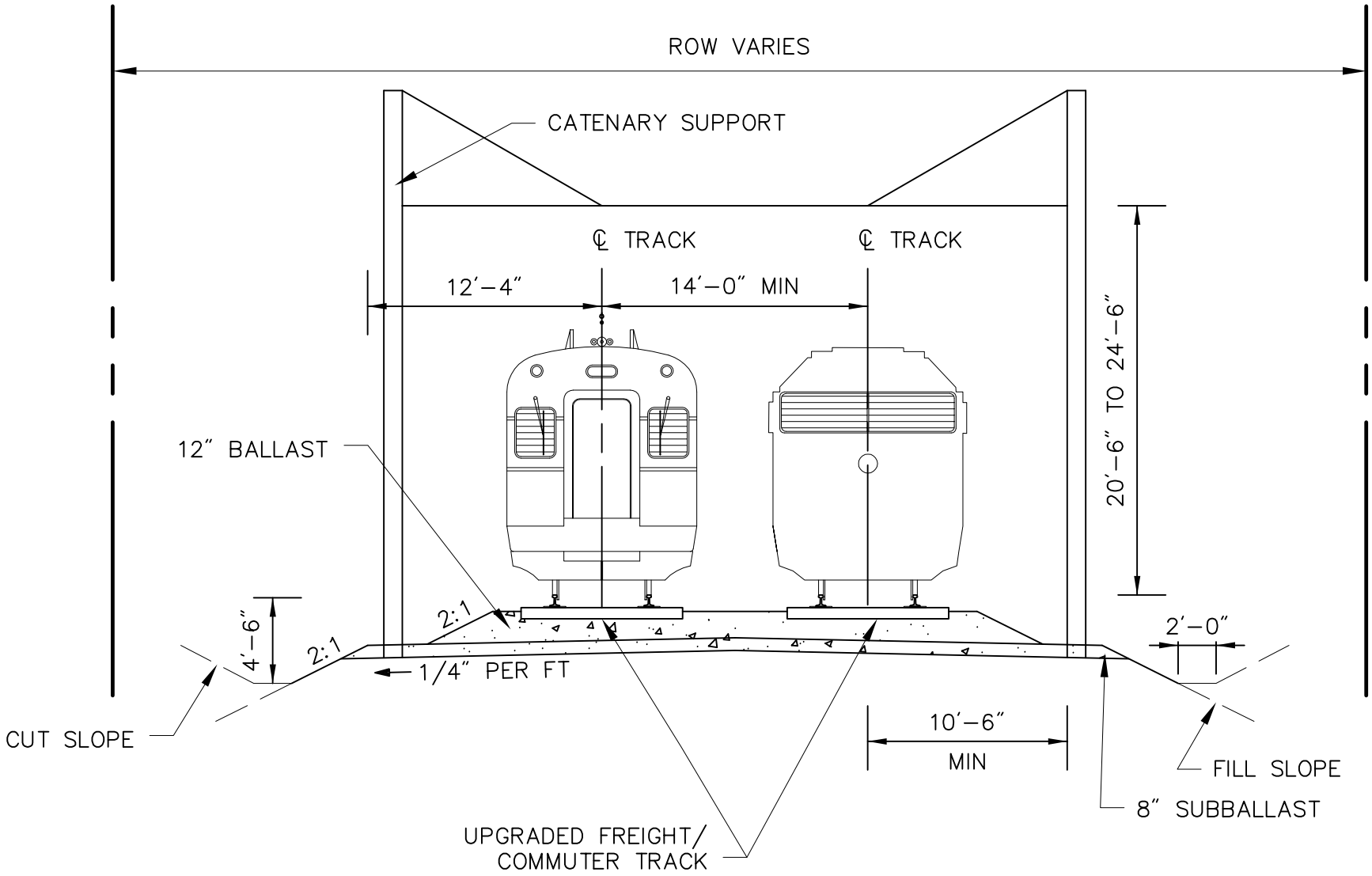
Executive Office of Transportation & Public Works

Not to Scale

South Coast Rail

Figure 3-2

Conventional/Diesel Multiple Units
Commuter Rail
Typical Cross Section



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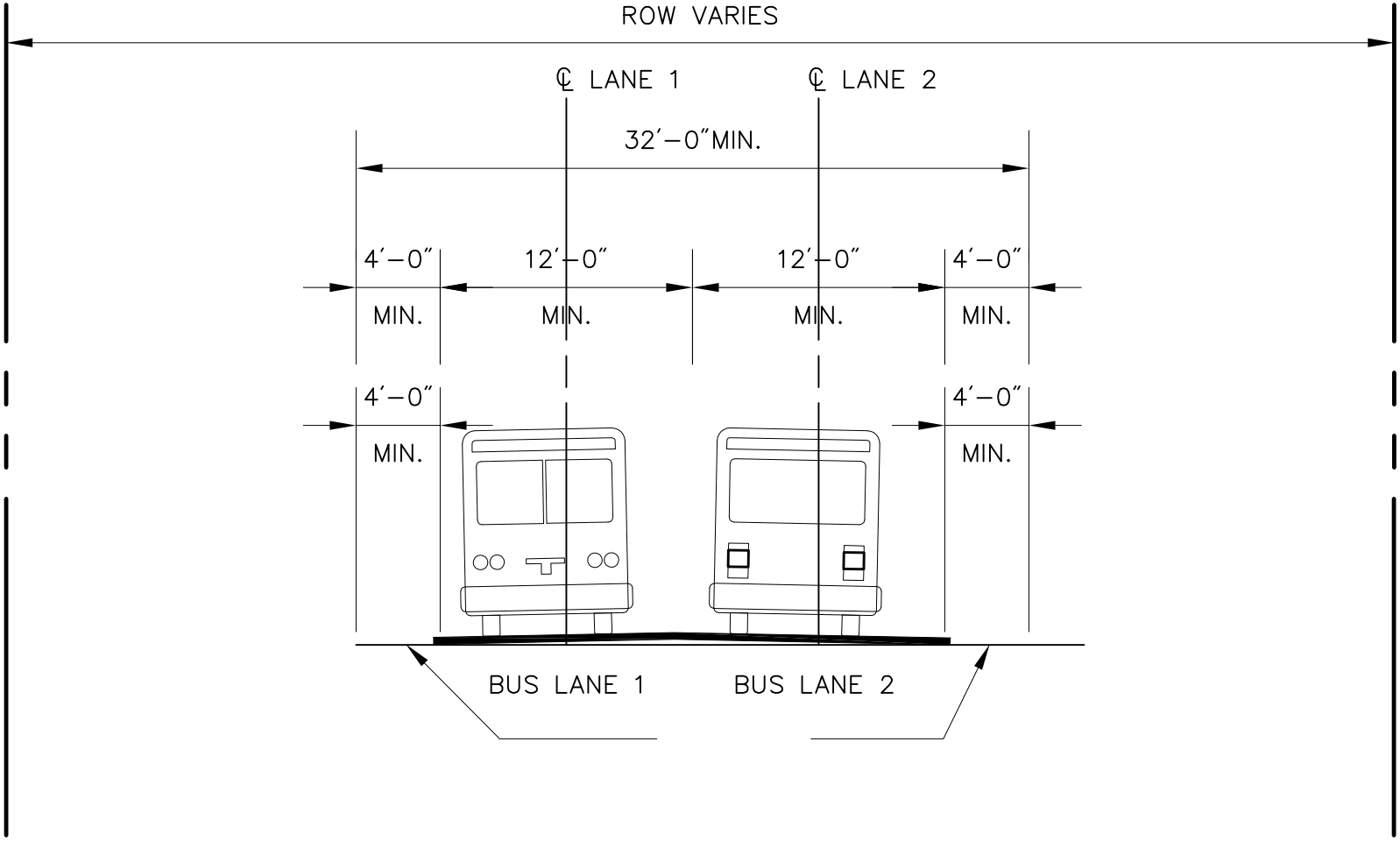
South Coast Rail

Figure 3-3

Electric Commuter Rail
Typical Cross Section

Not to Scale



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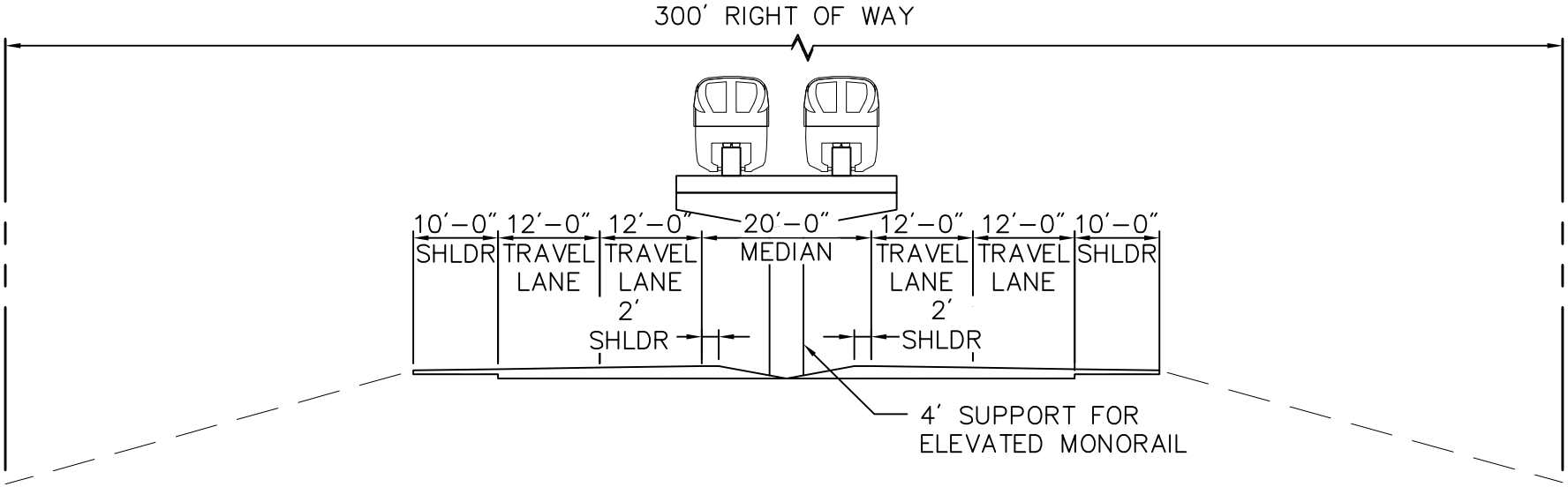
South Coast Rail

Figure 3-4

Bus Rapid Transit
Typical Cross Section

Not to Scale



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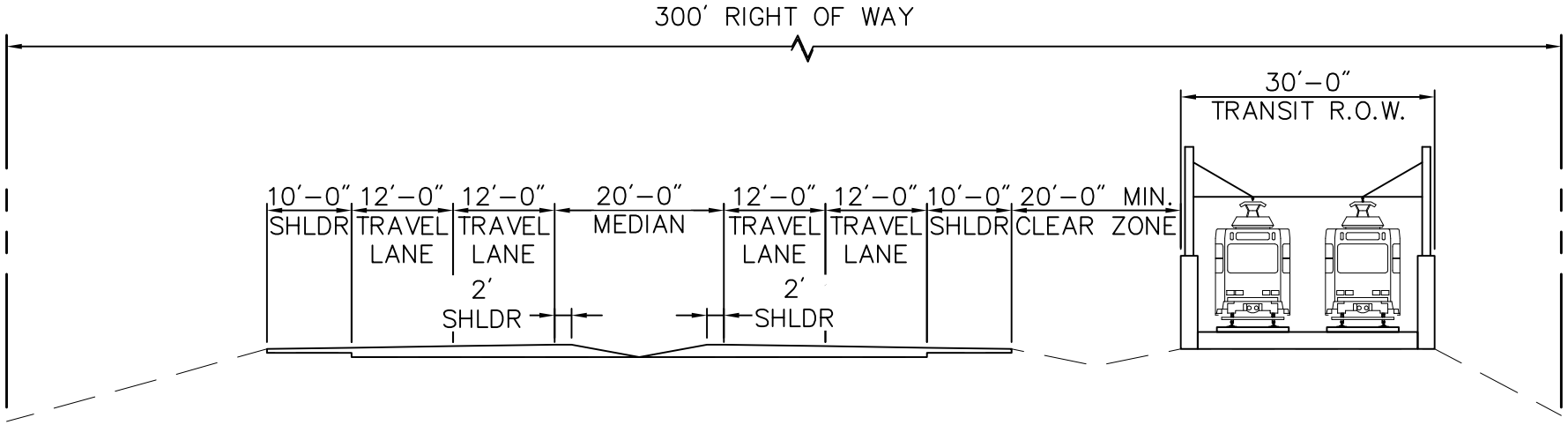
South Coast Rail

Figure 3-5

Monorail Along Route 24
Typical Cross Section

Not to Scale



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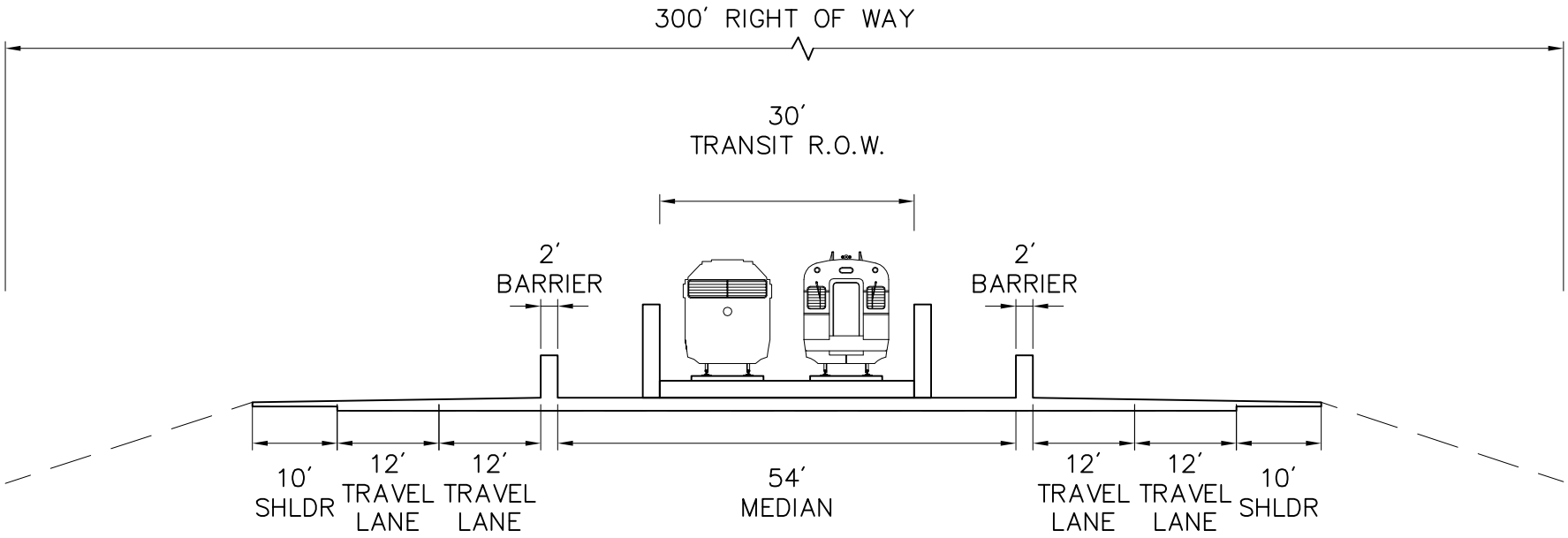
South Coast Rail

Figure 3-6

Electrified Light Rail Along Route 24
Typical Cross Section

Not to Scale



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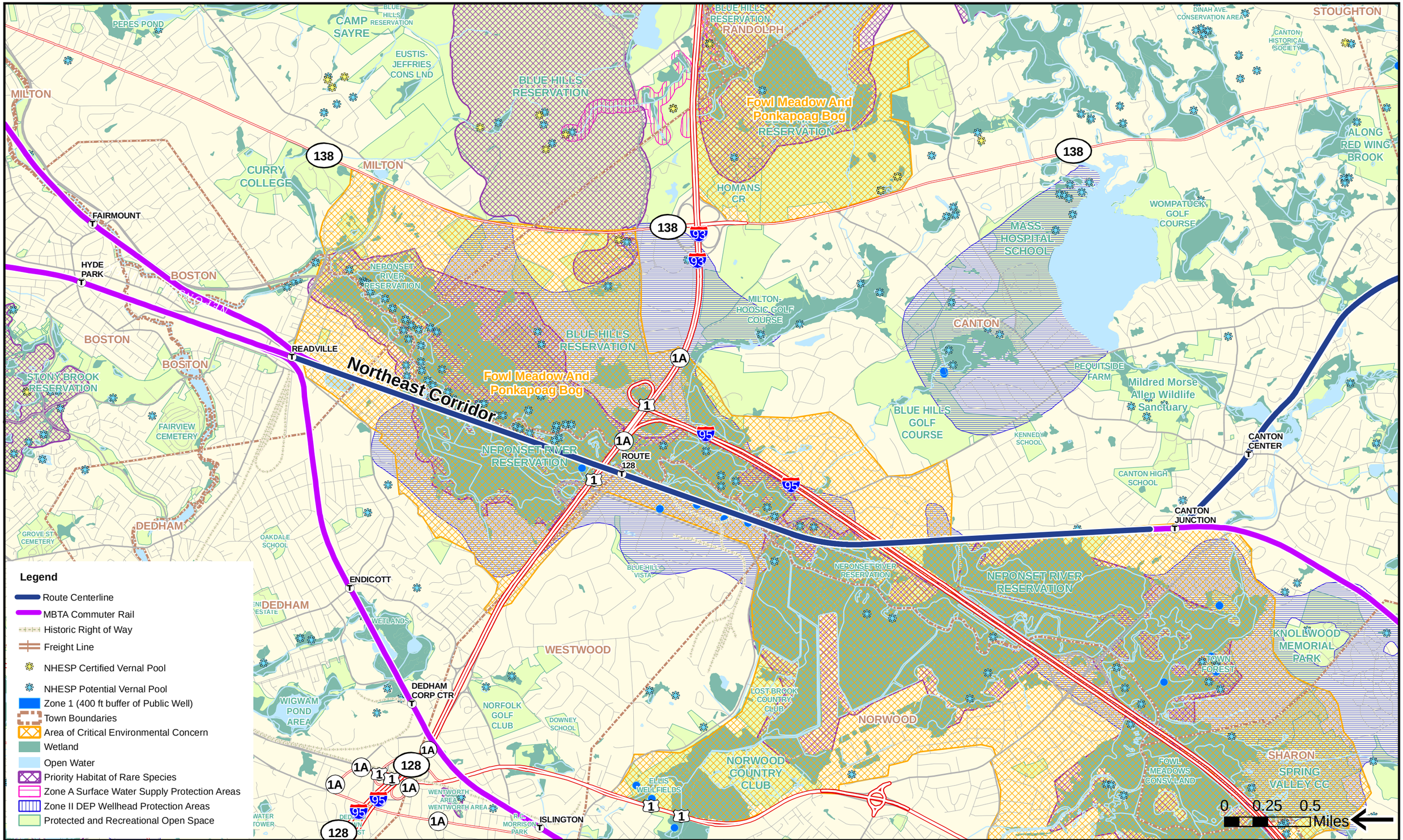
South Coast Rail

Figure 3-7

Heavy Rail Along Route 24
Typical Cross Section

Not to Scale



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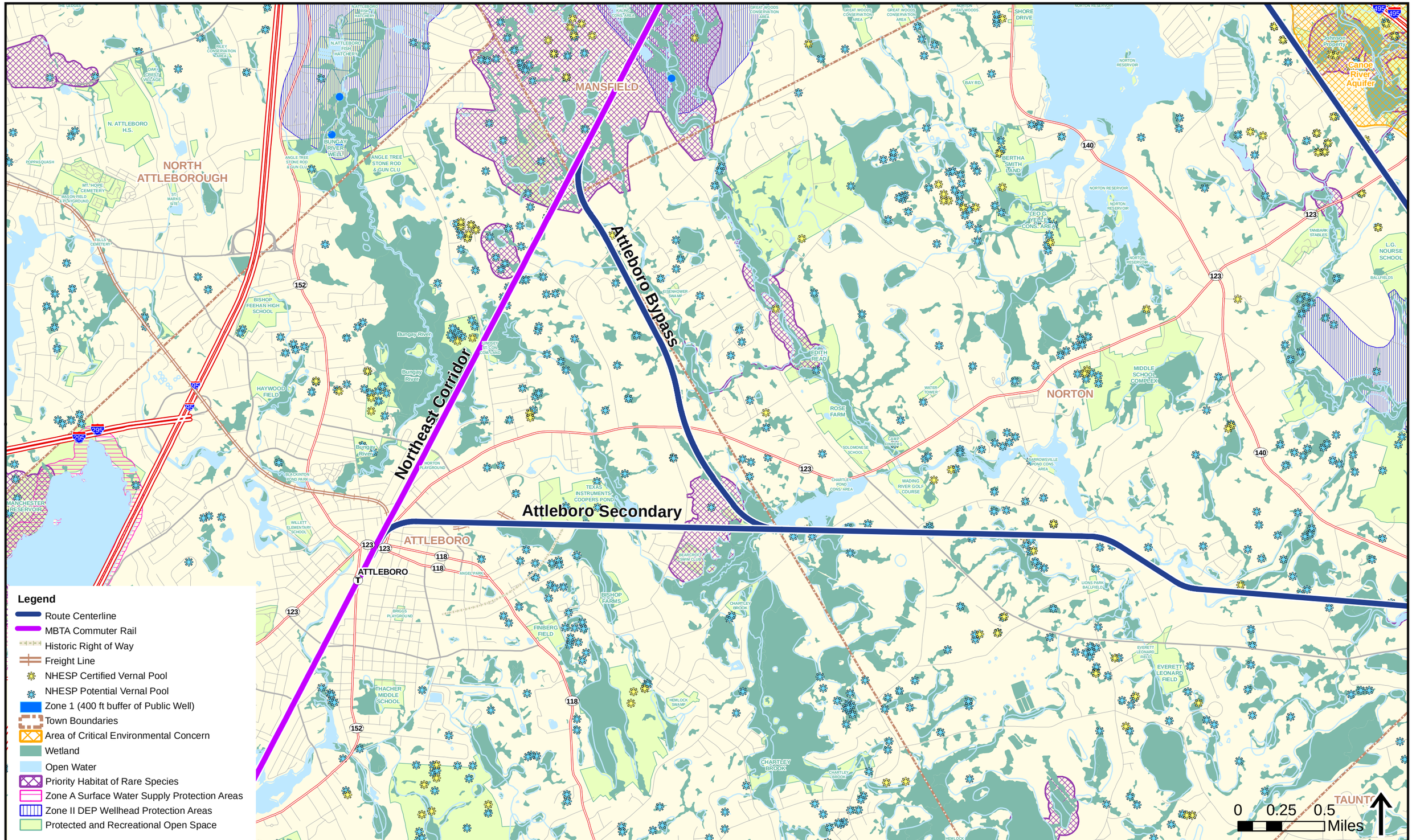
South Coast Rail

Figure 7-1
Environmental Resources in the Vicinity of the Northeast Corridor (Readville to Canton Junction)



Legend

- Route Centerline
- MBTA Commuter Rail
- Historic Right of Way
- Freight Line
- NHESP Certified Vernal Pool
- NHESP Potential Vernal Pool
- Zone 1 (400 ft buffer of Public Well)
- Town Boundaries
- Area of Critical Environmental Concern
- Wetland
- Open Water
- Priority Habitat of Rare Species
- Zone A Surface Water Supply Protection Areas
- Zone II DEP Wellhead Protection Areas
- Protected and Recreational Open Space

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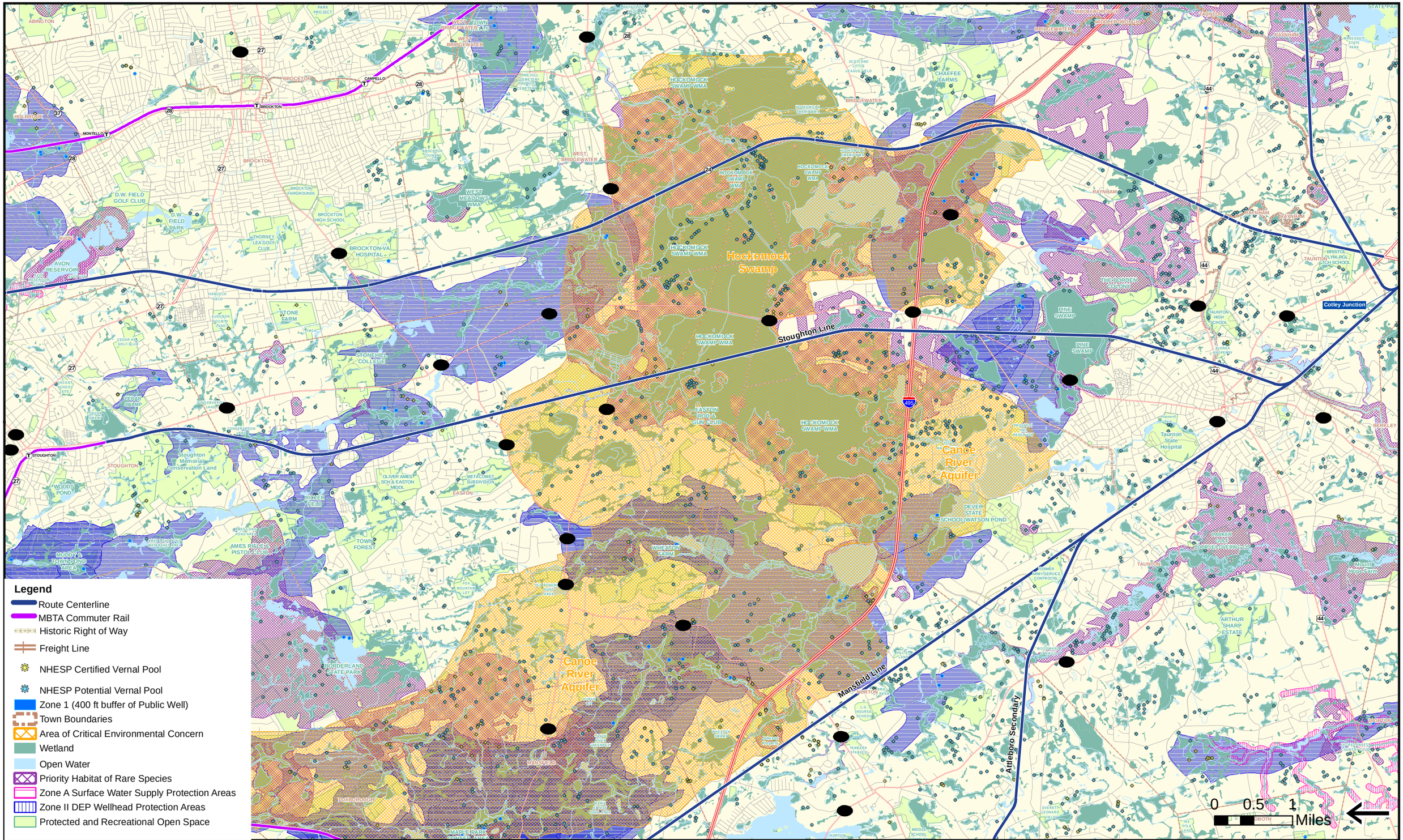
Figure 7-2
Environmental Resources in the Vicinity of the
Attleboro Bypass (Northeast Corridor to Attleboro Secondary)



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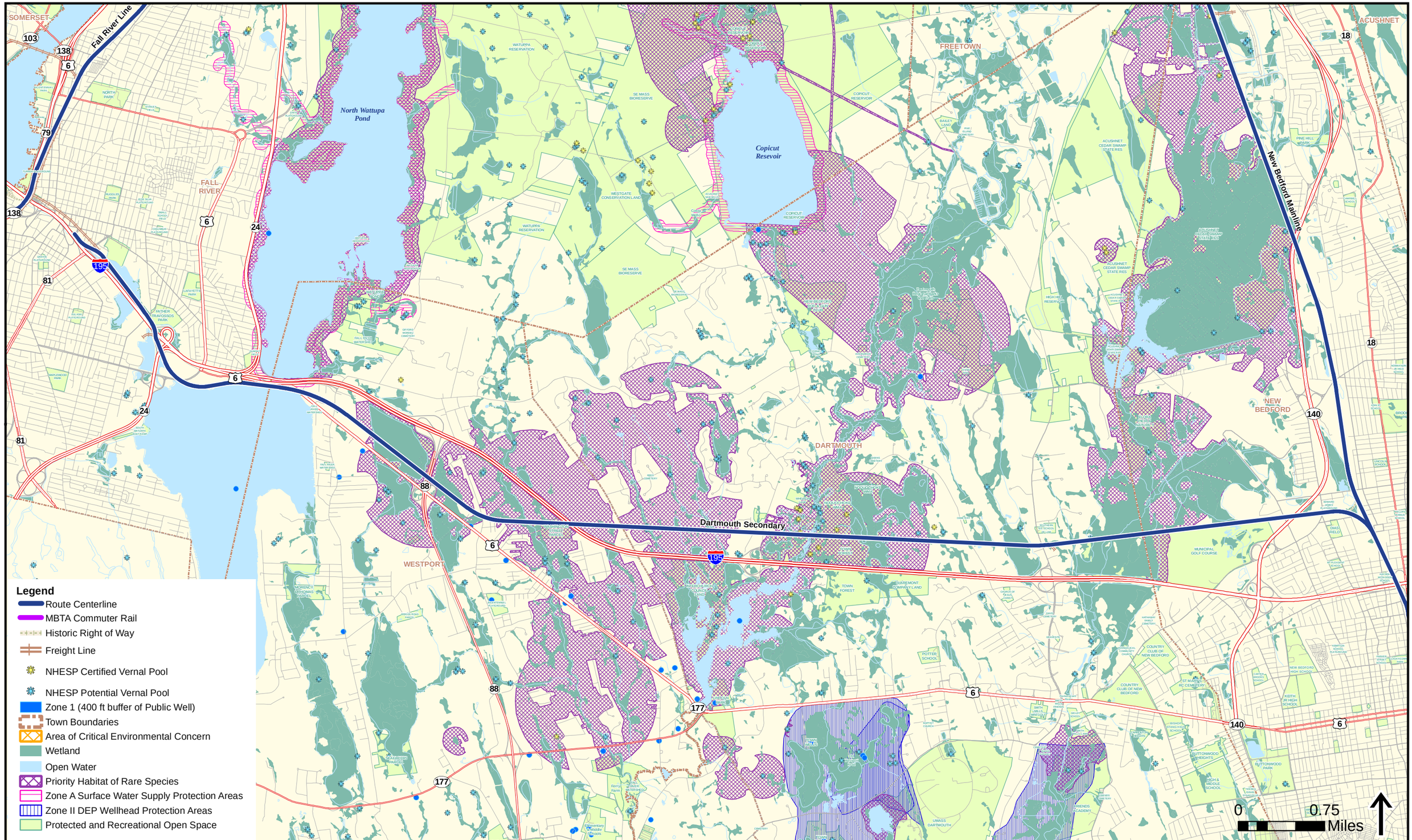
South Coast Rail

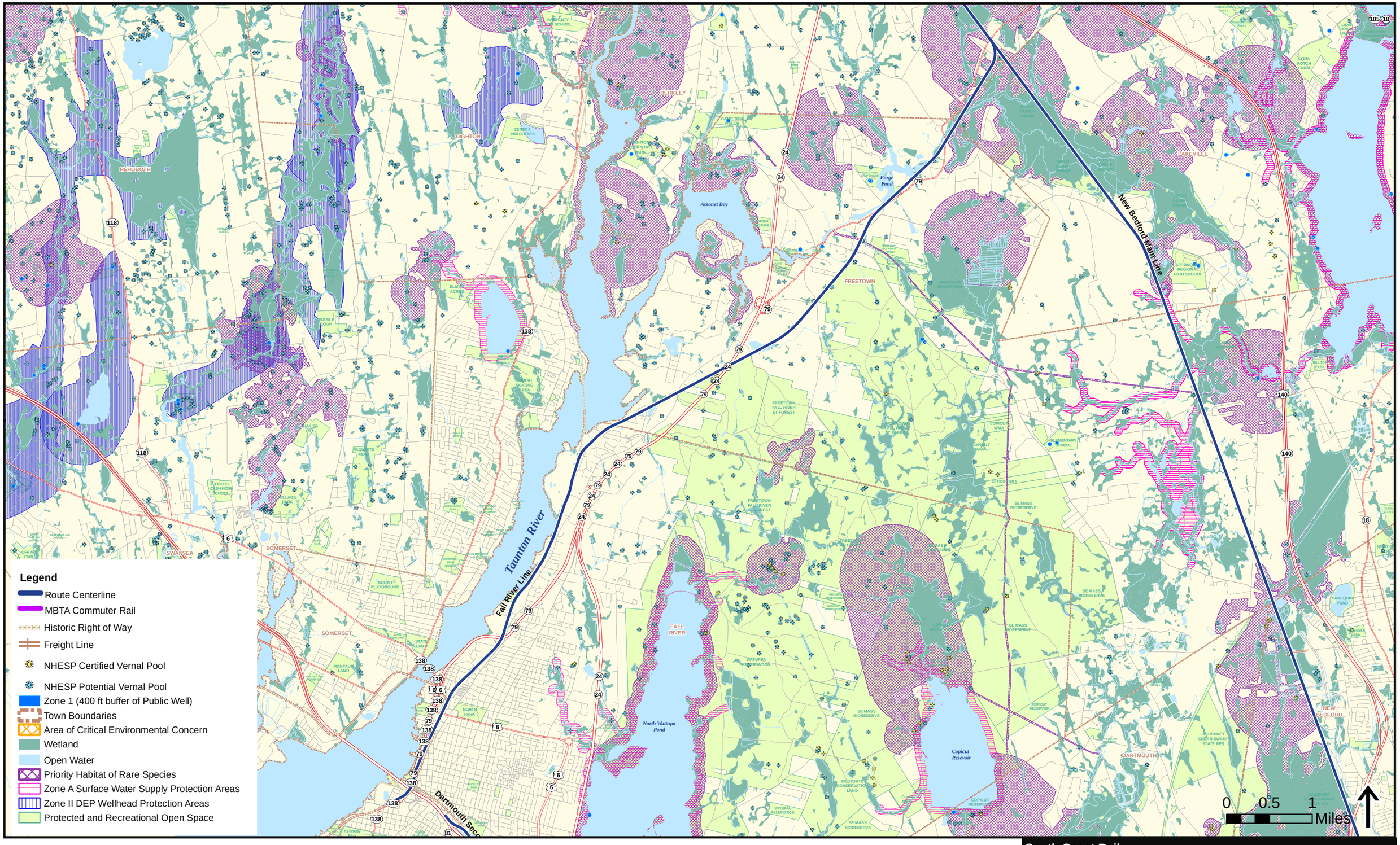
Figure 7-3
Environmental Resources in the Vicinity of the Stoughton Line (Stoughton Station to Cotley Junction)



South Coast Rail

Figure 7-4
Environmental Resources in the Vicinity of the
Dartmouth Secondary (Fall River to New Bedford)

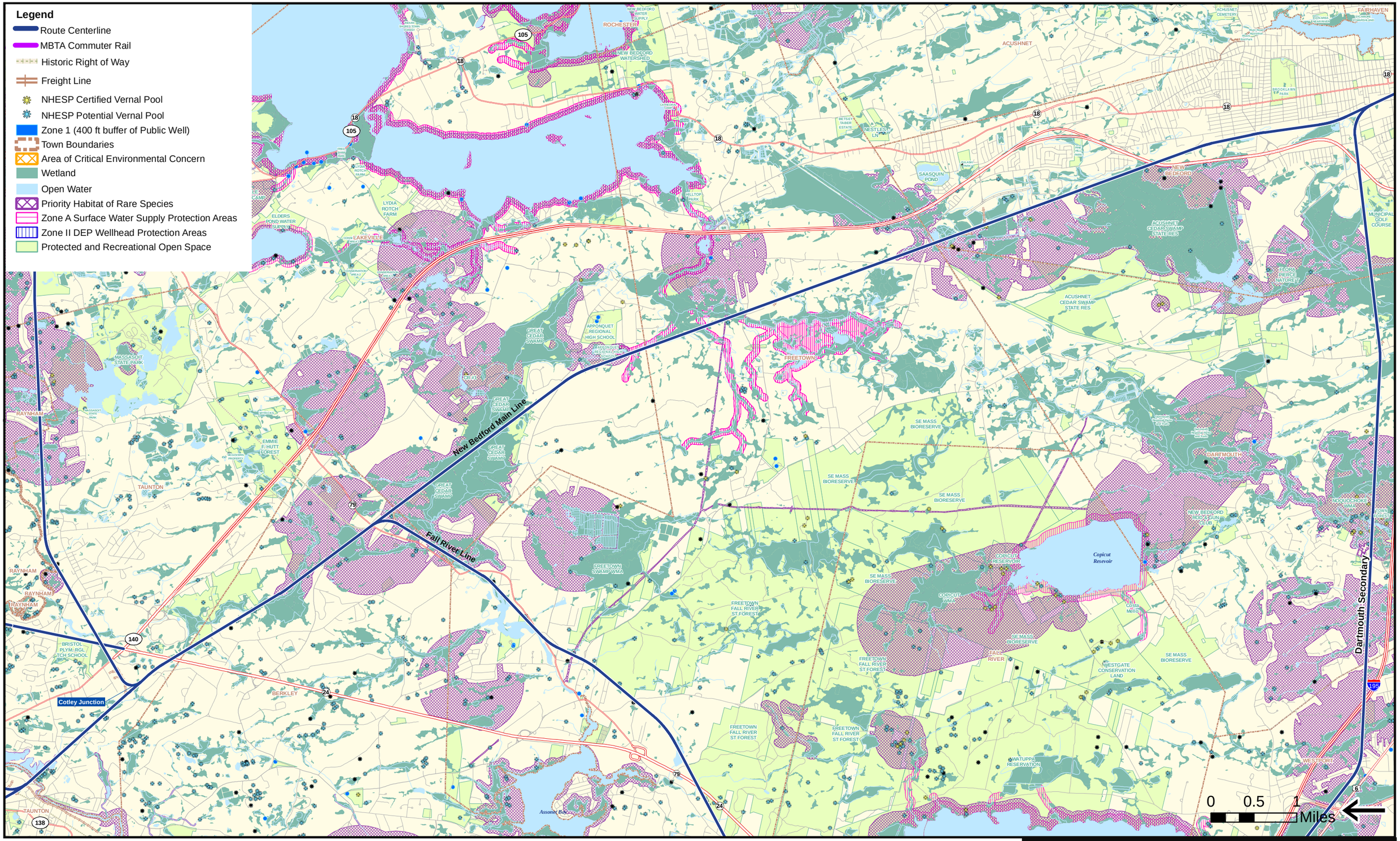
EOT Executive Office of Transportation & Public Works



South Coast Rail

Figure 7-5
Environmental Resources in the Vicinity of the
Fall River Line (Myricks Junction to downtown Fall River)

EOT Executive Office of Transportation & Public Works



South Coast Rail

Figure 7-6
Environmental Resources in the Vicinity of the
New Bedford Main Line (Cotley Junction to downtown New Bedford)

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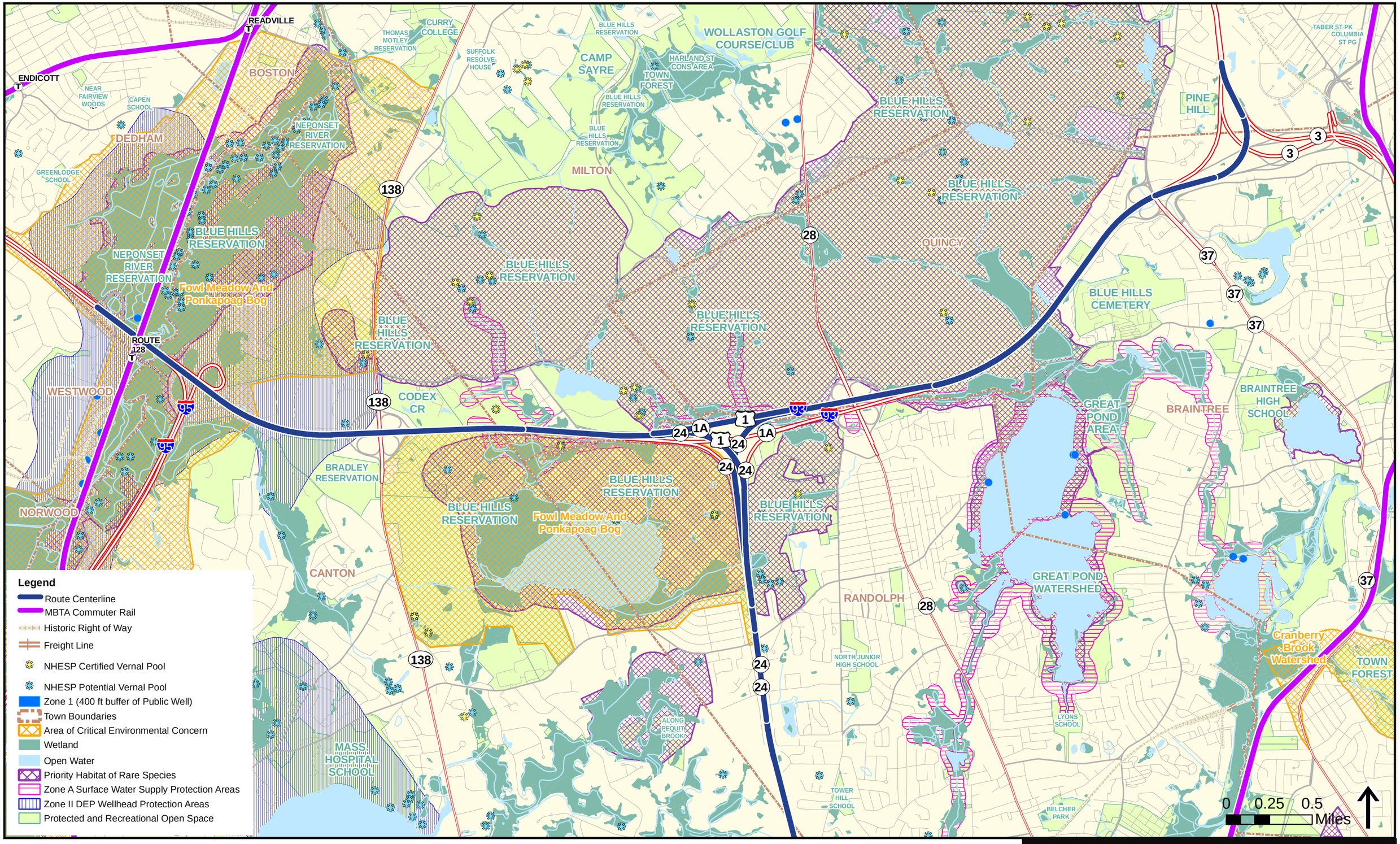

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South Coast Rail

Figure 7-7
Environmental Resources in the Vicinity of the Route 128 (Route 128 Station to Braintree)

Appendix A
Descriptions of Phase 1 Alternatives

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

99 High Street
Boston, Massachusetts 02110
617 728-7777
FAX 617 728-7782

Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 1

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 1. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 1 consists of conventional diesel commuter rail along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and a point near the Attleboro/Mansfield town line, a new track bypass (Attleboro Bypass) along the National Grid right-of-way in Attleboro and Norton, the Attleboro Secondary between a point near the Attleboro/Norton town line and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 1, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 74 and 73 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Northeast Corridor: From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed. Catenary supports and wire would not be constructed for this track, but modifications to the existing supports may be required. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Attleboro Bypass: A new single track Class 5 line would be constructed roughly following the National Grid right-of-way from the Northeast Corridor near the Attleboro/Mansfield/Norton town line (MP 0.00) to the Attleboro Secondary near the Attleboro/Norton town line (MP 2.62). Part of Chartley Pond in Norton might be affected where the line would tie into the Attleboro Secondary.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be single track for the entire length between the Attleboro Bypass and Weir Junction, with a passing siding in Norton (MP 4.49 to MP 6.86).

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). No existing commuter rail stations would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart and graphic.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a large volume of existing

institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. Property acquisition would not be needed.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Attleboro Bypass: The Attleboro Bypass would be constructing along an existing National Grid right-of-way. Modifications to the existing high voltage lines might be required. The right-of-way passes through several wetlands, which would require filling, and crosses Chartley Pond, part of which might be filled or spanned with a trestle. A moderate amount of property acquisition would be required. However, disruption to the existing transportation system would be minimal.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 1 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be new service, not extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

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Boston, Massachusetts 02110
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FAX 617 728-7782

Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 2

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 2. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 2 consists of conventional diesel commuter rail along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and Attleboro Station, the Attleboro Secondary between Attleboro Station and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This alternative requires a reverse move at Attleboro Station. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 2, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

- Reverse move requires at least 10 minutes because engineer must get off train, walk to other end, and perform a brake test before departing; this is consistent with the minimum time required by the MBTA to change the direction of a train

Travel Time

Travel times from New Bedford and Fall River to Boston would be 94 and 93 minutes, respectively. No transfer would be required. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the reverse move introduces increased chances of mechanical problems. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Northeast Corridor: From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed. Catenary supports and wire would not be constructed for this track, but modifications to the existing supports may be required. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be single track for the entire length between the Attleboro Station and Weir Junction, with a passing siding in Norton (MP 4.49 to MP 6.86).

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). No existing commuter rail stations would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction,

operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing commuter services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

The need for a reverse move at Attleboro Station would cause unacceptable impacts to the Northeast Corridor. Even with minimal turn times of 10 minutes for the reverse move, it is unlikely that more than four trains could be accommodated in an hour on one track. This would present a severe constraint on future expansion and an exceedingly inefficient use of system capacity. Mechanical faults are most frequent during reverse moves, decreasing reliability and increasing the probability of delays that could cascade throughout the Northeast Corridor. There is no space at Attleboro Station for constructing additional tracks without significant disruption to the fabric of the city.

Due to unacceptable impacts to the capacity and reliability of the transportation system, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 3

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 3. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 3 consists of conventional diesel commuter rail along the Attleboro and Dartmouth Corridors. This alternative includes the Northeast Corridor between South Station and a point near the Attleboro/Mansfield town line, a new track bypass (Attleboro Bypass) along the National Grid right-of-way in Attleboro and Norton, the Attleboro Secondary between a point near the Attleboro/Norton town line and Weir Junction, the New Bedford Secondary between Weir Junction and the Dartmouth Secondary in New Bedford, and the Dartmouth Secondary between New Bedford and the east side of Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 3, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Due to topographic challenges, Fall River Station would be on the east side of town on the Dartmouth Secondary
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 72 and 87 minutes, respectively. Travel time from New Bedford to Fall River would be 14 minutes (the extra minute in the difference between 72 and 87 is the dwell time at New Bedford Station). The travel time from Fall River is significantly longer than that from New Bedford because of the route configuration, traveling first from Fall River to New Bedford, and then to Boston. The travel time from New Bedford to Boston is slightly less than Alternative 1 because the station was assumed to be located further north for Alternative 3. The location used for Alternative 1, as well as other commuter rail alternatives, could not be used for Alternative 3, because that portion of the New Bedford Secondary is not included in Alternative 3, which diverges west at the Dartmouth Secondary.

No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Northeast Corridor: From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed. Catenary supports and wire would not be constructed for this track, but modifications to the existing supports may be required. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Attleboro Bypass: A new single track Class 5 line would be constructed roughly following the National Grid right-of-way from the Northeast Corridor near the Attleboro/Mansfield/Norton town line (MP 0.00) to the Attleboro Secondary near the Attleboro/Norton town line (MP 2.62). Part of Chartley Pond in Norton might be affected where the line would tie into the Attleboro Secondary.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be single track for the entire length between the Attleboro Bypass and Weir Junction, with a passing siding in Norton (MP 4.49 to MP 6.86).

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and the Dartmouth Secondary. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Dartmouth Secondary: Existing freight track would be upgraded to Class 5. The line would be restored from its present terminus in Westport to the east side of Fall River. The line would be double track for a short distance west of New Bedford (MP 0.36 to MP 0.69). The remainder would be single track, with a passing siding in Dartmouth (MP 4.17 to MP 6.67).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Dartmouth (1), Westport (1), and Fall River (1). No existing commuter rail stations would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Dartmouth Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. Property acquisition would not be needed.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Attleboro Bypass: The Attleboro Bypass would be constructing along an existing National Grid right-of-way. Modifications to the existing high voltage lines might be required. The right-of-way passes through several wetlands, which would require filling, and crosses Chartley Pond, part of which might be filled or spanned with a trestle. A moderate amount of property acquisition would be required. However, disruption to the existing transportation system would be minimal.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Dartmouth Secondary: Construction on the New Bedford Secondary and Dartmouth Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Dartmouth Secondary, because tracks would be located on existing

embankments. A moderate amount of property acquisition would be required to restore the western end of the Dartmouth Secondary, especially in Fall River.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 1 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be new service, not extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 4

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 4. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 4 consists of bus rapid transit (BRT) along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and Attleboro Station, the Attleboro Secondary between Attleboro Station and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 4, the following assumptions were made:

- New 24-foot wide BRT roadway to be constructed adjacent to existing freight rail lines, in order to allow freight operations to continue
- All undergrade bridges to be new structures, adjacent to existing structures if applicable; existing freight rail bridges would not be modified
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Attleboro Station and South Station to accommodate Boston-bound riders
- The busway may terminate just outside urban centers like New Bedford and Fall River, allowing buses to travel on local streets and obviating the need for tremendously expensive busway structures in city centers
- Maximum speed of 55 mph on BRT lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Initial operating plan headways of 5 minutes on the trunk and 10 minutes on the branches in both directions during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 106 and 103 minutes, respectively. One transfer would be required at Attleboro Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. BRT

would not be subject to delays from traffic congestion except in areas where it would operate on city streets. The impact of these sections on travel time and reliability was assumed to be negligible.

Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the BRT line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive buses have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the BRT line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Due to unacceptably long travel times, the need to transfer, and only medium reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 5

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 5. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 5 consists of diesel multiple unit (DMU) commuter rail along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and Attleboro Station, the Attleboro Secondary between Attleboro Station and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 5, the following assumptions were made:

- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Attleboro Station and South Station to accommodate Boston-bound riders
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction)
    - 24 trips in each direction during the peak two hours
- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours
- All trains travel the entire way from New Bedford or Fall River to Attleboro, so only one transfer is required for travel between Boston and the South Coast

Travel Time

Travel times from New Bedford and Fall River to Boston would be 97 and 95 minutes, respectively. One transfer would be required at Attleboro Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive DMU trains have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the DMU line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Conceptual Layout

Northeast Corridor: No improvements would be required, except modifications to Attleboro Station to provide for transfers. It is assumed that DMU platforms would be located on the Attleboro Secondary, as close to the Northeast Corridor as practicable, with a connecting walkway between the DMU platforms and the commuter rail platforms. This eliminates the need for DMU trains to enter the corridor.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Attleboro Station and Weir Junction (MP 0.00 to MP 9.40). Modifications would be required to the existing Attleboro Station to accommodate DMU trains, which would use a separate platform from the conventional diesel commuter rail trains on the Providence Line. The separate platform would be necessary due to the high frequency of service on the DMU line.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis south of Myricks Junction, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station at Attleboro would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the DMU lines. Overnight layover facilities would be constructed at undetermined locations in Attleboro, Fall River, and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing passenger services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the Attleboro Secondary and the New Bedford Secondary would also some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated because of existing services, but restricted to modifications to Attleboro Station. Property acquisition might be needed at Attleboro Station, depending on the platform configuration.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be considerably greater than for conventional commuter rail because of the need to provide two tracks throughout. Property acquisition would not be needed, except at Attleboro Station, where it might be required depending on the platform configuration.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 5 was assumed to be 15 minute peak headways on the branches, resulting in 7.5 minute headways on the trunk. This provides eight peak period trips to each terminal. It was assumed that trains would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three single-deck coaches per train, is 4,416 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 6

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 6. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 6 consists of diesel multiple unit (DMU) commuter rail along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and Attleboro Station, the Attleboro Secondary between Attleboro Station and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, the Fall River Secondary between Myricks Junction and downtown Fall River, and the Dartmouth Secondary between downtown New Bedford and the east side of Fall River. This routing is shown on an attached graphic. This alternative is equivalent to Alternative 5, with the addition of the Fall River – New Bedford line.

Design Assumptions

For Alternative 6, the following assumptions were made:

- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Attleboro Station and South Station to accommodate Boston-bound riders
- Due to topographic challenges, there would be two separate stations in Fall River, one on the west side of the city on the Fall River Secondary, and one on the east side of town on the Dartmouth Secondary
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction); design headway of 5 minutes on the Fall River – New Bedford line
    - 24 trips in each direction during the peak two hours

- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours; initial operating plan headway of 7.5 minutes on the Fall River – New Bedford line in both directions during the peak two hours
- All trains on the Fall River Secondary and New Bedford Secondary branches travel the entire way from New Bedford or Fall River to Attleboro, so only one transfer is required for travel between Boston and stations on these branches
- Trains on the Fall River – New Bedford Line travel only between Fall River and New Bedford; two transfers would be required to reach Boston from a station on this line, one in Attleboro and one in New Bedford

Travel Time

Travel times from New Bedford and Fall River to Boston would be 97 and 95 minutes, respectively. Travel time from New Bedford to Fall River would be 16 minutes. One transfer would be required at Attleboro Station, except for stations on the Fall River – New Bedford Line, from which two transfers would be required. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive DMU trains have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the DMU line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM. The transfer time in New Bedford between the two DMU lines was assumed to be 5 minutes.

Conceptual Layout

Northeast Corridor: No improvements would be required, except modifications to Attleboro Station to provide for transfers. It is assumed that DMU platforms would be located on the Attleboro Secondary, as close to the Northeast Corridor as practicable, with a connecting walkway between the DMU platforms and the commuter rail platforms. This eliminates the need for DMU trains to enter the corridor.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Attleboro Station and Weir Junction (MP 0.00 to MP 9.40). Modifications would be required to the existing Attleboro Station to accommodate DMU trains, which would use a separate platform from the conventional diesel commuter rail trains on the Providence Line. The separate platform would be necessary due to the high frequency of service on the DMU line.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis south of Myricks Junction, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Dartmouth Secondary: Existing freight track would be upgraded to Class 5. The abandoned portion of the line between Westport and Fall River would be restored. The line would entirely double track between the New Bedford Secondary (MP 0.00) and Route 24 in Fall River (MP 11.48). The remainder of the line in Fall River (MP 11.48 to MP 12.45) would be single track, in order to minimize the impact to the Quequechan River and downtown Fall River.

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), Fall River (2,

one on west side and one on east side), Dartmouth (1), and Westport (1). The existing commuter rail station at Attleboro would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the DMU lines. Overnight layover facilities would be constructed at undetermined locations in Attleboro, Fall River, and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart. Walls are assumed to be required in areas of widening or new construction through wetlands, or where required by topography.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing passenger services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the Attleboro Secondary, New Bedford Secondary, and Dartmouth Secondary would also some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated because of existing services, but restricted to modifications to Attleboro Station. Property acquisition might be needed at Attleboro Station, depending on the platform configuration.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be considerably greater than for conventional commuter rail because of the need to provide two tracks throughout. Property acquisition would not be needed, except at Attleboro Station, where it might be required depending on the platform configuration.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Dartmouth Secondary: Construction on the Dartmouth Secondary would be relatively simple. Massachusetts Coastal Railroad runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources might be considerable, because of the need for two tracks, and the proximity of the route in Fall River to South Watuppa Pond and the Quequechan River. A moderate level of property acquisition would be needed to restore the right-of-way through Westport and Fall River.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 6 was assumed to be 15 minute peak headways on the Fall River Secondary and New Bedford Secondary branches, resulting in 7.5 minute headways on the trunk. Headways of 7.5 minutes were assumed on the Fall River – New Bedford line. This provides eight peak period trips between Attleboro and each terminal and 16 peak period trips on the Fall River – New Bedford Line. It was assumed that trains would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three single-deck coaches per train, is 4,416 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 7

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 7. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 7 consists of electric commuter rail along the Attleboro Corridor. This alternative includes the Northeast Corridor between South Station and a point near the Attleboro/Mansfield town line, a new track bypass (Attleboro Bypass) along the National Grid right-of-way in Attleboro and Norton, the Attleboro Secondary between a point near the Attleboro/Norton town line and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 7, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- All existing freight track replaced with Class 7 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 110 mph on new lines; travel times on Northeast Corridor north of Route 128 Station per Amtrak schedules for trains stopping at Route 128 Station and Back Bay Station, as of February 2008; travel times on Northeast Corridor south of Route 128 Station limited by maximum speed, track geometry, and station stops only
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 55 and 56 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Conceptual Layout

Northeast Corridor: Catenary wire would be strung along Track 3 between Tower 1 interlocking (MP 228.50) and Readville (MP 219.00). The overhead supports required are in place along this section; all that would be needed is the wire and any necessary power infrastructure. From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed, along with new catenary supports and wires for the track. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Attleboro Bypass: A new single track Class 7 line would be constructed roughly following the National Grid right-of-way from the Northeast Corridor (MP 0.00) to the Attleboro Secondary (MP 2.62). New catenary supports, wires, and electric substations would be constructed along the length of the line. Part of Chartley Pond in Norton might be affected where the line would tie into the Attleboro Secondary.

Attleboro Secondary: Existing freight track would be upgraded to Class 7. The line would be single track for the entire length between the Attleboro Bypass and Weir Junction, with a passing siding in Norton (MP 4.23 to MP 7.63). New catenary supports, wires, and electric substations would be constructed along the length of the line.

New Bedford Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations. New catenary supports, wires, and electric substations would be constructed along the length of the line.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with a passing siding in Fall River (MP 9.56 to MP 11.11). New catenary supports, wires, and electric substations would be constructed along the length of the line.

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). No existing commuter rail stations would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Locomotive maintenance would be at existing Amtrak facilities through an agreement with the MBTA; coach maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a moderate volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. However, the MBTA does not currently operate electric trains, so there would be some knowledge gap. Existing layovers and maintenance facilities are designed for diesel engines, though it assumed a maintenance agreement could be reached with Amtrak, which has an appropriate facility, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches, with some training.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

The use of electric trains on the Northeast Corridor would be beneficial, because it would allow the MBTA and Amtrak to operate at less disparate speeds. This would decrease the need for a large but useless gap opening up between an Amtrak train and a following MBTA train, or a large but useless gap closing up between an MBTA train and a following Amtrak train. This would improve the utilization of existing capacity on the corridor.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. Property acquisition would not be needed.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Attleboro Bypass: The Attleboro Bypass would be constructing along an existing National Grid right-of-way. Modifications to the existing high voltage lines might be required. The right-of-way passes through several wetlands, which would require filling, and crosses Chartley Pond, part of which might be filled or spanned with a trestle. A moderate amount of property acquisition would be required. However, disruption to the existing transportation system would be minimal.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: The need to design and construct electrification infrastructure might represent a challenging or complicated aspect to the project, making it more difficult to complete the project in four years.

Operating Plan

The initial operating plan for Alternative 7 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be new service, not extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 11

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 11. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 11 consists of conventional diesel commuter rail along the Mansfield Corridor. This alternative includes the Northeast Corridor between South Station and Mansfield Junction, the former right-of-way between Mansfield Junction and Attleboro Junction, the Attleboro Secondary between Attleboro Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 11, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- Major modifications required in Mansfield Center to restore former right-of-way
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 70 and 69 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Conceptual Layout

Northeast Corridor: From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed. Catenary supports and wire would not be constructed for this track, but modifications to the existing supports may be required. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Mansfield Line: The former right-of-way through Mansfield, Norton, and Taunton would be restored. The line would be single track from Mansfield Junction (MP 0.00) to Attleboro Junction (MP 8.92), with a passing siding in Norton (MP 4.56 to MP 7.02).

The existing station at Mansfield would be reconstructed to allow restoration of the line. The Route 106 Underpass would be extended east, under the restored line, requiring major reconstruction of Route 106 and North Main Street. Property acquisitions would be required on all sides of the intersection. It is also assumed that property acquisitions would be required on both sides of the former right-of-way (Old Colony Road) between Route 106 and East Street. All grade crossings (intersections on Old Colony Road) would be closed, except Thomas Street, North Main Street, and East Street. The bike path currently occupying a portion of the right-of-way would be eliminated. A major grade separated structure would be required at I-495.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be single track for the entire length between Attleboro Junction and Weir Junction.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station in Mansfield would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing commuter services and on the city street network of downtown Mansfield. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

The restoration of the line through Mansfield would negatively impact the fabric of city streets in the community. Some grade crossings would be closed, and Old Colony Avenue would become a rail line with a frontage road. This would impact access to abutting properties.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. Property acquisition would not be needed.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Mansfield Line: The Mansfield Line would be constructed along an abandoned right-of-way between Taunton and Mansfield Center. Restoring this line would be difficult for several reasons. The right-of-way in downtown Mansfield has been converted into a city street, abutted by many buildings and driveways. Part of the right-of-way south of Mansfield Center has been converted to a bike path, and a regional sewer interceptor runs along the line. Major property acquisition would be required.

Extensive work would be required where the line meets the Northeast Corridor. After the line was abandoned, a grade separation was constructed where the Northeast Corridor crosses Route 106. This resulted in grades that are inadequate for both an at-grade crossing and a grade separation. To restore the line, Route 106 would be lowered, requiring demolition of many buildings. Again, major property acquisition would be necessary.

A new grade separated structure would be required at I-495. At the time I-495 was constructed, the line was already abandoned, and no provision for restoration of the line was made. The grade of the abandoned line and the grade of I-495 are therefore approximately equal. The grade of I-495 is constrained to the south of the line by an overhead bridge; the grade of the line is constrained by grade crossings in both directions. Constructing a new grade separation at this location would

require raising one facility and lowering the other, causing major disruption to I-495 and creating the potential for flooding at the low point on the lowered facility.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: Restoration of the line between the Northeast Corridor and I-495, including through downtown Mansfield, might represent a challenging or complicated aspect, making it more difficult to complete the project in four years.

Due to unacceptable construction impacts in downtown Mansfield, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 12

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 12. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 12 consists of bus rapid transit (BRT) along the Mansfield Corridor. This alternative includes the Northeast Corridor between South Station and Mansfield Junction, the former right-of-way between Mansfield Junction and Attleboro Junction, the Attleboro Secondary between Attleboro Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 12, the following assumptions were made:

- New 24-foot wide BRT roadway to be constructed adjacent to existing freight rail lines, in order to allow freight operations to continue
- New 24-foot wide BRT roadway to be constructed on existing abandoned railroad embankment without provision for restoration of rail line
- All undergrade bridges to be new structures, adjacent to existing structures if applicable; existing freight rail bridges would not be modified
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Attleboro Station and South Station to accommodate Boston-bound riders
- The busway may terminate just outside urban centers like New Bedford and Fall River, allowing buses to travel on local streets and obviating the need for tremendously expensive busway structures in city centers
- Maximum speed of 55 mph on BRT lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Initial operating plan headways of 5 minutes on the trunk and 10 minutes on the branches in both directions during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 97 and 94 minutes, respectively. One transfer would be required at Mansfield Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. BRT would not be subject to delays from traffic congestion except in areas where it would operate on city streets. The impact of these sections on travel time and reliability was assumed to be negligible.

Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the BRT line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive buses have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the BRT line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Conceptual Layout

Northeast Corridor: No improvements would be required.

Mansfield Line: The former right-of-way through Mansfield, Norton, and Taunton would be restored and converted into a new two-lane busway. The existing station at Mansfield would be modified to allow bus pick-up and drop-off on Mansfield Avenue. The Route 106 Underpass would not be modified; the busway would end at the intersection of Route 106 and Main Street. It is assumed that property acquisitions would be required on both sides of the former right-of-way (Old Colony Road) between Route 106 and East Street in order to accommodate the busway. All city street intersections on Old Colony Road would be closed, except Thomas Street, North Main Street, and East Street. The bike path currently occupying a portion of the right-of-way would be eliminated. A major grade separated structure would be required at I-495.

Attleboro Secondary: A new two-lane busway would be constructed adjacent to the existing freight track along the right-of-way. The busway would be on the east side of the existing track so that no grade crossing would be necessary where the busway diverges onto the Mansfield Line. Existing tracks would not be modified. Property acquisitions might be needed in downtown Taunton as well, in locations where the right-of-way is not wide enough to accommodate both the existing freight tracks and the busway.

New Bedford Secondary: A new two-lane busway would be constructed adjacent to the existing freight track along the right-of-way. The busway would be on the east side of the existing track so that no grade crossing would be necessary where the busway connects to the section along the Attleboro Secondary. Existing tracks would not be modified.

Fall River Secondary: A new two-lane busway would be constructed adjacent to the existing freight track along the right-of-way. The busway would be on the east side of the existing track to minimize impacts to the Assonet River in Freetown, where the river borders the west side of the right-of-way. Existing tracks would not be modified. A grade crossing of the busway at the New Bedford branch would be required at Myricks Junction, because the trunk line would be on the east side of those tracks.

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station in Mansfield would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the busway. Overnight layover facilities would be constructed at undetermined locations in Mansfield, Fall River, and New Bedford.

Typical Section

Typical sections include the following:

- Single-track and double-track rail with busway sections in fill or cut with slopes
- Single-track and double-track rail with busway sections in fill or cut with retaining walls

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would not be compatible with existing infrastructure. It would be a new rubber-tired mode along existing rail transportation corridors. Despite the fact that there is a large volume of existing institutional knowledge about the construction, operation, and maintenance of bus routes in the MBTA, this service would be isolated from other MBTA bus operations. Therefore, it is unlikely that equipment or crews could be moved between this service and other bus routes.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing commuter services and on the city street networks of downtown Mansfield and downtown Taunton. Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

The restoration of the line as a busway through Mansfield would negatively impact the fabric of city streets in the community. Some intersections would be closed, and Old Colony Avenue would become a busway with a frontage road. This would impact access to abutting properties. Impacts would also occur in Taunton, where existing grade crossings that currently only see a few trains a day would see a bus with signal priority in each direction every five minutes. This would reduce the capacity of these streets, increasing the potential for traffic congestion in the city.

Construction Impacts

Mansfield Line: The Mansfield Line would be constructed along an abandoned right-of-way between Taunton and Mansfield Center. Restoring this line as a busway would be difficult for several reasons. The right-of-way in downtown Mansfield has been converted into a city street, abutted by many buildings and driveways. Part of the right-of-way south of Mansfield Center has been converted to a bike path, and a regional sewer interceptor runs along the line. Major property acquisition would be required.

A new grade separated structure would be required at I-495. At the time I-495 was constructed, the line was already abandoned, and no provision for restoration of the line was made. The grade of the abandoned line and the grade of I-495 are therefore approximately equal. The grade of I-495 is constrained to the south of the line by an overhead bridge; the grade of the former rail line is constrained by grade crossings in both directions. Constructing a new grade separation at this location would require raising one facility and lowering the other, causing major disruption to I-495 and creating the potential for flooding at the low point on the lowered facility.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be large, because the busway would be adjacent to existing tracks, requiring a major widening of the embankment. A moderate level of property acquisition might be needed in downtown Taunton, in places where the right-of-way is not wide enough for tracks and the busway.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be large, because

the busway would be adjacent to existing tracks, requiring a major widening of the embankment. Property acquisition would probably not be needed.

Construction Time Frame: Restoration of the line between the Northeast Corridor and I-495, including through downtown Mansfield, might represent a challenging or complicated aspect, making it more difficult to complete the project in four years.

Due to unacceptable construction impacts in downtown Mansfield, this alternative was removed from further consideration.

Transportation
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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 13

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 13. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 13 consists of diesel multiple unit (DMU) commuter rail along the Mansfield Corridor. This alternative includes the Northeast Corridor between South Station and Mansfield Junction, the former right-of-way between Mansfield Junction and Attleboro Junction, the Attleboro Secondary between Attleboro Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 13, the following assumptions were made:

- Major modifications required in Mansfield Center to restore former right-of-way
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Mansfield Station and South Station to accommodate Boston-bound riders
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction)
    - 24 trips in each direction during the peak two hours
- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours
- All trains travel the entire way from New Bedford or Fall River to Mansfield, so only one transfer is required for travel between Boston and the South Coast

Travel Time

Travel times from New Bedford and Fall River to Boston would be 87 and 86 minutes, respectively. One transfer would be required at Mansfield Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive DMU trains have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the DMU line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Conceptual Layout

Northeast Corridor: No improvements would be required, except modifications to Mansfield Station to provide a cross-platform transfer. It is assumed that DMU platforms would be located on the Mansfield Line, as close to the Northeast Corridor as practicable, with a connecting walkway between the DMU platforms and the commuter rail platforms. This eliminates the need for DMU trains to enter the corridor.

Mansfield Line: The former right-of-way through Mansfield, Norton, and Taunton would be restored. The entire line would be double track for the entire length from Mansfield Center to Attleboro Junction (MP 0.00 to MP 8.92). The existing station at Mansfield would be reconstructed to allow restoration of the line and construction of a separate platform for DMU trains. The separate platform would be necessary due to the high frequency of service on the DMU line.

The Route 106 Underpass would be extended east, under the restored line, requiring major reconstruction of Route 106 and North Main Street. Property acquisitions would be required on all sides of the intersection. It also assumed that property acquisitions would be required on both sides of the former right-of-way (Old Colony Road) between Route 106 and East Street. All grade crossings (intersections on Old Colony Road) would be closed, except Thomas Street, North Main Street, and East Street. The bike path currently occupying a portion of the right-of-way would be eliminated. A major grade separated structure would be required at I-495.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Attleboro Junction and Weir Junction.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis south of Myricks Junction, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station at Mansfield would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the DMU lines. Overnight layover facilities would be constructed at undetermined locations in Mansfield, Fall River, and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing passenger services and on the city street network of downtown Mansfield. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the Attleboro Secondary and the New Bedford Secondary would also some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for longer trains and/or trains with more bi-level coaches.

The restoration of the line through Mansfield would negatively impact the fabric of city streets in the community. Some grade crossings would be closed, and Old Colony Avenue would become a rail line with a frontage road. This would impact access to abutting properties.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated because of existing services, but restricted to modifications to Mansfield Station.

Mansfield Line: The Mansfield Line would be constructed along an abandoned right-of-way between Taunton and Mansfield Center. Restoring this line would be difficult for several reasons. The right-of-way in downtown Mansfield has been converted into a city street, abutted by many buildings and driveways. Part of the right-of-way south of Mansfield Center has been converted to a bike path, and a regional sewer interceptor runs along the line. Providing a high frequency service, like DMU commuter rail, would be even more disruptive than conventional commuter rail because of the need to provide two tracks through this area. Major property acquisition would be required.

Extensive work would be required where the line meets the Northeast Corridor. After the line was abandoned, a grade separation was constructed where the Northeast Corridor crosses Route 106. This resulted in grades that are inadequate for both an at-grade crossing and a grade separation. To restore the line, Route 106 would be lowered, requiring demolition of many buildings. Again, major property acquisition would be necessary.

A new grade separated structure would be required at I-495. At the time I-495 was constructed, the line was already abandoned, and no provision for restoration of the line was made. The grade of the

abandoned line and the grade of I-495 are therefore approximately equal. The grade of I-495 is constrained to the south of the line by an overhead bridge; the grade of the line is constrained by grade crossings in both directions. Constructing a new grade separation at this location would require raising one facility and lowering the other, causing major disruption to I-495 and creating the potential for flooding at the low point on the lowered facility.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be considerably greater than for conventional commuter rail because of the need to provide two tracks throughout. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Construction Time Frame: Restoration of the line between the Northeast Corridor and I-495, including through downtown Mansfield, might represent a challenging or complicated aspect, making it more difficult to complete the project in four years.

Due to unacceptable construction impacts in downtown Mansfield, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 14

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 14. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 14 consists of diesel multiple unit commuter rail along the Mansfield Corridor. This alternative includes the Northeast Corridor between South Station and Mansfield Junction, the former right-of-way between Mansfield Junction and Attleboro Junction, the Attleboro Secondary between Attleboro Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, the Fall River Secondary between Myricks Junction and downtown Fall River, and the Dartmouth Secondary between downtown New Bedford and the east side of Fall River. This routing is shown on an attached graphic. This alternative is equivalent to Alternative 13, with the addition of the Fall River – New Bedford line.

Design Assumptions

For Alternative 14, the following assumptions were made:

- Major modifications required in Mansfield Center to restore former right-of-way
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Northeast Corridor between Mansfield Station and South Station to accommodate Boston-bound riders
- Due to topographic challenges, there would be two separate stations in Fall River, one on the west side of the city on the Fall River Secondary, and one on the east side of town on the Dartmouth Secondary
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction); design headway of 5 minutes on the Fall River – New Bedford line

- 24 trips in each direction during the peak two hours

- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours; initial operating plan headway of 7.5 minutes on the Fall River – New Bedford line in both directions during the peak two hours
- All trains on the Fall River Secondary and New Bedford Secondary branches travel the entire way from New Bedford or Fall River to Mansfield, so only one transfer is required for travel between Boston and stations on these branches
- Trains on the Fall River – New Bedford Line travel only between Fall River and New Bedford; two transfers would be required to reach Boston from a station on this line, one in Mansfield and one in New Bedford

Travel Time

Travel times from New Bedford and Fall River to Boston would be 87 and 86 minutes, respectively. Travel time from New Bedford to Fall River would be 16 minutes. One transfer would be required at Mansfield Station, except for stations on the Fall River – New Bedford Line, from which two transfers would be required. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 12.5 minutes, based on the difference between the average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive DMU trains have transfer times of 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 12.5 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the DMU line at 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM. The transfer time in New Bedford between the two DMU lines was assumed to be 5 minutes.

Conceptual Layout

Northeast Corridor: No improvements would be required, except modifications to Mansfield Station to provide a cross-platform transfer. It is assumed that DMU platforms would be located on the Mansfield Line, as close to the Northeast Corridor as practicable, with a connecting walkway between the DMU platforms and the commuter rail platforms. This eliminates the need for DMU trains to enter the corridor.

Mansfield Line: The former right-of-way through Mansfield, Norton, and Taunton would be restored. The entire line would be double track for the entire length from Mansfield Center to Attleboro Junction (MP 0.00 to MP 8.92). The existing station at Mansfield would be reconstructed to allow restoration of the line and construction of a separate platform for DMU trains. The separate platform would be necessary due to the high frequency of service on the DMU line.

The Route 106 Underpass would be extended east, under the restored line, requiring major reconstruction of Route 106 and North Main Street. Property acquisitions would be required on all sides of the intersection. It also assumed that property acquisitions would be required on both sides of the former right-of-way (Old Colony Road) between Route 106 and East Street. All grade crossings (intersections on Old Colony Road) would be closed, except Thomas Street, North Main Street, and East Street. The bike path currently occupying a portion of the right-of-way would be eliminated. A major grade separated structure would be required at I-495.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Attleboro Junction and Weir Junction.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis south of Myricks Junction, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Dartmouth Secondary: Existing freight track would be upgraded to Class 5. The abandoned portion of the line between Westport and Fall River would be restored. The line would entirely double track between the New Bedford Secondary (MP 0.00) and Route 24 in Fall River (MP 11.48). The remainder of the line in Fall River (MP 11.48 to MP 12.45) would be single track, in order to minimize the impact to the Quequechan River and downtown Fall River.

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), Fall River (2, one on west side and one on east side), Dartmouth (1), and Westport (1). The existing commuter rail station at Mansfield would be reconstructed.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing passenger services and on the city street network of downtown Mansfield. The existing freight services on the Attleboro Secondary, New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the Attleboro Secondary, New Bedford Secondary, and Dartmouth Secondary would also some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for longer trains and/or trains with more bi-level coaches.

The restoration of the line through Mansfield would negatively impact the fabric of city streets in the community. Some grade crossings would be closed, and Old Colony Avenue would become a rail line with a frontage road. This would impact access to abutting properties.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated because of existing services, but restricted to modifications to Mansfield Station.

Mansfield Line: The Mansfield Line would be constructed along an abandoned right-of-way between Taunton and Mansfield Center. Restoring this line would be difficult for several reasons. The right-of-way in downtown Mansfield has been converted into a city street, abutted by many buildings and driveways. Part of the right-of-way south of Mansfield Center has been converted to a bike path, and a regional sewer interceptor runs along the line. Providing a high frequency service, like DMU commuter rail, would be even more disruptive than conventional commuter rail because of the need to provide two tracks through this area. Major property acquisition would be required.

Extensive work would be required where the line meets the Northeast Corridor. After the line was abandoned, a grade separation was constructed where the Northeast Corridor crosses Route 106. This resulted in grades that are inadequate for both an at-grade crossing and a grade separation. To restore the line, Route 106 would be lowered, requiring demolition of many buildings. Again, major property acquisition would be necessary.

A new grade separated structure would be required at I-495. At the time I-495 was constructed, the line was already abandoned, and no provision for restoration of the line was made. The grade of the abandoned line and the grade of I-495 are therefore approximately equal. The grade of I-495 is constrained to the south of the line by an overhead bridge; the grade of the line is constrained by grade crossings in both directions. Constructing a new grade separation at this location would require raising one facility and lowering the other, causing major disruption to I-495 and creating the potential for flooding at the low point on the lowered facility.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be considerably greater than for conventional commuter rail because of the need to provide two tracks throughout. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Dartmouth Secondary: Construction on the Dartmouth Secondary would be relatively simple. Mass Coastal Railroad runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources might be considerable, because of the need for two tracks, and the proximity of the route in Fall River to South Watuppa Pond and the Quequechan River. A moderate level of property acquisition would be needed to restore the right-of-way through Westport and Fall River.

Construction Time Frame: Restoration of the line between the Northeast Corridor and I-495, including through downtown Mansfield, might represent a challenging or complicated aspect, making it more difficult to complete the project in four years.

Due to unacceptable construction impacts in downtown Mansfield, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 15

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 15. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 15 consists of electric commuter rail along the Mansfield Corridor. This alternative includes the Northeast Corridor between South Station and Mansfield Junction, the former right-of-way between Mansfield Junction and Attleboro Junction, the Attleboro Secondary between Attleboro Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 15, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, third track required on Northeast Corridor between Readville and Canton Junction
- Major modifications required in Mansfield Center to restore former right-of-way
- All existing freight track replaced with Class 7 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 110 mph on new lines; travel times on Northeast Corridor north of Route 128 Station per Amtrak schedules for trains stopping at Route 128 Station and Back Bay Station, as of February 2008; travel times on Northeast Corridor south of Route 128 Station limited by maximum speed, track geometry, and station stops only
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 50 and 51 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Conceptual Layout

Northeast Corridor: Catenary wire would be strung along Track 3 between Tower 1 interlocking (MP 228.50) and Readville (MP 219.00). The overhead supports required are in place along this section; all that would be needed is the wire and any necessary power infrastructure. From Readville (MP 219.00) to Canton Junction (MP 214.33) a third track would be constructed, along with new catenary supports and wires for the track. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required. It is assumed that existing bridges can be widened and that no modifications to Route 128 Station are required, because when the station was constructed, provision was made for a third track.

Mansfield Line: The former right-of-way through Mansfield, Norton, and Taunton would be restored. The line would be single track from Mansfield Junction (MP 0.00) to Attleboro Junction (MP 8.92), with a passing siding in Norton (MP 4.14 to MP 7.45). New catenary supports, wires, and electric substations would be constructed along the length of the line.

The existing station at Mansfield would be reconstructed to allow restoration of the line. The Route 106 Underpass would be extended east, under the restored line, requiring major reconstruction of Route 106 and North Main Street. Property acquisitions would be required on all sides of the intersection. It also assumed that property acquisitions would be required on both sides of the former right-of-way (Old Colony Road) between Route 106 and East Street. All grade crossings (intersections on Old Colony Road) would be closed, except Thomas Street, North Main Street, and East Street. The bike path currently occupying a portion of the right-of-way would be eliminated. A major grade separated structure would be required at I-495.

Attleboro Secondary: Existing freight track would be upgraded to Class 7. The line would be single track for the entire length between Attleboro Junction and Weir Junction. New catenary supports, wires, and electric substations would be constructed along the length of the line.

New Bedford Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations. New catenary supports, wires, and electric substations would be constructed along the length of the line.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with a passing siding in Fall River (MP 9.56 to MP 11.11). New catenary supports, wires, and electric substations would be constructed along the length of the line.

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station in Mansfield would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Locomotive maintenance would be at existing Amtrak facilities through an agreement with the MBTA; coach maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a moderate volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. However, the MBTA does not currently operate electric trains, so there would be some knowledge gap. Existing layovers and maintenance facilities are designed for diesel engines, though it assumed a maintenance agreement could be reached with Amtrak, which has an appropriate facility, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches, with some training.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing commuter services and on the city street network of downtown Mansfield. The existing freight services on the Attleboro Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the future expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Canton Junction to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

The restoration of the line through Mansfield would negatively impact the fabric of city streets in the community. Some grade crossings would be closed, and Old Colony Avenue would become a rail line with a frontage road. This would impact access to abutting properties.

The use of electric trains on the Northeast Corridor would be beneficial, because it would allow the MBTA and Amtrak to operate at less disparate speeds. This would decrease the need for a large but useless gap opening up between an Amtrak train and a following MBTA train, or a large but useless gap closing up between an MBTA train and a following Amtrak train. This would improve the utilization of existing capacity on the corridor.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. Property acquisition would not be needed.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Mansfield Line: The Mansfield Line would be constructed along an abandoned right-of-way between Taunton and Mansfield Center. Restoring this line would be difficult for several reasons. The right-of-way in downtown Mansfield has been converted into a city street, abutted by many buildings and driveways. Part of the right-of-way south of Mansfield Center has been converted to a bike path, and a regional sewer interceptor runs along the line. Major property acquisition would be required.

Extensive work would be required where the line meets the Northeast Corridor. After the line was abandoned, a grade separation was constructed where the Northeast Corridor crosses Route 106. This resulted in grades that are inadequate for both an at-grade crossing and a grade separation. To restore the line, Route 106 would be lowered, requiring demolition of many buildings. Again, major property acquisition would be necessary.

A new grade separated structure would be required at I-495. At the time I-495 was constructed, the line was already abandoned, and no provision for restoration of the line was made. The grade of the abandoned line and the grade of I-495 are therefore approximately equal. The grade of I-495 is constrained to the south of the line by an overhead bridge; the grade of the line is constrained by grade crossings in both directions. Constructing a new grade separation at this location would require raising one facility and lowering the other, causing major disruption to I-495 and creating the potential for flooding at the low point on the lowered facility.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: Restoration of the line between the Northeast Corridor and I-495, including through downtown Mansfield, might represent a challenging or complicated aspect, making it more difficult to complete the project in four years.

Due to unacceptable construction impacts in downtown Mansfield, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 17

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 17. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 17 consists of conventional diesel commuter rail along the Middleborough Corridor. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 17, the following assumptions were made:

- Based on operating plan and preliminary operations analysis, double track of Old Colony Main Line required between South Station and Braintree Junction
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 82 and 81 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Old Colony Main Line: From South Station (MP 0.00) to Braintree Junction (MP 11.55), both single track sections would be eliminated. In Boston (MP 1.40 to MP 4.05), the existing cross section is two Red Line Ashmont Branch tracks, one Old Colony Main Line track, and two Red Line Braintree Branch tracks. This section would be reconstructed as three Red Line tracks and two Old Colony Main Line tracks. In Quincy and Braintree (MP 6.19 to MP 10.65), the existing cross section is one Old Colony Main Line track and two Red Line tracks. Between Holbrook Road and Adams Street, a second Old Colony Main Line track would be constructed on the west side of the right-of-way. Between Adams Street and Water Street, the Red Line would be placed in a tunnel, and three tracks provided on the service for the Old Colony Main Line. Between Water Street and Braintree Junction, a second Old Colony Main Line track would be constructed on the east side of the right-of-way. The work required and construction staging for this section are detailed in a memorandum titled "Preliminary Analysis of Old Colony Main Line Improvements".

This work would require reconstructing the existing commuter rail stations at JFK/UMass and Quincy Center. No work would be required at the station at Braintree.

Middleborough Line: Preliminary operations analysis shows that, in general, the sidings on the Middleborough Line are sufficient to support the desired headway. At the southern end of the line (MP 31.23 to MP 34.71), a second track would be constructed as part of a passing siding, the remainder of which would be along the Middleborough Secondary.

The existing station at Middleborough/Lakeville would be relocated, because it is located on the Buzzards Bay Secondary, south of the junction between the Middleborough Line, the Middleborough Secondary, and the Buzzards Bay Secondary. If the station were not relocated, a reverse move would be required.

Middleborough Secondary: Existing freight track would be upgraded to Class 5. The line would be mostly single track (MP 20.47 to MP 16.08), with the end near Middleborough Junction (MP 21.20 to MP 20.47) and the end near Cotley Junction (MP 16.08 to MP 13.30) having double track sections.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Cotley Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail stations at JFK/UMass, Quincy Center, and Middleborough/Lakeville would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls
- Triple-track sections in cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Middleborough Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Middleborough Line would not affect existing service to stations between Middleborough/Lakeville Station and South Station. The extension of the lines might require longer trains and/or trains with more bi-level coaches, which could present an operational problem at South Station, where Tracks 12 and 13 are not long enough to accommodate trains with more than six coaches.

Double-track on the Old Colony Main Line would be sufficient to provide service to New Bedford and Fall River via the Middleborough Line. Two tracks would not, however, provide enough capacity on the Old Colony Main Line to allow the addition of another branch to Wareham or Buzzards Bay in the future. The infrastructure needed to allow for future implementation of this service is described as part of Alternative 63. In addition, increasing the number of trains on the Middleborough Line might have a negative effect on reliability.

Construction Impacts

Old Colony Main Line: The construction of a second track on the Old Colony Main Line would be very complicated, causing disruption to Old Colony commuter rail service, Red Line rapid transit service, and local traffic in Quincy and Braintree. A high level of property acquisition would be required. The impacts of this segment are detailed in a memo titled "Preliminary Analysis of Old Colony Main Line Improvements".

Middleborough Secondary: Construction on the Middleborough Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to a few trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on existing embankments. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except

in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: The construction of a second track on the Old Colony Main Line through Quincy and Braintree is a challenging and complicated design and construction aspect to the project, requiring difficult construction and extensive staging. It is anticipated that the project could not be completed in four years.

Due to unacceptable construction impacts to the Old Colony Main Line and the Red Line, and the inability to reach completion within four years, this alternative was removed from further consideration. However, at the request of the Executive Office of Transportation, this alternative was carried through into the next phase of the project. The alternative was therefore further analyzed, as described below.

Operating Plan

The initial operating plan for Alternative 17 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. Some trains would be new service, while others would be extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 18

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 18. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 18 consists of conventional diesel commuter rail along the Middleborough Corridor with conversion of the Red Line Braintree Branch to commuter rail. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic. This alternative is equivalent to Alternative 17, with the exception of the work between Braintree Junction and South Station.

Assumptions

For Alternative 18, the following assumptions were made:

- Red Line Braintree Branch tracks between Braintree Station and Columbia Junction converted to commuter rail tracks
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 82 and 81 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Old Colony Main Line: From South Station (MP 0.00) to Braintree Junction (MP 11.55), the Old Colony Main Line would be upgraded to have three tracks. North of Columbia Junction, this would require widening, property acquisitions, and realignment of Red Line and freight tracks. Between Columbia Junction and Braintree Station, the Red Line Braintree Branch would be eliminated and replaced with two commuter rail tracks.

This work would require reconstructing the existing commuter rail stations at JFK/UMass, Quincy Center, and Braintree.

Middleborough Line: Preliminary operations analysis shows that, in general, the sidings on the Middleborough Line are sufficient to support the desired headway. At the southern end of the line (MP 31.23 to MP 34.71), a second track would be constructed as part of a passing siding, the remainder of which would be along the Middleborough Secondary.

The existing station at Middleborough/Lakeville would be relocated, because it is located on the Buzzards Bay Secondary, south of the junction between the Middleborough Line, the Middleborough Secondary, and the Buzzards Bay Secondary. If the station were not relocated, a reverse move would be required.

Middleborough Secondary: Existing freight track would be upgraded to Class 5. The line would be mostly single track (MP 20.47 to MP 16.08), with the end near Middleborough Junction (MP 21.20 to MP 20.47) and the end near Cotley Junction (MP 16.08 to MP 13.30) having double track sections.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Cotley Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail stations at JFK/UMass, Quincy Center, and Middleborough/Lakeville would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight, existing commuter, and existing rapid transit services. The existing freight services on the Middleborough Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Middleborough Line would not affect existing service to stations between Middleborough/Lakeville Station and South Station. The extension of the lines might require longer trains and/or trains with more bi-level coaches, which could present an operational problem at South Station, where Tracks 12 and 13 are not long enough to accommodate trains with more than six coaches.

Triple-track on the Old Colony Main Line would be sufficient to provide service to New Bedford and Fall River via the Middleborough Line and allow the addition of another branch to Wareham or Buzzards Bay in the future.

This alternative would replace an existing, high-frequency rapid transit service (Red Line Braintree Branch) with a low-frequency commuter rail service. This would be a very large reduction in the capacity of the transit system in Braintree and Quincy. Residents and commuters at Braintree and Quincy Center, who currently enjoy service throughout the day at a maximum headway of 15 minutes, would see service greatly reduced, especially during the off-peak periods. Residents and commuters at Quincy Adams, Wollaston, and North Quincy would see their service eliminated entirely.

Due to unacceptable reductions in the capacity and quality of the public transit system as a result of eliminating the Red Line Braintree Branch, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Tier 1 Screening Process
Alternative 20

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 20. This memo corresponds to the Tier 1 Screening Process.

Alternative Description

Alternative 20 consists of bus rapid transit (BRT) along the Middleborough Corridor. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough/Lakeville Station, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Assumptions

For Alternative 20, the following assumptions were made:

- New 24-foot wide BRT roadway to be constructed adjacent to existing freight rail lines, in order to allow freight operations to continue
- All undergrade bridges to be new structures, adjacent to existing structures if applicable; existing freight rail bridges would not be modified
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Middleborough Line between Middleborough/Lakeville Station and South Station to accommodate Boston-bound riders
- The busway may terminate just outside urban centers like New Bedford and Fall River, allowing buses to travel on local streets and obviating the need for tremendously expensive busway structures in city centers
- Maximum speed of 55 mph on BRT lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Initial operating plan headways of 5 minutes on the trunk and 10 minutes on the branches in both directions during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 110 and 106 minutes, respectively. One transfer would be required at Middleborough/Lakeville Station. The reliability of

this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. BRT would not be subject to delays from traffic congestion except in areas where it would operate on city streets. The impact of these sections on travel time and reliability was assumed to be negligible.

Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Middleborough Line and 5 minute headways on the BRT line, service could be coordinated to arrive prior to each Middleborough Line train such that successive buses have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Middleborough Line could arrive on the BRT line at 7:25AM, 7:30AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Due to unacceptably long travel times, the need to transfer, and only medium reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 21

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 21. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 21 consists of diesel multiple unit (DMU) commuter rail along the Middleborough Corridor. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough/Lakeville Station, a new track bypass along I-495 in Middleborough, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Assumptions

For Alternative 21, the following assumptions were made:

- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Middleborough Line between Middleborough/Lakeville Station and South Station to accommodate Boston-bound riders
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction)
    - 24 trips in each direction during the peak two hours
- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours
- All trains travel the entire way from New Bedford or Fall River to Middleborough/Lakeville, so only one transfer is required for travel between Boston and the South Coast

Travel Time

Travel times from New Bedford and Fall River to Boston would be 101 and 99 minutes, respectively. One transfer would be required at Middleborough/Lakeville Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Middleborough Line and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Middleborough Line train such that successive DMU trains have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Middleborough Line could arrive on the DMU line at 7:25 AM, 7:30 AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Due to unacceptably long travel times, the need to transfer, and only medium reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 22

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 22. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 22 consists of diesel multiple unit (DMU) commuter rail along the Middleborough and Dartmouth Corridors. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough/Lakeville Station, a new track bypass along I-495 in Middleborough, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, the Fall River Secondary between Myricks Junction and downtown Fall River, and the Dartmouth Secondary between downtown New Bedford and the east side of Fall River. This routing is shown on an attached graphic. This alternative is equivalent to Alternative 22, with the addition of the Fall River – New Bedford line.

Assumptions

For Alternative 22, the following assumptions were made:

- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Middleborough Line between Middleborough/Lakeville Station and South Station to accommodate Boston-bound riders
- Due to topographic challenges, there would be two separate stations in Fall River, one on the west side of the city on the Fall River Secondary, and one on the east side of town on the Dartmouth Secondary
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction); design headway of 5 minutes on the Fall River – New Bedford line

  - 24 trips in each direction during the peak two hours

- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours; initial operating plan headway of 7.5 minutes on the Fall River – New Bedford line in both directions during the peak two hours
- All trains on the Fall River Secondary and New Bedford Secondary branches travel the entire way from New Bedford or Fall River to Middleborough/Lakeville, so only one transfer is required for travel between Boston and stations on these branches
- Trains on the Fall River – New Bedford Line travel only between Fall River and New Bedford; two transfers would be required to reach Boston from a station on this line, one in Middleborough/Lakeville and one in New Bedford

Travel Time

Travel times from New Bedford and Fall River to Boston would be 101 and 99 minutes, respectively. Travel time from New Bedford to Fall River would be 16 minutes. One transfer would be required at Middleborough/Lakeville Station, except for stations on the Fall River – New Bedford Line, from which two transfers would be required. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Middleborough Line and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Middleborough Line train such that successive DMU trains have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Middleborough Line could arrive on the DMU line at 7:25 AM, 7:30 AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM. The transfer time in New Bedford between the two DMU lines was assumed to be 5 minutes.

Due to unacceptably long travel times, the need to transfer, and only medium reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 30

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 30. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 30 consists of conventional diesel commuter rail along the Stoughton Corridor. This alternative includes the Northeast Corridor between South Station and Canton Junction, the Stoughton Line between Canton Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 30, the following assumptions were made:

- Trestle required through Hockomock Swamp
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 70 and 69 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated

for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Northeast Corridor: No improvements would be required.

Stoughton Line: A second track would be constructed from Canton Junction (MP 15.00) to Stoughton Station (MP 18.70). The line would continue as double track to a point just south of the Stoughton/Easton town line (MP 21.72). The remainder of the line south to Weir Junction would be single track, with a passing siding in Raynham (MP 28.72 to MP 32.13). It is assumed that north of Stoughton Station, existing bridges can be widened; south of Stoughton Station, new bridges are required.

Existing stations at Canton Center and Stoughton would be reconstructed with 800-foot full-length high-level platforms, replacing the existing low-level platforms with mini-highs. A frontage road would be constructed in part of Stoughton to eliminate grade crossings, and a new grade separation would be constructed at Route 138 in Raynham.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail stations in Canton Center and Stoughton would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls
- Single-track section on trestle

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart. Trestle was assumed to be required through the Hockomock Swamp.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail

coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the New Bedford Secondary and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Stoughton Line would not affect existing service to Canton Center or Stoughton. The addition of some new trains to the Northeast Corridor might present a restraint on the expansion of existing commuter and intercity services. However, since service could be implemented on this line by extending existing trains rather than adding new trains, these impacts would be smaller than the impacts of introducing an entirely new service. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

Construction Impacts

Stoughton Line: Construction hours on the Stoughton Line would be restricted north of Stoughton Station by existing commuter rail and freight service. South of Stoughton Station, construction would be simple, as it would entail only constructing tracks on an existing, abandoned railroad embankment. At the southern end of the line, in Taunton, there is infrequent freight service provided by Massachusetts Coastal Railroad that could interfere with construction occasionally. A low level of property acquisition would be required in Raynham, where parts of the right-of-way are under private ownership, and in the vicinity of Route 138, where a grade separation would be constructed.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Because there is an existing embankment through the swamp, it is anticipated that construction work could proceed along the embankment from both ends, without disturbing the wetlands except in areas of bridges and culverts.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 30 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be new service, not extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 31

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 31. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 31 consists of bus rapid transit (BRT) along the Stoughton Corridor. This alternative includes the Northeast Corridor between South Station and Canton Junction, the Stoughton Line between Canton Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 31, the following assumptions were made:

- Two-lane viaduct required through Hockomock Swamp
- New 24-foot wide BRT roadway to be constructed adjacent to existing freight rail lines, in order to continue to allow freight operations
- New 24-foot wide BRT roadway to be constructed on existing abandoned railroad embankment without provision for restoration of rail line
- All undergrade bridges to be new structures, adjacent to existing structures if applicable; existing freight rail bridges would not be modified
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Stoughton Line between Stoughton Station and South Station to accommodate Boston-bound riders
- The busway may terminate outside urban centers like New Bedford and Fall River, allowing buses to travel on local streets and obviating the need for tremendously expensive busway structures in city centers
- Maximum speed of 55 mph on BRT lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Initial operating plan headways of 5 minutes on the trunk and 10 minutes on the branches in both directions during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 101 and 98 minutes, respectively. One transfer would be required at Stoughton Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. BRT would not be subject to delays from traffic congestion except in areas where it would operate on city streets. The impact of these sections on travel time and reliability was assumed to be negligible.

Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Stoughton Line and 5 minute headways on the BRT line, service could be coordinated to arrive prior to each Stoughton Line train such that successive buses have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Stoughton Line could arrive on the BRT line at 7:25AM, 7:30AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Due to unacceptably long travel times, the need to transfer, and only medium reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Tier 1 Screening Process
Alternative 32

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 32. This memo corresponds to the Tier 1 Screening Process.

Alternative Description

Alternative 32 consists of diesel multiple unit (DMU) commuter rail along the Stoughton Corridor. This alternative includes the Northeast Corridor between South Station and Canton Junction, the Stoughton Line between Canton Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 32, the following assumptions were made:

- Trestle required through Hockomock Swamp
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Stoughton Line between Stoughton Station and South Station to accommodate Boston-bound riders
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction)
    - 24 trips in each direction during the peak two hours
- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours
- All trains travel the entire way from New Bedford or Fall River to Stoughton, so only one transfer is required for travel between Boston and the South Coast

Travel Time

Travel times from New Bedford and Fall River to Boston would be 90 and 88 minutes, respectively. One transfer would be required at Stoughton Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Stoughton Line and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Stoughton Line train such that successive DMU trains have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Stoughton Line could arrive on the DMU line at 7:25 AM, 7:30 AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Conceptual Layout

Northeast Corridor: No improvements are required.

Stoughton Line: The DMU line would be constructed as double-track for the entire length from Stoughton Station (MP 18.70) to Weir Junction (MP 35.40). It is assumed that south of Stoughton Station, new bridges are required.

A new DMU platform would be constructed south of Brock Street to service both DMU tracks. A covered walkway would connect the DMU platform to the existing station, a distance of approximately 1250 feet. The separate DMU track would be necessary due to the high frequency of service on the DMU line. A frontage road would be constructed in part of Stoughton to eliminate grade crossings, and a new grade separation would be constructed at Route 138 in Raynham.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station in Stoughton would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the DMU lines. Overnight layover facilities would be constructed at undetermined locations in Stoughton, Fall River, and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls
- Double-track section on trestle

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart. Trestle was assumed to be required through the Hockomock Swamp.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the New Bedford Secondary and Fall River Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the New Bedford Secondary would allow some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Stoughton Line would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Construction Impacts

Stoughton Line: Construction hours on the Stoughton Line would be at Stoughton Station by existing commuter rail and freight service. South of Stoughton Station, construction would be simple, as it would entail only constructing tracks on an existing, abandoned railroad embankment. At the southern end of the line, in Taunton, there is infrequent freight service provided by Massachusetts Coastal Railroad that could interfere with construction occasionally. A low level of property acquisition would be required in Raynham, where parts of the right-of-way are under private ownership, and in the vicinity of Route 138, where a grade separation would be constructed.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Because there is an existing embankment through the swamp, it is anticipated that construction work could proceed along the embankment from both ends, without disturbing the wetlands except in areas of bridges and culverts. The need for two tracks on the trestle would represent a significantly larger impact to the swamp than the single track required by conventional commuter rail or electric commuter rail.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 32 was assumed to be 15 minute peak headways on the branches, resulting in 7.5 minute headways on the trunk. This provides eight peak period trips to

each terminal. It was assumed that trains would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three single-deck coaches per train, is 4,416 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 33

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 33. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 33 consists of diesel multiple unit commuter (DMU) rail along the Stoughton and Dartmouth Corridors. This alternative includes the Northeast Corridor between South Station and Canton Junction, the Stoughton Line between Canton Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, the Fall River Secondary between Myricks Junction and downtown Fall River, and the Dartmouth Secondary between downtown New Bedford and the east side of Fall River. This routing is shown on an attached graphic. This alternative is equivalent to Alternative 32, with the addition of the Fall River – New Bedford line.

Design Assumptions

For Alternative 33, the following assumptions were made:

- Trestle required through Hockomock Swamp
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- No additional trains provided on the Stoughton Line between Stoughton Station and South Station to accommodate Boston-bound riders
- Due to topographic challenges, there would be two separate stations in Fall River, one on the west side of the city on the Fall River Secondary, and one on the east side of town on the Dartmouth Secondary
- Maximum speed of 70 mph on new lines; travel times on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Design headways of 5 minutes on the trunk (north of Myricks Junction) and 10 minutes on the branches (south of Myricks Junction); design headway of 5 minutes on the Fall River – New Bedford line
    - 24 trips in each direction during the peak two hours

- Initial operating plan headways of 7.5 minutes on the trunk and 15 minutes on the branches in the peak direction during the peak two hours; initial operating plan headway of 7.5 minutes on the Fall River – New Bedford line in both directions during the peak two hours
- All trains on the Fall River Secondary and New Bedford Secondary branches travel the entire way from New Bedford or Fall River to Stoughton, so only one transfer is required for travel between Boston and stations on these branches
- Trains on the Fall River – New Bedford Line travel only between Fall River and New Bedford; two transfers would be required to reach Boston from a station on this line, one in Stoughton and one in New Bedford

Travel Time

Travel times from New Bedford and Fall River to Boston would be 90 and 88 minutes, respectively. Travel time from New Bedford to Fall River would be 16 minutes. One transfer would be required at Stoughton Station. The reliability of this alternative would be medium, because although commuter rail is not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 17.5 minutes, based on the difference between the average headways of the two services. Assuming 40 minute headways on the Stoughton Line and 5 minute headways on the DMU line, service could be coordinated to arrive prior to each Stoughton Line train such that successive DMU trains have transfer times of 35, 30, 25, 20, 15, 10, 5, and 0 minutes. The average of these values is 17.5 minutes. For example, passengers taking an 8:00AM train on the Stoughton Line could arrive on the DMU line at 7:25 AM, 7:30 AM, 7:35AM, 7:40AM, 7:45AM, 7:50AM, 7:55AM, or 8:00AM.

Conceptual Layout

Northeast Corridor: No improvements are required.

Stoughton Line: The DMU line would be constructed as double-track for the entire length from Stoughton Station (MP 18.70) to Weir Junction (MP 35.40). It is assumed that south of Stoughton Station, new bridges are required.

A new DMU platform would be constructed south of Brock Street to service both DMU tracks. A covered walkway would connect the DMU platform to the existing station, a distance of approximately 1250 feet. The separate DMU track would be necessary due to the high frequency of service on the DMU line. A frontage road would be constructed in part of Stoughton to eliminate grade crossings, and a new grade separation would be constructed at Route 138 in Raynham.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 8.12 to MP 11.11).

Dartmouth Secondary: Existing freight track would be upgraded to Class 5. The abandoned portion of the line between Westport and Fall River would be restored. The line would entirely double track between the New Bedford Secondary (MP 0.00) and Route 24 in Fall River (MP 11.48). The remainder of the line in Fall River (MP 11.48 to MP 12.45) would be single track, in order to minimize the impact to the Quequechan River and downtown Fall River.

Station Locations: New commuter rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), Fall River (2, one on west side and one on east side), Dartmouth (1), and Westport (1). The existing commuter rail stations in Canton Center and Stoughton would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the DMU lines. Overnight layover facilities would be constructed at undetermined locations in Stoughton, Fall River, and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls
- Double-track section on trestle

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart. Trestle was assumed to be required through the Hockomock Swamp.

Compatibility with Existing Infrastructure

This alternative would be mostly compatible with existing infrastructure. It would be a new mode on the MBTA's system, but the operation and maintenance of DMU trains would be similar to that of the diesel trains currently operating on the system. Therefore, there would be a considerable volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required and some equipment specific to DMU vehicles might be needed. Crews working on the existing commuter rail system would probably be qualified to work on the new lines, with only minor training. It would use existing transportation corridors.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the New Bedford Secondary, Fall River Secondary, and Dartmouth Secondary are small in scope, but DMU service would operate at relatively high frequency. The provision of a second track on the New Bedford Secondary and the Dartmouth Secondary would allow some operational flexibility for freight, but it would still be more difficult to schedule freight operations with DMU service than with conventional commuter rail.

Impacts to existing commuter rail trains on the Stoughton Line would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Construction Impacts

Stoughton Line: Construction hours on the Stoughton Line would be at Stoughton Station by existing commuter rail and freight service. South of Stoughton Station, construction would be simple, as it would entail only constructing tracks on an existing, abandoned railroad embankment. At the southern end of the line, in Taunton, there is infrequent freight service provided by Massachusetts Coastal Railroad that could interfere with construction occasionally. A low level of property acquisition would be required in Raynham, where parts of the right-of-way are under private ownership, and in the vicinity of Route 138, where a grade separation would be constructed.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Because there is an existing embankment through the swamp, it is anticipated that construction work could proceed

along the embankment from both ends, without disturbing the wetlands except in areas of bridges and culverts. The need for two tracks on the trestle would represent a significantly larger impact to the swamp than the single track required by conventional commuter rail or electric commuter rail.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. The impacts would be greater than for conventional commuter rail because of the need to provide additional siding areas. Property acquisition would not be needed.

Dartmouth Secondary: Construction on the Dartmouth Secondary would be relatively simple. Massachusetts Coastal Railroad runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources might be considerable, because of the need for two tracks, and the proximity of the route in Fall River to South Watuppa Pond and the Quequechan River. A moderate level of property acquisition would be needed to restore the right-of-way through Westport and Fall River.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 33 was assumed to be 15 minute peak headways on the Fall River Secondary and New Bedford Secondary branches, resulting in 7.5 minute headways on the trunk. Headways of 7.5 minutes were assumed on the Fall River – New Bedford line. This provides eight peak period trips between Stoughton and each terminal and 16 peak period trips on the Fall River – New Bedford Line. It was assumed that trains would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three single-deck coaches per train, is 4,416 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 34

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 34. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 34 consists of electric commuter rail along the Stoughton Corridor. This alternative includes the Northeast Corridor between South Station and Canton Junction, the Stoughton Line between Canton Junction and Weir Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 34, the following assumptions were made:

- All track south of Canton Junction reconstructed to Class 7
- Trestle required through Hockomock Swamp
- All existing freight track replaced with Class 7 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 110 mph on new lines; travel times on Northeast Corridor north of Route 128 Station per Amtrak schedules for trains stopping at Route 128 Station and Back Bay Station, as of February 2008; travel times on Northeast Corridor south of Route 128 Station limited by maximum speed, track geometry, and station stops only
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 51 and 52 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Conceptual Layout

Northeast Corridor: No track improvements would be required. Catenary wire would be strung along Track 3 between Tower 1 interlocking (MP 228.50) and Readville (MP 219.00). The overhead supports required are in place along this section; all that would be needed is the wire and any necessary power infrastructure.

Stoughton Line: Existing commuter rail track would be upgraded to Class 7. The line would be double track from Canton Junction (MP 15.00) to just south of the Stoughton/Easton town line (MP 21.72). The remainder of the line south to Weir Junction would be single track, with a passing siding in Raynham (MP 28.72 to MP 32.13). It is assumed that north of Stoughton Station, existing bridges can be widened; south of Stoughton Station, new bridges are required. New catenary supports, wires, and electric substations would be constructed along the length of the line.

Existing stations at Canton Center and Stoughton would be reconstructed with 800-foot full-length high-level platforms, replacing the existing low-level platforms with mini-highs. A frontage road would be constructed in part of Stoughton to eliminate grade crossings, and a new grade separation would be constructed at Route 138 in Raynham.

New Bedford Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for the entire length between Weir Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations. New catenary supports, wires, and electric substations would be constructed along the length of the line.

Fall River Secondary: Existing freight track would be upgraded to Class 7. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with a passing siding in Fall River (MP 9.56 to MP 11.11). New catenary supports, wires, and electric substations would be constructed along the length of the line.

Station Locations: New commuter rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail stations in Canton Center and Stoughton would be reconstructed.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls
- Single-track section on trestle

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart. Trestle was assumed to be required through the Hockomock Swamp.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a moderate volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. However, the MBTA does not currently operate electric trains, so there would be some

knowledge gap. Existing layovers and maintenance facilities are designed for diesel engines, though it assumed a maintenance agreement could be reached with Amtrak, which has an appropriate facility, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches, with some training.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the New Bedford Secondary and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Stoughton Line would not affect existing service to Canton Center or Stoughton. The addition of some new trains to the Northeast Corridor might present a restraint on the expansion of existing commuter and intercity services. However, since service could be implemented on this line by extending existing trains rather than adding new trains, these impacts would be smaller than the impacts of introducing an entirely new service. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

The use of electric trains on the Northeast Corridor would be beneficial, because it would allow the MBTA and Amtrak to operate at less disparate speeds. This would decrease the need for a large but useless gap opening up between an Amtrak train and a following MBTA train, or a large but useless gap closing up between an MBTA train and a following Amtrak train. This would improve the utilization of existing capacity on the corridor.

Construction Impacts

Stoughton Line: Construction hours on the Stoughton Line would be restricted north of Stoughton Station by existing commuter rail and freight service. South of Stoughton Station, construction would be simple, as it would entail only constructing tracks on an existing, abandoned railroad embankment. At the southern end of the line, in Taunton, there is infrequent freight service provided by Massachusetts Coastal Railroad that could interfere with construction occasionally. A low level of property acquisition would be required in Raynham, where parts of the right-of-way are under private ownership, and in the vicinity of Route 138, where a grade separation would be constructed.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Because there is an existing embankment through the swamp, it is anticipated that construction work could proceed along the embankment from both ends, without disturbing the wetlands except in areas of bridges and culverts.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: The need to design and construct electrification infrastructure might represent a challenging or complicated aspect to the project, making it more difficult to complete the project in four years.

Operating Plan

The initial operating plan for Alternative 34 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be new service, not extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 37

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 37. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 37 consists of monorail service from Fall River/New Bedford to Boston along the Route 24/140 and I-93 corridors. This alternative includes the construction of a monorail with two branches. One branch would start in New Bedford and follow the Route 140 corridor north to Taunton, where it would merge with the other branch, beginning in Fall River and following the Route 24 corridor. From Taunton, the monorail line would follow Route 24 north to Route 128. It would then turn east, following Route 128 to the Braintree Split. It would then roughly follow the I-93 corridor north to Boston, terminating in the vicinity of South Station. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 37, the following assumptions were made:

- The monorail infrastructure will be mostly self contained, and will require little to no reconstruction of existing highway or rail infrastructure
- Monorail will be of the "straddle" type
- Preference will be to construct the monorail guideway at grade where possible along the Route 24 and 128 corridors
- Elevated guideway will be required where crossing wetland areas, intersecting highways, and traversing areas of dense development
- Maximum speed of 50 mph on monorail lines
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 73 and 65 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because monorail trains are not subject to delays from traffic congestion.

Conceptual Layout

Route 140: Monorail guideway would be located in the existing grass median along Route 140 from New Bedford to Taunton and the intersection of Routes 140 and 24. Guideway would be at-grade except at overpasses and interchanges, where it would be elevated above the intersecting road. This would require approach sections of considerable length.

Route 24: Monorail guideway would be located along the northbound shoulder of Route 24. No widening of Route 24 would take place, and the monorail guideway would be constructed at-grade except in the vicinity of interchanges, overpasses, and wetlands. At overpasses and interchanges, the guideway would be elevated above the intersecting road. This would require approach sections of considerable length. At wetlands, the guideway would be on a low viaduct, to minimize impacts to the resource.

Route 128: Monorail guideway would be constructed along the existing grass median. Since most intersecting roads cross Route 128 below grade, it is assumed that nearly all of the monorail guideway could be constructed at grade.

Braintree to Boston: Beginning at a point just west of the Braintree Split (Route 3/128/93 Interchange), the monorail guideway would become elevated and cross over Route 128 NB/I-93 SB. It would then follow the southbound shoulder of I-93 north to approximately Robertson Street in West Quincy. Between Robertson Street and Squantum Street, the guideway would cross the southbound lanes of I-93 and follow an existing concrete median. North of Squantum Street, the monorail guideway would cross the northbound lanes and then follow the northbound shoulder, crossing the Neponset River. At Interchange 14, the guideway would turn northeast, and follow Morrissey Boulevard north to the JFK/UMass MBTA station. It would then follow the MBTA rail corridor north to where the rail corridor abuts the east side of the I-93 corridor, and follow the northbound shoulder and Frontage Road until reaching Widett Circle in South Boston. The guideway would then turn east, roughly following Widett Circle, and cross over the MBTA/Amtrak train yards before turning north, crossing Dorchester Avenue and terminating along the Fort Point Channel across from South Station. This entire section would be elevated.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility, to be located somewhere along the line. Overnight layover facilities would be constructed at undetermined locations in Boston, Fall River, and New Bedford.

Station Locations: New monorail stations would be constructed in Boston (1), Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1).

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Guideway at-grade in median
- Elevated guideway in median
- Guideway at-grade in shoulder
- Elevated guideway in shoulder
- Elevated guideway in shoulder at bridge

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would be incompatible with existing infrastructure. It would be the only monorail in operation in the northeastern United States. There would be no institutional knowledge about the construction, operation, and maintenance of this alternative. New layovers and maintenance facilities would be needed throughout the system. Crews working on the public transit system would be not qualified to work on the new service. All infrastructure, vehicles, and equipment would be custom-ordered, driving up the expense.

This alternative would require a new guideway within existing transportation corridors. Monorail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Because the monorail does not directly interchange with any other modes of transportation (road or rail), the impacts to the existing transportation network would be minimal. However, the monorail would use part of the existing right-of-way on Route 24, limiting future expansion of that roadway. The Route 24 corridor has heavy development abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Construction Impacts

Route 140: Construction impacts on this portion are assumed to be minimal. The existing median is wide enough to accommodate the construction of the guideway without disrupting traffic along the highway. Traffic management would be required at bridges and interchanges where the guideway crosses above an existing overpass. No property acquisition would be required.

Route 24: Construction impacts along Route 24 would likely be confined to interchanges and bridges, as well as wetland crossings. Because the monorail would be located in the shoulder of the highway, it would cross many interchange ramps and cross above the existing bridges and intersecting roads. This would likely require traffic management as well as temporary closure or relocation of ramps at interchanges. No property acquisition would be required.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Through any wetland area, the guideway would be elevated on piers. Depending on the existing side slopes along the roadway, it is likely that these piers can be placed in areas of existing fill, minimizing impact to the wetland area.

Route 128: Because Route 128 has an existing grass median, construction impacts would likely be minimal. However, the need for construction access the median would still result in some traffic management impacts to the roadway, especially during off-peak travel hours. No property acquisition would be required.

Braintree to Boston: Construction impacts along this portion are extremely large. Portions of the corridor contain heavy residential development, which would limit night-time construction. In addition, I-93 travels through a very narrow right-of-way, making impacts to the normal operation of the road likely during construction. Constructing portions of the guideway that would travel in the median of I-93 would also impact the operation of the HOV zipper lane. Around the Neponset River crossing, the guideway must to be constructed through wetland areas. North of the JFK/UMass MBTA station, available right-of-way is very narrow or not available at all. Significant property impacts would be required in order to bring the guideway to South Station.

Construction Time Frame: The need to design and construct a monorail system of this length, which would be by far the longest in the world, represents a challenging and complicated aspect to the project. It is anticipated that the project could not be completed in four years.

Due to unacceptable impacts on the Braintree to Boston section and the inability to reach completion within four years, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 38

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 38. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 38 consists of monorail service from Fall River/New Bedford to Quincy Adams Station along the Route 24/140 and Route 128 corridors. This alternative includes the construction of a monorail with two branches. One branch would start in New Bedford and follow the Route 140 corridor north to Taunton, where it would merge with the other branch, beginning in Fall River and following the Route 24 corridor. From Taunton, the monorail line would follow Route 24 north to Route 128. It would then turn east, following Route 128 to the Braintree Split. At the Braintree Split, it would cross over existing roads and rails and terminate at Quincy Adams Station on the Red Line, where passengers would transfer to the rapid transit system to reach Boston. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 38, the following assumptions were made:

- The monorail infrastructure will be mostly self contained, and will require little to no reconstruction of existing highway or rail infrastructure
- Monorail will be of the "straddle" type
- Preference will be to construct the monorail guideway at grade where possible along the Route 24 and 128 corridors
- Elevated guideway will be required where crossing wetland areas, intersecting highways, and traversing areas of dense development
- Maximum speed of 50 mph on monorail lines; travel times on existing lines per MBTA schedules as of February 2008
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 92 and 84 minutes, respectively. One transfer would be required at Quincy Adams Station. The reliability of this alternative would be medium, because although heavy rail and monorail are not subject to delays from traffic

congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 4.5 minutes, half of the peak period headway on the Red Line as of February 2008.

Conceptual Layout

Route 140: Monorail guideway would be located in the existing grass median along Route 140 from New Bedford to Taunton and the intersection of Routes 140 and 24. Guideway would be at-grade except at overpasses and interchanges, where it would be elevated above the intersecting road. This would require approach sections of considerable length.

Route 24: Monorail guideway would be located along the northbound shoulder of Route 24. No widening of Route 24 would take place, and the monorail guideway would be constructed at-grade except in the vicinity of interchanges, overpasses, and wetlands. At overpasses and interchanges, the guideway would be elevated above the intersecting road. This would require approach sections of considerable length. At wetlands, the guideway would be on a low viaduct, to minimize impacts to the resource.

Route 128: Monorail guideway would be constructed along the existing grass median. Since most intersecting roads cross Route 128 below grade, it is assumed that nearly all of the monorail guideway could be constructed at grade.

Braintree Split to Quincy Adams Station: Beginning at a point west of the Braintree Split (Route 3/128/93 Interchange), the monorail guideway would become elevated and cross over the Braintree Split ramps. It would remain elevated as it crossed the complicated Exits 18-19 ramps on Route 3, traversing to the north side of Route 3. It would cross over the existing rail tracks and terminate at a station located above the existing commuter rail and Red Line tracks, abutting Quincy Adams Station. This entire section would be elevated.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility, to be located somewhere along the line. Overnight layover facilities would be constructed at undetermined locations in Quincy or Braintree, Fall River, and New Bedford.

Station Locations: New monorail stations would be constructed in Quincy (1), Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1).

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Guideway at-grade in median
- Elevated guideway in median
- Guideway at-grade in shoulder
- Elevated guideway in shoulder
- Elevated guideway in shoulder at bridge

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would be incompatible with existing infrastructure. It would be the only monorail in operation in the northeastern United States. There would be no institutional knowledge about the construction, operation, and maintenance of this alternative. New layovers and maintenance facilities would be needed throughout the system. Crews working on the public transit system

would be not qualified to work on the new service. All infrastructure, vehicles, and equipment would be custom-ordered, driving up the expense.

This alternative would require a new guideway within existing transportation corridors. Monorail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Because the monorail does not directly interchange with any other modes of transportation (road or rail), the impacts to the existing transportation network would be minimal. However, the monorail would use part of the existing right-of-way on Route 24, limiting future expansion of that roadway. The Route 24 corridor has heavy development abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Impacts to the existing transportation system would also include effects on existing rapid transit services. The volume of passengers transferring to the Red Line would be large, likely leading to chronic overcrowding north of Quincy Adams Station. This would also cause a decline in reliability and deterioration of quality of service.

Construction Impacts

Route 140: Construction impacts on this portion are assumed to be minimal. The existing median is wide enough to accommodate the construction of the guideway without disrupting traffic along the highway. Traffic management would be required at bridges and interchanges where the guideway crosses above an existing overpass. No property acquisition would be required.

Route 24: Construction impacts along Route 24 would likely be confined to interchanges and bridges, as well as wetland crossings. Because the monorail would be located in the shoulder of the highway, it would cross many interchange ramps and cross above the existing bridges and intersecting roads. This would likely require traffic management as well as temporary closure or relocation of ramps at interchanges. No property acquisition would be required.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Through any wetland area, the guideway would be elevated on piers. Depending on the existing side slopes along the roadway, it is likely that these piers can be placed in areas of existing fill, minimizing impact to the wetland area.

Route 128: Because Route 128 has an existing grass median, construction impacts would likely be minimal. However, the need for construction access the median would still result in some traffic management impacts to the roadway, especially during off-peak travel hours. No property acquisition would be required.

Braintree Split to Quincy Adams Station: Construction impacts along this portion would be significant. The need to erect an elevated monorail above the many crisscrossing ramps, rail lines, and rapid transit lines would require temporary closure of roadways and rail lines for safety during overnight hours. The volumes on these roadways are large at all times of the day, and closures would cause significant delays to the traveling public.

Construction Time Frame: The need to design and construct a monorail system of this length, which would be by far the longest in the world, represents a challenging and complicated aspect to the project. It is anticipated that the project could not be completed in four years.

Due to unacceptable impacts on the Braintree Split to Quincy Adams Section, unacceptable impacts to the Red Line, and the inability to reach completion within four years, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 39

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 39. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 39 consists of monorail service from Fall River/New Bedford to Route 128 Station along the Route 24/140 and Route 128 corridors. This alternative includes the construction of a monorail with two branches. One branch would start in New Bedford and follow the Route 140 corridor north to Taunton, where it would merge with the other branch, beginning in Fall River and following the Route 24 corridor. From Taunton, the monorail line would follow Route 24 north to Route 128. It would then turn west, following Route 128 towards I-95 in Canton and Westwood. After the I-95 interchange, it would cross over existing roads and rails and terminate at Route 128 Station on the Northeast Corridor, where passengers would transfer to the commuter rail system to reach Boston. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 39, the following assumptions were made:

- The monorail infrastructure will be mostly self contained, and will require little to no reconstruction of existing highway or rail infrastructure
- Monorail will be of the "straddle" type
- Preference will be to construct the monorail guideway at grade where possible along the Route 24 and 128 corridors
- Elevated guideway will be required where crossing wetland areas, intersecting highways, and traversing areas of dense development
- No additional trains provided on the Northeast Corridor between Route 128 Station and South Station to accommodate Boston-bound riders
- Maximum speed of 50 mph on monorail lines; travel times on existing lines per MBTA schedules as of February 2008
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 86 and 78 minutes, respectively. One transfer would be required at Route 128 Station. The reliability of this alternative would be medium, because although commuter rail and monorail are not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 5 minutes, because arrivals of monorail trains at Route 128 Station could be coordinated with arrivals of commuter rail trains.

Conceptual Layout

Route 140: Monorail guideway would be located in the existing grass median along Route 140 from New Bedford to Taunton and the intersection of Routes 140 and 24. Guideway would be at-grade except at overpasses and interchanges, where it would be elevated above the intersecting road. This would require approach sections of considerable length.

Route 24: Monorail guideway would be located along the northbound shoulder of Route 24. No widening of Route 24 would take place, and the monorail guideway would be constructed at-grade except in the vicinity of interchanges, overpasses, and wetlands. At overpasses and interchanges, the guideway would be elevated above the intersecting road. This would require approach sections of considerable length. At wetlands, the guideway would be on a low viaduct, to minimize impacts to the resource.

Route 128: Monorail guideway would be constructed along the existing median. Since most intersecting roads cross Route 128 above grade, it is assumed that nearly all of the monorail guideway would be constructed on a viaduct. Bridges on this section are closely spaced, and it would not be practical to descend to an at-grade section before rising again for the next bridge.

Route 128 Station: At a point north of the I-95 Interchange, the monorail would cross over the southbound roadway of Route 128. It would cross over the existing rail tracks and terminate at a station located above the existing commuter rail tracks, abutting Route 128 Station.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility, to be located somewhere along the line. Overnight layover facilities would be constructed at undetermined locations in Westwood, Fall River, and New Bedford.

Station Locations: New monorail stations would be constructed in Westwood (1), Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1).

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Guideway at-grade in median
- Elevated guideway in median
- Guideway at-grade in shoulder
- Elevated guideway in shoulder
- Elevated guideway in shoulder at bridge

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would be incompatible with existing infrastructure. It would be the only monorail in operation in the northeastern United States. There would be no institutional knowledge about the construction, operation, and maintenance of this alternative. New layovers and maintenance facilities would be needed throughout the system. Crews working on the public transit system would be not qualified to work on the new service. All infrastructure, vehicles, and equipment would be custom-ordered, driving up the expense.

This alternative would require a new guideway within existing transportation corridors. Monorail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Because the monorail does not directly interchange with any other modes of transportation (road or rail), the impacts to the existing transportation network would be minimal. However, the monorail would use part of the existing right-of-way on Route 24, limiting future expansion of that roadway. The Route 24 corridor has heavy development abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Impacts to the existing transportation system would also include effects on existing commuter services. Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Construction Impacts

Route 140: Construction impacts on this portion are assumed to be minimal. The existing median is wide enough to accommodate the construction of the guideway without disrupting traffic along the highway. Traffic management would be required at bridges and interchanges where the guideway crosses above an existing overpass. No property acquisition would be required.

Route 24: Construction impacts along Route 24 would likely be confined to interchanges and bridges, as well as wetland crossings. Because the monorail would be located in the shoulder of the highway, it would cross many interchange ramps and cross above the existing bridges and intersecting roads. This would likely require traffic management as well as temporary closure or relocation of ramps at interchanges. No property acquisition would be required.

Construction within the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), would require additional caution, so as not to negatively affect the resource. Through any wetland area, the guideway would be elevated on piers. Depending on the existing side slopes along the roadway, it is likely that these piers can be placed in areas of existing fill, minimizing impact to the wetland area.

Route 128: Because Route 128 has an existing grass median, construction impacts would likely be minimal. However, the need for construction access the median and the need to erect an elevated structure in between the northbound and southbound roadways would result in considerable traffic management impacts to the roadway, especially during off-peak travel hours. No property acquisition would be required.

Route 128 Station: Construction impacts along this portion would be significant. The need to erect an elevated monorail above the highway and rail lines would require temporary closure of roadways and rail lines for safety during overnight hours. The volumes on these roadways are large at all times of the day, and closures would cause significant delays to the traveling public.

Construction Time Frame: The need to design and construct a monorail system of this length, which would be by far the longest in the world, represents a challenging and complicated aspect to the project. It is anticipated that the project could not be completed in four years.

Due to unacceptable impacts near Route 128 Section and the inability to reach completion within four years, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 40

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 40. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 40 consists of conventional diesel commuter rail along the Route 24 Corridor. This alternative includes the Northeast Corridor between South Station and Route 128 Station, new track along the Route 128 and Route 24 Corridors between Route 128 Station and Taunton, the New Bedford Secondary between Taunton and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 40, the following assumptions were made:

- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- On Route 128 and Route 24, tracks to be constructed adjacent to roadway in order to avoid need to reconstruct entire length of roadway
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 60 and 59 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Conceptual Layout

General: Commuter Rail design criteria limits vertical grades to 1.5%. The grades along the highways of this conceptual route vary up to approximately 4%. In areas where grades differ the commuter rail can be elevated using concrete columns, trench, lowered embankment, or a raised embankment. Construction in the median will require a new closed drainage system on both sides of the median to catch rainwater from the highway and tracks. Construction on one side of the highway will require a single store drain system. Storm water treatment systems will be required to meet current storm water discharge standards. For construction in the median a jersey style concrete barrier is included on both sides of the median to protect errant vehicles from getting onto the tracks. Track construction on one side of the highway will require a single row of barriers.

Northeast Corridor: From Readville (MP 219.00) to Route 128 Station (MP 217.48) a third track would be constructed. Catenary supports and wire would not be constructed for this track, but modifications to the existing supports may be required. It is assumed that existing bridges can be widened. No modifications to existing Route 128 Stationhouse would be required. The existing east platform would be widened with a new track placed on the east side of the widened platform.

Route 128: A new single-track Class 5 section would be constructed within the median from the east side of I-95 to Route 24. In this area, the median is preferred due to ACEC areas on the southern side of Route 128. On the north side the land adjacent to Route 128 is developed and constructing track on the north side would require the track to crossover the northbound lanes of Route 128 twice. The existing lanes would be shifted out to widen the median for the tracks. East of I-95 the proposed tracks cross under the southbound lanes of Route 128 and diverge from Route 128. After crossing I-95 the tracks curve to the north and becoming parallel to the Northeast Corridor tracks at the Route 128 Station. The proposed tracks would be elevated to cross I-95 and the ACEC areas to the east of the Route 128 station. Interchanges and bridges would be reconstructed.

Route 24: A new single track with sidings Class 5 line would be constructed along west side for the majority of the right-of-way. Just south of Interchange 20 the track goes from the west side of Route 24 under the southbound lanes to the median to avoid ACEC areas southwest of the Route 24 and Route 128 interchange. The track along Route 24 would connect to the northern leg of the Cotley junction. On the west side of Route 24 before this leg of the junction goes under Route 24, a turnout would direct the tracks along the west side of Route 24. The existing roadway would not be modified where the tracks are located on the west side. Interchanges would not be reconstructed other than new bridges in on/off ramps and the intersecting roadway. The profile of the tracks would go under or over the on/off ramps depending on existing interchange configuration. At the I-495 interchange the track was shifted from the West side of Route 24 to the median to utilized the wide median at the interchange. Running the Tracks around this interchange would have required multiple curves to avoid ramps, rest areas and right-of-way impacts.

Passing Sidings: Three passing sidings approximately 10,000 feet long would be located within the 29 mile stretch from the Cotley Junction to the Route 128 Station. The siding are located adjacent to the Route 128/Route 24 interchange; between the Route 140/Route 24 intersection and the Taunton River; and between Interchange 16 (Route 106) and Interchange 17 (Route 123).

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Route 24 in Taunton and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). No existing commuter rail stations would be reconstructed, but a platform would be added for the new track at Route 128 Station.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

However, this alternative would require a new guideway within existing transportation corridors. Heavy rail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing freight and existing commuter services. The existing freight services on the New Bedford Secondary and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of an entirely new service to the Northeast Corridor would present a significant restraint on the expansion of existing commuter and intercity services. This would be alleviated by the construction of the third track from Route 128 Station to Readville, where preliminary operations analysis shows there is not enough capacity for the trains that would be added by this alternative. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

Constructing a transit facility along Route 24 would limit future expansion of the highway by consuming a significant portion of the right-of-way. The Route 24 corridor has heavy development

abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated for several reasons. The section requiring a third track passes through extensive wetlands associated with the Neponset River. Much of this area is part of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). It is likely that constructing a third track would require filling of wetlands in this area. A low level of property acquisition would be needed at the connection point to the new branch.

The Northeast Corridor is one of the busiest rail lines in Massachusetts. Construction along this route would need to be scheduled to minimize disruption to existing services. For example, night work might be required for modifications to the electrification system. Work during operating hours would be restricted, lengthening the construction schedule.

Route 128: Construction along the Route 128 right-of-way would impact traffic because of the need to reconstruct interchanges and bridges. Work hours at these locations would likely be restricted so as not to cause traffic congestion during peak hours. Even with retaining walls, environmental impacts could be considerable. Property acquisition might be required at interchanges.

Route 24: Construction along the Route 24 right-of-way would impact traffic because of the need to reconstruct roadway, interchanges and bridges. Work hours at these locations would likely be restricted so as not to cause traffic congestion during peak hours. Even with retaining walls, environmental impacts could be considerable. Impacts to Route 24 would be worse for commuter rail than for light rail, heavy rail, or monorail, because commuter rail requires flatter grades and therefore additional earthworks and structures. Property acquisition might be required at interchanges.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisitions would not be needed.

Construction Time Frame: The need for large amounts of earthworks, new structures, and interchange reconstruction would represent a challenging and complicated aspect to the project, making it more difficult to complete the project in four years.

Due to major impacts resulting from earthworks, new structures, and interchange reconstruction, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 41

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 41. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 41 consists of light rail or heavy rail along the Route 24 and Route 128 Corridors. This alternative includes the Northeast Corridor between South Station and Route 128 Station, Route 128 between Route 128 Station and Route 24, Route 24 between Route 128 and Fall River, and Route 140 between Route 24 and New Bedford. The distance from the Route 128 Station to Fall River and New Bedford is approximately 43 and 50 miles respectively. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 41, the following assumptions were made:

- All lines double track for entire length
- On Route 128 and Route 24, tracks to be constructed in the median in order to avoid multiple bridge construction at interchanges along the roadway
- On Route 140, tracks to be constructed in median, which is wide enough to accommodate the new facility
- Interchanges impacted by the track are reconstructed to current freeway standards
- No additional trains provided on the Northeast Corridor between Route 128 Station and South Station to accommodate Boston-bound riders
- Maximum speed of 50 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Initial operating plan headways of 10 minutes on the trunk and 20 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 94 and 86 minutes, respectively. One transfer would be required at Route 128 Station. The reliability of this alternative would be medium, because although light rail, heavy rail, and commuter rail are not subject to delays from traffic congestion, the need to transfer to reach Boston would introduce additional variability into travel time. Transfer time was assumed to be 10 minutes, based on the difference between the

average headways of the two services. Assuming 30 minute headways on the Northeast Corridor and 10 minute headways on the light rail or heavy line, service could be coordinated to arrive prior to each Northeast Corridor train such that successive light rail or heavy rail trains have transfer times of 20, 10, and 0 minutes. The average of these values is 10 minutes. For example, passengers taking an 8:00AM train on the Northeast Corridor could arrive on the transit line at 7:40AM, 7:50AM, or 8:00AM. Since this is a high frequency service running every 10 minutes, riders will tend to gravitate to the transit trips that get them there just before the commuter rail. This could result in overcrowded trains that arrive just before a connecting train and low density trains for transit trains arriving well before a connection at the Route 128 Station.

Conceptual Layout

General: It is assumed the transit vehicles can negotiate the existing grades on the highways approximately no greater than 4%. Power would be supplied to the transit vehicles through an overhead catenary wire. A third rail system requires closer spacing between substations and would be more costly than an overhead catenary system. Construction in the median will require a new closed drainage system on both sides of the median to catch rainwater from the highway and tracks. A storm water treatment system will be required to meet current storm water discharge standards. A jersey style concrete barrier is included on both sides of the median to protect errant vehicles from getting onto the tracks. Platforms would typically be located in the median with an overhead station. Parking areas for stations would be located away from the stations and require shuttles or long walking distances.

Northeast Corridor: No improvements would be required, except modifications to the Route 128 Station to provide transfer.

Route 128: A new two-track section would be constructed within the median from the east side of I-95 to Route 24. In this area, the median is preferred due to ACEC areas on the southern side of Route 128. On the north side the land adjacent to Route 128 is developed and constructing track on the north side would require the track to crossover the northbound lanes of Route 128 twice. The existing lanes would be shifted out to widen the median for the tracks. East of I-95 the proposed tracks cross the southbound lanes of Route 128 and run along the southern side of the highway right-of-way. The proposed tracks would be elevated to cross the southbound lanes of Route 128 and ACEC areas to the east of the Route 128 station. The transit station would occupy a portion of the existing parking garage and some parking would need to be replicated in another location. Interchanges and bridges would be reconstructed.

Route 24: A new two-track section would be constructed within the median. The southbound lanes of Route 24 would need to be shifted to create the room in the median for the tracks. Interchanges and bridges would be reconstructed.

Route 140: A new two-track section would be constructed in the median, which is wide enough to accommodate the new facility. This would avoid reconstruction of interchanges and significant environmental impacts. The existing roadway would not be modified, but most bridges would need to be reconstructed. South of the Ashley Boulevard interchange in New Bedford, the median narrows, and minor widening of the roadway might be necessary.

New Bedford/Fall River Branch Junction: Where the two branches come together a complex set of elevated tracks is required so tracks going to New Bedford can cross northbound tracks and highway lanes.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility, to be located somewhere along the line. Overnight layover facilities would be constructed at undetermined locations in Route 128 Station, Fall River, and New Bedford.

Station Locations: New light rail or heavy rail stations would be constructed in Route 128 Station (1), Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Route 24), and Fall River (1). The existing commuter rail station at Route 128 Station would be modified for transfers.

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Double-track section in fill or cut with slopes, adjacent to four-, six-, or eight-lane highways
- Double-track section in the median of four-lane highway

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be similar to the MBTA's existing rapid transit system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for rapid transit vehicles, but it is assumed new facilities would be needed at the southern end of the system. Crews working on the existing rapid transit system would be qualified to work on the new service.

However, this alternative would require a new guideway within existing transportation corridors. Heavy rail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing commuter services. Impacts to existing commuter rail trains on the Northeast Corridor would be significant, as many of these trains are already operating at or near capacity. The addition of a large number of new passengers would likely result in overcrowding, and the need for additional trains, longer trains, and/or trains with more bi-level coaches.

Constructing a transit facility along Route 24 would limit future expansion of the highway by consuming a significant portion of the right-of-way. The Route 24 corridor has heavy development abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Construction Impacts

Route 128: Construction along the Route 128 right-of-way would impact traffic because of the need to reconstruct interchanges and bridges. Work hours at these locations would likely be restricted so as not to cause traffic congestion during peak hours. Even with retaining walls, environmental impacts could be considerable. Property acquisition might be required at interchanges.

Route 24: Construction along the Route 24 right-of-way would impact traffic because of the need to reconstruct interchanges and bridges. Work hours at these locations would likely be restricted so as not to cause traffic congestion during peak hours. Even with retaining walls, environmental impacts could be considerable. Property acquisition might be required at interchanges.

Route 140: Construction along the Route 140 right-of-way would impact traffic because of the need to reconstruct bridges. Work hours would probably not be restricted in most areas, however, due to lighter traffic volumes and the wide median available for staging. Environmental impacts would be minimal on this section, because work would disturb areas in the median rather than areas adjacent to the roadway. Property acquisition would probably not be required.

Construction Time Frame: The need to design and construct electrification infrastructure might represent a challenging or complicated aspect to the project, making it more difficult to complete the project in four years.

Operating Plan

The initial operating plan for Alternative 41 was assumed to be 20 minute peak headways on the branches, resulting in 10 minute headways on the trunk. This provides six peak period trips to each terminal. It was assumed that trains would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Due to highly unfavorable cost effectiveness, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 42

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 42. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 42 consists of light rail or heavy rail along the Route 24, Route 128, and Red Line Corridors. This alternative includes the Red Line between South Station and Quincy Adams Station near the Braintree Split, Route 128 between the Braintree Split and Route 24, Route 24 between Route 128 and Fall River, and Route 140 between Route 24 and New Bedford. The distance from the existing Quincy-Adams Station to Fall River and New Bedford is approximately 42 and 49 miles, respectively. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 42, the following assumptions were made:

- All lines double track for entire length
- On Route 128 and Route 24, tracks to be constructed in the median in order to avoid multiple bridge construction at interchanges along the roadway
- On Route 140, tracks to be constructed in median, which is wide enough to accommodate the new facility
- Interchanges reconstructed to current freeway standards
- Red Line Braintree Branch abandoned between Quincy Adams Station and Braintree Station, so the new facility becomes an extension of the Braintree Branch rather than a new branch on the Red Line
- Maximum speed of 50 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Initial operating plan headways of 10 minutes on the trunk and 20 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 89 and 81 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because heavy rail is not subject to delays from traffic congestion.

Conceptual Layout

General: It is assumed the transit vehicles can negotiate the existing grades on the highways approximately no greater than 4%. Power would be supplied to the transit vehicles through an overhead catenary wire. A third rail system requires closer spacing between substations and would be more costly than an overhead catenary system. The existing Red Line trackage uses a third rail, so dual mode transit cars similar to those currently used on the Blue Line would be required. Construction in the median will require a new closed drainage system on both sides of the median to catch rainwater from the highway and tracks. A storm water treatment system will be required to meet current storm water discharge standards. A jersey style concrete barrier is included on both sides of the median to protect errant vehicles from getting onto the tracks. Platforms would typically be located in the median with an overhead station. Parking areas for stations would be located away from the stations and require shuttles or long walking distances.

Braintree Branch: The Braintree Branch would be abandoned south of Quincy Adams Station, eliminating the present terminal station in Braintree. Passengers currently using this station could be accommodated either by a shuttle from Braintree to Quincy Adams or by the Old Colony commuter rail lines. Just south of Quincy Adams Station, a new two-track line would be constructed to connect the line towards the Braintree Split.

Route 128: A new two-track section would be constructed along the right-of-way between the Braintree Split and Route 24 in the median. Elevated track would be used immediately west of the Quincy Adams Station to go over existing tracks and roadways, including ramps and highway lanes associated with the Braintree Split. West of the Braintree Split, the median would be widened for track construction. Interchanges and bridges would be reconstructed.

Route 24: A new two-track section would be constructed within the median. The southbound lanes of Route 24 would need to be shifted to create the room in the median for the tracks. Interchanges and bridges would be reconstructed.

Route 140: A new two-track section would be constructed in the median, which is wide enough to accommodate the new facility. This would avoid reconstruction of interchanges and significant environmental impacts. The existing roadway would not be modified, but most bridges would need to be reconstructed. South of the Ashley Boulevard interchange in New Bedford, the median narrows, and minor widening of the roadway might be necessary.

New Bedford/Fall River Branch Junction: Where the two branches come together a complex set of elevated tracks is required so tracks going to New Bedford can cross northbound tracks and highway lanes.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion would be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

Station Locations: New heavy rail stations would be constructed in Raynham (1), Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Route 24), and Fall River (1). The existing Red Line station at Quincy Adams would not be modified.

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Double-track section in fill or cut with slopes, adjacent to four-, six-, or eight-lane highways
- Double-track section in the median of four-lane highway

These sections are shown in attached graphics.

Compatibility with Existing Infrastructure

This alternative would be partially compatible with existing infrastructure. It would be an extension of the MBTA's existing rapid transit system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for rapid transit vehicles, but it is assumed new facilities would be needed at the southern end of the system. Crews working on the existing rapid transit system would be qualified to work on the new service.

However, this alternative would require a new guideway within existing transportation corridors. Heavy rail tracks must be physically separated from highways and roadways, so an entirely new facility must be constructed within the existing right-of-way. This is not an effective use of existing infrastructure.

Transportation System Impacts

Impacts to the existing transportation system would include effects on existing rapid transit services. The extension of a rapid transit line to Fall River and New Bedford would require the line to fulfill both a rapid transit and a commuter function in urban areas, likely leading to chronic overcrowding north of Quincy Adams Station. This would also cause a decline in reliability and deterioration of quality of service. This alternative would also eliminate a rapid transit station in Braintree, requiring the thousands of commuters who use the garage there to find another way to commute.

Constructing a transit facility along Route 24 would limit future expansion of the highway by consuming a significant portion of the right-of-way. The Route 24 corridor has heavy development abutting the highway north of I-495, so any expansion that could not be completed within the existing right-of-way would have significant impacts to private structures.

Due to unacceptable impacts to the reliability and quality of service on the Red Line and the loss of Braintree Station, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 43

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 43. This memo corresponds to Phase 1 Screening Process.

Alternative Description

Alternative 43 consists of bus rapid transit (BRT) on the Route 24 and Route 128 Corridors. It includes a zipper bus lane on Route 24 from Interchange 14 (I-495) in Raynham to Interchange 21 (Route 128) in Randolph, a reversible direction bus lane on Route 128/I-93 from Interchange 4 (Route 24) to Interchange 13 (University Avenue) in Westwood, and the Northeast Corridor from Route 128 Station to South Station. Passengers would transfer between bus and commuter rail at Route 128 Station.

Design Assumptions

For Alternative 43, the following assumptions were made:

- Buses run express from New Bedford, Fall River, and Taunton to Boston
- No widening of Route 140 or Route 24 would be necessary south of Interchange 14
- No modifications to Route 24 between I-495 and just south of Route 128, other than installation of concrete zipper barriers
- Most existing interchanges along Route 128 will not be reconfigured
- Existing undergrade and overhead bridges on Route 128 will be reconstructed only if necessary
- 10 minute travel time savings for using the zipper lane and reversible bus lane on Route 24 and Route 128
- No additional trains provided on the Northeast Corridor between Route 128 Station and South Station to accommodate Boston-bound riders
- Travel time on existing connecting commuter rail lines per MBTA schedules as of February 2008
- Initial operating plan of 15 minute headways on each service in the peak direction during the peak period

Travel Time

Travel times from New Bedford and Fall River to Boston would be 67 minutes. One transfer would be required at Route 128 Station. The reliability of this alternative would be low, because buses in mixed traffic are subject to delays from traffic congestion. Despite the proposed improvements,

buses would still be in mixed traffic south of the proposed zipper lane on Route 24. The transfer introduces additional unreliability into this alternative. Travel time was assumed to be equal to auto travel time, less 10 minutes for the time saved by taking the Route 24 zipper lane and Route 128 reverse-flow lane. Transfer time was assumed to be 5 minutes, because arrivals could be coordinated with commuter rail arrivals.

Conceptual Layout

Route 24 from Interchange 14 (I-495) to Interchange 20 (Route 139): Along this section of highway, a concrete zipper barrier would be installed on both sides of the median. During AM hours, the barrier on the southbound roadway would be moved out, converting the left travel lane on the southbound side into a northbound bus lane. During PM hours, the opposite would occur, with the left travel lane on the northbound roadway becoming a southbound bus lane. Property acquisition would not be needed.

Route 24/128 Interchange: At a point north of Interchange 20 (Route 139), Route 24 would transition from a six-lane section to a seven-lane section, consisting of six conventional travel lanes and a center reverse-flow bus lane. The reverse-flow lane would utilize an existing grass median and follow the southbound alignment of Route 24. At Interchange 21, the ramp connecting Route 24 northbound to Route 128 northbound would be widened to accommodate the reverse-flow lane, carrying it to the median of Route 128. During AM hours, the reverse flow lane would serve as a northbound bus lane; during PM hours, as a southbound bus lane. Property acquisition would not be needed.

Route 128 from Interchange 4 (Route 24) to Interchange 13 (University Avenue): Beginning at the merge of the Route 24 ramps onto Route 128, a reverse-flow bus lane would be constructed in the median, following the alignment of Route 128. No access to Interchanges 3, 2, or 1 would be provided from the bus lane. These interchanges would not be reconfigured; however it is assumed that most bridges at these interchanges would need to be rebuilt. During AM hours, the reverse flow lane would serve as a northbound bus lane; during PM hours, as a southbound bus lane. Property acquisition would not be needed.

Route 128 Station: Just north of the Route 128/I-95 interchange, the reverse-flow lane would widen to two lanes and rise up, passing over the southbound lanes of Route 128 on a new viaduct. The viaduct would connect directly to the roof of the Route 128 garage. Buses would pick up and drop off at the platform stairway and elevator on the garage roof, and then descend the ramp back to Route 128. At the end of the ramp, vehicles traveling in the off-peak direction would exit the bus lane and enter mixed traffic. Minor property acquisition might be required.

Northeast Corridor: No improvements are required.

Station Locations: Park-and-ride facilities and/or bus shelters would be located in New Bedford (1), Fall River (1), and Taunton (1). It is possible that existing bus terminals in these cities would continue to be used. The selection of station sites is beyond the scope of this analysis.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the bus lines. Overnight layover facilities would be constructed at undetermined locations in Taunton, Fall River, and New Bedford.

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Six-lane mainline section on Route 24 with three lanes in each direction and zipper barriers on both side of the median

- Seven-lane mainline section on Route 24 with three lanes in each direction and a reverse-flow bus lane in the median
- Three-lane section on the Route 24 northbound to Route 128 northbound
- Seven-lane mainline section on Route 128 with three lanes in each direction and a reverse-flow bus lane in the median

These sections are shown in attached graphics. The locations of zipper lanes, reverse-flow lanes, and existing HOV zipper lanes are shown on the route graphic.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new express bus service operated or contracted out by the MBTA, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. A new maintenance facility and layover facilities would be required to accommodate the vehicles needed to run this service.

Transportation System Impacts

Impacts to the existing transportation system would include the increase in traffic from running additional buses. This could marginally increase congestion on highways. The capacity of the off-peak direction roadway on Route 24 would be significantly decreased by the zipper bus lane. The off-peak direction would be reduced from three lanes to two lanes; this would result in a capacity reduction of more than one-third, due to the capacity loss that occurs from having a hard obstruction (the zipper barrier) abutting the edge of the travel way.

Construction Impacts

Route 24: Route 24 is major commuting route between Fall River, New Bedford, and Boston. Thus, construction hours would be limited based on the need to maintain the flow of traffic. Lane closures would be restricted to off-peak hours. However, because work on Route 24 is limited in scope, impacts to existing traffic would be minimal.

Route 128: Route 128 is also a major commuting route. Since it is a beltway around Boston, both the northbound and southbound directions experience significant congestion during both the morning and afternoon peak periods. This would further limit construction hours and the ability to close lanes during large portions of the day. Construction impacts would be more significant because of the need to construct the new facility in the median.

The most significant disruptions to existing system users would occur at the Route 128/Route 24 interchange and the Route 128 connection, where new bridges over and under mainline facilities are needed. These locations would require extensive staging.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan was assumed to be a trip from each city every 15 minutes during the peak period. It was assumed that buses would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three bus platoons, is 2,700 passengers in the peak direction during the peak two hours.

Transportation
Land Development
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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 44

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 44. This memo corresponds to Phase 1 Screening Process.

Alternative Description

Alternative 44 consists of bus rapid transit (BRT) along the Route 24, Route 128, and Southeast Expressway Corridors. It includes a zipper bus lane on Route 24 from Interchange 14 (I-495) in Raynham to Interchange 21 (Route 128) in Randolph, a reversible direction bus lane on Route 128/I-93 from Interchange 4 (Route 24) to Interchange 7 (Route 3/I-93) in Braintree, and the existing HOV zipper lane along the Southeast Expressway (I-93).

Design Assumptions

For Alternative 44, the following assumptions were made:

- Buses run express from New Bedford, Fall River, and Taunton to Boston
- No widening of Route 140 or Route 24 would be necessary south of Interchange 14
- No modifications to Route 24 between I-495 and just south of Route 128, other than installation of concrete zipper barriers
- Most existing interchanges along Route 128 will not be reconfigured
- Existing undergrade and overhead bridges on Route 128 will be reconstructed only if necessary
- South Station Bus Terminal expanded separately, as part of South Station Overbuild Project
- 10 minute travel time savings for using the existing Southeast Expressway HOV lane
- 10 minute travel time savings for using the zipper lane and reversible bus lane on Route 24 and Route 128
- Initial operating plan of 15 minute headways on each service in the peak direction during the peak period

Travel Time

Travel times from New Bedford and Fall River to Boston would be 70 minutes. No transfer would be required. The reliability of this alternative would be low, because buses in mixed traffic are subject to delays from traffic congestion. Despite the proposed improvements, buses would still be in mixed traffic north of the existing terminus of the HOV zipper lane on the Southeast Expressway. Travel time was assumed to be equal to auto travel time, less 10 minutes for the time saved by taking

the Southeast Expressway HOV lane and 10 minutes for the time saved by taking the Route 24 zipper lane and Route 128 reverse-flow lane.

Conceptual Layout

Route 24 from Interchange 14 (I-495) to Interchange 20 (Route 139): Along this section of highway, a concrete zipper barrier would be installed on both sides of the median. During AM hours, the barrier on the southbound roadway would be moved out, converting the left travel lane on the southbound side into a northbound bus lane. During PM hours, the opposite would occur, with the left travel lane on the northbound roadway becoming a southbound bus lane. Property acquisition would not be needed.

Route 24/128 Interchange: At a point north of Interchange 20 (Route 139), Route 24 would transition from a six-lane section to a seven-lane section, consisting of six conventional travel lanes and a center reverse-flow bus lane. The reverse-flow lane would utilize an existing grass median and follow the southbound alignment of Route 24. At Interchange 21, the ramp connecting to Route 24 southbound from Route 128 northbound would be widened to accommodate the reverse-flow lane, carrying it to the median of Route 128. During AM hours, the reverse flow lane would serve as a northbound bus lane; during PM hours, as a southbound bus lane. Property acquisition would not be needed.

Route 128 from Interchange 4 (Route 24) to Interchange 7 (Route 3): Beginning at the merge of the Route 24 ramps onto Route 128, a reverse-flow bus lane would be constructed in the existing grass median, following the alignment of Route 128. From a point just south of Interchange 6 (Route 37), the reverse-flow lane would follow the alignment of Route 128 southbound. No access to Interchanges 5 or 6 would be provided from the bus lane. These interchanges would not be reconfigured; however it is assumed that most bridges at these interchanges would need to be rebuilt. During AM hours, the reverse flow lane would serve as a northbound bus lane; during PM hours, as a southbound bus lane. Property acquisition would not be needed.

Route 128/3/93 Interchange (Braintree Split): At Interchange 7 (Route 3 and I-93/Southeast Expressway), the ramp connecting Route 128 southbound to the Southeast Expressway northbound would be widened to accommodate the reverse-flow bus lane. The reverse-flow lane would terminate just south of the existing HOV zipper lane entrance/exit. Buses would enter/exit the reversible bus lane from/to the existing HOV zipper lane. Property acquisition would not be needed.

Southeast Expressway (I-93): No improvements would be made. Buses would use the existing HOV zipper lane between the Braintree Split and Columbia Road, and then travel in mixed traffic to the Massachusetts Avenue Connector overpass, where they would enter the existing HOV lane to South Station.

Station Locations: Park-and-ride facilities and/or bus shelters would be located in New Bedford (1), Fall River (1), and Taunton (1). It is possible that existing bus terminals in these cities would continue to be used. The selection of station sites is beyond the scope of this analysis.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the bus lines. Overnight layover facilities would be constructed at undetermined locations in Taunton, Fall River, and New Bedford.

The conceptual layout is shown in an attached graphic.

Typical Section

Typical sections include the following:

- Six-lane mainline section on Route 24 with three lanes in each direction and zipper barriers on both side of the median

- Seven-lane mainline section on Route 24 with three lanes in each direction and a reverse-flow bus lane in the median
- Three-lane section on the Route 128 northbound to Route 24 southbound ramp
- Nine-lane mainline section on Route 128 with four lanes in each direction and a reverse-flow bus lane in the median
- Three-lane section on the Route 128 southbound to Southeast Expressway northbound ramp

These sections are shown in attached graphics. The locations of zipper lanes, reverse-flow lanes, and existing HOV zipper lanes are shown on the route graphic.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new express bus service operated or contracted out by the MBTA, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. A new maintenance facility and layover facilities would be required to accommodate the vehicles needed to run this service.

Transportation System Impacts

Impacts to the existing transportation system would include the increase in traffic from running additional buses. This could marginally increase congestion on highways and in the Southeast Expressway HOV lane, and cause problems at the South Station Bus Terminal, depending on the future capacity of that facility and the number of vehicles to be served. The capacity available for carpools in the Southeast Expressway HOV lane would be reduced by the increase in bus traffic.

The capacity of the off-peak direction roadway on Route 24 would be significantly decreased by the zipper bus lane. The off-peak direction would be reduced from three lanes to two lanes; this would result in a capacity reduction of more than one-third, due to the capacity loss that occurs from having a hard obstruction (the zipper barrier) abutting the edge of the travel way.

Construction Impacts

Route 24: Route 24 is major commuting route between Fall River, New Bedford, and Boston. Thus, construction hours would be limited based on the need to maintain the flow of traffic. Lane closures would be restricted to off-peak hours. However, because work on Route 24 is limited in scope, impacts to existing traffic would be minimal.

Route 128: Route 128 is also a major commuting route. Since it is a beltway around Boston, both the northbound and southbound directions experience significant congestion during both the morning and afternoon peak periods. This would further limit construction hours and the ability to close lanes during large portions of the day. Construction impacts would be more significant because of the need to construct the new facility in the median.

The most significant disruptions to existing system users would occur at the Route 128/Route 24 interchange and the Braintree Split, where new bridges over and under mainline facilities are needed. These locations would require extensive staging.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan was assumed to be a trip from each city every 15 minutes during the peak period. It was assumed that buses would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three bus platoons, is 2,700 passengers in the peak direction during the peak two hours.

Transportation
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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 45

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 45. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 45 consists of enhanced public or private bus service from New Bedford, Fall River, and Taunton to Boston. This alternative includes bus routes via Route 24, Route 140, Route 128, and the Southeast Expressway. Enhanced park-and-ride facilities and/or bus shelters would be provided. This routing is shown on an attached graphic.

Design Assumptions

For Alternative 45, the following assumptions were made:

- Buses run express from New Bedford, Fall River, and Taunton/Raynham to Boston
- No highway infrastructure improvements
- South Station Bus Terminal expanded separately, as part of South Station Overbuild Project
- 10 minute travel time savings for using the existing Southeast Expressway HOV lane
- Initial operating plan of 15 minute headways on each service in the peak direction during the peak period

Travel Time

Travel times from New Bedford and Fall River to Boston would be 80 minutes. No transfer would be required. The reliability of this alternative would be low, because buses in mixed traffic are subject to delays from traffic congestion. Travel time was assumed to be equal to auto travel time, less 10 minutes for the time saved by taking the Southeast Expressway HOV lane.

Conceptual Layout

Station Locations: Park-and-ride facilities and/or bus shelters would be located in New Bedford (1), Fall River (1), and Taunton (1). It is possible that existing bus terminals in these cities would continue to be used. The selection of station sites is beyond the scope of this analysis.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are not included in this alternative, because no additional trains would be added to the existing MBTA commuter rail system.

Maintenance and Layover: Maintenance would be at a new facility located somewhere along the bus lines. Overnight layover facilities would be constructed at undetermined locations in Taunton, Fall River, and New Bedford.

The conceptual layout is shown in an attached graphic.

Typical Section

Since no highway improvements are required for this alternative, there are no typical sections.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new express bus service contracted out by the MBTA, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. A new maintenance facility and layover facilities would be required to accommodate the vehicles needed to run this service.

Transportation System Impacts

Impacts to the existing transportation system would be limited to the increase in traffic from running additional buses. This could marginally increase congestion on highways and in the Southeast Expressway HOV lane, and cause problems at the South Station Bus Terminal, depending on the future capacity of that facility and the number of vehicles to be served. The capacity available for carpools in the Southeast Expressway HOV lane would be reduced by the increase in bus traffic.

Construction Impacts

Construction impacts would be limited to impacts from any new stations.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan was assumed to be a trip from each city every 15 minutes during the peak period. It was assumed that buses would not layover at the terminals during the peak period, but start new trips in the opposing direction, resulting in off-peak direction service of approximately the same quality as peak direction service.

Capacity

The capacity of the initial operating plan, assuming three bus platoons, is 2,700 passengers in the peak direction during the peak two hours.

Transportation
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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 56

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 56. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 56 consists of conventional diesel commuter rail to South Station via old railroad rights-of-way between Providence, Fall River, and New Bedford. This alternative includes the Northeast Corridor between South Station and Providence Station, the Providence Warren & Bristol Railroad right-of-way between Providence Station and Bristol, the Fall River Warren & Providence Railroad right-of-way between Bristol and the west side of Fall River, a new right-of-way to connect the east and west sides of Fall River, the Dartmouth Secondary between the west side of Fall River and New Bedford, and the New Bedford Secondary between the Dartmouth Secondary and downtown New Bedford.

Design Assumptions

For Alternative 56, the following assumptions were made:

- Tunnel from Providence Station to East Providence Junction could be restored
- East Bay bike path, following the Providence Warren & Bristol right-of-way, to be eliminated
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Average speed on Providence to Fall River segment 35 mph
    - Most of line is abandoned; track charts were not available, but track geometry is clearly very poor due to multiple sharp curves
    - New right-of-way in Fall River would suffer from sharp curves and challenging grades
- Design headways of 15 minutes on the trunk (north/west of Fall River) and 30 minutes on the branches (south/east of Fall River)
    - Eight trips in each direction during the peak two hours

  - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours
  - Six total trains
  - Three trains to/from New Bedford
  - Three trains short turn in Fall River

Travel Time

Travel times from New Bedford and Fall River to Boston would be 111 and 95 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion.

Due to unacceptably long travel times, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 57

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 57. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 57 consists of enhanced public or private bus service on Interstate 195, connecting Wareham, New Bedford, Fall River, and Providence. Park-and-ride facilities and/or bus shelters would be provided. This routing is shown on an attached graphic.

Due to lack of service to Boston, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 58

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 58. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 58 consists of conventional diesel commuter rail along the Wareham Corridor. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, and the Buzzards Bay Secondary between Middleborough Junction and the Cape Cod Canal in Buzzards Bay. This routing is shown on an attached graphic.

Due to lack of service to New Bedford and Fall River, this alternative was removed from further consideration. Commuter rail service to Fall River, New Bedford, and Wareham was considered under Alternative 63.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 61

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 61. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 61 consists of feeder bus service to Middleborough/Lakeville Station. This alternative includes feeder bus routes from New Bedford, Fall River, and Taunton to Middleborough/Lakeville Station, which is the closet commuter rail station to all three cities. Park-and-ride facilities and/or bus shelters would be provided. This routing is shown on an attached graphic.

Assumptions

For Alternative 61, the following assumptions were made:

- New Bedford service via Route 140 and Route 79; Fall River service via Route 24, Route 44, and I-495; Taunton service via Route 44 and I-495
- Routes assumed to serve the center of each community
- Buses would operate in mixed traffic
- Speed assumed to be 45-65 mph, depending on the roadway
- Bus departures from each city would be coordinated with commuter rail departures (one trip from each city for each train)

Travel Time

Travel times from New Bedford and Fall River to Boston would be 94 and 90 minutes, respectively. One transfer would be required at Middleborough/Lakeville Station. The reliability of this alternative would be low, because buses in mixed traffic are subject to delays from traffic congestion, and because of the need to transfer to reach Boston. Transfer time was assumed to be 5 minutes because arrivals would be coordinated.

Due to unacceptably long travel times, the need to transfer, and low reliability, this alternative was removed from further consideration.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 62

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 62. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 62 consists of conventional diesel commuter rail along the Attleboro and Middleborough Corridors. This alternative includes the Northeast Corridor between South Station and a point near the Attleboro/Mansfield town line, a new track bypass (Attleboro Bypass) along the National Grid right-of-way in Attleboro and Norton, the Attleboro Secondary between a point near the Attleboro/Norton town line and Weir Junction, the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Weir Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

The purpose of Alternative 62 is to divide New Bedford and Fall River trains between the Northeast Corridor and the Old Colony Main Line/Middleborough Line, obviating the need for improvements to either corridor. It was assumed that some trains from each terminus would follow each route.

Design Assumptions

For Alternative 62, the following assumptions were made:

- Based on operations analysis, no improvements needed to Northeast Corridor or Old Colony Main Line; trains from New Bedford and Fall River are split between the two facilities
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours

  - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours
  - Two trains on each branch to/from Boston via Middleborough Route
  - One train on each branch to/from Boston via Attleboro Route

Travel Time

Travel times from New Bedford and Fall River to Boston would be 74 and 73 minutes, respectively, via the Attleboro route, and 82 and 81 minutes, respectively, via the Middleborough route. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Northeast Corridor: No improvements are required.

Attleboro Bypass: A new single track Class 5 line would be constructed roughly following the National Grid right-of-way from the Northeast Corridor near the Attleboro/Mansfield/Norton town line (MP 0.00) to the Attleboro Secondary near the Attleboro/Norton town line (MP 2.62). Part of Chartley Pond in Norton might be affected where the line would tie into the Attleboro Secondary.

Attleboro Secondary: Existing freight track would be upgraded to Class 5. The line would be single track for the entire length between the Attleboro Bypass and Weir Junction (MP 0.00 to MP 9.40).

Old Colony Main Line: No improvements are required.

Middleborough Line: At the southern end of the line (MP 31.23 to MP 34.71), a second track would be constructed as part of a passing siding, the remainder of which would be along the Middleborough Secondary.

The existing station at Middleborough/Lakeville would be relocated, because it is located on the Buzzards Bay Secondary, south of the junction between the Middleborough Line, the Middleborough Secondary, and the Buzzards Bay Secondary. If the station were not relocated, a reverse move would be required.

Middleborough Secondary: Existing freight track would be upgraded to Class 5. The line would be mostly single track (MP 20.47 to MP 16.08), with the end near Middleborough Junction (MP 21.20 to MP 20.47) and the end near Cotley Junction (MP 16.08 to MP 13.30) having double track sections.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Cotley Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1).

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors, with the exception of the Attleboro Bypass. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Attleboro Secondary, Middleborough Secondary, New Bedford Secondary, and Dartmouth Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

The addition of some new trains to the Northeast Corridor might present a restraint on the expansion of existing commuter and intercity services. However, since some trains would be routed along the Middleborough Line, the impacts would not be as significant as alternatives in which all trains use the Northeast Corridor. The increase in train traffic might have a negative effect on the reliability of service on the Northeast Corridor.

Extension of the Middleborough Line to serve would not affect existing service to stations between Middleborough/Lakeville Station and South Station. The extension of the lines might require longer trains and/or trains with more bi-level coaches, which could present an operational problem at South Station, where Tracks 12 and 13 are not long enough to accommodate trains with more than six coaches.

This alternative would preclude future extension of service to Wareham and Buzzards Bay without significant improvements to the Old Colony Main Line, because all the capacity on the line would be used by the Fall River, New Bedford, Kingston, and Greenbush Lines.

Construction Impacts

Northeast Corridor: Construction on the Northeast Corridor would be complicated but limited to the interlocking where the Attleboro Bypass would connect to the corridor.

Attleboro Bypass: The Attleboro Bypass would be constructing along an existing National Grid right-of-way. Modifications to the existing high voltage lines might be required. The right-of-way passes through several wetlands, which would require filling, and crosses Chartley Pond, part of which might be filled or spanned with a trestle. A moderate amount of property acquisition would be required. However, disruption to the existing transportation system would be minimal.

Attleboro Secondary: Construction on the Attleboro Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to two trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on the existing embankment. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Middleborough Secondary: Construction on the Middleborough Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to a few trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan

The initial operating plan for Alternative 62 was assumed to be 40 minute peak headways on the branches, resulting in 20 minute headways on the trunk. This provides three peak period trips to each terminal, meeting the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. It was assumed that four trains would use the Middleborough Route and two trains would use the Attleboro Route. Some trains would be new service, while others would be extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 8,640 passengers in the peak direction during the peak two hours.

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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 63

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 63. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 63 consists of conventional diesel commuter rail along the Middleborough and Wareham Corridors. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, the Fall River Secondary between Myricks Junction and downtown Fall River, and the Buzzards Bay Secondary between Middleborough Junction and the Cape Cod Canal in Buzzards Bay. This routing is shown on an attached graphic. This alternative is equivalent to the combination of Alternatives 17 and 58.

Assumptions

For Alternative 63, the following assumptions were made:

- Based on operating plan, triple-track of Old Colony Main Line required between South Station and Braintree Junction
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction
- Initial operating plan headways of 20 minutes on the trunk and 40 minutes on the branches in the peak direction during the peak two hours

Travel Time

Travel times from New Bedford and Fall River to Boston would be 82 and 81 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Old Colony Main Line: From South Station (MP 0.00) to Braintree Junction (MP 11.55), the Old Colony Line would be upgraded to a three-track cross section. Between South Station and Columbia Junction, this would require widening, adjustments to Red Line and freight tracks, and property acquisitions. In Boston, (MP 1.40 to MP 4.05), the existing cross section is two Red Line Ashmont Branch tracks, one Old Colony Main Line track, and two Red Line Braintree Branch tracks. This section would be reconstructed as two Red Line tracks and three Old Colony Main Line tracks. The remainder of the Red Line Braintree Branch, from Morrissey Boulevard to Braintree Station, would be put into a new tunnel. This would allow three Old Colony Main Line tracks on the surface. The work required and construction staging for this section are detailed in a memorandum titled "Preliminary Analysis of Old Colony Main Line Improvements".

This work would require reconstructing the existing commuter rail stations at JFK/UMass, Quincy Center, and Braintree.

Middleborough Line: The entire Middleborough Line would be upgraded to a two-track cross section. In most cases, the existing right-of-way and bridges are wide enough to accommodate another track. The existing station at Middleborough/Lakeville would not be relocated, and would be served by only trains on the Buzzards Bay Line. Existing stations on single-track segments would be reconstructed to accommodate the second track.

Middleborough Secondary: Existing freight track would be upgraded to Class 5. The line would be mostly single track (MP 20.47 to MP 16.08), with the end near Middleborough Junction (MP 21.20 to MP 20.47) and the end near Cotley Junction (MP 16.08 to MP 13.30) having double track sections.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Cotley Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Buzzards Bay Secondary: Existing freight track would be upgraded to Class 5. The line would be single-track for the entire length between Middleborough Junction and Buzzards Bay, with passing sidings in Middleborough/Rochester/Wareham (MP 7.81 to MP 10.00) and Wareham (MP 19.33 to MP 20.08). Station sidings would be located at Middleborough/Lakeville Station (MP 0.91) and Wareham Station (MP 14.54).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail stations at JFK/UMass, Quincy Center, Braintree, Holbrook/Randolph, Campello, and Bridgewater would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River, New Bedford, and Wareham/Buzzards Bay.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track, double-track, and triple-track sections in fill or cut with slopes
- Single-track, double-track, and triple-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single-, double-, and triple-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be a new branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Middleborough Secondary, New Bedford Secondary, Fall River Secondary, and Buzzards Bay Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Middleborough Line would not affect existing service to stations between Middleborough/Lakeville Station and South Station. The extension of the lines might require longer trains and/or trains with more bi-level coaches, which could present an operational problem at South Station, where Tracks 12 and 13 are not long enough to accommodate trains with more than six coaches.

Triple-track on the Old Colony Main Line would be sufficient to provide service to New Bedford, Fall River, and Wareham via the Middleborough Line. This configuration would improve reliability on the Old Colony Main Line and Middleborough Line. Three tracks would not, however, be necessary to provide service only to New Bedford and Fall River. The infrastructure needed to for that service only is described as part of Alternative 17.

Construction Impacts

Old Colony Main Line: The construction of second and third tracks on the Old Colony Main Line would be very complicated, causing disruption to Old Colony commuter rail service, Red Line rapid transit service, and local traffic in Quincy and Braintree. A high level of property acquisition would be required. The impacts of this segment are detailed in a memo titled "Preliminary Analysis of Old Colony Main Line Improvements".

Middleborough Line: Construction on the Middleborough Line would be complicated due to the need to work around existing passenger and freight service, of which passenger service is by far the largest. Existing stations would need to be reconstructed. Work during operating hours would be restricted, lengthening the construction schedule.

In most places, the existing embankment and structures are wide enough to permit a second track without significant work. This would simplify construction. Property acquisitions would be minor.

Middleborough Secondary: Construction on the Middleborough Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to a few trains a day. Impacts to

environmental resources would be minimal, except in siding areas, because tracks would be located on existing embankments. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Buzzards Bay Secondary: Construction on the Buzzards Bay Secondary would be relatively simple. Mass Coastal Railroad runs regular freight service on the line, including hauling trash from Cape Cod to an incinerator in Rochester. Work might be restricted so as not to disrupt this service. Impact to environmental resources would be minimal, except for siding areas, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: The construction of the second and third tracks on the Old Colony Main Line through Boston, Quincy, and Braintree is a challenging and complicated design and construction aspect to the project, requiring difficult construction and extensive staging. It is anticipated that the project could not be completed in four years.

Due to unacceptable construction impacts to the Old Colony Main Line and the Red Line, and the inability to reach completion within four years, this alternative was removed from further consideration.

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

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Boston, Massachusetts 02110
617 728-7777
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Memorandum

To: file

Date: March 20, 2008

Project No.: 10111.00

From: South Coast Rail team

Re: South Coast Rail – Phase 1 Screening Process
Alternative 64

The purpose of this memorandum is to document the assumptions, travel time, conceptual layout, typical section, transportation system impacts, construction impacts, operating plan, and capacity for South Coast Rail Phase 1 Alternative 64. This memo corresponds to the Phase 1 Screening Process.

Alternative Description

Alternative 64 consists of conventional diesel commuter rail along the Middleborough Corridor. This alternative includes the Old Colony Main Line between South Station and Braintree Junction, the Middleborough Line between Braintree Junction and Middleborough Junction, the Middleborough Secondary between Middleborough Junction and Cotley Junction, the New Bedford Secondary between Cotley Junction and downtown New Bedford, and the Fall River Secondary between Myricks Junction and downtown Fall River. This routing is shown on an attached graphic.

For Alternative 64, no improvements would be made to the Old Colony Main Line, and service would be restricted to Middleborough Line trains extended to New Bedford/Fall River, plus any additional capacity on the line. This alternative is not capable of meeting the same level of service as the other commuter rail alternatives analyzed in Phase 1. It was included at the request of the Interagency Coordinating Group.

Design Assumptions

For Alternative 64, the following assumptions were made:

- No improvements to Old Colony Main Line
- All existing freight track replaced with Class 5 track
- All existing undergrade bridges to be reconstructed, except existing commuter rail bridges and recently reconstructed bridges in New Bedford and Fall River, which may be widened
- Overhead bridges to be reconstructed only if existing width is too narrow
- Maximum speed of 79 mph on new lines; travel times on existing lines per MBTA schedules as of February 2008
- Design headways of 15 minutes on the trunk (north of Myricks Junction) and 30 minutes on the branches (south of Myricks Junction)
    - Eight trips in each direction during the peak two hours
    - Greater number of trips could be provided in the peak direction by reducing the number of trips in the off-peak direction

- Initial operating plan of two peak period trains to/from New Bedford and one peak period train to/from Fall River

Travel Time

Travel times from New Bedford and Fall River to Boston would be 82 and 81 minutes, respectively. No transfer would be required. The reliability of this alternative would be high, because commuter rail is not subject to delays from traffic congestion. It should be noted that the travel times calculated for this study may be less than those calculated for previous studies because of having fewer station stops and allowing operation at the maximum speed except where restricted by geometry.

Conceptual Layout

Old Colony Main Line: No improvements would be made to the Old Colony Main Line.

Middleborough Line: Preliminary operations analysis shows that, in general, the sidings on the Middleborough Line are sufficient to support the desired headway. At the southern end of the line (MP 31.23 to MP 34.71), a second track would be constructed as part of a passing siding, the remainder of which would be along the Middleborough Secondary.

The existing station at Middleborough/Lakeville would be relocated, because it is located on the Buzzards Bay Secondary, south of the junction between the Middleborough Line, the Middleborough Secondary, and the Buzzards Bay Secondary. If the station were not relocated, a reverse move would be required.

Middleborough Secondary: Existing freight track would be upgraded to Class 5. The line would be mostly single track (MP 20.47 to MP 16.08), with the end near Middleborough Junction (MP 21.20 to MP 20.47) and the end near Cotley Junction (MP 16.08 to MP 13.30) having double track sections.

New Bedford Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for the entire length between Cotley Junction and downtown New Bedford. This is not required by the operations analysis, but is desirable for allowing flexibility between commuter and freight operations.

Fall River Secondary: Existing freight track would be upgraded to Class 5. The line would be double track for a short distance south of Cotley Junction (MP 0.00 to MP 0.94). The remainder of the line would be single track, with passing sidings in Freetown (MP 2.20 to MP 4.34) and Fall River (MP 9.56 to MP 11.11).

Station Locations: New commuter rail stations would be constructed in Taunton (1), New Bedford (2, one downtown and one near northern city line), Freetown (1, on Fall River Secondary), and Fall River (1). The existing commuter rail station at Middleborough/Lakeville would be reconstructed.

South Station Improvements and In-Town Midday Layover: The proposed South Station improvements and a new in-town midday layover facility are included in this alternative.

Maintenance and Layover: Maintenance would be at existing MBTA facilities, though expansion might be required to accommodate additional vehicles. Overnight layover facilities would be constructed at undetermined locations in Fall River and New Bedford.

The conceptual layout is shown in an attached track chart.

Typical Section

Typical sections include the following:

- Single-track and double-track sections in fill or cut with slopes
- Single-track and double-track sections in fill or cut with retaining walls

These sections are shown in attached graphics. The locations of single- and double-track sections are shown on the route graphic and track chart.

Compatibility with Existing Infrastructure

This alternative would be fully compatible with existing infrastructure. It would be an extension of a branch on the MBTA's existing commuter rail system, and would use existing transportation corridors. Therefore, there would be a large volume of existing institutional knowledge about the construction, operation, and maintenance of this alternative. Existing layovers and maintenance facilities are designed for diesel engines and commuter rail coaches, though expansion might be required. Crews working on the existing commuter rail system would be qualified to work on the new branches.

Transportation System Impacts

Impacts to the existing transportation system would be limited to effects on existing freight and existing commuter services. The existing freight services on the Middleborough Secondary, New Bedford Secondary, and Fall River Secondary are small in scope, so it is unlikely that they could not be accommodated during the middle of the day or overnight. The provision of a second track on the New Bedford Secondary would also give some operational flexibility for freight. Still, the introduction of commuter rail onto these lines would restrict the windows for freight operation.

Extension of the Middleborough Line would not affect existing service to stations between Middleborough/Lakeville Station and South Station. The extension of the lines might require longer trains and/or trains with more bi-level coaches, which could present an operational problem at South Station, where Tracks 12 and 13 are not long enough to accommodate trains with more than six coaches.

This alternative would preclude the extension of commuter rail service to Wareham or Buzzards Bay in the future without infrastructure improvements on the Old Colony Main Line.

Construction Impacts

Middleborough Secondary: Construction on the Middleborough Secondary would be relatively simple. CSX runs regular freight service on the line, but this amounts only to a few trains a day. Impacts to environmental resources would be minimal, except in siding areas, because tracks would be located on existing embankments. Property acquisition would not be needed.

New Bedford Secondary and Fall River Secondary: Construction on the New Bedford Secondary and Fall River Secondary would be relatively simple. CSX runs regular freight service on the lines, but this amounts only to a few trains a week. Impacts to environmental resources would be minimal, except in siding areas on the Fall River Secondary, because tracks would be located on existing embankments. Property acquisition would not be needed.

Construction Time Frame: There are no challenging or complicated design or construction aspects to the project, so it is anticipated that the project could be completed in four years.

Operating Plan and Ridership

The initial operating plan for Alternative 64 was assumed to be two peak period trains to/from New Bedford and one peak period train to/from Fall River. This does not meet the minimum service acceptable under the MBTA Service Delivery Policy. It was assumed there would be one trip in the off-peak direction during the peak period. All trains would be extension of existing trains.

Capacity

The capacity of the initial operating plan, assuming eight double-deck coaches per train, is 4,320 passengers in the peak direction during the peak two hours. This is less than other commuter rail alternatives due to the inability to provide the same level of service.

Appendix B
Step 3: Detailed Screening Tables

- Screening Criterion 3.1 – Wetlands
- Screening Criterion 3.6 – Smart Growth Consistency

SOUTH COAST RAIL
Step 3 - Screening Criterion, 3.1 Wetlands

#	Alternative		3.1-1 Amount of Wetland fill		3.1-2 Fill in an ACEC		3.1-3 Number of Vernal Pools w/in 25 feet (CVP/PVP)		3.1-4 Length of wetland (Indirect)	Overall Ranking
1	Commuter rail to South Station via Attleboro Bypass	UF	7.82 acres	UF	0.46 acres	N	2 (7)	UF	6,300 feet	UF
3	Commuter rail to South Station via Attleboro Bypass, with Dartmouth	UF	9.74 acres	UF	0.46 acres	N	2 (6)	HUF	15,800 feet	HUF
5	DMUs to Attleboro Station	UF	5.32 acres; includes 0.67 acres salt marsh	F	0	N	2 (8)	F	0	F
6	DMUs to Attleboro Station with Dartmouth	HUF	10.89 acres; includes 0.67 acres salt marsh	F	0	N	3 (11)	UF	9,500 feet	HUF
7	Electrified commuter rail via Attleboro bypass	UF	8.46 acres; includes 0.51 acres salt marsh	UF	0.46 acres	N	2 (10)	UF	6,300 feet	UF
30	Commuter Rail, Stoughton	UF	6.74 acres	UF	0.76 acres	UF	9 (17)	UF	6,400 feet	UF
32	DMUs to Stoughton Station	UF	8.95 acres, including 0.67 acres salt marsh	HUF	1.41 acres	UF	9 (17)	UF	6.400 feet	HUF
33	DMUs to Stoughton Station with Dartmouth	HUF	14.52 acres, including 0.67 acres salt marsh	HUF	1.41 acres	UF	10 (20)	HUF	15,900 feet	HUF
34	Electrified commuter rail via Stoughton	UF	7.25 acres	UF	0.83 acres	UF	9 (17)	UF	6,400 feet	UF
43	BRT on Rt 24 to Rt 128 Station	F	0.31	UF	0.25 acres	F	0	F	0	F
44	BRT on Rt 24 to South Station	F	0.1	F	0	F	0	F	0	F
45	Enhanced Bus	F	0	F	0	F	0	F	0	F
62	Commuter rail via Attleboro (bypass) and Middleborough	UF	3.42 acres	F	0	N	2 (11)	UF	6,300 feet	UF
64	Middleborough	F	3.61 acres	F	0	N	0 (4)	F	0	F
KEY		F	0-0.5 ac	F	0	F	O	F	0	
HF	Highly Favorable	uf	3-10 ac	UF	0-1 AC	N	< 5 CVP	UF	1-10,000 FT	
F	Favorable	huf	more than 10	HUF	> 1 AC	UF	> 5 CVP	HUF	> 10,000 FT	
N	Neutral									
UF	Unfavorable									
HUF	Highly Unfavorable									

SOUTH COAST RAIL
Step 3 - Screening Criterion, 3.6 Smart Growth Consistency

#	Alternative		3.6-1 Serves Historic Population centers		3.6-2 Brownfields Redevelopment		3.6-2 Preserves land etc		3.6-3 Preserves Historic Resources		3.6-4 Stations in developed areas	Overall Ranking
1	Commuter rail to South Station via Attleboro Bypass	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
3	Commuter rail to South Station via Attleboro Bypass, with Dartmouth	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
5	DMUs to Attleboro Station	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	HF
6	DMUs to Attleboro Station with Dartmouth	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	HF
7	Electrified commuter rail via Attleboro bypass	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
30	Commuter Rail, Stoughton	HF	serves 4 historic population centers - New Bedford, Fall River, Taunton, Easton	F	Potential redevelopment in 5 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
32	DMUs to Stoughton Station	HF	serves 4 historic population centers - New Bedford, Fall River, Taunton, Easton	F	Potential redevelopment in 5 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
33	DMUs to Stoughton Station with Dartmouth	HF	serves 4 historic population centers - New Bedford, Fall River, Taunton, Easton	F	Potential redevelopment in 5 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
34	Electrified commuter rail via Stoughton	HF	serves 4 historic population centers - New Bedford, Fall River, Taunton, Easton	F	Potential redevelopment in 5 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
43	BRT on Rt 24 to Rt 128 Station	N	serves 2 historic population centers - New Bedford, Fall River	F	Potential redevelopment in 4 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	UF	Fall River and New Bedford stations could be located in developed areas. All other stations in undeveloped areas near highways	UF

SOUTH COAST RAIL
Step 3 - Screening Criterion, 3.6 Smart Growth Consistency

#	Alternative		3.6-1 Serves Historic Population centers		3.6-2 Brownfields Redevelopment		3.6-2 Preserves land etc		3.6-3 Preserves Historic Resources		3.6-4 Stations in developed areas	Overall Ranking
44	BRT on Rt 24 to South Station	N	serves 2 historic population centers - New Bedford, Fall River	F	Potential redevelopment in 4 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	UF	Fall River and New Bedford stations could be located in developed areas. All other stations in undeveloped areas near highways	UF
45	Enhanced Bus	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	F	Potential redevelopment in 5 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	UF	Fall River, New Bedford and Taunton stations could be located in developed areas. All other stations in undeveloped areas near highways	UF
62	Commuter rail via Attleboro (bypass) and Middleborough	F	serves 3 historic population centers - New Bedford, Fall River, Taunton	HF	Potential redevelopment in 6 clusters of 21 E sites	N	Minor loss of wildlife habitat -no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
64	Commuter Rail via Middleborough, no Infrastructure imprvements	N	serves 2 historic population centers - New Bedford, Fall River	F	Potential redevelopment in 4 clusters of 21 E sites	HF	No loss of wildlife habitat, no loss of farmland, no impact to drinking water supplies. Smart Growth strategies could be implemented to protect farmland from sprawl	HF	No impact to historic or archaeological resources	F	All stations could be located in developed area. Potential for highway stations to serve larger populations.	F
			Assumes that Attleboro Center, Middleborough Center, Stoughton Center are already served		Assumes that brownfields clusters in Attleboro, Middleborough and Stoughton are already served							
		HF	serves 4 cemters	HF	serves 6	HF	preserves land use in all categories	HF	NO IMPACT	F	all stations could be in developed areas - potential for highway stations to serve larger population	
		F	serves 3	F	serves 4-5	N	preserves land use in all categories with minor loss wildlife habitat			UF	Stations could serve developed areas in New Bedford and Fall River, all other stations in undeveloped areas near highways	
		N	serves 2	N	serves less than 4	UF	does not meet criterion					
		UF	serves less than 2	UF								
KEY												
HF	Highly Favorable											
F	Favorable											
N	Neutral											
UF	Unfavorable											
HUF	Highly Unfavorable											

Appendix C
Interagency Coordinating Group Minutes

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #12

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: April 1, 2008, 9:00 AM to 11:45 PM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Protection Act Unit
Samir Bukheri	US Environmental Protection Agency
Joe Cosgrove	Massachusetts Bay Transportation Authority
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Betsy Higgins	US Environmental Protection Agency
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	MA Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Scott Peterson	Central Transportation Planning Staff
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning Economic Development District
Liz Sorenson	MA Department of Conservation and Recreation ACEC Program
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmerman	US Environmental Protection Agency
Phil Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Packet of letters from individuals and organizations on "draft findings." Senders include: Audubon/ Taunton River Watershed Association; Public Employees for Environmental Responsibility; Heather Graf; George Spatcher; Lou Gitto; Gerald McDonald; Mark Sweeney.

PURPOSE/SUBJECT:
Continue discussion of the alternatives to be carried into Phase 2; discuss Interagency Group future activities and meetings.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to

evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The twelfth meeting was intended to continue the discussion of the alternatives to be advanced to Phase 2.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list).

Approval of 3.04.08 and 3.21.08 Meeting Minutes

At the March 21 meeting, group members suggested edits to the meeting minutes. Mr. Lehan had to leave the meeting before its conclusion and he submitted the following comments on the Phase 1 Screening Criteria draft document:

- In footnote 1, it is more precise to state: "…; the Massachusetts Department of Fish and Game, including its Division of Fisheries and Wildlife and the Natural Heritage and Endangered Species Program;. . . "

- Last sentence in the new language on p.2: use "The" instead of "These"…

- The new language in 2.3 on page 5: it states that the conceptual cost estimate will be refined based on an approximate cost for "mitigating wetland losses." Is this category of mitigation (for wetland losses) the only one at the Phase 1 stage in the screening process that EOT will have enough information on to refine the project alternative cost estimate…(e.g., but not for loss of priority habitat and/or open space)?

- The new language under the Phase 1 screening process description on p.10: I missed the discussion on this point because I had to leave for another meeting. My only question is whether the term "fail-safe" is the best way of characterizing this last aspect of the review. I think of it more as saying: The Group will conduct a final review at the end of Step 3 to determine whether the any modification to the Group's evaluation and rating of alternatives through Steps 1 and 2 is warranted.

With the addition of these comments and the notes listed in the March 21 meeting minutes, the Interagency Group accepted the March 4 meeting notes.

Ms. Egan noted that the members may not have had sufficient time to review the draft notes from the March 21 meeting. She asked for comments. Rosemary Monahan said she was not at the meeting so her name should be removed from the Attendance list. The members agreed they would like more time to review the notes. Ms. Egan asked for comments by close of business on April 7.

Alan Anacheka-Nasemann, Army Corps of Engineers, said that he was going to participate in a tour of the Assonet Cedar Swamp and Pine Swamp to be conducted by Mass Audubon. It will take place on Wednesday, April 16 at 11 AM. While there are some issues about access to the CSX right-of-way in the area, the tour will go forward and all are invited.

Mr. Anacheka-Nasemann noted that the Army Corps and the U.S. Environmental Protection Agency recently proposed a new joint rule under the Clean Water Act (CWA) on compensatory mitigation that could be found in 33 CFR 332. He encouraged members to review the rule and said that it will apply to the project, along with the existing, applicable rules. Where there is any difference, more stringent rules will apply.

Ms. Egan noted that she distributed print and electronic copies of letters she received commenting on the list of alternatives for Phase 2. Several are very thoughtful letters and some ask for additional information. There is a feeling that the public does not have access to the same information that has been made available to the Interagency Group. There are also commenters who would like to participate in the group meetings. Rich Lehan, MA Department of Fish and Game, said that PEER's letter comments on the concept of the proposed "Stoughton trestle" and notes that building an access road to the site would increase the impacts of the trestle. Ms. Egan said that she has said that EOT will not build a public access road through the Hockomock Swamp to service the trestle. Rosemary Monahan, EPA, said she was intrigued by Lou Gitto's comment letter suggesting a combination of alternatives with phasing. Liz Sorenson, Department of Conservation and Recreation, said she hopes it is very clear that Phase 1 is a coarse filter or people will continue to pose the same questions and fail to understand how the collapsing of alternatives was conducted. People may not understand that environmental impacts cannot be detailed at this level of examination.

Ms. Egan said that the presentation was clear on this point, even including a slide with the phrase "10,000 feet" to illustrate the viewpoint. This did cause some frustration in the meetings and it shows in the correspondence. Tim Timmerman, EPA, said that this situation could put some pressure on the MEPA process and he is concerned that the group not ignore or fail to include an alternative that could be the Least Environmentally Damaging Practicable Alternative (LEDPA). Sometimes a blended alternative or combination of alternatives arises later in the process and requires a strong look. He does not want to obviate this possibility. Mr. Anacheka-Nasemann said that the Highway Methodology is designed to be sensitive enough not to eliminate the LEDPA and it has informed this process.

Ms. Egan said that while she hopes not to be taken by surprise by a brand new option, she thinks that is unlikely. She said that EOT expects to be flexible. She encouraged the members to complete their review of the *Phase 1 Alternatives Analysis Technical Report*. After a brief discussion, the members agreed to submit comments to EOT on the technical report by close of business on April 11, 2008. Ms. Egan wants to complete editing the draft document and make it available to the public on line this month. While EOT and VHB are the document's authors, she appreciates comments and suggestions from the committee members on the material and presentation. Mr. Anacheka-Nasemann said he recommends spelling out as many terms as possible, versus using acronyms. Mr. Timmerman asked Ms. Egan to continue to forward comment letters. Ms. Egan noted letters forwarded by Heather Graf; by representatives of the Taunton River Watershed; by the Conservation Agent from Norton. Mr. Anacheka-Nasemann noted a comment from Kyla Bennett, PEER, in an email (distributed to members) on the fact that the project documents, website, etc., use the word "rail" to describe the project while the Basic Project Purpose describes the need to meet demand for "public transportation." He said that the Corps has responded to the project proponent by drafting a Basic Project Purpose that is broader than rail and includes examining a variety of alternatives. Betsy Higgins, EPA, agreed that the project purpose is properly articulated and it is not unusual for a proponent to choose or use a title that does not exactly describe the project purpose but is instead shorthand. She said that the real issue is if the project purpose is defined appropriately and

she feels that has been done in this case. Matt Schweisberg and Tim Timmerman, EPA, agreed that it is typical for permit agencies to define the Basic Project Purpose and project titles can be different.

Ms. Sorenson noted a comment letter from Norton's Board of Selectmen in opposition to the Attleboro route and asked if there are other, similar kinds of letters. Ms. Egan said that Norton, Attleboro, Taunton and Mansfield officials have been vocal about their opposition to the Attleboro route, along with their representatives and senators. She noted that Kyla Bennett, PEER, is opposing a 40R housing project in Easton and referred to comments that Ms. Egan made at a Lakeville meeting about that town's 40R investment. Investment is proposed for the area around the existing Lakeville train station. She said Lakeville does not want the station to be moved, which would interfere with the development, and she acknowledged this interest but made no promise. Ms. Bennett has taken the position that if Easton adopts a 40R project, then the train will follow.

Circling Back

Ms. Egan suggested that the group continue its review of the alternatives for advancement to Phase 2. She reviewed the list that the members were discussing as part of the circling back process, Step 4, after the March 21 presentation. The EOT/VHB team recommended four alternatives and the group was discussing the following list of alternatives, with no decisions made yet:

- No Build or TSM alternative
- Attleboro Electric (alternative #7)
- Stoughton Diesel (#30)
- Full Middleborough (#17 – added by EOT to serve potential casino)
- Attleboro/Middleborough Hybrid (#62)
- Bus Rapid Transit (#44)

A discussion about many aspects of the various alternatives took place. John Felix, Mass DEP, asked about the full Middleborough option, which had been eliminated and was included again by EOT. If that option was eliminated for cost, then returned, how could other alternatives be eliminated for cost? Ms. Egan said that the issue was cost plus time. Both the tunnel under Quincy (required to break the bottleneck for the full Middleborough option) and the monorail up Route 24 were both high in cost and have a longer construction period. The monorail is even higher in cost (by a rough estimate, a billion dollars more).

The issue of bus capacity was questioned. Could the bus option be more positive if platoons of buses, express buses or other strategies increased capacity? Mr. Timmerman asked if the catchment areas were wider than the 3 mile diameter used by CTPS to calculate ridership? Scott Peterson, CTPS, said that his team looked at the Old Colony Line as a model and used actual statistics for the catchment area. This information shows that 90% of the passengers drive about 3 miles to their station stops. Trains do have much more capacity (8,000 riders in a peak period versus 2700 for bus). Making more stops would affect bus travel time. Some strategies can be tested in a sensitivity analysis.

Mr. Timmerman said that the EPA members were pretty close to agreeing on a final list with some additions to the alternatives put forward by EOT at the last meeting. The No Build option should be called out explicitly so it is understood by the public. In addition, EPA proposes to include alternative #64, Middleborough simple, which would use the same infrastructure as alternative #17 south of Braintree. EPA feels this should be a standalone option. Mr. Timmerman also listed alternative #1,

Commuter Rail to South Station via the Attleboro bypass, which is a diesel option. This option could be the LEDPA and EPA would like to see it remain. Adding these to the list above would carry eight alternatives into Phase 2.

Mr. Anacheka-Nasemann asked how the quantity of work would differ to study two versions, for example, of the Attleboro route, one electric and one diesel. Mike McArdle, VHB, said that the two options would have different operating plans, so the team would have to build and run computer models for each. There are differences between the impacts as well on such parameters as noise, vibration and potential for contamination. He used a pad to draw one element of the Attleboro route showing a crossover to show the difficulty of handling southbound trains on the Northeast Corridor, in particular. He reminded the group that electric trains have better acceleration and deceleration rates. Amtrak's Acela can reach 150 mph in this track segment so it would catch up with diesel trains very quickly and the crossovers would be required to move the slower trains out of the way. Ms. Egan said that a third track would be required north of Canton as well. (Ms. Monahan asked that the team check the travel times for some of the alternatives since some differ between documents. Ms. Egan said that in some cases, the team had learned more and had better data, but the team will check that data.) The team plans to meet with the MBTA and Amtrak to discuss future plans for the corridor, and with freight operators, too, but it seems likely that all have plans to use more of the existing capacity. Ms. Egan noted that the MBTA would have to come to an agreement with Amtrak and that there is opposition to the Attleboro corridor in additional to the technical challenges. These issues can be overcome, but they are aspects of the options. She described realistic drawbacks to other options: Middleborough simple would preclude extending the rail to Wareham, a project of great interest; the full Middleborough option would require a triple track to allow full service to Fall River and New Bedford and Wareham (the Red Line would be put in the tunnel and two surface lines would remain for the Commuter Rail). Mr. Schweisberg asked why these concerns are relevant to the current choice. Ms. Egan said they are realities the project will have to face, which she is providing as background information as the group considers the alternatives. Mr. Timmerman pointed out the system benefits of the full Middleborough option. Ms. Egan said that community meetings have not yet been held in the Braintree and Quincy area, nor around Canton Junction, for the Attleboro line. Mr. Timmerman noted that there are Environmental Justice issues in the Quincy, Boston and Braintree area that will have to be part of the discussion.

Lealdon Langley, Mass DEP, asked about hybrid vehicles and whether an operations plan could be run to allow for diesel and/or hybrid fuels. Ms. Egan said that there are different operations concerns for alternative #62, for example, so considering another method of operation would mean treating it as another alternative. Mr. Langley also commented on the need to consider unequal levels of service and ways to address them. Mr. McArdle said that it would be possible to electrify part of the route and run diesel trains from Middleborough north.

There was a discussion about the pros and cons of modes and the work required to provide sufficient detail to assess the different alternatives. Mr. Grafe raised the issue of the impact of mode on climate change and air quality. Ms.Egan said there is an estimated premium of $300 million to construct the electric mode and some time and speed advantages. John Felix asked if EOT could submit 10-11 alternatives in the ENF and use the MEPA process to narrow the alternatives. Deerin Babb-Brott, MEPA, said he would have to consider the idea. Ms. Egan observed that public review of the alternatives will be more difficult with 10 or 11 options.

Steve Smith, SRPEDD, said that EOT will get a lot of resistance from the South Coast communities with 10 or more alternatives under consideration. Alternative #64, for example, offers such a poor level of

service that people will think it is not worth building. He pointed out that Environmental Justice is a huge issue for Fall River and New Bedford in particular. These communities will not accept a lower level of service than what the MBTA offers to other communities.

Mr. Timmerman noted that the Middleborough service performs better than the bus option and perhaps the capacity issue could be addressed. Mr. Smith agreed but said the more robust alternatives that provide full service to the South Coast are much more attractive to those communities.

Mr. Schweisberg said that the list of 10 is reasonable from a regulatory point of view. Based on what the group has learned to date, these are logical alternatives. He said that perception-based issues don't play into regulatory analysis. If EOT moves forward with the much shorter list of alternatives, EPA's comments on the permit application will reflect this opinion. EPA requires a reasonable amount of information to eliminate alternatives from detailed analysis. This translates in to a limited amount of analysis on key factors without engaging in a full-blown analysis.

The group discussed some filing options. Mr. Babb-Brott said that EOT could file the ENF with the full list (10 or so), identifying the constraints on some of the alternatives and asking that the review be limited to a subset of the options. Mr. McArdle said the team could begin work on two parallel tracks: undertaking the environmental work for each corridor while preparing the models and running the operating plans as a way of narrowing the options. Both are considerable undertakings but the operating plans results could reduce the potential alternatives before the environmental work is complete. Ms. Egan expressed concern about meeting the project schedule. Whatever approach is worked out, she does not want to get off track. Mr. Timmerman suggested presenting a smaller number of alternatives with variations (such as Stoughton Diesel and Electric), and doing a less than full-blown analysis. There is a general concern about keeping the state and federal processes on a parallel track.

Alan Anacheka-Nasemann recounted his experience with a landfill in Buffalo that included 20-25 sites and hydrogeological investigations. He does not see how the group can eliminate any of the principal alternatives under consideration at this time for this project. Betsy Higgins said she did not think EPA was proposing an unreasonable number of alternatives and it would be risky to proceed with too few options.

Mr. McArdle put a list of alternatives on a sheet for discussion:

- No build/TSM
- Attleboro: diesel and electric
- Stoughton: diesel and electric
- Full Middleborough
- Simple Middleborough
- Middleborough/Attleboro Hybrid (diesel/electric)
- Bus Rapid Transit

The members discussed some of the difficulties in trying to get more data without putting all of the options in the process or including all of them but not doing a complete investigation. Mr. Langley noted that it is not unusual for MEPA to meet with proponents to discuss this kind of difficulty. Mr. McArdle said he would like to meet with Mr. Babb-Brott to discuss possible ways to proceed. Mr. McArdle said that over the next six months the team will develop ridership and travel time data and have infrastructure and cost information in hand. This information can be shared with the Interagency Group.

Mr. Weinberg observed that it would resemble an expanded Phase 1 in more depth. It is not unusual for alternatives to rise from a DEIR filing. Getting comments may help with the review process.

Mr. Lehan said it's his view that EOT has consulted with the Interagency Group but it makes the final call on the alternatives. He suggested it is not realistic to expect agency concurrence on all of the issues at this point. The proponent makes judgments and EOT needs to make its own transportation determinations. If concurrence is not possible among the agencies, perhaps the goal is to reflect opinions about pros and cons through the discussion.

Ms. Egan said she would like to achieve consensus since the group has operated in that spirit to date. She is willing to go along with the Interagency Group's recommendations, gathering comments. That is acceptable. She can't guarantee that the Administration will concur with the list, but she will do her best to explain and advance. Ms. Higgins said that she respects that decision, but it is not technically required of Ms. Egan. Mr. Anacheka-Nasemann said this kind of concurrence is a goal of the Highway Methodology.

Ms. Egan said that rather than take some kind of formal action or ask the agencies to sign a letter, she would like to let the minutes reflect the alternatives that the Interagency Group members think are worthy of investigation pending new information or analysis. Mr. Felix asked about public reactions to the likely list. Ms. Egan said that besides opposition to some routes, there are proponents of monorail and/or rail on Route 24 who are likely to be vocal about not using the highway route one of those ways. She said that project materials, including the Executive Summary for the document, will clarify the reasons (high cost; rebuilding 20 interchanges; Route 24 would have to be widened through the Hockomock Swamp; construction duration; it would be the longest installation of monorail in the world, and, as such, unproven). Ms. Higgins said that the federal process will require an explanation for dropping alternatives, which is useful to reviewers.

Ms. Sorenson asked about the effects of future potential projects, such as widening Route 24 or breaking the bottleneck. How does the planning take them into account? Ms. Egan said one of the underlying assumptions is to include only projects that are approved or in long-term planning documents. Joe Cosgrove, MBTA, said that this project is hitting a lot of key issues facing the MBTA, such as the need to expand South Station's capacity and the bottleneck and layovers. The Boston constraints are a cost for all of the alternatives.

Mr. Weinberg said he felt the group has gone in the right direction and has not eliminated the LEDPA. Mr. Babb-Brott said that the alternatives may be representative, but they are not necessarily all equal. The process has generated a robust set of options to meet the project purpose. Mr. Lehan said he appreciates the goal of trying to achieve consensus and not ask each agency to produce a letter on the alternatives at this time. He looks forward to continuing the discussion and learning more about the impacts, such as how the ratings translate into real impacts. Ms. Higgins said that the alternatives present a range of pros and cons and require further analysis. From what the group has learned in Phase 1, some will have substantially more environmental impacts and EPA needs to learn more about the balance of practicability versus environmental impacts.

Mr. Anacheka-Nasemann – with assistance from Mr. Felix – proposed a consensus statement for the group to consider related to the list of alternatives:

Based on the information presented in frequent meetings, the Interagency Group has applied the Highway Methodology to a range of alternatives and developed a consensus position on a list of seven alternatives with mode variations that will be carried forward for further study.

The list is as follows:

- No build/TSM
- Attleboro: diesel and electric
- Stoughton: diesel and electric
- Full Middleborough
- Simple Middleborough
- Middleborough/Attleboro Hybrid (diesel/electric)
- Bus Rapid Transit

Mr. Anacheka-Nasemann said that given the limits of the Phase 1 criteria, he does not believe the list could be any shorter. Absent more detailed modeling, he would not feel comfortable cutting any further. Ms. Egan asked if that was the consensus feeling among the agencies. Mr. Weinberg said he would like to talk with Mr. Babb-Brott about a tier system or other review options within the MEPA process. The members said they would review the minutes and statement and get comments to Ms. Egan on the document by close of business on April 11.

Next Steps

Ms. Egan said that EOT is in the process of discussing how to roll out the alternatives information and there are details of the federal review to be worked out. She reminded the group that Goody Clancy is prepared to make a presentation on the Corridor Plan.

The following meetings and issues were discussed:

- Tours: the team will be setting up corridor tours this summer and the public will be invited. In the interim, Mr. Anacheka-Nasemann said that he will participate in one of two of the tours already set up and listen to public concerns, but he anticipates organizing tours just for agency representatives in the future. The currently scheduled tours will take place on 4/16 and 4/23 and invitations will be sent to the agency representatives.
- Commuter Rail Task Force: Mr. Smith said he would include the Interagency Group members in invitations to the next meetings. At the next meeting, on April 9 from 4-6PM, the group will potential South Coast Rail impacts and ways to mitigate them. This will be a discussion preliminary to a summer activity: establishing regional mitigation principles.
- Interagency Group meetings: After discussion, the group agreed to set up a meeting late in May and to hear from Goody Clancy on the Corridor Plan. In June, the Interagency Group may meet with the Commuter Rail Task Force.

Ms. Egan thanked the members of the Interagency Group for their patience, participation and ideas over the last 12 meetings.

Review of the Minutes

Interagency Group members typically provide comments on the minutes at a subsequent meeting. Because this is the last meeting of Phase 1, comments/corrections from the reviewers are provided here:

- Tim Timmerman, US EPA: on page 4 of 9 (second to last paragraph): Scott Peterson indicated that a 3-mile radius was used for estimating ridership and suggested that beyond such a radius the ridership communities associated with any given station begin to overlap with other stations. A discussion about this point ensued and it was agreed that it would make sense to confirm/better understand this baseline assumption as the alternatives are analyzed further (the sensitivity analysis part of the notes).

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- Group members to review and provide comments on the March meeting minutes by April 7 and on the Phase 1 Alternatives Analysis Technical Report by April 11.
- Schedule Corridor Plan presentation by Goody Clancy.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #11

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: March 21, 2008 - 9: AM to 11:45 PM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Samir Bukheri	US Environmental Protection Agency
Joe Cosgrove	Massachusetts Bay Transportation Authority
John Felix	Massachusetts Department of Environmental Protection
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	MA Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Scott Peterson	Central Transportation Planning Staff
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning Economic Development District
Liz Sorenson	MA Department of Conservation and Recreation ACEC Program
Mike Stroman	Massachusetts Department of Environmental Protection
Phil Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Draft Phase I Alternatives Analysis Technical Report; "Circling Back" Recommendations; Agenda

PURPOSE/SUBJECT:
Learn about the comments and reactions from four Civic Engagement meetings; circle back and review outcomes from previous decision points to discuss draft recommendations for Phase 2 alternatives; discussing Interagency Group action on the recommendations

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The eleventh meeting was intended as a discussion-only meeting to further cull the alternatives down to a shorter list.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list). She noted that with April approaching, the group would be asked to review the Phase 1 Alternative Analysis Technical Report and help finalize the list of alternatives that EOT will carry into Phase 2. There were a number of issues to discuss first.

Ms. Egan said she was asked to note that several members of the Commuter Rail Task Force dissented from the letter that the Interagency Group received at a previous meeting. The letter encouraged the group to move with some speed to assure service delivery to the South Coast communities. The letter was not vetted by the group members before it was sent and some felt it was not appropriate.

Ms. Egan said that she had extended the deadline for submitting comments on the alternatives to March 26 after the end of the civic engagement set of meetings. Based on conversations with various organizational representatives, she anticipates getting letters from Mass Audubon, PEER and the Taunton River Watershed Association, which she will share with the group.

She reminded the group of its early April meeting and the need to gather any comments on the alternatives that will progress into Phase 2 at that time.

Approval of 3.04.08 Meeting Minutes

Ms. Egan asked for comments on the minutes of the March 4 meeting. The following corrections and additions were listed:

- At the top of page 7, the date for comments to be submitted on the proposed casino project should be April 9, not April 29.
- On page 11, at the end of the first full paragraph, Alan Anacheka-Nasemann said that the text should be corrected to read: “in 2002, the Stoughton alternative was considered the sole feasible alternative by EOEA.” He asked that a new sentence follow, to read: The Corps never took a position on this issue.
- Rich Lehan, MA Department of Fish and Game, said he had some comments to make on the minutes and would prefer to submit them in writing before the next meeting. The March 4 meeting was a long one, and there are some refinements he would like to suggest. Since Tim Timmerman, US Environmental Protection Agency, was also not present, the group agreed to reconsider the minutes at the next meeting. Mr. Lehan said he would circulate his proposed edits.
- Liz Sorenson, DCR, clarified that there are two ACECs and one proposed ACEC.
- Matt Schweisberg, EPA, asked that the notes on page 4 be revised to indicate that wetland mitigation should be completed concurrent with the project’s construction, and that post-construction monitoring would extend for 5 years.
- By email, Tim Timmerman asked for the following revision on the fifth page, second paragraph, second to last sentence: "Mr. Timmermann asked if the option of taking the train to South Station and then taking the train to metro markets was compared to driving between the same two markets including any required travel through the Boston area."

Civic Engagement Meetings Highlights

Ms. Egan said she wanted to share her impressions of the key issues that were raised in the recent civic engagement meetings in Attleboro, Freetown and Lakeville and at the Commuter Task Force Meeting in Taunton. She highlighted the following issues, concerns and reactions:

- Several people suggested that funding for the South Coast Rail could just be given to municipalities facing a shortfall versus improving regional transportation.
- A number of people expressed frustration with revisiting the project alternatives and the fresh look at the options.
- In places where there is opposition to alternatives, the objections expressed by some are often not specific but are voiced just as a statement of opposition; i.e., you should not go through Taunton.
- Some people felt there was not enough notice of the meetings. Ms. Egan said that several people said they had signed in at a meeting and did not get an email. She said that part of the confusion may be the placement of a table in Norton by a citizen activist at which people signed in first but then did not sign in at the official EOT table.
- Several speakers said that people or human issues are more important than the environment, while others said that the environment is more important than people and/or their transportation needs.
- The number of grade crossings in a community and safety were mentioned frequently.
- The MBTA's assessments of communities were a common subject for discussion and questions.
- People spoke in favor of electrification as opposed to use of diesel fuel as a better option and also referred to the fast and very modern rail systems in Europe and Japan.
- The Attleboro corridor drew frequent objections due to the number of grade crossings in Taunton.
- Residents and elected officials said that the project will bring no community benefits to Norton, Attleboro and Mansfield.
- Speakers addressed the need to protect Chartley Pond and mentioned the Assonet Cedar Swamp, Pine Swamp and Hockomock Swamp as areas of concern.
- A representative of PEER suggested that the environmental review should include more than just Zone 1 areas.
- Environmental comments included the need to assess the value of wetlands in making comparisons and not count on acres to acres evaluations.
- There are supporters for breaking the Braintree bottleneck since they feel it will have to be done at some point and there are concerns that the alternatives should not preclude an extension to Wareham, which is not part of this project but could be a future project.
- Lakeville is concerned about the 40R district at the site of its rail station and hopes that the station will not have to be moved.
- The failure of the monorail option to advance was a source of disappointment. Many people felt that it was modern, visible and would encourage ridership by moving quickly up Route 24 in view of drivers stuck in highway traffic. Some were not persuaded by the drawbacks, and Ms. Egan said that they did not understand the potential wetland impacts and because monorail did not make it through Step 3, they did not learn that it has the highest estimated cost.
- Ms. Egan said there were a lot of rail supporters in Freetown and Lakeville.

Steve Smith listed a few issues of concern from the Task Force discussion, including:

- The need to look at wetlands carefully and to compare them in an apples-to-apples format.

- There is a great deal of support for electric rail options with an acknowledgment that the up front cost is high but a feeling that it is a better alternative and also lends itself to updating by new technologies in the future.
- There is support for breaking the bottleneck between Braintree and Boston as well as concern that whatever alternative is chosen should not conflict with service to Wareham.

Mr. Smith added that he gets questions about the Interagency group and its role. Some feel that the meetings should be open to the public. People print and review the minutes and are following the issues. Mr. Smith suggested that at some point, representatives of the Interagency group should meet with the Task Force. Mr. Felix asked what the general reactions are to the agency group. Ms. Egan said that there is a feeling that the agencies have power over the route choice. Some people seem to think that the Stoughton route is "a done deal," while others believe that Attleboro and Middleboro are not feasible nor can they provide the service that is needed. Others acknowledge the operations problems associated with Attleboro and Middleborough, the former related to Amtrak and the Northeast Corridor and the latter with breaking the bottleneck.

Ms. Egan said that for the next few months, once the alternatives are announced for the Phase 2 investigation, the focus of civic engagement will shift for the next few months to the Corridor Plan. It is important to get all 31 communities involved in these planning discussions. While there will be public meeting style events connected with the Army Corps and MEPA filings, it is more likely that EOT-led civic engagement over the next few months will focus on the smart growth and planning, particularly since there will be a lot of work going on to develop the alternatives and not a lot of information to share initially.

The members received a copy of the meeting presentation and comments summary via email. Steve Smith, SRPEDD, said that the project faces well-organized opposition in some areas with the dialogue in those communities likely to focus on negatives.

Ms. Egan said that this summer, EOT will be organizing tours of the corridors. There are a couple of tours proposed for the next couple of weeks (timing is important for vernal pools) and the group members discussed their availability. Lisa Standley, VHB, said she can set up a tour of Pine Swamp but the group could not walk the Assonet without a flagman. Ms. Egan said she is working with CSX to arrange access for the VHB team to begin environmental field work. Mr. Smith offered his office as a staging area for the swamp tours since it is centrally located and nearby.

Presentation and Discussion of Alternatives Recommendations

Ms. Egan said that Mike McArdle, VHB, would walk the group through the team's recommendations for the alternatives to advance into Phase 2. This is the "circling back" discussion that the group decided would permit a final look at the options to reduce the number, if possible, from 10, and to ensure that the group did not eliminate an option that could be the LEDPA, or the least environmentally damaging practicable alternative. Ms. Egan reminded the group that at the last meeting, a set of 9 alternatives remained at the end of the Step 3 analysis and the Secretary of Transportation asked to have a Middleborough alternative taken to the civic engagement meetings as well. Ms. Egan said that the information on the alternatives is updated in the draft narrative report and Chapter 9 walks through the Step 4, or "circling back" analysis. Based on discussions from the previous meetings and the input from the civic engagement meetings, the team has prepared a set of recommendations that includes at least one alternative from each corridor and most, but not all, of the modes. She reiterated that she is not expecting

decisions from agencies today, and encouraged the agencies to consider the draft written narrative and today's discussion before the group reconvenes on April 1 to hopefully recommend a final short list. She asked Mike McArdle, VHB's Project Manager, to present EOT's draft recommendations.

Mr. McArdle suggested the group follow along using the chart handout or looking at Chapter 9 of the report. He began with the Attleboro corridor. Of the three alternatives remaining there, the team was recommending advancing #7, Attleboro Electric. This option will have environmental impacts similar to #1, Attleboro diesel; it would operate over the same route as #1 but would provide faster service and attract higher ridership; electric infrastructure is already available on the Northeast Corridor; and electric trains have fewer impacts with regard to noise, vibration and potential for contamination. This option would have fewer impacts on the Acela, which travels at high speed in this area (150 miles per hour versus 79 mph for diesel).

EOT Recommendations for Discussion, STEP 4 "Circling Back"

ATTLEBORO OPTIONS
Alternative #1, Attleboro diesel: *eliminate* – marginal for 2 transportation criteria and neutral for 3 environmental criteria
Alternative #5, Attleboro DMU: *eliminate* – acceptable on environmental criteria, weaker on transportation (mobility and purpose)
Alternative #7, Attleboro electric: *carry forward*, similar to #1, but provides better quality of service, although not as compatible with existing diesel system

STOUGHTON OPTIONS
Alternative #30, diesel: *carry forward*, performs best on transportation criteria of the 10 alternatives, but worst on environmental criteria
Alternative #34, electric: *eliminate* - similar to #30 but has slightly poorer performance on transportation criteria and has a slightly greater wetland impact

MIDDLEBORO OPTIONS
Alternative #17, Middleborough diesel: *carry forward*
Alternative #62, Attleboro/Middleborough hybrid: *eliminate* - similar service and infrastructure are in #7 and #17, so dismiss this as a standalone
Alternative #64, Simple Middleborough diesel: *eliminate* – similar to #17 but provides lower level of service

HIGHWAY OPTIONS
Alternatives #44, BRT with Route 24 zipper lane: *carry forward*
45, Enhanced Bus: *eliminate* – eliminate as stand-alone since this will be incorporated in the "no build" or Transportation Service Management alternative

Mr. McArdle said that the Diesel Multiple Unit alternative to Attleboro Station would provide slower service; would require a transfer to existing commuter rail at Attleboro Station (further overcrowding service on commuter trains that are already at capacity); would result in lower ridership; and would have

more infrastructure requirements than other Attleboro options and thus would have a greater impact on the environment. Based on these results, the team was recommending that #7 advance.

Matt Schweisberg, EPA, asked Mr. McArdle how he could eliminate Alternatives 1 and 5 and keep 7? Mr. McArdle reviewed the rationale, which is laid out in more detail on pages 9-2 to 9-4 of the report. Mr. Schweisberg said he is concerned about eliminating practicable alternatives at this point, for instance, keeping in electric service and eliminating diesel. Mr. McArdle said that since most of the impacts on the environment, for example, are similar between #1 and #7, VHB could go back and change the mode if it is appropriate at some point to assess the diesel (as long as the Attleboro corridor remains in Phase 2). Ms. Standley added that public comments were more positive on electric service based on fewer impacts (noise, vibration, pollution). Mr. McArdle provided some information on electric service using the Northeast Corridor. The MBTA would be likely to develop an agreement with Amtrak to maintain its equipment and provide facilities for the electric diesels, etc.

The members had a discussion about how the process of narrowing options for environmental review typically works. Ms. Standley said that typically, the project proponent would file an Environmental Notification Form (ENF) with two or three options that would go through an environmental review. Lealdon Langley said that in a typical process, if more alternatives were considered at a later date, supplemental reports would be required. Mr. Anacheka-Nasemann asked about submitting four corridors for Phase 2, but Mr. Langley and others agreed that differences between modes are huge and they will have significantly different impacts. Mr. Felix said that theoretically, the options under discussion are the best ranked and range across corridors. Based on data alone, it might be possible to delete a mode and/or corridor. Ms. Egan said the group has discussed maintaining a diversity of corridors, as has the public. Mr. Schweisberg suggested that the data should point directly to certain alternatives and to rank the options otherwise is to depart from data driven decision making. Ms. Egan said that the recommendations are data based, that the group agreed to circle back and review the alternatives and the public is clearly interested in a diversity of corridors. Mr. Langley said that to eliminate diesel or prefer electric is to weigh Step 2 more heavily than the environmental factors. Ms. Egan said that those factors are neutral at Step 3, so the team chose the best of the options. Ms. Standley said that the essence of the process is not to reject an alternative that could be the LEDPA and seeks agency consensus on what alternatives are eliminated. Mr. Anacheka-Nasemann said it is natural that there is more tension at this step. Ms. Egan asked the group to let Mr. McArdle complete the full presentation.

Mr. McArdle said he was necessarily limited in what he could say about each alternative in a meeting, so he encouraged the committee members to review the narrative and look at the data, such as the ridership data. Phil Weinberg asked if there is a rule of thumb for greenhouse gas removal. Mr. McArdle said he did not have one, but direct burning of fuel is generally more efficient than conversion, but that issue can't be considered in isolation (e.g., without considering issues such as wetland impacts). Ms. Egan said that the Central Transportation Planning Staff will be modeling emissions for the alternatives, so that data will become available in Phase 2.

Mr. McArdle wrapped up the Attleboro discussion by saying that the DMU options would require a transfer and incur longer trip time and other penalties. Mr. Smith said he believes that the choice to retain Alternative #7, Attleboro corridor electric service to South Station, is a data driven decision.

[Liz Sorenson, DCR, said she missed the meeting where the Mansfield issues were discussed. She asked for a recap, and Mr. McArdle provided one for her. See Chapter 7 for information on the elimination of the Mansfield options.]

Turning to the Middleborough alternatives, Mr. McArdle said that the team is recommending that #17, Middleborough diesel, advance to Phase 2. This option represents the toughest case for the Middleborough corridor from the environmental point of view, so examining it makes sense because other, simpler options on this route with fewer impacts could be considered based on analysis of the full option, including breaking the bottleneck. Ms. Egan noted that Simple Middleborough (#64) fails to meet demand and has low ridership; it has no proponents among residents on the South Coast. Mr. Schweisberg said that it appears to him that the other options are not being dismissed but are not being analyzed in great detail in Phase 2. He would like to see combinations of options, such as bus and rail, and he will have a problem if EOT does not look at variations to the same degree. Ms. Egan said that it is fair to say that the Simple Middleborough is not being dismissed since it can be revisited based on the analysis of the full option. Mr. McArdle reminded the group that the TSM or modified No Build Alternative will be investigated in Phase 2. It includes a feeder bus system and will be analyzed at the same level as the other options. Ed Reiner, EPA, asked why electric service is not an option for Middleborough. Mr. McArdle said that cost is a key factor since it would require building more than 60 miles of electrified track. Mr. Schweisberg said that the analysis was not carried forward for 17 and 64. Ms. Egan said that the draft narrative should be revised to show the data for all the steps for 17 and 64. She added that the final document will have an Executive Summary that will summarize the reasons for carrying options forward and she encouraged the group members to read the document and familiarize themselves with the information. She understands that the team needs to fully back up and explain its recommendations and the final document will include that information. Ms. Egan said that the team could carry the Middleborough hybrid (#62) since it is the same as the Attleboro diesel option, with the exception of building the third track at Canton Junction on the north end of the Northeast Corridor. The environmental issues would be known based on the Attleboro corridor investigation from #7, so it only requires looking at noise, vibration and operations. That would mean carrying forward #62, which would also encompass #17 from the Middleborough corridor. Ms. Sorenson noted that 62 actually becomes three pieces that can be looked at in segments.

Mr. McArdle turned to the Stoughton corridor. The recommendation is to carry forward #30, commuter rail to South Station via Stoughton using diesel service. This option uses the same route as #34, which is electric service. They have similar impacts in terms of track infrastructure, and electric service (#34) offers faster travel speeds. Electric service would, however, have a greater impact through the Hockomock Swamp, an Area of Critical Environmental Concern (ACEC), and it may not be feasible to construct. Mr. Schweisberg said that the Stoughton route is a hard sell from an environmental point of view and questioned whether EOT really wanted to continue to investigate the Stoughton corridor in Phase 2. Mr. McArdle said the route performs well from a transportation viewpoint.

Mr. McArdle said that the recommendation for the highway corridor is to carry the BRT via a Route 24 zipper lane to Route 128 and route 93 and the HOV lane. Mr. Reiner asked if the dedicated lane would be an HOV plus BRT lane on Route 24 or a bus only lane. Ms. Egan said that is a much larger conversation with several other state agencies. On the Southeast Expressway, the HOV lane is a Central Artery commitment. Mr. Langley said that the project is still in need of a project purpose under the variance criteria and a zipper lane would provide that kind of purpose. Ms. Egan said that the team will also explore options to make the BRT service more attractive by marketing or enhancing the image of the service. She noted that #45 is part of the TSM alternative, so it is not really being eliminated. Mr.

Schweisberg said that is important to include that kind of statement in the narrative report. Ms. Egan agreed and said the Executive Summary will be like a fact sheet in that sense, focusing and presenting the information in a very accessible manner.

Ms. Egan then recapped her understanding of the group's initial feedback on EOT's recommendations. In addition to those alternatives proposed by EOT, Alternative #62 should be carried forward. It is acceptable to carry the enhanced bus alternative forward as part of the TSM alternative. She asked agencies to continue to consider the different alternatives and prepare to conclude the group's "circling back" recommendations on April 1.

Next Steps

Ms. Egan said she would like to get the sense of the group on how well this process has gone and what form the agency responses will take. EOT undertook a new kind of process, casting a wide net in terms of looking at alternatives and trying to be as transparent as possible. She is interested in the members' reactions and she hopes that the work has been thorough enough that EOT will not face surprises in the environmental review process. She asked what kind of action the agency members are willing to take in terms of signoff or review at this point.

Mr. Schweisberg said that having heard the entire presentation, he understands that not everything is being dismissed and that some standards have been applied to this narrowing process. He anticipates at least giving EOT some indication that EPA agrees or does not agree with the decisions.

There was a discussion about the process of agreement or approval. Mr. Anacheka-Nasemann said the Corps will prepare a Basic Project Purpose letter for agreement. It will describe the scope of alternatives, the process and the recommendations. It will be vetted with the federal agencies and he would appreciate feedback from the state agencies as well.

The parties agreed that they would try to have their comments ready by April 1 but the final responses may be delayed on the part of the federal agencies. Mr. Anacheka-Nasemann said that this has been a good process with a well-represented range of options that has been reviewed by the members of the Interagency Group and the public.

The group discussed the scoping process for MEPA and NEPA. The ENF filing will include a public review component.

Addressing the issue of the process for this project, the members agreed that whatever the outcome, it has been collaborative and data driven and is likely to save time in the MEPA process and it has included a very wide range of options. There is a distinction between the collaborative and endorsement processes, but the work produced data and information that will shorten the environmental process in all likelihood. The alternatives could have just been listed in the ENF and NOI, but Mr. Felix said that looking at them through this group was a huge time saver. Ms. Sorenson said that the recommendations have been informed by this consultative process. Mr. Langley said it has been a rational and data driven process. Mr. Anacheka-Nasemann said it will probably save considerable time by informing the Corps' decision making. The state agency representatives said that they will consult with MEPA and among themselves on the appropriate form of a response.

The group members said it might not be possible to have a letter ready and signed by April 1 given their review processes. Ms. Egan said that she would appreciate getting comments on the document and the recommendations and the team will update the document before it is posted on the website sometime in April.

Ms. Egan said that after the next meeting, she will be scheduling Goody Clancy to make a presentation on the Corridor Plan work and there will be tours this summer of the corridors.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- Group members to review and provide comments on the Phase 1 Alternatives Analysis Technical Report by April 1
- EOT to forward comments received from the public on the short list of 10 alternatives
- Schedule Corridor Plan presentation by Goody Clancy.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #10

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: March 4, 2008 - 9:10 AM to 12:10 PM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Joe Cosgrove	Massachusetts Bay Transportation Authority
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Greg Guimond	Southeastern Regional Planning and Economic Development District
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	MA Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Scott Peterson	Central Transportation Planning Staff
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Liz Sorenson	MA Department of Conservation and Recreation ACEC Program
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmermann	US Environmental Protection Agency
Phil Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Kate Barrett, Regina Villa Associates (RVA)

HANDOUTS:
Matrix of 9 alternatives for Phase 1, Step 3. PowerPoint slides summarizing Step 3 alternatives.

PURPOSE/SUBJECT:
Continue review of the results of the Step 3 analysis with members of the committee. Circle back and review outcomes from previous decision points to ensure continued consensus.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The tenth meeting focused on the Step 3 analysis. The list was narrowed to nine alternatives, which will be presented to the public during the March Civic

Engagement meetings. In the next agency meeting, the group will consider public comments received during the Civic Engagement meetings and continue discussions to further narrow the list for the in-depth environmental review. Part of this process will include looking back at earlier steps and recommendations in light of all of the data collected and discussed to-date – circling back.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list). She noted that this meeting would be the last until after the Civic Engagement meetings. She said she would like the group to revisit practicability. She pointed out that while some members want to include mitigation costs now, it is not possible to do so at this level of detail. Mitigation costs will be integrated during Phase 2 of the project when more detailed analyses are completed. Ms. Egan noted that the matrix does not currently include the Middleborough alternative with no infrastructure improvements, which was suggested by Tim Timmerman. Final documents will include it. She said she would like the group to complete discussion of Step 3 analyses and come to agreement on alternatives to advance to the next phase of the project. In addition, she hoped to circle back to previous discussions to ensure members were comfortable with decisions. Ms. Egan said her PowerPoint handout includes salient points on each alternative and this would be reviewed and discussed later in the meeting.

Approval of 2.21.08 Meeting Minutes

The minutes were formally approved.

Approval of 2.28.08 Meeting Minutes

The following comments were made:

Rich Lehan, MA Department of Fish and Game, noted that on page 7, the discussion about Criteria 3.3 omitted a paragraph that was originally included. In particular, the paragraph section should make clear that in general the Natural Heritage and Endangered Species Program (NHESP) does not consider indirect impacts; however, in the case of this project, program staff will consider impacts. Also on page 7, Mr. Lehan said that the section on measures for Criteria 3.3 should reflect that EOT will consult with NHESP staff and the program will provide further detail and qualitative input. Ms. Egan noted that the project team is currently consulting with NHESP staff.

Alan Anacheka-Nasemann, US Army Corps of Engineers, said that on page 5, second full paragraph, the third sentence should reflect that the Corps can only authorize the LEDPA (not the "most practicable alternative").

Greg Guimond, Southeastern Regional Planning and Economic Development District, noted that on page 3, second full paragraph, third sentence from the bottom, the destinations for the 35.5% increase in trips from the study area are Boston and Cambridge. He also asked about the origination point of the 3-bus platoons discussed on page 4, second full paragraph. Mr. McArdle said the buses would be from Fall River and New Bedford. Rosemary Monahan, US Environmental Protection Agency, suggested including Taunton as another origination point.

Tim Timmerman, US Environmental Protection Agency, noted that the discussion about wetlands on page 7 should note that there is currently no first-hand knowledge of the sites, so the discussion is qualitative in nature at this point.

Lealdon Langley, MA Department of Fish and Game, asked if there is more than one ACEC? If so, references should specify which ACEC. Liz Sorenson, Department of Conservation and Recreation ACEC Program, said there are three ACECs in the project area – Fowl Meadow, Ponkapoag Bog and Hockomock Swamp. Mr. Timmerman noted that the Attleboro alternative goes through a proposed ACEC.

Ms. Sorenson noted that Hockomock Swamp is misspelled and should not include an "a."

There were no further comments on the minutes, which were approved with revisions noted above.

Practicability Discussion

The group discussed wetlands mitigation. Ms. Egan noted again that specific wetlands mitigation would be integrated into the analyses later. VHB has preliminary results used for this phase, based on direct wetlands impacts. Lisa Standley, VHB, said the cost used is $500,000 to purchase and construct an acre of wetland. The current regulatory replacement standard is a 2:1 ratio, so the cost would be $1 million for each acre. She said that VHB used a worst-case scenario, which would be $10-$15 million for wetlands mitigation for the project. This is 1/10% of relative construction costs, so it would not change the rankings of any alternative for this criteria.

Mr. Anacheka-Nasemann said that the Corps does not assume a 2:1 ratio. Ms. Standley said she used a rough average from the Corps website as a starting point and considered DEP variance criteria. She thinks it is a reasonable baseline to work from. Mr. Anacheka-Nasemann said he can't comment on the information without the actual acreage and type of wetland. Mitigation will depend on the quality of the resource and rarity. For instance, if it is forested, mitigation will cost more. Mike McArdle, VHB, pointed out that even if the ratio were 3:1 or 4:1 the relative cost impact wouldn't change the rankings. Mr. Anacheka-Nasemann said he would like EOT and VHB to be certain of the estimates and that the project budget is sufficient to carry through with mitigation commitments. Ratios should be clarified in Phase 2 and mitigation projects should be the first to be built, not the last. Ms. Standley said that more detail will be provided in Phase 2.

John Felix, MA Department of Environmental Protection, asked if land purchases might affect the project timeline and extend the anticipated four year schedule? He said a variety of matters related to land acquisition can delay projects, such as court challenges. Mr. McArdle said the MBTA uses a 12 month rule for land acquisition. Joe Cosgrove, Massachusetts Bay Transportation Authority, said if relocations are necessary as part of acquisitions an additional 12 months is added to the timeline. Mr. Felix noted that once the MEPA/NEPA process is completed, there will still be a 2-year design period. He urged EOT to start with the ROW acquisition process, which could be time consuming, and to start immediately.

Ms. Egan said that Goody Clancy plans to update the Interagency group in April. The firm has been working with communities on priority preservation mapping and this will help with community endorsements for acquisitions. The Goody Clancy work will take 18 months. Smart Growth is an important focus of its work. EOT and Goody Clancy have a meeting scheduled on March 3 in Rochester to discuss that community's needs and plans. She added that it's important to relate mitigation to Smart Growth as transfer of development rights and other mitigation issues are discussed. She hopes to have a good regional understanding by Summer 2009.

Mr. Felix asked if hydrological connections are taken into account when considering mitigation? He suggested that sites contiguous to altered sites be considered for mitigation purposes due to the hydrological connection. Ms. Standley said the team is considering this matter to the extent practicable. Consolidation and banking are also being considered, which are allowed under the variance process. Ms. Egan noted that the Southeastern Massachusetts Commuter Rail Task Force will be developing regional mitigation principles. Mr. Guimond said the Task Force will want to be involved in wetlands mitigation decisions. Ms. Egan said this issue would be discussed further during the summer.

Ed Reiner, US Environmental Protection Agency, suggested the team look at lessons learned related to wetlands from the Old Colony Greenbush Line project. He noted that wetlands mitigation is not completed yet; however, the line is already operating. Greenbush is a good lesson and it might be good to require mitigation projects to be completed first. Ms. Egan suggested a working session on wetlands be scheduled for the group to discuss mitigation issues. Mr. Timmerman noted that permits dictate timeframe for mitigation projects and generally say they should be completed within 5 years of project completion. He said perhaps mitigation could be included in the physical infrastructure context. Mr. Reiner suggested regulators consider tightening mitigation requirements.

Mr. Felix asked if land subject to flooding was included on resource maps? DEP takes this issue seriously and it would likely require mitigation for this type of resource. Ms. Egan suggested the group revisit mitigation issues in a couple of months. Mr. McArdle said the most important point for the purposes of this discussion is that even with a higher wetlands replacement ratio, there would be no relative change to the rankings of alternatives.

Ms. Egan moved to a discussion of the Middleborough alternatives. She said the team recommended eliminating the corridor. The alternatives have significant constructability limitations, including the probable need for a tunnel in Quincy, and she pointed out the rankings on the Step 3 matrix. The team had analyzed several permutations of corridor alternatives and there were no noteworthy changes to overall relative rankings. Ms. Egan pointed out that Alternative #62 includes a Middleborough component. She asked the group members if they were comfortable with eliminating the corridor based on the capital cost and other constraints noted in the matrix rankings? Rick Carey, VHB, added that based on Criteria 2.4 and 2.5 rankings, Middleborough Alternative #64 (without infrastructure improvement) and #17 (full build) are not recommended to advance. Ms. Egan reviewed Alternatives #17 and #68 results from Step 2. She noted that Alternative #17, using the Middleborough Secondary, would cost a lot to build and includes a tunnel in Quincy Center. She said its overall cost-effectiveness ranking, at 38%, is in the lower bracket. The ridership ranking of 59% is mid-range and cost-effectiveness is 48%. The alternative's capacity is 8,640. She said Alternative #68 would utilize the existing corridor with no infrastructure improvements. From Middleborough Station south, the alternative would use the Middleborough Secondary to Fall River and New Bedford. The alternative's cost ranking is 63%, ridership is 41% and cost-effectiveness is 52%.

Scott Peterson, CTPS, discussed ridership. He said he used Journey to Work data from the 2000 Census to prepare the spreadsheet estimate. In discussing transfer penalties, he pointed out that if people must transfer in/out of vehicles more than two times, it is considered onerous. Mr. Peterson discussed transfers further, noting that connections and transfers within Boston were taken into account for the analysis of trips from the South Coast to Cambridge and Back Bay job centers in the Metro-Boston area. Ease of connections to the Orange Line, Green Line and Red Line for trip continuation to these centers was factored in. The higher the number of connections necessary to get to a destination, the more the route is considered to restrict service to desirable job markets. The recognized standard for transfer penalties is if

2 transfers are necessary to reach a destination, a person is less likely to use the alternative, so it is penalized in a ranking. Middleborough alternatives do not stop at Back Bay, so they do not serve that job center. Stoughton and Attleboro stop at both Back Bay and South Station, so they serve a broader market. Stopping at Back Bay is an advantage. All alternatives would stop at South Station and allow passenger to connect to Cambridge via Red Line. Additionally, without double tracks on the Old Colony line, train headways are longer, which is less desirable. He said Back Bay currently accounts for 45% of work trips to Boston. In addition, South Station also serves the Seaport market. Ms. Egan noted that additional workforce reductions might affect ridership.

Mr. Timmerman asked why ridership was not considered to South Station as the final destination? Liz Sorenson asked why the Red Line connection to Kendall and Cambridge was factored in? Mr. Peterson said the Boston market is considered to extend to East Cambridge, so the Central Square Red Line is included in the market. Transfers to the Green Line and Orange Line for destination points west are factored into the analyses. Ms. Monahan said she was surprised by how low Alternative #62 ranked for ridership and a travel time of 82 minutes. She asked why it was not an average of the Middleborough and Attleboro trips? Mr. Peterson said that CTPS looked at travel times from each terminus, and that the number was the longer trip, and the VHB rankings reflect this. Mr. Timmerman asked if the option of taking the train to South Station, then driving to metropolitan markets was evaluated against a transit trip with several transfers? Mr. Peterson said car travel within the Boston area was not calculated into the analyses, only public transit.

Mr. Timmerman asked for clarification on the modeling. Mr. Peterson said that train frequency and transfers to subways were included in the Middleborough analysis, so the New Bedford/Fall River trip was continued via Red Line to East Cambridge and access points to other markets via the Green and Orange lines. The more transfers necessary to get to a job market, the less favorable the ranking. A stop at Back Bay is favorable because it opens up more markets via the Orange Line and Green Line. In terms of comparing driving to Boston, auto trips were considered to terminate at South Station rather than extending to various parking locations throughout the City. He said based on the calculations using Journey to Work data, driving a car from South Station to other points within the metropolitan area or transferring to subway lines was considered a wash. Mr. Timmerman asked about the desirability of shifting between modes. Mr. Peterson said transfers take between 5-10 minutes. The combined in/out of vehicle time for a trip that transfers from South Station to Downtown Crossing via Red Line and then to the Green Line is comparable to any automobile trip. Ms. Sorenson asked why all trips were not terminated at South Station rather than continuing on to other market destination points to avoid complicating the comparisons? Mr. Peterson responded that many work trips are bound for the Back Bay job center. He also pointed out that access to the Orange Line opens up the Assembly Square market. The trade-offs in terms of trip time depend on the market. In-vehicle time is not weighted as heavily as out-of-vehicle time. Lealdon Langley, Massachusetts Department of Environmental Protection, reminded the team that trip times may need to be adjusted due to the MBTA readjusting schedules for certain existing commuter rail lines. He also noted that times may change due to the addition of tracks at South Station. Ms. Egan responded that the US Post Office move is factored in as part of this project and will be done within the project timeframe.

Ms. Egan returned the discussion to the Middleborough alternatives. She said there were four alternatives considered entering into Step 3: commuter rail to South Station via Middleborough, commuter rail to South Station with a Red Line taking, and the new alternative suggested by Mr. Timmerman (Alternative 64) that uses existing infrastructure and Alternative #62 that uses both Attleboro and Middleborough to reach South Station. The team recommends advancing Alternative #62 to Step 3.

She asked the group members if they were willing to preliminarily eliminate the other Middleborough alternatives? All decisions would be revisited during the Circle Back phase. The main issues for the alternatives proposed for elimination are the need for a tunnel, an 8-year construction period, high cost and the impact of taking the Red Line. Alternative #62 provides two times the capacity of extending the Middleborough line (#64). She said environmental issues associated with the Attleboro corridor argue for a Middleborough route, but the ones using only Middleborough aren't cost-effective. Mr. Carey noted that a number of iterations of Middleborough have been evaluated. The team would like to begin Phase 2 with a diversity of alternatives but not a large number.

Ms. Sorenson asked if a tunnel is the only option for the Quincy area? Ms. Egan said that New Bedford Mayor Lang is asking for creative ways to make a Middleborough option work. There are several options for the route through Quincy Center: (1) take the Red Line, (2) build next to the Red Line, (3) build above the Red Line, or (4) sink the Red Line in a tunnel. A tunnel is not practicable. Bridge flyovers and takings are also complex. The train cannot handle grades that would result from a tunnel or flyovers; however, the Red Line could handle them better. Also, Quincy has granite deposits in the area. Ms. Sorenson asked about an option to end the commuter rail at Quincy Adams? Ms. Egan said the Red Line, which is already heavily utilized, would be overloaded and the transfer would make it less desirable. Ridership could be increased over time, but the Braintree bottleneck will have to be broken eventually. The project is subject to a 20-year planning cycle and there are political realities for each alternative.

Mr. Timmerman said he would like to advance #62; it's an interesting approach. He is surprised at the numbers for #17; particularly with regard to cost, more than schedule. He understands the constructability and practicability issues. He wondered if casino mitigation might somehow come into play. Ms. Egan noted that the casino site is about a half mile from the right-of-way. Mr. Timmerman noted the cost of Alternative #64 (Middleborough without improvements) was really highlighting the cost of the line south of Middleborough.

Ms. Egan said the group still has decision points in the Step 3 process. EOT will present preliminary recommendations on alternatives to advance to Phase 2 to the legislature this week and the public next week. She said she will outline the pros and cons for all alternatives and emphasize that the alternatives presented are preliminary. She said the group could then make its final recommendation after the public input. She noted that it will be important to be firm about the drawbacks of the monorail and Middleborough alternatives when going out to the public. There are serious constraints. Mr. Guimond noted that the Town of Middleborough views the casino as a "done deal" and that the tribe has agreed to do work on Route 44. He suggested any requests to do more might be considered excessive. SRPEDD had asked the Tribe to upgrade I-495, but was told that was not acceptable. Mr. Timmerman said that whatever the mechanism, it would not have to be specific to the casino.

Mr. Anacheka-Nasemann said he attended a meeting about the casino. The Bureau of Indian Affairs (BIA) will prepare an EIS on the project. The government may put the land in Federal trust, which gives the tribe autonomy, including on wetlands issues. The Corps is cooperating on the project and during scoping the Middleborough alternatives may come up. Ms. Egan said there have been discussions about a station and a connection via shuttle to the casino, but there is no tie between the two projects now. Mr. Timmerman said he has questions about the ridership projections. Ridership could include regional movement such as workers from New Bedford traveling to Middleborough for the casino. Mr. Anacheka-Nasemann said he will keep abreast of the casino project and he is Corps' lead on it. The scoping session is planned soon. Mr. Timmerman said the session was planned by the BIA for the end of the month: the Federal Register Notice of Intent was recently issued. Mr. Anacheka-Nasemann said the

meetings are planned for March 23 and 24 and comments are due by April 29. Mr. Guimond noted that the spur to Wareham would open up the casino to the Cape market. He said that workers might not be able to depend on commuter rail to get to the casino because shifts may not coincide with train schedules. SRPEDD has suggested an express bus or diesel multiple units run to Middleborough from New Bedford/Fall River, which would provide flexibility for riders in either direction without eliminating a link to the Cape. Mr. Anacheka-Nasemann said higher ridership is likely and the group should keep it in mind.

Ms. Egan asked the group if it could agree to eliminate the Quincy tunnel and Red Line taking alternatives and advance Alternative #62? She also asked if members wanted to advance the extension of the existing Middleborough line or subsume it into #62? She asked for members' thoughts on these questions. Ms. Sorenson asked if a problem arose with #62 during Phase 2, could the group go back to the existing Middleborough alternative? Ms. Egan said that it was fair to say that it could be revisited. Ms. Sorenson clarified that after Step 3 only four routes would advance with nine alternatives. Ms. Egan pointed out that the four routes are very different and provide the needed diversity. She added that she intends to ask the group to circle back to revisit earlier decisions to make sure members are comfortable with the range of alternatives. This will be the final step before advancing to Phase 2, after the list is further narrowed to an appropriate number of alternatives. Using the matrix showing the results of Steps 1, 2 and 3 and the nine remaining alternatives, Ms. Egan asked if the group could agree to eliminate alternatives? Matt Schweisberg, US Environmental Protection Agency, said he was not comfortable eliminating #64 right now. Ms. Egan said she would like to flesh things out and have something to present to the public. Mr. Anacheka-Nasemann said it's important the public not have the perception that alternatives were eliminated prematurely. Ms. Egan said she would like to have a preliminary recommendation to advance Alternative #62 and #64.

Phase 1, Step 3 – Continuation of Alternatives Analysis Discussion

Ms. Standley reported that nine alternatives had advanced to Step 3 and VHB prepared a short list of issues and a new version of the matrix. Evaluation criteria were reviewed at the February 28 meeting and the group recommended eliminating four alternatives - #3, #32, #33 and #43. Ms. Standley said that VHB had requested additional input from Mr. Lehan and Jon Regosin from NHESP. She reported that Mr. Regosin had performed a complex analysis and developed a ranking for Criterion 3.3. He looked at new and abandoned rights-of-way and focused on impacts. Areas he looked at included the Attleboro Bypass, Stoughton station to Cotley Junction and the Dartmouth Secondary. He based the analysis on the length of impacted area, the number of habitats and species present in close proximity to the right-of-way and added this to the ranking for the total area of priority habitat. He weighted Criterion 3.3 with scores of 1 to 11. For Stoughton, he considered commuter rail, electrified commuter rail and diesel multiple units (DMUs). DMUs would require two tracks through endangered species habitat. The other alternatives would be on a trestle. Mr. Timmerman asked if a road would be associated with the trestle and would construction be in the right-of-way? Ms. Standley said that there would be no service road and construction would be in the right-of-way. Ms. Sorenson asked why DMUs would not use a trestle? Ms. Standley said DMUs must be double tracked due to high headways, and that a trestle would not be practicable. She said additional piers would be necessary for a trestle. Mr. Anacheka-Nasemann asked if the length of wetland included indirect impacts and if secondary impacts such as clearing were considered? He pointed out that the Hockomock Swamp has a large overhanging canopy in areas and other habitats. Ms. Standley said the calculations were for the length of new and abandoned rights-of-way crossing wetlands. Edge calculations and other impacts such as clearing were not included at this level, but would be factored in on a case-by-case basis in Phase 2 where more detail is available. Ms.

Egan pointed out that the Attleboro line is already cleared. Phase 2 will look at conditions on the ground in more detail.

Mr. Felix asked if EOT and VHB agree with the NHESP analysis? Mr. Lehan noted that NHESP used favorable to highly unfavorable rankings. The two Stoughton alternatives that would require a trestle were considered highly unfavorable; however, NHESP is comfortable with carrying the alternatives to Phase 2 for a more detailed analysis. There was discussion about NHESP's analysis. Mr. Lehan said a narrative to accompany the analysis is a challenge in describing the nuanced analysis. The scores were very close. The narrative should be refined. Ms. Egan asked why NHESP was amenable to including alternatives with unfavorable rankings? Mr. Lehan said that there is a distinction between DMUs and other alternatives. The question is how to more precisely articulate the information. Ms. Standley noted that there wasn't enough time to discuss the matter further in this meeting. Ms. Egan pointed out that the analysis would be part of the MEPA/NEPA document.

Ms. Sorenson noted the group had received a more detailed memo describing the Step 2 analysis. Would members like to receive one for Step 3? Ms. Standley said one had not been prepared for today, but it would be distributed soon. She added that the Criterion 3.1 ranking definitions would be spelled out in the memo. There were several different metrics used, which made it difficult to present in the matrix. Mr. Felix suggested using asterisks for highly unfavorable rankings with an explanation. Mr. Lehan said there is a gradation between unfavorable and highly unfavorable. He noted the qualitative differences between the trestle alternatives needs explanation. Ms. Standley pointed out that the matrix captures the intent of the analysis. DMUs are highly unfavorable, commuter rail is less unfavorable and the others are neutral or favorable. Mr. Schweisberg suggested a brief explanation be included in a methods section. Ms. Standley said VHB would update Step 3 documents with the new information and distribute them in a day or two. She pointed out that wetlands types and cover types were not included in the analysis at this level. There are differences, such as a less favorable ranking is usually assigned to salt march impacts. Ms. Sorenson asked how minor wetlands loss was defined? Ms. Standley said there is a spread of values and the information is presented as a relative comparison to the other alternatives. The purpose is to propose alternatives to dismiss without doing so too early.

Ms. Monahan asked why DMUs on Attleboro did so well in Criterion 3.6 (consistency with smart growth), but buses were ranked unfavorably. Ms. Egan said the DMUs have more frequent headways. Ms. Standley noted that Attleboro did well under all categories, serving three population centers and providing access to six 21E sites for better opportunities for development. The DMU alternative also avoided the need for the bypass, so loss of land was limited. Ms. Egan added that downtowns are served for this alternative where buses are neutral or unfavorable in serving population centers. She added that Fall River, New Bedford and Taunton would be served with a highway alternative, but there would be little help for brownfields and historic center development, except around the terminal stations.
Ms. Egan said that highway alternatives #43, #44 and #45 advanced to Step 3. Ms. Standley said that #43 (Bus Rapid Transit to Route 128) was recommended for elimination due to impacts to the Blue Hills Reservation. In addition, the alternative would drop people at the existing Route 128 commuter rail station, which already suffers from congestion and lack of seating capacity.

Ms. Egan reviewed the other alternatives in the matrix, using a PowerPoint handout. She pointed out that buses in general did not perform well on smart growth and capacity criteria, which is part of the project purpose. She has also heard that the region does not want buses. Ms. Monahan said that in the next phase, she hopes the team will look at ways to optimize the bus alternatives; for instance, considering other origination points in addition to Fall River, New Bedford and Taunton as a way to

improve performance and regional mobility. Mr. Timmerman noted that without appropriate land use policies there was no guarantee that development would follow smart growth principles. Results of an alternative based on smart growth can depend on how attractive it is made.

Ms. Egan said in general commuter rail alternatives assumed 6 peak period trains with 8 cars. For comparison, commuter rail trains have headways of 40 minutes. DMUs have headways of 7.5 minutes. Both Attleboro and Stoughton alternatives would serve downtown Taunton. Mr. Reiner asked about the assumption that commuter trains would be 20 minutes apart when the separation is 30 minutes on the Lowell line and also how they could meet the schedule given capacity issues? Ms. Egan said assumptions were made on the basis of MBTA service delivery policy. It is a baseline for comparison purposes not indicative of actual service times. She said that three trains would originate from Fall River and three from New Bedford. On the separate New Bedford and Fall River spurs, the headway would be 40 minutes. When the trains from each spur are running on the same track the headways would be 20 minute intervals. Mr. Anacheka-Nasemann asked if the team had taken a good look at Whittenton Junction and the Pine Swamp and asked if Stoughton numbers might change? Ms. Standley said that detailed analysis would be performed in Phase 2. Mr. Anacheka-Nasemann said the alternatives must be fully vetted in the next phase. Mr. McArdle reiterated that the rankings are comparative at this stage – the 10,000 foot level. Rankings from this phase will not be carried forward. Once alternatives reach Phase 2, they will be looked at with a fresh eye.

The group discussed the analyses "bell curve" method for assigning rankings. Mr. Felix asked about the difference between rankings of 8, 9 and 10 for Criterion 3.3. Ms. Egan said she is uncomfortable with the scale from a public transparency perspective and asked if it could be changed? Ms. Standley said VHB used NHESP's rankings for the criterion. Mr. Lehan said that NHESP staff had made a good faith effort to sort out alternatives using trestles versus those that don't to a level that would be helpful. Rankings are closely grouped. Reiterating distinctions would be useful. Mr. McArdle added that the scores are relative to each other. The group will have opportunities to comment in the next phase as alternatives are defined and analyzed in more detail. Mr. Felix asked if NHESP staff had based analyses on opinions or run the analyses first? He said that public transparency around this issue is important. Ms. Standley clarified that NHESP has done an objective quantitative analysis. Ms. Egan suggested keeping the scale but including an explanation. Ms. Standley added that the range is reasonable and does not result in eliminating any alternatives prematurely. She will explain the analyses and distribution in the Step 3 memo. Mr. Anacheka-Nasemann noted that the Pine Swamp is a mapped priority habitat and requested that the use of the Whittenton route as a bypass be built into the analysis.

Jerome Grafe, Massachusetts Department of Environmental Protection, asked VHB about the Route 128 route map. He was interested in impacts of the Stoughton corridor to Fowl Meadow ACEC and the bus alternatives' impacts on the Blue Hills Reservation and Ponkapoag Bog ACEC. Would the criteria for this project be the same as those used by MHD for the Add-a-Lane project? Ms. Standley said the dedicated bus lane would be entirely within the Blue Hills Reservation. She pointed out that the Add-a-Lane project ends at the Route 128/I-93/I-95 interchange. Ms. Sorenson asked if the Add-a-Lane could use the median in that area and the bus use an outer lane. Mr. Carey said the northbound side could work, but the southbound side would need an outside lane, which impacts the Blue Hills. Mr. Langley noted that in meetings with MHD, he learned that the Add-a-Lane project stormwater structures are beyond the outside highway lanes.

Mr. Grafe said he could agree to drop Alternative #43 but would like #44 and #45 to continue into Phase 2. He has concerns about zipper lane impacts and air quality benefits. In addition, general

purpose and HOV traffic tie-ins are difficult. Regarding smart growth, Criterion 3.6, he suggested a feeder bus system that ties into the HOV bus system and the I-93 to Route 24 corridor. Smart growth and ridership could be improved if a wider commuter-shed could be accommodated, providing more benefits.

Mr. Schweisberg asked if indirect impacts had been evaluated on the Northeast Corridor? Does the length indicated include edges? Ms. Standley said new and abandoned rail beds were evaluated for indirect impacts, not existing active lines. Wetlands crossings were analyzed, not edges.

Ms. Sorenson asked if open space impacts were the only reason for eliminating #43? She said that the breakdown lane is used currently for rush hour travel. She's interested in the ridership comparison. Mr. McArdle said that the alternative ends at Route 128 and I-95. #43 has a ridership ranking of 29%. #44 has a ridership ranking of 49%. The ridership for #43 is penalized for the transfer required to the commuter train at Route 128. He added that by the time the trains get to Route 128, there are usually no seats available so quality of service suffers and it becomes an unattractive alternative for commuters. Mr. Guimond noted that the bus alternatives are neutral or unfavorable on criteria 2.2 and 2.5 for providing sufficient capacity to meet demand (2.5) and compatibility with existing and planned future regional transportation systems (2.2). Mr. Timmerman suggested that the Blue Hills open space impact should be weighed relative to the quality of the resource. He added that acquisition of a better quality parcel might offset the loss of the land near the highway. The issue shouldn't be the tipping point. Ms. Egan noted that #43 is the worst performing bus alternative in terms of open space impacts, but the team would like to eliminate it because it performs poorly on a number of criteria, not just open space. If all previous criteria (from Step 2, etc.) are added up, #43 falls out when compared to the other bus alternatives. Ms. Egan noted that the group had agreed to the evaluation criteria before the analyses began. When looked at as a stand-alone or relative to other alternatives, #43 ranks highly unfavorable and drops out.

Mr. Grafe asked if increasing capacity on the Northeast Corridor is possible? Are there constraints at Back Bay or South Station? Mr. McArdle said the constraints are in the section from Route 128 to Canton Junction. An additional one to two trains are possible without adding rail infrastructure. Ms. Sorenson noted that the MBTA had looked at adding a third track as part of the Westwood Station project. Amtrak had considered adding a track; however, it elected not to go forward due to cost and environmental issues. A project to add a third rail is not currently on the books.

Mr. Schweisberg felt that some alternatives and criteria are being viewed at the 10,000-foot level, while others are evaluated in more detail, for instance the NHESP and wetlands issues. He said that while this is not necessarily bad, it could create issues around transparency. He said the group should develop a logic for dismissing or keeping alternatives that distinguishes the differences between the broad brush and detailed evaluations. Ms. Standley clarified that the same criteria were used to evaluate all alternatives.

Ms. Egan said the EIR can't have 10 alternatives, so the list must be narrowed. She would like to have a diversity of corridors and modes of transportation represented in the alternatives that are advanced to the MEPA/NEPA phase. The group discussed the pros and cons of the alternatives presented in the PowerPoint handout. Mr. McArdle asked the group to circle back and agree to eliminate #43. Even if the alternative's ranking on Criteria 3.4 were changed from highly unfavorable to unfavorable, it would still not perform well enough to be advanced to the next phase. Mr. Langely suggested that including an overall ranking might help when single criteria rankings are ambiguous. Ms. Egan said the group did not agree earlier on values for criteria. It's not simply a case of quantifying and averaging. This is the

reason she would like to circle back before the group makes its final recommendations. The group agreed to keep #43 in and change its criteria 3.3 and 3.4 rankings from highly unfavorable to unfavorable.

Ms. Egan suggested the group eliminate DMU alternatives (#32 and #33) due to the need for double tracking and associated wetlands impacts. She pointed out that #34 (electrified commuter rail) would have greater wetlands impacts due to catenary footings and longer sidings, which are necessary for the electric option. Mr. Felix objected to carrying the remaining two Stoughton alternatives due to impacts. Regarding alternatives #30 and #34, Mr. Timmerman asked if it was possible to look at them as if they were one alternative, with two ways to accomplish it (commuter rail or electrified commuter rail)? Mr. McArdle said there are operational differences for the two types of commuter rail; trip time, noise and other factors vary. Even though they are on the same corridor, they must be looked at as two different alternatives. He cautioned that the group should be careful about eliminating an alternative that might end up to be the only practicable one from a transportation perspective, but rather to keep some options open. For that reason, he recommended keeping #30 and #34. Mr. Anacheka-Nasemann noted that in 2002, the Stoughton alternative was the sole feasible alternative. The process ensures alternatives are open and moving forward. He is comfortable with most of VHB's conclusions.

Ms. Standley asked if the group could eliminate #3 (Commuter Rail via Dartmouth Secondary, New Bedford Secondary and Attleboro Bypass) based on the extensive environmental impacts? Members agreed to eliminate this alternative. Mr. Felix said the bell curve seems to work for high value ACECs, wetlands and endangered species criteria. He said that bordering vegetated wetlands impacts should also be evaluated. DEP considers these to have important value. Mr. Langley noted that #30 and #34 were less unfavorable for wetlands and endangered species than #32 and #33. Acreage of wetlands loss was also less for those alternatives.

Ms. Egan reported that the Southeastern Massachusetts Commuter Rail Task Force sent a letter to her supporting moving the process forward quickly and ensuring high quality service. Improved performance and air quality and reduced wetlands loss are important. Alternatives must be evaluated with more detail with an eye toward a diversity of corridors and modes. She said it's uncertain at this point if Stoughton would be the only LEDPA or if it's the most environmentally damaging alternative.

Ms. Egan noted that the group has now increased the number of alternatives from 9 to 11 that will advance to Phase 2, including #43 and the extension of the existing Middleborough line (Alternative 64). The number must be reduced, so she would like to circle back. She asked if the group could eliminate #43 based on lower quality of service and higher impacts than the other bus alternatives? Mr. Timmerman noted the difference between #45 and #44 is that #45 is not under state control, but is operated by private carriers. He also pointed out that Bus Rapid Transit would be controlled by the state and would operate more like commuter rail, which makes it more attractive. Mr. Schweisberg said he needs to review and consider previous materials before he will be comfortable with circling back. After further discussion, the group agreed to drop #43 and #6 (DMUs via Dartmouth Secondary). Mr. Guimond noted that the transfer requirement for DMUs decreases the value of those alternatives. From a regional perspective, they should be eliminated.

Mr. McArdle reviewed the team's recommendations:
Alternative #1, eliminate – marginal for 2 transportation criteria and neutral for 3 environmental criteria
Alternative #5, carry – acceptable on environmental criteria, weaker on transportation (mobility and purpose)
Alternative #6, eliminate – unfavorable environmental performance

Alternative #7, eliminate – neutral for transportation and environmental criteria
Alternative #30, carry – performed well on transportation criteria, environmental criteria poor
Alternative #34, carry – environmental impacts same as #30, but air quality improvement
Alternatives #44 and #45, carry
Alternative #62, carry

Mr. Reiner did not agree to dropping Alternatives 1 or 7 at this stage. Ms. Egan agreed that they would be presented to at the Civic Engagement meetings next week as alternatives that were not dismissed in Step 3.

The group did not agree to narrow the alternatives list further despite the team's recommendations. Ms. Egan thanked the members for their time, noting that they would meet again at the end of March to narrow the list further before the MEPA/NEPA phase. She invited members to attend the public meetings next week. She said the team would document public input, which the group could consider at the next meeting in order to make recommendations for the decision about the Phase 2 alternatives list in April.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- Civic Engagement Meetings scheduled for March 10 (Attleboro), March 11 (Lakeville), March 12 (Freetown).

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #9

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: February 28, 2008 - 9:00 to 11:45 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Samir Bukhari	US Environmental Protection Agency
Joe Cosgrove	Massachusetts Bay Transportation Authority
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Greg Guimond	Southeastern Regional Planning and Economic Development District
Bruce Kaplan	Central Transportation Planning Staff
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Scott Peterson	Central Transportation Planning Staff
Edward Reiner	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation ACEC Program
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmermann	US Environmental Protection Agency

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Cover Memo: Alternatives Analysis – Step 2 (Updated from last week); Matrix: Alternatives Analysis – Step 2 (Updated from last week); Cover Memo: Alternatives Analysis – Step 3; Matrix: Alternatives Analysis – Step 3; Middleborough alternative data; DVD of Middleborough alternative infrastructure constraints; Packet of environment-related public comments; Description of each alternative

PURPOSE/SUBJECT:
Complete review of the results of the second part of the preliminary Step 2 Alternatives Analysis process and begin the Step 3 analysis with members of the committee. Provide follow-up information from previous discussions.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay

Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The ninth meeting focused on a review of the results of the last elements of the Step 2 analysis of alternatives, Criteria 2.4 and 2.5, and the beginning of the Step 3 analysis. In the next meeting, the group will complete the analysis for Step 3 and look back at earlier steps and recommendations in light of all of the data collected and discussed to date.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list). She dealt with a couple of business items. One handout is a spreadsheet and copies of comment letters the team has received on the project related to environmental issues. (Members are welcome to request copies of other letters in the list.) The team hopes to finish the Step 2 discussion today (Criteria 2.4 and 2.5), then begin the Step 3 review. Next week, the group would finish Step 3 and revisit the alternatives in light of all the information collected, presented and discussed. At the end of next week's meeting, Ms. Egan hopes there will be a set of alternatives to bring to the Civic Engagement meetings the week of March 10. After the public comments have been reviewed by the Interagency Group, there will be a final review of the process and alternatives.

Ms. Egan asked the participants to introduce themselves (see the attendance).

Approval of 2.21.08 Meeting Minutes

Ms. Egan asked for comments on the draft minutes of the February 21 Interagency Group meeting. Lealdon Langley asked a clarifying question about the monorails in Canada. Mike McArdle, VHB, said they are really people movers and are rubber-tired. They are not true monorails.

Alan Anacheka-Nasemann said that the minutes appropriately reflect his comments on the need to review the Phase 1 narrative report on the alternatives screening process before the Army Corps can give its approval to the conclusions. Ms. Egan said the Interagency Group will receive the narrative before being asked to approve the draft recommendations. She reminded them that there is a lot of information available, but at this point, the data are best guesses without detailed information and the process will begin again in Phase 2.

There were no other comments on the minutes. Because Tim Timmerman was not at the meeting yet, formal approval was delayed until he arrived. (NOTE: the meeting ran late and the minutes approval was not revisited.)

Presentation on Step 2, Screening Criteria 2.4 and 2.5

Rick Carey, VHB, presented the data in the Step 2 matrix for Criteria 2.4 and 2.5. Mr. Carey reminded the group that Step 2.4 deals with capital cost, including estimated cost (in billions); cost score; ridership score; cost effectiveness score; and ranking. These are the most analytical elements of the analysis and he walked through the calculations.

Column 1, the estimated capital cost, ranges from a low of $90 million to a high of $2.4 billion. The team converted the cost into a score, ranging from a minimum of 0 for an alternative that would attract no riders to a theoretical maximum of 100. The higher the score, the better the rank.

Ridership estimates prepared by the Central Transportation Planning Staff (CTPS) from a simplified version of the regional model were also converted into a score. Again, there is a range of highest to lowest, with the lowest being alternative #5, the DMU Commuter Rail to Attleboro. The highest score is #34, electrified Commuter Rail to South Station via Stoughton.

The members discussed the issue of how the rankings might change with more detailed investigation, in particular related to travel time. The electrified options rank much higher but all of the aspects of travel time are not included at this level of investigation. Scott Peterson, CTPS, said that the travel time may decrease on the electrified options when there is more data, but he does not think the relative rankings will change. Transfers cause some alternatives to rank lower, and as long as they are present, they bring a time penalty. Mr. McArdle said that electric options are always better than diesel ones since the electric engines accelerate and decelerate more quickly. Mr. Peterson added that the ridership estimates only include 2000 Census Journey to Work data and not other trips, so the data in Phase 2 will provide a better feel for this topic. But on technical issues, he does not expect much change in the ranking. There were other clarifying questions about the assumptions. The team members said the capital cost estimate includes a trestle on the Stoughton commuter rail alternatives through the Hockomock Swamp, vehicle purchases, grade crossings, linear feet of track values, and more. There is a spreadsheet behind each of the capital cost numbers. The Step 2.4 estimate does not include wetland mitigation costs, since these are dependent on Step 3. The EOT team agreed to revisit Step 2.4 after Step 3 and incorporate mitigation costs. Mr. McArdle reported that EMUs – or Electric Mobile Units – exist only as plans and have not been built. (They might have advantages over DMUs, but they don't exist yet in reality.) Referring to the population data, Greg Guimond, SRPEDD, said there has been a 35.5% increase in trips from the study area so there is a good chance that the 2000 Census data underestimates the demand. Mr. Peterson said he grew the population forecast by 20% to allow for this kind of factor.

Returning to the matrix and analysis, Mr. Carey described the cost effectiveness score as an average of the cost and ridership scores. The rankings are described in the Step 2 Memo. The team found that the spread of scores fell into a typical bell curve with a few options at each end, high and low, and most falling in the middle of the curve. Alternative #45 has the highest score and #41 the lowest. The cost of #41 and the low ranking gave it Unfavorable status, so it fails to meet the criteria. It is the only alternative to fail Step 2.4.

Ed Reiner, U.S. Environmental Protection Agency, asked about the assumptions for the bus service options. Mr. McArdle said that the team presumed a standard operating scenario, which includes three buses each, 15 mins apart from New Bedford, Fall River and Taunton during peak travel time. More buses would be difficult to load at the stations and would also tie up the highway system. Steve Smith, SRPEDD, asked about bus lanes and the route to Boston. Mr. McArdle said that the buses would travel in general traffic on Routes 140 and 24 up to Interstate 495; travel in a zipper lane in the off peak direction up to Route 128 (Taunton to Randolph); and would use a dedicated bus lane to connect to the expressway zipper lane to reach Boston. Buses would share the HOV lane to Boston. Mr. Smith said that although Mass Highway Department has completed a study of converting Route 24 into an interstate highway (at a cost of $122 million), there are no plans to implement the study (it is not in the regional transportation plan). (Ms. Egan reminded everyone that the assumptions are based only on proposals or plans already in the regional transportation plan.) The members discussed the idea of changing or tweaking some of the assumptions; for example, giving the expressway zipper lane only to buses. The team said that this can be done, especially in Phase 2, if there are promising ideas or permutations. Ms. Egan said there is a tension in this process and when the group circles around the alternatives next week the members can

look at some of these underlying assumptions, which they are finding very helpful. Mr. McArdle pointed out that only one option is falling out in this criterion due to its very high cost.

There was a discussion of bus capacity and options. Liz Sorenson, DCR ACEC, asked about feeder bus service and learned that it is being carried forward as the No Action alternative. Mr. Carey said the next criterion would include a discussion of vehicle capacity.

Criterion 2.5 asks if an alternative provides sufficient capacity to meet demand. The first column lists the capacity of the mode. Commuter Rail carries the largest number of passengers: 8640 (8-car consists – or trains of double stacked trains with 40-minute headways, running 6 trips during peak hours). DMUs have the next largest capacity, at 4416 (3-car consists, 15-minute headways during peak times). Buses could carry 2700 in coaches, based on 3-bus platoons and 15-minute headways. On mode capacity, then, Commuter Rail ranks highest, DMU is in the middle or neutral position, and buses meet less than 50% of demand.

Demand was measured in terms of the number of daily work-related trips between South Coast communities and Boston. For this analysis, the latent demand for transit (the 2000 Journey to Work data) were compared to the maximum capacity of each alternative. The ability of each alternative to meet possible future ridership potential was calculated as the percent of capacity. Mr. Carey suggested that the demand figures are conservative since they are based on 2000 figures.

There was a brief discussion about the use of only three of the graphic symbols for the ratings versus all five. The team could use all 5 in a column even if none of the alternatives were rated at the extremes.

Mr. Reiner asked why the bus capacity number is low. Mr. McArdle said the number is based on typical bus operations. At a time certain, say 7 AM, riders board three buses, then there is another set of three buses 15 minutes later. For operational reasons, there can only be so many buses loading at one time. The BRT would have no stops north of Taunton. The enhanced bus would stop at park-and-rides. In the next phase, the team can work with CTPS to pose a number of questions, such as will ridership warrant capacity? For both buses and commuter rail. Mr. Peterson added that he can run the model both constrained and unconstrained. This could include articulated buses or double decker buses and other options.

Ms. Egan asked if it was possible to gather concurrence on the Step 2 recommendations before going on to Step 3. Only one option, #43, is recommended not to pass based on Steps 2.4 and 2.5.

Mr. Timmerman asked about the data he was interested in with regard to the Middleborough Alternatives as presented in the FEIR. Mr. McArdle said it was contained in the meeting packet. He reviewed the chart and said the information was based on detailed modeling from the last environmental review. Mr. Timmerman suggested that the option compares favorably to bus and it was his memory that during the last review, some of these options were constrained by the MBTA's Service Policy. Mr. McArdle said that the constraint is an infrastructure one in this case. The Middleborough options would only permit five trips a day, three of them during peak periods, in essence two of them from one city and one from another during rush hour. Mr. Timmerman and Ms. Egan asked if this option could be compared against the others in Step 3. Mr. McArdle said it could but it is hardly fair. There is a big difference in potential ridership capture. Mr. Anacheka-Nasemann said he would like to see how the Middleborough alternatives would place in Steps 2.4 and 2.5. Mr. McArdle said it can be done, but he does not think these alternatives will meet demand. Alternative #62 retains the Middleborough route and

service on this route (without infrastructure improvements) would be comparable to what was presented in the FEIR. The other leg – through Attleboro – performs twice as well since it is not constrained.

Mr. Timmerman said he is concerned that EOT convey to the public at the civic engagement meetings that the Interagency Group members are still reviewing the alternatives and are not 100% confident of making a decision yet. Ms. Egan said she would not mislead the communities and will clearly present the Step 2 data as draft; in any case, EOT is seeking public input and would not finalize the material before the meetings and the completion of the report. Mr. Felix said he is more concerned about items dropping out. Mr. Anacheka-Nasemann said he is not concerned about the process, but would like to see Middleborough data for criteria 2.4 and 2.5. Mr. Timmerman said that EPA feels that there are often proposals that the proponent doesn't want to look at that may provide the basis for a solution in the context of the NEPA process. This requires teasing out the differences between alternatives, understanding the assumptions and being open to possibilities. He confirmed that he does not expect to revisit the mile-long tunnel as an alternative to double tracking between Braintree and Boston, but he does think that further understanding the possibilities for the Middleborough route has value. Ms. Egan said VHB would attempt to do a quick analysis, although she is not sure what can be accomplished by next week. Mr. Timmerman responded that there is some tension in this process and EPA has to make informed decisions and that will be part of the MEPA/NEPA process. Ms. Egan said she is hoping not to face surprises in Phase 2, which is one of the reasons that EOT has undertaken an extensive Phase 1 process.

Mr. Smith said part of the tension is that an environmental group appears to be making operational decisions. The perception in the communities is that is the role for transportation experts. Mr. Anacheka-Nasemann said the LEDPA chooses the most practicable alternative with the least environmental imapcts. Mr. Smith said there is a strong perception that the Middleborough route does not meet the region's transportation objectives. Ms. Sorenson asked about a possible route connecting Brockton to Stoughton; Mr. McArdle responded with information that there is no longer a right-of-way, there is a hill in the way, and there are other issues. Mr. Langley turned to the idea of eliminating Mansfield alternatives due to the nature of the impacts on the built environment. He expressed concern that this kind of elimination could result in the choice of an option that would have more of an impact on the natural environment. This is a difficult tradeoff. Mr. Anacheka-Nasemann said that Mansfield would fall out of the mix on the practicability scale. Ms. Egan said she is sympathetic to Mr. Langley's position and this kind of project requires balancing different values and coming to a conclusion. Mr. Timmerman said he is asking about Middleborough because it is possible that the best solution from EPA's point of view is one that meets less than 100% of the goals, perhaps 80 or 90%, and has less impact on the environment.

Mr. Smith said that the Mansfield option is more than disruptive: it would be impossible to mitigate. Mr. Felix said that DEP has no hard and fast rule on variances, depending to some extent on past decisions, but DEP has issued wetland variances for airport safety projects and understands the need to preserve the safety area at the Mansfield Airport. Ms. Egan asked VHB if a capital cost estimate could be prepared for Mansfield. Mr. McArdle said he could not do so in a reasonable time frame. He would have to calculate how to replace the main street, reconfigure the entire downtown, etc., and it was a complex task.

Ms. Egan said that the group will revisit some of these issues after the completion of Step 3 and VHB will estimate figures for Step 2.4 and 2.5 for the Middleborough options. She summarized the results of the Step 2 analysis: elimination of #37, 38 and 39 (monorail); #40, 41, 42 and 63 (variations of Commuter Rail, Light Rail and Heavy Rail); # 2 (reverse move at Attleboro); the group will come back to #17 and 18 (Middleborough options). She asked if there were any objections to this plan and there were none. Mr.

Anacheka-Nasemann said he reserved the right to review the narrative report before giving agency approval.

Presentation, Phase 1, Step 3

Lisa Standley, VHB, said she would make a presentation on the assumptions used in the Step 3 process before reviewing the matrix and results with the members. She used a PowerPoint presentation and a series of color maps to highlight the presentation. The objective of this step is to dismiss alternatives that are likely to result in substantially higher environmental impacts than other practicable alternatives.

To explore the assumptions, Ms. Standley led the members through maps for a series of critical project segments: Northeast Corridor, Attleboro Bypass, Stoughton Right-of-Way, Dartmouth Secondary, Fall River and New Bedford lines (which were not covered due to lack of time; they were thoroughly examined during the previous environmental review), and Route 24/128. She explained their links to the alternatives, the differences between modes and the findings. (Ms. Standley highlighted locations of vernal pools, Zone 1s, Priority Habitats of Rare Species, protected and recreational open space and other important features, along with the ROWs and other data for each map/area.)

Northeast Corridor – Canton Junction to Readville: Alternatives 1, 3, 7
This area includes the Fowl Meadow and Ponkapoag Bog; vernal pools; and a public water supply well. Triple tracking would be required through this segment due to impacts on the North East Corridor. (Ms. Sorenson asked if Amtrak was already planning to install the third track. Mr. McArdle thought that was not the case and he would check that information.) The existing track is in the ACEC. She noted that the team is working with GIS maps and they do not provide all of the data the team needs to estimate impacts as they would like to do at this time. The GIS maps tend to underestimate the extent of wetlands. VHB previously delineated and flagged some of these wetlands before, however, and that information is at a much higher level and was used in this analysis.

Attleboro Bypass: Alternatives 1, 3, 7, 62
The bypass is the new track that would be needed to avoid the reverse move at the Attleboro Station. It would be new track laid in a power line right-of-way. Chartley Pond is north of the Attleboro Secondary and could be avoided; there is open space, conservation land and rare species habitat in the area. Vernal pools are not close to the proposed ROW.

Stoughton Line – Stoughton Station to Cotley Junction: Alternatives #30, 32, 33, and 34
This corridor passes through the Hockamock Swamp and Pine Swamp in Raynham. It is within the Hockamock ACEC, and within Raynham conservation land in Pine Swamp. There are rare species and open space and conservation land. Mr. Anacheka-Nasemann asked about the potential use of an old freight line in this area. Mr. McArdle said that is the abandoned Whittendon Junction branch. The group discussed this line and recommended that it be considered as an option to avoid impacts to Pine Swamp. Ms. Standley indicated where the trestle was planned for this ROW to cross over the Hockamock Swamp. The Easton Town Well lies 400 feet to the east of the ROW, which touches the edge of the Zone 1. Mr. Smith said that Pine Swamp is between the Taunton and Raynham municipal landfills.

Dartmouth Secondary: Alternatives 5, 6 and 32
Ms. Standley said that this is the route from New Bedford to Fall River. It is near the New Bedford Airport and passes both north of and below Route 195. There are wetlands and rare species area

crossings and the Westport Land Trust owns part of the former ROW west of I-195. This is a single track in degraded condition and is currently used only by freight traffic.

Highway – Route 128 Station to Braintree: Alternatives 43, 44 and 45
This segment includes Route 24 to Route 128 to Braintree. It would add a bus lane to the east to the HOV lane on the expressway and to the west, it would add a bus lane to the 128 Station in Westwood. The Blue Hills Reservation lies to the north of Route 128 and the Fowl Meadow and Ponkapoag Bog is west of 24 and both north and south of 128. The issues are related to 128 and adding a lane. Mass Highway looked at the possibility and did not advance the project due to environmental impacts.

Ms. Standley turned to the differences in impacts between modes. Commuter Rail could be one or two tracks; DMU would have to run on 2 tracks; and electric catenary would require longer sidings and overhead catenary towers and footings (probably every 100 feet). She said that it is difficult to calculate the impacts at the high level of comparisons being undertaken in this phase. South of Stoughton, detailed information is available for Fall River, Stoughton and New Bedford (up to 30% engineering design). The ability to understand impacts will improve in Phase 2.

Ms. Standley reviewed the evaluation criteria for Step 3 and the data that the team was and was not able to measure:

3.1 – Approximate level of wetland loss in acres, including wetlands within an ACEC, indirect wetlands impacts based on length of new or abandoned ROW and number of vernal pools in close proximity.
3.2 – The number of new stream or river crossings.
3.3 – Number of acres of mapped Priority Habitat with the ROW/Impact footprint.
3.4 – Number of acres of protected public open space directly impacted, including parks recreation areas and wildlife refuges.
3.5 – The number of acres of protected public water supply lands (mapped Zone 1 and Zone A) within the alternative footprint for new and abandoned ROW sections.
3.6 – Consistent with Smart Growth strategies.

Ms. Standley reviewed the evaluation rating options and how they were applied to each criterion. She said that as with the Step 2 ratings, the bell curve described how most of the alternatives were dispersed. She discussed how the GIS data were used to estimate impacts to the key resources identified in Step 3, and said that Criterion 3.3 would be refined based on input from the Natural Heritage Program staff. She clarified that indirect impacts to wetlands were estimated based on the length of track construction on new, abandoned, or poor-condition tracks through wetlands.

Based on the team's analysis and application of the criteria, Alternatives 3, 32, 33 and 43 should be dismissed at this level. This action would leave 9 remaining options: 1, Commuter Rail via Attleboro Bypass; 5, DMUs to Attleboro Station; 6, Combination of DMU Commuter Rail from Fall River and New Bedford to Attleboro Station, with the southern cities connection on the Dartmouth Secondary; 7, electrified Commuter Rail via Attleboro Bypass; 30, Commuter Rail via Stoughton; 34, Electrified Commuter Rail via Stoughton; 44, Bus Rapid Transit to South Station; 45, Enhanced Bus; and 62, Commuter Rail via Attleboro Bypass and Middleborough. The team recommends that Alternatives 3, 21, 33 and 43 should be dismissed.

Ms. Egan thanked the members for staying longer to complete the Step 3 overview. She said the group will take up from here next week, responding to questions and reviewing the data in the steps. She asked the members to be prepared to stay an extra half hour for the next meeting to accomplish the goals.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- Civic Engagement Meetings scheduled for March 10 (Attleboro), March 11 (Lakeville), March 12 (Freetown).
- Reschedule late March meeting.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #8

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: February 21, 2008 - 9:00 to 11:30 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Joe Cosgrove	Massachusetts Bay Transportation Authority
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Greg Guimond	Southeastern Regional Planning and Economic Development District
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Scott Peterson	Central Transportation Planning Staff
Edward Reiner	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning and Economic Development District
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmermann	US Environmental Protection Agency

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Meeting Agenda; Phase 1 Screening Criteria; Alternative Screening Process, Phase 1 – Step 2; Alternatives Analysis Chart for Step 2

PURPOSE/SUBJECT:
Review of the results of the preliminary Step 2 Alternatives Analysis process with members of the committee, along with a slight change in the evaluation criteria.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The eighth meeting focused on a review of the results of the Step 2 analysis of alternatives. The next two meetings will complete the analysis for Steps 2 and address Step 3.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list). She dealt with a couple of business items. With regard to a request for copies of the public comments, Ms. Egan said that the team was preparing them and they were not yet complete. Tim Timmerman, EPA, asked if they would be organized by topic or theme. Nancy Farrell, RVA, said they would be accompanied by a spreadsheet with organizing information.

Ms. Egan asked Steve Smith, Southeastern Regional Planning and Economic Development District (SRPEDD), for a brief update on plans for the next Commuter Rail Task Force Meeting. Mr. Smith said it was likely that the next meeting on March 12 would switch focus from challenges and/or mitigation for the project to the civic engagement presentation on the Alternatives Analysis process. The group would return to the issue of perceived negatives in April. Mr. Smith reported on the rough list of benefits that the group had developed last week, and Ms. Egan asked if the Interagency group could get a letter or summary of those benefits. Mr. Smith said he could get that information to the group. The key issues from the meeting focused on level and quality of service, open space transformation and preservation.

Ms. Egan said that Goody Clancy, the Corridor Plan consultant, would be making a presentation to the Interagency Group, but she thought it might be best to wait until April, after the alternatives analysis process has been completed and the Draft Literature Review that is part of the Corridor Plan project has been completed. There was general agreement with this suggestion, so the group reviewed the schedule of upcoming meetings. Ms. Egan reminded the members of the civic engagement meetings scheduled for March 10, 11 and 12 and the group confirmed its upcoming meeting schedule.

Ms. Egan reminded the members that the plan for sharing the alternatives analysis information includes posting the Interagency minutes, the step charts and the summary memos on the criteria and how they are applied. After some discussion, the group agreed that it would be sensible to wait to post the Step 2 review until all of the elements of that step have been concluded.

Ms. Egan asked for comments on the minutes of the February 14, 2008 meeting. The following comments and changes were submitted:

- Lealdon Langley noted (page 3, 2nd full paragraph) that he was referring to mitigation ratios related to the variance process, and the word "ratios" should be included for accuracy.
- John Felix and Tim Timmerman noted that the meeting had included comments from the agencies that there is no correct number of options to be carried forward from their perspectives. They want the right number but they don't have an opinion on what that number should be.
- On page 6, the first sentence under "Other Options" should include the word "eliminated."
- On page 7, second full paragraph, the text should read (last sentence) that the group requested to see comments on the project.
- Mr. Timmerman said he did not see a reference to his comments on the fact that in the future, the presence of amenities such as Internet service and other intangibles might make passengers more willing to accept slightly longer travel times than the current assumptions (i.e., 90 minutes); he noted, and others agreed, that the auto travel times are likely to lengthen, not get shorter, and that factor should also be kept in mind. In light of this fact, the group suggested that the wording on page 5, last sentence of the paragraph below the chart, should be edited to read: "Trip times will most likely be lengthened in subsequent stages of the analysis as more information becomes available."

The minutes of the meeting were accepted as amended.

Rosemary Monahan, U.S. EPA, said that it would be helpful to have a written description of each of the options. Mike McArdle, VHB Project Manager, said that would be possible; the team has the descriptions and will provide them to the group members.

Review of Evaluation Criteria Changes

Ms. Egan said she wanted to check with the group members on a change in the order of the Step 2 analysis elements. The team switched items 2.3 and 2.4 since ridership numbers are important and were not yet available in the first segment of the Step 2 review. Ms. Egan said that the team feels that it is not possible at this scale of the review to include information on operating costs, as originally indicated in 2.4. While capital costs will be estimated, the data that would result from estimating operating costs would not be helpful at this time. Mr. Timmerman said that reminded him of a concern about the adjective "reasonable" as applied to the cost estimates and a concern that the concept should be discussed. Ms. Egan said the team has set up a scale to make relative comparisons of cost at this time. Mr. Felix said he had a similar concern related to other descriptions in the chart, such as the comment that the Mansfield options would be "highly disruptive" to the downtown. Ms. Egan said that such comments will be described using photos and other data in the presentation, both at this meeting and at the Civic Engagement meetings. The Alternatives Analysis Report will contain a significant amount of detail undertaken for the alternatives.

The group members said that the changes to the Evaluation Criteria were acceptable.

Presentation of Phase 1 – Alternatives Analysis – Step 2

Ms. Egan opened the Alternatives Analysis segment of the meeting. She said that Step 1 reduced the number of alternatives from 37 to 28 by evaluating them against the Project Purpose. The first segment of Step 2, presented today, could reduce the alternatives from 28 to 14; this step will be completed with the ridership data in hand. Mike McArdle, VHB, used a map of the corridors, a series of enlarged photos and drawings on a white board to illustrate the Step 2 review process completed to date. He focused on presenting information about the alternatives that were ranked Highly Unfavorable in Step 2.1, 2.2 or 2.3.

Alternatives through Attleboro

Alternative #2: The first set of alternatives uses the Attleboro Secondary to reach the North East Corridor. Mr. McArdle said that Alternative Number 2, Commuter Rail to South Station via Attleboro Station with a reverse move, was Highly Unfavorable for Criterion 2.1, so it fails this level of analysis. Mr. McArdle described the difficulty associated with this alternative: the Acela bypasses the Attleboro station and local and regional trains are routed to side tracks to allow this passage. Trains using the Attleboro secondary would pull into the station and have to wait until the ends are switched so that the controls are from the northbound side, going toward Boston. This takes about 10-12 minutes. During peak periods, between 3 and 4 trains per hour would be serving the region, occupying the station space between 36 and 48 minutes and blocking the other trains, preventing them from getting out of the way of Amtrak as well. Alternative #2 does not pass Step 2.1 and is recommended for elimination.

Mansfield Former Right-of-Way

Alternatives #11, 12, 13, 14, and 15: Mr. McArdle said that these options initially appeared to be attractive due to travel time. There is an old railroad right-of-way that the Commonwealth sold to the town of Mansfield back in the 1960s that extends up to the North East Corridor. The right-of-way (ROW) has changed dramatically since that time. It cuts through downtown Mansfield, and it is now a city street (Old Colony Road). The downtown street circulation was changed to one way from Route 106 to Court St. and uses the ROW as an integral part of the circulation pattern. Part of the ROW is owned by the Mansfield Airport and is within the Obstruction Free Area. There is a sewer line below the ROW, and a 4.1-mile bike path is on a portion of the former rail line. Buildings and other obstructions are also on the former ROW. There are significant grade problems at Route 106, just south of the Mansfield Station. To cross beneath the ROW, the route would have to go beneath a Route 106 underpass that has a flooding problem. The ROW was interrupted by Route 495, and it would require a new grade-separated crossing. To minimize impacts to Downtown Mansfield, the project would have to construct a one-mile long tunnel and there would still be other challenges. Mr. McArdle said that *all* of the Mansfield alternatives have Highly Unfavorable or Unfavorable ratings for 2.1, 2.2 and 2.3 and should not advance.

The committee members had a discussion about the point at which impacts can or cannot be mitigated and how to compare infrastructure impacts to natural ones, such as wetland impacts, or developed impacts to undeveloped ones. The team members suggested that these details will be reported in the narrative, but in general, the Highly Unfavorable or Unfavorable ratings in these categories present challenges that are likely to be insurmountable, such as rebuilding most of downtown Mansfield, holding up trains from the west or southwest for most of the peak hours or other constraints that cannot be overcome. Ms. Monahan and Mr. Langley, for example, said they would like to work all the way through Step 2 before dismissing these alternatives. Mr. Anacheka-Nasemann said the team and group members have to stay open to creative solutions that might overcome the obstructions (he gave an example that would eliminate service to Stoughton and Canton to free up capacity on the Northeast Corridor which he said should not advance but was a way of thinking about new possibilities). His point was that reducing service in one area compensate for lost capacity. Ms. Egan reminded the members that after Step 3, the group can look back and review its decisions in the light of new or broader information. In addition, the steps will be subject to public review at the March Civic Engagement meetings. Mr. Anacheka-Nasemann said that the Army Corps of Engineers will need to review the final report before signing off formally on the alternatives. Mr. Felix said he was comfortable with the analysis to date, but he looks forward to seeing verification of the data in the meeting notes and report.

Returning to the topic of the Mansfield options, Steve Smith, Southeastern Regional Planning and Economic Development District, said that these alternatives would disrupt every mode of transportation in the community and that impact was really sufficient to knock out these options. Greg Guimond, also from the Southeastern Regional Planning and Economic Development District, said that the SRPEDD staff walked the ROW from Mansfield to Route 495 and saw no way that the rail could be restored to that route.

Middleborough

Alternatives #17 and 18: Mr. McArdle said that the Middleborough route would include trains from Fall River and New Bedford traveling via the Middleborough Secondary to the Old Colony Line at Middleborough, then to Boston. These options are rated Highly Unfavorable because of the need to provide double tracks – which do not currently exist – from the juncture of the Old Colony lines (Plymouth, Greenbush and Middleborough) north through Braintree and Quincy. There are double tracks over the Neponset River, then a track would have to be added from the Savin Hill Red Line Station to South Station. Mr. McArdle used a series of aerial images to show the highly developed areas the tracks currently pass through. Mr. Timmerman asked if the MBTA was already planning to double the tracks either in connection with construction at South Station or to improve service. Joe Cosgrove, MBTA Planning, said that the MBTA has no plan at this time to do the double track, and it is not in the long-range plan. Mr. McArdle said that the improvements planned for South Station to lengthen platforms and add 4 – 6 tracks (when the U.S. Postal service annex moves to South Boston) will allow service improvements to Greenbush, for example, because the commuter rail platforms will be longer and will accommodate longer trains. (Now the passengers have to walk a long way to South Station since there are not enough long platforms to accommodate the trains.) Mr. Anacheka-Nasemann asked if freight use results in cutting back passenger service and said he would like to know in general how freight use affects the alternatives. Ms. Egan said that there is a statewide freight plan underway that she will share with the group when it is complete. Mr. McArdle said that it has been possible to negotiate with track owners to create windows for their movements and the MBTA's needs. Mr. Anacheka-Nasemann said that at some point in this process, he will need to know what the worst case scenario would be in terms of number of freight trains which will also use the tracks. He has heard nightmare stories about negotiations with some companies. Ms. Egan said that this issue will be dealt with in depth in Phase 2.

Mr. McArdle returned to his presentation on double tracking. He indicated a cross-section location of the route near Archbishop Williams High School next to Route 3. There are homes and businesses all along the alignment as well as a car dealership. The route passes by a Stop and Shop with a parking garage; an historic cemetery; Quincy City Hall and Quincy Center; the Adams Academy; a multi-level parking garage; Adams National Park; and Burgin Parkway. There is little to no room along these sites to add a track. The only way to add a track would be to separate the Red Line and Commuter Rail tracks, placing the Red Line in a tunnel. Elevating the Commuter Rail would have similar costs, timeframes and impacts. A tunnel through the area would run about a mile and would take an estimated 8 years to construct and would face the significant challenge of finding ways to keep the Red Line and Commuter Rail running through the area. The construction would have significant impacts on the regional transportation system to make connections. Mr. McArdle said that in the event the rail line were to continue to Wareham, expanding the service would require triple tracking since the Middleborough line is already at capacity now. Mr. McArdle said that similar projects in other areas have been reviewed. The Silver Line tunnel for BRT took 8 years to complete and it does not include the facilities needed to run rail, like tracks, signalization, etc.. Lengthening the trains would not work for extending the line to Wareham because the platforms are not long enough so all the doors can't open, and the trains would not meet accessibility requirement.

The group members expressed disappointment that Middleborough alternatives are not going to meet the criteria. Mr. Reiner said that this was the case during the last phase of the project as well. Mr. Timmerman said he would be interested in finding out what kind of service could "fit" the current constraints, using existing infrastructure and Mr. McArdle said that he could estimate that and provide

the Level of Service (LOS) information for Middleborough for consideration at the next meeting. Mr. McArdle said that VHB has a video of the rail segments that would have to be double tracked and he will send it to the members so they can understand the difficulties and it can also be made available at the upcoming civic engagement meetings.

Highway System

Monorail Alternatives #37, 38 and 39: Mr. McArdle said that these options had a number of Highly Unfavorable and Unfavorable ratings. They include: the construction time frame for 60 miles of structure; the need to design an entire new system, order vehicles, hire and train staff and crew; building a control center in Boston and a maintenance and storage facility. Mr. McArdle said the construction estimate is 9 years. Given that this would be the longest operating monorail in the world, there would likely be a fairly long start-up for the service, which has never been operated at this length and in this kind of climate. Mr. McArdle was asked to compare the construction cost to laying rail track. He said that rail costs about $400 per foot and he believes the monorail would be double that cost, but he will get the details for the group. He provided other information in response to questions about this technology. Monorail runs at an estimated 50 mph, versus commuter rail, which has the capacity to reach 79 mph. The longest monorail he is aware of is in Canada. It is an automated people mover, using rubber tired vehicles and traveling about 30 miles. Mr. McArdle said the team would provide additional data on the cost for the group and the public.

Commuter Rail to South Station via 24 and 128, #40: This alternative would require reconstructing 20 interchanges along Route 24 and it would inhibit any future enhancements to Route 24. It would also require constructing a third track along the North East Corridor. The impacts to Route 24 give this alternative a Highly Unfavorable and it has two other Unfavorable ratings, so it does not pass to the next part of Step 2.

Light Rail/Heavy Rail to Route 128 Station via Route 140, 24 and 128, #41: This alternative would also limit Route 24 improvements; could impact North East Corridor operations; and would require siting a new maintenance and storage facility.

Light and Heavy Rail to South Station via Route 140, 24, 128 and Red Line, #42: This alternative would heavily impact the Red Line and bypass the Braintree Station. It would also limit Route 24 future improvements. It is Highly Unfavorable.

Other

Commuter Rail to South Station via Middleborough; extend line to Wareham, #63: This alternative would have a major impact on the Red Line and Old Colony Main Line service since it would require triple tracking (see #17 and 18 above).

Ms. Egan noted that service to Wareham is not in the TIP and there are no studies of the proposal at this point in time. The members asked about #62, which is retained. This option is a hybrid that includes trains running up from Fall River and New Bedford, proceeding north on existing rail lines (Old Colony and Middleborough).

Mr. Felix asked about Route 79 and using it for a bus route. Mr. McArdle said it is a narrow road that might be shorter in length but would actually take longer than the Middleborough secondary, which would be a dedicated right of way for the bus service.

Summary

Ms. Egan said the team will walk through the next elements in the Step 2 process at the next meeting and will distribute the matrix in advance. All of the ridership numbers will not be available, but final decisions on Step 2 will await the groups' review of all of this data.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- Packets of comments letters will be prepared for the interagency group members.
- The matrix for the rest of the Step 2 analysis and draft minutes of this meeting will be distributed before the next meeting.
- Civic Engagement Meetings scheduled for March 10 (Attleboro), March 11 (Lakeville), March 12 (Freetown).

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #7

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: February 14, 2008 - 9:00 to 11:30 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Samir Bukhari	US Environmental Protection Agency
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning and Economic Development District
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmermann	US Environmental Protection Agency
Phil Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Meeting Agenda; Alternatives Analysis Chart for Step 1; Tier 1 Alternatives Chart, Travel Times for Modes and Corridors

PURPOSE/SUBJECT:
Review of the results of the Step 1 Alternatives Analysis process with members of the committee, along with a brief discussion of a revision to the smart growth evaluation criteria and a summary report on the civic engagement meetings.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The seventh meeting focused on a review of the results of

the Step 1 analysis of alternatives. The next two meetings (Feb. 21 and 28) will cover the analysis for Steps 2 and 3.

PRESENTATION:
Kristina Egan, EOT Project Manager, asked the attendees to introduce themselves (see the Attendance list). The agenda called for approval of the minutes of the January 10, 2008 meeting. Ms. Egan asked for comments on the minutes and receiving none, asked for approval. The minutes of the meeting were accepted as submitted.

Ms. Egan reminded the committee members that it is her intention to post the Interagency Meeting minutes on the project website, www.southcoastrail.com. She asked if anyone felt that the posting would restrict the agency representatives in their ability to speak freely about the project. There was no objection from the participants, and Ms. Egan said she will continue to ask for review and approval of the minutes at each meeting prior to posting them.

Evaluation Criteria – Smart Growth Revisions

Ms. Egan said that she was proposing one change to the evaluation criteria in the area of smart growth. The suggestion is to include redevelopment potential in this category by looking at larger brownfields or greyfields sites, e.g.., 21E sites of one acre or more, or clusters of these sites. This addition would be made on page 10, and would say "has the potential to promote brownfields or greyfields development." The committee members discussed how much of this information is currently available. Rosemary Monahan said that she can check on the federal level for a list of sites that have been assessed or remediated. Phil Weinberg said he would bring up the issue with Katherine Finneran on the state level. Ms. Monahan said she would further investigate the federal data available.

Discussion of Step 1 Analysis

Tim Timmerman, EPA, asked if there is a list or description of the metrics being applied in the alternatives analysis. He asked about travel time, for instance, and how much of a factor it is in ruling an alternative in or out. Mike McArdle, VHB, said that in Step 1, the metrics are at a grand scale, but he and Ms. Egan agreed that the team could put together a memo or chart with brief explanations that would also help the public with its review of the information. Mr. McArdle noted that the team does not have ridership numbers in hand from the Central Transportation Planning Staff (CTPS) yet; they are due at the end of next week. The ridership data will provide information on the effect of travel time on choice. Mr. McArdle suggested that the committee members let the process work and see how the numbers drive it. If it means re-visiting earlier steps, that will not be a problem.

Ms. Egan noted that the Commuter Rail Task Force members have commented that how rail connects to the local bus system is also important. Right now, there is low bus ridership. She said there are models around the country – such as Boulder's Hop, Skip, Jump transit service – that use varieties of service, locally chosen, and market them creatively to overcome the bus "stigma." Mr. Timmerman said that because there isn't a good bus transit model in the current system, people may not appreciate its potential and may disregard it. Mr. McArdle said that he would like to include a feeder bus service as a Baseline for the project. That would allow EOT to use CTPS to model the service. The committee members had a discussion about the description. Mr. McArdle said the feeder service would not be part of a No Action alternative because it is not "reasonably forseeable" but would be part of a Baseline Alternative typically required for FTA funding that describes a set of lower cost improvements. He calls it a Transportation

System Management (TSM) alternative, which could be incorporated into any of the Build Alternatives. Mr. Timmerman and others agreed that this would be a good idea. The group agreed that the environmental analysis would look at the No-Action Alternative, a TSM Alternative, and a range of Build Alternatives.

John Felix, MassDEP, posed a couple of questions about the final criteria. He asked if ACECs are part of the criteria? Lisa Standley said that they are not included because they include both natural and developed areas and the designation is too broad. After some discussion including Lealdon Langley, Ms. Standley said the team would quantify the amount of wetland loss within an ACEC Mr. Felix asked about the inclusion of vernal pools. Ms. Standley said that both certified and potential pools are included. Mr. Felix asked about Zone 1's, which are important to the DEP reviewers. Ms. Standley said that issue will be looked at in detail in Phase 2, but to her knowledge, none of the routes goes through a Zone 1, although some of the routes are nearby. After some discussion, the members agreed to add a new category in Step 3 adding "within a Zone 1 or Zone A" for the (1) new or (2) abandoned rights of way and (3) highway routes.

There was a discussion about adding mitigation costs to the cost estimates in Step 2. Ms. Egan noted that the cost estimate in Step 2 could be refined after Step 3 to include mitigation costs. Ms. Standley reminded the members that the analysis is too macro at this level and proceeds from cost in Step 2 to environmental issues and wetlands in Step 3 – mitigation costs cannot be determined until after impacts have been identified. The process allows revisiting the alternatives based on this kind of consideration. Alan Anacheka-Nasemann said that the ratios are quite broad and can be adjusted based on a number of criteria. Mr. Langley echoed that thinking for the variance process. He would prefer not to see mitigation carved in stone at this point in time. Mr. McArdle said the Corps' ratios could serve as a framework and a way to compare the alternatives against each other. Ms. Standley said they could turn the ratios into approximate capital costs, and would start with a 2:1 mitigation:loss ratio since this is DEP's usual standard for a Variance. Mr. Anacheka-Nasemann reminded the committee members that the Corps does not factor mitigation into the LEDPA so adding mitigation up front does not affect the choice of the LEDPA.

Presentation of the Range of Alternatives

Mike McArdle, VHB, used a PowerPoint presentation to illustrate the Step 1 review process. He reviewed the main routes, through Attleboro (including Mansfield, which some recommend should be in a separate corridor), Middleborough and Stoughton and using the regional highways (Routes 24/140/79/128). Mr. McArdle reviewed the Phase 1, three-step evaluation process and project purpose. He listed the Step 1 evaluation criteria: does the alternative meet the project purpose by improving regional mobility (giving an option extra credit for providing intra-regional connectivity and improving quality of service). Ms. Egan pointed out that the Step 1 analysis does not eliminate any of the routes or any of the modes.

Mr. McArdle reviewed the graphic scheme for the five-scale evaluation rating options: highly favorable (filled in black circle); favorable (half-filled black circle); neutral (open circle); unfavorable (single slash in an open circle); and highly unfavorable (X in an open circle). Mr. McArdle described how the rating was applied for Criterion 1.1 and 1.2:

Criterion 1.1 - Does the alternative improve regional mobility?

HIGHLY FAVORABLE =
Connects New Bedford/Fall River to Boston and provides mobility within the region
FAVORABLE =
Connects New Bedford/Fall River to Boston
HIGHLY UNFAVORABLE =
Does not provide service between New Bedford/Fall River and Boston

Criterion 1-2 - Does the alternative improve the quality of service? (trip time expressed in minutes)

TRIP TIME:
HIGHLY FAVORABLE = ≤64
FAVORABLE = 65 – 90
NEUTRAL = 91 – 98
UNFAVORABLE = 99 – 105
HIGHLY UNFAVORABLE = > 106

* Existing drive time (auto) = 90 minutes from New Bedford

Mr. McArdle said that the automobile travel time of 90 minutes was tested over a two-week period. A staff member drove from New Bedford to Boston during peak travel times in several kinds of weather and the 90-minute trip was the result; it was also confirmed with CTPS. The other travel time ranges were confirmed using industry standards on Level of Service from the Transportation Research Board. Mr. McArdle said that industry research on customer preferences shows that people are willing to use transit that is slightly longer if they are offered a quality ride. Otherwise, demand decreases as length of trip increases. Rosemary Monahan, EPA, noted that increasingly heavier highway congestion over the coming years could lengthen the auto trip and Tim Timmerman noted that it is likely that new transit amenities (connections to wireless service, etc.) could improve the perception of the quality of service. The group agreed that the existing conditions should be used to evaluate alternatives rather than speculative future conditions.

Mr. McArdle displayed the mode trip time assumptions underlying 1.2:

Trip Time - Methodology	Assumption
Dwell Time	1 minute
Transfer Time	5-17 minutes depending on frequency of service
Maximum Operating Speed	
• Monorail, Light Rail, Heavy Rail	50 mph
• Bus	55 mph
• Diesel Multiple Unit Commuter Rail	70 mph
• Conventional Commuter Rail	79 mph
• Electric Commuter Rail	110 mph
Existing Services	Travel time per existing MBTA schedule
Hits All Stops; No Express	
Auto Drive Time	90 minutes from New Bedford
Existing HOV Lane	10 minute savings

Mr. McArdle said that the speeds are industry standards and are used only to compare options to each other. As in other sections of the analysis, in Phase 2, VHB will be analyzing detailed factors such as speed restrictions and track geometry, which will impact travel time. At this level of analysis, this information is not available and the industry mode speeds are used. Trip times will be adjusted in subsequent stages of the analysis as more information becomes available.

Mr. McArdle said that a route with no transfers rates as favorable, while one transfer rates an Unfavorable. Reliability is rated as high (favorable), medium (neutral) or low (unfavorable).

Mr. McArdle summarized the ratings that eliminate an option: an alternative does not make it to Step 2 if it receives one "highly unfavorable" or two "unfavorables" or one "highly unfavorable" and one "unfavorable." Mr. McArdle listed the options by corridor that EOT recommends be eliminated:

Attleboro and Mansfield Routes:

- Alternative 4, Bus Rapid Transit to Attleboro Station: Trip time (16 mins longer than drive time) and a transfer gave this alternative an unfavorable and highly unfavorable rating;
- All of the Mansfield options pass through this step since they perform well on trip time and reliability.

Middleborough:

- Alternative 20, Bus Rapid Transit to Middleborough/Lakeville Station: trip time of 110 minutes and a transfer eliminate this alternative;[1]
- Alternatives 21 and #22, Diesel Multiple Units, CR to Middleborough/Lakeville and to Middleborough/Lakeville Station with New Bedford to Fall River connection via Dartmouth Secondary: eliminate due to trip time and transfers.

Stoughton:

- Alternative 31, Bus Rapid Transit to Stoughton Station: dropped due to travel time and transfer.

Highway System:

- None of these options were eliminated.

Other Options:

- Alternative 56, Commuter Rail to South Station via Providence: trip time of 111 minutes, 21 mins longer than auto time;
- Alternatives 57, Enhanced bus on I195, and #58, CR to Wareham via Middleborough: eliminated since they do not provide service to Boston or to Fall River/New Bedford;
- Alternative 61, Feeder bus network to Middleborough/Lakeville Station: this alternative will be carried as the TSM Alternative. Steve Smith, SRPEDD, said he has data on vehicle trips between New Bedford and Fall River but he warned that Route 79 is equivalent to a back road; Mr. Timmerman said that there are ways to enhance bus service and he likes this option, which leverages existing infrastructure, and would like to see it stay in the mix; Ms. Egan said that more robust service options could be developed; and Mr. McArdle said it would take some time, but ridership information could be collected.

Ms. Monahan asked about the potential for a bus alternative to use the shoulder of Route 24. Mr. McArdle said that Route 24 was not built according to national highway standards. Using the shoulder would require major intersection improvements. Since safety is already a concern on Route 24, using the breakdown lane for travel would not be recommended. A dedicated bus lane in each direction presents other issues since it takes away capacity and other vehicles can jump into and out of the lane if it is not grade separated. VHB is currently looking into a "zipper lane" solution that would not reduce capacity.

Mr. McArdle summarized the results of the Step 1 analysis:

- All *Routes* are represented and will continue to the Step 2 Analysis
- All *Modes* are represented and will continue to the Step 2 Analysis
- Two alternatives incompatible with *Regional Mobility* are recommended to be dropped
- Seven alternatives incompatible with *Quality of Service* are recommended to be dropped.

Over the next two Interagency meetings, the team will present the results of the Step 2 and Step 3 analyses. Unfortunately, the ridership data will not be available until the week after next, so on February 21, the group will only be able to work through three of the five Step 2 criteria. The following week, the last two Step 2 criteria and the Step 3 criteria will be presented. At that point, there will be a

[1] The Middleborough options are 8 miles longer than the Attleboro and Stoughton corridor routes. Mr. Timmerman asked if EOT could look at BRT service in a corridor that goes up to a transfer point, such as Middleborough, via Route 79. Mr. McArdle said that VHB can taka a look at the possibility.

draft list of alternatives to bring to the March Civic Engagement meetings (week of March 10) for public review.

Summary

Ms. Egan asked the committee members if they had any objections to the Step 1 results. Several members commented on the advantages of having the material in advance of the meeting, which allowed them to review the ratings and prepare questions. They indicated that a memo or description of the background details and metrics would assist them in future steps and would help community members looking at the same data. There was a discussion among the members about providing the information to the public for review in advance of the March meetings. The recommendation was to post the results of the analysis of each step with a background memo and Interagency Committee meeting minutes so that the public can follow along with the process in advance of the meetings during the week of March 10. All materials posted to the website will be marked Draft, as no decisions will be made until after completing Step 3. Materials posted from this meeting will include:

- Cover memo and methodology
- Step 1 matrix
- Meeting notes

Steve Smith gave a brief summary of a Commuter Rail Task Force Meeting (2/13). Task Force members focused on the potential benefits of the South Coast Rail project and shared ideas for how to maximize them. More than 22 benefits were considered and Mr. Smith said more are likely to be included. He plans to share the information with the interagency group when it is ready. In addition, the Task Force talked about its role in representing regional interests for the project as opposed to individual community interests. Ms. Egan said that the Task Force may work on a set of principles for regional mitigation. Mr. Smith suggested that the Task Force members would benefit from a presentation on permitting related to the project, and Mr. Anacheka-Nasemann, Army Corps of Engineers, and Mr. Lealdon Langley, MassDep, said they would explore the idea with their agencies. Mr. Langley asked to see comments from environmental organizations, and Ms. Egan said packets would be prepared for the interagency group members.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- The meeting minutes, a memo with background information and a summary of the Step 1 analysis will be posted on the project website. This will be done for each of the Steps in the Phase 1 process.
- Previous Interagency Coordinating Committee meeting minutes will be posted on the website.
- Packets of comments letters will be prepared for the interagency group members.
- DEP and the Army Corps of Engineers will explore making a presentation on permitting to the Commuter Rail Task Force at a future meeting
- Civic Engagement Meetings scheduled for March 10 (Attleboro), March 11 (Lakeville), March 12 (Freetown).

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #6

LOCATION OF MEETING: EOT, Ten Park Plaza

DATE/TIME OF MEETING: January 10, 2007 - 9:00 to 11:15 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Bob Boeri	Massachusetts Office of Coastal Zone Management
Samir Bukhari	US Environmental Protection Agency
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Lealdon Langley	Massachusetts Department of Environmental Protection
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Mike Stroman	Massachusetts Department of Environmental Protection
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Tim Timmermann	US Environmental Protection Agency
John Patten	Massachusetts Historical Commission

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Joe Cosgrove, MBTA
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Revised Evaluation Criteria (12/27/08)

PURPOSE/SUBJECT:
Continued discussion of the revised Evaluation Criteria with the members of the Interagency Coordinating Group for the South Coast Rail Project. VHB produced a revised version of the evaluation document for final review by the committee members.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The fifth meeting was scheduled to focus on finishing the

draft Evaluation Criteria for the project based on written comments submitted by several of the agencies in late December.

PRESENTATION:
Kristina Egan, EOT Project Manager, thanked the agency representatives who provided comments on the Evaluation Criteria and said the main agenda items for the meeting were to complete the review and discussion of the draft document and to learn more about the alternatives. Ms. Egan asked the attendees to introduce themselves (see the Attendance list).

Ms. Egan noted that she had distributed drafts of the Interagency Coordinating Group meeting minutes for review. From this meeting forward, she will ask the members to review and approve the minutes at each subsequent meeting. In the meantime, she asked if there were any comments on the minutes from meetings 1 through 5, which were circulated before this meeting.

Tim Timmerman, EPA, said that he would submit some comments on his remarks.[1] Lealdon Langley, MassDEP, noted that at meeting #5, he had referred to the GIS layer for potential vernal pools and the minutes described adding a layer with this information. Mr. Langley noted that the information is already available in the GIS data.

Discussion of Final Draft Evaluation Criteria

The following suggestions were made with regard to finalizing the draft Screening Criteria document:

- Page 1, footnote: there are three tribes in question, including the Wampanoag of Gay Head, the Mashpee Wampanoag and the Narragansett in Rhode Island, so the language should refer to Tribal Historic Preservation Officers, not a single officer.
- Page 10: The draft uses the phrase "fail safe" to describe the Interagency Coordinating Groups review at the end of step 3. The group agreed that another word should be used, perhaps a "final review."
- Page 2: delete the phrase "a limited number of" in the first paragraph at the top of the page and correct a grammatical error in the second paragraph.
- Page 7: In the text at the top of the page introducing the elements of Step 3, change the phrase "actual delineated" wetland boundaries to reflect the fact that this is a preliminary phase or work. Lisa Standley, VHB, offered a replacement phrase: based on field investigations and preliminary engineering designs, which was accepted.
- Alan Anacheka-Nasemann asked about the work the Central Transportation Planning Staff will be doing (referenced on page 6) and suggested that CTPS be sure to elucidate the modeling assumptions and how they were verified. Ms. Egan said she plans to invite CTPS to present to the group in February.
- Matt Schweisberg asked about a change from the previous draft in the demand and ridership section. The previous version used the year 2002 to calculate trips per day, while this version uses 2000. Ms. Standley said that the team is looking for effective ways to measure demand. The previous draft employed the ridership figure from the Stoughton alternative. This version used the 2000 census Journey to Work data. All of these data will be updated.
- Page 7: Liz Sorensen suggested using an "e.g." in 3.1 where types of wetlands are listed in parentheses to avoid giving the impression that these are the only varieties that will be calculated.

[1] Please see the edits Mr. Timmerman submitted at the end of this summary.

- Mr. Schweisberg expressed concern about Section 2.3, Reasonable Capital and Operating Cost. He said that there might be an inherent conflict with the Clean Water Act based on the dependence on economic aspects of the evaluation, which could skew the alternatives toward growth options that might have a greater impact on aquatic resources. He suggested that it is important to be mindful of this potential conflict.

Ms. Egan thanked the members for their input. She noted that the document will remain a draft until reviewed at the community meetings, where additional input will be collected. She plans to share the input with the group. The group agreed that a February meeting will be needed to hear what the public contributed to the discussion. She thanked the agency representatives for coming to consensus on the draft screening criteria with these modifications.

Presentation of the Range of Alternatives

Mike McArdle, VHB, distributed A Master List of Alternatives and Alternatives Advancing to Phase 1 Alternatives Screening Process to the group. Mr. McArdle said that the public developed 60 alternatives in meetings, through email submissions and discussions. Many of the alternatives were similar, and the team was able to reduce the number to about 35 options. The matrix groups the options by route (through Attleboro, Middleborough, Stoughton; using the highway system; and other options). Mr. McArdle made several points about the alternatives:

- The MBTA's Service Delivery Policy provides the basis for the design of the alternatives to bring alternatives to similar footing to make comparisons between options. . This prompted an extended discussion about the Service Policy. Ed Reiner said that EPA feels that this policy is confining and will eliminate certain reasonable alternatives. Mr. Anacheka-Nasemann agreed, saying that the Army Corps of Engineers feels that the policy might eliminate less environmentally damaging options from the list. There were other comments about the policy and its potential to conflict with the LEDPA Mr. McArdle clarified that using the policy in this stage simply helps EOT to make assumptions about the level of service the alternatives would provide and permits EOT to make "apples to apples" types of comparisons. Ms. Standley said that using trip time is a way to compare across alternatives (as opposed to arrival times or South Station capacity); it is simply a broad kind of tool. Joe Cosgrove said that the operating plan lets the planner assess how much service can be provided. Alternatives have to fit within the existing system. There was a discussion about using the American Public Transportation Association's policy, but Mr. McArdle said it is too subjective. The group agreed to go forward using examples and will work with CTPS to understand what the effect of the Service Delivery Policy will be on the alternatives. They agreed that it was appropriate to use the MBTA Service Delivery Policy as a criterion for designing the alternatives, but not for evaluating them.
- Mr. McArdle reviewed the routes and service options. He clarified that all of the commuter rail options would require additional tracks at South Station and a mid-day layover in Boston.
- Mr. Timmerman suggested adding a bus only option for public and private carriers on the existing highway system. There was a discussion about using part of Route 24 – the breakdown lane – as a bus only route. Mr. McArdle said that it could be done off-peak but he would have to talk with Mass Highway Department about safety issues.
- Mr. McArdle highlighted elements of some of the alternatives, such as the need to add a track between Braintree and South Station to make that segment work; Diesel Multiple Units issues and benefits; diesel versus electric trains; and other issues.

- Mr. Timmerman suggested an alternative of using feeder buses to existing commuter rail points with commuter rail service enhancements.
- Mr. Langley said he was interested in more information on bus service to the Middleborough Commuter Rail service using Route 79. He asked about potential conflicts with freight trains. Mr. Egan said that state is developing an overall freight plan, which is not yet complete. There was a discussion about the condition of some tracks; the status of negotiations with CSX to acquire rights of way and/or operating agreements. Mr. McArdle noted that Federal Railroad Administration regulations do not allow running light rail or commuter rail on lines with freight given the safety issues involved.
- The team was asked to post or distribute the series of route maps and one-page descriptions of the alternatives to the group.

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- The criteria document will be updated and circulated to the group members for final review.
- The criteria will be presented to the communities in civic engagement meetings during the week of January 14, 2008.
- The Interagency Coordinating Group will need February meetings (to consider input gathered at the civic engagement meetings and review the preliminary ranking of alternatives through Steps 1 and 2).

Comments on Meeting Minutes Summaries, Meetings 1-5

T. Timmermann (EPA)
Suggested Edits to South Coast Rail Interagency Coordinating Group Meeting Notes
January 10, 2008

<u>October 23, 2007 Meeting Notes</u>

Page 4 (third paragraph up from the bottom, third sentence): please change the sentence to more accurately reflect my comments by editing the sentence to remove "…which are not always smart about development" so the sentence reads, "He is excited about the parallel, ongoing work with the corridor communities, given that there is development that is not consistent with the principles of smart growth and EPA would support future "smart growth" promoted by the project."

Page 5 (fourth paragraph from the bottom, last sentence): I recommend deletion of the last sentence (it reads, "In summary, the speakers agreed that their hearts are saying *go for it* (in terms of smart growth), while their minds are not so sure.") as it seems to offer an opinion about how the meeting attendees feel and I think we should just report the comments that are offered in the context of the meeting.

<u>January 3, 2008 Meeting Notes</u>

Page 3 (under discussion of criteria 2.5): please delete "or a similar concept" as it is my recollection that the group agreed to changing "ridership" to "capacity" but not "a similar concept."

Page 3 (bottom of page 3 and before section on follow-up actions and upcoming meetings): Please insert a note in the minutes to reflect that Betsy Higgins noted that EPA remains concerned that the SCR process continues to advance without further discussion/resolution of the NEPA EA/EIS issue that has been highlighted in previous meetings. In response, Kristina [Egan] indicated that she is working to set up a follow-up meeting to discuss those issues.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #5

LOCATION OF MEETING: EPA, One Congress Street, Boston

DATE/TIME OF MEETING: January 3, 2008 - 9:00 to 11:15 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Policy Act Office
Bob Boeri	Massachusetts Office of Coastal Zone Management
Samir Bukhari	US Environmental Protection Agency
Carl Deloi	US Environmental Protection Agency
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Betsy Higgins	US Environmental Protection Agency
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Mike Stroman	Massachusetts Department of Environmental Protection
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Tim Timmermann	US Environmental Protection Agency

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Proposed Evaluation Criteria, Revised (12/27/08)

PURPOSE/SUBJECT:
Continued discussion of the revised Evaluation Criteria with the members of the Interagency Coordinating Group for the South Coast Rail Project. Members submitted comments on the draft criteria to EOT, which revised them in conjunction with VHB and distributed them for review in advance of the meeting.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay

Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The fifth meeting was scheduled to focus on finishing the draft Evaluation Criteria for the project based on written comments submitted by several of the agencies in late December.

PRESENTATION:
Kristina Egan, EOT Project Manager, thanked the agency representatives who provided comments on the Evaluation Criteria and said the only agenda item for the meeting was to complete the review and discussion of the document. Ms. Egan asked the attendees to introduce themselves (see the Attendance list). She reminded everyone that the criteria are organized as a sequential, three-step, tiered screening process.

Janice Martin, VHB, led the discussion based on the changes from the last version of the document. Matt Schweisberg, EPA, asked for a clarification of the phrase "aquatic or natural environment." Ms. Egan said that the aquatic environment is contained in the natural environment, but the team chose to include both terms to refer to impacts on the environment in addition to wetlands and other 404 issues.

Alan Anacheka-Nasemann noted that in the introductory text on page 1, the author of the regulation at 40 CFR 230.10(a) is actually EPA, not the Army Corps of Engineers.

Turning to item 1.1 in Tier 1, Ms. Martin said that the team changed the wording to "Improve" regional mobility (1) to respond to concerns about what meeting demand means and (2) to include the concept of intra-regional mobility, which is a criteria that was proposed during the public meetings. The language should read "between Fall River/New Bedford and Boston."

Item 1.2: There was a discussion about the use of the term "improve" for quality of service. Several people agreed that there are times when travel by auto is quicker than by transit, but they choose to take transit for a number of reasons (convenience, etc.). The term "competitive" on the basis of travel time, etc., was considered. There was agreement that the goal is to encourage more transit use. Mike McArdle said that quality of service includes timeliness, convenience, comfort, reliability and safety and he reminded everyone that at this point, the analysis will be qualitative. The group agreed to consider alternative language that will add quality of service factors as a measure of improvement.

Item 1.3 – Deleted from Step 1 and moved to Step 3.

Step 2

Criteria 2.1 and 2.5 – the term "justify investment" was deleted; there was a discussion of the use of "improve" with an understanding that it will be a ranking (there could be some adverse impacts in the rest of the system, but it offers a regional benefit).
2.1 – Addition of long-term, per the last meeting; rephrase to include the logistics of the system.
2.2 – operational failure is a deal breaker (an alternative has to work with the system).
2.3 – In response to questions about including the cost of site remediation (21E), the consultants said they will not have full information so there will only be an estimated cost used. John Felix pointed out that the cost of wetland replication could be high, in addition to 21E costs. The team said it will not look at wetlands impacts until Step 3, and it could not estimate costs of mitigation until after impacts were

identified. A. Anacheka-Nasemann noted that, in the Corps/EPA "sequencing" process, mitigation is only considered after avoidance and minimization, and cautioned about advancing mitigation too soon. After discussion, the team and EOT agreed it would be possible to revisit Capital and Operating costs in Step 3 after looking at some of the environmental issues (for which there are costs, or using approximate costs). Mr. Schweisberg said he was not comfortable dismissing closely ranked options, and that EPA would probably not agree to dismiss alternatives with low levels of environmental impacts if these alternatives were even marginally practicable; Ms. Egan said the process is an iterative one and there will be judgment calls. Deerin Babb-Brott agreed and said it is necessary to go through the process and do a fail safe for issues of concern, allowing options to be put back on the table. There was a discussion about adding a Step 4 or agreeing to a thorough review of the alternatives based on real costs and other factors. Mr. Babb-Brott noted that one of the group's purposes is to do that kind of work. Ms. Egan and Lisa Standley said that the results of Step 3 could change some of the Step 2 ratings and alter a preliminary dismissal.
2.4 – This criterion was changed to be more specific and to recognize the goal of getting an operational system by 2016. After discussion, the group agreed to use a goal of a four-year construction period rather than a specific date.
2.5 – The group agreed to consider changing "ridership" to capacity or a similar concept and to define the terms. The group agreed that ridership would be estimated for the year 2030.

Step 3 – Rosemary Monahan suggested adding "consistency with smart growth" to the title of this criterion. The team noted that ridership is a proxy for air quality since the data for emissions will not be available until later in the design phase. At this point, there will only be a spreadsheet analysis with relative rankings. She described some of the parallel project work underway and noted that the project is inventing this modeling to some extent as it goes along; it has never been done before.

There was a discussion of the wording (since the aquatic environment is a subset of the natural environment); the team agreed to define terms and add a paragraph explaining the law and regulations being referred to.

Lisa Standley noted that in Step 3, the easiest way to assess the elements is to estimate the loss of resource. She said the team was urged to consider indirect impacts to the environment but it is very difficult to assess such factors at this level of information. But understanding the goal, the team will try to qualitatively assess these impacts based on the length of each alternative that crosses a wetland on a new or existing alignment, places fill along a wetland or is on the edge of a wetland. Further analysis of these impacts will have to take place in Phase 2 of the Highway Methodology and MEPA/NEPA process; there is too little information available at this stage. The group discussed the information available from GIS mapping, such as vernal pools and adding a layer to identify potential vernal pools. This will be added. In addition, any information available about wetland community types in GIS maps will be included.

3.2 – Add the number of existing stream crossings (as well as new) and specify if there is available information on widening the corridors that would impact the stream. Later design and environmental analysis stages will look at the potential to improve stream crossings for fish and wildlife passage as mitigation measures.

3.3 – Suggestion to add to the last paragraph – unless such information becomes available after consulting with the Natural Heritage and Endangered Species Program.

3.4 – Add Section 4F resources and an explanation of the Federal protection goals. (Note – Article 97 is an amendment to the state Constitution). At M. Stroman's suggestion, the group agreed to also use local mapping as a source to capture newly designated public lands that are not included in the Mass GIS database.

3.5 – Be more specific (don't use "some ways"); edit second sentence to say "The Commonwealth supports. . ." Protection of water supply – can be assessed in Phase 2 or add to third bullet here. There was a discussion about the impact of parking facilities; how to add environmental concerns to the smart growth assessment. There were observations about making any of the alternatives compatible with smart growth, but Ms. Monahan pointed out that the FTA uses smart growth as a New Starts criterion. Ms. Egan said that Goody Clancy, which is undertaking the parallel Corridor Plan, could do a presentation for the group. She noted that many elements of this criterion depend on station and layover facility sitings, which have not been determined at this stage. The group agreed that the first element would be easiest to assess at this stage.

The group agreed with the proposed ranking system (assigning ratings ranging from "highly favorable" to "highly unfavorable" to each alternative).

FOLLOW-UP ACTIONS AND UPCOMING MEETINGS:

- The criteria document will be revised based on this discussion and recirculated for final review.
- Kristina Egan will send an email confirming the next meeting, which will include a review of the alternatives, the beginning of the Step 1 analysis and the final acceptance of the criteria.
- The criteria will be presented to the communities in civic engagement meetings during the week of January 14, 2008.
- The Interagency Coordinating Group will need a February meeting (to consider input gathered at the civic engagement meetings and review the preliminary ranking of alternatives through Steps 1 and 2).
- The March meeting will focus on the results of the analysis.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #4

LOCATION OF MEETING: Ten Park Plaza, Boston

DATE/TIME OF MEETING: December 19, 2007 - 9:00 to 11 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Policy Act Office
Bob Boeri	Massachusetts Office of Coastal Zone Management
John Felix	Massachusetts Department of Environmental Protection
Lealdon Langley	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Alicia McDevitt	Massachusetts Executive Office of Energy and Environmental Affairs
Mary Beth Mello	Federal Transit Administration
Judith Molloy	Federal Transit Administration
Rosemary Monahan	US Environmental Protection Agency
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Mike Stroman	Massachusetts Department of Environmental Protection
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Tim Timmermann	US Environmental Protection Agency
Maria Tur	US Fish and Wildlife Service

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates (RVA)

HANDOUTS:
Proposed Evaluation Criteria
Synopsis of Public Input from November/December 2007 Meetings

PURPOSE/SUBJECT:
Continued discussion of the proposed Evaluation Criteria with the members of the Interagency Coordinating Group for the South Coast Rail Project; an update on the Evaluation Criteria suggested by the public, legislators and others at the November/December civic engagement meetings and submitted to EOT.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the

cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The fourth meeting was scheduled to focus on the Evaluation Criteria for the project since the group was not able to conclude this discussion in Meeting #3. The group received a summary of the public input received on the Evaluation Criteria in civic engagement meetings in November and December 2007.

PRESENTATION:
Kristina Egan, EOT Project Manager, noted that minutes of the November 27 Interagency meeting were emailed to the participants. Ms. Egan asked the attendees to introduce themselves (see the Attendance list).

The purpose of the meeting was to focus on the draft Evaluation Criteria (second meeting on this topic). In addition to the first discussion of the committee on this topic, civic engagement meetings in late November and December resulted in suggestions from the public, which Ms. Egan distributed to the members.

The meeting resulted in a revised set of draft Screening Criteria, which was dated 12/27/07 and distributed to the parties by Ms. Egan. Brief summary notes on the discussion are included below, and comments from the agencies that were submitted to Ms. Egan are also appended to these notes.

After extensive discussion, the consensus was that smart growth could be a useful criterion but should not be a screening factor at Step 1. T. Timmermann noted that smart growth is not part of the Section 404 Project Purpose and could not be considered in evaluating alternatives with regard to purpose and need. Others suggested that smart growth strategies could fit any option. There was agreement on including smart growth, probably in Step 3, and Rosemary Monahan and others said they would send Ms. Egan some thoughts on defining this criterion. Mary Beth Mello, Federal Transit Administration, noted that land use is one of the ranking criteria used for New Starts funding. L. Sorensen would like to see more specific definitions of "smart growth strategies".

The parties agreed to reorganize the list of alternatives by route rather than mode.

In the discussion of Step 2, there was concern about the term "does not adversely affect," which could eliminate options that improve the general system while creating some disadvantage (either short or long term). There was a discussion of the potential for some negative effect in another part of the transit system as a result of this kind of expansion. Tim Timmerman said he would not like the criterion to require an overall system improvement. He also noted that EPA would not be willing to dismiss an alternative because it had a minor adverse impact on the system, if the alternative provided a substantial benefit.

There was a discussion about the term "sufficient ridership" (2.5) and agreement to change the wording to the concept of more fully meeting demand for public transit as stated in the project purpose. The group discussed the use of ridership in Step 1 and Step 2, and agreed that Step 1 is a coarse filter and that ridership could not be quantified until Step 2.

Ms. Egan noted that the changes should include demand and public interest in better connections throughout the region; smart growth (1.3) will move to Step 3.

The team noted that Criterion 2.3 will be an order of magnitude set of costs since detailed costs are not possible to estimate at this time. J. Felix suggested that costs of hazardous materials clean-up be included in Step 2. The team will check the 21E database (Massachusetts Contaminated Sites), for example, but will not be able to cost such items as hazardous waste removal in detail at this stage of design. L. Langley suggested that the criterion should be clear that costs of land acquisition for wetland mitigation are not included.

With regard to Criterion 2.4, the goal is to give a lower ranking to alternatives that might include severe or costly construction challenges given the goal of getting the project completed by 2016. Ms. Egan said that timeliness is important to many residents and this is a comparative ranking, not a way to eliminate options. This criterion will be re-worded to emphasize its relationship to practicability. M. Schweisberg noted that EPA will make its own determination on "practicability" during the Section 404 review.

FOLLOW-UP ACTIONS:

- The agencies will send comments on the screening criteria to Ms. Egan by close of business on 12/21/07.
- Kristina Egan will send an email for scheduling a follow-up meeting to complete the screening criteria discussion after the next draft is circulated to committee members.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #3

LOCATION OF MEETING: Ten Park Plaza, Boston

DATE/TIME OF MEETING: November 27, 2007 - 9:30 to 11 AM

Attendance:	**Agency:**
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Policy Act Office
Bob Boeri	Massachusetts Office of Coastal Zone Management
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Richard Lehan	Department of Fish and Game
Alicia McDevitt	Massachusetts Executive Office of Energy and Environmental Affairs
Rosemary Monahan	US Environmental Protection Agency
Edward Reiner	US Environmental Protection Agency
Matt Schweisberg	US Environmental Protection Agency
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Mike Stroman	Massachusetts Department of Environmental Protection
Tim Timmermann	US Environmental Protection Agency
Maria Tur	US Fish and Wildlife Service
Philip Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Wendy Stern, Executive Office of Transportation
Kristina Egan, Executive Office of Transportation
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Mike McArdle, VHB
Lisa Standley, VHB
Nancy Farrell, Regina Villa Associates

HANDOUTS:
Slides – South Coast Rail: Project Update
Basic Project Purpose – Revised Draft for Review
Draft Screening Criteria
Maps: Light Rail Corridors; Highway Corridors; Rail Corridors
Definitions: Bus and Rail Transportation

PURPOSE/SUBJECT:
Detailed discussion of the Revised Project Purpose Statements with the members of the Interagency Coordinating Group for the South Coast Rail Project; project update; presentation of Evaluation Criteria and Preliminary Alternatives.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The third meeting included a project status update, a detailed discussion of a revised, draft Project Purpose and a presentation on preliminary alternatives and evaluation criteria.

PRESENTATION:
Kristina Egan, EOT Project Manager, noted that minutes of the October 27 Interagency meeting were emailed to the participants. Ms. Egan asked the attendees to introduce themselves (see the Attendance list).

Project Update

Kristina Egan distributed a set of printed slides entitled "South Coast Rail: Project Update for Interagency Coordinating Group." Ms. Egan outlined the history of the current phase of the project in brief, beginning with the launch in April 2007 of "A Plan for Action" by Governor Deval Patrick. In May, EOT began bi-monthly legislative briefings and in July, released the Strategic Environmental Permitting Plan and committed $17.2 million to the planning phase. In September, the land-use implementation program began, along with the kick-off of the environmental review. Ms. Egan said the civic engagement with south coast communities begin in October and EOT selected a Corridor Plan consultant in November.

The civic engagement process aims to find better ways to build and provide mitigation for the project, reduce or avoid lawsuits and generate enthusiasm for on-the-ground changes in communities. This process has been informed by past experience and seeks to be open, inclusive and transparent. It should also help EOT develop positive, long-term relationships in the region.

The preliminary environmental review process will take place over the next six months with VHB as the project consultant. In addition to work with the twelve agencies on the coordinating group, this process will help tap local creativity about how to build the rail; find faster ways to permit and build the project and develop ideas to improve the environment; and permit the state to measure carbon performance and test the concept of a wetlands mitigation bank. The key challenges are how to take a fresh look and resolve the question of the federal approach (i.e., Environmental Assessment vs. Environmental Impact Statement).

Ms. Egan reviewed the alternatives analysis/screening timetable and the Civic Engagement Calendar. Three rounds of meetings will take place: December 2007 (what new alternatives should EOT consider and how should they be evaluated?); January 2008 (what does the public think of the list of alternatives and evaluation criteria?); and in March 2008 (what does the community think of the draft findings?). The meetings will move around in the project area communities.

The Corridor Plan presents an opportunity to test a new approach for tying transportation, economic development and land use together. The Southeastern Regional Planning and Economic Development District (SRPEDD) is undertaking a 24-month effort to identify priority preservation and development

sites, while another consultant will begin an 18-month planning process to evaluate transit-oriented development potential. These projects could be a national model for financing and for creating quality places in the fastest growing region of MA. Ms. Egan explained the work that SRPEDD will be undertaking, including mapping and identifying key places in the communities to develop or to protect. She suggested that mapping could be useful for future mitigation and for the launching of the Transfer of Development Rights bank. Ms. Egan reviewed the major project milestones:

March 2008	Initial screening of alternatives complete
April 2008	Alternatives Analysis (Phase 1) complete – alternatives identified to move into detailed environmental review. The Final Economic Development and Land Use Corridor Plan are complete.
October 2009	Priority Development and Preservation Areas are designated
January 2010	Financing Plan released
April 2010	Alignment, stations and layover sites selected and permitting begins

Tim Timmerman, EPA, asked if the Alternative Analysis is a formalized scoping process and how it relates to the MEPA/NEPA process. Lisa Standley, VHB, said that the process is a wide-ranging, pre-MEPA/NEPA process to move from a very broad to a more limited range of options for a new ENF process.

Alan Anacheka-Nasemann, Army Corps, asked about the scope of SRPEDD's work. Ms. Egan said SRPEDD is working with 27 cities and towns and the results of its work will be shared with the agencies. Mr. Anacheka-Nasemann said that the Wetlands Mitigation Bank is currently on hold. He sees the South Coast Rail as the kind of project that could spur it to life. He suggested that the project could establish a unique Wetlands Mitigation Bank, which could become a form of mitigation, if the classic form of the bank has not yet been established by that time. Wendy Stern, EOT, suggested that South Coast Rail is a very suitable project for the bank. Mr. Anacheka-Nasemann asked a question about the alternatives screening and whether it is intended to choose the Least Environmentally Damaging and Practicable Alternative (LEDPA) before there is a public notice filing. Ms. Standley said that is not the goal. The current range of alternatives includes about 35 options, an impractical number to advance into the formal environmental, public review process. After application of a broad set of screening criteria, EOT plans to advance 4-6 alternatives into the formal process.

There was a discussion about the Basic Project Purpose and the ability of the public to review and comment on it. Mr. Anacheka-Nasemann said the BPP is defined by Section 404 and differs from the NEPA Purpose and Need statement. The Corps uses it to determine if the project is justified.

Rosemary Monahan, EPA, asked if the Corridor Plan will include financial feasibility data. Ms. Egan said it will identify and attempt to quantify revenue streams from new development, but it will not constitute the overall financing plan.

Section 404 Basic Project Purpose

Alan Anacheka-Nasemann, ACOE, said that he and Ms. Egan reviewed the comments and discussion on the draft Basic Project Purpose from the last meeting. He reminded the committee members that he plans to submit a formal letter to EOT on the project purpose and hoped that the wording can be finalized. Ms. Egan said that she worked with Mr. Anacheka-Nasemann to boil the language down to the essential

elements that capture the project. Changes were made based on what the state can and can't control; what it can support; what it can help make happen; and what the reasoning is for the project.

There was a robust discussion about the language, options and intent of several proposed elements and phrases in the purpose. Phil Weinberg, MassDEP, suggested that the wording was limiting in that it implied one-way travel. Liz Sorenson, DCR, was concerned about the distinction between smart growth and conservation. A couple of speakers were concerned that the statement did not focus on environmental impacts, but Mr. Anacheka-Nasemann said the process is intended to result in the least environmentally damaging alternative, so as the ultimate goal, environmental protection, does not need to be explicit. The roles of inter-regional mobility and smart growth were also discussed, as was the need to be clear about the corridor. Matt Schweisberg expressed concern about the possibility that encouraging development along the corridor could wind up having negative environmental consequences; Ms. Egan said that such development would not meet the goals of smart growth. Steve Smith, SRPEDD, said that the process should direct growth in a smart way that decreases threats to the environment. Ms. Egan said this is a more holistic approach to development. The group discussed project funding which Ms. Stern said could not realistically be paid for through regional development.

With some wording suggestions and edits, the group agreed to the following wording:

Section 404 Basic Project Purpose:

To more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts.

Combined NEPA and MEPA Project Purpose:

To more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts, to enhance regional mobility, while supporting smart growth planning and development strategies in affected communities.

Mr. Anacheka-Nasemann reminded the federal agency representatives that he will need their formal concurrence so that he can send a letter to EOT.

Evaluation Criteria

Mike McArdle, Janice Martin and Lisa Standley of VHB presented the draft screening criteria for committee consideration (see the handouts for a copy). Mr. McArdle explained that the team would be applying this analysis and criteria to each of the alternatives brought forward from the interagency coordination group, the civic engagement meetings and others for the project. The first step in the process is to ask three questions of each alternative: (1) does the option have the potential to meet the Basic Project Purpose; (2) would it be practicable to construct and operate; and (3) would the option have substantial environmental impacts that would make it impracticable to construct. Mr. McArdle began to discuss the sub-questions that would be applied to each category to assess the alternative from a broad screening point of view.

A discussion ensued, raising a number of questions about the screening tools. Mr. Schweisberg pointed out that the term "practicable" has a legal meaning in the Clean Water Act and he questioned its use in this context and expressed concern that the screening might be too fine. The group discussed the concept

of applying a Fatal Flaw Analysis as an option, but there is concern that the variance process might allow an option that currently appears to have a fatal flaw. Lisa Standley said that the intent of this level of screening is to look at the alternatives on USGS maps and answer some fundamental questions about them. Factors that are not practicable would be dropped. The team has struggled somewhat with the environmental screening (the third factor) since there may not be sufficient information at this level of design to make that determination. There was a proposal to change the word "substantial" to "significant", but Mr. Schweisberg said the term also has a specific meaning in the Clean Water Act and he would not recommend its use. Mr. Timmerman asked EOT to avoid the temptation to narrow the options by using too fine a filter. Mr. McArdle said the screening is intended to be framed broadly. The team is looking at the options from a 10,000 foot distance and weighing which are practicable or have more environmental impacts. Mr. Weinberg said that using "not practicable" in the third criteria doesn't get to relative importance. Perhaps the team should not weigh but should quantify. Mr. Timmerman suggested that the preferred alternatives from the earlier study should be carried forward. There were also suggestions to use just the Purpose and Need versus the proposed criteria or to make the screening process coarser rather than finer.

After some additional comments, the committee members agreed that a meeting should be scheduled in December to continue the discussion on criteria to be applied to the alternatives. Ms. Egan said she would consider the discussion with Mr. Anacheka-Nasemann and the team and would circulate a new version of the criteria before the meeting.

Preliminary Alternatives

Mr. McArdle outlined the alternatives proposed to date (which are listed on a handout to committee members). He said that the options are organized by mode and family - e.g., bus, rail, heavy rail, light rail, monorail – and route (highway, existing or historic rail, new rail, etc.). Almost all of the rail options use historic rail rights-of-way in some form, including the Route 79 historic right of way and the northeast Amtrak corridor, among others. The alternatives include:

- Use of the rail corridor via a number of rights of way to the Route 128 area, then branching off to the east to Quincy and the Red Line or traveling along the Expressway to Boston or rail of some kind to the northeast corridor to Boston
- Combinations of Light Rail (between Fall River and New Bedford and/or to Middleborough or - South Station) and Commuter Rail -
- DMU Commuter Rail
- Bus Rapid Transit (BRT) with or without rail, some using the 140 corridor to Route 24
- A bus lane on Route 24 or an HOV lane on Route 24

Mr. McArdle said the handout shows the permutations of the modes. A second handout provides information on the modes. EOT plans to present the chart and wide set of alternatives in the upcoming civic engagement meetings and welcomes suggestions from the committee members as well.

FOLLOW-UP ACTIONS:

- The federal agencies will contact Alan Anacheka-Nasemann with formal approval of the Draft - Project Purpose. -
- The team will circulate a revised set of criteria to committee members before the next meeting.

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group - Meeting #2

LOCATION OF MEETING: Ten Park Plaza, Boston

DATE/TIME OF MEETING: October 23, 2006 - 9:30 to 11 AM

Attendance:	**Agency:**
Karen Adams	US Army Corps of Engineers
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Policy Act Office
Chris Boelke	National Oceanic and Atmospheric Administration, NMFS
Bob Boeri	Massachusetts Office of Coastal Zone Management
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Betsy Higgins	US Environmental Protection Agency
Richard Lehan	Department of Fish and Game
Alicia McDevitt	Massachusetts Executive Office of Energy and Environmental Affairs
Joe Orfant	Massachusetts Department of Conservation and Recreation
Edward Reiner	US Environmental Protection Agency
Jon Regosin	Natural Heritage and Endangered Species Program
Matt Schweisberg	US Environmental Protection Agency
Mike Stroman	Massachusetts Department of Environmental Protection
Steve Smith	Southeastern Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Tim Timmermann	US Environmental Protection Agency
Philip Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Wendy Stern, Executive Office of Transportation
Kristina Egan, Executive Office of Transportation
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Rick Carey, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates

HANDOUTS:
Slides – South Coast Rail: Needs and Goals
Basic Project Purpose – Draft for Review
EOT Definitions Sheet: Bus and Rail Transportation
Maps: Existing Conditions; Existing Conditions, Bus Routes; Existing Conditions, Previous Commuter Rail Alternatives

PURPOSE/SUBJECT:

Detailed discussion of the Project Purpose with the members of the Interagency Coordinating Group for the South Coast Rail Project.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. The second meeting included a project status update and a detailed discussion of a draft Project Purpose.

PRESENTATION:
Kristina Egan, EOT Project Manager, noted that minutes of the first Interagency meeting were emailed to the participants. Since the meeting, EOT has signed a contract with VHB for the Alternatives Analysis and work has begun. The civic engagement aspect of the project began with a presentation and discussion at the South Coast Commuter Rail Task Force in Fall River on October 17. About 65 people participated in the meeting, which was filmed for cable television and included representatives of the regional press. The team collected ideas for alternatives from the Task Force members and audience and the ideas will be shared with the Interagency Coordinating Group at the November meeting. Ms. Egan noted that a number of Task Force and Public Meetings have already been set up for the next six months. She added that EOT is close to making a final selection of a consultant to undertake the corridor plan and that effort should kick off in November.

The attendees introduced themselves (see the Attendance list).

Kristina Egan distributed a set of printed slides entitled "South Coast Rail: Need and Goals." She described information that will be included in the preface to a larger document on project Purpose and Need. The South Coast area suffers from a lack of transportation services. Cities are up to 25 miles from current transit stations and existing rail is at capacity. The highways in the region are congested. The area also suffers from severe non-attainment for ozone. Southeastern MA is the fastest growing region in the state, which is increasing pressure on the existing transportation network. But this growth – from an economic or demographic point of view – is distributed unevenly. Ms. Egan noted that most of the growth is in exurban areas, with cities achieving rates of only 1-2% between 2000 and 2020, resulting in a continuing hollowing of the cities.

EOT has transportation-specific goals for the project. Improved transit accessibility and mobility are prime goals. There should be more mode choices, and the project should result in cost-effective travel options. Connectivity is another theme. The project aims to reduce congestion and improve highway safety. It also aims to provide a more equitable distribution of transportation services for low-income people and people of color, as well as between regions in the state.

The project goals include reducing air pollution and addressing climate change. EOT wants to take cars off the roads in the region and reduce the total number of vehicle miles traveled. Rail is part of the climate change solution and the corridor plan will help quantify how to link the Gateway Cities in a way that does not increase the number of vehicles on the roads. Alan Anacheka-Nasemann asked how EOT proposes to measure climate change impacts. Ms. Egan said that EOT has a contract with the Central

Transportation Planning Staff (CTPS), which will study air quality benefits and estimate greenhouse gas reductions for each alternative. She said that another goal is to stimulate sustainable development in the region to provide better access to jobs and educational opportunities for South Coast residents, bring new vitality to gateway cities and attract new economic growth to the entire region. In addition, the project will open the more affordable southeastern MA housing market to Greater Boston residents.

The project will also help to shape secondary growth impacts. These are intended to be elements of an achievable vision, a realistic and forward looking plan that first addresses land use change. The plan is also action-oriented, seeking to generate strategies, tools and implementation for near-term and long-term smart growth. The Corridor Plan is one part of this strategy, as is the support to the Southeastern Regional Planning and Economic Development District (SRPEDD) to work with communities in the region to generate local strategies and tools to support these efforts. A result of SRPEDD's work will be to identify priority preservation and development parcels in the communities.

Mr. Anacheka-Nasemann asked if smart growth in the region depends on the success of the rail project, or will it happen without the project? Ms. Egan said she sees the project as a catalyst for smart growth. An infusion of public funds and transportation investment will advance smart growth. Steve Smith, SRPEDD, said the rail project will be a magnet for investment. The region needs a stimulus and the urban areas need to be revitalized. Liz Sorenson asked if the work on preservation parcels is being coordinated at the state level since there is a great deal of working going on. Ms. Egan said she is working with Dave Cash of the Massachusetts Executive Office of Energy and Environmental Affairs and she used an example brought up in a Westport meeting about Agricultural Preservation Restriction funds. She is working with MassGIS and SRPEDD's projects are intended to achieve buy in from the local community preservation panels to shape future plans. She and SRPEDD will follow-up with Liz Sorenson to ensure that the Department of Conservation and Recreation's work is being incorporated into the corridor plan.

John Felix, Massachusetts Department of Environmental Protection (MassDEP), asked if Ms. Egan has looked at the issue of contamination. Janice Martin, VHB, said that there was work to identify contaminated sites in the previous environmental review. A number of the potential station sites are brownfields. Mr. Felix observed from his experience with Greenbush that chemicals were sprayed along the lengths of the rail right of ways to control growth.

Philip Weinberg, MassDEP, said that economic development does not translate into public purpose for wetlands variance applications. Elements of smart growth and sustainable growth can translate into broader public purpose for wetlands variances, so it will be important to stress that they are significant elements of the project.

Deerin Babb-Brott, Massachusetts Environmental Policy Act Office, suggested that EOT review the Secretary's Certificate for the New Bedford Airport Expansion Project for background and language. Mr. Felix said that the Certificate for the Route 93 off ramp to Anderson Center might be similarly useful.

Tim Timmermann, US Environmental Protection Agency (EPA), commended Ms. Egan for the meetings listed in her slides for the civic engagement process. He thinks it is great that EOT is asking people for their ideas on alternatives to consider. He said this kind of work is typical of the Environmental Notification Form process and his only concern is that EOT not give the impression to the public of funneling the options before the environmental review takes place. It's also possible that people will not

participate in the environmental process if they think they have already given input and don't have to take part in the environmental review.

Ms. Egan said that the public process is intended to parallel the work of the Interagency Coordinating Group, with alternatives development, criteria development and application happening within similar time frames. The team will bring the results of the public dialogue and review to the agencies members for review and discussion. Mr. Babb-Brott said that the results of the six-month process will be incorporated as part of the ENF. The process will include evaluating the sufficiency of the process and determining if a limited list of alternatives needs more work.

Wendy Stern asked about the evaluation process: should EOT ask members of the public how to evaluate the options or present a set of criteria that will be applied to the project. Ms. Egan said that while she expects to present a set of criteria, she also wants the public to weigh in on the criteria as part of the process. Public input will be welcome on the decision matrix, but the final criteria will be determined by the Interagency Group.

Basic Project Purpose

Alan Anacheka-Nasemann, Army Corps, reviewed the draft version of the Basic Project Purpose:

> To provide public transportation between Boston and greater Fall River and New Bedford, Massachusetts, increase transit accessibility and ridership, reduce air pollution, and catalyze smart growth in the affected communities.

This draft purpose is a jumping off point for discussion and review. Mr. Anacheka-Nasemann said that the purpose should be confined to the facts without evaluative language. It should help define the scope of the review and the alternatives. He and Ms. Egan are looking for comments and suggestions and hope to achieve consensus on a final version over the next two weeks. Then it will be memorialized in a letter to the project proponents.

Ms. Egan said that she and Mr. Anacheka-Nasemann worked on the language and gave examples of why they chose one set of words versus another in the draft statement, such as public transportation versus surface transportation; greater Fall River and New Bedford versus the South Coast region. They tried to avoid qualitative adjectives, such as safe and cost-effective and they considered that including the goal to reduce air pollution also captured climate change factors. They chose smart growth versus other options since it includes natural resource preservation.

Ms. Sorenson noted that the purpose does not include mode choice or regional conductivity, including how people will travel within the region. She was also interested in ensuring that sustainability is considered and that smart growth does not result in more pollution. Ms. Egan said EOT does not want to get people off the highways and on trains just to see the regional roadways fill up again.

Karen Adams, Army Corps, suggested replacing "affected communities" with the word "corridor."

Mr. Anacheka-Nasemann said he and Ms. Egan used the verb "catalyze" intentionally. He feel that the use of this term reflects the goal of smart growth, to make a reaction happen more quickly (as the term is used in chemistry).

John Felix said that in seeking a wetlands variance, EOT should be aware that reduction of regional traffic congestion and public safety are weighed in the analysis.

Mr. Babb-Brott posed a question to EPA representatives: would the inclusion of goals or evaluative terms in the purpose bring on a full-scale analysis of growth impacts, requiring a Cumulative Impact Assessment? Mr. Timmerman said his initial reaction at the start of the meeting was that it would require a broader assessment, but the use of smart growth and the concept of catalyzing growth is appealing. He is excited about the parallel, ongoing work with the corridor communities, which are not always smart about development and he would like to see as much of the growth be in the "smart" category as possible. Economic development is a specific category requiring an analysis of specific and cumulative effects, but he believes that EPA will not get in the way of the positive goals and benefits that EOT has for the project.

Mr. Timmerman added that there is language that is not needed in the purpose in the purest sense, such as transit accessibility and ridership, which are redundant with "public transportation". He said that air quality is important, but Ms. Sorenson said that she thinks it is tricky to include air quality since it will have to be looked at for each alternative. Ms. Egan asked if the wording were changed to add "in order to" before the goals in the latter half of the statement. Mr. Timmerman said that consequences are filters, so they should be out of any statement in its purest form. Reacting to Ms. Sorenson's statement, he said that smart growth is friendly to air quality.

Steve Smith, SRPEDD, asked what the flip side would be of not including specifics? Smart growth is one of the goals of the project so it seems like it should be included. Mr. Anacheka-Nasemann said it may be necessary to define the term. There may be a general understanding of what the term means, but being specific may be necessary. People may have different ideas about what it means. If the concept is not in the statement, the project may be limited to transportation and ancillary effects will not be required to be evaluated, but this may not be the project goal. Mr. Weinberg said he likes the smart growth aspect of the project but raised the concern that adding a lot of qualifiers could mean that the team and agencies wind up analyzing nuances to death.

Richard Lehan, Department of Fish and Game, reminded everyone that to secure a wetlands variance, the project has to make a showing of overriding public purpose. Mr. Timmerman added that the Basic Project Purpose is a term of art for the Clean Water Act and it will be important to capture the range of alternatives in the project as it goes forward. Mr. Weinberg said that the project needs to stand on its own without economic development. It might be better to talk more about issues such as greenhouse gases. EOT might have to quantify the environmental consequences of smart growth.

Mr. Anacheka-Nasemann added that the final alternative has to meet the Basic Purpose and Need and the team has to keep that in mind.

Ms. Stern suggested that the focus should be on the "musts" for the project versus what EOT would like to achieve.

Mr. Smith asked if transportation needs alone will satisfy the standards to be met for wetlands variance? John Felix said that any application has to pass the "straight face test." The proponent has to quantify the elements of the Basic Project Purpose and define the intent of concepts such as smart growth. One definition of that term is to build where there is already development, such as in a place like Weymouth,

versus in an undeveloped area. Mr. Anacheka-Nasemann said this relates to his earlier statement that smart growth needs to be defined clearly.

There was a discussion about growth in the region and the need for local regulations and by-laws to encourage smart growth. There was recognition that only tangible benefits (such as funding) and perhaps the kind of planning that EOT is undertaking can effect the right kind of land use change in municipalities. There was also recognition of the fact that new transit will bring riders, workers and commuters from Boston to the region. Mr. Smith said he would like to see a quid pro quo such as only placing stations in communities that make the appropriate zoning changes as a form of enticement to cooperate. Mr. Anacheka-Nasemann suggested that the link between ridership demand and economic development has to be made. Mr. Lehan said that air quality data needs to be argued in the permit and the issue of reduction versus improvement is an important nuance in these circumstances. The alternatives analysis should also be thorough. Mr. Weinberg said that a more conservative approach would be to say that the project will facilitate or complement smart growth. In considering being more proactive, EOT needs to keep in mind the regulatory review impacts. In summary, the speakers agreed that their hearts are saying *go for it* (in terms of smart growth), while their minds are not so sure.

Ms. Egan said that she will email another draft to the participants and invited input from the group's members in advance. There was a brief discussion of options: independent and dependent clauses versus different punctuation. Ms. Sorenson suggested that the language should reflect how an observer would evaluate an alternative to achieve smart growth, perhaps using the language: to provide smart growth and a conservation plan to catalyze sustainable development. Mr. Anacheka-Nasemann observed that the broadest language might best suit the variance review process; the narrower would fit the alternatives screening and the most selective the MEPA and NEPA reviews.

Mr. Timmerman noted that U.S. Fish and Wildlife was missing from the meeting. He said that he would provide thoughts on the language by a suggested deadline of November 2, if at all possible.

Ms. Egan said the next meeting, on November 27, will include draft evaluation criteria for review and discussion; a report on the public's suggestions of alternatives; and the revised purpose and need.

FOLLOW-UP ACTIONS:

- Each agency will provide comments to Kristina Egan or Alan Anacheka-Nasemann on the Draft - Project Purpose by November 2, if possible. -

SUMMARY NOTES OF MEETING
SOUTH COAST RAIL
Interagency Coordinating Group

LOCATION OF MEETING: Ten Park Plaza, Boston

DATE/TIME OF MEETING: September 25, 2007 9:30 AM

Attendance:	**Agency:**
Karen Adams	US Army Corps of Engineers
Alan Anacheka-Nasemann	US Army Corps of Engineers
Deerin Babb-Brott	Massachusetts Environmental Policy Act Office
Chris Boelke	National Marine Fisheries Service
Bob Boeri	Massachusetts Office of Coastal Zone Management
Nancy Durfee	Southeaster Regional Planning and Economic Development District
John Felix	Massachusetts Department of Environmental Protection
Jerome Grafe	Massachusetts Department of Environmental Protection
Greg Guimond	Southeaster Regional Planning and Economic Development District
Betsy Higgins	US Environmental Protection Agency
Ken Kimmell	MA Executive Office of Energy and Environmental Affairs
Richard Lehan	Department of Fish and Game
Rosemary Monahan	US Environmental Protection Agency
Edward Reiner	US Environmental Protection Agency
Jon Regosin	Natural Heritage and Endangered Species Program
Matt Schweisberg	US Environmental Protection Agency
Mike Stroman	Massachusetts Department of Environmental Protection
Steve Smith	Southeaster Regional Planning and Economic Development District
Liz Sorenson	Department of Conservation and Recreation, Areas of Critical Environmental Concern
Tim Timmermann	US Environmental Protection Agency
Maria Tur	US Fish and Wildlife
Philip Weinberg	Massachusetts Department of Environmental Protection

For South Coast Rail:
Wendy Stern, Executive Office of Transportation
Kristina Egan, Executive Office of Transportation
Mike McArdle, Vanasse, Hangen, Brustlin, Inc. (VHB)
Janice Martin, Vanasse, Hangen, Brustlin, Inc. (VHB)
Lisa Standley, Vanasse, Hangen, Brustlin, Inc. (VHB)
Nancy Farrell, Regina Villa Associates

PURPOSE/SUBJECT:
Kickoff meeting for the Interagency Coordinating Group for the South Coast Rail Project.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay

Transportation Authority (MBTA) have launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. This process includes meetings of the Interagency Coordinating Group, which bring together representatives of the federal and state agencies with jurisdiction over aspects of the project. By meeting with regulatory agency representatives on a regular basis through the Alternatives Analysis phase EOT hopes to streamline the review process to advance the project.

PRESENTATION:
The meeting began with welcoming remarks by Undersecretary of Transportation Wendy Stern, who noted the importance of the project and the advantages of discussing the pros and cons of elements of the project in an open and cooperative forum. She added that the Patrick Administration has committed to a fresh review of the alternatives.

The attendees introduced themselves (see the Attendance list).

EOT's South Coast Rail Manager, Kristina Egan, provided a short history of and context for the project. The intent of the project is to provide excellent transit access between Greater Boston and the South Coast region, which is within 50 miles of Boston but currently has limited transit service. EOT plans to link transit with land use change and to develop a new model for financing infrastructure with this project. The South Coast Rail project would be the third largest infrastructure effort in Massachusetts in recent history after the Central Artery and Deer Island wastewater treatment plant construction. The project will also open an affordable housing market to Greater Boston residents, improve air quality and address climate change by taking vehicles off the road and changing travel habits. Finally, the project will be a catalyst for smart growth in the region, preserving the assets of the old mill towns while providing new economic opportunities.

Ms. Egan said that a Final Environmental Impact Report (FEIR) was filed in 2002 and a Secretary's Certificate issued on the project. The former FEIR endorsed the so-called Stoughton alignment. This new phase will take a fair and fresh look at all of the alternatives. Ms. Egan said she has met with some stakeholders in the region, conducted an environmental listening session and worked with the Southeastern Massachusetts Commuter Rail Task Force and the Southeastern Regional Planning and Economic Development District (SRPEDD). She noted that EOT is seeking a consultant team to develop an economic development and land use corridor plan for the 28 municipalities in the region. This will also be a model for how the state can attract and manage growth. In addition, EOT has contracted with SRPEDD for technical assistance with outreach and civic engagement. Ms. Egan said that wide-ranging civic engagement is planned and the team will ask the public questions and bring the responses and opinions back to the Interagency Coordinating Group.

POWERPOINT:
Alan Anacheka-Nasemann, U.S. Army Corps of Engineers, outlined The Highway Methodology, which the Corps and the project will be using to integrate the project with the requirements of the Corps' permit regulations. The presentation outlined the standards the Corps must use to avoid impacts to aquatic resources; minimize impacts; and mitigate unavoidable impacts. The result must be the Least Environmentally Damaging Practicable Alternative (LEDPA). The Corps uses a step approach to reach this determination, employing: pre-application, application, public notice, evaluation and monitoring. The presentation also tracked the steps in the NEPA and MEPA processes; included information on the wetlands in the study area; and defined minimization and mitigation, should those steps be reached. Mr. Anacheka-Nasemann said that the Corps encourages joint review at all levels; looks forward to a

concurrent 404/NEPA/MEPA process; and believes that the Highway Methodology provides means for narrowing the range of options fairly quickly toward selection of the LEDPA. (A copy of the meeting presentation is available on the website, www.southcoastrail.com.)

Deerin Babb-Brott, Massachusetts Environmental Policy Act Unit (MEPA), explained the MEPA process in brief and noted that the analysis of impacts, particularly of secondary and cumulative impacts, will be very important for this project.

QUESTIONS AND COMMENTS:

- The purpose and need for the project should be defined broadly according to the Corps. (The - Corps and EOT will present a draft for discussion at the next meeting.) -
- There is great interest in how the state anticipates using planned growth along the corridor to finance the project and questions about the potential effect of casinos in southeastern MA on both the project and the corridor study.
- There were questions about all of the potential options to be examined, including a bus option; - Ms. Egan said all practicable ones are on the table. -
- There were concerns that the corridor planning study will lag behind this project and perhaps - hold up the rail planning. Ms. Egan outlined the schedule and said this was not a concern; - parallel work will be taking place. -
- Karen Adams noted that the Corps will prepare an internal Environmental Assessment but does not anticipate that an EIS will be needed at this time. There was some discussion of this plan and concerns that not planning to do an EIS might leave the project vulnerable at a later date. Ms. Adams said it was premature to begin with an EIS. EPA said it would raise concerns directly with the Corps.
- Ms. Egan distributed a draft schedule and asked the group to commit to meeting monthly. At these meeting, EOT and the Corps will be seeking agreement on key issues before moving forward. There was a discussion of this possibility and a request to submit documents for review two weeks before each meeting. VHB and EOT said they would try to meet that goal, but 10 days is a more reasonable plan. The parties agreed to try to concur or achieve concurrence on issues on a timely basis, as requested by EOT, but EPA and other agencies noted that this will not always be possible. The size of the group could affect the progress of discussions. Ms. Egan requested each agency to designate a lead person to channel reviews and comments.
- The Central Transportation Planning Staff (CTPS) will be doing a spreadsheet model of up to 20 - alternatives to evaluate ridership potential for different alternatives. After the screening of the - initial alternatives, CTPS will conduct in-depth modeling on ridership, air quality and - greenhouse gases for the practicable alternatives that emerge out of the initial screening. -
- The project will be likely to require a variance under the Wetlands Protection Act. The project purpose needs to tie into the alternatives analysis and demonstrate that the project is needed to meet a public transportation purpose. Economic development is seen as a benefit of the project, to meet community revitalization goals, but this is related to financing and impact assessment rather than purpose. Ms. Egan clarified that the analysis will compare a "smart growth" scenario to a baseline "business as usual" scenario.
- In response to a question about the potential impact of casinos on the project, Ms. Egan noted - that this will be included in the analysis if and when a location is proposed. -
- Steve Smith explained in some detail the membership and role of the Commuter Rail Task Force that is staffed by SRPEDD, noting that the task force was recently expanded to add new communities. The task force has focused on identifying potential rail stations and developing transit-oriented development recommendations.

- The alternatives analysis will consider capacity limitations at South Station. The USPS relocation proposal will undergo a separate environmental review process.

FOLLOW-UP ACTIONS:

- Each agency to designate a point person for the Interagency Coordinating Group.
- The calendar of meetings was established. (Please see separate save-the-date emails.)
- The EOT / Corps team will send materials out between two weeks and ten days in advance, - wherever possible. -
- EOT will post the Army Corps' Highway Methodology presentation on www.southcoastrail.com
- EOT will share dates for Commuter Rail Task Force meetings and civic engagement meetings - with the Interagency Coordinating Group. -

Appendix D
Civic Engagement Meeting Notes

SOUTH COAST RAIL

Summary Notes - March 2008 Civic Engagement Meetings

At the third round of civic engagement meetings for Phase 1 of the project, we asked the question: What do you think of the draft findings? Regional meetings were held in Attleboro on March 10; in Lakeville on March 11; and in Freetown on March 12. The Attleboro meeting format included a presentation, breakouts by corridor and a general question/answer and comment session. The Lakeville and Freetown meetings format included an open house, presentation and question/answer and comment session. This packet includes a summary of the presentation made at all of the meetings and a list of the questions and comments of the participants.

THE PRESENTATION

1. Project Background

The Executive Office of Transportation South Coast Rail Project Manager, Kristina Egan, thanked participants for taking the time to attend the meeting and offer their comments. She said that no route would be selected at the meeting. EOT's extensive civic engagement process is designed to engage people early in Phase 1 so the project team and Interagency Coordinating Group can consider the public's input when deciding which alternatives to recommend for in-depth environmental review in Phase 2. She said the narrowed list of alternatives recommended by the Interagency group is available on the project website at www.southcoastrail.com and in the meeting handout. [It can also be requested in print from EOT.] The presentation included a summary of a short-list of 10 alternatives. Public comment will be taken back to the Interagency Coordinating Group for consideration before narrowing the list of alternatives that will advance to the in-depth environmental review in Phase 2.

Ms. Egan said that the South Coast is the fastest growing region of the state. Fall River, New Bedford and Taunton are within 50 miles of Boston, which is the economic engine of New England, but these cities are underserved by public transit. There are several reasons the project is necessary. Roads and highways are at capacity and the situation is likely to worsen. Commuter rail is also reaching capacity. Riders complain of lack of seating and poor quality service, particularly on the Attleboro line. This project will improve transit service between Boston and Fall River, New Bedford and Taunton, as well as within the South Coast region.

As growth continues on the South Coast, pressure will increase on the transit and roadway systems. Oil is at more than $100 per barrel and climate change is a very real threat. The project

will provide real benefits to the regional economy and the transit system. Ms. Egan said that in the past, planners chose station locations based on where the cheapest land was available for parking garages. Using the principles of smart growth, the project will provide long-term enhancements such as improved quality of life, protection of water and other natural resources and preservation of historic and priority preservation sites, resulting in vibrant communities for people.

Ms. Egan said the South Coast Rail project will be a green project. Renewable energy will be incorporated into the design, potentially including features like solar arrays and wind turbines at stations. Smart growth is a key component of the project and will protect resources. Regional planning funding is incorporated into the project design. Ms. Egan said EOT has designed an open and transparent process and she encouraged people to contact her directly. The decision process is a balancing act and hearing from the public about which factors are most important will help with the decision-making process.

2. The 10 Alternatives

Ms. Egan referred to the PowerPoint file for the following discussion. (The presentation is posted on www.southcoastrail.com.) The alternatives evaluation process for Phase 1 has looked at alternatives from a 10,000-foot level, a broad brush review of a range of potential ways to meet transportation needs. The Phase 1 review does not provide all the answers, but the alternatives must be feasible. The next phase of the project will be an "on the ground" review that is more detailed. This environmental review will take 2 years to complete.

Beginning in November, Ms. Egan said, EOT reached out to the public to hear ideas and comments. An Interagency Coordinating Group is reviewing public input from three rounds of civic engagement meetings, which were held in November/December and January. The Interagency group includes representatives from 11 federal and state regulatory agencies such as the U.S. Army Corps of Engineers, the US Environmental Protection Agency and the Massachusetts Department of Environmental Protection.

The first round of civic engagement meetings resulted in 65 alternatives that the public asked the project team to evaluate, Ms. Egan said. The team combined similar concepts and came back to the public with 38 proposed alternatives for review and asked the question "What do you think of the alternatives and the proposed evaluation criteria?" This third series of meetings is presenting a short-list of 10 alternatives and asking the public "What do you think of the draft alternatives and what are the most important criteria to you?" After the final series of engagement meetings for this phase, the Interagency group will further narrow the list to a smaller number for in-depth review.

Ms. Egan said the Phase 1 evaluations looked at each alternative and asked the following questions in a three step sequence:

Step 1: Does the alternative meet the project purpose – getting people back and forth from Boston, improving regional mobility and supporting smart growth?

Step 2: Is the alternative practicable or buildable – from cost, ridership, construction and timeframe perspectives?

Step 3: What are the relative environmental impacts of each alternative? The environmental impacts considered are primarily related to wetlands issues. Wetlands are subject to the most extensive regulations. Phase 2 will result in the identification of the Least Environmentally Damaging Practicable Alternative (LEDPA). The Army Corps can only permit the LEDPA.

Ms. Egan noted that a fourth step will be circling back to make sure the Interagency group is comfortable with earlier decisions, based on public input during this final phase of engagements, before making final recommendations for Phase 2 alternatives. She pointed out that there is no right answer. The decision-making process is a balancing act and no process will produce a silver bullet result. There are pros and cons for all the alternatives. For instance, the fastest alternative might be the most damaging or a route might impact direct abutters' home values, yet increase the value of other homes in the area.

The 10 alternatives are organized around four main corridors, Ms. Egan said. The corridors use the existing Attleboro, Stoughton and Middleborough lines and the highway system (Routes 140 and 24) as backbones. Ms. Egan outlined the list of 10 alternatives and listed some key pros and cons for each one.

Attleboro Alternatives

- ***Commuter Rail to South Station via Attleboro Bypass***
- ***Electrified Commuter Rail to South Station via Attleboro Bypass***
- ***Diesel Multiple Unit Commuter Rail to Attleboro Station***

The commuter rail alternatives would add six peak hour trains – three from New Bedford and three from Fall River - through Attleboro to South Station. The commuter trains would have eight cars and would use an old freight rail between Attleboro and New Bedford/Fall River that would cross the proposed 3 Mile River Area of Critical Environmental Concern (ACEC), up to the Northeast Corridor line. (Options that could go through Mansfield have been eliminated because the town center would have to be rebuilt to accommodate the rail.) The commuter rail alternatives would use a new rail bypass. This bypass would travel along an existing National Grid power line right-of-way. These alternatives would require adding a third track from Readville to Canton Junction to handle the increased capacity necessary for the additional trains on Amtrak's Northeast Corridor. The third track would run through Canton, Westwood, Dedham and the Readville section of Boston and it would run through the Fowl Meadow ACEC. Ms. Egan said that electrified commuter rail provides a faster trip. The trains accelerate and decelerate more quickly. The electrified commuter rail trip time is estimated at a broad brush level to be 55 minutes; it requires construction of a catenary system (overhead power lines). The commuter rail trip time is 74 minutes. Both alternatives deliver a good level of service to customers. These alternatives require approximately 15 grade crossings in Taunton, 11 of which are fairly close together.

The third alternative discussed in the Attleboro corridor was running three-car self propelled trains called diesel multiple units (DMUs) from New Bedford and Fall River along the existing freight line and stop at Attleboro Station where passengers would have to transfer to commuter rail. The advantage of the DMU option is that no third track is necessary on the northern section of the corridor because passengers would feed into the exiting commuter rail system and the bypass would not be necessary. A disadvantage is the transfer. Whenever a transfer is involved

in a mode of transit it is less attractive to riders who are prefer a one-seat ride. Ms. Egan said the Norton Conservation Commission had notified her of the potential impact on Chartley Pond, a state-protected resource, and the Massachusetts Audubon Society had told her about other wetlands concerns in the southern portion of the Attleboro alternative. She added that Taunton Mayor Crowley had expressed concern about the grade crossing in his community. She noted that there are new technologies that could be used to reduce the impacts on communities of grade crossings, such as decreasing the time necessary for the gates to be down.

Middleborough Alternatives

- **Commuter Rail to South Station via the Middleborough Line without Old Colony Main Line Improvements**
- **Commuter Rail to South Station via the Middleborough Line**
- **Commuter Rail to South Station via Attleboro/Middleborough**

These alternatives use existing freight lines in the southern section, carrying trains from Fall River and New Bedford north to Cotley Junction in Taunton, where they would travel east to the Old Colony line to travel north again. The segment of the Old Colony Line from Braintree north to South Station is a bottleneck because it is a single track, which already carries the Old Colony Main Line, Greenbush, Plymouth and Middleborough lines. Transportation experts have determined that no more then three trains can be added to the line without "breaking the bottleneck." This would require adding a second track from Braintree to South Station.

The first Middleborough alternative would add three peak hour trains from the New Bedford/Fall River area (2 from one city and 1 from the other). It could only serve half the number of riders as alternatives using six peak trains because this option does not include a second track in the bottleneck area.

The second alternative would add six peak trains, but it would require double tracking in several areas, including through Quincy. The corridor through Quincy would impact a portion of a historic cemetery, a public roadway (the Burgin Parkway) and incur a high cost. The Interagency group recommended eliminating this alternative, but the team has been asked by the Secretary of Transportation and other Secretaries to retain it for more detailed study. It would have the benefit of increasing the reliability of service of all the Old Colony commuter rail lines.

The third Middleborough alternative is a hybrid that would send half the trains through the Middleborough corridor (without opening the bottleneck) and half through Attleboro. The advantage is that adding tracks in the Fowl Meadow ACEC and in Quincy would not be necessary, because the number of additional trains traveling those corridors can be managed with existing capacity. The alternative is cheaper, as a result. This alternative has disadvantages, including taking up the limited spare capacity on the Northeast Corridor and Old Colony lines and foreclosing the option of extending commuter rail to Wareham without infrastructure improvement to the Old Colony Main Line.

Stoughton Alternatives

- ***Commuter Rail to South Station via Stoughton***
- ***Electrified Commuter Rail to South Station via Stoughton***

Ms. Egan said that the Stoughton alternatives would come north from New Bedford and Fall River to use an existing right-of-way of an old rail line just north of Route 44 that no longer has tracks on the rail bed to reach the existing Stoughton Line. The challenge for these alternatives is that the former rail line runs through the Hockomock Swamp ACEC which is home to state-listed and rare species and vernal pools, as well as the Pine Swamp conservation area in Raynham. The electrified commuter rail would have slightly greater wetlands impacts because the catenary power lines would have to be constructed through the Hockomock Swamp. This alternative would provide good service, with the straightest shot to Boston, good cost effectiveness and little impact on the rest of the transportation infrastructure.

Highway Alternatives

- ***Express Bus in Dedicated Lane to South Station via Route 24, Route 128 and the SE Expressway HOV Lane***
- ***Enhanced Bus Service on Existing Private Carrier Routes***

The bus rapid transit (BRT) alternative would travel in existing traffic from Fall River and New Bedford. Where Route 24 increases to three lanes in each direction, a dedicated zipper lane would be constructed for the BRT. The zipper lane would use the off-peak lane for the BRT, so peak travel lane capacity would not be impacted. At Route 128, a new, dedicated lane would be constructed on the outside of the existing highway from Route 24 to the Southeast Expressway. Once the BRT reached the area of I-93 in Braintree, it would join the existing High Occupancy Vehicle (HOV) zipper lane. Trip time for this alternative is good at 70 minutes and the cost is lower than other alternatives. There would be some impacts to the Hockomock Swamp along Route 24 and to the Blue Hills Reservation, a state park protected under State Constitution Article 97. This alternative is not likely to meet demand since it can handle only one-quarter of the riders who can ride commuter rail. It does not encourage smart growth.

The second bus alternative would be to utilize existing private carriers and expand service along existing routes. A disadvantage is the long trip time and, in general, buses are not viewed as favorably by potential transit customers. Bus service would not be likely to meet demand or to encourage smart growth. There are BRT vehicles currently in use that provide a look and experience similar to light rail.

Other Route 24 alternatives not carried forward (commuter rail and monorail)

Ms. Egan reviewed other highway corridor alternatives that the public had suggested, but that were not advanced to this stage.

Rail up the highway system – The width of the Route 24 median varies. To accommodate rail, another lane would have to be built and 20 interchanges would have to be rebuilt on Route 24 because commuter trains cannot travel on tracks on severe grades that would be required to "fly over" the existing interchanges.

Elevated Monorail – While this alternative is visible to drivers on Route 24, it would be the longest monorail ever built, so it is unproven. The infrastructure would be entirely new and would have to be specially designed and built at great cost. The MBTA currently swaps engineers and train cars between lines, as necessary. With a monorail system this would not be possible. A monorail

would also take eight years to construct. A four year construction period is what EOT is planning for.

3. Closing

Ms. Egan said that the decision on which alternatives advance to Phase 2 depends on point of view: "where you stand depends on where you sit." It is not an easy decision. Opinions differ depending on where people live. She has heard the most negative comments from people from Easton, Stoughton, Norton and Attleboro. Fall River and New Bedford have been waiting a long time for service, so they are eager for the project to be built. Up to this point, there has been limited regional dialogue. She said it is important for residents of different communities to talk to each other and hear each other's concerns and interests. The alternatives have trade-offs and there are issues with all of the options. Stoughton is a good transportation alternative, but there are environmental impacts. Bus alternatives are cheaper and have fewer impacts, but they would transport fewer riders. Supporting and advancing smart growth means choosing locations near historic village centers where there are more grade crossings. The Patrick Administration is committed to South Coast Rail. The Southeast has been left out of transit planning until now, and it is a high priority to make the connection. Ms. Egan said the team wants to hear what people think about the process and alternatives, what are their most important criteria, and what's the best way to weigh criteria. The overarching question is "What do you think of the proposed findings?"

Ms. Egan thanked participants again for taking time out of their busy schedules to attend the meeting and share their thoughts. EOT will continue its extensive outreach program and the public will have other opportunities to comment on alternatives during the Phase 2 in-depth environmental review process. Ms. Egan said that new information would be posted in April and she asked participants to stay in touch using the website (www.southcoastrail.com) or email.

Attleboro Meeting – March 10, 2008

Thacher Elementary School

General Questions and Comments

Responses to questions and comments, where appropriate, follow bulleted groupings.
Names are provided where given by speakers.
Flipchart notes from the general session discussion are also included.

- Frank Cook, Attleboro City Council President and Ward Councilor, said the City Council passed a resolution on January 22 supporting the Stoughton alternative. Stoughton was the alternative chosen last time, yet the state is spending $17 million on planning for this project when local services are level funded and suffering. He said it is a travesty.
- Representative Elizabeth Poirier said she is vehemently against the Attleboro alternatives. She is disappointed in the process. People have questions, but the state has provided few answers. She receives complaints that the train into Boston is late and the quality of service is poor. The state should concentrate on fixing what it has, rather than extending service. The MBTA has a high debt load and fares are increasing, yet quality of service suffers. She said the funding for the project must be bonded and a vote of the legislature is necessary.
- Mayor Charles Crowley, Taunton, said the City Council voted unanimously to oppose the Attleboro alternatives and support the Stoughton alternatives. He is concerned that the 15 grade crossings in his community will affect the ability of emergency responders to reach destinations. There are fewer grade crossings in Stoughton and the route is more direct and economical. He added that in terms of environmental impacts, engines are better now than when the line was last in service. The City will do whatever it can to stop the Attleboro alternatives.
- Representative John Lepper noted that the Stoughton route results in less loss of wetlands and other environmental impacts and capacity is higher. He said human impact is important and the 15 grade crossings in Taunton should be weighed against impacts to the Hockomock Swamp.
- Representative Jay Barrows endorsed the Stoughton alternatives. He encouraged EOT to look more closely at the highway corridor. He is concerned that trains will be longer than the platforms at South Station.
- Bob Kimball, Norton Selectman, thanked EOT for the opportunity to participate. He said Norton is against the Attleboro alternatives. He said that EOT presented 10 alternatives tonight, but an 11th alternative is about jobs and the economy. Communities could use the money being spent on the project. Rather than transporting jobs out of the region, people should be kept local.
- George Dentino, Mansfield Selectman, said that Mansfield is against the Attleboro alternatives. He noted that only one Attleboro alternative has been dropped and three remain. Norton, Attleboro, Taunton and Raynham suffer impacts, but don't see any benefit from the Attleboro alternatives.
- Walter Thibadeau, Attleboro City Councilor, noted that there is limited service capacity on the existing Attleboro line and passengers are demanding more cars to

meet need. He said Attleboro has two stations and minimum ridership in terms of City residents, yet it is the largest ridership South Station, with 17,000 passengers.

- Brian Kirby, Attleboro City Councilor, said he is disappointed that the alternative is being revisited and the cost to do so is $17.2 million. Construction costs will be $1.6-2 billion. He noted the MBTA is currently operating in the red and wonders where the money will come from. He recognizes that Fall River and New Bedford need service, but the work could be phased. He joins with Taunton, Norton and Mansfield against the Attleboro alternatives.
- Jack Lank, Attleboro Chamber of Commerce, said he joins with the others against the Attleboro alternatives. He sees no economic benefit, only disruption and wonders who is paying for the project?
- Joe Dent (sp?), Attleboro resident, lives near the tracks. For 10 years he thought nothing would happen and now the idea is being revisited. How many people will the project move? What are the ridership numbers?
- Susanna Girard, resident, said she understands the need for the process, but she's frustrated with the lack of answers. Her concerns include safety, wetlands, the Route 123 route and National Grid easement. She lives near the right-of-way, which is supposed to be only for electric transmission not trains. She's concerned about property value impacts and the proximity to her home.
- George Thatcher, Attleboro resident, said it would be better if the community received the $1 billion for redevelopment of manufacturing and fishing industries. He said people want to stay closer to home and do not want to commute. He's not convinced about ridership numbers.
- Lou Gitto, Stoughton resident, suggested the highway alternatives be looked at as short-term solutions, while longer term issues are resolved, such as the Braintree bottleneck. He said the highway alternatives are lower cost and could be eliminated once the long-term improvements are made. If the Braintree bottleneck is broken, the Wareham extension would be possible.
- Mary Ann Kinney, Mansfield, said that Fall River and New Bedford are entitled to service, but Taunton should not be sacrificed for the Attleboro alternatives. She is not in favor of any Attleboro alternatives. She favors Stoughton alternative 30 from a cost-benefit perspective. The trip time is 74 minutes and 6.7 acres of wetlands are impacted. She thinks this alternative has the best "bang for the buck." It's compatible with the system and is a straight shot into Boston. It also provides another rail corridor for redundancy. She also noted that shippers may want to use the rail system for freight and tankers to Boston from Fall River and New Bedford harbors. She thinks Stoughton remains the best alternative.

Ms. Egan noted that the overarching concern expressed by many people is related to spending so much money on the project. She understands the concern. The project is one piece of an overall approach to increasing economic development in New Bedford and Fall River, an the Administration is seeking a holistic approach by promoting other housing, education, and jobs initiatives under other agencies. The project is a high priority for the Administration, which believes the South Coast deserves better transportation options and that connecting the cities must be done for the future. The Administration and Legislature will decide the best way to fund the project. The money

used for the project can only be used for transportation projects, so it is not available for other assistance.

Ms. Egan addressed the ridership and economic justification questions. She said modeling is being done now. She noted that people from Fall River and New Bedford do commute to Boston. The existing journey-to-work demand is about 8-9,000 people, in addition to other regional trips. She said the project is looking at cost effectiveness and attractiveness of alternatives. The most reasonable option can be debated and the civic engagement process will help flesh this out.

Ms. Egan said she understands the frustration with the lack of answers. She said this level of analysis – 10,000 feet – is not designed to answer all the questions. She noted that historically the public process has not happened until there is a specific plan. The process for this project is designed to get public input early to impact the overall big picture development of the project.

Additional comments and questions

- Representative Lepper read an excerpt from the 1995 DEIR that stated that the Attleboro alternative was not practicable and asked why the state is back again?

Ms. Egan said the alternatives evaluation must be revisited. The project cannot go forward without it. She pointed out that before the 2002 study, Attleboro was the preferred alternative. EOT wants a transparent process that provides the data so people can see why certain decisions are made. The South Coast Rail project has been studied for many years. In 2002, a state-level environmental review recommended one particular route. However, the lead federal agency regulating the project, the U.S. Army Corps of Engineers, was not part of that review process. In order to obtain a Clean Water Act permit under federal law, we need to go through the Corps' methodology which requires looking at the alternatives again. The 2002 data is out-of-date now, so we are consolidating this federal review with an updated state review. Mr. McArdle added that since the previous studies, the Northeast Corridor has seen an increase in demand for service both from Amtrak and the MBTA. The corridor is congested. He said the ridership analyses in Phase 1 are spreadsheet analyses. The next phase will use computer simulations and include Amtrak and MBTA service on the Northeast Corridor to test assumptions about demand 20-30 years out. The corridor can handle three additional trains without improvements near Canton Junction. Six trains are really necessary to meet demand and would require infrastructure improvements. He noted that the Central Transportation Planning Staff model extends the southeast region for ridership projections. The team will come back to the public with results of the more detailed analyses.

- A participant said he appreciates that this phase is a 10,000 foot review. He noted that Stoughton has a reasonable trip time of 52 minutes. He asked what the cost

would be over the next 20-30 years? He would like to see computations of cost taking into account trip distance, ridership numbers and environmental impacts.

- Ken Zanoni, Norton, noted that he had signed in at previous meetings, but did not receive a notice about this series of meetings. He said that the Attleboro route makes no sense. Stoughton makes the most sense. He said concerns go beyond the environment. There are people concerns, for instance, the impacts of grade crossings to people in Taunton. He thinks people concerns should outweigh other concerns.
- Bob Mulkern, Norton, said he also was not notified.

Ms. Egan reported that in addition to emailing the meeting notice and having it posted on the website since last fall, EOT flyered locally at public places and sent out a press release to all local and regional media including the *Attleboro Sun*. She does not know why the information wasn't printed by the *Sun*. She told the participants she would double check the database to ensure their emails are included.

- Heather Graf asked when the team would narrow the list to 4-6 alternatives? She said the lengthy process is frustrating.
- A gentleman from Norton noted that companies, such as State Street where he works, are encouraging employees to telecommute. He also said he is concerned about the congestion on the Attleboro line and the ability to respond to emergencies on trains and elsewhere. The more trains on the line the more likely there will be delays that could affect the entire corridor.
- A participant noted that he was at the Easton meeting. He said the public was promised information on current assessments to towns by the MBTA. He would like to know the current assessment for Attleboro. He noted that assessments will increase with new service.

Ms. Egan said she understands the frustration people feel in terms of the length of the evaluation process. She said the Interagency group will review public input from these meetings at the group's meeting next week. An announcement about the recommended list for Phase 2 will be made in April. She said the team is looking at the ripple down effects of emergencies on various corridors and the effects on reliability. She noted that the project is not looking just at Boston companies, but is also considering businesses throughout the corridors. The corridor plan that is taking place concurrent with the alternatives evaluation is looking at community plans, residential growth and other factors. As part of the project, ridership will be further investigated, such as who rides the trains and why. Ms. Egan said she will speak with the MBTA regarding community assessment information.

- Repesentative Lepper said the Legislature approved the MBTA assessments, which will include Taunton and other communities that might not have direct service but are in the area surrounding a station. He noted that Attleboro was not assessed until 2000 for service it was receiving prior to that year.

General session flipchart notes

- There was a prediction that the Attleboro route would cut emergency response time by 50% in the city of Taunton.
- There are no economic benefits from the project for Attleboro.
- Will the project serve enough people to be cost effective?
- Several speakers were frustrated by the lack of specific data or answers to questions on safety, wetlands, utility easements, property values and other questions in this early phase of work.
- EOT should measure the cost on a 25-year basis.
- The project should not sacrifice Taunton for Fall River/New Bedford Rail Service.
- People concerns should outweigh environmental concerns.
- The project should study what major Boston companies are planning for the future in terms of employment and investment.

Corridor breakout questions and comments

Attleboro Corridor:

- Is EOT sure that there is sufficient ridership from Fall River and New Bedford to justify the investment in an expensive system?
- Why is the Attleboro bypass needed and how would it work?
- The Attleboro corridor is not a practical option since the North East Corridor is already overcrowded with regional and Amtrak trains. Amtrak has already considered and rejected the idea of adding a track along the northern section due to the wetlands impacts and the presence of an ACEC.
- Several speakers addressed the issue of grade crossings, particularly in Taunton, and the impact peak hours trains could have on local streets and public safety.
- Several speakers noted that homes are very close to the tracks in some sections of Taunton.
- Older tracks are built with wooden ties and are quieter than the new, concrete versions. A resident asked if the project will take noise into account when designing the new rail. He feels that the wooden ties and stones are quieter than the other options.
- Although the project will have regional benefits, impacts will fall heavily on some individual communities.
- A few speakers asked why EOT is reconsidering the routes when it found that the Stoughton route was the best alternative the last time.
- Funding for the project is a concern in several ways: the cost of the review; how to pay for the project; what assessments will be on communities in the region.
- EOT and its consultants need to look carefully at Chartley Pond and surrounding wetlands. Vernal pools are also a concern in the region.
- Can tracks run beneath the high tension wires?
- The process has to consider human impacts as well as environmental ones.
- What will the process be for public meetings during the environmental work?
- Who makes the final decision on the route? How does the public have real impact?

- Is EOT taking the potential impact of a casino into consideration?

Stoughton Corridor

- What are the impacts on wetlands in the Fowl Meadow and Ponkapoag Bog area?
- Railbed through Hockomock Swamp is floating on logs.
- What are the impacts on public water supply/school children?
- Mystic Valley Amphipods: rare species in Hockomock Swamp.
- There are tribal burial grounds in Hockomock Swamp.
- Difference between Dean Street station and the Downtown Taunton station sites and lines.
- Underpass exists under 495.
- Mayor Crowley explains concerns and preferences of the City of Taunton.
- Whittenton Junction has a large number of grade crossings as the Attleboro Line through downtown (Mayor Crowley).
- There are many economic impacts to the City of Taunton if the Attleboro route is used. What about impact to people?
- Make sure there is enough parking, sidewalks and bike trails.
- Explain the VHB hybrid alternative. What are benefits and concerns?
- What about stopping trains at Braintree and taking the Red Line.
- Taunton has already created two TOD districts to help spur growth.
- Trains every 20 minutes through downtown Taunton.
- 94 percent of fire runs are medical and all but one fire station are on the east side of the city.
- What are advantages of electric?

Middleborough Corridor

- Split—Fall River always one way and New Bedford always the other. Cross transfer platform.
- Consider a new approach: For the short term, consider using Bus Rapid Transit on Route 24. It will have a low cost and will be more desirable despite lower capacity. In the long term (10-15 years) find a way to break the Braintree bottleneck. Once that is broken, there won't be need for the bus service.
- Consider acquisitions and other options to break bottleneck now.
- Consider future extension to Wareham with elimination of bottleneck and higher capacity.
- Really want to eliminate this corridor?
- Right of Way—limited capacity.
- Capacity issues even without Middleborough.
- Quincy Station entrance.
- Trip times accurate even with Amtrak plans of increasing service two to three times?
- Triple tracks all the way—similar to New Haven.
- Different levels of service conflicts, regional and local.
- Stage plan: 5 to 10 year
- Max Speed: Electric Commuter Rail: 110 mph. Commuter Rail: 79 mph.
- Shuttle south with transfer at Taunton?

- Why not use 79 for right of way. Capture lower Raynham.
- Wells in Easton draw in reverse due to porous subsurface.
- Retaining wall and drain: capture runoff from train.
- Piles needed support in existing gravel rail bed over peat
- Water supply is most important criteria.

Highway Corridor

- Might have least property takings.
- As long as travel times works, it's a good alternative.
- How directional is traffic on Route 24?
- Impact of zipper lane on opposing traffic?
- Operating costs of zipper lane?
- Dedicated Bus Lane—no cars allowed. Attractive, timely bus option.
- Incremental development of zipper lane. Start it further north first.
- Disagrees with statement that bus rapid transit doesn't encourage smart growth. "T" in TOD = Transit.
- This option allows incremental additions to transportation alternative to cars and incremental smart growth development.
- Can accomplish smart growth objectives with Bus Rapid Transit with the right policies.
- Need adequate parking.
- Use this option without adding capacity to highway as temporary fix (10-15 years) while working on Braintree bottleneck and then no need for bus service.

Lakeville Meeting – March 11, 2008

Lakeville Library

Questions and Comments

Responses to questions and comments, where appropriate, follow bulleted groupings.
Names are provided where given by speakers.
Flipchart notes from general session discussion are also included.

- Derek Makey, Lakeville Selectman, said Lakeville had approved a 40R development near the existing station. He's concerned about the potential impacts of the project if the station is relocated. He noted the project has received subsidies from the state and wants to be sure the funding is guaranteed.
- John Crowley, Lakeville, said he lives near Berkley and Route 140. He likes the route through Berkley and the first stop being Bridgewater. He said that a Wareham connection could come later. He wants the Lakeville station to stay in its current location. He asked if ridership would be lost if the train goes to Middleborough? He said the line through Taunton could go down Route 140 or the Stoughton/Mansfield alternative could be chosen.
- Jim Barry, Lakeville, said he thinks fare income will vary and that it will not cover operating costs. He would like to see a table listing assessment/contributions versus impacts to communities.
- Joe Peneski, Lakeville, noted that freight trains currently use the old line in Middleborough. He said the area is populated and he thinks once people are aware of the project there will be a big response. He's also concerned about work in the Assonet Swamp, which is over the aquifer for the area's drinking water wells, and the disruption it may cause to community water supply.
- Joanna Donohue, Lakeville, said she lives on Taunton Street about 50-75 feet from the tracks. She asked if the line would be rebuilt, how many cars would run on it and how grade crossings would be managed?
- A participant asked about the possibility of a tunnel in Taunton, similar to Greenbush through Hingham, given the City's concerns about grade crossings?
- Selectman Makey reported that the Selectmen met last night. If Middleborough is chosen, would it preclude a Wareham extension?
- Representative Canessa asked if people understand why the project is needed and that the Corps must be involved due to the environmental impacts. He asked about the Corps' role?

Ms. Egan said during the 2002 environmental review when the Stoughton alternative was chosen as the preferred alternative, the state didn't think it needed Corps review because no federal money would be used for the project. The state subsequently determined that Corps review is necessary under the National Environmental Policy Act because it has jurisdiction under the Clean Water Act, so the alternatives selection and evaluation must be redone. The project uses the Corps' methodology for review and decision regarding the Least Environmentally Damaging Practicable Alternative. EOT must consider and screen all alternatives. Redoing the process gives the state a chance to do the evaluation differently and factor in performance on energy and smart growth.

Regarding Lakeville's 40R project, Ms. Egan noted that she previously worked for the Massachusetts Smart Growth Alliance, so she understands the community's concerns. She said she doesn't want to move the station, but using the existing alignment means the train would have to back up into the station losing 10 minutes of trip time. She said the Middleborough line joins the Old Colony Line north of the Lakeville Station and bypasses that station, and it would mean another station would be needed; however, the existing station could be used if the Wareham extension were built.

Ms. Egan said there is no room in the system at the Braintree bottleneck on the Old Colony line, so if trains are added from New Bedford/Fall River through Middleborough there would not be enough capacity on the corridor for additional trains from Wareham. If Middleborough ridership was increased and the Wareham extension was added, the area from Braintree north would likely have to be triple-tracked to provide capacity.

In answering the question about loss of ridership if Middleborough is chosen, Ms. Egan said the trip is longer and trains will have to slow down to negotiate a sharp angle on the secondary, which will reduce performance. It does not perform as well as Stoughton. She added that Attleboro and Stoughton lines serve both Back Bay and South Station. Middleborough serves only South Station.

Ms. Egan said that no rail line can be self-sustaining. The state would subsidize it. Cost estimates will be provided in Phase 2 of the project. She will get more information on the MBTA assessments.

Regarding rail traffic on the freight line, Ms. Egan noted that the current freight trains run infrequently. Commuter trains would add 32-38 trains per day. She said safety measures would be added to the line, such as gates and horns. There will be trade-offs, such as if communities want quiet zones, horns would not be used, but this raises safety issues. She added the state will work with communities to reduce noise and vibration impacts. With regard to a tunnel in Taunton, she noted the area is not very long, so the grades up and down would be too steep for the commuter rail trains to negotiate.

Additional comments and questions

- Gerry Pieri, Green Harbor, said while he does not live locally, he spent the last four decades looking at this project as a former Assistant Secretary of Transportation. He said the Stoughton via Whittenton Junction works best. He noted that the Attleboro line switches do not work well in a high speed environment. Middleborough is more difficult. He said that some of the Taunton grade crossings could be moved and others eliminated. The electrified and diesel commuter rail speed is a function of the right-of-way, not the vehicles. Diesel engines can reach speeds of 103 mph with little difficulty. Intrusions into grade crossings can be reduced by 97 percent with median barriers. Smart growth goals of serving an additional 8-10,000 homes are good. Some routes will serve more than others.
- A participant commented on the Middleborough option, asking if the Wareham extension would still be precluded with double-tracking. He also asked how factors were weighted?
- Susan McGrath, East Taunton resident and abutter to tracks, noted that her home had been built before the rail line. She asked if the line is at-grade at Route 140 in Taunton? She

noted the sharp corner in East Taunton, river and grade crossings and proximity of the tracks to community ball fields. Traffic is already an issue in Taunton Center, near schools and for access to the mall. She asked about the station symbol at Old Colony Avenue? She is concerned about water resources, including brooks and tributaries and also about dangers to large animals from collisions with trains.

- Heather Lewis, South Easton, said she thinks the environment should be the most important criterion. She is disappointed with the alternatives presented. She doesn't think they are alternatives to the 2002 alternative, but are modifications. She expected something different. She noted that she has hiked on the abandoned rail bed and her son was able to float a toy boat on the bed even before the recent storm. Water on the rail bed is an issue.
- Doug Lewis, South Easton, also said environmental protection is the most important criteria, specifically water resources. The Stoughton alternatives pass near Easton drinking water wells. National attention about water resources is growing and it is a growth issue. Water can't be replaced. He asked about the decision-making criteria. What are the criteria and how are they weighted? What is the process to get to the next step in April? He would like to know more about the timeline and activities.
- A participant asked why the focus was getting people to Boston? Business is more mobile now and jobs should be kept local. The New Bedford and Fall River economies should be supported with local job generation.

Ms. Egan addressed the comments and question above. She said the train won't solve all the region's problems. There are many other initiatives taking place concurrently. It's not an "either/or" approach. Appropriate solutions will include many components. Initiatives to bring more jobs and appropriate development to the South Coast are already in the planning stages. The many initiatives must all take place in the larger context of regional economic development. She understands that some people don't think the money should be spent on the project, but she noted that Boston is the economic engine of the region and there must be access to that market.

Ms. Egan explained that there is no precise equation for weighting and evaluating the criteria. She said the public process is designed so the decisions can be made collectively, with a transparent process. People's wishes are taken seriously. Input from this series of meetings will be summarized and provided to the Interagency Coordinating Group, which includes 11 federal and state regulatory agencies. The decisions must be made within the context of environmental law. The agencies will consider the public's input when deciding which alternatives will advance to Phase 2. There are extensive wetlands and any alternative will have some environmental impact. Wetlands are highly valued. The recommended alternative must be practicable and the least environmentally damaging. Alternatives are also judged on how well they meet the project purpose.

Ms. Egan said she appreciates the public's thoughtful comments and the Interagency group will consider them as the group makes the decision on the short-list in April. Once the list is narrowed in April, the environmental review process – Massachusetts Environmental Policy Act/National Environmental Policy Act – will begin to develop a Draft Environmental Impact Report/Draft Environmental Impact Statement and a series of public hearings will be scheduled. Opportunities for public review and comment will continue throughout the environmental review process.

- Representative Canessa noted that it would be short-sighted to choose the Middleborough corridor and; therefore, exclude extensions to Wareham and the Cape. Extending rail to the Cape is important to the Senate President.
- A participant asked for confirmation that a third rail at Quincy is necessary to extend the Middleborough line to Wareham.
- Priscilla Chapman, Massachusetts Audubon Society, thanked Ms. Egan for recognizing the importance of the Assonet Swamp. She is disappointed that the Route 24 and 140 rail alternative is off the table. She urged the team to rethink the decision.
- John Walsh, Lakeville, has land that borders the Assonet Swamp. He said at the Berkley meeting there was no similar emphasis for the Assonet Swamp as there was for the Hockomock Swamp. He asked if private land is viewed differently than public land during evaluations?

Ms. Egan asked Mr. McArdle to review the Route 24 rail decision process, which eliminated the rail alternative. Mr. McArdle said there three types of rail systems that were considered, in addition to the highway alternatives. Commuter rail, heavy rail such as the Red Line and light rail such as the Green Line. Commuter rail cannot negotiate the topography and steep grades that would be necessary to fly over the interchanges. He said the Route 24 rail alternatives had many issues, including constructability and travel times. Land acquisitions would be necessary to build another travel lane to accommodate rail and automobile vehicles. Once at Route 128, the question becomes where to tie into the existing system. Requiring a transfer at 128 to the existing line wouldn't work because there is currently no capacity on the trains for additional passengers at that station. Tying heavy rail into Quincy Adams would require adding capacity to the Red Line to accommodate the additional trains. The light rail option is penalized because a transfer would be required to the Red Line, which increases the travel time. These reasons are the main ones for eliminating the Route 24 train alternative.

State and public resources were included in this phase, Ms. Egan said. The Assonet Swamp and other resources will be factored into Phase 2 evaluations. She said it's important for the team to view these resources first hand. Although a resource may not be on the 10,000 foot review level maps, all resources will be noted in Phase 2.

Ms. Egan addressed Representative Canessa's question about bundling the Wareham extension into the overall project. The Wareham extension to Middleborough would require triple-tracks at Quincy. The Wareham project has been discussed, but is not currently on the books. It has not been developed enough to warrant inclusion and possibly eliminate the Middleborough alternatives. The project team will keep the idea in mind and look at system requirements. She noted that there are many projects that have not been developed beyond the basic idea and they cannot be factored into evaluations. For instance, there is a proposal to widen Route 24, but it is not on the books and; therefore, cannot be used in this project's evaluation process.

In response to a question, Ms. Egan said that trip time is weighted and quality of service is important.

- A participant asked if, in determining cost-effectiveness, are ecosystem services considered?

Ms. Egan said she understands resource economics, but it is not part of the regulatory environmental review. The team did; however, look at the wetland impacts and found that mitigation costs did not change the ranking of any alternative.

- Doug Lewis, South Easton, asked what the dates of the ridership study were and what the current Providence/Boston trip time is? He said before the state spends $1 billion, it should know the ridership numbers. A clear answer has not been provided.

Scott Peterson, Central Transportation Planning Staff (CTPS), said that travel time ridership forecasting and competing alternative costs will be considered in Phase 2. He used 2000 Census Journey to Work data for this initial evaluation. Time and transfers were factored in. Transfers are viewed by passengers as more time consuming than they really take, which is why they make an alternative more unattractive to potential riders. Ms. Egan said the scoring matrices are on the website. More detailed ridership information will be available in Phase 2. The previous study in 2002 forecast ridership to 2010 the typical forecast period at that time. The new ridership forecast will be for 2016 to 2034, Mr. Peterson said. Ms. Egan added that the state knows there is a demand. Thousands travel back and forth between the South Coast and Boston, more than the 8,000 passengers the project will add capacity for. Mr. Peterson added that 80-90 percent of people commuting are driving. Changing land uses and other factors will increase the cost-effectiveness of the project. Cluster and other development patterns will add to the cost-effectiveness over time.

- A participant noted there is a lot of data. Stoughton's travel time is the best trip time. How much wetlands will be lost? Information on the impacts to water resources and MBTA assessments must be provided. Stoughton seems to be the best from a cost-benefit, cost-effectiveness perspective.

General session flipchart notes

- First stop at Bridgewater
- Why is there ridership lost on Middleborough?
- Do assessments to towns vary per alternative?
- What will be the grade crossing treatment?
- Will Wareham be impacted by New Bedford and Fall River trains?
- How will you weight the criteria as you go forward?
- Environment should be the top consideration.
- Disappointed that alternatives aren't different.
- Why aren't we developing local opportunities?

Freetown Meeting – March 12, 2008

Freetown Elementary School

Questions and Comments

Responses to questions and comments, where appropriate, follow bulleted groupings.
Names are provided where given by speakers.
Flipchart notes from general session discussion are also included.

- Lisa Pacheco, Freetown Selectman, said economic growth is important and it must be smart growth. Connections to the Riverfront Business Park and Fall River Industrial Park are important. The project should encourage migration from the north to the south for economic development, not just south to north migration. Both sides of Freetown should be served.
- Larry Ashley, Freetown Selectman, said an off-ramp and intermodal facility at exit 8 ½ are important and a transit-oriented development overlay should be prepared. He expressed concern about a layover facility in the center of Assonet at the site Boston Beer formerly occupied. There are abutting residential neighborhoods. The community does not want a layover facility.
- Donna Kulpa, Dighton, said she has advocated for years for transportation access for the elderly, low-income and disabled populations. She said station access should not be parking lot dependent. She also asked how the project would be funded.
- Jean Fox, Lakeville Selectman, said she works in New Bedford. There is an out-migration of workers; however, there has been some growth. The average income is lower. She said a north to south movement is important and noted more affordable land. Jobs should be kept local.
- Robert Raymond said he works in the Freetown Planning Department. The highway system hasn't changed much; however, traffic has increased significantly. He sees no way to relieve congestion except to build rail.
- Joseph Shaw, Freetown, noted that although there will be environmental impacts, the increasing dependency on oil for fuel must be addressed.
- Nuno Couto, Taunton, said he is for the project, but has heard on the radio that the train will provide access to the community for an undesirable population. He would like to see evidence of the anticipated economic growth.

Ms. Egan responded that it is unknown how much economic growth will result from the project. The issue is being studied now and the state is looking at ways to quantify the expected development. Most existing studies on economic growth are related to light rail systems (similar to the Green Line), not commuter rail. EOT has a team of specialists who are studying the issue. They are looking at appropriate station locations to attract new jobs, how much economic activity can be expected and how to tap into that growth to help pay for the project, and identifying priority natural resource areas. Results of the study are expected in summer 2009 and will include a suite of recommendations tailored to each community. The team has been meeting with Selectmen and others in each corridor community to learn about priority economic development and natural resource protection areas.

Ms. Egan noted that fare costs have not been set, yet. The project will be Americans with Disabilities Act compliant. The project will be designed so that feeder local services, such as

bus, will connect to the new system. The team will coordinate with regional and local transit providers to accomplish this.

Ms. Egan said that Census data was used to get origination and destination information for the region. She said the idea to bring jobs south, so there is a flow between the economies. She noted that Attleboro and Stoughton will stop at Back Bay, opening up that market. Middleborough will not stop at Back Bay.

Forecasting and planning out to 2030 is a short horizon, Ms. Egan said, but current transportation planning processes do not go out more than 20-30 years. It's important to look out as far as possible, but cost is an issue.

Additional comments and questions

- Martha Schroeder, Lakeville, said wildlife protection is important to her. If tracks will be upgraded, wildlife corridors and passageways should be incorporated. She hopes the state will do everything necessary to protect species, minimize the use of herbicides, etc.
- A Lakeville resident and member of FARE (Friends of Assonet River Environment) asked if a second track south of Taunton is needed, why must there be a split?
- Lou Gitto, Stoughton, asked EOT to consider short-term highway alternatives, so longer term infrastructure issues can be addressed over the next 10-15 years. In that time period, the bottleneck at Braintree could be broken. If the bottleneck isn't broken, economic growth along the Old Colony corridor will be stifled.
- Donald Michaud, Attleboro, said he lives near the bypass. He wants to know how the state will fund the project. He favors the train, but not through Attleboro. There is too much congestion on the Attleboro line. He said when Amtrak upgraded the corridor for the Acela, new rail beds and ties were laid. There is now more noise and vibration due to the cement ties. The Acela trains have different wheels and are quieter. He asked about ridership cost versus car travel. He thinks adding the Stoughton line will increase overall redundancy of the system.
- Donna Kulpa, Dighton, said she has concerns about paying for the project through bonding. There are already regional transportation agency funding issues. She said the Southeast Regional Transportation Association and others should join together to work out regional issues and ensure disparities in MBTA funding for the region are addressed. She added that the Taunton Disability Association had worked with CSX Rail to fix the grade crossing at Oak Street to make passage across the grade crossing easier for people with disabilities. She asked that similar improvements be made to other grade crossings.
- A participant asked about the possibility that the MBTA might purchase the freight lines in the southern end of the corridor from CSX.
- Nuno Couto, Taunton, asked about the level of state commitment to the project. Will it really be built and will it be on-time?

Ms. Egan said that state funds and bonds will be used for the project. There won't be one single funding source, but she is not certain at this time what the mix will be. The state expects to issues its funding plan in January 2010. It will report on the economic development study and funding mix. She agreed that regional transit funding is an important issue. She said the team is coordinating now with the Southeastern Regional Transit Authority and the Greater

Attleboro/ Taunton Regional Transit Authority, the regional agencies in the South Coast. EOT will coordinate with these agencies more during the project scoping in the next phase.

If the MBTA owned the freight lines, it would not necessarily need to double-track to New Bedford, for instance, Ms. Egan said.

Mr. McArdle responded to the comment about cement ties. He said they are stiffer than timber, so they generate more noise, but there are measures that can minimize noise and vibration. Timber ties and ballast mats could be used in sensitive areas of the corridor where new rail beds will be built or existing ones rebuilt. The team will conduct a noise and vibration study in the next phase. Baseline noise will be measured by monitors and would then be modeled to forecast noise and vibration with trains.

Ms. Standley responded to the question about wildlife protection measures. She said embankments that are currently barriers to passage could be made more permeable. The project would provide an opportunity to rebuild existing culverts. Currently they do not have shelves, so only fish can pass. The Army Corps of Engineers, MA Department of Environmental Protection and MA Natural Heritage and Endangered Species Program will work with the team on wildlife mitigation issues.

Ms. Egan noted that automobile costs generally average about $7-$8,000 per year for fuel, maintenance, etc. On a personal note, she said her monthly commuter rail pass costs $180 for Zone 4. Her automobile costs are about $500 per month. It's universally known that public transit is more cost-effective. She added that both public transit and private automobile travel are subsidized.

In terms of level of commitment, Ms. Egan noted that the state had completed the Plan for Action for the South Coast project within 90 days. She was hired as a dedicated staff person for the project, which is on schedule. She said she can't guarantee the project will be built, but the state has a great team working on it and she wouldn't have taken the job if she didn't believe in it.

Additional discussion

- Barbara Boone, North Easton, asked who the ultimate decision-maker is? *The Army Corps of Engineers is the ultimate decision-maker on the alternative selected, Ms. Egan said. The Corps co-chairs the Interagency Coordinating Group and will determine the LEDPA. The Corps takes public input very seriously. It will be up to the Legislature and Administration to identify and secure funding.*
- Robert Raymond, Planning Department, asked how environmental and human impacts will be weighed, such as takings, noise, etc. *Ms. Egan noted that the decision will be made within the framework of environmental law, but the agencies are not indifferent to human impacts. Phase 2 will look at and weigh grade crossings, noise, construction and other impacts. Mr. Anacheka-Nasemann, US Army Corps of Engineers, said the Corps will issue a public notice when the permit application is submitted. Public interest is included in the review. The Corps must balance myriad interests and look at other issues such as impacts to historic properties, safety and economics. He said no decision will satisfy everyone.*

- A participant is concerned about administration changes and the impacts to the project timeline. *Ms. Egan said that she was appointed to this new position and given the resources to further the project. Mr. Anacheka-Nasemann said that the Corps is a department within the Defense Department run by a Colonel and Lieutenant Colonel who serve three- year terms. He noted that he has been working on the project since 2001 and there are standards in place for those who follow him.*

General session flipchart notes

- Smart "Growth" is important
- Impacts on environment twenty years from now may well be greater without rail.
- Studies on Economic Growth
- Why double track New Bedford if there is no freight.

SOUTH COAST RAIL

Summary Notes - January 2008 Civic Engagement Meetings

At the second round of civic engagement meetings for Phase 1 of the project, we asked the question: What do you think of the proposed alternatives and evaluation criteria? Regional meetings were held in Norton on January 15; in Fall River on January 16; and in Easton on January 31. This packet includes a summary of the presentation made at all of the meetings and a list of the issues raised by the participants.

THE PRESENTATION

1. Project Background

The Executive Office of Transportation South Coast Rail Manager, Kristina Egan, presented the overall project background and used a PowerPoint presentation to highlight her key points (a copy of the presentation is available at www.southcoastrail.com or by request in print from EOT). The presentation included an explanation of the project as well as the purpose of the meetings. The civic engagements are opportunities to update the public on the project as well as to gather public input by specifically asking communities: *"What do you think of the proposed alternatives and the evaluation criteria?"*

Ms. Egan presented the project purpose, which frames the planning:

> To more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts to enhance regional mobility, while supporting smart growth planning and development strategies in affected communities.

Ms. Egan noted that southeastern Massachusetts is the fastest growing area in the state. Governor Patrick's administration is addressing this growth and a number of other goals, including: restoring public transit to the cities of Fall River and New Bedford and improving mobility and transportation choices in the region; reducing congestion and improving highway safety; reducing air pollution and addressing climate change; stimulating job growth; revitalizing the South Coast cities; and preserving natural resources. The project has a long history, and a Final Environmental Impact Report identified a preferred alternative in April 2002. In April 2007, Governor Deval Patrick released a Plan for Action for the project to include (1) a civic engagement process, (2) a corridor plan to develop a smart growth approach and assist cities and towns with preservation and priority development planning and (3) a thorough environmental review process.

The Patrick-Murray Administration also committed to taking a fresh look at the alternatives, and evaluating several different transportation routes along which the project could be built. To conduct this analysis, the Executive Office of Transportation in partnership with the Massachusetts Bay Transportation Authority (MBTA), is undertaking a two phase environmental review. Phase 1 is a six-month period in which EOT is listening to public suggestions on alternatives and evaluation criteria. This phase takes place between October 2007 and March 2008. Up to 6 alternatives will enter Phase 2, an in-depth environmental investigation and public review of the alternatives. The investigation will take two years, from 2008 to 2010, resulting in the choice of a final mode, route, stations and layover facilities. Permitting will begin in 2010, with construction to begin in 2012. Service start-up is planned for 2016.

Ms. Egan said that during this fresh look, there will be a coordinated federal and state review of the project, which was not the case before. The Army Corps of Engineers is the lead federal agency and the regulatory agencies (11 in total) are working together on the state and federal review. The Army Corps issues a permit only if the alternative chosen is the Least Environmentally Damaging Practicable Alternative (LEDPA). This decision is made by the Army Corps with input from other agencies and the public.

Ms. Egan reviewed the civic engagement process and said that the next set of meetings, in March 2008, will focus on presenting the draft findings of a preliminary analysis of the alternatives to the public and gathering comments. It's clear that EOT heard the public: after the December meetings, EOT had a list of 60 route and transportation mode alternatives and 37 major evaluation criteria categories. There are four main routes: through Attleboro, Middleborough and Stoughton or via a highway.

Ms. Egan turned to Mike McArdle, the lead consultant to the state on this project, to present the transit modes and alternatives and the evaluation criteria.

2. Project Alternatives and Evaluation Criteria – VHB, Inc.

Mike McArdle presented the project routes with each of the various modes of transportation being considered from New Bedford and Fall River to Boston, which addresses the project purpose. Mr. McArdle first presented the different types of transit modes: commuter rail; diesel multiple unit commuter rail (known as DMUs); light rail (like the MBTA's Green Line); heavy rail (like the Red Line); monorail; electrified commuter rail; bus; bus rapid transit; and a busway in a high occupancy vehicle lane (HOV lane).

Mr. McArdle reviewed the potential different corridors using a series of maps. Many of the corridors use existing rail tracks or beds, such as the routes through Attleboro, Stoughton and Middleborough. Other options use a former rail corridor from Taunton to Mansfield and one from south of Taunton to Attleboro. Enhanced bus service for Route 24 is an alternative. The monorail would use the existing highway corridor up Route 24. Some of the options may not fit the project purpose, such as going to Providence. Because many of the 60+ alternatives were permutations of the same alternatives, the team consolidated them to a list of 35. (Note: handouts showing all of the alternatives are available on the project website.)

Mr. McArdle described the process of applying the criteria to the alternatives. This will take place in three steps, in sequence. The team will ask:

1. Does it meet the project purpose? (Step 1)
2. Is it practicable? Is the alternative feasible to build; will it operate efficiently and does it make sense? (Step 2)
3. How do the environmental impacts compare? (Step 3)

At Step 1, does it meet the project purpose, the team will ask if an option improves regional mobility and quality of service. At Step 2, the question of practicability involves improving existing and planned regional system capacity, reliability and quality; compatibility with existing infrastructure; providing benefits at a reasonable capital and operating cost; ability to be constructed within a reasonable timeframe and without substantial impacts; and providing sufficient capacity to meet demand. At Step 3, the team will compare the magnitude of impacts to the natural environment and the consistency of the alternatives with smart growth. This includes approximating the level of wetland loss, estimating the number of stream crossings and number of acres of Priority Habitat affected, as well as the number of acres of protected public open space that would be directly impacted. Mr. McArdle noted that this work will take place on a broad level, with detailed information to be gathered and shared with the communities during the in-depth environmental work of Phase 2.

In closing, Mr. McArdle said the team will use an evaluation system with five ratings: highly favorable, favorable, neutral, unfavorable and highly unfavorable.

Norton Meeting – January 15, 2008
J.C. Solmonese Gym
Questions and Comments

- Chair Robert Kimball, speaking for the Norton Selectmen: The Town of Norton Board of Selectmen, as well as Mayor Crowley of Taunton and Mayor Dumas of Attleboro, are opposed to putting a train track in their communities. They are unified against the Attleboro/Norton route. They pointed out that using the local right of way will require raising the elevation of the electric poles. They are also opposed to the alternate route due to newly developed subdivisions in both Norton and Attleboro. The town has voted to set aside a fund for legal action.
- Representative Betty Poirier: The route will severely degrade the corridor along the route, and she stated her opposition to the alternative Attleboro/Norton route.
- Representative Jay Barrows: He agreed with Representative Poirier that Attleboro is not the most practical route. Speaking to the alternative route numbers 11, 12, 13 and 62, he said that the Old Colony was abandoned in the 1960s and a new sewer line now runs along this route. In addition, the federal government just invested in a $600,000 bike trail, which is extremely popular. He expressed concerns about the capacity - with 17 trains per day and the Acela on the line – and said he hopes that common sense will prevail.
- Senator Jim Timilty: He requested that EOT take the Attleboro alternative off the table since it has 15 at grade crossings. He agrees with his colleagues in the House and Senate, as well as his local constituents, in opposing the Attleboro alternative.

- Representative Steve D'Amico: He appreciates the Army Corps taking the time to look at all the alternatives, no matter how unreasonable they may. This phase started with 60 alternatives, now consolidated down to 35, many of which will be eliminated within the next round. He expressed confidence that as EOT takes a closer look at the Attleboro route with the all of the grade crossings and with the increased time, this route will fall by the wayside, but he supports looking at all of the alternatives.
- City of Attleboro, Mayor Dumas: The City of Attleboro, the Town of Norton and the City of Taunton, and the surrounding communities are opposed to the Attleboro route. It does not provide any economic benefit for any of our communities. He went on the record that these entities are not in favor of this route.
- Town of Norton Conservation Commission Agent, Jenn Carlino: Mass GIS mapping does not clearly show the extensive wetlands along the Attleboro route. Wetlands in this area are underestimated. How will the evaluation address the floodplain impacts? She didn't notice if this will be included in the river and stream portion? Ms. Egan said the floodplain impacts will be addressed in Phase 2. Ms. Carlino said that Chartley Pond is owned by the Conservation Commission and will fall under the protection of Article 97.
- Representing Mayor Crowley, his assistant, Todd Castro, read a statement: The Mayor and the Municipal Council of Taunton have unanimously gone on record to support the Stoughton Route, where there are only five (5) at grade crossings within the city limits, and oppose the Attleboro Route due to tremendous impacts of the fifteen (15) at grade crossings. Stoughton routes have been going through the Hockomock Swamp beginning at or around 1847, locomotives ran through the area for over 110 years. Locomotives at that time were far more environmentally unfriendly then those being utilized today. We are therefore adamantly opposed to the Attleboro Route.
- Dan Domdery, City of Taunton Planning Board: the Stoughton Route is vitally important economically to the City of Taunton and City of New Bedford, so we support the Stoughton Route over the proposed Attleboro alternative.
- Selectmen Town of Mansfield, George Dentino: the Town of Mansfield opposes the Attleboro line because it serves no purpose for us. He understands the purpose of looking at a number of alternatives, crossing them out one by one, but he respectfully asked EOT to cross out the Attleboro route first, then go on from there.
- Norton Selectmen Tim Giblin: Don't waste money on studying this route; spend the money instead to help the communities with schools, municipal police and fire.

Other comments and questions:

- Heather Graf, Citizens Concerned About Tracks (CCAT) coordinator: the Project Purpose does not include the City of Taunton. The Criteria does not mention the MBTA Service Policy.
- Norton resident: Create one type of active service to get us there. Concerned about the impact on safety with the many rail crossings and environmental impacts.
- Norton resident: Attleboro should not be allowed; it has fifteen (15) at grade crossings and will cross over Chartley Pond. This can't be environmentally feasible.

- Attleboro resident, Ken Zanoni: He expressed concerns surrounding his property value, the power lines and the wetlands, and safety. He has questions about the overall safety and how this process is going to address this issue.
- Larry Garrone: Step one project purpose – a lot that needs to be defined there.
- Mansfield resident: On the short list, step three, will the project be linking impacts to the environment with smart growth? One suggestion is to add a Step 4, which would assess the impact to human environment to address issues that people are talking about tonight.
- Chuck Murray, Norton: Broad description of north-south 195 as arteries, mobility, environmental impact statement, land taking and impact to grade crossings. Mike McArdle addressed this question, Route 24 varies in cross section, some sections have a medium barrier, some have no strip at all, but there may be opportunities to use one side or the other.
- Chris McGowan, Mansfield: Concerned as to when alternatives number 11-14 and 62 became official part of the process. They have a significant impact to the community.
- Mansfield resident: MBTA will want to cut out 20 minutes of the commute, spending 51 million dollars to make it user-friendlier.
- Norton resident, Ed Kelly: How much of the inter-regional process is being driven by casino in Middleborough? Will the train and casino be considered in tandem at some level since the casino will have an impact on this project?

Q: How does the project team evaluate the human impact of the project?
A: Ms. Egan: In Phase 1, some of the environmental impacts that are being reviewed have implications for public health such as drinking water, habitat, climate change. Phase 2 will take a more in-depth look at the safety and quality of human impact. Mike McArdle added that when going through the state review, the consultants will be looking at noise and vibration impacts, traffic impacts, safety impacts, and impacts to property values to mitigate these issues.

- Norton resident, Ron O'Riley: In item 3.1, Wetlands, won't be looked at in-depth until Phase 2. EOT should look at wetlands in Phase 1. There are a lot more wetlands that are shown on MassGIS as well as many vernal pools. Since some alternatives could be eliminated in Phase 1 under these types of criteria, EOT should not wait until the second phase to review these important issues.

Q: How will the route cross Route 123?
A: Mike McArdle mentioned that the consultants will look at the possibility of going over and under it. This will happen in Phase 2. In this phase, the team will be looking at conceptual cost of the alternatives.

- Jay Barrows: The 2.75 mile extension goes over Chartley Pond, and it goes in or over Route 123, and the National Grid power lines will need to be raised. There seem to be many issues surrounding this alternative.

Q: Norton resident, Paul Nelson: How many alternatives will the environmental review look at?

A: The process will narrow to 5 or 6 alternatives in depth. The team cannot study 35 alternatives at an in-depth level.

- Norton resident, Lyle McBride: At the risk of being up popular, he suggested that many of the plans through Stoughton, Taunton or Attleboro could be good for Fall River and New Bedford. This project could enhance inter-regional communication with "local transportation" since not everyone wants to go to Boston. But the Attleboro Route would make it easier to provide access to the Providence airport. A lot of local driving age people – young and old - don't drive, which means they are dependent on the kindness of strangers.
- A speaker suggested a strong need to lean toward rail, due to a future with high fuel costs.
- Bridgewater, Bob Wood: A good book on the history of railroading is covered in *Men, Cities and Transportation*. He suggested that rail up the median strip of the highway is not feasible due to the number of accidents that happen along our major highways.

Q: What is the anticipated ridership? How much money will be spent on this study?
A: EOT will be using the Central Transportation Planning Staff (CTPS) to model the ridership using census data. In Phase 1, this will be a relative ranking. In terms of cost, the study and environmental work have an estimated cost of $17.2 million, with $3.2 million being spent this year, $0.5 million of which is being used to do a study to help communities along the entire corridor prepare for the train and the growth impacts that are expected.

Q: Since the Boston to Middleborough line goes further south, what is the ridership on the Middleborough line? Why can't the existing freight line be used?
A: The consultants are currently looking at the existing freight line, but the issue on the Middleborough line is from Braintree north to South Station where there is a single track.

- Currently there is no parking available at any station!

Q: You don't have the number for what ridership will be? Do you have the census data from Fall River and New Bedford of people that work and drive to Boston?
A: Once the modeling is complete, there will be more accurate data to share with the public.

Q: Is there a no build option?
A: There is a no build option built into the alternatives.

Q: In order to finance the project, doesn't the project need legislative approval to do the bonding or funding?
A: Ms. Egan said that is correct as far as the budget and funding process.

Q: Ms. Egan was asked to define regional mobility? The project needs to add a definition of region.

A: The study area includes all the area from Canton south and east, west from Middleborough to Attleboro. The region includes 31 cities and towns.

Q: Will the towns have to pay an MBTA assessment fee?
Q: How much money will the project cost per rider?
A: The team will look at overall cost per rider to compare the lines and routes.

Q: Will the work include an evaluation of the subsidy/rider operations?
A: Every transit line in America is subsidized to some degree.

- New Bedford Mayor Scott Lang made closing comments. He reaffirmed the need for transportation to the City of New Bedford to serve the largest number of people for the least amount of cost. He thanked everyone for the opportunity to hear about their concerns.

Fall River Meeting – January 16, 2008
Advanced Technology and Manufacturing Center
Questions and Comments

This meeting was hosted by the South Coast Commuter Rail Task Force.

- Dan McGaffy, Rochester Board of Selectmen: Triangle feature is important with the connection from New Bedford to Providence. The feeder system is critical for fixed routes; people will need a way to get to the rail without driving due to parking constraints. SRPEDD is also aware of the increased demand on Route 495 as well as the casino impact. Grade crossings will need to be addressed.
- Bob Carney, Dartmouth Board of Selectmen: I would be concerned about time and construction and expense of monorail and rail.
- Lisa Pacheco, Freetown Board of Selectmen: Freetown's exit 8 ½ and the construction of the layover or station site in the same area may cause traffic problems and constraints.
- Heather Graf, CCAT: Our position is to support re-establishment rail service to the Cities of Taunton, New Bedford and Fall River, while we adamantly oppose the Attleboro alternative.
- John Bullard, Southeastern Commuter Rail Task Force: Climate change is an issue that should be taken into account. It is important to measure relative carbon emissions from the different alternatives. We should also be planning to power the trains with cleaner fuels and technologies that mitigate climate change. We should also plan to adapt to climate change and be mindful that we locate stations in places that won't be impacted by sea level rise.
- Nick Morrison: You should take into consideration time/speed of travel. Not only the speed of the train but the estimated total commute time for someone in the southeast to get to Boston and home.
- Roland Hebert, SRPEDD, New Bedford resident: Ridership should take into consideration shorter rides and stops in between the south and Boston, for example New Bedford to Brockton. Capture all regional rides.

- Lou Gitto, Stoughton: Consider the cost of energy in the future and how that may affect increased ridership.
- Robb Johnson, The Nature Conservancy: Middleborough alternatives should include an option that does not require the train to back-up into Lakeville due to the delay that incurrs. Some alternatives will reinforce bad growth patterns. Induced growth and impact traffic, secondary growth impacts, should be considered.
- Richard McCarthy, Town of Raynham Planner: Monorail on highways would make serving towns difficult, especially developing in a smart growth way. Foster smart growth principles for land use planning.
- Priscilla Chapman, Massachusetts Audubon: Thank you for allowing due process for considering alternatives for the South Coast Rail project. It is important to follow the Army Corps of Engineers process to get at a practicable alternative, but we are hoping that you do not eliminate alternatives that would be less environmentally damaging in the first phase if you go from 35 alternatives to 6. How will you define demand? Mike McArdle gave a brief overview of how this will be defined.
- Sue Peterson, SRPEDD Commission: We could improve wetlands with the rail project. Especially taking a closer look at wetlands restoration/improvement. By creating a net/net benefit since not all of the wetlands have been damaged equally.
- Edgar Adams, Roger Williams University: Development patterns that would be encouraged by different alternatives should be considered in the criteria. Clarify smart growth criteria and how will this be measured. Expanding highways will worsen habitat loss.
- Philip Viveiros: Alternatives need clarification within the criteria for Station level development potential (around stations). As well, integrate and enhance local bus service, including GATRA and BAT.
- Jim Soule, Fall River: Station sites for Fall River and New Bedford should take into consideration sea level rise. Weaver's Cove in Fall River should be considered as a station site.
- Tony Macedo, Raynham: Monorail up Route 24 could have potential problems for route and station sites along the highway. Mike McArdle gave a brief overview of how Route 24 currently exists.
- Chris McGowan, Mansfield: Had a question concerning the location of the station site in Fall River near the Heritage State Park.
- Nick Morrison: What will be the total cost of fare? Pricing of fares needs to be addressed. People will not use it for commuting purposes if it is too expensive and only want to use if for recreation.
- Robb Johnson, The Nature Conservancy: In the process of evaluating will there be a scale or weight? We shouldn't have only one form of power considered for alternatives, competitive with future.
- Carolyn LeMarre, Taunton River Watershed Alliance: Could you post GIS maps, land use on the web-site?
- John Bullard, Southeastern Commuter Rail Task Force: Consider sequencing a solution for changing fuel sources.
- Roland Hebert, SRPEDD: Have financing deficit for transportation. By waiting until 2010 puts project in competitive disadvantage. We should support the Cabral Bill as way to help fund the project.

- Anthony Cucchi, The Trustees of Reservations: In terms of mode of transportation with the changing technology maybe an adaptability or retro-fitting of mode could be incorporated into the plan.
- Dave Farmer, Attleboro resident: Consider carbon footprint, pricing and initial screening with stage-by-stage implementation and how this can be converted.
- Lou Gitto, Stoughton: Consider subsidy in context of future costs of travel. When you define cost/rider and fares, consider full cost of service. By stating the full cost of service and the subsidy/rider.
- Robb Johnson, The Nature Conservancy: To address Roland's previous comments concerning a finance plan, I vote for moving it up and the administration should come out with a plan before 2010. A tremendous amount of expectations have been raised, but how will we pay for it? Speed up finance plan.

Easton Meeting – January 31, 2008
Southeastern Regional Vocational Tech School
Questions and Comments

Key Points Raised:

- An appreciation for the fresh look and the review process; the importance of due process in evaluating and choosing an alternative
- Decision should be based on analysis and not politics
- Impacts on municipal and private wells, groundwater, water quality. Put more weight on water supply impacts.
- Concern about safety and children
- Concern about whistle noise
- Concern about grade crossings and impact on traffic flow
- Concern about adequate mitigation to property owners on and near the rail rights of way
- Do the ridership figures make the project practicable? Quantify demand, existing and future.
- The possibility of freight trains adds another level of environmental concern
- Abutters are nervous about nighttime freight
- This is an economic development project
- Location of layover facilities
- 15 grade crossings in Taunton, with 11 of them within a 1 ¼ mile radius
- Norton bypass route has two wildlife preserves that span about ½ mile, plus part of Chartley Pond, an area with about a mile of conservation restriction along the right of way.
- The Mansfield sewer line runs beneath the old Mansfield line.
- Protecting large, unfragmented ecosystems—such as the Hockomock--is an important stated priority for the State
- There are 15 historic properties affected by the Stoughton route plus the potential for historic finds in the Hockomock during construction

- A number of trees would have to be cut down, just along the Pine Oaks Golf Course
- Support for a monorail along Route 24
- Support for the Middleborough alternative
- Impact of possible casino location (access for jobs and tourists)
- No diesel. Plan for future use without fossil fuels.
- Travel cost of the train for consumers vs. quality of service received
- Capacity of the rail line up north and at South Station
- Cost/benefit of the Stoughton line vs. cost to upgrade between Braintree and Boston
- Funding the project and the financial impact on the communities. Effect on Local Aid and local MBTA assessments.
- Consider disability access in all planning
- Consider air rights above stations, if possible
- DMUs have more flexibility
- Request to send MBTA assessments for Bristol County communities to the Easton Board of Selectmen

SOUTH COAST RAIL

Summary Notes – November/December 2007
Civic Engagement Meetings

At the first round of civic engagement meetings for Phase 1 of the project, we asked the question: What new alternatives should we consider and how should we evaluate them?
Regional meetings were held in Berkley on November 28; Stoughton on December 5; and Dartmouth on December 6. This packet includes a summary of the presentation made at all of the meetings and a list of the issues raised by the participants.

The Presentation

1. Project Background

Kristina Egan, South Coast Rail Project Manager, Executive Office of Transportation, opened the meeting and used a PowerPoint presentation to explain the project. **[Please note that the PowerPoint is available at www.SouthCoastRail.com in its entirety. The presentation is abbreviated here.]**

Ms. Egan explained the goals, purpose and history of the project. The first round of civic engagement meetings – these three and other community, neighborhood and business presentations - are opportunities to give the public updates on the project and to gather public input by specifically asking two questions: What new alternatives should we consider and how should we evaluate them?

Ms. Egan presented the project purpose, which the entire project flows from:

> To more fully meet the existing and future demand for public transportation between, Fall River/New Bedford and Boston, Massachusetts to enhance regional mobility, while supporting smart growth planning and development strategies in affected communities.

Ms. Egan said that the project has a long history and a preferred alternative was identified in a 2002 environmental document. Governor Deval Patrick announced a new plan for action in April 2007, and this new look at the region includes wide ranging civic engagement, a Corridor Plan and a new Environmental Review.

The planning includes both a state (MEPA) and federal (NEPA) environmental review process. The Army Corps of Engineers co-chairs the Interagency Group with EOT. The Corps uses a methodology known as the Least Environmentally Damaging Practicable Alternative (LEDPA); it can only issue a permit if the alternative is one that can be built with the least damage to the environment.

The Project Goals include serving the South Coast; improving mobility in the region; reducing congestion and improving highway safety; reducing air pollution and addressing climate change; stimulating and channeling job growth; revitalizing the historic cities in the region; and preserving natural resources.

The Corridor Plan will help identify station locations and areas for natural resource and historic preservation. The project will also provide technical assistance to the communities so they can develop and implement land use changes.

Ms. Egan said the project has two phases. In the first six months, EOT is asking questions, collecting and examining data and conducting an alternatives analysis. The schedule for the alternatives analysis calls for three rounds of public meetings in Nov/Dec 2007; Jan/Feb 2008; and March 2008. The in-depth environmental review, which will take two years, begins in April 2008. The Corridor Plan results are slated for release in April 2009, with Priority Development and Preservation Areas designated in October 2009. A project financing plan will be released in January 2010. The alignment, station and layover facility locations and environmental document will be completed in 2010, when permitting will begin. Construction will begin in 2012 and service is scheduled to begin in 2016.

Ms. Egan asked Mike McArdle, Project Manager for the Vanasse Hangen Brustlin, to present the current list of alternatives and the Evaluation Criteria.

2. <u>Project Alternatives and Evaluation Criteria</u>

Mike McArdle outlined the project corridors and alternatives that meet the project purpose. He reviewed the potential modes under consideration, including: enhanced bus routes, bus rapid transit, light rail, heavy rail, commuter rail, and monorail. Mr. McArdle used a series of maps to review the different corridors that have been considered in the past, as well as new ones. Many of the routes use existing rights-of-way, such as the Attleboro, Stoughton and Middleboro corridors. Two other options would use a former rail corridor from Taunton to Mansfield and one from Myricks to Attleboro. The monorail

would use the existing ROW up Route 24. Heavy rail would also be taken into consideration for transit through Middleboro, Attleboro or Stoughton. Mr. McArdle said the team was collecting suggestions for alternatives at this series of meetings. Then evaluation criteria will be applied to the alternatives to screen the list to a manageable number for the environmental review.

Mr. McArdle reviewed the steps in the review of the alternatives. The team is asking questions at each step and will rate the alternatives on how well they perform at each step. The questions include:

1. Does it meet the project purpose?
2. Does it make sense, cost effective, etc.?
3. Environmental impacts

Some options will drop out at Step 1 if they do not meet the project purpose; for example, rail to Providence. At Step 2, practicability involves compatibility with existing infrastructure; proving benefits at a reasonable capital cost; ability to be constructed within a reasonable time frame and without substantial impacts; and the ability to meet travel demand in the region. At Step 3, the team will compare the magnitude of impacts on the natural environment and the consistency of alternatives with smart growth goals. This includes estimating the level of wetland loss, the number of stream crossings and Priority Habitats affected, as well as the number of acres of protected public open space that could be affected. Mr. McArdle noted that these will be high level estimates, with detailed information, including wetlands mapping and flagging, to be completed in Phase 2. Mr. McArdle reviewed the evaluation system for the ratings, which includes five levels: highly favorable, favorable, neutral, unfavorable and highly unfavorable.

Berkley Civic Engagement Meeting
November 28, 2007

Questions and Suggestions

- There were suggestions on how to advertise the meetings in the communities and share project information: including providing more lead time for press releases; notifying cable stations; asking Selectmen to announce the meetings; sending notices to the Councils on Aging in the region.
- Meeting participants suggested locating state facilities in the South Coast region; appointing a Transportation Czar to coordinate all transportation facilities; finding ways to encourage economic development in the region.
- Regarding Evaluation Criteria, speakers suggested that the alternatives should be: time efficient; more appealing; use the most direct route and not involve a transfer; be efficient – trains go both ways, multi-fundamental approach; be "Not so pie in the sky" (cost effective); consider affordability – fiscal burden on towns, tax payers, consumer, and municipalities; encourage Smart growth; use right of ways, especially Route 24 – least environmentally damaging. More people should be encouraged to work at home.
- A monorail up Route 24 would be the most visible route (people sitting in their cars stuck in traffic and seeing the monorail go by could be prompted to use transit).

Questions/Comments:

- How many crossings and trips in Berkley?
- Rep. Sullivan noted the long history of the project and expressed hope that there will be a good solution that considers the issues fairly.
- $1.5 million being spent on this project when there have been buses 5 years ago.
- Given problems with route 24, there is a strong need for other transportation alternatives for southeastern MA.
- On Route 24, Route 140 and Route 44 there are accidents daily, so this is for the South Coast region as well.
- 32 trains/day in Berkley at the two grade crossings already.
- Lakeville is seeing growth related to the rail, the other communities will see it as well (20% of most trips are shopping, and errands, highest traffic time is related to schools).
- Is there something in it for Berkley? Where will the closest station be?

- Rail drives economic development in region, this could be good for our region in terms of safety with more owner occupied housing.
- Why did Taunton get dropped from the project purpose?
- Monorail?
- High level, not detail oriented, three step process.
- 45 minute drive to Boston, time factor for people to get to Boston needs to be appealing - if not, they won't use transit.
- Commuter rail, bus service, not one exclusive answer to the problem – highway, bus service, commuter rail, encourage institutions of the state open facilities in Southeastern Mass. Too much in Boston, make jobs here to cut down on traffic. Need a Traffic Czar.
- Direct route, no transfers, one seat ride – positive factors to include.
- Looking at all alternatives, system needs to evolve and move forward. Train should go both ways.
- The state has to specify the financial burdens on taxpayers, towns/city, etc.
- If Smart growth is the goal, then consider monorail on Route 24 using existing highway rights-of way, which will be less environmentally damaging. Rail would be damaging to the Hockomock Swamp. Berkley was one of the most impacted towns with the least benefit the last time the project was considered.
- People should work from home, don't encourage people to drive/work to Boston. The speaker predicted that 90% of the riders will be going there (Boston), with 10% coming to the South Coast. The $1.7 million should be spent on economic development.
- What happened to the past plan? Don't redo what has already been done.
- Eliminate the alternatives being bandied about - there are already 39 now. Eliminate alternatives which do not achieve the project purpose which should be: providing safe, efficient, reliable commuter rail service fro southeastern Massachusetts from Taunton to the seaport cities of New Bedford and Fall River, to meet the demand for public transportation between the south coast and Boston. Next, do an operational analysis and eliminate the options that are not practicable and those that simply do not work (namely, the proposed "Attleboro Alternative"). This exercise seems to be a waste of time and money, and these energies could and should be spent more productively. The south coast rail project appears to be going backwards instead of moving forward.
- The use of Route 24 monorail could dovetail with proposals for federalization of 24, perhaps with matching funds. Safety – rail crossing should be considered.

- Pricilla from Mass Audubon: Appreciated the open and fair process that is being conducted.

Stoughton Civic Engagement Meeting
December 5, 2008

In general, responses to the questions were provided by Project Manager Kristina Egan, EOT, and Mike McArdle, VHB:

Q: Does the project include improved service in and around these communities in addition to service to and from Boston?
A: Yes, the state will be looking at coordinating and improving public transportation connections to the future service from this region to Boston.

Q: Will this provide weekend service from Stoughton to Boston?
It was decided this suggestion would be included under project criteria.

Q: What would the building of a Casino in this region do to the location of the route?
It was decided this suggestion be analyzed as part of the smart growth corridor plan.

Q: Does the state have a preferred alternative at this time?
A: No, the state does not have a preferred alternative at this time. A brief history of the previous studies and permit was outlined and it was mentioned that Gov. Patrick is committed to the project.

Q: Howard Hansen, Stoughton Town Moderator, asked about east - west connections. Will the project bring people where they currently going or where they may be going in the future?

A: Improvements to feeder transit systems will be investigated as part of this project. There has also been mentioned, at a previous meeting: light rail being run from Fall River and New Bedford to Taunton, as well as light rail to Attleboro and/or Middleborough from Taunton and finally improved bus service between Fall River and New Bedford.

Ms. Egan noted that the South Coast is the fastest growing area in the state and the Administration is promoting smart growth as part of this transportation project to help communities plan transit oriented development and to protect priority preservation areas. She said that the current 41 possible alternatives will be reviewed and a short list of two to six possible routes would go through the permitting process.

Q: Why not build a Vancouver style system?

Q: What about a elevating the track? Similar to what happened to the Long Island railroad in the late 1960s and early 1970s. Then there would be less impact to the community such as grade crossings.

Q: What about the cost to the riders?
A: This will not be determined in this phase, although cost effectiveness is a measure.

Ms. Egan collected a list of Alternatives and Criteria suggestions. They included these Alternatives:

- Commuter Rail on Route 24
- Building a system similar to Vancouver's SkyTrain
- Elevating the railroad similar to what was done with the Long Island Railroad
- Expand existing park and ride lots and widen Route 24
- Do nothing (what happens if we do nothing?)
- Expand platforms to existing commuter rail stations and use light rail to bring people to the existing system
- Use the $1.4 billion and invest in video conferencing technology and promote people to work from home
- Extend Red Line south from Braintree to Middleborough
- Electrify commuter rail
- Build a combined bus /rail transit system to Boston and Providence

Evaluation Criteria to consider included:

- Expanded weekend service for Stoughton
- Safety
- Avoidance of hazardous waste sites
- Economic impact to the local communities
- Most traffic from Route 24 goes west on Route 128 (commuter rail to Boston does not address this)
- Detail the economic benefits to the people of Fall River and New Bedford
- Evaluate the changes from global warming and the impacts to water quality
- Consider noise (Middleborough layover, idling locomotives are very loud); also, elevating tracks may not be a good thing because of noise.
- The number of cars projected to be taken off the road versus the cost
- The ease of the commute
- The time of the commute
- Cost to riders
- Research and pursue non-diesel technology
- Ensure not putting too many trains on any one line
- Quality of service for commuting between communities along the line
- Ability of the region to compete economically in a global market
- Operations and maintenance costs over the useful life of the project
- Compare against highway expansion and repair costs
- Compare against increased gas prices
- Service frequency per hour, not per day

- Service flexibility
- Cost of moving more people out of the city into region, even if they go into smart growth developments they will still need and use cars
- Vehicle miles traveled
- Long-term operating expense
- Providing enough parking (some towns are restricting parking to residents only)
- Protection of drinking water supply wells
- Free parking
- Impact on South Station
- Cost of relocating business to Fall River and New Bedford
- A report on the impact of requiring transfer from one mode to another
- Whatever route taken, what are the impacts to the other parts of the system

Other comments included:

- John Anzivino noted that three of Stoughton's wells that supply 60% of the town's water are directly abutting the old railbed. He also raised a concern about freight service and noise.
- Cynthia Walsh noted that the route taken should get the residents of Fall River and New Bedford to Bridgewater State College. The Casino and other economic developments should be considered in locating the route.
- Kyla Bennett felt the visual impact of service (either rail or monorail) speeding along side or up the middle or Route 24 would be greater on commuters who were stuck in traffic than service hidden in the Hockomock swamp.

Dartmouth Civic Engagement Meeting
December 6, 2007

Overall questions/statements:

- Currently, there are too many options on the table.
- When is the next interagency meeting?
- When will we get answers?
- Not enough time to review material before next civic engagement meetings in January.
- How will you deal with existing delays when it already will take a 1 hour 15 minutes to 1 hour 40 minutes by transit when it only takes 55 minutes by car?
- How can the project deal with South Station expansion issues, such as the community of South Boston taking a position against expansion?
- How will you help protect our local farms when the area is impacted by development?

Suggested Evaluation Criteria:

- Time (travel time, capacity issues)
- Impact of transfer
- Capacity of South Station
- Reinforce existing New Bedford and Fall River station planning
- Keep farmers and wetlands in mind
- Timeliness is extremely important (completeness of trip)
- Number of jobs available along the route

Alternatives to Include:

- Right-of-way to Providence
- New Bedford Industrial Business Park station or stop

Appendix 3.1-B

Evaluation of the Middleborough Simple/Rapid Bus Combination Alternative

Note: The following text was initially provided as Section 3.1.8 of the DEIS/DEIR.

Evaluation of the Middleborough Simple/Rapid Bus Combination Alternative

A new alternative that combined the Middleborough Simple Rail Alternative with the Rapid Bus Alternative was evaluated at the request of EPA to determine whether it should warrant further analysis in the DEIS/DEIR. The consideration of this alternative was based on the potential of complementing the low ridership of the Middleborough Simple Alternative with the ridership of the Rapid Bus Alternative, thereby creating a potentially practicable alternative for further consideration in the DEIS/DEIR.

This section provides an evaluation of the Middleborough Simple/Rapid Bus Combination Alternative, at a level of detail consistent with the analysis conducted in the initial alternatives analysis. This section also includes a qualitative assessment of the alternative, and incorporates information from the DEIR/DEIS level analysis, where applicable.

The Middleborough Simple/Rapid Bus Combination Alternative would reroute the Middleborough Line to New Bedford and provide Rapid Bus service to Fall River. This option would meet the MBTA Service Delivery Policy for commuter rail to New Bedford, and provide a comparable level of bus service to Fall River. The Rapid Bus service component of this alternative would provide express bus service to Boston using a proposed dedicated, primarily reversible bus lane to be built along Routes 24 and I-93/128, the existing I-93 HOV zipper lane, and a short portion through mixed traffic.

The Middleborough Simple/Rapid Bus Combination Alternative would require two midday layover facilities: a midday layover facility near South Station for trains and a midday layover for buses. It would also require highway improvements to Route 24. The same capital improvements required for the Rapid Bus Alternative north of Taunton would be required for the Middleborough Simple / Rapid Bus Combination Alternative.

The following evaluates the performance of the Middleborough Simple/Rapid Bus Combination Alternative when applying the criteria from the initial alternatives analysis for the 65 alternatives. Since the initial alternatives analysis in April 2008, the data that was used in that evaluation has been revised and updated. The following information was updated since the initial alternatives analysis, (as reflected in the Phase 1 Report):

- ***Travel Time*** – Travel time for Rapid Bus has been refined to reflect future travel conditions particularly at the Southeast Expressway zipper lane.
- ***Ridership*** – The ridership projections used in the initial alternatives analysis (as stated in the Phase 1 Report) were based on data and tools available at the time. Since then, CTPS developed a more robust Travel Demand Model that more accurately projects the future transportation demand from the South Coast Region.
- ***Capital Cost*** – Capital cost has been refined based on a better understanding of the design specifics of the Rapid Bus and Middleborough Simple alternatives.
- ***Cost-Effectiveness*** – The measure of cost-effectiveness has not changed since the initial analysis of alternatives. However, the values that are used within this calculation include cost and ridership, both of which changed as detailed above.

For the purposes of this evaluation, the more recent data was used in order to more accurately analyze the viability and practicability of the Middleborough Simple / Rapid Bus Combination Alternative.

Initial Alternatives Analysis Criteria Applied to the Middleborough Simple/Rapid Bus COMBINATION Alternative

Step 1 Evaluation

The Middleborough Simple/Rapid Bus Combination Alternative would meet the Basic Project Purpose because:

- Criterion 1.1 – *Improve regional mobility*
  - It would provide public transit connections between New Bedford/Fall River and Boston.
- Criterion 1.2 – *Improve quality of service*
  - It would provide a peak commuter rail transit trip of 89 minutes from New Bedford to Boston. The morning peak Rapid Bus travel time from Fall River to Boston is estimated at 91 minutes. This alternative would provide a comfortable transit trip with no transfers. The Rapid Bus connection between Fall River and Boston would provide low reliability service because portions of the route are shared with general purpose traffic and mixed HOV traffic.

Recommend: Advance to Step 2 evaluation. It should be noted that the ridership of this combined alternative is low, indicating that the demand for transit goes unmet to a substantial degree, resulting in only minimal achievement of the Project Purpose.

Step 2 Evaluation

The Middleborough Simple/Rapid Bus Combination Alternative was determined to be not practicable to construct and operate. See below for the alternative's ability to meet Step 2 criteria:

- Criterion 2.1 – *Is operationally compatible with the existing transportation infrastructure.*
  The Middleborough Simple/Rapid Bus Combination Alternative:
  - Would need to extend the Middleborough Line west along the Middleborough Secondary, providing a new commuter rail station stop at East Taunton (South).
  - Would need to provide track and railroad bridge improvements along the New Bedford Main Line south of Cotley Junction.
  - Would need to construct all the infrastructure improvements of the Rapid Bus Alternative, except the station stops in New Bedford (Whale's Tooth and King's Highway) and Taunton (Taunton Galleria and Taunton Depot).
  - Would need to provide expanded capacity at Boston's South Station Bus Terminal and new Rapid Bus station stops at Fall River Depot and Freetown.
  - Would require storage/maintenance facilities for both the bus and rail vehicles.

- Criterion 2.2 – *Does not significantly adversely affect the existing or future capacity, reliability, and quality of the regional transportation system*
  The Middleborough Simple / Rapid Bus Combination Alternative would adversely affect the transportation system, because it:
  - Reduces reliability of the Middleborough line and the Old Colony Main Line service by extending trips for all trains, and using all available capacity.
  - Precludes future commuter or passenger rail service from Boston to Wareham and Cape Cod without costly improvements on the Old Colony Main Line.

- Restricts windows for freight operations on the Middleborough Secondary.
- Decreases non-peak-direction capacity on Route 24 by taking a lane for use in the peak direction as the Rapid Bus zipper lane.
- Decreases user capacity of existing Southeast Expressway HOV lane by increasing traffic volume in the lane.

- Criterion 2.3 – *Could be constructed without substantial impacts to the existing transportation system and within a reasonable timeframe*
  The Middleborough Simple / Rapid Bus Combination Alternative would adversely affect the transportation system, because it:
  - Would need to close the existing Middleborough/Lakeville Station and replace it with a station stop on the Middleborough Secondary close to Middleborough Center. The existing Middleborough/Lakeville Station would need to be closed because the extension of the line via the Middleborough Secondary bypasses this station. This station is heavily used and is the site of a new Transit Oriented Development (TOD); TOD implementation is one of the main goals of the South Coast Rail project.
  - Would impact existing freight service.
  - Could not be constructed within a 4-year timeframe.
  - Would have significant impacts to Route 3 at Braintree Split to construct bus lane.
  - Would have significant impacts to Route 24 to construct zipper lane (including bridge and interchange improvements).

- Criterion 2.4 – *Provides transportation system benefits at a reasonable capital cost*
  The Middleborough Simple / Rapid Bus Combination Alternative:
  - Has a combined cost-effectiveness score of 30 percent, which is below the 40 percent threshold for failing on this criterion in the initial alternatives analysis (Phase 1 Report).

- Criterion 2.5 – *Provides sufficient capacity to meet demand*
  The Middleborough Simple / Rapid Bus Hybrid Alternative:
  - Would have an operating capacity of 5,220 passengers, which represents 65% of the estimated regional demand of 8,000 work trips.

Recommendation: Dismiss from further consideration, due to higher cost and relatively low ridership, resulting in low cost-effectiveness, as noted below:

- The cost of the alternative is estimated at $1.41 billion in year of expenditure. This is as expensive as the Stoughton Diesel and Whittenton Diesel.
- Ridership is estimated to be 1,950 one-way boardings (3,800 daily boardings).

The Middleborough Simple/Rapid Bus Combination Alternative meets the Project Purpose only partially due to its low ridership and is not considered practicable in light of the infrastructure costs in combination with low ridership and the amalgamation of other factors described above. The combination alternative would require the entire Rapid Bus infrastructure, except for a few stations, plus a major investment in rail improvements, and thus includes much of the Rapid Bus Alternative and Middleboro Simple infrastructure improvements. Because the service areas of the separate bus and rail components of this alternative overlap the ridership of the combined alternative is less than the sum of the ridership of each individual alternative. To wit, ridership for the Rapid Bus Alternative by itself is projected to be approximately 2,100 one-way passengers per day (4,200 round trips), whereas the

Middleboro Simple Alternative would draw approximately 1,550 passengers (3,100 round trips). The Middleborough Simple/Rapid Bus Combination Alternative is projected to have approximately 1,950 daily passengers (3,800 round trips). This mediocre ridership performance would come with the cost of infrastructure for both bus and rail components of the combined alternative.

When comparing the ridership projections to the capital cost of each alternative, it is estimated that the Rapid Bus Alternative would require a capital cost investment of approximately $0.8 billion and the Middleboro Simple Alternative an investment of approximately $1 billion. The Combination Alternative, however, would essentially require much of the infrastructure improvements of both alternatives although there is some cost saving as commuter rail improvements would not be needed for the Fall River portion (as Fall River would be served by Rapid Bus) and Rapid Bus improvements would not be needed for the New Bedford portion (as New Bedford would be served by rail). The cost of the Combination Alternative would amount to approximately $1.4 billion. With ridership less than Rapid Bus and just slightly more than Middleboro Simple (which was already considered underperforming in terms of ridership), the cost of the Hybrid Alternative becomes impractical (i.e. fewer riders but higher cost of either Rapid Bus or Middleboro Simple alone). By ways of comparison, the Rapid Bus Alternative would be approximately $100 per rider and the Hybrid Alternative would be roughly $107 per rider.[1]

The Middleborough Simple/Rapid Bus Combination Alternative would introduce a disparity of service between the Fall River and New Bedford communities. New Bedford would be served by commuter rail, which is not affected by motor vehicle traffic conditions or accidents, and is less affected by inclement weather; while snow occasionally causes switching problems, the speed of commuter rail is not affected by snow. Fall River would be served by bus, which can be substantially affected by traffic conditions and accidents, and is far more affected by weather; during snow conditions it would affect the operation of bus zipper lanes, and traffic in general purpose lanes would move more slowly due to hazardous road conditions.

With regard to Smart Growth, Taunton would be served by only one rail station: East Taunton South, the furthest from downtown of all Taunton station options, which decreases the potential for smart growth and provides less of a catalyst for revitalization of downtown Taunton.

[1] Cost per rider is demonstrated in terms of annualized capital cost and annual operating and maintenance cost in reference to annual boardings.

Appendix 3.1-C

Station Siting Report: EOT's Final Recommendations (October 2008)

SOUTH COAST RAIL

Station Siting Report: EOT's Final Recommendations

Prepared for

Executive Office of Transportation and Public Works
Boston, Massachusetts

Massachusetts Bay Transportation Authority
Boston, Massachusetts

Prepared by

VHB/Vanasse Hangen Brustlin, Inc.
Boston, Massachusetts

Southeastern Regional Planning & Economic Development District; Taunton, Massachusetts

September 29, 2008
Revised: October 10, 2008
FINAL

Summary List of Station Recommendations

- **Battleship Cove** – A part-time station with bus connections, but no parking, located near downtown Fall River and serving the tourist areas of the waterfront.
- **Fall River Depot** – A multi-modal transportation center with transit-oriented development one-mile north of downtown Fall River on Davol Street.
- **Freetown** – A transit-oriented development and regional parking station located at the current U-Storage site, serving nearby industrial parks and commuters throughout the region.
- **Freetown Park** – A bus-only station located inside the interchange of the proposed Exit 8 ½, serving nearby industrial parks and commuters throughout the region.
- **State Pier** – A part-time station with bus connections, but no parking, geared toward serving downtown New Bedford's residents and tourists.
- **Whale's Tooth** – A multi-modal transportation center adjacent to the Hicks Logan area mill redevelopments in New Bedford.
- **King's Highway** – A multi-modal station in north New Bedford with potential for new jobs and housing, serving commuters throughout the region.
- **East Taunton** (north) – A station for the Attleboro or Stoughton rail alternatives, located at the current Target Plaza, with future transit-oriented development.
- **East Taunton** (south) – A station for the Middleborough and Attleboro-Middleborough Hybrid rail alternatives, located at the current Mini Golf site.
- **Taunton** – A multi-modal transportation center with transit-oriented development close to downtown Taunton, serving the Stoughton rail alternative.
- **Taunton Depot** – A multi-modal transportation center with transit-oriented development in downtown Taunton, serving the Attleboro and Attleboro-Middleborough hybrid alternatives, currently located at the GATRA/ Oak Street site.
- **Whittenton** – A station in Taunton with mill redevelopment potential, serving the Whittenton variation of the Stoughton rail alternative.
- **Galleria Station** – A bus-only station located in the current Saturday overflow parking lot at the Galleria Mall in Taunton, serving commuters throughout the region.

- **Raynham Park** – A station located at the current Dog Track in Raynham that would serve commuters throughout the region and has potential for large-scale transit-oriented development, serving the Stoughton rail alternative.
- **Easton Village** – A village-style station with limited parking in downtown Easton, close to the historic train station, serving the Stoughton rail alternative.
- **North Easton –** A regional parking station serving commuters throughout the region, located in the Roche Brothers Plaza and serving the Stoughton rail alternative.
- **Middleborough Center** – A village-style station with limited parking in downtown Middleborough, serving the Middleborough and Attleboro-Middleborough Hybrid rail alternatives.
- **Barrowsville** – A village-style station with limited parking in Norton, at the old train station site serving the Attleboro and Attleboro-Hybrid rail alternatives.

Contents

1 Introduction 1

1.1 Site Selection Process 1
1.2 Civic Engagement 2

2 Station Site Identification and Screening 3

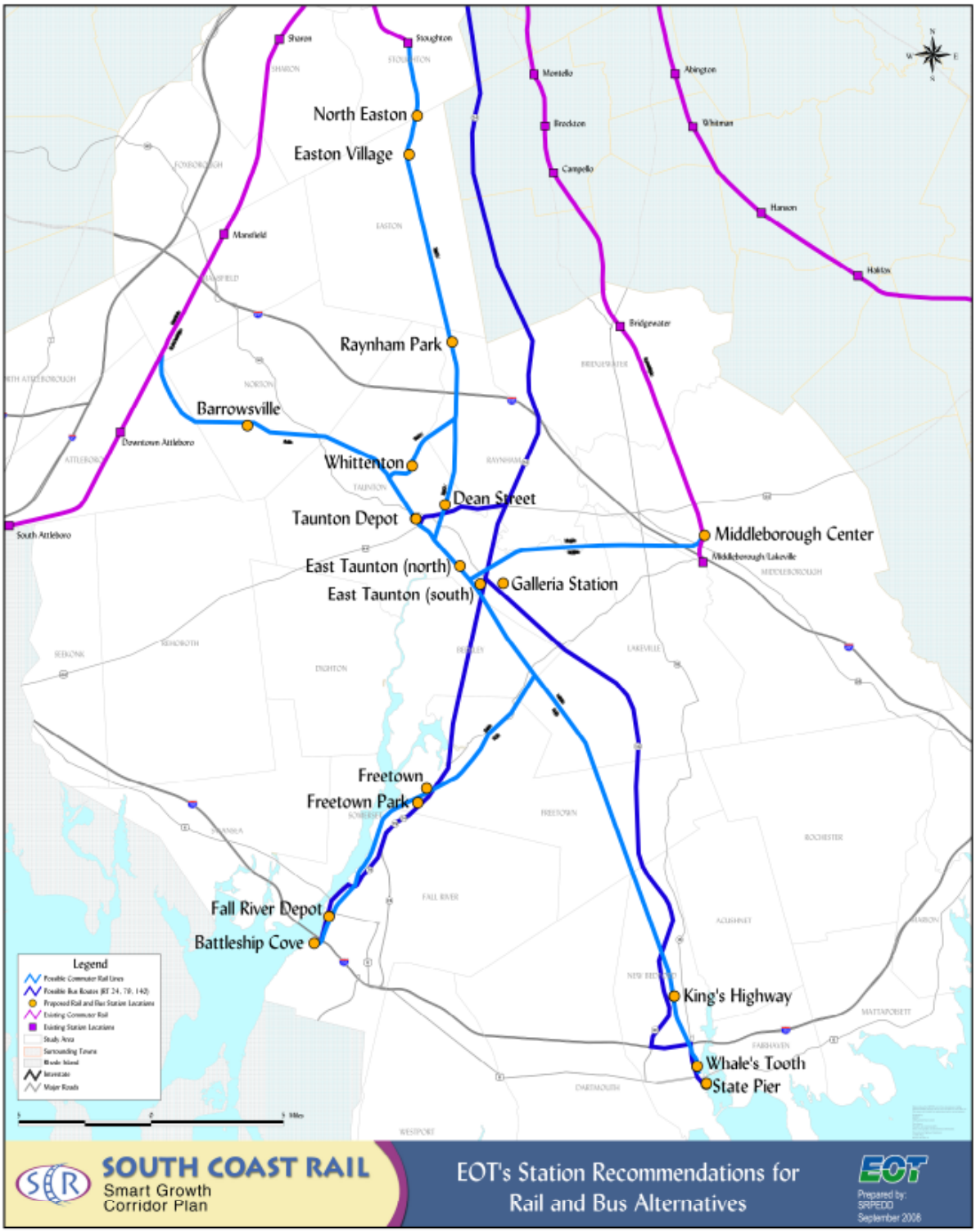
2.1 Guiding Principles for Station Selection 3
2.2 Site Identification Process 4
2.3 Screening Criteria 7

3 Station Recommendations 11

3.1 New Bedford 11
3.2 Fall River 13
3.3 Freetown 15
3.4 Lakeville 17
3.5 Berkley 17
3.6 Middleborough 17
3.7 Taunton 18
3.8 Norton 22
3.9 Attleboro 23
3.10 Raynham 23
3.11 Easton 24
3.12 Summary 26
3.13 Other Station Considerations 32
3.14 Next Steps 33

Background Information

Attachment 1 – Comments Received Through Civic Engagement Process
Attachment 2 – Identified Stations
Attachment 3 – Data on Identified Station Sites
Attachment 4 – City and Town Maps (May 2008 Drafts)


North Easton
Easton Village
Raynham Park
Barrowsville
Whittenton
Dean Street
Taunton Depot
East Taunton (north)
East Taunton (south)
Galleria Station
Middleborough Center
Freetown
Freetown Park
Fall River Depot
Battleship Cove
King's Highway
Whale's Tooth
State Pier
Legend
SOUTH COAST RAIL
Smart Growth
Corridor Plan
EOT's Station Recommendations for
Rail and Bus Alternatives
Prepared by:
SRPEDD
September 2008

1 Introduction

1.1 Site Selection Process

EOT's "Fresh Look" at the South Coast Rail project includes taking a fresh look at potential station locations to serve each of the five public transportation alternatives that are being evaluated in Phase 2. No preferred route has yet been selected, so stations were identified for each of the alternatives.

The selection process included working with the public through the project's extensive civic engagement process to identify a wide range of potential station locations, evaluating these to determine if they were practicable, and if they were consistent with EOT's station selection guiding principles and the Commonwealth's Sustainable Development principles. Over fifty rail station sites and thirty bus station sites were identified. After a rigorous and objective analysis, EOT recommends a total of 18 stations for all five of the alternatives.

The station sites are being identified before the selection of the final route for several reasons:

- EOT seeks to evaluate the environmental impacts of the stations as part of each alternative in the state and federal environmental review process. This process officially begins in November 2008.
- In order to calculate the number of riders projected to ride each of the alternatives, the ridership model requires station locations be identified. The alternatives analysis requires an assessment of how well each alternative meets the existing and future demand for public transportation.
- EOT is undertaking a parallel land use and economic development corridor plan. In order to assess the economic development potential of each alternative, EOT needs to evaluate specific station locations and surrounding areas. The corridor plan effort is scheduled to be complete June 2009.

- One of EOT's objectives is to help cities and towns improve land use and zoning before the transit service opens. This technical assistance will be delivered beginning in November 2008. In order to begin appropriate zoning around stations, stations need to be selected.

None of the station sites EOT recommends are set in stone. The environmental review process will allow EOT and the U.S. Army Corps of Engineers to gather further data on the environmental impacts of each of the sites. Stations will not be considered final selections until the conclusion of the state and federal environmental review process, which is scheduled to be complete in Spring 2010.

1.2 Civic Engagement

Public input for station identification and selection was received over a two month period. Stakeholders, local officials and members of the public shared written and oral comments. Their comments include both support and opposition for potential station locations, concerns for neighborhood impacts and suggestions for new station sites. On July 30th, the Southeastern Regional Planning and Economic Development District (SRPEDD) and EOT hosted a station siting open house in Taunton where members of the public could speak with project team members on the station selection process. Their comments were recorded and included in the meeting notes. Additional written comments were received during the comment period. Attachment 1 of this report contains these materials.

2

Station Site Identification and Screening

2.1 Guiding Principles for Station Selection

Different station sites would serve different purposes. EOT envisions that some station sites would help catalyze village-style development or redevelopment with homes and shops close to the train station, with many users of the stations walking or biking to the stations. Other sites would mainly serve commuters who drive to the station. We've called these regional magnet stations because they will attract drive-in customers and will need substantial parking facilities.

EOT developed a list of guiding principles to be used in station screening. These principles are consistent with the Commonwealth's Sustainable Development Principles. Not all stations are expected to meet all the guidelines.

- The total number of stations should be enough to capture strong ridership, but not so many that trip time would be reduced and ridership would suffer. Stations should be spaced at a reasonable distance. A rule of thumb is to space stations 3 to 5 miles apart.
- There should be a balance of types of stations to serve customers who drive to stations and "smart stations" to serve existing and future customers who walk and bike to stations.
  - Stations intended to serve walk/bike customers should be located near existing population centers, dense housing, jobs and retail centers, and be served by public infrastructure (roads, sewer and water services).
  - Stations intended to serve customers who drive should be accessible from major arterial roads, have sufficient parking capacity, and have future redevelopment potential.

- Stations should be located in places that will facilitate economic development for municipalities and the region.
- Stations should prioritize the reuse of previously-developed land, such as brownfields and grayfields.
- Station sites should be compatible with existing and proposed local planning goals.
- Stations should be "practicable", meaning capable of being constructed and used after taking into consideration cost, existing technology and logistics.
- Station location should take into account the potential for generating wind and solar power, or other renewable energy.
- Stations sites should be selected to avoid or minimize impacts to critical environmental resources.

2.2 Site Identification Process

Potential station locations for the South Coast Rail Phase 2 Alternatives were initially identified by the Southeastern Regional Planning and Economic Development District (SRPEDD), and screened in an iterative process by the multi-disciplinary project team. SRPEDD staff and input from the public identified a total of 73 rail and bus stations, some of which overlap, totaling 55 rail stations and 30 bus stations. Attachment 2 depicts the track segments of the rail alternatives with all identified potential station sites. These segments include the Fall River Secondary, New Bedford Line, the rail bed that extends south of the Stoughton Station, Whittenton Branch variation on the Stoughton alternative, Attleboro Secondary, and Middleborough Secondary. Attachment 2 also shows all the identified bus stations.

The initial criteria for site identification were:

- Track geometry (a tangent track section) and land available to construct 800-foot platforms, for the rail stations.
- Would not require new development within an Area of Critical Environmental Concern (ACEC).
- Not within a public water supply Zone 1.
- Vacant or land with foreseeable potential for redevelopment.

Table 1 lists the sites identified in this step, by municipality. Attachment 4 shows the location of each potential station site, by municipality.

Table 1 Station Sites Evaluated

Town	Site Location	Rail Segment	Rapid Bus
New Bedford	State Pier	New Bedford Main Line	Rapid Bus
New Bedford	Elm Street	New Bedford Main Line	
New Bedford	Whale's Tooth (parking lot)	New Bedford Main Line	Rapid Bus
New Bedford	Davis Street	New Bedford Main Line	
New Bedford	Church Street	New Bedford Main Line	
New Bedford	King's Highway	New Bedford Main Line	Rapid Bus
New Bedford	New Bedford Industrial Park (Lot 11)	New Bedford Main Line	Rapid Bus
New Bedford	Cove Street & JFK		Rapid Bus
New Bedford	NSTAR Site		Rapid Bus
Freetown	South Main Street (U-Storage)	Fall River Secondary	
Freetown	South Main Street (South of bridge over tracks)	Fall River Secondary	
Freetown	Exit 8 ½ Interchange		Rapid Bus
Freetown	River Front Park	Fall River Secondary	
Freetown	Copicut Road	Fall River Secondary	
Freetown	North of Boston Beer Site	Fall River Secondary	
Freetown	Boston Beer Site	Fall River Secondary	Rapid Bus
Freetown	NW Side of High Street	Fall River Secondary	
Freetown	SE Side of Elm Street	Fall River Secondary	
Freetown	NE Side of Chipaway Road	New Bedford Main Line	
Freetown	South of Chase Road	New Bedford Main Line	
Freetown	Fly Ash Site		Rapid Bus
Freetown	Park & Ride off N. Main Street (Exit 10)		Rapid Bus
Freetown	Northeast Corner of Exit 10		Rapid Bus
Freetown	East Side of Gurney Rd., South of Chase Rd.		Rapid Bus
Freetown	Northeast side of Chase Rd. and Gurney Rd.		Rapid Bus
Freetown	Western Interchange of Route 140/ Chase Rd.		Rapid Bus
Fall River	Battleship Cove (behind gate)	Fall River Secondary	
Fall River	Battleship Cove (state salt shed)	Fall River Secondary	Rapid Bus
Fall River	Davol Street	Fall River Secondary	Rapid Bus
Fall River	Proposed LNG Site (Weaver's Cove)	Fall River Secondary	
Lakeville	West Lakeville	New Bedford Main Line	
Lakeville	Howland Road	New Bedford Main Line	
Berkley	Myricks Junction	New Bedford Main Line	
Berkley	NW of Myricks Junction	New Bedford Main Line	

Table 1 Station Sites Evaluated (continued)

Town	Site Location	Rail Segment	Rapid Bus
Berkley	Parcel 15		Rapid Bus
Berkley	Parcel 14		Rapid Bus
Berkley	Parcel 1		Rapid Bus
Berkley	Parcel 2		Rapid Bus
Middleborough	Existing MBTA Layover	Middleborough Secondary	
Middleborough	Old Station Site	Middleborough Secondary	
Middleborough	SW Route 44 (Striar Property)	Middleborough Old Colony Line	
Middleborough	SE Route 44 (Everett St.)	Middleborough Old Colony Line	
Middleborough	NE Route 44 (Everett St.)	Middleborough Old Colony Line	
Middleborough	Plymouth Street (Rockland)	Middleborough Old Colony Line	
Taunton	Galleria Site (Mall)	New Bedford Main Line	
Taunton	Mini Golf Site	New Bedford Main Line	
Taunton	Target Plaza	Attleboro Secondary	
Taunton	Weir Junction	Attleboro Secondary	
Taunton	Dean Street	Rail Bed South of Stoughton	Rapid Bus
Taunton	GATRA/ Oak Street	Attleboro Secondary	Rapid Bus
Taunton	State Hospital	Attleboro Secondary	
Taunton	Whittenton Junction	Attleboro Secondary	
Taunton	Whittenton	Whittenton Branch	
Taunton	Old Colony Ave. (East Taunton)	Middleborough Secondary	
Taunton	Galleria Mall Overflow Parking Lot		Rapid Bus
Taunton	Industrial Park		Rapid Bus
Taunton	Northwoods		Rapid Bus
Norton	Barrowsville (South Worcester Street)	Attleboro Secondary	
Norton	John Scott Boulevard East	Attleboro Secondary	
Norton	John Scott Boulevard West	Attleboro Secondary	
Attleboro	Pleasant Street (Route 123)	Attleboro Bypass	
Raynham	E. Brittania Street	Rail Bed South of Stoughton	
Raynham	Center Street/Route 138	Rail Bed South of Stoughton	Rapid Bus
Raynham	Carver Street	Rail Bed South of Stoughton	Rapid Bus
Raynham	Route 138/I-495 Overpass	Rail Bed South of Stoughton	Rapid Bus
Raynham	Ryan Industrial Park	Rail Bed South of Stoughton	
Raynham	Dog Track	Rail Bed South of Stoughton	
Raynham	Staples Plaza		Rapid Bus
Raynham	Flea Market		Rapid Bus
Easton	Easton Station (Route 123)	Rail Bed South of Stoughton	
Easton	Center/Depot Street (Church)	Rail Bed South of Stoughton	
Easton	Old Train Station (Downtown)	Rail Bed South of Stoughton	
Easton	North Easton (Roche Brothers)	Rail Bed South of Stoughton	

2.3 Screening Criteria

The identified sites were screened based on criteria related to practicability, minimizing environmental impacts, and the ability to support smart growth principles. The criteria used in this screening process are described below. Note that sites are not expected to meet all criteria.

2.3.1 Practicability

Practicability asks if the site is practicable to develop – is the configuration of the site suitable for development, or are there significant obstacles? Is the site accessible to potential riders? Would there be significant costs to develop a station at this site? Three criteria were used to evaluate practicability:

- Site Quality: Does the site provide sufficient size, with suitable flat topography, for a platform and parking (for a regional parking site)?
- Suitability of Road Network: Is the site accessible using road infrastructure with ability to accommodate station traffic? For a regional magnet station, is the site within reasonable distance of a highway interchange for a regional parking station?
- Site Cost: Are there constraints (substantial environmental contamination (21E) or existing land uses) that would make redevelopment impracticable from a cost standpoint?

2.3.2 Environmental Impacts

This step of screening determined if any of the station alternatives should be dismissed based on potential impacts to the aquatic or natural environment. It considers the potential for other significant adverse environmental consequences to occur as a result of each potential site, particularly to wetlands, federal- and state-listed rare species, public water supplies, and open space.

- ACEC: Would the station require new development ("greenfield development") in an Area of Critical Environmental Concern (ACEC)?
- Priority Habitat: Would station construction affect Priority Habitat of state-listed rare species?
- Wetlands: Would the station require filling wetlands?
- Vernal Pools: Would the station impact a vernal pool?

- Floodplains: Would the station require filling an inland floodplain?
- Drinking Water: Would the station be within a public water supply Zone 2?

2.3.3 Smart Growth

This step of screening determined if the station alternatives support the smart growth objectives of the South Coast Rail project. EOT does not expect all sites to support smart growth due to the need to provide some regional parking stations geared toward drive-in customers.

- Reuse: Is the site an underutilized or vacant brownfield or grayfield?
- Infrastructure: Is the site served by existing water and sewer infrastructure? Or, does the site have potential to connect easily to such infrastructure?
- Site Location: Is the site within walking distance to a city, town or village center? Is there an adequate existing or projected density of households and jobs within the one-mile station area?
- Equity: Does the site serve an environmental justice population?
- TOD Potential: Is there sufficient potential for transit-oriented development?
  - Does the site have foreseeable redevelopment potential?
  - Is there potential for special amenities to make development especially attractive to the market (such as proximity to a waterfront)?

To assess transit-oriented development (TOD) potential, Goody Clancy, the firm responsible for developing the South Coast Rail Economic Development and Land Use Corridor Plan, conducted a preliminary analysis that compared alternative stations. The assessment of site location and TOD opportunities was based on site visits and photographic documentation; orthophotos; land use maps based on 2005 MassGIS data; 2006 Claritas household and jobs data for one-mile, half-mile, and quarter-mile radii around proposed station sites. This analysis was further informed by SRPEDD's work over the past four years with the Southeastern Massachusetts Commuter Rail Task Force to identify viable station sites. Conversations with community leaders in municipalities that might host stations further enriched the analysis.

2.3.4 Circling Back

After assessing stations' practicability, avoidance of environmental impacts, and smart growth potential, the South Coast Rail's project team then looked at each alternative's full scope of station sites. The analysis assumed that three stations were

required regardless of alternative: at least one station in Fall River, at least one station in New Bedford, and at least one station in Taunton. In addition, each alternative could include one intermediate station between Fall River and Taunton and one intermediate station between New Bedford and Taunton. Other stations that could be considered, depending on the alternative, include one intermediate station between Taunton and Attleboro, one intermediate station between Taunton and the Old Colony Middleborough line, and up to three intermediate stations between Taunton and Stoughton.

The team also assessed whether stations were adequately spaced to capture ridership and whether the types of stations along each route would allow for a good mix of village-style stations, transit-oriented development stations and regional magnet stations with sufficient parking facilities.

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3 Station Recommendations

The site screening criteria were applied to the 73 potential station sites. The following sections describe EOT's recommendations for stations sites that will be advanced for further analysis in the Phase 2 state and federal environmental review process.

3.1 New Bedford

Nine potential station sites were evaluated in New Bedford:

- State Pier
- Elm Street
- Whale's Tooth (parking lot)
- Davis Street
- Church Street
- King's Highway
- New Bedford Industrial Park (Lot 11)
- Cove Street & JFK
- NSTAR Site

The evaluation recommended that three sites be advanced into Phase 2. All three sites would serve the rail alternatives and the Rapid Bus alternative.

3.1.1 State Pier

The State Pier station, located at New Bedford's State Pier, would serve all of the rail alternatives and the Rapid Bus alternative. The site is anticipated to be a platform only station to serve the downtown area and ferry customers. The station site would be geared to serve walk-in customers. The station likely would not operate full time and would not have full-length raised platforms. There would be no parking facilities. The site would support mainly walk-in and bike-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 18). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools, or priority habitats. It is not located within a public water supply Zone II. However, the site is within the 100-year coastal floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station. It is located on the waterfront and in downtown New Bedford, near museums and colleges, and in proximity to jobs and population, including low income and minority populations. Although the site is too small for redevelopment to occur right at the station, the downtown area may benefit from reinvestment if a station were built.

3.1.2 Whale's Tooth

The Whale's Tooth station, located at the Whale's Tooth parking lot would serve all of the rail alternatives, and the Rapid Bus alternative. This 14-acre site, located on the New Bedford waterfront, was identified as the preferred site in the 2002 Final Environmental Impact Report on South Coast Rail. The City of New Bedford has constructed a parking lot on the site in anticipation of the commuter rail project. The station would include intermodal connections, potentially including ferry services. The site would serve walk-in, bike-in, and drive-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 18 and I-195). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools, or priority habitats. It is not located within a public water supply Zone II. However, the site is within the 100-year coastal floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. It is located in close proximity to the waterfront, downtown New Bedford, and the Hicks Logan redevelopment area. The site is located in

proximity to jobs and population, including low income and minority populations. The station could also catalyze transit-oriented development. The Hicks Logan area offers an opportunity to develop a mixed-use waterfront neighborhood that would be served by rail. Immediately adjacent to the station site are old mill buildings in the process of being converted into homes.

3.1.3 King's Highway

The King's Highway station, located in northern New Bedford along King's Highway east of Route 140, would serve all of the rail alternatives and the Rapid Bus alternative. This site would occupy part of an approximately 55-acre site that is now a shopping plaza. The site would serve walk-in, bike-in, and drive-in customers.

A station would be practicable to construct at this site, which has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 140). Cost of land acquisition could be high, as the site is currently occupied by active businesses. The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools, or priority habitats. It is not located within a public water supply Zone II, and is not within the 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. The site is located in proximity to jobs and population. The station could also catalyze redevelopment in that it offers an opportunity to revitalize an aging shopping plaza by redeveloping it into a mixed-use neighborhood or lifestyle center. The site also presents an opportunity for joint development.

3.2 Fall River

Four potential station sites were identified in Fall River:

- Battleship Cove (behind gate)
- Battleship Cove (state salt shed)
- Davol Street
- Proposed LNG Site (Weaver's Cove)

The evaluation recommended that two sites be advanced into Phase 2. These two sites would serve all of the rail alternatives and one of the sites also would serve the Rapid Bus alternative.

3.2.1 Battleship Cove (behind gate)

The Battleship Cove station, an approximately 2.2-acre site on the Fall River waterfront located behind the Ponte Del Gada monument, would serve all of the rail alternatives. The station is anticipated to be a platform only station that would not operate full-time. The station would serve the downtown area and the Battleship Cove tourist area. The station site would be geared to serve walk-in customers and pick up-drop off customers. There would be minimal parking. The City of Fall River constructed a pickup-drop off loop road for the future commuter rail station as part of the Ponte Del Gada monument.

Battleship Cove station is practicable to construct. It has sufficient size and flat topography to construct a station (with limited parking); is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 79 and I-195). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools, or priority habitats. It is not located within a public water supply Zone II and is not within the 100-year coastal floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station. It is located on the waterfront, close to downtown Fall River, near the Fall River Heritage Park and other tourist attractions. The site is in proximity to jobs and population, including low income and minority populations. Although the site is too small for redevelopment to occur right at the station, the station could spur redevelopment in the waterfront area, a place with old manufacturing buildings and vacant land which the City would like to redevelop.

3.2.2 Davol Street

The Fall River Depot station, located one mile north of downtown Fall River at Route 79 and Davol Street, would serve all of the rail alternatives and the Rapid Bus alternative. The site, an approximately 8-acre area near the Fall River waterfront, was the site of the historic train station. The site is envisioned to be a multi-modal transportation center with new mixed-use development and parking facilities. The site would serve walk-in, bike-in, and drive-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station (with structured parking); is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 79). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools, or priority habitats. It is not located within a public water supply Zone II and is not within the 100-year coastal floodplain.

This site supports smart growth principles. The station would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. It is located one-mile north of downtown Fall River, close to a dense residential neighborhood and aging shopping plaza, and across from a redeveloping waterfront along Route 79. The site is located in proximity to jobs and population, including low income and minority populations. The station could also catalyze redevelopment in that it offers a classic transit-oriented development opportunity that fits with the City's plans for redeveloping the waterfront.

3.3 Freetown

Seventeen potential station sites were identified in Freetown:

- South Main Street (U-Storage Site)
- South Main Street (South of bridge over tracks)
- Exit 8 ½ Interchange
- River Front Park
- Copicut Road
- North of Boston Beer Site
- Boston Beer Site
- NW Side of High Street
- SE Side of Elm Street
- NE Side of Chipaway Road
- South of Chase Road
- Fly Ash Site
- Park & Ride off N. Main Street (Exit 10)
- Northeast Corner of Exit 10
- East Side of Gurney Rd., South of Chase Rd.
- Northeast Side of Chase Rd. and Gurney Rd.
- Western Interchange of Route 140/ Chase Rd.

The evaluation recommended that two sites be advanced into Phase 2 – one site which would serve all of the rail alternatives and one site that would serve the Rapid Bus alternative.

3.3.1 South Main Street (U Storage)

The Freetown station, located at Site 6 on South Main Street would serve all of the rail alternatives. The site is approximately 18 acres, is currently occupied by a U Storage business, and is near the Fall River Executive Park and the River Front Park. The site would serve drive-in customers and customers shuttled between the station and the industrial parks.

The site is practicable to construct. It has sufficient size and flat topography to construct a station (with structured parking); is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 24). A new interchange for Route 24 is being constructed nearby. The site is favorable from an environmental perspective, as it is partially a previously-developed site that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II and is not within the 100-year floodplain. Wetlands are located on part of the site.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. The site is located in proximity to two industrial parks that are projected to host thousands of jobs. The site has potential for mixed-use development and for parking facilities for commuters.

3.3.2 Exit 8 ½ Interchange

This site, situated at the proposed new interchange in Freetown, known as Exit 8 ½, would serve the Rapid Bus alternative. The site is about 3 acres in size and is proximate to both the Fall River Executive Park in Freetown and the River Front Park. The site would serve only drive-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a bus station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 24). The site is favorable from an environmental perspective, as it is a piece of land that will be unusable once Exit 8 ½ is built. The site does not contain vernal pools, priority habitats, or wetlands. It is not located within a public water supply Zone II and is not within the 100-year floodplain.

This site supports some smart growth principles. The site would require development of an undeveloped area, but it would be right at a highway interchange. It is located in proximity to jobs. However, the site has no potential for new commercial or residential development.

3.4 Lakeville

Two potential new station sites were identified in Lakeville:

- West Lakeville
- Howland Road

The evaluation recommended that neither site be advanced because of environmental impacts (wetlands, priority habitat, and floodplains) and because the sites would not support smart growth.

3.5 Berkley

Six potential station sites were identified in Berkley:

- Myricks Junction
- NW of Myricks Junction
- Parcel 15
- Parcel 14
- Parcel 1
- Parcel 2

The evaluation recommended that none of these sites be advanced. The land area for the sites considered for rail stations - Myricks Junction and NW of Myricks Junction – are not suitably sized lots. There are some environmental constraints, as well. In evaluating the four "Parcel" sites considered for the Rapid Bus alternative, EOT concluded that the Galleria Mall Overflow Parking Lot in Taunton provides better connectivity to Routes 24 and 140 than these Berkley sites.

3.6 Middleborough

Six potential station sites were identified in Middleborough:

- Existing MBTA Layover
- Old Station Site
- SW Route 44 (Striar Property)
- SE Route 44 (Everett St.)

- NE Route 44 (Everett St.)
- Plymouth Street (Rockland)

The evaluation recommended that one site be advanced into Phase 2 which would serve the Middleborough rail alternative.

3.6.1 Old Station Site

The Middleborough Center station, located at the old station site in downtown Middleborough, would serve the Middleborough rail alternative. The 7-acre site would primarily serve walk-in and bike-in customers. The station would attract some drop-off and pick-up customers, but the regional parking facilities are available at the nearby Lakeville station. This station could also serve the proposed casino. Shuttles would be necessary to transport people from the station to the proposed casino site.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 495). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain vernal pools, priority habitats, or wetlands. It is not located within a public water supply Zone II and is not within the 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate sewer and water infrastructure to serve the station and support redevelopment. It is located in downtown Middleborough, close to jobs and population. The station could help spur more village-style development in the downtown.

3.7 Taunton

Thirteen potential station sites were identified in Taunton:

- Galleria Site (Mall)
- Mini Golf Site
- Target Plaza
- Weir Junction
- Dean Street
- GATRA/ Oak Street

- State Hospital
- Whittenton Junction
- Whittenton
- Old Colony Ave. (East Taunton)
- Galleria Mall Overflow Parking Lot
- Industrial Park
- Northwoods

The evaluation recommended that six sites, which would serve different alternatives, be advanced into Phase 2. One site would serve the Middleborough rail alternative and the Attleboro-Middleborough Hybrid alternative. Two sites would serve the Attleboro rail alternative and the Attleboro-Middleborough Hybrid alternative. Two sites would serve the Stoughton rail alternative and two sites would serve the Whittenton variation on the Stoughton rail alternative. Two sites would serve the Rapid Bus alternative.

3.7.1 Mini Golf Site

The East Taunton (south) station site, located off Route 140 in Taunton, would serve the Middleborough rail alternative and the Attleboro-Middleborough Hybrid alternative. This is an approximately 13-acre site currently occupied by a Mini Golf business. The station would function as a regional magnet station, serving customers that drive to the station.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 24 and Route 140). The site is favorable from an environmental perspective, as it is partially a previously-developed site that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II and is not within the 100-year floodplain. Wetlands are located on a portion of the site.

This site supports some smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. The location of the site, and future planned development for the site, makes it an unlikely candidate for transit-oriented development.

3.7.2 Target Plaza

The East Taunton (north) station, located at the rear of Target Plaza, would serve the Attleboro and Stoughton rail alternatives. This site is approximately 14 acres and is located off of Route 140. The Plaza is a newer big-box retail site that hosts Target, Home Depot, and other stores. There is vacant land near the existing freight tracks. The station would serve customers that drive to the station, as well as potential future walk-in or bike-in customers if redevelopment were to occur.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 24 and Route 140). The site is favorable from an environmental perspective, as it is partially a previously-developed site that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II and is not within the 100-year floodplain. Wetlands are located on a portion of the site.

This site supports some smart growth principles. The site has adequate infrastructure to serve the station and support redevelopment. It is located in proximity to jobs and services, as well as multi-family housing, and has adequate infrastructure to support redevelopment. It is located at a key highway junction for Freetown, Berkley and Lakeville. The station could also catalyze transit-oriented development in that it offers an opportunity in the future to redevelop a shopping center it into a mixed-use neighborhood or lifestyle center.

3.7.3 Dean Street

The Taunton station, located at the Dean Street site, would serve the Stoughton rail alternative. The site is approximately 8 acres, and is located off of Route 44 just north of the historic train station and within walking distance of downtown. The City of Taunton has invested in remediating this brownfield site in anticipation of a future train station. The site is zoned for mixed-use redevelopment and would be a multi-modal transportation center serving walk-in, bike-in, and drive-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; is accessible using existing road infrastructure; and is within a reasonable distance of a highway (Route 44). The site is favorable from an environmental perspective, as it is a previously-developed site (containing abandoned industrial buildings and foundations) that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II. Portions of the site are within a mapped 100-year floodplain, and wetlands are located on a portion of the site.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. It is located near downtown Taunton. The site is located in proximity to jobs and services. The station could also catalyze transit-oriented development. The area offers an infill development opportunity to develop a mixed-use, village-style neighborhood that would be served by rail.

3.7.4 GATRA/Oak Street

The Taunton Depot station, located at the GATRA/ Former Oak Street Mall site, would serve the Attleboro rail alternative and the Attleboro-Middleborough Hybrid alternative, and would serve as a terminal station for the Rapid Bus alternative. This site is an approximately 24-acre site in the center of Taunton, and currently contains the GATRA maintenance facility and bus station and provides an opportunity for multi-modal connections. The station would serve walk-in, bike-in, and drive-in customers. GATRA would consider shifting the maintenance facility and the bus terminal just south of the site, and if this happens, the site has potential for redevelopment.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; and is accessible using existing road infrastructure. The site is favorable from an environmental perspective, as it is partially a previously-developed site that does not contain wetlands, vernal pools or priority habitats. It is not located within a public water supply Zone II or mapped 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. The site is in downtown Taunton at the site of a former mall. It is located in proximity to population (including minority and low-income populations), jobs and services. The station could also catalyze transit-oriented development and presents an opportunity for redeveloping an area that can spur economic development in the downtown of Taunton.

3.7.5 Whittenton

The Whittenton station would serve the Whittenton variation of the Stoughton rail alternative. (This variation is an option to avoid crossing Pine Swamp in Raynham.) This approximately 18-acre site is near downtown Taunton. The site would serve walk-in, bike-in, and drive-in customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; and is accessible using existing road infrastructure. The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain wetlands, vernal pools or priority habitats. It is not located within a

public water supply Zone II. Portions of the site are within a mapped 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. It is located near downtown Taunton, next to old mill buildings, and in proximity to jobs, services and population. The station could also catalyze transit-oriented development. The area is a former mill village with medium-density housing in proximity. There is potential for adaptive reuse of the mill buildings, residential infill and a mill village "main street."

3.7.6 Galleria Mall Overflow Parking Lot

The Galleria Station, located at the Galleria Mall Overflow Parking Lot, would serve the Rapid Bus alternative. Portions of the existing paved parking areas at this 9-acre Galleria Mall site could be redeveloped to serve as a bus-oriented development.

This site is practicable to construct. It has sufficient size, is accessible using existing road infrastructure, and is within a reasonable distance of a highway (Route 24 and Route 140). This use of the existing site is favorable from an environmental perspective, as it is an entirely developed site that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II or within a mapped 100-year floodplain. Portions of the mall site contain wetlands, but the re-use of the existing parking lot would not impact wetlands.

This site supports some smart growth principles. The site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support redevelopment. It is located in proximity to jobs and population. The station could also catalyze transit-oriented development. The site has future potential for a mixed-use development.

3.8 Norton

Three site alternatives were identified in Norton:

- Barrowsville (South Worcester Street)
- John Scott Boulevard East
- John Scott Boulevard West

The evaluation recommended that one site be advanced into Phase 2. This site would serve the Attleboro rail alternative.

3.8.1 Barrowsville (South Worcester Street)

The Barrowsville station, located on South Worcester Street in Norton, would serve the Attleboro rail alternative and the Attleboro-Middleborough Hybrid alternative. This approximately 7-acre site is near the former train station. The station would be village-style with limited parking, and serve primarily drop-off/pick-up customers.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; and is accessible using existing road infrastructure. The site is favorable from an environmental perspective, as a portion of the site is a previously-developed site that does not contain any vernal pools or priority habitats. A portion of the site, which would not be used, does contain wetlands. There are two vernal pools within a half-mile on nearby properties. It is not located within a public water supply Zone II or a mapped 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has some infrastructure to serve the station (water only). It is located in proximity some housing and limited retail. The station could also catalyze some small-scale, village-style development.

3.9 Attleboro

One alternative (Pleasant Street, Route 123) was identified in Attleboro. The evaluation did not recommend that this site be advanced into Phase 2 because of the high level of potential wetland impacts, and the low ability of the site to support smart growth.

3.10 Raynham

Eight site alternatives were identified in Raynham:

- E. Brittania Street
- Center Street/Route 138
- Carver Street
- Route 138/I-495 Overpass
- Ryan Industrial Park
- Dog Track
- Staples Plaza
- Flea Market

The evaluation recommended that one site be advanced into Phase 2. This site would serve the Stoughton rail alternative.

3.10.1 Dog Track

The Raynham Park station, located at the Raynham-Taunton Greyhound Park in Raynham, would serve the Stoughton rail alternative. The site is now occupied by a dog track and has large surface parking along Route 138 near the Raynham/ Easton town line. The station would be located on a portion of this approximately 80-acre site. The site would be geared toward serving mostly drive-in customers with additional future walk-in customers being drawn from future redevelopment on the site.

The site is practicable to construct. It has sufficient size and adequate, but sloping, topography to construct a station; is accessible using existing road infrastructure, and is within a reasonable distance of a highway (Route 138). The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain vernal pools or priority habitats. It is not located within a public water supply Zone II. Portions of the site are within a mapped 100-year floodplain. Wetlands and the Hockomock Swamp Area of Critical Environmental Concern are located adjacent to the site.

This site supports smart growth principles. The site would not require development of an undeveloped area and has some infrastructure to serve the station and support redevelopment (water only, not sewer). It is located in proximity to jobs. The station could also catalyze transit-oriented development. The site offers potential for a large mixed-use development, although redevelopment would initially be car-oriented because the site is not near an existing downtown or densely developed areas.

3.11 Easton

Four site alternatives were identified in Easton:

- Easton Station (Route 123)
- Center/Depot Street (Church)
- Old Train Station (Downtown)
- North Easton (Roche Brothers)

The evaluation recommended that two sites be advanced into Phase 2. Both sites would serve the Stoughton rail alternative.

3.11.1 Old Train Station

The Easton Village station, located south of the historic H.H. Richardson train station, would serve the Stoughton rail alternative. The site is limited to the railroad right-of-way and is in walking distance of downtown Easton. The site would be a village-style station serving walk-in and bike-in customers. Very little, if any, parking would be provided.

The site is practicable to construct. It has sufficient size and flat topography to construct a station; and is accessible using existing road infrastructure. The site is favorable from an environmental perspective, as it is a previously-developed site that does not contain vernal pools or priority habitats. A portion of the site contains a stream and wetlands. A portion of the site is within a public water supply Zone II. The site is not within a mapped 100-year floodplain.

This site supports smart growth principles. The site would not require development of an undeveloped area and has some infrastructure to serve the station (water only, not sewer). It is located in downtown Easton, close to multi-family housing, some jobs and services. The station could also catalyze transit-oriented development. Immediately adjacent to the station site are old mill buildings which have potential for adaptive reuse.

3.11.2 North Easton

The North Easton station, at the rear of the Roche Brothers plaza, would serve the Stoughton rail alternative. This existing retail plaza, anchored by Roche Brothers supermarket, occupies an approximately 10-acre site. New medical buildings have been constructed or are under construction. The station would likely have shared structured parking facilities with the medical buildings and would primarily serve drive-in customers, although the station may attract some walk-in customers from the existing development on the plaza and from limited nearby residences.

The site is practicable to construct. It has sufficient size to construct a station; and is accessible using existing road infrastructure. It has good highway access from Route 138. The site is favorable from an environmental perspective, as it does not contain vernal pools or priority habitats. A portion of the site is within a public water supply Zone II and wetlands are present on part of the site. The site is not located within a mapped 100-year floodplain.

This site supports some smart growth principles. It is located in proximity to jobs and services, and has some infrastructure (water only, not sewer) to support redevelopment.

3.12 Summary

This summary provides information on the stations selected in three formats. Immediately following is a list of stations by municipality. The second format is a list of stations by alternative route. (Some stations serve more than one alternative.) The third format shows the recommended stations on maps.

3.12.1 Recommendations by Municipality

Table 2, below, shows EOT's recommendations for the stations that will be evaluated in the Phase 2 environmental analysis. Stations are recommended in Fall River (2), Freetown (2), New Bedford (3), Taunton (6), Raynham (1), Easton (2), Middleborough (1) and Norton (1).

Table 2 Results of Station Screening

Town	Station Name	Site Location	Route Served				
			Attleboro	Middle-borough	Att-Mid Hybrid	Stoughton	Rapid Bus
Fall River	Battleship Cove	Battleship Cove (behind gate)	■	■	■	■	
Fall River	Fall River Depot	Davol Street	■	■	■	■	■
Freetown	Freetown	South Main Street (U-Storage)	■	■	■	■	
Freetown	Freetown Park	Exit 8 1/2 Interchange					■
New Bedford	State Pier	State Pier	■	■	■	■	■
New Bedford	Whale's Tooth	Whale's Tooth	■	■	■	■	■
New Bedford	King's Highway	King's Highway	■	■	■	■	■
Taunton	East Taunton (North)	Target Plaza	■			■	
Taunton	East Taunton (South)	Mini-golf		■	■		
Taunton	Taunton	Dean Street				■*	
Taunton	Taunton Depot	GATRA/Oak Street	■		■		■
Taunton	Whittenton	Whittenton				■**	
Taunton	Galleria Station	Galleria Mall Overflow Parking Lot					■
Raynham	Raynham Park	Dog Track				■	
Easton	Easton Village	Old Train Station				■	
Stoughton	North Easton	North Easton (Roche Brothers)				■	
Middleborough	Middleborough Center	Old Station Site		■	■		
Norton	Barrowsville	Barrowsville (South Worcester Street)	■		■		

* Dean Street would serve the Stoughton route, but not the Whittenton variation

** Whittenton would serve the Whittenton variation of the Stoughton route only

3.12.2 Recommendations by Alternative

Nine new stations are recommended for the Attleboro Alternative:

1. Battleship Cove, Fall River
2. Fall River Depot
3. Freetown
4. State Pier, New Bedford
5. Whale's Tooth, New Bedford
6. King's Highway, New Bedford
7. East Taunton (South), Taunton
8. Taunton Depot
9. Barrowsville, Norton

Eight new stations are recommended for the Middleborough Alternative:

1. Battleship Cove, Fall River
2. Fall River Depot
3. Freetown
4. State Pier, New Bedford
5. Whale's Tooth, New Bedford
6. King's Highway, New Bedford
7. East Taunton (South), Taunton
8. Middleborough Center

Ten new stations are recommended for the Attleboro-Middleborough Hybrid Alternative:

1. Battleship Cove, Fall River
2. Fall River Depot
3. Freetown
4. State Pier, New Bedford
5. Whale's Tooth, New Bedford

6. King's Highway, New Bedford
7. East Taunton (South), Taunton
8. Middleborough Center
9. Taunton Depot
10. Barrowsville, Norton

Twelve new stations are recommended for the Stoughton Alternative:

1. Battleship Cove, Fall River
2. Fall River Depot
3. Freetown
4. State Pier, New Bedford
5. Whale's Tooth, New Bedford
6. King's Highway, New Bedford
7. East Taunton (North)
8. Taunton*
9. Whittenton, Taunton*
10. Raynham Park
11. Easton Village
12. North Easton

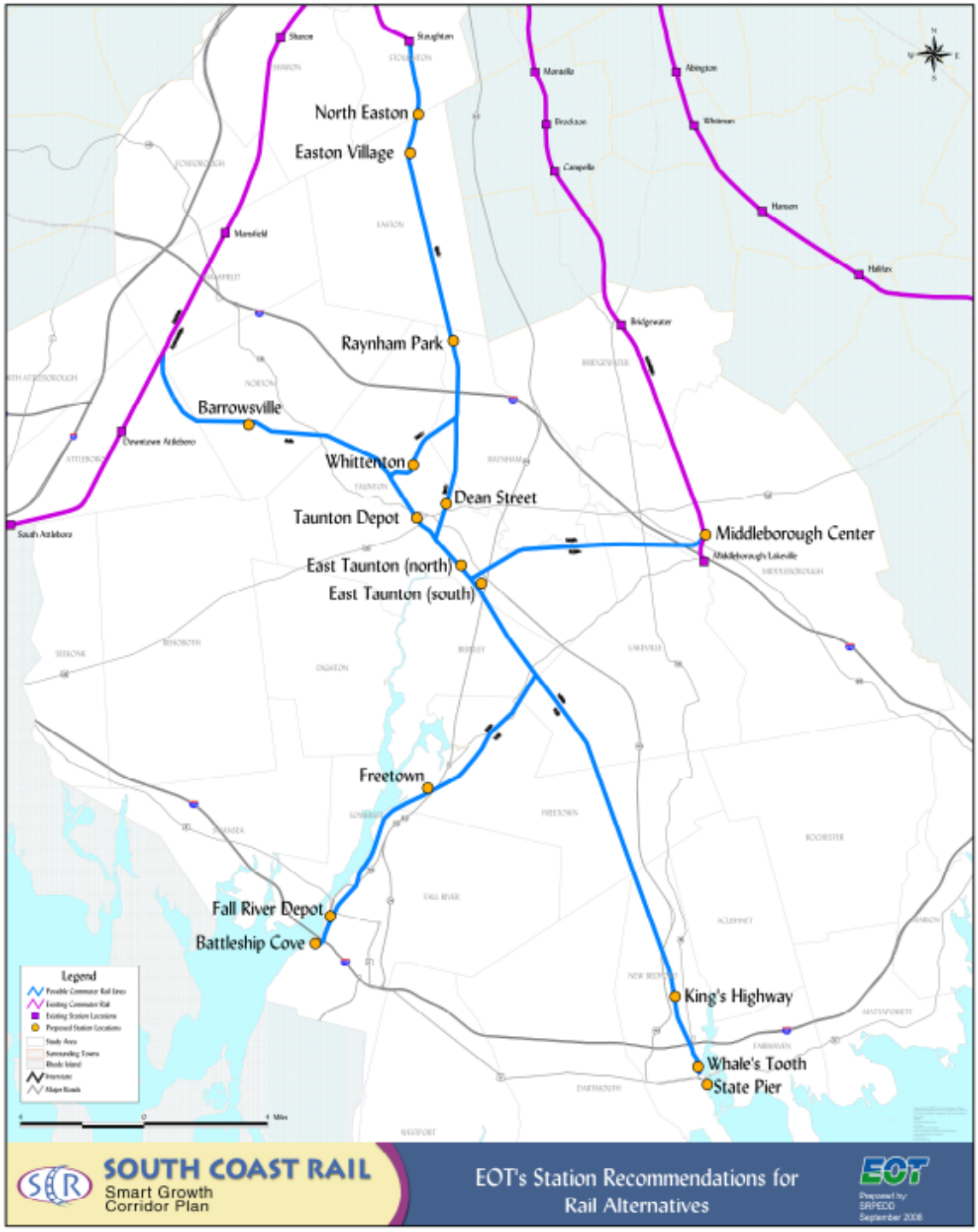
* For the Whittenton variation of the Stoughton Alternative, the Whittenton site is recommended instead of the Dean Street site (Taunton station).

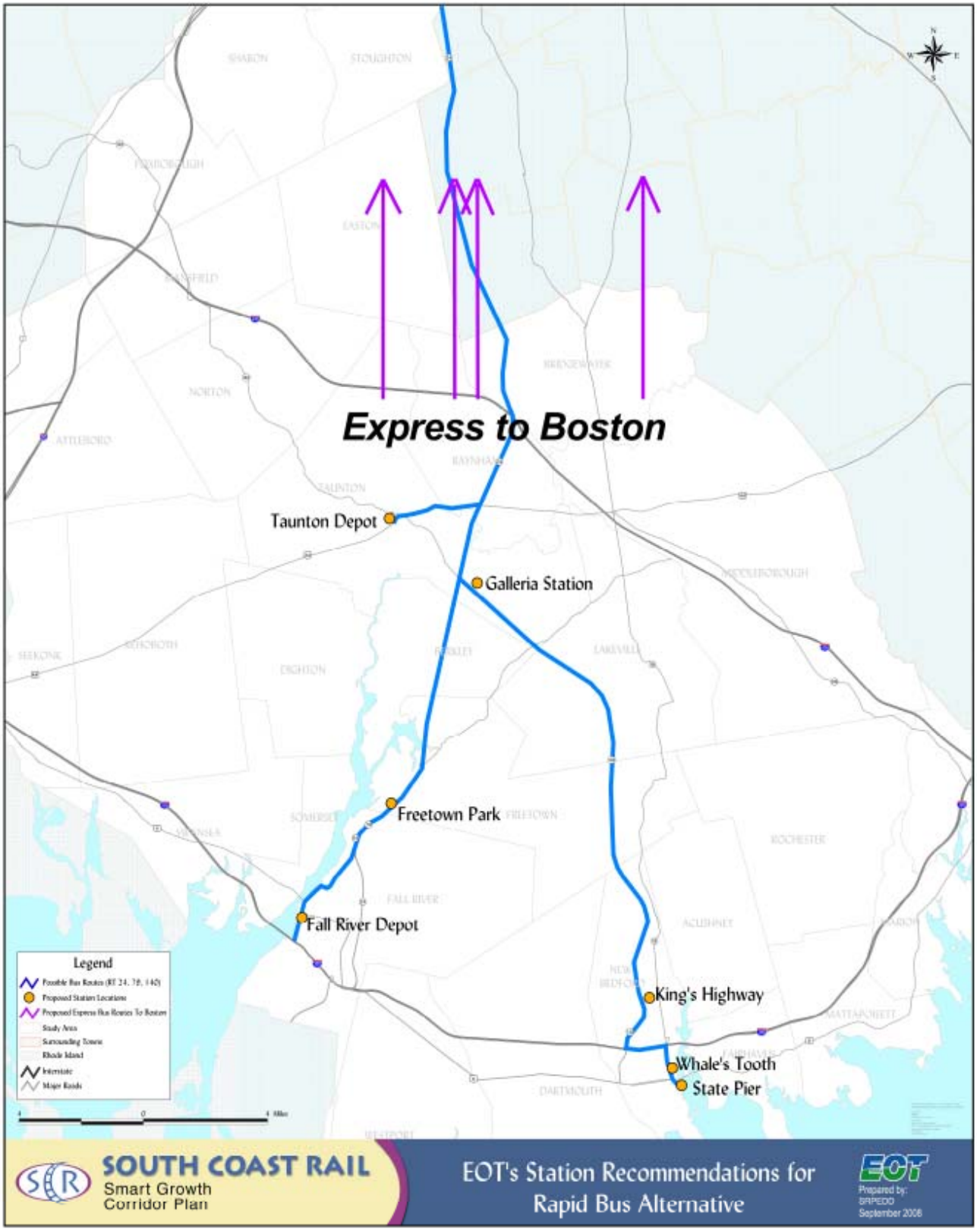
Seven new stations are recommended for the Rapid Bus Alternative

1. Fall River Depot
2. Freetown Park
3. State Pier, New Bedford
4. Whale's Tooth, New Bedford
5. King's Highway, New Bedford
6. Galleria Station, Taunton
7. Taunton Depot

3.12.3 Recommendations Mapped

The following figures show the recommended Phase 2 rail stations and Rapid Bus stations.




Express to Boston
Taunton Depot
Galleria Station
Freetown Park
Fall River Depot
King's Highway
Whale's Tooth
State Pier
Legend
SOUTH COAST RAIL
Smart Growth
Corridor Plan
EOT's Station Recommendations for
Rapid Bus Alternative
EOT
Prepared by:
September 2008

3.13 Other Station Considerations

In addition to the Phase 2 stations identified in this report, EOT is considering modifications to two existing commuter rail stations, and adding a commuter rail station to the Old Colony Middleborough Line as part of the South Coast Rail project.

3.13.1 Existing Lakeville Station

The current terminal for the Middleborough Commuter Rail Line is the Lakeville MBTA Station, located in Lakeville close to the border of Middleborough. The Town of Lakeville has adopted a Chapter 40R Smart Growth Overlay Zone around the station to help catalyze new smart growth housing. Numerous projects in the immediate vicinity have been developing, including the Kensington Court Housing Development, the Lakeville Corporate Park and other commercial and retail developments on Route 105. The Town, along with private developers, has invested in creating smart growth development around the station.

The state acknowledges the value and importance of the existing Lakeville station and has no intention of closing the station. If the Middleborough Alternative or Attleboro-Middleborough Hybrid Alternative were selected, EOT commits to exploring all other options before taking the adverse action of closing the station.

3.13.2 Existing Stoughton Station

Some public comment has suggested moving the Stoughton station platforms slightly south of their existing location in order to reduce traffic at grade crossings and to help spur redevelopment of currently underutilized land. EOT will work with the Town of Stoughton to further explore the potential benefits and drawbacks of shifting the station.

3.13.3 East Bridgewater and West Bridgewater

The towns of East Bridgewater and West Bridgewater have requested EOT consider adding a station to the existing Middleborough Line to serve their communities and help spur economic development. EOT and the MBTA will explore this idea and develop data to better understand the number of riders that would use the system.

3.14 Next Steps

As part of the Phase 2 environmental analysis for each of the alternatives and as part of the economic development analysis of the Smart Growth Corridor Plan, additional information will be developed for each station site. The additional information will be documented in the Draft Environmental Impact Report /Draft Environmental Impact Statement and/or the Corridor Plan, and includes:

- Calculating the potential ridership from each station
- Determining the parking and access requirements
- Documenting existing environmental conditions
- Developing a conceptual design for the rail or bus station
- Evaluating the environmental impacts of each station
- Evaluating the potential smart growth opportunities at each station and in the immediate vicinity of each station

EOT will conduct a series of civic engagement meetings (scheduled for November through January) that will allow people in the region the opportunity to contribute ideas to plan each of the stations. These station workshops will provide neighborhoods, businesses, abutters, and others the opportunity to help craft a vision for each of the stations and help evaluate the role of each station in the region's Smart Growth Corridor Plan.

Background Documents

- Attachment 1 – **Comments Received through Civic Engagement Process**

  This contains notes from the July 2008 open house and all comment letters and emails received.

- Attachment 2 – **Identified Stations**

  These maps show the different track segments and highways with all of the identified and considered station sites.

- Attachment 3 – **Data on Identified Station Sites**

  This matrix provides data related to practicability, environmental impact, and smart growth for each identified station site.

- Attachment 4 – **City and Town Maps (May 2008 Drafts)**

  These maps were developed to solicit public input during the public comment period. Each city or town map shows the identified sites and aerial photos of the sites as cut-outs.

Attachment 1 – Comments Received through Civic Engagement Process

Date	Name(s)	Organization	Comment	Response*
7/29/08	Kenneth Fiola	Fall River Office of Economic Development	• In favor of Davol Street station location in Fall River. • Fall River Redevelopment Authority will continue to work with EOT and South Coast Rail Taskforce in planning Transit Oriented Development.	Comment Noted
7/31/08	Jill Maclean	City of New Bedford	• In favor of moving Whale's Tooth platform location north towards Wamsutta Street for better Transit Oriented Development.	EOT is currently looking into potentially moving the Whale's Tooth platform north.
7/31/08	Lisa Pacheco	Freetown Board of Selectmen	• Approves South Main Street Site in Assonet. • Applauds efforts of Governor Deval Patrick and South Coast Rail Project.	Comment Noted.
7/30/08	Mayor Charles Crowley	Mayor of Taunton	• In favor of Stoughton Route. • Opposed to Whittenton variation of Stoughton Route and opposed to Attleboro route due to high number of grade crossings.	EOT acknowledges Mayor Crowley's support for the Stoughton Route and Opposition to the Whittenton variation and Attleboro Alternative. EOT appreciates his interest and involvement in the project.
7/31/08	Tony Medeiros	Resident	• Concerned about Brockton water main installation along train tracks. • In favor of bus option.	EOT and VHB will coordinate with project corridor communities to make sure there are no impacts to existing infrastructure such as water mains.
7/31/08	Connie Murphy	CJ Murphy Insurance	• In favor of Commuter Rail. • Suggests stations along Route 140 and Route 44 in Raynham.	EOT has examined stations in the areas suggested and agrees the area should be served.
7/31/08	Tino	Tino's Travel & Insurance	• Suggests station on County Street in Taunton.	EOT believes that the station site listed as the Target Plaza will serve the area suggested.
7/31/08	Barbara Cardoza	WEIR Corporation	• In favor of Stoughton Route via Dean St.	Comment Noted

* All participants who sent in comments will receive individual responses from EOT.

Date	Name(s)	Organization	Comment	Response*
7/31/08	Gerri Pieri	Resident	• In favor of Myricks Transfer Station. • In favor of Raynham I-495 park and ride station Station. • Opposed to Raynham Dog Track station.	EOT cannot plan a commuter rail system that would have the capacity to provide timely and reliable transfers at the Myricks station location. EOT also believes that the Raynham Dog Track station will provide good opportunities for transit oriented development. The I-495 station would be too expensive to construct.
7/31/08	Mary Delano	Saint-Gobain Performance Plastics	• Concerned that too many stations are being considered in Raynham and not enough in Taunton.	EOT's short list of station location includes 8 locations in Taunton and 2 locations in Ryanham. There will likely be 1 station site in Raynham and 1 or 2 in Taunton.
7/31/08	Frank Meninno	Easton Historical Society	• Supports EOT's decision to remove from consideration using North Easton's historic museum as a station site.	Comment Noted
7/31/08	Ken Martin	Resident	• Consider incorporating a parking garage at the Roche Brothers Plaza station site.	If the Roche Brothers Plaza station site is selected, a parking garage would be incorporated into the design.
7/27/08	Virgil A.	Resident	• Suggests alternative route from Easton through Taunton to New Bedford.	Any commuter rail route must be planned on a pre-existing rail right of way.
7/13/08	Christine Junge	Resident	• Where exactly is the downtown/Old Station Site in Easton?	This station location is located in downtown Easton on Mechanic Street.

* All participants who sent in comments will receive individual responses from EOT.

Date	Name(s)	Organization	Comment	Response*
7/30/08	James Purcell	Norton Town Manager	• Requests detailed list of station sites in Norton.	EOT is currently looking at the three stations sites listed in the Station Site Matrix on www.SouthCoastRail.com. They are the South Worcester Street site, the John Scott Blvd East site and the John Scott Blvd West site.
7/31/08	Jennifer Carlino	Norton Conservation Commission	• Identifies nearby wetlands for the three Norton station sites under consideration.	Comment Noted
8/1/08	Ronald and Janet O'Reilly	Resident	• Opposed to South Worcester site in Norton. Concerned for access, limited growth opportunities and impacts school bus operations. • Opposed to Attleboro Alternative.	EOT acknowledges opposition to South Worcester station site and Attleboro alternative. EOT believes there are some opportunities for smart growth in the area and believe the station would serve the community on a local level rather than as a regional parking station.
7/30/08	Joan Roche	Resident	• Has safety concerns for Attleboro Alternative.	EOT is cognizant of safety concerns for the project and will try to address them as best possible.
7/30/08	Ken Zanoni, Mark Sweeney, Debra and Larry Garrone, Susanna Girard, Lisa McIntosh, Brenda and Joseph Daday, Dianna Edgerly, Paul and Jean Shea, Melanie Silva, Luis Ydrach, Deborah Salley.	CCATS	• Opposed to South Worcester site in Norton. Concerned for access and limited growth opportunities. • Opposed to Attleboro Alternative.	EOT acknowledges opposition to South Worcester station site and Attleboro alternative. EOT believes there are significant opportunities for smart growth in the area and the station would serve the community on a local level rather than as a regional parking station.

* All participants who sent in comments will receive individual responses from EOT.

Date	Name(s)	Organization	Comment	Response*
7/31/08	Representatives John Quinn and Stephen Canessa	MA House of Representatives	• Opposed to elimination of Lakeville MBTA Commuter Rail Station.	EOT would only close Lakeville station as a last resort and is committed to exploring all other options before doing so.
7/29/08	Charles Evirs	Lakeville Board of Selectmen	• Opposed to elimination of Lakeville MBTA Commuter Rail Station.	EOT would only close Lakeville station as a last resort and is committed to exploring all other options before doing so.
7/31/08	Roger O'Shea, Sherry Clancy, Ofer Drucker, Jonathon White	Resident	• Opposed to elimination of Lakeville MBTA Commuter Rail Station.	EOT would only close Lakeville station as a last resort and is committed to exploring all other options before doing so.
7/13/08	Jeff Feroce	Resident	• Will stations be spaced properly? Why investigate a new station in Middleboro when there's already on in Lakeville?	As a rule of thumb, station selections for each alternative will be spaced approximately 3 to 5 miles apart. There may be exceptions.
7/30/08	Dean Lauzon	Resident	• Would like to know what impacts he can expect as an abutter to potential Everett Street station site.	EOT is in the process of determining what land takings and abutter impacts can be expected for stations that are advancing. EOT will reach out to abutters to discuss mitigation as soon as there is more information.
7/30/08	Bill Hinkley	Resident	• Requests that any Middleboro alternative allow a future extension to Wareham and Buzzards Bay.	While an extension to Wareham and Buzzards Bay is not part of the South Coast Rail Project, EOT is working to design alternatives in a way that would not preclude the extension.

* All participants who sent in comments will receive individual responses from EOT.

Date	Name(s)	Organization	Comment	Response*
7/13/08	Robb Johnson	The Nature Conservancy	• Concerned for potential environmental impacts of Raynham Dog Track Station. • In favor of the Oak Street Mall Station in Taunton. • In favor of MBTA Layover site and old Station site over Everett Street site on the Middleborough alternative.	EOT believes that the Raynham Dog Track site provides a good opportunity for smart growth. EOT agrees that Oak Street Mall station, the MBTA Layover site and the Old station site in Middleborough are favorable locations.
7/30/08	George Spatcher	Spatcher Law Offices	• Opposed to Attleboro alternative. • Fall River and New Bedford require multiple stops. • Consider a transportation hub off Routes 140 and 24 in Taunton.	EOT acknowledges opposition to Attleboro and agrees that Fall River and New Bedford will require multiple stops. EOT believes that the Target Plaza station site in Taunton will serve as the regional transportation hub that has been suggested.
7/31/08	Kyla Bennett	New England PEER	• Concerned that station locations are being selected prematurely.	EOT must make station locations in order to determine ridership numbers. Station construction impacts must be evaluated as a part of the overall impact analysis for each alternative.
7/30/08	Forrest Lindwall	Resident	• Interested in relocating current Stoughton station for redevelopment purposes.	Comment noted
7/30/08	Neal Kelly	Resident	• Who owns line between East Brittania Street and Thrasher Street?	These are privately owned properties.
7/30/08	Tom Davis	Greater New Bedford Industrial Foundation	• Concerned about New Bedford Industrial Park Station traffic impacts, potential ridership and limited development space.	Comment noted

* All participants who sent in comments will receive individual responses from EOT.

Date	Name(s)	Organization	Comment	Response*
7/30/08	Richard Merrill	Greater New Bedford Industrial Foundation	• Concerned about the bridge condition across the Taunton River near the Dean Street site. • Stations should have access from major highways.	EOT will select a mix of stations: some close to highways, some in town centers, to offer development opportunities and some serve as regional parking facilities.
7/30/08	Mike Ferrara	Taunton Community Development	• Opposed to Whittenton variation due to too many grade crossings.	Comment noted
7/30/08	Dick Shafer	Taunton Economic Development	• Opposed to Whittenton variation due to too many grade crossings.	Comment noted
7/30/08	Jamie Thorn	CCATS	• Opposed to Attleboro Alternative due to environmental concerns and neighborhood impacts.	Comment noted
7/30/08	Bob and Darlene Turner	Resident	• In favor of the town center Easton station site.	Comment noted

* All participants who sent in comments will receive individual responses from EOT.

SUMMARY NOTES OF OPEN HOUSE
South Coast Rail – Station Siting

LOCATION OF MEETING: SRPEDD, Taunton, MA

DATE/TIME OF MEETING: July 30, 2008, 3 to 6 PM

Attendance:
Attached

For South Coast Rail:
Kristina Egan, Executive Office of Transportation
Nancy Farrell, Regina Villa Associates (RVA)
Nancy Durfee, SRPEDD
Greg Guimond, SRPEDD
Steve Smith, Executive Director, SRPEDD

HANDOUTS:
Project Fact Sheet #2; matrix of station siting options; short list of station sites; maps of bus routes and rail alternatives; memo on siting criteria and evaluation process; large maps of segments of the region were on easels around the meeting room

PURPOSE/SUBJECT:
An opportunity for members of the public to ask questions and comment on the proposed sites for rail and bus stations in the project area.

BACKGROUND:
The South Coast Rail Project, led by the Massachusetts Executive Office of Transportation and Public Works (EOT), is intended to improve transportation between downtown Boston and the South Coast, particularly the cities of Taunton, Fall River and New Bedford. To further this effort, EOT and the Massachusetts Bay Transportation Authority (MBTA) launched a comprehensive and transparent planning process to evaluate transportation alternatives for the South Coast region. EOT worked with SRPEDD and the South Coast Rail communities to develop and screen a potential list of rail and bus stations for the alternatives. The information was presented in a number of meetings and posted on the website. A comment period was set up and an Open House scheduled within the period.

COMMENTS:
A number of written comments were submitted to EOT and a summary of the comments is attached. Other participants spoke with Project Manager Kristina Egan or other project staff, and brief summaries of their concerns are listed here:

- Mayor Charles Crowley, Taunton, expressed his opposition to the Attleboro alternative and the Whittenton variation of the so-called Stoughton alternative and his support for the Dean St. and Target Plaza sites as stations in his community. Mayor Crowley said that the Whittenton variation includes far more grade crossings, is too close to homes in several sections and there might be a problem with some of the fill at sites near old factories along the route. The Stoughton route via Dean St. would be close to downtown Taunton, in two transportation districts and

would provide economic development. A shuttle would carry passengers from the GATRA site to Dean St. Mayor Crowley said the community is also seeking to establish a downtown National Park designation and has developed site plans for the Dean St. location. Ms. Egan said the team would like to set up station workshops later in the fall in partnership with the city. She also promised Mayor Crowley she would do a tour with him of the Whittenton variation if that site advances through the scoping period on the state Environmental Notification Form/federal Notice of Intent.

- Neal Kelly, a Taunton surveyor, asked who owns the line between East Brittania St. and Thrasher St. Ms. Egan said she did not have that information with her and a team member would get back to him if the team has it.
- Chuck Evirs, Chairman, Lakeville Board of Selectmen, submitted a comment letter from the Board of Selectmen. He noted the work the community has invested in establishing a 200+ unit 40R development near the Lakeville Station. There are new and existing buildings operating there, and the Zoning Board of Appeals has granted or is considering additional permits for the area in conjunction with the relocation of Route 79. The Town has readied the site for a developer and keeping an active station will assist the economic development plans. Ms. Egan said the only scenario in which the station would be closed would be the Middleboro route (which would require trains to back into the Lakeville Station). Ms. Egan said she appreciates the work the community has put into its development plans and EOT would close the Lakeville Station only if it is absolutely necessary. Selectman Evirs said that several elected officials also planned to submit comment letters on this topic. NOTE: Letters opposing the Lakeville Station closing were submitted by Oxford Development, which is building the Kensington Court Housing Development adjacent to the station; CANPRO Investments; National Development, owner of the former Lakeville State Hospital site; and Rep. John F. Quinn and Rep. Stephen R. Canessa.
- Tom Davis is the executive director of the Greater New Bedford Industrial Foundation and manages the New Bedford Business Park. Mr. Davis said he has three concerns about the proposed station at the park (one of a group of three under consideration, with only one likely to be chosen). Mr. Davis said that the businesses at the park have produced 3500 new jobs over the last nine years. The site would experience significant traffic impacts if a station were located there. The second issue is that according to a survey Mr. Davis undertook, most of the people who work at the center come from New Bedford (60%), Dartmouth (20%) and a mix of local communities. Most live from 1 – 25 minutes from the site, none come from the Boston area. Bus service is available to the park but has little ridership (5 – 15 people ride the bus). Mr. Davis said that his final concern is that there is little space left for development and the one lot there is likely to be under agreement in 6-12 months. He could see benefits from expanding the airport, and Mr. Davis supports rail in general, but he does not see benefits for the park and its employees of siting a station there.
- Frank Meninno, curator, Easton Historical Society, said he had come to the meeting to ascertain if the designation of the Easton Old Station means that EOT wants to take the old building, a property donated by the Ames family that is now a museum, or if it means that EOT is looking to site a station near the historic building. Ms. Egan assured Mr. Meninno said the term was used to indicate the location of a platform. She could not say that the platform wouldn't be near or close to the station or the parking lot, but EOT will work with the Historical Society on those plans. There is no plan to take or use the museum as a station itself. Mr. Meninno asked for a written note or clarification of this plan, and Ms. Egan said she would be happy to send a statement to that effect.

- Jim Purcell, Norton Town Manager, gave Ms. Egan a letter from the Board of Selectmen requesting maps and information on the proposed station sites in Norton. Ms. Egan said that the town is talking with a couple of property owners in Norton. Mr. Purcell said that the town's position is that it does not want to be helpful and it opposes the Attleboro alternative. Ms. Egan said she will look at the other possible locations and notify the town if any of them appear to be likely and offer an opportunity for a conversation.
- Richard Merrill, North Abington, discussed the condition of the bridge across the Taunton River near the Dean St. site. He asked about the issues of access to major highways for the potential stations. Ms. Egan said EOT hopes for a mix of stations, some close to highways, some in town centers, some offering opportunities for local economic development and walking and biking and some serving as regional parking facilities.
- Mike Ferrara, Director of Community Development, Taunton, and Dick Shafer, Director of Economic Development, Taunton, said that the Whittenton variation involves many grade crossings in the community, an issue that Taunton would like to discuss with EOT. Freight is another issue for discussion. Ms. Egan said that the fall station workshops would provide an opportunity to have a detailed review of Taunton's concerns. They suggested that Ms. Egan talk with Patti Byrne, CSX, NE Regional Office, Selkirk, NY.
- Jamie Thorne, a member of CCATS, said he is opposed to the Attleboro alternative. He lives on Justine Lane, very close to the proposed alignment and while he doesn't mind the slow CSX trains, he feels commuter rail will disrupt his quiet residential neighborhood. He is also concerned about the impacts of the bypass on the swamp.
- Tony Medeiros suggested that the bus alternative should include routes that reach Route 128 and travel west toward Westwood.
- Gerry Pieri, Green Harbor, MA, said that allowing transfers at Myricks is key to the success of the rail option south of Taunton. He suggested that the Raynham I-495 park-and-ride station be advanced for further consideration, and provided a memo with details. He said that the proposed station at the Raynham Dog Track provides poor park-and-ride access, is not near a population center and has traffic issues. It was proposed as a station site in earlier studies because the land would be relatively inexpensive, but Mr. Pieri now feels that it was a mistake. With regard to Taunton, Mr. Pieri suggested that the line could be elevated through most of the community, creating crossings over a linear park. (Mr. Pieri submitted a detailed memo with additional comments.)
- Bob and Darlene Turner, Easton, said that they would like to meet with EOT to discuss the Easton downtown station. Mr. Turner has plans to develop the "Shovel Shop," and is working with the Town of Easton on his plans and permits. Mr. and Mrs. Turner are very interested in a station at the town center location and would like to work with EOT. Ms. Egan said she appreciated the offer and would be in. Mr. Turner said he would have excess capacity at his on-site treatment plant and he owns the parking lot for the old station site and leases the space to the museum. He hopes to begin building in 2009 and open in 2010.
- Dean and Paula Lauzon oppose the proposed site at NE Route 44, Everett St., which abuts their property (160 Everett St.).

2

FALL RIVER
OFFICE OF
ECONOMIC
DEVELOPMENT

July 29, 2008

Ms. Kristina Egan
SouthCoast Rail Manager
Executive Office of Transportation
10 Park Plaza, Room 4150
Boston, MA 02116

Dear Ms. Egan:

On behalf of the Fall River Office of Economic Development, I would like to take this opportunity to comment favorably upon EOT's listing of the Davol Street location as a possible site for an inter-modal transportation center containing both the commuter rail and bus station, as well as an additional rail station at Battleship Cove.

As you are aware, the City of Fall River has been working closely with EOT, the SouthCoast Rail Task Force and its legislation delegation in extending commuter rail from Boston to Fall River. As such, the listing of the Davol Street and Battleship Cove locations for further analysis is a welcome step in the overall process of reestablishing commuter rail to Fall River.

Furthermore, in the event that these locations receive a favorable recommendation upon the conclusion of the further analysis study, I hope that the Commonwealth would then proceed with the securement of the Davol Street site and release the funding for construction of the inter-modal transportation center at that location.

Lastly, as the Fall River Redevelopment Authority (FRRA) continues to look at the feasibility of the relocation of Route 79 and the development of an 8 to 10 acre parcel as a result of additional land created by the roadway relocation, the FRRA is prepared to work closely with EOT and the SouthCoast Rail Task Force in the development of Transit Oriented Design for that area in and around the proposed commuter rail/bus terminal.

Thank you for your time and attention in this matter. If you have any questions, please do not hesitate to call.

Sincerely,

Kenneth Fiola, Jr., Esq., Ec.D.
Executive Vice President

KF/mra

One Government Center, Fall River, Massachusetts 02722-7700
(508) 324-2620
(508) 675-1497
FAX (508) 677-2840
www.froed.org

3

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:04 PM
To: cpatton@reginavilla.com
Subject: Fw: New Bedford Commuter Rail Comments

----- Original Message -----
From: Jill Maclean <Jill.Maclean@newbedford-ma.gov>
To: Kristina Egan (E-mail) <Kristina.Egan@state.ma.us>
Sent: Thu Jul 31 16:15:00 2008
Subject: New Bedford Commuter Rail Comments

Kristina,

The only comment I'd like to add is that if the Whale's Tooth station location were to be moved to north towards Wamsutta Street, it would have the potential to be a TOD district. Thank you for the opportunity to comment.

Jill M. Maclean
Assistant City Planner
City of New Bedford
133 William St.
New Bedford, MA 02740
508.979.1488
www.ci.new-bedford.ma.us

4

TOWN OF FREETOWN
Board of Selectmen
Town Hall
3 North Main Street
P. O. Box 438
Assonet, MA 02702-0438
508.644.2201
508.644.3342 [f]

31 July 2008

Kristina Egan,
South Coast Rail Manager
10 Park Plaza, Suite 4150
Boston, MA 02116

RE: Support for Proposed Rail Station in Freetown, Massachusetts

Dear Ms. Egan:

By a unanimous vote at their meeting of 28 July 2008, the Board of Selectmen approved the potential South Coast Commuter Rail Station Site located on South Main Street in Assonet.

We applaud the efforts of Governor Deval Patrick, Secretary of Transportation Bernard Cohen and Commuter Rail Project Manager Kristina Egan. It is hopeful that under the current administration we will witness this long awaited project come to fruition. The South Coast Corridor is extremely vital for the health and welfare of our citizens.

The current Freetown Board of Selectmen has worked tirelessly to develop a strategy that will encourage economic growth and development for our South Main Street Corridor. These efforts include Transit Oriented Development, 43-D Permitting, Exit 8 1/2 and 2 Commercial/Industrial Parks-all located within a half mile of the proposed station site. It is with these accomplishments at hand that Freetown will have the ability to grow and prosper.

We are more than happy to welcome the South Main Street Station Site to Freetown!

Sincerely,

Lisa Pacheco, Chairman

5

City of Taunton
Office of the Mayor

Charles Crowley
Mayor

Todd J. Castro
Assistant to the Mayor

Gill E. Enos
Budget Director

15 Summer Street
Taunton, MA 02780
Tel. (508) 821-1000
Fax. (508) 821-1005

July 30, 2008

Kristina Egan, South Coast Rail Manager
Executive Office of Transportation and Public Works
Ten Park Plaza
Boston, MA 02116

Dear Kristina,

The citizens of Taunton have been supporters of the South Coast Rail Project and we have offered our strong support for the original 'Stoughton Route' option that would offer the greatest ridership and provide the most direct route for passengers wishing to utilize the rail service for business and pleasure between Boston and the South Coast region. As you are well aware, the 'Stoughton Route' option would allow trains to travel over a similar rail bed that has existed since around 1847 when that line was installed through the Hockamock Swamp servicing the communities of Easton, Raynham, Taunton and points south. The 'Stoughton Route' as has been described and outlined in your earlier presentations would allow train service through our community with only five (5) road crossings as opposed to the fifteen (15) road crossings that would result on the 'Attleboro Route' which would devastate our community.

Recent reports have suggested that the state is now choosing to examine an alternative 'Stoughton Route' option that I would call the 'Stoughton Alternative' that would have the train service travel through Easton and North Raynham and then turn along the route once referred to as the Whittenton Branch that would see trains travel from North Raynham by Prospect Hill in Taunton and under Bay Street and continuing through the village of Whittenton and connecting to the

current rail line near West Britannia Street in Taunton. The rail line, according to that plan, would then travel through the center of Downtown Taunton. The route would raise all the same concerns the 'Attleboro Route' would raise by having the train cross a series of streets in our congested downtown area and create a traffic and public safety nightmare. This 'so-called' 'Stoughton Alternative' is not a plan that makes any sense. That option would have trains crossing under Bay Street and then crossing at grade level Whittenton Street, Warren Street, West Britannia Street, Danforth Street, Tremont Street, Oak Street, Porter Street, Cohannet Street, Winthrop Street, Harrison Avenue, Somerset Avenue, Weir Street, Ingell Street and Hart Street. As you can see, that 'Stoughton Alternative' or plan B would create fourteen (14) grade crossings.

Once again, on behalf of my community I would like to offer my strong support for the original 'Stoughton Route' option for rail service to the South Coast as it is the most direct route and it has the greatest ridership potential. That option would only create five (5) at grade crossings in our community. I would also emphasize my strong opposition to the 'Attleboro Route' that would create fifteen (15) at grade crossings and to the route or option of the 'so-called' Stoughton Alternative' that would create fourteen (14) at grade crossings in our community.

Respectfully,

Charles Crowley, Mayor

cc. Senator Marc Pacheco
Representative James Fagan
Representative Patricia Haddad
Representative Steven Canessa

Charlie Patton

From: Tony Medeiros [thebeat95@verizon.net]
Sent: Thursday, July 31, 2008 9:35 AM
To: Charlie Patton
Subject: Re: South Coast Rail

Kristina,
It was a pleasure meeting you and reviewing the information gathered about this monumental decision that the Commonwealth will face very soon.

As I reviewed most of it after, I came up with a few more points and questions.

1.) *Train Stations and Water Supplies, etc.* - I live on the end of Bennett St. Ext. (the Dead-end side nearest the Ventura Grain Company (Abuts my back yard).

BROCKTON WATER MAIN was recently installed along the Train Track. I spoke with the Lead Engineer on the project and he stated the precautions they are making relative to shut offs in the event the pipe leaks. etc.

I'VE NOTICED WORKERS ON THE RAILROAD BRIDGE over the Taunton River, just south of Rt. 44 and DEAN ST. have been working on the PIPELINE NEXT to the BRIDGE for WEEKS. They have been putting additional steel rings of some sort around major sections of the Pipe.

The Train has been running back and forth the Ventura Grain, and I'm wondering if that small little Engine and two or three Grain cars are causing problems when they CROSS the BRIDGE? It they are having some kind of problem with the Bridge section, I could imagine what could be happening UNDERGROUND in that area where the Pipe and Track run next to each other.

2.) *ECONOMICS TO DO WHAT IS BETTER FOR the REGION -*

BUS OPTION - Supposedly significantly much lower in cost even with Rt. 24 changes (Federal Funds)

Drop the Train idea, and use the remaining $500 Million to work on needed INFRASTRUCTURE in NEW BEDFORD, FALL RIVER, ATTLEBORO, and TAUNTON and TOWNS. Just in Taunton: WATER PIPES - I must change filters in my Whole House filter, wait minutes while the water comes out pure, Walker Elementary School - Needs Funds for renovation, Morey Bridge - DAM project is in serious need of replacement, Roads, Water, Sewer, Public Safety needs. Add Police and Fire Position.

IN 2016 it would be somewhat embarrassing to PROUDLY POINT to our SPARKLING NEW TRAIN - while in the back ground our Cities and Towns are Crumbling apart in other areas.

A wise homeowner fixes the ROOF before ADDING an "In Ground" SWIMMING POOL. Getting by with a cheaper Above Ground Poll.

Thanks again, and Keep the Faith,
Tony Medeiros
68 Bennett St., Ext
Taunton, MA

7

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:02 PM
To: cpatton@reginavilla.com
Subject: Fw: Stations

----- Original Message -----
From: C.J. Murphy Insurance Agency, Inc. <cjmurphyins@GMAIL.COM>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Sent: Thu Jul 31 16:16:00 2008
Subject: Stations

I am writting in SUPPORT of the MBTA in Taunton,MA
The city desperately needing an easier and more efficient way in travelling to Boston. The highway is a mess with all the congestion.

A station will be adequate along the Route 140 highway which is connected to Route-24
A station wll also be adequate on Route-44 in Raynham, which is connected to Route-24

Your attention is desperately needed in this manner.

Best Regards.
Connie Murphy

4

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:04 PM
To: cpatton@reginavilla.com
Subject: Fw: station

----- Original Message -----
From: Tino's Travel & Insurance & C.J. Murphy Ins. <TINOS@tmlp.com>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Sent: Thu Jul 31 11:15:45 2008
Subject: station

I am writting in support of the MBTA commuter rail in Taunton and surrounding areas.

There is a perfect location on County St in Taunton, MA which connects to cities like Fall River and New Bedford and there surrounding areas.

This will reduce traffic and the number of vehicles on the road, especially Route 24, which is a horror show during rush hour.

Thank You for your time.
Tino.

9

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:04 PM
To: cpatton@reginavilla.com
Subject: Fw: South Coast Rail project

----- Original Message -----
From: Elisa Scully <elisa@weircorp.org>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Cc: mayor@tmlp.net <mayor@tmlp.net>
Sent: Thu Jul 31 14:50:06 2008
Subject: South Coast Rail project

Dear Ms. Egan:

The WEIR Corporation is a nonprofit, volunteer-led Community Development Corporation based in Taunton. We are writing to express our support of Mayor Charles Crowley and his conclusion that the Stoughton route via Dean Street is the preferred option for bringing the South Coast Rail project through Taunton. We believe that this alternative offers the best way to promote our community's economic development while ensuring our residents' safety.

Thank you for the opportunity to contribute our input regarding this important project.

Sincerely,

Barbara Cardoza
President
WEIR Corporation

10

Gerry Pieri

Transportation, Management, Planning, Logistics

30 July 2008

Kristina Egan, South Coast Rail Manager
Massachusetts Executive Office of Transportation
Ten Park Plaza, Suite 4150
Boston, Massachusetts 02116-3973

Dear Kristina,

Congratulations !

I have reviewed the recent station siting documents, and I see much positive progress in your huge effort.

I do, however, have a few concerns:

1. I notice that the transfer station (R25) at Myricks in Berkley was not advanced for further consideration. Perhaps this was due to an incorrect assumption that the station could not be built on the already-built-up rail right-of-way, or that it might encroach upon a nearby priority habitat.

The Myricks station is critical. It enables successful rail operations south of Taunton, and it may be the key to your not having to try to build a third track inside of Route 128.

I suggest that Myricks (R25) be advanced for further consideration. I have enclosed an attachment with further details.

2. I notice that the Raynham I-495 park-and-ride station (R40) was not advanced for further consideration. This appears to be based on incorrect assumptions that the station site would require substantial land-takings.

The Raynham I-495 park-and-ride station is critical. It maximizes rail access to persons enables successful not living near the rail line. Also, it enables four other Smart Growth stations at very low cost and very high potential ridership.

I suggest that Raynham I-495 park-and-ride station (R39) be advanced for further consideration. I have enclosed an attachment with further details.

46 Bay Street (Box 394)
Green Harbor, Massachusetts 02041-0394
781-834-4285 **Fax 781-834-7561**
GerryPieri@gmail.com

3. I notice that Raynham Dog Track station (R41) was advanced for further consideration.

I remain convinced that the Dog Track location provides poor park-and-ride access, almost no nearby population, serious traffic issues, and no Smart Growth advantage. It is certainly not a viable substitute for the I-495 site.

I suggest that it be eliminated. I have enclosed an attachment with further details.

4. I note that the list of stations advanced for further analysis makes Whittenton and Taunton stations mutually exclusive. I suggest that this should not be the case. Each of these sites has huge potential as non-park-and-ride stations without the cost of massive parking lots. Each has its own ridershed

5. I note with interest the *Selecting Station Sites* document. Obviously, much effort went into it.

However, I do note that the document seems to treat each station site as a stand-alone entity rather than in the context of the overall project.

Also, I do not see the justification some of the numbers in the document. For example:

- Why is "under 5 acres unacceptable for rail", if the rail station is to be a Smart Growth non-park-and-ride station?

- Why does $7 million automatically disqualify a site even though the resulting benefit may well exceed that amount.

As always, I would be more than glad to answer further questions either by phone or in a meeting.

Regards,

Gerry Pieri

46 Bay Street (Box 394)
Green Harbor, Massachusetts 02041-0394
781-834-4285 **Fax 781-834-7561**
GerryPieri@gmail.com

Myricks Station (R28) Should Be Advanced For Further Consideration

Overview:

The transfer station at Myricks is critical to the viability of the entire South Coast rail project:

- It enables comprehensive service and quadruples trip options for New Bedford and Fall River riders.
- It substantially reduces rail passenger cars needed (and empty seat miles) during peak hours.
- It eliminates the need for South Coast passengers to drive north to the first common station (Target Plaza)
- It reduces trains through Canton Junction and on the northeast corridor – to the extent that it becomes unnecessary to construct a third track through the Fowl Meadow wetlands between Route 128 and Boston.
- It eliminates the infrastructure requirements and operational nightmare of the transfer station on the common track (eg: in Taunton)

The purpose of the Myricks station is to enable an absolutely seamless and absolutely reliable transfer between every through train (to/from either South Coast City) and a shuttle train (to/from the other city). Any incidential use of the station by nearby residents is merely a bonus.

The station site (northwest of Myricks Street) is ideal:

- ***Size*** -- Less than 1.3 acres is needed for the optimum station design. Considerably more space is available in the already-built-up right-of-way.
- ***Accessibility*** -- not an issue for a transfer station; more than adequate for incidental use by nearby residents
- ***Environmental*** – Environmental impact is essentially nil. There is no need to encroach upon a nearby priority habitat. Noise and other impacts will not differ substantially from train operations without a station.
- ***Smart Growth*** – Adjacent population or jobs are not valid considerations for a transfer station; rather, it enhances smart growth at stations south of Myricks.
- ***Equity*** – Trip options are quadrupled for disadvantaged riders who have access to South Coast stations and for disadvantaged riders who have access to the Taunton station and seek employment on the South Coast.

Details:

Introduction - A station is needed at Myricks Junction to enable transfer between every through train (to or from either Fall River or New Bedford) and a shuttle train (to/from the other city).

With the transfer station, passengers from either South Coast city will have access to every train to and from Boston. This effectively doubles the number of trains available to the passenger (in each direction). Thus, the number of round trip options is quadrupled.

The transfer station at Myricks is a critical element in the overall South Coast rail project. As such it must be evaluated in the context of the overall project rather than as an individual local station.

Impacts avoided -- Without the transfer station, South Shore commuter rail will experience a combination of three undesirable phenomena:

- Pressure to increase the number and frequency of trains on both branches,
- Unrealized ridership due to the inadequate frequency of trains,
- A tendency of riders to drive to the first common station (Target Plaza) in order to maintain their choice of return trains.

Each of these impacts has substantial effects:

- **Increase in the number and frequency of trains:**
  - increases rolling stock requirements,
  - increases the number of train crews needed,
  - increases fuel use,
  - puts additional pressure on Canton Junction (the most critical operational asset),
  - probably requires an additional track (currently unavailable) at South Station,

  - generates a real need for the environmental nightmare of constructing a third track through the Fowl Meadow between Route 128 and Readville[1].

- **Unrealized ridership** translates into lost revenue and a lost opportunity to fully achieve the environmental, energy, and socio-economic goals of South Coast Rail. Unrealized ridership is not limited to regular commuters. It is also an issue during off-peak hours when there are plenty of seats available, but the round trip options are so few that it simply becomes more convenient to drive than to risk missing a return train.

- **The first common station** phenomenon is real and widespread. One recent example in Massachusetts: The Kingston station is under-utilized and the Plymouth station is very lightly used while, at the same time, the first common station in Halifax exceeded its parking capacity within weeks of the opening of the Old Colony and the next common station (Hanson) approaches full parking capacity. The impact on local roads in Halifax and Hanson at train time is substantial. A similar impact is possible at Target Plaza.

Location -- There is little choice regarding the location of the transfer station:

- It must be at the junction of the two branches.

- It must be south of the switch between the two branches.

Location at the junction is required to enable seamless and reliable transfer. A location further south obviously would preclude transfer. A location further north – such as Taunton -- on the common track creates major operational issues and infrastructure costs, increases fuel and rolling stock requirements, and probably precludes any type of seamless and reliable transfer.

Location south of the switch is necessary to allow the two trains to be on adjacent tracks at the same time with only a few feet of platform between the doors of both trains.

For a number of reasons, the old "wye" southeast of Myricks Avenue (site R24) is not suitable. An appropriate station cannot be designed to fit on the site without major land-takings and reconfiguration of tracks.

---

[1] A third track through the Fowl Meadow would be very expensive, and may not be possible at all. In the 1970's (when environmental restrictions were much weaker than today), Route I-95 was diverted from its planned route into Boston (via the Fowl Meadow) and rerouted to follow state route 128 around Boston. Years later (ca. 1990), construction of a vital MDC pipeline through the Fowl Meadow had to incorporate extremely complex (and expensive) procedures to protect endangered species in the meadow.

Old "wye" area
Fall River line is to right; New Bedford line is straight; industrial siding is to left. The old "wyw" area is not a good location for the station, in part due to the sharp divergence of the New Bedford track in part due to the need for major takings of residential property just behind trees and to the right.

Fortunately, however, the switch between the two branches can be moved ¼ mile or more northwest of Myricks Avenue, making the intervening built-up right-of-way an ideal site. A carefully-designed three-track[2], two-platform station will fit within the already-built-up portion of the right of way[3].

There is even room to allow for future extension of the platforms to 1,030 feet providing capacity for 12-car trains with two locomotives.

[2] The center track will be for the shuttle train. It will be stub-ended to the North. It will connect to both branches.
[3] There is room for gauntlet rails for wide freight trains within the already-built-up right-of-way.

Looking northwest at station site
There is ample room within the already-built-up right-of-way to contain the station without encroachment on sensitive areas

Seamless and reliable transfer – A transfer between trains does not work well unless the transfer is absolutely seamless and absolutely reliable. The rider of one train must know that the other train will always be there, on time, with no need to wait on the platform. The actual transfer must be merely a short walk (ideally less than ten feet) on a covered platform that is level with the floors of both trains – no stairs, no long walks, no curved paths.

Such a transfer can be designed, implemented, and consistently operated at Myricks.

It has been argued that a transfer is a substantial detriment to the marketability of a transit service. Such is often the case. Numerous examples can be cited – both in Massachusetts and in other locations such as Jamaica, Long Island.

Such need not be the case, however, at Myricks. An absolutely seamless and absolutely reliable transfer is possible which, (as has been demonstrated in Dallas, Texas and elsewhere) presents no detriment to marketability.

Incidental use of the station – Myricks is intended to be a transfer station and is entirely justified as such. However, there probably will be some incidental use of as a walk-in station for nearby residents. This use is merely a bonus.

It is not intended that Myricks be a park-and-ride station. Demand would appear to be very light. No provisions – other than a few handicapped spaces should be made by the MBTA. The town of Berkley can discourage park-and-ride on nearby streets with appropriate parking restrictions[4] as it sees fit[5].

Environment – It is difficult to see where the station has an impact on the environment greater than the impact of merely running trains though the area without stopping. The station will not occupy land other than that which is already built up on the railroad right of way. There will be no encroachment into the nearby priority habitat area. There will be no substantial increase in street traffic.

Smart growth – In the context of the overall project, Myricks is a key element in the promotion of Smart Growth.

The Myricks transfer station will not encourage much residential growth or industrial development in the immediate station area. That is not the purpose of a transfer station. And, there is a real question whether such growth would be desirable in the immediate area.

Rather, the Myricks station will enable Smart Growth at station locations south of Myricks by increasing the quality of the rail passenger service to those locations.

Environmental Justice – In the context of the overall project, Myricks is a key element in the promotion of Environmental Justice.

Much has been made – as it should be made – in recent years of the concept of "Environmental Justice". In the past, public transit projects would bypass, or, worse yet, run "closed-door" through, areas with disadvantaged populations. Now, this situation has changed.

The Myricks transfer station will not encourage directly serve a disadvantaged population in the immediate station area.

Rather, the Myricks station will enable substantially better and more frequent service options at station locations south of Myricks. The same holds true for service in the reverse direction from Taunton to the South Coast.

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[4] Possibly something as simple as 2-hour parking between 9 AM and noon.

[5] Alternatively, Berkley could opt for some sort of nearby town-owned parking lot for town residents and issue parking stickers to residents similar to the stickers issued to residents of sea-side towns for beach parking.

The Taunton, New Bedford, and Fall River stations are accessible by foot or by local transit to a number of disadvantaged populations. Myricks promotes Environmental Justice to these populations by quadrupling the daily rail trip options to them.

Raynham - Route I-495 Park-and-Ride Station (R39) Should Be Advanced For Further Consideration

Overview:

The Raynham Route I-495 park-and-ride station is needed to enable the "Smart Growth" concept in Taunton, Raynham, and Easton:

- It is the only possible viable location for a regional park-and-ride station.
- It maximizes rail access to thousands of potential riders who do not reside near the railroad.
- It provides this access without placing a new burden on local roads or highway interchanges.
- It is the only way to discourage potential riders from using local streets and secondary roads to reach non-park-and-ride stations that are intended for "Smart Growth"

The Raynham Route I-495 park-and-ride station can be implemented without several of the negative impacts in the July 10 station site screening draft:

- The topography does not require "major site work". Rather it merely requires the construction of an "air rights" parking garage above the existing highway.
- The accessibility is not merely "good". Rather, it is "excellent" with direct access in all directions from both routes I-495 and state route 138 – all without using the existing already-burdened highway interchange, and all without left turns onto or off of route 138.
- The site does not involve encroaching on the supermarket office complex. Rather, it is essentially confined to the existing state-owned highway right-of-way. The site acquisition cost may be close to zero.
- The station likely can be built without encroaching on any wetlands.
- The station likely can be built without encroaching on any priority habitat.
- The station enhances overall equity and Environmental Justice both in that it maximizes station access (via automobile) to disadvantaged populations and in that it enables the location of the downtown Taunton station at a site that is within walking or transit distance of other disadvantaged populations.

Essentially, the Raynham Route I-495 issue becomes one of balancing park-and-ride and Smart Growth stations. In this case, the project needs to spend money on a parking garage and some ramps at the optimum park-and-ride location thereby maximizing the ridership options for persons not living near the railroad. In turn, this single park-and-ride station enables as many as four non-park-and-ride stations at "Smart Growth" locations within walking (or transit) distance of well over 10,000 residences and major job sites.

The benefit-cost analysis seems obvious. The parking garage will likely pay for itself in parking fees and train tickets; substantial funds will be saved on constructing the Smart Growth stations; and the ridership potential is maximized.

Details:

The Raynham Route I-495 park-and-ride station is a very critical key to maximizing the success of South Coast Commuter Rail.

Not only does it provide convenient access to the train by persons who live some distance from the track in West Taunton, Norton, Raynham, and the far southern regions of Easton but also it enables the construction of non-park-and-ride stations in downtown Taunton and Whittenton.

Concept -- The Raynham Route I-495 park-and-ride station is based on a concept that was proposed in a study commissioned by the MBTA in 1972.[1] [2]

In that concept:

- An "air rights" parking facility is constructed above the highway at the location where the highway and railroad intersect.
- Access to the parking facility is via long, straight ramps parallel to the highway and immediately adjacent to the highway.
- Bridges already carry the highway over the rail tracks.
- The station platform is adjacent to the tracks beneath the highway bridge and extending in both directions along the rail right-of-way.
- There are no land takings. Rather, the "footprint" of entire facility is within the existing highway and railroad rights-of-way.

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[1] ***Plan for Acquisition and Use of Railroad Rights of Way*** December 1972 For Massachusetts Bay Transportation Authority by Thomas K. Dyer, Inc. Consulting Engineers (Page 101)

[2] By citing the station design concept, the author does not necessarily endorse other portions of the cited report.

Raynham Route I-495

The Raynham Route I-495 park-and-ride station concept contains four variations from the 1972 concept:

- To avoid the expense of reconstructing the existing bridges that carry Route I-495 over the railroad right-of-way, it may be cost-effective to locate the station platforms immediately south of the highway.

- There is already an adjacent highway interchange between Routes 138 and I-495. This interchange and its ramps will remain in their existing configuration – completely independent of the station. No station-related traffic will use these ramps.

- An additional set of ramps is needed to provide secondary automobile access to the station to and from Route 138. These ramps should be configured so that no left turns are required on Route 138 by automobiles entering or leaving the station. (It appears that these ramps can fit within the existing highway rights-of-way.)

- There will be some need to enable walk-in and bicycle access to the station from Route 138 and nearby buildings.

Requirements – There are four critical requirements for the Raynham Route I-495 park-and-ride station:

- The station must be located at Route I-495 with direct access to and from that highway. Any relocation of the station site to the north or south along Route 138 conflicts with the purpose of the station, and seriously compromises its viability.

- The entrance ramps from Route I-495 to the station parking facility must be long enough to contain any queue of traffic and to preclude any "back-up" onto the highway.

- The already-congested interchange between the two highways must not see any increased demand due to station-related traffic.

- The parking facility must be readily-expandable (strong enough to add one or more additional decks).

The Raynham dog track station is not viable and should be removed from further consideration.

Overview – This station serves no purpose for South Coast Rail.

- The only real potential for this station is to serve the dog track.
- There is no real assurance that the dog track site will ever be developed for other uses – either commercial or associated with the gambling resort industry.
- The location is too far from Route I-495 to be a viable regional park-and-ride station.
- Access via Route 138 is already limited by traffic congestion, and would be exacerbated with the addition of commuter rail patrons.
- The station does nothing to enable Smart Growth stations in Taunton, Raynham, or Easton.

Discussion – The station was proposed as a park-and-ride station to take traffic off Route 138.

There is essentially no walk-in commuter potential. There are no residences within a half-mile walk, and only about 40 residences within a mile.

Park and ride traffic would have been mostly from the south, would have created local traffic congestion on route 138 at the entrance to the dog track, and would have exacerbated already excessive traffic on Route 138 between I-495 and the dog track.

It is doubtful that many motorists on Route I-495 would opt to use the already-saturated highway interchange at Route 138 to join the already-excessive traffic on Route 138. Rather, they are more likely to attempt to find parking near another station in Taunton.

It is even more doubtful that residents of Raynham south of I-495 would use Route 138 to reach this site. They, too, are more likely to attempt to find parking near another station in Taunton.

The regional park-and-ride function is far better served by the proposed I-495 park-and-ride station.

From: Delano, Mary J. <Mary.J.Delano@saint-gobain.com>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Cc: wnn545@aol.com <wnn545@aol.com>
Sent: Thu Jul 31 09:03:09 2008
Subject: STATIONS - Middleboro - taunton

Hi Kristina,

I am sorry I was unable to attend your open house on Wednesday July 30th. As Human Resource Manager my employees have no public transportation available to them. I have employees from Fall River, Lakeville, New Bedford, Buzzards Bay and Plymouth.

Stations in these areas are paramount for industry and commuting purposes. I do not understand why on earth there would be 3 stations in Raynham, when the town opposed the commuter rail from day one. Taunton is the largest City in the state of Massachusetts area wise and should be the City considered for 3 stations, not Raynham, a small town.

Please respond.

Regards

Mary Delano

Human Resource Manager

Saint-Gobain Performance Plastics

700 Joseph E. Warner Blvd.

Taunton, MA 02780

Tel: (508) 828-5515

Fax:(508) 823-1168

mary.j.delano@saint-gobain.com

12

PCSArea: General Comments

Category: :

From:: Meninno, Frank

Received:: 7/31/2008 9:42:23 PM

Documents Attached: None

Images Attached: None

Comments:

Enter any feedback or general comments below.
Thank you for your time at the open house. Your information on the North Easton station will certainly ease some nerves, now that we know our historic building is safe and will still be ours. I look forward to receiving your statement to share with the board. I hope that sensitivity to the impact on the historic district will be maintained, as this is a major cultural center for Easton and a gathering place as well.

13

EOT

SOUTH COAST RAIL

South Coast Rail Project

January 2008 – Civic Engagement Meetings

COMMENTS

Name (optional): Ken Martin

Address: 18 Sunset Dr S. Easton Ma 02375

Please write any comments you have pertaining to the *South Coast Rail Project* in the space provided below. (If you need additional space, please use the reverse side.)

Put a parking garage on Rock Bro. in Easton like canton junction
There are nine crossings in Easton Seven for cars + truck one for walking and one water department
The old Railroad station the streets are to small

You may leave this comment sheet with project staff at the door, mail it to Kristina Egan, South Coast Rail Manager, Executive Office of Transportation, Ten Park Plaza, Room 4133, Boston, MA 02116-3973 or email it to Kristina.Egan@eot.state.ma.us.

14

Kristina Eagan

To whom it may concern my idea of the commuter rail to new bedof, goes as follows in Easton by Roche Brothers instead of bearing right it should stay to about 18° to left. that way it would go by the small ponds Lewis and not the center of Easton, and there is plenty of open land, than thru ~~th~~ Stonehill College where maybe a stop with be available. than Thru 123 and simpson spring farms abuted. than thru 106 and Raynam dog track. a stop also there. as it moves foward by Taunton don't take the loop. instead stay to the left. by the post office and near St. Joseph. Cemetary and than it avoids Taunton Center where some objections have occured. But the way I suggest and you can see on the Townis maps its a better away and conrail already exists.

P.S. Than buses can take commuters downtow or industrial parks or courts. etc. etc.

Kristina Eagan · 7/27/08 43 Bithop Ave Stoughton ma 02072

P.S

It has been in the comitee's to build an Oceanarium Museum in New Bedord waterfront widch the bus system would serve it from the Train, a lot of schools take field Trips to see the "COVE", USS massachussets and than the Oceanarium museum if built consider it as part of the whole project.

P.S. happy to make this suggestions and maybe more in the future.

Virgil D. 1/27/08

15

PCSArea: Contact Us

Category: :

From:: Junge, Chistine

Received:: 7/13/2008 6:12:01 PM

Documents Attached: None

Images Attached: None

Comments:

Please fill out the form below with your specific questions on South Coast Rail?
As someone new to Easton, I am not sure what is meant by one of the potential rail road sites: what does downtown/Old Station Site mean? Where exactly is that? Thank you.

16

TOWN OF NORTON

70 East Main Street
MUNICIPAL CENTER, NORTON, MA 02766

Telephone: (508) 285-0212 Fax: (508) 285-0297
E-mail: jpurcell@nortonmaus.com

James P. Purcell
Town Manager

July 30, 2008

IN HAND

Ms. Kristina Egan
South Coast Rail Manager
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973

Re: Potential Station Sites

Dear Ms. Egan: Kristina

Would you kindly provide me with a detailed list (and map if available) identifying each location the Executive Office of Transportation is considering as a potential station site?

Your earliest attention to this request would be appreciated.

Sincerely,

James P. Purcell
Town Manager

mtb

17

Norton Conservation Commission
70 East Main Street
Norton, MA 02766

July 31, 2008

Kristina Egan
South Coast Rail Manager
Executive Office of Transportation
Ten Park Plaza, Rm 4140
Boston MA 02116

Dear Ms. Egan,

I have attended the Open House and reviewed the potential station locations for the Town of Norton. I offer the following comments.

Site ID R52: South Worcester Street
The Conservation Commission issued an Order of Resource Area Delineation (DEP file number 250-759) for the owner, David Azanow, at Map 27, parcels 182, 185, 191 and 311. A minimum of 4,000 linear feet of bordering vegetated wetland were verified. The property contains bordering vegetated wetland, bank (intermittent streams), and 2 certified vernal pools (CVP4449 and CVP4450). Potential turtle nesting habitat was also observed.

Site ID R53: John Scott Blvd (1.5 acres)
The location from the plan at the Open House is a parcel containing 4.5 acres on the Norton Assessor's Map (Map 26, parcel 171). It contains bordering vegetated wetlands and a bank (intermittent stream). Crossing of the wetland/stream was permitted in DEP file number 250-225 in 1989.

Site ID R54: John Scott Blvd (3 acres)
There are not any files in the Conservation Office pertaining to the property at Map 26 parcel 251, containing 3.54 acres. There is a sizeable wetland to the southeast of this parcel.

Thank you. If you have any questions please do not hesitate to contact me.

Sincerely,

Jennifer Carlino
Conservation Agent

CC: Heather Graf, CCAST
James P. Purcell, Norton Town Manager
Gregg Guimond, Nancy Durfee, SRPEDD

Phone (508) 285-0275 • Fax (508) 285-0277 • conservation@nortonmaus.com

18

Ronald O'Reilly
29 Union Road
Norton MA 02766

August 1, 2008

Ms. Kristina Egan,
South Coast Rail Manager
Ten Park Plaza, suite 4150
Boston MA 02116-3973

Subject: The South Coast Rail Project: Proposed Attleboro Alternatives and Proposed Station Site off South Worcester Street at the Intersection of Barrows Street.

To Whom It May Concern:

I am writing as a fifty year resident of Norton who has lived just over a mile from the proposed Barrowsville Station site for the past thirty-six years. My wife who joins me in these comments is a life long resident of Norton and has also resided just over one mile from the site for the past thirty-six years.

The proposed site at the South Worcester Street at grade railroad crossing is located in an older section of Norton known as Barrowsville. Barrowsville was the home of the former Defiance Bleachery which employed many immigrants and others who settled in that area in the early 1900's. Many small houses and a number of three deckers were built to accommodate the housing needs of the influx of people who came to live in Barrowsville to work at Defiance Bleachery. These are now older, privately owned, mostly single family homes with the exception of some three deckers that have been divided up into apartments. The area is residential except for a combined deli and package store across the street from the proposed South Worcester Street station and a mill building located on Barrows Street. There is no land available for growth or commercial development except the small site of a former bar room that has been closed for many years, or by dislocation of tenants in the three

deckers. This site is not conducive to the stated objective of proposed station sites as being a location for "smart growth".

The main issue with the proposed South Worcester Street station site is the access roads. South Worcester Street is a narrow two lane country road with many curves. One curve is a 75degree left turn approximately one hundred yards south of the proposed station site. Barrows Street is another narrow road with many curves. Dean Street starts where South Worcester Street makes the aforementioned 75 degree left turn and is also a narrow, winding road. Many of the homes on South Worcester Street are now located close to the road as the road has been widened over the years. Many of the residents back out of their driveways on to the street because the house lots are small. This road is not a candidate for widening to improve traffic flow. Barrows Street is a road with a mix of older and newer homes with the older ones closest to the road, especially the three deckers. Barrows Street is not a prospect for widening as the three deckers are all located in close proximity to the side walk. The land across the street from the three deckers is wet lands and is the out flow from Barrowsville Pond. The area is in a flood plain and is highly susceptible to flooding during a "hundred years' storm. Such torrential rain storms tend to occur every five to ten years, despite the nomenclature used to describe their expected statistical frequency.

Access to major highways is another issue with the proposed South Worcester Street station site. Barrows Street is a narrow, road with many curves along its one-and-two-tenths (1.2) miles length. Barrows Street ends at Route 140 (Taunton Avenue) that is a dangerous intersection and was the scene a recent fatal accident. Accessibility for the proposed South Worcester Street site is terrible.

MBTA parking at the proposed Barrowsville Station site might be limited as a review of the satellite image shows the site has been previously disturbed for gravel removal leaving a number of depressions that appear now to be isolated wetlands. The egress from the site would be difficult because of the abutting home to the left and a curve in the road restricting the view of those leaving the proposed parking area. The probable limitations on development and the less than desirable egress would likely encourage neighboring property owners to open their yards to parking, especially at the commercial building on South Worcester Street that has

been closed for many years. All of the private property that has potential for parking is located on South Worcester Street and Dean Street east of the proposed station site. People who park off site would be walking along streets without side walks and rushing to cross the tracks as the train sounds its horn approaching the South Worcester Street at grade railroad crossing. Human nature being what it is people will be ducking under the gates to beat the approaching train. This site is a fatal accident waiting to happen unless it is permanently manned by MBTA Police. That is not going to happen as evidenced by the lack of police presence at other stations in this area which handle ten times the volume of commuters as this proposed site is planned to handle. Two of the stations in communities neighboring Norton have experienced fatal accidents in recent years, when commuters rushing to catch the approaching train crossed the tracks, so a fatal accident is not an unrealistic scenario. Neither of these large commuter stations have MBTA Police present on a daily basis, so it is unrealistic to think that would occur in Norton.

An issue that I have not read about or heard discussed is the impact on the cost of additional school buses in both Taunton and Norton. Taunton will have school buses tied up at as many as fifteen on grade crossings throughout the city delaying the pick-up and drop-off of children from kindergarten through high school. The slowing down of bus routes due to the delays at one or more of the fifteen at-grade crossings in Taunton will necessitate the addition of more buses to serve the needs of their children at a cost which has not been determined but which would be borne by the city.

In Norton: four of the five schools' bus routes will be affected due to buses being delayed at the South Worcester Street and John B. Scott Boulevard at-grade crossings. The buses for these four schools start their morning routes for high school pick-ups at 6:45 AM and end the morning run at the Joseph C. Solmonese Elementary School at approximately 9:15 AM. The buses for the high school, middle school and two elementary schools travel the roads that would be impacted by the commuter trains during the morning hours. The Norton bus routes would be slower as the buses would be delayed at one and possibly both of the at-grade crossings. Slower bus routes would require the town to add additional buses. The number of buses and the cost is not determinable at this time, but there can be no doubt that there would be additional school bussing costs for the Norton

School Department. These additional local costs are conveniently being ignored by the South Coast Rail Project "planners".

The South Coast Rail Project has indicated that, if the Attleboro Alternative is selected, one of its objectives will be the acquisition by the MBTA of the existing CSX Rail Road, (CSX) Attleboro freight line. This freight line serves the South Coast Region of Massachusetts. If CSX does not reach an agreement to continue using the line for its one-hundred-twenty-five car freight trains at times convenient for the MBTA commuter line, freight service to the South Coast areas of New Bedford, Fall River, Middleboro and the Cape might be terminated or reduced. CSX currently runs these long freight trains to the South Coast area and returns approximately twelve times a week, some times more often. In any event, the movement of freight will be at a higher cost because CSX is paying the MBTA a fee to use the tracks it now owns at times dictated by the MBTA, not necessarily at the most convenient and cost efficient time for CSX and its South Coast customers. This is another negative impact of the Attleboro Alternative that is ignored by the South Coast Rail Project "planners".

The termination or minimization of freight service to the industries and commercial entities in the South Coast Region will have a far greater negative impact on the area than the hoped for benefits of commuter rail service. Massachusetts manufacturers are already burdened with high costs for transportation; energy; health care; unemployment and income taxes compared to their counter parts in other areas of the country. The loss or increased cost of freight service to the South Coast Region as a result of the MBTA acquiring the tracks, a stated objective of the South Coast Rail Project, will only increase the exodus of manufacturing from Massachusetts. Every employment statistic supports the fact that manufacturing is crucial to the state's economy and should be encouraged, but industry will not be served with the loss of the current freight service to the South Coast. The preservation of the existing industrial and commercial employers in the South Coast Region is another argument that the Attleboro Alternative should be dropped from further consideration.

The proposed South Worcester Street station site should be dropped from further consideration for the following reasons:

1. The surrounding area is fully developed with many homes.

2. Accessibility to Routes 140 and 123 is poor.
3. The local roads, South Worcester Street and Barrows Street, are narrow and curved with many of the homes close to the road. Additional traffic on these roads would have a negative impact on the quality of life of these residents.
4. The proposed South Worcester Street station land available for parking appears to be restricted for development due to wetlands and possibly vernal pools on site. Much of the land along the tracks from Barrowsville to Chartley Pond is wet lands and is located in a flood plain. The tracks, laid out in the late 1800's, are surrounded by wetlands. Apparently the most expeditious method was to fill the wet lands to raise the track bed. Some of these wet lands were also formed when the adjacent land was excavated for fill used to raise the track bed. Excavation along the track bed resulted in the formation of isolated wet lands and vernal pools. There is standing water along much of the aforementioned single track, for a good part if not all of the year.
5. The proposed commuter rail route through Norton, on the Attleboro Alternative, would adversely affect school bus schedules in both the City of Taunton and the Town of Norton. When school buses are inevitably delayed at the on grade crossings in these communities, both of these school departments would be forced to add additional buses to serve the needs of their students.
6. With the MBTA taking ownership of the existing CSX Rail road freight line, a stated objective of the South Coast Rail Project, the cost of freight service to the South Coast Region will increase assuming that CSX continues to service the Region. The loss of this freight service is likely if CSX no longer has an equity stake in the tracks that service the South Coast.

Due to my familiarity with Norton, especially the Barrowsville and Chartley sections of town, I can say with some authority and knowledge

that there is not a good train location anywhere in Norton along the existing or proposed railroad tracks for the Attleboro Alternatives.

The Attleboro Alternative rail route and the proposed South Worcester Street station site should be dropped from further consideration for the South Coast Rail Project for the aforementioned reasons. The negative affects of converting the existing CXS freight line to a commuter rail service far out weigh any perceived benefits to the South Coast Region.

In conclusion, my wife (Janet J. O'Reilly) would like to add her comment that the Attleboro Alternatives and the South Worcester Street station location are a case of 'Dumb and Dumber!'

Yours truly,

Ronald O'Reilly
Charter Member and Assistant coordinator of Citizens Concerned About Tracks (CCATS) since 1995
Member of Norton Conservation Commission since 2003

And

Janet J O'Reilly

19

From: postmaster@comcast.net (Webmail Postmaster)
To: jalroche@comcast.net
Subject: Returned mail: User unknown
Date: Wednesday, July 30, 2008 3:03:10 PM

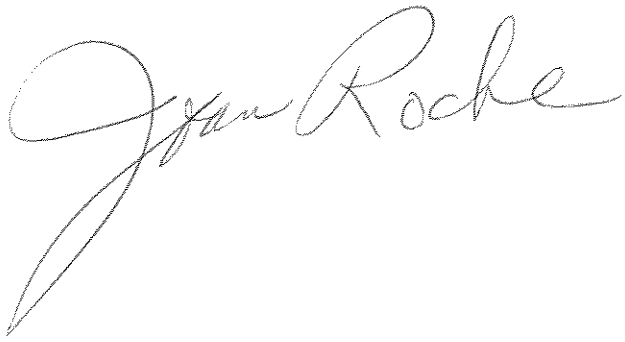
The following addresses had fatal errors:

kristina.egan@eot.state.ma.us: 550 5.1.1 <kristina.egan@eot.state.ma.us>
recipient invalid domain

Attached Message

From: jalroche@comcast.net [Save Address]
To: kristina.egan@eot.state.ma.us
Cc: heathergraf1@cimcast.net
Date: Wed, 30 Jul 2008 19:03:08 +0000

Dear Kristina,
I am very concerned about your running the railroad line through Norton and Attleboro. I have a friend who's grandson, AJ Girard lives right on the purposed route in Attleboro. AJ is Visual Impair and it would be very difficult and dangerous for him to have trains go by his house at all hours of the day and night. He depends on his hearing to get around and the background noise would be a distraction. His paarents would never feel safe leaving him out in the yard to try to play. This would be a big worry and concern.
I also do not think that the proposed route though Norton would be advantagous to the residents as we can access train in either Attleboro or Mansfield. Why put another route so close together.?
Thank you for taking my concerns into consideration when you make your decision.
Joan Roche
153 Godfrey Dr.
Norton, Ma. o2766



20

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Monday, July 28, 2008 4:26 PM
To: Charlie Patton
Subject: FW: COMMENTS/STATIONS

Kristina Egan
South Coast Rail Manager
****
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973
T: 617-973-7314
E: Kristina.Egan@eot.state.ma.us

From: Zanoni, Kenneth [mailto:Kenneth.Zanoni@staples.com]
Sent: Monday, July 28, 2008 4:17 PM
To: Egan, Kristina (EOT)
Subject: COMMENTS/STATIONS

Please note below information was also posted on:
https://www.commentmgr.com/cmprojects/projects/1212/pcsthankyou.asp

Re: 'Potential Stations EOT Recommends for Further Analysis *DRAFT* – July 9, 2008'

[To Serve - The Attleboro Alternative]

NORTON: RAIL SITE #R52 SOUTH WORCESTER STREET (Just after Barrows Street Intersection)

The selection of a Rail station on South Worcester St is one of the most absurd and ridiculous suggestions we have heard to date. The South Worcester Street Site IS NOT a desirable station location for various reasons.

According to SRPEDD – Station locations should fit into one of two categories:

- They should either serve as a REGIONAL FACILITY - attracting commuters from surrounding communities, or
- They should serve a tighter knit densely populated area, with the potential of being a TOD (Transit Oriented Development) - associated with the concept of 'Smart Growth'.

The South Worcester Street Site does not fit into either of these categories.

A REGIONAL FACILITY:***

"Should be accessible from major arterial roads."

"The road network serving the site should be able to accommodate the anticipated station traffic (at least 500 trips per day) with minimal improvements required."

The South Worcester Street location is over one mile from a major access road (Rte. 123) and four miles from Norton Center. It is a narrow winding road that is ill-equipped to handle additional traffic. To suggest taking a minimum of 500 cars per day through the residential neighborhoods of South Worcester Street, and across three already dangerous intersections is absurd.

One only need to review roads and intersections leading to the potential station. You will find the intersections of South Worcester Street with Rte. 123, John Scott Blvd. and Barrows Street leading to this location are dangerous mainly due to the "Country roads" that could not handle the additional traffic. Taking Barrows St. to South Worcester St. from Rte. 140 is equally horrific. Another possible route from the east - Rte. 123 to South Worcester via Olympia and Power Streets would be even worse for drivers and residents.

Under 'Measures Used to Evaluate Practicability'***

The South Worcester Street location deserves a highly unfavorable rating due to the need for major road improvements (not feasible without property takings), excessive cost for necessary improvements to infrastructure, as well as the site being too remote from a highway.

As for TOD Potential:

The South Worcester Street location is: Off the beaten path, over one mile from a major access road, four miles from Norton Center. It is not in an area/or near to a place - where people either work or shop, there are no medical offices in the vicinity, no tourist attraction, it is not an appropriate site for a multi-modal center, nor would it be suitable as a potential transit oriented

development.

The South Worcester Street Site does NOT meet any of the following 'Guiding Principles':***

- "Stations intended to serve walk/bike customers should be located near existing population centers, dense housing, jobs and retail centers, and be served by public infrastructure (roads, sewer, and water)"

- "Stations should be located in places that will facilitate economic development for municipalities and the region."

- "Stations should prioritize the reuse of previously-developed land, such as brownfields and grayfields."
- "Station sites should be compatible with existing and proposed planning goals."

The South Worcester Street Site does NOT meet any of the following 'Measures Used to Consistency with Smart Growth Objectives'***

- "A site which has a favorable location for a station supportive of smart growth should be a redevelopment site... in proximity to a high density population; and should be in proximity to businesses which provide jobs."

- "A favorable site should serve an Environmental Justice population..."
- "Public water and sewer are available to support Transit Oriented Development in the vicinity of the site."
- A TOD should be a catalyst for revitalization and inspire desirable economic development for the community and the region.

On the Chart of 25 'Potential Rail and Bus Stations EOT Recommends to Advance for Further Analysis'***

Last Column/Comments:

The South Worcester Street Site is - "Close to general store and apartments". This is an exaggeration, and misleading to anyone unfamiliar with the area. The facts show, there is a small deli/convenience/package store in the vicinity, several two-family homes on South Worcester Street and a couple of buildings with 2-6 rental units in them.

A Station Site should be a welcome addition to the city or town where it is located, not viewed as an added burden. Benefits of the station to the host community should outweigh the negative impacts.

The South Worcester Street Site is ill-advised and should be rejected due to its highly unfavorable rating because it would be an additional public safety burden.

It appears the South Worcester Street Site passed the first round of cuts because there were no acreage, zoning or wetlands issues identified to knock it out immediately, also likely because there was a need for the project proponent to find some/any shred of a potential benefit (from the South Coast Rail Project) that the Town of Norton might find enticing. And this site was the only spot in Norton where a train could conceivably stop that had more than 3 acres of land.

The South Worcester Street Site does not pass muster here, it is unsuitable as a regional facility or a potential TOD, it is perceived to be more detrimental than beneficial to our community, and we urge planners who are screening station locations to eliminate it from the second phase of the alternatives analysis.

Local commuters look forward to the scheduled expansion of the downtown Attleboro station, and if the Stoughton Route is chosen for the South Coast Rail - Norton residents also anticipate being close to three new commuter rail stations in both Taunton and Easton (which have potential as both TOD and regional facilities).

Finally, besides dropping the South Worcester Street Site from the list of potential station locations, we reiterate the need for the project proponents to eliminate the Attleboro Route (and its four alternatives) from further consideration for the South Coast Rail.

In closing, I am recommending to Heather Graf - Coordinator of CCATS that there be an investigation into the $17.2 million dollar fund (appropriated by the State Legislature to RESTUDY this thing again) and how those monies are being spent.

The only ones making out on this deal are you Kristina and the high paid consultants, who have $17.2 MILLION dollars to spend on this pitiful process. Several things come to mind. While the proposed Attleboro route has existing freight tracks, you have exaggerated this point just like the exaggeration of the proposed train station neighborhood. You implied the many grade crossings in Taunton and Norton were already grossly affected by freight trains. Yet when questioned at our last meeting in Norton, you had no idea that only two trains per day on a busy day were passing through, usually in the wee hours of the morning. You did not know how many trains were actually passing through on a normal day. You have also proposed a station site that does not even meet your own requirements for selecting stations. One can only conclude that you and your high

paid consultants can make more money by wasting resources on a wasteful study.

*** Reference: EOT Report/South Coast Rail

'Selecting Station Sites *DRAFT – July 9, 2008*'

Submitted by:

Kenneth Zanoni

28 E Hodges St.

Norton, MA 02766

508-285-7285

Charter Member of CCATS (since 1995)

Former Chairman of the Norton Board of Selectmen

Former Norton Planning Board Member

Former SRPEDD Commissioner for the Norton Planning Board

C.c. Heather Graf - Coordinator of CCATS

21

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Wednesday, July 23, 2008 2:58 PM
To: Charlie Patton
Subject: FW: COMMENTS/STATIONS

Kristina Egan
South Coast Rail Manager
****
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973
T: 617-973-7314
E: Kristina.Egan@eot.state.ma.us

-----Original Message-----
From: Mark C Sweeney [mailto:Mark_C_Sweeney@raytheon.com]
Sent: Wednesday, July 23, 2008 2:46 PM
To: Egan, Kristina (EOT)
Subject: COMMENTS/STATIONS

Kristina,

Please relook at the potential Norton Rail Station on South Worcester Street as it's proposed location is so "buried" in the center of Norton, it is only accessible by traveling on winding narrow streets that are in residential areas and have dangerous intersections.

Also, traveling to the station may bring a commuter thru the intersections
South Worcester Street and RT 123,
which I personally was involved in a major accident in 2003, and Barrows Street and RT 140,
where my entire family was involved in a major accident in 2004.

Both of these accidents were not our fault for the record.

The RT 140 and Barrows Street intersection has had fatalities both before
and after our family's 2004 accident.

On another point, the Norton Station's current proposed location has no current working or shopping value other than a small convenient store and a closed restaurant.

This location would not provide any significant number of new jobs or substantial economic development.

The area is just residential with very little smart growth potential.

Locating the Rail Station at this proposed site would be viewed by the surrounding residents as an added burden to their way of life.

Please reevaluate this site.

Mark Sweeney

14 Laura Lane
Norton, MA 02766
Member of CCATs

22

Subject: COMMENTS/STATIONS
To: Ms. Kristina Egan, South Coast Rail Manager
Ten Park Plaza, Suite 4150
Boston, MA 02116-3973

Re: The South Coast Rail Project
Subject: NORTON - Proposed South Worcester Street Site
(At Barrows Street Intersection)

The South Worcester Street Site in Norton should not advance for further consideration as a potential station location.
Reasons why the South Worcester Street site is unsuitable as a station location:

Access Issues:
The South Worcester Street Site is too remote and not easily accessible from either major artery (Rte. 123 or Rte. 140). From any direction access to this site would require commuters to negotiate narrow winding roads, through: residential neighborhoods and several dangerous intersections, putting both drivers and residents at risk. The station site itself is AT a dangerous intersection. None of the roads leading to the station site are equipped to handle any additional traffic. ["The road network serving the site should be able to accommodate the anticipated station traffic of at least 500 trips per day, with minimal road improvements."]

Development of a station site at the South Worcester Street location would necessitate major costly road improvements, including land takings. Due to access issues, the South Worcester Street Site would not serve as a regional facility/attracting commuters from surrounding communities.

The area does not lend itself to development that would inspire any desirable economic growth for the town, and certainly not for the region. The South Worcester Street Site is not close to commercial or industrial enterprises, and is a long way from both Norton and Attleboro Centers. There are not businesses which provide jobs, stores to draw shoppers, medical or other professional office buildings, and certainly nothing to invite tourists in this area.

The trip time from New Bedford and Fall River via the Attleboro Route is excessive, without adding a stop in Norton (which would have little appeal for South Coast commuters). Residents of Norton are already served by train stations in Mansfield and Attleboro (with the downtown Attleboro facility slated for major expansion). And if the Stoughton Route is chosen for the South Coast Rail, commuters from this area can look forward to three new stations (two in Taunton and one in Easton) which do have the potential to serve as regional facilities and/or TODs. The South Worcester Street Site does not meet the criteria associated with 'Smart Growth'.

This location offers no potential as a TOD (Transit Oriented Development).

A station should be a welcome addition to the host community. The benefits of a station should outweigh the negative impacts. A train station at the South Worcester Street Site would be more detrimental than beneficial for the town of Norton, and of little value to commuters from surrounding communities.

The South Worcester Street Site should be rejected as a potential station location due to its unfavorable rating.

Further, there is no site in Norton along the Attleboro Route - either existing or proposed track, that would be suitable for a train station.

Finally, the ill-advised Attleboro Route/Alternatives in their entirety should be eliminated from further consideration.

This exercise has been, and continues to be a colossal waste of time, money and energies that should (particularly in these difficult financial times) be spent more productively.

Submitted by,
Debra and Larry Garrone, Norton
Susanna Girard, Attleboro
Lisa McIntosh, Mansfield
Brenda and Joseph Daday, Attleboro
Dianna Edgerly, Norton
Paul and Jean Shea
Melanie Silva, Attleboro
Luis V. Ydrach, Attleboro
Deborah Salley, Norton

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:02 PM
To: cpatton@reginavilla.com
Subject: Fw: COMMENTS/STATIONS

----- Original Message -----
From: Heather Graf <heathergraf1@msn.com>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Sent: Thu Jul 31 16:52:19 2008
Subject: COMMENTS/STATIONS

Re: South Coast Rail Project
Attleboro Alternatives/Proposed Norton Station

Kristina,

The more people I talk to, the greater the variation in responses on why Norton does not want its own train station.
The gentleman who just phoned for example said:
"You need only look as far as the neighboring community of Mansfield. Speak with members of the Tri-County Chamber of Commerce, who will tell you that local businesses there (other than a well placed gas station, coffee/donut shop or newspaper stand) see no real benefit from commuters, who simply blow in and out of the rail station. On the other hand, it makes the town a less desirable place to be (particularly at certain times of day) when there is a traffic nightmare with gridlock. And the station causes a drain on services - both in manpower and cost: for Public Safety as well as Public Works. Rte. 106 in Mansfield is a mess."
The person who called works for the Norton Highway Department.

Points well taken.

Heather Graf
CCATS

24

The Commonwealth of Massachusetts
House of Representatives
State House, Boston 02133-1054

July 31, 2008

Kristina Egan,
South Coast Rail Manager
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973

RE: Comments on Station Locations

Dear Ms. Egan:

We are writing to express our concerns and opposition to the possible elimination of the Lakeville MBTA Commuter Rail Station as station selection for the South Coast Rail project is finalized.

There are several factors that make this station vital to the Town of Lakeville and the Town's Master Plan economic objectives. It will play a significant role in numerous projects such as the Kensington Court Housing Development, expansion of the entire Lakeville Corporate Park and other commercial and retail development projects on Route 105. The station's proximity to these projects will make it a vital component in promoting desirable and strategic economic growth in the Town of Lakeville.

These factors also set up the current station as a valuable site for transit oriented development to be identified as part of the South Coast Rail Economic Development and Land Use Corridor Plan. Eliminating the station will only have a negative impact on the Town of Lakeville and the surrounding area.

Thank you for your time and consideration. Please do not hesitate to contact us with any questions or concerns.

Sincerely,

JOHN F. QUINN
State Representative
9th Bristol District

STEPHEN R. CANESSA
State Representative
12th Bristol District

25

Town of Lakeville

Town Office Building
345 Bedford Street
Lakeville, MA 02347

OFFICE OF
SELECTMEN
TELEPHONE (508) 946-8803
FAX (508) 946-0112

July 29, 2008

Kristina Egan,
South Coast Rail Manager
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973

RE: Comments on Station Locations

Dear Kristina:

At a meeting held on July 15, 2008, the Board of Selectmen was updated by our representative to the Commuter Rail Task Force on information she received at the July 11, 2008 meeting of the Task Force regarding potential commuter rail station locations. The Board of Selectmen would like to take this opportunity to formalize our objection to any considerations given to closing the commuter rail station in Lakeville.

The Elected Officials and the residents of Lakeville have put exhaustive efforts into planning and rezoning the area around our train station to create an attractive business, industrial and residential area. These efforts include:

1. In addition to the original industrial park, we presently have a 200+ unit 40R development under construction directly adjacent to the train station.

2. A Walgreen's Pharmacy and a construction rental equipment business were recently opened. There are two banks and two real estate offices also located in that area.

3. The Zoning Board of Appeals has permitted a law office for that area and a convenience store with retail gasoline sales is also being considered. A CVS Pharmacy is permitted and will begin construction next year in conjunction with the relocation of Route 79, which will include a new signalized traffic intersection where Commercial Drive intersects with Main Street (Route 105).

4. The property known as the former Lakeville Hospital property is being planned for development with a Super Stop & Shop and a Chili's Restaurant. Additionally, the developers of this property have begun the permitting process for a high end condominium/townhouse residential development which will be enhanced by the relocation of Route 79.

Recently, the Town of Lakeville was the recipient of a $375,000.00 MORE Job Opportunity Grant from the Executive Office of Housing & Economic Development to improve the municipal water service in this area. We are presently in talks with officials in Taunton regarding the design and construction of a water tower.

In summary, Lakeville has, and is continuing to, put many hours and monies into this area of Town with the target being increased tax dollars from more business driven development. Closing the commuter rail station would have a severe detrimental affect on our efforts to define this area as Lakeville's pedestrian friendly Business District. The current rail station parking lot is filled to capacity most days and at times, overflow capacity. By eliminating the Lakeville commuter rail station, it would mean additional traffic would be diverted onto already crowded State highways, namely Interstate 495 and Route 24.

We would like to respectfully request that these factors be seriously considered when evaluating your options for the potential rail expansion.

Sincerely,

Charles E. Evirs, Jr, Chairman
Lakeville Board of Selectmen

2C

OXFORD DEVELOPMENT
10 Owl Drive
Sharon, MA 02067

July 28, 2008

Mr. Charles Evirs, Jr., Chairman
Town of Lakeville, Board of Selectmen
Selectmen Office
346 Bedford Street
Lakeville, MA 02347

Dear Mr. Evirs & Selectmen:

We are writing you today to express our concern and strong opposition to the contemplated elimination of the Lakeville MBTA Commuter Rail Station.

As you are aware, this station is obviously vital to the Kensington Court Housing Development which is to be built adjacent to the MBTA station. As a "Smart Growth" development future residents will rely on this MBTA rail station's proximity. Additional, we feel the station serves a significant role in the future commercial growth in this area.

We would like to offer our continued support of the Town of Lakeville's position on this issue. If there are any other local/state agencies or government officials that you feel we should be contacting on this matter, please contact us. We would also like to be notified if there are any further meetings and/or hearings held on this issue where the MBTA Station is on the agenda. We would like to be kept informed, so that we may formally reiterate our position on the contemplated closing of the Lakeville MBTA Station and attend and stress our strong disapproval.

Thank you for your consideration.

Very truly yours,

Jonathan White, Manager
Oxford Development

JUL 29 2008

27

INVESTISSEMENTS
CANPRO
INVESTMENTS

RECEIVED
JUL 28 2008
SELECTMAN'S OFFICE

July 28, 2008

Ms. Nancy Yeatts, Chairman
Town of Lakeville, Board of Selectmen
Selectmen Office
346 Bedford Street
Lakeville, MA 02347

Dear Ms. Yeatts & Selectmen:

We are writing in reference to the letter I sent you on March 13, 2008 to reiterate and express our concern and strong opposition to the contemplated elimination of the Lakeville MBTA Commuter Rail Station.

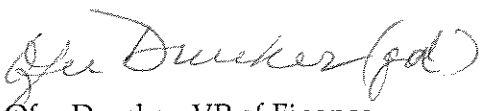
This station is vital to the Kensington Court Housing Development to be built on Commercial Drive, as well as for the development of the entire Lakeville Corporate Park and other commercial/retail developments on Route 105. Current tenants use this facility on a daily basis and the lot is always full and future tenants will rely on this MBTA rail station's proximity as well. Clearly, the station serves a significant role in the future commercial growth in this area and is vital to the Town Master Plan economic objectives.

We would like to offer our continued support of the Town of Lakeville's position on this issue. If there are any other local/state agencies or government officials that you feel we should be contacting on this matter, please contact myself or Ms. Jeanne Alexander at our Lakeville Office. We would also like to be notified if there are any further meetings and/or hearings held on this issue where the MBTA Station is on the agenda. We would like to be kept informed, so that we may formally reiterate our position on the contemplated closing of the Lakeville MBTA Station and attend and stress our strong disapproval.

Thank you for your consideration.

Lakeville Corporate Park
10 Riverside Drive
Lakeville, MA 02347
Phone: (508) 947-5565 Fax: (508) 947-4077

Very truly yours,



Ofer Drucker, VP of Finance
Canpro Investments, Ltd.

c: Jeanne Alexander, Property Manager
Canpro Investments, Ltd.

Ken Motta, Senior Project Manager
Field Engineering Co., Inc.

Jonathan White, President
Oxford Development

Elliot Schneider
Oxford Development

28

NATIONAL DEVELOPMENT T: 617.527.9800 F: 617.965.7361 www.natdev.com

2310
Washington
Street
Newton
Lower Falls
MA 02462

July 31, 2008

Board of Selectmen
Town of Lakeville
346 Bedford Street
Lakeville, MA 02347

Re: Elimination of Lakeville MBTA Commuter Rail Station

Dear Selectmen:

As the owner of the former Lakeville State Hospital property located on Main Street and Route 105, National Development is opposed to the elimination of the Lakeville MBTA Commuter Rail Station.

This station is vital to the development on Route 105 as well as other areas of the Town. National Development is proposing to develop a mixed-use project that will consist of commercial, retail and residential components. The close proximity of the Commuter Rail Station will be a valuable resource to occupants of both the residential and commercial components for daily commuting purposes. Train station commuters provide valuable economic support to area businesses.

The Town of Lakeville has National Development's full support on this issue. If there are additional agencies that we should notify to express our support please let me know.

Very truly yours,

Sherry A. Clancy
Project Manager

29

PCSArea: General Comments

Category: :

From:: O'Shea, Roger

Received:: 7/28/2008 12:57:15 PM

Documents Attached: None

Images Attached: None

Comments:

Enter any feedback or general comments below.
Dont close the Lakeville MBTA station on your proposal to expand. It exists now,with increased parking spaces Too many delays beyond the Greenbush rail connection with only one line to Boston. Too costly!!!! 40 R& B housing around Lakeville station in the works. The Commonwealth does not have the funds!!!!

30

PCSArea: Contact Us

Category: :

From:: Feroce, Jeff

Received:: 7/13/2008 6:22:45 AM

Documents Attached: None

Images Attached: None

Comments:

Please fill out the form below with your specific questions on South Coast Rail?
Regarding the proposal for a new station in Middleboro, given there's already a station already operating in Lakeville, what's the rationale? Would love to know. If a Middleboro station was inplemented, would the Lakeville one remain online? Honestly, this makes about as much sense (none) as the 3 Brockton stops now in place (Campello, Brockton, Montello). We riders joke that when one end of the train is in Brockton, the other is still in Campello.

31

PCSArea: General Comments **Category:** :

From:: Lauzon, Dean **Received:**: 7/30/2008 2:31:31 PM

Documents Attached: None

Images Attached: None

Comments:

Enter any feedback or general comments below.
Living across the street from the potential everett street (#160), site I was wondering what the impact on the Nemasket River was going to be for this site and secondly if this plan would include taking my house. Seeing that the land across from my house and further from the train line is residential and the land my house is on is listed as general use, I am having a hard time understanding why the land across the street is being studied. I don't mind having a rail line that runs behind my house and would even be willing to put up with the additional noise of more trains, but please don't leave me up in the air. Take my house or go somewhere else. Between talk of the expansion of 44, possible casino plans and now this, my house has been up for grabs by the state for 10 years. My wife and I would love to know so we can move on with our lives. We couldn't give our house away. Dean Lauzon 160 Everett Street Middleboro, MA 02346 508-923-0368

32

PCSArea: Contact Us

Category: :

From:: Hinkley, Bill

Received:: 7/30/2008 1:08:55 PM

Documents Attached: None

Images Attached: None

Comments:

Please fill out the form below with your specific questions on South Coast Rail?

Comment on Middleboro station sites. Though I am not a resident of the project area, I request that the planning team keep open the option of restoring commuter rail service to Wareham and Buzzards Bay. I understand that moving the Middleboro-Lakeville station would complicate if not preclude this service. I understand that this process must find the best alternative for the project at hand, but I hope that you will keep open the opportunity for the Buzzards Bay extension. This would be a very important project for some other economically struggling areas. Thank you for allowing this comment.

33

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:02 PM
To: cpatton@reginavilla.com
Subject: Fw: Station Location Comments

----- Original Message -----
From: Robb Johnson <rjohnson@tnc.org>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Cc: Alison A. Bowden <abowden@tnc.org>; gguimond@srpedd.org <gguimond@srpedd.org>; Nancy Durfee <ndurfee@srpedd.org>; rmccarthy@Town.raynham.ma.us <rmccarthy@Town.raynham.ma.us>; Erika A. Ueberbacher <EUeberbacher@Town.raynham.ma.us>
Sent: Thu Jul 31 16:54:43 2008
Subject: Station Location Comments

Hi Kristina,

Alison Bowden and I have reviewed documents provided at the latest meeting of the Commuter Rail Taskforce relating to potential rail and bus stations for the South Coast Commuter Rail project. Our analysis was aided by GIS datalayers provided to us by SRPEDD which depict the alternative routes and station sites. Thank you for helping to make those available to us.

On behalf of The Nature Conservancy, we have the following comments regarding the draft list of "Potential Rail and Bus Stations EOT Recommends to Advance for Futher Analysis", dated July 10, 2008.

1. A potential rail station at Raynham Dog Track is rated in the above documents as "very favorable" from an environmental standpoint, and "favorable" from a smart growth standpoint. We find it is neither. The fact that this location is currently developed does not automatically make it a sensible location for redevelopment. The site is partially within (and otherwise surrounded on three sides by) the Hockomock Swamp Area of Critical Environmental Concern. In spite of its acres of impervious pavement, portions of the site are still mapped as Priority Habitat for Rare Species (NHESP, 2006) and Estimated Habitat for Rare Species (NHESP 2006). Several certified vernal pools are in very close proximity to the site. But for its development prior to existing regulations that protect wetlands and rare species, it is quite likely that the entirety of this site would now be under NHESP jurisdiction. The site also fails to meet most standard considerations for a smart growth site. Given that it is separated from Easton by Hockomock Swamp, and lies at the northernmost end of Raynham, intensified development of this site would neither strenghten nor support existing development nodes. Rather than making this site the locus for instensified development, it is better considered a favorable site for reduction of its development footprint and environmental impact. The fact that it is quite "practicable" should not sway its ranking in the other two categories. For the next stage of analysis, we urge EOT to identify an alternate station site further to the south along the Stoughton line, even if less practicable.

2. Regarding the three alternatives for Taunton stations on the Whittendon/Attleboro line, the GATRA/Oak Street Mall site seems to be the best from an environmental standpoint. Both the State Hospital and Whittendon sites have frontage on the Mill River, which is the site of a streamflow / fish passage restoration project that involves many partners, including the Commonwealth, SRPEDD and The Nature Conservancy. Once this project is completed, the Mill River will become an integral component of the Taunton River basin's high quality habitat for migratory fish. Protecting, restoring and enhancing a healthy landscape buffer to the Mill River should be a key consideration in the future plans for the sites that border it.

3. Regarding the three alternatives for Middleborough stations on the Middleborough line, we favor the MBTA Layover site or the Old Station site over the Everett Street site. The Everett Street site (NE Route 44) lies between, and in close proximity to, the Nemasket River (home to New England's largest herring run) and Purchade Brook, a high quality coldwater stream (a relatively uncommon habitat within the North Atlantic coastal region). Development of a station in this location would be likely to intensify and hasten development pressure within the buffer zone of both the Nemasket River and Purchade Brook.

Thank you for providing these documents for public review, and for consideration of our comments. We look forward to continued engagement in the South Coast Commuter Rail study process.

Best regards,

Robb

Robb Johnson
Southeast Massachusetts Program Director

The Nature Conservancy
204 Long Pond Road
Plymouth, MA 02360-2607

rjohnson@tnc.org
(508) 732-0300 Ext. 23
(508) 732-9198 (Fax)

34

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:06 PM
To: cpatton@reginavilla.com
Subject: Fw: South Coast Rail/Station Sites

----- Original Message -----
From: George I. Spatcher <gis@spatcherlaw.com>
To: Egan, Kristina (EOT) <Kristina.Egan@state.ma.us>
Cc: ssmith@srpedd.state.ma.us <ssmith@srpedd.state.ma.us>; gguimond@srpedd.state.ma.us <gguimond@srpedd.state.ma.us>; rhebert@srpedd.state.ma.us <rhebert@srpedd.state.ma.us>; heathergraf1@comcast.net <heathergraf1@comcast.net>; DSPATCH@comcast.net <DSPATCH@comcast.net>
Sent: Thu Jul 31 17:01:22 2008
Subject: South Coast Rail/Station Sites

Dear Kristina:

My comments on the possible station sites for the South Coast Rail are mostly general and conceptual rather than specific for each location.

As you know from my letter of March 26, 2008, I do not believe that the Attleboro Alternative is feasible at all for the reasons that I stated then. The possible Station Site that has been considered on South Worcester Street in Norton is also not feasible. It would be located in Barrowsville, a small village section of Norton that is not easily accessible from Routes 123 or 140, and is some distance from Route 495. The area is still relatively rural and residential, but with low density. 100 +/- years ago it was the site of a small whistle stop type station in the era when people walked and rode bikes, or were transported by horse and buggy and later by the Mode T Ford. But today it makes no sense whatsoever and should not advance to any further consideration.

I do agree with the concept that stations should be closer together in more densely populated urban and metropolitan areas, as they are now in Boston and the immediately surrounding area. Certainly Fall River and New Bedford may warrant more than one station each, depending upon their needs and wants.

But for Taunton I believe that only one station is feasible and warranted. Whether the chosen route is the Stoughton Alternative or the Middleboro Alternative, a large regional transportation center should be built off Routes 140 and 24 in Taunton in the vicinity of Silver City Galleria. Such a facility would be able to accommodate rail, limo, van, taxi and any related transportation services. It also would be easily accessible to Route 495 and the Taunton Municipal Airport. I would predict that such a transportation center could become one of the busiest and most popular in the Commonwealth, creating a transportation hub for Southeastern Massachusetts. Built it and they will come!

Overall, I believe that station sites should be selected prudently, judiciously and conservatively. Fewer stations at better locations should be the preferred priority. On other portions of the Old Colony Line that have been reactivited, I fear that some sites were selected to appease the specific municipality and the greater community, rather that based upon the best planning judgement.

Please advise me if you have any questions or additional information. Thank you for the opportunity to submit these comments during the study and selection process.

Sincerely,

George I. Spatcher, Jr.
Attorney at Law

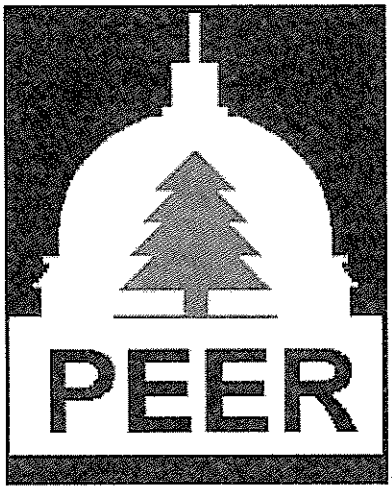
Spatcher Law Offices
Bronson Building
8 North Main Street, Suite 403
Attleboro, MA 02703-0040
Phone: (508) 222-9166
Fax: (508) 222-0336
e-mail: gis@spatcherlaw.com <mailto:gis@spatcherlaw.com>

35

Charlie Patton

From: Egan, Kristina (EOT) [Kristina.Egan@state.ma.us]
Sent: Thursday, July 31, 2008 5:02 PM
To: cpatton@reginavilla.com
Subject: Fw: Comments on station siting

----- Original Message -----
From: Kyla Bennett <biojustus@comcast.net>
To: 'Egan, Kristina (EOT)' <Kristina.Egan@state.ma.us>
Sent: Thu Jul 31 16:38:11 2008
Subject: Comments on station siting



<<Picture (Metafile)>>

July 31, 2008

Kristina Egan
South Coast Rail Manager
Executive Office of Transportation
Ten Park Plaza, Room 4150
Boston, MA 02116-3973

RE: Comments on Draft Station Sites

Dear Ms. Egan,

Thank you for the opportunity to comment on the Site Selection Process for potential station site locations along the South Coast rail corridor. In general, I believe that the selection of potential station sites is premature, and have serious concerns about the significant errors contained in the existing documents. If the Commonwealth has eliminated alternatives based on information in these documents, then the alternatives analysis may be flawed. My detailed comments are set forth below.

Guiding Principles. The Executive Office of Transportation (EOT) developed a list of "guiding principles" in their station selection process. The first of these principles is:

The total number of stations should be enough to capture strong ridership, but not so many that trip time would be reduced and ridership would suffer. Stations should be spaced at a reasonable distance (3 to 5 miles apart).

Because the EOT has not yet determined ridership figures, it is impossible to determine what the total number of stations should be. Similarly, to my knowledge, the EOT has not determined a maximum trip time above which ridership would "suffer" (nor is the word "suffer" defined). Therefore, this guiding principle cannot be used to select preferred station sites

because the data simply does not yet exist. EOT also violates its own guiding principle when it says that stations should be at least 3 miles apart. One of the proposed station locations, at the Roche Brothers Plaza, is less than 3 miles from an existing station in Stoughton.

The second principle states in part:

Stations intended to serve walk/bike customers should be located near existing population centers, dense housing, jobs and retain (sic) centers, and be served by public infrastructure (roads, sewer and water services).

The proposed station stop at Shovel Shop in Easton would have to serve walk/bike customers, as there is limited parking in the area. However, this part of town has no sewer.

Initial Standards for Identifying Possible Sites. The four standards for identifying possible station sites are: 1) Track geometry and land available to construct an 800-foot platform; 2) Would not require new development within an ACEC; 3) Not within a public water supply Zone 1; and 4) Vacant or re-developable land. I have a number of concerns with these standards. First, if the bus alternative is truly being considered as an alternative, rather than just being given lip service, why is an 800-foot platform necessary for all alternatives? The station siting analysis should have different criteria for the bus and the train alternatives. Second, the standards eliminate stations requiring new developments in ACECs, yet several of the alternatives still on the table require massive new construction of track in ACECs. In many cases, construction of a station in an ACEC would be far less damaging than construction of miles of train track that would bisect the habitat of an ACEC. This distinction is therefore non-sensical. Third, the restriction of keeping stations out of Zone I drinking water supplies is not nearly stringent enough. Many of the municipal wells in southeastern Massachusetts are gravel-packed, and therefore extremely susceptible to contaminants. Stations and tracks should be kept out of Zone Is and Zone IIs to ensure the quality of municipal drinking water. Finally, standard four, which suggests developing station sites on "vacant or re-developable land" is directly contradictory with one of the guiding principles, which gives preference to station siting on brownfields or grayfields. After all, land is either vacant, or it is re-developable. Given that the Commonwealth has eminent domain powers, a developed site is potentially re-developable. This standard is therefore meaningless.

Screening Criteria. The screening criteria (highly favorable, favorable, neutral, unfavorable, and highly unfavorable) appear arbitrary. In other words, the range of values that lead to a particular screening value are not only unavailable to the public, but are also not justified anywhere. In order to assess the validity of the screening criteria, this information must be made available. For example, that a highway 1 mile away should receive an unfavorable rating, and why? Where did this number come from, and what is its basis?

The Matrix. The matrix presented to the task force on July 9, 2008 contained errors. When the matrix first came out, it said that the Shovel Shop station location in Easton was not in a Zone II. It appears as if the station is indeed in a Zone II. As of the date of this letter, the matrix now says TBD. How can this station stop be given a screening criteria value, and chosen as a potential station stop, when critical information is missing? Similarly, this same station originally said that it provided regional parking. It does not. The value on the matrix is now blank. How was this change factored into its ultimate ranking?

Conclusion. Choosing station locations for a mass transportation system without knowing ridership figures or even mode of transportation is putting the cart before the horse. If any of these station stops are eliminated before the Least Environmentally Damaging Practicable Alternative (LEDPA) is determined by the Corps, it is very possible that the entire process will be flawed.

Thank you for the opportunity to comment.

Sincerely,

Kyla Bennett

Kyla Bennett, Director
New England PEER
P.O. Box 574
North Easton, MA 02356
508-230-9933
fax: 508-230-2110
e-mail: nepeer@peer.org
web site: www.peer.org

From: Forrest Lindwall [mailto:forrest@mistry.com]
Sent: Wednesday, July 30, 2008 8:40 AM
To: Egan, Kristina (EOT)
Subject: South Coast Rail Stations

Hi Kristina:
Attempted to send you news clippings of station articles but I guess I had the wrong e-mail address. Hopefully this works--let me know if you receive it and also if you would like to continue receiving this type of info.

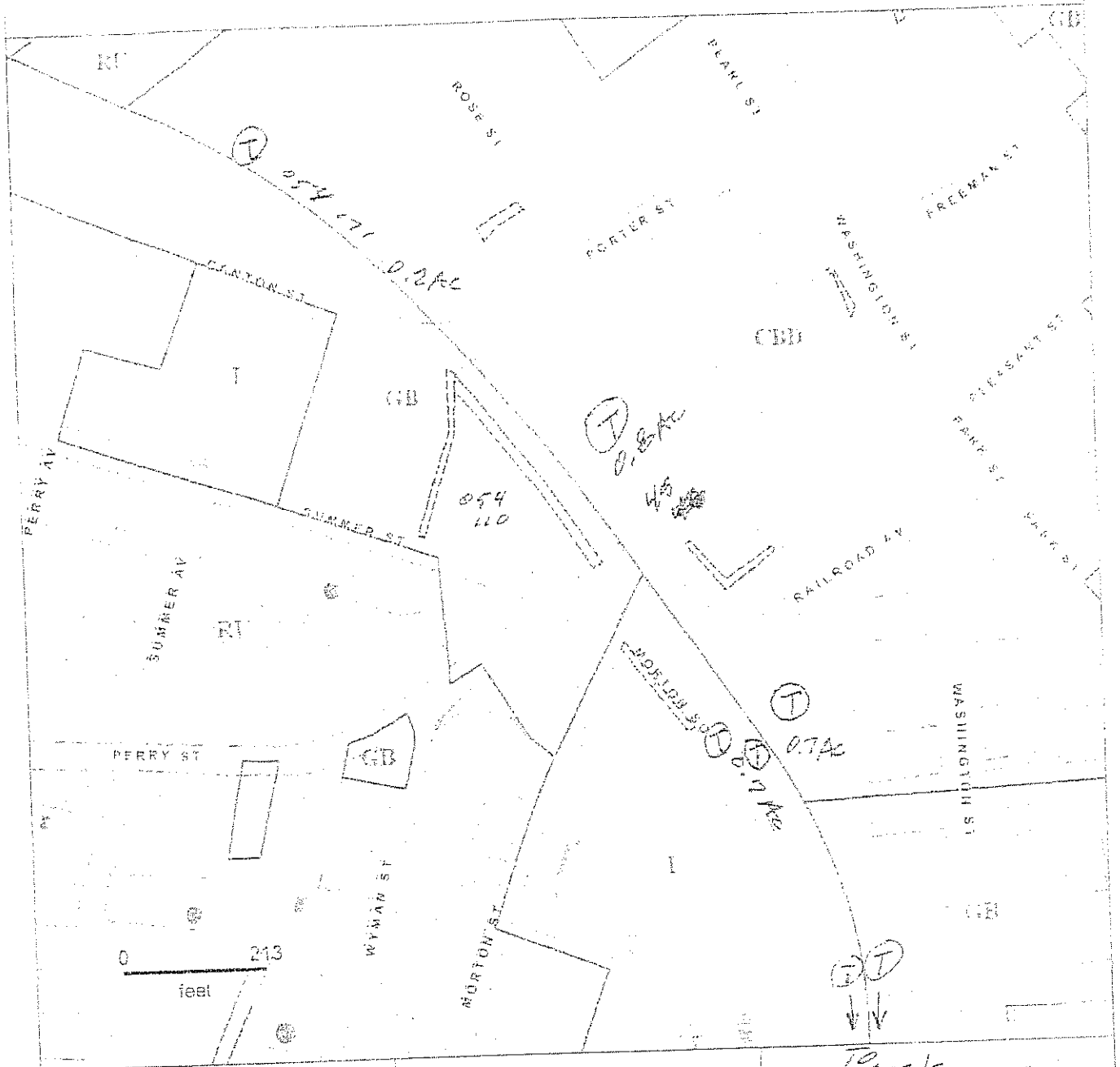
Sorry can't make it to Taunton this evening but do want to cast one pearl on the water regarding stations. There is a very small grass roots group that feels there would be merit in considering relocating the Station in Stoughton if that route is selected as the preferred alternative. The attached maps identify the T Parcels that currently are squeezed in and around the present station which is located one block from the center of Town and does little to enhance the character of downtown. The idea is to look at 3 distinctly underutilized parcels of land southerly of the existing station (immediately adjacent to the present layover area for trains) which offer far more area and could have access from both Morton and Brock Streets. Should this relocation be implemented the opportunity to revitalize downtown Stoughton from the back side to the front and much of the these underutilized parcels with mixed use/smart growth development would be tremendous. And obviously this could only happen as part of the South Coast Rail project with the T in front of the bus/train. If you think this is worth exploring further let me know. Hope all is well.....Forrest

Forrest C.Lindwall
Executive Vice President
Mistry Associates,Inc.
315 Main Street
Reading,MA 01867
Tel:(781)944-6400 X208
Fax:(781)944-0180

7/17/2008

Town of Stoughton

Property Map

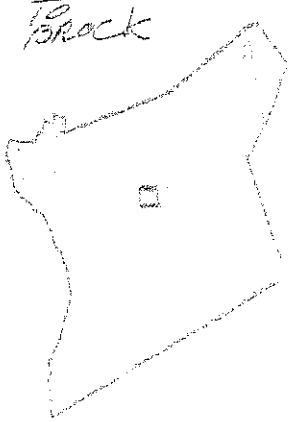


Property Information

Property ID	053 100 0
Location	55 BROCK ST
Owner 1	CAMARA THERESA M
Owner 2	CAMARA JOHN E
Owner 3	
Bill Addr	55 BROCK ST
City St Zip	STOUGHTON MA 02072
Sale Price	$0
Total Area	0.310 acres

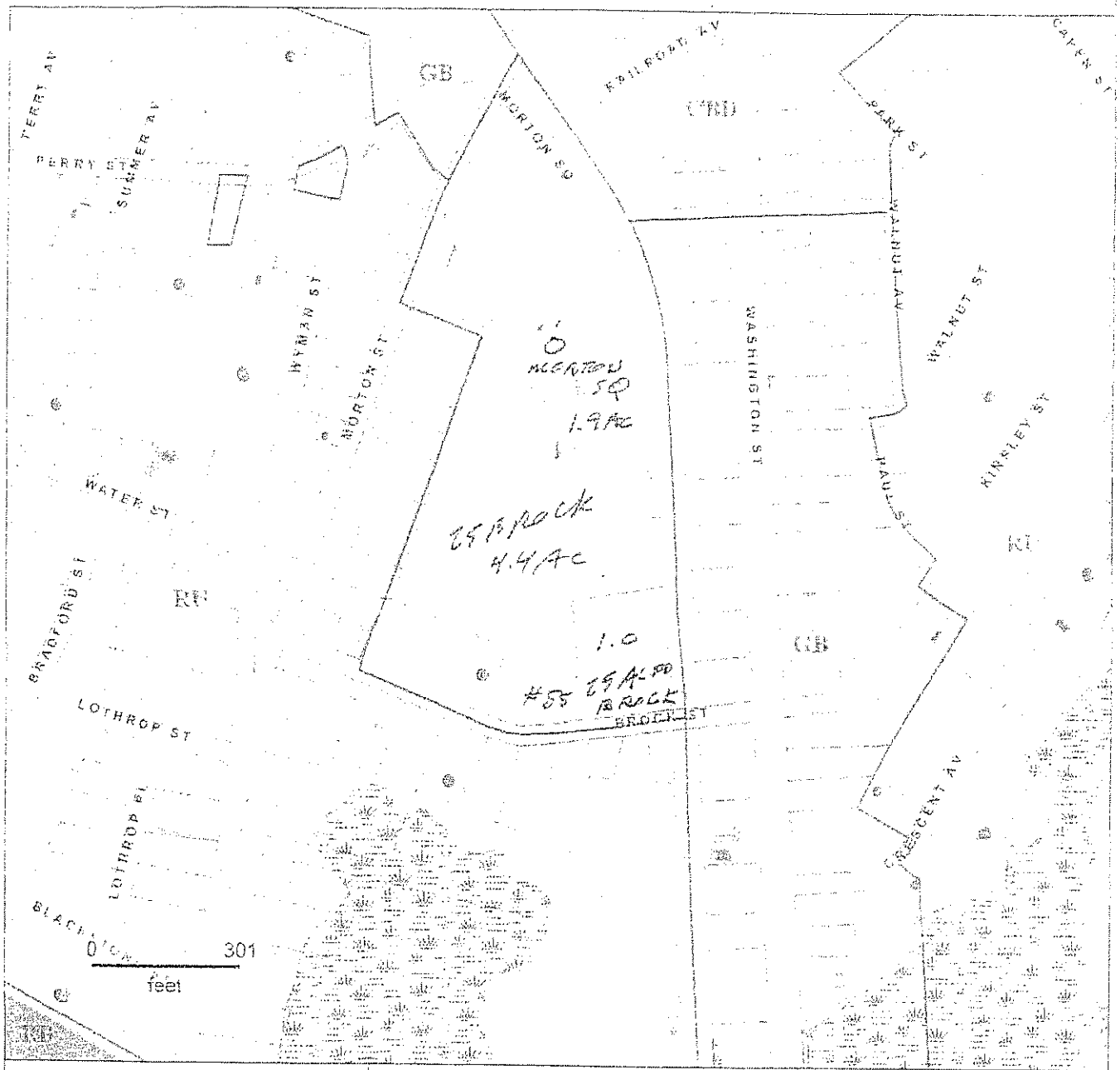
MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

The Town of Stoughton makes no claims, no representations and no warranties, expressed or implied, concerning the validity, (expressed or implied), the reliability, or the accuracy of the GIS data and GIS data products furnished by the Town, including the implied validity of any uses of such data. The use of the data in any such manner, shall not supercede any federal, state or local laws or regulations.



Lot 054 110 11 2 Canton St 3.2 Ac
Stoughton Canton Avenue Prop LLC

Property Map



Property Information

Property ID	054 406 0
Location	MORTON SQ
Owner 1	MURPHY COAL CO INC
Owner 2	
Owner 3	
Bill Addr	P O BOX 25- 765 WASHINGTO
City St Zip	STOUGHTON MA 02072
Sale Price	50
Total Area	1.900 acres

7.3 Acres

MORTON SQ

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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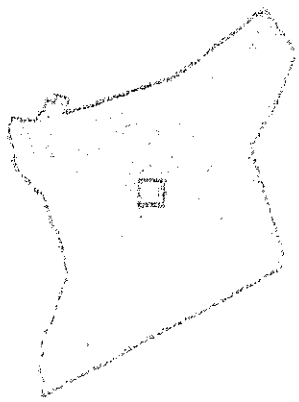
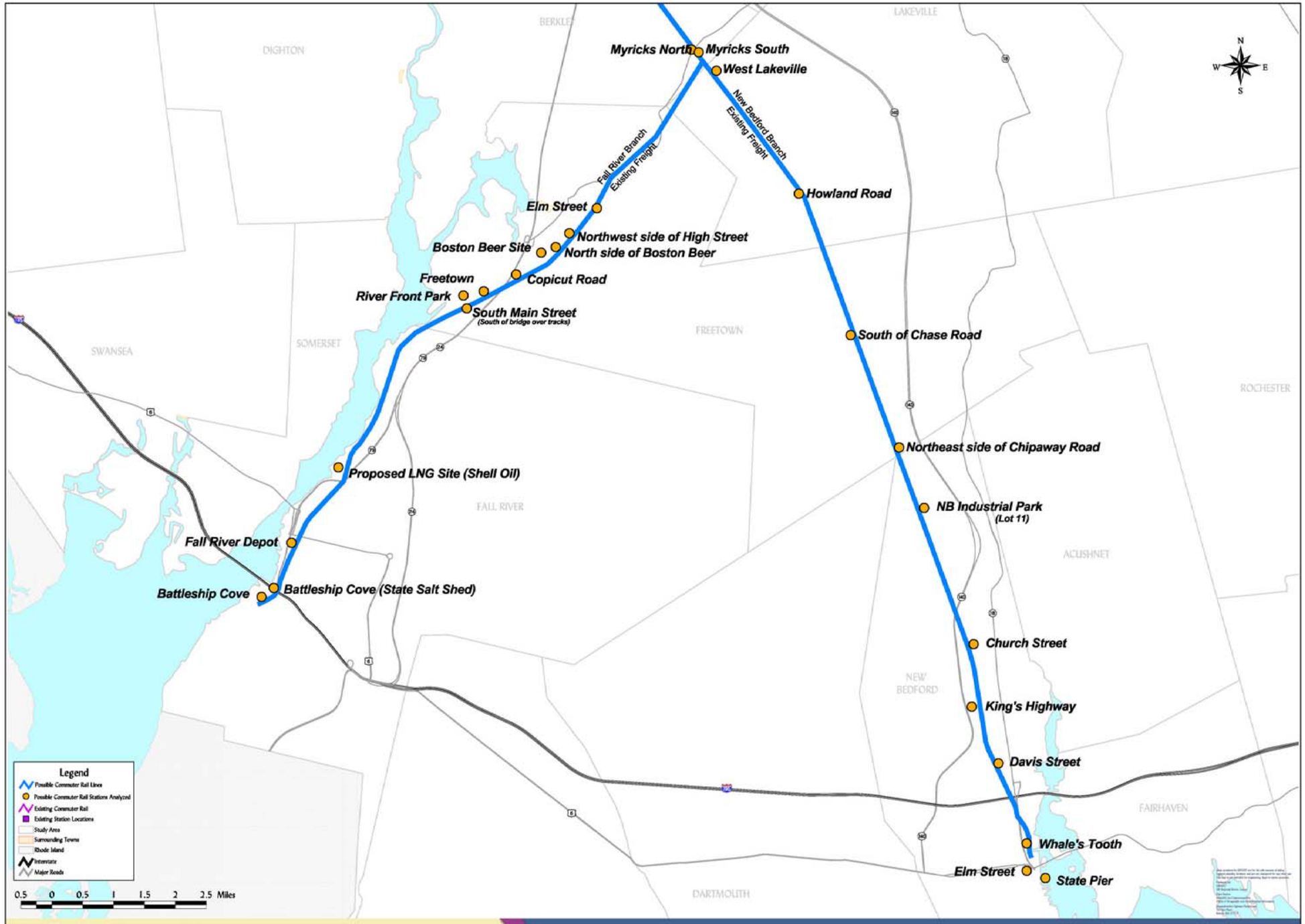


MURPHY COAL 1.9AC
25 ROCK 4.4AC #55 1.0 AC BROADWAY

Attachment 2 – Identified Stations



SOUTH COAST RAIL
Smart Growth
Corridor Plan

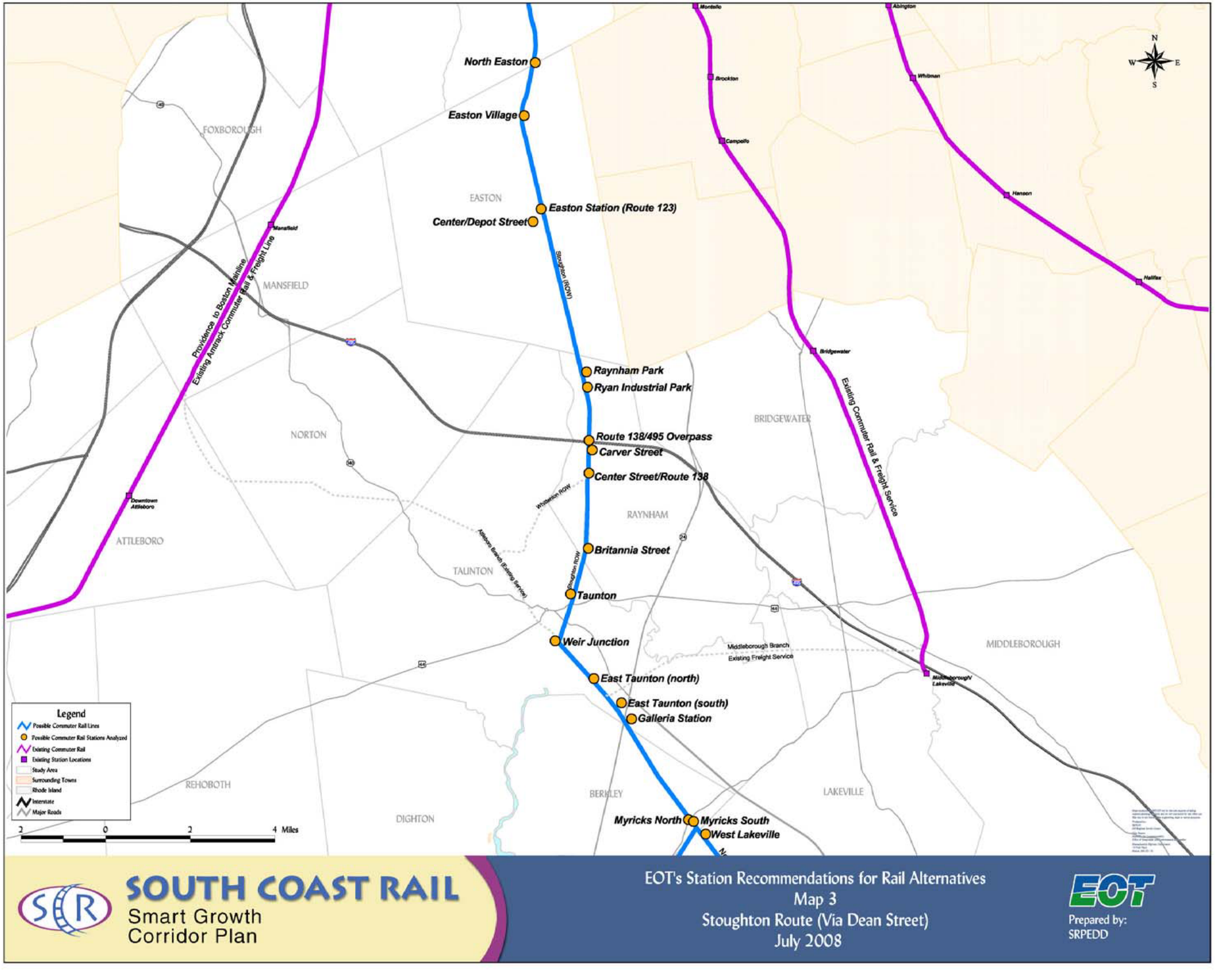
EOT's Station Recommendations for Rail Alternatives
Map 1
New Bedford / Fall River Branches
July 2008

EOT
Prepared by:
SRPEDD

SOUTH COAST RAIL
Smart Growth
Corridor Plan

Identified Station Sites or
Map 2
Attleboro Route
J

EOT
Prepared :
SRP DD


North Easton
Easton Village
Easton Station (Route 123)
Center/Depot Street
Raynham Park
Ryan Industrial Park
Route 138/495 Overpass
Carver Street
Center Street/Route 138
Britannia Street
Taunton
Weir Junction
East Taunton (north)
East Taunton (south)
Galleria Station
Myricks North
Myricks South
West Lakeville
FOXBOROUGH
EASTON
MANSFIELD
NORTON
ATTLEBORO
TAUNTON
RAYNHAM
BRIDGEWATER
MIDDLEBOROUGH
REHOBOTH
BERKLEY
DIGHTON
LAKEVILLE
Providence to Boston Mainline
Existing Amtrack Commuter Rail & Freight Line
Stoughton (ROW)
Whittenton ROW
Attleboro Branch (Existing Service)
Stoughton ROW
Existing Commuter Rail & Freight Service
Middleborough Branch
Existing Freight Service
Montello
Brockton
Campello
Abington
Whitman
Hanson
Halifax
Bridgewater
Middleborough/ Lakeville
Mansfield
Downtown Attleboro
Legend
Possible Commuter Rail Lines
Possible Commuter Rail Stations Analyzed
Existing Commuter Rail
Existing Station Locations
Study Area
Surrounding Towns
Rhode Island
Interstate
Major Roads
2 0 2 4 Miles
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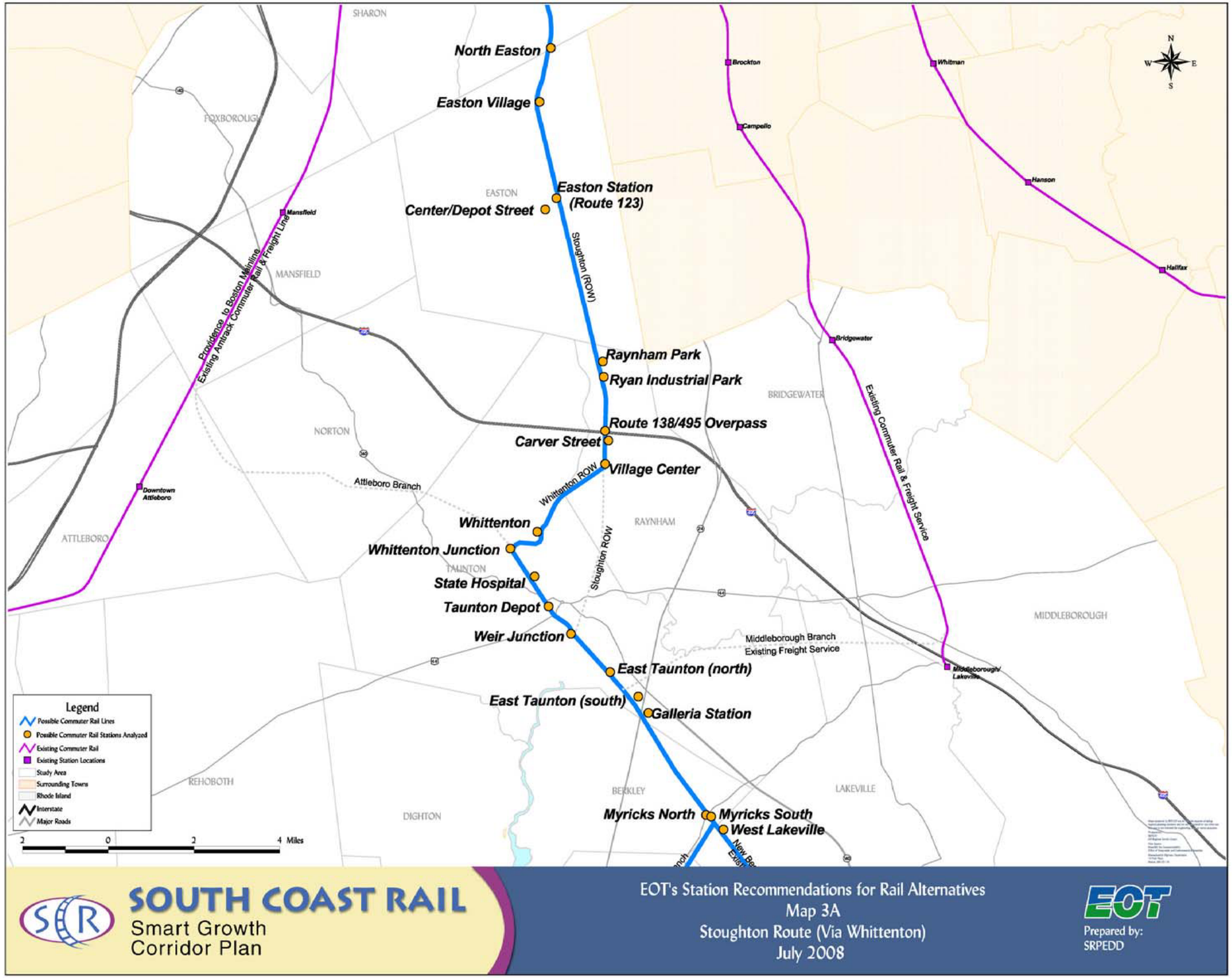
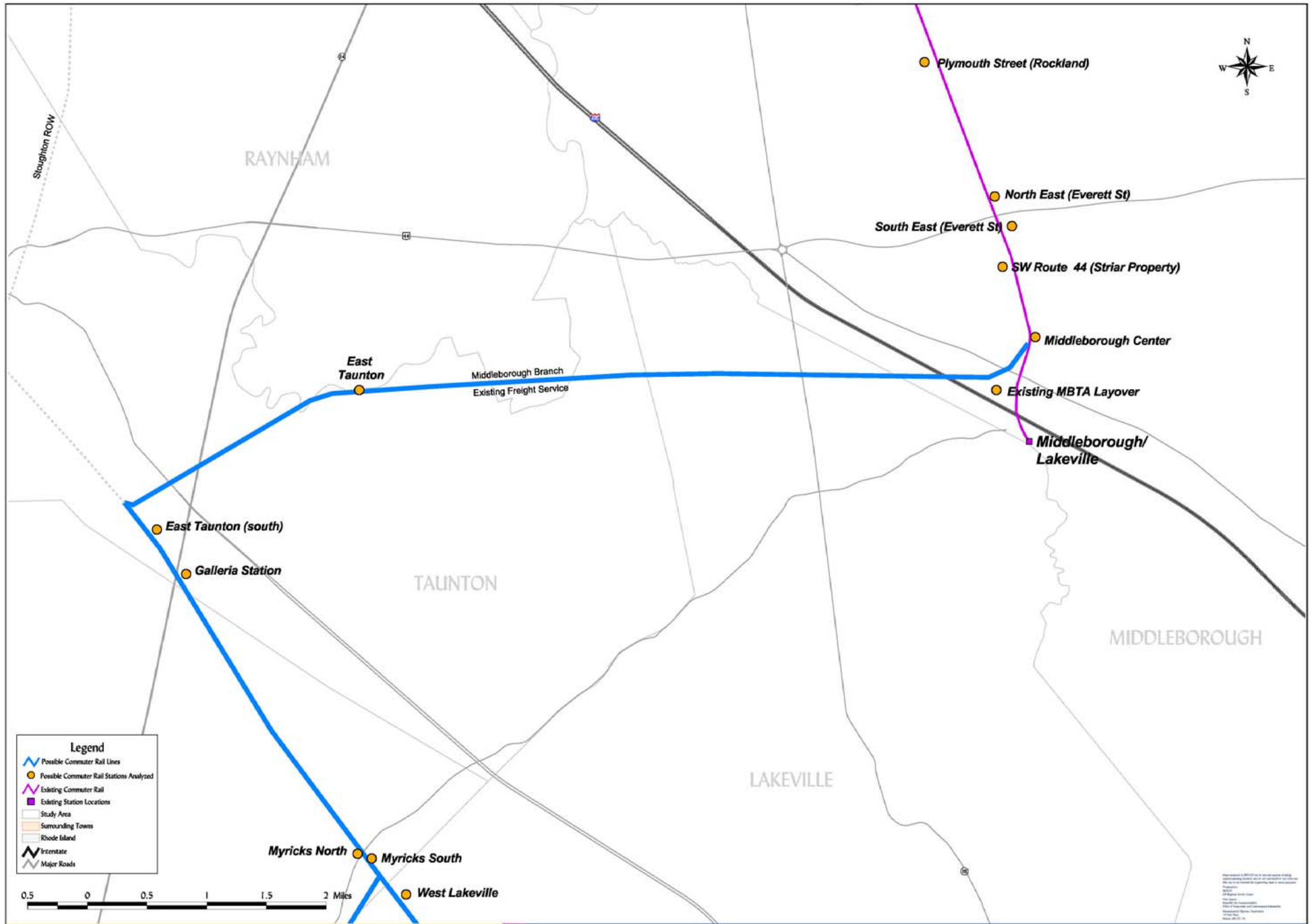
S
SOUTH COAST RAIL
Smart Growth
Corridor Plan
EOT's Station Recommendations for Rail Alternatives
Map 3
Stoughton Route (Via Dean Street)
July 2008
EOT
Prepared by:
SRPEDD

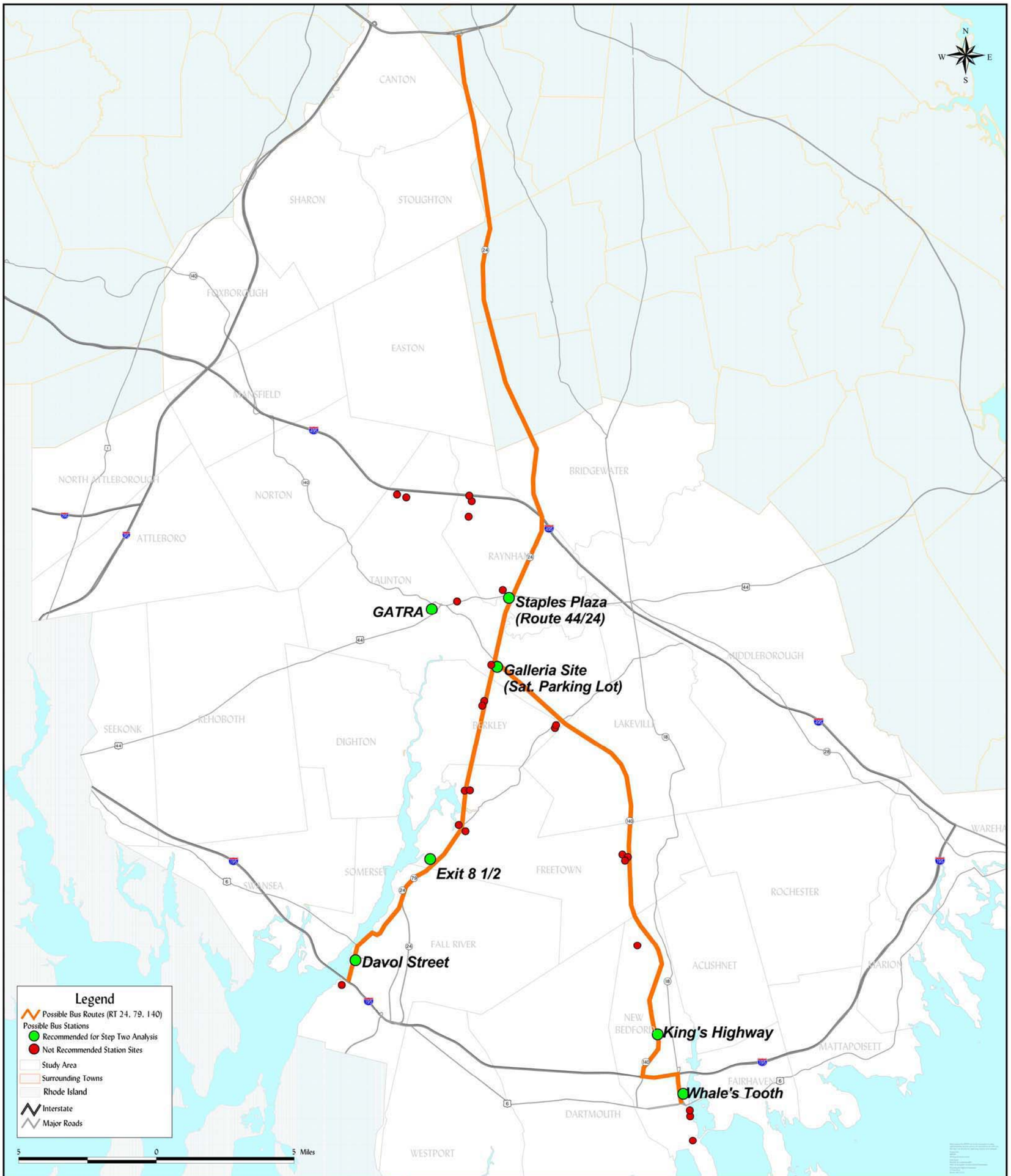

North Easton
Easton Village
Easton Station
(Route 123)
Center/Depot Street
Raynham Park
Ryan Industrial Park
Route 138/495 Overpass
Carver Street
Village Center
Whittenton
Whittenton Junction
State Hospital
Taunton Depot
Weir Junction
East Taunton (north)
East Taunton (south)
Galleria Station
Myricks North
Myricks South
West Lakeville
Stoughton (ROW)
Whittenton ROW
Stoughton ROW
Attleboro Branch
Providence to Boston Mainline
Existing Amtrack Commuter Rail & Freight Line
Existing Commuter Rail & Freight Service
Middleborough Branch
Existing Freight Service
Middleborough/
Lakeville
Downtown
Attleboro
Mansfield
Brockton
Campello
Whitman
Hanson
Halifax
Bridgewater
SHARON
FOXBOROUGH
EASTON
MANSFIELD
NORTON
ATTLEBORO
TAUNTON
RAYNHAM
BRIDGEWATER
MIDDLEBOROUGH
REHOBOTH
BERKLEY
LAKEVILLE
DIGHTON
N
W
E
S
Legend
Possible Commuter Rail Lines
Possible Commuter Rail Stations Analyzed
Existing Commuter Rail
Existing Station Locations
Study Area
Surrounding Towns
Rhode Island
Interstate
Major Roads
2 0 2 4 Miles
SOUTH COAST RAIL
Smart Growth
Corridor Plan
EOT's Station Recommendations for Rail Alternatives
Map 3A
Stoughton Route (Via Whittenton)
July 2008
EOT
Prepared by:
SRPEDD



SOUTH COAST RAIL
Smart Growth
Corridor Plan

EOT's Station Recommendations for Rail Alternatives
Map 4
Middleborough Route
July 2008

EOT
Prepared by:
SRPEDD



SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Proposed Bus Stations

EOT
Prepared by:
SRPEDD
July 2008

Attachment 3 - Data on Identified Station Sites

Draft Commuter Rail and Express Bus Station Sites

Fall River		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R1	Battleship Cove (behind gate)	All Rail Routes	2.2	Level	Poor	Industrial	Vacant	Industrial/ Commercial	No	Yes	Limited	Potential	Yes	Yes	0.5 mile	Fair	N/A	Execellent	Excellent	Yes	No	No	No	No	No	No	No	Yes
R2	Battleship Cove (state salt shed)	All Rail Routes	3.2	Level	Poor	Industrial	State DPW yard	Industrial/ Commercial/Museum	No	Yes	V limited	Yes	Yes	Yes	0.5 mile	Fair	N/A	Good	Good	Yes	No	No	No	No	No	No	Yes	Yes
R3	Davol Street	All Rail Routes	7.9	Level	Good	Industrial	Abandon Building	Industrial/ Commercial	No	Yes	Moderate	Yes	Yes	Yes	0.6 mile	Good	6,100	Execellent	Excellent	Yes	No	No	No	No	No	No	No	Yes
R4	Proposed LNG Site (Weaver's Cove)	All Rail Routes	3.5	Level	Good	Industrial	Industrial	Highway/ Industrial/ Park	No	Yes	No	Potential	Yes	Yes	0.03 miles	Good	25,400	Fair	Fair	No	No	No	No	No	No	No	Adjacent	Yes
Bus																												
B1	Battleship Cove (State salt shed)	Bus Rapid	3.2	Level	Poor	Industrial	State DPW yard	Industrial/ Commercial/Museum	No	Yes	V limited	Yes	Yes	Yes	0.5 mile	Fair	N/A	Good	Good	Yes	No	No	No	No	No	No	Yes	Yes
B2	Davol Street (Pearce and Davol Street)	Bus Rapid	7.9	Level	Good	Industrial	Abandon Building	Industrial/ Commercial	No	Yes	Moderate	Yes	Yes	Yes	0.6 mile	Good	6,100	Execellent	Excellent	Yes	No	No	No	No	No	No	No	Yes

New Bedford		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R5	State Pier	All Rail Routes	7	Poor	Level	Industrial	Industrial	Industrial	Yes	Yes	None	Yes	Yes	Yes	0.01 mile	Good	29,000	Good	Good	Yes	No	No	No	Yes	No	No	Yes	Yes
R6	Elm Street	All Rail Routes	3.1	Poor	Cut Required	Mixed use Business	Parking and Highway	Business	Adjacent	Yes	Existing CBD	Yes	Yes	Yes	0.01 mile	Fair	45,600	Good	Good	Yes	No	No	No	No	No	No	No	No
R7	Whale's Tooth (parking lot)	All Rail Routes	14	Fair	Level	Industrial B	Industrial	Industrial	No	Yes	Limited	Potential	Yes	Yes	0.7 mile	Fair	45,600	Fair	Fair	Yes	No	No	No	No	No	No	Yes	Yes
R8	Davis Street	All Rail Routes	4	Poor	Level	Industrial	Vacant	Industrial/ Residential	No	Yes	Existing residential	Potential	Yes	Yes	.69 mile	Poor	N/A	Good	Good	Yes	No	No	No	No	No	No	No	Yes
R9	King's Highway	All Rail Routes	55	Fair	Level	Industrial B	Commercial	Commercial	No	Yes	Moderate	Yes	Yes	Yes	0.9 mile	Good	23,900 *(2001)*	Execellent	Excellent	No	No	No	No	No	No	No	No	Yes
R10	Church Street	All Rail Routes	7.2	Good	Level	Industrial	Commercial	Commercial/ Industrial	No	Yes	Limited	Yes	Yes	Yes	1 mile	Good	8,900	Good	Fair	No	No	No	No	No	No	No	No	Yes
R11	New Bedford Industrial Park (Lot 11)	All Rail Routes	9.2	Good	Level	Industrial C	Industrial	Industrial	No	No	None	Yes	Yes	Yes	0.7 mile	Fair	3,710 *(2002)*	Fair	Execellent	No	No	Partial	No	No	No	No	No	No
Bus																												
B3	Cove Street & JFK	Bus Rapid	2.2	Poor	Level	Industrial B	Industrial	Industrial	No	Yes	V. Limited	Yes	Yes	Yes	1.72 miles	Fair	19,200	Good	Good	Yes	No	No	No	No	No	No	Yes	Yes
B4	NSTAR site	Bus Rapid	12	Good	Level	Industrial B	Industrial	Industrial	No	Yes	V. Limited	Yes	Yes	Yes	0.52 mile	Fair	23,700	Good	Good	Yes	No	No	No	No	No	No	Yes	Yes
B5	New Bedford State Pier	Bus Rapid	7	Poor	Level	Industrial B	Industrial	Industrial	Yes	Yes	None	Yes	Yes	Yes	0.01 mile	Good	29,000	Good	Good	Yes	No	No	No	Yes	No	No	Yes	Yes
B6	Whale's Tooth (parking lot)	Bus Rapid	14	Fair	Level	Industrial B	Industrial	Industrial	No	Yes	Limited	Potential	Yes	Yes	0.7 mile	Good	45,600	Fair	Fair	Yes	No	No	No	No	No	No	Yes	Yes
B7	Kings Highway	Bus Rapid	55	Good	Level	Industrial B	Commercial	Commercial	No	Yes	Moderate	Yes	Yes	Yes	0.9 mile	Good	23,900 *(2001)*	Execellent	Excellent	No	No	No	No	No	No	No	No	Yes
B8	New Bedford Industrial Park (Lot 11)		9.2	Good	Level	Industrial C	Industrial	Industrial	No	No	None	Yes	Yes	Yes	0.7 mile	Fair	3,710 *(2002)*	Fair	Execellent	No	No	Partial	No	No	No	No	No	No

Freetown		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R12	South Main Street (South of bridge over tracks)	All Rail Routes	5	Steep	Poor	Industrial	Field/Woods	Field/Woods	No	N/A	None	Yes	Yes	Yes	0.10 mile	Good*	2,700	Good	Fair	No	No	Likely	No	No	No	No	No	No
R13	South Main Street U Storage site	All Rail Routes	18	Level	Good	General Use	U storage	Industrial/ Comm./Resid.	No	Yes	Moderate	Yes	Yes	Yes	0.25 mile	Good*	2,700	Good	Good	No	No	Yes	No	No	No	No	No	Potential
R14	River Front Park	All Rail Routes	60 +	Rolling	Good	Industrial	Industrial	Industrial	No	Yes	None	Yes	No	No	1.20 miles	Good*	2,700	Good	Good	No	No	Yes	No	No	No	No	Adjacent	Potential
R15	Copicut Road	All Rail Routes	9.4	Level	Fair	General Use	Industrial	Resid./ Gravel Removal	No	Yes	None	Yes	No	No	1.20 miles	Fair	N/A	Fair	Fair	No	No	No	No	No	No	No	Adjacent	Potential
R16	North of Boston Beer site	All Rail Routes	6	Level	Fair	Industrial	Industrial / Residential	Residential/ Industrial	No	Yes	None	Yes	Potential	Potential	0.5 mile	Fair	N/A	Poor	Good	No	No	Yes	No	No	No	No	No	No
R17	Boston Beer Site	All Rail Routes	29	Level	Good	Industrial	Gravel	Industrial	No	Yes	None	Yes	Potential	Potential	0.6 mile	Fair	N/A	Poor	Good	No	No	Yes	No	No	No	No	No	No
R18	NW Side of High Street	All Rail Routes	5	Level	Good	General Use	Residential	Residential	No	Yes	None	No	No	No	0.9 mile	Fair	N/A	Fair	Poor	No	No	Likely	No	No	No	No	No	No
R19	SE Side of Elm Street	All Rail Routes	3.5	Level	Fair	General Use	Residential	Residential/ Historical	Adjacent	Yes	None	No	No	No	1.23 miles	Fair	3,600	Fair	Poor	No	No	Yes	No	No	No	No	No	No
R20	NE Side of Chipaway Road	All Rail Routes	3	Level	Fair	General Use	Residential	Residential	No	Yes	None	No	No	No	1.12 miles	Fair	1,800	Fair	Fair	No	No	Yes	No	Yes	No	No	No	No
R21	South of Chase Road	All Rail Routes	22	Level	Good	General Use	Auto/ Comm.	Bogs/ Gravel/ Residential	No	No	Limited	No	No	No	1.2 miles	Good	3,400	Poor	Poor	No	No	Adjacent	No	Adjacent	No	No	No	Yes
Bus																												
B9	Exit 8 1/2 Interchange	Bus Rapid	3	Level	Fair	General Use	Woods/ Vacant	Residential	No	No	No	No	Yes	Yes	0.05 mile	Good*	2,700	Good	Fair	No	No	No	No	No	No	No	No	No

Draft Commuter Rail and Express Bus Station Sites

B10	Boston Beer Site	Bus Rapid	29	Level	Good	Industrial	Vacant	Industrial	No	No	No	Yes	Yes	Yes	0.6 mile	Fair	N/A	Poor	Good	No	No	No	No	No	No	No	No
B11	Fly Ash Site	Bus Rapid	18	Level	Fair	General Use	Capped Fly Ash	Residential	No	Limited	No	Limited	Yes	Yes	0.13 mile	Fair	5,990	Poor	Fair	No	No	No	No	Yes	No	No	Yes	Yes
B12	Park Ride off N. Main St. (Exit 10)	Bus Rapid	3	Level	Fair	General Use	Park and Ride	Residential	No	No	No	No	No	No	0.11 mile	Good	3,600	Fair	Poor	No	No	No	No	No	No	No	No	No
B13	Northeast Corner of Exit 10	Bus Rapid	8	Hilly	Good	General Use	Residential/ Woods	Residential	No	No	No	No	No	No	0.08 mile	Good	3,600	Poor	Poor	No	No	No	No	Yes	No	No	No	No
B14	East Side of Gurney Road, South of Chase Road	Bus Rapid	11	Level	Good	General Use	Woods/ Vacant	Residential	No	Yes	No	No	No	No	0.75 mile	Good	7,400	Poor	Poor	No	No	No	No	No	No	No	No	No
B15	Western Interchange of Route 140 /Chase Road	Bus Rapid	3.5	Steep	Poor	General Use	Land within Interchange	Residential	No	No	No	No	No	No	0.01 mile	Good	7,400	Poor	Fair	No	No	No	No	No	No	No	No	No
B16	Northeast side of Chase and Gurney Road	Bus Rapid	6.5	Level	Good	General Use	Commercial/ Industrial	Residential	No	No	No	No	No	No	0.5 mile	Good	N/A	Poor	Fair	No	No	No	No	No	No	No	Yes	No

	Lakeville	**Route Served**	**Zoning, Land Use and Economic Development**										**Infrastructure**					**Location**			**Environmental**							
			Acres	**Topo-graphy**	**Geometry**	**Zoning**	**Existing Land Use**	**Surrounding Land Use**	**Historic District**	**Redev. Potential**	**Potential TOD**	**Eco. Opp. Area**	**Water Line**	**Sewer line**	**Distance to Highway Intersection**	**Suitability of road network**	**Avg. Daily Trips**	**Prox. To Pop.**	**Prox. To Jobs**	**Environ. Justice Population**	**Area of Critical Concern**	**Wetlands**	**Cert. Vernal**	**2006 Priority. Hab.**	**Well-head Prot.**	**Surface Water**	**Flood-plain**	**Brown-field**
Site #	***Possible Station Locations***																											
Rail																												
R22	West Lakeville	All Rail Routes	11	Level	Good	Residential	Vacant Brick yard	Residential	No	Yes	No	No	No	No	1.5 miles	Poor	N/A	Poor	Poor	No	No	Yes	No	Yes	No	No	Adjacent	Yes
R23	Howland Rd.	All Rail Routes	33	Level	Good	Residential	Vacant	Residential	No	No	No	No	No	No	2.8 miles	Poor	1,900	Poor	Poor	No	No	No	No	Yes	No	No	No	Yes

	Berkley	**Route Served**	**Zoning, Land Use and Economic Development**										**Infrastructure**					**Location**			**Environmental**							
			Acres	**Topo-graphy**	**Geometry**	**Zoning**	**Existing Land Use**	**Surrounding Land Use**	**Historic District**	**Redev. Potential**	**Potential TOD**	**Eco. Opp. Area**	**Water Line**	**Sewer line**	**Distance to Highway Intersection**	**Suitability of road network**	**Avg. Daily Trips**	**Prox. To Pop.**	**Prox. To Jobs**	**Environ. Justice Population**	**Area of Critical Concern**	**Wetlands**	**Cert. Vernal**	**2006 Priority. Hab.**	**Well-head Prot.**	**Surface Water**	**Flood-plain**	**Brown-field**
Site #	***Possible Station Locations***																											
Rail																												
R24	Myricks Junction	All Rail Routes	2	Level	Good	General Business	Commercial	Mixed Comm./ Ind. Res.	No	Yes	No	No	No	No	1.2 miles	Good	3,200	Fair	Poor	No	No	Adjacent	No	Adjacent	No	No	No	No
R25	NW of Myricks Junction	All Rail Routes	3.4	Level	Good	Residential	Residential/ Farm	Commercial/ Residential	No	Yes	No	No	No	No	1.3 miles	Good	3,200	Fair	Poor	No	No	No	No	Yes	No	No	No	No
Bus																												
B17	Parcel 15	Bus Rapid	2.7	Level	Good	General Business	Commercial	Commercial	No	Yes	No	Yes	No	No	0.23 mile	Good	8,400	Poor	Poor	No	No	No	No	No	No	No	No	Yes
B18	Parcel 14	Bus Rapid	3.1	Level	Good	General Business	Vacant Commercial	Commercial	No	Yes	No	Yes	No	No	0.31 mile	Good	8,400	Poor	Poor	No	No	Yes	No	No	No	No	No	Yes
B19	Parcel 1	Bus Rapid	2.8	Level	Good	General Business	Residential/ Home Business	Residential	No	No	No	Yes	No	No	0.74 mile	Good	4,700	Poor	Poor	No	No	No	No	No	No	No	No	No
B20	Parcel 2	Bus Rapid	5.3	Level	Good	General Business	Cleared Vacant	Residential	No	Yes	No	Yes	No	No	0.12 mile	Good	4,700	Poor	Poor	No	No	Yes	No	No	No	No	No	No

	Taunton	**Route Served**	**Zoning, Land Use and Economic Development**										**Infrastructure**					**Location**			**Environmental**							
			Acres	**Topo-graphy**	**Geometry**	**Zoning**	**Existing Land Use**	**Surrounding Land Use**	**Historic District**	**Redev. Potential**	**Potential TOD**	**Eco. Opp. Area**	**Water Line**	**Sewer line**	**Distance to Highway Intersection**	**Suitability of road network**	**Avg. Daily Trips**	**Prox. To Pop.**	**Prox. To Jobs**	**Environ. Justice Population**	**Area of Critical Concern**	**Wetlands**	**Cert. Vernal**	**2006 Priority. Hab.**	**Well-head Prot.**	**Surface Water**	**Flood-plain**	**Brown-field**
Site #	***Possible Station Locations***																											
Rail																												
R26	Galleria Site (Mall)	All Rail Routes	47.5	Rolling	Good	Industrial	Commercial	Commercial/ Res. Industrial	No	Yes	High	Yes	Yes	Yes	0.4 miles	Good	29,600	Poor	Good	No	No	Yes	No	No	No	No	Adjacent	No
R27	Mini Golf Site	Middleborough only	13.1	Level	Fair	Industrial	Commercial	Industrial/ Commercial	No	Yes	No	Yes	Yes	Yes	0.46 miles	Poor	68,000	Fair	Fair	No	No	Yes	No	No	No	No	No	No
R28	Target Plaza	Attleboro/ Whittenton/ Stoughton	14	Level	Fair	Industrial	Vacant	Commercial/ Multi-family Res.	No	Yes	Limited	Yes	Yes	Yes	1.0 miles	Good	23,020	Good	Good	No	No	Yes	No	No	No	No	No	No
R29	Weir Junction	Attleboro/ Whittenton/ Stoughton	18	Level	Poor	Industrial	Industrial	Industrial/ Residential	No	Yes	Moderate	Yes	Yes	Yes	2.7 miles	Poor	7,900	Excellent	Good	Yes	No	No	No	No	No	No	No	Yes
R30	Dean Street	Stoughton only	8	Level	Fair	Industrial	Vacant	Vacant Ind./ Residential	Adjacent	Yes	Limited	Yes	Yes	Yes	2.1 miles	Fair	24,800	Excellent	Fair	No	No	Yes	No	No	No	No	Yes	Yes
R31	GATRA / Oak Street Mall	Attleboro/ Whittenton	24	Level	Good	Business District	Bus Station/ Office/ Retail	Residential/ Commercial	No	Yes	High	Yes	Yes	Yes	2.9 miles	Fair	23,700	Excellent	Excellent	Yes	No	No	No	No	No	No	No	Yes
R32	State Hospital	Attleboro/ Whittenton	161	Level	Good	Open Space and Con.	State offices/Vacant	Residential	No	Yes	High	No	Yes	Yes	3.4 miles	Poor	3,300	Fair	Fair	Yes	No	Yes	No	No	No	No	Yes	Yes
R33	Whittenton Junction	Attleboro/ Whittenton	3.4	Level	Fair	Industrial	Vacant	Residential/ Industrial	No	Yes	No	Yes	Yes	Yes	4.2 miles	Poor	N/A	Fair	Poor	Yes	No	Adjacent	No	No	No	No	No	Yes
R34	Whittenton	Whittenton only	18	Level	Good	Industrial/ Urban Resid.	Vacant	Commercial/ Resid./ Industrial	No	Yes	Moderate	Yes	Yes	Yes	3.5 miles	Poor	1,580	Excellent	Good	No	No	Adjacent	No	No	No	No	Yes	Yes
R35	Old Colony Avenue (East Taunton)	Middleborough only	3.5	Level	Poor	Industrial	Industrial Bldg.	Industrial/ Residential	No	Yes	V. Limited	No	Yes	Yes	1.8 miles	Fair	8,700	Good	Fair	No	No	Yes	No	No	No	No	Adjacent	Yes
Bus																												
B21	Galleria Mall Overflow Parking lot	Bus Rapid	9.2	Level	Good	Industrial	Vacant parking Lot	Woods/ Highway	No	Yes	No	Yes	Yes	Yes	0.6 mile	Good	29,600	Poor	Fair	No	No	Yes	No	No	No	No	No	No
B22	Dean Street	Bus Rapid	8	Level	Fair	Industrial	Vacant	Vacant Ind./ Residential	Adjacent	Yes	Limited	Yes	Yes	Yes	2.1 miles	Poor	24,800	Good	Fair	No	No	Yes	No	No	No	No	Yes	Yes
B23	GATRA / Oak Street	Bus Rapid	12	Level	Good	Business District	Bus Station/ Office/ Retail	Residential/ Commercial	No	Yes	High	Yes	Yes	Yes	2.9 miles	Poor	23,700	Good	Good	Yes	No	No	No	No	No	No	No	Yes
B24	Industrial Park	Bus Rapid	3	Level	Fair	Industrial	Office/ Warehouse	Commercial/ Industrial	No	Yes	No	Yes	Yes	Yes	0.4 mile	Good	15,100	Poor	Good	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
B25	Northwoods	Bus Rapid	3	Level	Good	Industrial	Commercial	Commercial/ Industrial	No	Yes	No	Yes	Yes	Yes	0.41 mile	Good	15,100	Poor	Good	No	No	No	No	Yes	Yes	No	Yes	Yes

Draft Commuter Rail and Express Bus Station Sites

Raynham		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R36	E. Brittanna Street	Stoughton only	2.9	Level	Poor	Business District	Junk Yard	Land Fills/ Residential	No	Yes	Very Limited	Yes	Yes	No	3.2 miles	Poor	N/A	Poor	Poor	No	No	Yes	No	Yes	No	No	Adjacent	Yes
R37	Center Street/ Route 138	Stoughton/ Whittenton	6.6	Cut required	Poor	Business District	Commercial	Commercial/ Residential	No	Yes	Very Limited	Yes	Yes	Yes	0.65 miles	Good	18,300	Fair	Good	No	No	Yes	No	No	No	No	Adjacent	Potential
R38	Carver Street	Stoughton/ Whittenton	21	Level	Good	Business District	Commercial/ Residential	Warehouse/ Residential	No	Yes	Very Limited	Yes	Yes	Yes	0.21 miles	Good	24,000	Fair	Fair	No	No	Yes	No	Yes	No	No	No	Potential
R39	Route 138/ I-495 Overpass	Stoughton/ Whittenton	16	Major structural	Good	Business District	Highway	Commercial/ Residential	No	Yes	No	Yes	Yes	Yes	0.04 miles	Good	24,000	Fair	Fair	No	No	Yes	No	Yes	No	No	Yes	No
R40	Ryan Industrial Park	Stoughton/ Whittenton	3.4	Level	Good	Industrial	Warehouse	Industrial	No	Limited	No	Yes	Yes	Yes	1.3 miles	Good	21,300	Fair	Fair	No	Adjacent	Yes	No	Yes	No	No	No	Yes
R41	Dog Track	Stoughton/ Whittenton	80+	Level	Good	Industrial	Greyhound Track	Vacant/ Industrial/ Commercial	No	Yes	Yes	Yes	Yes	Yes	1.6 miles	Good	21,300	Fair	Fair	No	Adjacent	Yes	No	No	No	No	Adjacent	Yes
Bus																												
B26	Staples Plaza	Bus Rapid	12	Level	Good	Business District	Commercial	Commercial	No	Yes	No	Yes	Yes	Yes	0.42 mile	Good	14,900	Fair	Good	No	No	No	No	No	No	No	No	Yes
B27	Center Street	Bus Rapid	6	Level	Poor	Business District	Commercial	Commercial	No	Yes	No	Yes	Yes	Yes	0.68 mile	Fair	21,400	Fair	Good	No	No	Yes	No	No	Yes	No	No	Yes
B28	Flea Market	Bus Rapid	6	Level	Fair	Business District	Commercial	Commercial	No	Yes	No	Yes	Yes	Yes	0.48 mile	Good	14,900	Fair	Good	No	No	Yes	No	Yes	No	No	No	Yes
B29	Carver Street	Bus Rapid	21	Level	Good	Business District	Commercial/ Residential	Warehouse/ Residential	No	Yes	Very Limited	Yes	Yes	Yes	0.21 miles	Good	24,000	Fair	Fair	No	No	Yes	No	Yes	No	No	No	Potential
B30	Route 138/ 495 Overpass	Bus Rapid	16	Level	Good	Business District	Highway	Commercial/ Residential	No	Yes	No	Yes	Yes	Yes	0.04 miles	Good	24,000	Fair	Fair	No	No	Yes	No	Yes	No	No	Yes	No

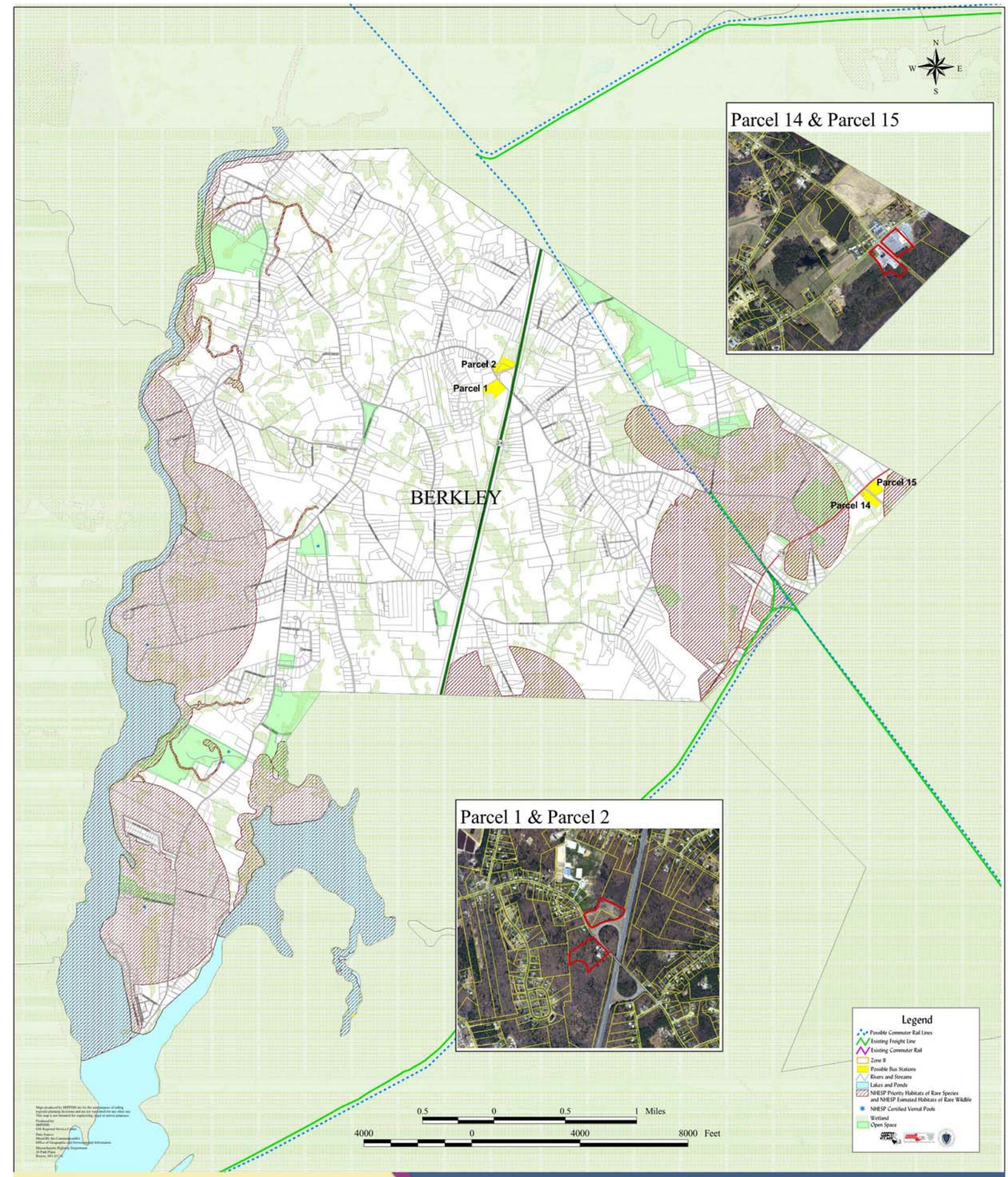
Easton		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R42	Easton Station (Route 123)	Stoughton/ Whittenton	4.4	Level	Fair	Industrial	Lumber Company	Houses	No	Yes	No	No	Yes	No	3.1 miles	Poor	18,700 *(2001)*	Fair	Fair	No	No	Yes	No	No	No	No	Partial	Yes
R43	Center / Depot Street (Church)	Stoughton/ Whittenton	12.6	Rolling	Fair	Residential	Former Church	Residential	No	Yes	No	No	Yes	No	3.2 miles	Poor	18,700	Fair	Fair	No	No	Yes	No	No	No	No	Yes	Yes
R44	Old Train Station (Downtown)	Stoughton/ Whittenton	7.9	Level	Poor	Industrial	Office/ Museum	Factories/ Offices	Yes	Yes	Yes	No	Yes	No	3.6 miles	Poor	3,715 *(2003)*	Good	Good	No	No	No	No	No	Zone 2	No	No	Yes
R45	North Easton (Roche Brothers)	Stoughton/ Whittenton	10+	Rolling	Fair	Commercial	Retail/ Office Residential	Office/ Shopping Apartments	No	Yes	Yes	No	Yes	No	2.8 miles	Good	13,000 *(2000)*	Fair	Good	No	No	Partial	No	No	Zone 2	No	No	No

Middleborough		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R46	Existing MBTA Layover	Middleborough only	25	Level	Good	General Use	MBTA Layover	Residential /Comm.	No	Yes	No	Potential	Yes	Yes	0.41 mile	Poor	15,410	Good	Good	No	No	No	No	No	Yes	No	No	Potential
R47	Old Station Site	Middleborough only	7.1	Level	Fair	General Use	Armory /CSX operations	Residential	No	Yes	V. Limited	Potential	Yes	Yes	0.82 mile	Fair	3,900	Execellent	Execellent	No	No	No	No	No	No	No	No	Potential
R48	SW Route 44 (Striar Property)	Middleborough only	26	Rolling	Fair	General Use / Resid.	Pond, Bogs, woods and	Residential / Warehousing	No	Limited	No	HWS	Yes	Yes	1.3 miles	Poor	5,800	Good	Good	No	No	Yes	No	Yes	Yes	No	No	Yes
R49	SE Route 44 (Everett St.)	Middleborough only	7.6	Rolling	Fair	General Use	Vacant	Residential	No	Yes	No	Potential	Yes	No	2.2 miles	Good	3,310	Good	Good	No	No	Yes	No	No	No	No	No	No
R50	NE Route 44 (Everett St.)	Middleborough only	7.1	Level	Good	General Use	Agr./ Residential	Agriculture and Residential	No	Yes	No	Potential	Yes	No	2.4 miles	Good	2,300	Good	Good	No	No	Yes	No	No	No	No	No	No
R51	Plymouth Street (Rockland)	Middleborough only	70	Level	Fair	General Use	Former Ind.	Residential	No	Limited	No	HWS	Yes	No	3.8 miles	Poor	N/A	Poor	Poor	No	No	Yes	No	No	No	No	Partial	Yes

Norton		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R52	Barrowsville (South Worcester Street)	Attleboro only	6.8	Level	Poor	Commercial	Residential/ Industrial	Residential	No	Yes	No	Potential	Yes	Yes	3.3 miles	Poor **	N/A	Fair	Good	No	Adjacent	No	No	No	No	No	No	Potential
R53	John Scott Blvd. East	Attleboro only	1.5	Level	Fair	Industrial	Industrial	Residential	No	Yes	No	Potential	Yes	Yes	5.2 miles	Fair	14,040	Fair	Fair	No	No	Potential	No	No	No	No	No	Potential
R54	John Scott Blvd. West	Attleboro only	3	Level	Fair	Industrial	Industrial	Residential	No	Yes	No	Potential	Yes	Yes	5.1 miles	Fair	14,040	Fair	Fair	No	No	No	No	No	No	No	No	Potential

Attleboro		Route Served	Zoning, Land Use and Economic Development										Infrastructure					Location			Environmental							
			Acres	Topo-graphy	Geometry	Zoning	Existing Land Use	Surrounding Land Use	Historic District	Redev. Potential	Potential TOD	Eco. Opp. Area	Water Line	Sewer line	Distance to Highway Intersection	Suitability of road network	Avg. Daily Trips	Prox. To Pop.	Prox. To Jobs	Environ. Justice Population	Area of Critical Concern	Wetlands	Cert. Vernal	2006 Priority. Hab.	Well-head Prot.	Surface Water	Flood-plain	Brown-field
Site #	*Possible Station Locations*																											
Rail																												
R55	Pleasant St. (Route 123)	Attleboro only	3	Level	Fair	SF Resid.	Residential	Residential	No	No	No	No	Yes	No	5.2 miles	Good	12,500	Poor	Fair	No	No	Yes	No	No	No	No	No	No

Attachment 4 – City and Town Maps (May 2008 Drafts)



SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Berkley
Possible Bus Station Sites
June 2008 DRAFT

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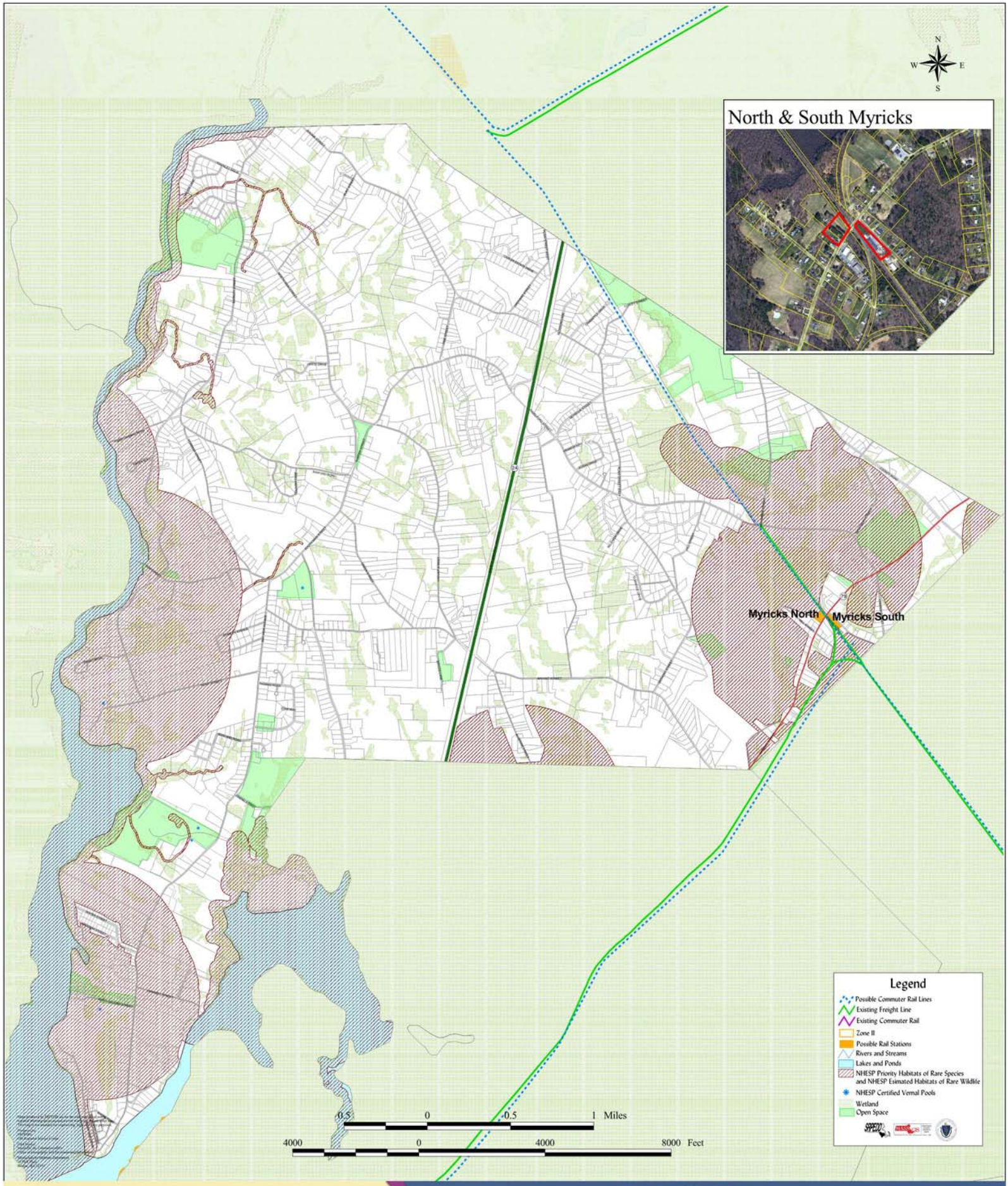

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Berkley
Possible Rail Station Sites
May 2008 DRAFT

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Easton Station (Route 123) ,
Center Street/Depot Street

N
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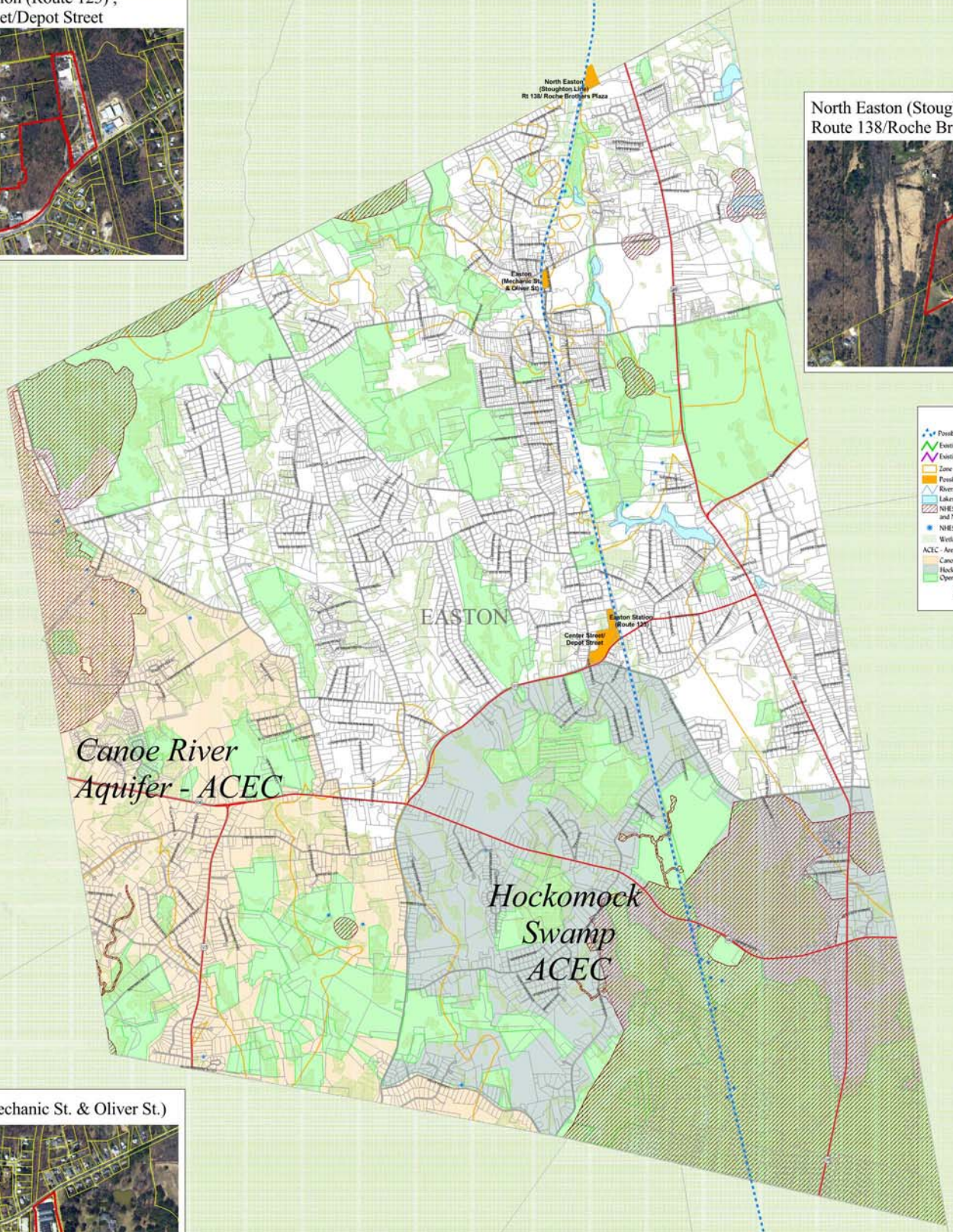
S

North Easton (Stoughton line)
Route 138/Roche Brothers Plaza



Legend

- Possible Commuter Rail Lines
- Existing Freight Line
- Existing Commuter Rail
- Zone II
- Possible Station Locations
- Rivers and Streams
- Lakes and Ponds
- NHESP Priority Habitats of Rare Species and NHESP Estimated Habitats of Rare Wildlife
- NHESP Certified Vernal Pools
- Wetland

ACEC - Areas of Critical Environmental Concern

- Canoe River Aquifer
- Hockomock Swamp
- Open Space

Easton (Mechanic St. & Oliver St.)

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Old Regional Service Center
Data Source:
MassGIS, Ag Commonwealth
Office of Geographic and Environmental Information
Massachusetts Highway Department
10 Park Plaza
Boston, MA 02116

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Easton
Possible Rail Station Sites
May 2008 DRAFT

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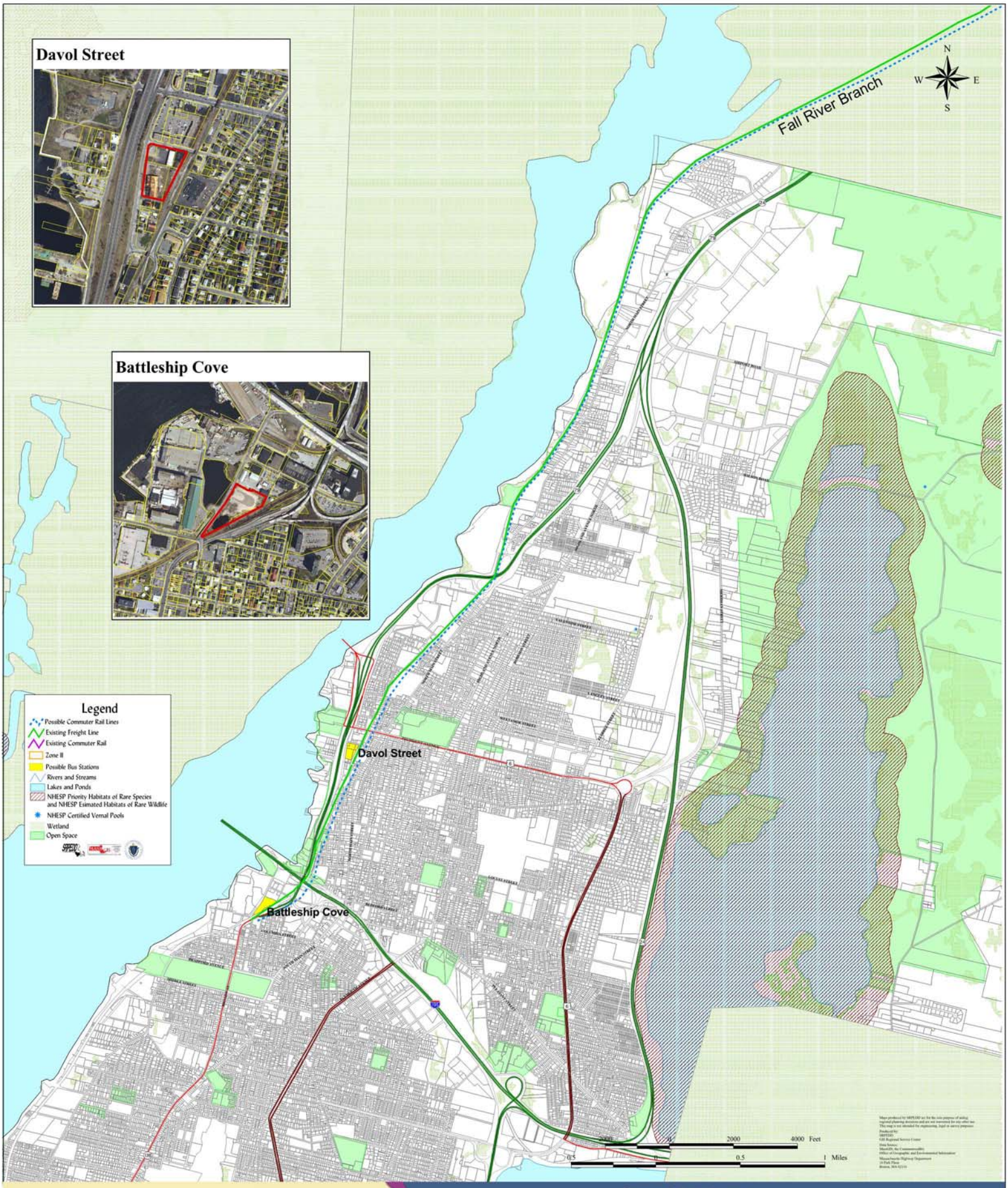

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

City of Fall River
Possible Bus Station Sites
June 2008 DRAFT

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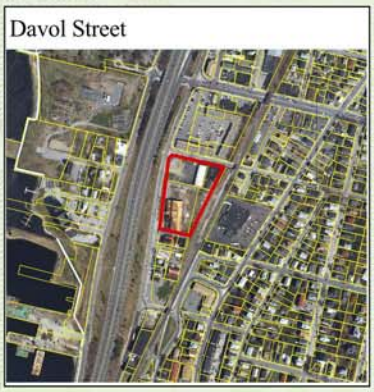

Fall River Branch

N
W
E
S

Legend
- Possible Commuter Rail Lines
- Existing Freight Line
- Existing Commuter Rail
- Zone II
- Possible Rail Stations
- Rivers and Streams
- Lakes and Ponds
- NHESP Priority Habitats of Rare Species and NHESP Estimated Habitats of Rare Wildlife
- NHESP Certified Vernal Pools
- Wetland
- Open Space

Proposed LNG Site (Shell Oil)

0 0.5 1 Miles

3000 0 3000 6000 Feet

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

City of Fall River
Possible Rail Station Sites
May 2008 DRAFT

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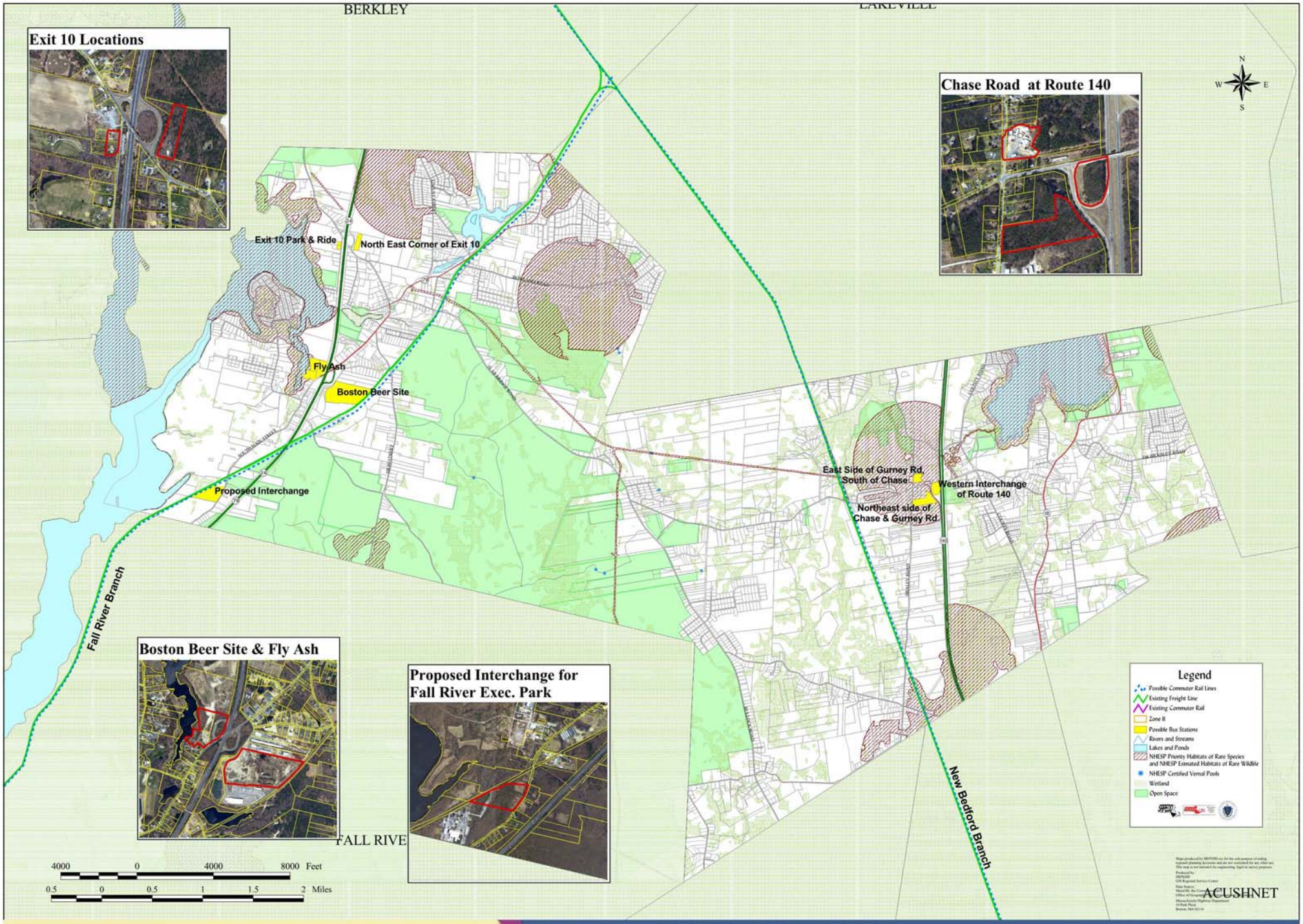

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Freetown
Possible Bus Station Sites
June 2008 DRAFT

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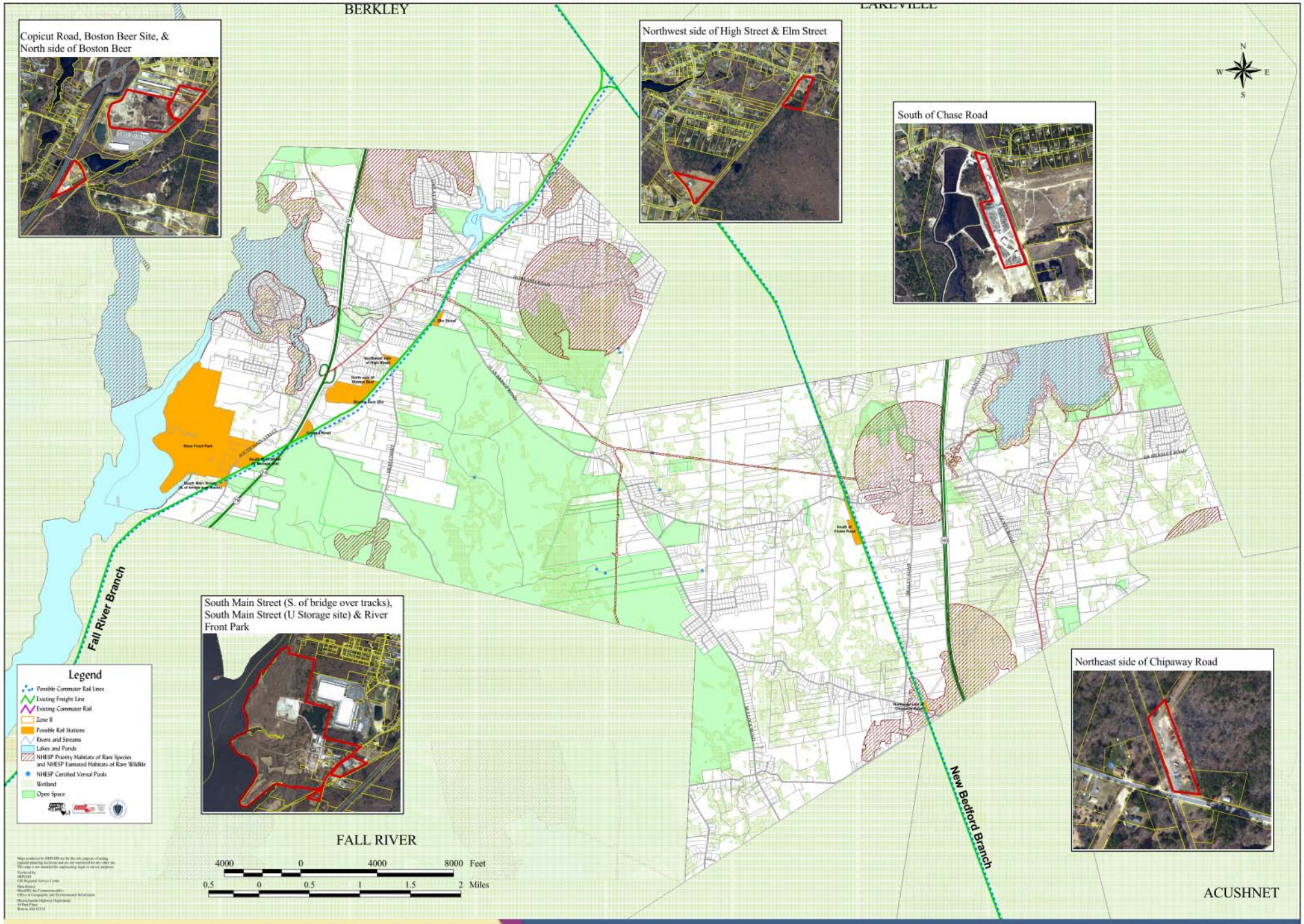

SOUTH COAST RAIL

Commuter Rail Corridor
Study Area

Town of Freetown
Possible Rail Station Sites
May 2008 DRAFT

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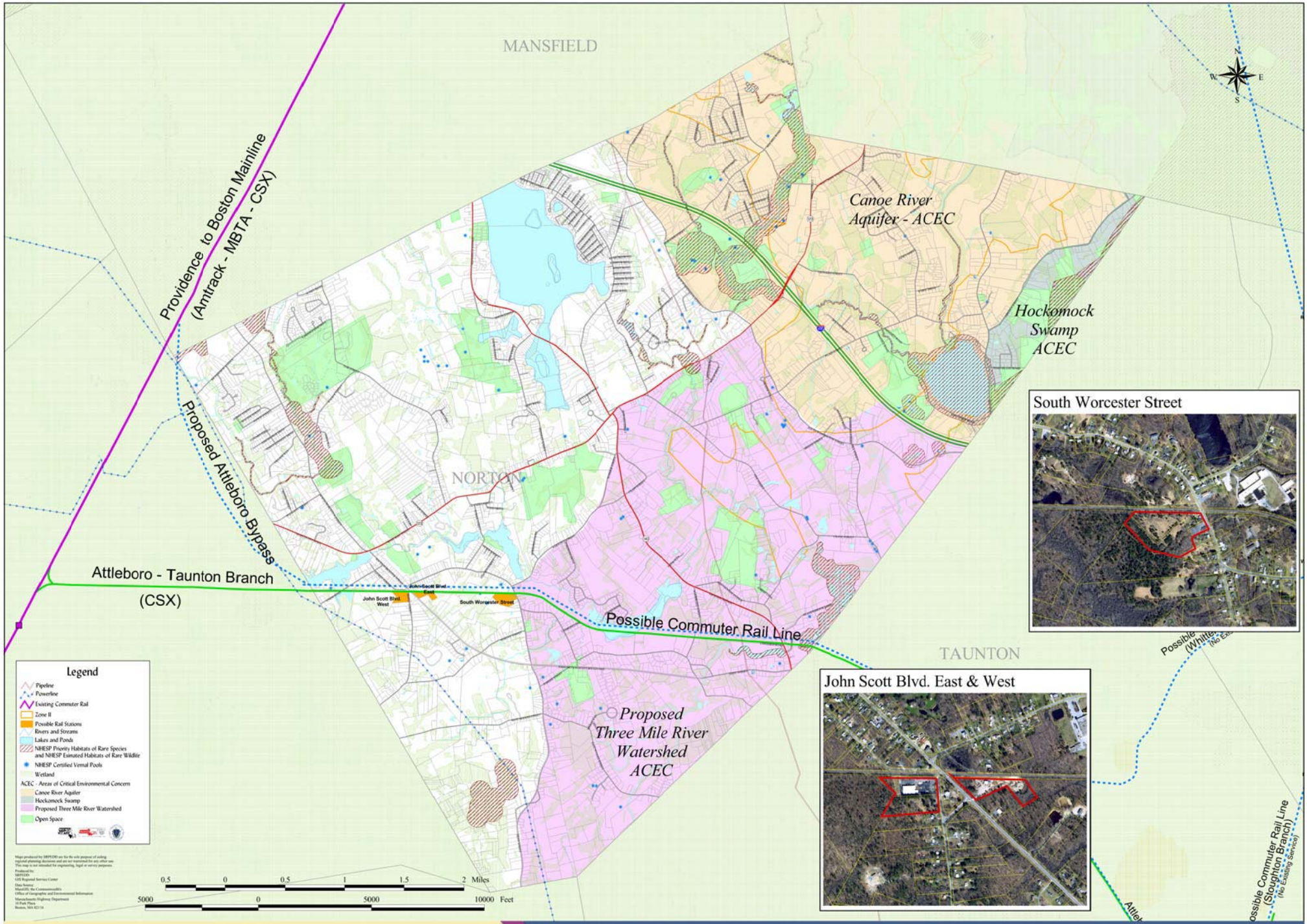

SOUTH COAST RAIL

Commuter Rail Corridor
Study Area

Town of Norton
Possible Rail Station Sites
May 2008 DRAFT

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SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Lakeville
Possible Rail Station Sites
May 2008 DRAFT

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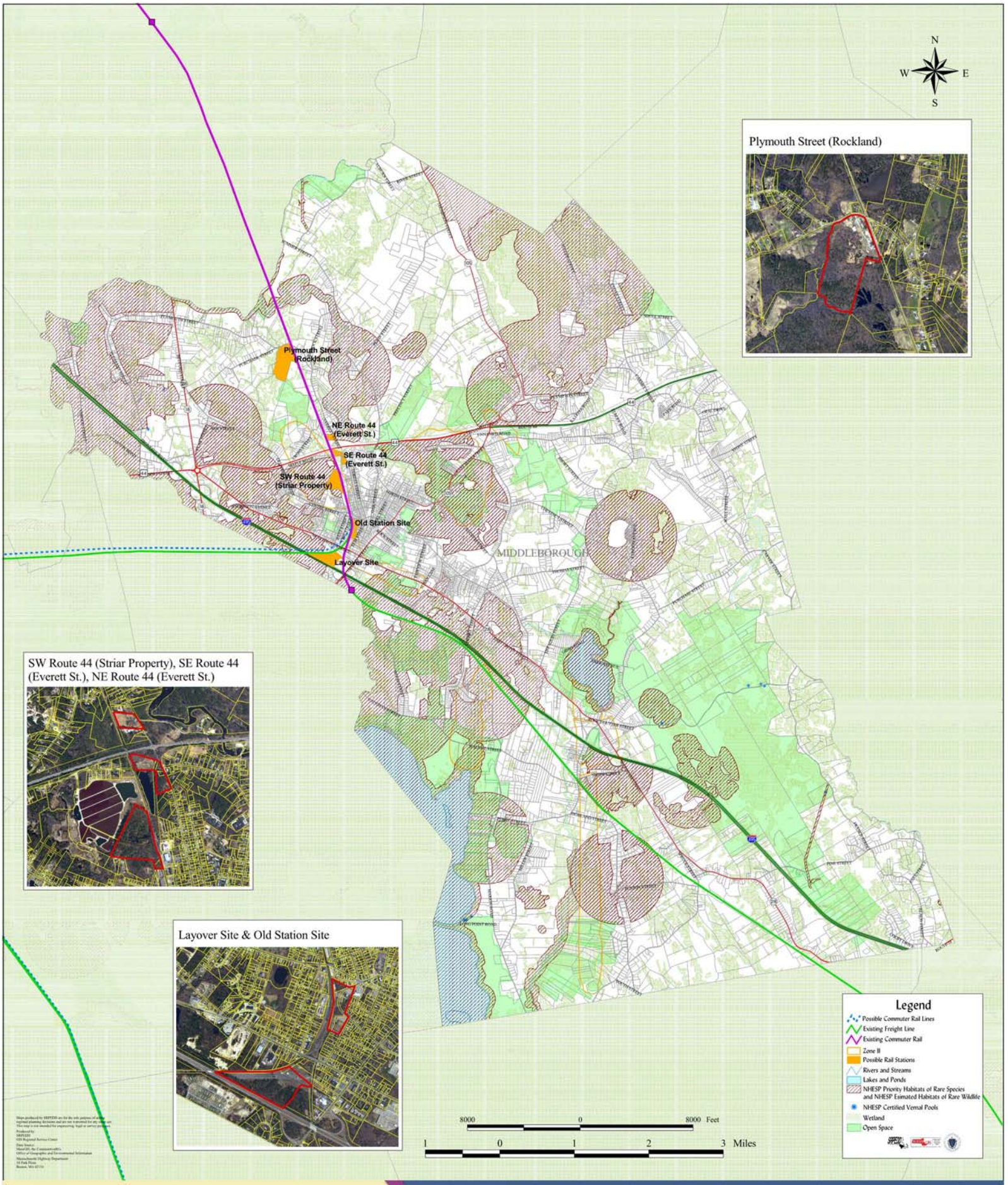

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Middleborough
Possible Rail Station Sites
May 2008 DRAFT

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Whale's Tooth

NB State Pier & NSTAR

Cove Street & Route 18

ACUSHNET

Industrial Park

NEW BEDFORD

King's Highway

Whale's Tooth

State Pier

NSTAR

Cove Street & Route 18

FAIRHAVEN

New Bedford Industrial Park (Lot 11)

King's Highway

N

W E

S

5000 0 5000 10000 Feet

0.5 0 0.5 1 1.5 2 2.5 Miles

Legend

- Possible Commuter Rail Lines
- Existing Freight Line
- Existing Commuter Rail
- Zone II
- Possible Bus Stations
- Rivers and Streams
- Lakes and Ponds
- NHESP Priority Habitats of Rare Species and NHESP Esimated Habitats of Rare Wildlife
- NHESP Certified Vernal Pools
- Wetland
- Open Space

SOUTH COAST RAIL

Commuter Rail Corridor Study Area

City of New Bedford

Possible Bus Station Sites

June 2008 DRAFT

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Whale's Tooth & Elm Street

Church Street

NB State Pier

ACUSHNET

NEW BEDFORD

FAIRHAVEN

New Bedford Industrial Park (Lot 11)

King's Highway

Davis Street

N

W E

S

Legend

- Possible Commuter Rail Lines
- Existing Freight Line
- Existing Commuter Rail
- Zone II
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- Wetland
- Open Space

5000 0 5000 10000 Feet

0.5 0 0.5 1 1.5 2 2.5 3 Miles

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

City of New Bedford
Possible Rail Station Sites
May 2008 DRAFT

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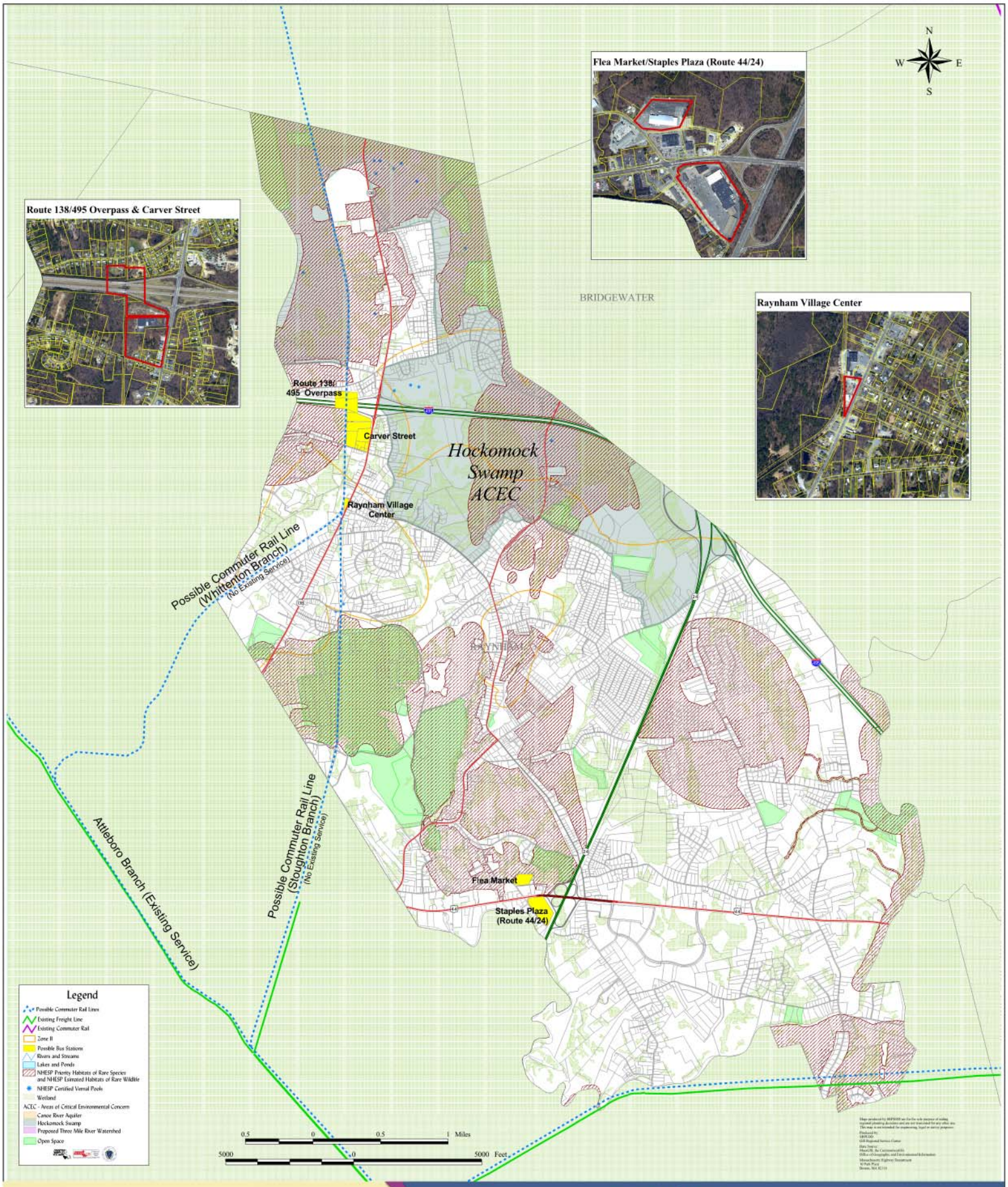

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Raynham
Possible Bus Station Sites
June 2008 DRAFT

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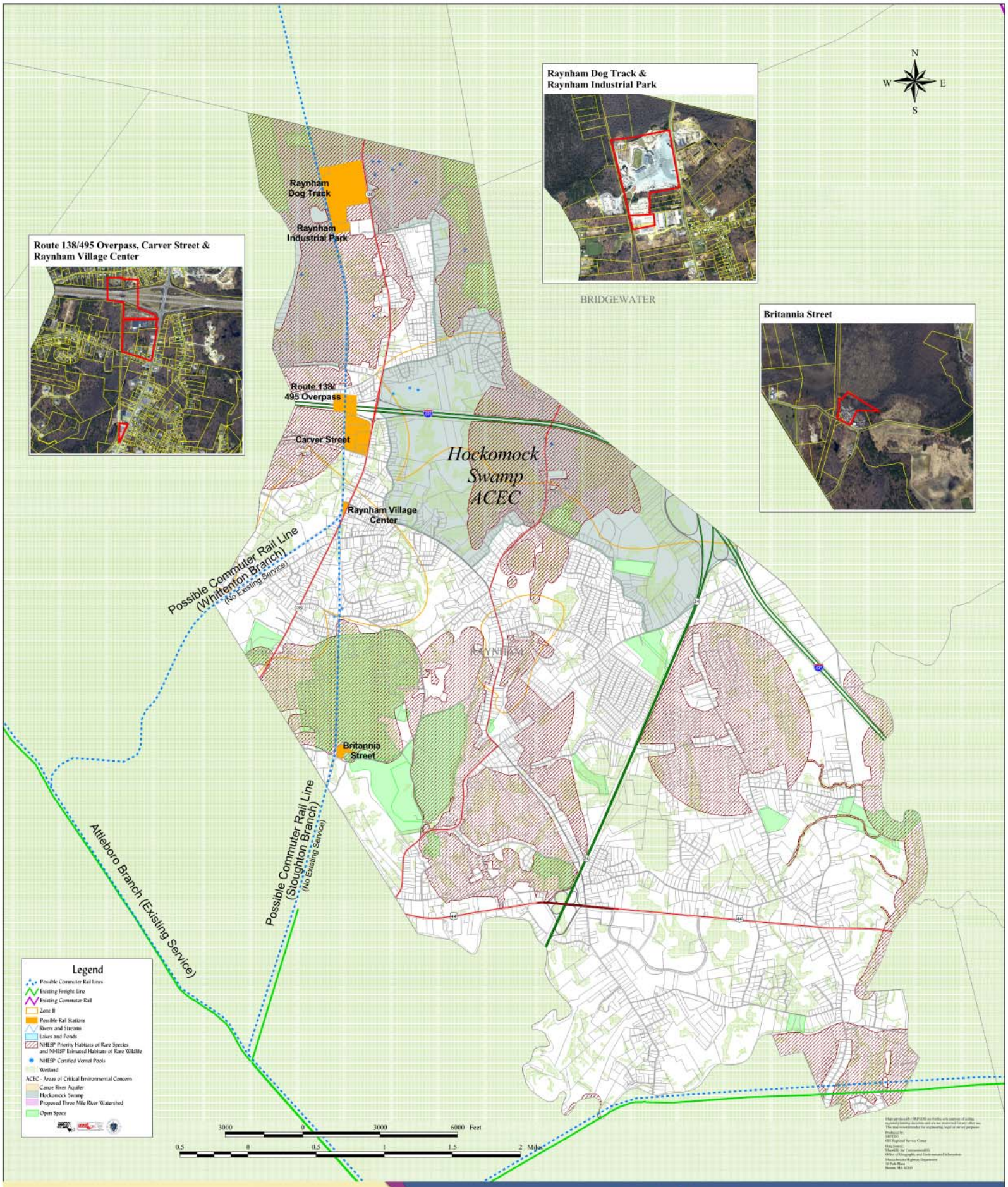

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

Town of Raynham
Possible Rail Station Sites
May 2008 DRAFT

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SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

City of Taunton
Possible Bus Station Sites
June 2008 DRAFT

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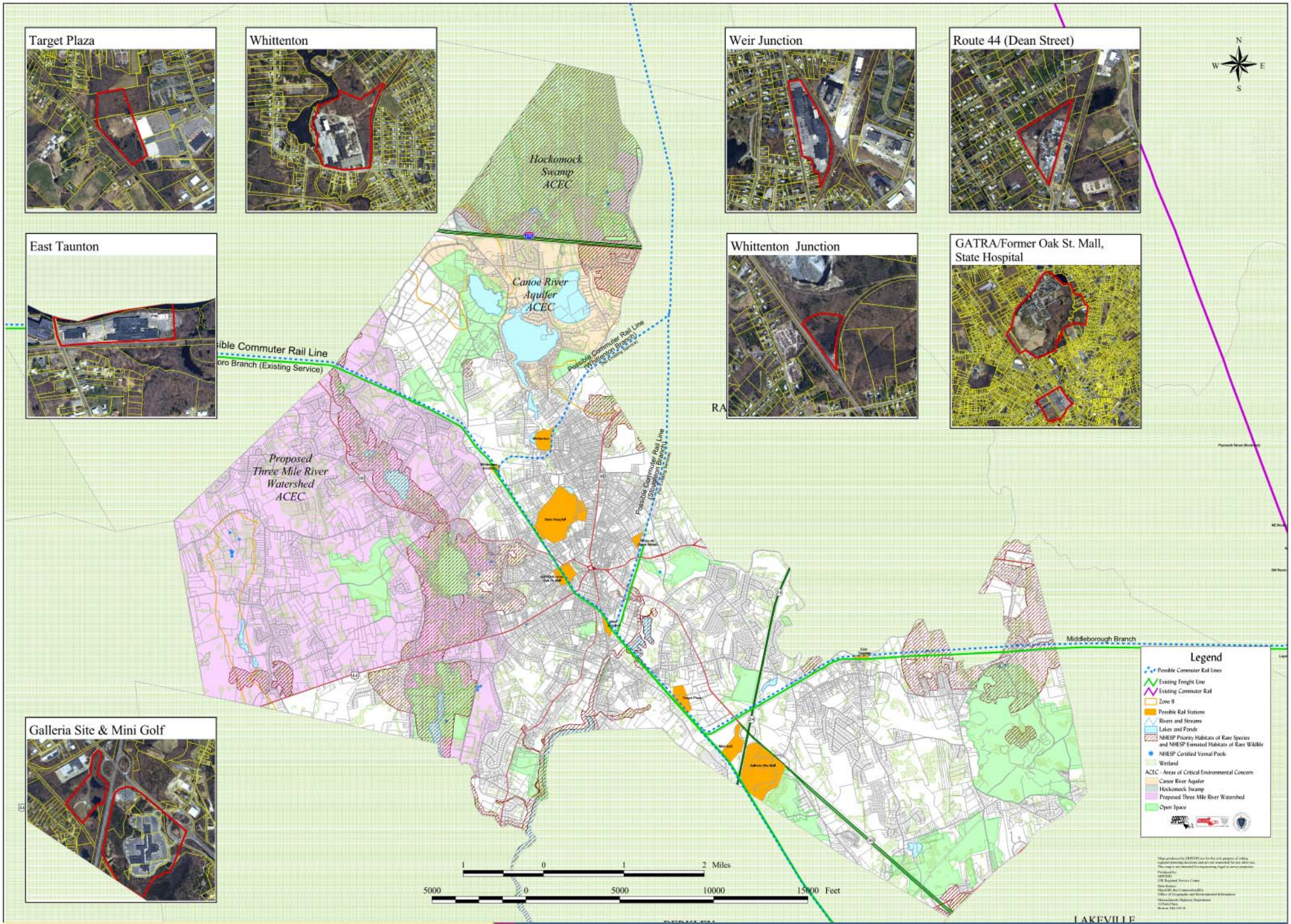

SOUTH COAST RAIL
Commuter Rail Corridor
Study Area

City of Taunton
Possible Rail Station Sites
May 2008 DRAFT

EOT
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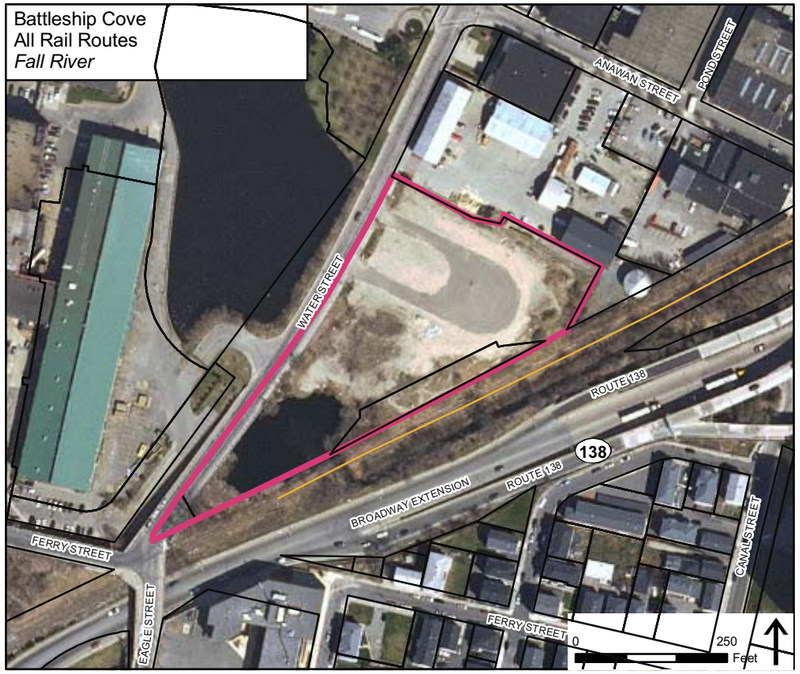
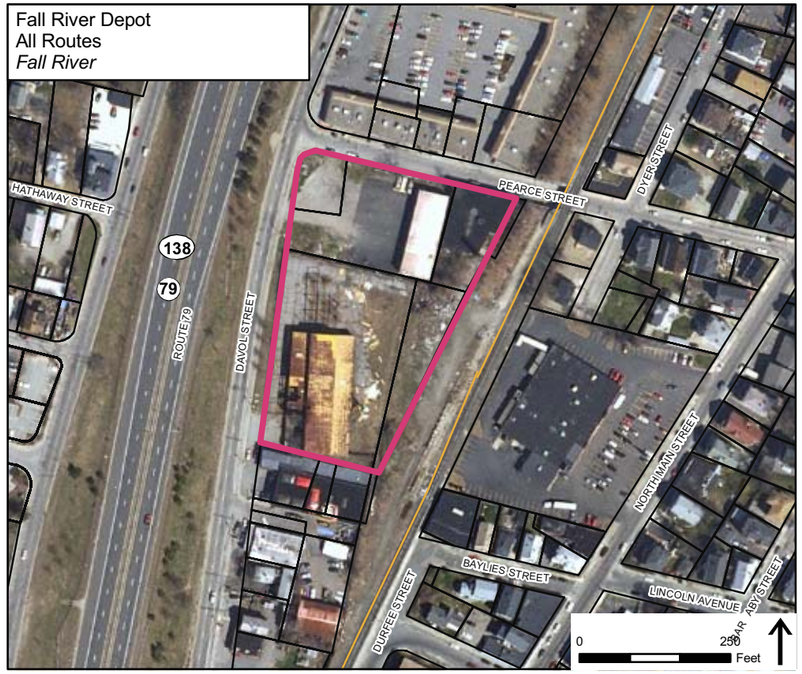
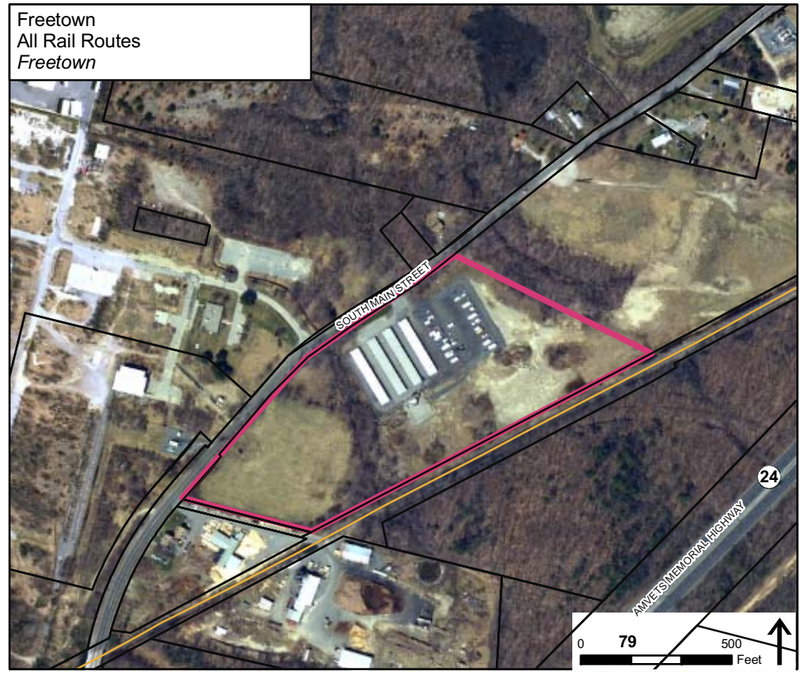
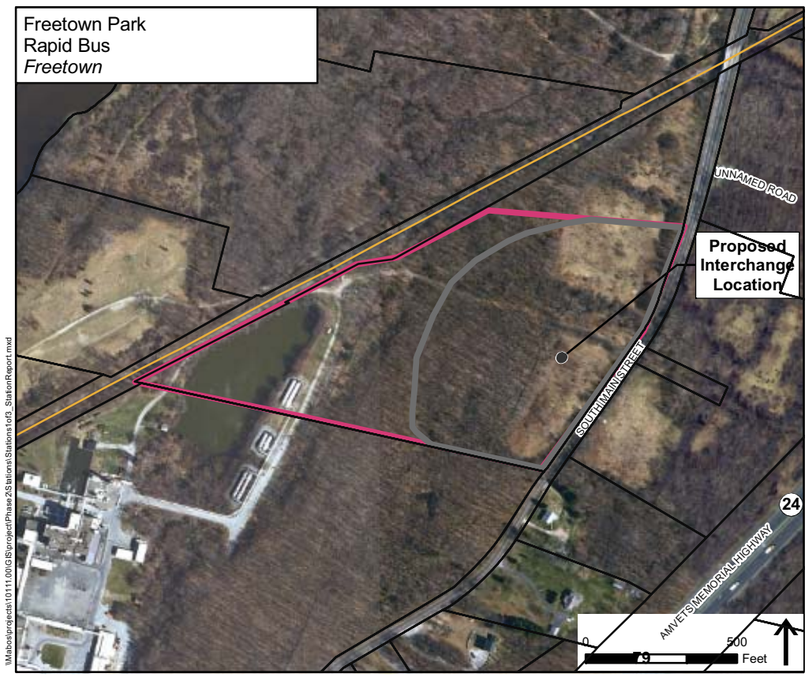
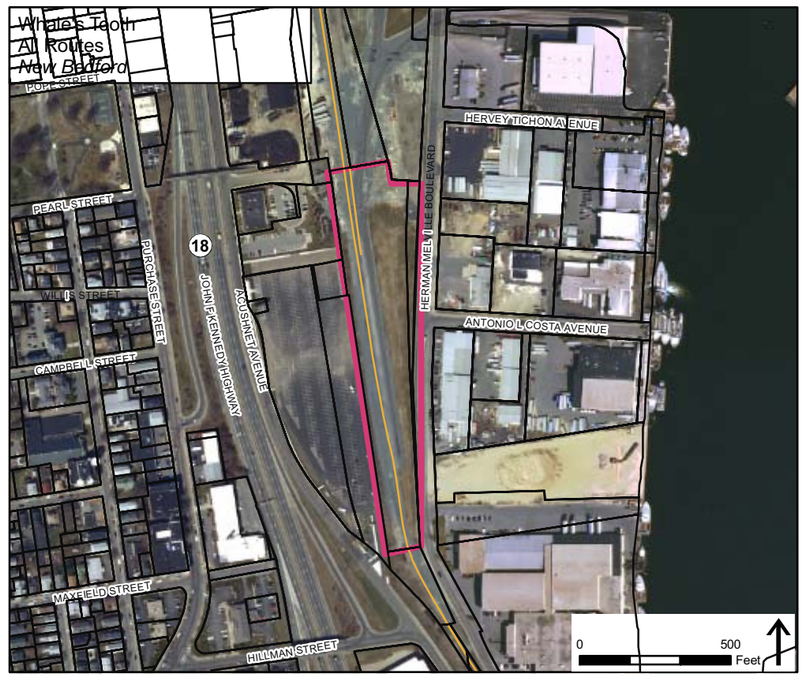
Attachment 5 - Recommended Station Site Photos











Legend

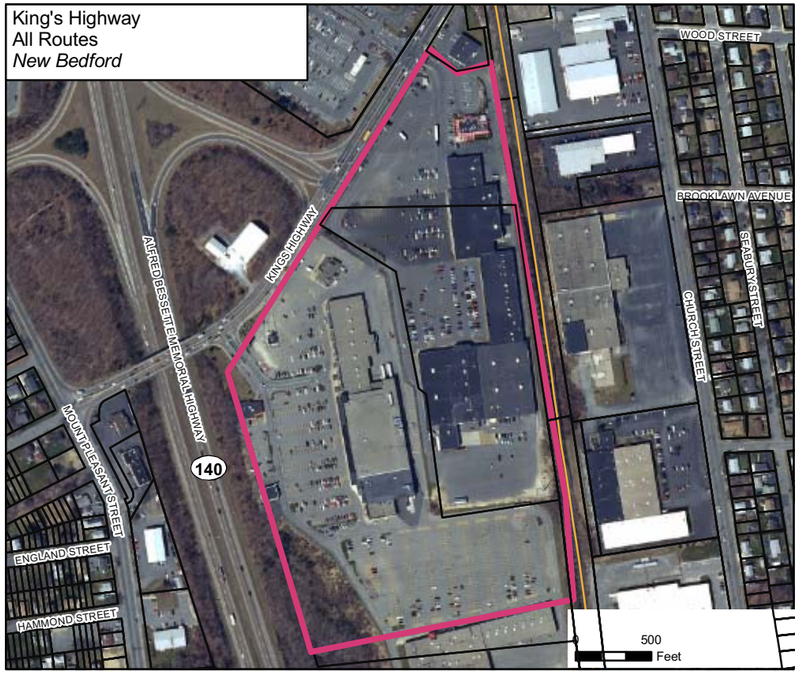
- Proposed Alternative
- Proposed Station Location
- Parcel Boundary

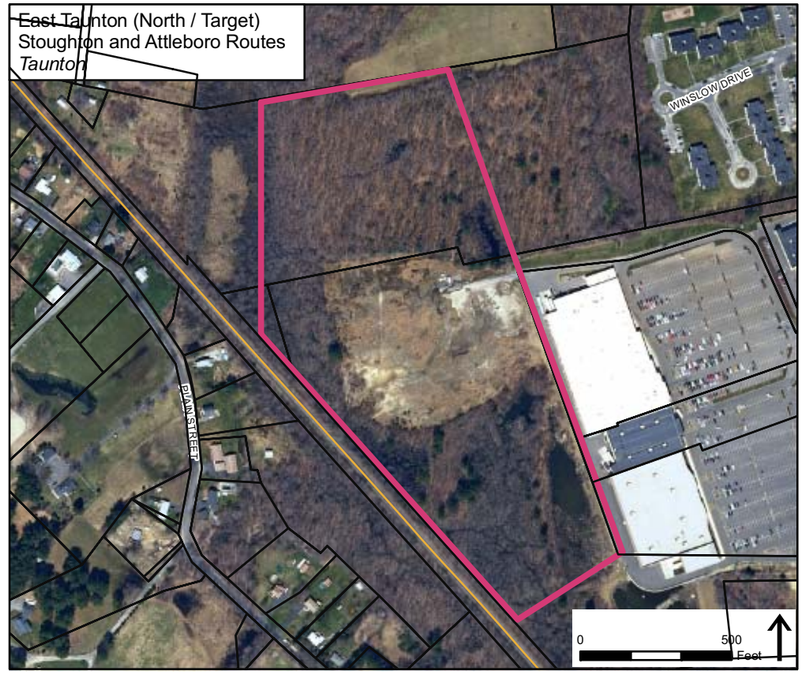
SOUTH COAST RAIL

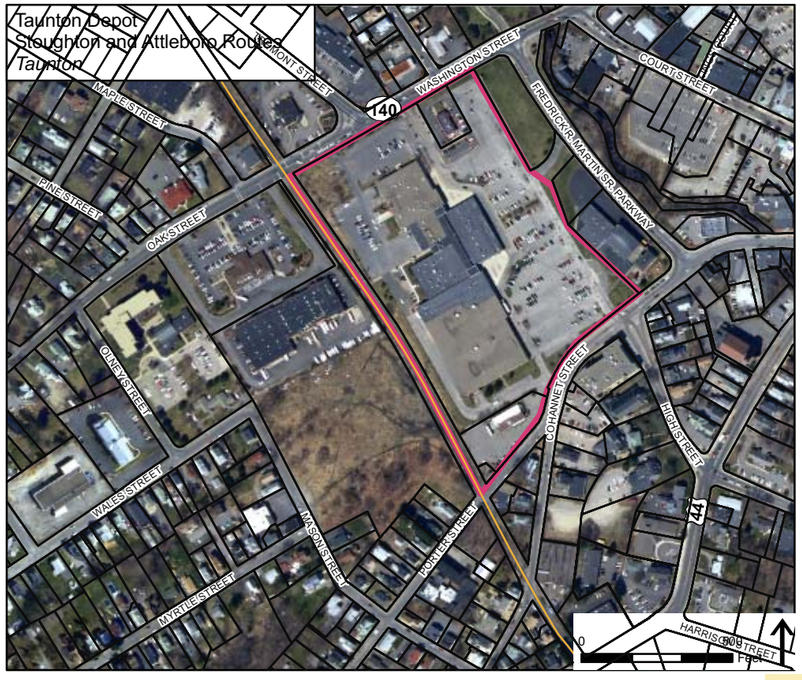
Proposed Station Locations

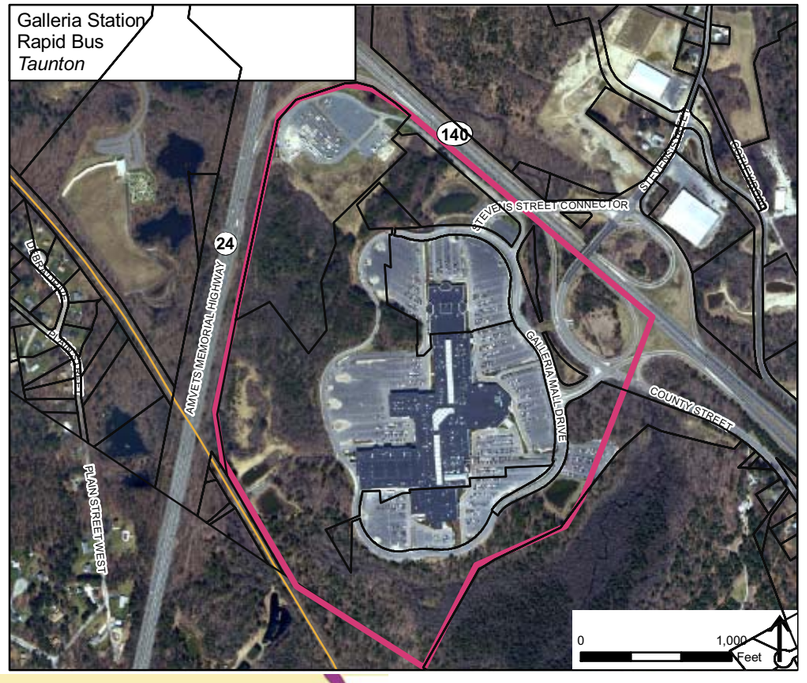
Fall River, Freetown and New Bedford

EOT









Legend

- Proposed Alternative
- Proposed Station Location
- Parcel Boundary

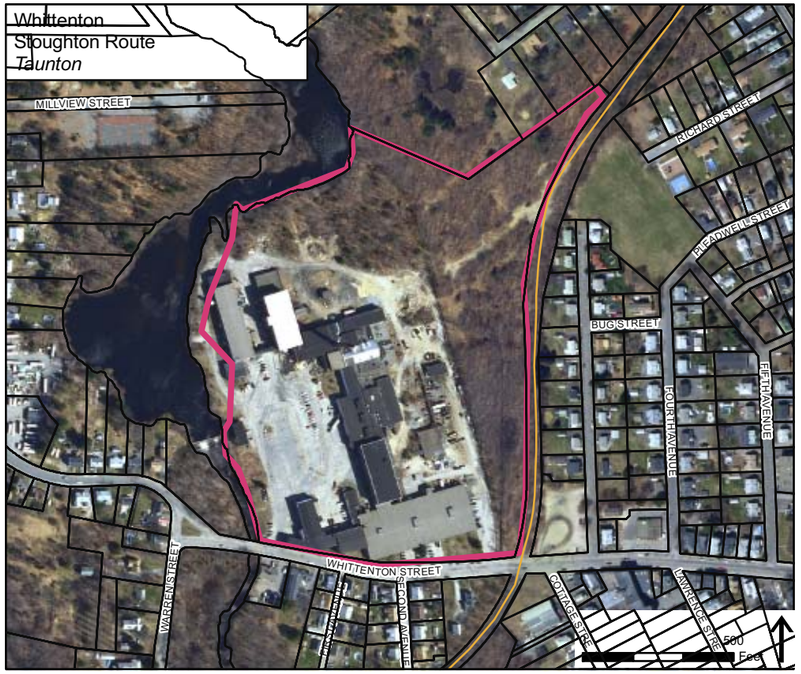
SOUTH COAST RAIL

Proposed Station Locations

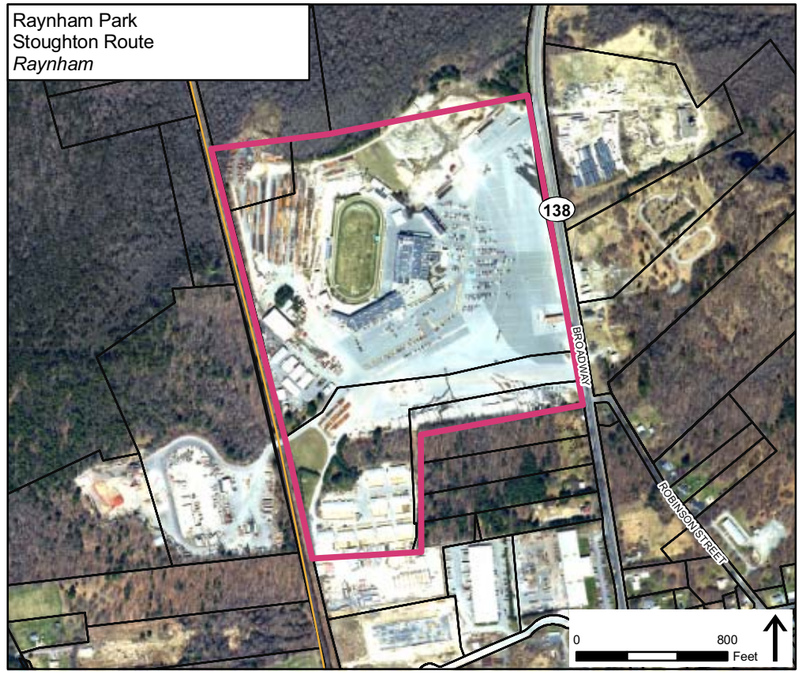
New Bedford and Taunton

EOT

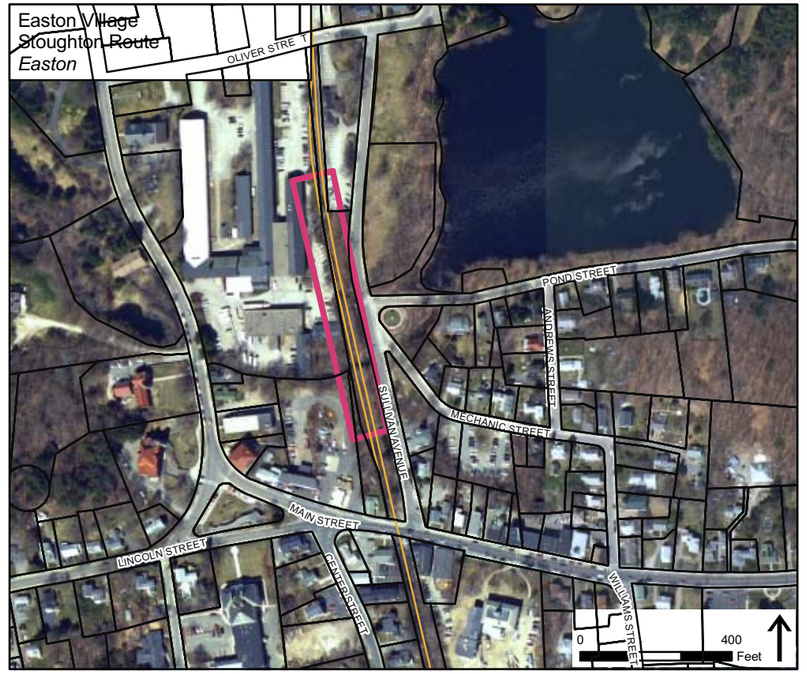
Whittenton
Stoughton Route
Taunton



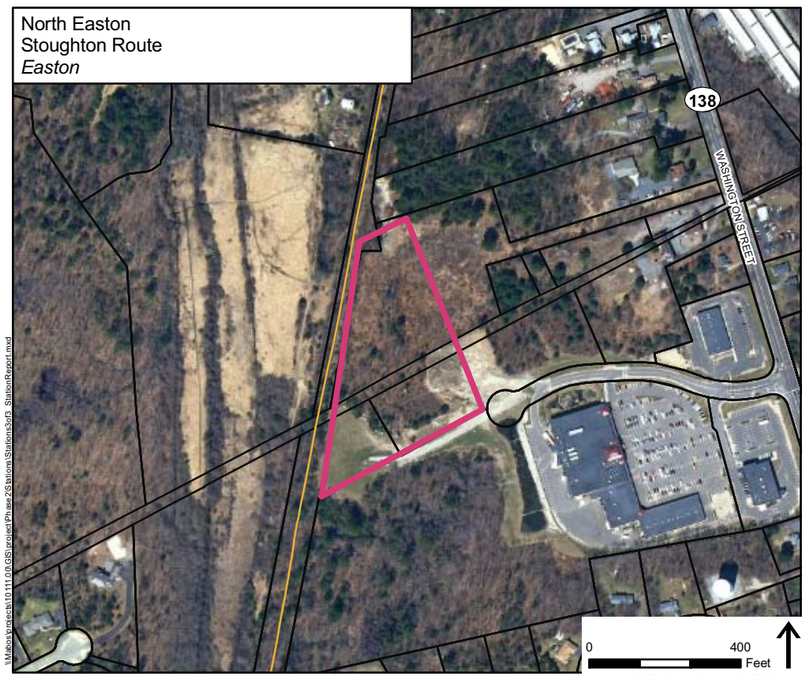
Raynham Park
Stoughton Route
Raynham



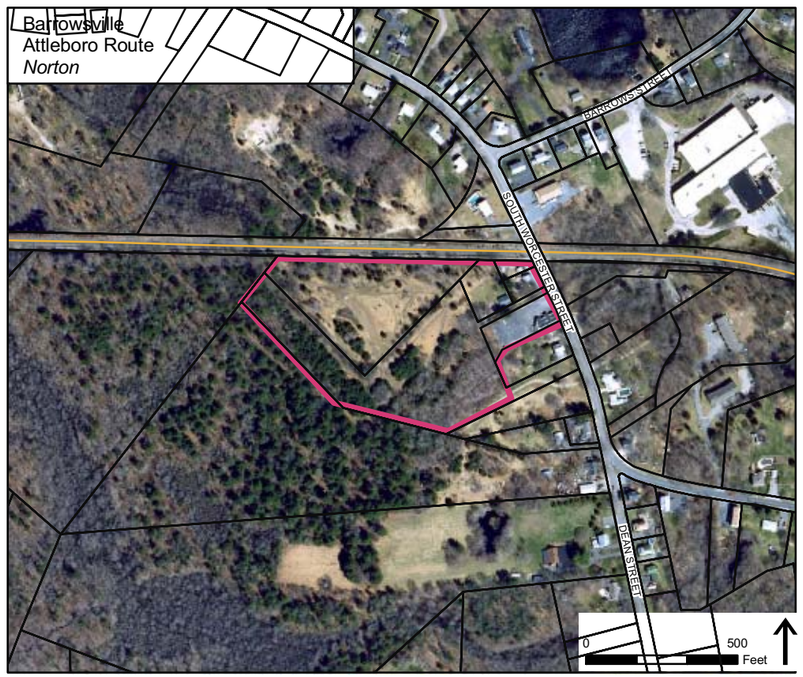
Easton Village
Stoughton Route
Easton



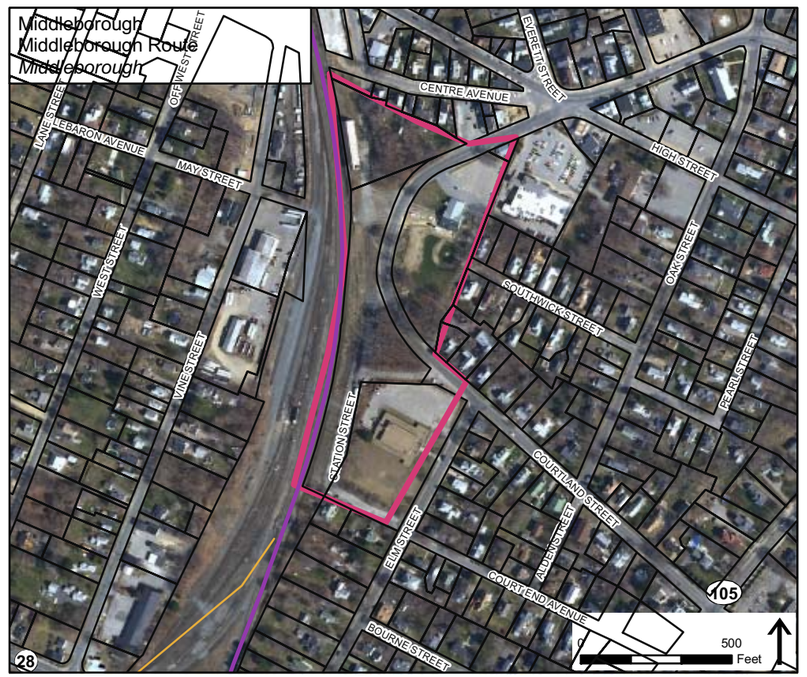
North Easton
Stoughton Route
Easton



Barrowsville
Attleboro Route
Norton



Middleborough
Middleborough Route
Middleborough



Legend

- Proposed Alternative
- Proposed Station Location
- Parcel Boundary

SOUTH COAST RAIL

Proposed Station Locations

Taunton, Raynham, Easton, Norton, and Middleborough

EOT

M:\docs\projects\101110\GIS\ProjectPhase2\Station\Station3of3_StationReport.mxd

Appendix 3.1-D

Technical Memorandum: Network Simulation Analysis of Proposed 2030 MBTA/Amtrak Operations (August 2009)

South Coast Rail Network Simulation Analysis	
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

Massachusetts Executive Office of Transportation
MBTA South Coast Rail Project

(MBTA/EOTPW Contract No X2PS68; SYSTRA Project C0574800)

Technical Memorandum

Network Simulation Analysis of Proposed 2030 MBTA/Amtrak Operations

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Massachusetts Executive Office of Transportation
MBTA SOUTH COAST RAIL PROJECT (MBTA/EOTPW Contract No X2PS68)

Draft Report

TABLE OF CONTENTS

0. Revision History 1

1. Executive Summary 2

1.1. Network Simulation Scenarios 3
- 1.1.1. Year 2030 No-Build Alternative 3
- 1.1.2. Year 2030 Attleboro SCR Build Alternative 3
- 1.1.3. Year 2030 Stoughton SCR Build Alternative 3

1.2. Assumptions Underlying Simulations 4
- 1.2.1. Operations 4
- 1.2.2. Infrastructure 5
- 1.2.3. Rolling Stock 5
- 1.2.4. Methodology 6
- 1.2.5. Simulation Results 6

2. Introduction 12

2.1. Project Schematic (Not To Scale) 14

3. 2008 Capacity Utilization Analysis 16

4. Assumptions 18

4.1. Track and Station Infrastructure 18
- 4.1.1. Study Limits 18
- 4.1.2. Simulation Model Infrastructure Changes for 2030 Under the “No-Build” Scenario 18
- 4.1.3. Simulation Model Infrastructure Changes for 2030 under the “Stoughton Build” Scenario 18
- 4.1.4. Simulation Model Infrastructure Changes for 2030 under the “Attleboro Build” Scenario 20
- 4.1.5. Assumed Civil Speeds for New Track 21

4.2. Signaling Infrastructure 21

4.3. Operations 22
- 4.3.1. Peak Periods 22
- 4.3.2. Stop Types 23
- 4.3.3. Amtrak Operations – All Scenarios (No-Build and Build Alternatives) 23
- 4.3.4. MBTA Operations 25
- 4.3.5. Combined MBTA and Amtrak Operating Plans 26
- 4.3.6. Equipment Manipulations at South Station 27

4.4. Rolling Stock 29
- 4.4.1. MBTA Rolling Stock 29
- 4.4.2. Amtrak Rolling Stock 29

5. Sources of Technical Data 31

6. Simulation Calibration 33

7. Simulation Randomization 34

8. Simulation Results 35

8.1. On Time Performance Results 35

8.2. Signal Delay Results 37

8.2.1. Signal Delay Totals 37
8.2.2. Signal Delay Location 39

8.3. Running Time Results 41

8.4. South Station Occupancy Charts 41

8.5. Sub-Alternative: The "Whittenton Variant" 51

9. Conclusions 52

10. Appendix 54

10.1. Simulated Train Consists 54

10.1.1. Amtrak Acela (Summary Screen Shot from RAILSIM) 54
10.1.2. Amtrak Regional (Summary Screen Shot from RAILSIM) 54
10.1.3. MBTA Diesel: F40 Pulling Eight Coaches (Summary Screen Shot from RAILSIM) 55
10.1.4. MBTA Electric: HHP-8 Pulling Eight Coaches (Summary Screen Shot from RAILSIM) 55

10.2. Locomotive Attributes 56

10.2.1. Amtrak Acela Power Car (RAILSIM Rolling Stock Library Detail) 56
10.2.2. Amtrak Regional Alstom HHP-8 (RAILSIM Rolling Stock Library Detail) 61
10.2.3. MBTA Diesel: F40 (RAILSIM Rolling Stock Library Detail) 67

10.3. Train Performance Calculator (TPC) Running Time Results 72

10.4. Operating Plans 73

10.4.1. Amtrak 2020 Projected Northeast Corridor "North End" Operating Plan 73
10.4.2. 2030 No-Build Operating Plan, NEC and Dorchester Branch 74
10.4.3. 2030 No-Build Operating Plan, Old Colony Line 91
10.4.4. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – NEC and Dorchester Branch 97
10.4.5. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Whittenton Variant 114
10.4.6. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Old Colony Line 115
10.4.7. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – NEC and Dorchester Branch 123
10.4.8. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – Old Colony Line 140
10.4.9. 2030 Attleboro Alternative Operating Plan, Diesel Option — NEC and Dorchester Branch 146
10.4.10. 2030 Attleboro Alternative Operating Plan, Diesel Option — Old Colony Line 166

0. Revision History

Revision	**Date**	**Comments**
1.0	August 11, 2009	Initial Release
1.1	August 28, 2009	Revision in accordance with Review Comments

1. Executive Summary

In order to assess the relative feasibilities of the two remaining corridors being considered for an extension of MBTA commuter rail service to the southern Massachusetts cities of New Bedford and Fall River - a project known as "South Coast Rail (SCR)" - network simulations of the projected operations were performed and are described in this report.

The two remaining SCR infrastructure corridors are as follows:

- The Attleboro Alternative – MBTA trains would use 29 miles of Amtrak's Northeast Corridor (NEC) from South Station to a new NEC interlocking, CP Norton, located just north of Attleboro Station, where they would connect via a new bypass track to the Attleboro Secondary, a freight rail corridor. They would then travel via this and other substantially or entirely rebuilt existing rail corridors to reach the southern terminals at New Bedford and Fall River.
- The Stoughton Alternative – MBTA trains would use 15 miles of the NEC from South Station to Canton Junction, where they would diverge onto the MBTA Stoughton Branch, an existing MBTA service. The route would continue on an extension of the Stoughton Branch, and then via substantially or entirely rebuilt existing rail corridors to reach the southern terminals.

Figures in Section 2.1 below depict the rail corridors in schematic fashion illustrating the track, interlocking, and station configuration of the project.

These two alternative routes join at Weir Junction, in Taunton, MA, 40 miles from South Station via the Attleboro route and 35½ miles from South Station via the Stoughton route. From Weir Junction the common route follows the New Bedford Main Line (a freight corridor) for five miles to Myricks Junction, where the route forks, with the easterly branch continuing 14½ miles along the New Bedford Main Line to the city of New Bedford, and the westerly branch continuing 12½ miles along the Fall River Secondary to the city of Fall River.

The Stoughton Alternative has an associated sub-alternative, the Whittenton Variant. It is identical to the Stoughton Alternative, except that it would diverge from the proposed Stoughton alignment two miles south of the proposed station at Raynham Place to connect with the southerly portion of the Attleboro Secondary via the existing Whittenton Branch corridor. It would then proceed via the Attleboro Secondary to join the New Bedford Main Line, south of which it would again be coincident with the Stoughton Alternative.

Both diesel and electric options are being considered for each of the two corridor alternatives and one sub-alternative. The two major alternatives, with options, were simulated, as was a No-Build condition. However, the No-Build condition was assumed not to be a candidate for electrification, and only its diesel option was simulated. Finally, the Whittenton Variant was not simulated, as its results can be expected to be substantially the same as that achieved by the Stoughton Alternative.

1.1. Network Simulation Scenarios

1.1.1. Year 2030 No-Build Alternative

A conceptual Year 2030 No-Build (i.e., South Coast Rail not implemented) operating plan combining projected MBTA and Amtrak operations was developed for use as a study baseline. It was based upon estimated 2030 service volumes provided by MBTA and Amtrak. This operating plan was applied to a comprehensive RAILSIM® Network Simulation model that contains current "as in place" rail infrastructure, plus all infrastructure upgrades anticipated to be in place as of the year 2030. All upgrades identified were in the vicinity of South Station, the most significant of which was the expansion of South Station from 13 platform tracks to 18 platform tracks.

1.1.2. Year 2030 Attleboro SCR Build Alternative

To create the conceptual 2030 Attleboro SCR Build Alternative, trains were added to the 2030 No-Build operating plan to provide the desired level of SCR service. Critically, as there is no MBTA service today which is a candidate for extension to the SCR terminals via the Attleboro Alternative route, all of the trains providing SCR service were of necessity **new** trains, requiring new operating slots on 29 miles of the busy NEC. In order to compensate for the significant increase in NEC traffic, infrastructure upgrades were designed and implemented in the simulation model, including:

- New NEC third track from the junction of the Attleboro Bypass (CP Norton) to the point where existing third track begins at Readville Station, a distance of 20 miles; and

- Substantial reconfiguration of Mansfield, Junction, and Transfer Interlockings on the NEC.

In addition, conceptual designs of the Attleboro Alternative rail infrastructure between the NEC and the SCR terminals were prepared and implemented in the simulation model. Finally, the operating plan was applied to the completed simulation model and network simulations were performed.

1.1.3. Year 2030 Stoughton SCR Build Alternative

To create the conceptual 2030 Stoughton SCR Build Alternative, trains were added to the 2030 No-Build operating plan to provide the same level of SCR service as described immediately above. However, under this alternative, since it uses an existing MBTA branch - unlike the Attleboro SCR Build Alternative - existing MBTA Stoughton Branch trains could be extended or shifted and extended to the new SCR terminals to provide the required level of SCR service.

In fact, no infrastructure upgrades to the NEC were required by SCR under this alternative. Again, conceptual designs of the Stoughton Build Alternative rail infrastructure between Junction Interlocking on the NEC and the SCR terminals were prepared and implemented in the simulation model. Finally, the operating plan was applied to the completed simulation model and network simulations were performed.

1.2. Assumptions Underlying Simulations

1.2.1. Operations

1.2.1.1. MBTA

Peak-period trains are defined as peak-direction trains whose South Station arrival times fall between 7:00 AM and 9:00 AM or whose South Station departure times fall between 4:00 PM and 6:30 PM. The peak direction is northbound in the morning and southbound in the evening.

As directed by the MBTA, the assumption for growth used in the design of 2030 No-Build operations was that MBTA train volumes would increase over April 2008 volumes by one peak-direction train per existing MBTA branch in each of the two daily peak periods, so long as the additions could be accommodated without requiring new infrastructure. Early in the study it was determined that the Old Colony Main Line is currently near capacity, so the assumption for the MBTA Old Colony Greenbush, Plymouth, and Middleborough Branches was that no new trains would be added for these services for 2030. (However, with the addition of five long platform tracks and the lengthening of existing platform tracks 11-13 proposed for South Station in 2030, it will be possible to run longer consists on the Old Colony Line. This will increase Old Colony Line passenger capacity by as much as 30%, even without an increase in the number of trains.) The net assumed increase in trains for the 2030 No-Build scenario was therefore one train each for the remaining MBTA branches - Worcester, Needham, Franklin, Providence (NEC), Stoughton, and Dorchester - six new peak-direction trains in each peak period, for a total of 12 new trains.

At MBTA's direction, MBTA station dwells for peak-period peak-direction trains were set at 120 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations, and 60 seconds at all other station stops. Non-peak period and reverse-peak trains were assigned dwells of 45 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations and dwells of 30 seconds at all other station stops.

1.2.1.2. Amtrak

The Amtrak 2030 operating plan for simulation was assumed to be the proposed 2020 "North End" (New York – Boston) Amtrak operating plan developed by Amtrak in 2003 for application to the MTA/LIRR East Side Access Project and the Metro-North/ConnDOT New Haven Line Traction Power Study.

It was assumed that all Amtrak station dwells would be 120 seconds in length.

1.2.1.3. South Coast Rail

The proposed South Coast Rail morning peak-period service plan mandates three inbound trains from New Bedford and three from Fall River, with one additional inbound train from each southern terminal falling just outside the peak period. One reverse-peak train would run outbound to each of the southerly terminals during the morning peak period. The evening peak period service would mirror the morning peak service in terms of volume, end terminals, and reverse-peak service level.

Off-peak SCR service would consist of one train in each direction between South Station and each of the two southerly terminals approximately every two hours.

Complete operating plans for all revenue trains for the three scenarios may be found in the Appendix to this document.

1.2.2. Infrastructure

The existing infrastructure for both the NEC and the MBTA trackage is a matter of record. Grades, civil speeds, track lengths and configuration, stations, and signal system attributes and functioning were taken from existing documents and implemented in the comprehensive simulation model. Track and signal designs were prepared for the new and upgraded track required for South Coast Rail and also implemented in the model.

A complete listing of the sources of the data underlying the simulation model may be found in this document under Section 5 of this report, "Sources of Technical Data."

1.2.3. Rolling Stock

A detailed list of the attributes of the specific MBTA and Amtrak rail equipment referenced immediately below may be found in the Appendix to this document. Each train was assumed to carry a passenger load equivalent to its seated capacity, regardless of time of day.

1.2.3.1. MBTA

Diesel Consists

The assumption for MBTA diesel motive power was that which is in use today—a 3,000 horsepower F40PH or F40PH-2C locomotive. It was assumed to be pulling eight bi-level Kawasaki coaches, except in the case of the Framingham/Worcester Branch, whose trains were assigned seven bi-level Kawasaki coaches. This is because this particular service was assigned exclusive use of South Station tracks 1 and 2, which are now and will remain in 2030 capable of berthing only eight total vehicles. This diesel power assumption is very conservative, and assumes that the MBTA will not procure any new diesel locomotives prior to the year 2030 planning horizon of this project.

Electric Consists

The assumption for MBTA electric motive power was the 8,046 horsepower Amtrak HHP-8 locomotive, with coach counts equal to those of the diesel option.

A key assumption in electric scenarios was that under electrification in the Attleboro Alternative, *only* the MBTA trains providing South Coast Rail service were electrified; all other MBTA trains remain diesel-powered. The same assumption applied to the Stoughton Alternative, except that all Stoughton service, even those trains short-turning at Stoughton, was assumed to use electric motive power. Under the No-Build Scenario, only diesel motive power was simulated.

1.2.3.2. Amtrak

Year 2030 Amtrak train consists are assumed to be substantially similar to the two primary consists being used by Amtrak in the subject territory today. They are both capable of utilizing the dual-frequency signal necessary for operation of the nine-aspect cab signal system in use on the NEC, including the so-called "Super Clear" aspect, which allows operation at very high speeds.

The first of these consists is the Acela Express, which operates through this territory at up to 150 MPH, making it the fastest passenger train in North America. The Acela Express consist is comprised of the following:

- 2-Acela Power Cars (12.5 kV)
- 1 Acela End Coach Car
- 3 Acela Coaches
- 1 Acela Bistro Car
- 1 Acela First Class Car

The second Amtrak consist in common use through the subject territory is the Amtrak Regional, a longer, less highly-powered train than the Acela (but still higher-performance than the diesel-powered MBTA trains). For the purposes of Year 2030 operation, it was assumed to be comprised of:

- 1 Amtrak HHP-8 Locomotive
- 1 Amfleet Amcafe
- 8 Amfleet II Corridor Coaches

1.2.4. Methodology

With the operations, infrastructure, and rolling stock accurately implemented in the RAILSIM simulation model, it was possible to simulate the whole as a network. In network simulation, the scheduled trains operate over virtual track, responding to the track alignment and civil speeds in accordance with the performance attributes of the rolling stock, carrying out the required station stops and station dwells in accordance with the prescribed operating plan, and responding to commands given by the signal system which in turn is responding to the presence of all trains concurrently on the track. In short, the simulation parallels actual railroad operations to a very high degree.

The operator of the simulation performs work very similar to that of an actual train dispatcher. Over a period of time, by setting train priorities at interlockings and making route revisions to individual trains as required, the operator is able, in a successful simulation, to develop an operation which is smooth and keeps delay to individual trains very low.

1.2.5. Simulation Results

Simulations were performed under both deterministic (unperturbed) and randomized (perturbed) conditions. Under deterministic simulation, all trains initially enter service on time and station and terminal dwell times are fixed. Under randomized simulation, terminal departure and intermediate station dwells are statistically randomized to reflect real-world variations in day-to-day operations.

The randomized simulation stresses the system in a realistic manner (using randomization profiles approved by the MBTA), and its response to this stress is measured quantitatively and qualitatively.

Two types of conventional quantitative analyses were undertaken using the network simulation model, measurements of simulated on time performance and signal delay.

On time performance (OTP) measures the degree to which trains arrive or leave late, on time or early relative to the intended schedule. On time performance is a concrete measure of service quality observable by the public. The MBTA threshold for on time performance is to arrive within 04'59"; otherwise the train is considered to be late.

Ideally, a planned operation will deliver all trains to their terminals not only within a given agency's definition of "on time," but with no lateness at all. However, in operations as intense as those simulated here, this is not a reasonable goal; hence the adoption of the 4'59" threshold. On the other hand, a network simulation that is unable, under deterministic conditions, to deliver all of its trains to their terminals within the agency's on time standard is symptomatic of a defective operation.

Signal delay is a measure of the time during which a train is forced to operate under signal indications less favorable than the best possible indication. Cumulative signal delay (across the entire simulation) measures traffic congestion independently of scheduled arrival and departure times. Comparing cumulative signal delay statistics under deterministic conditions and then under randomized conditions for the same infrastructure and operating plan provides insight into whether or not the network as designed is capable of absorbing the normal day-to-day variations in train performance and minor random delays. In addition, aggregate signal delay may be used to compare relative levels of traffic congestion across different infrastructure configurations or under different operating plans, providing a relative measure of schedule recoverability between alternatives.

1.2.5.1. On Time Performance

A summary of the simulated on-time performance of weekday revenue trains (excluding the trains in the Old Colony Line service) is shown for the arrivals at South Station (Table 1 below) and arrivals at the southern terminals (Table 2 below) respectively. The tables detail the percentage of trains whose arrival times are within the MBTA on time standard.

Under deterministic conditions, the No-Build and Stoughton Diesel and Electric Alternatives were all able to meet the MBTA on-time standard, i.e., 100% of the weekday trains arrived at South Station no more than 04'59" late. Trains arriving at the southern terminals attained the standard over 90% of the time. Much of that lateness was apparently due to insufficient running time allowed the southbound MBTA Providence (800 Series) trains, which are allowed less running time by MBTA schedules than are the northbound Providence trains.

OTP for South Station arrivals under randomization for the No-Build and Stoughton Diesel and Electric Alternatives also largely met the MBTA lateness standard, with the peak-period peak-direction trains achieving 100% conformance and no less than 95.9% of all weekday trains achieving the standard. Not surprisingly, the No-Build was slightly better than the Stoughton Electric, which in turn was slightly better than the Stoughton Diesel. The solid results for all No-Build and Stoughton

Alternative simulations indicate the ability of any of these scenarios to resist and recover from operating anomalies.

By contrast, the Attleboro Alternative experienced exceptionally poor OTP, caused by operational congestion in the Tower 1 terminal interlocking throat. In fact, the RAILSIM Network Simulator, which is a very robust, capable, and well-tested simulation tool, was unable to complete the simulation and spontaneously failed around 5:30 PM. This is in itself a striking result, and one which points to a fatal flaw in the Attleboro Alternative operating plan.

OTP is not reported for the Attleboro Alternative for "PM Peak-Period Trains" or for "All Weekday Trains" because the simulation was unable to generate those results; the missing results are indicated by the grayed-out areas of the tables. However, results are available for the Attleboro AM Peak-Period trains, as the AM Peak Period is the less intense of the two daily peak periods. These results fall well below the 100% target, with none better than 69.4% and no randomized result better than 50%. While not as striking as the outright failure of the evening simulation, these results still indicate a fatally-flawed operation.

Table 1: On-Time Performance - Revenue Train Arrivals at South Station*

ALTERNATIVE	AM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	100.0%	100.0%	100.0%	98.6%
Stoughton Diesel	100.0%	100.0%	100.0%	95.9%
Stoughton Electric	100.0%	100.0%	100.0%	97.9%
Attleboro Diesel	61.1%	44.4%`		
Attleboro Electric	69.4%	50.0%		

*** These results do not include Old Colony Line trains.**

Table 2: On-Time Performance - Revenue Train Arrivals at Southerly Terminals*

Alternative	PM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	94.9%	87.2%	97.1%	91.4%
Stoughton Diesel	93.0%	75.0%	93.3%	85.0%
Stoughton Electric	92.5%	80.0%	95.0%	87.1%
Attleboro Diesel				
Attleboro Electric				

*** These results do not include Old Colony Line trains.**

1.2.5.2. Signal Delay

Table 3, Table 4, and Table 5 tabulate cumulative signal delay for revenue trains operated, excluding Old Colony Line service. Again, as the Attleboro Alternative simulations were unable to continue past the 5 PM to 6 PM hour, Attleboro Alternative results are limited to the AM Peak-Period trains and missing Attleboro results are grayed-out in the tables.

"Total Trains" in Table 3 and Table 4 refers to all those trains whose scheduled times at South Station make them AM or PM Peak-Period trains, respectively. In Table 5, "Total Trains" refers to all scheduled weekday trains. Total signal delay is the sum of all the signal delay experienced by the individual trains under the defined scenario. The "Avg./Train" is the total signal delay divided by the Total Trains.

As can be seen, although the increase in Total Trains is small between the No-Build and Stoughton Alternatives, there is a substantial increase in signal delay under the Stoughton Alternative. This is due to two factors. The first is that to create the Stoughton Alternative operating plan, two early-morning and two late-evening Stoughton Branch trains (which run on a nearly-empty railroad) were removed and replaced with SCR trains which run at a busier and more congested time of day. The second is that although there is no increase in the overall number of Stoughton Branch trains between the No-Build and Stoughton Alternative, under SCR the Stoughton Branch trains have a much longer route with significant amounts of delay-causing single-track railroad.

Signal delay under the Attleboro Alternative more than doubles with respect to the Stoughton Alternative in all measures.

Table 3: Cumulative Signal Delay
AM Peak-Period Peak-Direction Revenue Trains Only*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	30	0:59:47	0:02:00	1:11:53	0:02:24
Stoughton Diesel	31	1:48:52	0:03:31	1:38:36	0:03:11
Stoughton Electric	31	1:52:10	0:03:37	1:42:39	0:03:19
Attleboro Diesel	36	4:46:19	0:07:57	6:01:42	0:10:03
Attleboro Electric	36	4:56:27	0:08:14	6:06:24	0:10:11

*** These results do not include Old Colony Line trains.**

Table 4: Cumulative Signal Delay
PM Peak-Period Peak-Direction Revenue Trains Only*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	41	2:08:37	0:03:08	2:24:33	0:03:32
Stoughton Diesel	42	2:29:22	0:03:33	2:51:37	0:04:05
Stoughton Electric	42	2:29:28	0:03:34	2:55:18	0:04:10
Attleboro Diesel	48				
Attleboro Electric	48				

*** These results do not include Old Colony Line trains.**

Table 5: Cumulative Signal Delay
All Weekday Revenue Trains*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	284	8:57:22	0:01:54	9:51:49	0:02:05
Stoughton Diesel	284	13:55:01	0:02:56	14:33:01	0:03:04
Stoughton Electric	284	13:16:34	0:02:48	13:55:45	0:02:57
Attleboro Diesel	322				
Attleboro Electric	322				

*** These results do not include Old Colony Line trains.**

1.2.5.3. South Coast Rail Running Times under Network Simulation

Simulated running times under deterministic Network Simulation for South Coast Rail trains are shown in Table 6. These are the end-to-end times for peak-period, peak-direction trains (provided only for the morning for the Attleboro Alternative). It is clear that these running times are longer than the unimpeded Train Performance Calculator (TPC) train simulations which were reported in 2008 (and reported again in the appendix to this document). These results reflect longer dwells than those assumed for the TPC runs and delays under Network Simulation en route due both to congestion on the NEC and also due to single-track constraints on new SCR infrastructure. It is likely that continued refinement of the SCR operating plan to better "tune" its performance to the single-track constraints will lower these running times.

The 2-4 minute difference in TPC running times between the Whales Tooth route and the Fall River route has been somewhat attenuated under network simulation.

Although the Whittenton Variant did not undergo Network Simulation, the TPC running times results indicate that the Whittenton Variant would add several minutes to the Stoughton Alternative running times.

Table 6: Average SCR Simulated Running Times
Peak-Period Peak-Direction Trains
Deterministic Simulation

ALTERNATIVE	AM Peak Period Trains		PM Peak Period Trains	
	Whales Tooth to South Station	Fall River to South Station	South Station to Whales Tooth	South Station to Fall River
Stoughton Diesel	1:32:42	1:32:21	1:40:33	1:32:04
Stoughton Electric	1:23:37	1:23:43	1:29:16	1:26:30
Attleboro Diesel	1:38:45	1:38:48		
Attleboro Electric	1:36:59	1:35:56		

1.2.5.4. Conclusions

The detailed analysis of MBTA no-build conditions and projected SCR rail operations in the year 2030, under a variety of infrastructure and operating conditions, has led to the following conclusions:

1. The 2030 No-Build scenario is operationally feasible.

2. The 2030 Stoughton Build and Stoughton/Whittenton Build scenarios are operationally feasible. Adjustments to their operating plans during final design would further improve performance.

3. The Attleboro Build Alternative is operationally infeasible based upon its failure to achieve the MBTA on time standard in the morning peak, even under the most favorable deterministic simulation conditions, and upon the outright failure of the simulation in the evening peak due to overwhelming congestion in the Tower 1 terminal interlocking throat.

4. Terminal throat and terminal approach capacities were thoroughly evaluated in the simulation effort, with all revenue and non-revenue movements represented. It is clear from many iterative simulation variations in this area that as train volumes grow, access to and from the South Station platforms through the terminal interlocking throat becomes more difficult. Congestion in the terminal throat and back-ups south of the terminal contribute to late arrivals. Those late arrivals, in turn, prevent the expeditious clearing or filling of platform tracks. The lateness then cascades until train volumes begin to shrink after the peak periods. The Stoughton simulation, with its lower net additional train volume, was able to work through these challenges and adjust successfully. However, during the PM peak, the Attleboro Alternative simulation reached a point at which the terminal interlocking was overwhelmed and the simulation aborted, in spite of a lengthy and concerted effort to find an operational solution. This very clearly indicates that the Attleboro Alternative is infeasible due to the constraints in the immediate area about South Station, the terminal throat, and its approaches. In particular, the location of the storage facility south of the terminal interlocking throat (between the terminal itself and the terminal throat interlocking) places an insurmountable operational burden on peak period operations, as revenue trains compete for limited capacity and terminal track space with non-revenue equipment trains moving between the terminal and the yard.

2. Introduction

The South Coast Rail (SCR) project being considered by the Massachusetts Executive Office of Transportation (EOT) and the Massachusetts Bay Transportation Authority (MBTA) would extend MBTA commuter rail service south from South Station in Boston to two new endpoints—New Bedford and Fall River, MA. Each alternative would make use of the Amtrak Northeast Corridor (NEC) and a combination of three or more of the following freight corridors: an extension of the MBTA Stoughton Line, the Attleboro Secondary, the Whittenton Branch, the New Bedford Main Line, and the Fall River Secondary.

There are two primary alternative routes under consideration for the new service:

1. Attleboro Alternative—Under this alternative, MBTA trains would use 29 miles of Amtrak's Northeast Corridor (NEC) from South Station to a new NEC interlocking, CP Norton, located just north of Attleboro Station, where they would connect via a new bypass track to the Attleboro Secondary, a freight rail corridor. They would then travel via this and other substantially or entirely rebuilt existing rail corridors to reach the southern terminals at New Bedford and Fall River. Both diesel and electric train operating scenarios are being considered.
2. Stoughton Alternative—Under this alternative, MBTA trains would use 15 miles of the NEC from South Station to Canton Junction, where they would diverge onto the MBTA Stoughton Branch, an existing MBTA service. The route would continue on an extension of the Stoughton Branch, and then via substantially or entirely rebuilt existing rail corridors to reach the southern terminals. Both diesel and electric train operating scenarios are being considered.
    - Whittenton Variant—this variant to the Stoughton Alternative would be identical to the Stoughton Alternative, except that it would diverge from the Stoughton alignment two miles south of the proposed station at Raynham Place to connect with the southerly portion of the Attleboro Secondary, and would then proceed via the Attleboro secondary to join the New Bedford Main Line and then via the New Bedford Main Line and the Fall River Secondary to the southerly terminals. Again, diesel and electric train sub-alternatives operating scenarios are being considered.

Of the two primary alternatives under consideration, the Attleboro Alternative will have the greater impact on the busy NEC for two primary reasons:

- The Attleboro Alternative uses a longer segment of the NEC corridor (29 miles for the Attleboro Alternative compared to 15 miles for the Stoughton Alternative and Whittenton Variant);

- All of the New Bedford/Fall River trains under the Attleboro Alternative would be **new** trains, not extensions of existing trains as under the Stoughton Alternative and Whittenton Variant. By contrast, under the Stoughton Alternative and Whittenton Variant, there would be no net increase of trains in the Stoughton service over the train volume projected for the target year of 2030 without SCR (the No-Build Stoughton service). However, the Stoughton Alternative

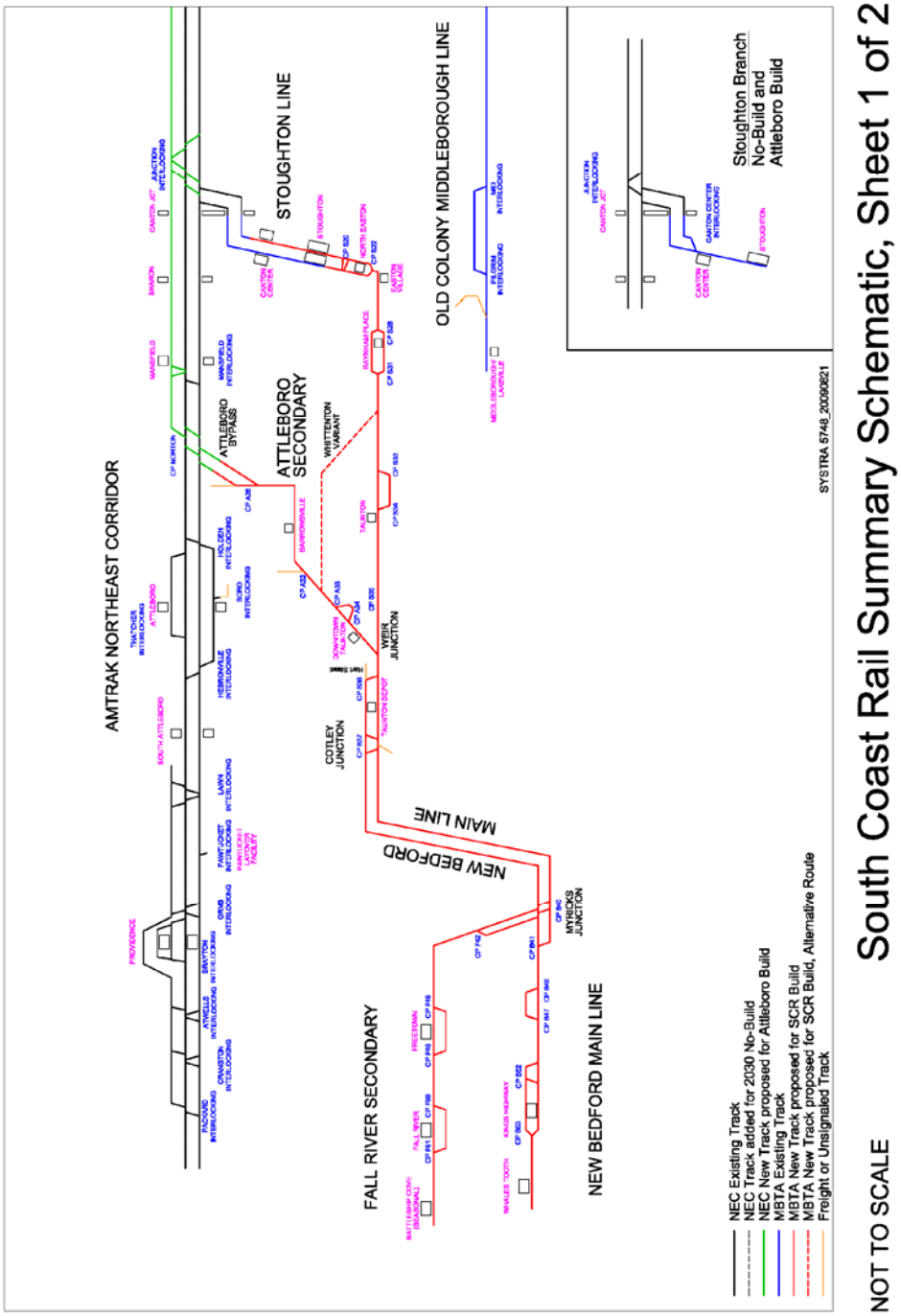
operating plan does shift some of the earliest and latest No-Build Stoughton trains closer to the peak periods.

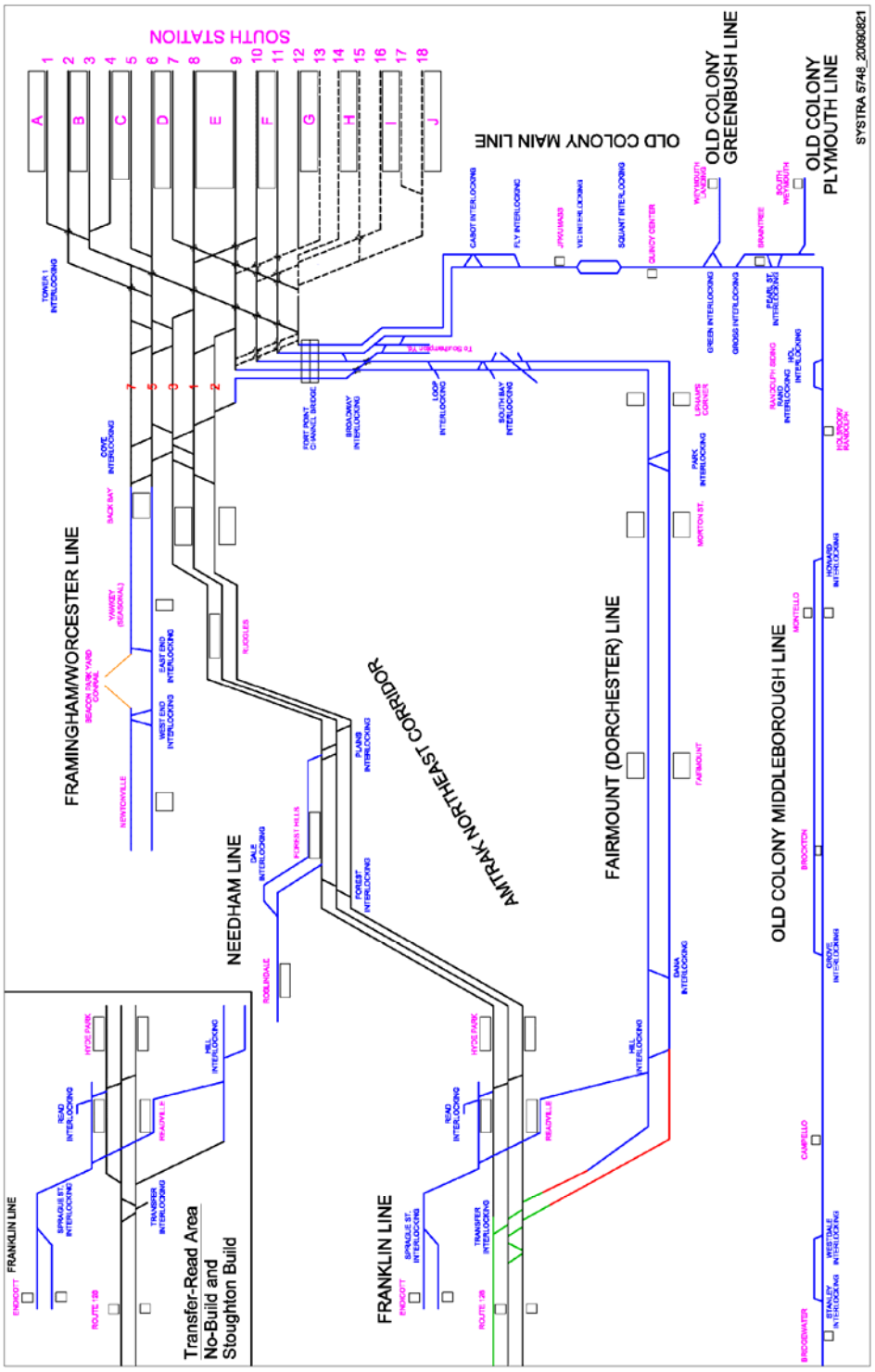
The purpose of the present study is to determine, via network simulations, the operational feasibilities of the two major alternatives, and to compare their operational stability with that which would occur under a "No-Build" scenario. The No-Build scenario reflects infrastructure and MBTA/Amtrak operations predicted for the year 2030 in the absence of SCR.

This simulation effort uses SYSTRA's RAILSIM Simulation Software Suite.

The figures in Section 2.1 below depict the rail corridors in schematic fashion illustrating the track, interlocking, and station configuration of the project.

2.1. Project Schematic (Not To Scale)





South Coast Rail Summary Schematic, Sheet 2 of 2

NOT TO SCALE

3. 2008 Capacity Utilization Analysis

Prior to the present network simulation study, an analysis was made of projected signal system capacity utilization within the subject territory under one 2030 No-Build and three 2030 Build scenarios. The three Build scenarios were the Attleboro and Stoughton Alternatives under consideration in the present study, and a Middleborough Alternative using the Old Colony Line, which has since been dropped. In each case, the capacity utilization analysis divided the territory into interlocking-to-interlocking segments and determined, for each segment, the percentage of practical available capacity of the proposed track and signal system that would be used by the target operating plan. Where that portion significantly exceeded 100%, the track and signal system was deemed inadequate to support the proposed operations, and infrastructure improvements were indicated.

Specifically, this analysis estimated the ability of the main MBTA trunk lines to accommodate projected 2030 traffic both with and without South Coast Rail, focusing on anticipated "peak of the peak one hour" operations in the morning and evening. The analysis made use of a comprehensive RAILSIM simulation model of:

- Amtrak's Northeast Corridor as presently configured and signaled between Providence and South Station in Boston; and

- The Old Colony Main Line/Middleborough Branch as presently configured and signaled between Middleborough and Boston.

Single train unimpeded simulations yielded clearing times for all signals encountered. These times were aggregated and subjected to analysis, and yielded for each scenario the location and estimated severity of anticipated capacity constraints.

The analysis' findings were:

1. The Attleboro Alternative was projected to be feasible with third track added to the Northeast Corridor between the Attleboro Bypass connection and Readville. However, this third track was not specifically analyzed; its projected success was based upon an assumption that the third track would increase capacity of the upgraded two-track area by approximately 50%.
2. The Stoughton Alternative was projected to be feasible using current NEC infrastructure.
3. The Middleborough Alternative was found to be infeasible.

The capacity utilization analysis techniques employed, which are static by nature, are most appropriate for early planning efforts. However, these results were always subject to more detailed and authoritative analysis, which is the purpose of the current study. The aggregation of the capacity used by each passing train in a given hour to produce a total capacity used for that hour for a given segment of track does not consider the sequence, performance envelopes, and separation of the trains being delivered to that segment. The more sensitive network analysis contained herein has found this to be a critical issue for the NEC because of the intermingling of 150 MPH Amtrak Acela Expresses, 125 MPH Amtrak Regionals, 79 MPH MBTA diesels, and under electric train scenarios, 100 MPH MBTA electrics. The present network simulation captures all of the interplay between the signal

system, infrastructure, operating plan, and highly variable train performance at a 0.1-second simulation time step for all trains simultaneously. Dynamic network simulation of this type is the logical and appropriate follow-on to static planning analyses such as capacity utilization work.

Critically, the capacity utilization exercise did not consider operations in Tower 1 Interlocking, the South Station terminal, and non-revenue traffic between South Station and a yard location to be reached via the Fort Point Channel Bridge. The present network simulation clearly shows that capacity constraints in these areas are in fact the primary limiting conditions for the implementation of South Coast Rail.

For these reasons, the present network simulation exercise should be considered a far more definitive and authoritative analysis of South Coast Rail than was the foregoing capacity utilization exercise.

4. Assumptions

4.1. Track and Station Infrastructure

4.1.1. Study Limits

SYSTRA maintains a RAILSIM database of much of the passenger rail infrastructure of the northeastern United States. The portion of this database representing MBTA lines and Amtrak's NEC from Providence north was expanded and reviewed to ensure compliance with the latest available and most reliable data sources for the existing physical plant and for those infrastructure upgrades which are currently planned for the year 2030. This review resulted in a simulation model which reflects existing and proposed grades, track configuration, wayside signals, cab signal master locations and code change points, signal control lines and timers, station platforms, and civil speeds.

The resulting simulation model extends from Providence, RI to South Station, Boston, MA on the NEC. Also included are the northerly portions of the existing MBTA Franklin, Needham, Plymouth, and Greenbush Branches, the Dorchester Branch, the Old Colony Line to Middleboro, and a portion of the Worcester Line from Beacon Park Yard to its junction with the NEC at Back Bay (Cove Interlocking).

4.1.2. Simulation Model Infrastructure Changes for 2030 Under the "No-Build" Scenario

Programmed MBTA and Amtrak capital improvements already committed for the Northeast Corridor between Providence and Boston circa Year 2030 were included in the simulation model. All of these changes to today's physical plant were at or adjacent to South Station:

- Tracks 1-10 were altered in accordance with an anticipated "platform infill" project;
- Track 13 was extended;
- Five new tracks (14-18) were added to the east side of the terminal;
- Tower 1 Interlocking was extended to the south toward the Fort Point Channel Bridge so as to incorporate two new right-handed ladders on the four tracks crossing the Bridge.

These changes were taken from data sources 11, 12, and 13 in the numbered list provided below in Section 5, "Sources of Technical Data."

4.1.3. Simulation Model Infrastructure Changes for 2030 under the "Stoughton Build" Scenario

The simulation model for the Stoughton Alternative and Whittenton Variant was developed from the 2030 No-Build model in accordance with conceptual track and signal design source documents listed

in Section 5, "Sources of Technical Data." The revisions to 2030 No-Build infrastructure required by this alternative were:

- The elimination of Canton Center Interlocking;
- The addition of second platforms at Canton Center and Stoughton; and
- The extension of double-track to and beyond Stoughton Station.

New SCR infrastructure elements added for this alternative were:

- The extension of the Stoughton Line (the "Stoughton Extension") to Weir Junction (south of which the SCR infrastructure is identical for the Stoughton and Attleboro Alternatives);
- New or substantially rebuilt track along the New Bedford Main Line from Weir Junction through Cotley Junction to Myricks Junction and thence to New Bedford;
- New or substantially rebuilt track from Myricks Junction on the New Bedford Main Line to Fall River via the Fall River Secondary; and
- New or substantially rebuilt track from the Stoughton Extension south of Raynham Place at Milepost (MP) 29.6 via the Whittenton Branch to join the Attleboro Secondary at Whittenton Junction (Attleboro Secondary MP 33.1), thence along the Attleboro Secondary to join the Stoughton New Bedford Main Line at Weir Junction. This "Whittenton Variant" route is 1.6 miles longer than the Stoughton Line route and would replace the Stoughton Alternative's Taunton Station stop with a stop at Downtown Taunton Station.

Public station stops off the NEC under the Stoughton Alternative would be as follows (from north to south):

Canton Junction
Canton Center
Stoughton
North Easton
Easton Village
Raynham Place
Taunton (Stoughton Alternative only)
Downtown Taunton (Whittenton Variant only)
Taunton Depot

(via Fall River Secondary)
Freetown
Fall River Depot
Battleship Cove (seasonal)

(via New Bedford Main Line)
Kings Highway

Whales Tooth

4.1.4. Simulation Model Infrastructure Changes for 2030 under the "Attleboro Build" Scenario

The simulation model for the Attleboro Alternative was developed in accordance with conceptual track and signal design source documents listed in Section 5. Very significant changes to 2030 No-Build infrastructure were required on the NEC for this alternative, as follows:

- A new NEC interlocking, CP Norton, located at MP 200.5, where new NEC third track is proposed to begin;
- The extension of the new third track to Readville, giving the NEC continuous third track from CP Norton to South Station;
- The reconfiguration of Mansfield Interlocking;
- Reconstruction of one platform and construction of a new Track 3 platform at Mansfield, Sharon, and Canton Junction Stations on the NEC;
- The substantial reconfiguration of Junction Interlocking;
- The substantial reconfiguration of Transfer Interlocking; and
- Additional reconfigurations necessitated at locations where the new third track intercepts existing spurs and sidings.

New SCR infrastructure elements required by this alternative:

- The construction of a new two-track "Attleboro Bypass" to connect CP Norton, on the NEC, with the Attleboro Secondary;
- New or substantially rebuilt track along the Attleboro Secondary from the Attleboro Bypass to Weir Junction;
- New or substantially rebuilt track along the New Bedford Main Line from Weir Junction through Cotley Junction to Myricks Junction and thence to New Bedford; and
- New or substantially rebuilt track from Myricks Junction on the New Bedford Main Line to Fall River via the Fall River Secondary.

Public station stops off the NEC under the Attleboro Alternative would be as follows (from north to south):

Barrowsville
Downtown Taunton

Taunton Depot

(via Fall River Secondary)
Freetown
Fall River Depot
Battleship Cove (seasonal)

(via New Bedford Main Line)
Kings Highway
Whales Tooth

4.1.5. Assumed Civil Speeds for New Track

Civil speed profiles for all tracks may be found in the data sources listed in Section 5, "Sources of Technical Data." The new NEC third track was assumed to have a civil speed profile identical to the adjacent existing NEC track, as indicated by Amtrak's Employee Timetable and Special Instructions, eff. 5/12/2008.

The maximum passenger civil speed in effect on South Coast Rail-exclusive infrastructure was assumed to be 70 MPH for diesel equipment and 100 MPH for electric equipment. On the NEC, MBTA diesel equipment was allowed a maximum authorized speed of 79 MPH, while MBTA electric equipment was allowed a maximum authorized speed of 100 MPH.

4.2. Signaling Infrastructure

Signal layouts and control lines for all existing and proposed track were taken from data sources listed in Section 5, "Sources of Technical Data."

Train operations in existing MBTA territory off-NEC are controlled by an Automatic Train Control and Cab Signal System (ATC/CSS), which uses the following standard code (pulse) rates measured in pulses per minute (ppm) to indicate the following speeds:

Code Rate	Speed
180	Maximum Authorized Speed (MAS)
120	45 MPH
75	30 MPH
0 (No Code)	15 MPH or less

The Northeast Corridor from Providence to Tower 1 Interlocking has in place a recently-implemented dual frequency (100 Hz/250 Hz) nine-aspect Automatic Train Control and Cab Signal System (ATC/CSS) which allows some Amtrak trains (specifically, the Acela Express) to travel at speeds up to 150 MPH. It enables the high-speed trains to achieve their full potential wherever alignment conditions permit, while safely separating them from slower trains that will share the railroad. The nine code rate aspects and their associated speeds defined for this system are as follows:

Code Rate	Speed
180/180	150 MPH
180/-	125 MPH
270/270	100 MPH
120/120	80 MPH
270/-	60 MPH
120/-	45 MPH
75/75	30 MPH
75/-	30 MPH
0 (No Code)	15 MPH or less

At this time, neither the 100 MPH nor the 60 MPH speed command is used in the subject territory.

MBTA trains are presently not capable of reading the dual-frequency code rates and are therefore limited to the four code rates (including 0 Code) that they normally encounter in MBTA-only territory. For the purposes of this study, it is assumed that MBTA diesel trains in 2030 *will not* be equipped to read the 250 Hz signal, but under electric train operating scenarios, MBTA electric trains *will* be equipped to read both frequencies. As the MBTA diesels are limited to 79 MPH on the NEC and the 60 MPH speed code is not being transmitted, MBTA diesel trains are not penalized for their inability to read the 250 Hz signal.

For the new SCR territory between Canton Junction and the stations at New Bedford and Fall River (the Stoughton Alternative and Whittenton Variant), a conceptual ATC/CSS system was designed for use in these simulations by the consulting firm Vanasse Hangen Brustlin, Inc. (VHB). A similar conceptual ATC/CSS was designed by the consulting firm HNTB, Inc, for the Attleboro Bypass and Secondary, between CP Norton on the NEC and Weir Junction. In both cases and for both diesel and electric operation, the SCR ATC/CSS system will use the four code rate/speed combinations identical to those currently in place in MBTA territory.

The functionality of all of these signal systems was incorporated into the RAILSIM simulation model, including signals, cab signal master locations and code change points, control lines, signal aspects, and code rate timers.

4.3. Operations

4.3.1. Peak Periods

The MBTA-defined official peak periods used for this analysis were 7:00 AM to 9:00 AM in the morning and 4:00 PM to 6:30 PM in the evening. A peak period train is one which has either a morning South Station arrival or evening South Station departure time which falls within those windows.

4.3.2. Stop Types

There are several types of stops assigned to trains in the Amtrak and MBTA operating plans according to the sources used for this study. Their definitions, and how they were treated in simulation, are as follows:

- "S" Stop: Regular Stop to receive or discharge passengers. Under RAILSIM, an S stop ends when both the required dwell time has elapsed and the scheduled departure time has been reached.

- "D" Stop: Stops only to discharge passengers; the train may leave early. In the present simulations, every scheduled D stop was simulated. Under RAILSIM, a D stop ends when the required dwell time has elapsed, regardless of the clock time.

- "F" Stop: Stops for boarding or departing passengers after advance notice to the conductor. In actual railroad operation these stops may be skipped if such notice does not occur. In the present simulations, every scheduled F stop was simulated, using the D stop method (in other words, it was assumed that there were passengers desiring to board or depart at all "F" stop stations).

- "L" Stop: Stops to pick up or discharge passengers, but the train may leave ahead of schedule. In the present simulations, every scheduled L stop was simulated, using the D stop method.

The simulation assumption that every indicated stop was modeled, including flag stops, lends conservatism to the study.

4.3.3. Amtrak Operations – All Scenarios (No-Build and Build Alternatives)

The Amtrak 2030 operating plan for all scenarios was assumed to be the projected 2020 "North End" (New York – Boston) Amtrak operating plan developed by Amtrak in 2003 for application to the MTA/LIRR East Side Access Project and the Metro-North/ConnDOT New Haven Line Traction Power Study. This is the best available representation of future Amtrak operations in the subject time frame and falls well within the limits set out in the Amtrak-MBTA Operating Agreement dated July 1, 2003. This operating plan is presented in its entirety in the Appendix to this document. Table 7 lists South Station Amtrak arrivals at and departures from Boston's South Station for current (2008) and anticipated 2030 operations.

As shown in the table, the Amtrak operating plan projected for 2030 reflects an increase of five Acela Express round trips and one Regional round trip for a total of 12 new trains, plus movements to and from storage as required. Critically, Amtrak South Station arrivals and departures during the intense PM Peak Period grow from five in 2008 to nine in 2030.

Table 7: AMTRAK ARRIVALS AND DEPARTURES SOUTH STATION, BOSTON

2008 vs. 2030

2008			2030	
Arrivals	Departures		Arrivals	Departures
7:52	**5:10**		06:11	**04:16**
10:02	6:05		**09:23**	05:45
11:05	**6:15**		10:02	**06:16**
11:44	**7:15**		**10:23**	06:45
12:33	8:20		**11:22**	**07:16**
13:43	**9:15**		11:56	07:45
15:20	9:35		**12:32**	**08:16**
15:43	11:05		**13:19**	**09:16**
17:15	**11:15**		14:02	09:40
17:43	**12:15**		**14:19**	**10:16**
18:33	**13:15**		**15:16**	**11:16**
19:10	13:40		15:56	11:45
19:35	**15:15**		**16:16**	**12:16**
20:05	15:20		16:59	**13:16**
20:38	**16:30**		**17:16**	13:45
21:35	**17:20**		17:56	**14:16**
22:05	17:35		**18:16**	**15:16**
22:35	18:45		**19:16**	15:40
23:50	21:45		19:56	**16:16**
			20:16	**17:16**
			21:05	17:40
			21:16	**18:16**
			22:09	**19:16**
			22:19	19:40
			23:13	23:09
10 Acelas	**10 Acelas**		**15 Acelas**	**15 Acelas**
9 Regionals	**9 Regionals**		**10 Regionals**	**10 Regionals**
19 Total Trains	**19 Total Trains**		**25 Total Trains**	**25 Total Trains**

Bold times indicate Acela Express train.

Shaded cells denote arrivals and departures during MBTA peak periods.

In the development of the combined Amtrak/MBTA NEC 2030 operating plan, it was assumed that Amtrak operating slots remain as proposed by Amtrak. Therefore, no changes were made to any of the times given for Amtrak in any of the study operating plans.

4.3.4. MBTA Operations

4.3.4.1. 2030 No-Build

Development of the 2030 MBTA No-Build operating plan was based upon April, 2008, MBTA weekday operating plans for all services to South Station. At MBTA direction, service growth in 2030 *without* South Coast Rail was assumed to consist of one additional peak-period peak-direction train per MBTA branch serving South Station in each of the two daily peak periods, *if* the additions could be accommodated without added infrastructure. There are nine branches serving South Station (the Worcester, Needham, Franklin, Providence (NEC), Stoughton, and Dorchester Branches, and the Old Colony Greenbush, Plymouth, and Middleborough Branches). As no new Old Colony trains were added, six new peak-direction trains were created per peak period, for a total of twelve additional No-Build trains.

Six new trains were inserted into the AM peak period, and six into the PM peak period of the April 2008 MBTA operating plan, making as few changes to existing train patterns as possible. However, given the increase in platform tracks under the projected 2030 infrastructure configuration and the addition of the 16 peak/near-peak period trains, it was not possible to retain the current equipment cycle plan, and therefore equipment cycling at South Station was entirely revamped. The resulting equipment dependencies are shown in the Appendix to this document, both in the tabular operating plans and on graphic charts of station occupancy for South Station.

4.3.4.2. 2030 South Coast Rail Build

The morning peak-period service proposed for SCR would consist of three peak-direction (northbound) trains from New Bedford and three from Fall River, with South Station arrival times falling within the defined morning peak period of 7:00AM-9:00AM. An additional train from each southerly terminal has a South Station time falling just outside the AM peak period, for a total of four trains northbound from each of the southern terminals and arriving at South Station in or near the 7 AM - 9 AM morning peak period. Proposed SCR morning peak service would also include one reverse-peak train departing South Station during the AM peak period for New Bedford and one for Fall River. The total SCR train volume for the morning peak/near-peak period would therefore consist of eight northbound trains and two southbound trains.

The PM peak period SCR train pattern would mirror the morning peak-period pattern, with a southbound peak direction.

It was assumed that SCR trains would be stored during the midday at South Station or within the Southampton Street Yard complex and would not consume NEC capacity “deadheading” to a more distant midday storage location. This is consistent with the global assumption used for the No-Build scenario.

The total number of SCR trains in each of the “Build” alternative operating plans is 38. This includes nine round-trips between South Station and each of the southern terminals, plus one mid-day off-peak round trip short-turning at Taunton Depot.

Current Stoughton Branch service consists of 19 trains in each direction, including two short-turns to Canton Junction and one short-turn to Canton Center. One new train was added in each direction for assumed growth for 2030, giving a total of 40 trains for the No-Build scenario.

Under the Stoughton Build scenario, several very early and very late Stoughton trains were eliminated in accordance with direction received. The remaining Stoughton slots were extended and several new slots added as required, with the result that the Stoughton Build operating plan consists of 20 trains in each direction to and from the Stoughton Branch for a total of 40 trains. Nine trains in each direction serve each of the southern terminals. In addition there is the single mid-day round trip to Taunton Depot, bringing the total SCR service to the requisite 38 trains. Finally, there is a single short-turn to Stoughton late in the day.

Implementation of the South Coast Rail service was very different for the Attleboro Build Alternative from that for the Stoughton Build Alternative. In the case of the Stoughton Build operating plan, there was no net increase in Stoughton Branch NEC train volumes over the No-Build Alternative. By contrast, as there is no service today which could logically be extended from CP Norton south to the southerly terminals from the NEC/Attleboro Bypass junction, **all 38** of the South Coast Rail trains under the Attleboro Build alternative are new trains on the NEC.

4.3.4.3. Station Dwells

Per MBTA direction, MBTA station dwells for peak period trains (that is, peak direction trains with South Station arrival/departure times falling within the defined peak periods) were set at 120 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations, and 60 seconds at all other station stops. Non-peak period and reverse-peak trains were assigned dwells of 45 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations and dwells of 30 seconds at all other station stops.

It was assumed that all Amtrak station dwells would be 120 seconds in length.

4.3.5. Combined MBTA and Amtrak Operating Plans

Based upon the operations assumptions listed immediately above, new conceptual 24-hour operating plans were developed for the following scenarios:

- A single 2030 No-Build Operating Plan: the Amtrak 2020 Operating Plan combined with the 2008 MBTA Operating Plan with its anticipated increases for 2030.

- A single 2030 Attleboro Build Operating Plan: the 2030 No-Build Operating Plan combined with the proposed South Coast Rail trains under the Attleboro Alternative. Under this alternative all SCR trains are “new” trains, not extensions of existing trains.

- Two 2030 Stoughton Build Operating Plans: the 2030 No-Build Operating Plan combined with the revised Stoughton service, under which all but two of the daily Stoughton round trips are extended to the southern terminals. This operating plan was developed in diesel and electric versions.

The four referenced operating plans can be found in the Appendix to this report.

4.3.6. Equipment Manipulations at South Station

South Station has 13 platform tracks today and is assumed to gain five platform tracks on its east side by the year 2030. In addition a planned "platform infill" project is anticipated to decrease the lengths of platform tracks 1-10. Finally, a pair of parallel right-hand ladders has been assumed for the four tracks crossing the Fort Point Channel Bridge to serve the Dorchester and Old Colony Lines. All of these modifications have been implemented in the simulation model in accordance with the source documents listed in Section 5, "Sources of Technical Data."

The resulting configuration of South Station and its terminal interlocking, Tower 1, will continue to pose a challenge to train dispatchers in 2030. RAILSIM identified 492 separate potential routes through Tower 1 Interlocking, but even with the number of available routes, there will still be routing constraints. Terminal interlocking route considerations are listed below.

- Five tracks enter Tower 1 Interlocking on its south end from NEC Cove Interlocking, numbered 7, 5, 3, 1, and 2 from west to east. Four additional tracks enter Tower 1 Interlocking from the Old Colony Line and the Dorchester Line via the Fort Point Channel Bridge. Platform access from these points of entry resulting from the proposed Tower 1 configuration will be as follows:
    - Track 7 entering Tower 1 can reach only platform tracks 1-6.
    - Tracks 5 and 3 entering Tower 1 can reach only platform tracks 1-10.
    - Tracks 1 and 2 entering Tower 1 can reach only platform tracks 1-13.
    - All four tracks entering Tower 1 via the Fort Point Channel Bridge can access all 18 platform tracks (no constraint).

In addition, for reasons of train length, Amtrak trains are limited to South Station platform tracks 8, 9, and 10, although their use of these tracks was assumed to be not exclusive. Again for reasons of train length, Tracks 1 and 2 were limited to the 8-vehicle Framingham/Worcester trains (locomotive + 7 coaches).

As they do today, the configurations of Tower 1 Interlocking and the entering service branches and the Amtrak platform requirements lend themselves to the practical division of South Station into several logical service areas in the terminal equipment manipulation plans:

1. Worcester Branch trains were almost exclusively slotted to platform tracks 1 and 2, given the direct access they enjoy to those tracks.
2. Trains coming over the Fort Point Channel Bridge (Old Colony and Dorchester Lines) were generally routed to platform tracks 13-18, given that they have the best access to those tracks and many NEC trains cannot access these tracks at all.
3. As described, Amtrak trains were confined to platform tracks 8-10.

4. Finally, the remaining NEC trains were generally routed to a total of seven platform tracks, 3-7 on the west side of the Amtrak trains and 11-12 on the east side of the Amtrak trains.

Equipment manipulation plans developed for these analyses took into account equipment types – i.e. in scenarios featuring electric motive power for select MBTA services, electric trains could only be turned for other electric trains.

MBTA trains turning at the platform at South Station were given a minimum *scheduled* turn time of 15 minutes, but a departing train was allowed to leave as little as 10 minutes after the arrival of late-arriving equipment. Analogously, Amtrak trains turning at South Station were given at least 20 minutes as a scheduled turn, but were allowed to turn in as little as 15 minutes from a late-arriving inbound train.

In addition, all required equipment moves to and from storage were modeled. Trains traveling between South Station and their midday and overnight storage location were sent over the Fort Point Channel Bridge and onto the lead tracks for Southampton Street Yard. Although Southampton Street Yard will not accommodate all stored trains, this operating assumption captured all non-revenue moves through Tower 1 and Broadway Interlockings, where such moves and their effect on interlocking capacity and terminal operational stability is the most critical.

Storage and equipment manipulations/dependencies at the outbound terminals were not modeled.

4.4. Rolling Stock

The RAILSIM rolling stock library is a highly detailed database of world-wide rolling stock which can be used to form virtually any needed consist. Assembling a consist in the simulation model results in a train which incorporates the attributes and performance of each of the specific rolling stock models being used, so that the assembled consist behaves very much like the real-world train.

Detailed specifications of all rolling stock described below and used in these simulations may be found in the Appendix to this report.

All trains were simulated with full seated passenger loads, regardless of time of day.

4.4.1. MBTA Rolling Stock

The assumption for MBTA operations was the use of a single 3,000 horsepower F40PH or F40PH-2C locomotive propelling seven Kawasaki bi-level coaches and one bi-level cab car. The F40PH series locomotive is a model developed from the freight GP-40 locomotive, and equipped with an auxiliary generator necessary to provide Head End Power.

Under the electrified South Coast Rail options, all non-SCR MBTA trains would remain diesel-powered, except that under the Stoughton Alternative those four remaining Stoughton Branch trains not extended to the southern SCR terminals would also be electrically-powered, giving the Stoughton Branch a homogenous electric fleet distinct from the remainder of the MBTA South Side services. Electric operation in general allows higher maximum speeds, better acceleration performance and therefore lower scheduled running times and better schedule recovery.

The locomotive assumed for the electrified simulations was a single 8,046 horsepower Amtrak HHP-8 locomotive, propelling consists identical to those for the diesel simulations.

4.4.2. Amtrak Rolling Stock

Year 2030 Amtrak train consists are assumed to be substantially similar to the two primary consists being used by Amtrak in the subject territory today. They are both capable of utilizing the dual-frequency signal for the nine-aspect cab signal system in effect on the NEC, including the so-called “Super Clear” aspect, which allows operation at very high speeds.

The first of these consists is the Acela Express, which operates through this territory at speeds of up to 150 MPH, making it the fastest passenger train in North America. The Acela Express consist is comprised of the following:

- 2-Acela Power Cars (12.5 kV)
- 1 Acela End Coach Car
- 3 Acela Coaches
- 1 Acela Bistro Car
- 1 Acela First Class Car

The second Amtrak consist in common use in the subject territory is the Amtrak Regional, a longer, less high-performance train than the Acela (but still higher-performance than diesel-powered MBTA trains). For the purposes of Year 2030 operation, it was assumed to be comprised of:

- 1 Amtrak HHP-8 Locomotive
- 1 Amfleet Amcafe
- 8 Amfleet II Corridor Coaches

5. Sources of Technical Data

The following source documents were used to develop and refine the RAILSIM® simulation models. This list is not all-inclusive; additional sources of information, including input from the MBTA and other consulting firms in the Project Team who contributed information and advice to the simulation modeling effort.

1. Amtrak Northeast Corridor Employees Timetable No. 2 Effective 12:01 AM May 12, 2008.
2. MBTA Commuter Rail Service Employee Timetable No. 6, General Order No. 601, Effective 12:01 AM, Monday, April 30, 2007.
3. Drawings: Nine-Aspect Cab Signal System, Signal Control Lines for the Northeast High-speed Rail Improvement Project, New Haven to Boston; Amtrak P.I., LS Transit Systems, Inc., marked up with as-build signal locations.
4. Drawings: Davisville to Lawn, Signal Control Lines Eastward and Westward, prepared by Amtrak Office of the Chief Engineer C&S, Dwg. No. NHBO170.0,12 sheets, undated.
5. Drawings: Northeast Corridor Signal Control Lines, Proposed Third Track, Attleboro Bypass to Transfer, prepared by HNTB, Inc., 10 sheets. Version received on May 27, 2009.
6. Drawings: Attleboro Bypass and Secondary, Signal Control Lines, Proposed, prepared by HNTB, Inc., 3 sheets, received on June 2, 2009.
7. Drawings: South Coast Rail, Aspect Charts, All Alternatives, rev. March 3, 2009, prepared by VHB,10 sheets ("marked-up" version received March 25, 2009).
8. Drawings: South Coast Rail, Aspect Charts, Fall River, rev. March 3, 2009, prepared by VHB, 3 sheets ("marked-up" version received March 25, 2009).
9. Drawings: South Coast Rail, Aspect Charts, Stoughton-Whittenton Alternative, rev. February 2, 2009, prepared by VHB,3 sheets ("marked-up" version received March 25, 2009.
10. Drawings: MBTA Track Master Plan, South Station – Southampton – Back Bay, prepared by STV Group, August 8, 1994.
11. Drawings: TUDC/HINES, South Station Phase I Track Layout Concept, September, 2007, prepared by VHB, Inc., 3 sheets.
12. Drawing: Sketch of Proposed Track Easement, Future USPS 6 Track Expansion, prepared by HNTB, Inc., September 25, 2007, 1 sheet.
13. Drawing: Informal CADD drawing, Boston South Station with 5 Track Expansion, Modification 1 + 2, prepared by VHB, Inc., 1 sheet, Spring, 2009.
14. Drawing: Tower 1 Interlocking Aspect Chart, Issue Date, April 16, 1995.
15. Drawing: Amtrak Cove & Tower 1 Signal Aspects, 1 sheet, December 10, 1990.
16. Drawing: MBTA South Bay Complex, Route and Aspect Sheet, prepared by STV, Inc., 1 sheet, August, 1995.

17. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Middleborough Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 5 sheets, last dated May 29, 1996.

18. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Middleborough Line Control Lines, prepared by Thomas K Dyer, Inc., 8 sheets, last dated July 27, 1993.

19. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Main Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 2 sheets, last dated May 29, 1996.

20. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Main Line Control Lines, prepared by Thomas K Dyer, Inc., 6 sheets, last dated June 13, 1996.

21. Drawing: MBTA Old Colony Railroad Rehabilitation Project, Green Interlocking Location Plan, prepared by Safetran Systems Corporation, 1 sheet, dated January 26, 1999.

22. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Plymouth Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 5 sheets, last dated May 29, 1996.

23. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Plymouth Line Control Lines, prepared by Thomas K Dyer, Inc., 9 sheets, last dated February 8, 1994.

6. Simulation Calibration

Calibration is the means by which a network simulation model is demonstrated to accurately represent real world rail operations. It normally entails the observation of signal clearing times (the time required for an Automatic Block Signal or Cab Signal to restore to best aspect after passage of a train) at selected locations, and the collection of point-to-point running time and station dwell time data samples. Typically, a threshold correlation of simulated operation to within 10% of observed (field) operations is considered credible given day-to-day variations in train performance, station dwells, weather conditions, and so forth.

RAILSIM network simulations of MBTA operations have been performed since 1995, at which time a successful calibration of their F40PH/GP40/Kawasaki bi-level coach consist was performed. Early in the present simulations, simulated unimpeded running times which included a 5% Schedule Margin or "pad" were calculated with this calibrated consist for end-to-end runs on the Stoughton and Middleborough branches. Station dwells were set in accordance with MBTA direction as outlined in Section 4.3.4.3 above. The simulated running times were compared with off-peak MBTA schedule times and found to agree within 5%, a very good result which lends confidence to the reliability of the simulation techniques being employed here.

Amtrak Acela and conventional electric locomotive-hauled performance calibration has been repeatedly verified by simulations involving Amtrak's Northeast Corridor west of Penn Station New York, where RAILSIM simulation experience extends back to 1992, and so has not been repeated here as part of the present study.

Infrastructure that does not exist cannot be observed. This applies to the entire proposed railroad between NEC departure points Canton Junction and CP Norton and the southern terminals at Fall River and New Bedford. The railroad between these points will be completely reconstructed and although conceptual designs of track and signal systems have been prepared, they are only provisional at this time. Therefore, this simulation serves only as a *predictor* of likely South Coast Rail train performance given assumptions such as:

- Maximum operating speeds of 70 MPH for diesel (although 79 MPH for MBTA diesel on the NEC) and 100 MPH for electric operation;
- Civil speed restrictions;
- Station stops and stopping pattern;
- Likely or anticipated station dwell times given Kawasaki bi-level cars to be used, extent of high-level station platforms (which speed boarding) and ridership demand; and
- Other Northeast Corridor traffic unrelated to New Bedford and Fall River service.

7. Simulation Randomization

A randomized (perturbed) simulation analysis was performed for each of the three simulation models to evaluate the stability of the schedule under realistic conditions. Randomized simulation analysis mimics real-world terminal departure delays and intermediate station dwell-related delays, as it is based on historical on-time performance data. Large changes in on time performance and total minutes of signal delay in response to small perturbations (statistically controlled delay events) likely indicate a fragile Operating Plan that would potentially have difficulty overcoming minor challenges. On the other hand, a railroad operation that exhibits an ability to recover from real-world fluctuations in performance without a tendency toward cascading delays is likely to be more viable under actual conditions.

Two elements of the operation were randomized, train put-ins (i.e., times of train entry into service), and station dwells. Table 8 lists the MBTA-approved parameters used. They are identical for MBTA and Amtrak trains, except that the Amtrak put-in randomization is more severe. This reflects the fact that the northbound Amtrak trains putting in at the south end of the model have already been operation for some time and, for those trains that are late, have accumulated a larger relative degree of lateness.

Table 8: Simulation Randomization Parameters

	Maximum Early (seconds)	Maximum Late (seconds)	Mean (seconds)	Standard Deviation (seconds)
Train Put-In, MBTA	120	300	75	120
Train Put-In, Amtrak	120	600	75	120
Station Dwell, MBTA	10	60	20 (late)	10
Station Dwell, Amtrak	10	60	20 (late)	10

8. Simulation Results

Two types of conventional quantitative analyses were undertaken using the network simulation – *on time performance* and *signal delay*.

On time performance and signal delay results were generated for both deterministic and randomized operations. Under deterministic simulation, all equipment initially enters service on time and station and terminal dwell times are fixed. Under perturbed simulation, terminal departure and intermediate station dwells are statistically randomized to reflect real-world variations in day-to-day operations. For example, an MBTA or Amtrak train could experience an unpredictable delay leaving Providence Station for any number of reasons ranging from a minor mechanical problem to unusual travel demand or a passenger requiring assistance. The randomized simulation stresses the system and its response to this is measured quantitatively.

8.1. On Time Performance Results

On time performance measures the extent to which trains arrived or left late, on time, or early relative to the intended operating plan. On time performance is a concrete measure of service quality observable by the public. The public does not necessarily know that a schedule may allow a certain amount of "recovery" time to overcome a delay en route and still arrive at destination on time. Patrons will perceive that their train is "late" if it does not arrive or depart when the published schedule says it should. This is "on time performance" and is the measure of delay as it is perceived by the public.

The MBTA standard, and in fact a common standard in the commuter rail industry for on time performance is that a train arriving more than 0:04:59 (h:mm:ss) late with respect to its scheduled arrival time is defined as a "late train"; otherwise the train is considered on time.

On time performance was measured and reported at South Station for northbound trains and at Providence, Roslindale, Endicott, Stoughton, Back Bay, Fall River and New Bedford for southbound trains.

When trains are moderately late in a deterministic model, it is an indication that scheduled running times may be inadequate and that before service is implemented, schedules should be adjusted. This is to be expected for a railroad and operation that has not yet been designed to the 100% level.

Table 9 and Table 10 display on-time performance statistics for arrivals at South Station and the southerly terminals, respectively, for both deterministic and randomized simulations for all three infrastructure scenarios, and for both the SCR diesel and electrified options. These results are for revenue trains only, with Old Colony Line trains excluded.

Table 9: On-Time Performance - Revenue Train Arrivals at South Station*

ALTERNATIVE	AM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	100.0%	100.0%	100.0%	98.6%
Stoughton Diesel	100.0%	100.0%	100.0%	95.9%
Stoughton Electric	100.0%	100.0%	100.0%	97.9%
Attleboro Diesel	61.1%	44.4%`		
Attleboro Electric	69.4%	50.0%		

* These results do not include Old Colony Line trains.

Table 10: On-Time Performance - Revenue Train Arrivals at Southerly Terminals*

ALTERNATIVE	PM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	94.9%	87.2%	97.1%	91.4%
Stoughton Diesel	93.0%	75.0%	93.3%	85.0%
Stoughton Electric	92.5%	80.0%	95.0%	87.1%
Attleboro Diesel				
Attleboro Electric				

* These results do not include Old Colony Line trains.

The deterministic simulations for the No-Build and both Stoughton Alternative options (diesel and electric) achieved 100% conformance with the MBTA lateness standard for South Station arrivals, with the AM Peak-Period trains achieving the standard even under randomization. Deterministic OTP for arrivals at the southern terminals was consistently lower than that of South Station arrivals, although for the No-Build and Stoughton Alternatives the results are above 90% in all cases, with the electric option yielding (again) equal or slightly better results. Much of this outbound lateness is apparently due to insufficient running time allowed MBTA Providence (800 Series) trains. These trains were consistently unable to meet their scheduled times on this run, even when unimpeded by other traffic. The same result was not seen in the northbound direction, as the MBTA operating plan provides the northbound Providence-to-Boston service with approximately 10 extra minutes more running time than is allowed the southbound run.

Such positive results for the No-Build and Stoughton Alternatives are clear predictors of a successful future operation.

By contrast, the Attleboro Alternative, simulated under deterministic conditions and using electric locomotives for the SCR service, was unable to meet the MBTA on time performance standard for AM South Station arrivals. Furthermore, the simulation was unable to process the PM period at all, failing at between 5 PM and 6 PM. The material increase in NEC trains (eight peak-direction trains in or near each peak period, and a total of 38 **all new** NEC trains) is simply more that the system is capable of accommodating under the assumed simulated infrastructure.

OTP is not reported for the Attleboro Alternative for “PM Peak-Period Trains” or for “All Weekday Trains” because the simulation was unable to generate those results; the missing results are indicated

by the grayed-out areas of the tables. However, results are available for the Attleboro AM Peak-Period trains, as the AM Peak Period is the less intense of the two daily peak periods. These results fall well below the 100% target, with none better than 69.4% and no randomized result better than 50%. While not as striking as the outright failure of the evening simulation, these results still indicate a fatally-flawed operation.

The Attleboro Alternative simulations included exhaustive failed attempts to find routing, interlocking priority and/or timing changes that would enable the PM Peak operation to succeed. As the simulations progressed, the principal issue became very clear: an intractable conflict between the equally-important non-revenue equipment movements inbound over the Fort Point Channel Bridge and the outbound PM Peak train service departing South Station.

From approximately 5:00 to 5:30 PM, catastrophic delays occur in the Tower 1 terminal interlocking throat as:

- Some westbound PM Peak revenue trains cannot leave the station platforms on time because of the high volume of conflicting non-revenue equipment movements coming from storage, and
- Other westbound PM Peak revenue trains cannot leave on time because those PM Peak revenue movements out of the station that are successful have prevented their equipment from reaching the assigned platform from storage.

This tension between the inbound equipment moves and the outbound revenue trains is not resolvable in the Attleboro Build scenario given the desired train volume coupled with limited storage options available at South Station, which place the storage facility on the opposite side of the terminal interlocking from the terminal itself. Such a design lacks the “pull through” capability implemented at some other large successful rail terminals, such as New York’s Penn Station, and forces passenger-carrying revenue trains to compete for limited terminal interlocking throat capacity with non-revenue trains which are necessary to support later departures.

8.2. Signal Delay Results

8.2.1. Signal Delay Totals

Signal delay is a measure of the time during which a train is forced to operate under signal indications less favorable than the best possible indication. When more trains are operated over a line in a fixed period of time than the system will easily support, signal delays will accrue because following trains will receive downgraded signals. Signal delay time, it should be noted, is not equivalent to lateness, as a train can be accruing signal delay while it is moving. In fact, the train might still be on time while operating under less than most favorable signals, depending on the amount of recovery time built into its schedule.

Cumulative signal delay (across the entire simulation) measures aggregate traffic congestion independently of scheduled arrival and departure times (which can be improved relatively arbitrarily by incorporating more recovery time in schedules). Comparing cumulative signal delay statistics under deterministic conditions and then under randomized conditions for the same infrastructure and

operating plan provides insight into whether or not the network as designed is capable of absorbing normal day-to-day variations in train performance and minor random delays. In addition, signal delay statistics may be used to compare relative levels of traffic congestion across different infrastructure configurations or under different operating plans, to provide a relative measure of schedule recoverability between alternatives. If train operations recover quickly from day-to-day variations in train performance and minor random delays, the tested operating plan is likely fundamentally sound; this will be reflected by little change from deterministic to randomized simulations in accrued signal delay, or even a reduction and vice versa.

Signal delay minutes were computed and totaled for all non-Old Colony Line revenue trains in the simulation and are shown in Table 11, Table 12, and Table 13. Again, as the Attleboro Alternative simulations were unable to continue past the 5 PM to 6 PM hour, Attleboro Alternative results are limited to the AM Peak-Period trains and missing Attleboro results are grayed-out in the tables.

"Total Trains" in Table 11 and Table 12 refers to all those trains whose scheduled times at South Station make them AM or PM Peak-Period trains, respectively. In Table 13, "Total Trains" refers to all scheduled weekday trains. Total signal delay is the sum of all the signal delay experienced by the individual trains under the defined scenario. The "Avg./Train" is the total signal delay divided by the Total Trains.

As can be seen, although the increase in Total Trains is small between the No-Build and Stoughton Alternatives, there is a substantial increase in signal delay under the Stoughton Alternative. This is due to two factors. The first is that to create the Stoughton Alternative operating plan, two early-morning and two late-evening Stoughton Branch trains (which run on a nearly-empty railroad) were removed and replaced with SCR trains which run at a busier and more congested time of day. The second is that although there is no increase in the overall number of Stoughton Branch trains between the No-Build and Stoughton Alternative, under SCR the Stoughton Branch trains have a much longer route with significant amounts of delay-causing single-track railroad.

Signal delay under the Attleboro Alternative more than doubles with respect to the Stoughton Alternative in all measures.

Table 11: Cumulative Signal Delay
AM Peak-Period Peak-Direction Revenue Trains Only*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	30	0:59:47	0:02:00	1:11:53	0:02:24
Stoughton Diesel	31	1:48:52	0:03:31	1:38:36	0:03:11
Stoughton Electric	31	1:52:10	0:03:37	1:42:39	0:03:19
Attleboro Diesel	36	4:46:19	0:07:57	6:01:42	0:10:03
Attleboro Electric	36	4:56:27	0:08:14	6:06:24	0:10:11

*** These results do not include Old Colony Line trains.**

Table 12: Cumulative Signal Delay
PM Peak-Period Peak-Direction Revenue Trains Only*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	41	2:08:37	0:03:08	2:24:33	0:03:32
Stoughton Diesel	42	2:29:22	0:03:33	2:51:37	0:04:05
Stoughton Electric	42	2:29:28	0:03:34	2:55:18	0:04:10
Attleboro Diesel	48				
Attleboro Electric	48				

*** These results do not include Old Colony Line trains.**

Table 13: Cumulative Signal Delay
All Weekday Revenue Trains*

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	284	8:57:22	0:01:54	9:51:49	0:02:05
Stoughton Diesel	284	13:55:01	0:02:56	14:33:01	0:03:04
Stoughton Electric	284	13:16:34	0:02:48	13:55:45	0:02:57
Attleboro Diesel	322				
Attleboro Electric	322				

*** These results do not include Old Colony Line trains.**

8.2.2. Signal Delay Location

By querying the simulation results, it is possible to determine the approximate locations where congestion occurs. Figure 1 below plots the aggregate signal delay from 4 AM to 11 AM for the two No Build simulations, for the two Stoughton Build electric option simulations, and for the two Attleboro Build electric option simulations on an interlocking-by-interlocking basis against the Northeast Corridor Milepost system. Table 14 immediately below the chart lists the NEC interlockings and their milepost stationings for reference. This chart is limited to the morning because only in the morning is a complete set of results available for all alternatives.

Signal delay is almost non-existent in the southern portion of the territory. Delay for the Attleboro Alternative begins climbing at approximately MP 200, the location of CP Norton Interlocking (junction of the Attleboro Bypass), and at approximately MP 214, corresponding to Junction Interlocking, signal delay spikes in all scenarios. The Attleboro Alternative in particular reaches very high levels of signal delay, with a substantial increase at this location with the application of randomization. The Stoughton Alternative shows an increase over the No-Build here as well. Interestingly, for both the Stoughton Alternative and the No-Build, the level of signal delay at Junction Interlocking does not increase with randomization, indicating that the system was able to absorb the perturbation without ill effects in both cases.

Signal delay spikes again at approximately MP 225, in the area of Plains Interlocking. Again, the Attleboro Alternative sees very high levels, this in an area in which three tracks already exist today. Signal delay levels for the No-Build and Stoughton Alternatives are similar and again demonstrate

resilience in the face of randomization (i.e., do not vary much with randomization). Of particular note are the Attleboro Alternative spikes at the east end of the chart – they are literally "off the chart", and are indicative of the overwhelming congestion that occurs close in to the Tower 1 terminal interlocking throat under the Attleboro scenarios.

As with the on time performance results, the use of electric motive power for the South Coast Rail trains has a very minor positive effect on signal delay results.

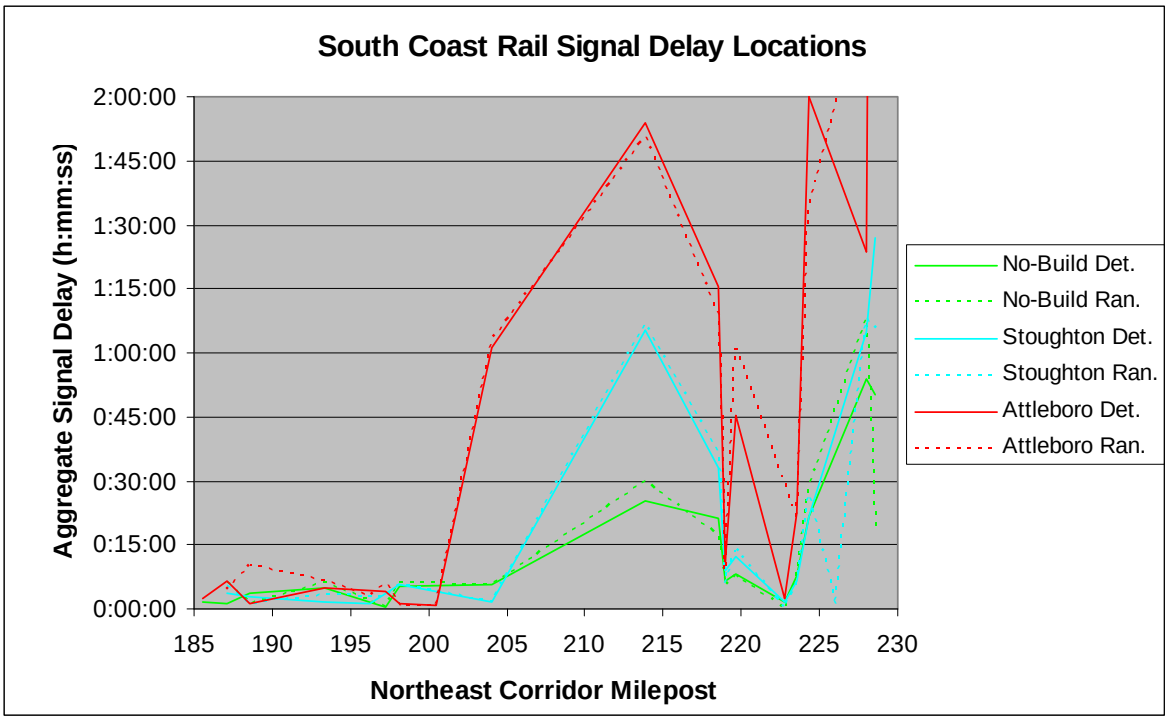


Figure 1: Locations of Simulated Signal Delay

Table 14: NEC Interlocking Locations

NEC Interlocking	NEC Milepost
ORMS	185.6
PAWTUCKET	187.1
LAWN	188.6
HEBRONVILLE	193.3
THATCHER	196.2
BORO	197.2
HOLDEN	198.1
NORTON	200.5
MANSFIELD	204.0
JUNCTION	213.9
TRANSFER	218.5

READ	219.6
FOREST	223.5
PLAINS	224.3
COVE	228.0
TOWER 1	228.5

8.3. Running Time Results

Simulated running times under deterministic Network Simulation for South Coast Rail trains are shown in Table 15. These are the end-to-end times for peak-period, peak-direction trains (provided only for the morning for the Attleboro Alternative). It is clear that these running times are longer than the unimpeded Train Performance Calculator (TPC) train simulations which were reported in 2008 (and reported again in the appendix to this document). These results reflect longer dwells than those assumed for the TPC runs plus delays en route due both to congestion on the NEC and also due to single-track constraints on new SCR infrastructure. It is likely that continued refinement of the SCR operating plan to better "tune" its performance to the single-track constraints will lower these running times.

The 2-4 minute difference in TPC running times between the Whales Tooth route and the Fall River route has been somewhat attenuated by network simulation.

Although not simulated, the TPC running times indicate that the Whittenton Variant would add several minutes to the Stoughton Alternative running times.

Table 15: Average SCR Simulated Running Times
Peak-Period Peak-Direction Trains
Deterministic Simulation

ALTERNATIVE	AM Peak Period Trains		PM Peak Period Trains	
	Whales Tooth to South Station	Fall River to South Station	South Station to Whales Tooth	South Station to Fall River
Stoughton Diesel	1:32:42	1:32:21	1:40:33	1:32:04
Stoughton Electric	1:23:37	1:23:43	1:29:16	1:26:30
Attleboro Diesel	1:38:45	1:38:48		
Attleboro Electric	1:36:59	1:35:56		

8.4. South Station Occupancy Charts

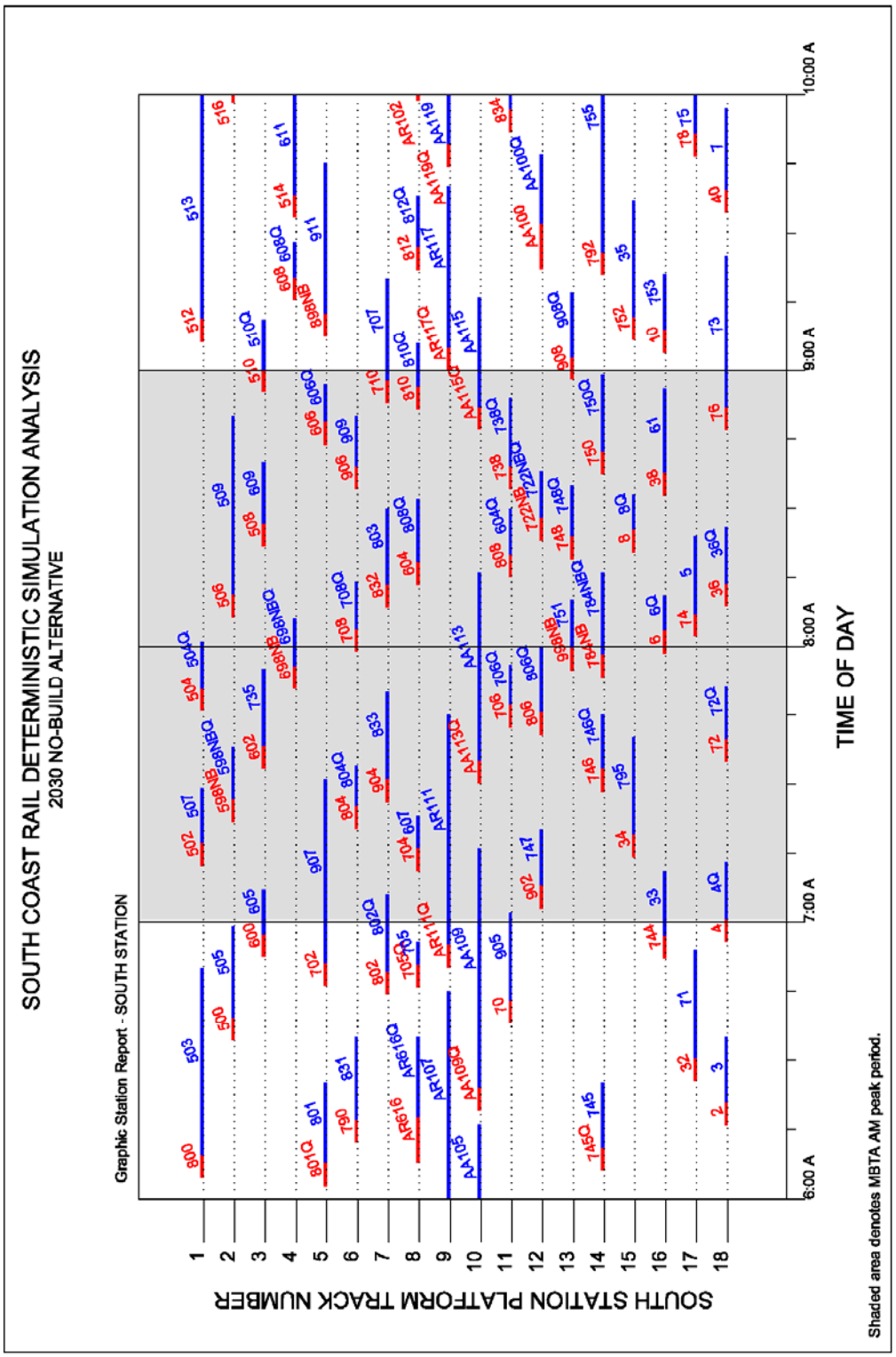
The following two Station Occupancy Charts illustrate the simulated equipment manipulations at South Station for the No-Build and Stoughton Alternatives, SCR diesel version only. The Station Occupancy Charts for the SCR electric versions of these two alternatives are not appreciably different, and the Attleboro versions are not available due to the failure of the simulation during the PM Peak period.

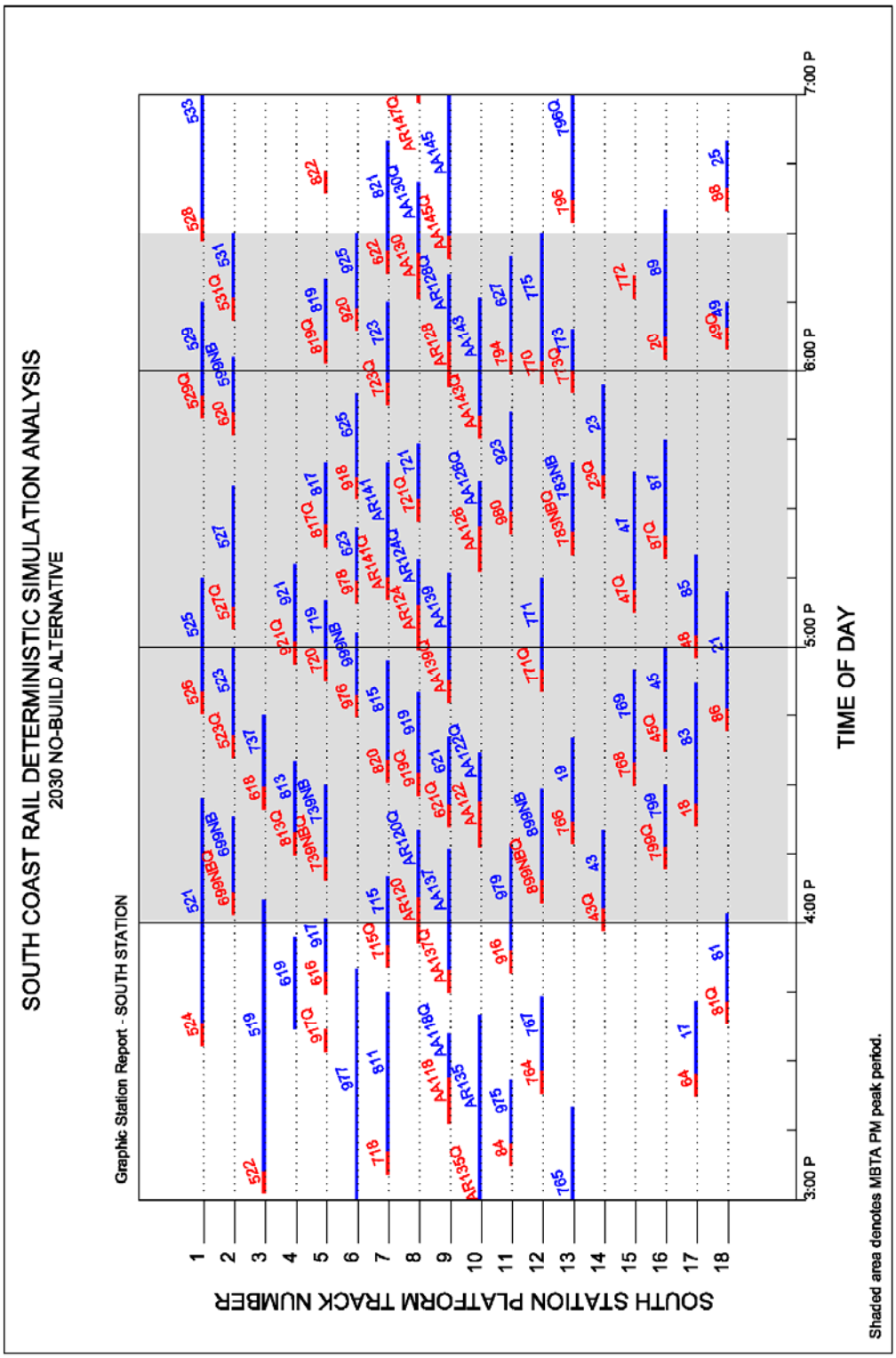
Each chart covers a four-hour period enclosing either the AM or PM peak period, with the actual peak period shaded gray. These Occupancy Charts are generated by the simulation model and depict actual operations. The time of day is shown along the X axis, and the South Station platform track number along the Y axis.

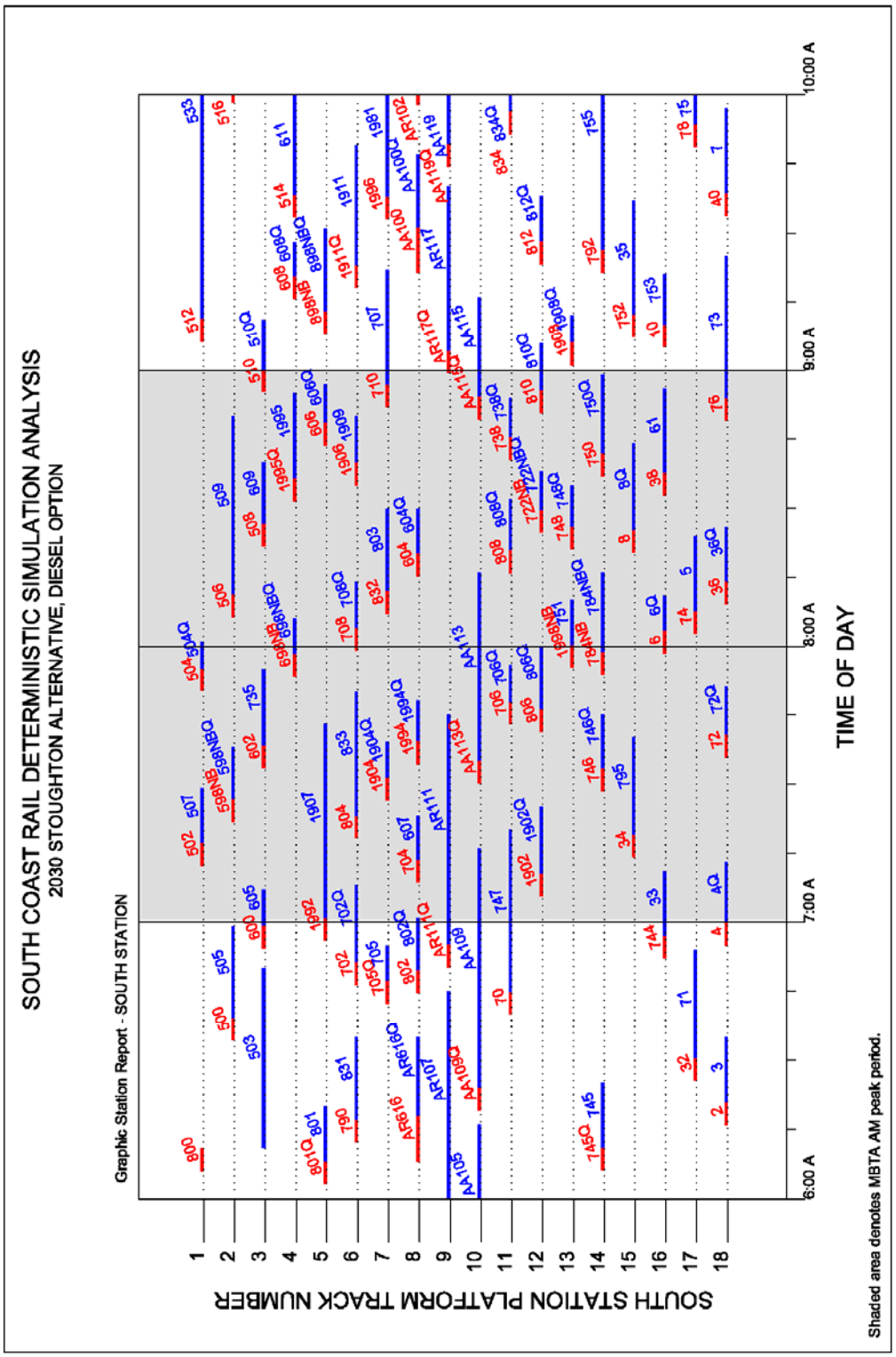
Arriving trains are shown in red and departing trains in blue. Train numbers ending with a "Q" designate non-revenue trains that have either come from or are going to the yard; all other trains are revenue trains. Train names that begin with "AA" are Amtrak Acela trains and those beginning with "AR" are Amtrak Regional trains. MBTA train numbering is by branch, as follows:

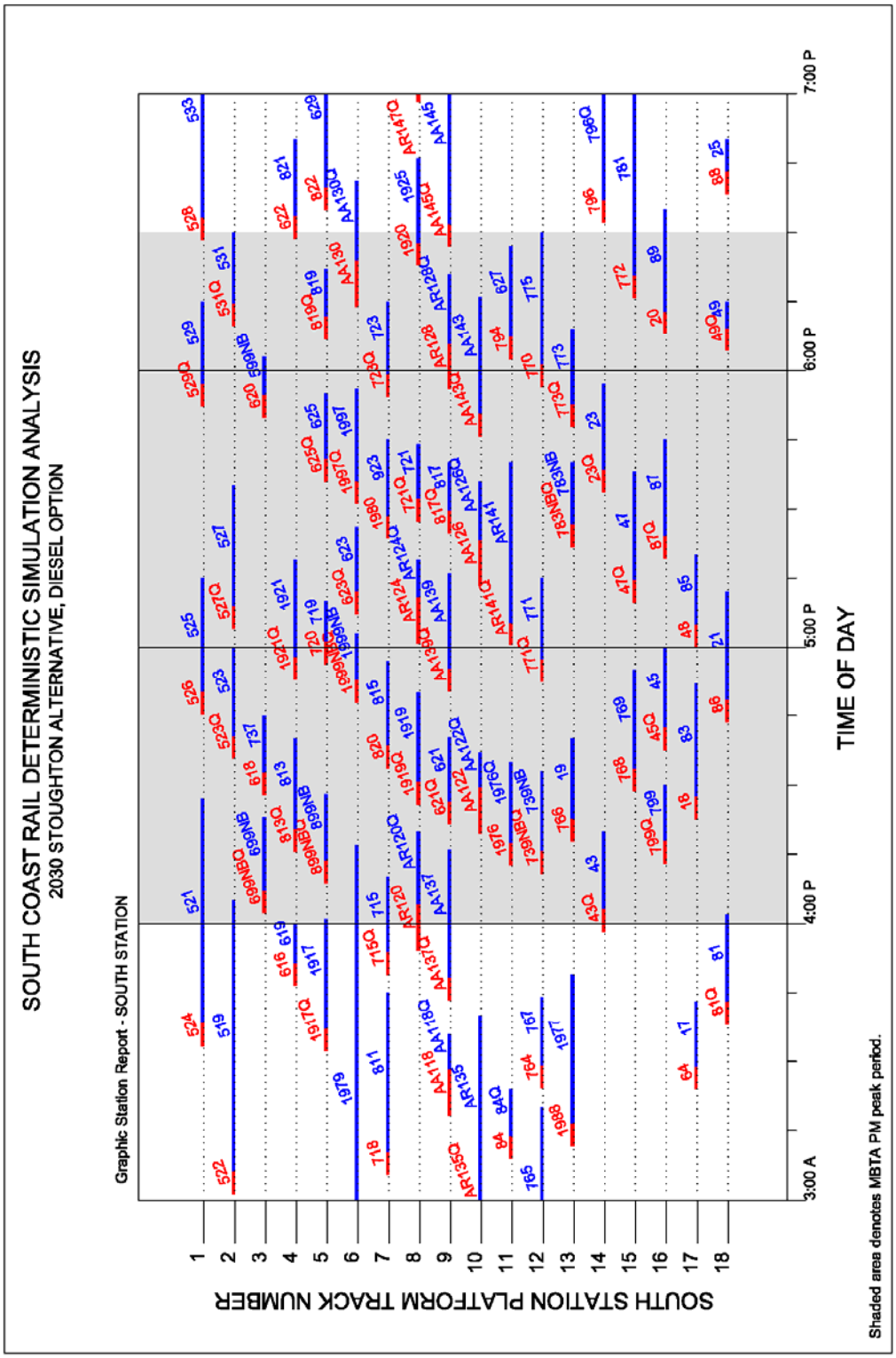
- 1-99 Trains—Old Colony Line
- 500 Trains—Framingham/Worcester Branch
- 600 Trains—Needham Branch
- 700-739 Trains—Franklin Branch via NEC
- 740-789 Trains—Dorchester Branch
- 790-799 Trains—Franklin Branch via Dorchester Branch
- 800 Trains—Providence (NEC)
- 900 Trains—Stoughton Branch Trains
- 1900 Trains—Stoughton Alternative SCR Trains

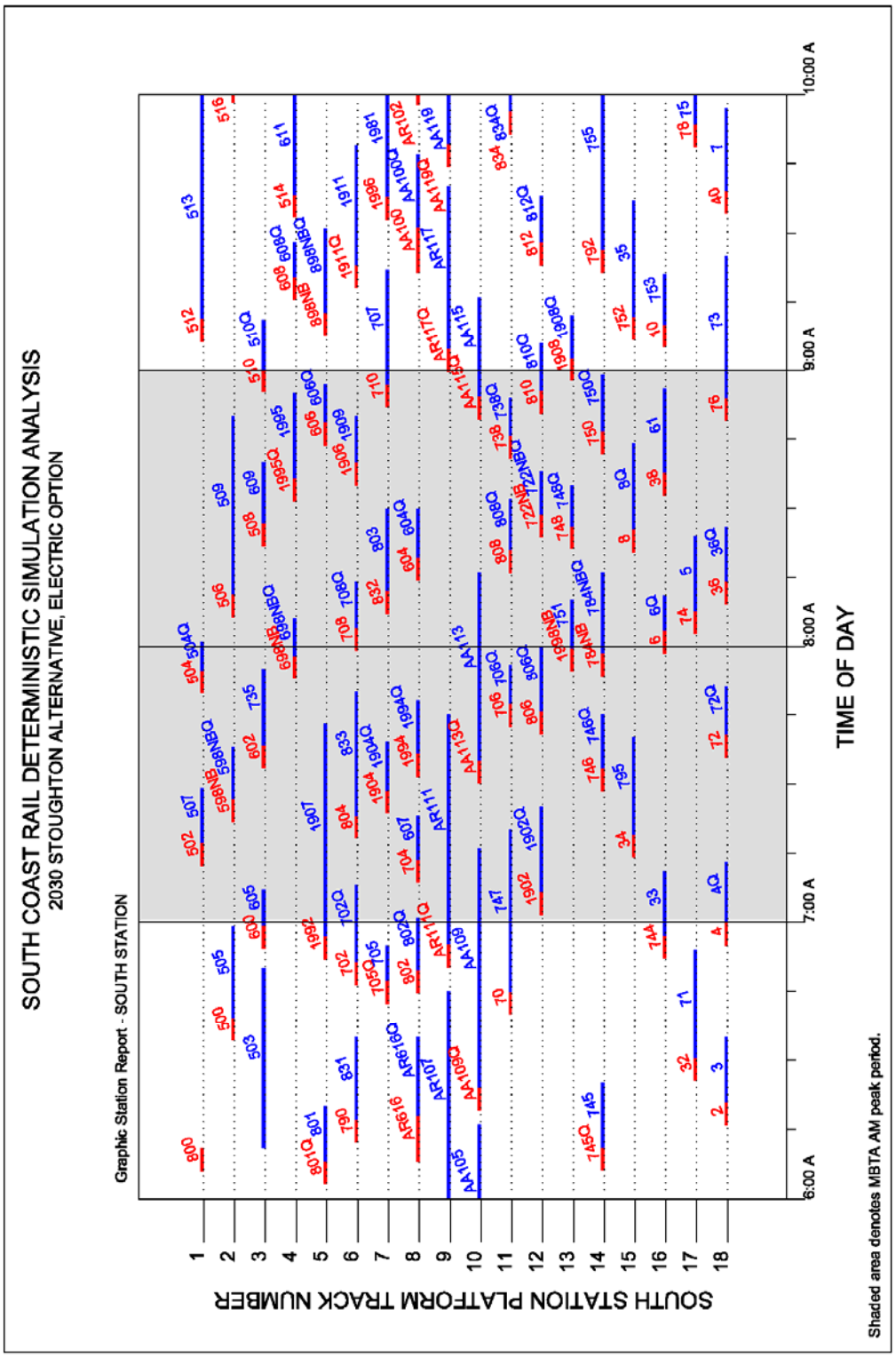
These charts illustrate how the simulated operation was staged in South Station. As has been previously noted, Amtrak trains were confined to platform tracks 8-10, although those tracks were occasionally used by an MBTA train where appropriate (and where there was no conflicting Amtrak need). The pattern of usage is clear to see: Worcester Branch trains use Tracks 1, 2, and sometimes 3; Amtrak trains use Tracks 8-10; trains coming over the Fort Point Channel Bridge generally use Tracks 13-18, and the MBTA NEC trains use Tracks 3-7 and 11-12.

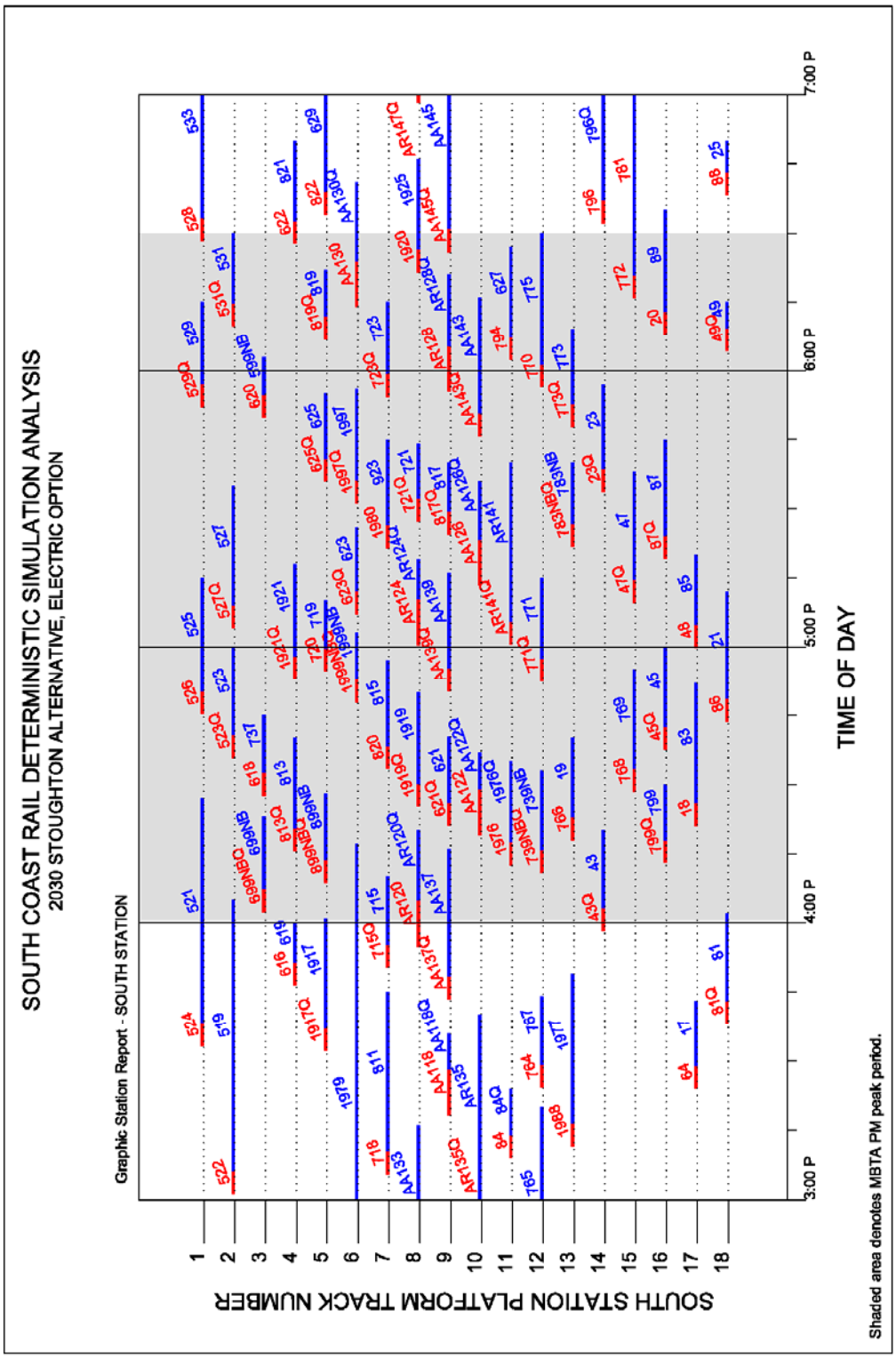

SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 NO-BUILD ALTERNATIVE
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
6:00 A
7:00 A
8:00 A
9:00 A
10:00 A
Shaded area denotes MBTA AM peak period.

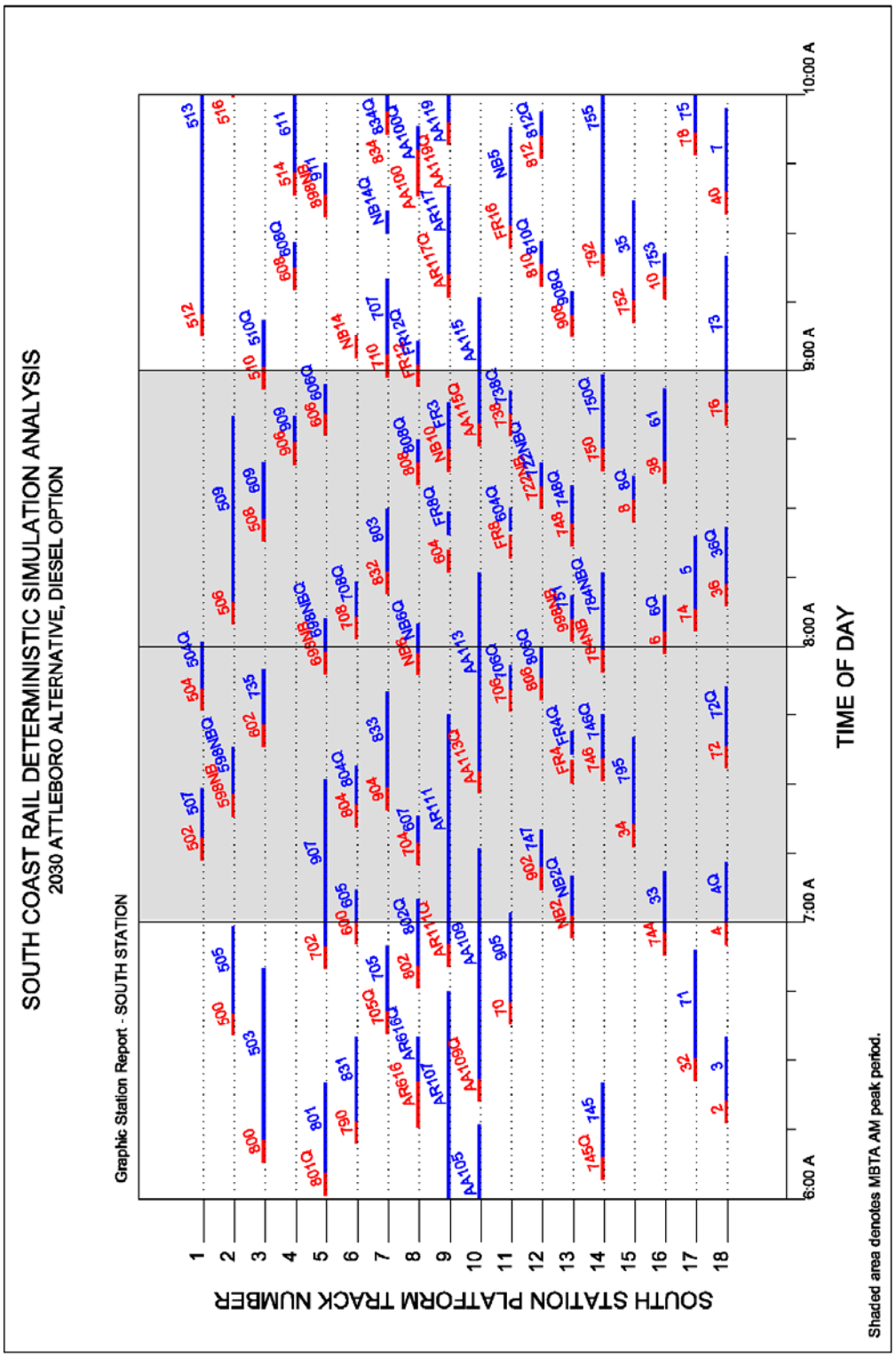

SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 NO-BUILD ALTERNATIVE
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
3:00 P
4:00 P
5:00 P
6:00 P
7:00 P
Shaded area denotes MBTA PM peak period.

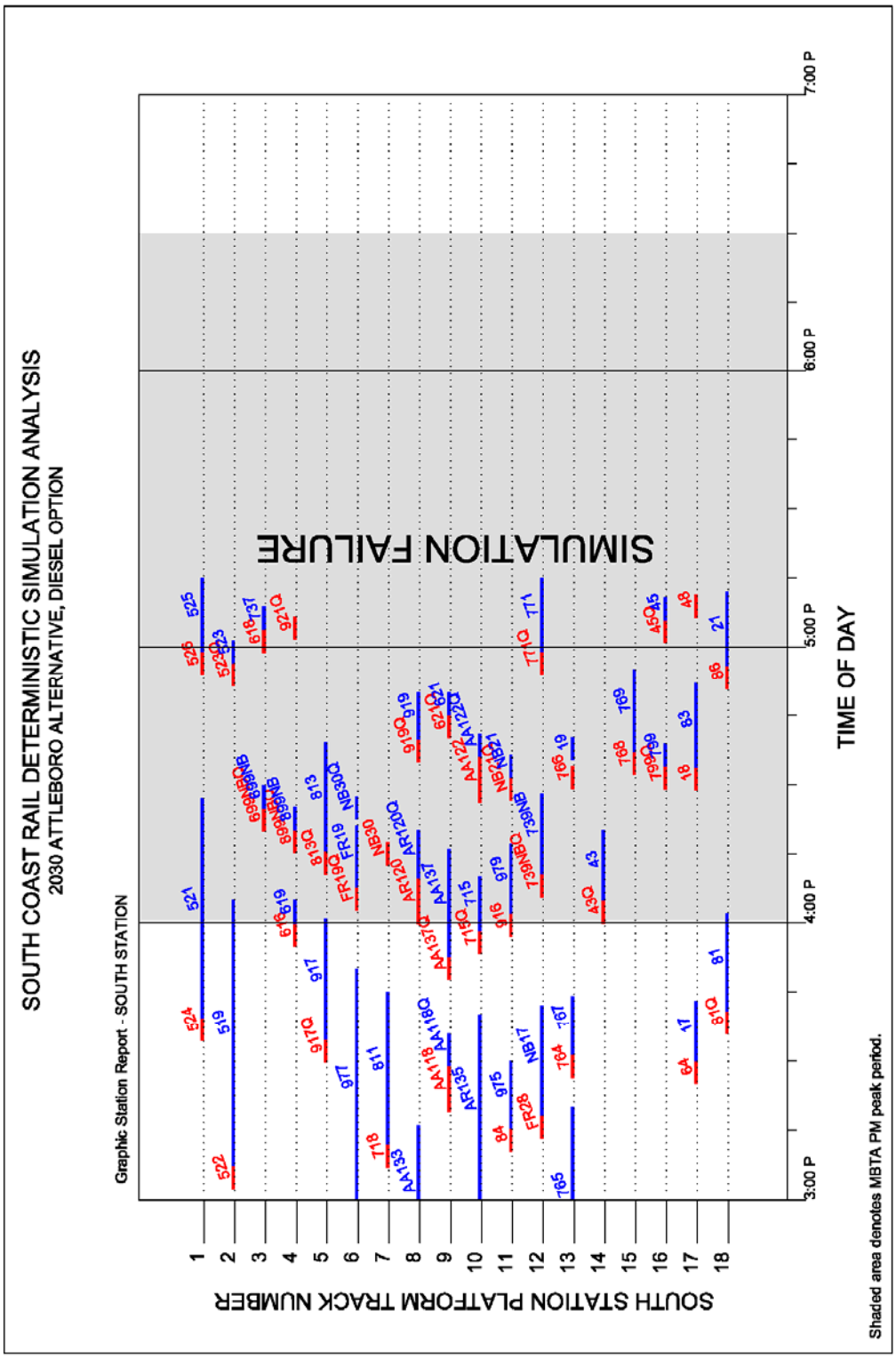

SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 STOUGHTON ALTERNATIVE, DIESEL OPTION
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
6:00 A
7:00 A
8:00 A
9:00 A
10:00 A
Shaded area denotes MBTA AM peak period.


SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 STOUGHTON ALTERNATIVE, DIESEL OPTION
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
3:00 A
4:00 P
5:00 P
6:00 P
7:00 P
Shaded area denotes MBTA PM peak period.


SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 STOUGHTON ALTERNATIVE, ELECTRIC OPTION
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
6:00 A
7:00 A
8:00 A
9:00 A
10:00 A
Shaded area denotes MBTA AM peak period.


SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 STOUGHTON ALTERNATIVE, ELECTRIC OPTION
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
3:00 P
4:00 P
5:00 P
6:00 P
7:00 P
Shaded area denotes MBTA PM peak period.


SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 ATTLEBORO ALTERNATIVE, DIESEL OPTION
Graphic Station Report - SOUTH STATION
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
6:00 A
7:00 A
8:00 A
9:00 A
10:00 A
Shaded area denotes MBTA AM peak period.


SOUTH COAST RAIL DETERMINISTIC SIMULATION ANALYSIS
2030 ATTLEBORO ALTERNATIVE, DIESEL OPTION
Graphic Station Report - SOUTH STATION
SIMULATION FAILURE
SOUTH STATION PLATFORM TRACK NUMBER
TIME OF DAY
3:00 P
4:00 P
5:00 P
6:00 P
7:00 P
Shaded area denotes MBTA PM peak period.

8.5. Sub-Alternative: The "Whittenton Variant"

This operating variant is identical to the Stoughton Alternative, except that it diverges from the Stoughton alignment approximately two miles south of the proposed station at Raynham Place to connect with the southern portion of the Attleboro Secondary, and then proceeds via the Attleboro secondary to join the New Bedford Main Line and then via the New Bedford Main Line and the Fall River Secondary to the southern terminals. It replaces the Stoughton Alternative's Taunton Station stop with a stop at Downtown Taunton, on what would be the Attleboro alignment.

The Whittenton route is approximately 1.6 miles longer, with more severe speed restrictions, than the Stoughton Alternative route. RAILSIM Train Performance Calculator (single train) simulations using both diesel and electric locomotives were performed to quantify the travel time difference between the two routes. Regardless of motive power, the Stoughton route could potentially save as much as five minutes running time over the Stoughton/Whittenton Variant Route.

The performance of the Whittendon Variant on the NEC will be nearly identical to that achieved by the Stoughton Build Alternative, and was therefore not subjected to full network simulation analysis.

9. Conclusions

The foregoing memorandum has detailed a very complex study of rail operations, following up on a late-2008 Capacity Utilization Analyses conducted over the same territory. It has brought a very robust simulation tool – the RAILSIM Network Simulator – to bear on the issues now being considered by the Massachusetts EOT. This exercise has led to the following conclusions:

1. The 2030 No-Build scenario is operationally feasible. This is indicated by its consistent ability to deliver trains on time, under deterministic simulation, 100% of the time to South Station and well over 90% of the time to the southern terminals. In addition, AM peak period arrivals at South Station achieve the 100% target even under randomization.

2. The Stoughton scenario (and its Whittenton Variant) is operationally feasible. Refinements to their operating plans during final design would further improve the outcome. Results for the Stoughton scenario were only marginally less favorable than for the No-Build. Again, deterministic results were 100% OTP at South Station and over 90% at the southern terminals.

3. The following conservative assumptions lend validity to the positive findings for the No-Build and Stoughton:

    a. The use of eight fully-loaded bi-level coaches at all times for all MBTA trains except the Framingham/Worcester Branch;

    b. The continued use of the F40 locomotive by MBTA in 2030, whose design will be 50 to 60 years old at that point;

    c. Generous two-minute peak period dwells at four NEC stations;

    d. Simulation of all F and L stops in the MBTA schedule as full scheduled stops.

4. The Attleboro Alternative, as configured, has been found to be unworkable and operationally infeasible. This result was indicated by the following findings:

    a. Although the simulation was able to process the AM operations, on time performance under deterministic conditions was far from adequate. The simulation operation fell well short of the minimum target of 100% on time performance, even in the less-intense AM Peak Period and before the imposition of randomization.

    b. Despite a lengthy and concerted effort by very experienced operators of RAILSIM, it was not possible to force the simulation to complete the proposed weekday operation, to say nothing of achieving the on-time standard. The proposed MBTA electric consist, using a high performance 8,046 horsepower HHP-8 locomotive, was used for this effort. The ability of this locomotive to recover from delay substantially exceeds the ability of the diesel F40 locomotive; the intent was to give the Attleboro Alternative the best possible chance of succeeding.

c. The simulation failure in the PM Peak indicates that catastrophic delays, related to fatal flaw-level terminal throat interlocking congestion, may be expected under this scenario even under the most favorable conditions, and demonstrates that the Attleboro Alternative is conceptually defective. In short, the desired train volumes cannot be supported at Tower 1 Interlocking and its approaches.

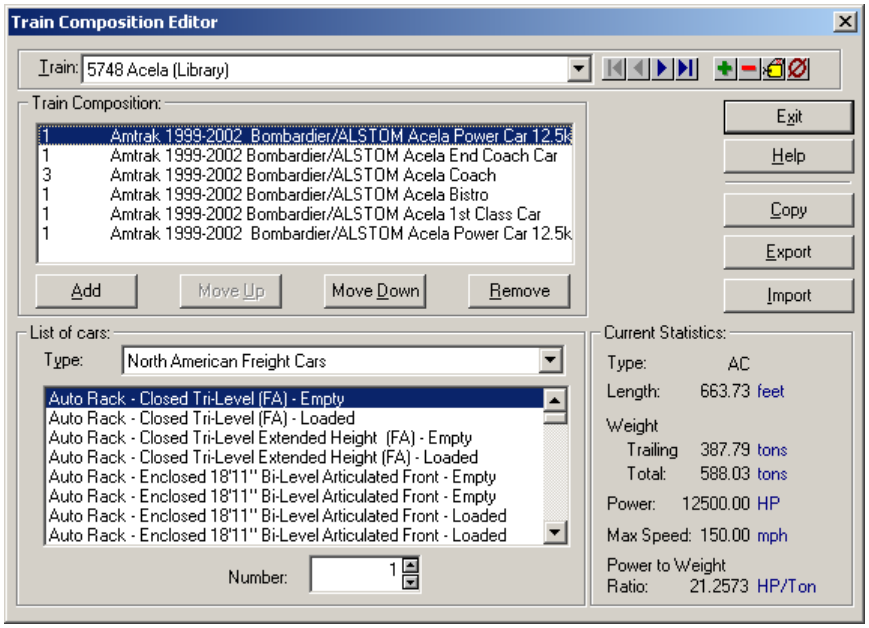
5. The limiting condition in all scenarios (and the fatal flaw in the case of the Attleboro Build scenarios) was found to be the terminal throat interlocking capacity and terminal approach capacity at South Station, which were thoroughly evaluated in the simulation. From the many iterative attempts to optimize the simulations in this area it is clear that as train volumes grow, capacity is quickly reached and then, in the case of the Attleboro Alternative, overwhelmed by the train volumes. Congestion in the terminal throat causes late arrivals. These in turn further exacerbate the problem of clearing or loading platform tracks expeditiously, and the problem persists until train volumes begin to shrink after the peak periods.

6. The electric option for the Stoughton and Attleboro has only a very slight positive effect on simulation results, as measured by on time performance and signal delay. Its primary benefit will be in providing modestly shorter end-to-end running times, and in providing an enhanced ability to recover from routine minor delays, such as door problems or unexpected excess passenger loading.

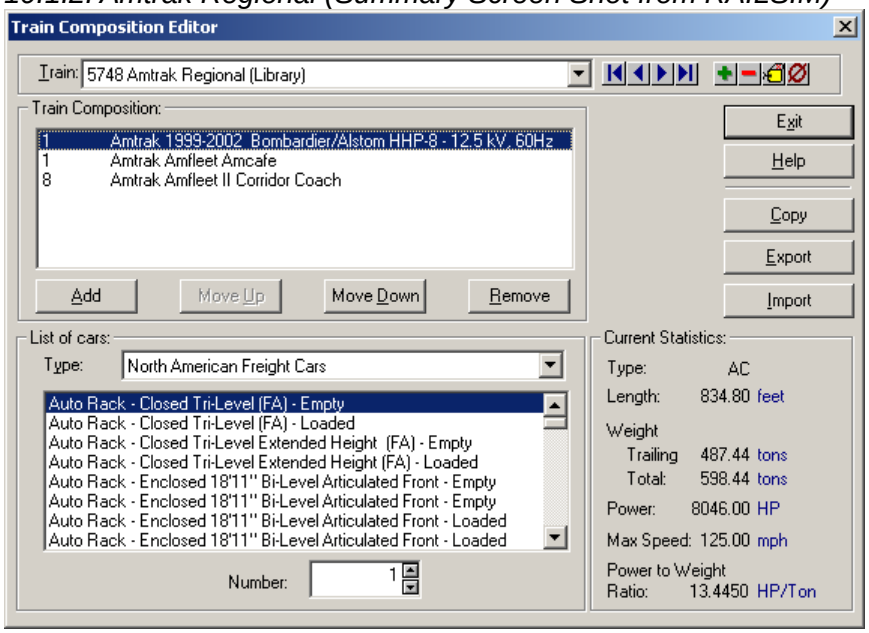
10. Appendix

10.1. Simulated Train Consists

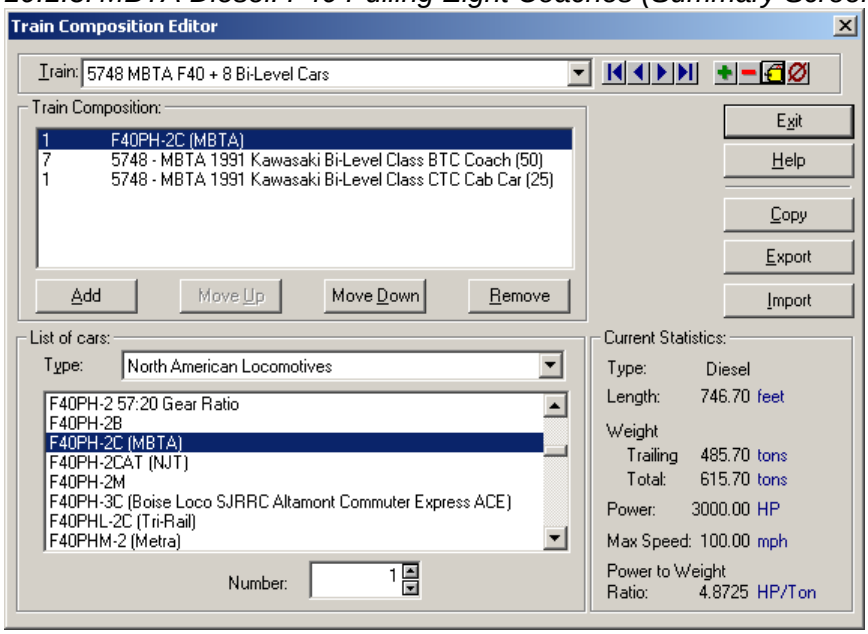
10.1.1. Amtrak Acela (Summary Screen Shot from RAILSIM)



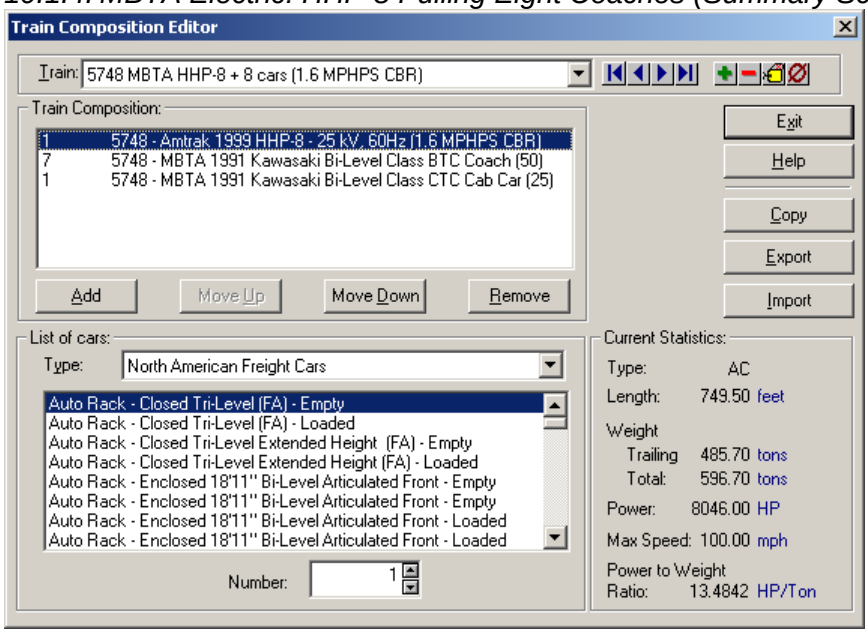
10.1.2. Amtrak Regional (Summary Screen Shot from RAILSIM)



10.1.3. MBTA Diesel: F40 Pulling Eight Coaches (Summary Screen Shot from RAILSIM)

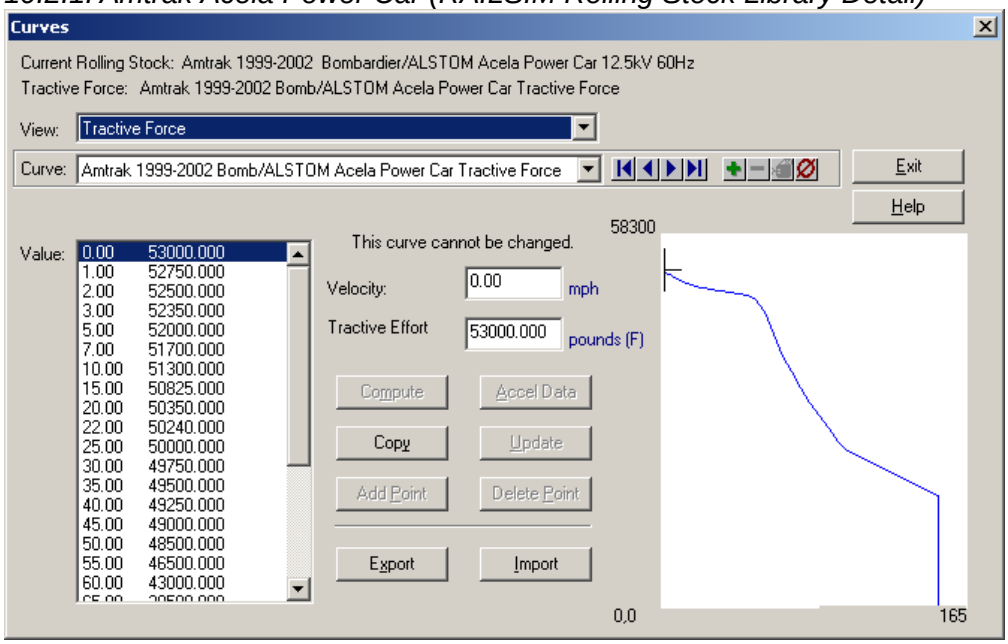


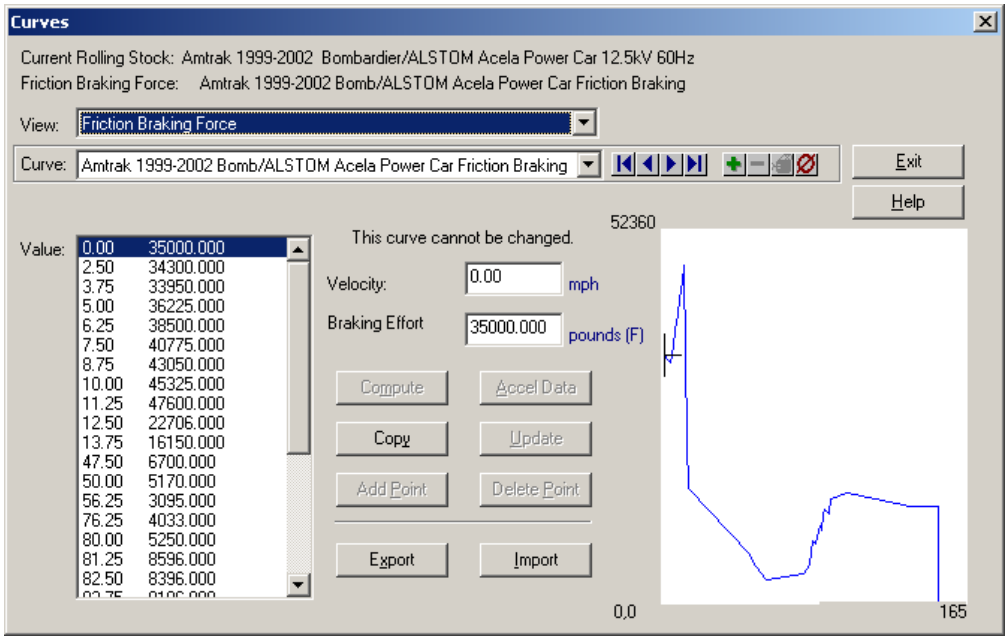
10.1.4. MBTA Electric: HHP-8 Pulling Eight Coaches (Summary Screen Shot from RAILSIM)

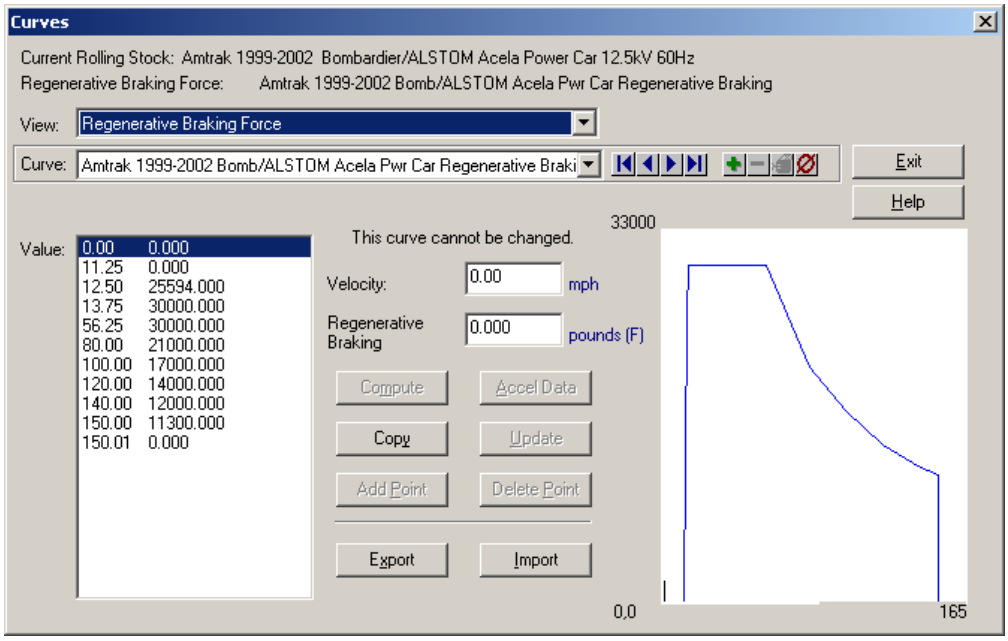


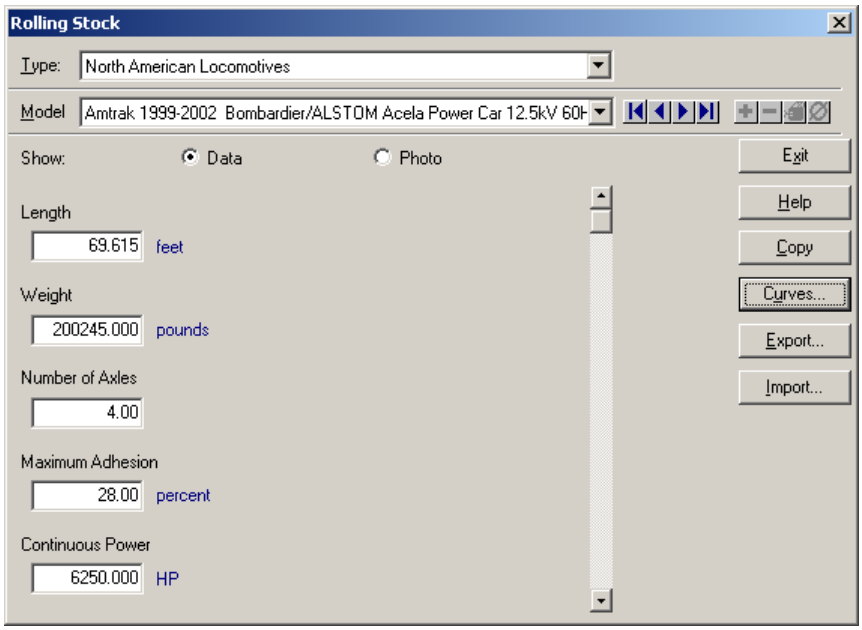
10.2. Locomotive Attributes

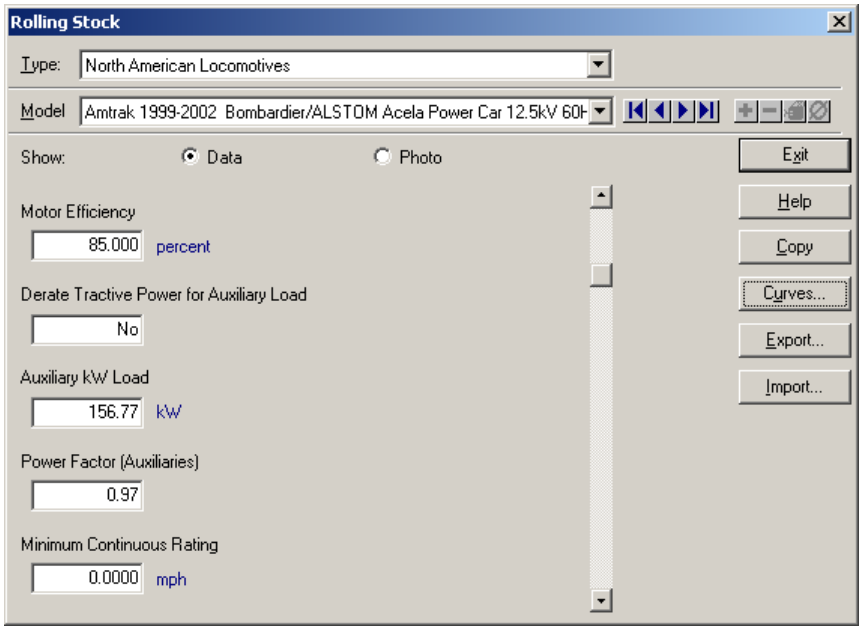
10.2.1. Amtrak Acela Power Car (RAILSIM Rolling Stock Library Detail)

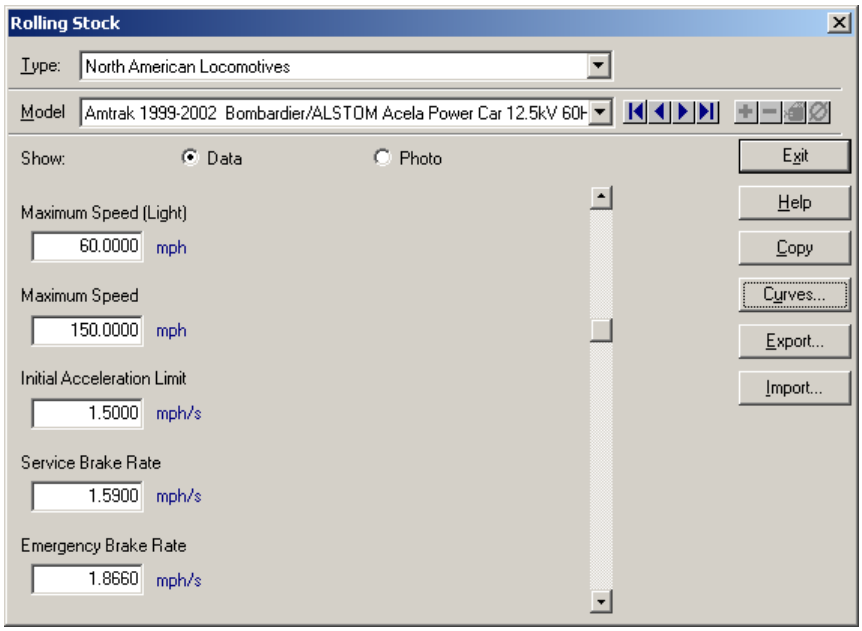


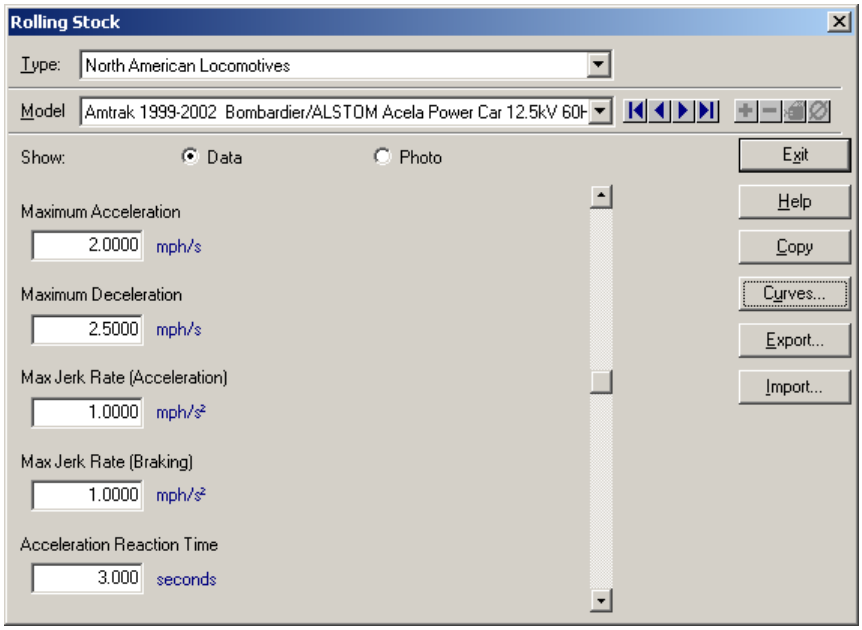


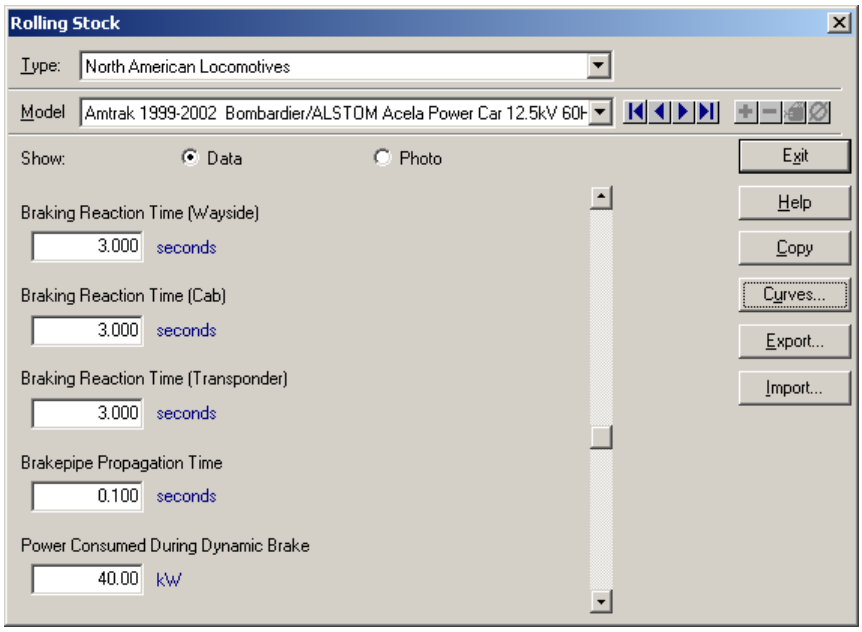

Curves
Current Rolling Stock: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz
Regenerative Braking Force: Amtrak 1999-2002 Bomb/ALSTOM Acela Pwr Car Regenerative Braking
View: Regenerative Braking Force
Curve: Amtrak 1999-2002 Bomb/ALSTOM Acela Pwr Car Regenerative Braki
Exit
Help
Value:
0.00 0.000
11.25 0.000
12.50 25594.000
13.75 30000.000
56.25 30000.000
80.00 21000.000
100.00 17000.000
120.00 14000.000
140.00 12000.000
150.00 11300.000
150.01 0.000
This curve cannot be changed.
Velocity: 0.00 mph
Regenerative Braking 0.000 pounds (F)
Compute
Accel Data
Copy
Update
Add Point
Delete Point
Export
Import
33000
0,0
165

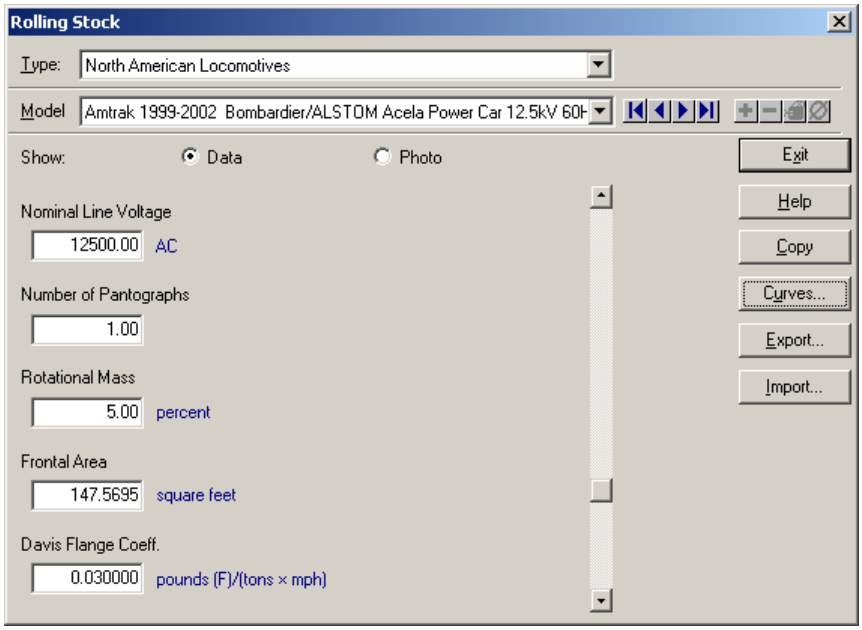

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Length
69.615 feet
Weight
200245.000 pounds
Number of Axles
4.00
Maximum Adhesion
28.00 percent
Continuous Power
6250.000 HP

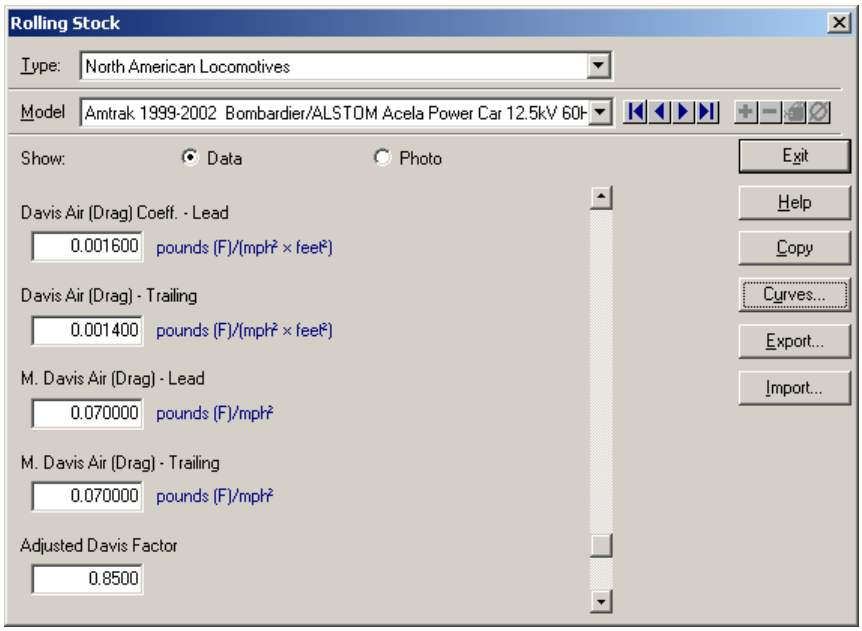

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Motor Efficiency
85.000 percent
Derate Tractive Power for Auxiliary Load
No
Auxiliary kW Load
156.77 kW
Power Factor (Auxiliaries)
0.97
Minimum Continuous Rating
0.0000 mph

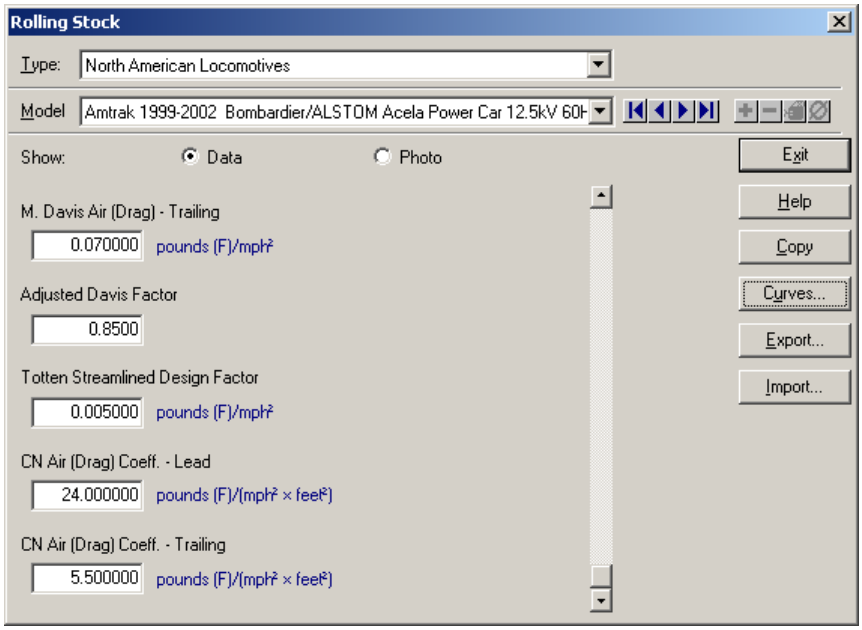

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Speed (Light)
60.0000 mph
Maximum Speed
150.0000 mph
Initial Acceleration Limit
1.5000 mph/s
Service Brake Rate
1.5900 mph/s
Emergency Brake Rate
1.8660 mph/s


Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Acceleration
2.0000 mph/s
Maximum Deceleration
2.5000 mph/s
Max Jerk Rate (Acceleration)
1.0000 mph/s²
Max Jerk Rate (Braking)
1.0000 mph/s²
Acceleration Reaction Time
3.000 seconds

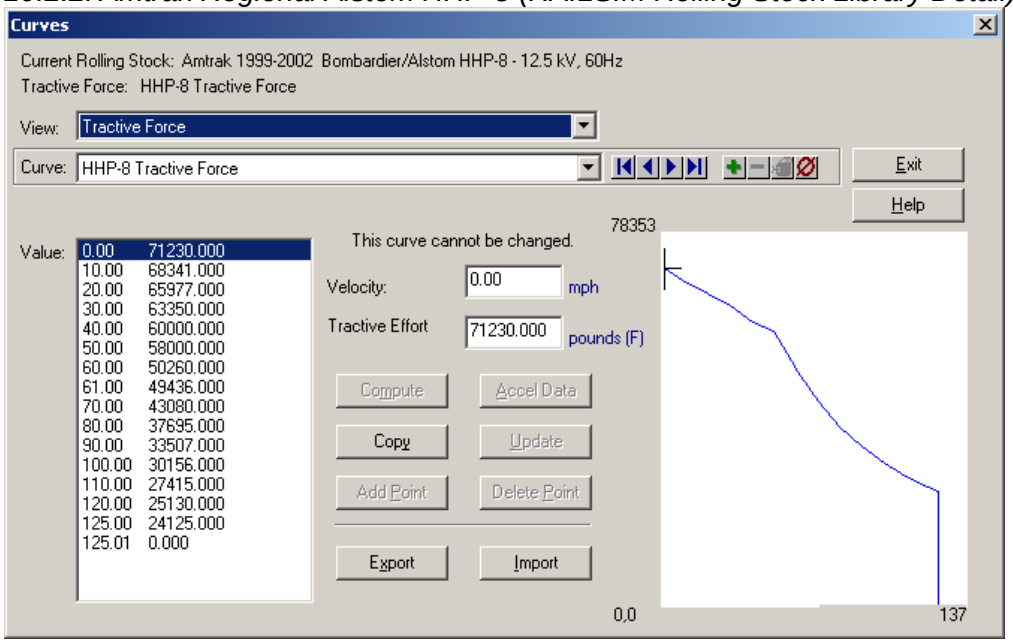

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Braking Reaction Time (Wayside)
3.000 seconds
Braking Reaction Time (Cab)
3.000 seconds
Braking Reaction Time (Transponder)
3.000 seconds
Brakepipe Propagation Time
0.100 seconds
Power Consumed During Dynamic Brake
40.00 kW

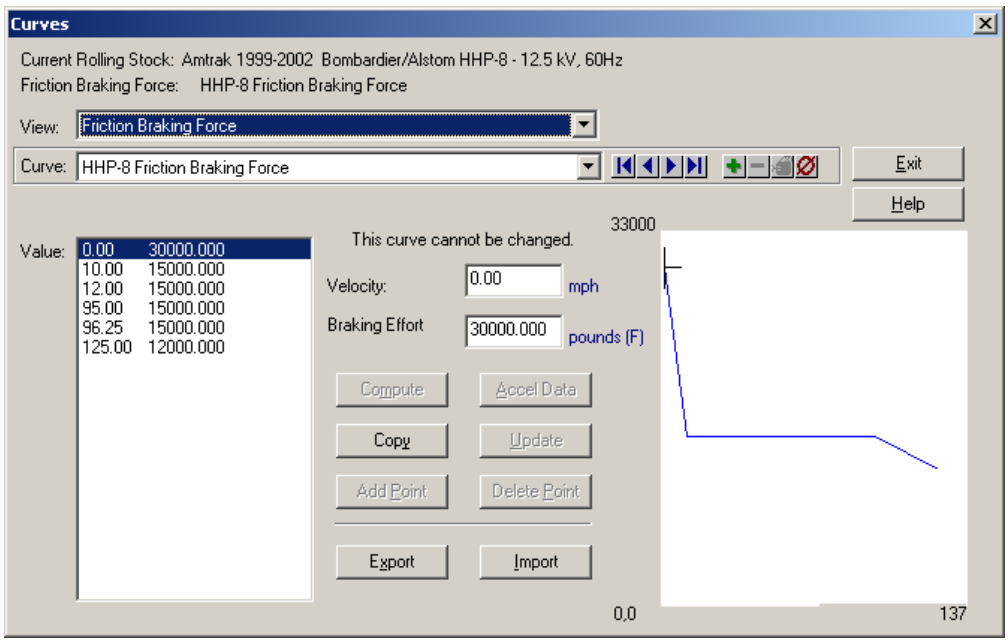

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Nominal Line Voltage
12500.00 AC
Number of Pantographs
1.00
Rotational Mass
5.00 percent
Frontal Area
147.5695 square feet
Davis Flange Coeff.
0.030000 pounds (F)/(tons × mph)

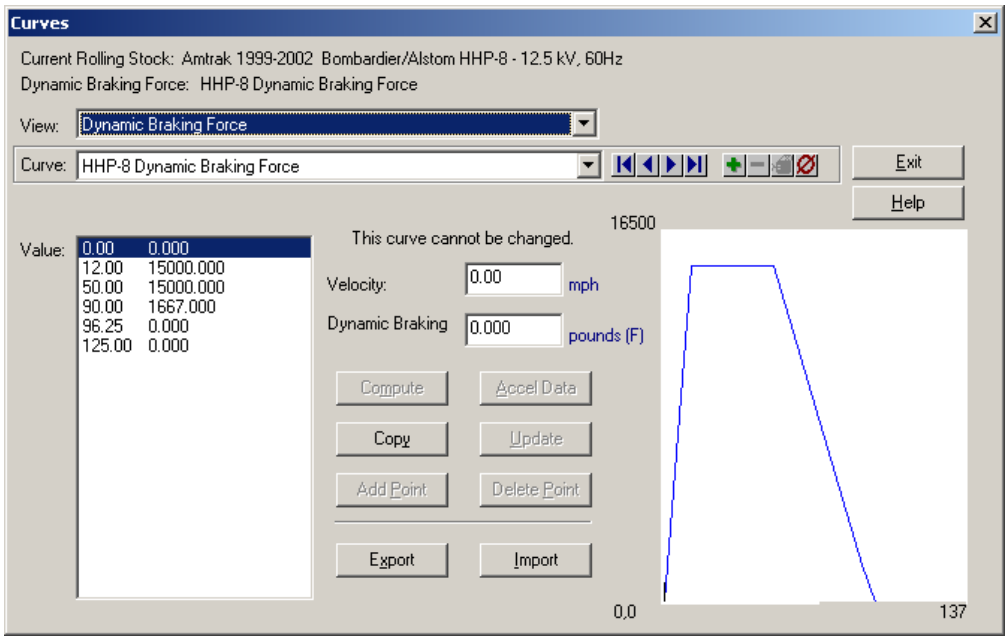

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60H
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Davis Air (Drag) Coeff. - Lead
0.001600 pounds (F)/(mph² × feet²)
Davis Air (Drag) - Trailing
0.001400 pounds (F)/(mph² × feet²)
M. Davis Air (Drag) - Lead
0.070000 pounds (F)/mph²
M. Davis Air (Drag) - Trailing
0.070000 pounds (F)/mph²
Adjusted Davis Factor
0.8500

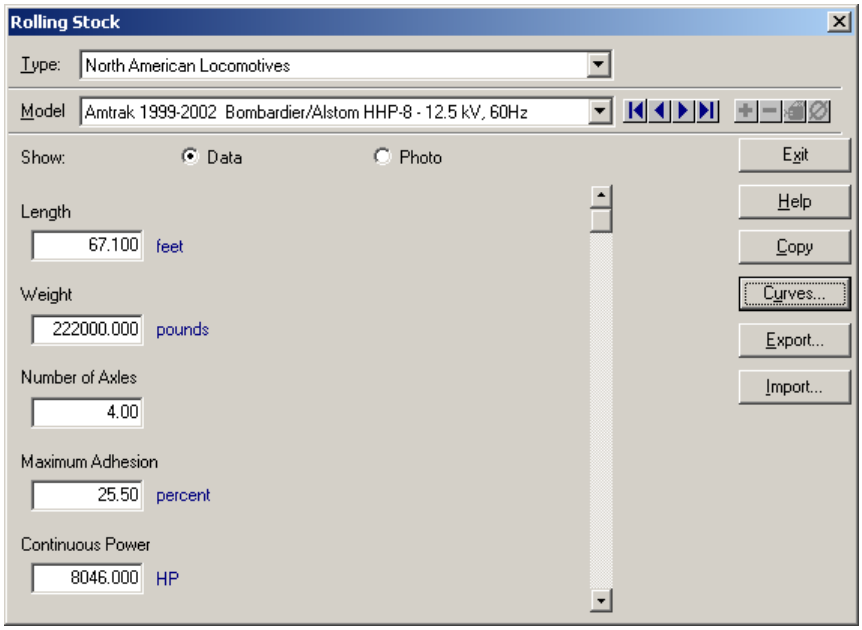


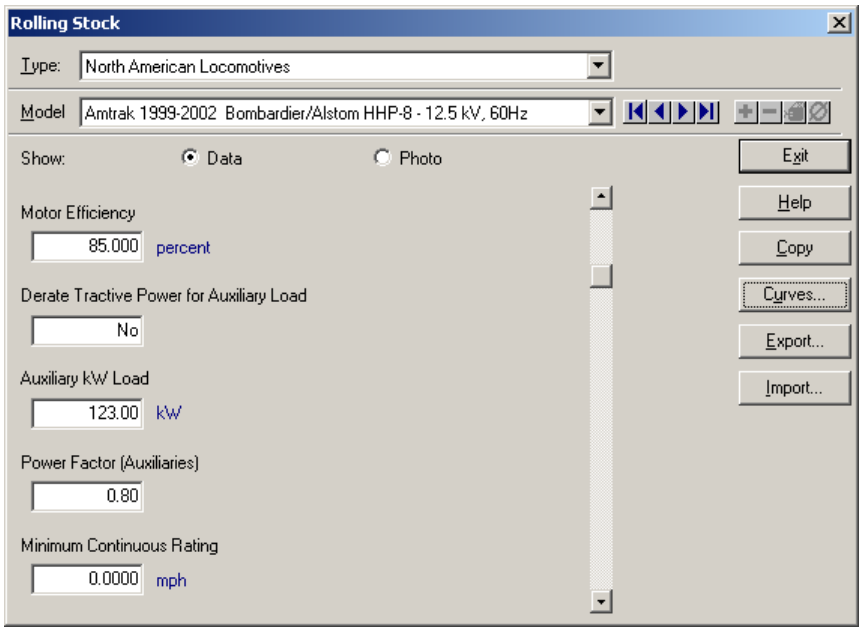
10.2.2. Amtrak Regional Alstom HHP-8 (RAILSIM Rolling Stock Library Detail)

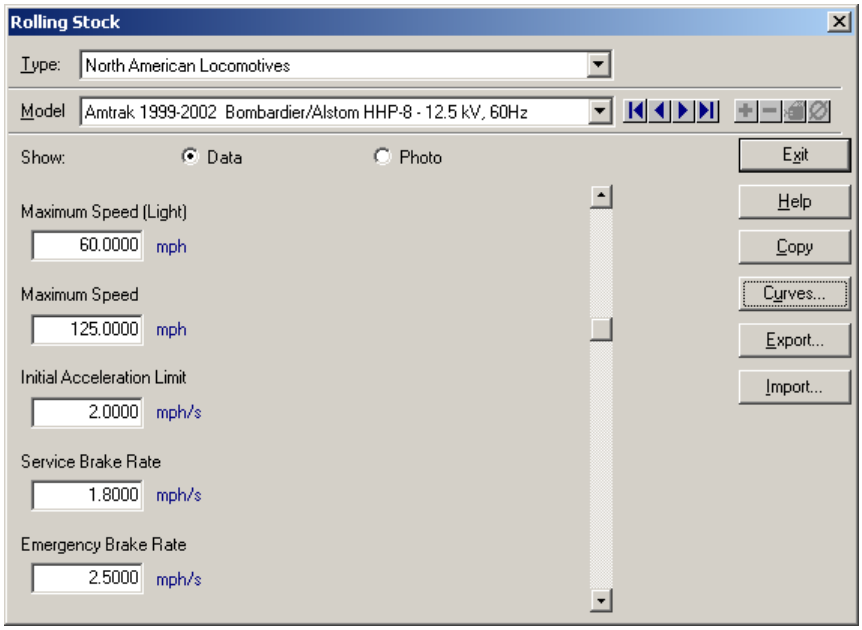


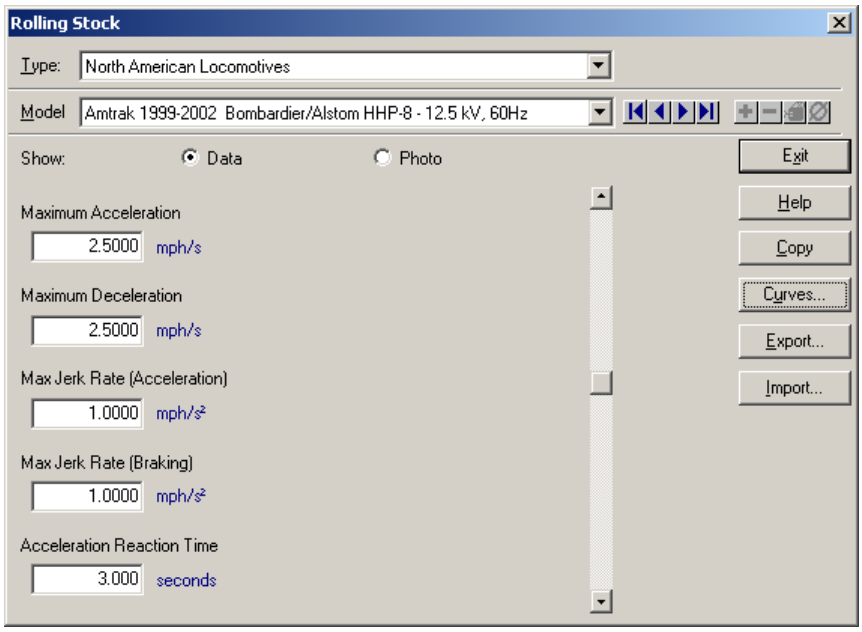

Curves
Current Rolling Stock: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Friction Braking Force: HHP-8 Friction Braking Force
View: Friction Braking Force
Curve: HHP-8 Friction Braking Force
Exit
Help
Value:
0.00 30000.000
10.00 15000.000
12.00 15000.000
95.00 15000.000
96.25 15000.000
125.00 12000.000
This curve cannot be changed.
Velocity: 0.00 mph
Braking Effort 30000.000 pounds (F)
Compute
Accel Data
Copy
Update
Add Point
Delete Point
Export
Import
33000
0,0
137

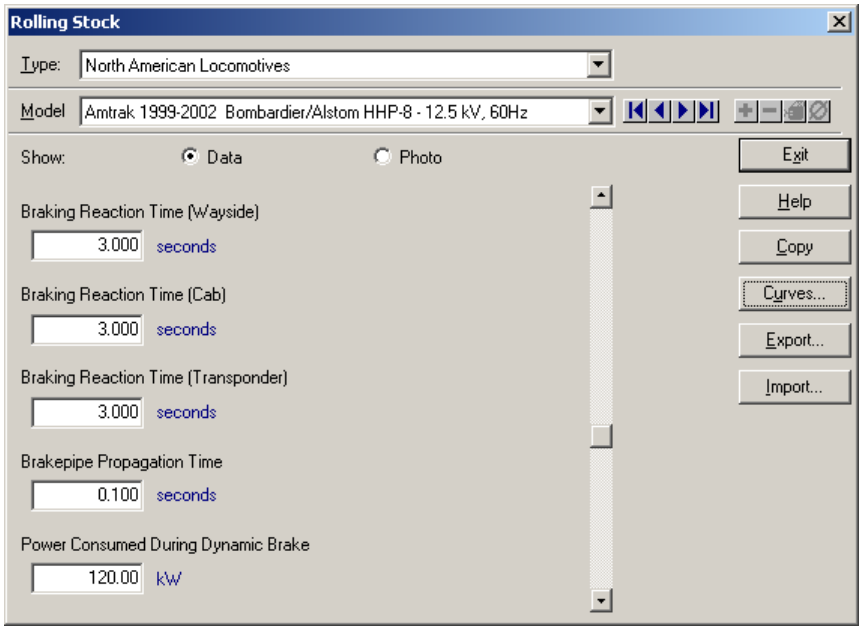

Curves
Current Rolling Stock: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Dynamic Braking Force: HHP-8 Dynamic Braking Force
View: Dynamic Braking Force
Curve: HHP-8 Dynamic Braking Force
Exit
Help
Value:
0.00 0.000
12.00 15000.000
50.00 15000.000
90.00 1667.000
96.25 0.000
125.00 0.000
This curve cannot be changed.
Velocity: 0.00 mph
Dynamic Braking 0.000 pounds (F)
Compute
Accel Data
Copy
Update
Add Point
Delete Point
Export
Import
16500
0,0
137

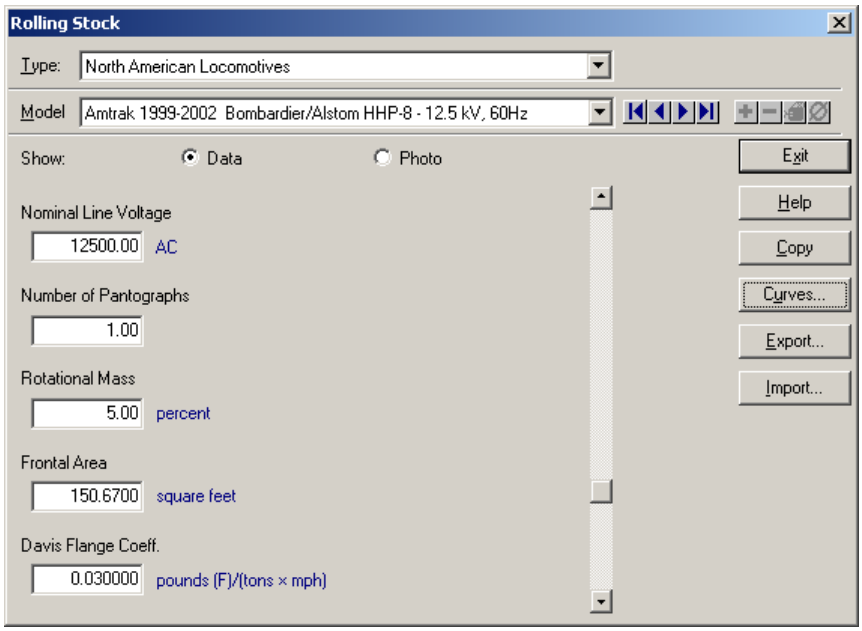

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Length
67.100 feet
Weight
222000.000 pounds
Number of Axles
4.00
Maximum Adhesion
25.50 percent
Continuous Power
8046.000 HP

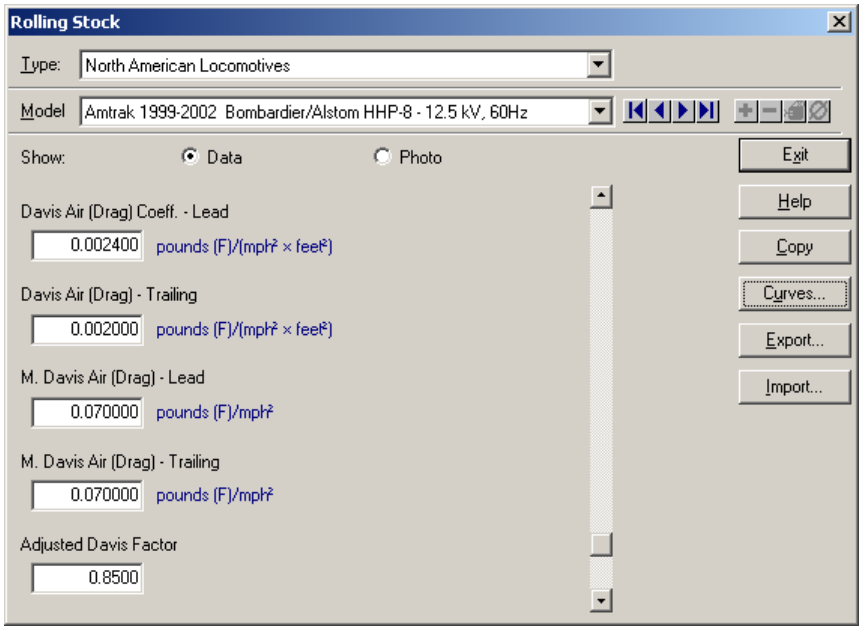

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Motor Efficiency
85.000 percent
Derate Tractive Power for Auxiliary Load
No
Auxiliary kW Load
123.00 kW
Power Factor (Auxiliaries)
0.80
Minimum Continuous Rating
0.0000 mph

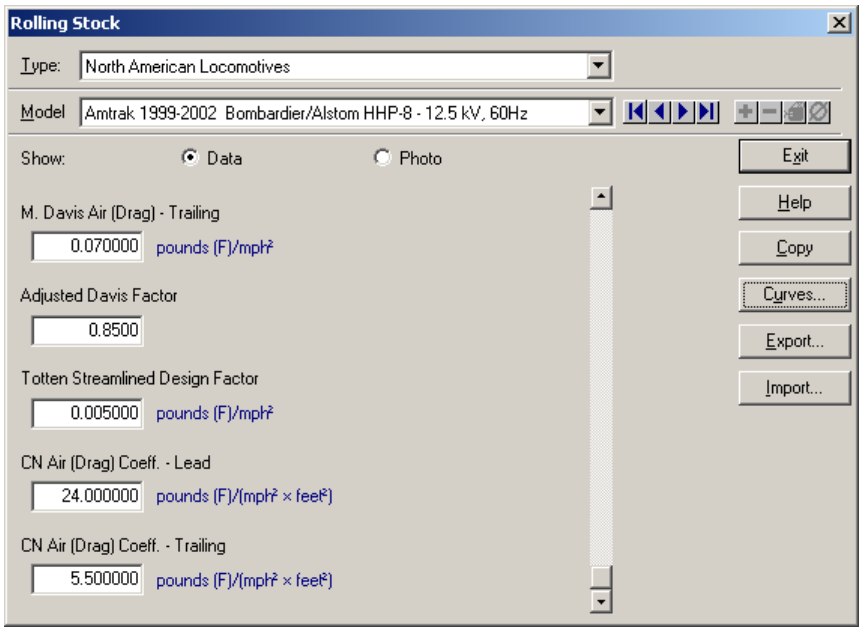

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Speed (Light)
60.0000 mph
Maximum Speed
125.0000 mph
Initial Acceleration Limit
2.0000 mph/s
Service Brake Rate
1.8000 mph/s
Emergency Brake Rate
2.5000 mph/s


Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Acceleration
2.5000 mph/s
Maximum Deceleration
2.5000 mph/s
Max Jerk Rate (Acceleration)
1.0000 mph/s²
Max Jerk Rate (Braking)
1.0000 mph/s²
Acceleration Reaction Time
3.000 seconds

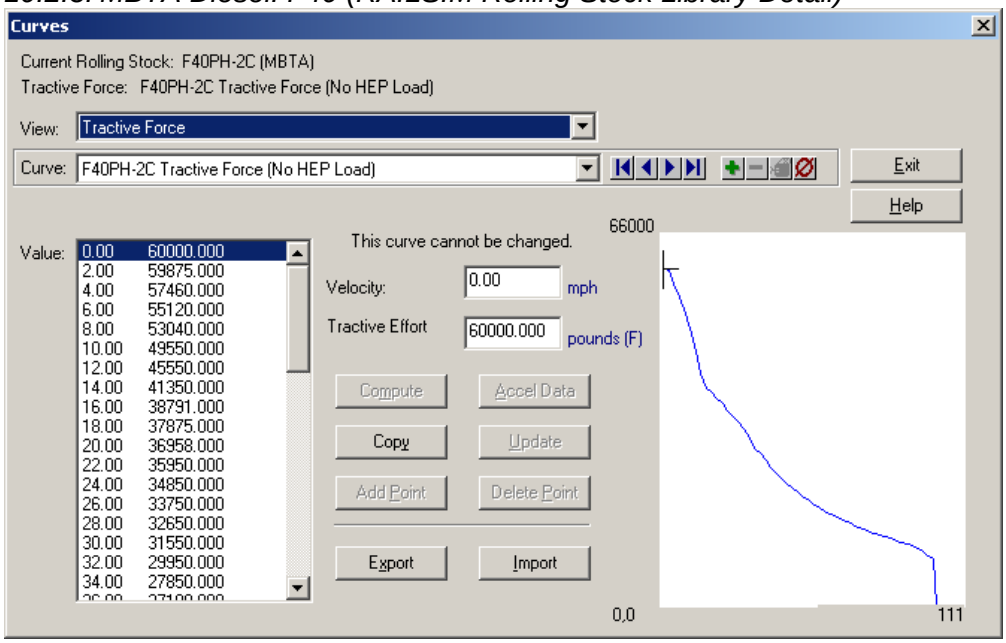

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Braking Reaction Time (Wayside)
3.000 seconds
Braking Reaction Time (Cab)
3.000 seconds
Braking Reaction Time (Transponder)
3.000 seconds
Brakepipe Propagation Time
0.100 seconds
Power Consumed During Dynamic Brake
120.00 kW

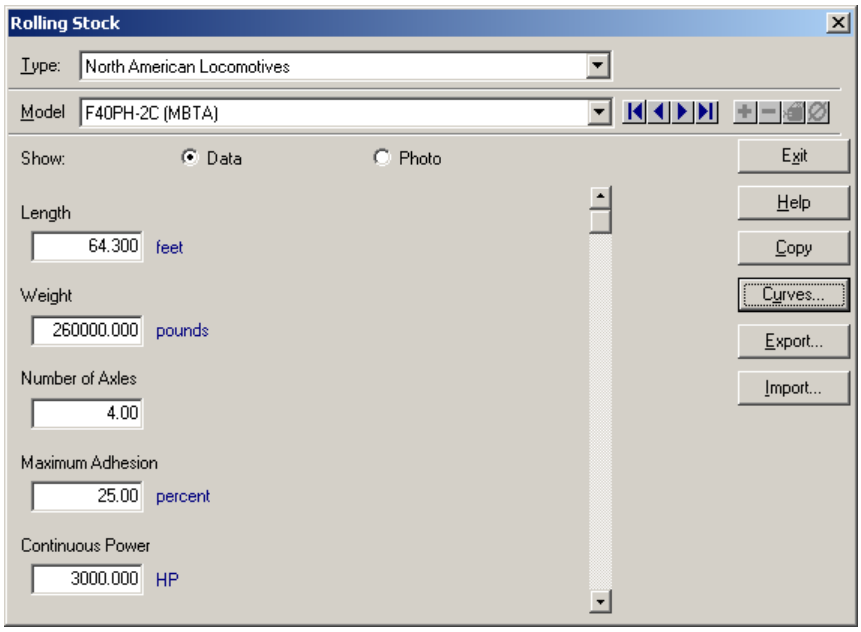

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Nominal Line Voltage
12500.00 AC
Number of Pantographs
1.00
Rotational Mass
5.00 percent
Frontal Area
150.6700 square feet
Davis Flange Coeff.
0.030000 pounds (F)/(tons × mph)

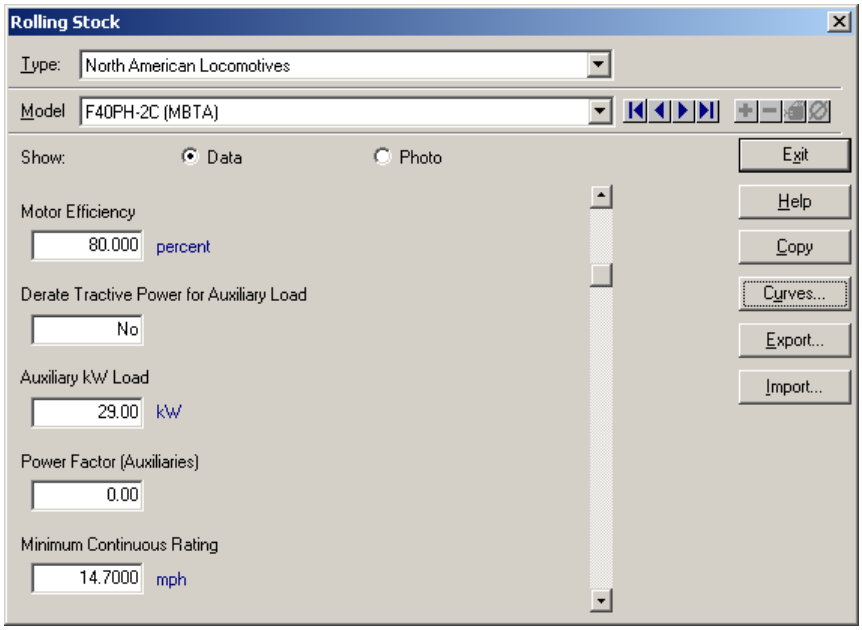

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Davis Air (Drag) Coeff. - Lead
0.002400 pounds (F)/(mph² × feet²)
Davis Air (Drag) - Trailing
0.002000 pounds (F)/(mph² × feet²)
M. Davis Air (Drag) - Lead
0.070000 pounds (F)/mph²
M. Davis Air (Drag) - Trailing
0.070000 pounds (F)/mph²
Adjusted Davis Factor
0.8500

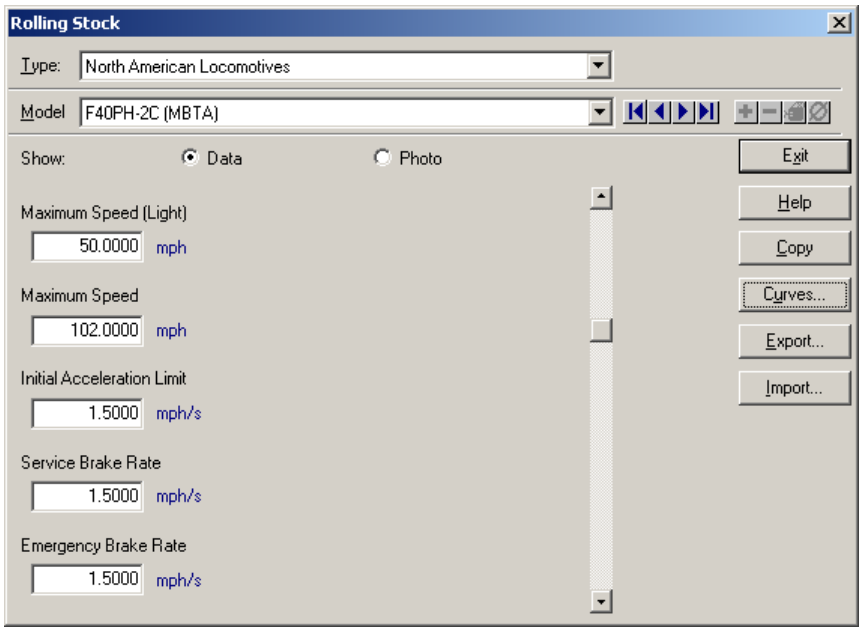

Rolling Stock
Type: North American Locomotives
Model Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
M. Davis Air (Drag) - Trailing
0.070000 pounds (F)/mph²
Adjusted Davis Factor
0.8500
Totten Streamlined Design Factor
0.005000 pounds (F)/mph²
CN Air (Drag) Coeff. - Lead
24.000000 pounds (F)/(mph² × feet²)
CN Air (Drag) Coeff. - Trailing
5.500000 pounds (F)/(mph² × feet²)

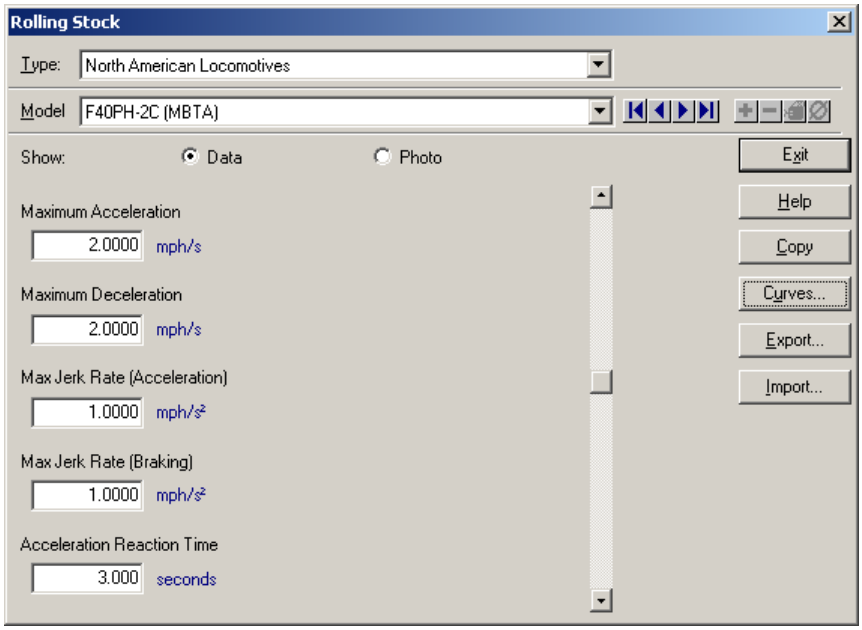
10.2.3. MBTA Diesel: F40 (RAILSIM Rolling Stock Library Detail)

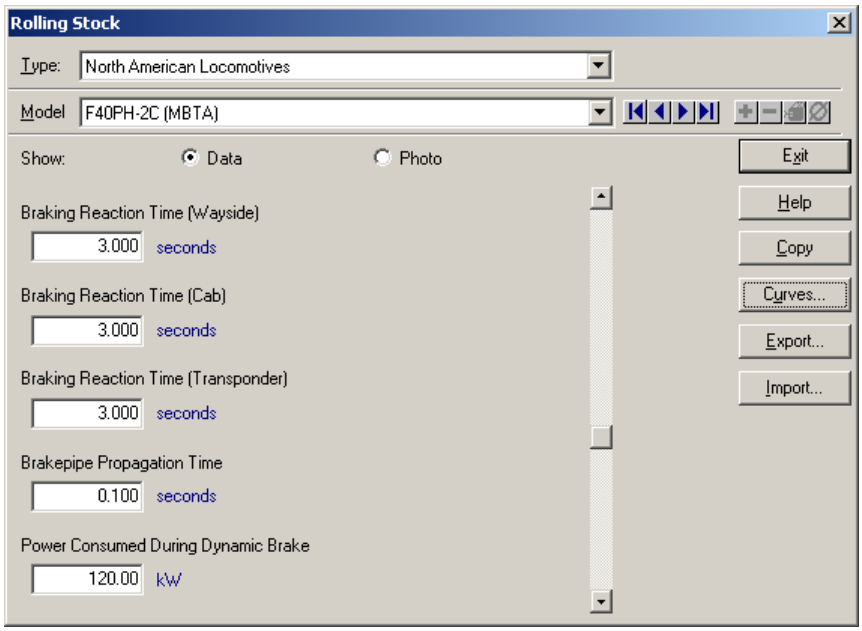


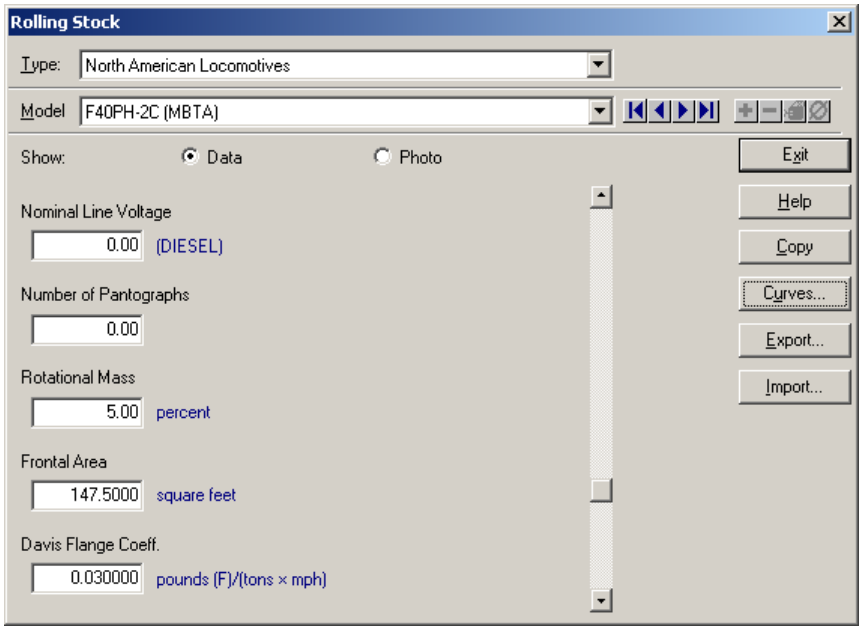


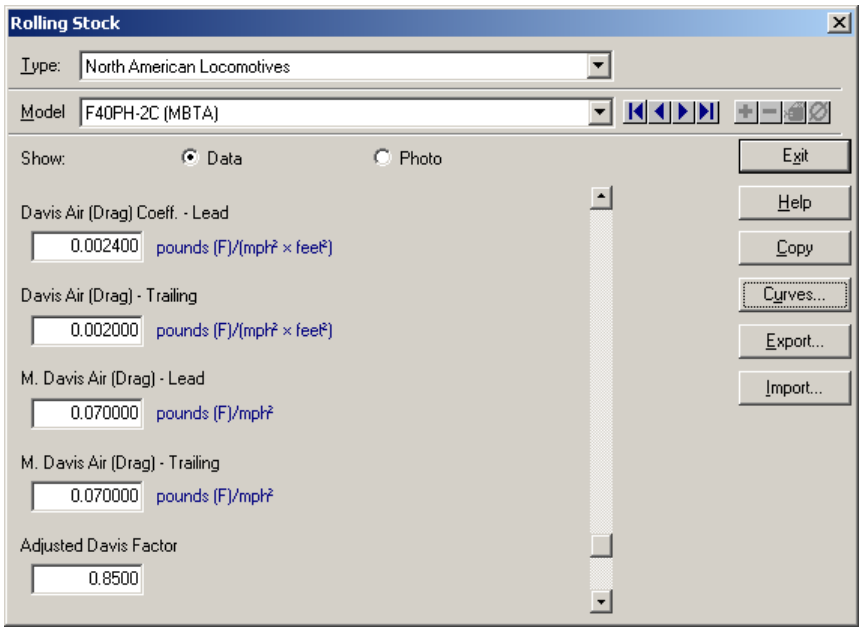

Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Motor Efficiency
80.000 percent
Derate Tractive Power for Auxiliary Load
No
Auxiliary kW Load
29.00 kW
Power Factor (Auxiliaries)
0.00
Minimum Continuous Rating
14.7000 mph

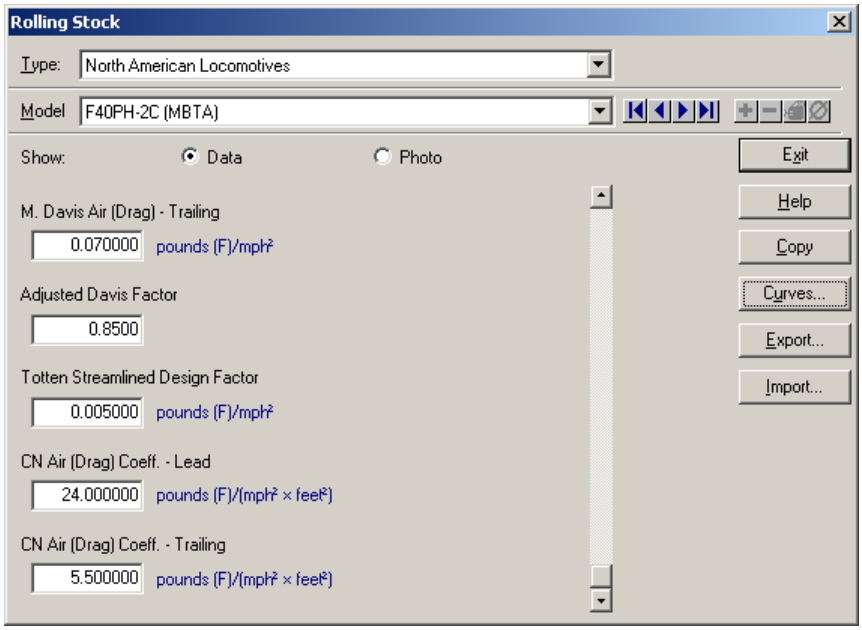

Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Speed (Light)
50.0000 mph
Maximum Speed
102.0000 mph
Initial Acceleration Limit
1.5000 mph/s
Service Brake Rate
1.5000 mph/s
Emergency Brake Rate
1.5000 mph/s


Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Maximum Acceleration
2.0000 mph/s
Maximum Deceleration
2.0000 mph/s
Max Jerk Rate (Acceleration)
1.0000 mph/s²
Max Jerk Rate (Braking)
1.0000 mph/s²
Acceleration Reaction Time
3.000 seconds


Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Braking Reaction Time (Wayside)
3.000 seconds
Braking Reaction Time (Cab)
3.000 seconds
Braking Reaction Time (Transponder)
3.000 seconds
Brakepipe Propagation Time
0.100 seconds
Power Consumed During Dynamic Brake
120.00 kW


Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Nominal Line Voltage
0.00 (DIESEL)
Number of Pantographs
0.00
Rotational Mass
5.00 percent
Frontal Area
147.5000 square feet
Davis Flange Coeff.
0.030000 pounds (F)/(tons × mph)


Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
Davis Air (Drag) Coeff. - Lead
0.002400 pounds (F)/(mph² × feet²)
Davis Air (Drag) - Trailing
0.002000 pounds (F)/(mph² × feet²)
M. Davis Air (Drag) - Lead
0.070000 pounds (F)/mph²
M. Davis Air (Drag) - Trailing
0.070000 pounds (F)/mph²
Adjusted Davis Factor
0.8500


Rolling Stock
Type: North American Locomotives
Model F40PH-2C (MBTA)
Show: Data Photo
Exit
Help
Copy
Curves...
Export...
Import...
M. Davis Air (Drag) - Trailing
0.070000 pounds (F)/mph²
Adjusted Davis Factor
0.8500
Totten Streamlined Design Factor
0.005000 pounds (F)/mph²
CN Air (Drag) Coeff. - Lead
24.000000 pounds (F)/(mph² × feet²)
CN Air (Drag) Coeff. - Trailing
5.500000 pounds (F)/(mph² × feet²)

10.3. Train Performance Calculator (TPC) Running Time Results

MBTA South Coast Rail
RAILSIM® Train Performance Calculator Results

	Departure From:	To Arrival At:	Distance (Miles)	Inter-mediate Stops	Alternative	Including Dwells: Run Time (h:mm:ss)	Including Dwells: Avg. Speed (MPH)	Without Dwells: Run Time (h:mm:ss)	Without Dwells: Average Speed (MPH)	Maximum Speed Attained (MPH)
INBOUND DIESEL	Fall River	South Station	56.6	7	Attleboro	1:23:39	40.6	1:19:26	42.8	75.2
	Fall River	South Station	51.3	12	Stoughton Local	1:21:51	37.6	1:15:16	40.9	75.2
	Fall River	South Station	51.3	7	Stoughton Zone Express	1:12:20	42.5	1:08:39	44.8	75.2
	New Bedford	South Station	59.8	7	Attleboro	1:27:10	41.2	1:22:58	43.3	75.2
	New Bedford	South Station	54.5	12	Stoughton Local	1:25:20	38.3	1:18:46	41.5	75.2
	New Bedford	South Station	54.5	7	Stoughton Zone Express	1:15:50	43.1	1:12:09	45.3	75.2
	East Taunton	Raynham	9.1	1	Whittenton Route	0:17:00	32.1	0:16:28	33.2	55.2
	East Taunton	Raynham	7.5	1	Stoughton Branch Route	0:11:49	38.0	0:11:18	39.8	42.6
	Whittenton Route time minus Stoughton Route time					***0:05:10***	-	***0:05:10***	-	-
OUTBOUND DIESEL	South Station	Fall River	56.8	7	Attleboro	1:24:08	40.5	1:19:55	42.6	75.2
	South Station	Fall River	51.1	13	Stoughton Local	1:24:32	36.3	1:17:26	39.6	71.6
	South Station	Fall River	51.1	7	Stoughton Zone Express	1:12:41	42.2	1:09:00	44.5	75.2
	South Station	New Bedford	60.0	7	Attleboro	1:26:07	41.8	1:21:54	43.9	75.2
	South Station	New Bedford	54.3	13	Stoughton Local	1:26:31	37.7	1:21:46	39.9	71.6
	South Station	New Bedford	54.3	7	Stoughton Zone Express	1:14:40	43.7	1:10:59	45.9	75.2
	Raynham	East Taunton	9.1	1	Whittenton Route	0:16:22	33.4	0:15:50	34.5	57.1
	Raynham	East Taunton	7.5	1	Stoughton Branch Route	0:11:28	39.2	0:10:56	41.1	66.7
	Whittenton Route time minus Stoughton Route time					***0:04:54***	-	***0:04:54***	-	-
INBOUND ELECTRIC	Fall River	South Station	56.6	7	Attleboro	1:11:59	47.2	1:07:47	50.1	95.2
	Fall River	South Station	51.3	12	Stoughton Local	1:09:49	44.1	1:03:15	48.6	95.2
	Fall River	South Station	51.3	7	Stoughton Zone Express	1:01:31	50.0	0:57:50	53.2	95.2
	New Bedford	South Station	59.8	7	Attleboro	1:13:17	49.0	1:09:00	52.0	95.2
	New Bedford	South Station	54.5	12	Stoughton Local	1:11:53	45.5	1:05:11	50.2	95.2
	New Bedford	South Station	54.5	7	Stoughton Zone Express	1:03:14	51.7	0:59:30	55.0	95.2
	East Taunton	Raynham	9.1	1	Whittenton Route	0:15:24	35.5	0:14:53	36.7	75.5
	East Taunton	Raynham	7.5	1	Stoughton Branch Route	0:09:56	45.2	0:09:24	47.8	95.2
	Whittenton Route time minus Stoughton Route time					***0:05:28***	-	***0:05:29***	-	-
OUTBOUND ELECTRIC	South Station	Fall River	56.8	7	Attleboro	1:12:55	46.7	1:08:43	49.6	95.2
	South Station	Fall River	51.1	13	Stoughton Local	1:13:23	41.8	1:06:16	46.3	95.2
	South Station	Fall River	51.1	7	Stoughton Zone Express	1:02:40	48.9	0:59:00	52.0	95.2
	South Station	New Bedford	60.0	7	Attleboro	1:12:08	49.9	1:07:55	53.0	95.2
	South Station	New Bedford	54.3	13	Stoughton Local	1:12:35	44.9	1:05:29	49.8	95.2
	South Station	New Bedford	54.3	7	Stoughton Zone Express	1:01:53	52.7	0:58:12	56.0	95.2
	Raynham	East Taunton	9.1	1	Whittenton Route	0:15:04	36.3	0:14:32	37.6	76.3
	Raynham	East Taunton	7.5	1	Stoughton Branch Route	0:09:30	47.3	0:08:58	50.1	95.2
	Whittenton Route time minus Stoughton Route time					***0:05:34***	-	***0:05:34***	-	-

NOTES: 5% Schedule Margin applied; 0% Comfort Braking; Full Seated Load of 1,475 pass. in 7 MBTA Kawasaki Bi-Level coaches and 1 Bi-Level Cab Car.

MOTIVE POWER: Diesel - One GP40LH-2 (MBTA/AMF) ; Electric - One Amtrak 1999 HHP-8 - 25 kV, 60Hz

SYSTRA 5748_20090624_0001

10.4. Operating Plans

The following applies to all of the operating plan data:

- Peak Period trains are shaded gray.
- Any train name ending in "NB" is a train added for assumed MBTA service growth for 2030.
- An "AA" Amtrak train is an Acela Express; an "AR" Acela train is a Regional.

10.4.1. Amtrak 2020 Projected Northeast Corridor "North End" Operating Plan

EB TRAIN	WB TRAIN	Notes	P AR	P DP	ORMS	LAWN	HEB	HOL	M'FLD	JCT	RT128	T'FER	BBAY	COVE	Boston
616		Amtrak Night Owl	05:25	05:27	05:28	05:31	05:35	05:38	05:41	05:53	D 05:57	05:59	D 06:07	06:08	D 06:11
100		Amtrak Acela Express	08:43	08:45	08:46	08:49	08:52	08:55	08:57	09:05	D 09:09	09:10	D 09:19	09:20	D 09:23
102		Amtrak Acela Regional	09:16	09:18	09:19	09:22	09:26	09:29	09:32	09:44	D 09:48	09:50	D 09:58	09:59	D 10:02
104		Amtrak Acela Express	09:43	09:45	09:46	09:49	09:52	09:55	09:57	10:05	D 10:09	10:10	D 10:19	10:20	D 10:23
106		Amtrak Acela Express	10:42	10:44	10:45	10:48	10:51	10:54	10:56	11:04	D 11:08	11:09	D 11:18	11:19	D 11:22
108		Amtrak Acela Regional	11:10	11:12	11:13	11:16	11:20	11:23	11:26	11:38	D 11:42	11:44	D 11:52	11:53	D 11:56
110		Amtrak Acela Express	11:52	11:54	11:55	11:58	12:01	12:04	12:06	12:14	D 12:18	12:19	D 12:28	12:29	D 12:32
112		Amtrak Acela Express	12:39	12:41	12:42	12:45	12:48	12:51	12:53	13:01	D 13:05	13:06	D 13:15	13:16	D 13:19
114		Amtrak Acela Regional	13:16	13:18	13:19	13:22	13:26	13:29	13:32	13:44	D 13:48	13:50	D 13:58	13:59	D 14:02
116		Amtrak Acela Express	13:39	13:41	13:42	13:45	13:48	13:51	13:53	14:01	D 14:05	14:06	D 14:15	14:16	D 14:19
118		Amtrak Acela Express	14:36	14:38	14:39	14:42	14:45	14:48	14:50	14:58	D 15:02	15:03	D 15:12	15:13	D 15:16
120		Amtrak Acela Regional	15:10	15:12	15:13	15:16	15:20	15:23	15:26	15:38	D 15:42	15:44	D 15:52	15:53	D 15:56
122		Amtrak Acela Express	15:36	15:38	15:39	15:42	15:45	15:48	15:50	15:58	D 16:02	16:03	D 16:12	16:13	D 16:16
124		Amtrak Acela Regional	16:13	16:15	16:16	16:19	16:23	16:26	16:29	16:41	D 16:45	16:47	D 16:55	16:56	D 16:59
126		Amtrak Acela Express	16:36	16:38	16:39	16:42	16:45	16:48	16:50	16:58	D 17:02	17:03	D 17:12	17:13	D 17:16
128		Amtrak Acela Regional	17:10	17:12	17:13	17:16	17:20	17:23	17:26	17:38	D 17:42	17:44	D 17:52	17:53	D 17:56
130		Amtrak Acela Express	17:36	17:38	17:39	17:42	17:45	17:48	17:50	17:58	D 18:02	18:03	D 18:12	18:13	D 18:16
132		Amtrak Acela Express	18:36	18:38	18:39	18:42	18:45	18:48	18:50	18:58	D 19:02	19:03	D 19:12	19:13	D 19:16
134		Amtrak Acela Regional	19:10	19:12	19:13	19:16	19:20	19:23	19:26	19:38	D 19:42	19:44	D 19:52	19:53	D 19:56
136		Amtrak Acela Express	19:36	19:38	19:39	19:42	19:45	19:48	19:50	19:58	D 20:02	20:03	D 20:12	20:13	D 20:16
138		Amtrak Acela Regional	20:19	20:21	20:22	20:25	20:29	20:32	20:35	20:47	D 20:51	20:53	D 21:01	21:02	D 21:05
140		Amtrak Acela Express	20:36	20:38	20:39	20:42	20:45	20:48	20:50	20:58	D 21:02	21:03	D 21:12	21:13	D 21:16
142		Amtrak Acela Regional	21:23	21:25	21:26	21:29	21:33	21:36	21:39	21:51	D 21:55	21:57	D 22:05	22:06	D 22:09
144		Amtrak Acela Express	21:39	21:41	21:42	21:45	21:48	21:51	21:53	22:01	D 22:05	22:06	D 22:15	22:16	D 22:19
146		Amtrak Acela Express	22:33	22:35	22:36	22:39	22:42	22:45	22:47	22:55	D 22:59	23:00	D 23:09	23:10	D 23:13
	201	Amtrak Acela Express	04:56	04:54	04:53	04:50	04:47	04:44	04:42	04:34	S 04:30	04:29	S 04:20	04:19	S 04:16
	103	Amtrak Acela Regional	06:31	06:29	06:28	06:25	06:21	06:18	06:15	06:03	S 05:59	05:57	S 05:49	05:48	S 05:45
	105	Amtrak Acela Express	06:56	06:54	06:53	06:50	06:47	06:44	06:42	06:34	S 06:30	06:29	S 06:20	06:19	S 06:16
	107	Amtrak Acela Regional	07:31	07:29	07:28	07:25	07:21	07:18	07:15	07:03	S 06:59	06:57	S 06:49	06:48	S 06:45
	109	Amtrak Acela Express	07:56	07:54	07:53	07:50	07:47	07:44	07:42	07:34	S 07:30	07:29	S 07:20	07:19	S 07:16
	111	Amtrak Acela Regional	08:31	08:29	08:28	08:25	08:21	08:18	08:15	08:03	S 07:59	07:57	S 07:49	07:48	S 07:45
	113	Amtrak Acela Express	08:56	08:54	08:53	08:50	08:47	08:44	08:42	08:34	S 08:30	08:29	S 08:20	08:19	S 08:16
	115	Amtrak Acela Express	09:56	09:54	09:53	09:50	09:47	09:44	09:42	09:34	S 09:30	09:29	S 09:20	09:19	S 09:16
	117	Amtrak Acela Regional	10:26	10:24	10:23	10:20	10:16	10:13	10:10	09:58	S 09:54	09:52	S 09:44	09:43	S 09:40
	119	Amtrak Acela Express	10:56	10:54	10:53	10:50	10:47	10:44	10:42	10:34	S 10:30	10:29	S 10:20	10:19	S 10:16
	121	Amtrak Acela Express	11:56	11:54	11:53	11:50	11:47	11:44	11:42	11:34	S 11:30	11:29	S 11:20	11:19	S 11:16
	123	Amtrak Acela Regional	12:31	12:29	12:28	12:25	12:21	12:18	12:15	12:03	S 11:59	11:57	S 11:49	11:48	S 11:45
	125	Amtrak Acela Express	12:56	12:54	12:53	12:50	12:47	12:44	12:42	12:34	S 12:30	12:29	S 12:20	12:19	S 12:16
	127	Amtrak Acela Express	13:56	13:54	13:53	13:50	13:47	13:44	13:42	13:34	S 13:30	13:29	S 13:20	13:19	S 13:16
	129	Amtrak Acela Regional	14:31	14:29	14:28	14:25	14:21	14:18	14:15	14:03	S 13:59	13:57	S 13:49	13:48	S 13:45
	131	Amtrak Acela Express	14:56	14:54	14:53	14:50	14:47	14:44	14:42	14:34	S 14:30	14:29	S 14:20	14:19	S 14:16
	133	Amtrak Acela Express	15:56	15:54	15:53	15:50	15:47	15:44	15:42	15:34	S 15:30	15:29	S 15:20	15:19	S 15:16
	135	Amtrak Acela Regional	16:26	16:24	16:23	16:20	16:16	16:13	16:10	15:58	S 15:54	15:52	S 15:44	15:43	S 15:40
	137	Amtrak Acela Express	16:56	16:54	16:53	16:50	16:47	16:44	16:42	16:34	S 16:30	16:29	S 16:20	16:19	S 16:16
	139	Amtrak Acela Express	17:56	17:54	17:53	17:50	17:47	17:44	17:42	17:34	S 17:30	17:29	S 17:20	17:19	S 17:16
	141	Amtrak Acela Regional	18:26	18:24	18:23	18:20	18:16	18:13	18:10	17:58	S 17:54	17:52	S 17:44	17:43	S 17:40
	143	Amtrak Acela Express	18:56	18:54	18:53	18:50	18:47	18:44	18:42	18:34	S 18:30	18:29	S 18:20	18:19	S 18:16
	145	Amtrak Acela Express	19:56	19:54	19:53	19:50	19:47	19:44	19:42	19:34	S 19:30	19:29	S 19:20	19:19	S 19:16
	147	Amtrak Acela Regional	20:26	20:24	20:23	20:20	20:16	20:13	20:10	19:58	S 19:54	19:52	S 19:44	19:43	S 19:40
	613	Amtrak Night Owl	23:55	23:53	23:52	23:49	23:45	23:42	23:39	23:27	S 23:23	23:21	S 23:13	23:12	S 23:09

10.4.2. 2030 No-Build Operating Plan, NEC and Dorchester Branch

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 1 of 17)

Train:	800			790			500			802			702			600			744		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	04:56	30							S	05:31	30									
ORM		04:57									05:32										
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30									
ATT	S	05:16	45							S	05:51	45									
MANSFIELD	S	05:25	45							S	06:01	45									
SHARON	S	05:33	45							S	06:10	45									
STOUGHTON																					
CANTON CENTER																					
CANTON JCT	S	05:40	30							S	06:17	30									
JUNCTION		05:42									06:18										
ROUTE 128	S	05:45	45							S	06:22	45									
ENDICOTT				S	05:48	30							S	06:26	30						
READVILLE				S	05:51	30							S	06:29	30				S	06:31	30
READ		05:48									06:25			06:30							
FAIRMOUNT				D	05:54	30													S	06:34	30
MORTON ST				D	05:58	30													D	06:38	30
UPHAM'S CORNER				D	06:04	30													D	06:44	30
HYDE PARK	S	05:50	30							S	06:27	30									
ROSLINDALE																S	06:35	30			
FOREST HILLS																S	06:38	30			
PLAINS		05:54									06:31			06:37			06:39				
RUG										S	06:37	30				S	06:42	30			
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:46	30			
COV		06:03						06:31			06:42			06:44			06:47				
TOWER 1		06:06			06:12						06:45			06:47			06:49			06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:50	300	D	06:55	300

Prev Trn:	730			934			540			903Q			743Q			745Q			801Q		
Train:	703			901			501			903			743			745			801		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	04:00	300	S	05:15	300	S	05:30	300	S	05:35	300	S	05:40	300	S	06:25	300	S	06:25	300
TOWER 1		04:01			05:16						05:36			05:42			06:27			06:26	
BROADWAY-CABOT														05:44			06:29				
COV		04:02			05:17			05:34			05:37									06:28	
BACK BAY							S	05:36	30	S	05:40	30							S	06:30	30
RUG																			S	06:33	30
PLAINS		04:06			05:21						05:43									06:36	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK																					
UPHAM'S CORNER													D	05:50	30	D	06:35	30			
MORTON ST													D	05:56	30	D	06:41	30			
FAIRMOUNT													D	06:00	30	D	06:45	30			
READ		04:11			05:26						05:47									06:42	
READVILLE													D	06:04	30	D	06:49	30			
ENDICOTT	D	04:18	30																		
ROUTE 128										S	05:51	45							S	06:45	45
JUNCTION					05:31						05:54									06:46	
CANTON JCT																					
CANTON CENTER				S	05:38	30				S	05:59	30									
STOUGHTON				D	05:46	30				D	06:10	30									
SHARON																				06:54	45
MANSFIELD																				07:01	45
HOLDEN																				07:05	
ATT																			S	07:10	45
SOUTH ATTLEBORO																				07:16	30
ORM																				07:24	
PROVIDENCE																			D	07:25	30

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 2 of 17)

Train:	902			704			502			804			698NB			904			746		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE										S	06:07	60									
ORM											06:08										
SOUTH ATTLEBORO										S	06:16	60									
ATT										S	06:29	120									
MANSFIELD										S	06:38	120									
SHARON										S	06:48	120									
STOUGHTON	S	06:28	30													S	06:48	60			
CANTON CENTER	S	06:36	30													S	06:56	60			
CANTON JCT	S	06:39	30													S	07:00	60			
JUNCTION		06:40									06:53						07:01				
ROUTE 128	S	06:44	45							S	06:58	120				S	07:06	120			
ENDICOTT				D	06:49	1															
READVILLE																			S	07:06	60
READ		06:47			06:52						07:01						07:10				
FAIRMOUNT																			S	07:09	60
MORTON ST																			D	07:13	60
UPHAM'S CORNER																			D	07:19	60
HYDE PARK	S	06:49	30													S	07:11	60			
ROSLINDALE																					
FOREST HILLS																					
PLAINS		06:53			06:58						07:06						07:17				
RUG				S	07:00	60				S	07:10	60									
BACK BAY	D	06:59	30	D	07:04	60	S	07:06	60	D	07:14	60	S	07:17	60	D	07:20	60			
COV		07:00			07:05			07:07			07:15			07:18			07:21				
TOWER 1		07:03			07:08						07:18						07:24			07:27	
SOUTH STATION	D	07:04	300	D	07:09	300	D	07:12	300	D	07:19	300	D	07:23	300	D	07:25	300	D	07:30	300

Prev Trn:	790			800			705Q			500			70			600			902		
Train:	831			503			705			505			905			605			747		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:35	300	S	06:50	300	S	06:55	300	S	06:59	300	S	07:02	300	S	07:07	300	S	07:20	300
TOWER 1		06:36						06:56						07:03			07:08			07:22	
BROADWAY-CABOT																				07:24	
COV		06:39			06:54			06:58			07:03			07:05			07:10				
BACK BAY	S	06:40	30	S	06:56	30				S	07:05	30	S	07:07	30	S	07:12	30			
RUG																					
PLAINS		06:45						07:02						07:10			07:17				
FOREST HILLS																S	07:18	30			
ROSLINDALE																D	07:22	30			
HYDE PARK																					
UPHAM'S CORNER																					
MORTON ST																					
FAIRMOUNT																					
READ		06:49						07:11						07:16							
READVILLE							S	07:12	30										D	07:44	30
ENDICOTT							D	07:16	30												
ROUTE 128																					
JUNCTION		06:53												07:20							
CANTON JCT													S	07:23	30						
CANTON CENTER													S	07:26	30						
STOUGHTON													D	07:34	30						
SHARON																					
MANSFIELD	S	07:08	45																		
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 3 of 17)

Train:	602			706			806			504			698NB			998NB			784NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE							S	06:33	60												
ORM								06:34													
SOUTH ATTLEBORO							S	06:42	60												
ATT							S	06:52	120												
MANSFIELD							S	07:04	120												
SHARON							S	07:13	120												
STOUGHTON																S	07:17	60			
CANTON CENTER																S	07:25	60			
CANTON JCT																S	07:29	60			
JUNCTION								07:19									07:30				
ROUTE 128							S	07:24	120							S	07:34	120			
ENDICOTT				S	07:18	60															
READVILLE				S	07:21	60													S	07:31	60
READ					07:22			07:28									07:37				
FAIRMOUNT																			S	07:34	60
MORTON ST																			D	07:38	60
UPHAM'S CORNER																			D	07:44	60
HYDE PARK																S	07:39	60			
ROSLINDALE	S	07:16	60										S	07:35	30						
FOREST HILLS	S	07:19	60										S	07:38	30						
PLAINS		07:20			07:29			07:33						07:39			07:43				
RUG	S	07:23	60	S	07:33	60							S	07:42	30						
BACK BAY	D	07:27	60	D	07:37	60	D	07:40	60	S	07:40	60	S	07:46	30	S	07:49	30			
COV		07:28			07:38			07:41			07:41			07:47			07:50				
TOWER 1		07:31			07:40			07:44						07:49			07:53			07:52	
SOUTH STATION	D	07:32	300	D	07:41	300	D	07:45	300	D	07:46	300	D	07:51	300	D	07:54	300	D	07:55	300

Prev Trn:	704			502			702			34			904			602			998NB		
Train:	607			507			907			795			833			735			751		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	07:23	300	S	07:29	300	S	07:31	300	S	07:40	300	S	07:50	300	S	07:55	300	S	08:10	300
TOWER 1		07:24						07:32			07:42			07:51			07:56			08:11	
BROADWAY-CABOT											07:44									08:12	
COV		07:26			07:33			07:35						07:54			07:58				
BACK BAY	S	07:28	30	S	07:35	30	S	07:36	30				S	07:55	30	S	08:00	30			
RUG													S	07:58	30						
PLAINS		07:32						07:39						08:02			08:03				
FOREST HILLS	S	07:35	30																		
ROSLINDALE	D	07:39	30																		
HYDE PARK																					
UPHAM'S CORNER										D	07:50	30							D	08:20	30
MORTON ST										D	07:56	30							D	08:26	30
FAIRMOUNT										D	08:00	30							D	08:30	30
READ								07:43						08:06			08:11				
READVILLE										D	08:04	30				D	08:14	30	D	08:34	30
ENDICOTT										D	08:08	30				D	08:18	30			
ROUTE 128							S	07:48	45				S	08:10	45						
JUNCTION								07:49						08:11							
CANTON JCT							S	07:54	30				S	08:15	30						
CANTON CENTER							S	07:57	30												
STOUGHTON							D	08:05	30												
SHARON																					
MANSFIELD													S	08:28	45						
HOLDEN														08:35							
ATT													D	08:39	45						
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 4 of 17)

Train:	708			506			832			604			808			748			508		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	07:12	60						
ORM														07:14							
SOUTH ATTLEBORO													S	07:22	60						
ATT													S	07:32	120						
MANSFIELD							S	07:26	120				S	07:44	120						
SHARON							S	07:35	120												
STOUGHTON																					
CANTON CENTER																					
CANTON JCT							S	07:41	60												
JUNCTION								07:42						07:54							
ROUTE 128							S	07:47	120												
ENDICOTT	D	07:35	1																		
READVILLE																S	07:56	60			
READ		07:39						07:49						08:01							
FAIRMOUNT																S	07:59	60			
MORTON ST																D	08:03	60			
UPHAM'S CORNER																D	08:09	60			
HYDE PARK							S	07:52	60												
ROSLINDALE										S	07:55	60									
FOREST HILLS										S	07:57	60									
PLAINS		07:46						07:55			07:58			08:06							
RUG	S	07:51	60							S	08:02	60									
BACK BAY	D	07:55	60	S	07:59	60	D	08:02	60	D	08:06	60	D	08:11	60				S	08:17	60
COV		07:56			08:00			08:03			08:07			08:12						08:19	
TOWER 1		07:58						08:06			08:10			08:15			08:17				
SOUTH STATION	D	07:59	300	D	08:05	300	D	08:07	300	D	08:11	300	D	08:16	300	D	08:20	300	D	08:23	300

Prev Trn:	832			508			506			906			710			10			898NB		
Train:	803			609			509			909			707			753			911		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	08:30	300	S	08:40	300	S	08:50	300	S	08:50	300	S	09:20	300	S	09:21	300	S	09:45	300
TOWER 1		08:31			08:41						08:51			09:21			09:22			09:46	
BROADWAY-CABOT																	09:23				
COV		08:34			08:42			08:54			08:53			09:24						09:47	
BACK BAY	S	08:35	30	S	08:45	30	S	08:56	30	S	08:54	30	S	09:25	30				S	09:50	30
RUG	S	08:38	30																		
PLAINS		08:41			08:50						08:58			09:28						09:53	
FOREST HILLS																					
ROSLINDALE				D	08:59	30															
HYDE PARK																					
UPHAM'S CORNER																D	09:31	30			
MORTON ST																D	09:37	30			
FAIRMOUNT																D	09:41	30			
READ		08:45									09:02			09:32						09:58	
READVILLE													S	09:36	30	D	09:45	30			
ENDICOTT													D	09:39	30						
ROUTE 128	S	08:49	45							S	09:07	45									
JUNCTION		08:50									09:08									10:03	
CANTON JCT	S	08:54	30							S	09:13	30							S	10:07	30
CANTON CENTER										S	09:16	30							S	10:10	30
STOUGHTON										D	09:24	30							D	10:18	30
SHARON	S	09:00	45																		
MANSFIELD	S	09:08	45																		
HOLDEN		09:13																			
ATT	S	09:15	45																		
SOUTH ATTLEBORO	S	09:22	30																		
ORM		09:29																			
PROVIDENCE	D	09:30	30																		

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 5 of 17)

Train:	722NB			906			738			750			606			810			710		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																S	07:35	60			
ORM																	07:37				
SOUTH ATTLEBORO																S	07:45	60			
ATT																S	07:55	120			
MANSFIELD																S	08:05	120			
SHARON																S	08:14	120			
STOUGHTON				S	07:48	60															
CANTON CENTER				S	07:57	60															
CANTON JCT				S	08:01	60										S	08:24	60			
JUNCTION					08:02												08:25				
ROUTE 128				S	08:07	120										S	08:30	120			
ENDICOTT	S	07:58	60				S	08:15	60										S	08:27	60
READVILLE	S	08:01	60				S	08:19	60										S	08:31	60
READ		08:03			08:10			08:21									08:33			08:32	
FAIRMOUNT										S	08:19	60									
MORTON ST										D	08:23	60									
UPHAM'S CORNER										D	08:29	60									
HYDE PARK				S	08:13	60										S	08:36	60			
ROSLINDALE													S	08:26	60						
FOREST HILLS													S	08:28	60						
PLAINS		08:10			08:19			08:25						08:29			08:42			08:37	
RUG	S	08:14	60	S	08:23	60							S	08:33	60				S	08:42	60
BACK BAY	D	08:19	60	D	08:27	60	D	08:35	60				D	08:37	60	D	08:46	60	D	08:47	60
COV		08:20			08:28			08:36						08:38			08:47			08:48	
TOWER 1		08:22			08:31			08:39			08:37			08:41			08:50			08:51	
SOUTH STATION	D	08:23	300	D	08:32	300	D	08:40	300	D	08:40	300	D	08:42	300	D	08:51	300	D	08:52	300

Prev Trn:	514			712			792			910			516			60			610		
Train:	611			805			755			709			511			757			613		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	10:00	300	S	10:25	300	S	10:29	300	S	10:50	300	S	11:00	300	S	11:37	300	S	12:00	300
TOWER 1		10:01			10:26			10:30			10:51						11:38			12:01	
BROADWAY-CABOT								10:31									11:39				
COV		10:02			10:27						10:52			11:04						12:02	
BACK BAY	S	10:05	30	S	10:30	30				S	10:55	30	S	11:06	30				S	12:05	30
RUG																			S	12:08	30
PLAINS		10:09			10:36						10:59									12:12	
FOREST HILLS	S	10:12	30																S	12:13	30
ROSLINDALE	D	10:15	30																D	12:16	30
HYDE PARK				S	10:41	30															
UPHAM'S CORNER							D	10:39	30							D	11:47	30			
MORTON ST							D	10:45	30							D	11:53	30			
FAIRMOUNT							D	10:49	30							D	11:57	30			
READ					10:42						11:04										
READVILLE							D	10:53	30	S	11:05	30				D	12:01	30			
ENDICOTT										D	11:08	30									
ROUTE 128				S	10:46	45															
JUNCTION					10:48																
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
SHARON				S	10:57	45															
MANSFIELD				S	11:05	45															
HOLDEN					11:12																
ATT				S	11:14	45															
SOUTH ATTLEBORO				S	11:21	30															
ORM					11:29																
PROVIDENCE				D	11:30	30															

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 6 of 17)

Train:	510			908			512			898NB			752			608			912		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE										S	07:52	30							S	08:10	30
ORM											07:53									08:11	
SOUTH ATTLEBORO										S	08:02	30							S	08:20	30
ATT										S	08:12	45							S	08:30	45
MANSFIELD										S	08:22	45							S	08:38	45
SHARON										S	08:31	45							S	08:47	45
STOUGHTON				S	08:22	30															
CANTON CENTER				S	08:30	30															
CANTON JCT				S	08:34	30				S	08:41	30							S	08:54	30
JUNCTION					08:35						08:42									08:55	
ROUTE 128				S	08:39	45				S	08:47	45							S	08:59	45
ENDICOTT																					
READVILLE													S	08:46	30						
READ					08:41						08:50									09:02	
FAIRMOUNT													D	08:49	30						
MORTON ST													D	08:53	30						
UPHAM'S CORNER													D	08:59	30						
HYDE PARK				S	08:43	30				S	08:53	30							S	09:04	30
ROSLINDALE																S	08:56	30			
FOREST HILLS																S	08:59	30			
PLAINS					08:46						08:58						09:00			09:09	
RUG																S	09:04	30	S	09:14	30
BACK BAY	S	08:50	60	D	08:52	30	S	09:02	30	D	09:03	30				D	09:08	30	D	09:18	30
COV		08:51			08:53			09:03			09:04						09:09			09:19	
TOWER 1					08:56						09:07			09:07			09:12			09:22	
SOUTH STATION	D	08:56	300	D	08:57	300	D	09:08	300	D	09:08	300	D	09:10	300	D	09:13	300	D	09:23	300

Prev Trn:	512			714			518			756			612			816			912		
Train:	513			807			711			759			515			913			761		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	12:10	300	S	12:14	300	S	12:45	300	S	12:45	300	S	13:00	300	S	13:20	300	S	13:32	300
TOWER 1					12:15			12:46			12:46						13:21			13:33	
BROADWAY-CABOT											12:47									13:34	
COV		12:14			12:16			12:47						13:04			13:22				
BACK BAY	S	12:16	30	S	12:19	30	S	12:50	30				S	13:06	30	S	13:25	30			
RUG				S	12:22	30	S	12:53	30												
PLAINS					12:25			12:55									13:31				
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK				S	12:32	30										S	13:41	30			
UPHAM'S CORNER										D	12:55	30							D	13:42	30
MORTON ST										D	13:01	30							D	13:48	30
FAIRMOUNT										D	13:05	30							D	13:52	30
READ					12:33			13:01									13:43				
READVILLE							S	13:03	30	D	13:09	30							D	13:56	30
ENDICOTT							D	13:06	30												
ROUTE 128				S	12:36	45										S	13:47	45			
JUNCTION					12:39												13:50				
CANTON JCT				S	12:41	30										S	13:53	30			
CANTON CENTER																S	13:56	30			
STOUGHTON																D	14:04	30			
SHARON				S	12:47	45															
MANSFIELD				S	12:55	45															
HOLDEN					13:01																
ATT				S	13:03	45															
SOUTH ATTLEBORO				S	13:10	30															
ORM					13:18																
PROVIDENCE				D	13:19	30															

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 7 of 17)

Train:	792			514			834			516			712			610			910		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT							S	09:00	45												
MANSFIELD							S	09:09	45												
SHARON							S	09:18	45												
STOUGHTON																			S	09:40	30
CANTON CENTER																			S	09:49	30
CANTON JCT							S	09:25	30										S	09:52	30
JUNCTION								09:26												09:53	
ROUTE 128							S	09:27	45										S	09:57	45
ENDICOTT	S	08:54	30										S	09:44	30						
READVILLE	S	09:00	30										S	09:47	30						
READ								09:31						09:48						10:00	
FAIRMOUNT	S	09:03	30																		
MORTON ST	D	09:07	30																		
UPHAM'S CORNER	D	09:13	30																		
HYDE PARK																			S	10:02	30
ROSLINDALE																S	09:59	30			
FOREST HILLS																S	10:02	30			
PLAINS								09:37						09:55			10:03			10:07	
RUG							S	09:41	30				S	09:59	30	S	10:07	30			
BACK BAY				S	09:29	30	S	09:44	30	S	09:54	30	S	10:03	30	S	10:11	30	S	10:12	30
COV					09:30			09:45			09:55			10:04			10:12			10:14	
TOWER 1		09:21						09:48						10:07			10:15			10:15	
SOUTH STATION	D	09:25	300	D	09:35	300	D	09:49	300	D	10:00	300	D	10:08	300	D	10:16	300	D	10:17	300

Prev Trn:	716			758			760			614			713Q			520			818		
Train:	809			615			763			915			713			517			617		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	13:56	300	S	14:00	300	S	14:25	300	S	14:25	300	S	14:40	300	S	14:45	300	S	15:00	300
TOWER 1		13:57			14:01			14:26			14:26			14:41						15:01	
BROADWAY-CABOT								14:27													
COV		13:58			14:02						14:27			14:42			14:49			15:02	
BACK BAY	S	14:01	30	S	14:05	30				S	14:30	30	S	14:45	30	S	14:51	30	S	15:05	30
RUG	S	14:04	30	S	14:08	30				S	14:33	30	S	14:48	30				S	15:08	30
PLAINS		14:06			14:12						14:36			14:50						15:12	
FOREST HILLS				S	14:14	30													S	15:13	30
ROSLINDALE				D	14:18	30													D	15:16	30
HYDE PARK	S	14:11	30							S	14:43	30									
UPHAM'S CORNER							D	14:35	30												
MORTON ST							D	14:41	30												
FAIRMOUNT							D	14:45	30												
READ		14:12									14:44			14:56							
READVILLE							D	14:49	30				S	14:58	30						
ENDICOTT													D	15:01	30						
ROUTE 128	S	14:17	45							S	14:49	45									
JUNCTION		14:19									14:52										
CANTON JCT	S	14:22	30							S	14:55	30									
CANTON CENTER										S	14:57	30									
STOUGHTON										D	15:04	30									
SHARON	S	14:28	45																		
MANSFIELD	S	14:36	45																		
HOLDEN		14:42																			
ATT	S	14:44	45																		
SOUTH ATTLEBORO	S	14:54	30																		
ORM		15:01																			
PROVIDENCE	D	15:03	30																		

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 8 of 17)

Train:	754			814			912			756			612			714			518		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	09:49	30															
ORM					09:50																
SOUTH ATTLEBORO				S	09:59	30															
ATT				S	10:09	45															
MANSFIELD				S	10:17	45															
SHARON				S	10:25	45															
STOUGHTON							S	10:40	30												
CANTON CENTER							S	10:49	30												
CANTON JCT				S	10:32	30	S	10:52	30												
JUNCTION					10:33			10:53													
ROUTE 128				S	10:37	45	S	10:57	45												
ENDICOTT																S	11:26	30			
READVILLE	S	09:55	30							S	11:03	30				S	11:29	30			
READ					10:41			11:00									11:30				
FAIRMOUNT	D	09:58	30							D	11:06	30									
MORTON ST	D	10:02	30							D	11:10	30									
UPHAM'S CORNER	D	10:08	30							D	11:16	30									
HYDE PARK				S	10:42	30	S	11:02	30												
ROSLINDALE													S	11:17	30						
FOREST HILLS													S	11:20	30						
PLAINS					10:47			11:07						11:21			11:37				
RUG				S	10:52	30	S	11:12	30				S	11:24	30	S	11:39	30			
BACK BAY				S	10:57	30	S	11:15	30				S	11:28	30	S	11:43	30	S	11:59	30
COV					10:58			11:16						11:29			11:45			12:00	
TOWER 1		10:15			11:01			11:19			11:23			11:32			11:47				
SOUTH STATION	D	10:19	300	D	11:02	300	D	11:20	300	D	11:27	300	D	11:33	300	D	11:48	300	D	12:05	300

Prev Trn:	762			84			764			718			914			917Q			616		
Train:	765			975			767			811			977			619			917		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	15:20	300	S	15:26	300	S	15:44	300	S	15:45	300	S	15:50	300	S	15:57	300	S	16:01	300
TOWER 1		15:21			15:27			15:45			15:46			15:51			15:58			16:02	
BROADWAY-CABOT		15:22						15:46													
COV					15:28						15:49			15:52			16:01			16:05	
BACK BAY				S	15:31	30				S	15:50	30	S	15:55	30	S	16:02	60	S	16:06	60
RUG				S	15:34	30				S	15:53	30	S	15:58	30	S	16:05	60	S	16:09	60
PLAINS					15:37						15:56			16:02			16:09			16:12	
FOREST HILLS																S	16:10	60			
ROSLINDALE																D	16:13	60			
HYDE PARK				S	15:42	30							S	16:06	30				S	16:17	60
UPHAM'S CORNER	D	15:30	30				S	15:54	30												
MORTON ST	D	15:36	30					16:00	30												
FAIRMOUNT	D	15:40	30					16:04	30												
READ					15:44						16:01			16:08						16:19	
READVILLE	D	15:44	30				D	16:08	30												
ENDICOTT																					
ROUTE 128				S	15:48	45							S	16:12	45				S	16:23	120
JUNCTION					15:51						16:05			16:13						16:24	
CANTON JCT				S	15:54	30							S	16:19	30				S	16:29	60
CANTON CENTER				D	15:57	30													S	16:32	60
STOUGHTON																			D	16:41	60
SHARON										S	16:12	45									
MANSFIELD										S	16:21	45									
HOLDEN											16:29										
ATT										S	16:31	45									
SOUTH ATTLEBORO										S	16:37	30									
ORM											16:45										
PROVIDENCE										D	16:46	30									

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 9 of 17)

Train:	758			816			716			520			614			760			762		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	11:41	30															
ORM					11:42																
SOUTH ATTLEBORO				S	11:51	30															
ATT				S	12:01	45															
MANSFIELD				S	12:09	45															
SHARON				S	12:17	45															
STOUGHTON																					
CANTON CENTER																					
CANTON JCT				S	12:24	30															
JUNCTION					12:25																
ROUTE 128				S	12:29	45															
ENDICOTT							S	12:46	30												
READVILLE	S	12:11	30				S	12:49	30							S	13:19	30	S	14:06	30
READ					12:33			12:50													
FAIRMOUNT	D	12:14	30													D	13:22	30	D	14:09	30
MORTON ST	D	12:18	30													D	13:26	30	D	14:13	30
UPHAM'S CORNER	D	12:24	30													D	13:32	30	D	14:19	30
HYDE PARK				S	12:34	30															
ROSLINDALE													S	13:17	30						
FOREST HILLS													S	13:20	30						
PLAINS					12:39			12:56						13:21							
RUG				S	12:44	30	S	12:57	30				S	13:24	30						
BACK BAY				S	12:49	30	S	13:01	30	S	13:09	30	S	13:28	30						
COV					12:50			13:02			13:10			13:29							
TOWER 1		12:31			12:53			13:04						13:32			13:39			14:26	
SOUTH STATION	D	12:35	300	D	12:54	300	D	13:06	300	D	13:15	300	D	13:33	300	D	13:43	300	D	14:30	300

Prev Trn:	522			715Q			916			699NBQ			624			899NBQ			799Q		
Train:	519			715			979			699NB			521			899NB			799		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:29	300	S	16:30	300
TOWER 1					16:11			16:18			16:24						16:30			16:31	
BROADWAY-CABOT																				16:32	
COV		16:09			16:14			16:21			16:27			16:31			16:33				
BACK BAY	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:34	60			
RUG				S	16:19	60	S	16:26	60	S	16:32	60				N	16:37				
PLAINS					16:21			16:28			16:36						16:40				
FOREST HILLS										S	16:37	60									
ROSLINDALE										D	16:40	60									
HYDE PARK							S	16:32	60												
UPHAM'S CORNER																			S	16:41	60
MORTON ST																			S	16:48	60
FAIRMOUNT																			S	16:53	60
READ					16:27			16:35									16:44				
READVILLE				S	16:29	60													D	16:57	60
ENDICOTT				D	16:32	60													D	17:01	1
ROUTE 128							S	16:40	120												
JUNCTION								16:41									16:48				
CANTON JCT							S	16:47	60												
CANTON CENTER																					
STOUGHTON																					
SHARON																S	16:55	120			
MANSFIELD																S	17:04	120			
HOLDEN																	17:11				
ATT																S	17:15	120			
SOUTH ATTLEBORO																S	17:24	60			
ORM																	17:32				
PROVIDENCE																D	17:33	60			

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 10 of 17)

Train:	818			914			522			718			764			524			616		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	13:28	30																		
ORM		13:29																			
SOUTH ATTLEBORO	S	13:38	30																		
ATT	S	13:48	45																		
MANSFIELD	S	13:56	45																		
SHARON	S	14:04	45																		
STOUGHTON				S	14:20	30															
CANTON CENTER				S	14:27	30															
CANTON JCT				S	14:30	30															
JUNCTION		14:09			14:32																
ROUTE 128	S	14:13	45																		
ENDICOTT										S	14:46	30									
READVILLE										S	14:49	30	S	15:02	30						
READ		14:17			14:37						14:50										
FAIRMOUNT													D	15:05	30						
MORTON ST													D	15:09	30						
UPHAM'S CORNER													D	15:15	30						
HYDE PARK				S	14:39	30															
ROSLINDALE																			S	15:30	30
FOREST HILLS																			S	15:34	30
PLAINS		14:22			14:44						14:56									15:35	
RUG	S	14:27	30																		
BACK BAY	S	14:32	30	S	14:49	30	S	14:57	30	S	15:00	30				S	15:29	30	S	15:40	30
COV		14:33			14:50			14:58			15:01						15:30			15:41	
TOWER 1		14:36			14:53						15:04			15:21						15:44	
SOUTH STATION	D	14:37	300	D	14:54	300	D	15:03	300	D	15:05	300	D	15:26	300	D	15:35	300	D	15:45	300

Prev Trn:	739NBQ			813Q			621Q			618			919Q			768			820		
Train:	739NB			813			621			737			919			769			815		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:30	300	S	16:35	300	S	16:40	300	S	16:45	300	S	16:50	300	S	16:55	300	S	16:57	300
TOWER 1		16:31			16:36			16:41			16:46			16:51			16:56			16:58	
BROADWAY-CABOT																	16:57				
COV		16:34			16:39			16:44			16:49			16:54						17:01	
BACK BAY	S	16:35	60	S	16:40	60	S	16:45	60	S	16:50	60	S	16:55	60				S	17:02	60
RUG	S	16:39	60	S	16:43	60	S	16:49	60	S	16:54	60	S	16:59	60				S	17:06	60
PLAINS		16:42			16:46			16:53			16:57			17:02						17:09	
FOREST HILLS							S	16:54	60												
ROSLINDALE							D	16:57	60												
HYDE PARK										S	17:03	60									
UPHAM'S CORNER																S	17:06	60			
MORTON ST																S	17:13	60			
FAIRMOUNT																S	17:18	60			
READ		16:47			16:51						17:06			17:08						17:13	
READVILLE	D	16:49	60							D	17:07	60				D	17:22	60			
ENDICOTT	D	16:52	1							D	17:11	60									
ROUTE 128				S	16:54	120							S	17:10	120						
JUNCTION					16:55									17:11						17:17	
CANTON JCT													S	17:17	60						
CANTON CENTER													S	17:20	60						
STOUGHTON													D	17:30	60						
SHARON				S	17:05	120													S	17:24	120
MANSFIELD				S	17:14	120													S	17:33	120
HOLDEN					17:22															17:39	
ATT				S	17:24	120													S	17:47	120
SOUTH ATTLEBORO				S	17:33	60													S	17:54	60
ORM					17:41															18:03	
PROVIDENCE				D	17:42	60													D	18:04	60

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 11 of 17)

Train:	916			766			618			820			768			976			526		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE										S	15:23	30									
ORM											15:24										
SOUTH ATTLEBORO										S	15:32	30									
ATT										S	15:41	45									
MANSFIELD										S	15:52	45									
SHARON										S	16:00	45									
STOUGHTON	S	15:14	30																		
CANTON CENTER																S	16:16	30			
CANTON JCT	S	15:24	30							S	16:08	30				S	16:19	30			
JUNCTION		15:25									16:09						16:20				
ROUTE 128	S	15:29	45													S	16:24	45			
ENDICOTT																					
READVILLE				S	15:55	30															
READ		15:32									16:13						16:27				
FAIRMOUNT				D	15:58	30							D	16:11	30						
MORTON ST				D	16:02	30							D	16:15	30						
UPHAM'S CORNER				D	16:08	30							D	16:21	30						
HYDE PARK	S	15:35	30													S	16:29	30			
ROSLINDALE							S	16:09	30												
FOREST HILLS							D	16:11	30												
PLAINS		15:40						16:12			16:17						16:33				
RUG																					
BACK BAY	S	15:44	30				D	16:18	30	S	16:25	30				S	16:39	30	S	16:41	30
COV		15:45						16:19			16:26						16:40			16:42	
TOWER 1		15:47			16:13			16:21			16:29			16:26			16:43				
SOUTH STATION	D	15:49	300	D	16:19	300	D	16:22	300	D	16:30	300	D	16:32	300	D	16:44	300	D	16:47	300

Prev Trn:	523Q			976			720			526			771Q			921Q			978		
Train:	523			999NB			719			525			771			921			623		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:00	300	S	17:03	300	S	17:10	300	S	17:15	300	S	17:15	300	S	17:18	300	S	17:26	300
TOWER 1					17:04			17:11						17:16			17:19			17:27	
BROADWAY-CABOT														17:17							
COV		17:04			17:07			17:14			17:19						17:22			17:30	
BACK BAY	S	17:06	60	S	17:08	60	S	17:15	60	S	17:21	60				S	17:23	60	S	17:31	60
RUG				S	17:12	60	S	17:19	60							S	17:27	60	S	17:35	60
PLAINS					17:15			17:22									17:30			17:39	
FOREST HILLS																			S	17:40	60
ROSLINDALE																			D	17:43	60
HYDE PARK																S	17:37	60			
UPHAM'S CORNER													S	17:26	60						
MORTON ST													S	17:33	60						
FAIRMOUNT													S	17:38	60						
READ					17:19			17:27									17:39				
READVILLE													D	17:42	60						
ENDICOTT							D	17:33	1												
ROUTE 128				S	17:23	120										S	17:43	120			
JUNCTION					17:24												17:44				
CANTON JCT				D	17:30	60										S	17:51	60			
CANTON CENTER																S	17:55	60			
STOUGHTON																D	18:04	60			
SHARON																					
MANSFIELD																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 12 of 17)

Train:	720			978			980			918			620			770			920		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
STOUGHTON										S	17:00	30							S	17:40	30
CANTON CENTER										S	17:07	30									
CANTON JCT				S	16:46	30	S	17:02	30	S	17:10	30							S	17:50	30
JUNCTION					16:47			17:03			17:11									17:51	
ROUTE 128				S	16:52	45	S	17:07	45	S	17:16	45									
ENDICOTT	S	16:30	30																		
READVILLE	S	16:33	30													S	17:35	30			
READ		16:34			16:55			17:10			17:19									17:54	
FAIRMOUNT																D	17:38	30			
MORTON ST																D	17:42	30			
UPHAM'S CORNER																D	17:48	30			
HYDE PARK	S	16:37	30																		
ROSLINDALE													S	17:31	30						
FOREST HILLS													D	17:34	30						
PLAINS		16:43			16:59			17:14			17:23			17:35						17:58	
RUG																					
BACK BAY	S	16:48	30	S	17:05	30	S	17:20	30	S	17:27	30	D	17:40	30				S	18:02	30
COV		16:49			17:06			17:21			17:28			17:41						18:03	
TOWER 1		16:52			17:09			17:24			17:31			17:44			17:54			18:06	
SOUTH STATION	D	16:53	300	D	17:10	300	D	17:25	300	D	17:32	300	D	17:45	300	D	17:59	300	D	18:07	300

Prev Trn:	527Q			817Q			783NBQ			721Q			980			918			620		
Train:	527			817			783NB			721			923			625			599NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:35	300	S	17:40	300	S	17:40	300	S	17:44	300	S	17:51	300	S	17:55	300	S	18:03	300
TOWER 1					17:41			17:41			17:45			17:52			17:56				
BROADWAY-CABOT								17:42													
COV		17:39			17:44						17:48			17:55			17:59			18:07	
BACK BAY	S	17:41	60	S	17:45	60				S	17:49	60	S	17:57	60	S	18:00	60	S	18:09	60
RUG				S	17:49	60				S	17:53	60	S	18:01	60	S	18:04	60			
PLAINS					17:52						17:56			18:04			18:08				
FOREST HILLS																S	18:09	60			
ROSLINDALE																D	18:12	60			
HYDE PARK										S	18:03	60									
UPHAM'S CORNER							S	17:51	60												
MORTON ST							S	17:58	60												
FAIRMOUNT							S	18:03	60												
READ					17:58						18:05			18:08							
READVILLE							D	18:07	60	S	18:06	60									
ENDICOTT										D	18:10	60									
ROUTE 128													S	18:14	120						
JUNCTION					18:00									18:15							
CANTON JCT													S	18:20	60						
CANTON CENTER													S	18:27	60						
STOUGHTON													D	18:32	60						
SHARON				S	18:07	120															
MANSFIELD				S	18:18	120															
HOLDEN					18:24																
ATT				S	18:26	120															
SOUTH ATTLEBORO				S	18:33	60															
ORM					18:41																
PROVIDENCE				D	18:42	60															

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 13 of 17)

Train:	794			772			622			528			822			796			824		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	17:24	30				S	18:00	30
ORM														17:25						18:01	
SOUTH ATTLEBORO													S	17:35	30				S	18:10	30
ATT													S	17:46	45				S	18:18	45
MANSFIELD													S	17:55	45				S	18:26	45
SHARON													S	18:04	45				S	18:34	45
STOUGHTON																					
CANTON CENTER																					
CANTON JCT													S	18:12	30						
JUNCTION														18:13						18:43	
ROUTE 128													S	18:18	45				S	18:47	45
ENDICOTT	D	17:41	30													S	18:14	30			
READVILLE				S	17:55	30															
READ														18:20						18:49	
FAIRMOUNT				D	17:58	30															
MORTON ST				D	18:02	30															
UPHAM'S CORNER				D	18:08	30															
HYDE PARK													S	18:23	30						
ROSLINDALE																					
FOREST HILLS							S	18:09	30												
PLAINS								18:10						18:28						18:54	
RUG																					
BACK BAY							S	18:16	30	S	18:24	30	S	18:33	30				S	18:59	30
COV								18:17			18:25			18:34						19:00	
TOWER 1		18:02			18:14			18:20						18:37			18:34			19:02	
SOUTH STATION	D	18:08	300	D	18:19	300	D	18:21	300	D	18:30	300	D	18:38	300	D	18:40	300	D	19:03	300

Prev Trn:	773Q			529Q			723Q			819Q			794			531Q			770		
Train:	773			529			723			819			627			531			775		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:09	300	S	18:15	300	S	18:15	300	S	18:20	300	S	18:25	300	S	18:30	300	S	18:30	300
TOWER 1		18:10						18:16			18:21			18:26						18:31	
BROADWAY-CABOT		18:11																		18:32	
COV					18:19			18:19			18:24			18:29			18:34				
BACK BAY				S	18:21	60	S	18:20	60	S	18:25	60	S	18:30	60	S	18:36	60			
RUG							S	18:24	60	S	18:29	60	S	18:34	60						
PLAINS								18:27			18:32			18:38							
FOREST HILLS													S	18:39	60						
ROSLINDALE													D	18:42	60						
HYDE PARK																					
UPHAM'S CORNER	S	18:20	60																S	18:41	60
MORTON ST	S	18:27	60																S	18:48	60
FAIRMOUNT	S	18:32	60																S	18:53	60
READ								18:31			18:36										
READVILLE	D	18:36	60				S	18:32	60										D	18:57	60
ENDICOTT							D	18:36	60												
ROUTE 128										S	18:39	120									
JUNCTION											18:40										
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
SHARON										S	18:47	120									
MANSFIELD										S	18:56	120									
HOLDEN											19:03										
ATT										S	19:08	120									
SOUTH ATTLEBORO										S	19:13	60									
ORM											19:20										
PROVIDENCE										D	19:21	60									

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 14 of 17)

Train:	530			774			922			776			532			924			626		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
STOUGHTON							S	18:52	30							S	19:19	30			
CANTON CENTER							S	18:59	30												
CANTON JCT							S	19:02	30												
JUNCTION								19:03									19:29				
ROUTE 128							S	19:07	45							S	19:33	45			
ENDICOTT																					
READVILLE				S	18:46	30				S	19:07	30									
READ								19:10									19:36				
FAIRMOUNT				D	18:49	30				D	19:10	30									
MORTON ST				D	18:53	30				D	19:14	30									
UPHAM'S CORNER				D	18:59	30				D	19:20	30									
HYDE PARK							S	19:12	30												
ROSLINDALE																			S	19:42	30
FOREST HILLS																			S	19:45	30
PLAINS								19:17									19:41			19:46	
RUG																			S	19:49	30
BACK BAY	S	19:03	30				S	19:22	30				S	19:26	30	S	19:44	30	S	19:53	30
COV		19:04						19:23						19:27			19:45			19:54	
TOWER 1					19:05			19:26			19:26						19:48			19:56	
SOUTH STATION	D	19:09	300	D	19:10	300	D	19:27	300	D	19:31	300	D	19:32	300	D	19:49	300	D	19:58	300

Prev Tm:	920			622			822			528			530			774			922		
Train:	925			821			629			533			725			777			927		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:30	300	S	18:50	300	S	19:10	300	S	19:15	300	S	19:30	300	S	19:41	300	S	19:45	300
TOWER 1		18:31			18:51			19:11						19:31			19:42			19:46	
BROADWAY-CABOT																	19:43				
COV		18:34			18:54			19:14			19:19			19:32						19:47	
BACK BAY	S	18:35	60	S	18:55	30	S	19:15	30	S	19:21	30	S	19:35	30				S	19:50	30
RUG	S	18:38	60	S	18:58	30	S	19:19	30				S	19:38	30				S	19:53	30
PLAINS		18:41			19:01			19:22						19:41						19:56	
FOREST HILLS							S	19:23	30												
ROSLINDALE							D	19:27	30												
HYDE PARK	S	18:48	60	S	19:08	30													S	20:03	30
UPHAM'S CORNER																D	19:51	30			
MORTON ST																D	19:57	30			
FAIRMOUNT																D	20:01	30			
READ		18:50			19:10									19:46						20:05	
READVILLE													S	19:48	30	D	20:05	30			
ENDICOTT													D	19:51	30						
ROUTE 128				S	19:13	45													S	20:08	45
JUNCTION		18:54			19:14															20:11	
CANTON JCT	S	18:57	60	S	19:18	30													S	20:14	30
CANTON CENTER	S	19:00	60																S	20:17	30
STOUGHTON	D	19:09	60																D	20:26	30
SHARON				S	19:24	45															
MANSFIELD				S	19:33	45															
HOLDEN					19:40																
ATT				S	19:47	45															
SOUTH ATTLEBORO				S	19:54	30															
ORM					20:02																
PROVIDENCE				D	20:03	30															

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 15 of 17)

Train:	926			534			628			778			798			536			826		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	19:53	30
ORM																				19:54	
SOUTH ATTLEBORO																			S	20:03	30
ATT																			S	20:13	45
MANSFIELD																			S	20:22	45
SHARON																			S	20:31	45
STOUGHTON	S	19:35	30																		
CANTON CENTER																					
CANTON JCT	S	19:45	30																S	20:39	30
JUNCTION		19:47																		20:40	
ROUTE 128																			S	20:45	45
ENDICOTT													D	20:19	30						
READVILLE										S	20:15	30	S	20:22	30						
READ		19:52																		20:47	
FAIRMOUNT										D	20:18	30									
MORTON ST										D	20:22	30									
UPHAM'S CORNER										D	20:28	30									
HYDE PARK	S	19:54	30																S	20:48	30
ROSLINDALE																					
FOREST HILLS							S	20:23	30												
PLAINS		19:59						20:24												20:53	
RUG							S	20:27	30												
BACK BAY	S	20:04	30	S	20:28	30	S	20:31	30							S	20:56	30	S	20:58	30
COV		20:05			20:29			20:32									20:57			20:59	
TOWER 1		20:08						20:35			20:34			20:39						21:02	
SOUTH STATION	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300	D	21:02	300	D	21:03	300

Prev Trn:	924			626			532			776			824			926			798		
Train:	631			823			535			779			727			929			825		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	20:10	300	S	20:15	300	S	20:20	300	S	20:49	300	S	20:50	300	S	20:55	300	S	21:05	300
TOWER 1		20:11			20:16						20:50			20:51			20:56			21:06	
BROADWAY-CABOT											20:51										
COV		20:12			20:17			20:24						20:52			20:57			21:07	
BACK BAY	S	20:15	30	S	20:20	30	S	20:26	30				S	20:55	30	S	21:00	30	S	21:10	30
RUG	S	20:18	30	S	20:23	30							S	20:58	30	S	21:03	30	S	21:13	30
PLAINS		20:22			20:27									21:00			21:06			21:17	
FOREST HILLS	S	20:23	30																		
ROSLINDALE	D	20:26	30																		
HYDE PARK				S	20:33	30										S	21:13	30	S	21:23	30
UPHAM'S CORNER										D	20:59	30									
MORTON ST										D	21:05	30									
FAIRMOUNT										D	21:09	30									
READ					20:35									21:05			21:15			21:25	
READVILLE										D	21:13	30	S	21:08	30						
ENDICOTT													D	21:12	30						
ROUTE 128				S	20:38	45										S	21:18	45	S	21:28	45
JUNCTION					20:40												21:21			21:30	
CANTON JCT				S	20:43	30										S	21:24	30	S	21:33	30
CANTON CENTER																S	21:27	30			
STOUGHTON																D	21:35	30			
SHARON				S	20:49	45													S	21:39	45
MANSFIELD				S	20:57	45													S	21:47	45
HOLDEN					21:03															21:52	
ATT				S	21:05	45													S	21:55	45
SOUTH ATTLEBORO				S	21:12	30													S	22:02	30
ORM					21:19															22:09	
PROVIDENCE				D	21:21	30													D	22:11	30

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 16 of 17)

Train:	928			630			726			780			930			632			828		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	21:45	30
ORM																				21:46	
SOUTH ATTLEBORO																			S	21:55	30
ATT																			S	22:05	45
MANSFIELD																			S	22:13	45
SHARON																			S	22:21	45
STOUGHTON	S	20:51	30										S	21:53	30						
CANTON CENTER																					
CANTON JCT	S	21:01	30										S	22:03	30						
JUNCTION		21:02												22:05						22:26	
ROUTE 128	S	21:06	45																S	22:30	45
ENDICOTT							S	21:27	30												
READVILLE										S	21:23	30									
READ		21:09						21:30						22:08						22:34	
FAIRMOUNT										D	21:26	30									
MORTON ST										D	21:30	30									
UPHAM'S CORNER										D	21:36	30									
HYDE PARK	S	21:11	30																S	22:35	30
ROSLINDALE				S	21:22	30										S	22:32	30			
FOREST HILLS				S	21:25	30										S	22:35	30			
PLAINS		21:15			21:26			21:36						22:13			22:36			22:40	
RUG				S	21:29	30										S	22:39	30			
BACK BAY	S	21:19	30	S	21:33	30	S	21:40	30				S	22:20	30	S	22:43	30	S	22:45	30
COV		21:20			21:34			21:41						22:21			22:44			22:46	
TOWER 1		21:23			21:37			21:44			21:42			22:24			22:46			22:49	
SOUTH STATION	D	21:24	300	D	21:38	300	D	21:45	300	D	21:47	300	D	22:25	300	D	22:47	300	D	22:50	300

Prev Trn:	628			772			534			780			726			826			930		
Train:	633			781			537			827			635			729			931		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	21:15	300	S	21:57	300	S	22:20	300	S	22:25	300	S	22:30	300	S	22:35	300	S	22:54	300
TOWER 1		21:16			21:58						22:26			22:31			22:36			22:55	
BROADWAY-CABOT					21:59																
COV		21:17						22:24			22:27			22:32			22:37			22:56	
BACK BAY	S	21:20	30				S	22:26	30	S	22:30	30	S	22:35	30	S	22:40	30	S	22:59	30
RUG	S	21:23	30							S	22:33	30	S	22:38	30	S	22:43	30	S	23:02	30
PLAINS		21:27									22:37			22:42			22:46			23:05	
FOREST HILLS	S	21:28	30										S	22:43	30						
ROSLINDALE	D	21:31	30										D	22:46	30						
HYDE PARK										S	22:43	30				S	22:52	30	S	23:11	30
UPHAM'S CORNER				D	22:07	30															
MORTON ST				D	22:13	30															
FAIRMOUNT				D	22:17	30															
READ											22:45						22:54			23:13	
READVILLE				D	22:21	30										S	22:55	30			
ENDICOTT																D	23:00	30			
ROUTE 128										S	22:48	45							S	23:16	45
JUNCTION											22:50									23:19	
CANTON JCT										S	22:53	30							S	23:22	30
CANTON CENTER																			S	23:25	30
STOUGHTON																			D	23:33	30
SHARON										S	22:59	45									
MANSFIELD										S	23:07	45									
HOLDEN											23:13										
ATT										S	23:15	45									
SOUTH ATTLEBORO										S	23:22	30									
ORM											23:29										
PROVIDENCE										D	23:32	30									

MBTA 2030 No-Build Operating Plan
NEC and Dorchester Branch
(Page 17 of 17)

Train:	782			728			934			730			538			540		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																		
ORM																		
SOUTH ATTLEBORO																		
ATT																		
MANSFIELD																		
SHARON																		
STOUGHTON							S	23:54	30									
CANTON CENTER																		
CANTON JCT							D	00:04	30									
JUNCTION								00:05										
ROUTE 128							D	00:09	45									
ENDICOTT				D	22:47	30				D	00:20	30						
READVILLE	S	22:31	30															
READ					22:50			00:12			00:23							
FAIRMOUNT	D	22:34	30															
MORTON ST	D	22:38	30															
UPHAM'S CORNER	D	22:44	30															
HYDE PARK																		
ROSLINDALE																		
FOREST HILLS																		
PLAINS					22:57			00:17			00:31							
RUG																		
BACK BAY				S	23:01	30	S	00:21	30	S	00:36	30	S	01:17	30	S	01:24	30
COV					23:02			00:22			00:37			01:18			01:25	
TOWER 1		22:50			23:05			00:25			00:40							
SOUTH STATION	D	22:55	300	D	23:06	300	D	00:26	300	D	00:41	300	D	01:23	300	D	01:30	300

Prev Trn:	536			632			828		
Train:	539			731			829		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1					23:51			00:00	
BROADWAY-CABOT									
COV		23:29			23:52			00:01	
BACK BAY	S	23:31	30	S	23:55	30	S	00:04	30
RUG				S	23:58	30	S	00:07	30
PLAINS					00:01			00:11	
FOREST HILLS									
ROSLINDALE									
HYDE PARK							S	00:16	30
UPHAM'S CORNER									
MORTON ST									
FAIRMOUNT									
READ					00:06			00:18	
READVILLE				S	00:08	30			
ENDICOTT				D	00:11	30			
ROUTE 128							S	00:21	45
JUNCTION								00:23	
CANTON JCT							S	00:26	30
CANTON CENTER									
STOUGHTON									
SHARON							S	00:31	45
MANSFIELD							S	00:39	45
HOLDEN								00:44	
ATT							S	00:48	45
SOUTH ATTLEBORO							S	00:56	30
ORM								01:03	
PROVIDENCE							D	01:06	30

10.4.3. 2030 No-Build Operating Plan, Old Colony Line

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 1 of 6

Train:	2			32			70			4			34			72			6		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH	S	05:20	30							S	06:00	30							S	06:58	60
BRIDGEWATER	S	05:30	30							S	06:10	30							S	07:08	60
CAMPELLO	S	05:37	30							S	06:18	30							S	07:16	60
BROCKTON	S	05:41	30							S	06:22	30							S	07:20	60
MONTELLO	S	05:44	30							S	06:25	30							S	07:23	60
HOLBROOK/RANDOLPH	S	05:49	30							S	06:30	30							S	07:28	60
SOUTH WEYMOUTH				S	06:01	30							S	06:49	60						
BRAINTREE	D	05:56	30										D	06:57	60						
GREENBUSH PUTIN							N	06:19								N	07:16				
QUINCY CENTER							D	06:22	30	D	06:42	30							D	07:39	60
JFK/UMASS	D	06:10	30	D	06:21	30	D	06:30	30							D	07:27	60	D	07:48	60
BROADWAY-CABOT		06:14			06:25			06:34			06:55			07:14			07:32			07:52	
TOWER 1		06:15			06:26			06:35			06:56			07:15			07:33			07:54	
SOUTH STATION	D	06:17	300	D	06:29	300	D	06:38	300	D	06:58	300	D	07:17	300	D	07:36	300	D	07:56	300

Prev Trn:	2			32			744			74			38			76			752		
Train:	3			71			33			5			61			73			35		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:35	300	S	06:54	300	S	07:11	300	S	08:24	300	S	08:56	300	S	09:25	300	S	09:37	300
TOWER 1		06:36			06:55			07:12			08:25			08:57			09:26			09:38	
BROADWAY-CABOT		06:38			06:56			07:13			08:26			08:58			09:27			09:39	
JFK/UMASS																					
QUINCY CENTER	D	06:49	30										S	09:09	30	S	09:38	30			
GREENBUSH PUTIN				N	07:10											N	09:41				
BRAINTREE	D	06:55	30				D	07:32	30	D	08:43	30	S	09:15	30					09:55	30
SOUTH WEYMOUTH							D	07:39	30				D	09:22	30				D	10:02	30
HOLBROOK/RANDOLPH	D	07:03	30							S	08:51	30									
MONTELLO	D	07:08	30							S	08:56	30									
BROCKTON	D	07:12	30							S	08:59	30									
CAMPELLO	S	07:20	30							S	09:03	30									
BRIDGEWATER	D	07:38	30							S	09:11	30									
MIDDLEBOROUGH	D	07:50	30							D	09:23	30									

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 2 of 6

Train:	74			36			8			38			76			10			40		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Prev Trn:	40			78			754			80			42			14			82		
Train:	7			75			63			9			39			77			65		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 3 of 6

Train:	78			12			60			80			42			14			82		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30				D	11:51	30	D	12:32	30
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44	
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45	
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:46	300	D	12:07	300	D	12:48	300

Prev Trn:	62			16			44			64			81Q			43Q			766		
Train:	15			79			41			17			81			43			19		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 4 of 6

Train:	62			16			44			84			64			18			86		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	13:08	30										S	15:25	30			
BRIDGEWATER				S	13:18	30										S	15:35	30			
CAMPELLO				S	13:26	30										S	15:43	30			
BROCKTON				S	13:30	30										S	15:47	30			
MONTELLO				S	13:33	30										S	15:50	30			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	30			
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:26	300	D	16:24	300	D	16:46	300

Prev Trn:	18			45Q			85			48			47Q			87Q			23Q		
Train:	83			45			21			85			47			87			23		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 5 of 6

Train:	48			20			88			22			52			90			54		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	16:54	30				S	17:57	30									
BRIDGEWATER				S	17:04	30				D	18:10	30									
CAMPELLO				D	17:11	30				D	18:18	30									
BROCKTON				D	17:15	30				D	18:22	30									
MONTELLO				D	17:18	30				D	18:26	30									
HOLBROOK/RANDOLPH				D	17:23	30				S	18:32	30									
SOUTH WEYMOUTH	S	16:31	30										S	19:03	30				S	20:17	30
BRAINTREE	D	16:38	30	D	17:31	30							D	19:11	30				D	20:25	30
GREENBUSH PUTIN							N	18:05								N	19:46				
QUINCY CENTER							D	18:21	30							D	19:52	30			
JFK/UMASS																					
BROADWAY-CABOT		16:56			18:03			18:32			18:54			19:26			20:02			20:43	
TOWER 1		16:57			18:04			18:33			18:55			19:27			20:03			20:44	
SOUTH STATION	D	16:59	300	D	18:06	300	D	18:34	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300

Prev Trn:	49Q			20			88			22			52			90			54		
Train:	49			89			25			51			27			91			55		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26			21:31	
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27			21:32	
JFK/UMASS													S	20:13	30				S	21:36	30
QUINCY CENTER				S	18:48	30	S	19:03	30				S	20:21	30	S	20:38	30			
GREENBUSH PUTIN				N	18:51											N	20:41				
BRAINTREE	S	18:33	60							S	19:47	30							S	21:48	30
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30							D	21:55	30
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30						
MONTELLO							S	19:20	30				S	20:39	30						
BROCKTON							S	19:23	30				S	20:42	30						
CAMPELLO							S	19:27	30				S	20:46	30						
BRIDGEWATER							D	19:35	30				D	20:54	30						
MIDDLEBOROUGH							D	19:48	30				D	21:05	30						

MBTA 2030 No-Build Operating Plan
Old Colony Line
Page 6 of 6

Train:	92			56			28		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Prev Trn:	92			56			28		
Train:	93			29			57		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			

10.4.4. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – NEC and Dorchester Branch

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 1 of 17

Train:	800			790			500			802			702			600			1992		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	04:56	30							S	05:31	30									
ORM		04:57									05:32										
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30									
ATT	S	05:16	45							S	05:51	45									
MANSFIELD	S	05:25	45							S	06:01	45									
SHARON	S	05:33	45							S	06:10	45									
WHALES TOOTH																			S	05:22	30
KINGS HIGHWAY																			S	05:27	30
FALL RIVER																					
FREETOWN																					
CP B40																				05:43	
TAUNTON DEPOT																			S	05:45	30
DEAN ST																			S	05:50	30
RAY																			S	05:59	30
EASTON VILLAGE																			S	06:07	30
NORTH EASTON																			S	06:11	30
STOUGHTON																			S	06:16	30
CANTON CENTER																			S	06:24	30
CANTON JCT	S	05:40	30							S	06:17	30							S	06:28	30
JUNCTION		05:42									06:18									06:29	
ROUTE 128	S	05:45	45							S	06:22	45							S	06:34	45
ENDICOTT				S	05:48	30							S	06:26	30						
READVILLE				S	05:51	30							S	06:29	30						
READ		05:48									06:25			06:30						06:38	
FAIRMOUNT				D	05:54	30															
MORTON ST				D	05:58	30															
UPHAM'S CORNER				D	06:04	30															
HYDE PARK	S	05:50	30							S	06:27	30							S	06:39	30
ROSLINDALE																S	06:37	30			
FOREST HILLS																S	06:40	30			
PLAINS		05:54									06:31			06:37			06:41			06:45	
RUG										S	06:37	30				S	06:44	30			
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:48	30	D	06:48	30
COV		06:03						06:31			06:42			06:44			06:49			06:49	
BROADWAY-CABOT					06:12																
TOWER 1		06:06									06:45			06:47			06:51			06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:52	300	D	06:53	300

Prev Trn:										743Q			801Q			745Q			790		
Train:	703			5501			501			743			801			745			831		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	04:00	300	S	04:45	300	S	05:30	300	S	05:40	300	S	06:20	300	S	06:25	300	S	06:35	300
TOWER 1		04:01									05:42			06:21			06:27			06:36	
BROADWAY-CABOT											05:44						06:29				
COV		04:02			04:49			05:34						06:23						06:39	
BACK BAY				N	04:50		S	05:36	30				S	06:25	30				S	06:40	30
RUG													S	06:28	30						
PLAINS		04:06												06:31						06:45	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK																					
UPHAM'S CORNER										D	05:50	30				D	06:35	30			
MORTON ST										D	05:56	30				D	06:41	30			
FAIRMOUNT										D	06:00	30				D	06:45	30			
READ		04:11												06:37						06:49	
READVILLE										D	06:04	30				D	06:49	30			
ENDICOTT	D	04:18	30																		
ROUTE 128													S	06:40	45						
JUNCTION														06:41						06:53	
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON														06:52	45						
MANSFIELD														07:00	45				S	07:08	45
HOLDEN														07:04							
ATT													S	07:09	45						
SOUTH ATTLEBORO														07:16	30						
ORM														07:24							
PROVIDENCE													D	07:25	30						

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 2 of 17

Train:	744			1902			704			502			804			698NB			1904		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:07	60						
ORM														06:08							
SOUTH ATTLEBORO													S	06:16	60						
ATT													S	06:29	120						
MANSFIELD													S	06:38	120						
SHARON													S	06:48	120						
WHALES TOOTH																			S	05:54	60
KINGS HIGHWAY																			S	05:59	60
FALL RIVER				S	05:36	60															
FREETOWN				S	05:44	60															
CP B40					05:55															06:15	
TAUNTON DEPOT				S	05:57	60													S	06:17	60
DEAN ST				S	06:02	60													S	06:22	60
RAY				S	06:11	60													S	06:31	60
EASTON VILLAGE				S	06:19	60													S	06:39	60
NORTH EASTON				S	06:23	60													S	06:43	60
STOUGHTON				S	06:28	60													S	06:48	60
CANTON CENTER				S	06:36	60													S	06:56	60
CANTON JCT				S	06:39	60													S	07:00	60
JUNCTION					06:40									06:53						07:01	
ROUTE 128				S	06:44	120							S	06:58	120				S	07:06	120
ENDICOTT							D	06:49	1												
READVILLE	S	06:31	30																		
READ					06:47			06:52						07:01						07:10	
FAIRMOUNT	S	06:34	30																		
MORTON ST	D	06:38	30																		
UPHAM'S CORNER	D	06:44	30																		
HYDE PARK				S	06:48	30													S	07:11	60
ROSLINDALE																					
FOREST HILLS																					
PLAINS					06:53			06:58						07:06						07:17	
RUG							S	07:00	60				S	07:10	60						
BACK BAY				D	06:57	30	D	07:04	60	S	07:06	60	D	07:14	60	S	07:17	60	D	07:20	60
COV					06:58			07:05			07:07			07:15			07:18			07:21	
BROADWAY-CABOT																					
TOWER 1		06:52			07:01			07:08						07:18						07:24	
SOUTH STATION	D	06:55	300	D	07:02	300	D	07:09	300	D	07:12	300	D	07:19	300	D	07:23	300	D	07:25	300

Prev Trn:	800			705Q			500			600			70			704			502		
Train:	503			705			505			605			747			607			507		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:50	300	S	06:55	300	S	06:59	300	S	07:07	300	S	07:20	300	S	07:23	300	S	07:29	300
TOWER 1					06:56						07:08			07:22			07:24				
BROADWAY-CABOT														07:24							
COV		06:54			06:58			07:03			07:10						07:26			07:33	
BACK BAY	S	06:56	30				S	07:05	30	S	07:12	30				S	07:28	30	S	07:35	30
RUG																					
PLAINS					07:02						07:17						07:32				
FOREST HILLS										S	07:18	30				S	07:35	30			
ROSLINDALE										D	07:22	30				D	07:39	30			
HYDE PARK																					
UPHAM'S CORNER																					
MORTON ST																					
FAIRMOUNT																					
READ					07:11																
READVILLE				S	07:12	30							D	07:44	30						
ENDICOTT				D	07:16	30															
ROUTE 128																					
JUNCTION																					
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON																					
MANSFIELD																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 3 of 17

Train:	746			602			1994			706			806			504			698NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:33	60						
ORM														06:34							
SOUTH ATTLEBORO													S	06:42	60						
ATT													S	06:52	120						
MANSFIELD													S	07:04	120						
SHARON													S	07:13	120						
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER							S	06:04	60												
FREETOWN							S	06:12	60												
CP B40								06:23													
TAUNTON DEPOT							S	06:25	60												
DEAN ST							S	06:30	60												
RAY							S	06:39	60												
EASTON VILLAGE							S	06:47	60												
NORTH EASTON							S	06:51	60												
STOUGHTON							S	06:56	60												
CANTON CENTER							S	07:04	60												
CANTON JCT							S	07:08	60												
JUNCTION								07:09						07:19							
ROUTE 128							S	07:14	120				S	07:24	120						
ENDICOTT										S	07:18	60									
READVILLE	S	07:06	60							S	07:21	60									
READ								07:18			07:22			07:28							
FAIRMOUNT	S	07:09	60																		
MORTON ST	D	07:13	60																		
UPHAM'S CORNER	D	07:19	60																		
HYDE PARK							S	07:19	60												
ROSLINDALE				S	07:16	60													S	07:35	30
FOREST HILLS				S	07:19	60													S	07:38	30
PLAINS					07:20			07:25			07:29			07:33						07:39	
RUG				S	07:23	60				S	07:33	60							S	07:42	30
BACK BAY				D	07:27	60	D	07:28	60	D	07:37	60	D	07:40	60	S	07:40	60	S	07:46	30
COV					07:28			07:29			07:38			07:41			07:41			07:47	
BROADWAY-CABOT																					
TOWER 1		07:27			07:31			07:32			07:40			07:44						07:49	
SOUTH STATION	D	07:30	300	D	07:32	300	D	07:33	300	D	07:41	300	D	07:45	300	D	07:46	300	D	07:51	300

Prev Trn:	34			1992			804			602			1998NB			832			508		
Train:	795			1907			833			735			751			803			609		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	07:40	300	S	07:43	300	S	07:50	300	S	07:55	300	S	08:10	300	S	08:30	300	S	08:40	300
TOWER 1		07:42			07:44			07:51			07:56			08:11			08:31			08:41	
BROADWAY-CABOT		07:44												08:12							
COV					07:47			07:54			07:58						08:34			08:42	
BACK BAY				S	07:48	30	S	07:55	30	S	08:00	30				S	08:35	30	S	08:45	30
RUG							S	07:58	30							S	08:38	30			
PLAINS					07:51			08:02			08:03						08:41			08:50	
FOREST HILLS																					
ROSLINDALE																			D	08:59	30
HYDE PARK																					
UPHAM'S CORNER	D	07:50	30										D	08:20	30						
MORTON ST	D	07:56	30										D	08:26	30						
FAIRMOUNT	D	08:00	30										D	08:30	30						
READ					07:55			08:06			08:11						08:45				
READVILLE	D	08:04	30							D	08:14	30	D	08:34	30						
ENDICOTT	D	08:08	30							D	08:18	30									
ROUTE 128				S	08:00	45	S	08:10	45							S	08:49	45			
JUNCTION					08:01			08:11									08:50				
CANTON JCT				S	08:06	30	S	08:15	30							S	08:54	30			
CANTON CENTER				S	08:09	30															
STOUGHTON				S	08:17	30															
NORTH EASTON				S	08:23	30															
EASTON VILLAGE				S	08:27	30															
RAY				S	08:35	30															
DEAN ST				S	08:44	30															
TAUNTON DEPOT				S	08:49	30															
CP B40					08:51																
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY				S	09:07	30															
WHALES TOOTH				D	09:12	30															
SHARON																S	09:02	45			
MANSFIELD							S	08:28	45							S	09:10	45			
HOLDEN								08:35									09:15				
ATT							D	08:39	45							S	09:19	45			
SOUTH ATTLEBORO																S	09:26	30			
ORM																	09:34				
PROVIDENCE																D	09:35	30			

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 4 of 17

Train:	1998NB			784NB			708			506			832			604			808		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	07:12	60
ORM																				07:14	
SOUTH ATTLEBORO																			S	07:22	60
ATT																			S	07:32	120
MANSFIELD													S	07:26	120				S	07:44	120
SHARON													S	07:35	120						
WHALES TOOTH	S	06:23	60																		
KINGS HIGHWAY	S	06:28	60																		
FALL RIVER																					
FREETOWN																					
CP B40		06:44																			
TAUNTON DEPOT	S	06:46	60																		
DEAN ST	S	06:51	60																		
RAY	S	07:00	60																		
EASTON VILLAGE	S	07:08	60																		
NORTH EASTON	S	07:12	60																		
STOUGHTON	S	07:17	60																		
CANTON CENTER	S	07:25	60																		
CANTON JCT	S	07:29	60										S	07:41	60						
JUNCTION		07:30												07:42						07:54	
ROUTE 128	S	07:34	120										S	07:47	120						
ENDICOTT							D	07:35	1												
READVILLE				S	07:31	60															
READ		07:36						07:39						07:49						08:01	
FAIRMOUNT				S	07:34	60															
MORTON ST				D	07:38	60															
UPHAM'S CORNER				D	07:44	60															
HYDE PARK	S	07:38	60										S	07:52	60						
ROSLINDALE																S	07:55	60			
FOREST HILLS																S	07:57	60			
PLAINS		07:41						07:46						07:55			07:58			08:06	
RUG							S	07:51	60							S	08:02	60			
BACK BAY	S	07:48	60				D	07:55	60	S	07:59	60	D	08:02	60	D	08:06	60	D	08:11	60
COV		07:49						07:56			08:00			08:03			08:07			08:12	
BROADWAY-CABOT																					
TOWER 1		07:50			07:52			07:58						08:06			08:10			08:15	
SOUTH STATION	D	07:52	300	D	07:55	300	D	07:59	300	D	08:05	300	D	08:07	300	D	08:11	300	D	08:16	300

Prev Trn:	506			1906			1995Q			10			710			1911Q			514		
Train:	509			1909			1995			753			707			1911			611		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	08:50	300	S	08:50	300	S	08:55	300	S	09:21	300	S	09:22	300	S	09:49	300	S	10:00	300
TOWER 1					08:51			09:01			09:22			09:23			09:50			10:01	
BROADWAY-CABOT											09:23										
COV		08:54			08:53			09:03						09:26			09:51			10:02	
BACK BAY	S	08:56	30	S	08:54	30	S	09:04	30				S	09:27	30	S	09:54	30	S	10:05	30
RUG																S	09:57	30			
PLAINS					08:58			09:08						09:30			10:00			10:09	
FOREST HILLS																			S	10:12	30
ROSLINDALE																			D	10:15	30
HYDE PARK																S	10:05	30			
UPHAM'S CORNER										D	09:31	30									
MORTON ST										D	09:37	30									
FAIRMOUNT										D	09:41	30									
READ					09:02			09:12						09:34			10:07				
READVILLE										D	09:45	30	S	09:38	30						
ENDICOTT													D	09:41	30						
ROUTE 128				S	09:07	45	S	09:17	45							S	10:10	45			
JUNCTION					09:08			09:18									10:11				
CANTON JCT				S	09:13	30	S	09:23	30							S	10:14	30			
CANTON CENTER				S	09:16	30	S	09:26	30							S	10:17	30			
STOUGHTON				D	09:24	30	D	09:34	30							S	10:26	30			
NORTH EASTON				S	09:30	30	S	09:40	30							S	10:32	30			
EASTON VILLAGE				S	09:34	30	S	09:44	30							S	10:36	30			
RAY				S	09:42	30	S	09:52	30							S	10:44	30			
DEAN ST				S	09:51	30	S	10:01	30							S	10:53	30			
TAUNTON DEPOT				S	09:56	30	S	10:06	30							D	10:58	30			
CP B40					09:58			10:08													
FREETOWN				S	10:09	30															
FALL RIVER				S	10:17	30															
KINGS HIGHWAY							S	10:24	30												
WHALES TOOTH							D	10:29	30												
SHARON																					
MANSFIELD																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 5 of 17

Train:	748			508			722NB			1906			738			750			606		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	06:57	60									
FREETOWN										S	07:05	60									
CP B40											07:16										
TAUNTON DEPOT										S	07:18	60									
DEAN ST										S	07:23	60									
RAY										S	07:32	60									
EASTON VILLAGE										S	07:40	60									
NORTH EASTON										S	07:44	60									
STOUGHTON										S	07:48	60									
CANTON CENTER										S	07:57	60									
CANTON JCT										S	08:01	60									
JUNCTION											08:02										
ROUTE 128										S	08:07	120									
ENDICOTT							S	07:58	60				S	08:15	60						
READVILLE	S	07:56	60				S	08:01	60				S	08:19	60						
READ								08:03			08:10			08:21							
FAIRMOUNT	S	07:59	60													S	08:19	60			
MORTON ST	D	08:03	60													D	08:23	60			
UPHAM'S CORNER	D	08:09	60													D	08:29	60			
HYDE PARK										S	08:13	60									
ROSLINDALE																			S	08:26	60
FOREST HILLS																			S	08:29	60
PLAINS								08:10			08:19			08:25						08:30	
RUG							S	08:14	60	S	08:23	60							S	08:33	60
BACK BAY				S	08:17	60	D	08:19	60	D	08:27	60	D	08:35	60				D	08:37	60
COV					08:19			08:20			08:28			08:36						08:38	
BROADWAY-CABOT																					
TOWER 1		08:17						08:22			08:31			08:39			08:37			08:41	
SOUTH STATION	D	08:20	300	D	08:23	300	D	08:23	300	D	08:32	300	D	08:40	300	D	08:40	300	D	08:42	300

Prev Trn:	712			792			1998			709Q			516			60			1912		
Train:	805			755			1981			709			511			757			1983		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	10:25	300	S	10:29	300	S	10:46	300	S	10:53	300	S	11:00	300	S	11:37	300	S	11:44	300
TOWER 1		10:26			10:30			10:47			10:54						11:38			11:45	
BROADWAY-CABOT					10:31												11:39				
COV		10:27						10:48			10:55			11:04						11:46	
BACK BAY	S	10:30	30				S	10:51	30	S	10:58	30	S	11:06	30				S	11:49	30
RUG							S	10:54	30										S	11:52	30
PLAINS		10:36						10:57			11:02									11:55	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK	S	10:41	30				S	11:02	30										S	12:00	30
UPHAM'S CORNER				D	10:39	30										D	11:47	30			
MORTON ST				D	10:45	30										D	11:53	30			
FAIRMOUNT				D	10:49	30										D	11:57	30			
READ		10:42						11:04			11:07									12:02	
READVILLE				D	10:53	30				S	11:08	30				D	12:01	30			
ENDICOTT										D	11:11	30									
ROUTE 128	S	10:46	45				S	11:07	45										S	12:05	45
JUNCTION		10:48						11:08												12:06	
CANTON JCT							S	11:11	30										S	12:09	30
CANTON CENTER							S	11:14	30										S	12:12	30
STOUGHTON							S	11:23	30										S	12:21	30
NORTH EASTON							S	11:29	30										S	12:27	30
EASTON VILLAGE							S	11:33	30										S	12:31	30
RAY							S	11:41	30										S	12:39	30
DEAN ST							S	11:50	30										S	12:48	30
TAUNTON DEPOT							S	11:55	30										S	12:53	30
CP B40								11:57												12:55	
FREETOWN							S	12:08	30												
FALL RIVER							S	12:19	30												
KINGS HIGHWAY																			S	13:11	30
WHALES TOOTH																			D	13:16	30
SHARON	S	10:57	45																		
MANSFIELD	S	11:05	45																		
HOLDEN		11:12																			
ATT	S	11:14	45																		
SOUTH ATTLEBORO	S	11:21	30																		
ORM		11:29																			
PROVIDENCE	D	11:30	30																		

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 6 of 17

Train:	810			710			510			1908			512			898NB			752		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	07:35	60													S	07:52	30			
ORM		07:37															07:53				
SOUTH ATTLEBORO	S	07:45	60													S	08:02	30			
ATT	S	07:55	120													S	08:12	45			
MANSFIELD	S	08:05	120													S	08:22	45			
SHARON	S	08:14	120													S	08:31	45			
WHALES TOOTH										S	07:26	60									
KINGS HIGHWAY										S	07:31	60									
FALL RIVER																					
FREETOWN																					
CP B40											07:47										
TAUNTON DEPOT										S	07:49	60									
DEAN ST										S	07:54	60									
RAY										S	08:03	60									
EASTON VILLAGE										S	08:11	60									
NORTH EASTON										S	08:15	60									
STOUGHTON										S	08:21	60									
CANTON CENTER										S	08:28	60									
CANTON JCT	S	08:24	60							S	08:33	60				S	08:41	30			
JUNCTION		08:25									08:34						08:42				
ROUTE 128	S	08:30	120							S	08:39	120				S	08:47	45			
ENDICOTT				S	08:27	60															
READVILLE				S	08:31	60													S	08:46	30
READ		08:33			08:32						08:41						08:50				
FAIRMOUNT																			D	08:49	30
MORTON ST																			D	08:53	30
UPHAM'S CORNER																			D	08:59	30
HYDE PARK	S	08:36	60							S	08:43	60				S	08:53	30			
ROSLINDALE																					
FOREST HILLS																					
PLAINS		08:42			08:37						08:51						08:58				
RUG				S	08:42	60															
BACK BAY	D	08:46	60	D	08:47	60	S	08:50	60	D	08:55	60	S	09:02	30	D	09:03	30			
COV		08:47			08:48			08:51			08:56			09:03			09:04				
BROADWAY-CABOT																					
TOWER 1		08:50			08:51						08:59						09:07			09:07	
SOUTH STATION	D	08:51	300	D	08:52	300	D	08:56	300	D	09:00	300	D	09:08	300	D	09:08	300	D	09:10	300

Prev Trn:	807Q			610			512			518			756			1985Q			612		
Train:	807			613			513			711			759			1985			515		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	11:55	300	S	12:00	300	S	12:10	300	S	12:45	300	S	12:45	300	S	12:49	300	S	13:00	300
TOWER 1		11:56			12:01						12:46			12:46			12:50				
BROADWAY-CABOT														12:47							
COV		11:57			12:02			12:14			12:47						12:51			13:04	
BACK BAY	S	12:00	30	S	12:05	30	S	12:16	30	S	12:50	30				S	12:54	30	S	13:06	30
RUG	S	12:03	30	S	12:08	30				S	12:53	30				S	12:57	30			
PLAINS		12:06			12:12						12:55						13:00				
FOREST HILLS				S	12:13	30															
ROSLINDALE				D	12:16	30															
HYDE PARK	S	12:13	30													S	13:05	30			
UPHAM'S CORNER													D	12:55	30						
MORTON ST													D	13:01	30						
FAIRMOUNT													D	13:05	30						
READ		12:14									13:01						13:07				
READVILLE										S	13:03	30	D	13:09	30						
ENDICOTT										D	13:06	30									
ROUTE 128	S	12:17	45													S	13:10	45			
JUNCTION		12:20															13:11				
CANTON JCT	S	12:22	30													S	13:14	30			
CANTON CENTER																S	13:17	30			
STOUGHTON																S	13:26	30			
NORTH EASTON																S	13:32	30			
EASTON VILLAGE																S	13:36	30			
RAY																S	13:44	30			
DEAN ST																S	13:53	30			
TAUNTON DEPOT																S	13:58	30			
CP B40																	14:00				
FREETOWN																S	14:11	30			
FALL RIVER																S	14:19	30			
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON	S	12:28	45																		
MANSFIELD	S	12:36	45																		
HOLDEN		12:42																			
ATT	S	12:45	45																		
SOUTH ATTLEBORO	S	12:55	30																		
ORM		13:00																			
PROVIDENCE	D	13:04	30																		

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 7 of 17

Train:	608			812			792			1996			514			834			516		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	08:10	30															
ORM					08:11																
SOUTH ATTLEBORO				S	08:20	30															
ATT				S	08:30	45										S	09:00	45			
MANSFIELD				S	08:38	45										S	09:09	45			
SHARON				S	08:47	45										S	09:18	45			
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	08:04	30									
FREETOWN										S	08:12	30									
CP B40											08:23										
TAUNTON DEPOT										S	08:25	30									
DEAN ST										S	08:30	30									
RAY										S	08:39	30									
EASTON VILLAGE										S	08:47	30									
NORTH EASTON										S	08:51	30									
STOUGHTON										S	08:56	30									
CANTON CENTER										N	09:04										
CANTON JCT				S	08:54	30				S	09:08	30				S	09:25	30			
JUNCTION					08:55						09:09						09:26				
ROUTE 128				S	08:59	45				S	09:14	45				S	09:27	45			
ENDICOTT							S	08:54	30												
READVILLE							S	09:00	30												
READ					09:02						09:18						09:31				
FAIRMOUNT							S	09:03	30												
MORTON ST							D	09:07	30												
UPHAM'S CORNER							D	09:13	30												
HYDE PARK				S	09:04	30				S	09:19	30									
ROSLINDALE	S	08:56	30																		
FOREST HILLS	S	08:59	30																		
PLAINS		09:00			09:09						09:25						09:37				
RUG	S	09:04	30	S	09:14	30										S	09:41	30			
BACK BAY	D	09:08	30	D	09:18	30				S	09:28	30	S	09:29	30	S	09:44	30	S	09:54	30
COV		09:09			09:19						09:29			09:30			09:45			09:55	
BROADWAY-CABOT								09:21													
TOWER 1		09:12			09:22						09:32						09:48				
SOUTH STATION	D	09:13	300	D	09:23	300	D	09:25	300	D	09:33	300	D	09:35	300	D	09:49	300	D	10:00	300

Prev Trn:	761Q			1984			716			758			760			713Q			520		
Train:	761			1987			809			615			763			713			517		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	13:32	300	S	13:49	300	S	13:56	300	S	14:00	300	S	14:25	300	S	14:40	300	S	14:45	300
TOWER 1		13:33			13:50			13:57			14:01			14:26			14:41				
BROADWAY-CABOT		13:34												14:27							
COV					13:51			13:58			14:02						14:42			14:49	
BACK BAY				S	13:54	30	S	14:01	30	S	14:05	30				S	14:45	30	S	14:51	30
RUG				S	13:57	30	S	14:04	30	S	14:08	30				S	14:48	30			
PLAINS					14:00			14:06			14:12						14:50				
FOREST HILLS										S	14:14	30									
ROSLINDALE										D	14:18	30									
HYDE PARK				S	14:05	30	S	14:13	30												
UPHAM'S CORNER	D	13:42	30										D	14:35	30						
MORTON ST	D	13:48	30										D	14:41	30						
FAIRMOUNT	D	13:52	30										D	14:45	30						
READ					14:07			14:14									14:56				
READVILLE	D	13:56	30										D	14:49	30	S	14:58	30			
ENDICOTT																D	15:01	30			
ROUTE 128				S	14:10	45	S	14:19	45												
JUNCTION					14:11			14:21													
CANTON JCT				S	14:14	30	S	14:24	30												
CANTON CENTER				S	14:17	30															
STOUGHTON				S	14:26	30															
NORTH EASTON				S	14:32	30															
EASTON VILLAGE				S	14:36	30															
RAY				S	14:44	30															
DEAN ST				S	14:53	30															
TAUNTON DEPOT				S	14:58	30															
CP B40					15:00																
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY				S	15:16	30															
WHALES TOOTH				D	15:21	30															
SHARON							S	14:30	45												
MANSFIELD							S	14:38	45												
HOLDEN								14:44													
ATT							S	14:46	45												
SOUTH ATTLEBORO							S	14:56	30												
ORM								15:03													
PROVIDENCE							D	15:05	30												

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 8 of 17

Train:	712			610			1910			754			814			1912			756		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	09:32	30						
ORM														09:33							
SOUTH ATTLEBORO													S	09:41	30						
ATT													S	09:51	45						
MANSFIELD													S	09:59	45						
SHARON													S	10:08	45						
WHALES TOOTH																S	09:43	30			
KINGS HIGHWAY																S	09:48	30			
FALL RIVER							S	08:49	60												
FREETOWN							S	08:57	60												
CP B40								09:08									10:04				
TAUNTON DEPOT							S	09:10	60							S	10:06	30			
DEAN ST							S	09:15	60							S	10:11	30			
RAY							S	09:24	60							S	10:20	30			
EASTON VILLAGE							S	09:32	60							S	10:28	30			
NORTH EASTON							S	09:36	60							S	10:32	30			
STOUGHTON							S	09:41	30							S	10:39	30			
CANTON CENTER							S	09:49	30							S	10:45	30			
CANTON JCT							S	09:52	30				S	10:15	30	S	10:49	30			
JUNCTION								09:53						10:16			10:50				
ROUTE 128							S	09:57	45				S	10:20	45	S	10:56	45			
ENDICOTT	S	09:44	30																		
READVILLE	S	09:47	30							S	09:55	30							S	11:03	30
READ		09:48						10:00						10:24			10:59				
FAIRMOUNT										D	09:58	30							D	11:06	30
MORTON ST										D	10:02	30							D	11:10	30
UPHAM'S CORNER										D	10:08	30							D	11:16	30
HYDE PARK							S	10:02	30				S	10:25	30	S	11:03	30			
ROSLINDALE				S	09:59	30															
FOREST HILLS				S	10:02	30															
PLAINS		09:55			10:03			10:07						10:30			11:06				
RUG	S	09:59	30	S	10:07	30							S	10:35	30						
BACK BAY	S	10:03	30	S	10:11	30	S	10:12	30				S	10:39	30	S	11:12	30			
COV		10:04			10:12			10:14						10:40			11:13				
BROADWAY-CABOT																					
TOWER 1		10:07			10:15			10:15			10:15			10:43			11:16			11:23	
SOUTH STATION	D	10:08	300	D	10:16	300	D	10:17	300	D	10:19	300	D	10:44	300	D	11:17	300	D	11:27	300

Prev Trn:	1989Q			818			762			764			718			1988			616		
Train:	1989			617			765			767			811			1977			619		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:49	300	S	15:00	300	S	15:20	300	S	15:44	300	S	15:45	300	S	15:49	300	S	16:00	300
TOWER 1		14:50			15:01			15:21			15:45			15:46			15:50			16:01	
BROADWAY-CABOT								15:22			15:46										
COV		14:51			15:02									15:49			15:51			16:04	
BACK BAY	S	14:54	30	S	15:05	30							S	15:50	30	S	15:54	30	S	16:05	60
RUG	S	14:57	30	S	15:08	30							S	15:53	30	S	15:57	30	S	16:08	60
PLAINS		15:00			15:12									15:56			16:01			16:12	
FOREST HILLS				S	15:13	30													S	16:13	60
ROSLINDALE				D	15:16	30													D	16:16	60
HYDE PARK	S	15:05	30													S	16:05	30			
UPHAM'S CORNER							D	15:30	30	S	15:54	30									
MORTON ST							D	15:36	30		16:00	30									
FAIRMOUNT							D	15:40	30		16:04	30									
READ		15:07												16:01			16:07				
READVILLE							D	15:44	30	D	16:08	30									
ENDICOTT																					
ROUTE 128	S	15:10	45													S	16:11	45			
JUNCTION		15:11												16:05			16:12				
CANTON JCT	S	15:14	30													S	16:18	30			
CANTON CENTER	S	15:17	30													S	16:21	30			
STOUGHTON	S	15:26	30													S	16:30	30			
NORTH EASTON	S	15:32	30													S	16:35	30			
EASTON VILLAGE	S	15:36	30													S	16:40	30			
RAY	S	15:44	30													S	16:48	30			
DEAN ST	S	15:53	30													S	16:57	30			
TAUNTON DEPOT	S	15:58	30													S	17:02	30			
CP B40		16:00															17:04				
FREETOWN	S	16:11	30													S	17:15	30			
FALL RIVER	S	16:19	30													S	17:23	30			
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON													S	16:12	45						
MANSFIELD													S	16:21	45						
HOLDEN														16:29							
ATT													S	16:31	45						
SOUTH ATTLEBORO													S	16:37	30						
ORM														16:45							
PROVIDENCE													D	16:46	30						

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 9 of 17

Train:	612			714			518			758			816			716			520		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	11:40	30						
ORM														11:41							
SOUTH ATTLEBORO													S	11:50	30						
ATT													S	12:00	45						
MANSFIELD													S	12:08	45						
SHARON													S	12:16	45						
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DEAN ST																					
RAY																					
EASTON VILLAGE																					
NORTH EASTON																					
STOUGHTON																					
CANTON CENTER																					
CANTON JCT													S	12:23	30						
JUNCTION														12:24							
ROUTE 128													S	12:28	45						
ENDICOTT				S	11:26	30										S	12:46	30			
READVILLE				S	11:29	30				S	12:11	30				S	12:49	30			
READ					11:30									12:32			12:50				
FAIRMOUNT										D	12:14	30									
MORTON ST										D	12:18	30									
UPHAM'S CORNER										D	12:24	30									
HYDE PARK													S	12:33	30						
ROSLINDALE	S	11:17	30																		
FOREST HILLS	S	11:20	30																		
PLAINS		11:21			11:37									12:38			12:56				
RUG	S	11:24	30	S	11:39	30							S	12:43	30	S	12:57	30			
BACK BAY	S	11:28	30	S	11:43	30	S	11:59	30				S	12:48	30	S	13:01	30	S	13:09	30
COV		11:29			11:45			12:00						12:49			13:02			13:10	
BROADWAY-CABOT																					
TOWER 1		11:32			11:47						12:31			12:52			13:04				
SOUTH STATION	D	11:33	300	D	11:48	300	D	12:05	300	D	12:35	300	D	12:53	300	D	13:06	300	D	13:15	300

Prev Trn:	1917Q			522			715Q			1986			699NBQ			524			899NBQ		
Train:	1917			519			715			1979			699NB			521			899NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:01	300	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:28	300
TOWER 1		16:02						16:11			16:18			16:24						16:29	
BROADWAY-CABOT																					
COV		16:05			16:09			16:14			16:21			16:27			16:31			16:32	
BACK BAY	S	16:06	60	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:33	60
RUG	S	16:09	60				S	16:19	60	S	16:26	60	S	16:32	60				S	16:36	60
PLAINS		16:12						16:21			16:28			16:36						16:39	
FOREST HILLS													S	16:37	60						
ROSLINDALE													D	16:40	60						
HYDE PARK	S	16:17	60							S	16:32	60									
UPHAM'S CORNER																					
MORTON ST																					
FAIRMOUNT																					
READ		16:19						16:27			16:35									16:43	
READVILLE							S	16:29	60												
ENDICOTT							D	16:32	60												
ROUTE 128	S	16:23	120							S	16:40	120									
JUNCTION		16:24									16:41									16:47	
CANTON JCT	S	16:29	60							S	16:47	60									
CANTON CENTER	S	16:32	60							S	16:50	60									
STOUGHTON	N	16:41								N	16:59										
NORTH EASTON	S	16:47	60							S	17:05	60									
EASTON VILLAGE	S	16:51	60							S	17:09	60									
RAY	S	16:59	60							S	17:17	60									
DEAN ST	S	17:11	60							S	17:26	60									
TAUNTON DEPOT	S	17:16	60							S	17:31	60									
CP B40		17:18									17:33										
FREETOWN										S	17:44	60									
FALL RIVER										S	17:52	60									
KINGS HIGHWAY	S	17:34	60																		
WHALES TOOTH	D	17:39	60																		
SHARON																			S	16:54	120
MANSFIELD																			S	17:03	120
HOLDEN																				17:13	
ATT																			S	17:14	120
SOUTH ATTLEBORO																			S	17:23	60
ORM																				17:31	
PROVIDENCE																			D	17:32	60

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 10 of 17

Train:	1984			614			760			1986			762			818			522		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																S	13:28	30			
ORM																	13:29				
SOUTH ATTLEBORO																S	13:38	30			
ATT																S	13:47	45			
MANSFIELD																S	13:54	45			
SHARON																S	14:02	45			
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	12:45	30									
FREETOWN										S	12:53	30									
CP B40											13:04										
TAUNTON DEPOT	S	12:06	30							S	13:06	30									
DEAN ST	S	12:11	30							S	13:11	30									
RAY	S	12:20	30							S	13:20	30									
EASTON VILLAGE	S	12:28	30							S	13:28	30									
NORTH EASTON	S	12:32	30							S	13:32	30									
STOUGHTON	S	12:39	30							S	13:39	30									
CANTON CENTER	S	12:45	30							S	13:45	30									
CANTON JCT	S	12:49	30							S	13:49	30									
JUNCTION		12:50									13:50						14:03				
ROUTE 128	S	12:56	45							S	13:56	45				S	14:12	45			
ENDICOTT																					
READVILLE							S	13:19	30				S	14:06	30						
READ		12:59									13:59						14:15				
FAIRMOUNT							D	13:22	30				D	14:09	30						
MORTON ST							D	13:26	30				D	14:13	30						
UPHAM'S CORNER							D	13:32	30				D	14:19	30						
HYDE PARK	S	13:03	30							S	14:03	30									
ROSLINDALE				S	13:17	30															
FOREST HILLS				S	13:20	30															
PLAINS		13:06			13:21						14:06						14:19				
RUG				S	13:24	30										S	14:25	30			
BACK BAY	S	13:12	30	S	13:28	30				S	14:12	30				S	14:29	30	S	14:57	30
COV		13:13			13:29						14:13						14:30			14:58	
BROADWAY-CABOT																					
TOWER 1		13:16			13:32			13:39			14:16			14:26			14:32				
SOUTH STATION	D	13:17	300	D	13:33	300	D	13:43	300	D	14:17	300	D	14:30	300	D	14:34	300	D	15:03	300

Prev Trn:	799Q			739NBQ			813Q			621Q			618			1919Q			768		
Train:	799			739NB			813			621			737			1919			769		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:30	300	S	16:33	300	S	16:40	300	S	16:40	300	S	16:45	300	S	16:50	300	S	16:55	300
TOWER 1		16:31			16:34			16:41			16:41			16:46			16:51			16:56	
BROADWAY-CABOT		16:32																		16:57	
COV					16:37			16:44			16:44			16:49			16:54				
BACK BAY				S	16:38	60	S	16:45	60	S	16:45	60	S	16:50	60	S	16:55	60			
RUG				S	16:42	60	S	16:48	60	S	16:49	60	S	16:54	60	S	16:59	60			
PLAINS					16:45			16:51			16:53			16:57			17:02				
FOREST HILLS										S	16:54	60									
ROSLINDALE										D	16:57	60									
HYDE PARK													S	17:03	60						
UPHAM'S CORNER	S	16:41	60																S	17:06	60
MORTON ST	S	16:48	60																S	17:13	60
FAIRMOUNT	S	16:53	60																S	17:18	60
READ					16:50			16:56						17:06			17:06				
READVILLE	D	16:57	60	D	16:52	60							D	17:07	60				D	17:22	60
ENDICOTT	D	17:01	60	D	16:56	60							D	17:11	60						
ROUTE 128							S	16:59	120							S	17:10	120			
JUNCTION								17:00									17:11				
CANTON JCT																S	17:17	60			
CANTON CENTER																S	17:20	60			
STOUGHTON																S	17:30	60			
NORTH EASTON																S	17:35	60			
EASTON VILLAGE																S	17:40	60			
RAY																S	17:48	60			
DEAN ST																S	17:57	60			
TAUNTON DEPOT																S	18:02	60			
CP B40																	18:04				
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																S	18:20	60			
WHALES TOOTH																D	18:25	60			
SHARON							S	17:10	120												
MANSFIELD							S	17:19	120												
HOLDEN								17:37													
ATT							S	17:29	120												
SOUTH ATTLEBORO							S	17:38	60												
ORM								17:46													
PROVIDENCE							D	17:47	60												

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 11 of 17

Train:	718			1988			764			524			616			1976			766		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH				S	13:42	30															
KINGS HIGHWAY				S	13:43	30															
FALL RIVER																S	14:41	30			
FREETOWN																S	14:49	30			
CP B40					13:59												15:00				
TAUNTON DEPOT				S	14:01	30										S	15:02	30			
DEAN ST				S	14:06	30										S	15:07	30			
RAY				S	14:15	30										S	15:16	30			
EASTON VILLAGE				S	14:23	30										S	15:24	30			
NORTH EASTON				S	14:27	30										S	15:28	30			
STOUGHTON				S	14:34	30										S	15:35	30			
CANTON CENTER				S	14:40	30										S	15:41	30			
CANTON JCT				S	14:44	30										S	15:45	30			
JUNCTION					14:45												15:46				
ROUTE 128				S	14:51	45										S	15:52	45			
ENDICOTT	S	14:46	30																		
READVILLE	S	14:49	30				S	15:02	30										S	15:55	30
READ		14:50			14:54												15:55				
FAIRMOUNT							D	15:05	30										D	15:58	30
MORTON ST							D	15:09	30										D	16:02	30
UPHAM'S CORNER							D	15:15	30										D	16:08	30
HYDE PARK				S	14:58	30										S	15:59	30			
ROSLINDALE													S	15:30	30						
FOREST HILLS													S	15:34	30						
PLAINS		14:56			15:01									15:35			16:02				
RUG																					
BACK BAY	S	15:00	30	S	15:07	30				S	15:29	30	S	15:40	30	S	16:04	30			
COV		15:01			15:08						15:30			15:41			16:05				
BROADWAY-CABOT																					
TOWER 1		15:04			15:11			15:21						15:44			16:08			16:13	
SOUTH STATION	D	15:05	300	D	15:12	300	D	15:26	300	D	15:35	300	D	15:45	300	D	16:09	300	D	16:19	300

Prev Trn:	820			523Q			1999NBQ			720			526			771Q			1921Q		
Train:	815			523			1999NB			719			525			771			1921		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:57	300	S	17:00	300	S	17:03	300	S	17:10	300	S	17:15	300	S	17:15	300	S	17:19	300
TOWER 1		16:58						17:04			17:11						17:16			17:20	
BROADWAY-CABOT																	17:17				
COV		17:01			17:04			17:07			17:14			17:19						17:23	
BACK BAY	S	17:02	60	S	17:05	60	S	17:08	60	S	17:15	60	S	17:21	60				S	17:24	60
RUG	S	17:06	60				S	17:12	60	S	17:19	60							S	17:28	60
PLAINS		17:09						17:15			17:22									17:31	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK																			S	17:38	60
UPHAM'S CORNER																S	17:26	60			
MORTON ST																S	17:33	60			
FAIRMOUNT																S	17:38	60			
READ		17:13						17:19			17:27									17:40	
READVILLE																D	17:42	60			
ENDICOTT										D	17:33	60									
ROUTE 128							S	17:23	120										S	17:44	120
JUNCTION		17:17						17:24												17:45	
CANTON JCT							S	17:30	60										S	17:52	60
CANTON CENTER							S	17:33	60										S	17:58	60
STOUGHTON							S	17:42	60										S	18:05	60
NORTH EASTON							S	17:48	60										S	18:11	60
EASTON VILLAGE							S	17:52	60										S	18:15	60
RAY							S	18:00	60										S	18:23	60
DEAN ST							S	18:09	60										S	18:32	60
TAUNTON DEPOT							S	18:14	60										S	18:37	60
CP B40								18:16												18:39	
FREETOWN							S	18:27	60												
FALL RIVER							S	18:35	60												
KINGS HIGHWAY																			S	18:55	60
WHALES TOOTH																			D	19:00	60
SHARON	S	17:24	120																		
MANSFIELD	S	17:33	120																		
HOLDEN		17:39																			
ATT	S	17:47	120																		
SOUTH ATTLEBORO	S	17:54	60																		
ORM		18:03																			
PROVIDENCE	D	18:04	60																		

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 12 of 17

Train:	618			820			768			526			720			1980			620		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	15:19	30															
ORM					15:20																
SOUTH ATTLEBORO				S	15:28	30															
ATT				S	15:45	45															
MANSFIELD				S	15:54	45															
SHARON				S	16:02	45															
WHALES TOOTH																S	15:48	30			
KINGS HIGHWAY																S	15:53	30			
FALL RIVER																					
FREETOWN																					
CP B40																	16:09				
TAUNTON DEPOT																S	16:11	30			
DEAN ST																S	16:18	30			
RAY																S	16:25	30			
EASTON VILLAGE																S	16:33	30			
NORTH EASTON																S	16:37	30			
STOUGHTON																S	16:44	30			
CANTON CENTER																S	16:50	30			
CANTON JCT				S	16:09	30										S	16:54	30			
JUNCTION					16:10												16:55				
ROUTE 128																S	17:01	45			
ENDICOTT													S	16:33	30						
READVILLE													S	16:36	30						
READ					16:15									16:37			17:04				
FAIRMOUNT							D	16:11	30												
MORTON ST							D	16:15	30												
UPHAM'S CORNER							D	16:21	30												
HYDE PARK																S	17:08	30			
ROSLINDALE	S	16:12	30																S	17:33	30
FOREST HILLS	D	16:14	30																D	17:36	30
PLAINS		16:15			16:20									16:43			17:11			17:37	
RUG																					
BACK BAY	D	16:21	30	S	16:24	30				S	16:41	30	S	16:48	30	S	17:17	30	D	17:42	30
COV		16:22			16:25						16:42			16:49			17:18			17:43	
BROADWAY-CABOT																					
TOWER 1		16:25			16:28			16:26						16:52			17:21			17:46	
SOUTH STATION	D	16:26	300	D	16:30	300	D	16:32	300	D	16:47	300	D	16:53	300	D	17:22	300	D	17:47	300

Prev Trn:	623Q			527Q			817Q			783NBQ			721Q			1980			625Q		
Train:	623			527			817			783NB			721			923			625		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:26	300	S	17:35	300	S	17:40	300	S	17:40	300	S	17:44	300	S	17:45	300	S	17:55	300
TOWER 1		17:27						17:41			17:41			17:45			17:46			17:56	
BROADWAY-CABOT											17:42										
COV		17:30			17:39			17:44						17:48			17:49			17:59	
BACK BAY	S	17:31	60	S	17:41	60	S	17:45	60				S	17:49	60	S	17:51	60	S	18:00	60
RUG	S	17:35	60				S	17:49	60				S	17:53	60	S	17:56	60	S	18:04	60
PLAINS		17:39						17:52						17:56			17:58			18:08	
FOREST HILLS	S	17:40	60																S	18:09	60
ROSLINDALE	D	17:43	60																D	18:12	60
HYDE PARK													S	18:03	60						
UPHAM'S CORNER										S	17:51	60									
MORTON ST										S	17:58	60									
FAIRMOUNT										S	18:03	60									
READ								17:56						18:05			18:02				
READVILLE										D	18:07	60	S	18:06	60						
ENDICOTT													D	18:10	60						
ROUTE 128																S	18:08	120			
JUNCTION								18:00									18:09				
CANTON JCT																S	18:14	60			
CANTON CENTER																S	18:17	60			
STOUGHTON																D	18:28	60			
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON							S	18:07	120												
MANSFIELD							S	18:18	120												
HOLDEN								19:24													
ATT							S	18:26	120												
SOUTH ATTLEBORO							S	18:33	60												
ORM								18:41													
PROVIDENCE							D	18:42	60												

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 13 of 17

Train:	770			794			772			1920			622			528			822		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	17:22	30
ORM																				17:23	
SOUTH ATTLEBORO																			S	17:31	30
ATT																			S	17:44	45
MANSFIELD																			S	17:53	45
SHARON																			S	18:01	45
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	16:46	30									
FREETOWN										S	16:54	30									
CP B40											17:05										
TAUNTON DEPOT										S	17:07	30									
DEAN ST										S	17:12	30									
RAY										S	17:22	30									
EASTON VILLAGE										S	17:30	30									
NORTH EASTON										S	17:37	30									
STOUGHTON										S	17:44	30									
CANTON CENTER										S	17:50	30									
CANTON JCT										S	17:54	30							S	18:08	30
JUNCTION											17:55									18:09	
ROUTE 128										S	18:01	45							S	18:13	45
ENDICOTT				D	17:41	30															
READVILLE	S	17:35	30				S	17:55	30												
READ											18:04									18:17	
FAIRMOUNT	D	17:38	30				D	17:58	30												
MORTON ST	D	17:42	30				D	18:02	30												
UPHAM'S CORNER	D	17:48	30				D	18:08	30												
HYDE PARK										S	18:08	30							S	18:20	30
ROSLINDALE																					
FOREST HILLS													S	18:14	30						
PLAINS											18:11			18:15						18:25	
RUG																					
BACK BAY										S	18:17	30	S	18:21	30	S	18:24	30	S	18:29	30
COV											18:18			18:22			18:25			18:30	
BROADWAY-CABOT					18:07																
TOWER 1		17:54						18:14			18:21			18:25						18:33	
SOUTH STATION	D	17:59	300	D	18:08	300	D	18:19	300	D	18:22	300	D	18:26	300	D	18:30	300	D	18:34	300

Prev Trn:	1997Q			620			773Q			529Q			723Q			819Q			794		
Train:	1997			598NB			773			529			723			819			627		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:56	300	S	18:03	300	S	18:09	300	S	18:15	300	S	18:15	300	S	18:22	300	S	18:27	300
TOWER 1		17:57						18:10						18:16			18:23			18:28	
BROADWAY-CABOT								18:11													
COV		18:00			18:07						18:19			18:10			18:26			18:31	
BACK BAY	S	18:02	60	S	18:09	60				S	18:21	60	S	18:20	60	S	18:27	60	S	18:32	60
RUG	S	18:07	60										S	18:24	60	S	18:31	60	S	18:36	60
PLAINS		18:09												18:27			18:34			18:40	
FOREST HILLS																			S	18:41	60
ROSLINDALE																			D	18:44	60
HYDE PARK																					
UPHAM'S CORNER							S	18:20	60												
MORTON ST							S	18:27	60												
FAIRMOUNT							S	18:32	60												
READ		18:13												18:31			18:38				
READVILLE							D	18:36	60				S	18:32	60						
ENDICOTT													D	18:36	60						
ROUTE 128	S	18:19	120													S	18:41	120			
JUNCTION		18:20															18:42				
CANTON JCT	S	18:25	60																		
CANTON CENTER	S	18:28	60																		
STOUGHTON	S	18:37	60																		
NORTH EASTON	S	18:43	60																		
EASTON VILLAGE	S	18:47	60																		
RAY	S	18:55	60																		
DEAN ST	S	19:04	60																		
TAUNTON DEPOT	S	19:09	60																		
CP B40		19:11																			
FREETOWN	S	19:22	60																		
FALL RIVER	S	19:30	60																		
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON																S	18:49	120			
MANSFIELD																S	18:58	120			
HOLDEN																	19:05				
ATT																S	19:08	120			
SOUTH ATTLEBORO																S	19:15	60			
ORM																	19:22				
PROVIDENCE																D	19:23	60			

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 14 of 17

Train:	796			824			530			774			922			776			532		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	18:00	30															
ORM					18:01																
SOUTH ATTLEBORO				S	18:10	30															
ATT				S	18:18	45															
MANSFIELD				S	18:26	45															
SHARON				S	18:34	45															
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DEAN ST																					
RAY																					
EASTON VILLAGE																					
NORTH EASTON																					
STOUGHTON													S	18:52	30						
CANTON CENTER													S	18:59	30						
CANTON JCT													S	19:02	30						
JUNCTION					18:43									19:03							
ROUTE 128				S	18:47	45							S	19:07	45						
ENDICOTT	S	18:14	30																		
READVILLE										S	18:46	30				S	19:07	30			
READ					18:49									19:10							
FAIRMOUNT										D	18:49	30				D	19:10	30			
MORTON ST										D	18:53	30				D	19:14	30			
UPHAM'S CORNER										D	18:59	30				D	19:20	30			
HYDE PARK													S	19:12	30						
ROSLINDALE																					
FOREST HILLS																					
PLAINS					18:54									19:17							
RUG																					
BACK BAY				S	18:59	30	S	19:03	30				S	19:22	30				S	19:26	30
COV					19:00			19:04						19:23						19:27	
BROADWAY-CABOT		18:39																			
TOWER 1					19:02						19:05			19:26			19:26				
SOUTH STATION	D	18:40	300	D	19:03	300	D	19:09	300	D	19:10	300	D	19:27	300	D	19:31	300	D	19:32	300

Prev Trn:	531Q			770			1920			622			822			528			530		
Train:	531			775			1925			821			629			533			725		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:30	300	S	18:30	300	S	18:46	300	S	18:50	300	S	19:10	300	S	19:15	300	S	19:35	300
TOWER 1					18:31			18:47			18:51			19:11						19:36	
BROADWAY-CABOT					18:32																
COV		18:34						18:48			18:54			19:14			19:19			19:37	
BACK BAY	S	18:36	60				S	18:51	30	S	18:55	30	S	19:15	30	S	19:21	30	S	19:40	30
RUG							S	18:54	30	S	18:58	30	S	19:19	30				S	19:43	30
PLAINS								18:57			19:01			19:22						19:46	
FOREST HILLS													S	19:23	30						
ROSLINDALE													D	19:27	30						
HYDE PARK							S	19:02	30	S	19:08	30									
UPHAM'S CORNER				S	18:41	60															
MORTON ST				S	18:48	60															
FAIRMOUNT				S	18:53	60															
READ								19:04			19:10									19:51	
READVILLE				D	18:57	60													S	19:53	30
ENDICOTT																			D	19:56	30
ROUTE 128							S	19:07	45	S	19:13	45									
JUNCTION								19:08			19:14										
CANTON JCT							S	19:11	30	S	19:18	30									
CANTON CENTER							S	19:14	30												
STOUGHTON							S	19:23	30												
NORTH EASTON							S	19:29	30												
EASTON VILLAGE							S	19:33	30												
RAY							S	19:41	30												
DEAN ST							S	19:50	30												
TAUNTON DEPOT							S	19:55	30												
CP B40								19:57													
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY							S	20:13	30												
WHALES TOOTH							D	20:18	30												
SHARON										S	19:24	45									
MANSFIELD										S	19:33	45									
HOLDEN											19:40										
ATT										S	19:47	45									
SOUTH ATTLEBORO										S	19:54	30									
ORM											20:02										
PROVIDENCE										D	20:03	30									

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 15 of 17

Train:	626			1926			534			628			778			798			536		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH				S	18:42	60															
KINGS HIGHWAY				S	18:47	60															
FALL RIVER																					
FREETOWN																					
CP B40					19:03																
TAUNTON DEPOT				S	19:05	60															
DEAN ST				S	19:10	60															
RAY				S	19:19	60															
EASTON VILLAGE				S	19:27	60															
NORTH EASTON				S	19:31	60															
STOUGHTON				S	19:36	30															
CANTON CENTER																					
CANTON JCT				S	19:45	30															
JUNCTION					19:47																
ROUTE 128																					
ENDICOTT																D	20:19	30			
READVILLE													S	20:15	30						
READ					19:52																
FAIRMOUNT													D	20:18	30						
MORTON ST													D	20:22	30						
UPHAM'S CORNER													D	20:28	30						
HYDE PARK				S	19:54	30															
ROSLINDALE	S	19:42	30																		
FOREST HILLS	S	19:45	30							S	20:23	30									
PLAINS		19:46			19:59						20:24										
RUG	S	19:49	30							S	20:27	30									
BACK BAY	S	19:53	30	S	20:04	30	S	20:28	30	S	20:31	30							S	20:56	30
COV		19:54			20:05			20:29			20:32									20:57	
BROADWAY-CABOT																	20:44				
TOWER 1		19:56			20:08						20:35			20:34							
SOUTH STATION	D	19:58	300	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300	D	21:02	300

Prev Trn:	774			922			631Q			626			532			776			824		
Train:	777			1927			631			823			535			779			727		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	19:41	300	S	19:49	300	S	20:10	300	S	20:17	300	S	20:20	300	S	20:49	300	S	20:50	300
TOWER 1		19:42			19:50			20:11			20:18						20:50			20:51	
BROADWAY-CABOT		19:43															20:51				
COV					19:51			20:12			20:19			20:24						20:52	
BACK BAY				S	19:54	30	S	20:15	30	S	20:22	30	S	20:26	30				S	20:55	30
RUG				S	19:57	30	S	20:18	30	S	20:25	30							S	20:58	30
PLAINS					20:00			20:22			20:29									21:00	
FOREST HILLS							S	20:23	30												
ROSLINDALE							D	20:26	30												
HYDE PARK				S	20:05	30				S	20:35	30									
UPHAM'S CORNER	D	19:51	30													D	20:59	30			
MORTON ST	D	19:57	30													D	21:05	30			
FAIRMOUNT	D	20:01	30													D	21:09	30			
READ					20:07						20:37									21:05	
READVILLE	D	20:05	30													D	21:13	30	S	21:08	30
ENDICOTT																			D	21:12	30
ROUTE 128				S	20:10	45				S	20:40	45									
JUNCTION					20:11						20:42										
CANTON JCT				S	20:14	30				S	20:45	30									
CANTON CENTER				S	20:17	30															
STOUGHTON				S	20:26	30															
NORTH EASTON				S	20:32	30															
EASTON VILLAGE				S	20:36	30															
RAY				S	20:44	30															
DEAN ST				S	20:53	30															
TAUNTON DEPOT				S	20:58	30															
CP B40					21:00																
FREETOWN				S	21:11	30															
FALL RIVER				S	21:19	30															
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON										S	20:51	45									
MANSFIELD										S	20:59	45									
HOLDEN											21:05										
ATT										S	21:07	45									
SOUTH ATTLEBORO										S	21:14	30									
ORM											21:21										
PROVIDENCE										D	21:23	30									

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 16 of 17

Train:	826			1928			630			726			780			1930			632		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	19:53	30																		
ORM		19:54																			
SOUTH ATTLEBORO	S	20:04	30																		
ATT	S	20:14	45																		
MANSFIELD	S	20:22	45																		
SHARON	S	20:30	45																		
WHALES TOOTH																S	20:38	30			
KINGS HIGHWAY																S	20:43	30			
FALL RIVER				S	19:45	30															
FREETOWN				S	19:53	30															
CP B40					20:04												20:59				
TAUNTON DEPOT				S	20:06	30										S	21:01	30			
DEAN ST				S	20:11	30										S	21:06	30			
RAY				S	20:20	30										S	21:15	30			
EASTON VILLAGE				S	20:28	30										S	21:23	30			
NORTH EASTON				S	20:32	30										S	21:27	30			
STOUGHTON				S	20:39	30										S	21:34	30			
CANTON CENTER				S	20:45	30										S	21:40	30			
CANTON JCT	S	20:37	30	S	20:49	30										S	21:44	30			
JUNCTION		20:38			20:50												21:45				
ROUTE 128	S	20:42	45	S	20:56	45										S	21:51	45			
ENDICOTT										S	21:27	30									
READVILLE													S	21:23	30						
READ		20:46			20:59						21:30						21:54				
FAIRMOUNT													D	21:26	30						
MORTON ST													D	21:30	30						
UPHAM'S CORNER													D	21:36	30						
HYDE PARK	S	20:49	30	S	21:03	30										S	21:58	30			
ROSLINDALE							S	21:22	30										S	22:30	30
FOREST HILLS							S	21:25	30										S	22:33	30
PLAINS		20:54			21:06			21:26			21:36						22:01			22:34	
RUG							S	21:29	30										S	22:37	30
BACK BAY	S	20:58	30	S	21:12	30	S	21:33	30	S	21:40	30				S	22:07	30	S	22:41	30
COV		20:59			21:13			21:34			21:41						22:08			22:42	
BROADWAY-CABOT																					
TOWER 1		21:02			21:16			21:37			21:44			21:42			22:11			22:44	
SOUTH STATION	D	21:03	300	D	21:17	300	D	21:38	300	D	21:45	300	D	21:47	300	D	22:12	300	D	22:45	300

Prev Trn:	1926			798			628			772			534			780			726		
Train:	1929			825			633			781			537			827			635		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	20:55	300	S	21:05	300	S	21:15	300	S	21:57	300	S	22:20	300	S	22:25	300	S	22:30	300
TOWER 1		20:56			21:06			21:16			21:58						22:26			22:31	
BROADWAY-CABOT											21:59										
COV		20:57			21:07			21:17						22:24			22:27			22:32	
BACK BAY	S	21:00	30	S	21:10	30	S	21:20	30				S	22:26	30	S	22:30	30	S	22:35	30
RUG	S	21:03	30	S	21:13	30	S	21:23	30							S	22:33	30	S	22:38	30
PLAINS		21:06			21:17			21:27									22:37			22:42	
FOREST HILLS							S	21:28	30										S	22:43	30
ROSLINDALE							D	21:31	30										D	22:46	30
HYDE PARK	S	21:11	30	S	21:23	30										S	22:43	30			
UPHAM'S CORNER										D	22:07	30									
MORTON ST										D	22:13	30									
FAIRMOUNT										D	22:17	30									
READ		21:13			21:25												22:45				
READVILLE										D	22:21	30									
ENDICOTT																					
ROUTE 128	S	21:16	45	S	21:28	45										S	22:48	45			
JUNCTION		21:17			21:30												22:50				
CANTON JCT	S	21:20	30	S	21:33	30										S	22:53	30			
CANTON CENTER	S	21:23	30																		
STOUGHTON	S	21:32	30																		
NORTH EASTON	S	21:38	30																		
EASTON VILLAGE	S	21:42	30																		
RAY	S	21:50	30																		
DEAN ST	S	21:59	30																		
TAUNTON DEPOT	S	22:04	30																		
CP B40		22:06																			
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY	S	22:22	30																		
WHALES TOOTH	D	22:27	30																		
SHARON				S	21:39	45										S	22:59	45			
MANSFIELD				S	21:47	45										S	23:07	45			
HOLDEN					21:52												23:13				
ATT				S	21:55	45										S	23:15	45			
SOUTH ATTLEBORO				S	22:02	30										S	23:22	30			
ORM					22:09												23:29				
PROVIDENCE				D	22:11	30										D	23:32	30			

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 17 of 17

Train:	782			828			728			730			538			540		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	21:47	30												
ORM					21:48													
SOUTH ATTLEBORO				S	21:57	30												
ATT				S	22:13	45												
MANSFIELD				S	22:22	45												
SHARON				S	22:29	45												
WHALES TOOTH																		
KINGS HIGHWAY																		
FALL RIVER																		
FREETOWN																		
CP B40																		
TAUNTON DEPOT																		
DEAN ST																		
RAY																		
EASTON VILLAGE																		
NORTH EASTON																		
STOUGHTON																		
CANTON CENTER																		
CANTON JCT																		
JUNCTION					22:30													
ROUTE 128				S	22:40	45												
ENDICOTT							D	22:47	30	D	00:20	30						
READVILLE	S	22:31	30															
READ					22:43			22:50			00:23							
FAIRMOUNT	D	22:34	30															
MORTON ST	D	22:38	30															
UPHAM'S CORNER	D	22:44	30															
HYDE PARK				S	22:45	30												
ROSLINDALE																		
FOREST HILLS																		
PLAINS					22:50			22:57			00:31							
RUG																		
BACK BAY				S	22:55	30	S	23:01	30	S	00:36	30	S	01:17	30	S	01:24	30
COV					22:56			23:02			00:37			01:18			01:25	
BROADWAY-CABOT																		
TOWER 1		22:50			22:59			23:05			00:40							
SOUTH STATION	D	22:55	300	D	23:00	300	D	23:06	300	D	00:41	300	D	01:23	300	D	01:30	300

Prev Trn:	630			536			632			828		
Train:	729			539			731			829		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:35	300	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1		22:36						23:51			00:00	
BROADWAY-CABOT												
COV		22:37			23:29			23:52			00:01	
BACK BAY	S	22:40	30	S	23:31	30	S	23:55	30	S	00:04	30
RUG	S	22:43	30				S	23:58	30	S	00:07	30
PLAINS		22:46						00:01			00:11	
FOREST HILLS												
ROSLINDALE												
HYDE PARK	S	22:52	30							S	00:16	30
UPHAM'S CORNER												
MORTON ST												
FAIRMOUNT												
READ		22:54						00:06			00:18	
READVILLE	S	22:55	30				S	00:08	30			
ENDICOTT	D	23:00	30				D	00:11	30			
ROUTE 128										S	00:21	45
JUNCTION											00:23	
CANTON JCT										S	00:26	30
CANTON CENTER												
STOUGHTON												
NORTH EASTON												
EASTON VILLAGE												
RAY												
DEAN ST												
TAUNTON DEPOT												
CP B40												
FREETOWN												
FALL RIVER												
KINGS HIGHWAY												
WHALES TOOTH												
SHARON										S	00:31	45
MANSFIELD										S	00:39	45
HOLDEN											00:44	
ATT										S	00:48	45
SOUTH ATTLEBORO										S	00:56	30
ORM											01:03	
PROVIDENCE										D	01:06	30

10.4.5. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Whittenton Variant

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Whittenton Variant
(Page 1 of 3)

Train:	1992			1902			1904			1994			1998NB			1906			1908		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
WHALES TOOTH	S	05:17	30				S	05:49	60				S	06:18	60				S	07:21	60
KINGS HIGHWAY	S	05:22	30				S	05:54	60				S	06:23	60				S	07:26	60
FALL RIVER				S	05:31	60				S	05:59	60				S	06:52	60			
FREETOWN				S	05:39	60				S	06:07	60				S	07:00	60			
TAUNTON DEPOT	S	05:40	30	S	05:52	60	S	06:12	60	S	06:20	60	S	06:41	60	S	07:13	60	S	07:44	60
DOWNTOWN TAUNTON	S	05:45		S	05:57		S	06:17		S	06:25		S	06:46		S	07:18		S	07:49	
RAY	S	05:59	30	S	06:11	60	S	06:31	60	S	06:39	60	S	07:00	60	S	07:32	60	S	08:03	60
EASTON VILLAGE	S	06:07	30	S	06:19	60	S	06:39	60	S	06:47	60	S	07:08	60	S	07:40	60	S	08:11	60
NORTH EASTON	S	06:11	30	S	06:23	60	S	06:43	60	S	06:51	60	S	07:12	60	S	07:44	60	S	08:15	60
STOUGHTON	S	06:16	30	S	06:28	60	S	06:48	60	S	06:56	60	S	07:17	60	S	07:48	60	S	08:21	60
CANTON CENTER	S	06:24	30	S	06:36	60	S	06:56	60	S	07:04	60	S	07:25	60	S	07:57	60	S	08:28	60
CANTON JCT	S	06:28	30	S	06:39	60	S	07:00	60	S	07:08	60	S	07:29	60	S	08:01	60	S	08:33	60
JUNCTION		06:29			06:40			07:01			07:09			07:30			08:02			08:34	
ROUTE 128	S	06:34	45	S	06:44	120	S	07:06	120	S	07:14	120	S	07:34	120	S	08:07	120	S	08:39	120
READ		06:38			06:47			07:10			07:18			07:36			08:10			08:41	
HYDE PARK	S	06:39	30	S	06:48	30	S	07:11	60	S	07:19	60	S	07:38	60	S	08:13	60	S	08:43	60
PLAINS		06:45			06:53			07:17			07:25			07:41			08:19			08:51	
RUG																S	08:23	60			
BACK BAY	D	06:48	30	D	06:57	30	D	07:20	60	D	07:28	60	S	07:48	60	D	08:27	60	D	08:55	60
COV		06:49			06:58			07:21			07:29			07:49			08:28			08:56	
TOWER 1		06:52			07:01			07:24			07:32			07:50			08:31			08:59	
SOUTH STATION	D	06:53	300	D	07:02	300	D	07:25	300	D	07:33	300	D	07:52	300	D	08:32	300	D	09:00	300

Prev Trn:				1992			1906			1995Q			1911Q			1996			1912		
Train:	5501			1907			1909			1995			1911			1981			1983		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	04:45	300	S	07:43	300	S	08:50	300	S	08:55	300	S	09:49	300	S	10:48	300	S	11:44	300
TOWER 1					07:44			08:51			09:01			09:50			10:47			11:45	
COV		04:49			07:47			08:53			09:03			09:51			10:48			11:46	
BACK BAY	N	04:50		S	07:48	30	S	08:54	30	S	09:04	30	S	09:54	30	S	10:51	30	S	11:49	30
RUG													S	09:57	30	S	10:54	30	S	11:52	30
PLAINS					07:51			08:58			09:08			10:00			10:57			11:55	
HYDE PARK													S	10:05	30	S	11:02	30	S	12:00	30
READ					07:55			09:02			09:12			10:07			11:04			12:02	
ROUTE 128				S	08:00	45	S	09:07	45	S	09:17	45	S	10:10	45	S	11:07	45	S	12:05	45
JUNCTION					08:01			09:08			09:18			10:11			11:08			12:06	
CANTON JCT				S	08:06	30	S	09:13	30	S	09:23	30	S	10:14	30	S	11:11	30	S	12:09	30
CANTON CENTER				S	08:09	30	S	09:16	30	S	09:26	30	S	10:17	30	S	11:14	30	S	12:12	30
STOUGHTON				S	08:17	30	D	09:24	30	D	09:34	30	S	10:26	30	S	11:23	30	S	12:21	30
NORTH EASTON				S	08:23	30	S	09:30	30	S	09:40	30	S	10:32	30	S	11:29	30	S	12:27	30
EASTON VILLAGE				S	08:27	30	S	09:34	30	S	09:44	30	S	10:36	30	S	11:33	30	S	12:31	30
RAY				S	08:35	30	S	09:42	30	S	09:52	30	S	10:44	30	S	11:41	30	S	12:39	30
DOWNTOWN TAUNTON				S	08:49		S	09:56		S	10:06		S	10:58		S	11:55		S	12:53	
TAUNTON DEPOT				S	08:54	30	S	10:01	30	S	10:11	30	D	11:03	30	S	12:00	30	S	12:58	30
FREETOWN							S	10:14	30							S	12:13	30			
FALL RIVER							S	10:22	30							S	12:21	30			
KINGS HIGHWAY				S	09:12	30				S	10:29	30							S	13:16	30
WHALES TOOTH				D	09:17	30				D	10:34	30							D	13:21	30

10.4.6. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Old Colony Line

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 1 of 6

Train:	2			32			70			4			34			72			6		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH	S	05:20	30							S	06:00	30							S	06:58	60
BRIDGEWATER	S	05:30	30							S	06:10	30							S	07:08	60
CAMPELLO	S	05:37	30							S	06:18	30							S	07:16	60
BROCKTON	S	05:41	30							S	06:22	30							S	07:20	60
MONTELLO	S	05:44	30							S	06:25	30							S	07:23	60
HOLBROOK/RANDOLPH	S	05:49	30							S	06:30	30							S	07:28	60
SOUTH WEYMOUTH				S	06:01	30							S	06:49	60						
BRAINTREE	D	05:56	30										D	06:57	60						
GREENBUSH PUTIN							N	06:19								N	07:16				
QUINCY CENTER							D	06:22	30	D	06:42	30							D	07:39	60
JFK/UMASS	D	06:10	30	D	06:21	30	D	06:30	30							D	07:27	60	D	07:48	60
BROADWAY-CABOT		06:14			06:25			06:34			06:55			07:14			07:32			07:52	
TOWER 1		06:15			06:26			06:35			06:56			07:15			07:33			07:54	
SOUTH STATION	D	06:17	300	D	06:29	300	D	06:38	300	D	06:58	300	D	07:17	300	D	07:36	300	D	07:56	300

Prev Tm:	2			32			744			74			38			76			752		
Train:	3			71			33			5			61			73			35		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:35	300	S	06:54	300	S	07:11	300	S	08:24	300	S	08:56	300	S	09:25	300	S	09:37	300
TOWER 1		06:36			06:55			07:12			08:25			08:57			09:26			09:38	
BROADWAY-CABOT		06:38			06:56			07:13			08:26			08:58			09:27			09:39	
JFK/UMASS																					
QUINCY CENTER	D	06:49	30										S	09:09	30	S	09:38	30			
GREENBUSH PUTIN				N	07:10											N	09:41				
BRAINTREE	D	06:55	30				D	07:32	30	D	08:43	30	S	09:15	30					09:55	30
SOUTH WEYMOUTH							D	07:39	30				D	09:22	30				D	10:02	30
HOLBROOK/RANDOLPH	D	07:03	30							S	08:51	30									
MONTELLO	D	07:08	30							S	08:56	30									
BROCKTON	D	07:12	30							S	08:59	30									
CAMPELLO	S	07:20	30							S	09:03	30									
BRIDGEWATER	D	07:36	30							S	09:11	30									
MIDDLEBOROUGH	D	07:50	30							D	09:23	30									

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Whittenton Variant
(Page 2 of 3)

Train:	1996			1910			1912			1984			1986			1988			1976		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
WHALES TOOTH							S	09:38	30							S	13:33	30			
KINGS HIGHWAY							S	09:43	30							S	13:38	30			
FALL RIVER	S	07:59	30	S	08:44	60							S	12:40	30				S	14:36	30
FREETOWN	S	08:07	30	S	08:52	60							S	12:48	30				S	14:44	30
TAUNTON DEPOT	S	08:20	30	S	09:05	60	S	10:01	30	S	12:01	30	S	13:01	30	S	13:56	30	S	14:57	30
DOWNTOWN TAUNTON	S	08:25		S	09:10		S	10:06		S	12:06		S	13:06		S	14:01		S	15:02	
RAY	S	08:39	30	S	09:24	60	S	10:20	30	S	12:20	30	S	13:20	30	S	14:15	30	S	15:16	30
EASTON VILLAGE	S	08:47	30	S	09:32	60	S	10:28	30	S	12:28	30	S	13:28	30	S	14:23	30	S	15:24	30
NORTH EASTON	S	08:51	30	S	09:36	60	S	10:32	30	S	12:32	30	S	13:32	30	S	14:27	30	S	15:28	30
STOUGHTON	S	08:56	30	S	09:41	30	S	10:39	30	S	12:39	30	S	13:39	30	S	14:34	30	S	15:35	30
CANTON CENTER	N	09:04		S	09:49	30	S	10:45	30	S	12:45	30	S	13:45	30	S	14:40	30	S	15:41	30
CANTON JCT	S	09:08	30	S	09:52	30	S	10:49	30	S	12:49	30	S	13:49	30	S	14:44	30	S	15:45	30
JUNCTION		09:09			09:53			10:50			12:50			13:50			14:45			15:46	
ROUTE 128	S	09:14	45	S	09:57	45	S	10:56	45	S	12:56	45	S	13:56	45	S	14:51	45	S	15:52	45
READ		09:18			10:00			10:59			12:59			13:59			14:54			15:55	
HYDE PARK	S	09:19	30	S	10:02	30	S	11:03	30	S	13:03	30	S	14:03	30	S	14:58	30	S	15:59	30
PLAINS		09:25			10:07			11:06			13:06			14:06			15:01			16:02	
RUG																					
BACK BAY	S	09:28	30	S	10:12	30	S	11:12	30	S	13:12	30	S	14:12	30	S	15:07	30	S	16:04	30
COV		09:29			10:14			11:13			13:13			14:13			15:08			16:05	
TOWER 1		09:32			10:15			11:16			13:16			14:16			15:11			16:08	
SOUTH STATION	D	09:33	300	D	10:17	300	D	11:17	300	D	13:17	300	D	14:17	300	D	15:12	300	D	16:09	300

Prev Trn:	1985Q			1984			1989Q			1988			1917Q			1986			1919Q		
Train:	1985			1987			1989			1977			1917			1979			1919		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	12:49	300	S	13:49	300	S	14:49	300	S	15:49	300	S	16:01	300	S	16:17	300	S	16:50	300
TOWER 1		12:50			13:50			14:50			15:50			16:02			16:18			16:51	
COV		12:51			13:51			14:51			15:51			16:05			16:21			16:54	
BACK BAY	S	12:54	30	S	13:54	30	S	14:54	30	S	15:54	30	S	16:06	60	S	16:22	60	S	16:55	60
RUG	S	12:57	30	S	13:57	30	S	14:57	30	S	15:57	30	S	16:09	60	S	16:26	60	S	16:59	60
PLAINS		13:00			14:00			15:00			16:01			16:12			16:28			17:02	
HYDE PARK	S	13:05	30	S	14:05	30	S	15:05	30	S	16:05	30	S	16:17	60	S	16:32	60			
READ		13:07			14:07			15:07			16:07			16:19			16:35			17:06	
ROUTE 128	S	13:10	45	S	14:10	45	S	15:10	45	S	16:11	45	S	16:23	120	S	16:40	120	S	17:10	120
JUNCTION		13:11			14:11			15:11			16:12			16:24			16:41			17:11	
CANTON JCT	S	13:14	30	S	14:14	30	S	15:14	30	S	16:18	30	S	16:29	60	S	16:47	60	S	17:17	60
CANTON CENTER	S	13:17	30	S	14:17	30	S	15:17	30	S	16:21	30	S	16:32	60	S	16:50	60	S	17:20	60
STOUGHTON	S	13:26	30	S	14:26	30	S	15:26	30	S	16:30	30	N	16:41		N	16:59		S	17:30	60
NORTH EASTON	S	13:32	30	S	14:32	30	S	15:32	30	S	16:36	30	S	16:47	60	S	17:05	60	S	17:36	60
EASTON VILLAGE	S	13:36	30	S	14:36	30	S	15:36	30	S	16:40	30	S	16:51	60	S	17:09	60	S	17:40	60
RAY	S	13:44	30	S	14:44	30	S	15:44	30	S	16:48	30	S	16:59	60	S	17:17	60	S	17:48	60
DOWNTOWN TAUNTON	S	13:58		S	14:58		S	15:58		S	17:02		S	17:13		S	17:31		S	18:02	
TAUNTON DEPOT	S	14:03	30	S	15:03	30	S	16:03	30	S	17:07	30	S	17:18	60	S	17:36	60	S	18:07	60
FREETOWN	S	14:16	30				S	16:16	30	S	17:20	30				S	17:49	60			
FALL RIVER	S	14:24	30				S	16:24	30	S	17:28	30				S	17:57	60			
KINGS HIGHWAY				S	15:21	30							S	17:36	60				S	18:25	60
WHALES TOOTH				D	15:26	30							D	17:41	60				D	18:30	60

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Whittenton Variant
(Page 3 of 3)

Train:	1980			1920			1926			1928			1930		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
WHALES TOOTH	S	15:43	30				S	18:37	60				S	20:33	30
KINGS HIGHWAY	S	15:48	30				S	18:42	60				S	20:38	30
FALL RIVER				S	16:42	30				S	19:40	30			
FREETOWN				S	16:50	30				S	19:48	30			
TAUNTON DEPOT	S	16:06	30	S	17:03	30	S	19:00	60	S	20:01	30	S	20:56	30
DOWNTOWN TAUNTON	S	16:11		S	17:08		S	19:05		S	20:06		S	21:01	
RAY	S	16:25	30	S	17:22	30	S	19:19	60	S	20:20	30	S	21:15	30
EASTON VILLAGE	S	16:33	30	S	17:30	30	S	19:27	60	S	20:28	30	S	21:23	30
NORTH EASTON	S	16:37	30	S	17:37	30	S	19:31	60	S	20:32	30	S	21:27	30
STOUGHTON	S	16:44	30	S	17:44	30	S	19:36	30	S	20:39	30	S	21:34	30
CANTON CENTER	S	16:50	30	S	17:50	30				S	20:45	30	S	21:40	30
CANTON JCT	S	16:54	30	S	17:54	30	S	19:45	30	S	20:49	30	S	21:44	30
JUNCTION		16:55			17:55			19:47			20:50			21:45	
ROUTE 128	S	17:01	45	S	18:01	45				S	20:56	45	S	21:51	45
READ		17:04			18:04			19:52			20:59			21:54	
HYDE PARK	S	17:08	30	S	18:08	30	S	19:54	30	S	21:03	30	S	21:58	30
PLAINS		17:11			18:11			19:59			21:06			22:01	
RUG															
BACK BAY	S	17:17	30	S	18:17	30	S	20:04	30	S	21:12	30	S	22:07	30
COV		17:18			18:18			20:05			21:13			22:08	
TOWER 1		17:21			18:21			20:08			21:16			22:11	
SOUTH STATION	D	17:22	300	D	18:22	300	D	20:09	300	D	21:17	300	D	22:12	300

Prev Trn:	1999NBQ			1921Q			1997Q			1920			922			1926		
Train:	1999NB			1921			1997			1926			1927			1929		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:03	300	S	17:19	300	S	17:56	300	S	18:46	300	S	19:49	300	S	20:55	300
TOWER 1		17:04			17:20			17:57			18:47			19:50			20:56	
COV		17:07			17:23			18:00			18:48			19:51			20:57	
BACK BAY	S	17:08	60	S	17:24	60	S	18:02	60	S	18:51	30	S	19:54	30	S	21:00	30
RUG	S	17:12	60	S	17:28	60	S	18:07	60	S	18:54	30	S	19:57	30	S	21:03	30
PLAINS		17:15			17:31			18:09			18:57			20:00			21:06	
HYDE PARK				S	17:38	60				S	19:02	30	S	20:05	30	S	21:11	30
READ		17:19			17:40			18:13			19:04			20:07			21:13	
ROUTE 128	S	17:23	120	S	17:44	120	S	18:19	120	S	19:07	45	S	20:10	45	S	21:16	45
JUNCTION		17:24			17:45			18:20			19:08			20:11			21:17	
CANTON JCT	S	17:30	60	S	17:52	60	S	18:25	60	S	19:11	30	S	20:14	30	S	21:20	30
CANTON CENTER	S	17:33	60	S	17:56	60	S	18:28	60	S	19:14	30	S	20:17	30	S	21:23	30
STOUGHTON	S	17:42	60	S	18:05	60	S	18:37	60	S	19:23	30	S	20:26	30	S	21:32	30
NORTH EASTON	S	17:48	60	S	18:11	60	S	18:43	60	S	19:29	30	S	20:32	30	S	21:38	30
EASTON VILLAGE	S	17:52	60	S	18:15	60	S	18:47	60	S	19:33	30	S	20:36	30	S	21:42	30
RAY	S	18:00	60	S	18:23	60	S	18:55	60	S	19:41	30	S	20:44	30	S	21:50	30
DOWNTOWN TAUNTON	S	18:14		S	18:37		S	19:09		S	19:55		S	20:58		S	22:04	
TAUNTON DEPOT	S	18:19	60	S	18:42	60	S	19:14	60	S	20:00	30	S	21:03	30	S	22:09	30
FREETOWN	S	18:32	60				S	19:27	60				S	21:16	30			
FALL RIVER	S	18:40	60				S	19:35	60				S	21:24	30			
KINGS HIGHWAY				S	19:00	60				S	20:18	30				S	22:27	30
WHALES TOOTH				D	19:05	60				D	20:23	30				D	22:32	30

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 2 of 6

Train:	74			36			8			38			76			10			40		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Prev Trn:	40			78			754			80			42			14			82		
Train:	7			75			63			9			39			77			65		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 3 of 6

Train:	78			12			60			80			42			14			82		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30				D	11:51	30	D	12:32	30
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44	
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45	
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:46	300	D	12:07	300	D	12:48	300

Prev Trn:	62			16			44			64			81Q			43Q			766		
Train:	15			79			41			17			81			43			19		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 4 of 6

Train:	62			16			44			84			64			18			86		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	13:08	30										S	15:25	30			
BRIDGEWATER				S	13:18	30										S	15:35	30			
CAMPELLO				S	13:26	30										S	15:43	30			
BROCKTON				S	13:30	30										S	15:47	30			
MONTELLO				S	13:33	30										S	15:50	30			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	30			
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:26	300	D	16:24	300	D	16:46	300

Prev Trn:	18			45Q			86			48			47Q			87Q			23Q		
Train:	83			45			21			85			47			87			23		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 5 of 6

Train:	48			20			88			22			52			90			54		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	16:54	30				S	17:57	30									
BRIDGEWATER				S	17:04	30				D	18:10	30									
CAMPELLO				D	17:11	30				D	18:18	30									
BROCKTON				D	17:15	30				D	18:22	30									
MONTELLO				D	17:18	30				D	18:26	30									
HOLBROOK/RANDOLPH				D	17:23	30				S	18:32	30									
SOUTH WEYMOUTH	S	16:31	30										S	19:03	30				S	20:17	30
BRAINTREE	D	16:38	30	D	17:31	30							D	19:11	30				D	20:25	30
GREENBUSH PUTIN							N	18:05								N	19:46				
QUINCY CENTER							D	18:21	30							D	19:52	30			
JFK/UMASS																					
BROADWAY-CABOT		16:56			18:03			18:33			18:54			19:26			20:02			20:43	
TOWER 1		16:57			18:04			18:34			18:55			19:27			20:03			20:44	
SOUTH STATION	D	16:59	300	D	18:06	300	D	18:35	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300

Prev Trn:	49Q			20			88			22			52			90			54		
Train:	49			89			25			51			27			91			55		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26			21:31	
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27			21:32	
JFK/UMASS													S	20:13	30				S	21:36	30
QUINCY CENTER				S	18:48	30	S	19:03	30				S	20:21	30	S	20:38	30			
GREENBUSH PUTIN				N	18:51											N	20:41				
BRAINTREE	S	18:33	60							S	19:47	30							S	21:48	30
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30							D	21:55	30
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30						
MONTELLO							S	19:20	30				S	20:39	30						
BROCKTON							S	19:23	30				S	20:42	30						
CAMPELLO							S	19:27	30				S	20:46	30						
BRIDGEWATER							D	19:35	30				D	20:54	30						
MIDDLEBOROUGH							D	19:48	30				D	21:05	30						

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option
Old Colony Line
Page 6 of 6

Train:	92			56			28		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Prev Trn:	92			56			28		
Train:	93			29			57		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			

10.4.7. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – NEC and Dorchester Branch

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 1 of 17

Train:	800			790			500			802			702			600			1992		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	04:56	30							S	05:31	30									
ORM		04:57									05:32										
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30									
ATT	S	05:16	45							S	05:51	45									
MANSFIELD	S	05:25	45							S	06:01	45									
SHARON	S	05:33	45							S	06:10	45									
WHALES TOOTH																			S	05:29	30
KINGS HIGHWAY																			S	05:34	30
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT																			S	05:48	30
DEAN ST																			S	05:53	30
RAY																			S	05:59	30
EASTON VILLAGE																			S	06:06	30
NORTH EASTON																			S	06:10	30
STOUGHTON																			S	06:16	30
CANTON CENTER																			S	06:24	30
CANTON JCT	S	05:40	30							S	06:17	30							S	06:28	30
JUNCTION		05:42									06:18									06:29	
ROUTE 128	S	05:45	45							S	06:22	45							S	06:34	45
ENDICOTT				S	05:48	30							S	06:26	30						
READVILLE				S	05:51	30							S	06:29	30						
READ		05:48									06:25			06:30						06:38	
FAIRMOUNT				D	05:54	30															
MORTON ST				D	05:58	30															
UPHAM'S CORNER				D	06:04	30															
HYDE PARK	S	05:50	30							S	06:27	30							S	06:39	30
ROSLINDALE																S	06:37	30			
FOREST HILLS																S	06:40	30			
PLAINS		05:54									06:31			06:37			06:41			06:45	
RUG										S	06:37	30				S	06:44	30			
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:48	30	D	06:48	30
COV		06:03						06:31			06:42			06:44			06:49			06:49	
BROADWAY-CABOT					06:12																
TOWER 1		06:06									06:45			06:47			06:51			06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:52	300	D	06:53	300

Prev Trn:										743Q			801Q			745Q			790		
Train:	703			5501			501			743			801			745			831		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	04:00	300	S	04:45	300	S	05:30	300	S	05:40	300	S	06:20	300	S	06:25	300	S	06:35	300
TOWER 1		04:01									05:42			06:21			06:27			06:36	
BROADWAY-CABOT											05:44						06:29				
COV		04:02			04:49			05:34						06:23						06:39	
BACK BAY				N	04:50		S	05:36	30				S	06:25	30				S	06:40	30
RUG													S	06:28	30						
PLAINS		04:06												06:31						06:45	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK																					
UPHAM'S CORNER										D	05:50	30				D	06:35	30			
MORTON ST										D	05:56	30				D	06:41	30			
FAIRMOUNT										D	06:00	30				D	06:45	30			
READ		04:11												06:37						06:49	
READVILLE										D	06:04	30				D	06:49	30			
ENDICOTT	D	04:18	30																		
ROUTE 128													S	06:40	45						
JUNCTION														06:41						06:53	
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON														06:52	45						
MANSFIELD														07:00	45				S	07:08	45
HOLDEN														07:04							
ATT													S	07:09	45						
SOUTH ATTLEBORO														07:16	30						
ORM														07:24							
PROVIDENCE													D	07:25	30						

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 2 of 17

Train:	744			1902			704			502			804			598NB			1904		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:07	60						
ORM														06:08							
SOUTH ATTLEBORO													S	06:16	60						
ATT													S	06:29	120						
MANSFIELD													S	06:38	120						
SHARON													S	06:48	120						
WHALES TOOTH																			S	06:01	60
KINGS HIGHWAY																			S	06:06	60
FALL RIVER				S	05:43	60															
FREETOWN				S	05:50	60															
TAUNTON DEPOT				S	06:01	60													S	06:20	60
DEAN ST				S	06:06	60													S	06:25	60
RAY				S	06:12	60													S	06:31	60
EASTON VILLAGE				S	06:18	60													S	06:36	60
NORTH EASTON				S	06:23	60													S	06:42	60
STOUGHTON				S	06:28	60													S	06:48	60
CANTON CENTER				S	06:36	60													S	06:56	60
CANTON JCT				S	06:39	60													S	07:00	60
JUNCTION					06:40									06:53						07:01	
ROUTE 128				S	06:44	120							S	06:58	120				S	07:06	120
ENDICOTT							D	06:49	1												
READVILLE	S	06:31	30																		
READ					06:47			06:52						07:01						07:10	
FAIRMOUNT	S	06:34	30																		
MORTON ST	D	06:38	30																		
UPHAM'S CORNER	D	06:44	30																		
HYDE PARK				S	06:48	30													S	07:11	60
ROSLINDALE																					
FOREST HILLS																					
PLAINS					06:53			06:58						07:06						07:17	
RUG							S	07:00	60				S	07:10	60						
BACK BAY				D	06:57	30	D	07:04	60	S	07:06	60	D	07:14	60	S	07:17	60	D	07:20	60
COV					06:58			07:05			07:07			07:15			07:18			07:21	
BROADWAY-CABOT																					
TOWER 1		06:52			07:01			07:08						07:18						07:24	
SOUTH STATION	D	06:55	300	D	07:02	300	D	07:09	300	D	07:12	300	D	07:19	300	D	07:23	300	D	07:25	300

Prev Trn:	800			705Q			500			600			70			704			502		
Train:	503			705			505			605			747			607			507		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:50	300	S	06:55	300	S	06:59	300	S	07:07	300	S	07:20	300	S	07:23	300	S	07:29	300
TOWER 1					06:56						07:08			07:22			07:24				
BROADWAY-CABOT														07:24							
COV		06:54			06:58			07:03			07:10						07:26			07:33	
BACK BAY	S	06:56	30				S	07:05	30	S	07:12	30				S	07:28	30	S	07:35	30
RUG																					
PLAINS					07:02						07:17						07:32				
FOREST HILLS										S	07:18	30				S	07:35	30			
ROSLINDALE										D	07:22	30				D	07:39	30			
HYDE PARK																					
UPHAM'S CORNER																					
MORTON ST																					
FAIRMOUNT																					
READ					07:11																
READVILLE				S	07:12	30							D	07:44	30						
ENDICOTT				D	07:16	30															
ROUTE 128																					
JUNCTION																					
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON																					
MANSFIELD																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 3 of 17

Train:	746			602			1994			706			806			504			698NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:33	60						
ORM														06:34							
SOUTH ATTLEBORO													S	06:42	60						
ATT													S	06:52	120						
MANSFIELD													S	07:04	120						
SHARON													S	07:13	120						
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER							S	06:11	60												
FREETOWN							S	06:18	60												
TAUNTON DEPOT							S	06:29	60												
DEAN ST							S	06:34	60												
RAY							S	06:40	60												
EASTON VILLAGE							S	06:47	60												
NORTH EASTON							S	06:51	60												
STOUGHTON							S	06:56	60												
CANTON CENTER							S	07:04	60												
CANTON JCT							S	07:08	60												
JUNCTION								07:09						07:19							
ROUTE 128							S	07:14	120				S	07:24	120						
ENDICOTT										S	07:18	60									
READVILLE	S	07:06	60							S	07:21	60									
READ								07:18			07:22			07:28							
FAIRMOUNT	S	07:09	60																		
MORTON ST	D	07:13	60																		
UPHAM'S CORNER	D	07:19	60																		
HYDE PARK							S	07:19	60												
ROSLINDALE				S	07:16	60													S	07:35	30
FOREST HILLS				S	07:19	60													S	07:38	30
PLAINS					07:20			07:25			07:29			07:33						07:39	
RUG				S	07:23	60				S	07:33	60							S	07:42	30
BACK BAY				D	07:27	60	D	07:28	60	D	07:37	60	D	07:40	60	S	07:40	60	S	07:46	30
COV					07:28			07:29			07:38			07:41			07:41			07:47	
BROADWAY-CABOT																					
TOWER 1		07:27			07:31			07:32			07:40			07:44						07:49	
SOUTH STATION	D	07:30	300	D	07:32	300	D	07:33	300	D	07:41	300	D	07:45	300	D	07:46	300	D	07:51	300

Prev Trn:	34			1992			804			602			1998NB			832			508		
Train:	795			1907			833			735			751			803			609		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	07:40	300	S	07:43	300	S	07:50	300	S	07:55	300	S	08:10	300	S	08:30	300	S	08:40	300
TOWER 1		07:42			07:44			07:51			07:56			08:11			08:31			08:41	
BROADWAY-CABOT		07:44												08:12							
COV					07:47			07:54			07:58						08:34			08:42	
BACK BAY				S	07:48	30	S	07:55	30	S	08:00	30				S	08:35	30	S	08:45	30
RUG							S	07:58	30							S	08:38	30			
PLAINS					07:51			08:02			08:03						08:41			08:50	
FOREST HILLS																					
ROSLINDALE																			D	08:59	30
HYDE PARK																					
UPHAM'S CORNER	D	07:50	30										D	08:20	30						
MORTON ST	D	07:56	30										D	08:26	30						
FAIRMOUNT	D	08:00	30										D	08:30	30						
READ					07:55			08:06			08:11						08:45				
READVILLE	D	08:04	30							D	08:14	30	D	08:34	30						
ENDICOTT	D	08:08	30							D	08:18	30									
ROUTE 128				S	08:00	45	S	08:10	45							S	08:49	45			
JUNCTION					08:01			08:11									08:50				
CANTON JCT				S	08:06	30	S	08:15	30							S	08:54	30			
CANTON CENTER				S	08:09	30															
STOUGHTON				S	08:17	30															
NORTH EASTON				S	08:22	30															
EASTON VILLAGE				S	08:26	30															
RAY				S	08:33	30															
DEAN ST				S	08:39	30															
TAUNTON DEPOT				S	08:44	30															
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY				S	08:59	30															
WHALES TOOTH				D	09:05	30															
SHARON																S	09:02	45			
MANSFIELD							S	08:28	45							S	09:10	45			
HOLDEN								08:35									09:15				
ATT							D	08:39	45							S	09:19	45			
SOUTH ATTLEBORO																S	09:26	30			
ORM																	09:34				
PROVIDENCE																D	09:35	30			

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 4 of 17

Train:	1998NB			784NB			708			506			832			604			808		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	07:12	60
ORM																				07:14	
SOUTH ATTLEBORO																			S	07:22	60
ATT																			S	07:32	120
MANSFIELD													S	07:26	120				S	07:44	120
SHARON													S	07:35	120						
WHALES TOOTH	S	06:30	60																		
KINGS HIGHWAY	S	06:35	60																		
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT	S	06:49	60																		
DEAN ST	S	06:54	60																		
RAY	S	07:00	60																		
EASTON VILLAGE	S	07:07	60																		
NORTH EASTON	S	07:11	60																		
STOUGHTON	S	07:17	60																		
CANTON CENTER	S	07:25	60																		
CANTON JCT	S	07:29	60										S	07:41	60						
JUNCTION		07:30												07:42						07:54	
ROUTE 128	S	07:34	120										S	07:47	120						
ENDICOTT							D	07:35	1												
READVILLE				S	07:31	60															
READ		07:36						07:39						07:49						08:01	
FAIRMOUNT				S	07:34	60															
MORTON ST				D	07:38	60															
UPHAM'S CORNER				D	07:44	60															
HYDE PARK	S	07:38	60										S	07:52	60						
ROSLINDALE																S	07:55	60			
FOREST HILLS																S	07:57	60			
PLAINS		07:41						07:46						07:55			07:58			08:06	
RUG							S	07:51	60							S	08:02	60			
BACK BAY	S	07:48	60				D	07:55	60	S	07:59	60	D	08:02	60	D	08:06	60	D	08:11	60
COV		07:49						07:56			08:00			08:03			08:07			08:12	
BROADWAY-CABOT																					
TOWER 1		07:50			07:52			07:58						08:06			08:10			08:15	
SOUTH STATION	D	07:52	300	D	07:55	300	D	07:59	300	D	08:05	300	D	08:07	300	D	08:11	300	D	08:16	300

Prev Trn:	506			1906			1995Q			10			710			1911Q			514		
Train:	509			1909			1995			753			707			1911			611		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	08:50	300	S	08:50	300	S	08:55	300	S	09:21	300	S	09:22	300	S	09:49	300	S	10:00	300
TOWER 1					08:51			09:01			09:22			09:23			09:50			10:01	
BROADWAY-CABOT											09:23										
COV		08:54			08:53			09:03						09:26			09:51			10:02	
BACK BAY	S	08:56	30	S	08:54	30	S	09:04	30				S	09:27	30	S	09:54	30	S	10:05	30
RUG																S	09:57	30			
PLAINS					08:58			09:08						09:30			10:00			10:09	
FOREST HILLS																			S	10:12	30
ROSLINDALE																			D	10:15	30
HYDE PARK																S	10:05	30			
UPHAM'S CORNER										D	09:31	30									
MORTON ST										D	09:37	30									
FAIRMOUNT										D	09:41	30									
READ					09:02			09:12						09:34			10:07				
READVILLE										D	09:45	30	S	09:38	30						
ENDICOTT													D	09:41	30						
ROUTE 128				S	09:07	45	S	09:17	45							S	10:10	45			
JUNCTION					09:08			09:18									10:11				
CANTON JCT				S	09:13	30	S	09:23	30							S	10:14	30			
CANTON CENTER				S	09:16	30	S	09:26	30							S	10:17	30			
STOUGHTON				D	09:24	30	D	09:34	30							S	10:26	30			
NORTH EASTON				S	09:28	30	S	09:39	30							S	10:31	30			
EASTON VILLAGE				S	09:32	30	S	09:43	30							S	10:35	30			
RAY				S	09:39	30	S	09:50	30							S	10:42	30			
DEAN ST				S	09:45	30	S	09:56	30							S	10:48	30			
TAUNTON DEPOT				S	09:50	30	S	10:01	30							D	10:53	30			
FREETOWN				S	10:02	30															
FALL RIVER				S	10:10	30															
KINGS HIGHWAY							S	10:16	30												
WHALES TOOTH							D	10:22	30												
SHARON																					
MANSFIELD																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 5 of 17

Train:	748			508			722NB			1906			738			750			606		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	07:03	60									
FREETOWN										S	07:10	60									
TAUNTON DEPOT										S	07:21	60									
DEAN ST										S	07:26	60									
RAY										S	07:32	60									
EASTON VILLAGE										S	07:38	60									
NORTH EASTON										S	07:43	60									
STOUGHTON										S	07:48	60									
CANTON CENTER										S	07:57	60									
CANTON JCT										S	08:01	60									
JUNCTION											08:02										
ROUTE 128										S	08:07	120									
ENDICOTT							S	07:58	60				S	08:15	60						
READVILLE	S	07:56	60				S	08:01	60				S	08:19	60						
READ								08:03			08:10			08:21							
FAIRMOUNT	S	07:59	60													S	08:19	60			
MORTON ST	D	08:03	60													D	08:23	60			
UPHAM'S CORNER	D	08:09	60													D	08:29	60			
HYDE PARK										S	08:13	60									
ROSLINDALE																			S	08:26	60
FOREST HILLS																			S	08:29	60
PLAINS								08:10			08:19			08:25						08:30	
RUG							S	08:14	60	S	08:23	60							S	08:33	60
BACK BAY				S	08:17	60	D	08:19	60	D	08:27	60	D	08:35	60				D	08:37	60
COV					08:19			08:20			08:28			08:36						08:38	
BROADWAY-CABOT																					
TOWER 1		08:17						08:22			08:31			08:39			08:37			08:41	
SOUTH STATION	D	08:20	300	D	08:23	300	D	08:23	300	D	08:32	300	D	08:40	300	D	08:40	300	D	08:42	300

Prev Trn:	712			792			1996			709Q			516			60			1912		
Train:	805			755			1981			709			511			757			1983		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	10:25	300	S	10:29	300	S	10:46	300	S	10:53	300	S	11:00	300	S	11:37	300	S	11:44	300
TOWER 1		10:26			10:30			10:47			10:54						11:38			11:45	
BROADWAY-CABOT					10:31												11:39				
COV		10:27						10:48			10:55			11:04						11:46	
BACK BAY	S	10:30	30				S	10:51	30	S	10:58	30	S	11:06	30				S	11:49	30
RUG							S	10:54	30										S	11:52	30
PLAINS		10:36						10:57			11:02									11:55	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK	S	10:41	30				S	11:02	30										S	12:00	30
UPHAM'S CORNER				D	10:39	30										D	11:47	30			
MORTON ST				D	10:45	30										D	11:53	30			
FAIRMOUNT				D	10:49	30										D	11:57	30			
READ		10:42						11:04			11:07									12:02	
READVILLE				D	10:53	30				S	11:08	30				D	12:01	30			
ENDICOTT										D	11:11	30									
ROUTE 128	S	10:46	45				S	11:07	45										S	12:05	45
JUNCTION		10:48						11:08												12:06	
CANTON JCT							S	11:11	30										S	12:09	30
CANTON CENTER							S	11:14	30										S	12:12	30
STOUGHTON							S	11:23	30										S	12:21	30
NORTH EASTON							S	11:27	30										S	12:26	30
EASTON VILLAGE							S	11:31	30										S	12:30	30
RAY							S	11:38	30										S	12:37	30
DEAN ST							S	11:44	30										S	12:43	30
TAUNTON DEPOT							S	11:49	30										S	12:48	30
FREETOWN							S	12:01	30												
FALL RIVER							S	12:09	30												
KINGS HIGHWAY																			S	13:03	30
WHALES TOOTH																			D	13:09	30
SHARON	S	10:57	45																		
MANSFIELD	S	11:05	45																		
HOLDEN		11:12																			
ATT	S	11:14	45																		
SOUTH ATTLEBORO	S	11:21	30																		
ORM		11:29																			
PROVIDENCE	D	11:30	30																		

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 6 of 17

Train:	810			710			510			1908			512			898NB			752		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	07:35	60													S	07:52	30			
ORM		07:37															07:53				
SOUTH ATTLEBORO	S	07:45	60													S	08:02	30			
ATT	S	07:55	120													S	08:12	45			
MANSFIELD	S	08:05	120													S	08:22	45			
SHARON	S	08:14	120													S	08:31	45			
WHALES TOOTH										S	07:34	60									
KINGS HIGHWAY										S	07:39	60									
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT										S	07:53	60									
DEAN ST										S	07:58	60									
RAY										S	08:04	60									
EASTON VILLAGE										S	08:11	60									
NORTH EASTON										S	08:15	60									
STOUGHTON										S	08:21	60									
CANTON CENTER										S	08:28	60									
CANTON JCT	S	08:24	60							S	08:33	60				S	08:41	30			
JUNCTION		08:25									08:34						08:42				
ROUTE 128	S	08:30	120							S	08:39	120				S	08:47	45			
ENDICOTT				S	08:27	60															
READVILLE				S	08:31	60													S	08:46	30
READ		08:33			08:32						08:41						08:50				
FAIRMOUNT																			D	08:49	30
MORTON ST																			D	08:53	30
UPHAM'S CORNER																			D	08:59	30
HYDE PARK	S	08:36	60							S	08:43	60				S	08:53	30			
ROSLINDALE																					
FOREST HILLS																					
PLAINS		08:42			08:37						08:51						08:58				
RUG				S	08:42	60															
BACK BAY	D	08:46	60	D	08:47	60	S	08:50	60	D	08:55	60	S	09:02	30	D	09:03	30			
COV		08:47			08:48			08:51			08:56			09:03			09:04				
BROADWAY-CABOT																					
TOWER 1		08:50			08:51						08:59						09:07			09:07	
SOUTH STATION	D	08:51	300	D	08:52	300	D	08:56	300	D	09:00	300	D	09:08	300	D	09:08	300	D	09:10	300

Prev Trn:	807Q			610			512			518			756			1985Q			612		
Train:	807			613			513			711			759			1985			515		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	11:55	300	S	12:00	300	S	12:10	300	S	12:45	300	S	12:45	300	S	12:49	300	S	13:00	300
TOWER 1		11:56			12:01						12:46			12:46			12:50				
BROADWAY-CABOT														12:47							
COV		11:57			12:02			12:14			12:47						12:51			13:04	
BACK BAY	S	12:00	30	S	12:05	30	S	12:16	30	S	12:50	30				S	12:54	30	S	13:06	30
RUG	S	12:03	30	S	12:08	30				S	12:53	30				S	12:57	30			
PLAINS		12:06			12:12						12:55						13:00				
FOREST HILLS				S	12:13	30															
ROSLINDALE				D	12:16	30															
HYDE PARK	S	12:13	30													S	13:05	30			
UPHAM'S CORNER													D	12:55	30						
MORTON ST													D	13:01	30						
FAIRMOUNT													D	13:05	30						
READ		12:14									13:01						13:07				
READVILLE										S	13:03	30	D	13:09	30						
ENDICOTT										D	13:06	30									
ROUTE 128	S	12:17	45													S	13:10	45			
JUNCTION		12:20															13:11				
CANTON JCT	S	12:22	30													S	13:14	30			
CANTON CENTER																S	13:17	30			
STOUGHTON																S	13:26	30			
NORTH EASTON																S	13:30	30			
EASTON VILLAGE																S	13:34	30			
RAY																S	13:41	30			
DEAN ST																S	13:47	30			
TAUNTON DEPOT																S	13:52	30			
FREETOWN																S	14:04	30			
FALL RIVER																S	14:12	30			
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON	S	12:28	45																		
MANSFIELD	S	12:36	45																		
HOLDEN		12:42																			
ATT	S	12:45	45																		
SOUTH ATTLEBORO	S	12:55	30																		
ORM		13:00																			
PROVIDENCE	D	13:04	30																		

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 7 of 17

Train:	608			812			792			1996			514			834			516		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	08:10	30															
ORM					08:11																
SOUTH ATTLEBORO				S	08:20	30															
ATT				S	08:30	45										S	09:00	45			
MANSFIELD				S	08:38	45										S	09:09	45			
SHARON				S	08:47	45										S	09:18	45			
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	08:11	30									
FREETOWN										S	08:18	30									
TAUNTON DEPOT										S	08:29	30									
DEAN ST										S	08:34	30									
RAY										S	08:40	30									
EASTON VILLAGE										S	08:47	30									
NORTH EASTON										S	08:51	30									
STOUGHTON										S	08:56	30									
CANTON CENTER										N	09:04										
CANTON JCT				S	08:54	30				S	09:08	30				S	09:25	30			
JUNCTION					08:55						09:09						09:26				
ROUTE 128				S	08:59	45				S	09:14	45				S	09:27	45			
ENDICOTT							S	08:54	30												
READVILLE							S	09:00	30												
READ					09:02						09:18						09:31				
FAIRMOUNT							S	09:03	30												
MORTON ST							D	09:07	30												
UPHAM'S CORNER							D	09:13	30												
HYDE PARK				S	09:04	30				S	09:19	30									
ROSLINDALE	S	08:56	30																		
FOREST HILLS	S	08:59	30																		
PLAINS		09:00			09:09						09:25						09:37				
RUG	S	09:04	30	S	09:14	30										S	09:41	30			
BACK BAY	D	09:08	30	D	09:18	30				S	09:28	30	S	09:29	30	S	09:44	30	S	09:54	30
COV		09:09			09:19						09:29			09:30			09:45			09:55	
BROADWAY-CABOT								09:21													
TOWER 1		09:12			09:22						09:32						09:48				
SOUTH STATION	D	09:13	300	D	09:23	300	D	09:25	300	D	09:33	300	D	09:35	300	D	09:49	300	D	10:00	300

Prev Trn:	761Q			1984			716			758			760			713Q			520		
Train:	761			1987			809			615			763			713			517		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	13:32	300	S	13:49	300	S	13:56	300	S	14:00	300	S	14:25	300	S	14:40	300	S	14:45	300
TOWER 1		13:33			13:50			13:57			14:01			14:26			14:41				
BROADWAY-CABOT		13:34												14:27							
COV					13:51			13:58			14:02						14:42			14:49	
BACK BAY				S	13:54	30	S	14:01	30	S	14:05	30				S	14:45	30	S	14:51	30
RUG				S	13:57	30	S	14:04	30	S	14:08	30				S	14:48	30			
PLAINS					14:00			14:06			14:12						14:50				
FOREST HILLS										S	14:14	30									
ROSLINDALE										D	14:18	30									
HYDE PARK				S	14:05	30	S	14:13	30												
UPHAM'S CORNER	D	13:42	30										D	14:35	30						
MORTON ST	D	13:48	30										D	14:41	30						
FAIRMOUNT	D	13:52	30										D	14:45	30						
READ					14:07			14:14									14:56				
READVILLE	D	13:56	30										D	14:49	30	S	14:58	30			
ENDICOTT																D	15:01	30			
ROUTE 128				S	14:10	45	S	14:19	45												
JUNCTION					14:11			14:21													
CANTON JCT				S	14:14	30	S	14:24	30												
CANTON CENTER				S	14:17	30															
STOUGHTON				S	14:26	30															
NORTH EASTON				S	14:31	30															
EASTON VILLAGE				S	14:35	30															
RAY				S	14:42	30															
DEAN ST				S	14:48	30															
TAUNTON DEPOT				S	14:53	30															
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY				S	15:08	30															
WHALES TOOTH				D	15:14	30															
SHARON							S	14:30	45												
MANSFIELD							S	14:38	45												
HOLDEN								14:44													
ATT							S	14:46	45												
SOUTH ATTLEBORO							S	14:56	30												
ORM								15:03													
PROVIDENCE							D	15:05	30												

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 8 of 17

Train:	1910			712			610			754			814			1912			756		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	09:32	30						
ORM														09:33							
SOUTH ATTLEBORO													S	09:41	30						
ATT													S	09:51	45						
MANSFIELD													S	09:59	45						
SHARON													S	10:08	45						
WHALES TOOTH																S	09:52	30			
KINGS HIGHWAY																S	09:57	30			
FALL RIVER	S	08:46	60																		
FREETOWN	S	08:53	60																		
TAUNTON DEPOT	S	09:04	60													S	10:11	30			
DEAN ST	S	09:09	60													S	10:16	30			
RAY	S	09:15	60													S	10:22	30			
EASTON VILLAGE	S	09:22	60													S	10:29	30			
NORTH EASTON	S	09:26	60													S	10:33	30			
STOUGHTON	S	09:31	30													S	10:39	30			
CANTON CENTER	S	09:39	30													S	10:45	30			
CANTON JCT	S	09:42	30										S	10:15	30	S	10:49	30			
JUNCTION		09:43												10:16			10:50				
ROUTE 128	S	09:47	45										S	10:20	45	S	10:56	45			
ENDICOTT				S	09:44	30															
READVILLE				S	09:47	30				S	09:55	30							S	11:03	30
READ		09:50			09:48									10:24			10:59				
FAIRMOUNT										D	09:58	30							D	11:06	30
MORTON ST										D	10:02	30							D	11:10	30
UPHAM'S CORNER										D	10:08	30							D	11:16	30
HYDE PARK	S	09:52	30										S	10:25	30	S	11:03	30			
ROSLINDALE							S	09:59	30												
FOREST HILLS							S	10:02	30												
PLAINS		09:57			09:55			10:03						10:30			11:06				
RUG				S	09:59	30	S	10:07	30				S	10:35	30						
BACK BAY	S	10:02	30	S	10:03	30	S	10:11	30				S	10:39	30	S	11:12	30			
COV		10:04			10:04			10:12						10:40			11:13				
BROADWAY-CABOT																					
TOWER 1		10:05			10:07			10:15			10:15			10:43			11:16			11:23	
SOUTH STATION	D	10:07	300	D	10:08	300	D	10:16	300	D	10:19	300	D	10:44	300	D	11:17	300	D	11:27	300

Prev Trn:	1989Q			818			762			764			718			1988			616		
Train:	1989			617			765			767			811			1977			619		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:49	300	S	15:00	300	S	15:20	300	S	15:44	300	S	15:45	300	S	15:49	300	S	16:00	300
TOWER 1		14:50			15:01			15:21			15:45			15:46			15:50			16:01	
BROADWAY-CABOT								15:22			15:46										
COV		14:51			15:02									15:49			15:51			16:04	
BACK BAY	S	14:54	30	S	15:05	30							S	15:50	30	S	15:54	30	S	16:05	60
RUG	S	14:57	30	S	15:08	30							S	15:53	30	S	15:57	30	S	16:08	60
PLAINS		15:00			15:12									15:56			16:01			16:12	
FOREST HILLS				S	15:13	30													S	16:13	60
ROSLINDALE				D	15:16	30													D	16:16	60
HYDE PARK	S	15:05	30													S	16:05	30			
UPHAM'S CORNER							D	15:30	30	S	15:54	30									
MORTON ST							D	15:36	30		16:00	30									
FAIRMOUNT							D	15:40	30		16:04	30									
READ		15:07												16:01			16:07				
READVILLE							D	15:44	30	D	16:08	30									
ENDICOTT																					
ROUTE 128	S	15:10	45													S	16:11	45			
JUNCTION		15:11												16:05			16:12				
CANTON JCT	S	15:14	30													S	16:18	30			
CANTON CENTER	S	15:17	30													S	16:21	30			
STOUGHTON	S	15:26	30													S	16:30	30			
NORTH EASTON	S	15:30	30													S	16:34	30			
EASTON VILLAGE	S	15:34	30													S	16:38	30			
RAY	S	15:41	30													S	16:45	30			
DEAN ST	S	15:47	30													S	16:51	30			
TAUNTON DEPOT	S	15:52	30													S	16:56	30			
FREETOWN	S	16:04	30													S	17:08	30			
FALL RIVER	S	16:12	30													S	17:16	30			
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON													S	16:12	45						
MANSFIELD													S	16:21	45						
HOLDEN														16:29							
ATT													S	16:31	45						
SOUTH ATTLEBORO													S	16:37	30						
ORM														16:45							
PROVIDENCE													D	16:46	30						

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 9 of 17

Train:	612			714			518			758			816			716			520		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	11:40	30						
ORM														11:41							
SOUTH ATTLEBORO													S	11:50	30						
ATT													S	12:00	45						
MANSFIELD													S	12:08	45						
SHARON													S	12:16	45						
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT																					
DEAN ST																					
RAY																					
EASTON VILLAGE																					
NORTH EASTON																					
STOUGHTON																					
CANTON CENTER																					
CANTON JCT													S	12:23	30						
JUNCTION														12:24							
ROUTE 128													S	12:28	45						
ENDICOTT				S	11:26	30										S	12:46	30			
READVILLE				S	11:29	30				S	12:11	30				S	12:49	30			
READ					11:30									12:32			12:50				
FAIRMOUNT										D	12:14	30									
MORTON ST										D	12:18	30									
UPHAM'S CORNER										D	12:24	30									
HYDE PARK													S	12:33	30						
ROSLINDALE	S	11:17	30																		
FOREST HILLS	S	11:20	30																		
PLAINS		11:21			11:37									12:38			12:56				
RUG	S	11:24	30	S	11:39	30							S	12:43	30	S	12:57	30			
BACK BAY	S	11:28	30	S	11:43	30	S	11:59	30				S	12:48	30	S	13:01	30	S	13:09	30
COV		11:29			11:45			12:00						12:49			13:02			13:10	
BROADWAY-CABOT																					
TOWER 1		11:32			11:47						12:31			12:52			13:04				
SOUTH STATION	D	11:33	300	D	11:48	300	D	12:05	300	D	12:35	300	D	12:53	300	D	13:06	300	D	13:15	300

Prev Trn:	1917Q			522			715Q			1986			699NBQ			524			899NBQ		
Train:	1917			519			715			1979			699NR			521			899NR		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:01	300	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:28	300
TOWER 1		16:02						16:11			16:18			16:24						16:29	
BROADWAY-CABOT																					
COV		16:05			16:09			16:14			16:21			16:27			16:31			16:32	
BACK BAY	S	16:06	60	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:33	60
RUG	S	16:09	60				S	16:19	60	S	16:26	60	S	16:32	60				S	16:36	60
PLAINS		16:12						16:21			16:28			16:36						16:39	
FOREST HILLS													S	16:37	60						
ROSLINDALE													D	16:40	60						
HYDE PARK	S	16:17	60							S	16:32	60									
UPHAM'S CORNER																					
MORTON ST																					
FAIRMOUNT																					
READ		16:19						16:27			16:35									16:43	
READVILLE							S	16:29	60												
ENDICOTT							D	16:32	60												
ROUTE 128	S	16:23	120							S	16:40	120									
JUNCTION		16:24									16:41									16:47	
CANTON JCT	S	16:29	60							S	16:47	60									
CANTON CENTER	S	16:32	60							S	16:50	60									
STOUGHTON	N	16:41								N	16:59										
NORTH EASTON	S	16:46	60							S	17:03	60									
EASTON VILLAGE	S	16:50	60							S	17:07	60									
RAY	S	16:57	60							S	17:14	60									
DEAN ST	S	17:03	60							S	17:20	60									
TAUNTON DEPOT	S	17:08	60							S	17:25	60									
FREETOWN										S	17:37	60									
FALL RIVER										S	17:45	60									
KINGS HIGHWAY	S	17:23	60																		
WHALES TOOTH	D	17:29	60																		
SHARON																			S	16:54	120
MANSFIELD																			S	17:03	120
HOLDEN																				17:13	
ATT																			S	17:14	120
SOUTH ATTLEBORO																			S	17:23	60
ORM																				17:31	
PROVIDENCE																			D	17:32	60

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 10 of 17

Train:	1984			614			760			1986			762			818			522		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																S	13:28	30			
ORM																	13:29				
SOUTH ATTLEBORO																S	13:38	30			
ATT																S	13:47	45			
MANSFIELD																S	13:54	45			
SHARON																S	14:02	45			
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	12:54	30									
FREETOWN										S	13:01	30									
TAUNTON DEPOT	S	12:11	30							S	13:12	30									
DEAN ST	S	12:16	30							S	13:17	30									
RAY	S	12:22	30							S	13:23	30									
EASTON VILLAGE	S	12:29	30							S	13:30	30									
NORTH EASTON	S	12:33	30							S	13:34	30									
STOUGHTON	S	12:39	30							S	13:39	30									
CANTON CENTER	S	12:45	30							S	13:45	30									
CANTON JCT	S	12:49	30							S	13:49	30									
JUNCTION		12:50									13:50						14:03				
ROUTE 128	S	12:56	45							S	13:56	45				S	14:12	45			
ENDICOTT																					
READVILLE							S	13:19	30				S	14:06	30						
READ		12:59									13:59						14:15				
FAIRMOUNT							D	13:22	30				D	14:09	30						
MORTON ST							D	13:26	30				D	14:13	30						
UPHAM'S CORNER							D	13:32	30				D	14:19	30						
HYDE PARK	S	13:03	30							S	14:03	30									
ROSLINDALE				S	13:17	30															
FOREST HILLS				S	13:20	30															
PLAINS		13:06			13:21						14:06						14:19				
RUG				S	13:24	30										S	14:25	30			
BACK BAY	S	13:12	30	S	13:28	30				S	14:12	30				S	14:29	30	S	14:57	30
COV		13:13			13:29						14:13						14:30			14:58	
BROADWAY-CABOT																					
TOWER 1		13:16			13:32			13:39			14:16			14:26			14:32				
SOUTH STATION	D	13:17	300	D	13:33	300	D	13:43	300	D	14:17	300	D	14:30	300	D	14:34	300	D	15:03	300

Prev Trn:	799Q			739NBQ			813Q			621Q			618			1919Q			768		
Train:	799			739NR			813			621			737			1919			769		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:30	300	S	16:33	300	S	16:40	300	S	16:40	300	S	16:45	300	S	16:50	300	S	16:55	300
TOWER 1		16:31			16:34			16:41			16:41			16:46			16:51			16:56	
BROADWAY-CABOT		16:32																		16:57	
COV					16:37			16:44			16:44			16:49			16:54				
BACK BAY				S	16:38	60	S	16:45	60	S	16:45	60	S	16:50	60	S	16:55	60			
RUG				S	16:42	60	S	16:48	60	S	16:49	60	S	16:54	60	S	16:59	60			
PLAINS					16:45			16:51			16:53			16:57			17:02				
FOREST HILLS										S	16:54	60									
ROSLINDALE										D	16:57	60									
HYDE PARK													S	17:03	60						
UPHAM'S CORNER	S	16:41	60																S	17:06	60
MORTON ST	S	16:48	60																S	17:13	60
FAIRMOUNT	S	16:53	60																S	17:18	60
READ					16:50			16:56						17:06			17:06				
READVILLE	D	16:57	60	D	16:52	60							D	17:07	60				D	17:22	60
ENDICOTT	D	17:01	60	D	16:56	60							D	17:11	60						
ROUTE 128							S	16:59	120							S	17:10	120			
JUNCTION								17:00									17:11				
CANTON JCT																S	17:17	60			
CANTON CENTER																S	17:20	60			
STOUGHTON																S	17:30	60			
NORTH EASTON																S	17:35	60			
EASTON VILLAGE																S	17:39	60			
RAY																S	17:46	60			
DEAN ST																S	17:52	60			
TAUNTON DEPOT																S	17:57	60			
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																S	18:12	60			
WHALES TOOTH																D	18:18	60			
SHARON							S	17:10	120												
MANSFIELD							S	17:19	120												
HOLDEN								17:27													
ATT							S	17:29	120												
SOUTH ATTLEBORO							S	17:38	60												
ORM								17:46													
PROVIDENCE							D	17:47	60												

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 11 of 17

Train:	718			1988			764			524			616			1976			766		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH				S	13:47	30															
KINGS HIGHWAY				S	13:52	30															
FALL RIVER																S	14:50	30			
FREETOWN																S	14:57	30			
TAUNTON DEPOT				S	14:06	30										S	15:08	30			
DEAN ST				S	14:11	30										S	15:13	30			
RAY				S	14:17	30										S	15:19	30			
EASTON VILLAGE				S	14:24	30										S	15:26	30			
NORTH EASTON				S	14:28	30										S	15:30	30			
STOUGHTON				S	14:34	30										S	15:35	30			
CANTON CENTER				S	14:40	30										S	15:41	30			
CANTON JCT				S	14:44	30										S	15:45	30			
JUNCTION					14:45												15:46				
ROUTE 128				S	14:51	45										S	15:52	45			
ENDICOTT	S	14:46	30																		
READVILLE	S	14:49	30				S	15:02	30										S	15:55	30
READ		14:50			14:54												15:55				
FAIRMOUNT							D	15:05	30										D	15:58	30
MORTON ST							D	15:09	30										D	16:02	30
UPHAM'S CORNER							D	15:15	30										D	16:08	30
HYDE PARK				S	14:58	30										S	15:59	30			
ROSLINDALE													S	15:30	30						
FOREST HILLS													S	15:34	30						
PLAINS		14:56			15:01									15:35			16:02				
RUG																					
BACK BAY	S	15:00	30	S	15:07	30				S	15:29	30	S	15:40	30	S	16:04	30			
COV		15:01			15:08						15:30			15:41			16:05				
BROADWAY-CABOT																					
TOWER 1		15:04			15:11			15:21						15:44			16:08			16:13	
SOUTH STATION	D	15:05	300	D	15:12	300	D	15:26	300	D	15:35	300	D	15:45	300	D	16:09	300	D	16:19	300

Prev Trn:	820			523Q			1999NBQ			720			526			771Q			1921Q		
Train:	815			523			1999NB			719			525			771			1921		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:57	300	S	17:00	300	S	17:03	300	S	17:10	300	S	17:15	300	S	17:15	300	S	17:18	300
TOWER 1		16:58						17:04			17:11						17:16			17:19	
BROADWAY-CABOT																	17:17				
COV		17:01			17:04			17:07			17:14			17:19						17:22	
BACK BAY	S	17:02	60	S	17:06	60	S	17:08	60	S	17:15	60	S	17:21	60				S	17:23	60
RUG	S	17:06	60				S	17:12	60	S	17:19	60							S	17:27	60
PLAINS		17:09						17:15			17:22									17:30	
FOREST HILLS																					
ROSLINDALE																					
HYDE PARK																			S	17:37	60
UPHAM'S CORNER																S	17:26	60			
MORTON ST																S	17:33	60			
FAIRMOUNT																S	17:38	60			
READ		17:13						17:19			17:27									17:39	
READVILLE																D	17:42	60			
ENDICOTT										D	17:33	60									
ROUTE 128							S	17:23	120										S	17:43	120
JUNCTION		17:17						17:24												17:44	
CANTON JCT							S	17:30	60										S	17:51	60
CANTON CENTER							S	17:33	60										S	17:55	60
STOUGHTON							S	17:42	60										S	18:04	60
NORTH EASTON							S	17:46	60										S	18:09	60
EASTON VILLAGE							S	17:50	60										S	18:13	60
RAY							S	17:57	60										S	18:20	60
DEAN ST							S	18:03	60										S	18:26	60
TAUNTON DEPOT							S	18:08	60										S	18:31	60
FREETOWN							S	18:20	60												
FALL RIVER							S	18:28	60												
KINGS HIGHWAY																			S	18:46	60
WHALES TOOTH																			D	18:52	60
SHARON	S	17:24	120																		
MANSFIELD	S	17:33	120																		
HOLDEN		17:39																			
ATT	S	17:47	120																		
SOUTH ATTLEBORO	S	17:54	60																		
ORM		18:03																			
PROVIDENCE	D	18:04	60																		

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 12 of 17

Train:	618			820			768			526			720			1980			620		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	15:19	30															
ORM					15:20																
SOUTH ATTLEBORO				S	15:28	30															
ATT				S	15:45	45															
MANSFIELD				S	15:54	45															
SHARON				S	16:02	45															
WHALES TOOTH																S	15:57	30			
KINGS HIGHWAY																S	16:02	30			
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT																S	16:16	30			
DEAN ST																S	16:21	30			
RAY																S	16:27	30			
EASTON VILLAGE																S	16:34	30			
NORTH EASTON																S	16:38	30			
STOUGHTON																S	16:44	30			
CANTON CENTER																S	16:50	30			
CANTON JCT				S	16:09	30										S	16:54	30			
JUNCTION					16:10												16:55				
ROUTE 128																S	17:01	45			
ENDICOTT													S	16:33	30						
READVILLE													S	16:36	30						
READ					16:15									16:37			17:04				
FAIRMOUNT							D	16:11	30												
MORTON ST							D	16:15	30												
UPHAM'S CORNER							D	16:21	30												
HYDE PARK																S	17:08	30			
ROSLINDALE	S	16:12	30																S	17:33	30
FOREST HILLS	D	16:14	30																D	17:36	30
PLAINS		16:15			16:20									16:43			17:11			17:37	
RUG																					
BACK BAY	D	16:21	30	S	16:24	30				S	16:41	30	S	16:48	30	S	17:17	30	D	17:42	30
COV		16:22			16:25						16:42			16:49			17:18			17:43	
BROADWAY-CABOT																					
TOWER 1		16:25			16:28			16:26						16:52			17:21			17:46	
SOUTH STATION	D	16:26	300	D	16:30	300	D	16:32	300	D	16:47	300	D	16:53	300	D	17:22	300	D	17:47	300

Prev Trn:	623Q			527Q			817Q			783NBQ			721Q			1980			625Q		
Train:	623			527			817			783NB			721			923			625		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:26	300	S	17:35	300	S	17:40	300	S	17:40	300	S	17:44	300	S	17:45	300	S	17:55	300
TOWER 1		17:27						17:41			17:41			17:45			17:46			17:56	
BROADWAY-CABOT											17:42										
COV		17:30			17:39			17:44						17:48			17:49			17:59	
BACK BAY	S	17:31	60	S	17:41	60	S	17:45	60				S	17:49	60	S	17:51	60	S	18:00	60
RUG	S	17:35	60				S	17:49	60				S	17:53	60	S	17:56	60	S	18:04	60
PLAINS		17:39						17:52						17:56			17:58			18:08	
FOREST HILLS	S	17:40	60																S	18:09	60
ROSLINDALE	D	17:43	60																D	18:12	60
HYDE PARK													S	18:03	60						
UPHAM'S CORNER										S	17:51	60									
MORTON ST										S	17:58	60									
FAIRMOUNT										S	18:03	60									
READ								17:56						18:05			18:02				
READVILLE										D	18:07	60	S	18:06	60						
ENDICOTT													D	18:10	60						
ROUTE 128																S	18:08	120			
JUNCTION								18:00									18:09				
CANTON JCT																S	18:14	60			
CANTON CENTER																S	18:17	60			
STOUGHTON																D	18:26	60			
NORTH EASTON																					
EASTON VILLAGE																					
RAY																					
DEAN ST																					
TAUNTON DEPOT																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON							S	18:07	120												
MANSFIELD							S	18:18	120												
HOLDEN								18:24													
ATT							S	18:26	120												
SOUTH ATTLEBORO							S	18:33	60												
ORM								18:41													
PROVIDENCE							D	18:42	60												

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 13 of 17

Train:	770			794			772			1920			622			528			822		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	17:22	30
ORM																				17:23	
SOUTH ATTLEBORO																			S	17:31	30
ATT																			S	17:44	45
MANSFIELD																			S	17:53	45
SHARON																			S	18:01	45
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER										S	16:59	30									
FREETOWN										S	17:06	30									
TAUNTON DEPOT										S	17:17	30									
DEAN ST										S	17:22	30									
RAY										S	17:28	30									
EASTON VILLAGE										S	17:35	30									
NORTH EASTON										S	17:39	30									
STOUGHTON										S	17:44	30									
CANTON CENTER										S	17:50	30									
CANTON JCT										S	17:54	30							S	18:08	30
JUNCTION											17:55									18:09	
ROUTE 128										S	18:01	45							S	18:13	45
ENDICOTT				D	17:41	30															
READVILLE	S	17:35	30				S	17:55	30												
READ											18:04									18:17	
FAIRMOUNT	D	17:38	30				D	17:58	30												
MORTON ST	D	17:42	30				D	18:02	30												
UPHAM'S CORNER	D	17:48	30				D	18:08	30												
HYDE PARK										S	18:08	30							S	18:20	30
ROSLINDALE																					
FOREST HILLS													S	18:14	30						
PLAINS											18:11			18:15						18:25	
RUG																					
BACK BAY										S	18:17	30	S	18:21	30	S	18:24	30	S	18:29	30
COV											18:18			18:22			18:25			18:30	
BROADWAY-CABOT					18:07																
TOWER 1		17:54						18:14			18:21			18:25						18:33	
SOUTH STATION	D	17:59	300	D	18:08	300	D	18:19	300	D	18:22	300	D	18:26	300	D	18:30	300	D	18:34	300

Prev Trn:	1997Q			620			773Q			529Q			723Q			819Q			794		
Train:	1997			599NR			773			529			723			819			627		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:56	300	S	18:03	300	S	18:09	300	S	18:15	300	S	18:15	300	S	18:22	300	S	18:27	300
TOWER 1		17:57						18:10						18:16			18:23			18:28	
BROADWAY-CABOT								18:11													
COV		18:00			18:07						18:19			18:19			18:26			18:31	
BACK BAY	S	18:02	60	S	18:09	60				S	18:21	60	S	18:20	60	S	18:27	60	S	18:32	60
RUG	S	18:07	60										S	18:24	60	S	18:31	60	S	18:36	60
PLAINS		18:09												18:27			18:34			18:40	
FOREST HILLS																			S	18:41	60
ROSLINDALE																			D	18:44	60
HYDE PARK																					
UPHAM'S CORNER							S	18:20	60												
MORTON ST							S	18:27	60												
FAIRMOUNT							S	18:32	60												
READ		18:13												18:31			18:38				
READVILLE							D	18:36	60				S	18:32	60						
ENDICOTT													D	18:36	60						
ROUTE 128	S	18:19	120													S	18:41	120			
JUNCTION		18:20															18:42				
CANTON JCT	S	18:25	60																		
CANTON CENTER	S	18:28	60																		
STOUGHTON	S	18:37	60																		
NORTH EASTON	S	18:42	60																		
EASTON VILLAGE	S	18:46	60																		
RAY	S	18:53	60																		
DEAN ST	S	18:58	60																		
TAUNTON DEPOT	S	19:04	60																		
FREETOWN	S	19:16	60																		
FALL RIVER	S	19:24	60																		
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON																S	18:49	120			
MANSFIELD																S	18:58	120			
HOLDEN																	19:05				
ATT																S	19:08	120			
SOUTH ATTLEBORO																S	19:15	60			
ORM																	19:22				
PROVIDENCE																D	19:23	60			

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 14 of 17

Train:	796			824			530			774			922			776			532		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	18:00	30															
ORM					18:01																
SOUTH ATTLEBORO				S	18:10	30															
ATT				S	18:18	45															
MANSFIELD				S	18:26	45															
SHARON				S	18:34	45															
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT																					
DEAN ST																					
RAY																					
EASTON VILLAGE																					
NORTH EASTON																					
STOUGHTON													S	18:52	30						
CANTON CENTER													S	18:59	30						
CANTON JCT													S	19:02	30						
JUNCTION					18:43									19:03							
ROUTE 128				S	18:47	45							S	19:07	45						
ENDICOTT	S	18:14	30																		
READVILLE										S	18:46	30				S	19:07	30			
READ					18:49									19:10							
FAIRMOUNT										D	18:49	30				D	19:10	30			
MORTON ST										D	18:53	30				D	19:14	30			
UPHAM'S CORNER										D	18:59	30				D	19:20	30			
HYDE PARK													S	19:12	30						
ROSLINDALE																					
FOREST HILLS																					
PLAINS					18:54									19:17							
RUG																					
BACK BAY				S	18:59	30	S	19:03	30				S	19:22	30				S	19:26	30
COV					19:00			19:04						19:23						19:27	
BROADWAY-CABOT		18:39																			
TOWER 1					19:02						19:05			19:26			19:26				
SOUTH STATION	D	18:40	300	D	19:03	300	D	19:09	300	D	19:10	300	D	19:27	300	D	19:31	300	D	19:32	300

Prev Trn:	531Q			770			1920			622			822			528			530		
Train:	531			775			1925			821			829			533			725		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:30	300	S	18:30	300	S	18:46	300	S	18:50	300	S	19:10	300	S	19:15	300	S	19:35	300
TOWER 1					18:31			18:47			18:51			19:11						19:36	
BROADWAY-CABOT					18:32																
COV		18:34						18:48			18:54			19:14			19:19			19:37	
BACK BAY	S	18:36	60				S	18:51	30	S	18:55	30	S	19:15	30	S	19:21	30	S	19:40	30
RUG							S	18:54	30	S	18:58	30	S	19:19	30				S	19:43	30
PLAINS								18:57			19:01			19:22						19:46	
FOREST HILLS													S	19:23	30						
ROSLINDALE													D	19:27	30						
HYDE PARK							S	19:02	30	S	19:08	30									
UPHAM'S CORNER				S	18:41	60															
MORTON ST				S	18:48	60															
FAIRMOUNT				S	18:53	60															
READ								19:04			19:10									19:51	
READVILLE				D	18:57	60													S	19:53	30
ENDICOTT																			D	19:56	30
ROUTE 128							S	19:07	45	S	19:13	45									
JUNCTION								19:08			19:14										
CANTON JCT							S	19:11	30	S	19:18	30									
CANTON CENTER							S	19:14	30												
STOUGHTON							S	19:23	30												
NORTH EASTON							S	19:28	30												
EASTON VILLAGE							S	19:32	30												
RAY							S	19:39	30												
DEAN ST							S	19:45	30												
TAUNTON DEPOT							S	19:50	30												
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY							S	20:05	30												
WHALES TOOTH							D	20:11	30												
SHARON										S	19:24	45									
MANSFIELD										S	19:33	45									
HOLDEN											19:40										
ATT										S	19:47	45									
SOUTH ATTLEBORO										S	19:54	30									
ORM											20:02										
PROVIDENCE										D	20:03	30									

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 15 of 17

Train:	626			1926			534			628			778			798			536		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
ATT																					
MANSFIELD																					
SHARON																					
WHALES TOOTH				S	18:49	60															
KINGS HIGHWAY				S	18:54	60															
FALL RIVER																					
FREETOWN																					
TAUNTON DEPOT				S	19:08	60															
DEAN ST				S	19:13	60															
RAY				S	19:19	60															
EASTON VILLAGE				S	19:26	60															
NORTH EASTON				S	19:30	60															
STOUGHTON				S	19:36	30															
CANTON CENTER																					
CANTON JCT				S	19:45	30															
JUNCTION					19:47																
ROUTE 128																					
ENDICOTT																D	20:19	30			
READVILLE													S	20:15	30						
READ					19:52																
FAIRMOUNT													D	20:18	30						
MORTON ST													D	20:22	30						
UPHAM'S CORNER													D	20:28	30						
HYDE PARK				S	19:54	30															
ROSLINDALE	S	19:42	30																		
FOREST HILLS	S	19:45	30							S	20:23	30									
PLAINS		19:46			19:59						20:24										
RUG	S	19:49	30							S	20:27	30									
BACK BAY	S	19:53	30	S	20:04	30	S	20:28	30	S	20:31	30							S	20:56	30
COV		19:54			20:05			20:29			20:32									20:57	
BROADWAY-CABOT																	20:44				
TOWER 1		19:56			20:08						20:35			20:34							
SOUTH STATION	D	19:58	300	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300	D	21:02	300

Prev Trn:	774			922			631Q			626			532			776			824		
Train:	777			1927			631			823			535			779			727		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	19:41	300	S	19:49	300	S	20:10	300	S	20:17	300	S	20:20	300	S	20:49	300	S	20:50	300
TOWER 1		19:42			19:50			20:11			20:18						20:50			20:51	
BROADWAY-CABOT		19:43															20:51				
COV					19:51			20:12			20:19			20:24						20:52	
BACK BAY				S	19:54	30	S	20:15	30	S	20:22	30	S	20:26	30				S	20:55	30
RUG				S	19:57	30	S	20:18	30	S	20:25	30							S	20:58	30
PLAINS					20:00			20:22			20:29									21:00	
FOREST HILLS							S	20:23	30												
ROSLINDALE							D	20:26	30												
HYDE PARK				S	20:05	30				S	20:35	30									
UPHAM'S CORNER	D	19:51	30													D	20:59	30			
MORTON ST	D	19:57	30													D	21:05	30			
FAIRMOUNT	D	20:01	30													D	21:09	30			
READ					20:07						20:37									21:05	
READVILLE	D	20:05	30													D	21:13	30	S	21:08	30
ENDICOTT																			D	21:12	30
ROUTE 128				S	20:10	45				S	20:40	45									
JUNCTION					20:11						20:42										
CANTON JCT				S	20:14	30				S	20:45	30									
CANTON CENTER				S	20:17	30															
STOUGHTON				S	20:26	30															
NORTH EASTON				S	20:30	30															
EASTON VILLAGE				S	20:34	30															
RAY				S	20:41	30															
DEAN ST				S	20:47	30															
TAUNTON DEPOT				S	20:52	30															
FREETOWN				S	21:04	30															
FALL RIVER				S	21:12	30															
KINGS HIGHWAY																					
WHALES TOOTH																					
SHARON										S	20:51	45									
MANSFIELD										S	20:59	45									
HOLDEN											21:05										
ATT										S	21:07	45									
SOUTH ATTLEBORO										S	21:14	30									
ORM											21:21										
PROVIDENCE										D	21:23	30									

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 16 of 17

Train:	826			1928			630			726			780			1930			632		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	19:53	30																		
ORM		19:54																			
SOUTH ATTLEBORO	S	20:04	30																		
ATT	S	20:14	45																		
MANSFIELD	S	20:22	45																		
SHARON	S	20:30	45																		
WHALES TOOTH																S	20:47	30			
KINGS HIGHWAY																S	20:52	30			
FALL RIVER				S	19:54	30															
FREETOWN				S	20:01	30															
TAUNTON DEPOT				S	20:12	30										S	21:06	30			
DEAN ST				S	20:17	30										S	21:11	30			
RAY				S	20:23	30										S	21:17	30			
EASTON VILLAGE				S	20:30	30										S	21:24	30			
NORTH EASTON				S	20:34	30										S	21:28	30			
STOUGHTON				S	20:39	30										S	21:34	30			
CANTON CENTER				S	20:45	30										S	21:40	30			
CANTON JCT	S	20:37	30	S	20:49	30										S	21:44	30			
JUNCTION		20:38			20:50												21:45				
ROUTE 128	S	20:42	45	S	20:56	45										S	21:51	45			
ENDICOTT										S	21:27	30									
READVILLE													S	21:23	30						
READ		20:46			20:59						21:30						21:54				
FAIRMOUNT													D	21:26	30						
MORTON ST													D	21:30	30						
UPHAM'S CORNER													D	21:36	30						
HYDE PARK	S	20:49	30	S	21:03	30										S	21:58	30			
ROSLINDALE							S	21:22	30										S	22:30	30
FOREST HILLS							S	21:25	30										S	22:33	30
PLAINS		20:54			21:06			21:26			21:36						22:01			22:34	
RUG							S	21:29	30										S	22:37	30
BACK BAY	S	20:58	30	S	21:12	30	S	21:33	30	S	21:40	30				S	22:07	30	S	22:41	30
COV		20:59			21:13			21:34			21:41						22:08			22:42	
BROADWAY-CABOT																					
TOWER 1		21:02			21:16			21:37			21:44			21:42			22:11			22:44	
SOUTH STATION	D	21:03	300	D	21:17	300	D	21:38	300	D	21:45	300	D	21:47	300	D	22:12	300	D	22:45	300

Prev Trn:	1926			798			628			772			534			780			726		
Train:	1929			825			633			781			537			827			635		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	20:55	300	S	21:05	300	S	21:15	300	S	21:57	300	S	22:20	300	S	22:25	300	S	22:30	300
TOWER 1		20:56			21:06			21:16			21:58						22:26			22:31	
BROADWAY-CABOT											21:59										
COV		20:57			21:07			21:17						22:24			22:27			22:32	
BACK BAY	S	21:00	30	S	21:10	30	S	21:20	30				S	22:26	30	S	22:30	30	S	22:35	30
RUG	S	21:03	30	S	21:13	30	S	21:23	30							S	22:33	30	S	22:38	30
PLAINS		21:06			21:17			21:27									22:37			22:42	
FOREST HILLS							S	21:28	30										S	22:43	30
ROSLINDALE							D	21:31	30										D	22:46	30
HYDE PARK	S	21:11	30	S	21:23	30										S	22:43	30			
UPHAM'S CORNER										D	22:07	30									
MORTON ST										D	22:13	30									
FAIRMOUNT										D	22:17	30									
READ		21:13			21:25												22:45				
READVILLE										D	22:21	30									
ENDICOTT																					
ROUTE 128	S	21:16	45	S	21:28	45										S	22:48	45			
JUNCTION		21:17			21:30												22:50				
CANTON JCT	S	21:20	30	S	21:33	30										S	22:53	30			
CANTON CENTER	S	21:23	30																		
STOUGHTON	S	21:32	30																		
NORTH EASTON	S	21:37	30																		
EASTON VILLAGE	S	21:41	30																		
RAY	S	21:48	30																		
DEAN ST	S	21:54	30																		
TAUNTON DEPOT	S	21:59	30																		
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY	S	22:14	30																		
WHALES TOOTH	D	22:20	30																		
SHARON				S	21:39	45										S	22:59	45			
MANSFIELD				S	21:47	45										S	23:07	45			
HOLDEN					21:52												23:13				
ATT				S	21:55	45										S	23:15	45			
SOUTH ATTLEBORO				S	22:02	30										S	23:22	30			
ORM					22:09												23:29				
PROVIDENCE				D	22:11	30										D	23:32	30			

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
NEC and Dorchester Branch
Page 17 of 17

Train:	782			828			728			730			538			540		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	21:47	30												
ORM					21:48													
SOUTH ATTLEBORO				S	21:57	30												
ATT				S	22:13	45												
MANSFIELD				S	22:22	45												
SHARON				S	22:29	45												
WHALES TOOTH																		
KINGS HIGHWAY																		
FALL RIVER																		
FREETOWN																		
TAUNTON DEPOT																		
DEAN ST																		
RAY																		
EASTON VILLAGE																		
NORTH EASTON																		
STOUGHTON																		
CANTON CENTER																		
CANTON JCT																		
JUNCTION					22:30													
ROUTE 128				S	22:40	45												
ENDICOTT							D	22:47	30	D	00:20	30						
READVILLE	S	22:31	30															
READ					22:43			22:50			00:23							
FAIRMOUNT	D	22:34	30															
MORTON ST	D	22:38	30															
UPHAM'S CORNER	D	22:44	30															
HYDE PARK				S	22:45	30												
ROSLINDALE																		
FOREST HILLS																		
PLAINS					22:50			22:57			00:31							
RUG																		
BACK BAY				S	22:55	30	S	23:01	30	S	00:36	30	S	01:17	30	S	01:24	30
COV					22:56			23:02			00:37			01:18			01:25	
BROADWAY-CABOT																		
TOWER 1		22:50			22:59			23:05			00:40							
SOUTH STATION	D	22:55	300	D	23:00	300	D	23:06	300	D	00:41	300	D	01:23	300	D	01:30	300

Prev Trn:	630			536			632			828		
Train:	729			539			731			829		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:35	300	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1		22:36						23:51			00:00	
BROADWAY-CABOT												
COV		22:37			23:29			23:52			00:01	
BACK BAY	S	22:40	30	S	23:31	30	S	23:55	30	S	00:04	30
RUG	S	22:43	30				S	23:58	30	S	00:07	30
PLAINS		22:46						00:01			00:11	
FOREST HILLS												
ROSLINDALE												
HYDE PARK	S	22:52	30							S	00:16	30
UPHAM'S CORNER												
MORTON ST												
FAIRMOUNT												
READ		22:54						00:06			00:18	
READVILLE	S	22:55	30				S	00:08	30			
ENDICOTT	D	23:00	30				D	00:11	30			
ROUTE 128										S	00:21	45
JUNCTION											00:23	
CANTON JCT										S	00:26	30
CANTON CENTER												
STOUGHTON												
NORTH EASTON												
EASTON VILLAGE												
RAY												
DEAN ST												
TAUNTON DEPOT												
FREETOWN												
FALL RIVER												
KINGS HIGHWAY												
WHALES TOOTH												
SHARON										S	00:31	45
MANSFIELD										S	00:39	45
HOLDEN											00:44	
ATT										S	00:48	45
SOUTH ATTLEBORO										S	00:56	30
ORM											01:03	
PROVIDENCE										D	01:06	30

10.4.8. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – Old Colony Line

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 1 of 6

Train:	2			32			70			4			34			72			6		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH	S	05:20	30							S	06:00	30							S	06:58	60
BRIDGEWATER	S	05:30	30							S	06:10	30							S	07:08	60
CAMPELLO	S	05:37	30							S	06:18	30							S	07:16	60
BROCKTON	S	05:41	30							S	06:22	30							S	07:20	60
MONTELLO	S	05:44	30							S	06:25	30							S	07:23	60
HOLBROOK/RANDOLPH	S	05:49	30							S	06:30	30							S	07:28	60
SOUTH WEYMOUTH				S	06:01	30							S	06:49	60						
BRAINTREE	D	05:56	30										D	06:57	60						
GREENBUSH PUTIN							N	06:19								N	07:16				
QUINCY CENTER							D	06:22	30	D	06:42	30							D	07:39	60
JFK/UMASS	D	06:10	30	D	06:21	30	D	06:30	30							D	07:27	60	D	07:48	60
BROADWAY-CABOT		06:14			06:25			06:34			06:55			07:14			07:32			07:52	
TOWER 1		06:15			06:26			06:35			06:56			07:15			07:33			07:54	
SOUTH STATION	D	06:17	300	D	06:29	300	D	06:38	300	D	06:58	300	D	07:17	300	D	07:36	300	D	07:56	300

Prev Trn:	2			32			744			74			38			76			752		
Train:	3			71			33			5			61			73			35		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:35	300	S	06:54	300	S	07:11	300	S	08:24	300	S	08:56	300	S	09:25	300	S	09:37	300
TOWER 1		06:36			06:55			07:12			08:25			08:57			09:26			09:38	
BROADWAY-CABOT		06:38			06:56			07:13			08:26			08:58			09:27			09:39	
JFK/UMASS																					
QUINCY CENTER	D	06:49	30										S	09:09	30	S	09:38	30			
GREENBUSH PUTIN				N	07:10											N	09:41				
BRAINTREE	D	06:55	30				D	07:32	30	D	08:43	30	S	09:15	30					09:55	30
SOUTH WEYMOUTH							D	07:39	30				D	09:22	30				D	10:02	30
HOLBROOK/RANDOLPH	D	07:03	30							S	08:51	30									
MONTELLO	D	07:08	30							S	08:56	30									
BROCKTON	D	07:12	30							S	08:59	30									
CAMPELLO	S	07:20	30							S	09:03	30									
BRIDGEWATER	D	07:38	30							S	09:11	30									
MIDDLEBOROUGH	D	07:50	30							D	09:23	30									

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 2 of 6

Train:	74			36			8			38			76			10			40		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:46	300	D	09:05	300	D	09:34	300

Prev Trn:	40			78			764			80			42			14			82		
Train:	7			75			63			9			39			77			65		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 3 of 6

Train:	78			12			60			80			42			14			82		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30				D	11:51	30	D	12:32	30
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44	
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45	
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:46	300	D	12:07	300	D	12:48	300

Prev Trn:	62			16			44			64			81Q			43Q			766		
Train:	15			79			41			17			81			43			19		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 4 of 6

Train:	62			16			44			84			64			18			86		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	13:08	30										S	15:25	30			
BRIDGEWATER				S	13:18	30										S	15:35	30			
CAMPELLO				S	13:26	30										S	15:43	30			
BROCKTON				S	13:30	30										S	15:47	30			
MONTELLO				S	13:33	30										S	15:50	30			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	30			
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:26	300	D	16:24	300	D	16:46	300

Prev Trn:	18			45Q			86			48			47Q			87Q			23Q		
Train:	83			45			21			85			47			87			23		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 5 of 6

Train:	48			20			88			22			52			90			54		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	16:54	30				S	17:57	30									
BRIDGEWATER				S	17:04	30				D	18:10	30									
CAMPELLO				D	17:11	30				D	18:18	30									
BROCKTON				D	17:15	30				D	18:22	30									
MONTELLO				D	17:18	30				D	18:26	30									
HOLBROOK/RANDOLPH				D	17:23	30				S	18:32	30									
SOUTH WEYMOUTH	S	16:31	30										S	19:03	30				S	20:17	30
BRAINTREE	D	16:38	30	D	17:31	30							D	19:11	30				D	20:25	30
GREENBUSH PUTIN							N	18:05								N	19:46				
QUINCY CENTER							D	18:21	30							D	19:52	30			
JFK/UMASS																					
BROADWAY-CABOT		16:56			18:03			18:33			18:54			19:26			20:02			20:43	
TOWER 1		16:57			18:04			18:34			18:55			19:27			20:03			20:44	
SOUTH STATION	D	16:59	300	D	18:06	300	D	18:35	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300

Prev Trn:	49Q			20			88			22			52			90			54		
Train:	49			89			25			51			27			91			55		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26			21:31	
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27			21:32	
JFK/UMASS													S	20:13	30				S	21:36	30
QUINCY CENTER				S	18:48	30	S	19:03	30				S	20:21	30	S	20:38	30			
GREENBUSH PUTIN				N	18:51											N	20:41				
BRAINTREE	S	18:33	60							S	19:47	30							S	21:48	30
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30							D	21:55	30
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30						
MONTELLO							S	19:20	30				S	20:39	30						
BROCKTON							S	19:23	30				S	20:42	30						
CAMPELLO							S	19:27	30				S	20:46	30						
BRIDGEWATER							D	19:35	30				D	20:54	30						
MIDDLEBOROUGH							D	19:48	30				D	21:05	30						

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option
Old Colony Line
Page 6 of 6

	Train:	92			56			28		
Station Code:		Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH								S	21:25	30
BRIDGEWATER								S	21:35	30
CAMPELLO								S	21:42	30
BROCKTON								S	21:46	30
MONTELLO								S	21:49	30
HOLBROOK/RANDOLPH								S	21:54	30
SOUTH WEYMOUTH					S	21:22	30			
BRAINTREE					D	21:29	30	D	22:00	30
GREENBUSH PUTIN		N	20:46							
QUINCY CENTER		D	20:49	30				D	22:05	30
JFK/UMASS										
BROADWAY-CABOT			21:02			21:46			22:18	
TOWER 1			21:04			21:47			22:19	
SOUTH STATION		D	21:07	300	D	21:49	300	D	22:22	300

	Prev Trn:	92			56			28		
	Train:	93			29			57		
Station Code:		Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION		S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1			22:01			22:31			22:41	
BROADWAY-CABOT			22:02			22:32			22:42	
JFK/UMASS								S	22:46	30
QUINCY CENTER		S	22:13	30	S	22:43	30			
GREENBUSH PUTIN		N	22:16							
BRAINTREE								S	22:59	30
SOUTH WEYMOUTH								D	23:06	30
HOLBROOK/RANDOLPH					S	22:56	30			
MONTELLO					S	23:01	30			
BROCKTON					S	23:04	30			
CAMPELLO					S	23:08	30			
BRIDGEWATER					D	23:16	30			
MIDDLEBOROUGH					D	23:27	30			

10.4.9. 2030 Attleboro Alternative Operating Plan, Diesel Option — NEC and Dorchester Branch

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 1 of 20

Train:	800			790			500			802			702			600			744		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	04:56	30							S	05:31	30									
ORM		04:57									05:32										
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30									
HEBRONVILLE		05:09									05:44										
ATT	S	05:16	45							S	05:51	45									
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DOWNTOWN TAUNTON																					
BARROWSVILLE																					
MANSFIELD	S	05:25	45							S	06:01	45									
SHARON	S	05:33	45							S	06:10	45									
STOUGHTON																					
CANTON CENTER																					
CANTON JCT	S	05:40	30							S	06:17	30									
JUNCTION INT.		05:40									06:17										
ROUTE 128	S	05:45	45							S	06:22	45									
ENDICOTT				S	05:48	30							S	06:26	30						
READVILLE				S	05:51	30							S	06:29	30				S	06:31	30
READ		05:49									06:26			06:30							
FAIRMOUNT				D	05:54	30													S	06:34	30
MORTON ST.				D	05:58	30													D	06:38	30
UPHAMS CORNER				D	06:04	30													D	06:44	30
HYDE PARK	S	05:50	30							S	06:27	30									
ROSLINDALE VILLAGE																S	06:37	30			
FOREST HILLS																S	06:40	30			
PLAINS		05:55									06:32			06:37			06:41				
RUG										S	06:37	30				S	06:44	30			
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:48	30			
COV		06:03						06:31			06:42			06:44			06:49				
TOWER 1		06:06			06:12						06:45			06:47			06:51			06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:52	300	D	06:55	300

Prev Trn:	730			538			934			540			903Q			743Q			745Q		
Train:	703			5501			901			501			903			743			745		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	04:00	300	S	04:45	300	S	05:15	300	S	05:30	300	S	05:35	300	S	05:40	300	S	06:25	300
TOWER 1		04:01						05:16						05:36			05:42			06:27	
BROADWAY-CABOT																	05:44			06:29	
COV		04:02			04:49			05:17			05:34			05:37							
BACK BAY				N	04:50					S	05:36	30	S	05:40	30						
RUG																					
PLAINS		04:06						05:21						05:43							
FOREST HILLS																					
ROSLINDALE VILLAGE																					
HYDE PARK																					
UPHAMS CORNER																D	05:50	30	D	06:35	30
MORTON ST.																D	05:56	30	D	06:41	30
FAIRMOUNT																D	06:00	30	D	06:45	30
READ		04:11						05:26						05:47							
READVILLE																D	06:04	30	D	06:49	30
ENDICOTT	D	04:18	30																		
ROUTE 128													S	05:51	45						
JUNCTION INT.								05:31						05:54							
CANTON JCT																					
CANTON CENTER							S	05:38	30				S	05:59	30						
STOUGHTON							D	05:46	30				D	06:10	30						
SHARON																					
MANSFIELD																					
BARROWSVILLE																					
DOWNTOWN TAUNTON																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 2 of 20

Train:	NB2			902			704			502			904			904			698NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:04	60						
ORM														06:05							
SOUTH ATTLEBORO													S	06:13	60						
HEBRONVILLE														06:16							
ATT													S	06:26	120						
WHALES TOOTH	S	05:24	60																		
KINGS HIGHWAY	S	05:29	60																		
FALL RIVER																					
FREETOWN																					
CP B40		05:38																			
TAUNTON DEPOT	S	05:47	60																		
DOWNTOWN TAUNTON	S	05:54	60																		
BARROWSVILLE	S	06:09	60																		
MANSFIELD	S	06:22	120										S	06:35	120						
SHARON													S	06:45	120						
STOUGHTON				S	06:28	30										S	06:43	60			
CANTON CENTER				S	06:36	30										S	06:51	60			
CANTON JCT				S	06:39	30										S	06:55	60			
JUNCTION INT.		06:33			06:40									06:48			06:56				
ROUTE 128	S	06:37	120	S	06:44	45							S	06:55	120	S	07:01	120			
ENDICOTT							D	06:49	1												
READVILLE																					
READ		06:40			06:48			06:52						06:59			07:05				
FAIRMOUNT																					
MORTON ST.																					
UPHAMS CORNER																					
HYDE PARK				S	06:49	30										S	07:06	60			
ROSLINDALE VILLAGE																					
FOREST HILLS																					
PLAINS		06:44			06:55			06:58						07:03			07:11				
RUG							S	07:00	60				S	07:07	60						
BACK BAY	S	06:50	60	D	06:59	30	D	07:04	60	S	07:06	60	D	07:11	60	D	07:15	60	S	07:17	60
COV		06:51			07:00			07:05			07:07			07:12			07:16			07:18	
TOWER 1		06:54			07:03			07:08						07:15			07:19				
SOUTH STATION	D	06:55	300	D	07:04	300	D	07:09	300	D	07:12	300	D	07:16	300	D	07:20	300	D	07:23	300

Prev Trn:	801Q			790			800			705Q			500			70			600		
Train:	801			831			503			705			505			905			605		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:25	300	S	06:35	300	S	06:50	300	S	06:55	300	S	06:59	300	S	07:02	300	S	07:07	300
TOWER 1		06:26			06:36						06:56						07:03			07:08	
BROADWAY-CABOT																					
COV		06:28			06:39			06:54			06:58			07:03			07:05			07:10	
BACK BAY	S	06:30	30	S	06:40	30	S	06:56	30				S	07:05	30	S	07:07	30	S	07:12	30
RUG	S	06:33	30																		
PLAINS		06:36			06:45						07:02						07:10			07:17	
FOREST HILLS																			S	07:18	30
ROSLINDALE VILLAGE																			D	07:22	30
HYDE PARK																					
UPHAMS CORNER																					
MORTON ST.																					
FAIRMOUNT																					
READ		06:42			06:49						07:11						07:16				
READVILLE										S	07:12	30									
ENDICOTT										D	07:16	30									
ROUTE 128	S	06:45	45																		
JUNCTION INT.		06:46			06:53												07:20				
CANTON JCT																S	07:23	30			
CANTON CENTER																S	07:26	30			
STOUGHTON																D	07:34	30			
SHARON	S	06:54	45																		
MANSFIELD	S	07:01	45	S	07:08	45															
BARROWSVILLE																					
DOWNTOWN TAUNTON																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN		07:08																			
ATT	S	07:10	45																		
SOUTH ATTLEBORO		07:16	30																		
ORM		07:24																			
PROVIDENCE	D	07:25	30																		

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 3 of 20

Train:	FR4			746			602			706			906			604			NB6		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	06:33	60						
ORM														06:34							
SOUTH ATTLEBORO													S	06:42	60						
HEBRONVILLE														06:45							
ATT													S	06:52	120						
WHALES TOOTH																			S	06:19	60
KINGS HIGHWAY																			S	06:24	60
FALL RIVER	S	05:56	60																		
FREETOWN	S	06:03	60																		
CP B40		06:07																		06:33	
TAUNTON DEPOT	S	06:16	60																S	06:42	60
DOWNTOWN TAUNTON	S	06:23	60																S	06:49	60
BARROWSVILLE	S	06:38	60																S	07:04	60
MANSFIELD	S	06:51	120										S	07:04	120						
SHARON													S	07:13	120						
STOUGHTON																					
CANTON CENTER																					
CANTON JCT																					
JUNCTION INT.		07:02												07:16						07:28	
ROUTE 128	S	07:06	120										S	07:24	120				S	07:32	120
ENDICOTT										S	07:18	60									
READVILLE				S	07:06	60				S	07:21	60									
READ		07:09									07:22			07:28						07:35	
FAIRMOUNT				S	07:09	60															
MORTON ST.				D	07:13	60															
UPHAMS CORNER				D	07:19	60															
HYDE PARK																					
ROSLINDALE VILLAGE							S	07:16	60												
FOREST HILLS							S	07:19	60												
PLAINS		07:13						07:20			07:29			07:32						07:39	
RUG							S	07:23	60	S	07:33	60									
BACK BAY	S	07:19	60				D	07:27	60	D	07:37	60	D	07:40	60	S	07:40	60	S	07:45	60
COV		07:20						07:28			07:38			07:41			07:41			07:46	
TOWER 1		07:23			07:27			07:31			07:40			07:44						07:49	
SOUTH STATION	D	07:24	300	D	07:30	300	D	07:32	300	D	07:41	300	D	07:45	300	D	07:46	300	D	07:50	300

Prev Trn:	902			704			502			702			34			904			602		
Train:	747			607			507			907			795			833			735		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	07:20	300	S	07:23	300	S	07:29	300	S	07:31	300	S	07:40	300	S	07:50	300	S	07:55	300
TOWER 1		07:22			07:24						07:32			07:42			07:51			07:56	
BROADWAY-CABOT		07:24												07:44							
COV					07:26			07:33			07:35						07:54			07:58	
BACK BAY				S	07:28	30	S	07:35	30	S	07:36	30				S	07:55	30	S	08:00	30
RUG																S	07:58	30			
PLAINS					07:32						07:39						08:02			08:03	
FOREST HILLS				S	07:35	30															
ROSLINDALE VILLAGE				D	07:39	30															
HYDE PARK																					
UPHAMS CORNER													D	07:50	30						
MORTON ST.													D	07:56	30						
FAIRMOUNT													D	08:00	30						
READ											07:43						08:06			08:11	
READVILLE	D	07:44	30										D	08:04	30				D	08:14	30
ENDICOTT													D	08:08	30				D	08:18	30
ROUTE 128										S	07:48	45				S	08:10	45			
JUNCTION INT.											07:49						08:11				
CANTON JCT										S	07:54	30				S	08:15	30			
CANTON CENTER										S	07:57	30									
STOUGHTON										D	08:05	30									
SHARON																					
MANSFIELD																S	08:28	45			
BARROWSVILLE																					
DOWNTOWN TAUNTON																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN																	08:37				
ATT																D	08:39	45			
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 4 of 20

Train:	698NB			794NB			998NB			708			606			832			604		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
HEBRONVILLE																					
ATT																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DOWNTOWN TAUNTON																					
BARROWSVILLE																					
MANSFIELD																S	07:26	120			
SHARON																S	07:35	120			
STOUGHTON							S	07:21	60												
CANTON CENTER							S	07:29	60												
CANTON JCT							S	07:33	60							S	07:41	60			
JUNCTION INT.								07:34									07:41				
ROUTE 128							S	07:38	120							S	07:47	120			
ENDICOTT										D	07:35	1									
READVILLE				S	07:31	60															
READ								07:40			07:39						07:51				
FAIRMOUNT				S	07:34	60															
MORTON ST.				D	07:38	60															
UPHAMS CORNER				D	07:44	60															
HYDE PARK							S	07:42	60							S	07:52	60			
ROSLINDALE VILLAGE	S	07:35	30																S	07:55	60
FOREST HILLS	S	07:38	30																S	07:57	60
PLAINS		07:39						07:45			07:46						07:57			07:58	
RUG	S	07:42	30							S	07:51	60							S	08:02	60
BACK BAY	S	07:46	30				S	07:52	30	D	07:55	60	S	07:59	60	D	08:02	60	D	08:06	60
COV		07:47						07:53			07:56			08:00			08:03			08:07	
TOWER 1		07:49			07:52			07:54			07:58						08:06			08:10	
SOUTH STATION	D	07:51	300	D	07:55	300	D	07:56	300	D	07:59	300	D	08:05	300	D	08:07	300	D	08:11	300

Prev Trn:	998NB			832			508			506			906			NB10			710		
Train:	751			803			609			509			909			FR3			707		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	08:10	300	S	08:30	300	S	08:40	300	S	08:50	300	S	08:50	300	S	08:53	300	S	09:20	300
TOWER 1		08:11			08:31			08:41						08:51			08:54			09:21	
BROADWAY-CABOT		08:12																			
COV					08:34			08:42			08:54			08:53			08:57			09:24	
BACK BAY				S	08:35	30	S	08:45	30	S	08:56	30	S	08:54	30	S	08:59	30	S	09:25	30
RUG				S	08:38	30															
PLAINS					08:41			08:50						08:58			09:01			09:28	
FOREST HILLS																					
ROSLINDALE VILLAGE							D	08:59	30												
HYDE PARK																					
UPHAMS CORNER	D	08:20	30																		
MORTON ST.	D	08:26	30																		
FAIRMOUNT	D	08:30	30																		
READ					08:45									09:02			09:06			09:32	
READVILLE	D	08:34	30																S	09:36	30
ENDICOTT																			D	09:39	30
ROUTE 128				S	08:49	45							S	09:07	45	S	09:12	45			
JUNCTION INT.					08:50									09:08			09:13				
CANTON JCT				S	08:54	30							S	09:13	30						
CANTON CENTER													S	09:16	30						
STOUGHTON													D	09:24	30						
SHARON				S	09:00	45															
MANSFIELD				S	09:08	45										S	09:27	45			
BARROWSVILLE																S	09:40	30			
DOWNTOWN TAUNTON																S	09:55	30			
TAUNTON DEPOT																S	10:02	30			
CP B40																	10:11				
FREETOWN																S	10:20	30			
FALL RIVER																S	10:26	30			
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN					09:13																
ATT				S	09:15	45															
SOUTH ATTLEBORO				S	09:22	30															
ORM					09:29																
PROVIDENCE				D	09:30	30															

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 5 of 20

Train:	FR8			748			808			508			722NB			NB10			906		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE							S	07:16	60												
ORM								07:17													
SOUTH ATTLEBORO							S	07:26	60												
HEBRONVILLE								07:29													
ATT							S	07:36	120												
WHALES TOOTH																S	07:00	60			
KINGS HIGHWAY																S	07:05	60			
FALL RIVER	S	06:43	60																		
FREETOWN	S	06:50	60																		
CP B40		06:54															07:14				
TAUNTON DEPOT	S	07:03	60													S	07:23	60			
DOWNTOWN TAUNTON	S	07:10	60													S	07:30	60			
BARROWSVILLE	S	07:25	60													S	07:45	60			
MANSFIELD	S	07:38	120				S	07:48	120							S	07:58	120			
SHARON																					
STOUGHTON																			S	07:48	60
CANTON CENTER																			S	07:57	60
CANTON JCT																			S	08:01	60
JUNCTION INT.		07:49						07:57									08:09			08:02	
ROUTE 128	S	07:53	120													S	08:13	120	S	08:07	120
ENDICOTT													S	07:58	60						
READVILLE				S	07:56	60							S	08:01	60						
READ		07:56						08:01						08:03			08:16			08:11	
FAIRMOUNT				S	07:59	60															
MORTON ST.				D	08:03	60															
UPHAMS CORNER				D	08:09	60															
HYDE PARK																			S	08:13	60
ROSLINDALE VILLAGE																					
FOREST HILLS																					
PLAINS		08:00						08:05						08:10			08:20			08:18	
RUG													S	08:14	60				S	08:23	60
BACK BAY	S	08:06	60				D	08:15	60	S	08:17	60	D	08:19	60	S	08:26	60	D	08:27	60
COV		08:07						08:16			08:19			08:20			08:27			08:28	
TOWER 1		08:10			08:17			08:19						08:22			08:30			08:31	
SOUTH STATION	D	08:11	300	D	08:20	300	D	08:20	300	D	08:23	300	D	08:23	300	D	08:31	300	D	08:32	300

Prev Trn:	10			898NB			FR16			514			712			792			910		
Train:	753			911			NB5			611			805			755			709		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:21	300	S	09:45	300	S	09:53	300	S	10:00	300	S	10:25	300	S	10:29	300	S	10:50	300
TOWER 1		09:22			09:46			09:54			10:01			10:26			10:30			10:51	
BROADWAY-CABOT		09:23															10:31				
COV					09:47			09:57			10:02			10:27						10:52	
BACK BAY				S	09:50	30	S	09:59	30	S	10:05	30	S	10:30	30				S	10:55	30
RUG																					
PLAINS					09:53			10:01			10:09			10:36						10:59	
FOREST HILLS										S	10:12	30									
ROSLINDALE VILLAGE										D	10:15	30									
HYDE PARK													S	10:41	30						
UPHAMS CORNER	D	09:31	30													D	10:39	30			
MORTON ST.	D	09:37	30													D	10:45	30			
FAIRMOUNT	D	09:41	30													D	10:49	30			
READ					09:58			10:06						10:42						11:04	
READVILLE	D	09:45	30													D	10:53	30	S	11:05	30
ENDICOTT																			D	11:08	30
ROUTE 128							S	10:12	45				S	10:46	45						
JUNCTION INT.					10:03			10:13						10:48							
CANTON JCT				S	10:07	30															
CANTON CENTER				S	10:10	30															
STOUGHTON				D	10:18	30															
SHARON													S	10:57	45						
MANSFIELD							S	10:27	45				S	11:05	45						
BARROWSVILLE							S	10:40	30												
DOWNTOWN TAUNTON							S	10:55	30												
TAUNTON DEPOT							S	11:02	30												
CP B40								11:11													
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY							S	11:20	30												
WHALES TOOTH							D	11:25	30												
HOLDEN														11:12							
ATT													S	11:14	45						
SOUTH ATTLEBORO													S	11:21	30						
ORM														11:29							
PROVIDENCE													D	11:30	30						

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 6 of 20

Train:	738			760			FR12			606			NB14			710			810		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	07:38	60
ORM																				07:39	
SOUTH ATTLEBORO																			S	07:48	60
HEBRONVILLE																				07:51	
ATT																			S	07:58	120
WHALES TOOTH													S	07:19	60						
KINGS HIGHWAY													S	07:24	60						
FALL RIVER							S	07:07	60												
FREETOWN							S	07:14	60												
CP B40								07:18						07:33							
TAUNTON DEPOT							S	07:27	60				S	07:42	60						
DOWNTOWN TAUNTON							S	07:34	60				S	07:49	60						
BARROWSVILLE							S	07:49	60				S	08:04	60						
MANSFIELD							S	08:02	120				S	08:17	120				S	08:08	120
SHARON																			S	08:17	120
STOUGHTON																					
CANTON CENTER																					
CANTON JCT																			S	08:27	60
JUNCTION INT.								08:13						08:28						08:27	
ROUTE 128							S	08:17	120				S	08:32	120				S	08:33	120
ENDICOTT	S	08:15	60													S	08:27	60			
READVILLE	S	08:19	60													S	08:31	60			
READ		08:21						08:26						08:35			08:32			08:37	
FAIRMOUNT				S	08:19	60															
MORTON ST.				D	08:23	60															
UPHAMS CORNER				D	08:29	60															
HYDE PARK																			S	08:39	60
ROSLINDALE VILLAGE										S	08:26	60									
FOREST HILLS										S	08:29	60									
PLAINS		08:25						08:30			08:30			08:39			08:37			08:44	
RUG										S	08:33	60				S	08:42	60			
BACK BAY	D	08:35	60				S	08:36	60	D	08:37	60	S	08:45	60	D	08:47	60	D	08:49	60
COV		08:36						08:37			08:38			08:46			08:48			08:50	
TOWER 1		08:39			08:37			08:40			08:41			08:49			08:51			08:53	
SOUTH STATION	D	08:40	300	D	08:40	300	D	08:41	300	D	08:42	300	D	08:50	300	D	08:52	300	D	08:54	300

Prev Trn:	NB18			516			60			FR20			610			512			714		
Train:	TD7			511			757			NB9			613			513			807		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	10:53	300	S	11:00	300	S	11:37	300	S	11:53	300	S	12:00	300	S	12:10	300	S	12:10	300
TOWER 1		10:54						11:38			11:54			12:01						12:11	
BROADWAY-CABOT								11:39													
COV		10:57			11:04						11:57			12:02			12:14			12:12	
BACK BAY	S	10:59	30	S	11:06	30				S	11:59	30	S	12:05	30	S	12:16	30	S	12:15	30
RUG													S	12:08	30				S	12:18	30
PLAINS		11:01									12:01			12:12						12:21	
FOREST HILLS													S	12:13	30						
ROSLINDALE VILLAGE													D	12:16	30						
HYDE PARK																			S	12:28	30
UPHAMS CORNER							D	11:47	30												
MORTON ST.							D	11:53	30												
FAIRMOUNT							D	11:57	30												
READ		11:06									12:06									12:29	
READVILLE							D	12:01	30												
ENDICOTT																					
ROUTE 128	S	11:12	45							S	12:12	45							S	12:32	45
JUNCTION INT.		11:13									12:13									12:35	
CANTON JCT																			S	12:37	30
CANTON CENTER																					
STOUGHTON																					
SHARON																			S	12:43	45
MANSFIELD	S	11:27	45							S	12:27	45							S	12:51	45
BARROWSVILLE	S	11:40	30							S	12:40	30									
DOWNTOWN TAUNTON	S	11:55	30							S	12:55	30									
TAUNTON DEPOT	S	12:02	30							S	13:02	30									
CP B40		12:11									13:11										
FREETOWN	S	12:20	30																		
FALL RIVER	S	12:26	30																		
KINGS HIGHWAY										S	13:20	30									
WHALES TOOTH										D	13:25	30									
HOLDEN																				12:57	
ATT																			S	12:59	45
SOUTH ATTLEBORO																			S	13:06	30
ORM																				13:14	
PROVIDENCE																			D	13:15	30

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 7 of 20

Train:	510			908			512			898NB			FR16			752			608		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE										S	07:52	30									
ORM											07:53										
SOUTH ATTLEBORO										S	08:02	30									
HEBRONVILLE											08:05										
ATT										S	08:12	45									
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER													S	07:40	60						
FREETOWN													S	07:47	60						
CP B40														07:51							
TAUNTON DEPOT													S	08:00	60						
DOWNTOWN TAUNTON													S	08:07	60						
BARROWSVILLE													S	08:22	60						
MANSFIELD										S	08:22	45	S	08:35	120						
SHARON										S	08:31	45									
STOUGHTON				S	08:22	30															
CANTON CENTER				S	08:30	30															
CANTON JCT				S	08:34	30				S	08:41	30									
JUNCTION INT.					08:35						08:42			08:46							
ROUTE 128				S	08:39	45				S	08:47	45	S	08:50	120						
ENDICOTT																					
READVILLE																S	08:46	30			
READ					08:43						08:50			08:53							
FAIRMOUNT																D	08:49	30			
MORTON ST.																D	08:53	30			
UPHAMS CORNER																D	08:59	30			
HYDE PARK				S	08:43	30				S	08:53	30									
ROSLINDALE VILLAGE																			S	08:56	30
FOREST HILLS																			S	08:59	30
PLAINS					08:48						08:58			08:57						09:00	
RUG																			S	09:04	30
BACK BAY	S	08:50	60	D	08:52	30	S	09:02	30	D	09:03	30	S	09:03	60				D	09:08	30
COV		08:51			08:53			09:03			09:04			09:04						09:09	
TOWER 1					08:56						09:07			09:07			09:07			09:12	
SOUTH STATION	D	08:56	300	D	08:57	300	D	09:08	300	D	09:08	300	D	09:08	300	D	09:10	300	D	09:13	300

Prev Trn:	612			756			FR11Q			518			816			912			NB28		
Train:	711			759			FR11			515			913			761			NB13		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	12:45	300	S	12:45	300	S	12:53	300	S	13:00	300	S	13:20	300	S	13:32	300	S	13:53	300
TOWER 1		12:46			12:46			12:54						13:21			13:33			13:54	
BROADWAY-CABOT					12:47												13:34				
COV		12:47						12:57			13:04			13:22						13:57	
BACK BAY	S	12:50	30				S	12:59	30	S	13:06	30	S	13:25	30				S	13:59	30
RUG	S	12:53	30																		
PLAINS		12:55						13:01						13:31						14:01	
FOREST HILLS																					
ROSLINDALE VILLAGE																					
HYDE PARK													S	13:41	30						
UPHAMS CORNER				D	12:55	30										D	13:42	30			
MORTON ST.				D	13:01	30										D	13:48	30			
FAIRMOUNT				D	13:05	30										D	13:52	30			
READ		13:01						13:06						13:43						14:06	
READVILLE	S	13:03	30	D	13:09	30										D	13:56	30			
ENDICOTT	D	13:06	30																		
ROUTE 128							S	13:12	45				S	13:47	45				S	14:12	45
JUNCTION INT.								13:13						13:50						14:13	
CANTON JCT													S	13:53	30						
CANTON CENTER													S	13:56	30						
STOUGHTON													D	14:04	30						
SHARON																					
MANSFIELD							S	13:27	45										S	14:27	45
BARROWSVILLE							S	13:40	30										S	14:40	30
DOWNTOWN TAUNTON							S	13:55	30										S	14:55	30
TAUNTON DEPOT							S	14:02	30										S	15:02	30
CP B40								14:11												15:11	
FREETOWN							S	14:20	30												
FALL RIVER							S	14:26	30												
KINGS HIGHWAY																			S	15:20	30
WHALES TOOTH																			D	15:25	30
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 8 of 20

Train:	812			792			514			834			516			712			NB18		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE	S	08:10	30																		
ORM		08:11																			
SOUTH ATTLEBORO	S	08:20	30																		
HEBRONVILLE		08:23																			
ATT	S	08:30	45							S	09:00	45									
WHALES TOOTH																			S	08:41	30
KINGS HIGHWAY																			S	08:46	30
FALL RIVER																					
FREETOWN																					
CP B40																				08:55	
TAUNTON DEPOT																			S	09:04	30
DOWNTOWN TAUNTON																			S	09:11	30
BARROWSVILLE																			S	09:26	30
MANSFIELD	S	08:38	45							S	09:09	45							S	09:39	45
SHARON	S	08:47	45							S	09:18	45									
STOUGHTON																					
CANTON CENTER																					
CANTON JCT	S	08:54	30							S	09:25	30									
JUNCTION INT.		08:54									09:25									09:50	
ROUTE 128	S	08:59	45							S	09:27	45							S	09:54	45
ENDICOTT				S	08:54	30										S	09:44	30			
READVILLE				S	09:00	30										S	09:47	30			
READ		09:03									09:31						09:48			09:57	
FAIRMOUNT				S	09:03	30															
MORTON ST.				D	09:07	30															
UPHAMS CORNER				D	09:13	30															
HYDE PARK	S	09:04	30																		
ROSLINDALE VILLAGE																					
FOREST HILLS																					
PLAINS		09:09									09:35						09:55			10:01	
RUG	S	09:14	30							S	09:41	30				S	09:59	30			
BACK BAY	D	09:18	30				S	09:29	30	S	09:44	30	S	09:54	30	S	10:03	30	S	10:07	30
COV		09:19						09:30			09:45			09:55			10:04			10:08	
TOWER 1		09:22			09:21						09:48						10:07			10:11	
SOUTH STATION	D	09:23	300	D	09:25	300	D	09:35	300	D	09:49	300	D	10:00	300	D	10:08	300	D	10:12	300

Prev Trn:	716			758			760			614			713Q			520			TD26		
Train:	809			615			763			915			713			517			FR15		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	13:59	300	S	14:00	300	S	14:25	300	S	14:25	300	S	14:40	300	S	14:45	300	S	14:53	300
TOWER 1		14:00			14:01			14:26			14:26			14:41						14:54	
BROADWAY-CABOT								14:27													
COV		14:01			14:02						14:27			14:42			14:49			14:57	
BACK BAY	S	14:04	30	S	14:05	30				S	14:30	30	S	14:45	30	S	14:51	30	S	14:59	30
RUG	S	14:07	30	S	14:08	30				S	14:33	30	S	14:48	30						
PLAINS		14:09			14:12						14:36			14:50						15:01	
FOREST HILLS				S	14:14	30															
ROSLINDALE VILLAGE				D	14:18	30															
HYDE PARK	S	14:14	30							S	14:43	30									
UPHAMS CORNER							D	14:35	30												
MORTON ST.							D	14:41	30												
FAIRMOUNT							D	14:45	30												
READ		14:15									14:44			14:56						15:06	
READVILLE							D	14:49	30				S	14:58	30						
ENDICOTT													D	15:01	30						
ROUTE 128	S	14:20	45							S	14:49	45							S	15:12	45
JUNCTION INT.		14:22									14:52									15:13	
CANTON JCT	S	14:25	30							S	14:55	30									
CANTON CENTER										S	14:57	30									
STOUGHTON										D	15:04	30									
SHARON	S	14:31	45																		
MANSFIELD	S	14:39	45																S	15:27	45
BARROWSVILLE																			S	15:40	30
DOWNTOWN TAUNTON																			S	15:55	30
TAUNTON DEPOT																			S	16:02	30
CP B40																				16:11	
FREETOWN																			S	16:20	30
FALL RIVER																			S	16:26	30
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN		14:42																			
ATT	S	14:47	45																		
SOUTH ATTLEBORO	S	14:57	30																		
ORM		15:04																			
PROVIDENCE	D	15:06	30																		

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 9 of 20

Train:	610			910			754			814			FR20			912			756		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE										S	09:49	30									
ORM											09:50										
SOUTH ATTLEBORO										S	09:58	30									
HEBRONVILLE											10:01										
ATT										S	10:08	45									
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER													S	09:44	30						
FREETOWN													S	09:51	30						
CP B40														09:55							
TAUNTON DEPOT													S	10:04	30						
DOWNTOWN TAUNTON													S	10:11	30						
BARROWSVILLE													S	10:26	30						
MANSFIELD										S	10:16	45	S	10:39	45						
SHARON										S	10:25	45									
STOUGHTON				S	09:40	30										S	10:40	30			
CANTON CENTER				S	09:49	30										S	10:49	30			
CANTON JCT				S	09:52	30				S	10:32	30				S	10:52	30			
JUNCTION INT.					09:53						10:32			10:50			10:53				
ROUTE 128				S	09:57	45				S	10:37	45	S	10:54	45	S	10:57	45			
ENDICOTT																					
READVILLE							S	09:55	30										S	11:03	30
READ					10:01						10:41			10:57			11:01				
FAIRMOUNT							D	09:58	30										D	11:06	30
MORTON ST.							D	10:02	30										D	11:10	30
UPHAMS CORNER							D	10:08	30										D	11:16	30
HYDE PARK				S	10:02	30				S	10:42	30				S	11:02	30			
ROSLINDALE VILLAGE	S	09:59	30																		
FOREST HILLS	S	10:02	30																		
PLAINS		10:03			10:07						10:47			11:01			11:07				
RUG	S	10:07	30							S	10:52	30				S	11:12	30			
BACK BAY	S	10:11	30	S	10:12	30				S	10:56	30	S	11:07	30	S	11:15	30			
COV		10:12			10:14						10:57			11:08			11:16				
TOWER 1		10:15			10:15			10:15			11:00			11:11			11:19			11:23	
SOUTH STATION	D	10:16	300	D	10:17	300	D	10:19	300	D	11:01	300	D	11:12	300	D	11:20	300	D	11:27	300

Prev Trn:	818			762			84			FR28			764			718			914		
Train:	617			765			975			NB17			767			811			977		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	15:00	300	S	15:20	300	S	15:30	300	S	15:42	300	S	15:44	300	S	15:45	300	S	15:50	300
TOWER 1		15:01			15:21			15:31			15:43			15:45			15:46			15:51	
BROADWAY-CABOT					15:22									15:46							
COV		15:02						15:32			15:46						15:49			15:52	
BACK BAY	S	15:05	30				S	15:35	30	S	15:48	60				S	15:50	30	S	15:55	30
RUG	S	15:08	30				S	15:38	30							S	15:53	30	S	15:58	30
PLAINS		15:12						15:41			15:50						15:56			16:02	
FOREST HILLS	S	15:13	30																		
ROSLINDALE VILLAGE	D	15:16	30																		
HYDE PARK							S	15:46	30										S	16:06	30
UPHAMS CORNER				D	15:30	30							S	15:54	30						
MORTON ST.				D	15:36	30								16:00	30						
FAIRMOUNT				D	15:40	30								16:04	30						
READ								15:48			15:55						16:01			16:08	
READVILLE				D	15:44	30							D	16:08	30						
ENDICOTT																					
ROUTE 128							S	15:52	45	S	16:01	120							S	16:12	45
JUNCTION INT.								15:55			16:02						16:05			16:13	
CANTON JCT							S	15:58	30										S	16:19	30
CANTON CENTER							D	16:01	30												
STOUGHTON																					
SHARON																S	16:12	45			
MANSFIELD										S	16:16	120				S	16:21	45			
BARROWSVILLE										S	16:31	60									
DOWNTOWN TAUNTON										S	16:46	60									
TAUNTON DEPOT										S	16:53	60									
CP B40											17:02										
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY										S	17:11	60									
WHALES TOOTH										D	17:16	60									
HOLDEN																	16:29				
ATT																S	16:31	45			
SOUTH ATTLEBORO																S	16:37	30			
ORM																	16:45				
PROVIDENCE																D	16:46	30			

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 10 of 20

Train:	612			714			518			758			816			716			NB28		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	11:45	30						
ORM														11:46							
SOUTH ATTLEBORO													S	11:55	30						
HEBRONVILLE														11:58							
ATT													S	12:05	45						
WHALES TOOTH																			S	11:41	30
KINGS HIGHWAY																			S	11:46	30
FALL RIVER																					
FREETOWN																					
CP B40																				11:55	
TAUNTON DEPOT																			S	12:04	30
DOWNTOWN TAUNTON																			S	12:11	30
BARROWSVILLE																			S	12:26	30
MANSFIELD													S	12:13	45				S	12:39	45
SHARON													S	12:21	45						
STOUGHTON																					
CANTON CENTER																					
CANTON JCT													S	12:28	30						
JUNCTION INT.														12:28						12:50	
ROUTE 128													S	12:33	45				S	12:54	45
ENDICOTT				S	11:26	30										S	12:46	30			
READVILLE				S	11:29	30				S	12:11	30				S	12:49	30			
READ					11:30									12:37			12:50			12:57	
FAIRMOUNT										D	12:14	30									
MORTON ST.										D	12:18	30									
UPHAMS CORNER										D	12:24	30									
HYDE PARK													S	12:38	30						
ROSLINDALE VILLAGE	S	11:17	30																		
FOREST HILLS	S	11:20	30																		
PLAINS		11:21			11:37									12:43			12:56			13:01	
RUG	S	11:24	30	S	11:39	30							S	12:48	30	S	12:57	30			
BACK BAY	S	11:28	30	S	11:43	30	S	11:59	30				S	12:53	30	S	13:01	30	S	13:07	30
COV		11:29			11:45			12:00						12:54			13:02			13:08	
TOWER 1		11:32			11:47						12:31			12:57			13:04			13:11	
SOUTH STATION	D	11:33	300	D	11:48	300	D	12:05	300	D	12:35	300	D	12:58	300	D	13:06	300	D	13:12	300

Prev Trn:	616			917Q			522			715Q			916			FR19Q			699NBQ		
Train:	619			917			519			715			979			FR19			699NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:00	300	S	16:01	300	S	16:05	300	S	16:10	300	S	16:17	300	S	16:21	300	S	16:23	300
TOWER 1		16:01			16:02						16:11			16:18			16:22			16:24	
BROADWAY-CABOT																					
COV		16:04			16:05			16:09			16:14			16:21			16:24			16:27	
BACK BAY	S	16:05	60	S	16:06	60	S	16:11	60	S	16:15	60	S	16:22	60	S	16:25	60	S	16:28	60
RUG	S	16:08	60	S	16:09	60				S	16:19	60	S	16:26	60				S	16:32	60
PLAINS		16:12			16:12						16:21			16:28			16:27			16:36	
FOREST HILLS	S	16:13	60																S	16:37	60
ROSLINDALE VILLAGE	D	16:16	60																D	16:40	60
HYDE PARK				S	16:17	60							S	16:32	60						
UPHAMS CORNER																					
MORTON ST.																					
FAIRMOUNT																					
READ					16:19						16:27			16:35			16:32				
READVILLE										S	16:29	60									
ENDICOTT										D	16:32	60									
ROUTE 128				S	16:23	120							S	16:40	120	S	16:38	120			
JUNCTION INT.					16:24									16:41			16:39				
CANTON JCT				S	16:29	60							S	16:47	60						
CANTON CENTER				S	16:32	60															
STOUGHTON				D	16:41	60															
SHARON																					
MANSFIELD																S	16:53	120			
BARROWSVILLE																S	17:06	60			
DOWNTOWN TAUNTON																S	17:21	60			
TAUNTON DEPOT																S	17:28	60			
CP B40																	17:37				
FREETOWN																S	17:46	60			
FALL RIVER																S	17:52	60			
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 11 of 20

Train:	520			614			760			TD26			762			818			914		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																S	13:31	30			
ORM																	13:32				
SOUTH ATTLEBORO																S	13:43	30			
HEBRONVILLE																	13:46				
ATT																S	13:52	45			
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT										S	13:04	30									
DOWNTOWN TAUNTON										S	13:11	30									
BARROWSVILLE										S	13:26	30									
MANSFIELD										S	13:39	45				S	13:59	45			
SHARON																S	14:07	45			
STOUGHTON																			S	14:20	30
CANTON CENTER																			S	14:27	30
CANTON JCT																			S	14:30	30
JUNCTION INT.											13:50						14:10			14:32	
ROUTE 128										S	13:54	45				S	14:17	45			
ENDICOTT																					
READVILLE							S	13:19	30				S	14:06	30						
READ											13:57						14:21			14:36	
FAIRMOUNT							D	13:22	30				D	14:09	30						
MORTON ST.							D	13:26	30				D	14:13	30						
UPHAMS CORNER							D	13:32	30				D	14:19	30						
HYDE PARK																			S	14:39	30
ROSLINDALE VILLAGE				S	13:17	30															
FOREST HILLS				S	13:20	30															
PLAINS					13:21						14:01						14:25			14:44	
RUG				S	13:24	30										S	14:30	30			
BACK BAY	S	13:09	30	S	13:28	30				S	14:07	30				S	14:34	30	S	14:49	30
COV		13:10			13:29						14:08						14:35			14:50	
TOWER 1					13:32			13:39			14:11			14:26			14:37			14:53	
SOUTH STATION	D	13:15	300	D	13:33	300	D	13:43	300	D	14:12	300	D	14:30	300	D	14:39	300	D	14:54	300

Prev Trn:	699NBQ			524			739NBQ			799Q			NB21Q			813Q			621Q		
Train:	899NB			521			739NB			799			NB21			813			621		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:24	300	S	16:27	300	S	16:28	300	S	16:30	300	S	16:36	300	S	16:39	300	S	16:40	300
TOWER 1		16:25						16:29			16:31			16:37			16:40			16:41	
BROADWAY-CABOT											16:32										
COV		16:28			16:31			16:32						16:40			16:43			16:44	
BACK BAY	S	16:29	60	S	16:33	60	S	16:33	60				S	16:41	60	S	16:44	60	S	16:45	60
RUG	S	16:32	60				S	16:37	60							S	16:47	60	S	16:49	60
PLAINS		16:35						16:40						16:43			16:50			16:53	
FOREST HILLS																			S	16:54	60
ROSLINDALE VILLAGE																			D	16:57	60
HYDE PARK																					
UPHAMS CORNER										S	16:41	60									
MORTON ST.										S	16:48	60									
FAIRMOUNT										S	16:53	60									
READ		16:39						16:45						16:48			16:55				
READVILLE							D	16:47	60	D	16:57	60									
ENDICOTT							D	16:50	1	D	17:01	1									
ROUTE 128													S	16:54	120	S	16:58	120			
JUNCTION INT.		16:43												16:55			16:59				
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
SHARON	S	16:50	120													S	17:09	120			
MANSFIELD	S	16:59	120										S	17:09	120	S	17:18	120			
BARROWSVILLE													S	17:22	60						
DOWNTOWN TAUNTON													S	17:37	60						
TAUNTON DEPOT													S	17:44	60						
CP B40														17:53							
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY													S	18:02	60						
WHALES TOOTH													D	18:07	60						
HOLDEN		17:08															17:26				
ATT	S	17:10	120													S	17:28	120			
SOUTH ATTLEBORO	S	17:19	60													S	17:37	60			
ORM		17:27															17:45				
PROVIDENCE	D	17:28	60													D	17:46	60			

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 12 of 20

Train:	522			718			FR28			764			524			616			916		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
HEBRONVILLE																					
ATT																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER							S	13:44	30												
FREETOWN							S	13:51	30												
CP B40								13:55													
TAUNTON DEPOT							S	14:04	30												
DOWNTOWN TAUNTON							S	14:11	30												
BARROWSVILLE							S	14:26	30												
MANSFIELD							S	14:39	45												
SHARON																					
STOUGHTON																			S	15:14	30
CANTON CENTER																					
CANTON JCT																			S	15:24	30
JUNCTION INT.								14:50												15:25	
ROUTE 128							S	14:54	45										S	15:29	45
ENDICOTT				S	14:46	30															
READVILLE				S	14:49	30				S	15:02	30									
READ					14:50			14:57												15:33	
FAIRMOUNT										D	15:05	30									
MORTON ST.										D	15:09	30									
UPHAMS CORNER										D	15:15	30									
HYDE PARK																			S	15:35	30
ROSLINDALE VILLAGE																S	15:30	30			
FOREST HILLS																S	15:34	30			
PLAINS					14:56			15:01									15:35			15:40	
RUG																					
BACK BAY	S	14:57	30	S	15:00	30	S	15:07	30				S	15:29	30	S	15:40	30	S	15:44	30
COV		14:58			15:01			15:08						15:30			15:41			15:45	
TOWER 1					15:04			15:11			15:21						15:44			15:47	
SOUTH STATION	D	15:03	300	D	15:05	300	D	15:12	300	D	15:26	300	D	15:35	300	D	15:45	300	D	15:49	300

Prev Trn:	618			919Q			768			820			523Q			976			720		
Train:	737			919			769			815			523			999NB			719		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:45	300	S	16:50	300	S	16:55	300	S	16:57	300	S	17:00	300	S	17:03	300	S	17:10	300
TOWER 1		16:46			16:51			16:56			16:58						17:04			17:11	
BROADWAY-CABOT								16:57													
COV		16:49			16:54						17:01			17:04			17:07			17:14	
BACK BAY	S	16:50	60	S	16:55	60				S	17:02	60	S	17:06	60	S	17:08	60	S	17:15	60
RUG	S	16:54	60	S	16:59	60				S	17:06	60				S	17:12	60	S	17:19	60
PLAINS		16:57			17:02						17:09						17:15			17:22	
FOREST HILLS																					
ROSLINDALE VILLAGE																					
HYDE PARK	S	17:03	60																		
UPHAMS CORNER							S	17:06	60												
MORTON ST.							S	17:13	60												
FAIRMOUNT							S	17:16	60												
READ		17:06			17:06						17:13						17:19			17:27	
READVILLE	D	17:07	60				D	17:22	60												
ENDICOTT	D	17:11	60																D	17:33	1
ROUTE 128				S	17:10	120										S	17:23	120			
JUNCTION INT.					17:11						17:17						17:24				
CANTON JCT				S	17:17	60										S	17:30	60			
CANTON CENTER				S	17:20	60															
STOUGHTON				D	17:30	60															
SHARON										S	17:24	120									
MANSFIELD										S	17:33	120									
BARROWSVILLE																					
DOWNTOWN TAUNTON																					
TAUNTON DEPOT																					
CP B40																					
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN											17:45										
ATT										S	17:47	120									
SOUTH ATTLEBORO										S	17:54	60									
ORM											18:03										
PROVIDENCE										D	18:04	60									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 13 of 20

Train:	NB30			766			618			768			820			976			526		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	15:23	60						
ORM														15:24							
SOUTH ATTLEBORO													S	15:32	60						
HEBRONVILLE														15:35							
ATT													S	15:49	120						
WHALES TOOTH	S	14:41	30																		
KINGS HIGHWAY	S	14:46	30																		
FALL RIVER																					
FREETOWN																					
CP B40		14:55																			
TAUNTON DEPOT	S	15:04	30																		
DOWNTOWN TAUNTON	S	15:11	30																		
BARROWSVILLE	S	15:26	30																		
MANSFIELD	S	15:39	45										S	15:58	120						
SHARON													S	16:06	120						
STOUGHTON																					
CANTON CENTER																S	16:16	60			
CANTON JCT													S	16:13	60	S	16:19	60			
JUNCTION INT.		15:50												16:13			16:20				
ROUTE 128	S	15:54	45													S	16:26	120			
ENDICOTT																					
READVILLE				S	15:55	60															
READ		15:57												16:17			16:30				
FAIRMOUNT				D	15:58	60				D	16:11	60									
MORTON ST.				D	16:02	60				D	16:15	60									
UPHAMS CORNER				D	16:08	60				D	16:21	60									
HYDE PARK																S	16:33	60			
ROSLINDALE VILLAGE							S	16:14	60												
FOREST HILLS							D	16:16	60												
PLAINS		16:01						16:17						16:21			16:34				
RUG																					
BACK BAY	S	16:07	30				D	16:23	60				S	16:28	60	S	16:38	60	S	16:41	60
COV		16:08						16:24						16:29			16:39			16:42	
TOWER 1		16:11			16:13			16:26			16:26			16:32			16:42				
SOUTH STATION	D	16:12	300	D	16:19	300	D	16:27	300	D	16:32	300	D	16:33	300	D	16:43	300	D	16:47	300

Prev Trn:	526			771Q			FR23Q			921Q			978			FR32			527Q		
Train:	525			771			FR23			921			623			NB25			527		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:15	300	S	17:15	300	S	17:17	300	S	17:20	300	S	17:26	300	S	17:31	300	S	17:35	300
TOWER 1					17:16			17:18			17:21			17:27			17:32				
BROADWAY-CABOT					17:17																
COV		17:19						17:21			17:24			17:30			17:35			17:39	
BACK BAY	S	17:21	60				S	17:22	60	S	17:25	60	S	17:31	60	S	17:36	60	S	17:41	60
RUG										S	17:29	60	S	17:35	60						
PLAINS								17:25			17:32			17:39			17:38				
FOREST HILLS													S	17:40	60						
ROSLINDALE VILLAGE													D	17:43	60						
HYDE PARK										S	17:39	60									
UPHAMS CORNER				S	17:26	60															
MORTON ST.				S	17:33	60															
FAIRMOUNT				S	17:38	60															
READ								17:30			17:41						17:43				
READVILLE				D	17:42	60															
ENDICOTT																					
ROUTE 128							S	17:36	120	S	17:45	120				S	17:49	120			
JUNCTION INT.								17:37			17:46						17:50				
CANTON JCT										S	17:53	60									
CANTON CENTER										S	17:57	60									
STOUGHTON										D	18:06	60									
SHARON																					
MANSFIELD							S	17:51	120							S	18:04	120			
BARROWSVILLE							S	18:04	60							S	18:17	60			
DOWNTOWN TAUNTON							S	18:19	60							S	18:32	60			
TAUNTON DEPOT							S	18:26	60							S	18:39	60			
CP B40								18:35									18:48				
FREETOWN							S	18:44	60												
FALL RIVER							S	18:50	60												
KINGS HIGHWAY																S	18:57	60			
WHALES TOOTH																D	19:02	60			
HOLDEN																					
ATT																					
SOUTH ATTLEBORO																					
ORM																					
PROVIDENCE																					

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 14 of 20

Train:	720			FR32			978			980			918			620			770		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
HEBRONVILLE																					
ATT																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER				S	15:38	30															
FREETOWN				S	15:45	30															
CP B40					15:49																
TAUNTON DEPOT				S	15:58	30															
DOWNTOWN TAUNTON				S	16:05	30															
BARROWSVILLE				S	16:20	30															
MANSFIELD				S	16:34	45															
SHARON																					
STOUGHTON													S	17:00	60						
CANTON CENTER													S	17:07	60						
CANTON JCT							S	16:49	60	S	17:02	60	S	17:10	60						
JUNCTION INT.					16:45			16:50			17:03			17:11							
ROUTE 128				S	16:49	45	S	16:55	120	S	17:07	120	S	17:16	120						
ENDICOTT	S	16:34	60																		
READVILLE	S	16:37	60																S	17:35	60
READ		16:38			16:52			16:59			17:11			17:20							
FAIRMOUNT																			D	17:38	60
MORTON ST.																			D	17:42	60
UPHAMS CORNER																			D	17:48	60
HYDE PARK																					
ROSLINDALE VILLAGE																S	17:31	60			
FOREST HILLS																D	17:34	60			
PLAINS		16:44			16:56			17:03			17:15			17:24			17:35				
RUG																					
BACK BAY	S	16:48	60	S	17:02	30	S	17:08	60	S	17:20	60	S	17:27	60	D	17:40	60			
COV		16:49			17:03			17:09			17:21			17:28			17:41				
TOWER 1		16:52			17:06			17:12			17:24			17:31			17:44			17:54	
SOUTH STATION	D	16:53	300	D	17:07	300	D	17:13	300	D	17:25	300	D	17:32	300	D	17:45	300	D	17:59	300

Prev Trn:	817Q			783NBQ			721Q			980			918			FR27Q			620		
Train:	817			783NB			721			923			625			FR27			599NB		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:40	300	S	17:40	300	S	17:44	300	S	17:45	300	S	17:55	300	S	17:58	300	S	18:03	300
TOWER 1		17:41			17:41			17:45			17:46			17:56			17:59				
BROADWAY-CABOT					17:42																
COV		17:44						17:48			17:49			17:59			18:02			18:07	
BACK BAY	S	17:45	60				S	17:49	60	S	17:51	60	S	18:00	60	S	18:03	60	S	18:09	60
RUG	S	17:49	60				S	17:53	60	S	17:56	60	S	18:04	60						
PLAINS		17:52						17:56			17:58			18:08			18:05				
FOREST HILLS													S	18:09	60						
ROSLINDALE VILLAGE													D	18:12	60						
HYDE PARK							S	18:03	60												
UPHAMS CORNER				S	17:51	60															
MORTON ST.				S	17:58	60															
FAIRMOUNT				S	18:03	60															
READ		17:56						18:05			18:02						18:10				
READVILLE				D	18:07	60	S	18:06	60												
ENDICOTT							D	18:10	60												
ROUTE 128										S	18:08	120				S	18:16	120			
JUNCTION INT.		18:00									18:09						18:17				
CANTON JCT										S	18:14	60									
CANTON CENTER										S	18:17	60									
STOUGHTON										D	18:26	60									
SHARON	S	18:07	120																		
MANSFIELD	S	18:18	120													S	18:31	120			
BARROWSVILLE																S	18:44	60			
DOWNTOWN TAUNTON																S	18:59	60			
TAUNTON DEPOT																S	19:06	60			
CP B40																	19:15				
FREETOWN																S	19:24	60			
FALL RIVER																S	19:30	60			
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN		18:24																			
ATT	S	18:26	120																		
SOUTH ATTLEBORO	S	18:33	60																		
ORM		18:41																			
PROVIDENCE	D	18:42	60																		

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 15 of 20

Train:	NB34			794			920			772			622			528			822		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																			S	17:25	60
ORM																				17:26	
SOUTH ATTLEBORO																			S	17:35	60
HEBRONVILLE																				17:38	
ATT																			S	17:50	120
WHALES TOOTH	S	16:35	30																		
KINGS HIGHWAY	S	16:40	30																		
FALL RIVER																					
FREETOWN																					
CP B40		16:49																			
TAUNTON DEPOT	S	16:58	30																		
DOWNTOWN TAUNTON	S	17:05	30																		
BARROWSVILLE	S	17:20	30																		
MANSFIELD	S	17:33	45																S	17:58	120
SHARON																			S	18:06	120
STOUGHTON							S	17:40	60												
CANTON CENTER																					
CANTON JCT							S	17:50	60										S	18:13	60
JUNCTION INT.		17:44						17:51												18:13	
ROUTE 128	S	17:48	45																S	18:17	120
ENDICOTT				D	17:41	1															
READVILLE										S	17:55	60									
READ		17:51						17:55												18:21	
FAIRMOUNT										D	17:58	60									
MORTON ST.										D	18:02	60									
UPHAMS CORNER										D	18:08	60									
HYDE PARK																			S	18:22	60
ROSLINDALE VILLAGE																					
FOREST HILLS													S	18:09	60						
PLAINS		17:55						17:59						18:10						18:27	
RUG																					
BACK BAY	S	18:01	30				S	18:05	60				S	18:16	60	S	18:24	60	S	18:33	60
COV		18:02						18:06						18:17			18:25			18:34	
TOWER 1		18:05			18:02			18:09			18:14			18:20						18:37	
SOUTH STATION	D	18:06	300	D	18:08	300	D	18:10	300	D	18:19	300	D	18:21	300	D	18:30	300	D	18:38	300

Prev Trn:	723Q			773Q			529Q			819Q			794			NB34			531Q		
Train:	723			773			529			819			627			NB29			531		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:06	300	S	18:09	300	S	18:15	300	S	18:20	300	S	18:23	300	S	18:27	300	S	18:30	300
TOWER 1		18:07			18:10						18:21			18:24			18:28				
BROADWAY-CABOT					18:11																
COV		18:10						18:19			18:24			18:27			18:31			18:34	
BACK BAY	S	18:11	60				S	18:21	60	S	18:25	60	S	18:28	60	S	18:33	60	S	18:36	60
RUG	S	18:15	60							S	18:29	60	S	18:32	60						
PLAINS		18:18									18:32			18:36			18:35				
FOREST HILLS													S	18:37	60						
ROSLINDALE VILLAGE													D	18:40	60						
HYDE PARK																					
UPHAMS CORNER				S	18:20	60															
MORTON ST.				S	18:27	60															
FAIRMOUNT				S	18:32	60															
READ		18:22									18:36						18:40				
READVILLE	S	18:23	60	D	18:36	60															
ENDICOTT	D	18:27	60																		
ROUTE 128										S	18:39	120				S	18:46	120			
JUNCTION INT.											18:40						18:47				
CANTON JCT																					
CANTON CENTER																					
STOUGHTON																					
SHARON										S	18:47	120									
MANSFIELD										S	18:56	120				S	19:01	120			
BARROWSVILLE																S	19:14	60			
DOWNTOWN TAUNTON																S	19:29	60			
TAUNTON DEPOT																S	19:36	60			
CP B40																	19:45				
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY																S	19:54	60			
WHALES TOOTH																D	19:59	60			
HOLDEN											19:04										
ATT										S	19:06	120									
SOUTH ATTLEBORO										S	19:13	60									
ORM											19:20										
PROVIDENCE										D	19:21	60									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 16 of 20

Train:	796			824			530			774			922			776			532		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	18:00	30															
ORM					18:01																
SOUTH ATTLEBORO				S	18:10	30															
HEBRONVILLE					18:13																
ATT				S	18:18	45															
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DOWNTOWN TAUNTON																					
BARROWSVILLE																					
MANSFIELD				S	18:26	45															
SHARON				S	18:34	45															
STOUGHTON													S	18:52	30						
CANTON CENTER													S	18:59	30						
CANTON JCT													S	19:02	30						
JUNCTION INT.					18:37									19:03							
ROUTE 128				S	18:47	45							S	19:07	45						
ENDICOTT	S	18:14	30																		
READVILLE										S	18:46	30				S	19:07	30			
READ					18:51									19:11							
FAIRMOUNT										D	18:49	30				D	19:10	30			
MORTON ST.										D	18:53	30				D	19:14	30			
UPHAMS CORNER										D	18:59	30				D	19:20	30			
HYDE PARK													S	19:12	30						
ROSLINDALE VILLAGE																					
FOREST HILLS																					
PLAINS					18:55									19:17							
RUG																					
BACK BAY				S	18:59	30	S	19:03	30				S	19:22	30				S	19:26	30
COV					19:00			19:04						19:23						19:27	
TOWER 1		18:34			19:02						19:05			19:26			19:26				
SOUTH STATION	D	18:40	300	D	19:03	300	D	19:09	300	D	19:10	300	D	19:27	300	D	19:31	300	D	19:32	300

Prev Trn:	770			920			FR31Q			622			822			528			530		
Train:	775			925			FR31			821			629			533			725		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:30	300	S	18:30	300	S	18:40	300	S	18:50	300	S	19:10	300	S	19:15	300	S	19:35	300
TOWER 1		18:31			18:31			18:41			18:51			19:11						19:36	
BROADWAY-CABOT		18:32																			
COV					18:34			18:44			18:54			19:14			19:19			19:37	
BACK BAY				S	18:35	60	S	18:46	60	S	18:55	30	S	19:15	30	S	19:21	30	S	19:40	30
RUG				S	18:36	60				S	18:58	30	S	19:19	30				S	19:43	30
PLAINS					18:41			18:48			19:01			19:22						19:46	
FOREST HILLS													S	19:23	30						
ROSLINDALE VILLAGE													D	19:27	30						
HYDE PARK				S	18:46	60				S	19:08	30									
UPHAMS CORNER	S	18:41	60																		
MORTON ST.	S	18:48	60																		
FAIRMOUNT	S	18:53	60																		
READ					18:50			18:53			19:10									19:51	
READVILLE	D	18:57	60																S	19:53	30
ENDICOTT																			D	19:56	30
ROUTE 128							S	18:59	120	S	19:13	45									
JUNCTION INT.					18:54			19:00			19:14										
CANTON JCT				S	18:57	60				S	19:18	30									
CANTON CENTER				S	19:00	60															
STOUGHTON				D	19:09	60															
SHARON										S	19:24	45									
MANSFIELD							S	19:14	120	S	19:33	45									
BARROWSVILLE							S	19:27	60												
DOWNTOWN TAUNTON							S	19:42	60												
TAUNTON DEPOT							S	19:49	60												
CP B40								19:58													
FREETOWN							S	20:07	60												
FALL RIVER							S	20:13	60												
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN											19:45										
ATT										S	19:47	45									
SOUTH ATTLEBORO										S	19:54	30									
ORM											20:02										
PROVIDENCE										D	20:03	30									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 17 of 20

Train:	924			626			926			534			628			778			798		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE																					
ORM																					
SOUTH ATTLEBORO																					
HEBRONVILLE																					
ATT																					
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER																					
FREETOWN																					
CP B40																					
TAUNTON DEPOT																					
DOWNTOWN TAUNTON																					
BARROWSVILLE																					
MANSFIELD																					
SHARON																					
STOUGHTON	S	19:19	30				S	19:35	30												
CANTON CENTER																					
CANTON JCT							S	19:45	30												
JUNCTION INT.		19:29						19:47													
ROUTE 128	S	19:33	45																		
ENDICOTT																			D	20:19	1
READVILLE																S	20:15	30	S	20:22	30
READ		19:37						19:51													
FAIRMOUNT																D	20:18	30			
MORTON ST.																D	20:22	30			
UPHAMS CORNER																D	20:28	30			
HYDE PARK							S	19:54	30												
ROSLINDALE VILLAGE				S	19:42	30															
FOREST HILLS				S	19:45	30							S	20:23	30						
PLAINS		19:41			19:46			19:59						20:24							
RUG				S	19:49	30							S	20:27	30						
BACK BAY	S	19:44	30	S	19:53	30	S	20:04	30	S	20:28	30	S	20:31	30						
COV		19:45			19:54			20:05			20:29			20:32							
TOWER 1		19:48			19:56			20:08						20:35			20:34			20:39	
SOUTH STATION	D	19:49	300	D	19:58	300	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300

Prev Trn:	774			922			NB33Q			924			626			532			824		
Train:	777			927			NB33			631			823			535			727		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	19:41	300	S	19:43	300	S	19:53	300	S	20:10	300	S	20:15	300	S	20:20	300	S	20:48	300
TOWER 1		19:42			19:44			19:54			20:11			20:16						20:49	
BROADWAY-CABOT		19:43																			
COV					19:45			19:57			20:12			20:17			20:24			20:50	
BACK BAY				S	19:48	30	S	19:59	30	S	20:15	30	S	20:20	30	S	20:26	30	S	20:53	30
RUG				S	19:51	30				S	20:18	30	S	20:23	30				S	20:56	30
PLAINS					19:54			20:01			20:22			20:27						20:58	
FOREST HILLS										S	20:23	30									
ROSLINDALE VILLAGE										D	20:26	30									
HYDE PARK				S	20:01	30							S	20:33	30						
UPHAMS CORNER	D	19:51	30																		
MORTON ST.	D	19:57	30																		
FAIRMOUNT	D	20:01	30																		
READ					20:03			20:06						20:35						21:03	
READVILLE	D	20:05	30																S	21:06	30
ENDICOTT																			D	21:10	30
ROUTE 128				S	20:06	45	S	20:12	45				S	20:38	45						
JUNCTION INT.					20:09			20:13						20:40							
CANTON JCT				S	20:12	30							S	20:43	30						
CANTON CENTER				S	20:17	30															
STOUGHTON				D	20:24	30															
SHARON													S	20:49	45						
MANSFIELD							S	20:27	45				S	20:57	45						
BARROWSVILLE							S	20:40	30												
DOWNTOWN TAUNTON							S	20:55	30												
TAUNTON DEPOT							S	21:02	30												
CP B40								21:11													
FREETOWN																					
FALL RIVER																					
KINGS HIGHWAY							S	21:20	30												
WHALES TOOTH							D	21:25	30												
HOLDEN														21:03							
ATT													S	21:05	45						
SOUTH ATTLEBORO													S	21:12	30						
ORM														21:19							
PROVIDENCE													D	21:21	30						

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 18 of 20

Train:	536			826			FR36			928			630			726			780		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE				S	20:11	30															
ORM					20:12																
SOUTH ATTLEBORO				S	20:22	30															
HEBRONVILLE					20:25																
ATT				S	20:30	45															
WHALES TOOTH																					
KINGS HIGHWAY																					
FALL RIVER							S	19:44	30												
FREETOWN							S	19:51	30												
CP B40								19:55													
TAUNTON DEPOT							S	20:04	30												
DOWNTOWN TAUNTON							S	20:11	30												
BARROWSVILLE							S	20:26	30												
MANSFIELD				S	20:37	45	S	20:43	45												
SHARON				S	20:44	45															
STOUGHTON										S	20:50	30									
CANTON CENTER																					
CANTON JCT				S	20:51	30				S	21:00	30									
JUNCTION INT.					20:51			20:54			21:01										
ROUTE 128				S	20:56	45	S	20:58	45	S	21:05	45									
ENDICOTT																S	21:27	30			
READVILLE																			S	21:23	30
READ					21:00			21:01			21:09						21:30				
FAIRMOUNT																			D	21:26	30
MORTON ST.																			D	21:30	30
UPHAMS CORNER																			D	21:36	30
HYDE PARK				S	21:01	30				S	21:10	30									
ROSLINDALE VILLAGE													S	21:22	30						
FOREST HILLS													S	21:25	30						
PLAINS					21:06			21:05			21:15			21:26			21:36				
RUG													S	21:29	30						
BACK BAY	S	20:56	30	S	21:09	30	S	21:11	30	S	21:18	30	S	21:33	30	S	21:40	30			
COV		20:57			21:10			21:12			21:19			21:34			21:41				
TOWER 1					21:13			21:15			21:22			21:37			21:44			21:42	
SOUTH STATION	D	21:02	300	D	21:14	300	D	21:16	300	D	21:23	300	D	21:38	300	D	21:45	300	D	21:47	300

Prev Trn:	776			FR35Q			926			798			628			FR36			772		
Train:	779			FR35			929			825			633			NB37			781		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	20:49	300	S	20:53	300	S	20:55	300	S	21:05	300	S	21:15	300	S	21:53	300	S	21:57	300
TOWER 1		20:50			20:54			20:56			21:06			21:16			21:54			21:58	
BROADWAY-CABOT		20:51																		21:59	
COV					20:57			20:57			21:07			21:17			21:57				
BACK BAY				S	20:59	30	S	21:00	30	S	21:10	30	S	21:20	30	S	21:59	30			
RUG							S	21:03	30	S	21:13	30	S	21:23	30						
PLAINS					21:01			21:06			21:17			21:27			22:01				
FOREST HILLS													S	21:28	30						
ROSLINDALE VILLAGE													D	21:31	30						
HYDE PARK							S	21:13	30	S	21:23	30									
UPHAMS CORNER	D	20:59	30																D	22:07	30
MORTON ST.	D	21:05	30																D	22:13	30
FAIRMOUNT	D	21:09	30																D	22:17	30
READ					21:06			21:15			21:25						22:06				
READVILLE	D	21:13	30																D	22:21	30
ENDICOTT																					
ROUTE 128				S	21:12	45	S	21:18	45	S	21:28	45				S	22:12	45			
JUNCTION INT.					21:13			21:21			21:30						22:13				
CANTON JCT							S	21:24	30	S	21:33	30									
CANTON CENTER							S	21:27	30												
STOUGHTON							D	21:35	30												
SHARON										S	21:39	45									
MANSFIELD				S	21:27	45				S	21:47	45				S	22:27	45			
BARROWSVILLE				S	21:40	30										S	22:40	30			
DOWNTOWN TAUNTON				S	21:55	30										S	22:55	30			
TAUNTON DEPOT				S	22:02	30										S	23:02	30			
CP B40					22:11												23:11				
FREETOWN				S	22:20	30															
FALL RIVER				S	22:26	30															
KINGS HIGHWAY																S	23:20	30			
WHALES TOOTH																D	23:25	30			
HOLDEN											21:53										
ATT										S	21:55	45									
SOUTH ATTLEBORO										S	22:02	30									
ORM											22:09										
PROVIDENCE										D	22:11	30									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 19 of 20

Train:	NB38			930			632			782			828			728			FR40		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE													S	21:42	30						
ORM														21:43							
SOUTH ATTLEBORO													S	21:52	30						
HEBRONVILLE														21:55							
ATT													S	22:08	45						
WHALES TOOTH	S	20:31	30																		
KINGS HIGHWAY	S	20:36	30																		
FALL RIVER																			S	21:48	30
FREETOWN																			S	21:55	30
CP B40		20:45																		21:59	
TAUNTON DEPOT	S	20:54	30																S	22:08	30
DOWNTOWN TAUNTON	S	21:01	30																S	22:15	30
BARROWSVILLE	S	21:16	30																S	22:30	30
MANSFIELD	S	21:33	45										S	22:17	45				S	22:43	45
SHARON													S	22:24	45						
STOUGHTON				S	21:50	30															
CANTON CENTER																					
CANTON JCT				S	22:00	30															
JUNCTION INT.		21:44			22:02									22:27						22:54	
ROUTE 128	S	21:48	45										S	22:35	45				S	22:58	45
ENDICOTT																D	22:47	1			
READVILLE										S	22:31	30									
READ		21:51			22:06									22:39			22:50			23:01	
FAIRMOUNT										D	22:34	30									
MORTON ST.										D	22:38	30									
UPHAMS CORNER										D	22:44	30									
HYDE PARK													S	22:40	30						
ROSLINDALE VILLAGE							S	22:32	30												
FOREST HILLS							S	22:35	30												
PLAINS		21:55			22:10			22:36						22:45			22:57			23:05	
RUG							S	22:39	30												
BACK BAY	S	22:01	30	S	22:17	30	S	22:43	30				S	22:50	30	S	23:01	30	S	23:11	30
COV		22:02			22:18			22:44						22:51			23:02			23:12	
TOWER 1		22:05			22:21			22:46			22:50			22:54			23:05			23:15	
SOUTH STATION	D	22:06	300	D	22:22	300	D	22:47	300	D	22:55	300	D	22:55	300	D	23:06	300	D	23:16	300

Prev Trn:	534			780			726			826			NB38			930			536		
Train:	537			827			635			729			FR39			931			539		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:20	300	S	22:25	300	S	22:30	300	S	22:35	300	S	22:53	300	S	22:58	300	S	23:25	300
TOWER 1					22:26			22:31			22:36			22:54			22:59				
BROADWAY-CABOT																					
COV		22:24			22:27			22:32			22:37			22:57			23:00			23:29	
BACK BAY	S	22:26	30	S	22:30	30	S	22:35	30	S	22:40	30	S	22:59	30	S	23:03	30	S	23:31	30
RUG				S	22:33	30	S	22:38	30	S	22:43	30				S	23:06	30			
PLAINS					22:37			22:42			22:46			23:01			23:09				
FOREST HILLS							S	22:43	30												
ROSLINDALE VILLAGE							D	22:46	30												
HYDE PARK				S	22:43	30				S	22:52	30				S	23:15	30			
UPHAMS CORNER																					
MORTON ST.																					
FAIRMOUNT																					
READ					22:45						22:54			23:06			23:17				
READVILLE										S	22:55	30									
ENDICOTT										D	23:00	30									
ROUTE 128				S	22:48	45							S	23:12	45	S	23:20	45			
JUNCTION INT.					22:50									23:13			23:23				
CANTON JCT				S	22:53	30										S	23:26	30			
CANTON CENTER																S	23:29	30			
STOUGHTON																D	23:37	30			
SHARON				S	22:59	45															
MANSFIELD				S	23:07	45							S	23:27	45						
BARROWSVILLE													S	23:40	30						
DOWNTOWN TAUNTON													S	23:55	30						
TAUNTON DEPOT													S	00:02	30						
CP B40														00:11							
FREETOWN													S	00:20	30						
FALL RIVER													S	00:26	30						
KINGS HIGHWAY																					
WHALES TOOTH																					
HOLDEN					23:13																
ATT				S	23:15	45															
SOUTH ATTLEBORO				S	23:22	30															
ORM					23:29																
PROVIDENCE				D	23:32	30															

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
NEC and Dorchester Branch
Page 20 of 20

Train:	934			730			538			540		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE												
ORM												
SOUTH ATTLEBORO												
HEBRONVILLE												
ATT												
WHALES TOOTH												
KINGS HIGHWAY												
FALL RIVER												
FREETOWN												
CP B40												
TAUNTON DEPOT												
DOWNTOWN TAUNTON												
BARROWSVILLE												
MANSFIELD												
SHARON												
STOUGHTON	S	23:53	30									
CANTON CENTER												
CANTON JCT	D	00:03	30									
JUNCTION INT.		00:04										
ROUTE 128	D	00:08	45									
ENDICOTT				D	00:20	1						
READVILLE												
READ		00:12			00:23							
FAIRMOUNT												
MORTON ST.												
UPHAMS CORNER												
HYDE PARK												
ROSLINDALE VILLAGE												
FOREST HILLS												
PLAINS		00:16			00:31							
RUG												
BACK BAY	S	00:20	30	S	00:36	30	S	01:17	30	S	01:24	30
COV		00:21			00:37			01:18			01:25	
TOWER 1		00:24			00:40							
SOUTH STATION	D	00:25	300	D	00:41	300	D	01:23	300	D	01:30	300

Prev Trn:	632			828		
Train:	731			829		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	23:50	300	S	23:59	300
TOWER 1		23:51			00:00	
BROADWAY-CABOT						
COV		23:52			00:01	
BACK BAY	S	23:55	30	S	00:04	30
RUG	S	23:58	30	S	00:07	30
PLAINS		00:01			00:11	
FOREST HILLS						
ROSLINDALE VILLAGE						
HYDE PARK				S	00:16	30
UPHAMS CORNER						
MORTON ST.						
FAIRMOUNT						
READ		00:06			00:18	
READVILLE	S	00:08	30			
ENDICOTT	D	00:11	30			
ROUTE 128				S	00:21	45
JUNCTION INT.					00:23	
CANTON JCT				S	00:26	30
CANTON CENTER						
STOUGHTON						
SHARON				S	00:31	45
MANSFIELD				S	00:39	45
BARROWSVILLE						
DOWNTOWN TAUNTON						
TAUNTON DEPOT						
CP B40						
FREETOWN						
FALL RIVER						
KINGS HIGHWAY						
WHALES TOOTH						
HOLDEN					00:46	
ATT				S	00:48	45
SOUTH ATTLEBORO				S	00:56	30
ORM					01:03	
PROVIDENCE				D	01:06	30

10.4.10. 2030 Attleboro Alternative Operating Plan, Diesel Option — Old Colony Line

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 1 of 6

Train:	2			32			70			4			34			72			6		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH	S	05:20	30							S	06:00	30							S	06:58	60
BRIDGEWATER	S	05:30	30							S	06:10	30							S	07:08	60
CAMPELLO	S	05:37	30							S	06:18	30							S	07:16	60
BROCKTON	S	05:41	30							S	06:22	30							S	07:20	60
MONTELLO	S	05:44	30							S	06:25	30							S	07:23	60
HOLBROOK/RANDOLPH	S	05:49	30							S	06:30	30							S	07:28	60
SOUTH WEYMOUTH				S	06:01	30							S	06:49	60						
BRAINTREE	D	05:56	30										D	06:57	60						
GREENBUSH PUTIN							N	06:19								N	07:16				
QUINCY CENTER							D	06:22	30	D	06:42	30							D	07:39	60
JFK/UMASS	D	06:10	30	D	06:21	30	D	06:30	30							D	07:27	60	D	07:48	60
BROADWAY-CABOT		06:14			06:25			06:34			06:55			07:14			07:32			07:52	
TOWER 1		06:15			06:26			06:35			06:56			07:15			07:33			07:54	
SOUTH STATION	D	06:17	300	D	06:29	300	D	06:38	300	D	06:58	300	D	07:17	300	D	07:36	300	D	07:58	300

Prev Trn:	2			32			744			74			38			76			752		
Train:	3			71			33			5			61			73			35		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	06:35	300	S	06:54	300	S	07:11	300	S	08:24	300	S	08:56	300	S	09:25	300	S	09:37	300
TOWER 1		06:36			06:55			07:12			08:25			08:57			09:26			09:38	
BROADWAY-CABOT		06:38			06:56			07:13			08:26			08:58			09:27			09:39	
JFK/UMASS																					
QUINCY CENTER	D	06:49	30										S	09:09	30	S	09:38	30			
GREENBUSH PUTIN				N	07:10											N	09:41				
BRAINTREE	D	06:55	30				D	07:32	30	D	08:43	30	S	09:15	30					09:55	30
SOUTH WEYMOUTH							D	07:39	30				D	09:22	30				D	10:02	30
HOLBROOK/RANDOLPH	D	07:03	30							S	08:51	30									
MONTELLO	D	07:08	30							S	08:56	30									
BROCKTON	D	07:12	30							S	08:59	30									
CAMPELLO	S	07:20	30							S	09:03	30									
BRIDGEWATER	D	07:38	30							S	09:11	30									
MIDDLEBOROUGH	D	07:50	30							D	09:23	30									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 2 of 6

Train:	74			36			8			38			76			10			40		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Prev Trn:	40			78			754			80			42			14			82		
Train:	7			75			63			9			39			77			65		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 3 of 6

Train:	78			12			60			80			42			14			82		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30				D	11:51	30	D	12:32	30
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44	
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45	
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:46	300	D	12:07	300	D	12:48	300

Prev Trn:	62			16			44			64			81Q			43Q			766		
Train:	15			79			41			17			81			43			19		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 4 of 6

Train:	62			16			44			84			64			18			86		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	13:08	30										S	15:25	60			
BRIDGEWATER				S	13:18	30										S	15:35	60			
CAMPELLO				S	13:26	30										S	15:43	60			
BROCKTON				S	13:30	30										S	15:47	60			
MONTELLO				S	13:33	30										S	15:50	60			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	60			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	60			
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	60
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:26	300	D	16:24	300	D	16:46	300

Prev Trn:	18			45Q			86			48			47Q			87Q			23Q		
Train:	83			45			21			85			47			87			23		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 5 of 6

Train:	48			20			88			22			52			90			54		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	16:54	60				S	17:57	30									
BRIDGEWATER				S	17:04	60				D	18:10	30									
CAMPELLO				D	17:11	60				D	18:18	30									
BROCKTON				D	17:15	60				D	18:22	30									
MONTELLO				D	17:18	60				D	18:26	30									
HOLBROOK/RANDOLPH				D	17:23	60				S	18:32	30									
SOUTH WEYMOUTH	S	16:31	60										S	19:03	30				S	20:17	30
BRAINTREE	D	16:38	60	D	17:31	60							D	19:11	30				D	20:25	30
GREENBUSH PUTIN							N	18:05								N	19:46				
QUINCY CENTER							D	18:21	30							D	19:52	30			
JFK/UMASS																					
BROADWAY-CABOT		16:56			18:03			18:32			18:54			19:26			20:02			20:43	
TOWER 1		16:57			18:04			18:33			18:55			19:27			20:03			20:44	
SOUTH STATION	D	16:59	300	D	18:06	300	D	18:34	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300

Prev Trn:	49Q			20			88			22			52			90			54		
Train:	49			89			25			51			27			91			55		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26			21:31	
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27			21:32	
JFK/UMASS													S	20:13	30				S	21:36	30
QUINCY CENTER				S	18:48	30	S	19:03	30				S	20:21	30	S	20:38	30			
GREENBUSH PUTIN				N	18:51											N	20:41				
BRAINTREE	S	18:33	60							S	19:47	30							S	21:48	30
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30							D	21:55	30
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30						
MONTELLO							S	19:20	30				S	20:39	30						
BROCKTON							S	19:23	30				S	20:42	30						
CAMPELLO							S	19:27	30				S	20:46	30						
BRIDGEWATER							D	19:35	30				D	20:54	30						
MIDDLEBOROUGH							D	19:48	30				D	21:05	30						

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option
Old Colony Line
Page 6 of 6

Train:	92			56			28		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Prev Trn:	92			56			28		
Train:	93			29			57		
Station Code:	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			

Appendix 3.1-E

Modified Rapid Bus Alternative Technical Memorandum

Draft Technical Memorandum

Modified Rapid Bus Alternative

Prepared for

massDOT

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SOUTH COAST RAIL

May 2012

Table of Contents

1 Introduction and Background 1-1

2 DEIS/DEIR Rapid Bus Alternative 2-1

2.1 Infrastructure 2-1
2.2 Operations 2-3
2.3 Logistics/Construction Impacts 2-4
2.4 Ridership 2-4
2.5 Cost 2-5
2.6 Environmental Impacts 2-6

3 Modified Rapid Bus Alternative 3-1

3.1 Infrastructure 3-2
3.2 Operations 3-12
3.3 Logistics/Construction Impacts 3-15
3.4 Ridership 3-15
3.5 Costs 3-16
3.6 Environmental Impacts 3-17

4 Evaluation of the Modified Rapid Bus Alternative 4-1

4.1 Evaluation of Project Purpose 4-1
4.2 Evaluation of Practicability 4-6
4.3 Evaluation of Environmental Impacts 4-10

5 Conclusion 5-1

List of Tables

Table No.	Description	Page
Table 1	DEIS/DEIR Rapid Bus Alternative Travel Time	2-4
Table 2	DEIS/DEIR Daily Ridership Projection (2030)	2-5
Table 3	DEIS/DEIR Rapid Bus Alternative Costs	2-5
Table 4	Braintree Split to Boston Travel Times per Alternative	3-7
Table 5	I-93 Alternatives Capital Costs	3-9
Table 6	Modified Rapid Bus Alternative Operations	3-12
Table 7	Modified Rapid Bus Alternative Travel Time and Frequency	3-13
Table 8	Modified Rapid Bus Alternative Feeder Bus Plan	3-14
Table 9	Modified Rapid Bus Alternative Ridership	3-16
Table 10	Modified Rapid Bus Alternative Costs	3-16
Table 11	Ridership Comparison	4-2
Table 12	Travel Time Comparison (2030)*	4-3
Table 13	Reduction in VMT Comparison	4-4
Table 14	Interregional Links Comparison	4-5
Table 15	Cost per Rider Comparison	4-7
Table 16	On-Time Performance Comparison	4-8
Table 17	Air Quality Beneficial Effects Comparison	11
Table 18	Wetland Loss Comparison	4-12
Table 19	Priority Habitat Loss Comparison	4-13

List of Figures

Figure No.	Description
1	DEIS/DEIR Rapid Bus Alternative Route and Stations
2	DEIS/DEIR Rapid Bus Routes
3	Route 24 Cross-Section
4	Configuration and Operation of Alternative 1, "Commitment"
5	Savin Hill Cross-Section, Alterntive 1, "Commitment"
6	Configuration and Operation of Alternative 2, "Maintain Exit at Savin Hill"
7	Savin Hill Cross-Section, Alterntive 2, "Maintain Exit at Savin Hill"
8	Configuration and Operation of Alternative 3, "HOV Lanes in Both Direction"
9	Savin Hill Cross-Section, Alternative 3, "HOV Lanes in Both Direction"
10	Configuration and Operation of Alternative 4, "Minimalist"
11	Savin Hill Cross-Section, Alternative 4, The "Minimalist"
12	In Line Station Cross Section
13	Modified Rapid Bus Alternative
14	Modified Rapid Bus Service Plan
15	Types of Incidents that Cause Delay on a Highway

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1

Introduction and Background

In February 2011, the United States Army Corps of Engineers (USACE), in cooperation with the Massachusetts Department of Transportation (MassDOT) issued a Draft Environmental Impact Statement/Draft Environment Impact Report (DEIS/DEIR) for the South Coast Rail project. A number of alternative routes and alternative modes were presented in the DEIS/DEIR and in June 2011, the EOEEA issued a Certificate pursuant to Massachusetts Environmental Projection Act (MEPA) identifying the Stoughton Electric Alternative as the Preferred Alternative and the alternative that should be progressed through the Final Environmental Impact Report (FEIR). However, comments received on the DEIS/DEIR raised questions about the Rapid Bus Alternative that prompted the USACE to request additional analysis. The comments received on the DEIS/DEIR Rapid Bus Alternative were reviewed and can be summarized as follows:

- *Performance*: Travel speed of the DEIS/DEIR Rapid Bus Alternative was identified as too slow. The slow travel speed did not make the alternative competitive with rail. Further analysis of speed improvements was requested, including additional opportunities for the Rapid Bus Alternative to operate in its own designated lane or at higher speeds. Overall reductions in travel time would be the objective of these modifications.
- *Congestion*: It was noted that the Rapid Bus Alternative was subjected to congestion "hot spots," which would affect its projected travel time and reliability. It was suggested that the Rapid Bus Alternative include additional measures to address congestion.

- *Ridership*: Ridership on the Rapid Bus Alternative was noted as being lower than the Commuter Rail alternatives. The May 2010 memo from Central Transportation Planning Staff (CTPS) accompanying the projections indicated there were five major factors contributing to lower performance measures than the Commuter Rail alternatives including:
  - Run times are longer to South Station;
  - The Commuter Rail alternatives serve several more stations;
  - Lack of connectivity with the Orange Line;
  - Transfer times between the Rapid Bus Alternative and the rapid transit lines are a little longer than with the commuter lines;
  - Fewer new stations are being provided in areas of projected growth; and
  - Lack of intra-regional connectivity/no intermediate stations.

The goal of this memorandum is to address these comments. This memorandum reevaluated the DEIS/DEIR Rapid Bus Alternative and the opportunities available to improve its service and make it a more attractive alternative that more closely matches what the rail alternatives achieve. This new Modified Rapid Bus Alternative was then compared against the Preferred Alternative as outlined in the Secretary's Certificate. More specifically, the evaluation addressed the following questions on the Modified Rapid Bus Alternative:

- Does the alternative meet the project purpose?
- Is it practicable as defined in 40 C.F.R. 2310.10?
- Is it the least environmentally damaging?

2

DEIS/DEIR Rapid Bus Alternative

The following sections describe the Rapid Bus Alternative as it was developed and presented in the South Coast Rail project DEIS/DEIR focusing on the infrastructure, operating plan, construction, ridership, cost, and the environmental impacts.

2.1 Infrastructure

This section outlines the infrastructure proposed of the Rapid Bus Alternative in the DEIS/DEIR. It summarizes the improvements to the guideway, proposed stations, and the midday/overnight layover facility. Figure 1 shows the location of the guideway and stations of the DEIS/DEIR Rapid Bus Alternative.

2.1.1 Guideway

The DEIS/DEIR Rapid Bus Alternative alignment would use the existing Route 140 and Route 24 highway corridors from New Bedford and Fall River, a proposed dedicated bus lane along Route 24 from I-495 to I-93 and along I-93 to the existing Zipper Lane, which starts at the Braintree Split. The DEIS/DEIR Rapid Bus would travel along the Zipper Lane until its terminus in Savin Hill where it would merge into a section of mixed traffic on I-93 and enter again into an HOV lane that brings the buses into the South Station Bus Terminal. Figure 1 outlines this guideway.

This alignment would require:

- Route 24 mainline widening between Route 140 and I-495 to accommodate new general purpose lanes;
- Route 24 mainline widening between Route 139 and I-93 to accommodate a new median bus Zipper Lane;

- An I-93 barrier-separated, permanent, single reversible bus lane in the median of I-93/Route 24 from the Route 139 interchange to the Logan Express lot;
- Separate single-direction bus ramps within the I-93 interchange area ;
- A bus-only connection to the Logan Express lot via a flyover from I-93;
- A two-lane, two-way barrier separated bus lane on I-93 between the Logan Express Lot and the I-93 existing Zipper Lane; and
- Interchange modifications.

2.1.2 Stations

The DEIS/DEIR Rapid Bus Alternative included six new stations in the corridor as well as serving an expanded South Station in Downtown Boston as shown in Figure 1:

- Whale's Tooth
- Kings Highway
- Fall River Depot
- Freetown
- Galleria
- Downtown Taunton

Each station would provide ADA compliant access with canopies/shelters, parking, drop-off areas and bus access. South Station would be the downtown terminal for all Rapid Bus Alternative service. Because South Station's bus terminal is at capacity, it would be expanded to accommodate the Rapid Bus Alternative vehicles and passengers.

2.1.3 Midday and Overnight Layover Facilities

A site for a midday and overnight layover facilities would be required to support the DEIS/DEIR Rapid Bus Alternative. The site identified for the midday layover was the Logan Express site on I-93 in Braintree. The Logan Express site is currently used as a park-and-ride station for buses serving Logan Airport. About 35 to 40 buses would use this site. Direct bus access ramps between the site and the I-93 exclusive busway would be constructed. A parking deck would be required to replace park-and-ride spaces lost to bus storage.

It was assumed that the contract bus provider would secure an overnight layover facility and include the cost of acquiring and operating the site as part of the contract bid. The overnight storage and maintenance facilities for the Rapid Bus Alternative

would be close to the South Coast and Taunton terminals with enough space to accommodate the 60-bus fleet.

2.2 Operations

This section describes the DEIS/DEIR Rapid Bus Alternative operating plan, which focused on the proposed service, the stations locations, travel time and frequency, and the fleet that would be required. Rapid Bus Alternative service would be operated by a private contractor.

2.2.1 Service

The DEIS/DEIR Rapid Bus Alternative would operate four routes and serve the following stations:

- New Bedford Route stopping at stations:
  - Whale's Tooth
  - King's Highway
  - South Station
- Taunton (Galleria) Route stopping at stations:
  - Galleria Station
  - South Station
- Fall River Route stopping at stations:
  - Fall River
  - Freetown
  - South Station
- Downtown Taunton Route stopping at stations:
  - Downtown Taunton
  - South Station

Each route would provide peak-period peak-direction service on 15-minute headways with hourly service in the reverse direction during the peak periods. During off-peak periods hourly service would be provided in both directions. Figure 2 shows the service pattern provided by the DEIS/DEIR Rapid Bus Alternative. Table 1 provides the estimated end-to-end travel time for each route.

Table 1 DEIS/DEIR Rapid Bus Alternative Travel Time

Routes	Estimated Travel Time (hr:min)
New Bedford	1:43
Fall River	1:31
Downtown Taunton	1:08
Galleria Station	1:06

2.2.3 Fleet

The DEIS/DEIR Rapid Bus Alternative would need 58 buses to operate its planned service. The buses would be over-the-road buses with amenities that include seating for all passengers, restrooms, reading lights, individual air controls, WiFi and other regional bus comfort amenities.

2.3 Logistics/Construction Impacts

The DEIS/DEIR Rapid Bus Alternative would require about 4.5 years to construct and would be largely focused on reconstructing Route 24 to accommodate the reversible bus lane, the flyovers on Route 24 to I-93 and the I-93 flyover across the Braintree Split. All the bridges and interchanges from Route 140 to I-93 would be reconstructed to accommodate the widening. Construction staging would require Traffic Management Plans on these roadways to ensure temporary construction impacts are minimized on the regional transportation network.

2.4 Ridership

The DEIS/DEIR Rapid Bus Alternative was projected to have a daily ridership potential of 4,200 riders with a net increase in transit boardings of 1,700 in 2030. Table 2 provides the daily inbound boardings by station as well as other summary information.

Table 2 DEIS/DEIR Daily Ridership Projection (2030)

Stations	Daily Boardings
Whales Tooth	580
Kings Highway	280
Fall River Depot	420
Freetown	290
Galleria	130
Downtown Taunton	400
Total Daily Station Inbound Boardings	2,100
Total Daily Ridership	4,200
Total Daily New Transit Boardings	1,700

2.5 Cost

Estimated capital costs include the cost of new infrastructure such as modification to bridges, the highway, stations and the new Zipper Lane as well as the cost of new buses. The cost to expand the South Station bus facility and the Logan Express lot were also included. The DEIS/DEIR Rapid Bus Alternative cost was calculated in present year capital costs and escalated to mid-year of construction. As shown in Table 3, capital cost for the DEIS/DEIR Rapid Bus Alternative would be an estimated $812 million.

Table 3 DEIS/DEIR Rapid Bus Alternative Costs

Total Infrastructure Cost	$449,777,000
Real Estate Cost	$12,770,000
Eng./Services Cost	$60,945,000
Contingency	$142,579,000
Vehicle Cost	$34,800,000
Total	$700,871,000
Year-of-Expenditure	$811,579,000
O&M Cost	$39,600,000/year

Notes: Total infrastructure costs were estimated in 2009 dollars.
Professional services are13.55% of infrastructure costs without contingency.
Professional services include Design, Permitting, Construction Phase Inspection & Project Management.
Contingencies are 31.70% of infrastructure costs and include Indirect Soft Costs, Mitigation Contingency, and Construction Contingency.
Escalation was calculated at 3.25% per year +

Operating and Maintenance (O&M) costs include the cost to operate the buses and maintain the Rapid Bus Alternative infrastructure including stations and dedicated Rapid Bus Alternative zipper and permanent lanes. The annual O&M costs (2009 $) for the DEIS/DEIR Rapid Bus Alternative were estimated to be $39.56 Million.

2.6 Environmental Impacts

The environmental impacts of the DEIS/DEIR Rapid Bus Alternative can be summarized as follows:

- A loss of 21.5 acres of wetlands, 4.0 acres of which are located in Areas of Critical Environmental Concern (ACEC);
- A loss of 16.3 acres of priority habitat for three state-listed species;
- A loss of 4.5 acres of Article 97 public open space; and
- An anticipated annual $41,638 municipal tax loss.

In addition, the Rapid Bus Alternative had lowest reduction in vehicle miles traveled (VMT) with 81,500 miles/day and the lowest air quality benefits with a 9.3 kg/day reduction in volatile organic compounds (VOCs) and a 6,588 tons/year reduction in carbon dioxide ($CO_{2)}$.

3

Modified Rapid Bus Alternative

Based on the comments received on the DEIS/DEIR Rapid Bus Alternative, the new Modified Rapid Bus Alternative would reduce travel times, increase reliability, and connectivity by:

- Eliminating bottlenecks associated with the Zipper Lane;
- Improving connection to Back Bay employment area by directly routing some service; and
- Provide additional Rapid Bus Alternative stations in the vicinity of stations proposed for the Commuter Rail alternative, specifically the Raynham and Easton areas.

An array of alternatives was considered to accomplish these changes. A detailed evaluation was conducted on each alternative based on the criteria established in the DEIS/DEIR. The changes that were selected and are now part of the Modified Rapid Bus Alternative are described in the next sections.

3.1 Infrastructure

This section outlines the infrastructure requirements for the Modified Rapid Bus Alternative including improvements to the guideway, the proposed new stations, and the midday/overnight layover facility.

3.1.1 Guideway

Many of the components of the Modified Rapid Bus Alternative would remain unchanged from the DEIS/DEIR Rapid Bus Alternative. The unchanged guideway elements are:

- Use existing Route 140 and Route 24 highway corridors from New Bedford and Fall River to I-495 along Route 24 in Taunton;
- Widen Route 24 from two to three general purpose lanes in each direction between Route 140 and I-495 in Taunton;
- Provide a barrier-separated, permanent, single reversible bus lane in the median of I-93 and Route 24 from I-495 on Route 24 in Taunton through the I-93 in Canton to the Logan Express lot in Braintree;
- Provide separate single-direction bus ramps within the Route 3/I-93 interchange (the Braintree Split);
- Provide a bus-only connection to the Logan Express lot in Braintree via a flyover from I-93;
- Provide a two-lane, two-way barrier separated bus lane on I-93 between the Logan Express lot and the I-93 existing Zipper Lane; and
- Expand/deck the Logan Express lot to replace parking spaces lost to bus staging.

The following sections describe changes to the guideway from the DEIS/DEIR Rapid Bus Alternative.

3.1.1.1 Route 24

The Modified Rapid Bus Alternative changes the Route 24 Zipper Lane, replacing it with a permanent, reversible exclusive bus lane. Zipper Lane was a technology proposed to replicate the existing high-occupancy vehicle (HOV) facility on I-93 from Braintree to Boston. HOV facilities are typically designated for vehicles with two or more passengers. This HOV lane is assembled for the morning and evening peak periods by "borrowing" a lane from the non-peak direction and installing a temporary barrier that allows the peak direction to use it as an HOV lane. For instance, in the morning when traffic is predominantly traveling to the north from the South Shore areas to Boston, one southbound travel lane is taken to provide the

northbound HOV lane. This technology was envisioned for a segment of the DEIS/DEIR Rapid Bus Alternative alignment, as well, and included a new 15-mile Zipper Lane on Route 24 between I-495 in Taunton and Route 139 in Stoughton.

Since publication of the DEIS/DEIR, MassDOT has indicated the proposed Route 24 Zipper Lane is no longer an operationally viable improvement. At more than double the length of the existing I-93 Zipper Lane, it was judged to have significant long-term operational, maintenance and reliability issues[1]. Therefore, the Modified Rapid Bus Alternative would include a barrier-separated, permanent, reversible lane in the median of Route 24. Route 24 would be widened to provide a 22-foot median (inside dimension) with a 10-foot right shoulder and 4-foot left shoulder in both the northbound and southbound directions. The exclusive bus lane would be increased to 21 miles with 2-foot wide barriers on either side. Figure 3 depicts the DEIS/DEIR and the Modified Rapid Bus Alternative cross-sections for this segment of Route 24. The overall Route 24 roadway width including the Modified Rapid Bus Alternative guideway would be 126 feet, which is 8 feet narrower than the DEIS/DEIR Rapid Bus Alternative cross-section as the shoulder and the travel lanes would be reduced 2 feet each.

3.1.1.2 Bridging the I-93 Zipper Lane to South Station Gap

There are two HOV facilities on I-93 between Braintree and Boston. The southern HOV facility extends from Braintree to just south of the MBTA Savin Hill Station in Boston and provides alternating northbound and southbound HOV travel in a moveable Zipper Lane that "borrows" roadway capacity from a non-peak direction lane during peak periods. The northern HOV facility (South Station HOV) is a permanent, two-lane (one in each direction) facility that begins on I-93 at the Massachusetts Avenue Connector and continues to I-90 eastbound, South Station and the Kneeland Street at Lincoln Street intersection. The gap between the HOV facilities is approximately two miles.

The DEIS/DEIR Rapid Bus Alternative was proposed to use both of these facilities. However, like all I-93 HOV traffic today, the buses would merge into the I-93 general purpose lanes at the exit of the Zipper Lane, travel in the general purpose lanes and then enter the north HOV facility to access South Station. This merge into general traffic results in significant congestion in both the Zipper Lane and the general purpose lanes.

According to the Central Transportation Planning Staff (CTPS), 2030 future conditions result in further deterioration of traffic conditions through this area. Under 2030 future conditions, the Zipper Lane is expected to provide little to no

[1] [1] Per 12/16/11 meeting with Frank DePaola, Massachusetts Department of Transportation

travel time savings over the general purpose lanes. The DEIS/DEIR Rapid Bus Alternative operations reflected this projected change.

The Modified Rapid Bus Alternative evaluated design alternatives that would bridge this gap and improve future flow through this area. However, this section of I-93 is constrained by many elements that have previously precluded connecting these two HOV facilities. These constraints include:

- Immediately east of the highway:
  - Savin Hill Bay
  - McConnell Park
  - Savin Hill neighborhood including Environmental Justice communities
- Immediately west of the highway:
  - MBTA Savin Hill Station
  - Four MBTA Red Line Tracks
  - One MBTA Commuter Rail Track
  - Savin Hill/Columbia neighborhood including Environmental Justice communities

The following sections describe the design alternatives that work within these constraints, the impacts of these alternatives on the immediate area and on regional transportation, and summarizes with a conclusion that bridging this gap is not a practicable improvement for the Modified Rapid Bus Alternative.

Design Alternatives

Four alternatives were evaluated that could potentially bridge the I-93 HOV gap for the Modified Rapid Bus Alternative.

- ***Alternative 1, The "Commitment" Alternative*** – This alternative was developed to assess the maximum travel time benefit for this segment of I-93. The connection would be provided by constructing a reversible HOV lane that does not allow entry or exit from Braintree to South Station. This "commitment" would maximize the speed through this section for both the HOV lane and the general purpose lanes (merges and diverges contribute greatly to highway delay so eliminating them maximizes flow). The "commitment" from Braintree to South Station, however, would displace some HOV vehicles not destined to South Station. Figure 4 highlights the configuration and operation of this alterative. Figure 5 demonstrates the widening required for this alternative and shows the widening into existing rail infrastructure in Savin Hill; these impacts will be discussed in greater detail in later sections.

- ***Alternative 2, The "Maintain Exit at Savin Hill" Alternative*** – This alternative would also provide a reversible HOV lane between the two existing HOV systems but would maintain the access points in the vicinity of Savin Hill and the Massachusetts Avenue Connector for commuters not destined for South Station. The purpose of this alternative is to assess what travel time savings can be achieved without altering who uses the lanes today. Figure 6 highlights the configuration and operation of this alterative. Figure 7 demonstrates the widening required for this alternative and shows the widening into existing rail infrastructure in Savin Hill; these impacts will be discussed in greater detail in later sections.
- ***Alternative 3, The "HOV Lanes in Both Direction" Alternative*** – The goal of this alternative is to provide permanent infrastructure that would not require reversing direction of a single HOV lane; this alternative would provide a permanent two-directional solution by constructing HOV lanes in both directions of the highway. The lanes would not be barrier separated from the general purpose lanes, which would require less widening. Figure 8 highlights the configuration and operation of this alterative. Figure 9 demonstrates the widening required for this alternative and shows the widening into existing rail infrastructure in Savin Hill; these impacts will be discussed in greater detail in later sections.
- ***Alternative 4, The "Minimalist" Alternative*** – This alternative attempts to improve the Zipper Lane travel time without significant infrastructure improvements. It would make only an operational change where the Zipper Lane merges with the general purpose lanes in Savin Hill. To make this exit more efficient for the Zipper Lane, the general purpose lanes would merge from four lanes to three and allow the Zipper Lane to exit in its own auxiliary lane. It was determined that this alternative would improve the operation of the Zipper Lane, but it would cause a queue in the general purpose lanes that would have regional transportation impacts. Figure 10 highlights the configuration and operation of this alterative. No widening would be required in the Savin Hill area (See Figure 11).

Impacts and Costs

Although these alternatives would provide improvements to the operation of the HOV lane, they would have significant impacts on regional transportation or significant costs that would make them impracticable. The following sections describe this in further detail.

Highway Impacts

As shown in Figures 5, 7 and 9, Alternatives 1, 2 and 3 would require widening I-93 by 40 to 50 feet from approximately the Savin Hill area to the Massachusetts Avenue

Connector. The widening would accommodate the connection between the existing Zipper Lane and the South Station HOV lane and would require:

- Reconstructing approximately ¼ mile of the I-93 viaduct;
- Rebuilding seven overhead bridges and two undergrade bridges;
- Shifting and reconstructing two on-ramps and four off-ramps; and
- Tunneling approximately ½ mile of the Commuter Rail.

VISSIM traffic simulation prepared for this analysis showed that Alternatives 1, 2 and 3 would increase flow on I-93 through this section and would provide a travel time savings over 2030 projections for both HOV traffic and general purpose traffic. Table 4 shows these travel time savings.

As shown in Figure 11, Alternative 4 would not require highway widening in Savin Hill, the most constrained area of the HOV lane gap. This alternative would instead alter the operation at the merge of the Zipper Lane with the general purpose lanes. However, in order to increase flow through the area, I-93 would be widened north of Savin Hill to accommodate auxiliary lanes that ease flow upstream of Savin Hill. Two bridges, two on-ramps, and two off-ramps would be reconstructed for this widening.

VISSIM traffic simulation of the Alternative 4 improvements show that while these improvements would increase flow for HOV traffic coming out of the Zipper Lane, it would have significant impact on the general purpose lanes. Table 4 shows this impact on the general purpose lane travel time. Slowing general purpose lanes through this already congested section of I-93 would have a significant impact on regional transportation and regional air quality. MassDOT is committed to make no alterations to I-93 that would impact regional transportation and regional air quality.

It should be noted that the VISSIM traffic simulation also showed that the Zipper Lane in the 2030 No-Build and with each alternative could not process all the general HOV traffic entering from the Braintree Split. Should the Modified Rapid Bus Alternative become the Preferred Alternative, the proposed Braintree Split bus flyover and the bus merge with general HOV traffic would need to be expanded to include additional infrastructure. This additional infrastructure was not included in the capital cost estimate of the Modified Rapid Bus Alternative.

Table 4 Braintree Split to Boston Travel Times per Alternative

	Travel Times (m:ss)					
	Existing	2030 No Build	2030 Alternative 1	2030 Alternative 2	2030 Alternative 3	2030 Alternative 4
Zipper/HOV Lane	15:47	24:52	11:10	16:08	16:04	14:14
General Purpose Lanes	21:32	26:49	22:49	24:23	25:42	30:47

The regional transportation impact of Alternative 4 would make this alternative an impracticable solution for the Modified Rapid Bus Alternative. Alternatives 1, 2, and 3 would improve travel time; however, their impact on adjacent transit operation in order to provide this travel time savings are significant and are discussed in the next section.

Transit Impacts

Widening I-93 in the Savin Hill area would be feasible but difficult and it would impact the MBTA Savin Hill Station, four MBTA Red Line tracks (two tracks service Ashmont and two tracks serving Braintree) and one MBTA Old Colony Commuter Rail Line track; MBTA infrastructure through Savin Hill abuts I-93 for 1 ½ miles.

As shown in Figures 5, 7 and 9, widening the highway to accommodate Alternatives 1, 2 and 3 would require widening onto MBTA right-of-way and would significantly impact the MBTA service. MBTA tracks would need to be combined, tunneled, or both combined and tunneled in order to accommodate this widening.

Many alternatives were considered to determine the most feasible and cost-effective solution. One option considered tunneling the two MBTA Red Line Braintree tracks and one Commuter Rail track. Another option considered relocating the Red Line Braintree tracks, merging them with the Ashmont tracks, and tunneling only the Commuter Rail track. A new flyover structure for the Braintree tracks would be constructed to pass over the Commuter Rail track and the inbound Ashmont track. Of these design alternatives, it was determined that the second option would be more feasible and cost-effective as it would require tunneling only the Commuter Rail track.

This alternative would have transit impacts on all three MBTA services. While Ashmont service and the Commuter Rail would experience some service disruptions and weekend outages, the Braintree service would be significantly more impacted; service to Braintree would be suspended for more than one year. Alternative shuttle transportation would need to be provided during this shutdown and this would have significant regional transportation impacts to South Shore communities.

The regional transportation impacts of Alternatives 1, 2, and 3 would make these alternatives impracticable solutions for the Modified Rapid Bus Alternative. While Alternative 4 does not require any transit shutdown, it would have regional transportation impact on the general purpose lanes that make Alternative 4 also an impracticable solution for the Modified Rapid Bus Alternatives.

Environmental Impacts

All of the alternatives would require property acquisitions. Alternatives 1, 2, and 3 requiring the most (up to 14 private property acquisitions), eight of which are in environmental justice neighborhoods. These alternatives would also acquire the Boston Collegiate Charter School. Potential job losses and loss of property tax revenue would be expected. Alternatives 1, 2, and 3 also would move the highway closer to environmental justice residential neighborhoods for a length of approximately ½ to ¾ mile, which would increase noise levels. This impact would be somewhat offset by noise levels reduced by a new Commuter Rail tunnel.

Alternative 4 would require seven private-property acquisitions, none within environmental justice neighborhoods. However, Alternative 4 would move the highway closer to environmental justice residential neighborhoods for a length 550 feet. Alternative 4 would also impact the Washburn Street Green and General Casimir Pulaski Square for highway widening north of Savin Hill. The General Casimir Pulaski Square is a memorial to a Revolutionary War hero of Polish descent, and is located adjacent to the Polish America Citizen Club. Acquiring a portion of the Washburn Street Green and General Casimir Pulaski Square would impact the public's use of these properties, could trigger Article 97 review, and would likely be subject to Article 97 and Section 4(f) requirements. The General Casimir Pulaski Square likely does not qualify for Article 97 protection because it is not used for conservation or recreation purposes. This site would, however, likely qualify for Section 4(f) protection if the project were subject to approval by one of the federal Department of Transportation agencies (FHWA, FTA, FRA). Washburn Street Green's function as a recreation area and buffer from the highway would be diminished. General Casimir Pulaski Square would be entirely taken, removing this facility from public use. The locations of these two facilities within environmental justice communities mean that the loss of their use for Alternative 4 could be considered a disproportionate impact to the environmental justice populations, since there would not be similar losses in non-environmental justice neighborhoods. The Washburn Street Green is location-specific and its function as a neighborhood resource could not be replaced by a similar facility at another location without acquiring and demolishing residences. Replacement of this facility is considered infeasible.

In addition, shutting down and shuttling MBTA Red Line Braintree service for a period of more than one year can have a significant impact on environmental justice populations in South Shore communities, who rely on transit to access jobs, schools,

and health care services as well as social and cultural events. Environmental justice populations would be disproportionately impacted by a disruption of these transit services for Alternatives 1, 2, or 3.

Costs

The estimated order-of-magnitude capital cost for construction of each of the I-93 alternatives is shown in Table 5. The estimate for mid-point of construction is included, as well.

Table 5 I-93 Alternatives Capital Costs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Total Infrastructure Cost ($M)	$625	$624	$625	$15
Real Estate Cost ($M)	$11	$11	$11	$5
Eng./Services Cost ($M)	$84	$84	$84	$2
Contingency ($M)	$313	$312	$313	$5
Total ($M)	$1,033	$1,031	$1,033	$27
Mid-Year of Construction ($M)	$1,212	$1,210	$1,212	$31

As shown in Table 5, Alternatives 1, 2, and 3 would be more than $1 billion to construct, which would make the improvements cost-prohibitive and impracticable for the Modified Rapid Bus Alternative. While Alternative 4 is a less costly option, it has regional transportation impacts that make that alternative also impracticable for the Modified Rapid Bus Alternative.

Conclusions

It was concluded that the alternatives that require widening the highway and tunneling the Commuter Rail (Alternative 1, 2 and 3) would cause unacceptable impacts to regional transportation and environmental justice communities while significantly increasing the construction costs. These alternatives, therefore, would be impracticable for the Modified Rapid Bus Alternative. Alternative 4 would increase general purpose travel time, which would have regional transportation impacts and regional air quality impacts that make that operational change alone also impracticable for the Modified Rapid Bus Alternative. In addition, MassDOT is committed to make no alterations I-93 that that would have negative impacts on regional transportation and air quality.

For these reasons, the Modified Rapid Bus Alternative would not include any of the infrastructure or operational changes considered here to close the I-93 HOV gap; in

terms of this gap, the Modified Rapid Bus Alternative would be unchanged from the DEIS/DEIR Rapid Bus Alternative.

3.1.2 Stations

The stations identified in the DEIS/DEIR Rapid Bus Alternative would remain in the Modified Rapid Bus Alternative. In addition, there would be two new stations in the South Coast region, one equivalent to the rail alternatives' Raynham Place Station at Exit 16 in West Bridgewater and the other equivalent to the rail alternatives' Easton Station at Exit 18 in Brockton. Back Bay Station would also be added to the alternative and would provide a direct connection to the Orange Line and the Back Bay employment area. The Modified Rapid Bus Alternative would, therefore, include the following stations:

- Whale's Tooth
- King's Highway
- Fall River Depot
- Freetown
- Galleria
- Downtown Taunton
- West Bridgewater
- Brockton
- South Station
- Back Bay

Alternative locations for potential, additional Modified Rapid Bus Alternative stations in or near Raynham and Easton were also evaluated. Existing park-and-rides, vacant parcels and underutilized parcels were all reviewed for potential station siting. Proposed, new station locations were selected based on the availability of property near an existing Route 24 interchange, that avoids wetland impacts and can support an in-line station with adjacent park-and-rides with access from local street networks.

The Brockton and West Bridgewater in-line stations would be located within the Route 24 right-of-way. They would offer the Modified Rapid Bus Alternative easy access with a ramp from the reversible bus lane, which would save travel time by not requiring the buses to have to get on and off the highway. Commuters would access the stations' park-and-ride from local street networks and would access the stations' platform via a pedestrian bridge. Figure 13 depicts a cross-section of how Brockton and West Bridgewater Stations would be designed for the alternative. Figure 14 shows the location of these stations.

3.1.2.1 West Bridgewater Station

The West Bridgewater Station would located on a privately help undeveloped area north of West Street. The West Bridgewater Station would acquire 5.49 acres (portions of four parcels) of privately property. No residential, business, or community facility displacements would result from these acquisitions for the West Bridgewater Station.

3.1.2.2 Brockton Station

The Brockton Station would be located on Oak Street, adjacent to an existing parking lot and industrial building. The Brockton Station would acquire 2.35 acres (approximately 16 percent) of one privately held property. No residential, business, or community facility displacements would result from this acquisition for the Brockton Station.

3.1.2.3 Back Bay

Back Bay Station was also added to the Modified Rapid Bus Alternative. A connection to Back Bay would more closely match the service provided by the rail alternatives and would provide a direct connection for the South Coast communities to the employment area in the Back Bay area of Boston. The Back Bay area of Boston, served by the Orange Line, is second only to South Station in terms of office market size.

3.1.3 Midday and Overnight Layover Facilities

The Logan Express site on I-93 in Braintree was identified as the site for the Rapid Bus Alternative midday layover as part of the DEIS/DEIR. Bus and Logan Express parking on this site would need to be expanded to accommodate the additional buses estimated for the Modified Rapid Bus Alternative. It is also anticipated that an overnight layover facility would need to be acquired for the alternative. Previously, it was assumed that a private operator would provide the Rapid Bus Alternative service and would use their existing facilities. However, no private operator has an overnight facility in the South Coast Region that would be able to accommodate all the buses for the Modified Rapid Bus Alternative. Therefore, it is assumed that the Modified Rapid Bus Alternative would carry the cost of this overnight facility.

3.2 Operations

The DEIS/DEIR Rapid Bus Alterative operations were modified to accommodate local and express service that provide interregional connectivity. The following sections describe the operating plan of the Modified Rapid Bus Alternative including interregional connections, travel times, frequency and the fleet required to provide this service.

3.2.1 Service Plan

The Modified Rapid Bus Alternative would operate multiple routes as shown in Table 6.

Table 6 Modified Rapid Bus Alternative Operations

	EXPRESS ROUTES												LOCAL ROUTES									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Whale' s Tooth	●	●											●	●					●		●	
Kings Highway			●	●									●	●					●		●	
Fall River Depot					●	●									●	●				●		●
Freetown							●	●							●	●				●		●
Galleria									●	●			●	●	●	●			●	●	●	●
Downtown Taunton											●	●					●	●	●	●	●	●
West Bridgewater													●	●	●	●	●	●	●	●	●	●
Brockton													●	●	●	●	●	●	●	●	●	●
South Station	●		●		●		●		●		●		●		●		●		●	●		
Back Bay		●		●		●		●		●		●		●		●		●			●	●

The routes and stops summarized in Table 6 were developed to enhance the DEIS/DEIR Rapid Bus Alternative operating plan that provided express service but did not provide interregional connectivity. To provide interregional connectivity, the Modified Rapid Bus Alternative would operate with both local and express service. As shown in Table 6, an example of express service would be Route 1. It would make only two stops; it would pick up passengers at Whale's Tooth Station and travel express to South Station. Route 13, on the other hand, would provide a local service starting at Whale's Tooth Station and making stops at Kings Highway, Galleria, West Bridgewater, Brockton, and South Station. The local routes would provide a more robust regional connectivity for the South Coast region than what was provided in the DEIS/DEIR Rapid Bus Alternative.

Figure 15 shows a schematic of express and local services the Modified Rapid Bus Alternative would provide. Each route would operate peak-period peak-direction service with 15-minute headways and hourly service in the reverse direction during

the peak. During off-peak periods hourly service would be provided in both directions. Table 7 provides the estimated end-to-end travel time for each route.

Table 7 Modified Rapid Bus Alternative Travel Time and Frequency

Route	Estimated Travel Time (hr:min)	
	Local Service	Express Service
Whale's Tooth to South Station	1:30	1:18
Whale's Tooth to Back Bay	1:37	1:25
Kings Highway to South Station	1:14	1:09
Kings Highway to Back Bay	1:21	1:17
Fall River Depot to South Station	1:26	1:11
Fall River Depot to Back Bay	1:33	1:18
Freetown to South Station	1:05	1:00
Freetown to Back Bay	1:12	1:07
Downtown Taunton to South Station	1:04	1:00
Downtown Taunton to Back Bay	1:12	1:08
Galleria Station to South Station	1:01	0:56
Galleria Station to Back Bay	1:09	1:04
West Bridgeport Station to South Station	0:42	NA
West Bridgeport Station to Back Bay	0:50	NA

Buses in the peak direction would utilize the proposed Route 24 permanent, reversible HOV lane. Reverse peak buses would not have access to this lane and would be required to exit Route 24 to access the stations at West Bridgewater and Brockton. In the off-peak periods, the lane would be temporarily closed, all buses would be cleared, and it would be prepared to operate in the next peak direction. With this alternative, the permanent reversible lane on Route 24 and the in-line stations would not be accessible in the midday and nighttime service periods. During those periods, the Modified Rapid Bus Alternative would use the general purpose lanes and passengers would board/alight at the adjacent park-and-ride facilities.

3.2.2 Feeder Bus Plan

Feeder bus connections would also be included in the Modified Rapid Bus Alternative. The feeder bus service would be designed to:

- Minimize the number of transfers required by Modified Rapid Bus Alternative riders;
- Employ potential route modifications to existing bus routes to integrate the Modified Rapid Bus Alternative and local bus service to the extent possible;

- Minimize route modifications to avoid inconveniencing current bus users;
- Accommodate feeder buses within the Modified Rapid Bus Alternative station sites as close as possible to boarding areas/platforms; and
- Plan for ADA compliant pedestrian connections to bus stops adjacent to and within the station sites.

Three regional transit authorities currently provide local bus service proximate to the corridor: Brockton Area Transit Authority (BAT), the Southeastern Regional Transit Authority (SRTA), and Greater Attleboro Taunton Regional Transit Authority (GATRA). Based on consultations with those operators the proposed feeder bus plan presented in Table 8 was developed.

There are no existing local bus routes or operators in the vicinity of the proposed West Bridgewater station. Development of a new route to serve just this station would not be cost-effective. Therefore, no feeder buses are proposed to serve West Bridgewater station. For the remaining stations, extensions/modifications of the existing routes would comprise the feeder bus service. Existing headways for each of these routes would not be modified.

Table 8 Modified Rapid Bus Alternative Feeder Bus Plan

Station	Potential for Feeder Bus	Routes Serving Station (Extensions/Modifications Required)
Fall River Depot	Yes	SRTA 2, FRIP
Whales Tooth Station	Yes	SRTA 1, 2
Kings Highway Station	Yes	SRTA 8
Freetown Station	Yes	SRTA 2
Galleria Station	Yes	GATRA 3,8
Taunton Depot	Yes	GATRA 1, 6, 7, 8
Brockton Station	Yes	BAT 4, 4A, 14
West Bridgewater Station	No	

3.2.3 Fleet

The Modified Rapid Bus Alternative would require 144 over-the-road buses (with spares) with amenities that include seating for all passengers, restrooms, reading lights, individual air controls, WiFi and other regional bus comfort amenities.

3.3 Logistics/Construction Impacts

The construction elements of the Modified Rapid Bus Alternative are largely the same at those of the DEIS/DEIR Rapid Bus Alternative. The Modified Rapid Bus Alternative would also require about 4.5 years to construct and would be focused on reconstructing Route 24 to accommodate the reversible bus lane, the flyovers on Route 24 to I-93 and the I-93 flyover across the Braintree Split. All the Route 24 bridges and interchanges from Route 140 to I-93 would be reconstructed to accommodate the widening. Construction staging would require Traffic Management Plans on these roadways to ensure temporary construction impacts are minimized on the regional transportation network.

In addition to highway improvements, the Modified Rapid Bus Alternative would now also include the construction of the Brockton and West Bridgewater in-line stations. Constructing these stations would require additional widening of Route 24 to accommodate the ramps to and from the elevated in-line station in addition to the added width needed for the guideway. A deceleration and acceleration lane would transition to/from these ramps at the level of the roadway. Buses bypassing these stations would remain at the level of the roadway in the Modified Rapid Bus Alternative guideway unimpeded by stopping buses or the station infrastructure. The South Station bus terminal would also be expanded to accommodate the additional Modified Rapid Bus Alternative fleet. A midday layover facility would be constructed at Logan Express in Braintree and an overnight layover would be required but a site has not yet been selected for that facility.

3.4 Ridership

The 2030 ridership projected for the Modified Rapid Bus Alternative would have a projected total daily ridership of 10,330 total riders and approximately 5,900 new transit boardings as summarized in Table 9.

Table 9 Modified Rapid Bus Alternative Ridership

Station	2030 Ridership		
	South Station	Back Bay	Total
Whales Tooth	400	210	610
Kings Highway	390	220	610
Fall River Depot	810	270	1,080
Freetown	420	190	610
Galleria	290	150	440
Downtown Taunton	450	185	635
West Bridgewater	410	190	600
Brockton	420	160	580
Total Station Peak Inbound Boardings	3,590	1,575	5,165
Total Daily Ridership	7,180	3,150	10,330
Total Daily New Transit Boardings			5,900

3.5 Costs

Estimated order-of-magnitude capital costs were developed and include the cost of new infrastructure such as modification to bridges, the highway, stations and the new Zipper Lane as well as the cost of new buses. The cost to expand the South Station bus facility and the Logan Express lot were also included. As shown in Table 10, the Modified Rapid Bus Alternative is estimated to be $1.0 billion.

Table 10 Modified Rapid Bus Alternative Costs

Total Infrastructure Cost	$515,000,000
Real Estate Cost	$18,000,000
Eng./Services Cost	$70,000,000
Contingency	$163,000,000
Vehicle Cost	$86,000,000
Total	$852,000,000
Year-of-Expenditure	$1,000,000,000
O&M Cost	$39,600,000/year

Notes: Total infrastructure costs were estimated in 2009 dollars.
Professional services are13.55% of infrastructure costs without contingency.
Professional services include Design, Permitting, Construction Phase Inspection & Project Management.
Contingencies are 31.70% of infrastructure costs and include Indirect Soft Costs, Mitigation Contingency, and Construction Contingency.
Escalation was calculated at 3.25% per year +

The annual O&M costs (2009 $) for the Modified Rapid Bus Alternative are estimated to be $74.5 Million. Operating and Maintenance costs include the cost to operate the buses and maintain the Modified Rapid Bus Alternative infrastructure including stations and dedicated Modified Rapid Bus Alternative lanes.

3.6 Environmental Impacts

The environmental effects of the Modified Rapid Bus Alternative are summarized in this section.

3.6.1 Beneficial Effects

The Modified Rapid Bus Alternative would improve access to jobs, colleges, hospitals and Boston. None of the impacts would result in disproportionately high and adverse human health or environmental effects to environmental justice populations, meeting the requirements of the Executive Order, DOT Order, and EPA guidance.

Climate change is also an important consideration in evaluating the South Coast Rail project alternatives. The primary greenhouse gas emitted by transportation sources is Carbon Dioxide (CO_2). The Modified Rapid Bus Alternative would reduce the greenhouse gas CO_2 by 48,416.3tons/year.

The Modified Rapid Bus Alternative would also reduce vehicle miles traveled (VMT) by approximately 284,800.

3.6.2 Adverse Impacts

The Modified Rapid Bus Alternative would also have adverse impacts. The adverse impacts are summarized in the following sections.

3.6.2.1 Wetland Impacts

Wetland impacts are the principal category of environmental impacts considered for Section 404 permits and the Massachusetts Wetlands Protection Act. Direct wetland impacts, both temporary and permanent, are anticipated for the Modified Rapid Bus Alternative.

Temporary impacts include short-term disturbances (erosion controls, temporary structures, etc.) to wetlands and waterways during construction that would cease once construction activities are complete.

Permanent impacts are those that would result in the loss of wetlands. Permanent impacts may include, but are not limited to, wetland fill, dredging, and watercourse relocation or alteration. This analysis also summarized wetland fill within Areas of Critical Environmental Concern (ACEC), as these wetlands receive a higher level of state regulatory protection.

The Modified Rapid Bus Alternative would result in approximately 21.5 acres of wetland loss, of which 4.0 acres are in ACECs and an additional 8.7 acres of temporary impact.

3.6.2.2 Open Space and Tax Loss

A total of 0.19 acres of protected open space would be acquired for the Modified Rapid Bus Alternative. An additional 38.9 acres of property that is not open space would be acquired, projected to cause an annual loss in municipal taxes of $41,638. The Modified Rapid Bus Alternative, because it requires modifications to an instate highway, would require approval and NEPA review by FHWA. Impacts to public open space would trigger FHWA review under Section 4(f) of the Department of Transportation Act, which prohibits the use of public parkland unless these are no feasible and prudent alternatives.

3.6.2.3 Priority Habitat

Rare species are an important environmental resource, protected under the Massachusetts Endangered Species Act and Wetlands Protection Act. Temporary and permanent direct impacts to rare species and their habitat are anticipated for each of the project build alternatives. Direct impacts include impacts from construction, grading, vegetation management, and mortality associated with potential collisions with rail traffic. These activities may result in degradation of ecological function, loss of habitat, as well as loss of rare plant and animal species. This criterion also describes the amount of 'barrier effect' for each alternative. A corridor may act as a barrier that interferes with the movement of some mammals, amphibians, birds and reptiles from one habitat to another. The width of a corridor can influence the frequency of wildlife crossings, as well as the mortality associated with potential collisions with traffic. The Modified Rapid Bus Alternative would result in a loss of 16.3 acres of priority habitat for state-listed species, which include the Blandings Turtle, Eastern Box turtle, and Marbled Salamander. The Modified Rapid Bus Alternative would not create a new barrier to wildlife movement.

3.6.2.4 Water Quality

The Modified Rapid Bus Alternative would involve construction within two Zone A areas and within Zone II areas for 11 wells. These areas would be disturbed only temporarily and would not receive any long-term impacts. This alternative would also require stormwater discharges to two Zone A areas, Zone II areas for 11 wells, and five different waterbodies, including Town River in the Hockomock Swamp ACEC. The Modified Rapid Bus Alternative may require a variance from the Massachusetts Department of Environmental Protection (MA DEP) unless the proposed stormwater discharges in Zone A areas can be removed or relocated.

Although the Rapid Bus Alternative would use highways near multiple waterbodies and ground water protection areas, the road upgrades and new traffic would not introduce new pollutant sources because they would occur within and along existing highways. The increased paved area would only increase pollutant loading if the new pavement increased the amount of traffic on the road. Based on the change in vehicle miles traveled (VMT) at the peak hour, the Rapid Bus Alternative would reduce roadway use by approximately 0.3 percent. Since this alternative would actually decrease the total automotive traffic conveyed along the corridor by approximately one percent, the additional paved area would not increase loading of roadway contaminants such as metals, hydrocarbons, salt, and sediment. The primary potential for water resource impacts would be from increased runoff rates due to increased paved area.

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Evaluation of the Modified Rapid Bus Alternative

This section summarizes the results the Modified Rapid Bus Alternative analysis and compares it to the results of the alternatives developed during the DEIS/DEIR including the Stoughton Electric Alternative and the Rapid Bus Alternative. The evaluation is consistent with the evaluation conducted for the DEIS/DEIR Alternatives Analysis, which follows the process described in *The Highway Methodology*[2]. In evaluating the Modified Rapid Bus Alternative, this chapter addressed the following questions:

- Does the Modified Rapid Bus Alternative meet the project purpose?
- Is the Modified Rapid Bus Alternative practicable?
- What are the environmentally impacts of the Modified Rapid Bus Alternative?

The following sections answer these questions individually and in comparison to how the DEIS/DEIR Stoughton Electric Alternative and the DEIS/DEIR Rapid Bus Alternative compare.

4.1 Evaluation of Project Purpose

This evaluation assesses whether the Modified Rapid Bus Alternative would meet the project purpose "to more fully meet the existing and future demand for public transportation between Fall River/ New Bedford and Boston, Massachusetts to enhance regional mobility." The performance measures used to evaluate how well the alternative meets the project purpose include:

- *Ridership demand* – Does the alternative meet the demand for public transportation?

[2] United States Army Corps of Engineers, NEDEP-360-1-30, *The Highway Methodology*, October 1993.

- *Improve quality of service* – Does the alternative provide a transit trip that is competitive to travel by car and does it meet the MBTA's Service Delivery Policy?
- *Reduce vehicle miles traveled* – Does the alternative shift from auto mode reliance to using the transit mode?
- *Improve regional mobility* – Does the alternative provide public transit connections between New Bedford/Fall River and Boston and provide public transit connections between South Coast cities (New Bedford, Fall River, Taunton and others)?

4.1.1 Ridership Demand

Table 11 provides the projected 2030 ridership of the Modified Rapid Bus Alternative in comparison to the DEIS/DEIR Stoughton Electric and Rapid Bus Alternatives.

Table 11 Ridership Comparison

	DEIS/DEIR		
Station	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Total Station Peak Inbound Boardings	4,790	2,100	5,165
Total Daily Ridership	9,580	4,200	10,330
Total Daily New Transit Boardings	5,900	1,700	5,900
Percent New Transit Trips	61.6%	40.5%	57.1%

As shown in Table 11, the Modified Rapid Bus Alternative is projected to capture 5,165 boardings at the proposed new stations. Of these trips, 57.1 percent are anticipated to be new transit trips (an improvement from the DEIS/DEIR Rapid Bus Alternative that captured 40.5 percent new transit trips). The remaining Modified Rapid Bus Alternative ridership (42.9 percent) would be shifted from existing transit modes and transit services, such as the Providence/Attleboro Commuter Rail line or the regional bus service provided today in the South Coast Region. By comparison, the Stoughton Electric alternative is projected to capture approximately 61.6 percent new transit ridership.

It is worthwhile to note that the ridership estimates presented in this table were calculated using optimal run times based on future traffic volumes. The model does not adjust for reliability or on-time performance issues that could occur. This will be discussed in more detail in the practicability evaluation section of this chapter.

4.1.2 Travel Time

Commuters from the South Coast region currently rely on autos and private bus service to access Boston. The average commuting time by auto during rush hour is currently 90 minutes from Fall River and New Bedford to Boston. The CTPS travel demand model projects slower commutes as congestion along already slow corridors continues to degrade. A future (2030) commute from New Bedford and Fall River to Boston is expected to be approximately 10 to 30 minutes longer than in current peak period conditions. An improved quality of service would provide a competitive travel time and improved reliability with respect to existing commuter options during peak commuting periods.

Speed data provided by CTPS supplemented by VISSIM traffic simulation for the Modified Rapid Bus Alternative was used to determine future travel time from end-point to end-point along these corridors.

Table 12 Travel Time Comparison (2030)*

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Travel Time (min)	76	103	90 (local service) 78 (express service)

* Presented in travel time from Whale's Tooth to South Station.

Table 12 summarizes the travel times for each alternative. The Modified Rapid Bus Alternative has improved travel times compared to the DEIS/DEIR Rapid Bus Alternative, but the travel times are still longer than the travel time achieved by the Stoughton Electric Alternative. The Modified Rapid Bus Alternative is anticipated to have a 90-minute travel time with local service and a 78-minute travel time with express service. The DEIS/DEIR Rapid Bus Alternative had a travel time of 103 minutes, with the Stoughton Electric providing the fastest travel time of 76 minutes.

The travel time estimates presented in this summary provide an understanding of the most optimistic service the Modified Rapid Bus Alternative is able to provide. These travel times do not account for delays beyond average daily congestion and how frequently those delays would occur, which will be discussed in more detail in the Practicability section of this chapter.

4.1.3 Service Delivery Policy

While an alternative might offer benefits for the transit system in the South Coast region, it may not meet the MBTA Service Delivery Policy. To maintain acceptable

service, the MBTA has established a Service Delivery Policy[3] to ensure it provides quality transit services that meet the needs of the riding public. The minimum frequency of service levels provides the guidelines by which the MBTA maintains accessibility to the transportation network within a reasonable waiting period. The minimum frequency of service standards is the minimum frequency that must be maintained in a service. Commuter Rail and Commuter Bus minimum frequencies should provide at a minimum three trips in a peak direction during the morning and evening peak periods.[4] The Modified Rapid Bus Alternative was designed to exceed this minimum standard and provides 15-minute headways in the peak periods and one-hour headways in the non-peak.

4.1.4 Vehicle Miles Traveled

Vehicle Miles Traveled (VMT) is an important gauge for an alternative's transportation system benefits. VMT measures the extent of motor vehicle operation or the total number of vehicle miles traveled within the study area on given day. This particular measure quantifies how many miles of travel would be removed from the regional roadway network by commuters who elect to travel by train or bus rather than drive. This reduction in driving has several environmental benefits, notably cleaner air and a reduction in greenhouse gas emissions. Fewer cars on the road also eases congestion along highway corridors, resulting in travel time benefits. The alternative with the greatest VMT change (reduction) receives the highest score under this criterion.

Table 13 Reduction in 2030 VMT Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Reduction in VMTs	295,900	81,500	284,800

As shown in Table 13, Stoughton Electric Alternative would have the highest reduction in VMT with 295,900 daily miles. While the Modified Rapid Bus Alternative would reduce VMT by 284,800 daily miles, the difference between what the Modified Rapid Bus Alternative is able to reduce in VMT to that of Stoughton Electric Alternative is equivalent to one vehicle traveling around the world approximately 125 times every year. Alternatively, if an average daily commute is 40 miles (20 miles each way), this difference is also the equivalent of taking approximately 277 cars off the road every day.

[3] Massachusetts Bay Transportation Authority, *Service Delivery Policy*, MBTA Board of Directors approved January 14, 2009.

[4] Between LIRR, MNRR, MBTA, and METRA, the average service provided is 2.9 peak period trains.

4.1.5 Regional Mobility

This section discusses the interregional connectivity provided by this alternative and how well it meets the project purpose to improve regional mobility. As all the alternatives provide a connection from Fall River and New Bedford to Boston, an alternative will be considered more favorable if it also enhances mobility between points within the region by including interregional links that provide one-seat rides from one municipality to another. Connections within a municipality were not counted. For instance, New Bedford, which would accommodate two stations, would provide a one-seat ride from Whale's Tooth to King's Highway. However, this connection was not considered an improvement to regional mobility as it is confined to just New Bedford.

The Modified Rapid Bus Alternative would provide commuter bus service to South Station via Route 24, Route 140, and I-93 serving stations in: New Bedford, Fall River, Taunton (Downtown Taunton and Galleria), Freetown, West Bridgewater, Brockton, and Boston. The service plan provides regional connectivity between stations in these communities. Table 14 summarizes how many connections each alternative is able to provide.

Table 14 Interregional Links Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Interregional Links	41	5	18

As shown in Table 14, the Modified Rapid Bus Alternative would provide 18 interregional one-way links, which improves the interregional connectivity of the DEIS/DEIR Rapid Bus Alternative that has only five links. The Stoughton Electric Alternative would have the greatest interregional connectivity with 41 links.

4.1.6 Project Purpose Summary

Based on the measures established in the evaluation of the Project Purpose, it was concluded that the Modified Rapid Bus Alternative has the ability to meet the Project Purpose. It is projected to have a strong ridership demand, would improve the quality of service, reduce vehicle miles traveled, and improve regional connectivity. However, the Practicability evaluation in the next section challenges this conclusion. The Practicability evaluations dive deeper into the question of whether or not the Modified Rapid Bus Alternative really would provide a quality service and meet the projected ridership demand.

4.2 Evaluation of Practicability

One of the goals of this analysis was to determine if the Modified Rapid Bus Alternative is practicable. This section summarizes the practicability of the alternative in terms of its constructability, cost effectiveness, and performance.

The following measures indicate how practicable the alternative would be to implement based on the Clean Water Act regulatory definition of practicable: "capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose." Three measures were used to evaluate how practicable the alternative is:

- *Cost per Rider*– Measures how costly it would be to provide an alternative compared to the number of riders expected to use the system.
- *Construction Schedule and Constructability* – The time required to construct the alternative and the complexity of that construction are also measures of practicability because longer and complex construction schedules become increasingly more expensive, as well as delay the delivery of project benefits.
- *On-Time Performance and Reliability* – Measures how well the alternatives would be able to serve the South Coast region in terms of providing the passengers an assurance that they will arrive on time. This measure also demonstrates how existing capacity constraints translate into impacts on the overall reliability of the service.

4.2.1 Cost per Rider

This criterion evaluates how well an alternative performs based on the capital and operating and maintenance cost needed to serve riders projected to use the system. The metric for this criterion is cost per rider including infrastructure construction, land acquisition, environmental mitigation and other construction elements as well as the cost of operating and maintaining the system. 2030 ridership was developed using the Central Transportation Planning Staff (CTPS) regional model. CTPS refined their regional travel demand model set to include regional transportation projects, land use alternatives based on regional plans for the study area, and the proposed operation plan for each project alternative. Further information incorporated into their analysis includes station locations, station parking availability and cost, and fares.

Table 15 Cost per Rider Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Capital Cost (YOE)	$1.88 billion	$0.81 billion	$1.00 billion
O&M Cost	$28.1 million/year	$39.6 million/year	$74.5 million/year
Cost per Rider	$45.76	$99.79	$42.07

4.2.2 Construction Schedule

Construction time contributes to short-term impacts and how quickly new transit services can be implemented. The Modified Rapid Bus Alternative was evaluated to determine whether it could be constructed within a reasonable, 4-year timeframe to achieve the Project Purpose and meet the 4-year construction schedule commitment outlined in Governor Patrick's *South Coast Rail, A Plan for Action*. In addition to trying to maintain this schedule, a shortened construction period would potentially ensure lower construction costs. Construction costs escalate over time and increase significantly with longer construction periods (particularly with regard to the cost of materials such as steel and concrete). As with the previous measures, this criterion was used to evaluate the alternatives in the DEIS/DEIR, as well. The Modified Rapid Bus Alternative would have the same 4.5-year schedule as did the DEIS/DEIR Rapid Bus Alternative. The construction schedule, despite adding new elements to enhance the alternative, has not changed since the DEIS/DEIR. Therefore, from the constructability perspective, the Modified Rapid Bus Alternative would be a practicable alternative.

4.2.3 On-Time Performance and Reliability

While project travel time is an important initial criterion in evaluating the practicability of an alternative, the reliability of meeting that travel time on a consistent basis is another key factor. The MBTA Service Delivery Policy defines "on time" as being no more than 5 minutes late, particularly for routes with published schedules such as a Commuter Rail or Commuter Bus service. This is the basis by which proposed system on-time performance is evaluated. Infrastructure constraints, however, can affect on-time performance and an alternative's reliability. The Modified Rapid Bus Alternative was calculated to have a maximum on-time performance of 88 percent. This on-time performance calculation was based historical rates of:

- Accidents in mixed-traffic sections of the corridor;

- Accidents in the I-93 Zipper Lane; and
- Zipper lane closures due to inclement weather.

Table 16 summarizes the On-Time Performance difference between alternatives.

Table 16 On-Time Performance Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
On-Time Performance	97.9%	88.3% (maximum)	88.3% (maximum)

Figure 15, however, demonstrates that highway delays are routinely caused by many other factors, as well. All factors that cause delay could not be included in the on-time performance calculation of the Modified Rapid Bus Alternative. More specifically, impacts of on-time performance that were not taken into account for the Modified Rapid Bus Alternative include:

- *Delays caused by minor incidents on a highway that is already at capacity.* On a congested highway or an HOV lane at capacity, even a seemingly minor incident such as solar glare or a slow-moving vehicle can have a cascading impact on delay, which influences the perception of the commuter and their decision to take a bus. The Federal Highway Administration describes congested highway systems as highly variable and unpredictable and that on any given day, unusual circumstances can change the highway's performance, dramatically affecting travel speeds and delays. The traveling public experiences these drastic performance swings, and their expectation or fear of unreliable traffic conditions affects how they choose to travel.[5]
- *Delays caused by incidents such as rain events or less-severe snow storms that do not close the Zipper Lane for the entire peak period but do impact on-time-performance.* The frequency of these types of delays are not quantifiable for the corridor. However, anecdotal evidence shows these types of incidents frequently impact travel times.
- *Delays caused by vehicles pulled over in the shoulder of a highway due to a flat tire, a general breakdown, or simply from being stopped by police.* While the frequency of these incidents is not recorded, they contribute a great deal to delay on a highway system during peak periods (as shown in Figure 15).

[5] Federal Highway Administration, "Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation, September 1, 2005, http://ops.fhwa.dot.gov/congestion_report/

While the Modified Rapid Bus Alternative would have an exclusive bus lane for the majority of its travel into Boston, it is vulnerable to all of these elements once it enters the Zipper Lane at the Braintree Split as well as while it travels in the general purpose lanes. This last eight miles on I-93 can severely impact the reliability and on-time performance and sway travel time delay drastically. When there is an incident on I-93, the magnitude of delay from Braintree to Boston can easily exceed 30 minutes under current conditions. In order to alleviate the issue of reliability, the Modified Rapid Bus Alternative would need an exclusive bus lane for the entire length of the corridor including to:

- Upgrade the Braintree Split flyover to include a more-efficient merge between Modified Rapid Bus Alternative buses with general HOV traffic;
- Widen I-93 from the Braintree Split to Boston and improve the capacity/ reliability of the Zipper Lane to allow vehicles to pass breakdowns in the lane; and
- Provide a connection from the end of the existing Zipper Lane to South Station, which was ruled infeasible due to cost and impact to regional transportation, as outlined in Chapter 3.

Without these improvements, the Modified Rapid Bus Alternative would not be a practicable alternative because:

- The last eight miles of the corridor into Boston would be at capacity by 2030[6];
- Breakdowns, incidents, weather, and any other factors will continue to compromise the reliability of the Zipper Lane;
- As the system becomes more saturated, delays will be cascading;
- Delay caused at the merge of the Zipper Lane with general purpose lanes in Savin hill will continue to degrade and impact reliability;
- Reliability issues would degrade the service from its onset.

Ridership, as it is currently shown for the Modified Rapid Bus Alternative, would not increase no matter what additional infrastructure improvements are made to increase reliability.

It should be noted that rail is not subject to the variability and reliability issues associated with traffic on highways. Rail alternatives are also able to more readily add capacity to a transit system without infrastructure modifications simply by adding additional train cars to a train set.

[6] Central Transportation Planning Staff (CTPS) studies.

4.2.4 Practicability Summary

For the reasons outlined in this section, the evaluation finds that the Modified Rapid Bus Alternative is not a practicable alternative based on lack of reliability on the existing, at-capacity highway infrastructure in the northern section of the corridor, though it may be slightly less expensive per rider than the DEIS/DEIR Stoughton Electric Alternative.

It is also important to note that the travel demand model, which projects ridership for the South Coast Rail project and which measured whether the Modified Rapid Bus Alternative would meet the Project Purpose, bases its estimates on a service operating plan, travel time, and the connections the system will make to employment areas, to name a few factors. The model does not take into account the reliability of a highway network that the transit system would operate on. As a result, the ridership presented in this memorandum (like the travel time of the Modified Rapid Bus Alternative service and its on-time performance) were all estimated average conditions.

4.3 Evaluation of Environmental Impacts

The purpose of this section is to compare the environmental impacts of the Modified Rapid Bus Alternative to the DEIS/DEIR Stoughton and Rapid Bus Alternatives. As stated in the Section 404(b)(1) Guidelines at 40 CFR 230.10(a), "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." Therefore, the discussion below identifies impacts to the aquatic environment under the Clean Water Act. It identifies other impacts to the overall natural environment, as is required under the Guidelines, and also to the human environment and compares the Modified Rapid Bus Alternative to the DEIS/DEIR Stoughton Electric and Rapid Bus Alternatives.

4.3.1 Beneficial Effects

The following sections summarize the environmental benefits provided by each alternative including those to environmental justice and air quality.

4.3.1.1 Environmental Justice

The Modified Rapid Bus Alternatives would improve access to jobs, colleges, hospitals and Boston. None of the impacts would result in disproportionately high and adverse human health or environmental effects to environmental justice

populations, meeting the requirements of the Executive Order, DOT Order, and EPA guidance.

4.3.1.2 Air Quality

The predominant sources of air pollution anticipated from the proposed South Coast Rail project include emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOCs) from locomotive engines and from motor vehicles traveling to and from the train stations. A mesoscale analysis evaluated the regional air quality impacts (VOCs, NOx, CO, and PM emissions) from the proposed project by determining the change in total ozone precursor emissions (volatile organic compounds and nitrogen oxides) for the existing and future conditions within the study area; the microscale analysis calculated the CO and PM concentrations for the same conditions at congested intersections near the proposed stations.

Table 17 Air Quality Beneficial Effects Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
NOX Reduction (kg/day)	(43.3)	0.0	(39.3)
$PM_{2.5}$ Reduction (kg/day)	(1.7)	0.0	(1.4)
PM_{10} Reduction (kg/day)	(6.1)	1.7	(5.3)
VOCs Reduction (kg/day)	(55.9)	(9.3)	(50.9)
CO_2 Reduction (tons/year)	(62,333.7)	(6,588.0)	(48,416.3)

As shown in Table 17, while improved from the DEIS/DEIR Rapid Bus Alternative, the Modified Rapid Bus Alternative would still have fewer Air Quality benefits than the DEIS/DEIR Stoughton Electric Alternative. The Modified Rapid Bus Alternative would also reduce the greenhouse gas CO_2 by 48,416.3 tons/year compared the DEIS/DEIR Stoughton Electric Alternative, which would reduce CO_2 by 62,333.7 ton/year.

4.3.2 Adverse Impacts

The following sections compare the environmental impacts of each alternative including those to wetlands and priority habitat.

4.3.2.1 Wetland Impacts

Wetland impacts are the principal category of environmental impacts considered for Section 404 permits and variances under the Massachusetts Wetlands Protection Act. Direct wetland impacts, both temporary and permanent, are anticipated for each of the build alternatives.

Temporary impacts include short term disturbances (erosion controls, temporary structures, etc.) to wetlands and waterways during construction that would cease once construction activities are complete.

Permanent impacts are those that would result in the loss of wetlands. Permanent impacts may include, but are not limited to, wetland fill, dredging, and watercourse relocation or alteration. This analysis also evaluated the amount of wetland fill within an ACEC, as wetlands within ACECs receive a higher level of state regulatory protection.

Table 18 Wetland Loss Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Wetland Loss (acres)	11.9	21.5	21.6
Wetland Loss in ACECs (acres)	1.8	4.0	4.0

As shown in Table 18, the Modified Rapid Bus Alternative would result in 21.6 acres of wetland loss, 4.0 of which are in ACECs. By comparison, the Stoughton Electric would have approximately half of those impacts and Stoughton Electric would, therefore, be the less environmentally damaging alternative between the two.

4.3.2.2 Priority Habitat

Rare species are an important environmental resource, protected under the Massachusetts Endangered Species Act and Wetlands Protection Act. Temporary and permanent direct impacts to rare species and their habitat are anticipated for each of the project build alternatives. Direct impacts include impacts from construction, grading, vegetation management, and mortality associated with potential collisions with rail traffic. These activities may result in degradation of ecological function, loss of habitat, as well as loss of rare plant and animal species. This criterion also describes the amount of 'barrier effect' for each alternative. A corridor may act as a barrier that interferes with the movement of some mammals, amphibians, birds and reptiles from one habitat to another. The width of a corridor can influence the frequency of wildlife crossings, as well as the mortality associated with potential collisions with traffic.

Table 19 Priority Habitat Loss Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
Priority Habitat Loss (acres)	9.9	16.3	16.3

The Modified Rapid Bus Alternatives would result in a loss of 16.3 acres of wildlife habitat, as would the Rapid Bus Alternative from the DEIS/DEIR. By comparison, Stoughton Electric would result in 6.4 fewer acres with 9.9 acres of priority habitat loss.

4.3.3 Environmental Benefits and Impacts Summary

The Modified Rapid Bus Alternative would have twice as much wetland impacts and approximately 30 percent less air quality benefit based on a reduction of annual CO_2 emissions. This evaluation finds that the Modified Rapid Bus Alternative would have environmental impacts beyond those of the DEIS/DEIR Stoughton Electric Alternative.

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5 Conclusion

The purpose of this analysis was to address concerns raised related to the evaluation of the Rapid Bus Alternative in the DEIS/DEIR. The concerns included:

- *Performance*: Travel speed was identified as too slow. The slow travel speed did not make the alternative competitive with rail.
- *Congestion*: The alternative was subjected to congestion "hot spots," which would affect its projected travel time and reliability.
- *Ridership*: Ridership on the Rapid Bus Alternative was noted as being lower than the Commuter Rail alternatives.

In order to address these concerns and improve the alternative so it is more competitive with rail, operational and infrastructure improvements were identified and evaluated in terms of cost and impacts. The Modified Rapid Bus Alternative was developed to reduce travel times, provide additional regional connections, and increase reliability in order to attract greater ridership.

This evaluation found that the Modified Rapid Bus Alternative would not practicable for the following reasons:

- It is infeasible to construct a fully exclusive bus lane all the way into Boston;
- The Modified Rapid Bus Alternative must use a section of existing highway system that is subject to heavy congestion and is vulnerable to significant delays, which impact the alternative's reliability (and would ultimately affect ridership);
- Additional investment would not result in additional ridership;
- Operating and maintenance costs would be almost three time that of the DEIS/DEIR Stoughton Electric Alternative; and
- The wetland impacts are greater than that of the DEIS/DEIR Stoughton Electric Alternative with fewer air quality benefits.

For these reasons, the finding in this evaluation suggest that the Modified Rapid Bus Alternative be removed from further South Coast Rail project consideration.

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Figures

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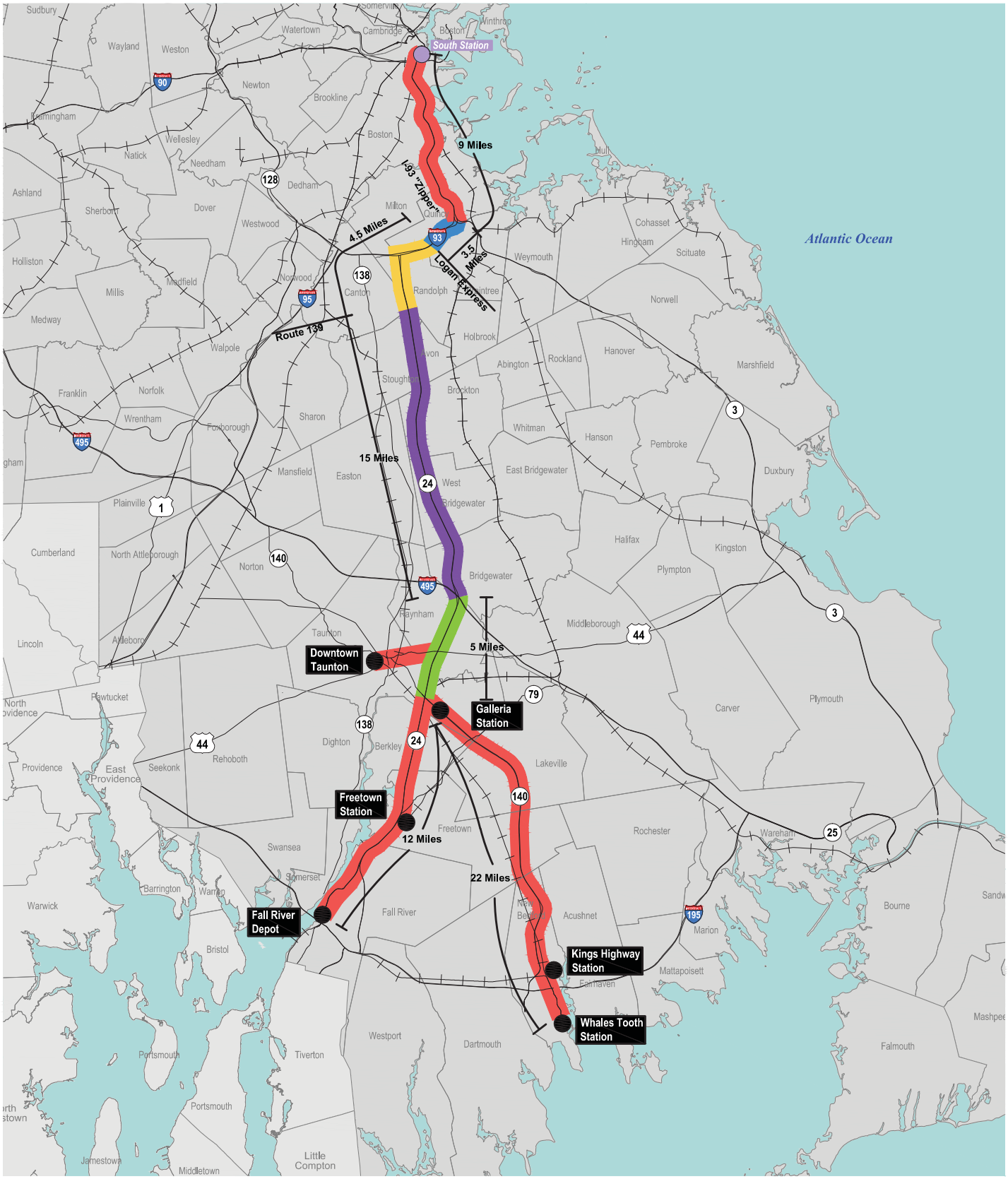

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SOUTH COAST RAIL

Legend

- No Change
- Expand from 2 to 3 Lanes in Each Direction Bus Uses GP Lanes
- Permanent Reversible (Bus Only in Median)
- Two-Way (Bus Only) in Median
- One-Way Contra-Flow Zipper Lane

0 3.5 7 Miles

Figure 1
DEIS/DEIR Rapid Bus Alternative

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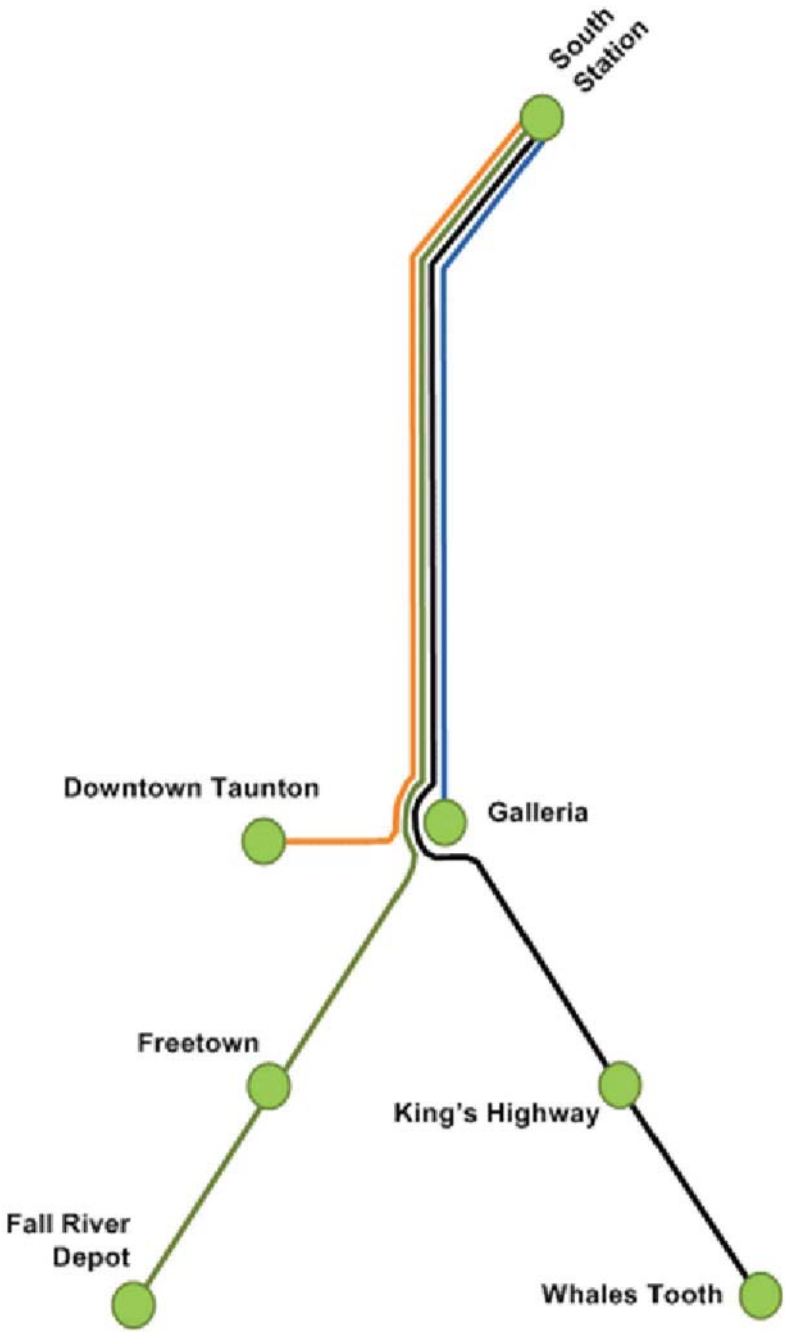

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Figure 2
DEIS/DEIR Rapid Bus Routes

Not to Scale

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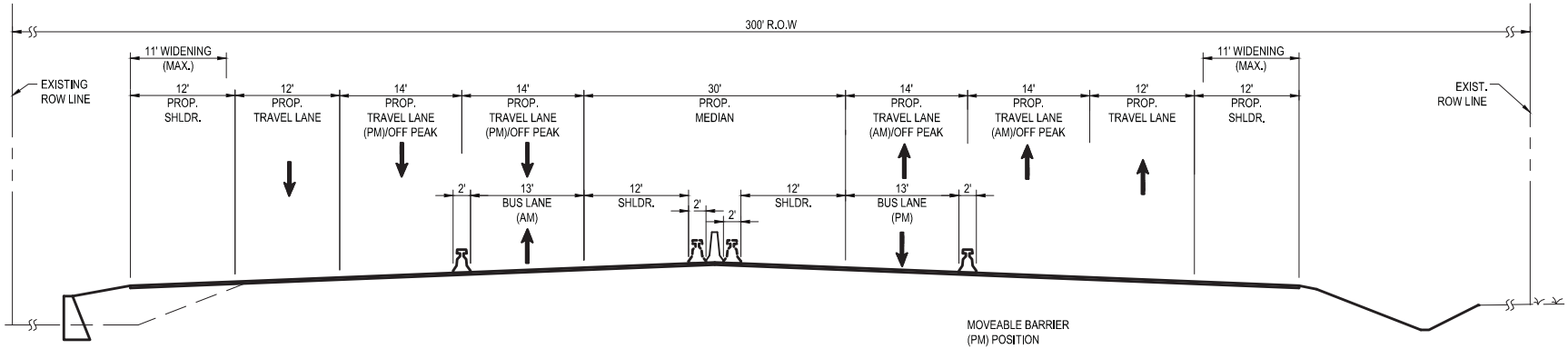
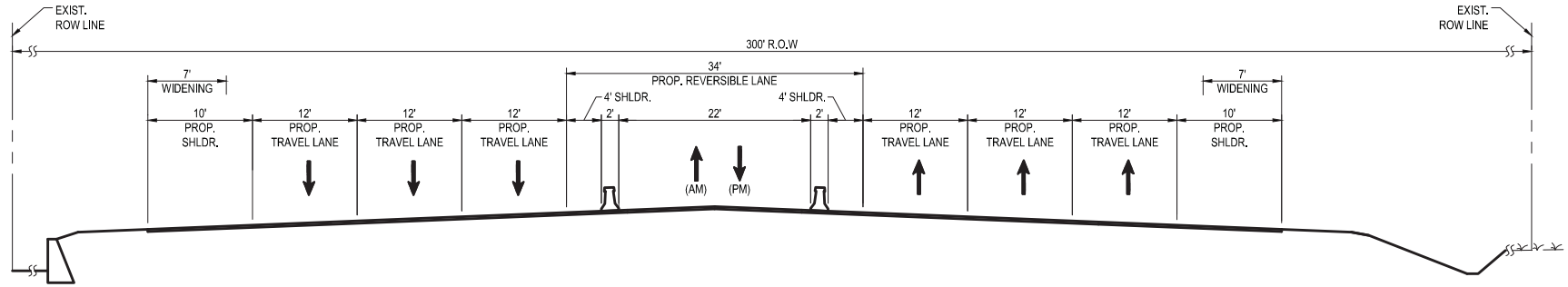
ROUTE 24



DEIS/DEIR PROPOSED TYPICAL SECTION
N.T.S.



MODIFIED RAPID BUS ALTERNATIVE
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Figure 3
Route 24 Cross-Section

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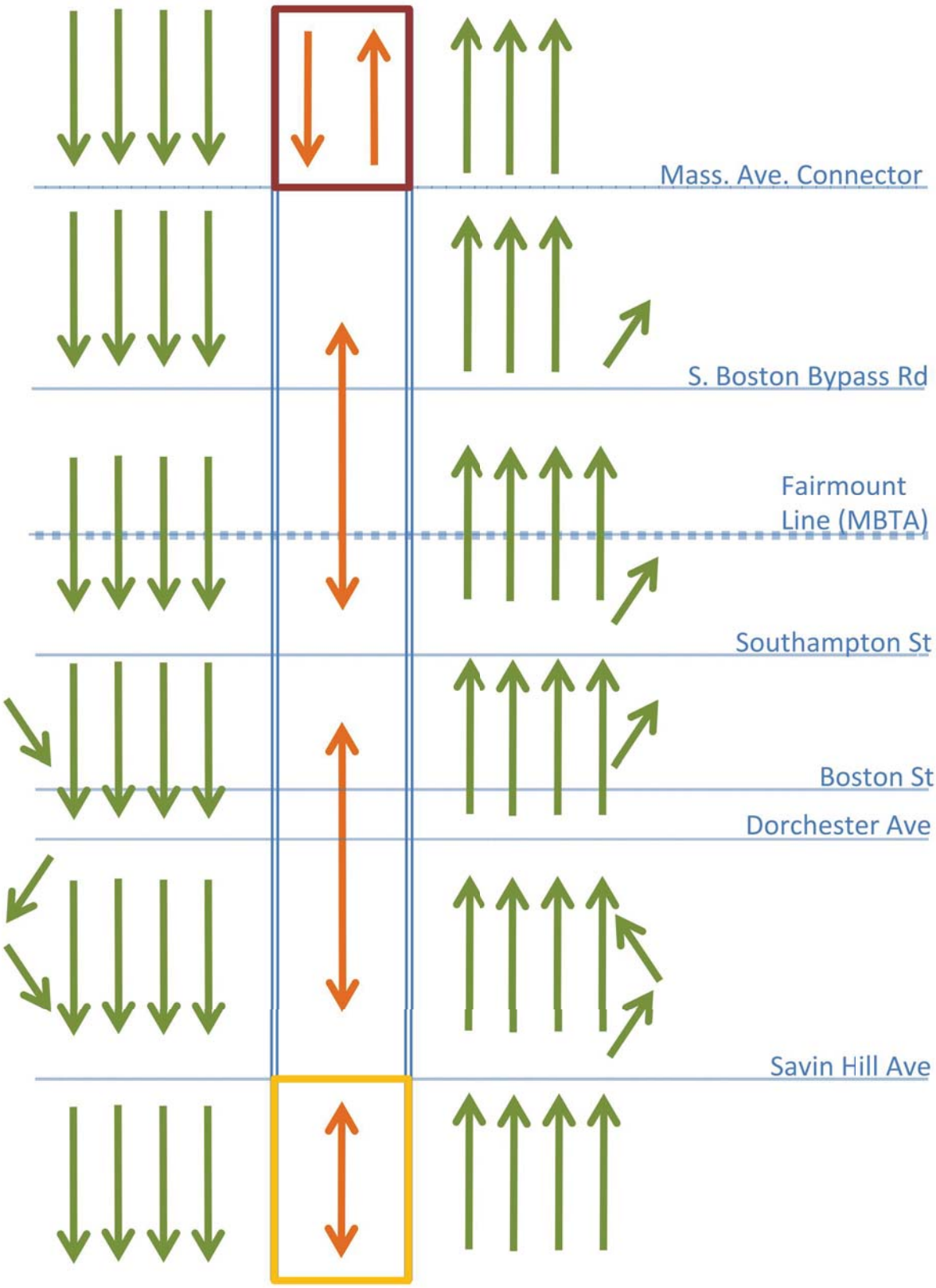

Figure 4
Configuration and Operation of Alternative 1, "Commitment"

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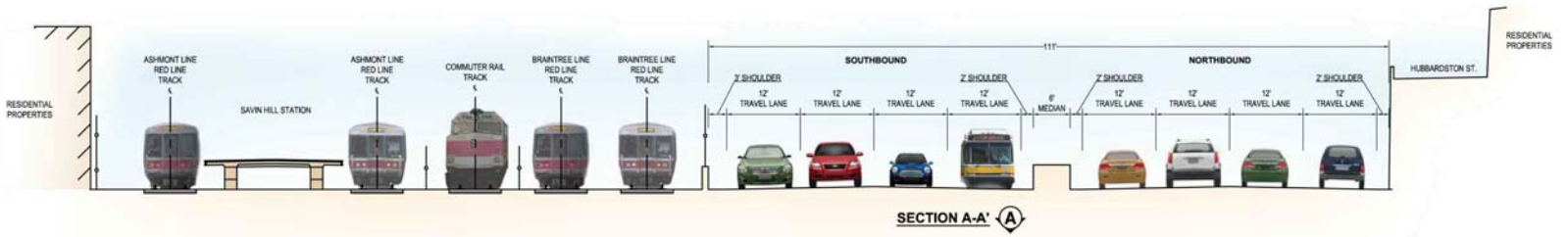

Savin Hill Neighborhood

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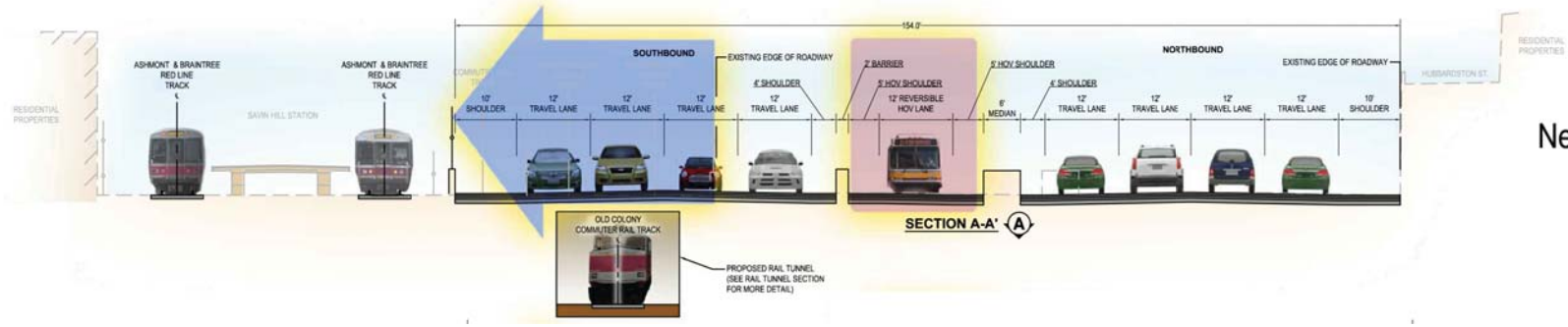

Savin Hill Neighborhood

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Figure 5
Savin Hill Cross-Section, Alternative 1, "Commitment"

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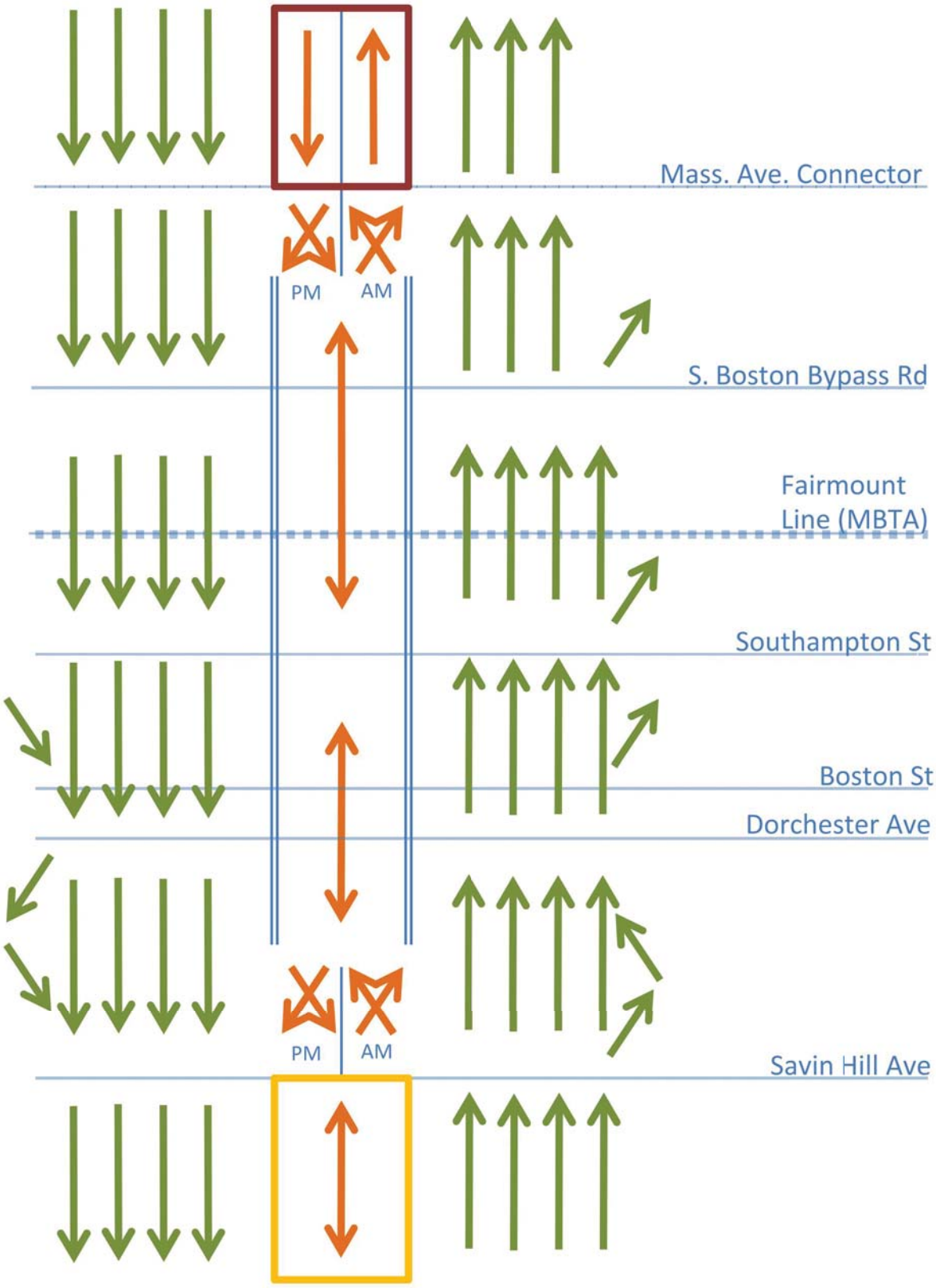

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Figure 6
Configuration and Operation of Alternative 2, "Maintain Exit at Savin Hill"

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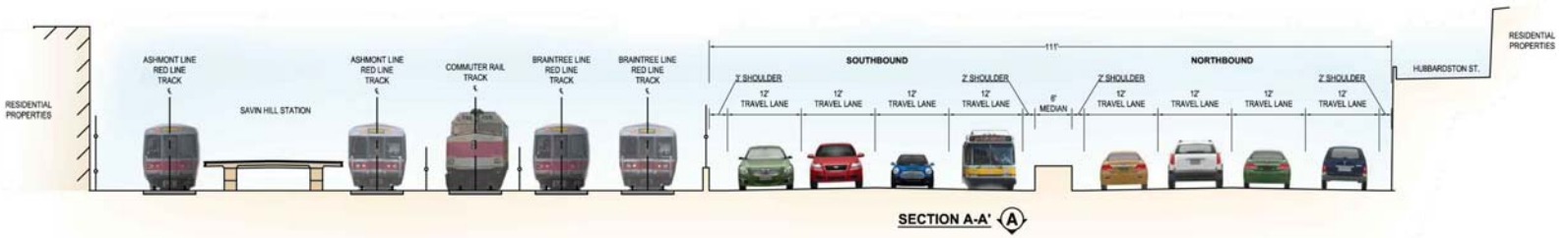

Savin Hill Neighborhood

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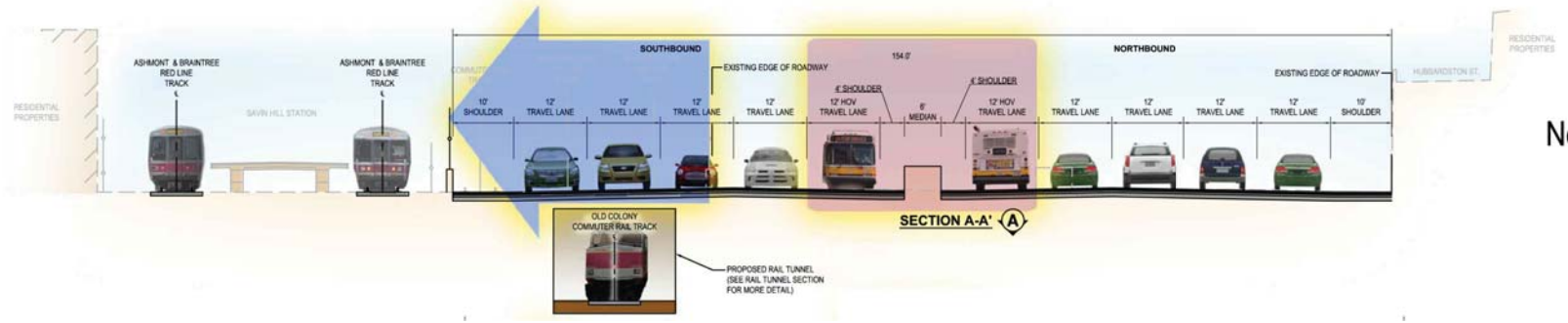

Savin Hill Neighborhood

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Figure 7
Savin Hill Cross-Section, Alternative 2, "Maintain Exit at Savin Hill"

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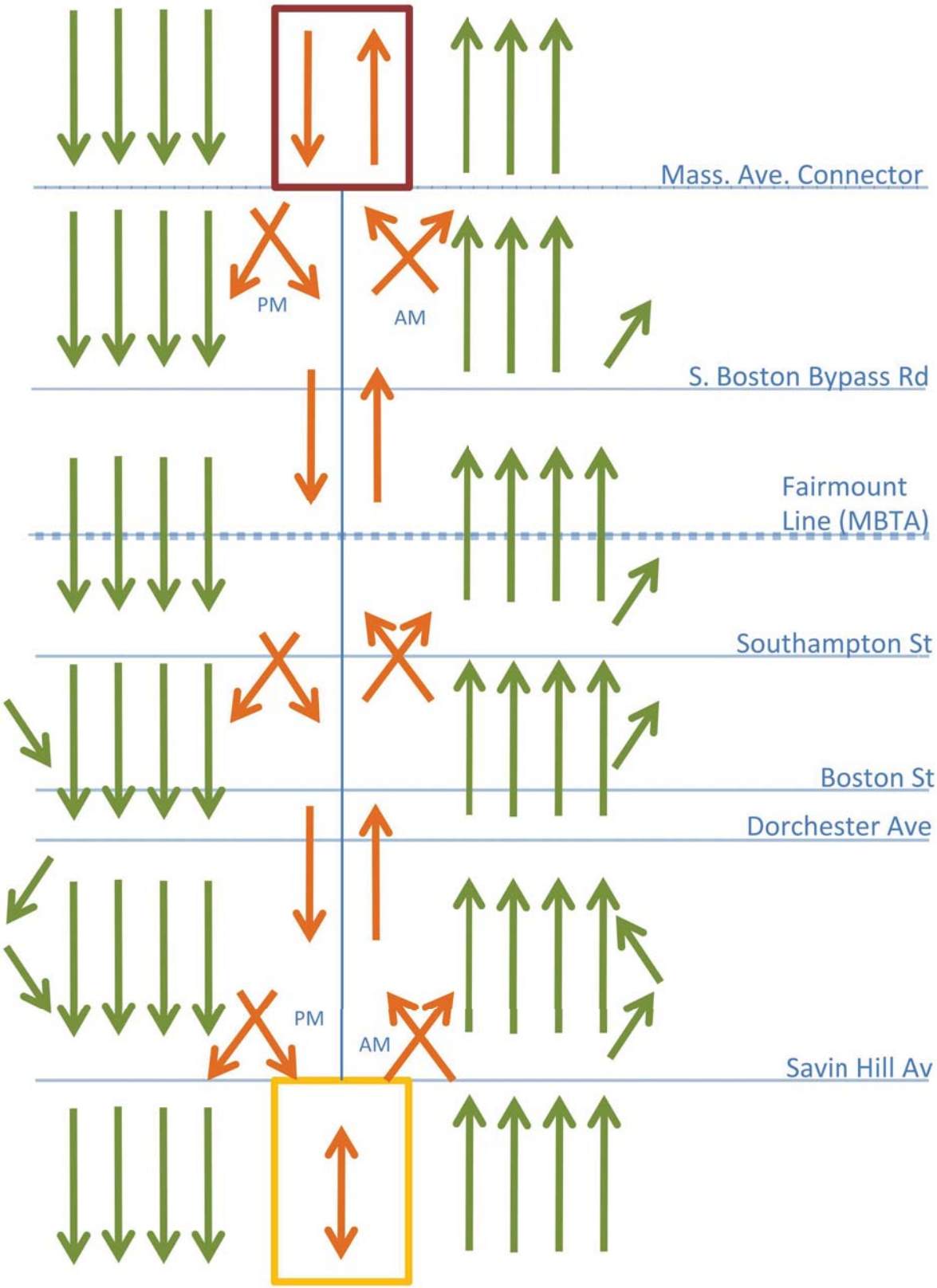

Figure 8
Configuration and Operation of Alternative 3, "HOV Lanes in Both Directions"

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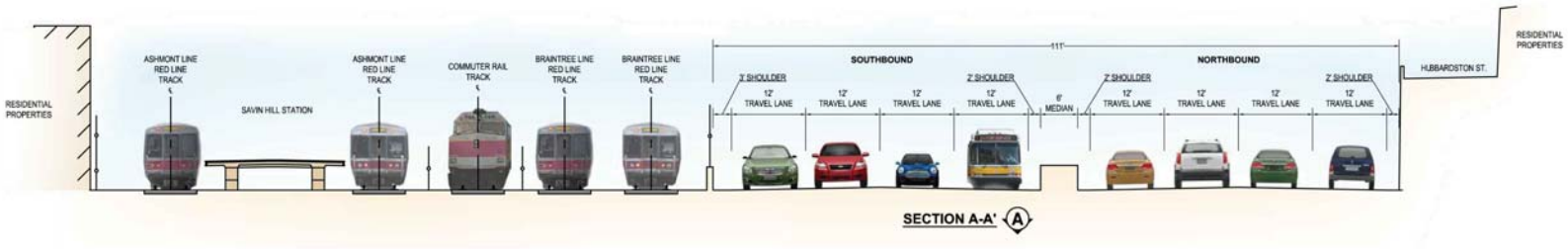

Savin Hill Neighborhood

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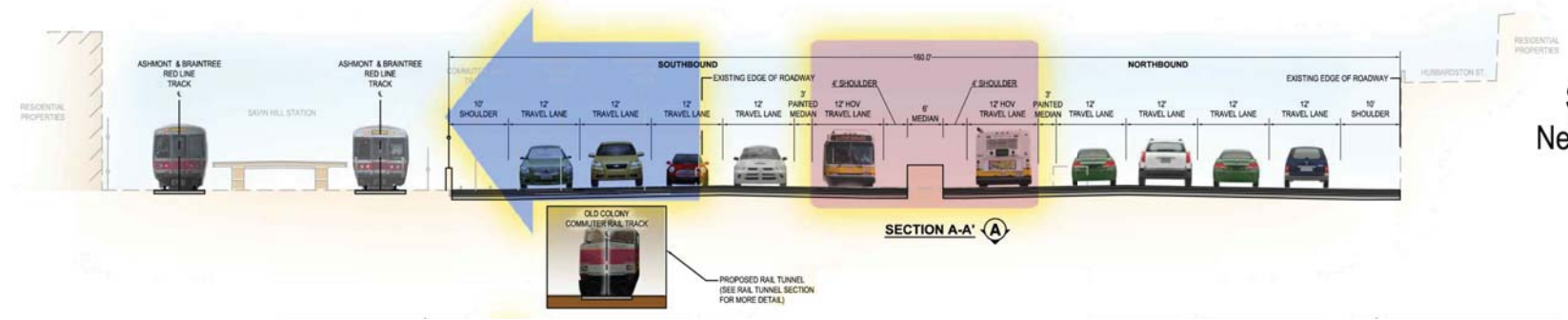

Savin Hill Neighborhood

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Figure 9
Savin Hill Cross-Section, Alternative 3, "HOV Lanes in both Directions"

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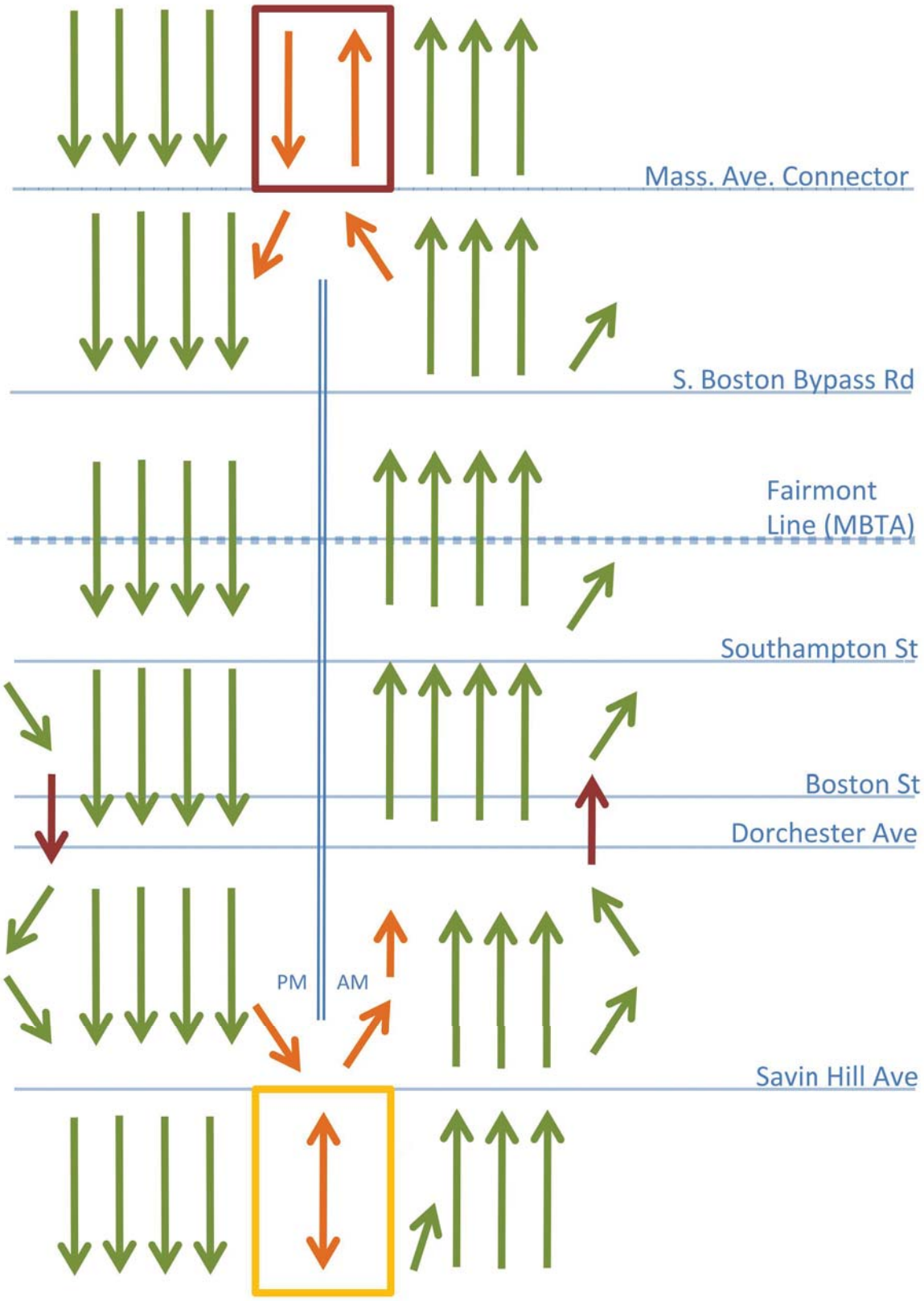

Figure 10
Configuration and Operation of Alternative 4, "Minimalist"

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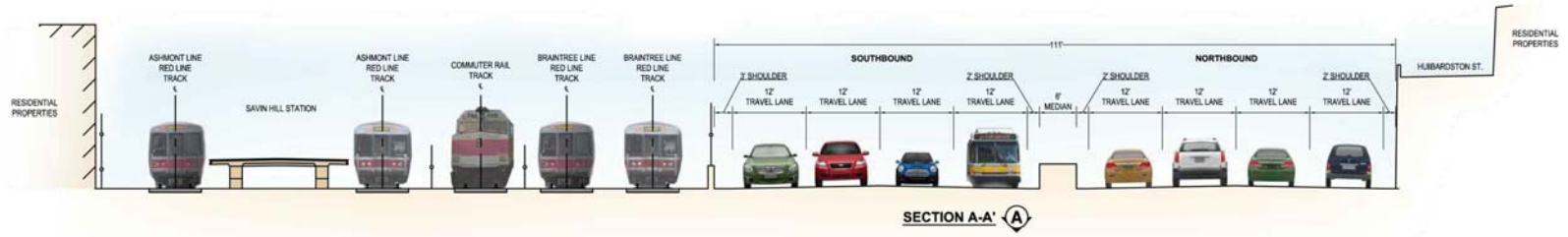

Savin Hill Neighborhood

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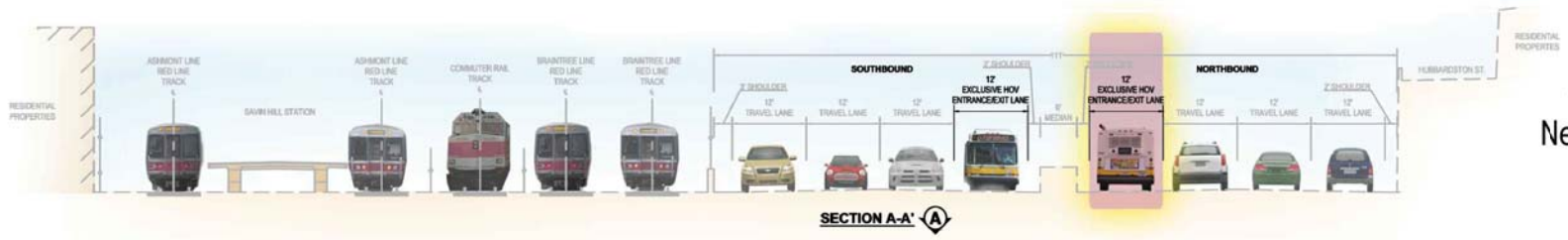

Savin Hill Neighborhood

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SOUTH COAST RAIL

Figure 11
Savin Hill Cross-Section, Alternative 4, The "Minimalist"

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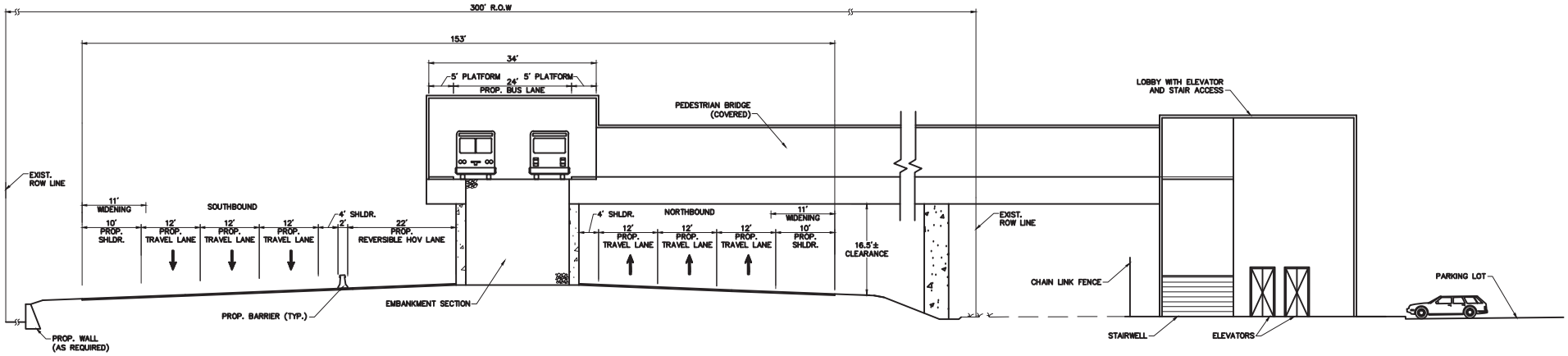

Figure 12
In Line Station
Typical Cross Section

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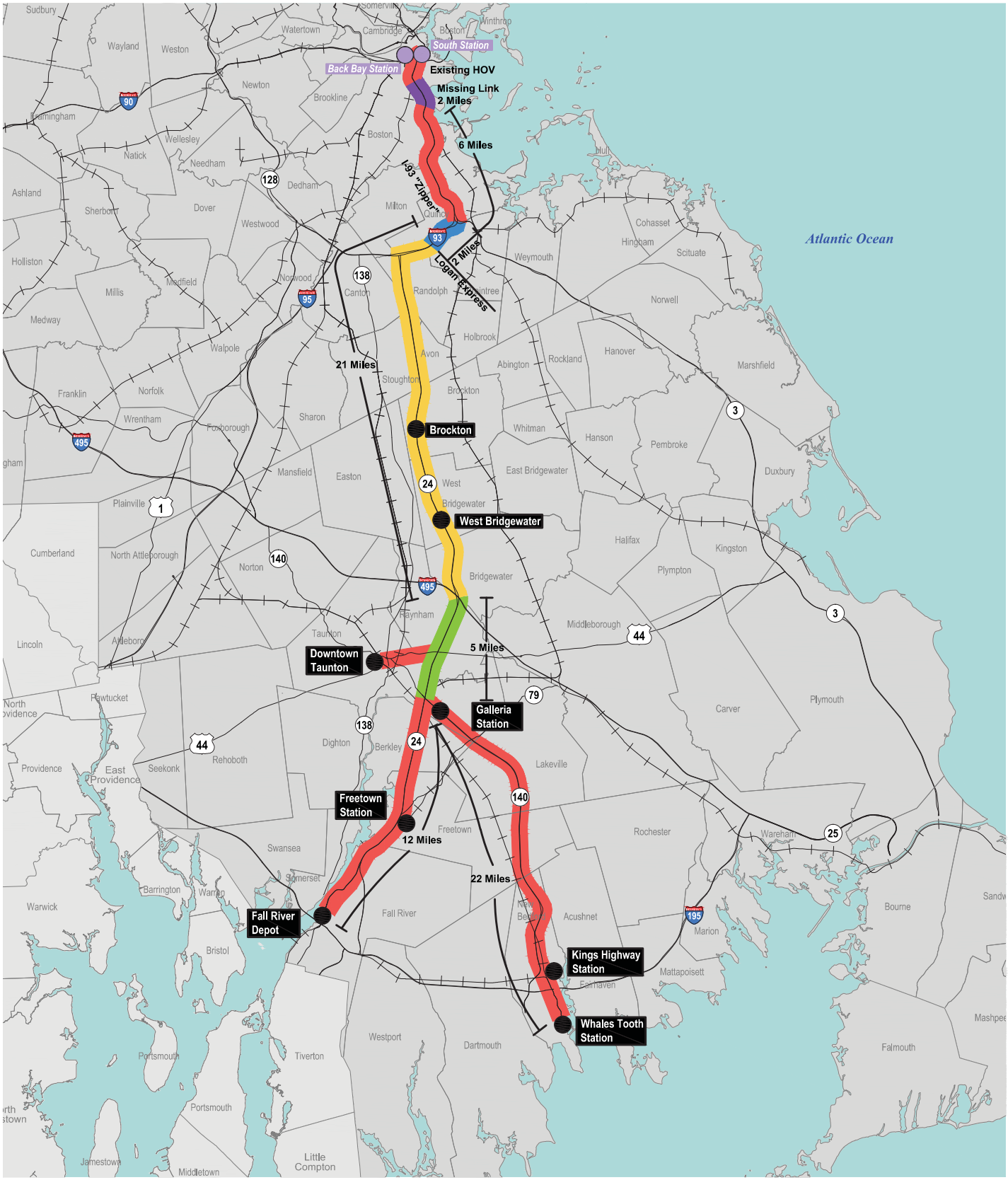

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SOUTH COAST RAIL

Legend

- No Change
- Expand from 2 to 3 Lanes in Each Direction Bus Uses GP Lanes
- Permanent Reversible (Bus Only in Median)
- Two-Way (Bus Only) in Median
- "Missing Link" (See Figures)

0 3.5 7 Miles

Figure 13
Modified Rapid Bus Alternative

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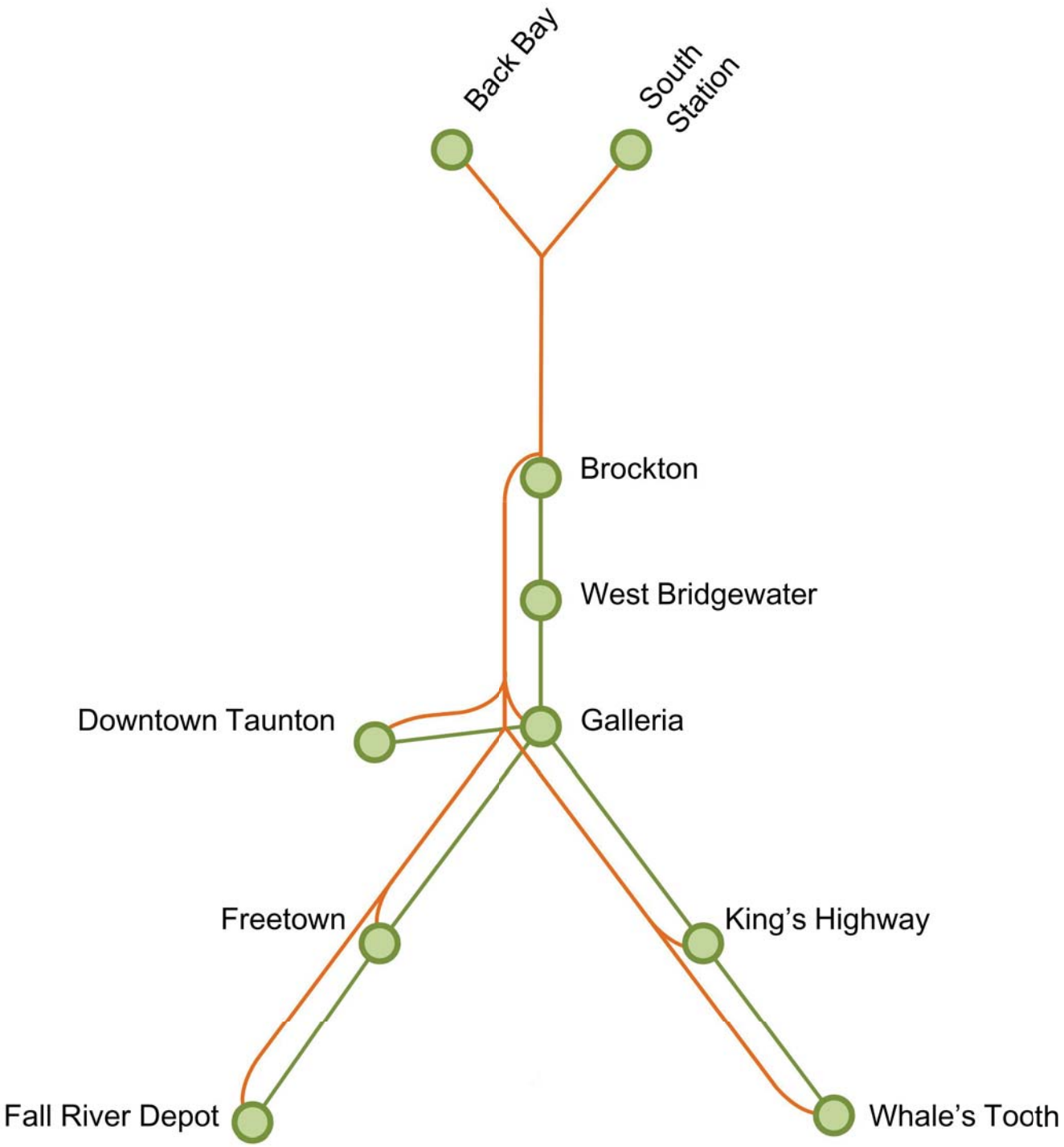

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SOUTH COAST RAIL

Figure 14
Modified Rapid Bus Service Plan

Not to Scale

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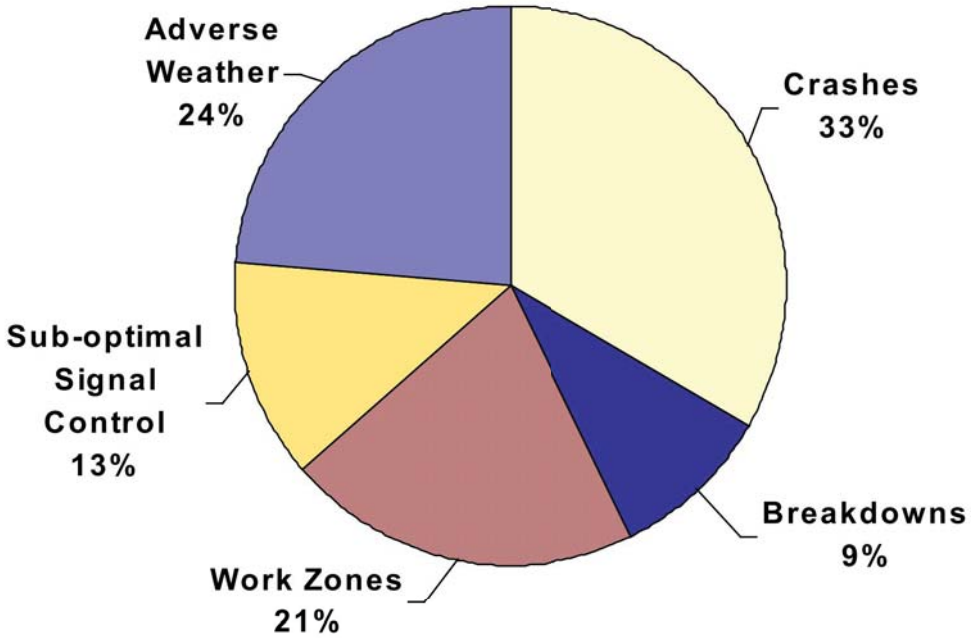

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SOUTH COAST RAIL

Figure 15
Types of Incidents that Cause Delay on a Highway

Not to Scale

Source: "Temporary Losses of Highway Capacity and Impact on Performance" University of Tennessee, March 2002

Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Modified Rapid Bus

Appendices and Back Up Documentation

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116

Prepared by

99 High Street, 10th Floor
Boston, Massachusetts 02110

June 2012

List of Appendices

A ..... Station Siting Analysis

B ..... Feeder Bus Service Analysis

C ..... VISSIM Traffic Simulation Analysis

D ..... I-93 "Missing Link" Design Alternatives

E ..... Back Bay Connection Analysis

F ..... Environmental Analysis

G ..... Modified Rapid Bus Service Plan and Operating and Maintenance Cost Methodology

H ..... Ridership Methodology (to come from CTPS)

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix A: Station Siting Analysis

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June 2012

Table of Contents

Table of Contents i

List of Tables ii

List of Figures ii

Introduction 1

Station Design and Evaluation 1

2.1 Introduction 1
2.2 Option 1: At Grade Exit and Entrance 2
2.3 Option 2: Flyover Exit and Entrance Ramps 3
2.4 Option 3: Slip Ramps 4
2.5 Option 4: In-Line Station 6
2.6 Conclusions 9

Selection of Station Locations 1

Capital Costs 1

Figures 2

List of Tables

Table No.	Description	Page
1	Commuter and Rapid Bus Stations	1
2	Evaluation of the Options -Station Options Performance Characteristics	9

List of Figures

Figure No.	Description	Page
1	Option 1 - At Grade Exit and Entrance	2
2	Option 2 - Rapid Bus Flyover Lanes	3
3	Option 3 - Rapid Bus Slip Ramps	5
4	Example of Median Slip Ramp	5
5	Option 4 - In-Line Stations over Route 24	7
6	Elevated BRT Station	7
7	Ottawa BRT Station Entrance	8
8	Existing Park and Ride Locations	15
9	Brockton In-Line Station, Rapid Bus Alternative	16
10	West Bridgewater In-Line Station, Rapid Bus Alternative	16
11	Brockton In-Line Station, Property Acquisitions	16
12	West Bridgewater In-Line Station, Property Acquisitions	16

1 Introduction

This memorandum addressed comments received on the DEIS/DEIR for the South Coat Rail Project that stated that the poor performance of the Rapid Bus Alternative was due to:

- Relatively few stations served
- Longer transfer times between the rapid bus transit lines
- Few new stations provided in growth areas
- Lack of intra-regional connectivity/no intermediate stations

Six Rapid Bus stations were included in the DEIS/DEIR as shown in Table 1.

Table 1 Commuter and Rapid Bus Stations

Commuter Rail	Rapid Bus
Whales Tooth	Whales Tooth
King's Highway	King's Highway
Fall River Depot	Galleria
Freetown	Fall River Depot
Dean Street	Freetown
Raynham Park	Taunton Depot
North Easton	
Easton Village	

This report identifies potential Rapid Bus Stations in the vicinity of North Easton and Easton Village which would serve growth areas north of Taunton and along Route 24.

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2

Station Design and Evaluation

2.1 Introduction

In order to identify suitable locations for the station locations, a typical station footprint was developed. Four potential station access design options were considered:

- **Option 1:** At-grade Exit and Entrance (buses access station by exiting busway and crossing mixed traffic lanes)
- **Option 2:** Flyover Exit and Entrance (buses access station by via direct ramp from busway into station site)
- **Option 3:** Slip Ramps (buses access station via busway slip ramps from / to existing overpasses)
- **Option 4:** In-line station (buses access station located directly within busway)

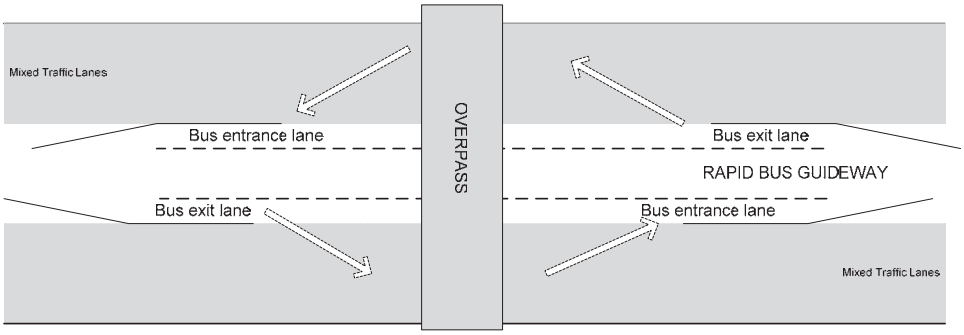
The four options were evaluated on the basis of five factors:

- **Bus Operations:** The operating environment provided the Rapid Buses
- **East of Transfers:** The directness of transfers to the Rapid Bus system
- **Traffic Impacts:** The potential traffic impacts of the options
- **Right-of-Way Required:** The additional land needed to accommodate the access option
- **Interchange reconstruction:** Whether the option would entail reconstruction of existing interchanges

2.2 Option 1: At Grade Exit and Entrance

The least expensive method of getting buses to and from the guideway would be to have them exit across the mixed traffic lanes and return in the same manner. Stations would be located off-alignment, on a site that is available nearby. Buses would access them by exiting the guideway, weaving across multiple lanes of traffic on Route 24 and then traveling on the local road system to the station.

Figure 1 Option 1 - At Grade Exit and Entrance



Bus Operations

The risks of delays and schedule disruptions associated with crossing mixed traffic on Route 24 and navigating local roads with this option would be significant.

Ease of Transfers/Station Access

Rapid Bus patrons would be able to easily access stations and transfer to local buses. However, locating stations away from the Rapid Bus guideway would add time to trips and introduce the risk of delays due to local traffic.

Traffic Effects

There would be significant traffic effects on the highway system caused by buses entering and existing to access the system. The effects to local roads would be minimal and could be lessened with Transit Signal Priority (TSP) treatments for buses.

Right-of-Way Required

Acceleration and deceleration lanes would be required to access and depart the Rapid Bus guideway. The 2 lane widths of additional widening would be in addition to the width needed for the guideway itself.

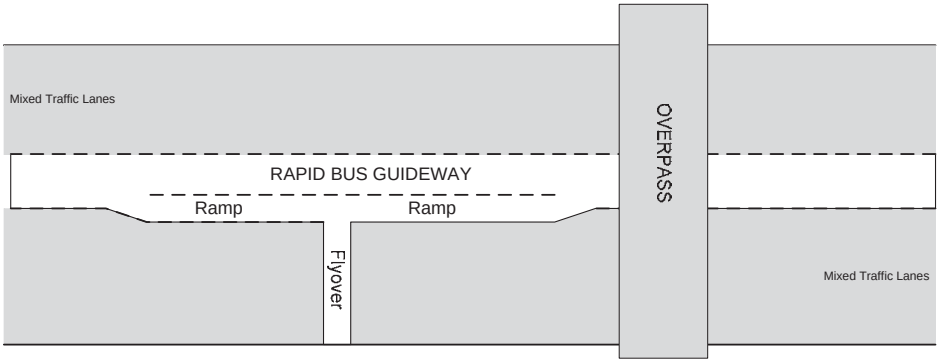
Interchange Reconstruction

This option would not require reconstruction of existing interchanges.

2.3 Option 2: Flyover Exit and Entrance Ramps

Option 2 would include the construction of ramps parallel to the Rapid Bus Guidway, connecting with a new overpass / flyover that would connect either to a station off or immediately adjacent to the existing guidway (depending on the availability of land). Buses would access the stations by exiting the guideway via the new ramps, which would either connect directly with the station or with the local road system (connecting to the station).

Figure 2 Option 2 - Rapid Bus Flyover Lanes



Bus Operations

Option 2 would eliminate the delay and operational problems associated with the merging with highway traffic in Option 1. If an off-alignment station is used in conjunction with this alternative, the delays associated with accessing the station via the local road network would be significant.

Ease of Transfers/Station Access

Rapid Bus patrons would be able to easily access stations and transfer to local buses. If an off-alignment station is used with this option, this would add time and potentially delays to trips.

Traffic Impacts

There would be no impact to highway traffic. If an off-alignment station is used there would be minimal impacts which could be lessened with Transit Signal Priority (TSP) treatments for buses.

Right-of-Way Required

One lane width would be added to the Rapid Bus guideway for the ramp in the median of Route 24. Depending on the direction of traffic in the Rapid Bus guideway, this ramp would be reversed to provide access in the opposite direction. The amount of additional land required for the ramps connecting with the parking area would vary based on site conditions. It is unlikely these ramps could be located adjacent to interchange ramps as they would have to pass over those before descending to grade.

Interchange Reconstruction

This option would require construction of ramps at either end of the flyover as well as construction of a new flyover across mixed traffic lanes. While this would not impact existing interchanges it would require a significant amount of construction.

2.4 Option 3: Slip Ramps

Option 3 would be a variant of Option 2. Ramps would be constructed that connect the Rapid Bus guideway with an existing overpass. Stations would be located off-alignment, on an available site nearby. Buses would access them by exiting the guideway via ramps and then traveling on the local road system.

Figure 3 Option 3 - Rapid Bus Slip Ramps

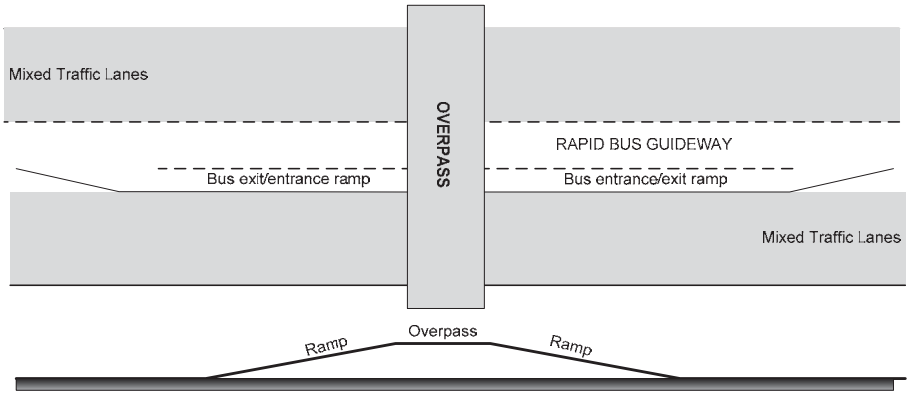


Figure 4 Example of Median Slip Ramp

Bus Operations

The delays associated with accessing the station via the local road network would be significant.

Ease of Transfers/Station Access

Rapid Bus patrons would be able to easily access stations and transfer to local buses. However, locating stations away from the Rapid Bus guideway would add time to trips and introduce the risk of delays due to local traffic.

Traffic Impacts

The effects to local roads would be minimal and could be lessened with Transit Signal Priority (TSP) treatments for buses.

Right-of-Way Required

Because only a single additional lane of width to the Rapid Bus guideway the added width of right-of-way would be limited.

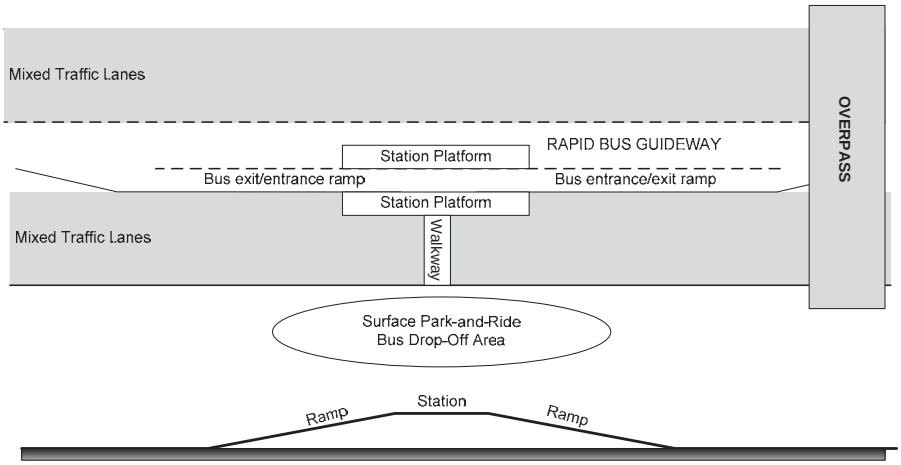
Interchange Reconstruction

While this option would be significantly simpler in terms of the construction required, it would entail creating an intersection in the middle of the existing overpass, most likely with a traffic signal to enable bus access/egress from the ramp into/from the overpass traffic. This would require reconstruction of the overpass.

2.5 Option 4: In-Line Station

This option would construct stations in the median of Route 24 (above mixed traffic/the Rapid Bus guideway). A ramp would be constructed that would provide a connection between the guidway and the station. A pedestrian only connection/overpass would be also be constructed to connect with a parking lot located adjacent to the highway.

Figure 5 Option 4 - In-Line Stations over Route 24



The following figures show an entrance to a BRT station in Ottawa, Canada and an elevated BRT Station in HuoCheZhan China.

Figure 6 Elevated BRT Station

Figure 7 Ottawa BRT Station Entrance

Bus Operations

Option 4 would provide buses with the most direct and shortest possible routing to each station. There would be no traffic interactions, eliminating both routine delays and the risk of occasional serious delays.

Ease of Transfers

While buses would have excellent access to the station platform, patrons transferring from other buses or arriving to the station on their own would have to walk from the drop-off or parking areas via a walkway over the roadway. Depending on the specifics of the site this could range from about 100 feet, which would be convenient, to greater distances. The transfers could be relatively convenient but site conditions could negatively affect transfers if a site immediately adjacent to the roadway is not available.

Traffic Impacts

Option 4 would have no traffic impacts as it would involve no surface street operations.

Right-of-Way Required

Option 4 would require only one lane width of additional median width.

Interchange Reconstruction

No interchange reconstruction would be required as this option would be implemented away from any interchange.

2.6 Conclusions

Table 2 summarizes the performance of the four options.

Table 2 Evaluation of the Options -Station Options Performance Characteristics

Factor	Option 1 At-Grade	Option 2 Flyover	Option 3 Slip Ramp	Option 4 On Line Median
Bus Operations	Poor	Fair	Fair	Very Good
Ease of Transfers	Fair	Good	Fair	Very Good
Traffic Impacts	Very Poor	Very Good	Poor	Very Good
Right-of-Way Required	Very Good	Poor	Good	Very Good
Interchange Reconstruction	Very Good	Fair	Very Poor	Very Good

Based on this analysis, only Option 4 is recommended to be kept. Only Option 4 avoids all of the negatives and is rated as Very Good for each. This analysis resulted in the determination that the in-line station design provided the best design for the following reasons:

- It provides the most efficient and fastest operation for the buses, avoiding delays associated with leaving the Rapid Bus Guideway and potential delays due to operating on surface streets.
- It provides the most convenient access for transit riders, providing access via elevator and a pedestrian overpass to the station platforms.
- It minimizes the footprint of the stations and avoids potential wetland impacts as it would by-and-large be constructed within an existing transportation right-of-way.

- It would avoid the need to reconstruct existing interchanges or construct new interchanges, a significant cost savings.

In –Line Station Structures and Operations

The in-line bus stations would be elevated side-platform stations in the median of Route 24. The stations would be 220 feet long, 34 feet wide, and 22 feet high. Two ramps would provide a connection between the permanent reversible bus lane and the station. The ramps would parallel the highway and would be 700 feet long and 34 feet wide and rise at an average gradient of 3%. Both the station and ramps would be constructed on retained fill. Approaching the ramps from the reversible busway, there would be two 1,000 feet long, 22 feet wide acceleration and deceleration lanes. The total width needed to accommodate the in-line stations and rapid bus lanes at the surface of the roadway would be 52 feet, 26 feet wider than the width needed for the rapid bus guideway alone.

A covered pedestrian walkway with lighting and dynamic signage would be constructed over the northbound side of Route 24 and would connect the station to a bank of elevators / stairs on the other side of the highway. This bank of elevators / stairs would be located adjacent to a field of parking with access to the local road-way system.

In the peak direction, buses stopping at the station would leave the reversible busway via the access ramps and stop at the Rapid Bus Station. Depending on the direction of travel, passengers would board / alight from either the left or right-hand platform. Passengers would be allowed to cross the bus travel lane to access the pedestrian walkway to the parking area. Upon departing the station, buses would travel via the second ramp, accelerate and rejoin the reversible busway.

In the midday and evening, time will be required to change direction of the reversible lane. The lane would be closed, all buses would be cleared, and then it would be prepared for operation in the reverse direction. This alternative therefore assumes that the permanent reversible lane on Route 24 and the in-line stations would not be accessible in the midday and nighttime service periods. During those periods, the Rapid Bus would use the general purpose lanes and passengers would board / alight at the adjacent park and ride facilities.

.

3

Selection of Station Locations

Potential station locations were identified by evaluating existing park and ride locations based on the following:

- Proximity to an existing Route 24 interchange
- Availability of vacant land
- Suitability of the site for a in-line station footprint

The seven existing Park and Ride Locations in the vicinity of the Rapid Bus guideway are shown in Figure 8.

Of these seven alternative locations, numbers 4 (Raynham Taunton Dog Track), 7 (Raynham at Route 138), and 5 (Union Plaza in Taunton) were dismissed for being too far from the Rapid Bus guideway. Constructing stations at these locations would require diverting buses from further south on local roads, increasing their overall trip times for customers coming from Fall River and New Bedford. Location number 7 (Raynham at Route 138) was eliminated from consideration due to the fact that it is less than 10 miles from the proposed station at Taunton Depot. Locating a station so close to another proposed station would result in an overlap of the catchment area for potential riders and would not maximize the potential number of new riders. This left two potential locations, one at Exit 16 (in West Bridgewater) and one at Exit 18 (in Brockton).

The existing park-and-ride lot at Exit 16 has 185 spaces and is served by Bloom Bus on a 30-minute headway during rush hours. Route 106 passes over Route 24. Exit 18 does not have an existing park-and-ride, although buses pick up riders in the Westgate Mall in front of the Dicks Sporting Goods Store. It is assumed the riders park in the shopping center lot. Both of these locations are close to existing highway interchanges which preclude the use of in-line stations. A visual survey was conducted for vacant land adjacent to the highway and far enough from an interchange that would be suitable for the construction of two potential stations.

The two locations identified were the intersection of West Street and Route 24 for Exit 16, in West Bridgewater, and the intersection of Oak Street and Route 24 for Exit 18 in Brockton. These two locations are shown in Figure 9 and Figure 10. A typical footprint for an in-line station was developed for these two locations and placed with special attention being paid to the location of wetlands and other ecologically sensitive lands. The park and ride for the West Bridgewater station would be provided on all or a portion of parcels 36-19, 36-20, 36-33, 29-005 and the park and ride for the Brockton station would be provided on a portion of parcel 014-001. The West Bridgewater station would be 4.79 acres and able to accommodate approximately 600 parking spaces while the Brockton station would be 2.35 acres and able to accommodate approximately 300 parking spaces. The proposed site of the West Bridgewater station is largely undeveloped, while the proposed site of the Brockton station has been previously developed.

The following two images (Figure 11 and Figure 12) show the wetlands in the vicinity of the two station sites and the proposed layout of the stations.

4

Capital Costs

Information on the capital costs of the proposed in-line stations will be developed further if the Modified Rapid Bus Alternative is advanced in this process. For purposes of order of magnitude estimation, it was assumed that the two stations would cost $15M a piece, and the site work and associated structures (access ramps, parking, etc) would also cost $15M a piece, for a total cost of $55M.

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Figures

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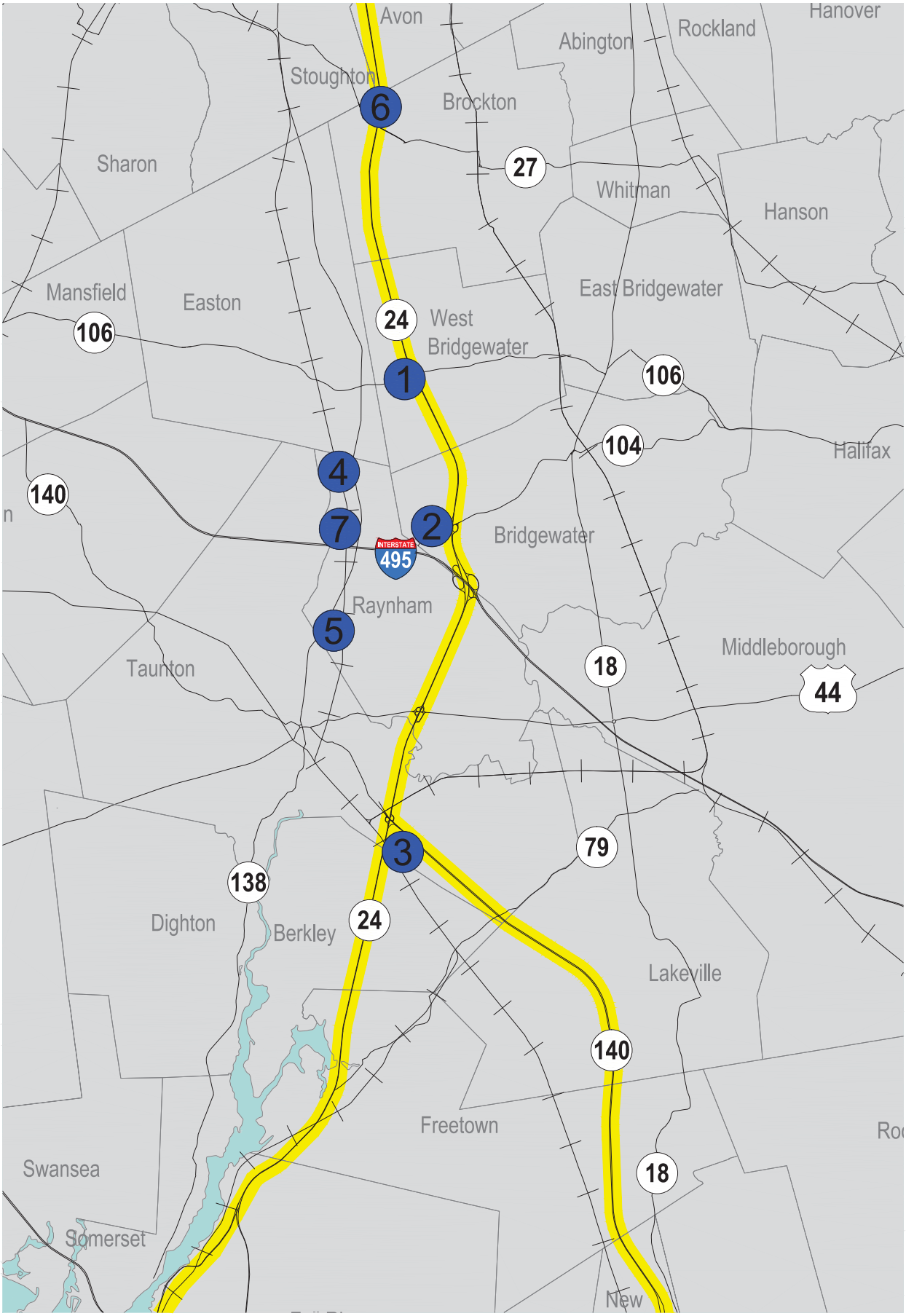

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Legend

1. West Bridgewater P&R
2. Bridgewater at Route 104
3. Taunton Silver City Galleria
4. Raynham Taunton Dog Track
5. Union Plaza in Taunton
6. Brockton at Westgate Mall
7. Raynham at Route 138

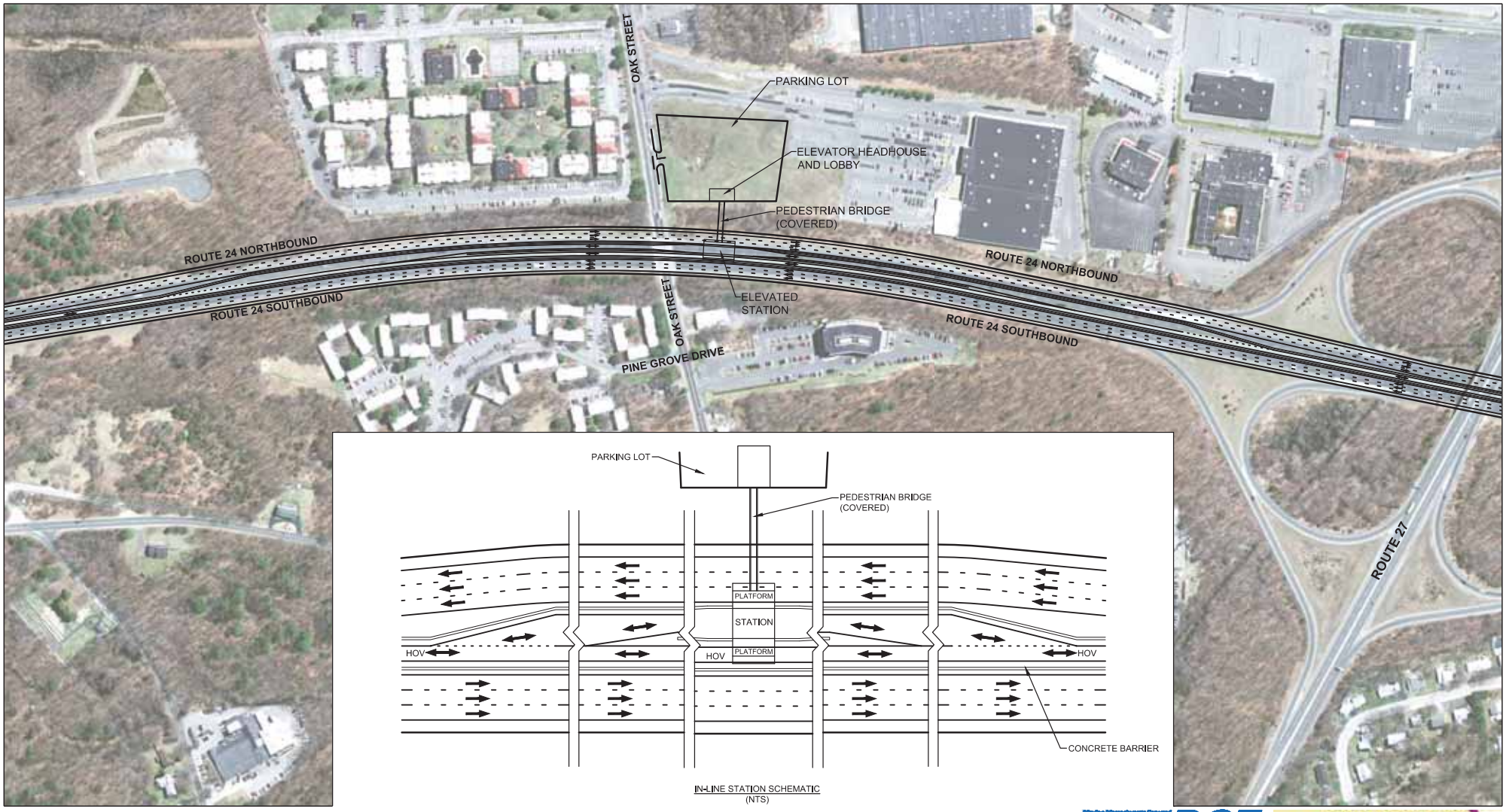
0 1 2 Miles

massDOT

SOUTH COAST RAIL

Figure 8
Existing Park and Ride Locations

Prepared by: VHB



IN-LINE STATION SCHEMATIC
(NTS)

0 150 300 Feet

massDOT

SOUTH COAST RAIL

Figure 9
Brockton In-Line Station
Rapid Bus Alternative

Prepared by: VHB

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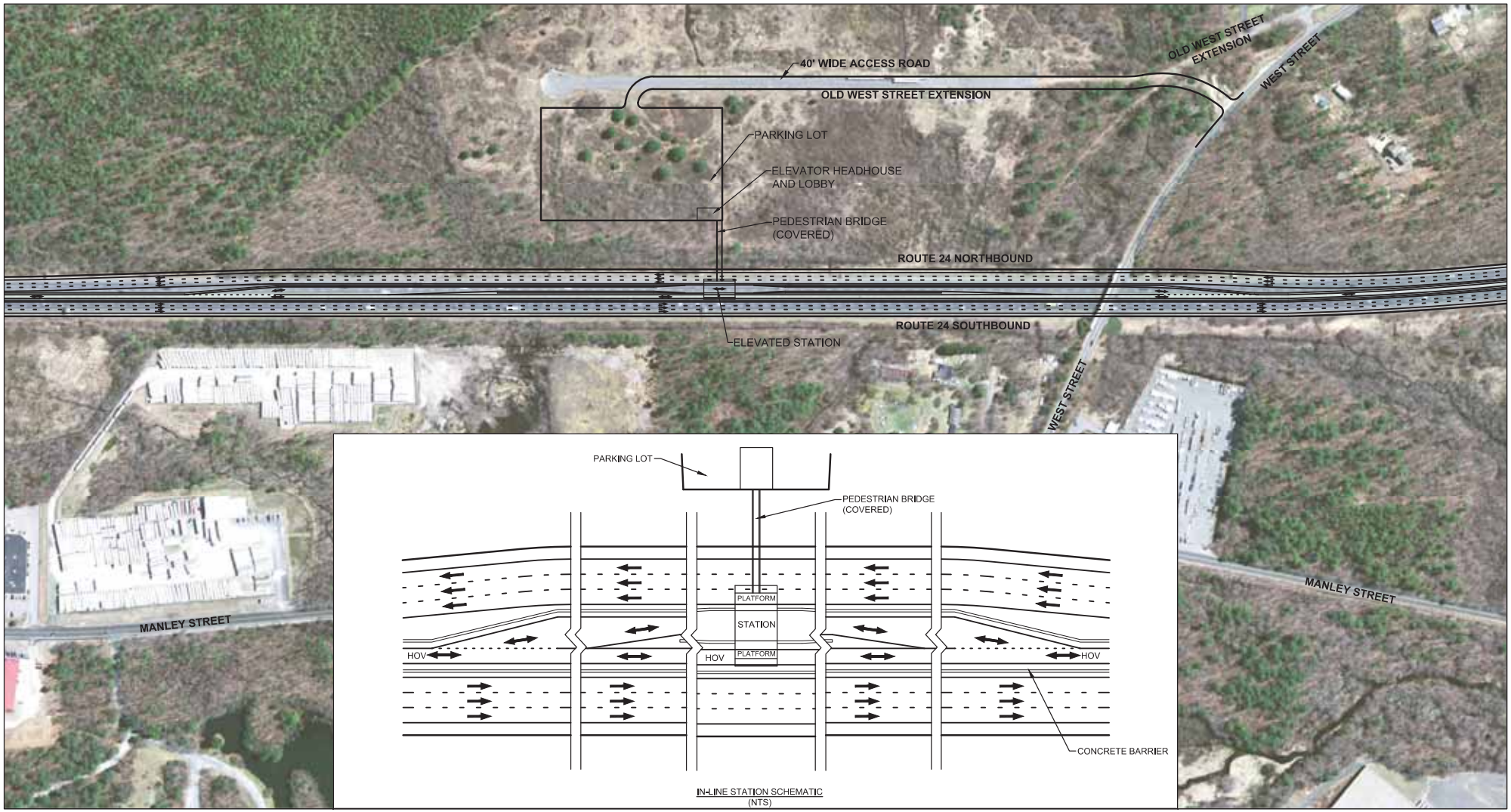

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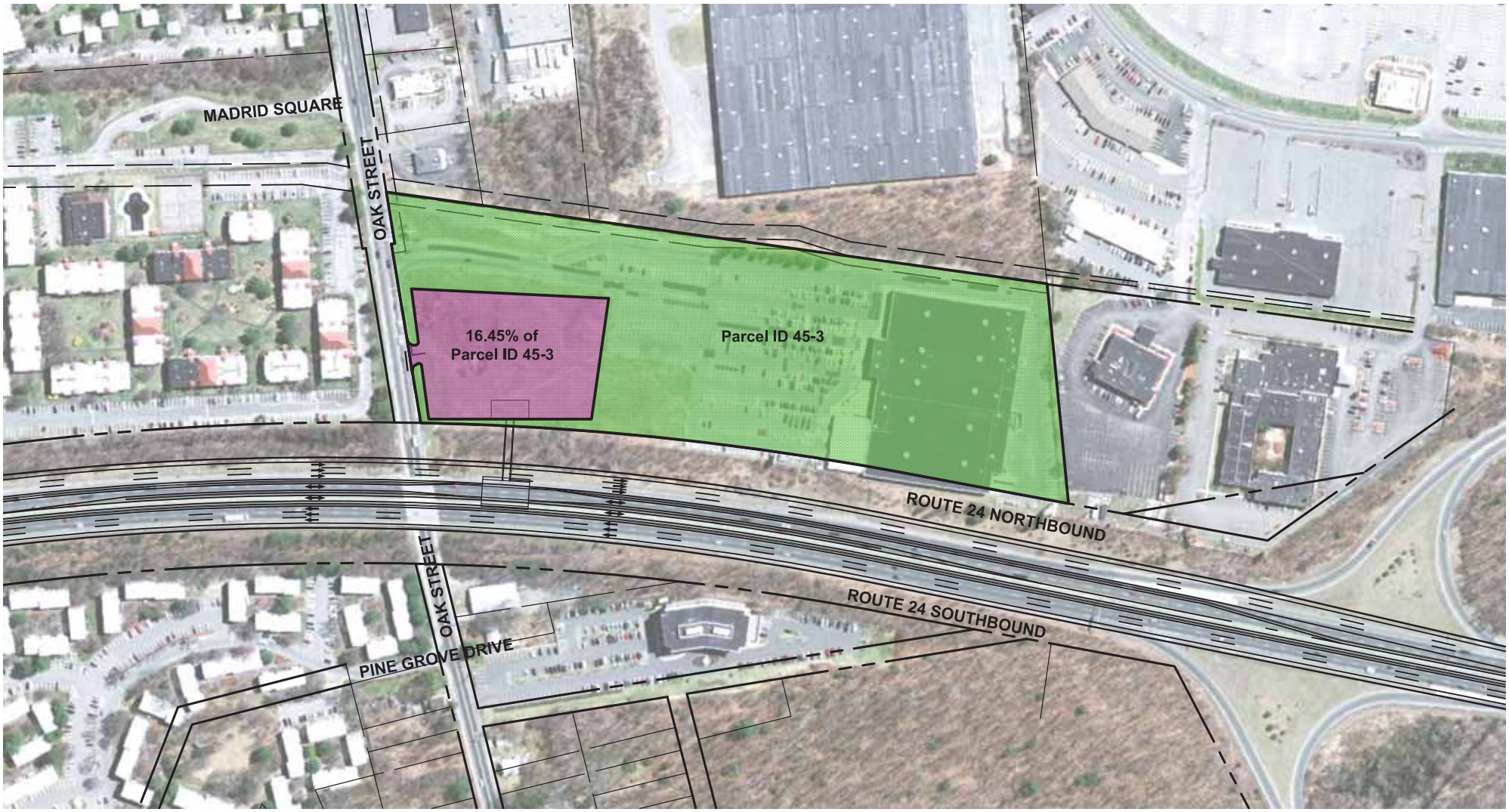
SOUTH COAST RAIL

0 150 300 Feet

Figure10
West Bridgewater In-Line Station
Rapid Bus Alternative

Prepared by: VHB



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Legend

- *Impacted Parcel*
- *Taking Area*

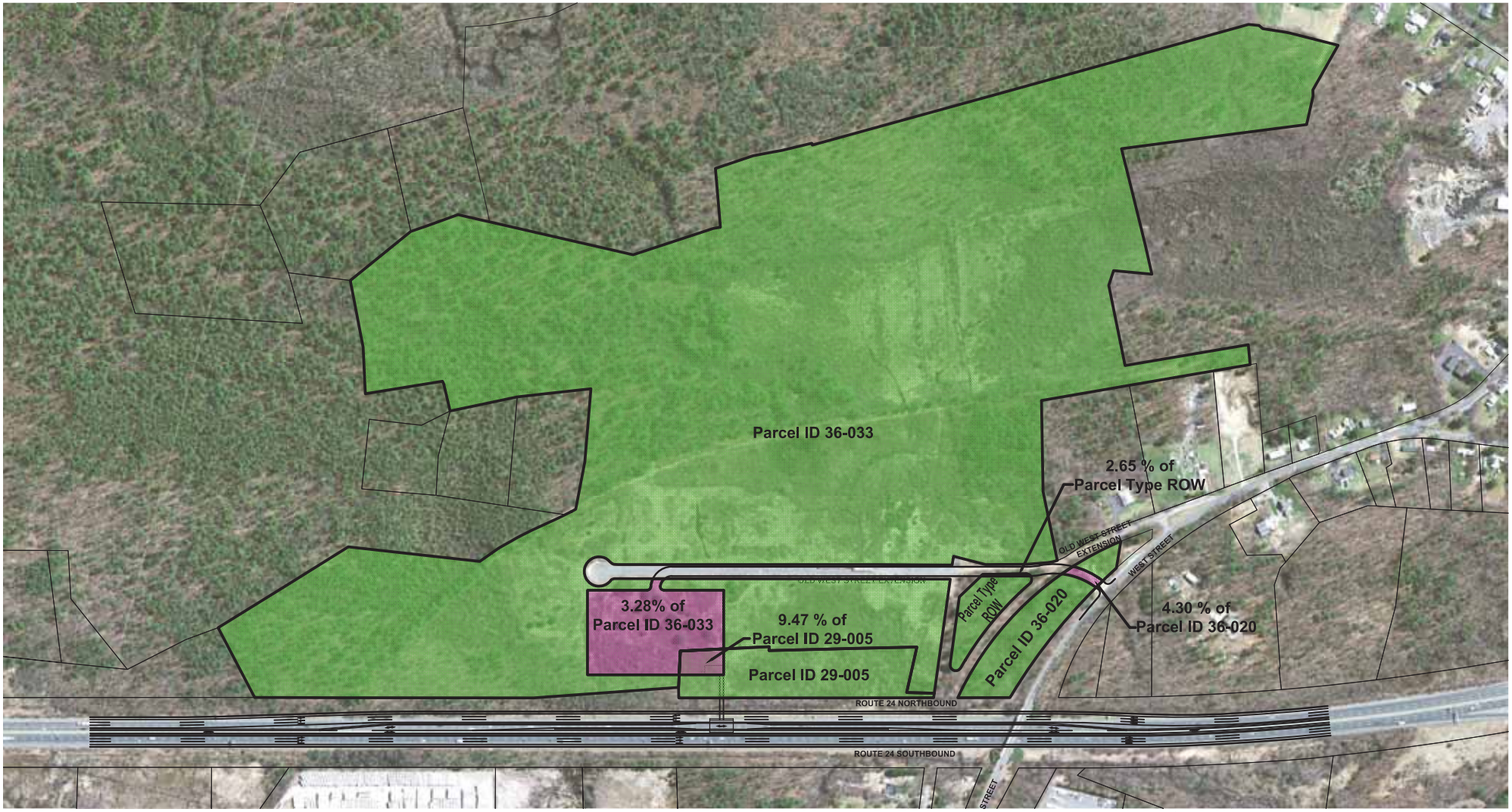
0 100 200 Feet

massDOT

SOUTH COAST RAIL

Figure 11
Brockton In-Line Station
Property Acquisitions

Source: MassGIS, City of Brockton
Prepared by: VHB



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Legend

- *Impacted Parcel*
- *Taking Area*

0 200 400 Feet

massDOT

SOUTH COAST RAIL

Figure 12
West Bridgewater In-Line Station Property Acquisitions

Source: MassGIS
Prepared by: VHB

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix B: Feeder Bus Service Analysis

Prepared for

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10 Park Plaza
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SOUTH COAST RAIL

June 2012

Table of Contents

1 Introduction 1

2 Stations without Feeder Bus Provisions 1

2.1 North Easton and Easton Village Stations - Rail 1
2.2 Raynham Place Station – Rail 3
2.3 Taunton Station - Rail 3
2.4 Battleship Cove Station – Rail and Rapid Bus 4
2.5 West Bridgewater – Rapid Bus 5

3 Stations with Feeder Bus Provisions 1

3.1 Taunton Depot - Rail 1
3.2 Taunton Depot – Rapid Bus 2
3.3 Freetown Station – Rail and Rapid Bus 3
3.4 Fall River Depot – Rail and Rapid Bus 5
3.5 King's Highway Station – Rail and Rapid Bus 6
3.6 Whale's Tooth Station – Rail and Rapid Bus 8
3.7 Galleria Station – Rapid Bus 10
3.8 Brockton Station – Rapid Bus 11

List of Figures

Figure No.	Description	Page
Figure 1	North Easton Station – Rail	2
Figure 2	Easton Village Station – Rail	2
Figure 3	Raynham Place Station – Rail	3
Figure 4	Taunton Station – Rail	4
Figure 5	Battleship Cove Station - Rail and Rapid Bus	5
Figure 6	West Bridgewater Station – Rapid Bus	6
Figure 7	Taunton Depot – Rail	1
Figure 8	Taunton Depot Feeder Bus Service	2
Figure 9	Taunton Station – Rapid Bus	2
Figure 10	Taunton Station - Rapid Bus, Feeder Bus Services	3
Figure 11	Freetown Station – Rail and Rapid Bus	4
Figure 12	Freetown Station Feeder Bus Service	4
Figure 13	Fall River Depot – Rail and Rapid Bus	5
Figure 14	Fall River Depot Close-Up	5
Figure 15	Fall River Depot Feeder Bus Service	6
Figure 16	King's Highway Station – Rail and Rapid Bus	7
Figure 17	King's Highway Station Feeder Bus Service	7
Figure 18	Whale's Tooth Station – Rail and Rapid Bus	8
Figure 19	Whale's Tooth Station Feeder Bus Services	9
Figure 20	Galleria Station Feeder Bus Services	10
Figure 21	Galleria Station Feeder Bus Services	11
Figure 22	Brockton Station Feeder Bus Services	12

List of Tables

Table No.	Description	Page
1	Feeder Bus Ridership Results	21

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1 Introduction

This memo describes the proposed feeder bus service plan for each South Coast Rail station for the Stoughton Commuter Rail alternative and each Rapid Bus station for the Modified Rapid Bus alternative. The following objectives guide this plan:

- Identify potential route modifications to existing bus routes to integrate SCR and local bus services to the extent possible.
- Minimize the number of transfers required by transit riders to use the SCR system.
- Limit route modifications to the extent possible to avoid inconveniencing current bus users.
- For stations served by bus, accommodate buses within the station site and as close as possible to the station platforms.
- Plan for ADA compliant pedestrian connections to bus stops adjacent to the station sites and within the SCR station sites.

Three regional transit authorities, Brockton Area Transit Authority (BAT), the Southeastern Regional Transit Authority (SRTA) and Greater Attleboro Taunton Regional Transit Authority (GATRA) currently provide local bus service to the SCR corridor. On February 8, 2012 a meeting was hosted by SRPEDD with representatives of each of the bus operators to review the draft version of this memorandum. This version reflects their input and suggestions.

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2

Stations without Feeder Bus Provisions

2.1 North Easton and Easton Village Stations - Rail

The proposed North Easton Station and Easton Village Station areas are not currently served by public transit. In consultation with Brockton Area Transit (BAT), it was concluded that it would not be operationally or economically feasible to extend existing BAT buses to serve either Easton Station as the BAT system operates on a pulse – providing a single location from which all of the buses originate and return to meet at the same time. The added distance to extend existing BAT routes to either Easton station could not be accomplished while maintaining this type of operation. Either the buses serving the Easton stations would fall out of synchronization with the balance of the BAT system or the entire system would have to operate on a schedule dictated by service to these stations – likely forcing longer headways that would reduce service or requiring more buses increasing operating costs throughout the BAT system. For this reason it is not recommended to extend the BAT system to North Easton or Easton Village Station, nor are there other bus systems which could reasonably be extended to serve either.

It may be possible for either or both stations to be served by shuttle bus service, as GATRA has successfully implemented in Mansfield that would provide door-to-door service, but not fixed route feeder bus service.

Figure 1 North Easton Station – Rail

Figure 2 Easton Village Station – Rail

2.2 Raynham Place Station – Rail

The proposed Raynham Park Station area is not currently served by public transit. Bloom Bus operates private commuter bus service from the adjacent Raynham Park entertainment complex to Boston and Taunton, but the SCR connects to both of these locations directly. There are no nearby developments which would be better served by a feeder bus connection. Therefore, no modifications to existing bus service are recommended to serve this station.

Figure 3 Raynham Place Station – Rail

2.3 Taunton Station - Rail

The proposed Taunton Commuter Rail Station is located .75 miles east of Taunton Green (the center of downtown Taunton), just north of Dean Street / Route 44. Of the six GATRA routes serving downtown Taunton, none currently stop in the proposed station area. GATRA Route #7 travels in the vicinity of the proposed station, stopping at the intersection of Longmeadow Road and Dean Street, .4 miles east of the station. In consultation with GATRA it was concluded that modifying Route #7 to directly access the Taunton Station site would require relocating service away from schools and businesses currently served along Longmeadow Road, depriving them of transit service. There are no other GATRA routes in the immediate vicinity that could reasonably be re-routed to serve this location. Because the Taunton Depot Station site is also located within Taunton it was deemed reasonable to focus on that station for feeder bus service.

Figure 4 Taunton Station – Rail

2.4 Battleship Cove Station – Rail and Rapid Bus

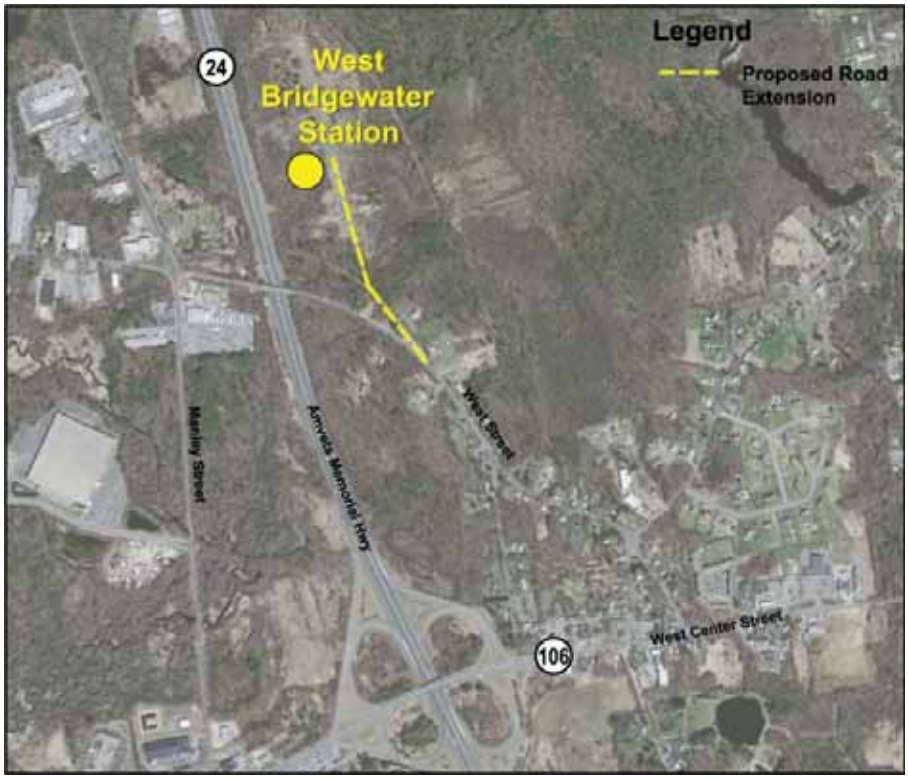
Battleship Cove Station is envisioned as a seasonal station providing access to local tourist attractions (including Battleship Cove). The site is adjacent to Broadway, a divided highway that forms a barrier to pedestrians from or to the east. Buses do not currently operate west of Broadway in this area. Due to the seasonal nature of this station and the proximity of Fall River Depot, no feeder bus service to this station is recommended. It has been noted that as the roadways in the vicinity of Battleship Cove are reconfigured it may prove desirable to revisit this station to assess how feeder bus service might be provided.

Figure 5 Battleship Cove Station - Rail and Rapid Bus

2.5 West Bridgewater – Rapid Bus

The West Bridgewater Station would be located off of West Street where it crosses under Route 24. An access road would be constructed to the station site which would be located as shown to minimize impacts to wetlands. This would be an on-line station, with the Rapid Bus buses rising from the median guideway to access the elevated platforms of the station. There are no buses routes in the vicinity of this station site.

Figure 6 West Bridgewater Station – Rapid Bus



3

Stations with Feeder Bus Provisions

3.1 Taunton Depot - Rail

This proposed station area is served by the GATRA Route #8 bus. The route currently extends from County Street to loop through the Taunton Depot shopping center. Because the walk distance from the front corner of the shopping center building to the station platform is almost 900 feet, it is recommended that a short extension of Route #8 beyond the shopping center and into the station site be provided.

Figure 7 Taunton Depot – Rail

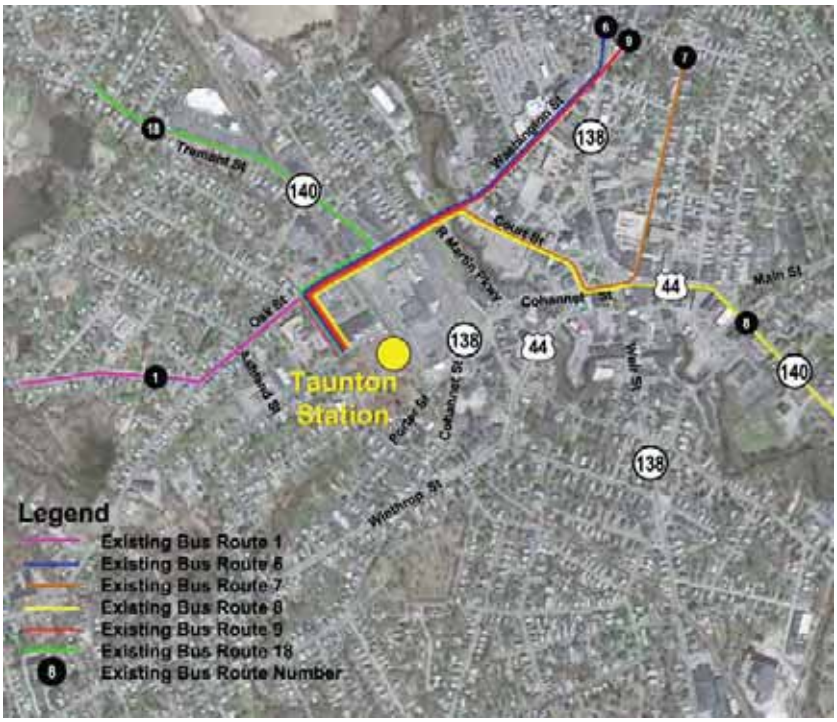
Figure 8 Taunton Depot Feeder Bus Service

3.2 Taunton Depot – Rapid Bus

This proposed Taunton Rapid Bus station is served by the GATRA Routes #1, 6, 7, 8, and 18. The routes extend from the Bloom Bus terminal in downtown Taunton in all directions. No extensions to these routes are proposed as they would be less than ½-mile away from the proposed Rapid Bus station.

Figure 9 Taunton Station – Rapid Bus

Figure 10 Taunton Station - Rapid Bus, Feeder Bus Services



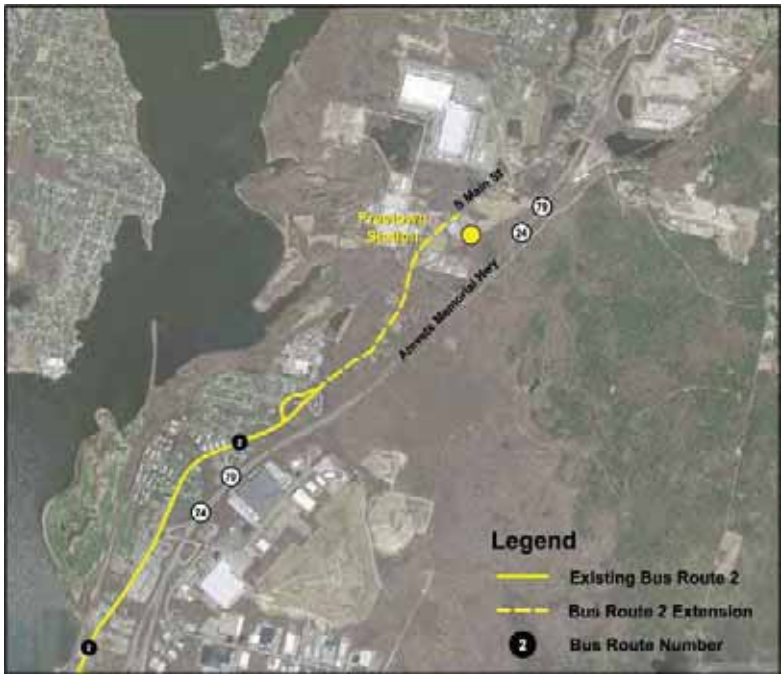
3.3 Freetown Station – Rail and Rapid Bus

The proposed Freetown Station area is not currently served by public transit. SRTA Route #2 (N. Main Street) travels from downtown Fall River to the Freetown town limits. The route operates on half-hour headways between 5:50 AM and 5:50 PM.

A 1-mile extension of SRTA Route #2 along S. Main Street is proposed, terminating at the proposed Freetown station.

Figure 2 Freetown Station – Rail and Rapid Bus

Figure 12 Freetown Station Feeder Bus Service



3.4 Fall River Depot – Rail and Rapid Bus

The Fall River Depot is planned for the former location of the Fall River Station, a location served by two SRTA routes, the Fall River Industrial Park Route and Route #2. These routes run along Main Street and are well within convenient walking distance to the station platform assuming provision of an adequate pedestrian pathway. Baylies Street could be an acceptable pedestrian route if the station site plan were to meet the path at the corner of Durfee Street and Baylies Street.

Figure 3 Fall River Depot – Rail and Rapid Bus

Figure 4 Fall River Depot Close-Up

It was concluded during the review of this station that an adequate pedestrian pathway between Main Street and the station site probably cannot be provided and maintained. Therefore, the Feeder Bus plan is to adjust Route #2 and the FR Industrial Park Route to divert at Odd Street to Durfee Street to Turner Street to N. Davol Street, then via President Avenue to return to Main Street.

It is recommended that a method to alert buses of the presence of passengers at the station as buses will operate at times when there is little likelihood of there being a commuter train in the station. This could be accomplished by dynamic signage but other methods may be equally effective.

Figure 5 Fall River Depot Feeder Bus Service

3.5 King's Highway Station – Rail and Rapid Bus

King's Highway Station is set amid regional shopping destinations separated by expansive parking lots. Access to these stories is from King's Highway / Tarkiln Road. The station site is located between two retail properties.

SRTA Route #8 (Mount Pleasant) connects to the station area at its northern terminus adjacent to the Fieldstone Marketplace. Route #8 travels between the station area and downtown New Bedford. Therefore no modification to Route #8 is needed.

It was noted that a significant concentration of residents exists east of the station location across Church Street. Provisions of a pedestrian connection from the station site to this area is being planned to facilitate people walking to the station.

Figure 6 King's Highway Station – Rail and Rapid Bus

Figure 7 King's Highway Station Feeder Bus Service

3.6 Whale's Tooth Station – Rail and Rapid Bus

Whale's Tooth Station is the eastern terminal station for South Coast Rail Project, located adjacent to downtown New Bedford. A Transit Development Plan (Draft) has been developed for the SRTA bus system that serves New Bedford.

Figure 8 Whale's Tooth Station – Rail and Rapid Bus

As part of that analysis modifications to the proposed SRTA bus system that would link SCR via Whale's Tooth Station to SRTA were recommended. Those recommendations were based in part on the construction of a new dedicated bus/pedestrian bridge across Route 18 from Purchase Street directly into the Whale's Tooth Station site. However, the transit/pedestrian bridge was proposed as part of a TIGER grant application for an expanded Whale's Tooth Station that was not funded. While efforts to secure funding from other sources are on-going, pending receipt of such grants the planning for this station must reflect the existing infrastructure, which lacks the dedicated transit/pedestrian bridge and the intermodal center. The Whale's Tooth Station will still include provisions for transfers, including from buses, those being dropped off and park-and-riders, but site access will be limited to the existing street system.

During the review with SRTA the possibility of an interim service plan, one not dependent on the transit bridge, was explored. Based on that consultation the feeder bus plan for Whale's Tooth Station would modify the two busiest routes, Route #1 (Fort Rodman) and Route #2 (Lund's Corner).

Route #1 – Fort Rodman would now travel through the downtown on the inbound trips via Pleasant Street to the SRTA Downtown Terminal, and then continue northbound, turning right onto Hillman Street. Route #1 would then turn left into Acushnet Avenue and proceed to the Whale's Tooth station. Outbound trips would depart the Whale's Tooth Station traveling south on Acushnet Avenue, turn right onto Hillman Street and then left onto Pleasant Street and continue to the Downtown Terminal.

Route #2 – Lund's Corner interlines with route #1. The route already uses Acushnet Avenue to access downtown, and could stop at Whale's Tooth Station along its current path.

This would provide the Whale's Tooth Station with frequent service (10 minute headways) and riders of the entire SRTA system convenient access to the Whale's Tooth Station via transfer at the downtown terminal. Operationally, all it would require is extending Route #1 from the downtown terminal to Whale's Tooth Station, a distance of 0.7 miles.

Figure 9 Whale's Tooth Station Feeder Bus Services

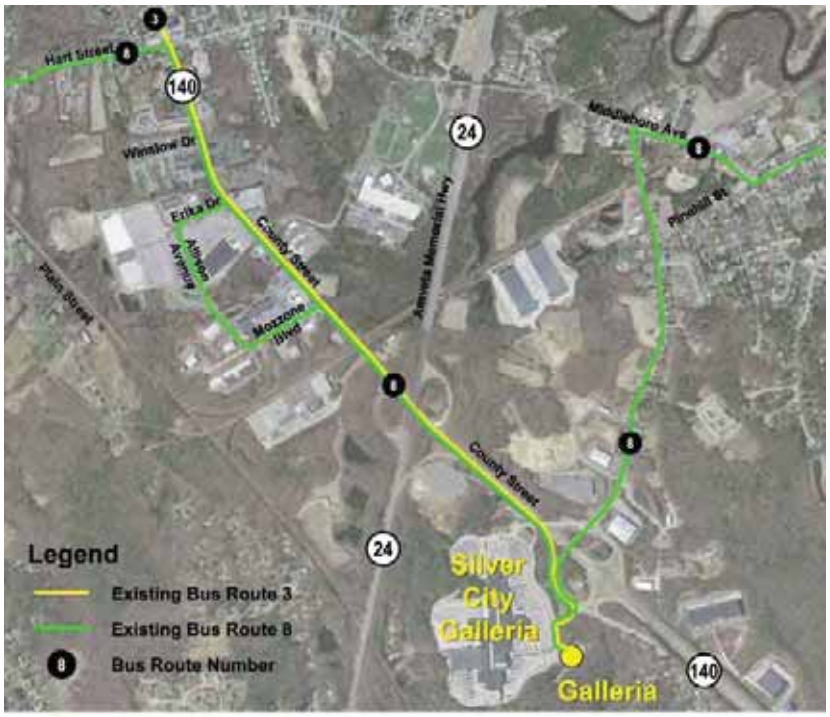
Figure 20 Galleria Station Feeder Bus Services

3.7 Galleria Station – Rapid Bus

The Galleria Station would be located in the current site of the bus park and ride in the Silver City Galleria site. Buses destined for South Station would originate at this station and proceed north on the Rapid Bus guideway to Raynham and Easton Stations before continuing to South Station.

The mall park-and-ride is already served by GATRA routes #3 and #8. GATRA route 8 is described above, Route 3 travels between the Silver City Galleria and the Myles Standish Industrial Park in Taunton.

Figure 10 Galleria Station Feeder Bus Services



3.8 Brockton Station – Rapid Bus

The Brockton Station would be located north of Westgate Mall. This would also be an on-line station, with the Rapid Bus buses rising from the median guideway to access the elevated platforms of the station. BAT routes #4, 4A and 14 currently serve Westgate Mall at the Dick's Sporting Goods store site. The #4 and 4A bus serve downtown Brockton, the #14 bus travels north to Stoughton. It is proposed that these routes would be extended to the Rapid Bus Easton Station as shown in the following site map.

Figure 22 Brockton Station Feeder Bus Services

4

Conclusions

The route extensions planned for the South Coast Rail project would be implemented as funding is identified by the local RTA's responsible for providing the bus service. These feeder bus services were incorporated into CTPS' 2030 model inputs in order to accurately reflect the potential intermodal connections that would be available to SCR passengers.

The projected ridership for these routes (with the Modified Rapid Bus Alternative) is shown below. Information on the potential feeder bus ridership for the Stoughton Electric Alternative is not yet available and will be presented upon completion of the rail ridership modeling results.

Table 1 Feeder Bus Ridership Results

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Whales Tooth	37	27	29	36	29
Kings Highway	4	3	4	4	3
Fall River	55	47	48	54	48
Freetown	6	5	5	5	5
Galleria	16	12	13	15	13
Taunton	45	37	38	42	35
Brockton Station	8	7	7	7	6
Total	171	138	144	163	139

Source: CTPS

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix C: VISSIM Traffic Simulation Analysis

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June 2012

Table of Contents

1 Introduction 1

1.1 Background Information 2
1.2 Sources of Calibration Data 3
1.3 Key Calibration Measures 3
1.3.1 Traffic Volume 3
1.3.2 Travel Time and Speed 4
1.3.3 Observations 5

2 Alternatives 1

3 Results 1

3.1 Introduction 1
3.2 Discussion of Results 3
3.2.1 2030 No-Build Condition 5
3.2.2 2030 Alternative 1 5
3.2.3 2030 Alternative 2 5
3.2.4 2030 Alternative 3 6
3.2.5 2030 Alternative 4 6

4 Summary 1

List of Tables

Table No.	Description	Page
Table 1	2010 Existing and Simulated Traffic Peak Hour Volumes	4
Table 2	Existing and Simulated Peak Hour Travel Times	4
Table 3	Existing and Simulated Peak Hour Speeds	5
Table 4	Simulated Peak Hour Traffic Volumes	2
Table 5	Peak Hour Simulated Travel Times	4
Table 6	2030 Peak Hour Operational Impacts	4

1 Introduction

VHB/Vanasse Hangen Brustlin, Inc. (VHB) has developed a VISSIM traffic simulation of the northbound Interstate 93 (I-93), the Southeast Expressway, to illustrate how operations may change with the implementation of a Bus Rapid Transit (BRT) line through the South Coast Rail Project.

The proposed BRT line is one implementation alternative being considered for a South Coast Rail line. This alternative would provide service between Fall River and South Station in Boston via Route 24 and I-93 using existing and proposed HOV lanes.

Currently, there are two HOV lanes on northbound I-93 between Braintree and Boston. The southernmost HOV lane extends from Braintree to just south of the Savin Hill Station in Boston and provides alternating northbound and southbound HOV travel in a moveable "zipper" lane. The northern HOV lane begins on I-93 at the Mass Ave Connector and provides connection to Interstate 90 eastbound, South Station and the Kneeland Street at Lincoln Street intersection. In order to provide a more complete BRT service, the 1.9 mile gap between the two existing HOV lanes would be upgraded to improve overall HOV travel times. Additional lanes or improved merge segments will require geometric changes to the expressway at the current merge point for the southern HOV lane at the Savin Hill Station. Four alternatives were developed and are modeled in VISSIM to understand the operational impacts of each.

The purpose of this memorandum is to describe the steps taken in the development of the VISSIM model including acquiring data, calibrating the model, and the results of each alternative.

1.1 Background Information

A VISSIM traffic simulation model was developed to simulate operations on I-93 northbound during the 7:00 AM peak hour.[1] The study area begins south of Exit 14: Morrissey Boulevard and ends past the beginning of the existing northern HOV lane. The network includes I-93, HOV lanes, and on- and off-ramps for Morrissey Boulevard, Columbia Road, Southampton Street, Frontage Road, and I-90/South Station. The network also includes links representing segments of the southeast expressway south of Morrissey Boulevard to allow for queuing past the study area which exists today. Existing conditions is based on available 2010 volumes. These volumes are shown in Figure 1.

VISSIM is a microscopic, time step and behavior-based simulation software model used to assess multi-modal urban traffic and public transit operations. The program uses a vehicle behavior model that replicates individual driver behavior characteristics, providing realistic modeling of lane-changing behavior in various situations and the ability to model parallel vehicle flows. VISSIM can report several types of transportation engineering and planning measures of effectiveness (MOEs), including delay, speed, density, travel time, stops and queues, and therefore can be a useful tool for the evaluation of various alternatives. VISSIM can display results in both 2D and 3D environments. The simulation model was developed using VISSIM Version 5.20-14.

[1] Traffic volumes from 6:00 – 7:00 AM were also included in the model so it would be preloaded with vehicles by the start of the 7:00 – 8:00 AM peak hour.

1.2 Sources of Calibration Data

Roadway links in the VISSIM model were constructed from aerial photographs and coded with information such as the number and width of lanes, vehicle speeds, and traffic restrictions, such as HOV-only lanes. The simulation network was calibrated using volume, travel time, and speed data. All data was provided by the Central Transportation Planning Staff (CTPS) in Boston.

The traffic volume data were obtained from the CTPS transportation planning model for 2010 and 2030 for the expressway, ramps, and the HOV lanes. Volumes were provided for each highway segment and each on- and off-ramp on an hourly basis from 6:00-10:00AM. Additionally, some origin-destination data for HOV drivers was provided to better understand how these drivers will use the alternative geometries being suggested for BRT implementation.

Travel time and speed data were obtained from a data report published by Boston Region Metropolitan Planning Organization.[2] The travel time data was collected through multiple travel time runs between 2003 and 2006 then normalized to determine a representative value. Travel times were provided by segment along I-93. Segments are typically defined by on- and off-ramps or by other defined landmarks such as overpasses. Travel times were provided for 30-minute increments from 6:00-10:00 AM. These travel time values were used to determine link speeds which were also used to calibrate the model. CTPS also provided average travel time data, summarized by ½-hour periods during the morning peak, for the southern HOV lane.

1.3 Key Calibration Measures

Traffic volume, travel time, and speed were all used to calibrate the network. Visual determination of the back of the queue locations from the VISSIM simulations were compared to field observations to validate network operations. All model output and data are based on ten iterations of traffic simulation.

1.3.1 Traffic Volume

Traffic volumes provided by CTPS were used to calibrate the existing conditions model. Volumes were calibrated to within +/-8 percent of the volume data provided for the main line and within +/-13 percent of the provided volume data for the ramp volumes. Table 1 shows the data provided and how closely the simulated volumes match that data.

[2] *Speeds and Travel Times on Limited-Access Highways in the Boston Metropolitan Region 2004-2007,* Central Transportation Planning Staff. Boston, MA February 2008.

Table 1 2010 Existing and Simulated Traffic Peak Hour Volumes

Location	Existing Volume [a]	Simulated Volume	Percent Error
Interstate 93 at:			
Exit 14 off-ramp	6,350	6,879	8%
Zipper Lane, south of merge point	1,300	1,227	-6%
Exit 15 Columbia Rd	6,900	7,277	5%
Exit 16 Southampton St	8,100	8,141	1%
Exit 18 Mass Ave	7,500	7,486	0%
Exit 20 I-90/South Station	6,500	6,479	0%
North of HOV ramp	3,500	3,543	1%
HOV lane, north of I-90/South Station ramp	200	195	-2%

Source: a *Expressway Highway Volumes,* Central Transportation Planning Staff, Boston, MA.

1.3.2 Travel Time and Speed

2003 to 2006 travel times provided by CTPS were used to calibrate the network to ensure that sufficient vehicle volumes were moving through the network and behaving in a way representative of existing Southeast Expressway operations. Travel times on each segment in the study area were calibrated to within +/- 25 percent of the provided travel times while the overall travel time through the study area was calibrated to within +/- 10 percent of the CTPS data. Table 2 shows CTPS travel time values, simulated average travel time values, and minimum and maximum simulated travel time values.

Table 2 Existing and Simulated Peak Hour Travel Times

		7:00-7:30AM			7:30-8:00 AM		
			Simulated			Simulated	
Segment Ends	Segment Length (mi.)	Field Data [a]	Mean	Percent Error	Field Data [a]	Mean	Percent Error
Zipper Lane entry to merge	5.68	11:00	11:12	1.8%	11:45	12:10	3.5%
General Purpose Lanes							
Exit 8 to Zipper Lane merge							
Exit 14 off-ramp to Zipper Lane merge	0.52	1:34	1:29	-4.6%	1:34	1:30	-4.0%
Zipper Lane merge to Exit 15	0.92	1:44	1:20	-23.5%	1:58	1:57	-0.7%
Exit 15 to Exit 16	0.67	2:01	1:42	-15.7%	2:01	1:56	-4.0%
Exit 16 to Exit 18	0.28	0:25	0:26	1.9%	0:26	0:26	1.9%
Exit 18 to Exit 20	0.22	0:18	0:18	-1.2%	0:18	0:20	9.9%
Total Travel time							
Zipper Lane entry to Frontage Road on-ramp							
General Purpose	7.31	20:11	21:57	8.8%	20:45	21:07	1.7%
HOV	7.31	15:30	15:04	-2.8%	16:30	16:27	-0.3%

Source: a Travel Times (m:ss). *Speeds and Travel Times on Limited-Access Highways,* Central Transportation Planning Staff, Boston, MA, February 2008.

CTPS speeds were derived from travel time and location data. In order to calibrate to this data, simulation speeds were derived from the travel time and location data from VISSIM as well. The CTPS speeds and simulation speeds for each segment are shown in Table 3.

Table 3 Existing and Simulated Peak Hour Speeds

	7:00 - 7:30 AM			7:30 - 8:00 AM		
Location	Existing Speed [a]	Simulated Speed	Percent Error	Existing Speed [a]	Simulated Speed	Percent Error
Interstate 93 at:						
Exit 14 off-ramp to HOV lane merge	20	21	5.0%	20	21	5.0%
HOV lane merge to Exit 15	32	42	31.3%	28	28	0%
Exit 15 to Exit 16	20	24	20.0%	20	21	5.0%
Exit 16 to Exit 18	41	40	2.5%	39	38	2.6%
Exit 18 to Exit 20	43	45	4.4%	43	40	7.5%

Source: a Speeds in mph - *Speeds and Travel Times on Limited-Access Highways,* Central Transportation Planning Staff, Boston, MA.

1.3.3 Observations

General observations were made of the existing traffic operations of I-93 and compared to the calibrated simulation results. Beyond the above calibrated MOE's, the simulation results compared favorably to the following operational observations:

- The typical back of the general purpose lane rolling queue extends to just north of the Furnace Brook Parkway off-ramp.
- The HOV lane merge results in rolling queue in the HOV lane that typically extends past the Morrissey Boulevard off-ramp.
- The HOV lane merge impacts the two leftmost general purpose lanes resulting in a rolling queue typically back to the Freeport Street off-ramp.
- The stop-and-go operation of I-93 between Exit 14 and Exit 20, with more free-flow conditions occurring between the end of the southern HOV lane to a point just south of Columbia Road and north of the Dorchester Avenue overpass.

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2

Design Alternatives

The VISSIM tool was used to assess the benefits and impacts of the four Design Alternatives proposed to bridge the gap between the existing Zipper Lane and HOV lane on I-93. To best understand the impacts of constructing each BRT alternative six models were developed: 2010 Existing Conditions, 2030 No-Build Conditions, and four 2030 Build models for each proposed alternatives.

The calibrated Existing Condition model illustrates operations today and provides a model calibration base for projecting future operation as well as a baseline for comparing results. The 2030 No-Build Condition models the future volumes provided by CTPS and makes no geometric changes to the network. For the purpose of the operations analysis the following traffic volume assumptions were made:

- Alternative 1 would connect the existing Zipper and HOV lanes creating an uninterrupted HOV connection between Braintree and South Station, but the alternative would remove egress from and access to the Zipper Lane and northern HOV ramp, respectively. This restriction would result in a shift of 1800 vehicles during the peak hour from the Zipper Lane to the general purpose lanes in order for these vehicles to reach their destinations via off-ramps located south of the Exit 20.
- Alternative 2 would widen the cross-section of the Southeast Expressway and provide a dedicated, reversible lane connecting the existing Zipper and HOV lanes, and allow entry and exit from the Zipper or HOV lanes at the existing points. Therefore some HOV vehicles from the general purpose lanes and Zipper Lane would utilize the new connection if their destination is the northern HOV lane or the Tip O'Neill Tunnel.
- Alternative 3 would widen the cross-section of the Southeast Expressway to provide an additional concurrent HOV lane, or diamond lane in each direction, connecting the existing Zipper and HOV lanes. Mainline and ramp volumes would be the same as the No-Build condition, but HOV vehicles would have access to an additional concurrent HOV lane. About 2250 vehicles would have access to this lane during the peak hour.
- Alternative 4 would modify the mainline configuration of the Southeast Expressway but would not connect the existing Zipper and HOV lanes; therefore, no changes would be made to the No-Build volume conditions.

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3 Results

3.1 Introduction

Once the five different future VISSIM models were developed, each one was simulated for ten iterations. For each iteration of the simulation, volume and travel time data were collected. Volume and travel time results for each alternative are summarized in Table 4 and Table 5, respectively. Table 4 reports the desired amount of peak hour traffic from the CTPS model (demand volume) and the amount of peak hour traffic processed by the simulation (service volume) at two locations; the entry point to the Zipper Lane in Braintree and a location south of the existing Zipper Lane exit . The travel time table shows travel time through the network in three smaller segments and for the entire length of the network.

Table 4 Simulated Peak Hour Traffic Volumes

	2010 Existing Vol.[a]	2030 No-Build Volume			2030 Alternative 1 Volume			2030 Alternative 2 Volume			2030 Alternative 3 Volume			2030 Alternative 4 Volume		
	Dem[b]	Dem[b]	Serv[c]	Dem Served	Dem[b]	Serv[c]	Dem Served	Dem[b]	Serv[c]	Dem Served	Dem[b]	Serv[c]	Dem Served	Dem[b]	Serv[c]	Dem Served
Zipper Lane Entry, Braintree																
				74%	1,061	6,633	62%	8,790	6,528	74%	8,790	6,648	76%	8,790	6,239	71%
General Purpose lanes	7,000	8,790	6,491		5											
Zipper Lane	1,300	2,030	1,324	65%	241	243	101%	2,066	1,504	73%	2,066	1,484	72%	2,066	1,510	73%
North of Morrissey Boulevard, Boston																
				78%	1,017	6,575	65%	8,350	6,244	75%	8,350	6,487	78%	8,350	5,494	66%
General Purpose lanes	5,900	8,350	6,519		5											
Zipper Lane	1,300	2,030	1,209	60%	241	245	102%	2,066	1,444	70%	2,066	1,443	70%	2,066	1,506	73%

Sources:

a 2010 *Expressway Highway Volumes,* Central Transportation Planning Staff, Boston, MA, March 2011.

b Dem- Demand volumes for the given alternative expressed in vehicles per hour, 2030 Regional Travel Demand Model, Central Transportation Planning Staff, Boston, MA, January 2012.

c Serv- Volume of vehicles served during the peak hour of simulation expressed in vehicles per hour, VISSIM simulation data.

3.2 Discussion of Results

All of the proposed alternatives are directed at improving operations for the Zipper Lane to provide reliable bus rapid transit service into South Station. All of the alternatives would achieve that goal in some capacity. Unfortunately, none of the alternatives would substantially improve future operations of the general purpose lanes. The projected 2030 traffic demand provided by CTPS reflects annual growth of 1.64 percent for the general purpose lanes and by 2.25 percent for Zipper Lane volumes over the 2010 existing volumes.

Off-ramp volume growth from 2010 to 2030 would be focused on the tightly spaced exit ramps north of Columbia Road. This increase in mainline volumes passing the Columbia Road on-ramp would limit the ability of vehicles to merge in at this point and would affect on-ramp queues. At times, the increase in volume would also create some additional friction at the northern off-ramps.

General purpose lane volumes in 2030 would have grown to an extent that vehicle queues would extend out of the physical limits of the modeled network. The saturation flow rate is approximately 1650 vehicles per hour per lane with low speeds preventing vehicles from entering the network. All alternatives, including No-Build, would be unable to serve all of the volume demanding access to the Southeast Expressway, effectively extending the peak commuting periods and the travel time for all users that enter I-93 south of the Braintree Split.

This queue extension of general purpose lanes would likely impact access to the Zipper Lane in the future. New, dedicated ramp connections from Route 128 to the Zipper Lane, which are included as part of each of the Build alternatives, would minimize this impact for Rapid Bus and Route 128 HOV traffic. In addition, another factor predicted to restrict vehicles from entering the Zipper Lane is the projected saturation flow rate of the Zipper Lane at the entry point. Due to the entry speed, configuration and enforcement, the maximum number of vehicles simulated to enter the Zipper Lane is approximately 1,500 vehicles per hour, about 75 percent of the demand volume. This is a reoccurring problem that limited the improvements for all alternatives, with the exception of Alternative 1.

Table 5 shows the change in travel time through the simulation network for 2010 Existing Conditions, 2030 No-Build Conditions, and each of the four 2030 Alternatives. Changes in travel time for the Zipper or HOV lane varies with each condition while travel times for the general purpose lanes are consistently higher for 2030 conditions than in the existing 2010 condition. Table 5 shows peak hour travel time for vehicles that were served during the peak hour, therefore, the volume of vehicles that are not served are not represented in this table. Table 6 presents the impacts of these vehicles on travel times.

Table 6 summarizes the amount of unmet peak hour volumes and the saturation flow rates for both the general purpose and HOV lanes under each alternative. Additionally, this table estimates the impact that unmet volume and reduced saturation flow rates would have on peak hour operations in the form of peak hour spreading. Peak hour spreading or the additional peak hour travel time is a representation of the minutes that will likely be added to the existing peak hour in order to process all of the volume demand based on the simulated saturation flow rates. The peak hour for the general purpose lane traffic could spread from 60 minutes to a period of between 79 minutes and 96 minutes. These peak hour spreading projections are based on additional travel time needed for the peak hour traffic volume demand to travel through the study area network. If operations on other ramps and facilities on I-93 should degrade then that could result in further peak hour spreading that the modeled network cannot account for.

Table 5 Peak Hour Simulated Travel Times

Travel Times (m:ss)	7:00 - 7:30AM / 7:30 - 8:00AM					
	2010 Existing	2030 No-Build	2030 Alternative 1	2030 Alternative 2	2030 Alternative 3	2030 Alternative 4
via Zipper or HOV lane						
Zipper entry to Zipper exit	11:41	21:23	7:36	12:29	12:49	8:29
Zipper Entry to HOV entry	15:47	24:52	11:10	16:08	16:04	14:14
via General Purpose Lane						
Zipper entry to Zipper exit	16:40	21:45	19:29	20:05	19:35	24:44
Zipper Entry to HOV entry	21:32	26:49	22:49	24:23	25:42	30:47

N/A- Not Applicable: The presence of Zipper or HOV lanes varies depending on the alternative. Zipper or HOV lanes are not present if marked N/A.
Travel Time values presented apply to vehicles served during the peak hour, volume demand that was not served contribute to peak hour spreading.

Table 6 2030 Peak Hour Operational Impacts

	2030 No-Build	2030 Alternative 1	2030 Alternative 2	2030 Alternative 3	2030 Alternative 4
via HOV lane					
Unmet Peak Hour Volume (vehicles)	706	-2	562	582	556
Saturation Flow Rate (vphpl)	1,324	243	1,504	1,484	1,510
Additional Peak Hour Travel Time (minutes)	32	0	22	24	22
via General Purpose Lane					
Unmet Peak Hour Volume (vehicles)	2,299	3,982	2,262	2,142	2,551
Saturation Flow Rate (vphpl)	1,623	1,658	1,632	1,662	1,560
Additional Peak Hour Travel Time (minutes)	21	36	21	19	25

Projections shown are derived from modeled output of the study area network described. Changes elsewhere on Interstate 93 or the ramps serving Interstate 93 can also impact operations through the study area network.

3.2.1 2030 No-Build Condition

The No-Build Condition shows constraints on Interstate 93 in both the general purpose lanes and in the Zipper Lane. During modeling, a visual inspection of queue lengths in the Zipper Lane illustrated that some volume would be unable to enter the network at the Zipper Lane entry point in Braintree. At times, the queuing in the Zipper Lane would prevent vehicles from entering the network, requiring an additional 32 minutes to process the peak hour traffic demand. Zipper Lane volumes would grow at a higher rate than the general purpose lane volumes and that results in the Zipper Lane travel times which surpass general purpose lane travel times during the peak hour of this condition.

Like the Zipper Lane, the general purpose lanes would also suffer from over capacity volumes and would not serve the entire general purpose lane demand volume. The saturation flow rate on the general purpose lanes at the beginning of the network would be 1,623 vehicles per hour per lane for the No-Build condition. This would result in 26 percent of general purpose lane demand not being processed during the No-Build condition peak hour, yielding an estimated peak hour spread of 21 minutes.

3.2.2 2030 Alternative 1

Alternative 1 would provide a continuous HOV lane that connects the existing Zipper Lane to the northern HOV lane into Boston. Zipper Lane volumes would be severely reduced, which would allow the remaining vehicles to move at free flow speeds. Travel times for the Zipper Lane would be improved over No-Build and Existing conditions.

This change, however, would move approximately 1,800 vehicles on the southeast expressway during the peak hour that previously used the Zipper Lane. Without access to the expressway at the current end of the Zipper Lane, these vehicles would no longer reach their destination using the Zipper Lane. This further increase in volume beyond 2030 growth would increase travel times on the expressway. Impacts would be mitigated slightly by the removal of the existing Zipper merge point. By removing the existing merge point on the left side of the expressway the general purpose vehicles would no longer shift from right to left while traveling through this segment, which would result in smoother traffic flow. However, this alternative would have the highest general purpose lane demand and the highest percentage of unmet demand at 38 percent which would result in the largest peak hour spread of an additional 36 minutes to process the additional demand.

3.2.3 2030 Alternative 2

Alternative 2 would provide a reversible bus lane that would connect the existing Zipper Lane to the northern HOV lane into Boston including provision of access points at the current Zipper and HOV lane end points. These access points would allow vehicles to exit the reversible lane and allow general purpose lane vehicles to enter the reversible or HOV lanes. This change in the geometry would provide a greater distance for Zipper Lane vehicles to merge into the general purpose lanes and would allow some vehicles to remain in their lane upon exiting the

Zipper. These factors would maintain travel times in the existing Zipper Lane close to 2010 conditions. However, 28 percent of the HOV traffic demand would not be accommodated in the peak hour which would result in an additional 22 minutes of peak hour spread.

General purpose lane traffic would be maintained close to No-Build conditions with some additional congestion at the Exit 20 off-ramp where the new reversible lane would rejoin the general purpose lanes to allow drivers to enter and exit. Also similar to the No-Build condition, 26 percent of demand would be unmet during the peak hour, which would result in a peak hour spread of 21 minutes.

3.2.4 2030 Alternative 3

Alternative 3 would provide a concurrent HOV lane, or diamond lane, that would connect the existing Zipper Lane to the northern HOV lane into Boston. Despite the additional travel lane, travel times would not be greatly improved over the No-Build condition because of the additional weaving that the new lane would cause. HOV drivers would be more inclined to use the less congested HOV lane instead of the general purpose lanes; however, the challenges of merging into the general purpose lanes would prompt vehicles to remain in the new lane until very late in the trip. Drivers would then be forced to weave across four lanes of traffic in an effort to exit the highway. This maneuver would cause much of the congestion in the general purpose lanes in the vicinity of Exits 18 and 20 to an extent that the existing Zipper Lane would also be impacted by this downstream congestion in the form of queues extending to the Morrissey Boulevard exit.

The source of this queuing would be north of the Columbia Road on-ramp. Existing and projected No-build simulations indicate that traffic flow typically frees up past the Columbia Road on-ramp. However, the projected weaving and lane changing by vehicles in the left most HOV lane to Exits 16 to 20 would cause greater congestion north of Columbia Road in Alternative 3 as compared with other alternatives. Alternative 3 would result in a slight improvement for the general purpose lanes over the No-Build condition with estimated unmet demand of 24 percent and peak hour spread of 19 minutes. Conversely, the travel in the new lane would be least improved over the No-Build condition with a saturation flow rate under 1,500 vehicles per hour and the largest peak hour spread of 24 minutes.

3.2.5 2030 Alternative 4

Alternative 4 would merge general purpose traffic into three lanes south of the existing Zipper Lane northern exit point and allow the Zipper Lane traffic to exit into an empty fourth general purpose lane. No new connections or dedicated HOV lane between the end of the existing Zipper Lane and the northern HOV lane into Boston are proposed in Alternative 4. An auxiliary lane would be added to connect the Columbia Road on-ramp and the Southhampton Street off-ramp which would allow vehicles a greater distance over which to merge onto Interstate 93.

In Alternative 4, travel times for the Zipper Lane would be improved beyond existing conditions but the alternative would still result in a peak hour spread of 22 minutes for HOV traffic. This improvement, however, would be at the cost of the general purpose lane travel time. The lane drop in the general purpose lanes would result in reductions in the service flow rate which would result in queuing past Braintree and the entry to the Zipper Lane. In Alternative 4, the general purpose lanes would have the lowest saturation flow rate – 1560 vehicles per hour per lane. The first three alternatives would be able to maintain a general purpose saturation flow rate that would be comparable to the No-Build condition, while Alternative 4 would not. Unmet demand for the general purpose lane would be 29 percent with vehicle flows lower than Alternative 1. The estimated additional travel time due to peak hour spreading in the general purpose lane would be 25 minutes.

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Summary

All four alternatives would result in significantly improved HOV travel times over the 2030 No-Build HOV travel time (24:52). The reduction in HOV travel time would range from a high of almost 14 minutes (Alternative 1) to a low of almost 9 minutes (Alternatives 2 and 3).

Alternative 1 would present the best travel time (11:10) via the HOV and the best travel time in the general purpose lanes (22:49) through the modeled studied area of the four alternatives. Since this alternative would not permit HOV traffic to enter or leave the HOV lane from the Braintree entry point until Exit 20, over 88 percent of the HOV traffic accommodated in the No-Build alternative would be required to use the general purpose lanes. While the general purpose lane travel times through the simulated area would improve with Alternative 1 due to the complete elimination of the HOV merge, the increased general purpose lane volume would result in the greatest peak hour spread of all the alternatives since the projected demand could not be fully processed with the proposed capacity in the defined peak period. This projected peak hour spreading would likely result in 11 to 17 minutes more of general purpose traffic travel time than the other alternatives.

Alternative 2 presented the least HOV travel time reduction of the four alternatives as compared with the No-Build but the second best improvement in general purpose lane travel times. HOV travel time with Alternative 2 would be almost 5 minutes longer than Alternative 1. However, HOV vehicles would retain the ability to exit the HOV lane before Exit 20. The less significant reduction in general purpose lane travel times could be attributed to the two segments of added general purpose lanes where HOV traffic would be able to merge in the general purpose lanes to exit. Alternative 2 would also result in peak hour spread due to unmet demand in the defined peak period but at a much lesser extent than Alternative 1 (a difference of 15 minutes for the general purpose lanes). However, this alternative would result in unmet demand and peak hour spreading for the HOV lane as well due to obstruction of the HOV lane entry by projected general purpose lane queuing through the Braintree Split and the modeled capacity of the HOV lane entry.

Alternative 3 would present similar results to Alternative 2, demonstrating that the segments of permanent, reversible lane proposed in Alternative 2 are no more effective than an HOV diamond lane. The simulation of this alternative illustrated weaving difficulties from the HOV diamond lane to the closely spaced Exits 16-20 off-ramps leading to congestion and delay in the section of highway north of Columbia Road.

Alternative 4 resulted in the second best HOV travel time through the modeled area (14:14) but at the expense of general purpose lane travel times. With Alternative 4, travel times in the general purpose lanes would increase as compared with the No-Build (by 4 minutes), and therefore it is the only alternative that results in a negative travel time impact within the modeled study area. This increase in travel time is the result of the reduction in general purpose lane capacity that is proposed as part of this alternative. Proposed improvements at the exit ramps would offset the decreased lane capacity but not effectively enough to result in a reduction in travel time. Additionally, this alternative would result in peak hour spreading for both the HOV and general purpose lanes.

Figures

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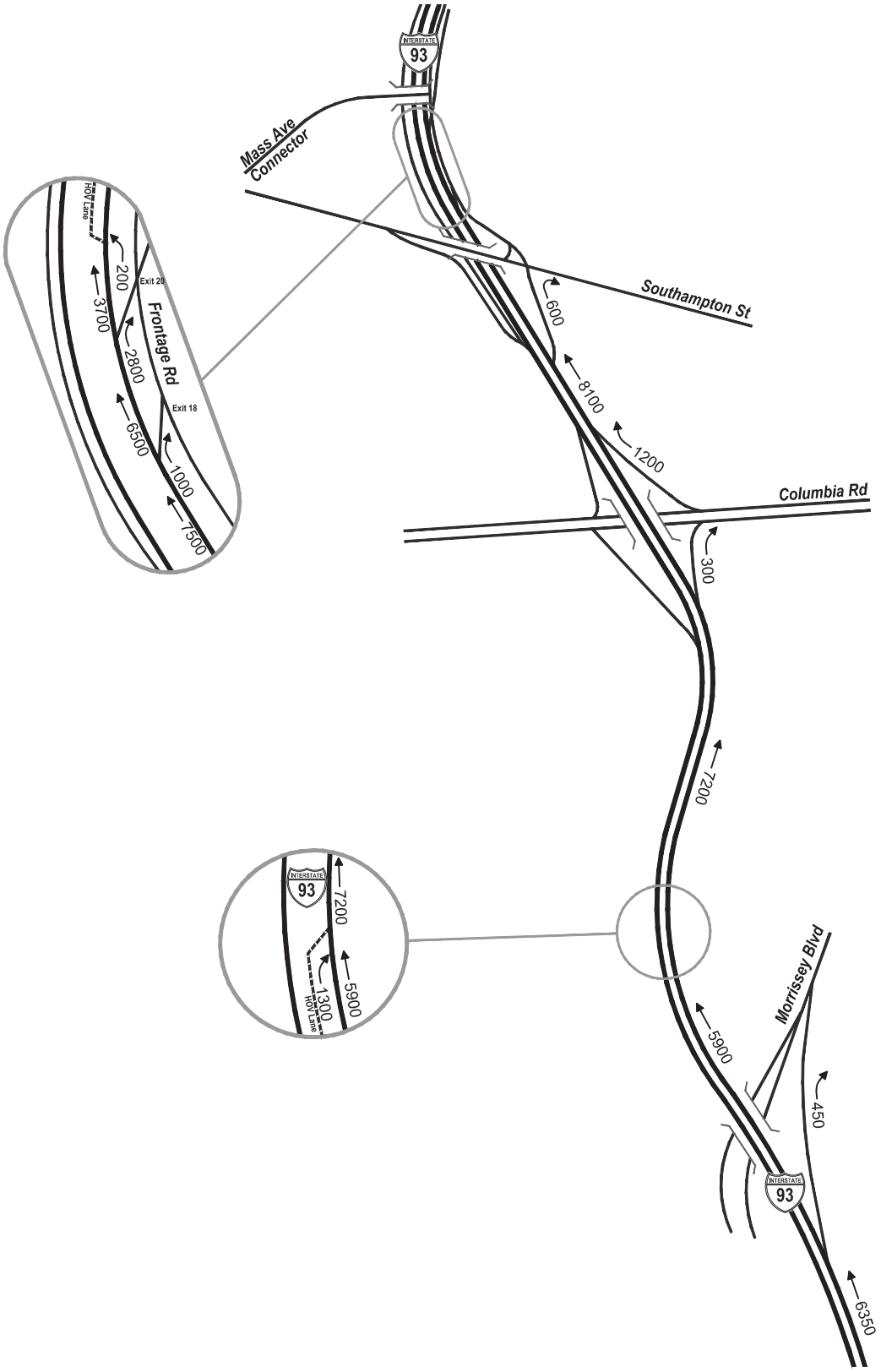

Not to Scale

Vanasse Hangen Brustlin, Inc.

2010 Existing Conditions
7:00-8:00 AM Peak Hour
Traffic Volumes

Figure 1

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix D: I-93 "Missing Link" Design Alternatives

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Table of Contents

1 Introduction 1-1

2 Existing Conditions 2-1

3 2030 No-Build Alternative 3-1

4 Design (Build) Alternatives 4-1

5 Comparison of "Missing Link" Alternatives 5-1

6 Constructability of Design Alternatives 6-1

6.4.1 Alternatives 1-3 6-7

6.4.2 Alternative 4 6-9

7 Environmental Impact of Design Alternatives 7-1

7.2.1 Property Acquisitions 7-3

7.2.2 Noise Impacts 7-5

7.2.3 Transit Access 7-6

7.6.1 Historic Resources 7-8

7.6.2 Archaeological Resources 7-8

8 Ridership of the Design Alternatives 8-1

9 Costs 9-1

10 Conclusions 10-1

List of Tables

Table No.	Description	Page
Table 1	Bridge Crossing Summary	2-4
Table 2	Summary of "Missing Link" Alternatives Infrastructure	5-1
Table 3	Peak Hour Simulated Travel Times	5-2
Table 4	2030 Peak Hour Operational Impacts	5-3
Table 5	Bus/Shuttle Service Summary	6-5
Table 6	Property Acquisition Requirements	7-2
Table 7	Number of Residential Building Acquisitions in Environmental Justice Neighborhoods: I-93 Section	7-5
Table 8	Number of Commercial Building Acquisitions in Environmental Justice Neighborhoods – I-93 Section	7-5
Table 9	Length of Highway Segment Closer to Residential Properties in Environmental Justice Neighborhoods – I-93 Section	7-6
Table 10	2030 Ridership Projections	8-1
Table 11	Total Cost for I-93 Infrastructure	9-1

List of Figures

Figure No.	Description	Page
1	I-93 HOV Extension Schematic Existing Conditions	1-1
2	Savin Hill Retaining Wall	2-2
3	I-93 Looking North	2-2
4	I-93 Looking South	2-3
5	Old Colony Commuter Rail and Red Line Tracks	2-3
6	Southeast Expressway Existing Conditions Sections	2-3
7	Southeast Expressway Alternative 1 Sections	4-2
8	Properties Adjacent to Highway Right-of-Way	4-3
9	Alternative 1 – the “Commitment Alternative” Zipper Lane Ops	4-4
10	Alternative 1 – the “Commitment Alternative”	4-4
11	Alternative 1 – the “Commitment Alternative”	4-4
12	Southeast Expressway Alternative 2 Sections	4-5
13	Moveable Barrier Configuration	4-5
14	Alternative 2 – the “Maintain Exist at Savin Hill Alternative” Zipper Lane Ops	4-5
15	Alternative 2 – the “Maintain Exist at Savin Hill Alternative”	4-5
16	Alternative 2 – the “Maintain Exist at Savin Hill Alternative”	4-5
17	Southeast Expressway Alternative 3 Sections	4-6
18	Alternative 3 – the “HOV Lanes in Both Directions Alternative” Zipper Lane Ops	4-6
19	Alternative 3 – the “HOV Lanes in Both Directions Alternative”	4-6
20	Alternative 3 – the “HOV Lanes in Both Directions Alternative”	4-6
21	Southeast Expressway Alternative 4 Sections	4-8
22	Alternative 4 - the "Minimalist Alternative Alternative" Zipper Lane Ops	4-8
23	Alternative 4 - the "Minimalist Alternative"	4-8
24	Alternative 4 - the "Minimalist Alternative"	4-8

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1 Introduction

Currently, there are two, separate HOV facilities on I-93 (Southeast Expressway) between Braintree and Boston. The southernmost HOV facility extends from Braintree to just south of the Savin Hill Station in Boston and provides alternating northbound and southbound HOV travel in a moveable "zipper" lane which "borrows" roadway capacity from a non-peak direction lane during peak periods. The "northern HOV" or "South Station HOV" facility is a fixed (permanent), two-lane (one in each direction) facility that begins on I-93 at the Massachusetts Avenue "Mass Ave" Connector and provides a connection to I-90 eastbound, South Station and Kneeland Street at the Lincoln Street intersection. A gap or "Missing Link" of approximately 2 miles exists between each facility. Figure 1 depicts this infrastructure.

In the DEIS, the Rapid Bus Alternative was proposed to use both of these facilities. However, like all I-93 HOV traffic today, the rapid buses would have to merge into the I-93 general purpose lanes at the northern exit of the Zipper Lane, travel in the general purpose lanes and then enter the northern HOV facility to access South Station. This merge into general traffic currently results in significant congestion in both the Zipper Lane and the general purpose lanes. According to the Central Transportation Planning Staff (CTPS), in 2030, further deterioration of conditions is expected and as a result the Zipper Lane would no longer be able to provide a travel time advantage over the general purpose lanes. As a result, future users, including potential Rapid Bus riders, using either the Zipper Lane or the general purpose lanes would experience longer than desirable travel time. The travel time for the Rapid Bus Alternative, presented in the DEIS/DEIR, reflected this projected congestion. In addition, the existing Zipper Lane HOV facility does not include standard highway shoulders. This less than optimal configuration results in overall slower travel in this section as well as reliability issues, since there is no excess capacity for auto breakdowns or snow removal. Incidents in the Zipper Lane and significant snowfall result in closure of the facility which would affect Rapid Bus system reliability.

The following report presents a summary of existing (2010) I-93 infrastructure and traffic conditions; 2030 No Build conditions; and four potential future (2030) alternative infrastructure improvements that could alleviate deficiencies that would impact the efficiency of a proposed Rapid Bus system as well as all travel on I-93. Three of the alternatives present infrastructure to eliminate the "missing link" between the two existing HOV facilities. A fourth alternative relies on operational reconfigurations at the end of the Zipper Lane to provide improved rapid bus performance. This report details the conceptual designs, performance impacts and costs of each alternative.

To support this analysis, the project team developed VISSIM® traffic models to simulate operations on I-93 northbound. A detailed traffic simulation methodology and results report can be found in Appendix C.

2

Existing Conditions

Today, I-93 is at capacity for the segment from Savin Hill to Massachusetts Avenue. One major issue is created by the northbound vehicles exiting the Zipper Lane and merging with the general purpose traffic, which causes congestion for both HOV travelers and general purpose lane travelers. This capacity issue causes long travel times for general purpose vehicles as well as high-occupancy vehicles. The only way to resolve the current issue in this section of the highway would be to increase capacity.

From the northern end of the existing Zipper Lane to the existing HOV, the I-93 right-of-way is severely constrained and has the following characteristics:

- Located in cut and viaduct sections.
- Comprised of 4-12' lanes in both the northbound and southbound directions with substandard shoulders and a 4'-6" concrete median.
- Includes four exits on the northbound side, and one on the southbound side and two entrances (one on each side).
- Constrained on both sides by dense development and local roadways (such as Frontage Road) and a 1,500 foot retaining wall that supports Hubbardton Street, the Savin Hill neighborhood and the Boston Globe building. Figure 2 depicts the retaining wall. Figures 3 and 4 show the proximity of the surrounding elements.
- Crossed by 10 overgrade bridges, most notably Savin Hill Avenue.
- Crossed by 3 undergrade bridges, most notably the I-93 bridge over the MBTA Ashmont and Braintree Red Line railroad tracks and the MBTA Old Colony Commuter Rail tracks.

- Constrained on the southbound side by the Savin Hill Red Line Station and the Red Line and Old Colony railroad tracks. Figure 5 shows the proximity of the railroad tracks to the edge of the highway.

Figure 2 Savin Hill Retaining Wall

Figure 3 I-93 Looking North

Figure 4 I-93 Looking South

Figure 5 Old Colony Commuter Rail and Red Line Tracks

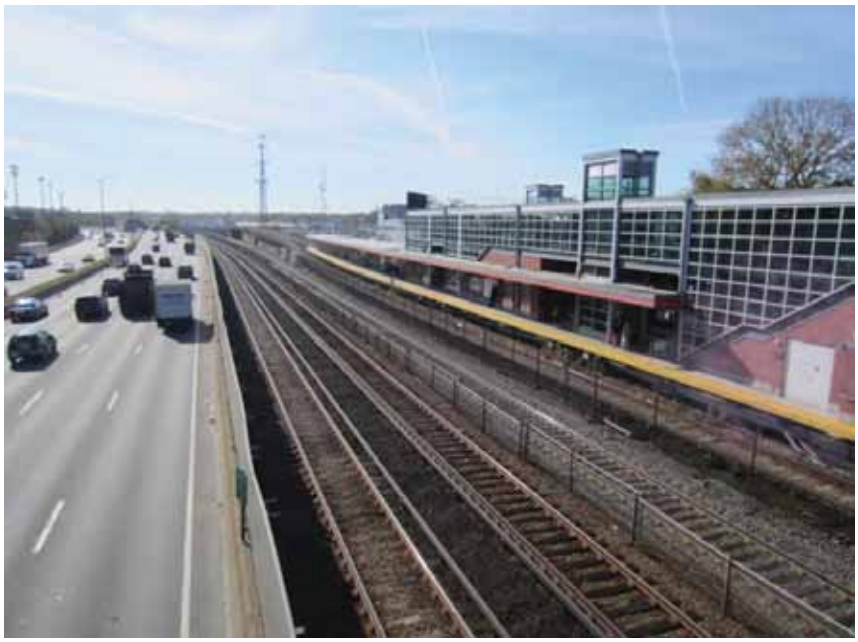

Table 1 summarizes the bridge crossings in this section of I-93. Figure 6 shows typical cross sections at three locations throughout this section of the corridor.

Table 1 Bridge Crossing Summary

No.	Description	Type
1	Savin Hill Avenue	OH
2	*Columbia Road Viaduct*	*UG*
3	*Siding Track to Boston Globe*	*UG*
4	Dorchester Avenue	OH
5	Boston Street	OH
6	Southampton Street	OH
7	Commuter Rail (Fairmont Line)	OH
8	South Boston Bypass Road	OH
9	Massachusetts Avenue Connector	OH

Note: OH= Over-head, UG= Under-grade

Traffic volumes provided by CTPS were used to calibrate the existing conditions traffic simulation model. Results of the calibration are presented in Appendix C.

General observations were made of the existing traffic operations of I-93 and compared to the calibrated simulation results. Beyond the above calibrated measures, the simulation results compared favorably to the following operational observations:

- The general purpose lane rolling queue typically extends to just north of the Furnace Brook Parkway off-ramp.
- The Zipper Lane merge results in rolling queue in the Zipper Lane that typically extends past the Morrissey Boulevard off-ramp.
- The Zipper Lane merge impacts the two leftmost general purpose lanes resulting in a rolling general purpose lane queue typically back to the Freeport Street off-ramp.
- I-93 between Exit 14 and Exit 20 operates with stop and go traffic, with more free-flow conditions occurring between the end of the Zipper Lane to a point just south of Columbia Road and north of the Dorchester Avenue overpass.

3

2030 No Build Alternative

The 2030 No Build Alternative represents future volumes provided by CTPS and makes no geometric or operational changes to I-93. The traffic simulation model prepared for this condition shows that in the 2030 demand for both the I-93 Zipper Lane and the general purpose lanes will exceed available capacity. This condition is described further in Appendix J.

Queuing at the Zipper Lane entry in 2030 will likely extend beyond Exit 14 (Morrissey Boulevard). The configuration of the Zipper Lane entry and queuing resulting from capacity saturation in both lanes would delay vehicles from entering the modeled study area and the Zipper Lane. For both the I-93 general purpose lanes and the Zipper Lane, this projected capacity saturation would result in unmet demand which would lead to lengthened trip times, peak hour spreading and no incentive to use the Zipper lane over the general purpose lanes. This No Build condition propagates through to each of the Build alternatives.

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Design (Build) Alternatives

In order to provide a more complete Rapid Bus service and improve overall Rapid Bus travel times, the 2 mile gap on I-93 between the two existing HOV facilities would need to be upgraded to remove conflict between HOV / Rapid Bus traffic and general purpose traffic. This objective can only be attained by the addition of capacity on I-93 through new lanes or revised merge segments. Capacity additions can only be provided through physical, geometric infrastructure changes to the I-93 at the current merge point and in the 2 mile gap. Operationally, the objective was to provide as close to "free flow" conditions for HOV / Rapid Bus travelers in this segment of I-93, as projected and simulated in 2030. Solutions were investigated to add capacity or provide exclusivity for the HOV traffic, which either added capacity to the I-93 cross section or reassigned capacity from general purpose traffic.

Four alternatives were developed to remove or lessen conflict between I-93's HOV / Rapid Bus traffic and general purpose traffic at the northern end of the existing Zipper lane. The alternatives described below provide varying levels of improvement, impacts and access for future HOV / Rapid Bus commuters and general purpose travelers. Each alternative requires that I-93 be widened. Each alternative was modeled in VISSIM and compared with the 2030 No Build to understand the future 2030 operational impacts of each.

Compliance with design criteria and several other factors guided the development of the Design Alternatives. One major objective was to minimize the number of residential or commercial property takings necessary to enable the widening. Two options for each alternative were analyzed with respect to this objective; widening on alternating sides of the expressway or holding the median and widening equally on both sides of I-93. Based on a preliminary, qualitative analysis that considered the major impacts for each option, the conclusion was made to widen on alternating sides of the highway. Although this option would result in more complicated construction phasing, it would minimize the socio-economic impacts to adjacent

neighborhoods as well as limit size of the construction zone that would have been required if construction was conducted on both sides of I-93.

Aside from the design alternatives described below, a few additional alternatives were discussed but were fatally flawed and not analyzed further. These included tunneling the HOV lane under/or elevating the HOV lane above the existing Southeast Expressway. Each of these options would require more complicated construction phasing and would create major delays and impacts to the existing traffic operations on I-93. Although cost estimates were not prepared for these two additional alternatives, it can be assumed that the cost to construct these alternatives would match or greatly exceed the cost of any of the alternatives described below and in addition would have significantly greater impacts to the traveling public for an extended period of time.

The studied alternatives would decrease travel times for the Rapid Bus Alternative as compared with the simulated 2030 No Build and the Rapid Bus Alternative presented in the DEIS/R. Three of the four alternatives would also improve traffic operations and travel times in the I-93 general purpose lanes as compared with 2030 No Build conditions/travel times. The alternatives described below provide varying levels of impacts, access for HOV/Rapid Bus commuters and general purpose travelers.

4.1 Alternative 1 – The "Commitment" Alternative

Alternative 1 would provide a new, 12' wide reversible lane with two 5' shoulders in the median of I-93 from the end of the existing Zipper Lane in Savin Hill to the beginning of the South Station HOV lane past the South Bay Plaza. With this alternative, four lanes of general purpose travel will be maintained in both the northbound and southbound directions. These general purpose lanes will be separated from the new, reversible lane by a two foot barrier on one side and a six foot wide median on the other. A ten foot outer shoulder and a four foot inner shoulder will be provided for both the northbound and southbound directions of travel adjacent to the general purpose lanes. Construction of this facility would remove the "missing link" between the end of the existing Zipper Lane and the start of the South Station HOV facility; thereby creating one continuous HOV/Rapid Bus facility comprised of a Zipper Lane, a reversible lane and a two-lane permanent facility. Figure 7 shows three typical cross sections and a plan view for this alternative.

Unlike existing operations, Alternative 1 would restrict access/egress from the HOV facility for its entire length from the existing Braintrain entrance to the Zipper Lane though to the exit from the existing South Station HOV facility (Exit 20: I-

90 / Kneeland / Lincoln). Vehicles that would enter the new, continuous HOV facility in Braintree would be committed to traveling to and exiting at Exit 20.

Due to the restrictions on the northbound side from Savin Hill Station up to immediately following the Columbia Road Exit (Exit #15), I-93 would be widened on the southbound side to make capacity for the new, center permanent reversible lane. This placement would limit the amount of property takings (especially residential) required but would result in impact to the MBTA tracks and bridge crossings. Immediately following this section, I-93 would be widened on the northbound side to provide capacity for the permanent reversible lane. For a similar reason as before, widening the highway in this section on the northbound side would limit the number of property takings required for the construction. Figure 8 shows properties adjacent to the top of the retaining wall for the highway.

Figure 8 Properties Adjacent to Highway Right of Way

Frontage Road (on the eastern side of the highway near South Bay Plaza), Von Hillern Street (on the eastern side of the highway north of the Columbia Road exit) and Sydney Street (on the western side of the highway just south of the Columbia Road exit) would all require reconstruction.

As stated above, construction of Alternative 1 will impact adjacent rail lines. The impact mileage (distance, not trackage) for the Old Colony Commuter Rail line would be approximately 1 mile (south from the siding track at the Boston Globe to Freeport Street); for the Braintree Red Line would be approximately 1.7 miles (Red Line portal at Boston Avenue to Freeport Street); for the Ashmont Red line would be approximately ½ mile (south of Savin Hill Station to Freeport Street); and for the Red Line Yard Lead tracks would be approximately ¾ mile (north of JFK / UMass Station

to north of Dorchester Avenue). More details about rail line reconstruction, service disruptions and staging can be found in Chapter 6 of this report.

Alternative 1 results in a continuous HOV / Rapid Bus facility which would operate in peak directions only. As such, one lane of the existing South Station HOV facility would not be required and would be blocked by a moveable barrier in the opposing direction.

Since Alternative 1 would restrict HOV's that enter the Zipper Lane in Braintree to exiting only at Exit 20, HOV demand in the proposed, continuous HOV facility would be severely reduced in 2030. This reduced demand would allow all remaining vehicles, including rapid buses, to move at free flow speeds through the continuous HOV facility. Travel times for the HOV facility would be improved over No Build conditions by over 14 minutes.

This change, however, would move approximately 1,800 vehicles to I-93's general purpose lanes during the peak hour that previously used the Zipper Lane. Without access to the general purpose lanes at the current end of the Zipper Lane, these vehicles can no longer reach their destination using the Zipper Lane. This further increase in general purpose traffic volume beyond 2030 growth would impact travel time in I-93's general purpose lanes. Those impacts would be mitigated slightly by the removal of the existing Zipper / general purpose lanes merge, resulting in improved overall travel time (by 4 minutes) in the general purpose lanes with this alternative as compared with the 2030 No Build. By removing the existing merge point on the left side of the expressway the general purpose vehicles are no longer weaving through this segment, smoothing traffic flow. However, this alternative would have the highest general purpose lane demand and the highest percentage of unmet demand (38 percent) of the Design Alternatives, which would result in the largest peak hour spreading of I-93 demand (an additional 36 minutes needed during the peak hour to process the additional demand.)

Figures 9 – 11 include plan view graphics showing the detailed layout of this alternative.

4.2 Alternative 2 – the "Maintain Exit at Savin Hill" Alternative

Alternative 2 would widen I-93 to provide a combination of new, general purpose lanes and a new permanent, reversible lane in the median of I-93 between the end of the Zipper Lane and the start of the South Station HOV facility. New general purpose lanes would be constructed on the northbound and southbound sides of I-93 immediately north of the existing Zipper Lane's northbound exit / southbound entrances. HOV / Rapid Bus traffic would exit the Zipper Lane directly into this new lane (approximately 2,400 feet), where the option to merge into a general purpose

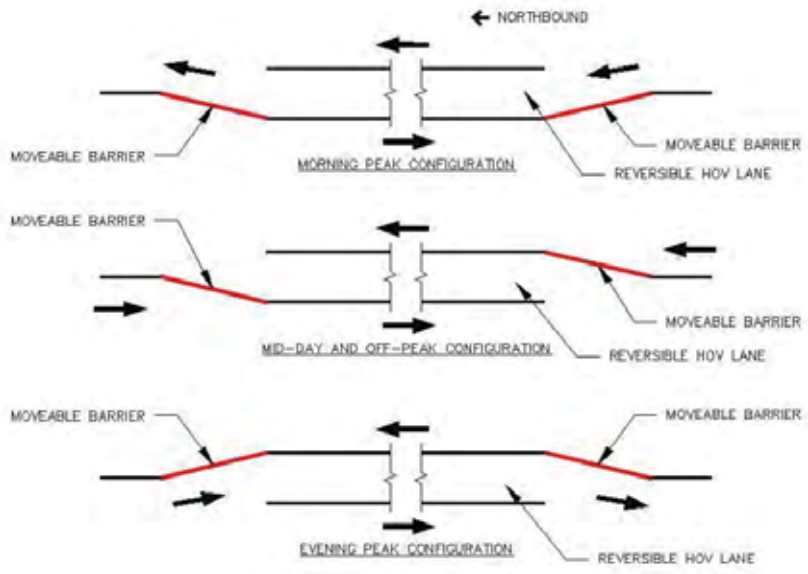
lane/exit I-93 or stay in the lane would exist. This lane would also be available to general purpose traffic.

Continuing on I-93, the new general purpose lane would feed into a new, reversible HOV-only lane just north of the Savin Hill retaining wall section. Similar to Alternative 1, the reversible lane would be a 12' wide travel lane in the center of I-93 with two 5' shoulders on either side. Four lanes of general purpose travel will be maintained in both the northbound and southbound directions. These general purpose lanes will be separated from the new, reversible lane by a two foot barrier on one side and a six foot wide median on the other. A ten foot outer shoulder and a four foot inner shoulder will be provided for both the northbound and southbound directions of travel adjacent to the general purpose lanes. The reversible HOV lane would extend for approximately 7,200 feet before exiting in another new, general purpose lane. The new, general purpose lane would serve the same function as the previous section, allowing HOV vehicles to stay in the lane or merge/exit with general purpose traffic. General purpose traffic would also have access to this lane. Figure 12 shows three typical cross sections for this alternative. This second section of new general purpose lane, would extend approximately 1,700 feet, before feeding into the existing South Station HOV lane.

Similar to Alternative 1, this alternative's reversible HOV lane would require a rigid moveable barrier at both ends to prevent vehicles from entering the HOV lane with vehicles traveling in the opposite direction. Figure 13below shows a sketch of how this moveable barrier would work for the morning and evening peak hours as well as the midday period. Also similar to Alternative 1, I-93 widening would occur on both the south and north sides of the highway.

Figures 14 – 16 are additional graphics related to this alternative.

Figure 14 Moveable Barrier Configuration



Alternative 2 would provide a permanent, reversible lane that connects the existing Zipper Lane to the South Station HOV lane into Boston but with access points at the current Zipper and HOV lane end points. These access points would allow vehicles to exit the Zipper Lane and would allow general purpose lane vehicles to enter the zipper or HOV lanes. This change in the geometry would provide a greater distance for Zipper Lane vehicles to merge into the general purpose lanes and would allow some vehicles to remain in their lane. These factors would maintain travel times in the existing Zipper Lane close to 2010 conditions and save over eight minutes in Zipper Lane travel time over 2030 No Build Conditions. However, 28 percent of the HOV traffic demand would not be accommodated in the peak hour resulting in 22 minutes of peak hour spreading.

General purpose lane traffic would be maintained close to No Build conditions with some additional congestion at the Exit 20 off-ramp where the new HOV lane rejoins the general purpose lanes to allow drivers to enter and exit. Roughly 2.5 minutes of travel time would be saved in the general purpose lanes. Also similar to the No Build condition, 26 percent of the general purpose lane demand would be unmet during the peak hour, resulting in peak hour spreading of 21 minutes.

4.3 Alternative 3 – the "HOV Lanes in Both Directions" Alternative

Alternative 3 would widen I-93 to provide new HOV Diamond lanes in the median of I-93 between the end of the Zipper Lane and the start of the South Station HOV facility. New HOV Diamond lanes would be constructed on the northbound and southbound sides of I-93 immediately north of the existing Zipper Lane's northbound exit/southbound entrances. HOV/Rapid Bus traffic would exit the Zipper Lane directly into this new HOV Diamond lane, where the option to merge into a general purpose lane/exit I-93 or stay in the lane would exist. Non-HOV traffic from the general purpose lanes would not be permitted to enter the HOV Diamond lane. Enforcement would be required.

The HOV Diamond lanes would be 12' wide with a 3' painted median between the diamond lane and the general purpose lanes. This will provide a visual separation between the lanes and inhibit vehicles from entering the HOV lane. Additionally, as with the previous alternatives, this alternative would provide a 10' right shoulder and a 4' left shoulder on both the northbound and southbound directions.

Figure 17 shows three typical cross sections for this alternative. Figures 18 – 20 provide additional graphics related to this alternative.

Alternative 3 would not greatly improve travel times in the general purpose lanes over the No Build condition because of the additional weaving that the HOV Diamond lane would cause. HOV drivers would be more inclined to use the less

congested HOV lane instead of the general purpose lanes, however, the challenges of merging into the general purpose lanes would cause vehicles to remain in the HOV lane until very late in the trip. Drivers would then be forced to weave across four lanes of traffic in an effort to exit the highway. This maneuver would cause congestion in the general purpose lanes in the vicinity of Exits 18 and 20 to an extent that the existing Zipper Lane would also be impacted downstream in the form of queues extending to the Morrissey Boulevard exit.

The origin of this queuing would be north of the Columbia Road on-ramp. Existing and projected No-Build simulations indicate that traffic flow typically would free up past the Columbia Road on-ramp. However, with Alternative 3, weaving and lane changing by vehicles caused by vehicles entering/exiting the HOV lane in the section of I-93 from Exit 16 to Exit 20 would cause greater congestion north of Columbia Road as compared with other alternatives. Alternative 3 would result in a slight travel time improvement for the general purpose lanes over the No Build condition with an estimated unmet demand of 24 percent and peak hour spreading of 19 minutes. Conversely, the travel in the HOV lane would be least improved over the No Build condition with a saturation flow rate under 1,500 vehicles per hour and the largest peak hour spreading of 24 minutes. However, travelers in the combined zipper and HOV lane would save roughly 8 minutes over the 2030 No Build travel time, similar to Alternative 2.

4.4 Alternative 4 – the "Minimalist" Alternative

Unlike the previous three alternatives, which proposed widening I-93 to provide new HOV lane facilities, Alternative 4 proposes to reassign the existing lanes on I-93 and provide short areas of new general purpose lane capacity to ease congestion.

Currently, HOV traffic in the I-93 Zipper Lane outlets into four general purpose lanes during the morning peak period. For this alternative, instead of merging the Zipper Lane into the left-most of the four general purpose lanes, it is proposed that the general purpose lanes would merge prior to the end of the Zipper Lane, creating three general purpose lanes and one open exit lane for Zipper Lane vehicles. Therefore, HOV traffic exiting the Zipper Lane would have a clear lane to continue on I-93 and would not be required to merge into existing traffic. This reconfiguration is also proposed on the southbound side of I-93. While the existing merge would be removed by this new configuration, a new merge point would be created within the general purpose lanes south of the Zipper Lane's northern exit. Essentially, a general purpose lane would be 'dropped' with four general purpose lanes combining to three lanes.

This alternative also proposes the widening of I-93 between South Bay Plaza and the Columbia Road exit (Exit 15). I-93 contains two on-ramps and two off-ramps in this section which results in a high level of vehicular weaving and merging. This creates a bottleneck which results in significant delay through this area. In order to mitigate this delay, Alternative 4 would provide an auxiliary lane in both the northbound and southbound directions between the on-ramps and off-ramps. These auxiliary lanes would between the on-ramp northbound at the Columbia Road exit to the off-ramp at the Southampton Street exit and the opposite on the southbound side, from the on-ramp at the South Bay Plaza to the off-ramp at the Columbia Road exit.

Figure 21 shows three typical cross sections for this alternative. Figures 22 – 24 provide additional graphics related to this alternative as well as

With Alternative 4 there would be no new connections or dedicated HOV lane between the end of the existing Zipper Lane and the South Station HOV lane. The "Missing Link" would not be filled with an HOV facility which differentiates this alternative from Alternatives 1-3.

In Alternative 4, travel times for the Zipper Lane would be improved beyond existing conditions and by almost 10 minutes over the 2030 No Build, but the alternative would still result in peak hour spreading of 22 minutes for HOV traffic. This improvement, however, would be at the cost of the general purpose lane travel time. The lane drop in the general purpose lanes would cause reductions in the service flow rate resulting in general purpose lane queuing past the entry to the Zipper Lane and Braintree. The general purpose lanes would have the lowest saturation flow rate of 1,560 vehicles per hour per lane. Travel times in the general purpose lanes would increase by almost 4 minutes over the 2030 No Build. The first three alternatives were able to maintain a general purpose lane saturation flow rate that is comparable to the No Build condition, while Alternative 4 does not. Unmet demand for the general purpose lane is 29 percent with vehicle flows lower than Alternative 1. The estimated additional travel time due to peak hour spreading in the general purpose lane is 25 minutes.

5

Comparison of Design Alternatives

Each of the alternatives, results in the geometric modification of I-93 and improved travel times for vehicles traveling that would be traveling in HOV lane in 2030. Table 2 presents a summary of the infrastructure features of each of the alternatives.

Table 2 Summary of "Missing Link" Alternatives Infrastructure

Alternative	1	2	3	4
Amount of Proposed I-93 Widening	Approximately 2 miles	Same as Alt. 1	Same as Alt. 1	Approximately ½ mile
Amount of Proposed Rail Reconfiguration Required	Commuter Rail: 0.92 miles Braintree Red Line: 1.62 miles Ashmont Red Line: 0.42 miles Red Line Yard Lead Tracks: 0.75 miles	Same as Alt. 1	Same as Alt. 1	None
Proposed HOV Lane Configuration	Zipper + Permanent Reversible + Permanent Lane	Zipper + General Purpose + Permanent Reversible + General Purpose + Permanent Lane	Zipper + HOV Diamond + Permanent Lane	Zipper+ Converted General Purpose Lane + Permanent Lane
Proposed I-93 General Purpose Lane Configuration	No change: 4 lanes	No change: 4 lanes	No change: 4 lanes	3 lanes + Interchange improvements
HOV Accessibility	No access/egress between Braintree and I-93 Exit 20	Access/Egress in General Purpose Lane segments only	Egress from HOV diamond lane to General Purpose Lane only	Access/Egress in General Purpose Lane segments only

Table 3 shows the change in travel time through the simulation network for 2010 Existing Conditions, 2030 No Build Conditions, and each of the four 2030 Design Alternatives. Changes in travel time for the Zipper or HOV lane varies with each condition while travel time for the general purpose lanes is consistently higher for 2030 conditions than it is in the existing 2010 condition. Table 3 shows peak hour travel time for vehicles that were served during the peak hour, therefore, the volume of vehicles that are not served are not represented in this table.

Table 3 Peak Hour Simulated Travel Times

Travel Times (m:ss)	7:00 - 8:00 AM					
	2010 Existing	2030 No Build	2030 Alternative 1	2030 Alternative 2	2030 Alternative 3	2030 Alternative 4
via Zipper and HOV lane						
Zipper entry to Zipper exit	11:41	21:23	7:36	12:29	12:49	8:29
Zipper Entry to HOV entry	15:47	24:52	11:10	16:08	16:04	14:14
via General Purpose Lane						
Zipper entry to Zipper exit	16:40	21:45	19:29	20:05	19:35	24:44
Zipper Entry to HOV entry	21:32	26:49	22:49	24:23	25:42	30:47

N/A- Not Applicable: The presence of Zipper or HOV lanes varies depending on the alternative. Zipper or HOV lanes are not present if marked N/A.
Travel Time values presented apply to vehicles served during the peak hour, volume demand that was not served contributes to peak hour spreading.

Table 4 summarizes the amount of unmet peak hour volumes and the saturation flow rates for both the general purpose and HOV lanes (Zipper plus Missing Link HOV treatment) under each alternative. Additionally, this table estimates the impact that unmet volume and reduced saturation flow rates will have on peak hour operations in the form of peak hour spreading. Peak hour spreading or the additional peak hour travel time is a representation of the minutes that will likely be added to the existing peak hour in order to process all of the volume demand based on the simulated saturation flow rates. The peak hour for the general purpose lane traffic could spread from 60 minutes to a period of between 79 minutes and 96 minutes. These peak hour spreading projections are based on additional travel time needed for the peak hour traffic volume demand to travel through the study area network. If operations on other ramps and facilities on I-93 should degrade then that could result in further peak hour spreading that the modeled network cannot account for.

Table 4 2030 Peak Hour Operational Impacts

	2030 No Build	2030 Alternative 1	2030 Alternative 2	2030 Alternative 3	2030 Alternative 4
via HOV lane					
Unmet Peak Hour Volume (vehicles)	706	-2	562	582	556
Saturation Flow Rate (Vehicles Per Hour Per Lane – VPHPL)	1,324	243	1,504	1,484	1,510
Additional Peak Hour Travel Time (minutes)	32	0	22	24	22
via General Purpose Lane					
Unmet Peak Hour Volume (vehicles)	2,299	3,982	2,262	2,142	2,551
Saturation Flow Rate (VPHPL)	1,623	1,658	1,632	1,662	1,560
Additional Peak Hour Travel Time (minutes)	21	36	21	19	25

Projections shown are derived from modeled output of the study area network described. Changes elsewhere on Interstate 93 or the ramps serving Interstate 93 can also impact operations through the study area network.

All four alternatives would result in significantly improved HOV travel times over the 2030 No Build HOV travel time (24:52). The reduction in HOV travel time would range from a high of almost 14 minutes (Alternative 1) to a low of almost 9 minutes (Alternatives 2 and 3).

Alternative 1 would present the best travel time (11:10) via the HOV and the best travel time in the general purpose lanes (22:49) through the modeled studied area of the four alternatives. Since this alternative would not permit HOV traffic to enter or leave the HOV lane from the Braintree entry point until Exit 20, over 88 percent of the HOV traffic accommodated in the No Build alternative would be required to use the general purpose lanes. While the general purpose lane travel times through the simulated area would improve with Alternative 1 due to the complete elimination of the HOV merge, the increased general purpose lane volume would result in the greatest peak hour spreading of all the alternatives since the projected demand could not be fully processed with the proposed capacity in the defined peak period. This projected peak hour spreading would likely result in 11 to 17 minutes more of general purpose traffic peak hour spreading than the other alternatives.

Alternative 2 would present the least HOV travel time reduction of the four alternatives as compared with the No Build but the second best improvement in general purpose lane travel times. HOV travel time with Alternative 2 would be almost 5 minutes longer than Alternative 1. However, HOV vehicles would retain the ability to exit the HOV lane before Exit 20. The less significant reduction in general purpose lane travel times could be attributed to the two segments of added general purpose lanes where HOV traffic would be able to merge in the general purpose lanes to exit. Alternative 2 would also result in peak hour spreading due to unmet demand in the defined peak period but at a much lesser extent than Alternative 1 (a difference of 15 minutes for the general purpose lanes). However, this alternative would also result in unmet demand and peak hour spreading for the HOV lane due to obstruction of the HOV lane entry by projected general purpose lane queuing through the Braintree Split as well as the modeled capacity of the HOV lane entry.

Alternative 3 would present similar results to Alternative 2, demonstrating that the segments of permanent, reversible lane proposed in Alternative 2 would be no more effective than a HOV diamond lane. The simulation of this alternative illustrated weaving difficulties from the HOV diamond lane to the closely spaced Exits 16-20 off-ramps leading to congestion and delay in the section of highway north of Columbia Road.

Alternative 4 resulted in the second best HOV travel time through the modeled area (14:14) but at the expense of general purpose lane travel times. With Alternative 4, travel times in the general purpose lanes would increase as compared with the No Build (by 4 minutes), and therefore it is the only alternative that would result in a negative travel time impact within the modeled study area. This increase in travel time is the result of the reduction in general purpose lane capacity that is proposed as part of this alternative. Proposed improvements at the exit ramps would offset the decreased lane capacity but not effectively enough to result in a reduction in travel time. Additionally, this alternative would result in peak hour spreading for both the HOV and general purpose lanes.

6

Constructability of Design Alternatives

6.1 Highway Impacts

In order to maintain the current capacity of the Southeast Expressway, the highway would need to be widened on either the northbound or the southbound side, described in the previous section, for Alternatives 1-3. Although there is variation between these three alternatives, the major differences come from the design of the HOV lane. The impacts and overall envelope of the widening are very similar for Alternatives 1-3. Below are the impacts to the highway infrastructure for Alternatives 1-3. Refer to the earlier figures for more detailed graphics of the expressway for these alternatives.

From the end of the existing Zipper Lane to the off-ramp for exit 15 the expressway would need to be widened approximately 40'-50' on the southbound side of the highway. This would provide enough space for the permanent reversible lane, the diamond lanes or the additional general purpose lanes in the median of the I-93. The widening of the highway would extend up to and through the Columbia Road exit. This means that the on-ramp to the southbound side of the I-93 would be affected. Widening the road by 40'-50' on the southbound side would require a shift of the on ramp as well. Additionally the off-ramp from the southbound side would be affected in a similar way. It would need to be realigned to accommodate for the additional width of the highway in this section. Since the roadway would only be widened on the southbound side, the northbound off ramp at the Columbia Road exit would be unaffected by this change.

Immediately following the Columbia Road exit, construction of the permanent reversible lane would switch from widening the highway on the southbound side to widening the highway on the northbound side. The amount of widening would be the same, at approximately 40'-50'. This widening would affect the on ramp to the northbound side at Columbia Road in the same way the on ramp to the southbound side was affected by the widening on the southbound side. The on ramp would be

extended farther north to allow for the extra width on the northbound side of the I-93. There are no additional on ramps on the northbound side of the expressway, but there are three additional off-ramps at Exit 16, Exit 18 and Exit 20. Two of these three exits connect to roads at a higher elevation than the highway; one connects to Frontage Road at the same elevation. The widening on the northbound side between Columbia Road and the entrance to the existing permanent HOV lane would affect each of these off ramps. For the off-ramps the need to meet the side road at a higher elevation, longer deceleration lanes and an off-ramp extended slightly farther than the existing would accommodate the wider highway and the change in elevation. For the off ramp that connects to Frontage Road at the same elevation the pavement striping would be extended in order to give the vehicles exiting the highway a longer deceleration distance.

The highway infrastructure impacts for Alternative 4 are slightly less than those of Alternatives 1-3 because of more limited construction. Refer to Figures 23-26 for more detailed graphics of the expressway for these alternatives. Below is a summary of the highway infrastructure impacts for Alternative 4.

Since the goal of this alternative is to decrease the delay while minimizing the amount of construction needed, there would only be one area of highway reconstruction. In the location of the auxiliary lanes, between Columbia Road and Southampton Street, on the northbound and southbound side of the highway, the road would need to be widened approximately 20'-22' to accommodate the new lane.

In addition to widening the highway, a new retaining wall would need to be constructed on the southbound side to support the properties located adjacent to the highway on the embankment.

6.2 Bridge Impacts

From the end of the Zipper Lane to the beginning of the permanent HOV lane there are seven overhead bridges, and two undergrade bridges. The overhead bridges are at Savin Hill Avenue, Dorchester Avenue, Boston Street, Southampton Street, South Boston Bypass Road, Massachusetts Avenue Connector and the Fairmont Line of the Commuter Rail; the undergrade bridges are at Columbia Road where I-93 is up on a viaduct and for the track siding from the Commuter Rail line that leads to the Boston Globe property. Although the highway is only being widened on one side or the other, all of the bridges would need to be reconstructed for Alternatives 1-3. The east or the west abutment for each of the bridges in addition to the bridge piers in the median of the highway would need to be removed and reconstructed. Only two of the nine bridges mentioned above would need to be reconstructed for Alternative 4; Dorchester Avenue and Boston Street.

The current minimum clearance requirement for bridges crossing highways is 16' for all bridges over highways. When one abutment of the bridge requires reconstruction, the entire bridge would be required to be brought up to standards should it currently provide less than 16' of clearance. If additional clearance is required, the whole bridge section over the highway would be raised and would continue out away from the edge of the highway. This would be required so as to not create too steep of a slope on the bridge approach. This is an especially important consideration for the bridge that carries the Commuter Rail Fairmont Line tracks across the highway. Since train tracks cannot accommodate as steep of a grade as roadways, adjusting the height of the bridge would affect the track approach on either side of the highway.

Beginning soon after the existing retaining wall ends on the northbound side, the highway enters an elevated section. The highway is currently raised approximately 25'-30' above the tracks to allow trains to pass under the highway as they enter and exit JFK / UMass Station. Figures 7, 13, and 18 show typical cross sections for Alternatives 1-3 of I-93 as the highway begins the viaduct section and as the train tracks are under the highway. In this section since the highway is being widened on the southbound side, the viaduct would only need to be reconstructed on that side, by adding in piers to support the additional highway width. Immediately south of this viaduct section is a small bridge section with a track siding connection the Boston Globe. Similar to the Columbia Road viaduct, this bridge could also be extended by connecting to the existing bridge structure. This reconstruction is only required in Alternatives 1-3, Alternative 4 does not impact the viaduct section.

6.3 Impacts to Rail Lines

For approximately a mile and a half of this section of I-93, the MBTA Red Line tracks as well as one Old Colony Commuter Rail line run parallel to the highway. From Savin Hill until the highway shifts to the viaduct section, the tracks run parallel on the southbound side. At the location where the highway starts to be on a viaduct section the tracks cross under the highway and continue running parallel on the northbound side. Around the location of the South Bay Plaza the tracks veer off towards South Station and Cabot Yard. This can be seen well in Figure 27 which shows I-93 looking northbound with the tracks directly adjacent to the highway.

Figure 27 Tracks Adjacent to Highway

The additional width that would be required to accommodate the proposed Rapid Bus route (Alternatives 1-3) within I-93 in the area between the MBTA Red Line stations of Savin Hill and JFK / UMass, would result in encroachment onto the railroad right-of-way. Eliminating any tracks in this area will cause significant impacts to existing Red Line and Commuter Rail operations. The rail infrastructure in this segment will need to be modified to accommodate the widened expressway, including relocating the existing Braintree line tracks and the Old Colony commuter rail track.

Multiple alternatives were investigated to determine the most feasible and cost effective solution for the rail lines that would be impacted by the widening of I-93. The first option would be to tunnel two Braintree Line tracks and one Commuter Rail track. This option was determined to be infeasible because the required cross section for the tunnel would extend from the existing Commuter Rail location to well beneath the existing expressway. This would require closure of at least one travel lane in the southbound direction of I-93, which would be infeasible. A second option would enable sharing of the Ashmont line track with the Braintree line. In this option, the Commuter line would be relocated in a tunnel beneath its existing location, and the Braintree line would crossover the top of the tunnel south of Savin Hill Station to tie back in to the existing Braintree line tracks. This option was also determined to be infeasible due to the fact that it would be a permanent condition that created multiple new conflict points between inbound and outbound direction trains. It would significantly limit operations for the Red Line.

The selected, feasible option would require relocation of the Braintree line tracks by merging the Braintree line with the Ashmont Line south of Savin Hill station. A new flyover structure would be constructed for the Braintree line in order to pass over the Old Colony commuter rail line and the inbound track of the Ashmont line. The inbound Ashmont line and the Old Colony commuter rail line would need to be realigned to accommodate the piers for the new flyover structure. A grade-separated junction of the two Red Line branches would be required to cross over the commuter rail track and to avoid operational conflicts on the Red Line. Just south of Savin Hill Station, the railroad cross-section would be reduced from five tracks to three tracks. In order to further reduce the railroad cross-section at Savin Hill Station, a tunnel will be constructed for the commuter rail track, thereby allowing room on the surface for expansion of I-93. The tunnel will require a ventilation system, emergency egress points and a pumping station for stormwater and groundwater infiltration.

Service would be suspended on the Braintree line for the entirety of the railroad-specific construction tasks, approximately 4 years. Ashmont line trains and commuter rail trains would continue normal operation with some service disruptions and weekend outages. Alternative transportation services would need to be provided during these shutdowns. Table 5 below shows a breakdown the alternative transportation needed to service total ridership for the Braintree Red Line. This would create significant impacts to the communities in the South Shore for the duration of the construction phase.

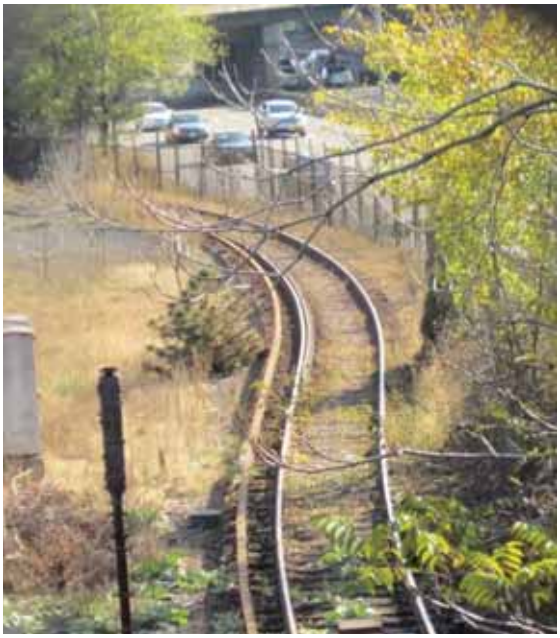
Table 5 Bus/Shuttle Service Summary

ID	Bus/Shuttle Service		Formula
A	Total Riders =	13,518	
B	Riders per Bus =	50	
C	Total Bus Trips Needed during the Peak Hours =	270	A/B
D	Round trip per bus (hr) =	2	
E	Operating Time (hr) =	19	
F	Total Peak Period Time (hr) =	4	
G	Trips per Bus during the Peak Hours =	2	F/D
H	Total Buses Needed =	135	C/G
I	Provide Bus Service for 4 years (4yrs x 365.25=)	1,461	
J	*Total Bus Days* =	*197,494*	H*I

The total number of riders at the affected stations was determined by the total typical weekday entries at each station that would be closed. Peak ridership numbers were determined by assuming 40% of the total weekday entries. An additional 20% is added to the total peak hour entries to account for the existing riders traveling outbound on the Braintree line. It is assumed that the number of buses used during the peak period would be sufficient to service the off-peak ridership. Total bus days is the product of the number of buses used and the number of days the service is running.

Another location where widening I-93 would affect the tracks is between Boston Street and JFK / UMass Station. The track that is the closest to the edge of the highway is a yard lead track for the Red Line as well as a track used for additional storage. This track brings trains from the main line to connect to the yard lead tracks to Cabot yard near South Station. With Alternatives 1-3, the yard lead tracks would be affected by widening the highway. Due to the extent of the proposed widening at this location (40-50'), the yard lead track adjacent to the highway would be eliminated. The three other yard lead tracks would need to be realigned to account for the 10' offset required to any wall or fence. Figure 28 shows the proximity of this yard lead track to the edge of the highway.

Figure 28 Siding Track Proximity to Highway



In order to continue to provide access to Cabot Yard without creating additional conflict points or major operational constraints, the tracks within Columbia Junction would need to be reconfigured. New turnouts would be provided to the Ashmont line tracks north of JFK / UMass Station and would tie in to existing track locations to provide a new alignment to connect to the yard lead tracks. This will provide uninhibited connections between the Ashmont Line tracks, both northbound and southbound, to enter and exit Cabot yard.

The only track impacts that would result from construction of Alternative 4 would be to yard lead adjacent to the highway pictured in Figure 28. Even though the widening of the highway is only approximately 22' in this location, this would still cover the yard lead track and would need to be removed. The same level of access to

Cabot yard that is currently provided would be maintained with this reconstruction. Due to the fact that Columbia Junction is a very congested and compact area, there is little that can be done to add infrastructure at that location without affecting a significant number of the tracks and operations. Currently there are turnouts from the Braintree line to Cabot yard as well as a connection from the outbound Ashmont line track. Two new turnouts can be installed between the inbound track at the Red Line tunnel entrance and the outbound yard lead track adjacent to the inbound Red Line track. Additionally the left hand turnouts just south of the JFK / UMass Station Ashmont platform could be reversed which would provide a connection between the outbound Ashmont track and the inbound track that then connects to the Cabot yard lead track.

6.4 Construction Staging

Physical constraints within the I-93 / railroad corridor limit the options for expansion of transportation facilities connecting Boston with communities in southeast Massachusetts. The width of right-of-way available is a primary constraint when considering widening projects on I-93 or adding more tracks to the railroad corridor. Because of these constraints and the location of the existing infrastructure, construction phasing would play a critical role in determining the cost, schedule and sequence of tasks needed in order to complete the construction of the Rapid Bus Alternative with minimal impact to existing facilities.

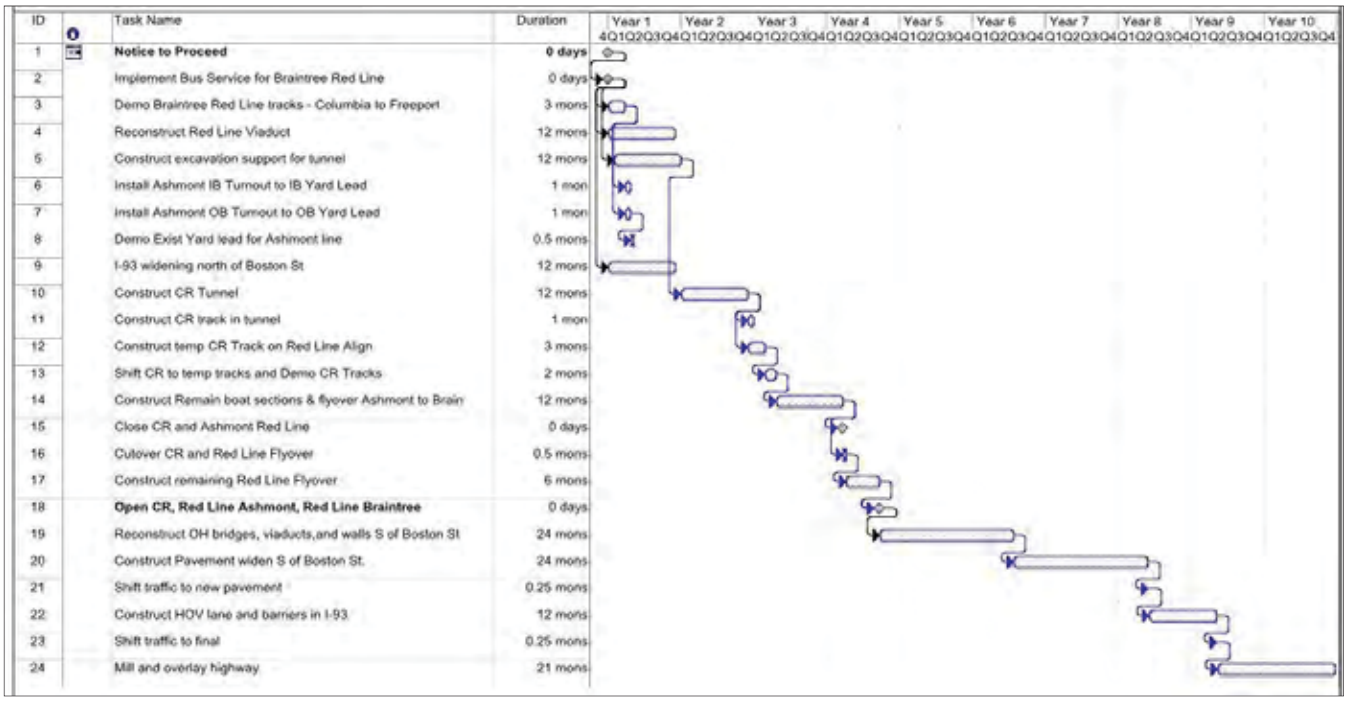
6.4.1 Alternatives 1-3

The first major task needed for the construction of the Rapid Bus infrastructure includes relocating the railroad to make room for the proposed widening of I-93. The two areas where modifications would be needed are the rail corridor between Dorchester Avenue and JFK / UMass, and between JFK / UMass Station and Freeport Street, south of Savin Hill Station. Both locations of rail modification would be constructed simultaneously, as follows:

1. Establish Bus Shuttle Service for Braintree Red Line and close Braintree Red Line Andrew Square Station (*1 day*);
2. Demolish existing Braintree Red Line tracks from Columbia Junction to Freeport Street (*3 months*);
3. Reconstruct Red Line Viaduct. Construct earth support system adjacent to Commuter Rail and I-93 for new tunnel section. Install new facing point turnout on Ashmont Inbound track at Columbia Junction for connection to a Inbound Yard Lead track and install new trailing point right hand turnout on Ashmont Outbound track at Columbia Junction for connection to Outbound Yard Leak track (*1 year*);

4. Demolish existing yard lead track for Ashmont line (*2 weeks*);
5. Begin highway widening and bridge reconstruction unaffected by rail modifications north of Boston Street (*1 year*);
6. Construct cut and cover tunnel and short section of boat section to support temporary skeleton track (*1 year*);
7. Construct track within the tunnel and boat section (*1 month*);
8. Construct temporary skeleton track along Braintree Inbound Red Line alignment from Freeport Street to the Boston Globe siding for Commuter Rail and shift Commuter Rail operations (*3 months*);
9. Demolish Commuter Rail Tracks and shift Commuter Rail to temporary alignment (*2 months*);
10. Construct remainder of boat sections and begin flyover from Ashmont to Braintree Red Line (*1 year*);
11. Close Commuter Rail Line and Ashmont Red Line (*1 day*);
12. Cut over for Commuter Rail and Red Line flyover (*3 weeks*);
13. Construct remainder of Red Line Flyover (*6 months*);
14. Reopen Commuter Rail, Ashmont and Braintree Red Lines (*1 day*).
15. Continue reconstruction overhead bridges, viaduct structure and retaining walls south of Boston Street (*2 years*);
16. Continue constructing additional width of highway pavement south of Boston Street (*2 years*);
17. Shift traffic on to the new pavement area (*1 week*);
18. Construct HOV lane and barriers in the center of I-93 and finish construction of overhead bridges (*1 year*);
19. Shift traffic to final condition (*1 week*);
20. Mill and overlay highway and add permanent striping during off-peak hours (*2 years*).

The entire duration for the construction of these rail modifications and highway construction would be approximately 10 years. Below is a graphic depicting the estimated schedule for Alternatives 1-3:



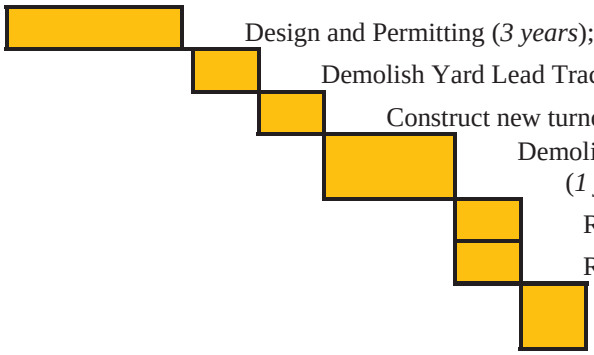
ID	Task Name	Duration
1	**Notice to Proceed**	**0 days**
2	Implement Bus Service for Braintree Red Line	0 days
3	Demo Braintree Red Line tracks - Columbia to Freeport	3 mons
4	Reconstruct Red Line Viaduct	12 mons
5	Construct excavation support for tunnel	12 mons
6	Install Ashmont IB Turnout to IB Yard Lead	1 mon
7	Install Ashmont OB Turnout to OB Yard Lead	1 mon
8	Demo Exist Yard lead for Ashmont line	0.5 mons
9	I-93 widening north of Boston St	12 mons
10	Construct CR Tunnel	12 mons
11	Construct CR track in tunnel	1 mon
12	Construct temp CR Track on Red Line Align	3 mons
13	Shift CR to temp tracks and Demo CR Tracks	2 mons
14	Construct Remain boat sections & flyover Ashmont to Brain	12 mons
15	Close CR and Ashmont Red Line	0 days
16	Cutover CR and Red Line Flyover	0.5 mons
17	Construct remaining Red Line Flyover	6 mons
18	**Open CR, Red Line Ashmont, Red Line Braintree**	0 days
19	Reconstruct OH bridges, viaducts,and walls S of Boston St	24 mons
20	Construct Pavement widen S of Boston St.	24 mons
21	Shift traffic to new pavement	0.25 mons
22	Construct HOV lane and barriers in I-93	12 mons
23	Shift traffic to final	0.25 mons
24	Mill and overlay highway	21 mons

6.4.2 Alternative 4

The construction for Alternative 4 requires less phasing because the construction is limited to a small section of the corridor between Boston Street and Dorchester Avenue. The sequence of construction phases is described below:

1. Demolish Yard Lead track (3 months);
2. Construct new turnouts between Red Line Inbound track and Yard Lead track (6 months);
3. Demolish existing left hand crossover at the southern end of the Ashmont Line platform and construct new right hand crossover with signal modifications (6 months);
4. Implement Zipper Lane exit reconfiguration (1 day);
5. Reconstruct overhead bridges (6 months);
6. Construct new auxiliary lanes (6 months).

The total duration for this construction would be approximately 2-3 years. Below is a graphic depicting the estimated schedule for Alternative 4:



Design and Permitting (*3 years*);

Demolish Yard Lead Tracks (*3 months*);

Construct new turnout from Inbound Red Line to Yard Lead Track (*6 months*);

Demolish existing left hand crossover and install new right hand crossover (*1 year*);

Reconfigure Zipper Lane exit (*1 day*);

Reconstruct overhead bridges (*6 months*);

Construct new auxiliary lane (*6 months*).

7

Environmental Impact of Design Alternatives

This section provides an evaluation of the environmental impacts of the Design Alternatives.

7.1 Land Use, Zoning and Socioeconomics

This section discusses the impacts of the Modified Rapid Bus Alternatives on land use and zoning, with a focus on the parcels that would have to be acquired to construct each alternative. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the I-93 Southeast Expressway section.

Table 6 lists the property acquisitions that would be required for each of the four design options considered for the I-93 Southeast Expressway section through Boston's Savin Hill area. As shown on the table, Alternative 1 would require the acquisition of six residential properties, six commercial properties, and one school. Alternatives 2 and 3 would affect the school and six residential properties, as well as seven commercial properties. Alternative 4 would affect four residential and two commercial properties.

The acreages occupied by these parcels have not been determined, and as such the potential property tax loss and socioeconomic impact cannot be calculated for these alternatives.

During Final Design, when actual acquisition requirements are determined, MassDOT will seek to re-zone or obtain a zoning variance for each of the acquired parcels, if necessary.

Table 6 Property Acquisition Requirements

Address	Type of Property	Alternative 1	Alternative 2	Alternative 3	Alternative 4
215 Sydney Street (Boston Collegiate Charter School)	Institutional	Y	Y	Y	N
202 Sydney Street	Residential	Y	Y	Y	N
82 Crescent Avenue	Residential	Y	Y	Y	N
35 Cottrell Street	Residential	Y	Y	Y	N
7 Cottrell Street	Residential	Y	Y	Y	N
3 Cottrell Street	Residential	Y	Y	Y	N
92 Mt. Vernon Street	Residential	Y	Y	Y	N
82 Boston Street	Residential	N	N	N	Y
29 Rawson Street	Residential	N	N	N	Y
34 Rawson Street	Residential	N	N	N	Y
11 Washburn Street	Residential	N	N	N	Y
15 Washburn Street	Residential	N	N	N	Y
750 Dorchester Avenue	Commercial	N	Y	Y	Y
149 Buttonwood Street	Commercial	Y	Y	Y	Y
33 Locust Street	Commercial	Y	Y	Y	N
66 Von Hillern Street	Commercial	Y	Y	Y	N
50 Von Hillern Street	Commercial	Y	Y	Y	N
45 Ellery Street	Commercial	Y	Y	Y	N
400 Southampton Street	Commercial	Y	Y	Y	N
Totals (Residential / Commercial)		6 / 6	6 / 7	6 / 7	5 / 2

7.2 Environmental Justice

This section discusses property acquisitions and noise impacts in environmental justice neighborhoods potentially resulting from improvements to the I-93 HOV lane

section. The study area is predominated by environmental justice neighborhoods that may be adversely impacted by the construction or operation of the Rapid Bus Alternative. Environmental justice populations are defined by the Massachusetts Executive Office of Energy and Environmental Affairs Environmental Justice Policy and identified by the US Census Bureau block data in MassGIS mapping. The Environmental Justice Policy is intended to prevent disproportionate adverse impacts to populations disadvantaged because of minority, low income, foreign-born, or English as second language status. Based on MassGIS mapping, environmental justice neighborhoods are present on the east side of I-93 from where the railroad tracks pass under I-93 just south of Columbia Road north to Southampton Street, and on the west side of I-93 for the entire study area except between Southampton Street and the Fairmont Line Commuter Rail. Environmental justice neighborhoods on both sides of the highway include commercial and residential properties. MassGIS mapping does not indicate which environmental justice criteria are met by these neighborhoods.

7.2.1 Property Acquisitions

In the east side environmental justice neighborhoods, three large commercial enterprises (First Electronics Corporation, Olde Bostonian, and Eagle Electric Supply) occupy the space between I-93 and railroad tracks north of Columbia Road, and are accessed by Von Hillern Street. Farther north, 2- and 3-story residential buildings and a range of commercial, industrial, and institutional enterprises (including a church and the Boston Housing Authority) occupy properties east of the railroad tracks, which in this segment abuts the highway alignment.

In the west side environmental justice neighborhoods, commercial and institutional properties between William T. Morrissey Boulevard and Savin Hill Avenue include Yale Electric, Local 103 International Brotherhood of Electrical Workers (IBEW), the Joint Apprenticeship and Training Committee (JATC) for the electrical industry training facility, and the City of Boston Patrick C. Campbell Resource Center (school bus yard). The MBTA Savin Hill Station, which serves this environmental justice neighborhood, is located immediately south of the Savin Hill Avenue bridge over I-93, and several commercial businesses abut the avenue here. A residential neighborhood, consisting of 1-, 2-, and 3-story homes, abuts the highway and then railroad tracks north to Columbia Road, with some interspersed commercial businesses and institutional (Boston Collegiate Charter School and American Legion) properties in the area immediately south of Columbia Road (along Sydney Street). Pedestrian access to the MBTA JFK / UMass Station, an underpass beneath I-93, is also in this area.

North of Columbia Road, one 3-story apartment building and one 2-story residence abut the southbound off-ramp from I-93 to Columbia Road, and additional commercial buildings, such as ATS Auto Equipment and First Trade Union Bank, abut this segment of the highway south of Dorchester Avenue. Two- and 3-story residential and commercial buildings abut Washburn Street Green and General Casimir Pulaski Square immediately north of Dorchester Street, and various commercial enterprises occupy buildings along the south side of Boston Street. The Fortress (storage space), Holiday Inn, and Bickford's Family Restaurant are north of Boston Street, with a frontage road separating the latter two properties from the I-93 corridor south of Southampton Street. North of the Fairmont Line Commuter Rail bridge over I-93, warehouses and a truck shipping center are along the frontage road extending north to the Massachusetts Avenue Connector. A parking garage and additional warehouses are north of the connector, to the end of the study area.

Potential property acquisition impacts to the environmental justice neighborhoods are summarized in the tables below. Tables 7 and 8 identify the number of residential and commercial (including industrial and institutional) buildings, respectively, in environmental justice neighborhoods that would be acquired for each of the four alternatives. For easy geographic reference, the study area is divided into four segments, identified by major street crossings over I-93. For this study, land acquisitions are identified based direct impacts to buildings: if a structure is within the footprint of the widened highway, the parcel or parcels it occupies would be acquired. Acquisitions of vacant parcels, or partial parcel acquisition of portions not occupied by buildings, are not included in this evaluation as they would be unlikely to substantively impact residences, businesses (i.e., jobs), or property tax revenues.

Rapid Bus Alternatives 1, 2, and 3 would require acquisition of six residential and three commercial buildings in environmental justice neighborhoods. The residential buildings are located on the west side of I-93 north of Columbia Road along Mount Vernon Street and Cottrell Street, and would be impacted by the relocated southbound off-ramp from I-93 to Columbia Road. Five of the residential properties are individual units in a row-house building on Mount Vernon Street; one is a multi-family home on Cottreel Street. A 1-story commercial building on Locust Street would also be impacted by this off-ramp. The northbound on-ramp from Columbia Road to I-93, on the east side of the highway, would impact the Eagle Electric Supply building. These alternatives would also impact one school site, which is not a commercial property. The southbound on-ramp from Columbia Road to I-93, also on the west side, would impact the Boston Collegiate Charter School on Sydney Street just south of Crescent Avenue. Rapid Bus Alternative 4 would not impact residential or commercial buildings within environmental justice neighborhoods.

Table 7 Number of Residential Building Acquisitions in Environmental Justice Neighborhoods: I-93 Section

	Alternative			
Segment	1	2	3	4
Morrissey Boulevard to Savin Hill Avenue	0	0	0	0
Savin Hill Avenue to Columbia Boulevard	0	0	0	0
Columbia Boulevard to Dorchester Avenue	6	6	6	0
Dorchester Avenue to Massachusetts Avenue Connector	0	0	0	0
TOTAL	6	6	6	0

Table 8 Number of Commercial Building Acquisitions in Environmental Justice Neighborhoods – I-93 Section

	Alternative			
Segment	1	2	3	4
Morrissey Boulevard to Savin Hill Avenue	0	0	0	0
Savin Hill Avenue to Columbia Boulevard	0	0	0	0
Columbia Boulevard to Dorchester Avenue	2	2	2	0
Dorchester Avenue to Massachusetts Avenue Connector	0	0	0	0
TOTAL	2	2	2	0

Acquiring residential or commercial property for the project would be conducted in accordance with the Uniform Relocation Act. The loss of commercial buildings could result in a loss of jobs for the local environmental justice neighborhoods, depending whether the businesses would relocate within the local community or not. The number of potential job losses has not been investigated for this evaluation. The municipalities would realize a loss of property tax revenues when the privately held properties are transferred to public ownership. The property tax revenue losses have not been calculated for this evaluation. The potential job losses and property tax revenue decreases would be associated with Rapid Bus Alternatives 1, 2, and 3, but not Alternative 4.

7.2.2 Noise Impacts

Each of the Rapid Bus alternatives would move the highway closer to residences, increasing noise levels for occupants. For Rapid Bus Alternatives 1, 2, and 3, this impact would be somewhat offset by noise level reductions resulting from moving the railroad tracks into a tunnel for a portion of these segments. Table 9 identifies the length of highway widening segments that would move the highway closer to environmental justice residential neighborhoods, again for each alternative and divided into four segments.

Rapid Bus Alternatives 1, 2, and 3 would move the highway closer to environmental justice residential neighborhoods for a total distance of approximately 3,950 feet on the west side of I-93 for the segment from the MBTA Savin Hill Station north to Columbia Road, and from Dorchester Avenue to Boston Street. Alternative 4 would move the highway closer to environmental justice residential neighborhoods for a total distance of approximately 550 feet on the west side of I-93 for the segment from Dorchester Avenue to Boston Street.

Table 9 Length of Highway Segment Closer to Residential Properties in Environmental Justice Neighborhoods – I-93 Section

	Alternatives			
Segment	1	2	3	4
Morrissey Boulevard to Savin Hill Avenue	0[1]	0	0	0
Savin Hill Ave. to Columbia Boulevard	3,800	3,800	3,800	0
Columbia Boulevard to Dorchester Avenue	150	150	150	0
Dorchester Avenue to Massachusetts Avenue Connector	0	0	0	550
TOTAL	3,950	3,950	3,950	550

1 Length in feet

7.2.3 Transit Access

The qualtitative analysis of impacts to environmental justice populations focused on temporary reductions in transit service that could result from constructing the railroad tunnel, land acquisition required for widening the highway to accommodate constructing the improvements necessary for each Rapid Bus alternative, and potential impacts (such as increases in noise) that may result from moving the highway closer to environmental justice neighborhoods. Reductions in service were based on a review of the MBTA's Ridership and Service Statistics, Thirteenth Edition (known as the 2010 Blue Book) for the affected light rail and commuter rail lines.

As described in Chapter 6, "Constructability of Design Alternatives," construction of Alternatives 1-3 would require tunneling MBTA tracks underneath the Southeast Expressway. This construction activity would require the cessation of MBTA Red Line Braintree Branch service for an undetermined period of time. This cessation would adversely impact subway riders for this period. There would be no service to the five Braintree Branch stations south of the JFK / UMass Station: North Quincy, Wollaston, Quincy Center, Quincy Adams, and Braintree. An average of approximately 28,000 riders per weekday board or alight at these stations, according to the 2010 Blue Book. Alternative transportation would be sought by these current Braintree Branch customers.

Disrupting transit service for a long term can adversely impact environmental justice populations, who typically rely on transit more than non-environmental justice populations to access jobs, schools, and health care services. The MBTA Red Line

Braintree predominantly serves communities meeting one or more environmental justice criterion. An average of nearly 38,000 riders per day use this line south of the project area, some portion of which are members of environmental justice neighborhoods. Environmental justice populations would be disproportionately impacted by a disruption of these transit services under Rapid Bus Alternatives 1, 2, or 3. Because the tunnel would not be required for Rapid Bus Alternatives 4, environmental justice populations would not be impacted by these alternatives.

7.3 Visual

This section discusses the visual impacts of the Modified Rapid Bus Alternatives. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the I-93 Southeast Expressway HOV section.

Beginning in Boston at South Station, along I-93, the highway alignment passes through concentrated commercial and industrial development in the vicinity of the Route 3 interchange. These properties would be visible to bus riders. The highway in this segment is a divided multi-lane road, but with no median.

The modifications to I-93 and the adjacent rail corridor in the I-93 Southeast Expressway HOV would potentially change the visual and aesthetic environment. The Southeast Expressway section would introduce new visual elements that would be visible to motorists on I-93, commuter and Red Line riders, and residents of adjacent neighborhoods. These visual elements would be consistent with the existing developed, transportation nature of the corridor, and would include new traffic lanes, a new retaining wall and in some cases, new rail flyovers. The Old Colony Commuter Rail line would be placed in a tunnel, resulting in adverse visual impacts for commuter rail riders.

The changes within the I-93 Southeast Expressway HOV section would not have an adverse visual impact, although commuter rail passengers would have views of the highway replaced with views of a tunnel.

7.4 Noise

New highway construction is not expected to result in noise impacts because there are few receptor locations adjacent to the major roadways, they are located substantial distances away from the roadways, and most of the roadway is boarded by ledge, and hills, and thick wooded areas that reduce highway noise, and the relatively small increase in sound levels that will be generated by the increased bus traffic on the major roadways.

7.5 Vibration

Using the FTA vibration curve (adjusted for speed) for rubber tired vehicles (buses), the vibration assessment indicated that for buses traveling at a speed of 60 mph, the impact distance for a vibration level of 80 VdB is 15 feet. Using the FTA vibration impact criterion of 72 VdB for frequent events (greater than 70 events per day), the impact distance is 40 feet. Since there are no receptors located within these distances of the highway, no vibration impacts are expected to occur from the Rapid Bus Alternatives.

7.6 Cultural Resources

This section discusses the impacts of the Modified Rapid Bus Alternatives on cultural resources.

7.6.1 Historic Resources

Project work items for the Modified Rapid Bus Alternatives consist of roadway and interchange modifications primarily within or immediately adjacent to the existing right-of-way. No historic resources are present within the highway corridor rights-of-way where project improvements are planned. Therefore work within the rights-of-way will have no potential direct impacts to historic resources.

There are no historic properties located within the 50 foot APE of the I-93 section which would be affected by visual or noise impacts.

7.6.2 Archaeological Resources

The Modified Rapid Bus Alternatives Area of Potential Effect (APE) includes the existing highway corridor rights-of-way, interchange reconfigurations, bridge reconstructions, and any other work areas that would involve earthmoving outside of the existing highway rights-of-way.

There are no recorded archaeological sites or identified sensitive areas within the highway corridor rights-of-way where project improvements are planned. No direct impacts to archaeological resources in the previously disturbed highway rights-of-way are anticipated.

The archaeological survey was not conducted for the interchange reconfigurations, bridge reconstructions, and other work areas that would involve earthmoving outside of the previously disturbed highway rights-of-way within the APE. These project elements are located in geographical areas that contain or are in proximity to recorded sites and have the potential to contain unrecorded sites in sensitive areas.

7.7 Air Quality

The effectiveness of a Rapid Bus system is directly dependent upon the roadway treatment of the 1.9 mile gap between the existing zipper lane and the northern HOV lane into Boston. Four alternatives have been evaluated for their impacts on traffic, which in turn directly affects their impact on air quality. Each of these alternatives provides a different treatment of how the vehicle in the zipper lane proceed to the HOV lanes, back into the general purpose lanes, and how traffic from the general purpose lane proceed into the HOV lanes. The weaving action from each of these alternatives either favors the zipper lane or the general purpose lanes. It should be noted that the majority of emissions in this study area are from the vehicles in the general purpose travel lanes.

Alternative 1 reduces travel time as compared to the 2030 No Build Condition for both the zipper and general purpose lanes, but results in a substantially longer time of peak congestion. Alternatives 2 and 3 reduce travel time for the zipper lane, but the travel time for the general purpose lanes and the time of peak congestion remain about the same as the 2030 No Build Condition. Alternative 4 reduces travel time as compared to the 2030 No Build Condition for the zipper lane, but results in a longer travel time for the general purpose lanes and the time of peak congestion.

Automobile emissions of the ozone precursor emissions (VOCs and NOx) and CO are expected to be reduced for Alternatives 2 and 3 as compared to the 2030 No Build Condition because the zipper lane travel time would be improved and the general purpose lane travel time and the time of peak operation will be the same. Alternative 4 is expected to result in small air quality benefits due to zipper lane travel time improvements, however, automobile emissions are expected to increase for Alternative 4 as compared to the 2030 No Build Condition because, while the zipper lane travel time would be improved, the general purpose lane travel time and the time of peak operation would be greater.

7.8 Open Space

This section discusses direct impacts to public open space (parks, conservation lands, recreation lands, and wildlife refuges), which are protected under Article 97 of the Massachusetts Constitution, and to publicly-owned wildlife sanctuaries and refuges. Although the South Coast Rail Project is currently not anticipated to require review or funding by a federal transportation agency, this criterion also includes those properties protected under Section 4(f) of the federal Department of Transportation Act because the FTA and FHWA are cooperating agencies under NEPA. Should the FHWA be required to review the Rapid Bus Alternative under NEPA or Section 4(f), the impacts of the interchange improvements and the HOV Alternative 4 would require a Section 4(f) Evaluation.

Several public open spaces are proximate to the highway alignment within the I-93 Southeast Expressway HOV section of the project area, including (from south to north):

- McConnell Park, a sports field facility east of I-93 and south of Savin Hill Avenue;
- Shannon's Park, an open space west of I-93 and between Columbia Road and Mt. Vernon Street;
- Washburn Street Green, an open space west of I-93 and between Washburn Street and Dorchester Avenue; and
- General Casimir Pulaski Square, a memorial park between I-93 and Power Street, south of Boston Street.

Each of these facilities is adjacent to existing transportation corridors (I-93, railroads, and surface streets) with high ambient noise levels and a highly developed visual environment. None of the alternatives would move the highway closer to McConnell Park. Alternatives 1, 2, and 3 would move the southbound off-ramp for Columbia Road approximately 50 to 55 feet closer to Sharon's Park. Relocating the highway closer to this facility would not affect the use of it. Alternative 4 would not move the highway.

Alternatives 1, 2, and 3 would not require acquisition of any portion of these public open spaces. Alternative 4 would impact the Washburn Street Green and General Casmir Pulaski Square for widening the highway. Washburn Street Green is owned by the City of Boston, and at least a portion of the site would have to be acquired by the MBTA. General Casimir Pulaski Square is on part of a parcel owned by the Commonwealth of Massachusetts so the parcel would not need to be acquired from another entity. However, using a portion of the Washburn Street Green and all of General Casimir Pulaski Square to widen the highway for Alternative 4 would impact the public's use of these properties and could trigger Article 97 review. Washburn Street Green's function as a recreation area and buffer from the highway would be diminished. General Casimir Pulaski Square would be entirely taken, removing this facility from public use unless replaced.

As mentioned above, Article 97 of the Massachusetts Constitution protects all publicly owned lands used for conservation or recreation purposes. Similarly, Section 4(f) of the US DOT Act protects parks and recreation areas under certain circumstances. Acquiring portions of the Washburn Street Green for Alternative 4 would likely be subject to Article 97 and Section 4(f) requirements. The General Casimir Pulaski Square likely does not qualify for Article 97 protection because it is not used for conservation or recreation purposes. This site likely qualifies for Section 4(f) protection if the project were subject to approval by one of the federal Department of Transportation agencies (FHWA, FTA, FRA).

In addition to those protections, the locations of these two facilities within environmental justice communities mean that the loss of their use for Alternative 4 could be considered a disproportionate impact to the environmental justice populations, since there would not be similar losses in non-environmental justice neighborhoods. The Washburn Street Green is location-specific and its function as a neighborhood resource could not be replaced by a similar facility at another location without acquiring and demolishing residences. Replacement of this facility is considered infeasible. The General Casimir Pulaski Park is a memorial to a Revolutionary War hero of Polish descent, and is located adjacent to the Polish America Citizen Club. Replacement of this facility may require negotiation with the local citizens, given its apparent affiliation with the Polish community.

7.9 Hazardous Materials

Detailed Phase I Environmental Site Assessments have not been conducted for the properties potentially affected by the I-93 Southeast Expressway HOV section alternatives, or for any area requiring modification of existing highways.

7.10 Biodiversity, Threatened and Endangered Species, Wetlands, Water Resources, and Coastal Zones/Chapter 91 Areas

The proposed improvements along the I-93 Southeast Expressway HOV section would be entirely within a developed transportation corridor in an urban area and would not affect any of these resources.

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8

Ridership of the Design Alternatives

In order to assess the effectiveness of each I-93 Design Alternative, ridership projections were developed for the year 2030. Using the same model used to project ridership for the DEIS/DEIR, CTPS developed ridership projections for the entire Modified Rapid Bus Corridor (including the proposed improvements along Route 24, additional stations, and added service). In addition to the four I-93 Design Alternatives, a "No-Build" alternative that included all Modified Rapid Bus Improvements, except for those in the I-93 corridor. The development of ridership and the results are described in more detail in Appendix H. [NOTE: Appendix H will be provided by CTPS directly]

Using the No-Build alternative as a base-line, it is possible to determine the overall benefit attributable to each of the four Design Alternatives. This is shown in Table 10. Alternative 1 would have the greatest ridership, with Alternative 4 being the least effective at attracting riders.

Table 10 2030 Ridership Projections

Alternative	Total Ridership	Ridership Associated with I-93 Design Alternative
1	12610	2278
2*	13626	3294
3*	13569	3237
4	12021	1689
No Build	10332	0

* Extrapolated based on travel time

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9 Costs

9.1 Capital Costs

Costs for the four build alternatives were developed using the methodology presented in the DEIS/DEIR. As shown in Table 11, Alternatives 1-3 would have capital costs comparable to that of the DEIS/DEIR Rapid Bus Alternative. Only Alternative 4, which includes minimal improvements to I-93, would be close in capital cost to the DEIS/DEIR Rapid Bus Alternative.

Table 11 Total Cost for I-93 Infrastructure

Description		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permanent Single Reversible Lane Construction		$625,447,000	$624,395,000	$624,597,000	$14,659,000
Real Estate Cost		$10,697,000	$11,823,000	$11,823,000	$5,067,000
Engineering Services	13.55%	$84,749,000	$84,606,000	$84,633,000	$1,987,000
Contingencies	50.00%	$312,724,000	$312,198,000	$312,299,000	$4,647,000
Total Cost - Alternative 1		$1,033,617,000	$1,033,022,000	$1,033,352,000	$26,360,000

9.2 Operating and Maintenance Costs

The only operating and maintenance (O&M) costs directly associated with the I-93 section would be the maintenance of the "missing link" alternative treatments (i.e. permanent reversible lanes). This would include repaving the added lane miles, snow plowing, and other required maintenance. Alternative 1-3 would have essentially the same incremental O&M cost, while Alternative 4 would have less (due to the fewer lane miles). The cost of operating bus service would be irrelevant as the I-93 segment is only a small portion of the overall project.

10

Conclusions

It was concluded that the alternatives that require widening the highway and tunneling the Commuter Rail (Alternative 1, 2 and 3) would cause unacceptable impacts to regional transportation and environmental justice communities while significantly increasing the construction costs. These alternatives, therefore, would be impracticable for the Modified Rapid Bus Alternative. Alternative 4 would increase general purpose travel time, which would have regional transportation impacts and regional air quality impacts that make that operational change alone also impracticable for the Modified Rapid Bus Alternative. In addition, MassDOT is committed to make no alterations I-93 that that would have negative impacts on regional transportation and air quality.

For these reasons, the Modified Rapid Bus Alternative would not include any of the infrastructure or operational changes considered here to close the I-93 HOV gap; in terms of this gap, the Modified Rapid Bus Alternative would be unchanged from the DEIS/DEIR Rapid Bus Alternative.

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Figures

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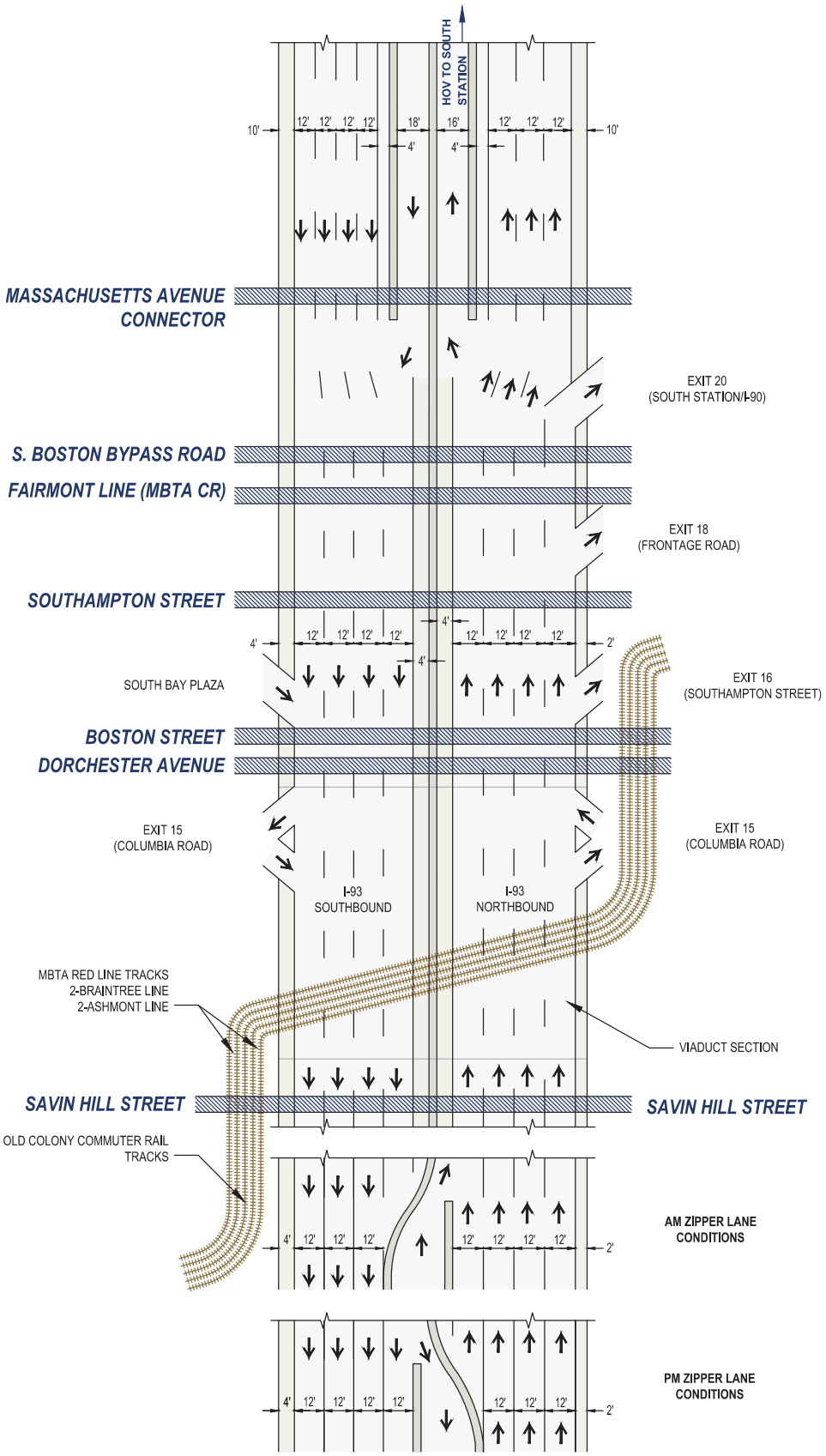

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Figure 1
I-93 HOV Extension Schematics
Existing Conditions

NOT TO SCALE

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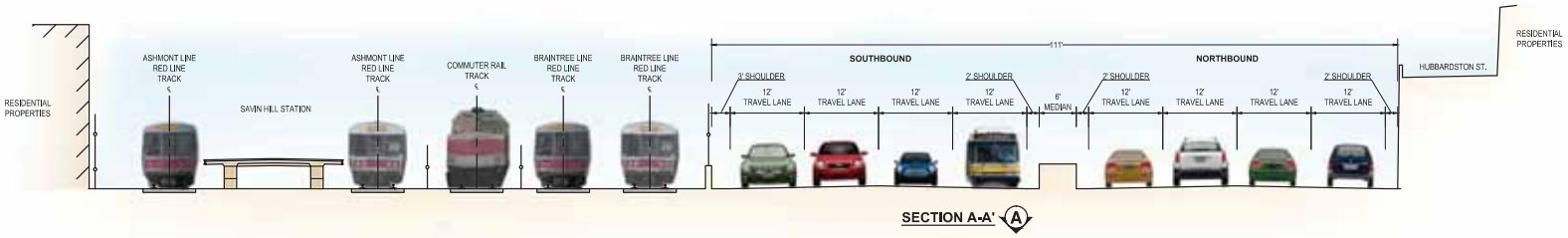

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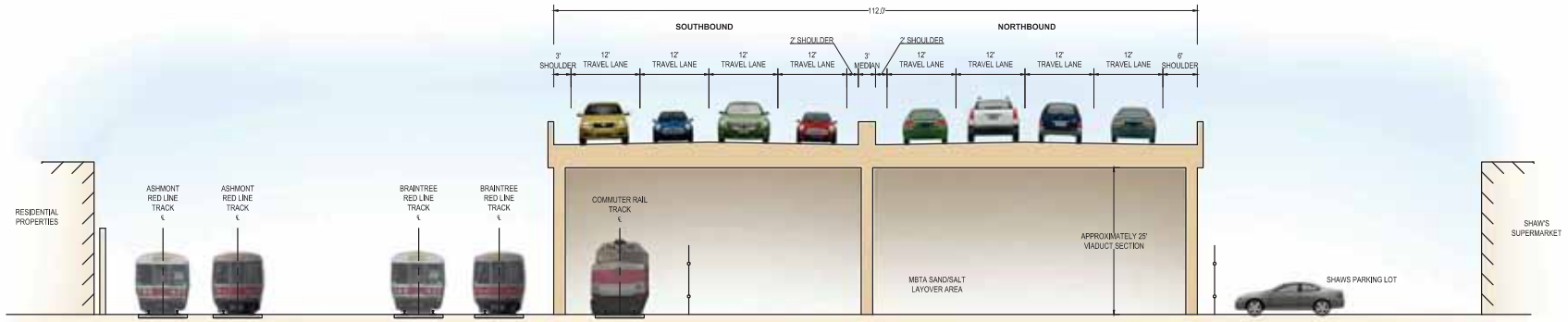

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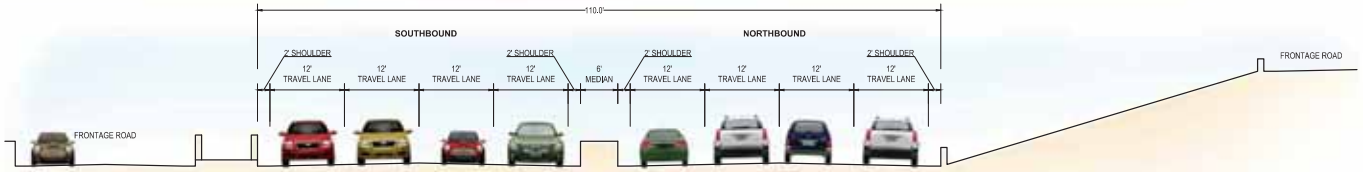

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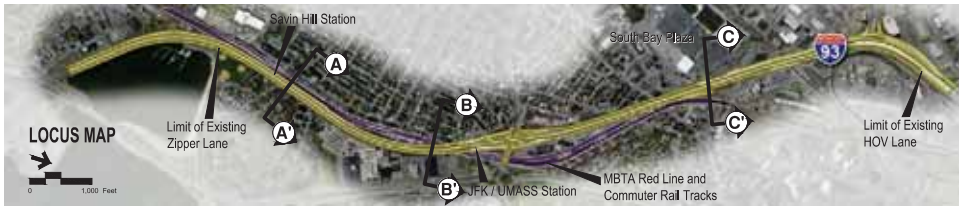

Savin Hill Neighborhood

Figure 6
Southeast Expressway Existing Conditions Sections

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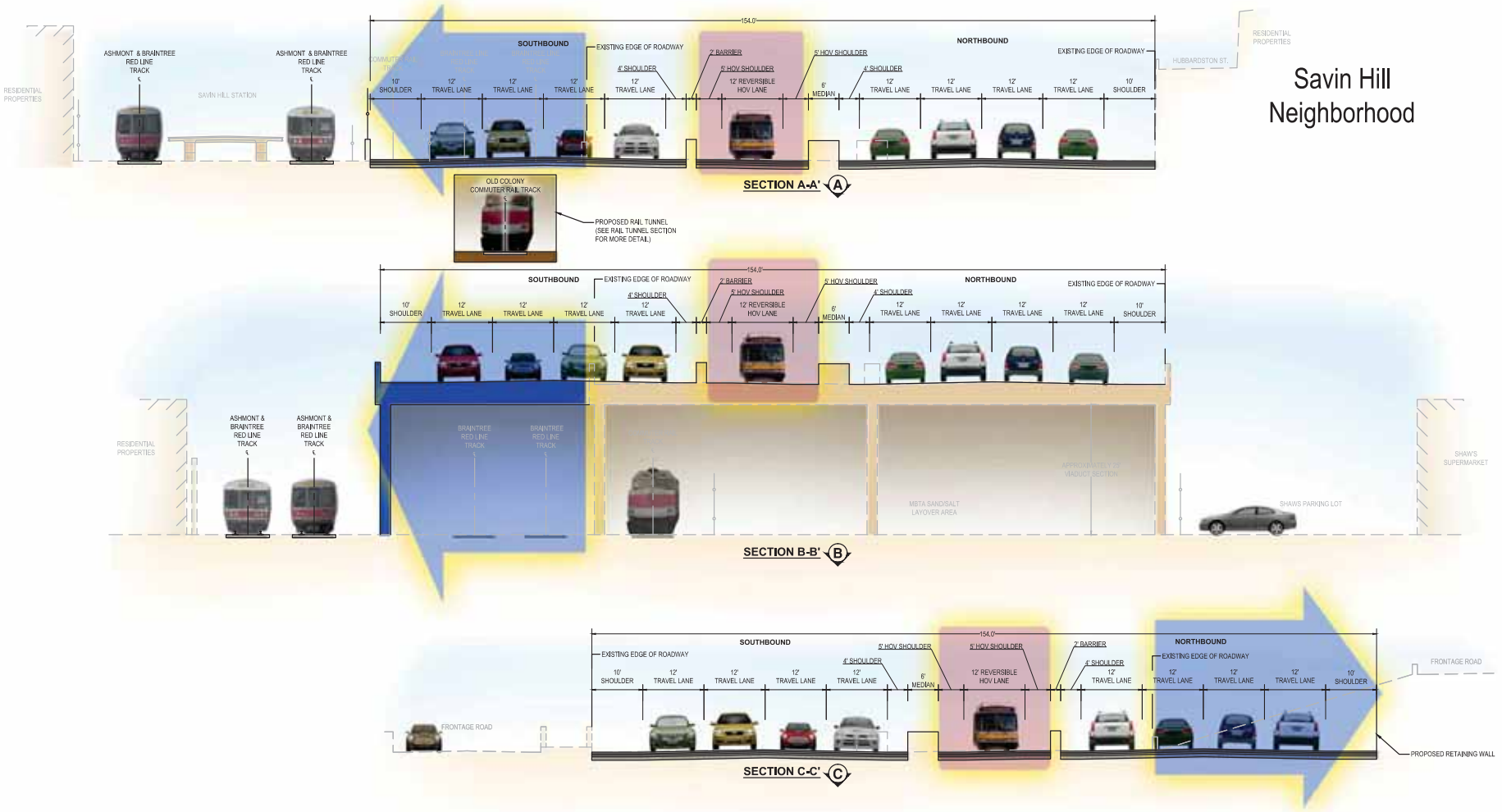

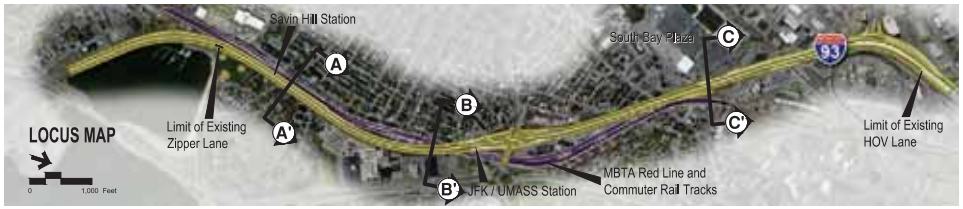

Figure 7
Southeast Expressway
Alternative 1 Sections
The "Commitment" Alternative

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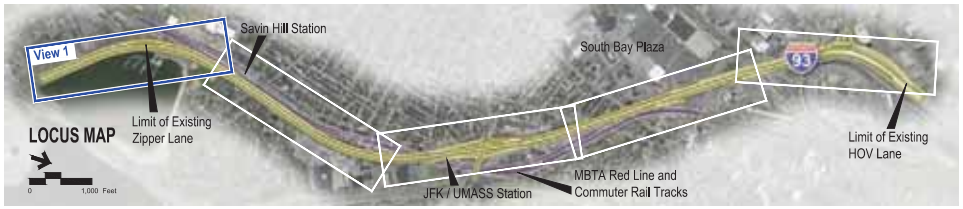

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Figure 9
Alternative 1
The "Commitment" Alternative

Zipper Lane Operations
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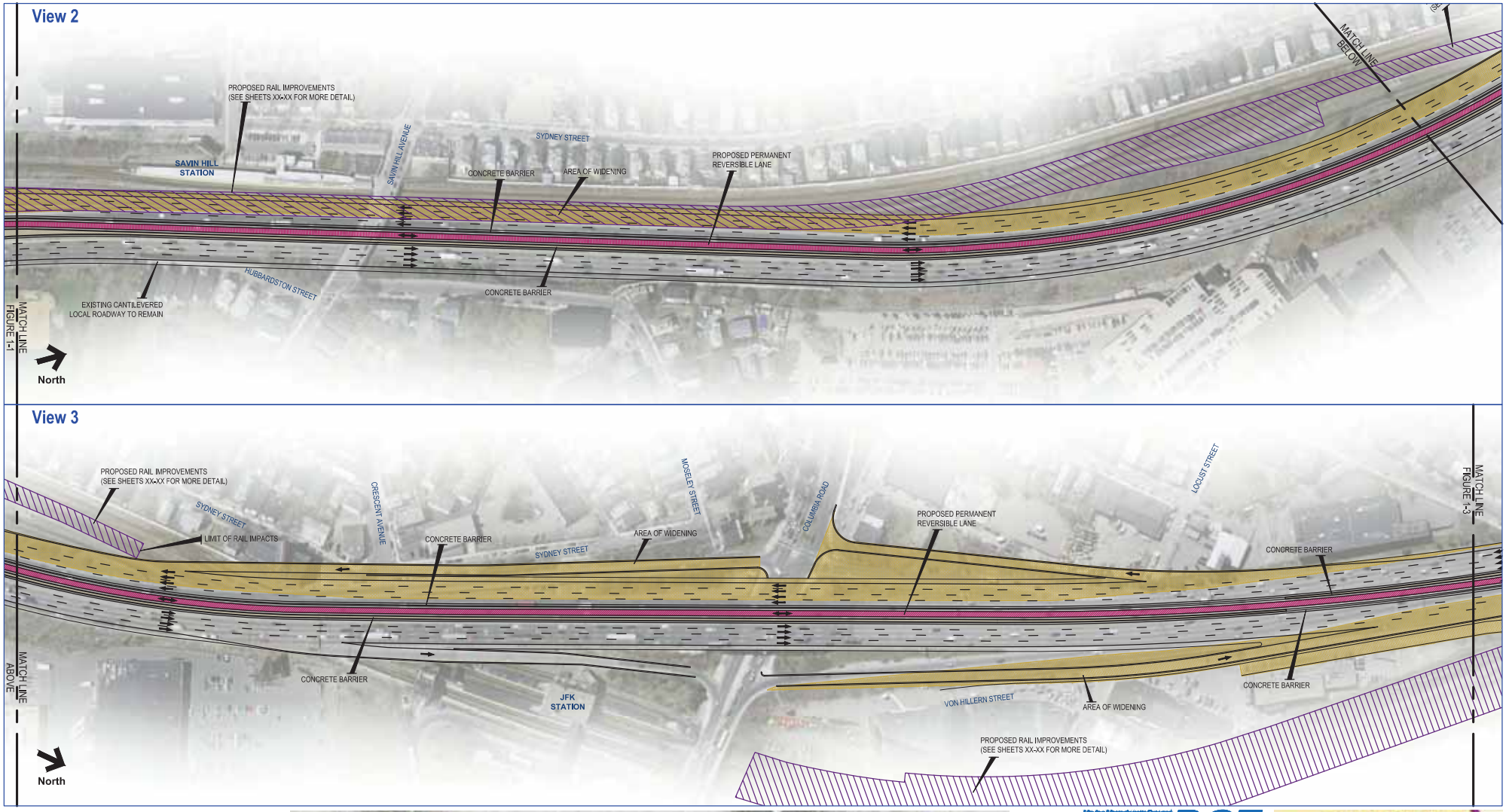

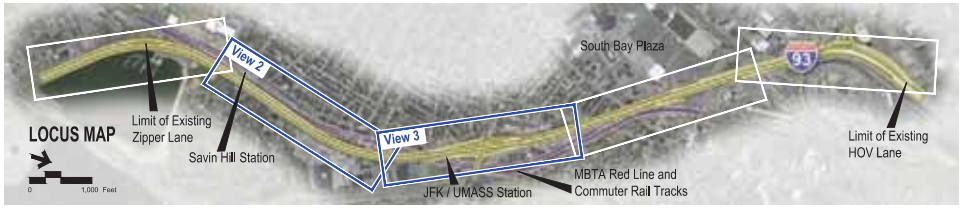

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Figure 10
Alternative 1
The "Commitment" Alternative

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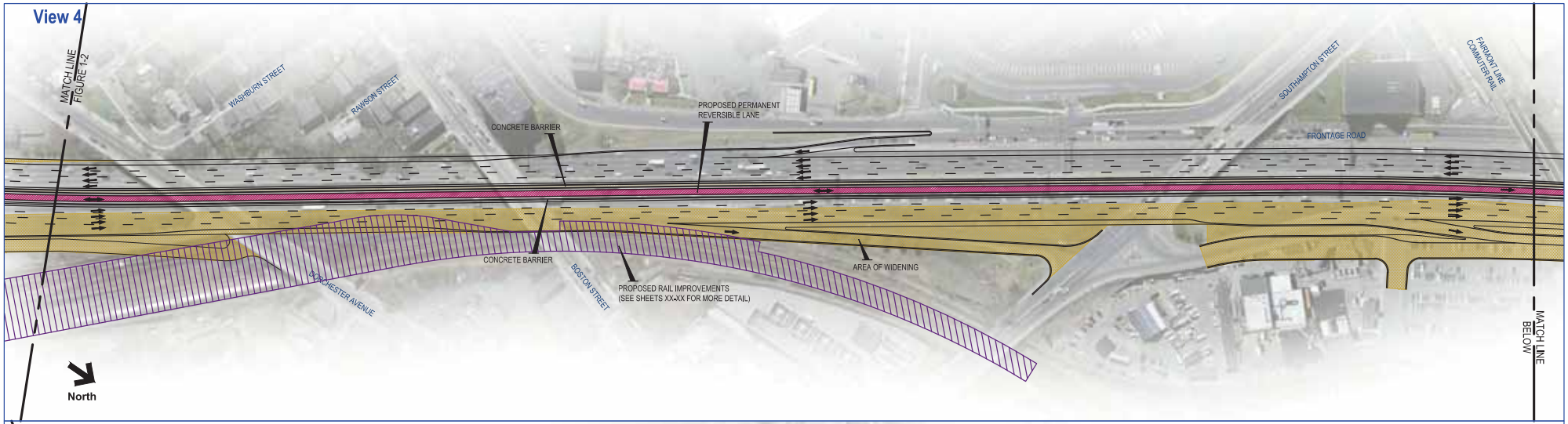

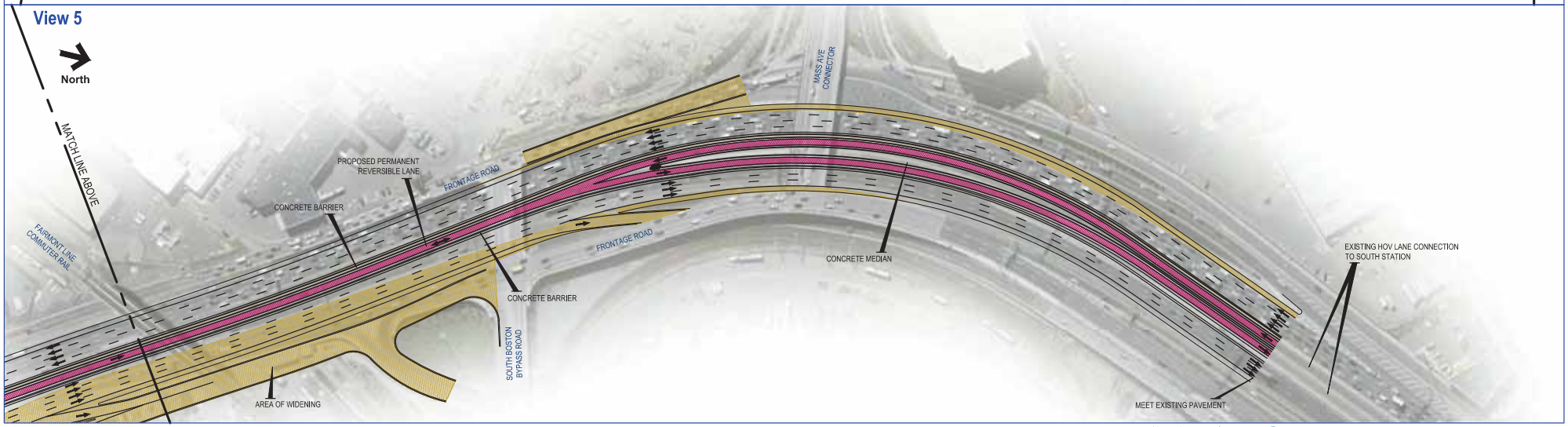

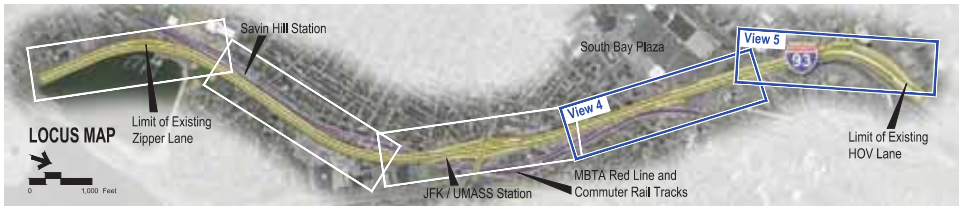

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massDOT

SOUTH COAST RAIL

Figure 11
Alternative 1
The "Commitment" Alternative

MassGIS
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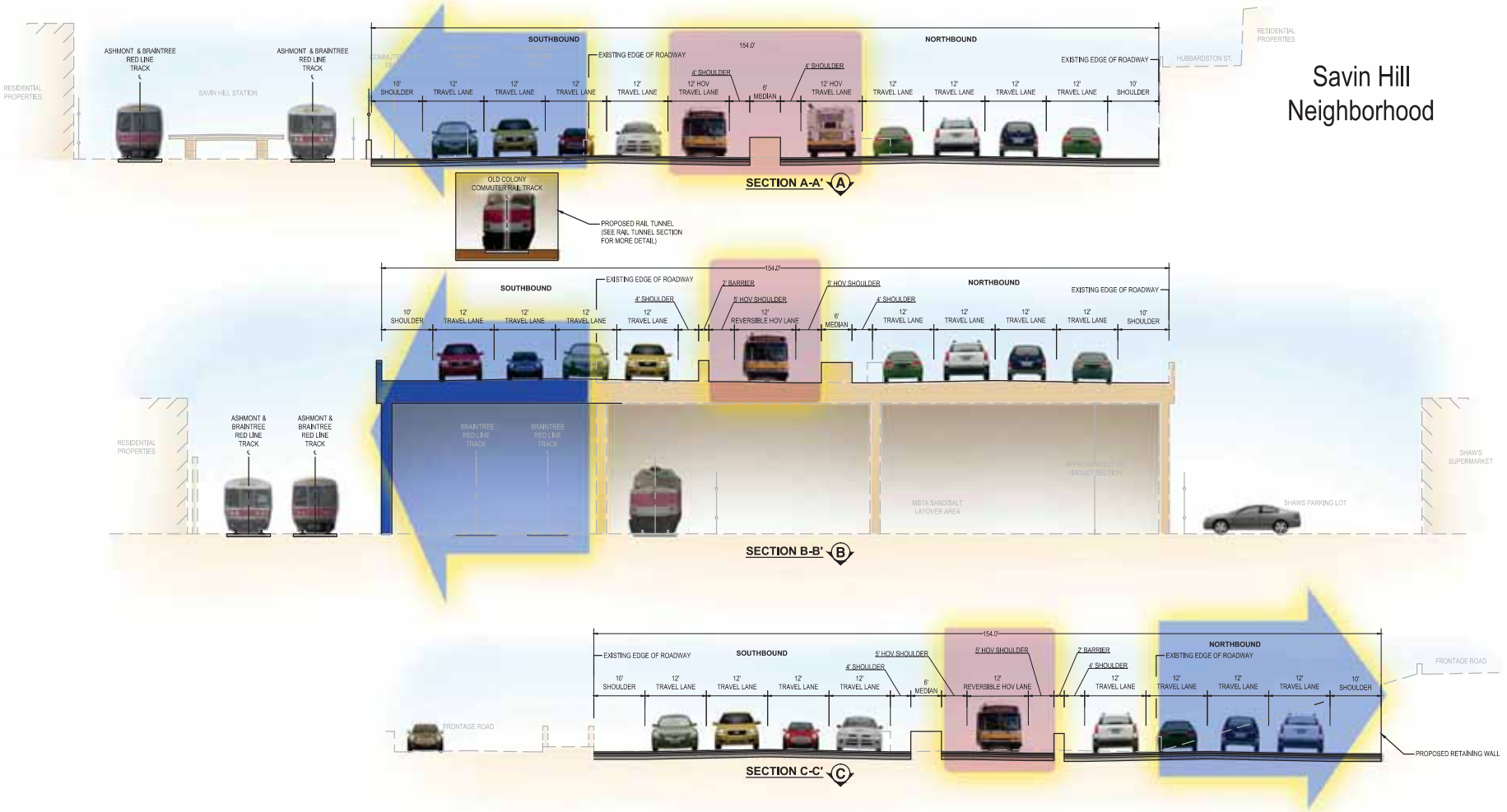

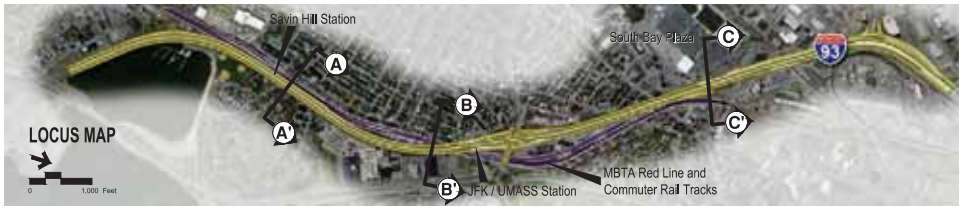

Figure 12
Southeast Expressway Alternative 2 Sections The "Maintain Exit at Savin Hill" Alternative
MassGIS
Prepared by: VHB

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View 1: AM Zipper Lane Configuration

View 1: PM Zipper Lane Configuration

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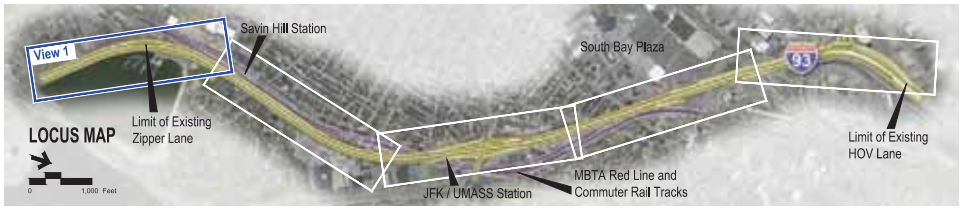

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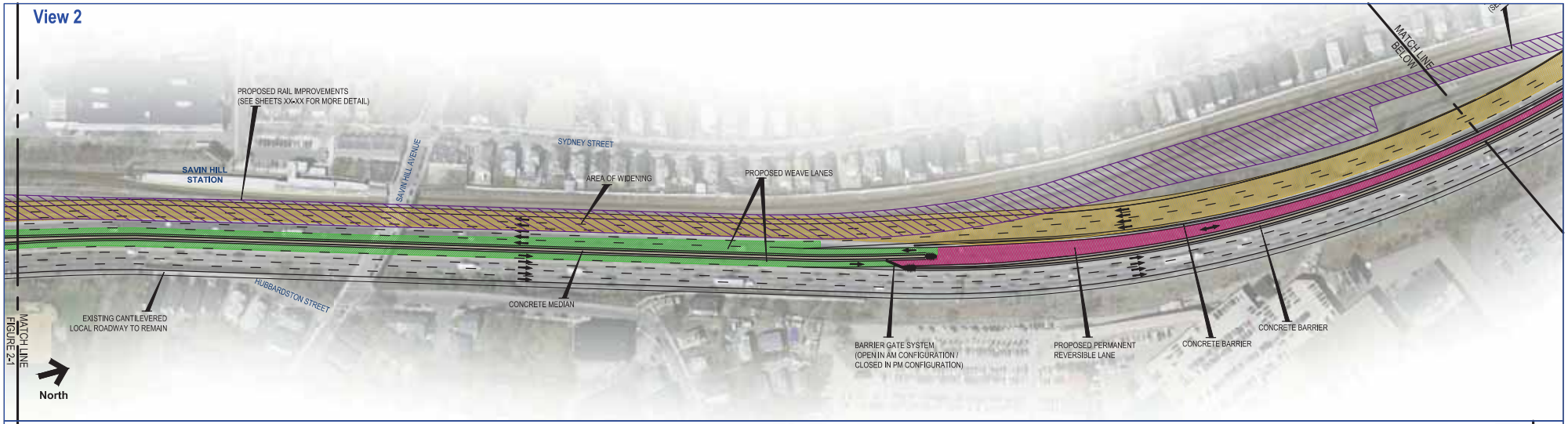
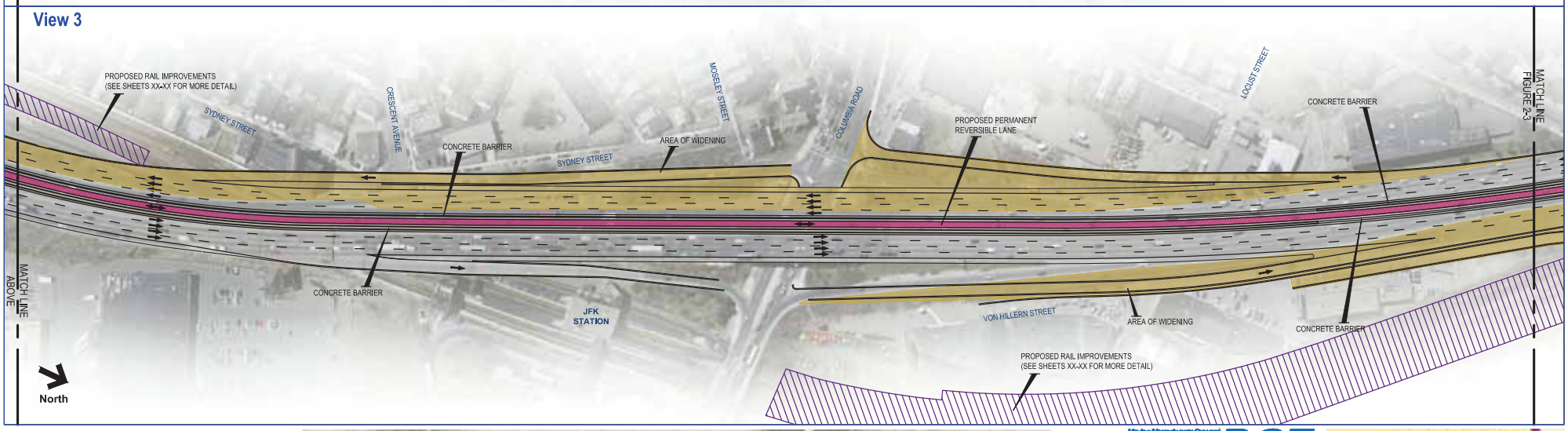
Figure 14
Alternative 2
The "Maintain Exit at Savin Hill" Alternative
Zipper Lane Operations
MassGIS
Prepared by: VHB





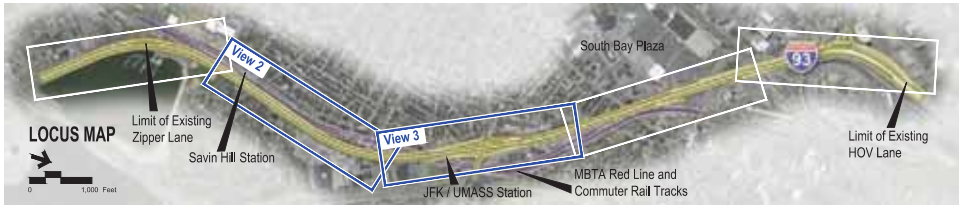


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Figure 15
Alternative 2
The "Maintain Exit at Savin Hill" Alternative

MassGIS
Prepared by: VHB

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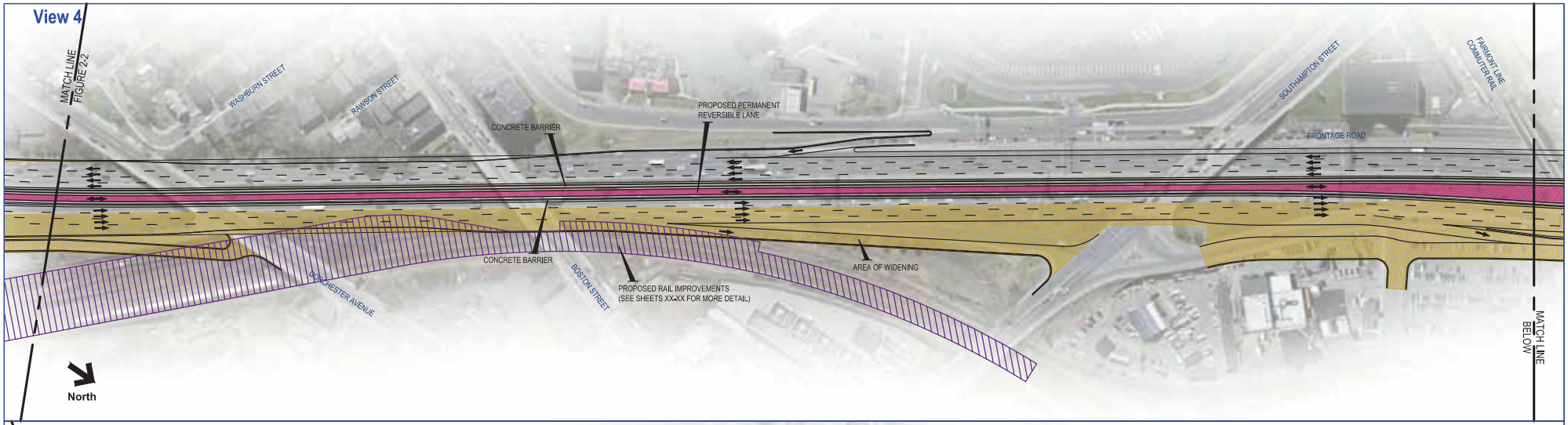

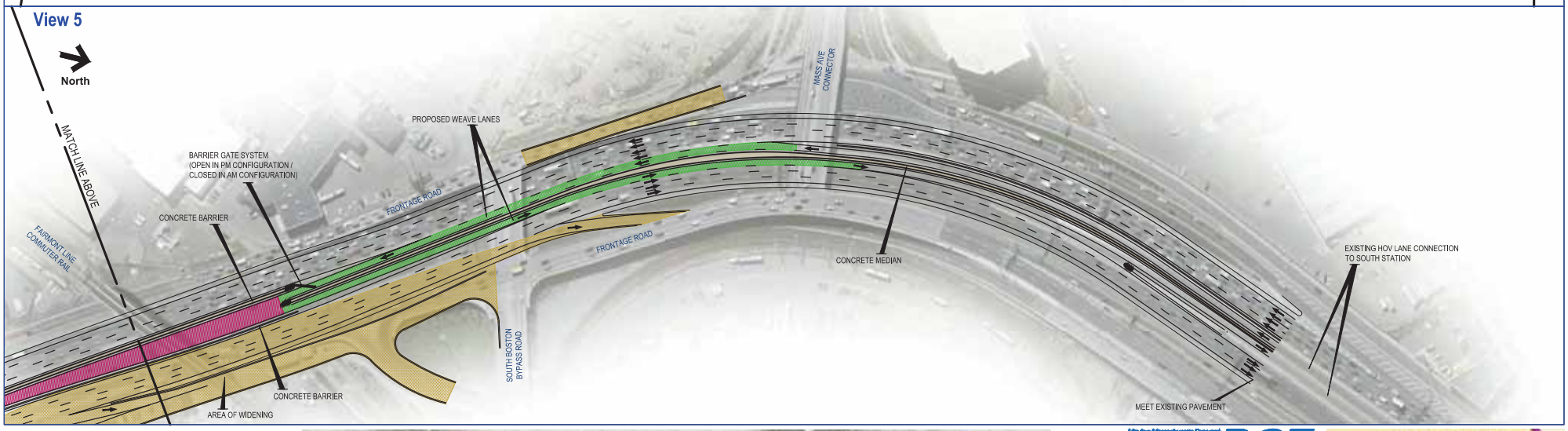

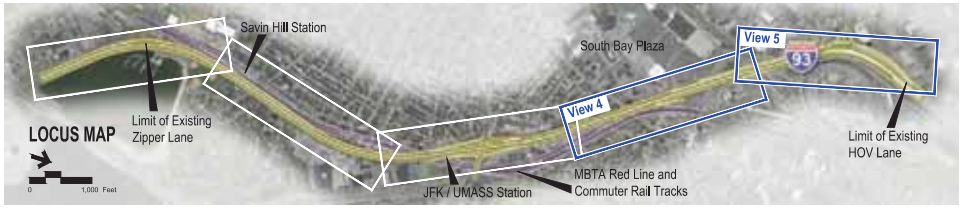

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Figure 16
Alternative 2
The "Maintain Exit at Savin Hill" Alternative

MassGIS
Prepared by: VHB

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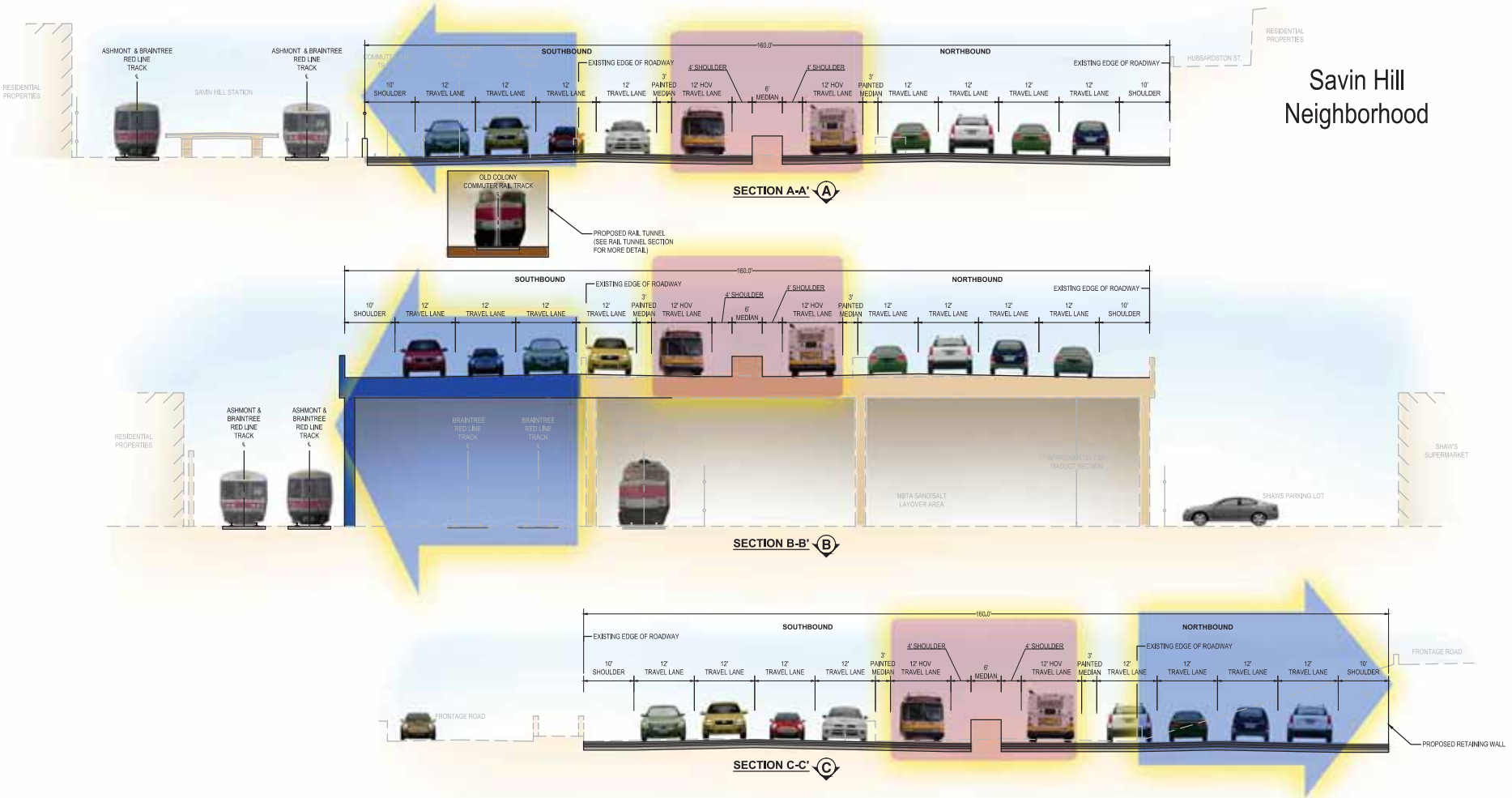

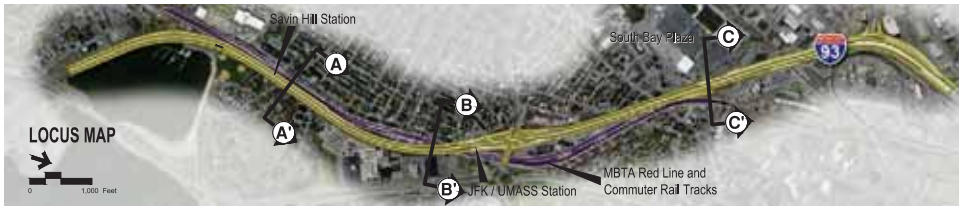

Figure 17
Southeast Expressway
Alternative 3 Sections
The "HOV Lanes in Both Directions" Alternative
MassGIS
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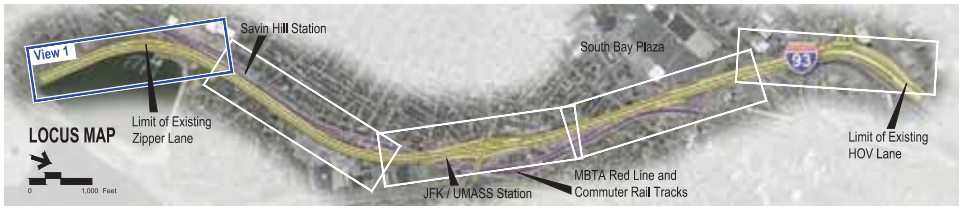

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Figure 18
Alt. 3 - The "HOV Lanes in Both Directions" Alternative
Zipper Lane Operations

MassGIS
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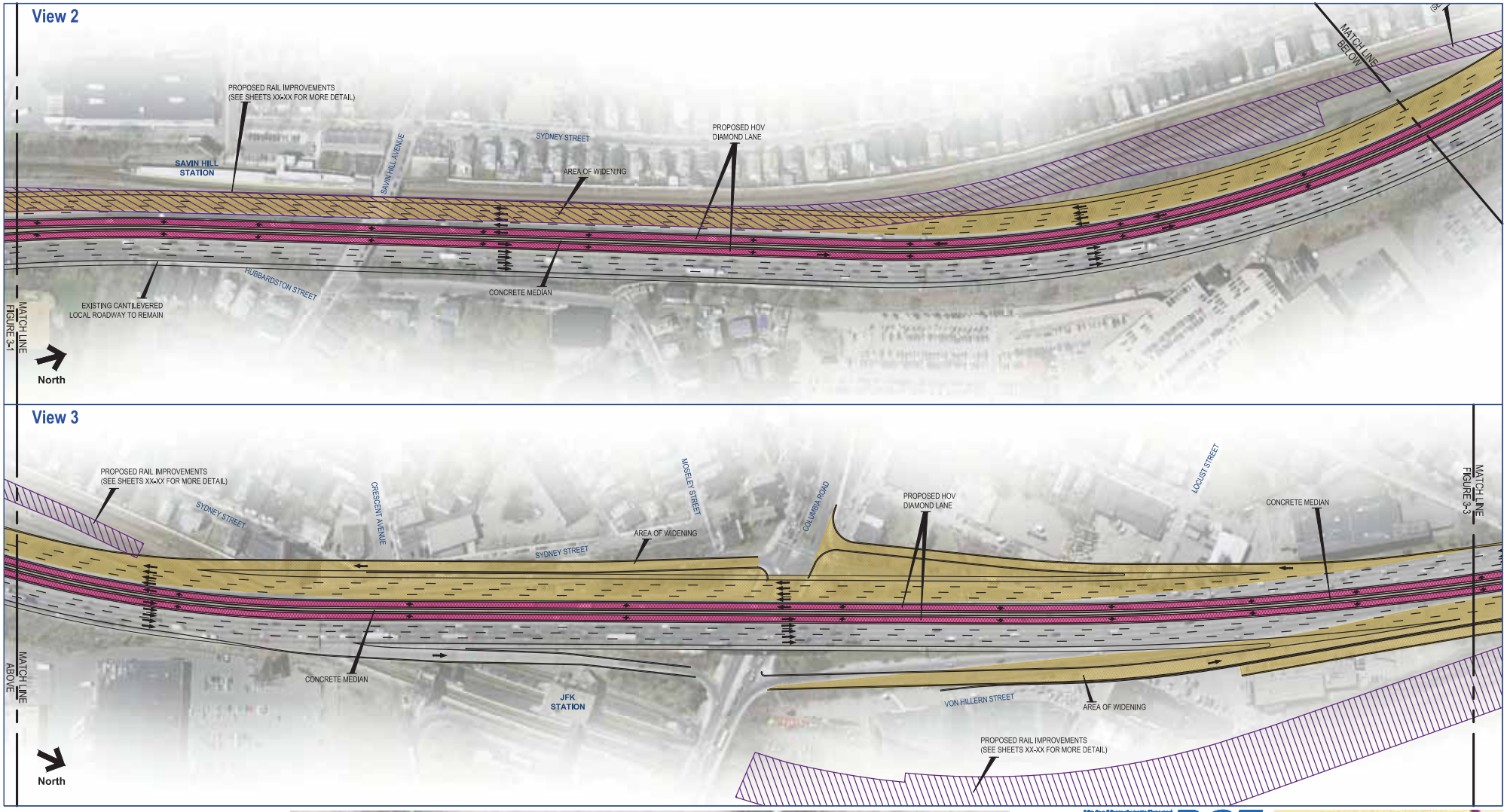

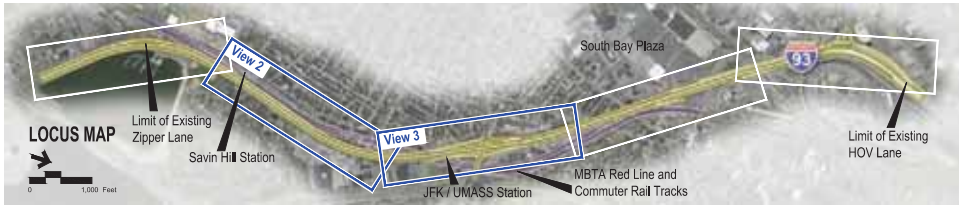

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Figure 19
Alt. 3 - The "HOV Lanes in Both Directions" Alternative
Zipper Lane Operations

MassGIS
Prepared by: VHB

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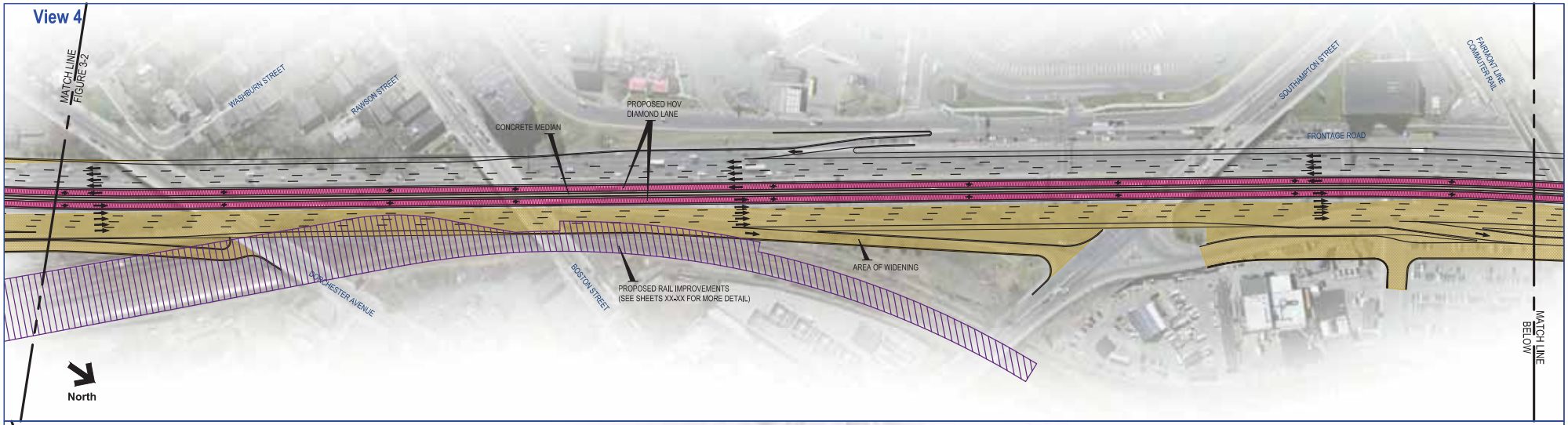

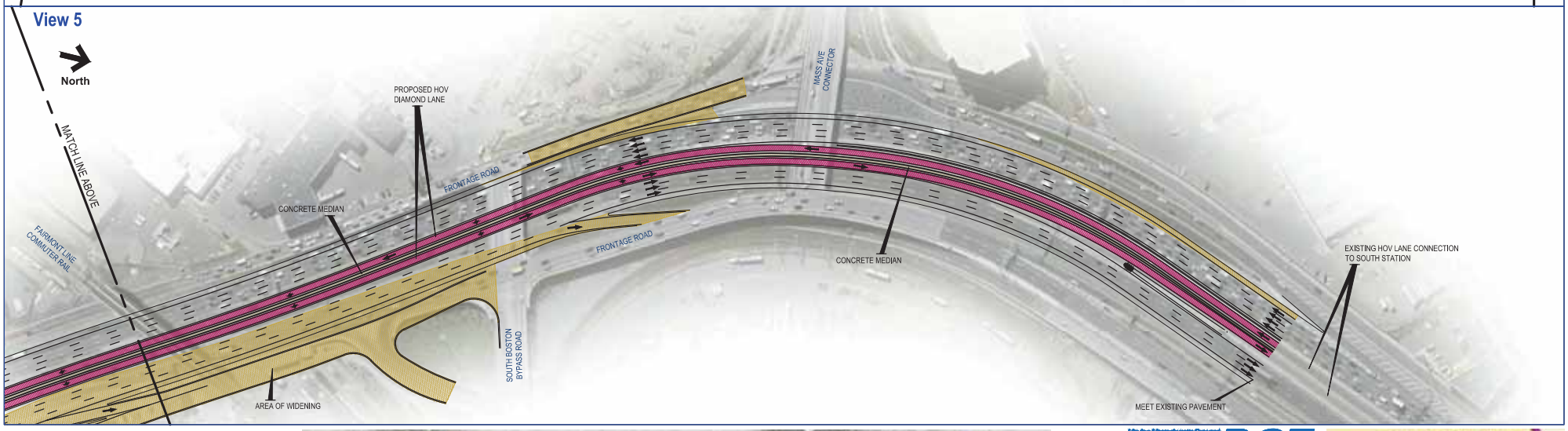

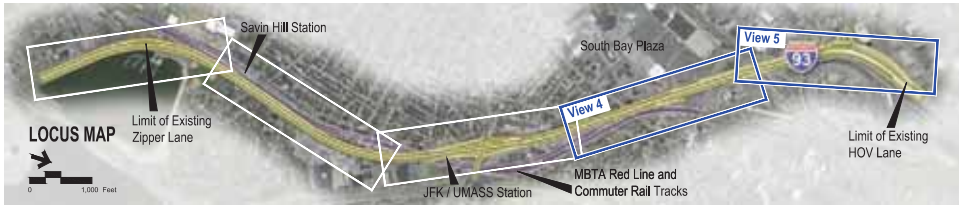

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Figure 20
Alt. 3 - The "HOV Lanes in Both Directions" Alternative
Zipper Lane Operations

MassGIS
Prepared by: VHB

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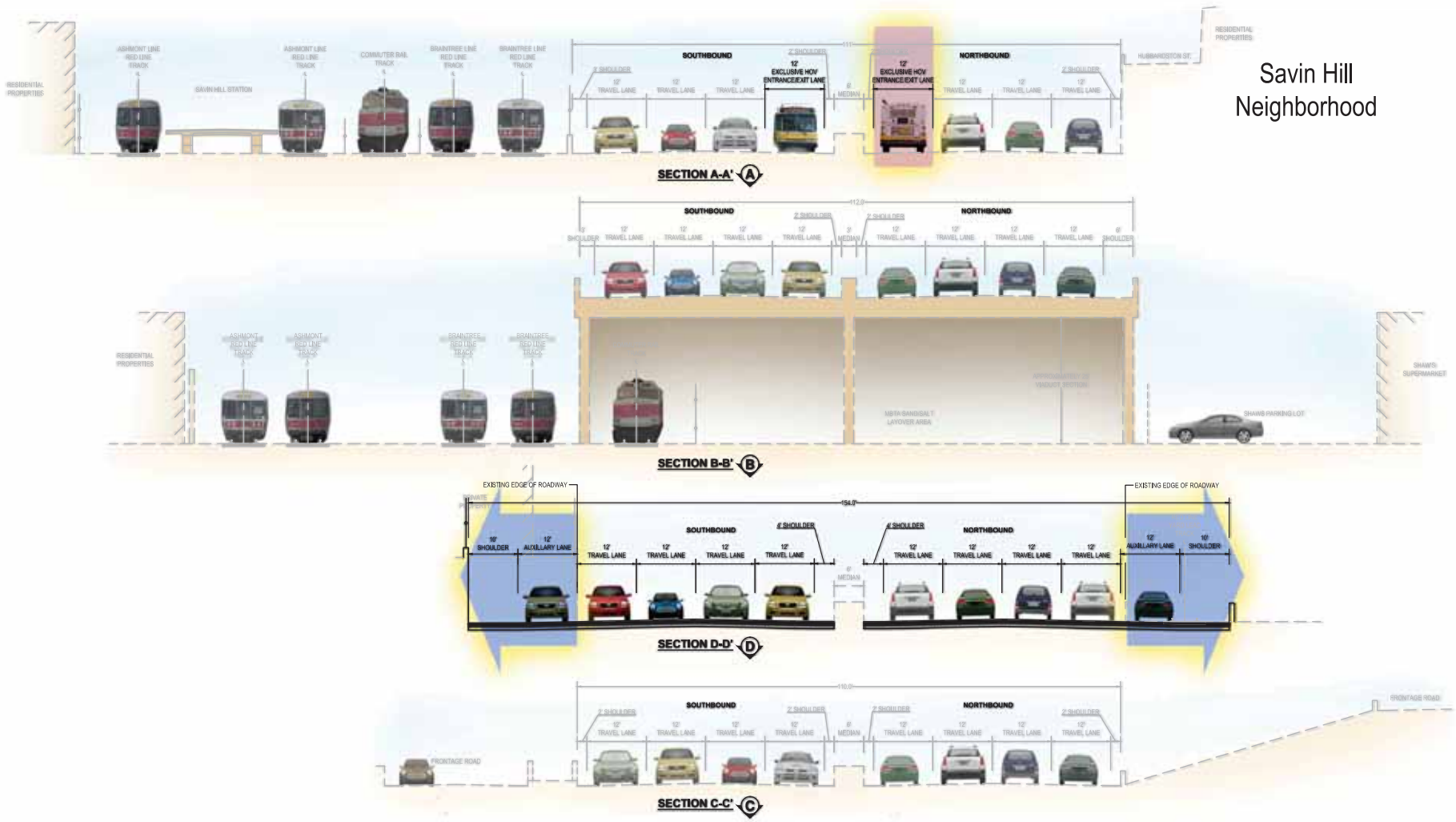


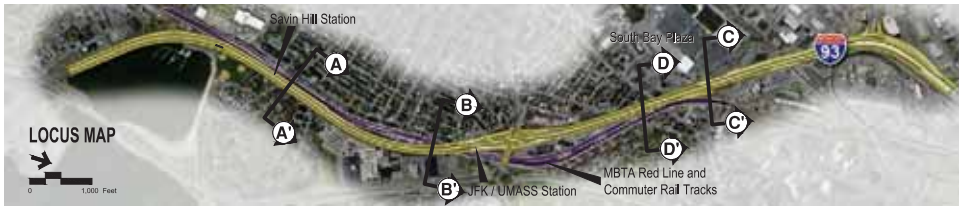
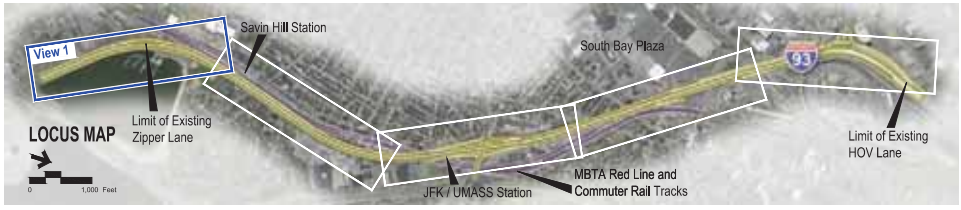


Figure 21
Southeast Expressway
Alternative 4 Sections
The "Minimalist" Alternative

MassGIS
Prepared by: VHB

View 1: AM Zipper Lane Configuration

View 1: PM Zipper Lane Configuration



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massDOT

SOUTH COAST RAIL

Figure 22
Alternative 4
The "Minimalist" Alternative
Zipper Lane Operations

MassGIS
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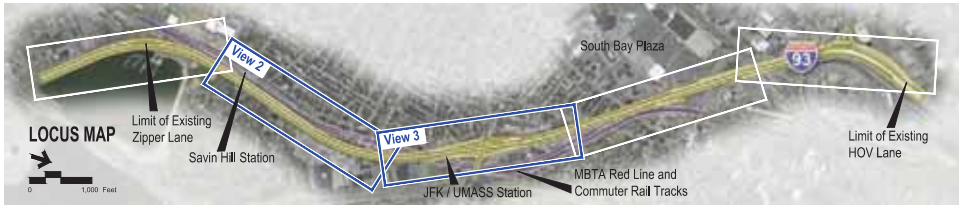

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Figure 23
Alternative 4
The "Minimalist" Alternative

MassGIS
Prepared by: VHB

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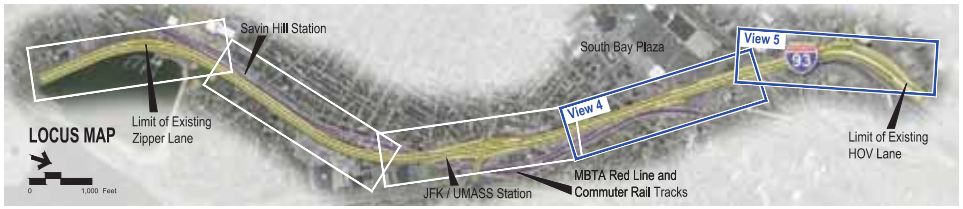

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Figure 24
Alternative 4
The "Minimalist" Alternative

MassGIS
Prepared by: VHB

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix E: Back Bay Connection Analysis

Prepared for

massDOT

Massachusetts Department of Transportation
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Boston, Massachusetts 02116-3969

Prepared by

VHB Vanasse Hangen Brustlin, Inc.

99 High Street, 10th Floor
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SOUTH COAST RAIL

June, 2012

Table of Contents

1 Initial Station Evaluation 1-1
1.1 Evaluation 1-1
1.2 Station Locations Selected for Further Evaluation 1-4
1.2.1 Alternative 1 – Ruggles Station 1-4
1.2.2 Alternative 2 – Back Bay Station 1-4
1.2.3 Alternative 3 – Downtown Crossing 1-4
2 Travel Routes 2-5
2.1 Downtown Crossing 2-5
2.2 Back Bay 2-6
2.2.1 Option 1 (Via Kneeland Street) 2-6
2.2.2 Option 2 (via Massachusetts Avenue) 2-6
2.3 Ruggles Station 2-7
2.4 Travel Times 2-7
2.4.1 Local Travel Times 2-7
2.4.2 Orange Line Travel Time/Transfer Penalty 2-9
2.5 Bus Stops/Staging 2-9
2.6 Route Comparison 2-13
3 Conclusions 3-1

List of Tables

Table No.	Description	Page
1	Evaluated Orange Line Connections – Initial Assessment Summary	1-3
2	Existing Local Travel Time Summary (minutes)	2-8
3	Increased Travel Time (2012 to 2030)	2-8
4	2030 AM Peak Hour Travel Times (minutes)	2-9
5	Orange Line Station Alternatives	2-14

List of Figures

Figure No.	Description	Page
1	Orange Line Stations	1-2
2	BRT Alternative, Downtown Crossing – Inbound/Outbound	2-5
3	BRT Alternative, Back Bay Station – Inbound/Outbound – Option 1	2-5
4	BRT Alternative, Back Bay Station – Inbound/Outbound – Option 2	2-5
5	BRT Alternative, Ruggles Station – Inbound/Outbound	2-5
6	Back Bay Station	2-10
7	Downtown Crossing	2-11
8	Ruggles Station	2-12

1 Initial Station Evaluation

The Rapid Bus Alternative presented in the Draft EIS/EIR was envisioned to provide express service to South Station where a transfer to the Red Line, Silver Line, and local bus service would be available. A connection to the Orange Line was not included, which would have resulted in remote, indirect and ineffective Rapid Bus access to Back Bay. Based on comments received on the DEIS/DEIR, this memorandum presents and evaluates potential alternatives to providing this connection, the feasibility and opportunities of providing it, recommendation of the preferred connection among the considered routes, and the potential impacts.

1.1 Evaluation

The Rapid Bus Alternative is planned to serve the South Coast Rapid Bus stations proposed in Fall River, New Bedford, Taunton (Galleria), Downtown Taunton, West Bridgewater and Brockton Stations. So that the Rapid Bus Alternative is highly competitive with the studied rail alternatives and since high ridership is expected, two separate routes destined for either South Station or Back Bay/the Orange Line are planned. A single route serving both areas would increase travel times for passengers and decrease service efficiency and attractiveness of the Rapid Bus alternative.

In order to provide the Rapid Bus connection to the Back Bay area, direct and indirect access was studied via transfers to Orange Line stations. Except for Back Bay Station, all connections would be indirect and would require a transfer to the Orange Line.

Eight stations were evaluated and screened, including:

- Ruggles
- Massachusetts Avenue
- Back Bay
- Tufts Medical Center
- Chinatown
- Downtown Crossing
- State Street
- Haymarket

These stations are illustrated in **Figure 1.**

Figure 1 Orange Line Stations

Factors considered in the screening included ease of access from Rapid Bus Alternative right-of-way (I-93), connectivity to additional transit services, availability and type of facility for bus staging, and station attractiveness (ridership ranking). A summary of the initial evaluation is provided in Table 1.

Table 1 Evaluated Orange Line Connections – Initial Assessment Summary

Station	Access	Existing Bus Staging Opportunities	Public Transportation Connections	Orange Line Station Entries* (Rank)	Evaluate further?
Haymarket	Located within 1 mile of I-93; access to the station uses congested urban streets	Off-Street Bus Turnaround	Green Line 16 Bus Routes	6,019 (10th)	N
State Street	Located within 1 mile of I-93; access to the station uses congested urban streets	On-Street	Blue Line 5 Bus Routes Local Private Shuttles	7,323 (9th)	N
Ruggles	Located within 2 miles of I-93; access to the station uses congested urban streets	Off-Street Bus Turnaround	3 Commuter Rail Lines 14 Bus Routes Local Private Shuttles	8,378 (6th)	Y
Massachusetts Avenue	Located within 2 miles of I-93; access to the station uses congested urban streets	On-Street	2 Bus Routes	5,248 (14th)	N
Back Bay	Located within 2 miles of I-93; access to the station uses congested urban streets	Off-Street Bus Turnaround	4 Commuter Rail Lines 3 Bus Routes 1 Amtrak Regional	16,769 (1st)	Y
Tufts Medical Center	Located within 1 mile of I-93; access to the station uses congested urban streets	On-Street	Silver Line 3 Bus Routes	5,684 (13th)	N
Chinatown	Located within 1 mile of I-93; access to the station uses congested urban streets	On-Street	Silver Line 1 Bus Route	5,822 (12th)	N
Downtown Crossing	Located within 2 miles of I-93; access to the station uses congested urban streets	On-Street	Red Line Silver Line 17 Bus Routes	11,563 (3rd)	Y

*MBTA Ridership and Service Statistics, Thirteenth Edition 2010

1.2 Station Locations Selected for Further Evaluation

Of the eight evaluated stations, three were considered for further evaluation based on initial review including Downtown Crossing, Back Bay, and Ruggles. It was determined that these stations would be most attractive based on proximately to Back Bay, existing transit connections and ridership.

1.2.1 Alternative 1 – Ruggles Station

Ruggles Station is located south of Downtown Boston, approximately 1.5 miles from I-93. This station provides connections to the Orange Line, Commuter Rail, 14 local bus routes, and private shuttles serving the Longwood Medical and Academic Area (LMA) and Northeastern University. It is ranked 6th in ridership and provides an off-street dedicated bus staging area via Ruggles Street.

1.2.2 Alternative 2 – Back Bay Station

Back Bay Station experiences the highest ridership of all Orange Line stations. It is located in the Back Bay business and retail district and is considered the most desirable location next to South Station for Rapid Bus riders. Although Rapid Bus customers would not have to transfer to the Orange Line if service terminated directly at the station, connections to the Commuter Rail, Amtrak Regional, and three local bus routes are available. There is a dedicated off-street bus staging area on Clarendon Street.

1.2.3 Alternative 3 – Downtown Crossing

Downtown Crossing is the closest to I-93 (within ½-mile) of all the stations considered. At Downtown Crossing connections can be made to the Red Line, Silver Line and 17 local bus routes. The Downtown Crossing Orange Line Station has the third highest ridership, indicating that it could be attractive to possible new ridership from the Rapid Bus Alternative. Multiple buses stage on-street in and around Downtown Crossing on Franklin, Washington, and Summer Streets.

2

Travel Routes

Travel routes between I-93 and the three station alternatives were chosen using the shortest path available for buses. As Rapid Buses would all travel the same path from the South Coast up to the northern end of the Zipper Lane, this assessment only includes the local travel time.

Travel routes are shown in the attached Figures 2 through 5. A summary of the proposed routing is provided below.

2.1 Downtown Crossing

Serving the Downtown Crossing Station would require Rapid Buses to travel the shortest distance on local streets. The buses would utilize the zipper lane to its fullest extent, the planned HOV extension on I-93 North between the end of the zipper lane and the existing I-93 HOV lane and exit to Lincoln Street. The bus would continue straight on to Lincoln Street, turn slightly-left onto Summer Street, and then right on Devonshire Street. At the end of Devonshire Street the bus would turn left onto Franklin Street and arrive at the Downtown Crossing on-street bus stop at the corner of Franklin Street and Washington Street. The inbound local travel distance would be approximately 1.5 miles on local streets.

The outbound route would continue on Franklin Street to Bromfield Street and then turn left onto Tremont Street. At Essex Street the bus would turn left and use the dedicated on-street bus lane for a segment of the road that allows the bus to advance ahead of queued traffic at the traffic signals (though a substantial travel time advantage is not provided). The bus would next turn right onto Surface Road and continue to just south of Kneeland Street where it would be able to access the southbound HOV lane.

The overall outbound route is approximately 1.5 miles on local streets. Rapid Bus passengers traveling to Back Bay would alight from the bus at the station, travel through the station to the fare array, pay an additional fare to access the Orange Line and travel one station south / west to Back Bay. This would take approximately 10 minutes from the point where the passengers exited the bus to the point when they arrived at Back Bay Station.

2.2 Back Bay

Two alternatives were analyzed for Rapid Bus access to Back Bay Station– one that uses the shortest distance (via Massachusetts Avenue) and one that uses the existing I-93 HOV lane (via Kneeland Street).

2.2.1 Option 1 (via Kneeland Street)

Option 1 would allow the Rapid Buses to utilize the zipper lane to its fullest extent, the planned HOV extension on I-93 North between the end of the zipper lane and the existing I-93 HOV lane, exiting to Kneeland Street. The route would then continue on Kneeland Street, right on Charles Street, through Park Plaza to St. James Avenue, arriving at the off-street Back Bay bus terminal on Clarendon Street. The inbound travel distance is approximately 2 miles on local city streets.

In the outbound direction this route would reverse but use streets parallel to the inbound routing due to a one-way street network in the area. The outbound travel distance is slightly shorter traveling approximately 1.5 miles on local streets to the I-93 HOV lane.

2.2.2 Option 2 (via Massachusetts Avenue)

Option 2 for Back Bay Station is more direct than Option 1, as the bus does not have to travel North to South Station, and then backtrack to get to Back Bay. This route would exit I-93 North earlier at Exit 18 (Mass Ave), before the entrance to the South Station HOV. The route would then continue on the Frontage Road to East Berkeley Street, St. James Avenue and then Clarendon Street. The inbound route travels approximately 2 miles on local streets.

The outbound route would differ due to a one-way street network in the Back Bay area. The buses would exit the terminal and turn left onto Columbus Avenue. The buses would then travel south on Arlington Street and continue

onto Herald Street, where the bus would access I-93. The outbound route is shorter than the inbound route traveling approximately 1.2 miles on local streets.

No transfer to the Orange Line would be required since passengers would alight at Back Bay, the preferred destination.

2.3 Ruggles Station

Buses traveling to Ruggles Station would also exit I-93 North at Exit 18 (Mass Ave.), before the entrance to the South Station HOV. The buses would then follow the Frontage Road to the Mass Ave Connector before merging into Melnea Cass Boulevard. Continuing on Melnea Cass Blvd., buses would turn left onto Tremont Street and then immediately right onto Ruggles Street where the off-street Ruggles Station bus staging area is located. Exiting the station, the Rapid Buses would reverse this route to I-93 South. The overall distance for travel between I-93 and Ruggles Station is approximately 2 miles in each direction.

Upon alighting from the bus at Ruggles station, passengers would travel through the station to the fare array, pay an additional fare to access the Orange Line and travel one station north/east to Back Bay. This would take approximately nine minutes from the point where the passengers exited the bus to the point when they arrived at Back Bay Station.

2.4 Travel Times

The total travel time to Back Bay Station for each Orange Line alternative was estimated for the year 2030. The total travel time includes the following:

- Local travel times previously presented with an adjustment for increased congestion in the future.
- Any time needed for passengers to transfer between the bus stations and the Orange Line if applicable.
- Travel time between Orange Line Station and Back Bay Station if applicable.

2.4.1 Local Travel Times

Each of the alternative Orange Line stations are in the city of Boston and the street network around them experiences congestion during the peak hours.

Traffic congestion and signal delays result in longer travel times compared to calculating travel time using distance alone. For this reason, a travel time study was conducted to determine real-time travel between I-93 and the stations during the peak hours. The study focused on the following days and peak times:

- Tuesday, January 17, 2012: 7:00 – 9:00 AM and 4:00 – 6:00 PM
- Wednesday, January 18, 2012: 7:00 – 9:00 AM and 4:00 – 6:00 PM
- Thursday, January 19, 2012: 7:00 – 9:00 AM and 4:00 – 6:00 PM

Averaged results of the travel time study between I-93 and the alternative stations are shown in Table 2 for the peak direction (inbound in the AM and outbound in the PM).

Table 2 Existing Local Travel Time Summary (minutes)*

Station	AM Peak – Inbound	PM Peak - Outbound
Downtown Crossing	6:51	6:28
Back Bay – Option 1 (via South Station)	8:35	13:13
Back Bay – Option 2 (Exit 28)	10:28	8:36
Ruggles	11:19	16:14

*Includes averaged travel times between I-93 and station

The local travel time runs were then adjusted to account for increased congestion by the year 2030. This adjustment was made using data provided by CTPS. The data provided by CTPS suggests that travel times will increase by 9 -30 percent between 2012 and 2030. These increases vary by direction as shown in Table 3.

Table 3 Increased Travel Time (2012 to 2030)

Route	Travel Time Increases
Ruggles - Inbound	12 %
Ruggles - Outbound	14 %
Downtown Crossing – Inbound	20 %
Downtown Crossing - Outbound	30 %
Back Bay Option 1 - Inbound	11 %
Back Bay Option 1 - Outbound	9 %
Back Bay Option 2 - Inbound	14 %
Back Bay Option 2 - Outbound	20 %

Source: CTPS

2.4.2 Orange Line Travel Time/Transfer Penalty

Next, a transfer penalty was added to the Downtown Crossing and Ruggles Station routes to allow for passengers to transfer to the Orange Line and complete their trip to Back Bay Station. During peak periods, Orange Line trains are scheduled to arrive every five minutes. The penalty assumes an average wait time equal to half of the scheduled headway, or 2.5 minutes for each transfer plus an additional 2.5 minutes to account for the inconvenience of having to transfer.[1] No transfer penalty was added to the Option 1 or 2 Back Bay alternatives.

A summary of the projected 2030 travel times are provided in Tables 4 for the AM peak hour. Overall, the Rapid Bus alternative to Back Bay Station via South Station (Option 1) is the shortest travel route during both the morning and evening peak hours.

Station	Local Travel Time	Transfer Penalty[1]	Time to Back Bay Station	Total Time to Back Bay Station
Downtown Crossing	7	5	5	17
Back Bay – Option 1	9	0	0	9
Back Bay – Option 2	11	0	0	11
Ruggles	12	5	4	21

[1] Transfer Penalty provide by CTPS

2.5 Bus Stops/Staging

The characteristics of the three alternative stations vary greatly. This section describes station locations, amenities, accessibility, and current buses using the proposed bus staging areas.

Figure 6 Back Bay Station

As shown in Figure 6, Back Bay Station has a dedicated off-street bus staging area. This area, located off Clarendon Street, provides a direct connection into Back Bay Station. The Back Bay bus stop connection to the Orange Line platform is the most convenient of the three alternatives. Passengers would disembark the buses and enter Back Bay Station at the same level as the Orange Line Station and walk through the fare array. A centralized elevator is provided to access the shared Orange Line platform below.

Currently, there are two MBTA bus routes that use the Back Bay bus terminal staging area. Only one of these buses uses the drop-off during the peak hours:

- **Route 39** – provides services from Forest Hills Station to Back Bay Station via Huntington Avenue. This route uses articulated buses. Headways are approximately 5-10 minutes during the peak hours.
- **Route 170** – provides late evening services between Dudley Square and Central Square in Waltham. This bus does not make peak hour stops at the Back Bay bus terminal.

The Back Bay bus terminal also provides reserved employee parking spaces. Relocation of these spaces would afford additional bus staging area, and would probably be required.

Figure 7 Downtown Crossing

There are several bus stops that serve the Downtown Crossing Station. The existing stop at Franklin Street and Washington Street, shown in Figure 7, was chosen since it is the closest stop to both the inbound and outbound Orange Line platforms. Stairs are provided on the other side of Franklin Street to both the inbound and outbound platforms. Elevator service is provided to the outbound platform only at Franklin Street. Inbound elevator service requires passengers to travel down Washington Street to a second Orange Line entrance at the corner of Washington Street at Winter Street. Rapid bus services to this location may require street-level improvements to make the Franklin Street pedestrian crossings ADA accessible between the bus stops and station entrances.

The Downtown Crossing stop at Franklin Street and Washington Street provides a limited, on-street, bus staging area. This section of Devonshire Street is restricted to buses, taxis, and emergency vehicles only during the daytime. There is no formal bus shelter for passengers; however, shelter is available in the covered retail plazas adjacent to the bus stop. The following bus routes currently use this bus stop:

- **Route 92** – provides service between Assembly Square Mall and Downtown via Sullivan Square Station, Main St. and Haymarket Station. Headways during peak hours are approximately 15 minutes.
- **Route 93** – provides service between Sullivan Square Station and Downtown via Bunker Hill Street and Haymarket Station. Headways during peak hours are approximately 7-10 minutes.

Figure 8 Ruggles Station

Ruggles Station provides an off-street bus terminal on Ruggles Street, shown in Figure 8. This station provides passengers with covered sheltered from inclement weather. This station serves 13 MBTA buses including:

- **CT2** – this route provides services between Sullivan Station and Ruggles Station via Kendall / MIT. Headways during peak hours are approximately 23 minutes.
- **CT3** – provides services between Beth Israel Deaconess Medical Center and Andrews Station. Headways during peak hours are approximately 25 minutes.
- **Route 8** – provides services between Harbor Point / UMass Boston and Kenmore Station via Boston University Medical Center. Headways during peak hours are approximately 25 minutes.
- **Route 15** – serves Kane Square or Fields Corner Station and Ruggles Station via Uphams Corner. Headways during peak hours are approximately 9 minutes.
- **Route 19** – provides service between Fields Corner Station and Kenmore Square or Ruggles Station via Grove Hall. Headways during peak hours are approximately 25 minutes.
- **Route 22** – serves Ashmont Station and Ruggles Station via Talbot Avenue and Jackson Square. Headways during peak hours are approximately 8 minutes.

- **Route 28** – provides services between Mattapan Station and Ruggles Station via Dudley Station. Headways during peak hours are approximately 8 minutes.
- **Route 29** – provides off-peak evening service to Mattapan Station and Jackson Square via Seaver Street and Columbus Avenue. Headways during peak hours are approximately 15-20 minutes.
- **Route 42** – travels between Forest Hills Station and Dudley Station or Ruggles Station. Headways during peak hours are approximately 25 minutes.
- **Route 43** – serves Ruggles Station and Park Station via Tremont Street. Headways during peak hours are approximately 12 minutes.
- **Route 44** – travels between Jackson Square Station and Ruggles Station via Seaver Street and Humboldt Avenue. Headways during peak hours are approximately 12 minutes.
- **Route 45** – provides service between Franklin Park Zoo and Ruggles Station via Blue Hill Avenue. Headways during peak hours are approximately 12 minutes.
- **Route 47** – travels between Central Square in Cambridge and Broadway Station via Boston University Medical Center. Headways during peak hours are approximately 22 minutes.

Passenger connections from the bus stop to the Orange Line platform requires passengers to use either stairs or elevator services to reach the station's fare array. Passengers must then use another set of stairs or an elevator to descend to the shared Orange Line platform below.

2.6 Route Comparison

A detailed comparison of the four Orange Line alternatives is provided in Table 5.

Table 5 Orange Line Station Alternatives

Route	Travel Time Ranking	Available Alternative Local Route	Bus Staging Area	Public Transportation Connections	Orange Line Station Entries* (Rank)	Accessibility Between Bus Stop & Orange Line
Downtown Crossing	2nd – Inbound 2nd – Outbound	No – Inbound Yes – Outbound	Limited on-street. Indirect access to Orange Line.	Red Line Silver Line 17 Bus Routes	11,563 (3rd)	Fair - may require improvements
Back Bay – Option 1	1st – Inbound 1st – Outbound	Yes – Inbound Yes – Outbound	Off-street bus staging area. No pedestrian shelter. Ability to expand queuing area.	4 Commuter Rail Lines 3 Bus Routes 1 Amtrak Regional	16,769 (1st)	Good
Back Bay – Option 2	3rd – Inbound 4th – Outbound	Yes – Inbound Yes – Outbound	Off-street bus staging area. No pedestrian shelter. Ability to expand queuing area.	4 Commuter Rail Lines 3 Bus Routes 1 Amtrak Regional	16,769 (1st)	Good
Ruggles Station	4th – Inbound 3rd - Outbound	No – Inbound No – Outbound	Off-street bus staging area. Covered passenger waiting area.	3 Commuter Rail Lines 14 Bus Routes 1 LMA Shuttle	8,378 (6th)	Good

*MBTA Ridership and Service Statistics, Thirteenth Edition 2010

3

Conclusions

The conclusion of this analysis is that the Back Bay Option 1 connection is most attractive for the Rapid Bus. This alternative makes maximum use of the I-93 HOV infrastructure. While this station does not provide the greatest number of commuter connections, it does provide the most overall benefits.

Key factors in this decision are:

- Back Bay Station Option 1 provides the shortest travel time for riders to the Back Bay in both the inbound and outbound direction;
- Back Bay Option 1 works better with the preferred alternatives for improving the connection between the existing I-93 Zipper Lane and South Station HOV Lane;
- There is a dedicated off-street bus terminal at Back Bay Station which services only one local bus route during the peak hours;
- No transfer to the Orange Line would be necessary to access the Back Bay area;
- There is the ability to expand the bus queuing area at Back Bay Station if needed by relocating employee parking; and
- Back Bay Station has the highest station entries, and is therefore the most desirable, Orange Line Station.

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Figures

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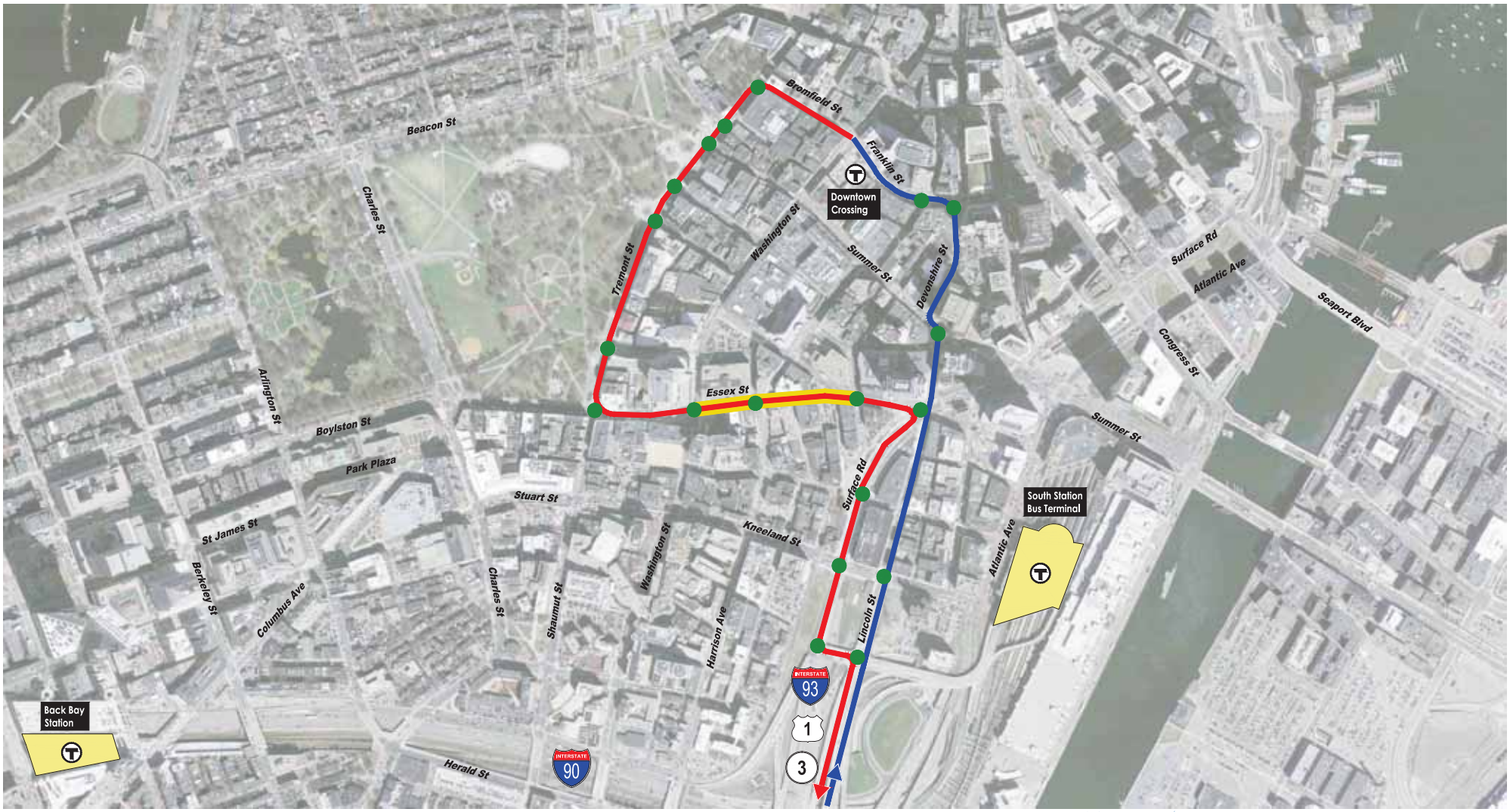

massDOT

SOUTH COAST RAIL

Figure 2
BRT Alternative
Downtown Crossing
Inbound/Outbound

Prepared by: VHB

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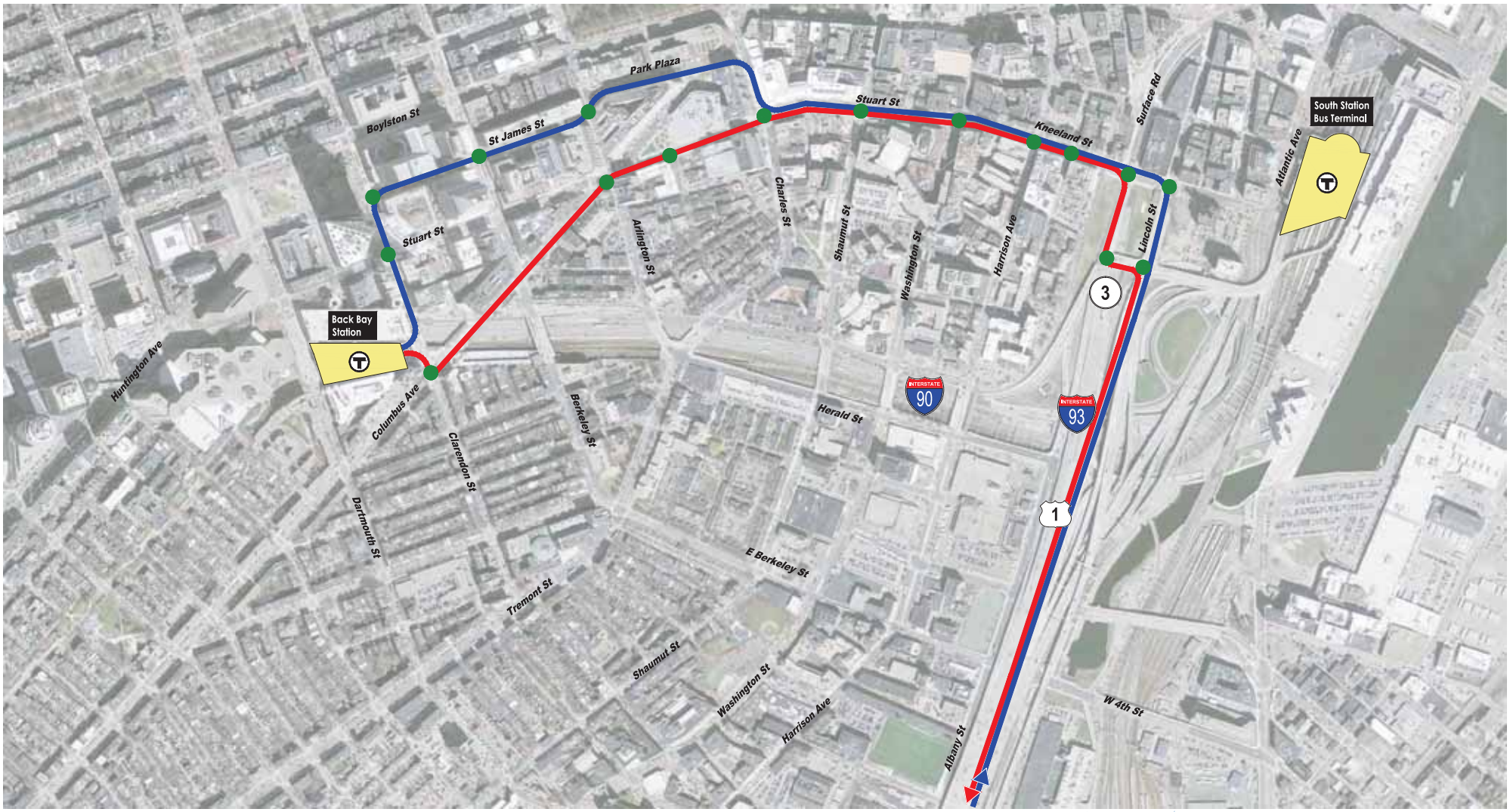

Figure 3
BRT Alternative
Back Bay Station
Inbound/Outbound - Option 1

Prepared by: VHB

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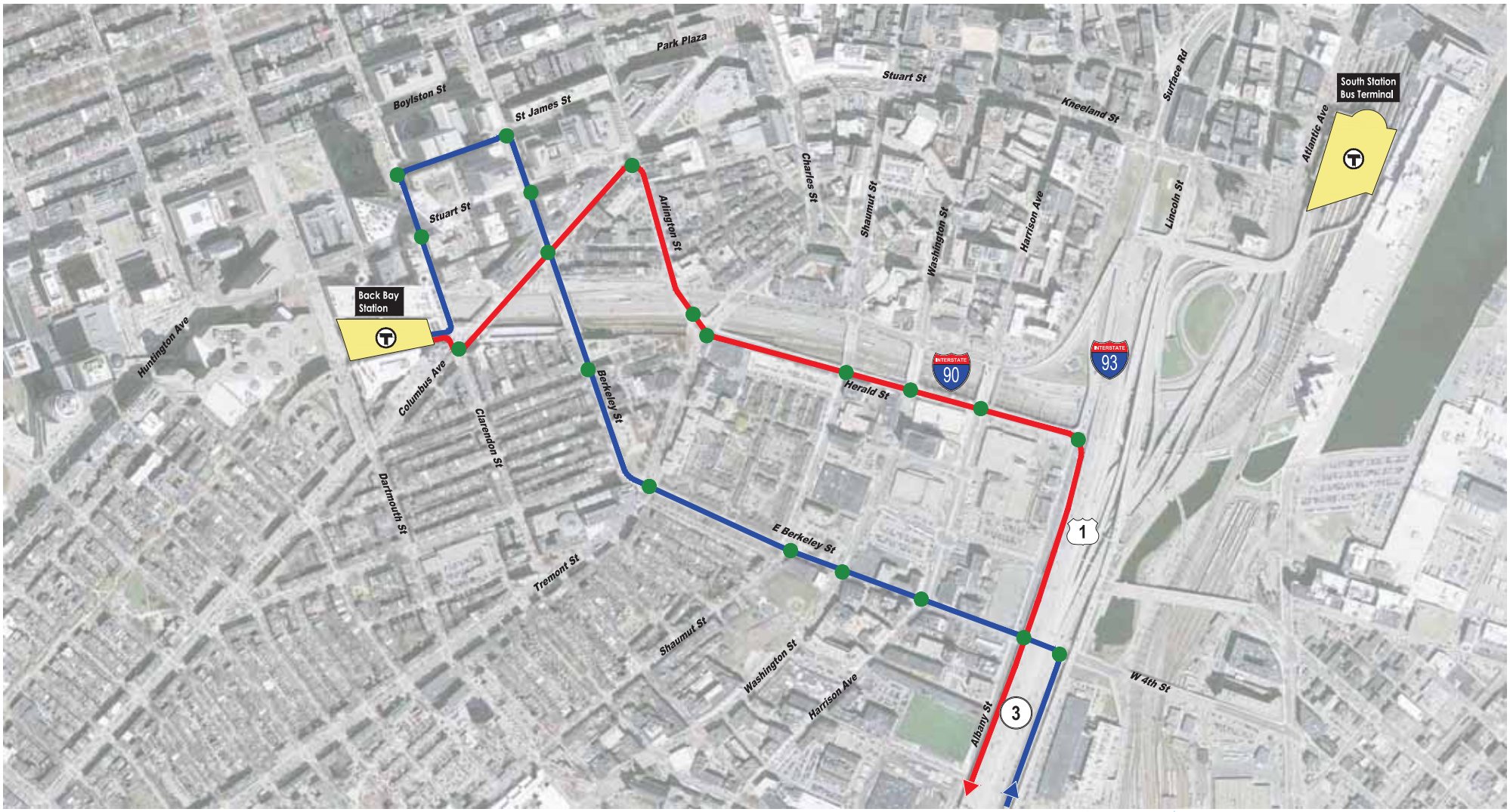

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0 250 500 Feet

LEGEND

OUTBOUND

INBOUND

TRAFFIC SIGNAL

Figure 4
BRT Alternative
Back Bay Station
Inbound/Outbound - Option 2

Prepared by: VHB

0 500 1000 Feet

LEGEND

OUTBOUND

INBOUND

TRAFFIC SIGNAL

Figure 5
BRT Alternative
Ruggles Station
Inbound/Outbound

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Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix F: Environmental Analysis

Prepared for

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June 2012

Table of Contents

1 Environmental Impacts 1

1.1 Land Use and Zoning 1
1.1.1 Highway Elements 1
1.1.2 Stations 2
1.1.3 Summary 5
1.2 Socioeconomics 5
1.2.1 Highway Elements 6
1.2.2 Stations 6
1.2.3 Summary 10
1.3 Environmental Justice 10
1.3.1 Highway Elements 10
1.3.2 Stations 11
1.3.3 Summary 18
1.4 Visual Resources 19
1.4.1 Highway Elements 19
1.4.2 Stations 21
1.4.3 Summary 23
1.5 Noise 24
1.5.1 Highway Elements 24
1.6 Vibration 25
1.7 Cultural Resources 25
1.7.1 Highway Elements 25
1.7.2 Stations 26
1.7.3 Summary 30
1.8 Air Quality 30
1.8.1 Mesoscale Analysis 30
1.8.2 Alternative Fuels 31
1.9 Open Space 32
1.9.1 Highway Elements 32
1.9.2 Stations 33
1.9.3 Summary 35
1.10 Hazardous Materials 37
1.11 Biodiversity 37
1.11.1 Highway Elements 37
1.11.2 Stations 40
1.11.3 Summary 40
1.12 Threatened and Endangered Species 41

1.12.1 Highway Elements 41
1.13 Wetlands 43
1.13.1 Highway Elements 44
1.13.2 Stations 48
1.13.3 Summary 49
1.14 Water Resources 49
1.14.1 Highway Elements 50
1.14.2 Stations 52
1.14.3 Summary 54
1.15 Coastal Zone Management –Chapter 91 Resources 55
1.15.1 Highway Elements 55
1.15.2 Stations 57
1.16 Indirect and Cumulative Impacts 58

Figures ..... Error! Bookmark not defined.

List of Tables

Table No.	Description	Page
Table 1	Rapid Bus: Route 24 Highway Alignment Acquisition Parcel Land Uses (DEIS/DEIR)	2
Table 2	Fall River Depot Station: Acquisition Parcel Land Uses	2
Table 3	Freetown Station: Acquisition Parcel Land Uses	3
Table 4	King's Highway Station: Acquisition Parcel Land Uses	3
Table 5	Brockton Station: Acquisition Parcel Land Uses	4
Table 6	West Bridgewater Station: Acquisition Parcel Land Uses	4
Table 7	Whale's Tooth Station: Acquisition Parcel Land Uses	4
Table 8	Summary of Land Acquisition Requirements for the MODIFIED Rapid Bus Alternative	5
Table 9	Fall River Depot Station: Land Acquisition	6
Table 10	Freetown Station: Land Acquisition	7
Table 11	Whale's Tooth Station: Land Acquisition	8
Table 12	Brockton Station: Land Acquisition	9
Table 13	West Bridgewater Station: Land Acquisition	9
Table 14	Fall River Depot Station: Environmental Justice Land Acquisition	12
Table 15	Whale's Tooth Station: Environmental Justice Land Acquisition	17
Table 16	Summary of Potential Direct Effects to Visual and Aesthetic Resources from the Rapid Bus Alternative	24
Table 17	Air Quality Beneficial Effects Comparison	31
Table 18	Changes in CNG as Compared to Gasoline in LDVs	32
Table 19	Rapid Bus Alternative Protected Open Space Acquisition	33
Table 20	Summary of Potential Direct Effects to Protected Open Spaces and ACECs from the Rapid Bus Alternative	36
Table 21	Rapid Bus Alternative - Impacts to Vernal Pools	38
Table 22	Rapid Bus Alternative – Loss of Habitat	38
Table 23	Impacts to Rare Species Habitat Functions – Rapid Bus Alternative	43
Table 24	Direct Wetland Impacts – Rapid Bus Alternative (from the DEIS/DEIR)	44
Table 25	Permanent BVW Impacts by Cover Type	46

Table 26 Direct Wetland Impacts 47

Table 27 Stormwater Discharges for the Rapid Bus Alternative 50

Table 28 Construction and Stormwater Discharges in Public Water Supply Well Protection Areas for the Rapid Bus Alternative 51

Table 29 Non-Tidal River and Stream Crossings – Rapid Bus Alternative 56

1 Environmental Impacts

This section provides an evaluation of the environmental impacts of the Modified Rapid Bus Alternative, and compares the modified alternatives' environmental impacts to the DEIS/DEIR Rapid Bus Alternative.

As described in the main report, "Modified Rapid Bus Alternative" the DEIS/DEIR was modified to improve its overall performance. This included modifications to the infrastructure along Route 24, and additional stations along Route 24. As described in Appendix D "I-93 'Missing Link' Design Alternatives," no modifications were made to the segment of I-93 between Route 24 and South Station. The six bus stations identified in the DEIS/DEIR will be retained (Downtown Taunton, Fall River Depot, Freetown, Galleria, Kings Highway, Whale's Tooth) and two new "in-line" stations would be added within the Route 24 median at West Bridgewater (Exit 16) and Brockton (Exit 18). With the optimization of the Rapid Bus Alternative, a new bus maintenance and layover facility and expansion of the Logan Express lot would be required. The location for this new bus maintenance and layover facility has not yet been identified and the environmental impacts of this facility would need to be analyzed in further work.

1.1 Land Use and Zoning

This section discusses the impacts of the Modified Rapid Bus Alternatives on land use and zoning, with a focus on the parcels that would have to be acquired to construct this alternative. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to Route 24.

1.1.1 Highway Elements

Land uses and public or private ownership of the parcels that would be acquired along the highway alignments for the Rapid Bus Alternative are listed in Table 1.

The Route 24 improvements would require the use of two undeveloped public parcels (4.52 acres) and four undeveloped private parcels (0.42 acres).

Table 1 Rapid Bus: Route 24 Highway Alignment Acquisition Parcel Land Uses (DEIS/DEIR)

City/Town	Public Ownership		Private Ownership					
				Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	Subtotal
Highway Alignments								
Bridgewater	1	0.19						
Raynham	1	4.33	4				0.42	0.42
TOTAL	2	4.52	4				0.42	0.42

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

1.1.2 Stations

The land use impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR, except for the two new in-line stations which would require property acquisition for the parking lots and access roads.

Fall River Depot

The Fall River Depot Station site is a previously developed parcel surrounded by commercial and industrial development. Land uses and zoning designations of the parcels that would be acquired to construct the Fall River Depot Station are listed in Table 2.

Table 2 Fall River Depot Station: Acquisition Parcel Land Uses

Parcel	Ownership	Generalized	General	Area
O-15-1	Private	Industrial	Industrial	0.82
O-15-2	Private	Industrial	Industrial	0.32
O-15-8	Private	Industrial	Industrial	0.38
O-15-18	Private	Industrial	Industrial	1.52
O-15-20	Public	Industrial	Industrial	0.17
O-22-5	Private	Commercial	Commercial	0.12
O-22-6	Private	Residential	Residential	0.10
O-22-7	Private	Commercial	Commercial	0.06
O-22-11	Private	Industrial	Industrial	0.47
TOTAL				3.96

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Freetown

The Freetown Station site is a previously developed parcel surrounded by commercial and low density residential development and undeveloped land. The land use and zoning designation of the parcel that would be acquired to construct the Freetown Station are listed in Table 3.

Table 3 Freetown Station: Acquisition Parcel Land Uses

Parcel Number	Ownership	Generalized Zoning	General Land Use	Area (acres)
233-19	Private	Other	Forest	4.18

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Galleria

The Galleria Station is an existing bus station that would serve the Rapid Bus Alternative. It is located at the Silver City Galleria Mall, near the intersection of Routes 140 and 24 in Taunton. The Galleria Station would be restriped to improve traffic flow and parking for the Rapid Bus Alternative, but no land acquisition would be required. Accordingly, no changes to land use would result at this location.

King's Highway

The King's Highway Station site is a previously developed parcel surrounded by industrial development. The land use and zoning designation of the parcel that would be acquired to construct the King's Highway Station are listed in Table 4.

Table 4 King's Highway Station: Acquisition Parcel Land Uses

Parcel Number	**Ownership**	**Generalized Zoning**	**General Land Use**	**Area (acres)**
123-43	Private	Industrial	Commercial	3.89

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Brockton Station

The Brockton Station site is an undeveloped portion of a parcel with commercial development. The land use and zoning designation of the portion of the parcel that would be acquired to construct the Brockton Station are listed in Table 5.

Table 5 Brockton Station: Acquisition Parcel Land Uses

Parcel Number	Ownership	Generalized Zoning	General Land Use	Area (acres)
45-3	Private	Commercial	Undeveloped	2.35

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

West Bridgewater Station

The West Bridgewater Station site is comprised of portions of four undeveloped parcels and is surrounded by undeveloped land. The land use and zoning designation of the parcels that would be acquired to construct the West Bridgewater Station are listed in Table 6.

Table 6 West Bridgewater Station: Acquisition Parcel Land Uses

Parcel Number	Ownership	Generalized Zoning	General Land Use	Area (acres)
29-005	Private	Industrial	Undeveloped	0.45
36-020	Private	Industrial	Undeveloped	0.16
36-021	Private	Industrial	Undeveloped	0.04
36-033	Private	Industrial	Undeveloped	4.84
TOTAL				5.49

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Whale's Tooth

The Whale's Tooth Station site is a previously developed parcel surrounded by industrial development. The City of New Bedford recently constructed a parking lot at this site in anticipation of the proposed South Coast Rail project. Land uses and zoning designations of the parcels that would be acquired to construct the Whale's Tooth Station are listed in Table 7.

Table 7 Whale's Tooth Station: Acquisition Parcel Land Uses

Parcel Number	Ownership	Generalized Zoning	General Land Use	Area (acres)
66-101	Public	Industrial	Transportation/	1.92
66-121	Public	Industrial	Industrial	0.38
66-133	Public	Industrial	Transportation/	3.38
66-133A	Private	Industrial	Transportation/	0.05
66-157	Public	Industrial	Transportation/	0.26
TOTAL				5.99

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

1.1.3 Summary

The Rapid Bus Alternative would be comprised of the elements listed in Table 8 which also summarizes the acquisition requirements and affected land uses potentially resulting from implementing this alternative.

Based upon preliminary engineering plans and excluding a bus layover facility, part or all of eight publicly owned parcels comprising 16.95 acres of land, and part or all of 15 privately owned parcels comprising 12.50 acres of land would be acquired for the Rapid Bus Alternative. Affected private land uses would be principally industrial or undeveloped land, with little effect to residential or commercial land use. All of this land would be converted to transportation/utilities use and be publicly owned if this alternative is selected.

Table 8 Summary of Land Acquisition Requirements for the MODIFIED Rapid Bus Alternative

City/Town	Public Ownership		Private Ownership					
				Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	Subtotal
Highway Alignments								
Reversible Bus Lanes	2	4.52	4				0.42	0.42
Stations								
Taunton Depot	1	6.32						
Galleria								
Freetown			1				4.18	4.18
Fall River Depot	1	0.17	8	0.10	0.18	3.68		3.96
King's Highway			1			3.89		3.89
Whale's Tooth	4	5.94	1			0.05		0.05
Brockton			1		2.35			2.35
West Bridgewater			4				5.49	5.49
SUMMARY/TOTAL[1]	8	16.95	16	0.10	2.53	7.62	10.09	20.34
Maintenance Facility (site to be determined)								

1- Excludes maintenance facility because a site has not been selected. Does not include the HOV lane Alternatives.

1.2 Socioeconomics

This section discusses the impacts of the Modified Rapid Bus Alternatives on social and economic factors, with a focus on the parcels that would have to be acquired to construct this alternative. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.2.1 Highway Elements

The number, area, public or private ownership, and general land use of parcels that would be acquired along the highway alignments for the Rapid Bus Alternative are summarized in Table 1 and Table 2.

All of the affected private land along the Route 24 highway alignment rights-of-way would be undeveloped property, totaling 0.42 acres in Raynham. There would be no impacts to residential, commercial, or industrial land. Approximately 4.33 acres of public land would be acquired for the interchange reconfiguration in Raynham and a small area in Bridgewater. No residential, business, or community facility displacements would result from these acquisitions along the Rapid Bus Alternative alignments.

All of the land in Bridgewater and Raynham that would be acquired for the Rapid Bus right-of-way consists of partial takings of either publicly or privately owned parcels. Property tax revenue losses for small acquisitions cannot be calculated at this phase.

1.2.2 Stations

The land use impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would require property acquisition for the parking lots and access roads.

Fall River Depot

The Fall River Depot Station site is a previously developed parcel including and surrounded by commercial and industrial development. Parcels that would be acquired and converted to transportation/utilities land use to construct the Fall River Depot Station are listed in Table 9.

Table 9 Fall River Depot Station: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
O-15-1	Private	Industrial	Industrial	$6,203.70	Yes	0.82	100.0
O-15-2	Private	Industrial	Industrial	$5,346.69	No	0.32	100.0
O-15-8	Private	Industrial	Industrial	$7,653.62	Yes	0.38	100.0
O-15-18	Private	Industrial	Industrial	$5,122.82	No	1.52	100.0
O-15-20	Public	Industrial	Industrial	-	No	0.17	100.0
O-22-5	Private	Commercial	Commercial	$3,725.37	Yes	0.12	100.0
O-22-6	Private	Residential	Commercial	$5,138.56	No	0.10	100.0
O-22-7	Private	Commercial	Commercial	$3,592.69	Yes	0.06	52.4
O-22-11	Private	Industrial	Industrial	$3,627.43	Yes	0.47	100.0
TOTAL				$40,410.88		3.96	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

The Fall River Depot Station would require 3.96 acres of land, comprised of 3.79 acres (eight parcels) of privately owned land and 0.17 acres (one parcel) of publicly owned land. Business displacements would result from these acquisitions. Commercial or industrial buildings on five of the parcels listed above would be acquired to construct this station. Businesses present include a flooring store, electrical company, tire service shop, and automobile detail service. Job losses from businesses occupying these buildings would be expected. No residential or community facility displacements would result from these acquisitions for the Fall River Depot Station.

Parcel number O-15-20 is owned by the City of Fall River; no property tax revenue loss would result from acquiring this parcel. All other parcels are privately owned and would be acquired in whole or in excess of 50 percent; property tax revenue losses for the City of Fall River are estimated at $40,410.88 per year, in 2009 dollars.

Freetown

The Freetown Station site is a previously developed parcel surrounded by low density residential development and undeveloped land. The parcel that would be acquired and converted to transportation / utilities land use to construct the Freetown Station is listed in Table 10.

Table 10 Freetown Station: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
233-19	Private	Undeveloped	Undeveloped	TBD	No	4.18	16.6

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.

The Freetown Station would require acquisition of 4.18 acres (one parcel) of privately owned land. No residential, business, or community facility displacements would result from this acquisition for the Freetown Station.

Less than 50 percent of parcel number 233-19 would be acquired for the Freetown Station and, accordingly, property tax revenue loss cannot be determined at this phase.

Galleria

The Galleria Station is an existing parking lot that would serve the Rapid Bus Alternative. It is located at the Silver City Galleria Mall, near the intersection of Routes 140 and 24 in Taunton. The Galleria Station would be expanded to meet the expected parking needs for the Rapid Bus Alternative, but no land acquisition would be required. There would be no direct effects to land uses or the social and economic environment at this location.

King's Highway

The King's Highway Station site is a previously developed parcel surrounded by industrial development. This station would share a parking lot with adjacent businesses; no land acquisition would be required. There would be no direct effects to land uses or the social and economic environment at this location.

Whale's Tooth

The Whale's Tooth Station site is a previously developed parcel surrounded by industrial development. The City of New Bedford recently constructed a parking lot at this site in anticipation of the proposed South Coast Rail project. Parcels that would be acquired and converted to transportation / utilities land use to construct the Whale's Tooth Station are listed in Table 11.

Table 11 Whale's Tooth Station: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
66-101	Public	Industrial	Industrial	-	No	1.92	100.0
66-121	Private	Industrial	Industrial	TBD	No	0.38	26.6
66-133	Public	Industrial	Industrial	-	No	3.38	100.0
66-133A	Private	Industrial	Industrial	$1,227.47	No	0.05	100.0
66-157	Public	Industrial	Industrial	-	No	0.26	100.0
TOTAL				$1,227.471		5.99	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

TBD: To be determined.

1: Additional property tax revenue losses may result from small and/or partial acquisitions that cannot be determined at this phase.

The Whale's Tooth Station would require 5.99 acres of land, comprised of 0.43 acres (two parcels) of privately owned land and 5.56 acres (three parcels) of publicly owned land. No residential, business, or community facility displacements would result from these acquisitions for the Whale's Tooth Station.

Parcel numbers 66-101, 66-133, and 66-157are owned by the City of New Bedford; no property tax revenue loss would result from acquiring these parcels. EOT may lease, rather than acquire, these parcels from the City of New Bedford. Less than 50 percent of parcel number 66-121 would be acquired and, accordingly, property tax revenue loss cannot be determined at this phase. Over 50 percent of parcel number 66-133A would be acquired; property tax revenue losses for the City of New Bedford are estimated at $1,227.47 per year, in 2009 dollars. Additional property tax revenue losses could result from the partial acquisition.

Brockton Station

The Brockton Station site is an undeveloped portion of a parcel otherwise developed for commercial use surrounded by other commercial and residential development. The portion of the parcel that would be acquired and converted to transportation / utilities land use to construct the Brockton Station is listed in Table 12.

Table 12 Brockton Station: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
45-3	Private	Commercial	Undeveloped	TBD	No	2.35	15.8

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.

The Brockton Station would require acquisition of 2.35 acres (15.8 percent of one parcel) of privately owned land. No residential, business, or community facility displacements would result from this acquisition for the Brockton Station.

Less than 50 percent of parcel number 014-001 would be acquired for the Brockton Station and, accordingly, property tax revenue loss cannot be determined at this phase.

West Bridgewater Station

The West Bridgewater Station site is comprised of portions of four undeveloped parcels and is surrounded by other undeveloped land. The portions of the parcels that would be acquired and converted to transportation / utilities land use to construct the West Bridgewater Station are listed in Table 13.

Table 13 West Bridgewater Station: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
29-005	Private	Industrial	Undeveloped	TBD	No	0.45	9.47
36-020	Private	Industrial	Undeveloped	TBD	No	0.16	4.30
36-021	Private	Industrial	Undeveloped	TBD	No	0.04	2.65
36-033	Private	Industrial	Undeveloped	TBD	No	4.84	3.28
TOTAL						5.49	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.

The West Bridgewater Station would require acquisition of 4.79 acres (portions of four parcels) of privately owned land. No residential, business, or community facility displacements would result from these acquisitions for the West Bridgewater Station.

Less than 50 percent of the parcels that would be acquired for the West Bridgewater Station and, accordingly, property tax revenue loss cannot be determined at this phase.

1.2.3 Summary

The Rapid Bus Alternative would require land acquisition with direct effects to land uses and the social and economic environment, respectively, potentially resulting from implementing this alternative.

Based upon preliminary engineering plans (but excluding layover facilities until site selection and parcels of which less than 50 percent would be acquired), privately owned land that would be acquired for the Rapid Bus Alternative would result in property tax revenue losses in Taunton, West Bridgewater, Freetown, Fall River and New Bedford. Additional property tax revenue losses may result from small and/or partial acquisitions that cannot be determined at this phase. Job losses would be expected in Fall River.

1.3 Environmental Justice

This section discusses the impacts of the Rapid Bus Alternative on environmental justice communities. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.3.1 Highway Elements

The Rapid Bus Alternative alignment from Braintree to Taunton passes through environmental justice neighborhoods in Randolph, Stoughton, and Brockton. Randolph and Brockton are outside of the South Coast Rail environmental justice study area and are not further considered here. The direct acquisition, neighborhood fragmentation, noise level, and air quality impacts to the environmental justice populations in Stoughton potentially resulting from upgrading and using the highway alignments through Stoughton are described below. South of the I-93 Southeast Expressway HOV Section

The Rapid Bus Alternative would use existing highway rights-of-way for new construction between Braintree and Taunton. Interchange ramp improvements at some locations would require work outside of the existing right-of-way, acquiring adjoining parcels. No environmental justice neighborhood land would be acquired for upgrading the current or reconstructing the existing highway alignments or interchanges. No jobs or residences would be lost for these alternatives.

Because the Rapid Bus Alternatives would use existing, active highway alignments, fragmentation of environmental justice neighborhoods, or any other neighborhoods, would not result from adding Rapid Bus service to these alignments.

The Rapid Bus Alternatives would use existing highway alignments, modified for dedicated bus use. The existing sound environment consists of heavy traffic on an active major highway system. The noise level study concluded that adding Rapid Bus service to the existing highways would not appreciably change the sound environment. There would be no impacts to environmental justice populations from the Rapid Bus Alternatives.

Changes in other resources that would result from using the existing highway alignments for the Rapid Bus Alternative may affect environmental justice populations:

- No vibration impacts are expected from the rubber-tired buses operating on public roads.i There would be no adverse vibration impacts to environmental justice populations along the Rapid Bus Alternative alignments.
- The Rapid Bus Alternative's impact to air quality would be very small (less than a 1.5 percent increase in pollutant levels) and would not result in air pollutant concentrations in excess of the NAAQS.ii There would be no air quality impacts to environmental justice populations along the Rapid Bus Alternative alignments.
- Protected open space would be acquired in West Bridgewater, Bridgewater, and Raynham along the Rapid Bus Alternative alignment.iii However, none of these acquisitions would be within environmental justice neighborhoods. No publicly owned parcels in ACECs would be acquired for the Rapid Bus Alternative.
- No cultural resource sites in environmental justice neighborhoods along the Rapid Bus Alternative alignments would be adversely impacted.iv Use of the existing highway alignments is not anticipated to result in the loss of any historic property, known archaeological resource, or known/documented traditional cultural resource.
- The Corps is undertaking NHPA Section 106 consultation with the Native American tribes to determine if the South Coast Rail alternatives would have an adverse effect on any undocumented traditional cultural resources of significance to the tribes. If such adverse effects were found to occur, there could be a disproportionate adverse impact to an environmental justice community.

1.3.2 Stations

The environmental justice impacts of the Rapid Bus Alternatives to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would be within developed industrial areas and would have no environmental justice impacts.

Fall River Depot

The Fall River Depot Station site is partially within and would therefore serve an environmental justice neighborhood in Fall River, and would also serve environmental justice populations in nearby Swansea. The adjacent neighborhood meets environmental justice minority and low income criteria. The following subsections describe the direct and indirect impacts to environmental justice populations in Fall River and Swansea potentially resulting from constructing and using the Fall River Station along the Fall River Secondary.

Direct

Portions of four parcels within an environmental justice neighborhood would be acquired for the Fall River Depot Station, as listed in Table 14.

Table 14 Fall River Depot Station: Environmental Justice Land Acquisition

Municipality	Parcel Number	Ownership	Generalized Zoning	General Land Use	Environmental Justice Categories	Area (acres)
Fall River	O-22-5	Private	Industrial	Commercial	Income, Minority	0.12
Fall River	O-22-6	Private	Industrial	Commercial	Income, Minority	0.10
Fall River	O-22-7	Private	Industrial	Commercial	Income, Minority	0.06
Fall River	O-22-11	Private	Industrial	Industrial	Income, Minority	0.47
Total						0.75

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Five other parcels outside of the environmental justice neighborhood boundary would also be acquired. The nine parcels that would be acquired for the Fall River Depot Station are privately owned and used for commercial or industrial purposes. Acquiring these nine parcels would result in a property tax revenue loss of $40,411 for the City of Fall River, directly affecting the financial resources available for the surrounding environmental justice neighborhood.

Commercial or industrial buildings on some of the parcels listed above would be acquired to construct this station. The businesses present include a flooring store (Jay Vee's Discount Flooring), electrical companies (GEMCO electrical contractors and Cotter Electrical, tire service shop (Jimmy's Used Tires), and automobile detail service (Auto Accent). No readily available information suggests that these businesses are owned by environmental justice populations. Employees may be residents of the surrounding environmental justice neighborhoods. Job losses from these businesses would be expected and would adversely impact the surrounding environmental justice neighborhood. It is not known if these businesses are likely to relocate nearby.

Indirect

The Fall River Depot Station site would not require redevelopment of an undeveloped area and has adequate infrastructure to serve the station and support

nearby redevelopment. It is located 1 mile north of downtown Fall River, close to a dense residential neighborhood and aging shopping plaza, and across from a redeveloping waterfront along Route 79. This site is close to employment opportunities and environmental justice neighborhoods. The station could also catalyze redevelopment in that it offers a classic TOD opportunity that fits with the City's plans for redeveloping the waterfront. This redevelopment opportunity could spur growth in the proximate environmental justice neighborhoods.

Property values in environmental justice neighborhoods surrounding the Fall River Depot Station site may increase due to a perceived market value of residences or businesses close to a transit center. Additionally, TOD in the vicinity of the site could further enhance property values.

Statistical information suggests that the Fall River environmental justice populations may benefit from access to transit services at the Fall River Depot Station. As noted above, 57.3 percent of the Fall River population is defined as living in environmental justice neighborhoods. The site is close to (within 0.5 mile of) neighborhoods meeting environmental justice income and/or minority criteria. Approximately 50.2 percent of the population (4,652 persons) within 0.5 mile of the Fall River Station site resides in a designated environmental justice neighborhood. Neighborhoods meeting a full range of environmental justice criteria are near the Fall River Station site.

Approximately 20.7 percent of the households in Fall River had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the environmental justice population in Fall River in particular is likely to realize an improvement in local employment and access to transit services for employment and/or educational opportunities both inside and outside the community.

The Fall River Depot Station site is also approximately 4 miles from downtown Swansea, where 5.7 percent of the population is defined as living in environmental justice neighborhoods. The environmental justice neighborhoods in Swansea meet income criteria. Approximately 4.5 percent of the households in Swansea had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, the majority of the environmental justice population in Swansea is likely to possess the means to commute via automobile to the Fall River Depot Station but is not within walking distance. If any of the rail alternatives or the Rapid Bus Alternative are selected, the Swansea environmental justice population would likely realize an improvement in access to transit services for employment and/or educational opportunities outside the community.

Freetown

The Freetown Station site is not within or near any environmental justice neighborhoods. An analysis of direct or indirect impacts to environmental justice populations from constructing and using the Freetown Station was not performed.

Galleria

The Galleria Station site is not within or near any environmental justice neighborhoods, but the station could serve environmental justice populations in nearby Taunton. The nearby neighborhoods meet environmental justice low income and/or minority criteria. The following subsections describe the direct and indirect impacts to the environmental justice populations in Taunton potentially resulting from using the Galleria Station for the Rapid Bus Alternative.

Direct

There are no environmental justice neighborhoods close to the Galleria Station and, therefore, there would be no land acquisition impacts to environmental justice populations.

Indirect

The Galleria Station site would not require redevelopment of an undeveloped area and has adequate infrastructure to serve the station and support nearby redevelopment. It is close to employment opportunities, but not environmental justice neighborhoods. The station could catalyze further transit-oriented development of the adjacent Silver City Galleria Mall, and the site has potential for future mixed-use development. However, the distance of this site from environmental justice neighborhoods limits the potential growth-inducing effects that this station may have on those neighborhoods.

As noted above, no environmental justice neighborhoods are present within 0.5 mile of the Galleria Station. However, statistical information suggests that the Taunton environmental justice populations may benefit from the Galleria Station. The station is approximately 2.5 miles from downtown Taunton, where 12.7 percent of the population is defined as living in environmental justice neighborhoods. These neighborhoods are identified as meeting minority and/or low income environmental justice criteria.

Only 9.3 percent of the households in Taunton had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, the this portion of the environmental justice populations in Taunton in particular would likely realize an improvement in local employment and incremental improvement to access to transit services for employment and/or educational opportunities both inside and outside the community as bus service is expanded south to Fall River and New Bedford, and north into Boston.

King's Highway

The King's Highway Station site is not within but is near to environmental justice neighborhoods in New Bedford. This station would also serve environmental justice

populations in nearby Fairhaven. The following subsections describe the direct and indirect impacts to environmental justice populations in New Bedford and Fairhaven potentially resulting from constructing and using the King's Highway Station along the New Bedford Main Line.

Direct

There are no environmental justice neighborhoods close to the King's Highway Station and, therefore, there would be no land acquisition impacts to environmental justice populations.

Indirect

The King's Highway Station site would not require development of an undeveloped area and has adequate infrastructure to serve the station and support nearby redevelopment. The site is near employment opportunities and environmental justice neighborhoods. The station could also catalyze redevelopment in that it offers an opportunity to revitalize an aging shopping plaza by redeveloping it into a mixed-use neighborhood or lifestyle center. The site also presents an opportunity for joint development. This redevelopment opportunity could spur growth in the nearby environmental justice neighborhoods.

Property values in environmental justice neighborhoods surrounding the King's Highway Station site may increase due to a perceived market value of residences or businesses close to a transit center. Additionally, TOD in the vicinity of the site could further enhance property values.

In New Bedford, 68.2 percent of the population is defined as living in environmental justice neighborhoods. The site is near (within 0.5 mile of) one neighborhood meeting environmental justice income criteria. Approximately 20.9 percent of the population (1,213 persons) within 0.5 mile of the King's Highway Station site resides in a designated environmental justice neighborhood. Neighborhoods meeting a full range of environmental justice criteria are outside of the 0.5-mile radius around the King's Highway Station site.

Approximately 21.7 percent of the households in New Bedford had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the New Bedford environmental justice populations in particular is likely to realize an improvement in local employment or access to transit services for employment and / or educational opportunities inside or outside the community.

The King's Highway Station site is approximately 6.75 miles from downtown Fairhaven, where 9.7 percent of the population is defined as living in an environmental justice neighborhood. The environmental justice population in Fairhaven meets income criteria.

Approximately 7.0 percent of the households in Fairhaven had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the environmental justice population in Fairhaven in particular is likely to realize an improvement in access to transit services for employment and/or educational opportunities outside the community.

Whale's Tooth Station

The Whale's Tooth Station site is located within and near environmental justice neighborhoods in New Bedford. This station may also serve environmental justice populations in nearby Fairhaven and Dartmouth. The following subsections describe the direct and indirect impacts to environmental justice populations in New Bedford, Fairhaven, and Dartmouth potentially resulting from constructing and using the Whale's Tooth Station for the New Bedford Main Line or Rapid Bus Alternative of the South Coast Rail Project.

Direct

Portions of four or five parcels (depending upon the alternative chosen) within an environmental justice neighborhood would be acquired for the Whale's Tooth Station, as listed in Table 15.

Table 15 Whale's Tooth Station: Environmental Justice Land Acquisition

Municipality	Parcel Number	Ownership	Generalized Zoning	General Land Use	Environmental Justice Categories	Area (acres)
New Bedford	66-101	Public	Industrial	Industrial	Income, Minority	1.92
New Bedford	66-1211	Public	Industrial	Industrial	Income, Minority	0.38
New Bedford	66-133	Public	Industrial	Industrial	Income, Minority	3.38
New Bedford	66-133A	Private	Industrial	Industrial	Income, Minority	0.05
New Bedford	66-157	Public	Industrial	Industrial	Income, Minority	0.26
Total						5.99

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

1 This parcel would be acquired for the train station (all rail alternatives) but not the bus station (Rapid Bus Alternative). The bus station would require acquisition of 5.61 acres of environmental justice neighborhood land.

Four of the parcels that would be acquired for the Whale's Tooth Station are publicly owned and one is privately owned. All are zoned for industrial purposes and the general land use is industrial; they are all used for transportation / utilities. None are used for residential purposes. One of the publicly owned parcels, number 66-121, would only be acquired for the train station and would not be acquired for the bus station. The total area that would be acquired for the bus station would therefore be 5.61 acres. EOT may lease, rather than acquire, the publicly owned parcels from the City of New Bedford. All of the land would be used a parking lot for the station. There would be no impacts to environmental justice populations because no residences or jobs would be lost.

Indirect

The Whale's Tooth Station site would not require development in an undeveloped area and has adequate infrastructure to serve the station and support nearby redevelopment. The site is close to the New Bedford waterfront, downtown New Bedford, and the Hicks Logan redevelopment area. The station would be in near employment opportunities and environmental justice populations. Immediately adjacent to the state site are old mill buildings in the process of being converted to homes. The station could also catalyze TOD. The Hicks Logan area presents an opportunity to develop a mixed-use waterfront neighborhood that would be served by rail. This redevelopment opportunity could spur growth in the nearby environmental justice neighborhoods.

Property values in environmental justice neighborhoods surrounding the Whale's Tooth Station site may increase due to a perceived market value of residences or businesses close to a transit center. Additionally, TOD in the vicinity of the site could further enhance property values.

Statistical information suggests that environmental justice populations may benefit from the Whale's Tooth Station. In New Bedford, 68.2 percent of the population is defined as living in environmental justice neighborhoods. The site is within a

neighborhood meeting environmental justice income and minority criteria, and is close to (within 0.5 mile of) other neighborhoods meeting foreign-born, minority, and / or income criteria. Approximately 85.6 percent of the population (8,937 persons) within 0.5 mile of the Whale's Tooth Station site resides in a designated environmental justice neighborhood.

Approximately 21.7 percent of the households in New Bedford had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the environmental justice population in New Bedford in particular is likely to realize an improvement in local employment and access to transit services for employment and / or educational opportunities both inside and outside the community.

The Whale's Tooth Station site is also approximately 2 miles from downtown Fairhaven, where 9.7 percent of the population is defined as living in environmental justice neighborhoods. The environmental justice populations in Fairhaven meet income criteria. Approximately 7.0 percent of the households in Fairhaven had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the environmental justice population in Fairhaven in particular is likely to realize an improvement in access to transit services for employment and / or educational opportunities outside the community.

The Whale's Tooth Station site is approximately 4 miles from downtown Dartmouth, where 11.8 percent of the population is defined as living in environmental justice neighborhoods. The environmental justice populations in Dartmouth meet foreign born and / or income criteria. Approximately 6.4 percent of the households in Dartmouth had no registered motor vehicles in 2000, compared to a statewide average of 12.7 percent. Based on these data, this portion of the environmental justice population in Dartmouth in particular is likely to realize an improvement in access to transit services for employment and / or educational opportunities outside the community.

1.3.3 Summary

As described above, the majority of the land acquisitions for the Rapid Bus Alternative would not impact environmental justice populations. Property acquisition at one location, the Fall River Depot Station site, in an environmental justice neighborhood would result in job losses, as described above. No other private property acquisitions within environmental justice neighborhoods would result in residence or job losses.

The Rapid Bus Alternative's Route 24 highway segment would not require any environmental justice neighborhood land that would result in job loss or neighborhood fragmentation, and air quality would not be impacted. Noise levels along each segment would not increase appreciably.

The private property acquisitions required for the Fall River Depot Station described above for the Attleboro Electric Alternative are the same for the Rapid Bus Alternative. No other station sites within environmental justice neighborhoods would result in residence or job losses.

The indirect effects to environmental justice populations near the stations that would be serviced by the Rapid Bus Alternative would be primarily realized at new stations within or near environmental justice neighborhoods. These stations would be Downtown Taunton, Fall River Depot, King's Highway, and Whale's Tooth. The environmental justice populations would be expected to see benefits from TOD, increased property values, and improvements in access to transit.

Overall indirect effects to environmental justice populations in terms of improvements in transit access to jobs, colleges, and hospitals, and travel times to Boston for environmental justice populations in Taunton, Fall River, and New Bedford are provided in the CTPS report (Appendix). For the Rapid Bus Alternative, average improvements in each of these metrics would be realized for environmental justice populations at higher percentages than for non-environmental justice populations.

1.4 Visual Resources

This section discusses the visual impacts of the Rapid Bus Alternative. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.4.1 Highway Elements

The visual impacts of the Rapid Bus Alternative would be unchanged from those identified in the DEIS/DEIR.

Land uses where the highway enters Quincy, transitions from developed land to the open space of the Blue Hills Reservation. The broad median here is forest or grass. The visual environment in this brief segment is of forested or landscaped areas. The highway alignment passes through the Route 28 interchange and then diverges from I-93 to Route 24 entering Randolph. Adjacent property in this short segment includes the Blue Hills Reservation and the Fowl Meadow and Ponkapoag Bog ACEC with a forested median, but views of these adjacent open spaces from the highway are compromised by the extensive existing transportation corridor. The highway alignment then narrows, with a narrow un-vegetated median, and passes by residential, commercial, and undeveloped land in Randolph, Canton, Stoughton, Avon, and Brockton; some adjacent forested land is visible from the highway. Visible open space predominates along the east side of the highway alignment in West

Bridgewater, including the West Bridgewater State Forest. Land use to the west is a mixture of visible commercial, agricultural, and industrial properties.

Approaching the Route 106 interchange, the alignment enters the Hockomock Swamp ACEC and Wildlife Management Area, and visible surrounding land use is undeveloped, agricultural, residential, and industrial land in West Bridgewater and Bridgewater. Forested views predominate outside of the transportation corridor. The median in this segment continues as a narrow, un-vegetated strip.

The highway alignment passes into Raynham at the I-495 interchange. The broad median through the interchange is forested. South of the interchange in this segment, the narrow un-vegetated median returns but forested adjacent open spaces with adjoining residential development are visible. This general visual character continues into Taunton, concluding at the Route 24 / Route 140 interchange.

Components of the highway alignment construction for the Rapid Bus Alternative that would potentially change the visual and aesthetic environment are:

- Dedicated bus lane construction;
- Mixed-use traffic lane construction; and
- Interchange reconstruction

Constructing the bus and mixed-use traffic lanes within the existing highway alignment would affect the visual environment along this previously disturbed corridor. As described above, much of the highway alignment consists of a multi-lane roadway with a narrow un-vegetated median. The dedicated bus lanes would be constructed within the median. The mixed-use traffic lanes would be constructed on the outer side of the existing lanes. All work along the roadway itself would be conducted within the existing right-of-way. The right-of-way is generally 300 feet wide through most of the highway alignment, and the existing roadway occupies only a portion of the right-of-way. Roadway widening would typically range between 20 and 50 feet on either side of the current constructed roadway. Vegetation would likely be removed in some segments of the alignment to accommodate the greater road width. If reversible lanes are used, the movable barriers and moving equipment would be introduced into the visual environment.

The overall visual effect to motorists is expected to be minimal. Impacts to the visual environment would be an incremental addition to the existing disturbed environment rather than a substantive change in the visual character along the highway. The actual impacts will be determined during final design if this alternative is selected. Any changes would be visible to bus passengers as well as motorists, but would likely be minimally visible to occupants of nearby properties.

Interchange improvements would include modifying ramp geometry to accommodate the widening along Route 24, removal of the inner loop off ramps to eliminate weaving along the main line, intersection improvements along the local roads to accommodate the removal of the inner loop ramps, and bridge replacements

where the proposed Route 24 roadway cannot be accommodated. At most locations, these improvements can be accomplished within the existing right-of-way, with little impact to the existing visual environment. At selected locations, ramp improvements would extend outside the existing right-of-way, requiring acquisition of some adjacent parcels. These improvements, too, would have little impact on the existing visual environment. Any vegetation present would be removed to accommodate the highway infrastructure. The visual environment at the interchanges would be altered from its current condition, but the new construction would be an incremental addition to the current visual environment rather than a change in visual character. These changes would be visible to bus passengers as well as automobile drivers and passengers, and occupants of nearby properties.

1.4.2 Stations

The visual impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would be within developed industrial areas or undeveloped land and would have no visual impacts.

Downtown Taunton

The Downtown Taunton Station site is a previously developed, currently vacant parcel surrounded by commercial development. The site is adjoined by facilities for the Greater Attleboro Taunton Regional Transit Authority (GATRA) and the Bloom Bus, as well as associated parking. These structures are in fair visual condition. The site is visible from nearby streets and adjoining properties, but the view is somewhat obstructed by vegetation.

The Downtown Taunton Station would be affected by replacing the existing vacant lot with a new parking lot, with a new canopy and platform constructed adjacent to the existing GATRA facilities. The station would be visible to users, occupants of nearby properties, and passers-by. Its appearance would be in keeping with the existing developed visual environment. Impacts to the visual environment in the vicinity of the Downtown Taunton Station would be minimal.

Fall River Depot

The Fall River Depot Station site is a previously developed site surrounded by commercial and industrial development. Numerous commercial/industrial buildings in poor to fair visual condition are present on-site. The existing parking lots are also in poor condition. This site is visible from adjacent roads and nearby properties.

The Fall River Depot Station would favorably affect the visual environment by replacing the existing vacant commercial buildings and parking lot with a new canopy, platform, and parking deck. The station would be visible to users, passers-

by, and occupants of nearby buildings. Its appearance would be an improvement compared to the existing vacant buildings and parking lots. Impacts to the visual environment in the vicinity of the Fall River Depot Station would be moderately beneficial.

Freetown

The Freetown Station site is behind a self-storage facility with associated parking; immediately adjacent properties are open land and forest. A cellular phone tower site is also adjacent. Low-density residential development is nearby. The self-storage facility contains four buildings in fair visual condition, and can be viewed from adjacent roads and residences. The self-storage facility and cell tower would remain at the site.

The Freetown Station would affect the visual environment by adding a new access road, canopy, platform, and parking lot north and east of the existing self-storage facility. A bus drop-off loop would be included at this location. The station would be partially visible to users, passers-by, and occupants of nearby buildings, although off-site views would be obstructed by the existing buildings and surrounding vegetation. Impacts to the visual environment in the vicinity of the Freetown Station would be minimal.

Galleria

The Galleria Station is an existing parking lot that would serve the Rapid Bus Alternative. It is located at the Silver City Galleria Mall, near the intersection of Routes 140 and 24 in Taunton. The Galleria Station improvements would include re-surfacing and re-striping existing pavement to improve traffic flow and meet the expected parking needs for the Rapid Bus Alternative. No impacts to the visual environment would result from using the Galleria Station for the Rapid Bus Alternative.

King's Highway

The King's Highway Station site is along the railroad right-of-way behind the King's Highway Plaza, a traditional strip mall (commercial development). The site is visible from adjacent roads and some of the commercial buildings. The existing retail establishments are in a variety of sizes and visual conditions.

The King's Highway Station would affect the visual environment by adding a new canopy and platform. Parking would be shared with the existing, surrounding commercial businesses. The station would be partially visible to users, passers-by, and occupants of adjacent buildings. Its appearance would be in keeping with the

nearby developed visual environment. Impacts to the visual environment in the vicinity of the King's Highway Station would be minimal.

Whale's Tooth

The Whale's Tooth Station site is at an existing parking lot surrounded by industrial development. The site is visible from adjacent roads and properties, as well as nearby residences at higher elevations.

The Whale's Tooth Station would minimally affect the visual environment with a new canopy and platform constructed at the existing parking lot. The station would be visible to users, occupants of nearby properties, and passers-by. Its appearance would be in keeping with the surrounding developed visual environment. Impacts to the visual environment in the vicinity of the Whale's Tooth Station would be minimal.

Brockton Station

The Brockton Station would be along Oak Street, in front of an existing parking lot and industrial building. The new parking lot would be visible from Oak Street and from a residential apartment/condominium complex but would be consistent with the visual character of Oak Street.

West Bridgewater Station

The West Bridgewater Station would be in an undeveloped area approximately 1,500 feet north of West Street. The parking lot would not be visible from any residential or developed area, and would not be visible from West Street.

1.4.3 Summary

The Rapid Bus Alternative would be comprised of the elements listed in Table 16, which also summarizes the direct effects to visual and aesthetic resources potentially resulting from implementing this alternative.

In general, the Rapid Bus Alternative presents minimal impacts to the visual environment. The visual impacts would vary locally and by individual component, and this alternative would utilize existing infrastructure (with new construction in the existing right-of-way). Vegetation removal in narrow strips along the right-of-way to accommodate highway widening would minimally change the visual character for occupants and users of adjoining properties, and these changes would be highly visible. Most impacts to the visual environment would be incremental

additions to an existing, disturbed landscape with active highway (including bus) use.

Table 16 Summary of Potential Direct Effects to Visual and Aesthetic Resources from the Rapid Bus Alternative

Element/Component	Change in Visual Environment	Visual Impact
Highway Alignments		
Dedicated Bus Lanes and Mixed-Use Traffic Lanes	New lane construction in existing median and widened automobile lanes within right-of-way in developed transportation corridor	Minimal
Interchanges	New traffic ramp construction within right-of-way in developed transportation corridor	Minimal
Stations		
Downtown Taunton	New station construction in developed area	Minimal
Galleria	None	None
Freetown	New station construction in partially developed/ undeveloped area	Minimal
Fall River Depot	New station construction in developed area	Moderate (beneficial)
King's Highway	New station construction in developed area	Minimal
Whale's Tooth	New station construction in developed area	Minimal
West Bridgewater	New station in median	Minimal
Brockton	New station in medial	Minimal
Layover Facility		
Logan Express	None	None

1.5 Noise

This section discusses the noise impacts of the Rapid Bus Alternative. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.5.1 Highway Elements

New highway construction is not expect to result in noise impacts because there are few receptor locations adjacent to the major roadways, they are located substantial distances away from the roadways, and most of Route 24 is boarded by ledge, hills, and thick wooded areas that reduce highway noise, and the relatively small increase in sound levels that will be generated by the increased bus traffic on the major roadways.

The increase of bus traffic on the local roadways near bus station locations will range from 8 to 4 buses over the peak hour. The volume of buses will be reduced during off-peak time periods. The change in peak hour sound levels at the nearest residential locations to the bus stations will be less than 1 dBA. A change of 1 dBA

will not be noticed by the receptor locations because it takes an increase of 3 dBA or greater to be perceived by the human ear.

1.6 Vibration

This section discusses the impacts of the Rapid Bus Alternative on environmental justice communities. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to Route 24.

The Rapid Bus Alternative would provide commuter bus service to South Station via Route 140, Route 24, and I-93. South of the I-495 interchange in Raynham, buses would travel in the general purpose lanes with mixed traffic. North of I-495, buses would use a combination of new zipper bus lanes, new reversible bus lanes, existing zipper HOV lanes, and existing HOV lanes, along with a short section in mixed traffic. Using the FTA vibration curve (adjusted for speed) for rubber tired vehicles (buses), the vibration assessment indicated that for buses traveling at a speed of 60 mph, the impact distance for a vibration level of 80 VdB is 15 feet. Using the FTA vibration impact criterion of 72 VdB for frequent events (greater than 70 events per day), the impact distance is 40 feet. Since there are no receptors located within these distances of the highway, no vibration impacts are expected to occur from the Rapid Bus Alternative.

1.7 Cultural Resources

This section discusses the impacts of the Rapid Bus Alternative on cultural resources. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.7.1 Highway Elements

A cultural resources reconnaissance survey was partially completed for the Rapid Bus Alternative elements, and impacts to identified resources are presented below.

Historic Resources

The impacts to historic resources of the Rapid Bus Alternative may be permanent or temporary, direct or indirect. Two (n=2) historic districts are located within the Rapid Bus working Area of Potential Effect (APE). The working APE was defined as 50 feet from edge of road right-of-way, and is different from the Corps APE which was defined later.

Direct Impacts

Project work items for the Rapid Bus Alternative consist of roadway and interchange modifications primarily within or immediately adjacent to the existing right-of-way. No historic resources are present within the highway corridor rights-of-way where project improvements are planned. Therefore work within the rights-of-way will have no potential direct impacts to historic resources. Stations are discussed in Section 3.10 below.

Indirect Impacts

The majority of work for the Rapid Bus Alternative is proposed within or immediately adjacent to the existing rights-of-way. No visual and noise impacts are anticipated to occur to the two historic properties identified within the 50 foot APE. These two properties are:

- Blue Hills MRA (Map No. Ca.E, De.A, Qu.A, Br.A, Ra.A; Appendics B-9, B-23, B-24) in Quincy, Braintree, Milton, Randolph, Dedham, and Canton; and
- Daniel Waldo Field Park (Map No. Av.A, Appendix B-26) in Avon.

Potential project impacts to historic resources in the Rapid Bus APE may be reassessed at a future date as plans are developed.

Archaeological Resources

The Rapid Bus APE includes the existing highway corridor rights-of-way, interchange reconfigurations, bridge reconstructions, and any other work areas that would involve earthmoving outside of the existing highway rights-of-way.

There are no recorded archaeological sites or identified sensitive areas within the highway corridor rights-of-way where project improvements are planned. No direct impacts to archaeological resources in the previously disturbed highway rights-of-way are anticipated.

The archaeological survey has not yet been conducted for the interchange reconfigurations, bridge reconstructions, and other work areas that would involve earthmoving outside of the previously disturbed highway rights-of-way within the APE. These project elements are located in geographical areas that contain or are in proximity to recorded sites and have the potential to contain unrecorded sites in sensitive areas. Project impacts to archaeological resources in the Rapid Bus APE will be assessed at a future date.

1.7.2 Stations

The environmental justice impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would

be within the Route 24 ROW and would have no cultural resources impacts. The two new in-line stations would have no impact on historic structures, but have not been evaluated for potentially sensitive archaeological resources.

Downtown Taunton

Downtown Taunton Station in Taunton is proposed on Oak Street behind the existing GATRA bus station. There are no historic resources on the site; therefore, there will be no direct impacts to historic resources.

However, the Taunton Car Manufacturing Company Building (Map No. Ta.206) is located at 3 Myrtle Street within the station APE. The introduction of a new station could have indirect visual effects on this historic property through the introduction of modern station structures and parking that alter the historic setting. However, the effect will not be adverse because of the existing dense urban character of the surrounding area and the original transportation function of the historic building. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

There are no recorded archaeological sites within the 11-acre project parcel, but it is assessed as having areas of moderate and high archaeological sensitivity for post-contact Euro-American industrial and railroad-related structures.

The current conceptual plan indicates that the proposed parking lot and subsurface stormwater management area will be constructed in the southern portion of the parcel assigned high archaeological sensitivity. An intensive (locational) archaeological survey is needed to identify any archaeological sites. Project impacts will be assessed once the intensive survey is completed.

Fall River Depot

There are no historic resources on the site of the proposed Fall River Depot Station on the Fall River Secondary. Therefore, there will be no direct impacts to historic resources.

The proposed Station is located across the rail right-of-way from the Pearce-Durfee Street Area (Map No. FR.L) and across Route 138 from the 800 Davol Street Inn (Map No. FR.073). Both of these historic properties are recommended eligible to the NRHP. The introduction of a new station will have indirect visual effects on these two historic properties through the introduction of modern station structures and parking that could alter the historic setting. However, the effect would not be adverse due to the industrial character of the adjacent part of the Pearce-Durfee Street Area and the presence of the highway. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

There are no recorded archaeological sites or identified archaeologically sensitive areas within the 8-acre project parcel. No project impacts to archaeological resources are anticipated by the construction of this proposed station.

Freetown

The Freetown Station does not have any historic resources on the proposed site or within the APE. Therefore, there would be no impacts to historic resources.

The proposed Freetown Station lies within the Lower Taunton River Basin Archaeological District. The 18-acre project parcel contains areas of moderate and high archaeological sensitivity for pre-contact Native American habitation and resource procurement / processing sites.

The current conceptual plan indicates that the proposed parking lot and subsurface stormwater management area will be constructed in the southern portion of the parcel assigned high archaeological sensitivity. An intensive (locational) archaeological survey is needed to identify any archaeological sites. Project impacts will be assessed once the intensive survey is completed.

Galleria

The Galleria Station in Taunton is an additional station proposed at an existing park and ride. The Galleria Station does not have any historic resources on the proposed site or within the APE. There will be no impacts to historic resources.

No archaeological survey was conducted for the proposed improvements to the existing Galleria Station Park and Ride bus station because no ground surface impacts are planned. Assuming that no impacts are proposed, there would be no impacts to archaeological resources.

King's Highway

The King's Highway Station does not have any historic resources on the proposed site or within the APE. There will be no impacts to historic resources.

The 55-acre project parcel contains areas of moderate archaeological sensitivity for pre-contact Native American habitation and resource procurement / processing sites. In addition, buildings are documented as present between 1895 and 1911. Though these buildings have been razed, undocumented archaeological deposits related to this period of site use may be present in the north part of the parcel.

The current conceptual plan indicates that the proposed work will be contained within the existing paved shopping plaza in areas assigned low archaeological

sensitivity. No project impacts to archaeological resources are anticipated in these previously disturbed areas.

Whale's Tooth

The parcel that will be used for the Whale's Tooth Station does not have any historic properties on it. There will be no direct impacts to historic resources.

The proposed Whale's Tooth Station on the New Bedford Main Line is across John F. Kennedy Highway from the New Bedford Textile School (Map No. NB.069). The introduction of a new station may have indirect visual effects on the New Bedford Textile School; however, due to the intervening highway, the effect will not be adverse. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

The entire 8.7-acre project parcel lies within the Achusnet Avenue Waterfront Industrial historic area and because of location is assessed as having a high archaeological sensitivity for pre-contact Native American habitation and resource procurement/processing sites and documented nineteenth century industrial and commercial sites. The archaeologically sensitive strata, if present, would be located below the raised and capped paved parking lot and the capped superfund site soils.

The current conceptual plan indicates that the proposed work will be contained within the existing disturbed paved parking lot. No project impacts to archaeological resources are anticipated.

The Rapid Bus Alternative would be comprised of the elements listed in Table 23. As the table shows, this alternative would not result in adverse effects to any known historic or archaeological resource. Additional investigation of areas of potential archaeological sensitivity would be required at any interchange proposed to be reconfigured, and at two proposed station locations.

Brockton Station

This station would be located in a disturbed area between Oak Street and an industrial building and parking lot. There are no structures on or adjacent to the site, and development would have no effect on historic resources. Archaeological sensitivity has not been evaluated.

West Bridgewater Station

This station would be located in an undeveloped area east of Route 24, and north of West Street. There are no structures on or adjacent to the site, and development

would have no effect on historic resources. Archaeological sensitivity has not been evaluated.

1.7.3 Summary

Impacts to cultural resources resulting from the Rapid Bus Alternative are incomplete at this time since both historic and archaeological reconnaissance survey of most project elements are outstanding. The summary of potential impacts that would result from the implementation of this alternative would be determined once the cultural resources reconnaissance surveys have been completed.

1.8 Air Quality

The Air Quality study included three elements. A mesoscale analysis was completed for the regional study area, as shown in Table 1.9-1. A microscale analysis was conducted based on the traffic study that identified the intersections in the vicinity of bus stations that would be affected by the Rapid Bus Alternative. The intersections were ranked based upon congestion following EPA's guidelines. The Build Alternative with the highest projected ridership at each station was used to evaluate the impacts in the areas around proposed station locations. Separate microscale analyses were not conducted for the Rapid Bus Alternative because the lower projected ridership for this alternative would result in equal or less impact than the analysis using the other alternatives with higher ridership. The microscale analysis evaluated for the other alternatives represent the highest concentrations for each intersections. All of the pollutant concentrations at the receptors for each of the study intersections are below the NAAQS standards for the other alternatives. Since the emissions at these intersections, which represent the worst-case scenario (i.e. highest volumes and delays), are well below the NAAQS standards, it is expected that the remainder of the study area will also fall below the NAAQS air quality standards.

The effects of alternative fuels were also reviewed, and are summarized below.

1.8.1 Mesoscale Analysis

The predominant sources of air pollution anticipated from the proposed South Coast Rail project include emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOCs) from locomotive engines and from motor vehicles traveling to and from the train stations. A mesoscale analysis evaluated the regional air quality impacts (VOCs, NOx, CO, and PM emissions) from the proposed project by determining the change in total ozone precursor emissions (volatile organic compounds and nitrogen oxides) for the existing and future conditions within the study area; the microscale analysis calculated the CO and PM

concentrations for the same conditions at congested intersections near the proposed stations.

Table 17 Air Quality Beneficial Effects Comparison

	DEIS/DEIR		
	Stoughton Electric	Rapid Bus	Modified Rapid Bus
NOX Reduction (kg/day)	(43.3)	0.0	(39.3)
$PM_{2.5}$ Reduction (kg/day)	(1.7)	0.0	(1.4)
PM_{10} Reduction (kg/day)	(6.1)	1.7	(5.3)
VOCs Reduction (kg/day)	(55.9)	(9.3)	(50.9)
CO_2 Reduction (tons/year)	(62,333.7)	(6,588.0)	(48,416.3)

As shown in Table 17, while improved from the DEIS/DEIR Rapid Bus Alternative, the Modified Rapid Bus Alternative would still have fewer Air Quality benefits than the DEIS/DEIR Stoughton Electric Alternative. The Modified Rapid Bus Alternative would also reduce the greenhouse gas CO2 by 48,416.3 tons/year compared the DEIS/DEIR Stoughton Electric Alternative, which would reduce CO2 by 62,333.7 ton/year.

1.8.2 Alternative Fuels

Alternative fuels were also evaluated for the Rapid Bus Alternative The following is a discussion of these emission impacts of these fuels.

- **Diesel** -The EPA has established regulations to reduce the amount of sulfur in diesel fuel. Heavy-duty trucks and buses are primary emitters of NOx and PM emissions from mobile sources. Over the past ten years, these regulations have reduced NOx and PM emissions from heavy duty engines by 90 percent. EPA expects to continue the program to regulate fuels and vehicle technologies into the future. The impact of this program will be to reduce annual emissions of NOx, VOCs, and PM by a projected 2.6 million, 115,000 and 109,000 tons, respectively in 2030.
- **Biodiesel** -EPA evaluated biodiesel fuels in 2002 and compiled data set on biodiesel tailpipe emissions from heavy-duty engines. This study concluded that biodiesel decreases emissions of PM, CO, and hydrocarbons (HC) commensurately with its blend level. Later studies have shown that biodiesel PM emissions are not only reduced but are less toxic. These studies are analyzed the impact of biodiesel fuels on air quality and human health, which concluded that the PM from B100 (100 percent biodiesel) and B20 (20 percent biodiesel, 80 percent diesel) is 20 percent and 5 percent, respectively, less toxic than PM from diesel. A lifecycle analysis completed by the National Renewable Energy

Laboratory found that carbon dioxide emissions for B100 were 78.5 percent less than those from petroleum diesel.

- **Natural Gas** -Natural gas is stored on vehicles in two forms: compressed and liquefied. Tailpipe emissions are the same for either form of natural gas in light-duty vehicles (LDVs), and evaporative emissions are negligible for both forms since the fuel systems in natural gas vehicles were built to accommodate their extremely low evaporation temperature and pressure. While the use of natural gas would substantially reduce particulate matter, it would significantly increase the emission of methane. Natural gas is largely comprised of methane, which is 23 times more potent as a GHG than CO2. Table 18 presents the changes in emissions of CNG as compared to gasoline in light duty vehicles (LDV).

Table 18 Changes in CNG as Compared to Gasoline in LDVs

Pollutant	Percent Change
Volatile Organic Compounds (VOC)	10%
Carbon Monoxide (CO)	20% to 40%
Oxides of Nitrogen (NOx)	0%
Particulate Matter (PM)	80%
Methane	+ 400%

This analysis assumes that the Rapid Bus Alternative would use diesel fuel. EPA has and continues to achieve substantial reductions in VOC, NO_X, CO, CO_2, $PM_{2.5}$, and PM_{10} emissions from diesel fuel. The existing buses currently run on diesel and have the infrastructure in place to serve additional buses. If the Rapid Bus Alternative is selected as the Preferred Alternative, EOT would evaluate the use of alternative technologies (hybrid) or fuels.

1.9 Open Space

This section discusses the impacts of the Rapid Bus Alternative on protected public open space. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.9.1 Highway Elements

Two ACECs are present along this corridor, the Fowl Meadow and Ponkapoag Bog ACEC and the Hockomock Swamp ACEC. The Rapid Bus highway alignment passes through the Fowl Meadow and Ponkapoag Bog ACEC for a short segment at the I-93/Route 24 interchange, and through the Hockomock Swamp ACEC from near the Route 24/Route 106 interchange to the Route 24/I-495 interchange.

The Rapid Bus alignment also passes through or is adjacent to several protected open spaces, but avoids incursions into the Blue Hills Reservation. No publicly owned

parcels in ACECs would be acquired for constructing the Rapid Bus Alternative. The estimated area of protected open space acquisition required for constructing the Rapid Bus Alternative is listed in Table 19. This area would be used for the widened right-of-way necessary for the interchange ramp improvements.

Table 19 Rapid Bus Alternative Protected Open Space Acquisition

City/Town	Name	Ownership	Use	Acquisition Area (acres)
West Bridgewater, Bridgewater	Hockomock Swamp WMA	Public	Conservation	0.19
Raynham	Woodland Conservation Area	Public	Conservation	4.31
Total				4.50

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

These parcels are owned by the Commonwealth of Massachusetts and the Town of Raynham for conservation purposes, and would therefore be considered Article 97 land subject to the provisions of the EEA's Article 97 Land Disposition Policy.

Traffic delays on highways through and near the protected open spaces and ACECs may occur when constructing the bus or traffic lanes, or constructing new ramps at the interchanges, but the construction activities are not expected to impact streets directly accessing these sites. Access to protected open spaces and ACECs are not anticipated to be substantively impacted by implementing the Rapid Bus Alternative.

1.9.2 Stations

The environmental justice impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would be within the Route 24 ROW and would have no impacts on public open space.

Downtown Taunton

The Downtown Taunton Station site is a previously developed parcel that is near the Mill River Park protected open space in Taunton, but is neither within or near any ACECs. No protected open space land would be acquired for constructing the Downtown Taunton Station.

Local traffic may use Oak Street to access Mill River Park, passing the Downtown Taunton Station site. Temporary traffic congestion on Oak Street during peak usage periods may result from commuters accessing the Downtown Taunton Station,

minimally changing traffic patterns on local streets and/or delaying access to Mill River Park. The level of service at the intersection of Washington Street and Court Street, near Mill River Park, would degrade one level at both the morning and evening weekday peak hours. However, the level of service on other nearby streets would not change and peak traffic usage (morning and evening commute times) would not coincide with likely park recreational use (mid-day).

Fall River Depot

The Fall River Depot Station site is a previously developed parcel that is near five protected open spaces. This site is not within or proximate to any ACECs. No protected open space land would be acquired for constructing the Fall River Depot Station.

Local traffic is unlikely to use the surface streets in the immediate vicinity of the Fall River Depot Station site to access the nearby protected open spaces, all of which are separated from the site by major highways (Routes 138 and 79) or the existing Fall River Secondary, and have better access from other streets. No changes in access to the protected open spaces are expected.

Freetown

The Freetown Station site is a previously developed parcel that is near the Freetown-Fall River State Forest protected open space. It is not proximate to or within any ACECs. No protected open space land would be acquired for constructing the Freetown Station.

The portion of the Freetown-Fall River State Forest proximate to the Freetown Station site is an isolated parcel, separated from the main body of the state forest by Route 24 and the existing Fall River Secondary. The isolated parcel is also separated from the Freetown Station site by the Fall River Secondary. Access to this isolated parcel is unlikely to be affected by constructing or using the Freetown Station.

Galleria

The Galleria Station site is developed as an existing transit facility that is not within or near any protected open spaces or ACECs. No direct or indirect effects to protected open spaces or ACECs would result from using the Galleria Station for the Rapid Bus Alternative.

King's Highway

The King's Highway Station site is a previously developed parcel that is near two protected open spaces: the Charles S. Ashley School and Brooklawn Park. This location is not within or near any ACEC. No protected open space land would be acquired for constructing the King's Highway Station.

The nearby protected open spaces are a school and a neighborhood park, both with several surface street access options. Commuter automobile traffic to and from the King's Highway Station would be using different routes and generally moving away from, rather than toward, these protected open spaces. And, peak traffic usage (morning and evening commute times) would not coincide with likely park recreational use (mid-day). Access to the protected open spaces would not be impacted by the reconfigured intersection or the King's Highway Station.

Whale's Tooth

The Whale's Tooth Station site is a previously developed parcel that is near the New Bedford Whaling National Historic Park, Fisherman's Wharf Pier #3, State Pier, Clasky / Common Park, and the John Avery Parker School protected open spaces. Several un-named protected open spaces are also proximate to this site. No ACECs are near the Whale's Tooth Station site. No protected open space land would be acquired for constructing the Whale's Tooth Station.

Local traffic may use Acushnet Avenue, Hillman Street, or the nearby Herman Melville Boulevard to access the New Bedford Whaling National Historic Park and the adjoining Fisherman's Wharf Pier #3 or State Pier. Commuter traffic to and from the Whale's Tooth Station may temporarily increase congestion on these roads during high usage periods, causing temporary delays in accessing these protected open spaces. However, peak traffic periods (morning and evening commute times) are unlikely to coincide with use of these protected open spaces (mid-day). No changes in access to the other proximate protected open spaces are expected.

1.9.3 Summary

The Rapid Bus Alternative would be comprised of the elements listed in Table 20, which also summarizes the direct effects to protected open spaces and ACECs potentially resulting from implementing this alternative.

Table 20 Summary of Potential Direct Effects to Protected Open Spaces and ACECs from the Rapid Bus Alternative

	Direct Effects	
Element/Component	Acquisition Area (acres)	Number of Parcels
Highway Alignments		
Reversible Bus Lanes	0	
Interchange Improvements	4.5	2
Stations		
Downtown Taunton	0	
Galleria	0	
Freetown	0	
Fall River Depot	0	
King's Highway	0	
Whale's Tooth	0	
TOTAL	4.5	2

For the Rapid Bus Alternative, approximately 4.5 acres of land would be acquired from protected open spaces. No publicly owned parcels of ACEC land would be acquired. Access to protected open spaces and ACECs would not be significantly impacted by constructing, reconstructing, or using the highway alignments or stations.

The Rapid Bus Alternative's impacts to ACEC key functions and values would be:

- **Biodiversity:** The Rapid Bus Alternative is not anticipated to adversely affect biodiversity in the Hockomock Swamp ACEC other than a small loss of habitat immediately adjacent to the existing Route 24.
- **Farmland soils**: The Rapid Bus Alternative would not impact any mapped areas of designated farmland soils within an ACEC.
- **Historic and archaeological resources**: The Rapid Bus Alternative would not affect any areas of archaeological sensitivity within ACECs.
- **Rare species**: The Rapid Bus Alternative would potentially impact the Fowl Meadow and Ponkapoag Bog ACEC and the Hockomock Swamp ACEC, which encompass most of Priority and Estimated Habitat polygons (PH454/EH350), and (PH1392/EH59), respectively. Approximately 0.3 acres of habitat potentially used by marbled salamander would be impacted within the Fowl Meadow and Ponkapoag Bog ACEC; and approximately 22 acres of habitat potentially used by eastern box turtle would be impacted within the Hockomock Swamp ACEC. An additional 11 state-listed species occur within the Hockomock Swamp polygon (PH1392/EH59). Other species and their habitat may occur within the polygons or within the contiguous ACECs.
- **Water resources**: The Rapid Bus Alternative would discharge to the Neponset River within the Fowl Meadow and Ponkapoag Bog ACEC. Discharges to the Town River in Bridgewater, within the Hockomock Swamp ACEC, from the proposed Rapid Bus Alternative route would also be expected. Stormwater management for these discharges would be explored through the design process.

- **Wetlands:** Potential permanent wetland impacts along the Route 24 include the loss of 4.03 acres within the Hockomock Swamp ACEC, out of 8,260 total acres of wetlands within this ACEC.

1.10 Hazardous Materials

This section discusses the potential for the Rapid Bus Alternative to encounter hazardous materials, contaminated soil, or contaminated groundwater. The analysis includes the information provided in the DEIS/DEIR for station sites. It is assumed that bus stations would have to be constructed at each station location, with the exception of the proposed Galleria Station. Because no soil disturbance would occur at the proposed Galleria Station, a Phase I ESA was not prepared. Recognized Environmental Conditions were identified at each of the station location for the Rapid Bus Alternative consisting of Fall River Depot, Freetown, Galleria, King's Highway, Downtown Taunton and Whale's Tooth. A total of eight structures would be demolished for station construction. For this alternative, a total of 15 RECs were identified. Four of the RECs were evaluated as having a "high" impact, six RECs were evaluated with "medium" impacts and five RECs were evaluated as having "low" impacts.

In summary, there is a substantial likelihood that contamination would be encountered and would need to be addressed at Fall River Depot and Downtown Taunton stations. There is a moderate likelihood that contamination would be encountered and would need to be addressed at the King's Highway station. It is unlikely that contamination would be encountered at the Freetown station. An engineered barrier was constructed at the Whale's Tooth site and contaminated soil was left in place beneath the barrier. There are potential impacts related to exposure during the future excavation or construction at this site.

1.11 Biodiversity

This section discusses the impacts of the Rapid Bus Alternative on environmental justice communities. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.11.1 Highway Elements

Impacts to biodiversity can be characterized as direct (the direct loss of biological resources) or indirect (losses of ecosystem function that may affect populations of plants or animals over time). The proposed Brockton and West Bridgewater in-line

stations would be constructed within the Route 24 median and would have no direct or indirect effects on biodiversity. The parking areas for these stations would have a minimal impact on biodiversity as the properties required are semi-developed.

Direct

The Rapid Bus Alternative would require filling approximately 2.26 acres of wetlands containing 72 Potential Vernal Pools (Table 21), and would result in the loss of upland forested habitat within 100 feet of four Potential Vernal Pools, with a loss of approximately 4.33 acres of this habitat (8 percent). This could affect the function of the vernal pool by reducing shading or detrital inputs. There would be a loss of upland forested non-breeding habitat within 750 feet of 70 Potential Vernal Pools, with a loss of approximately 14.93 acres of habitat (2 percent).

Table 21 Rapid Bus Alternative - Impacts to Vernal Pools

	Direct Impacts		
Number of Vernal Pools	Fill to VPH[1]	Loss of Buffer Habitat[2]	Loss of Upland Habitat[3]
72	2.26	4.33	14.93

1 Fill to VPH (Vernal Pool Habitat) was calculated as the loss of wetland where a vernal pool occurs.

2 Loss of forested upland within 100 feet of VPH.

3 Upland Habitat loss was calculated for forested upland habitat between 100 and 750 feet of a vernal pool.

The Rapid Bus Alternative would also result in the loss of natural plant communities and wildlife habitat, as shown in Table 22. A total of 334.13 acres of natural habitats would be lost. This area consists largely of narrow strips of forested uplands (126.89 acres) and upland shrub habitats (184.16 acres) along the edges of the highways or within interchanges.

Table 22 Rapid Bus Alternative – Loss of Habitat

Cover Type[1] (acres)											
			PFO			UF	USS	AG	P	CL	
OW	PEM	PSS	WSC	WSD	WSM						Total
0.10	4.22	0.74	0.00	12.22	4.19	126.89	184.16	0.00	0.38	1.23	334.13

1 Cover type abbreviations:

OW= open water, PEM = Palustrine Emergent Marsh, PSS = Palustrine Shrub Scrub, PFO = Palustrine Forested WSC = Wooded Swamp Coniferous, WSD = Wooded Swamp Deciduous, WSM = Wooded Swamp Mixed, UF = upland forested, USS = upland scrub shrub, AG = agricultural, P = powerline, CL = cleared land (*e.g.,* gravel pit).

Source: MassGIS and VHB. Based on orthophoto aerial interpretation of Study Area cover types.

Indirect

The analysis of indirect impacts evaluates the effects of the Rapid Bus Alternative on key elements of biodiversity. Because the Rapid Bus Alternative's impacts on natural communities would occur entirely along the edge of, or in the median of, heavily-traveled highways, indirect impacts to natural communities, wildlife or fisheries are anticipated to be minor and restricted to the edges of these communities.

Biomap Core Habitats

The existing highways (I-93 and Route 24) cross three Biomap Core Habitats (Blue Hills State Reservation, Fowl Meadow and Ponkapoag ACEC, and the Hockomock Swamp ACEC). Constructing the bus lanes in the median of I-93 and the northern part of Route 24 would not result in new barriers to wildlife movement, although there could be a negligible increase in the barrier effect (caused by the 8-lane highway) associated with the loss of vegetation in the median. Constructing a reversible bus lane in the median of Route 24 could require minor widening of the highway fill footprint, with some loss of natural habitats adjacent to the shoulder of the highway. This work would not affect the ability of the Hockomock Swamp to support wildlife or plant communities.

Living Waters

The Rapid Bus Alternative does not cross any Living Waters.

Fisheries Habitat

The Rapid Bus Alternative crosses five waterways that provide important fisheries habitat: the Blue Hill River, Beaver Brook, the Town River, Dam Lot Brook, and the Taunton River. Adding a dedicated bus lane in the median of I-93 or Route 24 would require that these existing bridges be widened. Widening would maintain the hydraulic opening and would not affect the substrate, and could increase shading of the waterway. This would not adversely affect the ability of each waterway to provide fisheries habitat or fish passage.

Vernal Pools

Vernal pool complexes, composed of potential vernal pools, are mapped adjacent to Route 24 in several locations:

- West of Route 24, south of Maple Street (West Bridgewater);
- West of Route 24, north of Orchard Street adjacent to Dam Lot Brook (Raynham);
- Both sides of Route 24 near the Taunton River (Raynham).

Constructing a reversible bus lane in the median of Route 24 at these locations could require minor widening of the highway fill footprint, with some loss of natural habitats adjacent to the shoulder of the highway. This work would not create a new

barrier to wildlife movement, and would result in a negligible loss of upland areas used by vernal pool amphibians for non-breeding habitat.

Other Important Habitat Areas

In addition to the Biomap Core Habitats, there are several large undeveloped areas and wetland complexes adjacent to Route 24. The potential minor widening of the highway footprint would not affect wildlife movement and would not decrease the ability of these large areas to support diverse wildlife and plant communities.

1.11.2 Stations

The biodiversity impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would be within the Route 24 ROW and would have no biodiversity impacts. The only biodiversity impacts would occur at the Freetown Station.

Freetown Station would be a new train or bus station constructed to serve the Fall River Secondary for all rail alternatives or the Rapid Bus Alternative. The proposed station site would fragment an undeveloped corridor of forest and fields that extends from the Copicut Road/Route 24 intersection to South Main Street, along the west side of the active freight tracks. Although there is development along the frontage of South Main Street, this development has left substantial back land intact. Constructing the proposed station would fragment this area and reduce habitat value of the remaining portions. Approximately 4.33 acres of habitat would be lost, largely upland shrub habitat.

1.11.3 Summary

The Rapid Bus Alternative would require constructing dedicated bus lanes, and could require minor widening along the perimeter of Route 24 and Route 128/I-93. The majority of the proposed stations for this alternative would be located in previously developed areas and would not impact natural plant or animal communities.

The Rapid Bus Alternative would result in the loss of 316.98 acres of upland habitat and 21.48 acres of wetland habitats, some of which is within the Hockomock Swamp ACEC. These areas are adjacent to the existing highways, or are within highway interchanges. The Rapid Bus Alternative would not create a new barrier to wildlife movement, although it could slightly exacerbate the existing barrier caused by Route 24.

1.12 Threatened and Endangered Species

This section discusses the impacts of the Rapid Bus Alternative on Threatened or Endangered Species. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.12.1 Highway Elements

Impacts to biodiversity can be characterized as direct (the direct loss of biological resources) or indirect (losses of ecosystem function that may affect populations of plants or animals over time). The proposed Brockton and West Bridgewater in-line stations would be constructed within the Route 24 median and would have no direct or indirect effects on priority habitats.

The Rapid Bus passes through one NHESP Priority Habitat (PH1392/EH59) and is adjacent to four Priority Habitats (PH229/EH111, PH454/EH350, PH451/EH328, and PH282/EH179). These Priority Habitats include land within the Fowl Meadow and Ponkapoag ACEC (Blue Hills Reservation) as well as the Hockomock Swamp ACEC. The following sections describe both direct and indirect impacts as they relate to this alternative.

Direct

The majority of the proposed work would be within the existing highway right-of-way and would not impact rare species and their habitat. However, minor temporary and permanent impacts may occur within narrow strips immediately adjacent to the highway right-of-way during roadway widening and construction.

The Rapid Bus Alternative could result in the loss of potential habitat of five state-listed species (Blanding's turtle, eastern box turtle, blue-spotted salamander, marbled salamander, and gypsywort). These species are known to be present within the Priority Habitats crossed by this roadway.[1]

The Rapid Bus would potentially impact rare species habitat within the Fowl Meadow and Ponkapoag Bog ACEC and the Hockomock Swamp ACEC, which encompass most of Priority and Estimated Habitat polygons (PH454/EH350), and (PH1392/EH59) respectively. Approximately 0.3 acres of habitat potentially used by marbled salamander would be impacted within the Fowl Meadow and Ponkapoag Bog ACEC; and approximately 22 acres of habitat potentially used by eastern box

turtle would be impacted within the Hockomock Swamp ACEC. An additional 11 state-listed species occur within the Hockomock Swamp polygon (PH1392/EH59). Other rare species and their habitat may occur within the polygons or within the contiguous ACECs.

Indirect

The Rapid Bus Alternative is located along the existing highway corridors of Route 24 and I-93. Existing culverts carry streams beneath the highway and may provide migratory habitat to wildlife species. The highway itself does not provide suitable habitat for any of the rare species and restricts movement between areas of suitable habitat except through the culverts. Potential suitable foraging, breeding, and nesting habitat for amphibians and reptiles could be found adjacent to the highway. This alternative would result in minor habitat losses from roadway widening. Table 23 lists the species found within the Priority Habitat polygons and the potential habitat functions that could be impacted.

The majority of the proposed work would be within the existing highway right-of-way median and would not impact rare species and their habitat. However, there would only be a minor loss of habitat along the periphery of the Priority and Estimated Habitats polygons. This minor loss of habitat is not likely to affect the persistence of rare species populations.

Table 23 Impacts to Rare Species Habitat Functions – Rapid Bus Alternative

		Habitat Functions			
Polygon #	**Species**	**Migration**	**Foraging**	**Breeding/Nesting**	**Wintering**
PH 454/EH 350	Marbled Salamander	No loss	Minor loss	No loss	Minor loss
PH 1392/EH 591	Blue-Spotted Salamander	No loss	Minor loss	No loss	Minor loss
	Blanding's Turtle	No loss	Minor loss	No loss	Minor loss
	Eastern Box Turtle	No loss	Minor loss	No loss	Minor loss
	Gypsywort	--	--	--	--
PH 282/EH 179	Eastern Box Turtle	No loss	Minor loss	No loss	Minor loss

1 Habitat Priority Habitat (PH1392) includes an additional 11 state-listed species which do not occur adjacent to the highway

The Rapid Bus Alternative would adversely affect habitat of three state-listed species (marbled salamander, Blanding's turtle, and eastern box turtle) and result in loss of approximately 16.2 acres within natural areas of three Priority and Estimated Habitat polygons. Impacts would occur where the highway needs to be widened to accommodate the bus lane.

The majority of the proposed work would be within the existing highway right-of-way median and would not impact rare species and their habitat. In locations where the proposed work occurs outside of the existing developed area, there would only be loss of habitat along the periphery of the Priority and Estimated Habitats polygons. This minor loss of habitat is not likely to affect the persistence of rare species populations. None of the proposed station sites would impact Priority and Estimated Habitat.

Two ACECs that contain two Priority and Estimated Habitats (PH454/EH350 and PH1392/EH59) would be impacted by the Rapid Bus Alternative. Based on EOT's analysis, approximately 0.3 acres of habitat would be impacted within the Fowl Meadow and Ponkapoag Bog ACEC; and approximately 22 acres of habitat would be impacted within the Hockomock Swamp ACEC. Other rare species and their habitat may occur within the polygons or within the contiguous ACECs.

1.13 Wetlands

This section discusses the impacts of the Rapid Bus Alternative on wetlands. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.13.1 Highway Elements

The Rapid Bus Alternative would result in temporary and permanent impacts to wetland areas adjacent to the existing Route 24, I-95, and Route 128 corridors. Impacts are associated with the construction of a one-way reversible lane, redesigns of ramps for safety, and the widening of stream crossings. The following sections describe both direct and indirect impacts that would occur if the Rapid Bus alternative were selected.

Direct

The Rapid Bus Alternative crosses through 11 municipalities. Table 24 summarizes direct wetland resource impacts by town, as presented in the DEIS/DEIR.

Table 24 Direct Wetland Impacts – Rapid Bus Alternative (from the DEIS/DEIR)

Station	Bank (lf)		BVW (ac)		BLSF (ac)		ORWs (ac)	
	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
Avon	--	240	1.96	0.69	8.58	0.72	--	--
Braintree	--	112	0.05	0.02	0.69	0.41	--	--
Bridgewater	--	--	1.37	0.72	3.55	0.55	1.15	0.42
Brockton	--	192	0.93	0.53	1.48	0.20	--	--
Canton	--	64	--	--	--	--	--	--
Quincy	--	96	0.02	0.01	0.35	0.12	--	--
Randolph	--	64	1.05	0.21	5.64	1.50	--	--
Raynham	--	96	7.51	1.24	1.30	0.13	0.53	0.60
Stoughton	--	--	0.70	0.26	0.54	0.10	--	--
Taunton	--	64	3.97	1.05	2.46	0.20	0.11	0.04
West Bridgewater	--	192	3.91	3.92	6.06	0.39	0.36	0.37
Total	--	1,120	21.47	8.65	30.65	4.32	2.15	1.43

As shown in Table 52, the greatest temporary impacts to Bank would occur in Avon (240 linear feet). The largest permanent impacts to BVW would occur within Raynham (7.51 acres), the largest permanent impacts to BLSF would occur in Avon (8.58 acres), and the largest permanent impacts to ORWs would occur in Bridgewater (1.15 acres).

Bank

The existing culverts and stream crossings of the existing roadways used by the Rapid Bus alternative would be maintained or extended, as necessary to accommodate lane additions. Permanent impacts to Bank would be calculated through the final design process once the preferred alternative is selected. Existing culverts associated with established roadways would generally be improved in place and would not result in additional permanent impacts except along Route 24 where existing culverts would not be replaced but would be extended as needed. Approximately 1,120 linear feet of temporary bank impacts are anticipated where culvert or bridge replacement / extension is proposed. Additional impacts to Bank would be calculated during the final design process once the preferred alternative is selected. There would be no impacts to Coastal Bank along this alternative.

Bordering Vegetated Wetlands (BVW)

The Rapid Bus Alternative would permanently impact approximately 21.47 acres of BVW and temporarily impact approximately 8.65 acres. The bulk of these impacts are concentrated in locations along Route 24 where wetlands located within or adjacent to existing interchanges would be impacted during the reconfiguration of the interchange. Approximately 4.03 acres of permanent impact and 3.19 acres of temporary impact would occur within the Hockomock Swamp ACEC in Bridgewater and West Bridgewater. Additional information regarding impacts to ACECs can be found in the Environmental Consequences Technical Report – Protected Open Space and Areas of Critical Environmental Concern.2

Table 25 summarizes permanent impacts to wetlands by cover type within each municipality along the Rapid Bus Alternative. Greatest wetland impacts would occur within areas of wooded swamp (16.41 acres), with relatively large impacts also occurring within areas of mixed (coniferous and deciduous) wooded swamp (4.19 acres). The wetland delineations created using the GIS model are expected to overestimate the size of the wetland and therefore the impacts. Wetland impacts would be re-evaluated once the preferred alternative is selected and wetland boundaries have been delineated in the field.

Table 25 Permanent BVW Impacts by Cover Type

Municipality	Total Area (acres)	Cover Type[1] (acres) OW Open Water	PEM Deep Marsh	PEM Shallow Marsh	PSS Shrub Scrub	PFO WSC	PFO WSD	PFO WSM
Avon	1.96	--	--	1.20	0.11	--	0.65	--
Braintree	0.05	--	--	--	--	--	0.05	--
Bridgewater	1.37	--	0.08	0.76	--	--	0.52	0.01
Brockton	0.93	--	0.01	0.23	0.12	--	0.57	--
Canton	--	--	--	--	--	--	--	--
Quincy	0.02	--	--	0.02	--	--	--	--
Randolph	1.05	--	--	0.23	--	--	0.82	--
Raynham	7.51	0.10	--	--	--	--	5.26	2.15
Stoughton	0.70	--	0.08	0.02	0.02	--	0.58	--
Taunton	3.97	<0.01	--	--	<0.01	--	2.08	1.89
West Bridgewater	3.91	--	0.08	1.51	0.49	--	1.69	0.14
Total (subcategory)	21.47	0.10	0.25	3.97	0.74	--	12.22	4.19
Totals (Cowardin)	21.47	0.10	4.22	0.74	16.41			

1 Cover type abbreviations:
Cowardin types: PEM = Palustrine Emergent Marsh, PSS = Palustrine Shrub Scrub, PFO = Palustrine Forested
Ecological sub-category: WSC = Wooded Swamp Coniferous, WSD = Wooded Swamp Deciduous, WSM = Wooded Swamp Mixed.
Source: MassGIS and VHB. Based on orthophoto aerial interpretation of Study Area cover types.

The estimated areas of wetland impacts created by the construction of the Rapid Bus Alternative have been revised since the publication of the DEIS/DEIR and are summarized in Table 26 below. As shown, the total direct wetland impacts (loss) are identical to the Rapid Bus Alternative evaluated in the DEIS/DEIR, although there are minor differences in some categories. An additional 9 acres of wetlands would be temporarily altered for construction.

Table 26 Direct Wetland Impacts

Wetland Type	Total Impacted Area (acres)	DEIS/DEIR Total Impacted Area (acres)
Wooded Swamp Deciduous	13.25	12.22
Wooded Swamp Mixed Trees	2.73	4.19
Shrub Swamp	0.94	0.74
Deep Marsh	0.25	0.25
Shallow Marsh Meadow or Fen	4.20	3.97
Open Water	0.11	0.1
Total	21.48	21.47

Sources: MassGIS 2002, 2005; municipal data 2009.

Bordering Land Subject to Flooding (BLSF)

Approximately 30.65 acres of BLSF would be permanently impacted and approximately 4.32 acres of BLSF would be temporarily impacted as a result of the Rapid Bus alternative. Any fill that would be placed within BLSF would occur along the edges of existing roadways and would not restrict flood flows. Impact areas mostly occur in locations where the mapped 100-year floodplain overlays existing areas of Route 24. Because of the previous disturbance from the existing roadway, construction would not impact important wildlife habitat in these areas. The impact estimates for BLSF represent the areal extent of potential floodplain impacts based on FEMA flood mapping and do not take into account the volume of flood storage that potentially would be lost. Prior to the final design process, more accurate mapping and flood elevation contours would be generated. This information would be used during the final design process to accurately calculate potential loss of flood storage volume and to provide adequate compensatory flood storage mitigation. This alternative would not impact any Land Subject to Coastal Storm Flowage.

Riverfront Area

There are 13 perennial streams that cross the Rapid Bus Alternative. At each of these perennial stream crossings, there would be impacts to Riverfront Area. Because the most of the work associated with the Rapid Bus Alternative is reconstruction in the median or the addition of a traffic lane, the majority of the work would occur in previously developed Riverfront Area. Additional Riverfront Area impacts are expected where the Blue Hill River flows within the I-93/Route 128 median. Exact impacts would be calculated during the final design process once the preferred alternative is selected.

Outstanding Resource Waters (ORWs)

Wetlands containing five potential vernal pools would be impacted along this segment; these impacts constitute impacts to ORWs. Approximately 2.15 acres of ORWs would be permanently impacted and approximately 1.43 acres of ORWs would be temporarily impacted along this alternative. Impacts to ORWs are estimated using the wetland boundaries created in the GIS model. These boundaries are expected to overestimate the size of the wetland and, therefore, the associated impacts to ORWs. Impacts to ORWs would be re-evaluated once the preferred alternative has been chosen to more accurately represent actual loss of ORWs in part through field work to determine if potential vernal pools would be certifiable.

Indirect

The Rapid Bus Alternative follows existing, active roadways that have been in service for decades. Indirect impacts, such as fragmentation of wetland habitat or hydrologic alterations of upgradient and downgradient wetlands, may have been caused by the construction of these roadways in the past. The wetland impacts that are associated with the proposed lane additions, intersection reconfigurations, or work in the medians occur largely within the existing disturbed footprint of the roadway and involve narrow linear impacts that have negligible indirect impacts to the affected wetland systems. However, some loss of wetland function would occur in proportion to the amount of wetland area that would be lost as a result of the project. Additional impacts, such as noise impacts that effect sensitive species and barriers to wildlife migration are anticipated to be negligible because the roadway is already present and in heavy use by motor vehicles. Indirect impacts are further discussed in the Environmental Consequences Technical Report – Biodiversity3 and the Environmental Consequences Technical Report – Water Resources. 4

1.13.2 Stations

The wetland impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. Construction of the Freetown Station and the proposed Brockton Station parking lot could impact wetlands.

Freetown Station

Freetown Station would permanently impact approximately 0.01 acres of wooded swamp deciduous (PFO) wetlands and temporarily impact approximately 0.04 acres of BVW associated with the unnamed brook that runs along the southern side of the

station site. Potential Bank impacts to the brook associated with the reconstruction of the railroad corridor are accounted for under the Fall River Secondary impacts. No Riverfront Area or BLSF impacts are anticipated at this site. The wetland delineations created using the GIS model are expected to overestimate the size of the wetland and therefore the impacts. Wetland impacts would be re-evaluated once the preferred alternative is selected and wetland boundaries have been delineated in the field.

West Brockton Station

The MassGIS wetland mapping indicates that a small wetland is present in the southeast corner of the proposed parking lot, adjacent to the existing private parking lot. Construction of the parking lot could impact approximately 6,000 square feet of this wetland. Wetland impacts would be re-evaluated once the preferred alternative is selected and wetland boundaries have been delineated in the field.

1.13.3 Summary

The Rapid Bus Alternative would permanently impact 21.48 acres of BVW, 30.65 acres of BLSF, and 26 locations with Riverfront Area. The bulk of these impacts are concentrated in locations along Route 24 where wetlands located within existing interchange cloverleaves would be impacted during the reconfiguration of the interchange. Additional impacts would be distributed along the corridor where wetlands are present at the edge of the existing roadway embankment and could not be avoided where lane additions occur. These impacts are common to all of the Rapid Bus Alternatives

Due to the impacts described above, this alternative would result in the largest amount of direct impact (as compared with the DEIS/DEIR alternatives) within the Hockomock Swamp ACEC, 4.03 acres. Indirect impacts would occur along this portion of the Rapid Bus Alternative, would be minimized because work would include roadway improvements to an existing roadway corridor. Impacts such as fragmentation have already occurred through the initial construction of the roadway and hydrology would be maintained through the use of existing bridges and culverts. Additionally, approximately 2.15 acres of impacts to ORWs would occur along the Rapid Bus Alternative.

1.14 Water Resources

This section discusses the impacts of the Rapid Bus Alternative on water resources. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.14.1 Highway Elements

Table 27 lists waterbodies near the Rapid Bus Alternative corridor and identifies the waterbodies that would receive stormwater discharges from the highways used for this alternative. The Rapid Bus Alternative would add approximately 174.8 acres of impervious area to the existing highways to accommodate the new bus traffic. These highways have largely closed drainage systems that remove suspended solids from stormwater runoff and convey the runoff to nearby wetlands and streams. Based on the design of I-93/Route 128 and Route 24, this analysis assumes that the highways discharge to all named streams they cross, including the Blue Hill River, Dam Lot Brook, Lovett Brook, the Taunton River, and the Town River. Since the existing stormwater drainage system would be retained, with capacity upgrades where necessary, these streams areas would receive additional stormwater discharges under this alternative due to the increased pavement. Additional stormwater discharges would occur in wetlands adjacent to the proposed corridor.

The highways are assumed to discharge to the Zone A areas currently crossed by the highways, which are associated with Blue Hill River, Brockton Reservoir, Farm River, and the Richardi Reservoir. The refined drainage design for the Rapid Bus Alternative will attempt to discharge any new or increased stormwater water flows outside of Zone A areas in order to comply with the proposed Massachusetts Stormwater Management Regulations (314 CMR 21.00). If this drainage design proves impractical, the Rapid Bus Alternative may require a variance from MA DEP to allow a new or increased stormwater discharge in a Zone A area.

Table 27 Stormwater Discharges for the Rapid Bus Alternative

Waterbody	Highway	Municipality	ACEC/ORW	Stormwater Discharges Proposed
Blue Hill River (includes Zone A)	I-93/Route 128	Quincy, Randolph	No	Yes[1]
Brockton Reservoir (Zone A only)	Route 24	Avon	No	Yes (Zone A only)[1]
Dam Lot Brook	Route 24	Raynham	No	Yes[1]
Farm River (Zone A only)	I-93/Route 128	Quincy, Randolph	No	Yes (Zone A only)[1]
Lovett Brook	Route 24	Brockton	No	Yes[1]
Richardi Reservoir (Zone A only)	I-93/Route 128	Quincy, Randolph	No	Yes (Zone A only)[1]
Taunton River	Route 24	Raynham	No	Yes[1]
Town River	Route 24	Bridgewater, West Bridgewater	Yes[2]	Yes[1]

1 Based on the highway design, these waterbodies and/or Zone A areas are assumed to receive stormwater discharges from the existing highway drainage system. The Rapid Bus Alternative would reuse the existing drainage system and discharge points, but there would be additional impervious area discharging to these waterbodies.

2 Hockomock Swamp ACEC.

The highways along this alternative intersect the Zone II areas for 11 existing and proposed Public Water Supply Wells, including nine wells operated by the Raynham Center Water District and two inactive wells operated by the West Bridgewater Water Department. There would be stormwater discharges in the Zone II areas for these wells. The individual wells, their protection zones, and potential impacts are listed in Table 28. No Zone I areas would be affected by the Rapid Bus Alternative.

Table 28 Construction and Stormwater Discharges in Public Water Supply Well Protection Areas for the Rapid Bus Alternative

Well	Distance from Proposed Limit of Work (miles)	Water System	Location of Protection Zone Crossings	Construction in Protection Zones	Stormwater Discharges in Protection Zones
Gushee Pond Well #1	0.6	Raynham Center Water District	Bridgewater, Raynham	Zone II	Zone II
Gushee Pond Well #2	0.6		Bridgewater, Raynham	Zone II	Zone II
Gushee Pond Well #3	0.7		Bridgewater, Raynham	Zone II	Zone II
Lake Nip Well #1A	0.9		Bridgewater, Raynham	Zone II	Zone II
Lake Nip Well #1B	0.9		Bridgewater, Raynham	Zone II	Zone II
Lake Nip Well #2	0.9		Bridgewater, Raynham	Zone II	Zone II
Lake Nip Well #2A	0.9		Bridgewater, Raynham	Zone II	Zone II
Lake Nip Well #2B	0.9		Bridgewater, Raynham	Zone II	Zone II
Fountain Well1	0.8		Bridgewater, Raynham	Zone II	Zone II
Manley St Well #3A	0.2	West Bridgewater Water Department	Brockton, West Bridgewater	Zone II	Zone II
Manley St Well #3B	0.1		Brockton, West Bridgewater	Zone II	Zone II

1 Proposed well

Although the Rapid Bus Alternative would use highways near multiple waterbodies and ground water protection areas, the road upgrades and new traffic would not introduce new pollutant sources because they would occur within and along existing highways. The increased paved area proposed under the Rapid Bus Alternative would only increase pollutant loading if the new pavement increased the amount of traffic on the road. Based on the change in vehicle miles traveled (VMT) at the peak hour, the Rapid Bus Alternative would reduce roadway use by approximately 0.3 percent. Since this alternative would actually decrease the total automotive traffic conveyed along the corridor by approximately one percent, the additional paved area would not increase loading of roadway contaminants such as metals, hydrocarbons, salt, and sediment. The primary potential for water resource impacts would be from increased runoff rates due to increased paved area. The highway drainage systems would need to be expanded or modified to accommodate the extra runoff from additional pavement and still meet the Massachusetts Stormwater Management Standards. Existing pipes and discharge points would be reused wherever possible however, these discharges will be inspected to determine whether they should be redirected away from sensitive resources.

Existing bridges and culverts for stream crossings would be expanded as necessary to accommodate new travel lanes and to meet stream flow recommendations. The operation of the Rapid Bus Alternative would not be expected to contribute

contaminants that would impair any of the waterbodies or drinking water sources along the line.

1.14.2 Stations

The water resources impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would not affect sensitive water resources.

Downtown Taunton

The Downtown Taunton is undeveloped and would require a new stormwater drainage system. Infiltration may not be practicable on this site due to soil contamination. A stormwater management area is proposed on the east side of the site that would discharge to the local municipal system. The system modifications would be designed to maintain peak flows into the local stormwater system and to remove suspended solids. With the proposed capacity upgrades to the stormwater management system (if needed), reconstructing the station would have no impacts to the municipal drainage system or to surface or ground water resources.

Fall River Depot

Under the Rapid Bus Alternative, the station would include approximately 468 surface parking spaces and would result in a net increase of 4.41 acres of impervious area. Drainage inside the garage (under the rail alternatives) would discharge to the sanitary sewer as required by health codes, while outdoor stormwater would be discharged to the municipal stormwater system. The limits of work would not affect any waterbodies or drinking water protection areas.

The Fall River Depot station site would redevelop a developed site and would actually decrease the total impervious area under the Rapid Bus Alternative. Given the existing industrial character of the local waterfront and the other highways and parking areas nearby, the station would not be expected to increase the potential for water pollution. Existing peak flows into the municipal stormwater system would be maintained through the sizing of the closed drainage system and, if necessary, by the addition of subsurface detention chambers. With a stormwater design to prevent flooding and remove suspended solids, there would be no impacts to the local stormwater system or to surface or ground water resources.

Freetown

Under the Rapid Bus Alternative, the station would include approximately 215 parking spaces and a net increase of 3.01 acres of impervious area. The site is

partially surrounded by wetland areas, including an unnamed stream on the northeast edge and another unnamed stream on the southwest edge. However, the limits of work would not intersect any named waterbodies or drinking water protection areas.

Given that this portion of the site is undeveloped, a new stormwater drainage system would be required. A stormwater management area would be included at the west end of the site to treat and manage stormwater flows from the west portion of the parking lot. This stormwater management area would discharge to the wetland southwest of the site. A second and third management area would be included at the northeast portion of the site to treat and manage stormwater flows from the entrance roadways and east portion of the parking lot. These stormwater management areas would discharge to the wetland north of the site. With proper design of the stormwater management system, there would be no impacts to surface or ground water resources.

Galleria

The Galleria station is an existing bus station that would be expanded to serve the Rapid Bus Alternative. It is located at the Silver City Galleria Mall, near the intersection of Routes 140 and 24 in Taunton. The improvements to this facility would take place within the existing paved footprint and would result in 486 total parking spaces and no change in impervious area. Since neither the use of the site nor the paved area would change, no changes would be required to the stormwater drainage system. The limits of work would not affect any waterbodies or drinking water protection areas. No impacts are anticipated to any surface or ground water resources.

King's Highway

The station would include approximately 387 existing shared parking spaces under the Rapid Bus Alternative. The King's Highway station site would reuse a developed area and would cause no net increase in impervious area. Since there would be no increase in impervious area and no change in use, there would be no modifications required to the stormwater drainage system and no impacts to water resources. The limits of work would not affect any waterbodies or drinking water protection areas. No impacts are anticipated to any surface or ground water resources.

Whale's Tooth

Under the Rapid Bus Alternative, the station would include approximately 677 parking spaces and would have no change in impervious area. The limits of work would not affect any waterbodies or drinking water protection areas. New Bedford

Harbor is east of the site and is separated from the site by existing industrial development.

Given the existing industrial character of the local waterfront and the benign nature of the proposed use, the station would not be expected to increase the potential for water pollution. The existing parking lot has an underground drainage system that discharges near the tracks. This drainage system would remain in place for the station and may not require any upgrades to provide effective stormwater management, as the site improvements would occur almost entirely within the existing built footprint. No impacts are expected to surface or ground water resources.

Brockton Station

The Brockton Station would include approximately 300 parking spaces, and approximately 2.5 acres of new pavement. A new stormwater drainage system would be required to treat and manage stormwater flows. With proper design of the stormwater management system, there would be no impacts to surface or ground water resources.

West Bridgewater Station

The West Bridgewater Station would include approximately 600 parking spaces, and approximately 4.5 acres of new pavement. A new stormwater drainage system would be required to treat and manage stormwater flows. With proper design of the stormwater management system, there would be no impacts to surface or ground water resources.

1.14.3 Summary

The Rapid Bus Alternative would involve construction within two Zone A areas and within Zone II areas for 11 wells. These areas would be disturbed only temporarily and would not receive any long-term impacts. This alternative would also require stormwater discharges to two Zone A areas, Zone II areas for 11 wells, and five different waterbodies, including Town River in the Hockomock Swamp ACEC. The Rapid Bus Alternative may require a variance from MA DEP unless the proposed stormwater discharges in Zone A areas can be removed or relocated in the final design.

Since the entire highway corridor for this alternative already conveys automotive traffic under existing conditions, the Rapid Bus Alternative would not add any new potential pollutant sources. While paved highway area would increase by 163 acres under the Rapid Bus Alternative, overall vehicular travel is expected to decrease by approximately 0.3 percent based on vehicle miles traveled (VMT) during the peak

hour. Although it is anticipated that the additional pavement would not increase pollutant loading in stormwater runoff since traffic would decrease, an increase in impervious surface of this magnitude will require consultation with DEP to determine whether groundwater recharge and treatment measures have been met.

1.15 Coastal Zone Management – Chapter 91 Resources

This section discusses the impacts of the Rapid Bus Alternative on the coastal zone and Chapter 91 waterways. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

1.15.1 Highway Elements

The reversible busway would include new construction only within inland communities and therefore not include any work within filled tidelands, flowed tidelands or the Massachusetts Coastal Zone. The construction (on the Route 24 section) includes work within two non-tidal rivers and streams presumed subject to Chapter 91.

This alternative includes crossings of three non-tidal rivers or streams reviewed for potential jurisdiction under Chapter 91, two of which may be jurisdictional under Chapter 91. These crossings are the Taunton River in Raynham and the Town River in East Bridgewater. Table 29 lists each crossing and provides a summary of the jurisdictional status of each.

Table 29 Non-Tidal River and Stream Crossings – Rapid Bus Alternative

Waterbody	Municipality	Jurisdictional	Rationale	Presently Licensed	Anticipated Ch. 91 approval	Improvements
Blue Hill River	Quincy	No	Not navigable during any season	No	None	Construction of new pavement within median.
Town River	East Bridgewater	Potentially	Navigable during at least part of the year	No. Presumed authorized by legislation for construction of Rt. 24	Minor project modification if the improvements do not expand the footprint of the existing structure greater than 10 percent.	Construction of new travel lanes within existing bridge footprint.
Taunton River	Raynham	Potentially	Navigable year round; presumed public funds expended for stream clearance, channel improvement or flood control	No. Presumed authorized by legislation for construction of Rt. 24	Minor project modification if the improvements do not expand the footprint of the existing structure greater than 10 percent.	Construction of new travel lanes within existing bridge footprint.

The Town River crosses Route 24 at the East Bridgewater / Bridgewater boundary. The existing structure is a modern highway overpass with a concrete deck supported by concrete abutments. The deck is a single structure accommodating the entire roadway cross section and median. The river is potentially jurisdictional because it is navigable during at least part of the year and the likelihood of public expenditure of funds for flood control upstream or downstream of Route 24. The jurisdictional status would be confirmed through consultation with DEP.

Should the river be confirmed jurisdictional, proposed work may be authorized by DEP as maintenance or a minor modification for previously authorized uses if the reversible bus way can be built within the footprint of the existing structure, or at a minimum does not require an increase in the footprint by greater than 10 percent. If the work increases the footprint by greater than 10 percent, a new license is anticipated because the work would not meet the regulatory criteria established by 310 CMR 9.22.

The Taunton River crosses Route 24 at the Taunton / Raynham boundary. The existing structure is a modern highway overpass with a concrete deck supported by concrete abutments. The deck is a single structure accommodating the entire roadway cross section and median. The river is potentially jurisdictional because it is navigable during at least part of the year and the likelihood of public expenditure of funds for flood control upstream or downstream of Route 24.

The proposed work may be authorized by DEP as maintenance or a minor modification if the reversible bus way can be built within the footprint of the existing structure, or at a minimum does not require an increase in the footprint by greater than 10 percent. If the work increases the footprint by greater than 10 percent, a new license is anticipated because the work would not meet the regulatory criteria established by 301 CMR 9.22.

1.15.2 Stations

The Coastal Zone or Chapter 91 impacts of the Rapid Bus Alternative to construct stations would not differ from those in the DEIS/DEIR. The two new in-line stations would not be within the Coastal Zone or Chapter 91 waterways.

Fall River Depot

Fall River Depot station would not be located within filled tidelands and would not be subject to Chapter 91. At the Fall River Depot Station site, Davol Street is the first major transportation infrastructure adjacent to the coast. As a result, the first 100 feet of the site's frontage on Davol Street are located within the coastal zone associated with the Taunton River. The majority of the station site is located landward of the coastal zone boundary.

The proposed station construction would require a Federal Consistency Certification under the Coastal Zone Management Program because it includes work within the Massachusetts Coastal Zone. Preliminary consultation with representatives of the MZCMP indicates that the proposed station construction would be consistent with the regulatory policies.

Freetown Station

The Freetown station would not be located within filled tidelands and therefore would not be subject to Chapter 91. At the Freetown station site, South Main Street is the first major transportation infrastructure adjacent to the coast. As a result, the first 100 feet of the site's frontage are located within the coastal zone associated with the Taunton River (the entrance driveway). The majority of the station site is located landward of the coastal zone boundary.

The proposed driveway station construction would require a Federal Consistency Certification under the Coastal Zone Management Program because it includes work within the Massachusetts Coastal Zone. Preliminary consultation with representatives of the MZCMP indicates that the proposed station construction would be consistent with the regulatory policies.

Whale's Tooth Station

The majority of the Whale's Tooth station would be located on landlocked filled tidelands because the station site was entirely separated from the existing mean high water mark of New Bedford Harbor by interconnected public ways on January 1, 1984, and is at least 250 feet landward of the existing mean high water mark. Accordingly, the station would not require a Waterways license. However, the station would require a Public Benefit Determination.

The station would be located entirely within the Coastal Zone associated with New Bedford Inner Harbor but outside the New Bedford/Fairhaven DPA. The proposed station construction would require a Federal Consistency Certification under the Coastal Zone Management Program because it includes work within the Massachusetts Coastal Zone. Preliminary consultation with representatives of the MZCMP indicates that the proposed station construction would be consistent with the regulatory policies.

1.16 Indirect and Cumulative Impacts

This section discusses the impacts of the Rapid Bus Alternative on environmental justice communities. The analysis includes the information provided in the DEIS/DEIR with additional information based on modifications to the Route 24 section.

As described in the DEIS/DEIR, the total induced growth for the Rapid Bus Alternative under Scenario 2 would be the same as in Scenario 1. The Rapid Bus Alternative is expected to result in a total induced growth of 1,310 households, a 1.8-percent increase over the No-Build Alternative regional growth of 74,371 households. The distribution of the growth (induced and baseline) would shift to be concentrated in the PDAs. New growth would be largest in Fall River, Foxborough, New Bedford, Taunton. The Smart Growth scenario would shift growth (induced and baseline) out of rural communities such as Acushnet, Berkley, Lakeville, Rehoboth, Wareham and Westport, as well as more developed communities (Mansfield).

The Rapid Bus Alternative is not anticipated to result in station area TOD development at any of the stations. The change to the project (with the addition of two in-line stations) would not change the indirect or cumulative impacts of the Rapid Bus Alternative.

Modified Rapid Bus Alternative
Technical Memorandum - DRAFT

Appendix G:

Modified Rapid Bus Service Plan and Operating and Maintenance Cost Methodology

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116

Prepared by

99 High Street, 10th Floor
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June 2012

Table of Contents

1 Introduction 1

2 Service Plan 1

2.1 Stopping Patterns and Headways 1
2.2 Running Times 4

3 O&M Cost Model Development 1

3.1 Bus Operations and Maintenance 1
3.2 Busway Maintenance 2
3.3 Stations Operation and Maintenance 3

4 Results/Conclusions 1

List of Tables

Table No.	Description	Page
Table 1	**Modified Rapid Bus Stopping Patterns and Headways**	**3**
Table 2	**Modified Rapid Bus Station-to-Station Travel Times**	**4**
Table 3	**Cost per Revenue Mile for Bus Service**	**2**
Table 4	**O&M Cost Factors**	**1**
Table 5	**Rapid Bus O&M Costs**	**2**

List of Figures

Figure No.	Description	Page
Figure 1	Modified Rapid Bus Stopping Schematic	2

1 Introduction

This memo documents both the service plan and operating and maintenance cost estimation for the South Coast Rail Modified Rapid Bus Alternative. The O&M model was developed in accordance with US Department of Transportation Federal Transit Administration "Estimation of Operating and Maintenance Costs for Transit Systems," December 1992.

An integral component of the development of O&M costing is the integration with the ridership forecasts and service plan developed for a project (the ridership estimation is discussed further in Appendix H and will be provided directly from CTPS). Iterating ridership, the service plan and the O&M cost ensures that the costs for the project adequately reflect the demand and projected usage of a transit service.

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2

Service Plan

The proposed span of service for the Rapid Bus Alternative was designed to be comparable with that of the rail alternative. Bus service would run from approximately 6:00 AM to Midnight, every weekday. The weekend span of service would be similar to weekdays.

2.1 Stopping Patterns and Headways

Eighteen routes were developed for the Rapid Bus Alternative. These routes and their stopping patterns were designed to provide travel times that are most competitive with the rail alternatives. Service is available from each station to both terminals in Boston (South Station and Back Bay) as shown in Figure 1. Express (non-stop) service to Boston is available from every station but West Bridgewater (which is served by all local routes and stops at Brockton before operating non-stop to Boston).

Preliminary headways were developed and were designed to be competitive with those of the rail alternatives, and to closely match those of the DEIS/DEIR Rapid Bus alternative. In the peak period and peak direction, each station (except West Bridgewater) was assumed to be served by an express route and a local route at 30 minute headways to each terminal in Boston. This level of service provides a combined minimum of at least one bus every fifteen minutes to each Boston terminal.

In the off-peak period, or off-peak direction (during the peak-period), all buses were assumed to operate all-stop local from each Boston terminal to either Fall River, or New Bedford at 60 minute service headways.

Consistent with standard practice, the initial service plan was used as an input in the ridership model (described in Appendix H). Information on ridership by line was used to adjust the service plan in order to accommodate the projected ridership demand.

Stopping patterns, as well as preliminary and final headways are showing below in Table 1.

Figure 1 Modified Rapid Bus Stopping Schematic

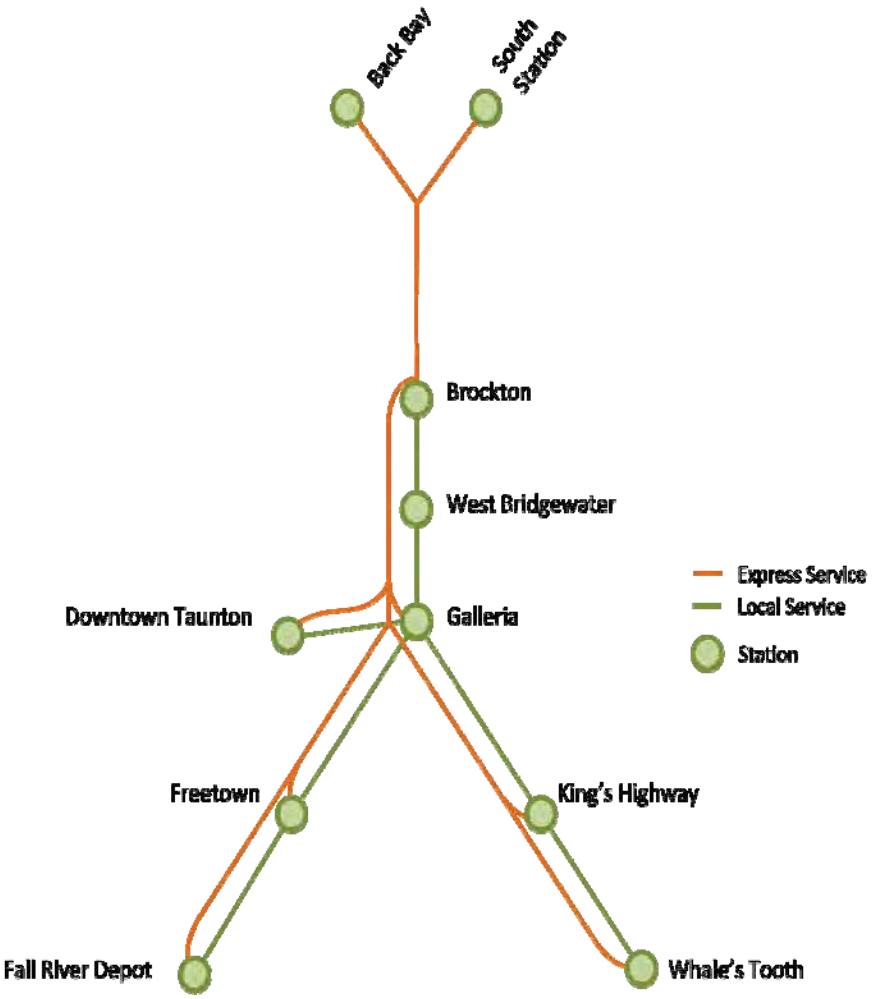

Table 1 Modified Rapid Bus Stopping Patterns and Headways

		EXPRESS ROUTES										LOCAL ROUTES											
STATION		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Whale's Tooth		x	x											x	x					x		x	
Kings Highway				x	x									x	x					x		x	
Fall River Depot						x	x									x	x				x		x
Freetown								x	x							x	x				x		x
Galleria										x	x			x	x	x	x			x	x	x	x
Downtown Taunton												x	x					x	x	x	x	x	x
West Bridgewater														x	x	x	x	x	x	x	x	x	x
Brockton														x	x	x	x	x	x	x	x	x	x
South Station		x		x		x		x		x		x		x		x		x		x	x		
Back Bay			x		x		x		x		x		x		x		x		x			x	x
Initial Headways (un-adjusted for ridership demand)																							
Peak Direction	Peak Period	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	Service Does Not Operate			
	Off-Peak Period	Service Does Not Operate																		60	60	60	60
Off-Peak Direction	Peak Period	Service Does Not Operate																		60	60	60	60
	Off-Peak Period	Service Does Not Operate																		60	60	60	60
Final Headways (adjusted for ridership demand)																							
Peak Direction	Peak Hour*	30	30	20	30	15	30	30	30	30	30	30	30	15	30	7.5	20	12	30	Service Does Not Operate			
	Off-Peak Period	Service Does Not Operate																		60	60	60	60
Off-Peak Direction	Peak Period	Service Does Not Operate																		60	60	60	60
	Off-Peak Period	Service Does Not Operate																		60	60	60	60

*** Frequencies were adjusted only in the peak hour, and remain unadjusted during the remaining peak period**

Denotes frequencies that change between initial and final set of headways

2.2 Running Times

Running times were developed for each proposed station assuming based on the proposed improvements described in other sections of this report. Table 2 presents this data.

Table 2 Modified Rapid Bus Station-to-Station Travel Times

				Brockton	West Bridgewater *	Galleria	Downtown Taunton	Freetown	Fall River	Kings Highway	New Bedford
Modified Rapid Bus Alternative	South Station	Travel Time (Mins)	Local	36	42	61	64	65	86	74	90
			Express	N/A	N/A	56	60	60	71	69	78
	Back Bay		Local	44	50	69	72	72	93	82	97
			Express	N/A	N/A	64	68	67	78	77	85
DEIS/DEIR Rapid Bus Alternative	South Station	Travel Time (Mins)	Local	N/A	N/A	66	68	Not Calculated	91	Not Calculated	103
			Express	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Back Bay		Local	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Express	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Stoughton Electric Alternative	South Station	Travel Time (Mins)	Local	N/A	N/A	N/A	57	68	75	77	82
			Express	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Back Bay		Local	N/A	N/A	N/A	56	67	74	83	88
			Express	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3

Vehicle Requirements and Maintenance/Layover Space

Vehicle requirements were calculated based on the information developed for the service plan. The Modified Rapid Bus project would use standard over-the-road coaches with a capacity of 50 people per bus. A spare factor (the number of buses held out of service for maintenance and repairs) of 15 percent was assumed.

The DEIS/DEIR Rapid Bus Alternative would have required 50 vehicles total, with mid-day storage space for 35-40 vehicles.

144 vehicles would be required for the Modified Rapid Bus Alternative. Of the 144 vehicles, 110 would need to be stored during the mid-day between the AM and PM peak hours (the remaining would either be used for reverse peak service or be kept out of service for maintenance/inspections).

The DEIS/DEIR identified the Logan Express Park and Ride lot on Forbes Road in Braintree as a suitable mid-day layover location. Given the number of vehicles that would need to be stored there in the mid-day (110), a parking structure would need to be constructed to accommodate displaced single-occupancy vehicle parking.

The DEIS/DEIR assumed that the Rapid Bus Alternative would be contracted out to a private carrier with facilities in the South Coast Region, and that maintenance and overnight storage would occur at their facilities. Given the sheer number of vehicles required for the Modified DEIS/DEIR a separate maintenance facility/overnight storage location would need to be identified. This effort was not undertaken as part of this evaluation and would need to happen if the Modified Rapid Bus Alternative advanced further.

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O&M Cost Model Development

In keeping with current FTA practice, the resource build-up approach was used to develop O&M costs. This approach assumes that each expense incurred by a transit system is driven by a key supply variable, such as revenue hours, revenue miles, among others. Every effort was made to make this model comparable to the one used the development of the DEIS/DEIR Rapid Bus Alternative.

Line item costs will be calculated using the following equation: **TC = US x UC**

- TC = Total Annual Cost
- US = Unit of Service; operating statistics such as vehicle hours
- UC = Unit Cost; the price for each unit of service

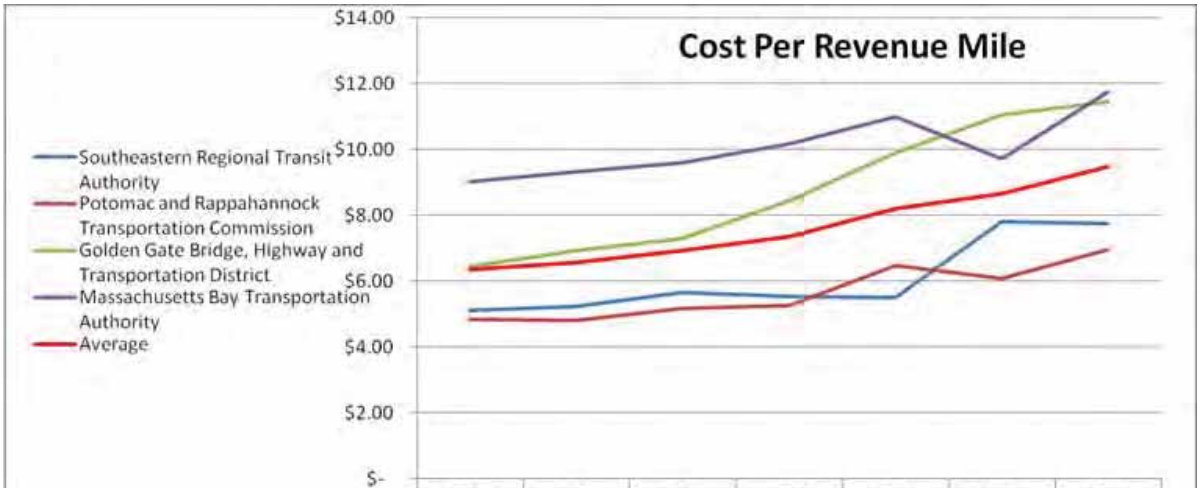
Wherever necessary, costs were escalated to 2009 dollars, using an assumed three percent annual escalation rate.

3.1 Bus Operations and Maintenance

This element includes the variable cost of providing bus service, as well as the variable and fixed costs associated with maintaining the buses required for service. Cost Factors for this element were derived from information used in the development of the DEIS/DEIR Rapid Bus Alternative.

This cost factor was developed using information from Southeastern Regional Transit Authority, Potomac and Rappahannock Transportation Commission, Golden Gate Bridge, Highway and Transportation District, and the Massachusetts Bay Transportation Authority. All of these operators are similar to the proposed SCR Rapid Bus service in terms of either geography or type of operation. Historical information on the total costs for operations and maintenance for these agencies were obtained from the Federal Transit Administration's National Transit Database.

Table 3 Cost per Revenue Mile for Bus Service



	2000	2001	2002	2003	2004	2005	2006
Southeastern Regional Transit Authority	$5.11	$5.25	$5.65	$5.52	$5.49	$7.80	$7.75
Potomac and Rappahannock Transportation Commission	$4.85	$4.81	$5.18	$5.26	$6.47	$6.08	$6.95
Golden Gate Bridge, Highway and Transportation District	$6.45	$6.93	$7.32	$8.45	$9.90	$11.05	$11.46
Massachusetts Bay Transportation Authority	$9.01	$9.31	$9.59	$10.16	$10.98	$9.72	$11.75
Average	$6.36	$6.57	$6.93	$7.35	$8.21	$8.66	$9.48

The annual cost was then divided by revenue miles operated and averaged to get an appropriate cost-factor for the Modified Rapid Bus alternative, in this case $9.48 per revenue mile of service (which when escalated to 2009 dollars is $10.36 / revenue mile).

3.2 Busway Maintenance

This element includes the cost of maintaining the new bus-only lanes that would be constructed as part of the Rapid Bus Alternative. Included in this are the cost of maintenance (including snow removal and resurfacing), the cost of day-to-day busway operations, and costs related to the overall safety of the busway. To be consistent with the DEIS / DEIR, the same cost factors (which were received from MassHighway) were used.

These cost factors include the following:

- Annual cost per snow removal and other maintenance: $7,600 / lane mile ($7,828 in 2009 dollars).
- Annual cost per square foot for pavement resurfacing $1.43 / square yard ($1.47 in 2009 dollars).

3.3 Stations Operation and Maintenance

Outside of the terminals in Boston, there would be two types of stations for the Rapid Bus Alternative: major stations, such as the in-line ones at West Bridgewater and Brockton and minor ones such as the stations at Taunton Galleria, Kings Highway, and Freetown. All stations would include a platform for loading/unloading of buses, and a parking area. Major stations would include a structure to access the station located in the middle of the highway, as well as elevators and other vertical circulation elements. It was assumed that all stations would be unmanned.

The DEIS/DEIR methodology included O&M costs only for South Station. Given the minimal infrastructure required at other stations (parking areas and a small shelter), this was appropriate. The addition of substantially larger and more complex stations at West Bridgewater and Brockton necessitated revisiting this assumption. Elevator maintenance is particularly complicated, and maintenances of these structures would be costly.

To determine a cost factor for this element, an average of two costs were used:

- *The MBTA's cost for an unmanned Green Line Station: $9,330*
- *Boston Express' cost for its South Londonderry Terminal: $48,247*

Average cost per station: $28,788

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5 Results/Conclusions

The only factors that were changed from what was included in the DEIS/DEIR methodology are the costs for Busway Maintenance and Operations and the inclusion of a cost for the Operations and Maintenance of West Bridgewater and Brockton stations. The removal of the Zipper Lane on Route 24 changed the overall nature of busway operations and costs associated with the maintenance of the Route 24 Zipper Lane are no longer included. A cost for the stations in Brockton and West Bridgewater was also included since these two in-line stations would include maintenance-intensive features such as elevators and structures that would not exist at the other rapid bus stations. The cost factors and their sources are listed in Table 4.

Table 4 O&M Cost Factors

Factor	Unit Cost (2009$)	Source
Bus Operations and Maintenance	$10.36/hour of service (daily)	Average of Costs for Southeastern Regional Transit Authority, Potomac and Rappahannock Transportation Commission, Golden Gate Bridge, Highway and Transportation District, and Massachusetts Bay Transportation Authority
Busway Maintenance and Operations	$7,828 / lane mile $1.47 / square yard	MassHighway maintenance costs
Operations and Maintenance of West Bridgewater and Brockton Stations	$24,768/Station (Annual)	Average of Green Line and Boston Express Stations maintenance costs
Operations and Maintenance at South Station	$40,686/bay (annual)	Newmark Knight Frank Global Management Services (Managing Company for South Station Bus Terminal)

Note: Numbers presented represent the cost factor in 2008$, which have been adjusted for inflation (3% per year)

Using the service plans developed for each alternative, the annual O&M cost for each alternative was developed. Supply variables for each cost factor, along with the annual costs for that supply variable are listed below. For comparison, information is also presented for the DEIS/DEIR Rapid Bus Alternative, as shown in Tables 5.

Table 5 Rapid Bus O&M Costs

Alternative	Movement of Vehicles And Their Maintenance		Maintenance of Busways		O&M Cost for South Station		O&M Cost for Brockton and West Bridgewater Stations		Total O&M Cost
	Annual Revenue Miles	Annual Cost ($2009)	Distance/Area	Annual Cost ($2009)	Number of Bays Required	Annual Cost ($2009)	Number of Stations	Annual Cost ($2009)	
DEIS/DEIR Rapid Bus	3,648,575	$35,679,161	23 Miles 91,140 Sq Yards*	$3,553,865	8	$325,486	N/A	N/A	$39,558,512
Modified Rapid Bus Alternative	6,930,953	$71,798,100	33 Miles 464,757 Sq Yards	$942,181	10	$406,857	2	$49,536	$74,486,484
Stoughton Electric	424,780	$33,393,866	N/A	N/A	N/A	N/A	N/A	N/A	$28,060,648

* The DEIS/DEIR also included the cost for staff to man a barrier transfer machine for a new proposed "Zipper Lane" on Route 24 that is not applicable to this analysis as this element was removed from the proposed alternatives.

Appendix 3.2-A

Feeder Bus Plan

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

99 High Street
Boston, Massachusetts 02110
617 728-7777
FAX 617 728-7782

Memorandum

To: South Coast Project Team

Date: August 2, 2012

Project No.: 10111.34

From: Mike Lambert
Paul Carbone

Re: South Coast Rail: Draft Feeder Bus Plan

This memo describes the proposed feeder bus service plan for each South Coast Rail station for the Stoughton commuter rail alternative and each Rapid Bus station. The following objectives guide this plan:

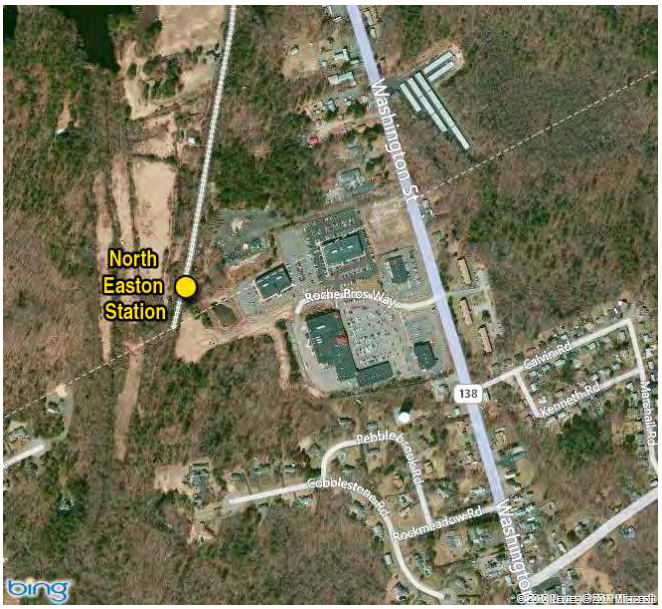
1. Minimize the number of transfers required by transit riders to use the SCR system
2. Identify potential route modifications to existing bus routes to integrate SCR and local bus services to the extent possible
3. Limit route modifications to the extent possible to avoid inconveniencing current bus users
4. For stations served by bus, accommodate buses within the station site and as close as possible to the station platforms
5. Plan for ADA compliant pedestrian connections to bus stops adjacent to the station sites and within the SCR station sites.

Three regional transit authorities, Brockton Area Transit Authority (BAT), the Southeastern Regional Transit Authority (SRTA) and Greater Attleboro Taunton Regional Transit Authority (GATRA) currently provide local bus service to the SCR corridor.

POTENTIAL RAIL STATION FEEDER BUS PROVISIONS

This section provides a description of the recommended Feeder Bus system for each station. Feeder Bus maps specific to each station are included. It proceeds from north to south.

North Easton Station



The proposed North Easton Station area is not currently served by public transit. By extending Route #9 from Brockton past its current terminus at Stonehill College it would be possible to provide bus access to this station. However, the Easton Village Station could be connected to the BAT system by the same route and that connection would be shorter and more direct.
For this reason it is not recommended to extend the BAT system to North Easton Station, nor are there other bus systems which could reasonably be extended to serve North Easton Station.

Easton Village Station

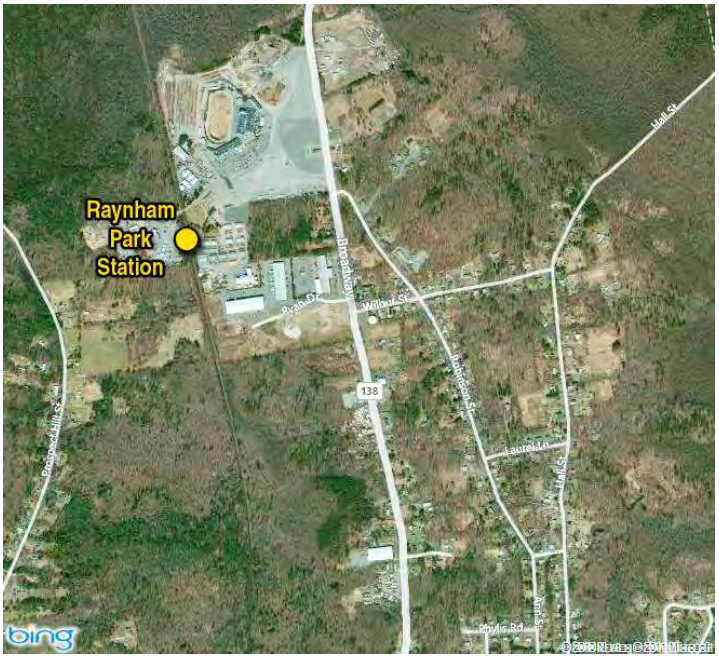
The Easton Village Station would be located within the H. H. Richardson Historic District of North Easton. The station area is not currently served by public transit. Brockton Area Transit (BAT) Route #9 currently connects downtown Brockton to two Easton destinations: Stonehill College and Easton Industrial Park.

It is recommended to extend BAT Route #9 less than three miles to Easton Village Station.

Raynham Place Station

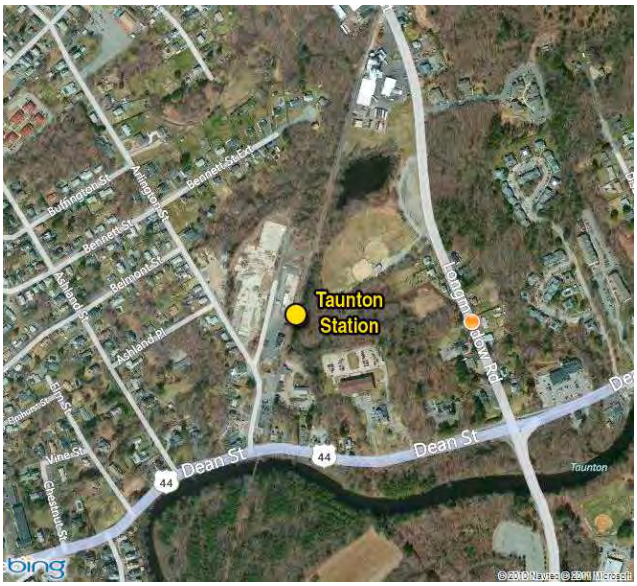
The proposed Raynham Park Station area is not currently served by public transit. Bloom Bus operated private commuter bus service from the adjacent Raynham Park entertainment complex to Boston and Taunton, but the SCR connects to both directly.

There are no nearby developments to which bus service could connect that are not more accessible from other SCR stations. Therefore, no modifications to existing bus service are recommended to serve this station.



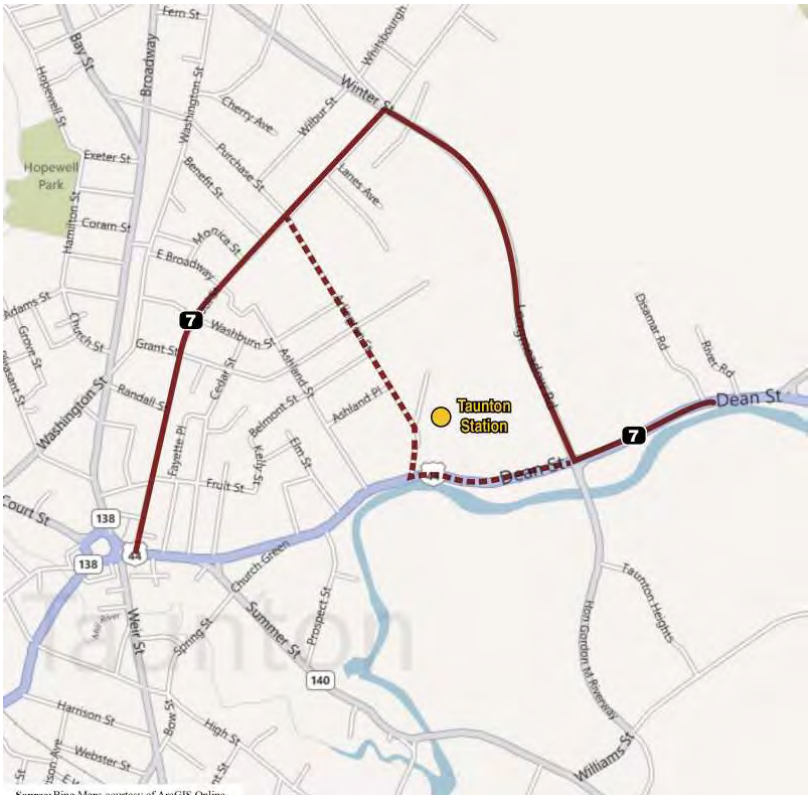
Taunton Station

The proposed Taunton Commuter Rail Station is located .75 miles east of Taunton Green (the center of downtown Taunton), just north of Dean Street/Route 44.



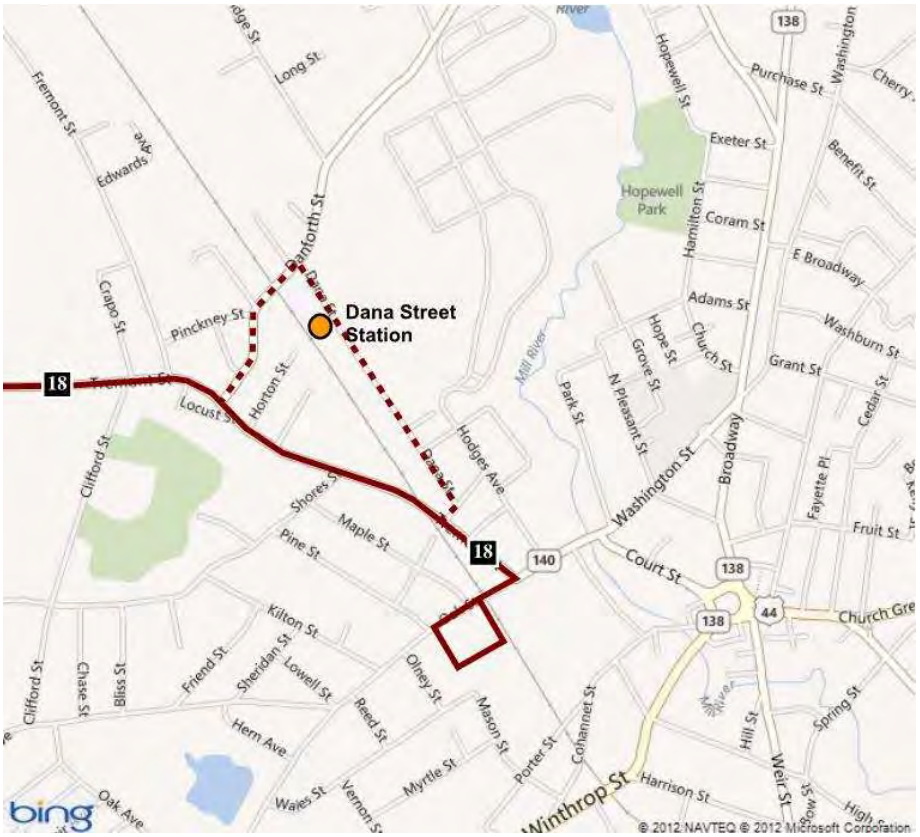
Of the six GATRA routes serving downtown Taunton, none currently stop in the proposed station area. GATRA Route #7 travels in the vicinity of the proposed station, stopping at the intersection of Longmeadow Road and Dean Street, .4 miles east of the station.

It is recommended that the GATRA Route #7 be realigned from Longmeadow Road to Arlington Street, which would connect directly to Taunton Station. This would establish a basic connection between Taunton Station and Taunton Green operating every 30 minutes on weekdays.



Dana Street Station
The proposed Dana Street Commuter Rail Station is 6/10th of a mile north of the GATRA Bloom Bus Terminal in downtown Taunton. Of the routes serving downtown Taunton, none stop at the proposed station area.

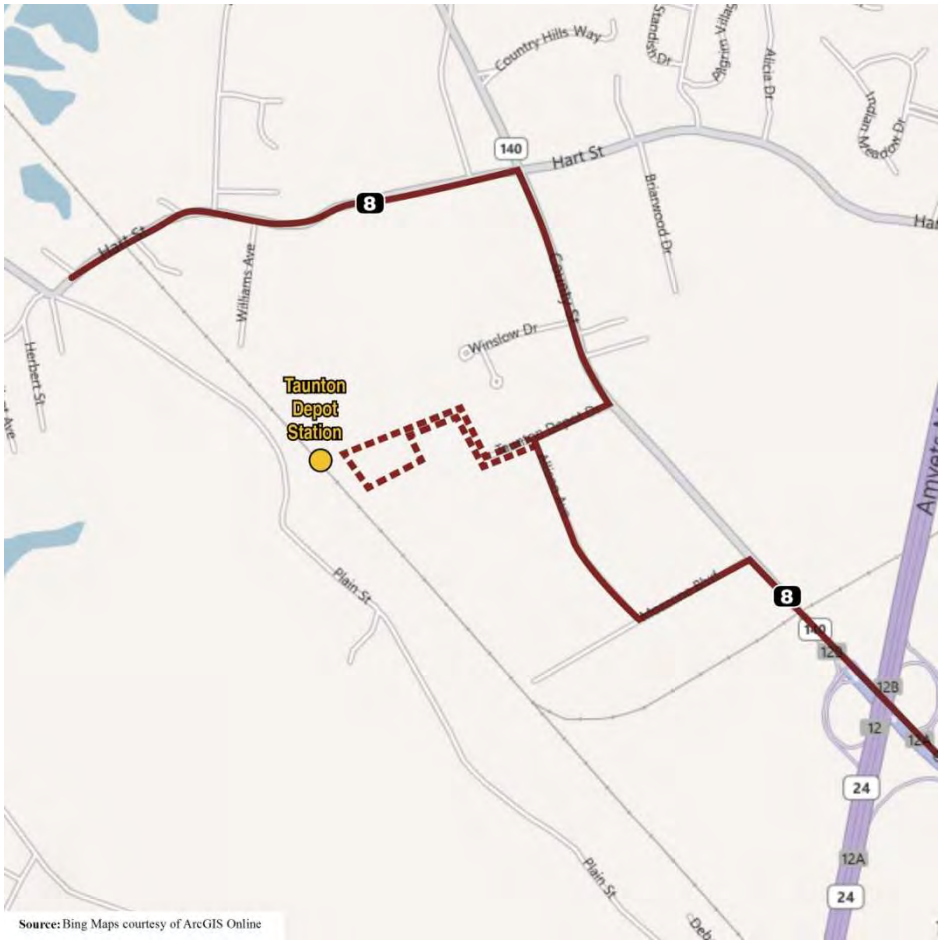
GATRA Route #18 travels along Route 140 and has no stops between Bloom Terminal and Norton Avenue. It is recommended that the GATRA Route #18 be rerouted to connect to Dana Street Station, which would increase Route #18 by 3/10th of a mile and would not eliminate any existing stops. This realignment would provide a bus connection operating approximately every 30 minutes in the peak period and every 80 minutes off-peak.



Taunton Depot

This proposed station area is served by the GATRA Route #8 bus. The route currently extends from County Street to loop through the Taunton Depot shopping center.

Because the walk distance from the front corner of the shopping center building to the station platform is almost 900 feet, it is recommended that a short extension of Route #8 beyond the shopping center and into the station site be provided.



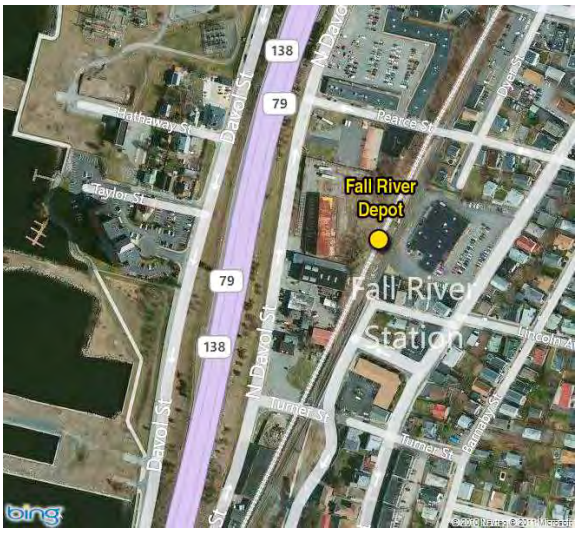
Freetown Station

The proposed Freetown Station area is not currently served by public transit. SRTA Route #2 (N. Main Street) travels from downtown Fall River to the Freetown town limits. The route operates on half-hour headways between 5:50 AM and 5:50 PM.

The recommended Freetown Station Feeder Bus Plan includes a 1-mile extension of SRTA Route #2 along S. Main Street, terminating the route at the proposed Freetown station.

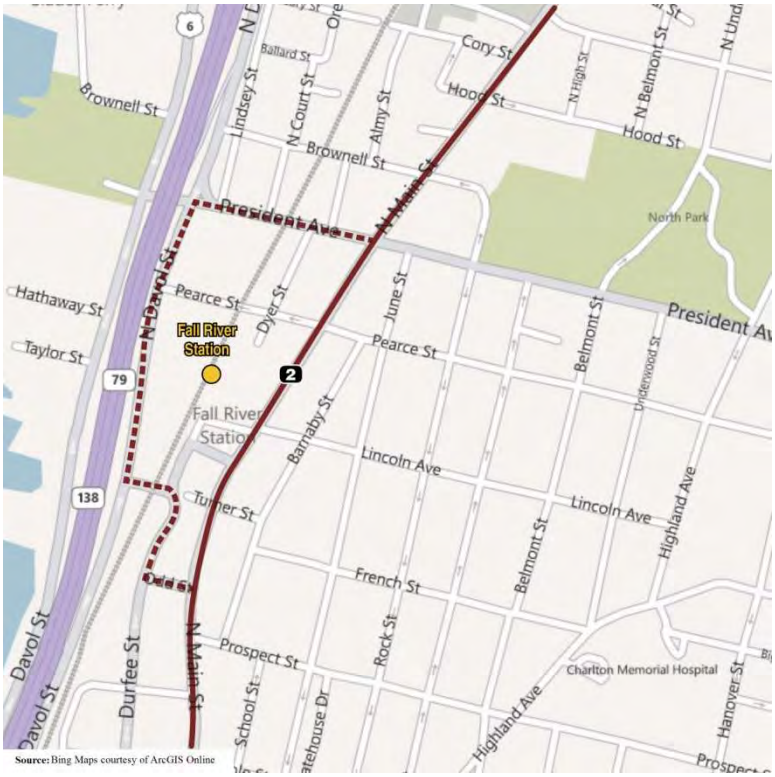
Fall River Depot

The Fall River Depot is planned for the former location of the Fall River Station, a location served by two SRTA routes, the Fall River Industrial Park Route and Route #2. These routes run along Main Street and are well within convenient walking distance to the station platform assuming provision of an adequate pedestrian pathway. Baylies Street could be an acceptable pedestrian route if the station site plan were to meet the path at the corner of Durfee Street and Baylies Street.



Only if an adequate pedestrian pathway between Main Street and the station site cannot be provided, is the recommended alternative to adjust Route #2 and the FR Industrial Park Route to divert at Odd Street to Durfee Street to Turner Street to N. Davol Street, then via President Avenue to return to Main Street.

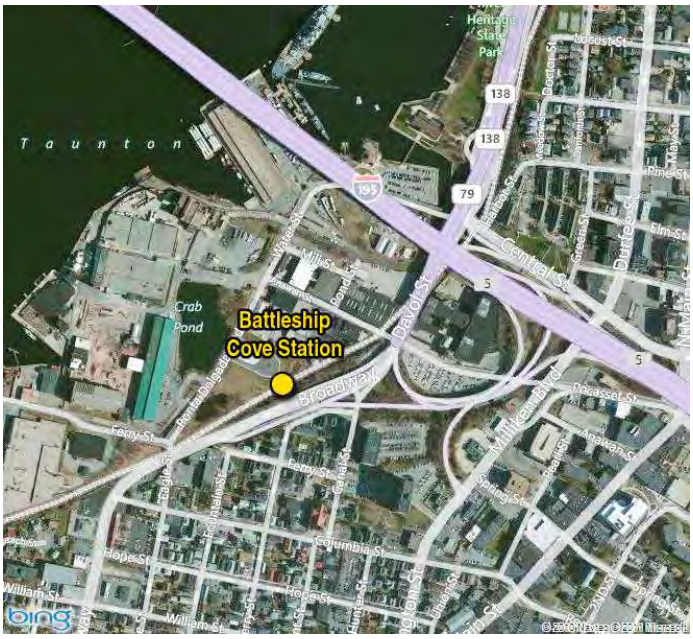
At this point the need for a route deviation is not confirmed. If adequate pedestrian access is available from Main Street the walk distance is convenient (less than 400 feet down Baylies Street) to avoid the need to reroute existing bus service.



Battleship Cove Station

Battleship Cove Station is envisioned as a seasonal station providing access to local tourist attractions. The site is adjacent to Broadway, a divided highway that forms a barrier to pedestrians from or to the east.

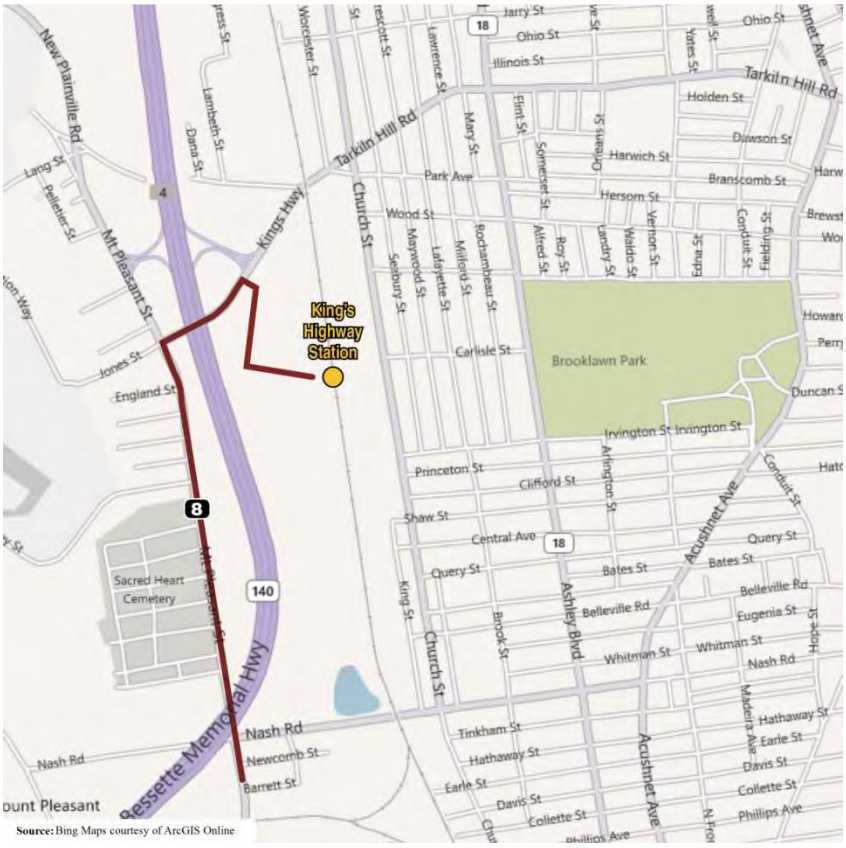
Buses do not currently operate west of Broadway in this area. Due to the seasonal nature of this station, its function to provide access to Battleship Cove and the proximity of Fall River Depot to provide commuter service year round, no feeder bus service to this station is recommended.



King's Highway Station

The King's Highway Station is set amid regional shopping destinations separated by expansive parking lots. Store parking lots are accessed from King's Highway/Tarkiln Road. The station site is located between two retail properties.

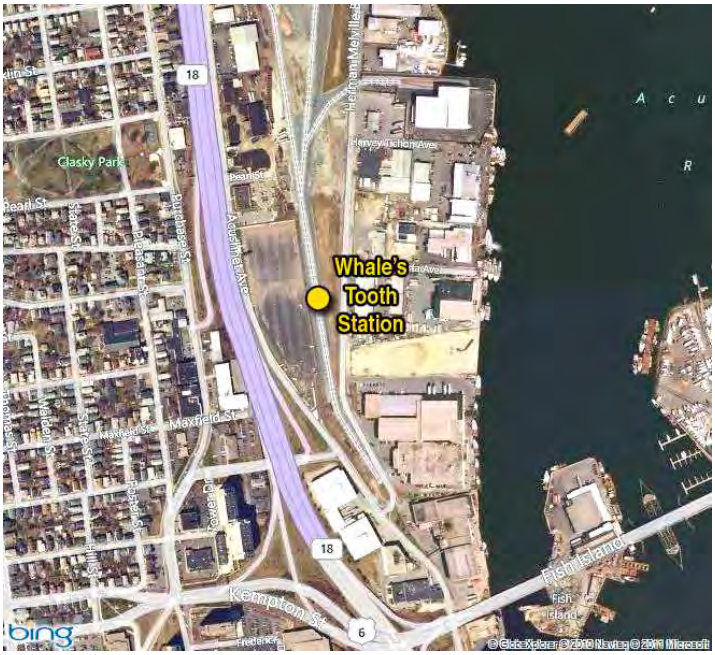
SRTA Route #8 (Mount Pleasant) connects to the station area at its northern terminus, the Fieldstone Marketplace. Route #8 travels between the station area and downtown New Bedford. Therefore no modification to Route #8 is needed.



Source: Bing Maps courtesy of ArcGIS Online

Whale's Tooth Station

Whale's Tooth Station is the eastern terminal station for South Coast Rail, located adjacent to downtown New Bedford. A Transit Development Plan (Draft) has been developed for the SRTA bus system that serves New Bedford.



As part of that analysis modifications to the proposed SRTA bus system that would link SCR via Whale's Tooth Station to SRTA were recommended. Those recommendations are described below.

Route #1 – Fort Rodman would now travel through the downtown on the inbound trips via Pleasant Street before turning right onto Hillman Street. Route #1 would then turn left into Acushnet Avenue and proceed to the Whale's Tooth station.
Outbound trips would depart the Whale's Tooth Station traveling south on Acushnet Avenue. They would turn right onto Hillman Street and then left onto Pleasant Street. Route #1 would travel into downtown via Sixth Street and then continue along the routing for Option A.

Route #2 – Lund's Corner would be interlined with route #1. The inbound route would terminate at Whale's Tooth, no longer traveling into downtown. Outbound route #2 would depart from Whale's Tooth and travel north.

Route #3 – Ashley Boulevard would travel north through downtown before terminating at the Whale's Tooth station. Inbound trips would travel north past the existing terminal on Pleasant Street before turning right onto the transit-only bridge at Pearl Street and into Whale's Tooth station. Outbound trips would depart from Whale's Tooth station and travel west on the transit-only bridge and then left onto Pleasant Street.

Route #4 – Ashley Boulevard would no longer travel into downtown once the Whale's Tooth Station is functional. Inbound trips would follow their existing routing before turning left from Purchase Street onto the new transit-only bridge at Pearl Street. The route would then terminate at Whale's Tooth.
Outbound trips would depart Whale's Tooth and travel west across the transit-only bridge and right onto Purchase Street. Two of the outbound trips (1 morning and 1 evening) would travel to the Industrial Park, and two trips (1 morning and 1 evening) would travel to the North End.

Route #6 – Shawmut-Rockdale would become interlined with the Route #11. This change would result in a decreased headway of 30 minutes. Route #6 would continue the two variations in Option A, Rockdale and Shawmut. Inbound trips would travel through downtown and north along Pleasant Street/Purchase Street. The route would then access Whale's Tooth via the transit-only bridge at Pearl Street.

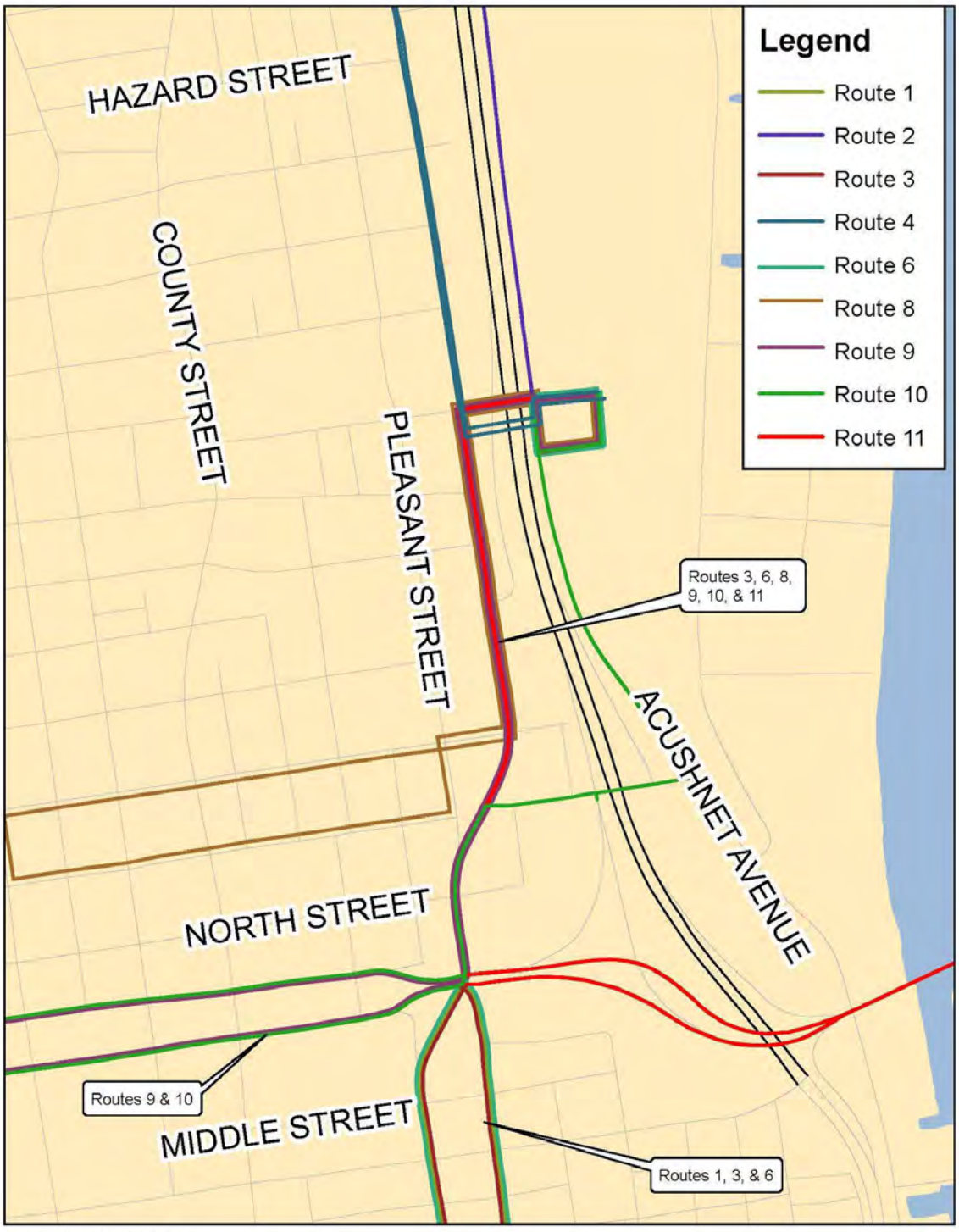
Outbound trips would depart Whale's Tooth and travel west across the transit-only bridge and left onto Purchase/Pleasant Street. The route would continue onto Sixth Street and into downtown, following the routing in Option A. The outbound trips would alternate between traveling to Rockdale and Shawmut.

Route #8 – Mt. Pleasant would change its routing to access Whale's Tooth. The inbound route currently travels south along Cottage Street before turning east onto Kempton and into downtown. The inbound route would continue south on Cottage as it does currently, but instead would turn east at Hillman Street, left onto Pleasant Street, and then right onto Maxfield Street. From Maxfield the route would travel north along Purchase Street before turning right onto the transit-only bridge and into Whale's Tooth.
The outbound trips would depart Whale's Tooth, cross the transit-only bridge and turn south onto Purchase Street. Route #8 would then travel west along Maxfield and then north onto Cottage Street. From there, route #8 would continue its existing routing.

Route #9 – New Bedford to Fall River would no longer travel into downtown. Inbound trips would travel east along Kempton before turning north onto Pleasant Street. The route would continue through on Purchase Street. Route #9 inbound trips would use the transit-only bridge to access Whale's Tooth from Purchase Street.
Outbound trips would follow a similar routing in reverse. Departing Whale's Tooth, route #9 would cross the transit-only bridge and turn south onto Purchase Street. The route would then continue onto Pleasant Street and turn west onto Mill Street.

Route #10 – Dartmouth Mall inbound trips would travel east on Kempton before turning north onto Pleasant Street. The route would continue through onto Purchase and turn east onto Hillman. Route #10 then turns north onto Acushnet and into Whale's Tooth.
Route #10 outbound trips would depart Whale's Tooth and travel south along Acushnet. Route #10 then turns west on Hillman Street and then south onto Purchase/Pleasant from which the route would turn west onto Mill Street.

Route #11 – Fairhaven would no longer serve downtown New Bedford. The route would travel west on U.S. 6 (Mill Street) before turning north onto Pleasant Street. Route #11 would continue through on Purchase Street and would access Whale's Tooth via the transit-only bridge at Pearl Street. As mentioned above, this route would be interlined with route #6, resulting in a 30-minute headway.
Outbound trips would depart Whale's Tooth and travel west on the transit-only bridge and then south on Purchase Street. The route would continue through onto Pleasant Street before turning east onto U.S. 6.



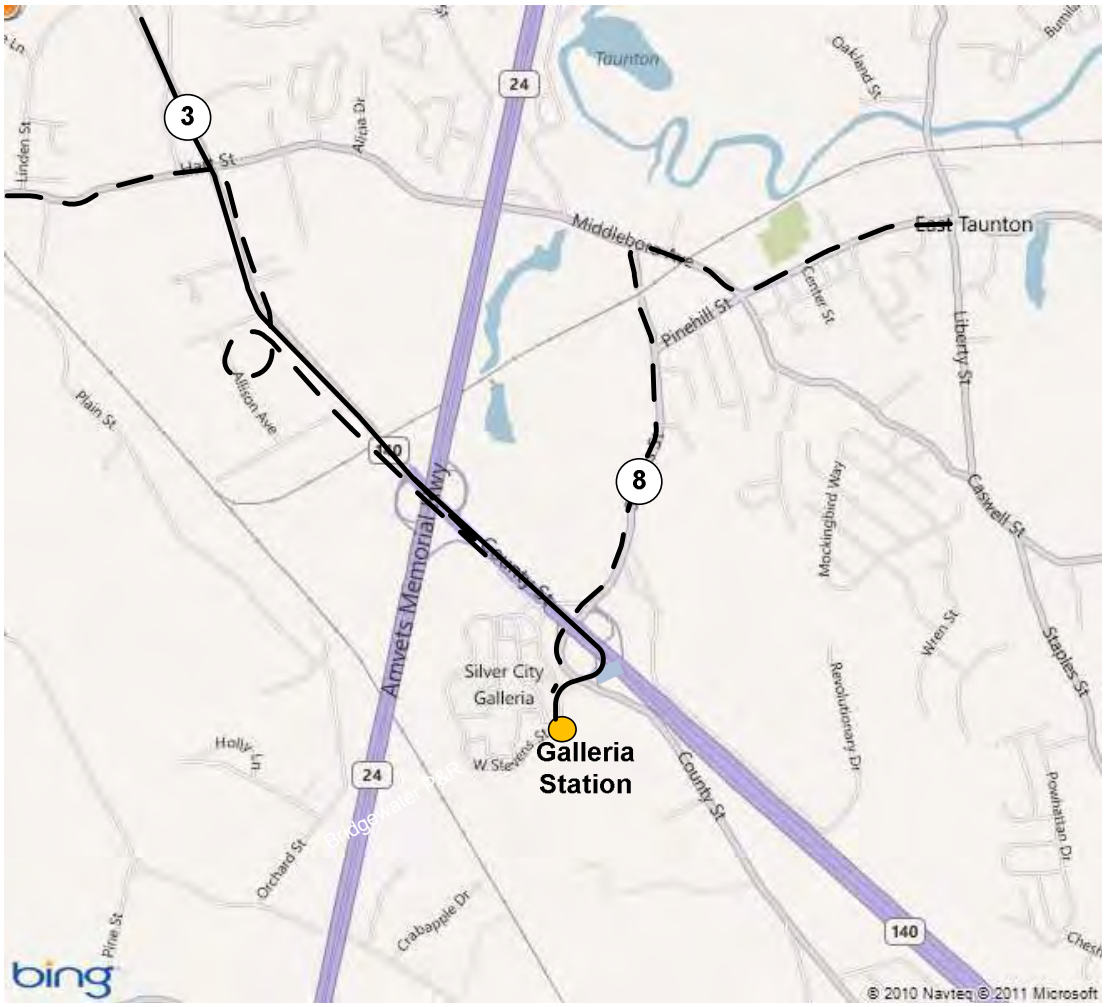
Source: MassGIS and VHB, Inc.

POTENTIAL RAIL STATION FEEDER BUS PROVISIONS

The Rapid Bus Alternative would serve the same station locations for the Whales Tooth, King's Highway Station, Fall River Depot, and Freetown Stations. The same feeder bus service would be provided. In addition stations would be provided at Galleria, Raynham and Easton with the Rapid Bus Alternative.

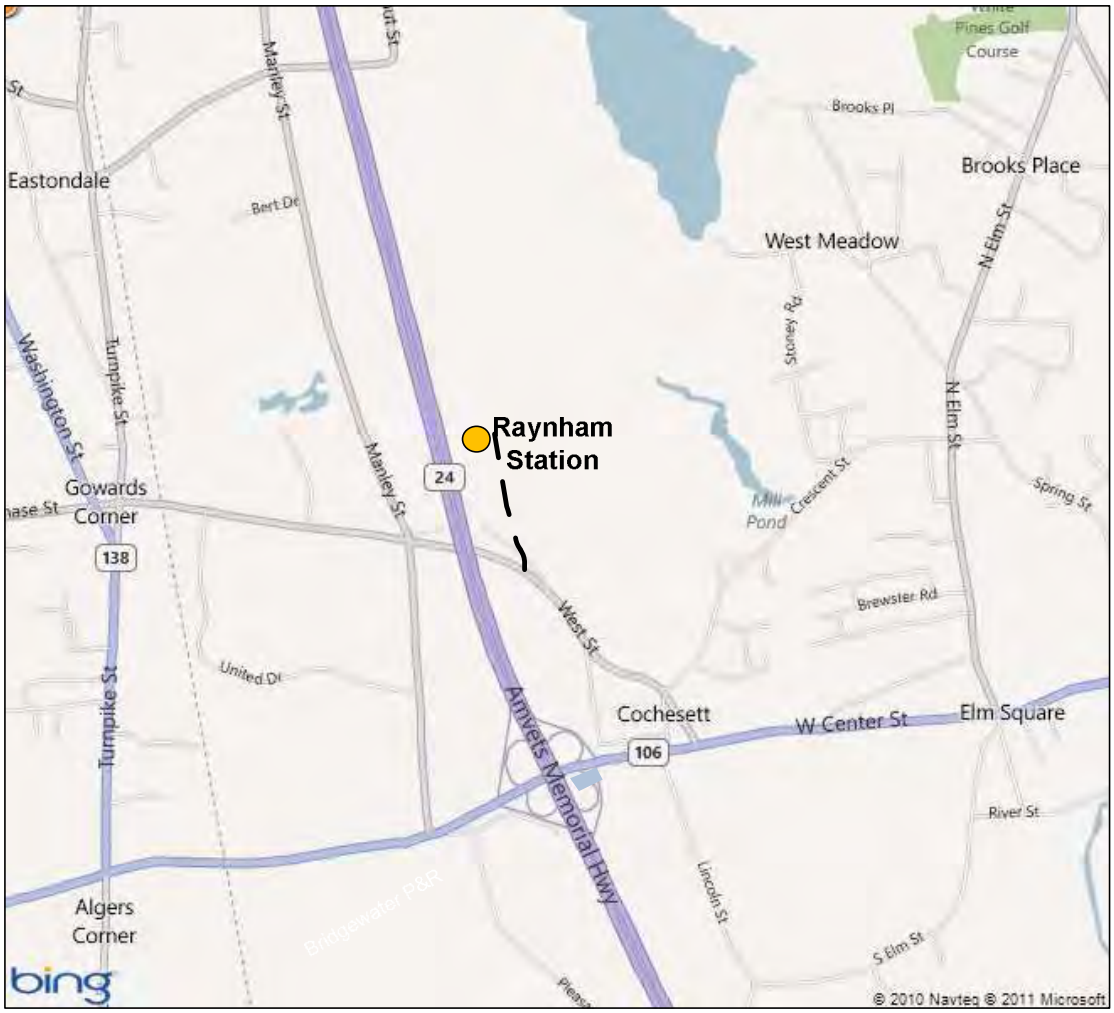
Galleria Station

The Galleria Station would be located in the current site of the bus park and ride in the Silver City Galleria site. Buses destined for South Station would originate at this station and proceed north on the Rapid Bus guideway to Raynham and Easton Stations before continuing to South Station. GATRA routes # 8 and 3 serve the mall and the park and ride



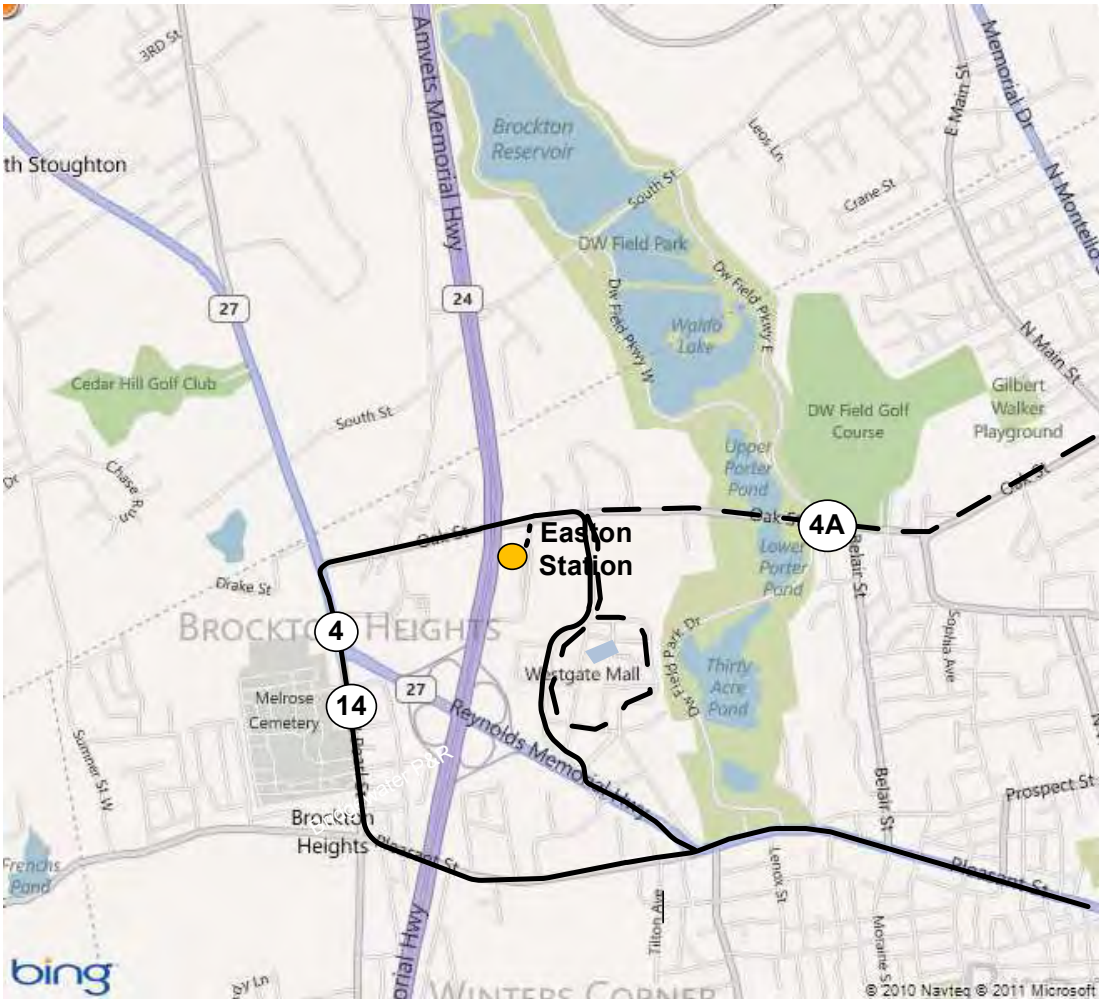
Raynham Station

The Raynham Station would be located off of West Street where it crosses under Route 24. An access road would be constructed to the station site which must be located as shown to avoid wetlands impacts. This would be an on-line station, with the Rapid Bus buses rising from the median guideway to access the elevated platforms of the station. There are no buses routes in the vicinity of this station site.



Easton Station

The Easton Station would be located north of Westgate Mall. This would also be an on-line station, with the Rapid Bus buses rising from the median guideway to access the elevated platforms of the station. BAT routes #4, 4A and 14 currently serve West Gate at the Dick's Sporting Goods store site. It is proposed that this route would be extended to the Rapid Bus Easton Station as shown in the following site map.



Appendix 3.2-B

Bridge Summary

Bridge Summary

1 New Bedford Mainline Bridges

1.1 No Work Bridges

The following is a list of bridge crossings (both undergrade and overhead) that would not require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

- Howland Road (M.P. 43.26) – Overhead
- Route 140 (M.P. 50.66) – Overhead
- Deane Street (M.P. 53.31) – Undergrade
- Sawyer Street (M.P. 53.57) – Undergrade
- Coggeshall (M.P. 53.67) – Undergrade
- Cedar Grove Street (M.P. 53.79) – Undergrade
- I-195 Ramp (M.P. 53.81) – Overhead
- Weld Street/Route 18 Ramp (M.P. 53.95) – Undergrade
- Logan Street (M.P. 54.01) – Undergrade

1.2 Bridges Requiring Rehabilitation or Reconstruction

The following is a list of bridge crossings (both undergrade and overhead) that require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

1.2.1 Taunton River (M.P. 35.56)

The bridge over the Taunton is a four-span structure carrying a single active track. One span consists of a steel plate thru girder structure, while the other three spans consist of steel stringers supporting a timber deck. The three piers are steel bents supported by HP piles.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and cannot accommodate the two tracks as currently proposed. The structure is envisioned to be a two-span, two-bay, ballasted steel plate thru girder superstructure carrying two sets of tracks. There would be three total girders, with two exterior and one common interior girder. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to reconnect the stream banks on either side of the bridge. The existing piles would be removed to one foot below grade.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, one bay of the new thru girder superstructure must be constructed adjacent to the existing thru girder structure. This will require that the Track 1 alignment be far enough away from the existing structure to allow construction of the first bay, maintaining horizontal clearance as necessary for erection and safe rail operation. The alignment of the second track would be determined by that of the first, as the two bays share the interior plate girder.

1.2.2 Brickyard Road (M.P. 35.79)

The bridge over Brickyard Road is a single-span, multiple steel stringer structure with an open deck. The west superstructure carries one active track. The east superstructure appears to be older and is not currently in service.

This bridge currently rates for Cooper E80 loading, but reconstruction is recommended to reduce future maintenance costs. The proposed structure is envisioned to be a single-span ballasted precast box girder superstructure carrying two sets of tracks. The existing stacked stone abutments could likely be reused but would require rehabilitation, as well as some geometric modifications to the backwalls and bearing areas.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). After the eastern superstructure is demolished, a portion of the new precast box girder superstructure must be constructed adjacent to the existing structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the Stage 1 track alignment as well as the final track alignments. The box girders would be transversely post-tensioned after each stage of new construction to ensure adequate distribution of structural live loads.

1.2.3 Route 24 (M.P. 37.69)

The Route 24 Bridge over the railroad right of way is a single-span reinforced concrete rigid frame structure carrying Route 24 Northbound and Southbound as well as a center median. The bridge currently crosses one active track.

The bridge requires reconstruction as it does not provide adequate horizontal clearance to accommodate the two proposed sets of tracks. A type study would be required to determine the preferred structure type. The demolition and construction would require coordinated staging of both Route 24 and the active railroad underneath.

1.2.4 Cotley River (M.P. 38.93)

The bridge over the Cotley River is a single-span steel plate girder structure currently carrying a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying two sets of tracks. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to recreate the stream banks on either side of the bridge.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing structure, maintaining horizontal clearance as necessary for erection and safe rail operation. Given the narrow width of the existing structure, this should not require greater track spacing than the minimum 14'-0" at any point during construction.

1.2.5 Cotley River (M.P. 39.46)

The bridge over the Cotley River is a single-span steel plate girder structure currently carrying a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying two sets of tracks. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to recreate the stream banks on either side of the bridge.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing structure, maintaining horizontal clearance as necessary for erection and safe rail operation. Given the narrow width of the existing structure, this should not require greater track spacing than the minimum 14'-0" at any point during construction.

1.2.6 Assonet River (Cedar Swamp)(M.P. 42.14)

The bridge over the Cedar Swamp River is a two-span timber girder structure currently carrying a single active track. The abutments and pier are timber bents founded on timber piles.

This bridge was replaced in 2011 with a new timber superstructure, timber pile caps, timber pile posts and back walls. However, the timber piles in the ground are original.

The current bridge rates for Cooper E78 loading. However, replacement can be considered to upgrade the foundation. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to reconnect the stream banks on either side of the bridge. The existing piles would be removed to one foot below grade.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing timber girder structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

1.2.7 Fall Brook (Freetown Brook)(M.P. 45.43)

The bridge over the Fall Brook is a single-span steel girder structure, currently carrying a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the brook's

average seasonal high water elevation. The space between the existing and proposed abutments would be graded to recreate the stream banks on either side of the bridge.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing steel girder structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

1.2.8 Route 18 (M.P. 54.17)

The bridge over Route 18 is a two-span thru plate girder structure supporting a ballasted deck. It currently carries a single active track. The abutments and pier are reinforced concrete.

The bridge requires reconstruction due to the proposed track alignment. . The proposed structure is envisioned to be a single-span ballasted steel plate thru girder superstructure carrying a single track. It is anticipated that new cast-in-place concrete abutments and pier would be required to accommodate the new track alignment.

It is assumed that track would be deactivated from Route 18 to the Terminus, allowing unimpeded construction along the segment.

1.2.9 Wamsutta Street (M.P. 54.21)

The bridge over Wamsutta Street and Acushnet Avenue is a three-span steel plate thru girder structure. The structure originally supported four superstructure bays, but the two western bays and half of the eastern interior bay have been removed. The eastern exterior bay, supported by two thru girders, carries the single active track across the bridge.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be single-span ballasted steel thru girder superstructure carrying one track. The existing southern gravity abutment and northern reinforced concrete abutment (shared with the Route 18 crossing) can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

It is assumed that track would be deactivated from Route 18 to the Terminus, allowing unimpeded construction along the segment.

2 Fall River Secondary Bridges

2.1 No Work Bridges

The following is a list of bridge crossings (both undergrade and overhead) that would not require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

- Route 24/79 (M.P. 45.58) – Undergrade
- South Main Street/Route 79 (M.P. 46.25) – Overhead
- Clark Street (M.P. 48.93) – Overhead
- Canedy's Underpass (M.P. 49.57) – Undergrade
- New Street (M.P. 49.81) – Overhead
- Western Expressway/Route 79 (M.P. 49.96) – Overhead
- Western Expressway Ramps (M.P. 50.06) – Overhead
- Weaver Street (M.P. 50.09) – Overhead
- Cove Street (M.P. 50.43) – Undergrade
- Clinton Street (M.P. 50.49) – Undergrade
- Brightman Street (M.P. 50.69) – Overhead
- Central Street (M.P. 52.05) – Overhead
- NB Ramp (M.P. 52.05) – Overhead
- SB Ramp (M.P. 52.06) – Overhead
- I-195 (M.P. 52.07) – Overhead
- Route 138 / Davol Street (M.P. 52.09) – Overhead
- Western Expressway, NB & SB (M.P. 52.09) – Overhead
- Anawan Street (M.P. 52.19) – Overhead

2.2 Bridges Requiring Rehabilitation or Reconstruction

The following is a list of bridge crossings (both undergrade and overhead) that require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

2.2.1 Cedar Swamp River (M.P. 41.51)

The bridge over the Cedar Swamp River is a three-span steel stringer structure supporting an open deck. The abutments and piers are stone masonry. It currently carries a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel plate thru girder superstructure, supported on pile supported, cast-in-place concrete abutments, carrying a single track. The existing concrete piers would be removed to two feet below the river's mud line elevation. The proposed abutments would be located behind the existing. The existing abutments would be partially removed to an elevation equal to the mean spring high tide, permitting the recreation of river bank on both sides of the bridge.

Due to the surrounding wetland resource areas, it is not feasible to construct a temporary track while the bridge is rebuilt. This would require constructing the proposed bridge within track outage windows. The following paragraphs describe the general construction methods and sequencing that would be used to construct the bridge:

1. Install Erosion Controls and Selective Trimming of Vegetation: Erosion controls (staked, embedded siltation fencing and/or hay bales) would be installed along the river banks at both ends of the bridge. Vegetation within the limit of work would be cleared and tree branches trimmed to prepare the work area. Any remaining ties or rail would be removed and disposed of in accordance with Massachusetts regulations.

2. New Bridge Substructure: The steel h-piles designed to support the bridge substructures would be installed outside the limits of the existing track and stone abutments. The substructure concrete would be installed during a track outage. The abutments would then be backfilled and the existing rail would be reinstalled.

3. New Bridge Thru-girders: The envisioned bridge consists of steel thru-girders, which would be located outside the limits of the existing bridge superstructure. Likewise, these girders would be installed onto the newly constructed bridge abutments without impacts to the existing track.

4. Realignment of Existing Track: The vertical alignment of the existing track would be realigned to match the proposed track profile in the vicinity of the bridge. This construction would occur within periodic track outages. Timber cribbing would be installed onto the existing steel stringers to raise the track profile to match the proposed.

5. New Superstructure Installation: Work associated with the installation of the new deck beams, ballast plate, new ballast and rail would all occur within

periodic track outages. This portion of the construction sequencing would focus on small (approx. 20ft) sections of track at a time. These sections would correspond to the existing bridge's span configuration.

a. Between days of active rail, the newly realigned tracks, ties, cribbing and a portion of the bridge superstructure would be removed. New floor beams would be installed, timber cribbing would be reinstalled onto the new floor beams, and track would be installed and reconnected, all in time for track service to resume. This process would repeat until the entire existing bridge had been removed.

b. Then, the staging process would repeat. In sections, the track and timber cribbing would be removed and new steel ballast plate, membrane waterproofing, and ballast would be installed. New rail would be installed and connected to the existing to allow track service to resume. This process would repeat until the new bridge construction was complete.

2.2.2 Farm Road (M.P. 46.53)

The bridge over Farm Road is a single-span steel stringer structure supporting an open deck. It currently carries a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. The existing stacked stone abutments can likely be reused but must be rehabilitated and widened to accommodate the new, wider superstructure.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing steel stringer structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

2.2.3 Farm Road (M.P. 47.75)

The bridge over Farm Road is a single-span steel stringer structure supporting an open deck. It currently carries a single active track.

The bridge does not rate for Cooper E80 loading. Given that the road spanned by the bridge is abandoned, the bridge can be filled in. The culvert through the south abutment would be maintained / rehabilitated.

2.2.4 Golf Cart Road (M.P. 47.90)

The Golf Cart Road is currently a grade crossing.

The proposed overhead bridge is envisioned to be a single-span concrete deck supported on steel stringers. The bridge would be designed to support only pedestrian traffic as well as emergency vehicles only. The abutments would most likely consist of cast-in-place reinforced concrete.

2.2.5 Golf Club Road (M.P. 48.11)

The Golf Club Road Bridge over the railroad right of way is currently a three-span steel thru girder structure.

The bridge requires reconstruction because the existing piers obstruct the proposed horizontal alignment. The proposed overhead bridge is envisioned to be a single-span steel stringer superstructure supporting a concrete deck. The structure accommodates two 11′-0″ lanes as well as a single 5′-0″ sidewalk. New cast-in-place concrete abutments are likely to be required, due to the current condition of the existing abutments and increased loading due to the proposed longer span.

2.2.6 Miller's Cove Road (M.P. 48.62)

The bridge over Miller's Cove Road is a single-span, ballasted, reinforced concrete slab bridge. It carries one active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. The existing stacked stone abutments with concrete facing are in poor condition. New cast-in-place concrete abutments are likely to be required, due to the current condition of the existing abutments.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing reinforced concrete structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

2.2.7 Collins Road (M.P. 49.06)

The bridge over Collins Road is a single-span thru girder structure with an open deck. The structure originally consisted of two bays, but only the eastern bay remains, carrying a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and provides inadequate horizontal clearance. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. The existing stacked stone abutments can likely be reused but require rehabilitation and widening to support the wider superstructure.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing thru girder structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

2.2.8 Ashley's Underpass (Ashley Street)(M.P. 49.21)

The bridge over the dirt path near Ashley Street is a single-span, timber stringer structure with an open deck. A timber bent has been added adjacent to the south abutment. It currently carries one active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and provides inadequate horizontal clearance. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. The existing stacked stone abutments can likely be reused but require rehabilitation and widening to support the wider superstructure.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing timber stringer structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

2.2.9 Brownell Street (M.P. 51.03)

The bridge over Brownell Street is a single-span thru girder structure with an open deck. The structure consists of two bays, but only the west bay currently carries active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and provides inadequate horizontal clearance. The proposed structure is envisioned to be a single-span ballasted steel tub superstructure carrying a single track. The existing stone masonry abutments can likely be reused but would require

rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure must be constructed adjacent to the existing thru girder structure, maintaining horizontal clearance as necessary for erection and safe rail operation. This would require that the final superstructure be wide enough to support the stage one track alignment as well as the final track alignment.

2.2.10 President's Avenue (M.P. 51.11)

The bridge over President's Avenue is a two-span thru girder structure with an open deck and steel pier. The structure currently consists of two bays, but only the west bay currently carries active track. A third bay to the west has been removed.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and provides inadequate horizontal clearance. The proposed structure is envisioned to be a single-span ballasted steel plate thru girder superstructure carrying a single track. The existing stone masonry abutments can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

The construction staging of this bridge would follow the typical sequence for single existing track, single proposed track scenarios (see Alternatives Description Section 4.3). Move the active track to the eastern bay. Demolish the western bay and construct a new thru girder structure. Move the active track to the new structure in the western bay and demolish the eastern bay.

2.2.11 Pearce Street (M.P. 51.20)

The bridge over Pearce Street was recently reconstructed as part of an early action project. The bridge consists of a single-span ballasted steel tub superstructure carrying a single active track. The bridge originally consisted of two bays.

The bridge requires construction as there are currently two sets of tracks proposed over Pearce Street. The existing structure would be widened using the same ballasted steel tub construction as the existing structure. The existing stone masonry abutments were rehabilitated during previous construction, but may have to be modified to accommodate the additional width of the proposed superstructure.

The widening of the superstructure should be able to take place with minimal disturbance to rail traffic.

2.2.12 Turner Street (M.P. 51.40)

The bridge over Turner Street was recently reconstructed as part of an early action project. The bridge consists of a single-span ballasted steel tub superstructure carrying a single active track. The bridge originally consisted of three bays.

The bridge requires construction as there are currently two sets of tracks proposed over Pearce Street. The existing structure would be widened using the same ballasted steel tub construction as the existing structure. The existing stone masonry abutments were rehabilitated during previous construction, but may have to be modified to accommodate the additional width of the proposed superstructure.

The widening of the superstructure should be able to take place with minimal disturbance to rail traffic.

2.2.13 Channel near Battleship Cove (M.P. 52.38)

The bridge over the channel near the proposed Battleship Cove Station is a three-bay single span open deck timber girder structure currently carrying a single in-active track. The east and west bays are abandoned with the rails partially removed.

As this bridge lies just south of the platform at the proposed Battleship Cove Station, it is currently assumed that the bridge would be reconstructed to carry a single track. Further investigation is required to evaluate the preferred structure type as the current structure would be need to be replaced to carry any service.

Construction on this bridge can proceed unimpeded, as there is currently no active rail within the limits of work.

3 Stoughton Line Bridges

3.1 No Work Bridges

The following is a list of bridge crossings (both undergrade and overhead) that would not require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

- Revere Street (M.P. 15.21) – Undergrade
- I-495 (M.P. 30.48) – Overhead
- Summer Street (M.P. 34.80) – Overhead
- High Street (M.P. 35.00) - Overhead

3.2 Bridges Requiring Rehabilitation or Reconstruction

The following is a list of bridge crossings (both undergrade and overhead) that require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

3.2.1 Forge Pond (M.P. 15.79)

The bridge over Forge Pond is a single-span structure consisting of two earth filled arches adjacent to each other. The east arch is constructed of ashlar stone masonry and the west arch is a composite of a concrete ring at the bottom and a stone masonry ring on the top. The structure currently carries one active track.

The existing arch structure appears in relatively good condition, but its load carrying capabilities, especially with the loading of two sets of tracks as proposed, are unknown. The arch structure is historically significant. The proposed structure is envisioned to be a ballasted precast, prestressed concrete superstructure, supported by augered piles or drilled shafts. The intent is to span over the existing arch with the proposed superstructure, preventing loads from being transferred to the arch.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). The first half of the superstructure would be constructed over the arch at the proposed raised profile grade. After rail traffic has been diverted to the new bridge, the profile can be raised for the remainder of the rail bed and bridge construction can be completed. The superstructure would be transversely post-tensioned after each stage of new construction to ensure adequate distribution of structural live loads.

3.2.2 Bolivar Street (M.P. 16.11)

The bridge over Bolivar Street is a single-span thru girder structure with an open deck. The structure originally supported two sets of tracks, but currently consists of only a single superstructure bay, carrying active rail.

The bridge requires reconstruction as it does not rate for Cooper E80 loading and does not provide adequate vertical clearance over the roadway below. The proposed structure is envisioned to be a ballasted steel tub superstructure carrying two sets of tracks. The existing stacked stone abutments can likely be partially reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track, scenarios (see Alternatives Description Section 4.3). During the first stage, a portion of the new steel tub superstructure would be

constructed adjacent to the existing thru girder structure while providing adequate horizontal clearance for erection and safe rail operation. This would require that the final superstructure be designed wide enough to accommodate the stage one track alignment as well as the final track alignments.

3.2.3 Mill Brook (M.P. 16.56)

The bridge over Mill Brook is a single-span, earth filled, ashlar stone masonry arch structure. The structure currently carries one active track.

The existing arch structure appears in relatively good condition, but its load carrying capabilities, especially with the loading of two sets of tracks as proposed, are unknown. The arch structure is historically significant. The proposed structure is envisioned to be a ballasted precast, prestressed concrete superstructure, supported by augered piles or drilled shafts. The intent is to span over the existing arch with the proposed superstructure, preventing loads from being transferred to the arch.

The construction staging of this bridge would follow the typical sequence for single existing track, two proposed track scenarios (see Alternatives Description Section 4.3). The first half of the superstructure would be constructed over the arch at the proposed raised profile grade. After rail traffic has been diverted to the new bridge, the profile can be raised for the remainder of the rail bed and bridge construction can be completed.

3.2.4 Coal Yard Road (M.P. 19.07)

The bridge over Coal Yard Road is a single-span multiple steel stringer structure with an open deck. The structure originally supported three superstructure bays, but the easternmost bay has been removed. The remaining bays both carry active rail.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a ballasted precast box girder superstructure carrying two sets of tracks. The existing stacked stone abutments can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

The construction staging of this bridge would follow the typical sequence for two existing track, two proposed track scenarios (see Alternatives Description Section 4.3). The superstructure would be transversely post-tensioned after each stage of new construction to ensure adequate distribution of structural live loads.

3.2.5 Totman Farm Road (M.P. 20.85)

The bridge over Totman Farm Road is no longer in service and had its superstructure removed approximately 15 years ago. Only portions of the existing stacked stone abutments remain.

The proposed structure is envisioned to be a ballasted steel tub superstructure carrying two sets of tracks. New cast-in-place concrete abutments are likely to be required, due to the current condition of the existing abutments.

Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work.

3.2.6 Day's Farm Road (M.P. 21.57)

The bridge over Day's Farm Road is a single-span stringer structure with an open deck. The bridge carries a single inactive track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a ballasted steel tub superstructure carrying two sets of tracks. The existing stacked stone abutments can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work.

3.2.7 Cowessett Brook (M.P. 21.75)

The bridge over Cowessett Brook is a single-span steel stringer structure with an open deck. The single bay does not currently carry active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a ballasted steel tub superstructure carrying two sets of tracks. New abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the brook's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to reconnect the stream banks on either side of the bridge.

Construction on this bridge could proceed unimpeded, as there is currently no active rail within the limits of work.

3.2.8 Pond Street (M.P. 22.80)

The bridge over Ames Street is a single-span thru girder structure with an open deck. Two independent and identical superstructures each carry one inactive track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a ballasted steel tub superstructure carrying one track. The existing stacked stone abutments can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work.

3.2.9 Small Creek (M.P. 22.84)

The bridge over Small Creek is a single-span steel stringer structure with an open deck. Two independent superstructures carry one inactive track each and are supported by common, stacked stone, abutments.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a ballasted precast box girder superstructure carrying one track. The existing stacked stone abutments can likely be reused but would require rehabilitation to accommodate the increased loads, as well as some geometric modifications to the backwalls and bearing areas.

Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work.

3.2.10 Main Street (M.P. 22.93)

The Main Street Bridge over the railroad right of way has been filled in. The retaining walls in the depressed corridor leading to the bridge were left in place, and it is assumed that the bridge abutments were left in place as well. The bridge is located within the Town of Easton's Historic District.

Given the current existing roadway and railroad profiles, vertical clearances would not be adequate under the bridge. In order to provide adequate vertical clearance, the railroad profile would need to be lowered and the roadway profile would need to be raised. This increase in the roadway profile would be designed to minimize any potential negative impacts to historical resources. It is anticipated that new abutments would be required. They would be located to minimize the bridge's clear span, minimizing the required structure depth. Depending on how deep the railroad profile must be lowered, new retaining walls may need to be constructed in front of the existing walls to achieve the required grades. A type study would be required to

determine the preferred bridge type. The bridge would be a single-span over one track.

3.2.11 Bridge Street (M.P. 23.27)

The Bridge Street bridge over the railroad right of way has been filled in.

A type study would be required to determine a preferred structure type. The construction of the bridge would require staging if traffic is to be maintained on the roadway.

The construction staging of this bridge would follow the typical sequence for roadway bridges (see Alternatives Description Section 4.3).

3.2.12 Hockomock Swamp Trestle (M.P. 26.17)

The Hockomock Swamp trestle would start at approx. STA 1425+00, end at approx. STA 1510+00 and consist of a multi-span, ballasted superstructure supported by deep foundations.

The construction of the proposed trestle through the Hockomock Swamp ACEC is detailed in the Hockomock Swamp Trestle "FEIS/FEIR Technical Report".

3.2.13 Bridge Street (M.P. 30.20)

The Bridge Street bridge over the railroad right of way is a single-span structure of unknown type.

The bridge requires reconstruction as it does not provide the required horizontal clearance to accommodate two sets of tracks underneath, as proposed. A full type study would be required to properly determine a preferred structure type.

3.2.14 Route 138 Grade Separation (M.P. 31.31)

When in service, the intersection at Route 138 was a grade crossing. There is currently no rail through the intersection.

At Route 138, the proposed treatment of the intersection is to create a grade separation, depressing the track profile as required provide adequate vertical clearance under the bridge. This would improve safety and reduce traffic congestion. The lowering of the profile would require construction of retaining walls leading up to the structure on both sides. A full type study would be required to properly determine a preferred structure type. The construction of the bridge would be staged as to maintain traffic and to minimize impacts to abutters.

3.2.15 Thrasher Street (M.P. 33.33)

The Thrasher Street Bridge over the railroad right of way has been filled in. It is unknown whether the existing abutments or any retaining walls remain in place.

A type study would be required to determine the preferred structure type. The construction of the bridge would require staging if traffic is to be maintained on the roadway. The bridge would span over one track.

3.2.16 Construction Sequencing of Taunton River and Mill River Bridges:

The reconstruction of the Taunton River and Mill River bridges are complex in that they are located within an environmentally sensitive area, are not readily accessible by roadway, and are generally long span bridges. It is assumed that the track would be deactivated, as necessary, from Dean Street to Weir Junction, which would allow unimpeded construction along this segment of rail. Access to the bridges on the Taunton River would be accomplished with a combination of rail-mounted and barge-mounted cranes, as well the utilization of roadway access from Dean Street and Summer Street. The following paragraphs describe the general construction methods and sequencing that would be used to construct the bridges:

1. Install Erosion Controls and Selective Trimming of Vegetation: Erosion controls (staked, embedded siltation fencing and/or hay bales) would be installed along the river banks at both ends of the bridges. Vegetation within the limit of work would be cleared and tree branches trimmed to prepare the work areas. Any remaining ties or rail would be removed and disposed of in accordance with Massachusetts regulations.

2. Relocation of Existing Water Main: A 20-inch insulated water main is currently supported on the southern side of the bridges. The water main travels parallel to the existing railroad bed across all three Taunton river bridges and the Mill river bridge as well. This water main would need to be temporarily relocated prior to the demolition of the existing bridges. It is envisioned that the water main would be supported during construction operations by means of temporary utility bridges, located within close proximity to the railroad bridges. This would allow unfettered access to the bridges during construction, while minimizing disturbances to the water supply.

3. Demolition of Existing Bridges: The existing bridge superstructures would be completely removed and the existing steel h-pile foundations would be partially removed to approx. two feet below the river's mud line elevation.

4. New Bridge Substructure: The 2-span bridges are envisioned to be supported by deep foundations, i.e. steel h-piles or drilled shafts.

Installation of the deep foundation system would occur at both abutments and the center pier. It is anticipated that a cofferdam would be required to install the pile foundations and to construct the cast-in-place concrete center pier in the dry. The bridge abutments would be constructed and the existing abutments would be partially removed.

5. New Bridge Superstructure: The bridge superstructures are envisioned to consist of welded steel plate girders, arranged in a thru-girder configuration. The girders would be delivered to the bridge sites via barges and installed onto the bridge foundations. The deck beams and ballast plates wound then be installed.

6. Install New Ballast and Track: After placement of the steel ballast plates, installation of ballast and rail can commence in conjunction with off-bridge rail installation.

7. Relocation of Existing Water Main: In conjunction with the installation of ballast and rail, the existing water main would be relocated onto the new bridge superstructures. At this time, the temporary utility bridges would be permanently removed.

3.2.17 Taunton River (M.P. 34.38)

The bridge over the Taunton River at M.P. 34.38 is an open deck steel trestle structure consisting of one main span with three approach spans to the North and seven approach spans to the South. The main span consists of two steel plate girders. The approach spans consist of timber stringers. The girders and beams are supported on steel bents with HP piles. The bridge carries one active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a two-span, ballasted steel thru girder superstructure carrying a single track. The existing piles would be removed to two feet below grade and a new, pile supported, cast-in-place concrete pier would be constructed in the center of the span. New cast-in-place concrete abutments would be constructed behind the existing timber crib abutments, increasing the span length of the bridge. The existing abutments would then be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be regraded to recreate the river banks on either side of the bridge.

3.2.18 Taunton River (M.P. 34.62)

The bridge over the Taunton River is an open deck trestle structure consisting of one main span with nine approach spans to the North and six approach spans to the South. The main span consists of two steel plate girders. The approach spans consist

of timber stringers. The girders and beams are supported on steel bents with HP piles. The bridge carries one active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a two-span, ballasted steel thru girder superstructure carrying a single track. The pile would be removed to two feet below grade and a cast-in-place concrete pier would be constructed in the center of the span. New cast-in-place concrete abutments would be constructed behind the existing timber crib abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to recreate the stream banks on either side of the bridge.

3.2.19 Taunton River (M.P. 34.73)

The bridge over the Taunton River is an open deck trestle structure consisting of 17 spans spaced variably. The spans consist of two timber stringers supporting a timber deck. The longitudinal beams are supported on steel bents with HP piles. The bridge carries one active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a two-span, ballasted steel thru girder superstructure carrying a single track. The piles would be removed to two feet below grade and a cast-in-place concrete pier would be constructed in the center of the span. New cast-in-place concrete abutments would be constructed behind the existing timber crib abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to recreate the stream banks on either side of the bridge.

3.2.20 Mill River (M.P. 34.90)

The bridge over the Mill River is a single-span steel plate girder structure carrying a single active track.

The bridge requires reconstruction as it does not rate for Cooper E80 loading. The proposed structure is envisioned to be a single-span, ballasted steel tub superstructure carrying a single track. New cast-in-place concrete abutments would be constructed behind the existing abutments, increasing the span length. The existing abutments would be partially removed to an elevation equal to the river's average seasonal high water elevation. The space between the existing and proposed abutments would be graded to reconnect the stream banks on either side of the bridge.

4 Whittenton Branch Bridges

4.1 No Work Bridges

There are no bridges (both undergrade and overhead) that do not require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project:

4.2 Bridges Requiring Rehabilitation or Reconstruction

The following sections describe the bridge crossings (both undergrade and overhead) that require rehabilitation or reconstruction as part of the currently envisioned South Coast Rail project.

4.2.1 King Phillip Street (M.P. 32.16)

The bridge over King Phillip Street is no longer in service and its superstructure was removed at some point in the past. The full height existing granite block masonry abutment and wingwalls are still in place and are set right at the edge of the roadway.

The existing roadway width between the abutments is 20 feet, and there are no sidewalks. The height from the roadway to the existing abutment bridge seat is 11′-0″. This bridge requires complete replacement, because the existing abutment configuration does not provide adequate lateral or vertical clearance.

There are two options for the single track single span superstructure types that are dependent on the selection of the new abutment types.

Option 1: A 47′-7″ span with full height concrete abutments, a ballasted steel tub girder superstructure with 4 - 32″ deep girders and a total structure depth of 5′-4″.

Option 2: A 100′-9″ span with concrete stub abutments, a ballasted steel through girder superstructure with 2 – 7′-6″ deep through girders and a total structure depth of 4′-7″.

The roadway will be widened to meet current standards for local roads and to include a sidewalk, and the clearance will be increased from 11′-0″ to 14′-6″. Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work.

4.2.2 Bay Street (31.58)

The bridge carrying Bay Street over the Railroad right-of-way has been removed and filled in. It is unclear whether any substructure remains, although there are no visible signs of existing abutments or retaining walls. The new bridge will maintain the existing lane configuration for Bay Street, with two traffic lanes and two sidewalks over a single track.

It is anticipated that the new rail profile will need to be set from 4 to 5 feet below existing grade in order to achieve a minimum vertical clearance of 18'-6". This will likely require some low retaining walls along the railroad approaches. The MBTA preferred minimum lateral clearance to continuous obstructions is 12'-0". Using a 24'-0" overall lateral clearance, two different span lengths are feasible.

Option 1: A 29'-3" span with full height concrete abutments aligned with the approach retaining walls. The minimum structure depth for this span length would be approximately 2 feet ' for a concrete deck on steel stringers.

Option 2: A 63'-7" span with concrete stub abutments set at the limits of the right-of-way, behind the short railroad retaining walls. The minimum structure depth for this span length would be approximately 3 feet for a concrete deck on steel stringers.

Construction on this bridge can proceed unimpeded as there is currently no active rail within the limits of work. The bridge would be constructed in phases to maintain alternating one way traffic.

4.2.3 Mill River (M.P. 32.16)

The existing bridge is a seven-span concrete slab bridge carrying the Railroad right-of-way over the Mill River. The bridge had been converted to a trail bridge and is currently closed due to severe deterioration of the piers. The existing structure is roughly 100 feet long with a skewed concrete west abutment and square stone east abutment. Some of the concrete piers are severely deteriorated. The structure requires complete replacement due to the condition of the substructure and insufficient load capacity of the superstructure.

The abutments for the proposed structure will be set behind the existing abutments, resulting in a span length of roughly 120 feet. The river banks would be restored in front of the new abutments. As the six existing piers will be removed, it is assumed that a single pier located within the river is acceptable. This would result in a two-span structure with each span length around 60 feet. The existing piers and east abutment are square to the right-of-way at a slight bend in the river. All proposed substructure elements will be skewed at roughly 25 degrees to closely match the alignment of the river at the bridge location. The bottom of proposed structure will match the bottom of existing in order to maintain the hydraulic opening. The

existing structure is approximately 3′-6″ deep on the northern fascia and 4′-10″ deep on the southern fascia due to the curvature of the right-of-way. According to FEMA data, the 100-year flood elevation at this location is around elevation 51.4, approximately 3 feet below the proposed bottom of structure.

Two superstructure types are suitable for the possible span configurations:

Option 1: A 120-foot single span with concrete stub abutments. This span length would require a ballasted deck steel thru girder structure with an approximate top of rail to bottom of structure depth of 5′-5″.

Option 2: Two 60-foot spans with concrete stub abutments and a concrete center pier located within the river. For this alternative, a ballasted deck steel tub girder section could be used with an approximate top of rail to bottom of structure depth of 5′-10″. A steel thru girder structure could be used for this span configuration as well, with an approximate top of rail to bottom of structure depth of 5′-5″. The tub girder structure would be preferable to the thru girder as the thru girders are not structurally redundant and do not allow flexibility to realign the track or widen the bridge in the future.

Demolition of the existing structure and construction of the new railroad bridge can proceed unimpeded as there is currently no active rail within the limits of work.

Appendix 3.2-C

Hockomock Trestle Memorandum

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

99 High Street
Boston, Massachusetts 02110
617 728-7777
FAX 617 728-7782

Memorandum

To: File

Date: May 10, 2012

Project No.: 10111

From: Kristofer Kretsch, P.E.

Re: South Coast Rail
Hockomock Swamp Trestle

EXECUTIVE SUMMARY

This document specifically responds to the requirements of the Secretary's Certificate on the DEIR which states: "The FEIR should evaluate the engineering feasibility of constructing the proposed trestle in wetland soils … The FEIR should also discuss how access will be achieved for any maintenance or emergency situations along portions of the rail ROW, including sections of the rail located in the Hockomock and Pine Swamps." This report summarizes the concepts evaluated for constructing a trestle structure through the Hockomock Swamp between Foundry Street (MP 11.8) in Easton, MA and Race track Crossing (MP 14.10) in Raynham, MA. The proposed trestle is to be constructed through the swamp on the existing MBTA right-of way. Consideration of the trestle type and materials included evaluation to impacts to the sensitive areas adjacent to the right-of-way as well as construction cost and maintenance.

A subsurface soil exploration was performed as part of the evaluation to identify appropriate foundation types. Driven steel H-piles are suitable to the site, and steel pile pier bents are recommended to minimize impacts associated with excavation and hauling.

The superstructure types considered consisted of common steel and concrete structures and prefabricated concrete arch units. Steel deck beam and through girders and prestressed concrete box beams and Northeast Extreme (NEXT) beams were evaluated for cost, ease of construction and maintenance. Consideration was also given to maximizing span lengths to minimize the number of piers to be constructed. Prestressed concrete boxes were found to be the most cost effective, offered a range of workable span lengths, and require the least amount of maintenance. Steel structures offer longer span lengths, but they are more costly and require more maintenance. The concrete arch option is more costly than the prestressed beams, and physical limitations with the arch design would require the trestle to be constructed at an excessively higher elevation than the other alternatives resulting in more impacts associated with constructing longer approaches.

Additional consideration was given to prefabricated superstructure and substructure elements. Using prefabricated elements reduces construction time and impact associated with forming, trucking and placing cast-in-place concrete.

Access for construction would be from the north at Foundry Street and from the south from Race track Crossing. Construction of the trestle would require equipment working at grade within the right-of-way as the piles are installed. As the superstructure is erected, all work can be completed with equipment working from the superstructure as it is installed.

INTRODUCTION

Purpose of This Technical Report

This technical report was prepared to address the requirements of the Secretary's Certificate on the Draft Environmental Impact Report concerning the design, construction, and operations of the proposed Hockomock Swamp trestle.

Requirements of the Secretary's Certificate

The Certificate required that the Final Environmental Impact Report specifically address the impacts of the trestle related to infrastructure, access roads, construction, and on-going maintenance.

Comments on the DEIS/DEIR

Other comments on the DEIS/DEIR related to the Hockomock Trestle concerned engineering and construction methods, the design of the trestle, the relationship of subsurface soil conditions to the design, and the feasibility and cost of construction. In addition, commentors were concerned with the width of canopy clearing, on-going vegetation management, and emergency access.

TRESTLE DESIGN AND CONSTRUCTION

Soil Conditions

A subsurface exploration program was conducted by Jacobs Engineering Group, Inc. in February 2012 for the purposes of providing preliminary geotechnical recommendations for the trestle structure. Jacobs issued a design geotechnical memorandum presenting the findings of the program and resulting foundation recommendations. As part of the program, nine borings were drilled along the proposed trestle alignment, with an additional three borings drilled along the approaches.

The subsurface conditions encountered generally consisted of a layer of granular fill with thickness of about 0 to 3 feet, underlain by natural, loose to dense stratified silt and sand deposits, and very dense glacial till. A thin 2 to 7-foot thick layer of organic silt was encountered in the upper 5 to 10 feet of soil in almost all of the trestle borings. The top of bedrock was typically encountered at depths ranging from 39 to 66.5 feet depth along the trestle borings. Groundwater level readings at termination of drilling were consistently at 3.5 to 6 feet depth along the trestle borings.

Various alternatives were investigated to support the trestle foundations. Preliminary foundation type selection took into account soil conditions and shear strength of near surface soils, and depth to bedrock. Spread footing foundations were discounted due to the loose to medium dense strength consistency of the upper overburden soils. Due to the high groundwater level and variable depth to bedrock, it does not appear that drilled shafts are a cost effective alternative compared to driven piles. The proposed trestle bents are recommended to be founded on driven steel H-piles bearing on the underlying bedrock.

Trestle Design

As discussed above, the recommended foundation type for the trestle is driven steel H-piles bearing on the underlying bedrock. Jacobs' geotechnical memorandum recommends that two rows of piles be used at each pier, which results in a roughly 10-foot wide pier cap.

The structure would be approximately 20 feet wide at single track locations to accommodate the track and walkway. The structure would be wider at one location (between stations 1462+00 and 1468+00) to accommodate a track turnout with a second parallel track to accommodate maintenance vehicles. Per MBTA requirements, the minimum lateral clearance from centerline of track to continuous obstruction is 8.5 feet, while the minimum lateral clearance between track centerlines at two-track locations is 13 feet. The structure would be 37 feet wide in this two-track

section. In order to allow large mammal passage under the trestle, the minimum vertical clearance above the existing grade would be 5 feet.

Preliminary superstructure type selection took into account potential environmental impacts, construction cost, and overall constructability. The analysis assumed that the structure would have a ballasted deck and carry one track along the majority of the structure. The trestle would be designed to carry Cooper E-80 loading.

The trestle would need to accommodate catenary supports as well, which can be spaced at a maximum of 200 feet on center. The simplest way of supporting these poles would be at the pile cap, which would require that some piers be lengthened by 3 to 4 feet.

Precast or prefabricated elements are desirable for construction in the swamp to minimize impacts associated with forming, delivering and placing cast-in place concrete construction. Precast/prefabricated elements include pile caps, superstructure elements, deck slab panels and ballast retainers.

Several different superstructure alternatives were investigated for the trestle including prestressed concrete NEXT beams, adjacent prestressed concrete box beams, prestressed concrete arches, steel plate deck girders, and steel plate thru girders.

It is desirable to maximize span lengths in order to minimize the number of piers. Of the alternatives considered, steel plate girders and thru girders can be used to achieve the longest span lengths, but at significantly higher construction costs when compared to the concrete alternatives. The steel girders would also have much higher life cycle costs and possible future environmental impacts due to deterioration of the steel. Prestressed concrete box beams can achieve longer spans and are more cost effective than concrete NEXT beams or prestressed concrete arches. The box beams can be used for span lengths up to 50 feet.

Considering environmental impact, cost, and constructability, the recommended alternative is adjacent prestressed concrete box beams with 50-foot spans. The overall construction cost for this alternative is roughly $50,900,000.

Trestle Construction

Due to the sensitivity of the surrounding environment, construction methods should be used which minimize impacts outside the existing railroad bed. The construction activities would be performed within the constraints of a set boundary either side of the working area. This boundary would be defined by the installation of sedimentation and erosion controls along the existing railroad embankment.

The construction site can be accessed from the north through Foundry Street and from the south through Raynham Park. Raynham Park to the south is a likely candidate for a laydown area. To the north, there is a possible limited laydown area along the right-of-way, outside the limits of the swamp (adjacent to the Southeast Regional Vocational-Technical High School). Throughout construction, the site would be accessed only from the north and south ends, within the construction boundaries defined along the existing railroad right of way.

Construction Sequencing

Generally, the sequence of construction would utilize at least two crews per operation, working on the north and south halves of the trestle concurrently. Precast concrete elements including pile caps, deck slabs, and box beams can be utilized in order to expedite the construction process and minimize trucking and clean out areas associated with cast-in-place operations. The envisioned construction sequencing would consist of:

- Install erosion controls and selective trimming of vegetation
- Earthwork and construction of infiltration trenches
- Install piles and pile caps: Starting from the center of the Trestle and working back to

both ends, piles would be driven and pile caps installed by two separate work crews. Construction equipment would be working from existing grade within the erosion controls constructed at the right-of-way limits. Each crew would work from a separate laydown area on each end of the Trestle. In order to expedite the installation, the pile caps can be precast concrete, set on the piles and grouted into place. Each pile cap would be installed prior to the driving of piles at the next pier in order to avoid obstructing the movement of construction equipment on the embankment.

- Install trestle box girders: Once pile and pile cap construction is completed, the concrete box beams can be installed. This can also be done using two separate crews starting at both ends of the structure. Transverse post-tensioning of the box beams would be performed at this time to allow construction traffic access over the trestle. After the first span superstructure is erected, the beams in each subsequent span can be lifted in place using a crane located on top of the new structure.
- Install concrete deck: Once the box beams are installed, the contractor can install the concrete deck. This can be done either as the beam erection progresses, or once all beams of the trestle are erected. Precast deck panels may be used to expedite the process.
- Install ballast, track, signal cables, and power

The final step would be to install the ballast, track, signal cables, catenary wire and supports, and any ancillary items. The deck drain system would be installed prior to the ballast and linked to the infiltration trenches.

OPERATIONS AND MAINTENANCE

Access

Access for operations and maintenance would be from the trestle structure. There is a track turnout proposed on the superstructure for maintenance vehicles. Areas below the superstructure can be accessed from each of the piers with a ladder. There is no need for vehicular access at ground level.

Maintenance Activities

Routine maintenance for the trestle structure includes bi-annual bridge inspections in accordance with AREMA inspection guidelines, using ladders. All concrete and masonry structures and components should be given thorough, detailed inspections at scheduled intervals. A record of physical conditions should be kept. A special inspection may be required when the structure is subjected to abnormal conditions which may affect the capacity of the structure such as: floods, storms, fires, overloads and evidence of recent movement.

It is not anticipated that major equipment would be required. Long term maintenance to the trestle could consist of concrete repairs which would require working in localized, contained areas with small to moderate sized equipment working from the trestle. Maintenance of the track and ties and overhead catenary system would be done from the trestle.

Vegetation Management

The MBTA's program of annual vegetation maintenance on the ROW would control invasive species that may be established on the railbed or ballast. The Yearly Operating Plan for the Hockomock Swamp ACEC section of the track would be expanded to include a more specific protocol for the removal of invasive species. VMP staff would walk the track alignment on an annual basis, in July or August of each year and remove (pull) all individual plants of the invasive species listed above. Manual removal of invasive plants would be done within the railbed and within the adjacent wetlands or uplands, to a distance of 15 feet from the limit of clearing. An annual report would be prepared that documents the abundance and distribution of the species found. All removed invasive plant material would be placed in plastic bags and

disposed of at a landfill. The VMP would be modified to prohibit the use of herbicide along the trestle and within the Hockomock Swamp.

Attachments

Figure 1: Trestle Through Hockomock Swamp – Typical Section
Figure 2: Trestle Through Hockomock Swamp – Typical Elevation
Figure 3: Trestle Through Hockomock Swamp – Construction Sequence

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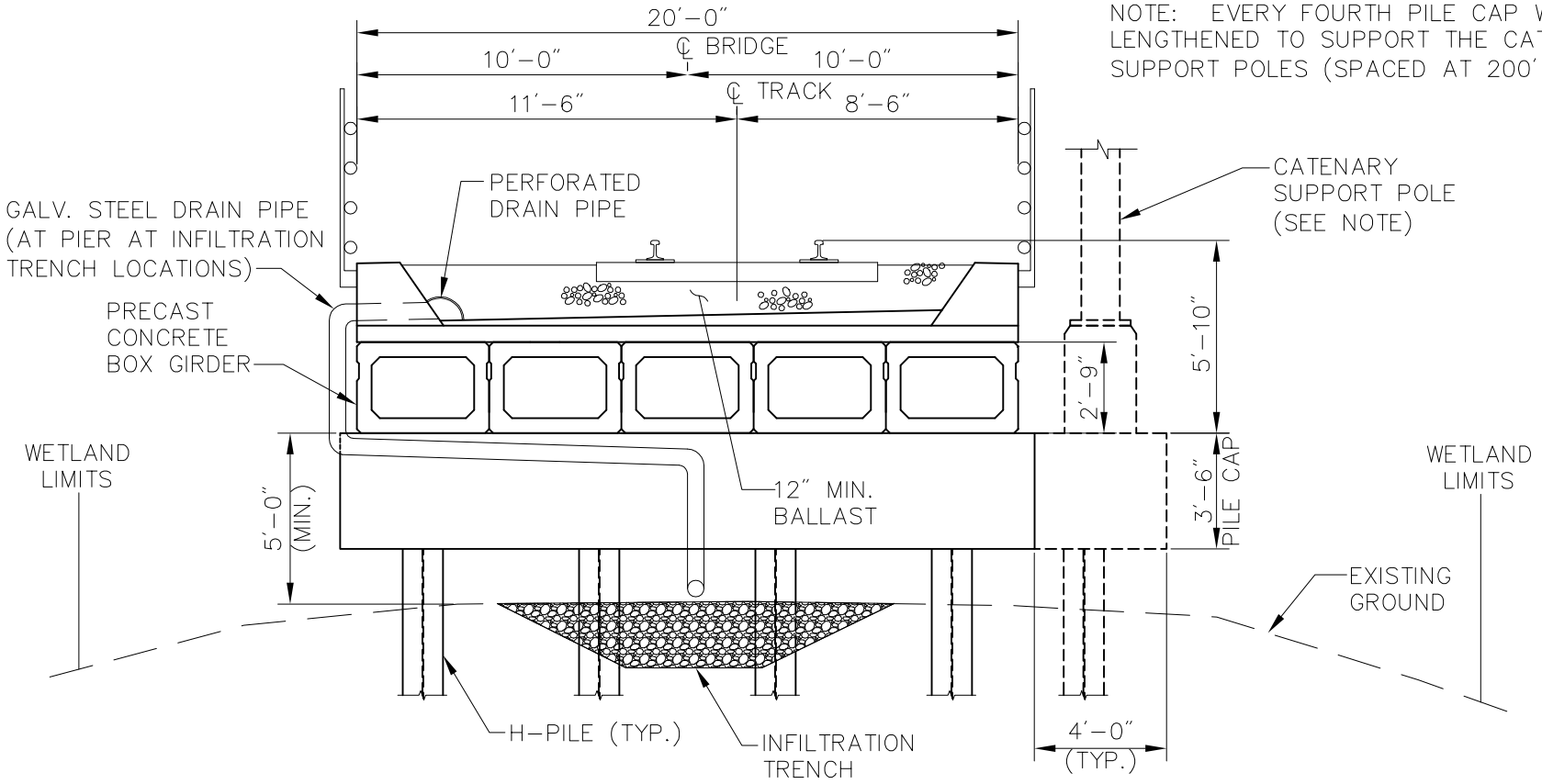

TYPICAL CROSS SECTION AT PIER

SCALE: 1/8" = 1-0'

FIGURE 1

TRESTLE THROUGH HOCKOMOCK SWAMP

TYPICAL SECTION

SOURCE

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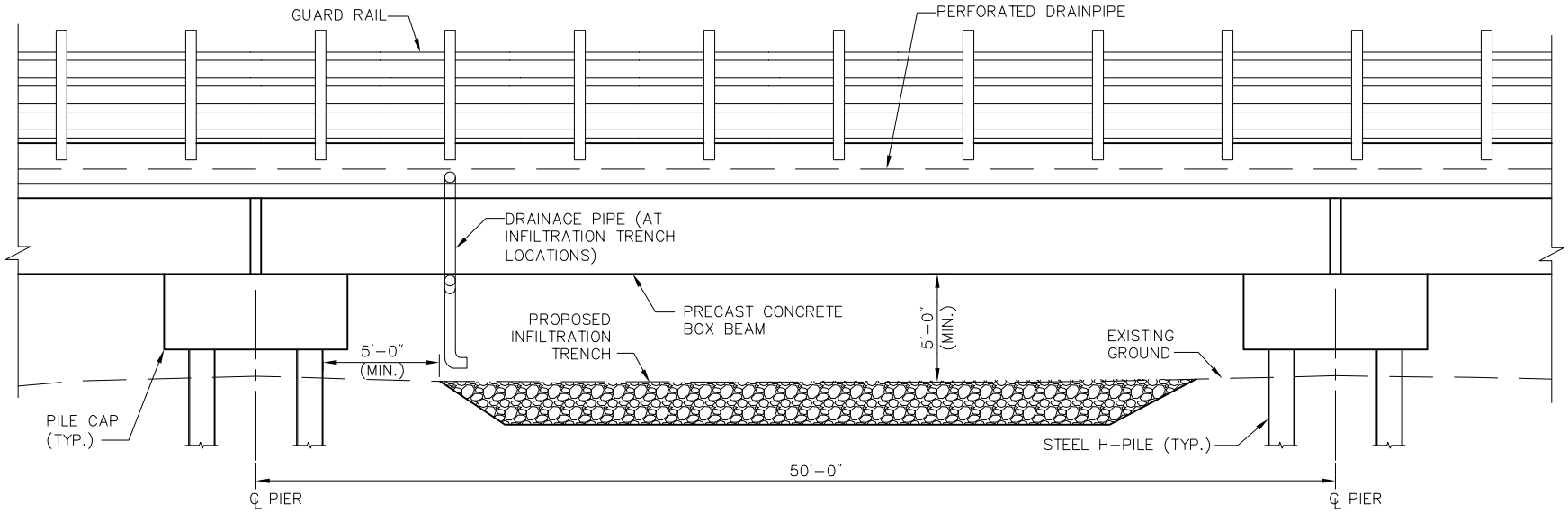
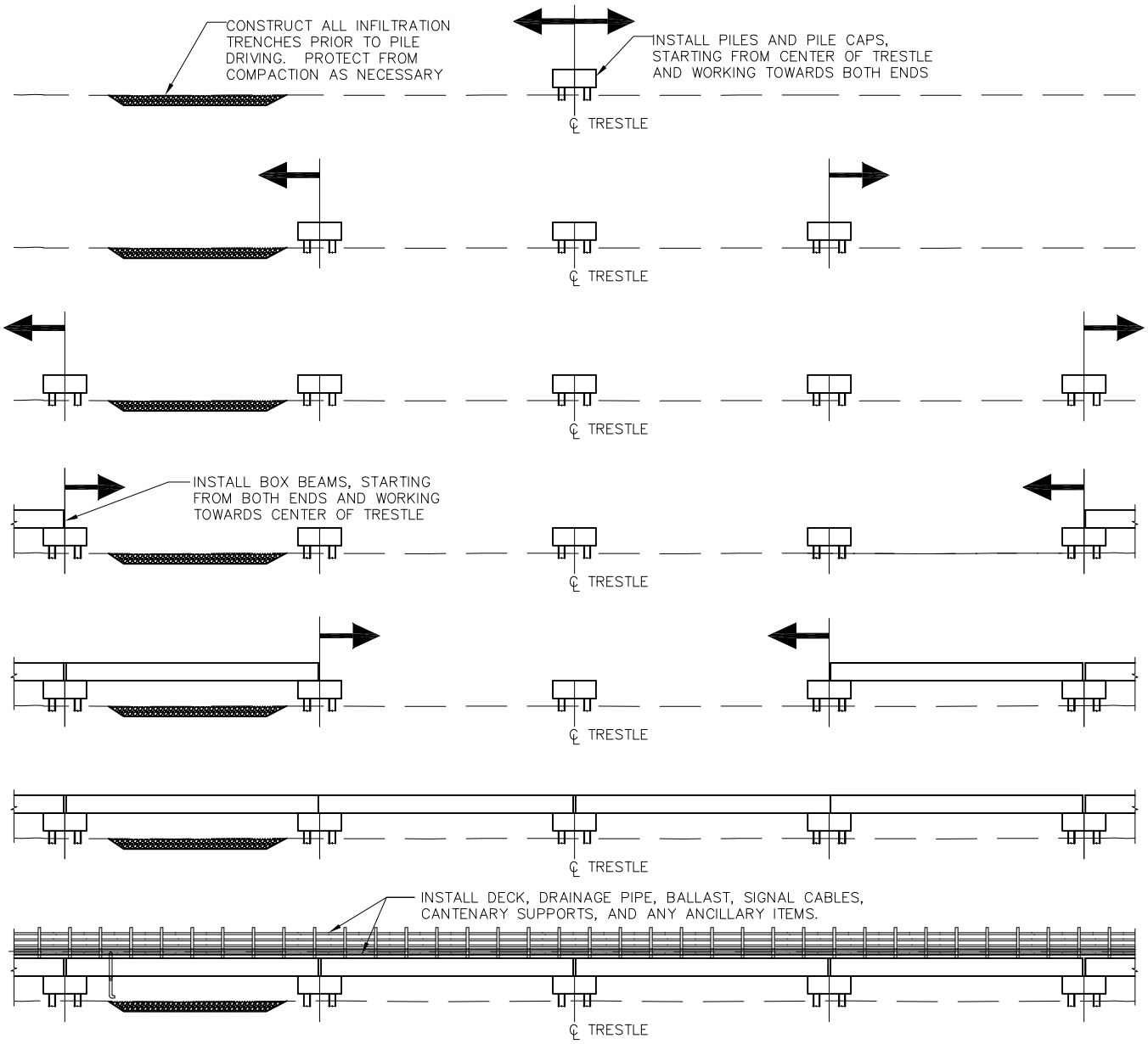


ELEVATION

SCALE: $\frac{1}{8}$" = 1'-0"

FIGURE 2
TRESTLE THROUGH HOCKOMOCK SWAMP

TYPICAL ELEVATION
SOURCE
PREPAREDBY VHB



CONSTRUCTION STAGING

SCALE: N.T.S.

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FIGURE 3
TRESTLE THROUGH HOCKOMOCK SWAMP

CONSTRUCTION SEQUENCE
SOURCE
PREPAREDBY VHB

Appendix 3.2-D

Pine Swamp Trestle Memorandum

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

101 Walnut Street
P. O. Box 9151
Watertown, MA 02471-9151
617 924 1770
FAX 617 924 2286

Memorandum

To: File

Date: March 9, 2012

Project No.: 10111

From: Mark Louro
Lisa Standley

Re: South Coast Rail
Pine Swamp Trestle

The Secretary's Certificate on the DEIR stated that "The FEIR should … evaluate the feasibility of constructing a trestle through Pine Swamp". The current design for the Stoughton Alternative includes an at-grade track structure through the Pine Swamp, utilizing the existing embankment to carry the proposed track. This memorandum compares the current at-grade design through the Pine Swamp with a trestle option similar to the structure proposed for the Hockomock Swamp. As documented below, a trestle could be constructed through Pine Swamp but is not practicable based on cost, particularly when considered in the context of impacts to biological resources.

Pine Swamp

Pine Swamp is a 275-acre wetland system located in western Raynham and consisting of several properties that are owned by the Town of Raynham Conservation Commission. The Stoughton Line crosses the swamp in a one-mile segment from King Phillip Street to East Britannia Street (Figure 1). This area consists of forested and marsh wetlands known as Pine Swamp, an area that is located within estimated habitat of rare wetlands species, and which supports an Atlantic white cedar swamp community. Atlantic white cedar swamps do not support unique wildlife species, although some wetland species are more likely to occur in these coniferous wetlands than in red maple swamps. Ambystomid salamanders, four-toed salamanders, wood frogs, spring peepers, and spotted turtles are characteristic reptiles and amphibians (although none of these are restricted to Atlantic white cedar wetlands). In the 2001 wildlife surveys, VHB found four-toed salamanders and spotted turtles in Pine Swamp. Some bird species (red-shouldered hawk, barred owl, brown creeper, golden-crowned kinglet, northern and Louisiana waterthrush) are also characteristic of Atlantic white cedar swamps. There are no small mammals restricted to these wetlands, although red squirrels inhabit coniferous wetlands as well as uplands.

Pine Swamp is currently fragmented by the former railroad bed, which acts as a barrier to aquatic organisms except at the two culverts. The swamp is also fragmented by the Taunton Municipal Light Corporation's overhead powerline which is maintained as a cleared utility corridor.

In November 2011, the UMass Extension Center for Agriculture published two sets of town maps based on CAPS[1]. In conjunction with DEP, UMass produced Important Wildlife Habitat maps. In cooperation with MassDOT and the Federal Highway Administration (FHWA), UMass produced IEI maps showing the 50 percent of the landscape with the highest IEI values and color-coded by habitat type (forests, shrublands, freshwater wetlands and aquatic habitats). These maps show the existing conditions and are useful in visualizing the existing important biodiversity areas. In addition, these maps are useful in identifying areas where biodiversity mitigation may be of the most value. The DEP map, "Habitat of Potential Regional or Statewide Importance", shows important wildlife habitat ONLY on the west side of the ROW in Pine Swamp, indicating that there is not a compelling wildlife habitat connectivity across the ROW.

Pine Swamp is a small (relative to the Hockomock) wetland ecosystem that is not recognized as an ACEC or Important Bird Area. It does not have extensive vernal pool complexes adjacent to the existing elevated embankment or track bed, and does not support state-listed salamanders or turtles. The only state-listed species present is a butterfly (Hessel's hairstreak). The area immediately adjacent to the existing embankment is a power line where invasive species (*Phragmites*) have become established.

At-Grade Option

The existing embankment through the Pine Swamp extends 5,300 feet from King Philip Street to East Britannia Street. The top of the embankment varies from elevation 67 at King Philip Street, the northern limit, to elevation 58 at East Britannia Street, the southern limit. The At-Grade Option for the Pine Swamp section of the Stoughton Alternative, as presented in the DEIS/DEIR, was developed to minimize wetland impacts, particularly through the 3,300-foot section where the existing embankment is narrowest (the "limited width area").

The cross section currently proposed under the South Coast Rail Project for the limited width area utilizes layers of geogrid reinforcing to stabilize the 1:1 embankment and minimize wetland impacts. The proposed cross section (Figure 1) consists of the ballast layer running level one foot beyond the end of the tie where the slope breaks and slopes 2:1 to the bottom of the subballast layer at which point the side slope steepens to 1:1 by introducing a mechanically stabilized reinforced earth (MSRE) treatment using geogrid reinforcing between six-inch layers of compacted gravel fill. This solution offers a cost effective slope retention system that reduces the overall footprint of the proposed track bed structure by minimizing the embankment width to approximately 24 feet. This MSRE cross section does not include a three foot level walkway within the 3,300-foot limited width area as is proposed elsewhere. Also the MSRE treatment enables the proposed top of rail profile to remain one to three feet above the existing embankment, minimizing any visual barrier effect to wildlife.

The At-Grade Option would cost approximately $5 Million, and would result in filling approximately 15,600 square feet of wetland (Figures 3 and 4). Wildlife passage would be provided by reconstructing the two existing stream crossings with extended culverts (which provide a shelf or bank on either side of the waterway to allow a passage for non-aquatic wildlife), and by adding at least four wildlife underpasses. These wildlife underpasses will maintain travel passages for species that may be unable to cross the tracks (salamanders, frogs, turtles, small mammals) as well as

[1] http://www.masscaps.org

enhance travel passages for small mammals that may be deterred from crossing an active rail line. Drift fences will be installed that will facilitate wildlife passage by directing movement to these underpasses.

Trestle Option

As required by the Secretary's Certificate, we have developed a trestle structure similar to the structure proposed for the Hockomock Swamp. It consists of two distinct cross sections – a 1,000-foot transition at each end and a central trestle structure, which is approximately 3,300 feet long. The transition (Figure 5) includes a cast-in-place (CIP) retained fill section that vertically transitions from the standard at-grade track cross section to the trestle at a grade of one percent. The retained fill section has an overall width of 28 to 30 feet. The cast-in-place retaining walls maintain a vertical barrier along each side of the track to minimize wetland impacts as the track profile rises up to the level of the trestle. The trestle (Figure 6) consists of a prestressed concrete superstructure. The overall width of the superstructure is 21 feet and is supported on pile caps that are spaced every 30 feet. The bottom of the superstructure is approximately three feet above the existing track bed to allow for inspection and maintenance, which translates to the top of rail profile rising up above the existing embankment as much as 9.5 feet. This solution reduces wetland impacts to only those locations where the pier caps and transition retaining walls extend into the bordering vegetated wetlands.

The design evaluated for Pine Swamp is the same as the trestle design for the Hockomock Swamp, because we assume that the same conditions exist in both locations. The railroad was built on fill placed over a swamp. Geotechnical borings from the Hockomock Swamp show a deep subsurface layer of peat over sand, silt and clay. Deep pilings are necessary to support the Cooper E-80 loadings required for the railroad. VHB and the geotechnical engineers at Jacobs have evaluated the data and conclude that the proposed pile-supported trestle is the most cost-effective structure in the Hockomock Swamp. It would therefore be the most cost-effective structure that meets the project loading requirements in Pine Swamp.

The superstructure types considered consisted of common steel and concrete structures, and prefabricated concrete arch units. Steel deck beam and through girders and prestressed concrete box beams and Northeast Extreme (NEXT) beams were evaluated for cost, ease of construction and maintenance. Consideration was also given to maximizing span lengths to minimize the number of piers to be constructed. Prestressed concrete boxes were found to be the most cost effective, offered a range of workable span lengths, and require the least amount of maintenance. Steel structures offer longer span lengths, but they are more costly, require more maintenance, and the advantage of longer span lengths is counter balanced by limited access to the trestle site. The concrete arch option is more costly than the prestressed beams, and physical limitations with the arch design require the trestle to be constructed at an excessively higher elevation than the other alternatives resulting in more impacts associated with constructing longer approaches. Based on the prestressed box beam type, the Trestle Option would cost approximately $50 Million, which includes engineering and construction costs. Other alternatives may be considered beyond the common bridge types, however it is not anticipated that any savings would be significant enough to make the trestle a viable option. This option would result in filling approximately 3,800 square feet of wetland (Figures 7 and 8).

Wildlife passage would be provided by the existing culverts (which do not have a shelf or bank on either side of the waterway to allow a passage for non-aquatic wildlife), and in the space under the trestle.

Taunton Municipal Power & Light Impacts

The Taunton Municipal Light Corporation (TMLC) currently uses the existing rail embankment for maintenance access of their overhead wires. A meeting was held with TMLC on February 16, 2012 (notes attached) to discuss the proposed track through the Pine Swamp and access requirements. TMLC annually inspects their wires and poles using the embankment for truck access for access. Once the track has been constructed they will be required to use a high-rail vehicle to perform this function A separate access road is not required and will not be constructed. With the At-Grade Option, the track will be less than three feet above the existing profile and the proposed embankment will allow access to each pole by foot and from a high-rail vehicle. TMLC may also relocate the line to Route 138 as another option.

Practicability

While each of the construction options offer a benefit to the project they appear to be on opposite ends of the spectrum regarding impacts and costs. The At-Grade MSRE solution provides a reasonable cost effective solution that retains and stabilizes the existing railroad track bed at a cost of less than $5 million and 15,600 square feet in wetland impacts, while maintaining wildlife passage. The At-Grade solution allows larger wildlife to cross over the tracks and provides wildlife passage for smaller animals through two enhanced culverts (reconstructed to meet Stream Crossing Standards, with upland shelves) and four additional between-the-ties wildlife passages. The Trestle Option has reduced impacts to wetlands (3,800 square feet) but at a cost of $50 million.

It is useful to compare Pine Swamp with the Hockomock Swamp to establish the justification for the extraordinary expense of an elevated trestle structure, at more than ten times the cost of at-grade rail. The South Coast Rail Project includes a 1.8-mile trestle through the Hockomock Swamp. The decision to elevate the track in the Hockomock Swamp was based on discussions with the Natural Heritage and Endangered Species Program staff during the prior MEPA process, and was an important mitigation commitment made in the 2002 FEIR and upheld by MassDOT in the current design for impacts on state-listed rare species.

The Hockomock Swamp is part of the Hockomock Swamp Area of Critical Environmental Concern (ACEC), which includes approximately 16,950 acres in Bridgewater, Easton, Norton, Raynham, Taunton, and West Bridgewater. In addition to its protection as an ACEC, portions of the swamp are also owned by MassWildlife as the Hockomock Swamp Wildlife Management Area, and it is designated as an Important Bird Area by the Massachusetts Audubon Society. The swamp is also designated as a Biomap Core Area by the NHESP, and is known to contain populations of several state-listed species.

A trestle was selected for the Hockomock Swamp section of the Stoughton Alternative, from Foundry Street to the Raynham Greyhound Park, to mitigate impacts of the South Coast Rail project on wetlands, rare species, vernal pools, and biological diversity. The Hockomock Swamp is a unique and highly valuable ecosystem, as indicated by its status as an Area of Critical Environmental Concern, Wildlife Management Area, Important Bird Area, and Biomap Core Habitat. The trestle, although it will increase project costs substantially, will allow vernal pool amphibians, state-listed rare salamanders and turtles, and other small vertebrates, to pass freely across the existing embankment through the swamp. Modifications to the embankment will allow passage of larger vertebrates.

While the Pine Swamp has conservation and biodiversity value, it is <u>not</u> a wildlife habitat for rare amphibians, a wildlife corridor, an ACEC or an IBA. The DEP Important Wildlife Habitat maps

show that there is important wildlife habitat currently only on the west side of the ROW. Pine Swamp therefore does not have the extraordinary wildlife habitat value on both sides of the ROW that justifies the additional $45 million expenditure necessary to construct a trestle. The proposed MSRE stabilized track bed through the Pine Swamp along with other proposed mitigation including modifications to existing culverts and additional wildlife crossings provide a reasonable cost-effective solution to reduce the barrier effect resulting from replacing the former tracks that is in keeping with the biological diversity and overall value of the Pine Swamp.

Summary

Because Pine Swamp does not provide extraordinary biodiversity values, a trestle would not provide significant biodiversity or rare species benefits. The cost increase (ten times the cost of the At-Grade Alternative) is not warranted and the trestle is not practicable based on cost. Proposed wildlife crossing structures would mitigate for the effects of reconstructing the At-Grade Option, and the proposed MSRE treatment would minimize wetland impacts.

Attachments

Figure 1 – Pine Swamp Crossing
Figure 2 – MSRE Cross-Section
Figure 3 – MSRE, Northern Approach
Figure 4 – MSRE, Southern Approach
Figure 5 – Trestle Cross-Section, Transition
Figure 6 – Trestle Cross-Section
Figure 7 – Trestle Option, Northern Approach
Figure 8 – Trestle Option, Southern Approach

TMLC Meeting Notes

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SOUTH COAST RAIL

Figure 1
Pine Swamp Crossing

0 162.5 325 Feet

Prepared by: VHB

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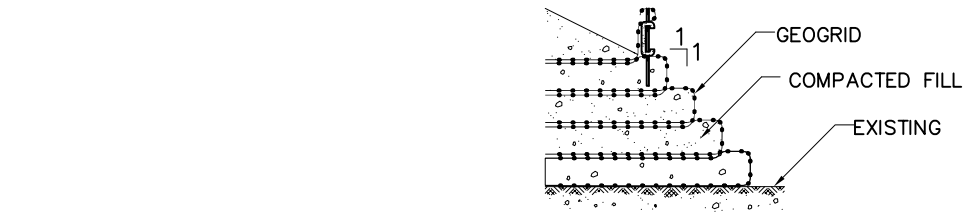


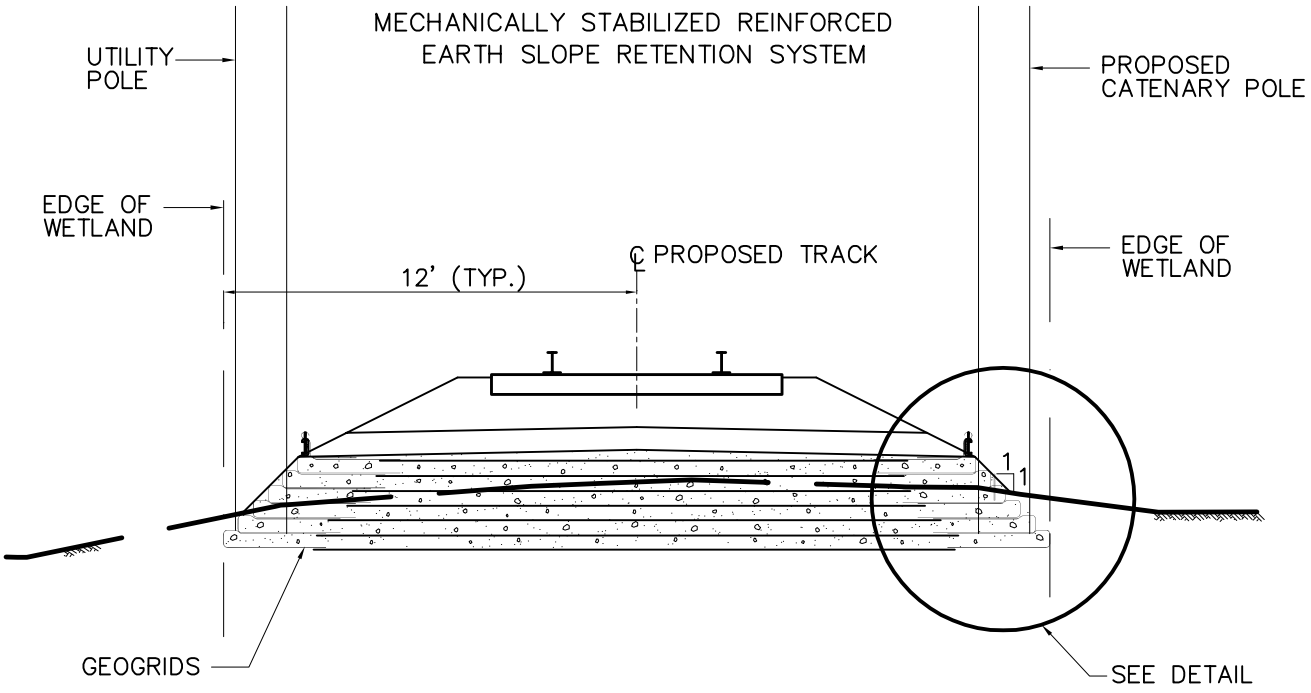
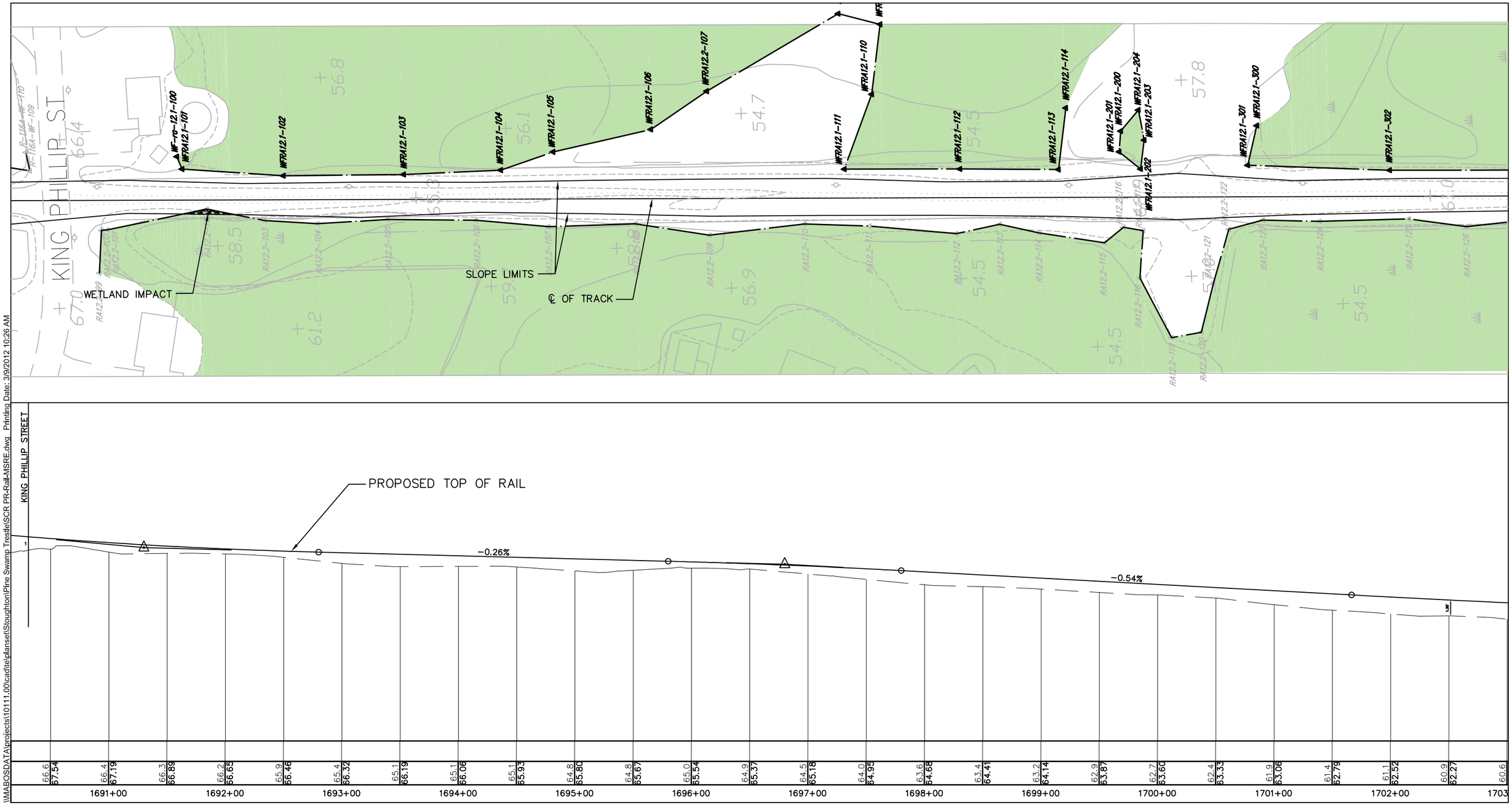


Figure 2
MSRE Cross Section
Not to Scale

Prepared by: VHB



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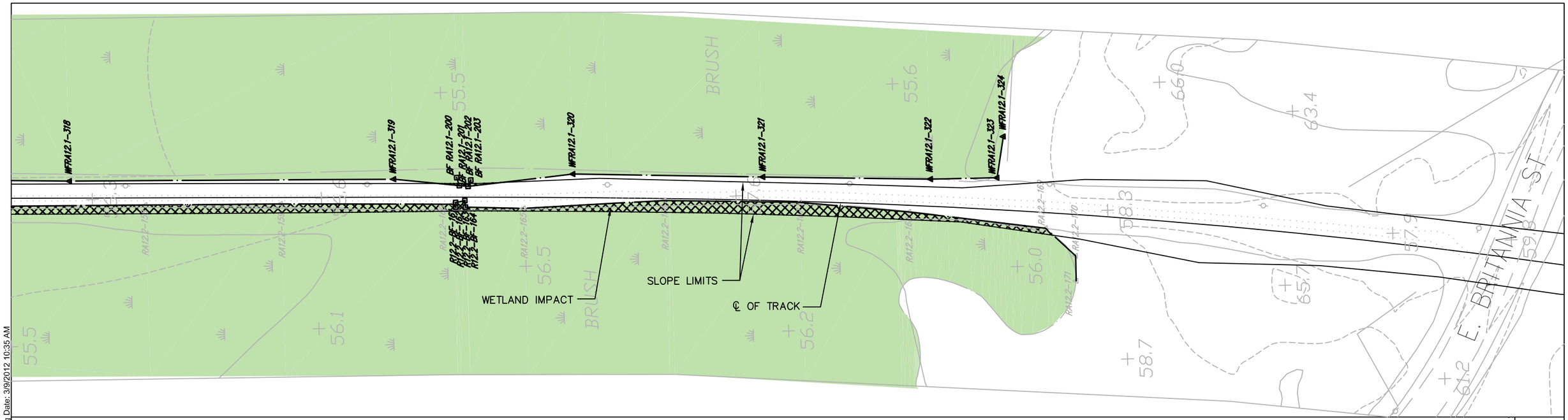
SOUTH COAST RAIL

Figure 3
Pine Swamp MSRE
Northern Approach

1"=80'

Prepared by: VHB



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SOUTH COAST RAIL

Figure 4
Pine Swamp MSRE
Southern Approach

1"=80'

Prepared by: VHB

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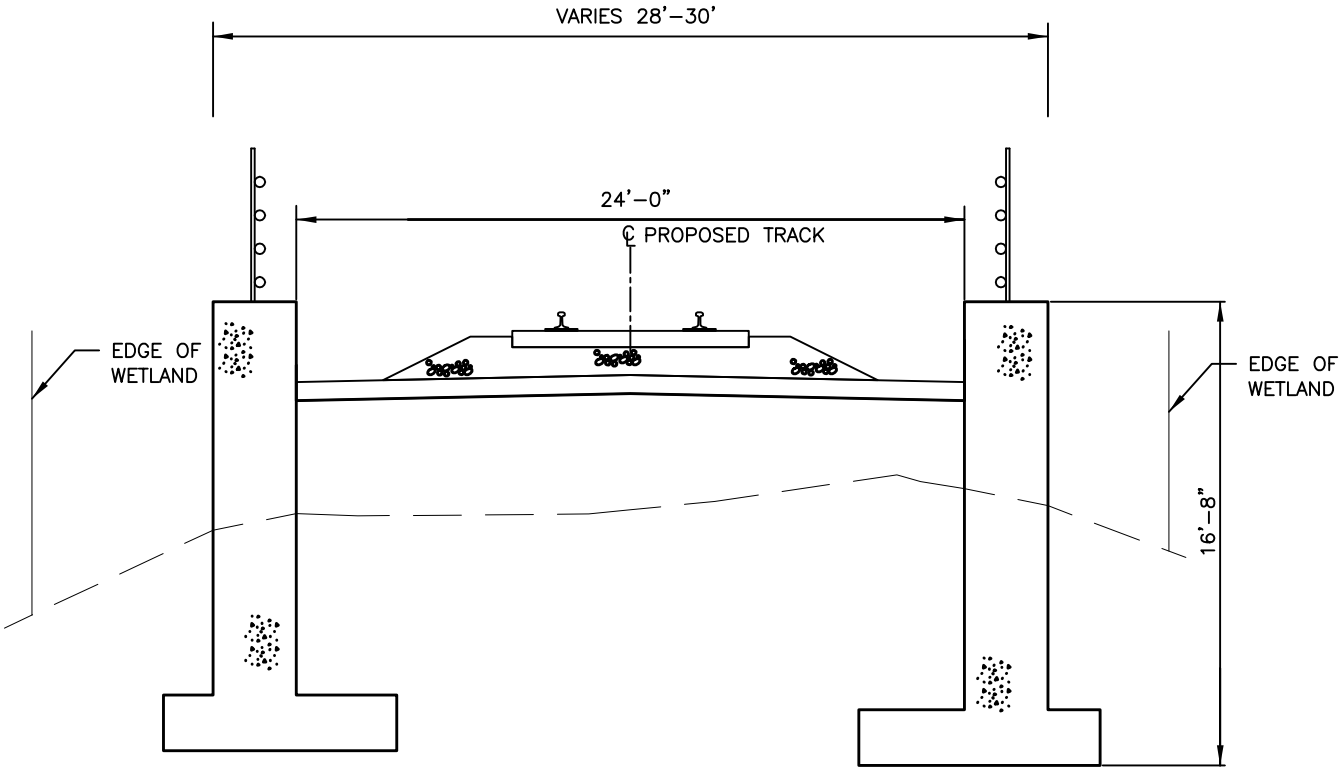

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SOUTH COAST RAIL

Figure 5
Transition Cross Section
Not to Scale

Prepared by: VHB

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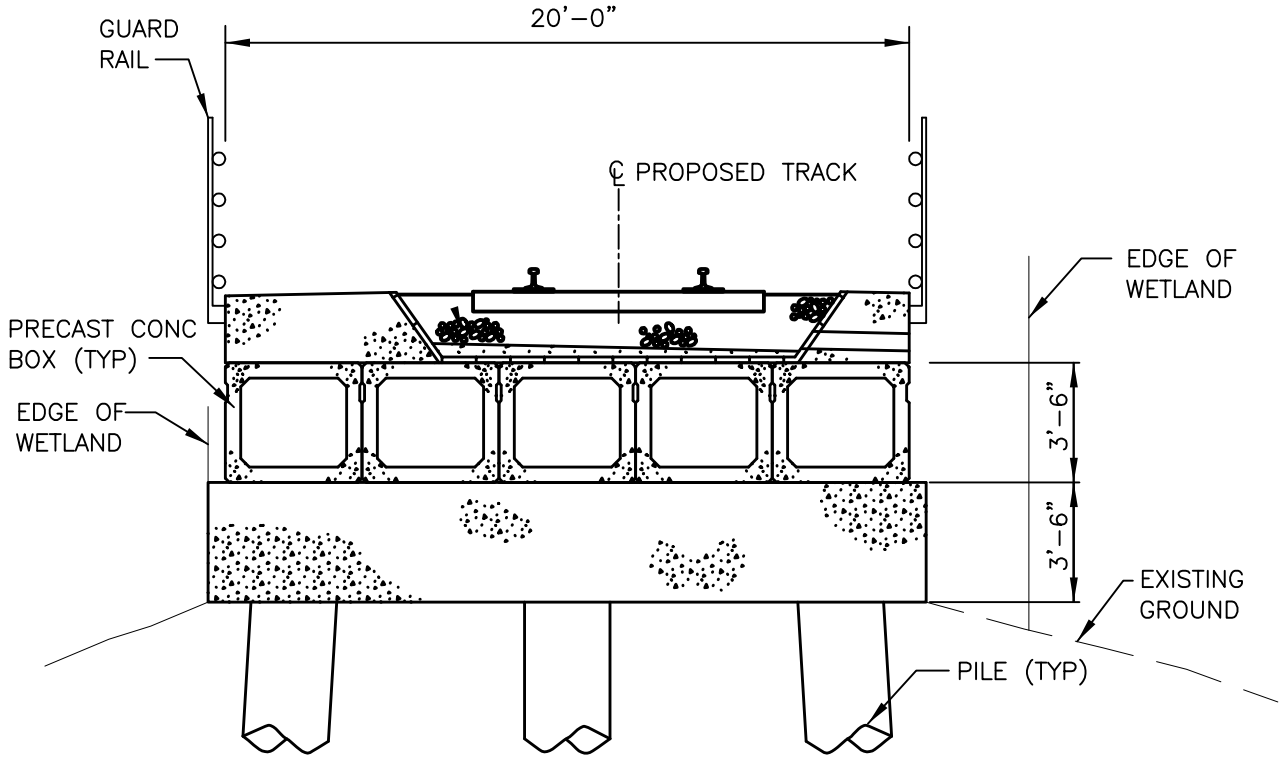

Figure 6
Trestle Cross Section
Not to Scale

Prepared by: VHB

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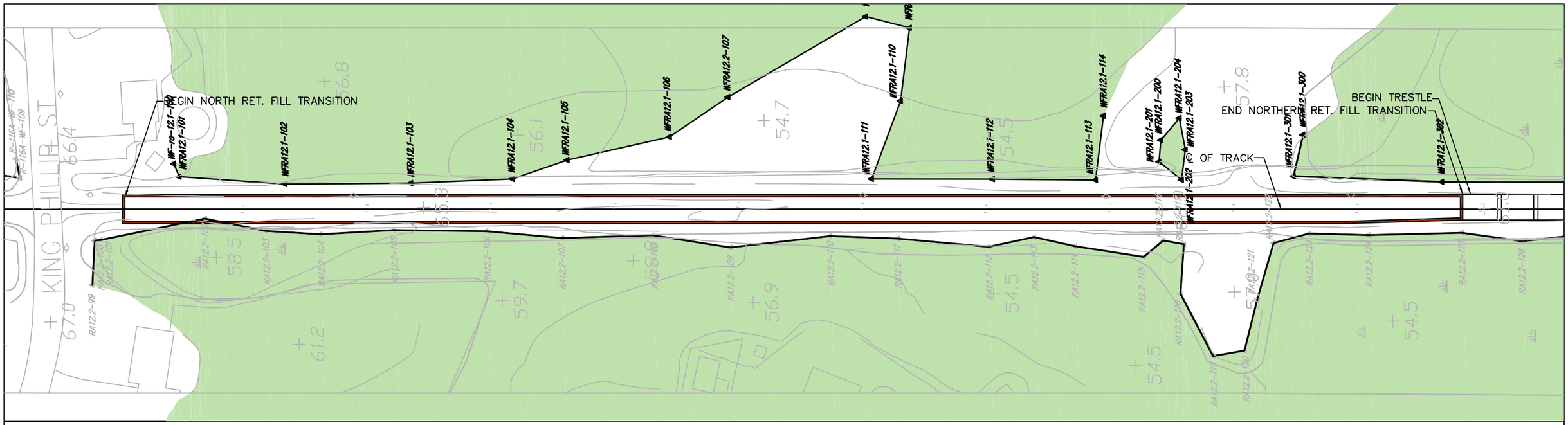
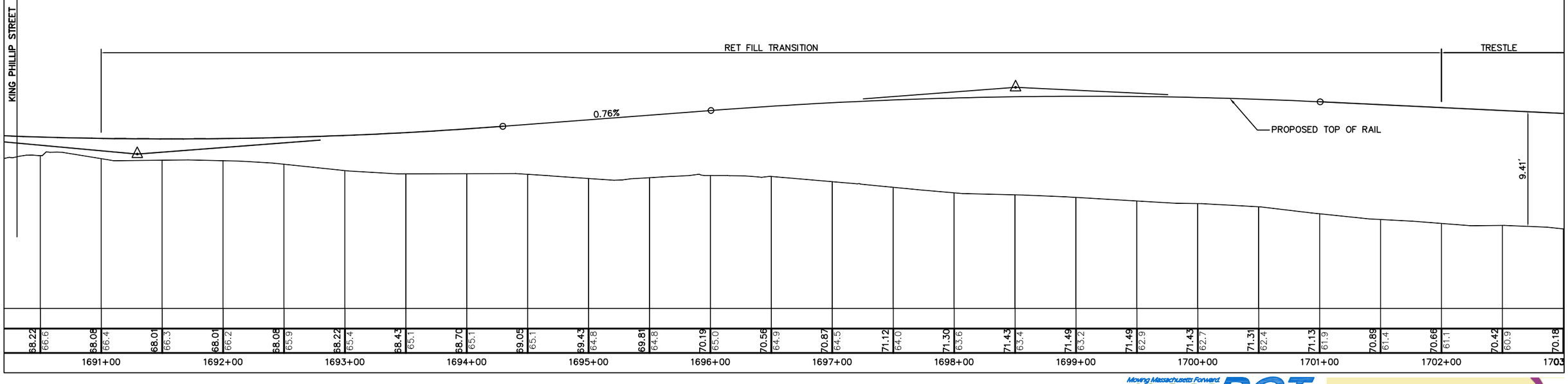


KING PHILLIP STREET



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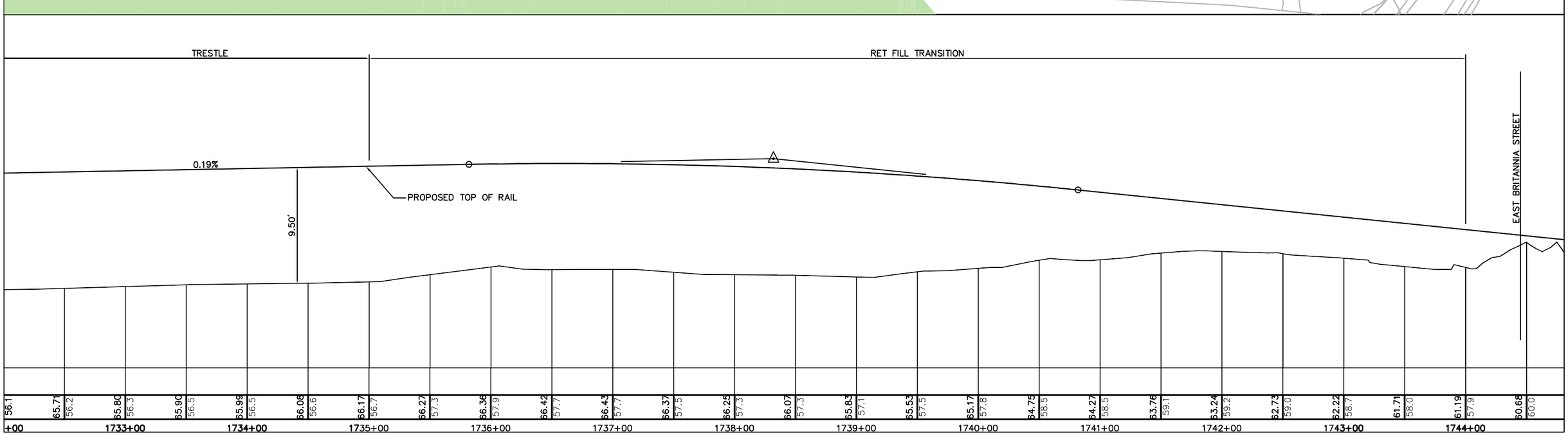
SOUTH COAST RAIL

Figure 7
Pine Swamp Trestle
Northern Transition
1"=80'

Prepared by: VHB



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0 40 80 Feet

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SOUTH COAST RAIL

Figure 8
Pine Swamp Trestle
Southern Transtion
1"=80'

Prepared by: VHB

Transportation
Land Development
Environmental
Services

Vanasse Hangen Brustlin, Inc.

99 High Street, 10th floor
Boston, Massachusetts 02111-2301
617 728-7777
FAX 617 728-7782

Meeting Notes

Attendees: Craig Foley, TMLP
Mike Horrigan, TMLP
Mark Louro, VHB

Date/Time: February 16, 2012
4:00 PM

Project No.: 10111.00

Place: TMLP
55 Weir Street
Taunton, MA

Re: South Coast Rail
TMLP coordination meeting
Pine Swamp

Notes taken by: M. Louro

The purpose of the meeting was to review the track alignment and typical section proposed through the Pine Swamp and discuss Taunton Municipal Light Plant maintenance needs. The discussion included the following.

- The track horizontal alignment will follow the existing railroad berm that runs through Pine Swamp between King Philip Street and East Britannia Street in Taunton, MA. The rail profile will be one to two feet above the existing berm profile.
- Once the track is in place TMLP will have to access their line from a high rail vehicle(s). If MBTA owns the vehicle then TMLP will have to coordinate each time access
- TMLP recently installed new poles, insulators and wire within this area so they do not expect to have to replace equipment for several years.
- TMLP inspects this line once annually.
- TMLP is concerned about not having unlimited access to this line once trains start running, especially in the event of an emergency. All inspections or work will have to be scheduled with MBTA and flaggers will be required. Much of the work that TMLP performs will be limited to off peak, night, or weekend work, which will be more costly. TMLP will be limited by the train schedule.
- A cost benefit analysis should be done to compare the cost of relocating the line to Route 138 with the cost of a high rail vehicle, flagging, training and increased labor costs to perform maintenance work at night and on weekends.
- The high rail vehicles will have to be able to auger poles, provide access to the wire and poles and haul materials.
- The existing pole line may have to be reset to provide 15 feet horizontal clearance from the proposed track and the catenary.
- The bare wire may have to be replaced by unsulated cable.
- TMLP is not sure if they have an easement agreement that defines access limitations and maintenance responsibilities related to this line.
- TMLP facilities are within the existing railroad right-of-way from Pine Swamp to the Easton Town Line/Raynham Park. The line in Raynham and Easton should be evaluated to see if relocations are warranted beyond Pine Swamp.
-

Appendix 3.2-E

Layover Facility Site Selection Report

Technical Report – DRAFT

Layover Facility Site Selection

Prepared for

Massachusetts Department of Transportation
Boston, Massachusetts

Prepared by

***VHB*/Vanasse Hangen Brustlin, Inc.**
Boston, Massachusetts

February 2012

Table of Contents

1 Introduction 1-1

1.1 Purpose of this Document 1-1
1.2 Purpose of the Layover Facility 1-2
1.3 Preliminary Site Selection 1-3
1.4 Public Involvement 1-5

2 Sites Evaluated in the DEIS/DEIR 2-1

2.1 Introduction 2-1
2.2 New Bedford Line 2-1
2.3 Fall River Line 2-16
2.4 Summary 2-40

3 Site Selection 3-1

3.1 Requirements of the Secretary's Certificate 3-1
3.2 Layover Facility Site Selection Criteria 3-1
3.3 New Bedford Line 3-2
3.4 Fall River Line 3-4
3.5 Recommendations 3-6

Figures

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1 Introduction

1.1 Purpose of this Document

The Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) for the South Coast Rail project, released for public review in March 2011, identified five potential sites for overnight layover facilities but did not identify a preferred site on either the Fall River or New Bedford branches. Since the release of the DEIS/DEIR, MassDOT has identified a preferred overnight layover facility location on each of the branches. The Final Environmental Impact Statement/Environmental Impact Report (FEIS/FEIR) will provide a detailed analysis of each of these two layover sites in accordance with the requirements of the Secretary of Energy and Environmental Affairs Certificate on the DEIR.

The Secretary's Certificate on the DEIR stated that:

> "The FEIR should include a rationale for selection of the preferred layover facilities and for elimination of others from further consideration. The evaluation of impacts associated with layovers should include potential conflicts and synergies with existing and future land use on and in the vicinity of the sites."

This document provides a comparison of the environmental impacts, operations, capital costs and operating costs associated with each of the five sites identified in the DEIS/DEIR (Chapter 2) and the rationale for selection of the preferred sites (Chapter 3). MassDOT is seeking public comment on the layover sites in advance of preparing the FEIR.

1.2 Purpose of the Layover Facility

The overnight layover facility is the location where trains are stored between the last trip at the end of each day and the first trip at the beginning of the next day. Efficient commuter rail operation requires that trains begin and end the day as close as possible to the outlaying terminal station. All of the MBTA's recently restored commuter rail lines, including the Greenbush, Kingston, Middleborough, and Newburyport Lines, have overnight layover facilities near the terminal station. For the South Coast Rail project, trains will start and end the day on both the Fall River and New Bedford branches; therefore, two layover facilities are needed, one on each line.

1.2.1 Location of Layover Facilities

The layover facility should be located close to the end of the line. If the layover facility is near the terminal, trains do not have to travel far to get to the start of their morning trips or from the end of their evening trips. If the layover facility is distant from the terminal, trains need to make a long distance non-revenue (deadhead) movement before they start their morning trips or after they end their evening trips.

The ideal location for an overnight layover facility is just beyond the terminal station. When trains complete a trip at the end of the day, they continue down the track into the layover facility. In the morning, they pull up from the layover facility to the first station, and then continue up the track towards Boston. There is no need for the train to reverse direction at the terminal station, and trains moving between the terminal station and the layover yard have no impact on revenue operations on the mainline track. The layover yards at Greenbush and Kingston have this type of operation.

If the area around the terminal station is constrained by urban development, environmental resources, or other limitations, it may not be possible to locate the layover facility beyond the terminal station. In this case, acceptable layover locations may be found adjacent to the mainline, as close to the terminal station as possible. The layover yards at Middleborough and Newburyport are located before the terminal station, each less than a mile.

There is no hard rule for the distance of a layover facility from the terminal, but increasing distance will result in less reliable operations and greater operating costs. The cost to the MBTA of operating a commuter rail vehicle was $11.92 per mile in 2010 based on the latest information provided by the National Transit Database.

1.2.2 Infrastructure Requirements

The area of the layover facility site must be large enough to accommodate the anticipated number of trains, service vehicles, and other support facilities. The site must be shaped appropriately to allow all tracks to be long enough to accommodate the full length of a train on each track.

Based on the operating plan that has been developed for South Coast Rail, each branch will require four trains to support the peak period service. In addition, a fifth train on each branch will be required as spare equipment, which can be used in the event of a breakdown.

The layover facility must accommodate the five trains anticipated. In addition, the facility should provide one track for future expansion of service and for maintenance equipment. Therefore, each layover site chosen for South Coast Rail must be able to accommodate six tracks.

The tracks must all be long enough to accommodate the longest train anticipated to be operated by the MBTA, which is assumed to be two locomotives and nine coaches, plus buffer space at the ends. This gives a minimum clear track length of approximately 950 feet. The tracks should be spaced with alternate 20-foot and 30-foot track centers, to allow enough space for maintenance vehicles to travel between trains. The layover facilities in Middleborough, Kingston, and Greenbush are of this style.

The site must also accommodate the yard lead track and turnouts, which means that the site must be considerably longer than 950 feet. At a minimum, the lead track must be long enough for a series of three #10 turnouts, a distance of about 400 feet. Allowing for some flexibility with track geometry, this results in the need for a site that has a rectangular shape and is approximately 1,500 feet long and 180 feet wide. The site must be able to accommodate necessary support facilities, including a storage shed, employee parking, crew facilities and storage space for maintenance equipment.

1.3 Preliminary Site Selection

The Southeast Regional Planning and Economic Development District (SRPEDD) identified 19 site alternatives for the layover facilities. Some of these sites would serve only one of the two branches, while others could serve both branches. Table 1-1 summarizes the site locations, which were described in more detail in the DEIS/DEIR Appendix 3.2-E.

Table 1-1: Potential Layover Sites Identified by SRPEDD

Site #	Site Location	Community	Terminal Distance[1]	SRPEDD Notes
Fall River Secondary				
1	Shaw Street	Fall River	-1.0[2]	Flood plain; condos, school
2	Battleship Cove (Behind Gate)	Fall River	0.0[3]	Good for only 2 tracks
3	Weaver's Cove West	Fall River	2.6	Flood plain; potential economic development conflict
3A	Weaver's Cove East	Fall River	2.6	SRPEDD note not provided for this site
4	North Fall River	Fall River	3.9	Cut section; country club, condos
5	ISP Facility	Freetown	5.3	Site size insufficient; layover footprint would need to be smaller
6	Saw Mill	Freetown	6.4	Sharp curve onto site
7	Copicut Road (North)	Freetown	6.9	Poor road access; poor lot shape
8	Copicut Road (South)	Freetown	6.9	Length and width may be problem
9	Boston Beer Site	Freetown	7.9	Town wants site for economic development
New Bedford Main Line				
10	Wamsutta Street	New Bedford	0.3	Poor ped link to downtown; no mixed use; SRTA bus
11	Wye (South of Nash Road)	New Bedford	1.3	Large wetlands; sharp curve, steep grade
12	Shawmut Avenue	New Bedford	1.3	Wetlands, streams; inadequate width
13	Church Street (East)	New Bedford	3.1	Good
14	Church Street (West)	New Bedford	3.1	Takings; wetlands issues
15	Off Braley Road	Freetown	7.4	Takings
16	South of Chace Road	Freetown	8.3	Cranberry bog; takings
Myricks Junction				
17	Myricks (Southeast)	Berkley	13.6	Inadequate width
18	Myricks (Northwest)	Berkley	14.3	Inadequate width
19	Myricks (SE Jct)	Berkley	13.6	Inadequate width; environmental concerns

1. Terminal distance is measured in miles from Battleship Cove Station on the Fall River Secondary and from Whale's Tooth Station on the New Bedford Main Line. Terminal distances for the sites near Myricks Junction are measured using the longest distance from the two terminal stations.
2. Negative distance indicates site is beyond the terminal station.
3. The configuration of the Battleship Cove site would require trains to cover approximately 1 mile, including reversing direction to access Battleship Cove Station. Accessing Fall River Depot would not require reversing direction.

Alternative sites were evaluated based on civil design, operations impact, anticipated environmental impact, and socioeconomic impact criteria. For the preliminary assessment, detailed design for each site was not feasible. Alternatives were evaluated based on general knowledge of the site layout, general operations knowledge, existing available macro-scale environmental information, and general knowledge of development in the surrounding area.

Civil design was assessed by examining several issues:

- Ability of the site to accommodate the layover facility
- Shape, layout, and grading of the site

- Complicated construction items, such as rebuilding bridges or large retaining walls

Operations impact was assessed by considering the distance of the site from the terminal station. The further a site is from the terminal, the more difficult operations become, because trains traveling to and from the layover facility will interfere with the mainline for a longer period of time, and therefore further restrict the time available for revenue train movements.

Anticipated Environmental impact was assessed by examining several issues:

- Need to fill in rivers, ponds, or other water bodies
- Need to fill in wetlands
- Need to acquire public open space

Socioeconomic impact was assessed by examining several issues:

- Property impacts, especially to developed land
- Proximity to residential development

As described in detail in the DEIS/DEIR Appendix 3.2-E, the assessment of the 19 preliminary sites concluded with the recommendation that five sites be advanced for further analysis:

- Site #3: Weaver's Cove West
- Site #3A: Weaver's Cove East
- Site #5: ISP Facility
- Site #10: Wamsutta Street
- Site #14: Church Street West

1.4 Public Involvement

The layover facilities have been the subject of continued public involvement since early in project development. This section describes the specific civic engagement activities associated with each site. While the proposed facilities were discussed in general project meetings, this section outlines the specific site consultation.

1.4.1 Public Meetings

MassDOT conducted Public Meetings in Fall River and New Bedford as part of the alternatives analysis and station siting. The following activities were conducted related to the stations and layover facilities:

- Two Station Workshops were held in New Bedford on November 13 and November 19, 2008. The subjects of the meetings were about uses of the potential station sites and included information about land uses near the potential Whale's Tooth site, which may include a layover facility. Meeting notices were translated into Spanish and Portuguese. Key concerns included the need to support economic development in the City of New Bedford and noise and safety issues around the station. Participants noted the need to support the activities of the Port.
- An Open House and Public Meeting were held in Fall River on September 17, 2009. The meeting was advertised in the Fall River Herald, direct abutters to the Fall River proposed sites were notified by mail and follow-up phone call, where possible, and the regional planning agency distributed flyers in the area near the potential sites. During the Open House, maps and photos of the potential sites were available, along with staff members who outlined the potential locations, size and operations to interested participants. Most of the questions raised during the Open House related to operation of the facility, when trains would start out of the site, when they would return; if there would be air quality impacts; how the MBTA acquires property; how the meeting was noticed. During the Public Meeting, the Project Manager outlined the potential rail layover facilities and responded to questions. No major questions were raised about the layover site during the meeting.

1.4.2 City of New Bedford

MassDOT met with the City of New Bedford on February 2, 2009. The need for and characteristics of layover facilities were described, using an aerial photograph of the Kingston layover facility for reference. The following comments were provided concerning Site #10, Wamsutta Street:

- It was noted that this is the same site as proposed in the 2002 FEIR, and that the CSX freight tracks for the harbor dredging project had been constructed to accommodate that concept.
- It was noted that the Wamsutta Mill complex on the opposite side of Wamsutta Street had been converted into a residential development.
- It was suggested that there is a need for coordination of projects in the area, including the layover facility, station, and potential for properties between the ROW and Route 18.
- It was suggested that structured parking could be a buffer between neighborhoods and the layover site.

- It was suggested that access over Route 18 between the station on the east and the neighborhoods on the west was very desirable.
- It was suggested that the industrial area to the east would not be impacted by the layover facility.
- Overall, the city would support the site, especially if the area had a comprehensive plan to help connect the station to neighborhoods.

The following comments were provided concerning Site #14, Church Street West:

- It was suggested that access to the parcel could be difficult.
- It was suggested that this was the best parcel from an economic development perspective.

MassDOT met with City officials again on July 26, 2010, to review the City's plans for the potential layover site, among other issues.

The port authority shared a study with MassDOT suggesting that the port would need significantly more space on the site for storage of rail cars.

There was a discussion about the potential to fit both needs, storage and layover, on the location, especially if there is no further development at Hicks Logan. Mayor Lang said he would defer to passenger rail over freight.

The City reminded MassDOT that space needs to be preserved on the site for ferry parking.

1.4.3 Town of Freetown

MassDOT met with the Town of Freetown on February 2, 2009. The need for and characteristics of layover facilities were described, using an aerial photograph of the Kingston layover facility for reference. The following comments were provided concerning Site #5, ISP Facility:

- It was noted that Exit 8½ is just to the north, and archeological resources were encountered on that project.
- It was noted that the ISP Facility is subject to significant homeland security restrictions.
- It was noted that this is the same site as proposed in the 2002 FEIR.

The following comments were provided concerning Site #6, Sawmill:

- It was suggested that a layover facility was not consistent with the potential TOD, the character of the town, or the goals for the area.

- It was questioned how potential residents and business at a future TOD would view the layover facility.

1.4.4 City of Fall River

MassDOT met with the City of Fall River on February 2, 2009. The need for and characteristics of layover facilities were described, using an aerial photograph of the Kingston layover facility for reference. The following comments were provided concerning Site #3, Weaver's Cove West:

- It was noted that the site is a brownfield and that there are few residences nearby.
- It was questioned whether the rest of the site would be developable if a portion was used for a layover.
- It was noted that the site would face challenges with the proposed LNG development.
- Overall, the city thought the site had good potential.

2

Sites Evaluated in the DEIS/DEIR

2.1 Introduction

As described in the DEIS/DEIR Chapter 3 (page 3-62 to 3-63), two alternative sites were identified on the New Bedford Main Line and three on the Fall River Secondary. This chapter provides a description of each site, and a comparison of the sites based on environmental impacts, operational considerations, conceptual acquisition cost estimate and the operating and maintenance costs for each site, based on information presented in the DEIS/DEIR.

2.2 New Bedford Line

Two overnight layover sites were evaluated in the DEIS/DEIR: Church Street and Wamsutta.

2.2.1 Church Street Site

The proposed Church Street site layover facility (Figure 2-1) would be constructed along the New Bedford Main Line and would serve all rail alternatives. It would be located in New Bedford between Church Street and Route 140, near where Route 140 crosses the New Bedford Main Line, approximately 3.1 miles from the southern terminus of the New Bedford Main Line. This site is located on the west side of the right-of-way, on the site of an existing waste disposal industry, near milepost 51.5.

- Distance from Terminal – 3.1 miles north of Whale's Tooth Station
- Lead Track – double lead track
- Length of yard – 1,500 feet

- Width of yard – 200 feet
- Number of storage tracks – six tracks (typical); five tracks for anticipated trains with a spare plus one for future expansion and maintenance equipment
- Highway Access – directly off existing private Pig Farm Road, connecting to Church Street

2.2.1.1 Land Use and Acquisitions

The Church Street site consists of two parcels of previously developed land within an industrial area. It is currently a junk yard (Frade's Disposal Company), with several buildings and stockpiles of materials distributed across the cleared area. Adjoining properties include transportation corridors, industrial land use, undeveloped land, and open space. Nearby properties include residential development to the east and Acushnet Cedar Swamp State Reservation to the west, across Route 140. Land uses and public or private ownership of the parcels that would be acquired to construct a layover facility at the Church Street site are listed in Table 2-1.

Table 2-1 Layover Facility at the Church Street Site: Acquisition Parcel Land Uses

City/Town	Public Ownership		Private Ownership				
			Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	TOTAL
New Bedford	0	0	2	0	0	9.18	29.63	38.81

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

The parcels that would be acquired to construct a layover facility at the Church Street site, and the approximate tax revenue and job losses, are listed in Table 2-2.

Table 2-2 Layover Facility at the Church Street Site: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
125-10	Private	Industrial	Undeveloped	$1,234.54	TBD	9.18	100.0
129-41	Private	Industrial	Industrial	$20,143.80	TBD	29.63	100.0
TOTAL				$21,378.34		38.81	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

The layover facility at the Church Street site would require 38.81 acres (two parcels) of privately owned land. Business displacement would result from these acquisitions. Industrial buildings on parcel number 129-41 would be acquired to construct the layover facility. Job losses from the disposal and recycling business would be expected but have not been quantified. No residential or community facility displacements would result from these acquisitions for the Church Street site. The

layover facility would make the portions not used for a layover inaccessible for future development. Complete acquisitions would be required as a result.

The two parcels would be wholly acquired; property tax revenue losses for the City of New Bedford are estimated at $21,378.34 per year, in 2009 dollars.

The Church Street site is not within or adjacent to any incompatible land use. The site and adjacent lands between Church Street and Route 140 are in industrial use. There are no plans to change land uses or zoning in this area.

2.2.1.2 Environmental Justice

Although there are no environmental justice communities within the layover site, an environmental justice neighborhood is located less than 0.5 mile northeast of the proposed layover facility, to the east of the New Bedford Main Line. Residents living within this neighborhood meet low income and minority criteria for designation. However, no parcels within an environmental justice neighborhood would be acquired for the Church Street site layover facility. There would be no land acquisition impacts to environmental justice populations.

2.2.1.3 Noise Impacts

Noise at all of the proposed South Coast Rail layover facilities would be dominated by train's idling locomotives. As per MBTA policy, trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. Other minor noise sources on the site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe noise impacts at the layover facilities were calculated based on the Source Reference Level of 109 dBA at 50 feet as cited in the FTA Guidelines[1]. The layover facility sound level was projected to the receptor locations based on propagation of noise over distance. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-3. There would be no noise impacts associated with this location.

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006

Table 2-3 Church Street Layover Facility Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact		Severe Impact	
			Ldn	Number of Impacts	Ldn	Number of Impacts
Church Street	79.8	55	55.3	0	61.2	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines, Environmental Consequences Technical Report - Noise).
- All facilities are assumed to have one train idling per hour (day and night).

2.2.1.4 Wetlands and Waterways

The site is largely comprised of the junk yard facility, with the remainder of the site characterized as forested areas. There are three wetland resources on the site located on the northeast, northwest and southern portions of the site. These resources are best characterized as forested wetlands. The wetland resources on site are regulated as Bordering Vegetated Wetlands (BVW) under the WPA and under federal jurisdiction. The site is not within any drinking water protection areas or adjacent to any waterbodies.

The proposed layover site would permanently impact approximately 0.07 acres of BVW classified as wooded swamp deciduous (PFO) wetlands and temporarily impact approximately 0.06 acres. These wetland impacts are associated with the wetland system along the eastern and southern sides of the site. Wetlands were avoided to the extent practicable during the conceptual design process to minimize impacts. No impacts to Bank, Riverfront Area, or BLSF are anticipated at this site. The wetland delineations created using the GIS model are expected to overestimate the size of the wetland and therefore the impacts. Wetland impacts would be re-evaluated once the preferred alternative is selected and wetland boundaries have been delineated in the field. Based on preliminary data, approximately 0.25 acres of wetland mitigation would be required.

2.2.1.5 Wild and Scenic Rivers

The Church Street site is not adjacent to any Wild and Scenic River.

2.2.1.6 Threatened and Endangered Species

According to the 2008 edition of the Natural Heritage Atlas and information from NHESP, there are no certified or potential vernal pools located on the property, nor is the property within Estimated or Priority Habitat of Rare Wildlife.

2.2.1.7 Chapter 91 and Coastal Zone

The Church Street layover site is outside of the Coastal Zone and does not require work within filled tidelands.

2.2.1.8 Hazardous Materials

The Church Street site consists of two previously developed parcels within an industrial area, currently occupied by a disposal and recycling operation. The northern portion of the Site is wooded and undeveloped. The remaining portion of the Site is used by the Frade's Disposal Company which operates the solid waste recycling, scrap metal recycling, and trash pick-up and disposal company. Based upon the Phase 1 Environmental Site Assessment conducted for the Church Street layover site, four recognized environmental concerns (RECs) and three potential environmental concerns were identified and are described below[2].

The four RECs described in Table 2-4 may have resulted in the release of oil or hazardous materials to soils or groundwater at the site. During the site reconnaissance of April 30, 2009, an area of pooled oil as well as a larger area of stained soil was observed on the ground surface in an unpaved area located in the western portion of the Frade's facility which is approximately 300 feet to the west of the proposed Site boundaries. The pooled oil was located in an area staging large trucks and other heavy equipment which utilize oil or hazardous materials (OHM). The presence of pooled oil and stained soil could represent a release that would require notification to the DEP. In addition, this condition may have impacted subsurface soil and ground water at the Site and therefore is considered a REC with a medium potential impact[3].

[2] Recognized Environmental Conditions (RECs), as defined by the ASTM E1527-05 standards, "means the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws."

[3] The ASTM Standard requires an opinion regarding the potential for each REC to affect the site. The potential impact for each REC identified, based on available information, is classified as either high, medium, or low. Criteria used to determine the potential impact are discussed below:

A 3,000 gallon diesel above-ground storage tank (AST) with a fuel dispenser pump was observed outside in the center of the Frade's facility. Even though a concrete pad was located under the AST, a large area of stained soil was observed around the dispenser pump and had migrated off the concrete pad onto the ground surface. The exterior of the AST was also rusted. The potential release of oil which may have occurred in this area over time could have impacted subsurface soil and ground water at the Site and therefore is considered a REC with a medium potential impact.

Table 2-4 Summary of RECs at the Proposed Church Street Layover Site

REC Description	Release Tracking Number (RTN)	Relative Impact
Current Existence of 3,000 Gallon Diesel Aboveground Storage tank with Stained Soil on Site	Not applicable	High
Presence of Pooled Oil and Stained Soil in Unpaved Area Near Site	Not applicable	Medium
Historic and Current Use of Area Near Site for Vehicle Repair and Maintenance	Not applicable	Medium
Existence of Underground Storage Tanks Near Site	Not applicable	Low

- RECs that are deemed to have a high potential impact consist of sites such as those with confirmed soil, ground water, and/or indoor air impacts that either were not reported to DEP or were reported to the DEP and have undergone some type of cleanup or remain an active case. Those properties that have undergone a cleanup and have achieved a Permanent Solution, such as an Response Action Outcome (RAO), are still considered high potential impact due to the fact that changing site use or regulations, construction activities, a DEP audit of the RAO, or identification of new environmental conditions (such as indoor air impacts in nearby structures) could trigger the need to conduct additional assessment and/or remediation activities. Other RECs with high potential impacts are those in which UST installation records exist but for which removal documentation is absent, indicating a likelihood that USTs may be present and those where the historic use of the property indicate that significant quantities of OHM were used and could constitute the a release of OHM.
- Properties with RECs that are deemed to have a medium potential impact consist of properties such as those with potential sources of OHM with limited or inconclusive information. For instance, a single-walled steel UST which has been removed, but limited or no documentation was available to show that proper sampling was conducted at the time of the UST removal to confirm that the UST did not leak, may be deemed a REC of medium potential impact.
- RECs that have low potential to impact a site include off-site properties where releases have occurred but have been mitigated or USTs where proper documentation is available indicating a release has not occurred, as well as for properties that have more recently installed USTs equipped with leak detection, are double walled, and/or contain overfill protection and spill containment.
- The findings also include a section for potential environmental concerns which are also known as de minimis conditions. These potential environmental concerns typically have less of a potential to impact a property than RECs, as they generally do not present a threat to human health or the environment and would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. An example of a potential environmental concern or de minimis condition would be the potential presence of asbestos containing materials and lead based paint based on the age of the building, which would have to be properly managed during building demolition

Mr. Frade stated that approximately 25 vehicles, including garbage and recycling trucks, are repaired and maintained at the Frade's Disposal repair garage which is located approximately 200 feet west of the proposed Site boundaries. An inspection of the repair garage by the DEP in 1998 indicated that the waste oil collection area was not being properly managed and displayed evidence of excessive spillage. The improper management, storage, use, and/or generation of these products may have or could result in a release of OHM which constitutes a REC with a medium potential impact.

It is possible that one or both of the underground storage tanks recorded on the site may still be present and OHM associated with the USTs on this property may also be present which would constitute a REC with a medium potential impact.

The Church Street layover site has three potential environmental concerns including:

- The property was historically used for the growing of crops. Therefore, pesticides, herbicides, and fertilizers may have been used and because of their persistence, may still be present in Site soils.
- A pad mounted electrical transformer is located in a shed in the western portion of the Frade's Disposal facility. Mr. Frade stated that the transformer is owned by NSTAR. It is not known if this transformer contains PCB transformer oil. The transformer has the potential to leak transformer oil directly onto the ground surface.
- During the site reconnaissance, the Frade's Disposal facility was being used for the storage of drums, tires, trucks, scrap metal, machinery, plastic, metal, and other recyclable materials, including bins of computer monitors and other miscellaneous debris and trash. The general storage of materials in this manner indicates historically poor housekeeping practices and a potential for impacts to soil or groundwater.

The presence of these RECs and potential concerns will require additional Phase II site investigations to characterize soil and groundwater contamination, determine the extent of contamination, and evaluate the cost of remediation. Based on the Phase I investigation, the overall impacts of to site construction costs are ranked as "medium".

2.2.1.9 Cultural Resources

The Church Street Layover Facility is located on the west side of the New Bedford Main Line rail ROW near Church Street. No National Register listed, determined eligible, or recommended eligible historic properties have been identified in the Area of Potential Effect (APE).

Historic Resources

No historic properties have been identified within the site or in the APE for the Church Street site layover facility. Therefore, there will be no impacts to historic resources.

Archaeological Resources

The entire project parcel is assessed as having moderate archaeological sensitivity for pre-contact/contact Native American habitation and resource procurement/processing sites and under-documented post-contact Euro-American agricultural-related cultural deposits. The current conceptual plan depicts construction activities within the sensitive areas. An intensive (locational) archaeological survey with subsurface testing is needed to identify any archaeological sites in the sensitive areas where project construction impacts may occur.

2.2.1.10 Operational Constraints

The New Bedford Main Line through this section of the corridor is single track until the bridge crossing at Tarkiln Hill Road where it becomes double track. Trains exiting the Church Street layover facility would enter the New Bedford Main Line on a single track and would travel approximately 1 mile southbound before entering the double track section. Under normal operating conditions, there is minimal chance of conflict through this area given the headways of 40 minutes, considerably longer than the time required for a train to travel from the layover facility to the station and back. If trains throughout the rest of the rail system are delayed that could cause delays on the New Bedford Main Line. When this occurs there is potential for conflict between passenger trains making their final trip to the Whale's Tooth Station and trains heading north towards the Church Street Site. The trains heading towards the layover facility could wait on the double track section for the southbound train to pass which would only cause minor delays to the trains heading for the layover facility.

2.2.1.11 Operations and Maintenance Costs

Since the Church Street Site is approximately 3.1 miles from the terminal station on the New Bedford Main Line, that would create 3.1 miles of non-revenue service each train would need to run twice a day, once in the morning and once in the evening. The cost to the MBTA of operating a commuter rail vehicle was $11.92 per mile in 2010 based on the latest information provided by the National Transit Database. For the 6.2 miles of non-revenue service for each of the four eight-car trains, the yearly operating cost for trains operating from this layover facility alternative would be approximately $567,600.

Additional costs that would be incurred are related to the degradation of the equipment. By adding an additional 6.2 miles of travel for the trains each day, that will quickly decrease the value of the equipment compared to having a layover facility in close proximity to the terminal station.

2.2.2 Wamsutta Site

The proposed Wamsutta site layover facility (Figure 2-2) would be constructed along the New Bedford Main Line and would serve all rail alternatives. It would be located in New Bedford near the intersection of Wamsutta Street and Herman Melville Boulevard, near the southern terminus of the New Bedford Main Line, immediately north of the Whale's Tooth Station. This site is located on the east side of the right-of-way, opposite the proposed Whale's Tooth Station and adjacent to an existing freight rail yard, near milepost 54.7.

- Distance from Terminal – 0.3 miles north of Whale's Tooth Station
- Lead Track – single lead track
- Length of yard – 1,200 feet
- Width of yard – 200 feet
- Number of storage tracks – six tracks (typical); five tracks for anticipated trains with a spare plus one for future expansion and maintenance equipment
- Highway Access – 400-foot driveway to Wamsutta Street

2.2.2.1 Land Use and Acquisitions

The Wamsutta site is a previously developed site, currently used as a rail yard by MassCoastal Rail, within an industrial area. The site is visible from adjacent roads and buildings. Adjoining properties are transportation corridors and industrial land uses. Industrial sites are located north, east, and south of this location, and Route 18 to the west. No commercial or residential properties, or open spaces, are located in close proximity to this site. The land use and ownership of the parcel that would be acquired to construct a layover facility at the Wamsutta site are listed in Table 2-5.

Table 2-5 Layover Facility at the Wamsutta Site: Acquisition Parcel Land Uses

City/Town	Public Ownership		Private Ownership					
				Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	TOTAL
New Bedford	1	11.02	0	0	0	0	0	0

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

The layover facility at the Wamsutta site would require 11.02 acres (one parcel) of publicly owned land. No residential, business, or community facility displacements would result from this acquisition for the Wamsutta site. Parcel number 72-275 is owned by Housing 70 Corporation (the City of New Bedford); no property tax revenue loss would result from acquiring this parcel.

The Wamsutta site is not within or adjacent to any incompatible land use. The site and adjacent lands between Route 18, Wamsutta Street and Herman Melville Boulevard are in industrial or transportation use. There are no plans to change land uses or zoning in this area. Use of this site as a layover facility was incorporated into the Transit-Oriented Development concept for the Whale's Tooth Station area.

Table 2-6 Layover Facility at the Wamsutta Site: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
72-275	Public	Industrial	Undeveloped	0	No	11.02	100.0

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

The layover facility would make the portions not used for a layover undevelopable, requiring complete acquisition of the property.

2.2.2.2 Environmental Justice

The Wamsutta site layover facility is located within an environmental justice census block that meets low income and minority criteria for designation. Adjacent to and north of the north of the proposed layover facility is an environmental justice census block that also meets foreign-born criteria for designation.

The Wamsutta site is within and near environmental justice census blocks in New Bedford. The site is within a census block meeting environmental justice low income and minority criteria, and is close to (within 0.5 mile of) other areas meeting foreign-born, minority, and/or income criteria. The direct land acquisition impacts to environmental justice populations that would potentially result from constructing and using a layover facility at the Wamsutta site are described below. One publicly owned parcel would be acquired for the Wamsutta site layover facility, as listed in Table 2-7.

Table 2-7 Wamsutta Site: Environmental Justice Land Acquisition

Municipality	Parcel Number	Ownership	Generalized Zoning	General Land Use	Environmental Justice Categories	Area (acres)
New Bedford	72-275	Public	Industrial	Transportation (Rail)	Income, Minority	11.02

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Although the Wamsutta site is located within an environmental justice census block, the site is owned by the City of New Bedford. No privately owned environmental justice neighborhood land would be acquired for constructing a layover facility at the Wamsutta site. There would be no impacts to environmental justice populations because no residences or jobs would be lost.

2.2.2.3 Noise Impacts

Noise at all of the proposed South Coast Rail layover facilities would be dominated by train's idling locomotives. Trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. The other minor noise sources on site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe noise impacts at the layover facilities were calculated based on the Source Reference Level of 109 dBA at 50 feet based on FTA Guidelines. The layover facility sound level was projected to the receptor locations based on propagation of noise over distance. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-8. There would be no noise impacts associated with this location.

Table 2-8 Wamsutta Layover Facility Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact		Severe Impact	
			Ldn	Number of Impacts	Ldn	Number of Impacts
Wamsutta	79.8	60	57.8	0	63.4	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines, Environmental Consequences Technical Report - Noise).
- All facilities are assumed to have one train idling per hour (day and night).

2.2.2.4 Wetlands and Waterways

Although the Wamsutta site is within 100 feet of a jurisdictional wetland, it would not impact this wetland.

2.2.2.5 Wild and Scenic Rivers

The Wamsutta site is not adjacent to any Wild and Scenic River.

2.2.2.6 Threatened and Endangered Species

According to the 2008 edition of the Natural Heritage Atlas and information from NHESP, there are no certified or potential vernal pools located on the property, nor is the property within Estimated or Priority Habitat of Rare Wildlife.

2.2.2.7 Chapter 91 and Coastal Zone

The proposed construction of the Wamsutta layover facility would be located in landlocked tidelands and would be exempt from licensing under 310 CMR 9.04(2). The construction of the Wamsutta layover facility would require a Public Benefit Determination under 301 CMR 13.00.

The layover facility would be located entirely within the coastal zone associated with New Bedford Inner Harbor but is not within the New Bedford/Fairhaven Designated Port Area (DPA). The construction would require a Federal Consistency Certification under the Massachusetts Coastal Zone Management Program (MCZMP). Preliminary consultation with representatives of the MCZMP indicates that the proposed facility would likely be determined to be consistent with the regulatory policies of the MCZMP.

2.2.2.8 Hazardous Materials

The Wamsutta layover site is located on a triangular shaped property in a commercial and light industrial area of New Bedford (Figure 2-2). The Site is located south of Wamsutta Street, east of the railroad tracks, and west of Herman Melville Boulevard and is approximately 12 acres in size. Due to immobile soil contamination, the Site was capped with a geotextile membrane in approximately 2004. Railroad tracks abut the Site to the west and travel off site to the north. Railroad tracks also travel from the northeastern Site boundaries to the harbor which is located approximately 100 feet to the east. The trains haul dredged sludge from the harbor to the east and travel to the Site for off-site disposal.

Based upon the tasks conducted for this Phase I ESA, five RECs and three potential environmental concerns associated with the Site were identified and are described below and in Table 2-9.

Table 2-9 Summary of RECs at the Proposed Wamsutta Layover Site

REC Description	Release Tracking Number (RTN)	Relative Impact
Historic Use of Site as Freight Yard and Placement of Permanent Engineered Barrier Above Impacted Soil at Site	4-118	Medium
Documented Release at Acushnet Estuary (New Bedford Superfund Site)	4-122	Medium
Documented Release at Adjoining Property (618 Acushnet Avenue)	4-14791	Low
Documented Release and Implementation of Activity and Use Limitation at Nearby Property (1 Wamsutta Street)	4-11715	Low
Documented Release at Nearby Property (New Bedford Main Interceptor)	4-127	Low

The former Conrail Yard comprising the Site was managed as a voluntary Brownfield site. The center of the Site contained elevated concentrations of PCBs, arsenic, lead, and polycyclic aromatic hydrocarbons (PAHs) with the perimeter having lower concentrations of these contaminants in soil. An agreement was reached with the DEP and EPA based on the financial infeasibility of remediation at the Site. The contamination was proposed to be left in place with proper engineering controls, such as a soil geotextile composition cap and land use restrictions consisting of an Activity and Use Limitation (AUL) in the areas exhibiting the highest concentrations of contamination above the Upper Concentration Limits. Since contaminated soil was left in place, there are potential impacts related to exposure during future soil disturbance at the Site during construction related to the South Coast Rail Project. The potential impact of this REC is considered medium because exposure is limited due to the engineered barrier and the existence of an AUL.

The Acushnet Estuary, a water body located to the east of the Site, was placed on the National Priorities List and became a Superfund site in 1983. This site contains PCB contamination that affects ambient air, surface water, ground water, soils, sediment, and the food chain. Although adequately regulated under State and Federal regulations, the PCB contamination associated with this site is widespread and has the potential to have impacted the subject Site historically or potentially impact it in the future through continued contaminant migration and is considered a REC with a medium potential impact.

A No. 2 fuel oil UST release from a western adjoining property, the Department of Employment and Training, located at 618 Acushnet Avenue, was identified in June 1999. A total of 20 tons of petroleum contaminated soil was removed from the property. A Class A-2 Release Action Outcome (RAO), indicating that a Permanent

Solution was achieved but that contamination was not reduced to background, was submitted to the DEP. The anticipated direction of ground water flow is to the east toward the property comprising the Site. However, given the quantity and regulatory status, this REC is deemed to have a low potential to affect soil and groundwater at the Site.

A diesel fuel UST release from a property located northeast of the Site was reported in October 1995. Approximately 100 cubic yards of petroleum impacted soil was removed. Exceedences of 2-methyl naphthalene in soil were detected above the applicable regulatory standards and a deed restriction consisting of an AUL was placed on the property along with a Class A-3 RAO in October 1996. Although ground water was not impacted, the ground water flow direction was determined to flow to the south-southwest toward the Site. Based on the proximity of the Site, the direction of ground water flow, and the implementation of an AUL indicating residual petroleum impacts are present, this REC is deemed to have a low potential to affect the Site.

PCBs were detected during the filling of an abandoned interceptor pipe with grout in soil in an area located northeast of the SiteBased on the proximity of this property to the Site and the lack of information available for review, this property is deemed a REC with low potential to impact the Site.

The Wamsutta layover site also has three potential environmental concerns, including:

- An electrical substation containing transformers abuts the Site to the west off Acushnet Avenue. It is not known if the transformers contain PCB transformer oil. The transformers have the potential to release transformer oil directly onto the ground surface.
- A motor repair facility abuts the Site to the east off Herman Melville Boulevard. Numerous 55-gallon drums were observed outside behind the facility facing the Site and most likely contained OHM. The drums were not placed on pallets or any other type of secondary containment structure. Releases or spills from the drums, should they occur, have the potential to impact the Site.
- Numerous piles of unused new creosote coated railroad ties were located in two areas in the northern portion of the Site. Creosote contains heavy organic compounds that have the potential to leach into soil and ground water.

The presence of these RECs and potential concerns will require additional Phase II site investigations to characterize soil and groundwater contamination, determine the extent of contamination, and evaluate the cost of remediation. Based on the Phase I investigation, the overall impacts of to site construction costs are ranked as "low" because this site is a capped landfill.

2.2.2.9 Cultural Resources

The Wamsutta Street Layover Facility is located on the east side of the New Bedford Main Line rail between Wamsutta Street and the proposed Whale's Tooth Station. The National Register Listed Wamsutta Mill Historic District (Map No. NB.D) and the recommended National Register eligible Revere Copper Products mill (Map No. NB.080) are both located about 400 feet to the north.

Historic Resources

The Wamsutta Street Layover Facility does not have any historic properties on the proposed site; therefore, there will be no direct impacts to historic resources.

The Wamsutta Layover Facility is located on the east side of the New Bedford Main Line rail between Wamsutta Street and the proposed Whale's Tooth Station. The Wamsutta Mill Historic District (Map No. NB.D) and the Revere Copper Products mill (Map No. NB.080) are both located within the APE . The introduction of a layover facility could have indirect visual and noise effects on the two nearby historic properties. Because the site is adjacent to the existing freight yard and will constitute an expansion of similar rail use, the visual impacts to the historic setting is likely to not be adverse. There will be no noise impacts to the adjacent historic industrial buildings, which are not a category of noise sensitive receptors under the FTA criteria. Vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

Archaeological Resources

The proposed Wamsutta Layover Facility in New Bedford is assessed as having high archaeological sensitivity for pre-contact/contact Native American habitation and resource procurement/processing sites and post-contact Euro-American domestic, commercial/wharves, and railroad-related structures and cultural deposits below the clean fill-geotextile composition cap.

The entire parcel is assessed as having a high archaeological sensitivity for pre-contact Native American habitation, resource procurement/processing sites, and documented post-contact Euro-American domestic, commercial/wharves, and railroad-related structures. This also includes cultural deposits within the Acushnet Avenue Waterfront Industrial historic area. The archaeologically sensitive strata are located below the capped Superfund site soils.

The current conceptual plan indicates that the proposed work will be contained within the existing disturbed railroad right-of-way/rail yard and capped Superfund site soils. Therefore, no project impacts to archaeological resources are anticipated.

2.2.2.10 Operational Constraints

The Wamsutta Site is located 0.3 miles north of the terminal station. As trains exit the layover facility they would be able to pull out onto a siding track separate from the New Bedford Main Line. By providing this additional track trains can pull out of the facility past a turnout south of the station and then turn around and enter the station. Due to the close proximity of the layover yard to the terminal station, there is minimal chance of there being a conflict between trains entering the layover facility and those entering the station.

2.2.2.11 Operations and Maintenance Costs

The Wamsutta layover facility is located 0.3 miles from the terminal station which is beneficial in that there would be minimal amounts of non-revenue miles traveled by each train in a given day. The cost per mile of service for the MBTA in 2010 was $11.92 based on the latest information provided by the National Transit Database. For each of the four eight-car trains to travel approximately 0.6 miles a day as non-revenue service to the Wamsutta site, the yearly operating cost for trains operating from this layover site alternative would be approximately $55,000.

Additional depreciation cost that would be incurred by having the layover facility far away from the terminal station is minimized for this alternative because of the close proximity of the layover facility to Whales Tooth Station.

2.3 Fall River Line

Three overnight layover sites were evaluated in the DEIS/DEIR: the ISP Site in Freetown, and two sites at Weavers Cove (Weavers Cove East and Weavers Cove West).

2.3.1 ISP Site

The proposed ISP site layover facility (Figure 2-3) would be constructed along the Fall River Secondary and would serve all rail alternatives. It would be located in Freetown west of Main Street between the existing Fall River Secondary and the Taunton River, approximately 5.3 miles north the southern terminus of the Fall River Secondary. This site is located on the west side of the right-of-way, opposite the existing ISP Facility, near milepost 47.1 in Freetown.

- Distance from Terminal – 5.3 miles north of Battleship Cove Station
- Lead Track – single lead track; potential for a long lead track or siding exists and can be assessed in FEIR

- Length of yard – 1,500 feet
- Width of yard – 180 feet
- Number of storage tracks – six tracks (typical); five tracks for anticipated trains with a spare plus one for future expansion and maintenance equipment
- Highway Access – 2440-foot driveway to south of layover on west side of right-of-way, new bridge or grade crossing across right-of-way at that point for 860-foot driveway to Horizon Way

2.3.1.1 Land Use and Acquistions

The ISP site consists of five undeveloped parcels surrounded by open space or other undeveloped land; an industrial facility is nearby to the northeast. A residential development is located less than 0.25-mile south this site. The Taunton River is immediately west of the site. Land uses and public or private ownership of the parcels that would be acquired to construct a layover facility at the ISP site are listed in Tables 2-10 and 2-11.

Table 2-10 Layover Facility at the ISP Site: Acquisition Parcel Land Uses

City/Town	Public Ownership		Private Ownership					
				Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	TOTAL
Freetown	0	0	5	0	0	0	43.57	43.57

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Table 2-11 Layover Facility at the ISP Site: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
234-2 (Freetown)	Private	Residential	Undeveloped	$362.78	No	11.03	100.0
235-9 (Freetown)	Private	Residential	Undeveloped	TBD	No	15.04	22.0
X-8-12 (Fall River)	Private	Residential	Undeveloped	$2,714.45	No	0.61	100.0
X-4-1 (Fall River)	Private	Industrial	Undeveloped	$10,189.67	No	10.53	100.0
X-4-22 (Fall River)	Private	Industrial	Undeveloped	$16,688.96	No	6.36	100.0
TOTAL				$29,955.86[1]		43.57	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.
1: Additional property tax revenue losses may result from small and/or partial acquisitions that cannot be determined at this phase

The layover facility at the ISP site would require 43.57 acres (five parcels) of privately owned land. No residential, business, or community facility displacements would

result from these acquisitions for the ISP site. The layover facility would make the portions not used for a layover inaccessible for future development, and would require complete acquisition of four of the five parcels.

Four of the parcels would be wholly acquired; property tax revenue losses for the Town of Freetown are estimated at $362.78 per year, and for the City of Fall River are estimated at $29,593.08 per year, in 2009 dollars. Less than 50 percent of parcel number 235-9 would be acquired and, accordingly, property tax revenue loss cannot be determined at this phase. Additional property tax revenue losses for the Town of Freetown could result from the partial acquisition.

The adjacent property, ISP Chemical is a chemical manufacturing plant which requires a high level of security, and which poses a risk in the event of a chemical accident. The operator of the facility has indicated that this land use is not compatible with an adjacent area where people may gather, or which has unrestricted access.

2.3.1.2 Environmental Justice

The ISP site is an undeveloped parcel surrounded by open space or other undeveloped land; an industrial facility is nearby to the northeast. A residential development is located less than 0.25-mile south of this site. The Taunton River is immediately west of the site. There are no environmental justice communities within 0.5 mile of the layover site. An analysis of direct or indirect impacts to environmental justice populations from constructing and using the ISP site layover facility was therefore not performed.

2.3.1.3 Noise Impacts

Noise at all of the proposed South Coast Rail layover facilities would be dominated by train's idling locomotives. Trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. The other minor noise sources on site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe noise impacts at the layover facilities were calculated based on the Source Reference Level of 109 dBA at 50 feet as defined in FTA Guidelines. The layover facility sound level was projected to the receptor locations based on propagation of noise over distance. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-12 No noise receptors would experience moderate or severe noise impacts at this location.

Table 2-12 ISP Layover Facility Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact		Severe Impact	
			Ldn	Number of Impacts	Ldn	Number of Impacts
ISP	79.8	50	53.4	0	59.6	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines, Environmental Consequences Technical Report - Noise).
- All facilities are assumed to have one train idling per hour (day and night).

2.3.1.4 Wetlands and Waterways

The ISP layover facility site is located in Freetown and Fall River on the opposite side of the Fall River Secondary from the ISP chemical facility. This site is bounded to the north by forested uplands and forested wetlands, to the south and east by the Fall River Secondary, and to the west by the Taunton River and forested uplands. The site is best characterized as a mix between forested areas and open field. There are no wetland resources located on the site, though there is a vegetated wetland system located adjacent to it. No buffer zones extend onto the proposed layover facility site.

The site is currently undeveloped and largely forested. There is a pond east of the railroad right-of-way that is an impounded section of unnamed perennial stream. This stream crosses beneath the right-of-way in a culvert and flows through the wetland approximately 300 feet north of the facility before discharging to the Taunton River.

The proposed layover site would result in the permanent alteration of approximately 0.95 acres to Land Subject to Coastal Storm Flowage and temporary alteration of 0.16 acres. No impacts to Bank or bordering vegetated wetlands are anticipated. Development of this layover facility would temporarily impact 0.29 acres and would permanently impact approximately 2.28 acres of previously undeveloped Riverfront Area associated with the Taunton River.

2.3.1.5 Wild and Scenic Rivers

The Taunton River received a designation as a National Wild and Scenic River on March 30, 2009. The entire river system was included in this designation; from its headwaters at the confluence of the Town and Matfield Rivers in Bridgewater downstream 40 miles to the confluence with the Quequechan River at the I-195 Bridge in Fall River. The segment of the River where the ISP Layover Facility is

proposed has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline under the Wild and Scenic Rivers program.

The layover facility would be visible from the Taunton River. As described above, this segment of the Taunton River has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline. No impacts to the Taunton River are anticipated that would jeopardize its National Wild and Scenic River recreational designation. The program does not prohibit development near designated rivers; rather it encourages regional river management practices to protect the use and enjoyment of these rivers. The design of the layover facility would be guided by land use and resource management objectives that are compatible with the river's classification.

2.3.1.6 Threatened and Endangered Species

According to the 2008 edition of the Natural Heritage Atlas and information from NHESP, there are no certified or potential vernal pools located on the property, nor is the property within Estimated or Priority Habitat of Rare Wildlife.

2.3.1.7 Chapter 91 and Coastal Zone

The ISP layover site is outside of the Coastal Zone and does not require work within filled tidelands.

2.3.1.8 Hazardous Materials

The ISP layover site is located between the railroad ROW and Barnaby Cove which is part of the Taunton River in the Town of Freetown. The land is currently undeveloped, except for a dirt pathway that traverses the property in a southwest-northeast orientation and the railroad tracks that abut the Site to the southeast. In a grassy area, several dirt roads are present and appear to be used by recreational vehicles. Based upon the tasks conducted for the Phase I ESA, five RECs associated with the Site were identified and are described in Table 2-13 and below.

Table 2-13 Summary of RECs at the Proposed ISP Layover Site

REC Description	Release Tracking Number (RTN)	Relative Impact
Documented Releases on or Encompassing the Layover Site	4-13482, 4-13856, and 4-15907	High
Existence of Large Quantity of Hazardous Chemicals and Existence of Risk Management Plan at Southwestern Adjoining Property (ISP Chemicals, 238 South Main Street)	Not applicable	High
Historic Use of Adjoining Properties	Not applicable	High
Documented Releases at Nearby Property (Former Synthetic Natural Gas Plant)	4-16971	Medium
Documented Releases at Southwestern Adjoining Property (238 South Main Street)	4-10219, 4-10965, 4-11891, 4-13804, 4-13805, 4-18988, 4-14027, 4-14485, 4-15568, 4-15700, 4-16479, 4-16533, 4-16702, 4-16703, 4-19297, and 4-19557	Medium

A total of 60 buried 55-gallon drums and contaminated soil were encountered during a due diligence test pit investigation in 1997. Impacted soil (80 tons) was removed and 6,300 cubic yards of soil was treated onsite by bioremediation and then returned to the excavation. Soil and ground water sampling revealed volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), EPH, and thallium above background levels. Fine white poly vinyl chloride (PVC) powder was observed in soil at a thickness of up to eight feet. Even though a Class A-2 RAO was achieved in December 1999, residual soil contamination and other buried materials may be present in this location.

Groundwater monitoring wells detected TCE, 1,1-dichloroethene and vinyl chloride above the applicable standards in 1997. The same compounds were detected in surface water collected from Barnaby Cove which is located downgradient of the Site. Response actions are currently ongoing. The documented releases in soil and ground water at the Site above the applicable standards constitute a REC which a high potential impact.

The adjoining ISP Freetown Fine Chemicals facility uses and stores over 58 chemicals. Because of the toxic nature of chemicals present at the ISP facility, EPA requires the preparation of a Risk Management Plan in the event of a release which could volatilize to the environment, impacting nearby receptors. According to the Risk Management Plan, the prevailing winds from the ISP facility were determined to be from the southeast to the northwest, toward the Layover Site. Because of the

large quantity and the toxic nature of the chemicals used at the facility, if there were a release of toxic and volatile chemical(s), it would most likely impact potential receptors at the Layover Site. Therefore, the proximity, volume, and characteristics of these toxic and volatile chemicals have been deemed a REC with a high potential impact.

The following companies operated on the southwestern adjoining property at 238 South Main Street from 1964 to the present:

- Thompson Chemical Corporation,
- Continental Oil Corporation,
- Olin Corporation,
- Polaroid Corporation, and,
- ISP Freetown Fine Chemicals.

Therefore numerous quantities of OHM have been stored, treated, used, and/or disposed on this property since the 1960s, and on the former Algonquin Synthetic Natural Gas property since the 1970s. The historic uses of these properties, including the use of numerous OHM, is considered a REC with a high potential impact due to the potential for releases not previously identified to have occurred over the past 45 years of use; these releases could potentially migrate and affect the quality of soils and groundwater at the Site.

Algonquin Synthetic Natural Gas operated a synthetic natural gas plant approximately 1,000 feet to the north of the Site (currently a Stop and Shop Distribution facility) from 1973 and 1986. Petroleum constituents were detected in surficial soil samples and ground water at this property in 2000. A release of nickel and zinc was also identified in an area of the property adjoining the Site. These metals were generated from the associated catalyst usage in synthetic gas plant activities. In March 2003, one surficial soil sample was collected from an area located between the proposed Site and South Main Street and submitted for laboratory analysis of metals, VOCs, SVOCs, and herbicides. Nickel was detected at 160 mg/kg which exceeds the Method 1 S-1 standard of 20 mg/kg. Therefore, impacted soil may have migrated to the Site and may be encountered during construction of the proposed ISP Layover Site. The potential presence of impacted soil from the nearby former synthetic natural gas plant constitutes a REC with a medium potential impact.

Although numerous releases have occurred at the ISP Chemicals property located immediately southwest of the Layover Site, the majority of these releases were released to the air or achieved a Class A-1 or B-1 RAO, in which contamination approached or achieved background. Two of these releases achieved a Class A-2 RAO, in which contamination was not reduced to background; however, they both achieved No Significant Risk, and most likely did not migrate to or impact the

Layover Site. However, the quantity of the releases at the adjoining property constitutes a REC with a medium potential impact as unidentified or improperly assessed releases could exist.

The presence of these RECs and potential concerns will require additional Phase II site investigations to characterize soil and groundwater contamination, determine the extent of contamination, and evaluate the cost of remediation. Based on the Phase I investigation, the overall impacts of to site construction costs are ranked as "high".

2.3.1.9 Cultural Resources

Cultural resources present at the ISP site include archaeological resources.

Historic Resources

No historic properties have been identified within the ISP Layover Facility site or in the APE; therefore there will be no impacts to historic resources.

Archaeological Resources

The proposed ISP Layover Facility in Freetown is assessed as having high archaeological sensitivity for pre-contact/contact Native American habitation and resource procurement/processing sites, which if present could be contributing elements to the Mother's Brook Site (19-BR-106) within the Lower Taunton River Basin Archaeological District. There could also be under-documented post-contact period Euro-American agricultural-related cultural deposits. The site contains a recorded archaeological site (MHC #19-BR-106). There could also be under-documented post-contact period Euro-American agricultural-related cultural deposits.

The site is near the "Peace Haven" site in Freetown, identified as a significant cultural and archaeological resource. Another nearby site, part of the Mother Brook area, was identified at the proposed Meditech facility in Freetown. Development plans for that site were recently abandoned due to the cost and uncertainty of the archaeological investigations required by the Massachusetts Historic Preservation Office.

The current conceptual plan depicts construction activities within the sensitive areas. An intensive (locational) archaeological survey is needed to identify any archaeological sites. Project impacts would be assessed once the intensive survey is complete.

2.3.1.10 Operations

The ISP Layover Facility site is located in a section of the Fall River Secondary that is single tracked. This increases the possibility of operational conflicts between trains exiting the layover facility in the morning and trains leaving Battleship Cove and heading northbound. This would create additional operational conflicts from revenue service trains traveling southbound to Battleship Cove and trains traveling northbound from Battleship Cove to the layover facility. In the evening revenue service trains would need to wait for the non-revenue service trains to enter the layover facility before continuing southbound to Battleship Cove. Similarly in the morning trains exiting the layover facility heading towards Battleship Cove would need to wait in the double track section for the revenue service trains traveling northbound to pass.

2.3.1.11 Operations and Maintenance Costs

The ISP layover alternative is located approximately 5.3 miles north of the terminal station, Battleship Cove. Operating a layover facility 5.3 miles from the terminal station would result in 10.6 miles of deadheading each day for each of the four eight-car trains. Based on the MBTA's operating expense per vehicle mile of $11.92 determined by the latest information provided by the National Transit Database, it can be assumed that it would cost approximately $970,400 yearly to operate this layover facility alternative.

Additionally there is a depreciation cost associated with operating a layover facility 5.3 miles from the terminal station. The train's value would depreciate faster by adding 10.6 miles a day to each of the train's trips.

2.3.2 Weaver's Cove East

The proposed Weaver's Cove East site layover facility (Figure 2-4) would be constructed along the east side of the Fall River Secondary and would serve all rail alternatives. It would be located in Fall River west of Main Street between the existing Fall River Secondary and Main Street, approximately 2.6 miles north of the southern terminus of the Fall River Secondary. This site is located on the east side of the right-of-way, opposite the proposed Weaver's Cove LNG Site in Fall River, near milepost 49.8.

- Distance from Terminal – 2.6 miles north of Battleship Cove Station
- Lead Track – single lead track; potential for a long lead track or siding exists and can be assessed in FEIR
- Length of yard – 1,050 feet

- Width of yard – 200 feet
- Number of storage tracks – six tracks (typical); five tracks for anticipated trains with a spare plus one for future expansion and maintenance equipment
- Highway Access – 440-foot driveway to North Main Street

2.3.2.1 Land Use and Acquisitions

Currently vacant land, a portion of the Weaver's Cove East site was previously developed. Approximately one-half of the site is cleared of vegetation or includes remnant building foundations; the remainder of the site is vegetated. Surrounding land to the north, east, and south is residential; industrial land use is present to the southwest. Undeveloped land is immediately west of the site, adjoining the Taunton River. The industrial site to the southwest is a former Shell Oil facility, and consists of completely cleared land with several large aboveground storage tanks and a short shipping dock. Land uses and public or private ownership of the parcels that would be acquired to construct a layover facility at the Weaver's Cove site are listed in Tables 2-14 and 2-15.

Table 2-14 Layover Facility at the Weaver's Cove East Site: Acquisition Parcel Land Uses

City/Town	Public Ownership		Private Ownership					
				Land Use Area (acres)				
	Number of Parcels	Area (acres)	Number of Parcels	Residential	Commercial	Industrial	Undeveloped	TOTAL
Fall River	0	0	3	0.05	0	0	17.94	17.99

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).

Table 2-15 Layover Facility at the Weaver's Cove East Site: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
T-1-19	Private	Industrial	Residential	TBD[1]	No	0.05	38.5
T-1-33	Private	Industrial	Undeveloped	$42,129.43	No	13.80	100.0
T-1-38	Private	Industrial	Undeveloped	$15,188.32	No	4.14	100.0
TOTAL				$57,317.75		17.99	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.
1: Additional property tax revenue losses may result from small and/or partial acquisitions that cannot be determined at this phase.

The layover facility at the Weaver's Cove East site would require 17.99 acres (three parcels) of privately owned land. No residential, business, or community facility displacements would result from these acquisitions for the Weaver's Cove East site.

The layover facility would make the undeveloped industrial portions not used for a layover unattractive for future development and would require complete acquisition of two of the three parcels.

Less than 50 percent of parcel number T-1-19 would be acquired and, accordingly, property tax revenue loss cannot be determined at this phase. Parcel numbers T-1-33 and T-1-38 would be wholly acquired; property tax revenue losses for the City of Fall River are estimated at $57,317.75 per year, in 2009 dollars. Additional property tax revenue losses could result from the partial acquisition.

The Weaver's Cove East site is not within or adjacent to any incompatible land use. The adjacent lands between the railroad and North Main Street are in residential or commercial use. There are no plans to change land uses or zoning in this area.

2.3.2.2 Environmental Justice

Although there are no environmental justice communities within the layover site, an EJ neighborhood is located south of the proposed layover facility, to the east of the Fall River Secondary. Residents living within this neighborhood meet low income criteria for designation. No parcels within an environmental justice neighborhood would be acquired for the Weaver's Cove East site layover facility. There would be no land acquisition impacts to environmental justice populations.

2.3.2.3 Noise Impacts

Noise at all of the proposed South Coast Rail layover facilities would be dominated by train's idling locomotives. Trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. The other minor noise sources on site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe noise impacts at the layover facilities were calculated based on the Source Reference Level of 109 dBA at 50 feet as per FTA Guidelines. The layover facility sound level was projected to the receptor locations based on propagation of noise over distance. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-16. One residential receptor would experience moderate impacts.

Table 2-16 Weaver's Cove East Layover Facility Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact		Severe Impact	
			Ldn	Number of Impacts	Ldn	Number of Impacts
Fall River - Weaver's Cove Sites (East or West)	79.8	55	55.3	1	61.2	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines, Environmental Consequences Technical Report - Noise).
- All facilities are assumed to have one train idling per hour (day and night).

2.3.2.4 Wetlands and Waterways

Two wetland resources were originally mapped on the property consisting of scrub shrub wetlands: Wetland FA-5C and Wetland FA-5D. Wetland FA-5D is located in a depression that formerly held an above ground storage tank. During the review of the Abbreviated Notice of Resource Area Delineation by the Fall River Conservation Commission, the Commission determined that Wetland FA-5C was not a jurisdictional wetland. Wetland FA-5D is not subject to jurisdiction under the Massachusetts Wetland Protection Act. The Taunton River is within 100 feet of the proposed site but is separated from the site by the Fall River Secondary. As a result of these regulatory determinations by the Fall River Conservation Commission, in their Order of Resource Area Delineation, it was determined that the proposed layover site would not impact jurisdictional bordering vegetated wetlands. No impacts to Bank, bordering vegetated wetlands, Riverfront Area (25 feet within the City of Fall River), or Land Subject to Coastal Storm Flowage are anticipated at this site.

2.3.2.5 Wild and Scenic Rivers

The Taunton River received a designation as a National Wild and Scenic River on March 30, 2009. The entire river system was included in this designation; from its headwaters at the confluence of the Town and Matfield Rivers in Bridgewater downstream 40 miles to the confluence with the Quequechan River at the Interstate 195 Bridge in Fall River. The segment of the River where the Weaver's Cove East Layover Facility is proposed has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline under the Wild and Scenic Rivers program.

The layover facility would be visible from the Taunton River. As described above, this segment of the Taunton River has been designated as a "recreational river area,"

recognizing its aesthetic value and developed shoreline. No impacts to the Taunton River are anticipated that would jeopardize its National Wild and Scenic River recreational designation. The program does not prohibit development near designated rivers; rather it encourages regional river management practices to protect the use and enjoyment of these rivers. The design of the layover facility would be guided by land use and resource management objectives that are compatible with the river's classification.

2.3.2.6 Threatened and Endangered Species

According to the 2008 edition of the Natural Heritage Atlas and information from NHESP, there are no certified or potential vernal pools located on the property, nor is the property within Estimated or Priority Habitat of Rare Wildlife.

2.3.2.7 Chapter 91 and Coastal Zone

Informal consultation with DEP Waterways staff indicated that the Department presumes that the Weaver's Cove East layover facility is located within filled tidelands. This jurisdiction was not expected because the existing site is approximately 20 feet in elevation above the shoreline of the Taunton River. This presumed jurisdictional boundary is based on the shoreline shown on two historic maps provided by the DEP prepared in 1865 and 1874. Both of these maps postdate the construction of the railroad. It is likely that the railroad impounded water in the vicinity of the proposed layover facility and this impoundment is represented on these historic maps. If the presumption is true, the construction of the proposed layover facility will require a new Chapter 91 license. The Waterways Regulations are designed to protect and promote the public's interest in tidelands through the inclusion of provisions to conserve the capacity for water-dependent uses. The use of the site for layover needs is expected to be classified by DEP as a nonwater-dependent Infrastructure Facility (310 CMR 9.55). This classification may waive some of the above-referenced provisions, as long as feasible mitigation or compensation measures are provided such as the protection of maritime commerce or recreation and associated public access, reduction of flood and erosion-related hazards on lands subject to the 100-year flood or projected sea level rise, and the attainment of water quality goals.

The layover facility would be located entirely within the coastal zone associated with the Taunton River but outside the Mount Hope Bay DPA. Accordingly, the proposed layover facility would require a Federal Consistency Certification under the MCZMP. Preliminary consultation with representatives of the MCZMP indicates that the proposed facility would likely be determined to be consistent with the regulatory policies of the MCZMP.

2.3.2.8 Hazardous Materials

The Weaver's Cove East Layover site consists of three parcels and is located between the railroad tracks which are located to the west and North Main Street which is located to the east in a mixed use area of Fall River. The former Shell Oil Company petroleum product distribution facility is located southwest of the railroad tracks. The Weaver's Cove portion of the Taunton River is located immediately west and northwest of the railroad tracks. The parcels comprising the site are currently undeveloped and surrounded by a chain-link fence. Groundwater monitoring wells were observed throughout the site.

The southernmost parcel (Parcel T-1-38) consists of a concrete slab from a former repair garage that was used by the New England Telephone & Telegraph company. The land around the slab consists of grass, shrubs and trees. The center parcel (Parcel T-1-33) consists of a heavily vegetated wetland area that reportedly was formed from a depression caused by the weight of a former gasoline aboveground storage tank. The northernmost parcel (Parcel T-15-1) is vegetated and primarily covered with shrubs and trees.

Based on the tasks conducted for the Weaver's Cove East Layover site Phase I ESA, five RECs and one potential environmental concern were identified and are described below and in Table 2-17.

Table 2-17 Summary of RECs at the Proposed Weaver's Cove East Layover Site

REC Description	Release Tracking Number (RTN)	Relative Impact
Previous Use of Site as Oil Storage Facility and Documented Petroleum Release on Site	4-749	High
Previous Use of Adjoining Property as Petroleum Product Distribution Facility and Documented Release (Shell Oil Company, 1 New Street)	4-749	High
Previous Use of Building on Parcel T-1-38 as Commercial Garage	Not applicable	Medium
Existence of Underground Storage Tanks (USTs) on Parcel T-1-38	Not applicable	Medium
Possible Presence of Elevated Concentrations of Metals in Site Soil	Not applicable	Low

According to historic Sanborn maps, from the early to mid 1900s, a large gasoline AST was located on the center portion of the Site and was removed in the mid-1900s. According to documents reviewed, Shell operated a crude oil refinery, product storage and distribution facility at the western abutting property from 1920 to 1929 and a petroleum product distribution facility from 1929 to 1995.

Documents obtained from the Fall River Fire Department depict a large area of petroleum impacts, which includes the Site and the abutting property located west of the

Site, as well as the former and current tank locations. Contours on the map show the thickness of the light non-aqueous phase liquids (LNAPL) in ground water of thickness up to 2.5 feet. In the center of the Site, the LNAPL thickness is shown to be two feet. The previous use of the Site as an oil storage facility and the documented extensive petroleum release constitutes a REC with a high potential impact.

Shell operated a crude oil refinery, product storage and distribution facility at the western abutting property (Weaver's Cove West) from 1920 to 1929 and a petroleum product distribution facility from 1929 to 1995. According to documents reviewed, extensive petroleum releases occurred on that property during that time. This property is currently being remediated with a LNAPL recovery and ground water treatment system. Even though active remediation activities are currently ongoing and ground water flows to the northwest toward the Taunton River and away from the Site, the presence of extensive LNAPL in the subsurface is deemed a REC with a high potential impact.

Recent aerial photographs of the southern portion Site located on Parcel T-1-38 show the presence of a concrete slab, indicating that a building was once present. A Sanborn map dated 1976 shows the existence of a "private garage" that was operated by New England Telephone and Telegraph Company. Vehicle repairs were likely performed in this building and petroleum and other OHM including motor oil, waste oil, fuel oil, alcohol, anti-freeze, and degreasing chemicals that may contain chlorinated solvents were likely to have been stored, used, and generated. The storage, use, and/or generation of these products may have or could result in a release of OHM constituting a REC with a medium potential impact.

According to records received from the Fall River Fire Prevention Department, three USTs were previously located on Parcel T-1-38, 2680 North Main Street. The records document the removal of the gasoline and waste oil tanks which were removed in 1988 and 1987, respectively. There are no records documenting the removal of the No. 6 fuel oil tank. It was not indicated on the removal records if contamination was encountered during the removal of the gasoline and waste oil tanks and detailed closure reports were not identified. Therefore, OHM may be present in the locations of the former USTs. In addition, it is possible that the No. 6 fuel oil UST, the integrity of which is unknown, may still be present. OHM associated with the USTs formerly/currently on this property would constitute a REC with a medium potential impact.

According to a report reviewed for a western adjoining property (1 New Street), arsenic and beryllium were detected in soil above applicable standards at a depth beginning from the ground surface to a depth of approximately eight feet below grade. The detection of these metals are believed to be attributable to historic filling activities in the 1920s during which fill material was dredged from the Taunton River. The potential presence of OHM at levels which could pose a risk to human or

ecological populations is considered a REC with a low potential impact and would need to be managed appropriately during any proposed construction activities.

Weaver's Cove East Layover site has one potential environmental concern. During the site reconnaissance, pole-mounted electrical transformers were observed on the Site. It is not known if these transformers contain PCB transformer oil. The transformers have the potential to leak transformer oil directly onto the ground surface.

The presence of these RECs and potential concerns will require additional Phase II site investigations to characterize soil and groundwater contamination, determine the extent of contamination, and evaluate the cost of remediation. Based on the Phase I investigation, the overall impacts of to site construction costs are ranked as "medium" to "high".

2.3.2.9 Cultural Resources

The historic survey completed for the Weaver's Cove layover facility parcel on the west side of the railroad right-of-way encompasses the historic resources in the APE of the current site on the east side of the right-of-way.

Historic Resources

Based on the survey completed for the west site, the Weaver's Cove East site overlaps into a portion of the North Main Street Area (Map No. FR.D) that has been recommended as eligible for the National Register. This part of the Area has no buildings. The construction of the layover facility would be an adverse effect as it would change the visual setting and the character of the area.

Two historic properties are located in the layover facility APE: the National Register-listed Squire William B. Canedy House (Map No. FR.012) and the National Register-eligible William J. Wiley Middle School (Map No. FR.013).

The William B. Canedy House would be separated from the layover facility by a modern building and outbuildings, and then by the tracks. There would be no adverse visual impact because the layover facility would not substantially alter the historic setting of the house, which is already converted to industrial uses (i.e. the tank farm). There would be no noise impacts that would require modifications to the building and no land acquisition from the property.

The William J. Wiley Middle School is located on the opposite (east) side of Main Street from the facility and separated from it by this major roadway and several modern buildings. There would be no property acquisition, no change in the setting of the school, and no noise impacts that would require modifications to the exterior of the building.

There will be no adverse effect to the nearby National Register-listed Squire William B. Canedy House and the National Register-eligible William J. Wiley Middle School.

Archaeological Resources

The project parcel on the west side of the railroad right-of-way within the proposed Weaver's Cove LNG Site was previously subjected to an archaeological reconnaissance survey in 2003. No areas of archaeological sensitivity were identified in the previously disturbed parcel, and no further work was deemed necessary.

The project parcel on the east side of the railroad right-of-way opposite the Weaver's Cove LNG Site has not been subjected to archaeological reconnaissance survey. An archaeological reconnaissance survey is needed to assess the archaeological sensitivity of this parcel. An intensive (locational) survey may be needed to identify archaeological sites in sensitive areas. Project impacts to archaeological resources for the Weaver's Cove East parcel will be assessed prior to completion of environmental review and when more design information is available.

2.3.2.10 Operations

The Weaver's Cove East site is located in a section of the Fall River Secondary that is single track. Since this site is located on the eastern side of the tracks there may be conflicts in the morning if trains heading northbound from Battleship Cove; however, there is a minimal chance of conflict in the morning because of the 40-minute headway allotted to each train. A similar opportunity for conflicts occurs in the evening with trains heading northbound from Battleship Cove to the layover facility. If these trains experience any significant delays that would require the revenue service trains heading southbound to wait prior to entering the single track section until the train heading to the layover facility clears the area.

2.3.2.11 Operations and Maintenance Costs

The Weavers Cove East site is located 2.6 miles north of Battleship Cove. In order to operate from this facility all four eight-car trains would need to travel these 2.6 miles to and from Battleship Cove as non-revenue service trains. Operating a layover facility 2.6 miles from the terminal station would result in 5.2 miles of deadheading each day for each of the four eight-car trains. Based on the MBTA's operating expense per vehicle revenue mile of $11.92 determined by the latest information provided by the National Transit Database, it can be assumed that it would cost approximately $476,000 yearly to operate trains our of this layover facility.

Additionally these are costs associated with the depreciation of the equipment by requiring an additional 5.2 miles of travel to and from the layover facility each day.

2.3.3 Weaver's Cove West

The proposed Weaver's Cove West site layover facility (Figure 2-5) would be constructed along the west side of the Fall River Secondary Line. The facility would be between the existing Fall River Secondary and the Taunton River, approximately 2.6 miles from the southern terminus of the Fall River Secondary. This site is located on the west side of the right-of-way, on the proposed Weaver's Cove LNG Site in Fall River, near milepost 49.8.

- Distance from Terminal – 2.6 miles north of Battleship Cove Station
- Lead Track – single lead track; potential for a long lead track or siding exists and can be assessed in FEIR
- Length of yard – 1,100 feet
- Width of yard – 200 feet
- Number of storage tracks – six tracks (typical); five tracks for anticipated trains with a spare plus one for future expansion and maintenance equipment
- Highway Access – direct access to site off of New Street

2.3.3.1 Land Use and Acquisition

The site is zoned as General Industrial by the City of Fall River. The site includes both developed and undeveloped land. The developed portion is highly disturbed by industrial uses associated with a petroleum products facility. The industrial site is a former Shell Oil facility, and consists of completely cleared land with several large aboveground storage tanks and a short shipping dock. The undeveloped portion is vegetated. Approximately seven acres of the Shell site, primarily the undeveloped portion, would be utilized for the proposed layover facility. Surrounding land in all directions except west and northwest is similarly undeveloped or industrial property. A narrow strip of lightly developed land (a cell phone tower site) is northwest of the site.

Portions of parcels that would be acquired to construct a maintenance/layover facility at the Weaver's Cove site are listed in Table 2-18.

Table 2-18 Layover Facility at the Weaver's Cove West Site: Land Acquisition

Parcel Number	Ownership	Generalized Zoning	General Land Use	Property Tax Revenue Loss	Job Loss	Area (acres)	Percent Acquisition
T-2-1	Private	Industrial	Industrial	TBD	No	48.74	100
T-15-2	Private	Industrial	Undeveloped	TBD	No	9.17	100
TOTAL				TBD		57.91	

Sources: MassGIS 2002, 2005; municipal data 2009, aerial mapping, and online research (various).
TBD: To be determined.

The layover facility would require the acquisition of approximately 57.91 acres (two parcels) of privately owned land, both zoned for industrial uses; one is undeveloped while the other was used as part of a currently inactive petroleum products facility as discussed in Section 2.3.7. The layover facility would make the portions not used for a layover inaccessible for future development and would require the complete acquisition of these parcels.

Property tax revenue and job losses could result from acquisition of the two privately-owned parcels at the site. However, precise revenue losses cannot be determined, as current property tax revenue information is not available at this time.

The Weaver's Cove West site is within the area formerly proposed for use as a liquefied natural gas facility, and owned by Hess. There is currently no proposal for an alternative development on this site, however the City of Fall River has convened a task force to identify potential future uses if the City were to acquire the property. Because of the preliminary nature of this planning effort, MassDOT anticipates that layover facility would be compatible with future land uses.

2.3.3.2 Environmental Justice

Although there are no Environmental Justice (EJ) communities within the layover site, an EJ neighborhood is located southeast of the proposed layover facility; to the east of the Fall River Secondary. Residents living within this neighborhood meet low income criteria for this designation. No parcels within an environmental justice neighborhood would be acquired for the Weaver's Cove West site layover facility. There would be no land acquisition impacts to environmental justice populations. There are no disproportionate impacts to this community for noise, visual or air quality impacts.

2.3.3.3 Noise Impacts

Noise at all of the proposed South Coast Rail layover facilities would be dominated by train's idling locomotives. Trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. The other minor noise sources on site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe noise impacts at the layover facilities were calculated based on the Source Reference Level of 109 dBA at 50 feet as per FTA Guidelines. The layover facility sound level was projected to the receptor locations based on propagation of noise over distance. This analysis revealed only one impact, which occurred at both the proposed Weaver's Cove East and West facilities. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-19. One residential receptor would experience a moderate noise impact.

Table 2-19 Weaver's Cove West Layover Facility Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact		Severe Impact	
			Ldn	Number of Impacts	Ldn	Number of Impacts
Fall River - Weaver's Cove Sites (East or West)	79.8	55	55.3	1	61.2	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines, Environmental Consequences Technical Report - Noise).
- All facilities are assumed to have one train idling per hour (day and night).

2.3.3.4 Wetlands

There are no vegetated wetland resources located on the site, though a portion of Land Subject to Coastal Storm flowage associated with the Taunton River is located in the northeast portion of the proposed layover facility site. The sections of the site that are not currently used by the oil facility, located on the eastern portion of the proposed facility, are characterized as scrub shrub uplands. The site includes Land Subject to Coastal Storm Flowage associated with the Taunton River, which is regulated by the Wetlands Protection Act. These areas are subject to flood inundation caused by coastal storms up to and including that caused by the 100-year storm.

The Taunton River is located less than 50 feet from the main portions of the proposed Weaver's Cove West Facility site. No other surface water resources exist on, or adjacent to, the site. There are no groundwater drinking water source protection resources on or adjacent to the site.

The proposed Weaver's Cove West layover would include construction within a small segment of Land Subject to Coastal Storm Flowage associated with the Taunton River. Flood hazard management measures should be included in the layover design (e.g., stormwater management for the 100-year storm, placement of oil and grease collection trays and separators outside of this area).

2.3.3.5 Wild and Scenic Rivers

The Taunton River received a designation as a National Wild and Scenic River on March 30, 2009. The entire river system was included in this designation; from its headwaters at the confluence of the Town and Matfield Rivers in Bridgewater downstream 40 miles to the confluence with the Quequechan River at the Interstate 195 Bridge in Fall River. The segment of the River where the Weaver's Cove West Layover Facility is proposed has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline under the Wild and Scenic Rivers program.

The layover facility would be visible from the Taunton River. As described above, this segment of the Taunton River has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline. No impacts to the Taunton River are anticipated that would jeopardize its National Wild and Scenic River recreational designation. The program does not prohibit development near designated rivers; rather it encourages regional river management practices to protect the use and enjoyment of these rivers. The design of the layover facility would be guided by land use and resource management objectives that are compatible with the river's classification.

2.3.3.6 Threatened and Endangered Species

According to the 2008 edition of the Natural Heritage Atlas and information from Natural Heritage and Endangered Species Program, there are no Certified or Potential Vernal Pools located on the property, nor is the property within Estimated or Priority Habitat of Rare Wildlife.

2.3.3.7 Chapter 91 and Coastal Zone

Approximately 4,300 sq. ft. of land within the northeast section of the Weaver's Cove West layover facility area is presumed to contain filled tidelands, subject to jurisdiction under Massachusetts General Law, Chapter 91 and accompanying Waterways Regulations at 310 CMR 9.00 (Figure 2-2). The Massachusetts Department of Environmental Protection (DEP) has created a series of presumed jurisdictional boundaries based on the shoreline shown on two historic maps prepared in 1865 and 1874. Jurisdiction is presumed versus confirmed due to the incompleteness of the data and DEP reserves the right to make determinations on a case-by-case basis. The

Waterways Regulations, administered by DEP, are designed to protect and promote the public's interest in tidelands through the inclusion of provisions to conserve the capacity for water-dependent uses.

The proposed site is located entirely within the jurisdictional Coastal Zone boundaries (Taunton River Estuary Coastal Zone). Accordingly, the proposed layover facility would require a Federal Consistency Certification by the Massachusetts Office of Coastal Zone Management (MCZM).

Human-induced coastal resources include a portion of the Mount Hope Bay (Fairhaven/New Bedford) Designated Port Area (DPA). DPAs are marine industrial land and water areas protected by regulation to preserve and the Commonwealth's marine economy. In terms of human-induced resources, the proposed facility is consistent with DPA temporary uses and would not affect the operations of the Mount Hope Bay DPA. EOT expects the layover facility project to be found consistent with MCZM program policies based on its minimal impacts and strategies for meeting applicable coastal regulations. The use of the site for a layover facility is expected to be classified by DEP as a Nonwater-dependent Infrastructure Facility (310 CMR 9.55), which may waive some of the Waterways regulatory provisions, as long as feasible mitigation or compensation measures are provided such as the protection of maritime commerce or recreation and associated public access, reduction of flood and erosion-related hazards on lands subject to the 100-year flood or projected sea level rise, and the attainment of water quality goals.

Public access to the water is limited, due to the industrial nature of the site and partial location within the DPA. However, there are some areas of the site where informed public access seems to be achieved, namely the northernmost vegetated portion via a series of pathways off of North Main Street. This public access may be restricted upon construction of the layover facility.

2.3.3.8 Hazardous Materials

Based on the tasks conducted for the proposed Weaver's Cove West Phase I Environmental Site Assessment (ESA), three Recognized Environmental Conditions (RECs) and two potential environmental concerns were identified and are described below and in Table 2-20.

Table 2-20 Summary of RECs at the Proposed Weaver's Cove West Layover Site

REC Description	RTN(s)	Relative Impact
Existence of USTs and ASTs at Site	Not applicable	High
Previous Use of Site as Petroleum Products Distribution Facility and Documented Release	4-749	High
Possible Presence of Elevated Concentrations of Metals in Site Soil	Not applicable	Low

According to the DEIS/DEIR, a total of 12 gasoline, fuel oil, and used oil tanks ranging in size from 1,000 gallons to 15,000 gallons were removed from the site from 1989 to 1998. A Certificate of Registration dated April 25, 2002 to Jay Cashman, Inc. at One New Street, the address of the site, grants the "keeping, storage, manufacture or sale of flammables or explosives as follows: 64,000,000 gallons of various petroleum products". A UST inventory notification dated May 1991 stated that eight USTs were located at the Site. Six of the USTs were listed as being permanently out of use and two of the USTs were listed as being currently in use. The size of the USTs or the type of product was not provided. The tank removal records list only six USTs having been removed since 1991. It was not indicated on the tank removal records if contamination was encountered during the removal and detailed closure reports were not identified. Therefore, oil and/or hazardous material (OHM) may be present in the locations of the former USTs. In addition, it is possible that at least two USTs, the integrity of which is unknown, may still be present. OHM associated with the USTs and ASTs that were formerly and currently may be present on this property would constitute a REC.

Shell operated a crude oil refinery, product storage and distribution facility on the site from 1920 to 1929 and a petroleum product distribution facility on the site from 1929 to 1995. According to documents reviewed, extensive petroleum releases occurred on the site during that time. A map of the depicts a large area of petroleum impacts, as well as the former and current tank locations. Contours on the map show the thickness of the light non-aqueous phase liquid (LNAPL) in groundwater at the site with thicknesses up to 2.5 feet. According to a recent Remedy Operation Status (ROS) Status Report dated November 2008, this property is currently being remediated with a LNAPL recovery and groundwater treatment system. The previous use of the site as an oil storage facility and the documented extensive petroleum release constitutes a REC.

According to a report reviewed for the property, arsenic and beryllium were detected in soil above applicable standards at a depth beginning from the ground surface to a depth of approximately eight feet below grade. The potential presence of OHM at levels which could pose a risk to human or ecological populations is considered a REC and would need to be managed appropriately during any proposed construction activities.

Even though not considered RECs, the following is considered to be a potential environmental concern: During the site reconnaissance, pole-mounted electrical transformers were observed on the site. It is not known if these transformers contain polychlorinated biphenyl (PCB) transformer oil. The transformers have the potential to leak transformer oil directly onto the ground surface.

The presence of these RECs and potential concerns will require additional Phase II site investigations to characterize soil and groundwater contamination, determine the extent of contamination, and evaluate the cost of remediation. Based on the Phase I investigation, the overall impacts of to site construction costs are ranked as "high".

2.3.3.9 Cultural Resources

No previously reported historic sites or structures are located within the boundaries of the Weaver's Cove West Layover facility.

Historic Resources

One previously reported historic structure referenced by Adams et al. (2009) FR.015 (MHC No. FLR.485) is located within the 400-foot wide study buffer for the proposed facility location. The Border City Mill No. 2 building; 1 Weaver Street is about 400 feet southwest of the southern end of the layover facility. As described by Adams et al. (2009:22) the "mill is a five-story, Italianate style brick mill loft with an exterior stair tower. The structure was designed by Josiah Brown, Fall River's first professional architect, and constructed in 1873 for the manufacture of worsted woolens, print cloth, sheeting, and shirting." The mill is an element of the Fall River Multiple Resource Area, which encompasses all of Fall River within the city limits, and is an individually listed property on the National Register of Historic Places.

Two other resources adjacent to the site were identified during the reconnaissance survey. These are referenced by Adams et al. (2009) as FR.A (the Fall River Branch Railroad Corridor) and FR.014 (21 Alton Street). The railroad corridor forms the eastern boundary of the Weaver's Cove West layover facility. FR.014 is immediately adjacent to the railroad line and on the east side of the railroad corridor. The residence at 21 Alton Street is a vernacular structure constructed about 1870. Neither the railroad corridor nor the residence was recommended as eligible to the National Register of Historic Places by Adams et al. (2009).

Although some historic resources were identified on sites adjacent to the proposed layover facility; no adverse impacts to these sites are anticipated. These historic structures are simply too far from the layover facility to be impacted by construction or operations of the facility. It is highly unlikely that any construction debris and/or particulate matter would reach these locations. Furthermore, no noise or vibration impacts were recorded at the historic sites.

Archaeological Resources

Past archeological studies completed for the Weaver's Cove Energy LNG Terminal project, located in the same area as the proposed Weaver's Cove West layover facility, showed that there are no archeological resources within the site.

2.3.3.10 Operations

The Weavers Cove West layover facility would be located on the west side of the single track section on the Fall River Secondary. There is a minimal chance of conflict in the morning because of the 40-minute headway allotted to each train. If a train

leaving Battleship Cove was delayed in the morning then the next train exiting the layover facility would need to wait to enter the single track section until the other train passes. Similarly in the evening if a non-revenue service train were heading northbound to the layover facility and had been delayed, the revenue service train heading southbound would need to wait before the layover facility

2.3.3.11 Operations and Maintenance Costs

The Weavers Cove West site is located 2.6 miles north of Battleship Cove. In order to operate from this facility all four eight-car trains would need to travel these 2.6 miles to and from Battleship Cove as non-revenue service trains. Operating a layover facility 2.6 miles from the terminal station would result in 5.2 miles of deadheading each day for each of the four eight-car trains. Based on the MBTA's operating expense per vehicle revenue mile of $11.92 determined by the latest information provided by the National Transit Database, it can be assumed that it would cost approximately $476,000 yearly to operate trains out of this layover facility.

Additionally these are costs associated with the depreciation of the equipment by requiring an additional 5.2 miles of travel to and from the layover facility each day.

2.4 Summary

This section summarizes environmental impacts and compares the sites on each branch.

2.4.1 Land Use and Acquisitions

Land acquisition could range from 11 acres (Wamsutta) to 39 acres (Church Street) on the New Bedford line, and from 18 acres (Weaver's Cove East) to 58 acres (Weaver's Cove West) on the Fall River line, as shown in Table 2-21. Land acquisition totals required for each site range due to the shape of the sites and how a layover facility would dissect them. If the layover dissects a site in a way that would make access and any future development infeasible on the remaining section of the site, it was assumed that the project would need to acquire the entire site rather than just a percentage.

Table 2-21 Summary of Layover Facility Land Acquisition

Site	Public Ownership Area in acres (number of parcels)	Private Ownership Land Use Area in acres (number of parcels)				
		Residential	Commercial	Industrial	Undeveloped	*Total*
Church Street Site	0	0	0	9.18 (1)	29.63 (1)	*38.81 (2)*
Wamsutta Site	11.02 (1)	0	0	0	0	*0*
ISP Site	0	0-	0-	0	43.57 (5)	*43.57 (5)*
Weaver's Cove East Site	0	0.05 (1)	0	0-	17.94 (2)	*17.99 (3)*
Weaver's Cove West Site	0	0	0	48.74 (1)	9.17 (1)	*57.91 (2)*

Tax effects of the layover site alternatives are listed in Table 2-22. Depending on the alternative selected, tax losses in New Bedford would range from zero to $21,378, while tax losses in Fall River would range from $29,956 to $57,318.

Table 2-22 Summary of Layover Facility Potential Effects to the Economic Environment

Candidate Layover Facility Site	Property Tax Revenue Loss[1]	Job Loss
Church Street Site	$21,378.34	Yes[2]
Wamsutta Site	$0.00	No
ISP Site	$29,955.86[3]	No
Weaver's Cove East Site	$57,317.75[3]	No
Weaver's Cove West Site	NA[4]	No

NA: Not available
1 Does not include partial takings
2 Job losses at the recycling facility are expected but have not been quantified.
3 Full extent of tax revenue loss has not been determined for this site acquisition; additional property tax revenue losses may result from small and/or partial acquisition that cannot be determined at this phase.
4 Tax loss has not been determined as current property tax revenue information was not available when this analysis was conducted.

2.4.2 Environmental Justice

None of the layover facilities on either the New Bedford or Fall River lines would result in impacts to environmental justice populations.

2.4.3 Noise

Noise at the proposed South Coast Rail layover facilities would be dominated by trains idling locomotives. Trains that will remain at the layover facilities for one hour or longer will be shut down and attached to electrical power, as needed. The other minor noise sources on site are not expected to contribute to the overall sound levels and impacts. Distances to moderate and severe impact at the layover facilities were

calculated based on the Source Reference Level of 109 dBA at 50 per FTA Guidelines. The existing sound levels, the project sound levels, and the number of impacts are shown in Table 2-23. Moderate noise impacts would occur at the Weaver's Cove East and West sites.

Table 2-23 Layover Facilities Sound Levels and Impacts

Location	Noise Exposure at 50' (Ldn)	Existing Noise Exposure (Ldn)	Moderate Impact Ldn	Moderate Impact Number of Impacts	Severe Impact Ldn	Severe Impact Number of Impacts
Church Street Site	79.8	55	55.3	0	61.2	0
Wamsutta Site	79.8	60	57.8	0	63.4	0
ISP Site	79.8	50	53.4	0	59.6	0
Weaver's Cove East	79.8	55	55.3	1	61.2	0
Weaver's Cove West	79.8	55	55.3	1	61.2	0

Assumptions:

- A Source Reference Level of 109 dBA at 50 from the center of the site for layover tracks was used (FTA Guidelines - Table 5-5).
- All facilities are assumed to have one train idling per hour (day and night).

2.4.4 Wetlands

The Church Street, ISP, Weaver's Cove East, and Weaver's Cove West sites have mapped wetland resources located on the property and are listed below in Table 2-24. Although the Wamsutta site is within 100 feet of a jurisdictional wetland, it would not impact this wetland. The Church Street site would impact approximately 0.1 acre of wetlands. On the Fall River line, no vegetated wetland impacts would be required at any site.

Table 2-24 Direct Wetland Impacts – Layover Facilities

Layover	Bank (lf)		BVW (ac)		Land Subject to Coastal Storm Flowage (ac)	
	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
Church Street	0	0	0.07	0.06	0	0
Wamsutta Site	0	0	0	0	0	0
ISP Site	0	0	0	0	0.95	0.16
Weavers Cove East	0	0	0	0	0	0
Weavers Cove West	0	0	0	0.04	0	0

2.4.5 Wild and Scenic Rivers

Neither of the proposed layover facilities on the New Bedford line would affect a Wild and Scenic River.

Each of the three proposed layover facilities on the Fall River line would be adjacent to and visible from the Taunton River. The Taunton River received a designation as a National Wild and Scenic River on March 30, 2009. The entire river system was included in this designation; from its headwaters at the confluence of the Town and Matfield Rivers in Bridgewater downstream 40 miles to the confluence with the Quequechan River at the Interstate 195 Bridge in Fall River. The segment of the River where the Weaver's Cove West Layover Facility is proposed has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline under the Wild and Scenic Rivers program.

As described above, this segment of the Taunton River has been designated as a "recreational river area," recognizing its aesthetic value and developed shoreline. No impacts to the Taunton River are anticipated that would jeopardize its National Wild and Scenic River recreational designation. The program does not prohibit development near designated rivers; rather it encourages regional river management practices to protect the use and enjoyment of these rivers. The design of the layover facility would be guided by land use and resource management objectives that are compatible with the river's classification.

2.4.6 Threatened and Endangered Species

None of the layover sites evaluated would affect state-listed threatened or endangered species, or species of special concern.

2.4.7 Chapter 91 and Coastal Zone

One of the layover facilities on the New Bedford Line, Wamsutta, would require construction in landlocked tidelands within the coastal zone (Table 2-25). On the Fall River line, the ISP site would not require work in the coastal zone or in any area subject to Chapter 91. Both the Weaver's Cove East and West sites would likely require Chapter 91 licenses due to construction in filled tidelands.

Neither of the proposed layover sites on the New Bedford Main Line is within a Designated Port Area (DPA). The Weaver's Cove West site is within a DPA, and may be inconsistent with the designated uses of this marine area.

Table 2-25 Project Elements in Filled Tidelands – Layover Sites

Facility Name	Waterbody	Municipality	Jurisdictional
Church Street	none	New Bedford	none
Wamsutta	New Bedford Harbor	New Bedford	Landlocked Tidelands Coastal Zone
ISP	None	Fall River/ Freetown	none
Weaver's Cove East	Taunton River	Fall River	Filled Tidelands Coastal Zone
Weaver's Cove West	Taunton River	Fall River	Filled Tidelands Coastal Zone

2.4.8 Hazardous Materials

On the New Bedford line, there are Recognized Environmental Conditions (RECs) at both the Church Street and Wamsutta layover facility sites (Table 2-26). At the Wamsutta site, the RECs are associated with the capped Superfund site, and construction is not anticipated to encounter any contaminated soil or groundwater. At the Church Street site, the presence of high, medium and low RECs would require additional pre-construction investigations to determine the extent of soil or groundwater contamination and the cost of site remediation or disposal. The overall risk is considered "medium".

On the Fall River line, high to medium RECs are present at all three sites, as a result of prior industrial activities. Additional pre-construction investigations would be required to determine the extent of soil or groundwater contamination and the cost of site remediation or disposal. The risk to the project of encountering substantial amounts of contamination, and associated cleanup costs, are considered "high" at the ISP and Weaver's Cove West sites, and "medium to high" at the Weaver's Cove East site.

Table 2-26 Summary of RECs at the Proposed Overnight Layover Sites

Layover Facility	REC Description	Release Tracking Number (RTN)	Relative Impact
Church Street	Current Existence of 3,000 Gallon Diesel Aboveground Storage tank with Stained Soil on Site	Not applicable	High
	Presence of Pooled Oil and Stained Soil in Unpaved Area Near Site	Not applicable	Medium
	Historic and Current Use of Area Near Site for Vehicle Repair and Maintenance	Not applicable	Medium
	Existence of Underground Storage Tanks Near Site	Not applicable	Low
Wamsutta	Historic Use of Site as Freight Yard and Placement of Permanent Engineered Barrier Above Impacted Soil at Site	4-118	Medium
	Documented Release at Acushnet Estuary (New Bedford Superfund Site)	4-122	Medium
	Documented Release at Adjoining Property (618 Acushnet Avenue)	4-14791	Low
	Documented Release and Implementation of Activity and Use Limitation at Nearby Property (1 Wamsutta Street)	4-11715	Low
	Documented Release at Nearby Property (New Bedford Main Interceptor)	4-127	Low
ISP	Documented Releases on or Encompassing the Layover Site	4-13482, 4-13856, and 4-15907	High
	Existence of Large Quantity of Hazardous Chemicals and Existence of Risk Management Plan at Southwestern Adjoining Property (ISP Chemicals, 238 South Main Street)	Not applicable	High
	Historic Use of Adjoining Properties	Not applicable	High
	Documented Releases at Nearby Property (Former Synthetic Natural Gas Plant)	4-16971	Medium
	Documented Releases at Southwestern Adjoining Property (238 South Main Street)	4-10219, 4-10965, 4-11891, 4-13804, 4-13805, 4-18988, 4-14027, 4-14485, 4-15568, 4-15700, 4-16479, 4-16533, 4-16702, 4-16703, 4-19297, and 4-19557	Medium
Weaver's Cove East	Previous Use of Site as Oil Storage Facility and Documented Petroleum Release on Site	4-749	High
	Previous Use of Adjoining Property as Petroleum Product Distribution Facility and Documented Release (Shell Oil Company, 1 New Street)	4-749	High
	Previous Use of Building on Parcel T-1-38 as Commercial Garage	Not applicable	Medium
	Existence of Underground Storage Tanks (USTs) on Parcel T-1-38	Not applicable	Medium
	Possible Presence of Elevated Concentrations of Metals in Site Soil	Not applicable	Low
Weaver's Cove West	Existence of USTs and ASTs at Site	Not applicable	High
	Previous Use of Site as Petroleum Products Distribution Facility and Documented Release	4-749	High
	Possible Presence of Elevated Concentrations of Metals in Site Soil	Not applicable	Low

2.4.9 Cultural Resources

As shown in Table 2-27, neither layover facility on the New Bedford line would have adverse effects to any historic resources. On the Fall River line, the ISP site and Weaver's Cove West sites would not have adverse effects to any historic resources. The Weaver's Cove East site could have adverse effects to the visual setting of the North Main Street district.

Table 2-27 Potential Effects on Historic Resources

Location	Direct Effects	Indirect Effects
Church Street	None	No adjacent resources
Wamsutta	None	No adverse noise or visual impacts to adjacent historic industrial buildings
ISP Site	None	No adjacent resources
Weaver's Cove East	None	Potential adverse effects to the visual setting of the North Main Street district
Weaver's Cove West	None	No adjacent resources

As shown in Table 2-28, on the New Bedford line, the Church Street site was determined to have moderate sensitivity for archaeological resources, and would require additional investigation to determine if archaeological resources were present, and the significance of those resources. The Wamsutta Street site would not affect archaeological resources located below the capped landfill.

On the Fall River line, the ISP site is in an area identified as having a high sensitivity for pre-contact Native American sites, and is close to several documented significant archaeological sites (Mother Brook, Peace Haven). The Weaver's Cove East site has low sensitivity but requires additional investigation. The Weaver's Cove West site has been investigated and found to have no archaeological resources.

Table 2-28 Potential Effects on Archaeological Resources

Location	Archaeological Sensitivity	Recommendation
Wamsutta	High sensitivity for pre-contact/contact Native American sites and post-contact Euro-American resources	Avoid work below clean fill-geotextile composition cap, or conduct an intensive (locational) survey
Church Street	Moderate sensitivity for pre-contact/contact Native American sites and post-contact Euro-American resources	Avoid, or conduct an intensive (locational) survey
ISP	High sensitivity for pre-contact/contact Native American sites related to the Mother's Brook Site (19-BR-106)	Avoid, or conduct an intensive (locational) survey
Weaver's Cove East	Low sensitivity	Archaeological reconnaissance survey
Weaver's Cove West	No/Low sensitivity (previously surveyed)	No further work

2.4.10 Operations

As shown in Table 2-29, the Church Street site in New Bedford is located 3.1 miles north, 2.8 miles further than the Wamsutta site. On the Fall River Secondary, the ISP Site is located 5.3 miles from the terminal station, 2.7 miles further than the Weaver's Cove East and Weaver's Cove West sites. Figures 2-6 and 2-7 show the layover facilities in relation to the terminal station for New Bedford and Fall River respectively. As previously mentioned, ideally the layover facility wouldbe located close to the end of the line. If the layover facility is near the terminal, trains do not have to travel far to get to the start of their morning trips or from the end of their evening trips. If the layover facility is distant from the terminal, trains need to make a long distance non-revenue (deadhead) movement before they start their morning trips or after they end their evening trips. While, all the sites are located relatively close to the end of the lines, the Wamsutta site is closer to the terminal in New Bedford and would provide more efficient operation than the Church Street site. Similarly, the Weaver's Cove sites are closer to the terminal in Fall River and would provide a more efficient operation than the ISP Site.

Table 2-29 Distance to Terminal Station

Location	Distance from Terminal Station
Church Street	3.1 miles north
Wamsutta	0.3 miles north
ISP Site	5.3 miles north
Weaver's Cove East	2.6 miles north
Weaver's Cove West	2.6 miles north

2.4.11 Operations Costs

As shown in Table 2-30, the distance of a layover facility to the terminal station contributes directly to the increase in operating and maintenance cost of the site alternative. On the New Bedford Mainline, Church Street would be more expensive to operate due to an additional 2.8 miles (5.6 miles roundtrip) that the trains would need to run deadhead miles. On the Fall River Secondary, the ISP Site would have additional 2.7 deadhead miles (5.4 miles roundtrip) than the Weaver's Cove sites.

Table 2-30 Operating and Maintenance Cost

Location	$ (2009 dollars)
Church Street	$567,600
Wamsutta	$55,000
ISP Site	$970,400
Weaver's Cove East	$476,000
Weaver's Cove West	$476,000

While each layover site will also have a capital cost investment, there is negligible differentiating factor in capital investment for each site and would not distinguish one site as favorable over another. Capital cost estimates were not used in this layover facility alternatives analysis.

3

Site Selection

3.1 Requirements of the Secretary's Certificate

The Secretary's Certificate on the DEIR stated that:

"The FEIR should expand on the analysis of the proposed layover facilities with detailed plans for the layover facilities and a comparative analysis of environmental impacts with a summary table showing land alteration, impervious area, wetland and water quality impacts, traffic impacts, air quality, noise and vibration, impacts to conservation lands/open space, and impacts to Environmental Justice populations. The alternatives analysis should include consideration of potential sites outside of Riverfront Area….. **The FEIR should include a rationale for selection of the preferred layover facilities and for elimination of others from further consideration.** The evaluation of impacts associated with layovers should include potential conflicts and synergies with existing and future land use on and in the vicinity of the sites."

This document provides the rational for selection of the preferred layover facilities on the New Bedford and Fall River branches, as required by the Certificate. Detailed plans of each site, and a detailed analysis of environmental impacts, will be provided in the FEIS/FEIR.

3.2 Layover Facility Site Selection Criteria

The area of the layover facility site must be large enough to accommodate the anticipated number of trains, service vehicles, and other support facilities. The site must be shaped appropriately to allow all tracks to be long enough to accommodate the full length of a train on each track. The shape of a layover site is typically rectangular therefore making rectangular parcels better suited for siting a layover facility

Based on the operating plan that has been developed for South Coast Rail, each branch will require four trains to support the peak period service. In addition, a fifth train on each branch will be required as spare equipment, which can be used in the event of a breakdown. The layover facility must accommodate the five trains anticipated. In addition, the facility should provide one track for future expansion of service and for maintenance equipment. Therefore, each layover site chosen for South Coast Rail must be able to accommodate six tracks.

The site would minimize environmental impacts and provide the most efficient operation by locating it as close as possible to the terminal station to ensure the least deadhead miles for non-revenue movements in and out of the layover facility. While there is no hard rule for the distance of a layover facility from the terminal, increasing distance between a layover facility and the terminal station would result in less reliable operations and greater operating costs.

3.3 New Bedford Line

Two sites were evaluated on the New Bedford line: Church Street and Wamsutta. The tables and text below summarize the comparison of these sites based on environmental (Table 3-1) and practicability (Table 3-2) factors. The Wamsutta site was selected because it is most favorable from an environmental perspective: it requires the lesser land acquisition, the lesser tax revenue loss, the lesser wetland impacts, no potential risk of hazardous materials remediation, and no impacts to historic or archaeological resources.

Table 3-1 Comparison of New Bedford Layover Facility Sites – Environmental Factors

Resource	Church Street	Wamsutta	More Favorable
Land Acquisition	39 acres	11 acres	Wamsutta
Tax Revenue Loss	$21,378/year	$0.00/ year	Wamsutta
Environmental Justice	No impacts	No impacts	Equal
Noise Impacts	No impacts	No impacts	Equal
Wetland Impacts	0.07 acres vegetated wetland	None	Wamsutta
Wild and Scenic Rivers	None	None	Equal
Threatened and Endangered Species	None	None	Equal
Coastal Zone	None	Chapter 91 license not required for work in landlocked tidelands. Not within the DPA	Equal
Hazardous Materials	Medium risk	Capped Superfund landfill – no impacts anticipated	Wamsutta
Cultural Resources	Intensive archaeological survey required in areas of moderate sensitivity. No above-ground impacts	No impacts to archaeological resources below capped landfill. No adverse effects to above-ground resources.	Wamsutta

The Wamsutta site was selected also because it is most favorable from an operating and cost perspective: it is closer to the terminal station and would therefore require less operating dollars to pull the trains in and out of the layover facility at the end and beginning of the day.

Table 3-2 Comparison of New Bedford Layover Facility Sites – Cost and Operations

Operational Element	Church Street	Wamsutta	More Favorable
Distance to Terminal Station	3.1 miles	0.3 miles	Wamsutta
Operating Cost	$567,600	$55,000	Wamsutta

3.4 Fall River Line

Three potential layover sites were evaluated on the Fall River line. Table 3-3 compares the environmental effects of the ISP, Weaver's Cove East and Weaver's Cove West sites, and Table 3.4 compares the practicability of these site alternatives.

The ISP site was rejected because it would require a substantial amount of construction within a previously-undisturbed Riverfront Area, and because it would introduce new industrial visual elements along the Taunton Wild and Scenic River. The adjacent property, ISP Chemical is a chemical manufacturing plant which requires a high level of security, and which poses a risk in the event of a chemical accident. The operator of the facility has indicated that this land use is not compatible with an adjacent area where people may gather, or which has unrestricted access. In addition, this site has the potential to contain significant Native American archaeological resources.

The Weavers Cove West site was rejected because development of this site as a layover facility would require a large amount of land acquisition (58 acres) and loss of property tax revenues to the City of Fall River. The site is within the Designated Port Area, and would be inconsistent with the maritime uses of the site. Although it would be within Riverfront Area and adjacent to the Wild and Scenic Taunton River, it would result in redevelopment of this disturbed area and would not introduce a new visual element. The Weaver's Cove East site is the most favorable from an environmental perspective.

Table 3-3 Comparison of Fall River Layover Facility Sites – Environmental Factors

Resource	ISP	Weaver's Cove East	Weaver's Cove West	Most Favorable
Land Acquisition	44 acres	18 acres	58 acres	Weaver's Cove East
Tax Revenue Loss	$29,956/year	$57,317/year	$236,120/year	ISP
Environmental Justice	No impacts	No impacts	No impacts	Equal
Noise Impacts	No impact	1 moderate	1 moderate	ISP
Wetland Impacts	2.28 acres of Riverfront Area Work in Land Subject to Coastal Storm Flowage	None	Riverfront Area impacts Work in Land Subject to Coastal Storm Flowage	Weaver's Cove East
Wild and Scenic Rivers	Adjacent to Taunton Wild and Scenic River	Adjacent to Taunton Wild and Scenic River	Adjacent to Taunton Wild and Scenic River	Weaver's Cove East
Threatened and Endangered Species	None	None	None	Equal
Coastal Zone	Not within Coastal Zone	Potentially within Filled tidelands	Potentially within Filled Tidelands.	ISP
Hazardous Materials	High risk	Medium to high risk	High risk	Weaver's Cove East
Cultural Resources	High sensitivity for pre-contact Native American sites related to the Mother's Brook Site	No archaeological sensitivity. Potential adverse effects to visual setting of the North Main Street District.	No archaeological sensitivity. No effects on above-ground resources.	Weaver's Cove West

From an operational perspective, the Weavers Cove sites are more favorable to the ISP Site. They are close to the terminal station and would therefore require less operating dollars to pull the trains in and out of the layover facility at the end and beginning of the day.

Table 3-4 Comparison of Fall River Layover Facility Sites – Cost and Operational Factors

Operational Element	ISP	Weaver's Cove East	Weaver's Cove West	Most Favorable
Distance to Terminal Station	5.3 miles	2.6 miles	2.6 miles	Weaver's Cove East/West
Operating Cost	$970,400	$476,000	$476,000	Weaver's Cove East/West

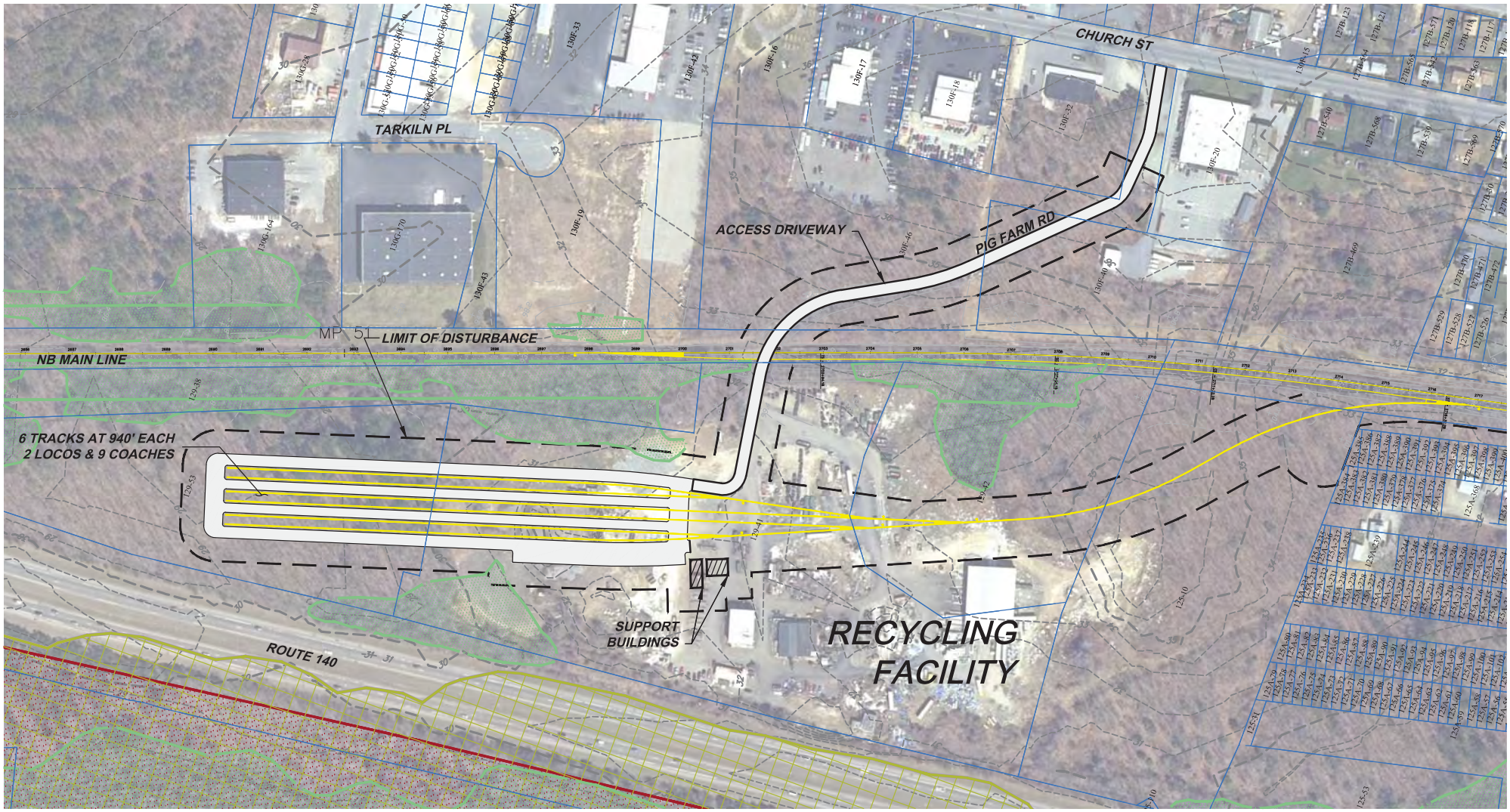
3.5 Recommendations

As previously outlined, the area of the layover facility site must be large enough to accommodate the anticipated number of trains, service vehicles, and other support facilities. Based on the operating plan that has been developed for South Coast Rail, each branch will require four trains to support the peak period service, a fifth train on each branch to provide a spare, and finally a sixth to accommodate future expansion Therefore, each layover site chosen for South Coast Rail must be able to accommodate six tracks.

The site selection would look to minimize environmental impacts and provide the most efficient operation that minimizes deadhead/non-revenue miles by locating the layover as close as possible to the terminal station. While there is no hard rule for the distance of a layover facility from the terminal, increasing distance between a layover facility and the terminal station would result in less reliable operations and greater operating costs

On the Fall River Secondary, ***Weaver's Cove East is the favorable location to site a Fall River layover facility*** as it has the least environmental impacts of the Fall River sites with fewest land acquisition, wetland impacts, impact to wild and scenic rivers, and from the perspective of encountering hazardous materials. Weaver's Cove East would also be operationally more efficient than ISP with its close proximity to the terminal station saving the project roughly $500,000 annually.

On the New Bedford Mainline, ***Wamsutta is the favorable location to site a New Bedford layover facility*** as it has less environmental impact than the Church Street site from the perspective of land acquisition, tax revenue loss, wetlands, hazardous materials, and cultural resources. Wamsutta would also be operationally more efficient saving the project roughly $500,000 annually.



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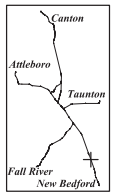
Legend

- ACEC
- Open Space
- Rare Species Estimated Habitat
- Rare Species Priority Habitat
- Wetland
- Zone A (400' Buffer of Public Water Supplies)
- Track
- Public Water
- Vernal Pool
- Zone 1 (Water Supply Protection Area)
- Property Line
- Pavement

0 100 200 Feet

Locus Map



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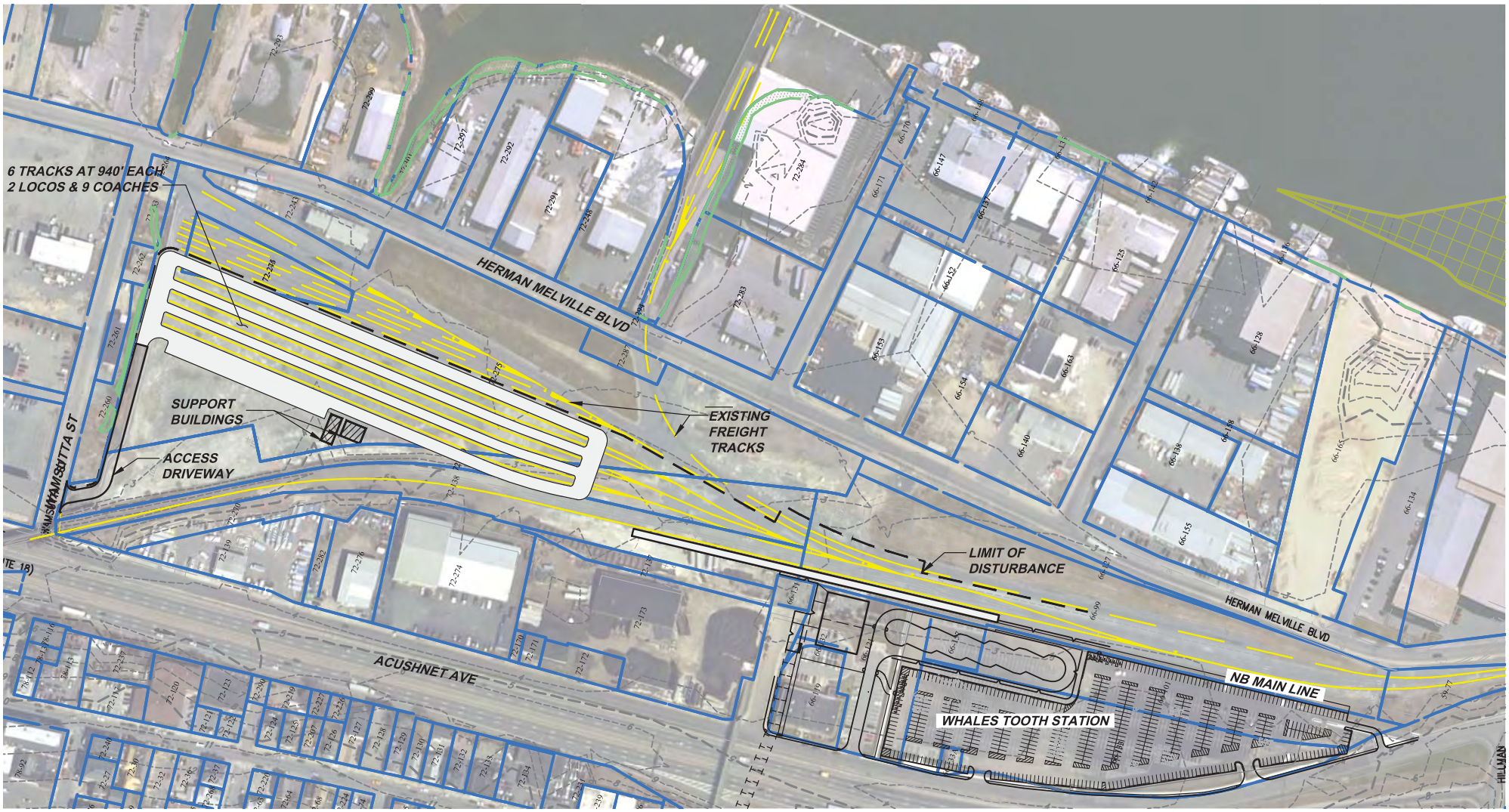
SOUTH COAST RAIL

Figure 2-1
New Bedford Mainline
Church Street Layover

Source: VHB, MassGIS
Prepared by: VHB



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- *ACEC*
- *Open Space*
- *Rare Species Estimated Habitat*
- *Rare Species Priority Habitat*
- *Wetland*
- *Zone A (400' Buffer of Public Water Supplies)*
- *Track*
- *Public Water*
- *Vernal Pool*
- *Zone 1 (Water Supply Protection Area)*
- *Property Line*
- *Pavement*

0 100 200 Feet

Locus Map

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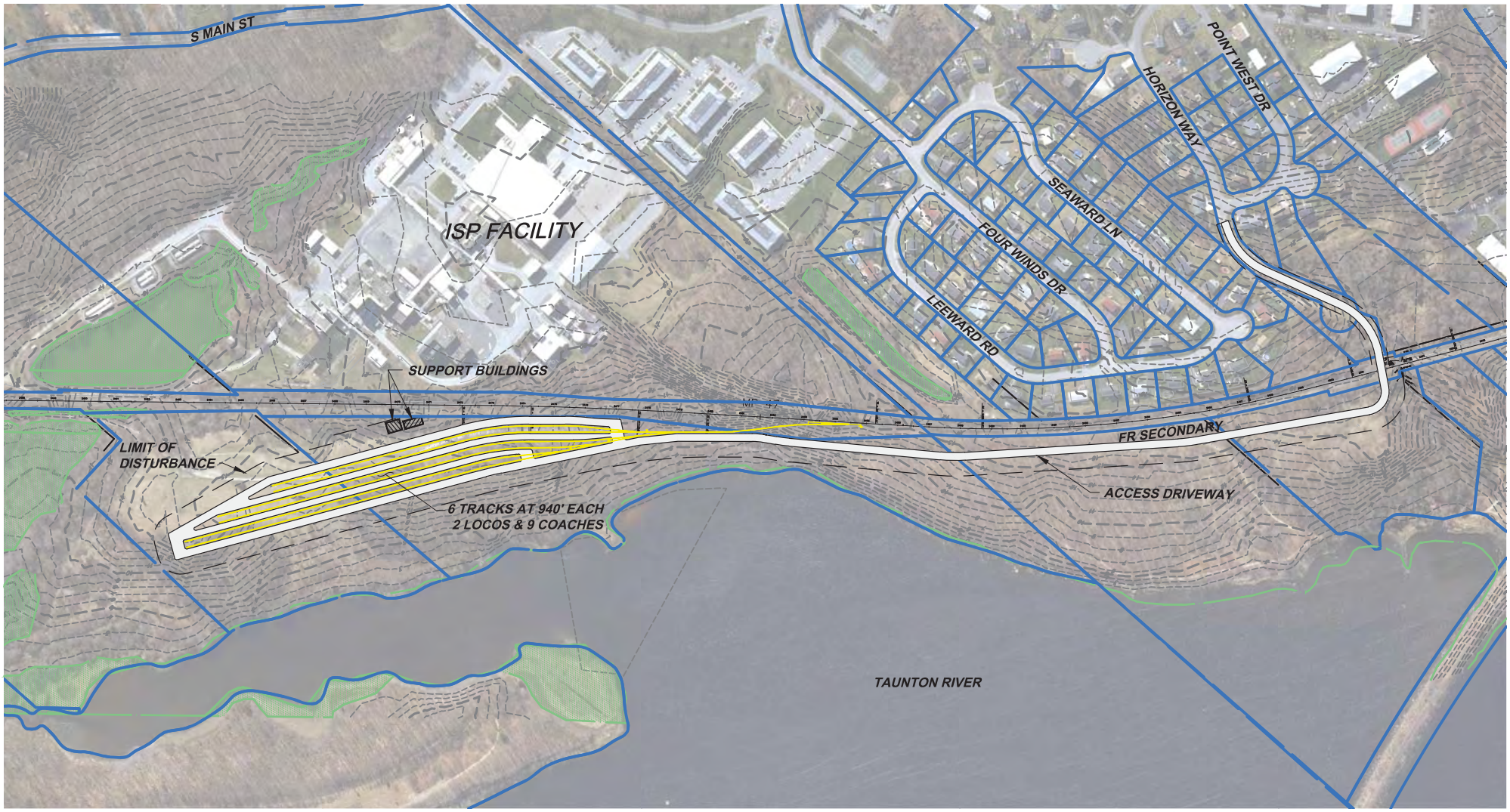
SOUTH COAST RAIL

Figure 2-2
New Bedford Mainline
Wamsutta Layover Option

Data Source: VHB, MassGIS
Prepared by: VHB



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Legend

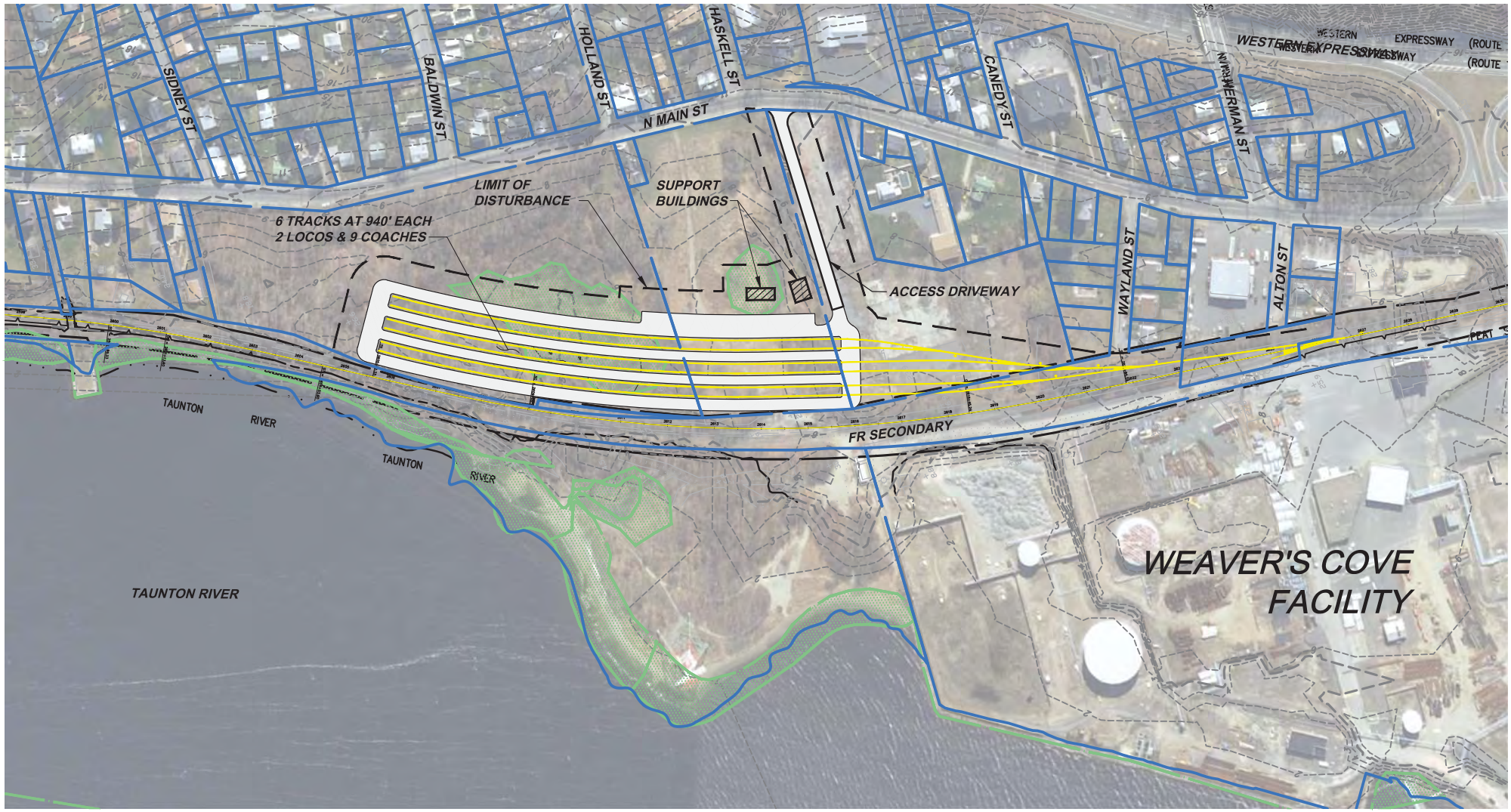
- ACEC
- Open Space
- Rare Species Estimated Habitat
- Rare Species Priority Habitat
- Wetland
- Zone A (400' Buffer of Public Water Supplies)
- Track
- Public Water
- Vernal Pool
- Zone 1 (Water Supply Protection Area)
- Property Line
- Pavement

0 150 300 Feet

Locus Map

Figure 2-3
Fall River Secondary
ISP Layover

Source: VHB, MassGIS
Prepared by: VHB



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Legend

- ACEC
- Open Space
- Rare Species Estimated Habitat
- Rare Species Priority Habitat
- Wetland
- Zone A (400' Buffer of Public Water Supplies)
- Track
- Public Water
- Vernal Pool
- Zone 1 (Water Supply Protection Area)
- Property Line
- Pavement

0 100 200 Feet

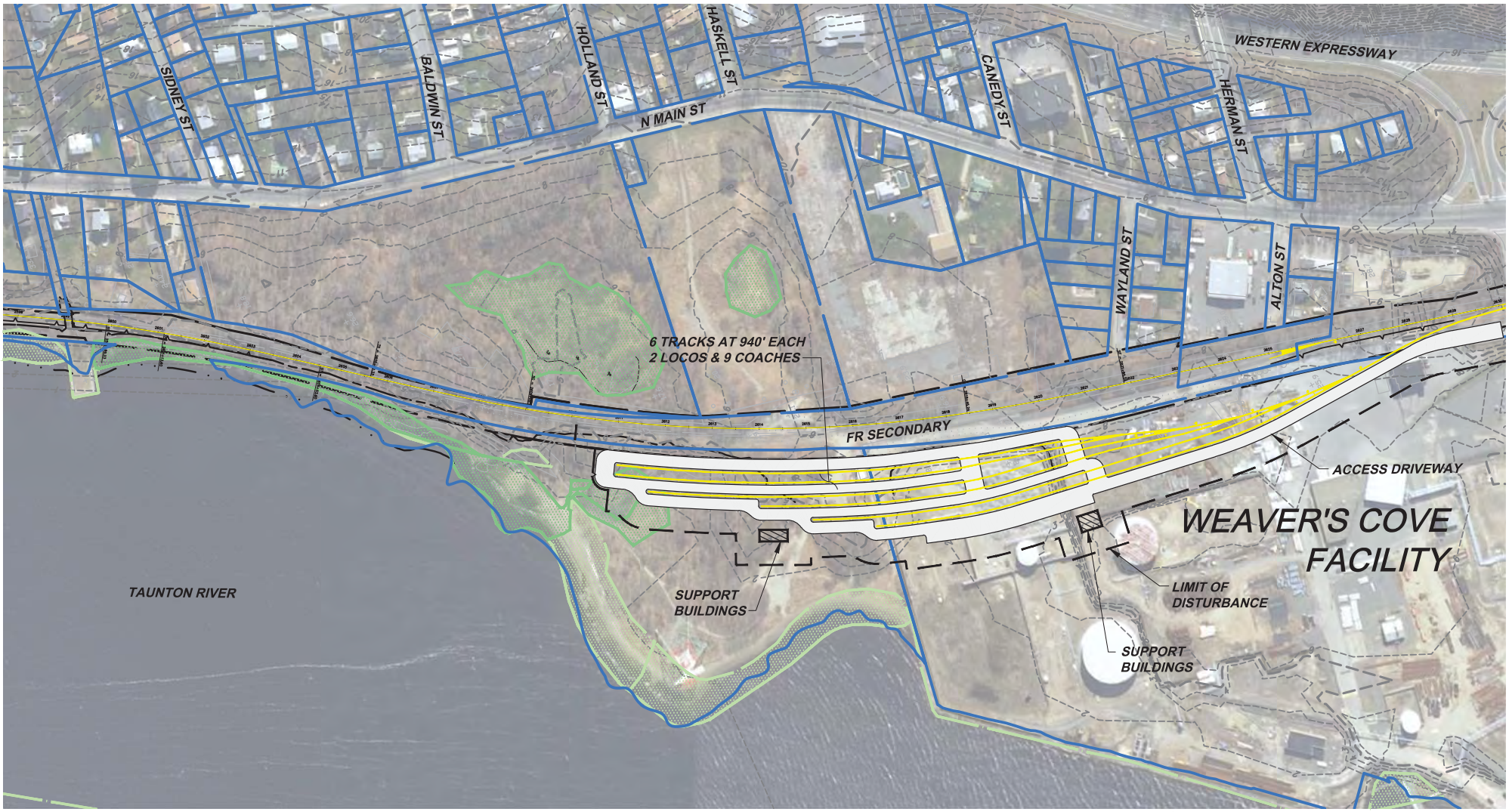
Locus Map

massDOT

SOUTH COAST RAIL

Figure 2-4
Fall River Secondary
Weaver's Cove East Layover

Source: VHB,MassGIS
Prepared by: VHB



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Legend

- *ACEC*
- *Open Space*
- *Rare Species Estimated Habitat*
- *Rare Species Priority Habitat*
- *Wetland*
- *Zone A (400' Buffer of Public Water Supplies)*
- *Track*
- *Public Water*
- *Vernal Pool*
- *Zone 1 (Water Supply Protection Area)*
- *Property Line*
- *Pavement*

0 100 200 Feet

Locus Map

massDOT

SOUTH COAST RAIL

Figure 2-5
Fall River Secondary
Weaver's Cove West Layover

Source: VHB,MassGIS
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Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

0 1500 3000 Feet

Figure 2-6
New Bedford Main Line

Layover Yard Options

Prepared by: VHB

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Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

0 1500 3000 Feet

Figure 2-7
Fall River Secondary Layover Yard Options

Prepared by: VHB

Appendix 3.2-F

Construction Staging Memorandum

FEIS/FEIR Technical Report

Construction Staging Memo

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116-3969

Prepared by

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SOUTH COAST RAIL

June 2012

Table of Contents

Table of Contents i

List of Tables iii

List of Figures iv

Construction Staging Summary 1

1.1 General 1

1.1.1 General Sequence of Work 1

1.1.2 Railroad Operations and Coordination 2

1.1.3 Bridge Construction Sequencing 2

1.2 Stoughton Line 6

1.2.1 Retaining Walls 6

1.2.2 Grade Crossings 7

1.2.3 Stations 8

1.2.4 Bridges 8

1.2.5 Culverts 11

1.2.6 Track 12

1.3 New Bedford Main Line 13

1.3.1 Retaining Walls 13

1.3.2 Grade Crossings 14

1.3.3 Stations 15

1.3.4 Bridges 15

1.3.5 Culverts 16

1.3.6 Track 17

1.4 Fall River Secondary 18

1.4.1 Retaining Walls 18

1.4.2 Grade Crossings 19

1.4.3 Stations 20

1.4.4 Bridges 20

1.4.5 Culverts 21

1.4.6 Track 22

Bridge Access and Laydown Summary 1

2.1 Stoughton Line Bridges 1

2.1.1 Kingsley Pond (Forge Pond), Canton 1

2.1.2 Bolivar Street, Canton 2

2.1.3 Mill Brook, Canton 2

2.1.4 Coal Yard Road, Stoughton 3
2.1.5 Totman Farm Road, Stoughton 3
2.1.6 Day's Farm Road, Easton 4
2.1.7 Cowessett Brook, Easton 4
2.1.8 Pond Street, Easton 4
2.1.9 Small Creek, Easton 4
2.1.10 Main Street, Easton 5
2.1.11 Bridge Street, Easton 5
2.1.12 Hockomock Swamp Trestle, Raynham 5
2.1.13 Bridge Street, Raynham 6
2.1.14 Route 138 Grade Separation, Raynham 6
2.1.15 Thrasher Street, Raynham 7
2.1.16 Taunton River (North), Taunton 7
2.1.17 Taunton River (Middle), Taunton 8
2.1.18 Taunton River (South), Taunton 8
2.1.19 Mill River, Taunton 8
2.2 New Bedford Main Line Bridges 9
2.2.1 Taunton River, Taunton 9
2.2.2 Brickyard Road, Taunton 9
2.2.3 Route 24, Taunton 10
2.2.4 Cotley River (North), Berkley 10
2.2.5 Cotley River (South) , Berkley 11
2.2.6 Assonet River (Cedar Swamp), Lakeville 11
2.2.7 Fall Brook (Freetown Brook), Freetown 12
2.2.8 Route 18, New Bedford 12
2.2.9 Wamsutta Street, New Bedford 12
2.3 Fall River Secondary Bridges 13
2.3.1 Cedar Swamp River (Assonet River), Lakeville 13
2.3.2 Farm Road (North), Freetown 13
2.3.3 Farm Road (South), Fall River 14
2.3.4 Golf Cart Road, Fall River 14
2.3.5 2.3.5 Golf Club Road, Fall River 14
2.3.6 Miller's Cove Road 15
2.3.7 Collins Road, Fall River 15
2.3.8 Ashley's Underpass (Ashley Street) , Fall River 15
2.3.9 Brownell Street, Fall River 16
2.3.10 President Avenue, Fall River 16
2.3.11 Pearce Street, Fall River 17
2.3.12 Turner Street, Fall River 17
2.3.13 Channel near Battleship Cove, Fall River 17

List of Tables

Table No.	Description	Page
Table 1-1	Construction Staging Summary	3

List of Figures

Figure No.	Description	Page
1-1	Figure Heading	1

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1

Construction Staging Summary

1.1 General

The purpose of this Construction Staging summary is to identify feasible construction staging and sequencing options for the construction of various elements of the South Coast Rail (SCR) project. An assessment of potential construction access locations and laydown areas for bridge construction and site specific constraints are contained in Part 2 - Bridge Access & Laydown Summary.

All construction will be performed in close coordination with the operating railroads - Massachusetts Bay Transportation Authority (MBTA), Mass Coastal Railroad (MCRR), and CSX. Flagging and inspection services will be provided by the operating railroad for a given section of track as defined under Railroad Operations and Coordination. The work will include the construction of retaining walls, bridges, stations, station platforms, track, special track work, interlockings, drainage, culvert rehabilitations, maintenance of utilities, power substations, and overhead catenary.

Proposed track within the active right-of-way will be reconstructed between 7:00 PM and 7:00 AM weeknights and over extended weekends subject to MCRR delivery consolidation, except in specified areas in the vicinity of the Acushnet Cedar Swamp, during amphibian breeding season (mid-March through Mid-April) as noted in the Biodiversity Report.

1.1.1 General Sequence of Work

The following provides a general construction sequence of construction for the South Coast Rail Project.

- Clear and grub, demolish buildings and address HAZMAT issues on all property taken for the project.
- Construct station and substation site features beyond the right-of-way.
- Remove abandoned tracks and utilities along the right-of-way.
- Construct retaining walls, culverts and bridges.
- Install drainage and utility improvements.

- Grade right of way and prepare subgrade for track construction.
- Install track and relocate existing track to remain.
- Construct platforms and canopies.
- Install signal cable, conduit, foundations and signal equipment.
- Install catenary foundations, poles, cantilevers, brackets and wires.

1.1.2 Railroad Operations and Coordination

MassCoastal Railroad (MCRR) operates and maintains freight service south of Winter Street in Taunton to New Bedford and Fall River. CSX Customer freight service operates between Weir Junction and Cotley Junction where deliveries are made during the week between 7:00 AM and 7:00 PM. There are no deliveries scheduled on weekends unless a special delivery is needed or a weekday delivery is postponed to a Saturday. Daily MCRR freight service passes through Cotley Junction to destinations in New Bedford and Fall River on alternate days. During SCR construction, deliveries can be coordinated through MCRR and CSX with customers to reduce the number of weekly shipments and provide longer windows for track and bridge construction. Depending on the customer and the location of the construction, shipments can be consolidated to allow for up to a 6-day (including the weekend) track outage once a month.

Passenger service at existing Canton and Stoughton stations cannot be disrupted on weekdays, during peak hours. Work in those areas will be scheduled during off-peak hours - midday, at night, or on weekends. Service shutdowns and flagging will have to be coordinated through MBTA.

All work outside of the active right-of-way can be completed during regular working hours as long as the work does not foul or have the potential to foul active tracks. This work may include station and substation sites and any work within the inactive right-of-way. Work that has the potential to foul active track will be limited to off-peak hours, nights and weekends or during service shutdowns, will require a flagger present and must be approved by the operating railroad(s) MBTA, MCRR and/or CSX. Work within the active commuter rail right-of-way will be subject to MBTA approval and will require an MBCR flagman to be present.

1.1.3 Bridge Construction Sequencing

Bridge reconstruction along active rail lines will be staged depending on the number of existing and proposed tracks. Bridge staging will take precedence over track staging with consideration for nearby structures, right-of-way limits and wetland boundaries. The work will be sequenced in order to minimize impacts to local rail and roadway traffic. A Bridge Staging Summary Table is provided on pages 3 and 5.

Table 1-1 Construction Staging Summary

General								Bridge		Tracks			Signals	Method*	CONSTRUCTION							
															Type		Grade Crossings Within 1500 Feet		Access			
Line	Operating Railroad	Approx. MP[2]	SCR MP[3]	Stationing	DOT No	Description	Town	Undergrade/ Overhead	Proposed Type	Active	Existing Service[4]	Proposed Offset	Territory		Existing Tracks	Proposed Tracks	North	South	North	South	Approx. Duration	Comments
STOUGHTON LINE																						
S	MBTA	0.87	15.79	833+71.2	—	Kingsly Pond (Forge Pond)	Canton	UG	Precast Girder Ballasted Deck	Active	P	14	Signalized	B	1	2	Washington Street	—	—	Washington Street, Ames Ave	1yr	
S	MBTA	1.19	16.11	850+60.8	546730J	Bolivar Street	Canton	UG	Steel Beam Tub Ballasted Deck	Active	P	14	Signalized	B	1	2	—	—	Bolivar Street	Bolivar Street	4mo	Should be sequenced with Bolivar and Mill Brook if required for access
S	MBTA	1.64	16.56	874+36.8	—	Mill Brook	Canton	UG	Precast Girder Ballasted Deck	Active	P	14	Signalized	B	1	2	—	Pine Street	—	Pine Street	1yr	Should be sequenced with Bolivar and Mill Brook if required for access
S	MBTA	4.22	19.07	1006+89.6	546738N	Coal Yard Road	Stoughton	UG	Precast Box Girder Ballasted Deck	Active	P	14	Signalized	D	2	2	Wyman Street, Porter Street	Brock Street	—	Washington Street	4mo	—
						End Active Track																
S	—	5.93	20.85	1100+88.0	546745Y	Totman Farm Road	Stoughton		Steel Beam Tub Ballasted Deck	—	—	16.6	Dark	B	1	2	—	—	Totman Farm Road	Washington Street	6mo	Tracks out of service
S	—	6.65	21.57	1139+00.0	—	Day's Farm Road (Private)	Easton	UG	Steel Beam Tub Ballasted Deck	—	—	20.6	Dark	B	1	2	—	—	Totman Farm Road	—	2mo	Tracks out of service. Construct Days Farm, Cowessett Brook and Totman Farm bridges in sequence
S	—	6.83	21.75	1148+28.0	—	Cowessett Brook	Easton	UG	Steel Beam Tub Ballasted Deck	—	—	0	Dark	B	1	1	—	—	Totman Farm Road	Elm Street	6mo	Tracks out of service. Construct Days Farm, Cowessett Brook and Totman Farm bridges in sequence
S	—	7.88	22.80	1204+00.0	—	Pond Street (Ped.)	Easton	UG	Steel Beam Tub Ballasted Deck	—	—	0	Dark	_	1	1	Elm Street, Oliver Street	—	Shovel Shop Square	Pond Street	2mo	Tracks out of service. Construct Days Farm, Cowessett Brook and Totman Farm bridges in sequence
S	—	7.92	22.84	1206+09.0	—	Small Creek	Easton	UG	Precast Box Girder Ballasted Deck	—	—	0	Dark	_	1	1	Oliver Street	—	Sullivan Street	—	2mo	Small Creek Bridge should be constructed after Pond Street Bridge if it is required to use the bridge over Pond Street for access
S	—	8.01	22.93	1211+23.2	546750V	Main Street	Easton	OH		—	—	0	Dark	_	1	1	Oliver Street	Williams Street	Main Street	—	2yr	Construction at Bridge Street should not occur at the same time
S	—	8.35	23.27	1228+65.6	546751C	Bridge Street	Easton	OH		—	—	0	Dark	_	1	1	Williams Street	—	Bridge Street	—	2yr	Construction at Main Street should not occur at the same time
S	—	11.25	26.17	1425+00.0	—	Hockomock Swamp Trestle	Raynham	UG		—	—	0	Dark	_	1	1	Foundry Street	—	Foundry Street	Race Track Crossing	2.5yr	Detailed in separate memo
S	—	15.28	30.20	1594+56.0	—	Bridge Street	Raynham	OH		—	—	14	Dark	_	1	2	—	Elm Street	Bridge Street	Elm Street	2yr	—
S	—	16.46	31.38	1656+86.4	—	Route 138 Grade Separation	Raynham	OH		—	—	0	Dark	_	1	1	—	Britton Street	Rte. 138	—	1.5yr	—
S	—	18.48	33.40	1763+52.0	—	Thrasher Street	Raynham	OH		—	—	14	Dark	_	1	2	—	—	Thrasher Street	Longmeadow Road	1.5yr	—
		18.93	33.81	1784+95.0		Begin Active Track																
S	CSX	19.50	34.38	1815+16.0		Taunton River	Taunton	UG	Through Plate Girder Open Deck	Active	F	0	Dark	A1	1	1	Dean Street	—	Deane Street	—	1yr	Should be sequenced with the other Taunton River and Mill River crossings. May require several lengthy work windows
S	CSX	19.70	34.62	1828+02.0	—	Taunton River	Taunton	UG	Through Plate Girder Open Deck	Active	F	0	Dark	A1	1	1	Dean Street	Summer Street	Deane Street	—	1yr	Should be sequenced with the other Taunton River and Mill River crossings. May require several lengthy work windows
S	CSX	19.80	34.73	1833+69.0	—	Taunton River	Taunton	UG	Through Plate Girder Open Deck	Active	F	0	Dark	A1	1	1	—	Summer Street, High Street	Dean Street	—	1yr	Should be sequenced with the other Taunton River and Mill River crossings. May require several lengthy work windows
S	CSX	20.00	34.90	1842+87.0	—	Mill River	Taunton	UG	Steel Beam Tub Ballasted Deck	Active	F	0	Dark	A1	1	1	Summer Street	High Street	Dean Street	—	6mo	Should be sequenced with the Taunton River crossings. May require several lengthy work windows

Notes:
1. Construction details assume one freight train per day between 7 AM and 7 PM
2. "Approx. MP" is based on point of beginning with Milepost 0.0 at Canton Junction for the Stoughton Line
3. "SCR MP" is based on point of beginning with Milepost 0.0 at South Station
4. P: Passenger; F: Freight

* Construction Method Legend
- A1: Roll in new structure during shutdown, 1 Existing Track, 1 Proposed Track
- A2: Oversized substructure, 1 Existing Track, 1 Proposed Track
- B: Construct ½ new bridge then replace existing, 1 Existing Track, 2 Proposed Tracks
- C: Construct ½ bridge at a time, 2 Existing Tracks, 2 Proposed Tracks

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Table 1-1 Construction Staging Summary (Continued)

															CONSTRUCTION							
		General						Bridge		Tracks					Type		Grade Crossings Within 1500 Feet		Access			
Line	Operating Railroad	Approx. MP[2]	SCR MP[3]	Stationing	DOT No	Description	Town	Undergrade/ Overhead	Proposed Type	Active	Existing Service[4]	Proposed Offset	Signals Territory	Method[5]	Existing Tracks	Proposed Tracks	North	South	North	South	Approx. Duration	Comments
NEW BEDFORD LINE																						
NB	CSX	11.80	35.56	1877+55.0	—	Taunton River	Taunton	UG	Through Plate Girder Ballasted Deck	Active	F	14	Dark	B	1	2	Ingell Street	—	Ingell Street	—	2 yr	
NB	CSX	12.00	35.79	1889+50.0	537302N	Brickyard Road	Taunton	UG	Precast Box Girder Ballasted Deck	Active	F	14	Dark	B	1	2	—	Hart Street	—	Plain Street Akron Street	4 mo	
NB	MCRR	13.90	37.69	1989+82.0	537304C	Route 24	Taunton	OH		Active	F	14	Dark	B	1	2	—	West Stevens Street	Route 24	Route 24	2 yr	Needs to allow both tracks to be constructed below.
NB	MCRR	15.17	38.93	2055+67.0	—	Cotley River	Berkley	UG	Steel Beam Tub Ballasted Deck	Active	F	14	Dark	B	1	2	—	—	Cotley Street	Padelford Street	1 yr	
NB	MCRR	15.70	39.46	2083+69.0	—	Cotley River	Berkley	UG	Steel Beam Tub Ballasted Deck	Active	F	14	Dark	B	1	2	—	—	Cotley Street	Padelford Street	1 yr	
NB	MCRR	18.60	42.14	2225+16.0	—	Assonet River	Lakeville	UG	Steel Beam Tub Ballasted Deck	Active	F	7.4	Dark	A2	1	1	—	—	Malbone Street	Howland Road	9 mo	Widen the proposed structure to account for rail traffic throughout construction.
NB	MCRR	21.65	45.43	2398+96.0	—	Fall Brook	Freetown	UG	Steel Beam Tub Ballasted Deck	Active	F	9.7	Dark	A2	1	1	—	Chace Road	—	Chace Road	9 mo	This location is a priority for sequencing construction with other bridges on the line due to existing bridge condition.
NB	MCRR	30.38	54.17	2860+00.0	5373273	Route 18	New Bedford	UG	Through Plate Girder Ballasted Deck	Active	F	0	Dark	A2	1	1	—	—	Purchase Street	Purchase Street	1.5 yr	Track to be deactivated from this point to the terminus at the proposed New Bedford Station.
NB	MCRR	54.21	54.21	2862+50.0	537328R	Wamsutta Street	New Bedford	UG	Through Plate Girder Ballasted Deck	Active	F	0	Dark	A2	1	1	—	—	Rail Yard	Rail Yard	1.5 yr	Track to be deactivated from this point to the terminus at the proposed New Bedford Station.
FALL RIVER SECONDARY:																						
FR	MCRR	0.92	41.51	2192+00.0	—	Cedar Swamp River	Lakeville	UG	Through Plate Girder Ballasted Deck	Active	F	0	Dark	A1	1	1	—	—	Adams Lane	Beechwood Road	8 mo	The proposed bridge is to be constructed within track outage windows.
FR	MCRR	4.98	45.58	2407+00.0	537363E	Route 24/79	Freetown	UG		Active	F		Dark	—			—	—	—	—		Bridge construction not required.
FR	MCRR	5.93	46.53	2457+35.0	537366A	Farm Road	Freetown	UG	Steel Beam Tub Ballasted Deck	Active	F		Dark	A2	1	1	—	—	South Main Street	Farm Road	1 yr	Widening the proposed structure to account for rail traffic will require work around the active track.
FR	MCRR	6.77	47.75	2501+00.0	537368N	Farm Road	Fall River	UG	(Remove & Fill in)	Active	F	0	Dark	—	1	1	—	—	—	Golf Cart Road	2 mo	Filling operations would require the work to be completed under track outage windows.
FR	MCRR	6.92	47.90	2529+61.2	—	Golf Cart Road	Fall River	OH	Concrete Deck on Steel Stringer	Active	F	15	Dark	—	1	1	—	—	—	Golf Club Road	1 yr	Needs to be constructed to allow track construction below.
FR	MCRR	7.13	48.11	2540+70.0	537369V	Golf Club Road	Fall River	OH	Concrete Deck on Steel Stringer	Active	F	15.5	Dark	—	1	2	—	—	—	Golf Club Road	1 yr	Needs to be constructed to allow track construction below.
FR	MCRR	7.98	48.62	2567+50.0	537370P	Miller's Cover Road	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	0	Dark	A2	1	1	—	—	Miller's Cove Road		1 yr	Widening the proposed structure to account for rail traffic will require work around the active track
FR	MCRR	8.42	49.06	2590+70.0	537372D	Collins Street	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	0	Dark	A2	1	1	—	—	Collins Road	North Main Street	1 yr	
FR	MCRR	8.58	49.21	2599+00.0	546592X	Ashley's Underpass	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	2	Dark	A2	1	1	—	—	Collins Road	Canady's Underpass	1 yr	Widening the proposed structure to account for rail traffic will require work around the active track.
FR	MCRR	10.40	51.03	2695.00.0	546594L	Brownell Street	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	0	Dark	B	1	1	—	—	Brownell Street	Pearce Street	1 yr	
FR	MCRR	10.48	51.11	2699+00.0	546595T	President's Avenue	Fall River	UG	Through Plate Girder Ballasted Deck	Active	F	0	Dark	B	1	1	—	—	President's Avenue	Parking Lot off North Main Street	1 yr	
FR	MCRR	10.57	51.20	2704+00.0	546596A	Pearce Street	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	14	Dark	C	1	1	—	—	Pearce Street	Main Street		Bridge construction not required.
FR	MCRR	10.77	51.40	2714+50.0	546597G	Turner Street	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	14	Dark	C	1	2	—	—	Turner Street	Open lay-down area		Bridge construction not required.
FR	MCRR	11.50	52.09	2751+00.0	—	Quequechan River	Fall River	UG	Steel Beam Tub Ballasted Deck	Active	F	0	Dark	—	1	1	—	—	Rail Yarde	—	6 mo	Construction cannot be phased at this location, so the track will be shut down and service suspended during bridge construction.

Notes:
1. Construction details assume one freight train per day between 7 AM and 7 PM
2. "Approx. MP" is based on point of beginning with Milepost 0.0 at Canton Junction for the Stoughton Line
3. "SCR MP" is based on point of beginning with Milepost 0.0 at South Station
4. P: Passenger; F: Freight

* Construction Method Legend
- A1: Roll in new structure during shutdown, 1 Existing Track, 1 Proposed Track
- A2: Oversized substructure, 1 Existing Track, 1 Proposed Track
- B: Construct ½ new bridge then replace existing, 1 Existing Track, 2 Proposed Tracks
- C: Construct ½ bridge at a time, 2 Existing Tracks, 2 Proposed Tracks

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One Existing Track - Two Proposed Tracks

The typical construction sequence to expand a single track bridge into a double track bridge will be as follows assuming the existing track is Track 1 and the proposed track is Track 2 (see figure on page 6).

- Demolish portions of the existing structure, as necessary, to construct the new Track 2 structure, while maintaining rail service on Track 1.
- Construct Track 2 structure and track.
- Install temporary crossovers no closer than 500 feet from the abutments and divert all railroad traffic to Track 2.
- Demolish remaining portions of existing Track 1 structure.
- Construct new Track 1 structure and track.
- Remove temporary crossovers after both track connections have been completed in their final configuration.

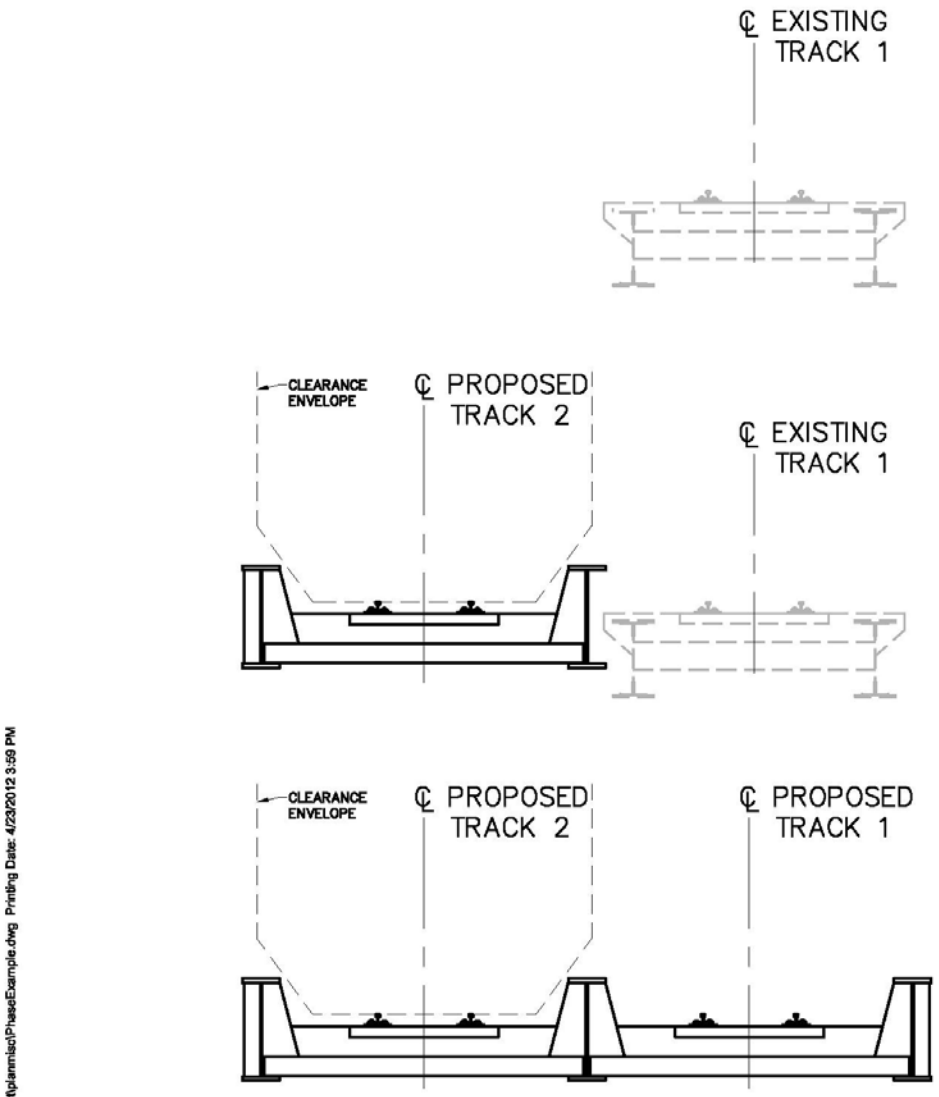
Two Existing Tracks - Two Proposed Tracks

Existing two-track bridges that will be reconstructed to accommodate two proposed tracks will utilize the following construction sequence (see figure on page 8).

- Install temporary crossovers, if necessary, to divert rail traffic to Track 2.
- Divert all railroad traffic to Track 2 over the existing bridge.
- Demolish the portions of the existing substructure that support Track 1.
- Construct proposed Track 1 substructure, superstructure and track.
- Divert rail traffic to the new Track 1 structure.
- Demolish remaining substructure and superstructure that supports Track 2.
- Construct proposed Track 2 structure and track
- Make track connections in their final configuration and remove temporary cross-overs.

One Existing Track - One Proposed Track

There are two options to reconstruct existing single track bridges. Both options must optimize material delivery and lay-down area access to minimize track outages. Option 1 will involve coordination with freight customers to consolidate deliveries during the week to provide longer track outage windows over the weekends. Option 2 will include the construction of wider abutments and a wider ballasted bridge structure to accommodate track shifts for maintenance of rail service. Option 1 is preferred and will be employed whenever possible. Option 2 may not feasible in areas with a constrained right-of-way



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Bridge Construction Sequence
One Existing Track -
Two Proposed Tracks

Prepared by: VHB

Option 1

- Construct the substructure abutments and piers at night and on weekends while maintaining rail service weekdays between 7:00 AM and 7:00 PM.
- Consolidate freight shipments to reduce or eliminate weekly shipments, and allow extended weekday or weekend work windows.
- Assemble superstructure elements in a nearby laydown area.
- Over an extended weekend shut down rail service and remove the existing superstructure.
- Load superstructure elements onto flatbed rail cars.
- Roll in the preassembled superstructure over existing piers and place on temporary blocking.
- Remove upper portions of the existing piers and lower the superstructure onto the bridge seats and construct approaches.
- Construct track on approaches.
- Open bridge to rail service.
- Remove remaining portions of the existing piers and abutments

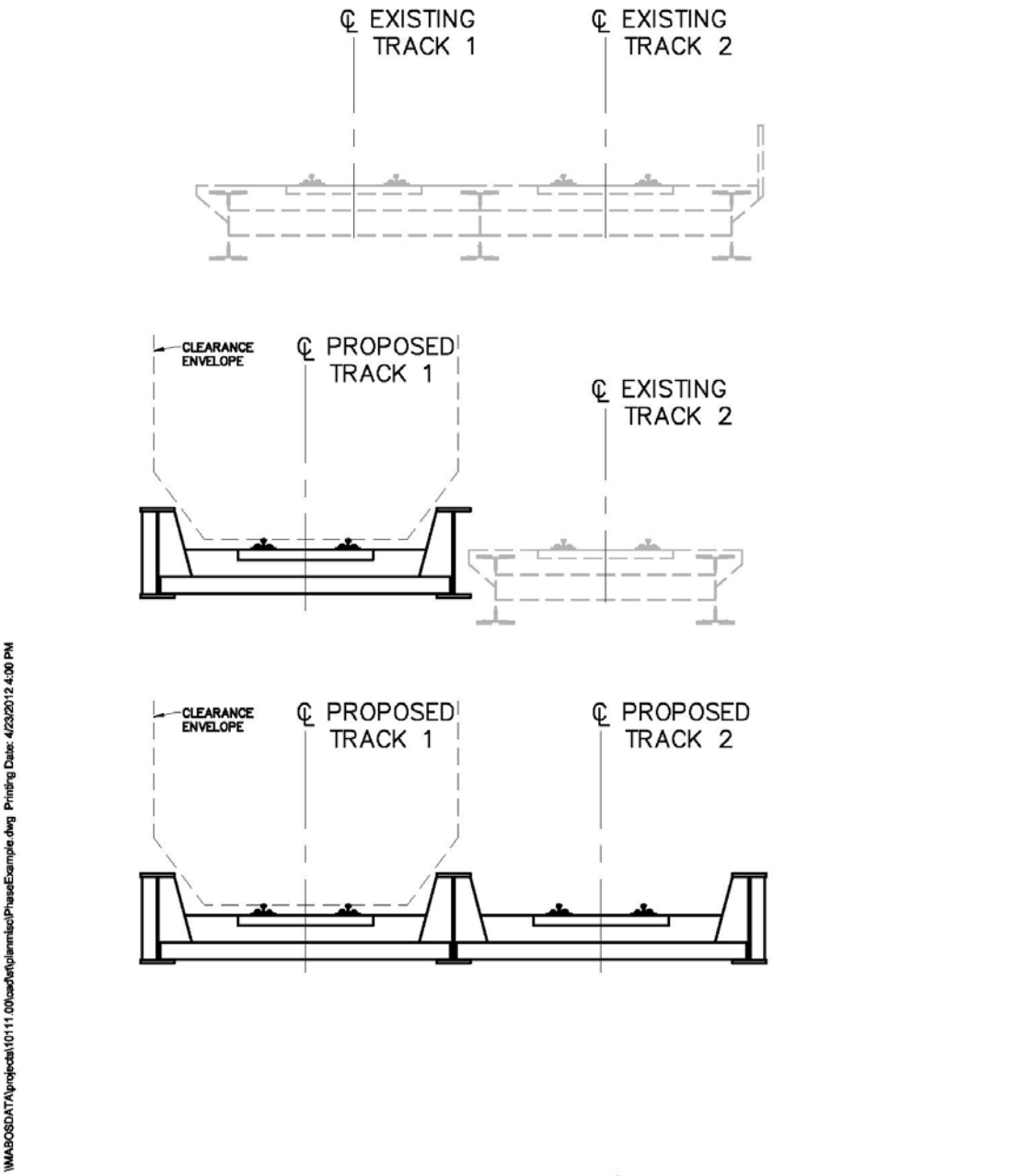
Under this scenario consecutive bridges will be constructed one location at a time to maximize access.

Option 2 (see figure on page 9)

- Construct the oversized abutments and piers at night and on weekends while maintaining rail service on the existing structure weekdays between 7:00 AM and 7:00 PM.
- Construct west half of the proposed superstructure.
- Install track on west half of the bridge and shift existing track on approaches to align with the track on the west half of the bridge.
- Remove existing superstructure and demolish substructure elements where possible.
- Construct east half of new superstructure while maintaining rail service on the west half of the bridge.
- Construct track in its final configuration.
- Remove remaining existing substructure elements.

Grade Crossings

Grade crossings located within 1500 feet of a bridge will have to be considered when evaluating the construction staging for the bridge. The Bridge Summary Table provided on pages 3 and 4 identifies the respective crossings for each bridge. In most cases reconstructing the crossing before the bridge may provide more operational flexibility. A new controller will improve the operation of the temporary and permanent crossings and the new equipment can be located to accommodate the various track shifts.



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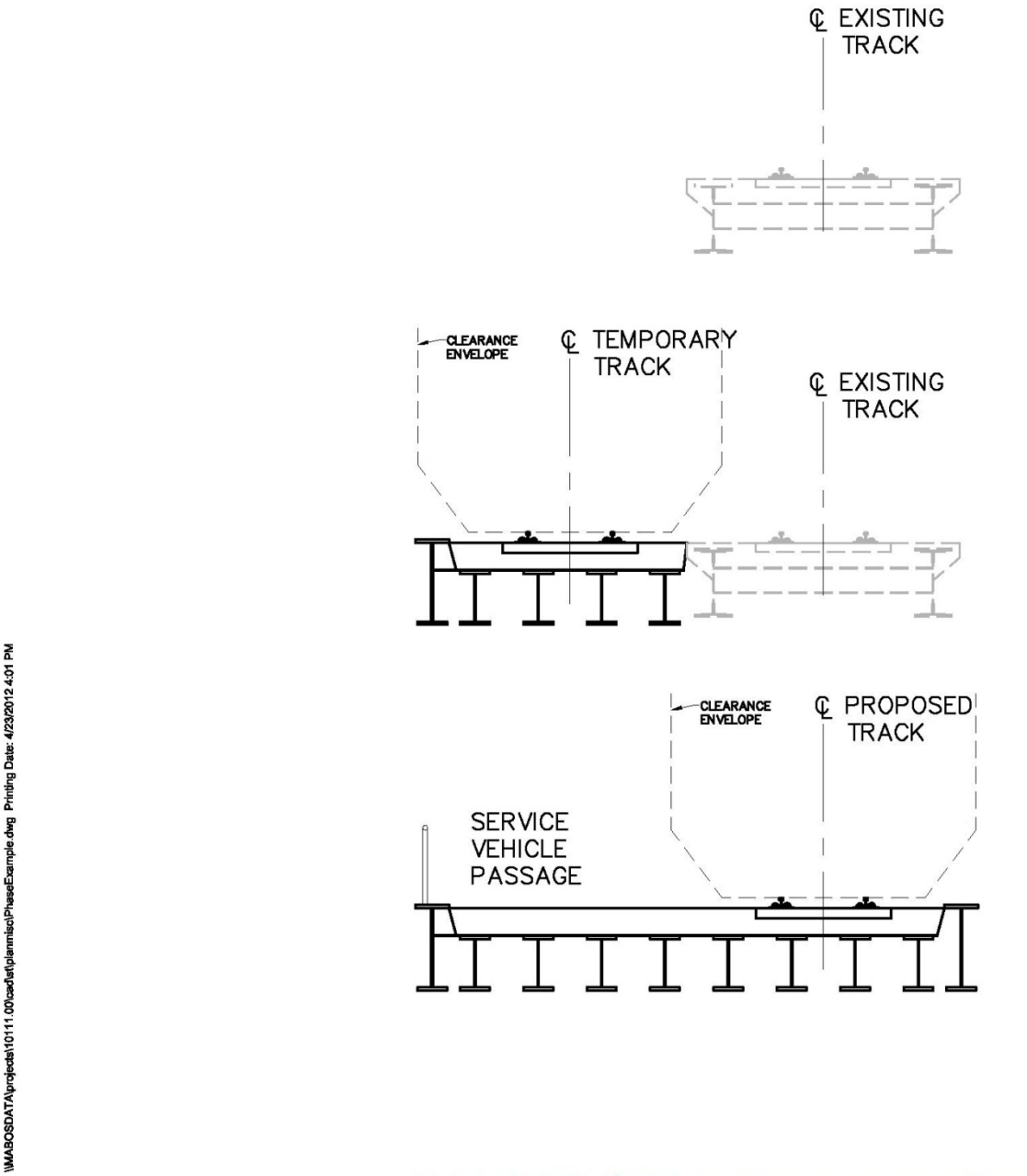
Bridge Construction Sequence
Two Existing Tracks -
Two Proposed Tracks

Prepared by: VHB



Not to Scale

Bridge Construction Sequence
One Existing Track -
One Proposed Track
Option 2

Prepared by: VHB

1.2 Stoughton Line

The SCR project will reconstruct the Stoughton Line from just south of Canton Junction Station to Weir Junction. This line has active passenger and freight service to Stoughton Station and active freight service between Winter Street in Taunton and Weir Junction. The right-of-way between Brock Street in Stoughton (MP 4.55) and Winter Street in Taunton (MP 18.93) is currently inactive with no rail remaining intact south of Short Street in Easton. Walls, bridges, and culverts within the inactive right-of-way can be constructed as resources allow. Construction within the active right-of-way must be coordinated and scheduled with MBTA and MCRR to minimize impacts to rail service and local traffic.

1.2.1 Retaining Walls

Construct retaining walls to the extent possible without fouling the active track. Work that requires foul time will be completed as allowed by flaggers. Retaining walls will be constructed along approximately 36,300 track feet as noted below.

- Station 818+00 to 821+00
- Station 833+00 to 836+00
- Station 839+00 to 851+00
- Station 856+00 to 871+00
- Station 879+00 to 885+00
- Station 894+00 to 899+00
- Station 981+00 to 996+00
- Station 1007+00 to 1009+00
- Station 1017+00 to 1033+00
- Station 1039+00 to 1062+00
- Station 1102+00 to 1116+00
- Station 1139+00 to 1145+00
- Station 1165+00 to 1171+00
- Station 1177+00 to 1232+00
- Station 1416+00 to 1425+00
- Station 1510+00 to 1543+00
- Station 1593+00 to 1602+00
- Station 1608+00 to 1611+00
- Station 1639+00 to 1683+00

- Station 1750+00 to 1762+00
- Station 1782+00 to 1797+00
- Station 1836+00 to 1839+00
- Station 1844+00 to 1854+00
- Station 1890+00 to 1902+00
- Station 1912+00 to 1941+00
- Station 1974+00 to 1977+00

1.2.2 Grade Crossings

Construct or remove the following grade crossings to the extent possible during the weekday hours within the inactive track areas and on nights and weekends with MBCR flagmen present within the active track areas. Active grade crossings that are proposed to be closed, such as Morton Street in Stoughton, cannot be dismantled/blocked until the proposed alternative access has been constructed.

MP 0.70 Washington Street	Maintain
MP 1.70 Pine Street	Maintain
MP 2.10 Will Drive	Maintain
MP 2.90 Central Street	Maintain
MP 3.20 Simpson Street	Maintain
MP 3.70 School Street	Maintain
MP 3.90 Porter Street (RTE 27)	Maintain
MP 4.00 Wyman Street	Maintain
MP 4.30 Brock Street	Maintain
MP 4.60 Plain Street	Maintain
MP 5.20 Morton Street	Close
MP 5.30 Pearson's Crossing	Close
MP 5.39 Stanley Prod. Co.	Close
MP 5.60 Fish and Game Club	Close
MP 7.60 Elm Street	Maintain
MP 7.80 Oliver Street	Maintain
MP 8.30 Williams Street	N/A
MP 8.65 Easton DPW	Close
Residential Access	Close
3-Way Path Crossing	Close
MP 9.15 Gary Lane	Maintain

- MP 9.55 Short Street — Maintain
- MP 10.00 Depot Street - Route 123 — Maintain
- ATV Tracks (Multiple) — Close
- MP 10.20 Purchase Street — Maintain
- MP 10.90 Prospect Street — Maintain
- MP 11.40 Country Club — Close
- MP 11.80 Foundry Street - Route 106 — Maintain
- MP 12.40 Power Line — Close
- MP 14.10 Race Track Crossing — Maintain
- MP 15.40 Elm Street — Maintain
- MP 15.80 Carver Street — Maintain
- MP 16.50 Britton Street — Maintain
- MP 17.10 King Phillip Street — Maintain
- MP 18.10 East Britannia Street — Maintain
- MP 18.90 Longmeadow Road — Maintain
- MP 19.40 Dean Street - Route 44 — Maintain

1.2.3 Stations

The following stations will be constructed along the Stoughton Line as part of the SCR Project.

- Canton (reconstruct existing)
- Stoughton
- North Easton
- Easton Village
- Raynham Park
- Taunton

1.2.4 Bridges

Bridge reconstruction along the active right-of-way along the Stoughton Line will follow the bridge construction sequencing outlined on pages 2 through 9 as dictated by the number of existing and proposed tracks. Bridge staging will take precedence over track staging with consideration for nearby structures, property limits and wetland boundaries. The work will be sequenced in order to minimize impacts on the Stoughton central business district.

One Existing Track - Two Proposed Tracks

The following existing undergrade bridges along the Stoughton Line will be expanded to support a 2-track cross section.

- MP 0.87 (Station 836+45.60) Kingsley Pond (Forge Pond)
- MP 1.20 (Station 853+88.00) Bolivar Street
- MP 1.64 (Station 877+11.20) Mill Brook

Two Existing Tracks - Two Proposed Tracks

The two track bridge that carries the Stoughton line over Coal Yard Road (MP 4.22, Station 1013+33.60) will be reconstructed to accommodate two tracks.

One Existing Track - One Proposed Track

The following single track undergrade bridges along the Stoughton Line will be reconstructed to provide a new single track bridge.

- MP 19.50 (Station 1815+16.00) Taunton River
- MP 19.70 (Station 1828+02.00) Taunton River
- MP 19.80 (Station 1833+69.00) Taunton River
- MP 20.00 (Station 1842+87.00) Mill River

Inactive Right-of-Way

The following bridges to be reconstructed are located along the inactive portion of the Stoughton Line right-of-way and construction can proceed unimpeded. Refer to the Bridge Access Summary for additional notes on sequencing bridges with other locations.

- MP 5.90 (Station 1102+04.00) Totman Farm Road
- MP 6.60 (Station 1139+00.00) Day's Farm Road (Private)
- MP 6.80 (Station 1148+28.00) Cowessett Brook
- MP 7.90 (Station 1204+00.00) Pond Street (Ped.)
- MP 7.95 (Station 1206+09.00) Small Creek
- MP 8.05 (Station 1211+23.20) Main Street
- MP 11.11 (Station 1228+52.35) Bridge Street
- MP 14.01 (Station 1425+00 to Station 1510+00) Hockomock Swamp (See description below)
- MP 13.86 (Station 1517+78.00) Begin Siding L2
- MP 15.32 (Station 1595+08.80) Bridge Street
- MP 16.43 (Station 1653+69.60) Route 138 Grade Separation
- MP 18.33 (Station 1753+85.00) Begin Siding L3
- MP 18.45 (Station 1760+35.20) Thrasher Street

Hockomock Swamp Trestle

The trestle proposed to span the Hockomock Swamp as part of the SCR Project will minimize impacts to the vegetation and wildlife in the Hockomock Swamp. The trestle will consist of a multi-span, ballasted superstructure supported by deep foundations and will extend from station 1425+00 in Easton to station 1510+00 in Raynham.

Due to the sensitivity of the surrounding environment, the approved construction method will minimize impacts outside the existing railroad bed. The construction activities will be performed within the constraints of a set boundary on either side of the work area. The boundary will be defined by the installation of sedimentation and erosion controls along the existing railroad embankment.

The construction site can be accessed from the north by Foundry Street and from the south through Raynham Park. Raynham Park offers ample space for the primary laydown area. To the north, there may be limited space for laydown along the right-of-way, outside the limits of the swamp (adjacent to the Southeast Regional Vocational-Technical High School). During construction, the site would be accessed from the north and south ends, within the construction boundaries defined along the existing railroad right of way.

Before construction begins, existing power lines spanning the right-of-way will be raised as needed to meet minimum clearance requirements. The trestle will be constructed from both ends using at least two crews per operation. Precast concrete elements including pile caps, deck slabs, and box beams can be used to expedite construction and minimize disruption within the swamp. The construction sequence will include the following.

- Install erosion controls and perform selective clearing and trimming of vegetation.
- Construct infiltration trenches and perform earthwork between pier locations.
- Drive piles starting from the center of the trestle, working out toward Foundry Street and Raynham Park. Each crew will work from separate laydown areas at each end of the trestle. Install precast pile caps prior to driving the next set of piles so construction equipment can progress outward, on the embankment, within the construction boundaries to the next pier location.
- Install precast concrete box beams using two crews starting at each end, working toward the center of the trestle. The transverse post-tensioning of the box beams must be completed during the installation of each span to allow construction access over the trestle to install the beams for next span.
- Install precast concrete deck panels. Deck panels may be installed span by span with the box beams or after all of the beams are in place.
- Install deck drainage, ballast, track, signal cables, traction power and ancillary items.

1.2.5 Culverts

All but three of the culverts located along the Stoughton Line are located within the inactive right-of-way and therefore they will be constructed as resources allow. Culvert CV-ST- 2.47 and CV-ST- 3.40 are located north of Stoughton Station and will be restored if required. The culvert CV-ST-19.10 is located south of Winter Street and will have to be reconstructed in stages during track outages and over extended weekends. MCRR will coordinate with customers to consolidate freight shipments to minimize weekday deliveries and provide longer weekend windows for construction. This work can be scheduled in conjunction with the track outages for the nearby bridge work as discussed on pages 2 through 9. Culverts along the Stoughton Line include the following:

- MP 2.47 CV-ST- 2.47
- MP 3.40 CV-ST- 3.40
- MP 4.49 CV-ST-4.49
- MP 4.94 CV-ST-4.94
- MP 5.04 CV-ST-5.04
- MP 5.26 CV-ST-5.26
- MP 5.45w CV-ST-5.45w
- MP 5.53w CV-ST-5.53w
- MP 5.94 CV-ST-5.94
- MP 6.45 CV-ST-6.45
- MP 6.83 CV-ST-6.83
- MP 7.06 CV-ST-7.06
- MP 7.21 CV-ST-7.21
- MP 7.23 CV-ST-7.23
- MP 7.42 CV-ST-7.42
- MP 9.22 CV-ST-9.22
- MP 9.35 CV-ST-9.35
- MP 10.05 CV-ST-10.05
- MP 10.23 CV-ST-10.23
- MP 10.41 CV-ST-10.41
- MP 10.90 CV-ST-10.90
- MP 10.95 CV-ST-10.95
- MP 11.11 CV-ST-11.11
- MP 11.23 CV-ST-11.23

- MP 11.33 CV-ST-11.33
- MP 11.34 CV-ST-11.34
- MP 11.44 CV-ST-11.44
- MP 11.59 CV-ST-11.59
- MP 11.61 CV-ST-11.61
- MP 11.65 CV-ST-11.65
- MP 11.91 CV-ST-11.91
- MP 12.09 CV-ST-12.09
- MP 12.38 CV-ST-12.38
- MP 12.68 CV-ST-12.68
- MP 12.99 CV-ST-12.99
- MP 13.12 CV-ST-13.12
- MP 13.42 CV-ST-13.42
- MP 14.02 CV-ST-14.02
- MP 14.1E CV-ST-14.1E
- MP 15.4E CV-ST-15.4E
- MP 15.4w CV-ST-15.4w
- MP 15.80 CV-ST-15.80
- MP 16.00 CV-ST-16.00
- MP 16.46E CV-ST-16.46E
- MP 16.73 CV-ST-16.73
- MP 17.37 CV-ST-17.37
- MP 17.96 CV-ST-17.96
- MP 18.18 CV-ST-18.18
- MP 19.10 CV-ST-19.10
- MP 19.41 CV-ST-19.41

1.2.6 Track

In general, track construction staging will support the construction staging and schedule of the nearest bridge under construction. Track construction along inactive rail lines will proceed as resources allow. The construction of track sidings can be completed with minimal disruption to freight service.

Inactive Right-of-Way

- Construct northerly section of new track in final position along the west side of right of way from Station 1020+00 to 1190+70.
- Construct southerly section of new track in final position along the east side of right of way from Station 1250+30 to 1780+80.
- Construct new sidings in final position along the east side of right of way from Station 1517+78 to 1632+16
- Relocate existing power line along the right-of-way within Pine Swamp to provide adequate clearance to the proposed catenary.
- Install interlocking track components, including two Track 1 to 2 crossovers, from Station 1041+00 to 1052+00

Active Right-of-Way

- Shift and connect existing Track 1 to Track 2:
  - Station 798+17 to 1145+56.
  - Station 1753+85 to 1784+95
  - Station 17886+70 to 1810+22
- Install Weir Junction interlocking track components from Station 1846+75 to 1872+54, including one crossover between High Street and Ingell Street, three yard tracks, connections to existing yard tracks and the connection to the Attleboro Line.
- Restore passenger and freight service.

1.3 New Bedford Main Line

This project will include the reconstruction of the New Bedford Main Line between Weir Junction and New Bedford. This line has active freight service operated by CSX between Weir Junction and Cotley Junction, and by MCRR between Weir Junction and New Bedford.

1.3.1 Retaining Walls

Construct retaining walls to the extent possible without affecting existing rail service. Retaining walls are proposed along approximately 8,100 track feet.

- Station 1990+00 to 1993+00
- Station 2020+00 to 2024+00
- Station 2176+00 to 2179+00
- Station 2280+00 to 2286+00

- Station 2525+00 to 2529+00
- Station 2674+00 to 2678+00
- Station 2752+00 to 2772+00
- Station 2787+00 to 2793+00
- Station 2814+00 to 2842+00
- Station 2849+00 to 2852+00

1.3.2 Grade Crossings

Reconstruct grade crossings or close existing crossings to the extent possible during off peak hours with a flagman and during weekend track outages. Active grade crossings that are proposed to be closed cannot be dismantled/blocked until the proposed alternative access has been constructed.

- MP 35.46 Ingell Street (Maintain)
- MP 35.98 Hart Street (Maintain)
- MP 36.48 Silva Crossing (Maintain)
- MP 37.81 W. Stevens Street (Maintain)
- MP 38.34 Cotley Street (Maintain)
- MP 38.47 Private Crossing (CLOSE)
- MP 38.57 Private Crossing (CLOSE)
- MP 39.85 Padelford Street (Maintain)
- MP 40.52 Myricks Street (Maintain)
- MP 40.96 Malbone Street (Maintain)
- MP 41.34 Obed Crossing (CLOSE)
- MP 42.39 Crossing Planks (CLOSE)
- MP 42.78 Private Crossing (CLOSE)
- MP 42.99 Gravel Bank (CLOSE)
- MP 43.09 Private Crossing (CLOSE)
- MP 43.41 Private Crossing (CLOSE)
- MP 43.56 Stonewall Crossing (CLOSE)
- MP 43.98 Jeep Crossing (CLOSE)
- MP 44.17 Jeep Crossing (CLOSE)
- MP 44.36 Townline Crossing (CLOSE)
- MP 45.09 Pierce Gravel Pit (CLOSE)
- MP 45.51 Gas Line (CLOSE)
- MP 45.62 Chace Road (Maintain)
- MP 46.06 Private Road (CLOSE)

- MP 46.30 Private Road (CLOSE)
- MP 46.37 Lucas Crossing (CLOSE)
- MP 46.66 Lawrence Crossing (CLOSE)
- MP 47.24 Braley Road (Maintain)
- MP 47.35 Occupation Crossing (CLOSE)
- MP 47.44 Pittsley Crossing (CLOSE)
- MP 47.84 East Chipaway Road (Maintain)
- MP 48.21 Private Road (Maintain)
- MP 49.03 Samuel Barnet Rd. (Maintain)
- MP 49.10 Polaroid Crossing (CLOSE)
- MP 49.41 Private Crossing (CLOSE)
- MP 51.17 Pig Farm Road (Maintain)
- MP 51.93 Tarkiln Hill Road (Maintain)
- MP 52.91 Nash Road (Maintain)

1.3.3 Stations

The following stations will be constructed along the New Bedford Main Line:

- Taunton Depot
- King's Highway
- Whales Tooth Station

1.3.4 Bridges

Bridge reconstruction along the New Bedford Main Line will follow the bridge construction sequencing outlined on pages 2 through 9 as dictated by the number of existing and proposed tracks. Bridge staging will take precedence over track staging with consideration for nearby structures, property limits and wetland boundaries. The work will be sequenced in order to minimize impacts local traffic.

One Existing Track - Two Proposed Tracks

The following single track bridges along the New Bedford Main Line will be reconstructed to support a 2-track cross section.

- MP BR 35.56 (Station 1877+55) Taunton River
- MP BR 35.79 (Station 1889+50) Brickyard Road
- MP BR 38.93 (Station 2055+67) Cotley River
- MP BR 39.46 (Station 2083+69) Cotley river

One Existing Track - One Proposed Track

The following single track bridges along the New Bedford Main Line will be reconstructed to provide a new single track bridge.

- MP BR 42.14 (Station 2225+16) Assonet River
- MP BR 45.43 (Station 2398+96) Fall Brook
- MP BR 54.17 (Station 2860+00) Route 18
- MP BR 54.21 (Station 2862+50) Wamsutta Street

The alignment and physical constraints of the existing undergrade railroad bridges at Route 18 and Wamsutta Street in New Bedford make it extremely difficult and costly to maintain rail service during construction. MBTA and MCRR will coordinate with the freight customer(s) in New Bedford to provide an alternative means of transportation for an extended period to deliver freight while the bridges are under construction.

1.3.5 Culverts

The existing culverts along the New Bedford Main Line will be reconstructed in stages during track outages and over extended weekends. MCRR will coordinate with customers to consolidate freight shipments to minimize weekday deliveries and provide longer weekend windows for construction. This work can be scheduled in conjunction with the track outages for the nearby bridge work as discussed on pages 2 through 9. Culverts along the New Bedford Main Line include the following:

- MP 17.89 CV-NB-17.89
- MP 19.69 CV-NB-19.69w
- MP 20.37 CV-NB-20.37
- MP 20.78 CV-NB-20.78
- MP 20.89 CV-NB-20.89
- MP 21.51 CV-NB-21.51
- MP 21.61 CV-NB-21.61
- MP 21.68 CV-NB-21.68
- MP 24.08 CV-NB-24.08
- MP 24.31 CV-NB-24.31
- MP 26.47 CV-NB-26.47
- MP 26.68 CV-NB-26.68
- MP 26.96 CV-NB-26.96
- MP 27.43 CV-NB-27.43
- MP 12.0 CV-NB-12w
- MP 14.52 CV-NB-14.52
- MP 14.74 CV-NB-14.74

- MP 15.01 CV-NB-15.01
- MP 16.4 CV-NB-16.4
- MP 16.89 CV-NB-16.89
- MP 22.24 CV-NB-22.24
- MP 22.52 CV-NB-22.52
- MP 22.58 CV-NB-22.58
- MP 22.71 CV-NB-22.71
- MP 22.84 CV-NB-22.84
- MP 23.65 CV-NB-23.65
- MP 28.47 CV-NB-28.47
- MP 28.60 CV-NB-28.60
- MP 28.87 CV-NB-28.87

1.3.6 Track

In general, track construction staging will support the construction staging and schedule of the nearest bridge under construction. Track construction along inactive rail lines will proceed as resources allow. The construction of track sidings can be done with minimal disruption to freight service. Environmental commitments may limit hours of construction to daytime only.

Construct sidings along the east side of right of way

- Station 1879+00 to 2180+00
- Station 2420+08 to 2515+63
- Station 2748+62 to 2839+33

Construct Wamsutta Layover Yard, Station 2881+36

Clear and grub,

Excavate, construct subgrade, install drainage, construct pavement,

Install tracks, connect to mainline track and place into service.

Track construction within the active right-of-way.

- Shift and connect existing Track 1 to Track 2:
- Install interlocking track components, including two crossovers, at the connection to the Fall River Secondary.
- Install interlocking track components, including two crossovers, from station 2870+00 to station 2840+00 in New Bedford.

- Install mainline track on existing track bed from station 1877+55 (north of Taunton River Bridge) to station 2180+00 south of the Fall River connection after sidings and second main tracks have been constructed.

1.4 Fall River Secondary

This project will reconstruct the Fall River Secondary between Myricks Junction and Fall River. This line has active freight service operated by MCRR between Myricks Junction and Fall River.

1.4.1 Retaining Walls

Construct retaining walls to the extent possible without affecting existing rail service. Retaining walls are proposed along approximately 21,000 track feet.

- Station 2158+00 to 2162+00
- Station 2188+00 to 2198+00
- Station 2203+00 to 2208+00
- Station 2224+00 to 2227+00
- Station 2234+00 to 2240+00
- Station 2259+00 to 2273+00
- Station 2280+00 to 2282+00
- Station 2433+00 to 2447+00
- Station 2457+00 to 2462+00
- Station 2490+00 to 2498+00
- Station 2511+00 to 2521+00
- Station 2568+00 to 2587+00
- Station 2598+00 to 2603+00
- Station 2625+00 to 2631+00
- Station 2638+00 to 2700+00
- Station 2710+00 to 2716+00
- Station 2720+00 to 2751+00

1.4.2 Grade Crossings

Reconstruct grade crossings or close existing crossings to the extent possible during off peak hours with a flagman and during weekend track outages. Active grade crossings that provide the single access to a property will be maintained, until the proposed alternative access has been constructed.

- MP 0.2 Mill Street CLOSE
- MP 0.4 Private Road CLOSE
- MP 0.6 Adams Lane CLOSE
- MP 0.8 Private Road CLOSE
- MP 0.9 Private Road CLOSE
- MP 1.2 Beechwood Street CLOSE
- MP 1.3 Richmond Road – North Maintain
- MP 2.0 Private Road CLOSE
- MP 2.3 Private Road CLOSE
- MP 2.4 Forge Road -North CLOSE
- MP 2.4 Richmond Road – South Maintain
- MP 2.7 Forge Road - South Maintain
- Farm Crossing CLOSE
- MP 3.0 Elm Street Maintain
- Farm Crossing CLOSE
- MP 3.7 High Street Maintain
- MP 4.5 Private Road CLOSE
- MP 4.7 Copicut Road Maintain
- MP 5.6 Brightman Lumber Maintain
- Former Private Crossing N/A
- Former Farm Crossing N/A
- Farm Crossing CLOSE
- Farm Crossing CLOSE
- Golf Service Road - North CLOSE
- ATV Crossing CLOSE
- Private Crossing CLOSE
- Private Road CLOSE
- Dirt Crossing CLOSE
- MP 9.0 Private Road CLOSE

1.4.3 Stations

The following stations will be constructed along the Fall River Secondary:

- Freetown
- Fall River Depot
- Battleship Cove

1.4.4 Bridges

Bridge reconstruction along the Fall River Secondary will follow the construction sequencing outlined on pages 2 through 9 depending on the number of existing and proposed tracks. Bridge staging and scheduling will take precedence over track staging requirements/needs with respect to nearby structures, right-of-way constraints and wetland boundaries. The work will be sequenced to minimize impacts to local traffic to the extent possible.

One Existing Track - Two Proposed Tracks

The following existing single track bridges along the Fall River Secondary will be expanded to support a 2-track cross section.

- UG BR 10.57 (Station 2704+00.00) Pearce Street - the existing span is new and does not have to be replaced.
- UG BR 10.77 (Station 2714+50.00) Turner Street – the existing span is new and does not have to be replaced.

One Existing Track - One Proposed Track

The following single track bridges along the Fall River Secondary will be reconstructed to provide a new single track bridge.

- UG BR 0.92 (Station 2192+07) Cedar Swamp
- UG BR 5.93 (Station 2457+35.00) Farm Road
- UG BR 6.77 (Station 2501+00.00) Farm Road – remove and backfill
- UG BR 6.92 (Station 2529+61.20) Golf Cart Road
- UG BR 7.13 (Station 2540+70.00) Golf Club Road
- UG BR 7.98 (Station 2567+50.00) Miller's Cove Road
- UG BR 8.42 (Station 2590+70.00) Collins Street
- UG BR 8.58 (Station 2599+00.00) Ashley's Underpass (Ashley Street)
- UG BR 10.40 (Station 2695+00.00) Brownell Street
- UG BR 10.48 (Station 2699+00.00) President's Avenue

1.4.5 Culverts

The existing culverts along the Fall River Secondary will be reconstructed in stages during track outages and over extended weekends. MCRR will coordinate with customers to consolidate freight shipments to minimize weekday deliveries and provide longer weekend windows for construction. This work can be scheduled in conjunction with the track outages for the nearby bridge work as discussed on pages 2 through 9. Culverts along the Fall River Secondary include the following:

- MP 0.42 CV-FR-0.42
- MP 0.58+- MP 0.58+-
- MP 1.14 CV-FR-1.14
- MP 1.20 CV-FR-1.20
- MP 1.47 CV-FR-1.47
- MP 1.59 CV-FR-1.59
- MP 1.76 CV-FR-1.76
- MP 2.13 CV-FR-2.13
- MP 2.21 CV-FR-2.21
- MP 2.71 CV-FR-2.71
- MP 2.95 CV-FR-2.95
- MP 4.50 CV-FR-4.50
- MP 5.49 CV-FR-5.49
- MP 5.55E CV-FR-5.55E
- MP 5.62 CV-FR-5.62
- MP 5.68 CV-FR-5.68
- MP 5.72 CV-FR-5.72
- MP 5.79 CV-FR-5.79
- MP 6.86 CV-FR-6.86
- MP 7.11 CV-FR-7.11
- MP 7.24 CV-FR-7.24
- MP 7.31 CV-FR-7.31
- MP 7.58 CV-FR-7.58
- MP 8.97 CV-FR-8.97
- MP 9.28 CV-FR-9.28
- MP 11.43 CV-FR-11.43
- MP 11.65 CV-FR-11.65

1.4.6 Track

In general, track construction staging will support the construction staging and schedule of the nearest bridge under construction. Track construction along inactive rail lines will proceed as resources allow. The construction of track sidings can be done with minimal disruption to freight service.

Construct new sidings in final position along the east side of right of way:

- from Station 2441+38 to 2410+59
- from Station 2501+92 t 2556+60
- from Station 2700+61 to 2718+47

Construct Weavers Cove Layover Yard, Station 2025+52

- Clear and grub,
- Excavate, construct subgrade, install drainage, construct pavement,
- Install tracks, connect to mainline track and place into service.

Track Construction within the active right-of-way

- Install interlocking track components, including two crossovers.
- Connect to the Fall River Secondary at Myricks Junction.
- Install interlocking track components from station 2740+00 to station 2770+00 in Fall River.

2

Bridge Access and Laydown Summary

2.1 Stoughton Line Bridges

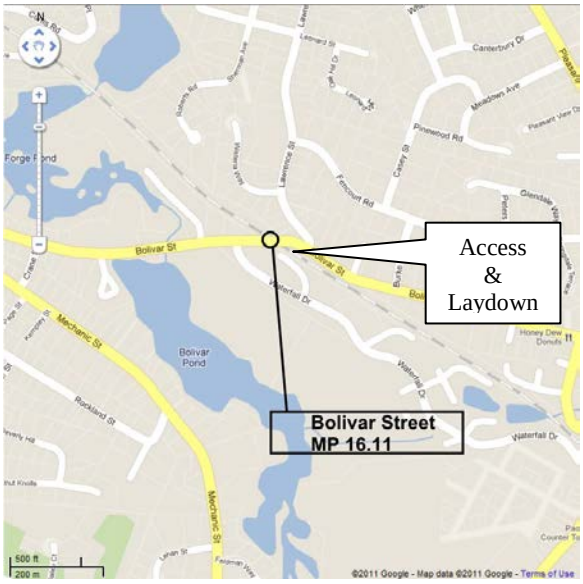
The following locations have been identified for access and construction laydown for the reconstruction of bridges along the Stoughton Line as part of the South Coast Rail project.

2.1.1 Kingsley Pond (Forge Pond), Canton

This site is accessible 0.22 miles west at Washington Street or 0.32 miles west at Ames Ave. Space for a lay-down area may be available behind 230 Bolivar Street.

This bridge can be constructed at any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. Material will have to be carried in over active track. The existing bridge rating is unknown, however based on current traffic the existing bridge could carry limited construction related traffic. The construction of this bridge should be sequenced with the Bolivar Street and Mill Brook bridges.

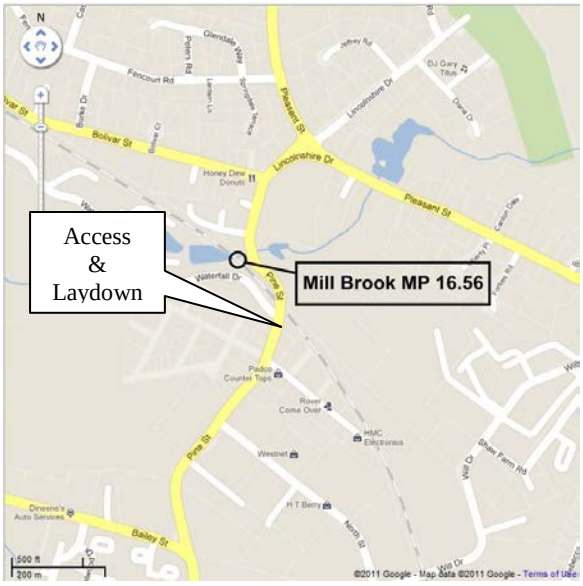
2.1.2 Bolivar Street, Canton



This site is accessible from Bolivar Street or from 333 Bolivar Street at Waterfall Drive to the east where laydown space is also available.

This bridge can be constructed any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. Material will have to be carried in over active track. The existing bridge is rated below Cooper E80. Based on the load capacity rating and current traffic, the existing structure could carry limited construction related traffic to construct other bridges on the line. The construction of this bridge should be sequenced with the construction of the Kingsley Pond and Mill Brook bridges.

2.1.3 Mill Brook, Canton

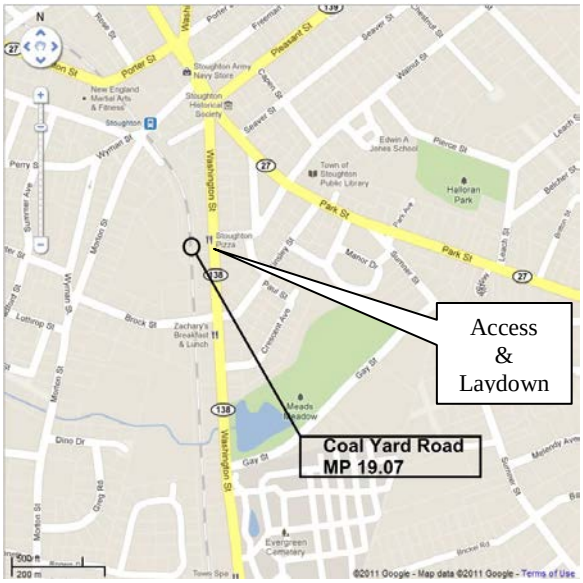


Access and lay-down are available 434 feet east at Pine Street.

This bridge can be constructed at any time. The existing bridge currently carries a single track for commuter rail traffic. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. Material will have to be carried in over active track. The existing bridge rating is unknown, however based on current traffic the existing bridge could carry limited construction related traffic. The construction of this bridge should be sequenced with the reconstruction of the Bolivar Street and Kingsley Pond bridges.

2.1.4 Coal Yard Road, Stoughton

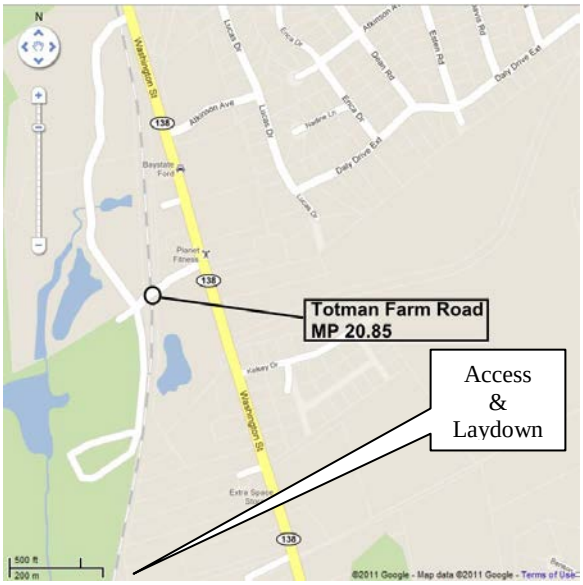
Access and space for lay-down for this bridge are available 165 feet east at 893 Washington Street/Route 138.



This bridge can be constructed at any time. Phased construction would include replacing each span separately while maintaining rail service on one of the other structures. The existing bridge is rated below Cooper E80, but currently carries commuter train traffic. Based on the rating and current rail traffic, the existing bridge could be used for limited construction related traffic. The Stoughton line south of this bridge is abandoned and this bridge will not be used for construction access to other bridges.

2.1.5 Totman Farm Road, Stoughton

This bridge is accessible from Totman Farm Road via Washington Street or 0.37 mile south from 2031-2183 Washington Street, where space is available for laydown.



This bridge could be constructed at any time. However, this location could be used to access the right of way and other locations to the south. The existing bridge is out of service and the superstructure has been removed. The right of way could be accessed from this location once the existing abutments are removed. The new bridge would then be constructed once access from this location is no longer required. Totman Farm Road will be used as primary access for the Morton Street frontage road.

2.1.6 Day's Farm Road, Easton

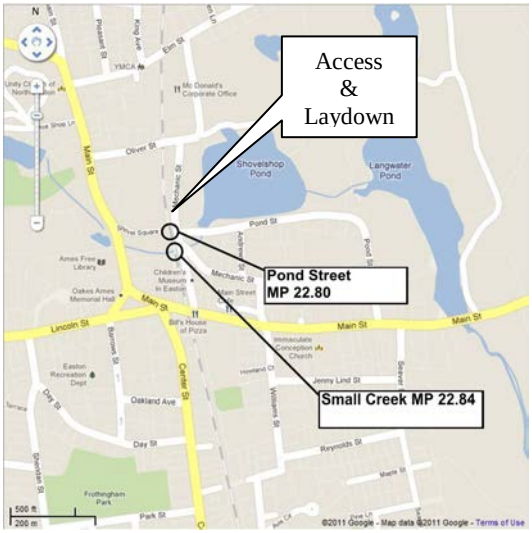
This site is accessible from the north via Totman Farm Road or 0.33 miles north from the shopping and office complex at 25 Washington Street, where laydown space is available.

The Days Farm Bridge will have to be reconstructed first to provide access to Cowessett Brook.

2.1.7 Cowessett Brook, Easton

The site is accessible from Totman Farm Road to the north or 0.45 miles north from the shopping complex at 25 Washington Street, where laydown space is available. Day's Farm Road Bridge will have to be constructed before this bridge to provide construction access along the right-of-way. Access is also available 0.85 miles south from Elm Street.

2.1.8 Pond Street, Easton



This site is accessible from Shovel Shop Square to the west and from the corner of Pond Street and Mechanic Street to the east. Lay-down space may be available in the area north of Shovel Shop Square.

This bridge can be constructed at any time without relying on construction of other bridges. This bridge should be constructed prior to the construction of the Small creek bridge if it is to be used to transport construction materials and equipment.

2.1.9 Small Creek, Easton

This site is accessible from Sullivan Street and Mechanic Street to the north. Lay-down space may be available in the vicinity north of Shovel Shop Square.

This bridge should be constructed after Pond Street if it is to be used to transport of construction materials and equipment.

2.1.10 Main Street, Easton

This site is accessible from Main Street or along Sullivan Avenue. Lay-down space may be available in the area north of Shovel Shop Square or at the rear of the parking area behind 101 Main Street.

This bridge can be constructed at any time as it is located within the inactive portion of the right-of-way; however, this bridge should not be constructed at the same time as Bridge Street as one road will be the detour for the construction of the other.

2.1.11 Bridge Street, Easton

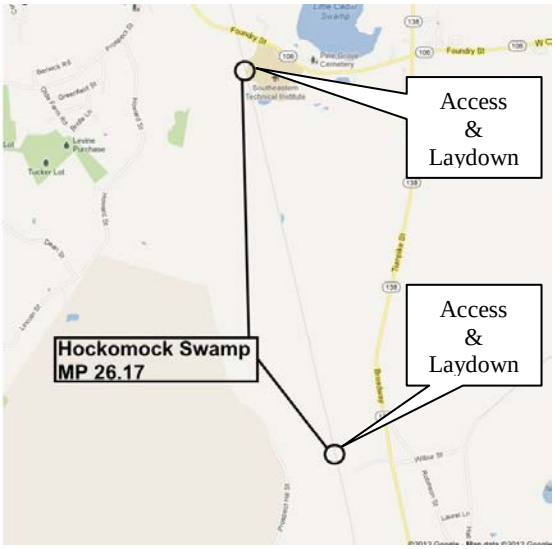
This site is accessible from Bridge Street or 425 feet north from Williams Street. Lay-down space may be available 0.54 miles north in the vicinity of Shovel Shop Square or 0.23 mile north at the rear of the parking area behind 101 Main Street.

This bridge can be constructed at any time, except during the construction of the Main Street Bridge.

2.1.12 Hockomock Swamp Trestle, Raynham

Access and lay-down are available to the north from the Vocational School and Foundry Street and to the south from the Race Track crossing.

The Hockomock Swamp Trestle construction will be completed working from the north and south using two crews. The staging is described on pages 13 and 14 of this report.



2.1.13 Bridge Street, Raynham

This site is accessible from Bridge Street or 0.14 miles south from Elm Street. Laydown space is available at the Race Track crossing, 1.07 miles north. This bridge can be constructed at any time. The roadway bridge construction over the inactive rail will not affect work in other locations.

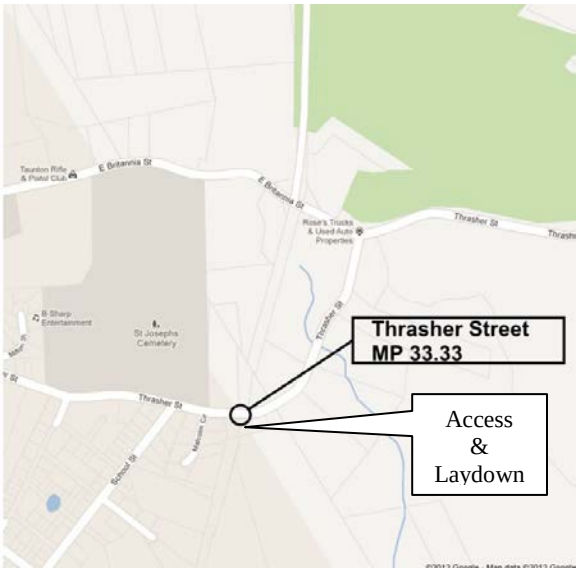
2.1.14 Route 138 Grade Separation, Raynham

This site is accessible from Route 138. Lay-down space is available in the rear of 728 Broadway or 686 Broadway along the Whittenton Branch ROW. This bridge can be constructed at any time. The roadway bridge construction over the future rail right-of-way will not affect work in other locations.

2.1.15 Thrasher Street, Raynham

This site is accessible from Thrasher Street. or 0.29 miles north from East Britannia Street or 0.50 miles south from Longmeadow Road, where space is available for laydown.

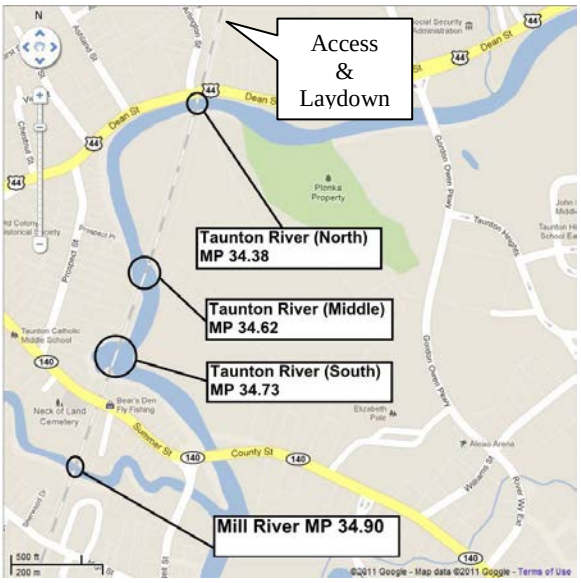
This bridge can be constructed at any time. The roadway bridge construction over the inactive rail will not affect work in other locations.



2.1.16 Taunton River (North), Taunton

This site is accessible from Dean Street. Space for lay-down is available 0.17 miles north at William Hooke Lane.

The bridge near Dean Street can be constructed at any time, but should be sequenced with the other Taunton River and Mill River bridges to the south. The proposed bridge will be constructed using accelerated methods, weeknights 7:00 PM to 7:00 AM, weekends 7:00 PM on Friday to 7:00 AM on Monday and as allowed by MCRR. Shipments will be coordinated with MCRR customers to provide one extended (5 or 6 day) weekend service shutdown per month to roll in the superstructure. Roadway work on Dean Street will be staged to minimize traffic impacts. The existing bridge structure is rated below Cooper E-80, but currently carries freight traffic and could carry limited construction related traffic. This bridge should be reconstructed in sequence from north to south with the two bridges to the south for construction access to the other sites.



2.1.17 Taunton River (Middle), Taunton

This site is accessible from Dean Street. Lay-down space is available 0.42 miles north at William Hooke Lane.

The middle bridge can be constructed at any time, but should be sequenced with the other Taunton River crossings to the north and south The proposed bridge will be constructed using accelerated methods, weeknights 7:00 PM to 7:00 AM, weekends 7:00 PM on Friday to 7:00 AM on Monday and as allowed by MCRR. Shipments will be coordinated with MCRR customers to provide one extended (5 or 6 day) weekend service shutdown per month to role in the superstructure. The existing bridge structure is rated below Cooper E-80, but currently carries freight traffic and could carry limited construction related traffic. This bridge should be constructed in sequence with the bridge to the north and south for construction access to the other sites.

2.1.18 Taunton River (South), Taunton

This site is accessible from Dean Street. Lay-down space is available 0.53 miles north at William Hooke Lane.

The southern bridge can be constructed at any time, but should be sequenced with the other Taunton River crossings to the north and the mill river crossing to the south. The proposed bridge will be constructed using accelerated methods weeknights 7:00 PM to 7:00 AM, weekends 7:00 PM on Friday to 7:00 AM on Monday and as allowed by MCRR. Shipments will be coordinated with MCRR customers to provide one extended (5 or 6 day) weekend service shutdown per month to roll in the superstructure. The existing bridge structure does not rate for Cooper E-80, but currently carries freight traffic. Based on the bridge rating, the bridge has limited capacity and should be reconstructed before it can carry construction traffic.

2.1.19 Mill River, Taunton

The site is accessible from Dean Street. Lay-down space is available 0.72 miles north at William Hooke Lane.

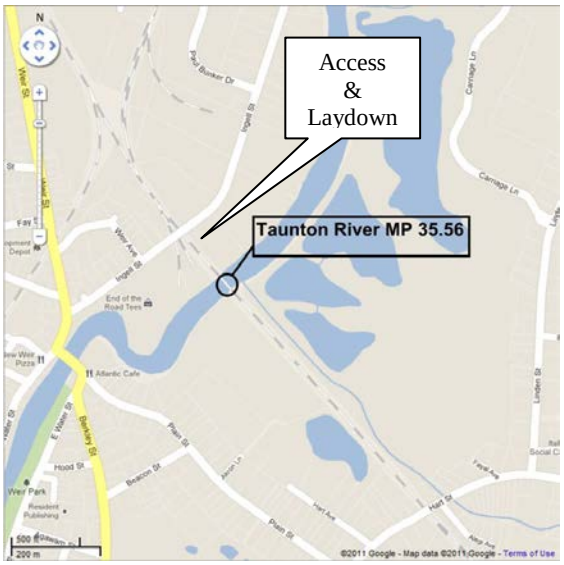
This bridge can be constructed at any time, but should be sequenced with the other Taunton River crossings to the north. The proposed bridge will be constructed using accelerated methods, weeknights 7:00 PM to 7:00 AM, weekends 7:00 PM on Friday to 7:00 AM on Monday and as allowed by MCRR. Shipments will be coordinated with MCRR customers to provide one extended (5 or 6 day) weekend service shutdown per month to erect the preassembled superstructure. The existing bridge structure is rated below Cooper E-80, but currently carries freight traffic and could carry limited construction related traffic. Where construction access is required from the north, this bridge should be constructed after the other Taunton River crossings to the north to allow the transport of construction materials and equipment.

2.2 New Bedford Main Line Bridges

The following locations have been identified for access and construction laydown for the reconstruction of bridges along the New Bedford Main Line as part of the South Coast Rail project.

2.2.1 Taunton River, Taunton

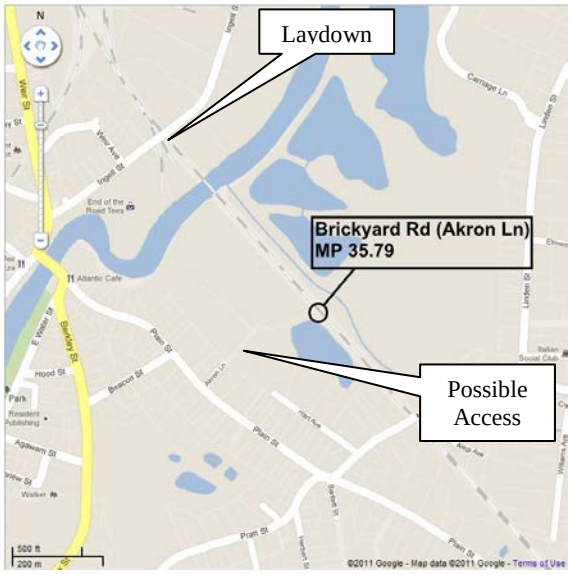
The access and lay-down for this site are 490 feet northwest of the site at Ingell Street.



This bridge can be constructed at any time. The staging will include the construction of a new one track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will have to be shifted to the new bridge to reconstruct the existing bridge. Construction material and equipment will have to be carried in over the active track. The existing bridge is rated for E64 loading, but is able to handle construction related traffic to construct other bridges to the south. The steel through-plate-girder bridge can be constructed one track at a time with three girders. The center girder will support both tracks.

2.2.2 Brickyard Road, Taunton

This site is seasonally flooded under the bridge. The site is accessible from Plain Street and Akron Lane 670 feet west of the site via the abandoned road or 0.25 miles south at the Hart Street grade crossing. A lay-down area for this site is located 0.30 miles northwest at Ingell Street.



This bridge can be constructed at any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. After shifting service to the new bridge, the

existing bridge can be reconstructed. Construction material and equipment will have to be carried in over active track. The existing bridge is rated for E97 loading, and could carry construction related traffic to construct other bridges on the line. The proposed prestressed box girder bridge would require post tensioning in each phase.

2.2.3 Route 24, Taunton

This site is accessible from Route 24. Access and lay-down at rail grade are available from the east at the Galleria Mall. The access road heads 0.15 miles southwest from Galleria Mall Drive to the right-of-way at a point 0.11 miles from the overhead crossing (0.26 miles total).

This bridge can be constructed at any time. Construction staging would not significantly affect rail service as this is a roadway bridge. This bridge has to be constructed before the tracks can be constructed below.

2.2.4 Cotley River (North), Berkley

This site is accessible from Cotley Street, 0.59 miles north of the site or 0.90 miles south from Padelford Street via the Cotley River South Bridge. This site is also accessible from Galleria Mall Road, 1.12 miles north where space for lay-down is also available.

This bridge can be constructed at any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service can then be shifted to the new bridge while the existing bridge is reconstructed. This will require material to be carried in over active track. The existing bridge and the Cotley River crossing to the south both accommodate Cooper E78 loading. Based on the strength rating and current rail traffic the existing bridge structures could carry construction related traffic. The Cotley River

bridges should be constructed sequentially if it is required to use one bridge as access for the other.

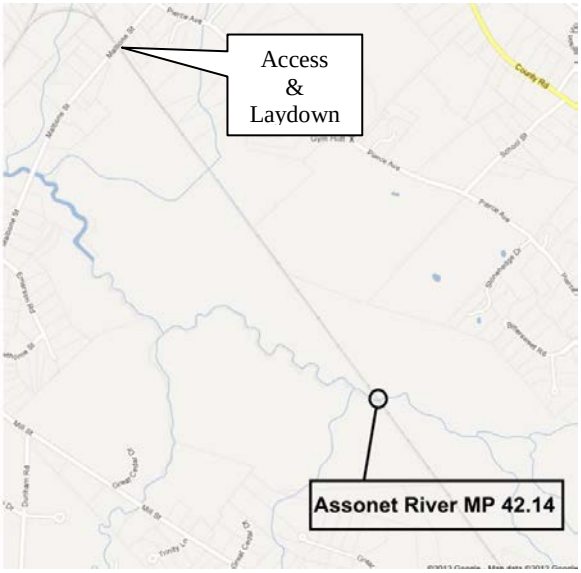
2.2.5 Cotley River (South) , Berkley

This site is accessible 0.40 miles south at Padelford Street and 1.12 miles north at Cotley Street via the Cotley River North Bridge. A potential lay-down area is located 1.66 miles north at the Galleria Mall Road access.

This bridge can be constructed at any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service can then be shifted to the new bridge while the existing bridge is reconstructed. The existing bridge and the Cotley River crossing to the north both accommodate Cooper E78 loading. Based on the strength rating and current rail traffic the existing bridge structures could carry construction related traffic. The Cotley River bridges should be constructed sequentially, as each bridge will provide access to the next.

2.2.6 Assonet River (Cedar Swamp), Lakeville

This site is accessible from Malbone Street, 1.19 miles north and 1.11 miles south from Howland Road. The Howland Road access is steep and would require an easement over private property. Lay-down and access are also available 1.63 miles northwest in the vicinity of Myricks Street and Grove Street at Myricks Junction.



This bridge can be constructed at any time. Widening the proposed structure to accommodate rail service during construction will require material to be carried in over active track. The existing timber bridge was recently reconstructed, rated for Cooper E78 loading and could carry construction related traffic.

2.2.7 Fall Brook (Freetown Brook), Freetown

This site is accessible from Chace Road, 0.17 miles south.

This bridge can be constructed at any time; however the existing bridge is not able to carry construction traffic. Widening the proposed structure to accommodate rail service during construction will require material to be carried in over active track. The existing bridge is rated at Cooper E51 loading, and is currently carrying freight traffic. Based on the bridge rating, the bridge has limited capacity and should be reconstructed before it can carry construction traffic.

2.2.8 Route 18, New Bedford

Access and lay-down for this site are available to the west side of 1750 Purchase Street.

This bridge is to be constructed as a three-span bridge including the span over Wamsutta Street, and can be constructed at any time. Alternative transportation will have to be provided to the MCRR customer to the south so the bridges can be closed for reconstruction. The Wamsutta Street Bridge will have to be replaced before it can accommodate construction traffic.

2.2.9 Wamsutta Street, New Bedford

Access and lay-down for this site is available from the rail yard immediately to the east.

This bridge is to be constructed as a three span bridge including the two spans over Route 18, and can be constructed at any time. Alternative transportation will have to be provided to the MCRR customer to the south so the bridges can be closed for reconstruction. This bridge is in poor condition and has a rated capacity of E55. This bridge would have to be reconstructed before it will be able to carry construction related traffic.

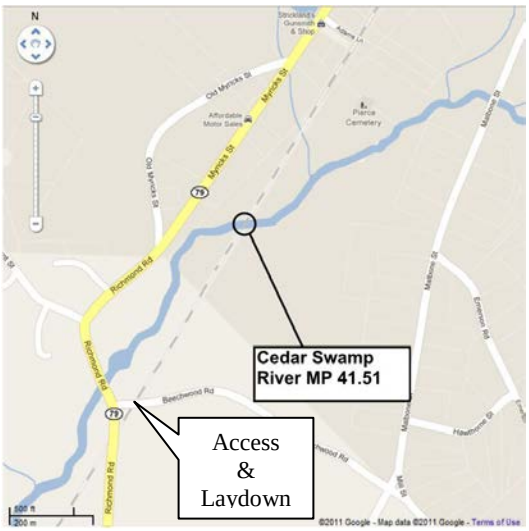
2.3 Fall River Secondary Bridges

The following locations have been identified for access and construction laydown for the reconstruction of bridges along the Fall River Secondary as part of the South Coast Rail project.

2.3.1 Cedar Swamp River (Assonet River), Lakeville

Access and lay-down for this site are available 0.31 miles south at Beechwood Road. Access is also available through private property on Adams Lane, 0.33 miles to the north.

This bridge can be constructed at any time. The proposed bridge will be constructed using accelerated methods weeknights 7:00 PM to 7:00 AM, weekends 7:00 PM on Friday to 7:00 AM on Monday and as allowed by MCRR. The existing bridge is rated below Cooper E80, and is currently carrying freight traffic. The bridge should be reconstructed before it can be used for construction traffic.

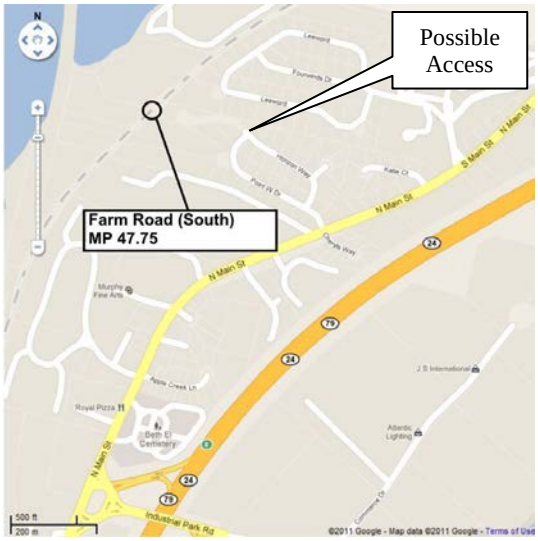


2.3.2 Farm Road (North), Freetown

Access and lay-down for the bridge are available 0.63 miles to the north at the abandoned rail yard located at 178-188 South Main Street. The site is also accessible 0.6 miles south from the Farm Road at M.P. 47.75. A temporary access easement would be required to gain access from the industrial plant service road to the south as well as from Farm Road.

This bridge can be constructed at any time. Widening the proposed structure to accommodate rail service during construction will require material to be carried in over active track. The existing steel bridge is rated below Cooper E80. Based on the rating capacity and current freight traffic the existing bridge could carry limited construction related traffic.

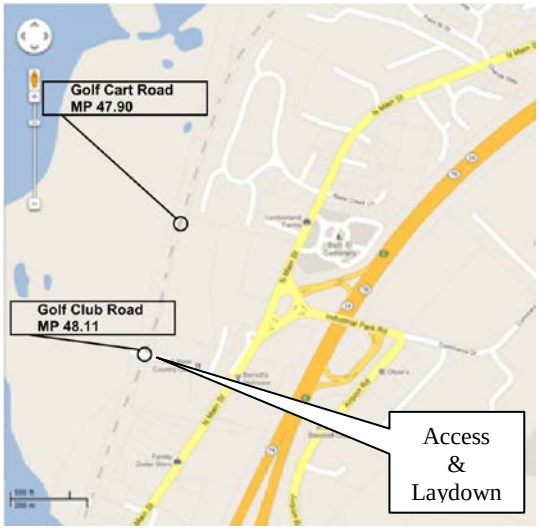
2.3.3 Farm Road (South), Fall River



The site is accessible from Golf Cart Road, 0.54 miles south. Access is also available 0.15 miles east from Horizon Way/Point West Drive via Farm Road. The abandoned rail yard located 1.48 miles northeast of the bridge site may provide an acceptable laydown area via the Farm Road North Bridge.

This bridge construction could commence at any time. Filling Operations would require work around scheduled track outages. This bridge is rated for E73 loading, and currently carries freight traffic. The existing bridge could carry construction related traffic.

2.3.4 Golf Cart Road, Fall River



Access and lay-down for this site is available 0.21 miles south at Golf Club Road (M.P. 48.11).

This overhead bridge can be constructed at any time. Construction staging would not significantly affect rail traffic as this is an overhead bridge.

2.3.5 2.3.5 Golf Club Road, Fall River

Access and lay-down for this site are available via the Golf Club Road at-grade crossing to the south.

This overhead bridge can be constructed at any time. Construction staging would not significantly affect rail traffic as this is an overhead bridge. This bridge must be reconstructed before the tracks below can be reconstructed.

2.3.6 Miller's Cove Road

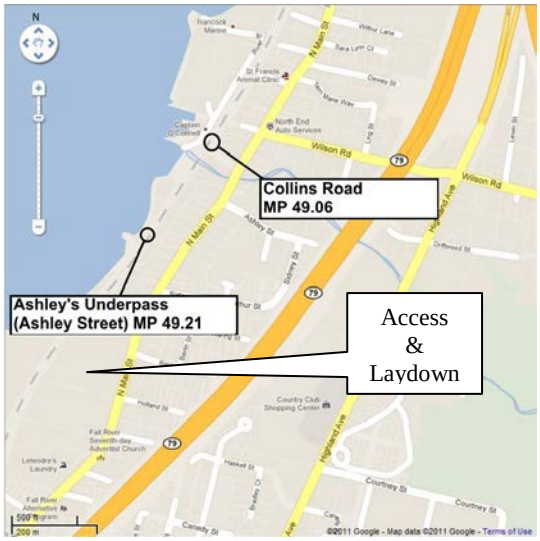
This site is accessible from abandoned Miller's Cove Road via 5856 North Main Street and 0.50 miles north from Golf Club Road. Lay-down and access for this site are also available 375 feet to the north from 3700-3820 North Main Street.

This bridge can be constructed at any time. Widening the proposed structure to accommodate rail service during construction will require material to be carried in over active track. The existing concrete bridge is rated below Cooper E80, but currently carries freight traffic. The existing bridge could carry limited construction related traffic.

2.3.7 Collins Road, Fall River

This site is accessible from Collins Road. Access and lay-down are available 0.50 miles southwest in the vicinity of 2684-2698 North Main Street.

This bridge can be constructed any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. Material will have to be carried in over active track. The existing bridge is rated below Cooper E80, but currently carries freight traffic. The existing bridge could carry limited construction related traffic.



2.3.8 Ashley's Underpass (Ashley Street) , Fall River

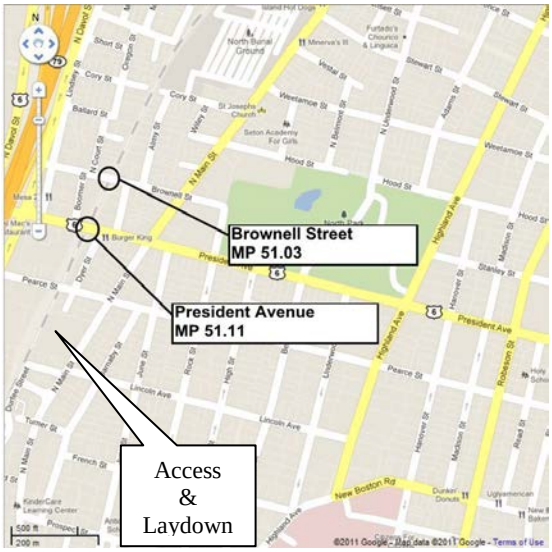
This site is accessible 280 feet north from Collins Road or 550 feet south at the Canedy's Underpass. The site is bounded and constrained by private property. This site is also accessible from Clark Street and River Street to the north. Some tree clearing may be necessary to gain access from River Street. Access and lay-down may be available 0.35 miles southwest in the vicinity of 2684-2698 North Main Street.

Ashley's Underpass can be constructed at any time. Widening the proposed structure to accommodate rail service during construction will require material to be carried in over active track. The existing bridge is rated below Cooper E80, but currently carries freight traffic and could carry limited construction related traffic.

2.3.9 Brownell Street, Fall River

This site is accessible from Brownell Street or 0.22 miles north via Railroad Avenue off of North Court Street. Lay-down space is available 0.25 miles south at 870 North Main street and is accessible from the Pearce Street and President's Avenue bridges.

This bridge can be constructed any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. The existing bridge is rated below Cooper E80, but currently carries freight traffic and could carry limited construction related traffic.



2.3.10 President Avenue, Fall River

This site is accessible from President Avenue or 0.15 miles south at the parking lot behind 870 North Main Street via Pearce Street Bridge, which can also be used for construction laydown. Additional access is also available 0.14 miles north via Railroad Avenue from North Court Street as long as the Brownell Street bridge has been reconstructed.

This bridge can be constructed any time. The staging will include the construction of a new single track bridge adjacent to the existing bridge while maintaining rail service on the existing bridge. Rail service will then be shifted to the new bridge while the existing bridge is reconstructed. The existing bridge is rated below Cooper E80, but currently carries freight traffic and could carry limited construction related traffic.

2.3.11 Pearce Street, Fall River

This site is accessible from Pearce Street or from the south via Main Street, which has space for construction laydown.

The existing single track bridge over Pearce Street will be retained and will be used to maintain rail service while a second span is constructed adjacent to the existing span. The proposed structure will be a separate structure.

2.3.12 Turner Street, Fall River

This site is accessible from Turner Street or from an open lay-down area immediately to the south, or from the parking lot behind 870 North Main Street to the north.

The existing single track bridge over Turner Street will be retained and will be used to maintain rail service while a second span is constructed adjacent to the existing span. The proposed structure will be built as a separate structure.

2.3.13 Channel near Battleship Cove, Fall River

Access and lay-down for this bridge are available from the north at 118-184 Water Street

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Appendix 3.2-G

Methodology and Assumptions of Central Transportation Planning Staff Regional Travel Demand Modeling (2009)

METHODOLOGY AND ASSUMPTIONS OF CENTRAL TRANSPORTATION PLANNING STAFF REGIONAL TRAVEL DEMAND MODELING

South Coast Rail Project

Central Transportation Planning Staff

State Transportation Building
Ten Park Plaza, Suite 2150
Boston, Massachusetts 02116

August 28, 2009

INTRODUCTION

The regional travel model set of the Central Transportation Planning Staff (CTPS) is based on procedures that have evolved over many years at CTPS. It follows the traditional four-step travel-modeling process of trip generation, trip distribution, mode choice, and trip assignment and is implemented in the EMME software package. This modeling process is employed to estimate present and future daily transit ridership and daily highway traffic volumes, primarily on the basis of demography and the characteristics of the transportation network. The model set simulates travel on the entire eastern Massachusetts transit and highway systems. When the model set is estimating future travel, the inputs include forecasts of demography and projections of transit and highway improvements.

The CTPS regional travel model set was expanded and customized for the purposes of the South Coast Rail (SCR) project. However, the resulting model set is very similar to the standard regional travel model set used by CTPS. The methodologies, procedures, and theories underlying the trip generation, trip distribution, mode-choice, and trip assignment sub-models of the standard CTPS model set are used by the SCR model set. The two model sets also use the same software, and there are other similarities as well.

The most notable modification of the standard CTPS model to produce the SCR model was the addition of 191 transportation analysis zones and the associated expansion of the highway and transit networks. The SCR model set thus also includes transit services not included in the standard model set. For future years, the operating plan for proposed SCR build transit services was provided by Vanasse Hangen Brustlin, Inc. (included as an appendix to the present document). Where possible, the expanded zone system and networks included in the SCR model set were developed from a statewide travel model maintained by the Executive Office of Transportation and Public Works (EOT) (the EOT model itself was not used for the SCR forecasting primarily because it did not include a mode choice sub-model). Other differences between the standard CTPS model and the SCR model are found in some of the inputs needed for the various sub-models; in most cases, these differences stem from the addition of zones and the associated enlargement of the highway and transit networks.

This memorandum describes in detail the model set developed for the SCR project. The model set will generally be referred to as "the model," for simplicity's sake. The organization of this memorandum is:

Description of the Model

- Overview of the Four Steps
- Notable Features of the Model
- Model Structures and Inputs

The Four Steps of the Travel Demand Modeling Process

- Trip Generation
- Trip Distribution
- Mode Choice
- Trip Assignment

Air Quality Analysis

DESCRIPTION OF THE MODEL

OVERVIEW OF THE FOUR STEPS

In the first step, trip generation, the total number of trips generated by residents of the 182 municipalities constituting the modeled area were calculated using demographic data. Similarly, the number of trips attracted to different types of land use, such as employment centers, schools, hospitals, shopping centers, etc., were estimated using land use data and trip generation rates obtained from travel surveys. This information on trips generated and attracted was produced at the level of disaggregated geographic areas known as transportation analysis zones (TAZs). All calculations were performed at the TAZ level.

In the second step, trip distribution, the model determined how the trips generated in each TAZ are distributed throughout the region. Trips were distributed based on transit and highway travel times between TAZs and on the relative attractiveness of each TAZ, which was also influenced by the number of jobs available and the size of schools, hospitals, shopping centers, etc.

Once the total number of trips between each pair of TAZs was determined, the mode choice step of the model (step three) allocated the total trips among the available modes of travel. The available modes of travel were walk, auto (single-occupant vehicle [SOV] and carpool), and transit (subdivided by access mode: walking to transit or driving to transit). To determine the proportion of trips to allocate to each mode, the model took into account the travel times, number of transfers required, parking availability, and costs associated with each option. Other variables, such as auto ownership and household size, were also included in the model.

After estimating the number of trips by mode for all possible TAZ combinations, in trip assignment (the fourth and final step) the model assigned trips to their respective specific routes. This was necessary because there is often more than one highway route or transit service between two TAZs.

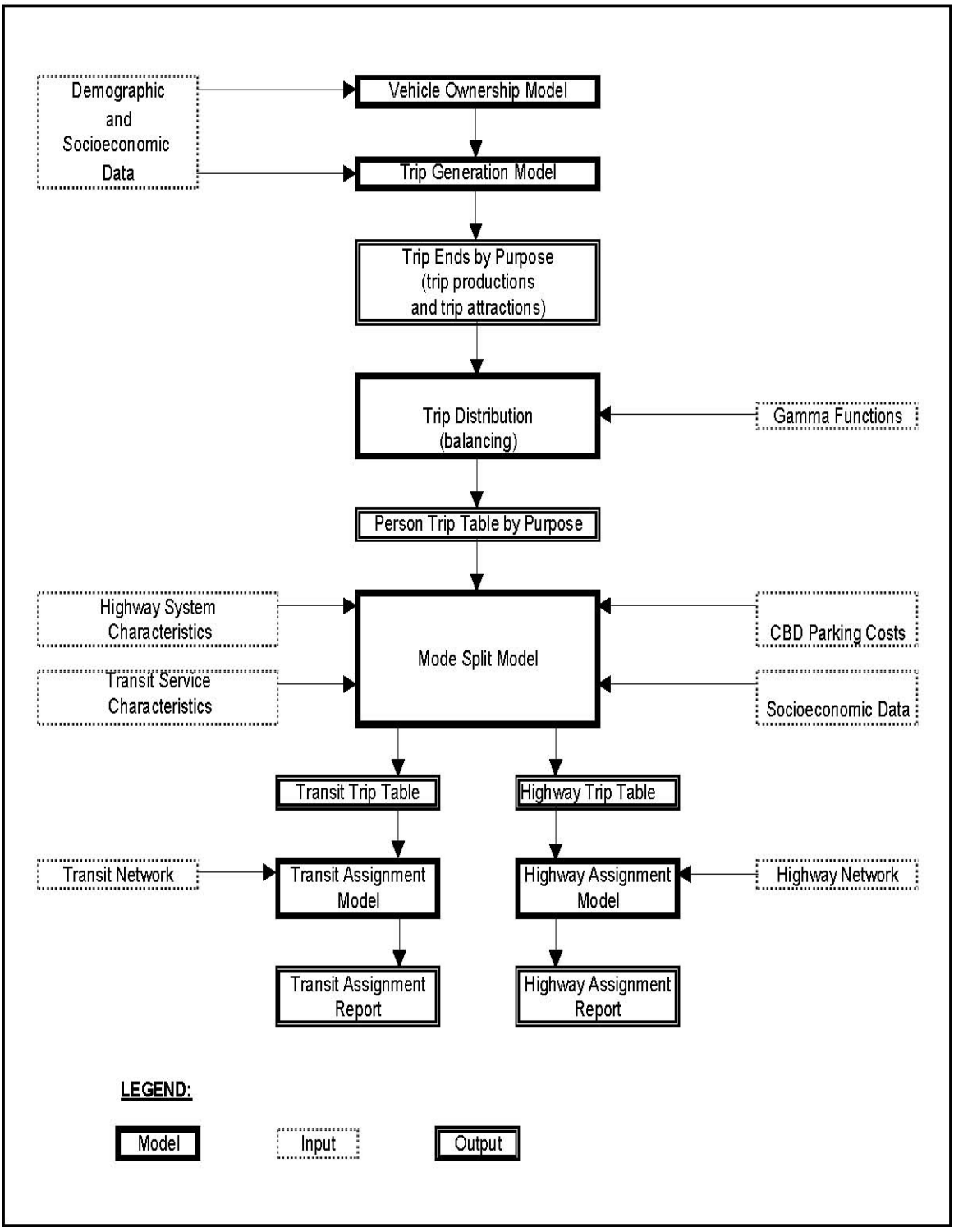
Various reports showing the transit ridership on different transit modes (including the specific ridership on each of the existing and proposed individual transit lines) and traffic volumes on the highway network were produced as needed. A schematic representation of the modeling process is shown in Figure 1.

NOTABLE FEATURES OF THE MODEL

The model developed for the South Coast Rail Study uses the best component models, networks, and input data available to CTPS at this time. Some of the notable features of the model are as follows:

- It incorporates both motorized and non-motorized trips.
- It simulates transit and highway travel during four time periods of a typical weekday.
- The trip generation, trip distribution, and mode choice components are well calibrated
- EMME software used in implementing the model is capable of performing multi-class, multi-path assignment that is superior to the traditional all-or-nothing assignment.

FIGURE 1
The Four-Step Demand Modeling Process



- The procedure that estimates air quality benefits is sophisticated and well integrated within the main model.

MODEL STRUCTURES AND INPUTS

Modeled Area

The model developed for the South Coast Rail project encompasses the 182 cities and towns in eastern Massachusetts indicated in Figure 2, which include the 101 municipalities of the Boston Region Metropolitan Planning Organization area and 81 additional communities. The figure also shows the boundaries of a core area and four concentric rings into which the modeled area is divided for model estimation and calibration purposes. These rings will be referred to in subsequent discussions.

Zone System

The modeled area for the South Coast Rail project is divided into 2,918 internal TAZs. There are also 117 external stations around the periphery of the modeled area that allow for travel between the modeled area and adjacent areas of Massachusetts, New Hampshire, and Rhode Island.

Transportation Networks

There are two types of network: transit and highway. Both are integrated in EMME. The highway network comprises express highways, principal and minor arterials, and local roadways. The transit network comprises commuter rail lines, rapid transit lines, and bus lines (MBTA and private carriers). The model contains service frequency (i.e., how often trains and buses run), routing, travel time, and fares for all lines.

- *Highway Network:* The regional highway network contains in excess of 100,000 links and 24,000 nodes. Like any highway network, it does not include some local and collector streets. Each link is coded with the appropriate free-flow speed, number of lanes, and lane capacity. Functional class is coded, as are various geographic flags useful for summarizing emissions. Another code is used to distinguish links open only to high-occupancy vehicles (HOVs) or closed to trucks.

- *Transit Network:* The transit network represents all MBTA bus and rail services in eastern Massachusetts, as well as private express buses, local transit agency bus routes, and Boston Harbor ferries. Included among the local transit agency bus routes are all of the Southeastern Regional Transit Authority (SRTA) bus routes. The private express bus services include existing DATTCO and Bloom buses between the South Coast study area and Boston. Most-likely travel paths are built through the network and afterwards skimmed, and the resulting impedances are input to the trip distribution and mode choice models. After mode choice, transit trip tables by time of day are assigned to the network travel paths.

Major Data Inputs

CTPS's travel model underwent a major revision in 1993, and several important data sources were used in that revision. Those and other major data items underlying the model are as follows:

- *Household Travel Survey:* In 1991, CTPS conducted a household travel survey. The survey took the form of an activity-based travel diary that was filled out for one weekday. Approximately 4,000 households, generating some 39,000 weekday trips, were represented in the final database. The data were used to estimate new models for trip generation, auto ownership, trip distribution, and mode choice.

- *External Cordon Survey:* Also in 1991, a survey of automobile travelers bound for the modeled area from adjacent areas was performed. Survey results were used in trip generation and distribution to update estimates of external trips.

- *Site-Level Employment Database:* Employment estimates for 1991 were taken from state-provided sources and a commercial vendor's database purchased by CTPS and were combined into a single, unified regional employment database that was updated to the base year 2000 based on employment data from the Department of Employment and Training and on extensive research by CTPS.

- *2000 U.S. Census:* Various census files were used in model estimation and calibration processes. In particular, Census Journey to Work information was incorporated into the model at several stages of model development for the South Coast Rail project.

- *Ground Counts:* Transit ridership and highway traffic volume data representing early 1990s conditions were amassed into a database and used to calibrate the travel sub-models. Updated counts and volumes have been used for model validation.

Analysis Year

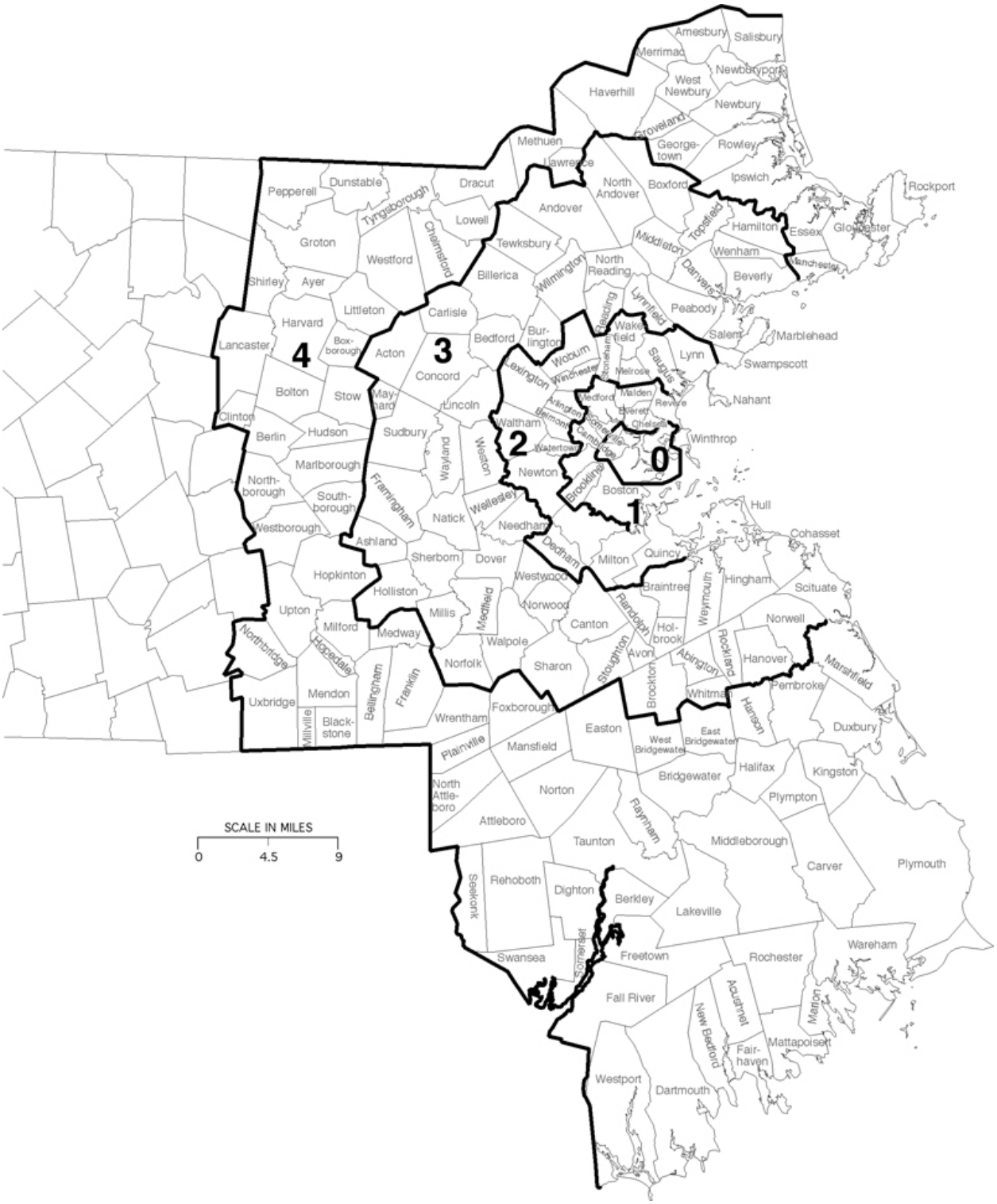
The base year is 2000 and the horizon year is 2030.

Time-of-Day Considerations

The mode choice and transit assignment steps of the modeling process are conducted on the basis of time periods. The four time periods modeled are an AM peak period, a midday period, a PM peak period, and a nighttime period. The trip generation model, however, is based on daily trips. The trip distribution model considers two time periods: peak and off-peak.

The highway and transit networks are built separately for each time period. Table 1 shows the time intervals associated with each time period. The highway vehicle trips and transit person trips created by the mode choice model are converted from production/attraction format to an origin/destination format, based upon the 1991 Household Travel Survey, prior to network assignment.

FIGURE 2
CTPS Modeled Area and Ring Boundaries



The factors used in dividing the highway person trips into different time periods were obtained from the 1991 Household Travel Survey. The final trip tables created for each time period reflect observed levels of congestion on the highway system. The results of the four assignments are summed to obtain daily (AWDT) results.

TABLE 1
Time Periods for Trip Assignment

Time Period	Highway Vehicle Trips	Transit Person Trips
AM Peak Period	6:00 AM – 9:00 AM	6:00 AM– 9:00 AM
Midday	9:00 AM– 3:00 PM	9:00 AM– 3:00 PM
PM Peak Period	3:00 PM– 6:00 PM	3:00 PM– 6:00 PM
Early Evening/Night	6:00 PM– 6:00 AM	6:00 PM– 6:00 AM

Population, Household, and Employment Forecasts

Households and employment by type are major inputs to the travel model process: they are the variables upon which trip generation estimates are based. The forecasts for the region were developed by combining household and employment predictions independently produced by the seven regional planning agencies/metropolitan planning organizations (RPAs/MPOs) in eastern Massachusetts: the Central Massachusetts Regional Planning Commission (CMRPC), Merrimack Valley Planning Commission (MVPC), Metropolitan Area Planning Council (MAPC), Montachusett Regional Planning Commission (MRPC), Northern Middlesex Council of Governments (NMCOG), Old Colony Planning Council (OCPC), and Southeastern Regional Planning and Economic Development District (SRPEDD).

Forecasts for the 101 cities and towns that make up the Boston Region MPO area were developed by MAPC based on its MetroFuture land use scenario. Forecasts for the 63 communities in the model belonging to RPAs/MPOs other than the Boston Region MPO were developed in a slightly different fashion. Each RPA/MPO independently maintains its own travel demand model, TAZ system, base-year estimates, and future-year forecasts. However, the Boston Region MPO's year 2000 base-year data have long been widely accepted as the most refined and detailed data set for the year 2000 for eastern Massachusetts, and significant faith has been invested in this data set in other studies, past and ongoing. Therefore, in the present modeling effort, future-year forecasts for these 63 communities pivoted off this vetted and reliable data but allowed for the growth projections envisioned by the individual RPA/MPO. This was done by adding the absolute changes in population and households predicted by the RPA/MPOs for the 63 communities to the Boston Region MPO's base-year estimates.

Employment forecasts were developed differently but also used the absolute change projected by the RPA/MPO and also pivoted off the Boston Region MPO's year 2000 data. The future-year Boston Region MPO distribution of employment by TAZ and by employment sector was applied to the RPA/MPO's absolute change at the community level. The resulting change was then added to the base-year Boston Region MPO employment data to produce the future-year

forecasts. This hybrid approach took advantage of the accuracy of the Boston Region MPO's widely accepted demographic data sets while still capturing and respecting the growth expressed and projected by the individual RPAs/MPOs.

For the 18 SRPEDD communities not within the boundaries of the standard CTPS regional travel demand model set, SRPEDD land use forecasts and base year estimates of population, households, and employment were used. These SRPEDD forecasts were constrained by town-level control totals developed by the Executive Office of Transportation and Public Works (EOT). In some instances SRPEDD re-allocated demographics within one of the given 18 communities, but in all instances the EOT town-level control totals were maintained.

CALIBRATION OF THE MODEL

Calibration is the process in which model results or outputs are compared with observed data in order to assess the accuracy of a model. The model set used in the SCR study underwent an extensive calibration process. For the base year, the trip distribution, mode choice, and trip assignment sub-models of the SCR model set were run through an iterative feedback loop dozens of times to estimate the most accurate model parameters possible. This process constitutes a feedback loop in that certain outputs from each sub-model are in turn used as an input into another sub-model. For instance, highway and transit skims are an output of the assignment sub-model but are also an input into the trip distribution and mode choice sub-models. An accurate model can thus be obtained by iteratively running this chain of sub-models.

Within this iterative calibration process, particular attention was paid to the trip distribution sub-model calibration. The trip tables used and produced in trip distribution were scrutinized to ensure they were consistent with observed data. The observed data to which the trip distribution sub-model was calibrated were origin-destination and trip-length frequency data from the regional Household Travel Survey and census Journey to Work data sets. The parameters of the trip distribution sub-model were estimated so that the sub-model would distribute trips in a way that closely mimics the actual pattern of how trips are distributed in reality.

Mode choice sub-model parameters were also calibrated within the iterative feedback loop. Certain mode choice coefficients were estimated so that mode shares produced by the sub-model matched observed mode shares found in the area being represented. The observed data to which the mode choice sub-model was calibrated were from the Household Travel Survey.

Within the iterative calibration process, the final product—highway and transit volumes loaded onto the network—was also given close attention. The observed data to which the highway and transit assignment results were calibrated included observed highway counts, transit counts, and transit information from specific transit project studies.

Highway assignment results were compared to observed road counts along several screenlines and at several different locations on major area highways. The locations of these counts are given in Table 2.

TABLE 2
Screenline and Roadway Calibration Locations

North-South Screenline

Route 152	Attleboro
Oak Hill Avenue	
Route 118	
Tremont Street	Taunton
Route 44	
Route 138	
Berkley Street	
Route 24	
Route 79	
Pierce Avenue	Lakeville
Howland Road	
Route 140	
County Street	
Route 18	
Route 105	
South Street	Middleborough
Route 28	
Route 58	
I-495	
Wareham Street	Plymouth
Wareham Road	
Bourne Road	
Herring Run	
Route 3	
Route 3A	

External Western Screenline

Route 15	Seekonk
Route 152	
Route 114	
Route 44	
I-195	
Route 6	
Route 114	
Route 136	Swansea
Route 103	

External Southern Screenline

Route 138	Fall River
Route 24	
Route 81	
Route 177	Westport

External Cape Screenline

Route 28	Plymouth
Route 6	

Roadway Calibration Locations

Route 3 South	South Plymouth
	North Plymouth
	Marshfield
	Norwell
	North Weymouth
Route 44	Seekonk
	Rehoboth
	West Taunton
	East Taunton
	West Middleborough
I-495	West of I-95
	East of Route 140
	West of Route 24
	East of Route 24
	Lakeville
	East of I-195
I-195	Swansea
	Dartmouth
	Marion
Route 24	Freetown
Route 140	New Bedford
I-95	North of I-295
	North of Route 140
	South of Route 1
	South of Neponset Street

Transit assignment results were scrutinized at more than one level. Transit ridership was calibrated to systemwide ridership statistics. Particular attention was also paid to existing commuter rail stations in the study area on the Providence and Middleborough/Lakeville lines as well as to the existing private bus lines from Boston to New Bedford, Taunton, and Fall River. Modeling of ridership on the local bus service provided by the SRTA was calibrated to passenger counts conducted by CTPS.

THE FOUR STEPS OF THE TRAVEL DEMAND MODELING PROCESS

TRIP GENERATION

The first step in the travel forecasting process is performed by the model set's trip generation model. This model uses socioeconomic characteristics of the region's population and information about the region's transportation infrastructure, transportation services, and geography to predict the amounts of travel that will be produced by and attracted to each of the TAZs within the region.

The trip generation model is composed of seven parts:

- Base-year detailed inputs
- Future-year inputs
- Estimation of base-year detailed input requirements for future years
- Estimation of disaggregate socioeconomic characteristics
- Estimation of vehicle ownership
- Estimation of trip productions and attractions
- Balancing of trip productions and attractions

A description of each of these parts is presented below.

Base-Year Inputs

The base-year inputs required for the trip generation model are presented in Table 3.

Future-Year Inputs

The future-year inputs required for the trip generation model, some of which are the same as for the base year, are:

- Total TAZ households
- Total TAZ population
- Total TAZ group quarters population
- Total community population by age
- TAZ employment in basic industries
- TAZ retail trade employment

TABLE 3
Trip Generation Model: Base-Year Input Requirements

Data	Source	Geographic Level
Population	2000 U.S. census	TAZ (census block)
Group Quarters Population	2000 U.S. census	TAZ (census block)
Household Size, Income, Workers, Vehicles	2000 U.S. census	TAZ (census block)
Population Age	2000 U.S. census	City or town
Basic, Retail, Service Employment	2000 CTPS estimates	TAZ
Public K-12 Employment	2000 CTPS estimates	TAZ
Private K-12 Employment	2000 CTPS estimates	TAZ
College Employment	2000 CTPS estimates	TAZ
Resident Workers	2000 U.S. census	TAZ (census block group)
Dorm Population	2000 U.S. census	TAZ (census block)
Labor Participation Rate by Age Group	Bureau of the Census	Region
Land Area	CTPS regional database	TAZ
Geographical Ring	CTPS regional database	TAZ
Public Use Microdata Areas	CTPS regional database	Public Use Microdata Areas
External Trip Productions and Attractions	1991 External Survey, 2000 U.S. Census	External station
External Growth Factors	RPA and CTPS estimates	External station
External Growth Factors	RPA forecasts	External station
Transit Walk Access Factor	Transit network	TAZ
External Attraction and Production Terminal Times	Trip distribution model	External station

- TAZ employment in service industries
- Regional labor participation rates
- External trip production and attraction growth factors
- Transit walk-access factors

Estimation of Base-Year Input Requirements for Future Years

Various procedures are used to prepare the trip generation model input data for future years. The variables that are estimated in these procedures are listed below. A description of how future-year estimations for these variables are made follows the list.

- Households by household size
- Households by income quartile
- Resident workers
- Households by workers per household
- School employment (K-12 and college)
- Dorm population
- External person trips
- Attraction and production terminal times

Household Size

The change in TAZ average household size is implied in the base-year inputs and future-year forecasts (total population minus group quarters population divided by total households). The distribution of future-year households by household size is estimated by the following procedure.

First, the future-year households are distributed among the household size categories in the same proportions as in the base year. It is then assumed that all households capable of making the implied change (households of two or more for household size reductions; all households for household size increases) will have the same probability of changing in size by one person. This probability of changing is set equal to the extent needed to match the forecasted change in household size, and the resulting distribution of households by household size is used for the future-year scenario.

As an example, suppose that in the base year the numbers of 1-person, 2-person, 3-person, 4-person, 5-person, and 6+-person households are, respectively, 100, 200, 50, 25, 10, and 5, with a total household population of 835. This represents an average household size of 2.141. If there were 780 future-year households, they would initially be distributed as 200, 400, 100, 50, 20, and 10 1-person, 2-person, 3-person, 4-person, 5-person, and 6+-person households, respectively.

However, if the future-year average household size were 2.000, then the households with 2 or more persons would have a 19 percent [(2.141 - 2) * 780/580] probability of dropping in size by one. The resulting distribution would thus be estimated as follows:

276 1-person households [200 + (.19 * 400)],
343 2-person households [400 – (.19 * 400) + (.19 * 100)],

90.5 3-person households [100 – (.19 * 100) + (.19 * 50)],
44.3 4-person households [50 – (.19 * 50) + (.19 * 20)],
and 26.2 5+-person households [20 – (.19*20) + 10].

In the case of TAZs with no households in the base year, the proportional distribution of households by household size at the community level is used for the base year in these calculations.

Household Income

The future-year distribution of households by household income quartile is estimated by assuming that the proportional distribution of households by income quartile remains constant within each TAZ. In the case of TAZs with no households in the base year, the proportional distribution of households by household income at the community level is used for the base year.

Resident Workers per Household

The change in the number of resident workers at the community level is obtained by combining base-year and future-year estimates of over-age-15 population and labor force participation by age cohort. Dividing the base-year and future-year estimates of community-level resident workers by the base-year and future-year numbers of households in the community, respectively, produces estimates of the base-year and future-year average workers per household. All of the TAZs within each community are assumed to have the proportional change in workers per household implied by these base-year and future-year community-level estimates. Multiplying the resultant estimate of resident workers per household by the forecasted number of households yields the forecasted number of resident workers by TAZ.

This estimation method (see Table 4) may be described via the following example. Assume that a community's 2000 and 2010 populations are distributed by age as follows: 1,000 and 1,200, 10,000 and 11,000, 2,000 and 2,500, and 500 and 600, respectively, in the 16-24, 25-54, 55-64, and 65+ age ranges. If the applicable labor force participation rates are applied, the estimated numbers of community resident workers become 10,317 and 11,785 for 2000 and 2010, respectively. If the estimated numbers of community households were 5,500 and 6,000 for 2000 and 2010, respectively, the community average workers per household for 2000 and 2010 would be 1.88 and 1.96, respectively. As 1.96 is 4.3% greater than 1.88, all of the TAZs in that community would be assumed to have a 4.3% increase in workers per household between 2000 and 2010.

TABLE 4
Labor Force Participation Rates

Age	2000	2010	2025	2030
16-24	65.9%	63.9%	63.4%	63.4%
25-54	84.1%	84.7%	85.1%	85.0%
55-64	59.2%	64.4%	63.6%	63.7%
65+	12.8%	15.2%	15.6%	14.5%

Household Workers

The future-year number of households per TAZ within each category of number of workers per household is estimated by using workers-per-household distribution curves developed by CTPS from the 1990 U.S. census. These curves, summarized in Table 5 below, indicate a default percentage distribution of households for the base-year and future-year TAZ estimates of average workers per household. The proportional changes in the default number of households within each category of workers per household implied by this comparison are applied to the actual base-year TAZ distribution of households to obtain the distribution of households by workers per household to be used for the future scenario. The average number of workers per household at the community level is used for the base year in TAZs with no households in the base year.

For example, if the average number of workers per household changes from 1.7 to 1.8, the default distribution of households among the categories 0-worker, 1-worker, 2-worker, and 3+-worker would change from 7%, 32%, 45%, and 16% to 5%, 29%, 47%, and 19% households, respectively. If the actual base-year distribution of households among those categories is 8%, 31%, 44%, and 17%, the changes in the default distributions indicates a future-year distribution of households of 6%, 28%, 46%, and 20% 0-worker, 1-worker, 2-worker, and 3+-worker households, respectively.

School Employment

- K-12

  The level of employment in schools providing education up to the 12th grade is assumed to be proportional to the number of community residents of ages 5-19.

- College

  The level of employment at all colleges and technical schools within the region is assumed to be proportional to the number of regional residents of ages 20-24.

TABLE 5
Workers per Household Diversion Curves

Avg. Workers	Households by Number of Workers				
per HH	0	1	2	3+	Total
<=.45	58%	40%	2%	0%	100%
.45 - .55	52%	46%	2%	0%	100%
.55 - .65	47%	46%	6%	1%	100%
.65 - .75	43%	46%	10%	1%	100%
.75 - .85	38%	46%	13%	3%	100%
.85 - .95	34%	46%	16%	4%	100%
.95 - 1.05	30%	45%	20%	5%	100%
1.05 - 1.65	65% - (35% * Avg)	60% - (16% * Avg)	(36% * Avg) - 15%	(15% * Avg) - 10%	100%
1.65 - 1.75	7%	32%	45%	16%	100%
1.75 - 1.85	5%	29%	47%	19%	100%
1.85 - 1.95	4%	26%	48%	22%	100%
1.95 - 2.05	3%	22%	48%	27%	100%
2.05 - 2.15	2%	18%	49%	31%	100%
2.15 - 2.25	1%	14%	49%	36%	100%
2.25 - 2.35	1%	10%	49%	40%	100%
2.35 - 2.45	1%	4%	50%	45%	100%
2.45 - 2.55	1%	4%	50%	45%	100%
> 2.55	0%	5%	50%	45%	100%

Dorm Population

The dorm population within a TAZ is assumed to be proportional to the total group quarters population within a TAZ.

External Person Trips

Base-year external person trips are factored up by forecasts of vehicle volumes at the external stations based upon the MassHighway statewide travel forecasting model.

Attraction and Production Terminal Times

The attraction and production terminal times are estimated through the application of a model developed at CTPS. This model estimates terminal times as a function of household and employment density. An alternative estimate of the production and attraction terminal times for each TAZ is based on household and employment density ranges. For regional modeling, the

larger of the two estimates is assigned to a TAZ. Several TAZs with regionally unique characteristics (locations of major generators such as airports or large colleges) were assigned terminal times in the base year different from the terminal time model estimates. In these cases, the model is used to estimate changes in terminal times.

Estimation of Detailed Socioeconomic Characteristics

A three-way distribution of the households within each TAZ by household size, income, and workers is required in order to estimate the distribution of households by vehicle ownership levels. While this is available from the U.S. census at the subregional level, such distributions at the TAZ level are estimated through iterative proportional fitting techniques. Using the appropriate subregional matrix as a seed, the cell values are adjusted through 10 iterations to match row and column totals to the estimated TAZ-level totals in order to produce an estimated three-way distribution of households for each TAZ.

Estimation of Vehicle Ownership

Base-year households are distributed by vehicle ownership based on data from the 2000 U.S. census. The distribution of future-scenario households by vehicle ownership is estimated through the application of a set of models developed by CTPS.

The CTPS vehicle ownership model was estimated as a set of four multinomial logit disaggregate choice models, one for each of four income categories, in which the decision maker was the household unit and the set of alternatives was the ownership, by the household, of 0, 1, 2, or 3-or-more vehicles. In this model, households were segmented into four income categories because of the belief that income is the most significant variable in vehicle-ownership choice. Other variables included in the model included household size, workers per household, household density, employment density, household location, and transit walk-access factors. The data set used to estimate this model contained 3,504 observations. Once estimated, the model was validated to observed vehicle ownership data. The models, one for each household income quartile, are presented in Table 6.

Estimation of Trip Productions and Attractions

The number of trip productions and trip attractions within a TAZ are estimated through the application of a set of models developed at CTPS. These models estimate the number of trip productions and attractions as a function of household size, workers per household, vehicles per household, income, household location, households, basic employment, retail employment, college employment, school employment, and service employment. The home-based trip production models are presented in Table 7, while the non-home-based trip production and trip attraction models are presented in Table 8.

TABLE 6
Summary of Auto Ownership Model

	Constant	HH Size	Workers per HH	HHs per Acre	Employ per Acre	High-Density	Low-Density	Ring01	Transit Walk-Accessibility
Low-Income Household Model									
0 Vehicles	-0.0474	-0.1692	-0.1312	0.0239		0.7136			
1 Vehicle									
2 Vehicles	-3.139	0.6182	0.4414	-0.0424					
3+ Vehicles	-5.074	0.7968	0.6927	-0.2232					
Medium-Low-Income Household Model									
0 Vehicles	-1.573	-0.1874	-0.3417	0.05		0.5716		0.5392	
1 Vehicle									
2 Vehicles	-1.745	0.5202	0.4279	-0.0627	-0.0334				-0.0056
3+ Vehicles	-5.101	0.7371	1.112	-0.0627	-0.0693				
Medium-High-Income Household Model									
0 Vehicles	-2.63			0.0459		0.7704			
1 Vehicle									
2 Vehicles	-1.223	0.6609	0.2377	-0.0391			0.4026	-0.5962	-0.0054
3+ Vehicles	-4.572	0.7899	1.289	-0.0779				-1.223	-0.0073
High-Income Household Model									
0 Vehicles	-2.793			0.0349					
1 Vehicle									
2 Vehicles	0.5049	0.3475	0.2688	-0.06	-0.0154				-0.0074
3+ Vehicles	-3.807	0.5717	1.628	-0.136	-0.0468				-0.0077

High-Density = 1 if HH/acre > 6 or Employ/acre > 7
Low-Density = 1 if HH/acre < 0.5 and Employ/acre< 0.7
Ring01 = 1 if TAZ is in Ring 0 or Ring 1
Transit Walk-Accessibility = Portion of TAZ within walk-access distance of transit service

TABLE 7
Home-Based Trip Production Rate Models

Home-Based Work Trip Production Rates				
Workers	**HH**	**Vehicles per HH**		
per HH	**Size**	**0**	**1**	**2+**
1	*1*	0.94	1.17	1.11
1	*2*	1.01	1.23	1.18
1	*3*	1.15	1.38	1.32
1	*4*	1.48	1.7	1.65
1	*5+*	1.56	1.78	1.71
2	*2*	2.47	2.66	2.47
2	*3*	2.64	2.81	2.61
2	*4*	2.68	2.84	2.64
2	*5+*	2.83	2.99	2.79
3+	*3*	2.72	3.14	3.68
3+	*4*	2.75	4.02	4.55
3+	*5+*	2.88	4.15	4.68

HB Work-Related Trip Production Rates			
HH	**Workers per HH**		
Size	**1**	**2**	**3+**
1	0.12		
2	0.1	0.18	
3	0.1	0.2	0.28
4	0.18	0.23	0.35
5+	0.21	0.29	0.41

Home-Based Personal Business Trip Production Rates					
Workers	**HH**	**Vehicles per HH**			
per HH	**Size**	**0**	**1**	**2**	**3+**
0	*1*	1.19	1.95	2.11	2.87
0	*2*	2.91	3.32	3.5	4.24
0	*3*	3.29	3.7	3.88	4.62
0	*4*	4.16	4.58	4.73	5.49
0	*5+*	1.56	4.71	4.87	5.63
1	*1*	0.5	1.01	1.2	1.27
1	*2*	1.85	2.35	2.55	2.62
1	*3*	2.25	2.82	3.04	3.11
1	*4*	2.52	2.91	3.08	3.13
1	*5+*	2.55	2.93	3.15	3.23
2	*2*	1.04	1.5	1.63	2.12
2	*3*	1.4	1.87	1.99	2.48
2	*4*	2.37	2.83	2.95	3.45
2	*5+*	2.44	2.91	3.03	3.52
3+	*3*	1.43	1.96	2.24	2.49
3+	*4*	2	2.75	3.14	3.49
3+	*5+*	2.34	3.2	3.67	4.08

TABLE 8
Trip Attraction Rates and Non-Home-Based Trip Production Rates

	Households	Basic Employment	Retail Employment	Service Employment		
				College	K-12	Other
Production Rate Models						
Non-Home-Based Work	0.07	0.47	1.78	1.86	0.93	0.93
Non-Home-Based Other	0.57		1.74	2.49	0.28	0.28
Attraction Rate Models						
Home-Based Work		1.42	1.64	1.23	1.23	1.23
Home-Based Work-Related		0.06	0.35	0.27	0.08	0.08
Home-Based Personal Business	1.25		4.17			
Home-Based Social/Recreational	1.28		1.34	1.13		
Home-Based School				3.3	9.25	
Home-Based Pick-Up/Drop-Off	0.13	0.04	0.04	0.04	4.25	0.04
Non-Home-Based Work	0.11	0.32	2.36	1.85	0.79	0.79
Non-Home-Based Other	0.59		1.91	2.01	0.22	0.22

Balancing of Trip Productions and Attractions

Connecting a trip production with a trip attraction of the same trip purpose forms a trip. As a result, the number of productions and attractions for each trip purpose must be equal. In order to achieve this, the trip productions and attractions are balanced.

For most trip purposes, the number of regional attractions is the least reliable estimate. As a result, the normal balancing procedure is to set the total number of regional attractions equal to the difference between the grand total of productions and the total number of external attractions.

However, future regional employment (the determinant of home-based work [HBW] trip regional attractions) is forecasted, so the numbers of future external HBW productions and attractions are less reliable. The model assumes that the number of external HBW productions will satisfy the forecasted employment within the region, so the HBW external productions are set equal to the difference between the total HBW attractions and the regional HBW productions.

The following changes were thus made as part of the balancing procedure:

- Regional HBW attractions are adjusted to match the base-year ratio of total regional HBW attractions to total regional HBW productions with the ratio from the 2000 U.S. census Journey to Work data (1.077).
- External HBW attractions are adjusted to match the base-year ratio of total external HBW attractions to total regional HBW productions with the ratio from the 2000 U.S. census Journey to Work data (.0442).

- External HBW productions are set equal to the difference between the grand total of HBW attractions and the regional HBW productions.

TRIP DISTRIBUTION

The trip distribution model performs the second step in the travel forecasting process. It combines the estimated trip productions and trip attractions prepared by the trip generation model into: an interregional vehicle trip table and an intraregional pick-up/drop-off vehicle trip table to be used as input into the highway assignment model; and intraregional person trip tables to be used as inputs into the mode choice model.

The trip distribution model is made up of three components: a set of internal-external trip distribution models and two sets of intraregional trip distribution models (one for peak travel periods and the other for non-peak travel periods). An overview of the model is presented below.

Internal-External Trip Distribution

Internal-external trip distribution refers to a process in which all internal and external average weekday (AWD) trip ends (trip productions and attractions) are combined into trips using AWD highway impedances, but only the trips with one end in an internal zone and the other end in an external zone are retained. The resultant internal-external trip tables are used as inputs to the highway assignment model. The remaining trip ends are used as inputs to the intra-regional trip distribution model.

The model includes a separate process for each of seven trip purposes: home-based work, home-based personal business, home-based social/recreational, home-based school, home-based pick-up/drop-off, non-home-based work, and non-home-based other. The process undertaken for each purpose consists of the following five steps:

- Convert highway travel times from time period origin-destination format to AWD production-attraction format
- Apply gamma functions to create an initial trip table estimate
- Initiate a three-dimensional balancing process, adjusting the initial trip table to match trip productions, trip attractions, and a trip-length frequency distribution
- Create internal/external vehicular trip tables
- Create intra-regional person trip table productions and attractions

Each of these steps is described below.

Conversion of Highway Travel Times

Estimates of highway travel times are prepared using the highway assignment model on an origin-destination basis for each time period. In order to use these with the trip productions and attractions from the trip generation model, the highway travel time estimates produced by the

highway assignment are adjusted for each trip purpose by temporal directional factors for each trip purpose from the latest regional household travel survey.

Applying Gamma Functions

Gamma functions are estimated using base-year highway travel time estimates and survey trip tables to produce an initial estimate of a model-based trip table. These functions provide an estimate of the number of trips within each cell of the trip table based upon linear regression fitting.

The resultant trip table is referred to as the seed trip table. A trip length frequency distribution is imposed upon the seed trip table by dividing the table into classes of zone pairs. The zone pairs within each class connect a common pair of districts (forming an "interchange") and fall within a designated range of trip lengths (or "class"). A separate gamma function is used for each interchange. The number of interchanges and classes used for each trip purpose is presented in Table 9.

TABLE 9
Number of Interchanges and Classes Used for Each Trip Purpose

	Internal-External		Intra-Regional Peak		Intra-Regional Non-Peak	
Trip Purpose	**Interchanges**	**Classes**	**Interchanges**	**Classes**	**Interchanges**	**Classes**
HBW	36	250	36	250	36	250
HBPB	36	250	34	228	36	246
HBSR	35	247	33	227	36	244
HBSC	24	229	16	218	16	224
HBPD	25	241	4	49	4	51
NHBW	36	250	36	250	36	249
NHBO	25	244	33	226	36	249

Three-Dimensional Balancing

The seed trip table is adjusted through an iterative process in order to match the trip table subtotals as closely as possible to the estimated trip productions, trip attractions, and trip length frequency distribution. Each iteration consists of adjusting all the cells within a dimension (row, column, or class) by the factor needed to match the sum of that dimension to the estimated subtotal in that dimension (productions for row, attractions for column, trip length range trips for class) and then performing the same calculations for the other two dimensions. Since there is more confidence in trip production estimates than in the trip attraction or trip length frequency estimates, the iterative process ends with an exact matching of the trip table production totals to the input trip productions for each purpose.

Internal-External Trip Tables

The portions of the resultant trip table connecting external stations and regional TAZs are saved and adjusted for use in the highway assignment model. Vehicle occupancy data from the latest external travel survey are used to convert the person trips to vehicle trips. Temporal and directional factors from the latest external travel survey are then used to convert the trips from one matrix of AWD trips from production zone to attraction zone to four matrices of time period (AM peak, midday, PM peak, and night) trips from origin zone to destination zone.

Intra-Regional Productions and Attractions

The portions of the resultant trip table connecting regional TAZs are summed by TAZ of production and TAZ of attraction for use in the Intra-Regional Trip Distribution Model. Data from the latest household travel survey are used to split these trip production and trip attraction files into peak-period and non-peak-period files.

Intra-Regional Trip Distribution (Peak and Non-Peak)

Intra-regional trip distribution refers to a process in which all peak-period and non-peak-period intra-regional trip ends are separately combined into trips using composite impedances from the mode choice model. The resultant peak and non-peak intra-regional trip tables are used as inputs to the mode choice model and highway assignment model (home-based pick-up/drop-off trips).

The model includes a separate process for each of seven trip purposes: home-based work, home-based personal business, home-based social/recreational, home-based school, home-based pick-up/drop-off, non-home-based work, and non-home-based other. Similar to the Internal-External Trip Distribution Model, the process undertaken for each purpose consists of the following three steps:

- Convert composite impedance estimates from time period to peak and non-peak format
- Apply gamma functions to create an initial trip table estimate
- Initiate a three-dimensional balancing process, adjusting the initial trip table to match trip productions, trip attractions, and a trip-length frequency distribution

The results of these steps are then processed to final form in the following two steps:

- Create pick-up/drop-off vehicular trip tables
- Create intra-regional person trip tables

The five steps are described below.

Conversion of Composite Impedances

Estimates of purpose-specific composite impedances are prepared using the mode choice model for origin-destination TAZ pairs for each time period. In order to use these with the intra-

regional trip productions and attractions from the Internal-External Trip Distribution Model, the composite impedance estimates produced by the mode choice model are adjusted for production -attraction TAZ pairs for each trip purpose by temporal factors for each trip purpose from the latest regional household travel survey.

Applying Gamma Functions

Gamma functions are estimated using base-year composite impedance estimates and trip tables to produce an initial estimate of a model-based trip table. These functions provide an estimate of the number of trips within each cell of the trip table based upon linear regression fitting.

The resultant trip table is referred to as the seed trip table. A trip length frequency distribution is imposed upon the seed trip table by dividing the table into classes of zone pairs. The zone pairs within each class connect a common pair of districts (forming an "interchange") and fall within a designated range of trip lengths (or "class"). A separate gamma function is used for each interchange. The number of interchanges and classes used for each trip purpose is presented in Table 9 (above).

Three-Dimensional Balancing

The seed trip table is adjusted through an iterative process to match the trip table subtotals as closely as possible to the estimated trip productions, trip attractions, and composite impedance range frequency distribution. This process is the same as the one used in the Internal-External Trip Distribution Model. Since there is more confidence in trip production estimates than in the trip attraction or trip length frequency estimates, the iterative process ends with an exact matching of the trip table production totals to the input trip productions for each purpose.

Pick-Up/Drop-Off Vehicular Trip Tables

Since they are all assumed to be vehicular trips, the resultant trip tables for the home-based pick-up/drop-off purpose are converted directly to vehicular trip tables so that they can be used in the highway assignment model. Vehicle occupancy data from the latest household travel survey are used to convert the person trips to vehicle trips. Temporal and directional factors from the latest household travel survey are then used to convert the trips from matrices of peak period and non-peak period trips from production zone to attraction zone to matrices of time period (AM peak, midday, PM peak, and night) trips from origin zone to destination zone.

Intra-Regional Person Trip Tables

The resultant trip tables for the other purposes are then prepared. Data from the latest household travel survey are used to split these peak-period and non-peak period files into AM peak, midday, PM peak, and night person trip tables. These trip tables are then used as inputs to the mode choice model.

MODE CHOICE

Overview

Mode choice is the third step in travel demand forecasting and in CTPS's regional travel demand model. It is the process in which the trips from distribution are split between the various available modes of the transportation network.

CTPS developed multinomial logit mode choice models by trip purpose using 1991 Household Travel Survey data, travel impedances obtained from highway and transit networks, 1990 and 2000 U.S. census data, and a variety of other data sources. The mode choice models estimate modal splits for four trip purposes: 1) home-based work and work-related (HBW); 2) home-based other (HBO), which includes home-based shopping, personal business, social, recreation, and other miscellaneous purposes; 3) home-based school (HBSC); and 4) non-home-based (NHB). These models have been calibrated and validated. The mode choice models are applied, by purpose, to the distributed trip tables that result from the trip distribution model.

The mode choice models split the trip purposes among six modes: 1) walk-access transit, 2) drive-access transit, 3) single-occupancy vehicles, 4) high-occupancy vehicles with two persons, 5) high-occupancy vehicles with three or more persons (for the HBW trip purpose only), and 6) a pure walk mode. Specific sub-mode selection (i.e., local bus, express bus, light rail, commuter rail, etc.) occurs during the transit assignment process.

The mode choice models estimate mode splits for intra-regional trips only (trips contained within the model boundaries). They estimate mode shares for both interzonal trips (from one zone to another zone) and intra-zonal trips (from and to the same zone); however, intra-zonal trips are only split between the walk and auto modes. Transit splits are not estimated for intra-zonal trips.

Variables

The following are brief descriptions of the variables the mode choice models use to estimate mode splits:

Nest coefficient: Represents the degree of interactivity between the modes within the nest and other modes or nests. The value ranges between 0 and 1, with 1 indicating that transfers to and from other modes are as likely as transfers to and from modes within a nest. A value of 0 indicates there would be no transfer between the nest modes and other modes.

In-vehicle travel time (IVTT): Represents time spent in the modal vehicle during a given trip. For the shared-ride modes, in-vehicle and out-of-vehicle time are functions of drive-alone time. This variable is often considered in conjunction with value of time (VOT).

Out-of-vehicle time: Includes all walk, boarding, and wait time.

Drive-access time: Represents driving time between a trip end and a transit station parking lot.

Terminal time: Represents the time it takes to access a vehicle at the production end of a trip and the time it takes to get from a vehicle to a destination at the attraction end of a trip.

Fare: Represents the transit fare, in dollars, a transit rider will pay to use the system.

Auto cost: Represents auto operating and toll costs. Also included is one-half of any applicable parking costs (because such costs are calculated on the basis of a one-way trip.) Also, for shared-ride modes, total costs are divided by the appropriate auto occupancy.

Household size: Represents the number of persons per household. This estimate is obtained from the Trip Generation sub-model.

Vehicles/person: Represents the total number of vehicles per person in a household. Vehicles are forecasted for 2030 using the vehicle availability model described earlier.

Population density: Represents total population per acre.

Percent transit origins/destinations: Represents the AM peak period transit share of work trip ends within a TAZ, as computed by the home-based work mode-choice model.

The Four Trip Purposes

Home-Based Work Model

Home-based work (HBW) is the only trip purpose for which the mode choice models distinguish between two-person carpools (HOV2) and three-or-more-person carpools (HOV3+). The model specifications are shown in Table 10. Formerly, travel in HOV lanes was restricted to HOV3+ vehicles during peak hours. For the past several years, however, any two-person vehicle may also use these facilities.

A transit nest is incorporated into the model on the basis that the decision to take transit over the other modes is made before selection of a particular transit mode. The transit coefficients are generic for both walk access (WAT) and drive access (DAT) and include coefficients for in-vehicle, initial wait, transfer wait, and total walk time. Drive-access time and production terminal times are included in drive-access transit as one parameter.

The WAT fare includes the transit fare in dollars. For DAT, costs include the transit fare and half of any parking cost. Population density by traffic zone, in people per acre, is included in walk-access transit, and it is positively correlated: the greater the density, the more likely a traveler is to choose this mode. The zones with high population densities also have more transit stops. Vehicles per worker is a socioeconomic input unique to this trip purpose for DAT. It is also positively correlated, since a higher vehicle-per-worker ratio increases the likelihood of taking a vehicle to a park-and-ride lot.

The auto times and costs are generic for the three auto modes. For HOV2, the auto cost is divided by 2 and for HOV3+ it is divided by 3.66 to reflect splitting the cost between the vehicle

TABLE 10
Home-Based Work Mode Choice Model Specifications

	Nest Coeff	Impedance Variables									Socioeconomic Variables		
		IVTT	Terminal Time	Walk Time	Initial Wait	Transfer Wait	Auto Access	Boarding Time	Fare ($)	Auto Cost ($)	Population. Density	Vehicles/ Worker	HHld Size
Drive Alone													
Top Level	1	-0.05466	-0.292							-0.32			
Application Level		-0.05466	-0.292							-0.32			
Ratio to IVTT/VOT ($/hr)		1	5.34211							$ 10.25			
HOV2													
Top Level	1	-0.05466	-0.292							-0.32			0.07322
Application Level		-0.05466	-0.292							-0.32			0.07322
Ratio to IVTT/VOT ($/hr)		1	5.34211							$ 10.25			-1.33955
HOV3+													
Top Level	1	-0.05466	-0.292							-0.32			0.2168
Application Level		-0.05466	-0.292							-0.32			0.2168
Ratio to IVTT/VOT ($/hr)		1	5.34211							$ 10.25			-3.96634
Walk													
Top Level	1			-0.1007									
Application Level				-0.1007									
Ratio to IVTT/VOT ($/hr)													
Walk-Access Transit													
Top Level	0.6791	-0.05466		-0.1007	-0.11292	-0.11292		-0.05466	-0.32		0.01889		
Application Level		-0.08049		-0.14828	-0.16628	-0.16628		-0.08049	-0.47121		0.02781		
Ratio to IVTT/VOT ($/hr)		1		1.8423	2.06593	2.06593		1	$ 10.25		-0.34551		
Drive-Access Transit													
Top Level	0.6791	-0.05466	-0.292	-0.1007	-0.11292	-0.11292	-0.13665	-0.05466	-0.32	-0.32		0.2897	
Application Level		-0.08049	-0.42998	-0.14828	-0.16628	-0.16628	-0.20122	-0.08049	-0.47121	-0.47121		0.4266	
Ratio to IVTT/VOT ($/hr)		1	5.34211	1.8423	2.06593	2.06593	2.5	1	$ 10.25	$ 10.25		-5.30011	

occupants. Household size is included as a positively correlated variable for the shared-ride modes and has a somewhat greater impact for HOV3+ than HOV2.

Home-Based Other Model

The home-based other (HBO) mode choice model combines the home-based shopping and home-based recreational trip tables output from the trip distribution process into a single HBO trip table that is split. The model specifications are shown in Table 11. The model is similar to the HBW mode choice model, except for the following three differences. First, since there is only one shared-ride mode, HOV2+, household size is only a parameter for this one mode. Second, the vehicles per person in a household is used, as opposed to vehicles per worker. Finally, a distance dummy equal to one if the trip distance is less than a mile, zero otherwise, is added to the walk mode. This reflects the fact that people taking short trips for this purpose are more likely to walk than choose another mode.

Non-Home-Based Model

The non-home-based (NHB) model splits work trips and non-work trips. The model specifications are shown in Table 12. There is a work dummy variable in the two auto modes which is equal to one if the trip is a non-home-based work trip and zero otherwise. The coefficient is positive for SOV and negative for HOV. The percent of trips attracted to the origin and destination zones that is SOV is a variable in the drive alone mode. The percentage is taken from the results of the HBW mode choice model and is positively correlated. Finally, the distance dummy in the walk mode is equal to one if the distance is less than a mile. It has a positive coefficient.

Home-Based School Model

The home-based school (HBSC) model was re-estimated and restructured in 2004 to allow for compatibility of the HBSC purpose with the Federal Transit Administration's Summit program. The previous HBSC model had one nest—all motorized modes. The revised HBSC model has two nests—transit and highway. The revised HBSC model specifications are shown in Table 13.

Pre-Assignment Procedure

The completion of the runs for the 16 mode choice applications (4 trip purposes by 4 time periods) results in the creation of 68 person trip tables. To prepare for subsequent highway and transit assignments, the trip tables must be converted from production-attraction to origin-destination format (except for NHB trips, where they are the same). This is done using factors from the 1991 Household Travel Survey.

For the highway assignment, it is necessary to convert person trips to vehicle trips by applying vehicle occupancy factors for HOV modes. These occupancy factors vary by trip purpose, and in the case of HBW trips a higher occupancy factor is applied to HOV3+ trips. Because the HBW HOV mode includes 2-person and 3-person-plus HOVs, the occupancy factor for the

TABLE 11
Home-Based Other Mode Choice Model Specifications

	Nest Coeff	Impedance Variables									Socioeconomic Variables			
		IVTT	Terminal Time	Walk Time	Initial Wait	Transfer Wait	Auto Access	Boarding Time	Fare ($)	Auto Cost ($)	Population. Density	Vehicles/ Worker	HHld Size	Distance Dummy
Drive Alone														
Top Level	1	-0.01965	-0.2308							-0.22378				
Application Level		-0.01965	-0.2308							-0.22378				
Ratio to IVTT/VOT ($/hr)		1	11.7463							$ 5.27				
HOV2+														
Top Level	1	-0.01965	-0.2308							-0.22378			0.1976	
Application Level		-0.01965	-0.2308							-0.22378			0.1976	
Ratio to IVTT/VOT ($/hr)		1	11.7463							$ 5.27			-10.0566	
Walk														
Top Level	1			-0.05895										0.9005
Application Level				-0.05895										0.9005
Ratio to IVTT/VOT ($/hr)														-15.2757
Walk-Access Transit														
Top Level	0.3722	-0.01965		-0.05895	-0.05895	-0.05895		-0.01965	-0.22378		0.00883			
Application Level		-0.05279		-0.15838	-0.15838	-0.15838		-0.05279	-0.60123		0.02373			
Ratio to IVTT/VOT ($/hr)		1		3.0002	3.0002	3.0002		1	$ 5.27		-0.44951			
Drive-Access Transit														
Top Level	0.3722	-0.01965	-0.2308	-0.05895	-0.05895	-0.05895	-0.04912	-0.01965	-0.22378	-0.22378		0.71239		
Application Level		-0.05279	-0.6201	-0.15838	-0.15838	-0.15838	-0.13198	-0.05279	-0.60123	-0.60123		1.914		
Ratio to IVTT/VOT ($/hr)		1	11.7463	3.0002	3.0002	3.0002	2.5	1	$ 5.27	$ 5.27		-36.2564		

TABLE 12
Non-Home-Based Work Mode Choice Model Specifications

		Impedance Variables									Socioeconomic Variables		
	Nest Coefficient	IVTT	Terminal Time	Walk Time	Initial Wait	Transfer Wait	Auto Access	Boarding Time	Fare ($)	Auto Cost ($)	Work Dummy	Distance Dummy	Percent SOV
Drive Alone													
Top Level	1	-0.03022	-0.3197							-0.1817	0.1926		0.00885
Application Level		-0.03022	-0.3197							-0.1817	0.1926		0.00885
Ratio to IVTT/VOT ($/hr)		1	10.5791							$ 9.98	-6.37326		-0.29295
HOV2+													
Top Level	1	-0.03022	-0.3197							-0.1817	-0.7627		
Application Level		-0.03022	-0.3197							-0.1817	-0.7627		
Ratio to IVTT/VOT ($/hr)		1	10.5791							$ 9.98	25.2383		
Walk													
Top Level	1			-0.07525								0.493	
Application Level				-0.07525								0.493	
Ratio to IVTT/VOT ($/hr)												-6.5515	
Walk-Access Transit													
Top Level	1	-0.03022		-0.07525	-0.08333	-0.08333		-0.03022	-0.1817				
Application Level		-0.03022		-0.07525	-0.08333	-0.08333		-0.03022	-0.1817				
Ratio to IVTT/VOT ($/hr)		1		2.49007	2.75745	2.75745		1	$ 9.98				
Drive-Access Transit													
Top Level	1	-0.03022	-0.3197	-0.07525	-0.08333	-0.08333	-0.07555	-0.03022	-0.1817	-0.1817			
Application Level		-0.03022	-0.3197	-0.07525	-0.08333	-0.08333	-0.07555	-0.03022	-0.1817	-0.1817			
Ratio to IVTT/VOT ($/hr)		1	10.5791	2.49007	2.75745	2.75745	2.5	1	$ 9.98	$ 9.98			

TABLE 13
Home-Based School Mode Choice Model Specifications

	Nest Coefficient	Impedance Variables							Population Density
		IVTT	Terminal Time	Walk Time	Wait Time	Drive Access Time	Fare ($)	Auto Cost ($)	
Drive Alone									
Top Level	0.5559	-0.0305	-0.0904					-0.1803	
Application Level		-0.0548	-0.1626					-0.3244	
Ratio to IVTT ($/hr)		1.0000	2.9672					$10.14	
HOV2+									
Top Level	0.5559	-0.0305	-0.0904					-0.1803	
Application Level		-0.0548	-0.1626					-0.3244	
Ratio to IVTT ($/hr)		1.0000	2.9672					$10.14	
Walk									
Top Level	1			-0.0791					
Application Level				-0.0791					
Ratio to IVTT ($/hr)									
Walk-Access Transit									
Top Level	0.5559	-0.0305		-0.0791	-0.0791		-0.1803		0.0150
Application Level		-0.0548		-0.1423	-0.1423		-0.3244		0.0270
Ratio to IVTT ($/hr)		1.0000		2.5967	2.5967		$10.14		-0.4927
Drive-Access Transit									
Top Level	0.5559	-0.0305	-0.0904	-0.0791	-0.0791	-0.0762	-0.1803	-0.1803	0.0150
Application Level		-0.0548	-0.1626	-0.1423	-0.1423	-0.1371	-0.3244	-0.3244	0.0270
Ratio to IVTT ($/hr)		1.0000	2.9672	2.5967	2.5967	2.5018	$10.14	$10.14	-0.4927

HOV2 mode is exactly 2 persons per vehicle. The exact values for 2-person-plus and 3-person-plus HOVs are the following:

Home-based work trips	HOV3+ = 3.373
Home-based other trips	HOV2+ = 2.404
Home-based school trips	HOV2+ = 2.788
Non-home-based trips	HOV2+ = 2.385

In addition to the manipulation of the output matrices from mode choice, it is necessary to bring in vehicle trip tables produced outside of the mode choice process. These vehicle trip tables are:

- Truck – The truck trip tables that have been used up to the present are based on survey data.
- External Through – This matrix consists of trips that pass through the study area without stopping and hence are exogenous to the travel model. The trips were estimated from the 1991 external travel survey, 2000 census Journey to Work data, and traffic counts.
- Taxi – The taxi vehicle trip table was originally developed from a 1993 survey and has since been revised several times based upon a factoring process. However, there has been no update of travel pattern data to create a true updated trip table.
- Logan Airport SOV and HOV – This trip table is developed from a separate modeling procedure, which was developed based on a Massport survey.

- Drive-Access-Transit Auto Access – DAT trips are determined through the station choice model, which is a part of the mode choice process. Each DAT trip requires a vehicle access trip.
- Internal–External SOV and HOV – The internal–external trip tables are generated through the trip distribution process.
- Pick-Up/Drop-Off SOV and HOV – The pick-up/drop-off (PUDO) tables are those trips in which a person is dropped off at his or her destination (not an intermediate park-and-ride lot) by the driver. They are produced in the trip generation process along with other productions and attractions, then put through trip distribution.

TRIP ASSIGNMENT

Trip assignment is the fourth step in the travel demand forecasting process and in CTPS's regional travel demand model. Trip assignment is the process by which each trip in the trip tables resulting from the mode choice model is assigned to a specific submode (for example, bus or rapid transit) and a specific route. The CTPS model uses one or the other of two distinct assignment procedures, depending upon whether the trip has been split to a transit or highway mode.

Highway Assignment Routine

The highway assignment implemented in EMME is an equilibrium assignment. The fundamental assumption underlying such an assignment procedure is that each user of the highway network will choose the route that he or she perceives to be the best. The assignment is an aggregate assignment in that traffic volumes on any given link are an aggregate number, as opposed to being associated with a specific trip. There are several inputs used by the EMME equilibrium assignment procedure. The key inputs are the highway demand matrices, the volume delay function, and the highway network:

- Highway demand matrices

  The demand matrices that the highway assignment procedure uses as an input are the demand matrices that result from mode choice and distribution. These are origin-destination matrices of single-occupancy vehicles, trucks, taxis, internal-external trips, through trips, and high-occupancy vehicles.

- Volume-delay function

  The function used in the highway assignment procedure is a volume-delay function, which, when applied in the context of a highway assignment, changes the speeds users of the network experience based upon the volumes on the network. The volume-delay function employed in the CTPS regional model is a variation on the so-called Bureau of Public Roads (BPR) function. Developed by its now defunct namesake, the BPR function is a widely used and validated volume-delay function that is parabolic in shape and takes the form:

  $$\text{Congested Speed} = (\text{Free-Flow Speed})/(1 + [\text{Volume/Capacity}]^4)$$

The CTPS regional model is segmented by time periods. For each time period, the BPR function is altered to reflect the number of hours in that period.

- Highway network

  The highway network is an abstract digital representation of the real highway network in eastern Massachusetts. For future-year scenarios, the highway network depicts roadway links that are planned in addition to the existing highway network. The base-year highway network is a depiction of the eastern Massachusetts highway network as it existed in the year 2000. The highway network in the base and future years includes information about number of lanes, free-flow speeds, and capacity (in vehicles per lane per hour). Freeways typically have a free-flow speed of 60 miles per hour, are three lanes, and have a capacity of 1,950 vehicles per lane per hour. Smaller arterials typically have a free-flow speed of 30 to 45 miles per hour, are coded as having one or two lanes, and have a capacity of 900 to 1,000 vehicles per lane per hour. Such parameters are consistent with widely accepted traffic engineering principles and the Transportation Research Board's *Highway Capacity Manual.*

The highway assignment procedure performs a multi-class generalized cost equilibrium auto assignment. The multi-class assignment runs an assignment for the demand matrices of three modes, SOV, HOV, and trucks, from the vehicle trip tables for each class, which are assigned by time period. Tolls affect the assignment and are stored on the network.

The highway assignment procedure is iterative in that the assignment is calculated repeatedly, in order to mathematically optimize assignment results. The CTPS regional model is set to run to 30 iterations before stopping. The assignment also considers another stopping criterion known as the relative gap. The relative gap is an estimate of the difference between the current assignment and a perfect equilibrium assignment, in which all paths used for a given origin-destination pair would have exactly the same time. The default relative gap is .5%, but CTPS employs .01% so that a more accurate assignment will result.

Another stopping criteria is the normalized gap (or trip time differential), which is the difference between the mean trip time of the current assignment and the mean minimal trip time. The mean trip time is the average trip time on the paths used in the previous iteration; the mean minimal trip time is the average trip time computed using the shortest paths of the current iteration. Again, a minimum level is selected, .01 minutes, in order for the designated number of iterations to be carried out. Note that the relative gap always decreases from one iteration to the next, whereas the trip time difference does not necessarily have this property. In a perfect equilibrium assignment, both the relative gap and the normalized gap are zero.

Transit Assignment Routine

The transit assignment used in EMME is a multi-path assignment based on the calculation of optimal transit strategies for system users. A transit strategy is roughly analogous to a path in highway assignment. The major difference between a strategy and a path is that a strategy may employ different modes, which in real terms is the equivalent of a transfer between modes. The transit assignment allows for users of the transit system switching within the transit network

between various available transit modes in order to reach their destination. In basic terms, the transit assignment algorithm examines at each node in the transit network, and for each transit network user, what transit service is optimal, given the origin and destination node pairs. This algorithm is repeated until the transit user arrives at the final destination. Like the highway assignment procedure, the transit assignment procedure utilizes several key inputs to estimate a transit assignment. Three of the key inputs are the transit demand matrices, the transit functions and the transit network:

- Transit demand matrices

  The transit demand matrices are just that, matrices of trips that have been split into the transit mode because the utility of their trip suggests transit may be an attractive mode choice for their particular origin destination pair.

- Functions

  The function used in the transit assignment procedure depicts the relative levels of attractiveness between the variety of sub-modes available in the eastern Massachusetts transit network. Costs are translated to time assuming a value of time of $12 per hour (using 1991 dollars) and doubling the out-of-vehicle time before adding it to in-vehicle time.

- Transit network

  The transit network is an abstract digital representation of the real transit network in eastern Massachusetts. For future-year scenarios, the transit network depicts transit links that are planned in addition to the existing transit network. The base-year transit network is a depiction of the eastern Massachusetts transit network as it existed in the year 2000. The transit network includes every commuter rail line, rapid transit line, bus route, and ferry route in eastern Massachusetts. The bus routes run on the highway network, and their run times are influenced by roadway traffic congestion. Among other things, the transit network in the base and future years includes information about vehicle headways, wait times, transit run times, and fares. The assignment algorithm takes into consideration all of these elements in calculating a transit assignment.

  Additionally, the transit network represents and accounts for park-and-ride facilities. Park-and-ride nodes provide connections between the highway and transit networks via a walk link. As a result, drive-access transit trips use both the highway and the transit networks.

  The transit network is augmented by a data input known in EMME as a line. This input contains many of the features unique to a given sub-mode such as run time, headways, and station stopping details. There is a different line file for each time period represented by the CTPS model.

  Another major element of the transit network is so-called walk links. Some walk links serve as transfers between sub-modes. Other walk links serve as transfers between modes (see park-and-ride information above) but the vast majority of walk links are so-

called walk-access links. All walk links have a hard-coded speed of 3 miles per hour.

Walk-access estimation

Walk-access links are an abstract representation of all of the walking routes transit users utilize in eastern Massachusetts to access the transit system. In other words, they are an aggregate abstraction of the sidewalks, roadways, backyards, driveways, and shortcuts people use to walk to the transit system.

The walk-access estimation process is an automated process that involves three steps. The first step builds paths and distances on a walk network roadway geographic information system (GIS) coverage that is created from the most recent statewide digital line graph (DLG) coverage of the roadway network. The roadways that are suitable for walking within the study area are then cut from that coverage. The path building and distance skimming between transit stops and zones is calculated on this coverage. The latest set of transit stops from the EMME databank are then imported into a GIS environment. The distances between stops and zones are then calculated from this coverage. Up to two walk links are created between each TAZ and the stations and stops on each transit line, with no links over one mile. Transfer links are created to connect all stations and stops within a quarter-mile walk.

Fare Coding

In addition to time, one of the key modeled metrics is cost. In the case of transit, user costs are captured by fares that are coded onto the network. The CTPS regional model allows for testing of a variety of complicated fare schemes. A significant portion of the fare information in the model is coded onto walk links. This makes intuitive sense because transit users often pay for access to the system at the end of their walk to access the system—at the turnstile, entrance to the bus, gate to the ferry, etc. The fares coded onto walk links are called boarding fares. The other kind of fare coding allowed for is zonal-based fare information. This type of fare structure is implemented with long-haul services such as commuter rail and express buses and is imposed on segments of the transit path.

Path-Building Conventions

As mentioned earlier, the transit assignment implemented in EMME is a multi-path assignment based on the computation of optimal strategies. An optimal strategy is one that minimizes the total expected perceived travel time for a transit system user. In order to reflect the fact that time is perceived by the transit system user differently depending on the portion of the trip being considered, weighting factors have been developed and applied to different portions of the transit trip. For example, transit riders perceive time spent waiting for a transit vehicle as more onerous than time spent traveling in a vehicle. The values shown in Table 14 are currently being used for the purposes of developing transit skims for mode choice and for building optimal strategies in transit assignment.

The values in the table apply both to walk-access transit and drive-access transit and to all sub-modes. They are all relative to in-vehicle time. Although these values theoretically correspond to marginal rates of substitution implicit in mode choice model coefficients, their final values are

also based on what is needed to find reasonable paths through the network within the pathbuilder.

TABLE 14
Current Pathbuilding Parameter Values

Parameter	Value
Initial wait time factor	2
Transfer wait time factor	2
Transfer penalty	2.45
Bus boarding penalty	7
Walk-access time factor	2
Walk speed	3.0 mph
Fare factor	1.0

AIR QUALITY ANALYSIS

The mobile-source emissions of alternative transportation scenarios can be forecasted and analyzed using the CTPS travel demand forecasting model in conjunction with U.S. Environmental Protection Agency (EPA) emissions rates that are developed by the EPA Mobile software. The model estimates traffic volumes, average highway speeds, vehicle miles traveled, and vehicle hours traveled. The EPA Mobile software develops emission factors by pollutant and speed for different years based on, among other things, assumptions about fleet fuel efficiency. Using these tools, reasonable estimates of emissions from mobile sources can be developed for various years and network conditions.

The procedure described above is used to estimate emissions from cars and trucks of carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), carbon dioxide (CO_2), and particulate matter. Emissions from commuter rail diesel locomotives and MBTA buses and some automobile emissions associated with park-and-ride lots are estimated off model.

In the South Coast Rail analysis, as in most transit studies, the emission factors and roadway networks remained constant between the no-build and build alternatives, and the observed emission changes are due to mode shifts from auto to transit that result in lower VMT and possibly lower congested speeds on the roadway network.

APPENDIX

Operating Plans for Proposed Build Alternatives

South Coast Rail Project

Vanasse Hangen Brustlin, Inc.

South Coast Rail Operation for Each Alternative (DRAFT)

List of Alternatives

Alt. 1A	Attleborough - Diesel	Rail
Alt. 1B	Attleborough - Electric	Rail
Alt. 4A - Local	Stoughton - Diesel - Local	Rail
Alt. 4B - Local	Stoughton - Electric - Local	Rail
Alt. 4C - Local	Stoughton - Diesel - Local - Whittenton Route	Rail
Alt. 4D - Local	Stoughton - Electric - Local - Whittenton Route	Rail
Alt. 5	Rapid Bus Alternative	Bus
Alt. 6	No Build (TSM) Alternative	Bus

Park-N-Ride Facilities in No Build Alternative

P-N-R Facility	Capacity	Fee*
Route 106 near Route 24 (West Bridgewater)	180**	Free
Route 24 Exit 12 Silver City Galleria (Taunton)	211	Free
Oak Street Bloom/GATRA Terminal (Tunton)	160	Free
I-495 Exit 8/Greyhound Track (Raynham)	150	Free
Mt. Pleasant Street (New Bedford)	201	Free
72 Sycamore Street (fairhaven)	28	Free

* Fee for commuter parking

** Route 106/Route 24 Park-N-Ride currently has a parking capacity of 140 spaces, but there is additional 40 spaces being planned to be added in the near future, and is included in the No Build Alternative.

Headway on Branches

Alternative	AM and PM Peaks	MD and NT
Alt. 1A, 1B - Attleborough	40 min	2 hr
Alt. 4A-Local, 4B-Local, 4C-Local, 4D-Local - Stoughton	40 min	2 hr
Alt. 5 - Rapid Bus Alternative	15 min	1 hr
Alt. 6 - No Build (TSM) Alternative	30 min	Varies*

* Headways vary for the off-peak hours.

Travel Time*

Alternative	Stations***	Northbound**		Southbound**	
		AM	PM	AM	PM
Alt. 1A (Fall River - S.Station)	Battleship Cove (Off Peak Only) - FR Depot - Freetown - E. Taunton - Taunton Depot - Barrowsville - Mansfield _ Rt. 128 - Ruggle St. (OB Only) - Back Bay - S. Station	82 min	n/a	n/a	86 min
Alt. 1B (Fall River - S.Station)		72 min	n/a	n/a	74 min
Alt. 1A (New Bedford - S.Station)	Whale's Tooth - King's Hwy - E. Taunton - Taunton Depot - Barrowsville - Mansfield - Rt. 128 - Ruggles St. (OB Only) - Back Bay - S. Station	84 min	n/a	n/a	87 min
Alt. 1B (New Bedford - S.Station)		75 min	n/a	n/a	76 min
Alt. 4A - Local (Fall River - S.Station)	Battleship Cove (Off-Peak Only) - FR Depot - Freetown - E. Taunton - Taunton - Raynham - Easton Village - N. Easton - Stoughton - Canton Ctr - Canton Junction - Rt. 128 - Hyde Park - Ruggle St.(OB Only) - Back Bay - S. Station	83 min	n/a	n/a	85 min
Alt. 4B - Local (Fall River - S.Station)		73 min	n/a	n/a	76 min
Alt. 4C - Local (Fall River - S.Station)	Battleship Cove (Off-Peak Only)- FR Depot - Freetown - E. Taunton - Taunton Depot - Raynham - Easton Village - N. Easton - Stoughton - Canton Ctr - Canton Junction - Rt. 128 - Hyde Park - Ruggle St. (OB Only) - Back Bay - S. Station	94 min	n/a	n/a	96 min
Alt. 4D - Local (Fall River - S.Station)		85 min	n/a	n/a	87 min
Alt. 4A - Local (New Bedford - S.Station)	Whale's Tooth - King's Hwy - E. Taunton - Taunton - Raynham - Easton Village - N. Easton - Stoughton - Canton Ctr - Canton Junction - Rt. 128 - Hyde Park - Ruggle St. (OB Only) - Back Bay - S. Station	85 min	n/a	n/a	86 min
Alt. 4B - Local (New Bedford - S.Station)		76 min	n/a	n/a	78 min
Alt. 4C - Local (New Bedford - S.Station)	Whale's Tooth - King's Hwy - E. Taunton - Taunton Depot - Raynham - Easton Village - N. Easton - Stoughton - Canton Ctr - Canton Junction - Rt. 128 - Hyde Park - Ruggle St. (OB Only) - Back Bay - S. Station	96 min	n/a	n/a	97 min
Alt. 4D - Local (New Bedford - S.Station)		87 min	n/a	n/a	89 min
Alt. 5 - Rapid Bus (FallRiver - S. Station)****	Fall River Depot - Freetown - South Station	91 min	81 min	81 min	88 min
Alt. 5 - Rapid Bus (New Bedford - S, Station)	Whale's Tooth - King's Highway - South Station	103 min	93 min	93 min	99 min
Alt. 5 - Rapid Bus (Taunton Depot - S. Station)	Taunton Depot - South Station	68 min	62 min	62 min	65 min
Alt. 5 - Rapid Bus (Taunton Galleria _ S. Station)	Galleria Station - South Station	66 min	60 min	60 min	63 min
Alt. 6 - No Build Alternative (FallRiver - S. Station)*****	Fall River Depot _ South Station	84 min	n/a	n/a	66 min
Alt. 6 - No Build Alternative (New Bedford - S. Station)	Fair Haven - Downtown New Bedford - Mt. Pleasant - Taunton - South Station	105 min	95 min	100 min	100 min
Alt. 6 - No Build Alternative (Taunton - S. Station)	GATRA/Bloom Terminal - Dog Track - 106@24 - Boston	86 min	75 min	70 min	75 min

* Travel times for the rail Alternatives were obtained from SYSTRA and include dwell time.

** Travel times for the rail Alternatives were provided for inbound and outbound without peak designation. Given data were assumed to be the peak direction. However, travel time for the off-peak direction should not differ significantly as long as the train makes the same stops.

*** The list of stations include all stations that will be operational in the build scenarios.

**** For the Rapid Bus Alternative, travel times have been refined to more accurately mimic the operations based on the CTPS' data, Google Map, and Transportation Studies.

***** For the No Build Alternative, travel times were estimated based on the measure time through bus rides for the peak period/peak direction, the others were estimated based on the current schedules.)

****** The build alternatives include station parking constraints at Taunton Station (200 spaces) and Barrowsville Station (264 spaces).

Parking Supply at Rail Stations in Build Conditions

2009 DEIR Planning	
Station	Parking Spaces Provided
N. Easton	519
Easton Village	0
Raynham Park	455
Taunton	200
East Taunton (N)	473
Freetown	183
FR Depot	510
Battelship Cove	0
King's Hwy	0
Whale's Tooth	694
Barrowsville	264
Taunton Depot	737
Stoughton Station	468
Canton Center	0
Mansfield	0
Sharon	0
Total	4503

Fare

Alternatives 1 (Attleboro)

From \ To	Battleship	FR Depot	Freetown	State Pier	Whale's Tooth	King's Hwy	E. Taunton	Taunton Depot	Barrowsville	Mansfield	Sharon	Canton Jct	Route 128	Hyde Park	Boston
Battleship	-	$1.61	$1.61	-			$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
Fall River Depot	$1.61		$1.61	-			$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
Freetown	$1.61	$1.61	-	-			$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
State Pier	-	-	-	-	$1.61	$1.61	$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
Whale's Tooth	-	-	-	$1.61		$1.61	$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
King's Hwy	-	-	-	$1.61	$1.61		$1.84	$1.84	$1.84	$2.34	$2.82	$3.05	$3.30	$3.59	$4.50
E. Taunton	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84		-	$1.61	$1.84	$2.57	$2.82	$3.05	$3.30	$4.34
Taunton Depot	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84		-	$1.61	$1.84	$2.57	$2.82	$3.05	$3.30	$4.34
Barrowsville	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84	$1.61	$1.61		$1.84	$2.57	$2.82	$3.05	$3.30	$4.34
Mansfield	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$1.84	$1.84	$1.84		$2.34	$2.57	$2.82	$3.05	$4.11
Sharon	$2.82	$2.82	$2.82	$2.82	$2.82	$2.82	$2.57	$2.57	$2.57	$2.34		$1.84	$2.34	$2.57	$3.39
Canton Jct	$3.05	$3.05	$3.05	$3.05	$3.05	$3.05	$2.82	$2.82	$2.82	$2.57	$1.84		$1.84	$2.34	$2.91
Route 128	$3.30	$3.30	$3.30	$3.30	$3.30	$3.30	$3.05	$3.05	$3.05	$2.82	$2.34	$1.84		$1.84	$2.68
Hyde Park	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.30	$3.30	$3.30	$3.05	$2.57	$2.34	$1.84		$2.68
Boston	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.34	$4.34	$4.34	$4.11	$3.39	$2.91	$2.68	$2.68	

Alternative 4 (Stoughton)

	Battleship	FR Depot	Freetown	State Pier	Whale's Tooth	King's Hwy	E. Taunton	Taunton	Whittenton	Raynham	Easton	Stoughton	Canton Ctr	Canton Jct	Route 128	Hyde Park	Boston
Battleship	-	$1.61	$1.61	-			$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
FR Depot	$1.61		$1.61	-			$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
Freetown	$1.61	$1.61	-	-			$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
State Pier	-	-	-	-	$1.61	$1.61	$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
Whale's Tooth	-	-	-	$1.61		$1.61	$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
King's Hwy	-	-	-	$1.61	$1.61		$1.84	$1.84	$1.84	$2.34	$2.57	$2.82	$3.05	$3.05	$3.30	$3.59	$4.50
E. Taunton	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84		$1.61	$1.61	$1.84	$2.34	$2.57	$2.82	$2.82	$3.05	$3.30	$4.34
Taunton	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84	$1.61		$1.61	$1.84	$2.34	$2.57	$2.82	$2.82	$3.05	$3.30	$4.34
Whittenton	$1.84	$1.84	$1.84	$1.84	$1.84	$1.84	$1.61	$1.61		$1.84	$2.34	$2.57	$2.82	$2.82	$3.05	$3.30	$4.34
Raynham	$2.34	$2.34	$2.34	$2.34	$2.34	$2.34	$1.84	$1.84	$1.84		$1.84	$2.34	$2.57	$2.57	$2.82	$3.05	$4.11
Easton	$2.57	$2.57	$2.57	$2.57	$2.57	$2.57	$2.34	$2.34	$2.34	$1.84		$1.84	$2.34	$2.34	$2.57	$2.82	$3.86
Stoughton	$2.82	$2.82	$2.82	$2.82	$2.82	$2.82	$2.57	$2.57	$2.57	$2.34	$1.84		$1.84	$1.84	$2.34	$2.57	$3.39
Canton Ctr	$3.05	$3.05	$3.05	$3.05	$3.05	$3.05	$2.82	$2.82	$2.82	$2.57	$2.34	$1.84		$1.61	$1.84	$2.34	$2.91
Canton Jct	$3.05	$3.05	$3.05	$3.05	$3.05	$3.05	$2.82	$2.82	$2.82	$2.57	$2.34	$1.84	$1.61		$1.84	$2.34	$2.91
Route 128	$3.30	$3.30	$3.30	$3.30	$3.30	$3.30	$3.05	$3.05	$3.05	$2.82	$2.57	$2.34	$1.84	$1.84		$1.84	$2.68
Hyde Park	$3.59	$3.59	$3.59	$3.59	$3.59	$3.59	$3.30	$3.30	$3.30	$3.05	$2.82	$2.57	$2.34	$2.34	$1.84		$2.41
Boston	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.34	$4.34	$4.34	$4.11	$3.86	$3.39	$2.91	$2.91	$2.68	$2.68	

Alternative 5 (Rapid Bus)

From \ To	Fall River	Freetown	New Bedford	Taunton	Boston
Fall River	-	-	-	-	$4.50
Freetown	-	-	-	-	$4.50
New Bedford	-	-	-	-	$4.50
Taunton	-		-	-	$4.34
Boston	$4.50	$4.50	$4.50	$4.34	-

* All fares are based on the 2006 MBTA fare structure.

** All new stations in Fall River and Newbedford were assigned Zone 8.

*** For the fare per commuter trip calculation, the monthly reduced pass fare was divded into 44 (22 commute day per month, two trips per day).

Alternative 6 (No Build/TSM)

	From	To	Fare (per trip)
Faill River	**Fall River**	**Boston**	$5.91
New Bedford	**New Bedford**	**Taunton**	$2.95
	New Bedford	**Boston**	$5.68
	Taunton	**Boston**	$4.59
Taunton	**W. Bridgewater**	**Boston**	$4.55
	Easton	**Boston**	$5.45
	Raynham	**Boston**	$5.45
	Taunton	**Boston**	$5.45

* No Build Conditions assumes that the existing commuter buses will continue providing the commuting services.

Appendix 3.2-H

CTPS Updated Ridership Analyses for the FEIS/FEIR

Note: This appendix provides two CTPS riderhip memos. The February 26, 2013 memo provides the most up-to-date ridership results for the Stoughton and Whittenton Alternatives (both electric and diesel variants). An earlier CTPS memo (December 17, 2012) pertains only to the Stoughton and Whittenton Electric Alternatives, but is included in this appendix because it also provides a discussion of the updates incorporated in the CTPS regional travel demand model since the work conducted for the DEIS/DEIR. Finally, please note that there is an error in Table 2, "South Coast Rail FEIR Selected Daily Auto and Transit Metrics For Air Quality " in the February 26, 2013 memo. The table does not include transit vehicle emissions (displaying results for automobile mode only). See Table 4.9-20 of the FEIS/FEIR for the summary of total regional emissions (including bus and rail transit emissions). The information in Table 4.9-20 was derived from detailed backup provided in Appendix C of the February 26, 2013 CTPS Memo.

DRAFT MEMORANDUM

DATE **February 26, 2013**
TO **Jean Fox, South Coast Rail Manager at MassDOT**
FROM **Scott Peterson, Director of Technical Services**
RE **FEIR Analysis – Updated Results including Diesel Options**

Introduction

In support of the South Coast Rail (SCR) environmental analysis, the Central Transportation Planning Staff (CTPS) was requested by the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning to conduct the travel demand analysis associated with the South Coast Rail Final Environmental Impact Report (FEIR) alternatives analysis. This was done using an updated version of the CTPS travel demand model that pivoted off of the work CTPS performed for the Draft Environmental Impact Report (DEIR). The improvements included updated demographic data for the future years and newer information on future year background transportation projects that are consistent with the Long Range Transportation Plans (LRTP) of the Metropolitan Planning Organizations (MPO's) in the study area. Seven scenarios were examined in this analysis. Five scenarios were examined using the travel demand model and the results of which were described in a memo dated December 17, 2012. Two new scenarios were added to the analysis since December 2012, which consist of diesel options for the Stoughton and Whittendon alternatives which have slower travel times and were examined using an elasticity based method.

1. Base Year – Year is 2010
2. True No-Build – Year is 2035
3. No-Build/Transportation System Management Option (TSM) – Year is 2035
4. Stoughton Electric Alternative – Year is 2035
5. Whittenton Electric Alternative – Year is 2035
6. Stoughton Diesel Alternative – Year is 2035
7. Whittenton Diesel Alternative – Year is 2035

The True No-build assumes land use changes and the transportation projects included in the LRTP. The True No-build includes existing private bus service from New Bedford, Fall River, and Taunton into Boston. The No-build/TSM pivots off of the True No-build and improves the frequency of the private bus operations serving the South Coast rail Study area. The two new scenarios examined using elasticities were diesel options of the Stoughton and Whittenton alternatives, number 6 and 7. Elasticities were used since the diesel operating plans mirrored those of the electric options, except for

travel time. It is an accepted practice in the transportation planning profession to use elasticities when only one service plan variable changes, such as travel time.

The performance metrics examined, include linked and unlinked transit trips by mode, station boardings in the study area, Vehicle Miles Traveled (VMT) in the System, and emissions estimates for various pollutants.

Summary of Findings

The four key transit metrics presented in Table 1 consist of daily linked transit trips, daily unlinked trips, boardings on the commuter rail system, and boardings on the private buses serving the study area compared to the True No-Build scenario. Detailed breakdowns of the systemwide transit results are included in Appendix A. Station level and mode of access data are presented in Appendix B.

The transit system grows from 1.27 million unlinked transit trips in 2010 to 1.61 million in 2035 if there are no improvements to the transportation system other than what was included in the LRTP. The growth in unlinked transit trips is primarily due to demographics, but some transit improvements such as the Green Line Extension, Assembly Square Orange Line Station, and the new Fairmount Line Stations are adding to the increase in transit trips in the future. The TSM represents a slight improvement of the private bus system and this adds 2,210 unlinked transit trips to the system daily. The Stoughton Electric option adds 9,310 unlinked transit trips to the True No-Build, while the Whittenton Electric option adds 8,210 unlinked trips to the True No-Build. Relative to the TSM they add 7,100 and 6,000 unlinked transit trips, respectively. There are two reasons the Whittenton Electric option has less demand than the Stoughton Electric option:

- The service plan for the Whittenton Electric option has slower travel times from the southernmost stations to South Station than the Stoughton Electric option.
- The Whittenton Electric option has a different stop pattern in Taunton, which causes the additional travel time.

The diesel options for the Stoughton and Whittenton alternatives have slower travel times into Boston from New Bedford, Fall River, and Taunton, resulting in less demand relative to their electric options. The Stoughton Diesel option has 9,010 more unlinked trips than the True No-build, 300 less than the electric option. The Whittenton Diesel option has 8,010 more unlinked trips than the True No-build, 200 less than the electric option.

The daily system wide linked transit trips grows from 1.02 million 2010 to 1.29 million in the 2035 No-build scenario. The No-Build/TSM experiences a small improvement over the No-Build, adding 1,900 daily linked transit trips. The Stoughton Electric adds 7,400 more linked transit trips and the Whittenton Electric option adds 6,600 daily linked transit trips relative to the True No-build. The Stoughton Diesel option has 7,100 new linked transit trips and the Whittenton Diesel option 6,250 new linked transit trips relative

to the True No-build. The reasons for these differences are the same as for the unlinked transit trips described above.

The commuter rail system, based on conductor's counts, had 145,000 daily boardings in 2010, which grows to 178,200 in the 2035 No-Build scenario. This increase is due to demographic growth and some improvements to the commuter rail system, examples of which are listed below.

- Fitchburg commuter rail travel time improvements
- Additional stations on the Fairmount Line
- Additional stations in Rhode Island on the Providence Line
- Yawkey Station is made a full-time stop

The No-Build/TSM causes a decrease in commuter rail boardings, by 490. This option adds bus service in the study area, which siphons off commuter rail riders from the Providence, Stoughton, and Middleborough commuter rail lines. The Stoughton Electric option adds 9,810 boardings daily to the commuter rail system and the Whittenton Electric option adds 8,910 boardings daily to the commuter rail system relative to the True No-build. The Stoughton Diesel option adds 9,260 boardings and the Whittenton Diesel option adds 8,460 boardings relative to the True No-build. This is between 450 and 550 lower than their corresponding electric options.

The private bus system in the study area had 1,600 daily boardings in 2010, but is forecasted to grow to 4,100 in the 2035 True No-Build scenario. The No-Build/TSM improves the private bus service in the South Coast rail corridor by adding frequency and this increases ridership to 6,000, an increase of 1,900 boardings. The Stoughton Electric option has 1,100 and the Whittenton Electric option 1,200 private bus trips relative to the True No-build. The Stoughton Diesel option has 1,250 private bus trips and the Whittenton Diesel option 1,350 new private bus trips relative to the True No-build. This is about 150 boardings more than the corresponding electric options.

Table 2 summarizes the traffic and CO2 metrics, while a more detailed breakdown of this information can be found in Appendix C. The emissions are a function of the change in passenger vehicles on the road due to the project and the change in transit vehicles being used. The No-Build/TSM with its improved bus service reduces passenger vehicle miles traveled (VMT) by 58,000 miles daily. The Stoughton Electric and Whittenton Electric options reduce VMT by 310,200 and 255,500 respectively. The change in VMT is a result people shifting from the auto mode to the transit option being improved. The vehicle hours traveled (VHT) is a proxy for time people spend in traffic as a result of congestion. The No-build/TSM reduces VHT by 3,300 hours daily. This reduction increases to 15,600 and 12,500 hours for the Stoughton Electric and Whittenton Electric options respectively. CO2 is a function of the VMT in this analysis and follows the same patterns, since this analysis didn't account for point source emissions (power plants) that produced the electricity. The diesel options, Stoughton and Whittendon, reduce VMT a little less than their electric counterparts: 297,200 and 243,500 respectively. Nitrous Oxide (NOx) experiences an increase in the TSM due to

more bus emissions being produced than the passenger vehicles emissions from auto trips being diverted to transit are being reduced for NOx. Both electric options experience the greatest reduction thanks to the technology being used, ranging from minus 50 kg to minus 40 kg. The diesel options produce more NOx, due to the characteristics of diesel fuel being burnt, with both alternatives showing an increase in NOx of 20 to 30 kg daily. The pattern for the Volatile Organic Compounds (VOC) follow a similar pattern as NOx, with the exception that the TSM ends up showing a reduction of minus 10 kg along with both diesel options.

Conclusion

The electric options attracts more riders than the diesel option due to the faster travel times, which is a function of faster acceleration of the electric technology being used by the locomotives. Regardless of the technology, electric or diesel, the Stoughton alternative consistently attracts more riders than the Whittenton alternative especially for trips south of Taunton, where additional travel time is needed to traverse the Whittenton Junction. The travel time difference between the Stoughton and Whittenton alternatives is a more significant factor in attracting riders than the travel time differences associated with the technology, diesel versus electric. Auto diversions, vehicle miles of travel, and air quality were also examined in this analysis and the results will be presented in a subsequent memo. The air quality analysis shows that the technology drives the benefits. Electric technology provides significantly more emissions savings than the diesel options and the TSM alternative when you combine the transit vehicle emissions with the passenger vehicle emissions being saved.

TABLE 1
South Coast Rail FEIR
Daily Transit Results

Year	2010	2035	2035	2035	2035	2035	2035
Scenario	Existing Conditions	True No-Build	No-Build / TSM	Stoughton Electric	Whittenton Electric	Stoughton Diesel	Whittenton Diesel
Unlinked Transit Trips	1,270,700	1,612,000	1,614,210	1,621,310	1,620,210	1,621,010	1,620,010
Difference with True No-Build	na	na	2,210	9,310	8,210	9,010	8,010
Linked Transit Trip	1,018,000	1,294,400	1,296,300	1,301,800	1,301,000	1,301,500	1,300,650
Difference with True No-Build	na	na	1,900	7,400	6,600	7,100	6,250
Commuter Rail (1)	145,000	178,200	177,710	188,010	187,110	187,460	186,660
Difference with True No-Build	na	na	-490	9,810	8,910	9,260	8,460
Study Area Private Buses (2)	1,600	4,100	6,000	1,100	1,200	1,250	1,350
Difference with True No-Build	na	na	1,900	-3,000	-2,900	-3,000	-2,900

(1) Commuter system calibrated to conductors counts

(2) Study area means the South Coast Rail project study area

TABLE 2
South Coast Rail FEIR
Selected Daily Auto and Transit Metrics
For Air Quality

Year Scenario	**2035** True No-Build	**2035** No-Build / TSM	**2035** Stoughton Electric	**2035** Whittenton Electric	**2035** Stoughton Diesel	**2035** Whittenton Diesel
VMT	118,952,000	118,894,000	118,641,800	118,696,500	118,654,800	118,708,500
Difference with No-Build	na	-58,000	-310,200	-255,500	-297,200	-243,500
VHT	3,959,800	3,956,500	3,944,200	3,947,300	3,944,700	3,947,700
Difference with No-Build	na	-3,300	-15,600	-12,500	-15,100	-12,100
NOx (kg)						
Difference with No-Build	na	36	-61	-51	20	30
VOC (kg)						
Difference with No-Build	na	-10	-50	-40	-10	-10
CO2 (1)						
Difference with No-Build	na	-0.026	-0.193	-0.162	-0.106	-0.065

(1) in millions of kg

APPENDIX A
Systemwide Transit Summary

South Coast Rail FEIR
Systemwide Transit Summary

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Average Daily Performance Measures for Transit Trips in the 182 Community Model Area	2006 Alternative	2010 Alternative	2035 True No-Build			2035 No-build/TSM			2035 Stoughton Electric			2035 Whittenton Electric			2035 Stoughton Diesel			2035 Whittenton Diesel		
	Base Year	Base Year	Boardings	% Diff with Base Year	Diff with Base Year	Boardings	% Diff with No-build	Diff with No-build	Boardings	% Diff with TSM	Diff with TSM	Boardings	% Diff with TSM	Diff with TSM	Boardings	% Diff with TSM	Diff with TSM	Boardings	% Diff with TSM	Diff with TSM
Middleboro Route CRR Line Total	11,000	10,600	11,200	9.8%	600	11,000	-1.8%	-200	10,600	-3.6%	-400	10,600	-3.6%	-400	10,650	-3.2%	-350	10,650	-3.2%	-350
Middleboro Route Inbound Total	5,500	5,300	5,600	9.8%	300	5,500	-1.8%	-100	5,300	-3.6%	-200	5,300	-3.6%	-200	5,325	-3.2%	-175	5,325	-3.2%	-175
Attleboro Route CRR Line Total	19,850	21,800	25,000	14.9%	3,200	24,700	-1.2%	-300	22,800	-7.7%	-1,900	23,000	-6.9%	-1,700	22,900	-7.3%	-1,800	23,100	-6.5%	-1,600
Attleboro Route Inbound Total	9,925	10,900	12,500	14.9%	1,600	12,350	-1.2%	-150	11,400	-7.7%	-950	11,500	-6.9%	-850	11,450	-7.3%	-900	11,550	-6.5%	-800
Stoughton Route CRR Line Total	9,750	8,600	9,300	8.4%	700	9,200	-1.1%	-100	21,700	135.9%	12,500	20,600	123.9%	11,400	21,000	128.3%	11,800	20,000	117.4%	10,800
Stoughton Route Inbound Total	4,875	4,300	4,650	8.4%	350	4,600	-1.1%	-50	10,850	135.9%	6,250	10,300	123.9%	5,700	10,500	128.3%	5,900	10,000	117.4%	5,400
Study Area CRR Lines	**40,600**	**41,000**	**45,500**	**11.0%**	**4,500**	**44,900**	**-1.3%**	**-600**	**55,100**	**22.7%**	**10,200**	**54,200**	**20.7%**	**9,300**	**54,550**	**21.5%**	**9,650**	**53,750**	**19.7%**	**8,850**
Study Area Inbound Total	20,300	20,500	22,750	11.0%	2,250	22,450	-1.3%	-300	27,550	22.7%	5,100	27,100	20.7%	4,650	27,275	21.5%	4,825	26,875	19.7%	4,425
Other CRR Lines	96,400	104,000	132,700	24.7%	28,700	132,810	0.1%	100	132,910	0.1%	100	132,910	0.1%	100	132,910	0.1%	100	132,910	0.1%	100
Total CRR - ALL Lines	137,000	145,000	178,200	22.9%	33,200	177,710	-0.3%	-500	188,010	5.8%	10,300	187,110	5.3%	9,400	187,460	5.5%	9,750	186,660	5.0%	8,950
SCR Rapid Bus Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCR Private Buses	1,800	1,600	4,100	156.3%	2,500	6,000	46.3%	1,900	1,100	-81.7%	-4,900	1,200	-80.0%	-4,800	1,250	-79.2%	-4,750	1,350	-77.5%	-4,650
Study Area Transit (CRR+Prvt Bus)	**42,400**	**42,600**	**49,600**	**16.4%**	**7,000**	**50,900**	**2.6%**	**1,300**	**56,200**	**10.4%**	**5,300**	**55,400**	**8.8%**	**4,500**	**55,800**	**9.6%**	**4,900**	**55,100**	**8.3%**	**4,200**
MBTA Bus Total	370,600	380,700	464,800	22.1%	84,100	464,900	0.0%	100	465,200	0.1%	300	465,200	0.1%	300	465,300	0.1%	400	465,300	0.1%	400
Orange Line Total	159,600	170,200	226,900	33.3%	56,700	227,200	0.1%	300	227,800	0.3%	600	227,700	0.2%	500	227,800	0.3%	600	227,700	0.2%	500
Red Line Total	226,400	231,400	293,200	26.7%	61,800	293,300	0.0%	100	293,600	0.1%	300	293,500	0.1%	200	293,600	0.1%	300	293,500	0.1%	200
Blue Line Total	50,540	62,400	72,100	15.6%	9,700	72,100	0.0%	-	72,200	0.1%	100	72,200	0.1%	100	72,200	0.1%	100	72,200	0.1%	100
Green Line Total	237,400	249,400	312,000	25.1%	62,600	312,100	0.0%	100	312,300	0.1%	200	312,300	0.1%	200	312,300	0.1%	200	312,300	0.1%	200
Silver Line Phase I & II Total	20,200	25,600	56,100	119.1%	30,500	56,300	0.4%	200	56,500	0.4%	200	56,400	0.2%	100	56,500	0.4%	200	56,400	0.2%	100
Silver Line Phase I, II, & III Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urban Ring Phase II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Transportation	5,000	4,400	4,600	4.5%	200	4,600	0.0%	-	4,600	0.0%	-	4,600	0.0%	-	4,600	0.0%	-	4,600	0.0%	-
Unlinked Transit Trips	**1,208,540**	**1,270,700**	**1,612,000**	**26.9%**	**341,300**	**1,614,210**	**0.6%**	**2,200**	**1,621,310**	**0.4%**	**7,100**	**1,620,210**	**0.4%**	**6,000**	**1,621,010**	**0.4%**	**6,800**	**1,620,010**	**0.4%**	**5,800**
Linked Transit Trips	**1,013,700**	**1,018,000**	**1,294,400**	**27.2%**	**276,400**	**1,296,300**	**0.1%**	**1,900**	**1,301,800**	**0.4%**	**5,500**	**1,301,000**	**0.4%**	**4,700**	**1,301,500**	**0.4%**	**5,200**	**1,300,650**	**0.3%**	**4,350**
Walk Access (Walk+Xfer)	899,200	903,300	1,164,960	29.0%	261,660	1,165,500	0.0%	540	1,167,300	0.2%	1,800	1,167,000	0.1%	1,500	1,167,200	0.1%	1,700	1,166,900	0.1%	1,400
Drive Access (KNR+PNR)	114,500	114,700	129,440	12.9%	14,740	130,800	1.1%	1,360	134,500	2.8%	3,700	134,000	2.4%	3,200	134,300	2.7%	3,500	133,750	2.3%	2,950
Transfer Ratio	1.19	1.25	1.25		1.23	1.25		1.16	1.25		1.29	1.25		1.28	1.25		1.31	1.25		1.33

APPENDIX B
Station Level and Mode of Access Data

South Coast Rail Study
Station Boarding Results

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Location		2010 Existing Conditions									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	3,410	1,710	0	100	1,600	0	0	0	0	0
2	Back Bay	1,270	950	0	10	310	710	500	140	50	20
3	Ruggles	170	100	0	10	60	100	60	20	10	10
4	Hyde Park	560	250	280	30	0	440	310	90	40	0
5	Rte 128 Station	710	0	600	110	0	590	410	120	60	0
6	Canton Junction	720	120	510	90	0	700	460	160	70	10
7	Canton Center	710	370	270	70	0	710	470	160	70	10
8	Stoughton	1,050	240	670	140	0	1,050	780	200	50	20
10	North Easton	na	na	na	na	na	na	na	na	na	na
11	Easton Village	na	na	na	na	na	na	na	na	na	na
12	Raynham	na	na	na	na	na	na	na	na	na	na
13	Taunton	na	na	na	na	na	na	na	na	na	na
14	Dana Street	na	na	na	na	na	na	na	na	na	na
15	Taunton Depot	na	na	na	na	na	na	na	na	na	na
16	Freetown	na	na	na	na	na	na	na	na	na	na
17	Fall River Depot	na	na	na	na	na	na	na	na	na	na
18	Battleship Cove	na	na	na	na	na	na	na	na	na	na
19	Kings Hwy	na	na	na	na	na	na	na	na	na	na
20	Whales Tooth	na	na	na	na	na	na	na	na	na	na
	Stoughton Line Totals	**8,600**	**3,740**	**2,330**	**560**	**1,970**	**4,300**	**2,990**	**890**	**350**	**70**
		4,300									

South Coast Rail Study
Station Boarding Results

Location		2035 True No-build									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	3,690	1,850	0	110	1,730	0	0	0	0	0
2	Back Bay	1,370	1,030	0	10	330	770	540	150	50	30
3	Ruggles	180	100	0	10	70	110	70	20	10	10
4	Hyde Park	600	260	300	30	10	470	330	100	40	0
5	Rte 128 Station	760	0	650	110	0	630	440	130	60	0
6	Canton Junction	780	120	550	90	20	760	500	170	80	10
7	Canton Center	770	410	280	80	0	770	510	170	80	10
8	Stoughton	1,140	260	730	150	0	1,140	850	220	50	20
10	North Easton	na	na	na	na	na	na	na	na	na	na
11	Easton Village	na	na	na	na	na	na	na	na	na	na
12	Raynham	na	na	na	na	na	na	na	na	na	na
13	Taunton	na	na	na	na	na	na	na	na	na	na
14	Dana Street	na	na	na	na	na	na	na	na	na	na
15	Taunton Depot	na	na	na	na	na	na	na	na	na	na
16	Freetown	na	na	na	na	na	na	na	na	na	na
17	Fall River Depot	na	na	na	na	na	na	na	na	na	na
18	Battleship Cove	na	na	na	na	na	na	na	na	na	na
19	Kings Hwy	na	na	na	na	na	na	na	na	na	na
20	Whales Tooth	na	na	na	na	na	na	na	na	na	na
	Stoughton Line Totals	**9,300**	**4,030**	**2,510**	**590**	**2,160**	**4,650**	**3,240**	**960**	**370**	**80**
		4,650									

South Coast Rail Study
Station Boarding Results

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Location		2035 TSM									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	3,650	1,830	0	110	1,710	0	0	0	0	0
2	Back Bay	1,360	1,020	0	10	330	780	540	150	50	40
3	Ruggles	180	100	0	10	70	110	70	20	10	10
4	Hyde Park	590	260	300	30	0	460	320	100	40	0
5	Rte 128 Station	750	0	640	110	0	620	430	130	60	0
6	Canton Junction	770	120	550	90	10	750	500	170	80	0
7	Canton Center	760	400	280	80	0	760	510	170	80	0
8	Stoughton	1,120	260	710	150	0	1,120	850	220	50	0
10	North Easton	na	na	na	na	na	na	na	na	na	na
11	Easton Village	na	na	na	na	na	na	na	na	na	na
12	Raynham	na	na	na	na	na	na	na	na	na	na
13	Taunton	na	na	na	na	na	na	na	na	na	na
14	Dana Street	na	na	na	na	na	na	na	na	na	na
15	Taunton Depot	na	na	na	na	na	na	na	na	na	na
16	Freetown	na	na	na	na	na	na	na	na	na	na
17	Fall River Depot	na	na	na	na	na	na	na	na	na	na
18	Battleship Cove	na	na	na	na	na	na	na	na	na	na
19	Kings Hwy	na	na	na	na	na	na	na	na	na	na
20	Whales Tooth	na	na	na	na	na	na	na	na	na	na
	Stoughton Line Totals	**9,200**	**3,990**	**2,480**	**590**	**2,120**	**4,600**	**3,220**	**960**	**370**	**50**
		4,600									

South Coast Rail Study
Station Boarding Results

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Location		2035 Stoughton Electric									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	9,470	4,740	0	280	4,450	0	0	0	0	0
2	Back Bay	3,690	2,770	0	40	880	880	610	170	70	30
3	Ruggles	220	130	0	10	80	120	80	20	10	10
4	Hyde Park	620	270	310	30	10	460	320	100	30	10
5	Rte 128 Station	760	0	650	110	0	600	420	130	50	0
6	Canton Junction	730	120	520	90	0	710	470	160	80	0
7	Canton Center	700	370	260	70	0	700	470	150	80	0
8	Stoughton	940	220	590	120	10	900	680	180	40	0
10	North Easton	460	110	320	30	0	450	310	80	50	10
11	Easton Village	150	120	0	30	0	150	120	20	10	0
12	Raynham	430	90	280	60	0	410	310	60	40	0
13	Taunton	670	230	260	120	60	620	480	100	40	0
14	Dana Street	na	na	na	na	na	na	na	na	na	na
15	Taunton Depot	400	80	220	60	40	380	290	60	30	0
16	Freetown	180	30	130	20	0	180	140	20	20	0
17	Fall River Depot	840	290	460	70	20	840	600	140	80	20
18	Battleship Cove	240	180	0	50	10	240	80	60	50	50
19	Kings Hwy	520	110	340	70	0	520	390	80	40	10
20	Whales Tooth	680	190	310	90	90	680	460	60	140	20
	Stoughton Line Totals	**21,700**	**10,050**	**4,650**	**1,350**	**5,650**	**8,840**	**6,230**	**1,590**	**860**	**160**
		10,850									

South Coast Rail Study
Station Boarding Results

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Location		2035 Whittenton Electric									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	8,990	4,500	0	270	4,220	0	0	0	0	0
2	Back Bay	3,500	2,630	0	40	830	830	580	160	70	20
3	Ruggles	210	120	0	10	80	110	70	20	10	10
4	Hyde Park	610	270	310	30	0	450	310	100	30	10
5	Rte 128 Station	800	0	680	120	0	630	440	140	50	0
6	Canton Junction	740	120	530	90	0	720	480	160	80	0
7	Canton Center	720	370	280	70	0	720	480	160	80	0
8	Stoughton	990	210	650	130	0	950	720	190	40	0
10	North Easton	490	110	350	30	0	480	330	90	50	10
11	Easton Village	150	120	0	30	0	150	120	20	10	0
12	Raynham	520	90	360	70	0	500	380	70	50	0
13	Taunton	na	na	na	na	na	na	na	na	na	na
14	Dana Street	320	50	220	50	0	310	240	50	20	0
15	Taunton Depot	360	70	210	60	20	340	260	50	30	0
16	Freetown	160	20	120	20	0	160	120	20	20	0
17	Fall River Depot	750	260	410	60	20	750	540	130	70	10
18	Battleship Cove	200	150	0	40	10	200	70	50	40	40
19	Kings Hwy	480	110	310	60	0	480	360	70	40	10
20	Whales Tooth	610	170	290	90	60	610	410	50	130	20
	Stoughton Line Totals	**20,600**	**9,370**	**4,720**	**1,270**	**5,240**	**8,390**	**5,910**	**1,530**	**820**	**130**
		10,300									

South Coast Rail Study
Station Boarding Results

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Location		2035 Stoughton Diesel									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	9,150	4,590	0	290	4,270	0	0	0	0	0
2	Back Bay	3,570	2,680	0	40	850	880	610	170	70	30
3	Ruggles	210	120	0	10	80	110	70	20	10	10
4	Hyde Park	600	260	300	30	10	460	320	100	30	10
5	Rte 128 Station	740	0	620	110	10	600	410	130	50	10
6	Canton Junction	710	110	490	90	20	710	460	160	80	10
7	Canton Center	680	360	250	70	0	670	440	140	80	10
8	Stoughton	910	210	560	120	20	860	650	170	40	0
10	North Easton	450	110	320	20	0	430	300	80	50	0
11	Easton Village	150	120	0	30	0	140	110	20	10	0
12	Raynham	420	90	280	50	0	390	290	60	40	0
13	Taunton	650	230	250	120	50	590	460	100	40	-10
14	Dana Street	na	na	na	na	na	na	na	na	na	na
15	Taunton Depot	390	80	220	60	30	360	270	60	30	0
16	Freetown	170	30	130	10	0	170	130	20	20	0
17	Fall River Depot	810	280	450	60	20	800	570	130	80	20
18	Battleship Cove	230	170	0	50	10	230	80	60	50	40
19	Kings Hwy	500	110	330	60	0	500	380	80	40	0
20	Whales Tooth	660	180	300	90	90	650	440	60	130	20
	Stoughton Line Totals	**21,000**	**9,730**	**4,500**	**1,310**	**5,460**	**8,550**	**5,990**	**1,560**	**850**	**150**
		10,500									

South Coast Rail Study
Station Boarding Results

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Location		2035 Whittenton Diesel									
Corridor		Daily Boardings	Access Mode				Inbound Boardings				
Station			Walk	PNR	KNR	Transit	Total	AM	MD	PM	NT
Stoughton											
1	South Station	8,720	4,370	0	290	4,060	0	0	0	0	0
2	Back Bay	3,400	2,550	0	30	820	830	580	160	70	20
3	Ruggles	200	110	0	10	80	110	70	20	10	10
4	Hyde Park	590	260	300	30	0	450	310	100	30	10
5	Rte 128 Station	780	0	650	120	10	630	430	140	50	10
6	Canton Junction	720	120	510	90	0	720	470	160	80	10
7	Canton Center	700	360	270	70	0	690	450	150	80	10
8	Stoughton	960	200	630	120	10	910	690	180	40	0
10	North Easton	480	110	350	20	0	460	320	90	50	0
11	Easton Village	150	120	0	30	0	140	110	20	10	0
12	Raynham	500	90	350	60	0	480	360	70	50	0
13	Taunton	na	na	na	na	na	na	na	na	na	na
14	Dana Street	310	50	220	40	0	300	230	50	20	0
15	Taunton Depot	350	70	200	60	20	330	250	50	30	0
16	Freetown	160	20	120	20	0	150	110	20	20	0
17	Fall River Depot	730	260	390	60	20	720	520	120	70	10
18	Battleship Cove	190	140	0	40	10	190	70	50	40	30
19	Kings Hwy	470	100	310	60	0	460	350	70	40	0
20	Whales Tooth	590	170	280	80	60	580	390	50	120	20
	Stoughton Line Totals	**20,000**	**9,100**	**4,580**	**1,230**	**5,090**	**8,150**	**5,710**	**1,500**	**810**	**130**
		10,000									

APPENDIX C
Highway and Transit Air Quality Metrics

South Coast Rail FEIR Study
Vehicle Emissions

Scenario	South Coast Rail FEIR Avg. Weekday Performance Measures								
	Auto Mode								
	VMT	VHT	MPH	CO kg	NOx kg	VOC kg	CO2 kg	PM2.5 kg	PM10 kg
2010 Base	109,926,000	3,655,700	30.07	1,516,100	118,010	48,810	61,190,310	3,010	4,780

Notes: VMT adjusted with HPMS data

All emission factors were developed using MOBILE 6.2, with inputs developed by MA DEP

CO emission factors are based on winter temperature and humidity assumptions

VOC, Nox, CO2, PM 2.5, and PM10 emission factors are based on summer temperature and humidity assumptions

South Coast Rail FEIR Study
Vehicle Emissions

Scenario	South Coast Rail FEIR 2035 Auto Mode Avg. Weekday Performance Measures										
	Linked Transit Trip	VMT	VHT	MPH	Avg Trip Length	CO kg	NOx kg	VOC kg	CO2 kg	PM2.5 kg	PM10 kg
Auto Mode Emissions											
NB	1,294,400	118,952,000	3,959,800	30.04	na	1,050,860	19,220	22,210	67,745,200	1,490	3,240
TSM	1,296,300	118,894,000	3,956,500	30.05	na	1,050,350	19,220	22,200	67,712,170	1,490	3,230
SLE	1,301,800	118,641,800	3,944,200	30.08	na	1,048,120	19,170	22,160	67,568,540	1,490	3,230
WLE	1,301,000	118,696,500	3,947,300	30.07	na	1,048,600	19,180	22,170	67,599,690	1,490	3,230
SLD	1,301,500	118,654,800	3,944,700	30.08	na	1,048,230	19,170	22,160	67,575,940	1,490	3,230
WLD	1,300,650	118,708,500	3,947,700	30.07	na	1,048,710	19,180	22,170	67,606,520	1,490	3,230
Auto Mode Emissions Deltas Relative to the No-build											
NB	na	na	na	na	na	na	na	na	na	na	na
TSM	1,900	-58,000	-3,300	0.01	30.5	-510	0	-10	-33,030	0	-10
SLE	7,400	-310,200	-15,600	0.04	41.9	-2,740	-50	-50	-176,660	0	-10
WLE	6,600	-255,500	-12,500	0.03	38.7	-2,260	-40	-40	-145,510	0	-10
SLD	7,100	-297,200	-15,100	0.04	41.9	-2,630	-50	-50	-169,260	0	-10
WLD	6,250	-243,500	-12,100	0.03	38.7	-2,150	-40	-40	-138,680	0	-10
Auto Mode Emissions Deltas Relative to the TSM											
NB	-1,900	58,000	3,300	-0.01	30.5	510	0	10	33,030	0	10
TSM	na	na	na	na	na	na	na	na	na	na	na
SLE	5,500	-252,200	-12,300	0.03	45.9	-2,230	-50	-40	-143,630	0	0
WLE	4,700	-197,500	-9,200	0.02	42.0	-1,750	-40	-30	-112,480	0	0
SLD	5,200	-239,200	-11,800	0.03	46.0	-2,120	-50	-40	-136,230	0	0
WLD	4,350	-185,500	-8,800	0.02	42.6	-1,640	-40	-30	-105,650	0	0

South Coast Rail FEIR Study
Vehicle Emissions

Scenario	South Coast Rail FEIR 2035 Transit Vehicles Avg. Weekday Performance Measures						
	VMT	CO kg	NOx kg	VOC kg	CO2 kg	PM2.5 kg	PM10 kg
Transit Vehicle Emissions Deltas Relative to the No-build							
NB	na	na	na	na	na	na	na
TSM	3,192	6	36	0	6,566	0	0
SLE	-540	-46	-11	0	-16,541	0	0
WLE	-540	-46	-11	0	-16,541	0	0
SLD	2,044	170	40	0	62,890	1	1
WLD	2,386	198	47	0	73,411	1	1
Transit Vehicle Emissions Deltas Relative to the TSM							
NB	-3,192	-6	-36	0	-6,566	0	0
TSM	na	na	na	na	na	na	na
SLE	-3,732	-51	-48	0	-23,108	0	0
WLE	-3,732	-51	-48	0	-23,108	0	0
SLD	-1,148	164	4	0	56,324	1	1
WLD	-806	192	11	0	66,845	1	1

South Coast Rail FEIR Study
Vehicle Emissions

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Scenario	South Coast Rail FEIR 2035 Total Avg. Weekday Performance Measures						
	VMT	CO kg	NOx kg	VOC kg	CO2 kg	PM2.5 kg	PM10 kg
Total Vehicle Emissions Deltas Relative to the No-build							
NB	na	na	na	na	na	na	na
TSM	-54,808	-504	36	-10	-26,464	0	-10
SLE	-310,740	-2,786	-61	-50	-193,201	0	-10
WLE	-256,040	-2,306	-51	-40	-162,051	0	-10
SLD	-295,156	-2,460	-10	-50	-106,370	1	-9
WLD	-241,114	-1,952	7	-40	-65,269	1	-9
Total Vehicle Emissions Deltas Relative to the TSM							
NB	54,808	504	-36	10	26,464	0	10
TSM	na	na	na	na	na	na	na
SLE	-255,932	-2,281	-98	-40	-166,738	0	0
WLE	-201,232	-1,801	-88	-30	-135,588	0	0
SLD	-240,348	-1,956	-46	-40	-79,906	1	1
WLD	-186,306	-1,448	-29	-30	-38,805	1	1

DRAFT MEMORANDUM

DATE **December 17, 2012**
TO **Jean Fox, South Coast Rail Manager at MassDOT**
FROM **Scott Peterson, Director of Technical Services**
RE **Results of the FEIR Analysis**

Introduction

In support of the South Coast Rail (SCR) environmental analysis, the Central Transportation Planning Staff (CTPS) was requested by the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning to conduct the regional travel demand modeling work associated with the South Coast Rail Final Environmental Impact Report (FEIR) alternatives analysis. This was done using an updated version of the CTPS travel demand model that pivoted off of the work CTPS performed for the Draft Environmental Impact Report (DEIR). The improvements included updated demographic data for the future years and newer information on future year background transportation projects that are consistent with the Long Range Transportation Plans (LRTP) of the MPO's in the study area. Five scenarios were modeled:

1. Base Year – Year is 2010
2. No-Build – Year is 2035
3. No-Build/Transportation Management System Option (TSM) – Year is 2035
4. Stoughton Electric Alternative – Year is 2035
5. Whittendon Electric Alternative – Year is 2035

The performance metrics examined, include linked and unlinked transit trips by mode, station boarding's in the study area, Vehicle Miles Traveled (VMT) in the System, and emissions estimates for various pollutants.

Summary of Findings

The four key transit metrics presented in Table 1 consist of daily linked transit trips, daily unlinked trips, boardings on the commuter rail system, and boardings on the private buses serving the study area compared to the No-Build scenario. Detailed breakdowns of the transit results are included in Appendix A. Station level and mode of access data are presented in Appendix B.

The transit system grows from 1.27 million unlinked transit trips in 2010 to 1.6 million in 2035 if there are no improvements to the transportation system other than what was included in the LRTP. The growth in unlinked transit trips is primarily due to

demographics, but some transit improvements such as the Green Line Extension, Assembly Square Orange Line Station, and the new Fairmount Stations are adding to the increase in transit trips in the future. The TSM represents a slight improvement of the private bus system and this adds 2,200 unlinked transit trips to the system daily. The Stoughton Electric option adds 9,310 unlinked transit trips to the No-Build, while the Whittendon Electric option adds a 8,210 unlinked trips to the No-Build. Relative to the TSM they add 7,100 and 6,000 unlinked transit trips. There are two reasons the Whittendon Electric option has less demand than the Stoughton Electric option:

- The service plan for the Whittendon Electric option has slower travel times from the southernmost stations to South Station than the Stoughton Electric option.
- The Whittendon Electric option has a different stop pattern in Taunton, which causes the additional travel time.

TABLE 1
South Couth Rail FEIR
Daily Transit Results

Year Scenario	**2010** Existing Conditions	**2035** No-Build	**2035** No-Build / TSM	**2035** Stoughton Electric	**2035** Whittendon Electric
Unlinked Transit Trips	1,270,700	1,612,000	1,614,210	1,621,310	1,620,210
Difference with No-Build	na	na	2,210	9,310	8,210
Linked Transit Trip	1,018,000	1,294,400	1,296,300	1,301,800	1,301,000
Difference with No-Build	na	na	1,900	7,400	6,600
Commuter Rail (1)	145,000	178,200	177,710	188,010	187,110
Difference with No-Build	na	na	-490	9,810	8,910
Study Area Private Buses (2)	1,600	4,100	6,000	1,100	1,200
Difference with No-Build	na	na	1,900	-3,000	-2,900

(1) Commuter system calibrated to conductors counts
(2) Study area means the South Coast Rail project study area

The daily system wide linked transit trips grows from 1.02 million 2010 to 1.29 million in the 2035 No-build scenario. The No-Build/TSM experiences a small improvement over the No-Build, adding 1,900 daily linked transit trips. The Stoughton Electric adds 7,400

more linked transit trips and the Whittendon Electric option adds 6,600 daily linked transit trips. Relative to the TSM they add between 5,500 and 4,700 linked transit trips. The reasons for these differences are the same as for the unlinked transit trips described above. In this analysis, a linked transit trips is also closely related to auto diversions and discussed later in this section, differing only by the number of people that may carpool together.

The commuter rail system, based on conductor's counts, had 145,000 daily boardings in 2010, which grows to 178,200 in the 2035 No-Build scenario. This increase is due to demographic growth and some improvements to the commuter rail system, examples of which are listed below.

- Fitchburg commuter rail travel time improvements
- Additional stations on the Fairmount Line
- Additional stations in Rhode Island on the Providence Line
- Yawkey Station is made a full-time stop

The No-Build/TSM causes a decrease in commuter rail boardings, by 490. This option adds bus service in the study area, which siphons of commuter rail riders from the Providence, Stoughton, and Middleborough commuter rail lines. The Stoughton Electric option adds 9,810 boardings daily to the commuter rail system. The Whittendon Electric option adds 8,910 boardings daily to the commuter rail system.

The private bus system in the study area had 1,600 daily boardings in 2010, which is expected to grow to 4,100 in the 2035 No-Build scenario. The No-Build/TSM additional bus service adds service and increases ridership to 6,000, an increase of 1,900 boardings. Both commuter rail options provide more stations in the study area and offer faster travel times to South Station, resulting a loss of private bus boardings.

Table 2 summarizes the traffic and CO2 metrics, while a more detailed breakdown of this information can be found in Appendix C. The No-Build/TSM with its improved bus service reduces vehicle miles traveled (VMT) by 58,000 miles daily. The Stoughton Electric and Whittendon options reduce VMT by 310,200 and 255,500 respectively. The change in VMT is a result people shifting from the auto mode to the transit option being improved. The vehicle hours traveled (VHT) is a proxy for time people spend in traffic as a result of congestion. The No-build/TSM reduces VHT by 3,300 hours daily. This reduction increases to 15,600 and 12,500 hours for the Stoughton Electric and Whittendon Electric options respectively. CO2 is a function of the VMT in this analysis and follows the same patterns.

TABLE 2

South Couth Rail FEIR

Daily Highway and CO2 Results

Year	**2035**	**2035**	**2035**	**2035**
Scenario	No-Build	No-Build / TSM	Stoughton Electric	Whittendon Electric
VMT	118,952,000	118,894,000	118,641,800	118,696,500
Difference with No-Build	na	-58,000	-310,200	-255,500
VHT	3,959,800	3,956,500	3,944,200	3,947,300
Difference with No-Build	na	-3,300	-15,600	-12,500
CO2 (1)	67.745	67.712	67.569	67.600
Difference with No-Build	na	-0.033	-0.176	-0.145

(1) in millions of kg

Overview of the Model

The model set is of the same type as those used in most large urban areas in North America. It is used to simulate existing travel conditions and to forecast future-year travel on the entire transportation system spanning eastern Massachusetts, for the transit, auto, and walk/bike modes. The travel demand model is a tool that uses the best transportation networks, and input data available to CTPS at this time. The model set simulates multiple modes of travel for trips between areas in the modeled region, eastern Massachusetts. Population, employment, number of households, auto ownership, highway and transit levels of service, downtown parking costs, auto operating costs and transit fares are some of the most important inputs that are used in applying the model to a real world situation. These inputs are periodically updated so that the model set simulates current travel patterns with as much accuracy as possible.

The CTPS travel model set has been used in numerous modeling activities; examples include the Green Line Extension New Starts Study, and several Air Quality Conformity Determinations and LRTP for the Boston Region Metropolitan Planning Organization (MPO). In light of these activities, the four-step modeling methodology has been reviewed and accepted by the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) for regional planning activities.

Major Features of the Model

Some important features of the model set are listed below.

1. The modeled area encompasses 182 cities and towns in eastern Massachusetts. The area is divided into 2,918 internal Transportation Analysis Zones (TAZ's). There are 146 external stations around the periphery of the modeled area that allow for travel between the modeled area and adjacent areas of Massachusetts, New Hampshire, and Rhode Island.

2. The model set was developed using data from a Household Travel Survey, an External Cordon Survey, several Transit Passenger Surveys, the 2010 U.S. Census data, an employment database for the region, and a vast database of ground counts of transit ridership and traffic volume data collected over the last decade. CTPS obtained the most current transit ridership data and highway volumes available to help calibrate the model for use in this study.

3. The transportation system is broken down into three primary modes. The transit mode contains all the MBTA rail and bus lines, commuter boat services, regional transit agencies, and private express bus carriers. The auto mode includes all of the express highways, all of the principal arterials, and many minor arterials and local roadways. Walk/bike trips are also examined and are represented in the non-motorized mode.

4. The model is set up to examine travel on an average weekday for four time periods. The time periods are AM peak (3 hrs.), Midday (6 hrs.), PM peak (3 hrs.), and Night (12 hrs.) The base year is 2010. The forecast year is 2035.

The Four-Step Model Methodology

The model set is based on the traditional four-step urban transportation planning process of trip generation, trip distribution, mode choice, and trip assignment. This process is used to estimate the daily transit ridership and highway traffic volumes, based on changes to the transportation system. The model set as it relates to transit takes into consideration data on service frequency (i.e. how often trains and buses arrive at any given transit stop), routing, travel time, transit parking availability, and fares for all of the transit services. The model set on the roadway system is sensitive to roadway locations, connectivity, length, speeds, capacity, lanes, truck exclusions, turn prohibitions, and tolls. Results from the computer model provide us with detailed information relating to transit ridership demand and roadway travel.

The Four-Step Model

1. Trip Generation: In the first step, the total number of trips produced by the residents in the model area is calculated using demographic and socio-economic data. Similarly, the numbers of trips attracted by different types of land use such as employment centers, schools, hospitals, shopping centers etc., are estimated using

land use data and trip generation rates obtained from travel surveys. All of these calculations are performed at the TAZ level.

2. Trip Distribution: In the second step, the model determines how the trips produced and attracted would be matched throughout the region. Trips are distributed based on transit and highway travel times between TAZ and the relative attractiveness of each TAZ.

3. Mode Choice: Once the total number of trips between all combinations of TAZ's is determined, the mode choice step of the model splits the total trips among the available modes of travel. The modes of travel are walk/bike, auto, and transit. To determine what proportions of trips each mode receives, the model takes into account the travel times and costs associated with these options. Some of the other variables used in the mode choice modeling are auto ownership rates, household size, and income.

4. Assignment: After estimating the number of trips by mode for all possible TAZ combinations, the model assigns them to their respective transportation networks, auto or transit. Reports are produced showing the transit and highway usage and the impact on regional air quality.

Application of the Model

Once the calibration was complete, the model was run for the forecast year, 2035, using future year inputs such as projected population and employment by TAZ, in addition to transportation system characteristics. The demographic forecasts were created by the local Regional Planning Agencies (RPAs) in the model area such as the Southeastern Regional Planning and Economic Development District (SRPEDD), Old Colony Planning Council (OCPC), and Metropolitan Area Planning Council (MAPC) for use in their most currently adopted LRTP.

Service Plan

The project team provided CTPS with the service plan for the No-Build/TSM, Stoughton Electric and Whittendon Electric options. The service plan consisted station locations, fares, parking information, frequency of service by time period, and travel times between stations. The service plan information is included in the consultant's report.

Comparison with DEIR Analysis

The FEIR results are differ from the DEIR in several ways. The base year was updated from 2006 to 2010. The forecast year was extended out to from 2030 in the DEIR to 2035 in the FEIR. The list of transportation projects in the LRTP is also significantly different. The DEIR included the Urban Ring Phase II, the Silver Line Phase III connection, and a host of other projects that are not included in the most current fiscally constrained LRTP. The land use is another important change. The 2030 forecasts

were developed with an eye towards a lot of population growth in the suburbs and employment growth in the major cities, like Boston and Taunton in the study area. Given the current economic climate, the 2035 forecasts have been scaled back in absolute numbers, along with a more targeted smart growth approach. The FEIR service plans for the Stoughton Electric and Whittendon options also differ slightly from those used in the DEIR, being more refined and the FEIR now includes a feeder bus network that compliments the proposed stations.

All of these changes have led to demand estimates in the FEIR that are between 10% and 20% lower for the bus and commuter alternatives than were estimated in the DEIR. The most significant change is the land use assumed in 2035, which drives the trip making from population locations (South Coast Rail Study area) to employment centers, namely Boston and Cambridge.

Conclusion

The results of this analysis show that the Stoughton and Whittendon Electric options capture a significant number of trips, between 7,400 and 6,600 respectively on a daily basis in 2035 relative to the No-Build scenario that would have otherwise been made by auto. This translates into a VMT savings, VHT reduction, and emissions benefits, which are shown in Table 2. The major difference between the two commuter rail alternatives are travel times for trains traveling the outer stations, south of Taunton, into Boston. The longer travel times from New Bedford and Fall River up through Taunton in the Whittendon Electric option reduces demand at these stations (see Appendix B). The stations in Taunton also see a reduction in the Whittendon Electric option, but drive access demand increases at Raynham Station, due to people willing to bypass the slower segment of train travel and pick up the line north of the delay during the AM time inbound commute. These results show the same pattern as observed in the DEIR for the electric options, although they are showing less demand. This is primarily a function of the most current RPA adopted land use assumptions in the model area and represents a more conservative view of future smart growth strategy consistent with the South Coast Rail Corridor Plan.

cc: Steve Woelfel, MassDOT
Natasha Velickovic, VHB
Ying Bao, CTPS
Grace King, CTPS

Note: Appendices to the December 17, 2012 CTPS Ridership Memo are omitted because they are superseded by the appendices to the February 26, 2013 CTPS Ridership Memo, provided earlier in this appendix to the FEIS/FEIR.

Appendix 4.1-A

Route 24 Growth Projections

South Coast Rail Project
Route 24 Growth Projection Analysis
2030 No-Build and Build (Rapid Bus Alternative) Conditions

VHB Project No. 10111.31

		Existing Conditions		Freetown Background Traffic[1]		Taunton ETIP[1]		CTPS Annual Growth Forecast		2030 No Build Conditions		Vehicle Reduction[2]		Rapid Bus Trips[3]		2030 Rapid Bus[4]	
Location	Direction	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Off-Peak Direction	Peak Direction	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Weekday Morning Peak Hour	Weekday Evening Peak Hour
I-93 south of Route 3	NB	5950	4755	4	20	0	1	0.1%	0.5%	6645	4880	*944*	*89*	*22*	*4*	5701	4791
	SB	6985	7375	20	4	1	0	0.1%	0.5%	7160	8235	*64*	*893*	*4*	*22*	7096	7342
I-93 south of Furnace Brook Parkway	NB	7845	5310	4	20	0	1	0.1%	0.5%	8760	5450	*944*	*89*	*22*	*4*	7816	5361
	SB	5085	7255	20	4	1	0	0.1%	0.5%	5220	8100	*64*	*893*	*4*	*22*	5156	7207
Route 24, south of I-93	NB	5100	2770	7	40	1	3	0.1%	0.5%	5700	2875	*944*	*89*	*22*	*4*	4756	2786
	SB	3400	6110	40	9	3	1	0.1%	0.5%	3520	6830	*64*	*893*	*4*	*22*	3456	5937
Route 24, south of Pond Street	NB	5355	3330	7	40	1	3	0.1%	0.5%	5985	3445	*944*	*89*	*22*	*4*	5041	3356
	SB	3070	6010	40	9	3	1	0.1%	0.5%	3180	6715	*64*	*893*	*4*	*22*	3116	5822
Route 24, north of Route 123	NB	5405	3255	18	100	2	7	0.1%	0.5%	6050	3435	*944*	*89*	*22*	*4*	5106	3346
	SB	2350	5445	99	22	7	2	0.1%	0.5%	2510	6100	*64*	*893*	*4*	*22*	2446	5207
Route 24, north of I-495	NB	5260	3435	36	200	3	7	0.1%	0.5%	5910	3720	*944*	*89*	*22*	*4*	4988	3635
	SB	2630	4755	198	45	13	2	0.1%	0.5%	2900	5355	*57*	*893*	*4*	*22*	2847	4484
Route 24, north of Route 44	NB	3930	2475	196	1102	17	72	0.1%	1.0%	5105	3705	*944*	*89*	*22*	*4*	4183	3620
	SB	2110	3860	1091	246	72	19	0.1%	1.0%	3320	5070	*57*	*893*	*4*	*22*	3267	4199
Route 24, north of Route 140	NB	3795	2060	268	1503	30	130	0.1%	1.0%	5020	3740	*651*	*51*	*18*	*3*	4387	3692
	SB	1860	3910	1487	336	131	35	0.1%	1.0%	3520	5240	*38*	*619*	*3*	*18*	3485	4639
Route 24, south of Route 140	NB	2800	1600	339	1904	73	19	0.1%	0.5%	3535	3560	*32*	*26*	*6*	*1*	3509	3535
	SB	1355	2875	1884	426	16	72	0.1%	0.5%	3285	3705	*19*	*51*	*1*	*6*	3267	3660
Route 24, north of Route 79	NB	1835	1610	357	2004	71	18	0.1%	0.5%	2475	3670	*32*	*26*	*6*	*1*	2449	3645
	SB	1430	2390	1983	448	16	70	0.1%	0.5%	3460	3185	*19*	*51*	*1*	*6*	3442	3140
Route 24 at Fall River Freetown Line	NB	2030	1890	2505	636	69	18	0.1%	0.5%	4840	2585	*0*	*13*	*6*	*1*	4846	2573
	SB	1770	2590	917	2530	15	68	0.1%	0.5%	2740	5490	*13*	*0*	*1*	*6*	2728	5496
Route 138, south of Bay Street	-	1345	1565	0	0	0	0	0.1%	0.5%	1435	1670	*0*	*0*			1435	1670
Route 138, south of Route 106	-	1400	1555	0	0	0	0	0.1%	0.5%	1495	1660	*0*	*0*			1495	1660
Route 140, north of Hathaway Road	NB	2015	2085	21	120	31	140	0.1%	0.5%	2300	2390	*593*	*51*	*8*	*1*	1715	2340
	SB	2160	2225	119	27	140	37	0.1%	0.5%	2465	2545	*32*	*542*	*1*	*8*	2434	2011
Route 140, south of Route. 24	EB	830	1740	50	281	344	91	0.1%	0.5%	1320	2150	*32*	*542*	*1*	*8*	1289	1616
	WB	1595	1060	278	63	75	342	0.1%	0.5%	1985	1590	*593*	*51*	*8*	*1*	1400	1540

1 Vehicle trips represent projected Route 24 traffic associated with the background developments identified in section 3.1.2.
2 Reduction (in vehicles per hour) in the number of passenger vehicles using Route 24 under the Rapid Bus Alternative. Based on the CTPS travel demand model.
3 Number of Rapid Bus vehicles on Route 24 during the peak hour. *Note* : North of Route 123 the rapid bus travels in an exclusive bus lane and does not affect vehicle operations along the general purpose lanes on Route 24.
4 Expected 2030 Route 24 peak hour traffic volumes under the Rapid Bus Alternative.

Appendix 4.1-B

Crash Data and Rate Analysis

SAFETY ANALYSIS SUMMARY TABLES

Table 1: Accidents on Primary Study Area Highways

	2004	2005	2006	Annual Percent Change
Accidents				
Route 24	865	1021	1025	9.2%
Route 140	247	253	256	1.8%
Route 93	659	1002	1056	28.7%
Total	1771	2276	2337	15.6%
Injuries				
Route 24	428	487	533	11.6%
Route 140	134	116	118	-5.9%
Route 93	330	433	367	8.0%
Total	892	1016	1018	7.0%
Fatalities				
Route 24	7	9	6	-2.4%
Route 140	3	4	5	29.2%
Route 93	4	3	5	20.8%
Total	14	16	16	7.1%

Massachusetts Highway Department, Accident Database, 2006.

Table 2: I-93 - Vehicular Crash Summary

	Randolph 2.7 miles [1]	Braintree 1.8 miles	Quincy 2.6 miles	Milton 1.5 miles	Boston 8.3 miles
Year					
2004	84	153	143	119	154
2005	135	219	286	232	129
2006	131	215	326	220	162
Total	350	587	755	571	445
Collision Type					
Angle	32	54	70	36	30
Head-on	4	7	7	6	2
Rear-end	155	313	445	376	263
Rear-to-Rear	1	3	2	0	3
Sideswipe	56	72	86	59	54
Single-vehicle crash	85	113	103	61	41
Unknown	17	25	42	33	52
Total	350	587	755	571	445
Severity					
Fatal	0	2	5	1	3
Injury	96	196	242	162	128
Property-related	227	346	421	365	233
Unknown	27	43	87	43	81
Total	350	587	755	571	445
Time of day					
Weekday, 7:00 AM - 9:00 AM	43	53	90	80	63
Weekday, 4:00 PM - 6:00 PM	34	86	99	69	22
Saturday, 11:00 AM - 2:00 PM	10	11	16	12	9
Weekday, other time	181	311	398	310	250
Weekend, other time	82	126	152	100	101
Total	350	587	755	571	445
Pavement Conditions					
Dry	253	420	542	431	316
Wet	72	137	173	117	83
Snow	12	10	8	8	13
Ice/Slush	8	3	14	2	7
Other	1	3	3	3	3
Unknown	4	14	15	10	23
Total	350	587	755	571	445

Source: MassHighway Crash Data

1 Approximate segment lengths

Table 3: Route 24 - Vehicular Crash Summary

	Fall River 9.5 miles [1]	Freetown 1.2 miles	Assonet n/a	Berkley 3.1 miles	Taunton 2.7 miles	Raynham 3.4 miles	Bridgewater 3.1 miles	West Bridgewater 4.4 miles	Brockton 3.8 miles	Avon 2.4 miles	Stoughton 1.5 miles	Canton 0.4 miles	Randolph 2.6 miles
Year													
2004	153	55	2	34	79	104	79	67	104	61	53	8	62
2005	140	79	7	32	80	115	92	86	163	63	67	4	90
2006	139	52	2	29	115	135	90	75	128	63	78	11	103
Total	432	186	11	95	274	354	261	228	395	187	198	23	255
Collision Type													
Angle	42	18	3	9	28	39	37	28	55	17	14	3	21
Head-on	6	2	0	0	1	1	3	1	1	2	1	0	0
Rear-end	106	38	2	28	154	159	85	83	149	80	88	10	109
Rear-to-Rear	0	1	0	0	1	2	0	0	1	0	1	0	1
Sideswipe	29	13	0	3	22	27	23	30	53	23	24	1	41
Single-vehicle crash	238	110	5	52	60	109	107	79	119	59	59	6	64
Unknown	11	4	1	3	8	17	6	7	17	6	11	3	19
Total	432	186	11	95	274	354	261	228	395	187	198	23	255
Severity													
Fatal	6	3	0	2	0	0	2	1	3	1	3	0	0
Injury	157	64	3	46	80	105	89	80	153	86	78	6	83
Property-related	255	115	6	43	180	220	150	131	215	89	108	13	143
Unknown	14	4	2	4	14	29	20	16	24	11	9	4	29
Total	432	186	11	95	274	354	261	228	395	187	198	23	255
Time of day													
Weekday, 7:00 AM - 9:00 AM	41	16	1	14	36	41	36	26	49	26	30	2	36
Weekday, 4:00 PM - 6:00 PM	40	10	0	8	44	83	34	29	37	22	19	4	27
Saturday, 11:00 AM - 2:00 PM	22	11	0	1	3	11	4	4	6	4	2	0	5
Weekday, other time	217	99	6	50	141	154	125	122	219	92	95	12	127
Weekend, other time	112	50	4	22	50	65	62	47	84	43	52	5	60
Total	432	186	11	95	274	354	261	228	395	187	198	23	255
Pavement Conditions													
Dry	273	137	4	66	193	259	157	156	283	138	153	17	184
Wet	122	28	5	24	64	69	93	53	79	39	34	6	47
Snow	19	17	2	2	6	5	6	11	14	4	5	0	8
Ice/Slush	14	4	0	2	7	12	5	4	10	2	4	0	7
Other	2	0	0	0	1	1	0	2	4	0	2	0	1
Unknown	2	0	0	1	3	8	0	2	5	4	0	0	8
Total	432	186	11	95	274	354	261	228	395	187	198	23	255

Source: MassHighway Crash Data

1 Approximate segment lengths

Table 4: Route 140 - Vehicular Crash Summary

	New Bedford 8.0 miles [1]	Freetown 3.0 miles	Lakeville 4.8 miles	Taunton 11.2 miles
Year				
2004	120	11	20	101
2005	119	19	26	87
2006	144	12	10	89
Total	383	42	56	277
Collision Type				
Angle	42	6	3	46
Head-on	4	1	0	3
Rear-end	131	6	9	138
Rear-to-Rear	0	0	0	0
Sideswipe	29	3	2	22
Single-vehicle crash	167	26	40	58
Unknown	10	0	2	10
Total	383	42	56	277
Severity				
Fatal	7	2	2	0
Injury	139	14	18	88
Property-related	218	26	35	170
Unknown	19	0	1	19
Total	383	42	56	277
Time of day				
Weekday, 7:00 AM - 9:00 AM	47	5	6	40
Weekday, 4:00 PM - 6:00 PM	48	8	6	29
Saturday, 11:00 AM - 2:00 PM	10	1	0	6
Weekday, other time	198	19	28	145
Weekend, other time	80	9	16	57
Total	383	42	56	277
Pavement Conditions				
Dry	255	36	41	200
Wet	99	4	6	63
Snow	10	2	6	5
Ice/Slush	12	0	1	3
Other	2	0	1	0
Unknown	5	0	1	6
Total	383	42	56	277

Source: MassHighway Crash Data

1 Approximate segment lengths

Table 5: Park and Ride Intersection Crash Summary[1]

	West Center St. (Route 106)/ Pleasant Street	Mt. Pleasant St. at Park and Ride
Year		
2004	1	0
2005	0	1
2006	3	0
Total	4	1
Collision Type		
Angle	1	0
Head-on	1	0
Rear-end	0	0
Sideswipe	1	1
Single Vehicle Crash	1	0
Unknown	0	0
Total	4	1
Severity		
Property Damage	2	1
Personal Injury	2	0
Fatality	0	0
Hit and Run	0	0
Unknown	0	0
Total	4	1
Conditions		
Dry	4	0
Wet	0	1
Ice/snow	0	0
Other	0	0
Unknown	0	0
Total	4	1
Time of Day		
7:00 – 9:00 AM	1	0
4:00 – 6:00 PM	1	0
Remainder of day	2	1
Total	4	1
Avg. Crash Rate[2] (MEV[3])	0.16	0.07
MassHighway District 5 Crash Rates	0.59	0.59

[1]Source: MassHighway Crash database 2004-2006

[2]MassHighway District 5 average crash rate is 0.59 for unsignalized intersections. Both intersections do not exceed District average.

[3]MEV=Million entering vehicles

Table 6: New Bedford Vehicular Crash Summary – Whale's Tooth Station Area

	Acushnet St at Hillman St	Herman Melville Blvd at McArthur Dr	Hillman St at Purchase	Kempton St at Pleasant at Purchase at Mill St	Union St at Route 18
Year					
2004	2	0	4	1	4
2005	1	0	2	1	1
2006	1	1	1	1	8
Total	4	1	7	3	13
Collision Type					
Angle	2	0	1	1	5
Head-on	0	0	0	0	0
Rear-end	1	0	2	1	3
Sideswipe	0	0	2	0	2
Single-vehicle crash	1	1	1	1	2
Unknown	0	0	1	0	1
Total	4	1	7	3	13
Severity					
Fatality	0	0	0	0	0
Injury	3	0	2	0	0
Property-related	1	1	4	2	8
Unknown	0	0	1	1	3
Total	4	1	7	3	11
Time of day					
Weekday, 7:00 AM - 9:00 AM	0	0	0	0	1
Weekday, 4:00 PM - 6:00 PM	0	0	0	0	1
Saturday, 11:00 AM - 2:00 PM	0	0	0	1	2
Weekday, other time	3	0	7	2	7
Weekend, other time	1	1	0	0	2
Total	4	1	7	3	13
Pavement Conditions					
Dry	2	1	5	3	10
Wet	2	0	1	0	3
Snow	0	0	0	0	0
Ice/Slush	0	0	0	0	0
Unknown	0	0	1	0	0
Total	4	1	7	3	13
Calculated Crash Tables	0.65	0.13	0.38	0.11	0.36
MassHighway District 5 Crash Rates	0.59	0.59	0.84	0.84	0.84

Table 6: New Bedford Vehicular Crash Summary - Whale's Tooth Station Area (Continued)

	Purchase St at Coggeshall St	Coggeshall St at Route 18 NB	Coggeshall St at Route 18 SB	North Front St at Coggeshall St	Belleville Ave at Coggeshall St	Weld St at Purchase St	Logan St at North Front St	Logan St at Purchase St	Wamsutta St at Acushnet Ave/	Logan St at Acushnet Ave	Purchase St at Route 18 SB Exit Ramp
Year											
2004	6	2	24	4	4	2	4	9	1	0	0
2005	7	10	16	1	7	1	3	2	2	0	1
2006	1	4	11	3	6	3	2	3	3	1	4
Total	14	16	51	8	17	6	9	14	6	1	5
Collision Type											
Angle	9	7	36	5	8	5	4	4	0	0	1
Head-on	0	0	1	0	1	0	0	2	0	1	0
Rear-end	0	4	5	1	4	0	4	3	1	0	2
Sideswipe	1	1	5	1	2	0	1	2	1	0	0
Single-vehicle crash	3	3	2	0	2	1	0	3	4	0	1
Unknown	1	1	2	1	0	0	0	0	0	0	1
Total	14	16	51	8	17	6	9	14	6	1	5
Severity											
Fatality	0	0	0	0	0	0	0	0	0	0	0
Injury	6	3	14	3	6	3	4	4	1	0	1
Property-related	7	13	31	3	11	2	4	8	4	1	3
Unknown	1	0	6	2	0	1	1	2	1	0	1
Total	14	16	51	8	17	6	9	14	6	1	5
Time of day											
Weekday, 7:00 AM - 9:00 AM	0	2	1	2	1	1	4	0	0	0	0
Weekday, 4:00 PM - 6:00 PM	1	1	6	1	2	2	0	3	1	0	1
Saturday, 11:00 AM - 2:00 PM	0	0	0	0	0	0	0	0	0	0	0
Weekday, other time	8	7	29	4	11	3	4	9	4	1	3
Weekend, other time	5	6	15	1	3	0	1	2	1	0	1
Total	14	16	51	8	17	6	9	14	6	1	5
Pavement Conditions											
Dry	11	14	42	7	13	5	1	8	4	1	3
Wet	3	2	8	1	3	1	3	4	2	0	2
Snow	0	0	0	0	0	0	0	1	0	0	0
Ice/Slush	0	0	1	0	0	0	5	0	0	0	0
Unknown	0	0	0	0	1	0	0	1	0	0	0
Total	14	16	51	8	17	6	9	14	6	1	5
Calculated Crash Tables	1.01	0.86	2.92	0.58	0.63	0.49	1.18	1.18	3.20	0.23	0.46
MassHighway District 5 Crash Rates	0.59	0.84	0.84	0.59	0.84	0.59	0.59	0.59	0.59	0.59	0.59

Table 7: New Bedford Vehicular Crash Summary – King's Highway Station Area

	Ashley Blvd (Route 18) at Wood St	Church St at Nash Rd	Church St at Park Ave	Church St at Tarkiln Hill Rd	King's Highway at Route 140 NB Ramps	King's Highway/ Jones St at Mt Pleasant St	King's Highway at Shaw's driveway*	King's Highway at Stop & Shop driveway*	King's Highway at Tarkiln Hill Rd
Year									
2004	3	4	11	5	2	5	5	11	4
2005	3	4	6	4	2	6	2	4	1
2006	1	2	11	9	0	5	3	2	2
Total	7	10	28	18	4	16	10	17	7
Collision Type									
Angle	6	6	23	11	1	4	1	6	4
Head-on	0	1	0	0	0	0	1	0	1
Rear-end	0	2	2	3	3	12	5	9	0
Sideswipe	0	1	2	0	0	0	3	0	0
Single-vehicle crash	1	0	0	2	0	0	0	1	2
Unknown	0	0	1	2	0	0	0	1	0
Total	7	10	28	18	4	16	10	17	7
Severity									
Fatality	0	0	0	0	0	0	0	0	0
Injury	2	3	15	4	0	4	3	11	2
Property-related	5	7	12	11	4	9	6	3	4
Unknown	0	0	1	3	0	3	1	3	1
Total	7	10	28	18	4	16	10	17	7
Time of day									
Weekday, 7:00 AM - 9:00 AM	0	1	0	2	1	0	0	1	1
Weekday, 4:00 PM - 6:00 PM	0	2	8	2	1	4	2	4	1
Saturday, 11:00 AM - 2:00 PM	0	0	3	1	0	0	0	0	1
Weekday, other time	6	4	12	10	1	11	5	9	4
Weekend, other time	1	3	5	3	1	1	3	3	0
Total	7	10	28	18	4	16	10	17	7
Pavement Conditions									
Dry	2	7	20	12	2	10	6	12	4
Wet	4	3	7	3	2	6	4	4	3
Snow	1	0	0	1	0	0	0	0	0
Ice/Slush	0	0	0	1	0	0	0	0	0
Unknown	0	0	1	1	0	0	0	1	0
Total	7	10	28	18	4	16	10	17	7
Calculated Crash Rates	0.40	0.50	1.69	0.71	0.16	0.64	0.46	0.62	0.26
MassHighway District 5 Crash Rates	0.84	0.84	0.59	0.84	0.84	0.59	0.84	0.84	0.59

* Due to lack of information on the accident reports, the total number of crashes reported for these two intersections might account for crashes inside the King's Plaza parking Lot and Fieldston Market parking lot.

Table 8: Freetown Vehicular Crash Summary

	S Main St at High Street	S Main St at Narrows St	S Main St at Ridge Hill Rd	S Main St at Route 24 SB Ramps
Year				
2004	1	1	1	0
2005	0	1	2	1
2006	0	2	1	0
Total	1	4	4	1
Collision Type				
Angle	0	2	3	1
Rear-end	1	1	0	0
Single-vehicle crash	0	1	0	0
Unknown	0	0	1	0
Total	1	4	4	1
Severity				
Fatal Injury	0	0	0	0
Injury	1	1	1	1
Property-related	0	3	2	0
Unknown	0	0	1	0
Total	1	4	4	1
Time of day				
Weekday, 7:00 AM - 9:00 AM	1	0	0	0
Weekday, other time	0	4	3	1
Weekend, other time	0	0	1	0
Total	1	4	4	1
Pavement Conditions				
Dry	1	4	2	1
Wet	0	0	2	0
Total	1	4	4	1
Calculated Crash Rates	0.08	0.45	0.30	0.09
MassHighway District 5 Crash Rates	0.59	0.59	0.59	0.59

Table 9: Fall River Station Vehicular Crash Summary

	Anawan St/ Pocasset St at Davol St	Davol St at Central	N Davol St at President Ave	N Davol St at Turner St	N Main St at President Ave	S Davol St at President Ave	Water St at Anawan St	Ferry St at Water St
Year								
2004	3	0	17	2	15	1	3	1
2005	2	0	18	1	5	2	0	0
2006	2	6	25	1	9	1	1	0
Total	7	6	60	4	29	4	4	1
Collision Type								
Angle	3	4	27	0	14	1	1	0
Head-on	0	0	3	0	0	0	0	0
Rear-end	2	2	20	1	9	1	1	0
Rear-to-rear	0	0	0	0	0	0	0	0
Sideswipe	1	0	6	2	4	1	1	0
Single-vehicle crash	0	0	3	1	2	1	1	1
Unknown	1	0	1	0	0	0	0	0
Total	7	6	60	4	29	4	4	1
Severity								
Fatality	0	0	0	0	0	0	0	0
Injury	0	1	15	1	5	0	0	0
Property-related	7	5	45	3	24	2	3	1
Unknown	0	0	0	0	0	2	1	0
Total	7	6	60	4	29	4	4	1
Time of day								
Weekday, 7:00 AM - 9:00 AM	0	0	2	1	1	2	0	0
Weekday, 4:00 PM - 6:00 PM	2	2	7	1	3	0	0	0
Saturday, 11:00 AM - 2:00 PM	0	0	3	1	1	0	1	0
Weekday, other time	2	3	32	1	16	2	2	1
Weekend, other time	3	1	16	0	8	0	1	0
Total	7	6	60	4	29	4	4	1
Pavement Conditions								
Dry	4	3	50	4	25	3	2	0
Wet	2	3	8	0	3	1	2	0
Snow	1	0	2	0	1	0	0	0
Ice/Slush	0	0	0	0	0	0	0	1
Total	7	6	60	4	29	4	4	1
Calculated Crash Rates	0.47	0.37	2.42	0.34	1.14	0.16	0.63	0.17
MassHighway District 5 Crash Rates	0.59	0.59	0.84	0.59	0.84	0.84	0.59	0.59

Table 10: Easton Vehicular Crash Summary

	Elm St at North Main St	Lincoln St at Barrows St	Lincoln St at Center St at Main St	Route 138 at Belmont St / Route 123	Route 138/ Washington St at Elm St	Route 138 / Washington St at Main St	Route 138/Washington St at Union St	Route 138/Washington St at Roosevelt Circle
Year								
2004	1	1	4	3	5	5	2	1
2005	1	0	1	6	6	6	1	0
2006	3	0	4	3	6	13	5	2
Total	5	1	9	12	17	24	8	3
Collision Type								
Angle	0	1	4	8	12	15	6	1
Head-on	0	0	1	0	0	1	2	0
Rear-end	3	0	2	2	1	7	0	1
Sideswipe	1	0	1	2	3	1	0	0
Single-vehicle crash	1	0	1	0	0	0	0	0
Unknown	0	0	0	0	1	0	0	1
Total	5	1	9	12	17	24	8	3
Severity								
Fatality	0	0	0	0	0	0	0	0
Injury	0	0	3	4	4	5	3	2
Property-related	5	1	4	7	10	19	4	1
Unknown	0	0	2	1	3	0	1	0
Total	5	1	9	12	17	24	8	3
Time of day								
Weekday, 7:00 AM - 9:00 AM	1	0	2	1	4	4	2	0
Weekday, 4:00 PM - 6:00 PM	1	1	3	2	3	7	0	0
Saturday, 11:00 AM - 2:00 PM	0	0	0	1	0	0	0	0
Weekday, other time	3	0	3	6	8	11	2	1
Weekend, other time	0	0	1	2	2	2	4	2
Total	5		9	12	17	24	8	3
Pavement Conditions								
Dry	4	1	8	11	12	19	4	3
Wet	1	0	0	1	3	4	3	0
Snow	0	0	1	0	0	1	1	0
Unknown	0	0	0	0	2	0	0	0
Total	5	1	9	12	17	24	8	3
Calculated Crash Rates	0.68	0.09	0.50	0.43	0.56	0.78	0.34	0.18
MassHighway District 5 Crash Rates	0.59	0.59	0.59	0.84	0.59	0.84	0.59	0.59

Table 11: Raynham Vehicular Crash Summary

	Route 138 at I-495 NB Off-Ramp	Route 138 at I-495 SB Off-Ramp	Route 138 at I-495 SB On-Ramp	Route 138/ Broadway St at Britton St	Route 138/ Broadway St at Carver St	Route 138/ Broadway St at Center St	Route 138/ Broadway St at Elm St	Route 138/Turnpike Street at Robinson St.
Year								
2004	1	0	0	1	5	1	3	0
2005	1	1	0	1	3	1	1	2
2006	0	1	1	1	10	1	1	1
Total	2	2	1	3	18	3	5	3
Collision Type								
Angle	2	0	1	1	9	1	3	0
Rear-end	0	1	0	1	1	1	1	0
Sideswipe	0	1	0	1	3	0	1	0
Single-vehicle crash	0	0	0	0	1	0	0	2
Unknown	0	0	0	0	4	1	0	1
Total	2	2	1	3	18	3	5	3
Severity								
Fatality	0	0	0	0	0	0	0	0
Injury	0	1	1	0	8	1	0	1
Property-related	2	1	0	2	5	2	4	2
Unknown	0	0	0	1	5	0	1	1
Total	2	2	1	3	18	3	5	3
Time of day								
Weekday, 7:00 AM - 9:00 AM	1	1	1	1	1	0	1	0
Weekday, 4:00 PM - 6:00 PM	0	1	0	0	2	0	0	0
Weekday, other time	1	0	0	2	11	3	3	1
Weekend, other time	0	0	0	0	4	0	1	2
Total	2	2	1	3	18	3	5	3
Pavement Conditions								
Dry	0	2	1	0	12	3	4	1
Wet	2	0	0	2	3	0	1	1
Ice/Slush	0	0	0	1	0	0	0	0
Snow	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	3	0	0	0
Total	2	2	1	3	18	3	5	3
Calculated Crash Rates	0.07	0.06	0.03	0.13	0.53	0.11	0.18	0.15
MassHighway District 5 Crash Rates	0.59	0.59	0.59	0.59	0.84	0.59	0.84	0.59

Table 12: Taunton Stations Study Area Vehicular Crash Summary

	Route 140 at Route 24 NB Ramps	Hart St at County St/ Route 140	Stevens St at Galleria Mall Ramp	County St at Galleria Mall Dr	Taunton Depot Dr at Route 140	Broadway at Taunton Green	Kilmer St at Lowell St and Oak St	Wash. St at Frederick R. Martin Sr. Pkwy	Taunton Green at Cohannet St	Taunton Green at Court St	Tremont St at Wash. St/ Oak St	Court St at Wash. St	Weir St at Taunton Green	Route 44 at Route 104	Union St/ Summer St at Main St	Dean St at Arlington St	Longmeadow Rd. at Dean St	Purchase St at Wash. St
Year																		
2004	0	15	6	1	4	2	2	0	4	3	1	4	13	4	3	1	13	14
2005	1	15	6	5	3	2	5	0	1	3	8	5	4	4	3	5	13	11
2006	1	16	5	3	1	5	5	1	6	8	12	3	6	4	1	3	12	11
Total	2	46	17	9	8	9	12	1	11	14	21	12	23	12	7	9	38	36
Collision Type																		
Angle	0	29	14	5	5	1	8	1	6	6	6	5	9	2	3	1	17	33
Head-on	0	3	1	1	0	0	0	0	0	0	1	0	0	1	0	0	2	1
Rear-end	2	9	0	3	2	3	1	0	1	1	10	1	8	5	4	7	14	1
Sideswipe	0	3	0	0	1	1	1	0	4	4	0	3	3	2	0	0	4	0
Single-vehicle crash	0	1	2	0	0	3	2	0	0	3	3	2	3	1	0	0		0
Unknown	0	1	0	0	0	1	0	0	0	0	1	1	0	1	0	1	1	1
Total	2	46	17	9	8	9	12	1	11	14	21	12	23	12	7	9	38	36
Severity																		
Fatality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Injury	1	14	9	2	1	2	3	0	0	2	6	1	8	5	4	1	14	11
Fatal Injury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Property-related	1	27	7	6	7	7	7	1	9	12	12	9	14	6	2	7	20	22
Unknown	0	5	1	1	0	0	2	0	2	0	3	2	1	1	1	1	4	3
Total	2	46	17	9	8	9	12	1	11	14	21	12	23	12	7	9	38	36
Time of day																		
Weekday, 7:00AM to 9:00AM	0	1	1	1	0	0	1	1	1	1	2	0	1	0	0	2	1	6
Weekday, 4:00PM to 6:00PM	0	5	3	1	0	3	1	0	1	3	2	0	4	1	1	0	4	6
Saturday, 11:00AM to 2:00PM	0	5	1	0	1	0	1	0	0	0	2	0	3	1	0	1	2	0
Weekday, other time	0	20	9	6	4	5	6	0	7	9	11	10	11	7	6	3	23	20
Weekend, other time	2	15	3	1	3	1	3	0	2	1	4	2	4	3	0	3	8	4
Total	2	46	17	9	8	9	12	1	11	14	21	12	23	12	7	9	38	36
Pavement Conditions																		
Dry	1	38	8	7	6	8	11	0	11	12	19	9	19	11	5	4	31	29
Wet	1	8	7	1	2	1	1	1	0	2	2	3	4	1	2	4	7	6
Ice	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Snow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Total	2	46	17	9	8	9	12	1	11	14	21	12	23	12	7	9	38	36
Calculated Crash Rates	0.04	1.37	1.19	0.52	0.26	0.38	1.33	0.04	0.46	0.64	0.77	0.52	0.68	0.39	0.33	0.37	0.91	3.77
MassHighway District 5 Crash Rates	0.59	0.84	0.84	0.84	0.84	0.84	0.59	0.59	0.59	0.59	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.59

Table 12: (Continued) Taunton Stations Study Area Vehicular Crash Summary

	School St at Arlington St	Spring St at Summer St	Winter St at Floral St at School St	Wash. St at Randall St	Wash. St at Mozzone Blvd.
Year					
2004	3	2	6	1	2
2005	12	1	9	0	0
2006	6	18	0	0	0
Total	21	21	15	1	2
Collision Type					
Angle	17	14	12	1	2
Head-on	1	3	0	0	0
Rear-end	1	2	1	0	0
Sideswipe	0	2	0	0	0
Single-vehicle crash	0	0	2	0	0
Unknown	2	0	0	0	0
Total	21	21	15	1	2
Severity					
Fatality	0	0	0	0	0
Injury	8	5	2	0	0
Fatal Injury	0	0	0	0	2
Property-related	12	13	12	1	0
Unknown	1	3	1	0	0
Total	21	21	15	1	2
Time of day					
Weekday, 7:00AM to 9:00AM	2	3	4	0	0
Weekday, 4:00PM to 6:00PM	1	2	4	0	0
Saturday, 11:00AM to 2:00PM	0	1	0	0	0
Weekday, other time	15	11	6	0	1
Weekend, other time	3	4	1	1	1
Total	21	21	15	1	2
Pavement Conditions					
Dry	17	18	11	1	2
Wet	3	3	4	0	0
Ice	0	0	0	0	0
Snow	1	0	0	0	0
Total	21	21	15	1	2
Calculated Crash Rates	2.00	1.23	1.01	0.04	0.02
MassHighway District 5 Crash Rates	0.59	0.84	0.59	0.84	0.59

Table 13: Norton Vehicular Crash Summary

	Dean St at John B. Scott Blvd	S Worcester St at John B. Scott Blvd	W. Main St at Old Colony Rd at N Worcester St
Year			
2004	0	0	0
2005	1	0	1
2006	1	1	1
Total	2	1	2
Collision Type			
Angle	1	0	2
Rear-end	1	0	0
Single-vehicle crash	0	1	0
Total	2	1	2
Severity			
Fatality	0	0	0
Injury	0	0	1
Property-related	2	1	1
Total	2	1	2
Time of day			
Weekday, 4:00 PM - 6:00 PM	0	0	1
Weekday, other time	1	1	1
Weekend, other time	1	0	0
Total	2	1	2
Pavement Conditions			
Dry	2	1	2
Total	2	1	2
Calculated Crash Rates	0.24	0.09	0.10
MassHighway District 5 Crash Rates	0.59	0.59	0.59

Appendix B – Crash Data & Rate Analysis

		TAUNTON	1/1/2004	12/31/2006	similar to: Summer Route							
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather
COUNTY STREET Rte 140	Rte 24	12/17/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET Rte 140 N	Rte 24	9/17/2005	8:16:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain
COUNTY STREET	HART STREET	1/2/2004	9:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET Rte 140 N	HART STREET	1/6/2004	3:29:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET Rte 140 S	HART STREET	1/17/2004	9:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET Rte 140 S	HART STREET	2/20/2004	1:04:00 PM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Daylight	Clear
COUNTY STREET	HART AVENUE	2/21/2004	11:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Cloudy
HART STREET	COUNTY STREET	2/28/2004	9:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET Rte 140 N	HART STREET	3/21/2004	10:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Cloudy
HART STREET	COUNTY STREET	4/17/2004	10:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COUNTY STREET Rte 140 N	HART STREET	5/7/2004	10:24:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear
COUNTY STREET	HART STREET	6/10/2004	9:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	HART STREET	6/30/2004	3:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET	HART STREET	6/30/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET Rte 140 N	HART STREET	8/10/2004	5:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COUNTY STREET	HART STREET	11/29/2004	12:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
HART STREET	COUNTY STREET	12/11/2004	11:00:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET Rte 140 N	HART STREET	1/22/2005	10:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
HART STREET	COUNTY STREET	2/15/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy
COUNTY STREET Rte 140	HART STREET	2/17/2005	12:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
COUNTY STREET Rte 140 N	HART STREET	3/4/2005	2:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
HART STREET	COUNTY STREET	3/5/2005	4:10:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
HART STREET	COUNTY STREET	3/5/2005	1:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COUNTY STREET Rte 140	HART STREET	4/19/2005	10:46:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
HART STREET	COUNTY STREET Rte 140 S	5/21/2005	12:59:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Rain
COUNTY STREET	HART STREET	6/2/2005	10:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
COUNTY STREET Rte 140 S	HART STREET	6/4/2005	9:30:00 PM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear
COUNTY STREET Rte 140	HART STREET	7/8/2005	8:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain
COUNTY STREET Rte 140	HART STREET	9/19/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET	HART STREET	9/23/2005	9:10:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COUNTY STREET	HART STREET	10/8/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain
COUNTY STREET Rte 140	HART STREET	12/30/2005	2:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear
COUNTY STREET	HART STREET	1/13/2006	5:27:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear
COUNTY STREET	HART STREET	1/28/2006	1:02:00 PM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET Rte 140	HART STREET	1/29/2006	7:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Rain
COUNTY STREET Rte 140	HART STREET	2/20/2006	2:33:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET Rte 140	HART STREET	3/20/2006	6:46:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET	HART STREET	4/9/2006	10:20:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear
COUNTY STREET	HART STREET	4/19/2006	10:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
HART STREET	COUNTY STREET	5/5/2006	9:37:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COUNTY STREET	HART STREET	5/13/2006	1:52:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain
HART STREET	COUNTY STREET Rte 140	7/29/2006	2:10:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET Rte 140 S	HART STREET	8/14/2006	9:32:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET	HART STREET	10/2/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET Rte 140 N	HART STREET	10/7/2006	12:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	HART STREET	11/12/2006	5:47:00 PM	Non-fatal injury	2	2	0	Head-on	Head-on	Wet	Dark - lighted roadway	Clear
HART STREET	COUNTY STREET	11/16/2006	8:30:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	HART STREET	11/28/2006	7:00:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Rain
STEVENS STREET	GALLERIA MALL DRIVE / Rte 140	12/22/2006	8:18:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Dark - lighted roadway	Rain
STEVENS STREET	GALLERIA MALL DRIVE	12/1/2006	9:39:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Severe crosswinds
GALLERIA MALL DRIVE	COUNTY STREET	9/29/2006	12:21:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
RAMP - RT 140 NB TO STEVENS ST	STEVENS STREET	8/2/2006	7:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
STEVENS STREET	GALLERIA MALL DRIVE	6/28/2006	12:34:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain
STEVENS STREET	GALLERIA MALL DRIVE / COUNTY STREET	12/29/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Dark - lighted roadway	Clear/Clear
STEVENS STREET	GALLERIA MALL DRIVE / Rte 140	12/10/2005	11:13:00 AM	Non-fatal injury	2	4	0	Angle	Angle	Wet	Dark - lighted roadway	Clear
STEVENS STREET	Rte 140 N	12/4/2005	8:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Snow/Cloudy
STEVENS STREET	Rte 140 N	11/12/2005	6:23:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
STEVENS STREET	GALLERIA MALL DRIVE / Rte 140 N	7/18/2005	5:45:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy
STEVENS STREET	Rte 140 N	3/8/2005	5:33:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Ice	Dusk	Sleet, hail (freezing rain or drizzle)
STEVENS STREET	Rte 140 N	11/19/2004	9:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
STEVENS STREET	GALLERIA MALL DRIVE	10/30/2004	9:30:00 PM	Not Reported	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain
STEVENS STREET	GALLERIA MALL DRIVE	8/20/2004	8:52:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Water (standing, moving)	Dark - lighted roadway	Clear/Clear
STEVENS STREET	Rte 140 N	4/30/2004	2:25:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
STEVENS STREET	Rte 140 N	4/25/2004	5:30:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy
STEVENS STREET	Rte 140 N	1/16/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COUNTY STREET	GALLERIA MALL DRIVE / Rte 140 S	10/14/2006	7:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	GALLERIA MALL DRIVE	8/14/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
COUNTY STREET	GALLERIA MALL DRIVE	6/27/2006	1:11:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Cloudy
STEVENS STREET	Rte 140 S	10/26/2005	6:35:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	GALLERIA MALL DRIVE	5/20/2005	6:30:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear
COUNTY STREET	GALLERIA MALL DRIVE	3/11/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Snow
COUNTY STREET	GALLERIA MALL DRIVE	2/22/2005	6:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
COUNTY STREET	GALLERIA MALL DRIVE	1/17/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear
COUNTY STREET	GALLERIA MALL DRIVE	11/3/2004	11:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COUNTY STREET	HOME DEPOT DRIVE	2/25/2006	9:45:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COUNTY STREET	TAUNTON DEPOT DRIVE / Rte 140	11/19/2005	9:05:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COUNTY STREET	TAUNTON DEPOT DRIVE	10/22/2005	2:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain
COUNTY STREET Rte 140 S	TAUNTON DEPOT DRIVE	3/21/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COUNTY STREET	TAUNTON DEPOT DRIVE	11/26/2004	6:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	TAUNTON DEPOT DRIVE	7/5/2004	10:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain
COUNTY STREET	TAUNTON DEPOT DRIVE	5/29/2004	9:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
COUNTY STREET	TAUNTON DEPOT DRIVE	1/23/2004	6:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
COUNTY STREET Rte 140 N	MOZZONE BOULEVARD	2/17/2006	8:21:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COUNTY STREET	MOZZONE BOULEVARD	12/2/2006	5:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear

EASTON	1/1/2004	12/31/2006	similar to: Washington Elm									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
1/19/2004	8:05:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Clear	WASHINGTON STREET Rte 138 N	MAIN STREET
1/28/2004	11:08:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow	DEPOT STREET Rte 123 E	PURCHASE STREET
1/31/2004	8:01:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Snow	Daylight	Clear	UNION STREET	WASHINGTON STREET Rte 138 N
2/1/2004	12:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	DEPOT STREET Rte 123 E	WASHINGTON STREET Rte 138
3/12/2004	10:57:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
3/15/2004	1:27:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	MAIN STREET	CENTER STREET
3/21/2004	7:21:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	DEPOT STREET	CENTER STREET
4/4/2004	5:37:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Cloudy	WASHINGTON STREET Rte 138 N	ELM STREET
4/8/2004	12:38:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	BELMONT STREET Rte 123 W	WASHINGTON STREET Rte 138 S
4/26/2004	3:12:00 PM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	WASHINGTON STREET Rte 138 N	ELM STREET
5/4/2004	5:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	CENTRAL STREET	DEPOT STREET
5/20/2004	8:18:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138	MAIN STREET
5/22/2004	1:10:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	DEPOT STREET Rte 123 W	CENTER STREET
5/26/2004	4:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	MAIN STREET
6/7/2004	11:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	DEPOT STREET
6/20/2004	2:23:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	DEPOT STREET	CENTER STREET
6/22/2004	2:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	MAIN STREET	WASHINGTON STREET Rte 138 N
6/29/2004	12:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CENTER STREET	MAIN STREET
7/3/2004	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	DEPOT STREET	CENTER STREET
7/15/2004	9:02:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear	ELM STREET	MAIN STREET
7/19/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	PURCHASE STREET
7/22/2004	8:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	CENTER STREET	DEPOT STREET Rte 123
7/29/2004	11:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	PURCHASE STREET
8/17/2004	4:33:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	LINCOLN STREET	BARROWS STREET
8/25/2004	8:55:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	CENTRAL STREET	DEPOT STREET
9/4/2004	12:51:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	DEPOT STREET Rte 123	CENTER STREET
9/6/2004	7:54:00 PM	Non-fatal injury	2	6	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138	MAIN STREET
9/14/2004	4:30:00 AM	Unknown	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	ELM STREET
9/20/2004	4:17:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	DEPOT STREET Rte 123 W	CENTER STREET
9/25/2004	6:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
9/27/2004	7:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	ELM STREET
10/7/2004	7:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
10/12/2004	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	DEPOT STREET Rte 123 E	CENTER STREET
10/18/2004	6:56:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138 N	BELMONT STREET Rte 123
10/18/2004	7:45:00 PM	Non-fatal injury	2	2	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear	DEPOT STREET Rte 123	CENTER STREET
10/27/2004	4:22:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	PURCHASE STREET
10/28/2004	1:07:00 AM	Unknown	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	WASHINGTON STREET Rte 138 S	UNION STREET
11/16/2004	4:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S	DEPOT STREET
11/16/2004	5:12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 N	BELMONT STREET Rte 123
11/16/2004	5:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	CENTER STREET	LINCOLN STREET / MAIN STREET
11/19/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Clear	CENTER STREET	MAIN STREET / LINCOLN STREET
12/7/2004	4:53:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain	DEPOT STREET Rte 123 W	PORTER STREET
12/9/2004	5:44:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S	ELM STREET
12/10/2004	1:52:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain	CENTER STREET	SUMMER STREET
12/18/2004	1:58:00 PM	Non-fatal injury	2	6	0	Angle	Angle	Wet	Daylight	Cloudy	WASHINGTON STREET Rte 138 S	PURCHASE STREET
1/9/2005	6:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	WASHINGTON STREET Rte 38 N	UNION STREET
1/10/2005	4:38:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET	ELM STREET / WASHINGTON STREET Rte 138 N
1/15/2005	11:03:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
1/22/2005	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	MAIN STREET	WASHINGTON STREET / Rte 138
1/28/2005	7:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	DEPOT STREET Rte 123 E	PURCHASE STREET
2/1/2005	9:00:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	MAIN STREET	LINCOLN STREET
2/9/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	DEPOT STREET	WASHINGTON STREET
2/15/2005	4:37:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	WASHINGTON STREET	Rte 138 S / MAIN STREET
2/16/2005	8:21:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET	ELM STREET Rte 138
2/22/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Daylight	Snow	WASHINGTON STREET Rte 138	MAIN STREET
3/2/2005	8:20:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Other	DEPOT STREET Rte 138	WASHINGTON STREET
3/10/2005	11:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138	ELM STREET
3/31/2005	6:28:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	MAIN STREET	WASHINGTON STREET Rte 138 S
4/1/2005	11:43:00 AM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	BELMONT STREET Rte 123	WASHINGTON STREET / Rte 138
4/6/2005	5:27:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S	ELM STREET
4/7/2005	3:24:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	DEPOT STREET Rte 123 W
4/22/2005	8:08:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
4/28/2005	12:01:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
5/1/2005	8:01:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	WASHINGTON STREET Rte 138 N	WASHINGTON STREET Rte 138 N / PURCHASE STREET
5/2/2005	6:42:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET	WASHINGTON STREET Rte 138 N / BELMONT STREET Rte 123
5/29/2005	6:42:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	WASHINGTON STREET	Rte 138 S / PURCHASE STREET
6/1/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S	PURCHASE STREET
6/9/2005	5:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138 N	BELMONT STREET Rte 123 E
6/11/2005	2:57:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Other	ELM STREET	WASHINGTON STREET / ELM STREET
6/17/2005	11:55:00 AM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
6/30/2005	3:12:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy	WASHINGTON STREET Rte 138 S	DEPOT STREET Rte 123 E
7/11/2005	2:10:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
7/13/2005	7:54:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
7/17/2005	10:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy/Cloudy	WASHINGTON STREET Rte 138 N	BELMONT STREET
7/19/2005	5:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	WASHINGTON STREET Rte 138 N	MAIN STREET
8/2/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	CENTRAL STREET	DEPOT STREET
8/19/2005	7:18:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	CENTER STREET	DEPOT STREET
8/19/2005	7:20:00 AM	Not Reported	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	DEPOT STREET Rte 123	CENTER STREET
8/30/2005	10:13:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	DEPOT STREET	CENTER STREET
9/6/2005	2:17:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	DEPOT STREET
9/12/2005	7:04:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	MAIN STREET
9/14/2005	2:45:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	BELMONT STREET Rte 123
10/28/2005	10:12:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 N	BELMONT STREET / Rte 123
11/20/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	CENTRAL STREET	DEPOT STREET
11/20/2005	10:05:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138	DEPOT STREET Rte 123 W

EASTON	1/1/2004	12/31/2006	similar to: Washington Elm									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
11/23/2005	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy	MAIN STREET	ELM STREET
12/16/2005	4:23:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Cloudy	WASHINGTON STREET	DEPOT STREET
12/18/2005	1:11:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	PURCHASE STREET
12/29/2005	3:34:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	WASHINGTON STREET Rte 138 S	ELM STREET
1/10/2006	1:00:00 PM	Not Reported	2	0	0	Angle	Angle	Not reported	Daylight	Clear	WASHINGTON STREET Rte 138	ELM STREET
1/13/2006	8:54:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	DEPOT STREET
1/17/2006	7:16:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	MAIN STREET / Rte 138 S
1/23/2006	5:35:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	DEPOT STREET Rte 123 E	WASHINGTON STREET
1/23/2006	7:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	LINCOLN STREET	MAIN STREET
1/25/2006	2:31:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	MAIN STREET	WASHINGTON STREET Rte 138
2/2/2006	9:44:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S	MAIN STREET
2/6/2006	5:41:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear	WASHINGTON STREET Rte 138 N	MAIN STREET
2/10/2006	5:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	CENTER STREET	MAIN STREET / LINCOLN STREET
2/17/2006	4:49:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy	WASHINGTON STREET Rte 138	DEPOT STREET
2/17/2006	5:55:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	WASHINGTON STREET Rte 138	MAIN STREET
2/20/2006	9:42:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	ELM STREET
2/26/2006	6:54:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S	UNION STREET
3/17/2006	1:39:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	DEPOT STREET	CENTER STREET
3/22/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy	WASHINGTON STREET Rte 138 S	WASHINGTON STREET Rte 138 S / MAIN STREET
3/26/2006	9:04:00 AM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Daylight	Clear/Clear	CENTER STREET	MAIN STREET / LINCOLN STREET
3/28/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	ELM STREET
3/31/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	MAIN STREET
4/1/2006	11:03:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy	WASHINGTON STREET Rte 138	PURCHASE STREET
4/1/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	BELMONT STREET
4/6/2006	4:06:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	CENTER STREET	DEPOT STREET Rte 123
4/15/2006	6:33:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S	MAIN STREET / Rte 138
4/27/2006	7:12:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S	WASHINGTON STREET Rte 138 S / PURCHASE STREET
5/19/2006	11:12:00 AM	Non-fatal injury	2	1	0	Head-on	Head-on	Wet	Daylight	Cloudy/Rain	WASHINGTON STREET Rte 138 S	UNION STREET
6/2/2006	10:07:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	WASHINGTON STREET Rte 138 S	ELM STREET
6/6/2006	4:00:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	CENTER STREET	DEPOT STREET
6/15/2006	2:31:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	WASHINGTON STREET	BELMONT STREET Rte 123
6/15/2006	9:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	WASHINGTON STREET Rte 138 N	MAIN STREET
6/16/2006	5:15:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	MAIN STREET
6/24/2006	12:00:00 PM	Not Reported	1	0	0	Angle	Angle	Dry	Daylight	Rain	WASHINGTON STREET Rte 138	DEPOT STREET Rte 123
7/10/2006	8:04:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	ELM STREET
7/12/2006	5:00:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy	DEPOT STREET	CENTER STREET
7/12/2006	8:47:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Cloudy	UNION STREET	WASHINGTON STREET Rte 138
7/26/2006	3:58:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	MAIN STREET	CENTER STREET
7/28/2006	4:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	WASHINGTON STREET	DEPOT STREET Rte 123 / WASHINGTON STREET Rte 138
8/3/2006	5:31:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	ELM STREET	MAIN STREET
8/31/2006	1:49:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	CENTER STREET	SUMMER STREET
9/8/2006	11:24:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	NORTH MAIN STREET	ELM STREET
9/16/2006	4:07:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	DEPOT STREET Rte 123	CENTER STREET
9/26/2006	10:16:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138 S	MAIN STREET
9/28/2006	8:24:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET	WASHINGTON STREET Rte 138 / DEPOT STREET
10/1/2006	3:52:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	WASHINGTON STREET Rte 138 N	BELMONT STREET Rte 123 E
10/6/2006	2:14:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET Rte 138 N	PURCHASE STREET
10/6/2006	8:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	MAIN STREET	WASHINGTON STREET Rte 138
10/17/2006	4:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain	DEPOT STREET Rte 123 W	CENTER STREET
10/20/2006	8:46:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	WASHINGTON STREET Rte 138	UNION STREET
10/24/2006	5:10:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	PURCHASE STREET	WASHINGTON STREET Rte 138
10/29/2006	7:04:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	DEPOT STREET Rte 123 W	CENTER STREET
11/7/2006	7:04:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	ELM STREET	NORTH MAIN STREET
11/19/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Cloudy	UNION STREET	WASHINGTON STREET
11/30/2006	7:38:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138	BELMONT STREET Rte 123
12/17/2006	11:03:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WASHINGTON STREET	PURCHASE STREET
12/21/2006	7:40:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N	ELM STREET
12/22/2006	4:27:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear	WASHINGTON STREET Rte 138	MAIN STREET
12/27/2006	11:34:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET	DEPOT STREET Rte 123
12/31/2006	6:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	WASHINGTON STREET Rte 138 N	WASHINGTON STREET Rte 138 / DEPOT STREET Rte 123

		FALL RIVER	1/1/2004	12/31/2006	is similar to:							
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather
AIRPORT ROAD	COMMERCE DRIVE	9/26/2006	3:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain
DAVOL STREET WEST	PRESIDENT AVENUE	10/29/2004	8:46:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET WEST	5/26/2005	6:22:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Rain/Cloudy
PRESIDENT AVENUE	DAVOL STREET WEST	11/8/2005	7:27:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	/ DAVOL STREET WEST	8/1/2006	1:10:00 AM	Not Reported	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Not reported	Clear
WATER STREET	ANAWAN STREET	5/15/2004	12:02:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
WATER STREET	ANAWAN STREET	5/31/2004	2:32:00 PM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
WATER STREET	ANAWAN STREET	11/12/2004	2:43:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain
WATER STREET	ANAWAN STREET	7/22/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain
ANAWAN STREET	BROADWAY EXTENSION	2/22/2004	2:40:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear
ANAWAN STREET	BROADWAY EXTENSION	4/13/2004	4:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain
ANAWAN STREET	BROADWAY EXTENSION	4/25/2004	3:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
ANAWAN STREET	BROADWAY EXTENSION	1/28/2005	1:03:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Snow	Daylight	Clear
ANAWAN STREET	BROADWAY EXTENSION	3/16/2006	10:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
CENTRAL STREET	DAVOL STREET EAST	12/31/2006	8:44:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
DAVOL STREET EAST	CENTRAL STREET	1/5/2006	3:12:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy
DAVOL STREET EAST	CENTRAL STREET	1/18/2006	4:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Rain
DAVOL STREET EAST	CENTRAL STREET	3/9/2006	9:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Clear
DAVOL STREET EAST	CENTRAL STREET	6/26/2006	5:09:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	CENTRAL STREET	8/14/2006	11:07:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	1/5/2004	2:13:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain
DAVOL STREET EAST	PRESIDENT AVENUE	2/7/2004	2:09:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain
PRESIDENT AVENUE	DAVOL STREET EAST	2/23/2004	12:21:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	4/5/2004	5:24:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	5/2/2004	6:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy
DAVOL STREET EAST	PRESIDENT AVENUE	6/13/2004	8:53:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	6/26/2004	12:21:00 AM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	6/29/2004	8:07:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy
DAVOL STREET EAST	PRESIDENT AVENUE	8/9/2004	5:26:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST Rte 6 W	PRESIDENT AVENUE	8/26/2004	1:06:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	10/2/2004	12:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Cloudy
PRESIDENT AVENUE	DAVOL STREET EAST	11/10/2004	6:38:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	11/17/2004	3:24:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	12/24/2004	6:41:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dawn	Cloudy
DAVOL STREET EAST	PRESIDENT AVENUE	12/25/2004	12:26:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	12/26/2004	9:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow
PRESIDENT AVENUE	DAVOL STREET EAST	12/28/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Dark - lighted roadway	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	3/19/2005	1:04:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	3/20/2005	12:06:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	4/1/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	4/7/2005	2:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	5/9/2005	10:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	5/11/2005	2:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	5/28/2005	4:43:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Other
DAVOL STREET EAST	PRESIDENT AVENUE	6/2/2005	1:31:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	7/4/2005	7:13:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	7/17/2005	11:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain
PRESIDENT AVENUE	DAVOL STREET EAST	8/10/2005	2:43:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	9/21/2005	4:56:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	9/22/2005	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	10/12/2005	9:44:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain
DAVOL STREET EAST	PRESIDENT AVENUE	10/18/2005	4:16:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	11/2/2005	9:43:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	12/23/2005	11:41:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	1/6/2006	6:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	1/16/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	3/27/2006	10:11:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	4/10/2006	10:48:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Other
DAVOL STREET EAST	PRESIDENT AVENUE	4/16/2006	2:54:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	4/25/2006	4:29:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	5/21/2006	2:18:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	5/22/2006	7:28:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	5/31/2006	6:14:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy
PRESIDENT AVENUE	DAVOL STREET EAST	6/6/2006	2:38:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	6/9/2006	10:24:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	6/10/2006	12:34:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain
PRESIDENT AVENUE	DAVOL STREET EAST	6/15/2006	8:19:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	7/4/2006	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	8/12/2006	1:07:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	8/12/2006	9:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	8/13/2006	3:27:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	8/30/2006	10:21:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy
PRESIDENT AVENUE	DAVOL STREET EAST	9/4/2006	12:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	10/12/2006	10:24:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
DAVOL STREET EAST	PRESIDENT AVENUE	10/18/2006	11:48:00 AM	Property damage only (none injured)	3	0	0	Head-on	Head-on	Dry	Daylight	Cloudy

		FALL RIVER	1/1/2004	12/31/2006	is similar to:							
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather
DAVOL STREET EAST	PRESIDENT AVENUE	11/5/2006	4:23:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear
DAVOL STREET EAST	PRESIDENT AVENUE	11/22/2006	9:22:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	DAVOL STREET EAST	12/19/2006	11:27:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
DAVOL STREET EAST	TURNER STREET	9/2/2004	3:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear
DAVOL STREET EAST	TURNER STREET	9/25/2004	11:41:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Cloudy
DAVOL STREET EAST	TURNER STREET	5/8/2005	7:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy
TURNER STREET	DAVOL STREET EAST	6/28/2006	8:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
WATER STREET	FERRY STREET	1/19/2005	9:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Snow
NORTH MAIN STREET	PRESIDENT AVENUE	1/12/2004	8:27:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Snow	Dark - lighted roadway	Snow
NORTH MAIN STREET	PRESIDENT AVENUE	1/17/2004	6:41:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
NORTH MAIN STREET	PRESIDENT AVENUE Rte 6 W	1/17/2004	1:17:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	2/17/2004	11:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	4/4/2004	7:16:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Rain
PRESIDENT AVENUE	NORTH MAIN STREET	5/25/2004	1:11:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	5/29/2004	5:22:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	6/9/2004	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Other
PRESIDENT AVENUE	NORTH MAIN STREET	7/18/2004	10:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain
NORTH MAIN STREET	PRESIDENT AVENUE	7/20/2004	11:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	7/30/2004	6:41:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy
PRESIDENT AVENUE	NORTH MAIN STREET	9/19/2004	1:09:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	9/26/2004	5:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	9/27/2004	7:46:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	11/12/2004	10:53:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	3/7/2005	6:14:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	3/22/2005	4:38:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Other
PRESIDENT AVENUE	NORTH MAIN STREET	4/25/2005	9:49:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	5/27/2005	9:47:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy
PRESIDENT AVENUE	NORTH MAIN STREET	9/19/2005	11:33:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	1/18/2006	7:20:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	2/17/2006	5:26:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	3/4/2006	3:03:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	3/13/2006	2:48:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	3/24/2006	2:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
PRESIDENT AVENUE	NORTH MAIN STREET	7/9/2006	7:17:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
PRESIDENT AVENUE	NORTH MAIN STREET	8/31/2006	11:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
NORTH MAIN STREET	PRESIDENT AVENUE	9/4/2006	10:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy
PRESIDENT AVENUE	NORTH MAIN STREET	10/30/2006	4:04:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear

FREETOWN	1/1/2004	12/31/2006	is similar to: Narrows									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
3/10/2004	7:39:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	SOUTH MAIN STREET	HIGH STREET
8/1/2004	4:19:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	SOUTH MAIN STREET	RIDGE HILL ROAD
11/5/2004	2:04:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Blowing sand, snow	NARROWS ROAD	SOUTH MAIN STREET
2/9/2005	8:46:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Cloudy	RIDGE HILL ROAD	SOUTH MAIN STREET
5/23/2005	5:43:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	SOUTH MAIN STREET	Rte 24 S / RAMP-RT 24 SB TO RT 79
10/28/2005	6:20:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - unknown roadway lighting	Clear	Rte 79	RIDGE HILL ROAD
11/11/2005	9:07:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	NARROWS ROAD	SOUTH MAIN STREET
4/10/2006	12:36:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Other	SOUTH MAIN STREET	NARROWS ROAD
7/19/2006	2:39:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	SOUTH MAIN STREET	NARROWS ROAD
11/24/2006	2:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	SOUTH MAIN STREET	RIDGE HILL ROAD

		NEW BEDFORD	1/1/2004	12/31/2006	or							
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	on-Fatal Injurie	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather
PURCHASE STREET	COGGESHALL STREET	3/24/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PURCHASE STREET	COGGESHALL STREET	3/28/2004	5:10:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Daylight	Clear
PURCHASE STREET	COGGESHALL STREET	4/16/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PURCHASE STREET	COGGESHALL STREET	5/22/2004	1:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COGGESHALL STREET	PURCHASE STREET	7/4/2004	4:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear
PURCHASE STREET	COGGESHALL STREET	10/23/2004	2:01:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
PURCHASE STREET	COGGESHALL STREET	3/18/2005	2:58:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
PURCHASE STREET	COGGESHALL STREET	5/18/2005	12:20:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
COGGESHALL STREET	PURCHASE STREET	9/16/2005	11:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain
COGGESHALL STREET	PURCHASE STREET	10/20/2005	3:09:00 PM	Non-fatal injury	3	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
COGGESHALL STREET	PURCHASE STREET	10/21/2005	10:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear
COGGESHALL STREET	PURCHASE STREET	11/19/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PURCHASE STREET	COGGESHALL STREET	12/5/2005	10:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear
PURCHASE STREET	COGGESHALL STREET	1/30/2006	12:16:00 PM	Non-fatal injury	2	1	0	deswipe, opposite direct	deswipe, opposite directi	Wet	Daylight	Cloudy
ACUSHNET AVENUE	COGGESHALL STREET	10/24/2004	10:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Clear
COGGESHALL STREET	ACUSHNET AVENUE	10/30/2004	3:30:00 AM	Property damage only (none injured)	2	0	0	deswipe, opposite direct	deswipe, opposite directi	Dry	Dark - lighted roadway	Clear/Clear
ACUSHNET AVENUE	COGGESHALL STREET	1/2/2005	3:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COGGESHALL STREET	Rte 18 N	1/20/2005	2:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear
ACUSHNET AVENUE	COGGESHALL STREET	4/2/2005	1:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy
COGGESHALL STREET	ACUSHNET AVENUE	4/9/2005	10:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
ACUSHNET AVENUE	COGGESHALL STREET	6/9/2005	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
ACUSHNET AVENUE	COGGESHALL STREET	6/15/2005	1:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COGGESHALL STREET	ACUSHNET AVENUE Rte 18	7/24/2005	12:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
COGGESHALL STREET	ACUSHNET AVENUE	8/10/2005	1:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Unknown
ACUSHNET AVENUE	COGGESHALL STREET	8/11/2005	12:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear
COGGESHALL STREET	ACUSHNET AVENUE	9/11/2005	1:41:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
ACUSHNET AVENUE	COGGESHALL STREET	1/24/2006	3:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ACUSHNET AVENUE Rte 18 N	COGGESHALL STREET	7/7/2006	7:30:00 AM	Non-fatal injury	3	2	0	Unknown	Unknown	Dry	Daylight	Clear/Clear
COGGESHALL STREET	ACUSHNET AVENUE	7/13/2006	6:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
ACUSHNET AVENUE	COGGESHALL STREET	8/3/2006	11:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	3/3/2004	10:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	3/20/2004	9:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	5/16/2004	3:00:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	5/18/2004	5:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	5/21/2004	7:10:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear
ASHLEY BOULEVARD	COGGESHALL STREET	5/24/2004	9:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	5/26/2004	12:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	5/31/2004	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	6/10/2004	5:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	6/18/2004	2:10:00 PM	Non-fatal injury	2	5	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	6/19/2004	7:20:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET / Rte 18	7/6/2004	8:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	7/30/2004	12:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Dark - lighted roadway	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	8/1/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	8/1/2004	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	8/5/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
COGGESHALL STREET	ASHLEY BOULEVARD	8/7/2004	8:20:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	9/5/2004	4:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	9/11/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
ASHLEY BOULEVARD	COGGESHALL STREET	9/15/2004	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	10/11/2004	3:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear
ASHLEY BOULEVARD	COGGESHALL STREET	10/19/2004	2:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain
ASHLEY BOULEVARD	COGGESHALL STREET	11/28/2004	1:50:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	12/19/2004	11:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Rain
ASHLEY BOULEVARD	COGGESHALL STREET	2/20/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Clear/Clear
ASHLEY BOULEVARD	COGGESHALL STREET	2/23/2005	11:58:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	3/7/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	3/7/2005	8:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COGGESHALL STREET	ASHLEY BOULEVARD	3/14/2005	9:45:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Other
ASHLEY BOULEVARD	COGGESHALL STREET	4/1/2005	5:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	4/17/2005	1:35:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear
COGGESHALL STREET	ASHLEY BOULEVARD	4/24/2005	9:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain
ASHLEY BOULEVARD	COGGESHALL STREET	7/24/2005	12:15:00 AM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	8/15/2005	4:50:00 PM	Not Reported	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	8/23/2005	6:06:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	10/26/2005	3:20:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Not Reported
ASHLEY BOULEVARD	COGGESHALL STREET	11/9/2005	6:50:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain
COGGESHALL STREET	ASHLEY BOULEVARD	11/16/2005	6:29:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	12/10/2005	9:15:00 AM	Not Reported	2	0	0	Not reported	Not reported	Ice	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	12/29/2005	9:50:00 PM	Property damage only (none injured)	4	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Clear
COGGESHALL STREET Rte 18 S	ASHLEY BOULEVARD	2/8/2006	12:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	3/7/2006	1:30:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Daylight	Clear
COGGESHALL STREET	ASHLEY BOULEVARD	4/18/2006	9:00:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
ASHLEY BOULEVARD	COGGESHALL STREET	5/2/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-to-rear	Rear-to-rear	Wet	Daylight	Rain
COGGESHALL STREET	ASHLEY BOULEVARD Rte 18 S	6/7/2006	1:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain
COGGESHALL STREET	Rte 18 S	6/15/2006	9:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	6/26/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Other
ASHLEY BOULEVARD	COGGESHALL STREET	6/27/2006	6:30:00 PM	Not Reported	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	8/5/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
ASHLEY BOULEVARD	COGGESHALL STREET	8/7/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear/Other

		NEW BEDFORD	1/1/2004	12/31/2006	or							
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicleson-Fatal Injurie		Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather
ASHLEY BOULEVARD	COGGESHALL STREET	11/29/2006	7:15:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy
NORTH FRONT STREET	COGGESHALL STREET	6/7/2004	6:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain
NORTH FRONT STREET	COGGESHALL STREET	6/21/2004	7:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
NORTH FRONT STREET	COGGESHALL STREET	6/25/2004	7:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
NORTH FRONT STREET	COGGESHALL STREET	10/15/2004	9:10:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COGGESHALL STREET	NORTH FRONT STREET	11/1/2005	2:40:00 PM	Not Reported	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Clear
COGGESHALL STREET	NORTH FRONT STREET	7/21/2006	5:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy
COGGESHALL STREET	NORTH FRONT STREET	7/27/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear
COGGESHALL STREET	NORTH FRONT STREET	12/31/2006	11:15:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
COGGESHALL STREET	BELLEVILLE AVENUE	6/6/2004	1:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain
BELLEVILLE AVENUE	COGGESHALL STREET	6/21/2004	7:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	7/6/2004	2:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear
COGGESHALL STREET	BELLEVILLE AVENUE	7/6/2004	6:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	1/12/2005	1:15:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Clear
COGGESHALL STREET	BELLEVILLE AVENUE	3/3/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy
BELLEVILLE AVENUE	COGGESHALL STREET	4/1/2005	7:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	8/16/2005	4:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	8/28/2005	1:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Unknown	Unknown	Unknown
BELLEVILLE AVENUE	COGGESHALL STREET	10/15/2005	11:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear
COGGESHALL STREET	BELLEVILLE AVENUE	11/28/2005	11:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	4/18/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	COGGESHALL STREET	9/14/2006	6:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Rain
BELLEVILLE AVENUE	COGGESHALL STREET	11/10/2006	9:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear
COGGESHALL STREET	BELLEVILLE AVENUE	11/11/2006	4:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, opposite direct	Sideswipe, opposite directi	Dry	Daylight	Clear/Other
BELLEVILLE AVENUE	COGGESHALL STREET	11/29/2006	12:24:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Other
COGGESHALL STREET	BELLEVILLE AVENUE	12/8/2006	6:30:00 PM	Non-fatal injury	2	2	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear
WASHBURN STREET	BELLEVILLE AVENUE	2/19/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Clear
WASHBURN STREET	BELLEVILLE AVENUE	4/12/2004	9:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
WASHBURN STREET	BELLEVILLE AVENUE	6/22/2004	7:25:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
WASHBURN STREET	BELLEVILLE AVENUE	8/6/2004	11:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear
BELLEVILLE AVENUE	WASHBURN STREET	12/22/2004	3:14:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	WASHBURN STREET	12/26/2004	2:05:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear
BELLEVILLE AVENUE	WASHBURN STREET	1/17/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Ice	Daylight	Cloudy/Clear
WASHBURN STREET	BELLEVILLE ROAD	1/28/2005	11:25:00 AM	Not Reported	2	0	0	Angle	Angle	Snow	Daylight	Snow/Snow
BELLEVILLE AVENUE	WASHBURN STREET	11/21/2005	8:30:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear
BELLEVILLE AVENUE	WASHBURN STREET	11/25/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	WASHBURN STREET	6/14/2006	6:01:00 PM	Non-fatal injury	3	3	0	Angle	Angle	Dry	Daylight	Clear
BELLEVILLE AVENUE	WASHBURN STREET	6/28/2006	5:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy
BELLEVILLE AVENUE	WASHBURN STREET	10/23/2006	3:30:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear
WASHBURN STREET	BELLEVILLE AVENUE	11/25/2006	6:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dawn	Clear
PURCHASE STREET	WELD STREET	2/10/2004	3:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
WELD STREET	PURCHASE STREET	4/13/2004	7:40:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain
PURCHASE STREET	WELD STREET	7/1/2005	1:54:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
PURCHASE STREET	WELD STREET	7/4/2006	9:14:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear
WELD STREET	PURCHASE STREET	8/4/2006	4:15:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
WELD STREET	PURCHASE STREET	8/9/2006	5:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
LOGAN STREET	NORTH FRONT STREET	2/19/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Daylight	Clear
LOGAN STREET	NORTH FRONT STREET	2/19/2004	8:27:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Ice	Daylight	Clear
NORTH FRONT STREET	LOGAN STREET	10/3/2004	6:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear
NORTH FRONT STREET	LOGAN STREET	12/21/2004	11:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear
LOGAN STREET	NORTH FRONT STREET	1/18/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Clear
LOGAN STREET	NORTH FRONT STREET	1/18/2005	9:05:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Ice	Daylight	Clear
NORTH FRONT STREET	LOGAN STREET	3/9/2005	8:14:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Ice	Daylight	Snow
NORTH FRONT STREET	LOGAN STREET	4/14/2006	11:05:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Wet	Dark - lighted roadway	Rain
NORTH FRONT STREET	LOGAN STREET	9/5/2006	9:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direct	Sideswipe, opposite directi	Wet	Dark - lighted roadway	Rain/Cloudy
LOGAN STREET	PURCHASE STREET	4/2/2004	11:35:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear/Unknown
PURCHASE STREET	LOGAN STREET	4/2/2004	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Daylight	Clear/Unknown
PURCHASE STREET	LOGAN STREET	5/29/2004	4:24:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear
LOGAN STREET	PURCHASE STREET	6/2/2004	4:00:00 PM	Non-fatal injury	1	1	0	Head-on	Head-on	Dry	Daylight	Clear
PURCHASE STREET	LOGAN STREET	6/28/2004	12:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy
PURCHASE STREET	LOGAN STREET	6/28/2004	12:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Not reported	Clear
LOGAN STREET	PURCHASE STREET	11/4/2004	6:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Rain
LOGAN STREET	PURCHASE STREET	11/18/2004	6:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same directio	Sideswipe, same directio	Dry	Dark - lighted roadway	Clear
PURCHASE STREET	LOGAN STREET	12/20/2004	2:18:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow
PURCHASE STREET	LOGAN STREET	7/27/2005	10:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear
PURCHASE STREET	LOGAN STREET	10/15/2005	7:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain
PURCHASE STREET	LOGAN STREET	6/15/2006	5:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear
PURCHASE STREET	LOGAN STREET	7/14/2006	10:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
PURCHASE STREET	LOGAN STREET	12/21/2006	5:00:00 PM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear
ACUSHNET AVENUE	WAMSUTTA STREET	8/5/2004	12:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Unknown
ACUSHNET AVENUE	WAMSUTTA STREET	2/2/2005	11:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direct	Sideswipe, opposite directi	Wet	Daylight	Clear
WAMSUTTA STREET	ACUSHNET AVENUE	10/25/2005	5:17:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain
ACUSHNET AVENUE	WAMSUTTA STREET	3/19/2006	2:33:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear
ACUSHNET AVENUE	WAMSUTTA STREET	7/20/2006	3:51:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy
WAMSUTTA STREET	ACUSHNET AVENUE	11/21/2006	2:54:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear
LOGAN STREET	ACUSHNET AVENUE	12/6/2006	11:10:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear

NEW BEDFORD	1/1/2004	12/31/2006	similar to: Kings Jones Park										
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Feet_From
2/19/2004	5:40:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dusk	Clear	NASH ROAD	CHURCH STREET	
4/1/2004	10:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain	PARK AVENUE	CHURCH STREET	
4/16/2004	5:15:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
7/8/2004	2:40:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	WOOD STREET	ASHLEY BOULEVARD	
7/26/2004	1:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Cloudy	CHURCH STREET	PARK AVENUE	
8/27/2004	9:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	CHURCH STREET	TARKILN HILL ROAD	
9/4/2004	2:15:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
9/30/2004	2:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	NASH ROAD	CHURCH STREET	
10/2/2004	2:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	PARK AVENUE	CHURCH STREET	
11/17/2004	5:50:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	PARK AVENUE	CHURCH STREET	
12/10/2004	5:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain	PARK AVENUE	CHURCH STREET	
1/5/2005	5:50:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy	KINGS HIGHWAY	MOUNT PLEASANT STREET	
3/25/2005	1:00:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
3/26/2005	5:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	WOOD STREET	ASHLEY BOULEVARD	
4/28/2005	5:00:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Cloudy	TARKILN HILL ROAD	CHURCH STREET	
4/29/2005	1:06:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	CHURCH STREET	PARK AVENUE	
6/20/2005	3:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
9/14/2005	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	PARK AVENUE	CHURCH STREET	
9/23/2006	2:00:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Rain	CHURCH STREET	PARK AVENUE	
9/29/2006	2:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
10/12/2006	4:40:00 PM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
10/28/2006	5:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Cloudy	NASH ROAD	CHURCH STREET	
11/3/2006	3:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
11/27/2006	1:00:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	TARKILN HILL ROAD	
12/4/2006	4:15:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dusk	Clear	CHURCH STREET	PARK STREET	
12/14/2006	3:46:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
12/23/2006	11:00:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain	CHURCH STREET	PARK AVENUE	
12/28/2006	9:30:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	CHURCH STREET	TARKILN HILL ROAD	
6/10/2004	5:40:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
6/18/2004	6:50:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy	KINGS HIGHWAY	MOUNT PLEASANT STREET	
9/16/2004	6:55:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dawn	Clear/Rain	KINGS HIGHWAY	MOUNT PLEASANT STREET	
12/22/2004	3:50:00 PM	Not Reported	2	0	0	Unknown	Unknown	Wet	Dusk	Clear	CHURCH STREET	TARKILN HILL ROAD	
1/20/2005	10:00:00 AM	Not Reported	2	0	0	Angle	Angle	Snow	Daylight	Clear	TARKILN HILL ROAD	CHURCH STREET	
2/2/2005	11:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
5/11/2006	6:52:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy	TARKILN HILL ROAD	CHURCH STREET	
1/12/2004	11:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy	KINGS HIGHWAY	RTE 140N ON RAMP	
4/11/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	KINGS HIGHWAY	MOUNT PLEASANT STREET	
5/23/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	TARKILN HILL ROAD	
6/18/2004	7:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	PARK AVENUE	CHURCH STREET	
6/25/2004	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy	KINGS HIGHWAY	MOUNT PLEASANT STREET	
7/9/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	NASH ROAD	CHURCH STREET	
7/22/2004	1:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
8/2/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	NASH ROAD	CHURCH STREET	
9/4/2004	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	TARKILN HILL ROAD	CHURCH STREET	
9/21/2004	9:17:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	CHURCH STREET	TARKILN HILL ROAD	
10/17/2004	12:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
11/12/2004	2:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	KINGS HIGHWAY	MOUNT PLEASANT STREET	
12/21/2004	4:22:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dusk	Clear	KINGS HIGHWAY	OFF ON RAMP Rte 140 N	
12/21/2004	10:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear	WOOD STREET	ASHLEY BOULEVARD	
12/28/2004	10:18:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Clear	WOOD STREET	ASHLEY BOULEVARD	
2/1/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Daylight	Clear/Clear	CHURCH STREET	TARKILN HILL ROAD	
2/24/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	MOUNT PLEASANT STREET	Rte 140 S / RAMP - RT 140 SB TO MT PLEASANT ST	
3/8/2005	10:06:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	KINGS HIGHWAY	MOUNT PLEASANT STREET	
3/21/2005	5:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Cloudy/Rain	WOOD STREET	ASHLEY BOULEVARD	
5/9/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	NASH ROAD	CHURCH STREET	
6/26/2005	9:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	NASH ROAD	CHURCH STREET	
8/20/2005	10:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
8/28/2005	3:40:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Clear	NASH ROAD	CHURCH STREET	
9/7/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
9/8/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY Rte 140 N	Rte 140 / Rte 140	
10/15/2005	1:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain	CHURCH STREET	PARK AVENUE	
10/20/2005	11:15:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
10/31/2005	1:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	WOOD STREET	ASHLEY BOULEVARD	
11/16/2005	4:34:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Dusk	Cloudy	NASH ROAD	CHURCH STREET	
11/19/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	TARKILN HILL ROAD	CHURCH STREET	
12/3/2005	6:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	KINGS HIGHWAY	Rte 140 / RAMP - KINGS HWY TO RT 140 NB	
1/31/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	CHURCH STREET	PARK AVENUE	
2/13/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear	TARKILN HILL ROAD	CHURCH STREET	
2/23/2006	3:17:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	KINGS HIGHWAY	MOUNT PLEASANT STREET	
3/8/2006	10:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	TARKILN HILL ROAD	CHURCH STREET	
3/9/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	CHURCH STREET	PARK AVENUE	
3/17/2006	3:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy	PARK AVENUE	CHURCH STREET	
3/24/2006	1:44:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	TARKILN HILL ROAD	CHURCH STREET	
3/29/2006	9:00:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	TARKILN HILL ROAD	CHURCH STREET	
4/3/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY	MOUNT PLEASANT STREET	
4/12/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	CHURCH STREET	TARKILN HILL ROAD	
5/11/2006	11:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Daylight	Clear	PARK AVENUE	CHURCH STREET	
8/29/2006	1:56:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	NASH ROAD	CHURCH STREET	
9/15/2006	6:24:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	KINGS HIGHWAY	MOUNT PLEASANT STREET	
10/18/2006	6:19:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	WOOD STREET	ASHLEY BOULEVARD	526 CHURCH STREET
11/17/2006	4:23:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CHURCH STREET	PARK AVENUE	
12/3/2006	10:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	TARKILN HILL ROAD	CHURCH STREET	
12/23/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	CHURCH STREET	PARK AVENUE	

NEW BEDFORD	1/1/2004	12/31/2006	is similar to: Hillman Pleasant									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
3/20/2004	4:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy	HILLMAN STREET	ACUSHNET AVENUE
3/21/2004	12:55:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain	UNION STREET	Rte 18 S
3/26/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	UNION STREET	ACUSHNET AVENUE
3/26/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy	MACARTHUR BLVD	LEONARDS WHARF STREET
4/16/2004	12:26:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	ACUSHNET AVENUE	HILLMAN STREET
4/22/2004	1:45:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	ACUSHNET AVENUE	UNION STREET
4/22/2004	1:45:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	ACUSHNET AVENUE	UNION STREET
5/18/2004	3:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	UNION STREET	Rte 18
5/24/2004	12:01:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Unknown	Unknown	Unknown	HILLMAN STREET	PLEASANT STREET
6/28/2004	6:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	MILL STREET	PURCHASE STREET / Rte 6 W
7/19/2004	4:50:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	PURCHASE STREET	HILLMAN STREET
8/12/2004	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy	HILLMAN STREET	PURCHASE STREET
12/9/2004	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	PLEASANT STREET	HILLMAN STREET
3/28/2005	1:25:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain	PURCHASE STREET	HILLMAN STREET
9/23/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	KEMPTON STREET	PLEASANT STREET
12/2/2005	1:10:00 AM	Non-fatal injury	1	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	HILLMAN STREET	ACUSHNET AVENUE
12/2/2005	2:00:00 AM	Not Reported	1	0	0	Unknown	Unknown	Wet	Dark - lighted roadway	Clear	UNION STREET	Rte 18
12/8/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	PURCHASE STREET	HILLMAN STREET
1/28/2006	11:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	MACARTHUR DRIVE	ACUSHNET AVENUE
6/7/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Rain	UNION STREET	Rte 18
6/17/2006	11:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	UNION STREET	Rte 18
7/11/2006	10:23:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	UNION STREET	Rte 18
8/3/2006	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	UNION STREET	Rte 18 S
9/11/2006	12:00:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	UNION STREET	ACUSHNET AVENUE
9/16/2006	1:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	UNION STREET	Rte 18 S
9/29/2006	11:51:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain	ACUSHNET AVENUE	HILLMAN STREET
10/21/2006	1:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	MILL STREET Rte 6 W	PURCHASE STREET / KEMPTON STREET
10/27/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	HILLMAN STREET	PURCHASE STREET
11/30/2006	2:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	ACUSHNET AVENUE	UNION STREET
12/3/2006	1:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain	ACUSHNET AVENUE	UNION STREET
13-Jun-2004	5:20 PM	Non-fatal injury		2	0	Single vehicle crash		Dry	Daylight	Clear	1000 KINGS HIGHWAY	
20-Oct-2004	8:00 PM	Property damage only (none injured)		0	0	Angle		Dry	Dark - lighted roadway	Clear	1000 KINGS HIGHWAY	
23-Jan-2004	7:05 PM	Property damage only (none injured)		0	0	Angle		Dry	Dark - lighted roadway	Clear	1001 KINGS HIGHWAY	
11-Mar-2004	10:05 PM	Non-fatal injury		2	0	Not reported		Not reported	Not reported	Not Reported	1001 KINGS HIGHWAY	
14-May-2004	1:25 PM	Non-fatal injury		1	0	Rear-end		Dry	Daylight	Clear	1001 KINGS HIGHWAY	
04-Jun-2004	4:40 PM	Non-fatal injury		1	0	Rear-end		Dry	Daylight	Clear	1001 KINGS HIGHWAY	
08-Jul-2004	4:15 PM	Non-fatal injury		1	0	Rear-end		Dry	Daylight	Clear/Clear	1001 KINGS HIGHWAY	
28-Jul-2004	3:20 PM	Non-fatal injury		1	0	Rear-end		Dry	Daylight	Cloudy	1001 KINGS HIGHWAY	
17-Aug-2004	1:30 PM	Non-fatal injury		1	0	Angle		Dry	Daylight	Clear/Cloudy	1001 KINGS HIGHWAY	
30-Oct-2004	5:04 PM	Not Reported		0	0	Angle		Wet	Daylight	Rain	1001 KINGS HIGHWAY	
09-Dec-2004	11:30 AM	Not Reported		0	0	Rear-end		Wet	Daylight	Rain	1001 KINGS HIGHWAY	
02-Jan-2004	11:15 AM	Non-fatal injury		2	0	Rear-end		Dry	Daylight	Rain/Snow	500 KINGS HIGHWAY	
06-Feb-2004	5:00 PM	Property damage only (none injured)		0	0	Sideswipe, same direction		Wet	Dark - lighted roadway	Rain/Cloudy	500 KINGS HIGHWAY	
21-Feb-2004	4:35 PM	Property damage only (none injured)		0	0	Angle		Wet	Not reported	Clear	500 KINGS HIGHWAY	
08-Mar-2004	1:00 PM	Non-fatal injury		1	0	Rear-end		Wet	Daylight	Cloudy/Snow	500 KINGS HIGHWAY	
06-Jul-2004	5:00 PM	Non-fatal injury		1	0	Rear-end		Wet	Daylight	Cloudy/Rain	500 KINGS HIGHWAY	
07-Jan-2005	6:40 PM	Non-fatal injury		1	0	Rear-end		Dry	Dark - lighted roadway	Clear/Rain	1001 KINGS HIGHWAY	
15-Mar-2005	12:00 PM	Non-fatal injury		1	0	Angle		Dry	Daylight	Clear	1001 KINGS HIGHWAY	
11-Oct-2005	7:22 AM	Non-fatal injury		2	0	Rear-end		Wet	Daylight	Cloudy	1001 KINGS HIGHWAY	
15-Nov-2005	4:40 PM	Property damage only (none injured)		0	0	Rear-end		Wet	Dusk	Rain	1001 KINGS HIGHWAY	
16-Apr-2005	4:20 PM	Property damage only (none injured)		0	0	Rear-end		Dry	Daylight	Clear	500 KINGS HIGHWAY	
04-Nov-2005	2:15 PM	Not Reported		0	0	Sideswipe, same direction		Dry	Daylight	Clear	500 KINGS HIGHWAY	
06-Jul-2006	4:30 PM	Non-fatal injury		1	0	Rear-end		Dry	Daylight	Clear	1001 KINGS HIGHWAY	
22-Jul-2006	9:45 PM	Not Reported		0	0	Angle		Dry	Dark - lighted roadway	Cloudy	1001 KINGS HIGHWAY	
22-Feb-2006	2:45 PM	Property damage only (none injured)		0	0	Sideswipe, same direction		Dry	Daylight	Clear/Clear	500 KINGS HIGHWAY	
06-May-2006	10:30 AM	Property damage only (none injured)		0	0	Rear-end		Dry	Daylight	Clear	500 KINGS HIGHWAY	
05-Dec-2006	3:50 PM	Property damage only (none injured)		0	0	Head-on		Dry	Dusk	Clear	500 KINGS HIGHWAY	

NORTON	1/1/2004	12/31/2006	is similar to: Old Colony North									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
2/4/2005	4:27:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear	DEAN STREET	JOHN BRYSON SCOTT BOULEVARD
12/6/2005	5:30:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	EAST MAIN STREET Rte 123 W	WEST MAIN STREET
1/8/2006	12:09:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Cloudy	DEAN STREET	JOHN BRYSON SCOTT BOULEVARD
2/27/2006	2:24:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	SOUTH WORCESTER STREET	JOHN BRYSON SCOTT BOULEVARD
12/27/2006	2:52:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	WEST MAIN STREET	NORTH WORCESTER STREET

RAYNHAM	1/1/2004	12/31/2006	is similar to: Foundry W									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection
1/16/2004	6:57:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dawn	Clear	BROADWAY Rte 138	ELM STREET EAST
2/9/2004	6:45:00 PM	Unknown	2	0	0	Angle	Angle	Dry	Dark - unknown roadway lighting	Clear	BROADWAY Rte 138	CARVER STREET
2/19/2004	1:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	BROADWAY Rte 138	ELM STREET WEST / ELM STREET EAST
4/14/2004	7:39:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	BROADWAY Rte 138 N	Rte 495 N
7/16/2004	6:00:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	BROADWAY Rte 138 N	CARVER STREET
7/22/2004	8:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	BROADWAY Rte 138	CARVER STREET
9/1/2004	12:30:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported	BROADWAY Rte 138	CARVER STREET
11/4/2004	1:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	BROADWAY Rte 138	CENTER STREET
11/15/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear	BROADWAY Rte 138 S	BRITTON STREET
11/17/2004	2:57:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Not reported	Daylight	Clear	CARVER STREET	BROADWAY
11/24/2004	10:02:00 PM	Unknown	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Rain	BROADWAY Rte 138	ELM STREET EAST
1/12/2005	7:05:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Slush	Dawn	Snow	BROADWAY Rte 138	BRITTON STREET Rte 138
2/11/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Clear	BROADWAY Rte 138	CARVER STREET
3/11/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Clear	BROADWAY Rte 138 N	Rte 495 N
4/19/2005	12:20:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	CENTER STREET	BROADWAY
5/8/2005	8:07:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain	BROADWAY Rte 138	CARVER STREET
9/14/2005	9:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	CARVER STREET	BROADWAY
9/24/2005	4:49:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	BROADWAY Rte 138	ELM STREET EAST
12/1/2005	8:30:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	BROADWAY Rte 138	Rte 495 S
2/15/2006	7:54:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear	BROADWAY Rte 138 N	Rte 495 S
2/20/2006	12:13:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	BROADWAY Rte 138 N	CARVER STREET
3/20/2006	12:00:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	BROADWAY Rte 138	CARVER STREET
4/1/2006	6:29:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy/Cloudy	BROADWAY Rte 138	CARVER STREET
4/8/2006	8:59:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Rain/Cloudy	BROADWAY Rte 138	CARVER STREET
4/19/2006	4:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	BROADWAY Rte 138	CARVER STREET
4/20/2006	7:19:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear	BROADWAY Rte 138	ELM STREET EAST
5/16/2006	3:37:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy	BROADWAY Rte 138 N	CARVER STREET
7/12/2006	6:54:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Cloudy	BROADWAY Rte 138 S	BRITTON STREET
7/13/2006	8:40:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Dusk	Cloudy/Cloudy	BROADWAY Rte 138 S	CARVER STREET
7/20/2006	3:46:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	BROADWAY Rte 138	CENTER STREET
8/14/2006	3:02:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	BROADWAY Rte 138	CARVER STREET
9/2/2006	5:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	BROADWAY Rte 138 N	CARVER STREET
10/4/2006	5:06:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	BROADWAY Rte 138 N	RAMP - RT 495 SB TO RT 138
11/7/2006	12:04:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	BROADWAY Rte 138	CARVER STREET

TAUNTON (EAST TAUNTON)	1/1/2004	12/31/2006	similar to: rte 140 route 140										
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Address/Landmark	Exit Distance	Feet_From
8/22/2004	5:36:00 AM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear/Clear	ROUTE 140 Rte 140 N		ROUTE 140 Rte 140 N
12/3/2004	5:45:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy	Rte 140		Rte 140 / Rte 140
9/30/2004	5:52:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear	Rte 140 N	Exit 12 on Rte 140	Rte 140 N
5/30/2006	6:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			SOUTH PRECINCT STREET Rte 140 / STRAWBERRY LANE Rte 140
10/15/2004	7:05:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	Rte 140 N	Exit 11 on Rte 140	Rte 140 N

FREETOWN	1/1/2004	12/31/2006	is similar to: rte 140 route												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
6/4/2005	2:00:00 AM	Fatal injury	2	0	2	Head-on	Head-on	Dry	Dark - roadway not lighted	Clear/Clear				200 feet S from Rte 140 N Milemarker 8.1	Rte 140 N
3/30/2006	5:07:00 AM	Fatal injury	1	1	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 8 on Rte 140		Rte 140
6/3/2004	5:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		Rte 140 S	1320 feet S from Exit 9 on Rte 140		Rte 140 S
10/8/2004	7:27:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear		Rte 140 N			Rte 140 N
12/20/2004	5:09:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Cloudy		Rte 140 S			Rte 140 S
4/30/2005	1:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 S
7/5/2005	9:04:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear					Rte 140 N
8/3/2005	9:11:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 feet S from Rte 140 S Milemarker 9.4	Rte 140 S
8/7/2005	7:48:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Rte 140 S Milemarker 8.3	Rte 140 S
10/9/2005	6:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain		NORTH OF EXIT 8 - Rte 140 N			Rte 140 N
1/11/2006	4:10:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear					Rte 140 S
2/12/2006	3:55:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow					ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / CHACE ROAD
4/20/2006	10:16:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				25 feet S from Rte 140 S Milemarker 8.7	Rte 140 S
4/20/2006	10:40:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 140
7/11/2006	8:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 140 N
12/26/2006	9:25:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear		SOUTH OF EXIT 8			Rte 140 S
1/12/2004	3:21:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear		Rte 140 N	5280 feet N from Exit 7 on Rte 140		Rte 140 N
6/19/2004	6:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear		Rte 140 S		150 feet N from Rte 140 S Milemarker 9.1	Rte 140 S
9/2/2004	12:29:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear		1125 feet E from RT 140 NORTH OVERPASS - WASHBURN ROAD			WASHBURN ROAD
9/20/2004	5:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 140 S				
12/11/2004	4:34:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear		Rte 140 S			Rte 140 S / Rte 140
12/22/2004	8:37:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		EXIT 8 - Rte 140 S			Rte 140 S
12/27/2004	7:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow		Rte 140 S		200 feet N from Rte 140 S Milemarker 8.3	Rte 140 S
12/28/2004	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear		ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S
1/5/2005	5:54:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear					320 feet W from Intersection WASHBURN ROAD Rte 140 / Rte 140
2/17/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy					Rte 140
5/14/2005	5:36:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear					Rte 140 N
5/23/2005	12:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 feet N from Rte 140 S Milemarker 10.5	Rte 140 S
6/21/2005	11:55:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Cloudy				Rte 140 S Milemarker 7.5	Rte 140 S
7/26/2005	5:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				2640 feet S from Rte 140 N Milemarker 10.0	Rte 140 N
8/22/2005	4:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear		ON RAMP TO 140N - CHACE ROAD Rte 140			CHACE ROAD Rte 140 / Rte 140
9/16/2005	2:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy					Rte 140 S
9/23/2005	2:39:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear		2500 feet N from ROUTE 140 SB NORTH OF CHACE RD - Rte 140 S	2500 feet S from Exit 8 on Rte 140		Rte 140 S
10/15/2005	6:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy					Rte 140 N
11/7/2005	4:29:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear					Rte 140 N
11/9/2005	7:32:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy					Rte 140 N
11/20/2005	2:36:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear					RAMP-CHACE RD TO RT 140 NB / Rte 140
10/5/2006	1:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		SOUTH OF EXIT 8			Rte 140 S
10/30/2006	3:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 140 S
10/30/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 S
10/30/2006	4:23:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear					Rte 140 N
10/30/2006	5:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear		OF EXIT 8 CHASE ROAD			Rte 140 S

LAKEVILLE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 140 route 140													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet From
6/29/2004	8:00:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			NORTH OF EXIT 9 - Rte 140 N			Rte 140 N
5/3/2006	4:05:00 PM	Fatal injury	2	1	1	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain						Rte 140 S
2/8/2004	9:08:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N
3/26/2004	12:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 140 S	Exit 10 on Rte 140		Rte 140 S
6/21/2004	2:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N			1500 feet N from Intersection Rte 140 N / COUNTY STREET
7/27/2004	5:29:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N / RAMP - COUNTY ST TO RT 140 SB Rte 18
10/14/2004	7:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO COUNTY ST
10/31/2004	4:30:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S
1/27/2005	6:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow			NORTH OF COUNTY. - ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 SB TO COUNTY ST
3/6/2005	3:41:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear	Rte 140 S	RAMP - RT 140 SB TO COUNTY ST				
8/19/2005	5:10:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						COUNTY STREET Rte 140 N
10/1/2005	5:25:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 N Milemarker 15.2	Rte 140 N
10/18/2005	12:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
11/29/2005	7:53:00 AM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			EXIT 10 - Rte 140 S			Rte 140 S
12/5/2005	9:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			SOUTH OF EXIT 10 - Rte 140 N			Rte 140 N
3/8/2006	1:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
4/5/2006	2:31:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 140 N Milemarker 14.9	Rte 140 N
7/20/2006	6:45:00 PM	Non-fatal injury	1	6	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 140 S
10/1/2006	2:45:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N
11/23/2006	7:47:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			HIGHLAND ST OVERPASS			Rte 140 S
11/9/2005	7:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 140		Rte 140 N
1/17/2004	3:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 N	Exit 9 on Rte 140		Rte 140 N
2/6/2004	12:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow			CURB ON BRIDGE OVERPASS OF COUNT - COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N
2/18/2004	11:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			Rte 140 S		200 feet S from Rte 140 S Milemarker 15.8	Rte 140 S
3/4/2004	1:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			Rte 140 N			Rte 140 N
3/26/2004	12:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 140 N			900 feet S from Intersection Rte 140 N / Rte 79
5/23/2004	8:33:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N
8/3/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 S			Rte 140 S
9/12/2004	2:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N
10/29/2004	11:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 140 N		Rte 140 N Milemarker 14.2	Rte 140 N
11/3/2004	2:53:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Not reported	Daylight	Clear/Clear			PICKENS STREET Rte 105			PICKENS STREET Rte 105 / Rte 140
11/17/2004	11:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP OFF TO COUNTY ROAD, LAKEVIL - ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO COUNTY ST
11/19/2004	2:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 N		Rte 140 N Milemarker 14.0	Rte 140 N
12/9/2004	4:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy			AT EXIT 9 - Rte 140 S			Rte 140 S
1/3/2005	10:52:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - roadway not lighted	Rain						Rte 140
1/6/2005	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Fog, smog, smoke					Rte 140 N Milemarker 13.0	Rte 140 N
1/16/2005	10:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow						Rte 140 N
2/6/2005	3:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Dark - roadway not lighted	Cloudy/Cloudy			ON-RAMP TO RTE 140 N FROM COUNTY - ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO COUNTY ST
3/11/2005	7:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			JUST SOUTH OF RT 79. - Rte 140 N			Rte 140 N / Rte 79
5/6/2005	7:48:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N
5/21/2005	5:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					100 feet S from Rte 140 S Milemarker 12.2	Rte 140 S
5/23/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					10 feet N from Rte 140 S Milemarker 14.6	Rte 140 S
6/17/2005	8:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AT RTE 79 - Rte 140 S			Rte 140 S / Rte 79
7/5/2005	6:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
8/18/2005	4:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 9 on Rte 140		Rte 140 S
8/26/2005	7:04:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						COUNTY STREET Rte 140 N
10/24/2005	11:44:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain						Rte 140 S
10/31/2005	4:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear						COUNTY STREET Rte 140 N
11/12/2005	8:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 S
12/9/2005	2:57:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow/Blowing sand, snow						COUNTY STREET / RAMP - RT 140 NB TO COUNTY ST
12/10/2005	8:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Clear			EXIT 9 - Rte 140 N			Rte 140 N
12/18/2005	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy			RAMP TO EXIT #9 - Rte 140 N			Rte 140 N
2/1/2006	2:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						1000 feet N from Intersection Rte 140 N / COUNTY STREET
3/5/2006	7:32:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 140 N Milemarker 14.3	Rte 140 N
4/20/2006	1:01:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					200 feet N from Rte 140 S Milemarker 11.6	Rte 140 S
12/30/2006	9:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Cloudy/Cloudy			ROUTE 140 ON RAMP			RAMP - COUNTY ST TO RT 140 SB

NEW BEDFORD 1/1/2004	12/31/2006	Where street or intersection is similar to: 4x 140 route 140													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet From
8/18/2004	1:55:00 AM	Fatal injury	2	0	1	Angle	Angle	Dry	Dark - lighted roadway	Cloudy	Rte 140 S	KEMPTON STREET Rte 6 W				
8/18/2004	7:14:00 AM	Fatal injury	4	1	1	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			Rte 140 S		Rte 140 S Milemarker 8.6	Rte 140 S
4/26/2005	2:05:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			250 feet S from EXIT 3 (HATHAWAY RD) - Rte 140			Rte 140 / HATHAWAY ROAD
7/14/2005	12:30:00 AM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 7 on Rte 140 S	Rte 140 S Milemarker 7.5	Rte 140 S
6/21/2006	3:15:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			BETWEEN EXITS 4 & 5			Rte 140 N
8/11/2006	8:05:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			105 feet S from EXIT 3			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO HATHAWAY RD
10/19/2006	4:15:00 PM	Fatal injury	2	1	1	Head-on	Head-on	Dry	Daylight	Clear/Clear						Rte 140 S / CHURCH STREET
1/10/2004	8:20:00 AM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			BETWEEN 1 95 RAMPS - Rte 140 N		200 feet S from Rte 140 N Milemarker 1.1	Rte 140 N
1/16/2004	4:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 S			1000 feet S from Intersection Rte 140 S / HATHAWAY ROAD
1/16/2004	5:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 S			1500 feet N from Intersection Rte 140 S / HATHAWAY ROAD
1/19/2004	3:25:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RTE 195 WEST ON RAMP - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			200 feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 WB
1/23/2004	6:35:00 AM	Non-fatal injury	1	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear			Rte 140 N	Exit 7 on Rte 140		Rte 140 N
2/9/2004	11:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizz			Rte 140 S			Rte 140 S / Rte 195
2/10/2004	3:41:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 S			50.0 feet N from Intersection Rte 140 S / Rte 6
2/23/2004	1:15:00 PM	Non-fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			NSW BEDFORD/FREETOWN LINE - Rte 140 N		Rte 140 N Milemarker 7.6	Rte 140 N
3/1/2004	1:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			JUST NORTH OF RTE 6 - Rte 140 N			Rte 140 N / Rte 6
3/5/2004	7:20:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain			Rte 140 N		100 feet N from Rte 140 N Milemarker 1.1	Rte 140 N
3/9/2004	5:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 195 EB TO RT 140 NB
3/20/2004	2:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Unknown	Clear			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S
3/23/2004	7:22:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			HATHAWAY RD, CONSTRUCTION AREA - Rte 140 S			Rte 140 S / HATHAWAY ROAD
3/24/2004	7:05:00 PM	Non-fatal injury	1	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy/Cloudy			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO MT PLEASANT ST
3/25/2004	11:34:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			HATHAWAY RD, CONSTRUCTION AREA - Rte 140 S			Rte 140 S / HATHAWAY ROAD
4/11/2004	1:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 140 S			Rte 140 S / MOUNT PLEASANT STREET
4/24/2004	5:45:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 140 N	Exit 4 on Rte 140	Rte 140 Milemarker 11.0	Rte 140 N
4/30/2004	10:45:00 AM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 140 N			Rte 140 N
4/30/2004	11:30:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Not reported	Daylight	Clear	Rte 140 N	ON RAMP Rte 195 E				
5/16/2004	11:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			RAMP - RT 195 EB TO RT 140 SB			RAMP - RT 195 EB TO RT 140 SB / Rte 195
6/3/2004	3:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 S		2.5 feet S from Rte 140 S Milemarker 2.0	Rte 140 S
6/3/2004	10:40:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			HATHAWAY ROAD			HATHAWAY ROAD / Rte 140
6/3/2004	11:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			KINGS HIGHWAY			KINGS HIGHWAY / RAMP - KINGS HWY TO RT 140 NB
6/4/2004	11:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N
6/23/2004	10:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 140 N			Rte 140 N
7/17/2004	3:48:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 N		25 feet S from Rte 140 N Milemarker 2.7	Rte 140 N
7/23/2004	12:33:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			RAMP - RT 195 EB TO RT 140 NB			RAMP - RT 195 EB TO RT 140 NB / Rte 140
7/27/2004	8:00:00 PM	Non-fatal injury	1	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported			RAMP - RT 140 NB TO CHURCH ST			RAMP - RT 140 NB TO CHURCH ST / PHILLIPS ROAD
8/23/2004	12:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 S		10 feet S from Rte 140 Milemarker 10.9	Rte 140 S
8/25/2004	9:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			WEST OF RTE 140 SOUTH - Rte 195 E		Rte 195 E Milemarker 23.3	Rte 195 E
8/28/2004	6:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear			1212 KEMPTON STREET			1212 KEMPTON STREET / Rte 140
8/29/2004	8:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N / Rte 195
8/31/2004	7:30:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			20 feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO MT PLEASANT ST
9/8/2004	2:35:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ON RAMP FROM BRALEY ROAD ONTO RTE - BRALEY ROAD			BRALEY ROAD / Rte 140
9/14/2004	8:59:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 140 N		50 feet N from Rte 140 N Milemarker 5.6	Rte 140 N
9/15/2004	3:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			Rte 140 N			Rte 140 N
9/29/2004	5:25:00 PM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140 S	KEMPTON STREET Rte 6				
9/30/2004	7:35:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Wet	Dark - lighted roadway	Rain			PHILLIPS ROAD Rte 140 N			PHILLIPS ROAD Rte 140 N / CHURCH STREET
10/1/2004	7:21:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 S			Rte 140 S
10/8/2004	8:16:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			400 feet S from EXIT 4 - Rte 140 S			Rte 140 S
10/14/2004	8:19:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			Rte 140 S			Rte 140 S
10/28/2004	7:35:00 AM	Non-fatal injury	2	4	0	Rear-end	Rear-end	Dry	Daylight	Clear			KINGS HIGHWAY			4 feet E from Intersection KINGS HIGHWAY / RAMP - KINGS HWY TO RT 140 NB Rte 140 E
11/2/2004	3:55:00 PM	Non-fatal injury	5	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 140 S			700 feet N from Intersection Rte 140 S / Rte 6
11/12/2004	12:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Not reported	Cloudy/Rain			SOUTH OF CHURCH ST. - Rte 140 S		Rte 140 S Milemarker 4.6	Rte 140 S
11/19/2004	5:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 140 S			500 feet N from Intersection Rte 140 S / Rte 6
11/21/2004	6:25:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 140 S		2.0 feet S from Rte 140 S Milemarker 6.1	Rte 140 S
12/3/2004	4:11:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Cloudy			Rte 140 N		1000 feet N from Rte 140 N Milemarker 7.0	Rte 140 N
12/7/2004	6:20:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			HATHAWAY ROAD			HATHAWAY ROAD / RAMP - RT 140 NB TO HATHAWAY RD Rte 140
12/16/2004	5:30:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear			ON RAMP TO RTE 195 EAST - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 EB
12/19/2004	11:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			20 feet N from ROUTE 195 OVERPASS - Rte 140 N			20 feet N from Intersection Rte 140 N / Rte 195
1/7/2005	4:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy						Rte 140 S / Rte 195
1/17/2005	6:15:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain					Rte 140 S Milemarker 1.0	ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / KEMPTON STREET Rte 6
1/17/2005	12:20:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Snow	Dark - roadway not lighted	Snow/Snow						Rte 140 S
2/3/2005	3:40:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Sleet, hail (freezing rain or drizzle)			AT RAMP FROM KINGS HIGHWAY - Rte 140 S			Rte 140 S / KINGS HIGHWAY Rte 18
3/3/2005	5:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
3/4/2005	2:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear					Rte 140 N Milemarker 7.3	Rte 140 N
3/4/2005	4:22:00 PM	Non-fatal injury	2	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						RAMP - RT 195 EB TO RT 140 NB
3/5/2005	4:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						BRALEY ROAD Rte 140 N / RAMP - BRALEY RD TO RT 140 NB
3/11/2005	3:45:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Snow						Rte 140 N
3/12/2005	1:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)						Rte 140 N / Rte 140
3/18/2005	3:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 195 Rte 195 E / RAMP - RT 195 EB TO RT 140 SB Rte 195 E
3/20/2005	5:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					100 feet S from Rte 140 N Milemarker 3.2	Rte 140 N
3/28/2005	6:55:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					150 feet S from Rte 140 N Milemarker 2.4	Rte 140 N
4/9/2005	11:15:00 PM	Non-fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			RAMP FROM ACUSHNET AVE - Rte 140 N		Rte 140 N Milemarker 5.9	Rte 140 N
4/17/2005	12:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 140 S Milemarker 6.8	Rte 140 S
5/30/2005	9:41:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			EXIT #3 (HATHAWAY ROAD) - Rte 140 N			Rte 140 N
5/31/2005	10:00:00 AM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Daylight	Clear						CHURCH STREET Rte 140 / RAMP - RT 140 NB TO CHURCH ST Rte 140
6/1/2005	6:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 7 on Rte 140		Rte 140 N
6/8/2005	12:32:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			BETWEEN EXIT 4 AND EXIT 5 - Rte 140 N			Rte 140 N
6/18/2005	3:00:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Other	Daylight	Clear/Clear			AT ROUTE 140 - Rte 195 E			Rte 195 E
6/30/2005	6:23:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			RTE 18 - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO RT 18
7/23/2005	9:31:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 7 on Rte 140		Rte 140 N / BRALEY ROAD
8/2/2005	2:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			@ RT 140 - Rte 195 W			Rte 195 W / Rte 140
8/3/2005	5:05:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	RAMP - RT 140 SB TO HATHAWAY RD	HATHAWAY ROAD				
8/6/2005	6:43:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					300 feet N from Rte 140 N Milemarker 5.7	Rte 140 N
8/29/2005	4:32:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy	Rte 140 S	Rte 6 W				
8/30/2005	8:35:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy						HILLMAN STREET / RAMP - RT 140 NB TO BRAYLEY RD Rte 18 N
9/5/2005	11:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			100 feet S from RAMP FROM RTE 195 WESTBOUND - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			100 feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 195 WB TO RT 140 NB
9/7/2005	2:00:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 S Milemarker 3.2	Rte 140 S
9/8/2005	12:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			AT EXIT 4, KINGS HIGHWAY - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO KINGS HWY
9/22/2005	6:21:00 PM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			RTE 195 RAMPS EXIT # 2 - Rte 140 N			Rte 140 N
10/11/2005	6:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			ON RAMP FROM CHURCH ST. TO 140 S - Rte 140 S			Rte 140 S / CHURCH STREET
10/13/2005	8:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain			@ HATHAWAY RD EXIT - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO HATHAWAY RD
10/17/2005	8:02:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear						RAMP - KINGS HWY TO RT 140 NB Rte 140 / Rte 140
10/19/2005	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						1000 feet S from Intersection Rte 140 S / MOUNT PLEASANT STREET
10/26/2005	7:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					Rte 140 S Milemarker 5.5	Rte 140 S
11/3/2005	5:30:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 140 N
11/6/2005	11:40:00 PM	Non-fatal injury	3	3	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Clear			30 feet E from 140 S ON RAMP - BRALEY ROAD			BRALEY ROAD / RAMP - BRAYLEY RD TO RT 140 NB
11/9/2005	5:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain						Rte 140 N / Rte 18
11/9/2005	5:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Wet	Dusk	Rain					Rte 195 Milemarker 13.0	Rte 195 / Rte 140
11/11/2005	2:00:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					400 feet N from Rte 140 S Milemarker 6.9	Rte 140 S
11/11/2005	3:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			OFF RAMP - CHURCH STREET			CHURCH STREET / Rte 140
11/12/2005	10:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
11/15/2005	6:40:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Cloudy			BETWEEN RAMPS TO EXIT 5 - Rte 140 S			Rte 140 S
11/22/2005	9:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy					300 feet S from Rte 140 S Milemarker 2.1	Rte 140 S
12/13/2005	9:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 140 / Rte 6
12/20/2005	5:45:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			HATHAWAY RD EXIT 3 - Rte 140 N			Rte 140 N / HATHAWAY ROAD
12/28/2005	7:40:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy						Rte 140 S
1/4/2006	4:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				200 feet S from Exit 5 on Rte 140		Rte 140
1/30/2006	2:00:00 AM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Cloudy						Rte 140 / ACUSHNET AVENUE
3/1/2006	4:33:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear					Rte 140 N Milemarker 0.1	Rte 140 N
3/17/2006	4:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			2.00 feet N from MT. PLEASANT STREET OVERPASS			Rte 140 S
3/21/2006	10:09:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
3/23/2006	7:20:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			EXIT 4			Rte 140 N
4/7/2006	1:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain						HATHAWAY ROAD Rte 140 / MOUNT PLEASANT STREET
4/11/2006	1:28:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N
4/26/2006	8:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			200 feet N from CHURCH STREET OFF RAMP			Rte 140 S
5/13/2006	2:45:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain/Cloudy			50 feet N from RAMP TO 195 WEST			50 feet N from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 WB
5/15/2006	10:37:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	Rte 140 S	KEMPTON STREET				
5/18/2006	10:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			EXIT 5	255 feet S from Exit 5 on Rte 140 S		Rte 140 S
6/19/2006	8:55:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140 S
6/26/2006	8:55:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	KEMPTON STREET Rte 140 S	KEMPTON STREET Rte 140 S				
6/27/2006	10:50:00 PM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear						BRALEY ROAD Rte 140 N
7/7/2006	11:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			NORTH RAMP			RAMP - RT 140 NB TO KINGS HWY
7/18/2006	9:57:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N
8/24/2006	7:49:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			NASH RD OVERPASS			Rte 140 N
9/2/2006	8:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 140 S Milemarker 7.6	Rte 140 S
9/13/2006	9:47:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140 N	CHURCH STREET / RAMP - RT 140 NB TO CHURCH ST				
9/14/2006	2:10:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain					100 feet S from Rte 140 N Milemarker 6.2	Rte 140 N
9/14/2006	9:09:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			SOUTH OF EXIT 4			Rte 140 S
9/16/2006	2:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy					Rte 140 S Milemarker 4.6	Rte 140 S
9/23/2006	8:38:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						KEMPTON STREET Rte 140 / Rte 140
10/1/2006	7:28:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy					300 feet N from Rte 140 S Milemarker 7.2	Rte 140 S
10/6/2006	8:15:00 PM	Non-fatal injury	1	4	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			JUST PRIOR TO EXIT #5	Exit 5 on Rte 140		Rte 140
10/15/2006	4:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			30 feet E from TELEPHONE POLE 37359			KEMPTON STREET / Rte 140
10/18/2006	9:29:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy	Rte 140 S	KEMPTON STREET				
10/19/2006	4:20:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			KINGS HIGHWAY			Rte 140 N / KINGS HIGHWAY
10/19/2006	5:20:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight

NEW BEDFORD 1/1/2004 12/31/2006 Where street or intersection is similar to: 4x 140 route 140

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
1/1/2006	5:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain				Exit 7 on Rte 140 N		ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - BRAYLEY RD TO RT 140 NB
12/28/2006	4:22:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy						Rte 140 N / Rte 6
1/9/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	RAMP - RT 140 SB TO BRAYLEY RD Rte 140 S	RAMP - RT 195 WB TO RT 140 SB Rte 195 W				
1/16/2004	8:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 140 S			Rte 140 S / HATHAWAY ROAD
1/17/2004	1:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP - RT 140 NB TO RT 195 EB			RAMP - RT 140 NB TO RT 195 EB
1/19/2004	3:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / KEMPTON STREET Rte 6
1/19/2004	3:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N
1/21/2004	6:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear			Rte 140 S	87 feet S from Exit 7 on Rte 140		Rte 140 S
1/21/2004	9:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 140 S			Rte 140 S / HATHAWAY ROAD
2/2/2004	1:05:00 PM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 140 N	100 feet N from Exit 13A on Rte 140	100 feet E from Rte 140 Milemarker 23.9	Rte 140 N
2/22/2004	5:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dusk	Snow			EXIT 4 KINGS HIGHWAY - Rte 140 N			500 feet N from Intersection Rte 140 N
3/5/2004	10:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain			ENTRANCE TO FIELDSTONE MARKET PL - KINGS HIGHWAY Rte 140			KINGS HIGHWAY Rte 140
3/9/2004	7:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear			Rte 140 S		Rte 140 S Milemarker 1.3	Rte 140 S
3/17/2004	8:30:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Daylight	Clear			Rte 140 S			Rte 140 S
3/22/2004	2:25:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			MERGE WITH ACUSHNET AVENUE NORTH - Rte 140 N		Rte 140 N Milemarker 6.2	Rte 140 N
3/27/2004	12:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			OFF RAMP - CHURCH STREET Rte 140 S			CHURCH STREET Rte 140 S / Rte 140
3/29/2004	7:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 140 S	5.0 feet S from Exit 4 on Rte 140		Rte 140 S
3/30/2004	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			RAMP - RT 140 NB TO RT 195 WB			RAMP - RT 140 NB TO RT 195 WB
4/14/2004	4:43:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			Rte 140 N			Rte 140 N
4/16/2004	8:23:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy	KEMPTON STREET Rte 140					
4/26/2004	6:47:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Clear			Rte 140 S		100 feet N from Rte 140 S Milemarker 1.9	Rte 140 S
4/30/2004	11:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			200 feet S from RTE 195 EAST RAMP - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			200 Feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 EB
5/9/2004	1:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140	KEMPTON STREET Rte 6				
5/9/2004	9:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			RTE 140 NORTH - INTERSTATE 195 Rte 195 W			INTERSTATE 195 Rte 195 W / RAMP - RT 195 WB TO RT 140 NB
5/19/2004	8:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			2 RAMP - BRAYLEY RD TO RT 140 SB Rte 140 S	500 feet N from Exit 25 on Rte 140 S		2 RAMP - BRAYLEY RD TO RT 140 SB Rte 140 S
5/21/2004	10:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			600 feet N from CHURCH STREET EXIT - Rte 140 N			600 feet N from Intersection Rte 140 N / CHURCH STREET
5/31/2004	12:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 N		200 feet S from Rte 140 N Milemarker 4.4	Rte 140 N
6/4/2004	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 N		Rte 140 N			Rte 140 N
6/9/2004	1:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - CHURCH ST TO RT 140 NB
6/9/2004	4:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain			Rte 140 S			Rte 140 S
6/22/2004	2:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			BETWEEN HATHAWAY RD RAMPS - HATHAWAY ROAD Rte 140 N		Rte 140 N Milemarker 1.6	HATHAWAY ROAD Rte 140 N
7/2/2004	5:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain			Rte 140 N			Rte 140 N
7/2/2004	6:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear			CHURCH STREET Rte 140 S			CHURCH STREET Rte 140 S
7/6/2004	4:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Fog, smog, smoke			Rte 140 N		75 feet S from Rte 140 N Milemarker 2.5	Rte 140 N
7/10/2004	5:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear	Rte 140 N	Rte 140 N				
7/30/2004	6:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	HATHAWAY ROAD	Rte 140 N / RAMP - HATHAWAY RD TO RT 140 NB				
8/3/2004	12:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			AT EXIT #2 - Rte 140 N			Rte 140 N
8/9/2004	6:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 WB Rte 195 W
8/12/2004	2:30:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 140 N		13 feet N from Rte 140 N Milemarker 0.1	Rte 140 N
8/16/2004	9:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 140 S		1320 Feet S from Rte 140 S Milemarker 1.3	Rte 140 S
8/31/2004	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			EXIT 4 - Rte 140 S			Rte 140 S
9/9/2004	5:20:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			Rte 140 N		75 feet S from Rte 140 N Milemarker 1.6	Rte 140 N
9/18/2004	1:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 140 N			Rte 140 N / CHURCH STREET
10/9/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Clear/Clear			RAMP - RT 195 EB TO RT 140 NB			RAMP - RT 195 EB TO RT 140 NB / Rte 140
10/9/2004	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140 S	KEMPTON STREET				
10/9/2004	9:16:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			RTE 195 EAST TO RTE 140 SOUTH - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			25 Feet N from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 195 EB TO RT 140 SB
10/19/2004	12:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			RAMP - RT 195 EB TO RT 140 NB			RAMP - RT 195 EB TO RT 140 NB / Rte 140
10/22/2004	4:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			1320 Feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO BRAYLEY RD
10/29/2004	2:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			KEMPTON STREET Rte 6 W			KEMPTON STREET Rte 6 W / Rte 140
11/1/2004	5:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			500 Feet N from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / KEMPTON STREET
11/7/2004	12:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Unknown	Rte 140 N	Rte 195 E				
11/23/2004	4:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			1000 Feet N from BRALEY RD - Rte 140			1000 Feet N from Intersection Rte 140 / BRALEY ROAD
11/29/2004	1:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			KINGS HIGHWAY			20 feet E from Intersection KINGS HIGHWAY / RAMP - KINGS HWY TO RT 140 NB Rte 140 E
12/3/2004	6:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			AT LAST CURVE IN RAMP - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO RT 195 WB
12/6/2004	6:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			CHACE RD. - Rte 140 N			Rte 140 N / CHACE ROAD
12/8/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Other			HATHAWAY ROAD Rte 140			HATHAWAY ROAD Rte 140 / Rte 140
12/10/2004	2:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 140 S			2640 feet N from Intersection Rte 140 S / Rte 6
12/15/2004	10:02:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 140 S		100 feet S from Rte 140 S Milemarker 4.9	Rte 140 S
12/17/2004	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	EXIT Rte 140 N	HATHAWAY ROAD				
12/21/2004	7:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Daylight	Clear/Clear			Rte 140 S		200 Feet N from Rte 140 S Milemarker 4.5	Rte 140 S
12/28/2004	3:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Sleet, hail (freezing rain or drizzle)			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO HATHAWAY RD
12/28/2004	7:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Slush	Daylight	Cloudy/Cloudy			200 feet S from CHURCH ST - Rte 140 S			200 feet S from Intersection Rte 140 S / CHURCH STREET
12/29/2004	3:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 140 S			Rte 140 S
1/17/2005	12:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow						Rte 140 S
1/19/2005	10:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow					200 feet N from Rte 140 N Milemarker 3.6	Rte 140 N
2/12/2005	12:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 140 S / Rte 6
2/13/2005	4:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			RAMP FROM 195 EB - Rte 140 S			Rte 140 S
2/19/2005	9:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO CHURCH ST
2/19/2005	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Other				150 feet S from Exit 6 on Rte 140		Rte 140 S
2/24/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	MOUNT PLEASANT STREET	Rte 140 S / RAMP - RT 140 SB TO MT PLEASANT ST				
2/25/2005	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow				200 Feet S from Rte 140 N Milemarker 0.9		Rte 140 N
3/3/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy						Rte 140
3/4/2005	3:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 140 S Milemarker 1.3	Rte 140 S
3/9/2005	4:37:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			N OF RTE 6 - Rte 140 S			Rte 140 S / Rte 6
3/10/2005	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	ROUTE 140 ON RAMP Rte 140 N	ACUSHNET AVENUE				
3/11/2005	3:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Snow	Not reported	Snow/Snow	Rte 140 S					
3/11/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Snow/Snow					100 Feet S from Rte 140 N Milemarker 1.6	HATHAWAY ROAD Rte 140 N
3/21/2005	6:04:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						RAMP - RT 140 NB TO CHURCH ST Rte 140 / Rte 140
3/23/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				40.0 feet S from Exit 24B on Rte 140		Rte 140
3/23/2005	11:26:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow						Rte 140 N
3/25/2005	12:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						CHURCH STREET Rte 140 / Rte 140
3/28/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - unknown roadway lighting	Clear					133 Feet S from Rte 140 N Milemarker 7.1	Rte 140 N
3/27/2005	2:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						Rte 140 N
3/28/2005	3:26:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain						Rte 140 S / Rte 6
3/29/2005	8:39:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Cloudy/Rain			HATHAWAY RD - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO HATHAWAY RD
4/4/2005	6:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					Rte 140 N Milemarker 5.9	Rte 140 N
4/15/2005	2:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 140 S
4/15/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not reported						ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / KEMPTON STREET
4/20/2005	5:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 N
4/27/2005	8:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy	Rte 195 W					Rte 140 N / Rte 18
4/30/2005	3:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 140 N / INTERSTATE 195
5/24/2005	2:54:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Not reported	Cloudy/Rain						50.0 feet N from Intersection Rte 140 S / Rte 6
5/26/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain					200 Feet N from Rte 140 S Milemarker 0.1	200 Feet N from Intersection Rte 140 S / Rte 6
5/28/2005	2:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Fog, smog, smoke						ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 EB
5/30/2005	8:53:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			JUST PRIOR TO EXIT #4 - Rte 140 S			Rte 140 S
6/1/2005	8:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE. 195 OFF-RAMP - RAMP - RT 195 EB TO RT 140 NB			RAMP - RT 195 EB TO RT 140 NB
6/7/2005	5:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						ACUSHNET AVENUE Rte 140 / Rte 140
6/9/2005	3:47:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			500 feet N from RTE 6 - Rte 140 S			500 Feet N from Intersection Rte 140 S / Rte 6
6/13/2005	8:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			.5 MILE NORTH OF EXIT 3 - Rte 140 S			Rte 140 S
6/23/2005	2:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			SOUTH OF EXIT 4 - Rte 140 S	Exit 4 on Rte 140		Rte 140 S
7/6/2005	6:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy						Rte 140 / CHURCH STREET
7/14/2005	6:05:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear			@ RTE 195 - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 195 EB TO RT 140 NB
7/26/2005	7:17:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140 N / BRALEY ROAD
8/3/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				200 Feet S from Rte 140 S Milemarker 6.5		Rte 140 S
8/5/2005	5:40:00 PM	Property damage only (none injured)	3	0	0	Unknown	Unknown	Dry	Daylight	Cloudy/Cloudy						Rte 140 S
8/16/2005	3:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						20.0 feet N from Intersection Rte 140 N / Rte 6
8/30/2005	7:29:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain/Rain			ON RAMP FOR EXIT 6 - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO RT 18
9/2/2005	4:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						RAMP - RT 140 SB TO RT 195 WB Rte 140 S
9/9/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	KINGS HIGHWAY Rte 140 N	Rte 140 / Rte 140				
9/17/2005	3:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				10.00 feet S from Rte 140 S Milemarker 5.0		Rte 140 S
9/17/2005	11:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Fog, smog, smoke			RTE 195 W AT 140 N - Rte 195 W			Rte 195 W / Rte 140
9/29/2005	5:55:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Water (standing, moving)	Daylight	Rain			ON RAMP FROM 195 EAST TO 140 NOR. - Rte 140			Rte 140
9/30/2005	9:00:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy			BRALEY RD EXIT 7 - Rte 140 S			Rte 140 S
10/8/2005	12:39:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			RT 140 N OFF RAMP - HATHAWAY ROAD Rte 18			HATHAWAY ROAD Rte 18 / Rte 18
10/13/2005	8:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain						Rte 140 S
10/14/2005	10:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain						Rte 140 S / ACUSHNET AVENUE
10/15/2005	9:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						Rte 140 S
10/19/2005	3:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy						Rte 140 N
10/26/2005	3:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			100 feet S from EXIT 2B - Rte 140 N			Rte 195 E / Rte 140
10/27/2005	1:30:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Dark - unknown roadway lighting	Clear				Exit 5 on Rte 140		Rte 140 S
11/3/2005	11:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	Rte 140 S	KEMPTON STREET Rte 6				
11/4/2005	10:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Cloudy			SOUTH OF EXIT 5 - Rte 140 S			Rte 140 S
11/6/2005	8:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						2640 feet N from Intersection Rte 140 S / Rte 6
11/12/2005	4:59:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						3.000 Feet S from Intersection Rte 140 N / CHURCH STREET
12/3/2005	6:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	KINGS HIGHWAY	Rte 140 / RAMP - KINGS HWY TO RT 140 NB				
12/9/2005	10:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Rain/Snow					Rte 140 S Milemarker 6.9	Rte 140 S
12/12/2005	7:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear/Clear			RAMP TO HATHAWAY RD. - Rte 140 S			Rte 140 S
12/21/2005	7:15:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			RT 195 WEST ON RAMP - ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO RT 195 WB
1/4/2006	2:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			SB RT 140 @ EXIT 6 NB W BEDFORD			
1/24/2006	10:38:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 140 N Milemarker 2.4	Rte 140 N
1/25/2006	10:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			RAMP TO HATHAWAY RD			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO H

NEW BEDFORD	1/1/2004	12/31/2006	Where street or intersection is similar to: 4x 140 route 140													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
6/7/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	BRALEY ROAD	Rte 140 / RAMP - BRAYLEY RD TO RT 140 NB				Rte 140 N / RAMP - RT 140 NB TO CHURCH ST
6/9/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			OFF RAMP TO CHURCH ST.			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO CHURCH ST
6/10/2006	12:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain						CHURCH STREET Rte 140 / RAMP - CHURCH ST TO RT 140 NB
6/15/2006	4:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain/Cloudy			CHURCH ST EXIT 5			Rte 140 S
6/15/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						
6/16/2006	4:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 N	KINGS HIGHWAY				RAMP - RT 140 NB TO HATHAWAY RD
6/24/2006	7:15:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			BETWEEN EXIT 3 AND 4			Rte 140 N
6/30/2006	8:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 140 S Milemarker 1.3	Rte 140 S
7/11/2006	2:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 140
7/13/2006	2:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					Rte 140 N Milemarker 3.0	Rte 140 N
7/13/2006	2:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Not reported	Rain/Rain			UNDER MT PLEASANT ST OVERPASS			Rte 140 N
8/2/2006	7:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain/Severe crosswinds						Rte 140 N
8/2/2006	7:26:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain/Severe crosswinds						NASH ROAD Rte 140 N / MOUNT PLEASANT STREET
8/5/2006	7:00:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						HATHAWAY ROAD Rte 140 N
8/6/2006	8:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			BETWEEN EXITS 4&5			Rte 140 N
8/11/2006	9:58:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			JUST NORTH OF RT. 195			Rte 140 N / Rte 195
8/22/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 140 S / Rte 195
8/25/2006	3:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy						15 feet N from Intersection Rte 140 N / MOUNT PLEASANT STREET
8/28/2006	3:22:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark - roadway not lighted	Rain/Cloudy			1/2 MILE SOUTH OF EXIT 7			Rte 140 N
8/29/2006	2:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO RT 195 WB
8/29/2006	2:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy				Exit 24B on Rte 140		Rte 140
9/1/2006	7:06:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			PRIOR TO RT 6			Rte 140 S
9/2/2006	1:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 140	Rte 140				ACUSHNET AVENUE / Rte 140
9/15/2006	3:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			MT. PLEASANT ST. OVERPASS			Rte 140 N
9/15/2006	10:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						Rte 140 N / Rte 195
9/16/2006	1:08:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	HATHAWAY ROAD	Rte 140 N / RAMP - HATHAWAY RD TO RT 140 NB				
9/16/2006	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 S Milemarker 2.5	Rte 140 S
9/16/2006	12:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140 S
9/24/2006	11:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear						KEMPTON STREET Rte 140 E / Rte 140
10/3/2006	1:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			NEAR EXIT 4			Rte 140 N
10/4/2006	2:28:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						RAMP - CHURCH ST TO RT 140 NB / Rte 140
10/12/2006	7:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			@ EXIT 6 RTE 18 NEW BEDFORD			Rte 140 S
10/12/2006	8:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE 6			Rte 140 S
10/13/2006	8:07:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 140 S / CHURCH STREET
10/15/2006	3:34:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			PRIOR TO EXIT 4		Rte 140 S Milemarker 3.8	Rte 140 S
10/21/2006	11:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			1000 feet N from ROUTE 6			1000 feet N from Intersection Rte 140 S / Rte 6
10/23/2006	7:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	PHILLIPS ROAD Rte 140	HERITAGE DRIVE / PURITAN WAY				
10/25/2006	8:00:00 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 140 / KINGS HIGHWAY
10/27/2006	7:02:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						BRALEY ROAD / RAMP - BRAYLEY RD TO RT 140 NB Rte 140 N
10/30/2006	8:50:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			EXIT 5			Rte 140 S
11/6/2006	1:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE 195			300 feet S from Intersection Rte 140 N / Rte 195
11/6/2006	1:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 140 N / KINGS HIGHWAY
11/10/2006	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear	ROUTE 6 Rte 140 S	ROUTE 6 Rte 140 S				
11/10/2006	9:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N
11/10/2006	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						50 feet S from Intersection Rte 140 S / CHURCH STREET
11/11/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear						Rte 140 S
11/13/2006	6:15:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dusk	Cloudy/Cloudy						ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 195 WB TO RT 140 NB
11/13/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy						100 Feet S from Intersection ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 SB TO RT 195 EB
11/13/2006	7:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				200 Feet N from Rte 140 N Milemarker 0.9		Rte 140 N
11/16/2006	10:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy				30 Feet N from Rte 140 S Milemarker 2.1		Rte 140 S
11/18/2006	7:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						Rte 140 S
11/30/2006	9:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear			BETWEEN EXITS 6 & 5			Rte 140 S
12/1/2006	1:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						300 feet S from Intersection INTERSTATE 195 Rte 195 E / RAMP - RT 195 EB TO RT 140 NB Rte 195 S
12/1/2006	6:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain						RAMP - RT 195 EB TO RT 140 NB / Rte 140
12/9/2006	5:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			NORTH OF RT 6			Rte 140 N / Rte 6
12/11/2006	5:14:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			PRIOR TO RT 6			Rte 140 S / Rte 6
12/12/2006	8:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			AT NASH RD OVERPASS			Rte 140 S / NASH ROAD
12/12/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						MOUNT PLASANT STREET / Rte 140 S
12/14/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP FROM 140 S TO HATHAWAY RD			RAMP - RT 140 SB TO HATHAWAY RD Rte 140
12/14/2006	6:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 140 S	Rte 6				
12/14/2006	10:39:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			HATHAWAY RD			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 S / RAMP - RT 140 SB TO HATHAWAY RD
12/18/2006	6:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			SOUTH OF EXIT #6			Rte 140 S
12/23/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear/Clear				Exit 3 on Rte 140		Rte 140
12/28/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 S / Rte 6
12/31/2006	3:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						RAMP - RT 140 SB TO BRAYLEY RD Rte 140
1/17/2004	5:05:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 140 N		200 feet N from Rte 140 N Milemarker 4.0	Rte 140 N
1/16/2005	11:30:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Snow						HATHAWAY ROAD Rte 140 / Rte 6
8/12/2005	2:05:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				300 feet N from Exit 5 on Rte 140		Rte 140
5/14/2006	3:31:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			RAMP TO BRALEY RD FROM 140 NB			ALFRED BESSETTE MEMORIAL HIGHWAY Rte 140 N / RAMP - RT 140 NB TO BRAYLEY RD
7/9/2006	9:45:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 6 S / Rte 140

TAUNTON	1/1/2004	12/31/2006	Intersection is similar to:														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From	
1/2/2004	9:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N			50 feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
1/5/2004	4:40:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear/Clear	Rte 140 N		Rte 140 N			Rte 140 N	
2/6/2004	6:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Slush	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/			COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N	
2/9/2004	1:05:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 NB	
2/20/2004	6:45:00 AM	Non-Fatal injury	2	2	0	Angle	Angle	Ice	Daylight	Clear/Clear			RAMP TO RT 140 FROM RT 24 SB, - ROUTE 140 Rte 140			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 SB	
2/21/2004	9:05:00 AM	Non-Fatal injury	2	1	0	Not reported	Not reported	Not reported	Daylight	Not Reported	Rte 140 N						
2/25/2004	2:30:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S	
3/26/2004	11:38:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			AT EXIT RAMP FROM RTE 140 SBL, - RAMP - RT 140 SB TO COUNTY ST			RAMP - RT 140 SB TO COUNTY ST / STEVENS STREET	
3/31/2004	1:26:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain	COUNTY STREET Rte 140 S						
4/8/2004	1:05:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N	
4/26/2004	8:45:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N	
4/29/2004	6:15:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N		Rte 140 N Milemarker 16.5	Rte 140 N	
5/1/2004	2:10:00 AM	Non-Fatal injury	2	4	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 SB	
5/16/2004	11:12:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Not reported	Cloudy/Cloudy			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO STEVENS ST	
7/9/2004	2:55:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
7/23/2004	5:30:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			STEVENS STREET			STEVENS STREET / RAMP - RT 140 NB TO STEVENS ST	
7/24/2004	4:25:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
8/6/2004	7:15:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N / Rte 140	
8/12/2004	7:50:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			RAMP FROM RT 140 TO RT 24 NB, TA - ROUTE 140 Rte 140			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 NB	
8/27/2004	5:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N	
8/31/2004	5:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N	
9/9/2004	4:15:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S	
9/14/2004	7:15:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N		100 feet S from Rte 140 N Milemarker 19.2	Rte 140 N	
9/23/2004	6:00:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N	
10/7/2004	6:15:00 AM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dawn	Clear			Rte 140 N	500 feet N from Exit 12 on Rte 140		Rte 140 N	
10/13/2004	6:50:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear	Rte 140 N		ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N	
10/29/2004	9:26:00 PM	Non-Fatal injury	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			COUNTY STREET Rte 140			COUNTY STREET Rte 140 / Rte 140	
11/1/2004	11:38:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N / STEVENS STREET	
11/9/2004	5:42:00 PM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S / Rte 140	
11/22/2004	8:30:00 PM	Non-Fatal injury	2	2	0	Head-on	Head-on	Dry	Dark - roadway not lighted	Clear/Clear			JUST SOUTH OF STEVENS STREET - COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S / STEVENS STREET	
12/6/2004	8:20:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy	Rte 140 N	RAMP - RT 24 NB TO RT 140 NB					
12/7/2004	7:15:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Rain	Rte 140 S		ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S	
12/10/2004	3:25:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N	
12/18/2004	1:44:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE 140 SB AT LIGHTS FOR RTE 24 - Rte 140 S			Rte 140 S	
12/30/2004	12:07:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear			COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S / LINDEN STREET	
12/31/2004	11:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 140 N			Rte 140 N	
1/9/2005	12:20:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 12 on Rte 140		Rte 140 S	
1/27/2005	4:40:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			STEVENS STREET RAMP - ROUTE 140 Rte 140 N			1500 feet S from Intersection ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO STEVENS ST	
2/10/2005	11:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	COUNTY STREET Rte 140						
2/11/2005	6:20:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 140 S	
2/12/2005	2:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 140	
2/24/2005	11:36:00 AM	Non-Fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			SOUTH OF EXIT 11 - Rte 140 N		Rte 140 N Milemarker 18.4	Rte 140 N	
3/11/2005	1:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Snow						Rte 140 N / Rte 24	
3/16/2005	6:10:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			HOLLOWAY STREET OVERPASS, - Rte 140 N			50 feet S from Intersection Rte 140 N / HOLLOWAY STREET	
3/19/2005	8:55:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 140 N	
3/26/2005	3:50:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						10 feet N from Intersection GUSS STREET / TREMONT STREET Rte 140 N	
4/5/2005	9:28:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			REST AREA - Rte 140			Rte 140 / Rte 140	
4/27/2005	4:45:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
4/29/2005	7:20:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 140 N	
5/9/2005	5:50:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dawn	Rain/Cloudy						Rte 140 N	
6/10/2005	3:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SILVER CITY GALLERIA MALL - STEVENS STREET Rte 140 S			STEVENS STREET Rte 140 S	
6/13/2005	10:13:00 AM	Non-Fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy						ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
6/17/2005	7:25:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 140 S / MYRICKS STREET Rte 79	
6/23/2005	1:40:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	Rte 140 S	RAMP - RT 140 TO RT 24 NB					
6/23/2005	7:00:00 AM	Non-Fatal injury	1	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140	
9/17/2005	8:16:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Clear	COUNTY STREET Rte 140 N	Rte 24					
10/5/2005	6:20:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						Rte 140 N	
10/27/2005	4:38:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N / RAMP - RT 140 NB TO RT 79	
11/5/2005	11:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			140 SB EXIT - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
11/8/2005	4:30:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 N	
11/29/2005	9:23:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			OFF RAMP TO ROUTE 140 SB - Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
12/24/2005	5:30:00 PM	Non-Fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy						Rte 140 N	
12/26/2005	12:25:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			EXIT 11B - Rte 140			Rte 140 / Rte 140	
1/12/2006	8:13:00 PM	Non-Fatal injury	2	5	0	Angle	Angle	Dry	Dark - lighted roadway	Clear						943 COUNTY STREET Rte 140 S	
1/23/2006	7:58:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)/Clear						Rte 140 N	
2/1/2006	12:10:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						ROUTE 140 Rte 140 / COUNTY STREET	
2/10/2006	3:24:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			OFF RAMP			STEVENS STREET Rte 140 / Rte 140	
2/15/2006	7:58:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear			RTE 140 NB 1/2 MILE SOUTH EXIT			Rte 140 N	
3/11/2006	4:10:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 140 S	
3/30/2006	11:46:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			ROBERT STUDLEY BRIDGE			TREMONT AVENUE Rte 140 S / Rte 140	
3/31/2006	12:40:00 PM	Non-Fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP			MYRICKS STREET Rte 140 / Rte 140	
4/17/2006	1:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			PRIOR TO EXIT 11			Rte 140 S	
5/3/2006	4:00:00 AM	Non-Fatal injury	2	3	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 140	
6/5/2006	8:00:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dusk	Clear						COUNTY STREET Rte 140 / Rte 140	
6/17/2006	9:16:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy						COUNTY STREET Rte 140 S / RAMP - RT 24 SB TO RT 140	
6/21/2006	7:10:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 140 S	
7/1/2006	6:47:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			EXIT 12			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 NB	
7/28/2006	7:48:00 PM	Non-Fatal injury	2	2	0	Angle	Angle	Wet	Dusk	Cloudy/Rain						COUNTY STREET Rte 140 / TAUNTON DEPOT DRIVE Rte 140	
8/4/2006	4:15:00 AM	Non-Fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 140 W / Rte 24	
8/15/2006	10:12:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			RT 24S OFF RAMP ONTO RT 140 S	Exit 12 on Rte 24 S		Rte 24 S / Rte 140	
8/20/2006	4:15:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140	COUNTY STREET					
9/23/2006	2:05:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			OFF RAMP			RAMP - RT 24 NB TO RT 140 NB / Rte 140	
9/27/2006	7:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N / Rte 140	
10/7/2006	5:40:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 S	Rte 140 S					
10/20/2006	10:50:00 AM	Non-Fatal injury	2	1	0	Head-on	Head-on	Wet	Daylight	Cloudy/Rain	MYRICKS STREET Rte 79 E	RAMP - RT 79 TO RT 140 SB Rte 140 S					
10/23/2006	1:05:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			MASS HWY			1000 COUNTY STREET Rte 140 N	
10/25/2006	11:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 140 TO RT 24 NB	
10/28/2006	3:15:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Severe crosswinds			RTE 140 N/B RAMP TO RTE24 N/B			RAMP - RT 140 TO RT 24 NB / Rte 24	
6/12/2004	11:50:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 140 TO RT 24 SB Rte 140 S	
8/22/2004	5:36:00 AM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear/Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N	
10/30/2004	5:55:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy			AT EXIT # 10 OFF RAMP - Rte 140 S			Rte 140 S	
12/3/2004	5:45:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy			Rte 140			Rte 140 / Rte 140	
8/23/2005	4:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140 N	
10/10/2005	2:05:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						COUNTY STREET Rte 140 / Rte 140	
12/4/2005	8:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow/Snow			GALLERIA MALL - COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N / STEVENS STREET	
12/17/2005	7:30:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						21 TREMONT STREET Rte 140	
4/13/2006	4:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						HIGHWAY 24 Rte 24 S / Rte 140	
6/4/2006	3:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear	Rte 140	COUNTY STREET					
7/8/2006	2:15:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						ROUTE 140 Rte 140 / COUNTY STREET	
8/21/2006	8:16:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			MASS HIGHWAY			ROUTE 140 Rte 140 N / COUNTY STREET	
12/17/2006	10:12:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 140 S Milemarker 15.0	Rte 140 S	
1/9/2004	7:29:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 140 N			Rte 140 N	
1/18/2004	12:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 140 S		10 feet N from Rte 140 S Milemarker 19.4	Rte 140 S	
2/2/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
2/2/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			Rte 140 N		Rte 140 N Milemarker 18.4	Rte 140 N	
2/2/2004	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			Rte 140 N		Rte 140 N Milemarker 18.4	Rte 140 N	
4/16/2004	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
4/16/2004	9:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Not reported	Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - STEVENS ST TO RT 140 NB	
4/28/2004	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear	Rte 24 N	RAMP - RT 24 NB TO RT 140 SB					
4/30/2004	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 140			Rte 140	
5/2/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			100 feet W from STEVENS STREET - COUNTY STREET Rte 140 N			100 feet W from Intersection COUNTY STREET Rte 140 N / STEVENS STREET	
5/5/2004	3:00:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
5/20/2004	6:25:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
6/7/2004	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			ROUTE 140 Rte 140			ROUTE 140 Rte 140 / COUNTY STREET	
6/9/2004	9:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			END OF RAMP FROM RTE 140 NB - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
6/19/2004	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy			RAMP TO RT 24 NB - RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
7/3/2004	9:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			NEAR RAMP FROM RT 140 NB, - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 NB	
7/12/2004	8:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N	
7/15/2004	4:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			STEVENS STREET Rte 140			STEVENS STREET Rte 140 / Rte 140	
8/3/2004	6:09:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			COUNTY STREET Rte 140 N			COUNTY STREET Rte 140 N / Rte 140	
8/5/2004	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 140 N			Rte 140 N	
8/24/2004	7:26:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			COUNTY STREET			COUNTY STREET / Rte 140	
9/6/2004	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain/Rain			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
9/13/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 140 S		ROUTE 140 Rte 140			ROUTE 140 Rte 140	
9/15/2004	7:30:00 AM	Property damage only (none injured)	4	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 140			Rte 140 / Rte 24	
9/21/2004	1:40:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear			COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S / Rte 140	
9/30/2004	5:52:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			Rte 140 N	Exit 12 on Rte 140		Rte 140 N	
10/5/2004	2:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 140	Rte 24					
10/6/2004	5:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			RAMP TO RTE 140 - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
10/7/2004	7:27:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S / LINDEN STREET	
10/11/2004	9:52:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			COUNTY STREET Rte 140			COUNTY STREET Rte 140 / Rte 140	
10/15/2004	7:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear	Rte 24 S	RAMP - RT 24 SB TO RT 140					
10/16/2004	2:25:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			COUNTY STREET Rte 140 S			COUNTY STREET Rte 140 S / STEVENS STREET	
10/21/2004	2:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	COUNTY STREET Rte 140						
10/25/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain			STEVENS STREET Rte 140 N			STEVENS STREET Rte 140 N	
10/25/2004	6:30:00 AM	Property damage only (none injured)	3	0	0	Head-on	Wet	Dawn	Cloudy/Rain		Rte 140						
10/25/2004	6:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Rain/Cloudy			1/2 MILE SOUTH OF RT 140 SB EXIT, - AMVETS MEMORIAL HIGHWAY Rte 24 N			2640 feet S from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 SB	
10/25/2004	7:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Rain/Cloudy			SOUTH OF RAMP TO RT 140 SB EXIT,

TAUNTON	1/1/2004	12/31/2006	Intersection is similar to:														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance		Feet_From
2/24/2005	3:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 79 OVER PASS - Rte 140 E				Rte 140 E
3/11/2005	7:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy							140 STEVENS STREET Rte 140 N
4/21/2005	11:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear							ROUTE 140 Rte 140 N / RAMP - RT 140 NB TO STEVENS ST
4/22/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy							AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
4/28/2005	4:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy							AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
4/28/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 140 N	RAMP - STEVENS ST TO RT 140 NB					
5/2/2005	12:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear							STEVENS STREET / RAMP - RT 140 NB TO STEVENS ST Rte 140 N
5/7/2005	5:52:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain							COUNTY STREET Rte 140 S / Rte 140
5/10/2005	9:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							RAMP - RT 24 SB TO RT 140 / Rte 140
5/26/2005	6:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear							AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB
6/1/2005	6:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 12A on Rte 140			Rte 140 N
6/17/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 S
6/21/2005	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 N
6/30/2005	7:22:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			50 feet E from MABS HIGHWAY - COUNTY STREET Rte 140 N				COUNTY STREET Rte 140 N
7/1/2005	1:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							COUNTY STREET Rte 140 / Rte 140
7/1/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB
7/1/2005	10:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear	Rte 140 N	COUNTY STREET					
7/10/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24			Rte 24 / Rte 140
7/12/2005	1:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear							COUNTY STREET / Rte 140
7/15/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140 N						
7/20/2005	1:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			GALLERIA MALL DRIVE - STEVENS STREET				STEVENS STREET / RAMP - RT 140 NB TO RT 79 Rte 140
7/26/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 N
7/27/2005	7:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 N	RAMP - RT 140 TO RT 24 SB					
8/2/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	Rte 140 S						
8/12/2005	5:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							COUNTY STREET Rte 140 / Rte 140
8/19/2005	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							COUNTY STREET Rte 140 / Rte 140
8/28/2005	2:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							COUNTY STREET Rte 140 S / MOZZONE BOULEVARD
9/4/2005	9:57:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear							1000 feet N from Intersection Rte 140 N / Rte 79
9/14/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear							COUNTY STREET Rte 140 N / STEVENS STREET
9/19/2005	4:09:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			STEVENS STREET OFF RAMP - Rte 140 S				Rte 140 S
9/26/2005	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			JUST PRIOR TO RAMP TO 24 NB - ROUTE 140 Rte 140 N				ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB
9/30/2005	7:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					1 feet N from Rte 140 S Millemarker 16.0		Rte 140 S
10/4/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140						
10/12/2005	11:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			END OF RAMP FROM RT 24SB TO RT 1 - RAMP - RT 24 SB TO RT 140				RAMP - RT 24 SB TO RT 140
10/14/2005	8:08:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain	RAMP - RT 140 TO RT 24 NB Rte 140 S						
10/23/2005	7:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear							Rte 140 S
10/25/2005	12:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain							COUNTY STREET Rte 140 N / MOZZONE BOULEVARD
10/28/2005	9:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Snow	Rte 140						
11/4/2005	7:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear							1000 COUNTY STREET Rte 140 S
11/13/2005	11:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy							Rte 140 N
11/14/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy					Rte 140 S Millemarker 18.6		Rte 140 S
11/15/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 140	Rte 24					
11/22/2005	7:07:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain			PRIOR TO RAMP FOR RT 24NB - ROUTE 140 Rte 140 N				ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB
11/22/2005	9:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			TOP OF RAMP FROM 140 TO RT 24 NB - RAMP - RT 140 TO RT 24 NB				RAMP - RT 140 TO RT 24 NB
11/29/2005	8:51:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							COUNTY STREET Rte 140 / Rte 140
11/30/2005	8:39:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy							STEVENS STREET Rte 140 N
12/1/2005	7:40:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear			NORTH OF ROUTE 79 - Rte 140 N				Rte 140 N
12/3/2005	5:52:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear					200 feet S from Rte 140 N Millemarker 18.9		Rte 140 N
12/4/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Cloudy			NEAR INTERSECTION FOR RT 24NB. - ROUTE 140 Rte 140 S				ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 NB
12/4/2005	12:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Snow							819 COUNTY STREET Rte 140
12/15/2005	8:04:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 N
12/20/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 140 S	Rte 24 N					
12/26/2005	1:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	RAMP - RT 140 TO RT 24 NB Rte 140 S						
1/3/2006	5:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow			EXIT 10				2 feet W from Intersection Rte 140 N
1/4/2006	8:11:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 12A on Rte 140 N			Rte 140 N
1/7/2006	2:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			X10				33 feet E from Intersection Rte 140 S
1/8/2006	2:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Cloudy	RAMP - RT 24 SB TO RT 140 Rte 24 S	RAMP - RT 24 SB TO RT 140 Rte 24 S					
1/12/2006	5:16:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear							COUNTY STREET Rte 140 N / Rte 140
1/14/2006	3:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			AT REST AREA				Rte 140 S
1/17/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear							Rte 24 S / Rte 140
1/20/2006	3:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							Rte 140 N / Rte 24
1/25/2006	4:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy							Rte 24 S / Rte 140
1/31/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain							Rte 140
2/13/2006	10:33:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Clear/Clear							Rte 140 N
2/15/2006	9:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 140 N Millemarker 16.3		Rte 140 N
3/7/2006	2:47:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear							RAMP - RT 140 TO RT 24 NB Rte 140 / Rte 24
3/7/2006	2:47:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 12 on Rte 140			COUNTY STREET Rte 140
3/10/2006	7:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear							Rte 140 N
3/25/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)			APPROX 150 FT PRIOR TO THE RT 79				Rte 140 S / Rte 79
4/4/2006	7:46:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain							Rte 140 N
4/6/2006	7:38:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							ROUTE 140 Rte 140 / RAMP - RT 140 NB TO STEVENS ST
4/18/2006	1:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140	Rte 24 / RAMP - RT 140 TO RT 24 NB					
4/24/2006	7:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 140	COUNTY STREET					
4/25/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			NECK				30 feet N from Intersection COUNTY STREET Rte 140 S / Rte 140
4/28/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 11 on Rte 24			Rte 24 / Rte 140
5/3/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain							Rte 140 N
5/4/2006	5:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear							Rte 140 N
5/5/2006	2:24:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear							Rte 140 N
5/13/2006	9:37:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				Exit 12 on Rte 24 S			RAMP - RT 24 SB TO RT 140 Rte 24 S
5/16/2006	2:42:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy			EXIT 10	Exit 10 on Rte 140 N			Rte 140 N
5/16/2006	4:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy							10 feet N from Intersection Rte 24 N / Rte 140
5/16/2006	5:25:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain							150 feet N from Intersection Rte 24 S / Rte 140
5/17/2006	5:06:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			MASS HIGHWAY DIST 5				COUNTY STREET Rte 140 N
5/20/2006	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 S	Rte 24 N					
5/24/2006	6:47:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear							ROUTE 140 Rte 140 / Rte 140
5/30/2006	10:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							ROUTE 140 Rte 140 / Rte 140
5/31/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 S
6/10/2006	1:36:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 N
6/26/2006	10:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 24				5280 feet S from Intersection Rte 140 N / Rte 24
6/29/2006	6:53:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 140 S	RAMP - RT 140 TO RT 24 NB					
8/2/2006	7:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	RAMP - RT 140 NB TO STEVENS ST	STEVENS STREET					
8/11/2006	7:53:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM RTE 24SB TO RTE 140				AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
9/7/2006	1:48:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							COUNTY STREET Rte 140 / TAUNTON DEPOT DRIVE Rte 140
9/12/2006	7:35:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported							Rte 140 / Rte 140
9/18/2006	4:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			JUST NORTH OF ROUTE 140 RAMP				AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
9/19/2006	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 24 N / Rte 140
9/29/2006	3:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy/Cloudy							COUNTY STREET Rte 140 N / STEVENS STREET
10/10/2006	8:09:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear							Rte 140 S
10/15/2006	8:34:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear	RAMP - RT 140 TO RT 24 NB	Rte 24 N / Rte 140					
11/6/2006	10:06:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear							Rte 140 N
11/9/2006	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy							Rte 140 N
11/12/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Cloudy							100 feet N from Intersection 605 COUNTY STREET Rte 140 S / HART STREET
11/13/2006	1:19:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain	Rte 140 N	Rte 24 S					
11/27/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear							Rte 140 N
11/30/2006	12:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			REST AREA				Rte 140 N
12/1/2006	9:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dawn	Rain							ROUTE 140 Rte 140 / COUNTY STREET
12/5/2006	7:29:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear							COUNTY STREET Rte 140 / Rte 24
12/13/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain							COUNTY STREET Rte 140 / RAMP - COUNTY ST TO RT 140 SB Rte 24
12/17/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	COUNTY STREET Rte 140	Rte 24	EXIT 12B RAMP				
12/17/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear							Rte 24 / Rte 140
12/20/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear							AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 140 TO RT 24 NB Rte 140
2/11/2004	2:10:00 PM	Unknown	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	Rte 140						
10/15/2004	7:05:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 140 N	Exit 11 on Rte 140			Rte 140 N
12/13/2004	5:57:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain			COUNTY STREET Rte 140				600 feet N from Intersection COUNTY STREET Rte 140 / Rte 24

FREETOWN (ASSONET)	1/1/2004	12/31/2006	is similar to: rte 24 route 24										
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Address/Landmark	Exit Distance	Feet_From
3/11/2005	2:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow	24 SB AT EXIT - 10. - Rte 24 S	Exit 10 on Rte 24 S	Rte 24 S
3/12/2005	9:00:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow			Rte 24 S / Rte 79
8/25/2006	3:00:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain		Exit 9 on Rte 24 S	Rte 24 S
8/13/2004	7:45:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dusk	Cloudy	Rte 24 S		Rte 24 S
12/10/2004	10:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain	Rte 24 S		Rte 24 S
1/22/2005	4:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Snow	Dusk	Snow		Exit 10 on Rte 24	Rte 24
2/21/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Snow/Snow	END OF RAMP FROM 24S TO X-10. - Rte 24		Rte 24 / NORTH MAIN STREET Rte 24
3/12/2005	8:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Cloudy	24SB NO OF X -10. - Rte 24 S	Exit 10 on Rte 24 S	Rte 24 S
5/21/2005	9:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy	RT 24 NB, NO OF X-9. - Rte 24 N	Exit 9 on Rte 24	Rte 24 N
11/7/2006	3:30:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		Exit 9 on Rte 24 S	Rte 24 S
7/26/2005	6:15:00 AM	Unknown	1	0	0	Unknown	Unknown	Dry	Daylight	Clear			Rte 24 N

AVON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Object_hit	Collision_with	Road_Surface	Lighting	Weather	Street	Address/Landmark	Exit Distance	Feet_From
10/20/2006	3:00:00 AM	Fatal injury	1	1	1	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain		EXIT 19	Exit 19 on Rte 24 S	Rte 24 S
1/9/2004	1:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S / RAMP - RT 24 SB TO CENTRAL ST
3/10/2004	3:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S
3/11/2004	11:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear		AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 19B on Rte 24 S	AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO HARRISON BLVD
3/14/2004	5:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy		Rte 24 N	Exit 19B on Rte 24 N	Rte 24 N / CENTRAL STREET
3/16/2004	5:30:00 PM	Non-fatal injury	4	1	0	Rear-end		Rear-end	Snow	Daylight	Snow		Rte 24 S		Rte 24 S
4/19/2004	3:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear		Rte 24 S	150 feet S from Exit 19B on Rte 24 S	Rte 24 S
5/3/2004	1:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Daylight	Rain		JORDANS FURNITURE - Rte 24 N		Rte 24 N
5/5/2004	7:45:00 AM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Dry	Daylight	Clear		Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
5/11/2004	7:25:00 PM	Non-fatal injury	3	2	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear		Rte 24 N		Rte 24 N / HARRISON BOULEVARD
6/2/2004	3:15:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Wet	Daylight	Rain/Rain		BY JORDONS FURNITURE - Rte 24 S		Rte 24 S
6/20/2004	11:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear		Rte 24 S	10 feet S from Exit 19B on Rte 24 S	Rte 24 S
7/2/2004	1:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Not reported	Daylight	Clear		Rte 24 S	1000 feet N from Exit 19A on Rte 24 S	Rte 24 S
7/11/2004	9:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S
7/26/2004	2:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear		Rte 24 S	800 feet S from Exit 19B on Rte 24 S	Rte 24 S
8/15/2004	10:40:00 PM	Non-fatal injury	3	3	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - lighted roadway	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO CENTRAL ST
8/17/2004	6:02:00 AM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Wet	Dawn	Cloudy/Cloudy		Rte 24 N	5000 feet S from Exit 19A on Rte 24 N	Rte 24 N
8/27/2004	4:20:00 PM	Non-fatal injury	2	1	0	Angle		Angle	Dry	Daylight	Clear		Rte 24 S	5000 feet S from Exit 19A on Rte 24 S	Rte 24 S
9/12/2004	4:10:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S
9/23/2004	4:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear		40 feet N from OF "ATTRACTIONS 18B SIGN (BLUE)" - Rte 24 S		Rte 24 S
9/27/2004	9:15:00 AM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear		Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
10/11/2004	3:04:00 PM	Non-fatal injury	1	6	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear		Rte 24 N	100 feet N from Exit 19B on Rte 24 N	Rte 24 N
10/17/2004	2:46:00 AM	Non-fatal injury	2	2	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Rain/Cloudy		Rte 24 S	3000 feet S from Exit 19B on Rte 24 S	Rte 24 S
11/3/2004	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear		Rte 24	Exit 19A on Rte 24	Rte 24
11/13/2004	10:25:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Slush	Daylight	Cloudy/Snow		Rte 24 S	Exit 19B on Rte 24 S	Rte 24 S
12/1/2004	4:49:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear		TOP OF THE RAMP AT EXIT 19 A - Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
12/16/2004	1:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 19 on Rte 24 N	AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO HARRISON BLVD
12/22/2004	5:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy		Rte 24 S	1500 feet S from Exit 19A on Rte 24 S	Rte 24 S
12/28/2004	3:00:00 PM	Non-fatal injury	3	3	0	Not reported		Not reported	Dry	Daylight	Clear		Rte 24	Exit 19A on Rte 24	Rte 24
12/28/2004	11:00:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Not reported	Daylight	Clear		Rte 24	Exit 19A on Rte 24	Rte 24
1/25/2005	8:00:00 PM	Non-fatal injury	2	1	0	Angle		Angle	Wet	Dark - roadway not lighted	Cloudy				RAMP - HARRISON BLVD TO RT 24 NB / Rte 24
2/4/2005	6:08:00 PM	Non-fatal injury	2	2	0	Not reported		Not reported	Not reported	Not reported	Not Reported			Exit 19A on Rte 24 N	HARRISON BOULEVARD Rte 24 N
2/21/2005	10:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Snow	Daylight	Cloudy/Snow		2 MILES NORTH OF HARRISON BLVD - Rte 24 N	Exit 19B on Rte 24 N	Rte 24 N
3/14/2005	4:21:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
3/30/2005	6:10:00 AM	Non-fatal injury	2	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
4/15/2005	7:03:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear		1000 feet S from HARRISON BLVD. - Rte 24 S		1000 feet S from Intersection Rte 24 S / HARRISON BOULEVARD
4/28/2005	4:10:00 PM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Dry	Daylight	Cloudy		1.5 MILES NORTH OF RT. 27 - Rte 24 S		7920 feet N from Intersection Rte 24 S / Rte 27
6/11/2005	8:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Not reported	Clear				Rte 24
6/14/2005	6:50:00 AM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Dry	Daylight	Clear				AMVETS MEMORIAL HIGHWAY Rte 24 N / EDWARD S HARRISON BOULEVARD
6/17/2005	9:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			1000 feet S from Exit 19A on Rte 24 N	Rte 24 N
6/17/2005	10:32:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
6/18/2005	1:09:00 PM	Non-fatal injury	1	2	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy			20 feet S from Exit 19A on Rte 24 S	Rte 24 S
7/1/2005	3:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear				HARRISON BOULEVARD / Rte 24
8/11/2005	2:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 S	Rte 24 S
8/29/2005	4:15:00 PM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Wet	Daylight	Rain/Cloudy			300 feet N from Exit 19A on Rte 24 S	Rte 24 S
8/30/2005	8:40:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Wet	Daylight	Rain		PRIOR TO SPLIT - Rte 24 N		Rte 24 N
8/31/2005	7:30:00 AM	Non-fatal injury	1	2	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Cloudy				AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO HARRISON BLVD
9/8/2005	8:45:00 AM	Non-fatal injury	3	2	0	Rear-end		Rear-end	Dry	Daylight	Clear			Exit 19A on Rte 24 N	Rte 24 N
9/16/2005	8:20:00 AM	Non-fatal injury	2	1	0	Not reported		Not reported	Wet	Daylight	Rain				Rte 24 / Rte 24
9/17/2005	5:45:00 AM	Non-fatal injury	2	1	0	Angle		Angle	Wet	Dark - roadway not lighted	Rain/Rain			5280 feet N from Exit 19A on Rte 24 S	Rte 24 S
10/3/2005	3:56:00 PM	Non-fatal injury	4	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear			500 feet N from Exit 19A on Rte 24 S	Rte 24 S
10/17/2005	9:20:00 AM	Non-fatal injury	3	2	0	Rear-end		Rear-end	Dry	Daylight	Clear		HIGHWAY SIGN RT 139 - AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-HARRISON BLVD TO RT 24 NB
10/18/2005	6:45:00 AM	Non-fatal injury	3	2	0	Rear-end		Rear-end	Wet	Daylight	Rain			Exit 19A on Rte 24	Rte 24 / Rte 24
10/31/2005	10:50:00 AM	Non-fatal injury	2	2	0	Rear-end		Rear-end	Dry	Daylight	Clear			100 feet S from Exit 19A on Rte 24 N	Rte 24 N
12/10/2005	1:00:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Unknown	Dark - roadway not lighted	Cloudy			Exit 19A on Rte 24	Rte 24
12/22/2005	7:05:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear			Exit 19A on Rte 24 N	Rte 24 N
12/25/2005	5:05:00 PM	Non-fatal injury	3	6	0	Angle		Angle	Dry	Dark - roadway not lighted	Cloudy/Cloudy		ON RAMP FROM HARRISSON BLVD. TO - Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
1/27/2006	5:27:00 PM	Non-fatal injury	1	2	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear				100 feet W from Intersection EDWARD S HARRISON BOULEVARD / Rte 24
2/4/2006	3:50:00 PM	Non-fatal injury	3	1	0	Rear-end		Rear-end	Dry	Daylight	Cloudy/Cloudy			Exit 19B on Rte 24 S	Rte 24 S
2/7/2006	5:39:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear			1500 feet N from Exit 19B on Rte 24 S	Rte 24 S
2/9/2006	11:50:00 AM	Non-fatal injury	1	4	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 S	Rte 24 S
2/16/2006	1:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 S	Rte 24 S
3/9/2006	1:02:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 N
3/12/2006	9:24:00 PM	Non-fatal injury	4	7	0	Head-on		Head-on	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Exit 19A on Rte 24 N	Rte 24 N
3/18/2006	3:55:00 PM	Non-fatal injury	1	3	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 S
3/19/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			1000 feet S from Exit 19B on Rte 24 N	Rte 24 N
3/28/2006	9:03:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
3/29/2006	8:05:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear			400 feet N from Exit 19B on Rte 24	Rte 24
4/10/2006	8:33:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 N
4/23/2006	4:20:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Rain			Exit 19A on Rte 24	Rte 24
4/27/2006	8:29:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 N	Rte 24 N
5/3/2006	11:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Rain/Cloudy			Exit 19A on Rte 24	AMVETS MEMORIAL HIGHWAY Rte 24 / EDWARD S HARRISON BOULEVARD
5/20/2006	9:20:00 PM	Non-fatal injury	2	1	0	Angle		Angle	Dry	Dark - roadway not lighted	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
5/22/2006	7:30:00 AM	Non-fatal injury	2	3	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
5/28/2006	3:53:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear			Exit 19A on Rte 24 N	Rte 24 N
5/29/2006	4:20:00 PM	Non-fatal injury	2	5	0	Angle		Angle	Dry	Daylight	Clear/Clear				Rte 24 S
6/29/2006	11:42:00 PM	Non-fatal injury	2	2	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 S
7/13/2006	6:32:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 N
8/4/2006	10:32:00 AM	Non-fatal injury	1	2	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy			Exit 19B on Rte 24 S	AMVETS MEMORIAL HIGHWAY Rte 24 S
8/13/2006	1:55:00 PM	Non-fatal injury	2	2	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 S	Rte 24 S
8/29/2006	5:10:00 PM	Non-fatal injury	3	1	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Daylight	Cloudy/Rain			Exit 19B on Rte 24 N	Rte 24 N
9/3/2006	6:29:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Dawn	Rain/Rain				Rte 24 N
10/23/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Wet	Dusk	Rain/Cloudy		ON RAMP	Exit 19B on Rte 24 N	CENTRAL STREET Rte 24 N
11/5/2006	2:38:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear			500 feet N from Exit 19B on Rte 24 S	Rte 24 S
11/21/2006	3:50:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear				EDWARD S HARRISON BOULEVARD / Rte 24
12/10/2006	1:42:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24
12/29/2006	12:30:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear				AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-HARRISON BLVD TO RT 24 NB
6/10/2004	12:00:00 AM	Not Reported	3	0	0	Rear-end		Rear-end	Wet	Daylight	Cloudy/Rain		Rte 24	Exit 19A on Rte 24	Rte 24
9/22/2004	6:00:00 AM	Not Reported	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		Rte 24 S	Exit 19B on Rte 24 S	Rte 24 S
1/29/2005	2:40:00 AM	Not Reported	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Clear			2500 feet S from Exit 19B on Rte 24 N	Rte 24 N
2/2/2005	8:45:00 AM	Not Reported	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear			Exit 19A on Rte 24 S	Rte 24 S
8/12/2005	3:00:00 PM	Not Reported	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear				Rte 24
11/23/2005	7:10:00 AM	Not Reported	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Rain/Snow			2200 feet S from Exit 19A on Rte 24 N	Rte 24 N
1/23/2006	7:14:00 AM	Not Reported	1	0	0	Single vehicle crash		Single vehicle crash	Snow	Daylight	Snow		ENTER TO RAMP		94 feet W from Intersection RAMP-HARRISON BLVD TO RT 24 NB / HARRISON BOULEVARD
6/20/2006	9:36:00 PM	Not Reported	2	0	0	Angle		Angle	Wet	Dark - lighted roadway	Rain/Rain			1000 feet N from Exit 19A on Rte 24 S	Rte 24 S
6/30/2006	5:10:00 PM	Not Reported	2	0	0	Not reported		Not reported	Dry	Daylight	Clear			Exit 19A on Rte 24	Rte 24 / EDWARD S HARRISON BOULEVARD
1/5/2004	7:45:00 AM	Property damage only (none injured)	3	0	0	Not reported		Not reported	Wet	Dawn	Cloudy		Rte 24	Exit 19A on Rte 24	Rte 24
2/3/2004	6:45:00 AM	Property damage only (none injured)	4	0	0	Rear-end		Rear-end	Wet	Daylight	Cloudy		Rte 24 N	1000 feet N from Exit EXT 20 on Rte 24	Rte 24 N
2/5/2004	1:00:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S
3/9/2004	11:36:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear		Rte 24 S	1500 feet N from Exit 19A on Rte 24 S	Rte 24 S
3/12/2004	3:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Snow/Blowing sand, snow		AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 19A on Rte 24 N	AMVETS MEMORIAL HIGHWAY Rte 24 N
3/15/2004	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 19B on Rte 24 N	AMVETS MEMORIAL HIGHWAY Rte 24 N
3/23/2004	2:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear		Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
4/4/2004	8:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear		EDWARD S HARRISON BOULEVARD		EDWARD S HARRISON BOULEVARD / RAMP-HARRISON BLVD TO RT 24 NB
4/8/2004	5:25:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear/Clear		Rte 24 S	30 feet N from Exit 19B on Rte 24 S	Rte 24 S
5/8/2004	2:20:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear		Rte 24 S	1000 feet N from Exit 19 on Rte 24 S	1000 feet N from Intersection Rte 24 S / EDWARD S HARRISON BOULEVARD
5/11/2004	6:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		Rte 24 N		Rte 24 N
5/25/2004	7:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / EDWARD S HARRISON BOULEVARD
6/2/2004	3:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Daylight	Rain/Rain		Rte 24 S		Rte 24 S
6/2/2004	12:09:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Dark - lighted roadway	Cloudy/Fog, smog, smoke		Rte 24 S	1500 feet N from Exit 19A on Rte 24 S	Rte 24 S
6/3/2004	3:30:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy		Rte 24 S	Exit 19A on Rte 24 S	Rte 24 S
6/10/2004	3:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy/Cloudy		Rte 24 S		Rte 24 S

AVON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Object_hit	Collision_with	Road_Surface	Lighting	Weather	Street	Address/Landmark	Exit Distance	Feet_From
6/21/2004	12:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - lighted roadway	Clear/Clear		Rte 24 S	300 feet N from Exit 19 on Rte 24 S	Rte 24 S
6/21/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Head-on		Head-on	Dry	Dark - roadway not lighted	Clear		HARRISON BOULEVARD Rte 24		HARRISON BOULEVARD Rte 24 / Rte 1
6/24/2004	8:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear		Rte 24 S		Rte 24 S
7/29/2004	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Cloudy		Rte 24 S	5280 feet S from Exit 19A on Rte 24 S	Rte 24 S
7/29/2004	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear		Rte 24 S	150 feet S from Exit 19A on Rte 24 S	Rte 24 S
8/15/2004	7:50:00 AM	Property damage only (none injured)	2	0	0	Angle		Angle	Wet	Daylight	Rain/Rain		Rte 24	Exit 19B on Rte 24	Rte 24 / Rte 24
8/31/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear	Rte 24 S			
9/16/2004	1:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		HARRISON BOULEVARD Rte 24 S		HARRISON BOULEVARD Rte 24 S
9/28/2004	12:15:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy		Rte 24 N	5000 feet N from Exit 19B on Rte 24 N	Rte 24 N
10/28/2004	3:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear		Rte 24 S	2500 feet S from Exit 19A on Rte 24 S	Rte 24 S
11/2/2004	6:24:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear		Rte 24 S	2000 feet S from Exit 19A on Rte 24 S	Rte 24 S
12/16/2004	1:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 19 on Rte 24 N	AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO HARRISON BLVD
12/28/2004	11:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Clear/Clear		Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
12/28/2004	11:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / EDWARD S HARRISON BOULEVARD
1/2/2005	6:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Rain				3000 feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - CENTRAL ST TO RT 24 SB
1/8/2005	5:22:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Cloudy			2500 feet S from Exit 19B on Rte 24 S	Rte 24 S
1/13/2005	8:10:00 AM	Property damage only (none injured)	4	0	0	Rear-end		Rear-end	Dry	Daylight	Cloudy/Cloudy			Exit 19B on Rte 24 S	Rte 24 S
2/9/2005	7:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Exit 19B on Rte 24 S	Rte 24 S
2/19/2005	2:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear			3000 feet N from Exit 19B on Rte 24 S	Rte 24 S
2/21/2005	10:35:00 AM	Property damage only (none injured)	3	0	0	Angle		Angle	Snow	Daylight	Snow/Snow			1000 feet S from Exit 19A on Rte 24 S	Rte 24 S
2/27/2005	3:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy		ACROSS FROM COSTCO - Rte 24 N		Rte 24 N
2/28/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Ice	Daylight	Cloudy				AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO HARRISON BLVD
3/10/2005	12:55:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			500 feet S from Exit 19B on Rte 24 S	Rte 24 S
4/16/2005	9:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Cloudy		ACROSS FROM HOME DEPOT - Rte 24 S		Rte 24 S
5/4/2005	8:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dusk	Cloudy		RAMP TO RTE 139 - Rte 24 N		Rte 24 N / Rte 139
5/14/2005	3:17:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy			5000 feet N from Exit 19B on Rte 24 S	Rte 24 S
5/15/2005	5:45:00 AM	Property damage only (none injured)	4	0	0	Rear-end		Rear-end	Dry	Dawn	Cloudy			15 feet N from Exit 19A on Rte 24 N	Rte 24 N
5/31/2005	1:35:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear		AT EXIT 18 N/B - Rte 24 N	Exit 18 on Rte 24	Rte 24 N
6/3/2005	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear				Rte 24 / Rte 24
6/10/2005	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear		ON RAMP TO 24 - Rte 24 S	Exit 19B on Rte 24 S	Rte 24 S
6/13/2005	2:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end		Rear-end	Dry	Daylight	Cloudy			1500 feet S from Exit 19A on Rte 24 N	Rte 24 N
6/25/2005	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
7/22/2005	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear			Exit 20 on Rte 24	Rte 24
7/30/2005	7:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			2640 feet S from Exit 19B on Rte 24 S	Rte 24 S
8/7/2005	4:45:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear/Clear		SOUTH EXIT 19 A - Rte 24 N	Exit 19A on Rte 24 N	Rte 24 N
9/2/2005	2:33:00 PM	Property damage only (none injured)	1	0	0	Unknown		Unknown	Dry	Daylight	Clear/Clear			5000 feet N from Exit 19A on Rte 24 N	Rte 24 N
9/24/2005	6:23:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
10/1/2005	1:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear			Exit 19B on Rte 24 S	Rte 24 S
10/8/2005	10:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			Exit 19B on Rte 24 N	Rte 24 N
10/31/2005	10:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			5280 feet S from Exit 19 on Rte 24 N	Rte 24 N
11/6/2005	4:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			700 feet N from Exit 19B on Rte 24 S	Rte 24 S
11/15/2005	1:16:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Exit 19B on Rte 24	Rte 24 / RAMP - RT 24 NB TO HARRISON BLVD
12/10/2005	6:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy/Cloudy			400 feet S from Exit 19A on Rte 24 S	Rte 24 S
12/15/2005	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Not Reported			Exit 19B on Rte 24 N	Rte 24 N
12/19/2005	3:10:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
12/29/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Dark - lighted roadway	Rain/Rain			1500 feet N from Exit 19A on Rte 24 S	Rte 24 S
1/13/2006	1:28:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 N	Rte 24 N
2/9/2006	6:44:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear				EDWARD S HARRISON BOULEVARD Rte 24 S
2/14/2006	7:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			500 feet S from Exit 19B on Rte 24 N	Rte 24 N
2/14/2006	10:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			500 feet N from Exit 19B on Rte 24 S	Rte 24 S
2/21/2006	9:20:00 AM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear				Rte 24 N / EDWARD S HARRISON BOULEVARD
4/26/2006	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
4/26/2006	4:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear			Exit 19A on Rte 24 S	Rte 24 S
4/27/2006	9:45:00 PM	Property damage only (none injured)	1	0	0	Angle		Angle	Dry	Dark - roadway not lighted	Clear/Clear			Exit 19B on Rte 24 N	Rte 24 N
5/13/2006	6:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Dusk	Cloudy/Rain			1000 feet S from Exit 19A on Rte 24 S	Rte 24 S
5/27/2006	11:47:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
6/6/2006	6:44:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			Exit 19A on Rte 24 N	Rte 24 N
7/10/2006	3:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			1500 feet S from Exit 19B on Rte 24 S	Rte 24 S
7/11/2006	7:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear				Rte 24 N
7/25/2006	8:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear			Exit 19A on Rte 24	Rte 24
8/7/2006	9:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Daylight	Cloudy/Cloudy			Exit 19B on Rte 24 N	Rte 24 N
8/16/2006	6:39:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			1000 feet N from Exit 19B on Rte 24 N	Rte 24 N
8/27/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear			Exit 19A on Rte 24 S	Rte 24 S
9/11/2006	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear				EDWARD S HARRISON BOULEVARD Rte 24
9/29/2006	7:04:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear/Clear				Rte 24 N
10/8/2006	2:59:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear			Exit 19B on Rte 24 S	Rte 24 S
10/17/2006	11:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Rain		1000 feet N from EXIT 18B		Rte 24 S
10/18/2006	8:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end		Rear-end	Dry	Daylight	Cloudy				AMVETS MEMORIAL HIGHWAY Rte 24 N / EDWARD S HARRISON BOULEVARD
10/30/2006	5:03:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear			Exit 19A on Rte 24	EDWARD S HARRISON BOULEVARD Rte 24
11/16/2006	1:32:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Fog, smog, smoke/Rain			Exit 19A on Rte 24 S	Rte 24 S
11/26/2006	9:08:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Dark - lighted roadway	Clear/Clear		NORTH OF EXIT 18B	Exit 18 on Rte 24	Rte 24 N
12/4/2006	5:36:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Rain/Rain			Exit 19A on Rte 24 N	Rte 24 N
12/8/2006	6:51:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Wet	Daylight	Snow/Snow				Rte 24 N / EDWARD S HARRISON BOULEVARD
10/23/2006	9:20:00 PM	Unknown	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 N
11/7/2006	3:55:00 PM	Unknown	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 S

BERKLEY	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24											
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
8/18/2005	2:40:00 PM	Fatal injury	2	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		Exit 10 on Rte 24		Rte 24 N
8/18/2006	7:34:00 AM	Fatal injury	2	2	1	Angle	Angle	Dry	Daylight	Clear/Clear	DRIVING NORTH	Exit 11 on Rte 24	Rte 24 Milemarker 13.1	Rte 24
1/17/2004	3:14:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy	Rte 24 S		Rte 24 S Milemarker 16.0	Rte 24 S
5/4/2004	11:28:00 PM	Non-fatal injury	3	3	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 S		Rte 24 S Milemarker 15.8	Rte 24 S
5/6/2004	10:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
6/4/2004	2:45:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	Rte 24 N			Rte 24 N
7/3/2004	2:58:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 N		Rte 24 N Milemarker 15.7	Rte 24 N
7/19/2004	8:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear	AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
7/22/2004	6:45:00 AM	Non-fatal injury	5	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 N			Rte 24 N
8/13/2004	5:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Cloudy/Cloudy	Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
8/13/2004	6:50:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 24 N			Rte 24 N
8/25/2004	5:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
8/27/2004	8:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 S		Rte 24 S Milemarker 13.0	Rte 24 S
12/4/2004	8:01:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
12/6/2004	5:52:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dawn	Clear	Rte 24 N			1000 feet N from Intersection Rte 24 N / PADELFORD STREET
12/11/2004	11:45:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 S		Rte 24 S Milemarker 15.1	Rte 24 S
12/13/2004	9:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
12/25/2004	3:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)/S	Rte 24 N			Rte 24 N
12/26/2004	6:42:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Snow	Dark - lighted roadway	Snow/Snow	BERKLEY FREETOWN LINE - Rte 24 S			Rte 24 S
1/1/2005	2:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy				Rte 24 S
4/12/2005	5:01:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy				PADELFORD STREET / Rte 24
4/12/2005	8:45:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear		1050 feet N from Exit 11 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-PADELFORD ST TO RT 24 SB
5/17/2005	4:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
6/13/2005	7:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy	RT 24 NB FREETOWN/BERKLEY LINE. - Rte 24 N			Rte 24 N
6/27/2005	3:50:00 PM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		0 feet S from Exit 11 on Rte 24 S		Rte 24 S
6/27/2005	12:47:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear	PADEFORD - AMVETS MEMORIAL HIGHWAY Rte 24	Exit 11 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 / PADELFORD STREET
8/4/2005	4:17:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
8/8/2005	12:47:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 N
9/17/2005	6:20:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	SOUTH OF PADELFORD STREET - Rte 24 S			Rte 24 S
9/17/2005	6:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	SOUTH OF PADELFORD STREET - Rte 24 S			Rte 24 S
9/27/2005	6:25:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Rte 24 N
12/4/2005	9:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Snow	AT PADELFORD STREET EXIT (EXIT 1 - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO PADELFORD ST
1/6/2006	1:37:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Rte 24 N / PADELFORD STREET
1/25/2006	12:50:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy	BERKLEY JUNCTION			BERKLEY STREET Rte 24 S / Rte 79
3/5/2006	6:17:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		250 feet S from Exit 11 on Rte 24		Rte 24
3/22/2006	4:30:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
3/29/2006	11:10:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear		10000 feet N from Exit 11 on Rte 24 S		Rte 24 S
5/30/2006	7:26:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 feet S from Intersection Rte 24 N / PADELFORD STREET
6/10/2006	3:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain				RAMP-RT 24 SB TO PADELFORD ST Rte 24 / Rte 24
6/30/2006	2:10:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain		Exit 11 on Rte 24		Rte 24
7/14/2006	1:30:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
7/25/2006	11:35:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear		Exit 11 on Rte 24 S		Rte 24 S
7/30/2006	1:01:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
9/19/2006	2:25:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	HEADING NORTH	1500 feet N from Exit 11 on Rte 24		Rte 24
10/2/2006	7:28:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear	HEADING NORTH	2500 feet S from Exit 11 on Rte 24		Rte 24
10/16/2006	8:47:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 N
11/6/2006	12:30:00 PM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Daylight	Clear		Exit 12 on Rte 24		Rte 24
11/8/2006	8:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain		1 feet S from Exit 11 on Rte 24		Rte 24
3/24/2004	9:45:00 AM	Not Reported	1	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 24	100 feet N from Exit 11 on Rte 24		Rte 24
8/13/2005	11:25:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 N
2/2/2004	7:40:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	JUST SOUTH OF THE TAUNTON LINE. - Rte 24 N			Rte 24 N
2/12/2004	3:05:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	BETWEEN EXIT 10 AND 11 - Rte 24			Rte 24 / Rte 24
2/12/2004	3:57:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 S	150 feet S from Exit 13 on Rte 24		Rte 24 S
4/15/2004	10:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy	Rte 24 N			Rte 24 N
5/17/2004	8:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy	Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
6/7/2004	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	50 feet N from FREETOWN TOWN LINE - Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
6/20/2004	5:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
7/3/2004	3:47:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24	100 feet S from Exit 11 on Rte 24		Rte 24
7/13/2004	4:51:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	PADELFORD STREET			PADELFORD STREET / RAMP-PADELFORD ST TO RT 24 NB Rte 24
7/22/2004	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 N			Rte 24 N
8/13/2004	7:11:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	1/2 MILE SOUTH OF EXIT-11. - Rte 24 N			Rte 24 N
8/13/2004	12:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain	24 ELM STREET Rte 24			24 ELM STREET Rte 24 / Rte 79
9/11/2004	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear	Rte 24 N			Rte 24 N
9/16/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain	Rte 24 S			Rte 24 S
9/16/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy	Rte 24 S	Exit 11 on Rte 24 S		Rte 24 S
11/1/2004	7:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	Rte 24 N			Rte 24 N
3/11/2005	3:59:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				PADELFORD STREET Rte 24 / Rte 24
3/14/2005	12:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N Milemarker 13.2	Rte 24 N
3/28/2005	2:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain		Exit 11 on Rte 24 S		Rte 24 S
3/28/2005	9:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain				Rte 24 S
4/20/2005	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Rte 24 S
4/27/2005	8:07:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain		Exit 11 on Rte 24 S		Rte 24 S
6/10/2005	1:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S Milemarker 13.5	Rte 24 S
6/13/2005	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Other				AMVETS MEMORIAL HIGHWAY Rte 24 S / BRYANT STREET
6/15/2005	6:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear		Exit 11 on Rte 24		Rte 24 / PADELFORD STREET
6/27/2005	12:47:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear		Exit 11 on Rte 24		Rte 24 / PADELFORD STREET
9/19/2005	12:40:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		3000 feet S from Exit 11 on Rte 24 S		Rte 24 S
9/26/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				11 ELM STREET Rte 79 / Rte 24
9/27/2005	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain/Cloudy				Rte 24 N
11/5/2005	3:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Rte 24 N
12/3/2005	7:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Rte 24 N
12/10/2005	9:18:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear/Clear		50 feet S from Exit 11 on Rte 24 S		Rte 24 S
1/24/2006	9:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
2/6/2006	4:13:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S Milemarker 14.4	Rte 24 S
2/14/2006	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		Exit 11 on Rte 24 S		Rte 24 S
5/13/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain		Exit 11 on Rte 24 S		Rte 24 S
6/7/2006	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain		Exit 11 on Rte 24		Rte 24
7/3/2006	10:30:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Rte 24
7/9/2006	1:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	3/4 MILE SOUTH OF TAUNTON/BERKLE			Rte 24 N
10/2/2006	7:28:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear	HEADING NORTH	2500 feet S from Exit 11 on Rte 24		Rte 24
10/5/2006	8:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Cloudy		Exit 11 on Rte 24		Rte 24
12/8/2006	3:32:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Rte 24 S
12/12/2006	1:29:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear		1000 feet S from Exit 11 on Rte 24 S		Rte 24 S
4/2/2005	12:38:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy	NORTH OF X 11 - AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 11 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-PADELFORD ST TO RT 24 NB
8/3/2006	4:10:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		Exit 10 on Rte 24		Rte 24

BRIDGEWATER 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 24 route 24

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
5/15/2005	1:55:00 AM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear			NEAR RTE 24 - 659 ELM STREET			659 ELM STREET
12/23/2006	11:45:00 AM	Fatal injury	2	4	1	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Daylight	Rain/Rain			ON RAMP			AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 495 NB TO RT 24 NB
1/3/2004	3:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rearend	Wet	Dark- roadway not lighted	Fog, smog, smoke			Rte 24			Rte 24
1/6/2004	5:25:00 PM	Non-fatal injury	3	1	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	660 feet N from Exit 14B on Rte 24 S		Rte 24 S
1/7/2004	12:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP-RT 24 NB TO RT 495 NB			RAMP-RT 24 NB TO RT 495 NB / Rte 495
1/14/2004	5:07:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Cloudy			Rte 24 N	10 feet N from Exit 14 on Rte 24		Rte 24 N
2/6/2004	10:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Not reported	Snow/Cloudy			BETWEEN THE RTE 24 RAMPS - Rte 495 S	Exit 7 on Rte 495 S		Rte 495 S / Rte 24
2/28/2004	4:18:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	500 feet S from Exit 15 on Rte 24 S		Rte 24 S
3/6/2004	5:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark- roadway not lighted	Rain/Rain			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
4/2/2004	1:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Cloudy			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S
4/13/2004	12:35:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
6/2/2004	6:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Wet	Daylight	Rain/Fog, smog, smoke			Rte 24 N			Rte 24 N
6/4/2004	4:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			AT END OF RAMP FROM BURGERKING P - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
6/10/2004	1:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 495 NB
6/15/2004	4:41:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14A on Rte 24 S		Rte 24 S
7/10/2004	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S
7/31/2004	4:04:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S
8/1/2004	11:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 N	300 feet S from Exit 15 on Rte 24 N		Rte 24 N
8/15/2004	6:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain/Rain			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
9/7/2004	7:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 14B on Rte 24 S		Rte 24 S
9/19/2004	1:15:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14A on Rte 24 S		Rte 24 S
9/19/2004	10:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
10/1/2004	4:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 24 N	20 feet N from Exit 17 on Rte 24		Rte 24 N
10/5/2004	5:53:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14A on Rte 24 S		Rte 24 S
10/21/2004	8:50:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
12/7/2004	12:25:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain			RTE 24S AT RTE 495 - Rte 24 S			Rte 24 S / Rte 495
12/21/2004	6:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark- roadway not lighted	Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
12/28/2004	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rearend	Wet	Daylight	Cloudy	Rte 24 N					
12/30/2004	1:37:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			RAMP FROM RT 24 NORTH TO RT 104 - PLEASANT STREET Rte 104 E			PLEASANT STREET Rte 104 E / RAMP-RT 24 NB TO RT 104
1/4/2005	12:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark- roadway not lighted	Rain/Fog, smog, smoke					Rte 24 N Milemarker 25.0	Rte 24 N
1/25/2005	3:25:00 PM	Non-fatal injury	1	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24		Rte 24
2/5/2005	1:40:00 PM	Non-fatal injury	8	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S
2/13/2005	5:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S
2/16/2005	11:49:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
2/21/2005	11:25:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Snow/Cloudy			200 feet N from ROUTE 104 OVERPASS - Rte 24 N			Rte 24 N
3/10/2005	1:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S
3/20/2005	12:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
4/3/2005	3:15:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
4/5/2005	11:04:00 AM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				1250 feet N from Exit 15 on Rte 24 N		Rte 24 N
4/7/2005	11:30:00 PM	Non-fatal injury	3	4	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Cloudy	Rte 24 S	RAMP-RT 24 SB TO RT 104				
4/30/2005	6:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S
5/18/2005	5:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Wet	Daylight	Clear/Clear				Exit 14A on Rte 24 S		Rte 24 S
5/27/2005	8:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear					Rte 24 S Milemarker 23.3	AMVETS MEMORIAL HIGHWAY Rte 24 S
6/5/2005	11:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 14B on Rte 24 S		Rte 24 S
6/14/2005	5:10:00 PM	Non-fatal injury	3	1	0	Rear-end	Rearend	Dry	Daylight	Cloudy				Exit 14B on Rte 24 S		Rte 24 S
6/16/2005	4:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 14A on Rte 24 S		Rte 24 S
6/17/2005	6:44:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
6/19/2005	2:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Clear/Clear			BURGER KING REST AREA - AMVETS MEMORIAL HIGHWAY Rte 24 N		Rte 24 N Milemarker 23.3	AMVETS MEMORIAL HIGHWAY Rte 24 N / Rte 495
7/5/2005	8:51:00 AM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Daylight	Clear						1000 feet E from Intersection 1348 PLEASANT STREET / Rte 24
8/7/2005	12:46:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
8/18/2005	10:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 14A on Rte 24 S		Rte 24 S
8/26/2005	5:30:00 PM	Non-fatal injury	3	1	0	Rear-end	Rearend	Dry	Daylight	Clear	Rte 24					
9/2/2005	3:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				1000 feet N from Exit 15 on Rte 24 N		Rte 24 N
9/16/2005	6:25:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark- roadway not lighted	Cloudy/Cloudy				Exit 15 on Rte 24 S		Rte 24 S
9/29/2005	4:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Wet	Daylight	Cloudy/Rain						Rte 24 S
10/9/2005	5:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S
11/17/2005	4:33:00 PM	Non-fatal injury	2	1	0	Rear-end	Rearend	Dry	Dusk	Clear/Cloudy						Rte 24 S
12/18/2005	3:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy						2640 feet W from Intersection Rte 24 N / RAMP - RT 24 NB TO RT 104
12/20/2005	4:55:00 PM	Non-fatal injury	3	1	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear				1000 feet N from Exit 15 on Rte 24 N		Rte 24 N
1/12/2006	6:13:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				500 feet N from Exit 15 on Rte 24 N		Rte 24 N
1/23/2006	12:08:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Sleet, hail (freezing rain or drizzle)/Snow				Exit 15 on Rte 24 N		Rte 24 N
1/25/2006	8:47:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 15 on Rte 24 S		Rte 24 S
1/25/2006	9:25:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Snow/Cloudy				Exit 15 on Rte 24 S		Rte 24 S
1/31/2006	2:29:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			RAMP 24 SB TO RTE 495 NB	Exit 14B on Rte 24 S		Rte 24 S / Rte 495
3/7/2006	8:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear				10000 feet N from Exit 15 on Rte 24 N		Rte 24 N
3/29/2006	8:04:00 AM	Non-fatal injury	5	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 24 N / Rte 104
5/1/2006	9:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Cloudy						Rte 24 N
5/4/2006	3:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
6/1/2006	9:10:00 PM	Non-fatal injury	4	4	0	Head-on	Head-on	Wet	Dark- roadway not lighted	Rain/Cloudy			BURGER KING REST AREA			1 ROUTE 24 SOUTH Rte 24 N
6/25/2006	8:24:00 AM	Non-fatal injury	3	2	0	Angle	Angle	Wet	Daylight	Rain						5280 feet N from Intersection Rte 24 N / Rte 104
6/25/2006	8:47:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						Rte 24 S
6/28/2006	2:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain				Exit 15 on Rte 24		Rte 24
6/28/2006	4:53:00 PM	Non-fatal injury	3	1	0	Rear-end	Rearend	Wet	Daylight	Cloudy/Cloudy						Rte 24 S
6/30/2006	3:52:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain				Exit 15 on Rte 24 N		Rte 24 N
7/5/2006	4:03:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			JUST AFTER BURGER KING REST AREA	Exit 15 on Rte 24 N		Rte 24 N
7/20/2006	10:00:00 AM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear						RAMP-RT 24 NB TO RT 104 / Rte 24
8/23/2006	5:20:00 AM	Non-fatal injury	5	1	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				250 feet N from Exit 15 on Rte 24 N		Rte 24 N
8/23/2006	12:55:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear/Clear				1000 feet N from Exit 15 on Rte 24 S		Rte 24 S
9/4/2006	2:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S / Rte 495
9/11/2006	7:31:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				0 feet S from Exit 15 on Rte 24 S		Rte 24 S
9/14/2006	4:25:00 PM	Non-fatal injury	3	2	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy				Exit 15 on Rte 24 S		Rte 24 S
9/29/2006	2:15:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear						Rte 24 / Rte 106
10/14/2006	5:58:00 AM	Non-fatal injury	1	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear/Clear						Rte 24 N
10/15/2006	9:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						1200 feet N from Intersection Rte 24 N / Rte 104
1/13/2006	8:20:00 AM	Non-fatal injury	2	2	0	Rear-end	Rearend	Dry	Daylight	Clear						Rte 104 E / Rte 24
1/18/2006	11:15:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark- roadway not lighted	Rain/Rain				Exit 15 on Rte 24 N		Rte 24 N
11/14/2006	9:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N
11/17/2006	6:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rearend	Wet	Dawn	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S
12/4/2006	9:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rearend	Wet	Daylight	Clear/Clear						Rte 24 S
12/19/2006	5:00:00 AM	Non-fatal injury	3	2	0	Head-on	Head-on	Dry	Dark- lighted roadway	Clear				35 feet S from Exit 14A on Rte 24		Rte 24
12/23/2006	8:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain				2640 feet N from Exit 15 on Rte 24		Rte 24
1/19/2004	5:48:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark- roadway not lighted	Clear	Rte 24 S					
1/26/2004	12:15:00 PM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			ON THE OVERPASS ABOVE RTE 495 - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO RT 495 NB
7/1/2005	9:00:00 AM	Not Reported	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain				Exit 15 on Rte 24 S		RAMP-RT 104 TO RT 24 NB Rte 24 S
9/13/2005	5:30:00 PM	Not Reported	1	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 24 S
9/30/2005	4:15:00 PM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear						Rte 24
10/3/2005	8:00:00 AM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Dawn	Fog, smog, smoke			BEFORE RTE 106 - Rte 24 N			Rte 24 N
12/9/2005	11:50:00 PM	Not Reported	2	0	0	Angle	Angle	Snow	Dark- lighted roadway	Snow			NORTH OF 106 EXIT - Rte 24			600 feet N from Intersection Rte 24 / Rte 106
1/25/2006	8:45:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow						Rte 24 S
3/3/2006	8:50:00 AM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			NEAR RT 106			Rte 24
5/21/2006	1:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 104 TO RT 24 NB
7/13/2006	6:00:00 PM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 16 on Rte 24		123 Rte 24
7/14/2006	10:30:00 AM	Not Reported	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 13 on Rte 24		Rte 24 S
12/22/2006	10:00:00 AM	Not Reported	4	0	0	Unknown	Unknown	Wet	Dark- roadway not lighted	Rain			BEFORE 123 EXIT			Rte 24 N
1/3/2004	1:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			Rte 24 S		Rte 24 S Milemarker 23.0	Rte 24 S
1/14/2004	2:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
1/21/2004	9:14:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 14A on Rte 24 S		Rte 24 S
1/25/2004	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear			Rte 24 N	1200 feet N from Exit 15 on Rte 24 N		Rte 24 N
1/31/2004	4:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			1320 feet N from BURGER KING NORTH REST AREA - Rte 24 N		Rte 24 N Milemarker 23.3	Rte 24 N
2/5/2004	8:02:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N
2/16/2004	11:10:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24			Rte 24
2/17/2004	2:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP TO BURGER KING REST AREA - Rte 24 N		Rte 24 N Milemarker 23.3	Rte 24 N
3/16/2004	7:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 104			Rte 104 / Rte 24
3/17/2004	7:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizz			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
4/1/2004	8:23:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			JUST SOUTH OF RAMP FROM 24 SOUTH - INTERSTATE 495 Rte 495 N			INTERSTATE 495 Rte 495 N / RAMP-RT 24 SB TO RT 495 NB
4/8/2004	12:01:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 24			Rte 24 / Rte 495
4/10/2004	5:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			AT MOBIL GAS STATION - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
4/13/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain/Rain			Rte 24 N	Exit 14 on Rte 24		Rte 24 N
4/20/2004	5:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14B on Rte 24 S		Rte 24 S
4/24/2004	10:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
5/2/2004	5:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			ON ON RAMP TO ROUTE 24 NORTH - Rte 495 N	Exit 7B on Rte 495 N		Rte 495 N
5/17/2004	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14 on Rte 24 S		Rte 24 S / Rte 495
5/17/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S			1320 feet N from Intersection Rte 24 S / Rte 495
5/28/2004	11:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			ENTRANCE TO BURGER KING LOT - - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
6/1/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain			Rte 24 S	5620 feet N from Exit 15 on Rte 24 S		Rte 24 S
6/2/2004	6:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Water (standing, moving)	Daylight	Rain/Rain			Rte 24 N			1320 feet N from Intersection Rte 24 N / Rte 104
6/10/2004	6:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dawn	Cloudy/Cloudy			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
6/11/2004	4:12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear	PLEASANT STREET	PLEASANT STREET / RAMP-RT 104 TO RT 24 NB				
6/12/2004	3:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 15 on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 104
6/20/2004	1:58:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
7/15/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
7/16/2004	4:25:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S	200 feet N from Exit 14A on Rte 24 S		Rte 24 S
8/6/2004	4:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
8/15/2004	3:35:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain			Rte 24 N	Exit 15 on Rte 24 N		Rte 24 N
8/15/2004	6:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Dawn	Rain/Rain			Rte 24	Exit 15 on Rte 24		Rte 24
8/20/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24 S			Rte 24 S / Rte 495
8/20/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dusk	Clear	Rte 24	Rte 495				
8/30/2004	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain/Cloudy			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S
9/2/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24	Exit 14A on Rte 24		Rte 24

BRIDGEWATER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From	
9/16/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark- lighted roadway	Rain			Rte 495			500 feet S from Intersection Rte 495 / Rte 24	
9/18/2004	7:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S	
9/30/2004	11:23:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- lighted roadway	Cloudy/Cloudy			ON RAMP FROM RTE 24SBL - INTERSTATE 495 Rte 495 S			INTERSTATE 495 Rte 495 S / RAMP-RT 495 SB TO RT 24 SB	
10/4/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			PLEASANT STREET Rte 24			PLEASANT STREET Rte 24 / Rte 104	
10/4/2004	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear	Rte 24 N	PLEASANT STREET Rte 104 E					
10/21/2004	6:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Cloudy/Cloudy			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S	
10/29/2004	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy			Rte 24 N	10 feet N from Exit 15 on Rte 24 N		Rte 24 N	
11/5/2004	6:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			Rte 24			Rte 24	
11/7/2004	2:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S		Rte 24 S Milemarker 25.0	Rte 24 S	
11/8/2004	5:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 14A on Rte 24 S		Rte 24 S	
11/10/2004	4:45:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark- roadway not lighted	Cloudy	Rte 24 S	Rte 104					
11/12/2004	11:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark- roadway not lighted	Sleet, hail (freezing rain or drizzle)/R			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S	
12/9/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 24 S	Exit 15 on Rte 24 S		Rte 24 S	
12/23/2004	9:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Water (standing, moving)	Dark- roadway not lighted	Severe crosswinds/Rain			Rte 24 N	Exit 14 on Rte 24		Rte 24 N	
1/4/2005	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dusk	Cloudy	Rte 24 S	Rte 104					
1/8/2005	2:28:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S	
1/14/2005	7:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy				Exit 15 on Rte 24 S		Rte 24 S	
1/20/2005	7:10:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Ice	Daylight	Clear						Rte 24 S	
1/20/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Clear/Snow				Exit 16 on Rte 24		Rte 24	
1/21/2005	8:17:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark- roadway not lighted	Cloudy/Cloudy				Exit 15 on Rte 24 S		Rte 24 S	
1/24/2005	11:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Snow	Daylight	Blowing sand, snow						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO RT 495 NB	
1/25/2005	11:10:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rearend	Dry	Dark- lighted roadway	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
2/2/2005	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Clear						Rte 24 S	
2/4/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear	BRIDGE STREET Rte 24						
3/3/2005	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Clear						Rte 495 / Rte 24	
3/8/2005	12:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain				Exit 14A on Rte 24 S		Rte 24 S	
3/12/2005	5:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Snow						Rte 24 S	
3/12/2005	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Snow/Rain				50 feet N from Exit 15 on Rte 24 S		Rte 24 S	
3/12/2005	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 14B on Rte 24 S		Rte 24 S	
3/24/2005	7:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S	
3/28/2005	8:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain				Exit 15 on Rte 24 N		Rte 24 N	
4/2/2005	12:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
4/9/2005	7:16:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
4/16/2005	3:25:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear/Clear			SOUTH OF BURGER KING REST AREA - AMVETS MEMORIAL HIGHWAY Rte 24 N		Rte 24 N Milemarker 23.3	AMVETS MEMORIAL HIGHWAY Rte 24 N	
5/9/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 14B on Rte 24 S		Rte 24 S	
5/25/2005	1:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S	
6/7/2005	6:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N	
6/16/2005	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear						INTERSTATE 495 Rte 495 S / RAMP-RT 24 SB TO RT 495 SB	
6/22/2005	4:19:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 14B on Rte 24 S		Rte 24 S	
6/24/2005	1:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark- lighted roadway	Clear				Exit 14B on Rte 24 S		Rte 24 S / RAMP - RT 495 NB TO RT 24 SB	
6/30/2005	7:56:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			RET 123 EXIT - Rte 24	Exit 123 on Rte 24		Rte 24	
7/7/2005	8:11:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Clear						Rte 24 N	
7/11/2005	3:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear						Rte 24 S	
7/17/2005	9:58:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				Exit 10 on Rte 24		Rte 24	
7/30/2005	3:27:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
8/4/2005	3:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			BURGER KING SERVICE AREA PARKING - Rte 24 S			Rte 24 S	
8/24/2005	8:26:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
8/25/2005	8:55:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				2800 feet N from Exit 15 on Rte 24 S		Rte 24 S	
8/30/2005	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Cloudy						Rte 24 N	
9/4/2005	8:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear						Rte 24	
9/27/2005	1:06:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Cloudy					Rte 24 S Milemarker 23.9	Rte 24 S / Rte 104	
10/3/2005	10:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Other	Fog, smog, smoke/Fog, smog, smoke				Exit 15 on Rte 24 N		Rte 24 N	
10/14/2005	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Cloudy/Rain				Exit 14A on Rte 24 S		Rte 24 S	
10/25/2005	3:18:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark- roadway not lighted	Rain				5280 feet N from Exit 15 on Rte 24 N		Rte 24 N	
11/3/2005	9:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			BRIDGEWATER/BROCKTON TOWN LINE - Rte 24 S			Rte 24 S	
11/6/2005	10:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Cloudy/Cloudy				2500 feet N from Exit 15 on Rte 24 S		Rte 24 S	
11/7/2005	11:47:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N	
11/10/2005	1:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain			W. BRIDGEWATER LINE - Rte 24 S			Rte 24 S	
11/22/2005	4:47:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain			W. BRIDGEWATER LINE - Rte 24 N			Rte 24 N	
11/22/2005	7:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain			NORTH OF RT 104. - Rte 24 S			Rte 24 S / Rte 104	
11/28/2005	8:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Cloudy/Cloudy				Exit 15 on Rte 24 S		Rte 24 S	
11/30/2005	1:13:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain						PLEASANT STREET / RAMP-RT 104 TO RT 24 SB Rte 24 S	
12/4/2005	7:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Cloudy			ON RAMP TO RT 104. - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 104	
12/16/2005	8:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S	
12/19/2005	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 24 S	
12/27/2005	8:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM RTE 24NB TO RTE 495 NB - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO RT 495 NB	
1/3/2006	8:07:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				2000 feet N from Exit 15 on Rte 24 S		Rte 24 S	
1/23/2006	6:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Snow				Exit 17 on Rte 24		Rte 24 S	
1/23/2006	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Cloudy	Rte 24 N	Rte 104					
1/25/2006	8:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 14A on Rte 24 S		Rte 24 S	
1/25/2006	8:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 15 on Rte 24 S		Rte 24 S	
1/31/2006	8:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Dark- lighted roadway	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)				Exit 14 on Rte 24		Rte 24 N	
2/4/2006	6:13:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Dark - unknown roadway lighting	Rain/Rain				Exit 14 on Rte 24		Rte 24 N	
2/13/2006	10:46:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear						10 feet N from Intersection RAMP-RT 24 NB TO RT 104 / PLEASANT DRIVE Rte 104 N	
2/21/2006	12:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 16A on Rte 104		Rte 104 / Rte 24	
3/2/2006	6:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - unknown roadway lighting	Snow/Blowing sand, snow			EXIT 16A	Exit 16 on Rte 24	Rte 24 Milemarker 16.0	RAMP-RT 104 TO RT 24 NB Rte 24 S	
3/8/2006	7:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark- roadway not lighted	Clear/Clear						Rte 24 S	
3/30/2006	3:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear						RAMP - RT 24 SB TO RT 495 SB Rte 24 S	
3/30/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear			23 APP. MILE MARKER		Rte 24 N Milemarker 23.0	Rte 24 N	
4/6/2006	9:16:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N	
4/6/2006	10:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				200 feet N from Exit 7A on Rte 495		Rte 495 / Rte 24	
4/23/2006	8:51:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Severe crosswinds						Rte 24 S	
5/13/2006	12:59:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain				Exit 15 on Rte 24 N		Rte 24 N	
5/14/2006	7:54:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				Exit 15 on Rte 24 N		Rte 24 N	
5/26/2006	6:43:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
6/1/2006	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 N		Rte 24 N	
6/1/2006	7:49:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Clear						Rte 104 / Rte 24	
6/3/2006	11:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Dark- roadway not lighted	Rain	Rte 24 S	Rte 24 S					
6/7/2006	1:33:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain				Exit 15 on Rte 24 N		Rte 24 N	
6/7/2006	9:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 15 on Rte 24 S		Rte 24 S	
6/7/2006	12:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 15 on Rte 24 N		Rte 24 N	
6/8/2006	10:21:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark- roadway not lighted	Cloudy						PLEASANT STREET Rte 104 / RAMP-RT 104 TO RT 24 SB Rte 24	
6/16/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			106 OFF RAMP			300 feet S from Intersection Rte 24 / Rte 106	
6/16/2006	7:28:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						500 feet E from Intersection 1420 PLEASANT STREET Rte 104 / Rte 24	
6/22/2006	7:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 14B on Rte 24 S		Rte 24 S	
6/25/2006	6:22:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain/Rain				Exit 15 on Rte 24 N		Rte 24 N	
6/26/2006	1:27:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
6/27/2006	2:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			ROAD NARROWS FROM 3 LANES TO 2			Rte 24	
7/15/2006	6:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				2640 feet N from Exit 15 on Rte 24 N		Rte 24 N	
7/18/2006	7:52:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				500 feet N from Exit 15 on Rte 24 S		Rte 24 S	
7/25/2006	3:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 14A on Rte 24 S		Rte 24 S	
7/25/2006	5:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP TO ROUTE 495 NORTHBOUND			INTERSTATE 495 Rte 495 N / RAMP-RT 24 SB TO RT 495 NB	
8/7/2006	9:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N	
8/20/2006	2:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Other	Rain				Exit 15 on Rte 24 N		Rte 24 N	
9/9/2006	4:47:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Other	Clear/Clear				Exit 15 on Rte 24 S		Rte 24 S	
9/15/2006	11:48:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark- lighted roadway	Clear/Clear			BURGER KING REST AREA			UNION STREET Rte 24 S	
9/19/2006	11:32:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain						Rte 24 N	
10/11/2006	9:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark- lighted roadway	Clear/Clear						Rte 24 S	
10/26/2006	4:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear				Exit 15 on Rte 24 N		Rte 24 N	
10/28/2006	8:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark- roadway not lighted	Rain/Rain			NORTH OF RTE104			Rte 24 N / Rte 104	
11/12/2006	9:01:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						Rte 24 N	
11/26/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark- lighted roadway	Clear						2600 feet N from Intersection Rte 24 S / Rte 104	
12/1/2006	2:49:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark- lighted roadway	Cloudy/Cloudy				Exit 14B on Rte 24 S		Rte 24 S	
12/4/2006	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Clear/Clear				2800 feet N from Exit 15 on Rte 24 S		Rte 24 S	
12/4/2006	10:30:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear/Clear				2800 feet N from Exit 15 on Rte 24 S		Rte 24 S	
12/15/2006	2:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 15 on Rte 24 S		Rte 24 S	
1/9/2004	4:30:00 PM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			RAMP-RT 104 TO RT 24 NB Rte 24			RAMP-RT 104 TO RT 24 NB Rte 24 / Rte 104	
2/15/2004	5:45:00 PM	Unknown	2	0	0	Rear-end	Rearend	Dry	Dark- roadway not lighted	Clear			Rte 24	Exit 15 on Rte 24		Rte 24	
1/21/2005	8:30:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear	Rte 24						
3/5/2005	1:03:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO RT 495 NB	
6/8/2005	8:00:00 PM	Unknown	2	0	0	Rear-end	Rearend	Dry	Dark- lighted roadway	Clear				Exit 7 on Rte 24		Rte 24	
8/31/2005	6:15:00 AM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear	Rte 24						
8/8/2006	5:51:00 PM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 14A on Rte 24 S		Rte 24 S	

BROCKTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From	
7/6/2004	10:45:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear			SOUTH OF EXIT FOR RTE 27 - Rte 24 N			Rte 24 N	
3/3/2005	2:54:00 AM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear				1000 feet N from Exit 18A on Rte 24 S		Rte 24 S	
7/10/2006	8:32:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear			RT 24 OFFRAMP			REYNOLDS HIGHWAY Rte 27 S	
1/13/2004	6:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Dark -roadway not lighted	Cloudy/Clear			Rte 24 N	1500 feet N from Exit 17B on Rte 24 N		Rte 24 N	
2/5/2004	9:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Unknown	Daylight	Clear			Rte 24 S			Rte 24 S / Rte 24	
2/5/2004	11:12:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S	5200 feet S from Exit 18A on Rte 24 S	5200 feet S from Rte 24 S Milemarker 32.0	Rte 24 S	
2/6/2004	8:16:00 PM	Non-fatal injury	2	7	0	Rear-end	Rear-end	Wet	Dark- lighted roadway	Rain			Rte 24 N	Exit 18B on Rte 24 N		Rte 24 N	
2/13/2004	3:30:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear	BELMONT STREET Rte 24						
2/19/2004	3:25:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N	
2/19/2004	8:07:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			Rte 24 S	Exit 18B on Rte 24 S		Rte 24 S	
3/15/2004	9:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 N	Exit 18A on Rte 24 N		Rte 24 N	
4/17/2004	1:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear/Clear			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S	
4/26/2004	5:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 24 S	100 feet N from Exit 17A on Rte 24 S		Rte 24 S	
5/5/2004	11:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			BELMONT STREET Rte 24	Exit 17B on Rte 24		BELMONT STREET Rte 24	
5/12/2004	8:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 27 SB TO RT 24 SB	
5/16/2004	3:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear			REYNOLDS HIGHWAY Rte 27 E			20 feet W from Intersection REYNOLDS HIGHWAY Rte 27 E / Rte 24	
5/24/2004	1:06:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark- lighted roadway	Rain/Cloudy			Rte 24 S	500 feet N from Exit 17B on Rte 24 S		Rte 24 S	
5/27/2004	7:32:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S			2640 feet N from Intersection Rte 24 S / Rte 123	
6/14/2004	5:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
6/15/2004	4:43:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N	50 feet S from Exit 18A on Rte 24 N		Rte 24 N	
8/4/2004	9:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S	
8/13/2004	1:00:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Rain/Rain			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
9/11/2004	12:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S	1000 feet S from Exit 17A on Rte 24 S		Rte 24 S	
9/14/2004	8:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	0 feet S from Exit 17A on Rte 24 S		Rte 24 S	
9/20/2004	6:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
9/21/2004	2:16:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	Exit 17B on Rte 24 S		Rte 24 S	
9/28/2004	4:53:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			BELMONT STREET Rte 123 E			200 feet W from Intersection BELMONT STREET Rte 123 E / RAMP-RT 123 EB TO RT 24 NB	
10/1/2004	4:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	100 feet S from Exit 17A on Rte 24 N		Rte 24 N	
10/6/2004	8:25:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N	
10/8/2004	7:55:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Fog, smog, smoke			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S	
10/12/2004	4:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 123 WB	
10/12/2004	8:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N	
10/23/2004	4:30:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	100 feet S from Exit 17A on Rte 24 N		Rte 24 N	
													200 feet E from CUMBERLAND FARMS GAS - RAMP-RT 24 NB TO RT				
10/29/2004	4:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			123 EB			RAMP-RT 24 NB TO RT 123 EB	
11/7/2004	3:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
11/9/2004	7:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 17B on Rte 24		Rte 24 / Rte 27	
11/13/2004	9:20:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Cloudy			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
11/18/2004	10:15:00 AM	Non-fatal injury	4	2	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S	
11/19/2004	3:25:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Cloudy/Clear			Rte 24 S	200 feet N from Exit 18A on Rte 24 S		Rte 24 S	
12/5/2004	3:20:00 AM	Non-fatal injury	1	3	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S	
12/17/2004	2:50:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 17B on Rte 24 N		Rte 24 N	
12/21/2004	7:37:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Unknown			RT 24 OVERPASS - REYNOLDS HIGHWAY Rte 27 E			REYNOLDS HIGHWAY Rte 27 E	
12/22/2004	1:45:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark -roadway not lighted	Clear	REYNOLDS HIGHWAY	RAMP-RT 24 NB TO RT 27 SB				Rte 24 S / Rte 123	
1/5/2005	9:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Snow				Exit 18A on Rte 24		Rte 24	
1/6/2005	11:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				250 feet N from Exit 18B on Rte 24 S		Rte 24 S	
1/10/2005	12:56:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark -roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)				Exit 18A on Rte 24 S		Rte 24 S / Rte 27	
1/11/2005	6:00:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear						1000 feet S from Intersection Rte 24 N / Rte 123	
1/11/2005	7:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 17A on Rte 24 N		Rte 24 N	
1/20/2005	5:30:00 AM	Non-fatal injury	4	2	0	Angle	Angle	Snow	Dawn	Snow/Sleet, hail (freezing rain or drizzle)				Exit 18B on Rte 24 N		Rte 24 N	
1/26/2005	9:50:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Snow	Daylight	Snow/Snow				Exit 18B on Rte 24 S		Rte 24 S	
1/28/2005	9:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			SOUTH OF ROUTE 123 - Rte 24 S			Rte 24 S / Rte 123	
2/13/2005	10:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S	
2/13/2005	12:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Cloudy/Cloudy				Exit 18B on Rte 24 S		Rte 24 S	
2/22/2005	12:10:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Other	Daylight	Cloudy				Exit 17A on Rte 24 N		Rte 24 N	
2/24/2005	5:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S	
2/28/2005	8:30:00 AM	Non-fatal injury	1	1	0	Not reported	Not reported	Ice	Daylight	Clear	Rte 24 N	Rte 27 S					
3/2/2005	4:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy	BELMONT STREET Rte 24						
3/12/2005	1:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Snow/Snow				2000 feet N from Exit 17B on Rte 24 S		Rte 24 S	
3/15/2005	8:07:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17B on Rte 24 N		Rte 24 N	
3/17/2005	6:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Clear						Rte 123 W / Rte 24	
3/20/2005	10:20:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear						Rte 24 N	
3/23/2005	2:00:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Daylight	Clear/Clear			AT ROUTE 123 - AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 17 on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / Rte 123	
4/4/2005	12:12:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			NORTH OF ROUTE 123. - AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 17 on Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N	
4/6/2005	7:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Cloudy				800 feet N from Exit 18A on Rte 24 S		Rte 24 S	
4/10/2005	1:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear				1200 feet N from Exit 18A on Rte 24 S		Rte 24 S	
4/12/2005	1:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 123 / Rte 24	
4/13/2005	3:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 17A on Rte 24		Rte 24	
4/13/2005	8:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet N from Exit 18B on Rte 24		Rte 24	
4/16/2005	1:28:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S	
4/19/2005	3:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17A on Rte 24		BELMONT STREET Rte 24 / RAMP-RT 123 EB TO RT 24 SB	
4/25/2005	9:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear				Exit 18A on Rte 24		Rte 24	
5/5/2005	9:03:00 AM	Non-fatal injury	5	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP-RT 24 NB TO RT 27 SB Rte 24 S / Rte 27	
5/6/2005	4:35:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N	
5/27/2005	5:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP-RT 123 EB TO RT 24 NB Rte 123 / Rte 24	
5/31/2005	6:45:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 17A on Rte 24 N		Rte 24 N	
6/6/2005	1:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S	
6/6/2005	4:30:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 24 S	BELMONT STREET Rte 123 W					
6/10/2005	10:30:00 AM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Daylight	Clear/Clear						200 feet N from Intersection Rte 24 N / Rte 27	
6/15/2005	7:38:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dusk	Cloudy/Cloudy				Exit 18A on Rte 24 N		Rte 24 N	
6/27/2005	1:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy						Rte 24 N	
7/7/2005	2:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				20 feet E from Exit 17A on Rte 24 S		Rte 24 S	
7/21/2005	3:56:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 18B on Rte 24 N		Rte 24 N	
7/24/2005	7:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				500 feet N from Exit 18B on Rte 24 S		Rte 24 S	
7/24/2005	7:45:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S	
7/31/2005	6:00:00 PM	Non-fatal injury	2	4	0	Rear-end	Rear-end	Dry	Daylight	Clear						350 feet S from Intersection Rte 24 N / Rte 123	
8/6/2005	9:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -unknown roadway lighting	Clear				Exit 19 on Rte 24		Rte 24 / Rte 24	
8/8/2005	9:40:00 AM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 18B on Rte 24 N		Rte 24 N	
8/14/2005	9:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Rain						Rte 24 N	
8/16/2005	3:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17A on Rte 24		Rte 24	
8/18/2005	9:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear/Clear				800 feet N from Exit 18B on Rte 24 S		Rte 24 S	
9/4/2005	7:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				200 feet S from Exit 17A on Rte 24 N		Rte 24 N	
9/22/2005	5:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			SOUTH OF ROUTE 27 - Rte 24 N			Rte 24 N	
9/24/2005	2:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Cloudy				25 feet W from Exit 18B on Rte 24 S		Rte 24 S	
9/24/2005	11:10:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear				Exit 18A on Rte 24 S		Rte 24 S	
9/25/2005	5:20:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						REYNOLDS HIGHWAY Rte 27 / RAMP-RT 27 SB TO RT 24 NB Rte 24	
9/29/2005	9:50:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Cloudy/Cloudy				Exit 18A on Rte 24 S		Rte 24 S	
10/4/2005	5:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S	
													RAMP FROM RTE 123 WB TO RTE 24 S - AMVETS MEMORIAL				
10/5/2005	11:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 123 WB TO RT 24 SB	
10/14/2005	7:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark- lighted roadway	Rain					Rte 123 Milemarker 22.0	2500 feet W from Intersection 1285 BELMONT STREET Rte 123 / Rte 24	
10/26/2005	1:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S	
11/29/2005	2:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy				Exit 17A on Rte 24 S		Rte 24 S	
11/29/2005	9:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	BELMONT STREET Rte 123					
12/3/2005	2:55:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear				200 feet N from Exit 17A on Rte 24 S		Rte 24 S	
12/3/2005	3:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18A on Rte 24		BROCKTON AVENUE Rte 24	
12/16/2005	9:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear				Exit 18A on Rte 24 N		Rte 24 N	
1/3/2006	12:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark -unknown roadway lighting	Snow/Rain						Rte 24 S	
1/23/2006	11:01:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Slush	Daylight	Snow				Exit 17A on Rte 24 N		Rte 24 N	
2/2/2006	6:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark -unknown roadway lighting	Clear/Clear				50 feet S from Exit 18A on Rte 24 S		Rte 24 S	
2/21/2006	2:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 feet S from Exit 18B on Rte 24 S		Rte 24 S	
2/22/2006	9:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 18A on Rte 24 S		Rte 24 S	
3/9/2006	8:55:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S	
3/12/2006	4:28:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP FROM 27 SB TO 24 SB	Exit 18B on Rte 24 S		Rte 24 S	
3/21/2006	11:39:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			RAMP FROM 24 S TO 27N			REYNOLDS HIGHWAY Rte 27 N / RAMP-RT 24 SB TO RT 27 NB	
3/29/2006	6:05:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear						BELMONT STREET Rte 24 / Rte 24	
4/20/2006	5:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 N	Rte 24 N Milemarker 145.0	Rte 24 N	
4/21/2006	4:32:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	BELMONT STREET Rte 123	Rte 24 S				BELMONT STREET Rte 123 / RAMP-RT 123 EB TO RT 24 SB Rte 24 S	
4/25/2006	6:35:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 feet N from Exit 17B on Rte 24 S		Rte 24 S	
4/28/2006	2:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N	
5/1/2006	7:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Cloudy				Exit 18B on Rte 24 S		Rte 24 S	
5/1/2006	8:10:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark- lighted roadway	Rain/Cloudy				Exit 18A on Rte 24 N		Rte 24 N	
5/3/2006	3:51:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 17A on Rte 24 N		Rte 24 N	
5/6/2006	11:25:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S	
5/20/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Cloudy/Rain				Exit 18B on Rte 24 N		Rte 24 N	
5/22/2006	6:50:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear/Clear				15 feet N from Exit 17A on Rte 24 N		Rte 24 N	
5/27/2006	2:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 123 EB TO RT 24 NB	
5/27/2006	4:02:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S	
5/27/2006	8:08:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Fog, smog, smoke/Fog, smog, smoke				500 feet N from Exit 17B on Rte 24 S		Rte 24 S	
5/28/2006	3:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 18A on Rte 24		Rte 24	
6/1/2006	1:15:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 1 on Rte 24 N		Rte 24 N	
6/3/2006	5:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 24	BELMONT STREET		Exit 17A on Rte 24		BELMONT STREET Rte 24	
6/3/2006	11:10:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Rain/Rain				Exit 18B on Rte 24 S		Rte 24 S	
6/15/2006	6:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						Rte 24	
7/14/2006	12:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				1000 feet S from Exit 17A on Rte 24 N		Rte 24 N	
7/14/2006	12:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				2500 feet S from Exit 18A on Rte 24 S		Rte 24 S	
8/3/2006	9:00:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N	
8/18/2006	2:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			EXIT 18	Exit 18A on Rte 24 S		Rte 24 S	
8/25/2006	1:35:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Wet	Not reported	Rain/Cloudy				Exit 18A on Rte 24 N		Rte 24 N	

BROCKTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
9/13/2006	2:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S
9/15/2006	3:25:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 17B on Rte 24 S		Rte 24 S
10/10/2006	6:03:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
10/10/2006	6:10:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 N		Rte 24 N
10/12/2006	7:43:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				50 feet N from Exit 17B on Rte 24 N		Rte 24 N
10/17/2006	2:08:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S
10/17/2006	6:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 17B on Rte 24 N		Rte 24 N
10/26/2006	1:58:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 17A on Rte 24		Rte 24
10/28/2006	6:50:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear				Exit 18B on Rte 24 N		Rte 24 N
10/29/2006	8:30:00 AM	Non-fatal injury	2	1	0	Unknown	Unknown	Wet	Dark -unknown roadway lighting	Rain				Exit 16 on Rte 24		Rte 24
11/6/2006	4:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 17A on Rte 24		Rte 24
11/9/2006	8:35:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 17A on Rte 24 S		Rte 24 S
11/17/2006	2:42:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy				Exit 18B on Rte 24		Rte 24
11/17/2006	8:55:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						Rte 24 N
11/18/2006	5:37:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 17B on Rte 24 S		Rte 24 S
11/30/2006	12:27:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S
12/4/2006	10:05:00 AM	Non-fatal injury	8	3	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				50 feet S from Exit 17A on Rte 24 N		Rte 24 N
12/11/2006	9:45:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	BELMONT STREET	BELMONT STREET				BELMONT STREET / RAMP-RT 123 EB TO RT 24 NB Rte 24
12/14/2006	8:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18A on Rte 24 N		Rte 24 N
12/20/2006	2:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 N	REYNOLDS HIGHWAY Rte 27 E				
3/9/2004	4:30:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Not Reported	Rte 24					
9/22/2004	1:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 24		41 LIBBY STREET			41 LIBBY STREET
7/30/2004	2:50:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP-RT 123 EB TO RT 24 NB			RAMP-RT 123 EB TO RT 24 NB / Rte 24
9/27/2004	11:55:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RAMP-RT 123 WB TO RT 24 SB			RAMP-RT 123 WB TO RT 24 SB / Rte 24
11/9/2004	9:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N			Rte 24 N / Rte 123
1/19/2005	12:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						OAK STREET / Rte 24
2/7/2005	2:55:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 N					
4/22/2005	7:30:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			SOUTH OF RTE 27 - AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 18A on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 27 SB Rte 27 S
7/24/2005	7:44:00 AM	Not Reported	1	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 18A on Rte 24 S		Rte 24 S
1/19/2006	6:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Cloudy				Exit 17A on Rte 24		Rte 24
1/23/2006	7:30:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Snow						BELMONT STREET / RAMP-RT 24 NB TO RT 123 WB
2/1/2006	7:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 27 SB TO RT 24 SB
6/4/2006	12:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Rain/Rain				2640 feet S from Exit 18A on Rte 24 S		Rte 24 S
9/7/2006	8:30:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				150 feet S from Exit 18A on Rte 24 N		Rte 24 N
9/13/2006	7:35:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 17B on Rte 24 N		Rte 24 N
9/21/2006	8:05:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				500 feet S from Exit 17A on Rte 24		Rte 24
10/17/2006	6:30:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark -roadway not lighted	Rain				Exit 17B on Rte 24		Rte 24
12/2/2006	4:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Not Reported				Exit 17A on Rte 24		Rte 24
1/19/2004	7:30:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark -roadway not lighted	Snow			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S
1/23/2004	10:30:00 AM	(none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 24	Exit 17A on Rte 24		Rte 24
1/28/2004	7:00:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Dark -roadway not lighted	Snow/Sleet, hail (freezing rain or drizz			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 123 WB TO RT 24 NB
2/3/2004	8:00:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 24			Rte 24 / REYNOLDS HIGHWAY
2/14/2004	5:20:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 27 NB
2/21/2004	8:45:00 PM	(none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S
3/4/2004	11:46:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 N	50 feet N from Exit 17B on Rte 24 N		Rte 24 N
3/12/2004	8:21:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			1015 BELMONT STREET Rte 123 E			1500 feet E from Intersection 1015 BELMONT STREET Rte 123 E / Rte 24
3/17/2004	8:00:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Slush	Dark -roadway not lighted	Snow/Snow			Rte 24 S			Rte 24 S / Rte 123
3/18/2004	11:35:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S
3/23/2004	7:50:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 18 on Rte 24 S		Rte 24 S
4/2/2004	6:15:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Cloudy			Rte 24 S			Rte 24 S
4/10/2004	1:30:00 AM	(none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy			Rte 24	200 feet N from Exit 18A on Rte 24		Rte 24
4/15/2004	8:45:00 PM	(none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	BROCKTON AVENUE Rte 24					
4/17/2004	2:10:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 N	Exit 18A on Rte 24 N	Rte 24 N Milemarker 33.0	Rte 24 N
4/23/2004	6:50:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy			Rte 24 N	Exit 17B on Rte 24 N		Rte 24 N
5/3/2004	3:25:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Cloudy			Rte 24 N	50 feet N from Exit 18B on Rte 24 N		Rte 24 N
5/8/2004	10:30:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -unknown roadway lighting	Cloudy/Cloudy	REYNOLDS HIGHWAY	RAMP-RT 24 NB TO RT 123 EB				
5/18/2004	8:30:00 AM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
5/25/2004	2:55:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 17B on Rte 24		Rte 24
5/25/2004	8:00:00 AM	(none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	Rte 24	Rte 123				
5/27/2004	9:50:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S			Rte 24 S / Rte 27
5/29/2004	2:10:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	100 feet S from Exit 18A on Rte 24		Rte 24
6/11/2004	6:15:00 AM	(none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 24 S			Rte 24 S / Rte 123
6/24/2004	3:12:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 17A on Rte 24 S		Rte 24 S
6/25/2004	12:01:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			BELMONT STREET Rte 24	Exit 18B on Rte 24		BELMONT STREET Rte 24
6/26/2004	8:18:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
7/11/2004	6:12:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 18B on Rte 24 S		Rte 24 S
7/19/2004	2:45:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			RAMP-RT 24 NB TO RT 123 WB			RAMP-RT 24 NB TO RT 123 WB / Rte 123
7/29/2004	12:05:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Rain			Rte 24 S	Exit 18B on Rte 24 S		Rte 24 S
8/4/2004	4:43:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 17A on Rte 24		Rte 24 / Rte 123
8/4/2004	12:15:00 AM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	Exit 17B on Rte 24 S		Rte 24 S
8/10/2004	5:30:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	BELMONT STREET Rte 123				
8/19/2004	2:37:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -unknown roadway lighting	Clear/Clear			Rte 24 S	Exit 18B on Rte 24 S		Rte 24 S
9/18/2004	8:50:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			Rte 24 N	Exit 18A on Rte 24 N		Rte 24 N
9/26/2004	7:50:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 17B on Rte 24 N		Rte 24 N
9/27/2004	7:15:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N			Rte 24 N
10/7/2004	8:55:00 AM	(none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
10/17/2004	2:45:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Clear/Cloudy			Rte 24 S	2500 feet N from Exit 18B on Rte 24 S		Rte 24 S
10/21/2004	3:15:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear			ROUTE 24 Rte 24 N	50 feet N from Exit 18A on Rte 24 N		ROUTE 24 Rte 24 N
10/21/2004	12:10:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Cloudy			BELMONT STREET Rte 123 E			BELMONT STREET Rte 123 E / RAMP-RT 123 EB TO RT 24 NB Rte 24
10/27/2004	5:00:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 S	5280 feet N from Exit 17A on Rte 24 S		Rte 24 S
10/28/2004	1:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 18B on Rte 24 N		Rte 24 N
10/29/2004	7:25:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			1/2 MILE SOUTH OF RT 27, EXIT 18 - Rte 24 N	2640 feet S from Exit 18 on Rte 24 N		Rte 24 N
11/2/2004	6:20:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear			Rte 24	Exit 18A on Rte 24		Rte 24
11/13/2004	6:45:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dawn	Snow/Cloudy			Rte 24 S	Exit 18A on Rte 24 S		Rte 24 S
11/13/2004	9:15:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Clear			Rte 24 S			Rte 24 S / BELMONT AVENUE
11/16/2004	12:50:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			Rte 24 N		Rte 24 N Milemarker 31.5	Rte 24 N
11/29/2004	1:20:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
12/3/2004	6:02:00 PM	(none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 24 S	200 feet N from Exit 17A on Rte 24 S		Rte 24 S
12/4/2004	1:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 17A on Rte 24		Rte 24
12/8/2004	1:30:00 PM	(none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 24 N	100 feet N from Exit 17A on Rte 24 N		Rte 24 N
12/10/2004	5:30:00 PM	(none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Rain/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 17B on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S
12/15/2004	6:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear			REYNOLDS HIGHWAY Rte 27 N			REYNOLDS HIGHWAY Rte 27 N / RAMP-RT 24 NB TO RT 27 NB Rte 24
12/21/2004	12:26:00 PM	(none injured)	3	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear	Rte 24 S	RAMP-RT 123 WB TO RT 24 SB				
12/22/2004	5:30:00 AM	(none injured)	3	0	0	Angle	Angle	Ice	Dark -roadway not lighted	Clear/Cloudy			Rte 24 N	500 feet N from Exit 17B on Rte 24 N		Rte 24 N
12/22/2004	10:05:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Other	Daylight	Clear/Clear			Rte 24 S	Exit 18B on Rte 24 S		Rte 24 S
12/28/2004	12:00:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear			Rte 24	200 feet N from Exit 18A on Rte 24		Rte 24
1/5/2005	3:53:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Snow				1000 feet N from Exit 18B on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S
1/10/2005	9:32:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM RT 123 EB TO RT 24 NB. - RAMP-RT 123 EB TO RT 24 NB			RAMP-RT 123 EB TO RT 24 NB / Rte 24
1/12/2005	6:30:00 AM	(none injured)	2	0	0	Angle	Angle	Wet	Dawn	Snow/Rain				Exit 17B on Rte 24 S		Rte 24 S
1/14/2005	5:05:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Dawn	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)				Exit 18A on Rte 24 S		Rte 24 S
1/19/2005	3:50:00 PM	(none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S
1/20/2005	9:00:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear						Rte 24 N
1/22/2005	7:00:00 PM	(none injured)	2	0	0	Angle	Angle	Snow	Dark - lighted roadway	Snow						Rte 24 S
		Property damage only											NORTH OF EXIT FOR 123 WB. - AMVETS MEMORIAL HIGHWAY Rte			
1/23/2005	3:10:00 PM	(none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow/Cloudy			24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 123 WB
1/25/2005	7:15:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				40 feet N from Exit 17A on Rte 24 S		Rte 24 S
1/26/2005	3:00:00 PM	(none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Snow				Exit 17A on Rte 24		Rte 24
1/28/2005	3:15:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 18 on Rte 24S		Rte 24S
1/30/2005	1:55:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 17B on Rte 24 S		Rte 24 S
1/30/2005	10:00:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark -roadway not lighted	Cloudy/Cloudy				Exit 17B on Rte 24 N		Rte 24 N
1/30/2005	10:55:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear						Rte 24 N
2/12/2005	1:45:00 AM	(none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 / Rte 27
2/12/2005	12:30:00 PM	(none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24
2/13/2005	8:40:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear			ROUTE 106 - Rte 24 N			2640 feet N from Intersection Rte 24 N
2/14/2005	7:20:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
2/18/2005	9:35:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear/Clear			SOUTH OF ROUTE 27 - Rte 24 N			Rte 24 N / Rte 27
2/21/2005	8:20:00 AM	(none injured)	2	0	0	Angle	Angle	Wet	Daylight	Snow/Snow			AT RT 123 - Rte 24 N			Rte 24 N / Rte 123
2/23/2005	8:00:00 AM	(none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 27 on Rte 24		Rte 24
3/9/2005	7:40:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Slush	Daylight	Clear/Blowing sand, snow				Exit 18A on Rte 24 S		Rte 24 S
3/9/2005	11:00:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear						Rte 24 N / Rte 27
3/10/2005	3:42:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
3/10/2005	3:45:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
3/11/2005	3:50:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Snow			1/2 MILE NORTH OF ROUTE 27 - Rte 24 S			2640 feet N from Intersection Rte 24 S / Rte 27
3/17/2005	3:45:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 17A on Rte 24 S		Rte 24 S
3/19/2005	2:30:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
3/25/2005	3:45:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear				500 feet N from Exit 18A on Rte 24 N		Rte 24 N
4/2/2005	5:15:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Rain				Exit 17A on Rte 24 S		Rte 24 S
4/2/2005	11:36:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 18A on Rte 24 S		Rte 24 S
4/4/2005	10:15:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
4/14/2005	4:15:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 19 on Rte 24		Rte 24
4/21/2005	2:00:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S / Rte 24
4/23/2005	10:10:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17A on Rte 24		Rte 24
4/24/2005	5:40:00 AM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						OAK STREET / Rte 24
4/28/2005	7:55:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Rain				Exit 17B on Rte 24 N		Rte 24 N
4/29/2005	1:00:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear				2640 feet N from Exit 17B on Rte 24 S		Rte 24 S
5/1/2005	9:40:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				Exit 18A on Rte 24 S		Rte 24 S
5/3/2005	6:54:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 17A on Rte 24 N		Rte 24 N
5/11/2005	4:40:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
5/12/2005	11:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	RAMP-RT 123 EB TO RT 24 NB Rte 24					123 BELMONT STREET

BROCKTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
5/19/2005	6:40:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				Exit 18A on Rte 24 N		Rte 24 N
5/27/2006	1:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	RAMP-RT 24 NB TO RT 27 NB	REYNOLDS HIGHWAY Rte 27 N				
9/29/2005	10:15:00 PM	(none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 24 N
6/3/2005	8:53:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S
6/4/2005	5:50:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear				Exit 17B on Rte 24 N		Rte 24 N
6/4/2005	11:10:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
6/13/2005	10:55:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear						Rte 24 N
6/22/2005	11:00:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark	Clear/Clear				Exit 18A on Rte 24 N		Rte 24 N
6/23/2005	4:30:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					Rte 24 Milemarker 75.0	Rte 24
6/25/2005	12:00:00 AM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 24 S
7/6/2005	5:45:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 16 on Rte 24		Rte 24 N
7/11/2005	1:45:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 24
7/22/2005	11:10:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 17A on Rte 24 N		Rte 24 N
7/29/2005	11:25:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 18A on Rte 24 S		RAMP - RT 24 SB TO RT 123 WB Rte 24 S
7/31/2005	3:03:00 AM	(none injured)	2	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Cloudy/Cloudy				1500 feet N from Exit 18B on Rte 24 S		Rte 24 S
8/3/2005	8:30:00 AM	(none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Clear	Rte 24	Rte 23 / Rte 24				
8/18/2005	11:00:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear						Rte 27 / Rte 24
8/26/2005	12:06:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
8/28/2005	2:55:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear/Cloudy				Exit 19 on Rte 24		Rte 24 N
8/29/2005	5:42:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Cloudy/Rain				Exit 18A on Rte 24 N		Rte 24 N
8/30/2005	9:42:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			AT RT 123. - Rte 24 N			Rte 24 N / Rte 123
9/6/2005	7:30:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear						Rte 24 N
9/7/2005	7:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17A on Rte 24 N		Rte 24 N / BELMONT STREET
9/10/2005	7:45:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear				100 feet N from Exit 17A on Rte 24		BROCKTON AVENUE Rte 24
9/12/2005	7:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						400 feet S from Intersection Rte 24 N / Rte 123
9/15/2005	4:45:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Cloudy				Exit 17A on Rte 24		Rte 24 / Rte 24
9/25/2005	3:00:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear				Exit 17A on Rte 24 S		Rte 24 S / Rte 123
10/3/2005	5:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 17B on Rte 24 S		Rte 24 S
10/4/2005	3:25:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S
10/4/2005	6:00:00 PM	(none injured)	3	0	0	Not reported	Not reported	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24
10/9/2005	1:40:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -roadway not lighted	Rain/Rain				Exit 17A on Rte 24 N		Rte 24 N
10/9/2005	2:26:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -unknown roadway lighting	Rain/Rain				Exit 18B on Rte 24 S		Rte 24 S
10/21/2005	11:45:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						BELMONT STREET / RAMP-RT 24 NB TO RT 123 EB
10/27/2005	2:43:00 PM	(none injured)	2	0	0	Rear-to-rear	Rear-to-rear	Dry	Daylight	Clear						BELMONT STREET Rte 123 E / Rte 24
10/27/2005	6:45:00 AM	(none injured)	2	0	0	Not reported	Not reported	Dry	Not reported	Clear				Exit 18A on Rte 24 N		Rte 24 N
10/27/2005	12:21:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17B on Rte 24		Rte 24 / BELMONT STREET
11/10/2005	7:20:00 AM	(none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain				Exit 17A on Rte 24 S		Rte 24 S
11/15/2005	11:30:00 AM	(none injured)	1	0	0	Head-on	Head-on	Dry	Daylight	Cloudy						500 feet S from Intersection Rte 24 S / Rte 123
11/17/2005	6:03:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain				Exit 18A on Rte 24 N		Rte 24 N
11/22/2005	4:30:00 PM	(none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Cloudy/Rain						Rte 24 S
11/22/2005	8:10:00 PM	(none injured)	2	0	0	Angle	Angle	Wet	Dark -roadway not lighted	Rain/Rain				Exit 18B on Rte 24 N		Rte 24 N
11/23/2005	2:40:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Snow				Exit 18A on Rte 24		REYNOLDS HIGHWAY Rte 24
11/30/2005	2:20:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Cloudy/Rain				Exit 17A on Rte 24 S		Rte 24 S
12/5/2005	3:30:00 PM	(none injured)	2	0	0	Angle	Angle	Ice	Daylight	Cloudy				Exit 17A on Rte 24		Rte 24
12/8/2005	12:02:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
12/9/2005	1:20:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Blowing sand, snow						Rte 24 N / RAMP - RT 24 NB TO RT 27 SB
12/9/2005	2:20:00 PM	(none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow/Blowing sand, snow			AT MERGE OF RAMP FROM RTE 123 WB - Rte 24 S	Exit 17B on Rte 24 S		Rte 24 S
12/11/2005	9:05:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S
12/14/2005	10:25:00 AM	(none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 17A on Rte 24 N		Rte 24 N
12/18/2005	9:10:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Cloudy/Cloudy			ON RAMP TO ROUTE 24 NORTH - Rte 123 E			Rte 123 E
12/23/2005	7:20:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
12/29/2005	5:55:00 PM	(none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark- lighted roadway	Clear						123 BELMONT STREET / Rte 24
1/4/2006	11:40:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S / Rte 24
1/21/2006	6:50:00 PM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear				Exit 18A on Rte 24		Rte 24
1/25/2006	3:10:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 feet S from Exit 18B on Rte 24 S		Rte 24 S
1/26/2006	5:10:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- lighted roadway	Clear			100 feet S from ROUTE 24			100 feet S from Intersection BELMONT STREET Rte 123 E / Rte 24
2/2/2006	12:00:00 PM	(none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 S		Rte 24 S
2/9/2006	6:25:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -roadway not lighted	Clear/Clear						Rte 24 S / Rte 123
2/13/2006	10:37:00 PM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark -roadway not lighted	Snow/Snow				Exit 18B on Rte 24 S		Rte 24 S
2/22/2006	4:45:00 PM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 24 / Rte 123
2/23/2006	8:25:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
3/1/2006	2:20:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / Rte 27
3/7/2006	12:03:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 feet S from Exit 17A on Rte 24 S	100 feet S from Rte 24 S Milemarker 25.0	Rte 24 S
3/8/2006	8:57:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			24 N OFF-RAMP TO 123 W	Exit 17B on Rte 24 N		Rte 24 N / Rte 123
3/13/2006	6:25:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear					Rte 24 S Milemarker 30.5	Rte 24 S
3/20/2006	3:41:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
3/23/2006	1:00:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
3/24/2006	9:44:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				250 feet N from Exit 17B on Rte 24 N		Rte 24 N
3/24/2006	10:40:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear				Exit 18A on Rte 24		Rte 24
3/30/2006	5:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			NEAR WESTGATE MALL			1500 feet E from Intersection 535 WESTGATE DRIVE / Rte 24
4/4/2006	3:00:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 123 EB TO RT 24 NB
4/8/2006	10:00:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
4/10/2006	6:15:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						200 feet S from Intersection Rte 24 N / Rte 123
4/22/2006	4:50:00 AM	(none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear				Exit 18A on Rte 24 N		Rte 24 N
4/24/2006	4:20:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Clear						BELMONT STREET Rte 24 / Rte 24
4/25/2006	8:15:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N
4/28/2006	1:05:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 17A on Rte 24 S		Rte 24 S
4/28/2006	9:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear						BELMONT STREET / Rte 24
5/2/2006	10:05:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 18A on Rte 24 N		Rte 24 N
5/12/2006	11:46:00 PM	(none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark- lighted roadway	Rain						1000 feet E from Intersection 700 OAK STREET Rte 24 / Rte 24
5/18/2006	2:10:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17A on Rte 24 N		BELMONT STREET Rte 24 N
5/19/2006	6:49:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain				200 feet S from Exit 17B on Rte 24 S		Rte 24 S
5/30/2006	8:20:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18A on Rte 24 N		Rte 24 N
6/20/2006	6:45:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 feet S from Exit 17A on Rte 24		Rte 24 / Rte 123
6/23/2006	10:15:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- lighted roadway	Cloudy				Exit 17A on Rte 24		REYNOLDS HIGHWAY Rte 24 / WEST STREET
7/10/2006	2:05:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear/Clear				Exit 17B on Rte 24 S		Rte 24 S
7/11/2006	4:06:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP TO ROUTE 123 EAST			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 24 NB TO RT 123 EB
7/14/2006	1:05:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				1000 feet S from Exit 18A on Rte 24 S		Rte 24 S
7/15/2006	9:25:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear			RAMP TO ROUTE 24 NORTH			Rte 27 E / Rte 24
7/17/2006	6:10:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP-RT 27 NB TO RT 24 NB Rte 27 / Rte 24
7/23/2006	12:00:00 AM	(none injured)	2	0	0	Angle	Angle	Dry	Dark -roadway not lighted	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
7/28/2006	5:22:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 18B on Rte 24 S		Rte 24 S
7/28/2006	11:50:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear				Exit 18B on Rte 24		Rte 24 / Rte 24
8/3/2006	4:20:00 AM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						300 feet N from Intersection Rte 24 S / Rte 123
8/3/2006	10:30:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear						Rte 24 / Rte 123
8/12/2006	1:56:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				0 feet S from Exit 17B on Rte 24 S		Rte 24 S
8/15/2006	12:30:00 PM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 18A on Rte 24 S		Rte 24 S
8/31/2006	5:45:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	BELMONT STREET Rte 123 E	Rte 24 N / RAMP-RT 123 EB TO RT 24 NB				
9/12/2006	10:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S / Rte 123
9/24/2006	12:15:00 PM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						100 feet E from Intersection REYNOLDS HIGHWAY / Rte 24
9/26/2006	10:35:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S
		Property damage only												Exit 17B on Rte 24 S		
10/2/2006	6:00:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Clear				Exit 18A on Rte 24 N		Rte 24 N
		Property damage only										BELMONT STREET / RAMP-RT 123 EB				
10/3/2006	8:36:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	TO RT 24 NB				
10/6/2006	1:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						BELMONT STREET / Rte 24
10/12/2006	8:40:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark -roadway not lighted	Clear/Clear				Exit 18A on Rte 24 S		Rte 24 S
10/15/2006	3:00:00 PM	(none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18A on Rte 24		Rte 24
10/18/2006	1:20:00 PM	(none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy						BELMONT STREET / RAMP-RT 123 EB TO RT 24 NB Rte 24
10/18/2006	9:00:00 AM	(none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						BELMONT STREET Rte 123 E / RAMP-RT 123 EB TO RT 24 NB Rte 24
10/20/2006	1:30:00 AM	(none injured)	2	0	0	Rear-end	Rear-end	Wet	Other	Clear				Exit 17B on Rte 24		Rte 24
10/24/2006	5:30:00 PM	(none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 123 / Rte 24
10/26/2006	8:25:00 PM	(none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark -roadway not lighted	Clear/Clear			RTE 24 OFF RAMP			RAMP-RT 24 NB TO RT 27 NB / Rte 27
11/6/2006	4:30:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Clear						Rte 24
11/28/2006	9:39:00 PM	(none injured)	4	0	0	Angle	Angle	Wet	Dark -roadway not lighted	Rain				75 feet W from Exit 17B on Rte 24		Rte 24
12/4/2006	9:22:00 AM	(none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear						Rte 24 N
12/4/2006	10:00:00 AM	(none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N / Rte 123
12/4/2006	10:00:00 AM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Snow				2000 feet N from Exit 18B on Rte 24 N		Rte 24 N
12/30/2006	5:30:00 PM	(none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark -unknown roadway lighting	Clear				Exit 18B on Rte 24 S		Rte 24 S
8/29/2004	12:30:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark -roadway not lighted	Cloudy/Cloudy			Rte 24	Exit 18B on Rte 24		Rte 24
11/13/2004	5:00:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Dark- lighted roadway	Clear			WESTGATE MALL ENTRANCE - REYNOLDS HIGHWAY Rte 27			REYNOLDS HIGHWAY Rte 27 / RAMP-RT 24 NB TO RT 27 NB
5/11/2005	12:37:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 N	BELMONT STREET Rte 123 E				
5/21/2005	6:41:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17B on Rte 24 N		Rte 24 N
2/2/2006	12:00:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- lighted roadway	Clear/Clear				Exit 18B on Rte 24 N		Rte 24 N
5/18/2006	1:30:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17B on Rte 24		Rte 24 / Rte 24

CANTON	1/1/2004	12/31/2006	similar to: rte 24 route 24												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Object_hit	Collision_with	Road_Surface	Lighting	Weather	Street	Address/Landmark	Exit Distance	Feet_From
8/16/2004	4:34:00 AM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy		Rte 24 S		Rte 24 S
3/8/2006	6:15:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				35 SHAWMUT ROAD Rte 1 / DEDHAM STREET Rte 24
3/21/2006	8:43:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 N
7/26/2006	5:38:00 PM	Non-fatal injury	1	1	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear				Rte 24 N
8/10/2006	4:25:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear				Rte 1 / Rte 24
9/15/2006	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear				Rte 24
11/1/2006	3:55:00 PM	Non-fatal injury	2	1	0	Rear-end		Rear-end	Dry	Daylight	Clear				WASHINGTON STREET Rte 24 / NEPONSET STREET
2/9/2004	3:30:00 PM	Not Reported	2	0	0	Not reported		Not reported	Dry	Daylight	Clear		Rte 24		Rte 24
2/3/2006	11:35:00 AM	Not Reported	2	0	0	Not reported		Not reported	Dry	Dark - lighted roadway	Clear			Exit 20A on Rte 24	Rte 24
4/29/2006	2:20:00 PM	Not Reported	1	0	0	Not reported		Not reported	Wet	Daylight	Clear			Exit 19A on Rte 24	Rte 24 N
5/17/2004	8:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction		Sideswipe, same direction	Dry	Daylight	Clear/Clear		RTE 139 - Rte 24 N		Rte 24 N
8/8/2004	12:40:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear		Rte 24 S	Exit 20A on Rte 24	Rte 24 S
10/12/2004	1:30:00 PM	Property damage only (none injured)	5	0	0	Rear-end		Rear-end	Wet	Daylight	Rain/Cloudy		Rte 93 N		1000 feet S from Intersection Rte 93 N / Rte 24
10/20/2004	9:10:00 AM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear		ONE HALF MILE BEFORE THE 95 SPLI - Rte 24 N		Rte 24 N
12/9/2004	5:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Dark - roadway not lighted	Clear		EXIT FOR 27 RT AND JORDAN STORE - Rte 24 N		Rte 24 N
12/23/2004	4:42:00 PM	Property damage only (none injured)	3	0	0	Rear-end		Rear-end	Wet	Dark - roadway not lighted	Rain/Cloudy		SOUTH OF THE HORSE BRIDGE - Rte 24 S		Rte 24 S
8/5/2005	3:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Cloudy		APPROX 1/2 MILE NORTH OF RTE 139 - Rte 24 S		Rte 24 S
10/3/2005	4:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Dry	Not reported	Not Reported				Rte 24
10/9/2005	8:43:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash		Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain				Rte 24 N
2/26/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash		Single vehicle crash	Dry	Daylight	Clear			15 feet S from Exit 20A on Rte 24	Rte 24 S
11/1/2006	6:19:00 AM	Property damage only (none injured)	2	0	0	Rear-end		Rear-end	Wet	Daylight	Rain				RAMP-RT 93 SB TO RT 95 SB Rte 24 / CROSS STREET Rte 1A
12/16/2006	4:10:00 PM	Property damage only (none injured)	2	0	0	Angle		Angle	Dry	Daylight	Clear		HALF MILE PRIOR TO ROUTE 139		Rte 24 N / Rte 139
12/22/2006	6:10:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash		Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Rte 24 S
4/1/2005	12:20:00 PM	Unknown	2	0	0	Rear-end		Rear-end	Dry	Daylight	Clear	Rte 24			

FALL RIVER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
3/14/2004	6:04:00 PM	Fatal injury	1	2	2	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			BETWEEN EXIT S 7 AND 8 - Rte 24 S		Rte 24 S Milemarker 7.7	Rte 24 S
7/2/2005	7:30:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						INTERSTATE 195 Rte 24 S / RAMP-RT 24 SB TO RT 195 EB
8/12/2005	12:00:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	Rte 24	Rte 195				
10/25/2005	11:10:00 PM	Fatal injury	1	0	1	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 8 on Rte 24 S		Rte 24 S
11/4/2006	6:46:00 AM	Fatal injury	1	1	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 5 on Rte 24 S		Rte 24 S
11/11/2006	12:00:00 AM	Fatal injury	1	1	1	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S / Rte 195
1/2/2004	10:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Snow	Daylight	Snow			RAMP-RT 24 NB TO BRAYTON AVE			RAMP-RT 24 NB TO BRAYTON AVE
1/16/2004	3:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear			Rte 24 S	2500 feet S from Exit 5 on Rte 24 S		Rte 24 S
1/20/2004	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			PRESIDENT AVENUE Rte 24			PRESIDENT AVENUE Rte 24
1/21/2004	7:40:00 AM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			ROUTE 24 Rte 24 S			500 feet N from Intersection ROUTE 24 Rte 24 S / JEFFERSON STREET
1/22/2004	5:15:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear			Rte 24 S		Rte 24 S Milemarker 5.9	Rte 24 S
1/28/2004	11:20:00 AM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizz			400 feet N from AIRPORT ROAD - Rte 24 N			Rte 24 N
1/31/2004	8:15:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			ON BRAGA BRIDGE - Rte 195 W			Rte 195 W / Rte 24
2/5/2004	3:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24	Exit 8B on Rte 24		Rte 24
2/5/2004	6:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 N	Rte 195 W				
2/6/2004	1:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Sleet, hail (freezing rain or drizzle)			Rte 24	1000 feet N from Exit 8 on Rte 24		Rte 24
2/7/2004	7:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24		Rte 24 Milemarker 8.3	Rte 24
2/7/2004	12:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S		75 feet N from Rte 24 S Milemarker 6.6	Rte 24 S
2/19/2004	7:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear			Rte 24	Exit 5 on Rte 24		Rte 24
2/28/2004	8:31:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Dark - roadway not lighted	Clear	ROUTE 24 S HIGHWAY Rte 24 S	FISH ROAD EXT				
3/4/2004	3:52:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Cloudy			30 feet N from RT 24N OFF RAMP - BRAYTON AVENUE			BRAYTON AVENUE
3/15/2004	3:30:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S		Rte 24 S Milemarker 5.0	Rte 24 S
3/24/2004	11:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			JUST PRIOR TO THE RTE. 195 SPLIT - Rte 24 S			Rte 24 S / Rte 195
3/27/2004	3:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Rain/Cloudy			RTE 195 EB & WB RAMPS - Rte 24 N			Rte 24 N / Rte 195
3/31/2004	2:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain			Rte 24	Exit 8 on Rte 24		Rte 24
4/10/2004	4:30:00 AM	Non-fatal injury	3	2	0	Head-on	Head-on	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N			Rte 24 N / AIRPORT ROAD
4/13/2004	1:04:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N		100 feet N from Rte 24 N Milemarker 8.1	Rte 24 N
4/13/2004	1:08:00 PM	Non-fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N		100 feet N from Rte 24 N Milemarker 8.1	Rte 24 N
4/14/2004	8:42:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 S		20 feet N from Rte 24 S Milemarker 7.6	Rte 24 S
4/25/2004	10:32:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N		Rte 24 N Milemarker 7.6	Rte 24 N
4/30/2004	4:40:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N			Rte 24 N
5/1/2004	3:00:00 PM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	Rte 24 N	Rte 195 W				
5/1/2004	6:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			RAMP-RT 195 EB TO RT 24 NB Rte 24 S		100 feet S from Rte 24 S Milemarker 2.8	RAMP-RT 195 EB TO RT 24 NB Rte 24 S / INTERSTATE 195
5/3/2004	4:34:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	1000 feet S from Exit 6 on Rte 24 S		Rte 24 S
5/9/2004	11:00:00 AM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Cloudy/Rain			SOUTH OF EXIT 5 - Rte 24 S		Rte 24 S Milemarker 3.5	Rte 24 S
5/22/2004	9:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Other			BRAYTON AVENUE Rte 24			BRAYTON AVENUE Rte 24 / Rte 24 N
5/27/2004	2:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N		100 feet N from Rte 24 N Milemarker 5.0	Rte 24 N
6/12/2004	9:53:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S		200 feet N from Rte 24 Milemarker 34.0	Rte 24 S
6/22/2004	5:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RAMP-RT 195 WB TO RT 24 SB			RAMP-RT 195 WB TO RT 24 SB / Rte 195
6/24/2004	3:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24	Exit 4 on Rte 24		Rte 24 / Rte 195
7/1/2004	8:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RT 24 NB NORTH OF EXIT 2 - RAMP-RT 24 NB TO BRAYTON AVE			RAMP-RT 24 NB TO BRAYTON AVE / Rte 24
7/3/2004	11:15:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N		Rte 24 N Milemarker 1.3	Rte 24 N
7/20/2004	1:45:00 PM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear/Clear			RAMP - RT 195 NB TO RT 24 SB			RAMP - RT 195 NB TO RT 24 SB / Rte 24
8/1/2004	4:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 24 N	0 feet N from Exit 5 on Rte 24		Rte 24 N
8/1/2004	11:57:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N
8/4/2004	11:25:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			INTERSTATE 195 Rte 195 W			INTERSTATE 195 Rte 195 W / RAMP-RT 24 SB TO RT 195 WB
8/18/2004	6:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 195 E		Rte 195 E Milemarker 14.9	Rte 195 E / RAMP - RT 24 SB TO RT 195 EB Rte 24
8/23/2004	11:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N
8/29/2004	12:48:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N
9/8/2004	12:11:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			, END OF RAMP FROM PRESIDENT AVE - Rte 24 S			Rte 24 S / PRESIDENT AVENUE
9/10/2004	12:43:00 AM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N			Rte 24 N
9/18/2004	12:57:00 PM	Non-fatal injury	1	5	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			Rte 24 N		300 feet S from Rte 24 N Milemarker 8.2	Rte 24 N
9/28/2004	2:45:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 24 N			Rte 24 N
10/7/2004	1:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			THE EXTENSION, AT EXIT 1 - Rte 24 N			Rte 24 N
10/14/2004	12:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N			Rte 24 N / RAMP - RT 24 NB TO RT 195 EB
10/20/2004	6:48:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N / RAMP-RT 24 NB TO BRAYTON AVE
11/3/2004	7:47:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			200 ROUTE 24			10 feet N from Intersection 200 ROUTE 24 / BRAYTON AVENUE
11/10/2004	9:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24	Exit 4 on Rte 24		Rte 24
11/13/2004	1:10:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 24	Rte 81				
11/13/2004	10:30:00 AM	Non-fatal injury	2	2	0	Not reported	Not reported	Snow	Daylight	Snow			SPLIT - ROUTE 24			ROUTE 24 / Rte 195
11/16/2004	2:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N / AIRPORT ROAD
11/18/2004	2:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S		200 feet S from Rte 24 S Milemarker 8.1	Rte 24 S
11/28/2004	4:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			Rte 24 N	300 feet N from Exit 8 on Rte 24		Rte 24 N
12/1/2004	11:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N		50 feet N from Rte 24 N Milemarker 8.1	Rte 24 N
12/6/2004	3:43:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			855 BRAYTON AVENUE			80 feet E from Intersection 855 BRAYTON AVENUE / Rte 24
12/15/2004	8:20:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N / RAMP-HIGHLAND AVE TO RT 24 NB
1/16/2005	5:45:00 PM	Non-fatal injury	1	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 2 on Rte 24 S		Rte 24 S / RAMP - RT 24 SB TO BRAYTON AVE
1/21/2005	3:05:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			@ RTE 195 - Rte 24 S			Rte 24 S / Rte 195
1/28/2005	4:35:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						1000 feet S from Intersection DAVOL STREET EAST Rte 24 / BRIGHTMAN STREET Rte 24 S
1/28/2005	11:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 195 W / Rte 24
2/6/2005	10:30:00 PM	Non-fatal injury	1	1	0	Angle	Angle	Ice	Dark - roadway not lighted	Cloudy/Snow						MERIDIAN STREET Rte 24 / Rte 24
2/8/2005	6:35:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
2/9/2005	4:30:00 PM	Non-fatal injury	1	1	0	Rear-end	Rear-end	Dry	Daylight	Dusk						Rte 24 / Rte 81
2/9/2005	7:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S
2/10/2005	9:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 24 / Rte 195
2/11/2005	3:15:00 PM	Non-fatal injury	3	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Clear/Clear				30 feet N from Exit 2 on Rte 24		Rte 24 N
2/22/2005	2:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				Exit 8 on Rte 24		Rte 24
2/22/2005	5:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 24 N Milemarker 1.0	Rte 24 N
3/8/2005	1:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					200 feet N from Rte 24 N Milemarker 8.1	Rte 24 N
3/9/2005	6:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 195 Rte 195 E / RAMP-RT 195 EB TO RT 24 NB
3/12/2005	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow						100 Rte 24 S / Rte 24
4/7/2005	3:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	Rte 81				
4/25/2005	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy						PRESIDENT AVENUE ROTARY / Rte 24
5/30/2005	7:02:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						BRAYTON AVENUE Rte 24 / Rte 24
6/4/2005	12:15:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					100 feet N from Rte 24 S Milemarker 2.9	Rte 24 S
6/8/2005	2:43:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy			AIRPORT RD. OVERPASS - Rte 24 N			Rte 24 N
6/21/2005	1:35:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			FREETOWN LINE - Rte 24 S			Rte 24 S
7/2/2005	4:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy					Rte 24 N Milemarker 1.0	Rte 24 N
7/9/2005	8:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain				500 feet N from Exit 5 on Rte 24		Rte 24 N
7/28/2005	12:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 24 S Milemarker 7.8	Rte 24 S
8/12/2005	11:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 1B on Rte 24		Rte 24 N
8/13/2005	12:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S / Rte 195
8/18/2005	1:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				250 feet W from Exit 8A on Rte 195		Rte 195 / Rte 24
8/19/2005	1:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 195 W / RAMP - RT 195 EB TO RT 24 NB
8/24/2005	8:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					150 feet N from Rte 24 S Milemarker 3.0	Rte 24 S
9/4/2005	11:00:00 PM	Non-fatal injury	1	4	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear						450 feet N from Intersection Rte 24 S / Rte 79
9/5/2005	9:25:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			FREETOWN/FALL RIVER LINE - Rte 24 S			Rte 24 S
9/6/2005	12:47:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 4 on Rte 24 S		Rte 24 S
9/10/2005	3:35:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
9/17/2005	4:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Fog, smog, smoke			24 SOUTH AT 195 SPLITS - Rte 24 S			Rte 24 S / Rte 195
9/17/2005	12:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy						1320 feet S from Intersection Rte 24 N / BRAYTON AVENUE
9/25/2005	3:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				7920 feet N from Exit 8 on Rte 24 S		Rte 24 S
9/25/2005	5:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						100 feet W from Intersection Rte 24 N / Rte 195
11/9/2005	7:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						250 feet S from Intersection ROUTE 24 Rte 79 N / WILSON ROAD
11/10/2005	12:01:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain			EXTENSION - Rte 195 E			Rte 195 E / Rte 24
11/14/2005	1:02:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
11/16/2005	12:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
12/16/2005	10:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain					100 feet N from Rte 24 N Milemarker 7.7	Rte 24 N
12/16/2005	10:50:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Snow	Daylight	Cloudy/Snow						Rte 24 N
1/3/2006	10:20:00 AM	Non-fatal injury	1	0	0	Not reported	Not reported	Wet	Daylight	Rain	Rte 24	Rte 81				
1/17/2006	2:59:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						280 feet W from Intersection RT 24 SB RAMP 195 WB Rte 24 S / INTERSTATE 195 Rte 195 W
1/19/2006	2:20:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			FALL RIVER			Rte 24 S
1/22/2006	4:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Exit 5 on Rte 24 S		Rte 24 S
2/7/2006	6:36:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			ON RAMP			BRAYTON AVENUE Rte 24 W / Rte 24
2/18/2006	2:07:00 AM	Non-fatal injury	1	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 8 on Rte 24		Rte 24
2/20/2006	2:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S / Rte 195
2/20/2006	10:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 5 on Rte 24 S		Rte 24 S
3/2/2006	10:40:00 PM	Non-fatal injury	4	2	0	Angle	Angle	Snow	Dark - lighted roadway	Snow/Cloudy				Exit 5 on Rte 24 S		Rte 24 S
3/4/2006	5:10:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
3/5/2006	2:55:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						0 feet E from Intersection Rte 24 S / RAMP - RT 24 SB TO RT 195 WB Rte 195 E
3/30/2006	4:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 2 on Rte 24 S		BRAYTON AVENUE Rte 24 S
4/1/2006	11:32:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
4/13/2006	8:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy					Rte 24 N Milemarker 4.9	Rte 24 N
4/14/2006	12:00:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			HIGHWAY SIGN FOR EXIT 1B	Exit 1B on Rte 24 S		Rte 24 S
4/24/2006	3:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 24 S		AIRPORT ROAD Rte 24 S
4/29/2006	8:53:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				5280 feet N from Exit 8 on Rte 24		Rte 24
5/3/2006	8:35:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain						Rte 195 E / RAMP - RT 24 NB TO RT 195 EB
5/4/2006	7:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear					100 feet S from Rte 24 N Milemarker 5.7	Rte 24 N
5/14/2006	10:43:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Not reported	Cloudy/Rain			RAMP TO 195 EAST			INTERSTATE 195 Rte 24 N / RAMP-RT 24 NB TO RT 195 EB
5/19/2006	3:04:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear			HEADING NORTH	500 feet S from Exit 8 on Rte 24		Rte 24
5/26/2006	6:05:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			ON THE RAMP FROM RT 24 N. TO RT			INTERSTATE 195 Rte 24 / RAMP-RT 24 NB TO RT 195 WB
5/26/2006	6:36:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			JUST NORTH OF EXIT#2	Exit 2 on Rte 24		Rte 24
6/4/2006	2:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S
6/11/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 N
6/17/2006	11:14:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						200 ROUTE 24
6/19/2006	6:59:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						BRAYTON AVENUE Rte 138 / ROUTE 24 Rte 138
7/8/2006	9:30:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 24 N / BRAYTON AVENUE
7/30/2006	4:00:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Not reported	Clear				Exit 8 on Rte 24		Rte 24
8/6/2006	5:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM ROUTE 81 TO 24 NORTH			Rte 24 N
8/11/2006	5:23:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			JUST WEST OF 24 NORTH			Rte 195 E / Rte 24
8/25/2006	6:10:00 PM	Non-fatal injury	2	3	0	Head-on	Head-on	Wet	Daylight	Rain/Cloudy						PRESIDENT AVENUE ROTARY Rte 24 N
8/27/2006	6:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain/Cloudy						Rte 24 N
9/1/2006	12:00:00 AM	Non-f

FALL RIVER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
10/16/2006	4:25:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 24		Rte 24
10/17/2006	3:30:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						Rte 24 N
10/21/2006	7:28:00 PM	Non-fatal injury	1	1	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear						Rte 24 / PRESIDENT AVENUE
10/21/2006	8:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						PRESIDENT AVENUE Rte 24 S
10/24/2006	4:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 195 / Rte 24
10/25/2006	7:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			RAMP TO PRES. AVE.			Rte 24 N
11/13/2006	7:48:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear						WILLIAM S. CANNING BOULEVARD Rte 81 N / RAMP RT 24 SB TO RT 81 NB
11/15/2006	2:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
11/17/2006	8:02:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			RAMP FROM RTE 24 SB TO RTEC195			20 feet E from Intersection INTERSTATE 195 Rte 195 E / RAMP-RT 24 SB TO RT 195 EB
11/19/2006	4:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			AT RTE 195 INTERCHANGE			INTERSTATE 195 Rte 24 S / RAMP-RT 24 SB TO RT 195 EB
11/21/2006	4:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 6 on Rte 24 S		ROUTE 24 Rte 24 S / WILSON ROAD
11/23/2006	6:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain						INTERSTATE 195 Rte 195 W / RAMP-RT 24 NB TO RT 195 WB
11/30/2006	6:04:00 AM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear			BETWEEN THE ROUTE 24 RAMPS (EXIT			Rte 195 W / RAMP-RT 195 WB TO RT 24 NB
12/1/2006	12:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			40 feet S from RT 24 S ON RAMP			BRAYTON AVENUE / RAMP-BRAYTON AVE TO RT 24 SB
12/16/2006	3:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24
4/28/2004	7:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			AIRPORT ROAD Rte 24			AIRPORT ROAD Rte 24
10/21/2004	2:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N
11/12/2004	3:05:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 24			Rte 24
2/2/2005	10:35:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Dark - roadway not lighted	Clear/Clear				60 feet E	from Exit 8 on Rte 24 S	Rte 24 S
2/25/2005	4:20:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 24 / Rte 79
1/3/2006	9:15:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Snow				500 feet N	from Exit 8 on Rte 79 N	Rte 79 N / Rte 24
1/4/2006	11:15:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S
1/30/2006	5:05:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Rain	Rte 24	Rte 79				
9/5/2006	4:10:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 7 on Rte 24		Rte 24
1/15/2004	1:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear			SPLIT TO RTE 195 E - Rte 24 N			Rte 24 N
1/18/2004	2:19:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Cloudy/Snow			RTE. 24 SOUTH/NORTH OF PRESIDENT - Rte 24		Rte 24 Milemarker 6.2	Rte 24
1/18/2004	7:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow			ROUTE 24 Rte 24 S	1320 feet S	from Exit 4 on Rte 24 S	ROUTE 24 Rte 24 S
1/22/2004	9:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S		Rte 24 S Milemarker 5.0	Rte 24 S
1/23/2004	10:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S		400 feet N from Rte 24 S Milemarker 2.9	Rte 24 S
1/27/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 5 on Rte 24		Rte 24
1/29/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Ice	Dark - roadway not lighted	Clear	RAMP-A/AIRPORT RD TO RT 24 NB	AIRPORT ROAD				
1/30/2004	6:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dawn	Clear	Rte 24 N	AIRPORT ROAD				
2/1/2004	10:15:00 PM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Dark - roadway not lighted	Clear	Rte 24 E					
2/2/2004	8:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N		300 feet S from Rte 24 N Milemarker 0.3	Rte 24 N
2/5/2004	2:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 S	1 feet S	from Exit 5 on Rte 24 S	Rte 24 S
2/6/2004	6:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Sleet, hail (freezing rain or drizz			Rte 24 E	100 feet N	from Exit 8B on Rte 24 E	Rte 24 E
2/13/2004	4:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 24 N					
2/25/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 24 S	2640 feet S	from Exit 6 on Rte 24 S	Rte 24 S
3/9/2004	7:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			END OF RAMP FROM RTE 24 NB TO RT - INTERSTATE 195 Rte 195 E			INTERSTATE 195 Rte 195 E / RAMP-RT 195 EB TO RT 24 NB
3/9/2004	10:25:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N			1000 feet N from Intersection Rte 24 N / Rte 81
3/15/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			INTERSTATE 195 Rte 24 N			INTERSTATE 195 Rte 24 N / RAMP-RT 195 EB TO RT 24 NB
3/16/2004	4:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Snow/Snow			Rte 24 S	2600 feet N	from Exit 5 on Rte 24 S	Rte 24 S
4/3/2004	2:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			100 feet S from FREETOWN LINE - ROUTE 24 Rte 24 S			ROUTE 24 Rte 24 S
4/4/2004	7:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			Rte 24 S	Exit 1B on	Rte 24 S	Rte 24 S
4/13/2004	6:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N			Rte 24 N
4/14/2004	12:44:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N		10 feet S from Rte 24 N Milemarker 5.8	Rte 24 N
4/15/2004	9:34:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 195 W			200 Rte 195 W / Rte 24
4/21/2004	11:52:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 24 N		Rte 24 N Milemarker 1.7	Rte 24 N
4/25/2004	6:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain			Rte 24 N			Rte 24 N
4/27/2004	6:48:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy			Rte 24 S	50 feet N	from Exit 7 on Rte 24 S	Rte 24 S
4/28/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			AIRPORT ROAD EXIT - Rte 24 N			Rte 24 N
5/3/2004	5:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 24 N					
5/4/2004	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP TO PRESIDENT AVE ROTARY - Rte 24 N			Rte 24 N
5/4/2004	7:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N / RAMP-BRAYTON AVE TO RT 24 NB
5/12/2004	1:20:00 AM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Dark - roadway not lighted	Clear			Rte 24 S	Exit 6 on	Rte 24 S	Rte 24 S
5/28/2004	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			1000 feet N from RTE 79 SPLIT - Rte 24 S			1000 feet N from Intersection Rte 24 S / Rte 79
5/28/2004	11:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain			500 feet N from AIRPORT ROAD EXIT - Rte 24 N			Rte 24 N
5/29/2004	1:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RT 24S ONRAMP - 900 BRAYTON AVENUE			900 BRAYTON AVENUE
6/1/2004	3:59:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S	1000 feet S	from Exit 2 on Rte 24 S	Rte 24 S
6/1/2004	10:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 S			25 feet W from Intersection Rte 24 S / RAMP - RT 24 SB TO RT 195 WB
6/4/2004	12:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear			Rte 24 S		100 feet N from Rte 24 S Milemarker 7.6	Rte 24 S
6/10/2004	8:22:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Cloudy/Rain			RAMP FROM RTE 195 WEST TO RTE 24 - Rte 195 W			Rte 195 W / Rte 24
6/28/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			RAMP-A/AIRPORT RD TO RT 24 SB			RAMP-A/AIRPORT RD TO RT 24 SB / Rte 24
6/29/2004	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP-RT 24 NB TO RT 195 WB			RAMP-RT 24 NB TO RT 195 WB / Rte 195
7/5/2004	7:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy			BRAYTON AVE. - ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N / RAMP-RT 24 NB TO BRAYTON AVE
7/13/2004	5:30:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain/Rain			Rte 24 S	Exit 5 on	Rte 24 S	Rte 24 S / PRESIDENT AVENUE
7/24/2004	5:46:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			EXIT 2 OFF RAMP - RAMP-RT 24 NB TO BRAYTON AVE			RAMP-RT 24 NB TO BRAYTON AVE / Rte 24
7/27/2004	6:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 4 on	Rte 24 S	Rte 24 S
7/28/2004	1:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy			INTERSTATE 195 Rte 195 E			INTERSTATE 195 Rte 195 E / RAMP-RT 195 EB TO RT 24 NB
8/1/2004	1:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N
8/19/2004	11:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			LANGLEY STREET Rte 24			LANGLEY STREET Rte 24 / HIGHLAND AVENUE Rte 24
8/20/2004	12:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N
8/21/2004	5:42:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Rain			Rte 24 N			Rte 24 N
8/21/2004	5:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain			Rte 24 S		Rte 24 S Milemarker 3.0	Rte 24 S
8/21/2004	6:44:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			200 ROUTE 24			200 ROUTE 24
9/1/2004	2:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM RTE 195 EAST TO RTE 24 - RAMP-RT 195 EB TO RT 24 NB			RAMP-RT 195 EB TO RT 24 NB / Rte 24
9/3/2004	9:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N
9/16/2004	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			1500 BRAYTON AVENUE			1500 BRAYTON AVENUE / Rte 24
9/16/2004	7:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RAMP-RT 6 TO RT 24 SB			RAMP-RT 6 TO RT 24 SB / Rte 24
9/16/2004	12:01:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy			BRAYTON AVENUE			BRAYTON AVENUE / RAMP-BRAYTON AVE TO RT 24 SB
9/18/2004	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			Rte 24 N		300 feet S from Rte 24 N Milemarker 8.2	Rte 24 N
9/24/2004	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N
9/25/2004	8:46:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			BETWEEN RAMP FROM RTE 24 SOUTH A - INTERSTATE 195 Rte 195 E			INTERSTATE 195 Rte 195 E / RAMP-RT 24 SB TO RT 195 EB
9/26/2004	7:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			1 PRESIDENT AVENUE ROTARY Rte 24			1 PRESIDENT AVENUE ROTARY Rte 24 / EASTERN AVENUE NORTH
9/30/2004	12:29:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Unknown	Clear/Clear			Rte 24 S		Rte 24 S Milemarker 7.9	Rte 24 S
10/3/2004	1:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			Rte 24 N		75 feet N from Rte 24 N Milemarker 4.7	Rte 24 N
10/6/2004	8:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N		50 feet S from Rte 24 Milemarker 11.5	Rte 24 N
10/14/2004	1:06:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			ON RAMP TO RTE 24 SB - RAMP-RT 6 TO RT 24 SB			RAMP-RT 6 TO RT 24 SB / Rte 24
10/14/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 24 N			Rte 24 N / Rte 95
10/14/2004	12:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 24 N			Rte 24 N
10/16/2004	4:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			Rte 24 N			Rte 24 N
10/17/2004	12:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain			Rte 24 N			Rte 24 N
10/30/2004	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			RAMP -RT 24 NB TO RT 195 WB			RAMP -RT 24 NB TO RT 195 WB / Rte 195
11/5/2004	6:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ROUTE 24 Rte 24 S			ROUTE 24 Rte 24 S / RAMP-RT 24 SB TO BRAYTON AVE
11/10/2004	2:27:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 24 Rte 24 S			ROUTE 24 Rte 24 S / JEFFERSON STREET
11/13/2004	5:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Clear			Rte 24 S			500 feet N from Intersection Rte 24 S / Rte 195
11/13/2004	8:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow			EXT - ROUTE 24			ROUTE 24 / BRAYTON AVENUE
11/18/2004	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N / RAMP - RT 24 NB TO RT 195 WB
11/24/2004	1:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N			Rte 24 N / BRAYTON EXTENSION
11/25/2004	12:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 24 S	Exit 2 on	Rte 24 S	Rte 24 S
12/1/2004	11:16:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			Rte 24 N		150 feet N from Rte 24 Milemarker 11.1	Rte 24 N
12/1/2004	12:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Cloudy/Rain			Rte 24 N		100 feet N from Rte 24 N Milemarker 8.1	Rte 24 N
12/6/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24			Rte 24
12/8/2004	6:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			500 feet N from RTE 195 - Rte 24 N			500 feet N from Intersection Rte 24 N / Rte 195
12/12/2004	12:29:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy			900 BRAYTON AVENUE Rte 24 N			900 BRAYTON AVENUE Rte 24 N
12/13/2004	7:34:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Cloudy			Rte 24 N		Rte 24 N Milemarker 3.0	Rte 24 N
12/19/2004	4:02:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S			100 feet S from Intersection Rte 24 S / NORTH MAIN STREET
12/20/2004	9:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow			Rte 24 N			Rte 24 N
12/21/2004	12:01:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24			Rte 24 / RAMP - BRAYTON AVE TO RT 24 NB
12/22/2004	1:37:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			ROUTE 24 Rte 24 S			ROUTE 24 Rte 24 S / RAMP-RT 24 SB TO AIRPORT RD
12/22/2004	7:17:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			ROUTE 24 Rte 24 N			ROUTE 24 Rte 24 N / RAMP-RT 24 NB TO AIRPORT RD
12/23/2004	10:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			ROUTE 24 Rte 24 S			ROUTE 24 Rte 24 S
1/4/2005	5:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				5280 feet N	from Exit 8B on Rte 24	Rte 24
1/5/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Rain/Cloudy	Rte 24 N	Rte 79 N				
1/9/2005	1:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear					Rte 24 S Milemarker 8.0	Rte 24 S
1/11/2005	8:05:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Clear			RAMP FROM RTE 79 N - Rte 24 N			Rte 24 N / Rte 79
1/18/2005	1:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 24 S
1/26/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - lighted roadway	Snow/Blowing sand, snow						MARIANO BP BOULEVARD Rte 24 / Rte 24
1/28/2005	4:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dusk	Clear						HERMAN STREET Rte 24 / HIGHLAND AVENUE Rte 24
1/29/2005	3:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						Rte 24 S
1/29/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Clear/Snow						1 EASTERN AVENUE Rte 24 / Rte 24
1/30/2005	6:48:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy						NORTH EASTERN AVENUE Rte 24 / NEW BOSTON ROAD Rte 24
2/1/2005	3:35:00 PM	Property damage only (none injured)	6	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet N	from Exit 8 on Rte 24 S	Rte 24 S
2/5/2005	6:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Clear						500 Rte 24 / Rte 24
2/9/2005	4:51:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 24 N Milemarker 0.1	Rte 24 N
2/11/2005	9:10:00 AM	Property damage only (none injured)	5	0	0	Unknown	Unknown	Wet	Daylight	Cloudy/Rain			AT THE RTE 24 NORTH RAMP - Rte 195 W			Rte 195 W / RAMP-RT 195 WB TO RT 24 NB
2/14/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy	Rte 24 N	Rte 79 N				
2/21/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow						PRESIDENT AVENUE Rte 24 N
2/22/2005	10:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N Milemarker 0.9	Rte 24 N
2/22/2005	10:08:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear					Rte 24 N Milemarker 1.1	Rte 24 N
2/24/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			500 feet S from ROUTE 24 NORTH MERGE - Rte 79 N			500 feet S from Intersection Rte 79 N / Rte 24
2/26/2005	4:05:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear					Rte 24 N Milemarker 8.0	Rte 24 N
2/28/2005	11:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			RAMP FROM RTE 24 NORTH (THE EXTE - INTERSTATE 195 Rte 195 W			INTERSTATE 195 Rte 195 W / RAMP-RT 24 NB TO RT 195 WB
3/2/2005	11:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Clear				100 feet N	from Exit 24 S	Rte 24 S
3/6/2005	11:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
3/11/2005	7:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			

FALL RIVER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
4/10/2005	8:50:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 / Rte 195
4/12/2005	3:51:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Unknown						700 Rte 24 N
4/15/2005	12:15:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear						GOVERNMENT CTR STREET Rte 195 / RAMP-AIRPORT RD TO RT 24 NB
4/17/2005	6:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					50 feet N from Rte 24 N Milemarker 3.5	Rte 24 N
4/19/2005	8:03:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						100 feet N from Intersection 101 ROUTE 24 Rte 81 N / NAPOLEON STREET Rte 24 N
4/23/2005	9:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain						200 ROUTE 24N HWY
5/25/2005	10:27:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain					Rte 24 N Milemarker 8.5	Rte 24 N
6/1/2005	12:56:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				300 feet N from Exit 8 on Rte 24 S		Rte 24 S
6/4/2005	1:15:00 PM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Dawn	Clear						Rte 195 / Rte 24
6/5/2005	4:56:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear				100 feet S from Exit 1B on Rte 24 S		Rte 24 S
6/6/2005	6:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			ACROSS FROM WATUPPA RESERVOIR - Rte 24			1000 feet N from Intersection Rte 24 / Rte 195
6/14/2005	2:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain						Rte 24 N
6/14/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						Rte 24 N
6/14/2005	7:49:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						BRAYTON AVENUE / RAMP-BRAYTON AVE TO RT 24 NB Rte 24 S
6/18/2005	4:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						200 ROUTE 24 / BRAYTON AVENUE
6/22/2005	4:16:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear						900 BRAYTON AVENUE Rte 24 S
6/24/2005	2:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 24 N
6/30/2005	8:36:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			ROTARY FROM PRESIDENT AVE TO RTE - PRESIDENT AVENUE ROTARY			PRESIDENT AVENUE ROTARY / Rte 24
7/7/2005	4:20:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 24 S		Rte 24 S
7/10/2005	1:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 24 S Milemarker 1.0	Rte 24 S
7/17/2005	6:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			50 feet W from ON RAMP FROM ROUTE 24N - Rte 195 E			50 feet W from Intersection Rte 195 E / Rte 24
7/23/2005	9:23:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			JUST BEYOND THE MERGE OF RTE. 79 - Rte 24 N			Rte 24 N
8/4/2005	1:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear						Rte 24 S / Rte 95
8/6/2005	11:49:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					10 feet S from Rte 24 S Milemarker 4.3	Rte 24 S
8/15/2005	10:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						10 feet S from Intersection Rte 24 N / RAMP - RT 24 NB TO RT 195 EB
8/18/2005	3:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			PRESIDENT AVE OFF RAMP - Rte 24 N			Rte 24 N
8/20/2005	8:59:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear						Rte 24 S
8/24/2005	5:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear				Exit 5 on Rte 24 S		Rte 24 S
8/28/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear/Clear			SOUTH OF PRESIDENT AVE. - Rte 24 S		Rte 24 S Milemarker 4.2	Rte 24 S
9/10/2005	6:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						WILLIAM S. CANNING BOULEVARD / ROUTE 24
9/12/2005	7:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			O/P - STAFFORD ROAD Rte 24 N			STAFFORD ROAD Rte 24 N
9/15/2005	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						Rte 24 N
9/18/2005	1:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			100 feet S from OF FREETOWN TOWN LINE - Rte 24 S			Rte 24 S
10/8/2005	1:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain				Exit 2 on Rte 24 S		Rte 24 S
10/9/2005	9:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy						Rte 24 S / Rte 195
10/13/2005	4:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						ROUTE 24 Rte 24 N / RAMP-RT 24 NB TO BRAYTON AVE
10/20/2005	9:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
10/22/2005	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain						Rte 24 N
10/30/2005	2:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					100 feet S from Rte 24 N Milemarker 1.3	Rte 24 N
11/6/2005	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
11/10/2005	9:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Daylight	Cloudy						INDUSTRIAL PARK ROAD Rte 24 / Rte 24
11/15/2005	7:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 24 S Milemarker 6.6	Rte 24 S
11/15/2005	9:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain						Rte 195 E / RAMP - RT 24 NB TO RT 195 EB
11/20/2005	3:25:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			RTE 195 - Rte 24 S			Rte 24 S
11/22/2005	7:41:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Rain/Rain						200 feet E from Intersection Rte 195 W / Rte 24
11/30/2005	3:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			JUST NORTH OF EXIT 8 - Rte 24 N			Rte 24 N
12/1/2005	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 79 Rte 79 N / ROUTE 24
12/7/2005	7:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					300 feet N from Rte 24 N Milemarker 4.3	Rte 24 N
12/9/2005	9:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow						Rte 24 N
12/12/2005	4:34:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear						Rte 195 W / Rte 24
12/15/2005	1:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
12/15/2005	12:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					200 feet S from Rte 24 N Milemarker 1.0	Rte 24 N
12/16/2005	12:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain					300 feet S from Rte 24 N Milemarker 8.2	Rte 24 N
12/21/2005	3:59:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						900 BRAYTON AVENUE Rte 24 S / Rte 24
12/23/2005	1:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S / NORTH MAIN STREET
1/3/2006	9:01:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Sleet, hail (freezing rain or drizzle)						Rte 24 S
1/3/2006	11:15:00 AM	Property damage only (none injured)	4	0	0	Angle	Angle	Slush	Daylight	Snow				50 feet S from Exit 8 on Rte 24 S		Rte 24 S
1/14/2006	4:58:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 5 on Rte 24		Rte 24
1/14/2006	11:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain						INTERSTATE 195 Rte 24 N
1/14/2006	12:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain				Exit 8 on Rte 24		Rte 24
1/23/2006	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Slush	Daylight	Rain/Snow						Rte 24 N
1/27/2006	1:46:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						PLYMOUTH AVENUE / RAMP-AIRPORT RD TO RT 24 NB Rte 195 E
1/27/2006	5:55:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear						Rte 195 E / Rte 24
1/31/2006	6:50:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				Exit 8 on Rte 24		Rte 24
2/3/2006	12:07:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy						Rte 24 N
2/13/2006	6:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear			RAMP FROM BRAYTON AVE. TO RTE. 2			BRAYTON AVENUE Rte 24 N
2/14/2006	1:00:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Ice	Dark - roadway not lighted	Clear			TOWARD 195 WEST			STATE HIGHWAY Rte 24 N / Rte 195
2/15/2006	5:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			NORTH OF EXIT 8 (AIRPORT RD EXIT			100 feet N from Intersection Rte 24 S
3/2/2006	3:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow						500 ROUTE 24
3/2/2006	8:51:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - roadway not lighted	Snow						Rte 24 N
3/9/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Dusk	Cloudy						Rte 195 / Rte 24
3/20/2006	3:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						1000 feet S from Intersection Rte 24 N / BRAYTON AVENUE
4/2/2006	1:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N Milemarker 2.9	Rte 24 N
4/7/2006	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 24 / Rte 195
4/24/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain				Exit 8 on Rte 24		Rte 24
4/26/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	ROUTE 79 Rte 24 N	ROUTE 79 Rte 24 N				
5/4/2006	12:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear					100 feet N from Rte 24 S Milemarker 4.8	Rte 24 S
5/11/2006	9:24:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	ClearOther						Rte 24 / Rte 24
5/13/2006	1:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Cloudy/Rain				Exit 2 on Rte 24 S		Rte 24 S
5/13/2006	6:22:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain				200 feet S from Exit 8 on Rte 24		Rte 24
5/15/2006	4:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						GOVERNMENT CTR STREET Rte 195 / Rte 24
5/15/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				300 feet N from Exit 2 on Rte 24		Rte 24
5/16/2006	9:46:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						100 feet E from Intersection 1 BRAYTON AVENUE Rte 24 / Rte 24
5/17/2006	1:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						PLYMOUTH AVENUE Rte 95 / Rte 24
5/20/2006	1:18:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			BRAYTON AVE EXIT			Rte 24 S / BRAYTON AVENUE
5/22/2006	7:30:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Cloudy				500 feet S from Exit 5 on Rte 24 S		Rte 24 S
6/2/2006	4:30:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			195 WEST			Rte 24 N / Rte 195
6/7/2006	1:43:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 24 N
6/7/2006	9:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 24 N
6/7/2006	11:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain					Rte 24 N Milemarker 7.1	Rte 24 N
6/13/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 21 on Rte 24		Rte 24 N
6/15/2006	10:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 1B on Rte 24 S		Rte 24 S
6/17/2006	12:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 24 N	Rte 24 N				
6/22/2006	5:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						RAMP - BRAYTON AVE TO RT 24 SB
6/25/2006	5:41:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			JUST PRIOR TO EXIT #2	Exit 2 on Rte 24		Rte 24
6/25/2006	6:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				300 feet N from Exit 8 on Rte 24		Rte 24
7/14/2006	1:14:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 24		Rte 24 / INDUSTRIAL PARK ROAD
8/11/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 24 N
8/17/2006	12:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
8/23/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RTE 24 SOUTH			Rte 195 E / Rte 24
8/25/2006	6:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy						Rte 24 N
8/26/2006	1:32:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						ROUTE 24 Rte 24 N / BEDFORD STREET
8/26/2006	5:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 24 S
9/6/2006	5:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy			ON RAMP TO ROUTE 195 WEST			RAMP-RT 24 NB TO RT 195 WB
9/8/2006	7:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						EASTERN AVENUE Rte 24 N
9/8/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
9/14/2006	6:30:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain			EAST OF RAMP FROM 24N			Rte 195 E / Rte 24
9/18/2006	5:22:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			ON RAMP FROM ROUTE 81 NORTH			ROUTE 24 Rte 24 N / RAMP-AIRPORT RD TO RT 24 NB Rte 81
9/22/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 195 Rte 195 W / RAMP-RT 195 EB TO RT 24 NB
10/6/2006	2:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 4 on Rte 24 S		Rte 24 S
10/14/2006	7:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Cloudy						Rte 24 N
10/17/2006	10:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
10/20/2006	1:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain	Rte 24	Rte 195				
10/21/2006	1:58:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Clear	RAMP - RT 24 SB TO RT 195 WB Rte 24 S	RAMP - RT 24 SB TO RT 195 WB Rte 24 S				
10/28/2006	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Severe crosswinds				Exit 8 on Rte 24		Rte 24
10/30/2006	8:39:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 5 on Rte 24 S		Rte 24 S
11/4/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear						200 Rte 24 N
11/7/2006	11:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy	INTERSTATE 195 Rte 24 N	INTERSTATE 195 Rte 24 N				
11/8/2006	5:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Rain	Rte 24 S	Rte 195 E				
11/15/2006	9:44:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Cloudy			RTE 195 SPLIT			1000 feet N from Intersection INTERSTATE 195 Rte 24 S / RAMP-RT 24 SB TO RT 195 EB
11/23/2006	9:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Sleet, hail (freezing rain or drizzle)/Severe crosswinds						Rte 24 / Rte 24
11/29/2006	3:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 8 on Rte 24 S		Rte 24 S
12/2/2006	10:36:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 1A on Rte 24		10 feet S from Intersection Rte 24 / Rte 81
12/4/2006	8:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow				Exit 5 on Rte 24 S		Rte 24 S
12/9/2006	1:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			3/4 MILE NORTH OF			RAMP-RT 195 EB TO RT 24 NB Rte 24 N / INTERSTATE 195
12/9/2006	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			ON RAMP FROM 138/79 NORTH			Rte 195 E / RAMP-AIRPORT RD TO RT 24 NB
12/9/2006	9:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				300 feet N from Exit 8 on Rte 24 S		Rte 24 S
12/16/2006	4:57:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						INTERSTATE 195 Rte 24 N / RAMP-RT 24 NB TO RT 195 WB
12/22/2006	9:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Cloudy						INTERSTATE 195 Rte 24 N / RAMP-RT 24 NB TO RT 195 EB
12/23/2006	7:02:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						Rte 24 N
12/26/2006	10:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 24 S	Rte 195				
1/18/2004	2:20:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Cloudy/Snow			SOUTH OF EXIT 6 - Rte 24 S		Rte 24 S Milemarker 6.1	Rte 24 S
6/20/2005	4:52:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			2500 feet S from EXIT 5 - Rte 24 N			Rte 24 N
1/30/2006	4:30:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				Exit 7 on Rte 24		Rte 24
10/28/2006	11:20:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 24 N
10/28/2006	12:29:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Severe crosswinds						Rte 24 N

FREETOWN	1/1/2004	12/31/2008	Where street or intersection is similar to: rte 24 route 24															
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From		
10/1/2004	7:45:00 PM	Fatal injury	2	4	1	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 24	50 Feet E from Exit 10 on Rte 24	50 feet E from Rte 24 Milemarker 12.9	Rte 24 / NORTH MAIN STREET		
11/1/2004	6:00:00 PM	Fatal injury	1	3	2	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24	Exit 9 on Rte 24		Rte 24		
3/27/2006	9:10:00 PM	Fatal injury	4	1	1	Unknown	Unknown	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N Milemarker 9.8	Rte 24 N		
1/14/2004	8:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			Rte 24 S	1000 feet S from Exit 10 on Rte 24 S		Rte 24 S		
2/2/2004	8:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N			Rte 24 N		
3/8/2004	8:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			Rte 24		Rte 24 Milemarker 9.5	Rte 24		
3/14/2004	6:05:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S	100 feet S from Exit 9 on Rte 24 S		Rte 24 S		
3/28/2004	6:25:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear			Rte 24 S	Exit 9 on Rte 24 S		Rte 24 S		
4/4/2004	2:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 24 S		15.8 feet N from Rte 24 S Milemarker 9.7	Rte 24 S		
4/10/2004	4:29:00 AM	Non-Fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			1000 feet N from FALL RIVER TOWN LINE - AM/ETS MEMORIAL HIGHWAY Rte 24 N			AM/ETS MEMORIAL HIGHWAY Rte 24 N		
5/15/2004	10:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N	Exit 9 on Rte 24		Rte 24 N		
6/23/2004	6:16:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			NORTH MAIN STREET Rte 24	Exit 10 on Rte 24		75 feet N from Intersection NORTH MAIN STREET Rte 24 / NORTH MAIN STREET		
7/17/2004	3:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S		Rte 24 S Milemarker 12.2	Rte 24 S		
7/22/2004	3:08:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 24 N	2640 feet N from Exit 9 on Rte 24		Rte 24 N		
7/26/2004	6:04:00 AM	Non-Fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N		Rte 24 N Milemarker 12.8	Rte 24 N		
8/5/2004	8:58:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			Rte 24 S	1.0 feet N from Exit 9 on Rte 24 S	1.0 feet N from Rte 24 S Milemarker 11.0	Rte 24 S		
10/1/2004	7:30:00 AM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 24			Rte 24		
10/4/2004	9:38:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S		Rte 24 S Milemarker 9.1	Rte 24 S		
10/8/2004	7:50:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Fog, smog, smoke			Rte 24 S		100 feet S from Rte 24 S Milemarker 9.0	Rte 24 S		
10/9/2004	12:10:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N		
11/13/2004	2:52:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Snow			Rte 24 S	2640 feet S from Exit 10 on Rte 24 S		Rte 24 S		
11/13/2004	8:15:00 AM	Non-Fatal injury	2	2	0	Angle	Angle	Snow	Daylight	Snow			AM/ETS MEMORIAL HIGHWAY Rte 24 N			AM/ETS MEMORIAL HIGHWAY Rte 24 N		
1/16/2005	10:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow						Rte 24 N		
1/27/2005	12:52:00 PM	Non-Fatal injury	5	2	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Snow/Snow				Exit 9 on Rte 24 S		Rte 24 S		
3/1/2005	6:00:00 AM	Non-Fatal injury	3	2	0	Angle	Angle	Slush	Daylight	Snow/Cloudy						Rte 24 N		
3/11/2005	2:55:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow			24 SB AT EXIT - 10. - Rte 24 S	Exit 10 on Rte 24 S		Rte 24 S		
3/12/2005	1:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Snow			EXIT 9 - Rte 24 N			100 feet S from Intersection Rte 24 N / Rte 79		
3/12/2005	6:45:00 AM	Non-Fatal injury	2	1	0	Not reported	Not reported	Snow	Dark - roadway not lighted	Snow				Exit 9 on Rte 24 S		Rte 24 S		
3/12/2005	7:31:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Snow	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)					Rte 24 S Milemarker 11.8	Rte 24 S		
3/12/2005	9:00:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow						Rte 24 S / Rte 79		
3/12/2005	9:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Cloudy						Rte 24 S		
3/12/2005	12:15:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow					100 feet S from Rte 24 N Milemarker 10.2	Rte 24 N		
4/16/2005	3:54:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy				Exit 9 on Rte 24 S		Rte 24 S		
5/9/2005	8:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 10 on Rte 24		AM/ETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 24 NB TO NORTH MAIN ST		
5/16/2005	10:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				700 Feet N from Exit 9 on Rte 24 S		Rte 24 S		
5/23/2005	5:43:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		SOUTH MAIN STREET Rte 24 S / RAMP-RT 24 SB TO RT 79						
6/5/2005	5:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 24 S Milemarker 11.3	Rte 24 S		
6/10/2005	6:35:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 24 N Milemarker 11.7	Rte 24 N		
6/26/2005	10:05:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				10.00 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
6/28/2005	10:10:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Clear				900 Feet N from Exit 9 on Rte 24		Rte 24		
7/31/2005	9:08:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N		
8/1/2005	2:49:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				10.00 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
8/2/2005	11:04:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					20 feet S from Rte 24 N Milemarker 10.1	Rte 24 N		
8/31/2005	11:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy						200 Feet S from Intersection AM/ETS MEMORIAL HIGHWAY Rte 24 N / COPICUT ROAD		
10/1/2005	2:00:00 AM	Non-Fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 10 on Rte 24 S		Rte 24 S		
10/7/2005	10:42:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				50 Feet N from Exit 10 on Rte 24 S		Rte 24 S		
10/10/2005	2:45:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S		
10/20/2005	2:40:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S		
12/1/2005	5:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			JUST NORTH OF EXIT 10 - Rte 24 S	Exit 10 on Rte 24 S		Rte 24 S		
12/14/2005	12:45:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				Exit 9 on Rte 24 S		Rte 24 S		
1/1/2006	2:40:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Snow	Dark - roadway not lighted	Snow/Snow				1000 Feet S from Exit 10 on Rte 24		Rte 24		
1/23/2006	9:40:00 PM	Non-Fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S		
1/24/2006	8:35:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 9 on Rte 24		Rte 24		
1/27/2006	1:00:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear					20.0 feet N from Rte 24 Milemarker 118.0	Rte 24 S		
4/1/2006	7:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy				500 Feet N from Exit 9 on Rte 24 S		Rte 24 S		
4/12/2006	1:30:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				2500 feet S from Exit 10 on Rte 24 S		Rte 24 S		
5/4/2006	5:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Clear/Cloudy				Exit 9 on Rte 24		Rte 24		
5/30/2006	6:50:00 PM	Non-Fatal injury	1	4	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 10 on Rte 24 S		Rte 24 S		
6/23/2006	1:36:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy				500 feet N from Exit 10 on Rte 24 S		Rte 24 S		
8/5/2006	9:53:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				100 feet N from Exit 10 on Rte 24 S		Rte 24 S		
8/15/2006	7:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				500 Feet N from Exit 8 on Rte 24		Rte 24 N		
8/18/2006	7:15:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 8 on Rte 24		AM/ETS MEMORIAL HIGHWAY Rte 24 / RAMP-RT 24 NB TO RT 79		
8/25/2006	3:00:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain				Exit 9 on Rte 24 S		Rte 24 S		
10/3/2006	4:17:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Clear/Clear				Exit 10 on Rte 24 S		Rte 24 S		
10/16/2006	3:40:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			JUST SOUTH OF EXIT 9			Rte 24 N		
11/26/2006	4:30:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S		
12/9/2006	3:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N		
5/4/2014	6:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 9 on Rte 24		Rte 24		
8/13/2014	7:45:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Dusk	Cloudy			Rte 24 S			Rte 24 S		
10/26/2006	7:45:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S		
1/14/2004	8:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy			Rte 24 S	1320 feet S from Exit 10 on Rte 24 S		Rte 24 S		
1/14/2004	9:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			500 Feet S from RAILROAD BRIDGE - Rte 24 S	2600 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
2/13/2004	11:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 N	1000 Feet N from Exit 9 on Rte 24		Rte 24 N		
3/15/2004	1:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			AM/ETS MEMORIAL HIGHWAY Rte 24 S			AM/ETS MEMORIAL HIGHWAY Rte 24 S		
4/17/2004	11:28:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N		
4/25/2004	6:24:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N		Rte 24 N Milemarker 9.7	Rte 24 N		
5/12/2004	10:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy			Rte 24 S	1000 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
5/12/2004	10:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy			Rte 24 S	Exit 9 on Rte 24 S		Rte 24 S		
5/14/2004	4:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N			Rte 24 N		
6/19/2004	12:11:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S	250 feet S from Exit 9 on Rte 24 S	250 feet S from Rte 24 S Milemarker 10.9	Rte 24 S		
6/23/2004	11:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			100 Feet E from EXIT 09 - Rte 24 S	Exit 9 on Rte 24 S		Rte 24 S		
6/24/2004	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N			Rte 24 N		
6/28/2004	7:00:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N		100 feet N from Rte 24 N Milemarker 11.6	Rte 24 N		
7/19/2004	12:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			Rte 24 N		25 feet N from Rte 24 N Milemarker 10.1	Rte 24 N		
7/28/2004	10:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			Rte 24 S	100 feet S from Exit 9 on Rte 24 S		Rte 24 S		
7/29/2004	5:23:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Other			RAMP-RT 24 SB TO NORTH MAIN ST Rte 24 S			RAMP-RT 24 SB TO NORTH MAIN ST Rte 24 S / Rte 24		
8/19/2004	9:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S	500 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
9/27/2004	6:40:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy			Rte 24 N			Rte 24 N		
10/3/2004	5:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear			Rte 24 S	5280 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
10/18/2004	6:34:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear		NORTH MAIN STREET RAMP-RT 24 NB TO NORTH MAIN ST						
10/30/2004	7:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			Rte 24 S	20 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
11/7/2004	4:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S		50 feet S from Rte 24 S Milemarker 10.2	Rte 24 S		
11/9/2004	7:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N			Rte 24 N		
11/12/2004	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N		
11/13/2004	6:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow			Rte 24 S	Exit 10 on Rte 24 S		Rte 24 S		
11/14/2004	9:57:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S	50 feet S from Exit 10 on Rte 24 S		Rte 24 S		
11/15/2004	7:58:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N			Rte 24 N		
12/10/2004	10:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			Rte 24 S			Rte 24 S		
12/11/2004	3:27:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N		
12/16/2004	12:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTH MAIN STREET Rte 24			SOUTH MAIN STREET Rte 24 / RIDGE HILL ROAD		
12/18/2004	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Rte 24 N	NORTH MAIN STREET						
12/22/2004	10:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			AM/ETS MEMORIAL HIGHWAY Rte 24 S			AM/ETS MEMORIAL HIGHWAY Rte 24 S		
1/9/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow					Rte 24 S Milemarker 8.9	Rte 24 S		
1/17/2005	3:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow			200 Feet S from RAILROAD BRIDGE - Rte 24 N			Rte 24 N		
1/18/2005	5:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 Feet S from Exit 9 on Rte 24 S		Rte 24 S		
1/22/2005	4:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Snow	Dusk	Snow				Exit 10 on Rte 24		Rte 24		
2/2/2005	4:10:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear						SOUTH MAIN STREET Rte 24 / Rte 24		
2/7/2005	12:28:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear						SOUTH MAIN STREET Rte 79 S / Rte 24		
2/11/2005	6:50:00 PM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S		
2/18/2005	8:28:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow				Exit 9 on Rte 24		SOUTH MAIN STREET Rte 24		
2/21/2005	5:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow						Rte 24 N		
2/21/2005	5:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow						Rte 24 N		
2/21/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Snow/Snow			END OF RAMP FROM 24 S TO X-10. - Rte 24			Rte 24 / NORTH MAIN STREET Rte 24		
2/21/2005	9:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Cloudy/Rain				Exit 9 on Rte 24 S		Rte 24 S		
3/1/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Snow						Rte 24 S		
3/5/2005	7:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			1/2 MILE S OF EXIT 9 - Rte 24 N		2640 feet S from Rte 24 N Milemarker 10.2	Rte 24 N		
3/8/2005	1:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Fog, smog, smoke			ON RAMP - Rte 24 S	Exit 9 on Rte 24 S		Rte 24 S / Rte 24		
3/12/2005	1:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Snow					200 Feet S from Rte 24 N Milemarker 10.0	Rte 24 N		
3/12/2005	2:17:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Snow					200 Feet S from Rte 24 N Milemarker 9.8	Rte 24 N		
3/12/2005	2:45:00 PM	Property damage only (none injured)	2	0	0	Rear-to-rear	Rear-end	Snow	Dark - roadway not lighted	Snow				5280 Feet N from Exit 9 on Rte 24 S		Rte 24 S		
3/12/2005	8:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Cloudy			24 SB NO OF X-10. - Rte 24 S	Exit 10 on Rte 24 S		Rte 24 S		
3/12/2005	11:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Cloudy			RT 24 NB NO OF X-10. - Rte 24 N	Exit 10 on Rte 24		Rte 24 N		
3/12/2005	12:36:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Snow				100 Feet N from Exit 9 on Rte 24 S		Rte 24 S		
3/14/2005	10:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			AT FALL RIVER / FREETOWN LINE - Rte 24 S			Rte 24 S		
4/19/2005	10:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 9 on Rte 24 S		Rte 24 S		
4/26/2005	12:25:01 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N		
5/10/2005	10:25:01 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S		
5/21/2005	9:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			RT 24 NB, NO OF X-9. - Rte 24 N	Exit 9 on Rte 24		Rte 24 N		
5/28/2005	8:50:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N Milemarker 10.5	Rte 24 N		
6/20/2005	2:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			NORTH OF X-10 - Rte 24 N			Rte 24 N		
6/22/2005	1:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			JUST NORTH OF EXIT - 9. - Rte 24 S	Exit 9 on Rte 24 S		Rte 24 S		
6/24/2005	6:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				20.0 feet S from Rte 24 N Milemarker 9.3		Rte 24 N		
6/25/2005	12:00:01 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 10 on Rte 24 S		Rte 24 S		
7/12/2005	10:25:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear						AM/ETS MEMORIAL HIGHWAY Rte 24 N / RAMP-RT 79 TO RT 24 NB		
8/5/2005	10:45:01 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N		
8/11/2005	5:01:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 10 on Rte 24		Rte 24		
8/13/2005	2:10:

FREETOWN	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
3/16/2006	10:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				50 feet N from Exit 10 on Rte 24 S		Rte 24 S
3/24/2006	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			COP CUT ROAD OVERPASS			AMVETS MEMORIAL HIGHWAY Rte 24 N / COP CUT ROAD
4/7/2006	11:17:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain				Exit 9 on Rte 24 S		Rte 24 S
4/11/2006	11:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				100 feet N from Exit 10 on Rte 24 S		Rte 24 S
4/29/2006	1:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 10 on Rte 24 S		Rte 24 S
5/9/2006	1:00:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
6/1/2006	8:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain						Rte 24 S / Rte 79
6/30/2006	10:28:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear				1 feet N from Exit 10 on Rte 24 S		Rte 24 S
7/27/2006	6:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy				20 feet N from Exit 9 on Rte 24		Rte 24
7/30/2006	9:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S
8/4/2006	4:02:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				2500 Feet N from Exit 10 on Rte 24 N		Rte 24 N
8/13/2006	10:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S
8/26/2006	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 24 N
8/28/2006	10:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain						Rte 24 N
9/27/2006	8:31:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear						SOUTH MAIN STREET Rte 24 / Rte 24
10/22/2006	8:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 9 on Rte 24 S		Rte 24 S
10/31/2006	5:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy						Rte 24 N
11/3/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			100 feet N from ASSONET RIVER BRIDGE	Exit 9 on Rte 24 S		Rte 24 S
11/7/2006	3:30:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 9 on Rte 24 S		Rte 24 S
11/9/2006	1:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			50 feet N from FREETOWN/FALL RIVE LINE			Rte 24 S
11/13/2006	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S
11/25/2006	11:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 24
11/30/2006	2:14:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 24 S		Rte 24 S
12/17/2006	7:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy						Rte 24 N / RAMP - RT 24 NB TO RT 79
12/19/2006	4:33:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			25 feet N from RTE 24 S OFF RAMP			SOUTH MAIN STREET
12/19/2006	4:44:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						SOUTH MAIN STREET / RAMP-RT 24 SB TO RT 79 Rte 24 S
7/26/2005	6:15:00 AM	Unknown	1	0	0	Unknown	Unknown	Dry	Daylight	Clear						Rte 24 N
12/30/2006	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 24 S		Rte 24 S

RANDOLPH	1/1/2004	12/31/2006	is similar to rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
1/4/2004	3:10:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Cloudy/Rain			HALF MILE NORTH OF RT 24 - Rte 93			Rte 93 / Rte 24
1/12/2004	2:50:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow			INTERSTATE 93 Rte 93 S	Exit 4 on Rte 93 S		INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
2/28/2004	4:12:00 PM	Non-fatal injury	2	2	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 24	Exit 20A on Rte 24		Rte 24 / Rte 24
3/11/2004	8:38:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			Rte 24 S		Rte 24 Milemarker 20.0	Rte 24 S
4/26/2004	11:10:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			INTERSTATE 93 Rte 93 S	Exit 4 on Rte 93 S		INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
5/24/2004	4:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			1/2 MILE NORTH OF RTE 139 - Rte 24 N			2640 feet N from Intersection Rte 24 N / Rte 139
6/15/2004	10:48:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			Rte 93 S			500 feet N from Intersection Rte 93 S / Rte 24
9/30/2004	7:25:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	Exit 20A on Rte 24 N		Rte 24 N / Rte 24
10/10/2004	2:25:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N			Rte 24 N / Rte 93
10/19/2004	10:55:00 PM	Non-fatal injury	1	2	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Clear/Clear			Rte 24 N			2640 feet S from Intersection Rte 24 N / Rte 93
11/4/2004	5:50:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			50 FEET SOUTH OF 93 SPLIT - Rte 24 N			50 feet S from Intersection Rte 24 N / Rte 93
11/11/2004	5:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			50 feet S from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB
11/14/2004	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP - RT 24 NB TO RT 93 NB Rte 24 N			RAMP - RT 24 NB TO RT 93 NB Rte 24 N / INTERSTATE 93
11/17/2004	6:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear	Rte 24 S					
12/1/2004	12:42:00 PM	Non-fatal injury	4	3	0	Angle	Angle	Wet	Daylight	Rain/Rain			UNDER HORSE BRIDGE - Rte 24 N			2000 feet N from Intersection Rte 24 N / CANTON STREET
12/28/2004	10:17:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear			Rte 24 N			Rte 24 N / Rte 139
12/28/2004	12:25:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			RAMP - RT 24 NB TO RT 93 NB			RAMP - RT 24 NB TO RT 93 NB
1/22/2005	10:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Snow	Dark - lighted roadway	Snow						Rte 24 / Rte 24
2/25/2005	9:05:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			HORSE BRIDGE - Rte 24 N			Rte 24 N
4/11/2005	9:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear						Rte 24
4/30/2005	4:05:00 PM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain						WEST STREET Rte 24 / Rte 24
4/30/2005	8:50:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy						Rte 24 N / Rte 139
5/14/2005	5:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			OFF RAMP FROM RT 24N TO RT 93 SO - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
5/16/2005	4:10:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S
6/8/2005	5:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						6000 feet S from Intersection Rte 24 N / Rte 93
6/17/2005	11:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RT 139 E/B RAMP TO RT 24 N/B - Rte 24 N			Rte 24 N / Rte 139
6/25/2005	10:30:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
6/29/2005	4:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			HORSE BRIDGE - Rte 24 S			2000 feet S from Intersection Rte 24 S
7/12/2005	2:41:00 AM	Non-fatal injury	2	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						1000 feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB
7/13/2005	11:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						1000 feet N from Intersection Rte 24 S / Rte 139
7/15/2005	10:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
7/16/2005	6:30:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 / Rte 24
7/25/2005	4:30:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy						1000 feet N from Intersection Rte 24 S / Rte 139
8/14/2005	3:45:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 20 on Rte 24		Rte 24
8/26/2005	10:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						1000 feet N from Intersection Rte 24 N / Rte 139
8/27/2005	5:10:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 24
8/30/2005	8:35:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			SOUTH OF 93 SPLIT - Rte 24 N			1000 feet S from Intersection Rte 24 N / Rte 93
9/13/2005	7:25:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S / Rte 24
10/30/2005	10:00:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			DUMP - Rte 24 N			Rte 24 N
10/31/2005	3:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						RAMP - RT 24 NB TO RT 93 NB / Rte 24
11/3/2005	10:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Not reported	Not reported	Not Reported						Rte 24 N / Rte 139
11/8/2005	4:09:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						Rte 24 S / Rte 139
11/17/2005	8:05:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 24
11/28/2005	2:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB Rte 93 S
12/6/2005	1:15:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N / Rte 139
12/10/2005	12:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Snow/Blowing sand, snow						350 feet S from Intersection Rte 24 S / Rte 93
12/14/2005	9:25:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
12/20/2005	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
1/2/2006	7:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear	Rte 24 N	Rte 93				
1/13/2006	6:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain						Rte 24 / Rte 93
1/22/2006	9:50:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain				Exit 20 on Rte 24		Rte 24
1/31/2006	8:05:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Sturh	Dark - lighted roadway	Snow/Rain			EXIT 21	Exit 21 on Rte 24		Rte 24
2/7/2006	5:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear				Exit 19 on Rte 24		Rte 24
2/8/2006	10:13:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			HORSEBRIDGE			Rte 24 S
2/23/2006	5:00:00 AM	Non-fatal injury	3	2	0	Rear-to-rear	Rear-to-rear	Wet	Daylight	Cloudy				200 feet S from Exit 5A on Rte 93		RAMP - RT 93 SB TO RT 24 SB Rte 93
3/13/2006	7:41:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy/Cloudy						Rte 24 N / Rte 139
3/21/2006	9:40:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 24
3/29/2006	8:20:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			RT 139 ON RAMP			Rte 24 S / Rte 139
4/11/2006	3:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 feet S from Exit 19 on Rte 24		Rte 24
4/11/2006	4:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						Rte 24 S
4/13/2006	2:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			NORTH OF EXIT 20			Rte 24 S
4/19/2006	3:15:00 PM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 24 N
4/21/2006	1:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 93
4/27/2006	1:06:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 20 on Rte 24		Rte 24 N
5/1/2006	7:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			SOUTH OF I-93			Rte 24 S / Rte 93
5/4/2006	1:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 S	Rte 93				
5/10/2006	12:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						Rte 24 / Rte 24
6/20/2006	8:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 1A
7/6/2006	8:55:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						Rte 24 N
7/11/2006	8:30:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N / Rte 139
7/15/2006	1:00:00 PM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 S
9/15/2006	8:42:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
9/24/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S
9/29/2006	3:15:00 AM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear						Rte 93 / Rte 24
10/11/2006	7:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain						Rte 93 N / Rte 24
10/19/2006	1:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
11/12/2006	3:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
11/5/2006	3:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						Rte 24
11/17/2006	5:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 24 / Rte 24
11/20/2006	3:31:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
12/5/2006	4:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 24 / Rte 93
12/14/2006	12:58:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						RANDOLPH ROAD Rte 24 / Rte 24
12/29/2006	12:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			1000 feet N from RT 139			1000 feet N from Intersection Rte 24 N / Rte 139
1/5/2004	4:50:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizz	Rte 24 N	Rte 139 E				
2/20/2004	4:20:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 24		Rte 24	Rte 24		
6/21/2004	12:34:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
8/19/2004	7:40:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 N					
9/28/2004	9:07:00 AM	Not Reported	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain			CENTER STREET Rte 24			CENTER STREET Rte 24 / SOUTH STREET Rte 24
9/29/2004	7:00:00 AM	Not Reported	2	0	0	Angle	Angle	Not reported	Daylight	Rain			POND STREET Rte 24			POND STREET Rte 24 / PALELLA PARK DRIVE Rte 24
10/22/2004	5:50:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 24			Rte 24 / Rte 139
10/24/2004	2:25:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy			61 REED STREET Rte 24			1500 feet W from Intersection 61 REED STREET Rte 24 / NORTH MAIN STREET Rte 28 W
1/11/2005	7:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20A on Rte 24		Rte 24 / Rte 24
2/15/2005	6:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						Rte 24 N / Rte 93
3/24/2005	8:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 20 on Rte 24		Rte 24 N
8/2/2005	4:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Not reported	Clear	Rte 24	Rte 24				Rte 24 N
10/7/2005	3:05:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						RANDOLPH ROAD Rte 24
11/2/2005	8:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 / Rte 93
2/7/2006	3:45:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 / Rte 139
4/12/2006	8:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Not Reported						Rte 24 / Rte 93
5/19/2006	7:15:00 AM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Cloudy			RANDOLPH EXIT HALF MILE AWAY	Exit 20 on Rte 24		Rte 24 / Rte 139
5/25/2006	3:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20B on Rte 24		Rte 24 S
9/20/2006	7:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20 on Rte 24		Rte 24
10/16/2006	3:25:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						200 feet S from Intersection Rte 93 / Rte 24
11/7/2006	9:07:00 AM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 24 / Rte 24
11/14/2006	8:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear	Rte 24	Rte 93				
12/20/2006	12:40:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 / Rte 24
1/2/2004	10:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Snow			Rte 24 N	Exit 20 on Rte 24		Rte 24 N
1/4/2004	1:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			ROUT 128 - Rte 24 S			Rte 24 S / Rte 93
1/13/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Sleet, hail (freezing rain or drizzle)			Rte 93			Rte 93 / Rte 24
1/26/2004	4:18:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			RAMP - RT 24 NB TO RT 93 NB Rte 24 S			RAMP - RT 24 NB TO RT 93 NB Rte 24 S / INTERSTATE 93
2/6/2004	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Snow/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
3/9/2004	4:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain			Rte 24 N			Rte 24 N
3/22/2004	9:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			Rte 93 S			100 feet S from Intersection Rte 93 S / Rte 24
4/17/2004	2:04:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S			Rte 24 S
5/8/2004	9:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N			Rte 24 N / RAMP - RT 93 NB TO RT 28 SB
5/9/2004	11:35:00 AM	Property damage only (none injured)	5	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			RT 24 NB SOUTH OF RT 93 - Rte 24 N			Rte 24 N / Rte 93 S
5/27/2004	7:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			1 MILE SOUTH OF 93 - Rte 24 N			5280 feet S from Intersection Rte 24 N / Rte 93
6/1/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			N OF 139 - Rte 24 N			Rte 24 N
6/13/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S / Rte 24
7/31/2004	11:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			Rte 24 S			Rte 24 S
8/1/2004	6:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			150 feet S from Intersection Rte 24 N / Rte 93
8/9/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 S			500 feet N from Intersection Rte 93 S / Rte 24
8/9/2004	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 21 on Rte 24		Rte 24
8/10/2004	11:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			Rte 24 S			20 feet S from Intersection Rte 24 S / Rte 93
8/15/2004	12:31:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Rain			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
8/24/2004	1:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			EXACTLY AT 1 MILE TO RT 93 S/B/N - Rte 24 S			Rte 24 S / Rte 93
9/22/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S			6000 feet N from Intersection Rte 24 S / Rte 139
10/22/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
10/26/2004	7:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S	4000 feet S from Exit 20A on Rte 24		Rte 24 S
11/8/2004	1:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			JUST SOUTH OF RTE 24 - Rte 93 N	500 feet S from Exit 4 on Rte 93 N		Rte 93 N / Rte 24
11/13/2004	6:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Snow	Dawn	Snow/Cloudy			Rte 24 N			Rte 24 N / Rte 93
11/15/2004	5:46:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear			Rte 24 N			100 feet S from Intersection Rte 24 N / Rte 93
11/17/2004	3:15:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
11/20/2004	3:30:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93			Rte 93 / Rte 24
12/1/2004	2:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Cloudy			Rte 24 N			4000 feet N from Intersection Rte 24 N / Rte 139
12/10/2004	11:01:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain			RAMP - RT 93 SB TO RT 24 SB			RAMP - RT 93 SB TO RT 24 SB / Rte 24
12/12/2004	4:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy			RTE 93 EXIT 4 RAMP TO RTE 24 SB - RAMP - RT 93 NB TO RT 24 SB			RAMP - RT 93 NB TO RT 24 SB
12/16/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear/Clear			HORSE BRIDGE - Rte 24 S			2000 feet N from Intersection Rte 24 S / CANTON STREET
12/26/2004	9:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow			SOUTH OF HORSE BRIDGE - Rte 24 N	Exit 20 on Rte 24		Rte 24 N

RANDOLPH	1/1/2004	12/31/2006	is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
12/27/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			Rte 24	Exit 20 on Rte 24		Rte 24
1/7/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N / Rte 139
1/8/2005	1:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Sleet, hail (freezing rain or drizzle)/Cloudy						INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
1/9/2005	2:42:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Slush	Daylight	Sleet, hail (freezing rain or drizzle)/Cloudy						INTERSTATE 93 Rte 93 N / RAMP - RT 24 NB TO RT 93 NB
1/26/2005	6:05:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Snow				Exit 20 on Rte 24		Rte 24 N
1/31/2005	4:34:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM 93 N TO 24 S - INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
2/10/2005	1:06:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 24 N
2/11/2005	2:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Dark - lighted roadway	Snow/Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
2/15/2005	7:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						5000 feet S from Intersection Rte 24 / Rte 93
2/17/2005	5:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S
2/23/2005	8:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 21 on Rte 24 N		Rte 24 N / Rte 93
3/1/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow						RAMP - RT 93 NB TO RT 24 SB Rte 93 N
3/23/2005	11:22:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain						5000 feet N from Intersection Rte 24 S / Rte 139
3/24/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain						Rte 93 / Rte 24
4/7/2005	1:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N / Rte 24
4/7/2005	10:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
4/11/2005	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20 on Rte 24		Rte 24
4/20/2005	12:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
5/5/2005	6:20:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S
5/28/2005	2:59:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 24 N / Rte 139
6/7/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20 on Rte 24		Rte 24
6/25/2005	9:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 S
6/26/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy						INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
6/30/2005	8:32:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 93 S / Rte 24
7/1/2005	2:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain						Rte 24 S
7/3/2005	12:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24
7/12/2005	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N / Rte 24
7/27/2005	8:21:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Dusk	Clear			1000 feet S from HORSE BRIDGE - Rte 24 S			Rte 24 S
8/4/2005	3:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 24
8/9/2005	7:30:00 PM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 24
8/9/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			JUST SOUTH OF THE HORSE BRIDGE - Rte 24 S			Rte 24 S
8/17/2005	10:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 20B on Rte 24		Rte 24 S
8/25/2005	7:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / INTERSTATE 93
8/26/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				1000 feet N from Exit 4 on Rte 93 N		1000 feet N from Intersection Rte 93 N / Rte 24
8/27/2005	11:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 S					INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
8/29/2005	2:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / Rte 93
8/29/2005	4:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Clear			PRIOR TO EXIT 20 - Rte 24	500 feet S from Exit 20 on Rte 24		Rte 24
8/29/2005	9:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain			RAMP TO S/B RTE 93 - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
9/11/2005	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RT. 139 ON RAMP FROM RT 24 N/B - Rte 24 N			Rte 24 N / Rte 139
9/13/2005	9:07:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			HORSE BRIDGE - Rte 24 S			Rte 24 S
10/7/2005	8:10:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			EXIT 20 - Rte 24 N	4000 feet N from Exit 20 on Rte 24		Rte 24 N
10/26/2005	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			FROM RAMP - Rte 24			Rte 24 / Rte 93
11/4/2005	6:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 N
11/10/2005	5:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						Rte 24 S / CANTON STREET
11/18/2005	11:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N / Rte 93
11/28/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			2000 feet S from HORSE BRIDGE - Rte 24 N			5000 feet S from Intersection Rte 24 N / Rte 93
12/4/2005	8:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow						INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB Rte 24
12/6/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				Exit 20B on Rte 24		Rte 24 / Rte 24
12/9/2005	1:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Blowing sand, snow/Snow						Rte 24 N
12/10/2005	2:28:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB
12/14/2005	10:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S / AMVETS MEMORIAL HIGHWAY Rte 24
12/18/2005	5:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S
12/28/2005	4:09:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 24 S
1/15/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 20A on Rte 24		Rte 24 / Rte 24
1/16/2006	3:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 93 S / Rte 24
1/29/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 20 on Rte 24		Rte 24
2/2/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 N
2/11/2006	2:22:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
2/11/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
2/24/2006	11:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
2/26/2006	4:59:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
3/2/2006	4:12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			NORTH OF RT 139			Rte 24 S
3/6/2006	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 24 on Rte 24		Rte 24 / Rte 24
3/23/2006	1:27:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 S	Rte 93 N				
3/23/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 139
3/28/2006	5:38:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						Rte 24 S
4/3/2006	8:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			NORTH OF 139 EXIT	Exit 20 on Rte 24		Rte 24
4/12/2006	3:57:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 24 N	Rte 93 N				
4/18/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / Rte 24
4/27/2006	7:50:00 AM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 19 on Rte 24		Rte 24 N
4/29/2006	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Clear/Clear			RAMP FROM ROUTE 93 SOUTH TO ROUT			RAMP - RT 93 SB TO RT 24 SB / Rte 24
5/1/2006	1:00:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 N / Rte 139
5/8/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear				Exit 21 on Rte 24		Rte 24 / Rte 93
5/10/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 24 N	Rte 24				
5/20/2006	1:57:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
5/21/2006	7:23:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear/Clear						Rte 24 S
5/28/2006	1:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 24 N
6/8/2006	2:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy	Rte 24 N	Rte 93 N / Rte 93 S				
6/8/2006	2:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 24 N	Rte 24 N				
6/22/2006	1:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 S	Rte 24 S				
6/23/2006	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 4 on Rte 24		Rte 24 N
7/7/2006	5:05:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Daylight	Clear						Rte 93 / Rte 24
7/11/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 20 on Rte 24		Rte 24
7/24/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 93
7/29/2006	10:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
8/1/2006	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				2 feet N from Exit 20 on Rte 24		Rte 24
8/4/2006	12:18:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy						Rte 93 S / AMVETS MEMORIAL HIGHWAY Rte 24 N
8/8/2006	8:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				15 feet N from Exit 20 on Rte 24		Rte 24 N
8/17/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
8/26/2006	12:35:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear						Rte 24 / Rte 93
9/8/2006	7:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N
9/9/2006	7:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 N
9/15/2006	7:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear						2640 feet N from Intersection Rte 24 S / Rte 139
9/18/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 24 / Rte 24
9/26/2006	9:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				5000 feet N from Exit 19 on Rte 24		Rte 24
9/28/2006	4:31:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
10/13/2006	7:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 24
10/13/2006	10:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N / Rte 93
10/14/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 4 on Rte 93		Rte 93 / Rte 24
10/20/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 24 N	Rte 93 N				
10/21/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear	RAMP - RT 24 NB TO RT 93 NB Rte 24 N	RAMP - RT 24 NB TO RT 93 NB Rte 24 N				
11/8/2006	11:09:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 N / INTERSTATE 93 Rte 93 S
11/10/2006	1:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 24 S
11/21/2006	5:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 2 on Rte 24 N		Rte 24 N
11/26/2006	6:00:00 AM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Dark - roadway not lighted	Clear				Exit 19 on Rte 24		Rte 24
12/1/2006	4:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dawn	Rain/Cloudy						Rte 24 S
12/11/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 24 N / Rte 93
12/13/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Rain						Rte 24 / Rte 24
12/23/2006	3:37:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - unknown roadway lighting	Rain/Rain			PRIOR TO HORSE BRIDGE			Rte 24 N
12/29/2006	11:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP - RT 24 NB TO RT 93 NB Rte 24 N / INTERSTATE 93
3/19/2004	2:45:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24			Rte 24 / Rte 93
6/22/2004	12:30:00 PM	Unknown	2	0	0	Not reported	Not reported	Dry	Dark - roadway not lighted	Clear			Rte 24			Rte 24 / Rte 24
12/26/2004	8:09:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow/Severe crosswinds			RT. 24 SOUTH RAMP FROM RT. 93 SO - RAMP - RT 93 SB TO RT 24 SB			RAMP - RT 93 SB TO RT 24 SB
7/17/2005	5:05:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				2000 feet N from Exit 5 on Rte 24		Rte 24 N
5/19/2006	3:10:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 28 on Rte 93		Rte 93 / Rte 24
11/28/2006	7:00:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						Rte 24 N / Rte 93

RAYNHAM	1/1/2004	12/31/2006	Intersection is similar to:													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
1/1/2004	8:15:00 PM	Non-Fatal injury	3	3	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
1/20/2004	5:05:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
2/2/2004	4:17:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP FROM RTE 44EAST - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 44 EB TO RT 24 NB
2/9/2004	3:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S		Rte 24 S Millemarker 21.3	Rte 24 S
2/17/2004	4:20:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
3/16/2004	8:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
3/18/2004	4:05:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Cloudy/Blowing sand, snow			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
3/22/2004	7:50:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
4/15/2004	4:15:00 PM	Non-Fatal injury	2	3	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 24 S			Rte 24 S
4/15/2004	5:00:00 PM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 24 N			2640 feet S from Intersection Rte 24 N / Rte 495
4/15/2004	9:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 24 S	Rte 44 E				
5/23/2004	7:30:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Dusk	Rte 24				Rte 24 Millemarker 1.0	Rte 24 / Rte 495
5/26/2004	4:50:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
5/28/2004	8:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
6/12/2004	2:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SOUTH OF ROUTE 495 - Rte 24 S			Rte 24 S / Rte 495
6/22/2004	8:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	0 feet S from Exit 14 on Rte 24		Rte 24 S
7/5/2004	3:25:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N	Exit 14A on Rte 24 N		Rte 24 N
7/9/2004	6:40:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Fog, smog, smoke			Rte 495 S			Rte 495 S / Rte 24
7/16/2004	3:45:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S		Rte 24 S Millemarker 20.0	Rte 24 S
8/21/2004	2:10:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
9/16/2004	4:30:00 PM	Non-Fatal injury	2	1	0	Head-on	Head-on	Wet	Dusk	Cloudy/Rain					1.00 feet S from Rte 24 Millemarker 20.0	Rte 24
9/28/2004	3:00:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain			ROUTE 44 Rte 44			ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 WB Rte 24
9/29/2004	9:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
9/29/2004	11:50:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
10/6/2004	10:48:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N		Rte 24 N Millemarker 22.0	Rte 24 N
10/9/2004	6:45:00 AM	Non-Fatal injury	1	1	0	Rear-end	Rear-end	Wet	Dusk	Fog, smog, smoke			Rte 24 N	Exit 14A on Rte 24 N		Rte 24 N
10/15/2004	8:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain	Rte 24 S	Rte 104				
10/19/2004	6:20:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Wet	Dawn	Rain			Rte 24 N	5200 feet N from Exit 13 on Rte 24		Rte 24 N
11/18/2004	8:43:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			5280 feet S from Intersection Rte 24 N / Rte 495
11/21/2004	10:30:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dry	Daylight	Cloudy		TOP OF RAMP RTE 24 SB TO RTE 495 - Rte 495 S			Rte 495 S / RAMP - RT 24 SB TO RT 495 SB
12/6/2004	6:15:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy			Rte 24 S	50 feet E from Exit 13B on Rte 24 S		Rte 24 S
12/8/2004	9:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
12/17/2004	1:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP-24 SOUTH TO 495 NORTH - Rte 24 N			Rte 24 N / Rte 495
12/17/2004	5:10:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
12/28/2004	8:20:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			BETWEEN RAMPS OF RTE 495 - Rte 24 N			Rte 24 N / Rte 495
1/7/2005	7:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dawn	Cloudy						906 PLEASANT STREET / Rte 24
1/8/2005	10:23:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13 on Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 44 WB
1/25/2005	7:25:00 AM	Non-Fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Clear/Clear				Exit 13 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 N
1/29/2005	2:00:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Cloudy/Cloudy					Rte 24 S Millemarker 21.0	Rte 24 S
2/13/2005	1:58:00 AM	Non-Fatal injury	2	3	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
2/13/2005	8:45:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
3/9/2005	5:40:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
4/4/2005	5:00:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			SOUTH OF ROUTE 495 - AMBER WAY Rte 24 S	Exit 14 on Rte 24		AMBER WAY Rte 24 S
4/19/2005	5:40:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
5/10/2005	6:35:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 feet N from Exit 13 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 N
5/11/2005	8:10:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S
5/21/2005	1:35:00 PM	Non-Fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain				Exit 13 on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 N
6/12/2005	1:20:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13B on Rte 24 S	Rte 24 S Millemarker 20.2	Rte 24 S
6/26/2005	10:45:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 14 on Rte 24		Rte 24 S
7/1/2005	7:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy				Exit 13A on Rte 24		Rte 24 N
7/14/2005	12:15:00 PM	Non-Fatal injury	2	1	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear				10 feet N from Exit 13B on Rte 24		Rte 24
8/1/2005	7:15:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP TO 24 SOUTH - ROUTE 44 Rte 44 E			ROUTE 44 Rte 44 E / RAMP - RT 44 EB TO RT 24 SB
8/14/2005	3:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	Rte 44				
8/25/2005	4:15:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
8/27/2005	3:44:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
9/30/2005	10:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain				Exit 13 on Rte 24		Rte 24 N
9/27/2005	1:10:00 PM	Non-Fatal injury	6	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
9/27/2005	6:30:00 AM	Non-Fatal injury	2	1	0	Rear-to-rear	Rear-to-rear	Wet	Daylight	Rain				30 feet S from Exit 14A on Rte 24 N		Rte 24 N
10/16/2005	2:13:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain				Exit 13 on Rte 24		Rte 24 S
10/21/2005	10:05:00 PM	Non-Fatal injury	2	3	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear			JUST NORTH OF ROUTE 44 - Rte 24 N	Exit 13A on Rte 24		Rte 24 N / Rte 44
10/21/2005	10:05:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			JUST NORTH OF RTE 44 - Rte 24 N			Rte 24 N
11/1/2005	11:00:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24	RAMP - RT 24 SB TO RT 44 WB				
11/4/2005	12:37:00 PM	Non-Fatal injury	4	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 24		Rte 24 N
11/16/2005	5:50:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear				5280 feet S from Exit 14A on Rte 24 N		Rte 24 N
11/19/2005	6:10:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 13B on Rte 24 S		Rte 24 S
11/30/2005	7:25:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain				4000 feet S from Exit 14 on Rte 24		Rte 24 S
12/12/2005	4:25:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			1/2 MILE NORTH OF ROUTE 44. - Rte 24 S		Rte 24 S Millemarker 21.3	Rte 24 S
1/5/2006	2:39:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			TOWNE FAIR TIRE			ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB Rte 24
1/20/2006	7:30:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear						ROUTE 44 Rte 44 E / RAMP - RT 24 NB TO RT 44 EB Rte 24
1/26/2006	11:11:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 W / RAMP - RT 24 NB TO RT 44 WB Rte 24 N
1/31/2006	2:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Not reported	Daylight	Rain						Rte 24 / Rte 495
2/1/2006	12:46:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy			100 feet S from PLEASANT STREET OVERPASS			Rte 24 N / PLEASANT STREET
2/4/2006	1:45:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Exit 14 on Rte 24		Rte 24 S
2/21/2006	11:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
3/1/2006	7:15:00 AM	Non-Fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy						BROADWAY Rte 104 S / RAMP - RT 24 NB TO RT 44 WB Rte 104
3/2/2006	5:07:00 PM	Non-Fatal injury	2	2	0	Angle	Angle	Snow	Dark - lighted roadway	Snow			ON RAMP			RAMP - RT 44 EB TO RT 24 SB Rte 44 / Rte 24
3/4/2006	6:44:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dusk	Clear						ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB Rte 24
3/22/2006	9:14:00 PM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB Rte 24
3/27/2006	4:20:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 24 S		Rte 24 S / Rte 24
3/27/2006	7:07:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear						RAMP - RT 24 NB TO RT 44 EB Rte 44 / PARAMOUNT DRIVE Rte 24
4/10/2006	3:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13A on Rte 24		Rte 24
4/17/2006	1:17:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				25 feet S from Exit 13A on Rte 24 S		Rte 24 S
5/13/2006	3:00:00 AM	Non-Fatal injury	1	1	0	Head-on	Head-on	Wet	Dusk	Rain/Fog, smog, smoke				200 feet S from Exit 14B on Rte 24 N		Rte 24 N
5/28/2006	8:40:00 AM	Non-Fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
6/1/2006	8:27:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						ROUTE 44 Rte 44 / RAMP - RT 44 EB TO RT 24 NB Rte 24
6/3/2006	8:30:00 AM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain				Exit 13A on Rte 24 S		Rte 24 S
6/21/2006	11:04:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
7/1/2006	3:30:00 PM	Non-Fatal injury	2	1	0	Not reported	Not reported	Wet	Daylight	Rain/Severe crosswinds	Rte 24 S	Rte 495				
7/20/2006	4:30:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
7/29/2006	2:36:00 PM	Non-Fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 W / RAMP - RT 24 NB TO RT 44 EB Rte 24
8/23/2006	5:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Not reported	Daylight	Clear/Clear						ROUTE 44 Rte 44 W / RAMP - RT 24 NB TO RT 44 EB Rte 24
8/25/2006	12:45:00 PM	Non-Fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Rain/Cloudy			CHRYSLER CAR DEALERSHIP			ROUTE 44 Rte 44 W / RAMP - RT 44 WB TO RT 24 NB
9/6/2006	3:41:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 W / RAMP - RT 24 NB TO RT 44 WB Rte 24
9/19/2006	11:45:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
9/28/2006	4:54:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24 S	ROUTE 44 Rte 44 E				
9/29/2006	4:53:00 PM	Non-Fatal injury	5	5	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				10.0 feet N from Exit 13B on Rte 24 S		Rte 24 S
10/3/2006	5:47:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 N
10/10/2006	5:06:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	RAMP - RT 24 SB TO RT 44 EB Rte 24 E	Rte 44 E				
10/20/2006	12:15:00 PM	Non-Fatal injury	1	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear						Rte 24 / Rte 495
10/25/2006	5:10:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S
11/13/2006	2:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain	RAMP RT 495 NB TO RT 24 NB	INTERSTATE 495 Rte 495 N				
11/20/2006	6:16:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 14 on Rte 24		Rte 24 S
12/5/2006	8:40:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						ROUTE 44 Rte 44 E / RAMP - RT 24 SB TO RT 44 EB Rte 24
12/11/2006	2:45:00 AM	Non-Fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear				Exit 13A on Rte 24		Rte 24
12/14/2006	10:44:00 PM	Non-Fatal injury	3	3	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear				50.0 feet S from Exit 13A on Rte 24 S		Rte 24 S
4/13/2004	4:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 24 S			Rte 24 S
6/9/2004	1:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			BRADFORD TRAILER - Rte 44			Rte 44 / Rte 24
10/15/2004	4:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 24 S			Rte 24 S
12/31/2004	5:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			OF ROUTE 495 - Rte 24 S			Rte 24 S / Rte 495
2/12/2005	6:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear/Cloudy						Rte 24
2/19/2005	1:05:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24					
3/5/2005	11:05:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						2000 feet S from Intersection Rte 24 N / Rte 495
3/23/2005	4:15:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Daylight	Cloudy						Rte 44 / Rte 24
4/25/2005	6:18:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
6/7/2005	11:10:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13B on Rte 24		AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 24 NB TO RT 44 WB
8/9/2005	10:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 13A on Rte 24		Rte 24
8/11/2005	5:00:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				16000 feet S from Exit 13A on Rte 24 S		Rte 24 S
8/12/2005	5:04:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 44 / Rte 24
9/21/2005	4:25:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			NORTH OF RTE 44 - Rte 24 S			Rte 24 S
2/10/2006	3:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S / Rte 44
3/24/2006	8:33:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy						BROADWAY Rte 44 N / RAMP - RT 138 TO RT 495 NB Rte 24
3/30/2006	7:46:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						ORCHARD STREET Rte 44 / RAMP - RT 24 NB TO RT 44 WB Rte 44
4/9/2006	6:00:00 PM	Not Reported	1	0	0	Not reported	Not reported	Wet	Dusk	Rain			SERVICE AREA	Exit 495 on Rte 24		Rte 24
5/28/2006	6:42:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy				Exit 13 on Rte 24		Rte 24 N
8/9/2006	6:15:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 44 / Rte 24
11/13/2006	5:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Wet	Daylight	Cloudy						ROUTE 44 Rte 44 / RAMP - RT 44 EB TO RT 24 SB
12/24/2006	10:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13A on Rte 24		Rte 24
12/29/2006	6:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear				200 feet S from Exit 13A on Rte 24 S		Rte 24 S
1/15/2004	2:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
1/15/2004	3:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Sand, mud, dirt, oil, gravel	Daylight	Clear			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
2/2/2004	8:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
2/9/2004	7:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
2/12/2004	4:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S / Rte 44
3/5/2004	4:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
3/5/2004	6:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			Rte 24 S			5940 feet N from Intersection Rte 24 S / Rte 44
3/9/2004	8:25:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy			Rte 24 S			1320 feet S from Exit 14 on Rte 24
3/12/2004	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Snow			Rte 24 S			660 feet N from Intersection Rte 24 S / Rte 44
3/12/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Snow			Rte 24 S	5280 feet S from Exit 14 on Rte 24		Rte 24 S
3/15/2004	7:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear			RAMP FROM RTE 495 SB TO RTE 24 NB - INTERSTATE 495 Rte 495 S			INTERSTATE 495 Rte 495 S / RAMP - RT 495 SB TO RT 24 NB
3/21/2004	12:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 44 EB
4/15/2004	4:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 24 S	3960 feet N from Exit 13B on Rte 24 S		Rte 24 S
4/21/2004	4:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24

RAYNHAM	1/1/2004	12/31/2006	Intersection is similar to:												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
8/9/2004	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
9/17/2004	4:30:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 13 on Rte 24 S		Rte 24 S / Rte 44
8/25/2004	7:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			@TO EXIT FOR RT 44 E/B. - ANNETS MEMORIAL HIGHWAY Rte 24 N			ANNETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 44 EB
8/25/2004	7:16:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			@EXIT FOR RT 44 E/B. - ANNETS MEMORIAL HIGHWAY Rte 24 N			ANNETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 44 EB
9/26/2004	6:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
9/8/2004	1:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
9/16/2004	3:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			Rte 24 S			Rte 24 S
9/22/2004	1:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
9/24/2004	3:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
9/25/2004	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SOUTH OF ROUTE 24. - Rte 495 N			Rte 495 N / Rte 24
9/27/2004	4:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
10/5/2004	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
10/8/2004	5:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
10/22/2004	3:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain			495 Rte 24 S	1 feet S from Exit 7 on Rte 24		495 Rte 24 S / Rte 495
10/22/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy			EXIT 14 - Rte 24	Exit 14A on Rte 24		Rte 24
10/25/2004	6:12:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain/Cloudy			Rte 24 N	Exit 7 on Rte 24		Rte 24 N
10/27/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
11/5/2004	4:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
11/8/2004	4:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear			Rte 24 S	Exit 14 on Rte 24		Rte 24 S
11/9/2004	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear			Rte 24 S	300 feet N from Exit 13A on Rte 24 S		Rte 24 S
11/11/2004	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			Rte 24 S		Rte 24 S Milemarker 20.0	Rte 24 S
11/13/2004	11:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Clear/Clear			Rte 24 S			Rte 24 S
11/17/2004	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
11/18/2004	5:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
11/21/2004	1:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy			RAMP- RTE 44EB TO RTE 24NB AT ME - ANNETS MEMORIAL HIGHWAY Rte 24 N			ANNETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 44 EB TO RT 24 NB
11/24/2004	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Rain			Rte 24 S	Exit 13B on Rte 24 S		Rte 24 S
12/6/2004	10:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			RAMP FROM 44EB TO RT 24 NB. - ROUTE 44 Rte 44			ROUTE 44 Rte 44 / RAMP - RT 44 EB TO RT 24 NB
12/9/2004	10:05:00 AM	Property damage only (none injured)	5	0	0	Not reported	Not reported	Wet	Daylight	Clear			UNDER BRIDGE OF RT 44 - Rte 24 N			Rte 24 N
12/13/2004	1:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			RAMP FROM RT 24 S TO RT 44E - Rte 24 S	Exit 13A on Rte 24 S		Rte 24 S
12/15/2004	11:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24		44 ROUTE 44			44 ROUTE 44
12/28/2004	8:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
12/28/2004	8:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N	Exit 13 on Rte 24		Rte 24 N
12/28/2004	9:10:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear			AT EXIT 13 - Rte 24 N	Exit 13 on Rte 24		Rte 24 N
1/5/2005	5:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
1/8/2005	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Slush	Daylight	Rain/Sleet, hail (freezing rain or drizzle)						RAMP - RT 44 EB TO RT 24 NB Rte 44 / Rte 24
1/10/2005	8:12:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy						SOUTH STREET EAST / Rte 24
1/11/2005	4:50:00 PM	Property damage only (none injured)	3	0	0	Rear-to-rear	Rear-to-rear	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
1/20/2005	12:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)				Exit 14 on Rte 24		Rte 24 S
2/2/2005	6:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RAMP RTE 24 NB TO RTE 495 SB - RAMP - RT 24 NB TO RT 495 SB			RAMP - RT 24 NB TO RT 495 SB / Rte 495
2/5/2005	4:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
2/13/2005	4:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy						2640 feet S from Intersection Rte 24 S / Rte 495
2/22/2005	3:17:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Cloudy					Rte 24 N Milemarker 20.8	Rte 24 N
2/25/2005	8:30:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Snow/Cloudy						Rte 24 N / Rte 495
3/2/2005	8:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				Exit 7A on Rte 495 N		INTERSTATE 495 Rte 495 N / RAMP - RT 495 NB TO RT 24 NB
3/4/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 14 on Rte 24		Rte 24 S
3/9/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				1320 feet S from Exit 13B on Rte 24 S		Rte 24 S
3/12/2005	10:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			NORTH OF RT 44. - Rte 24 N			Rte 24 N / Rte 44
3/17/2005	4:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 7 on Rte 24		Rte 24 N
3/30/2005	4:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				2640 feet S from Exit 13A on Rte 24 S		Rte 24 S
3/30/2005	11:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			AT EXIT 13 ON AND OFF RAMPS. - ANNETS MEMORIAL HIGHWAY Rte 24 N	Exit 13 on Rte 24		ANNETS MEMORIAL HIGHWAY Rte 24 N
4/15/2005	4:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2640 feet N from Exit 13B on Rte 24 S		Rte 24 S
4/20/2005	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13B on Rte 24 S		Rte 24 S
4/21/2005	5:08:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RT 24SB SOUTH OF RT 495 - ANNETS MEMORIAL HIGHWAY Rte 24 S	Exit 14 on Rte 24		ANNETS MEMORIAL HIGHWAY Rte 24 S / Rte 495
4/28/2005	6:48:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy						Rte 24 S
5/5/2005	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				50 feet E from Exit 13A on Rte 24 S		Rte 24 S
5/11/2005	5:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24 N		ANNETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 44 EB Rte 44 E
5/19/2005	7:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 13 on Rte 24		ANNETS MEMORIAL HIGHWAY Rte 24 N
5/20/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 13B on Rte 24 S		Rte 24 S
5/20/2005	5:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				5280 feet S from Exit 14 on Rte 24		ANNETS MEMORIAL HIGHWAY Rte 24 S
5/22/2005	10:57:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			RAMP FROM RT 24SB TO RT 44WB. - RAMP - RT 24 SB TO RT 44 WB			RAMP - RT 24 SB TO RT 44 WB / Rte 24
6/9/2005	6:48:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 feet N from Exit 13 on Rte 24		Rte 24 N
6/14/2005	1:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
6/17/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				5280 feet S from Exit 12 on Rte 24		Rte 24 S
6/20/2005	4:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear				Exit 13B on Rte 24		Rte 24
6/21/2005	1:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			SOUTH OF ON-RAMP FROM RT 495 SB. - ANNETS MEMORIAL HIGHWAY Rte 24 S	Exit 14 on Rte 24		ANNETS MEMORIAL HIGHWAY Rte 24 S / Rte 495
6/29/2005	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N
7/8/2005	3:32:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						Rte 24 S
8/30/2005	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain/Rain						Rte 24 N
8/30/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 24 N
9/8/2005	6:50:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N / Rte 44
9/13/2005	4:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 24 S					Rte 24 S
9/19/2005	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
9/19/2005	10:00:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 S
9/21/2005	8:03:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
9/22/2005	2:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				1500 feet S from Exit 14 on Rte 24		Rte 24 S
9/23/2005	12:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 7A on Rte 495		RAMP - RT 495 SB TO RT 24 NB Rte 495
9/26/2005	12:48:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						KING STREET Rte 24 N
9/30/2005	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				1000 feet N from Exit 13B on Rte 24		Rte 24
10/7/2005	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						Rte 24 / Rte 44
10/7/2005	10:44:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
10/8/2005	3:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain				Exit 14 on Rte 24		Rte 24 S
10/14/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Rain				Exit 8 on Rte 24		Rte 24 N
10/17/2005	1:38:00 PM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			BETWEEN RT 44 RAMPS. - Rte 24 N			Rte 24 N
10/22/2005	3:07:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				1000 feet N from Exit 13B on Rte 24 S		Rte 24 S
10/28/2005	10:27:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				1000 feet N from Exit 13B on Rte 24 S		Rte 24 S
10/28/2005	12:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
11/3/2005	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 44 / Rte 24
11/3/2005	12:26:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
11/9/2005	5:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			NORTH OF RTE 44 - Rte 24 N			Rte 24 N / Rte 44
11/14/2005	1:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			500 feet S from ROUTE 44 OVERPASS - Rte 24 N			Rte 24 N
11/16/2005	4:55:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
11/19/2005	3:49:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
11/25/2005	2:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP TO RTE 495 NB - Rte 24 S	Exit 14 on Rte 24		Rte 24 S
12/10/2005	4:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)				Exit 13A on Rte 24 S		Rte 24 S
12/10/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)				Exit 13A on Rte 24 S		Rte 24 S
12/10/2005	5:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)				Exit 13A on Rte 24 S		Rte 24 S
12/14/2005	5:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
12/15/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear					Rte 24 S Milemarker 19.7	Rte 24 S
12/16/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Snow						Rte 24 / Rte 495
12/16/2005	3:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Clear/Sleet, hail (freezing rain or drizzle)				Exit 13 on Rte 24		Rte 24 N
12/16/2005	3:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)				Exit 13 on Rte 24		Rte 24 N
12/16/2005	5:51:00 PM	Property damage only (none injured)	4	0	0	Not reported	Not reported	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)			WYNNIN WYNN LAW FIRM - ROUTE 44 Rte 104			ROUTE 44 Rte 104 / Rte 24
12/17/2005	2:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SOUTH OF RT 495. - Rte 24 S			Rte 24 S
12/20/2005	3:57:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2500 feet S from Exit 14 on Rte 24		Rte 24 S
1/2/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Cloudy				Exit 14 on Rte 24		402 feet S from Intersection Rte 24 S
1/1/2006	5:19:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Cloudy	Rte 24 S	ROUTE 44 Rte 44 E				
1/13/2006	4:04:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 24 S
1/19/2006	3:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Clear						RAMP - RT 24 NB TO RT 44 WB Rte 44 / Rte 24
1/20/2006	8:25:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
1/21/2006	11:33:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
1/30/2006	6:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				Exit 7A on Rte 495		Rte 495 / Rte 24
2/5/2006	6:24:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						ROUTE 44 Rte 44 W / RAMP - RT 44 WB TO RT 24 SB
2/11/2006	1:08:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear						ROUTE 44 Rte 44 E / RAMP - RT 24 NB TO RT 44 EB Rte 44
2/11/2006	1:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB Rte 24
2/11/2006	12:31:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						ROUTE 44 Rte 44 W / RAMP - RT 24 NB TO RT 44 EB Rte 24
2/12/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow/Snow				Exit 14 on Rte 24		Rte 24 S
2/12/2006	7:29:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Not reported	Not reported			CHRISTIAN HILL			SOUTH STREET EAST Rte 44 E / Rte 24
2/14/2006	7:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13 on Rte 24		Rte 24 N
2/25/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow				100 feet S from Exit 14 on Rte 24		Rte 24 S
2/25/2006	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dry	Cloudy				Exit 14A on Rte 24		Rte 24 / Rte 44
2/28/2006	2:23:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 14 on Rte 24		Rte 24 S
3/9/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						ROUTE 44 Rte 24 S / RAMP - RT 24 NB TO RT 44 EB
3/9/2006	8:34:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				5280 feet N from Exit 13 on Rte 24		Rte 24 N
3/10/2006	8:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 13 on Rte 24		Rte 24 N
3/24/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				1500 feet S from Exit 14A on Rte 24 N		Rte 24 N
3/26/2006	5:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				1600 feet N from Exit 13A on Rte 24 S		Rte 24 S
3/26/2006	11:31:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						ROUTE 44 Rte 44 E / RAMP - RT 24 NB TO RT 44 EB Rte 24
3/27/2006	4:22:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2500 feet S from Exit 14 on Rte 24		Rte 24 S
3/31/2006	3:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 E / RAMP - RT 24 NB TO RT 44 EB Rte 24
4/5/2006	4:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 14A on Rte 24		Rte 24
4/5/2006	5:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy				Exit 13B on Rte 24 S		Rte 24 S
4/9/2006	4:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 13B on Rte 24 S		Rte 24 S
4/14/2006	8:20:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Rain/Cloudy				100 feet N from Exit 13B on Rte 24 S		Rte 24 S
4/15/2006	12:07:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 / RAMP - RT 44 EB TO RT 24 NB Rte 24
4/17/2006	12:00:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear						1000 feet N from Intersection Rte 24 / Rte 140
4/20/2006	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
4/26/2006	8:36:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 14A on Rte 24 N		Rte 24 N
5/1/2006	4:04:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						RAMP - RT 44 WB TO RT 24 NB Rte 44 / Rte 24
5/2/2006	8:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain				Exit 14A on Rte 24 N		Rte 24 N
5/3/2006	7:44:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/

RAYNHAM 1/1/2004 12/31/2006 Intersection is similar to:

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
8/5/2006	7:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 7 on Rte 24		Rte 24 S
9/12/2006	4:33:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB Rte 24
8/15/2006	8:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear/Clear	ROUTE 44 Rte 44 E	RAMP - RT 44 EB TO RT 24 NB				
8/15/2006	12:09:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			MANDARIAN RESTAURANT			ROUTE 44 Rte 44 E / RAMP - RT 44 EB TO RT 24 NB
9/15/2006	12:18:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain						ROUTE 44 Rte 44 E / RAMP - RT 44 EB TO RT 24 SB
8/22/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			HONDA DEALERSHIP			ROUTE 44 / RAMP - RT 44 WB TO RT 24 NB Rte 44 W
8/25/2006	12:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 E / RAMP - RT 44 EB TO RT 24 NB
9/29/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 44 EB
9/3/2006	5:02:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 13B on Rte 24 S		Rte 24 S
9/8/2006	5:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				200 feet N from Exit 13 on Rte 24		Rte 24 N
9/10/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 44 Rte 44 E / Rte 24
9/15/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1800 feet N from Exit 13 on Rte 24		Rte 24 N
9/15/2006	7:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy					Rte 24 N Milemarker 19.5	Rte 24 N
9/19/2006	2:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 13A on Rte 24 S		Rte 24 S
9/25/2006	5:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			MOBIL REST AREA SOUTHBOUND			Rte 24
9/30/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - roadway not lighted	Unknown				Exit 13A on Rte 24		Rte 24
10/18/2006	4:50:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						ORCHARD STREET Rte 24
10/19/2006	5:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
10/20/2006	2:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	ROUTE 44 Rte 44	ORCHARD AVENUE / RAMP - RT 24 NB TO RT 44 EB				
10/21/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 140
10/25/2006	10:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
10/26/2006	2:16:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				30.0 feet N from Exit 13B on Rte 24 S		Rte 24 S
11/9/2006	8:17:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy				10.00 feet S from Exit 14A on Rte 24 N		Rte 24 N
11/17/2006	11:19:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				Exit 13B on Rte 24 S		Rte 24 S
11/23/2006	2:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain/Rain				Exit 14 on Rte 24		Rte 24 S
12/1/2006	1:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Exit 13A on Rte 24 S		Rte 24 S
12/1/2006	5:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy					Rte 24 N Milemarker 22.0	Rte 24 N
12/1/2006	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy					Rte 24 N Milemarker 22.5	Rte 24 N
12/5/2006	4:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy						ROUTE 44 Rte 44 / RAMP - RT 24 NB TO RT 44 EB
12/5/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear				100.00 feet N from Exit 13A on Rte 24 S		Rte 24 S
12/8/2006	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 24 S
12/8/2006	4:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
12/16/2006	1:18:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain						Rte 44 / Rte 24
12/23/2006	11:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain				Exit 13A on Rte 24		Rte 24 / Rte 44
6/7/2004	12:20:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear	Rte 24 S					Rte 24 S
9/25/2004	8:00:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			ROUTE 44 Rte 24 S			ROUTE 44 Rte 24 S / Rte 44
4/2/2005	6:00:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain					Rte 24 Milemarker 91.0	Rte 24 S
11/9/2005	4:35:00 PM	Unknown	2	0	0	Angle	Angle	Wet	Dusk	Cloudy						165 RAMP - RT 44 EB TO RT 24 SB Rte 44
1/13/2006	11:09:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Fog, smog, smoke						Rte 24 S / Rte 495
5/1/2006	4:04:00 AM	Unknown	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 13B on Rte 24		Rte 24

STOUGHTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Feet_From
1/4/2005	11:24:00 PM	Fatal injury	3	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			1/4 MILE BEFORERTE 139 - Rte 24 N		Rte 24 N / Rte 139
2/28/2005	6:35:00 AM	Fatal injury	2	2	1	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				120 feet S from Exit 19 on Rte 24	Rte 24 S
1/13/2005	11:30:00 AM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 20A on Rte 24 N	Rte 24 N / RTE 139
1/6/2004	8:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	Exit 20A on Rte 24 N	Rte 24 N
1/20/2004	12:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			NORTH OF AVON TOWN LINE - Rte 24 S	Exit 19 on Rte 24	Rte 24 S
3/20/2004	7:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N
4/8/2004	10:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 20A on Rte 24 N	Rte 24 N
4/15/2004	10:28:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			OFF RAMP FROM RT 24 N - LINDELOF A VENUE		LINDELOF A VENUE
4/17/2004	1:05:00 AM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N	100 feet N from Exit 20A on Rte 24 N	Rte 24 N
5/10/2004	8:00:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			LINDELOF A VENUE		LINDELOF A VENUE / RAMP - RT 24 SB TO RT 139 EB
5/21/2004	3:26:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			Rte 24 S	500 feet N from Exit 20A on Rte 24 S	Rte 24 S
6/15/2004	5:18:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 S	800 feet N from Exit 20B on Rte 24 S	Rte 24 S
7/4/2004	1:49:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear			MASS HWY RTE 24 - Rte 24 N		Rte 24 N
7/11/2004	11:02:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy			Rte 24 N	2000 feet N from Exit 20A on Rte 24 N	Rte 24 N
8/8/2004	12:21:00 PM	Non-fatal injury	1	5	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	5000 feet S from Exit 20A on Rte 24 N	Rte 24 N
8/8/2004	12:41:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 24 S	Exit 20A on Rte 24 S	Rte 24 S
8/17/2004	10:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Cloudy			ON RAMP FROM RT 139 TO RT 24 NOR - AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 139 EB TO RT 24 NB
10/7/2004	9:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 20A on Rte 24 N	Rte 24 N
11/3/2004	12:00:00 PM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Unknown	Clear			Rte 24 S	10 feet N from Exit 20A on Rte 24 S	Rte 24 S / Rte 139
11/14/2004	6:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			PAGE STREET OVER PASS - Rte 24 N	1200 feet S from Exit 20A on Rte 24 N	Rte 24 N
12/28/2004	11:05:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear			NORTH OF HARRISON BLVD. - AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 139 WB
1/12/2005	7:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Snow	Dark - lighted roadway	Snow					TURNPIKE STREET Rte 139 / PLEASANT STREET Rte 24
1/15/2005	3:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy				1000 feet S from Exit 20A on Rte 24 N	Rte 24 N
1/16/2005	10:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow /Clear				Exit 20A on Rte 24	4000 feet S from Intersection Rte 24
1/24/2005	12:01:00 AM	Non-fatal injury	2	4	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Clear				Exit 19 on Rte 24	Rte 24
2/17/2005	8:00:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE 93 - Rte 24 N		Rte 24 N / Rte 24
2/25/2005	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Slush	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)				Exit 19 on Rte 24	Rte 24
3/12/2005	3:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow /Snow				Exit 20A on Rte 24 N	Rte 24 N
4/11/2005	9:45:00 PM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
4/15/2005	3:55:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
4/15/2005	10:05:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				2500 feet N from Exit 20B on Rte 24 S	Rte 24 S
5/12/2005	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			SIGN FOR KOHLS - Rte 24 S	Exit 20A on Rte 24 S	Rte 24 S
5/19/2005	9:07:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
6/28/2005	4:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			1 MILE NORTH OD RT. 139 - Rte 24		Rte 24
7/18/2005	7:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 20A on Rte 24 N	Rte 24 N
8/8/2005	4:35:00 PM	Non-fatal injury	1	1	0	Unknown	Unknown	Dry	Daylight	Cloudy/Cloudy				1500 feet N from Exit 20B on Rte 24 N	Rte 24 N
8/14/2005	7:54:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Rain			NEAR RAMP AND 139 - LINDELOF AVENUE Rte 139		LINDELOF AVENUE Rte 139 / RAMP - RT 24 NB TO RT 139 WB
9/2/2005	2:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
9/3/2005	2:53:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
9/12/2005	9:05:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear					400 Rte 24 N
9/28/2005	8:26:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
10/20/2005	3:32:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20B on Rte 24 S	Rte 24 S
10/23/2005	3:00:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain				Exit 20A on Rte 24 S	Rte 24 S
10/25/2005	8:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Severe crosswinds					Rte 24 N / Rte 139
11/11/2005	4:00:00 PM	Non-fatal injury	3	4	0	Rear-to-rear	Rear-to-rear	Dry	Dawn	Clear				Exit 20B on Rte 24	Rte 24
11/12/2005	5:10:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
11/18/2005	7:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
11/23/2005	7:08:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Cloudy/Other					200 feet W from Intersection LINDELOF AVENUE Rte 139 W / RAMP - RT 139 EB TO RT 24 NB Rte 24 W
11/24/2005	5:55:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 20B on Rte 24 N	Rte 24 N
11/30/2005	1:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				3000 feet S from Exit 20A on Rte 24 S	Rte 24 S
1/7/2006	5:39:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 S
1/10/2006	4:20:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			APPROX. 1/2 MILE BEFORE EXIT 20	Exit 20A on Rte 24 S	Rte 24 S
1/25/2006	12:00:00 AM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy				Exit 20A on Rte 24 N	Rte 24 N
1/29/2006	10:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear			RAMP TO RT 24 NB		LINDELOF AVENUE Rte 139 / Rte 139
2/3/2006	11:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy				Exit 20B on Rte 24	Rte 24
2/10/2006	7:15:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				100 feet S from Exit 20A on Rte 24 N	Rte 24 N
2/27/2006	1:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 139 WB
3/7/2006	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
3/29/2006	6:48:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
3/31/2006	9:30:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				25 feet N from Exit 20A on Rte 24 N	Rte 24 N
4/11/2006	3:39:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1500 feet N from Exit 20B on Rte 24	Rte 24
4/21/2006	4:15:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
5/29/2006	4:28:00 PM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 20B on Rte 24 N	Rte 24 N
6/1/2006	1:30:00 PM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear					2640 feet N from Intersection Rte 24 N / Rte 27
6/12/2006	10:15:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 20B on Rte 24	Rte 24
6/23/2006	2:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 18 on Rte 24	Rte 24
6/29/2006	10:07:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20A on Rte 24 S	Rte 24 S
7/8/2006	9:05:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
7/17/2006	6:18:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 S
8/20/2006	7:55:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 20B on Rte 24 N	Rte 24 N
8/29/2006	11:39:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 20A on Rte 24 N	Rte 24 N
9/4/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy					Rte 24 S
9/16/2006	5:01:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
10/6/2006	1:30:00 AM	Non-fatal injury	1	1	0	Unknown	Unknown	Dry	Dark - unknown roadway lighting	Clear					Rte 24 S
10/6/2006	12:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 S
10/9/2006	3:53:00 AM	Non-fatal injury	1	5	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20 on Rte 24 S	AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP-RT 24 SB TO RT 139 EB
10/13/2006	10:45:00 AM	Non-fatal injury	1	1	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 139 EB TO RT 24 NB
10/23/2006	7:35:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 20B on Rte 24 N	Rte 24 N
10/29/2006	4:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Exit 20A on Rte 24	Rte 24
11/4/2006	4:52:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			SOUTH OF RT 139		Rte 24 S / Rte 139
11/14/2006	8:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				2500 feet S from Exit 20A on Rte 24 N	Rte 24 N
6/26/2004	7:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S		Rte 24 S
8/15/2004	4:35:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S	Exit 20B on Rte 24 S	Rte 24 S
10/1/2004	5:55:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	Exit 20A on Rte 24	Rte 24
1/25/2005	10:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Wet	Daylight	Clear					Rte 24
10/8/2006	12:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 139 EB TO RT 24 NB
1/16/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			CANTON TOWN LINE - Rte 24 N	Exit 20 on Rte 24 N	Rte 24 N
1/23/2004	8:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N		Rte 24 N
1/29/2004	3:30:00 PM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Ice	Daylight	Clear			Rte 24 S	Exit 20A on Rte 24 S	Rte 24 S
2/28/2004	4:57:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 S	Exit 20A on Rte 24 S	Rte 24 S
3/3/2004	7:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24	500 feet N from Exit 20A on Rte 24	Rte 24
3/19/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	Exit 20B on Rte 24 S	Rte 24 S
4/16/2004	3:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 24S		Rte 24S
4/21/2004	9:09:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N	100 feet S from Exit 20B on Rte 24 N	Rte 24 N
5/2/2004	1:52:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			B.J.'S WHOLESALE STORE - Rte 24 N	800 feet S from Exit 20A on Rte 24 N	Rte 24 N
5/8/2004	11:30:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 N	500 feet N from Exit 20B on Rte 24 N	Rte 24 N
5/9/2004	7:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			Rte 24 S	350 feet N from Exit 20A on Rte 24 S	Rte 24 S
5/15/2004	3:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 24 S	400 feet S from Exit 20B on Rte 24 S	Rte 24 S
6/6/2004	5:12:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear			500 feet S from FROM PAGE STREET UNDERPASS - Rte 24 N		Rte 24 N / PAGE STREET
7/13/2004	8:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy			Rte 24 N	300 feet N from Exit 20A on Rte 24 N	Rte 24 N
7/29/2004	4:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 24 S	2640 feet S from Exit 20A on Rte 24 S	Rte 24 S
8/15/2004	9:02:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			LINDELOF AVENUE Rte 139 N		200 feet W from Intersection LINDELOF AVENUE Rte 139 N / RAMP - RT 139 EB TO RT 24 NB Rte 24 W
8/25/2004	6:12:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ACROSS FROM RAMP SYSTEM - Rte 24 S		Rte 24 S / Rte 138
8/25/2004	6:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 S	2500 feet N from Exit 20A on Rte 24 S	Rte 24 S
8/30/2004	2:22:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 20B on Rte 24 N	Rte 24 N
8/30/2004	2:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 N	100 feet S from Exit 20A on Rte 24 N	Rte 24 N
9/3/2004	5:51:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 20B on Rte 24 N	Rte 24 N
9/22/2004	4:08:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	400 feet N from Exit 20B on Rte 24 S	Rte 24 S
9/22/2004	5:54:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	500 feet S from Exit 20B on Rte 24 S	Rte 24 S
9/30/2004	7:44:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	20 feet N from Exit 20A on Rte 24 N	Rte 24 N
9/30/2004	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	20 feet S from Exit 20A on Rte 24 N	Rte 24 N
10/22/2004	12:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy			ADJACENT TO BJ'S WHOLESALE CLUB - Rte 24 S		Rte 24 S
1/13/2004	7:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 139 WB Rte 139
1/18/2004	6:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy /Clear			Rte 24 N	Exit 20A on Rte 24 N	Rte 24 N
1/13/2004	2:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy /Cloudy			Rte 24 N	Exit 20B on Rte 24 N	Rte 24 N
12/11/2004	10:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy			SOUTH OF EXIT 20B (NEXT TO BOBS - Rte 24 N	Exit 20B on Rte 24 N	Rte 24 N
12/22/2004	9:06:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear			OFF RAMP 20B - Rte 24 S	Exit 20B on Rte 24 S	Rte 24 S
1/26/2005	6:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - roadway not lighted	Snow /Cloudy				1000 feet S from Exit 20A on Rte 24 N	Rte 24 N
2/5/2005	9:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				50 feet S from Exit 20A on Rte 24 N	Rte 24 N
2/7/2005	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 139 EB
2/14/2005	6:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				3000 feet S from Exit 20A on Rte 24 N	Rte 24 N
2/25/2005	9:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
3/11/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear					500 feet N from Intersection Rte 24 N / Rte 139
3/15/2005	6:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
3/20/2005	5:09:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				3000 feet N from Exit 20B on Rte 24 S	Rte 24 S
4/21/2005	9:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
5/14/2005	10:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				100 feet S from Exit 20A on Rte 24 N	Rte 24 N
5/26/2005	10:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Rain/Rain			JUST NORTH OF EXIT 19B (CENTRAL - Rte 24 S	Exit 19 on Rte 24	Rte 24 S / CENTRAL STREET
6/1/2005	8:00:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy				Exit 20A on Rte 24 S	Rte 24 S
6/7/2005	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20B on Rte 24 S	Rte 24 S
6/8/2005	9:11:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 139 EB
6/12/2005	1:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Cloudy					Rte 24 N
6/23/2005	3:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 139 EB TO RT 24 NB
6/25/2005	4:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
6/30/2005	4:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain				Exit 20B on Rte 24 S	Rte 24 S
7/11/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				4000 feet S from Exit 20A on Rte 24	Rte 24 / Rte 139
7/18/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 20B on Rte 24 S	Rte 24 S
8/7/2005	9:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			NORTH OF RTE 139 - Rte 24 S		Rte 24 S / Rte 139
8/17/2005	8:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S

STOUGHTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Feet_From
8/26/2005	2:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1500 feet N from Exit 20A on Rte 24 S	Rte 24 S
8/31/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy					Rte 24 S
10/10/2005	1:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain	LINDELOF AVENUE Rte 139	Rte 24 / RAMP - RT 139 EB TO RT 24 NB			
10/14/2005	5:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dusk	Rain				Exit 19 on Rte 24	Rte 24
10/24/2005	6:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Other	Cloudy/Clear					Rte 24 N
1/1/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 20B on Rte 24	Rte 24
11/1/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BETWEEN 20 AND 19 N OF BJ SIGN - Rte 24 S	150 feet S from Exit 20B on Rte 24 S	Rte 24 S
11/11/2005	11:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N
12/10/2005	3:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Dark - roadway not lighted	Snow /Cloudy				Exit 20A on Rte 24 S	Rte 24 S
12/23/2005	7:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadw ay	Clear/Clear				Exit 20B on Rte 24 S	Rte 24 S
12/30/2005	3:54:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
1/6/2006	2:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy				500 feet S from Exit 20 on Rte 24	Rte 24
1/12/2006	7:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				2500 feet N from Exit 20B on Rte 24 N	Rte 24 N
12/1/2006	4:08:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadw ay	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
1/24/2006	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				100 feet N from Exit 20A on Rte 24 S	Rte 24 S
1/24/2006	6:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadw ay	Clear/Clear				600 feet N from Exit 20A on Rte 24 S	Rte 24 S
1/26/2006	2:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				1500 feet N from Exit 20A on Rte 24 S	Rte 24 S
2/3/2006	7:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy					Rte 24 N / Rte 139
2/3/2006	7:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain				1000 feet N from Exit 20 on Rte 24	Rte 24 N
2/3/2006	11:04:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Fog, smog, smoke/Fog, smog, smoke					Rte 24 S
2/3/2006	11:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Fog, smog, smoke/Fog, smog, smoke					Rte 24 S
2/4/2006	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 20A on Rte 24 S	Rte 24 S
2/4/2006	4:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			NEAR IKEA STORE	Exit 20A on Rte 24	Rte 24
2/5/2006	3:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadw ay	Rain/Rain					Rte 24 S
2/12/2006	7:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Blow ing sand, snow					AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 139 EB TO RT 24 NB
2/26/2006	6:17:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadw ay	Clear /Other					LINDELOF AVENUE Rte 139 / RAMP - RT 139 EB TO RT 24 NB Rte 24
2/28/2006	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
3/3/2006	7:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ACROSS FROM JORDANS FURNITURE	1000 feet S from Exit 20A on Rte 24 N	Rte 24 N
3/12/2006	11:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
3/13/2006	3:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
3/21/2006	8:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
4/9/2006	6:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			SOUTH OF EXIT 20B	Exit 20B on Rte 24 S	Rte 24 S
4/17/2006	2:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 24 N / Rte 27
4/21/2006	2:42:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 24 N / Rte 139
4/29/2006	2:26:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 24 N / CENTRAL STREET
5/20/2006	5:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 20B on Rte 24 S	Rte 24 S
6/8/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain				Exit 20B on Rte 24 S	Rte 24 S
6/14/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					Rte 24 S
6/15/2006	6:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy	Rte 24	Rte 139 E			
7/15/2006	1:27:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S
7/23/2006	10:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N
7/24/2006	4:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 20B on Rte 24 S	Rte 24 S
7/28/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			TRAVELING ON HIGHWAY		Rte 24
8/15/2006	9:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy					RAMP - RT 24 NB TO RT 139 EB / Rte 139
9/5/2006	7:44:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N
9/13/2006	9:25:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N
9/14/2006	6:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			NORTH OF ROUTE 139		Rte 24 N / Rte 139
9/20/2006	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N
9/26/2006	2:30:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				700 feet N from Exit 20B on Rte 24 N	Rte 24 N
10/2/2006	5:48:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 24 S
11/10/2006	3:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			ON RAMP FROM 139 TO 24NB	Exit 20A on Rte 24 N	Rte 24 N
11/20/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N
12/1/2006	10:30:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Wet	Daylight	Rain				Exit 20A on Rte 24	Rte 24 / Rte 139
12/20/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 S	Rte 24 S / Rte 139
12/29/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
12/29/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 20A on Rte 24 N	Rte 24 N
1/8/2004	9:45:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	Exit 20A on Rte 24 N	Rte 24 N
1/27/2005	7:30:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				150 feet S from Exit 20A on Rte 24 N	Rte 24 N
6/26/2005	12:30:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 19 on Rte 24	Rte 24 S
9/26/2006	12:00:00 PM	Unknown	3	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 20A on Rte 24	Rte 24

TAUNTON	1/1/2004	12/31/2006	Intersection is similar to:														
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From	
1/2/2004	9:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N			50 Feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
1/26/2004	2:30:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear			Rte 24 N		Rte 24 N Milemarker 18.9	Rte 24 N	
2/2/2004	8:30:00 AM	Non-Fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N	
2/6/2004	4:55:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Snow/Snow			Rte 24 N			Rte 24 N	
2/9/2004	1:55:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 NB	
2/20/2004	6:45:00 AM	Non-Fatal injury	2	2	0	Angle	Angle	Ice	Daylight	Clear/Clear			RAMP TO RT 140 FROM RT 24 SB. - ROUTE 140 Rte 140			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 SB	
4/13/2004	7:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 24 N			Rte 24 N	
4/17/2004	4:20:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 N		Rte 24 N Milemarker 18.0	Rte 24 N	
5/1/2004	2:10:00 AM	Non-Fatal injury	2	4	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 SB	
5/11/2004	7:15:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dawn	Clear			Rte 24	15 Feet N from Exit 13 on Rte 24		Rte 24 / Rte 24	
6/28/2004	6:28:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S	
7/1/2004	4:00:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
7/9/2004	2:55:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
7/19/2004	4:05:00 PM	Non-Fatal injury	3	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
7/24/2004	4:25:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
7/28/2004	10:35:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Rain			Rte 24 N		Rte 24 N Milemarker 18.6	Rte 24 N	
8/6/2004	7:15:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N / Rte 140	
8/12/2004	7:00:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			RAMP FROM RT 140 TO RT 24 NB. TA - ROUTE 140 Rte 140			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 NB	
9/23/2004	2:35:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 S			Rte 24 S / Rte 140	
11/9/2004	5:42:00 PM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S / Rte 140	
11/20/2004	2:15:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
12/6/2004	8:20:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy	Rte 140 N	RAMP - RT 24 NB TO RT 140 NB					
12/16/2004	1:44:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			RTE 140 SB AT LIGHTS FOR RTE 24 - Rte 140 S			Rte 140 S	
1/3/2005	12:25:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S	
2/12/2005	2:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 140	
2/28/2005	9:30:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Snow	Dark - roadway not lighted	Snow/Snow				Exit 12 on Rte 24 S		Rte 24 S	
3/11/2005	1:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Snow						Rte 140 N / Rte 24	
4/13/2005	3:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N	
4/27/2005	4:45:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
4/28/2005	6:42:00 AM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Fog, smog, smoke					Rte 24 N Milemarker 18.0	Rte 24 N	
4/29/2005	2:50:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy					Rte 24 S Milemarker 18.0	Rte 24 S	
5/10/2005	4:45:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
5/31/2005	4:21:00 PM	Non-Fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 24 S	
6/7/2005	9:08:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
6/13/2005	10:13:00 AM	Non-Fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy						ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
6/23/2005	1:40:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	Rte 140 S	RAMP - RT 140 TO RT 24 NB					
7/11/2005	5:54:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 24 N Milemarker 18.5	Rte 24 N	
7/18/2005	4:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S	
8/9/2005	10:04:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						150 Feet N from Intersection Rte 24 N / Rte 44	
8/20/2005	4:19:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
9/18/2005	1:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy				Exit 12 on Rte 24 S		Rte 24 S	
9/27/2005	7:00:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24		Rte 24 / Rte 24	
10/27/2005	10:04:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
11/4/2005	2:37:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N	
11/4/2005	12:37:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 24		Rte 24	
11/5/2005	11:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			140 SB EXIT - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
11/10/2005	3:45:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S	
11/25/2005	9:23:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			OFF RAMP TO ROUTE 140 SB - Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
12/16/2005	4:05:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Snow						Rte 24 N	
12/21/2005	12:37:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						25 feet N from Intersection Rte 24 N / Rte 140	
1/4/2006	7:35:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy						Rte 24 N	
1/23/2006	8:40:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Snow	Daylight	Snow				Exit 12 on Rte 24		Rte 24	
3/17/2006	6:35:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 24 N Milemarker 18.9	Rte 24 N	
3/20/2006	9:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						SCHOOL STREET Rte 104 / ARLINGTON STREET Rte 24	
3/22/2006	1:10:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				1000 Feet N from Exit 12 on Rte 24 S		Rte 24 S	
4/7/2006	8:15:00 AM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S	
4/17/2006	5:53:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
4/20/2006	6:19:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S	
4/30/2006	11:54:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24		Rte 24	
5/2/2006	5:20:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S from Exit 12 on Rte 24 S		Rte 24 S	
5/9/2006	7:25:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				50 Feet S from Exit 12 on Rte 24		Rte 24	
6/17/2006	9:16:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy						COUNTY STREET Rte 140 S / RAMP - RT 24 SB TO RT 140	
7/1/2006	6:47:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			EXIT 12			ROUTE 140 Rte 140 / RAMP - RT 140 TO RT 24 NB	
7/2/2006	8:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 24 N Milemarker 16.8	Rte 24 N	
7/19/2006	11:42:00 PM	Non-Fatal injury	1	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Rain				Exit 12 on Rte 24 S		Rte 24 S	
8/3/2006	5:45:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				250 Feet N from Exit 12 on Rte 24 S		Rte 24 S	
8/4/2006	4:15:00 AM	Non-Fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 140 W / Rte 24	
8/15/2006	10:12:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			RT 24S OFF RAMP ONTO RT 140 S	Exit 12 on Rte 24 S		Rte 24 S / Rte 140	
9/11/2006	3:10:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S	Rte 24 S Milemarker 16.7	Rte 24 S	
9/22/2006	6:45:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
9/23/2006	2:05:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			OFF RAMP			RAMP - RT 24 NB TO RT 140 NB / Rte 140	
9/27/2006	7:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N / Rte 140	
10/2/2006	6:40:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			HEADING NORTH	Exit 12 on Rte 24		Rte 24	
10/11/2006	7:30:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dusk	Rain						Rte 24 S	
10/17/2006	6:15:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Wet	Dusk	Rain/Cloudy				Exit 12 on Rte 24 S		Rte 24 S	
10/25/2006	3:50:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
10/25/2006	11:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 140 TO RT 24 NB	
10/28/2006	3:15:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Severe crosswinds			RTE 140 N/B RAMP TO RTE24 N/B			RAMP - RT 140 TO RT 24 NB / Rte 24	
10/30/2006	7:38:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			50 feet E from RICKS MOBIL			500 Feet S from Intersection COUNTY STREET Rte 140 N / RAMP - COUNTY ST TO RT 140 SB Rte 24 S	
10/31/2006	10:47:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S	
11/8/2006	8:20:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 24 N	
11/9/2006	6:00:00 AM	Non-Fatal injury	5	2	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy					Rte 24 N Milemarker 17.5	Rte 24 N	
6/12/2004	11:50:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 140 TO RT 24 SB Rte 140 S	
9/28/2004	8:51:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			Rte 24 N			Rte 24 N	
9/5/2005	5:12:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S	
9/8/2005	7:37:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				1000 feet S from Exit 12 on Rte 24 S		Rte 24 S	
11/16/2005	5:10:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				50 Feet S from Exit 11 on Rte 24		Rte 24 S	
4/13/2006	4:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						HIGHWAY 24 Rte 24 S / Rte 140	
5/30/2006	4:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S	
9/19/2006	2:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 13 on Rte 24		Rte 24	
9/27/2006	11:35:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	RAMP - BAY ST TO RT 495 NB	Rte 24 S / Rte 140					
12/8/2006	5:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 12 on Rte 24 S		Rte 24 S	
12/20/2006	7:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 44	
1/3/2004	2:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Fog, smog, smoke			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
1/6/2004	12:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S	
1/19/2004	2:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
1/23/2004	2:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 N		Rte 24 N Milemarker 18.9	Rte 24 N	
1/25/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24		BAY STREET			BAY STREET / LAKEVIEW AVENUE	
2/2/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dry	Clear			RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
3/1/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24						
3/17/2004	10:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Snow			Rte 24 N			Rte 24 N	
4/9/2004	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S			2640 Feet S from Intersection Rte 24 S / Rte 44	
4/13/2004	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N	
4/16/2004	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
4/28/2004	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear	Rte 24 N	RAMP - RT 24 NB TO RT 140 SB					
4/28/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 24	Exit 13A on Rte 24	Rte 24 Milemarker 18.6	Rte 24	
5/5/2004	3:30:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
5/5/2004	6:33:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24	300 Feet S from Exit 12 on Rte 24		Rte 24	
5/6/2004	11:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
5/20/2004	6:25:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
5/21/2004	3:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
6/8/2004	9:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			END OF RAMP FROM RTE 140 N/B - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB	
6/19/2004	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy			RAMP TO RT 24 N/B. - RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB / Rte 140	
7/3/2004	5:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S			Rte 24 S	
7/3/2004	9:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			NEAR RAMP FROM RT 140 N/B. - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 NB	
7/14/2004	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S	
7/19/2004	9:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 24 N			Rte 24 N	
7/22/2004	8:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 N			Rte 24 N	
8/2/2004	7:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
8/26/2004	5:15:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear	Rte 24 S						
9/8/2004	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain/Rain			ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB	
9/15/2004	7:30:00 AM	Property damage only (none injured)	4	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 140			Rte 140 / Rte 24	
9/22/2004	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S			50 feet N from Intersection Rte 24 S / Rte 44	
10/6/2004	5:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			RAMP TO RTE 140 - AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140	
10/14/2004	6:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			ROUTE 44 - Rte 24 S			Rte 24 S / Rte 44	
10/18/2004	7:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear	Rte 24 S	RAMP - RT 24 SB TO RT 140					
10/17/2004	10:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Snow			Rte 24 N			Rte 24 N	
10/22/2004	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N			Rte 24 N	
10/25/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			200 Feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 SB	
10/25/2004	6:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Rain/Cloudy			1/2 MILE SOUTH OF RT 140SB EXIT. - AMVETS MEMORIAL HIGHWAY Rte 24 N			2640 Feet S from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 SB	
10/25/2004	7:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dawn	Rain/Cloudy			SOUTH OF RAMP TO RT 140SB EXIT. - AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 140 SB	
11/8/2004	5:31:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
11/12/2004	9:16:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/S			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	
11/13/2004	6:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dawn	Snow/Sleet, hail (freezing rain or drizz			Rte 24			Rte 24	
11/21/2004	8:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	Rte 24 S	Rte 140 / RAMP - RT 140 TO RT 24 SB					
11/24/2004	6:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			20 feet W from QUEBECOR WORLD - 1133 COUNTY STREET Rte 140 S			300 feet S from Intersection 1133 COUNTY STREET Rte 140 S / Rte 24	
12/6/2004	5:50:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 24		100 feet N from Rte 24 Milemarker 15.9	Rte 24	
12/7/2004	2:32:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 24 S	Exit 12 on Rte 24 S		Rte 24 S	

TAUNTON 1/1/2004 12/31/2006 Intersection is similar to:

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
5/28/2005	6:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB
5/28/2005	12:36:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 N
5/31/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 N
6/7/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N
6/17/2005	1:52:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
7/1/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 140 TO RT 24 NB
7/10/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24		Rte 24 / Rte 140
7/17/2005	4:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dawn	Clear/Clear						Rte 24 S
7/27/2005	7:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 140 N	RAMP - RT 140 TO RT 24 SB				
8/10/2005	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S
8/12/2005	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
8/30/2005	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						Rte 24 S
9/19/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
9/26/2005	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			JUST PRIOR TO RAMP TO 24 NB - ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB
9/27/2005	6:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Rain						Rte 24 N
9/27/2005	6:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy						Rte 24 N
10/5/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1 Feet S from Exit 12 on Rte 24		Rte 24
10/12/2005	11:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			END OF RAMP FROM RT 24SB TO RT 1 - RAMP - RT 24 SB TO RT 140			RAMP - RT 24 SB TO RT 140
10/14/2005	8:08:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain	RAMP - RT 140 TO RT 24 NB	Rte 140 S				
10/25/2005	9:49:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy						Rte 24 N
10/29/2005	3:29:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)						Rte 24 S
10/30/2005	6:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
11/4/2005	6:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy				Exit 12 on Rte 24 S		Rte 24 S
11/9/2005	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Cloudy				1.00 Feet S from Exit 12 on Rte 24 S		Rte 24 S
11/10/2005	10:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
11/19/2005	1:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 N
11/22/2005	7:07:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain			PRIOR TO RAMP FOR RT 24NB. - ROUTE 140 Rte 140 N			ROUTE 140 Rte 140 N / RAMP - RT 140 TO RT 24 NB
11/22/2005	9:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			TOP OF RAMP FROM 140 TO RT 24 NB - RAMP - RT 140 TO RT 24 NB			RAMP - RT 140 TO RT 24 NB
12/4/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Cloudy			NEAR INTERSECTION FOR RT 24NB. - ROUTE 140 Rte 140 S			ROUTE 140 Rte 140 S / RAMP - RT 140 TO RT 24 NB
12/5/2005	6:54:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Clear/Clear						Rte 24 S
12/8/2005	7:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
12/14/2005	4:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Cloudy				Exit 12 on Rte 24 S		Rte 24 S
12/15/2005	11:39:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24		Rte 24 N
12/16/2005	4:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Snow						Rte 24 N
12/21/2005	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 S Milemarker 19.2	Rte 24 S
12/21/2005	8:39:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				5280 Feet N from Exit 12 on Rte 24		Rte 24 N
12/21/2005	9:46:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						1500 Feet N from Intersection Rte 24 N / Rte 140
12/23/2005	5:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Cloudy					300 feet N from Rte 24 S Milemarker 17.1	Rte 24 S
12/29/2005	1:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	RAMP - RT 140 TO RT 24 NB	Rte 140 S				
12/29/2005	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 12 on Rte 24 S		Rte 24 S
1/8/2006	2:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Cloudy	RAMP - RT 24 SB TO RT 140	Rte 24 S RAMP - RT 24 SB TO RT 140 Rte 24 S				
1/12/2006	9:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Dawn	Not Reported				Exit 12 on Rte 24 S		Rte 24 S
1/17/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 24 S / Rte 140
1/19/2006	6:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 24 S
1/19/2006	6:25:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 24 S
1/20/2006	3:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 140 N / Rte 24
1/20/2006	6:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 24 N
1/20/2006	6:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy				Exit 12 on Rte 24		Rte 24
1/25/2006	4:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy						Rte 24 S / Rte 140
2/12/2006	7:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Clear/Cloudy				Exit 12 on Rte 24		Rte 24
2/14/2006	11:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Cloudy/Cloudy				Exit 12 on Rte 24 S		Rte 24 S
2/20/2006	2:56:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24		Rte 24
2/24/2006	1:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				5 Feet S from Exit 12 on Rte 24 S		Rte 24 S
2/24/2006	1:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S
3/7/2006	2:47:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						RAMP - RT 140 TO RT 24 NB Rte 140 / Rte 24
3/9/2006	4:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S
3/25/2006	4:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				5.00 Feet N from Exit 12 on Rte 24 S		Rte 24 S
3/31/2006	11:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24		Rte 24
4/9/2006	4:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Cloudy				Exit 12 on Rte 24		Rte 24
4/9/2006	3:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						Rte 24 S
4/18/2006	1:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 140	Rte 24 / RAMP - RT 140 TO RT 24 NB				
4/24/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 12 on Rte 24		Rte 24
4/28/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 11 on Rte 24		Rte 24 / Rte 140
4/30/2006	6:01:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
5/5/2006	1:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S
5/13/2006	3:32:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy						Rte 24 N
5/13/2006	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			HEADING NORTH	Exit 12 on Rte 24		Rte 24
5/13/2006	9:37:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				Exit 12 on Rte 24 S		RAMP - RT 24 SB TO RT 140 Rte 24 S
5/16/2006	4:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						10 feet N from Intersection Rte 24 N / Rte 140
5/16/2006	5:25:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						150 feet N from Intersection Rte 24 S / Rte 140
5/17/2006	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy				Exit 12 on Rte 24		Rte 24
5/24/2006	11:32:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Dark - roadway not lighted	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
5/28/2006	8:50:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear				1000 Feet N from Exit 13 on Rte 24		Rte 24
6/10/2006	10:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain	Rte 24	Rte 140				
6/20/2006	5:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Cloudy				Exit 12 on Rte 24		Rte 24
6/23/2006	5:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy				1500 Feet N from Exit 12 on Rte 24 S		Rte 24 S
6/26/2006	10:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			ROUTE 24			5280 Feet S from Intersection Rte 140 N / Rte 24
6/29/2006	6:53:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 140 S	RAMP - RT 140 TO RT 24 NB				
7/5/2006	2:34:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				1000 Feet N from Exit 12 on Rte 24 S		Rte 24 S
7/13/2006	3:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain				250 Feet N from Exit 12 on Rte 24 S		Rte 24 S
7/19/2006	4:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
7/19/2006	5:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				1 Feet S from Exit 13 on Rte 24		Rte 24 S
7/27/2006	1:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
8/1/2006	4:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
8/7/2006	4:19:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 Feet N from Exit 12 on Rte 24 S		Rte 24 S
8/8/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 24		Rte 24
8/9/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
8/11/2006	7:53:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM RTE 24SB TO RTE 140			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
8/16/2006	1:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 24 N
8/18/2006	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 S
8/21/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear	Rte 24	Rte 44				
8/27/2006	1:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 24	Rte 140				
8/28/2006	2:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain				Exit 12 on Rte 24 S		Rte 24 S
8/29/2006	4:40:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
9/8/2006	5:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 24 N	Rte 140				
9/18/2006	4:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			JUST NORTH OF ROUTE 140 RAMP			AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 140
9/19/2006	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N / Rte 140
9/20/2006	6:38:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Clear/Clear			HEADING NORTH	Exit 12 on Rte 24		Rte 24
9/29/2006	1:30:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear				400 Feet S from Exit 11 on Rte 24		Rte 24 S
10/11/2006	7:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy						Rte 24 S
10/12/2006	3:50:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
10/15/2006	8:34:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear	RAMP - RT 140 TO RT 24 NB	Rte 24 N / Rte 140				
10/21/2006	3:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
10/28/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Cloudy	Rte 24	Rte 140 / Rte 44				
10/28/2006	8:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						Rte 24 N
11/6/2006	11:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 N
11/10/2006	7:38:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				1320 Feet N from Exit 12 on Rte 24 S		Rte 24 S
11/10/2006	7:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 12 on Rte 24 S		Rte 24 S
11/20/2006	7:45:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 24		Rte 24 S
12/3/2006	11:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 12 on Rte 24		Rte 24
12/5/2006	7:29:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear						COUNTY STREET Rte 140 / Rte 24
12/7/2006	4:05:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 12 on Rte 24 S		Rte 24 S
12/13/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain						COUNTY STREET Rte 140 / RAMP - COUNTY ST TO RT 140 SB Rte 24
12/17/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear						Rte 24 / Rte 140
12/18/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 24 S
12/19/2006	6:20:00 AM	Property damage only (none injured)	2	0	0	Rear-to-rear	Rear-to-rear	Dry	Dark - lighted roadway	Not Reported						Rte 24 / COUNTY STREET
12/20/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						AMVETS MEMORIAL HIGHWAY Rte 24 / RAMP - RT 140 TO RT 24 NB Rte 140
12/22/2006	5:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				30 Feet N from Exit 12 on Rte 24 S		Rte 24 S
12/13/2004	5:57:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain			COUNTY STREET Rte 140			600 Feet N from Intersection COUNTY STREET Rte 140 / Rte 24
4/28/2005	8:10:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				Exit 12 on Rte 24		Rte 24
7/11/2006	8:50:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 Feet N from Exit 12 on Rte 24		Rte 24

WEST BRIDGEWATER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
10/16/2004	5:45:00 AM	Fatal injury	1	2	1	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain			Rte 24 N			Rte 24 N
2/2/2004	5:40:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Cloudy/Cloudy			Rte 24 S	Exit 17 on Rte 24		Rte 24 S
4/8/2004	6:44:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 24 N	100 feet N from Exit 16A on Rte 24 N		Rte 24 N
4/11/2004	4:40:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
4/14/2004	11:05:00 AM	Non-fatal injury	3	5	0	Angle	Angle	Wet	Daylight	Rain			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
5/24/2004	9:48:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 24	Exit 16B on Rte 24		Rte 24
7/3/2004	11:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
7/14/2004	7:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Rain			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
7/22/2004	1:07:00 PM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 16B on Rte 24 S		Rte 24 S
7/23/2004	3:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
8/1/2004	5:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 24 S	Exit 16A on Rte 24 S		Rte 24 S
8/28/2004	1:40:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S	Exit 16A on Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 106 WB
8/31/2004	6:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SOUTH OF WALNUT STREET OVERPASS - Rte 24 N			Rte 24 N
9/29/2004	5:09:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			106 AMVETS MEMORIAL HIGHWAY Rte 24 S	100 feet S from Exit 16B on Rte 24 S		106 AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 106 WB TO RT 24 SB
10/4/2004	8:30:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Fog, smog, smoke			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
10/16/2004	2:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			SO OF RT 123. - Rte 24 N			Rte 24 N / Rte 123
11/19/2004	1:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 16B on Rte 24 S		Rte 24 S
12/3/2004	5:25:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 16B on Rte 24 S		Rte 24 S
12/16/2004	9:35:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
12/19/2004	5:05:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Cloudy			Rte 24 N	Exit 16B on Rte 24 N		Rte 24 N
12/23/2004	7:35:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Wet	Dark- roadway not lighted	Rain/Severe crosswinds			WALNUT STREET Rte 24 N	Exit 17A on Rte 24 N		WALNUT STREET Rte 24 N
1/13/2005	10:07:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Daylight	Fog, smog, smoke/Cloudy				Exit 16A on Rte 24 S		Rte 24 S
1/28/2005	8:55:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Clear/Clear				Exit 16B on Rte 24 N		Rte 24 N
2/2/2005	5:42:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear				Exit 16B on Rte 24 N		Rte 24 N
2/17/2005	12:00:00 PM	Non-fatal injury	3	3	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				Exit 16A on Rte 24 N		Rte 24 N
2/19/2005	6:35:00 AM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
2/21/2005	10:30:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow						Rte 24
3/5/2005	5:17:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24		Rte 24
3/8/2005	5:50:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Snow	Dark- roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)			AT WALNUT STREET - Rte 24 S			Rte 24 S / WALNUT STREET
3/12/2005	5:35:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark- roadway not lighted	Snow/Snow				250 feet E from Exit 16B on Rte 24 S		Rte 24 S
3/21/2005	12:01:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Cloudy/Clear				Exit 16B on Rte 24 N		Rte 24 N
4/15/2005	4:08:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			WEST CENTER STREET - WEST CENTER STREET Rte 24 W			WEST CENTER STREET Rte 24 W / RAMP - RT 24 NB TO RT 106 EB
5/5/2005	7:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
5/6/2005	9:27:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
5/13/2005	4:22:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
5/27/2005	8:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark- roadway not lighted	Cloudy/Cloudy				10560 feet S from Exit 16B on Rte 24 S		Rte 24 S
6/9/2005	1:28:00 PM	Non-fatal injury	2	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
6/9/2005	1:30:00 PM	Non-fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
6/14/2005	7:20:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 16A on Rte 24 N		Rte 24 N
6/29/2005	10:40:00 AM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16B on Rte 24 N		Rte 24 N
7/2/2005	4:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
7/17/2005	8:00:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear			SOUTH OF ROUTE 123 - Rte 24 S			Rte 24 S / Rte 123
8/1/2005	3:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						EAST CENTER STREET Rte 106 / WEST CENTER STREET Rte 24
8/12/2005	3:00:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear						WEST CENTER STREET Rte 24 / Rte 24
9/3/2005	4:05:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						WEST CENTER STREET Rte 24 / Rte 106
9/27/2005	6:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Cloudy/Cloudy			SOUTH OF RTE 123 - Rte 24 S			Rte 24 S
10/3/2005	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						ROUTE 24 OVERPASS ST Rte 106
10/28/2005	4:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 16B on Rte 24 N		Rte 24 N
11/22/2005	10:58:00 AM	Non-fatal injury	2	3	0	Angle	Angle	Wet	Daylight	Rain/Rain			NORTH OF RT 104. - Rte 24 S			Rte 24 S / Rte 104
11/29/2005	12:02:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 16A on Rte 24 N		Rte 24 N
12/9/2005	9:10:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark- roadway not lighted	Clear				Exit 17 on Rte 24		Rte 24 S
12/14/2005	8:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 16A on Rte 24 N		Rte 24 N
12/15/2005	11:55:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark- roadway not lighted	Cloudy				10000 feet N from Exit 16B on Rte 24 N		Rte 24 N
1/25/2006	9:30:00 AM	Non-fatal injury	3	3	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Snow/Fog, smog, smoke				3040 feet S from Exit 16B on Rte 24 S		Rte 24 S
2/2/2006	6:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Unknown	Daylight	Clear				Exit 16B on Rte 24		Rte 24 / Rte 106
2/16/2006	1:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear				1000 feet N from Exit 16B on Rte 24 S		Rte 24 S
2/21/2006	6:05:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Dawn	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
3/29/2006	9:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
4/12/2006	6:05:00 AM	Non-fatal injury	2	3	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 17A on Rte 24 N		Rte 24 N
4/24/2006	3:34:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 24 S
4/26/2006	4:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 106 E	WEST CENTER STREET	ROUTE 24 OVERPASS ST			
5/13/2006	9:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Daylight	Rain/Rain						ROUTE 24 OVERPASS STREET
5/25/2006	2:26:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear						WEST CENTER STREET Rte 106 W / RAMP - RT 106 WB TO RT 24 SB
6/12/2006	12:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
6/28/2006	9:18:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				200 feet S from Exit 16A on Rte 24 N		Rte 24 N
8/2/2006	3:32:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear						WEST CENTER STREET / WEST CENTER STREET Rte 24
8/2/2006	6:51:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						WEST CENTER STREET Rte 106 W / Rte 24
8/18/2006	1:30:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 / Rte 106
8/18/2006	1:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				1000 feet S from Exit 16B on Rte 24 S		Rte 24 S
8/18/2006	4:05:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S from Exit 16A on Rte 24 S		Rte 24 S
8/23/2006	5:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Unknown						Rte 24
9/23/2006	8:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark- roadway not lighted	Cloudy						Rte 24 S / Rte 106
10/10/2006	5:50:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dawn	Clear				100 feet N from Exit 16A on Rte 24		Rte 24
10/13/2006	10:34:00 PM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Dark- roadway not lighted	Clear/Clear						Rte 24 N
10/21/2006	4:40:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 24 S
10/29/2006	1:50:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Cloudy				2640 feet N from Exit 16B on Rte 24 S		Rte 24 S
11/1/2006	8:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2640 feet N from Exit 16A on Rte 24 N		Rte 24 N
11/14/2006	1:18:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Cloudy/Clear				Exit 16B on Rte 24 S		Rte 24 S
11/15/2006	7:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy				1000 feet N from Exit 16A on Rte 24 N		Rte 24 N
11/17/2006	6:40:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dawn	Cloudy						Rte 24
12/4/2006	1:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				200 feet N from Exit 16A on Rte 24 S		Rte 24 S
2/2/2004	5:40:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Cloudy/Cloudy			Rte 24 S	Exit 17 on Rte 24		Rte 24 S
2/7/2004	3:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 24					
9/29/2004	4:00:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Not reported	Not Reported			Rte 24	100 feet S from Exit 16B on Rte 24		Rte 24
1/6/2005	10:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 24 / Rte 106
2/24/2005	2:00:00 PM	Not Reported	1	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24
4/17/2005	9:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear				Exit 16A on Rte 24		Rte 24
6/28/2005	6:55:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24
11/7/2005	3:41:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 24 / Rte 106
8/15/2006	6:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 24	Rte 28 / Rte 106				
10/13/2006	3:55:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 24	FOUDRY STREET Rte 106	EXIT RAMP			
11/3/2006	5:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 17A on Rte 24		Rte 24
11/15/2006	7:55:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 24 N / Rte 106
12/2/2006	9:30:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear				Exit 16A on Rte 24		Rte 24
1/12/2004	7:17:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark- roadway not lighted	Snow	Rte 24 S	WEST CENTER STREET Rte 106 W				
2/1/2004	8:00:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear			Rte 24 N	Exit 16B on Rte 24 N		Rte 24 N
3/9/2004	7:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
3/16/2004	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow/Snow			Rte 24 S	Exit 16A on Rte 24 S		Rte 24 S
3/18/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Other	Dawn	Cloudy/Snow			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
3/23/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
3/29/2004	7:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 16B on Rte 24 S		Rte 24 S
4/20/2004	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 W			Rte 24 W
4/20/2004	12:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
4/25/2004	1:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
4/26/2004	9:05:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark- roadway not lighted	Clear/Clear			Rte 24 S			Rte 24 S / Rte 106
5/14/2004	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N	Exit 16A on Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 106 EB
5/24/2004	10:05:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
6/2/2004	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RAMP - RT 24 NB TO RT 106 EB			RAMP - RT 24 NB TO RT 106 EB / Rte 106
6/4/2004	5:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S			7920 feet S from Intersection Rte 24 S / Rte 106
6/24/2004	7:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			1/2 MILE NORTH OF ROUTE 106. - Rte 24 S			2640 feet N from Intersection Rte 24 S / Rte 106
7/5/2004	6:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Cloudy/Rain			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
7/17/2004	3:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Cloudy/Cloudy			Rte 24 S	Exit 16A on Rte 24 S		Rte 24 S
7/19/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
7/19/2004	7:55:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Wet	Daylight	Rain			Rte 24 S	Exit 16A on Rte 24 S		Rte 24 S
7/23/2004	4:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
8/3/2004	2:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24			Rte 24 / Rte 24
8/4/2004	4:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 N			AMVETS MEMORIAL HIGHWAY Rte 24 N
9/7/2004	8:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
9/10/2004	1:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	Rte 24					
9/12/2004	12:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
9/22/2004	5:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 24 S	RAMP - RT 24 SB TO RT 106 EB				
9/22/2004	9:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Unknown			WEST CENTER STREET Rte 106 E			WEST CENTER STREET Rte 106 E / RAMP - RT 106 EB TO RT 24 NB
10/1/2004	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	106 feet E from Exit 16A on Rte 24 S		Rte 24 S
10/4/2004	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Fog, smog, smoke			Rte 24 N	Exit 17A on Rte 24 N		Rte 24 N
10/6/2004	6:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear			Rte 24 S	Exit 16A on Rte 24 S		Rte 24 S
10/18/2004	5:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark- roadway not lighted	Cloudy/Rain			Rte 24 N	Exit 16A on Rte 24 N		Rte 24 N
11/3/2004	5:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24	Exit 16A on Rte 24		Rte 24 / Rte 106
11/4/2004	11:32:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark- roadway not lighted	Rain			Rte 24 S	5400 feet S from Exit 16A on Rte 24 S		Rte 24 S
11/9/2004	8:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 24 S	Exit 10 on Rte 24		Rte 24 S / Rte 106
12/9/2004	4:08:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
12/10/2004	8:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain			Rte 24 N	Exit 16B on Rte 24 N		Rte 24 N
12/15/2004	11:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear			AMVETS MEMORIAL HIGHWAY Rte 24 S			AMVETS MEMORIAL HIGHWAY Rte 24 S
12/21/2004	9:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 106 W			Rte 106 W / Rte 24
12/23/2004	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -unknown roadway lighting	Rain			Rte 24	200 feet N from Exit 15 on Rte 24		Rte 24
12/23/2004	9:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain			Rte 24 N	Exit 16B on Rte 24 N		Rte 24 N
12/31/2004	12:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Clear			RT 24 OVERPASS - WEST CENTER STREET Rte 106 E			WEST CENTER STREET Rte 106 E
1/6/2005	9:47:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 16B on Rte 24 N		Rte 24 N
1/12/2005	6:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Dawn	Snow/Snow				Exit 16B on Rte 24 N		Rte 24 N
1/20/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 24 N

WEST BRIDGEWATER	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 24 route 24													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
1/20/2005	9:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Daylight	Clear				Exit 16A on Rte 24 N		Rte 24 N
2/5/2005	12:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Dark- roadway not lighted	Rain/Rain				Exit 16B on Rte 24 N		Rte 24 N
2/21/2005	10:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)						Rte 24
2/21/2005	10:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Snow			NORTH OF ROUTE 104 - Rte 24 S			Rte 24 S
3/4/2005	4:05:00 PM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear			1000 feet S from BROCKTON CITY LINE - Rte 24 S			Rte 24 S
3/9/2005	4:50:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear/Clear						RAMP - RT 24 NB TO RT 106 EB / Rte 106
3/21/2005	9:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
4/12/2005	9:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Snow/Snow				6336 feet N from Exit 16B on Rte 24 S		Rte 24 S
4/23/2005	6:07:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy				Exit 16A on Rte 24 S		Rte 24 S
5/6/2005	1:33:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear						Rte 24 S
5/17/2005	1:19:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy						AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 24 SB TO RT 106 WB Rte 106 N
5/23/2005	6:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Cloudy				5280 feet S from Exit 16B on Rte 24 S		Rte 24 S
6/13/2005	10:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 16B on Rte 106		RAMP - RT 106 WB TO RT 24 NB Rte 106
6/15/2005	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						WEST CENTER STREET Rte 24 / RAMP - RT 106 EB TO RT 24 NB
6/17/2005	1:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain				Exit 16A on Rte 24 N		Rte 24 N
6/18/2005	4:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16B on Rte 24 S		Rte 24 S
6/22/2005	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
6/23/2005	9:32:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
7/10/2005	9:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
7/14/2005	4:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				2640 feet N from Exit 16A on Rte 24 S		Rte 24 S
8/6/2005	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
8/19/2005	5:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
9/13/2005	4:47:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
9/21/2005	6:28:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				50 feet S from Exit 16A on Rte 24 S		Rte 24 S
9/22/2005	2:06:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
10/1/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	RAMP - RT 24 NB TO RT 106 EB	WEST CENTER STREET Rte 106				
10/4/2005	2:52:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear					Rte 24 N Milemarker 28.5	Rte 24 N
10/9/2005	7:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Rain					Rte 24 S Milemarker 25.8	Rte 24 S
10/12/2005	7:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 17A on Rte 24		Rte 24
10/18/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
10/19/2005	6:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear				1000 feet S from Exit 17A on Rte 24 N		Rte 24 N
10/24/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				1000 feet N from Exit 16B on Rte 24 S		Rte 24 S
11/6/2005	1:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear						Rte 24 S
11/9/2005	8:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark- roadway not lighted	Rain/Rain			SOUTH OF RTE 106 - Rte 24 S			Rte 24 S / Rte 106
11/10/2005	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Other				Exit 15 on Rte 24		Rte 24 S
11/15/2005	11:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain				Exit 16A on Rte 24 S		Rte 24 S
12/5/2005	10:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear			SOUTH OF RTE 123 - Rte 24 N			Rte 24 N / Rte 123
12/10/2005	10:08:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Clear/Clear						106 WEST CENTER STREET Rte 24
12/10/2005	12:09:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Clear						Rte 24 S
12/13/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
12/15/2005	12:01:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear						Rte 24 S / WALNUT STREET
12/24/2005	10:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark- roadway not lighted	Cloudy/Cloudy				200 feet N from Exit 16A on Rte 24 S		Rte 24 S
12/29/2005	9:13:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Cloudy				Exit 16A on Rte 24 S		Rte 24 S
12/31/2005	6:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark- roadway not lighted	Snow/Cloudy						Rte 24 S
1/3/2006	7:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)				Exit 17 on Rte 24		86 feet S from Intersection Rte 24 S
1/24/2006	4:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				10000 feet S from Exit 16A on Rte 24 S		Rte 24 S
1/25/2006	9:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				Exit 16B on Rte 24 S		Rte 24 S
1/30/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						WEST CENTER STREET Rte 24 / Rte 24
2/1/2006	6:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
2/2/2006	2:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16B on Rte 24 S		Rte 24 S
2/12/2006	2:14:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Blowing sand, snow						Rte 106 E / Rte 24
2/12/2006	12:33:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Blowing sand, snow				Exit 16A on Rte 24 S		Rte 24 S
2/12/2006	12:46:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Snow/Blowing sand, snow				100 feet S from Exit 16B on Rte 24 N		Rte 24 N
2/13/2006	2:38:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				2000 feet N from Exit 16B on Rte 24 N		Rte 24 N
3/2/2006	6:34:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark- roadway not lighted	Snow/Blowing sand, snow				100 feet S from Exit 16B on Rte 24 S		Rte 24 S
3/3/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				200 feet S from Exit 16A on Rte 24 N		Rte 24 N
3/27/2006	8:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
5/1/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy						Rte 106 / Rte 24
5/1/2006	4:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16B on Rte 24		Rte 24 / WEST CENTER STREET
5/8/2006	6:33:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
5/19/2006	7:17:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Wet	Daylight	Cloudy/Cloudy					Rte 24 Milemarker 16.6	Rte 24 N
6/16/2006	3:36:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
6/20/2006	4:18:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				5280 feet S from Exit 16A on Rte 24 N		Rte 24 N
6/25/2006	8:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 16A on Rte 24 S		Rte 24 S
6/30/2006	2:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
7/5/2006	3:49:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				500 feet N from Exit 16B on Rte 24 N		Rte 24 N
7/10/2006	5:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 16A on Rte 24 S		Rte 24 S
7/20/2006	6:13:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
8/10/2006	10:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				1000 feet S from Exit 16A on Rte 24 S		Rte 24 S
8/12/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
8/15/2006	11:17:00 AM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain				10560 feet N from Exit 16B on Rte 24 N		Rte 24 N
8/19/2006	9:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 16A on Rte 24		Rte 24
8/20/2006	3:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	AMVETS MEMORIAL HIGHWAY Rte 24	RAMP - RT 106 EB TO RT 24 NB				
8/21/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				500 feet S from Exit 16A on Rte 24		Rte 24
9/8/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- lighted roadway	Clear/Clear						WEST CENTER STREET Rte 106 E / RAMP - RT 106 EB TO RT 24 NB
9/9/2006	12:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 17A on Rte 24		Rte 24
9/16/2006	1:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16B on Rte 24 S		Rte 24 S
9/29/2006	1:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 S		Rte 24 S
10/10/2006	7:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 16A on Rte 24 N		5280 feet S from Intersection Rte 24 N / Rte 106
10/13/2006	11:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark- roadway not lighted	Clear/Clear				Exit 16B on Rte 24 S		Rte 24 S
10/29/2006	2:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark -unknown roadway lighting	Clear				Exit 16A on Rte 24		Rte 24
11/1/2006	8:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				Exit 16A on Rte 24 N		Rte 24 N
11/4/2006	2:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				Exit 17 on Rte 24		Rte 24 S
12/2/2006	11:23:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear				5280 feet S from Exit 16A on Rte 24 N		Rte 24 N
12/2/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark- roadway not lighted	Cloudy/Cloudy						Rte 24 N
12/8/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						WEST CENTER STREET Rte 106 / RAMP - RT 106 EB TO RT 24 NB
11/13/2004	12:55:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark- roadway not lighted	Snow/Snow			Rte 24 N	Exit 16B on Rte 24 N		Rte 24 N
1/22/2005	5:20:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear						Rte 24 S
9/20/2005	11:50:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	RAMP - RT 106 EB TO RT 24 NB	Rte 106				

BRAINTREE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	AddressLandmark	Exit Distance	Mile Marker Distance	Feat_From
12/17/2004	4:20:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Unknown	Dark - lighted roadway	Unknown/Unknown			NEAR SOUTH SHORE PLAZA - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
12/16/2006	9:40:00 AM	Fatal injury	3	0	1	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			BRAINTREE SPLIT			INTERSTATE 93 Rte 93 S / RAMP-RT 93 NB TO RT 3 SB
1/12/2004	4:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
2/2/2004	12:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
2/9/2004	8:02:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
2/14/2004	5:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N	1000 feet N from Exit 6 on Rte 93 N		Rte 93 N
2/16/2004	5:40:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N / RAMP - RT 93 NB TO RT 37
3/17/2004	10:43:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Snow/Snow			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
3/23/2004	2:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	500 feet N from Exit 6 on Rte 93 N		Rte 93 N
4/1/2004	5:46:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dusk	Rain/Rain			Rte 93 S	100 feet S from Exit 6 on Rte 93 S		Rte 93 S
4/8/2004	7:00:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy/Other			Rte 93 N	50 feet S from Exit 6 on Rte 93 N		Rte 93 N
4/11/2004	2:00:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			SOUTH SHORE PLAZA - Rte 93 N			Rte 93 N / Rte 3
5/2/2004	1:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Clear/Clear			Rte 93 S			Rte 93 S / Rte 37
5/4/2004	2:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S			Rte 93 S / Rte 37
5/14/2004	1:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Not reported	Clear			Rte 93 S			Rte 93 S / Rte 37
5/20/2004	6:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	200 feet S from Exit 6 on Rte 93 S		Rte 93 S
5/31/2004	2:10:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	500 feet S from Exit 6 on Rte 93 N		Rte 93 N
6/2/2004	11:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy			Rte 93 S	1500 feet S from Exit 6 on Rte 93 S		Rte 93 S
6/12/2004	2:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 S			Rte 93 S / Rte 37
6/20/2004	9:30:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 S	Rte 24 S				
6/24/2004	10:25:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	300 feet S from Exit 7 on Rte 93 N		Rte 93 N
6/24/2004	11:46:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	50 feet N from Exit 6 on Rte 93 N		Rte 93 N
6/27/2004	3:10:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 93 N	1500 feet S from Exit 6 on Rte 93 N		Rte 93 N
7/1/2004	3:20:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 S	20 feet S from Exit 7 on Rte 93		Rte 93 S
7/2/2004	4:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S / Rte 93
8/2/2004	7:10:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 N			Rte 93 N / Rte 3
8/5/2004	1:16:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain			Rte 93 S	5000 feet S from Exit 6 on Rte 93 S		Rte 93 S
8/15/2004	8:10:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Rain			Rte 93 S	300 feet N from Exit 6 on Rte 93 S		Rte 93 S
8/21/2004	10:25:00 AM	Non-fatal injury	2	3	0	Angle	Angle	Snow	Dark - lighted roadway	Clear/Cloudy			WASHINGTON STREET Rte 93			WASHINGTON STREET Rte 93 / Rte 3
9/4/2004	11:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
9/23/2004	3:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 N	1000 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/24/2004	2:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	2000 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/25/2004	12:51:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 7 on Rte 93 S		Rte 93 S / Rte 37
9/26/2004	1:00:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
9/30/2004	7:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	500 feet S from Exit 6 on Rte 93		Rte 93
10/8/2004	7:11:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	100 feet N from Exit 6 on Rte 93 N		Rte 93 N
10/13/2004	1:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N / RAMP - RT 3 SB TO WASHINGTON ST
10/14/2004	12:55:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 S	1000 feet S from Exit 6 on Rte 93 S		Rte 93 S
10/24/2004	3:44:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
10/29/2004	6:20:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dawn	Cloudy			Rte 93 N	1000 feet N from Exit 6 on Rte 93 N		Rte 93 N
11/5/2004	6:20:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dawn	Cloudy			Rte 93 S	1000 feet S from Exit 6 on Rte 93 S		Rte 93 S
11/6/2004	12:04:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
11/16/2004	2:06:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	2000 feet S from Exit 6 on Rte 93 S		Rte 93 S
11/19/2004	5:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S / Rte 93
11/23/2004	4:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 N	5280 feet S from Exit 6 on Rte 93 N		Rte 93 N
11/26/2004	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy			Rte 93 N			Rte 93 N
11/30/2004	2:08:00 PM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear	Rte 93 N	Rte 3 S				
12/3/2004	8:04:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	50 feet N from Exit 6 on Rte 93 N		Rte 93 N
12/4/2004	5:22:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 S	250 feet S from Exit 6 on Rte 93 S		Rte 93 S
12/9/2004	4:00:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			BUGIN PKWY - RAMP-WASHINGTON ST/BURGIN PKWY TO RT 93			RAMP-WASHINGTON ST/BURGIN PKWY TO RT 93 / RAMP-BURGIN PKWY TO RT 3 NB
12/17/2004	2:14:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			N/B RAMP TO X-WAY N/B - RAMP-RT 93 NB TO RT 93 NB Rte 93 N			RAMP-RT 93 NB TO RT 93 NB Rte 93 N
12/26/2004	12:52:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
12/29/2004	5:22:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	200 feet S from Exit 6 on Rte 93 N		Rte 93 N
1/1/2005	4:40:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy/Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
1/7/2005	6:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain						Rte 93
1/10/2005	5:05:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Clear			HYMONETICS - Rte 93 S	1500 feet N from Exit 6 on Rte 93 S		Rte 93 S
1/18/2005	3:48:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				75 feet N from Exit 7 on Rte 93 N		Rte 93 N
1/18/2005	6:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Unknown	Dark - roadway not lighted	Clear						Rte 93 N
1/24/2005	11:50:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Snow	Daylight	Clear				Exit 7 on Rte 93 N		Rte 93 N
1/25/2005	7:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Clear				3000 feet S from Exit 6 on Rte 93 N		Rte 93 N
2/3/2005	5:35:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Wet	Dusk	Rain						Rte 93 S
2/3/2005	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Not reported	Not reported	Not reported	Rte 93					
2/15/2005	9:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				500 feet N from Exit 7 on Rte 93 N		Rte 93 N
2/19/2005	2:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			BRAINTREE MALL - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
2/23/2005	8:40:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
2/27/2005	2:45:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
3/3/2005	1:20:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear						Rte 93 N / Rte 3
3/4/2005	7:18:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
3/10/2005	5:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 6 on Rte 93		Rte 93
3/10/2005	7:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						PILGRIM HIGHWAY Rte 3 / RAMP-RT 93 SB TO RT 3 SB
3/16/2005	5:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear				Exit 37 on Rte 93		Rte 93 S
3/21/2005	10:30:00 AM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Unknown	Daylight	Clear						Rte 93 N
3/22/2005	8:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 3 N		BRAINTREE SPLIT - Rte 3 N			Rte 3 N / Rte 93
3/28/2005	2:02:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Clear				Exit 6 on Rte 93 N		Rte 93 N
3/28/2005	4:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dusk	Rain				30 feet N from Exit 6 on Rte 93 N		Rte 93 N
3/31/2005	7:40:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
4/3/2005	4:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
4/3/2005	4:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
4/8/2005	2:40:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy				50 feet S from Exit 6 on Rte 93 S		Rte 93 S
4/20/2005	3:17:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
4/22/2005	3:43:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 S		Rte 93 S
4/26/2005	8:39:00 PM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 N					
5/6/2005	1:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy						Rte 93 N
5/24/2005	12:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			BRAINTREE SPLIT - Rte 93 S			Rte 93 S
5/25/2005	11:37:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain				Exit 6 on Rte 93 N		Rte 93 N
5/26/2005	12:57:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain						1000 feet S from Intersection Rte 3 N / Rte 93
6/3/2005	5:30:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						300 feet S from Intersection INTERSTATE 93 Rte 93 / GRANITE STREET Rte 37 S
6/6/2005	7:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 6 on Rte 93 N		Rte 93 N
6/16/2005	3:50:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear			SOUTH SHORE PLAZA - EXPRESSWAY BRAINTREE SPLIT Rte 93	Exit 6 on Rte 93		EXPRESSWAY BRAINTREE SPLIT Rte 93
6/16/2005	8:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						GRANITE STREET Rte 93 / Rte 93
6/21/2005	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 37
6/22/2005	1:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	Rte 93					
7/7/2005	7:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Rain				100 feet S from Exit 6 on Rte 93		Rte 93
7/8/2005	7:10:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dusk	Rain/Fog, smog, smoke						Rte 93 / Rte 93
7/14/2005	7:05:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
7/18/2005	8:02:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dusk	Rain			ADJACENT TO LOGAN EXPRESS - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
7/19/2005	5:45:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
7/24/2005	6:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						500 feet N from Intersection Rte 93 S / Rte 37
7/27/2005	3:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1500 feet N from Exit 6 on Rte 93 S		Rte 93 S
7/28/2005	12:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				100 feet S from Exit 6 on Rte 93 S		Rte 93 S
7/29/2005	5:30:00 PM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N					
8/14/2005	3:55:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Wet	Daylight	Rain						BRAINTREE HILL PARK Rte 93
8/16/2005	6:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N / Rte 37
8/17/2005	12:05:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			SOUTH OF RTE 37 - Rte 93 N			Rte 93 S
8/20/2005	2:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S			200 feet N from Exit 6 on Rte 93 S		Rte 93 S
8/25/2005	1:07:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 93 NB TO RT 3 SB
8/27/2005	8:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 3 N / RAMP - RT 3 NB TO RT 93 SB
8/29/2005	1:28:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 7 on Rte 93 N		Rte 93 N
8/30/2005	2:36:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain	Rte 93 N	GRANITE STREET				
8/31/2005	12:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
9/1/2005	7:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				500 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/12/2005	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						WASHINGTON STREET Rte 93 / Rte 93
9/15/2005	2:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Rain				Exit 6 on Rte 93 N		Rte 93 N
9/28/2005	7:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/30/2005	2:30:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Unknown	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
10/11/2005	4:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				70 feet S from Exit 7 on Rte 93 N		Rte 93 N
10/17/2005	11:25:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 S		Rte 93 S
10/21/2005	1:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 37 N / RAMP - RT 37 NB TO RT 93 NB
10/24/2005	1:30:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy						Rte 93 N
10/27/2005	6:55:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				2000 feet S from Exit 6 on Rte 93 N		Rte 93 N
10/31/2005	1:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Clear						Rte 93 S
11/2/2005	6:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear			BEFORE CAPE COD PROVIDENCE SPLIT - Rte 93 S			Rte 93 S
11/4/2005	7:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy			EXIT #6 - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
11/8/2005	6:45:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain						Rte 93 N / Rte 3
11/11/2005	8:32:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy			SPLIT - Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
11/16/2005	5:55:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dusk	Cloudy/Cloudy				700 feet S from Exit 6 on Rte 93 N		Rte 93 N
11/19/2005	10:31:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RTE. 93 N/B @ THE SPLT - Rte 93 N			Rte 93 N
11/20/2005	8:14:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear				20 feet N from Exit 6 on Rte 93 N		Rte 93 N
11/27/2005	7:20:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy				600 feet S from Exit 7 on Rte 93 N		Rte 93 N
11/30/2005	8:45:00 AM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				100 feet S from Exit 6 on Rte 93 N		Rte 93 N
12/5/2005	5:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Cloudy				800 feet S from Exit 6 on Rte 93 S		Rte 93 S
12/8/2005	7:05:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 6 on Rte 93 N		Rte 93 N
12/10/2005	12:00:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 37
12/12/2005	6:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				200 feet S from Exit 6 on Rte 93 N		Rte 93 N
1/1/2006	1:13:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow/Snow				500 feet S from Exit 7 on Rte 93 N		Rte 93 N
1/9/2006	12:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						2000 feet S from Intersection Rte 93 S / Rte 37
1/13/2006	6:34:00 PM	Non-fatal injury	3	3	0	Rear-to-rear	Rear-to-rear	Wet	Dark - lighted roadway	Rain/Rain			PRIOR TO 93N AND S SPLIT			Rte 3 N / Rte 93
2/3/2006	4:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
2/13/2006	4:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear						INTERSTATE 93 Rte 93 / RAMP-RT 3 NB TO RT 93 SB Rte 3

BRAINTREE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	AddressLandmark	Exit Distance	Mile Marker Distance	Feet_From
2/17/2006	2:10:00 AM	Non-fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear				100 feet N from Exit 6 on Rte 93 N		Rte 93 N / Rte 3
2/17/2006	6:35:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				50 feet S from Exit 6 on Rte 93 N		Rte 93 N
2/17/2006	8:35:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				Exit 6 on Rte 93 S		Rte 93 S
2/17/2006	8:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
2/20/2006	12:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear				2000 feet S from Exit 6 on Rte 93 N		Rte 93 N
3/8/2006	7:44:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 S
3/17/2006	7:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93 N		Rte 93 N
3/24/2006	5:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear						1800 feet S from Intersection Rte 93 S / WASHINGTON STREET
3/25/2006	4:12:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy				1000 feet N from Exit 6 on Rte 93 S		Rte 93 S
4/5/2006	7:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / WASHINGTON STREET Rte 37
4/6/2006	2:16:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP-RT 93 SB TO RT 37
4/7/2006	6:30:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy	Rte 93 N	Rte 3 S				Rte 93 N
4/8/2006	12:00:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 6 on Rte 93 S		Rte 93 S
4/18/2006	9:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 93 N
4/19/2006	7:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
4/21/2006	2:32:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93		Rte 93 S / RAMP-RT 93 SB TO RT 3 SB
4/30/2006	5:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear						Rte 93 N / RAMP - RT 93 NB TO RT 3 SB
5/14/2006	1:00:00 AM	Non-fatal injury	1	1	0	Angle	Angle	Wet	Dark - roadway not lighted	Rain/Severe crosswinds						Rte 3 / Rte 93
5/18/2006	4:33:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
5/22/2006	11:52:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 93 NB TO RT 3 SB
5/27/2006	11:24:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 S
5/27/2006	12:00:00 AM	Non-fatal injury	1	0	0	Single vehicle crash	Single vehicle crash	Not reported	Dawn	Fog, smog, smoke				400 feet N from Exit 6 on Rte 93 N		Rte 93 N
5/30/2006	4:28:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 S		Rte 93 S
6/1/2006	3:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 S		Rte 93 S
6/6/2006	4:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 93	Rte 3				
6/7/2006	8:30:00 AM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 6 on Rte 93		Rte 93 N
6/8/2006	3:07:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				Exit 6 on Rte 93 N		Rte 93 N
6/10/2006	1:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						Rte 93 N / RAMP - RT 93 NB TO RT 37
6/18/2006	12:00:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / UNION STREET
6/29/2006	3:41:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-to-rear	Dry	Daylight	Cloudy					Rte 93 Milemarker 8.0	Rte 93
6/30/2006	3:21:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy						Rte 93 S
7/7/2006	5:15:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet N from Exit 7 on Rte 93 N		Rte 93 N
7/7/2006	5:55:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 N / RAMP - RT 37 NB TO RT 93 NB
7/11/2006	10:03:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				2000 feet S from Exit 6 on Rte 93 S		Rte 93 S
7/23/2006	4:47:00 AM	Non-fatal injury	2	2	0	Rear-end	Water (standing, moving)	Dry	Dark - lighted roadway	Rain/Cloudy				Exit 6 on Rte 93 N		Rte 93 N
7/28/2006	8:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	WILLARD STREET Rte 93	Rte 37 / Rte 1A				
8/1/2006	3:05:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 7 on Rte 93 N		Rte 93 N
8/2/2006	11:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93		Rte 93
8/2/2006	11:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			93 N/B AT RT .3 S/B SPLIT			Rte 93 N / Rte 3
8/8/2006	1:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S / Rte 37
8/8/2006	10:45:00 AM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear						Rte 93 S / Rte 37
8/12/2006	2:52:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
8/26/2006	9:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear				Exit 6 on Rte 93 N		Rte 93 N
8/29/2006	12:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Rain	Rte 93 S	Rte 24				
9/15/2006	8:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93		Rte 93
10/3/2006	5:50:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						Rte 93 N
10/7/2006	12:45:00 PM	Non-fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 7 on Rte 93		Rte 93 S
10/8/2006	1:46:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 18 on Rte 3		Rte 3 S / Rte 93
10/8/2006	1:58:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 37
10/16/2006	2:37:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
10/20/2006	5:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Dusk	Rain				Exit 17 on Rte 3		Rte 3 / Rte 93
10/20/2006	7:10:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Rain			SOUTH OF EXIT 6	Exit 6 on Rte 93 S		Rte 93 S
10/29/2006	12:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Cloudy						Rte 93 N
11/5/2006	6:10:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93
11/12/2006	5:40:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Rain						Rte 93 S
11/18/2006	2:20:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			BRAINTREE SPLIT			Rte 93 N / Rte 93
11/19/2006	2:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 93 NB TO RT 3 SB
11/25/2006	8:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
12/16/2006	7:59:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear				1000 feet S from Exit 6 on Rte 93 N		852 feet W from Intersection Rte 93 N / RAMP-RT 93 NB TO RT 37
2/5/2004	7:20:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
8/25/2004	2:00:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 37			Rte 37 / Rte 93
9/16/2004	10:00:00 AM	Not Reported	1	0	0	Unknown	Unknown	Wet	Daylight	Rain	Rte 93 N					
12/6/2004	4:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear	Rte 93 E					
12/9/2004	4:00:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N			Rte 93 N / Rte 37
3/3/2005	4:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
3/30/2005	5:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 3
4/29/2005	4:45:00 AM	Not Reported	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				3000 feet S from Exit 37 on Rte 93		Rte 93 S
5/20/2005	9:15:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Dark - lighted roadway	Clear						INTERSTATE 93 Rte 93 N / Rte 93
5/25/2005	2:45:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BRAINTREE - Rte 93			Rte 93
6/30/2005	6:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
7/23/2005	1:30:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
7/31/2005	1:30:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Daylight	Clear				Exit 6 on Rte 93 S		Rte 93 S
8/16/2005	5:10:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93 S					
8/21/2005	3:30:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Daylight	Not Reported	SOUTH STREET Rte 93					
8/24/2005	4:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 37
9/25/2005	6:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
1/27/2006	5:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			BENNY AND PHILS			Rte 93 N
2/15/2006	5:00:00 AM	Not Reported	4	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 6 on Rte 93		Rte 93
2/20/2006	10:05:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S	GRANITE STREET				
4/14/2006	4:00:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 N	Rte 93 N Milemarker 1.0	Rte 93 N
4/14/2006	12:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93 / BRAINTREE SPLIT
4/26/2006	7:10:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 feet S from Exit 37 on Rte 93		Rte 93
4/28/2006	3:35:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
5/11/2006	5:00:00 AM	Not Reported	2	0	0	Unknown	Unknown	Dry	Daylight	Cloudy				Exit 3 on Rte 93 S		WASHINGTON STREET Rte 93 S / Rte 3
6/16/2006	4:35:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
7/1/2006	9:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				Exit 6 on Rte 93 S		Rte 93 S / Rte 3
8/4/2006	2:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / Rte 37
8/11/2006	9:10:00 AM	Not Reported	4	0	0	Rear-end	Rear-end	Dry	Not reported	Not Reported						INTERSTATE 93 Rte 93 / RAMP-RT 93 NB TO RT 3 SB Rte 3
8/14/2006	6:00:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Dusk	Clear						GRANITE STREET Rte 1 / MIDDLE STREET Rte 93
8/17/2006	10:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AFTER BRAINTREE PLAZA			Rte 93 S
10/3/2006	5:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			BRAINTREE SPLIT			Rte 93 / Rte 93
11/16/2006	5:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain				Exit 5 on Rte 93		Rte 93 S
1/5/2004	10:10:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain			Rte 93 S			175 feet W from Intersection Rte 93 S / Rte 37
1/5/2004	10:52:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Snow			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
1/9/2004	3:44:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
1/11/2004	2:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			ADJACENT TO HAEMONETICS BUILDING - Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
1/13/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Snow			Rte 93 N			Rte 93 N / Rte 3
1/15/2004	12:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Cloudy			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
1/18/2004	2:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 N			Rte 93 N
1/18/2004	5:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Dark - roadway not lighted	Cloudy/Snow	SOUTHEAST EXPRESSWAY Rte 93 S	ROUTE 3 Rte 3 S				
1/21/2004	5:09:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy/Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
1/22/2004	7:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
1/27/2004	11:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
1/31/2004	5:27:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
2/1/2004	11:27:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
2/2/2004	8:31:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
2/7/2004	1:39:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
2/7/2004	3:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Sleet, hail (freezing rain or drizz			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
2/10/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
2/14/2004	10:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N / RAMP - RT 93 NB TO RT 37
2/27/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
3/15/2004	12:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy			Rte 93 S	500 feet S from Exit 18 on Rte 93		Rte 93 S
3/21/2004	3:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - unknown roadway lighting	Rain			Rte 93	Exit 7 on Rte 93		Rte 93
3/21/2004	12:13:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Rain			Rte 93 N	1000 feet S from Exit 7 on Rte 93 N		Rte 93 N
3/26/2004	4:23:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 S	300 feet N from Exit 6 on Rte 93 S		Rte 93 S
3/26/2004	6:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			QUINCY BRAINTREE LINE - Rte 93 S	300 feet S from Exit 6 on Rte 93 S		Rte 93 S
3/27/2004	8:00:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy	Rte 93 N	RAMP-RT 93 NB TO RT 3 SB				
3/31/2004	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			Rte 3			Rte 3 / Rte 93
4/2/2004	4:36:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Water (standing, moving)	Dark - roadway not lighted	Rain			Rte 93 S	2500 feet N from Exit 6 on Rte 93 S		Rte 93 S
4/4/2004	12:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy	Rte 93 S	GRANITE STREET Rte 37				
4/6/2004	4:58:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	100 feet N from Exit 6 on Rte 93 N		Rte 93 N
4/7/2004	3:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	50 feet N from Exit 6 on Rte 93 N		Rte 93 N
4/9/2004	7:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 S			Rte 93 S / Rte 3
4/16/2004	9:40:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
5/3/2004	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			Rte 93 N	2500 feet S from Exit 7 on Rte 93 N		Rte 93 N
6/1/2004	4:39:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			RAMP-RT 93 SB TO RT 3 SB Rte 3 S	Exit 18 on Rte 3 S		RAMP-RT 93 SB TO RT 3 SB Rte 3 S / RAMP-RT 3 SB TO WASHINGTON ST
6/2/2004	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			Rte 93 N	500 feet N from Exit 6 on Rte 93 N		Rte 93 N
6/9/2004	5:00:00 AM	Property damage only (none injured)	2	0	0	Unknown	Not reported	Dry	Daylight	Clear			RAMP-RT 3 NB TO RT 93 NB			RAMP-RT 3 NB TO RT 93 NB / Rte 3
6/9/2004	8:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Clear			Rte 93 N	Exit 2 on Rte 93		Rte 93 N
6/18/2004	3:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain/Cloudy			Rte 93 S	2000 feet S from Exit 6 on Rte 93 S		Rte 93 S
6/21/2004	6:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 N	Exit 6 on Rte 93 N		10 feet N from Intersection Rte 93 N
6/27/2004	9:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Rte 93 N	GRANITE STREET				
7/12/2004	6:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
7/18/2004	5:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 S	1000 feet S from Exit 6 on Rte 93 S		Rte 93 S
7/20/2004	6:30:00 PM	Property damage only (none injured)	3	0	0	Rear-to-rear	Rear-to-rear	Dry	Dusk	Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
7/24/2004	12:02:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			ON RAMP FROM GRANITE STREET TO I - GRANITE STREET Rte 93 N			GRANITE STREET Rte 93 N / GRANITE STREET Rte 93
7/30/2004	7:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 N					
7/31/2004	4:05:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
8/1/2004	12:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Cloudy/Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N

BRAINTREE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
8/2/2004	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	50 feet N from Exit 6 on Rte 93 S		Rte 93 S
8/9/2004	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N			Rte 93 N
8/12/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
8/13/2004	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			PILGRIM HIGHWAY Rte 3			PILGRIM HIGHWAY Rte 3 / RAMP-RT 3 NB TO RT 93 NB
8/15/2004	6:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Rain/Cloudy			Rte 93 S	100 feet N from Exit 6 on Rte 93 S		Rte 93 S
8/15/2004	8:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain			Rte 93 N	Exit 6 on Rte 93 N		100 feet S from Intersection Rte 93 N / Rte 37
8/24/2004	8:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N					
8/28/2004	10:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 N	2000 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/13/2004	5:42:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy			Rte 93 N	5000 feet S from Exit 6 on Rte 93 N		Rte 93 N
9/28/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy			NORTH OF EXIT 6 - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
9/30/2004	3:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
10/1/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			RAMP-RT 93 NB TO RT 3 SB Rte 93 N			RAMP-RT 93 NB TO RT 3 SB Rte 93 N / Rte 3
10/1/2004	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
10/2/2004	9:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain			Rte 93 S	500 feet S from Exit 6 on Rte 93 S		Rte 93 S
10/5/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
10/12/2004	9:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			Rte 93 N	1 feet N from Exit 7 on Rte 93 N		Rte 93 N
10/13/2004	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	300 feet S from Exit 6 on Rte 93 N		Rte 93 N
10/14/2004	6:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
10/15/2004	4:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93	Exit 17 on Rte 93		Rte 93
10/19/2004	10:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			Rte 93 N	500 feet S from Exit 7 on Rte 93 N		Rte 93 N
10/24/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 93 N			Rte 93 N / Rte 3
10/30/2004	5:00:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dusk	Rain/Cloudy			Rte 93 N	1000 feet S from Exit 6 on Rte 93 N		Rte 93 N
11/2/2004	5:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear	Rte 93	Rte 3				
11/3/2004	4:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 93 N	500 feet N from Exit 17 on Rte 93		Rte 93 N
11/4/2004	12:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
11/5/2004	4:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / GRANITE STREET
11/5/2004	12:04:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Wet	Dark - lighted roadway	Clear/Clear			Rte 93 N			5280 feet S from Intersection Rte 93 N / Rte 37
11/16/2004	6:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S	100 feet N from Exit 6 on Rte 93 S		Rte 93 S
11/24/2004	4:21:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			ACROSS FROM HAEMONETICS - INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S
11/30/2004	10:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	Rte 93	RAMP-RT 93 NB TO RT 3 SB				
12/1/2004	5:26:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 N	500 feet N from Exit 6 on Rte 93 N		Rte 93 N
12/3/2004	7:42:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 N			Rte 93 N / Rte 37
12/7/2004	7:37:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
12/10/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93	Exit 6 on Rte 93		Rte 93
12/15/2004	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S			300 feet S from Intersection Rte 93 S / Rte 37
12/15/2004	6:35:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			93 N/B RTE 37 - Rte 93 W			Rte 93 W / Rte 37
12/15/2004	6:35:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			BRAINTREE SPLIT Rte 93			BRAINTREE SPLIT Rte 93
12/21/2004	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 93	Exit 6 on Rte 93		Rte 93
12/22/2004	3:10:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
12/22/2004	4:51:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			RAMP TO RT 93 NB FROM BURGIN PKY - RAMP-BURGIN PKWY TO RT 3 NB			RAMP-BURGIN PKWY TO RT 3 NB / Rte 93
12/22/2004	6:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy			Rte 93			Rte 93 / Rte 37
12/22/2004	8:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear			25 feet N from OVER PASS RT 93 - GRANITE STREET Rte 37 S			GRANITE STREET Rte 37 S / Rte 93
12/22/2004	10:34:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Cloudy			Rte 37			Rte 37 / Rte 93
12/23/2004	10:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Severe crosswinds			Rte 93			Rte 93
12/24/2004	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	Exit 6 on Rte 93		Rte 93
12/28/2004	1:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Snow			Rte 93	Exit 7 on Rte 93		Rte 93
12/31/2004	3:28:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			NORTH OF RT. 37 OFF RAMP - Rte 93 S			Rte 93 S / Rte 37
1/1/2005	5:58:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Wet	Dark - roadway not lighted	Cloudy/Clear						5280 feet S from Intersection Rte 93 N / Rte 37
1/5/2005	9:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy				Exit 7 on Rte 93 N		Rte 93 N
1/7/2005	5:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear				100 feet N from Exit 6 on Rte 93 S		Rte 93 S
1/7/2005	7:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 S		Rte 93 S
1/11/2005	2:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						1000 feet N from Intersection Rte 93 N / Rte 3
1/12/2005	1:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain				Exit 19 on Rte 93		Rte 93 S / Rte 93
1/14/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy	Rte 93 N	Rte 3 S				
1/16/2005	8:12:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Cloudy	Rte 93 N	Rte 3 S				
1/18/2005	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 N		500 feet N from Intersection Rte 93 N
1/19/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Dark - lighted roadway	Snow						Rte 93 / SOUTHEAST EXPRESSWAY
1/23/2005	12:15:00 PM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Snow	Dark - lighted roadway	Snow				Exit 6 on Rte 93		Rte 93
1/26/2005	1:45:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Wet	Daylight	Clear/Clear				Exit 6 on Rte 93 S		Rte 93 S
1/27/2005	10:57:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Slush	Daylight	Clear			RAMP TO RTE 3 SOUTH - Rte 93 S			Rte 93 S / RAMP-RT 93 SB TO RT 3 SB
1/27/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				Exit 6 on Rte 93		Rte 93
1/29/2005	3:30:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Cloudy				2500 feet S from Exit 6 on Rte 93		Rte 93
2/1/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						Rte 93 N / Rte 24
2/2/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 6 on Rte 93 S		Rte 93 S / Rte 37
2/3/2005	7:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S
2/5/2005	12:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Not Reported						Rte 93 S
2/9/2005	3:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18 on Rte 93		BRAINTREE SPLIT Rte 93 / Rte 3
2/10/2005	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Snow/Snow				Exit 6 on Rte 93 N		6 Rte 93 N
2/14/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Unknown	Dark - unknown roadway lighting	Clear						RAMP-RT 93 SB TO RT 3 SB
2/16/2005	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 93 SB TO RT 37 Rte 3 S
2/17/2005	6:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear			BEFORE SOUTH SHORE MALL - Rte 3			Rte 3 / Rte 93
2/23/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy			NORTH OF EXIT 6 - Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
2/23/2005	6:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93 N		Rte 93 N
2/25/2005	5:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dawn	Snow/Cloudy				2 feet S from Exit 6 on Rte 93 N		Rte 93 N
2/28/2005	10:06:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Snow	Dark - lighted roadway	Snow						Rte 93 S / Rte 93
3/3/2005	1:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				500 feet N from Exit 7 on Rte 93 N		Rte 93 N
3/5/2005	3:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Rte 93 N	Rte 3 S				
3/6/2005	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						INTERSTATE 93 Rte 93 / RAMP-RT 3 NB TO RT 93 SB Rte 3
3/7/2005	2:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93 N		Rte 93 N
3/7/2005	2:44:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93 N		Rte 93 N
3/8/2005	12:03:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Clear	Rte 93 N	Rte 3 S				
3/14/2005	1:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 93
3/17/2005	11:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy				5000 feet S from Exit 6 on Rte 93 N		Rte 93 N
3/18/2005	3:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				2000 feet S from Exit 6 on Rte 93 N		Rte 93 N
3/23/2005	6:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear						Rte 93 S
4/5/2005	5:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 N
4/9/2005	10:13:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 7 on Rte 93 N		Rte 93 N
4/12/2005	6:05:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Sleet, hail (freezing rain or drizzle)			BY WASHINGTON STREET RAMP - RAMP-RT 93 SB TO RT 3 SB Rte 3 S			RAMP-RT 93 SB TO RT 3 SB Rte 3 S / RAMP-RT 3 SB TO WASHINGTON ST
4/16/2005	2:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						INTERSTATE 93 Rte 93 S / RAMP-RT 93 NB TO RT 3 SB
4/18/2005	8:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy				100 feet S from Exit 6 on Rte 93 S		Rte 93 S
4/23/2005	9:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear						Rte 3 N / Rte 93
4/29/2005	6:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BETWEEN THE RAMPS AT EXIT 6 - Rte 93 N	Exit 6 on Rte 93 N		Rte 93 N
5/3/2005	5:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet S from Exit 7 on Rte 93		Rte 93 S
5/5/2005	3:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			HALF MILE BEFORE RT 24 SPLIT - Rte 93 N			Rte 93 N
5/6/2005	3:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						INTERSTATE 93 Rte 93 S
5/14/2005	8:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
5/18/2005	5:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy	Rte 93 N	WASHINGTON STREET				
5/19/2005	1:58:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RT. 93 S/B BEFORE EXIT 37 - Rte 93 S			Rte 93 S
5/21/2005	8:37:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain				Exit 7 on Rte 93 N		Rte 93 N
5/24/2005	4:10:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Rain			ON RT 3N AT THE MERGE OF RT 93S - PILGRIM HIGHWAY Rte 3			PILGRIM HIGHWAY Rte 3
5/26/2005	5:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				500 feet S from Exit 6 on Rte 93		Rte 93
5/26/2005	6:43:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				200 feet N from Exit 6 on Rte 93 N		Rte 93 N
5/27/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 N
6/1/2005	2:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
6/1/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				100 feet N from Exit 6 on Rte 93 S		Rte 93 S
6/7/2005	4:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				200 feet S from Exit 6 on Rte 93 N		Rte 93 N
6/7/2005	10:50:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
6/9/2005	2:26:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			MASS STATE LOTTERY - COLUMBIAN STREET Rte 93 N			COLUMBIAN STREET Rte 93 N
6/11/2005	7:20:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						GRANITE STREET / RAMP-RT 93 NB TO RT 37 Rte 93
6/13/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				400 feet S from Exit 7 on Rte 93 N		Rte 93 N
6/14/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BRAINTREE-QUINCY LINE - Rte 93 N			Rte 93 N
6/15/2005	6:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 6 on Rte 93 N		Rte 93 N
6/16/2005	10:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy				1000 feet N from Exit 17 on Rte 93		Rte 93 N
6/18/2005	5:31:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 93 N	Rte 3 S / Rte 93 N				
6/18/2005	11:51:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				300 feet S from Exit 7 on Rte 93 N		Rte 93 N
6/20/2005	7:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 37
6/22/2005	12:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain						Rte 93
6/24/2005	5:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						INTERSTATE 93 Rte 93 / RAMP-RT 3 NB TO RT 93 SB
7/7/2005	2:55:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
7/8/2005	12:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 7 on Rte 93 N		Rte 93 N
7/13/2005	6:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet S from Exit 6 on Rte 93 N		Rte 93 N
7/18/2005	4:05:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93 N					
7/18/2005	6:06:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Cloudy				Exit 6 on Rte 93		Rte 93
7/21/2005	7:04:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						GRANITE STREET Rte 37 S / RAMP-RT 37 SB TO RT 93 NB Rte 28 E
7/24/2005	1:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 93 N			Exit 7 on Rte 93 N		Rte 93 N
8/6/2005	4:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 S					
8/6/2005	11:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 6 on Rte 93 S		Rte 93 S
8/6/2005	11:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			NORTH OF EXIT 7 - Rte 93 S	Exit 6 on Rte 93 S		Rte 93 S
8/12/2005	4:00:00 PM	Property damage only (none injured)	4	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93
8/14/2005	4:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			SOUTH SHORE PLAZA - Rte 93 N			Rte 93 N
8/14/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Rain/Rain				1500 feet S from Exit 6 on Rte 93 S		Rte 93 S
8/16/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			NORTH OF RTE 37 - Rte 93 N			Rte 93 N / Rte 37
8/18/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 17 on Rte 93		Rte 93 / Rte 3
8/26/2005	4:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				10 feet S from Exit 5 on Rte 93		Rte 93 S
8/29/2005	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	WASHINGTON STREET Rte 93	Rte 93				
9/11/2005	1:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			RT. 93 S/B BEFORE EXIT 5A - Rte 93 S	Exit 5 on Rte 93		Rte 93 S
9/13/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			PAST SOUTH PLAZA 2 MILE BEFORE 95 - Rte 93 S			Rte 93 S
9/15/2005	10:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear						200 feet S from Intersection PILGRIM HIGHWAY Rte 3 S / RAMP-RT 93 SB TO RT 3 SB
9/16/2005	3:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						100 feet S from Intersection Rte 93 N / RAMP - RT 93 NB TO RT 3 SB

BRAINTREE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	AddressLandmark	Exit Distance	Mile Marker Distance	Feet_From
9/16/2005	7:10:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark- roadway not lighted	Rain				50 feet S	from Exit 7 on Rte 93 N	Rte 93 N
9/22/2005	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						BRAINTREE HILL PARK Rte 93 / Rte 93
9/27/2005	6:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 5	on Rte 93	Rte 93 N / Rte 93
9/28/2005	6:26:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 93 NB TO RT 3 SB
9/30/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 feet N	from Exit 6 on Rte 93	Rte 93 / Rte 93
10/2/2005	11:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 93
10/6/2005	6:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear			@ WASHINGTON STREET OFF-RAMP - RAMP-RT 93 SB TO RT 3 SB	Rte 3 S		RAMP-RT 93 SB TO RT 3 SB Rte 3 S / RAMP-RT 3 SB TO WASHINGTON ST
10/9/2005	11:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain			ON RAMP - GRANITE STREET Rte 37 N	Exit 6	on Rte 37 N	GRANITE STREET Rte 37 N / Rte 93
10/11/2005	9:36:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain				35 feet S	from Exit 7 on Rte 93 N	Rte 93 N
10/12/2005	7:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Cloudy						450 feet S from Intersection Rte 93 S / WASHINGTON STREET Rte 93 S
10/21/2005	7:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 6	on Rte 93	Rte 93
10/26/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 93 N	Rte 3 S				
11/1/2005	5:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
11/7/2005	6:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear						INTERSTATE 93 Rte 93 S / GRANITE STREET
11/9/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Cloudy/Rain			AT THE SPLIT - Rte 93 N			Rte 93 N
11/11/2005	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			S SHORE PLAZA EXIT - Rte 93			Rte 93 / Rte 93
11/16/2005	10:49:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 6	on Rte 93 S	Rte 93 S
11/22/2005	5:22:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain				Exit 6	on Rte 93 N	Rte 93 N
11/22/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain				75 feet S	from Exit 7 on Rte 93 N	Rte 93 N
11/24/2005	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Other						Rte 93 N / Rte 3
11/24/2005	12:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 N
11/25/2005	11:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						RAMP-RT 93 SB TO RT 3 SB Rte 3 S / RAMP-RT 3 SB TO WASHINGTON ST
12/5/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear				500 feet S	from Exit 6 on Rte 93 N	Rte 93 N
12/14/2005	1:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy						100 feet N from Intersection Rte 93 S / Rte 37
12/22/2005	3:22:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
12/23/2005	6:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				200 feet N	from Exit 6 on Rte 93 S	Rte 93 S
12/28/2005	2:09:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 S
12/28/2005	4:38:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 6	on Rte 93 S	Rte 93 S
1/1/2006	5:21:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Rain				Exit 16	on Rte 93	INTERSTATE 93 Rte 93 / RAMP-RT 93 NB TO RT 3 SB
1/1/2006	11:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Cloudy				Exit 6	on Rte 93 N	Rte 93 N
1/6/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				150 feet S	from Exit 6 on Rte 93 N	Rte 93 N
1/10/2006	4:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S	Rte 93 S				
1/10/2006	7:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 7	on Rte 93 N	Rte 93 N
1/10/2006	9:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				25 feet S	from Exit 6 on Rte 93 N	Rte 93 N
1/11/2006	6:31:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 N
1/11/2006	7:36:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 6	on Rte 93 N	Rte 93 N
1/12/2006	5:43:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
1/12/2006	11:35:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	Rte 93 N	Rte 3 S				
1/13/2006	6:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Cloudy			OFF RAMP FROM RT 93 S			PILGRIM HIGHWAY Rte 3 S / RAMP-RT 93 SB TO RT 3 SB
1/15/2006	2:54:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)			RT 37 RAMP AT RT 93 S			INTERSTATE 93 Rte 93 S / RAMP-RT 37 TO RT 93 SB
1/17/2006	12:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			BRAINTREE SPLIT			Rte 93 S
1/18/2006	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 7	on Rte 93 N	Rte 93 N
1/24/2006	9:26:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				1500 feet S	from Exit 6 on Rte 93 N	Rte 93 N
1/25/2006	1:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- roadway not lighted	Clear/Clear	Rte 93 N	Rte 3 S				
1/25/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear						Rte 93 / Rte 3
1/25/2006	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Snow/Snow				Exit 6	on Rte 93 N	Rte 93 N
1/29/2006	6:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain			GOLDS GYM	Exit 6	on Rte 93	Rte 93
2/1/2006	9:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
2/3/2006	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			HIGHWAY DEPT			Rte 93
2/9/2006	5:37:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear						Rte 93 N
2/9/2006	7:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 S	Rte 93 S
2/12/2006	6:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dawn	Snow						PILGRIM HIGHWAY Rte 3 / RAMP-RT 93 NB TO RT 3 SB
2/14/2006	6:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear						Rte 93
2/15/2006	4:50:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				200 feet S	from Exit 7 on Rte 93 N	Rte 93 N
2/17/2006	7:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear				Exit 7	on Rte 93 N	Rte 93 N
2/24/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark- unknown roadway lighting	Clear						Rte 93 S / Rte 3
2/27/2006	5:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear	Rte 93 N	RAMP-RT 93 NB TO RT 3 SB				
3/5/2006	2:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear						Rte 93 S
3/7/2006	11:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear						Rte 93 N
3/10/2006	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RAMP			SOUTHEAST EXPRESSWAY Rte 93
3/10/2006	6:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- unknown roadway lighting	Clear				Exit 6	on Rte 93 N	Rte 93 N
3/15/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
3/18/2006	6:18:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 7	on Rte 93 N	Rte 93 N
3/25/2006	9:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear/Clear	Rte 93 S	Rte 93 S				
3/26/2006	2:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 S	Rte 93 S
3/31/2006	6:12:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						100 feet E from Intersection PILGRIM HIGHWAY Rte 3 N / RAMP-RT 3 NB TO RT 93 NB Rte 3 N
4/6/2006	2:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 S	Rte 93 S
4/7/2006	3:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy						200 GRANITE STREET Rte 37 S / RAMP-BURGIN PKWY TO RT 3 NB Rte 93
4/9/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						GRANITE STREET Rte 37 / Rte 93
4/17/2006	11:44:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 93 N
4/29/2006	4:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			EXIT 6 OFF RAMP	Exit 6	on Rte 93 N	Rte 93 N
5/3/2006	4:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						GRANITE STREET Rte 93 / Rte 37
5/5/2006	5:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTH SHORE PLAZA EXIT			Rte 93 N
5/13/2006	7:42:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy						Rte 93 N / Rte 37
5/28/2006	5:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP TO ROUTE 3 S/B			Rte 93 S / RAMP-RT 93 SB TO RT 3 SB
6/1/2006	10:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark- roadway not lighted	Rain/Cloudy				500 feet S	from Exit 6 on Rte 93 S	Rte 93 S
6/2/2006	5:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 6	on Rte 93 N	Rte 93 N
6/3/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Cloudy						Rte 93 S
6/4/2006	10:10:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Cloudy						Rte 93 S / WASHINGTON STREET Rte 3
6/7/2006	2:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 6	on Rte 93 S	Rte 93 S
6/8/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 8	on Rte 93	Rte 93 / Rte 37
6/11/2006	7:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy				Exit 6	on Rte 93 N	Rte 93 N
6/13/2006	8:26:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
6/13/2006	8:29:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						75 feet S from Intersection Rte 3 S / Rte 93
6/13/2006	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 17	on Rte 93	Rte 93
6/13/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N	Rte 3 S				
6/14/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				20 feet N	from Exit 6 on Rte 93 S	Rte 93 S
6/19/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
6/19/2006	5:52:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 7	on Rte 93 N	Rte 93 N
7/5/2006	3:07:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
7/5/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6	on Rte 93	Rte 93
7/9/2006	6:22:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
7/14/2006	1:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				30 feet N	from Exit 6 on Rte 93 S	Rte 93 S
7/14/2006	10:40:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear						Rte 93 / Rte 93
7/14/2006	10:55:00 PM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
7/22/2006	3:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 / BRAINTREE HILL PARK
7/26/2006	12:40:00 PM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				800 feet S	from Exit 6 on Rte 93 S	Rte 93 S
7/27/2006	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 37	on Rte 93	Rte 93 S
7/28/2006	4:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						PILGRIM HIGHWAY Rte 3 / RAMP-RT 3 NB TO RT 93 SB
7/31/2006	1:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Cloudy	Rte 93 N	Rte 3				
8/3/2006	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet S	from Exit 7 on Rte 93 N	Rte 93 N
8/5/2006	11:49:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				1200 feet S	from Exit 6 on Rte 93 N	Rte 93 N
8/7/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear	Rte 93 S	Rte 93 S				
8/10/2006	6:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			ROUTE 37	Exit 6	on Rte 93 S	Rte 93 S
8/12/2006	3:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 93 / Rte 37
8/16/2006	10:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S	from Exit 6 on Rte 93 N	Rte 93 N
8/18/2006	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6	on Rte 93	Rte 93
8/28/2006	9:03:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain				Exit 6	on Rte 93 N	Rte 93 N
8/29/2006	6:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			@ SOUTH HAMPTON STREET OFF RAMP	Exit 6	on Rte 93 N	Rte 93 N / SOUTHAMPTON STREET
8/31/2006	9:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark- unknown roadway lighting	Clear				Exit 6	on Rte 93 S	Rte 93 S
9/9/2006	6:39:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
9/9/2006	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8	on Rte 93	Rte 93 S
9/30/2006	1:34:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Other	Dark- roadway not lighted	Clear/Clear						Rte 93 N
10/1/2006	8:29:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 7	on Rte 93	Rte 93 S
10/2/2006	10:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
10/2/2006	12:20:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear						Rte 93 / Rte 37
10/6/2006	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 37
10/7/2006	11:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
10/10/2006	10:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 3	on Rte 93	Rte 93 N
10/14/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear						Rte 93 S / Rte 37
10/15/2006	2:11:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N	Rte 37 W				
10/15/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 6	on Rte 93 S	Rte 93 S
10/15/2006	2:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy				Exit 6	on Rte 93	Rte 93
10/18/2006	5:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
10/19/2006	4:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP-RT 93 SB TO RT 3 SB Rte 3 / RAMP-RT 3 SB TO WASHINGTON ST
10/20/2006	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Rain						Rte 93 N
10/25/2006	5:07:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 7	on Rte 93 N	Rte 93 N
10/26/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- roadway not lighted	Clear						Rte 93 N
10/27/2006	7:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 N
11/1/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Rte 93 S	Rte 3 S				
11/8/2006	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain						INTERSTATE 93 Rte 93 N / GRANITE STREET Rte 37 N
11/10/2006	3:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						Rte 93 S / Rte 37
11/13/2006	9:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 6	on Rte 93 S	Rte 93 S
11/15/2006	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						200 feet S from Intersection Rte 93 S / Rte 37
11/16/2006	5:01:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 37
11/19/2006	9:48:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 93 N / Rte 37
11/21/2006	1:47:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 6	on Rte 93 N	Rte 93 N
11/21/2006	4:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						100 feet N from Intersection Rte 93 / Rte 3
11/21/2006	5:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Unknown						200 feet N from Intersection Rte 93 S / Rte 3

BRAINTREE	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	AddressLandmark	Exit Distance	Mile Marker Distance	Feet_From
11/22/2006	4:22:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear			PRIOR TO EXIT 6	Exit 6 on Rte 93 N		Rte 93 N
11/23/2006	5:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 6 on Rte 93 S		Rte 93 S
11/23/2006	8:26:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				500 feet N from Exit 6 on Rte 93 S		Rte 93 S
12/1/2006	7:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain				20 feet S from Exit 7 on Rte 93 N		Rte 93 N
12/3/2006	11:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
12/4/2006	5:51:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				Exit 37 on Rte 93		Rte 93 S
12/6/2006	7:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- unknown roadway lighting	Clear			SOUTH SHORE PLAZA EXIT			Rte 93 N / Rte 93
12/9/2006	11:13:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 N	Rte 93 N				
12/11/2006	2:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93		Rte 93
12/11/2006	11:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 6 on Rte 93 S		Rte 93 S
12/12/2006	6:25:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N
12/14/2006	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 37
12/14/2006	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				500 feet N from Exit 6 on Rte 93 N		Rte 93 N
12/18/2006	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 7 on Rte 93 N		Rte 93 N
12/18/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear			BRAINTREE SPLIT			Rte 93 N / RAMP-RT 93 NB TO WASHINGTON ST/BURGIN PK
12/19/2006	5:56:00 PM	Property damage only (none injured)	3	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				1000 feet S from Exit 6 on Rte 93 N		Rte 93 N
12/20/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						Rte 93 N
12/23/2006	7:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				25 feet E from Exit 6 on Rte 93 N		Rte 93 N
12/23/2006	9:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP-RT 37 NB TO RT 93 NB
12/27/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear						Rte 93 / Rte 1
12/29/2006	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / Rte 37
5/14/2004	6:15:00 PM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark- unknown roadway lighting	Clear			Rte 93 N	Exit 7 on Rte 93 N		Rte 93 N
9/27/2004	6:00:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Not reported	Dusk	Not Reported			Rte 93 N			Rte 93 N / Rte 37
1/4/2005	9:30:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 3
1/5/2005	11:45:00 AM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Snow						Rte 3 S / Rte 93
1/24/2005	4:10:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy						Rte 3 / Rte 93
2/3/2005	7:45:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				150 feet S from Exit 6 on Rte 93		Rte 93 / Rte 93
5/2/2005	2:30:00 AM	Unknown	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						Rte 93 S / HOLBROOK AVENUE
8/25/2005	11:20:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			S SHORE PLAZA ENTRANCE - GRANITE STREET Rte 93			GRANITE STREET Rte 93
2/22/2006	6:00:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				50 feet S from Exit 6 on Rte 93		Rte 93
11/15/2006	7:10:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Dark- roadway not lighted	Clear/Clear				Exit 6 on Rte 93 N		Rte 93 N

BOSTON (DORCHESTER) 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
2/21/2004	2:30:00 AM	Fatal injury	6	5	1	Angle	Angle	Dry	Dark - lighted roadway	Cloudy			GRANITE AVE EXIT - Rte 93 S	200 feet N from Exit 1 15 on Rte 93 S		Rte 93 S
8/12/2006	2:21:00 AM	Fatal injury	2	3	1	Rear-end	Rear-end	Dry	Not reported	Clear/Clear				1000 feet N from Exit 12 on Rte 93 S		Rte 93 S
1/7/2004	2:40:00 PM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Daylight	Clear			Rte 93 N			300 feet S from Intersection Rte 93 N / NEPONSET ON RAMP
1/11/2004	12:25:00 PM	Non-fatal injury	4	1 4	0	Rear-end	Rear-end	Dry	Daylight	Clear			N OF COLUMBIA RD - INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S
1/12/2004	9:20:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Snow			SAVIN HILL AVENUE Rte 93 N	200 feet S from Exit 15 on Rte 93 N		120 feet N from Intersection SAVIN HILL AVENUE Rte 93 N / HOV
1/26/2004	2:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Not reported	Daylight	Clear			150 Feet N From NEPONSET ON RAMP - Rte 93 N			Rte 93 N
1/29/2004	7:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 15 on Rte 93		500 feet N from Intersection Rte 93 S / SAVIN HILL AVENUE
1/31/2004	12:30:00 PM	Non-fatal injury	2	2	0	Not reported	Not reported	Dry	Daylight	Clear			GRANITE AVENUE Rte 93 S			GRANITE AVENUE Rte 93 S / Rte 93
2/4/2004	2:01:00 PM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear			Rte 93 N	Exit 13 on Rte 93 N		Rte 93 N
2/9/2004	11:05:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			FREEPORT ST ON RAMP SB - INTERSTATE 93 Rte 93 S	2000 feet N from Exit 12 on Rte 93 S		INTERSTATE 93 Rte 93 S
2/25/2004	12:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 N	2640 feet S from Exit 13 on Rte 93 N		Rte 93 N
2/26/2004	10:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			Rte 93 S			Rte 93 S / GRANITE AVENUE
3/13/2004	10:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N	100 feet N from Exit 15 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / COLUMBIA ROAD
3/17/2004	1:50:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Slush	Dark - lighted roadway	Rain/Sleet, hail (freezing rain or drizz			Rte 93 S	2 00 Feet S From Exit 12 on Rte 93 S		Rte 93 S
3/18/2004	9:00:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Slush	Daylight	Snow			Rte 93 S	Exit 15 on Rte 93 N		Rte 93 N
3/20/2004	5:15:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dusk	Clear			NEAR ROUND INN - Rte 93 S			Rte 93 S
3/22/2004	1:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			305 FREEPORT STREET			305 FREEPORT STREET / Rte 93
4/3/2004	6:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			GRANITE AVE - Rte 93 S			Rte 93 S / GRANITE AVENUE
4/3/2004	7:32:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			SOUTH BAY AVENUE Rte 93 S			SOUTH BAY AVENUE Rte 93 S / Rte 3A
4/17/2004	10:55:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy/Unknown			SOUTH BAY MALL - FRONTAGE ROAD Rte 93 S			FRONTAGE ROAD Rte 93 S / Rte 93
5/3/2004	5:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 S			Rte 93 S
5/8/2004	10:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / Rte 93
5/19/2004	3:45:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			NEPONSET ON RAMP - Rte 93 N			Rte 93 N
5/22/2004	7:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 13 on Rte 93 N		Rte 93 N
5/24/2004	9:05:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			GENERAL CASIMIR PULASKI SKYWAY Rte 93			GENERAL CASIMIR PULASKI SKYWAY Rte 93 / Rte 93
6/2/2004	6:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 N	Exit 13 on Rte 93 N		Rte 93 N / FREEPORT STREET
6/17/2004	7:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			GENERAL CASIMIR PULASKI SKYWAY Rte 93			GENERAL CASIMIR PULASKI SKYWAY Rte 93
7/30/2004	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			NECONSET CUT OUT - Rte 93 S	Exit 11B on Rte 93 S		Rte 93 S
9/4/2004	1:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
9/25/2004	3:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Daylight	Clear			Rte 93 N	Exit 14 on Rte 93 N	Rte 93 N Milemarker 76.2	Rte 93 N
9/28/2004	2:20:00 AM	Non-fatal injury	3	1	0	Not reported	Not reported	Wet	Daylight	Rain			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / COLUMBIA ROAD
10/4/2004	10:15:00 AM	Non-fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear			NEAR END OF ZIPPER LANE - GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
10/17/2004	1:38:00 AM	Non-fatal injury	2	5	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy/Cloudy			250 FREEPORT STREET			250 FREEPORT STREET / RAMP - RT 93 NB TO FREEPORT ST
11/29/2004	10:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			COLUMBIA ROAD Rte 93			COLUMBIA ROAD Rte 93
12/26/2004	1:15:00 PM	Non-fatal injury	2	4	0	Sideswipe, same direction	Sidesswipe, same direction	Wet	Daylight	Sleet, hail (freezing rain or drizzle)			INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S
1/2/2005	9:14:00 PM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy						Rte 93 S
1/6/2005	6:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Snow	Dawn	Snow						Rte 93 S
2/25/2005	2:45:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 13 on Rte 93 N		Rte 93 N
2/25/2005	6:30:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 12 on Rte 93 S		GALLIVAN BOULEVARD Rte 93 S
3/1/2005	2:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S					Rte 93 S
3/9/2005	10:08:00 AM	Non-fatal injury	1	1	0	Sideswipe, same direction	Sidesswipe, same direction	Snow	Dark - lighted roadway	Snow				Exit 12 on Rte 93 S		Rte 93 S
3/10/2005	9:45:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Not reported	Daylight	Clear						Rte 93 S
3/26/2005	4:00:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93		GALLIVAN BOULEVARD Rte 93
3/30/2005	6:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / GRANITE AVENUE
4/3/2005	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 93 N
5/2/2005	9:45:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						COLUMBIA ROAD / RAMP - COLUMBIA RD TO RT 93 SB
5/23/2005	4:30:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sidesswipe, same direction	Wet	Dark - lighted roadway	Rain						GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
6/7/2005	7:00:00 AM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				2640 feet S from Exit 13 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / WILLIAM T MORRISSEY BOULEVARD
6/9/2005	11:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Sidesswipe, opposite direction	Wet	Dark - lighted roadway	Rain						DORCHESTER AVENUE Rte 93 S / ASHMONT STREET
6/10/2005	6:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				2000 feet N from Exit 11A on Rte 93		Rte 93
6/24/2005	8:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93		Rte 93
7/25/2005	5:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				600 feet S from Exit 15 on Rte 93		Rte 93
7/27/2005	3:25:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
8/7/2005	3:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 12 on Rte 93 S		Rte 93 S
9/9/2005	10:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 S / Rte 93
10/2/2005	6:40:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 14 on Rte 93 N		Rte 93 N
10/11/2005	4:45:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain						Rte 93
10/19/2005	6:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	WILLIAM DAY BOULEVARD Rte 93	MORRISSEY SERVICE ROAD				
10/19/2005	11:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Sand, mud, dirt, oil, gravel	Daylight	Clear				Exit 13 on Rte 93		Rte 93
10/25/2005	11:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sidesswipe, same direction	Wet	Dark - roadway not lighted	Rain			ENTRANCE JFK MASS STATION - COLUMBIA ROAD			COLUMBIA ROAD / Rte 93
12/22/2005	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / GRANITE AVENUE
1/3/2006	2:40:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Not reported	Daylight	Rain						GALLIVAN BOULEVARD / Rte 93
1/5/2006	2:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Sleet, hail (freezing rain or drizzle)						WOODVILLE STREET Rte 93 / WOODVILLE TERRACE Rte 3
1/12/2006	10:48:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 14 on Rte 93 N		Rte 93 N
1/17/2006	9:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 / JOHN F FITZGERALD EXPRESSWAY
1/20/2006	3:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Not reported	Dark - lighted roadway	Rain				Exit 11 on Rte 93		Rte 93
1/23/2006	5:50:00 AM	Non-fatal injury	4	2	0	Rear-to-rear	Rear-end	Wet	Dark - lighted roadway	Rain				50 feet N from Exit 11 on Rte 93		Rte 93
1/24/2006	9:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 93
1/31/2006	3:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93
3/13/2006	5:30:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - unknown roadway lighting	Clear				Exit 12 on Rte 93 S		Rte 93 S
3/16/2006	7:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						COLUMBIA ROAD Rte 93 S / Rte 3
3/17/2006	11:10:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported						547 COLUMBIA ROAD / RAMP - COLUMBIA RD TO RT 93 NB
4/21/2006	10:40:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
5/10/2006	2:50:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain				50 feet N from Exit 1 on Rte 93 S		Rte 93 S
5/10/2006	6:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dusk	Rain						BLUE HILL AVENUE Rte 93 / COLUMBIA ROAD
5/10/2006	9:00:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 13 on Rte 93		Rte 93
5/15/2006	10:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						DORCHESTER AVENUE Rte 93 / GALLIVAN BOULEVARD
5/20/2006	2:50:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93 S		Rte 93 S
6/6/2006	1:14:00 AM	Non-fatal injury	2	3	0	Not reported	Not reported	Not reported	Daylight	Cloudy						GENEVA AVENUE Rte 93 / Rte 3
6/12/2006	9:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93		Rte 93 N
6/25/2006	9:00:00 AM	Non-fatal injury	2	2	0	Unknown	Unknown	Wet	Dark - lighted roadway	Rain						Rte 93 S
7/19/2006	2:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						DORCHESTER AVENUE Rte 93 / Rte 1
7/19/2006	10:15:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Daylight	Clear				Exit 15 on Rte 93		Rte 93
8/14/2006	3:05:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 18 on Rte 93		Rte 93
8/14/2006	11:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				2640 feet N from Exit 14 on Rte 93		Rte 93
8/21/2006	3:00:00 AM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
8/22/2006	8:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	3ENERAL CASIMIR PULASKI SKYWAY Rte 93 N	GENERAL CASIMIR PULASKI SKYWAY Rte 93 N		Exit 13 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
8/26/2006	1:49:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain				Exit 14 on Rte 93 N		Rte 93 N
8/29/2006	3:45:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			BEFORE ZIPPER			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / Rte 93
9/7/2006	7:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				900 feet N from Exit 12 on Rte 93		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
9/30/2006	1:00:00 AM	Non-fatal injury	3	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 14 on Rte 93 N		Rte 93 N
9/30/2006	12:00:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93		Rte 93
10/7/2006	4:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Dark - lighted roadway	Clear						DORCHESTER AVENUE Rte 93 / COLUMBIA ROAD
10/15/2006	4:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 93		Rte 93
10/16/2006	10:50:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 14 on Rte 93 N		Rte 93 N
11/10/2006	7:45:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						FREEPORT STREET / Rte 93
11/24/2006	12:45:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 15 on Rte 93 N		Rte 93 N
12/5/2006	5:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 12 on Rte 93		Rte 93
12/7/2006	6:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 12 on Rte 93 S		Rte 93 S
1/9/2004	8:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Ice	Daylight	Not Reported	Rte 93 N					
2/13/2004	4:55:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 93 S	300 feet N from Exit 2 0 on Rte 93 S		Rte 93 S
3/8/2004	11:57:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Snow			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / COLUMBIA ROAD
4/5/2004	7:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Ice	Daylight	Cloudy/Unknown	Rte 93 N					
4/15/2004	6:55:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain	SOUTH BAY AVENUE Rte 93					
4/16/2004	5:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			RAMP - RT 3A NB TO RT 93 NB Rte 3	Exit 10 on Rte 3		RAMP - RT 3A NB TO RT 93 NB Rte 3 / Rte 93
6/11/2004	6:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	WILLIAM T MORRISSEY BOULEVARD	RAMP - RT 93 NB TO MORRISSEY BLVD				
6/16/2004	5:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N / Rte 93
8/8/2004	12:52:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear			Rte 93	100 feet S from Exit 15 on Rte 93		Rte 93
10/2/2004	12:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	Exit 13 on Rte 93		Rte 93
10/26/2004	4:05:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 93 N			2 feet N from Intersection Rte 93 N / NEPONSET VALLEY PARKWAY
10/27/2004	6:00:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Clear	Rte 93 N					
11/11/2004	8:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	Exit 11B on Rte 93 S		Rte 93 S
12/9/2004	12:00:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Daylight	Clear			Rte 93 N	Exit 11 on Rte 93		Rte 93 N
1/22/2005	9:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Snow	Not reported	Snow			EXIT RAMP TO ASHMONT OFF 93 S - Rte 93 S			Rte 93 S
1/24/2005	11:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Snow	Daylight	Clear	WILLIAM T MORRISSEY BOULEVARD Rte 93 S					
1/29/2005	2:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 10 on Rte 93		Rte 93 S
2/1/2005	12:00:00 PM	Not Reported	1	0	0	Not reported	Not reported	Dry	Daylight	Clear	WASHINGTON STREET Rte 93	VASSAR STREET				
2/8/2005	7:20:00 AM	Not Reported	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93 S		Rte 93 S
2/12/2005	5:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dusk	Clear			TOWARDS BOSTON - Rte 93 N			Rte 93 N
3/9/2005	6:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear					Rte 93 S Milemarker 15.0	Rte 93 S
4/11/2005	3:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear	Rte 93	COLUMBIA ROAD				
4/12/2005	2:40:00 AM	Not Reported	4	0	0	Rear-to-rear	Rear-to-rear	Dry	Daylight	Clear				Exit 13 on Rte 93 N		Rte 93 N
5/10/2005	11:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sidesswipe, same direction	Dry	Daylight	Clear						Rte 93 S / WILLIAM T MORRISSEY BOULEVARD
6/13/2005	7:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						DORCHESTER AVENUE Rte 93 N / FREEPORT STREET
6/17/2005	3:10:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						GRANITE AVENUE Rte 93
8/5/2005	8:40:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				300 feet S from Exit 15 on Rte 93 N		Rte 93 N
10/1/2005	5:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93
10/13/2005	6:40:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Rain						Rte 93 / Rte 93
10/14/2005	5:50:00 AM	Not Reported	2	0	0	Head-on	Head-on	Wet	Dark - unknown roadway lighting	Rain				Exit 11B on Rte 93 S		Rte 93 S
10/14/2005	6:15:00 AM	Not Reported	3	0	0	Sideswipe, same direction	Sidesswipe, same direction	Wet	Dark - unknown roadway lighting	Rain				150 feet N from Exit 11B on Rte 93		Rte 93
10/17/2005	11:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Unknown	Not Reported						WILLIAM T MORRISSEY BOULEVARD Rte 93 / Rte 93
10/18/2005	6:45:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 93 S / Rte 93
1/9/2006	6:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear				Exit 13 on Rte 93		Rte 93
1/9/2006	7:45:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						JOHN F FITZGERALD EXPRESSWAY Rte 93 N / GENERAL CASIMIR PULASKI SKYWAY
1/14/2006	6:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dawn	Rain			JFK TRAIN STATION			COLUMBIA ROAD / Rte 93
2/6/2006	7:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			JFK LIBRARY			200 WILLIAM T MORRISSEY BOULEVARD Rte 93 N
2/28/2006	7:45:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	Rte 203	Rte 203				Rte 93 / GRANITE AVENUE
2/28/2006	8:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - unknown roadway lighting	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / COLUMBIA ROAD
4/4/2006	8:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 93 S	Rte 93 S				
5/21/2006	4:20:00 PM	Not Reported	4	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 / Rte 1
5/21/2006	4:20:00 PM	Not Reported	4	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						1 GENERAL CASIMIR PULASKI SKYWAY Rte 93
5/31/2006	6:50:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear						FREEPORT STREET Rte 93 / DORCHESTER AVENUE
7/26/2006	10:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93 N	Rte 93 N				
8/6/2006	2:00:00 AM	Not Reported	1	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 / COLUMBIA ROAD
8/22/2006	3:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Not Reported				Exit 11 on Rte 93		Rte 93
9/20/2006	4:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93 N		Rte 93 N
9/25/2006	9:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Not reported	Dark - roadway not lighted	Cloudy				Exit 12 on Rte 93		Rte 93
10/19/2006	9:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear				20 feet N from Exit 14 on Rte 93 N		Rte 93 N
10/27/2006	6:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N
1/2/2004	10:48:00 PM	Property damage only (none injured)	1

BOSTON (DORCHESTER) 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
3/5/2004	7:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			ON RAMP - Rte 93 S	1320 feet N from Exit 12 on Rte 93 S		10 Feet N from Intersection Rte 93 S / TOLMAN STREET
3/10/2004	1:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 S	Exit 12 on Rte 93 S		Rte 93 S
3/10/2004	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	200 Feet S from Exit 13 on Rte 93 N		Rte 93 N
3/12/2004	2:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 93 S			Rte 93 S / FREEPORT STREET
3/17/2004	8:18:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy			Rte 93 N	400 Feet S from Exit 15 on Rte 93 N		Rte 93 N
3/20/2004	9:20:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain			Rte 93 N			Rte 93 N / SAVIN HILL AVENUE
4/2/2004	7:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 93 S			Rte 93 S / FREEPORT STREET
4/2/2004	11:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
4/2/2004	11:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N	Exit 14 on Rte 93 N		Rte 93 N
4/5/2004	2:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			NEPONSET AVENUE Rte 93 N			NEPONSET AVENUE Rte 93 N / Rte 93
4/6/2004	8:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 13 on Rte 93 N		Rte 93 N
4/9/2004	3:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			KEYSTONE STREET Rte 93 N			KEYSTONE STREET Rte 93 N
4/9/2004	11:25:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 93 S	Exit 12 on Rte 93 S		Rte 93 S
4/12/2004	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTHEAST XPWY - Rte 90			Rte 90 / Rte 93
4/14/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain	Rte 93	GRANITE AVENUE				
4/19/2004	3:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 N	200 Feet N from Exit 13 on Rte 93 N		Rte 93 N
4/19/2004	10:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			KEYSTONE BLDG - Rte 93 S			Rte 93 S
4/26/2004	2:00:00 PM	Property damage only (none injured)	8	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 S	100 Feet S from Exit 12 on Rte 93 S		Rte 93 S
4/27/2004	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N	Exit 13 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
5/2/2004	10:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93	Exit 15 on Rte 93		Rte 93
5/13/2004	2:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S					
5/25/2004	12:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Unknown			Rte 93 S	200 Feet S from Exit 12 on Rte 93 S		Rte 93 S
5/26/2004	4:20:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			GRANITE AVENUE Rte 93 N			GRANITE AVENUE Rte 93 N / Rte 93
5/27/2004	5:50:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / COLUMBIA ROAD
5/27/2004	8:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			NORTH HOV BLDG - Rte 93 N			Rte 93 N
5/28/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 S			Rte 93 S / Rte 93
6/1/2004	9:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy			Rte 93			Rte 93 / 15
6/2/2004	8:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy			Rte 93 S			Rte 93 S
6/8/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S
6/15/2004	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93			Rte 93 / Rte 93
7/8/2004	4:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
8/4/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Cloudy			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / Rte 3A
8/13/2004	2:30:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 13 on Rte 93 N		Rte 93 N
8/16/2004	4:15:00 PM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Wet	Daylight	Cloudy			Rte 93 S	Exit 11A on Rte 93 S		Rte 93 S
8/26/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 93 N	Exit 14 on Rte 93 N		Rte 93 N
8/30/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	200 feet S from Exit 14 on Rte 93		Rte 93
9/24/2004	6:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 93 S			Rte 93 S
9/25/2004	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	200 feet S from Exit 13 on Rte 93		Rte 93
10/1/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N / Rte 93
10/3/2004	8:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy	Rte 93 S					
10/8/2004	10:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy			COLUMBIA ROAD Rte 93 S			COLUMBIA ROAD Rte 93 S
10/12/2004	9:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
11/10/2004	6:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear			Rte 93 S			Rte 93 S
11/16/2004	7:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 15 on Rte 93 N		Rte 93 N
11/17/2004	7:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 1 on Rte 93 S		Rte 93 S
11/29/2004	11:00:00 AM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
12/5/2004	9:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93	Exit 11 on Rte 93		Rte 93
12/15/2004	5:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93	Exit 12 on Rte 93		Rte 93
12/25/2004	1:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy			0 feet W from SAVIN HILL BALLFIELDS - Rte 93 N	5000 feet S from Exit 15 on Rte 93 N		Rte 93 N
12/28/2004	6:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N			GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / Rte 93
1/1/2005	1:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Not reported	Dark - lighted roadway	Clear				30 feet N from Exit 12 on Rte 93 S		Rte 93 S
1/5/2005	5:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		200 Feet S from NEPONSET ON RAMP TO 93 N/B - GENERAL CASIMIR PULASKI SKYWAY Rte 93 N				GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
1/9/2005	4:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
1/9/2005	5:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dawn	Snow						Rte 93 S
1/17/2005	3:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Cloudy/Snow				Exit 12 on Rte 93		Rte 93 N
1/19/2005	11:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Dark - lighted roadway	Snow	Rte 93 S					Rte 93 S
1/20/2005	9:16:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Clear				15 Feet N from Exit 17 on Rte 93 N		Rte 93 N
1/20/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Clear						Rte 93 / WILLIAM T MORRISSEY BOULEVARD
1/27/2005	7:04:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Clear/Clear			100 feet S from SAVIN HILL AVE OVERPASS - Rte 93 S			100 Feet S from Intersection Rte 93 S / SAVIN HILL AVENUE
1/28/2005	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / RAMP - RT 93 S/B TO COLUMBIA RD
2/5/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			JUST BEFORE DORCHESTER EXIT WHERE - Rte 93 S			Rte 93 S
2/11/2005	6:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Unknown	Clear/Clear			COLUMBIA ROAD ON RAMP TO 93 S/OUT - RAMP - COLUMBIA RD TO RT 93 S/B			RAMP - COLUMBIA RD TO RT 93 S/B / Rte 93
2/15/2005	1:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 10 on Rte 93		Rte 93 S
2/23/2005	10:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear			RT. 93 SOUTHBOUND - Rte 93 S			Rte 93 S
3/4/2005	4:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
3/9/2005	4:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - unknown roadway lighting	Snow/Sleet, hail (freezing rain or drizzle)				Exit 18 on Rte 93 S		Rte 93 S
3/9/2005	7:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			100 Feet S from MORRISSEY BLVD. - Rte 93 S			100 Feet S from Intersection Rte 93 S / WILLIAM T MORRISSEY BOULEVARD
3/9/2005	9:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Slush	Daylight	Clear/Cloudy				50 Feet S from Exit 13 on Rte 93		Rte 93 S / Rte 93
3/16/2005	2:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						WILLIAM T MORRISSEY BOULEVARD / RAMP - MORRISSEY BLVD TO RT 93 S/B
3/30/2005	6:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 12 on Rte 93		Rte 93
3/31/2005	6:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93
4/4/2005	7:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93 S		Rte 93 S
4/19/2005	9:35:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
4/23/2005	11:25:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain						COLUMBIA ROAD Rte 93 / Rte 93
4/30/2005	2:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain						FREEPORT STREET Rte 93 S / Rte 93
5/5/2005	3:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dry	Clear						Rte 93 S
5/5/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy	KOSCIUSZKO CIRCLE Rte 93					
5/27/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93
5/28/2005	12:01:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 / Rte 93
7/10/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	NEPONSET VALLEY PARKWAY Rte 93 S					
7/13/2005	10:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 S					
7/17/2005	2:00:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear				1500 feet N from Exit 12 on Rte 93 S		Rte 93 S
7/20/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / 14
7/21/2005	5:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				3000 Feet S from Exit 13 on Rte 93 N		Rte 93 N
8/3/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93		Rte 93
8/5/2005	8:20:00 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Dry	Dusk	Clear			JFK LIBRARY EXIT - Rte 93			Rte 93
8/15/2005	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 3 on Rte 93		Rte 93
8/25/2005	10:00:00 AM	Property damage only (none injured)	5	0	0	No Injured	Not reported	Not reported	Not reported	Not Reported						Rte 93 N
8/30/2005	4:30:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			GAS TANK - Rte 93 S			Rte 93 S
9/12/2005	1:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						FREEPORT STREET Rte 93 S
9/15/2005	10:00:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 12 on Rte 93 S		GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
10/11/2005	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93 S		Rte 93 S / Rte 93
10/22/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear/Clear	MASSACHUSETTS AVENUE Rte 93 S					
11/11/2005	7:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - roadway not lighted	Rain	Rte 93 N					
11/13/2005	4:20:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / COLUMBIA ROAD
12/10/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Dawn	Clear						Rte 93 N
1/1/2006	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Rain				Exit 15 on Rte 93 N		Rte 93 N
1/13/2006	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N / RAMP - RT 93 N/B TO FREEPORT ST
1/25/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				Exit 15 on Rte 93		Rte 93
1/26/2006	9:00:00 AM	Property damage only (none injured)	3	0	0	Rear-to-rear	Rear-to-rear	Dry	Daylight	Clear/Clear			COLUMBIA ROAD OFF RAMP	Exit 15 on Rte 93 N		Rte 93 N / ASHMONT STREET
2/1/2006	2:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 13 on Rte 93 N		Rte 93 N
2/14/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Snow	Dark - lighted roadway	Clear						Rte 93 / DUDLEY STREET
2/23/2006	1:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			MORRISSEY BLVD EXIT	Exit 14 on Rte 93 N		Rte 93 N / WILLIAM T MORRISSEY BOULEVARD
3/17/2006	6:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				500 feet S from Exit 13 on Rte 93		FREEPORT STREET Rte 93 S
3/24/2006	9:20:00 AM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / RAMP - COLUMBIA RD TO RT 93 SB
4/9/2006	6:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP I 93 N/B TO FRONTAGE ROAD Rte 93 S / Rte 3
4/7/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / COLUMBIA ROAD
4/25/2006	10:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain				Exit 15 on Rte 93		Rte 93
5/1/2006	5:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - unknown roadway lighting	Unknown				1000 Feet S from Exit 13 on Rte 93		Rte 93
5/9/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						FREEPORT STREET / Rte 93
5/9/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Dusk	Rain						Rte 93 S / GRANITE AVENUE
5/18/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			ZIPPER LANE GARAGE			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / Rte 93
5/19/2006	11:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear				300 Feet S from Exit 15 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N
5/20/2006	2:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Not Reported				Exit 13 on Rte 93 N		Rte 93 N
6/3/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			OPPOSITE CORITA GAS TANKS			GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
6/4/2006	2:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain						DORCHESTER AVENUE Rte 93 / COLUMBIA ROAD
6/6/2006	2:15:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						100 Feet S from Intersection GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / COLUMBIA ROAD
6/7/2006	8:32:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy						COLUMBIA ROAD / RAMP - COLUMBIA RD TO RT 93 N/B
6/13/2006	4:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93 / ADAMS STREET
6/16/2006	7:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
6/21/2006	2:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / WILLIAM T MORRISSEY BOULEVARD
6/22/2006	1:30:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		INTERSTATE 93 Rte 93
6/22/2006	10:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93 N		800 Feet S from Intersection Rte 93 N
6/27/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5A on Rte 93		1 GENERAL CASIMIR PULASKI SKYWAY Rte 93
6/29/2006	6:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				75 Feet S from Exit 15 on Rte 93 S		75 Feet S from Intersection Rte 93 S / RAMP - COLUMBIA RD TO RT 93 SB
7/10/2006	10:00:00 AM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Daylight	Clear						Rte 93 S
7/11/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						DORCHESTER AVENUE / GALLIVAN BOULEVARD Rte 93
7/16/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 15 on Rte 93		Rte 93
7/20/2006	9:20:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 / COLUMBIA ROAD
7/23/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported						SAVIN HILL AVENUE Rte 93 / DORCHESTER AVENUE
7/27/2006	9:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 13 on Rte 93 N		Rte 93 N
7/27/2006	9:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	Rte 93 N	RAMP - RT 93 N/B TO FREEPORT ST				
8/2/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			DORCHISTER YACHT CLUB			Rte 93 N
8/11/2006	6:35:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dusk	Clear				Exit 13 on Rte 93 N		Rte 93 N
8/19/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Daylight	Clear						Rte 93 N / WILLIAM T MORRISSEY BOULEVARD
8/24/2006	2:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						COLUMBIA ROAD / Rte 93
8/24/2006	6:00:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear				4000 Feet S from Exit 16 on Rte 93		Rte 93 / Rte 3A
8/24/2006	7:25:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Dusk	Clear/Clear				Exit 14 on Rte 93		Rte 93
8/26/2006	1:40:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 14 on Rte 93 N		Rte 93 N
9/10/2006	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						WILLIAM T MORRISSEY BOULEVARD / Rte 93
9/10/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			TUNNEL INTO BOSTON SOUTH OF 14			Rte 93 N
9/19/2006	10:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / FREEPORT STREET
9/27/2006	4:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		GENERAL CASIMIR PULASKI SKYWAY Rte 93 / SAVIN HILL AVENUE Rte 3
10/1/2006	3:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				Exit 18 on Rte 93 S		Rte 93 S
10/

BOSTON (DORCHESTER) - 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 route 93 Interstate 93 southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
2/12/2006	4:15:00 PM	Unknown	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Snow	Dusk	Snow				Exit 15 on Rte 93		Rte 93 S
7/28/2006	11:40:00 AM	Unknown	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				2000 Feet S from Exit 12 on Rte 93 S		Rte 93 S
8/23/2006	8:20:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 14 on Rte 93		Rte 93
12/22/2006	9:07:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						RAMP 15 Rte 93 / COLUMBIA ROAD

MILTON 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 route 93 interstate 93 s outheast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
5/5/2016	1:00:00 AM	Fatal injury	2	0	2	Head-on	Head-on	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
1/15/2004	11:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93			Rte 93
1/15/2004	11:50:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			EAST MILTON SQUARE - Rte 93 N			Rte 93 N
1/21/2004	11:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			FURNACE BROOK - Rte 93 N	300 f eet N from Exit 8 on Rte 93		Rte 93 N
1/27/2004	9:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N	50 f eet N from Exit 9 on Rte 93		Rte 93 N
1/30/2004	8:00:00 AM	Non-fatal injury	6	3	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 9 on Rte 93 S		Rte 93 S
3/8/2004	11:40:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Sleet, hail (f reezing rain or drizzle)	Rte 93 N		GRANITE AVENUE Rte 93 N			GRANITE AVENUE Rte 93 N / RAMP - GRANITE AVE NB TO RT 93 NB
3/30/2004	7:30:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
3/31/2004	3:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 N			1000 f eet S from Intersection Rte 93 N
4/1/2004	8:02:00 PM	Non-fatal injury	5	1	0	Angle	Angle	Water (standing, moving)	Dark - lighted roadway	Rain			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
4/4/2004	4:00:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			Rte 93 S	100 f eet N from Exit 10 on Rte 93 S		Rte 93 S
4/7/2004	4:30:00 PM	Non-fatal injury	4	4	0	Rear-end	Rear-end	Dry	Daylight	Clear			GRANITE AVENUE Rte 93 N	Clear		GRANITE AVENUE Rte 93 N / SERGEANT WILLIAM G WALSH EXPRESSWAY
4/14/2004	5:50:00 PM	Non-fatal injury	5	3	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 93 S					
5/16/2004	6:45:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear	Rte 93	Rte 24				
5/19/2004	12:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93			Rte 93
6/1/2004	5:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Cloudy/Rain			Rte 93			Rte 93 / Rte 93
6/2/2004	11:00:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear			SOUTHEAST EXPRESSWAY Rte 93 S	Exit 9 on Rte 93 S		SOUTHEAST EXPRESSWAY Rte 93 S
6/7/2004	10:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N			Rte 93 N
7/3/2004	4:39:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear			Rte 93 S	500 f eet N from Exit 10 on Rte 93 S		Rte 93 S
8/6/2004	6:00:00 PM	Non-fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Cloudy			Rte 93 N			500 f eet N from Intersection Rte 93 N / SQUANTUM STREET
8/10/2004	6:00:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S / Rte 93
8/10/2004	6:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Not reported	Clear	Rte 93					
8/10/2004	6:45:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 9 on Rte 93		Rte 93 N
8/15/2004	3:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain			Rte 93 S	Exit 11A on Rte 93 S		Rte 93 S
9/24/2004	7:40:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 28 N			4000 f eet N from Intersection Rte 28 N / Rte 93
9/29/2004	2:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93	Exit 3 on Rte 93		Rte 93 / HOUGHTON ROAD
10/3/2004	8:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 S	2500 f eet N from Exit 9 on Rte 93 S		Rte 93 S
10/13/2004	5:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	1000 f eet S from Exit 3 on Rte 93		Rte 93 S
10/29/2004	8:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93			Rte 93
11/3/2004	3:45:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	1500 f eet S from Exit 11 on Rte 93 N		Rte 93 N
11/10/2004	12:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 93 S			Rte 93 S
11/15/2004	2:58:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	200 f eet S from Exit 3 on Rte 93		Rte 93 S
11/16/2004	4:40:00 PM	Non-fatal injury	2	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N			Rte 93 N
11/16/2004	6:15:00 PM	Non-fatal injury	3	4	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			EAST MILTON SQ - Rte 93 N			Rte 93 N / MILTON STREET EAST
11/25/2004	1:45:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Cloudy			Rte 93 S	500 f eet S from Exit 10 on Rte 93 S		Rte 93 S
12/5/2004	11:05:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear			Rte 93 S	1000 f eet N from Exit 9 on Rte 93 S		Rte 93 S
12/10/2004	6:05:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Water (standing, moving)	Dark - lighted roadway	Cloudy/Rain			Rte 93 N	200 f eet N from Exit 9 on Rte 93		Rte 93 N
1/5/2005	9:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Snow				Exit 11 on Rte 93 N		Rte 93 N / Rte 93
1/14/2005	1:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			THE EAST MILTON SQUARE EXIT - Rte 93 N			Rte 93 N
1/31/2005	1:20:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				Exit 11 on Rte 93 S		Rte 93 S
2/4/2005	2:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	Rte 93	Rte 24 / Rte 95 S				
2/15/2005	6:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Dawn	Cloudy						10 f eet N from Intersection Rte 93 N
2/17/2005	8:45:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear						CEDAR LANE Rte 93 N
2/17/2005	9:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			S E EXPRESS NORTH BOUND - 11 GRANITE AVENUE Rte 93 N			11 GRANITE AVENUE Rte 93 N
2/24/2005	8:40:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
2/25/2005	2:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 f eet N from Exit 11 on Rte 93 N		Rte 93 N
2/27/2005	2:49:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
3/3/2005	6:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 11 on Rte 93 N		Rte 93 N
3/8/2005	10:15:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Snow	Dark - lighted roadway	Snow	Rte 93 N					
3/12/2005	12:10:00 PM	Non-fatal injury	2	4	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Sleet, hail (f reezing rain or drizzle)			50 f eet N from Exit 9 on Rte 93			BRYANT AVENUE Rte 93
3/14/2005	8:05:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93	Rte 28				
3/15/2005	6:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93
3/31/2005	8:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 93
4/2/2005	9:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Rain						Rte 93 S
4/2/2005	9:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Rain/Rain				Exit 9 on Rte 93		Rte 93 N
4/7/2005	4:00:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			OPPOSITE E MILTON SQ - Rte 93 S			Rte 93 S
4/7/2005	9:30:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear				Exit 11B on Rte 93 S		Rte 93 S
4/22/2005	4:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93 S		SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - GRANITE AVE SB TO RT 93 SB Rte 93
4/23/2005	2:04:00 AM	Non-fatal injury	1	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 9 on Rte 93		BRYANT AVENUE Rte 93
4/26/2005	2:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
4/30/2005	2:54:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			SQUANTUM - Rte 93 N	Exit 10 on Rte 93		Rte 93 N
5/13/2005	11:05:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				500 f eet S from Exit 11 on Rte 93 S		Rte 93 S
6/3/2005	5:15:00 PM	Non-fatal injury	1	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				50 f eet N from Exit 11 on Rte 93		2 GRANITE AVENUE Rte 93 / Rte 93
6/4/2005	3:35:00 PM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2500 f eet N from Exit 9 on Rte 93 S		Rte 93 S
6/6/2005	5:35:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear				100 f eet N from Exit 10 on Rte 93 S		Rte 93 S
6/9/2005	11:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / RAMP - RT 93 SB TO SQUANTUM ST
6/13/2005	7:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			PAUL CURRAN MEMORIAL OVERPASS - GRANITE AVENUE Rte 93			GRANITE AVENUE Rte 93
6/16/2005	5:13:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dawn	Cloudy/Cloudy						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / ADAMS STREET
7/5/2005	4:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				100 f eet N from Exit 10 on Rte 93 S		Rte 93 S
7/6/2005	5:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			EXIT 11 OFF RAMP - Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
7/16/2005	7:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				300 f eet S from Exit 3 on Rte 93 N		Rte 93 N
7/22/2005	3:00:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 93 N
8/2/2005	6:45:00 AM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 N
8/6/2005	11:57:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
8/8/2005	7:00:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 11 on Rte 93 N		Rte 93 N
8/10/2005	7:45:00 AM	Non-fatal injury	4	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93
8/10/2005	9:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 N
8/15/2005	7:45:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						MILTON STREET EAST Rte 93 N
8/25/2005	5:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
8/31/2005	2:35:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				Exit 11 on Rte 93 N		Rte 93 N
8/31/2005	5:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dusk	Cloudy/Rain				Exit 9 on Rte 93 S		Rte 93 S
9/2/2005	11:02:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
9/2/2005	11:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				2000 f eet S from Exit 11 on Rte 93 N		Rte 93 N
9/6/2005	5:55:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear				200 f eet S from Exit 9 on Rte 93		Rte 93
9/13/2005	7:00:00 AM	Non-fatal injury	2	2	0	Unknown	Unknown	Dry	Daylight	Clear				5280 f eet N from Exit 20 on Rte 93		Rte 93
9/17/2005	8:45:00 AM	Non-fatal injury	2	3	0	Not reported	Not reported	Wet	Daylight	Rain				10 f eet N from Exit 1 on Rte 93 S		Rte 93 S
9/21/2005	5:03:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
9/21/2005	9:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE Rte 93
10/4/2005	5:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear				300 f eet S from Exit 11 on Rte 93 N		Rte 93 N
10/13/2005	2:51:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				300 f eet S from Exit 11 on Rte 93 N		Rte 93 N
10/20/2005	4:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			1000 f eet N from ADAMS ST ON RAMP - SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N			1000 f eet N from Intersection SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / RAMP - ADAMS ST TO RT 93 NB
10/21/2005	7:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			1500 f eet S f rom OF GRANITE AVE ON RAMP - SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S			1500 f eet S f rom Intersection SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - GRANITE AVE SB TO RT 93
10/21/2005	7:05:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				300 f eet N from Exit 9 on Rte 93		Rte 93 N
10/25/2005	4:28:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain				Exit 9 on Rte 93 S		Rte 93 S
11/7/2005	7:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93
11/9/2005	4:15:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain			E. MILTON SQ. - Rte 93 N			Rte 93 N
11/10/2005	6:05:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						GRANITE AVENUE Rte 93 N
11/13/2005	3:26:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 93 N
11/15/2005	5:40:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain			RT. 3 SPLIT - Rte 93 S			Rte 93 S
11/16/2005	8:35:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Rain				Exit 11A on Rte 93 S		Rte 93 S
11/22/2005	11:50:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 10 on Rte 93 S		Rte 93 S
12/1/2005	7:15:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			EAST MILTON SQ. OVERPASS - Rte 93 N			Rte 93 N
12/12/2005	7:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						GRANITE AVENUE Rte 93
12/13/2005	8:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
1/11/2006	5:10:00 AM	Non-fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Not reported	Cloudy				5000 f eet S from Exit 11 on Rte 93 N		Rte 93 N
1/11/2006	11:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 N
1/14/2006	9:32:00 PM	Non-fatal injury	3	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
1/18/2006	5:15:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - unknown roadway lighting	Rain						Rte 93 N / Rte 93
1/19/2006	5:55:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				1000 f eet S from Exit 11 on Rte 93 N		Rte 93 N
1/28/2006	6:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93		Rte 93
2/3/2006	11:40:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Rain/Rain				Exit 9 on Rte 93		Rte 93 N
2/9/2006	4:20:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
2/9/2006	7:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93
2/16/2006	9:00:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 N
2/17/2006	1:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						Rte 93 S
2/21/2006	6:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dawn	Clear			BRIDGE EAST MILTON MA	Exit 9 on Rte 93		Rte 93 N
2/24/2006	6:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				500 f eet S f rom Exit 11 on Rte 93 N		Rte 93 N
3/8/2006	5:00:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear			ADJACENT TO MILTON	Exit 9 on Rte 93 S		Rte 93 S
3/11/2006	5:30:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
3/11/2006	10:50:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear			EXIT #4			Rte 93 S
3/20/2006	7:48:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
4/5/2006	2:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain				2500 f eet N from Exit 10 on Rte 93 S		Rte 93 S
4/7/2006	6:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 11 on Rte 93 N		Rte 93 N
4/18/2006	7:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
4/25/2006	9:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTH OF EXIT 11	Exit 11 on Rte 93 N		Rte 93 N
4/29/2006	10:16:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						2 GRANITE AVENUE / Rte 93
5/1/2006	8:58:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						1000 f eet S from Intersection Rte 93 S / SQUANTUM STREET Rte 138 S
5/4/2006	3:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93
5/5/2006	8:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
5/9/2006	2:50:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			EAST MILTON SQUARE			Rte 93 S
5/10/2006	2:30:00 PM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
5/23/2006	9:00:00 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 9 on Rte 93		Rte 93
6/16/2006	3:23:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						100 f eet S from Intersection Rte 93 N / SQUANTUM STREET
6/28/2006	2:50:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				3000 f eet S from Exit 11 on Rte 93		Rte 93
6/29/2006	11:13:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Not reported	Daylight	Clear						Rte 93 / SQUANTUM STREET Rte 93
6/30/2006	8:10:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy						500 f eet N f rom Intersection Rte 93 S / Rte 37
7/6/2006	9:05:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			EAST MILTON SQ			Rte 93
7/27/2006	4:25:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
7/30/2006	6:40:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
7/31/2006	2:30:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93
8/3/2006	2:40:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
8/3/2006	4:11:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
8/20/2006	4:30:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / GRANITE AVENUE
8/20/2006	8:48:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 11 on Rte 93 S		Rte 93 S
9/3/2006	5:10:00 PM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Wet	Daylight	Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - GRANITE AVE SB TO RT 93 SB
9/6/2006	3:35:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
9/15/2006	10:37:00 AM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
9/18/2006	6:55:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear			EAST MILTON SQUARE	400 f eet N from Exit 9 on Rte 93 S		Rte 93 S
9/26/2006	4:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 N
9/29/2006	3:15:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end

MILTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 s southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
11/23/2006	1:25:00 PM	Non-Fatal injury	2	3	0	Head-on	Head-on	Wet	Daylight	Rain/Cloudy						1000 feet S from Intersection GRANITE AVENUE / Rte 93
12/4/2006	5:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			ON RAMP MILTON			Rte 93 N
12/5/2006	7:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			OFF RAMP AT EXIT #11 FROM RT 93N	Exit 11 on Rte 93 N		Rte 93 N
12/14/2006	2:20:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Not Reported						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / RAMP - RT 93 SB TO GRANITE AVE NB Rte 28
2/27/2004	4:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 93			Rte 93
4/1/2004	5:55:00 PM	Not Reported	2	0	0	Not reported	Not reported	Wet	Daylight	Rain	Rte 93 S		Rte 93 S			Rte 93 S
8/12/2004	3:50:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 S	Exit 6 on Rte 93		Rte 93 S
9/4/2004	11:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93	100 Feet N From Exit 9 on Rte 93		Rte 93
11/3/2004	7:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear	Rte 93	ADAMS STREET				
12/7/2004	11:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain			Rte 93 N	Exit 9 on Rte 93		Rte 93 N
1/14/2005	2:40:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 N
1/22/2005	7:30:00 PM	Not Reported	2	0	0	Head-on	Head-on	Snow	Dark - lighted roadway	Severe crosswinds				Exit 11A on Rte 93 S		1300 Feet N From Intersection Rte 93 S
1/26/2005	9:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 Feet N From Exit 11 on Rte 93		Rte 93
2/24/2005	8:50:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
3/1/2005	12:00:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Snow				Exit 5 on Rte 93		Rte 93
4/13/2005	8:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 S
4/14/2005	7:20:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / HOUGHTON ROAD
6/10/2005	3:09:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				50 feet N from Exit 9 on Rte 93		Rte 93 N
6/24/2005	5:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S					
7/12/2005	6:20:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
7/22/2005	2:40:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93 S / POND STREET
7/27/2005	3:50:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 N
8/12/2005	4:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
9/1/2005	4:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 3 / Rte 93
9/7/2005	6:45:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 10 on Rte 93		SQUANTUM STREET Rte 93
9/16/2005	5:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear						Rte 93 S
9/27/2005	6:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear	Rte 93 N					
10/28/2005	6:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	Rte 93 S					
12/28/2005	12:10:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 93					
5/16/2006	5:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						YANKEE DIVISION HIGHWAY Rte 93 N / RAMP - PONKAPOAG TRAIL TO RT 93 NB
5/24/2006	4:10:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
7/31/2006	2:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AFTER E MISTON SQUARE			Rte 93 S
8/11/2006	3:00:00 PM	Not Reported	3	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93 N
8/15/2006	10:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 93
8/29/2006	4:15:00 AM	Not Reported	3	0	0	Not reported	Not reported	Wet	Daylight	Rain						Rte 93 N / Rte 138
9/10/2006	8:20:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 26 on Rte 93		Rte 93 S
9/21/2006	12:00:00 AM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 9 on Rte 93		Rte 93
10/11/2006	4:15:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy				Exit 9 on Rte 93		Rte 93
12/18/2006	3:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BEFORE EXIT 10	Exit 10 on Rte 93		S EEXPRESSWAY Rte 93 N
1/2/2004	12:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S	300 Feet S from Exit 10 on Rte 93 S		Rte 93 S
1/5/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain			Rte 93			Rte 93
1/7/2004	5:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Cloudy			Rte 93 N	100 Feet S from Exit 11 on Rte 93 N		Rte 93 N
1/8/2004	5:05:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			E MILTON TUNNEL - Rte 93 N	900 Feet N From Exit 9 on Rte 93		Rte 93 N
1/9/2004	12:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 S	100 Feet S from Exit 10 on Rte 93 S		Rte 93 S
1/15/2004	11:50:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			EAST MILTON SQUARE - Rte 93 N			Rte 93 N
1/18/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Dark - roadway not lighted	Cloudy/Snow			SOUTHEAST EXPRESSWAY Rte 93 N	500 Feet N From Exit 9 on Rte 93		SOUTHEAST EXPRESSWAY Rte 93 N
1/19/2004	8:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Cloudy			SOUTHEAST EXPRESSWAY Rte 93 S	100 Feet S from Exit 9 on Rte 93 S		SOUTHEAST EXPRESSWAY Rte 93 S
1/19/2004	12:06:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 3 on Rte 93		Rte 93 S
1/26/2004	4:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear			RT 93 Rte 93 N	250 feet N from Exit X 9 on Rte 93		RT 93 Rte 93 N
1/27/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			Rte 93 N			Rte 93 N
1/31/2004	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear	Rte 93 S					
2/7/2004	3:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	Exit 3 on Rte 93		Rte 93 S
2/11/2004	2:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTHEAST /WAY - Rte 93 N	500 Feet S from Exit 11 on Rte 93 N		Rte 93 N
2/17/2004	3:01:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 93 W					
2/22/2004	4:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	Exit 8 on Rte 93		Rte 93 S
3/4/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N			SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
3/5/2004	5:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			SOUTH MILTON SQUARE - Rte 93 N			Rte 93 N
3/8/2004	8:05:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Cloudy/Snow			Rte 93 S	2640 feet N from Exit 9 on Rte 93 S		Rte 93 S
3/10/2004	8:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
3/12/2004	7:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
3/14/2004	11:52:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Cloudy			E MILTON SQUARE - Rte 93 N			Rte 93 N
3/15/2004	3:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 9 on Rte 93 S		Rte 93 S
3/18/2004	2:36:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			MILTON SQUARE - Rte 93 N			Rte 93 N
3/19/2004	6:25:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	Rte 93 N	GRANITE AVENUE				
3/19/2004	11:52:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Cloudy			E MILTON SQUARE - Rte 93 N			Rte 93 N
3/20/2004	8:49:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	Rte 93 S		Rte 93 S			Rte 93 S
3/31/2004	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain	Rte 93 N	RAMP - ADAMS ST TO RT 93 NB				
4/1/2004	2:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Daylight	Rain/Cloudy			E MILTON SQ - Rte 93 N	1000 feet N from Exit 11 on Rte 93 N		Rte 93 N
4/1/2004	12:20:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain			Rte 93	7.5 feet S from Exit 9 on Rte 93		Rte 93
4/2/2004	8:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Not reported	Not reported	Not Reported			Rte 93 S	Exit 9 on Rte 93 S		Rte 93 S
4/6/2004	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	500 Feet N from Exit 9 on Rte 93 S		Rte 93 S
4/19/2004	1:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			BRYANT /AVENUE Rte 93 S	Exit 9 on Rte 93 S		BRYANT AVENUE Rte 93 S
4/23/2004	3:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			Rte 93 N	50 feet N from Exit 11 on Rte 93 N		Rte 93 N
4/28/2004	12:25:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N			Rte 93 N
4/29/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear			Rte 93	Exit 11 on Rte 93		Rte 93
5/4/2004	4:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 S	Exit 10 on Rte 93 S		Rte 93 S
5/4/2004	5:40:00 AM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Rain			10 feet N from ADAMS ST OVERPASS - SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N			10 feet N From Intersection SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / ADAMS STREET
5/12/2004	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	700 Feet S from Exit 11 on Rte 93 N		Rte 93 N
5/21/2004	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			Rte 93 S	Exit 10 on Rte 93 S		20 Feet N from Intersection Rte 93 S / SQUANTUM STREET
5/24/2004	6:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 93 S	100 Feet N from Exit 10 on Rte 93 S		Rte 93 S
6/13/2004	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	ADAMS STREET Rte 93 N	Rte 93 N				
6/13/2004	12:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			GRANITE AVENUE			GRANITE AVENUE / RAMP - RT 93 NB TO GRANITE AVE NB
7/11/2004	1:43:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N			Rte 93 N
7/12/2004	5:51:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 9 on Rte 93		Rte 93 N
8/2/2004	2:47:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	600 Feet S from Exit 11 on Rte 93 N		Rte 93 N
8/9/2004	7:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 S	Rte 93 S Milemarker 2.0		Rte 93 S / Rte 28
8/12/2004	2:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N			Rte 93 N
8/30/2004	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			BETWEEN RAMPS AT RT 28 - Rte 93 S			Rte 93 S / Rte 28
8/31/2004	5:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	50 feet N from Exit 11 on Rte 93 N		Rte 93 N
9/2/2004	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
9/14/2004	8:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	2000 feet N from Rte 93 N Milemarker 3.0		Rte 93 N
9/16/2004	8:17:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N	400 Feet S from Exit 11 on Rte 93 N		Rte 93 N
9/29/2004	9:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			Rte 93 S	Exit 3 on Rte 93		Rte 93 S
9/30/2004	7:28:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93	Exit 5 on Rte 93		Rte 93
10/1/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93	Exit 5 on Rte 93		Rte 93
10/1/2004	6:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N					
10/5/2004	12:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			YANKEE DIVISION HIGHWAY Rte 93 S			YANKEE DIVISION HIGHWAY Rte 93 S / RAMP - RT 93 SB TO PONKAPOAG TRAIL
10/15/2004	7:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			Rte 93 S	Exit 20 on Rte 93		Rte 93 S
10/19/2004	5:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy			Rte 93 N	300 Feet S from Exit 11 on Rte 93 N		Rte 93 N
10/19/2004	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Rain	Rte 93 S					
10/22/2004	6:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 N	600 Feet S from Exit 11 on Rte 93 N		Rte 93 N
10/23/2004	12:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93 S	200 Feet S from Exit 11 on Rte 93 S		Rte 93 S
10/26/2004	1:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 S	500 Feet S from Exit 11 on Rte 93 S		Rte 93 S
10/28/2004	3:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
10/31/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 S	Exit 5 on Rte 93		Rte 93 S
10/31/2004	12:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 S	700 Feet S from Exit 11A on Rte 93 S		Rte 93 S
11/6/2004	4:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 N	Exit 9 on Rte 93		Rte 93 N
11/17/2004	6:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 N	1200 Feet S from Exit 11 on Rte 93 N		Rte 93 N
11/26/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy			NORTH OF PONKAPOG - YANKEE DIVISION HIGHWAY Rte 93 N			YANKEE DIVISION HIGHWAY Rte 93 N / PONKAPOAG TRAIL
11/26/2004	8:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain			Rte 93 S	5000 feet S from Exit 8 on Rte 93		Rte 93 S
11/29/2004	4:42:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Cloudy			Rte 93 N	50 Feet N from Exit 3 on Rte 93 N		Rte 93 N
11/30/2004	5:06:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
12/2/2004	8:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
12/3/2004	3:43:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
12/7/2004	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93	Exit 3 on Rte 93		Rte 93
12/9/2004	12:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			SOUTHEAST EXPRESSWAY Rte 93 N	Exit 11 on Rte 93 N		SOUTHEAST EXPRESSWAY Rte 93 N
12/21/2004	10:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Dry			Rte 93 S	50 Feet S from Exit 10 on Rte 93 S		Rte 93 S
12/23/2004	9:57:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			Rte 93 S	Exit 9 on Rte 93 S		Rte 93 S
12/25/2004	2:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 S			Rte 93 S
12/28/2004	9:07:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear			Rte 93 S	Exit 11A on Rte 93 S		Rte 93 S
1/2/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain				500 Feet N from Exit 10 on Rte 93 S		Rte 93 S / SQUANTUM STREET
1/3/2005	8:56:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				50 Feet N from Exit 3 on Rte 93 N		Rte 93 N
1/6/2005	4:35:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - lighted roadway	Snow/Snow				1000 Feet S from Exit 11 on Rte 93 N		Rte 93 N
1/8/2005	8:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain						Rte 93
1/10/2005	6:00:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear				70 feet N from Exit 2 on Rte 93		Rte 93 N
1/11/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear						MILTON STREET EAST Rte 93
1/12/2005	2:41:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy				Exit 10 on Rte 93 S		Rte 93 S
1/13/2005	5:19:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Fog, smog, smoke				500 feet N from Exit 10 on Rte 93		Rte 93 N
1/14/2005	6:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Dark - lighted roadway	Not Reported						1500 Feet S from Intersection Rte 93 S
1/14/2005	8:20:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 9 on Rte 93		Rte 93
1/17/2005	9:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy/Cloudy			EAST MILTON SQUARE - Rte 93 S			Rte 93 S
1/19/2005	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				1000 Feet S from Exit 11 on Rte 93 N		Rte 93 N
1/20/2005	10:27:00 AM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear/Clear				500 Feet N from Exit 9 on Rte 93 S		Rte 93 S
1/23/2005	11:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Snow	Dark - lighted roadway	Snow				Exit 5 on Rte 93		1000 Feet N from Intersection Rte 93 S
1/25/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Slush	Daylight	Clear				50 Feet S from Exit 10 on Rte 93 S		Rte 93 S
1/26/2005	2:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow/Snow				100 Feet N from Exit 9 on Rte 93		Rte 93 N
1/27/2005	11:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			EAST MILTON SQUARE - Rte 93 N			Rte 93 N
2/1/2005	11:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
2/3/2005	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - RT 93 SB TO BRYANT AVE
2/7/2005	3:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
2/9/2005	2:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				100 Feet N from Exit 9 on Rte 93		Rte 93 N
2/10/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Cloudy	GRANITE AVENUE Rte 93					
2/10/2005	12:00:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Rain						Rte 93 N
2/12/2005	1:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93	Rte 93				
2/13/2005	9:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
2/15/2005	5:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain			STEDMAN ST BRIDGE UNDERPASS - Rte 93 N	Exit 9 on Rte 93		Rte 93 N
2/16/2005	6:15:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 6 on Rte 93		Rte 93 N / Rte 3
2/19/2005	2:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				100 Feet N from Exit 9 on Rte 93	

MILTON 1/1/2004 12/31/2005 Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
3/30/2005	6:28:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93 N		Rte 93 N
3/30/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 S / Rte 28
3/30/2005	7:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						50 feet S from Intersection Rte 93 N / BOULEVARD STREET
3/31/2005	11:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			EXIT 10 OFF RAMP - Rte 93 S	Exit 10 on Rte 93 S		Rte 93 S
4/6/2005	3:14:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
4/6/2005	7:44:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						Rte 93 N
4/7/2005	3:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
4/8/2005	7:38:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						YANKEE DIVISION HIGHWAY Rte 93 S / RAMP - RT 93 SB TO PONKAPOAG TRAIL
4/14/2005	6:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dusk	Clear		BETWEEN PONKAPOAG EXIT AND RT 24 - Rte 93				Rte 93
4/18/2005	6:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - GRANITE AVE SB TO RT 93 SB
4/20/2005	1:30:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
4/23/2005	1:43:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 9 on Rte 93		Rte 93 N
4/23/2005	9:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Clear				300 Feet S from Exit 11 on Rte 93 N		Rte 93 N
4/23/2005	9:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Cloudy				200 Feet S from Exit 11 on Rte 93 N		Rte 93 N
4/26/2005	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / RAMP - ADAMS ST TO RT 93 NB
4/28/2005	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy		2.0 feet S from ANTWERP ST OVERPASS - Rte 93 N				Rte 93 N
5/3/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / GRANITE AVENUE
5/5/2005	3:23:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - RT 93 SB TO SQUANTUM ST
5/6/2005	5:42:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				1000 feet N from Exit 9 on Rte 93		Rte 93 N
5/6/2005	7:09:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dusk	Cloudy/Rain				100 Feet S from Exit 11 on Rte 93 S		Rte 93 S
5/9/2005	8:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy		RT 24 NORTH BOUND OFFRAMP - Rte 93 S				Rte 93 S
5/11/2005	10:46:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
5/13/2005	9:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				600 Feet S from Exit 11 on Rte 93 N		Rte 93 N
5/18/2005	6:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
5/24/2005	10:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Cloudy				500 Feet S from Exit 11 on Rte 93 N		Rte 93 N
5/25/2005	2:43:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain						Rte 93 / SQUANTUM STREET
5/26/2005	9:35:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain				Exit 9 on Rte 93		Rte 93 N
5/27/2005	6:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				1500 feet S from Exit 11 on Rte 93 N		Rte 93 N
6/1/2005	6:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear		ROBERTSON ST OVERPASS / EAST MIL - Rte 93 N				Rte 93 N / RANDOLPH AVENUE
6/4/2005	3:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		200 Feet N from SQUANTUM ST BRIDGE - Rte 93 S				Rte 93 S
6/5/2005	4:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						Rte 93 N
6/6/2005	5:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
6/9/2005	12:29:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Dark - lighted roadway	Cloudy/Rain				Exit 11 on Rte 93 N		Rte 93 N
6/17/2005	3:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / GRANITE AVENUE
6/17/2005	3:38:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 / BRYANT AVENUE
6/20/2005	7:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / RANDOLPH AVENUE Rte 28
6/22/2005	2:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
6/28/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 S
6/29/2005	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 9 on Rte 93		Rte 93 N
7/3/2005	3:13:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
7/5/2005	5:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93 S		Rte 93 S
7/6/2005	4:03:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
7/6/2005	6:38:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				1000 Feet S from Exit 11 on Rte 93 N		Rte 93 N
7/8/2005	12:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy		, BETWEEN ON AND OFF RAMPS OF E - Rte 93 S				Rte 93 S / BRYANT AVENUE
7/24/2005	3:59:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - RT 93 SB TO SQUANTUM ST
7/24/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 7 on Rte 93		Rte 93 S
7/25/2005	3:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
7/29/2005	3:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
8/1/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
8/3/2005	9:26:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 N
8/4/2005	9:49:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
8/6/2005	11:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93 N		Rte 93 N
8/6/2005	11:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
8/8/2005	7:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				150 Feet N from Exit 9 on Rte 93		Rte 93 N
8/11/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93
8/13/2005	11:51:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy		, N OF EXIT 9 - Rte 93 S		Exit 9 on Rte 93 S		Rte 93 S
8/15/2005	3:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy						Rte 93 N
8/17/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93					
8/20/2005	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
8/20/2005	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93					
8/24/2005	10:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 93 N	Rte 24				Rte 93
8/26/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93		10 feet S from Intersection SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / GRANITE AVENUE
8/29/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
8/29/2005	9:02:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 S
8/30/2005	1:34:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy				150 feet S from Exit 3 on Rte 93		Rte 93 S
8/30/2005	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Cloudy						Rte 93 S
9/2/2005	5:56:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Cloudy				100 Feet S from Exit 10 on Rte 93 S		Rte 93 S
9/3/2005	12:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				300 Feet S from Exit 11 on Rte 93 N		Rte 93 N
9/8/2005	3:45:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy				1000 Feet S from Exit 11 on Rte 93 N		Rte 93 N
9/9/2005	6:53:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				900 Feet S from Exit 11 on Rte 93 N		Rte 93 N
9/11/2005	1:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 N
9/12/2005	1:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 N
9/15/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 N / Rte 93
9/16/2005	3:52:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 S / Rte 28
9/16/2005	11:19:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 11 on Rte 93 N		Rte 93 N
9/17/2005	10:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 10 on Rte 93 S		Rte 93 S
9/19/2005	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				10 feet S from Exit 11B on Rte 93 S		Rte 93 S
9/20/2005	7:01:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
9/20/2005	7:14:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93 S		Rte 93 S
9/21/2005	4:41:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				900 Feet S from Exit 11 on Rte 93 N		Rte 93 N
9/21/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			E. MILTON SQ. - Rte 93			Rte 93
9/28/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear						1000 Feet N from Intersection Rte 93 S / Rte 24
10/1/2005	6:25:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dusk	Rain/Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - GRANITE AVE SB TO RT 93 SB
10/8/2005	1:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy				Exit 10 on Rte 93 S		Rte 93 S
10/9/2005	3:12:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Rain						Rte 93 S / BRYANT AVENUE
10/11/2005	6:25:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Dawn	Cloudy/Rain				100 Feet N from Exit 9 on Rte 93 S		Rte 93 S
10/14/2005	7:10:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / RAMP - RT 93 SB TO BRYANT AVE
10/24/2005	4:50:00 PM	Property damage only (none injured)	8	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
10/25/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Severe crosswinds						Rte 93 N
10/26/2005	6:15:00 AM	Property damage only (none injured)	7	0	0	Angle	Angle	Wet	Dawn	Cloudy/Rain			200 Feet S from ON RAMP FROM BRYANT AVE., MILTON - Rte 93 S	1000 Feet S from Exit 9 on Rte 93 S		Rte 93 S
10/30/2005	6:53:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear						Rte 93 S
11/9/2005	3:31:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
11/9/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 93 N
11/10/2005	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 93 N
11/13/2005	1:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				50.00 feet N from Exit 9 on Rte 93		Rte 93 N
11/15/2005	3:44:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			EAST MILTON SQ. - Rte 93 N			Rte 93 N
11/22/2005	6:56:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy/Rain				100 Feet S from Exit 11A on Rte 93 S		Rte 93 S
11/25/2005	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
11/28/2005	6:12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				500 Feet S from Exit 11 on Rte 93 N		Rte 93 N
12/6/2005	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 N / BLUE HILLS RESERVATION ROAD
12/16/2005	4:05:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dusk	Rain/Rain				1500 feet N from Exit 4 on Rte 93		1500 Feet S from Intersection Rte 93 N / Rte 24
12/17/2005	5:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear		PRIOR TO GRANITE AVE. - SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N				SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
12/20/2005	9:50:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Clear				Exit 9 on Rte 93		Rte 93 N
12/23/2005	12:55:00 PM	Property damage only (none injured)	4	0	0	Unknown	Unknown	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
12/28/2005	5:03:00 AM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dawn	Cloudy/Clear				500 Feet S from Exit 11 on Rte 93 N		Rte 93 N
12/30/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 28
1/3/2006	8:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Cloudy			EAST MILTON SQ.	500 Feet S from Exit 10 on Rte 93 S		Rte 93 S
1/5/2006	3:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Clear/Clear						GRANITE AVENUE Rte 93 N / GRANITE AVENUE
1/5/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N	GRANITE AVENUE				
1/5/2006	4:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Rain						Rte 93
1/7/2006	9:00:00 AM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Daylight	Clear						BRYANT AVENUE Rte 93
1/9/2006	2:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			MILTON CENTER			Rte 93
1/12/2006	4:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				300 Feet S from Exit 10 on Rte 93 S		Rte 93 S
1/13/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy						Rte 93 S
1/14/2006	5:15:00 AM	Property damage only (none injured)	5	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Cloudy				Exit 11 on Rte 93 N		Rte 93 N
1/17/2006	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1320 Feet S from Exit 3 on Rte 93 N		Rte 93 N
1/19/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N
1/21/2006	8:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				Exit 6 on Rte 93		Rte 93
1/23/2006	5:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / GRANITE AVENUE
1/26/2006	3:07:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
1/27/2006	7:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
1/28/2006	3:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				5.0 feet E from Exit 5 on Rte 93		Rte 93
2/1/2006	1:30:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Cloudy		RAMP-RT 93 SB TO SQUANTUM ST SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S				
2/2/2006	8:56:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						YANKEE DIVISION HIGHWAY Rte 93 S / PONKAPOAG TRAIL
2/3/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						GRANITE AVENUE / RAMP - GRANITE AVE NB TO RT 93 NB
2/5/2006	8:38:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				50 feet N from Exit 11 on Rte 93		Rte 93
2/5/2006	10:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			EAST MILTON SQ.			Rte 93 N
2/10/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear	Rte 93	SQUANTUM STREET				
2/12/2006	8:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow				Exit 5 on Rte 93		Rte 93
2/13/2006	5:53:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 11 on Rte 93 N		Rte 93 N
2/15/2006	4:02:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
2/15/2006	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						RANDOLPH AVENUE Rte 93 / ADAMS STREET
2/17/2006	5:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear				1000 feet S from Exit 10 on Rte 93		SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / GRANITE AVENUE
2/21/2006	6:23:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
2/23/2006	8:00:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear						Rte 93
2/27/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93 N		Rte 93 N
2/28/2006	1:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93 S		BRYANT AVENUE Rte 93 S
3/1/2006	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				500 Feet S from Exit 11 on Rte 93 N		Rte 93 N
3/2/2006	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 93 N	GRANITE AVENUE				
3/2/2006	11:57:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
3/21/2006	9:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				1000 Feet S from Exit 11 on Rte 93 S		Rte 93 S
3/21/2006	9:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93		Rte 93
3/28/2006	5:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear				Exit 11 on Rte 93 N		SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / RAMP - RT 93 NB TO GRANITE AVE NB
3/29/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				400 Feet N from Exit 9 on Rte 93 S		Rte 93 S
4/1/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 9 on Rte 93		Rte 93 N
4/3/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93	

MILTON	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
5/5/2006	1:21:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 N
5/9/2006	5:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Clear				Exit 10 on Rte 93 S		Rte 93 S / SQUANTUM STREET
5/10/2006	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						SQUANTUM STREET Rte 93 N
5/10/2006	7:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						6 ADAMS STREET Rte 93
5/10/2006	10:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 11 on Rte 93 N		Rte 93 N
5/11/2006	8:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
5/13/2006	12:51:00 PM	Property damage only (none injured)	4	0	0	Unknown	Unknown	Wet	Daylight	Rain/Rain				Exit 9 on Rte 93		Rte 93 N
5/19/2006	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy		RT 93				
5/23/2006	12:28:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
5/26/2006	6:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 10 on Rte 93 S		Rte 93 S
5/27/2006	2:53:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
6/1/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 10 on Rte 93		Rte 93 / SQUANTUM STREET
6/2/2006	8:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy						1 ADAMS STREET Rte 93
6/5/2006	7:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / Rte 24
6/12/2006	2:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			EAST MILTON SQUARE			Rte 93 N
6/12/2006	3:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
6/14/2006	7:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		600 feet S from Intersection Rte 93
6/16/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93
6/17/2006	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		BRYANT AVENUE Rte 93 N
6/18/2006	1:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
6/18/2006	1:55:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				20 feet S from Exit 10 on Rte 93 S		Rte 93 S
6/20/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain				100 feet N from Exit 9 on Rte 93		Rte 93 N
6/21/2006	3:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
6/21/2006	3:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
6/22/2006	1:30:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet S from Exit 11 on Rte 93 N		Rte 93 N
6/22/2006	5:20:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				50 feet N from Exit 3 on Rte 93 N		Rte 93 N
6/23/2006	8:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 5 on Rte 93		100 feet S from Intersection Rte 93 N / Rte 28
6/24/2006	9:02:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
6/25/2006	8:56:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy						Rte 93 N
6/26/2006	10:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						HOUGHTON ROAD Rte 93
6/29/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						RANDOLPH AVENUE Rte 93 / ADAMS STREET
7/5/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			500 feet N from EAST MILTON SQUARE			Rte 93 N
7/10/2006	9:41:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		72 feet S from Intersection Rte 93 N / RAMP-RT 93 NB TO GRANITE AVE NB
7/12/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Clear						RANDOLPH AVENUE Rte 93 / ADAMS STREET
7/17/2006	2:54:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N
7/18/2006	1:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 14 on Rte 93		Rte 93
7/20/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				600 feet N from Exit 10 on Rte 93		Rte 93
7/21/2006	6:14:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			BRUSH HILL ROAD	Exit 9 on Rte 93		BRUSH HILL ROAD Rte 93 / TRUMAN HIGHWAY
8/6/2006	2:45:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						Rte 93 S
8/8/2006	6:12:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				150 feet S from Exit 3 on Rte 93		Rte 93 S
8/9/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
8/12/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5A on Rte 93		SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / RAMP - RT 93 NB TO GRANITE AVE NB
8/13/2006	3:56:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
8/15/2006	5:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
8/16/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 S
8/16/2006	6:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / RAMP - ADAMS ST TO RT 93 NB
8/23/2006	3:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 N
8/24/2006	9:01:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Cloudy/Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / ADAMS STREET
8/28/2006	8:26:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy						50 feet S from Intersection SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 S / GRANITE AVENUE
8/28/2006	8:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 S		Rte 93 S
8/31/2006	4:06:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93		Rte 93 N
8/31/2006	4:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				200 feet S from Exit 11 on Rte 93 N		Rte 93 N
9/3/2006	6:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						RAMP - GRANITE AVE NB TO RT 93 NB / Rte 93
9/3/2006	7:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 9 on Rte 93 S		Rte 93 S
9/5/2006	2:48:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 10 on Rte 93		Rte 93 N
9/7/2006	8:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Daylight	Clear						GRANITE AVENUE Rte 93 / Rte 3
9/13/2006	8:02:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			JUST BEYOND MILTON EXIT			Rte 93 N
9/15/2006	1:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
9/19/2006	1:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
9/20/2006	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear				Exit 11 on Rte 93 N		Rte 93 N
9/22/2006	6:04:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet N from Exit 11 on Rte 93 N		Rte 93 N / RAMP-RT 93 NB TO GRANITE AVE NB
9/22/2006	6:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 S		Rte 93 S
9/22/2006	8:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						COLUMBIA PARK Rte 93 / Rte 28
9/27/2006	6:45:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				500 feet S from Exit 11 on Rte 93 N		SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 N / GRANITE AVENUE
9/30/2006	3:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 N / SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 1A N
9/30/2006	5:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
9/30/2006	7:24:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			JUNCTON 24N			Rte 93 S
10/2/2006	9:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
10/3/2006	9:18:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
10/4/2006	4:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 feet S from Exit 11 on Rte 93 N		Rte 93 N
10/4/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
10/6/2006	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			NOT SURE PROBABLY IN MILTON			SOUTHEAST EXPRESSWAY Rte 93
10/6/2006	10:40:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
10/8/2006	11:59:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 10 on Rte 93		Rte 93 N
10/11/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet S from Exit 11 on Rte 93 N		Rte 93 N
10/11/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear				Exit 11 on Rte 93		Rte 93
10/11/2006	6:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain						SERGEANT WILLIAM G WALSH EXPRESSWAY Rte 93 / ADAMS STREET
10/13/2006	8:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		9 feet N from Intersection Rte 93 N / RAMP-RT 93 NB TO GRANITE AVE NB
10/18/2006	7:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear	RAMP-GRANITE AVE SB TO RT 93 SB	Rte 193 SB				Rte 93 N
10/18/2006	7:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 10 on Rte 93 S		Rte 93 S
10/23/2006	4:27:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain				Exit 11 on Rte 93 N		Rte 93 N
10/30/2006	7:30:00 PM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Dark - unknown roadway lighting	Clear						RANDOLPH AVENUE Rte 93 N
10/28/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	Rte 93 W	WILLARD ST				
10/29/2006	5:36:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 8 on Rte 93		Rte 93 N
10/30/2006	2:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
11/7/2006	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N / RAMP-RT 93 NB TO GRANITE AVE NB
11/8/2006	4:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - unknown roadway lighting	Rain/Cloudy		ON-RAMP TO RTE 93S				Rte 93
11/9/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain				Exit 9 on Rte 93 S		Rte 93 S
11/9/2006	6:14:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear				Exit 11 on Rte 93 N		48 feet N from Intersection RAMP RT 93 NB TO GRANITE AVE NB / Rte 93 N
11/10/2006	7:19:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			1000 feet S from EAST MILTON SQUARE			Rte 93 N
11/11/2006	4:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			UNDER EAST MILTON SQUARE			Rte 93 N
11/11/2006	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 11 on Rte 93 N		Rte 93 N
11/15/2006	7:18:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 11 on Rte 93 N		Rte 93 N
11/20/2006	3:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				500 feet S from Exit 11 on Rte 93 N		Rte 93 N
11/26/2006	1:41:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				10 feet S from Exit 11-12 on Rte 93 N		6 feet N from Intersection Rte 93 N / RAMP-RT 93 NB TO GRANITE AVE NB
11/28/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear	Rte 93	Rte 93				
11/30/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dawn	Cloudy			BY BRAINTREE EXIT			Rte 93
12/9/2006	7:00:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
12/19/2006	10:05:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			KEYSTONE CUTOUT	Exit 11 on Rte 93 S		Rte 93 S
1/13/2004	7:30:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 93 N			Rte 93 N
10/4/2004	4:50:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 11 on Rte 93 N		Rte 93 N
1/1/2005	1:25:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11A on Rte 93 S		Rte 93 S
7/3/2005	4:30:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 / Rte 28
7/6/2005	3:30:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	Rte 93					
4/12/2006	11:50:00 PM	Unknown	1	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93		Rte 93 N
5/9/2006	8:15:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						MILTON STREET Rte 93
9/1/2006	6:07:00 AM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				Exit 8 on Rte 93		Rte 93 N

BOSTON (NEPONSET)	1/1/2004	12/31/2006	is similar to: rte 93 route 93											
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Exit Distance	Feet_From
2/15/2005	7:05:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear				NEPONSET COURT Rte 93 N
7/15/2005	7:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				GENERAL CASIMIR PULASKI SKYWAY Rte 93 S
3/1/2005	1:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			60 feet N from Exit 12 on Rte 93	Rte 93 N / NEPONSET AVENUE
4/28/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Rte 93 S
7/23/2006	5:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dawn	Rain	Rte 93	Rte 93		

QUINCY (NORTH QUINCY)	1/1/2004	12/31/2006	similar to: rte 93 route 93									
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Exit Distance	Feet_From
9/3/2006	10:15:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear	15 feet N from Exit 12 on Rte 93	Rte 93 N
2/23/2005	3:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Exit 8 on Rte 93 S	Rte 93 S
1/25/2006	10:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear		Rte 93 / NEPONSET ROAD
8/3/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear	Exit 11 on Rte 93	Rte 93

QUINCY	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
11/26/2004	9:30:00 PM	Fatal injury	2	1	1	Angle	Angle	Dry	Dark - lighted roadway	Clear			FURNACE BROOK PKWY OVERPASS - Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
2/12/2005	9:15:00 AM	Fatal injury	3	2	2	Angle	Angle	Dry	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93		Rte 93
4/7/2005	3:36:00 AM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			125 feet S from ROBERTSON ST OVERPASS - INTERSTATE 93 Rte 93 S	2000 feet S from Exit 9 on Rte 93 S		INTERSTATE 93 Rte 93 S / ROBERTSON STREET
9/9/2006	3:20:00 AM	Fatal injury	2	0	1	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
11/24/2006	1:55:00 AM	Fatal injury	1	2	1	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				100 Feet N from Exit 8 on Rte 93 S		Rte 93 S
1/1/2004	4:10:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			SOUTHEAST EXPRESSWAY STREET Rte 93 N			SOUTHEAST EXPRESSWAY STREET Rte 93 N
1/4/2004	1:50:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 S	1584 feet N from Exit 8 on Rte 93 S		Rte 93 S
1/15/2004	10:35:00 AM	Non-Fatal injury	3	1	0	Angle	Angle	Wet	Daylight	Clear			INTERSTATE 93 Rte 93 N	Exit 8 on Rte 93 N		INTERSTATE 93 Rte 93 N
1/15/2004	10:50:00 AM	Non-Fatal injury	6	2	0	Rear-end	Rear-end	Ice	Daylight	Cloudy			INTERSTATE 93 Rte 93 N	Exit 8 on Rte 93 N		INTERSTATE 93 Rte 93 N
1/22/2004	1:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			INTERSTATE 93 Rte 93 S	660 Feet N from Exit 7 on Rte 93 S		INTERSTATE 93 Rte 93 S
1/22/2004	1:50:00 PM	Non-Fatal injury	2	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported			BETWEEN RAMPS - INTERSTATE 93 Rte 93 S	Exit 8 on Rte 93 S		INTERSTATE 93 Rte 93 S
1/28/2004	12:35:00 PM	Non-Fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow				500 Feet S from Exit 9 on Rte 93		Rte 93 S
2/9/2004	2:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			INTERSTATE 93 Rte 93 S	Exit 8 on Rte 93 S		INTERSTATE 93 Rte 93 S / FURNACE BROOK ROTARY
2/21/2004	2:15:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S	200 Feet S from Exit 8 on Rte 93 S		Rte 93 S
2/26/2004	2:20:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			YANKEE DIVISION HIGHWAY Rte 93 N	Exit 9B on Rte 93 N		YANKEE DIVISION HIGHWAY Rte 93 N / RAMP - RT 93 SB TO RT 28 SB
2/28/2004	6:33:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear			Rte 93 S	Exit 5B on Rte 93 S		Rte 93 S
3/7/2004	7:10:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 S	300 Feet N from Exit 7 on Rte 93 S		Rte 93 S
3/19/2004	5:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	300 Feet S from Exit 8 on Rte 93 N		Rte 93 N
3/20/2004	6:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy	Rte 93 S					Rte 93 S
4/14/2004	6:20:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dusk	Rain			SOUTHEAST EXPRESSWAY STREET Rte 3	1320 Feet N from Exit 8 on Rte 3		SOUTHEAST EXPRESSWAY STREET Rte 3
5/7/2004	2:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N					Rte 93 N
5/13/2004	1:55:00 AM	Non-Fatal injury	1	4	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	200 Feet N from Exit 8 on Rte 93 S		Rte 93 S
5/20/2004	1:30:00 AM	Non-Fatal injury	2	4	0	Rear-end	Rear-end	Dry	Daylight	Clear			FURNACE BROOK - Rte 93 N			Rte 93 N / Rte 93
5/20/2004	2:05:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 N	Exit 8 on Rte 93 N		Rte 93 N
5/21/2004	3:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			FURNACE BROOK - Rte 93 N			Rte 93 N / Rte 93
5/27/2004	9:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			TABER STREET Rte 93 N	Exit 8 on Rte 93 N		TABER STREET Rte 93 N
6/12/2004	1:03:00 PM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear			INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 3 SB
6/13/2004	3:45:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S / BRY ANT AVENUE
6/16/2004	5:30:00 PM	Non-Fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
6/27/2004	12:22:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 S	500 Feet S from Exit 8 on Rte 93 S		Rte 93 S
7/20/2004	7:00:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N / Rte 93
7/24/2004	4:00:00 PM	Non-Fatal injury	2	1	0	Not reported	Not reported	Not reported	Not reported	Not Reported			150 feet S from BRIDGE OVER FURNACE BROOK PKWY - SOUTHEAST EXPRESSWAY STREET Rte 93			SOUTHEAST EXPRESSWAY STREET Rte 93 / Rte 93
7/28/2004	7:18:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			20 feet N from FURNACE BROOK ROTARY OVERPASS - Rte 93 S			20 feet N from Intersection Rte 93 S / FURNACE BROOK PARKWAY
7/30/2004	8:45:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			7 SPLIT 93 128 - SOUTHEAST EXPRESSWAY STREET Rte 93	50 Feet S from Exit 7 on Rte 93		SOUTHEAST EXPRESSWAY STREET Rte 93
8/20/2004	4:45:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / FURNACE BROOK ROTARY Rte 93
9/7/2004	4:10:00 PM	Non-Fatal injury	3	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	1500 feet N from Exit 9B on Rte 93 S		Rte 93 S
9/11/2004	8:55:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93	Exit 8 on Rte 93		Rte 93
9/28/2004	6:00:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
10/1/2004	2:55:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			3000 feet S from Intersection Rte 93 N / FURNACE BROOK PARKWAY
10/1/2004	8:20:00 AM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 N		300 Feet N from Rte 93 N Milemarker 9.0	Rte 93 N
10/15/2004	2:40:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N	500 Feet S from Exit 9 on Rte 93 N		Rte 93 N
10/18/2004	5:43:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
10/22/2004	7:50:00 AM	Non-Fatal injury	5	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N			Rte 93 N
10/30/2004	1:22:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 N			Rte 93 N
11/14/2004	11:15:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 5 on Rte 93		Rte 93 N
11/16/2004	4:10:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Cloudy			Rte 93 S	100 Feet N from Exit 7 on Rte 93 S	100 feet N from Rte 93 S Milemarker 8.0	Rte 93 S
11/17/2004	4:00:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			ON RAMP FROM BURGIN PKWY TO RTE 93 - RAMP - BURGIN PKWY TO RT 93 SB			RAMP - BURGIN PKWY TO RT 93 SB / HONORABLE THOMAS S BURGIN PARKWAY
11/17/2004	4:10:00 PM	Non-Fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear			OPPOSITE SOUTH HOV BUILDING - Rte 93 S	300 feet N from Exit 7 on Rte 93 S		Rte 93 S
11/17/2004	6:30:00 PM	Non-Fatal injury	4	4	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			25 feet S from HOV LANE DROP AND ARROW BOARD - Rte 93 N	200 Feet S from Exit 8 on Rte 93 N		Rte 93 N
11/25/2004	1:30:00 PM	Non-Fatal injury	3	2	0	Angle	Angle	Wet	Daylight	Cloudy				Rte 93 S		Rte 93 S
12/1/2004	5:25:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93	Exit 8 on Rte 93		Rte 93
12/3/2004	4:50:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			Rte 93 N	1000 Feet S from Exit 8 on Rte 93 N		Rte 93 N
12/19/2004	5:14:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			AT BURGIN RAMP TO RTE 93 - CENTRE STREET			CENTRE STREET / HONORABLE THOMAS S BURGIN PARKWAY
12/21/2004	4:20:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Not reported	Dark - lighted roadway	Clear			Rte 93 E			10 feet E from Intersection Rte 93 E / Rte 24
1/1/2005	4:30:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 S / Rte 3
1/6/2005	3:50:00 PM	Non-Fatal injury	3	3	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain			10 feet S from SOUTH HOV BUILDING - Rte 93 N	600 Feet S from Exit 8 on Rte 93 N		Rte 93 N
1/6/2005	11:41:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Cloudy/Sleet, hail (freezing rain or drizzle)				100 Feet S from Exit 9 on Rte 93 N		Rte 93 N
1/8/2005	4:00:00 PM	Non-Fatal injury	2	3	0	Angle	Angle	Wet	Daylight	Rain/Rain						Rte 93 N / Rte 93
1/10/2005	1:15:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S					
1/19/2005	11:00:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Ice	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
1/20/2005	11:20:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Clear				Exit 12 on Rte 93		Rte 93 S
1/21/2005	6:07:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			BATES AVE OVERPASS - Rte 93 S	1500 feet N from Exit 8 on Rte 93 S		Rte 93 S
1/30/2005	3:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
2/2/2005	10:50:00 PM	Non-Fatal injury	7	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 / Rte 3 S
2/7/2005	9:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 S	Rte 3 S				
2/18/2005	5:15:00 PM	Non-Fatal injury	2	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy	Rte 93 N					
2/19/2005	8:00:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N
2/19/2005	8:05:00 PM	Non-Fatal injury	5	3	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
2/20/2005	12:52:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				300 Feet S from Exit 9 on Rte 93 N		Rte 93 N
2/21/2005	10:30:00 AM	Non-Fatal injury	2	1	0	Angle	Angle	Snow	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)				200 Feet S from Exit 8 on Rte 93 S		Rte 93 S
2/25/2005	2:00:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 14 on Rte 93		Rte 93 N
2/25/2005	8:20:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Cloudy			MERGE FROM BURGIN PKWY ON RAMP T - Rte 93 N			Rte 93 N / Rte 93
2/27/2005	2:45:00 AM	Non-Fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93
3/9/2005	5:43:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Slush	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)			93 N/B OFF RAMP AT FURNACE BROOK - RAMP - RT 93 NB TO FURNACE BROOK PARKWAY			RAMP - RT 93 NB TO FURNACE BROOK PARKWAY / FURNACE BROOK PARKWAY
3/9/2005	2:21:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 S
3/9/2005	8:28:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Ice	Daylight	Clear/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
3/11/2005	9:50:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy	Rte 93 S	Rte 3 S				
3/12/2005	12:00:00 PM	Non-Fatal injury	2	5	0	Angle	Angle	Wet	Daylight	Rain/Cloudy						Rte 93 N
3/15/2005	6:45:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
3/22/2005	3:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 3
4/1/2005	3:54:00 PM	Non-Fatal injury	4	3	0	Rear-end	Rear-end	Dry	Daylight	Clear			AT ROBERTSON ST OVERPASS - Rte 93 N	500 Feet S from Exit 9 on Rte 93 N		Rte 93 N
4/3/2005	3:10:00 PM	Non-Fatal injury	3	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
4/3/2005	3:12:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy						200 Feet S from Intersection INTERSTATE 93 Rte 93 S / BATES AVENUE
4/5/2005	9:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / GRANITE STREET
4/7/2005	4:00:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
4/9/2005	5:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 3
4/16/2005	2:25:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				5 Feet N from Exit 7 on Rte 93 S		Rte 93 S
4/23/2005	2:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy			RAMP TO BRY ANT AVENUE FROM S/B R - Rte 93	Exit 9 on Rte 93		Rte 93
4/26/2005	2:40:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 Feet N from Exit 9 on Rte 93 N		Rte 93 N
4/26/2005	3:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				50 Feet S from Exit 15 on Rte 93		Rte 93 S
4/30/2005	5:19:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dawn	Rain/Cloudy				Exit 9 on Rte 93 N		Rte 93 N
4/30/2005	6:35:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dusk	Clear/Rain				500 Feet S from Exit 8 on Rte 93 S		Rte 93 S
4/30/2005	6:50:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy						Rte 93 S
4/30/2005	11:40:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			JUST SOUTH OF THE SPLIT 93 TO 3 - Rte 3 S			500 Feet S from Intersection Rte 3 S / Rte 93
5/7/2005	11:29:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Rain				Exit 7 on Rte 93 S		Rte 93 S
5/9/2005	5:15:00 PM	Non-Fatal injury	1	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			KEYSTONE BUILDING - INTERSTATE 93 Rte 93			INTERSTATE 93 Rte 93
5/16/2005	1:05:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Rain/Cloudy						800 Feet N from Intersection RANDOLPH AVENUE Rte 28 S / Rte 93
5/16/2005	12:05:00 PM	Non-Fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear						Rte 93 N / RANDOLPH AVENUE Rte 28 N
5/17/2005	4:22:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 93 Rte 93 S
5/20/2005	8:05:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy	Rte 93 S	Rte 3 S				
5/24/2005	12:23:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			200 feet S from FURNACE BROOK - Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
5/27/2005	10:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Fog, smog, smoke				Exit 9 on Rte 93 N		Rte 93 N
5/28/2005	7:00:00 PM	Non-Fatal injury	2	4	0	Angle	Angle	Dry	Dusk	Clear						Rte 93 S
5/31/2005	4:05:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
6/3/2005	8:43:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
6/17/2005	11:01:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 9 on Rte 93		Rte 93 S
6/23/2005	7:15:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			IN S/B HOV LANE - Rte 93 S	500 Feet S from Exit 8 on Rte 93 S		Rte 93 S
6/25/2005	5:15:00 PM	Non-Fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
7/1/2005	1:45:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
7/19/2005	4:10:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				1900 Feet N from Exit 11 on Rte 93		Rte 93 N
7/19/2005	5:00:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			93 SOUTH BEFORE RTE 3 SPLIT - Rte 93 N	Exit 7 on Rte 93		Rte 93 N
7/20/2005	7:15:00 AM	Non-Fatal injury	5	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
7/20/2005	9:05:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
7/21/2005	10:15:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2000 Feet N from Exit 8 on Rte 93 N		Rte 93 N
8/4/2005	6:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
8/8/2005	6:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 Feet N from Exit 11 on Rte 93		Rte 93 N
8/13/2005	11:45:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
8/15/2005	1:30:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 5 on Rte 93		Rte 93 N
8/16/2005	2:15:00 PM	Non-Fatal injury	3	6	0	Not reported	Not reported	Unknown	Not reported	Not Reported						Rte 93 / Rte 3
8/16/2005	5:24:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RT. 3 SPLIT - INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 3 SB
8/23/2005	6:05:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S					
8/23/2005	8:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTH HOV BUILDING - Rte 93 N			Rte 93 N
8/26/2005	4:17:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 S
8/25/2005	7:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
9/6/2005	4:40:00 PM	Non-Fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				100 Feet S from Exit 8 on Rte 93 S		Rte 93 S
9/16/2005	2:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				500 Feet S from Exit 12 on Rte 3		SOUTHEAST EXPRESSWAY STREET Rte 3
9/16/2005	4:43:00 AM	Non-Fatal injury	3	3	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				4000 feet N from Exit 5B on Rte 93 S		Rte 93 S
9/21/2005	9:48:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP - RT 93 N/B TO ADAMS ST
9/28/2005	7:05:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
10/3/2005	9:50:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			FURNACE BROOK PKWY OVERPASS - Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
10/10/2005	11:52:00 AM	Non-Fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy	Rte 93 N	HONORABLE THOMAS S BURGIN PARKWAY				
10/15/2005	5:40:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark - lighted roadway	Rain/Cloudy				75 feet S from Exit 9 on Rte 93		Rte 93 S
10/16/2005	7:29:00 PM	Non-Fatal injury	1	1	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy/Cloudy						ADAMS STREET Rte 93 S
10/20/2005	8:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93
10/25/2005	5:50:00 AM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain						Rte 93 N / Rte 93
11/2/2005	9:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						FURNACE BROOK PKWY Rte 93 / Rte 93
11/3/2005	5:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N
11/4/2005	8:33:00 AM	Non-Fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93 N					
11/9/2005	8:55:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 Feet S from Exit 9 on Rte 93 N		Rte 93 N
11/17/2005	3:07:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
11/22/2005	5:00:00 AM	Non-Fatal injury	2	3	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				Exit 9 on Rte 93		Rte 93
11/22/2005	6:40:00 AM	Non-Fatal injury	2	1	0	Sideswipe, same

QUINCY	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 or us 93 or interstate 93 or southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
3/11/2006	5:30:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 9 on Rte 93		Rte 93 S
3/13/2006	1:30:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Not reported	Daylight	Cloudy				200 feet N from Exit 8 on Rte 93		Rte 93
3/19/2006	9:30:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						QUINCY SHORE DRIVE Rte 3 / Rte 93
3/24/2006	1:29:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
3/31/2006	4:10:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			EXITS 8 AND 9	Exit 8 on Rte 93 S		Rte 93 S / EXPRESSWAY SOUTH
4/1/2006	2:45:00 PM	Non-Fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S
4/4/2006	11:28:00 AM	Non-Fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 6B on Rte 93 S		Rte 93 S
4/5/2006	2:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Snow						SOUTHEAST EXPRESSWAY STREET Rte 93 S
4/7/2006	2:04:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			PRIOR TO FURNACE BROOK PARKWAY			INTERSTATE 93 Rte 1 A S / RAMP RT 93 SB TO FURNACE BROOK PARKWAY
4/7/2006	3:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 / Rte 3
4/9/2006	5:20:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				3 00 feet N from Exit 8 on Rte 93 N		Rte 93 N
4/11/2006	7:00:00 AM	Non-Fatal injury	4	2	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 7 on Rte 93 S		Rte 93 S
4/12/2006	1:35:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 93 N
4/13/2006	3:15:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		100 feet S from Intersection Rte 93 N
4/23/2006	10:17:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 8 on Rte 93 S		Rte 93 S
4/28/2006	4:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			RT. 3 SPLIT			INTERSTATE 93 Rte 93 N / RAMP - RT 3 NB TO 93 NB
4/28/2006	7:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO FURNACE BROOK PARKWAY
4/29/2006	3:00:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			BEFORE THE SPLIT TO RT 9 3 SOUTH			Rte 93 S / WASHINGTON STREET
4/30/2006	2:45:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93 S		Rte 93 S
5/6/2006	4:30:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93 S		Rte 93 S
5/13/2006	7:29:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Water (standing, moving)	Dark - lighted roadway	Rain/Cloudy				500 f eet N from Exit 8 on Rte 93 S		Rte 93 S
5/18/2006	4:40:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy						Rte 93 / Rte 3
5/18/2006	10:08:00 AM	Non-Fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			FURNACE BROOK RAMPS	200 f eet S from Exit 8 on Rte 93 N		Rte 93 N
6/1/2006	2:45:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
6/1/2006	7:45:00 AM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
6/1/2006	12:30:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
6/5/2006	8:15:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93
6/7/2006	4:55:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain			ROUTE 93			Rte 93 N / Rte 93
6/7/2006	11:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain				Exit 8 on Rte 93 S		Rte 93 S
6/16/2006	2:30:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
6/22/2006	5:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
6/22/2006	5:45:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 3 on Rte 93		Rte 93 N
6/28/2006	1:30:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				500 f eet S from Exit 8 on Rte 93 N		Rte 93 N
6/28/2006	7:40:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				5 00 f eet N from Exit 8 on Rte 93 N		Rte 93 N
6/29/2006	12:15:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - unknown roadway lighting	Rain				2950 f eet S from Exit 8 on Rte 93 N		Rte 93 N
7/6/2006	3:41:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 / FURNACE BROOK PARKWAY
7/7/2006	5:00:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				300 f eet N from Exit 7 on Rte 93		Rte 93 N
7/12/2006	3:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 9 on Rte 93 N		Rte 93 N
7/14/2006	4:00:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				1800 f eet N from Exit 8 on Rte 93 S		Rte 93 S
7/16/2006	3:30:00 AM	Non-Fatal injury	2	2	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93		Rte 93 N
7/19/2006	10:00:00 AM	Non-Fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
7/21/2006	4:28:00 PM	Non-Fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 7 on Rte 93 S		Rte 93 S
7/21/2006	9:48:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain				Exit 12 on Rte 93		Rte 93 S
7/23/2006	8:55:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy			RAMP TO RT 93 FROM BURGIN PARKWA			HONORABLE THOMAS S BURGIN PARKWAY / Rte 93
7/31/2006	4:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
8/5/2006	1:15:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
8/20/2006	7:30:00 AM	Non-Fatal injury	2	3	0	Angle	Angle	Wet	Daylight	Rain				Exit 8 on Rte 93 N		Rte 93 N
8/23/2006	12:25:00 PM	Non-Fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				500 f eet N from Exit 8 on Rte 93 S		Rte 93 S
8/25/2006	5:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dusk	Cloudy						Rte 93 / FURNACE BROOK PARKWAY Rte 3
8/30/2006	2:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 6 on Rte 93		Rte 93 S
9/2/2006	12:31:00 PM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			@ FURNESS BROOK PKWY	Exit 8 on Rte 93 S		Rte 93 S
9/3/2006	1:43:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93
9/3/2006	10:15:00 AM	Non-Fatal injury	2	1	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear				15 feet N from Exit 12 on Rte 93		Rte 93 N
9/5/2006	7:43:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
9/10/2006	7:13:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear				Exit 6B on Rte 93 S		Rte 93 S
9/12/2006	3:45:00 AM	Non-Fatal injury	2	2	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93 / Rte 3
9/15/2006	2:00:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						GRANITE STREET Rte 93 N
9/20/2006	4:15:00 PM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						50 feet S from Intersection INTERSTATE 93 Rte 93 N / ROBERTSON STREET
9/26/2006	5:45:00 AM	Non-Fatal injury	4	1	0	Rear-end	Rear-end	Wet	Dawn	Clear						Rte 93 / Rte 3
9/27/2006	7:00:00 AM	Non-Fatal injury	3	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
10/3/2006	8:00:00 AM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93	/ Rte 3				
10/8/2006	5:55:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
10/9/2006	10:45:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear						Rte 3 N / Rte 93
10/9/2006	6:20:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dawn	Clear				Exit 12 on Rte 93		Rte 93 S
10/9/2006	7:20:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				100 f eet S from Exit 8 on Rte 93 S		Rte 93 S
10/10/2006	4:45:00 PM	Non-Fatal injury	3	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
10/14/2006	6:15:00 AM	Non-Fatal injury	2	2	0	Unknown	Unknown	Dry	Dusk	Clear						ADAMS STREET Rte 93 / Rte 3
10/14/2006	12:35:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
10/18/2006	6:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S / FURNACE BROOK PARKWAY
10/18/2006	9:20:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				Exit 8 on Rte 93		Rte 93
10/25/2006	4:46:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
10/28/2006	1:15:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Daylight	Rain				200 feet N from Exit 11 on Rte 93		Rte 93
11/2/2006	10:04:00 PM	Non-Fatal injury	3	3	0	Rear-to-rear	Rear-to-rear	Dry	Dark - lighted roadway	Clear/Clear						FURNACE BROOK PARKWAY Rte 93 S
11/6/2006	1:40:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear						RANDOLPH AVENUE Rte 28 N / RAMP - RT 93 SB TO RT 28 NB
11/9/2006	11:51:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				800 f eet S from Exit 8 on Rte 93 S		Rte 93 S
11/16/2006	6:11:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			SOUTH OF FURNACE BROOK ROTARY			Rte 93 S
11/22/2006	11:40:00 AM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy				Exit 9 on Rte 93 N		Rte 93 N
11/23/2006	2:30:00 PM	Non-Fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 9 on Rte 93 N		Rte 93 N
11/25/2006	8:00:00 PM	Non-Fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear				Exit 7 on Rte 93 S		Rte 93 S
11/30/2006	3:25:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 3 N / Rte 93
11/30/2006	6:00:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			75 feet N from ENTRANCE TO HOV LANE			Rte 93 N
12/1/2006	6:30:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain						Rte 93 N
12/3/2006	5:25:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 9 on Rte 93		Rte 93
12/6/2006	2:30:00 AM	Non-Fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
12/9/2006	2:28:00 PM	Non-Fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				150 f eet S from Exit 7 on Rte 93 S		Rte 93 S
12/9/2006	6:54:00 PM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			PRIOR TO EXIT 11	Exit 11 on Rte 93		Rte 93 N
12/14/2006	4:45:00 AM	Non-Fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Cloudy				1200 f eet N from Exit 8 on Rte 93 N		Rte 93 N
1/14/2004	12:01:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Ice	Dusk	Severe crosswinds	Rte 93 S	FURNACE BROOK PARKWAY				
1/15/2004	11:00:00 AM	Not Reported	1	0	0	Not reported	Not reported	Ice	Daylight	Clear			Rte 93 N			Rte 93 N
3/28/2004	5:00:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
5/23/2004	3:30:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Daylight	Clear			Rte 93 S	Exit 5A on Rte 93 S		Rte 93 S
5/24/2004	4:10:00 AM	Not Reported	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 9 on Rte 93		Rte 93 S
6/9/2004	4:45:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93			Rte 93 / SOUTHEAST EXPRESSWAY STREET
6/26/2004	4:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 N	Exit 8 on Rte 93 N		Rte 93 N
7/10/2004	9:45:00 PM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Dark - lighted roadway	Clear			Rte 93 S			Rte 93 S / Rte 93
9/3/2004	3:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
9/8/2004	2:45:00 PM	Not Reported	4	0	0	Rear-end	Rear-end	Dry	Dawn	Rain/Clear			Rte 93			Rte 93
10/3/2004	5:35:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 S					
10/5/2004	4:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			Rte 93 S	2 feet S from Exit 10 on Rte 93		Rte 93 S / Rte 93
10/12/2004	6:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear			Rte 93	Exit 8 on Rte 93		Rte 93
12/13/2004	6:15:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear			SOUTHEAST EXPRESSWAY STREET Rte 93			1000 f eet N from Intersection SOUTHEAST EXPRESSWAY STREET Rte 93 / FURNACE BROOK PARKWAY
1/17/2005	8:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 S
2/3/2005	5:00:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Wet	Dusk	Rain				2000 f eet S from Exit 9 on Rte 93		Rte 93 S
2/3/2005	8:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dusk	Rain/Snow				Exit 10 on Rte 93		Rte 93
2/21/2005	4:30:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow						SOUTHEAST EXPRESSWAY STREET Rte 3
2/23/2005	3:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 8 on Rte 93 S		Rte 93 S
2/28/2005	3:15:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy				Exit 8 on Rte 93 S		Rte 93 / Rte 93
3/24/2005	3:50:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 S
4/14/2005	9:10:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / ADAMS STREET
5/26/2005	5:15:00 PM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 93 / ADAMS STREET
5/25/2005	4:25:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						
6/13/2005	2:30:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Cloudy	ROTARY CIRCLE Rte 93	FURNACE BROOK PARKWAY	BETWEEN EXIT 10 AND 9 Rte 93 S			
6/13/2005	10:35:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						FURNACE BROOK PARKWAY Rte 93 N
7/8/2005	1:00:00 PM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	Rte 93 S					
7/9/2005	6:30:00 AM	Not Reported	3	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain						Rte 93 S
7/13/2005	4:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93 S
7/28/2005	4:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
8/4/2005	10:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93 S
8/10/2005	8:55:00 AM	Not Reported	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	Rte 93	Rte 95				MILTON ROAD Rte 93
8/20/2005	5:00:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 93			Exit 8 on Rte 93 N		Rte 93 N
9/1/2005	4:10:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
9/1/2005	5:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	QUINCY STREET Rte 93 N					
9/1/2005	5:23:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
10/7/2005	4:20:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Cloudy				Exit 6 on Rte 93		Rte 93 N / Rte 93
10/20/2005	2:30:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 12 on Rte 93		Rte 93
11/15/2005	8:30:00 PM	Not Reported	3	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported			5 MINUTE DRIVE TO EXIT 12 - Rte 93 S	Exit 12 on Rte 93		Rte 93
1/12/2006	5:20:00 AM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Cloudy						Rte 93 N
1/13/2006	4:45:00 PM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Other	Rte 93 N	Rte 93 N				
1/25/2006	10:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear						Rte 93 / NEPONSET ROAD
2/3/2006	9:00:00 AM	Not Reported	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Cloudy						SAVILLE AVENUE Rte 93 / Rte 3A
3/17/2006	6:30:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93 N	Rte 93 N				
3/24/2006	6:25:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear						FURNACE BROOK PARKWAY Rte 93 N
4/5/2006	6:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Not reported	Clear				20 f eet S from Exit 9 on Rte 93		Rte 93 / BRYANT AVENUE
4/7/2006	5:03:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain				Exit 8 on Rte 93		Rte 93
5/11/2006	8:40:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Daylight	Rain	Rte 93 N	FURNACE BROOK PARKWAY				
6/8/2006	5:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain	Rte 93 N	FURNACE BROOK PARKWAY Rte 93 N				
6/11/2006	2:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 7 on Rte 93 S		Rte 93 S
6/22/2006	7:30:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear				Exit 8 on Rte 93 S		Rte 93 S
7/19/2006	9:55:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				100 f eet N from Exit 8 on Rte 93 S		Rte 93 S
7/24/2006	7:30:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S / FURNACE BROOK PARKWAY
8/21/2006	3:00:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain				Exit 8 on Rte 93		Rte 93
8/21/2006	4:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				10 f eet N from Exit 9 on Rte 93		Rte 93
8/28/2006	11:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				5280 f eet S from Exit 12 on Rte 93		Rte 93 S
9/2/2006	11:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	HONORABLE THOMAS S BURGIN PARKWAY Rte 93	HANCOCK STREET / WASHINGTON STREET				
9/9/2006	6:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
9/14/2006	3:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				400 f eet S from Exit 8 on Rte 93 S		Rte 93 S
9/23/2006	3:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			FROM SE XPRESSWAY			FURNACE BROOK PARKWAY / RAMP - RT 93 SB TO FURNACE BROOK PARKWAY
10/12/2006	6:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dusk	Rain			93 N AT BRAINTREE SPLIT			Rte 93 / FURNACE BROOK PARKWAY
10/12/2006	7:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 10 on Rte 93		Rte 93 N
11/8/2006	4:40:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain				Exit 9 on Rte 93		Rte 93
12/2/2006	9:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						WEST SQUANTUM STREET Rte 93 / Rte 3
1/5/2004	5:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	Rte 93 S					500 f eet N from Intersection Rte 93 S / Rte 3
1/15/2004	6:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			NEAR QUINCY HOV - IN INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S
1/15/2004	10:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N			528 f eet S from Exit 9 on Rte 93 N		Rte 93 N
1/20/2004	2:55:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 N			Exit 9 on Rte 93 N		Rte 93 N
1/30/2004	4:00:00 PM	Property damage only (none injured)	2	0

GLINN CY 1/1/2004 12/31/2005 Where street or intersection is similar to: rte 93 or us 93 or interstate 93 or southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
2/6/2004	2:18:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Water (standing, moving)	Daylight	Sleet, hail (freezing rain or drizzle)/R			Rte 93 N	Exit 5 on Rte 93		Rte 93 N
2/20/2004	10:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 7 on Rte 93 S		Rte 93 S
2/20/2004	10:55:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 93 S	Rte 3				
2/21/2004	3:30:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			FURNACE BROOK PARKWAY Rte 93 S			FURNACE BROOK PARKWAY Rte 93 S
2/21/2004	8:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			FURNACE BROOK PARKWAY Rte 93 N			FURNACE BROOK PARKWAY Rte FURNACE N
2/24/2004	6:25:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 N	Exit 8 on Rte 93 N		Rte 93 N
3/5/2004	6:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain	Rte 93 N					
3/7/2004	1:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93 S	2000 feet N from Exit 7 on Rte 93 S		Rte 93 S
3/23/2004	7:20:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear			Rte 93			Rte 93
4/2/2004	8:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
4/4/2004	11:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain			Rte 93 N	1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/4/2004	12:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			FURNACE BROOK PARKWAY Rte 93 N			FURNACE BROOK PARKWAY Rte 93 N / HANCOCK STREET
4/13/2004	8:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 93 N	1000 feet N from Exit 5 on Rte 93		Rte 93 N
4/15/2004	2:30:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain			Rte 93			Rte 93
4/15/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
4/21/2004	4:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			50 feet S from STEDMAN ST - INTERSTATE 93 Rte 93 N			50 feet S from Intersection INTERSTATE 93 Rte 93 N / STEDMAN STREET
4/30/2004	6:15:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93			Rte 93
5/5/2004	1:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			SOUTHEAST EXPRESSWAY STREET Rte 93 S	Exit 8 on Rte 93 S		SOUTHEAST EXPRESSWAY STREET Rte 93 S
5/5/2004	7:50:00 AM	Property damage only (none injured)	3	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			FURNACE BROOK PARKWAY Rte 93 S			FURNACE BROOK PARKWAY Rte 93 S / Rte 93
5/15/2004	10:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 6B on Rte 93 S		Rte 93 S
5/24/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 N			Rte 93 N
5/24/2004	9:45:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			SOUTHEAST EXPRESSWAY STREET Rte 93 S	1000 feet N from Exit 8 on Rte 93 S		SOUTHEAST EXPRESSWAY STREET Rte 93 S
5/26/2004	6:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy			AT RTE 24 - YANKEE DIVISION HIGHWAY Rte 93 S			YANKEE DIVISION HIGHWAY Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
5/26/2004	8:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			SOUTHEAST EXPRESSWAY STREET Rte 93 N	Exit 8 on Rte 93 N		SOUTHEAST EXPRESSWAY STREET Rte 93 N
5/27/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Not reported	Daylight	Cloudy			SOUTHEAST EXPRESSWAY STREET Rte 93 S	Exit 8 on Rte 93 S		SOUTHEAST EXPRESSWAY STREET Rte 93 S
5/28/2004	5:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Clear			SOUTHEAST EXPRESSWAY STREET Rte 93 S	500 feet S from Exit 9 on Rte 93		SOUTHEAST EXPRESSWAY STREET Rte 93 S
5/29/2004	6:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N / HONORABLE THOMAS S BURGIN PARKWAY
6/9/2004	5:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			FURNACE BROOK - INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N
6/10/2004	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / FURNACE BROOK ROTARY
6/11/2004	7:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
6/14/2004	5:33:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
6/22/2004	6:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	500 feet N from Exit 5 on Rte 93		Rte 93 N
7/1/2004	4:00:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			Rte 93 S	100 feet N from Exit 5B on Rte 93 S		Rte 93 S
7/7/2004	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			L-ANE CLOSES - Rte 93 N			Rte 93 N
7/28/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain			Rte 93 S	20 feet S from Exit 8 on Rte 93 S		Rte 93 S
8/8/2004	3:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93			Rte 93
8/11/2004	3:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	300 feet N from Exit 8 on Rte 93 S		Rte 93 S
8/21/2004	4:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain			Rte 93 N	Exit 9 on Rte 93 N		Rte 93 N
9/1/2004	11:42:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S			Rte 93 S / FURNACE BROOK PARKWAY
9/15/2004	2:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			RAMP - RT 93 SB TO RT 3 SB Rte 93 S			RAMP - RT 93 SB TO RT 3 SB Rte 93 S
9/21/2004	5:15:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 7 on Rte 93 S		Rte 93 S
9/24/2004	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
9/28/2004	6:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Cloudy			SOUTHEAST EXPRESSWAY STREET Rte 93			1000 feet N from Intersection SOUTHEAST EXPRESSWAY STREET Rte 93 / Rte 93
10/4/2004	3:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
10/5/2004	3:58:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 8 on Rte 93 N		Rte 93 N
10/15/2004	7:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy			FURNACE BROOK PARKWAY Rte 93 N			FURNACE BROOK PARKWAY Rte 93 N
10/17/2004	8:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 28 S			500 feet N From Intersection Rte 28 S / Rte 93
10/19/2004	4:41:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			Rte 93 N			7920 feet N from Intersection Rte 93 N / Rte 28
10/24/2004	3:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			Rte 93 S	800 feet S from Exit 8 on Rte 93 S		Rte 93 S
10/24/2004	3:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			INTERSTATE 93 Rte 93 S			200 feet N From Intersection INTERSTATE 93 Rte 93 S / ROBERTSON STREET
10/25/2004	8:26:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy/Cloudy			Rte 93 N	100 feet S from Exit 9 on Rte 93 N		Rte 93 N
11/12/2004	5:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Dark - lighted roadway	Snow			Rte 93 N			Rte 93 N
11/16/2004	6:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			BATES AVENUE Rte 93 N			BATES AVENUE Rte 93 N
11/16/2004	6:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			GRANITE STREET Rte 93 S			GRANITE STREET Rte 93 S / Rte 93
11/19/2004	3:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	300 feet N from Exit 7 on Rte 93 S		Rte 93 S
11/21/2004	10:30:00 PM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Dark - lighted roadway	Clear/Clear			INTERSTATE 93 Rte 93 S			INTERSTATE 93 Rte 93 S / FURNACE BROOK ROTARY
11/28/2004	9:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Dark - lighted roadway	Rain			STEADMAN ST. OVERPASS - Rte 93 S			Rte 93 S
11/30/2004	9:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	150 feet S from Exit 8 on Rte 93 S		Rte 93 S
12/3/2004	7:25:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 8 on Rte 93		Rte 93 S
12/7/2004	11:25:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Dark - lighted roadway	Rain/Rain			Rte 93 S	500 feet N from Exit 8 on Rte 93 S		Rte 93 S
12/19/2004	4:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93			Rte 93 / Rte 3
12/21/2004	1:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy			Rte 93	Exit 5 A on Rte 93		Rte 93
12/21/2004	10:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			93 SOUTHEAST EXPRESSWAY STREET			93 SOUTHEAST EXPRESSWAY STREET
12/22/2004	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Dark - lighted roadway	Clear			Rte 93 N	30 feet N from Exit 9 on Rte 93 N		Rte 93 N
12/28/2004	1:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy			INTERSTATE 93 Rte 93 S	Exit 7 on Rte 93 S		INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 3 SB
12/28/2004	12:55:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy			BRAINTREE SPLIT - Rte 93 S	Exit 7 on Rte 93 S		Rte 93 S
12/30/2004	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Clear			INTERSTATE 93 Rte 93 N			INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO FURNACE BROOK PARKWAY
12/31/2004	1:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Cloudy			Rte 93 N	Exit 5 on Rte 93		Rte 93 N
1/2/2005	2:04:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy				50 feet N from Exit 8 on Rte 93 N		Rte 93 N
1/5/2005	10:50:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Ice	Daylight	Sleet, hail (freezing rain or drizzle)			Rte 93			SOUTHEAST EXPRESSWAY STREET Rte 93 S
1/6/2005	9:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Snow			Rte 93			SOUTHEAST EXPRESSWAY STREET Rte 93 N / Rte 93
1/11/2005	3:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			Rte 93 S			Rte 93 S
1/12/2005	2:17:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			RAMP TO RTE 93 AFTER SPLIT TO RT - HONORABLE THOMAS S BURGIN PARKWAY			HONORABLE THOMAS S BURGIN PARKWAY / Rte 93
1/12/2005	2:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy	Rte 93 S	RAMP - BRYANT AVE TO RT 93 SB				
1/14/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Rain				100 feet N from Exit 8 on Rte 93 S		FURNACE BROOK PARKWAY Rte 93 S
1/14/2005	8:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Clear/Cloudy				1000 feet S From Exit 9 on Rte 93		Rte 93 S
1/17/2005	2:31:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow/Snow				Exit 8 on Rte 93 S		Rte 93 S
1/19/2005	10:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Ice	Daylight	Clear				900 feet N From Exit 9 on Rte 93		Rte 93 S
1/20/2005	8:55:00 AM	Property damage only (none injured)	12	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 S
1/21/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				200 feet N From Exit 2 on Rte 93		Rte 93
1/25/2005	10:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 S / Rte 3
1/29/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO FURNACE BROOK PARKWAY
1/29/2005	12:21:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - roadway not lighted	Clear				10 feet S from Exit 5B on Rte 93 S		Rte 93 S
2/2/2005	1:57:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				300 feet N from Exit 8 on Rte 93 S		Rte 93 S
2/2/2005	7:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
2/2/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
2/5/2005	7:58:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
2/9/2005	7:52:00 AM	Property damage only (none injured)	1	0	0	Unknown	Unknown	Dry	Dark - lighted roadway	Clear/Clear			150 feet N from ROUTE 24 SOUTH RAMP - YANKEE DIVISION HIGHWAY Rte 93 S			150 feet N from Intersection YANKEE DIVISION HIGHWAY Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
2/13/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			100 feet S from FURNACE BROOK PKWY OVERPASS - Rte 93 S			Rte 93 S
2/15/2005	5:08:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dawn	Rain/Rain				500 feet S from Exit 9 on Rte 93 N		Rte 93 N
2/19/2005	3:30:00 PM	Property damage only (none injured)	3	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			PRIOR EXIT 37 - Rte 93 N	1000 feet N From Exit 8 on Rte 93		1000 feet N From Rte 93 N
2/21/2005	8:02:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			OPPOSITE SOUTH HOV BUILDING - Rte 93 N	1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
2/23/2005	7:14:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
2/24/2005	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
2/25/2005	5:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow						Rte 93 N / Rte 93
3/2/2005	5:56:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear	Rte 93 S	RAMP - RT 93 SB TO RT 3 SB				
3/6/2005	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	Rte 93 N					
3/7/2005	8:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Blowing sand, snow			HOV LANE - Rte 93 N			Rte 93 N / Rte 93
3/9/2005	2:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						Rte 93 N / Rte 93
3/9/2005	7:23:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Snow/Snow				50 feet N from Exit 8 on Rte 93 S		Rte 93 S
3/9/2005	8:15:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Slush	Daylight	Rain/Snow				50 Feet S from Exit 8 on Rte 93 S		Rte 93 S
3/9/2005	8:26:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Snow	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
3/9/2005	8:27:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Clear/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
3/13/2005	3:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
3/19/2005	4:28:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			1000 feet E from RT 93 - Rte 28 E			1000 feet E From Intersection Rte 28 E / Rte 93
3/21/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93
3/27/2005	12:26:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						600 feet N From Intersection Rte 93 S / Rte 3
3/28/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain				300 feet S from Exit 8 on Rte 93 S		Rte 93 S
3/30/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			RT.128 RANDOLPH ST. - Rte 93 S			Rte 93 S / UNNAMED ROAD
4/2/2005	7:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			AT THE SPLIT - Rte 93 N	1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/7/2005	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				500 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/7/2005	8:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						1.0 WILLARD STREET / Rte 93
4/8/2005	7:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			SPLIT - Rte 93 N	1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/9/2005	7:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear				500 feet S from Exit 8 on Rte 93 S		Rte 93 S
4/12/2005	6:08:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO FURNACE BROOK PARKWAY
4/19/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				500 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/20/2005	3:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
4/22/2005	9:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy				100 feet N from Exit 8 on Rte 93 S		Rte 93 S
4/23/2005	2:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Cloudy				Exit 9 on Rte 93		Rte 93
4/23/2005	8:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Rain			RAMP TO RT 93 - HONORABLE THOMAS S BURGIN PARKWAY			HONORABLE THOMAS S BURGIN PARKWAY
4/23/2005	11:04:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy						2000 Feet S from Intersection Rte 28 / Rte 93
4/25/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 N / ADAMS STREET
4/26/2005	8:19:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
5/3/2005	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						300 feet S From Intersection Rte 93 S / Rte 93
5/11/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				Exit 8 on Rte 93 S		Rte 93 S
5/17/2005	4:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S / WASHINGTON STREET
5/21/2005	2:50:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						INTERSTATE 93 Rte 93 S
5/26/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						RANDOLPH AVENUE Rte 28 N / RAMP - RT 93 SB TO RT 28 NB
5/26/2005	11:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain						Rte 93
5/27/2005	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93		Rte 93 N
5/28/2005	3:38:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 / FURNACE BROOK PARKWAY
5/29/2005	5:11:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear				500 feet S from Exit 8 on Rte 93 S		Rte 93 S
6/9/2005	12:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - roadway not lighted	Rain				Exit 11 on Rte 93		Rte 93 N
6/13/2005	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			ON-OFF RAMPS FURNACE BROOK PKWY - Rte 93 S			Rte 93 S
6/13/2005	2:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear				Exit 8 on Rte 93 N		INTERSTATE 93 Rte 93 N / BATES AVENUE
6/13/2005	10:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 feet S from Exit 8 on Rte 93 N		Rte 93 N
6/19/2005	3:23:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy				2000 feet N from Exit 5B on Rte 93 S		Rte 93 S
6/24/2005	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-

QUINCY 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 or us 93 or interstate 93 or southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
8/26/2005	8:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						Rte 93 N
8/31/2005	2:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				200 feet N from Exit 8 on Rte 93 N		Rte 93 N
9/1/2005	6:36:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
9/2/2005	12:30:00 PM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93
9/8/2005	2:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			DORCHESTER GAS TANK - SOUTHEAST EXPRESSWAY STREET Rte 93 N			SOUTHEAST EXPRESSWAY STREET Rte 93 N
9/15/2005	7:28:00 AM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Cloudy				50 feet N from Exit 8 on Rte 93 S		Rte 93 S
9/16/2005	9:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy			1000 Feet S from SOUTH HOV BUILDING - Rte 93 N			Rte 93 N
9/19/2005	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
9/20/2005	6:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Fog, smog, smoke						30.0 feet N from Intersection Rte 93 S / CALIFORNIA AVENUE
9/25/2005	12:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 7 on Rte 93		Rte 93 N
9/28/2005	7:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear				200 feet N from Exit 8 on Rte 93 S		Rte 93 S
9/30/2005	2:47:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Clear/Clear			100 Feet N from SOUTH HOV LANE - Rte 93 S			Rte 93 S
10/1/2005	12:40:00 AM	Property damage only (none injured)	3	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear						50 feet N from Intersection INTERSTATE 93 Rte 93 N / BATES AVENUE
10/3/2005	3:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 / Rte 3
10/3/2005	5:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO FURNACE BROOK PARKWAY
10/7/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						FURNACE BROOK PARKWAY Rte 93 / WILLARD STREET Rte 93
10/7/2005	3:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				Exit 9 on Rte 93		Rte 93
10/7/2005	6:54:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Rain						INTERSTATE 93 Rte 93 S / RAMP - RT 93 NB TO FURNACE BROOK PARKWAY
10/7/2005	10:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
10/8/2005	8:05:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy			NORTH OF HOV BLDG - Rte 93 N			Rte 93 N
10/9/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Cloudy/Rain			FURNACE BROOK PKWY EXIT - Rte 93 S	Exit 8 on Rte 93 S		Rte 93 S
10/10/2005	12:01:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Rain						Rte 93 N
10/11/2005	10:38:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			SOUTH HOV BUILDING - Rte 93 N			Rte 93 N
10/12/2005	7:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Clear				Exit 9 on Rte 93		Rte 93 S
10/12/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						20 feet N from Intersection INTERSTATE 93 Rte 93 S / ROBERTSON STREET
10/14/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain				100 feet S from Exit 9 on Rte 93		Rte 93 S
10/14/2005	11:55:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark - lighted roadway	Rain/Rain						Rte 93 N
10/15/2005	1:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 8 on Rte 93 S		Rte 93 S
10/18/2005	6:20:00 AM	Property damage only (none injured)	3	0	0	Rear-to-rear	Rear-to-rear	Dry	Dusk	Clear						SOUTHEAST EXPRESSWAY STREET Rte 3 / Rte 3
10/18/2005	8:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear						Rte 93 / Rte 3
10/19/2005	6:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dusk	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 / Rte 3
10/21/2005	12:12:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			OFF RAMP - Rte 93 S			Rte 93 S / HONORABLE THOMAS S BURGIN PARKWAY
10/22/2005	2:37:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			NEAR RT 3 - SOUTHEAST EXPRESSWAY STREET			SOUTHEAST EXPRESSWAY STREET
10/22/2005	8:10:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				200 feet N from Exit 7 on Rte 93		Rte 93 N
10/23/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain						Rte 93 S
10/25/2005	12:45:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Dawn	Clear/Clear						Rte 93 S
11/2/2005	1:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 feet N from Exit 7 on Rte 93 S		Rte 93 S
11/2/2005	5:54:00 PM	Property damage only (none injured)	5	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						HONORABLE THOMAS S BURGIN PARKWAY Rte 93
11/4/2005	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Cloudy				Exit 8 on Rte 93		Rte 93
11/5/2005	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Fog, smog, smoke/Fog, smog, smoke				Exit 8 on Rte 93 N		Rte 93 N
11/17/2005	1:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			500 Feet N from I-93 - Rte 28 N			500 Feet N from Intersection Rte 28 N / Rte 93
11/19/2005	6:59:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
11/22/2005	9:20:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				100 Feet N from Exit 8 on Rte 93		Rte 93
11/22/2005	12:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Other	Rain				500 Feet N from Exit 8 on Rte 93 S		Rte 93 S
11/23/2005	2:45:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			SOUTH HOV BUILDING - Rte 93 N			100 feet N from Intersection Rte 93 N
11/25/2005	9:00:00 AM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear	SOUTHEAST EXPRESSWAY STREET Rte 93 S			Exit 8 on Rte 93		1000 feet S from Intersection SOUTHEAST EXPRESSWAY STREET Rte 93
11/30/2005	2:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Rain				Exit 8 on Rte 93 N		Rte 93 N
12/2/2005	4:50:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
12/5/2005	6:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						HONORABLE THOMAS S BURGIN PARKWAY Rte 93
12/5/2005	11:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
12/9/2005	10:36:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Snow/Clear				500 feet S from Exit 9 on Rte 93		Rte 93 S
12/10/2005	8:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
12/14/2005	6:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear						INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO FURNACE BROOK PARKWAY
12/15/2005	10:28:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
12/20/2005	9:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Cloudy/Clear				Exit 9 on Rte 93 N		Rte 93 N
12/27/2005	5:01:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 N
12/29/2005	5:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Clear/Fog, smog, smoke						Rte 93 / Rte 3
12/29/2005	6:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Clear/Rain			100 Feet N from SOUTH HOV BUILDING - Rte 93 N	500 feet S from Exit 8 on Rte 93 N		Rte 93 N
12/30/2005	3:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy				Exit 9 on Rte 93		Rte 93
12/30/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				150 feet S from Exit 8 on Rte 93 N		Rte 93 N
1/2/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear						Rte 93 S
1/4/2006	3:47:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				500 Feet S From Exit 9 on Rte 93		Rte 93 S
1/5/2006	4:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			JUST PRIOR TO EXIT 9 N/B ON ROUT	Exit 9 on Rte 93 N		Rte 93 N
1/5/2006	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			AT EAST MILTON EXIT			Rte 93 N
1/5/2006	7:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
1/17/2006	3:29:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy						Rte 93 S / ROBERTSON STREET
1/13/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 N / ADAMS STREET
1/17/2006	6:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear						300 Feet N From Intersection Rte 93 S / Rte 3
1/18/2006	5:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 / SOUTHEAST EXPRESSWAY STREET
1/18/2006	11:16:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
1/20/2006	4:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93 N
1/25/2006	8:21:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Snow				500 Feet S from Exit 8 on Rte 93 S		Rte 93 S
1/25/2006	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy				Exit 9B on Rte 93 S		Rte 93 S
1/26/2006	2:17:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
1/27/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
1/28/2006	3:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 Feet S from Exit 8 on Rte 93 S		Rte 93 S
2/2/2006	6:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
2/3/2006	3:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
2/3/2006	4:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						FURNACE BROOK PARKWAY / Rte 93
2/3/2006	6:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 9 on Rte 93		Rte 93
2/3/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				50 feet N from Exit 7 on Rte 93		Rte 93 N
2/4/2006	10:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				300 Feet S from Exit 9 on Rte 93 N		Rte 93 N
2/7/2006	3:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
2/10/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 S / ADAMS STREET
2/10/2006	7:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			AT EXIT 6 (ADJACENT TO SOUTH SHO	Exit 6 on Rte 93		Rte 93 N
2/12/2006	8:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow/Snow				Exit 8 on Rte 93 N		Rte 93 N
2/15/2006	4:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
2/17/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
2/22/2006	6:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				1000 feet N from Exit 8 on Rte 93 N		Rte 93 N
2/24/2006	2:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy			BRAINTREE SPUT	Exit 7 on Rte 93 S		Rte 93 S
2/24/2006	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
3/1/2006	2:25:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear						Rte 93 / Rte 3
3/10/2006	5:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / FURNACE BROOK PARKWAY
3/10/2006	11:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						Rte 93 N / Rte 28
3/13/2006	7:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				200 Feet N from Exit 8 on Rte 93 N		Rte 93 N
3/13/2006	12:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				300 Feet S from Exit 9 on Rte 93 N		Rte 93 N
3/17/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						FURNACE BROOK PARKWAY Rte 93 N / Rte 3
3/24/2006	2:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 93
3/24/2006	4:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
3/25/2006	2:25:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Cloudy				6000 feet N from Exit 9B on Rte 93 S		Rte 93 S
3/27/2006	4:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1000 Feet S from Exit 8 on Rte 93 S		Rte 93 S
4/1/2006	4:35:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Wet	Daylight	Cloudy						20 feet S from Intersection INTERSTATE 93 Rte 3 / FURNACE BROOK ROTARY
4/1/2006	4:40:00 PM	Property damage only (none injured)	3	0	0	Head-on	Head-on	Wet	Daylight	Rain/Rain						Rte 93 S / RAMP-RT 93 SB TO FURNACE BROOK PARKWAY
4/5/2006	2:31:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						300 Feet N From Intersection Rte 93 S / GRANITE STREET
4/8/2006	8:51:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				1000 Feet N From Exit 5 on Rte 93		Rte 93 N
4/10/2006	3:47:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93		Rte 93 S
4/10/2006	4:03:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 7 on Rte 93 S		Rte 93 S
4/12/2006	4:47:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
4/13/2006	3:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				250 feet N from Exit 8 on Rte 93 N		Rte 93 N
4/14/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear			PRIOR TO FURNACE BROOK NORTH OF	Exit 8 on Rte 93 N		Rte 93 N
4/19/2006	3:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				2000 feet S From Exit 9 on Rte 93 N		Rte 93 N
4/21/2006	4:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			HOV BUILDING			Rte 93 S
4/22/2006	4:52:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy						RAMP - FURNACE BROOK PARKWAY TO RT 93 SB / Rte 93
4/30/2006	7:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93	Rte 28				Rte 93 N
5/4/2006	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			1500 Feet N from HOV BUILDING	Exit 8 on Rte 93 S		Rte 93 S
5/5/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Ice	Daylight	Snow						Rte 93 N / GRANITE STREET
5/9/2006	12:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear						BATTERYMARCH PARK Rte 28 / WILLIAMS STREET Rte 93
5/10/2006	5:54:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain						50 feet N from Intersection INTERSTATE 93 Rte 93 S / STEDMAN STREET
5/11/2006	9:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				50 feet N from Exit 8 on Rte 93 N		Rte 93 N
5/13/2006	8:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 9B on Rte 93 S		Rte 93 / Rte 28
5/14/2006	12:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 7 on Rte 93		Rte 93 N
5/15/2006	1:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy/Cloudy				Exit 8 on Rte 93 S		Rte 93 S
5/16/2006	5:00:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						FURNACE BROOK PARKWAY Rte 93 S
5/16/2006	5:25:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy						FURNACE BROOK PARKWAY Rte 93 S
5/18/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
5/19/2006	12:25:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Water (standing, moving)	Daylight	Rain/Cloudy				Exit 8 on Rte 93 N		Rte 93 N
5/21/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	Rte 93 S	FURNACE BROOK PARKWAY				
5/20/2006	6:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						Rte 93 / FURNACE BROOK PARKWAY Rte 3
5/26/2006	6:45:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				Exit 10 on Rte 93		400 Feet S from Intersection Rte 93 / Rte 3
5/30/2006	8:40:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				40 feet N from Exit 8 on Rte 93 N		Rte 93 N
6/2/2006	5:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain			SE EXPRESSWAY QUINCY QUARY	500 Feet N from Exit 8 on Rte 93 S		Rte 93 S
6/3/2006	5:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Rain				Exit 8 on Rte 93		Rte 93
6/3/2006	12:10:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain						RAMP - RT 93 SB TO FURNACE BROOK PARKWAY
6/5/2006	8:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						5225 SOUTHEAST EXPRESSWAY STREET
6/9/2006	10:00:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Rain/Rain				Exit 8 on Rte 93 S		Rte 93 S
6/12/2006	11:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
6/13/2006	8:59:00 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 18 on Rte 93		Rte 93
6/14/2006	4:48:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
6/16/2006	6:48:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 feet N from Exit 8 on Rte 93 N		Rte 93 N
6/18/2006	1:20:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				500 Feet N From Exit 9 on Rte 93		Rte 93
6/20/2006	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				250 Feet S From Exit 8 on Rte 93 N		SOUTHEAST EXPRESSWAY STREET Rte 93 N
6/20/2006	6:30:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear				Exit 9 on Rte 93		Rte 93
6/21/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear			QUARTER MILE S OF FURNACE BROOK			Rte 93
6/23/2006	9:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 18 on Rte 93		Rte 93
6/24/2006	3:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				50 feet N from Exit 8 on Rte 93 S		Rte 93 S
6/26/2006	1:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						CENTRE STREET Rte 93 / HONORABLE THOMAS S BURGIN PARKWAY
6/26/2006

QUINCY	1/1/2004	12/31/2006	Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
7/23/2006	4:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Water (standing, moving)	Dark - lighted roadway	Rain				200 feet N from Exit 9 on Rte 93 N		Rte 93 N
7/25/2006	1:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			MR. TUX	Exit 8 on Rte 93 S		Rte 93 S
7/26/2006	2:23:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
7/26/2006	7:59:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
7/28/2006	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy				150 feet S from Exit 8 on Rte 93 N		Rte 93 N
8/3/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dawn	Clear				Exit 11 on Rte 93		Rte 93
8/4/2006	4:59:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / FURNACE BROOK PARKWAY
8/6/2006	7:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
8/11/2006	3:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
8/13/2006	1:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						300 feet N from Intersection Rte 93 S / Rte 3
8/14/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 feet N from Exit 8 on Rte 93 N		Rte 93 N
8/16/2006	10:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				100 feet N from Exit 8 on Rte 93 N		Rte 93 N
8/18/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet N from Exit 8 on Rte 93 S		Rte 93 S
8/18/2006	7:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S
8/18/2006	12:22:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
8/19/2006	6:15:00 AM	Property damage only (none injured)	1	0	0	Not reported	Not reported	Dry	Dawn	Clear	SOUTHEAST EXPRESSWAY STREET	WASHINGTON STREET / HANCOCK STREET				
8/25/2006	2:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain						250 feet N from Intersection Rte 93 S / FURNACE BROOK PARKWAY
8/26/2006	5:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5 on Rte 93		Rte 93 N
9/1/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N
9/5/2006	6:50:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 9 on Rte 93 N		Rte 93 N
9/5/2006	7:23:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Not reported	Clear/Clear				100 feet N from Exit 8 on Rte 93 N		Rte 93 N
9/6/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 / Rte 3
9/6/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
9/6/2006	5:40:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Unknown	Not reported	Not Reported						SOUTHEAST EXPRESSWAY STREET / FURNACE BROOK PARKWAY
9/6/2006	6:52:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			SOUTH HOV ENTRANCE	500 feet S from Exit 8 on Rte 93 N		Rte 93 N
9/8/2006	6:35:00 AM	Property damage only (none injured)	3	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Cloudy				1.5 feet N from Exit 8 on Rte 93		Rte 93
9/9/2006	3:17:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				100 feet S from Exit 8 on Rte 93 S		Rte 93 S
9/14/2006	7:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy			50 feet N from BATES AVE OVERPASS			50 feet N from Intersection INTERSTATE 93 Rte 93 S / BATES AVENUE
9/14/2006	11:20:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear			BETWEEN MILTON AND QUINCY			SOUTHEAST EXPRESSWAY STREET Rte 93 / ADAMS STREET
9/15/2006	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						100 feet N from Intersection Rte 93 N / Rte 3
9/15/2006	8:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
9/16/2006	2:27:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				300 feet S from Exit 8 on Rte 93 S		Rte 93 S
9/19/2006	4:23:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
9/19/2006	11:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						Rte 93 N / Rte 28
9/21/2006	7:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						YANKEE DIVISION HIGHWAY Rte 93 S / RAMP - RT 93 SB TO RT 28 NB
9/23/2006	5:05:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Daylight	Clear				Exit 8 on Rte 93		Rte 93
9/28/2006	8:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 N		Rte 93 N
9/29/2006	2:59:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Cloudy						Rte 93 S
10/1/2006	5:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Not reported	Rain			500 feet S from EXIT 9	500 feet S from Exit 9 on Rte 93 N		Rte 93 N
10/4/2006	6:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy						INTERSTATE 93 Rte 93 N / ROBERTSON STREET
10/5/2006	8:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				150 feet S from Exit 8 on Rte 93 N		Rte 93 N
10/6/2006	2:21:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 28
10/6/2006	6:05:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 N / Rte 3
10/6/2006	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear/Clear			NORTH OF BRAINTREE SPLIT			Rte 93 N
10/6/2006	10:35:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			500 feet S from EXIT 8	500 feet S from Exit 8 on Rte 93		Rte 93
10/7/2006	12:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1200 feet S from Exit 8 on Rte 93		Rte 93
10/8/2006	6:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93		Rte 93
10/9/2006	3:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 3
10/9/2006	7:20:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear				250 feet S from Exit 9 on Rte 93		Rte 93
10/12/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S		Rte 93 S			
10/14/2006	12:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear						INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO FURNACE BROOK PARKWAY
10/16/2006	9:30:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				500 feet N from Rte 93 S	Milemarker 9.0	Rte 93 S
10/16/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						40 WILLARD STREET / Rte 93
10/17/2006	7:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Not reported	Clear						SOUTHEAST EXPRESSWAY STREET
10/17/2006	8:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			ENTERING FROM 28			Rte 93 S / Rte 28
10/19/2006	12:15:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 S		Rte 93 S
10/19/2006	12:39:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	Rte 93		Rte 3 S			
10/23/2006	6:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy				Exit 8 on Rte 93 S		Rte 93 S
10/24/2006	5:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 8 on Rte 93		Rte 93
10/25/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Not reported	Clear				Exit 8 on Rte 93 N		Rte 93 N
10/28/2006	4:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain				500 feet S from Exit 9 on Rte 93 N		Rte 93 N
10/28/2006	10:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - unknown roadway lighting	Clear				2640 feet N from Exit 5 on Rte 93		Rte 93 N / Rte 28
10/28/2006	11:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 8 on Rte 93 N		Rte 93 N
11/1/2006	9:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 8 on Rte 93 S		Rte 93 S
11/2/2006	11:59:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain				50 feet N from Exit 8 on Rte 93 S		FURNACE BROOK PARKWAY Rte 93 S
11/3/2006	1:34:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				500 Feet S from Exit 8 on Rte 93 N		Rte 93 N
11/3/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear/Clear			QUINCY COLLEGE EXIT SIGN	Exit 8 on Rte 93 S		Rte 93 S
11/7/2006	9:00:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
11/8/2006	4:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Rain				Exit 8 on Rte 93 S		Rte 93 S
11/8/2006	4:52:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - roadway not lighted	Cloudy/Rain				1000 feet N from Exit 5B on Rte 93 S		Rte 93 S
11/8/2006	4:59:00 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain						INTERSTATE 93 Rte 93 / RAMP - RT 93 SB TO RT 3 SB
11/9/2006	3:30:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 9 on Rte 93 N		Rte 93 N
11/10/2006	7:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear				Exit 9 on Rte 93		Rte 93
11/14/2006	4:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear				Exit 11 on Rte 93		Rte 93 N
11/14/2006	6:36:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			NORTH OF EXIT 8B	Exit 8 on Rte 93 N		Rte 93 N
11/14/2006	10:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 14 on Rte 93		Rte 93 N
11/15/2006	9:10:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy				1000 feet N from Exit 11 on Rte 93 N		Rte 93 N
11/18/2006	3:20:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93		Rte 93
11/19/2006	4:08:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			RICCIUTI AVE	Exit 8 on Rte 93 S		RAMP - RT 93 SB TO FURNACE BROOK PARKWAY Rte 93 S
11/21/2006	5:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			SOUTH HOV BUILDING			Rte 93 S
11/24/2006	1:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 N
11/28/2006	5:55:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			PRIOR TO GRANITE AVE			Rte 93 N
11/30/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Wet	Dawn	Cloudy/Cloudy						INTERSTATE 93 Rte 93 N / BATES AVENUE
12/1/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Cloudy/Rain			PRIOR TO EXIT 8	Exit 8 on Rte 93 S		Rte 93 S
12/3/2006	1:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear						Rte 93 S / RAMP-FURNACE BROOK PARKWAY TO RT 93 SB
12/9/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear/Clear				Exit 5B on Rte 93 S		Rte 93 S
12/12/2006	7:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			500 feet S from HOV DRIVEWAY			Rte 93 N
12/12/2006	9:04:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				1000 feet S from Exit 9 on Rte 93 N		Rte 93 N
12/14/2006	11:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 8 on Rte 93		Rte 93
12/15/2006	6:37:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
12/15/2006	6:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
12/19/2006	7:10:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 11 on Rte 93		Rte 93 N
12/20/2006	8:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			1/4 MILE BEFORE EXIT 8	1320 feet N from Exit 8 on Rte 93 S		Rte 93 S
12/22/2006	2:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 8 on Rte 93 N		Rte 93 N
12/28/2006	5:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			SOUTH HOV BUILDING			Rte 93 S
1/16/2004	5:45:00 PM	Unknown	2	0	0	Not reported	Not reported	Dry	Dusk	Clear	Rte 93 N					
4/30/2004	2:30:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 8 on Rte 93 N		Rte 93 N
6/15/2004	8:00:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S		FURNACE BROOK PARKWAY			FURNACE BROOK PARKWAY
11/29/2004	1:30:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			Rte 93 S	1000 feet S from Exit 8 on Rte 93 S		Rte 93 S
1/20/2005	12:30:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Unknown	Daylight	Clear	Rte 93 S	Rte 93 S				
2/4/2005	7:15:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy			RT 3/93 SPLIT - Rte 93 S	Exit 7 on Rte 93 S		Rte 93 S
2/11/2005	4:00:00 PM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				30 feet N from Exit 8 on Rte 93 N		Rte 93 N
3/12/2005	12:40:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain				Exit 8 on Rte 93 N		Rte 93 N
3/15/2005	1:25:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 12 on Rte 93		Rte 93
4/28/2005	10:15:00 AM	Unknown	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 9 on Rte 93	Rte 93 Milemarker 45.0	Rte 93 S
5/29/2005	2:35:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				0 feet N from Exit 7 on Rte 93 S		Rte 93 S
7/16/2005	4:10:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						EXPRESSWAY Rte 93 S
8/1/2005	3:30:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / 8
8/3/2005	9:30:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						SOUTHEAST EXPRESSWAY STREET Rte 93 N / Rte 95
4/4/2006	5:35:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Water (standing, moving)	Dusk	Rain						NIPONSET ROAD / Rte 93
6/1/2006	4:00:00 PM	Unknown	2	0	0	Unknown	Unknown	Dry	Daylight	Clear				15 feet N from Exit 14 on Rte 93		Rte 93
7/24/2006	7:30:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						10 feet N from Intersection Rte 93 / WILLARD STREET
9/7/2006	8:00:00 AM	Unknown	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 8 on Rte 93 S		Rte 93 S
9/14/2006	8:15:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11 on Rte 93		Rte 93 N
11/28/2006	8:53:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 7 on Rte 93 S		Rte 93 S

RANDOLPH	1/1/2004	12/31/2006	is similar to: rte 93 route 93													
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Feet_From	
1/4/2004	3:10:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Cloudy/Rain			HALF MILE NORTH OF RT 24 - Rte 93		Rte 93 / Rte 24	
1/12/2004	2:50:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow			INTERSTATE 93 Rte 93 S	Exit 4 on Rte 93 S	INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB	
2/21/2004	1:30:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			Rte 93 N	Exit 5B on Rte 93 N	Rte 93 N	
4/11/2004	12:10:00 PM	Non-fatal injury	1	1	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 5A on Rte 93 N	Rte 93 N	
4/24/2004	11:14:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy			Rte 93 S	Exit 5B on Rte 93 S	Rte 93 S	
4/26/2004	11:10:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Rain/Cloudy			INTERSTATE 93 Rte 93 S	Exit 4 on Rte 93 S	INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB	
5/29/2004	10:30:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	Exit 5A on Rte 93 S	Rte 93 S	
6/15/2004	10:48:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			Rte 93 S		500 feet N from Intersection Rte 93 S / Rte 24	
7/3/2004	1:15:00 PM	Non-fatal injury	2	9	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	1000 feet S from Exit 5B on Rte 93 N	Rte 93 N	
7/3/2004	6:02:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear			Rte 1A N	7920 feet N from Exit 3 on Rte 1A	7920 feet S from Intersection Rte 1A N / Rte 93	
7/4/2004	11:32:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	100 feet N from Exit 5A on Rte 93 S	Rte 93 S	
7/21/2004	7:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear/Clear			INTERSTATE 93 Rte 93 N		INTERSTATE 93 Rte 93 N / RAMP - RT 28 SB TO RT 93 NB	
7/29/2004	3:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear/Clear			Rte 93 S	Exit 5B on Rte 93 S	Rte 93 S	
7/31/2004	5:30:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 93 N	Exit 5A on Rte 93 N	Rte 93 N	
8/7/2004	2:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			Rte 93 N	Exit 4 on Rte 93 N	Rte 93 N	
10/10/2004	2:25:00 PM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N		Rte 24 N / Rte 93	
10/19/2004	10:55:00 PM	Non-fatal injury	1	2	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Clear/Clear			Rte 24 N		2640 feet S from Intersection Rte 24 N / Rte 93	
11/4/2004	5:50:00 PM	Non-fatal injury	5	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			50 FEET SOUTH OF 93 SPLIT - Rte 24 N		50 feet S from Intersection Rte 24 N / Rte 93	
11/6/2004	7:19:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			SOUTH OF EXIT 5 - Rte 93 N	Exit 5 on Rte 93 N	Rte 93 N	
11/11/2004	5:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 S		50 feet S from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB	
11/14/2004	8:45:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP - RT 24 NB TO RT 93 NB Rte 24 N		RAMP - RT 24 NB TO RT 93 NB Rte 24 N / INTERSTATE 93	
11/19/2004	11:15:00 PM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy/Clear			Rte 93 S	50 feet N from Exit 5A on Rte 93 S	Rte 93 S	
12/28/2004	12:25:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			RAMP - RT 24 NB TO RT 93 NB		RAMP - RT 24 NB TO RT 93 NB	
12/31/2004	1:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 5B on Rte 93 N	Rte 93 N	
1/8/2005	5:50:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)			NORTH OF RT. 28 - Rte 93 S		Rte 93 S / Rte 28	
1/20/2005	5:55:00 AM	Non-fatal injury	1	1	0	Not reported	Not reported	Ice	Daylight	Clear				Exit 5B on Rte 93 N	Rte 93 N / Rte 93	
2/1/2005	8:55:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear					INTERSTATE 93 Rte 93 / NORTH MAIN STREET Rte 28	
2/11/2005	6:15:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Dawn	Cloudy/Snow				Exit 5B on Rte 93 S	Rte 93 S	
3/1/2005	3:15:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Snow	Daylight	Snow	Rte 93 N					
4/16/2005	8:36:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Dark - lighted roadway	Cloudy				Exit 4 on Rte 93 S	Rte 93 S	
4/28/2005	8:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Rain				Exit 4 on Rte 93 S	Rte 93 S	
5/5/2005	2:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Not reported	Clear/Clear					NORTH MAIN STREET Rte 28 / RAMP - RT 28 NB TO RT 93 NB	
5/10/2005	5:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 3 on Rte 93 S	Rte 93 S	
5/14/2005	5:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			OFF RAMP FROM RT 24N TO RT 93 SO - AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB	
5/25/2005	8:05:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy				Exit 5B on Rte 93 S	Rte 93 S	
5/31/2005	6:55:00 PM	Non-fatal injury	4	4	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			IN BETWEEN RAMPS AT EXIT 5 - Rte 93 S		Rte 93 S / Rte 28	
6/6/2005	5:00:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					6000 feet S from Intersection Rte 24 N / Rte 93	
6/17/2005	4:25:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S	
6/25/2005	9:50:00 PM	Non-fatal injury	1	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			10 feet S from RTE 93 OVERPASS - Rte 28 N		Rte 28 N	
6/28/2005	8:40:00 AM	Non-fatal injury	3	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 S	Rte 93 S	
7/1/2005	5:10:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear				20 feet N from Exit 5B on Rte 93 N	Rte 93 N	
7/12/2005	2:41:00 AM	Non-fatal injury	2	3	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					1000 feet N from Intersection AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB	
7/16/2005	6:30:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy					Rte 93 / Rte 24	
7/26/2005	10:31:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			RT. 93 NB TO RT. 24 S/B ON RAMP - Rte 93 N	Exit 4 on Rte 93 N	Rte 93 N	
7/26/2005	10:55:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Dry	Dark - roadway not lighted	Cloudy	Rte 93 S	Rte 24 S				
8/12/2005	4:00:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 N	Rte 93 N	
8/14/2005	6:09:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					Rte 93 N	
8/28/2005	2:45:00 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				1000 feet N from Exit 5A on Rte 93 S	Rte 93 S	
8/30/2005	8:35:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			SOUTH OF 93 SPLIT - Rte 24 N		1000 feet S from Intersection Rte 24 N / Rte 93	
9/13/2005	7:25:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 93 S / Rte 24	
10/6/2005	3:30:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 4 on Rte 93 S	Rte 93 S	
10/6/2005	3:41:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N	
10/22/2005	2:33:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet S from Exit 3 on Rte 93 S	Rte 93 S	
10/31/2005	3:15:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear					RAMP - RT 24 NB TO RT 93 NB / Rte 24	
11/18/2005	10:55:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S	
11/29/2005	2:50:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB Rte 93 S	
11/30/2005	8:20:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Fog, smog, smoke				30 feet S from Exit 5A on Rte 93	Rte 93	
12/10/2005	12:05:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Ice	Dark - lighted roadway	Snow/Blowing sand, snow					350 feet S from Intersection Rte 24 S / Rte 93	
12/17/2005	2:20:00 AM	Non-fatal injury	1	2	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Cloudy/Cloudy					Rte 93 N	
1/1/2006	1:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow				Exit 5B on Rte 93	Rte 93	
1/13/2006	6:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Rain					Rte 24 / Rte 93	
1/14/2006	10:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy				250 feet N from Exit 5A on Rte 93 N	Rte 93 N	
1/17/2006	9:08:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5A on Rte 93 N	Rte 93 N	
2/2/2006	9:13:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Fog, smog, smoke/Cloudy				1000 feet S from Exit 3 on Rte 93 S	Rte 93 S	
2/10/2006	6:49:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear/Clear			1 MILE SOUTH OF EXIT 6	5280 feet N from Exit 6 on Rte 93	Rte 93 N	
2/23/2006	5:00:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Wet	Daylight	Cloudy				200 feet S from Exit 5A on Rte 93	RAMP - RT 93 SB TO RT 24 SB Rte 93	
3/29/2006	3:31:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N	
4/4/2006	2:10:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 5A on Rte 93 N	Rte 93 N	
4/5/2006	9:22:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear				Exit 4 on Rte 93 S	Rte 93 S	
4/12/2006	2:45:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 S	Rte 93 S	
4/21/2006	1:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear					Rte 24 / Rte 93	
5/1/2006	7:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			SOUTH OF I-93		Rte 24 S / Rte 93	
5/4/2006	6:25:00 AM	Non-fatal injury	4	2	0	Rear-end	Rear-end	Wet	Dawn	Clear				Exit 5A on Rte 93 N	Rte 93 N	
5/13/2006	8:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 5A on Rte 93	Rte 93 / RANDOLPH ROAD	
5/18/2006	4:20:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				700 feet S from Exit 4 on Rte 93 N	Rte 93 N	
6/2/2006	4:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain				Exit 5A on Rte 93 N	Rte 93 N	
6/21/2006	3:14:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 5A on Rte 93 S	Rte 93 S	
7/6/2006	2:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			20 feet E from GATEWAY PLAZA		1395 NORTH MAIN STREET Rte 28 N / Rte 93	
7/12/2006	8:30:00 AM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				200 feet S from Exit 5B on Rte 93 S	Rte 93 S	
7/16/2006	2:25:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 93 N	
7/23/2006	8:00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Other	Rain/Cloudy				Exit 5B on Rte 93 N	Rte 93 N	
7/26/2006	5:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				500 feet S from Exit 3 on Rte 93	Rte 93	
8/10/2006	6:50:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP TO 93 SOUTH		Rte 93	
8/11/2006	5:10:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5B on Rte 93 S	Rte 93 S	
8/22/2006	3:21:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear					Rte 93 S	
8/22/2006	3:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 5A on Rte 93 S	Rte 93 S	
8/31/2006	5:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			NEAR RANDOLPH EXIT		Rte 93 S	
9/11/2006	1:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 93	
9/22/2006	4:45:00 AM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 2 on Rte 93	Rte 93	
9/25/2006	3:15:00 AM	Non-fatal injury	2	1	0	Unknown	Unknown	Dry	Daylight	Clear					Rte 93 / Rte 24	
10/3/2006	6:00:00 AM	Non-fatal injury	3	3	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear				3000 feet N from Exit 5A on Rte 93 N	Rte 93 N	
10/11/2006	7:45:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain					Rte 93 N / Rte 24	
10/21/2006	10:40:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				5000 feet N from Exit 5B on Rte 93 N	Rte 93 N	
10/23/2006	1:12:00 PM	Non-fatal injury	3	2	0	Head-on	Head-on	Wet	Daylight	Cloudy/Rain					Rte 93 S	
11/7/2006	3:30:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy				500 feet S from Exit 5A on Rte 93 S	Rte 93 S	
12/5/2006	4:30:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear					Rte 24 / Rte 93	
2/4/2004	3:05:00 PM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	NORTH MAIN STREET Rte 93 N	SCHOOL STREET				
6/21/2004	12:34:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			INTERSTATE 93 Rte 93 N		INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB	
10/26/2004	6:30:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear			Rte 93 N	Exit 6 on Rte 93	Rte 93 N	
1/8/2005	12:30:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)				Exit 5A on Rte 93	Rte 93	
1/25/2005	7:00:00 AM	Not Reported	2	0	0	Single vehicle crash	Single vehicle crash	Not reported	Daylight	Blowing sand, snow	Rte 93 S					
2/15/2005	6:45:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy					Rte 24 N / Rte 93	
6/30/2005	8:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				1900 feet E from Exit 3 on Rte 93	Rte 93	
10/24/2005	6:20:00 PM	Not Reported	2	0	0	Not reported	Not reported	Wet	Dusk	Rain					1000 feet S from Intersection Rte 93 N / Rte 37	
11/2/2005	8:00:00 AM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear					Rte 24 / Rte 93	
2/3/2006	11:40:00 AM	Not Reported	3	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy/Rain					785 feet E from Intersection INTERSTATE 93 Rte 1A S	
3/10/2006	11:00:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 5A on Rte 93 N	Rte 93 N	
4/12/2006	8:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Not Reported					Rte 24 / Rte 93	
6/7/2006	6:30:00 AM	Not Reported	3	0	0	Head-on	Head-on	Wet	Daylight	Rain				Exit 5B on Rte 93 N	Rte 93 N	
9/20/2006	11:05:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear					Rte 93 / Rte 93	
10/16/2006	3:25:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not reported					200 feet S from Intersection Rte 93 / Rte 24	
12/20/2006	12:40:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					Rte 93 / Rte 24	
1/4/2004	1:10:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy/Rain			ROUT 128 - Rte 24 S		Rte 24 S / Rte 93	
1/4/2004	3:00:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain			Rte 93 N	300 feet N from Exit 5A on Rte 93 N	Rte 93 N	
1/5/2004	2:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 S	Exit 4 on Rte 93 S	Rte 93 S	
1/13/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Sleet, hail (freezing rain or drizzle)			Rte 93		Rte 93 / Rte 24	
1/26/2004	4:16:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Cloudy			RAMP - RT 24 NB TO RT 93 NB Rte 24 S		RAMP - RT 24 NB TO RT 93 NB Rte 24 S / INTERSTATE 93	
1/28/2004	1:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Daylight	Snow	Rte 93 S		Rte 93 S	Exit 4 on Rte 93 S	Rte 93 S	
2/6/2004	11:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Daylight	Snow/Rain			AMVETS MEMORIAL HIGHWAY Rte 24 S		AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB	
2/28/2004	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear			Rte 93 N		Rte 93 N	
3/2/2004	6:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy			Rte 93 S	Exit 4 on Rte 93 S	Rte 93 S	
3/5/2004	3:50:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93 S	250 feet S from Exit 4 on Rte 93 S	Rte 93 S	
3/21/2004	2:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain			Rte 93 N	500 feet N from Exit 5B on Rte 93 N	Rte 93 N	
3/22/2004	9:05:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Cloudy			Rte 93 S		100 feet S from Intersection Rte 93 S / Rte 24	
3/23/2004	4:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N	Exit 5A on Rte 93 N	Rte 93 N	
5/4/2004	4:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	0 feet N from Exit 5B on Rte 93 S	Rte 93 S	
5/7/2004	3:49:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	200 feet S from Exit 4 on Rte 93 N	Rte 93 N	
5/8/2004	9:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 24 N		Rte 24 N / RAMP - RT 93 NB TO RT 28 SB	
5/8/2004	11:35:00 AM	Property damage only (none injured)	5	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			RT 24 NB SOUTH OF RT 93 - Rte 24 N		Rte 24 N / Rte 93 S	
5/20/2004	8:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	2500 feet N from Exit 5A on Rte 93 N	Rte 93 N	
5/27/2004	7:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			1 MILE SOUTH OF 93 - Rte 24 N		5280 feet S from Intersection Rte 24 N / Rte 93	
6/13/2004	5:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S		Rte 93 S / Rte 24	
6/16/2004	6:05:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			INTERSTATE 93 Rte 93 N	Exit 5 on Rte 93 N	500 feet N from Intersection INTERSTATE 93 Rte 93 N / RAMP - RT 28 NB TO RT 93 NB	
6/18/2004	3:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - roadway not lighted	Clear			Rte 93	Exit 6 on Rte 93	Rte 93	
6/24/2004	8:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 4 on Rte 93 N	Rte 93 N	
7/6/2004	8:29:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 93 S	200 feet N from Exit 3 on Rte 93 S	Rte 93 S	
8/1/2004	6:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			Rte 24 N		150 feet S from Intersection Rte 24 N / Rte 93	
8/2/2004	6:17:00 PM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			Rte 93 N	500 feet N from Exit 5B on Rte 93 N	Rte 93 N	
8/6/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			Rte 93 S		500 feet N from Intersection Rte 93 S / Rte 24	

RANDOLPH 1/1/2004 12/31/2006 is similar to: rte 93 route 93

Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Feet_From
8/10/2004	11:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear			Rte 24 S		20 feet S from Intersection Rte 24 S / Rte 93
8/12/2004	1:23:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			ON RAMP AT SPLIT OF RB3 AND R3 - Rte 93 N		Rte 93 N
8/15/2004	12:31:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Dark - roadway not lighted	Cloudy/Rain			INTERSTATE 93 Rte 93 N		INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
8/16/2004	9:30:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain			Rte 93		Rte 93
8/21/2004	2:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy			Rte 93 S	500 feet S from Exit 5A on Rte 93 S	Rte 93 S
8/24/2004	1:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			EXACTLY AT 1 MILE TO RT 93 SIGN - Rte 24 S		Rte 24 S / Rte 93
9/2/2004	11:06:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 5A on Rte 93 N	Rte 93 N
9/9/2004	4:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 N	Exit 4 on Rte 93 N	Rte 93 N
9/20/2004	8:22:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	100 feet N from Exit 5B on Rte 93 S	Rte 93 S
9/25/2004	9:04:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93 S	Exit 4 on Rte 93 S	Rte 93 S
10/1/2004	5:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93 N	Exit 5A on Rte 93 N	Rte 93 N
10/1/2004	5:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 93 N		Rte 93 N / Rte 93
10/8/2004	3:12:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 93 N	20 feet S from Exit 5A on Rte 93 N	Rte 93 N
10/22/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
11/8/2004	1:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy			JUST SOUTH OF RTE 24 - Rte 93 N	500 feet S from Exit 4 on Rte 93 N	Rte 93 N / Rte 24
11/13/2004	6:00:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rearend	Snow	Dawn	Snow/Cloudy			Rte 24 N		Rte 24 N / Rte 93
11/15/2004	5:46:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear/Clear			Rte 24 N		100 feet S from Intersection Rte 24 N / Rte 93
11/17/2004	3:15:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy			AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
11/20/2004	3:30:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear			Rte 93		Rte 93 / Rte 24
11/20/2004	3:42:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy			Rte 93 S	Exit 4 on Rte 93 S	Rte 93 S
11/28/2004	3:12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Cloudy/Rain			Rte 93 S	1000 feet N from Exit 3 on Rte 93 S	Rte 93 S
11/28/2004	12:39:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Rain/Cloudy	Rte 93 S	Rte 24 S			
12/10/2004	11:01:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain			RAMP - RT 93 SB TO RT 24 SB		RAMP - RT 93 SB TO RT 24 SB / Rte 24
12/12/2004	4:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Cloudy			RTE 93 EXIT 4 RAMP TO RTE 24 SB - RAMP - RT 93 NB TO RT 24 SB		RAMP - RT 93 NB TO RT 24 SB
12/14/2004	12:07:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Clear/Clear			Rte 93 S		Rte 93 S / Rte 28
12/27/2004	3:33:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			BETWEEN RT. 28 RAMPS - Rte 93 S		Rte 93 S / Rte 28
12/31/2004	1:30:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 93 N	Exit 5B on Rte 93 N	Rte 93 N
1/8/2005	1:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Daylight	Sleet, hail (freezing rain or drizzle)/Cloudy					INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
1/8/2005	2:42:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Slush	Daylight	Sleet, hail (freezing rain or drizzle)/Cloudy					INTERSTATE 93 Rte 93 N / RAMP - RT 24 NB TO RT 93 NB
1/20/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - lighted roadway	Clear				1000 feet N from Exit 3 on Rte 93 S	Rte 93 S
1/20/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Clear			RANDOLPH EXIT - Rte 93	Exit 5A on Rte 93	Rte 93
1/26/2005	9:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Snow	Daylight	Snow					NORTH MAIN STREET Rte 28 N / RAMP - RT 28 NB TO RT 93 NB Rte 139 E
1/28/2005	3:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Clear/Clear			BOTTOM OF RT. 93 S/B/ OFF RAMP - Rte 28 S		Rte 28 S / Rte 93
1/28/2005	3:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Ice	Daylight	Clear/Clear					NORTH MAIN STREET Rte 28 S / RAMP - RT 93 NB TO RT 28 SB
1/31/2005	4:34:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			RAMP FROM 93 N TO 24 S - INTERSTATE 93 Rte 93 N		INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
2/2/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Wet	Daylight	Clear				500 feet E from Exit 5A on Rte 93 S	Rte 93 S
2/4/2005	2:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Cloudy/Cloudy				50 feet N from Exit 4 on Rte 93 S	Rte 93 S
2/5/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - roadway not lighted	Clear				100 feet N from Exit 5A on Rte 93 S	Rte 93 S
2/11/2005	2:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Slush	Dark - lighted roadway	Snow/Cloudy					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
2/15/2005	7:15:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Wet	Daylight	Cloudy					5000 feet S from Intersection Rte 24 / Rte 93
2/23/2005	8:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear				Exit 21 on Rte 24 N	Rte 24 N / Rte 93
3/1/2005	5:30:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Snow	Daylight	Snow					RAMP - RT 93 NB TO RT 24 SB Rte 93 N
3/8/2005	10:07:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - lighted roadway	Snow/Sleet, hail (freezing rain or drizzle)				Exit 4 on Rte 93 N	Rte 93 N
3/11/2005	6:55:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 N	Rte 93 N
3/12/2005	3:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Rain				Exit 5A on Rte 93 N	Rte 93 N
3/15/2005	2:45:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear					Rte 93 N / AMVETS MEMORIAL HIGHWAY
3/21/2005	10:30:00 AM	Property damage only (none injured)	4	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
3/24/2005	6:30:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Wet	Dawn	Rain					Rte 93 / Rte 24
3/24/2005	8:46:00 AM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Slush	Daylight	Snow/Rain				2000 feet N from Exit 5A on Rte 93 S	2000 feet N from Intersection Rte 93 S / Rte 28
3/27/2005	7:20:00 AM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 4 on Rte 93 S	Rte 93 S
4/5/2005	4:45:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear	Rte 93 S				
4/6/2005	6:09:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				100 feet N from Exit 5A on Rte 93 N	Rte 93 N
4/6/2005	8:40:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
4/7/2005	10:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
4/10/2005	1:39:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				500 feet N from Exit 4 on Rte 93 S	Rte 93 S
4/11/2005	8:17:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				100 feet S from Exit 4 on Rte 93 S	Rte 93 S
4/20/2005	3:15:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 N	Rte 93 N
4/20/2005	12:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 NB
4/22/2005	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear				Exit 5B on Rte 93	Rte 93
4/29/2005	1:46:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear			AT THE RAMP TO RTE. 24 SOUTH - Rte 93 N	Exit 4 on Rte 93 N	Rte 93 N
5/4/2005	8:46:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear					Rte 93 N
5/6/2005	7:25:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear				500 feet S from Exit 4 on Rte 93 S	Rte 93 S
5/6/2005	5:55:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear					Rte 93 N / Rte 28
5/8/2005	3:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Rain	INTERSTATE 93 Rte 93 S				
5/8/2005	6:15:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear				Exit 4 on Rte 93 S	Rte 93 S
5/13/2005	11:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
5/26/2005	1:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain				Exit 4 on Rte 93 S	Rte 93 S
6/25/2005	12:34:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
6/26/2005	3:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Cloudy/Cloudy					INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 24 SB
6/27/2005	8:50:00 AM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Dawn	Clear/Clear				700 feet N from Exit 5A on Rte 93 S	Rte 93 S
6/30/2005	8:32:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear					Rte 93 S / Rte 24
7/1/2005	12:50:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear					Rte 93 N
7/5/2005	4:05:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
7/6/2005	6:25:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Wet	Dark - lighted roadway	Rain/Rain				Exit 5A on Rte 93 S	Rte 93 S
7/12/2005	4:10:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Clear	Daylight					Rte 93 / Rte 28
7/31/2005	2:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					Rte 93
8/2/2005	11:00:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				20 feet S from Exit 5A on Rte 93 N	Rte 93 N
8/4/2005	3:20:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Daylight	Clear					Rte 93 N / Rte 24
8/24/2005	6:20:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Cloudy/Cloudy				Exit 5A on Rte 93 N	Rte 93 N
8/25/2005	7:25:00 AM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 N / INTERSTATE 93
8/26/2005	8:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				1000 feet N from Exit 4 on Rte 93 N	1000 feet N from Intersection Rte 93 N / Rte 24
8/27/2005	11:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear	Rte 93 S				INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB
8/29/2005	2:00:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / Rte 93
8/29/2005	9:35:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - roadway not lighted	Cloudy/Rain			RAMP TO S/B RTE 93 - AMVETS MEMORIAL HIGHWAY Rte 24 N		AMVETS MEMORIAL HIGHWAY Rte 24 N / RAMP - RT 24 NB TO RT 93 SB
9/1/2005	3:55:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear				Exit 5B on Rte 93 N	Rte 93 N
9/14/2005	5:00:00 PM	Property damage only (none injured)	4	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Not reported	Clear				Exit 4 on Rte 93 S	Rte 93 S
9/21/2005	2:30:00 PM	Property damage only (none injured)	4	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
9/23/2005	8:25:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
9/30/2005	7:15:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dusk	Clear/Clear				2000 feet S from Exit 5A on Rte 93	Rte 93 / Rte 93
10/15/2005	5:10:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Wet	Dusk	Rain/Cloudy				Exit 5A on Rte 93 N	Rte 93 N
10/15/2005	12:24:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Wet	Daylight	Rain/Rain				Exit 5B on Rte 93 N	Rte 93 N
10/18/2005	4:40:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Daylight	Clear			100 YRDS PRIOR TO RT 28 - Rte 93		Rte 93 / Rte 28
10/26/2005	11:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			FROM RAMP - Rte 24		Rte 24 / Rte 93
10/27/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dawn	Clear					Rte 93 N / Rte 93
10/29/2005	9:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - roadway not lighted	Rain/Other					Rte 93 S
11/13/2005	5:20:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Dusk	Clear/Clear				1000 feet N from Exit 3 on Rte 93 S	Rte 93 S
11/17/2005	4:25:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear					Rte 93 / Rte 28
11/17/2005	4:57:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 5A on Rte 93 N	Rte 93 N
11/17/2005	6:01:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear				Exit 5B on Rte 93 N	INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 28 NB
11/18/2005	11:25:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear					Rte 24 N / Rte 93
11/21/2005	5:56:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Dark - lighted roadway	Cloudy/Cloudy				Exit 5A on Rte 93 N	Rte 93 N
11/24/2005	12:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
11/27/2005	4:53:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dark - lighted roadway	Cloudy/Cloudy			SPLIT - Rte 93 S		Rte 93 S
11/28/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear			2000 feet S from HORSE BRIDGE - Rte 24 N		5000 feet S from Intersection Rte 24 N / Rte 93
12/4/2005	8:25:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Daylight	Cloudy/Snow					INTERSTATE 93 Rte 93 S / RAMP - RT 93 SB TO RT 24 SB Rte 24
12/7/2005	12:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 S	Rte 24 N			
12/9/2005	2:20:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Snow	Daylight	Blowing sand, snow				10 feet E from Exit 5A on Rte 93	Rte 93
12/10/2005	2:28:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Rain					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 NB TO RT 24 SB
12/14/2005	10:10:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					Rte 93 S / AMVETS MEMORIAL HIGHWAY Rte 24
12/17/2005	7:45:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dark - roadway not lighted	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
12/17/2005	9:25:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear				Exit 4 on Rte 93 N	Rte 93 N
12/21/2005	5:43:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dark - lighted roadway	Clear/Clear				1500 feet N from Exit 3 on Rte 93 S	Rte 93 S
12/28/2005	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Clear	Rte 93 S				
12/28/2005	12:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy/Clear	Rte 93 S	Rte 24 N			
12/29/2005	6:00:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Wet	Dark - lighted roadway	Rain/Rain				1500 feet N from Exit 4 on Rte 93 S	Rte 93 S
12/30/2005	3:00:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear				Exit 5B on Rte 93 S	Rte 93 S
12/30/2005	5:10:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Dark - unknown roadway lighting	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
1/5/2006	5:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 3 on Rte 93	Rte 93 N
1/6/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Cloudy					1245 NORTH MAIN STREET Rte 93 N
1/9/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear					Rte 93 S
1/16/2006	3:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear					Rte 93 S / Rte 24
1/16/2006	9:40:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			ON RAMP FROM 28 S TO 93N		Rte 28 S / Rte 93
1/17/2006	10:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Exit 5A on Rte 93	Rte 93
1/25/2006	6:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Snow	Dark - lighted roadway	Snow				Exit 5B on Rte 93	Rte 93
1/28/2006	4:00:00 PM	Property damage only (none injured)	4	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
1/30/2006	7:40:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Cloudy				2000 feet W from Exit 4 on Rte 93	Rte 93
2/3/2006	5:35:00 PM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Wet	Dark - lighted roadway	Cloudy/Rog., smog, smoke				Exit 5A on Rte 93 N	Rte 93 N
2/3/2006	9:45:00 PM	Property damage only (none injured)	3	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				10 feet N from Exit 5A on Rte 93 S	Rte 93 S
2/11/2006	2:22:00 PM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
2/12/2006	8:05:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Snow/Snow				Exit 5B on Rte 93 N	Rte 93 N
2/17/2006	9:00:00 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear					INTERSTATE 93 Rte 93 N
2/26/2006	4:59:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear/Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
3/13/2006	3:25:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear/Cloudy					Rte 93 S
4/11/2006	7:07:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
4/18/2006	8:30:00 AM	Property damage only (none injured)	2	0	0	Rearend	Rearend	Dry	Daylight	Clear					Rte 93 S / Rte 24
4/29/2006	1:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Clear/Clear			RAMP FROM ROUTE 93 SOUTH TO ROUT		RAMP - RT 93 SB TO RT 24 SB / Rte 24
5/5/2006	1:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear					INTERSTATE 93 Rte 93 N / RAMP - RT 93 NB TO RT 28 NB
5/6/2006	3:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear				Exit 21 on Rte 24	Rte 24 / Rte 93
5/11/2006	4:28:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S

RANDOLPH	1/1/2004	12/31/2006	is similar to: rte 93 route 93												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Feet_From
5/15/2006	7:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain				Exit 5A on Rte 93 S	Rte 93 S / Rte 4
5/25/2006	3:02:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 4 on Rte 93 S	Rte 93 S
5/25/2006	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				20 feet S from Exit 5A on Rte 93 S	Rte 93 S
5/26/2006	6:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 5A on Rte 93 S	Rte 93 S
5/27/2006	3:13:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
5/31/2006	3:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 N	Rte 93 N
6/5/2006	7:00:00 AM	Property damage only (none injured)	5	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
6/7/2006	4:45:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy/Rain					Rte 93 N / Rte 28
6/7/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy				Exit 4 on Rte 93 S	Rte 93 S
6/13/2006	9:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					300 feet S from Intersection Rte 93 S / Rte 28
7/7/2006	5:05:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Daylight	Clear					Rte 93 / Rte 24
7/12/2006	12:15:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Rain	Rte 93	Rte 24			
7/14/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 3 on Rte 93	Rte 93
7/15/2006	12:50:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 5A on Rte 93 S	Rte 93 S
7/24/2006	8:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear					Rte 24 / Rte 93
7/26/2006	6:16:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 N	Rte 93 N
7/28/2006	1:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 93 N
7/30/2006	8:09:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - unknown roadway lighting	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
8/3/2006	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 58 on Rte 93	Rte 93
8/4/2006	6:33:00 AM	Property damage only (none injured)	1	0	0	Head-on	Head-on	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
8/4/2006	12:18:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy					Rte 93 S / AMVETS MEMORIAL HIGHWAY Rte 24 N
8/17/2006	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear					AMVETS MEMORIAL HIGHWAY Rte 24 S / RAMP - RT 93 SB TO RT 24 SB
8/20/2006	2:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
8/25/2006	2:32:00 AM	Property damage only (none injured)	5	0	0	Unknown	Unknown	Wet	Dark - roadway not lighted	Rain/Rain					Rte 93 S
8/26/2006	6:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dusk	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
8/26/2006	12:35:00 PM	Property damage only (none injured)	2	0	0	Unknown	Unknown	Dry	Daylight	Clear					Rte 24 / Rte 93
8/27/2006	4:20:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Wet	Daylight	Rain/Rain				Exit 5A on Rte 93 S	Rte 93 S
8/29/2006	2:45:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 5A on Rte 93 S	Rte 93 S
9/1/2006	1:15:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 4 on Rte 93 S	Rte 93 S
9/2/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				50 feet N from Exit 3 on Rte 93	Rte 93 N
9/22/2006	4:37:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 5B on Rte 93 N	Rte 93 N
9/24/2006	5:03:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 S	Rte 93 S
9/29/2006	7:35:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Dark - lighted roadway	Clear/Clear				Exit 4 on Rte 93 N	Rte 93 N
10/8/2006	5:15:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
10/9/2006	11:49:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - roadway not lighted	Cloudy/Clear				Exit 4 on Rte 93 N	Rte 93 N
10/12/2006	5:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear					Rte 93 N / Rte 28
10/13/2006	7:05:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rearend	Dry	Dark - roadway not lighted	Clear/Clear					Rte 93 N
10/13/2006	7:40:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Dark - lighted roadway	Clear					Rte 93 / Rte 24
10/13/2006	10:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear					Rte 24 N / Rte 93
10/14/2006	5:15:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 4 on Rte 93	Rte 93 / Rte 24
10/15/2006	1:39:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear/Clear				Exit 5A on Rte 93 S	Rte 93 S
10/17/2006	6:17:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Dark - unknown roadway lighting	Rain/Cloudy				Exit 5B on Rte 93 S	Rte 93 S
10/21/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - roadway not lighted	Clear/Clear	RAMP - RT 24 NB TO RT 93 NB Rte 24 N	RAMP - RT 24 NB TO RT 93 NB Rte 24 N			
10/28/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Rain			BETWEEN 5 AND 6	Exit 5A on Rte 93	Rte 93
11/4/2006	12:30:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear				Exit 5A on Rte 93 N	Rte 93 N
11/6/2006	2:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear					Rte 28 / Rte 93
11/6/2006	4:38:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 4 on Rte 93 N	Rte 93 N
11/9/2006	11:09:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy					AMVETS MEMORIAL HIGHWAY Rte 24 N / INTERSTATE 93 Rte 93 S
11/16/2006	5:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - roadway not lighted	Clear/Clear				1500 feet N from Exit 5B on Rte 93 S	Rte 93 S
11/24/2006	10:57:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear				Exit 5B on Rte 93 S	Rte 93 S
11/25/2006	10:40:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear				Exit 4 on Rte 93	Rte 93
11/26/2006	12:35:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear			RT 93 NORTH		Rte 28 N / Rte 93
11/27/2006	8:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy				1000 feet S from Exit 4 on Rte 93 N	Rte 93 N
12/1/2006	3:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Wet	Daylight	Cloudy				Exit 24 on Rte 93	Rte 93
12/6/2006	7:55:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear				100 feet S from Exit 4 on Rte 93 S	Rte 93 S
12/8/2006	11:48:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear					300 NORTH MAIN STREET Rte 93
12/11/2006	11:15:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported					Rte 24 N / Rte 93
12/18/2006	6:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Dark - unknown roadway lighting	Clear				Exit 5A on Rte 93 S	Rte 93 S
12/18/2006	7:56:00 PM	Property damage only (none injured)	3	0	0	Unknown	Unknown	Dry	Dark - unknown roadway lighting	Clear				Exit 5A on Rte 93 N	Rte 93 N
12/26/2006	1:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy/Cloudy				Exit 5 on Rte 93 N	Rte 93 N
12/29/2006	11:35:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear					RAMP - RT 24 NB TO RT 93 NB Rte 24 N / INTERSTATE 93
3/19/2004	2:45:00 PM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear			Rte 24		Rte 24 / Rte 93
6/17/2004	4:30:00 AM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy			Rte 93 N	500 feet S from Exit 4 on Rte 93 N	Rte 93 N
12/26/2004	8:09:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Snow	Dark - lighted roadway	Snow/Severe crosswinds		RT. 24 SOUTH RAMP FROM RT. 93 SO - RAMP - RT 93 SB TO RT 24 SB			RAMP - RT 93 SB TO RT 24 SB
3/31/2005	7:45:00 AM	Unknown	2	0	0	Rear-end	Rearend	Sand, mud, dirt, oil, gravel	Daylight	Clear				Exit 3 on Rte 93	Rte 93 N
6/6/2005	6:25:00 AM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Cloudy/Clear				Exit 5B on Rte 93	Rte 93
7/20/2005	12:15:00 PM	Unknown	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear					Rte 93 S / 5
11/10/2005	6:35:00 AM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dawn	Rain/Cloudy				Exit 5B on Rte 93 N	Rte 93 N
5/19/2006	3:10:00 AM	Unknown	2	0	0	Rear-end	Rearend	Dry	Daylight	Clear				Exit 28 on Rte 93	Rte 93 / Rte 24
1/03/2006	8:45:00 AM	Unknown	3	0	0	Rear-end	Rearend	Dry	Daylight	Clear/Clear					Rte 93 S
1/28/2006	7:00:00 AM	Unknown	2	0	0	Rear-end	Rearend	Wet	Daylight	Cloudy					Rte 24 N / Rte 93
12/26/2006	4:45:00 AM	Unknown	2	0	0	Rear-end	Rearend	Dry	Not reported	Cloudy				Exit 4 on Rte 93	Rte 93

BOSTON (SOUTH BOSTON) 1/1/2004 12/31/2006 Where street or intersection is similar to: rte 93 route 93 interstate 93 southeast expressway

Crash_Date	Crash_Time	Crash_Type	Total Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Address/Landmark	Exit Distance	Mile Marker Distance	Feet_From
1/17/2006	10:20:00 PM	Fatal injury	1	0	1	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear				Exit 16 on Rte 93	Rte 93 Milemarker 15.4	Rte 93 / SOUTHAMPTON STREET
1/2/2004	11:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
2/9/2004	3:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	Exit 15 on Rte 93		Rte 93 S
2/14/2004	11:20:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	Rte 93 N					
3/8/2004	9:10:00 AM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Wet	Daylight	Rain/Cloudy			Rte 93 S	Exit 15 on Rte 93		Rte 93 S
5/4/2004	5:15:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S			Rte 93 S
5/30/2004	8:00:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Dusk	Cloudy			CONNECTOR BRIDGE - Rte 93 S	Exit 18 on Rte 93 S	Rte 93 S Milemarker 16.0	Rte 93 S / MASSACHUSETTS AVENUE
7/23/2004	10:41:00 PM	Non-fatal injury	2	4	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - roadway not lighted	Clear/Clear			L RAMP Rte 93 N	Exit 20 on Rte 93 N		L RAMP Rte 93 N
8/15/2004	5:15:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Cloudy			Rte 93 S		Rte 93 S Milemarker 16.4	Rte 93 S
9/19/2004	8:00:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - unknown roadway lighting	Clear			Rte 93 S	100 feet N from Exit 12 on Rte 93 S		Rte 93 S
10/3/2004	2:40:00 AM	Non-fatal injury	3	6	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy			Rte 93	Exit 18 on Rte 93	Rte 93 Milemarker 16.0	Rte 93
10/19/2004	4:45:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dusk	Cloudy/Rain			Rte 93		Rte 93 Milemarker 16.8	Rte 93
10/16/2004	12:15:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain	FRONTAGE ROAD Rte 93 N	HAUL ROAD / HAGGERTY OVERPASS				
1/28/2005	2:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	Sideswipe, same direction	Unknown	Daylight	Unknown				Exit 18 on Rte 93		Rte 93
4/1/2005	7:05:00 PM	Non-fatal injury	3	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear			OPPOSITE EXIT 15 - Rte 93 S	1000 feet S from Exit 15 on Rte 93		Rte 93 S
4/8/2005	11:20:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
6/5/2005	1:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear			ANDREW SQUARE T STATION - ANDREW SQUARE Rte 93			ANDREW SQUARE Rte 93
8/14/2005	11:30:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Rain	Rte 93 S					Rte 93 S
8/16/2005	7:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	BROADWAY					BROADWAY Rte 93
10/7/2005	7:00:00 PM	Non-fatal injury	4	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 S
10/19/2005	4:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			SOUTH BAY - Rte 93 S	Exit 15 on Rte 93		Rte 93 S
11/5/2005	2:25:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Cloudy				Exit 15 on Rte 93		FRONTAGE ROAD Rte 93 / COLUMBIA ROAD
11/5/2005	9:45:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93		Rte 93 S
7/2/2006	12:30:00 PM	Non-fatal injury	4	2	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear/Clear			NEAR THE RAMADA CUT-OUT	2000 feet N from Exit 12 on Rte 93 S		Rte 93 S
7/18/2006	2:00:00 AM	Non-fatal injury	2	2	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear/Clear	FRONTAGE ROAD	BROADWAY / RAMP - BROADWAY TO RT 93 NB				
7/28/2006	7:18:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dusk	Rain						Rte 93 N / MASSACHUSETTS AVENUE
9/30/2006	5:00:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				1500 feet S from Exit 11 on Rte 93		Rte 93
10/27/2006	4:20:00 AM	Non-fatal injury	2	3	0	Rear-end	Rear-end	Dry	Daylight	Clear	WILLIAM T MORRISSEY BOULEVARD	DAY STREET / RAMP - MORRISSEY BLVD TO RT 93 SB				
11/7/2006	7:35:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear				3000 feet N from Exit 12 on Rte 93 S		Rte 93 S
11/11/2006	2:14:00 AM	Non-fatal injury	6	2	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11 on Rte 93 N		Rte 93 N
12/20/2006	5:55:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dusk	Clear	Rte 93	RAMP - COLUMBIA RD TO RT 93 NB				
11/12/2004	5:30:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported	Rte 93 S					
11/23/2004	7:45:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
12/18/2004	7:25:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Other	Clear/Unknown			MASSACHUSETTS TURNPIKE Rte 90 E	Exit 24 on Rte 90 E		MASSACHUSETTS TURNPIKE Rte 90 E / Rte 93
4/8/2005	5:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			BOSTON GLOBE - Rte 93 S			Rte 93 S
8/8/2005	12:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93 S			Exit 114 on Rte 93		Rte 93 S
8/14/2005	12:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not reported	Not Reported				Exit 20 on Rte 93		Rte 93
8/16/2005	9:15:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	Rte 93 S					
9/14/2005	2:00:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 / Rte 93
11/1/2005	3:30:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear						I 9 Rte 93
3/31/2006	5:55:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						MASSACHUSETTS AVENUE Rte 93 / FRONTAGE ROAD Rte 1
6/1/2006	11:05:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Not reported	Daylight	Not Reported	Rte 93	Rte 3A				
7/28/2006	2:15:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			AFTER THE GAS TANKS			Rte 93 S
8/19/2006	3:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93 S	KOSCIUSZKO CIRCLE				
8/30/2006	1:45:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				300 feet S from Exit 14 on Rte 93 N		SOUTH EAST EXPRESSWAY Rte 93 N
9/8/2006	3:30:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 10 on Rte 93		Rte 93 S
9/14/2006	8:00:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Dark - unknown roadway lighting	Cloudy			BROADWAY BRIDGE			167 feet S from Intersection RAMP - RT 93 NB TO WB / RAMP - RT 93 NB TO RT 93 NB HOV LANE
9/29/2006	12:00:00 PM	Not Reported	3	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				Exit 20 on Rte 93		Rte 93
12/6/2006	8:40:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 / Rte 3A
1/17/2004	12:20:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - roadway not lighted	Clear/Clear			Rte 93 S	Exit 18 on Rte 93 S	Rte 93 S Milemarker 15.7	Rte 93 S
1/19/2004	6:00:00 AM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear			Rte 93 S	Exit 18 on Rte 93 S	Rte 93 S Milemarker 15.7	Rte 93 S
1/19/2004	6:20:00 AM	Property damage only (none injured)	1	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dawn	Clear			Rte 93 S		Rte 93 S Milemarker 15.0	Rte 93 S
1/28/2004	3:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dusk	Snow			Rte 93 S			Rte 93 S
2/15/2004	2:52:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			LIBERTY SQUARE Rte 93 N			LIBERTY SQUARE Rte 93 N
2/19/2004	8:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			ROUTE 93 Rte 93 S			300 Feet S from Intersection ROUTE 93 Rte 93 S / ALBANY STREET ON RAMP
3/26/2004	11:15:00 AM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				200 feet S from Exit 15 on Rte 93		Rte 93 S
4/3/2004	2:58:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			RAMP D - Rte 90 W			200 feet N from Intersection Rte 90 W / Rte 93
4/3/2004	2:58:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 90 W		Rte 90 Milemarker 16.6	200 Feet E from Intersection Rte 90 W / Rte 93
4/16/2004	4:25:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 S	500 Feet N from Exit 12 on Rte 93 S		Rte 93 S
4/19/2004	8:37:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear			Rte 93 N			Rte 93 N / MASSACHUSETTS AVENUE
4/26/2004	2:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain			Rte 93	Exit 18 on Rte 93		Rte 93 S
4/30/2004	5:06:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			Rte 93 N			Rte 93 N
5/9/2004	8:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			FRONTAGE ROAD Rte 93 N		Rte 93 Milemarker 164.0	FRONTAGE ROAD Rte 93 N
5/9/2004	12:15:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Dry	Daylight	Clear	Rte 93 N			300 Feet S from Exit 15 on Rte 93 N		Rte 93 N
5/14/2004	3:48:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			MASSAVE CONN - INTERSTATE 93 Rte 93 S			500 feet N from Intersection INTERSTATE 93 Rte 93 S / MASSACHUSETTS AVENUE
5/21/2004	7:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			ENTRANCE TO I93N - COLUMBIA ROAD			COLUMBIA ROAD / Rte 93
5/28/2004	3:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Rte 93 S			200 Feet S from Intersection Rte 93 S / BOSTON STREET
6/2/2004	7:10:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 N			Rte 93 N
7/17/2004	11:25:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			LIBERTY TUNNEL Rte 93 N		Rte 93 N Milemarker 17.2	LIBERTY TUNNEL Rte 93 N
9/4/2004	3:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy			Rte 93	Exit 12 on Rte 93		Rte 93
9/15/2004	2:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Cloudy			FRONTAGE ROAD Rte 93 N		Rte 93 N Milemarker 16.8	FRONTAGE ROAD Rte 93 N / Rte 93
9/18/2004	8:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 N	Exit 18 on Rte 93 N		Rte 93 N
9/21/2004	11:50:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear			Rte 93 N	Exit 18 on Rte 93 N		Rte 93 N
9/23/2004	10:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear			Rte 93 N	Exit 20 on Rte 93 N		Rte 93 N
10/26/2014	7:30:01 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain			Rte 93 N			Rte 93 N
12/10/2014	8:38:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain			Rte 93 N			Rte 93 N / Rte 93
12/28/2004	1:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Cloudy/Sleet, hail (freezing rain or drizzle)			Rte 93 S	Exit 12 on Rte 93 S		Rte 93 S
1/15/2005	12:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Ice	Dark - roadway not lighted	Clear	Rte 93 S					Rte 93 S
2/2/2005	10:45:00 PM	Property damage only (none injured)	6	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear						Rte 93 S
2/9/2005	10:15:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear			SOUTH BOY SHOPPING COMPLEX - I93 Rte 93 N		Exit 1820 on Rte 93	93 Rte 93 N
2/17/2005	3:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Sand, mud, dirt, oil, gravel	Daylight	Clear			SOUTH BAY PLAZA - GENERAL CASIMIR PULASKI SKYWAY Rte 93	Exit 19 on Rte 93		300 Feet S from Intersection GENERAL CASIMIR PULASKI SKYWAY Rte 93
2/25/2005	4:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy/Cloudy			50 Feet N from BOSTON STREET OVERPASS - Rte 93 S			Rte 93 S / Rte 93
2/25/2005	9:30:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Clear				Exit 12 on Rte 93 S		Rte 93 S
2/25/2005	12:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Clear/Cloudy				500 Feet N from Exit 15 on Rte 93 N		Rte 93 N
4/21/2005	5:10:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dawn	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / RAMP - COLUMBIA RD TO RT 93 NB
5/2/2005	1:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear				Exit 15 on Rte 93 N		Rte 93 N
5/7/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain				Exit 15 on Rte 93		Rte 93 S
5/21/2005	1:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Cloudy			UNDERPASS RT 93 BROADWAY BRIDGE - WEST BROADWAY			WEST BROADWAY
6/29/2005	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 93 S
8/5/2005	8:50:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						Rte 93 S
8/12/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	Rte 93			25 Feet S from Exit 14 on Rte 93		Rte 93
8/15/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy						Rte 93 S
10/26/2005	10:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear			BETWEEN EXITS 14 AND 15 - Rte 93 N	Exit 14 on Rte 93 N		Rte 93 N
11/27/2005	4:50:01 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear						INTERSTATE 93 Rte 1 / Rte 1
12/17/2005	12:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93 N		GENERAL CASIMIR PULASKI SKYWAY Rte 93 N / COLUMBIA ROAD
1/2/2006	4:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 / COLUMBIA ROAD
1/7/2006	5:20:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear/Clear			DORCHESTER AVENUE OVERPASS			DORCHESTER AVENUE Rte 93 S / Rte 3A
2/12/2006	4:20:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Daylight	Snow				Exit 19 on Rte 93		Rte 93
2/17/2006	7:00:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear						F STREET Rte 93 / BROADWAY Rte 3
2/18/2006	1:05:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy						Rte 90 / Rte 93
3/17/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - unknown roadway lighting	Clear						GENERAL CASIMIR PULASKI SKYWAY Rte 93 S / COLUMBIA ROAD
3/24/2006	2:30:00 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Dry	Daylight	Cloudy				Exit 8 on Rte 93		Rte 93
4/3/2006	6:45:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Cloudy						WILLIAM DAY BOULEVARD Rte 93 / WILLIAM T MORRISSEY BOULEVARD Rte 3
5/15/2006	8:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy						FRONTAGE ROAD Rte 93 N / BROADWAY
6/5/2006	10:00:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						BROADWAY / Rte 93
6/29/2006	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 11A on Rte 93 S		Rte 93 S
7/16/2006	7:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				Exit 15 on Rte 93		Rte 93
8/16/2006	11:30:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear						Rte 93 S / NEPONSET AVENUE
9/15/2006	2:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Other	Daylight	Cloudy				Exit 11 on Rte 93		Rte 93 N
10/1/2006	12:50:00 PM	Property damage only (none injured)	4	0	0	Rear-end	Rear-end	Wet	Daylight	Rain/Rain				Exit 15 on Rte 93		COLUMBIA ROAD Rte 93 S
10/30/2006	5:50:00 AM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear				Exit 11B on Rte 93 N		JOHN F FITZGERALD EXPRESSWAY Rte 93 N / RAMP - I93 NB TO ATLANTIC AVE
11/21/2006	2:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear						Rte 93 N
12/10/2006	12:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear				100 Feet N from Exit 15 on Rte 93		Rte 93
12/20/2006	1:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear						Rte 3 S / Rte 93
3/2/2004	11:45:00 PM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear			Rte 93 S	500 Feet N from Exit 18 on Rte 93 S		Rte 93 S
10/20/2004	12:45:00 AM	Unknown	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear			INTERSTATE 93 Rte 93 S		Rte 93 Milemarker 16.0	INTERSTATE 93 Rte 93 S
7/27/2005	2:45:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear				1000 Feet N from Exit 18 on Rte 93 S		Rte 93 S
1/29/2006	6:30:00 AM	Unknown	2	0	0	Not reported	Not reported	Wet	Dark - lighted roadway	Rain				Exit 15 on Rte 93 S		Rte 93 S / Rte 93
9/15/2006	7:00:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			CLOSE ET EXIT 15	Exit 15 on Rte 93 N		Rte 93 N
10/11/2006	7:40:00 AM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear			1000 Feet N from WHITE WINDMILL			1000 Feet N from Intersection Rte 93 N / RAMP - RT 93 NB TO MORRISSEY BLVD

QUINCY (WEST QUINCY)	1/1/2004	12/31/2006	is similar to: rte 93 route 93												
Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Street	Intersection	Exit Distance	Feet_From	
10/3/2006	8:00:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	Rte 93	/ Rte 3			
1/17/2005	8:00:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear			Exit 9 on Rte 93	Rte 93 S	
10/18/2005	8:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear				Rte 93 / Rte 3	
5/8/2006	12:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear				BATTERYMARCH PARK Rte 28 / WILLIAMS STREET Rte 93	

		TAUNTON	1/1/2004	12/31/2006	similar to:									
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Address/Landmark	Feet_From
BROADWAY Rte 138 N	TAUNTON GREEN	7/19/2006	4:50:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
TAUNTON GREEN Rte 138 N	BROADWAY	7/12/2006	3:57:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	BROADWAY Rte 138	3/30/2006	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
BROADWAY	TAUNTON GREEN	3/3/2006	4:07:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TAUNTON GREEN	BROADWAY	1/9/2006	3:10:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	BROADWAY	8/11/2005	2:20:00 AM	Non-fatal injury	1	1	0	Unknown	Unknown	Dry	Dark - lighted roadway	Clear		
BROADWAY Rte 138 S	TAUNTON GREEN	2/23/2005	4:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
BROADWAY	TAUNTON GREEN	9/25/2004	9:46:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TAUNTON GREEN	BROADWAY	3/19/2004	10:10:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Daylight	Snow		
KILMER AVENUE	OAK STREET	1/18/2004	1:45:00 AM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear		
KILMER AVENUE	OAK STREET	8/22/2004	7:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
OAK STREET	KILMER AVENUE	2/22/2005	8:23:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
KILMER AVENUE	OAK STREET	8/3/2005	12:13:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
KILMER AVENUE	OAK STREET	9/17/2005	10:00:00 PM	Not Reported	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy		
OAK STREET	KILMER AVENUE	11/10/2005	9:55:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear		
OAK STREET	KILMER AVENUE	12/10/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
KILMER AVENUE	OAK STREET	1/28/2006	3:45:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear		
OAK STREET	KILMER AVENUE	4/10/2006	6:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
KILMER AVENUE	OAK STREET	6/16/2006	4:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
KILMER AVENUE	OAK STREET	7/10/2006	1:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
OAK STREET	KILMER AVENUE	7/26/2006	11:05:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
WASHINGTON STREET	FREDRICK R. MARTIN SR. PARKWAY	5/2/2006	6:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET	12/20/2006	10:27:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear		
TAUNTON GREEN	COHANNET STREET	12/9/2006	8:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET	11/25/2006	3:57:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET	10/13/2006	1:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET	5/26/2006	2:55:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET Rte 44	5/26/2006	2:55:00 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	WINTHROP STREET / COHANNET STREET	9/6/2005	5:30:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	WINTHROP STREET Rte 44 W	6/8/2004	11:02:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET	5/27/2004	9:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	WINTHROP STREET	5/6/2004	1:19:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COHANNET STREET / WINTHROP STREET	1/29/2004	2:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET	12/5/2006	3:34:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
COURT STREET	POST OFFICE SQUARE / TAUNTON GREEN Rte 140	10/11/2006	11:25:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET / POST OFFICE SQUARE	7/26/2006	3:35:00 PM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET	6/25/2006	5:41:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain		
POST OFFICE SQUARE	COURT STREET / TAUNTON GREEN	5/24/2006	5:34:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET	4/28/2006	4:35:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	POST OFFICE SQUARE / COURT STREET	4/23/2006	10:31:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy/Rain		
COURT STREET Rte 140	TAUNTON GREEN	4/20/2006	6:04:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET	12/5/2005	7:15:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	POST OFFICE SQUARE	10/31/2005	1:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET	6/5/2005	6:28:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
POST OFFICE SQUARE	TAUNTON GREEN	11/29/2004	2:39:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET / POST OFFICE SQUARE	10/8/2004	11:35:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
TAUNTON GREEN	COURT STREET / POST OFFICE SQUARE	9/24/2004	2:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
WASHINGTON STREET	TREMONT STREET Rte 140	12/28/2006	4:11:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear		
WASHINGTON STREET	TREMONT STREET	12/23/2006	12:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear		
WASHINGTON STREET	TREMONT STREET	12/13/2006	11:00:00 AM	Property damage only (none injured)	1	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
WASHINGTON STREET	TREMONT STREET	12/12/2006	11:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TREMONT STREET	WASHINGTON STREET	11/1/2006	4:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TREMONT STREET	WASHINGTON STREET	10/17/2006	10:31:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
TREMONT STREET	WASHINGTON STREET	8/19/2006	5:15:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	WEBSTER BANK	
WASHINGTON STREET	OAK STREET / TREMONT STREET Rte 140 N	6/11/2006	7:09:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
OAK STREET	TREMONT STREET	5/24/2006	3:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TREMONT STREET	WASHINGTON STREET	5/18/2006	6:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dusk	Clear		
TREMONT STREET Rte 140	WASHINGTON STREET Rte 140	2/14/2006	12:04:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Clear		
OAK AVENUE	TREMONT STREET / WASHINGTON STREET	1/19/2006	6:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear		
TREMONT STREET	WASHINGTON STREET	10/26/2005	9:08:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
TREMONT STREET	WASHINGTON STREET	10/20/2005	9:08:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy		
WASHINGTON STREET	TREMONT STREET	10/15/2005	10:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain		
TREMONT STREET	WASHINGTON STREET	10/1/2005	2:30:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TREMONT STREET	WASHINGTON STREET	7/14/2005	5:00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dawn	Clear		
WASHINGTON STREET Rte 140	TREMONT STREET	6/14/2005	11:40:00 AM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Dark - unknown roadway lighting	Clear		
TREMONT STREET Rte 140	WASHINGTON STREET	6/13/2005	8:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear		
WASHINGTON STREET	TREMONT STREET	1/15/2005	1:52:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear		
OAK STREET	TREMONT STREET	3/10/2004	7:35:00 PM	Not Reported	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Clear		
COURT STREET	WASHINGTON STREET	6/28/2006	2:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
COURT STREET	WASHINGTON STREET	5/3/2006	11:55:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain		
COURT STREET	WASHINGTON STREET	3/1/2006	8:14:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear		
OAK STREET	WASHINGTON STREET	11/26/2005	2:15:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear		
WASHINGTON STREET	COURT STREET	7/7/2005	7:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
WASHINGTON STREET	COURT STREET / PARK STREET	6/22/2005	11:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy		OAK STREET
WASHINGTON STREET	COURT STREET	4/15/2005	1:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear		
WASHINGTON STREET	COURT STREET	3/28/2005	6:30:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain		
COURT STREET	WASHINGTON STREET	12/29/2004	8:45:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Wet	Dark - lighted roadway	Cloudy		
WASHINGTON STREET	COURT STREET	11/29/2004	3:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
OAK STREET	WASHINGTON STREET	1/30/2004	2:25:00 PM	Unknown	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear		
WASHINGTON STREET	COURT STREET	1/10/2004	3:00:00 PM	Not Reported	2	0	0	Not reported	Not reported	Dry	Daylight	Clear		
MAIN STREET	WEIR STREET	11/12/2006	12:00:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Dark - lighted roadway	Cloudy		
TAUNTON GREEN	WEIR STREET	8/31/2006	10:27:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
TAUNTON GREEN	BROADWAY / WEIR STREET	6/22/2006	8:37:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Dusk	Clear		
WEIR STREET	MAIN STREET	3/12/2006	7:17:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
TAUNTON GREEN Rte 44 E	WEIR AVENUE / Rte 138	3/8/2006	10:29:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear		
MAIN STREET	TAUNTON GREEN / WEIR STREET Rte 138	2/11/2006	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear		

		TAUNTON	1/1/2004	12/31/2006	similar to:									
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Address/Landmark	Feet_From
TAUNTON GREEN	WEIR STREET	12/14/2005	5:18:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
MAIN STREET	WEIR STREET	11/22/2005	10:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain		
TAUNTON GREEN	WEIR STREET Rte 138 S	10/22/2005	1:44:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear		
MAIN STREET Rte 44	WEIR STREET	10/8/2005	11:05:00 PM	Non-fatal injury	3	2	0	Angle	Angle	Wet	Dark - lighted roadway	Rain		
Rte 44	BROADWAY	11/17/2004	5:45:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
MAIN STREET	WEIR STREET	9/10/2004	9:30:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
WEIR STREET	MAIN STREET	9/9/2004	5:00:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TAUNTON GREEN	WEIR STREET	9/7/2004	11:38:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear		
WEIR STREET Rte 138 N	TAUNTON GREEN	6/30/2004	1:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear		
TAUNTON GREEN	WEIR STREET	5/28/2004	3:20:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear		
MAIN STREET Rte 44 E	WEIR STREET	4/22/2004	4:38:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
WEIR STREET Rte 138 N	MAIN STREET Rte 44 W	4/2/2004	11:56:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Cloudy		
MAIN STREET	WEIR STREET	3/19/2004	5:07:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dusk	Clear		
TAUNTON GREEN	WEIR STREET	2/25/2004	11:15:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear		
TAUNTON GREEN	WEIR STREET	2/15/2004	8:05:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear		
WEIR STREET	MAIN STREET	2/12/2004	8:54:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear		
MAIN STREET	WEIR STREET	1/24/2004	12:34:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear		

		TAUNTON	1/1/2004	12/31/2006	similar to:								
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Feet_From
DEAN STREET Rte 104	CAPE HIGHWAY	1/17/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear	
CAPE HIGHWAY Rte 44	DEAN STREET	5/15/2004	2:47:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	
DEAN STREET Rte 104 S	DEAN STREET Rte 44 E / CAPE ROAD	9/6/2004	4:20:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear/Clear	
CAPE ROAD	DEAN STREET / Rte 44	9/18/2004	10:31:00 AM	Non-fatal injury	3	1	0	Head-on	Head-on	Wet	Daylight	Rain/Cloudy	
CAPE ROAD	DEAN STREET / Rte 44	2/4/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	
CHURCH GREEN Rte 44 E	DEAN STREET / Rte 44	4/29/2005	2:30:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44	Rte 44 / Rte 44	7/1/2005	11:50:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
CAPE HIGHWAY	DEAN STREET	11/17/2005	3:05:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 104	CAPE HIGHWAY	1/10/2006	9:40:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	
ROUTE 44 Rte 44	SOUTH MAIN STREET	4/14/2006	12:00:00 PM	Non-fatal injury	2	1	0	Not reported	Not reported	Dry	Daylight	Clear	44 ROUTE 44
Rte 44	DEAN STREET	7/15/2006	1:15:00 PM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	
CAPE HIGHWAY Rte 44 E	DEAN STREET	10/2/2006	11:55:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
MAIN STREET	UNION STREET	7/22/2004	6:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
CHURCH GREEN	MAIN STREET	11/24/2004	9:01:00 PM	Not Reported	2	0	0	Angle	Angle	Wet	Daylight	Rain	
MAIN STREET	UNION STREET	12/10/2004	4:55:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Dark - lighted roadway	Rain/Cloudy	
CHURCH GREEN	SUMMER STREET Rte 140 / SPRING STREET	2/23/2005	2:45:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
MAIN STREET	UNION STREET	4/6/2005	10:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	
CHURCH GREEN	MAIN STREET	8/23/2005	9:46:00 AM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	
MAIN STREET Rte 44	UNION STREET	6/23/2006	10:45:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Dark - lighted roadway	Clear	
DEAN STREET	ARLINGTON STREET	4/17/2004	3:20:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44 W	ARLINGTON STREET	1/26/2005	9:00:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow/Snow	
DEAN STREET	ARLINGTON STREET	3/23/2005	12:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET	ARLINGTON STREET	3/28/2005	2:40:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	
DEAN STREET Rte 44	ARLINGTON STREET / Rte 44	10/8/2005	2:05:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	
DEAN STREET Rte 44	ARLINGTON STREET	11/14/2005	7:00:00 AM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Wet	Daylight	Clear	
DEAN STREET Rte 44 W	ARLINGTON STREET	7/2/2006	2:35:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET	ARLINGTON STREET	11/9/2006	9:40:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Clear	
DEAN STREET	ARLINGTON STREET	11/25/2006	5:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Dark - lighted roadway	Clear	
DEAN STREET Rte 44 E	LONGMEADOW ROAD	1/6/2004	3:10:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	1/20/2004	3:34:00 PM	Not Reported	3	0	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44 E	LONGMEADOW ROAD	3/4/2004	2:54:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44 S	LONGMEADOW ROAD	4/7/2004	8:05:00 PM	Not Reported	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	6/20/2004	1:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	7/13/2004	10:35:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy	
DEAN STREET Rte 44 W	LONGMEADOW ROAD / GORDON M OWEN RIVERWAY STREET	7/22/2004	6:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44 E	LONGMEADOW ROAD	8/5/2004	7:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	
DEAN STREET	LONGMEADOW ROAD	8/8/2004	1:15:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Dark - lighted roadway	Clear	
DEAN STREET	LONGMEADOW ROAD	9/1/2004	12:18:00 PM	Property damage only (none injured)	3	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44 E	GORDON M OWEN RIVERWAY STREET / LONGMEADOW ROAD	10/21/2004	9:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
DEAN STREET Rte 44 W	LONGMEADOW ROAD / GORDON M OWEN RIVERWAY STREET	10/21/2004	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	
DEAN STREET	GORDON M OWEN RIVERWAY STREET / LONGMEADOW ROAD	12/16/2004	2:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	
DEAN STREET	LONGMEADOW ROAD	1/11/2005	2:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
DEAN STREET	LONGMEADOW ROAD	2/21/2005	3:44:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Wet	Daylight	Rain	
DEAN STREET	LONGMEADOW ROAD	3/29/2005	7:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dark - lighted roadway	Rain	
DEAN STREET	LONGMEADOW ROAD	5/21/2005	12:13:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Cloudy	
LONGMEADOW ROAD	DEAN STREET Rte 44 / GORDON M OWEN RIVERWAY STREET	6/7/2005	9:25:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
DEAN STREET Rte 44 E	LONGMEADOW ROAD	6/20/2005	4:59:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET	LONGMEADOW ROAD	6/23/2005	4:30:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	6/26/2005	5:19:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44 W	LONGMEADOW ROAD	9/15/2005	11:05:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	
DEAN STREET	LONGMEADOW ROAD	10/3/2005	3:30:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET	LONGMEADOW ROAD	10/29/2005	8:00:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain	
DEAN STREET	GORDON M OWEN RIVERWAY STREET / Rte 44	11/12/2005	12:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
DEAN STREET	LONGMEADOW ROAD / GORDON M OWEN RIVERWAY STREET	12/21/2005	4:10:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Daylight	Clear/Clear	
DEAN STREET Rte 44 W	LONGMEADOW ROAD / HON. GORDON M OWEN RIVERWAY	2/11/2006	10:50:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
DEAN STREET	LONGMEADOW ROAD	2/24/2006	1:15:00 PM	Non-fatal injury	2	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET	LONGMEADOW ROAD	3/5/2006	2:20:00 PM	Non-fatal injury	2	2	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	5/15/2006	5:00:00 PM	Unknown	2	0	0	Rear-end	Rear-end	Wet	Daylight	Rain	
DEAN STREET	LONGMEADOW ROAD	5/21/2006	6:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	
LONGMEADOW ROAD	DEAN STREET Rte 44 E / HON. GORDON M OWEN RIVERWAY	6/13/2006	8:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dusk	Clear	
DEAN STREET	LONGMEADOW ROAD	6/30/2006	12:05:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET	LONGMEADOW ROAD	7/4/2006	8:03:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44	LONGMEADOW ROAD	9/29/2006	1:02:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
DEAN STREET Rte 44 E	LONGMEADOW ROAD	9/29/2006	3:45:00 PM	Non-fatal injury	3	1	0	Rear-end	Rear-end	Dry	Daylight	Clear	
DEAN STREET Rte 44 W	LONGMEADOW ROAD / HON. GORDON M OWEN RIVERWAY	11/17/2006	5:50:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Dark - lighted roadway	Rain/Cloudy	
DEAN STREET Rte 44	LONGMEADOW ROAD	12/16/2006	11:07:00 AM	Non-fatal injury	3	4	0	Head-on	Head-on	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	1/8/2004	7:35:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	2/3/2004	3:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
WASHINGTON STREET	PURCHASE STREET	2/11/2004	12:04:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	3/5/2004	10:24:00 AM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	4/12/2004	4:08:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	5/5/2004	10:05:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	6/6/2004	8:01:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Dusk	Cloudy/Rain	
PURCHASE STREET	WASHINGTON STREET	6/13/2004	6:05:00 PM	Not Reported	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	6/16/2004	12:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	7/28/2004	9:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain/Clear	
WASHINGTON STREET	PURCHASE STREET	9/8/2004	2:16:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	9/28/2004	4:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	
WASHINGTON STREET	PURCHASE STREET	12/10/2004	12:36:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	
WASHINGTON STREET	PURCHASE STREET	12/16/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	
PURCHASE STREET	WASHINGTON STREET	1/28/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	3/25/2005	5:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	4/14/2005	2:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	5/23/2005	2:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	5/25/2005	12:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Wet	Other	Cloudy	
PURCHASE STREET	WASHINGTON STREET	6/2/2005	4:15:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	6/6/2005	3:30:00 AM	Not Reported	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	
PURCHASE STREET	WASHINGTON STREET	6/8/2005	8:08:00 AM	Property damage only (none injured)	1	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	7/8/2005	3:20:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	9/16/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Wet	Other	Cloudy	

		TAUNTON	1/1/2004	12/31/2006	similar to:								
Street	Intersection	Crash_Date	Crash_Time	Crash_Type	Total_Vehicles	Non-Fatal Injuries	Fatal Injuries	Collision_manner	Collision_with	Road_Surface	Lighting	Weather	Feet_From
WASHINGTON STREET	PURCHASE STREET	12/10/2005	7:15:00 PM	Not Reported	2	0	0	Angle	Angle	Ice	Dark - lighted roadway	Clear	
PURCHASE STREET	WASHINGTON STREET	1/5/2006	2:45:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Cloudy/Cloudy	
WASHINGTON STREET	PURCHASE STREET	2/1/2006	9:54:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	2/24/2006	12:28:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	6/14/2006	12:50:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
PURCHASE STREET	WASHINGTON STREET	6/20/2006	5:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
PURCHASE STREET	WASHINGTON STREET	6/30/2006	10:30:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
PURCHASE STREET	WASHINGTON STREET	8/7/2006	12:23:00 PM	Non-fatal injury	2	1	0	Head-on	Head-on	Dry	Daylight	Clear	
WASHINGTON STREET	PURCHASE STREET	8/9/2006	8:38:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	8/9/2006	7:27:00 AM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	WASHINGTON STREET	10/7/2006	10:49:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	
PURCHASE STREET	WASHINGTON STREET	10/11/2006	3:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
SCHOOL STREET	PURCHASE STREET	4/27/2004	11:15:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
PURCHASE STREET	SCHOOL STREET	5/9/2004	11:25:00 AM	Non-fatal injury	2	4	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	
SCHOOL STREET	PURCHASE STREET	10/16/2004	4:05:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
PURCHASE STREET	SCHOOL STREET	1/6/2005	9:02:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	
PURCHASE STREET	SCHOOL STREET	2/2/2005	7:45:00 AM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Clear	
ARLINGTON STREET	SCHOOL STREET	2/28/2005	8:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
ARLINGTON STREET	SCHOOL STREET	3/11/2005	12:45:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	
SCHOOL STREET	ARLINGTON STREET / PURCHASE STREET	3/18/2005	11:35:00 AM	Non-fatal injury	2	2	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	PURCHASE STREET / ARLINGTON STREET	7/5/2005	8:30:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Dusk	Clear	
PURCHASE STREET	SCHOOL STREET	9/19/2005	4:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	ARLINGTON STREET	9/28/2005	2:15:00 PM	Property damage only (none injured)	2	0	0	Not reported	Not reported	Dry	Daylight	Cloudy	
SCHOOL STREET	ARLINGTON STREET	10/25/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
ARLINGTON STREET	SCHOOL STREET	10/26/2005	1:40:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	
PURCHASE STREET	SCHOOL STREET	11/17/2005	2:35:00 PM	Non-fatal injury	2	3	0	Angle	Angle	Dry	Daylight	Clear/Clear	
SCHOOL STREET	ARLINGTON STREET	12/14/2005	2:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear/Clear	
SCHOOL STREET	PURCHASE STREET	2/23/2006	1:06:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
SCHOOL STREET	ARLINGTON STREET / PURCHASE STREET	3/26/2006	12:00:00 AM	Non-fatal injury	2	4	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
SCHOOL STREET	ARLINGTON STREET	5/3/2006	3:17:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	
ARLINGTON STREET	SCHOOL STREET	6/27/2006	3:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
SCHOOL STREET	PURCHASE STREET	8/31/2006	9:30:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	ARLINGTON STREET	11/24/2006	1:11:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear	
SUMMER STREET	CHURCH GREEN	11/15/2004	2:58:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Sideswipe, opposite direction	Dry	Daylight	Clear	
SUMMER STREET Rte 140 S	SPRING STREET	11/20/2004	11:26:00 AM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear	
SUMMER STREET	SPRING STREET	6/12/2005	9:48:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SUMMER STREET	SPRING STREET / CHURCH GREEN	1/13/2006	1:00:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	
SPRING STREET	SUMMER STREET	2/1/2006	7:20:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SUMMER STREET Rte 140 N	SPRING STREET / CHURCH GREEN	2/7/2006	3:16:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear	
SPRING STREET	SUMMER STREET Rte 140 S	2/28/2006	11:19:00 AM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	
SPRING STREET	SUMMER STREET	4/1/2006	8:50:00 AM	Unknown	2	0	0	Sideswipe, same direction	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	
SPRING STREET	SUMMER STREET	4/4/2006	8:50:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	
SPRING STREET	SUMMER STREET	4/11/2006	11:03:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear/Clear	
SUMMER STREET Rte 140	SPRING STREET	4/24/2006	10:42:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Wet	Daylight	Cloudy	
SPRING STREET	SUMMER STREET	5/1/2006	3:03:00 PM	Property damage only (none injured)	2	0	0	Head-on	Head-on	Dry	Daylight	Clear	
SPRING STREET	SUMMER STREET	6/24/2006	3:30:00 PM	Non-fatal injury	2	2	0	Angle	Angle	Wet	Daylight	Rain	
SPRING STREET	SUMMER STREET	7/18/2006	7:00:00 PM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SPRING STREET	SUMMER STREET	9/1/2006	12:00:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
SUMMER STREET Rte 140	SPRING STREET / CHURCH GREEN	9/26/2006	5:15:00 PM	Non-fatal injury	2	1	0	Angle	Angle	Dry	Daylight	Clear/Clear	
SPRING STREET	SUMMER STREET	9/29/2006	7:26:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SPRING STREET	SUMMER STREET	11/3/2006	8:56:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear/Clear	
SUMMER STREET	SPRING STREET	11/20/2006	11:57:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
SPRING STREET	SUMMER STREET	12/8/2006	5:47:00 PM	Non-fatal injury	3	3	0	Angle	Angle	Dry	Daylight	Clear/Rain	
SPRING STREET	SUMMER STREET	12/23/2006	9:35:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	
WINTER STREET	SCHOOL STREET	1/20/2004	7:33:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	Single vehicle crash	Dry	Daylight	Clear	
WINTER STREET	SCHOOL STREET	6/24/2004	4:00:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Rear-end	Dry	Daylight	Clear	
SCHOOL STREET	WINTER STREET	7/21/2004	10:15:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	
SCHOOL STREET	WINTER STREET	9/16/2004	4:15:00 PM	Property damage only (none injured)	3	0	0	Angle	Angle	Wet	Daylight	Rain/Cloudy	
WINTER STREET	SCHOOL STREET	12/6/2004	12:15:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy	
WINTER STREET	SCHOOL STREET	12/13/2004	7:40:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Cloudy/Rain	
WINTER STREET	SCHOOL STREET	2/17/2005	8:30:00 AM	Not Reported	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WINTER STREET	FLORAL STREET / SCHOOL STREET	3/16/2005	9:19:00 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Single vehicle crash	Dry	Dark - lighted roadway	Clear	
WINTER STREET	SCHOOL STREET	3/16/2005	7:30:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	WINTER STREET	5/12/2005	4:00:00 PM	Non-fatal injury	3	1	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	WINTER STREET	5/18/2005	3:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Cloudy	
SCHOOL STREET	WINTER STREET	6/26/2005	2:00:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
WINTER STREET	SCHOOL STREET	10/28/2005	5:30:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dusk	Clear	
SCHOOL STREET	WINTER STREET	11/21/2005	9:27:00 AM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Daylight	Clear	
SCHOOL STREET	WINTER STREET	12/26/2005	3:11:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Wet	Daylight	Rain	
BROADWAY	WASHINGTON STREET / RANDALL STREET	12/12/2004	8:40:00 PM	Property damage only (none injured)	2	0	0	Angle	Angle	Dry	Dark - lighted roadway	Clear	

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Easton, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 138/WASHINGTON ST | RIN #

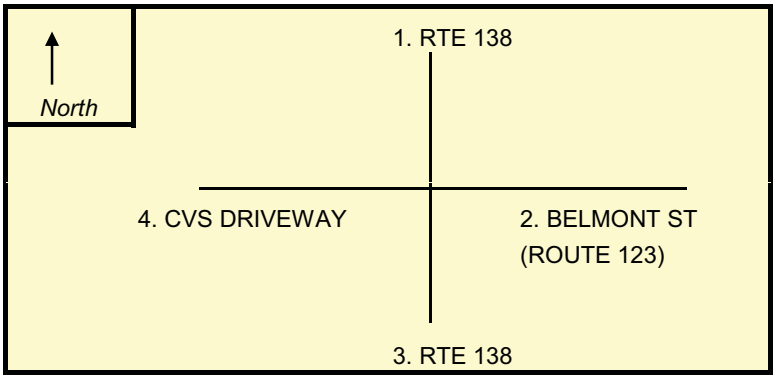
MINOR STREET(S) : BELMONT ST | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	825	690	686	111		

" K " FACTOR : 0.09 | APPROACH ADT : 25689 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 12 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 0.43 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Easton, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 138/WASHINGTON ST | RIN #

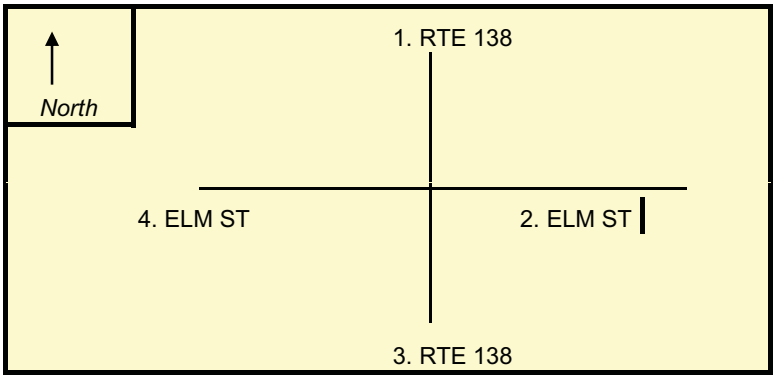
MINOR STREET(S) : ELM ST | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1214	383	304	586		

" K " FACTOR : 0.09 | APPROACH ADT : 27633.333 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 17 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 0.56 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Easton, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 138/WASHINGTON ST | RIN #

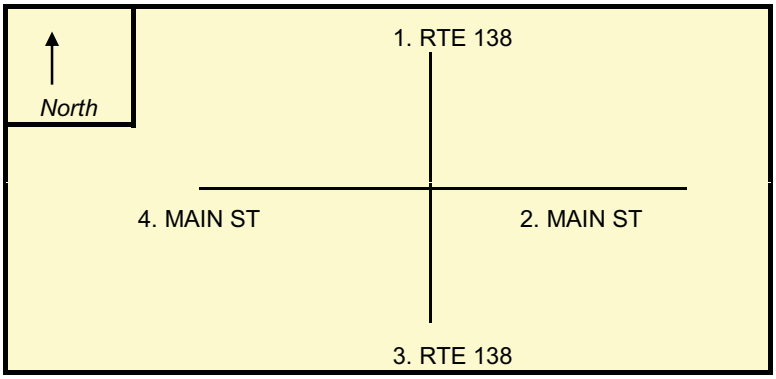
MINOR STREET(S) : MAIN ST | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	857	494	643	544		

" K " FACTOR : 0.09 | APPROACH ADT : 28200 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 24 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 8

CRASH RATE CALCULATION : 0.78 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Easton, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 138/WASHINGTON ST | RIN #

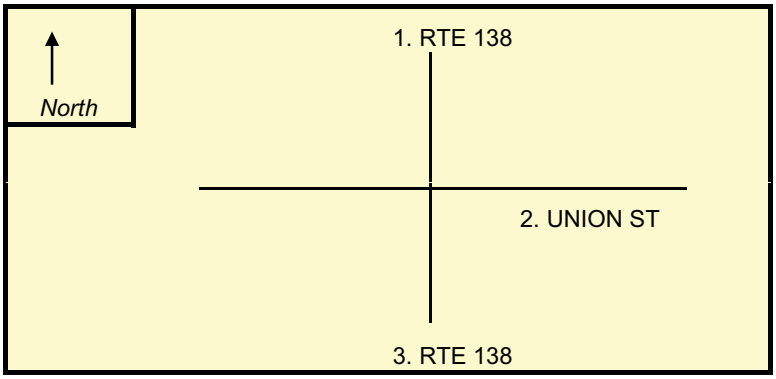
MINOR STREET(S) : UNION STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	1015	280	649			

" K " FACTOR : 0.09 | APPROACH ADT : 21600 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 8 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.34 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : EASTON, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : MAIN STREET | RIN #

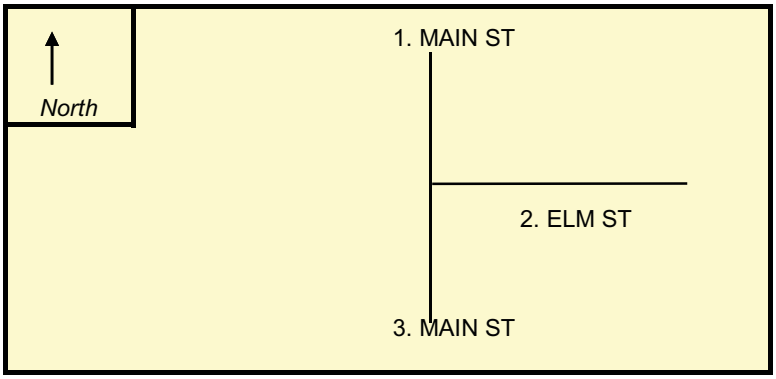
MINOR STREET(S) : ELM STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	195	210	200			

" K " FACTOR : 0.09 | APPROACH ADT : 6722 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 5 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.68 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : EASTON, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : LINCOLN STREET | RIN #

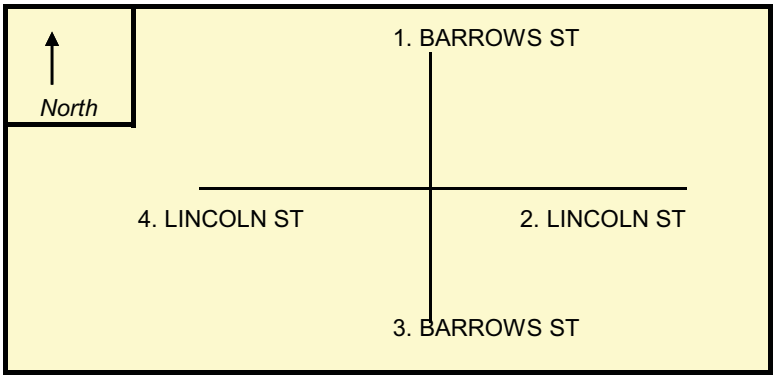
MINOR STREET(S) : BARROWS STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	167	410	30	290		

" K " FACTOR : 0.09 | APPROACH ADT : 9967 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.09 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : EASTON, MA | COUNT DATE : 9-23-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : MAIN STREET/LINCOLN STREET | RIN #

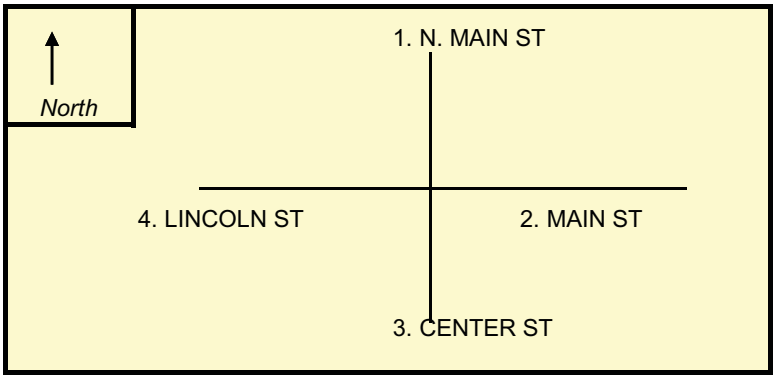
MINOR STREET(S) : CENTER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	145	840	240	245		

" K " FACTOR : 0.09 | APPROACH ADT : 16333 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 9 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.50 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-9-2008

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : DAVOL STREET/COLUMBIA STREET — RIN #

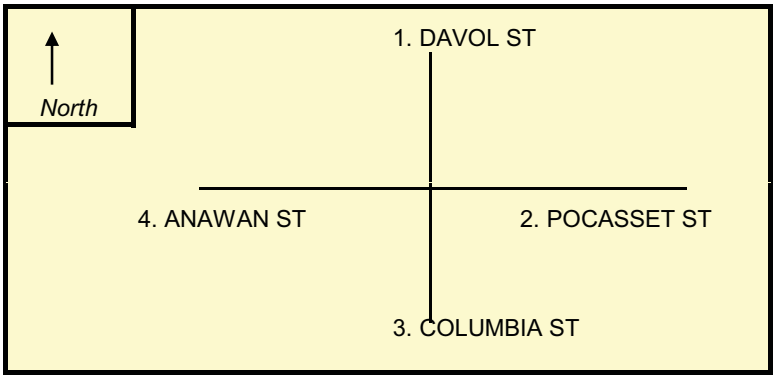
MINOR STREET(S) : ANAWAN STREET/POCASSET STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	568	187	226	244		

" K " FACTOR : 0.09 | APPROACH ADT : 13611 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.47 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-9-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WATER STREET | RIN #

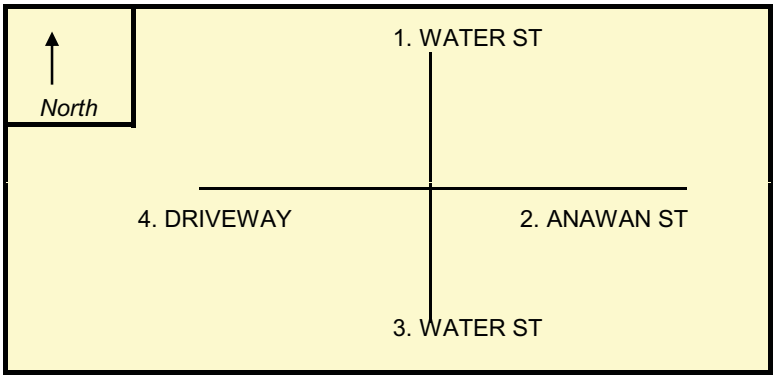
MINOR STREET(S) : ANAWAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	259	72	163	28		

" K " FACTOR : 0.09 | APPROACH ADT : 5800 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.63 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-9-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : DAVOL STREET | RIN #

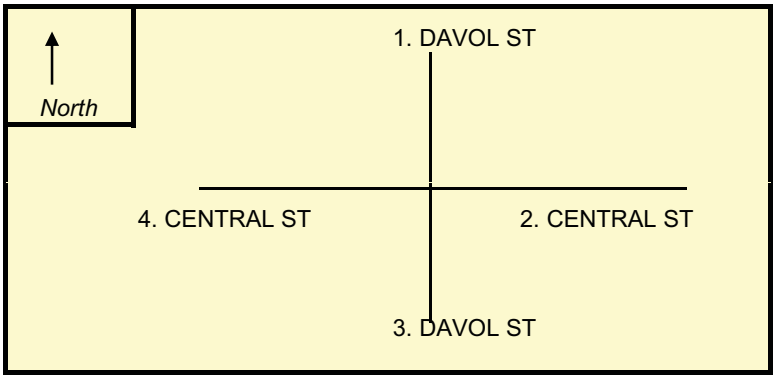
MINOR STREET(S) : CENTRAL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	537	479	310	1		

" K " FACTOR : 0.09 | APPROACH ADT : 14744 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 6 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.37 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-92008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : NORTH DAVOL STREET | RIN #

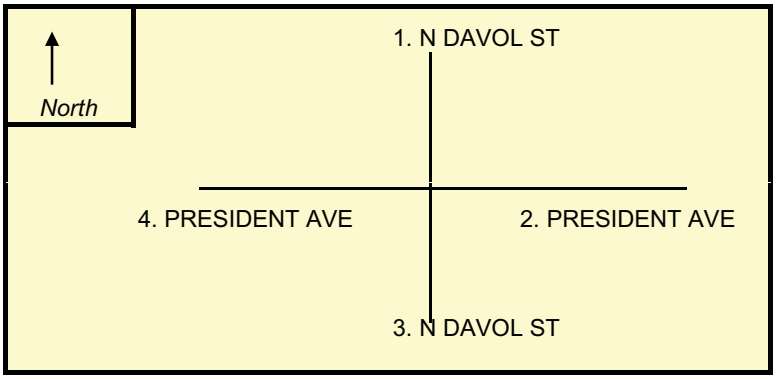
MINOR STREET(S) : PRESIDENT AVENUE | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	0	608	889	545		

" K " FACTOR : 0.09 | APPROACH ADT : 22689 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 60 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 20

CRASH RATE CALCULATION : 2.42 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments: A K-factor of 0.09 was assumed because ATRs data is missing

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-92008

DISTRICT : 5 | UNSIGNALIZED : x | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : NORTH DAVOL STREET — RIN #

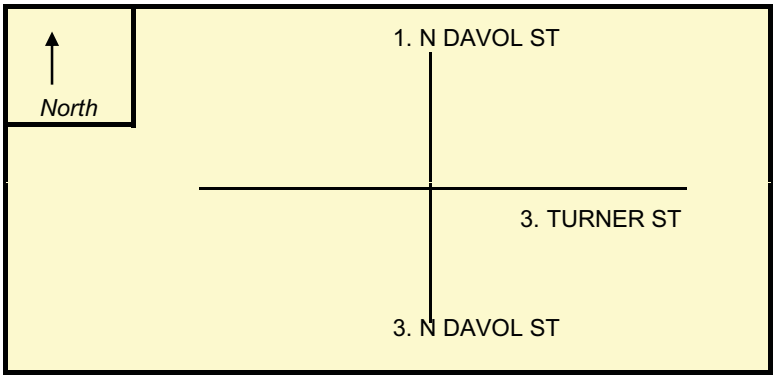
MINOR STREET(S) : TURNER STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	0	60	897			

" K " FACTOR : 0.09 | APPROACH ADT : 10633 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.34 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-92008

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : NORTH MAIN STREET — RIN #

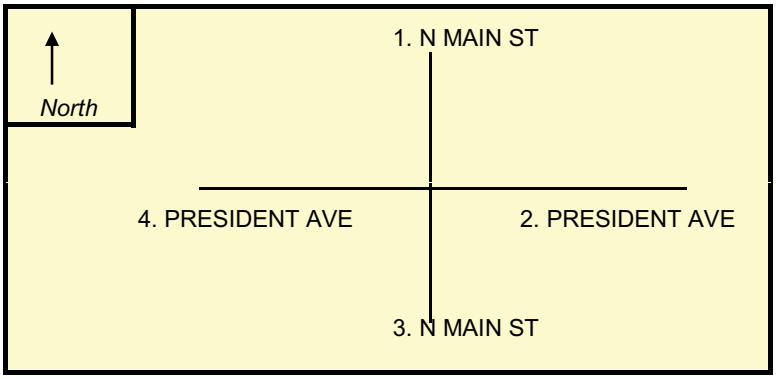
MINOR STREET(S) : PRESIDENT AVENUE — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	406	514	423	747		

" K " FACTOR : 0.09 | APPROACH ADT : 23222 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 29 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 10

CRASH RATE CALCULATION : 1.14 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE : 9-92008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SOUTH DAVOL STREET | RIN #

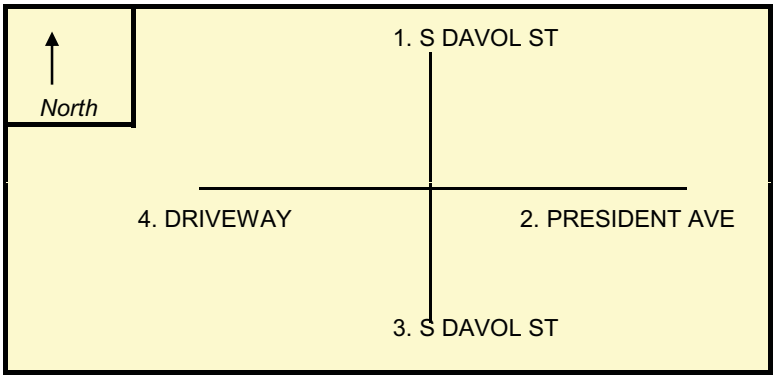
MINOR STREET(S) : PRESIDENT AVENUE | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1015	324	0	10		

" K " FACTOR : 0.09 | APPROACH ADT : 14989 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 29 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 10

CRASH RATE CALCULATION : 1.77 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments: A K-FACTOR = 0.09 WAS ASSUMED BECAUSE ATR DATA IS MISSING

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FALL RIVER, MA | COUNT DATE :

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : WATER STREET — RIN #

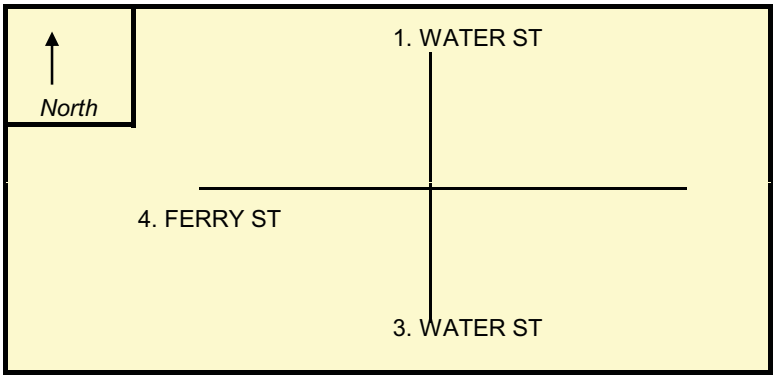
MINOR STREET(S) : FERRY STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	279		29	175		

" K " FACTOR : 0.09 | APPROACH ADT : 5367 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.17 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FREETOWN, MA | COUNT DATE : 9-10-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SOUTH MAIN STREET | RIN #

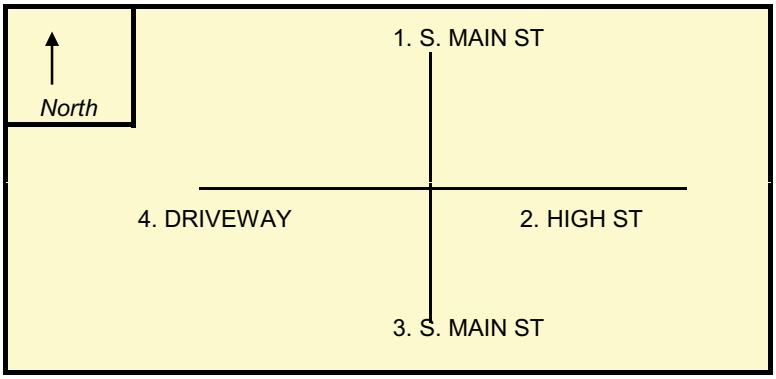
MINOR STREET(S) : HIGH STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1	411	15	541		

" K " FACTOR : 0.09 | APPROACH ADT : 10756 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.08 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FREETOWN, MA | COUNT DATE : 9-10-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SOUTH MAIN STREET | RIN #

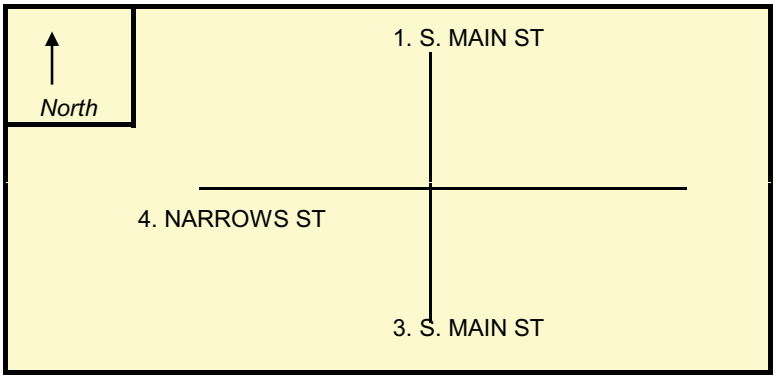
MINOR STREET(S) : NARROWS STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	357		248	120		

" K " FACTOR : 0.09 | APPROACH ADT : 8056 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.45 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FREETOWN, MA | COUNT DATE : 9-10-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SOUTH MAIN STREET | RIN #

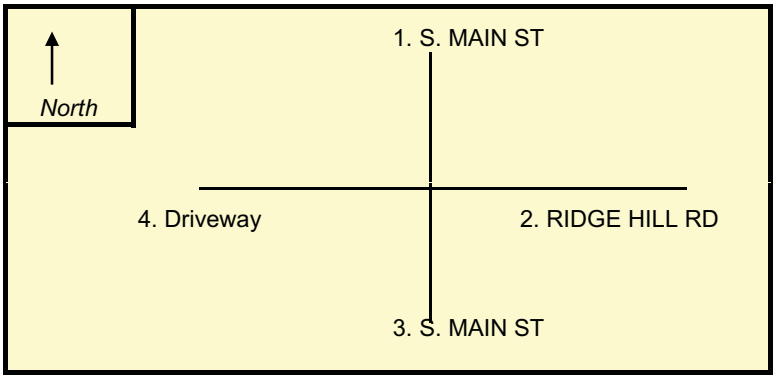
MINOR STREET(S) : RIDGE HILL ROAD | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	398	48	573	89		

" K " FACTOR : 0.09 | APPROACH ADT : 12311 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.30 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : FREETOWN, MA | COUNT DATE : 9-10-2008

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : SOUTH MAIN STREET — RIN #

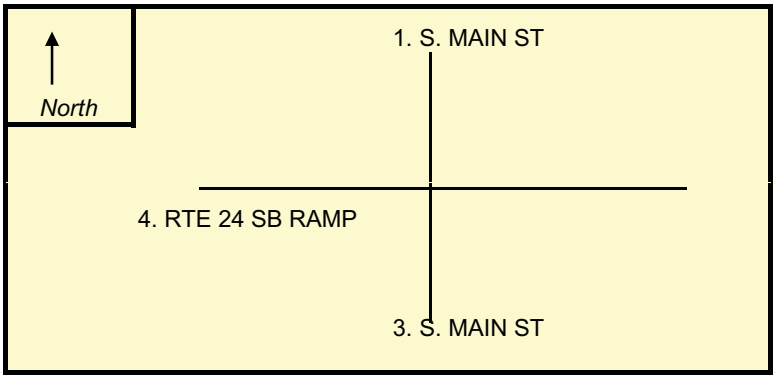
MINOR STREET(S) : ROUTE 24 SB RAMP — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	119		522	322		

" K " FACTOR : 0.09 | APPROACH ADT : 10700 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.09 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ACUSHNET AVENUE (ROUTE 18 NB) | RIN #

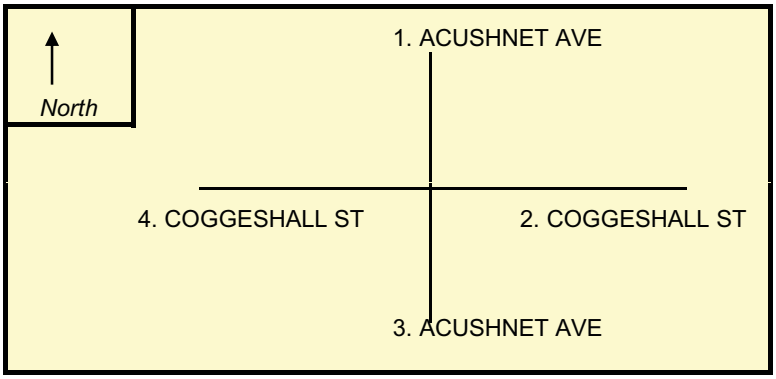
MINOR STREET(S) : COGGESHALL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	0	340	885	305		

" K " FACTOR : 0.09 | APPROACH ADT : 17000 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 16 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 0.86 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ACUSHNET AVENUE | RIN #

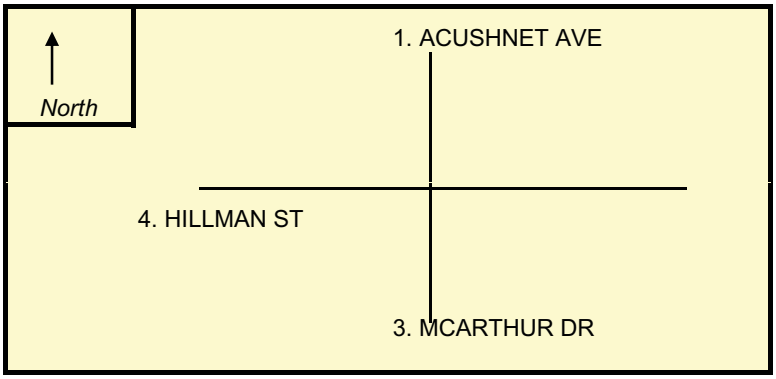
MINOR STREET(S) : HILLMAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	111		205	186		

" K " FACTOR : 0.09 | APPROACH ADT : 5578 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.65 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ASHLEY BOULEVARD (ROUTE 18 SB) | RIN #

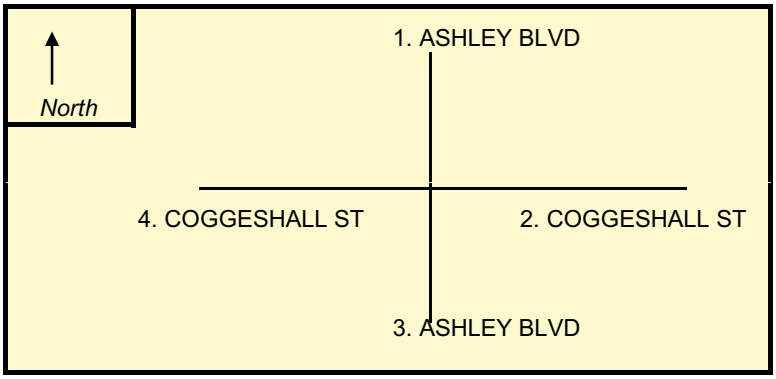
MINOR STREET(S) : COGGESHALL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	776	377	0	281		

" K " FACTOR : 0.09 | APPROACH ADT : 15933 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 51 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 17

CRASH RATE CALCULATION : 2.92 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COGGESHALL STREET | RIN #

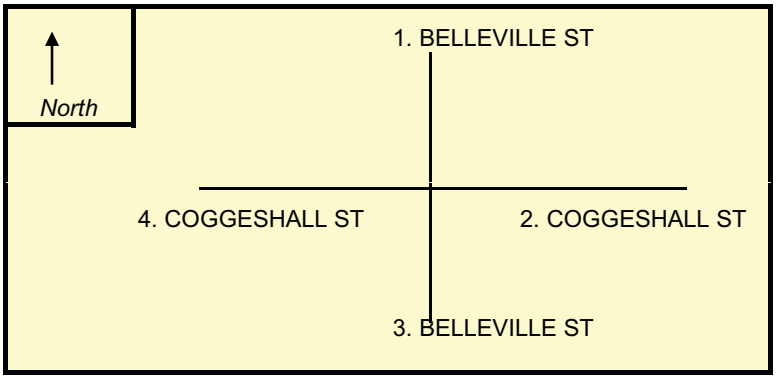
MINOR STREET(S) : BELLEVILLE STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	592	544	625	454		

" K " FACTOR : 0.09 | APPROACH ADT : 24611 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 17 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 0.63 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD, MA | COUNT DATE : 9/18/2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : CHURCH STREET | RIN #

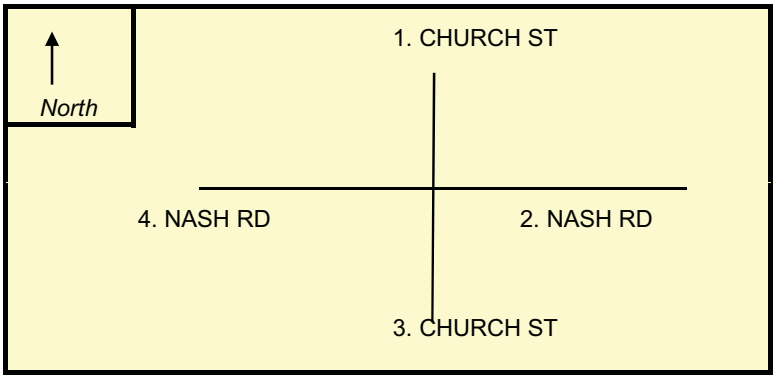
MINOR STREET(S) : NASH ROAD | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	449	362	248	589		

" K " FACTOR : 0.09 | APPROACH ADT : 18311 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 10 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.50 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : MC ARTHUR DRIVE | RIN #

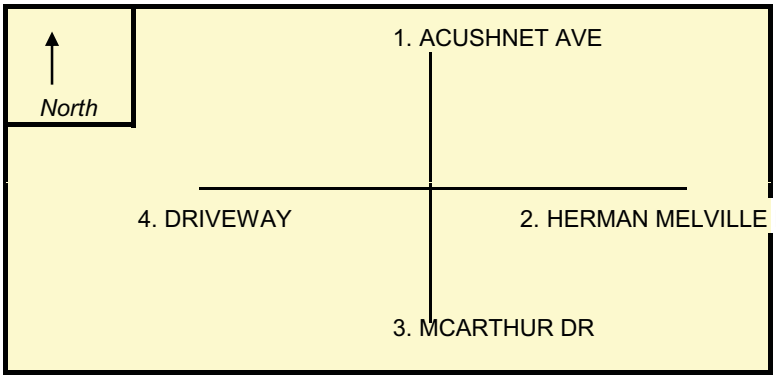
MINOR STREET(S) : HERMAN MELVILLE BOULEVARD | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		6851
VOLUMES (PM) :	194	198	236	5		

" K " FACTOR : 0.09 | APPROACH ADT : 7033 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.13 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : PURCHASE STREET | RIN #

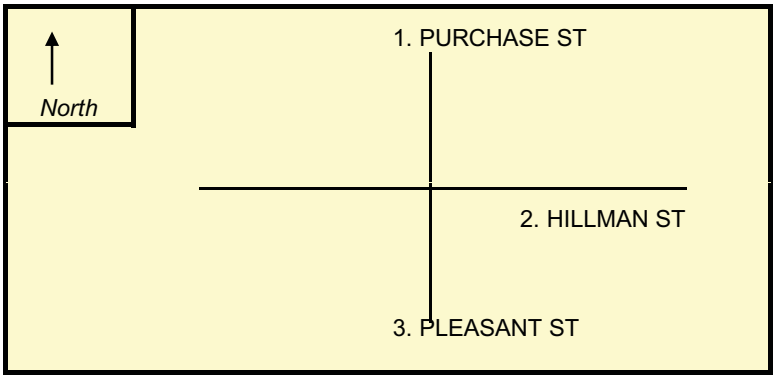
MINOR STREET(S) : HILLMAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	441	175	904			

" K " FACTOR : 0.09 | APPROACH ADT : 16889 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.38 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : KEMPTON STREET | RIN #

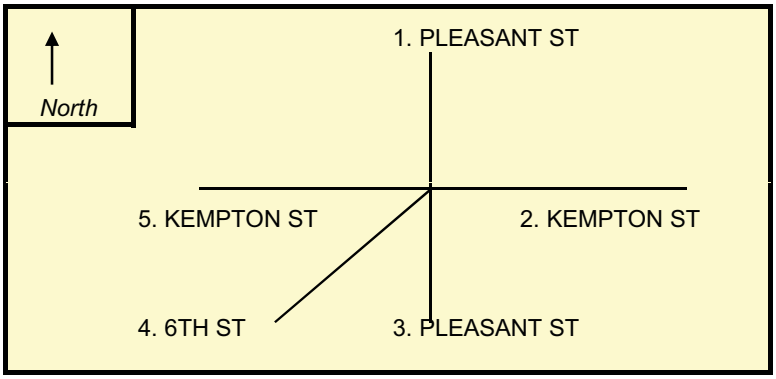
MINOR STREET(S) : PLEASANT STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	SW	EB	
VOLUMES (PM) :	436	771	685	0	438	

" K " FACTOR : 0.09 | APPROACH ADT : 25889 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 3 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.11 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD, MA | COUNT DATE : 9/18/2008

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : MT PLEASANT STREET — RIN #

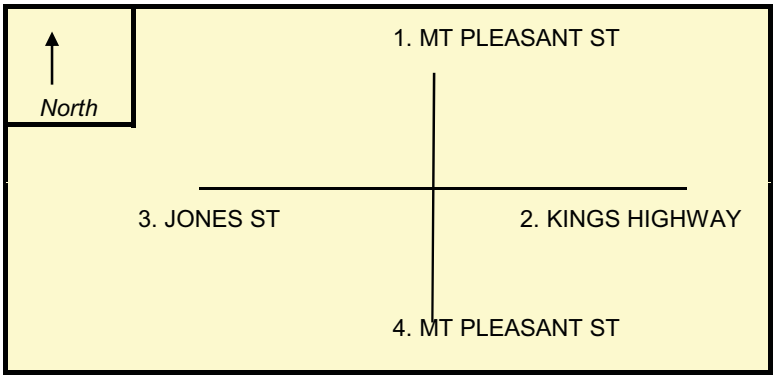
MINOR STREET(S) : JONES STREET/KINGS HIGHWAY — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	733	743	554	13		

" K " FACTOR : 0.09 | APPROACH ADT : 22700 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 16 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 0.64 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9/18/2008

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : KINGS HIGHWAY — RIN #

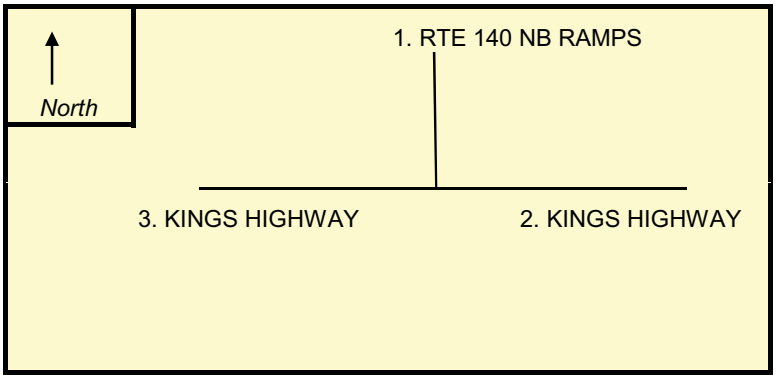
MINOR STREET(S) : ROUTE 140 NB RAMPS — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	EB			
VOLUMES (PM) :	616	833	647			

" K " FACTOR : 0.09 | APPROACH ADT : 23288.889 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.16 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ACUSHNET AVENUE (MCARTHUR DR) | RIN #

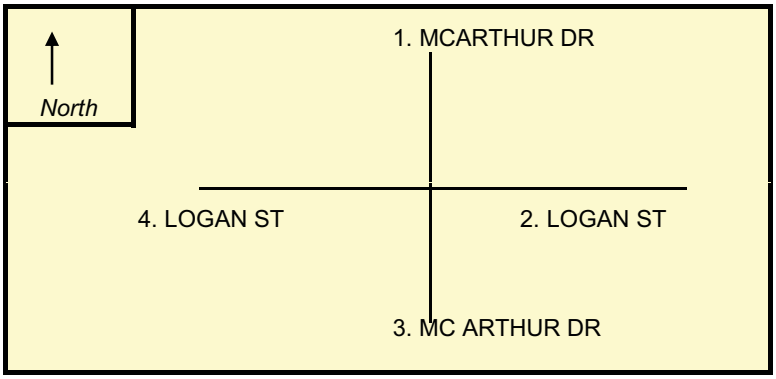
MINOR STREET(S) : LOGAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	9	105	74	167		

" K " FACTOR : 0.09 | APPROACH ADT : 3944 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.23 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : NORTH FRONT STREET — RIN #

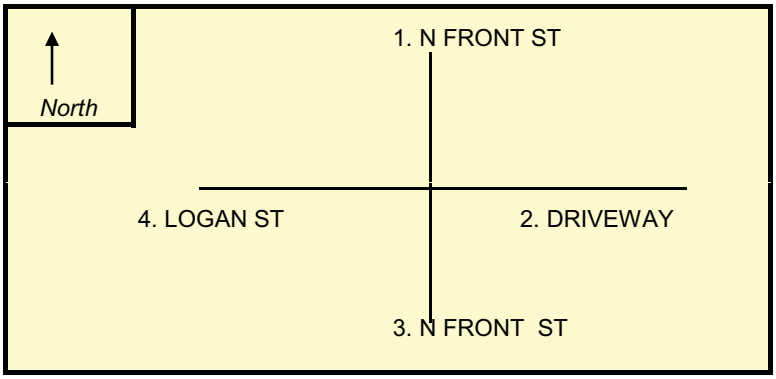
MINOR STREET(S) : LOGAN STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	184	76	206	160		

" K " FACTOR : 0.09 | APPROACH ADT : 6956 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 9 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 1.18 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : PURCHASE STREET | RIN #

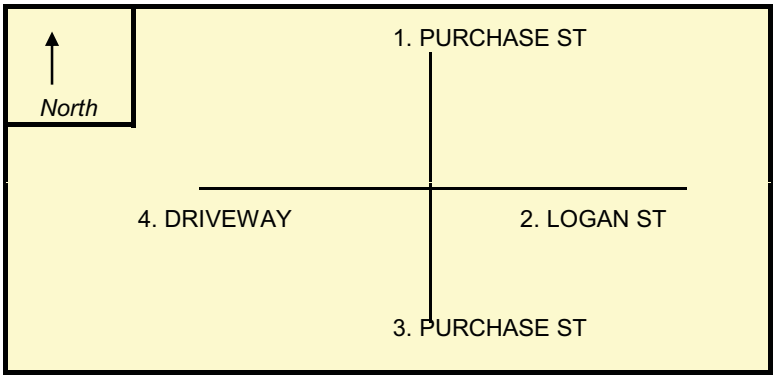
MINOR STREET(S) : LOGAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	362	126	478	6		

" K " FACTOR : 0.09 | APPROACH ADT : 10800 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 14 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 1.18 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COGGESHALL STREET | RIN #

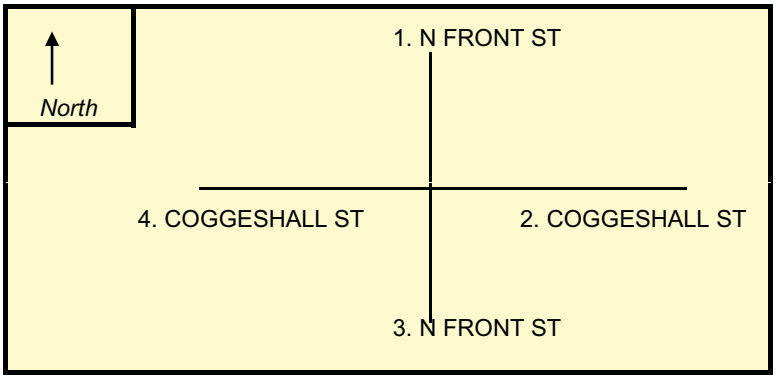
MINOR STREET(S) : NORTH FRONT STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	0	408	208	513		

" K " FACTOR : 0.09 | APPROACH ADT : 12544 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 8 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.58 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD, MA | COUNT DATE : 10/29/2008

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : CHURCH STREET — RIN #

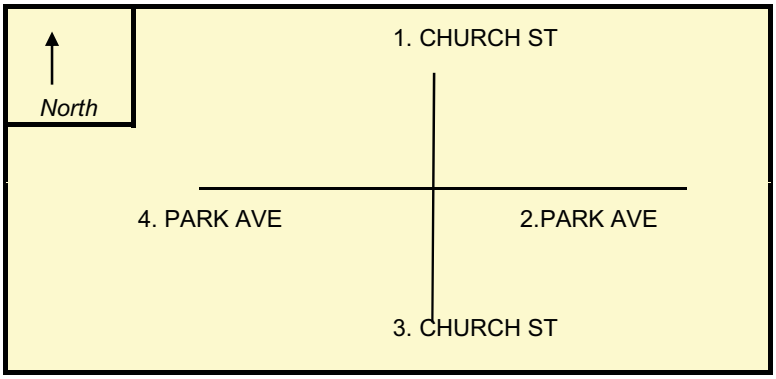
MINOR STREET(S) : PARK AVENUE — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	328	51	487	493		

" K " FACTOR : 0.09 | APPROACH ADT : 15100 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 28 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 9

CRASH RATE CALCULATION : 1.69 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : PURCHASE STREET | RIN #

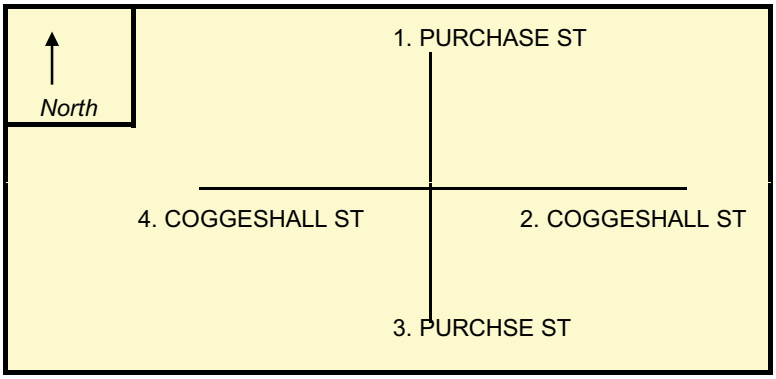
MINOR STREET(S) : COGGESHALL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	313	257	426	145		

" K " FACTOR : 0.09 | APPROACH ADT : 12678 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 14 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 1.01 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : PURCHASE STREET | RIN #

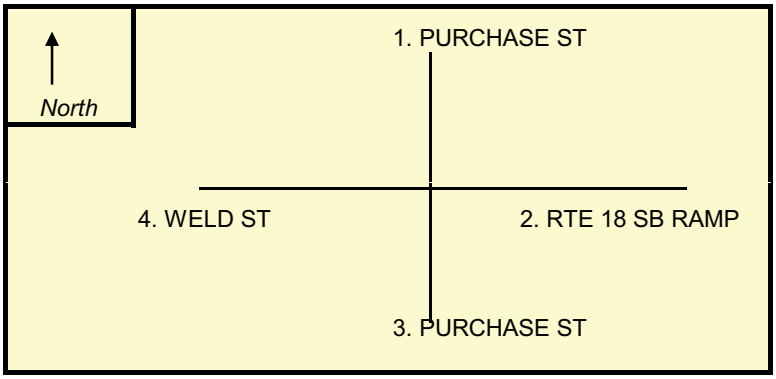
MINOR STREET(S) : WELD STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	269	249	428	67		

" K " FACTOR : 0.09 | APPROACH ADT : 11256 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 6 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.49 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD, MA | COUNT DATE : 9/18/2008

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : TARKILN HILL ROAD — RIN #

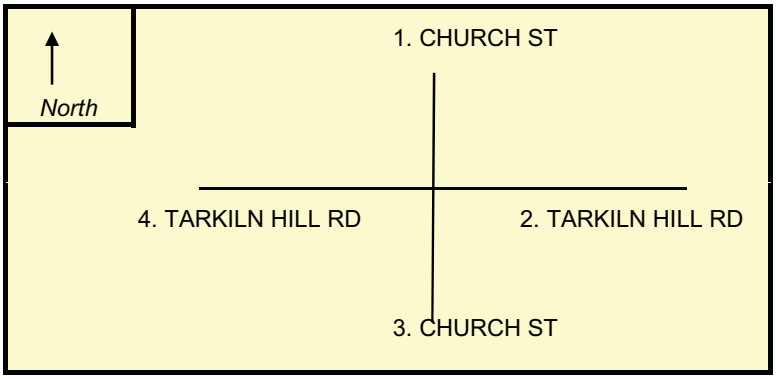
MINOR STREET(S) : CHURCH STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	446	537	467	627		

" K " FACTOR : 0.09 | APPROACH ADT : 23078 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 18 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 0.71 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 18 | RIN #

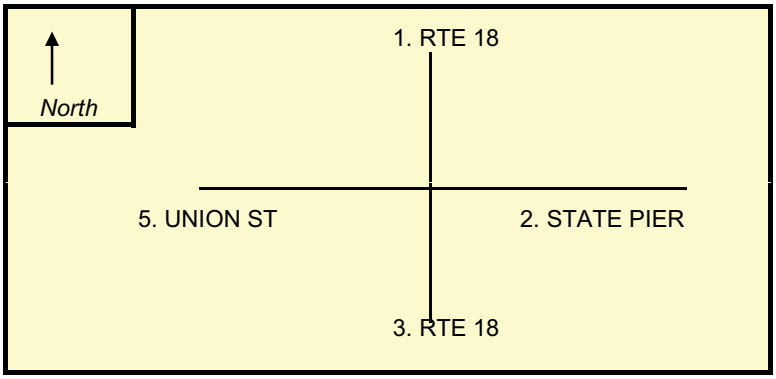
MINOR STREET(S) : UNION STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1362	102	1079	416		

" K " FACTOR : 0.09 | APPROACH ADT : 32878 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 13 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 0.36 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE : 9-24-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : ACUSHNET AVENUE (MCARTHUR DR) | RIN #

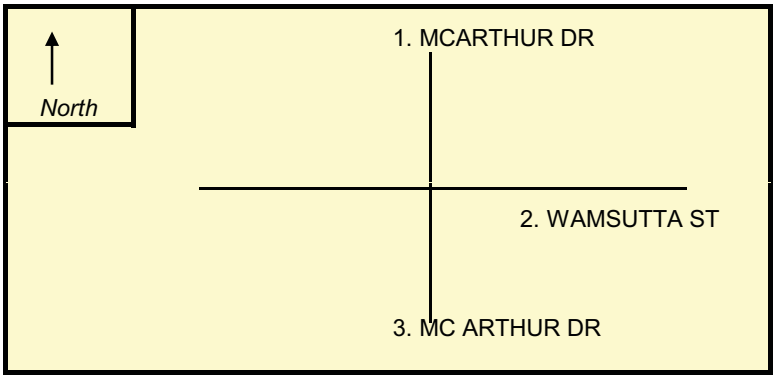
MINOR STREET(S) : WAMSUTTA STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	53	29	72			

" K " FACTOR : 0.09 | APPROACH ADT : 1711.1111 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 6 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 3.20 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD, MA | COUNT DATE : 9/18/2008

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 18/ASHLEY BLVD — RIN #

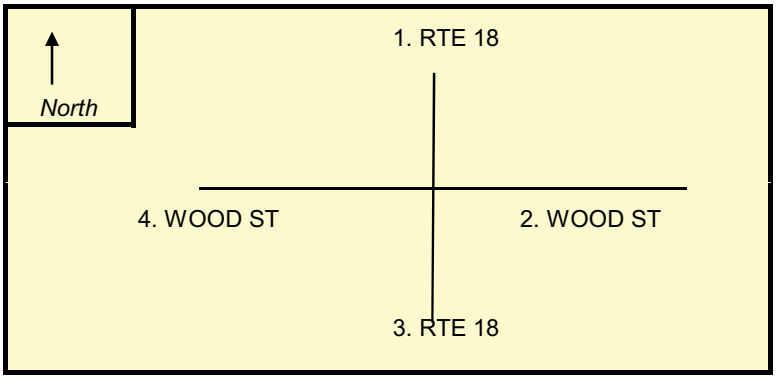
MINOR STREET(S) : WOOD STREET — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	609	196	459	172		

" K " FACTOR : 0.09 | APPROACH ADT : 15956 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.40 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE :

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : KINGS HIGHWAY — RIN #

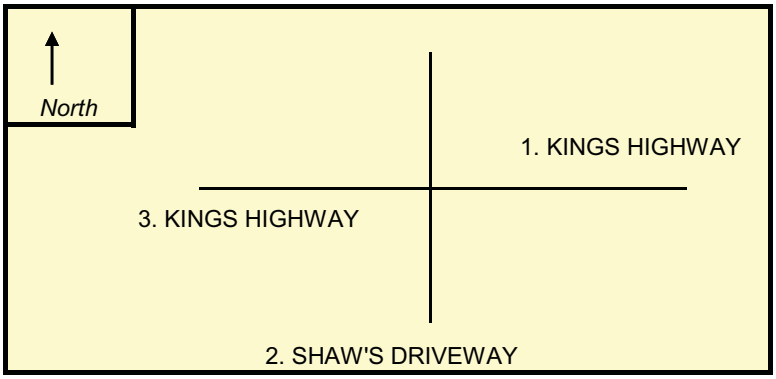
MINOR STREET(S) : SHAW'S DRIVEWAY — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	WB	NB	EB			
VOLUMES (PM) :	735	240	815			

" K " FACTOR : 0.09 | APPROACH ADT : 19889 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 10 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.46 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEW BEDFORD | COUNT DATE :

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : KINGS HIGHWAY — RIN #

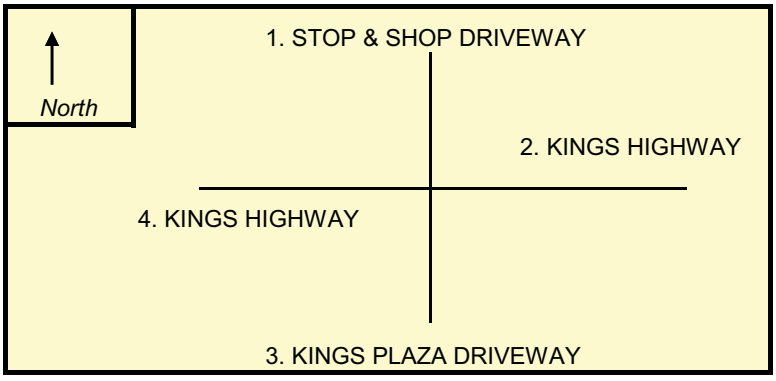
MINOR STREET(S) : STOP & SHOP DRIVEWAY — RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	340	650	290	960		

" K " FACTOR : 0.09 | APPROACH ADT : 24889 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 17 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 0.62 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NORTON, MA | COUNT DATE : 9/10/2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : JOHN B SCOTT BOULEVARD | RIN #

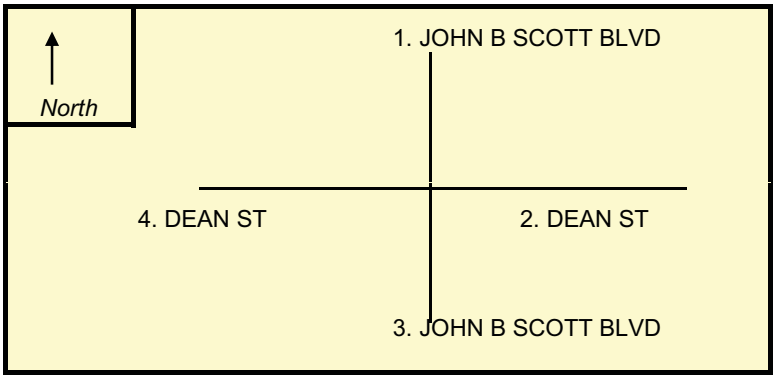
MINOR STREET(S) : DEAN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	273	135	175	100		

" K " FACTOR : 0.09 | APPROACH ADT : 7588.8889 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.24 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NORTON, MA | COUNT DATE : 9/10/2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : RTE 123 | RIN #

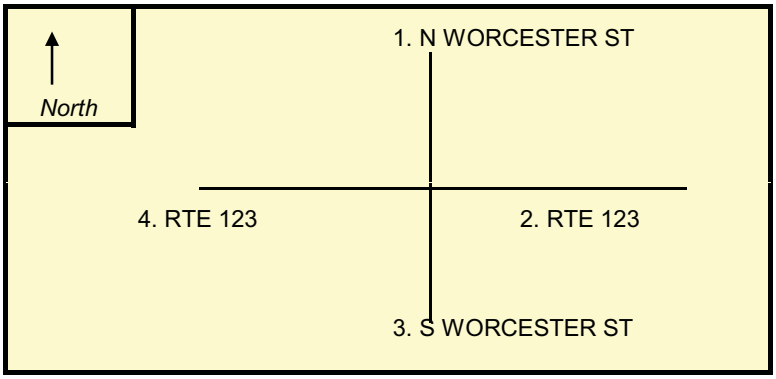
MINOR STREET(S) : NORTH WORCESTER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	220	585	304	600		

" K " FACTOR : 0.09 | APPROACH ADT : 18988.889 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.10 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NORTON, MA | COUNT DATE : 9/10/2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : JOHN B SCOTT BOULEVARD | RIN #

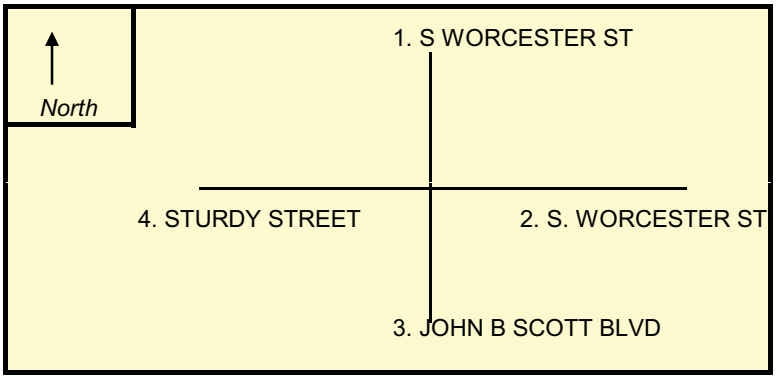
MINOR STREET(S) : SOUTH WORCESTER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	507	113	260	7		

" K " FACTOR : 0.09 | APPROACH ADT : 9855.5556 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.09 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

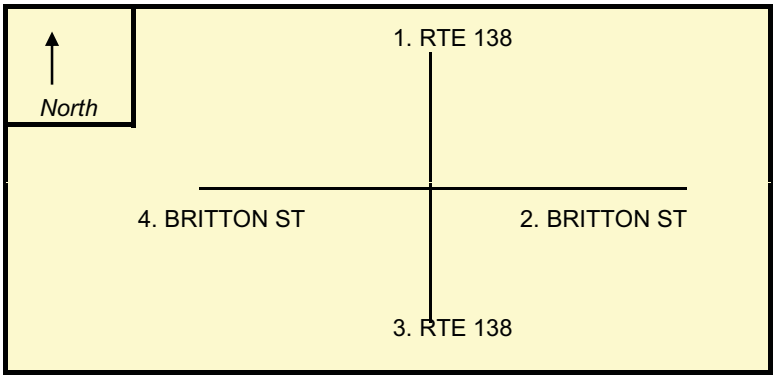
MINOR STREET(S) : BRITTON STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1142	24	746	50		

" K " FACTOR : 0.09 | APPROACH ADT : 21800 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 3 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.13 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

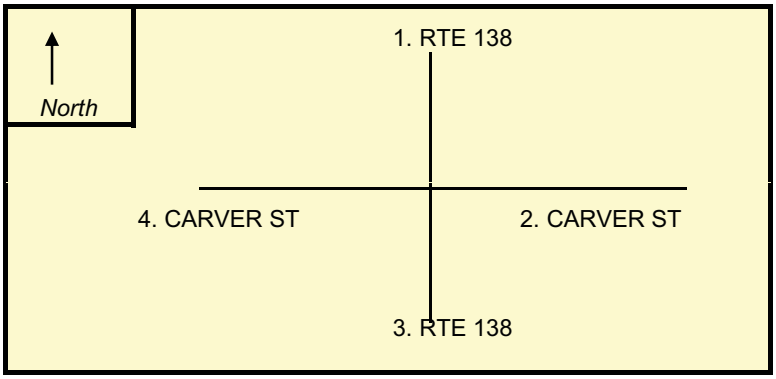
MINOR STREET(S) : CARVER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1549	155	759	307		

" K " FACTOR : 0.09 | APPROACH ADT : 30778 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 18 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 0.53 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

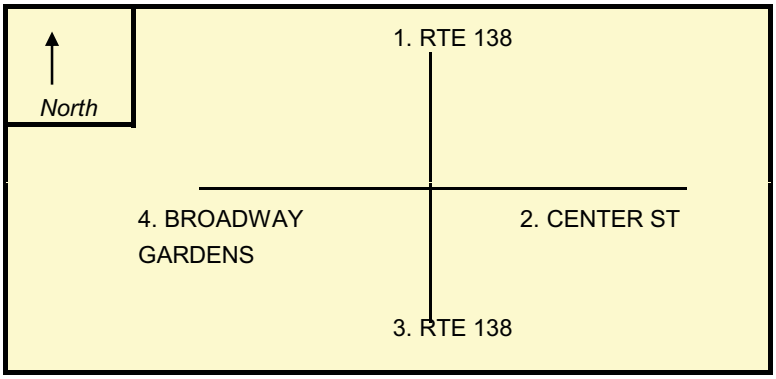
MINOR STREET(S) : CENTER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1391	123	749	1		

" K " FACTOR : 0.09 | APPROACH ADT : 25156 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 3 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.11 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

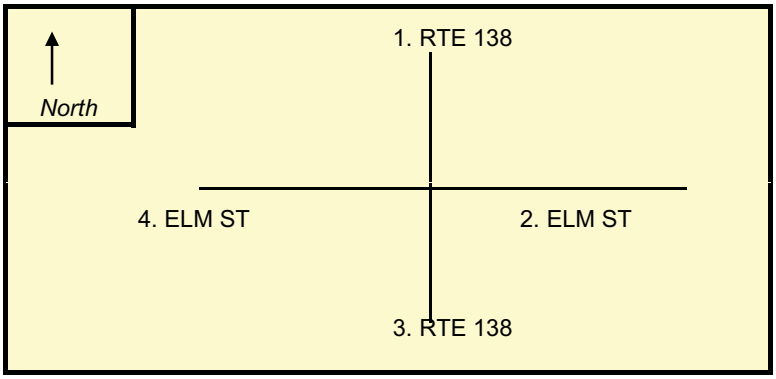
MINOR STREET(S) : ELM STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1016	359	862	57		

" K " FACTOR : 0.09 | APPROACH ADT : 25489 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 5 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.18 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

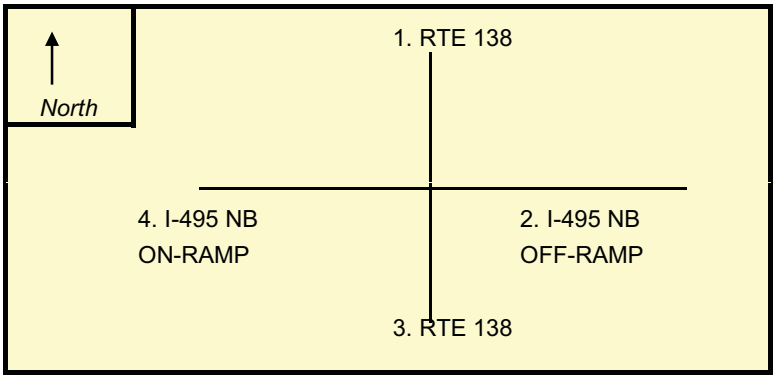
MINOR STREET(S) : I-495 NB OFF RAMP | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	1287	234	994			

" K " FACTOR : 0.09 | APPROACH ADT : 27944 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.07 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

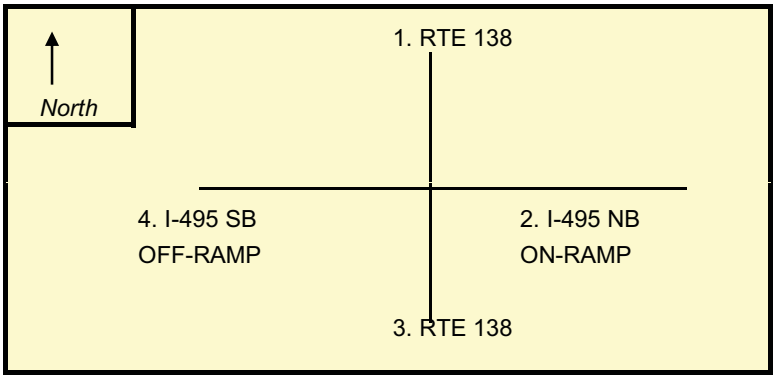
MINOR STREET(S) : I-495 SB OFF RAMP | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	1219		997	705		

" K " FACTOR : 0.09 | APPROACH ADT : 32456 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.06 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : RAYNHAM, MA | COUNT DATE : 9-18-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

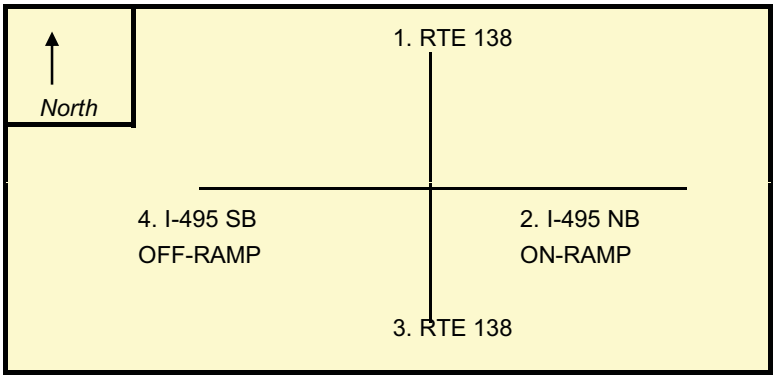
MINOR STREET(S) : I-495 SB ON RAMP | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	1219		997	705		

" K " FACTOR : 0.09 | APPROACH ADT : 32456 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.03 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : DEAN ST (ROUTE 44) | RIN #

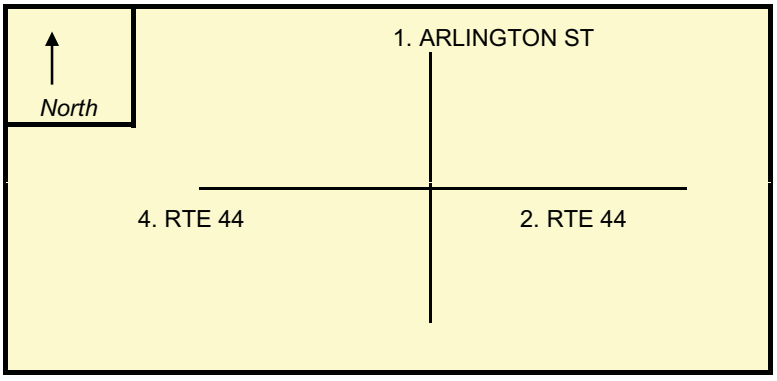
MINOR STREET(S) : ARLINGTON STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB		EB		
VOLUMES (PM) :	436	793		778		

" K " FACTOR : 0.09 | APPROACH ADT : 22300 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 9 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.37 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COHANNET STREET | RIN #

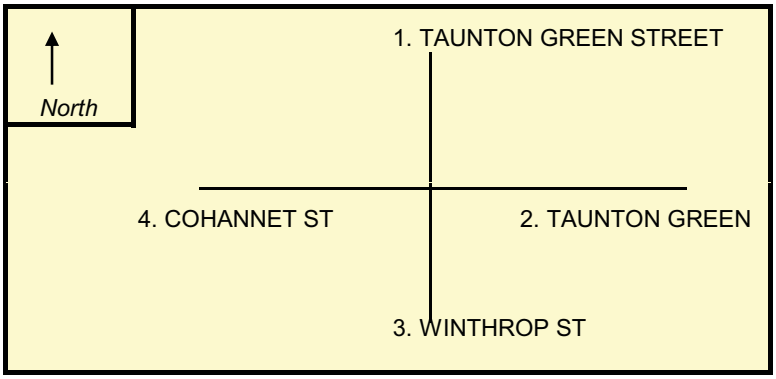
MINOR STREET(S) : TAUNTON GREEN ST | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1283	0	404	274		

" K " FACTOR : 0.09 | APPROACH ADT : 21789 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 11 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 0.46 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COUNTY STREET | RIN #

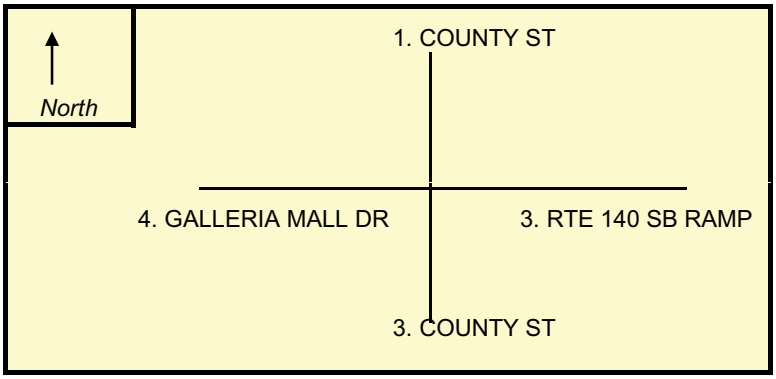
MINOR STREET(S) : GALLERIA MALL DRIVE | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	712	127	105	472		

" K " FACTOR : 0.09 | APPROACH ADT : 15733 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 9 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.52 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COURT STREET | RIN #

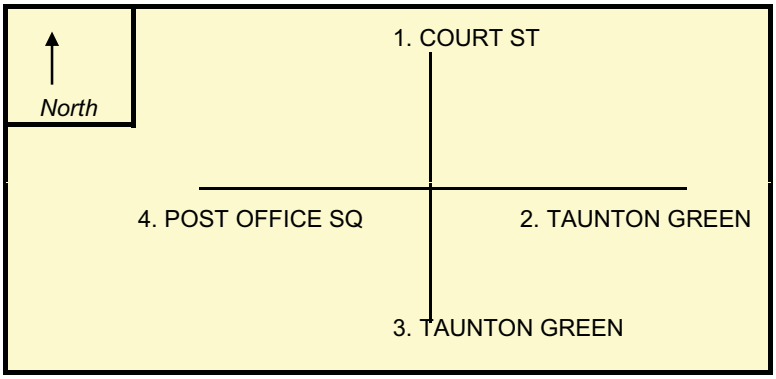
MINOR STREET(S) : TAUNTON GREEN ST | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	368	1399	0	21		

" K " FACTOR : 0.09 | APPROACH ADT : 19867 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 14 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 0.64 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WASHINGTON STREET | RIN #

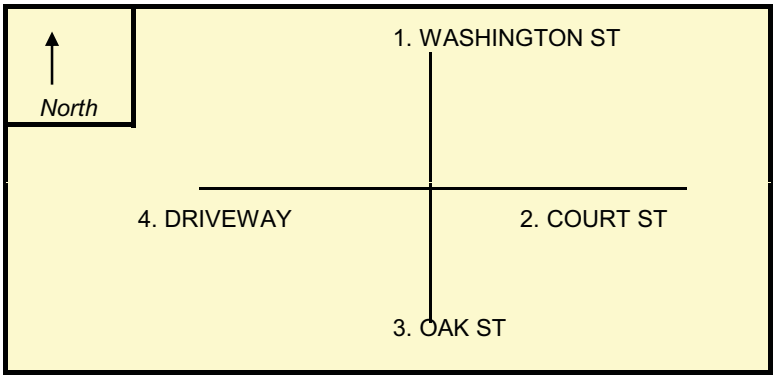
MINOR STREET(S) : COURT STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	698	433	771	0		

" K " FACTOR : 0.09 | APPROACH ADT : 21133 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 12 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 0.52 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COUNTY STREET (ROUTE 140) | RIN #

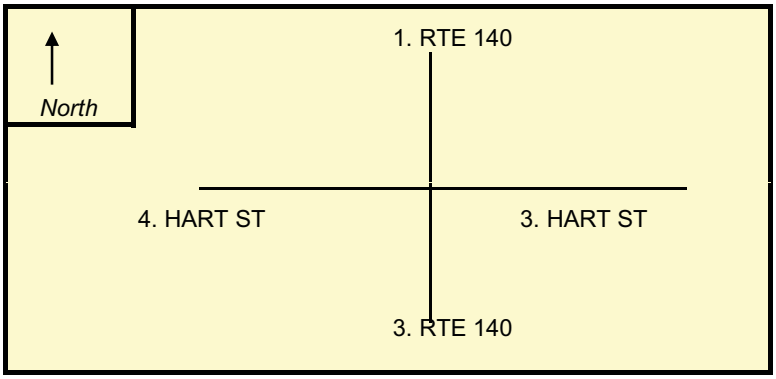
MINOR STREET(S) : HART STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	923	438	924	471		

" K " FACTOR : 0.09 | APPROACH ADT : 30622 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 46 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 15

CRASH RATE CALCULATION : 1.37 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : DEAN ST (ROUTE 44) | RIN #

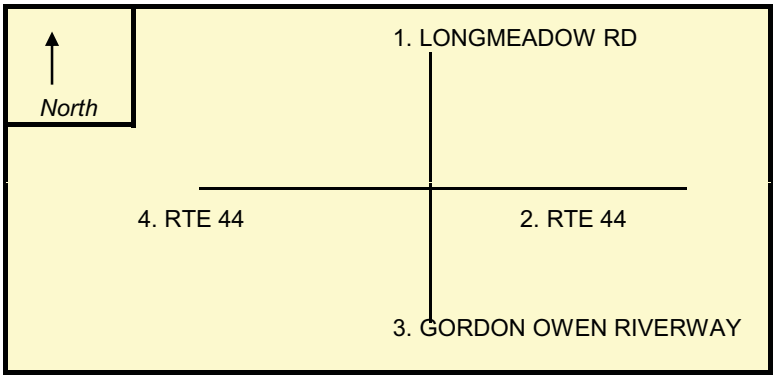
MINOR STREET(S) : LONGMEADOW ROAD | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	356	1344	624	1096		

" K " FACTOR : 0.09 | APPROACH ADT : 38000 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 38 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 13

CRASH RATE CALCULATION : 0.91 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : TAUNTON GREEN STREET | RIN #

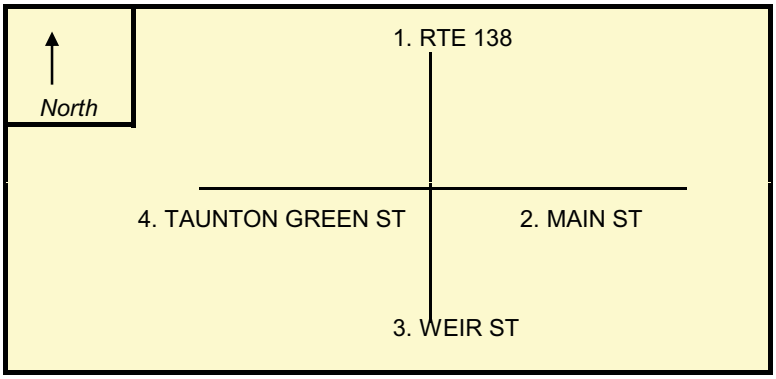
MINOR STREET(S) : WEIR STREET (ROUTE 138) | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	0	1090	325	1345		

" K " FACTOR : 0.09 | APPROACH ADT : 30667 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 23 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 8

CRASH RATE CALCULATION : 0.68 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WASHINGTON STREET/OAK STREET | RIN #

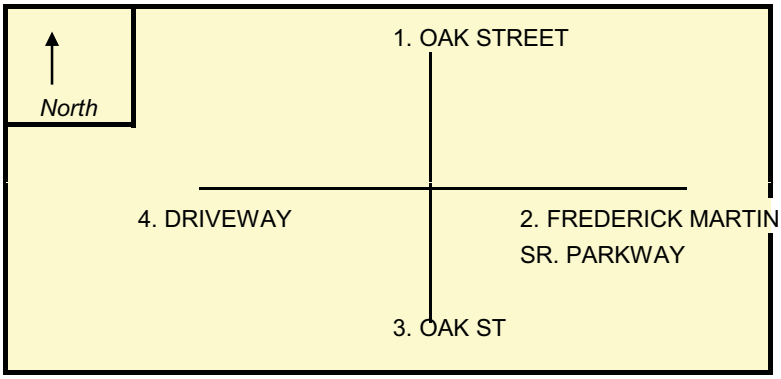
MINOR STREET(S) : FREDERICK MARTIN SR. PARKWAY | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1035	252	916	4		

" K " FACTOR : 0.09 | APPROACH ADT : 24522 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.04 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : OAK STREET | RIN #

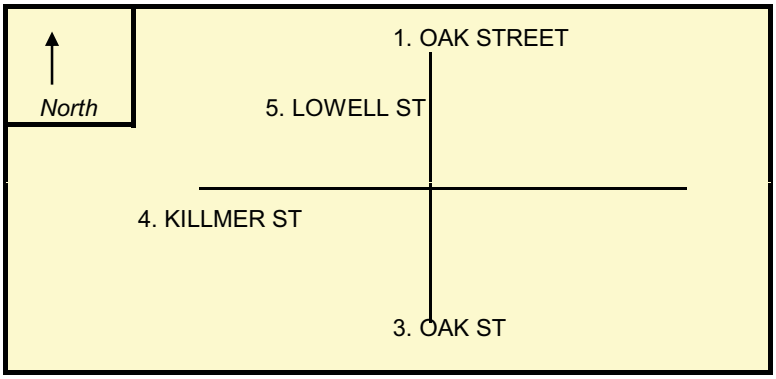
MINOR STREET(S) : KILMER STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB	NW	
VOLUMES (PM) :	420		224	98	2	

" K " FACTOR : 0.09 | APPROACH ADT : 8267 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 12 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 1.33 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WASHINGTON STREET | RIN #

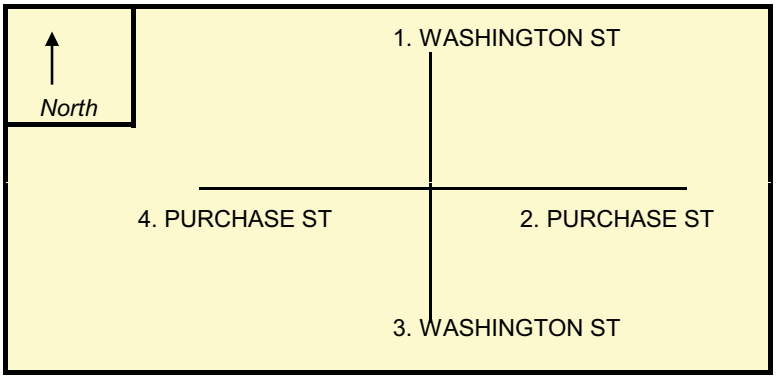
MINOR STREET(S) : PURCHASE STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	375	182	123	105		

" K " FACTOR : 0.09 | APPROACH ADT : 8722 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 36 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 12

CRASH RATE CALCULATION : 3.77 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SCHOOL STREET | RIN #

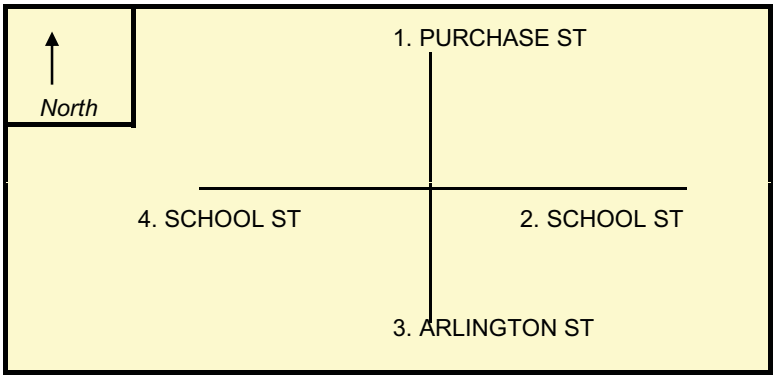
MINOR STREET(S) : PURCHASE STREET/ARLINGTON STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	383	213	126	139		

" K " FACTOR : 0.09 | APPROACH ADT : 9567 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 21 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 7

CRASH RATE CALCULATION : 2.00 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WASHINGTON STREET | RIN #

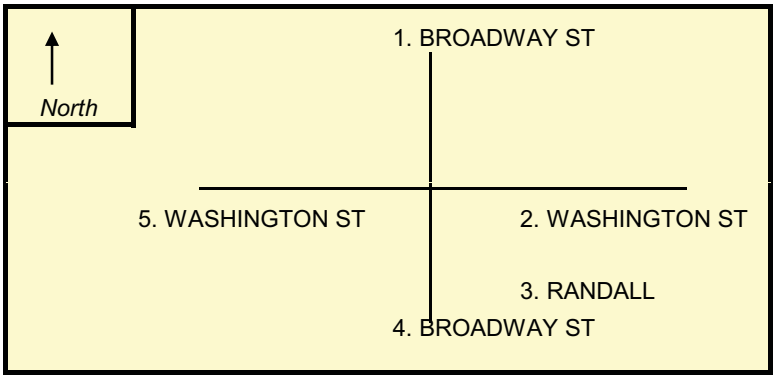
MINOR STREET(S) : RANDALL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NW	NB	EB	
VOLUMES (PM) :	923	178	22	544	433	

" K " FACTOR : 0.09 | APPROACH ADT : 23333 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 0

CRASH RATE CALCULATION : 0.04 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : DEAN STREET (ROUTE 44) | RIN #

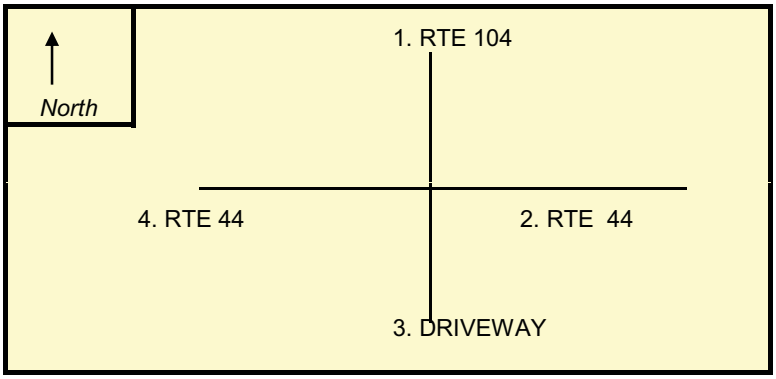
MINOR STREET(S) : ROUTE 104 | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	330	1051	28	1129		

" K " FACTOR : 0.09 | APPROACH ADT : 28200 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 12 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 4

CRASH RATE CALCULATION : 0.39 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COUNTY STREET (ROUTE 140) | RIN #

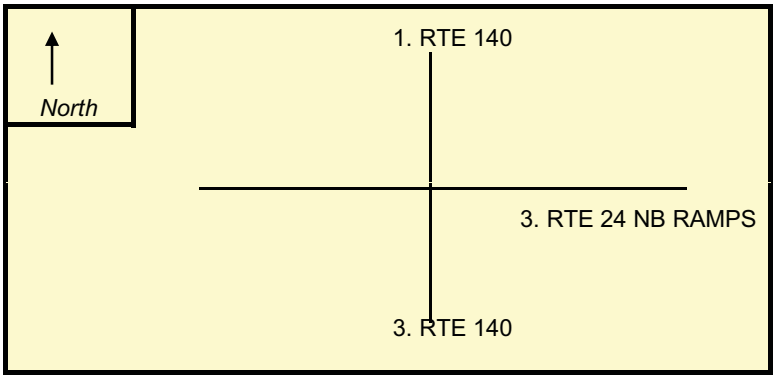
MINOR STREET(S) : ROUTE 24 NB RAMPS | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB			
VOLUMES (PM) :	2373	233	1458			

" K " FACTOR : 0.09 | APPROACH ADT : 45156 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.04 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : SUMMER STREET (ROUTE 140) | RIN #

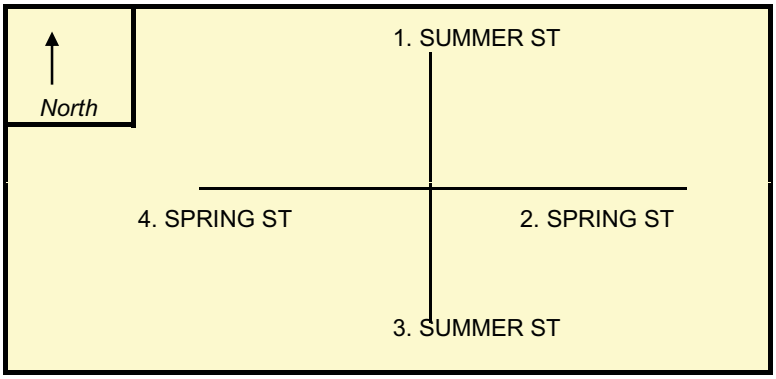
MINOR STREET(S) : SPRING STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	375	259	419	353		

" K " FACTOR : 0.09 | APPROACH ADT : 15622 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 21 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 7

CRASH RATE CALCULATION : 1.23 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : STEVENS/COUNTY STREET | RIN #

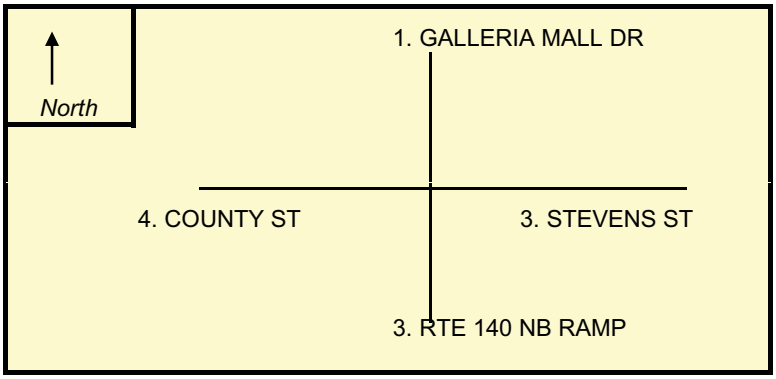
MINOR STREET(S) : GALLERIA MALL DRIVE RAMP | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	142	406	126	501		

" K " FACTOR : 0.09 | APPROACH ADT : 13056 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 17 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 6

CRASH RATE CALCULATION : 1.19 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : COUNTY STREET (ROUTE 140) | RIN #

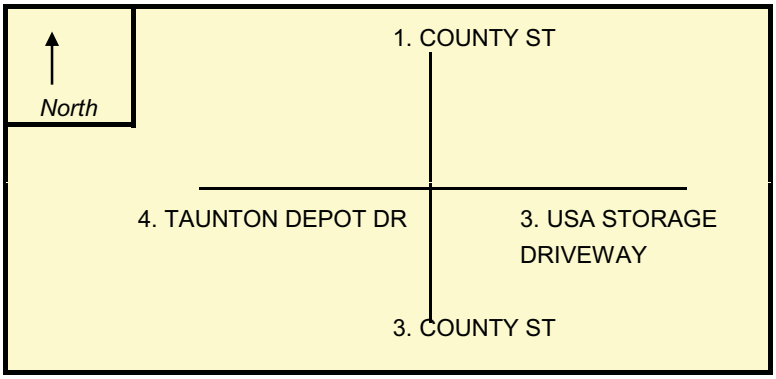
MINOR STREET(S) : TAUNTON DEPOT DR | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	1092	6	977	448		

" K " FACTOR : 0.09 | APPROACH ADT : 28033 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 8 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.26 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY STREET (ROUTE 138) | RIN #

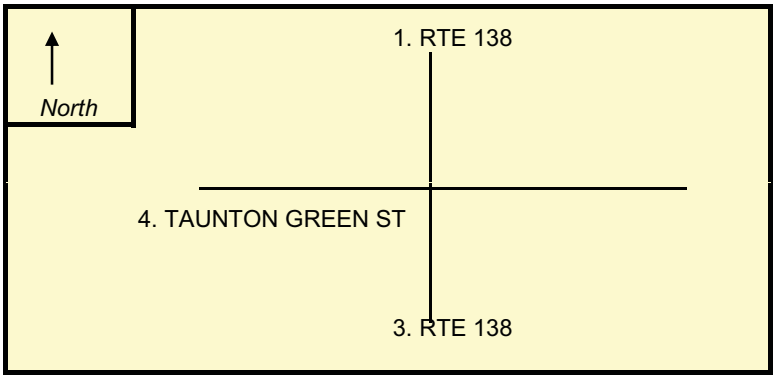
MINOR STREET(S) : TAUNTON GREEN STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB		NB	EB		
VOLUMES (PM) :	518		1414	0		

" K " FACTOR : 0.09 | APPROACH ADT : 21467 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 9 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 3

CRASH RATE CALCULATION : 0.38 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WASHINGTON STREET | RIN #

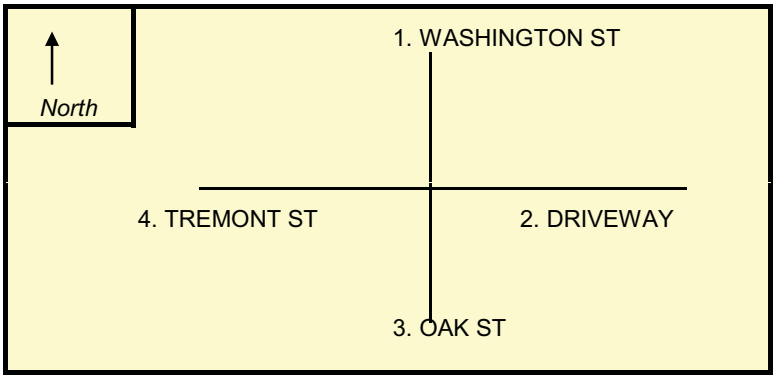
MINOR STREET(S) : TREMONT STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	860	185	455	738		

" K " FACTOR : 0.09 | APPROACH ADT : 24867 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 21 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 7

CRASH RATE CALCULATION : 0.77 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X | Source #

~ INTERSECTION DATA ~

MAJOR STREET : MAIN STREET | RIN #

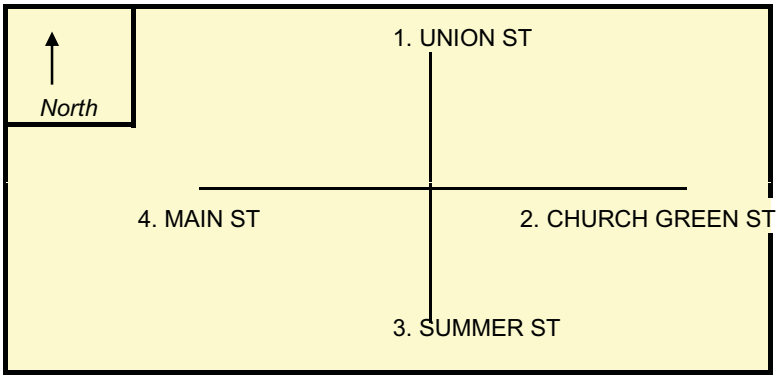
MINOR STREET(S) : UNION STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	0	504	417	848		

" K " FACTOR : 0.09 | APPROACH ADT : 19656 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 2

CRASH RATE CALCULATION : 0.33 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

last updated: 11/06/01

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON, MA | COUNT DATE : 10-1-2008 | ***MHD USE ONLY***

DISTRICT : 5 | UNSIGNALIZED : X | SIGNALIZED : | Source #

~ INTERSECTION DATA ~

MAJOR STREET : WINTER STREET | RIN #

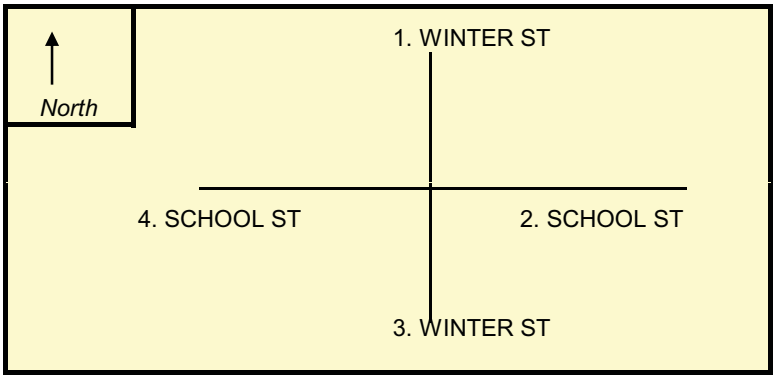
MINOR STREET(S) : SCHOOL STREET | RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	WB	NB	EB		
VOLUMES (PM) :	479	87	543	116		

" K " FACTOR : 0.09 | APPROACH ADT : 13611 | **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 15 | # OF YEARS : 3 | AVERAGE # OF ACCIDENTS (**A**) : 5

CRASH RATE CALCULATION : 1.01 | RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : TAUNTON | COUNT DATE :

DISTRICT : 5 | UNSIGNALIZED : | SIGNALIZED : X

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : ROUTE 140 (COUNTY STREET) RIN #

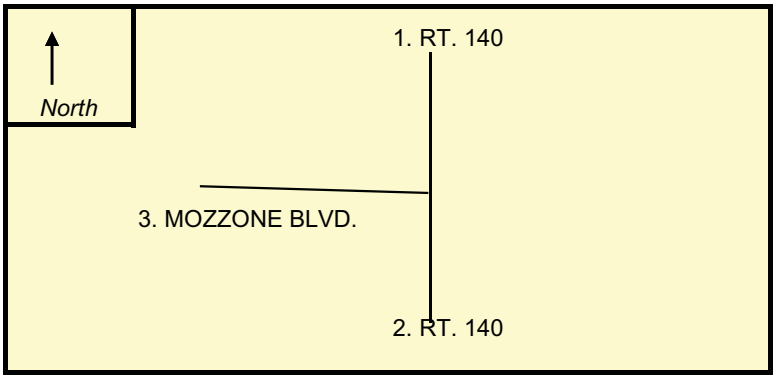
MINOR STREET(S) : MOZZONE BOULEVARD RIN #

RIN #

RIN #

RIN #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	SB	NB	EB			
VOLUMES (PM) :	1290	1030	375			

" K " FACTOR : 0.09 APPROACH ADT : 29944 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 # OF YEARS : 3 AVERAGE # OF ACCIDENTS (**A**) : 1

CRASH RATE CALCULATION : 0.06 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Source (optional):

Comments:

Appendix 4.1-C

Intersection Inventory Data Sheets

VHB **Computations** Pictures II: 8-15

* unsignalized

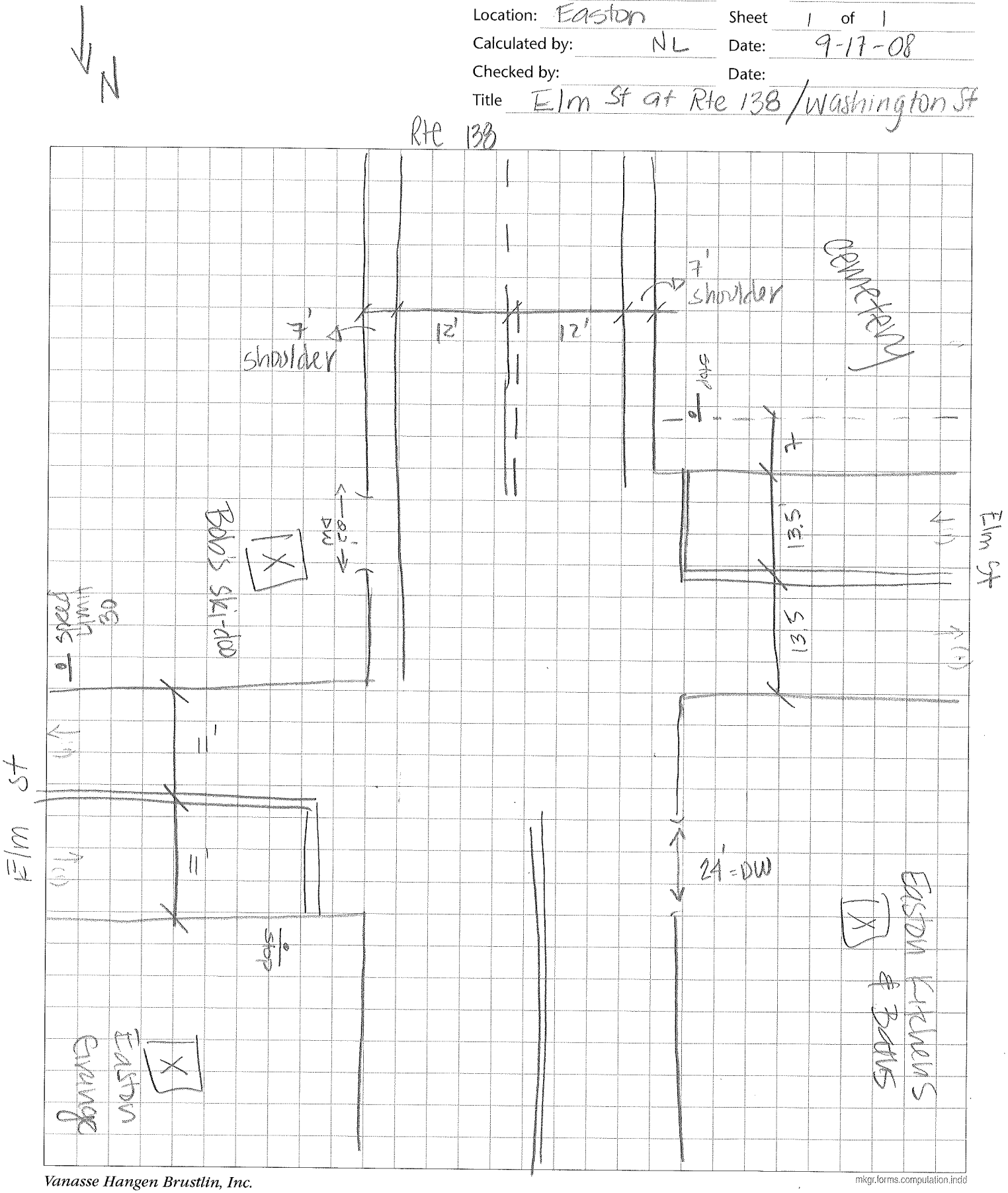
Project: SCR | Project # 10111.00

Location: Easton | Sheet 1 of 1

Calculated by: NL | Date: 9-17-08

Checked by: | Date:

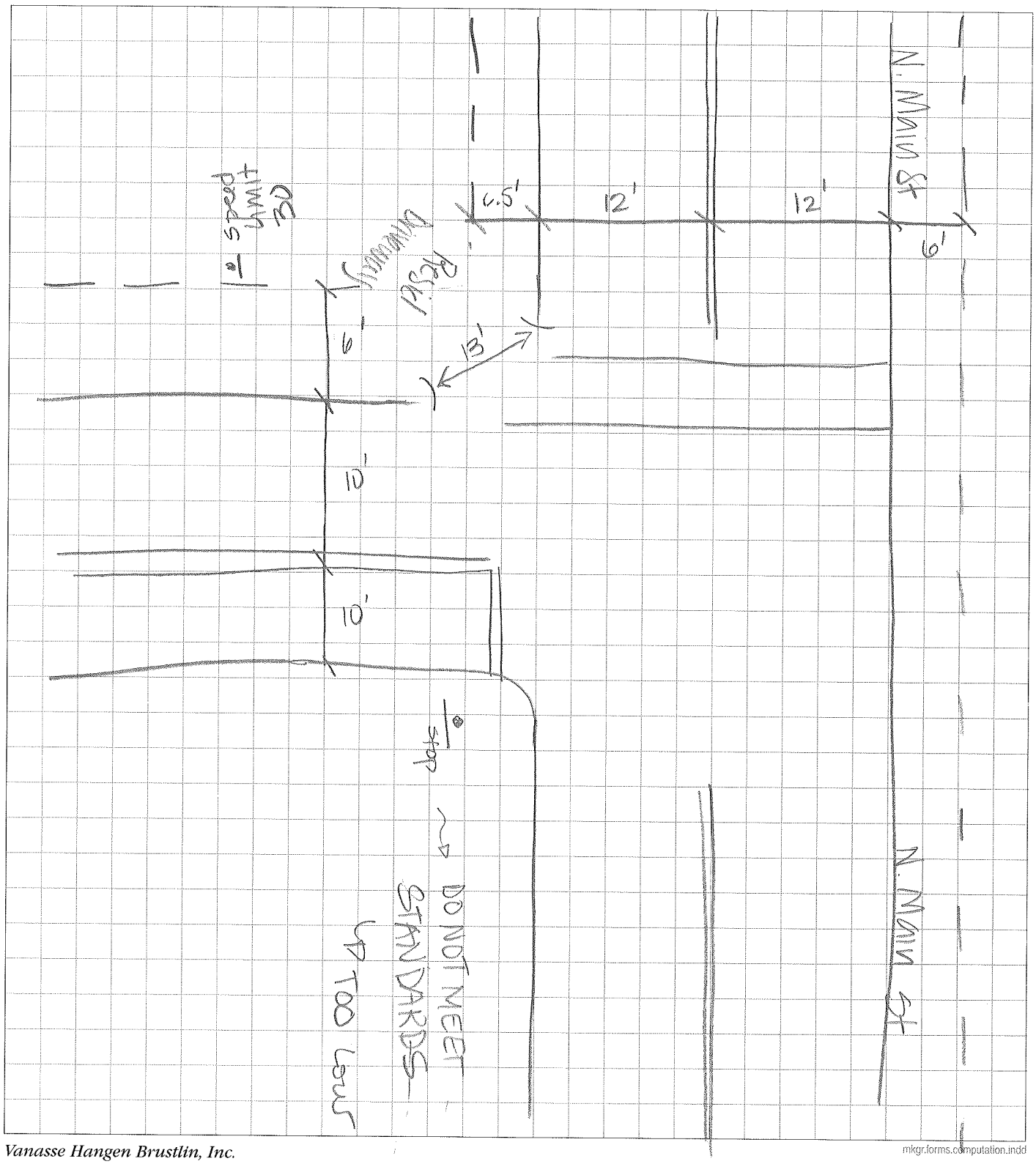
Title Elm St at Rte 138 / Washington St



VHB *Computations* pictures II : 16 – 24

Project: SCR
Location: Easton
Calculated by:
Checked by:
Title Elm St at N. Main St

Project # 10111.00
Sheet 1 of 1
Date: 9-17-08
Date:



VHB **Computations** pictures II : 25 - 34

* unsig

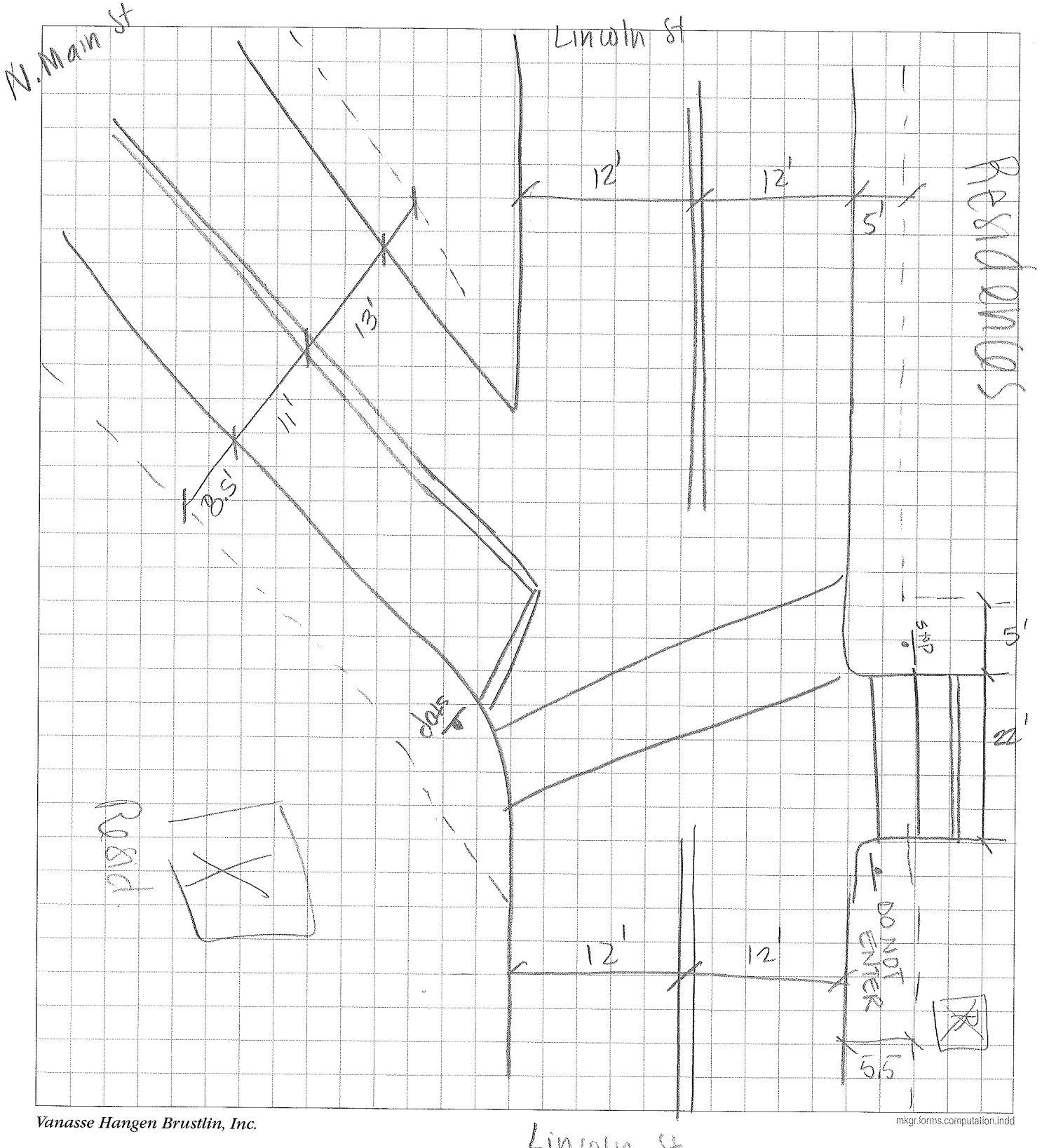
Project: SCR | Project # 10111.00

Location: Easton | Sheet 1 of 1

Calculated by: NL | Date: 9-17-08

Checked by: | Date:

Title Lincoln St at N. Main St.

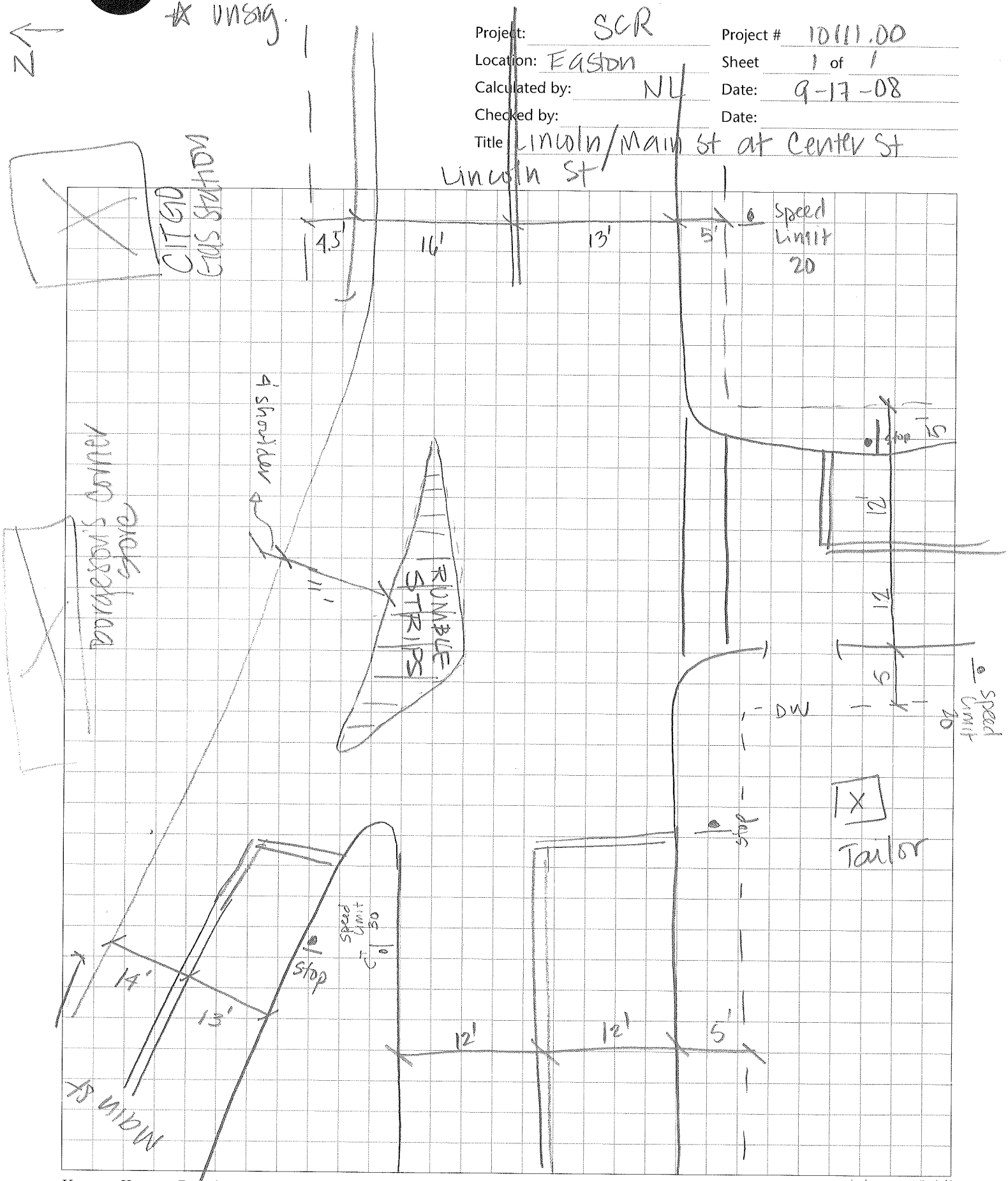


VHB **Computations** PIC II : 35 - 45

* UNSIG.

Project: SCR
Location: Easton
Calculated by: NL
Checked by:
Title Lincoln/Main St at Center St

Project # 10111.00
Sheet 1 of 1
Date: 9-17-08
Date:



Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

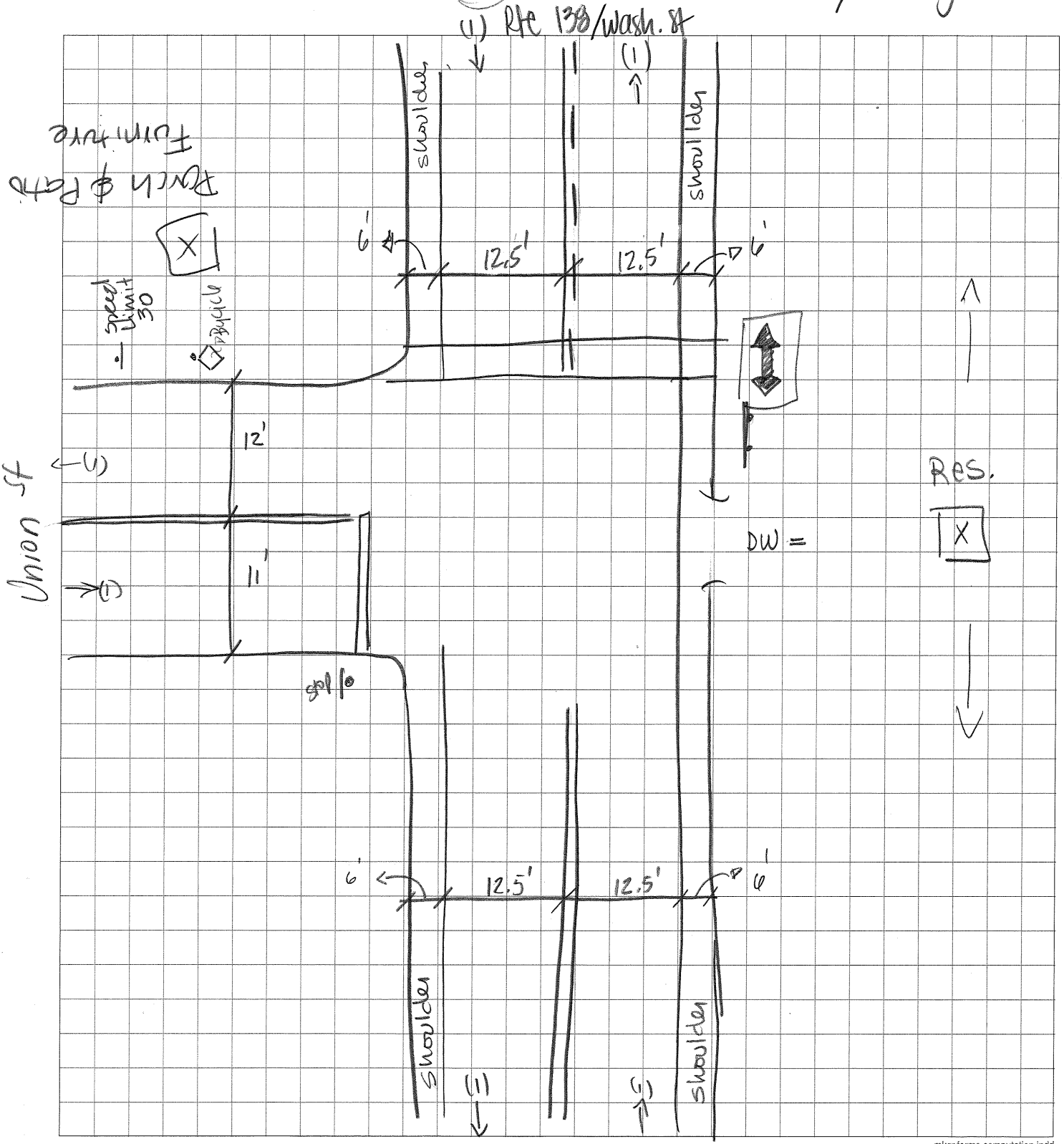
VHB **Computations** PICT cd I : 57 - 64

* unsignalized T-int
* No sidewalks on any approach
*

Project: SCR
Location: Easton, MA
Calculated by: NL
Checked by:

Project # 10111.00
Sheet 1 of 1
Date: 9-29-08
Date:

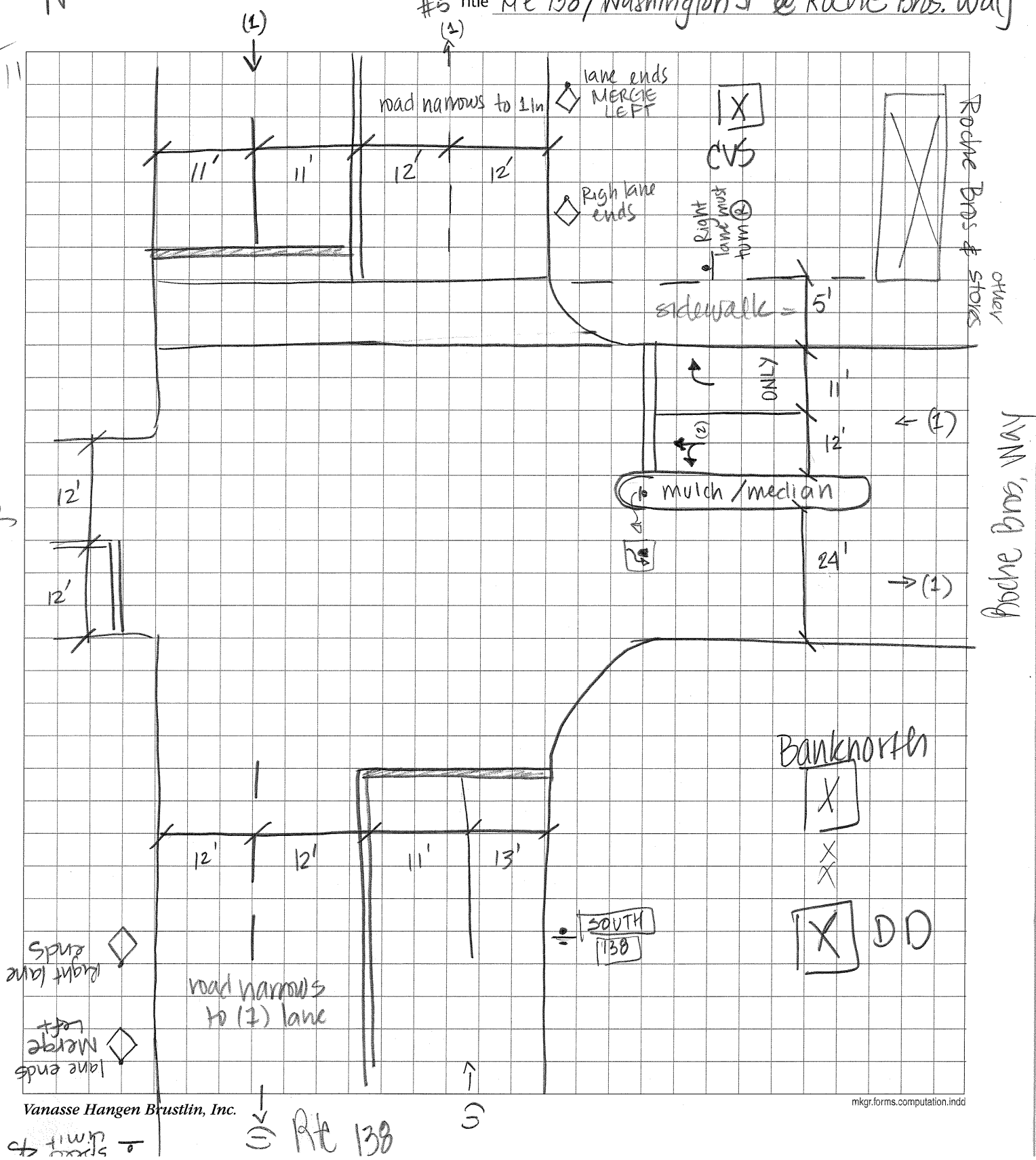
#5 Title Union St @ Rte 138/Washington St



VHB **Computations** pict edJ : 05-78

★ signalized int.
★ NO sidewalk on any approach

Project: SCR | Project # 10111.00
Location: Easton, MA | Sheet 1 of 1
Calculated by: NL | Date: 9-29-09
Checked by: | Date:
#5 Title Rte 138/Washington St @ Roche Bros. Way



Vanasse Hangen Brustlin, Inc.

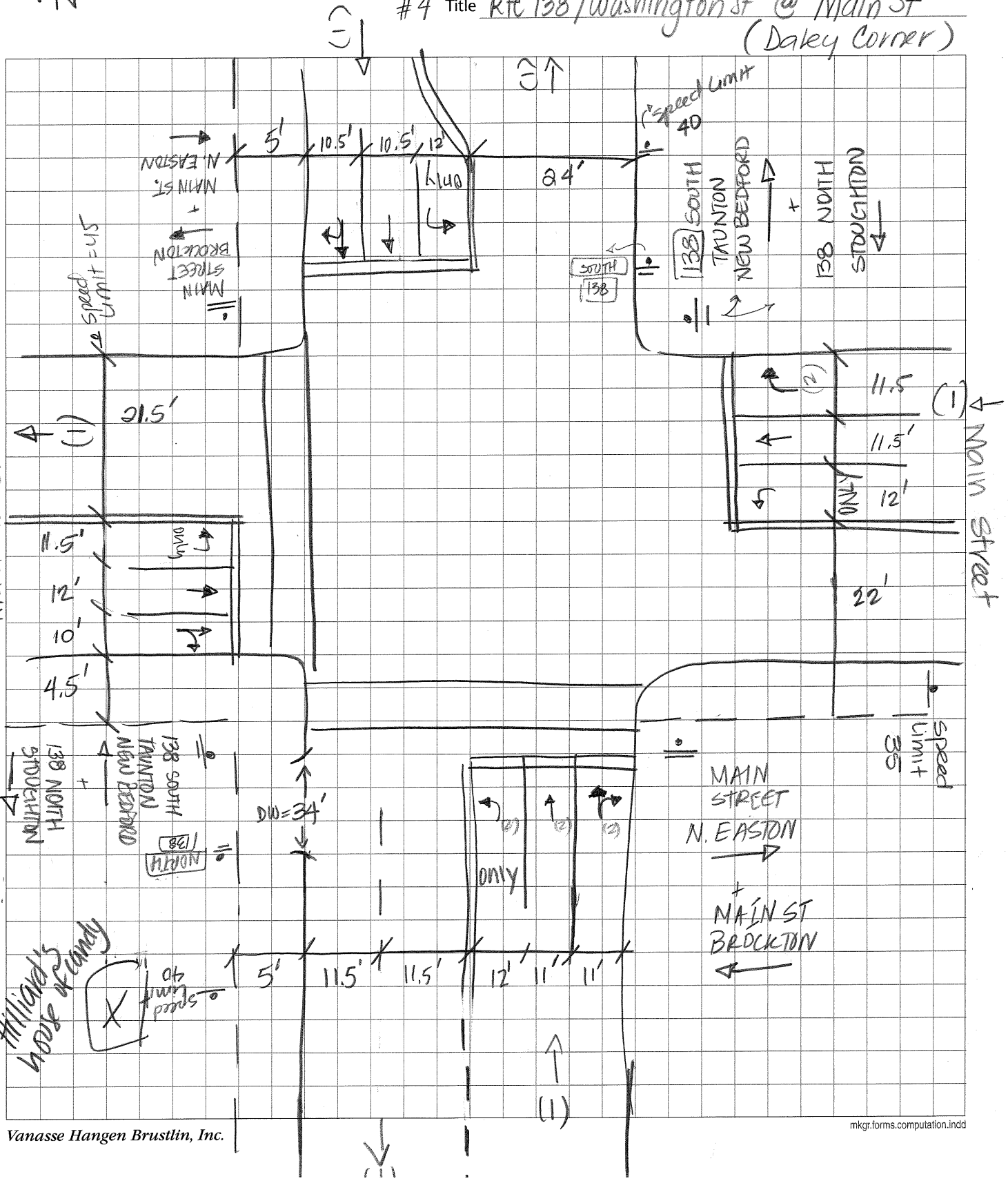
mkgr.forms.computation.indd

VHB **Computations** pict cd # 1-15

* signalized int
* stop bar at EBapp is set too close to int

Project: SCR | Project # 10111.00
Location: Easton, MA | Sheet 1 of 1
Calculated by: KL | Date: 9-29-08
Checked by: | Date:

#4 Title Rte 138/Washington St @ Main St (Daley Corner)



Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

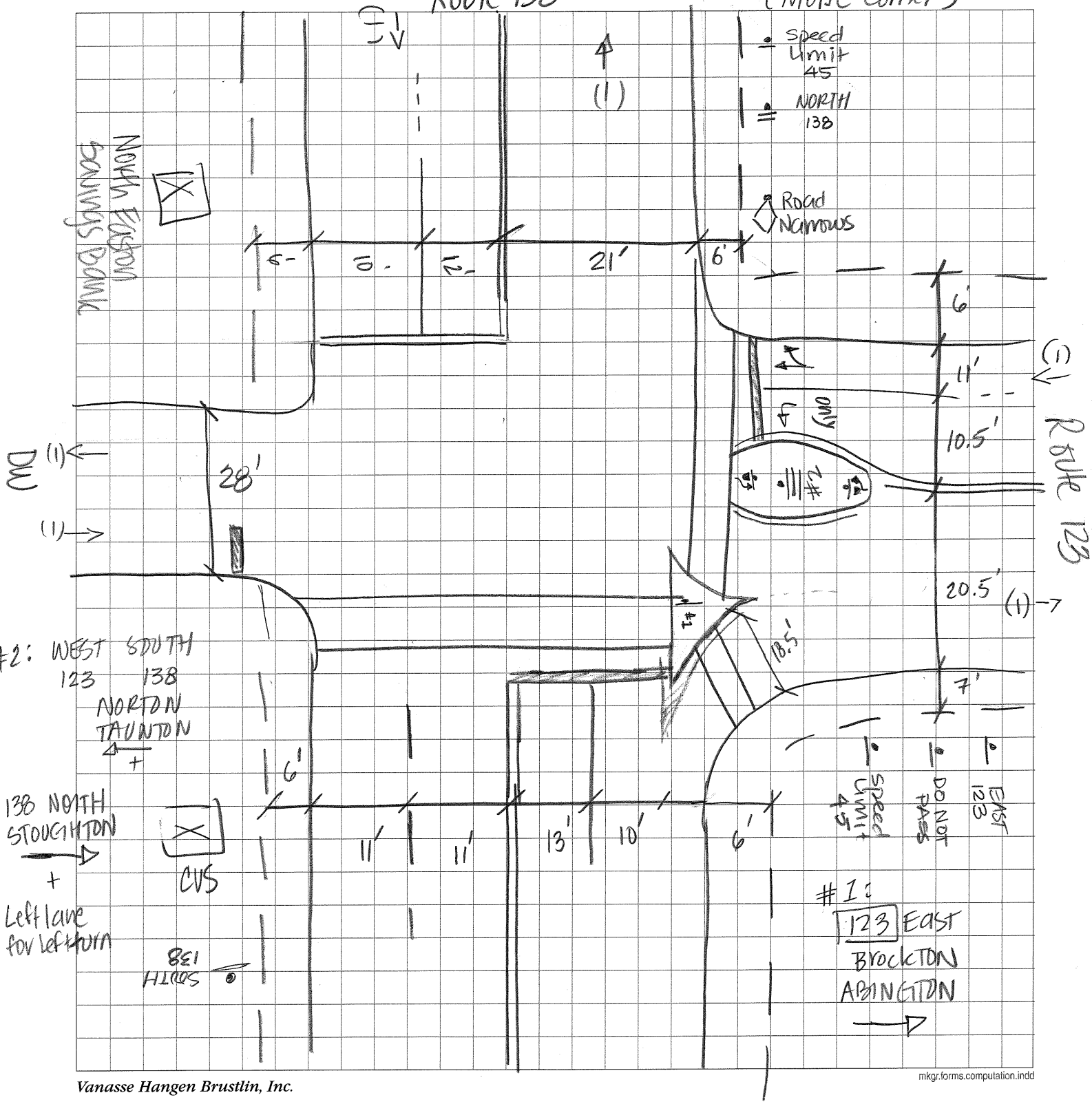
VHB **Computations** plot cd II : 16-33

Project: SCR | Project # 10111.00
Location: Easton, MA | Sheet 1 of 1
Calculated by: NL | Date: 9-29-08
Checked by: | Date:

#3 Title Rte 138/Washington St @ Rte 123/Belmont St

N

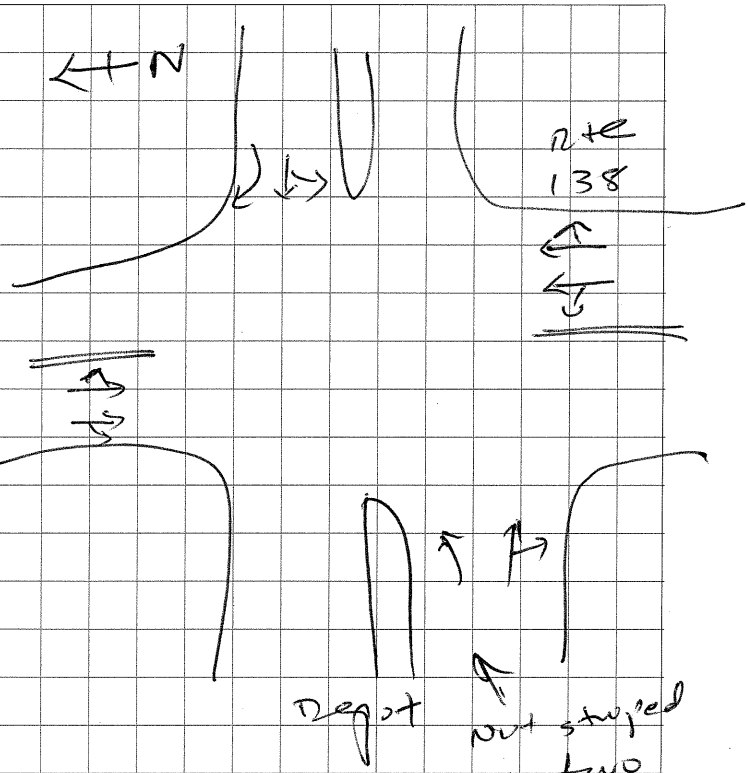
★ signalized int
★ median width ≅ 3'-11'



VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/29/08
Checked by: | Date:
Title Signal Timing & Phasing

Rt 138 / 123 @ Depot St



ϕ_1 Route 138

ϕ_2 Depot St.

ϕ_1

G = 29 18 30
Y = 4 4 4
R = 1 1 1

ϕ_2

G = 40 35 38
Y = 4 4 4
R = 1 1 1

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/29/08
Checked by: | Date:
Title Signal Timing & Phasing

Route 138 @ Roche Bros way

Storehedge village

Rte 138

Roche Bros way

$\phi 1$ Rte 138 NB LEAD
$\phi 2$ Rte 138 NB & SB
$\phi 3$ PED
$\phi 4$ Roche Bros Way/Storehedge

$\phi 1$

G = 12 11 8
Y = 4 4 4
R = 1 1 1

$\phi 2$

G = 11 18 14
Y = 4 4 4
R = 1 1 1

$\phi 3$ PED

W = 8
FDW = 14

Ped upon push button activation
$\phi 3$

$\phi 4$

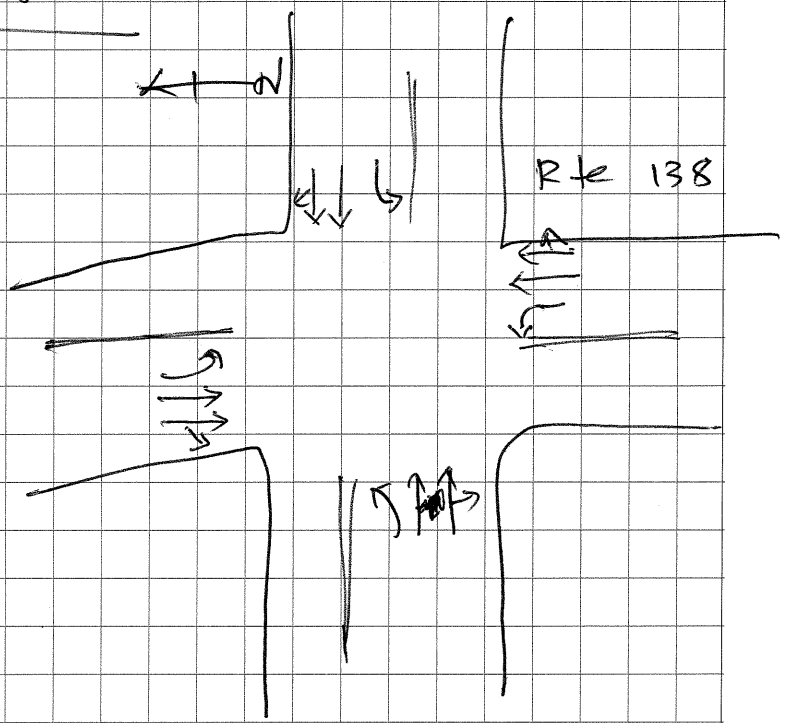
G = 12 13 11
Y = 4 4 4
R = 1 1 1

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/29/08
Checked by: | Date:
Title Signal Timing & Phasing

Route 138 @ Main Street

ϕ_1 Rte 138 LTs
ϕ_2 Rte 138 THs
ϕ_3
ϕ_3 ~~ϕ_8~~ Main St LTs
ϕ_4 ~~ϕ_7~~ Main St THs



Full Quad Operation
Concurrent Ped

ϕ_1
G = 10 8 8
Y = 3 4 4
R = 1 1 1

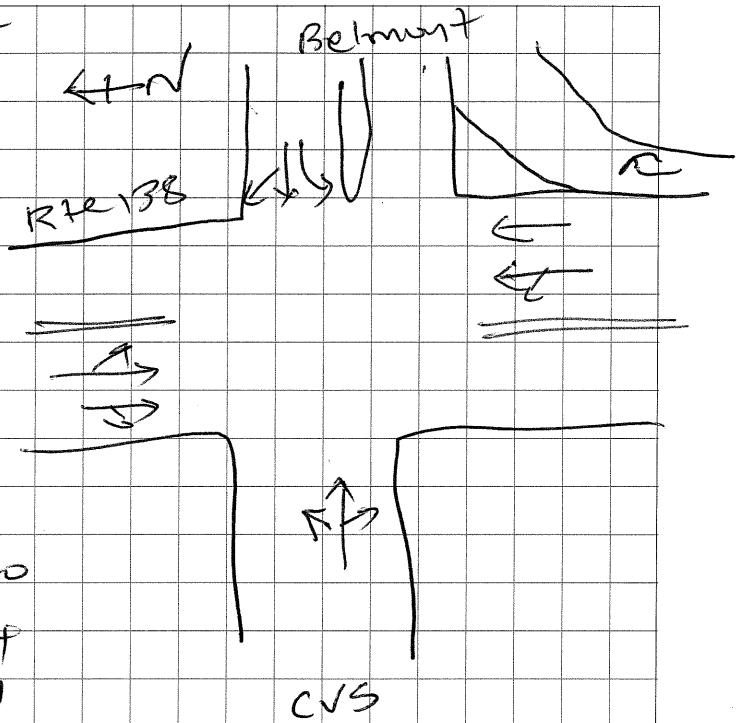
ϕ_2
G = 28 23 28
Y = 4 4 4
R = 1 1 1

ϕ_3
G = 12 8 10
Y = 3 4 4
R = 1 1 1

ϕ_4
G = 8 28 14
Y = 4 4 4
R = 1 1 1

Project: SCR | Project # 10111-31
Location: | Sheet of
Calculated by: RNR | Date: 9/29/08
Checked by: | Date:
Title Signal Timing & Phasing

Route 138 @ Belmont St



ϕ_1 Route 138 NB & SB

ϕ_2 Belmont St / CVS Dr

ϕ_1

FREE

G = 30 30 30
Y = 4 4 4
R = 1 1 1

ϕ_2

G = 30 30 21
Y = 4 4 4
R = 1 1 1

EASTON
RTE. 138 AT MAIN STREET (DAILEY'S CNR.)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0010	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT
RTE. 138 AT MAIN STREET (DAILEY'S CNR.)

IN THE TOWN OF

EASTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

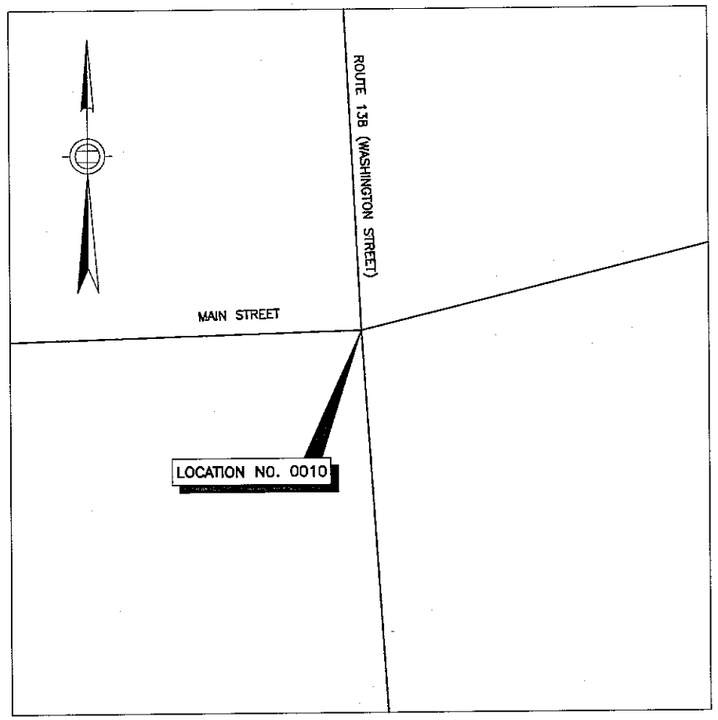
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued* or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I. STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II. OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: OPTICOM
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuonce: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR. SCALE IN FEET
0 200 400 800

REVISION NO	01
DATE:	11-26-01
INSERT BY:	J.C.CONNOR
DATE:	
FILE NAME:	0010T01.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116
MASSACHUSETTS
HIGHWAY DEPARTMENT

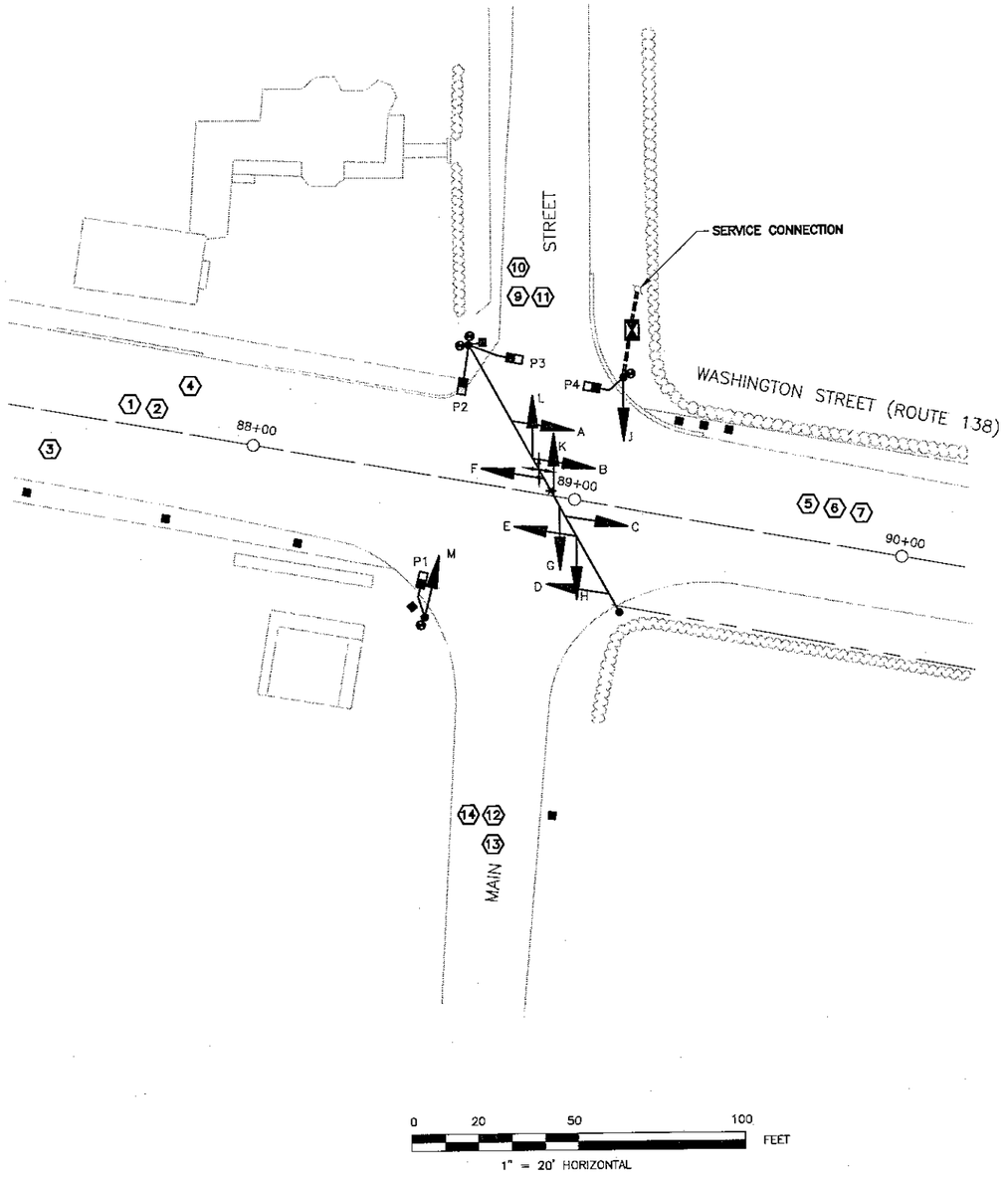
APPROVED BY:

STATE TRAFFIC ENGINEER Date

EASTON
RTE. 138 AT MAIN STREET (DAILEY'S CNR.)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0010	01	2	

TRAFFIC SIGNAL PLAN



NOTE:
THIS INTERSECTION HAS BEEN COMPLETELY REDONE. NEW AS-BUILT PLANS WERE NOT RECEIVED. BOTH ROADWAYS HAVE BEEN WIDENED TO ACCOMMODATE LEFT TURN LANES. THIS PLAN, EXISTING FROM THE 1954 CONSTRUCTION, DOES NOT REFLECT THIS WIDENING. LOOP LOCATIONS COULD NOT BE VERIFIED.

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

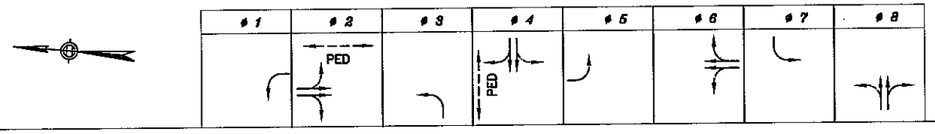
0010P01.DWG

EASTON
RTE. 138 AT MAIN STREET (DAILEY'S CNR.)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0010	01	3	

TRAFFIC SIGNAL DATA

APPROX NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	PHASE OPER.
ROUTE 138	NB	C	GL	YL	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
ROUTE 138	NB	A,B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
ROUTE 138	SB	F	R	R	R	G	Y	R	R	R	R	R	R	R	GL	YL	R	R	R	R	R	R	R	R	R	R	FY
ROUTE 138	SB	D,E	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
MAIN STREET	EB	G	R	R	R	R	R	R	GL	YL	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR
MAIN STREET	EB	H,J	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR
MAIN STREET	WB	K	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	GL	YL	R	R	R	R	FR
MAIN STREET	WB	L,M	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN	E-W	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF
PEDESTRIAN	N-S	P3-P4	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	OFF

TIMING IN SECONDS																											EMERGENCY DELAY
MINIMUM GREEN (INITIAL)	7			15			7			7			7			15			7			7				
PASSAGE TIME (VEHICLE)	2			4			2			3			2			4			2			3				
MAXIMUM 1	10			28			9			30			10			28			9			30				
MAXIMUM 2	15			30			15			30			15			30			15			30				
YELLOW CLEARANCE		4			4			4			4			4			4			4			4				
RED CLEARANCE			1			1			1			1			1			1			1			1			
WALK (W)				6						6						6						6					
PEDESTRIAN CLEARANCE				17						17						17						17					
RECALL	OFF			MIN			OFF			OFF			OFF			MIN			OFF			OFF				
MEMORY	NON-LOCKING			LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			LOCKING			NON-LOCKING			NON-LOCKING				

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
2	10' SIGNAL POLE, BASE, & FDN.
4	1 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
4	1 WAY, 5 SECTION SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
4	PEDESTRIAN HOUSING
4	PEDESTRIAN PUSH BUTTON, SIGN & SADDLES
4	OPTICOM RECIEVERS
2	OPTICOM 4 CHANNEL PHASE SELECTOR
1	OPTICOM STROBE LIGHT
12	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
13±	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

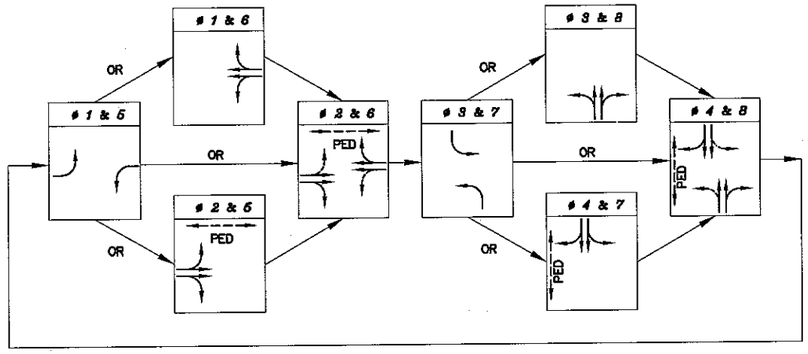
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

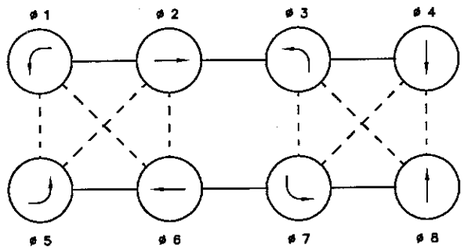
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE IN THE PAVEMENT SURFACE DURING INVENTORY.

PREFERENTIAL PHASING SEQUENCE



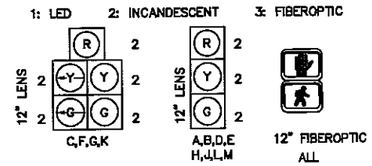
NEMA DUAL RING PHASING NOTES:



LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1				ø2	ø2	PRESENCE		
2				ø2	ø2	PRESENCE		
3				ø2	ø2	PRESENCE		
4				ø5	ø5	PRESENCE		
5				ø6	ø6	PRESENCE		
6				ø6	ø6	PRESENCE		
7				ø8	ø8	PRESENCE		
8				ø1	ø1	PRESENCE		
9				ø4	ø4	PRESENCE		
10				ø4	ø4	PRESENCE		
11				ø7	ø7	PRESENCE		
12				ø8	ø8	PRESENCE		
13				ø8	ø8	PRESENCE		
14				ø3	ø3	PRESENCE		

SIGNAL IDENTIFICATION



CONTROLLER MAKE & MODEL: PEEK 3000 SERIES
UTILITY POLE No. E.E. CO. BR. #32
METER No. 17-595-194
EMERGENCY PRE-EMPTION (TYPE): OPTICOM

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

0010D01.DWG

EASTON
RTE. 138 (WASHINGTON ST) AT RTE. 123 (BELMONT ST)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0024	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT
RTE. 138 (WASHINGTON ST) AT RTE. 123 (BELMONT ST)

IN THE TOWN OF

EASTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

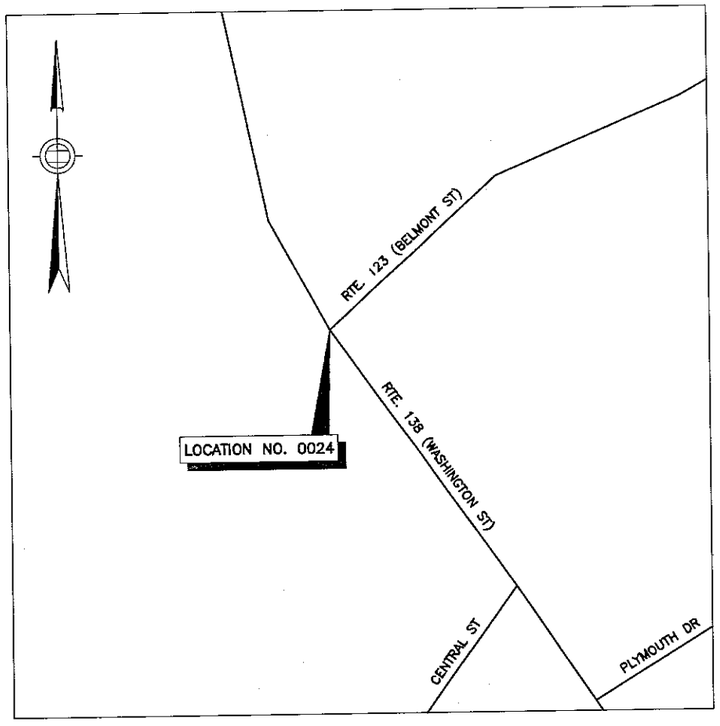
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued* or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO. 01
DATE: 11-27-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 0024T01.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

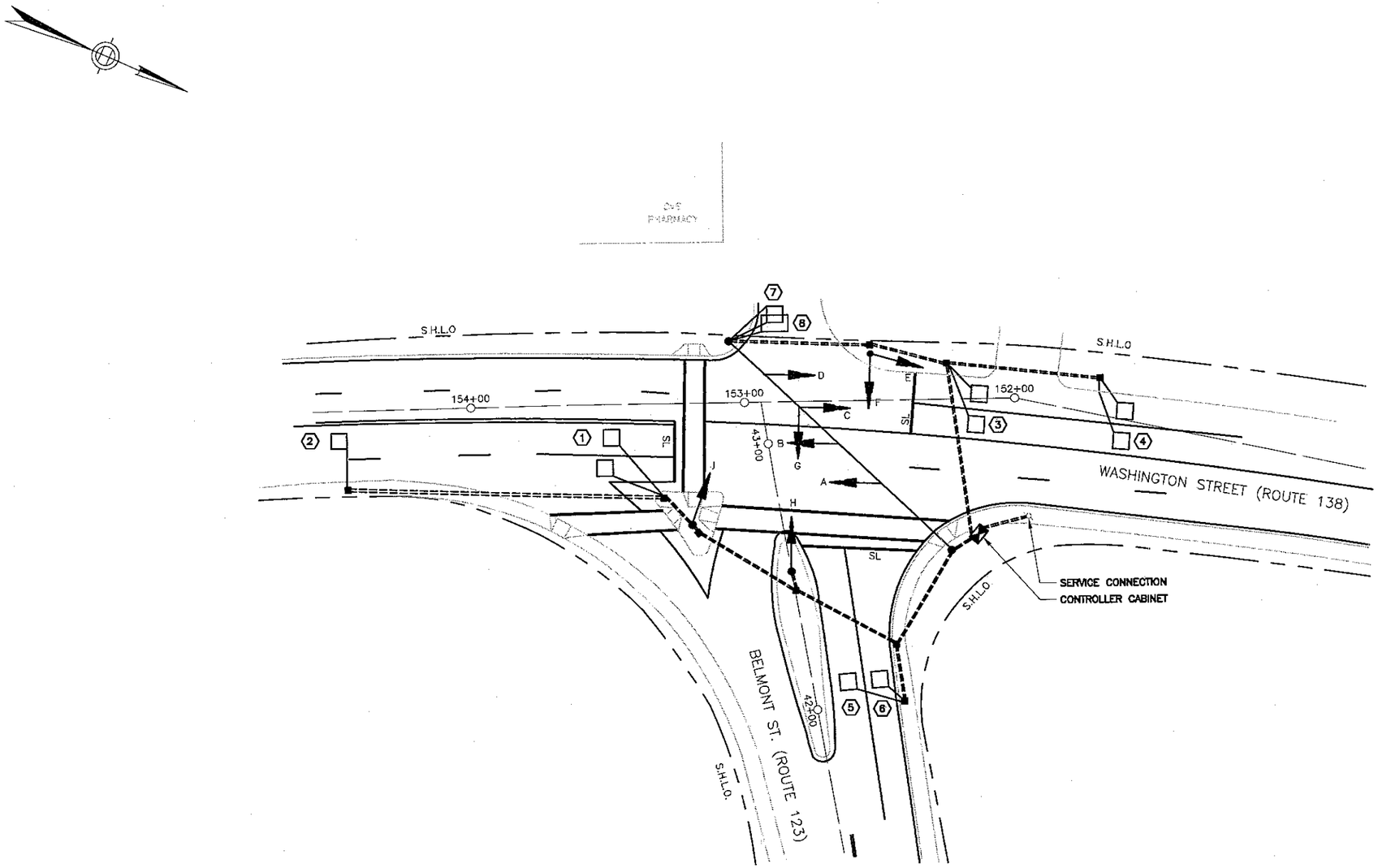
APPROVED BY:

STATE TRAFFIC ENGINEER Date

EASTON
RTE. 138 (WASHINGTON ST)
AT RTE. 123 (BELMONT ST)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0024	01	2	

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET
1" = 20' HORIZONTAL

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

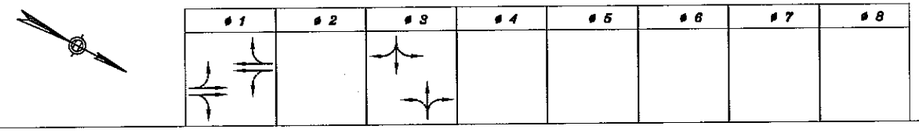
0024P0101.DWG

EASTON
RTE. 138 (WASHINGTON ST)
AT RTE. 123 (BELMONT ST)

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0024	01	3	

TRAFFIC SIGNAL DATA

APPROX. NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
WASHINGTON ST (ROUTE 138)	NB	A,B	G	Y	R				R	R	R																FY
WASHINGTON ST (ROUTE 138)	SB	C,D,E	G	Y	R				R	R	R																FY
BELMONT ST (ROUTE 123)	WB	F,G	R	R	R				G	Y	R																FR
DRIVE	EB	H,J	R	R	R				G	Y	R																FR

TIMING IN SECONDS																										EMERGENCY ONLY
MINIMUM GREEN (INITIAL)	8						8																			
PASSAGE TIME (VEHICLE)	4						4																			
MAXIMUM 1	30						30																			
MAXIMUM 2	30						30																			
YELLOW CLEARANCE		4						4																		
RED CLEARANCE			1						2																	
WALK (W)																										
PEDESTRIAN CLEARANCE																										
RECALL	EXT						OFF																			
MEMORY	LOCKING						LOCKING																			

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 4W, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
1	SPANWIRE ASSEMBLY BASE & FDN.
3	10' SIGNAL POLE, BASE, & FDN.
5	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
4	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
11	ROADWAY LOOP DETECTOR
9	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø2, ø4, ø5, ø6, ø7 AND ø8 NOT USED.

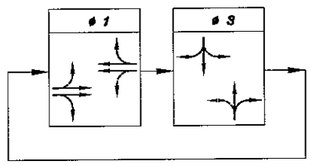
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

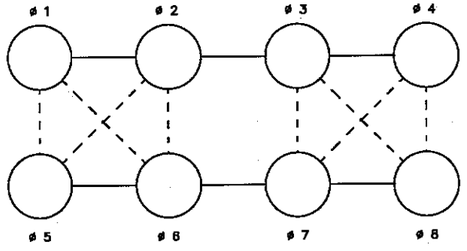
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE DURING SIGNAL INVENTORY.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:

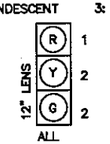


LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	2	6'X6'		ø1	ø1	PRESENCE		
2	1	6'X6'		ø1	ø1	PRESENCE		
3	2	6'X6'		ø1	ø1	PRESENCE		
4	2	6'X6'		ø1	ø1	PRESENCE		
5	1	6'X6'		ø2	ø2	PRESENCE		
6	1	6'X6'		ø2	ø2	PRESENCE		
7	1	6'X6'		ø2	ø2	PRESENCE		
8	1	6'X10'		ø2	ø2	PRESENCE		

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: CROUSE-HINDS (PIN)
UTILITY POLE No. NET&T CO. / B.E. CO. #127
METER No. 11-819-138
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

0024D01.DWG

EASTON				
RTE. 138 AT ROCHE BROTHERS DR				
STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	5-1287	01	1	3

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

WASHINGTON STREET (ROUTE 138) AT ROCHE BROTHERS DRIVEWAY

IN THE TOWN OF

EASTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

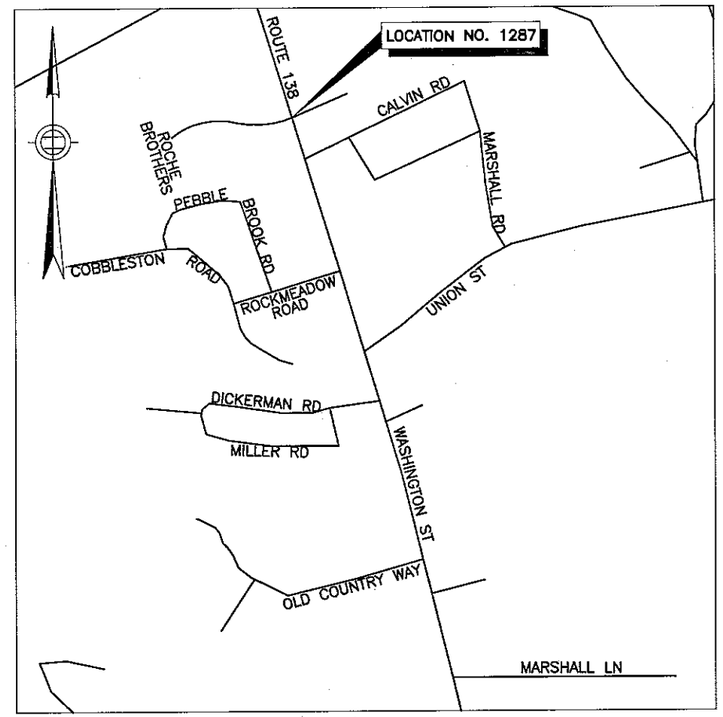
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued* or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 400 800 1600

REVISION NO	01
DATE:	12-22-2008
INSERT BY:	BG
DATE:	
FILE NAME:	1287T0101.DWG

COMMENTS:

MASS HIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

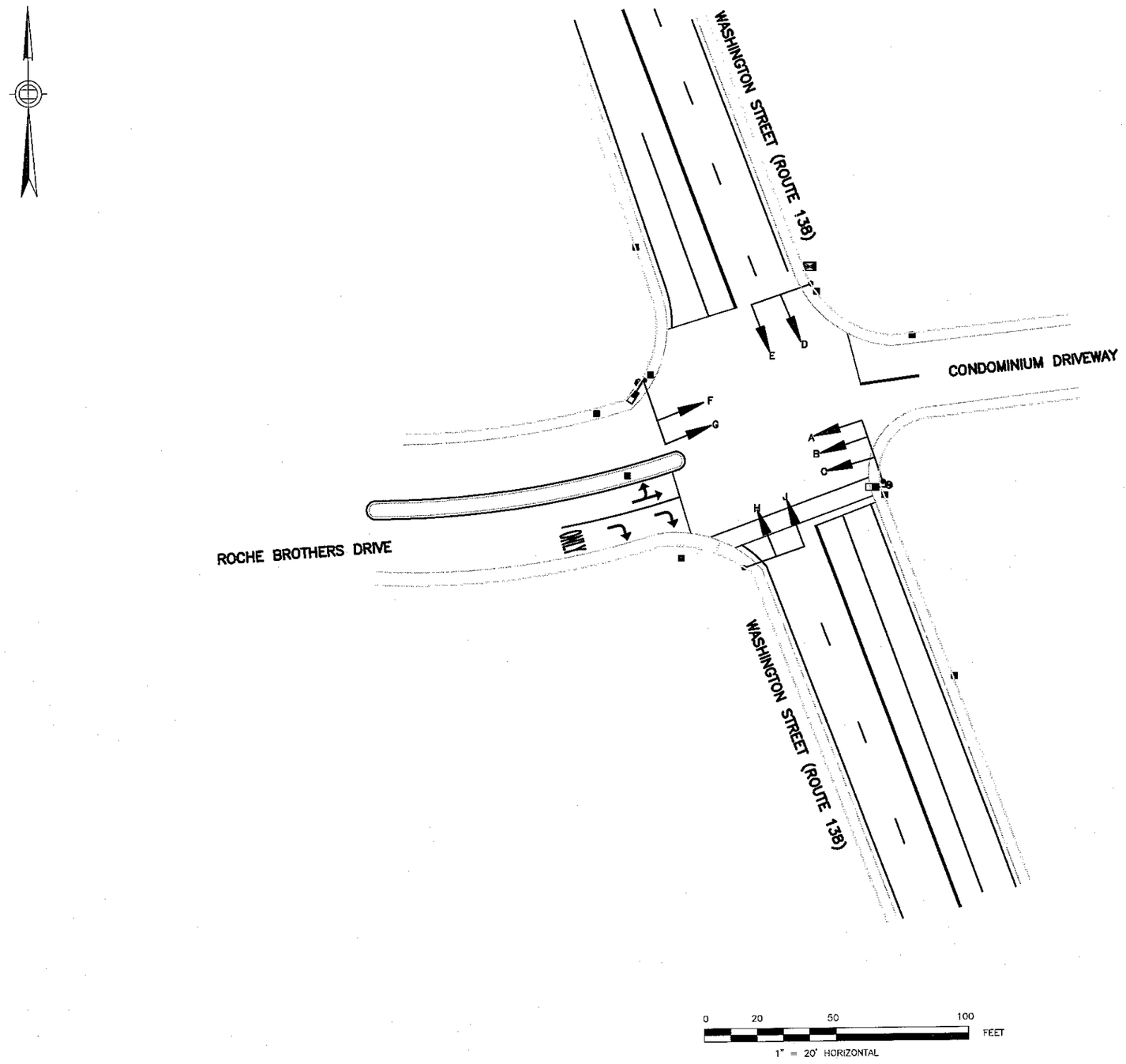
APPROVED BY:

STATE TRAFFIC ENGINEER Date

EASTON
WASHINGTON STREET (ROUTE 138) AT ROCHE BROTHERS DRIVEWAY

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	5-1287	01	2	3

LAYOUT PLAN



LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

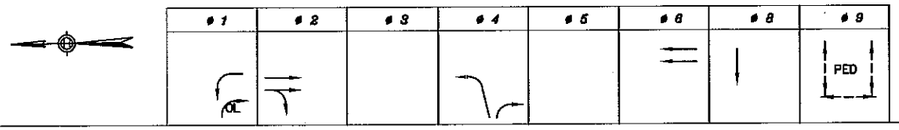
STATE TRAFFIC ENGINEER **Date**

1287P0101.DWG

EASTON
WASHINGTON STREET (ROUTE 138) AT ROCHE BROTHERS

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1287	01	3	3

TRAFFIC SIGNAL DATA



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TRAFFIC CODE
WASHINGTON ST (ROUTE 138)	NB-LT	E	GL	YL	RL	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	FRL
WASHINGTON ST (ROUTE 138)	NB	D	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	FY
WASHINGTON ST (ROUTE 138)	SB	H,J	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
ROCHE BROTHERS	EB-RT	C	R/GR	R/YR	R	R	R	R	R	R	R	GR	YR	R	R	R	R	R	R	R	R	R	R	R	R	FRR
ROCHE BROTHERS	EB	A,B	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	FR
CONDOMINIUM DRIVEWAY	WB	F,G	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	FR
PEDESTRIAN		ALL	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

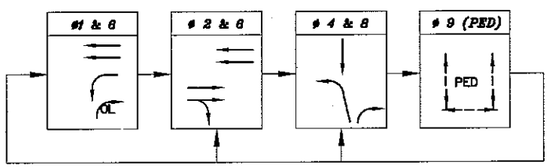
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MINIMUM GREEN (INITIAL)	6			10						6						10			6					
PASSAGE TIME (VEHICLE)	2			2						2						2			2					
MAXIMUM 1	14			50						20						50			20					
MAXIMUM 2	14			50						20						50			20					
YELLOW CLEARANCE		4			4						4						4			4				
RED CLEARANCE			1			2						1						2			1			
WALK (W)																						7		
PEDESTRIAN CLEARANCE																							15	
RECALL	NONE			NONE						NONE						NONE			NONE					
MEMORY	NON-LOCK			NON-LOCK						LOCKING						LOCKING			LOCKING					

EMERGENCY ONLY

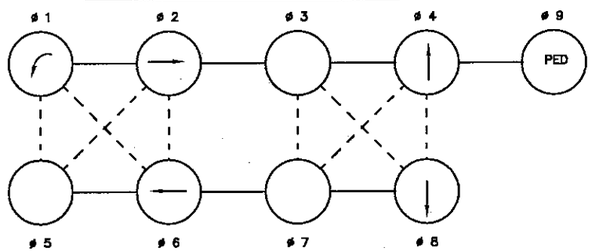
LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	X	XX		ø6	ø6	PRESENCE	0	0
2	X	XX		ø6	ø6	PRESENCE	0	0
3	X	XX		ø6	ø6	PRESENCE	0	0
4	X	XX		ø1	ø1	PRESENCE	0	0
5	X	XX		ø2	ø2	PRESENCE	0	0
6	X	XX		ø2	ø2	PRESENCE	0	0
7	X	XX		ø2	ø2	PRESENCE	0	0
8	X	XX		ø8	ø8	PRESENCE	0	0
9	X	XX		ø4	ø4	PRESENCE	6	0
10	X	XX		ø4	ø4	PRESENCE	6	0
51	X	XX		ø1	ø1	PRESENCE	6	0
52	X	XX		ø6	ø6	PRESENCE	6	0
53	X	XX		ø2	ø2	PRESENCE	0	0
54	X	XX		ø2	ø2	PRESENCE	0	0
55	X	XX						
56	X	XX		ø4	ø4	PRESENCE	0	0
57	X	XX		ø4	ø4	PRESENCE	0	0

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION
	SPANWIRE ASSEMBLY BASE & FDN.
	8' SIGNAL POLE, BASE, & FDN.
	10' SIGNAL POLE, BASE, & FDN.
4	MAST ARM ASSEMBLY, BASE, & FDN.
7	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
2	1 WAY, 5 SECTION SIGNAL HOUSING (12" LENS)
	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
2	PEDESTRIAN HOUSING
2	PEDESTRIAN PUSH BUTTON, SIGN, & SADDLES
9	LOOP DETECTOR AMPLIFIER
XX	ROADWAY LOOP DETECTOR
9	12" x 12" PULL BOX
	MAGNETIC DETECTOR
	MAGNETOMETER
	MAGNETIC AMPLIFIER
	OPTICOM RECEIVERS
	OPTICOM DUAL CHANNEL PHASE SELECTOR
	OPTICOM STROBE LIGHT
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø3, AND ø7 NOT USED.
2. EXCLUSIVE PEDESTRIAN TO BE ACTIVATED ONLY BY PEDESTRIAN ACTUATED PUSH BUTTON.

NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.

SIGNAL IDENTIFICATION NOTES:

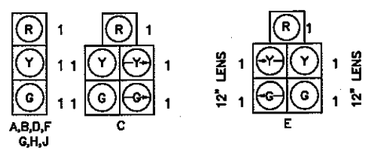
1. ALL SIGNAL HEADS DO HAVE 5" LOUVERED BACKPLATES
2. ALL RED SIGNAL LENSES SHALL BE 12" DIA.
3. ALL SIGNAL HEADS TO BE FIXED-MOUNTED.

FIELD NOTE:

1. LOOP DETECTORS WERE NOT VISIBLE.

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



ONE SECTION DUAL DISPLAY
12" LED/FIBER OPTIC
ALL

CONTROLLER MAKE & MODEL: EPAC 300
UTILITY POLE No. VERIZON 5
METER No.
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1287D01.01.DWG

(1)

VHB

Computations

stop sign ⊤ street sign

flashing beacon signal ahead

light pole

HR = Handicap Ramp

1 = Historic downtown → Govt. Center Flint Village

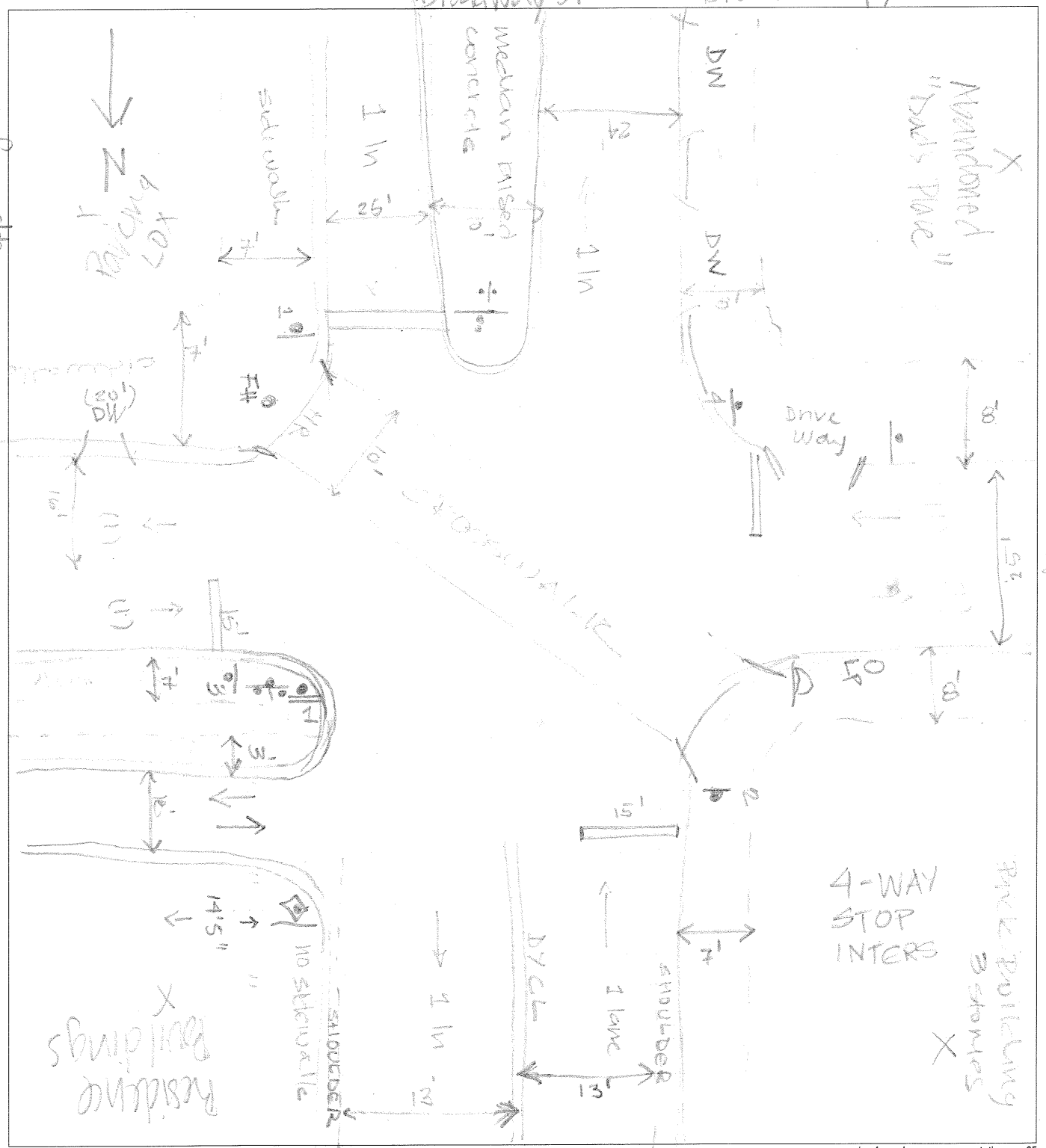
Project: SCR Project # 10111.31

Location: Fall River Sheet of

Calculated by: SJL Date: 9/10/08

Checked by: Date:

Title Driveway - Anawan/Pocasset St @ Broadway/David St



* 4 way stop int
* WB app at grade = 1%

* posted speed limit 30 MPH @ Pocasset St

mkgr.forms.humanres.computations.pm65

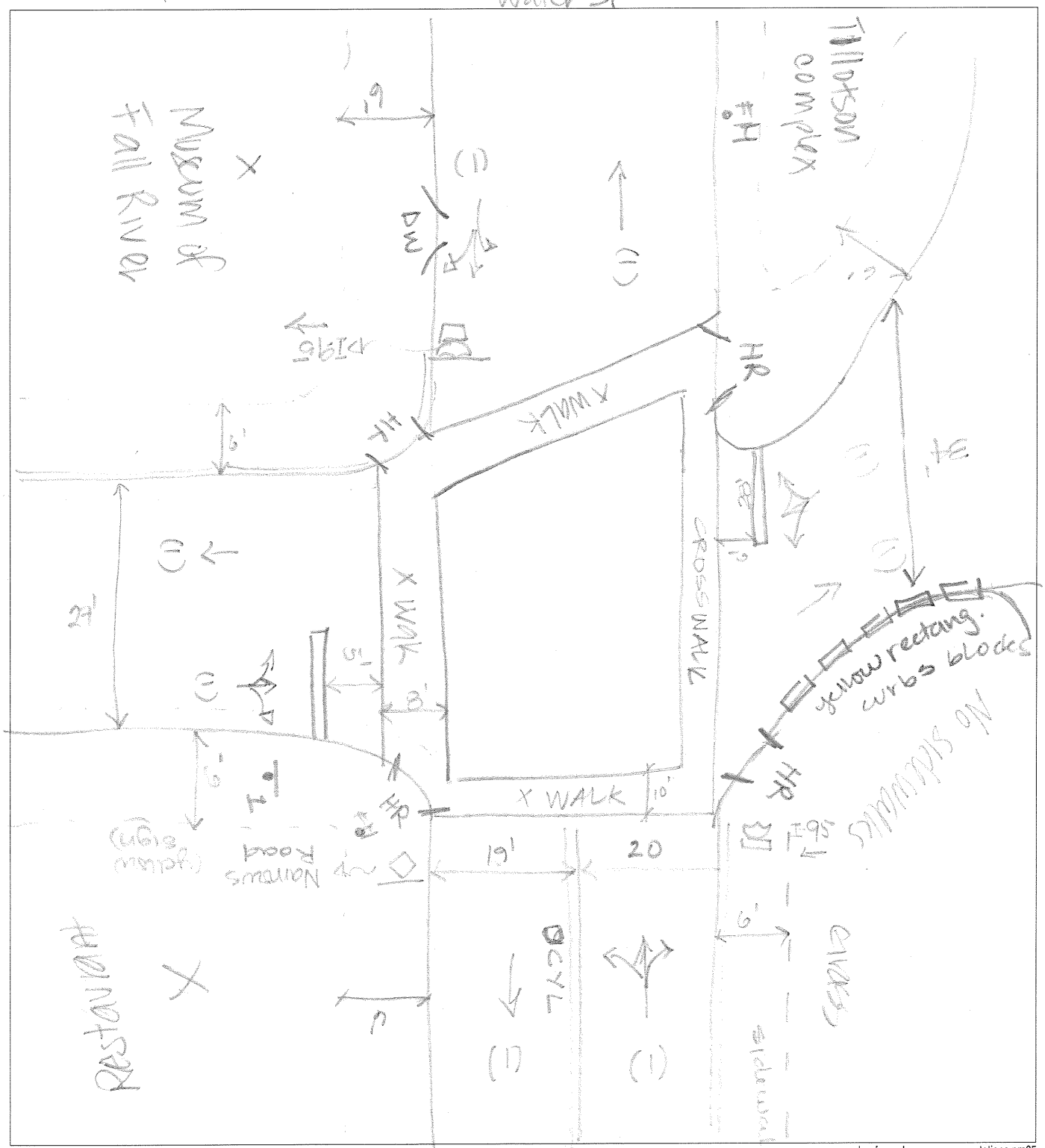
(7)

VHB *Computations*

Project: 10111.31 Project # SCR
Location: Fall River Sheet 1 of 1
Calculated by: NL Date: 9/10/08
Checked by: Date:
Title Inv. Anawan @ Water St

stop signs
Interstate signs

Pavem. cond = fair
x-walks → brick pavers



(3)

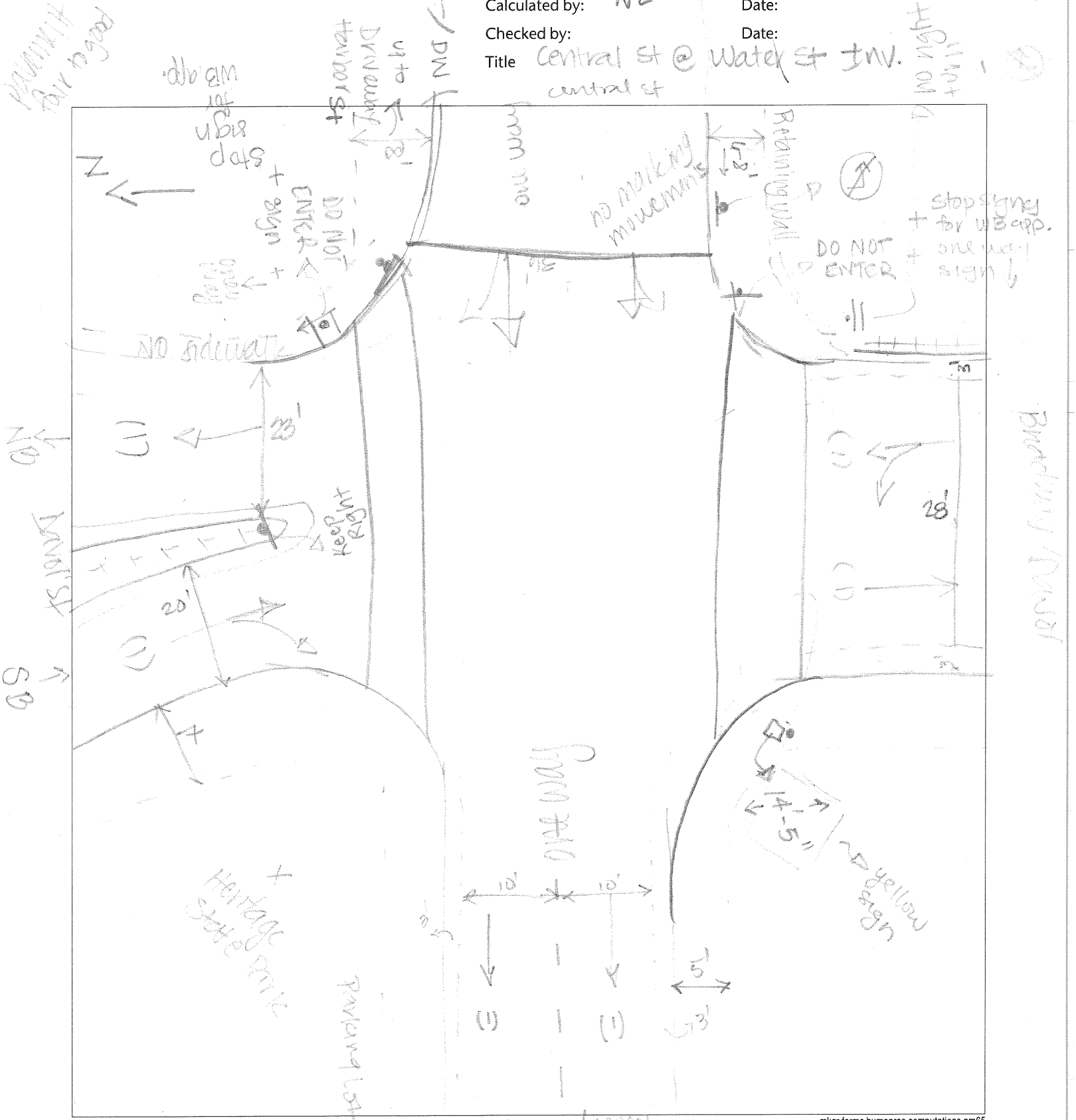
VHB

Computations

+ street signs

Project: SCR
Location: Fall River
Calculated by: NL
Checked by:
Title Central St @ Water St Inv.

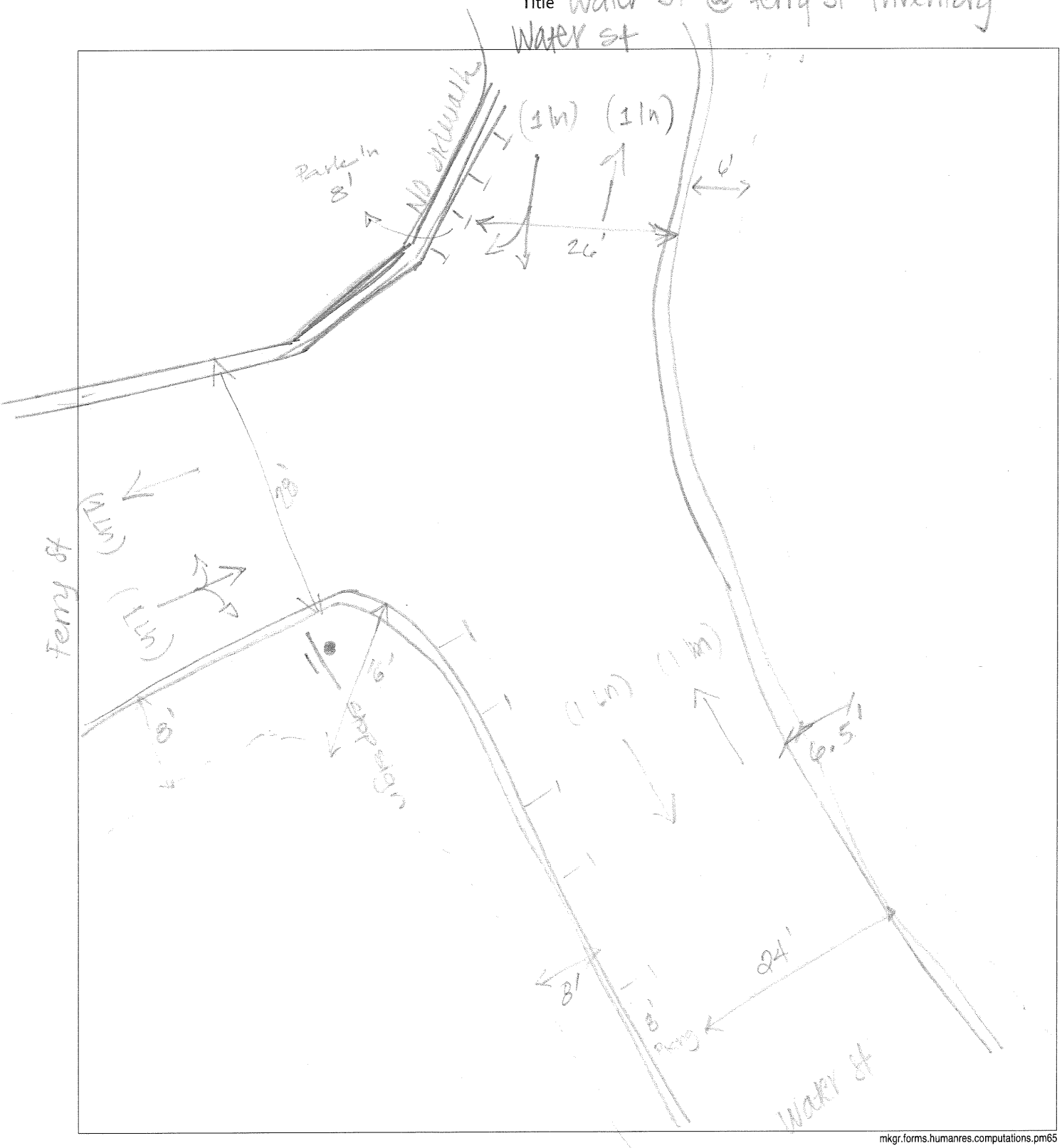
Project # 10111.31
Sheet of
Date:
Date:



(A)

VHB *Computations*

Project: SCR Project # 10111.31
Location: Fall River Sheet 1 of
Calculated by: NL Date:
Checked by: Date:
Title Water St @ Ferry St Inventory



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VHB

Traffic Signal Inventory

1. Intersection Location

Pawt St. NB @ President Ave — Intersection Name

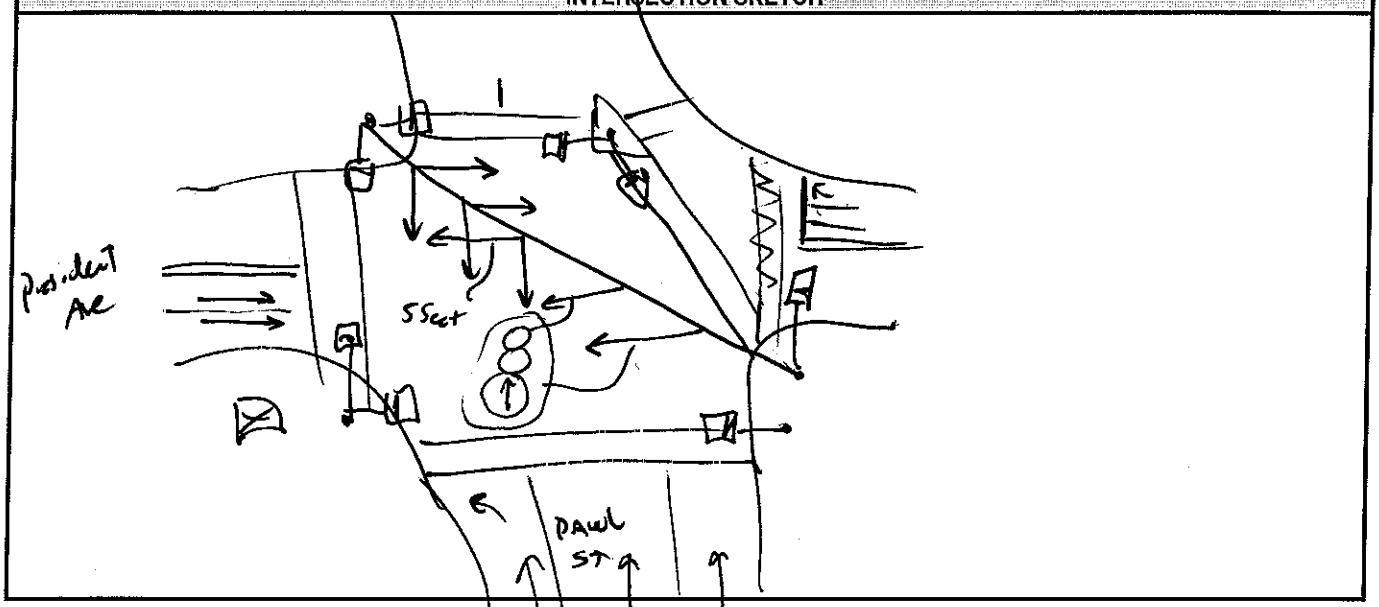
Fall River, MA — City or Town

N/A — RIDOT Traffic Signal #

9/4/07 — Date of Inventory

WLA — Inventory Conducted By

INTERSECTION SKETCH



Showing Cabinet Location, Signal Poles, Signal and Pedestrian Signals

Equipment				
Mast Arms	Yes ☐	No ☒		
Strain Poles	Embedded ☐	Bolted ☒		
Tether Wire	Yes ☒	No ☐	N/A ☐	
Overhead Signal Heads	Free Swinging ☐	Rigid ☒	N/A ☐	w/ Tether
Signal Head Visor Condition	Good ☒	Fair ☐	Poor ☐	
R10-12 Signs (prot/perm lefts)	Yes ☐	No ☒	N/A ☐	
LED Signal Heads	Some ☐	All ☒	None ☐	
Backplates	Yes ☒	No ☐		
Proper Signal Head Placement	Yes ☒	No ☐		
ADA pedestrian pushbuttons (2")	Yes ☒	No ☐	N/A ☐	
Pedestrian Signal Type	LED filled in ☐	LED ☒	Fiber ☐	Incand. ☐
Pedestrian Signal Displays	Overlapping Hand/Man ☒	Separate Hand/Man ☐	Words ☐	
Overall Condition	Good ☒	Fair ☐	Poor ☐	

VHB

Traffic Signal Inventory

2. Cabinet

Cabinet - External				
Size	"P" ☒	"M" ☐	Other ☐	If "Other" Size:
Mounting	Ground ☒	Pole ☐	Other ☐	
Meter Socket	Yes ☒	No ☐		
Concrete Pad	Yes ☒	No ☐	N/A ☐	
Manual Control	Yes ☐	No ☐		NOT CHECKED
Overall Cabinet Condition	Good ☒	Fair ☐	Poor ☐	
Photo of Inside of Cabinet Taken	Yes ☒	No ☐		

Police Door Switches	NOT CHECKED
Documentation in Cabinet	Box Plans only + 1 copy controller manual

3. Controller Data

Manufacturer	Model No.	Serial No.	Software Rev. Level/Date
EAGLE	EPAC	67660	3.32d Sept 00

Controller				
Type	NEMA - keyboard ☒	NEMA - Modular ☐	Non-NEMA ☐	Electromechanical ☐
Platform	TS1 ☐	TS2 Type 1 ☒	TS2 Type 2 ☐	
Phase Capable Controlling Leg	2 Phase ☐	4 Phase ☐	8 Phase ☒	
Setting Type	Keyboard ☒	Thumbwheel ☐	Dial ☐	Pin ☐
Controller Condition	Good ☒	Fair ☐	Poor ☐	

Misc.		
Backpanel Size	12 Pos.	
Conflict Monitor/MMU	Manufacturer: EDI	Model/Size: MMU-16E
Detector Relays	Manufacturer: EDI	Quantity/Type: 3 - 2-channel
Detector Relay Channels Faulting (list channel numbers)	RELAYS NOT SHOWING ANY INDICATIONS (CALLS OR FAULTS) - BUT DOES HAVE POWER + IS TRANSMITTING?	

VHB

Traffic Signal Inventory

4. *Signal Timing Sheet*

01	02 President Ave EB	03 Daval ST NB
04	05 President Ave EB-LT	06 President Ave WB
07	~~08~~ ϕ9: PED - EXCLUSIVE	OLA
OLB	OLC	OLD

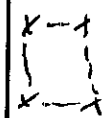
PHASE	01	02	03	04	05	06	07	08
Minimum Green (initial)		6	6		6	6		
Extension (passage) Vehicle Interval		3.0	3.0		3.0	3.0		
Yellow		3	3		3	3		
Red Clear		2	2		2	2		
Maximum Green I		15	33		27	27		
Maximum Green II		15	33		27	27		
Pedestrian Walk								
Pedestrian Clear								
Walk (flash/steady)								
Recall		SOFT				SOFT		
Memory								

ϕ9
3
7
15
EXT PCL = 2

Intersection Movements:

01	02	03	04	05	06	07	08
	MEM			PROT			

ϕ9



Coordination Data: COORD = 1|1|0|2|0|0

None → ZERO OFFSET

Pattern	Days	Time Period	Cycle L.	Offset	SPLIT TIMES 01	02	03	04	05	06	07	08
0|0|4	1	0:00 -										
0|0|4	2-7	0:00 - 06:00										
1|1|1	2-7	06:00 - 22:00	75	0		30	35		12	18		
0|0|4	2-7	22:00 - 0:00										

ϕ9

10

ϕ2 + ϕ6 = COORD PH

DATA = 9/4/07 12:36:30

VHB

Traffic Signal Inventory

5. Notes

- ALL LOOPS NOT WORKING AT RAMPS (ALL GOING TO MAX)

- ϕ1 PED TIMES: 7/15
  SPLIT = 10 SECONDS
  ∴ INTERSECTION PROBS OUT OF COORD W/ PED ACTUATION

NOTE: FULL INSPECTION NOT PERFORMED
(INCLUDING OPERATION OF PED. BUTTONS + LOOPS)

6. Recommendations

VHB

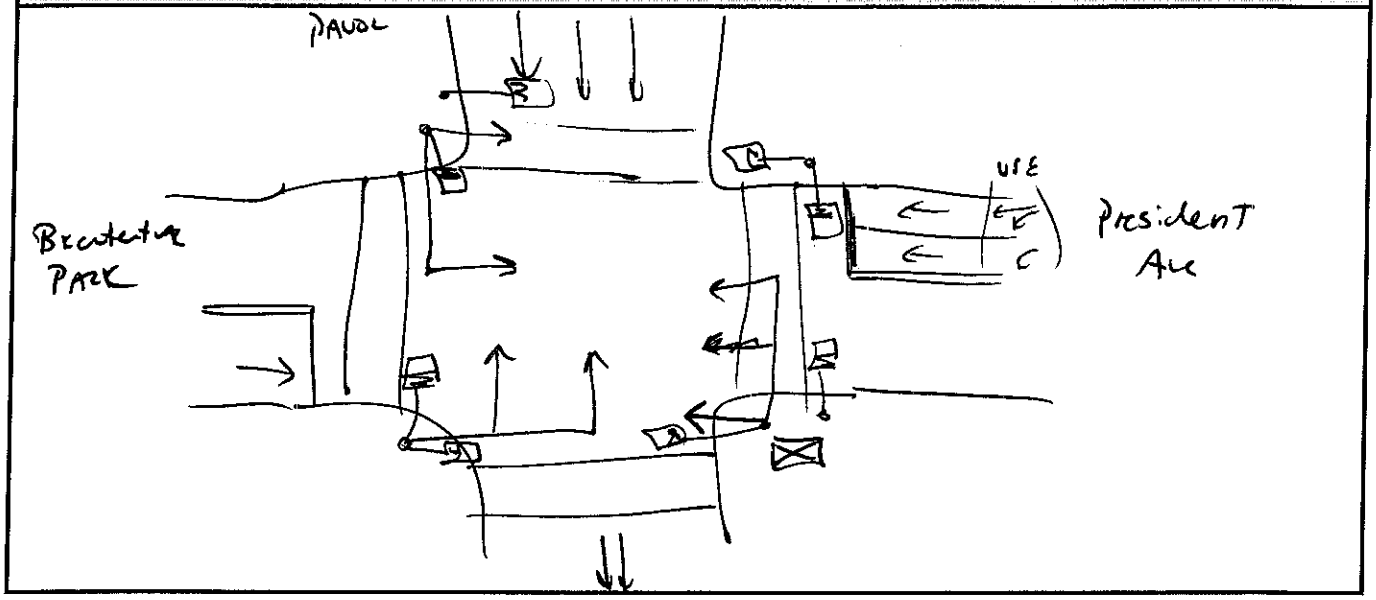
Traffic Signal Inventory

1. Intersection Location

Intersection Name	City or Town
Daval St. SB @ President Ave	Fall River, MA

RIDOT Traffic Signal #	Date of Inventory	Inventory Conducted By
N/A	9/4/07	WRA

INTERSECTION SKETCH



Showing Cabinet Location, Signal Poles, Signal and Pedestrian Signals

Equipment				
Mast Arms	Yes ☒	No ☐		
Strain Poles	Embedded ☐	Bolted ☐		
Tether Wire	Yes ☐	No ☐	N/A ☒	
Overhead Signal Heads	Free Swinging ☐	Rigid ☒	N/A ☐	
Signal Head Visor Condition	Good ☒	Fair ☐	Poor ☐	
R10-12 Signs (prot/perm lefts)	Yes ☐	No ☒	N/A ☐	
LED Signal Heads	Some ☐	All ☒	None ☐	
Backplates	Yes ☒	No ☐		
Proper Signal Head Placement	Yes ☒	No ☐		
ADA pedestrian pushbuttons (2")	Yes ☒	No ☐	N/A ☐	
Pedestrian Signal Type	LED filled in ☐	LED ☒	Fiber ☐	Incand. ☐
Pedestrian Signal Displays	Overlapping Hand/Man ☐	Separate Hand/Man ☐	Words ☐	
Overall Condition	Good ☒	Fair ☐	Poor ☐	

VHB

Traffic Signal Inventory

2. Cabinet

Cabinet - External				
Size	"P" ☒	"M" ☐	Other ☐	If "Other" Size:
Mounting	Ground ☒	Pole ☐	Other ☐	
Meter Socket	Yes ☒	No ☐		
Concrete Pad	Yes ☐	No ☐	N/A ☒	IN BIT AREA
Manual Control	Yes ☐	No ☐		NOT CHECKED
Overall Cabinet Condition	Good ☒	Fair ☐	Poor ☐	
Photo of Inside of Cabinet Taken	Yes ☒	No ☐		

Police Door Switches	NOT CHECKED
Documentation in Cabinet	~~NONE~~ BOX PLANS only

3. Controller Data

EAGLE	EPAC	67659	3.32d Sept 06
Manufacturer	**Model No.**	**Serial No.**	**Software Rev. Level/Date**

Controller				
Type	NEMA - keyboard ☒	NEMA - Modular ☐	Non-NEMA ☐	Electromechanical ☐
Platform	TS1 ☐	TS2 Type 1 ☒	TS2 Type 2 ☐	
Phase Capable Controlling Leg	2 Phase ☐	4 Phase ☐	8 Phase ☒	
Setting Type	Keyboard ☒	Thumbwheel ☐	Dial ☐	Pin ☐
Controller Condition	Good ☒	Fair ☐	Poor ☐	

Misc.		
Backpanel Size	12 Pos.	
Conflict Monitor/MMU	Manufacturer: EDI	Model/Size: MMU-16E
Detector Relays	Manufacturer: EDI	Quantity/Type: 2-2 channel
Detector Relay Channels Faulting (list channel numbers)	NONE	

VHB

Traffic Signal Inventory

4. Signal Timing Sheet

01	02 PARK ~~EB~~	03
04 DAUOL ST SB	05	06 President AVE WB
07	~~08~~ Ø9 PED EXCLUSIVE	OLA
OLB	OLC	OLD

PHASE	01	02	03	04	05	06	07	08
Minimum Green (initial)		4		12		12		
Extension (passage) Vehicle Interval		3.0		3.0		3.0		
Yellow		4		4		4		
Red Clear		2		2		2		
Maximum Green I		12		36		30		
Maximum Green II		12		36		30		
Pedestrian Walk								
Pedestrian Clear								
Walk (flash/steady)								
Recall								
Memory								

Ø9 — 3 — 7 — 15 — Ext PC = 2

(Ø6 = SOFT RECALL)

Intersection Movements:

01	02	03	04	05	06	07	08

Ø9 (PED)

Coordination Data:

DATA: 1|1|0|2|d|1 → 0 = BEGINNING GREEN

None

					SPLIT TIMES							
Pattern	Days	Time Period	Cycle L.	Offset	01	02	03	04	05	06	07	08
0|0|4	1	0:00-										
0|0|4	2-7	0:00- 06:00										
1|1|1	2-7	06:00- 22:00	75	5		16		25		20		
0|0|4	2-7	22:00- 0:00										

Free — Ø9 — 14

Ø4 = COORD PH
Ø6 = MIN RECALL
> RD 7.0.D

9/4/07 12:20:30

VHB

Traffic Signal Inventory

5. Notes

ϕ9 PED TIME = 7/15
SPLIT = 14 SECONDS

∴ INTERSECTION DROPS OUT OF COORDINATION w/ PED ACTUATIONS

- INTERSECTION APPEARS TO OPERATE CORRECTLY

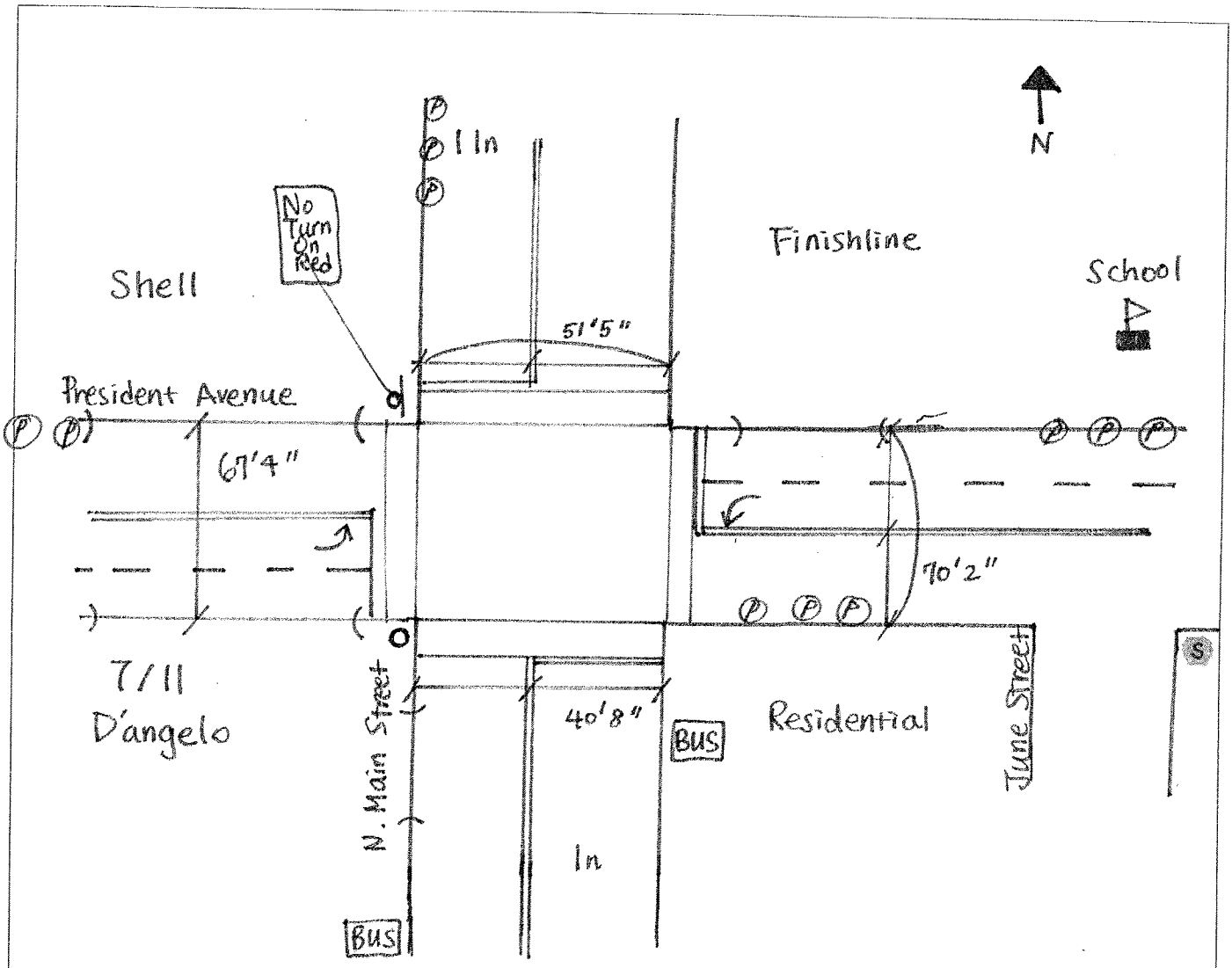
NOTE: FULL INSPECTION NOT PERFORMED
INCLUDING OPERATION OF PED BUTTONS + LOOPS

6. Recommendations

Project: Rt. 79
Location: Fall River
Calculated by: GS
Checked by:
Title PI

Project # 16137.00
Sheet 1 of 8
Date: Tues, 5/22, 2007
Date:

President Avenue @ N. Main Street



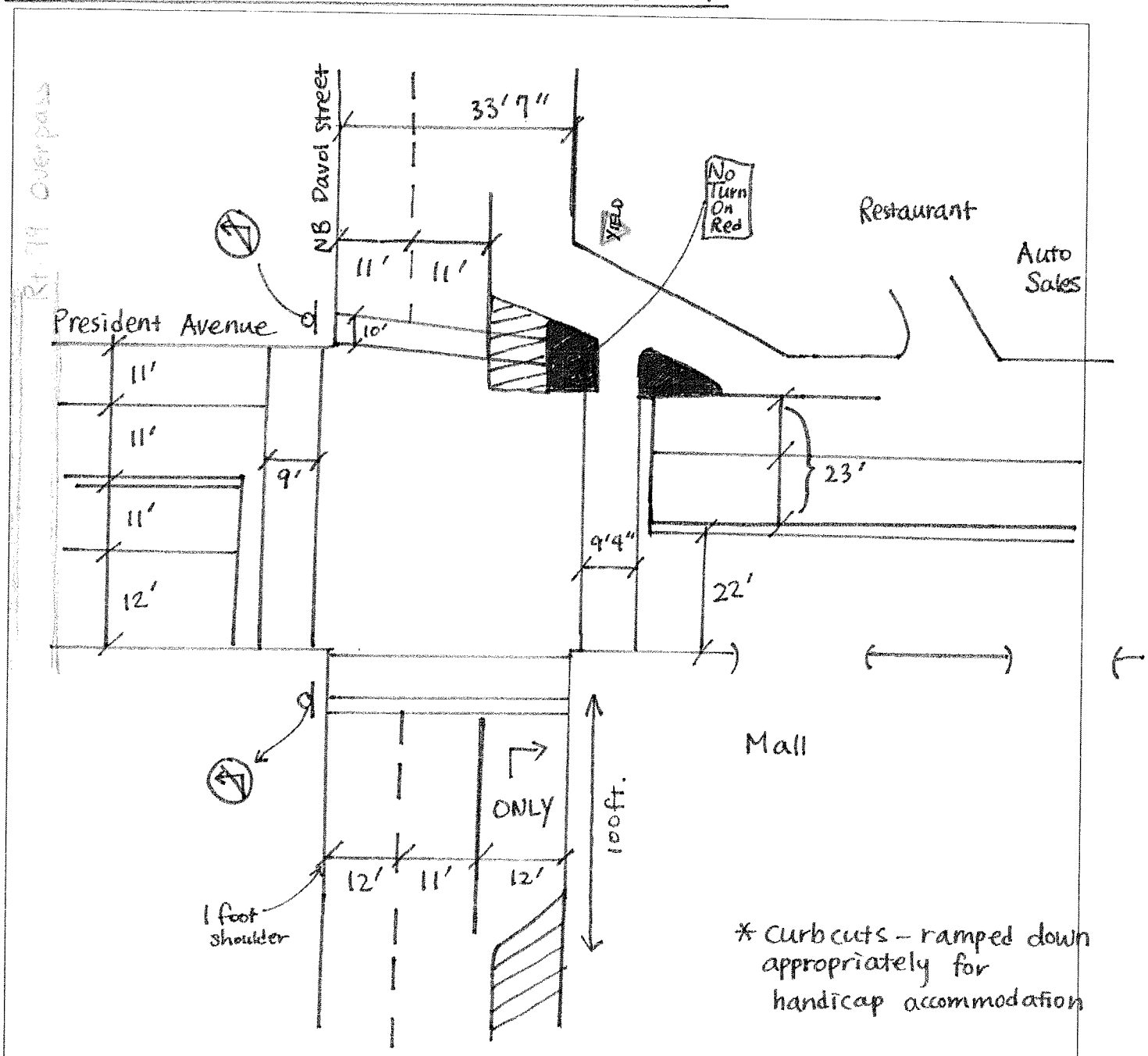
* Ped. Push buttons at all corners

* BUS SRTA - ②

Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

Project # 10137.00
Sheet 5 of 8
Date: Tues, May 22, 2007
Date:

Davol Street NB @ President Avenue (East)

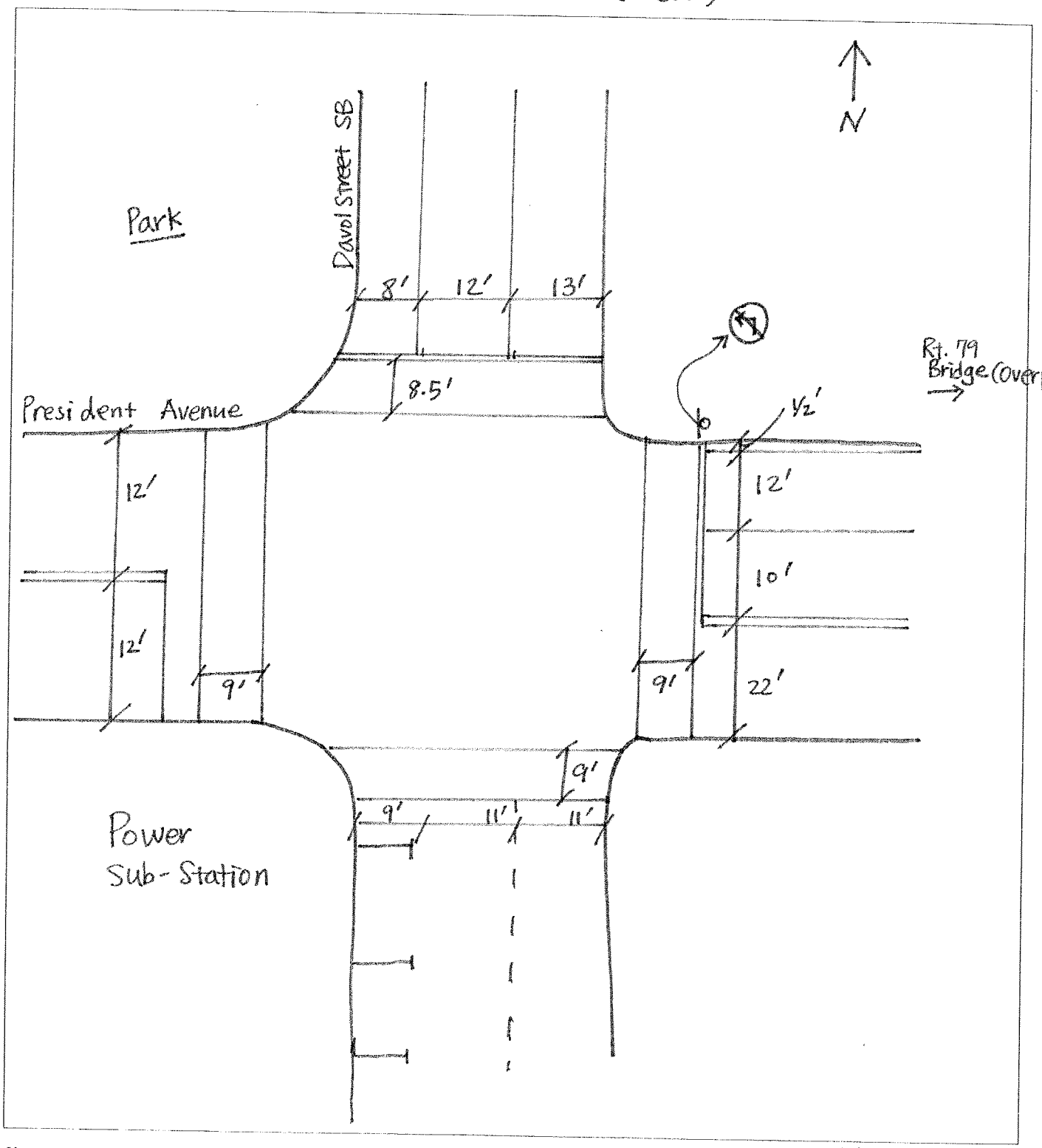


* Curb cuts - ramped down appropriately for handicap accommodation

Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

Project # 10137.00
Sheet 4 of 8
Date: Tuesday, May 22, 2007
Date:

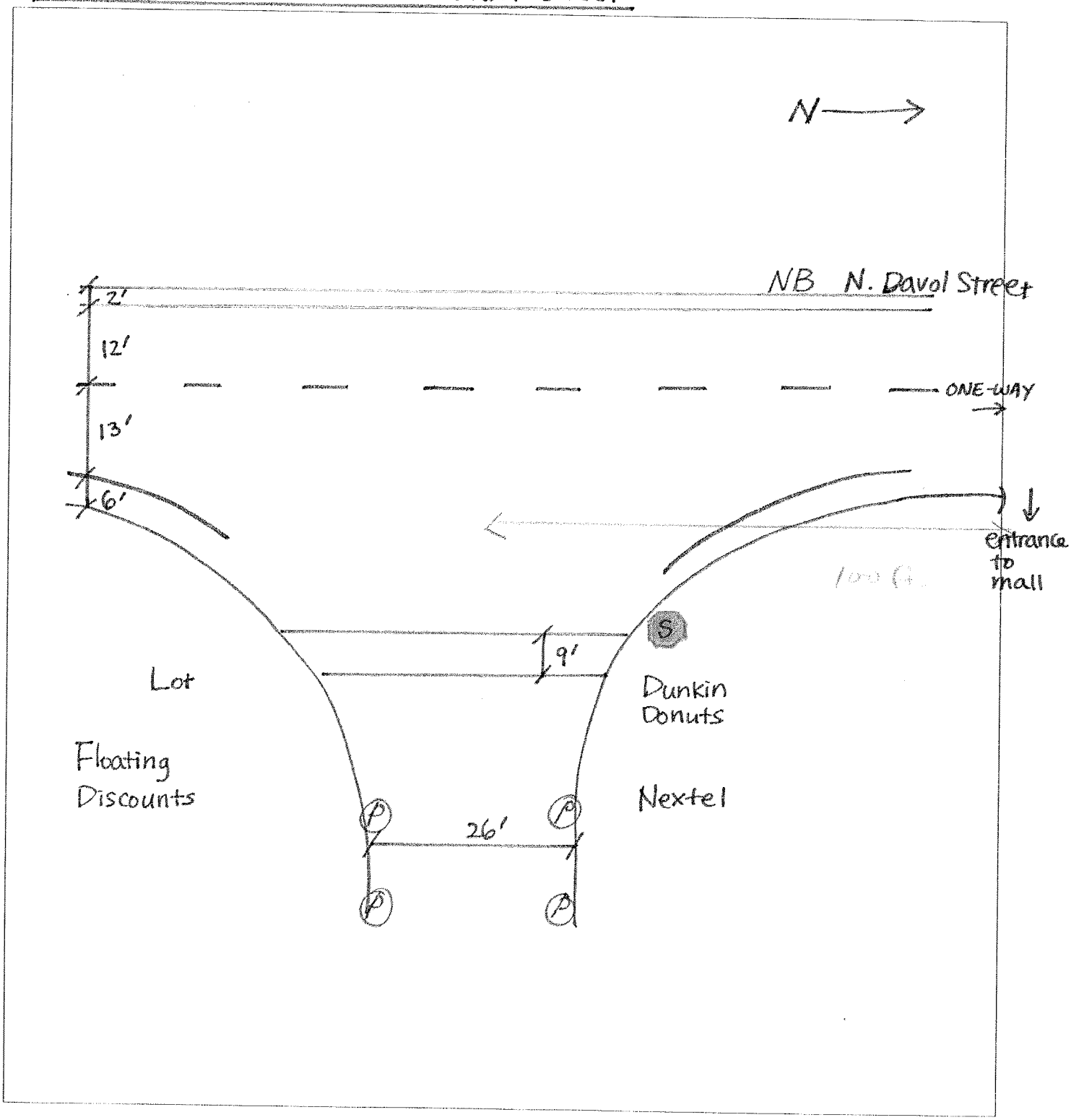
Davol Street SB @ President Avenue (West)



Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

Project # 10137.00
Sheet 6 of 8
Date: Tuesday, May 22, 2007
Date:

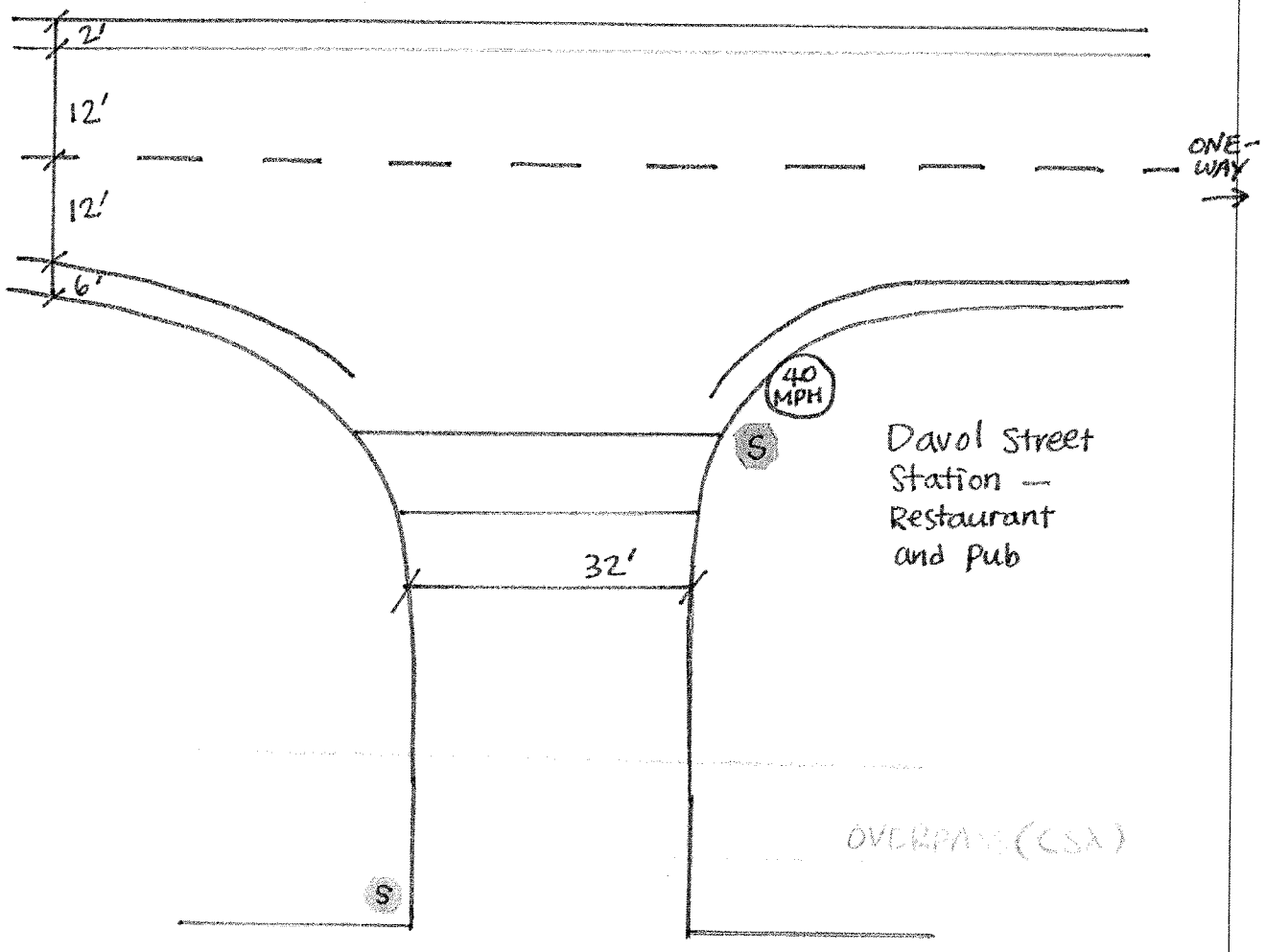
Pearce Street @ NB. N. Davol Street



Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

Project # 10137.00
Sheet 7 of 8
Date: May 22, 2007
Date:

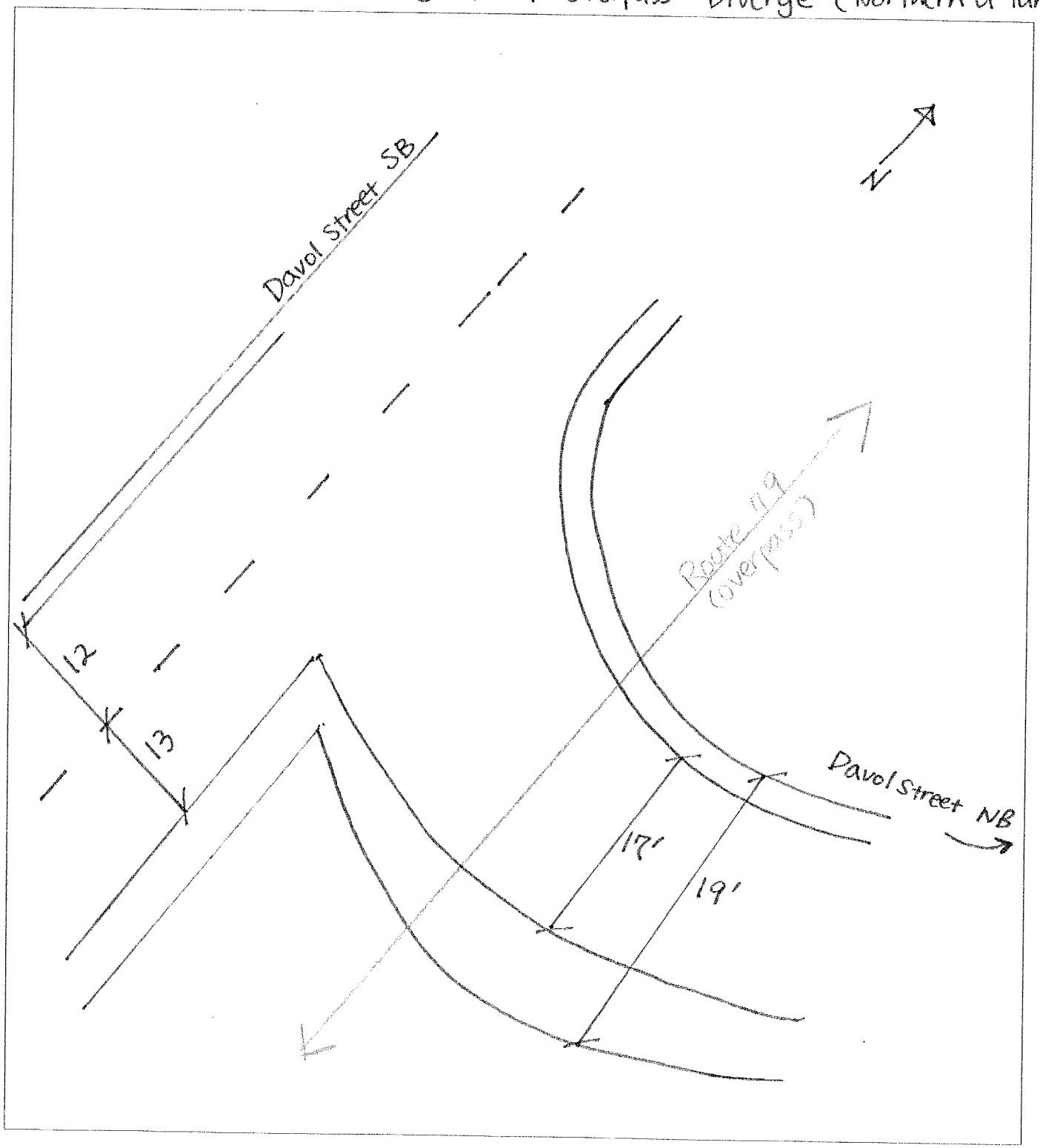
Turner Street @ NB. N. Davol Street



Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

Project # 10137.00
Sheet 2 of 8
Date: Tues, May 22, 2007
Date:

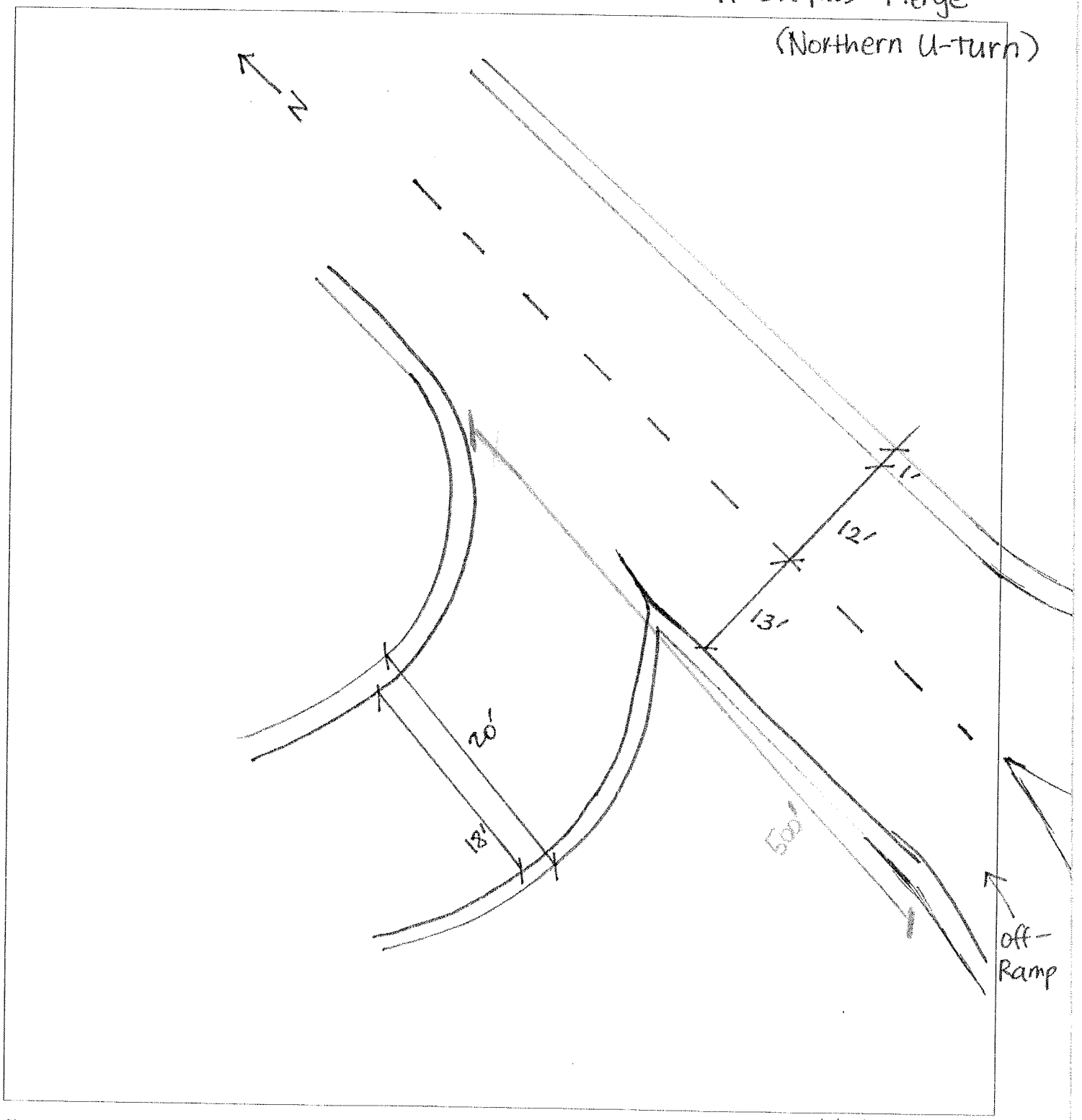
Davol Street SB U-turn @ Rt. 79 Overpass - Diverge (Northern U-turn)



Project: Rt. 79
Location: Fall River, MA
Calculated by: GS
Checked by:
Title PI

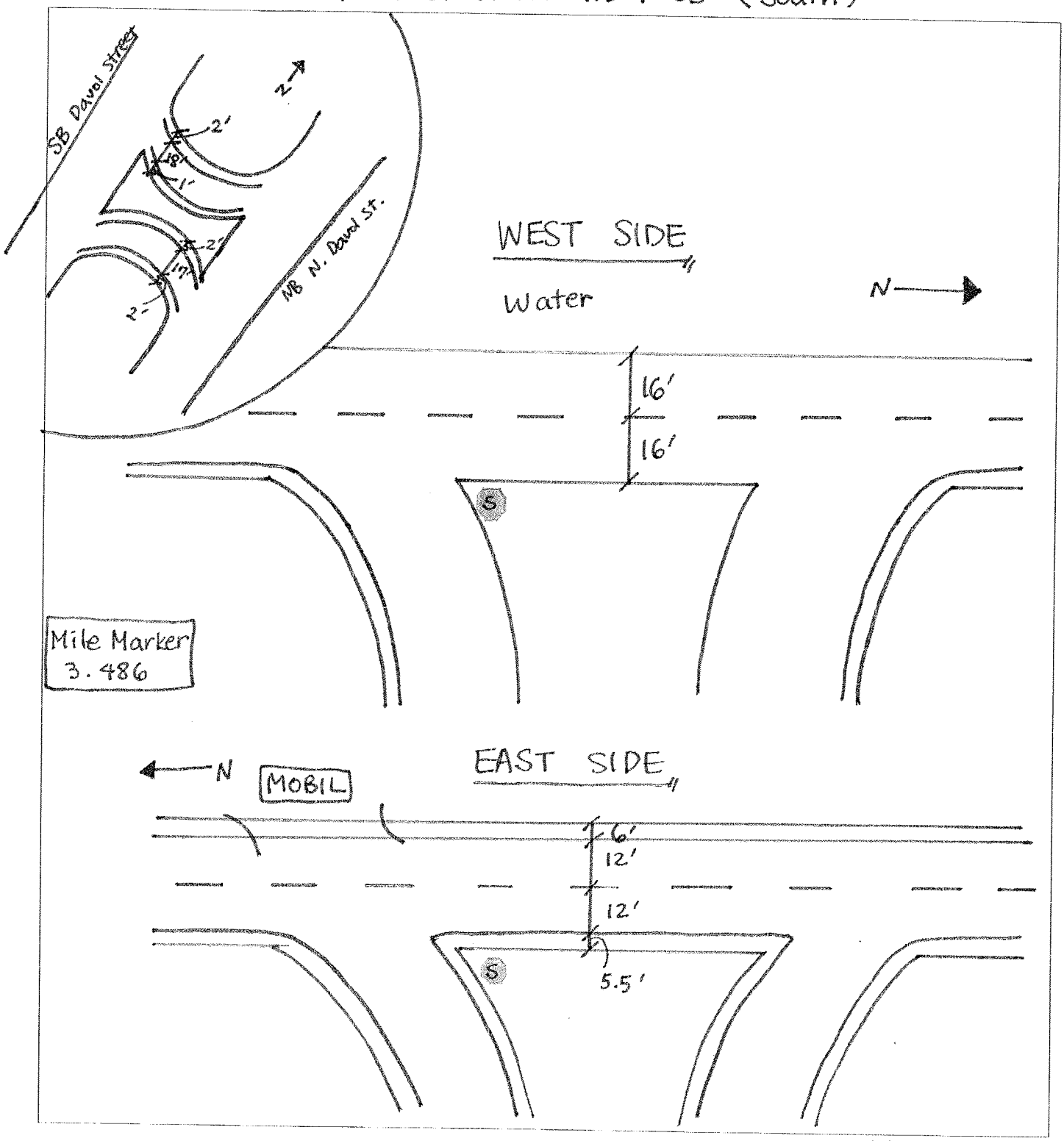
Project # 10137.00
Sheet 3 of 8
Date: Tues, May 22, 2007
Date:

Davol Street U-turn to NB Davol Street @ Rt. 79 Overpass - Merge



Project: Rt. 79 Project # 10137.00
Location: Fall River, MA Sheet 8 of 8
Calculated by: GS Date: Tuesday, May 22, 2007
Checked by: Date:
Title PI

U-Turns between Davol Street NB & SB (South)



VHB Traffic Signal Inventory

1. Intersection Location

North Main St @ President Ave
Intersection Name

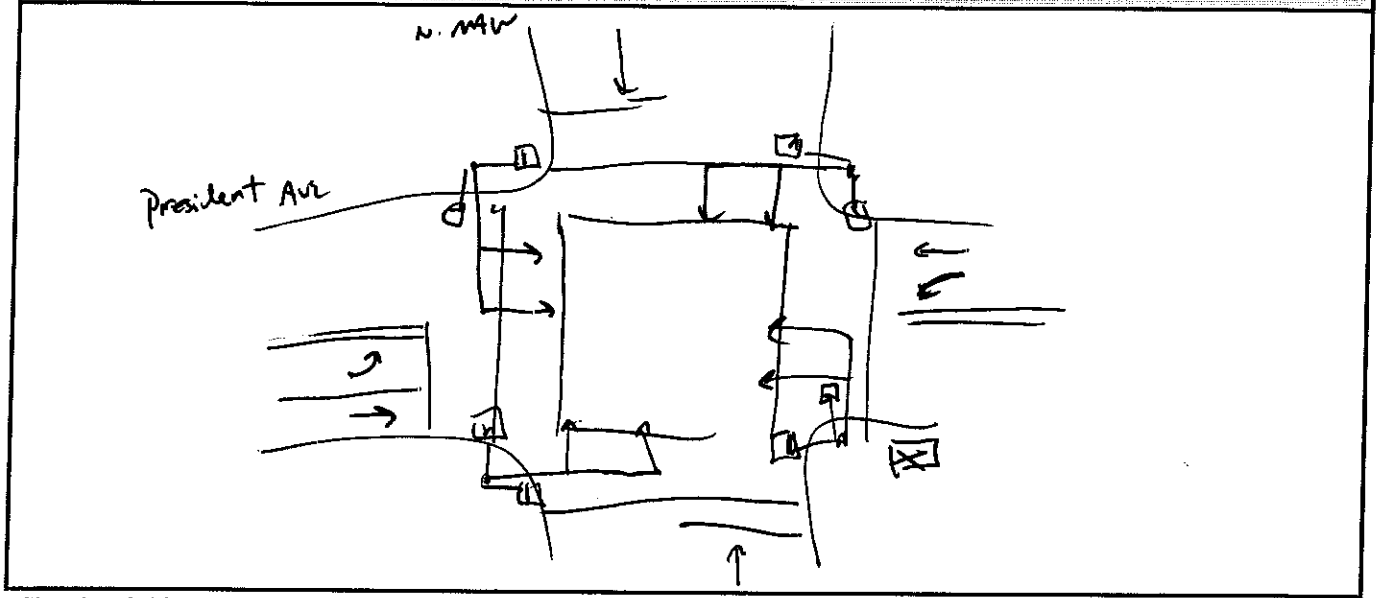
Fall River, MA
City or Town

N/A
RIDOT Traffic Signal #

9/4/07
Date of Inventory

CMA
Inventory Conducted By

INTERSECTION SKETCH



Showing Cabinet Location, Signal Poles, Signal and Pedestrian Signals

Equipment				
Mast Arms	Yes ☒	No ☐		
Strain Poles	Embedded ☐	Bolted ☐		NO
Tether Wire	Yes ☐	No ☐	N/A ☒	
Overhead Signal Heads	Free Swinging ☒	Rigid ☐	N/A ☐	
Signal Head Visor Condition	Good ☐	Fair ☒	Poor ☐	
R10-12 Signs (prot/perm lefts)	Yes ☐	No ☐	N/A ☒	
LED Signal Heads	Some ☐	All ☒	None ☐	APPEAR TO BE - SOME NOT SURE
Backplates	Yes ☐	No ☒		
Proper Signal Head Placement	Yes ☒	No ☐		
ADA pedestrian pushbuttons (2")	Yes ☐	No ☒	N/A ☐	OLD SMALL BUTTONS
Pedestrian Signal Type	LED filled in ☐	LED ☐	Fiber ☐	Incand. ☒
Pedestrian Signal Displays	Overlapping Hand/Man ☐	Separate Hand/Man ☐	Words ☒	OVERLAPPING
Overall Condition	Good ☐	Fair ☒	Poor ☐	

VHB

Traffic Signal Inventory

2. Cabinet

Cabinet - External				
Size	"P" ☒	"M" ☐	Other ☐	If "Other" Size:
Mounting	Ground ☒	Pole ☐	Other ☐	
Meter Socket	Yes ☒	No ☐		
Concrete Pad	Yes ☐	No ☐	N/A ☒	BACK OF SIDEWALK
Manual Control	Yes ☐	No ☐		NOT CHECKED
Overall Cabinet Condition	Good ☐	Fair ☒	Poor ☐	
Photo of Inside of Cabinet Taken	Yes ☐	No ☐		

Police Door Switches	NOT CHECKED
Documentation in Cabinet	NONE

3. Controller Data

SAGE	EPAC	61900	3.32d (Sept 00)
Manufacturer	**Model No.**	**Serial No.**	**Software Rev. Level/Date**

Controller				
Type	NEMA - keyboard ☒	NEMA - Modular ☐	Non-NEMA ☐	Electromechanical ☐
Platform	TS1 ☒	TS2 Type 1 ☐	TS2 Type 2 ☐	
Phase Capable Controlling Leg	2 Phase ☐	4 Phase ☐	8 Phase ☒	
Setting Type	Keyboard ☒	Thumbwheel ☐	Dial ☐	Pin ☐
Controller Condition	Good ☒	Fair ☐	Poor ☐	

Misc.		
Backpanel Size	12 BUS	
Conflict Monitor/MMU	Manufacturer: EDI	Model/Size: MSM-12
Detector Relays	Manufacturer: SARASOTA S36T	Quantity/Type: 4 - 2 CHANNEL
Detector Relay Channels Faulting (list channel numbers)	7&8 LABELED "President Ave PHASE" FAULTING RESET - OK FOR NOW BY UKB	

VHB

Traffic Signal Inventory

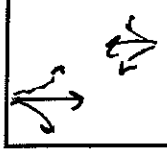
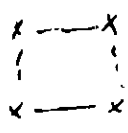
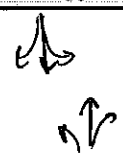
4. Signal Timing Sheet

01 President Ave EB/WB	02 PED (EXCL)	03 N. MAIN ST NB/SB
04	05	06
07	08	OLA
OLB	OLC	OLD

PHASE	01	02	03	04	05	06	07	08
Minimum Green (initial)	8		8					
Extension (passage) Vehicle Interval	5.0		6.0					
Yellow	3	3	3					
Red Clear	1		1					
Maximum Green I	35		25					
Maximum Green II	45		35					
Pedestrian Walk		10						
Pedestrian Clear		12						
Walk (flash/steady)								
Recall	SOFT							
Memory	LOCK		LOCK					

INT PH = 2

Intersection Movements:

01	02	03	04	05	06	07	08
							

Coordination Data:

X None

					SPLIT TIMES							
Pattern	Days	Time Period	Cycle L.	Offset	01	02	03	04	05	06	07	08

CLOCK OFF - controller = 12:43:30
WATCH = 1:04:35

VHB

Traffic Signal Inventory

5. Notes

- POOR PAVEMENT MARKINGS (EXCEPT SL, CW + ARROWS)

- ϕ1 WAS DROPPING CALLS
  TRAFFIC TOO HEAVY TO SERVE ϕ3

- INTERSECTION APPEARED TO OPERATE PROPERLY

NOTE: FULL INSPECTION NOT PERFORMED
INCLUDING OPERATION OF PED. BUTTONS + LOOPS

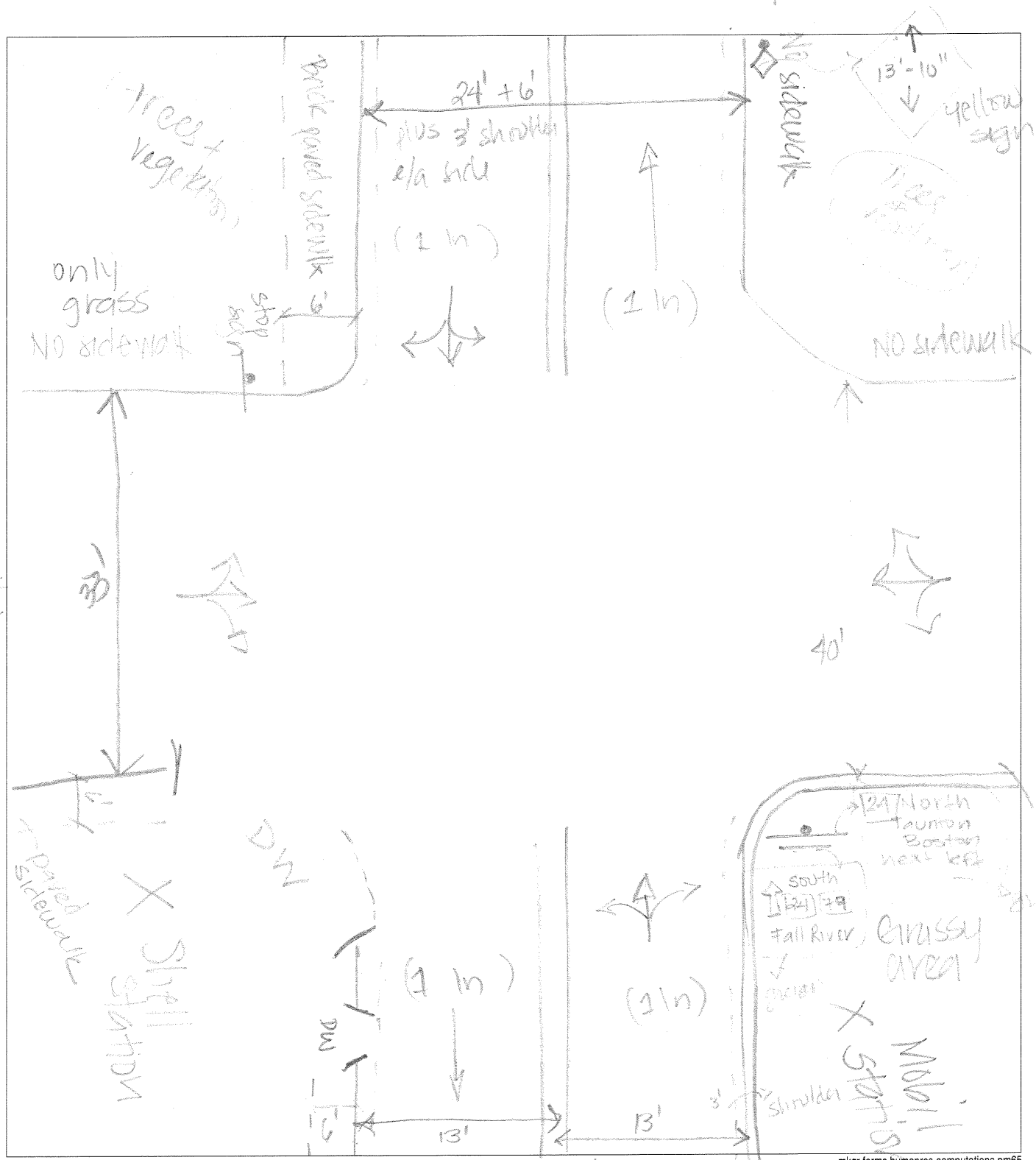
6. Recommendations

Computations

★ 40 MPH on S. Main St

Project: SCR
Location: FREETOWN
Calculated by: NL
Checked by:
Title S. Main St @ Ridge Hill

Project # 10111.31
Sheet of
Date: 9/10/08
Date:

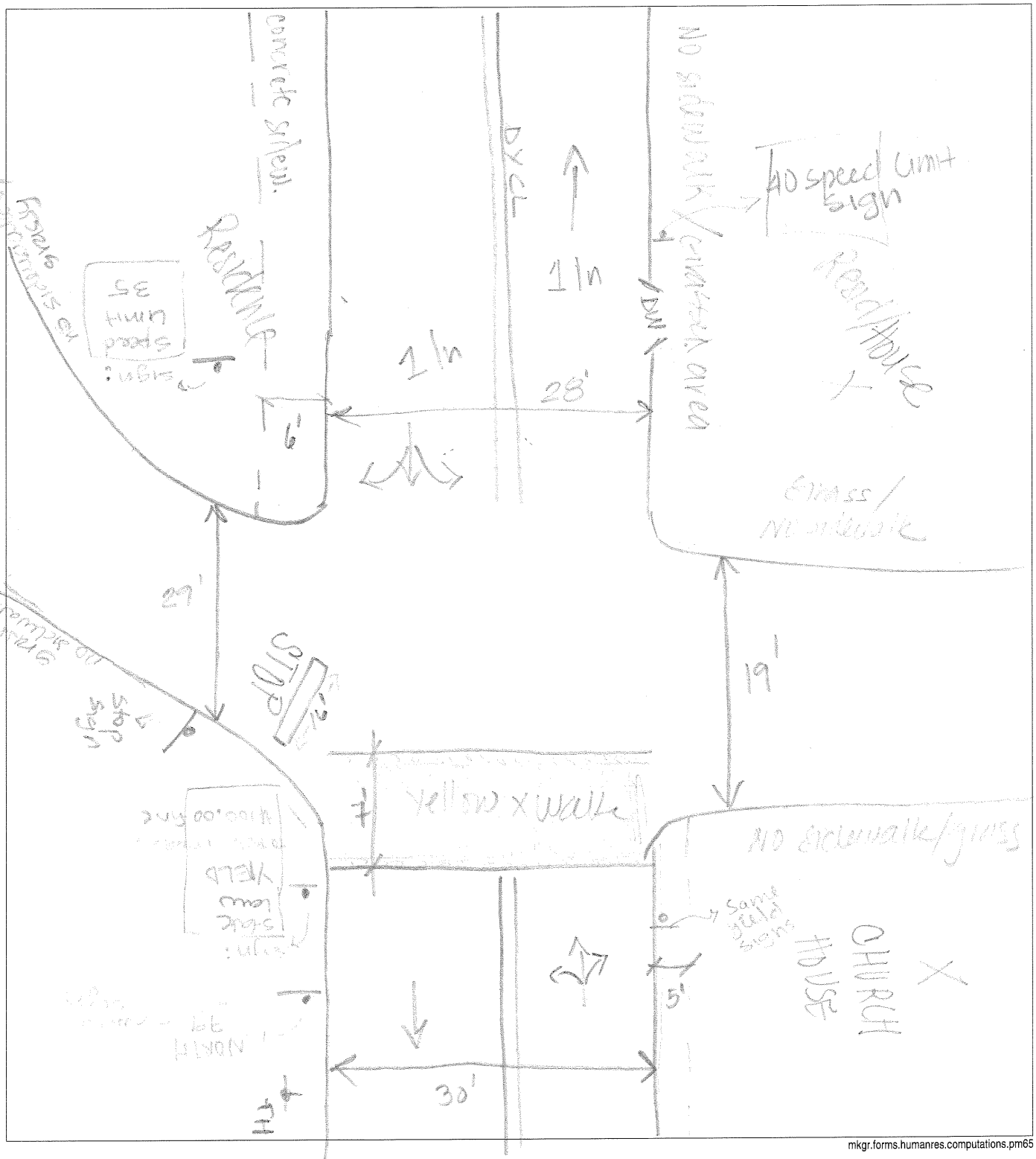


VHB *Computations*

Pavement = fair/good

Project: SCR
Location: TREETOWN
Calculated by: NL
Checked by:
Title S. Main St @ High St.

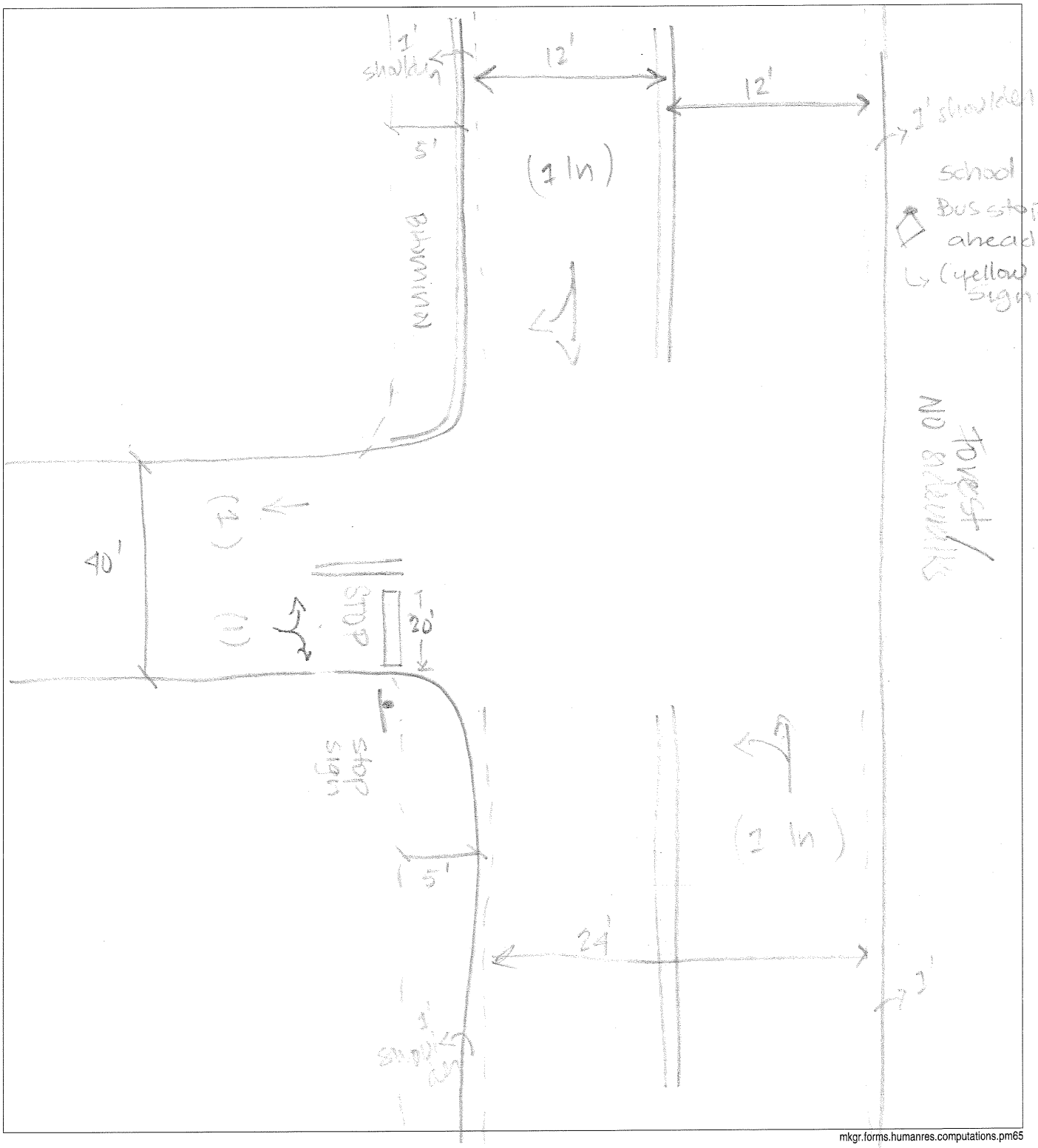
Project # 10111.31
Sheet 1 of 1
Date: 9/10/08
Date:



Computations

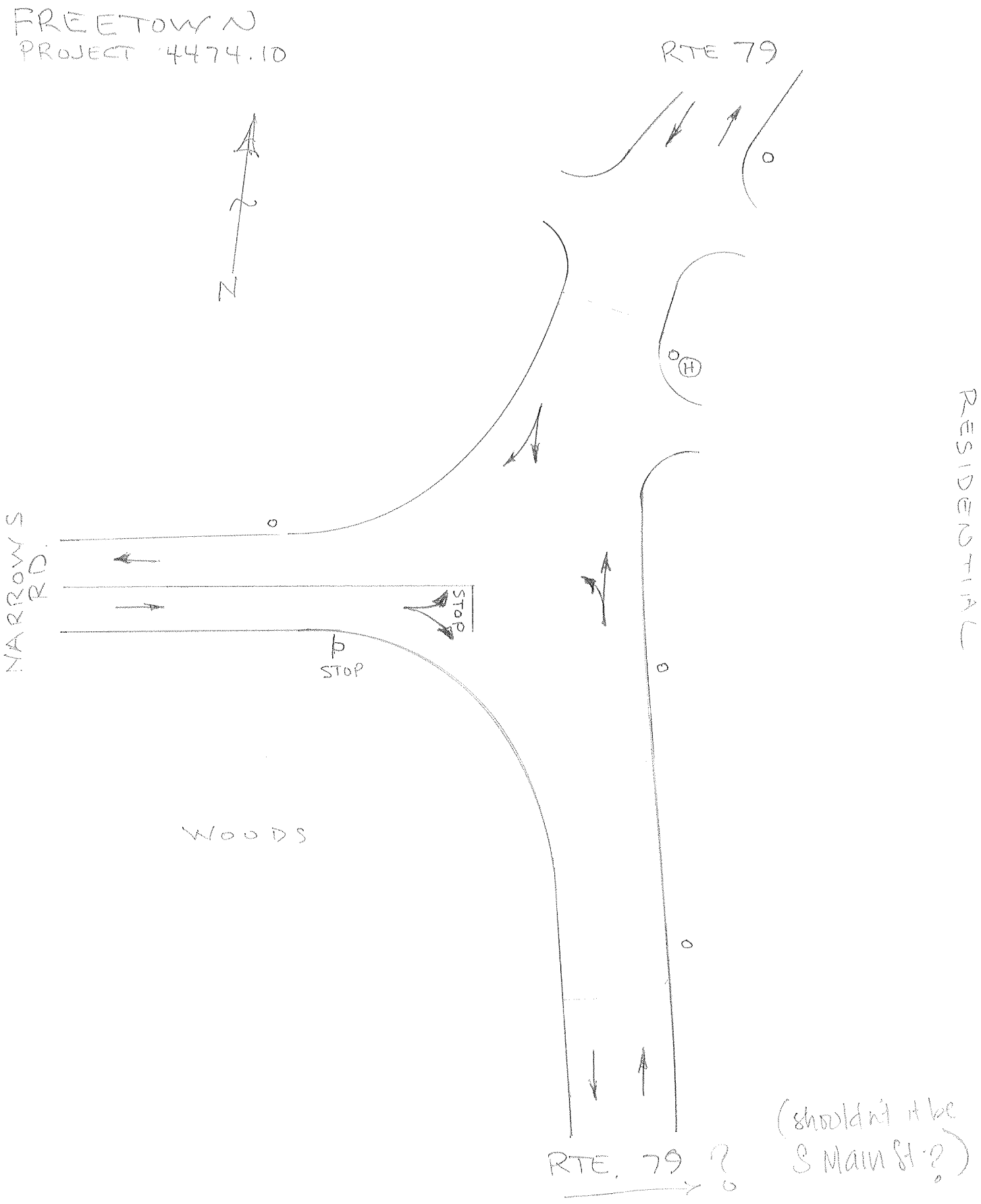
Project: SCR
Location: FREETOWN
Calculated by: NL
Checked by:
Title S. Main St @ Copicut Rd / Rte 79

Project # 10111.31
Sheet 1 of
Date: 9/10/08
Date:

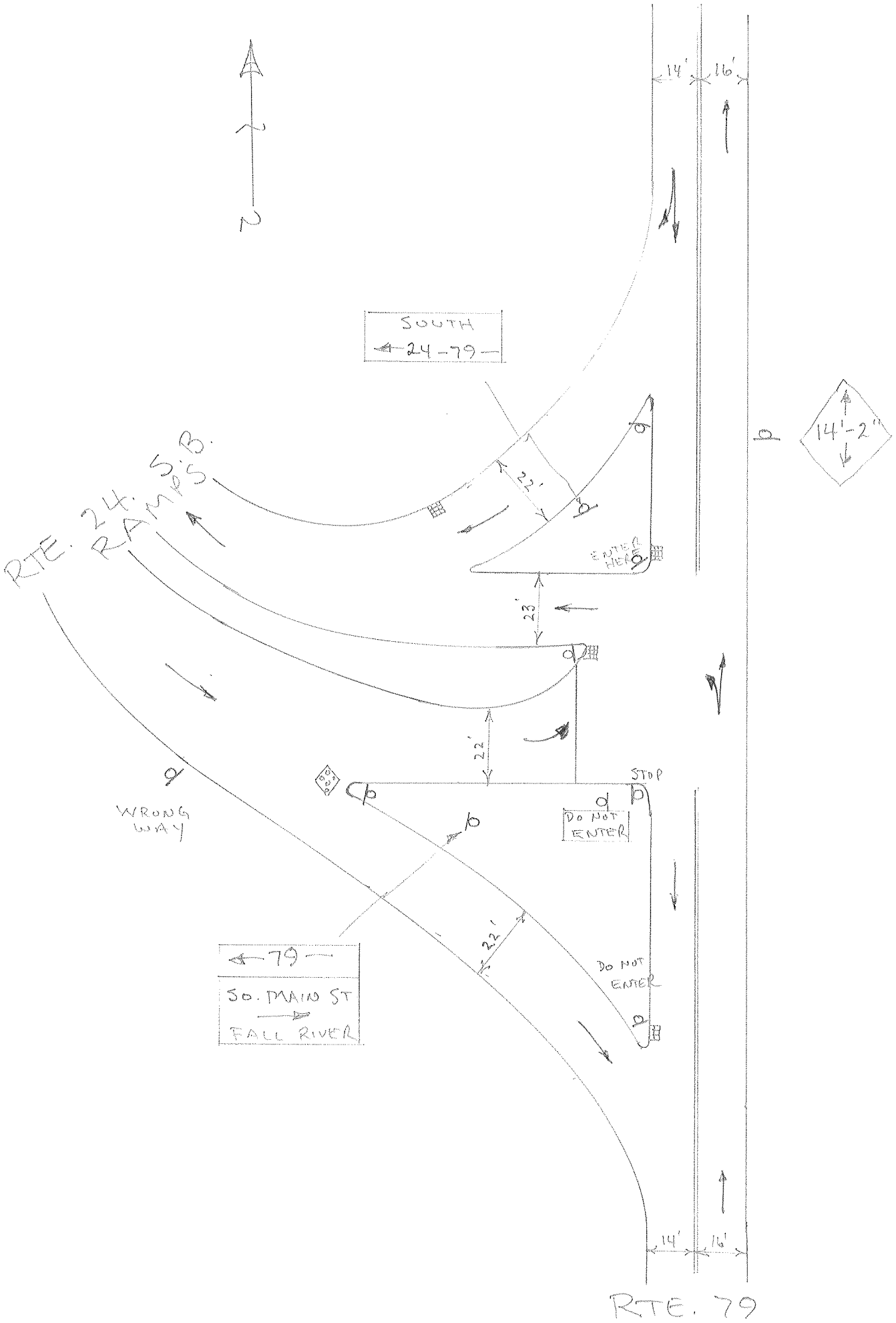


mkgr.forms.humanres.computations.pm65

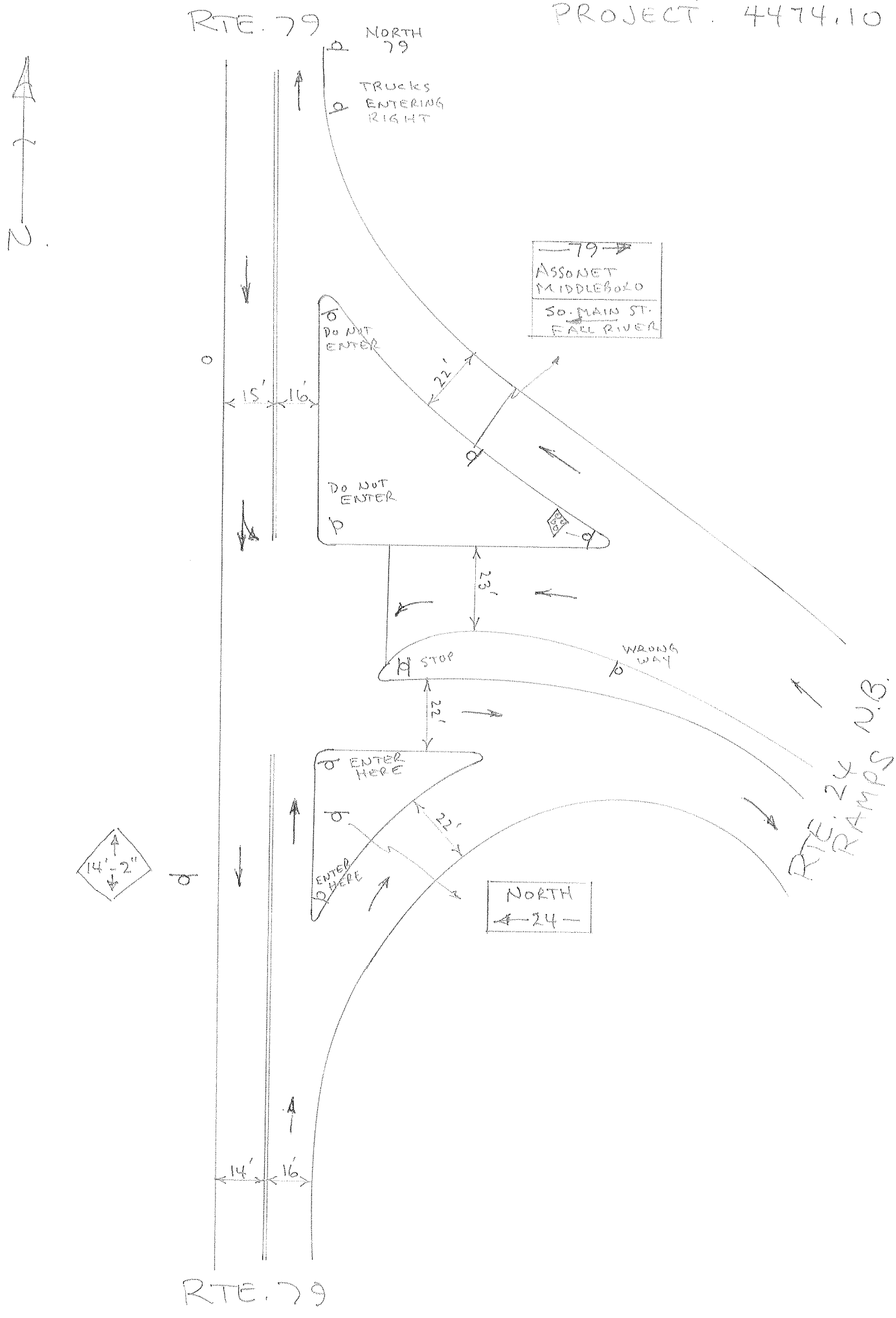
FREETOWN
PROJECT 4474.10



FREETOWN
PROJECT. 4474.10



FREETOWN
PROJECT. 4474.10



VHB **Computations**

Pleasant

* signalized

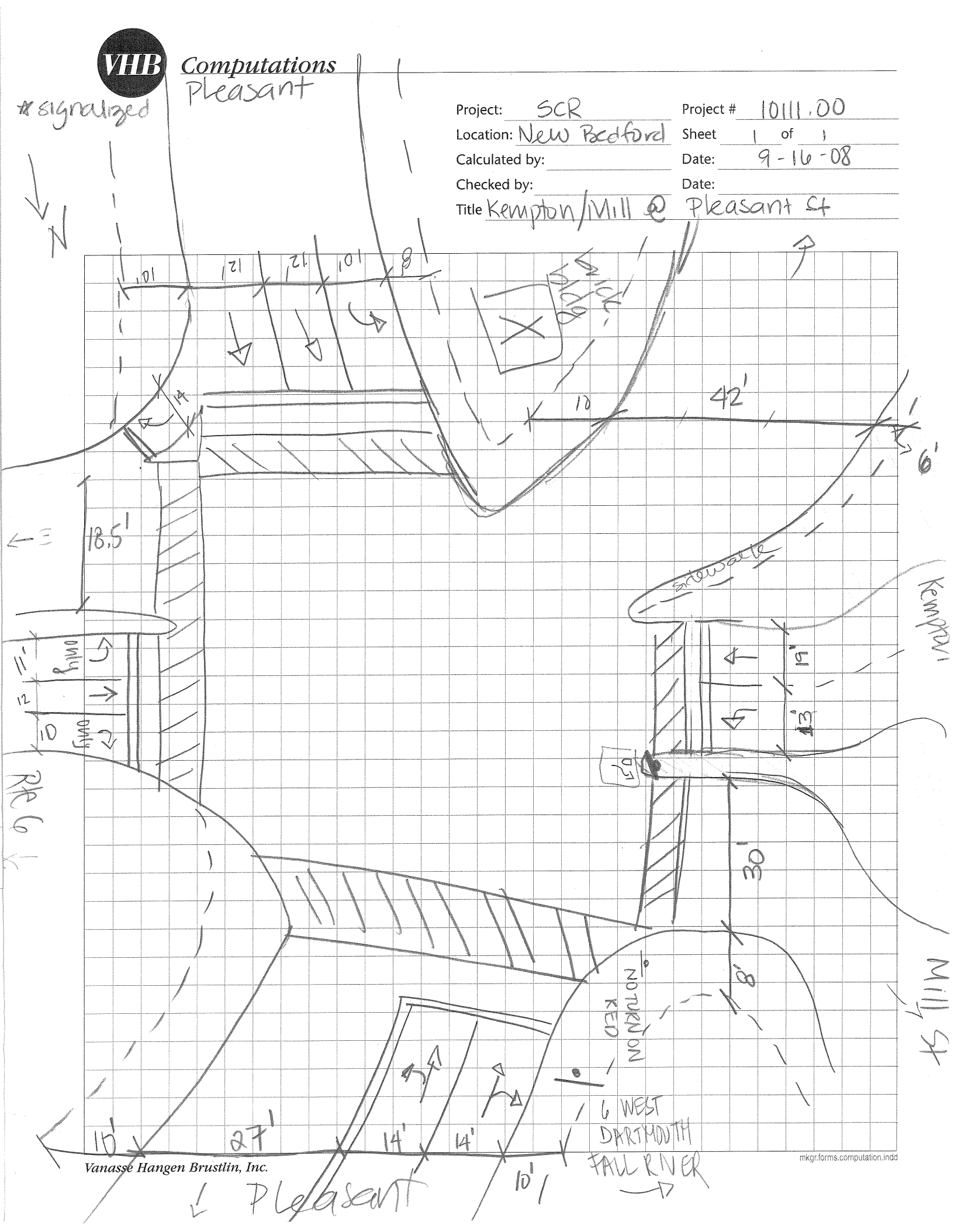
Project: SCR | Project # 10111.00

Location: New Bedford | Sheet 1 of 1

Calculated by: | Date: 9-16-08

Checked by: | Date:

Title Kempton/Mill @ Pleasant St

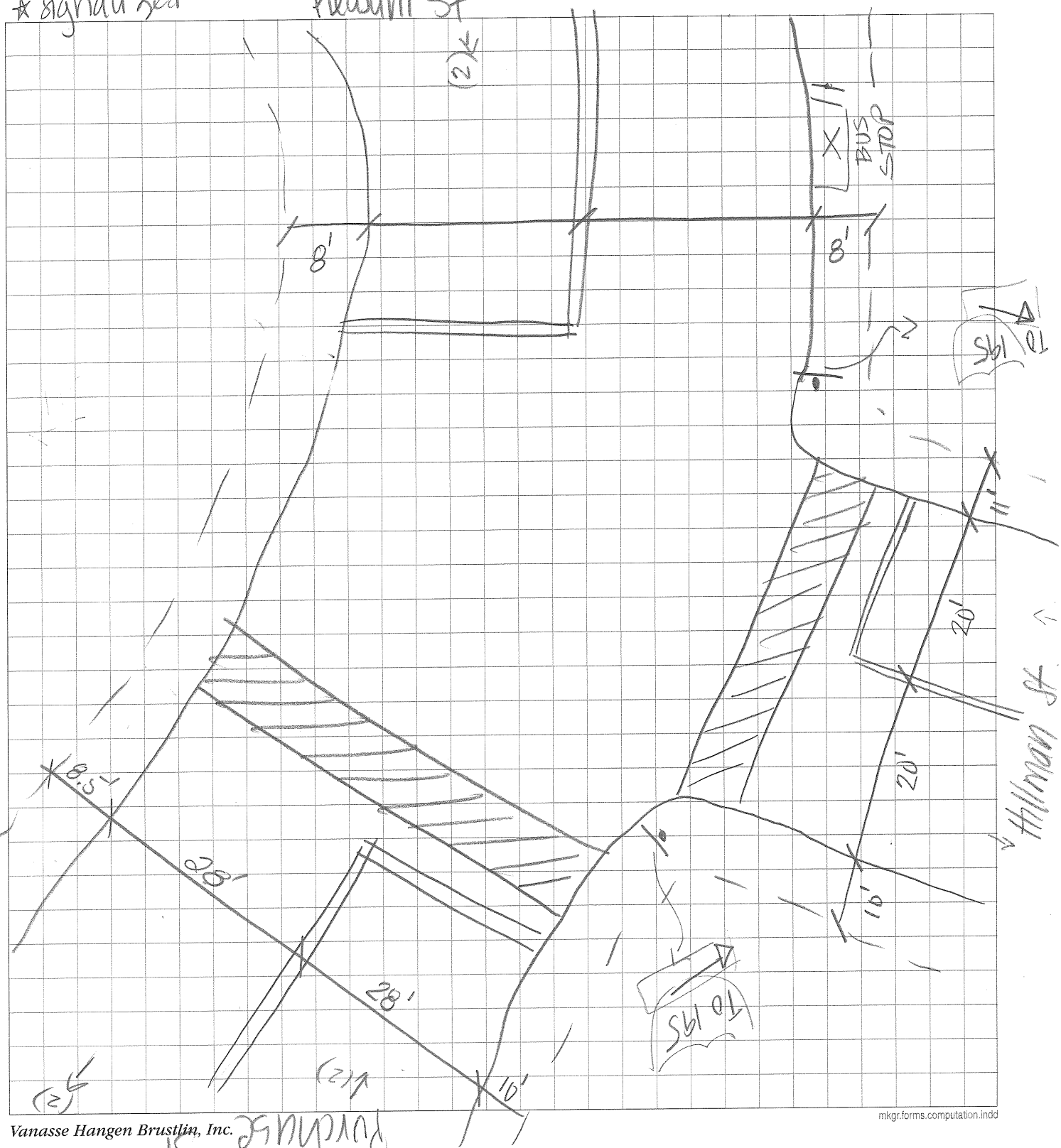


Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

VHB *Computations*

Project: SCR | Project # 10111.00
Location: New Bedford | Sheet 1 of 1
Calculated by: NL | Date: 9-16-08
Checked by: | Date:
Title (1) Hillman St @ Pleasant St/Purchase

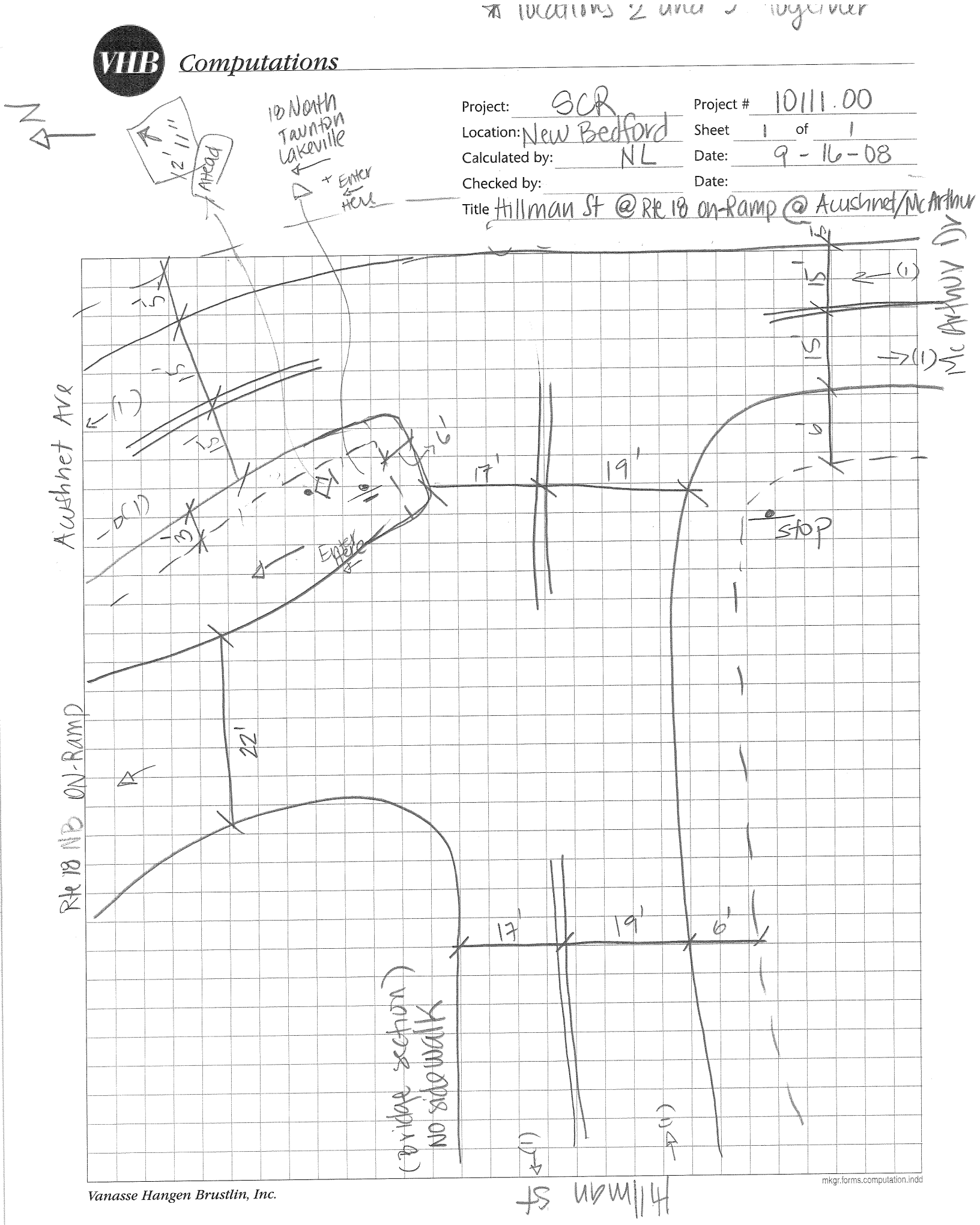


* locations 2 and 3 together

VHB *Computations*

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Hillman St @ Rte 18 on-Ramp @ Acushnet/McArthur

Project # 10111.00
Sheet 1 of 1
Date: 9-16-08
Date:



Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

Computations

* no markings

* unsig

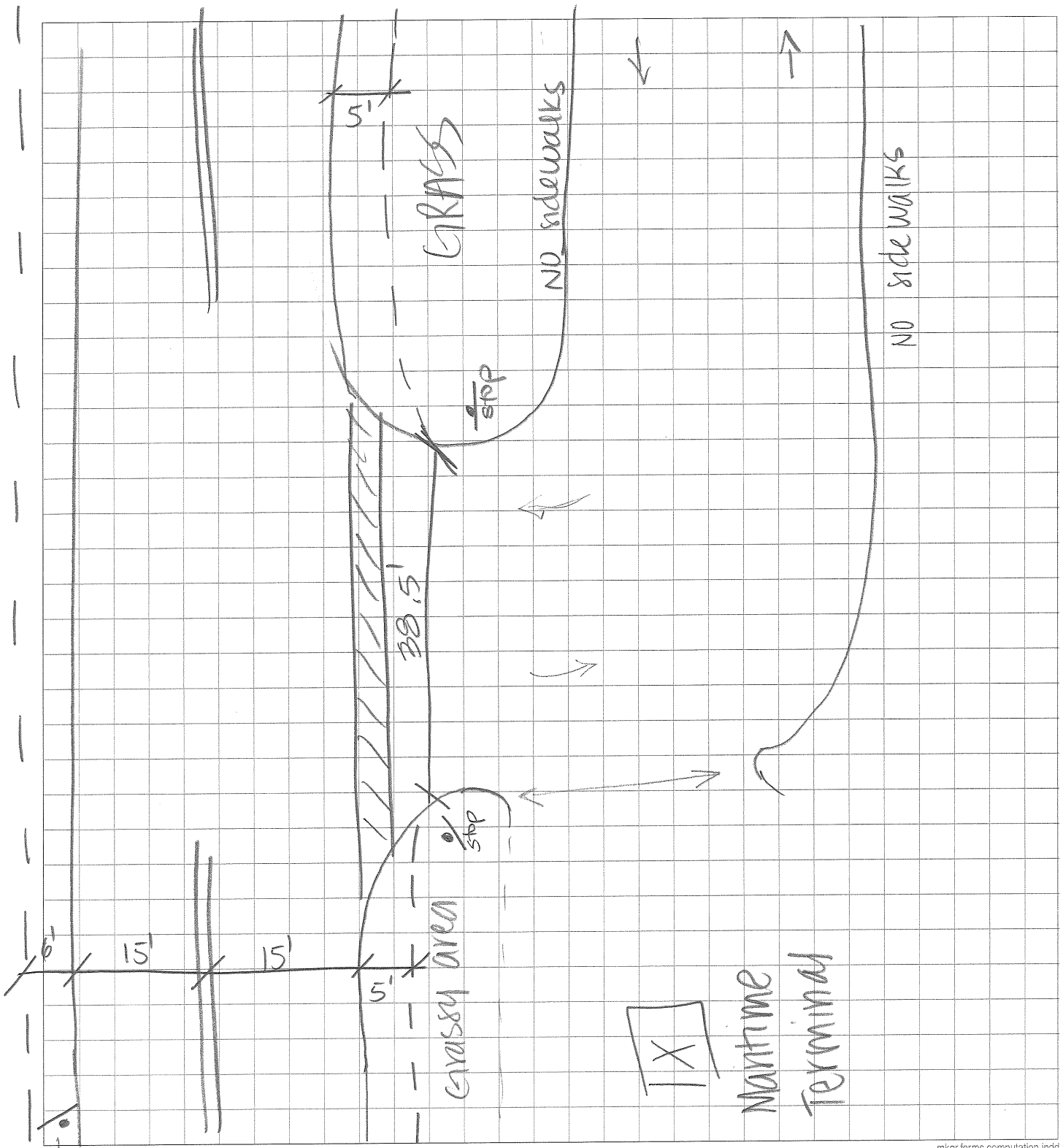
Project: SCR | Project # 10111.00

Location: New Bedford | Sheet 1 of 1

Calculated by: NL | Date: 9-16-08

Checked by: | Date:

Title McArthur Dr @ Herman Melville Blvd



20MPH speed limit

Computations

★ signalized

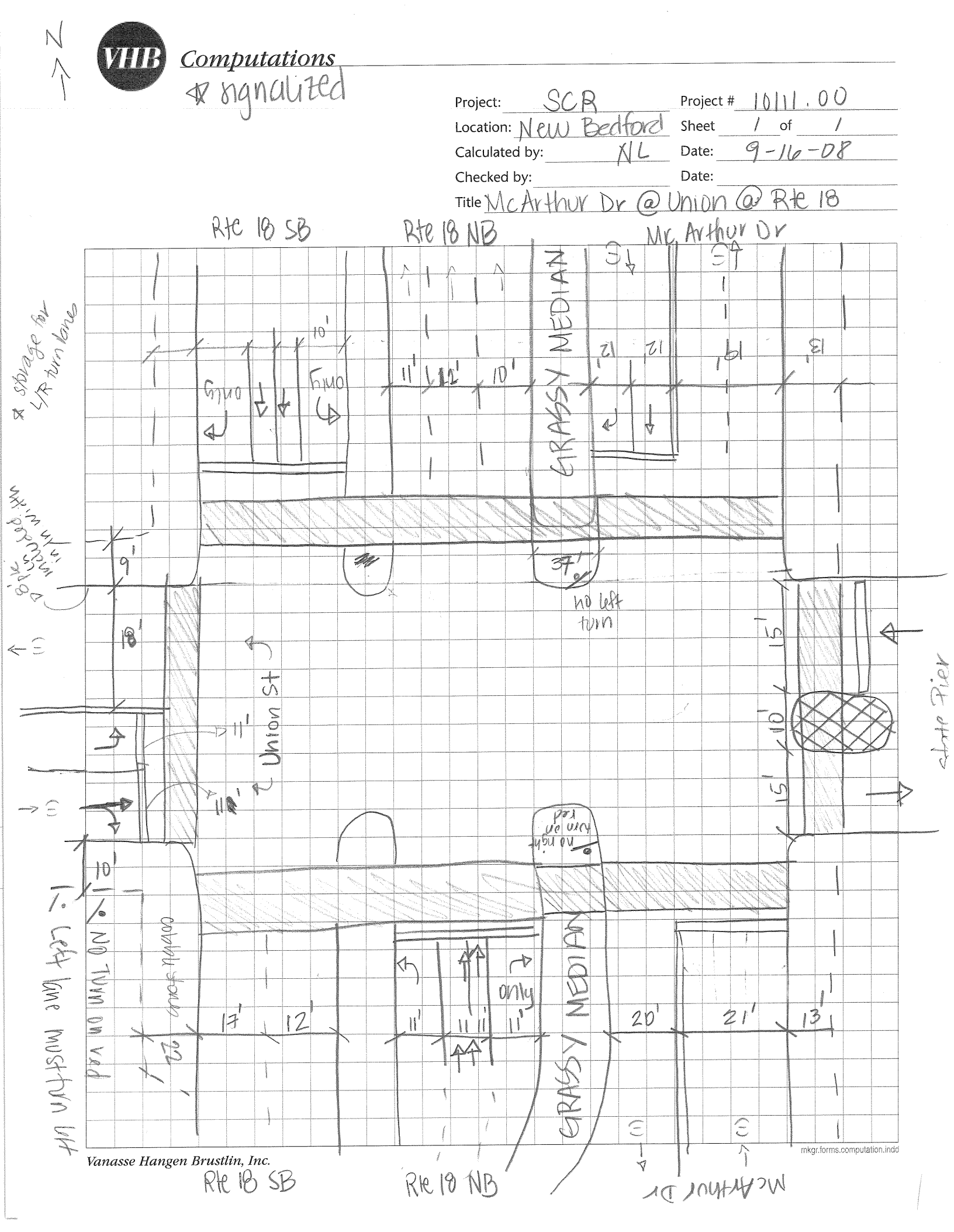
Project: SCR | Project # 10111.00

Location: New Bedford | Sheet 1 of 1

Calculated by: NL | Date: 9-16-08

Checked by: | Date:

Title McArthur Dr @ Union @ Rte 18



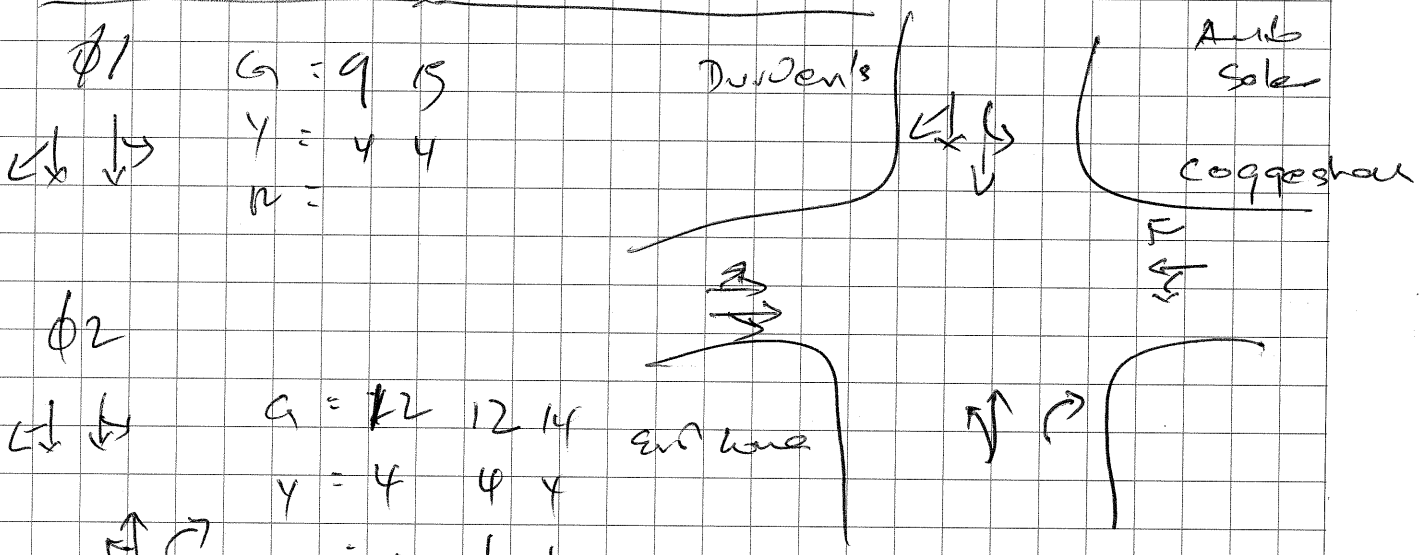
Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#5 Title Signal Timing & Phasing

Belleville @ Coggeshall St



ϕ1
G: 9 15
Y: 4 4
R:

ϕ2
G: 12 12 14
Y: 4 4 4
R: 1 1 1

ϕ3
PED
W = 7
FDW = 17

ϕ4
G: 21 27
Y: 4 4
R: 1 1

Auto Sales owner curious about when the rail will come to new location

Do you think it is worth going to some kind of new location → therapy?

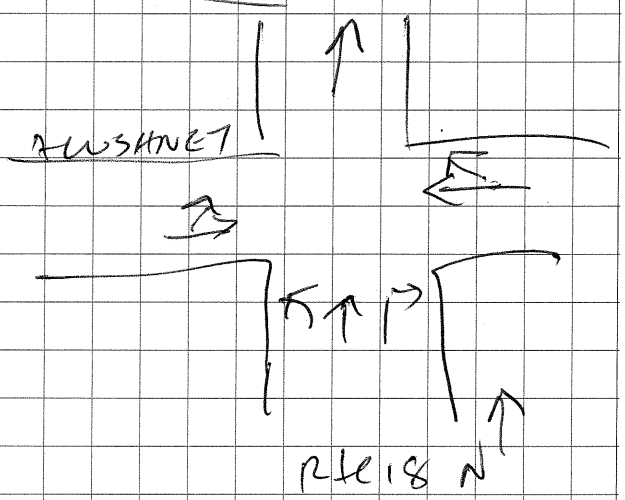
VHB *Computations*

Project: SCR | Project # 10117.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#2 Title Signal Timing & Phasing

Coggeshall @ Rte 18 North

ϕ_1 Rte 18 NB

ϕ_2 Acushnet Ave



ϕ_1 G = 33 33 33
Y = 4 4 4
R = 1 1 1

ϕ_2 G = 32 32 32
Y = ~~4~~ 4 4
R = 1 1 1

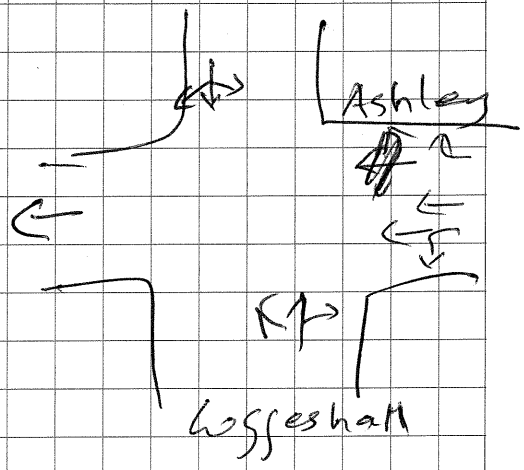
VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#3 Title Signal Timing & Phasing

Ashley Blvd (SB) & Cogswell

ϕ_1 Ashley

ϕ_2 Cogswell



ϕ_1

G =	29	29	29
Y =	4.3	4.3	3.1
R =	1	1	

ϕ_2

G =	25	25	25
Y =	4.3	4.3	4.3
R =	1	1	1

VHB

Computations

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Purchase St @ Coggeshall St.

Project # 10111.00
Sheet 1 of
Date: 9/16/08
Date:

★ Unsignalized

↑N

Purchase St

★ faded markings
★ school zone
- speed limit 20MPH @ Purchase
★ overhead warning sign for zoning / limit w. flashing beacons (2)

★ (2) bus stops e/a @ purchase right on, int corner

8' 16' 16' 10'

8 stop

stop 8

(1)

30'

12'

(1)

12'

(1)

8' stop

★ 4-WAY STOP intersection

stop

8

8' 16 16' 10'

X bridge footings columns

yellow warn sign: clearance 12'1"

(1) (1)

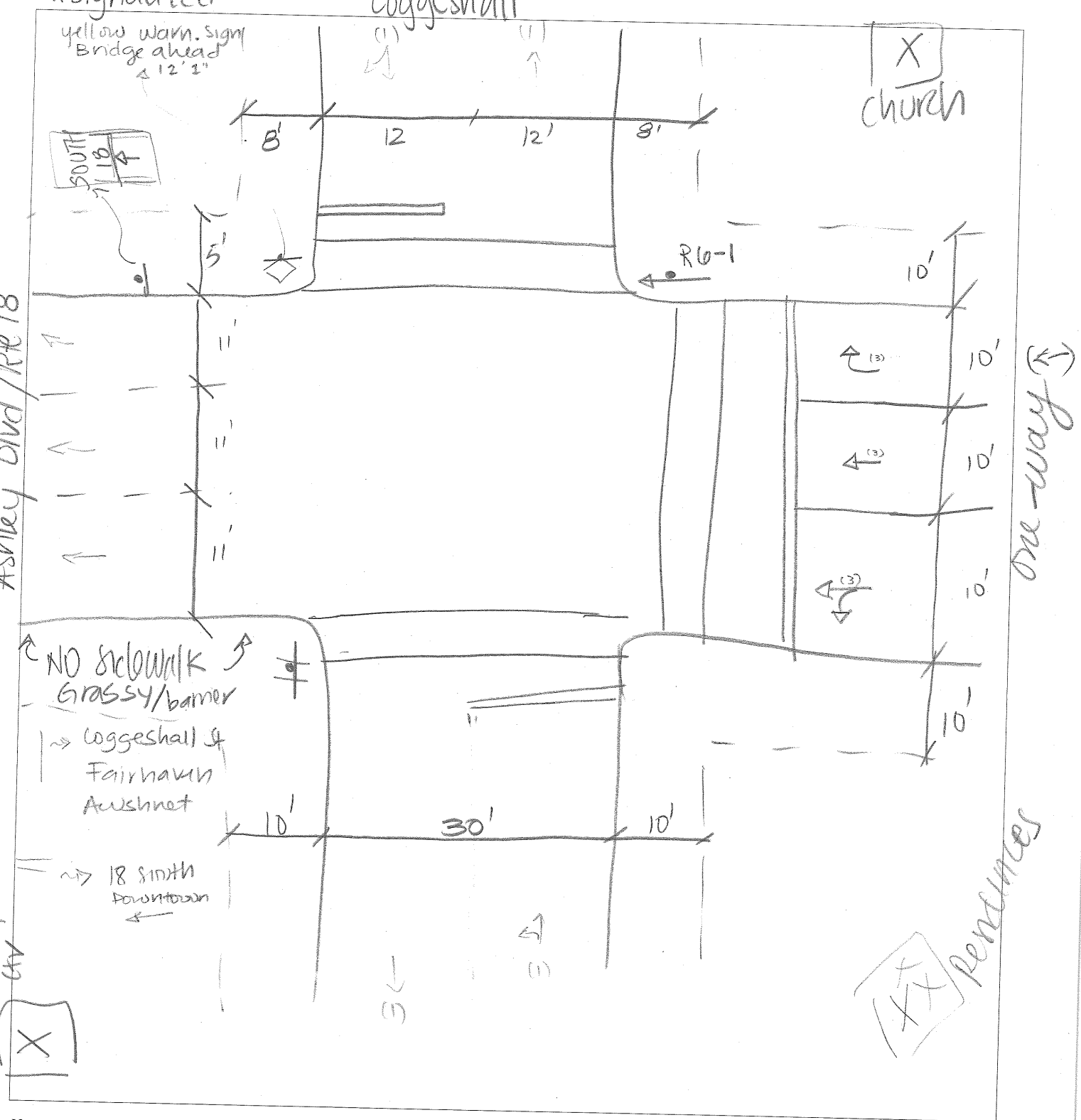
X-WALK SIGN
State law
Yield

(Bridge overpasses it)

Computations

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Coggeshall @ Rte 18 / Ashley Blvd (SB)

Project # 10111.31
Sheet 1 of 1
Date: 9/16/08
Date:



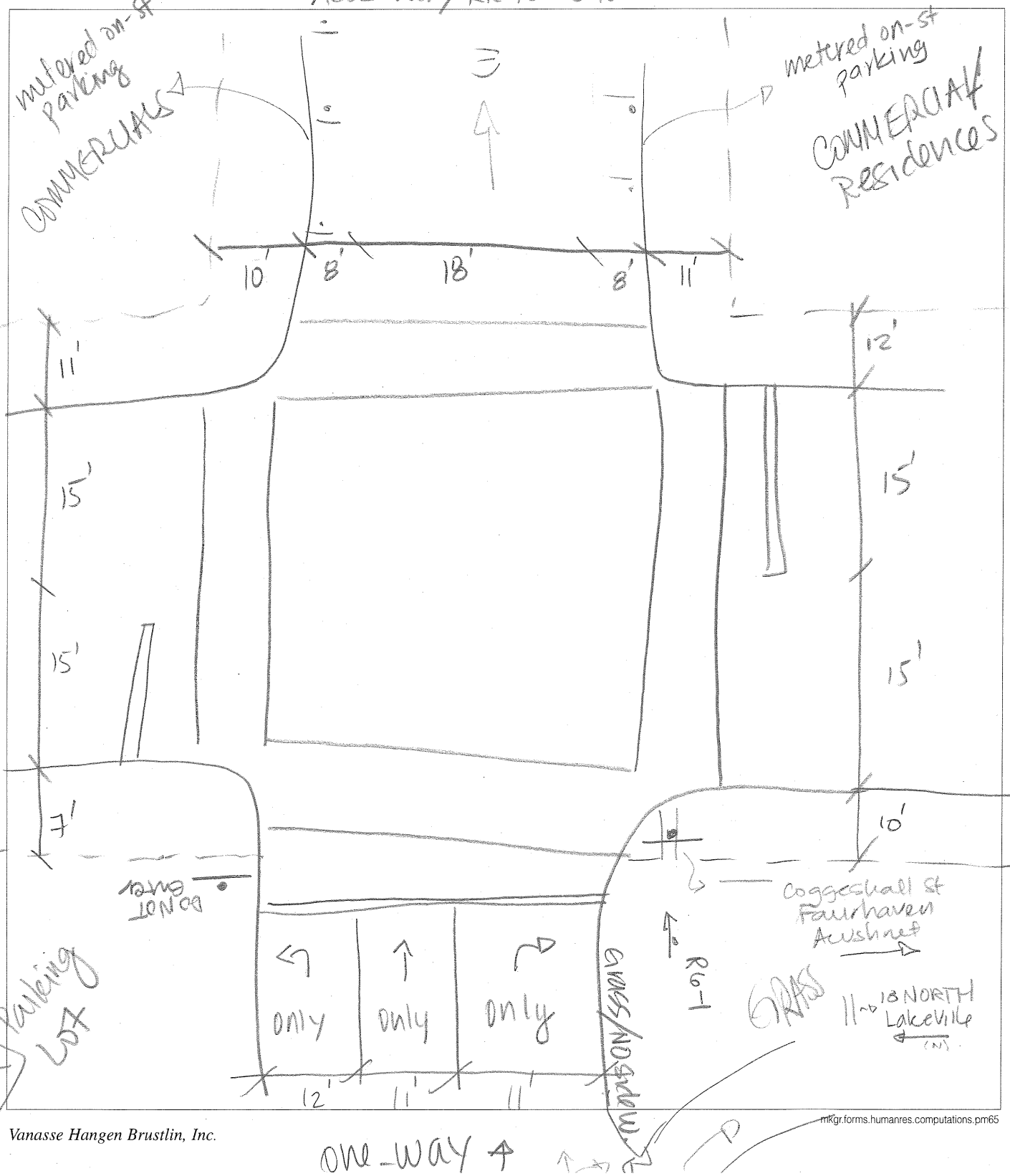
Computations

*signalized

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

Title: Acushnet Ave/18 NB @ Coggeshall St

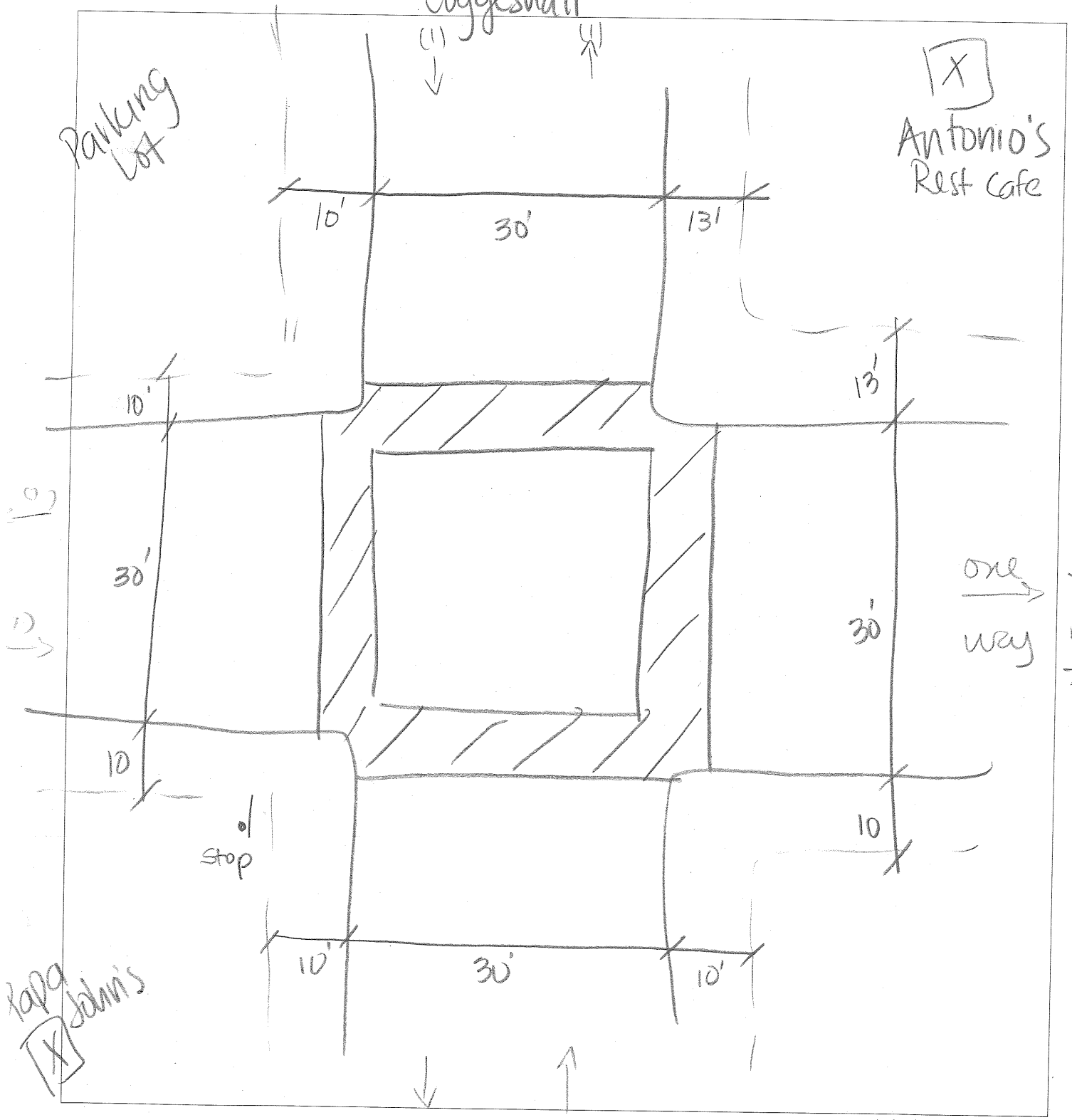


VHB *Computations*

N

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title North Front St @ Coggeshall St

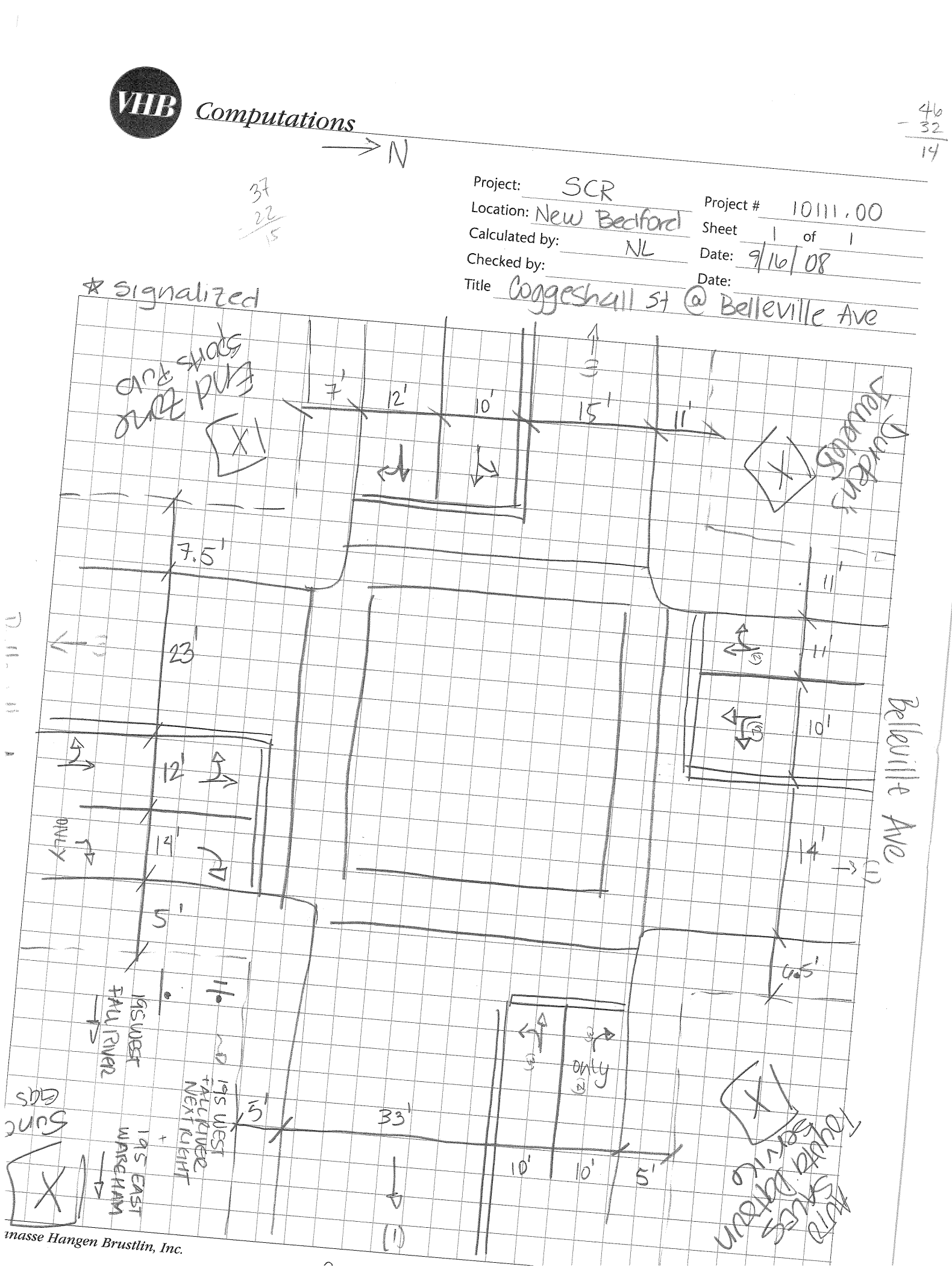
Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:



VHB **Computations**

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Coggeshall St @ Belleville Ave

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

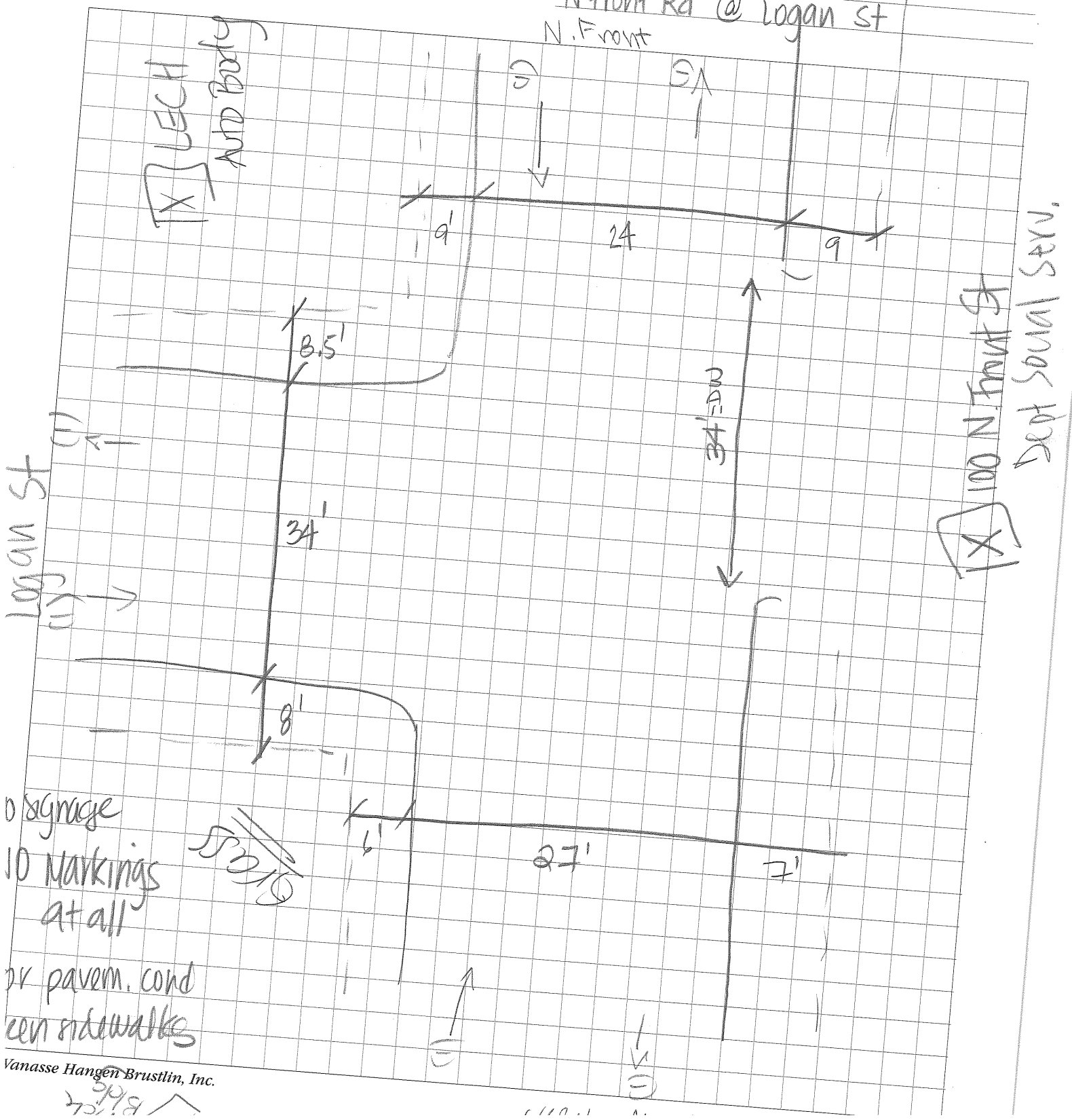


VHB *Computations*

☆ Unsig. ↑ N

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title N Front Rd @ Logan St

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

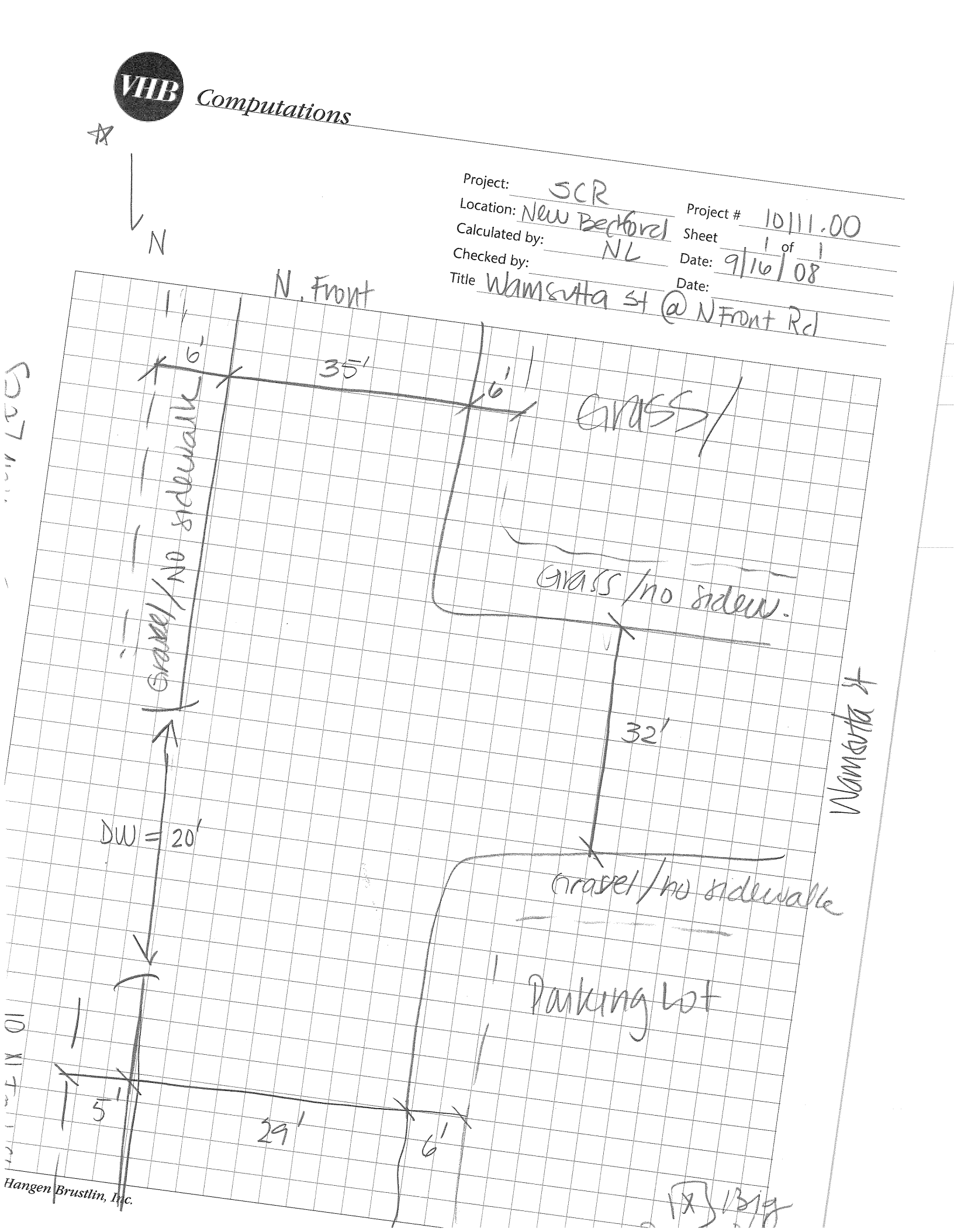


o signage
10 Markings
at all
or pavem. cond
een sidewalks

VHB *Computations*

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Wamsutta St @ N Front Rd

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

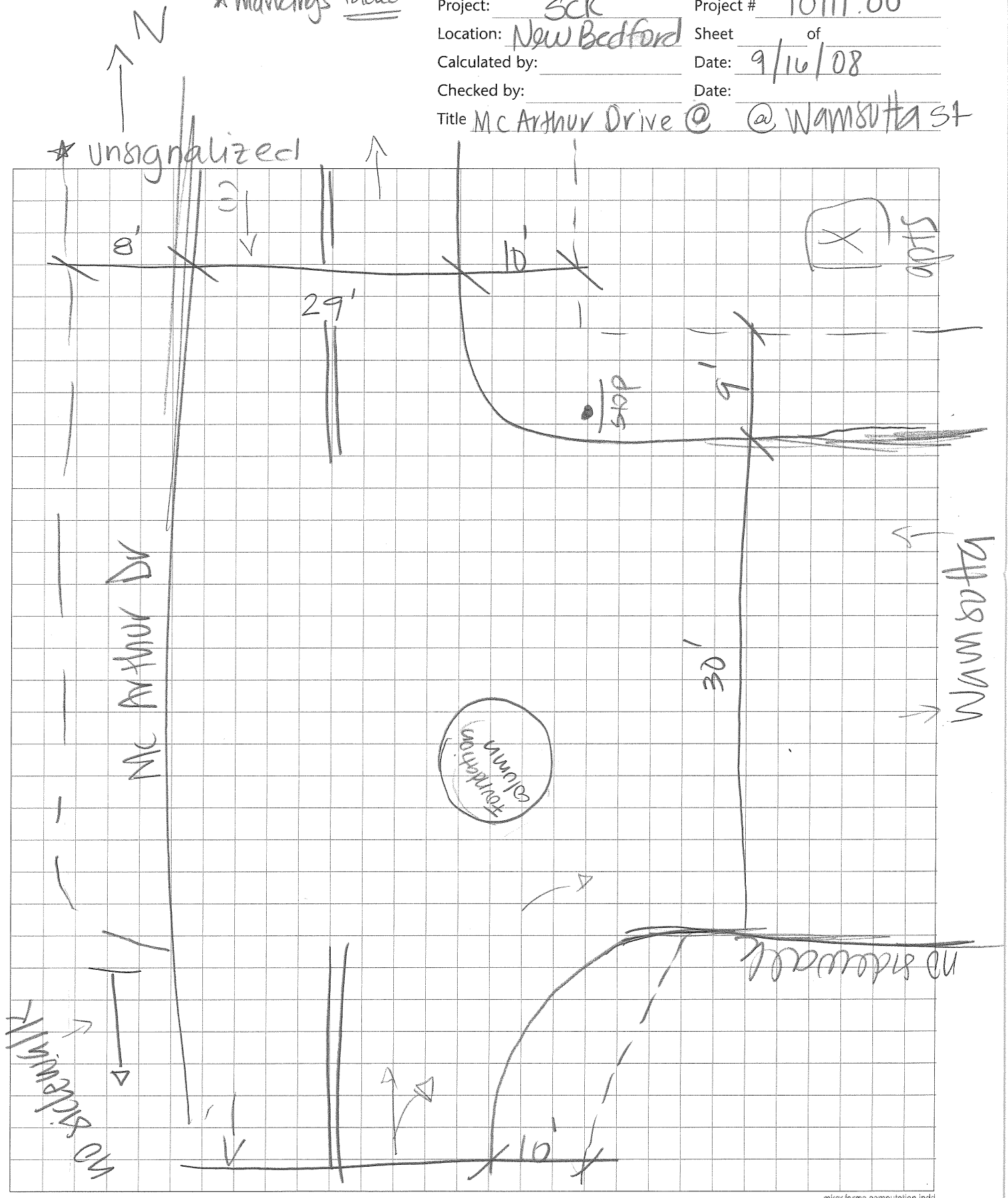


VHB *Computations*

★ Bridge (RR) over intersection
★ its foundations lie on sidewalks @ mt.

Project: SCR | Project # 10111.00
Location: New Bedford | Sheet of
Calculated by: | Date: 9/16/08
Checked by: | Date:
Title McArthur Drive @ @ Wamsutta St

★ markings faded



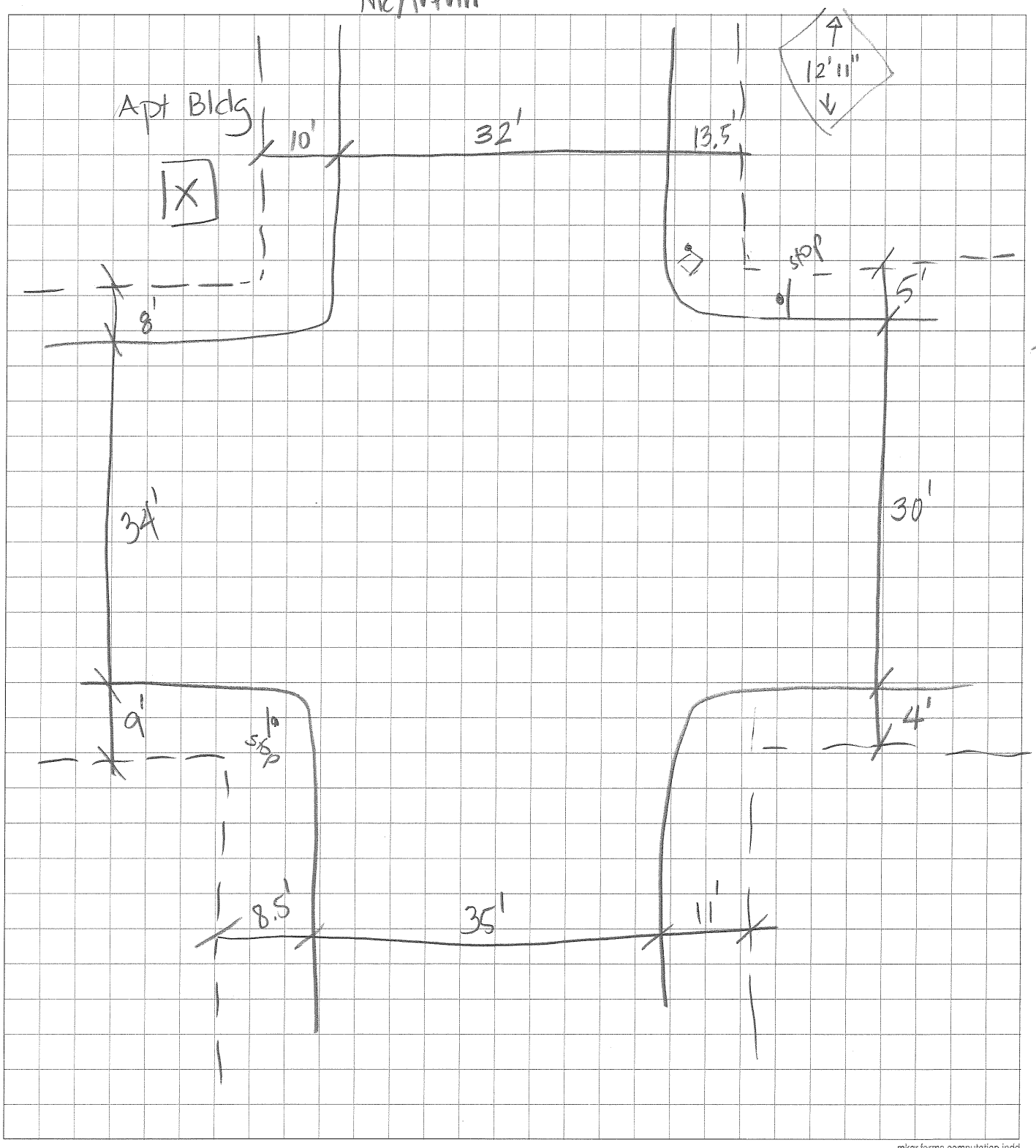
★ Bridge clearance =

VHB *Computations*

- ✱ unsig
- ✱ markings faded
- ✱ Rte 18 goes over Logan (westside)

N

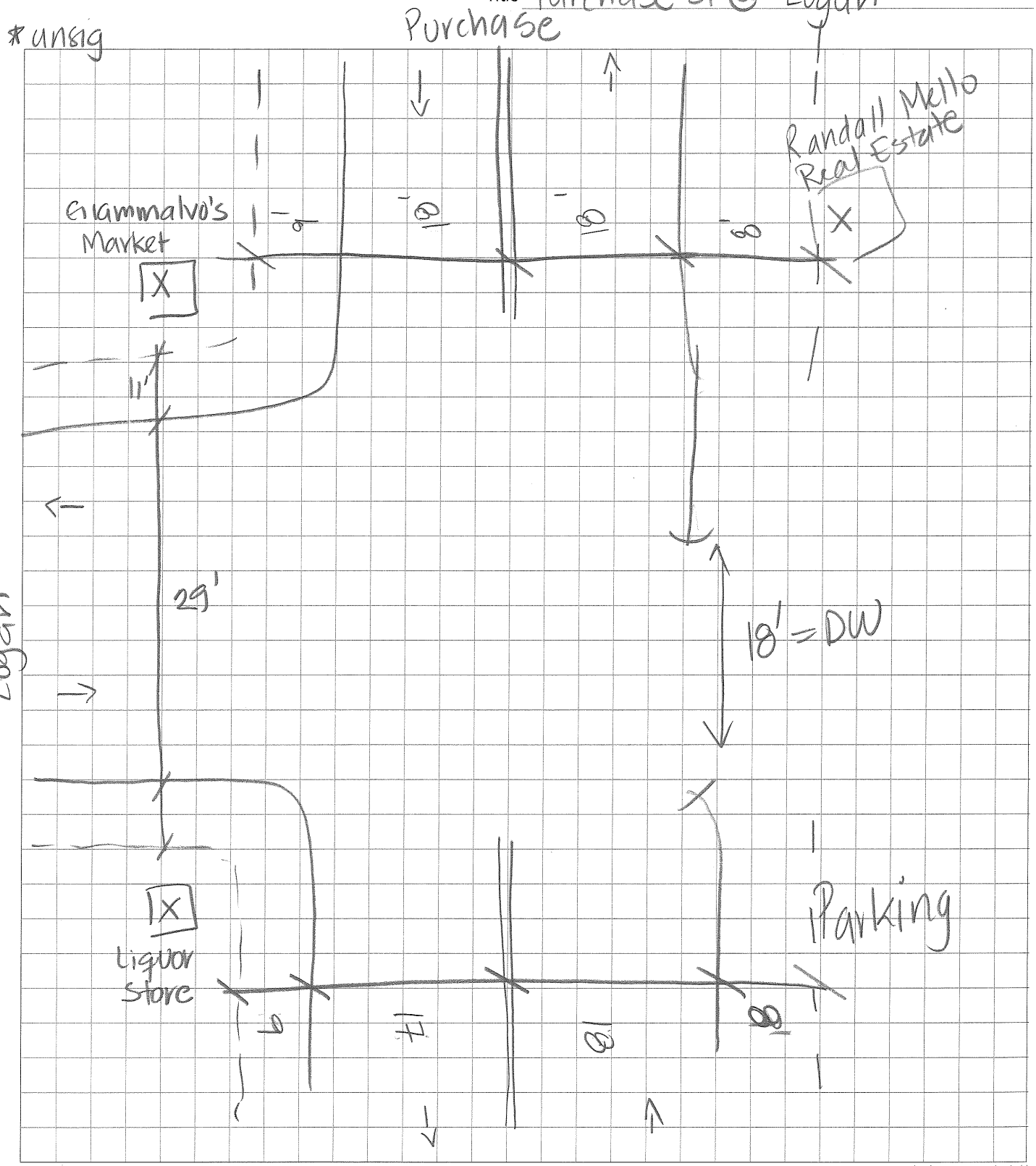
Project: SCR | Project # 10111.00
Location: New Bedford | Sheet of
Calculated by: | Date: 9-16-08
Checked by: | Date:
Title McArthur Dr @ Logan St



VHB *Computations*

* no signage (stop)

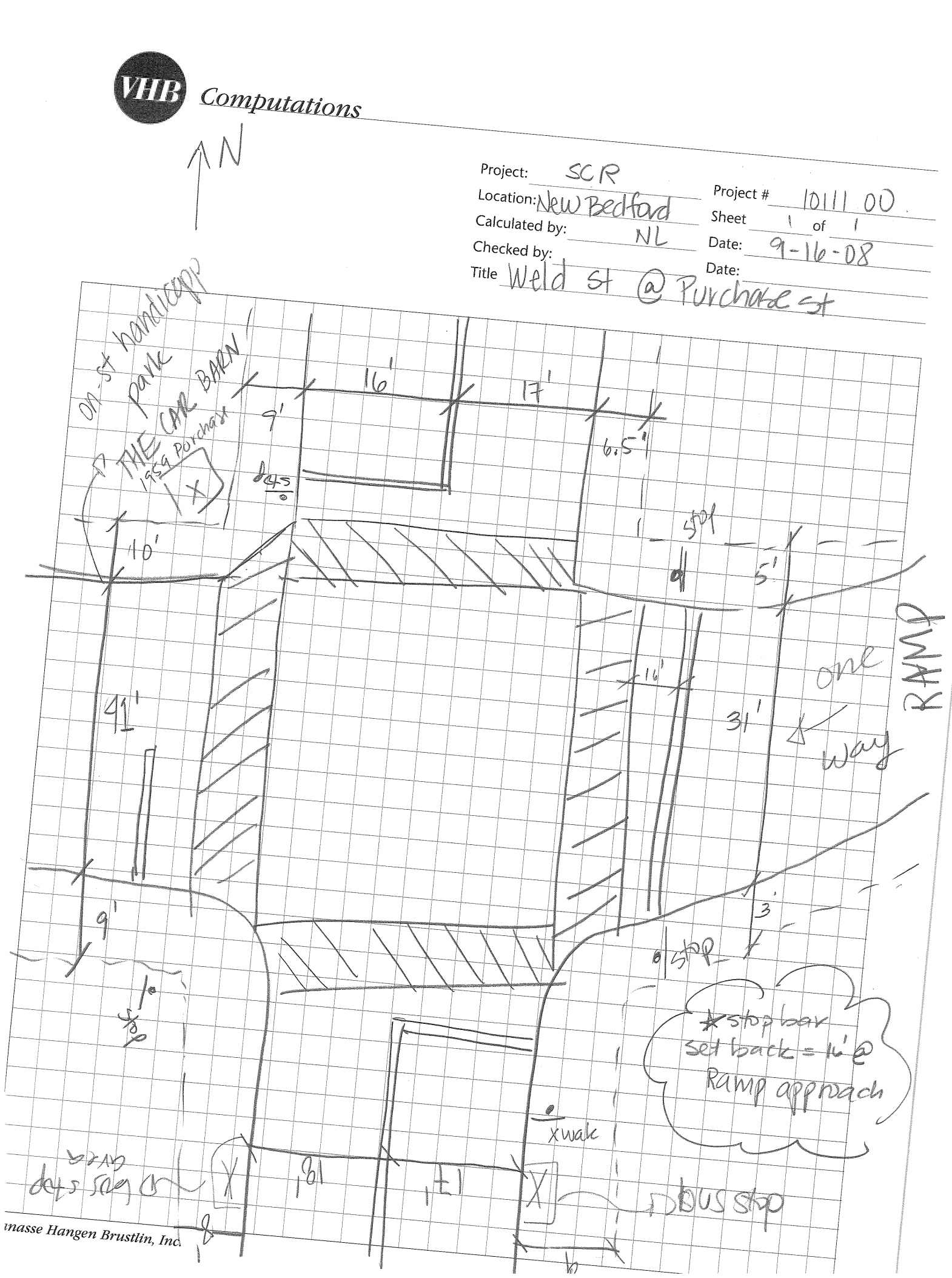
Project: SCR | Project # 10111.00
Location: New Bedford | Sheet of
Calculated by: NL | Date: 9-16-08
Checked by: | Date:
Title Purchase St @ Logan



VHB *Computations*

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Weld St @ Purchase St

Project # 10111.00
Sheet 1 of 1
Date: 9-16-08
Date:



Computations

#1 140 South
New Bedford
Dartmouth

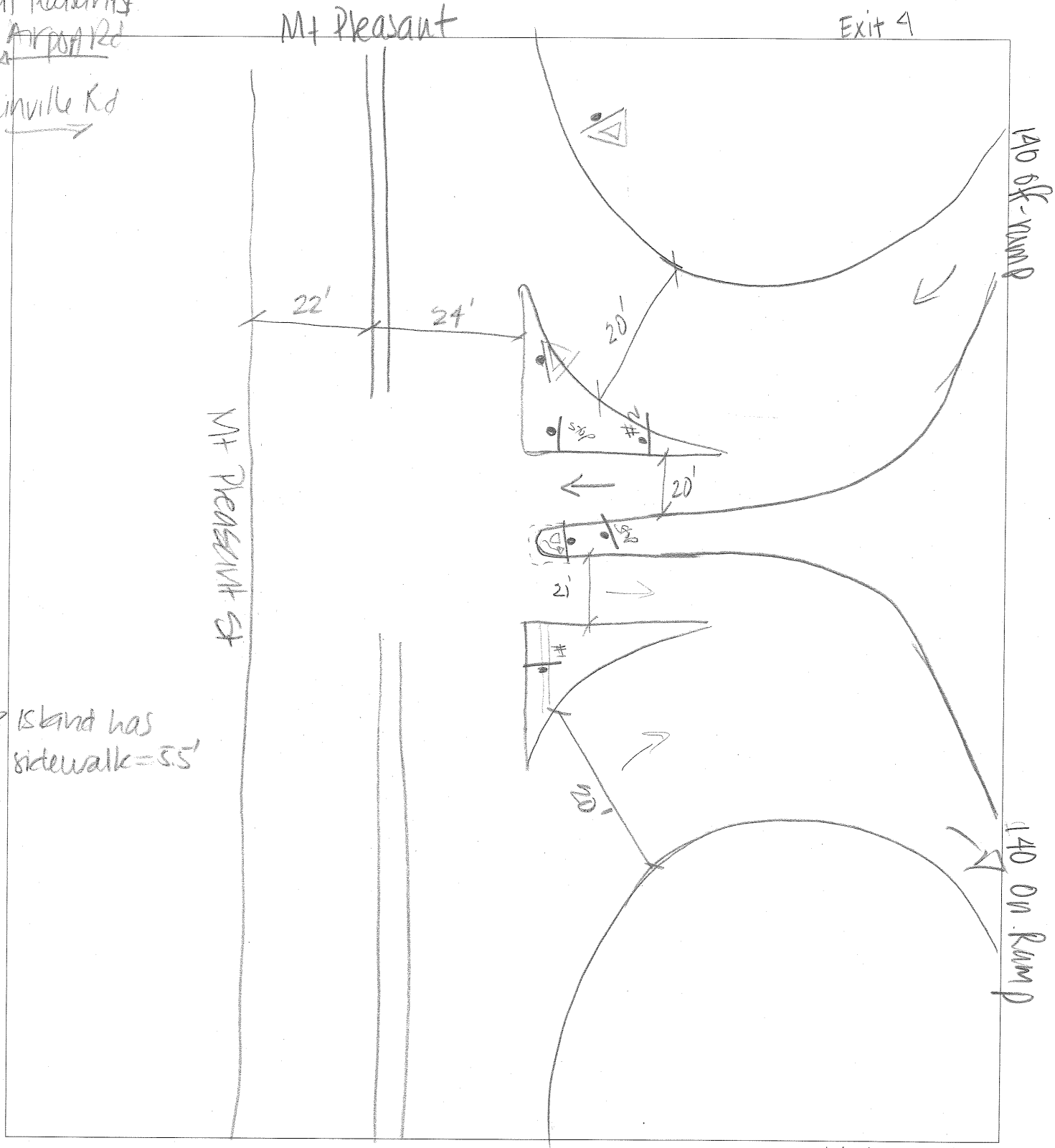
#2 MT Pleasant St
~~Airport Rd~~
Plainville Rd

N

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

Title Mt Pleasant St @ Rte 140 SB Off-Ramp



★ Island has sidewalk = 5.5'

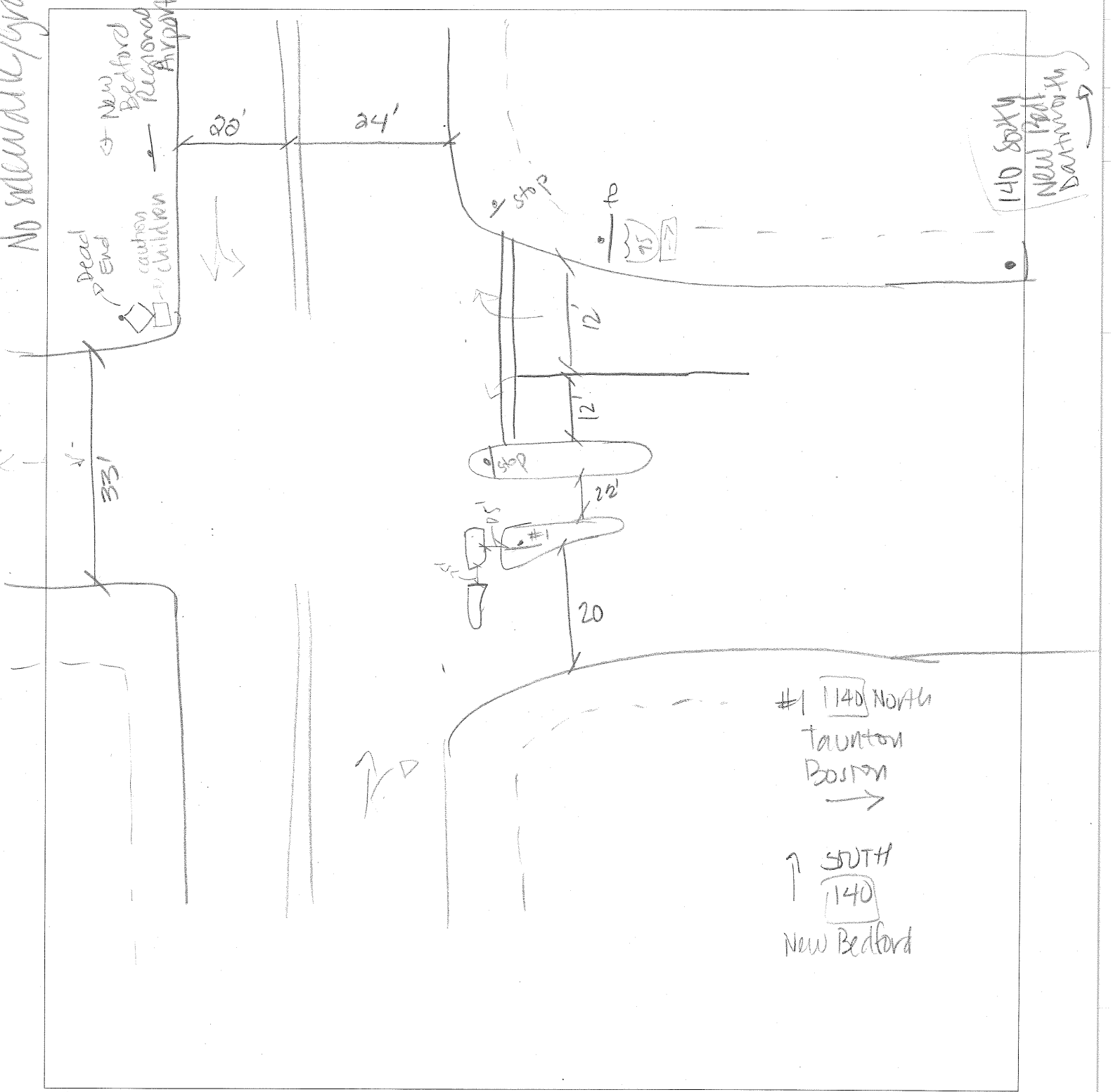
VHB

Computations

N

*signalized under const
- signals not working yet

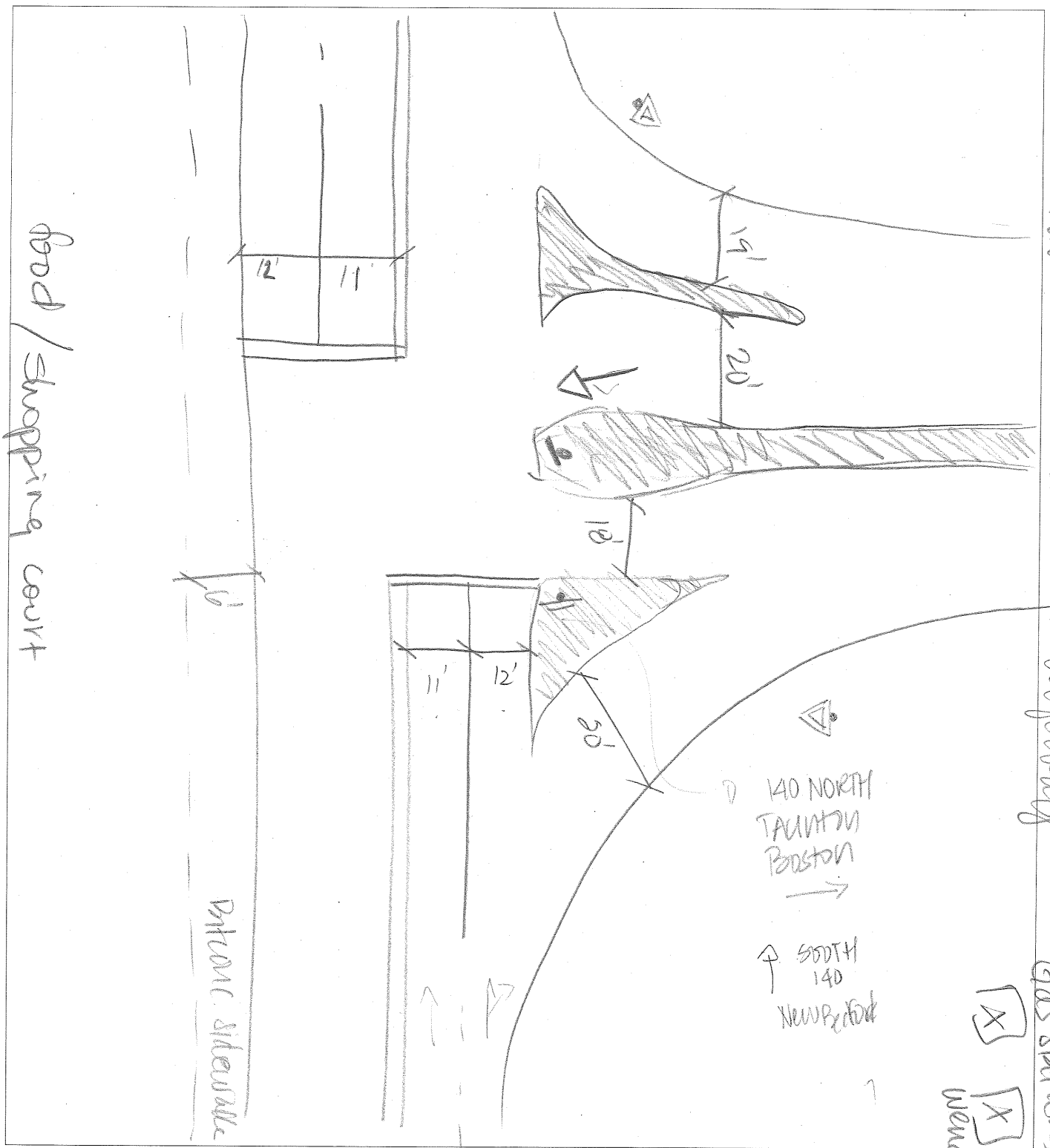
Project: SCR Project # 10111.00
Location: New Bedford Sheet 1 of 1
Calculated by: NL Date: 9/16/08
Checked by: Date:
Title Jones Rd @ Mt Pleasant



Computations

Project: SCR
Location: New Bedford
Calculated by:
Checked by:
Title Kings Highway @ 140 ON-Ramps

Project # 10111.00
Sheet 1 of
Date: 9/16/08
Date:

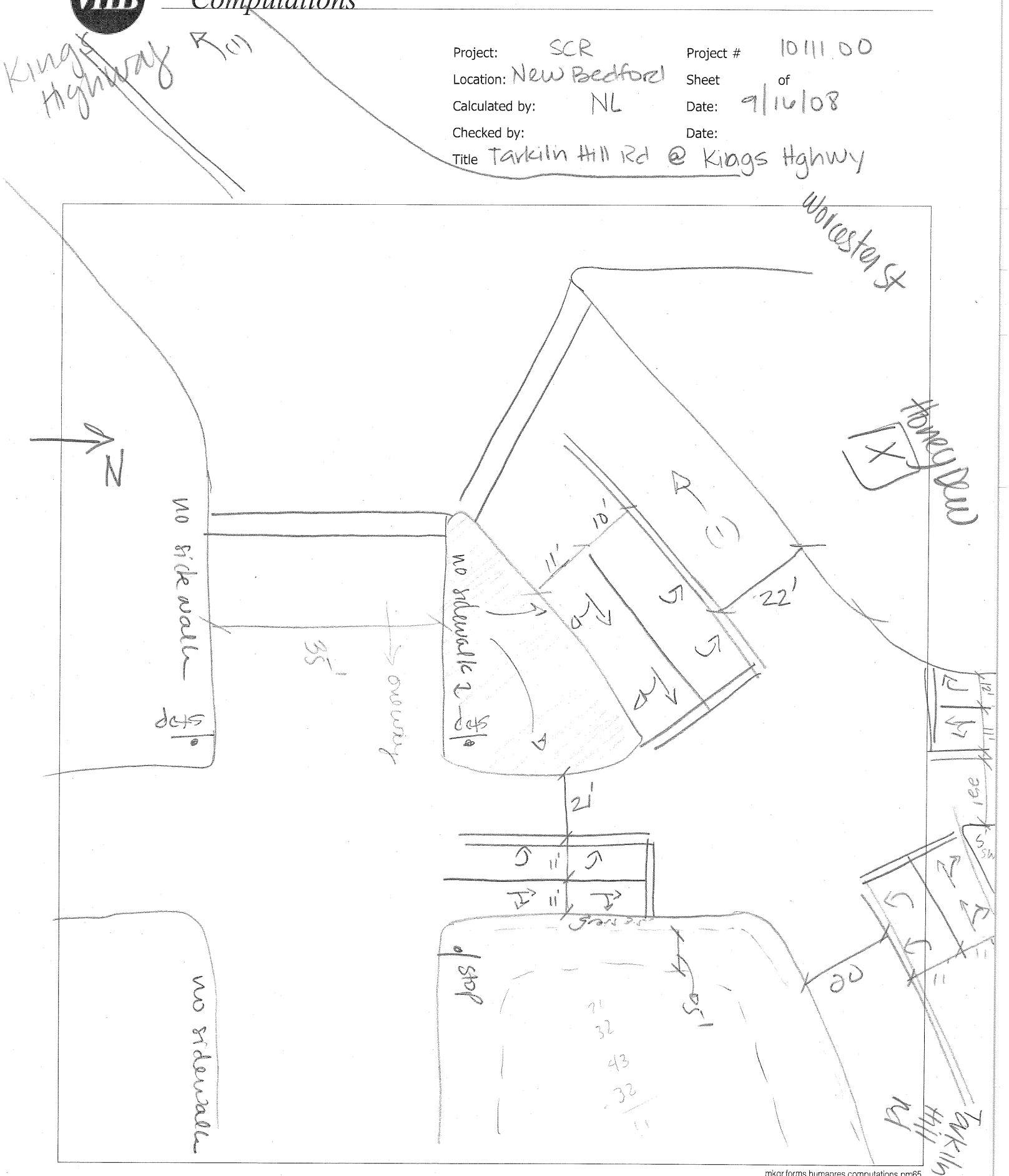


mkgr.forms.humanres.computations.pm65

Computations

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Tarkiln Hill Rd @ Kings Hghwy

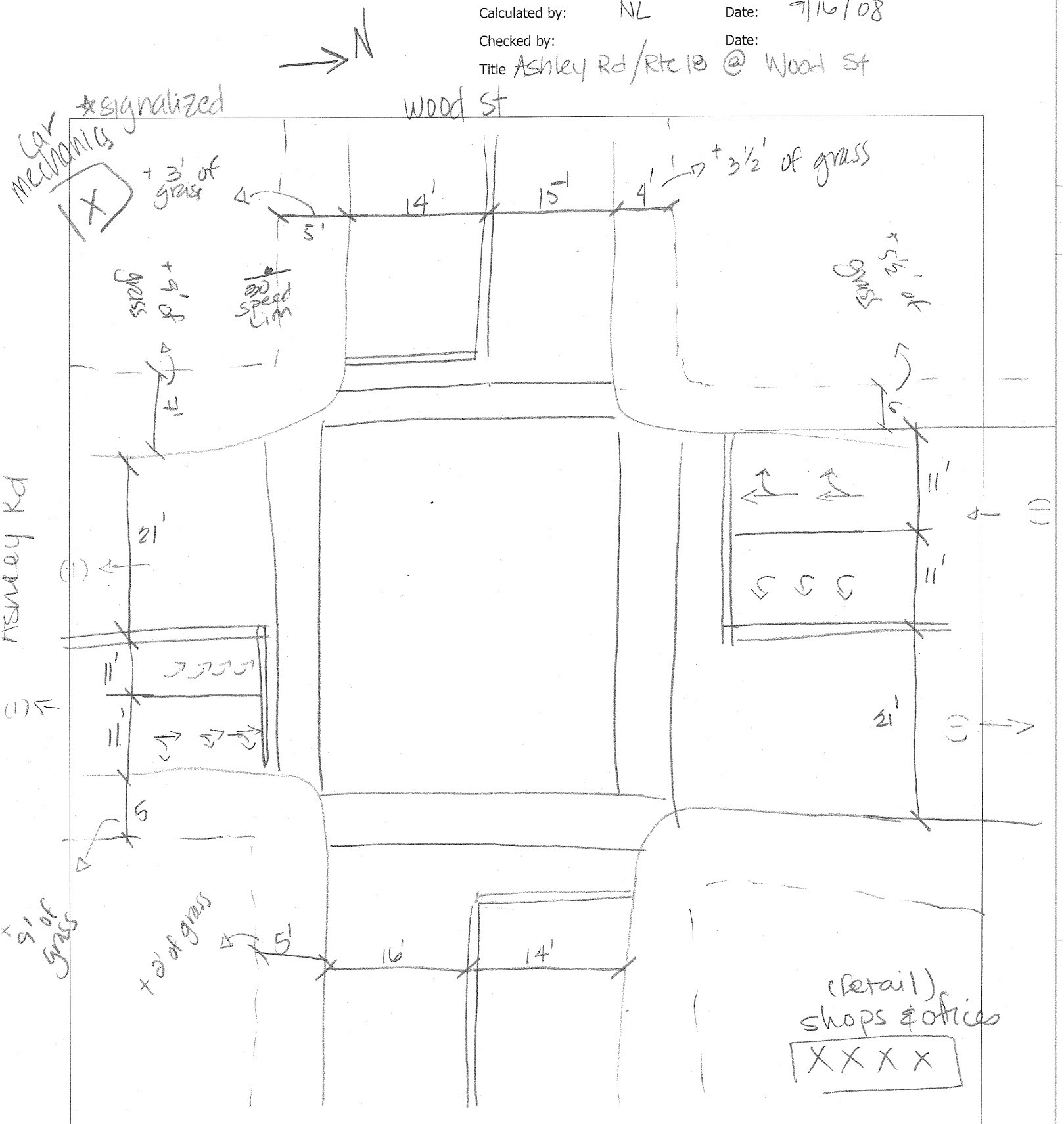
Project # 10111.00
Sheet of
Date: 9/16/08
Date:



Computations

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Ashley Rd/Rte 18 @ Wood St

Project # 10111.00
Sheet 1 of 1
Date: 7/16/08
Date:

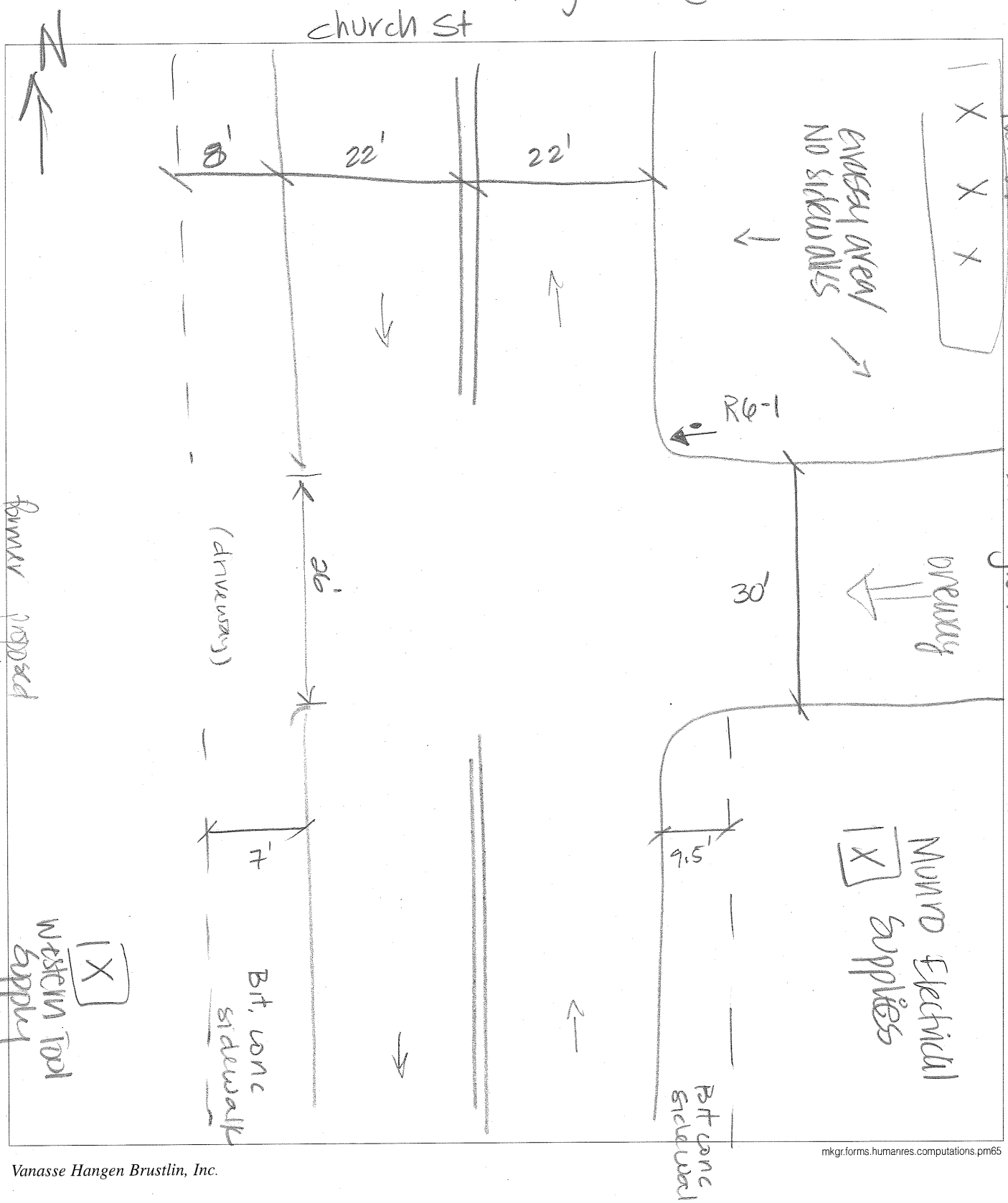


Computations

* Unsignalized
  - no stop signs
  - almost no markings

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Irvington St @ Church St

Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:

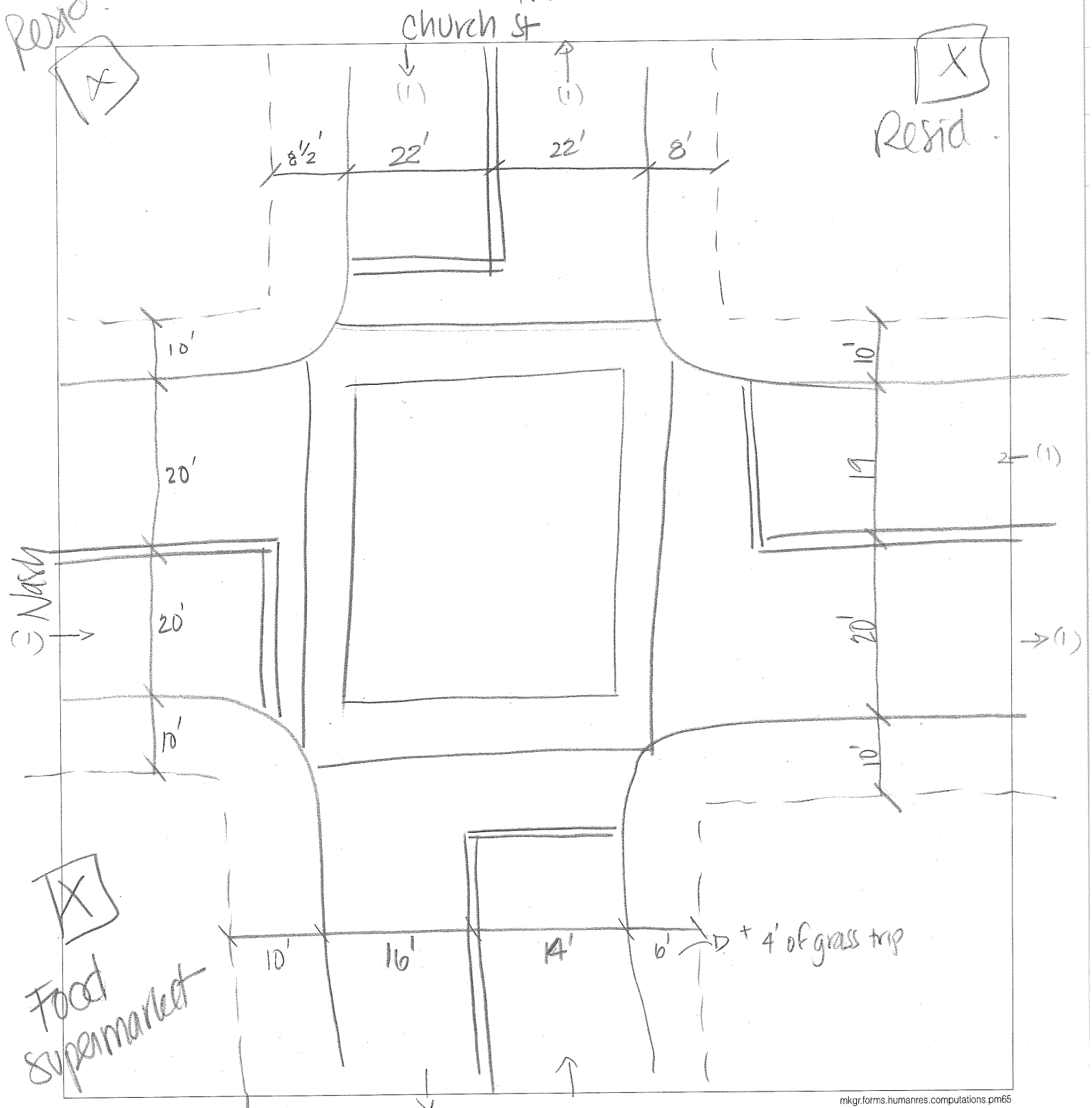


VHB *Computations*

* signalized

Project: SCR
Location: New Bedford
Calculated by: NL
Checked by:
Title Nash Rd @ Church St

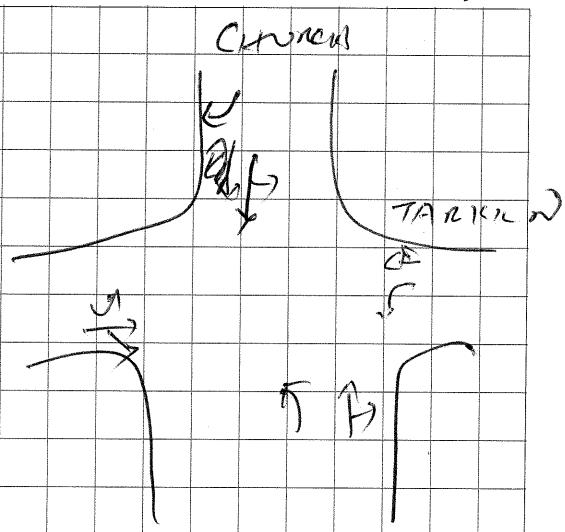
Project # 10111.00
Sheet 1 of 1
Date: 9/16/08
Date:



VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#8 Title Signal Timing & Phasing

CHURCH ST / TARKILN RD



$\phi 1$ TARKILN RD d_1 CHURCH

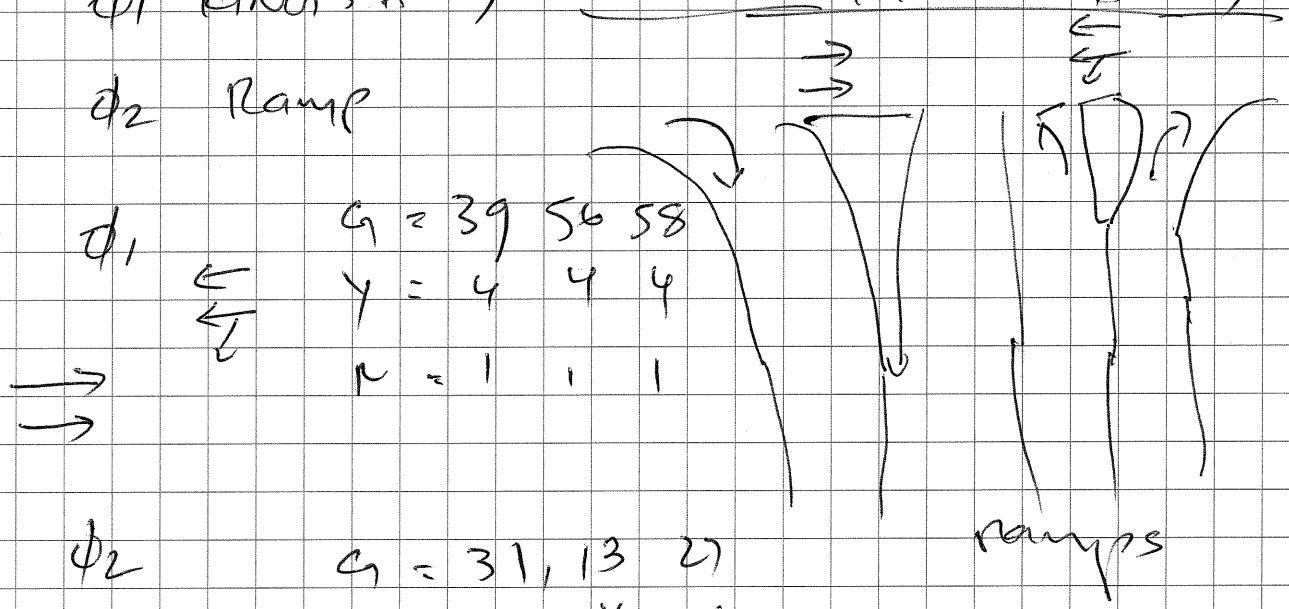
d_1 $G = 28, 28$
$Y = 4, 4$
$R = 1, 1$

$\phi 2$ $G = 28, 28$
$Y = 4 \quad 4$
$R = 1 \quad 1$

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#2 Title Signal Timing & Phasing

Route 140 N ON/OFF RAMP @ Kings Hwy



ϕ_1 Kings Hwy

ϕ_2 Ramp

ϕ_1 ← ←↓ → →

G = 39 56 58
Y = 4 4 4
R = 1 1 1

ϕ_2 ↑

G = 31, 13 27
Y = 4, 4 4
R = 1 1 1

ϕ_3 ← ←↓

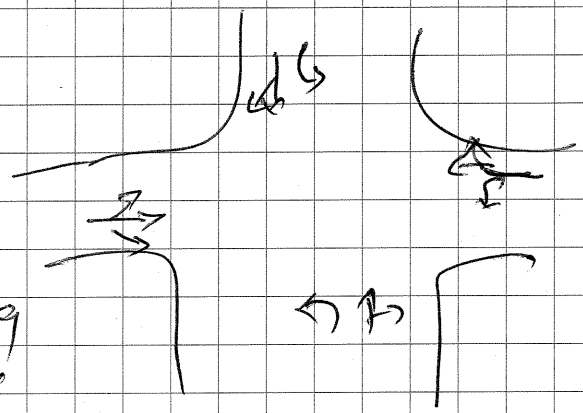
G = 8
Y = 3
R =

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RAK | Date: 9/16/08
Checked by: | Date:
Title Signal Timing & Phasing

Kinney Blvd @ Wood St.

ϕ_1 ~~Kinney~~ PUSH BUTTON
ϕ_2 RED
ϕ_3 WOOD



ϕ_1 G = 28 28 29
Y = 4 4 4
R = 1 1 1

ϕ_2 W = 7
RED FDW = 8

ϕ_3 G = 8 6 7 12
Y = ~~4~~ 4 4 4
R = 1 1 1 1

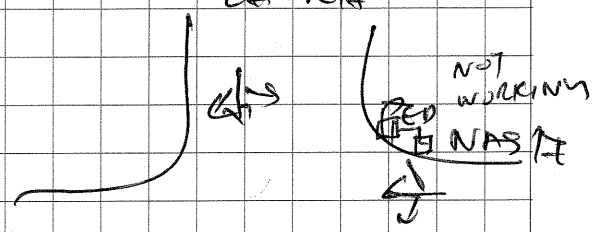
VHB *Computations*

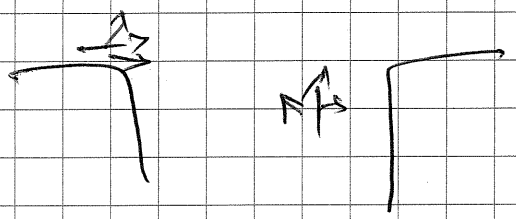
Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#7 Title Signal Timing & Phasing

CHURCH ST @ NASH

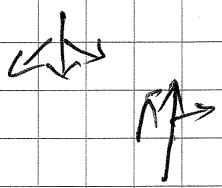
ϕ1 CHURCH ST

ϕ2 NASH





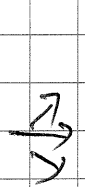
ϕ1



G =	22	22	22
Y =	4	4	4
R =	1	1	1

No Ped call on Push Button Act

ϕ2

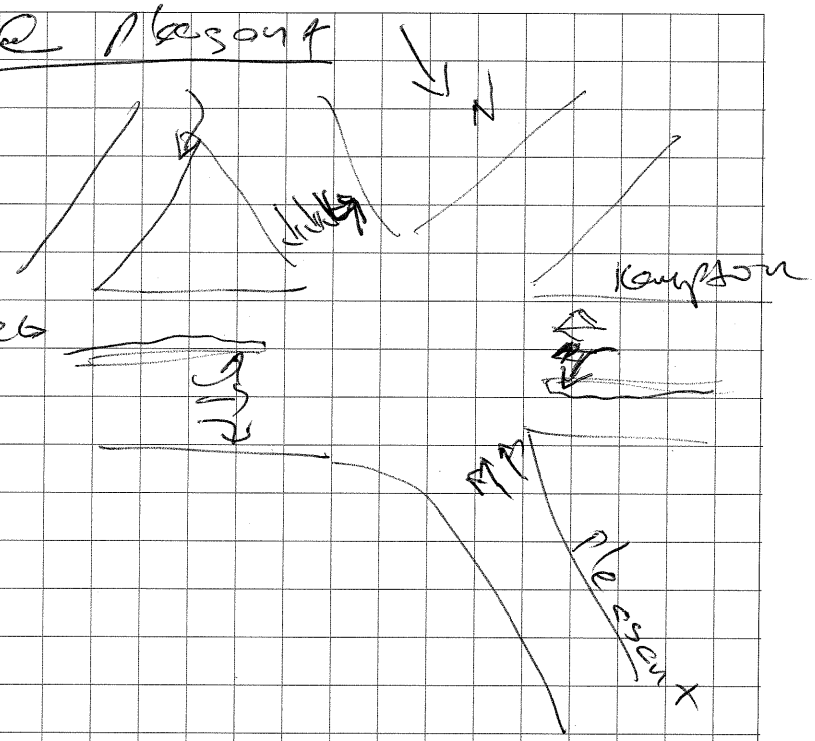


G =	24	30	30
Y =	4	4	4
R =	1	1	1

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#9 Title Signal Timing & Phasing

Kempton & Hill & Pleasant



ϕ_1 Kempton
ϕ_2 Rudeg
ϕ_3 Peel
ϕ_4 Pleasant SB
ϕ_5 Pleasant NB

ϕ_1 ⇐ ↙
G = 30 23
Y = 4 4
R = 1 1

ϕ_2 ↑ → ↓
G = 27 30
Y = 4 4
R = 1 1

ϕ_3 Ped
W = 9
FDW = 11

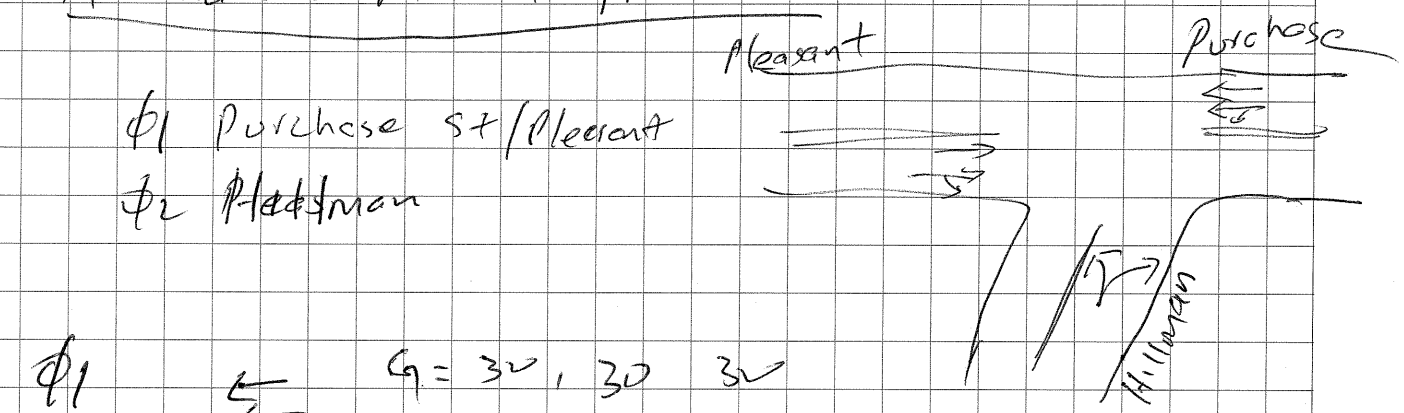
ϕ_4 MP
G = 31, 30
Y = 4 4
R = 1 1

ϕ_5 ↳ ↓
G = 20 29
Y = 4 4
R = 1 1

VHB *Computations*

Project: SCR | Project # 10111-37
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
#1 Title Signal Timing & Phasing

Hillman @ Pleasant / Purchase



ϕ_1 Purchase St / Pleasant
ϕ_2 Hillman

ϕ_1

G = 30, 30 30
Y = 4, 4 4
R = 1, 1 1

ϕ_2

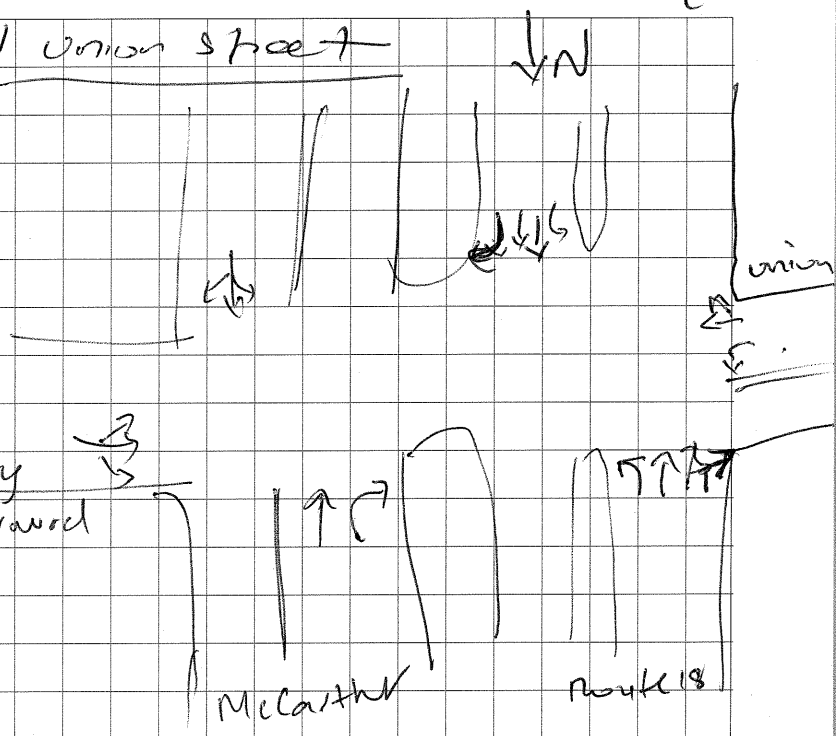
G = 20, 20 20
Y = 3, 3, 4
R = 1 1, 1

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/16/08
Checked by: | Date:
Title Signal Timing & Phasing

#7 + #6

Route 18 @ McCarthur / Union Street



ϕ_1 McCarthur SB RT
Rte 18 NB RT

ϕ_2 Rte 18 NB & SB LT

ϕ_3 McCarthur & Rte 18 THRUS

ϕ_4 PED

ϕ_5 Union & Ferry

ϕ_1 | G: 14 15 | Y: 2 2 | R: 1 1

ϕ_2 | G: 12 11 | Y: 4 4 | R: 6 5

ϕ_3 | G: 42 42 | Y: 4 4 | R: 4 4

ϕ_4 PED W = 17 FDW = 13 } 30

ϕ_5 G: 22 27 | Y: 4 4 | R: 6 6

Long red time

NEW BEDFORD				
KING'S HIGHWAY AT RTE 140 NB RAMPS				
STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1319	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT
KING'S HIGHWAY AT RTE 140 NB RAMPS

IN THE TOWN OF

NEW BEDFORD
BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

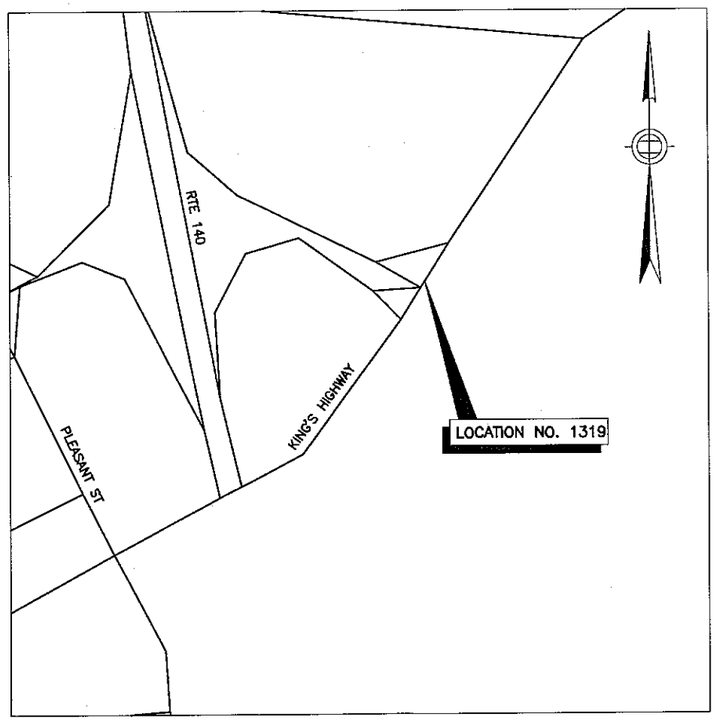
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I. STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II. OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: COORDINATED
(c) Special connection: TIME-BASED
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit.
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO	01
DATE:	01-18-02
INSERT BY:	I. TETER
DATE:	
FILE NAME:	1319T0101.DWG

COMMENTS:

MASSHIGHWAY

10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

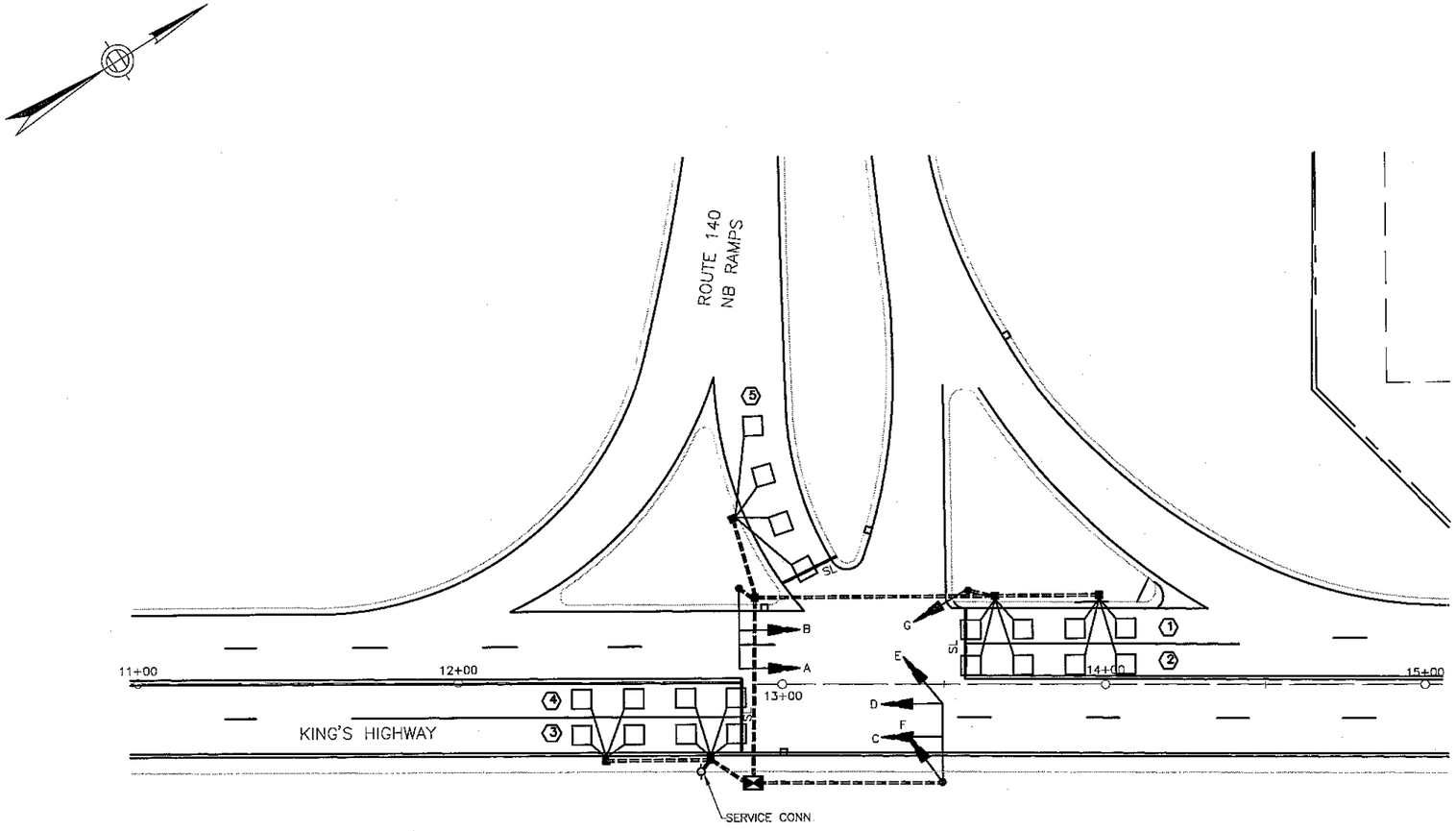
APPROVED BY:

STATE TRAFFIC ENGINEER Date

NEW BEDFORD
KING'S HIGHWAY AT RTE 140 NB RAMPS

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1319	01	2	

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET

1" = 20' HORIZONTAL

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

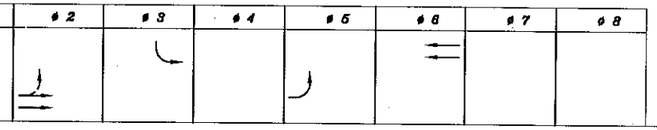
1319P0101.DWG

NEW BEDFORD
KING'S HIGHWAY AT RTE 140 NB RAMPS

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1319	01	3	

TRAFFIC SIGNAL DATA

APPROX. NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH DISK
KING'S HIGHWAY	WB	A,B				R	R	R	R	R	R				R	R	R	G	Y	R							FY
KING'S HIGHWAY	EB	D,G				G	Y	R	R	R	R				GL/RYL/R			R	R	R							FY
KING'S HIGHWAY	EB	C				G	Y	R	R	R	R				R	R	R	R	R	R							FY
FIELDSTONE MARKETPLACE	SB	E,F				R	R	R	G	Y	R				R	R	R	R	R	R							FR
PEDESTRIAN																											
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)						8			8						5			8									EMERGENCY ONLY
PASSAGE TIME (VEHICLE)						3			3						3			3									
MAXIMUM 1						30			35						10			30									
MAXIMUM 2						25			15						25			25									
YELLOW CLEARANCE							4			4						4			4								
RED CLEARANCE								1			1						1			1							
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL						OFF			OFF						OFF			OFF									
MEMORY						NON-LOCKING			NON-LOCKING						NON-LOCKING			NON-LOCKING									

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
1	10' SIGNAL POLE, BASE, & FDN.
2	MAST ARM ASSEMBLY, BASE, & FDN.
5	1 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
1	1 WAY, 5 SECTION SIGNAL HOUSING (12" LENS)
1	2 WAY, 3&5 SECTION SIGNAL HOUSING (12" LENS)
3	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
20	ROADWAY LOOP DETECTOR
6	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø1, ø4 , ø7 AND ø8 NOT USED.

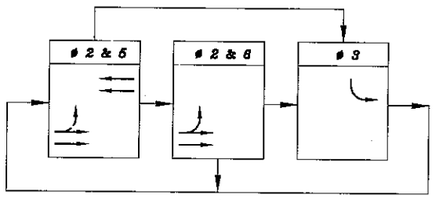
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR

PREFERENTIAL PHASING SEQUENCE



COORDINATION DATA
(ALL ENTRIES IN SECONDS)

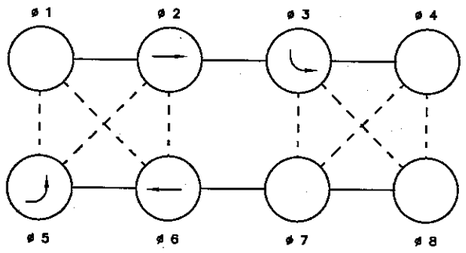
CYCLE	TIME PERIOD	OFFSET	CYCLE LENGTH
CYCLE 1	ALL DAY MONDAY-FRIDAY ALL DAY SATURDAY AND SUNDAY	0	80
CYCLE 2			
CYCLE 3			
CYCLE 4			

SPLIT	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
SPLIT 1		80	30		15	35		
SPLIT 2								
SPLIT 3								
SPLIT 4								

LOOP DETECTOR DATA

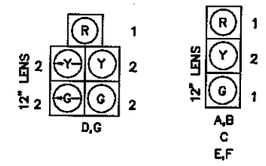
DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	4	6'X6'		ø6	ø6	PRESENCE		
2	4	6'X6'		ø6	ø6	PRESENCE		
3	4	6'X6'		ø2	ø2	PRESENCE		
4	4	6'X6'		ø2&5	ø2&5	PRESENCE		
5	4	6'X6'		ø3	ø3	PRESENCE		

NEMA DUAL RING PHASING NOTES:



SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: EPAC 300
UTILITY POLE No. COM. ELEC. # 382/9
METER No. 97-028-673 (7526257)
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1319D0101.DWG

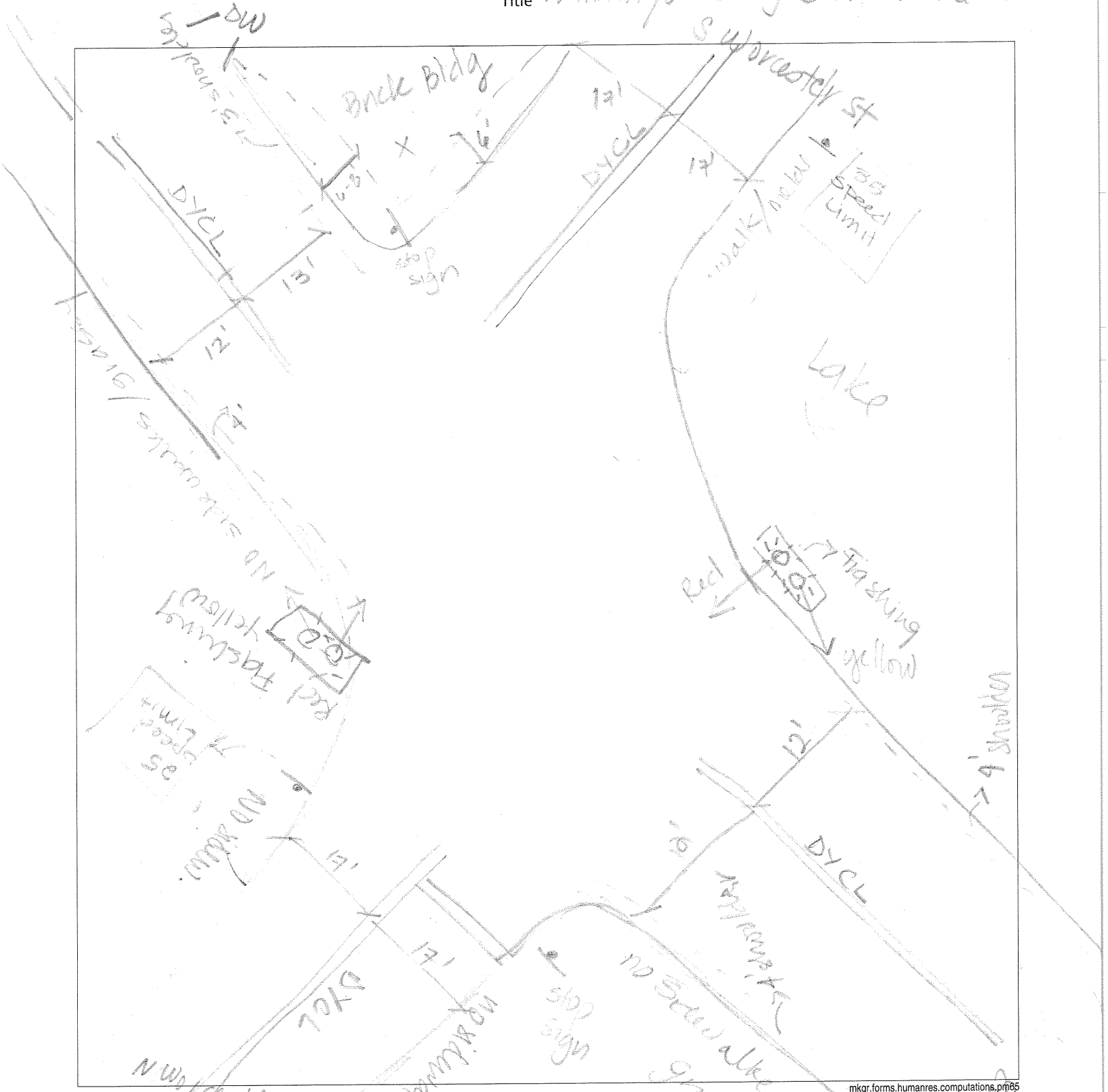
(1)

VHB *Computations*

Rte 123/Main St

Project: SCR
Location: NORION
Calculated by: NL
Checked by:
Title W Main/Old Colony @ N/S Worcester St

Project # 10111.31
Sheet 1 of 1
Date: 9/10/08
Date:



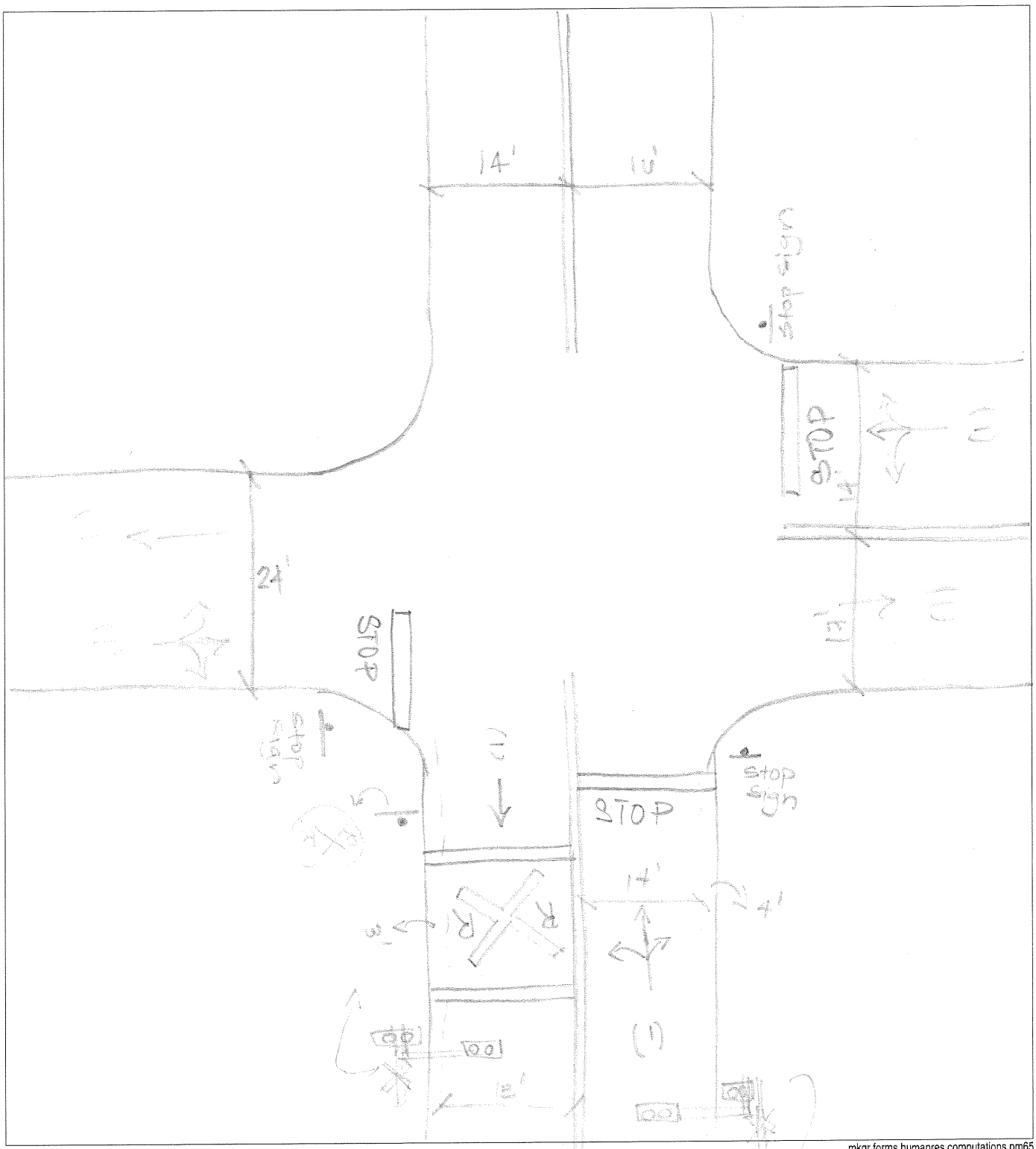
mkgr.forms.humanres.computations.pm65

Computations

* no sidewalks in any approach

Project: SCR
Location: Norton
Calculated by:
Checked by:
Title S. Worcester St/Sturdy @ John B Scott.

Project # 10111 31
Sheet of
Date:
Date:



mkgr.forms.humanres.computations.pm65

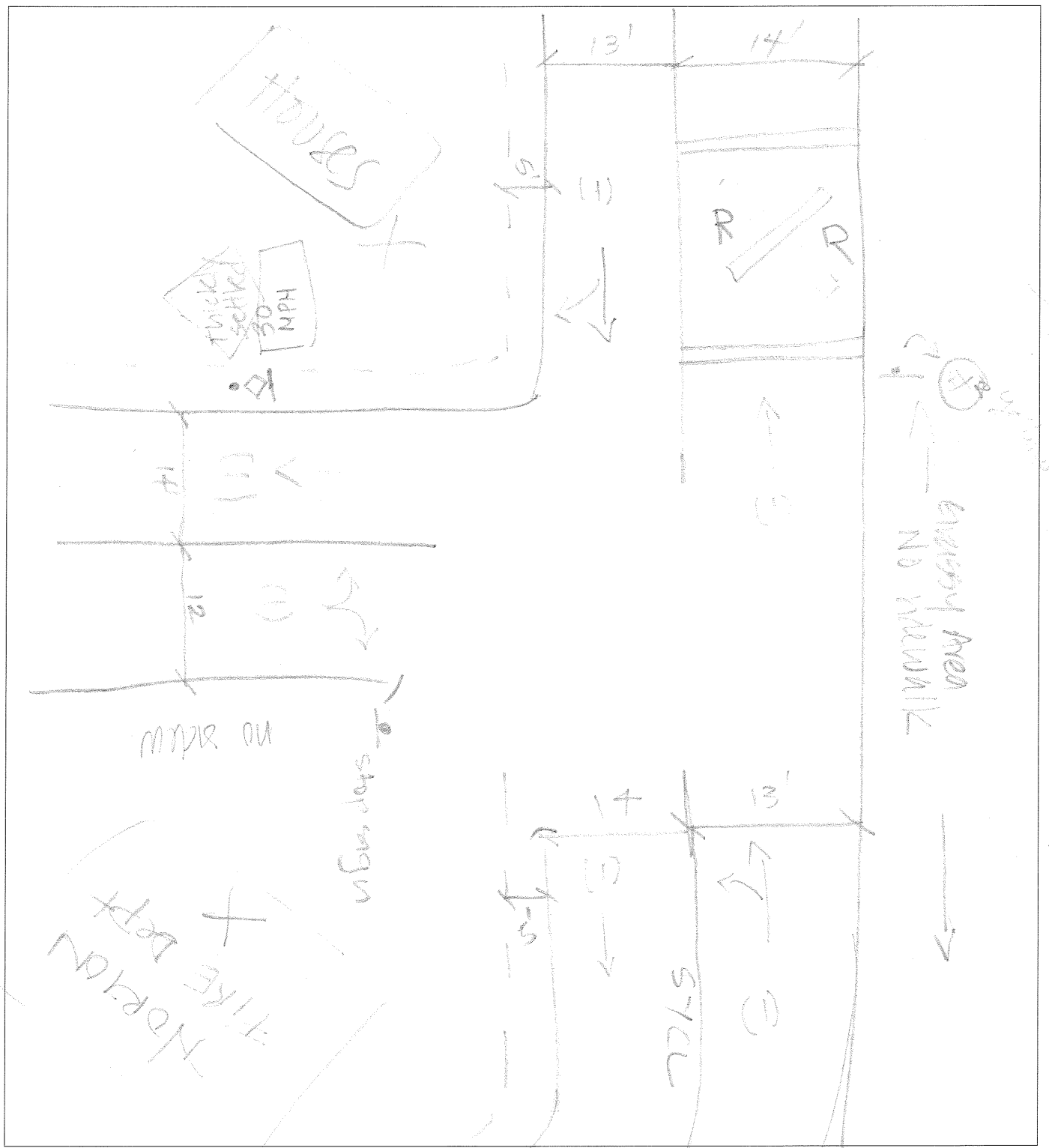
3

VHB *Computations*

& shipping very busy

Project: SCR
Location: Norton, MA
Calculated by: KL
Checked by:
Title Barrows St @ Dean St/S. Worcester St

Project # 10111.31
Sheet of
Date: 9/10/08
Date:



mkgr.forms.humanres.computations.pm65

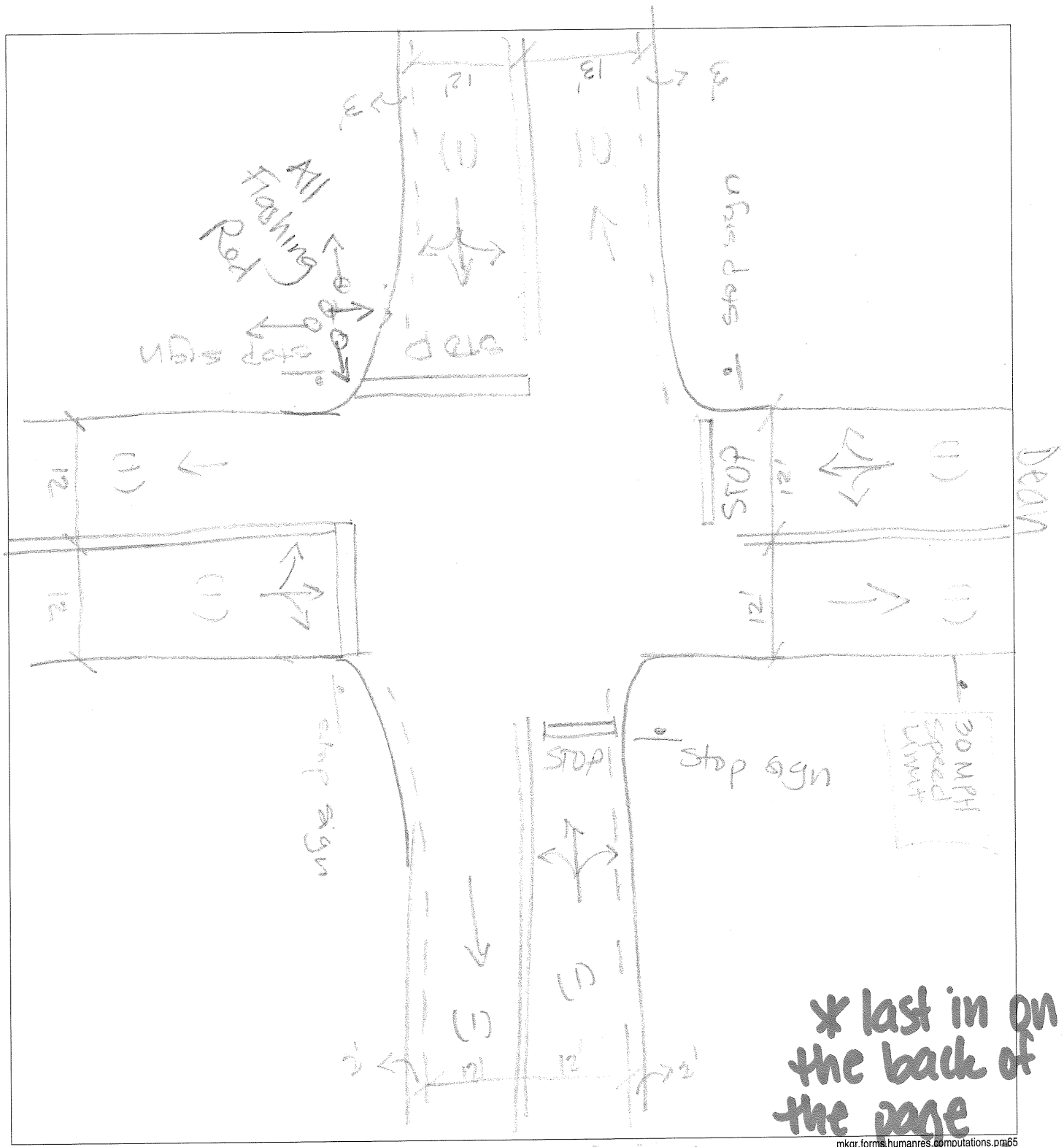
4)

VHB *Computations*

* No sidewalk on any approach

Project: SCR
Location: Norton
Calculated by: NL
Checked by:
Title John B Scott @ Dean St

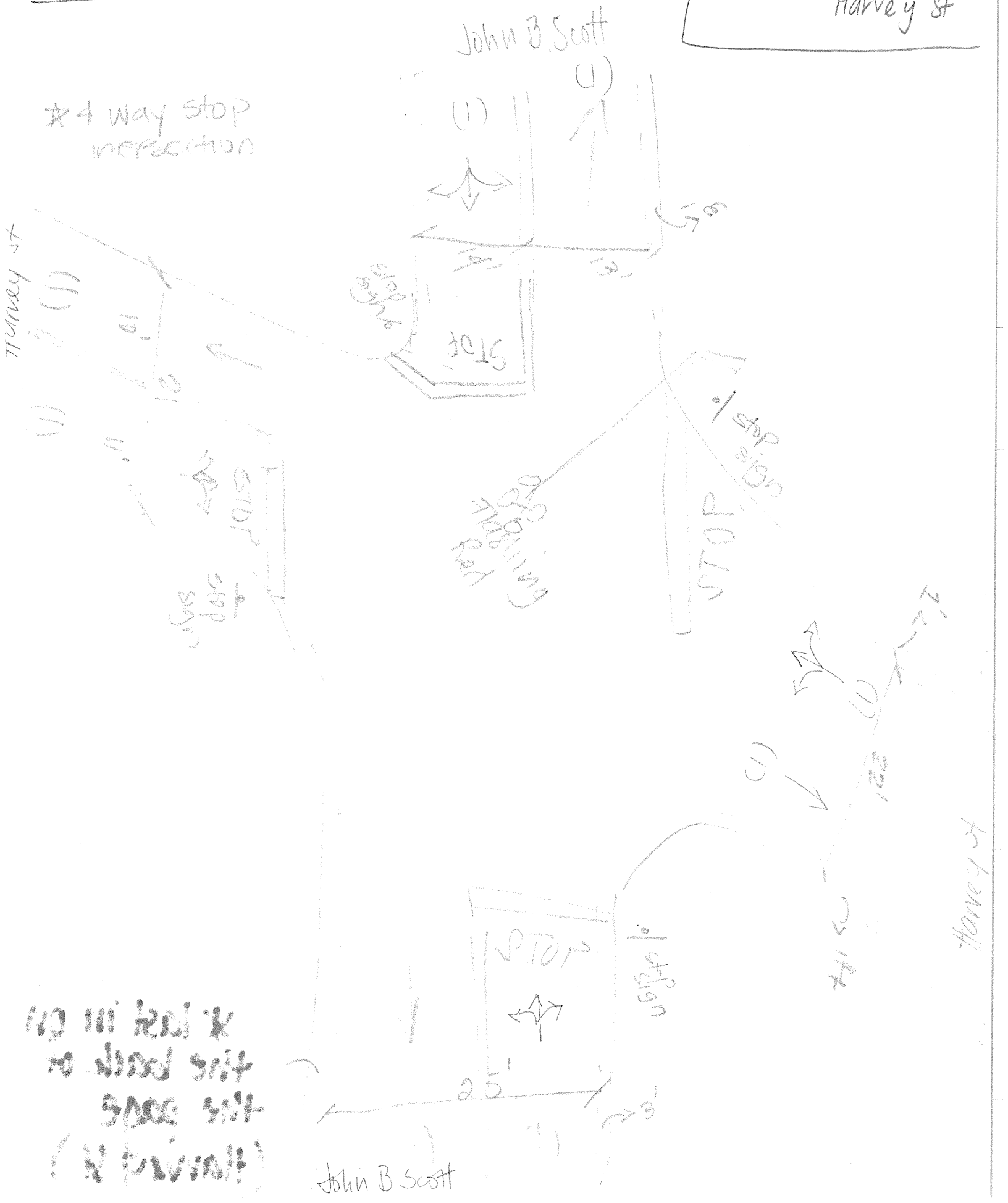
Project # 10111.31
Sheet 1 of
Date: 9/10/08
Date:



* last in on the back of the page (Harvey St)

South Coast Rail
10111.00

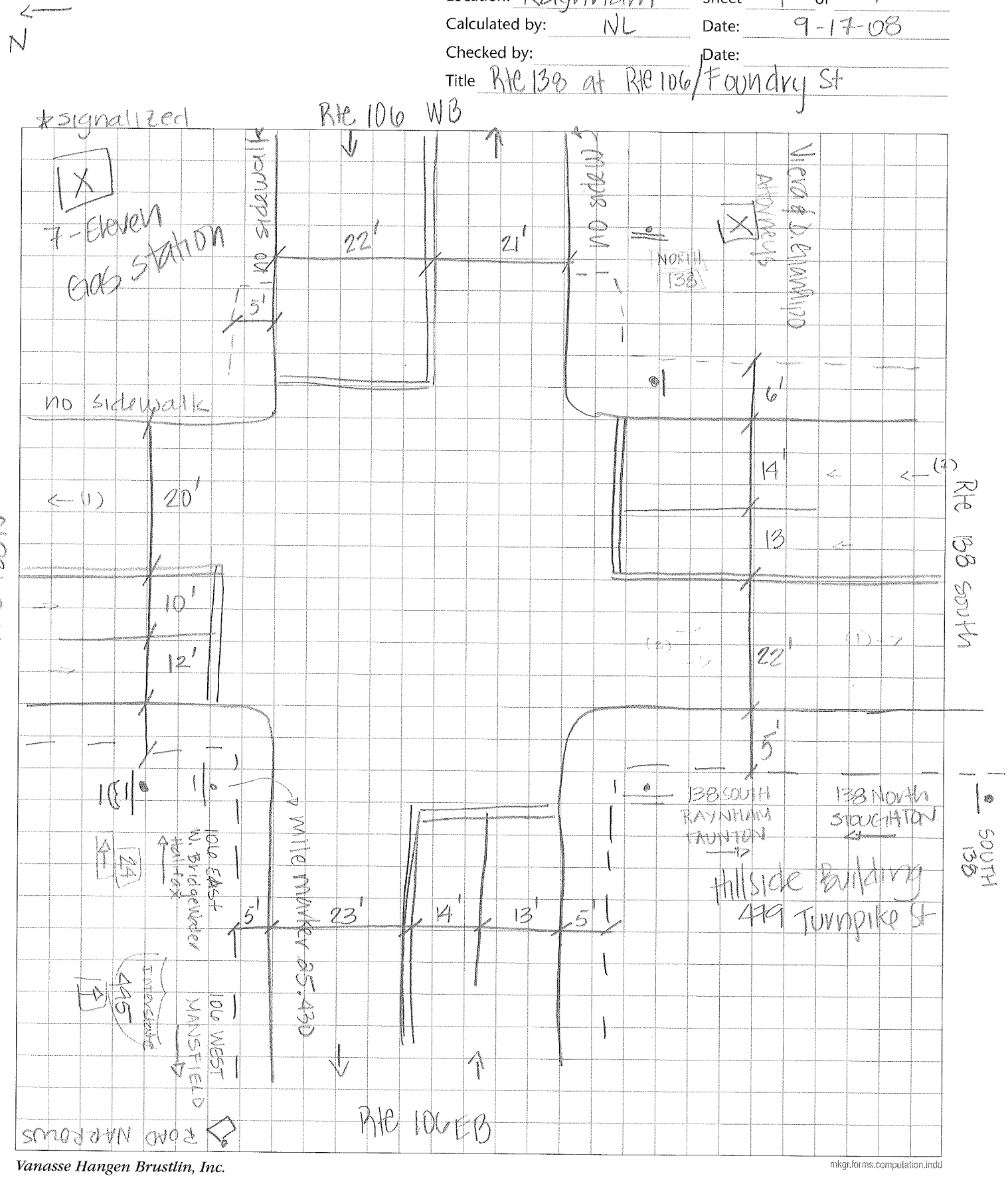
9-10-08
Int: John B Scott @
Harvey St



(1)

VHB *Computations* pictures 1 - 12

Project: SCR | Project # 10111.00
Location: Raynham | Sheet 1 of 1
Calculated by: NL | Date: 9-17-08
Checked by: | Date:
Title Rte 138 at Rte 106/Foundry St



(2)

VHB **Computations** pictures 13-19

* unsignalized
* good pavem cond
* good markings
* NO STOP SIGN !

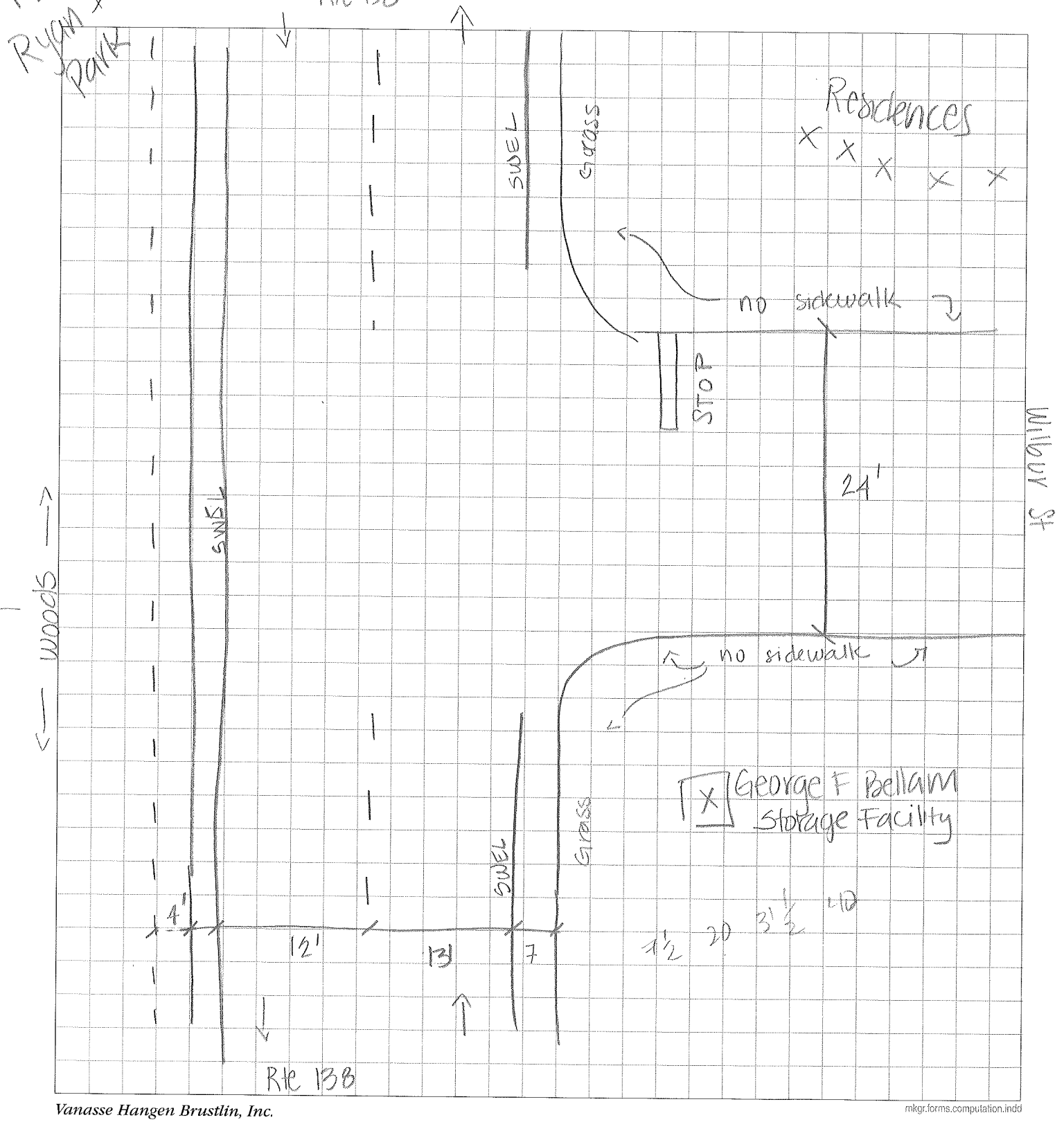
Project: SCR Project # 10111.00

Location: Raynham Sheet 1 of 1

Calculated by: NL Date: 9-17-08

Checked by: Date:

Title Wilbur St at Rte 138



VHB *Computations* pictures 20 - 29

→N

Project: SCR | Project # 10111.00

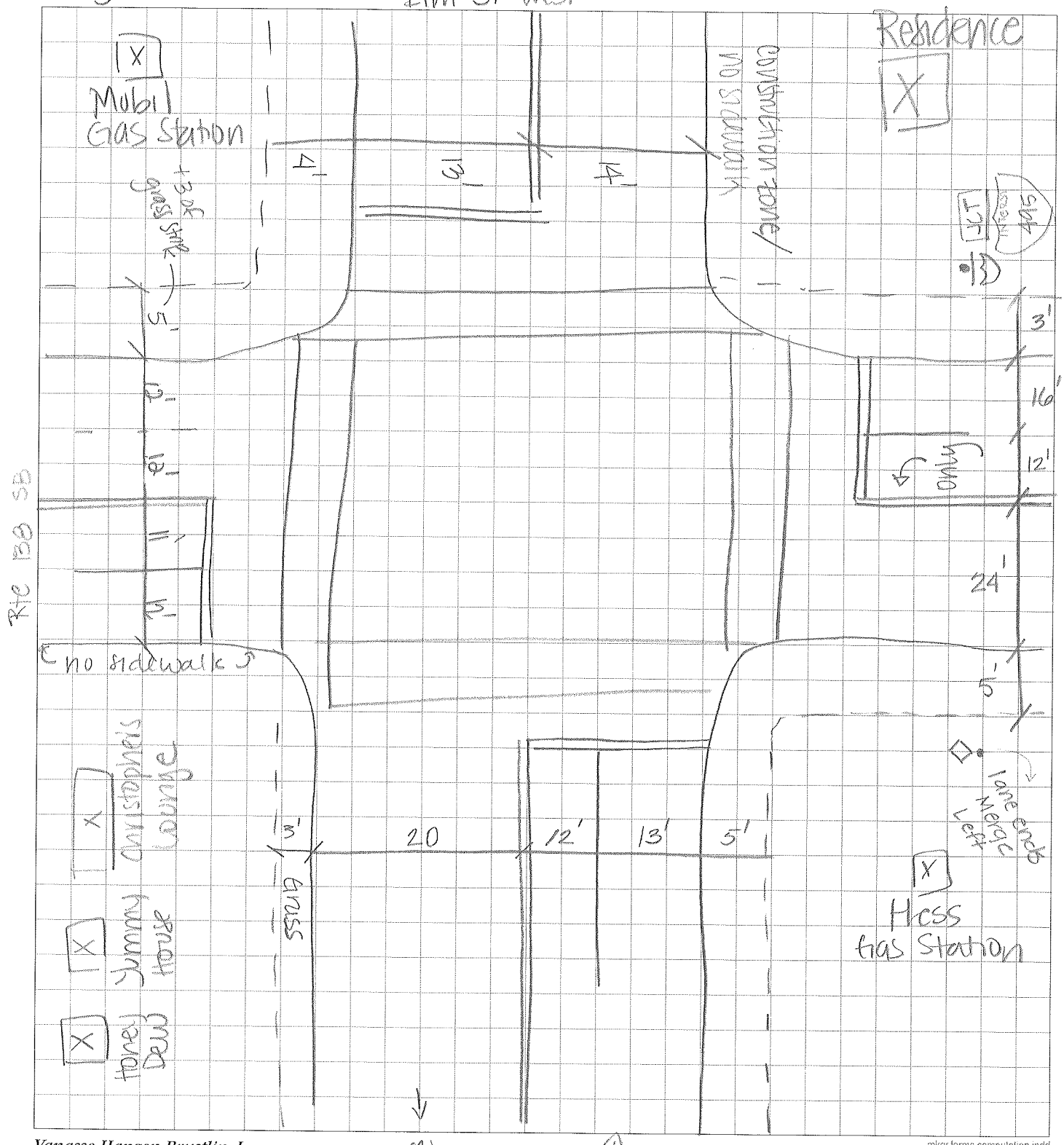
Location: Raynham | Sheet 1 of 1

Calculated by: | Date: 9-17-08

Checked by: | Date:

Title Elm St at Rte 138

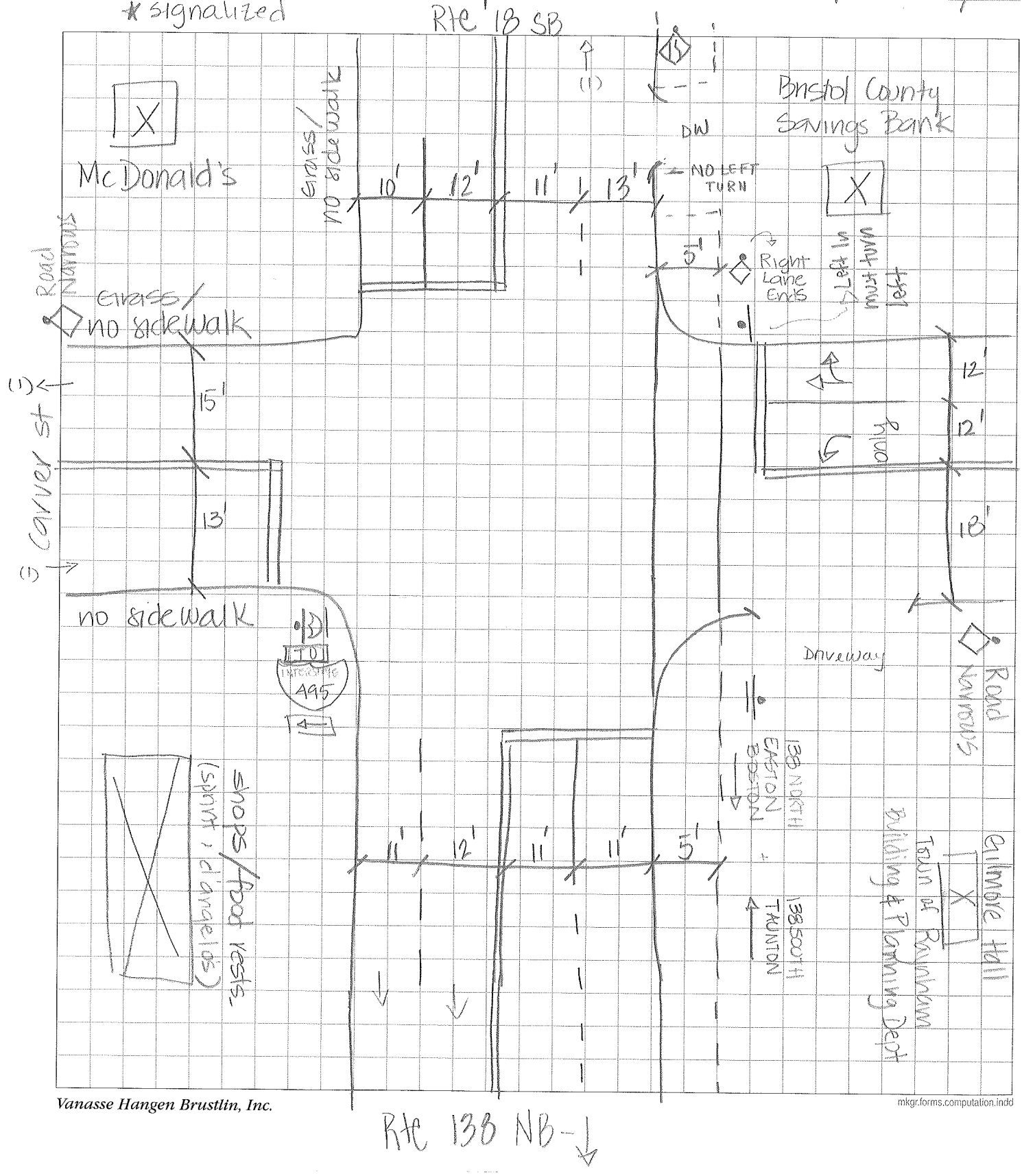
* construction zone @ Elm St West
* good marking cond.
* good pavem cond
* signalized



VHB *Computations* pictures: 30-41

★ good pavem. cond
★ good markings
★ BUSY INT. DURING PM HRS

Project: SCR | Project # 10111.00
Location: Raynham | Sheet 1 of 1
Calculated by: NL | Date: 9-17-08
Checked by: | Date:
Title Carver St @ Rte 138/Broadway St



Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

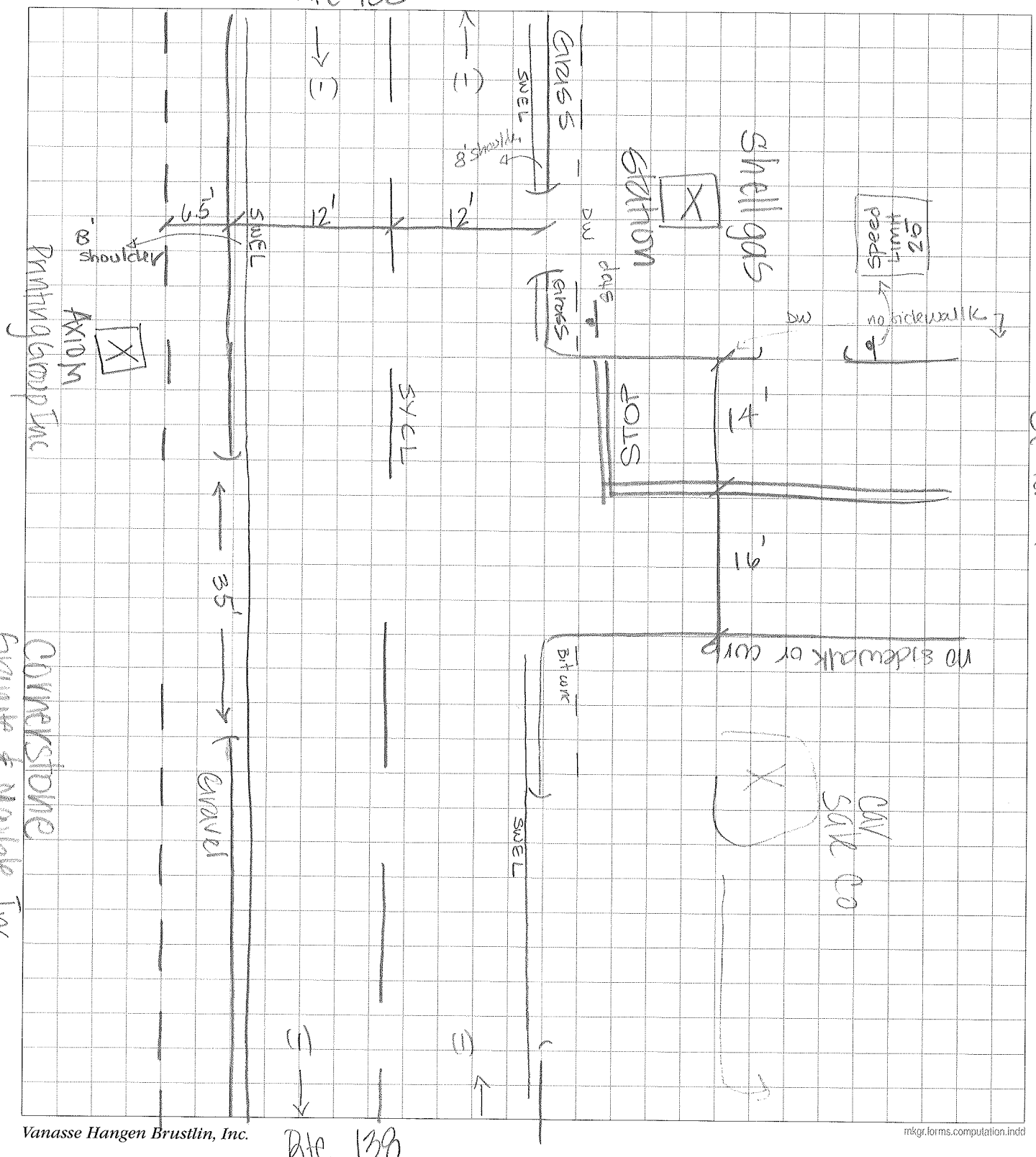
VHB **Computations** pictures 42 - 46

* unsignalized
* pavem. fair to good
* good markings
* LOTS OF TRAFFIC (NOON)

Project: SCR
Location: Raynham
Calculated by: NL
Checked by:

Project # 10111.00
Sheet 1 of 1
Date: 9-17-08
Date:

Title Rte 138/Broadway St at Center St



VHB *Computations*

pictures: 47 - 52

★ offset intersection

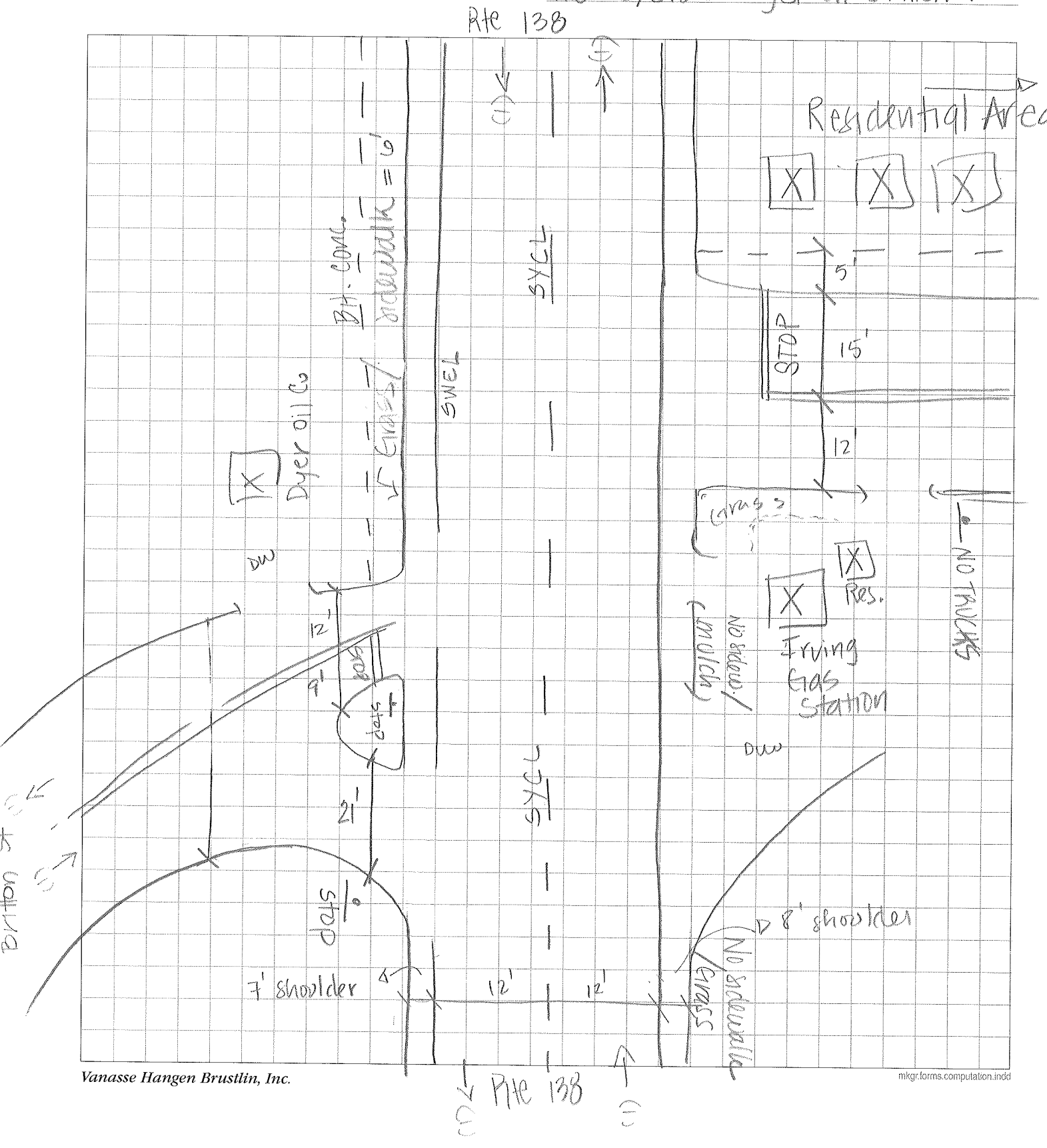
Project: SCR | Project # 10111.00

Location: Raynham | Sheet 1 of 1

Calculated by: NL | Date: 9-17-08

Checked by: | Date:

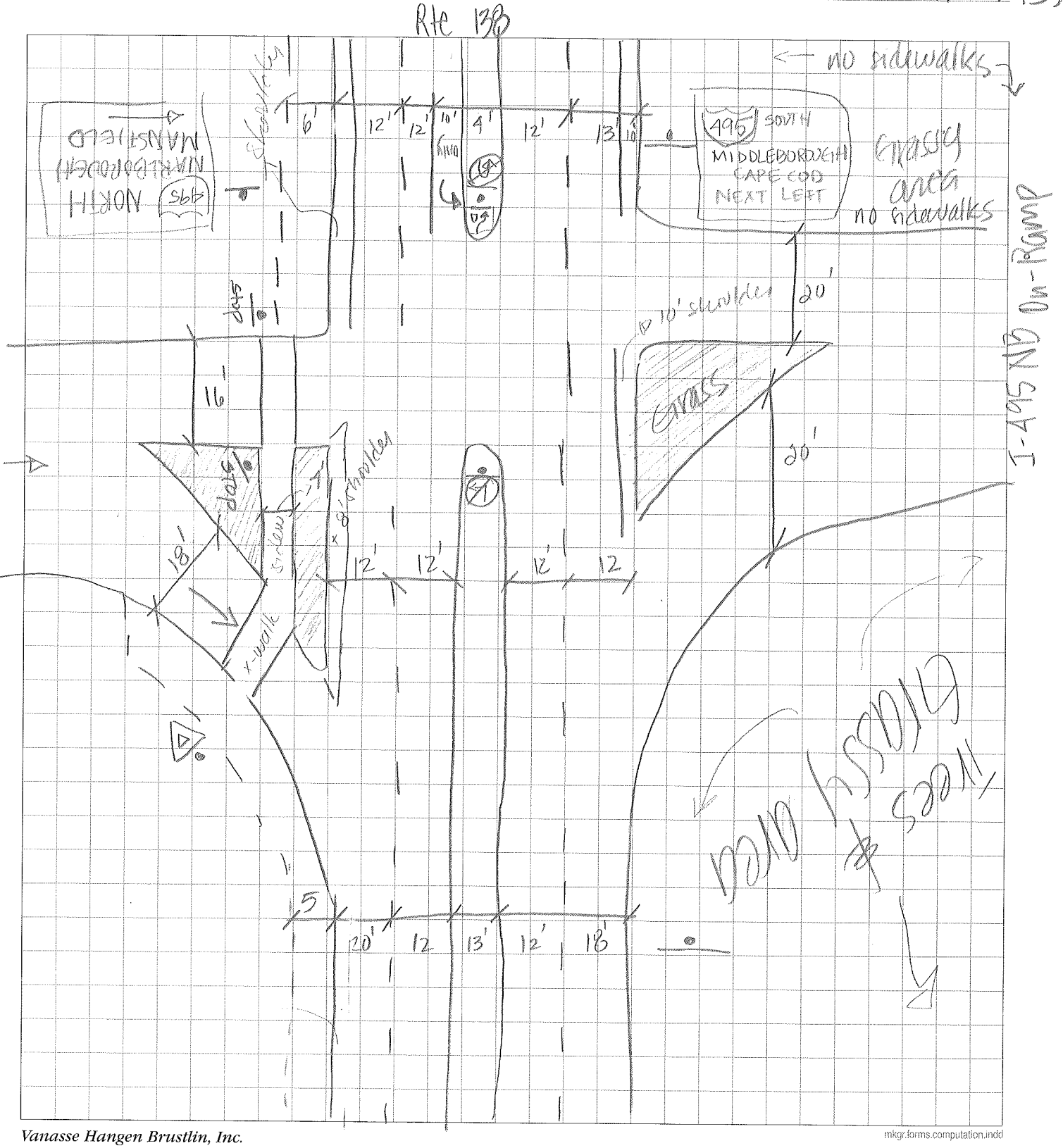
Title Rte 138/Broadway St at Britton St



VHB *Computations* pictures 53 - 60

* unsignalized
* 4a = 495 off-Ramp (left)
* 4b = 495 on-ramp (right

Project: SCR | Project # 10111.00
Location: Raynham | Sheet 1 of 1
Calculated by: NL | Date: 9-17-08
Checked by: | Date:
Title Rte 138 at I-495 ON-OFF RAMPS (4a & 4b)

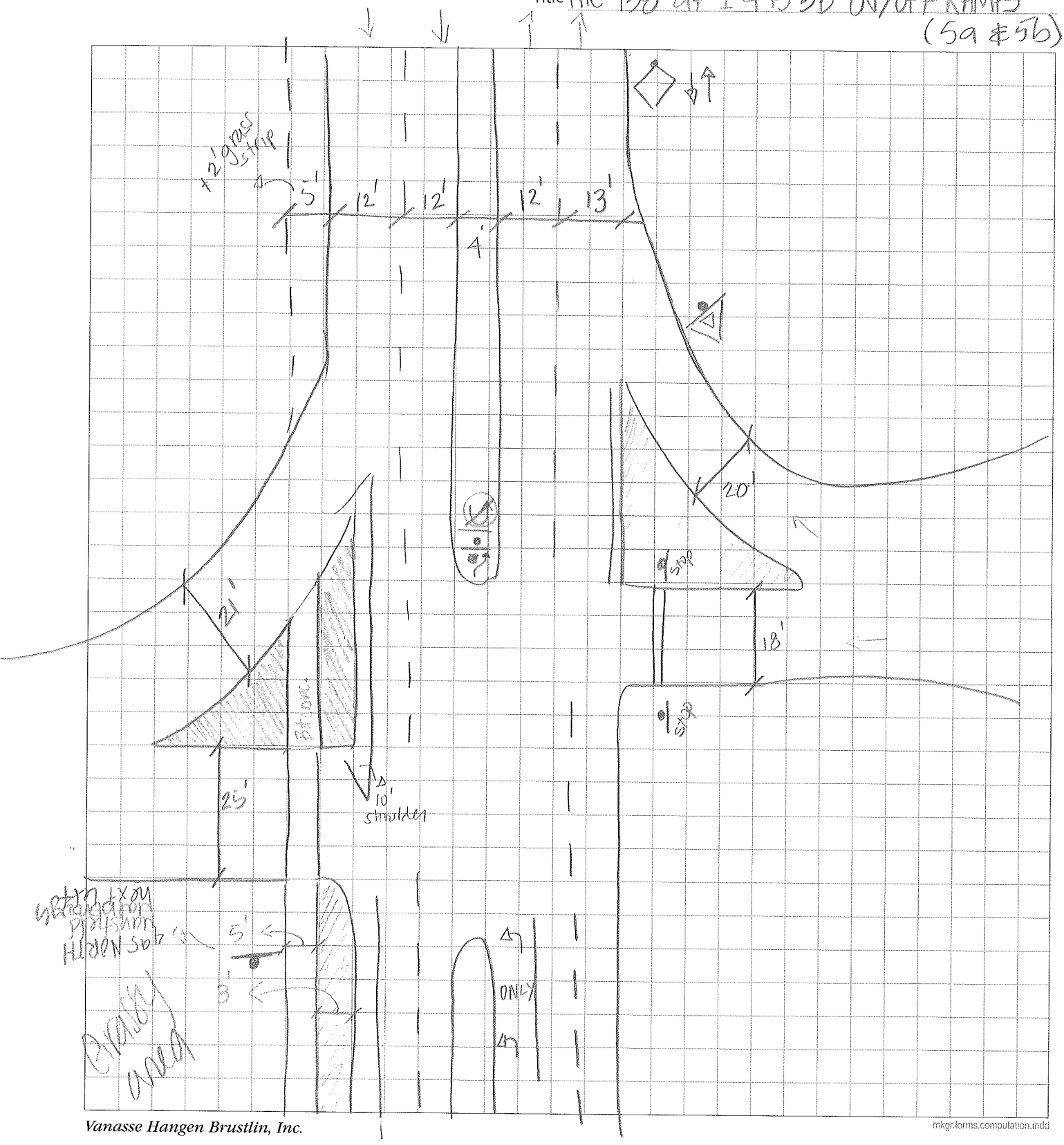


VHB **Computations** PICS: 61 - 69

N ↓ Not to design.

Project: SCR
Location: Raynham
Calculated by: NL
Checked by:
Title Rte 138 at I-495 SB ON/OFF RAMPS (5a & 5b)

Project # 10111.00
Sheet 1 of 1
Date: 9-17-08
Date:



Vanasse Hangen Brustlin, Inc.

mkgr.forms.computation.indd

VHB *Computations*

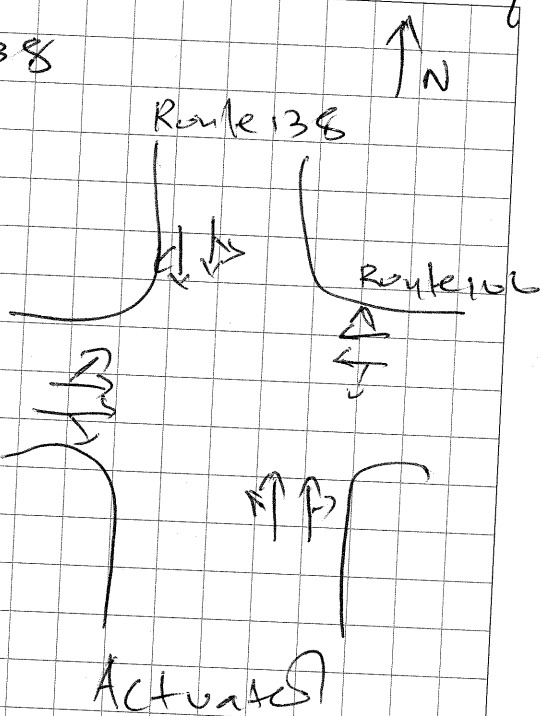
Project: SER | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/18/08
Checked by: | Date:
Title Signal Timing & Phasing

1-12 RAYNHAM / #1 TAUNTON

Route 106 @ Route 138

$\phi 1$ Route 106

$\phi 2$ Route 138



$\phi 1$

G =	11	24	30
Y =	4	4	4
R =	1	1	1

$\phi 2$

G =	30	30	30
Y =	4	4	4
R =	1	1	1

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RWR | Date: 9/18/08
Checked by: | Date:
#3 Title Signal Timing & Phasing

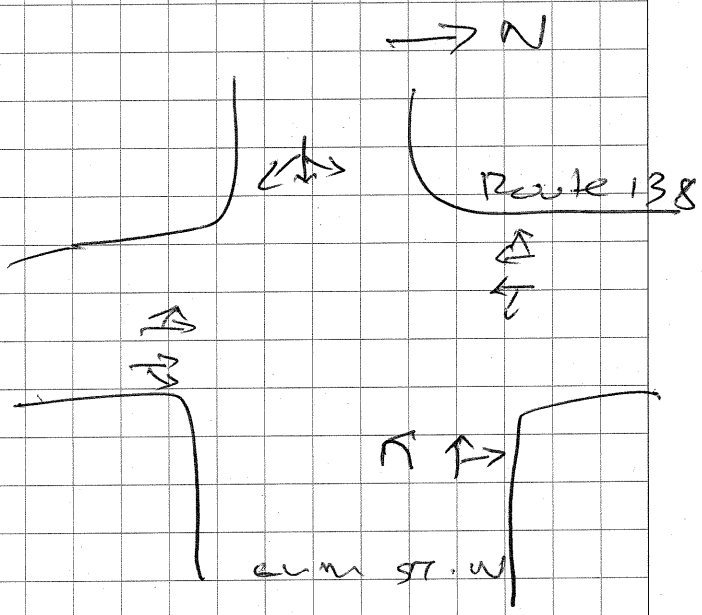
20-20

Route 138 @ Elm St. West

ϕ1 Route 138

ϕ2 Elm St. WB LEAD

ϕ3 Elm St. BOTH



Actuated

ϕ1

G = 25 44 18
Y = 4 4 4
R = 1 1 1

ϕ2

G = 8 11 12
Y = 3 3 4
R = 1 1 1

ϕ3

G = 20 11 12
Y = 4 4 4
R = 1 1 1

VHB *Computations*

HEAVY LEFTS DIFFICULT TO MAKE TURN – TOWN OF FILLMORE (SEWER DEPT) INTERSECTION IN A MESS DURING EVENING PEAK

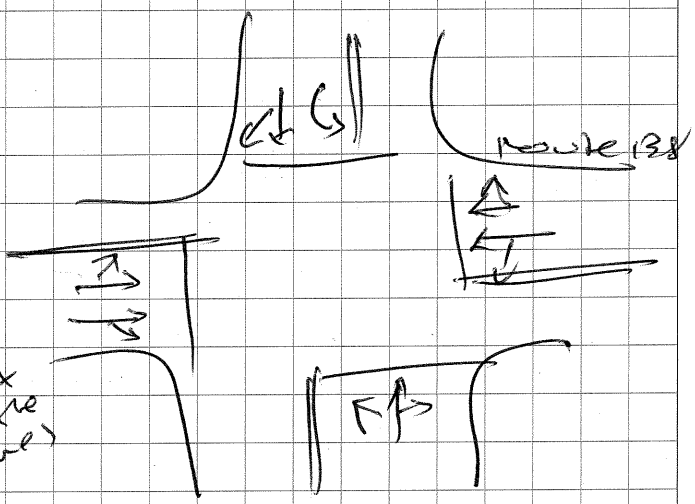
Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RMR | Date: 9/18/08
Checked by: | Date:
Title Signal Timing & Phasing

#6

31-41

ROUTE 138 @ CANVON ST → N

Φ1 Rte 138 NB
Φ2 Rte 138 Both
Φ3 CANVON ST.



Phase 2 would come on during field visit but not the times

Φ1
G = 6
Y = 3
R =

Φ2
Rest on Green
G = 25 16 55 37
Y = 4 4 4 4
R = 1 1 1 1

Φ3
G = 7 10 15 12
Y = 4 4 4 4
R = 1 1 1 1

RAYNHAM
RTE. 138 AT ELM STREET

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1338	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT
BROADWAY (ROUTE 138) AT ELM STREET

IN THE TOWN OF

RAYNHAM

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

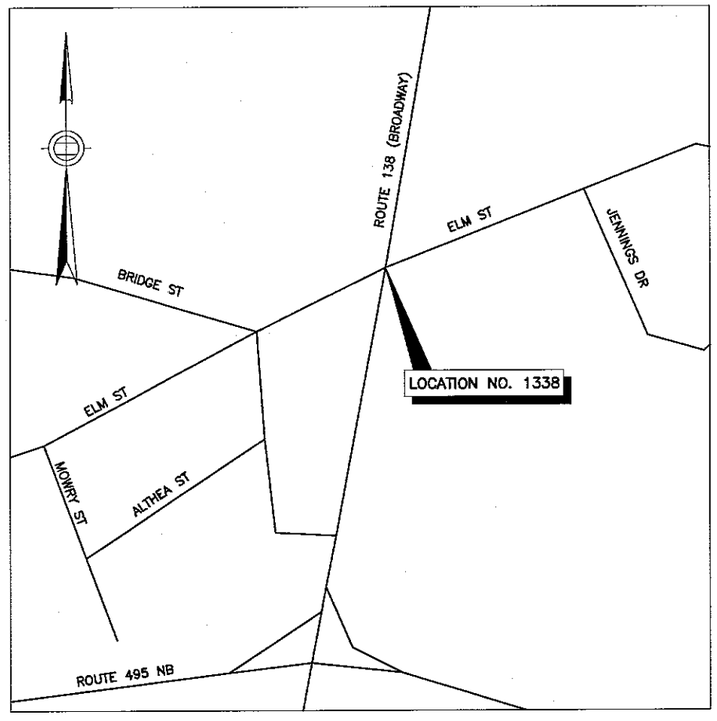
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued* or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50–60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO. 01
DATE: 12-12-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1338T0101.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

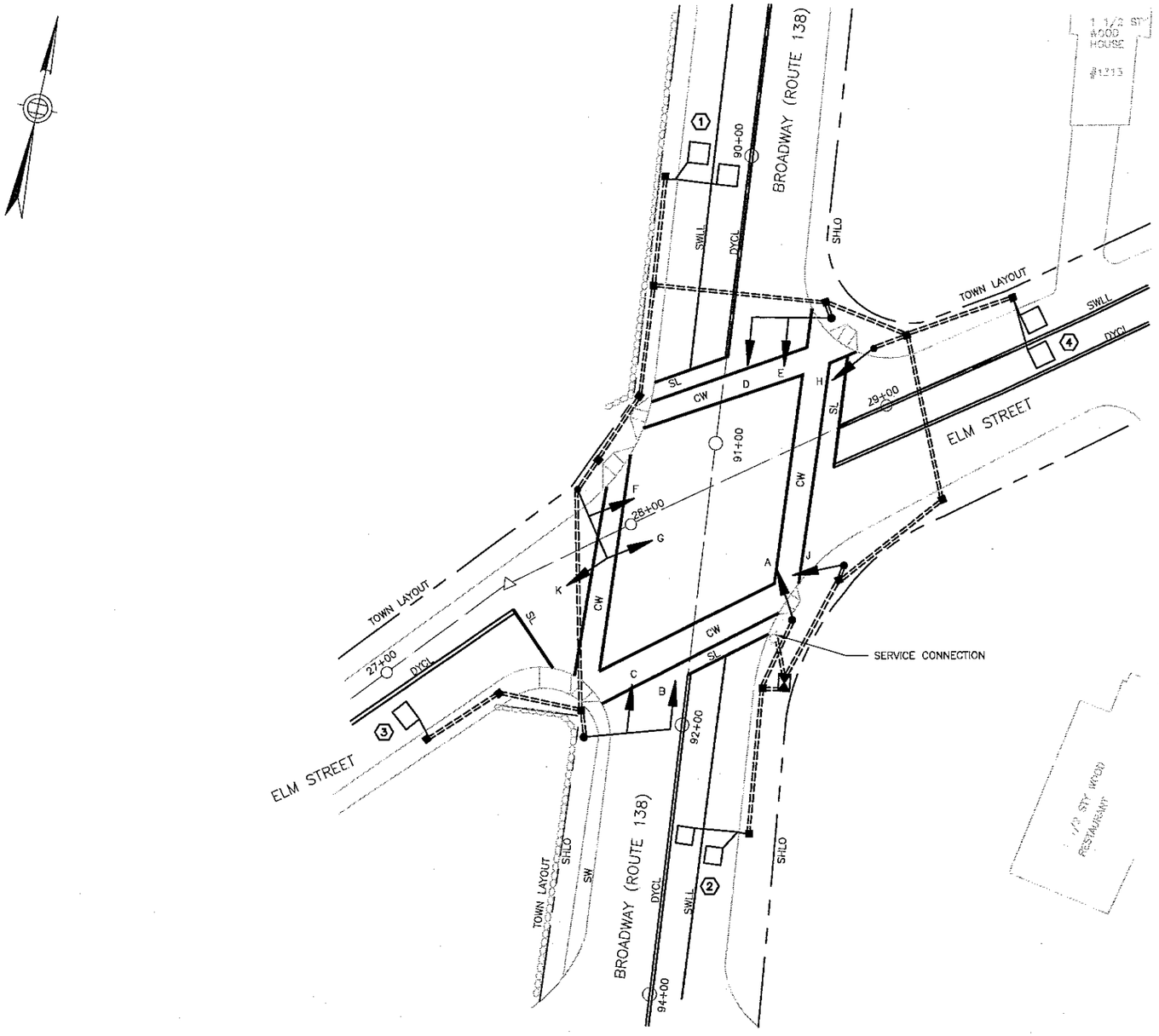
APPROVED BY:

STATE TRAFFIC ENGINEER Date

RAYNHAM
RTE. 138 AT ELM STREET

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1338	01	2	3

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET

1" = 20' HORIZONTAL

	SIGNAL CONTROLLER
	VEHICULAR SIGNAL
	OPTICALLY PROGRAMMED VEHICULAR SIGNAL
	FIRE PRE-EMPTION RECEIVER
	FIRE PRE-EMPTION STROBE LIGHT
	PEDESTRIAN SIGNAL
	PEDESTRIAN PUSH BUTTON
	PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

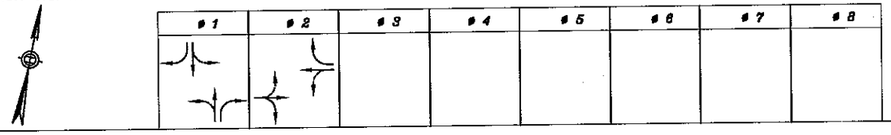
1338P0101.DWG

RAYNHAM
RTE. 138 AT ELM STREET

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1338	01	3	

TRAFFIC SIGNAL DATA

APPROX NORTH



SEQUENCE AND TIMING FOR FULLY--ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
BROADWAY (ROUTE 138)	NB	D,E	G	Y	R	R	R	R																			FY
BROADWAY (ROUTE 138)	SB	A,B,C	G	Y	R	R	R	R																			FY
ELM STREET	EB	K,H,J	R	R	R	G	Y	R																			FR
ELM STREET	WB	F,G	R	R	R	G	Y	R																			FR
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			9			9																					
PASSAGE TIME (VEHICLE)			4			4																					
MAXIMUM 1			35			20																					
MAXIMUM 2			35			20																					
YELLOW CLEARANCE				4			4																				
RED CLEARANCE					1			1																			
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL			EXT LOCKING			OFF LOCKING																					
MEMORY																											

EMERGENCY VEHICLE

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
3	10' SIGNAL POLE, BASE, & FDN.
1	25' MAST ARM ASSEMBLY, BASE, & FDN.
2	30' MAST ARM ASSEMBLY, BASE, & FDN.
8	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
1	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
7	ROADWAY LOOP DETECTOR
14	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø4, ø5, ø6, ø7 AND ø8 NOT USED.

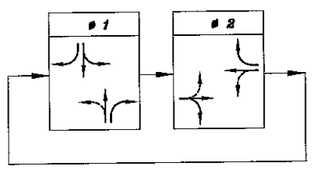
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

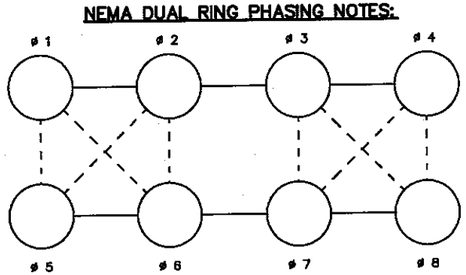
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:

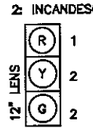


LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	2	6'X6'		ø1	ø1	PRESENCE		
2	2	6'X6'		ø1	ø1	PRESENCE		
3	1	6'X9'		ø2	ø2	PRESENCE		
4	2	6'X6'		ø2	ø2	PRESENCE		

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: TCT LMD
UTILITY POLE No. TMLP #210
METER No. 57-888-265
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1338D0101.DWG

RAYNHAM
BROADWAY (RTE 138) AT CARVER ST

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	5-1339	01	1	3

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT
BROADWAY (ROUTE 138) AT CARVER STREET

IN THE TOWN OF

RAYNHAM

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

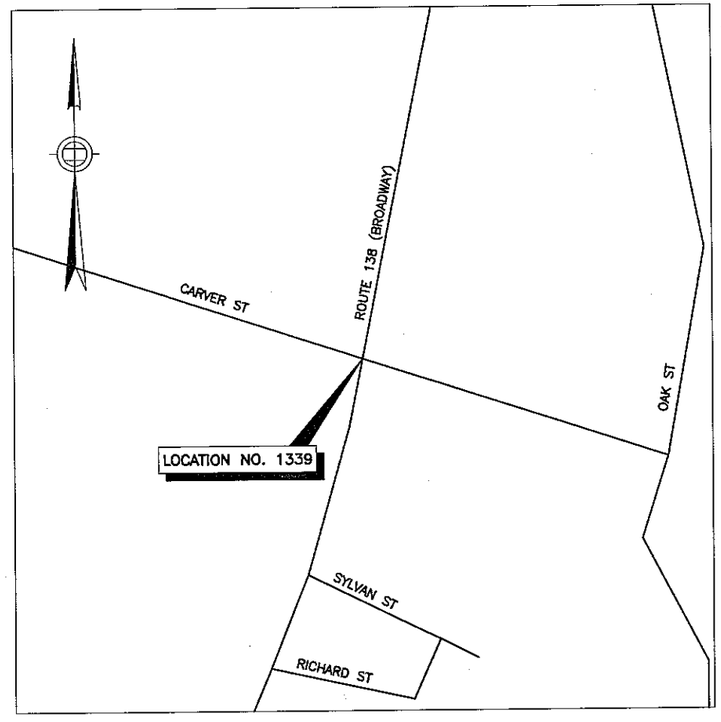
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued• or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I. STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II. OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operotion: Whenever a signal is not operating as a control device (etop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rote of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down ar hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR. SCALE IN FEET
0 200 400 800

REVISION NO 01
DATE: 12-12-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1339T0101.DWG

COMMENTS:

MASS HIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

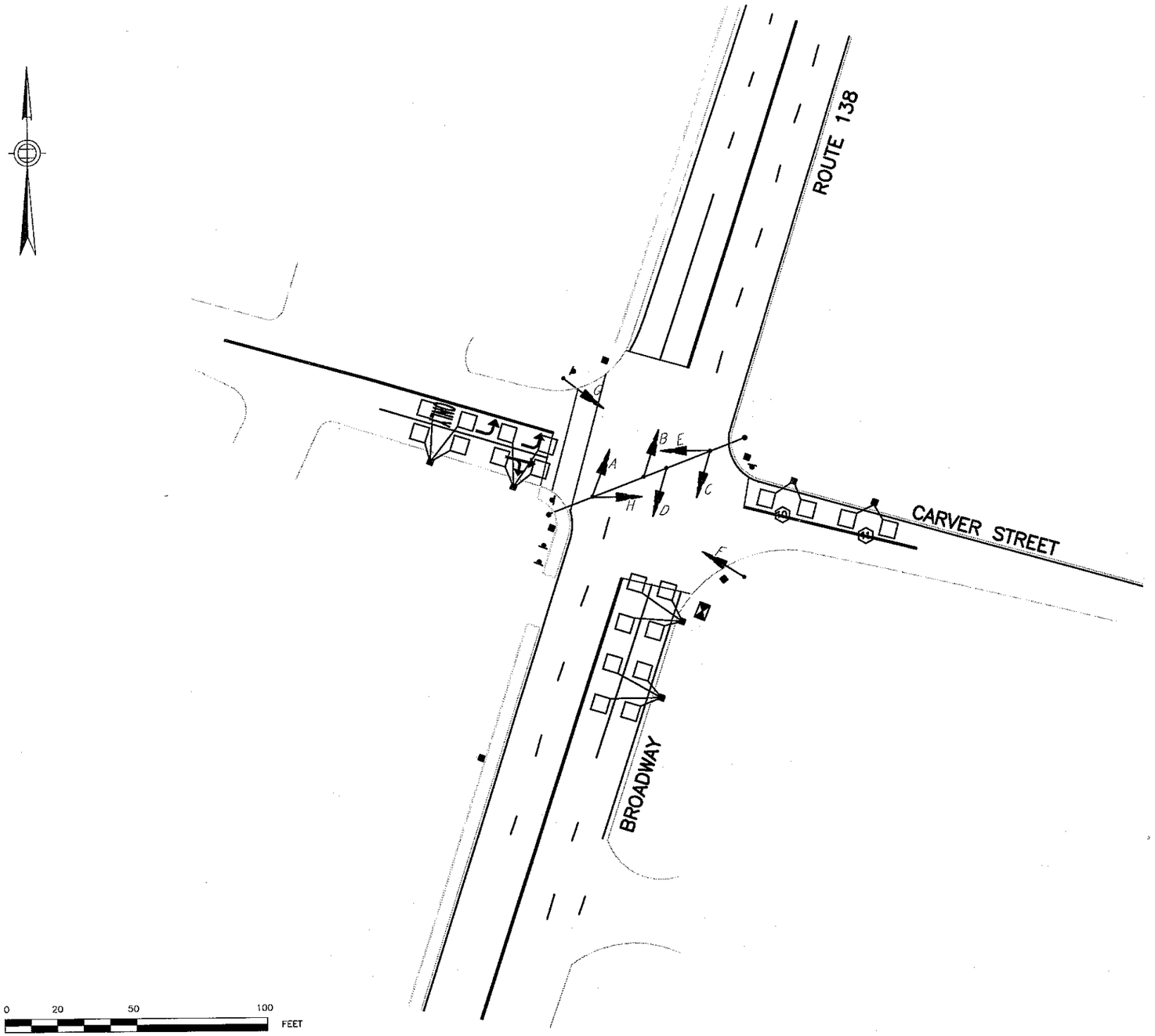
APPROVED BY:

STATE TRAFFIC ENGINEER Date

RAYNHAM
BROADWAY (RTE 138) AT CARVER ST

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	5-1339	01	2	3

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET

1" = 20' HORIZONTAL

1339P0101.DWG

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

RAYNHAM
BROADWAY (RTE 138) AT CARVER ST

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	5-1339	01	3	3

TRAFFIC SIGNAL DATA

ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8

SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
BROADWAY (RTE. 138)	NB	C	R	R	R	R	R	R				R	R	R				G	Y	R				R	R	R	FY
BROADWAY (RTE. 138)	NB	D	G/GLG/YL		R	R	R	R				R	R	R				G	Y	R				R	R	R	FY
BROADWAY (RTE. 138)	SB	A,B	R	R	R	G	Y	R				R	R	R				R	R	R				R	R	R	FY
CARVER STREET	WB	G,H	R	R	R	R	R	R				G	Y	R				R	R	R				R	R	R	FR
CARVER STREET	EB	E,F	R	R	R	R	R	R				R	R	R				R	R	R				G	Y	R	FR
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			5			5						5						5						5			EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			2			2						2						2						2			
MAXIMUM 1			10			60						20						60						20			
MAXIMUM 2			10			40						15						40						15			
YELLOW CLEARANCE				4.3			4.3						4						4.3						4		
RED CLEARANCE					1.7			1.7						1.2						1.7						1.2	
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL			OFF			MIN						OFF						MIN						OFF			
MEMORY			NON-LOCKING			NON-LOCKING						NON-LOCKING						NON-LOCKING						NON-LOCKING			

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION
1	SPANWIRE ASSEMBLY BASE & FDN. (85')
2	10' SIGNAL POLE, BASE, & FDN.
3	3 SECTION SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
1	5 SECTION SIGNAL HOUSING (12" LENS)
6	LOOP DETECTOR AMPLIFIER
20	ROADWAY LOOP DETECTOR
10	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø3, ø5, ø7 NOT USED.

NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

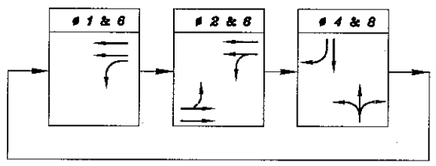
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.

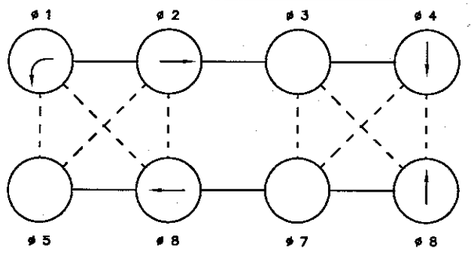
FIELD NOTES:

1. LOOP DETECTORS NOT VISIBLE DURING THE FIELD INSPECTION.

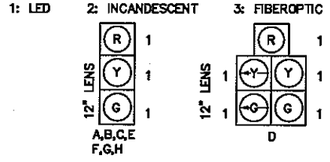
PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



SIGNAL IDENTIFICATION



LOOP DETECTOR DATA

DETECTOR NUMBER	NUNBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1				ø6	ø6	PRESENCE		
2				ø6	ø6	PRESENCE		
3				ø6	ø6	PRESENCE		
4				ø6	ø6	PRESENCE		
5				ø2	ø2	PRESENCE		
6	SEE FIELD NOTES			ø2	ø2	PRESENCE		
7				ø8	ø8	PRESENCE		
8				ø8	ø8	PRESENCE		
9				ø8	ø8	PRESENCE		
10				ø4	ø4	PRESENCE		
11				ø4	ø4	PRESENCE		
12				ø1	ø1	PRESENCE		

CONTROLLER MAKE & MODEL: PEEK 3000E
UTILITY POLE No. TMLP #179
METER No. 79-031-110
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

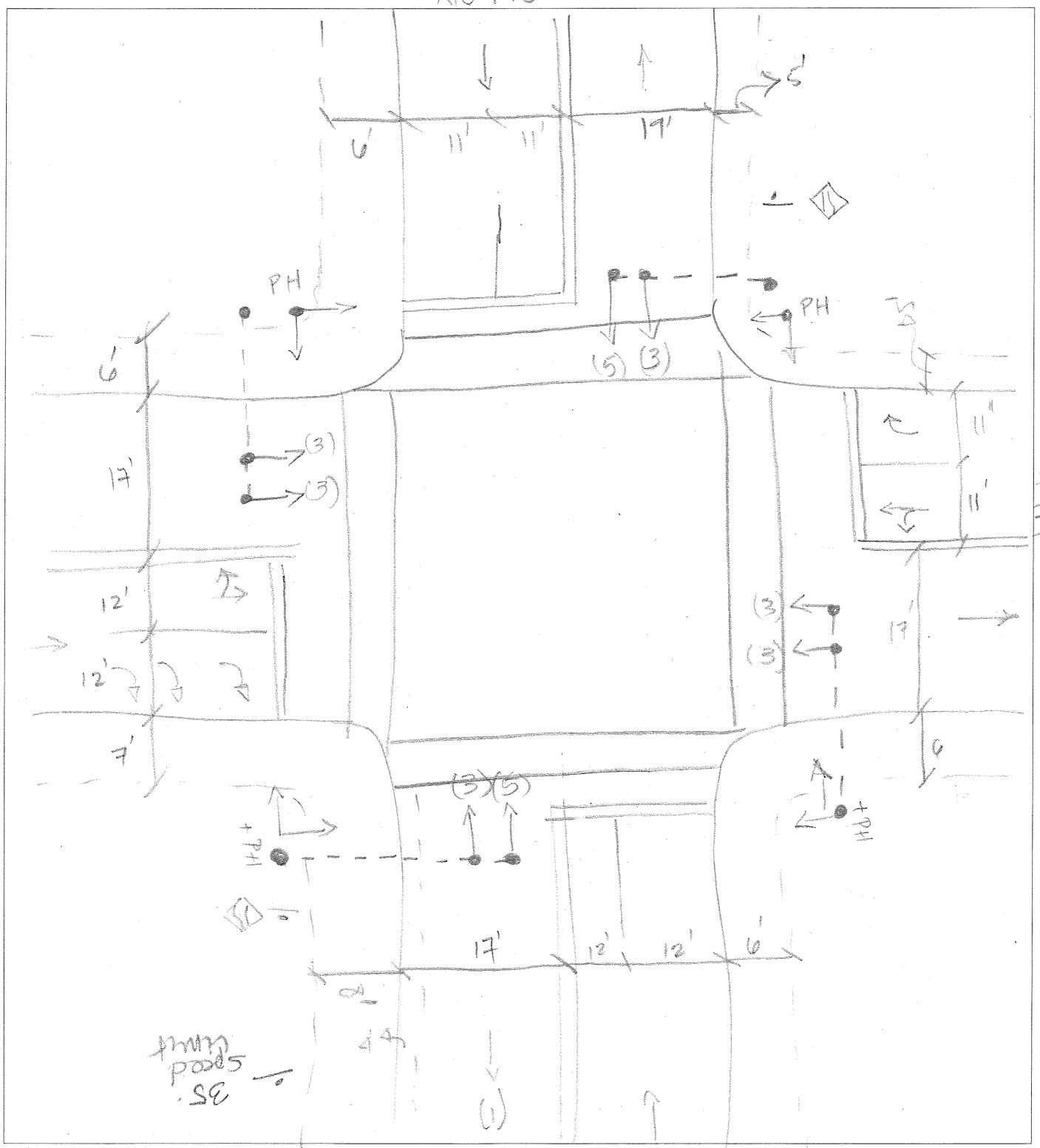
1339D0101.DWG

Computations

Project: SCR
Location: Taunton
Calculated by: NL
Checked by:
Title Hart St @ Rte 140

Project # 10111.31
Sheet of
Date: 9/11/08
Date:

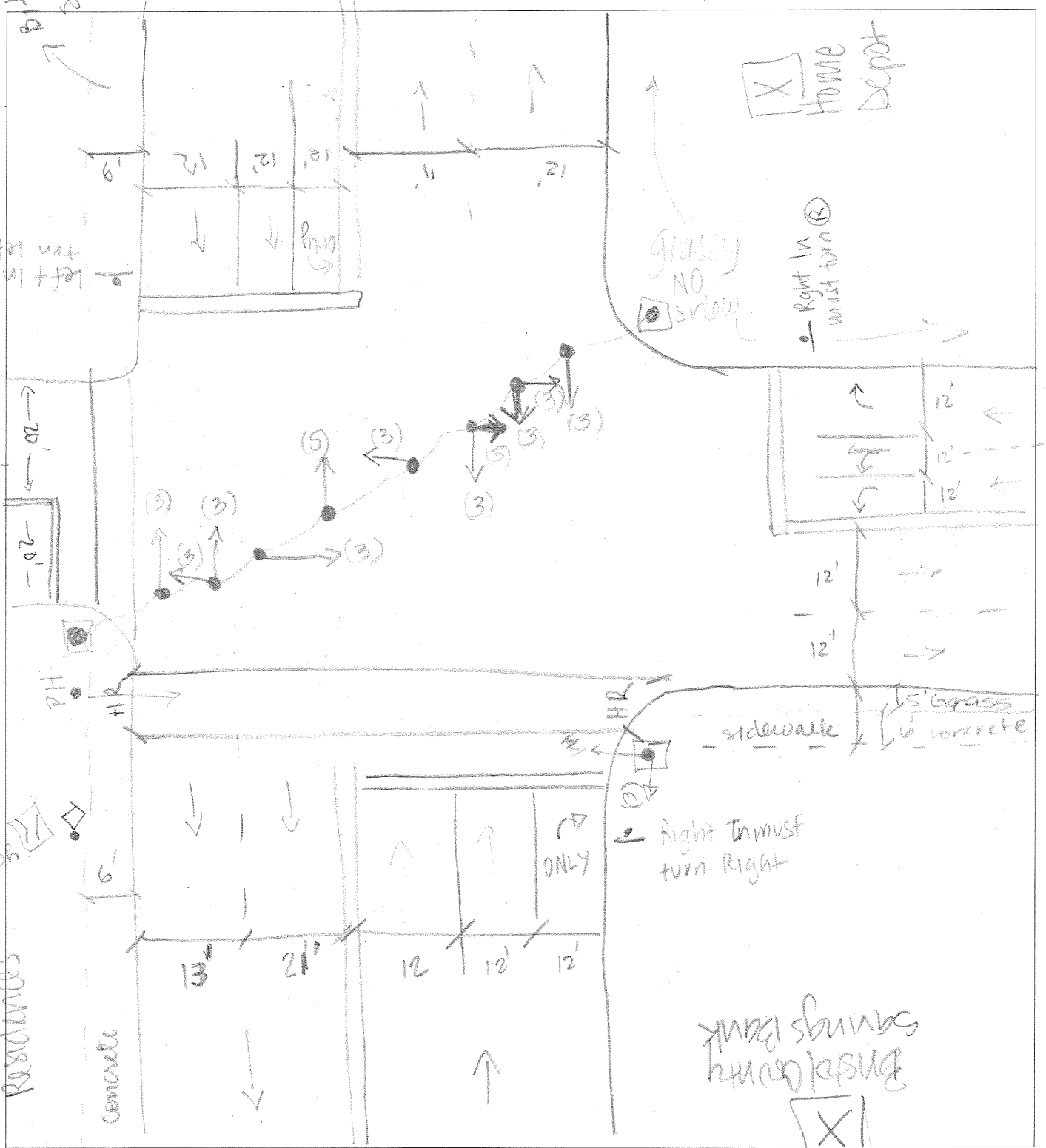
N



Computations

Project: SCR
Location: Taunton
Calculated by: NL
Checked by:
Title Taunton Depot @ Rte 140

Project # 10111 31
Sheet 1 of
Date: 9/11/08
Date:



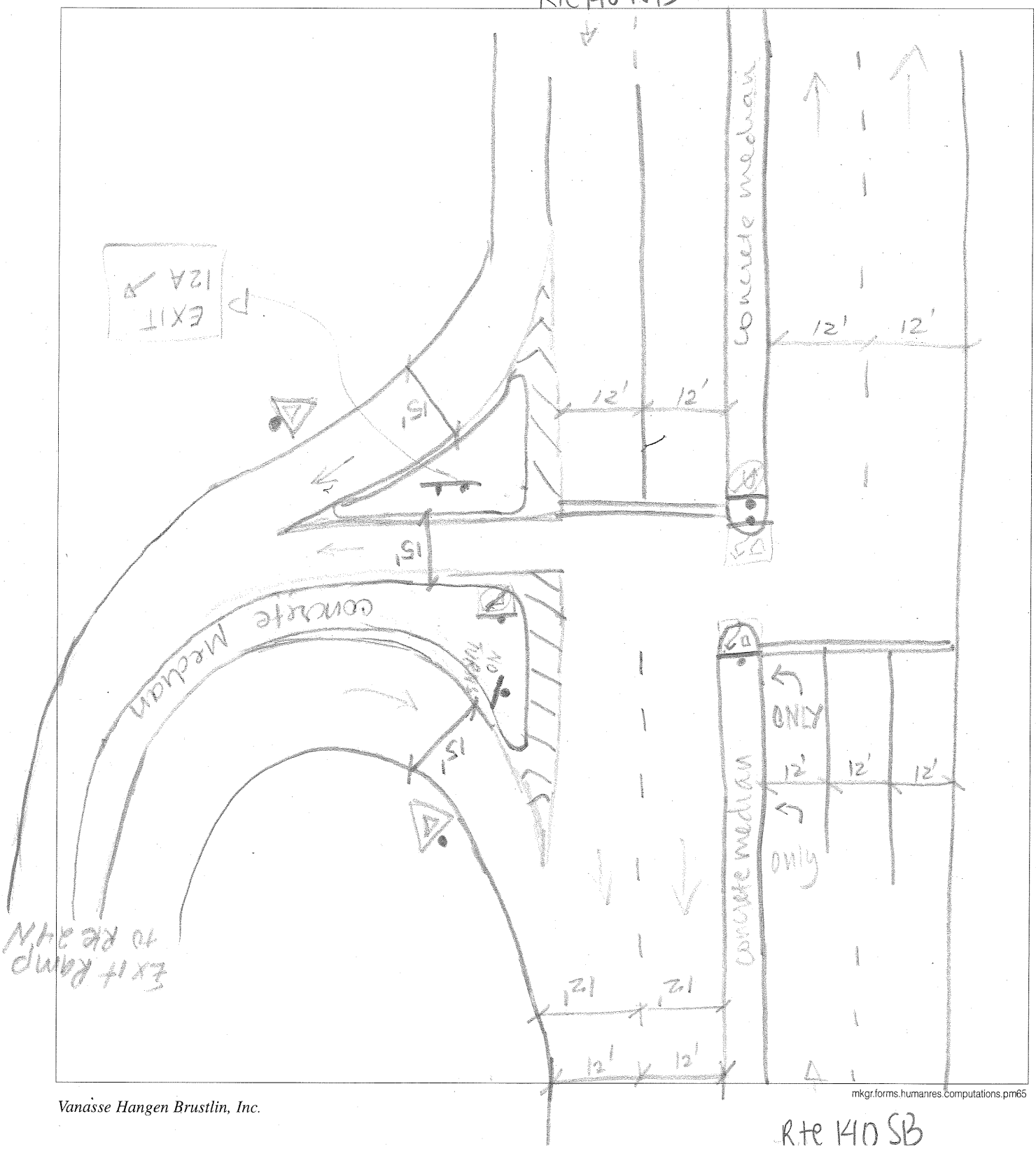
VHB *Computations*

*signalized

Project: SCR
Location: Taunton, MA
Calculated by:
Checked by:

Project # 10111.31
Sheet 1 of
Date: 9/11/08
Date:

#2 Title Rte 140 @ Exit 12A NORTH RAMP

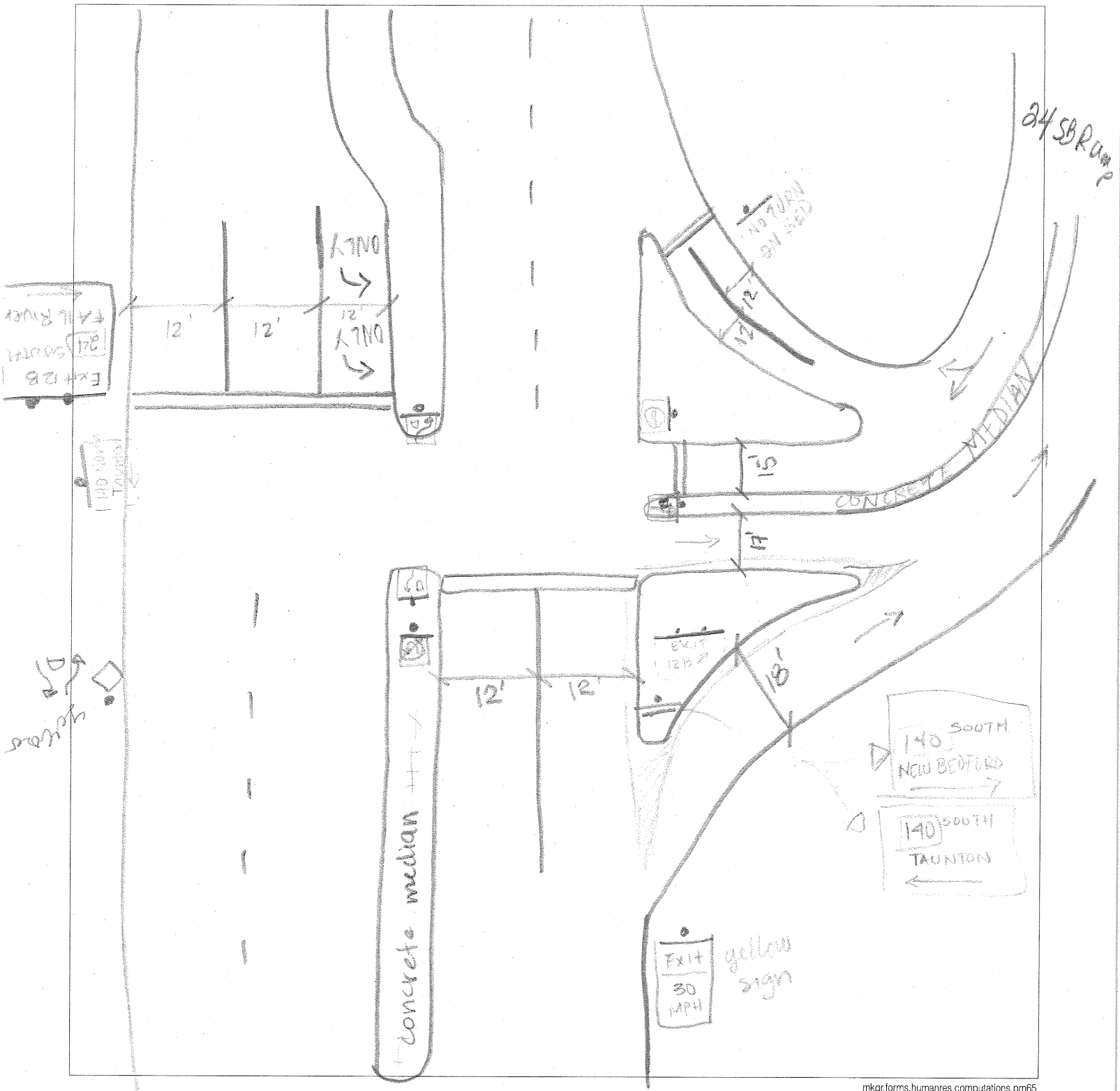


Computations

Project: SCR
Location: Taunton, MA
Calculated by:
Checked by:
Title Rte 140 @ Exit 12B Route 24 South

Project # 10111.31
Sheet of
Date:
Date:

#3



Computations

* Signalized

County St

SCR

Project: Project # 10111.31

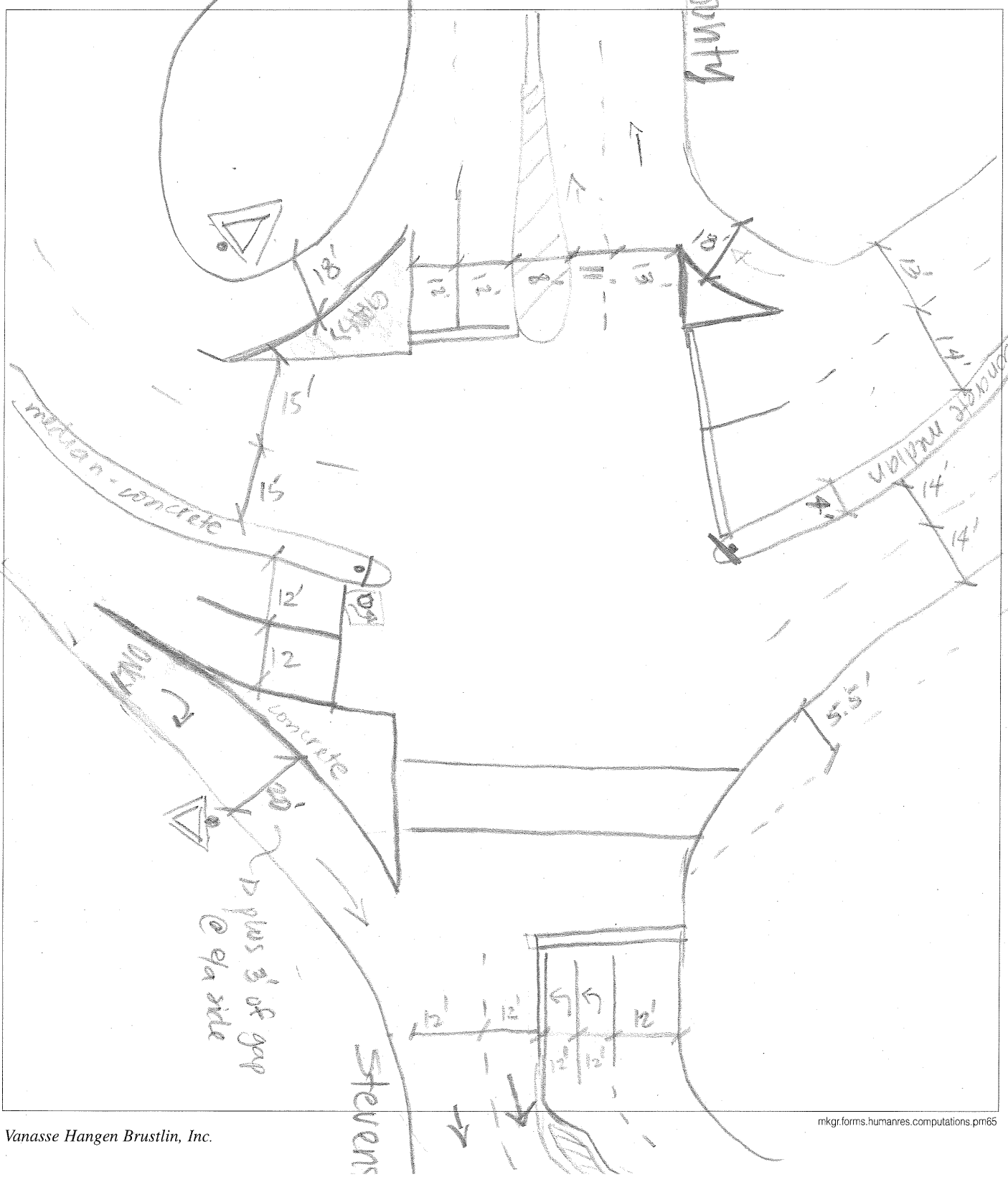
Location: Taunton Sheet of

Calculated by: Date: 9/4/08

Checked by: Date:

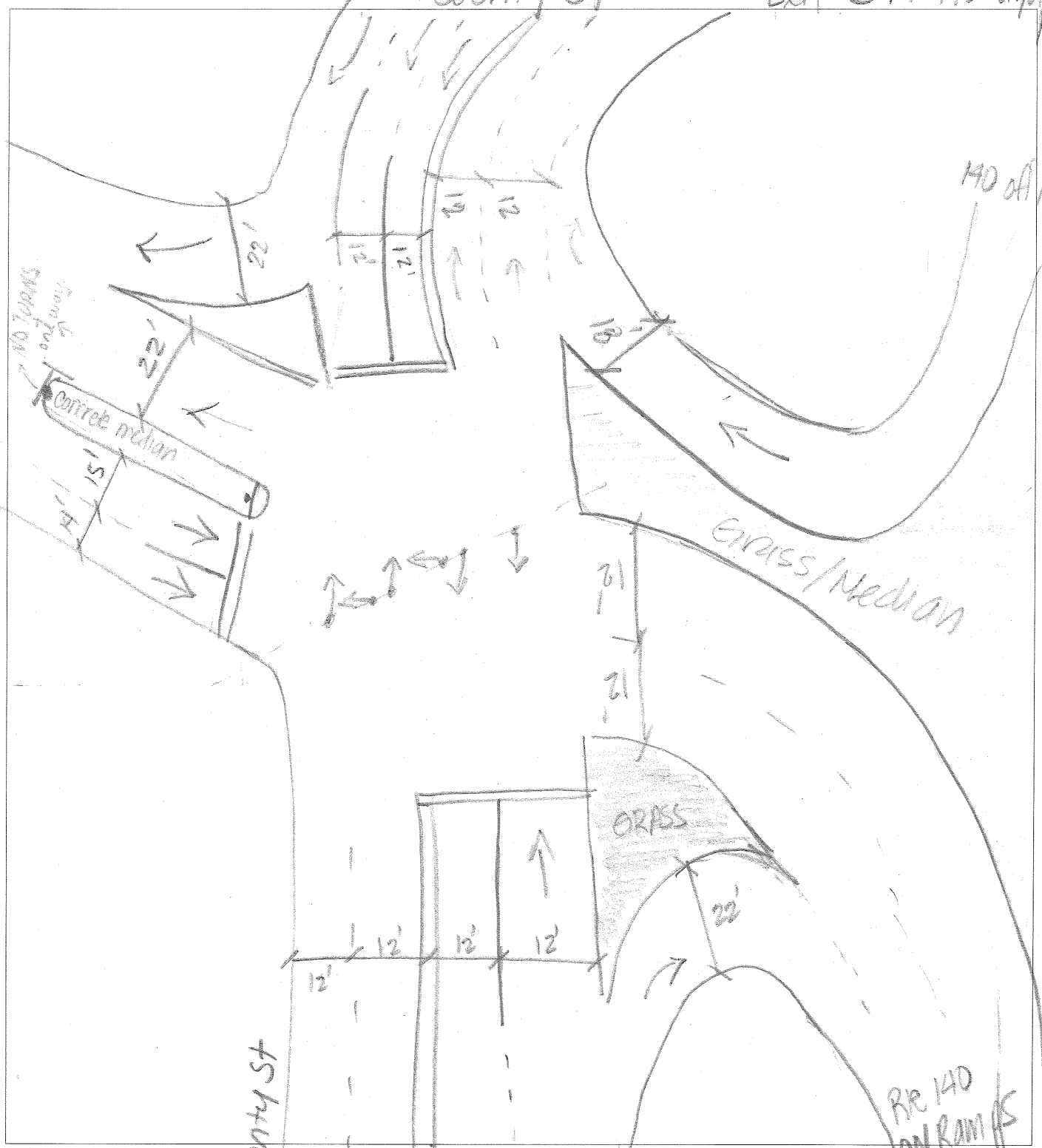
Title: Stevens St @ Rte 140 NB Off/On Ramps

#6



Computations

Project: SCR
Location: Taunton, MA
Calculated by: NL
Checked by:
Project # 10111.31
Sheet 1 of 1
Date: 9/11/08
Date:
#7 Title County St @ Galleria Mall SE entrance/ Exit @ RR 140 ON/OFF Ramps



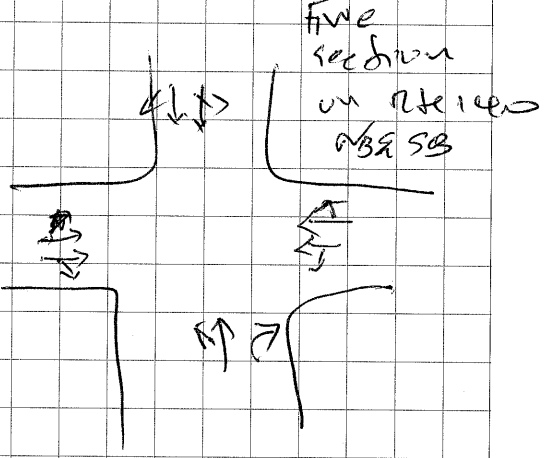
Project: SCR Project # 10111-31
Location: Sheet of
Calculated by: RNR Date: 9/11/08
Checked by: Date:
Title Signal Timing & Phasing

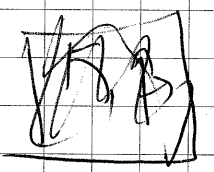
Route 1400 @ Hoyt Street

$\phi 1$ G = 46; 34 36
Y = 4 4 4
R = 1 1 1

$\phi 1A$ $\phi 1B$

$\phi 2$
PED = 24 sec





$\phi 3$
G = 19 19
Y = 4 4
R = 1 1

$\phi 1A$ or $\phi 1B$ is 11 seconds.

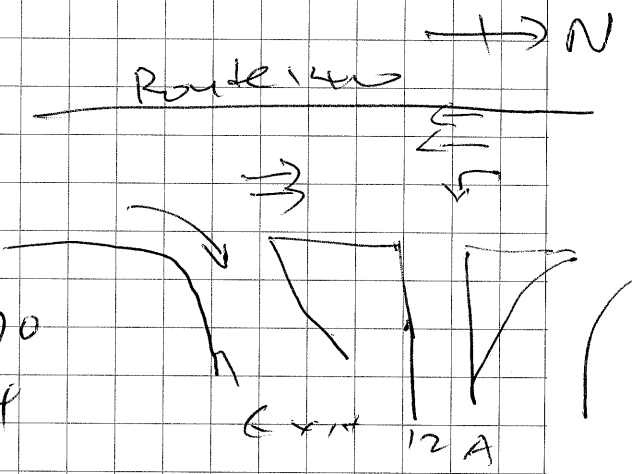
VHB *Computations*

Project: SCR Project # 10111.31
Location: Sheet of
Calculated by: RNR Date: 9/11/08
Checked by: Date:
Title Signal Timing & Phasing

Route 140 @ Exit 12A to Route 24 NB

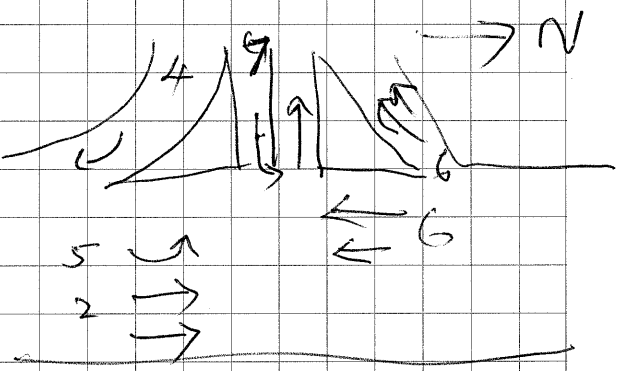
Ø1 G = 17 10 17 18
Y = 4 4 4 4
R = 1 1 1 1

Ø2 G = 69 65 85 70
Y = 4 4 4 4
R = 1 1 1 1



Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/11/08
Checked by: | Date:
#3 Title Signal Timing & Phasing

Route 1240 @ Exit 12B to Route 2 NB



ϕ_1

G = 35, 27
Y = 4 4
R = 4 1

ϕ_2

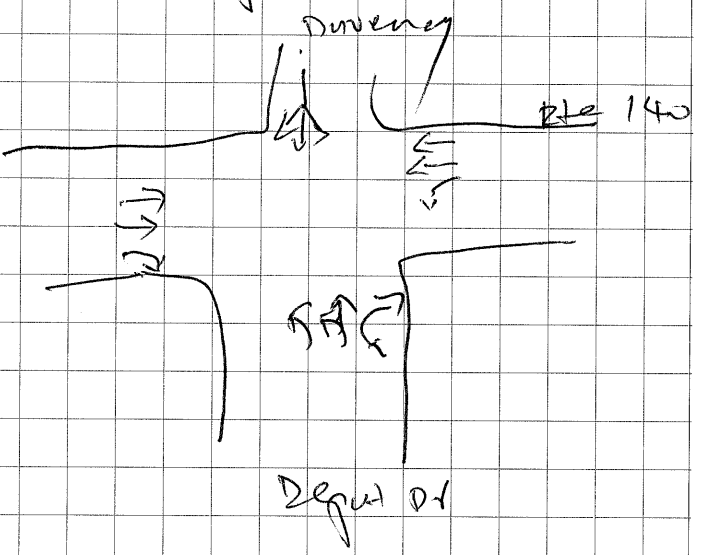
G = 10 12 20
Y = 4 4 4
R = 1 1 1

ϕ_3

G = 13, 23 42 40
Y = 4 4 4 4
R = 1 1 1 1

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/11/08
Checked by: | Date:
#5 Title Signal Timing & Phasing

Rte 140 @ Taunton Depot Drive



ϕ_1
G = 15 16 12
Y = 4 4 4
R = 1 1 1

ϕ_2
G = 31 40 34
Y = 4 4 4
R = 1 1 1

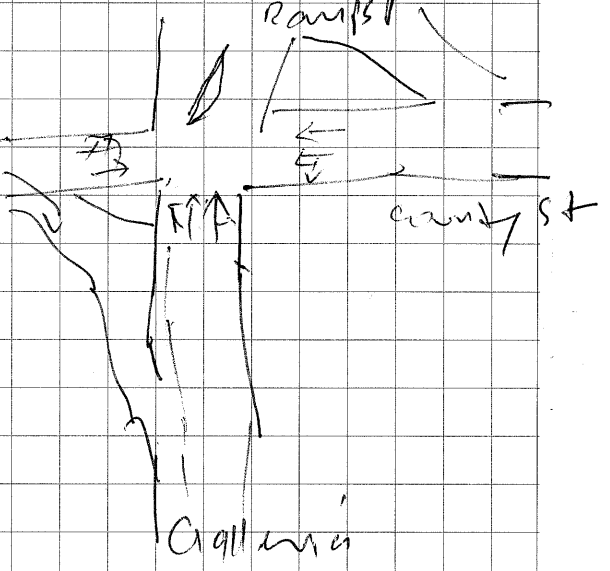
ϕ_3 Ped 25' 7
upon push button activation.

ϕ_4
G = 8 17
Y = 4 4
R = 1 1

VHB *Computations*

Project: SCR | Project # 10111.51
Location: | Sheet of
Calculated by: RNR | Date: 9/11/08
Checked by: | Date:
Title Signal Timing & Phasing

County St / Galleria Mall / Rte 140 SB Ramps



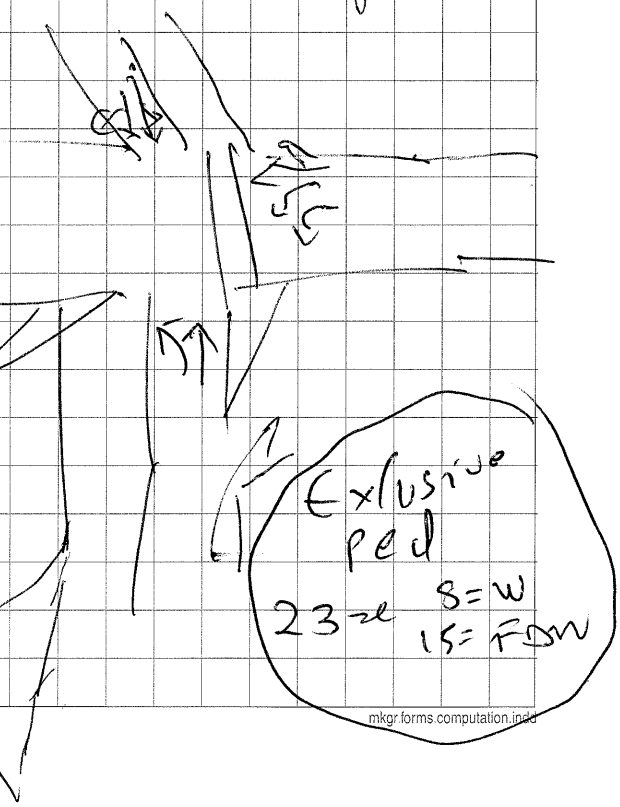
ϕ_1

G: 9 20 7 29
Y: 4 4 4 4
R: 1 1 1 1

ϕ_2

G: 10 9 13 8
Y: 4 4 4 4
R: 1 1 1 1

#6 Stevens St / Galleria Mall / Rte 140 NB Ramps



ϕ_1

G: 12 9 8
Y: 4 4 4
R: 1 1 1

ϕ_2

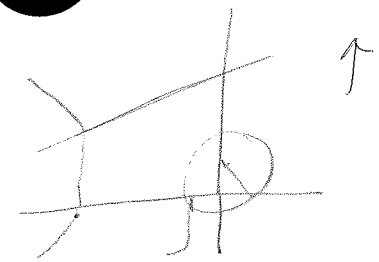
G: 29 18 120 58
Y: 4 4 4 4
R: 1 1 1 1

ϕ_3

G: 8 9 18
Y: 4 4 4
R: 1 1 1

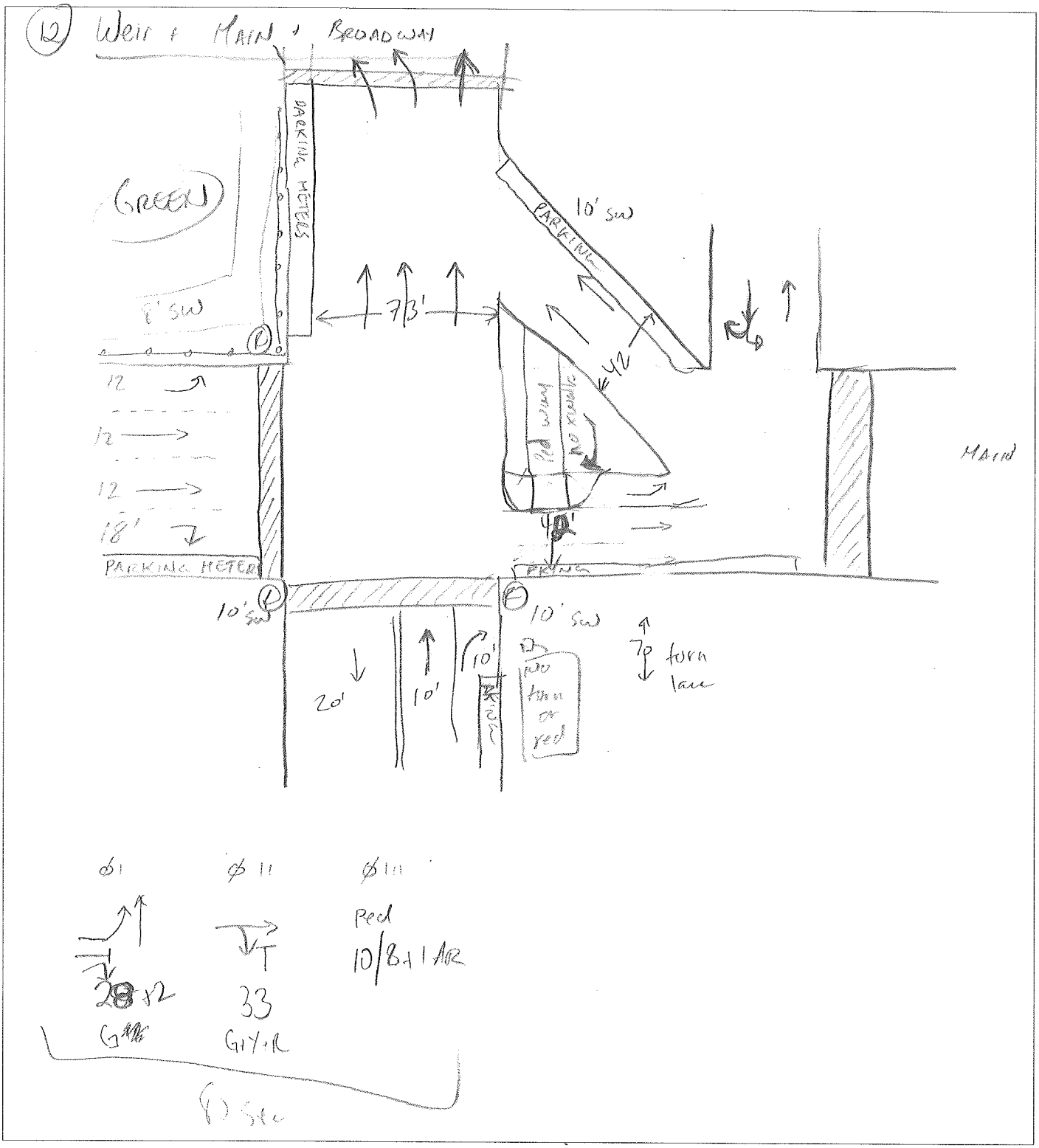
mkgr.forms.computation.indd

Computations



Project:
Location:
Calculated by: TV
Checked by:
Title

Project # 71914.06
Sheet of
Date: July 2006
Date:

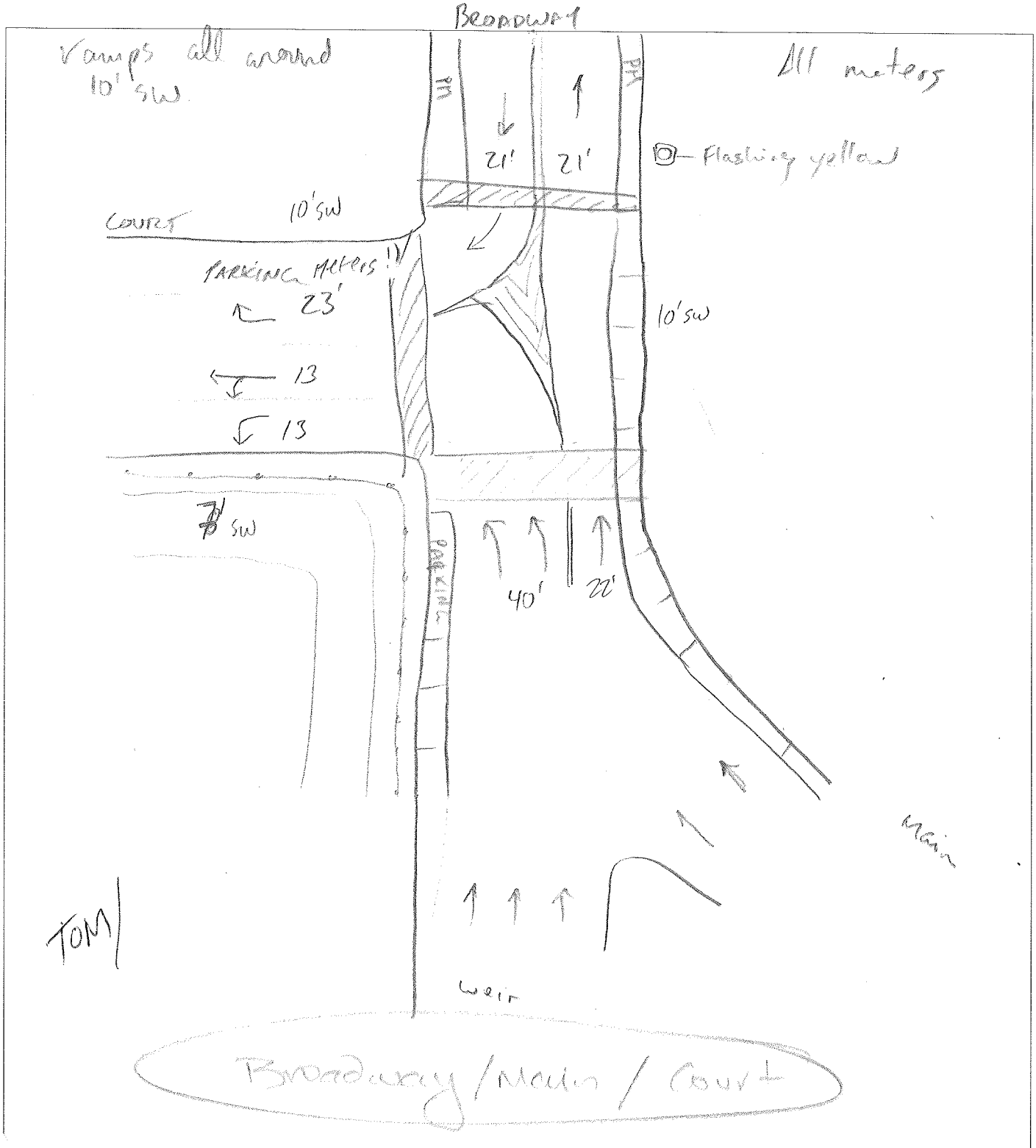


3

Computations

Project:
Location:
Calculated by: TV
Checked by:
Title

Project # 7914.02
Sheet of
Date: July 2006
Date:

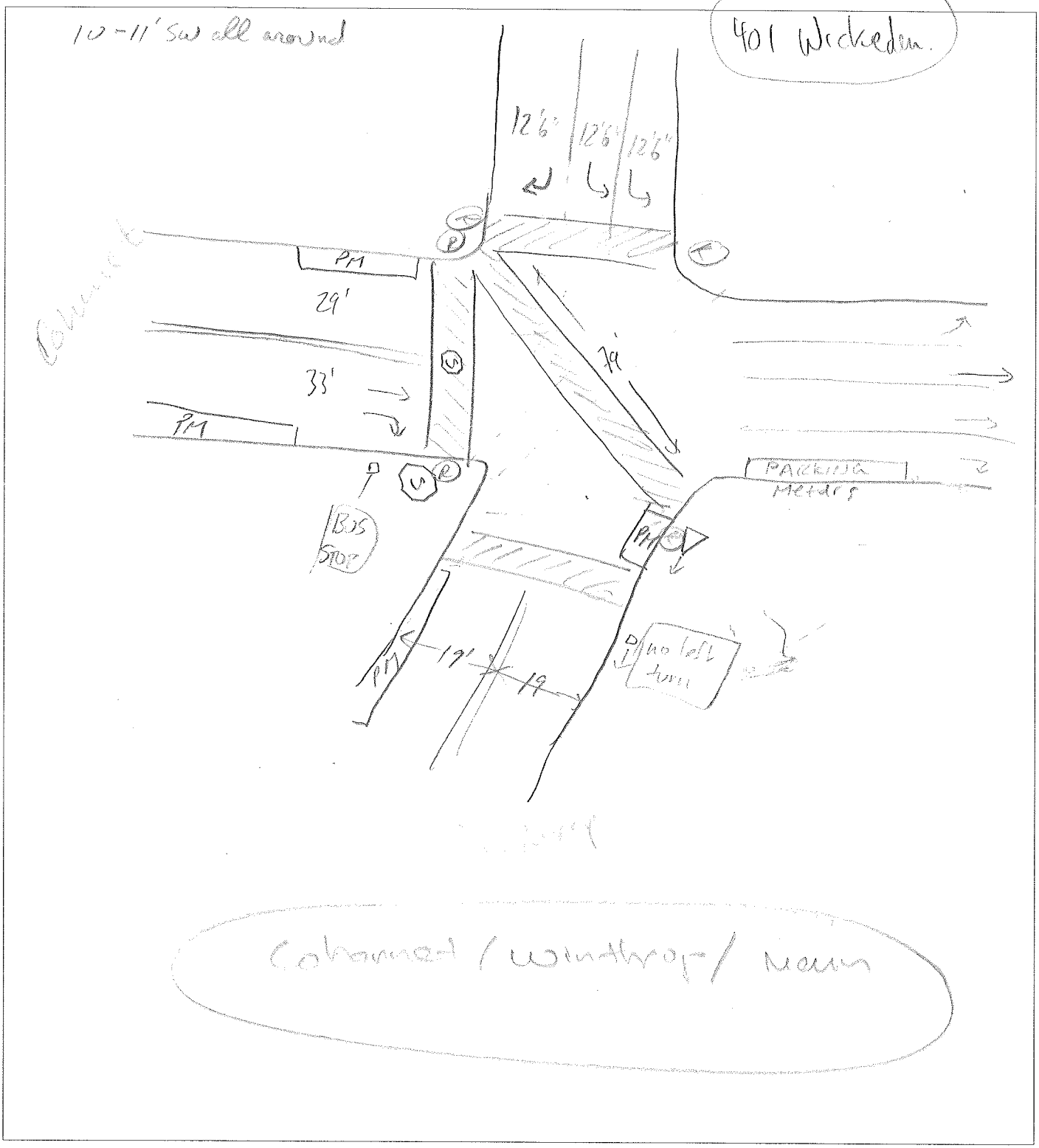


A

VHB *Computations*

Project:
Location:
Calculated by: TV
Checked by:
Title

Project # 71914.02
Sheet of
Date: July 2006
Date:



Computations

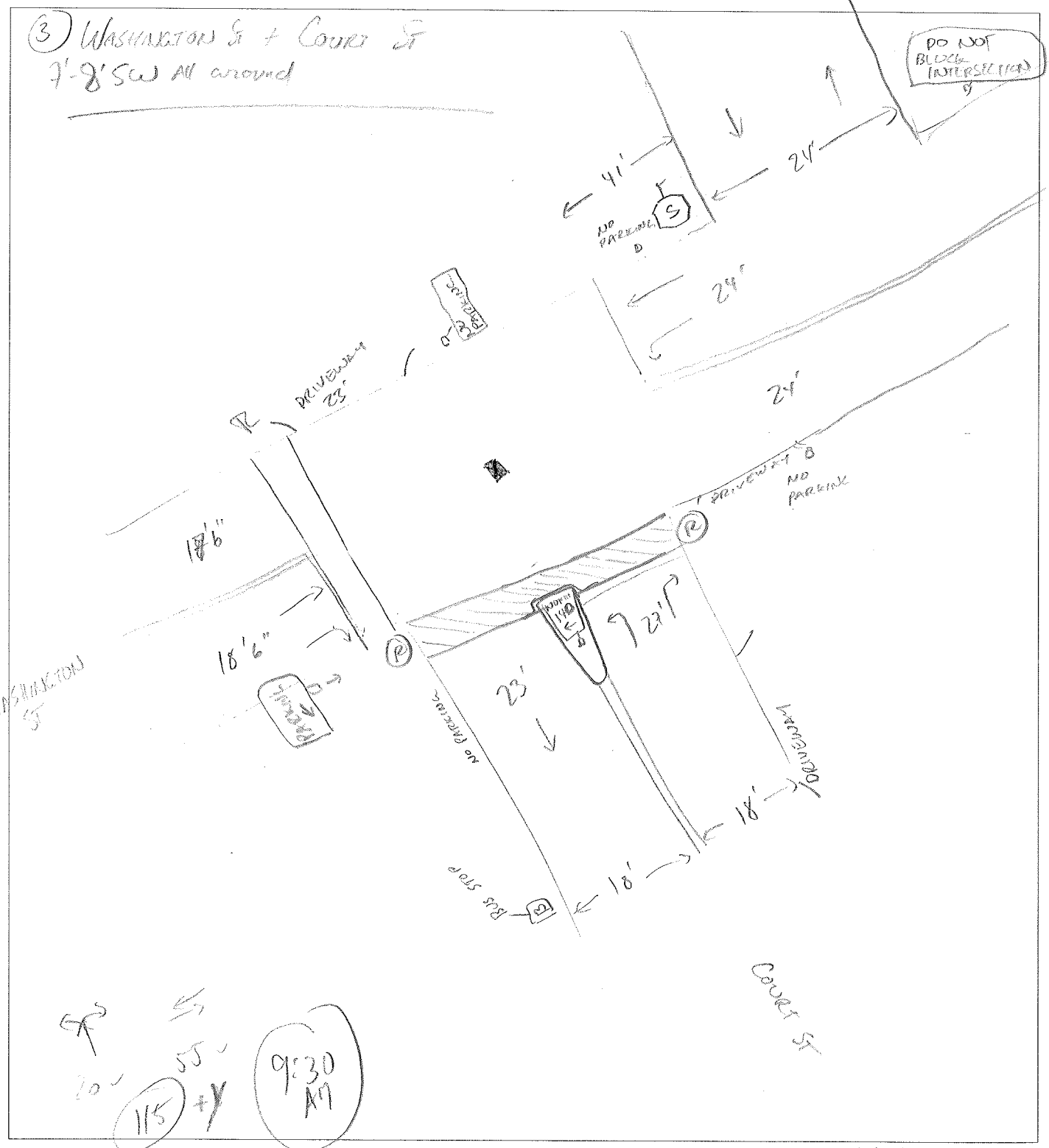
Project: | Project #

Location: | Sheet of

Calculated by: | Date:

Checked by: | Date:

Title

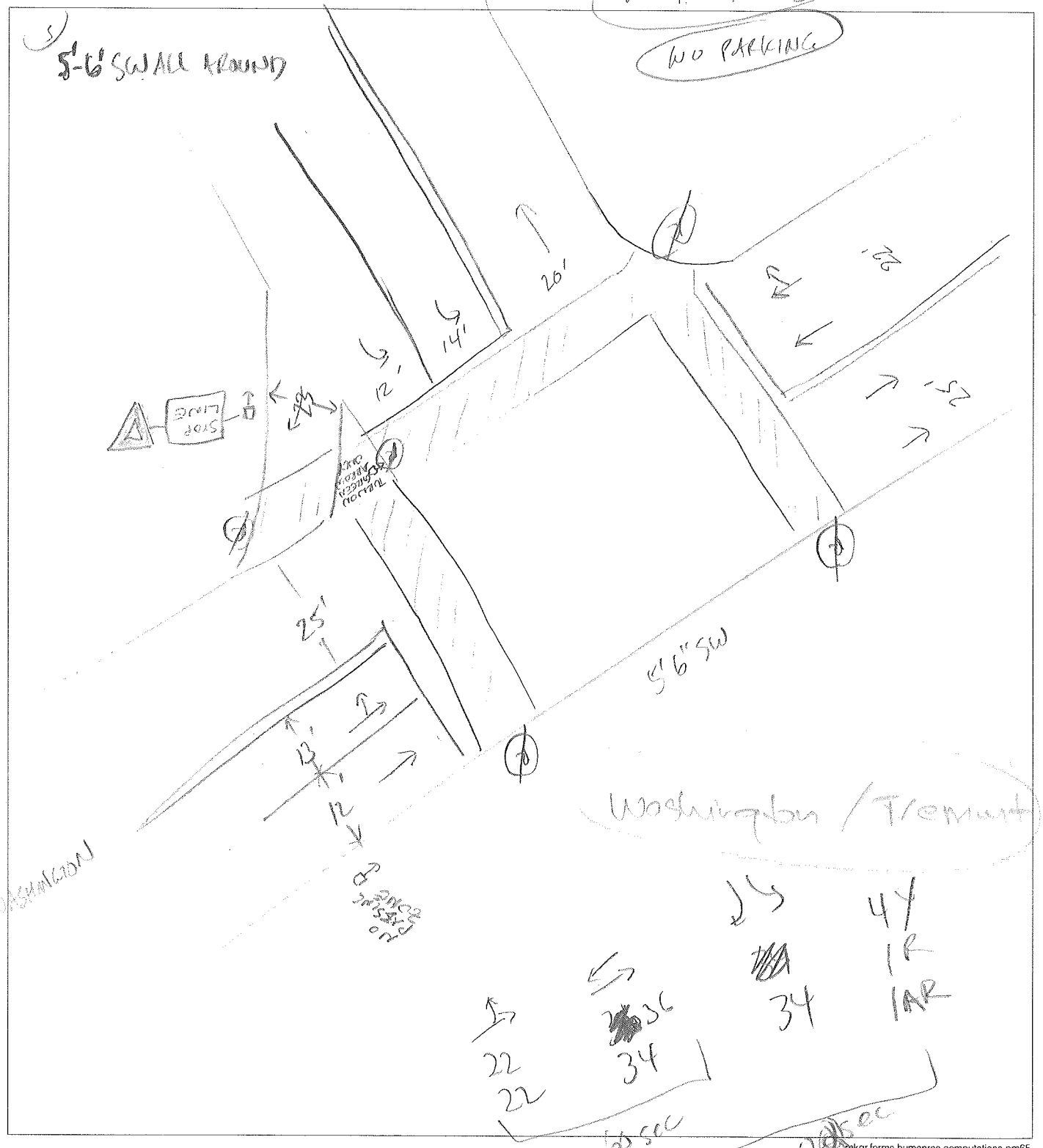


VHB

Computations

Project:
Location:
Calculated by: TV
Checked by:
Title

Project # 71944.02
Sheet of
Date: July 2006
Date:

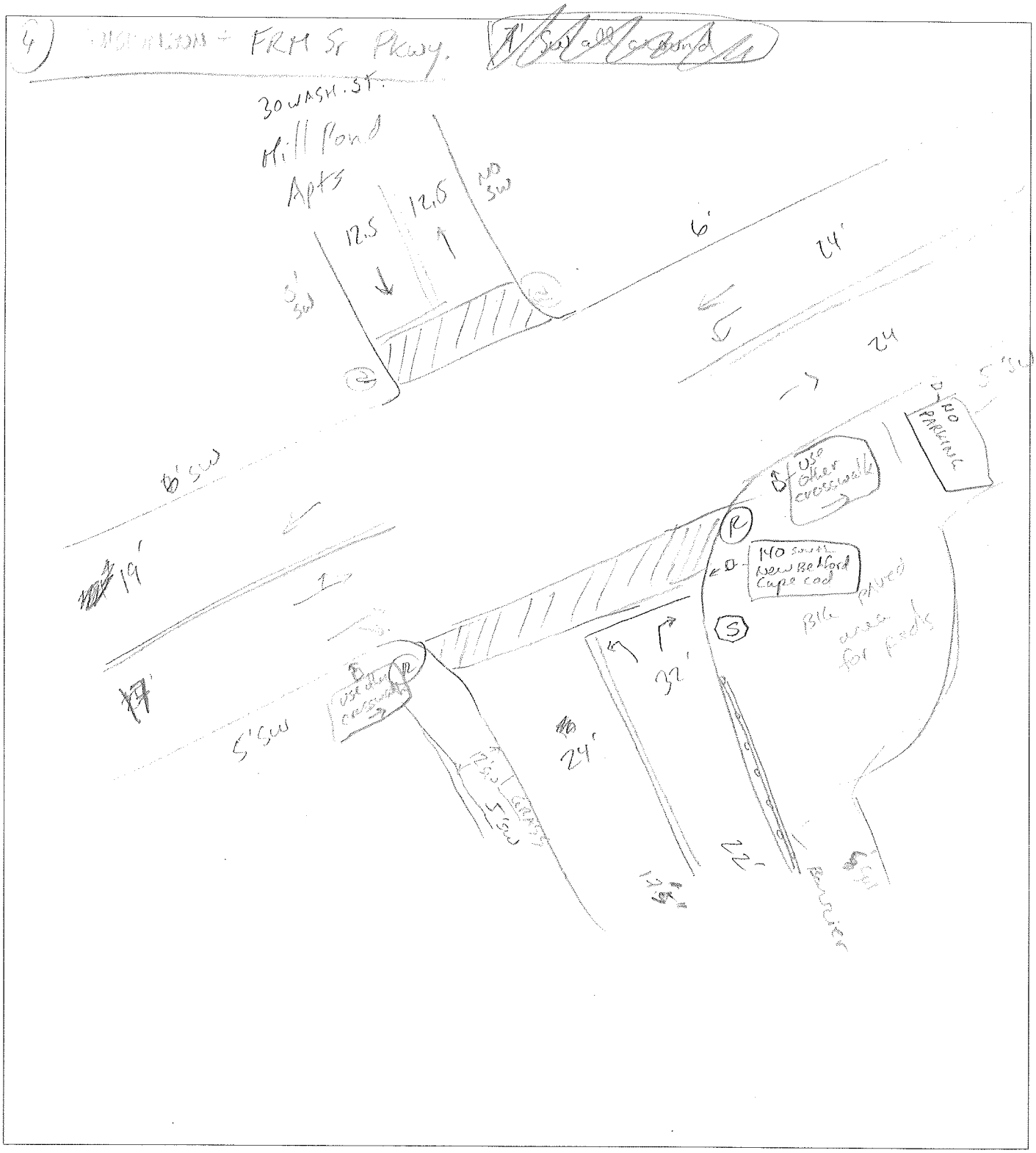


8

VHB *Computations*

Project:
Location:
Calculated by: TW
Checked by:
Title

Project #
Sheet of
Date: July 2016
Date:



VHB **Computations** pictures I : 1-9

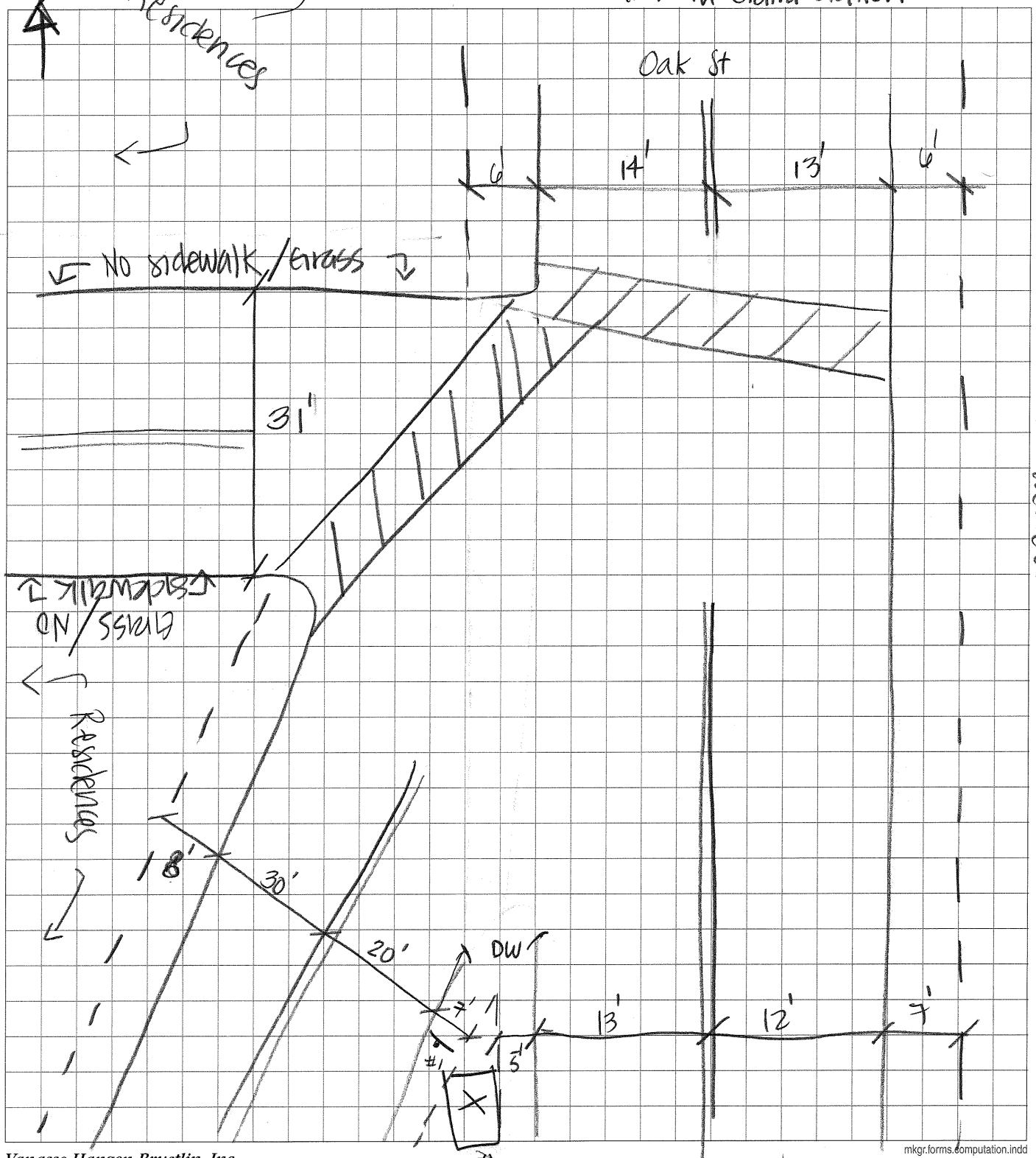
* unsignalized
* NO SIGNAGE
* faded markings
* flashing beacon on Oak St appr.

#1 Handicap Parking Fine $300

Project:	SCR	Project #	10111.00
Location:	Taunton	Sheet	1 of 1
Calculated by:	NL	Date:	9-24-08
Checked by:		Date:	

Title Lowell St @ Kilmer St @ Oak St

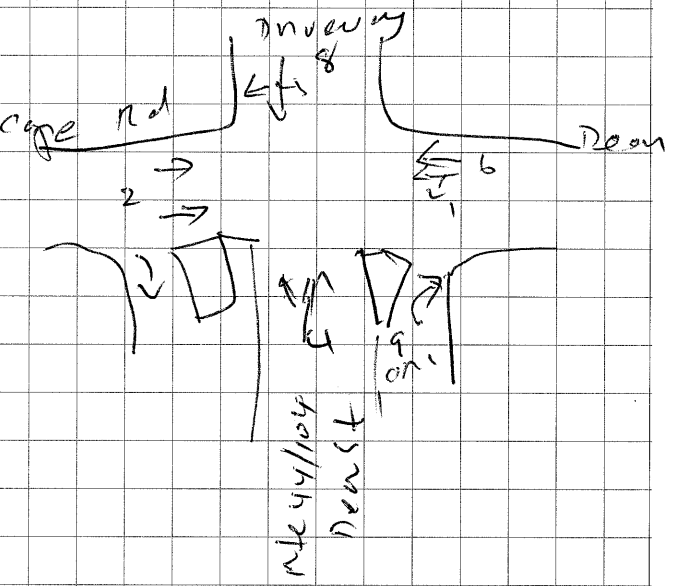
#7 in Cactra Station



VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/11/08
Checked by: | Date:
Title Signal Timing & Phasing #4

Dean Street / Cape Rd / South Main Street



ϕ_1 ← 6, ↓ 1, → 9

G : 5
Y : 3
R : 1

ϕ_2 ← ↓ →

G : 57, 33
Y : 4, 4
R : 1, 1

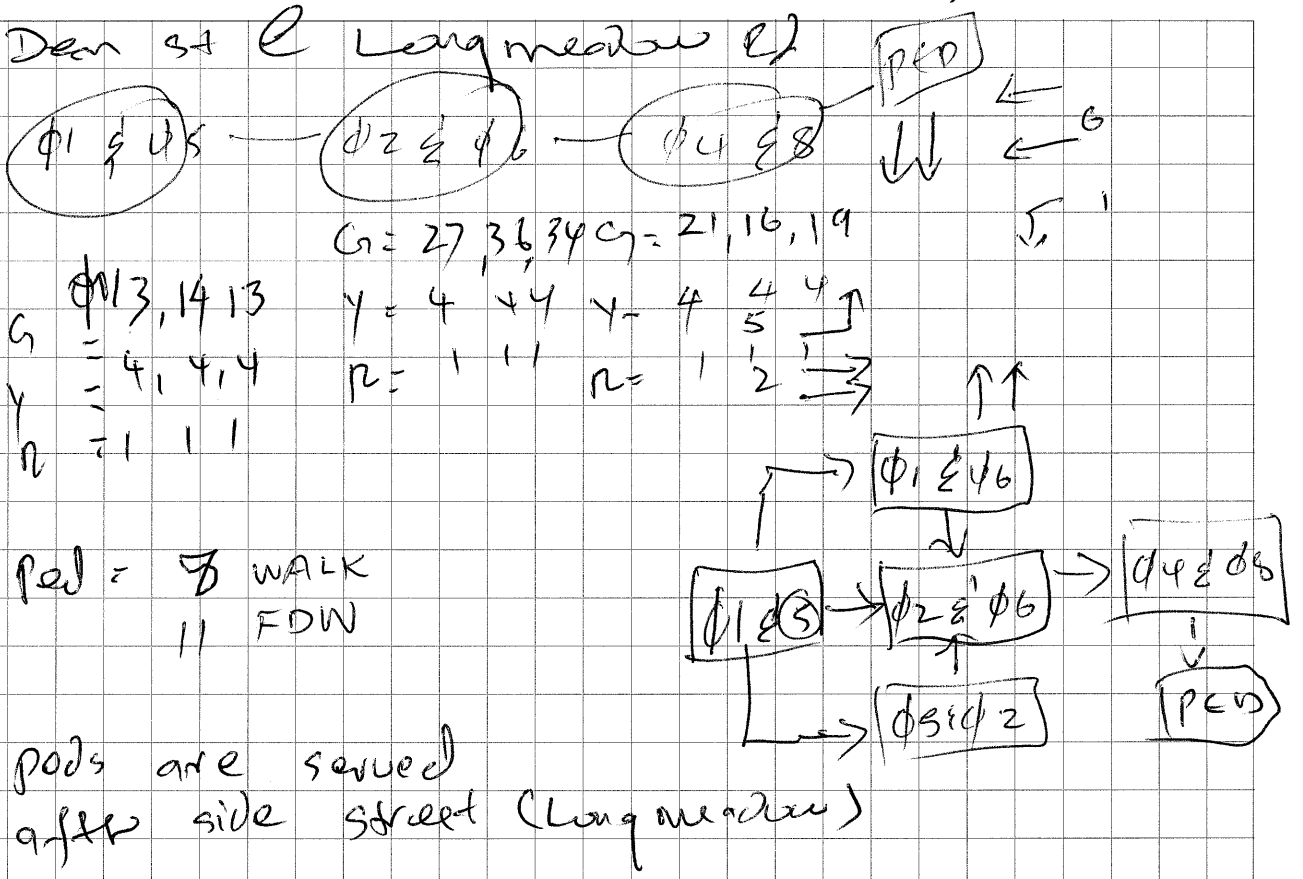
ϕ_3 ↓ ↑

G : 13, 13
Y : 4 4
R : 1 1

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: JZNR | Date: 9/11/08
Checked by: | Date:
Title Signal Timing & Phasing

#5

Dean St @ Longmeadow Rd



Ped = ~~ϕ~~ WALK
" FDW

pods are served after side street (Longmeadow)

VHB *Computations*

Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 4/11/08
Checked by: | Date:
Title Signal Timing & Phasing

TAUNTON

Dean St @ ARLINGTON

Dean St

Ø1 Dean Sheet

G	30	17	35	37	5
4	4	4	4	4	4
		1	1	1	
R	1				

Push Button's not working.

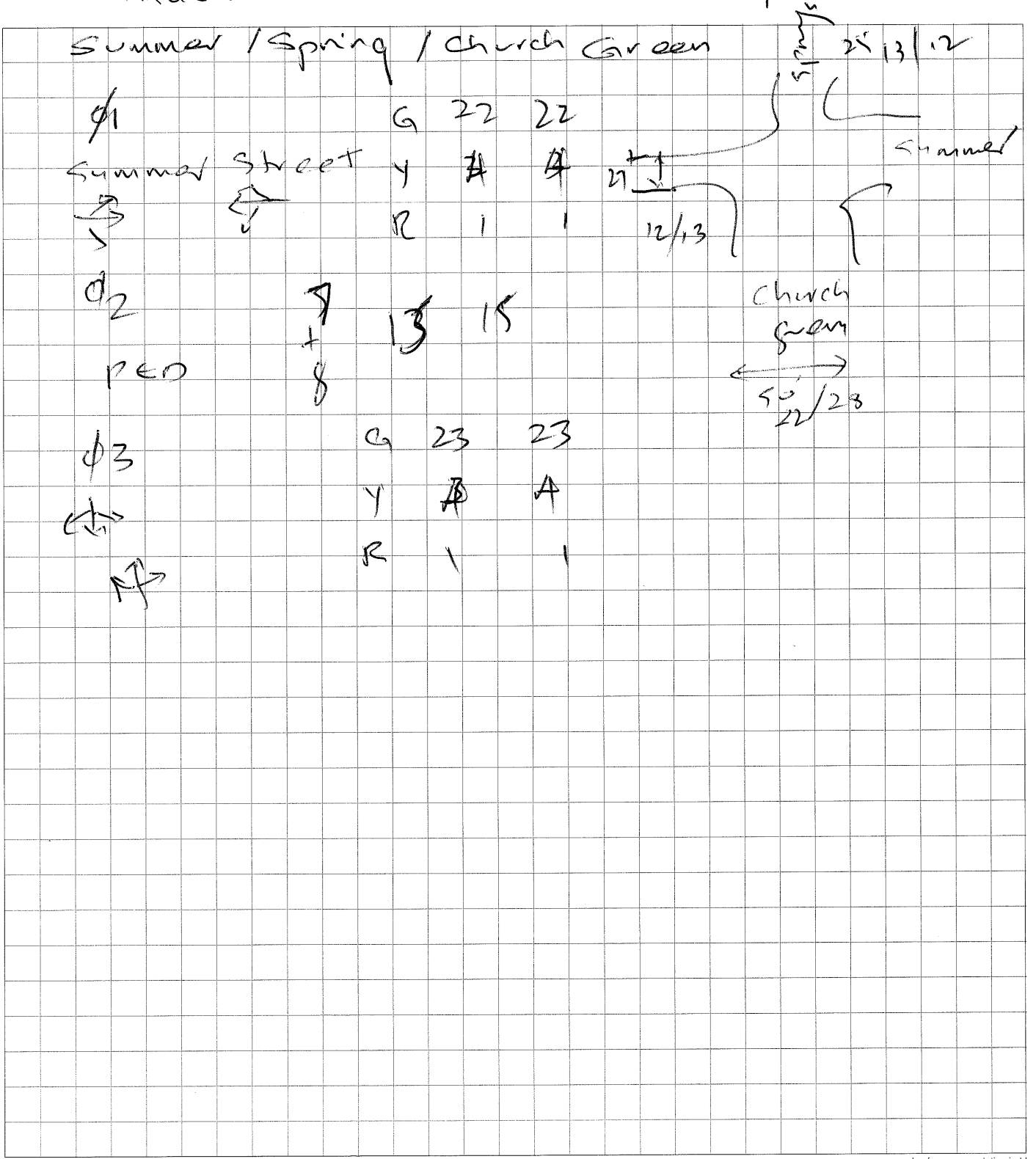
Ø2 Arlington

8	5	22	18
4	4	4	4
1	1		

VHB *Computations*

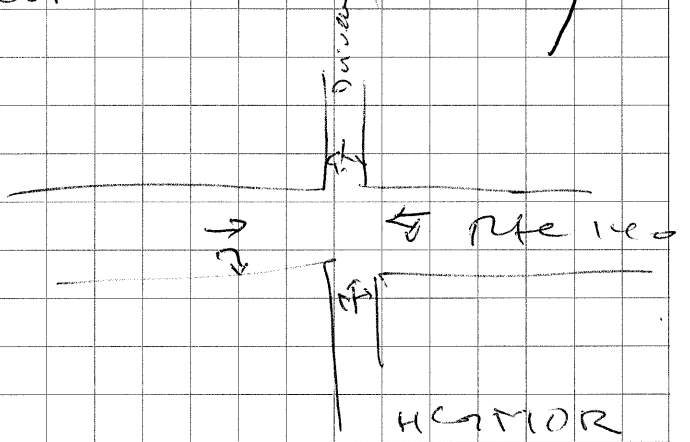
Project: SCR | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 4/11/08
Checked by: | Date:
Title Signal Timing & Phasing #8

TAUNTON



Project: SER | Project # 10111.31
Location: | Sheet of
Calculated by: RNR | Date: 9/11/08
Checked by: | Date:
#9 Title Signal Timing & Phasing

Route 140 / Hon Gordan Mowan Riverway



ϕ_1

← G = 40 40 29
Y = 4 4 4
R = 1 1 1

ϕ_2

PED 14 7 W 14
7 FDW

ϕ_3

G = 20 20 16
Y = 4 4 4
R = 1 1 1

Video Detection

(1)

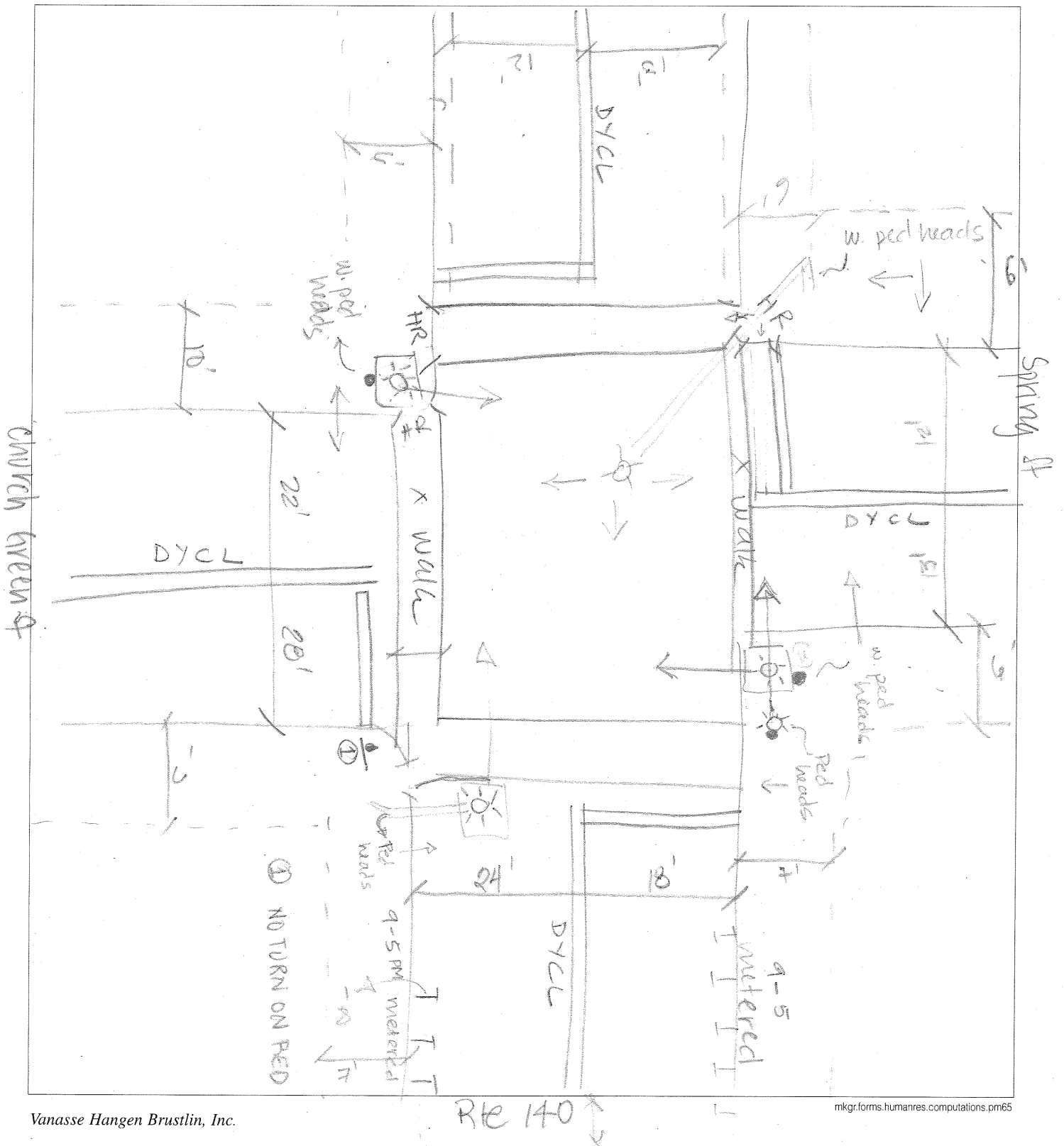
CFE
center for Ed.

Computations Dean St, Rte 44 Station

* bit skewed
* signalized w. ped phase
  * push button (thin little one)

Project: SCR
Location: TAUNTON
Calculated by: NL
Checked by:
Title Spring St / Church Green St @ Summer St

Project # 10111
Sheet of
Date: 9/11/08
Date:



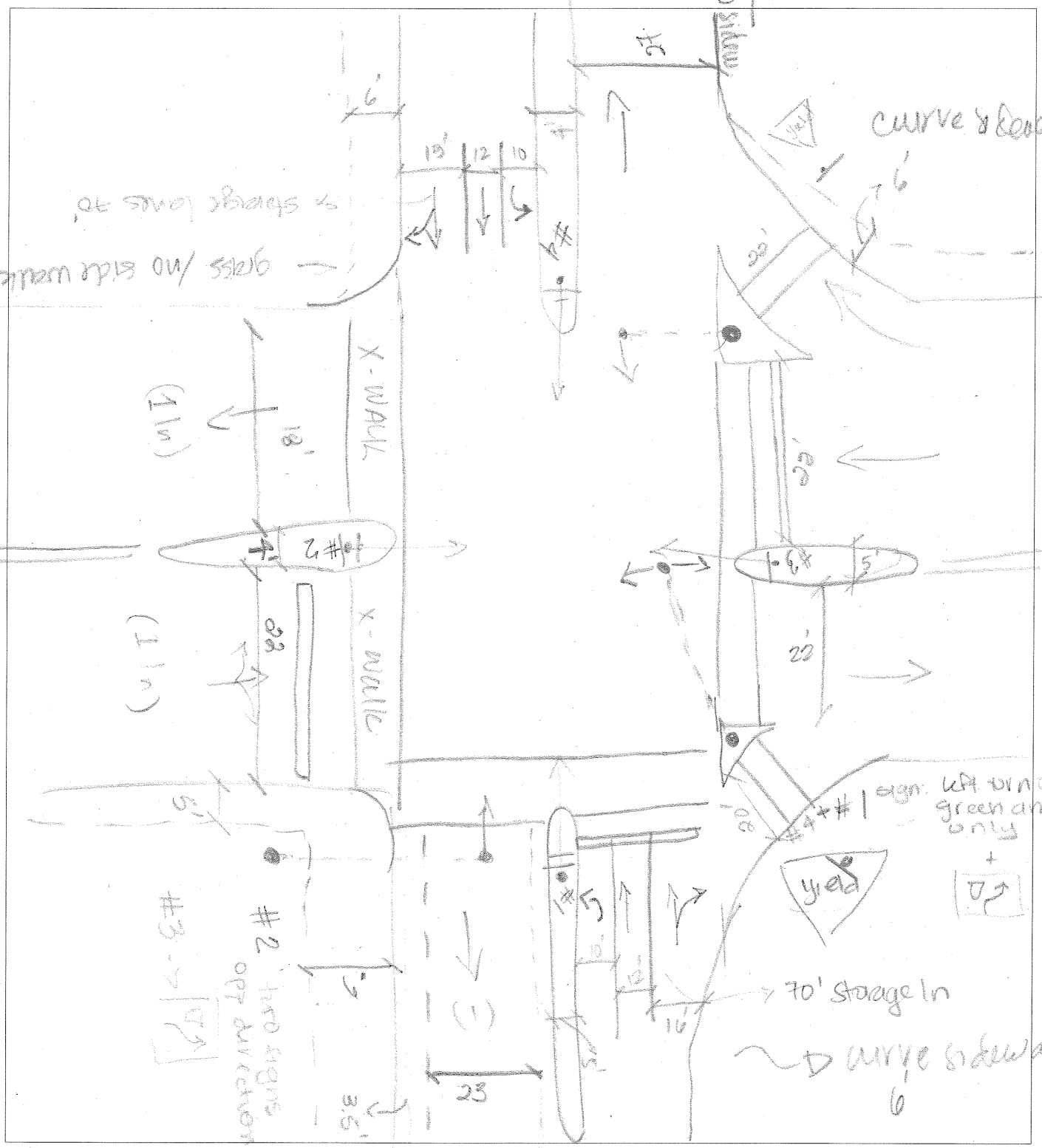
Computations

signal heads including signs

* mastarms include ped heads for 2 directions

Project: SCR
Location: Taunton
Calculated by: NL
Checked by:
Title Dean St @ Longmeadow St.

Project # 10111.31
Sheet 1 of 1
Date:
Date:



3

Computations

R6-1 = one way

R5-1 = do not enter

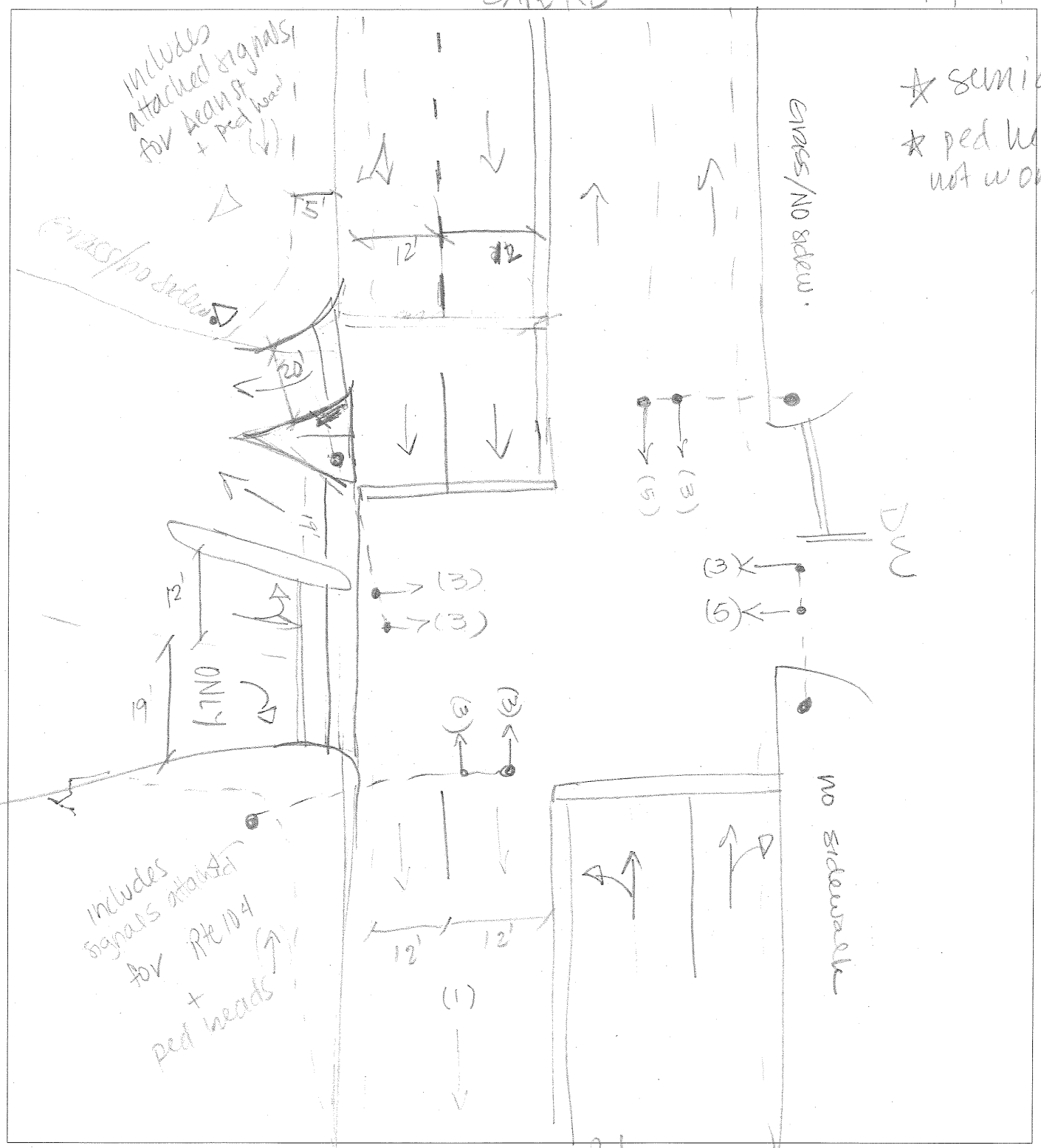
R1-1 = stop sign
R1-2 = yield
R4-7 = DO
R3-7R = Right Turn must turn right
R3-7L = Left " " " left

Project: SCR
Location: Taunton
Calculated by:
Checked by:
Title Cape Rd @ Rte 104

Project # 10111.31
Sheet 1 of
Date: 9/11/08
Date:

CAPE RD

R4-7



* semi act
* ped heads not w one

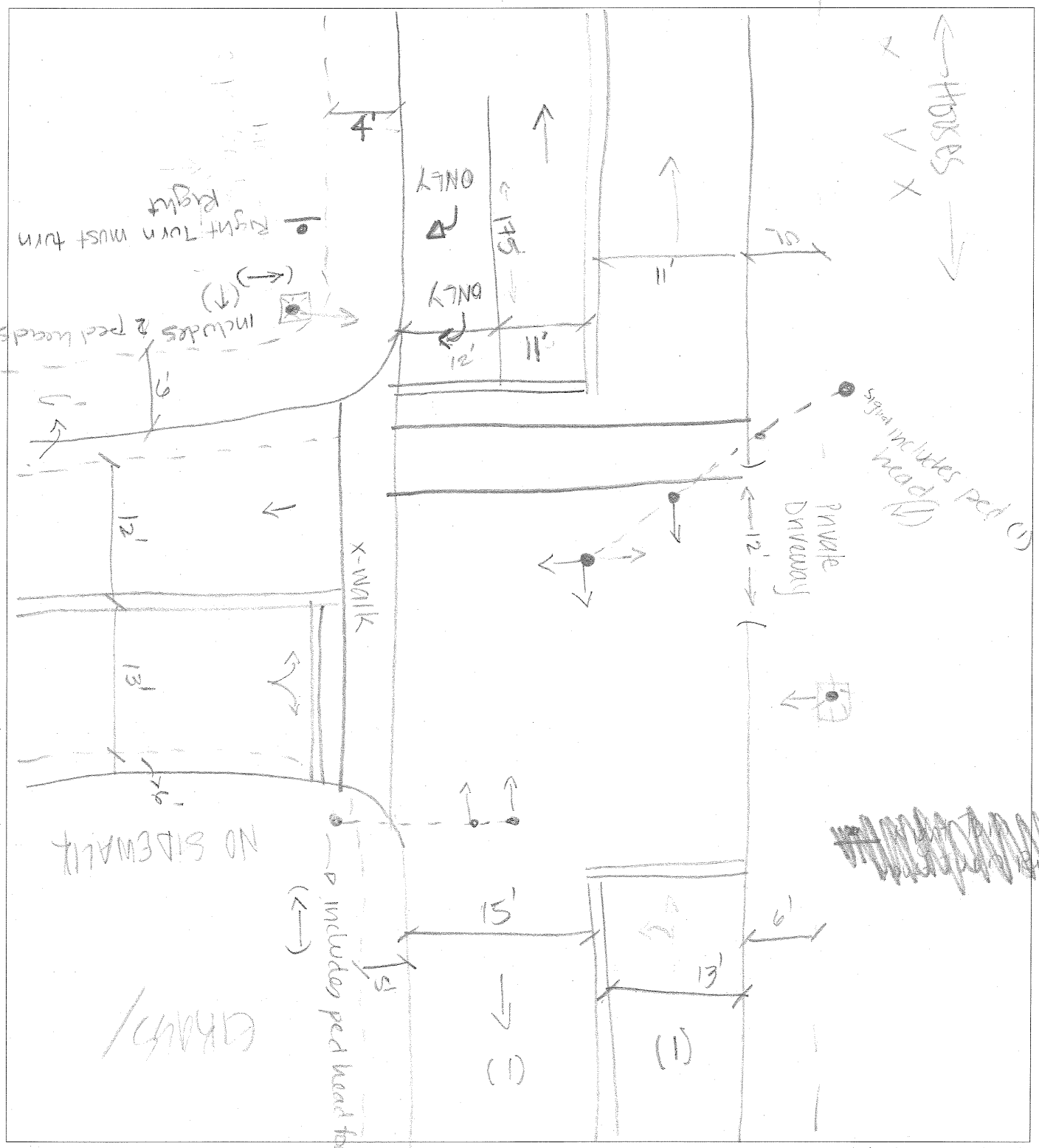
(4)

VHB

Computations

Project: SCR
Location: Taunton NL
Calculated by:
Checked by:
Title Hon Gordon M Owen @ Rte 140

Project # 10111.31
Sheet of
Date:
Date:



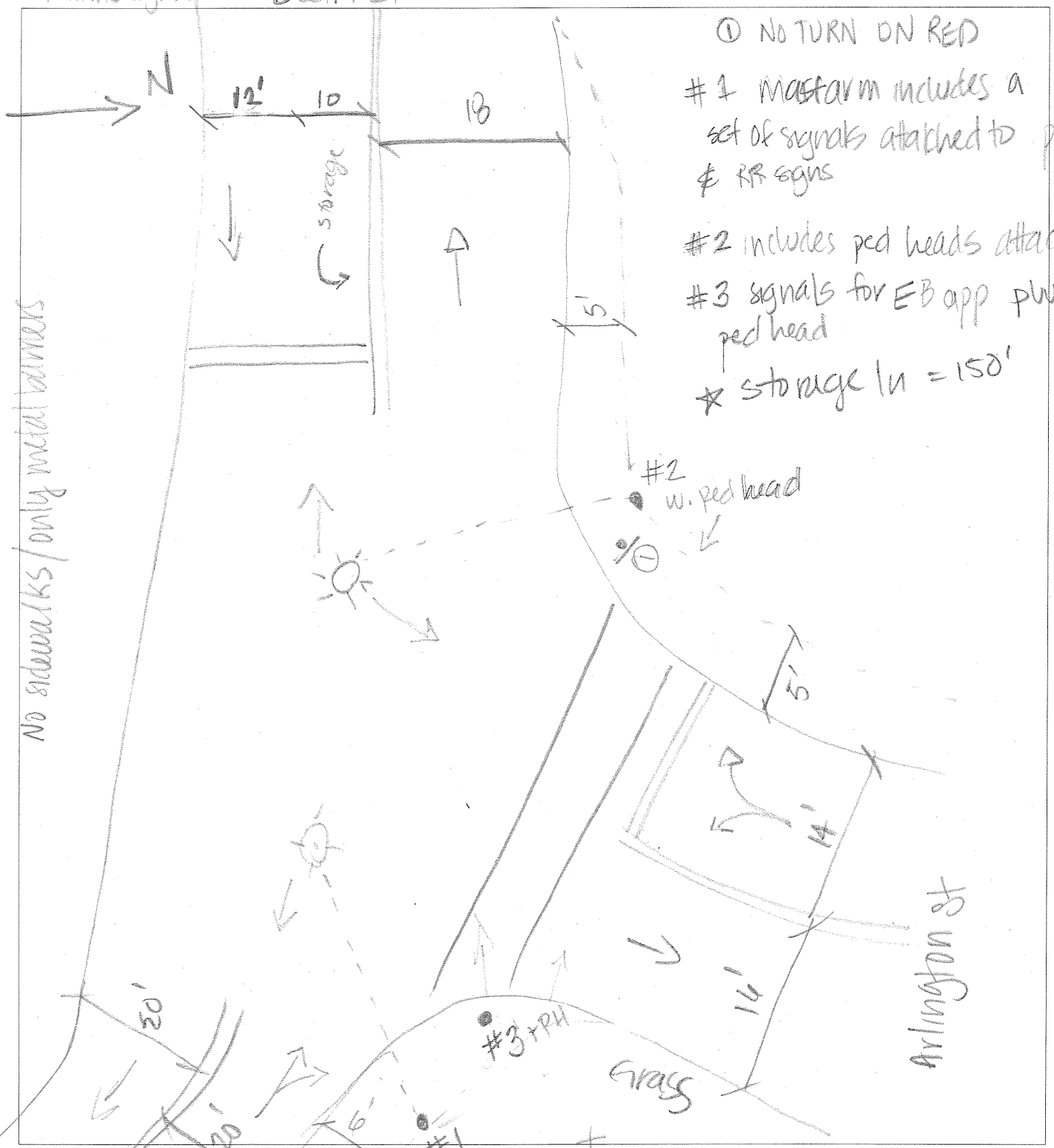
semi-actuated

Computations

* signalized w. ped phases - push buttons
* no x-walk on Dean st.
* no handicap ramps
* mast arms signals Dean St

Project: SCR
Location: Taunton
Calculated by: NL
Checked by:
Title Arlington St @ Dean St

Project # 10111.31
Sheet of
Date: 9/10/08
Date:



① NO TURN ON RED

#1 mast arm includes a set of signals attached to pole & RR signs

#2 includes ped heads attached

#3 signals for EB app plus ped head

* storage ln = 150'

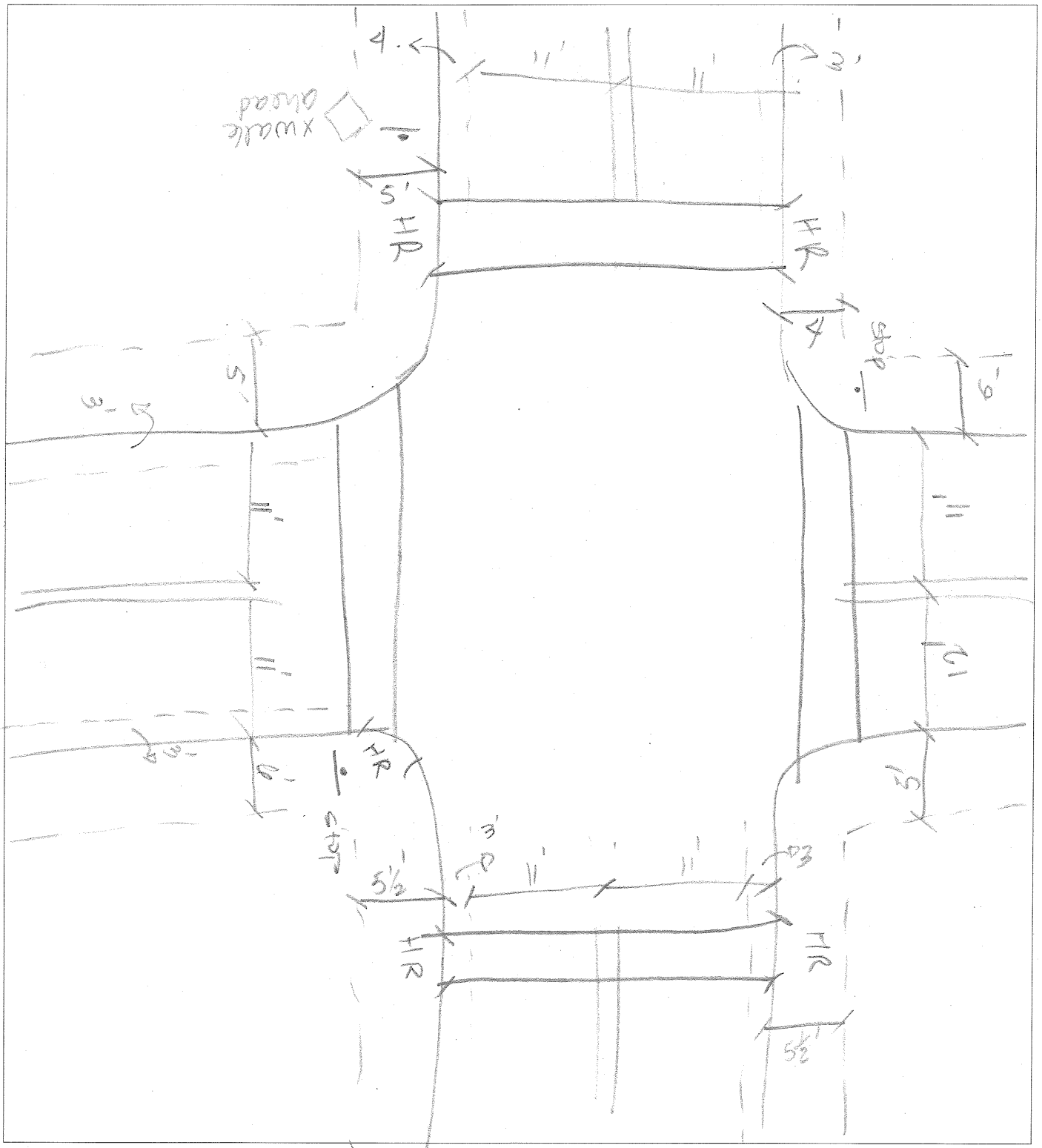
VHB

Computations

Project: SCR
Location: Taunton
Calculated by:
Checked by:
Title Washington St @ Purchase St

Project # 10111.31
Sheet of
Date: 9/11/08
Date:

↑ N

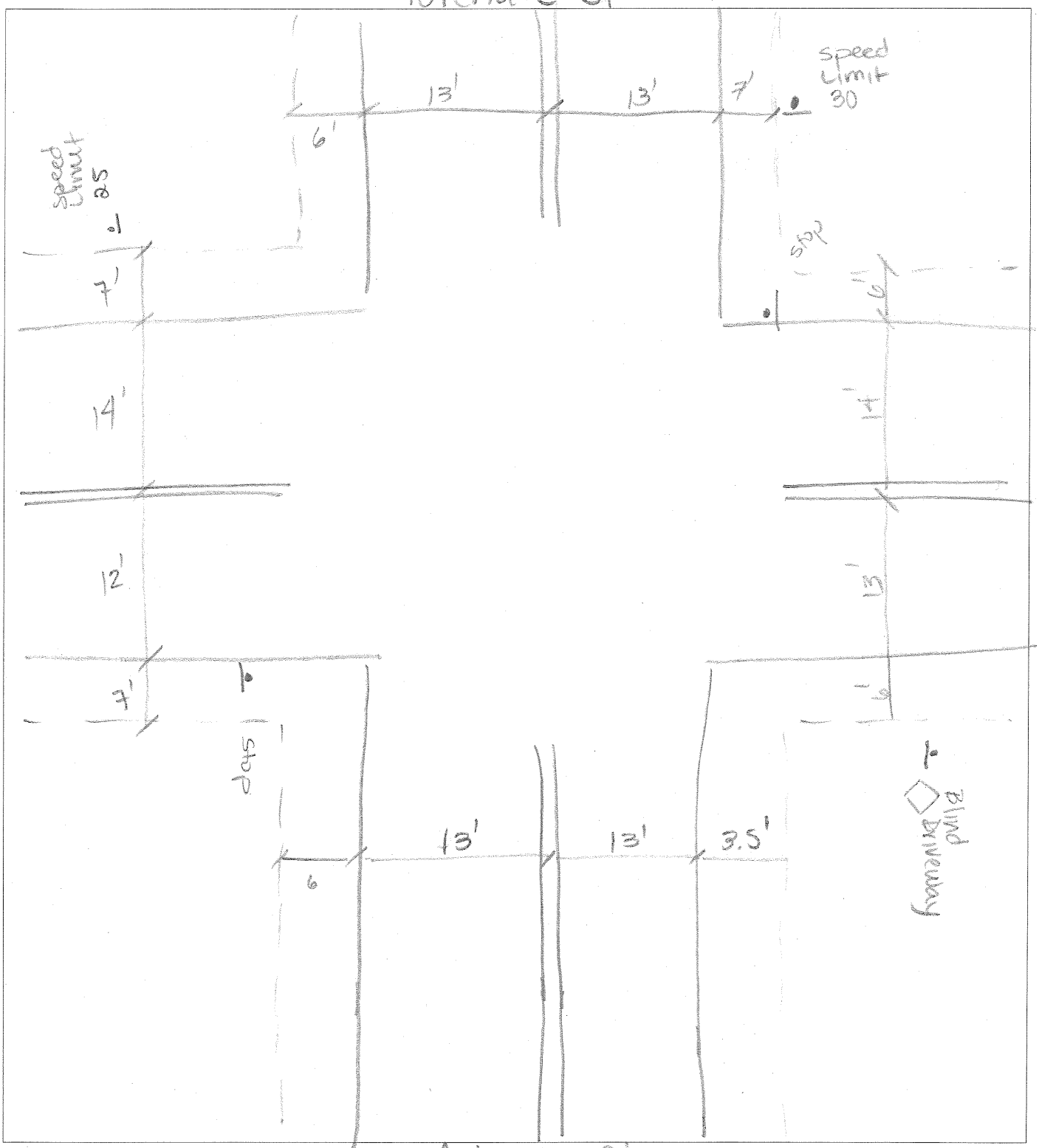

Washington
Main
Purchase
11'
11'
5'
11'
11'
5½'
3'
FR
FR
FR
FR
6'
4'
5'
5'
5

Computations

* Flashing signal overhead
Red for school st
Yellow for Arlington/
Purchase

Project: SCR
Location: Taunton, MA
Calculated by:
Checked by:
Title School St @ Arlington/Purchase St

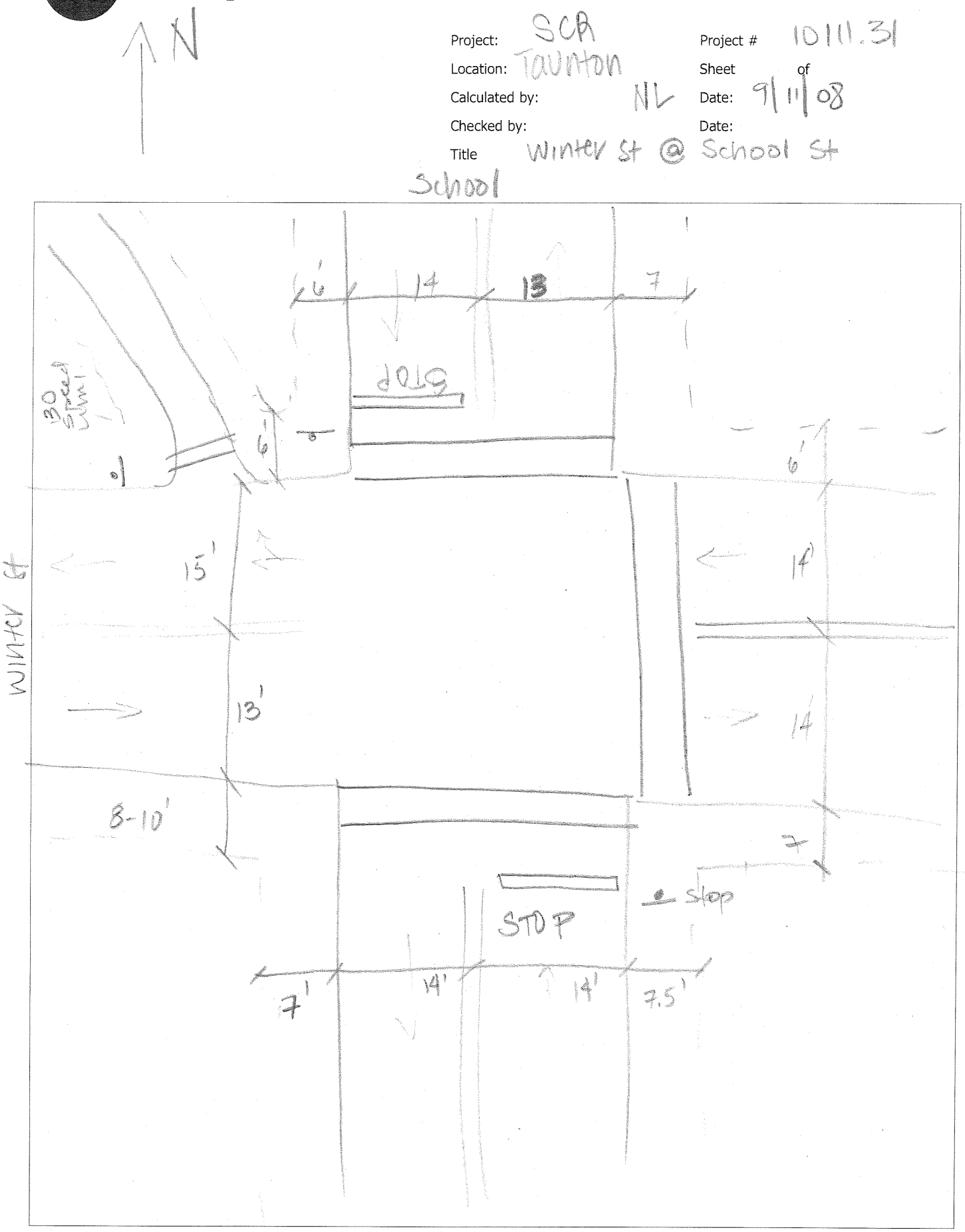
Project # 10111.31
Sheet of
Date:
Date:



Computations

Project: SCR
Location: Taunton
Calculated by: NL
Checked by:
Title: Winter St @ School St

Project # 10111.31
Sheet of
Date: 9/11/08
Date:

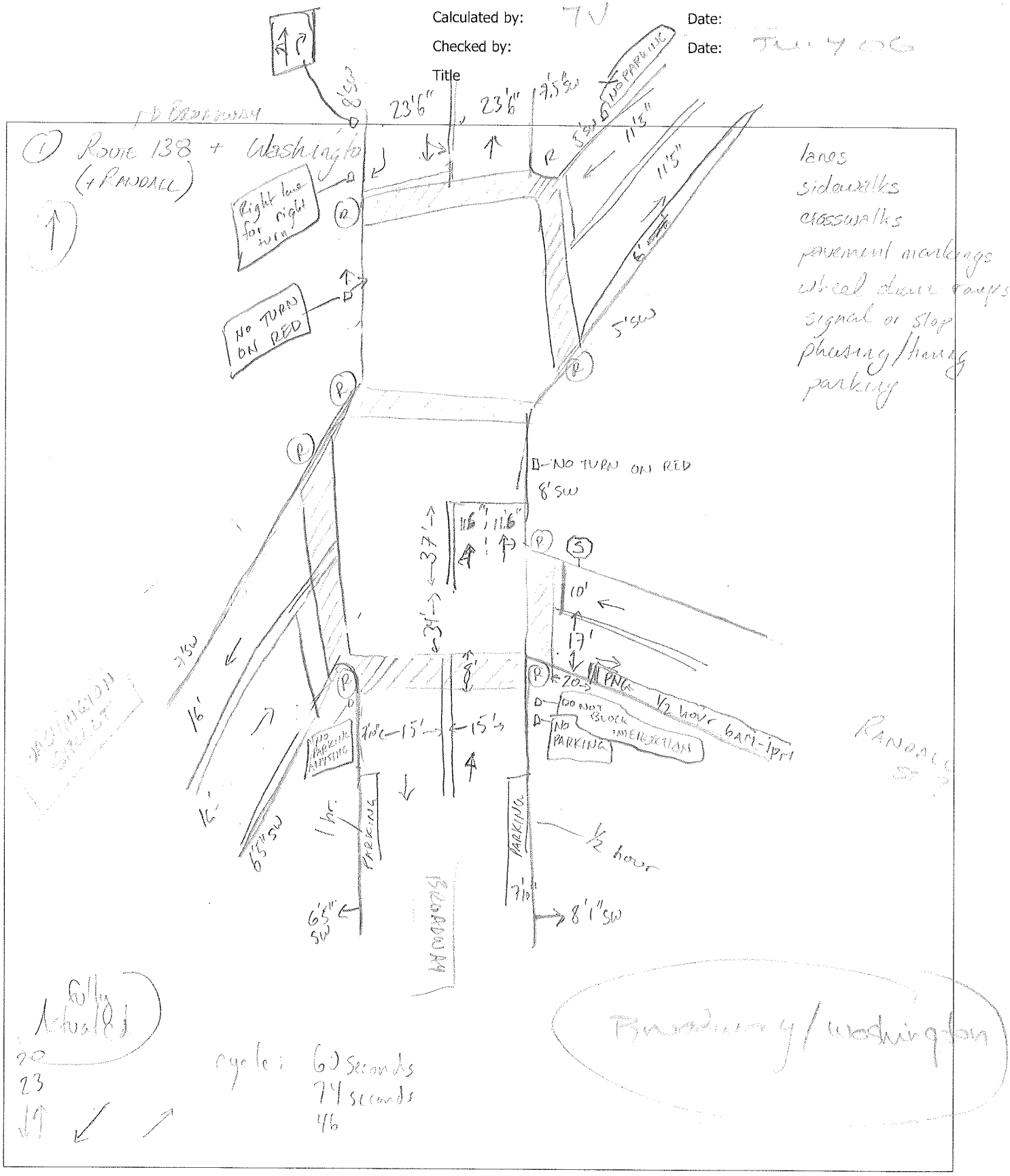


2 Dean

Computations

Project:
Location:
Calculated by: TV
Checked by:
Title

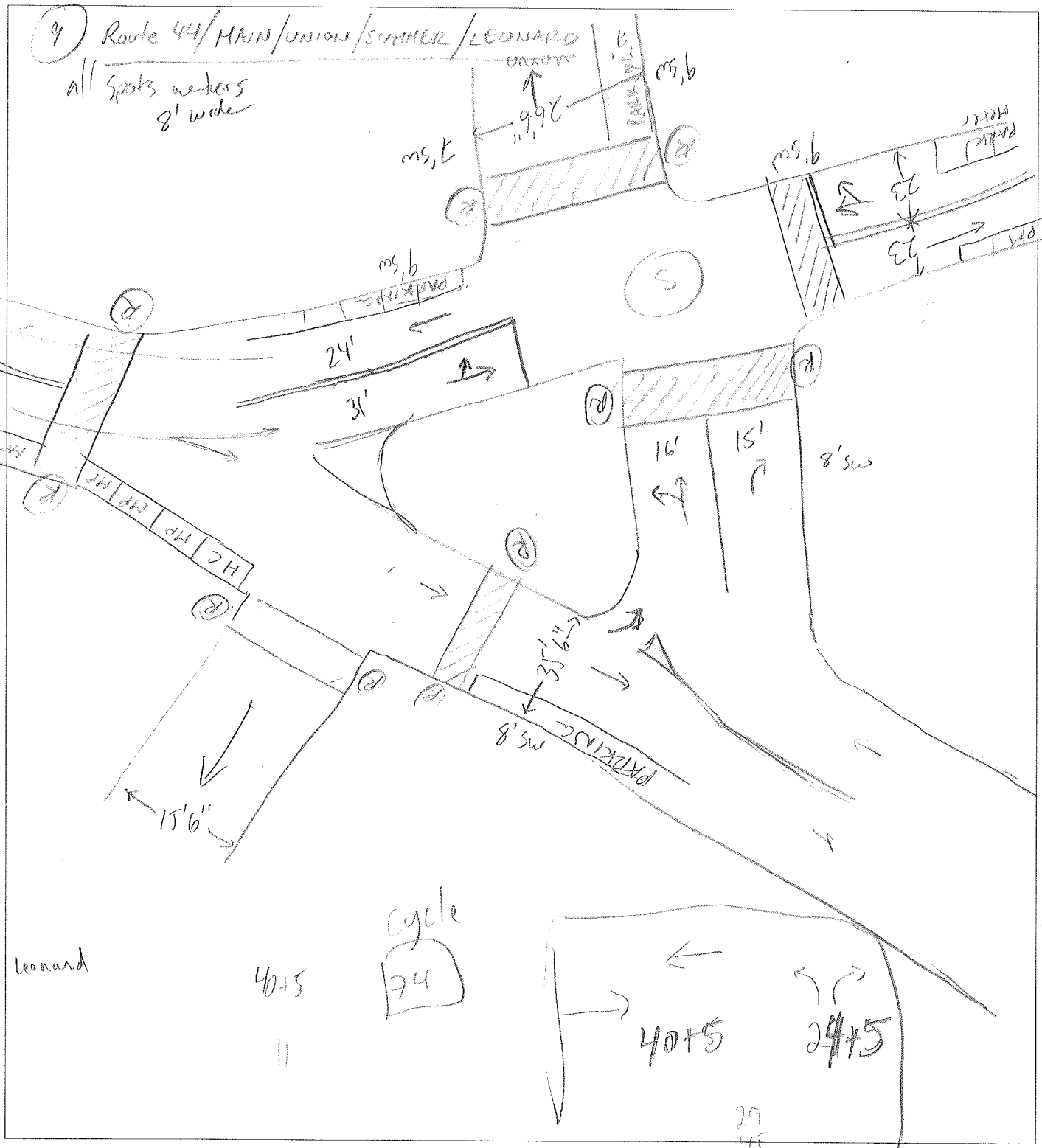
Project # 7914.002
Sheet of
Date:
Date: Jun 4 06

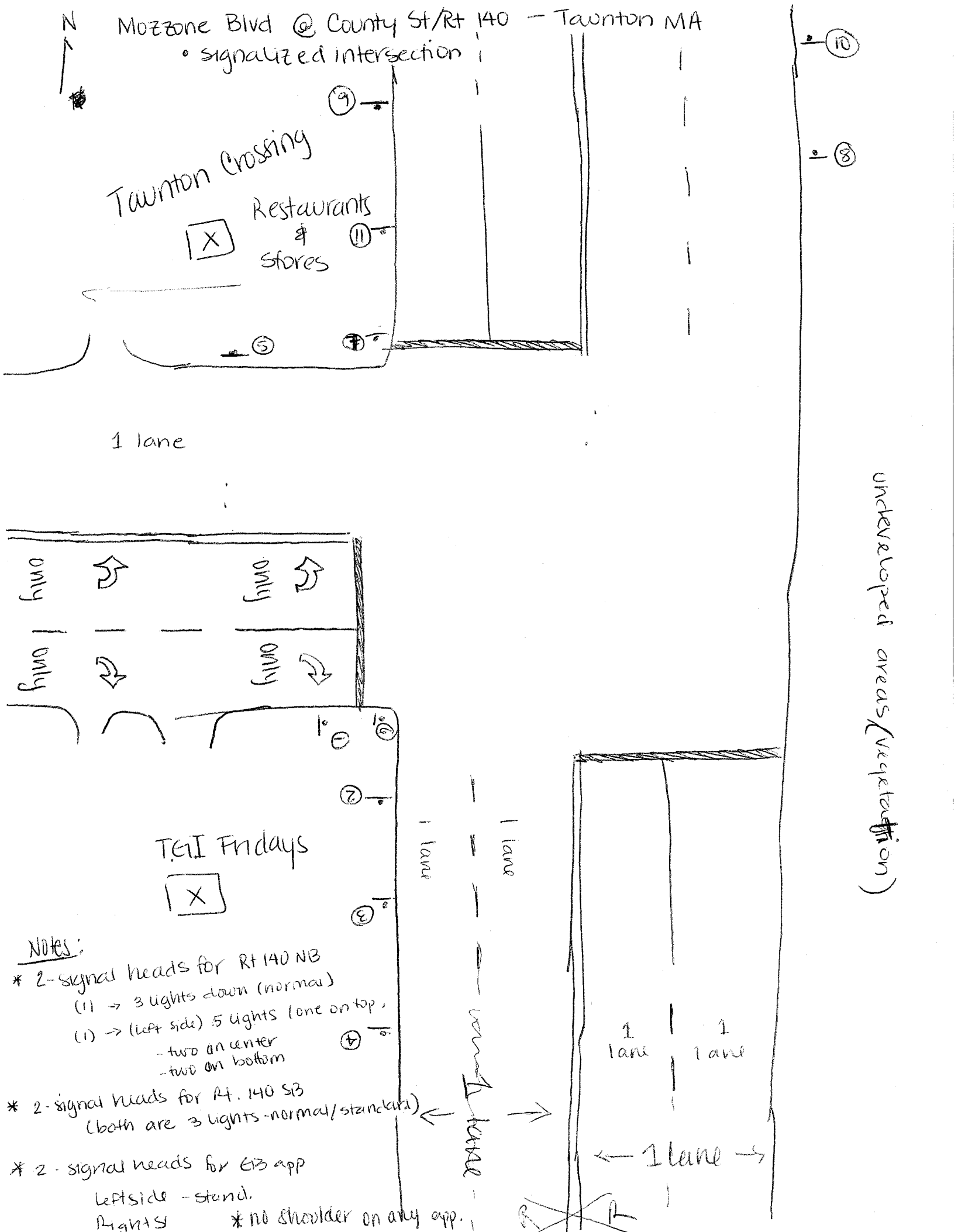


Computations

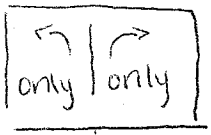
Project:
Location:
Calculated by: TV
Checked by:
Title

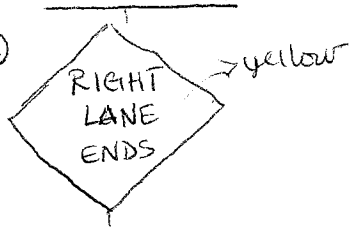
Project # 71914.02
Sheet of
Date: Friday June
Date:



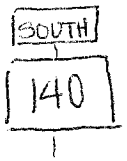

N
Mozzone Blvd @ County St/Rt 140 – Taunton MA
• signalized intersection
Taunton Crossing
X
Restaurants & stores
1 lane
only
only
only
only
TGI Fridays
X
1 lane
1 lane
1 lane
1 lane
1 lane
1 lane
1 lane
Undeveloped areas (vegetation)
Notes:
* 2-signal heads for Rt 140 NB
(1) → 3 lights down (normal)
(1) → (left side) 5 lights (one on top,
- two on center
- two on bottom
* 2-signal heads for Rt. 140 SB
(both are 3 lights-normal/standard)
* 2-signal heads for EB app
Leftside - stand.
Rights
* no shoulder on any app.

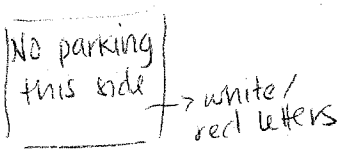
Sign Inventory

① 

② 

③

④ 

⑤ 

⑥ ~~④~~ ⑥

TO REQUEST
GREEN

WAIT
ON

⑧

⑨

⑩

⑪

TAUNTON
RTE. 44 AT LONGMEADOW RD & GORDON M. OWEN PKY

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0852	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

DEAN STREET (ROUTE 44) AT LONGMEADOW ROAD & GORDON M. OWEN PKY

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

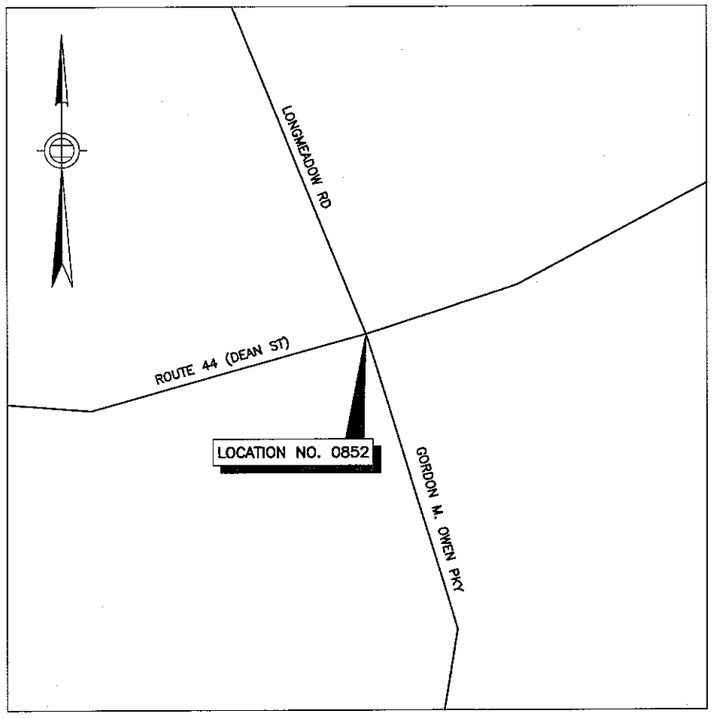
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II. OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50–60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO. 01
DATE: 12-06-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 0852T01.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

APPROVED BY:

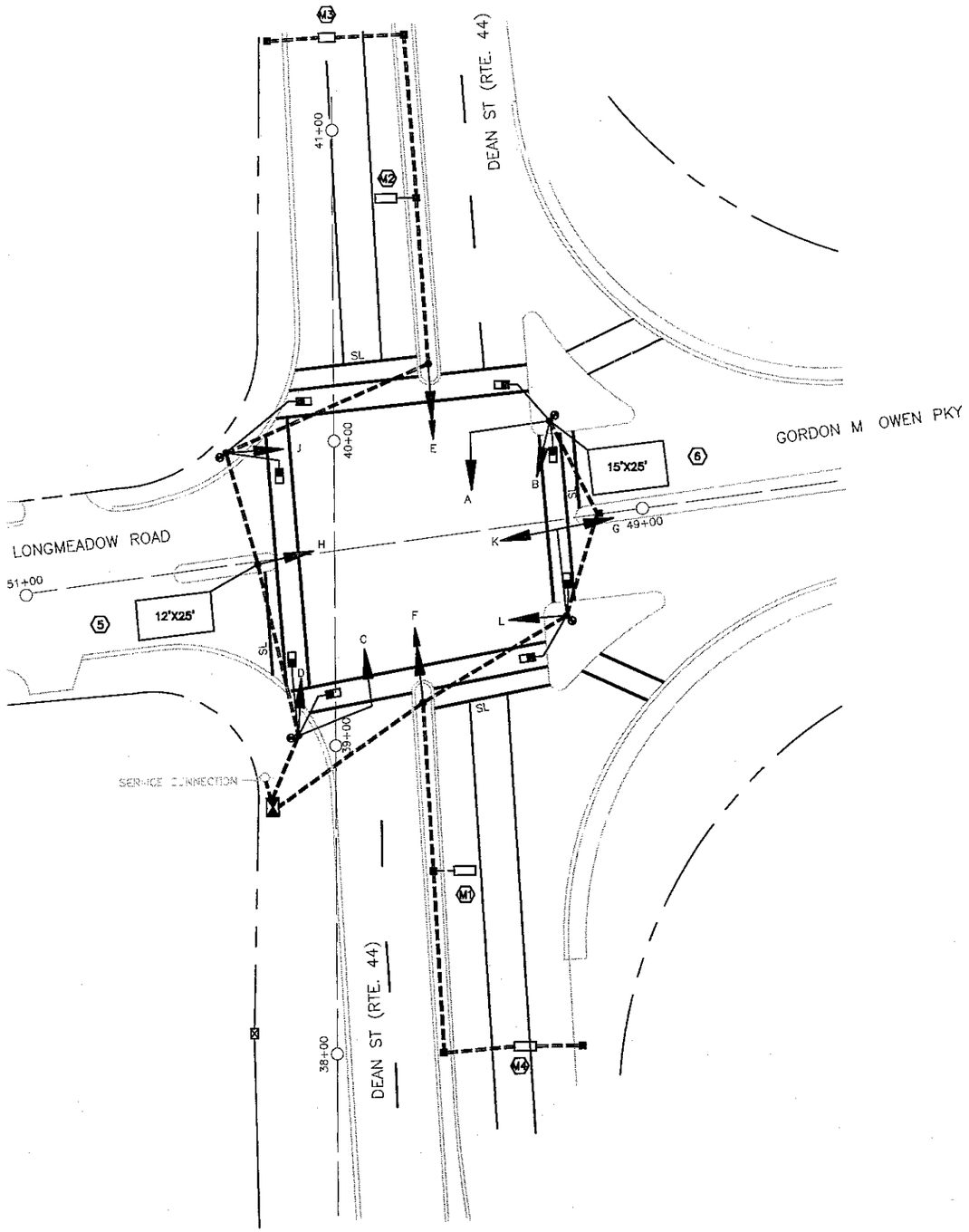
STATE TRAFFIC ENGINEER Date

TAUNTON

RTE. 44 AT LONGMEADOW RD & GORDON M. OWEN PKY

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0852	01	2	

TRAFFIC SIGNAL PLAN



LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

0852P0101.DWG

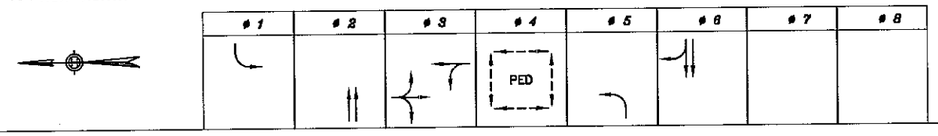
TAUNTON

RTE 44 AT LONGMEADOW RD & GORDON M. OWEN PKY

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	0852	01	3	

TRAFFIC SIGNAL DATA

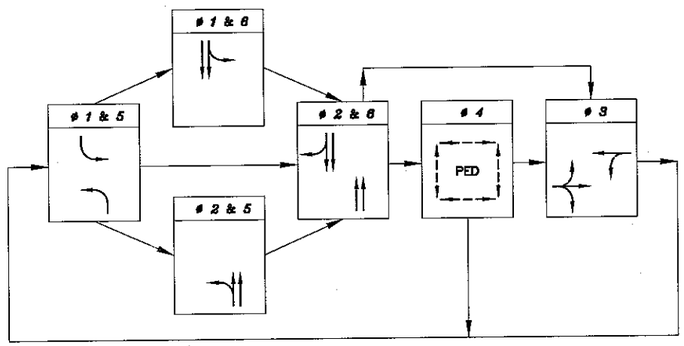
APPROX NORTH



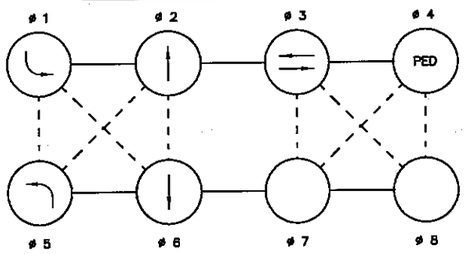
SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
DEAN STREET (ROUTE 44)	EB	E	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL		GL	YL	RL	RL	RL	RL							FRL
DEAN STREET (ROUTE 44)	EB	A,B	R	R	R	G	Y	R	R	R	R	R	R		R	R	R	R	R	R							FY
DEAN STREET (ROUTE 44)	WB	F	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL		RL	RL	RL	RL	RL	RL							FRL
DEAN STREET (ROUTE 44)	WB	C,D	R	R	R	R	R	R	R	R	R	R	R		R	R	R	G	Y	R							FY
GORDON M. OWEN PKY	NB	J,H,G	R	R	R	R	R	R	G	Y	R	R	R		R	R	R	R	R	R							FR
LONGMEADOW ROAD	SB	K,L	R	R	R	R	R	R	G	Y	R	R	R		R	R	R	R	R	R							FR
PEDESTRIAN	ALL	ALL	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW		DW	DW	DW	DW	DW	DW							OFF
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			9			12			9						9			12									EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			4			5			4						4			5									
MAXIMUM 1			18			35			25						18			35									
MAXIMUM 2			18			35			25						18			35									
YELLOW CLEARANCE				4			4			4						4			4								
RED CLEARANCE					1			1			1						1			1							
WALK (W)												8															
PEDESTRIAN CLEARANCE													10														
RECALL			OFF			ON			OFF			OFF			OFF			ON									
MEMORY			LOCKING			LOCKING			LOCKING			LOCKING			LOCKING			LOCKING									

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
4	10' SIGNAL POLE, BASE, & FDN.
3	MAST ARM ASSEMBLY, BASE, & FDN.
8	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
1	1 WAY, 4 SECTION, SIGNAL HOUSING (12" LENS)
1	2 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
8	PEDESTRIAN HOUSING
4	PEDESTRIAN PUSH BUTTON, SIGN, & SADDLES
1	LOOP DETECTOR AMPLIFIER
2	ROADWAY LOOP DETECTOR
4	MAGNETIC AMPLIFIERS
4	MAGNETIC DETECTOR
7	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø7 AND ø8 NOT USED.

NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

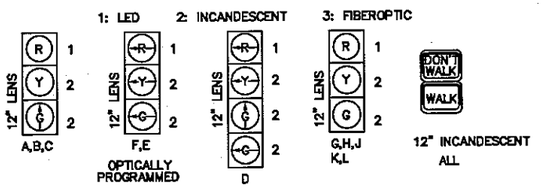
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE DURING SIGNAL INVENTORY.

LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
M1	1	MAGNETIC		ø5	ø5	PRESENCE		
M2	1	MAGNETIC		ø1	ø1	PRESENCE		
M3	1	MAGNETIC		ø6	ø6	PRESENCE		
M4	1	MAGNETIC		ø2	ø2	PRESENCE		
5	1	12'X25'		ø3	ø3	PRESENCE		
6	1	15'X25'		ø3	ø3	PRESENCE		

SIGNAL IDENTIFICATION



CONTROLLER MAKE & MODEL: EPAC 300
UTILITY POLE No. NO #
METER No. 60-371-881 (231 72 5)
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

0852D01.DWG

TAUNTON
ROUTE 44 AT ROUTE 104

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1365	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

CAPE HIGHWAY (ROUTE 44) & DEAN ST (ROUTE 44) AT DEAN STREET (ROUTE 104)

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I. STANDARDS OF INSTALLATION

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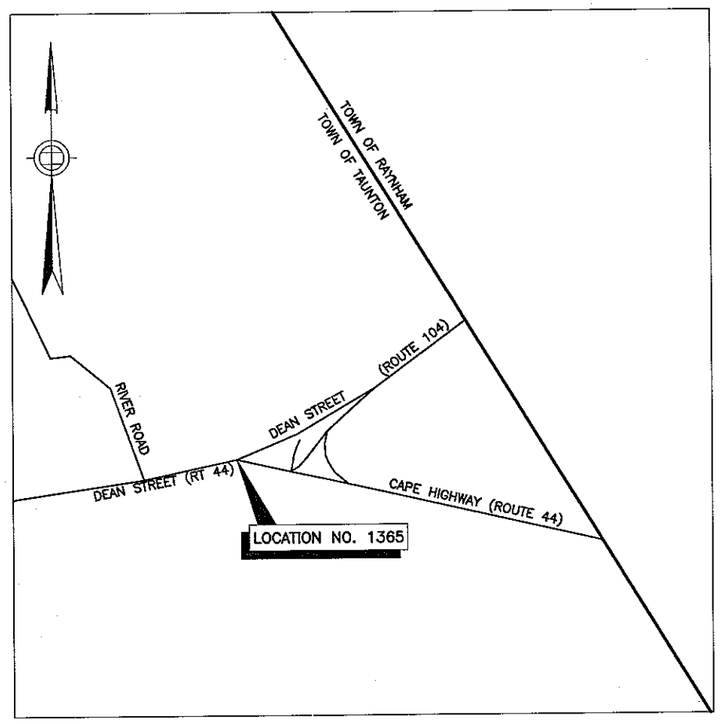
II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50–60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO 01
DATE: 12-06-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1365T0101.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116
MASSACHUSETTS
HIGHWAY DEPARTMENT

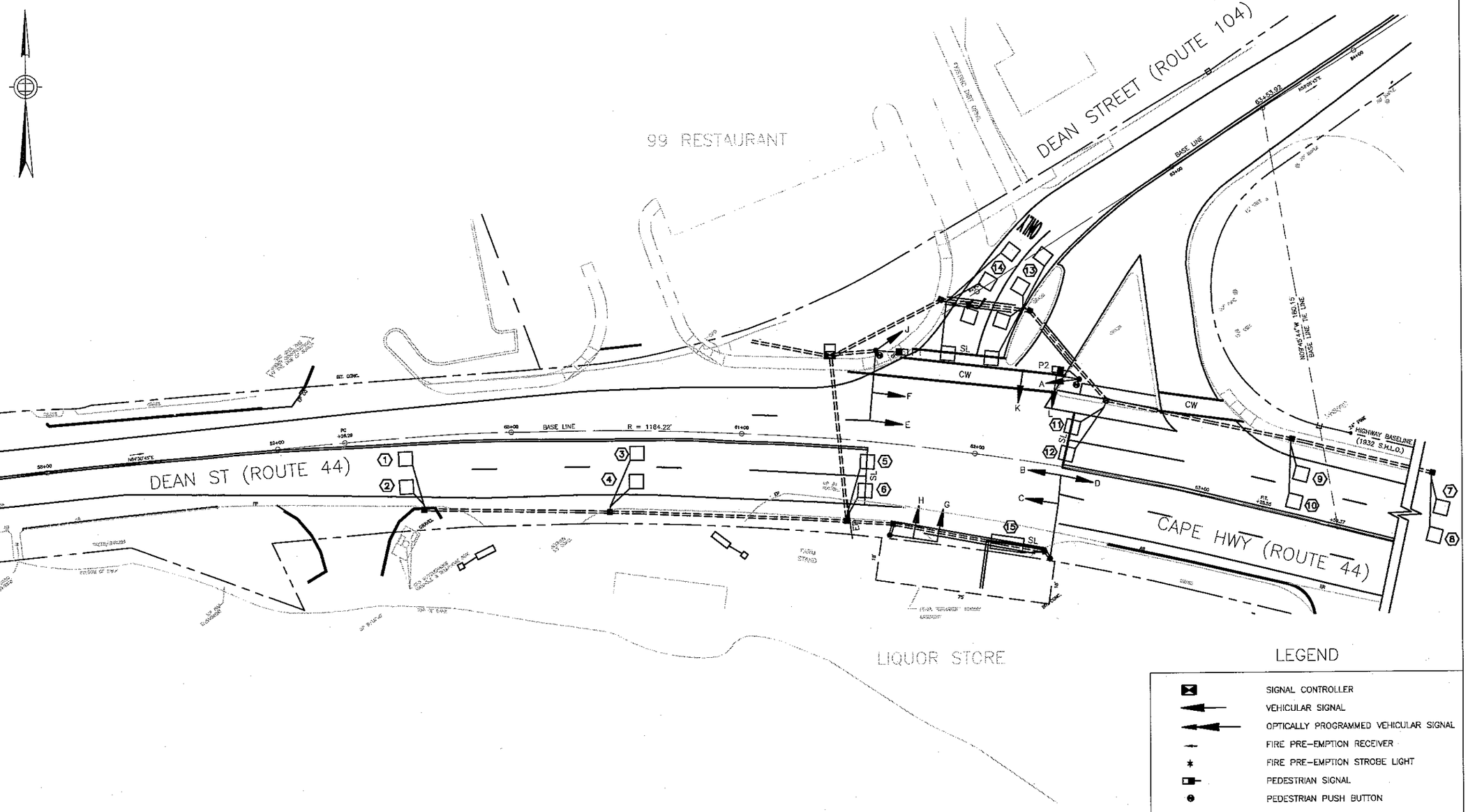
APPROVED BY:

STATE TRAFFIC ENGINEER Date

TAUNTON
ROUTE 44 AT ROUTE 104

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1365	01	2	

TRAFFIC SIGNAL PLAN



LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

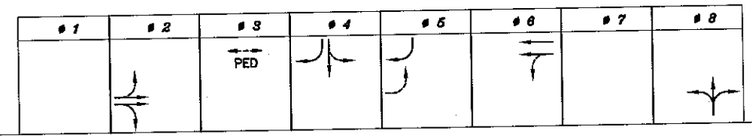
1365P0101.DWG

TAUNTON
ROUTE 44 AT ROUTE 104

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1365	01	3	

TRAFFIC SIGNAL DATA

APPROX. NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH STATE
DEAN STREET (ROUTE 44)	EB	A,B				G	Y	R	R	R	R	R	R	R	GL	YL	R	R	R	R				R	R	R	FY
DEAN STREET (ROUTE 44)	EB	C				G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R	FY
CAPE HWY (ROUTE 44)	WB	D,E,F				R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R				R	R	R	FY
DEAN ST (ROUTE 104)	SB	H,J				R	R	R	R	R	R	G	Y	R	GR	YR	R	R	R	R				R	R	R	FR
DEAN ST (ROUTE 104)	SB	G				R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R				G	Y	R	FR
DRIVEWAY	NB	K,L				R	R	R	R	R	R	R	R	R	R	R	R	R	R	R							
PEDESTRIAN		P1-P2				DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW			DW	DW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)			14						6			6			14					6						
PASSAGE TIME (VEHICLE)			2						2			2			2					2						
MAXIMUM 1			60						20			15			60					20						
MAXIMUM 2			60						25			15			60					20						
YELLOW CLEARANCE				4						4			4			4								4		
RED CLEARANCE					1						1			1			1									1
WALK (W)						6																				
PEDESTRIAN CLEARANCE							13	2																		
RECALL			MIN LOCKING			OFF LOCKING			OFF NON-LOCKING			OFF NON-LOCKING			MIN LOCKING					OFF NON-LOCKING						
MEMORY																										

EMERGENCY ONLY

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
4	MAST ARM ASSEMBLY, BASE, & FDN.
4	8' SIGNAL POLE, BASE, & FDN.
7	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
4	1 WAY, 5 SECTION SIGNAL HOUSING (12" LENS)
2	PEDESTRIAN HOUSING
2	PEDESTRIAN PUSH BUTTON, SIGN, & SADDLES
8	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
21	ROADWAY LOOP DETECTOR
10	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø1 AND ø7 NOT USED.

NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

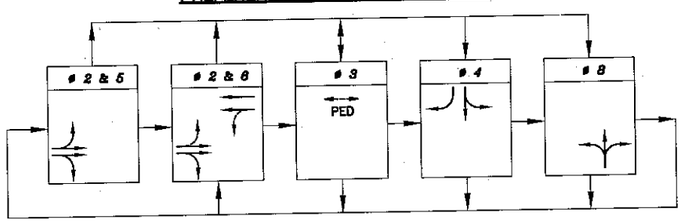
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE DURING SIGNAL INVENTORY.

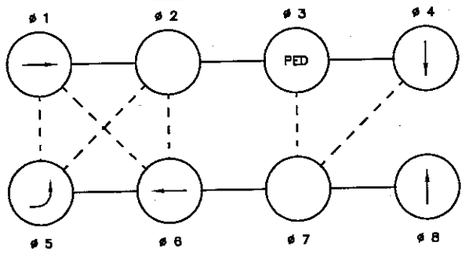
LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	1	6'X6'		ø2	ø2	PULSE		
2	1	6'X6'		ø2	ø2	PRESENCE		
3	1	6'X6'		ø2	ø2	PRESENCE		
4	1	6'X6'		ø2	ø2	PRESENCE		
5	1	6'X6'		ø5	ø5	PRESENCE		
6	1	6'X6'		ø2	ø2	PRESENCE		
7	1	6'X6'		ø6	ø6	PRESENCE		
8	1	6'X6'		ø6	ø6	PRESENCE		
9	1	6'X6'		ø6	ø6	PRESENCE		
10	1	6'X6'		ø6	ø6	PRESENCE		
11	1	6'X6'		ø6	ø6	PRESENCE		
12	1	6'X6'		ø6	ø6	PRESENCE		
13	4	6'X6'		ø4	ø4	PRESENCE		
14	4	6'X15'		ø4	ø4	PRESENCE		
15	1	6'X6'		ø8	ø8	PRESENCE		

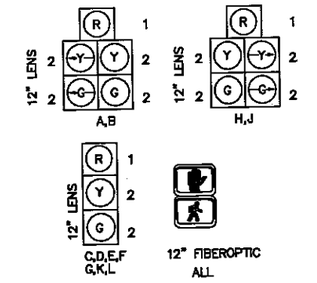
PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



SIGNAL IDENTIFICATION



CONTROLLER MAKE & MODEL: EPAC 300
UTILITY POLE No. TMLP #15
METER No. CPN2MN2182
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1365D0101.DWG

TAUNTON
GALLERIA MALL ENT. NEAR 140 AND 24

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1361	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

GALLERIA MALL ENTRANCE NEAR COUNTY ROAD (ROUTE 140) AND ROUTE 24

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

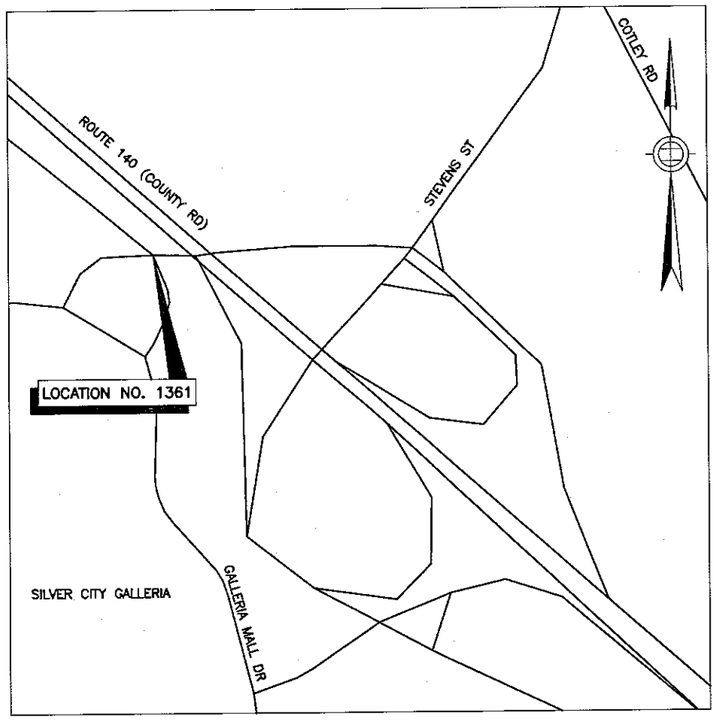
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I. STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR. SCALE IN FEET
0 200 400 800

REVISION NO 01
DATE: 12-05-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1361T0101.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

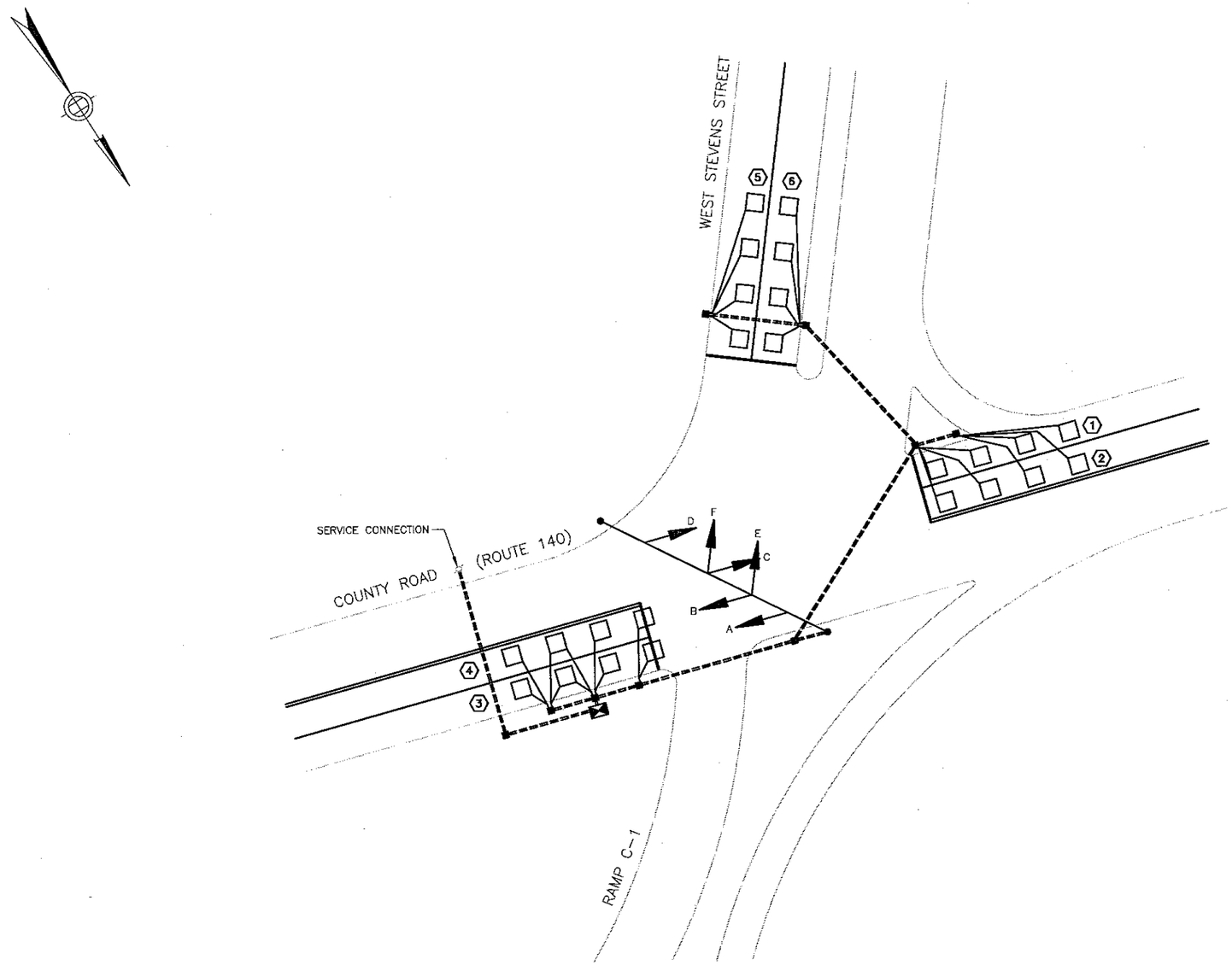
APPROVED BY:

STATE TRAFFIC ENGINEER Date

TAUNTON
GALLERIA MALL ENT. NEAR 140 AND 24

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1361	01	2	

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET

1" = 20' HORIZONTAL

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

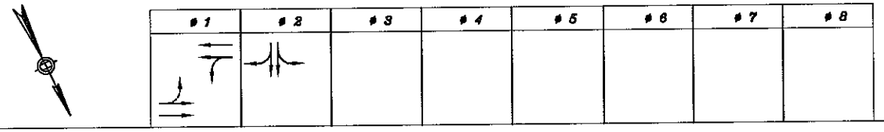
1361PO101.DWG

TAUNTON
GALLERIA MALL ENT. NEAR 140 AND 24

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1361	01	3	

TRAFFIC SIGNAL DATA

APPROX. NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH STATE
COUNTY ROAD (ROUTE 140)	WB	A,B	G	Y	R	R	R	R																			FY
COUNTY ROAD (ROUTE 140)	EB	C,D	G	Y	R	R	R	R																			FY
WEST STEVENS STREET	WB	E,F	R	R	R	G	Y	R																			FR
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			8			8																					
PASSAGE TIME (VEHICLE)			2			2																					
MAXIMUM 1			46			28																					
MAXIMUM 2			27			45																					
YELLOW CLEARANCE				4			4																				
RED CLEARANCE					1			1																			
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL				SOFT			OFF																				
MEMORY				LOCKING			LOCKING																				

JUNCTION BOX DETAIL

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
1	SPANWIRE ASSEMBLY BASE & FDN.
2	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
3	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
24	ROADWAY LOOP DETECTOR
9	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø3 – ø8 NOT USED.

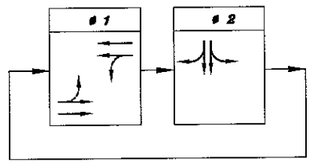
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

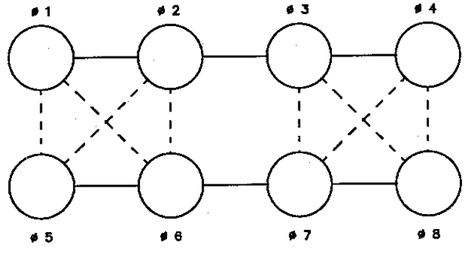
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE DURING SIGNAL INVENTORY.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:

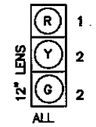


LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	4	6'X6'		ø1	ø1	PRESENCE		
2	4	6'X6'		ø1	ø1	PRESENCE		
3	4	6'X6'		ø1	ø1	PRESENCE		
4	4	6'X6'		ø1	ø1	PRESENCE		
5	4	6'X6'		ø2	ø2	PRESENCE		
6	4	6'X6'		ø2	ø2	PRESENCE		

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: EPAC 300
UTILITY POLE No. –
METER No. 97258539 (FNIMN67)
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1361D0101.DWG

TAUNTON
STEVENS ST AT ROUTE 140 OFF RAMP & GALLERIA MALL DR.

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1362	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

STEVENS STREET AT ROUTE 140 OFF RAMP & GALLERIA MALL DR.

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

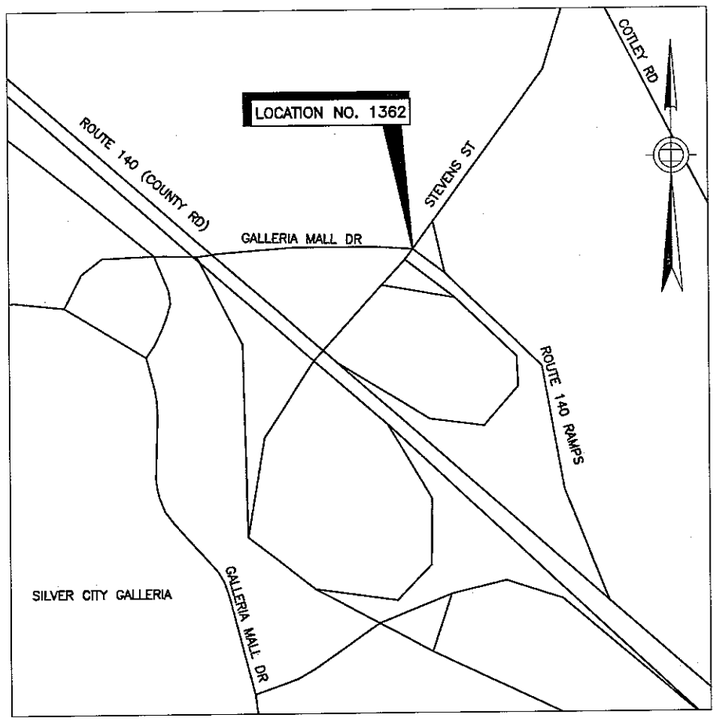
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued* or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR. SCALE IN FEET
0 200 400 800

REVISION NO. 01
DATE: 12-05-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1362T0101.DWG

COMMENTS:

MASS HIGHWAY
10 PARK PLAZA
BOSTON, MA 02116
MASSACHUSETTS
HIGHWAY DEPARTMENT

APPROVED BY:

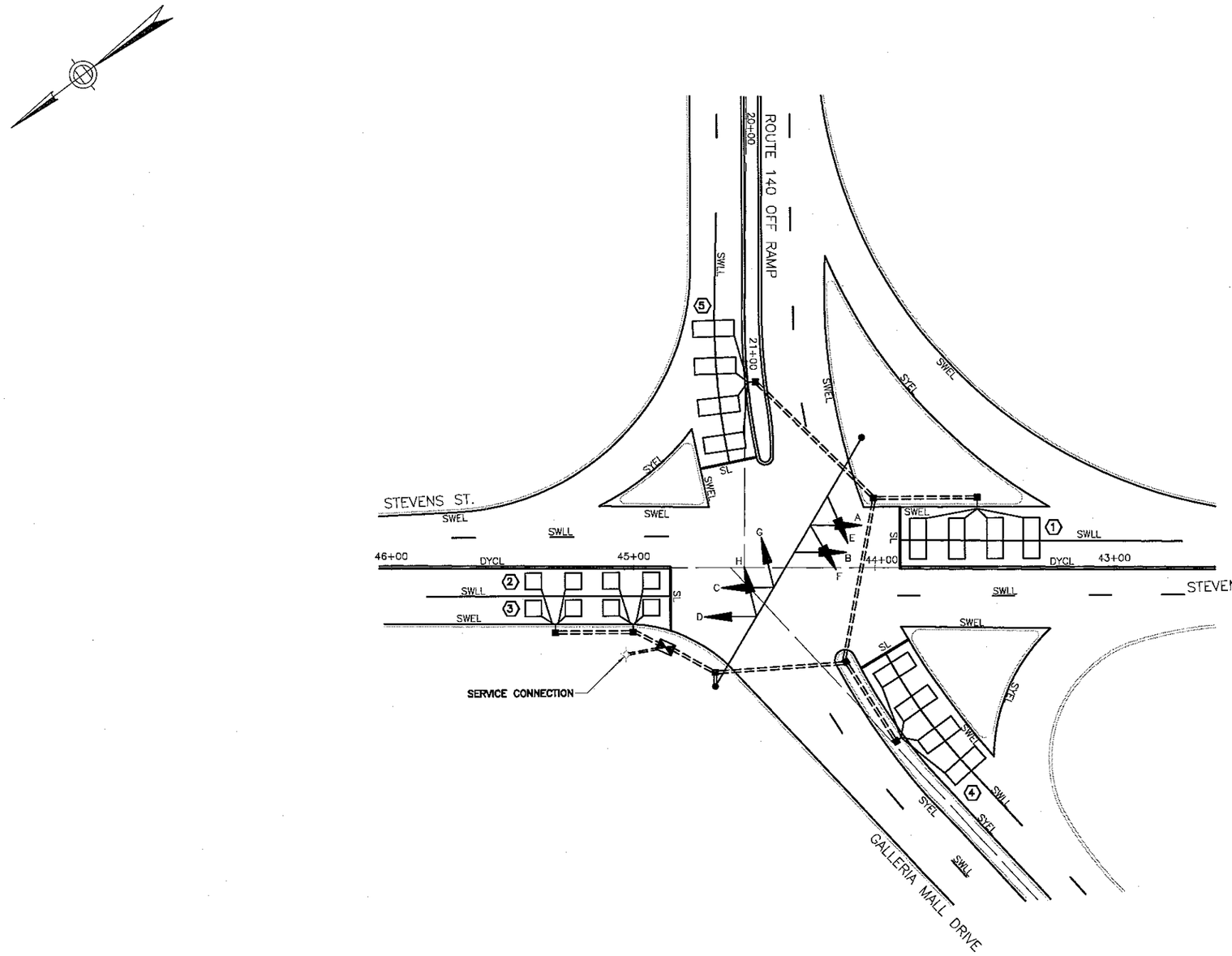
STATE TRAFFIC ENGINEER Date

TAUNTON

STEVENS ST AT ROUTE 140 OFF RAMP & GALLERIA MALL DR.

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1362	01	2	

TRAFFIC SIGNAL PLAN



0 20 50 100 FEET

1" = 20' HORIZONTAL

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

1362P0101.DWG

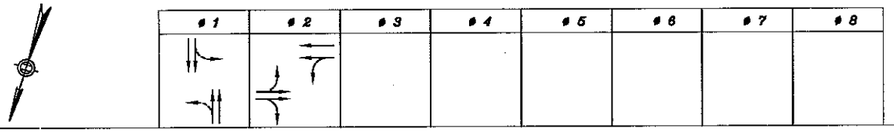
TAUNTON

STEVENS ST AT ROUTE 140 OFF RAMP & GALLERIA MALL DR.

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1362	01	3	

TRAFFIC SIGNAL DATA

APPROX NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	PHASE OVER
STEVENS STREET	NB	A,B	R	R	R	G	Y	R																			FR
STEVENS STREET	SB	C,D	R	R	R	G	Y	R																			FR
GALLERIA MALL DRIVE	EB	E,F	G	Y	R	R	R	R																			FY
ROUTE 140 OFF RAMP	WB	G,H	G	Y	R	R	R	R																			FY
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			8			8																					EMERGENCY FLYING
PASSAGE TIME (VEHICLE)			2			2																					
MAXIMUM 1			48			24																					
MAXIMUM 2			30			42																					
YELLOW CLEARANCE				4			4																				
RED CLEARANCE					1			1.1																			
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL																											
MEMORY																											

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 4DW & 8DW, CAB. & FDN.
1	SERVICE CONNECTION (OVERHEAD)
1	SPANWIRE ASSEMBLY BASE & FDN. W/ TETHER
2	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
3	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
20	ROADWAY LOOP DETECTOR
8	12" x 12" PULL BOX
1	SPECIAL FUNCTION UNIT-TIME BASED COORD.
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø3 – ø8 NOT USED.

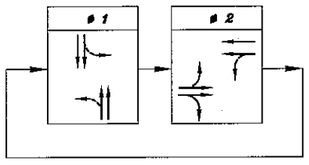
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

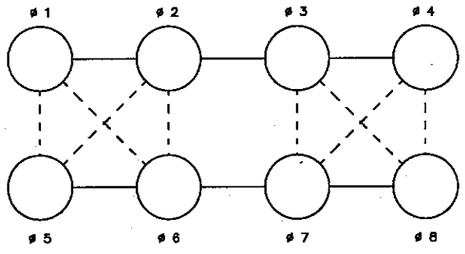
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS NOT VISIBLE DURING SIGNAL INVENTORY.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:

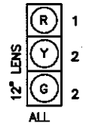


LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	4	6'X20'	3	ø1	ø1	PRESENCE		
2	8	6'X6'	3	ø1	ø1	PRESENCE		
3	4	6'X20'	3	ø1	ø1	PRESENCE		
4	4	6'X20'	3	ø2	ø2	PRESENCE		
5	4	6'X6'	3	ø2	ø2	PRESENCE		

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: EAGLE
UTILITY POLE No. TMLP / NET&T CO. 4 1/2
METER No. 28-169-006
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1362D01.01.DWG

TAUNTON RTE. 140 AT 24. NB. RAMP				
STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1363	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

COUNTY STREET (ROUTE 140) AT AMERICAN VETERANS MEMORIAL HIGHWAY (ROUTE 24) NORTHBOUND RAMP

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

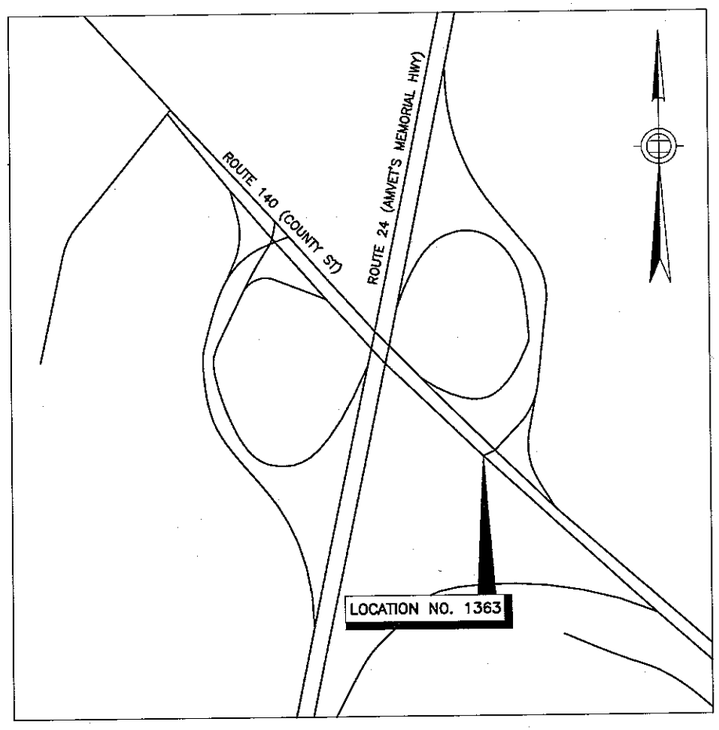
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever a signal is not operating as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be operated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at any time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR SCALE IN FEET
0 200 400 800

REVISION NO	01
DATE:	12-05-01
INSERT BY:	J.C.CONNOR
DATE:	
FILE NAME:	1363T0101.DWG

COMMENTS:

MASSHIGHWAY
10 PARK PLAZA
BOSTON, MA 02116
MASSACHUSETTS
HIGHWAY DEPARTMENT

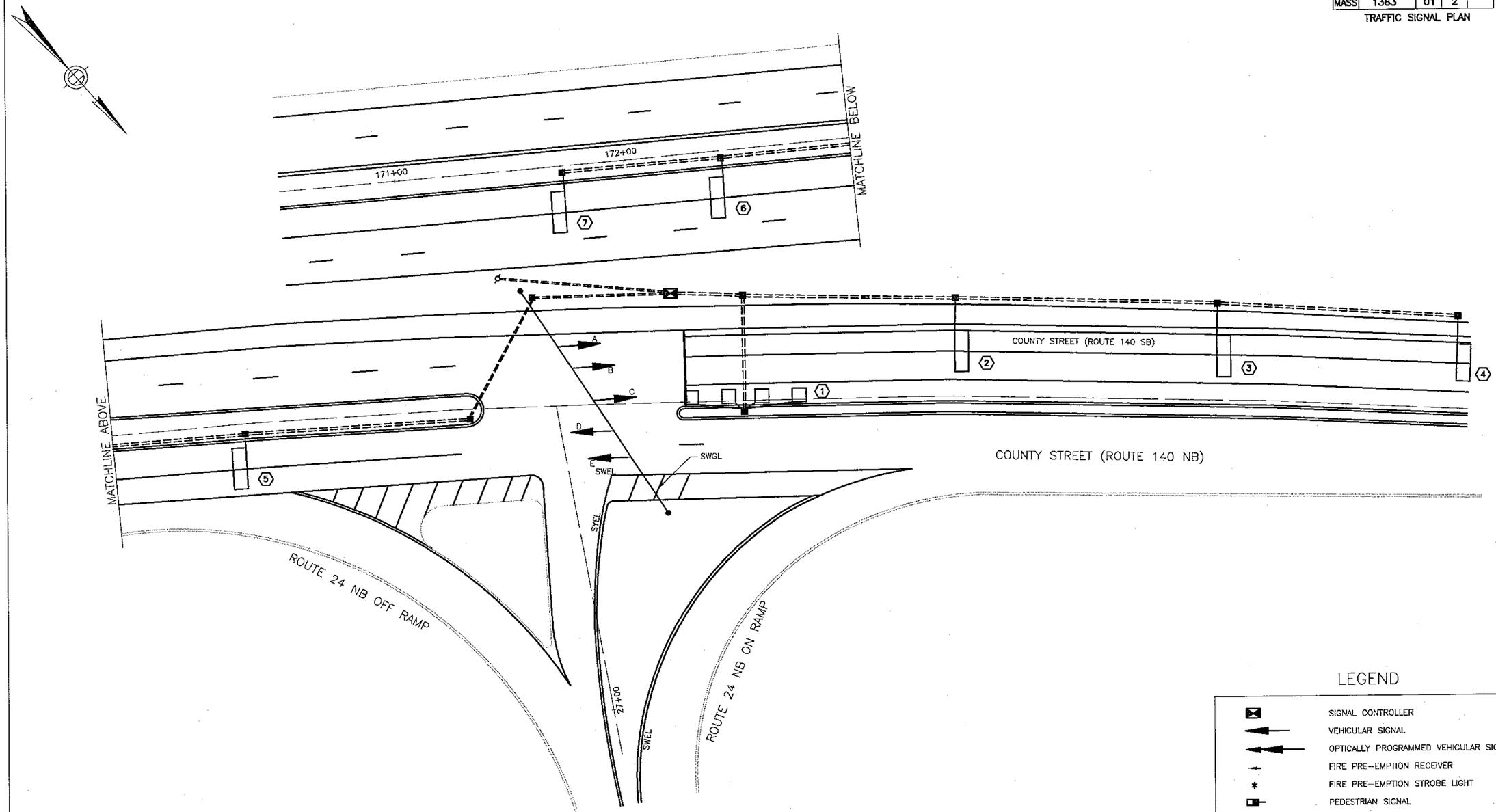
APPROVED BY:

STATE TRAFFIC ENGINEER Date

TAUNTON
RTE. 140 AT 24. NB. RAMP

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1363	01	2	

TRAFFIC SIGNAL PLAN



SCALE IN FEET
0 10 20 50 100 FEET

LEGEND

- SIGNAL CONTROLLER
- VEHICULAR SIGNAL
- OPTICALLY PROGRAMMED VEHICULAR SIGNAL
- FIRE PRE-EMPTION RECEIVER
- FIRE PRE-EMPTION STROBE LIGHT
- PEDESTRIAN SIGNAL
- PEDESTRIAN PUSH BUTTON
- PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

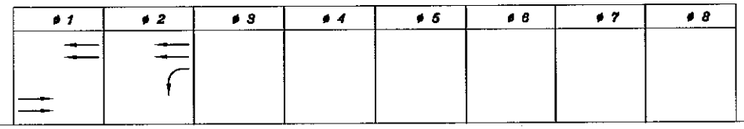
1363P0101.DWG

TAUNTON
RTE. 140 AT 24. NB. RAMP

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1363	01	3	

TRAFFIC SIGNAL DATA

APPROX NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH STATE
COUNTY ST (ROUTE 140)	EB-LT	C	RL	RL	RL	GL	YL	RL																			FRL
COUNTY ST (ROUTE 140)	EB	A,B	G	G	G	G	G	G																			FY
COUNTY ST (ROUTE 140)	WB	D,E	GV	Y	R	R	R	R																			FY
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			16			8																					EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			2			2																					
MAXIMUM 1			42			30																					
MAXIMUM 2			58			20																					
YELLOW CLEARANCE				4			4																				
RED CLEARANCE					1			1																			
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL			EXT			OFF																					
MEMORY			NON-LOCKING			NON-LOCKING																					

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 8DW, CAB. & FDN.
1	SERVICE CONNECTION (UNDERGROUND)
1	SPANWIRE ASSEMBLY BASE & FDN.
5	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
4	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
11	ROADWAY LOOP DETECTOR
10	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

5. ø3 – ø8 NOT USED.

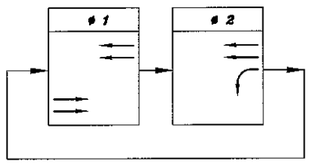
NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

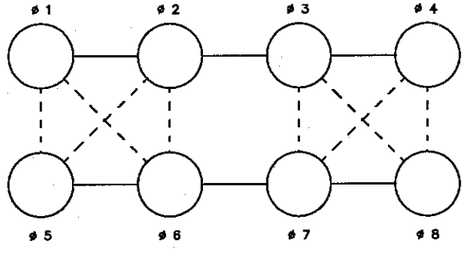
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTOR NOT VISIBLE DURING SIGNAL INVENTORY.

PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



COORDINATION DATA
(ALL ENTRIES IN SECONDS)

CYCLE	TIME PERIOD	OFFSET	CYCLE LENGTH
CYCLE 1	MONDAY-SATURDAY 1000-1200	0	82
CYCLE 2	SUNDAY 1100-1900	0	82
CYCLE 3	MONDAY-SATURDAY 0600-1000	0	82
CYCLE 4			

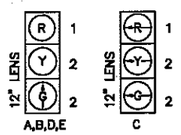
SPLIT	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8
SPLIT 1								
SPLIT 2								
SPLIT 3								
SPLIT 4								

LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
(1)	4	6'X6'	3	ø2	ø2	PRESENCE		
(2)	1	6'X18'	3	ø1	ø1	PULSE		
(3)	1	6'X18'	3	ø1	ø1	PULSE		
(4)	1	6'X18'	3	ø1	ø1	PULSE		
(5)	1	6'X18'	3	ø1	ø1	PULSE		
(6)	1	6'X18'	3	ø1	ø1	PULSE		
(7)	1	6'X18'	3	ø1	ø1	PULSE		

SIGNAL IDENTIFICATION

1: LED 2: INCANDESCENT 3: FIBEROPTIC



CONTROLLER MAKE & MODEL: TCT LMD 8000
UTILITY POLE No. –
METER No. 21-150-696 (34985H)
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

1363D101.DWG

TAUNTON RTE. 140 AT 24. SB. RAMP				
STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1364	01	1	

TITLE SHEET

THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS HIGHWAY DEPARTMENT

TRAFFIC SIGNAL LAYOUT PLAN AND PERMIT

COUNTY STREET (ROUTE 140) AT AMERICAN VETERANS HIGHWAY (ROUTE 24) SOUTHBOUND RAMP

IN THE TOWN OF

TAUNTON

BRISTOL COUNTY

Under authority of Chapter 89, Sec. 8 General Laws, Tercentenary Edition, the Massachusetts Highway Department hereby approves the following described traffic control signal installation, and auxiliary signs and surface markings, for the above location, provided that a permit for the opening of the road and the placing of structures thereon shall be received from the board or officer in charge of the road.

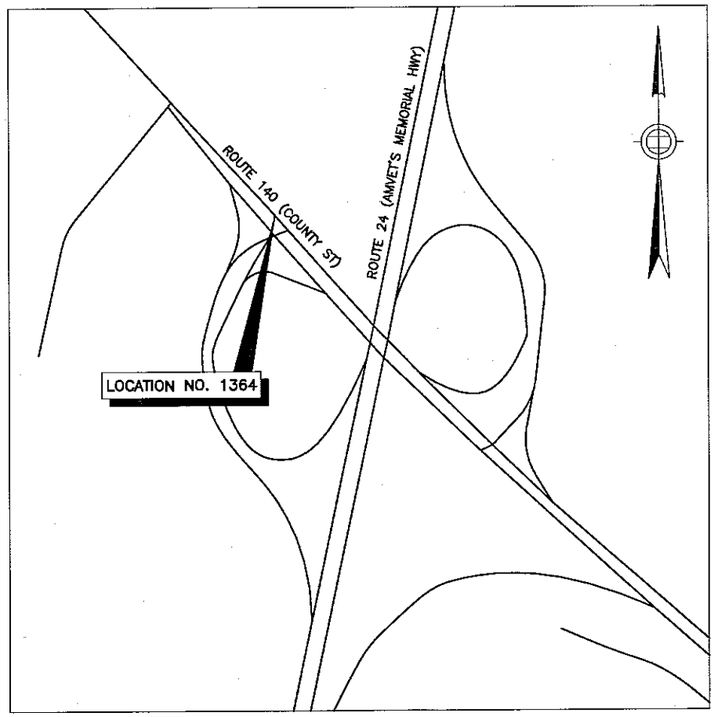
This permit is granted for the specific signal installation described herein and for its operation in accordance with the conditions set forth below and with the requirements of the Massachusetts Highway Department. The details for any material alterations or any continued or substantial departure from the provisions of this permit must be submitted to the department for approval with data sufficient to justify such modification. Failure to comply with these requirements automatically voids this permit during such time as non-compliance exists.

I STANDARDS OF INSTALLATION

The traffic control signal installation and all auxiliary signs and surface markings which are used in connection with such installation shall conform with the requirements of the Massachusetts Highway Department and with the sketch which is attached.

II OPERATION OF SIGNALS

(a) Type of control: AUTOMATIC
(b) Coordination: NONE
(c) Special connection: NONE
(d) Timing for automatic operation: SEE SHEET NO. 3
(e) Hours for Automatic Operation: CONTINUOUS
Signals may be operated automatically for a shorter period of time but not for a greater length of time than is here indicated except when unusual conditions arise which temporarily justify longer operation.
(f) Flashing Operation: Whenever o signal is not operoting as a control device (stop and go), it must Flash Yellow or Flash Red as set forth in the signal sequence and at the rate of 50-60 flashes per minute unless otherwise specified in Part II(e) of this Permit.
(g) Manual Operation: Signals may be opsrated manually at any time irrespective of the hours designated in Part II(3) of this permit
(h) Discontinuance: Signals may be discontinued at ony time. When this is done signal faces must be turned away from traffic, taken down or hooded, and the District Highway Engineer notified.



LOCUS MAP
(SCALE AS SHOWN)

HOR. SCALE IN FEET
0 200 400 800

REVISION NO. 01
DATE: 12-05-01
INSERT BY: J.C.CONNOR
DATE:
FILE NAME: 1364T0101.DWG

COMMENTS:

MASS HIGHWAY
10 PARK PLAZA
BOSTON, MA 02116

MASSACHUSETTS
HIGHWAY DEPARTMENT

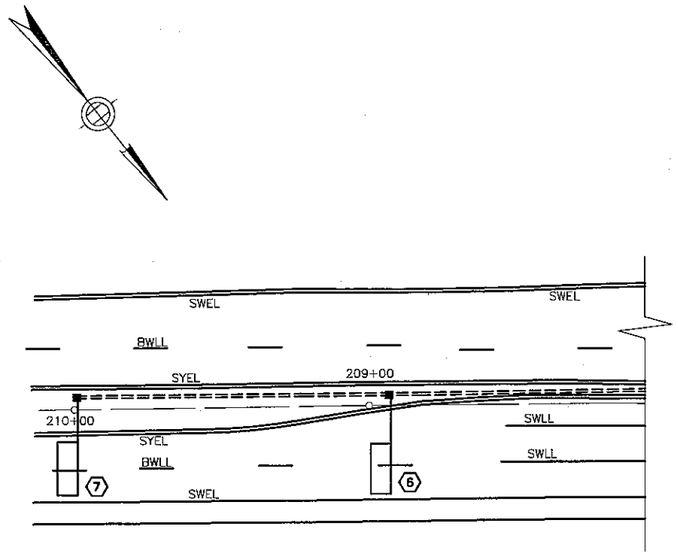
APPROVED BY:

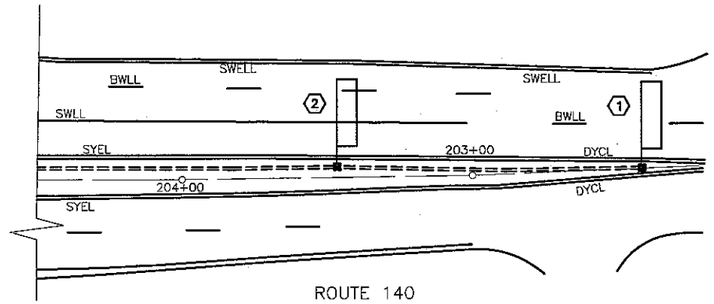
STATE TRAFFIC ENGINEER Date

TAUNTON
RTE. 140 AT 24. SB. RAMP

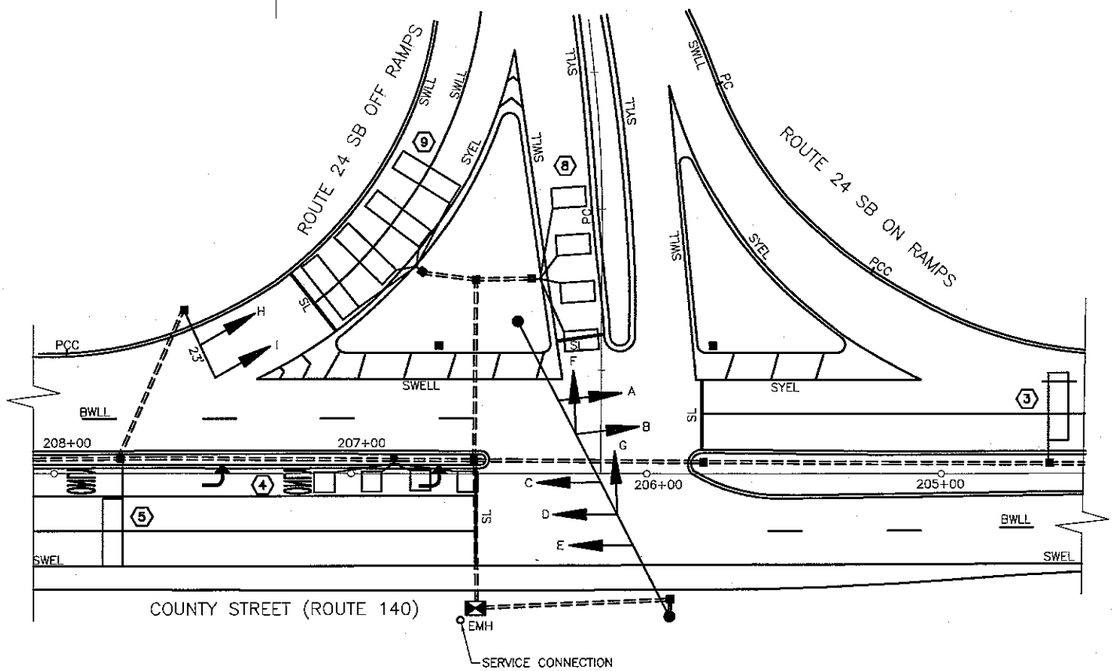
STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS.	1364	01	2	

TITLE SHEET PLAN





ROUTE 140



0 10 20 50 100

SCALE IN FEET

LEGEND

	SIGNAL CONTROLLER
	VEHICULAR SIGNAL
	OPTICALLY PROGRAMMED VEHICULAR SIGNAL
	FIRE PRE-EMPTION RECEIVER
*	FIRE PRE-EMPTION STROBE LIGHT
	PEDESTRIAN SIGNAL
	PEDESTRIAN PUSH BUTTON
	PULL BOX

APPROVED BY:

STATE TRAFFIC ENGINEER Date

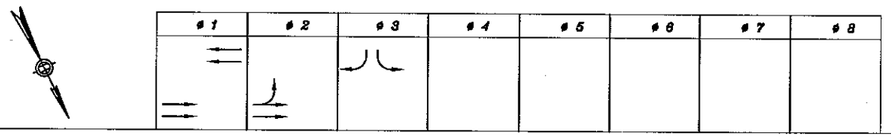
1364P0101.DWG

TAUNTON
RTE. 140 AT 24. SB. RAMP

STATE	SIGNAL ID NO.	REVISION NO.	SHEET NO.	TOTAL SHEETS
MASS	1364	01	3	

TRAFFIC SIGNAL DATA

APPROX. NORTH



SEQUENCE AND TIMING FOR FULLY-ACTUATED CONTROL (ISOLATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH OPER.
COUNTY ST (ROUTE 140)	EB	A,B	G	Y	R	R	R	R	R	R	R																FY
COUNTY ST (ROUTE 140)	WB	C	RL	RL	RL	GL	YL	RL	RL	RL	RL																FRL
COUNTY ST (ROUTE 140)	WB	D,E	G	G	G	G	Y	R	R	R	R																FY
ROUTE 24 SB RAMP	NB	F,G	R	R	R	R	R	R	GL	Y	R																FR
ROUTE 24 SB RAMP	NB	H,I	R	R	R	G	G	G	GV	Y	R																FR
TIMING IN SECONDS																											
MINIMUM GREEN (INITIAL)			10			8			12																		EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			4			3			4																		
MAXIMUM 1			34			20			40																		
MAXIMUM 2			34			20			40																		
YELLOW CLEARANCE				4			4			4																	
RED CLEARANCE					1			1			1																
WALK (W)																											
PEDESTRIAN CLEARANCE																											
RECALL			EXT			OFF			OFF																		
MEMORY			LOCKING			NON-LOCKING			NON-LOCKING																		

MAJOR ITEMS REQUIRED

QUANTITY	ITEM
1	CONTROLLER TYPE 4DW & 8DW, CAB. & FDN.
1	SERVICE CONNECTION
1	SPANWIRE ASSEMBLY BASE & FDN.
5	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LENS)
2	2 WAY, 3 SECTION SIGNAL HOUSING (12" LENS)
1	SPECIAL FUNCTION UNIT-TIME BASED COORDINATION
5	LOOP DETECTOR AMPLIFIER (DUAL CHANNEL)
9	ROADWAY LOOP DETECTOR
13	12" x 12" PULL BOX
	Necessary duct, cable, labor, miscellaneous
	material and equipment to complete the installation.

NOTES:

SEQUENCE AND TIMING NOTES:

1. ø4 – ø8 NOT USED.

NEMA DUAL RING PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

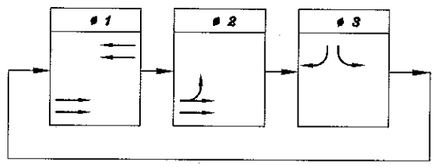
LOOP DETECTOR NOTES:

1. SEE LOOP DETECTOR DETAIL SHEET FROM DESIGN DOCUMENT FOR SPLICE PATTERN AND OTHER INFORMATION.
2. DELAY AND EXTENSION TIMES ARE IN SECONDS.
3. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED BY THE DETECTOR.
4. LOOP DETECTORS WERE NOT VISIBLE DURING SIGNAL INVENTORY.

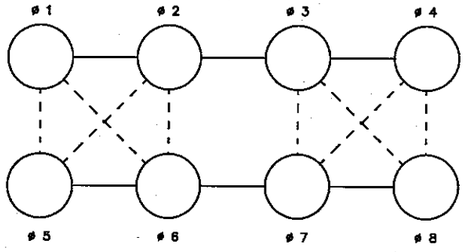
LOOP DETECTOR DATA

DETECTOR NUMBER	NUMBER OF SEGMENTS	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE PULSE PRESENCE	DELAY TIME	EXT. TIME
1	1	6'X20'		ø1	ø1	PRESENCE		
2	1	6'X20'		ø1	ø1	PRESENCE		
3	1	6'X20'		ø1	ø1	PRESENCE		
4	4	6'X6'		ø2	ø2	PRESENCE		
5	1	6'X20'		ø1	ø1	PRESENCE		
6	1	6'X20'		ø1	ø1	PRESENCE		
7	1	6'X20'		ø1	ø1	PRESENCE		
8	4	6'X10'		ø3	ø3	PRESENCE		
9	4	6'X20'		ø3	ø3	PRESENCE		

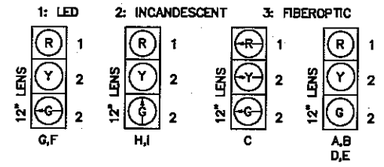
PREFERENTIAL PHASING SEQUENCE



NEMA DUAL RING PHASING NOTES:



SIGNAL IDENTIFICATION



CONTROLLER MAKE & MODEL: TCT LMD 8000
UTILITY POLE No. –
METER No. 312-32-714 (34424R)
EMERGENCY PRE-EMPTION (TYPE): NONE

APPROVED BY:

STATE TRAFFIC ENGINEER **Date**

136400101.DWG

Appendix 4.1-D

Description of Roadways and Intersections

New Bedford

Inventory of Roadways and Intersections

The study area for the whale's Tooth station traffic analysis is bounded by Coggeshall Street to the north, Union Street and the State Pier to the south, the Acushnet River to the east and Purchase Street to the west. The traffic study area for the King's Highway station in bounded by Tarkiln Hill Road, King's Highway and Route 140 interchange 4 to the north; Nash Street to the south; Ashley Boulevard to the east and Mt. Pleasant Street to the west. A comprehensive field inventory of traffic conditions on the study area roadways was conducted in October 2008. The field reconnaissance consisted of an inventory of existing roadway geometry, traffic volumes, and traffic operations. The transportation infrastructure in the vicinity of each site is described below.

Roadways

The following key roadways within the vicinity of the station sites provide access to the proposed stations.

Downtown Connector (Route 18) is a high speed, multi-lane, limited access highway that connects the northern sections of New Bedford and I-195 with downtown New Bedford and Route 6. The road begins at Coggeshall Street, Ashley Boulevard and Acushnet Avenue and terminates at the New Bedford/Fairhaven Bridge (Route 6) where the roadway continues as the J.F.K. Memorial Highway. The Downtown Connector is a state-owned and maintained roadway.

Ashley Boulevard (Route 18) is a major north-south roadway in New Bedford extending from Route 140 near the Freetown town line to Coggeshall Street where the Downtown Connector begins. Ashley Boulevard is a two-lane, urban arterial roadway with a mixture of commercial and multi-unit residential buildings. For the majority of its length, Ashley Boulevard is a two-lane two-way roadway; however, in the vicinity of Coggeshall Street, it is one-way southbound. Ashley Boulevard is a city owned and maintained roadway, which provides access to the surrounding community.

Acushnet Avenue extends in a north-south direction from the Freetown town line to Coggeshall Street where the Downtown Connector begins. For the majority of its length, Acushnet Avenue is a two-lane two-way roadway; however, in the vicinity of Coggeshall Street it is one-way northbound. The land use on this portion of Acushnet Avenue is primarily residential and commercial. South of I-195, Acushnet Avenue begins again at Washburn Street. It continues as a two-lane two-way roadway along the west side of the project site until Hillman Street where MacArthur Drive begins. The land use along this portion of Acushnet Avenue is primarily industrial. Acushnet Avenue is a city owned and maintained roadway. The proposed site driveway would be located on Acushnet Avenue south of Wamsutta Street.

J.F.K. Memorial Highway traverses the study area in a north-south direction from the New Bedford-Fairhaven Bridge (Route 6) to Cove Road. J.F.K. Memorial Highway is a multi-lane, divided, limited access highway that provides access from the southern portions of New Bedford and Dartmouth to the downtown area. The land use along J.F.K. Memorial Highway includes residential, commercial, industrial, port and marine uses. J.F.K. Memorial Highway is a city owned and maintained roadway.

Purchase Street is a minor arterial roadway that parallels the Downtown Connector through the study area from north of Coggeshall Street to Route 6 (Kempton Street). Purchase Street provides access to the site via Logan Street, North Front Street and Hillman Street. Purchase Street is a city owned and maintained roadway of variable width. In the vicinity of Logan Street, Purchase Street is a narrow two-lane roadway with parking on both sides of the street. In the vicinity of Hillman Street and Kempton Street, Purchase Street generally provides two travel lanes in each direction. The land uses along Purchase Street are a combination of commercial and residential.

North Front Street is a north-south roadway extending from Acushnet Avenue, north of Coggeshall Street to Wamsutta Street, south of I-195, where it becomes Herman Melville Boulevard. North of Coggeshall Street, North Front Street is a two-lane, one-way northbound urban roadway. Land uses in this section are mixed residential and commercial. South of Coggeshall Street and I-195, North Front Street is a two-lane, two-way roadway. Land use in this section is primarily industrial. North Front Street is a city owned and maintained roadway.

Logan Street is a two-lane, two-way, roadway that connects Purchase Street with Herman Melville Boulevard, North Front Street and the waterfront area. Land use along Logan Street is primarily industrial.

Hillman Street provides one of the only connections between the downtown area, the waterfront and Route 18. Hillman Street begins at Purchase Street and continues over Route 18 to Acushnet Avenue and MacArthur Drive. Hillman Street is a two-lane, two-way roadway of varying widths.

Herman Melville Boulevard is a north-south roadway extending from Wamsutta Street to the north to MacArthur Drive to the south. Herman Melville Boulevard is a two-lane, city owned and maintained roadway providing access to industrial and port facilities.

Coggeshall Street is a major east-west arterial roadway connecting New Bedford and Fairhaven. In the study area, Coggeshall Street is a two-lane, two-way roadway of varying width with parking on the north side of the street. Land use along Coggeshall Street is primarily commercial. Coggeshall Street is a city owned and maintained roadway.

MacArthur Drive is a north-south roadway that primarily serves as a frontage road to J.F.K. Memorial Highway. MacArthur Drive provides access to the waterfront land uses located along the east side of the roadway. This roadway provides one travel lane in each direction and is city owned and maintained.

Route 140 is a four-lane limited access highway. It runs north-south extending from Route 6 (Kempton Street) in the south to Taunton in the north. In New Bedford, Route 140 connects with I-195 and Route 6 (Kempton Street), providing easy access to along the South Coast. Its intersections with Mount Pleasant Street and King's Highway provide direct access to the proposed King's Highway station, which is located south of the Route 140 southbound ramps at King's Highway Street. South, by the piers, Route 140 intersects with Route 6 (Kempton Street) providing easy access to the proposed State Pier station, which its proposed location would be at the pier east of the intersections of Union Street at MacArthur Drive. Land uses in the vicinity of Route 140 are mainly commercial.

Mount Pleasant Street is a two-lane local roadway running north-south from Tarkiln Hill Road, to Durfee Street in downtown New Bedford. Its intersection with Route 140 in New Bedford provides connection to the New Bedford Regional Airport, (located west of Mt. Pleasant Street) as well as, easy access to the proposed King's Highway station. Land uses along Mt. Pleasant Street consist of a mix of residential and commercial uses.

King's Highway Street is a short four-lane local roadway located north of the proposed King's Highway station in New Bedford. It runs east-west from Jones Street to Tarkiln Road. In between, it intersects with the Route 140 northbound ramps, providing easy access to the shopping centers at both sides of the road and the proposed King's Highway Rail station. Land uses in the vicinity of the King's Highway station are commercial.

Church Street is a two-lane local roadway which runs north-south through the center of New Bedford. It connects with Route 140 in New Bedford and extends south to downtown, passing to the east of the proposed King's Highway station. Land uses along Church Street are characterized by a mix of commercial and residential areas.

Intersections

The following key intersections within the vicinity of the sites provide access to the proposed stations.

Hillman Street and Purchase Street intersect to form a three-legged, signalized intersection. The Purchase Street northbound approach consists of a through lane and a through/right-turn lane. The Purchase Street southbound approach consists of a shared left-turn/through lane and a through lane. The Hillman Street westbound approach accommodates one general purpose lane. This intersection is controlled by a two-phase signal. The first phase permits northbound and southbound movements. The second phase permits Hillman Street westbound movements. Sidewalks are present on all approaches and crosswalks are present across Hillman Street and northbound Purchase Street. Land uses in the vicinity of the intersection are primarily commercial and residential.

Purchase Street and the Route 18 Southbound Off-Ramp intersect to form a three-legged, unsignalized intersection. Purchase Street consists of a shared left-turn/through lane on the northbound approach and a shared through/right-turn lane on the southbound approach. The Route 18 southbound off-ramp is the westbound approach, with one general purpose lane, which is STOP-controlled. Traffic control includes signal heads with flashing yellow lights for the northbound and southbound approaches and a flashing red light for the westbound approaches. A crosswalk is provided on the northbound approach only and sidewalks are provided along both sides of Purchase Street. Land uses in the vicinity of this intersection are entirely commercial.

McArthur Drive and Herman Melville Boulevard intersect at a three-legged, unsignalized intersection. The northbound and southbound approaches on MacArthur Drive consist of one general purpose lane. The westbound Herman Melville Boulevard approach, which is under STOP-control, has sufficient width to accommodate two lanes. There are no sidewalks present along any approach. A crosswalk is located across Herman Melville Boulevard. Land uses in the vicinity of this intersection are primarily industrial.

Route 6 and Pleasant Street intersect to form a complex signalized intersection with four approaches. The eastbound Route 6 (Kempton Street) approach consists of a left-turn lane and a shared through/right-turn lane. The westbound Route 6 approach consists of an exclusive left-turn lane, a through lane and an exclusive right-turn lane. The northbound Pleasant Street approach consists of an exclusive left-turn lane, two through lanes and a channelized right-turn lane. The southbound Pleasant Street approach consists of two general purpose lanes. Mill Street is one-way in the westbound direction leaving the intersection and forms a one-way pair with Kempton Street. North 6th Street is one-way in the southbound direction leaving the intersection and forms a one-way pair with the northbound Pleasant Street approach.

The intersection is controlled by a five-phase traffic signal. The first phase is for eastbound traffic from Kempton Street. The second phase permits westbound Route 6 movements. The third phase is an exclusive pedestrian phase upon push button activation. The fourth phase permits southbound Pleasant Street movements. Finally, the fifth phase accommodates northbound Pleasant Street traffic. Right turns on red are not permitted for the westbound approach on Route 6. Sidewalks and crosswalks are present along all approaches of the intersection. Land uses in the vicinity include residential and commercial.

Route 18/MacArthur Drive and Union Street/State Pier intersect to form a six-legged, signalized intersection. Route 18 and MacArthur Drive run in the north-south direction and are parallel to each other separated by a median. The northbound MacArthur Drive approach consists of one general purpose lane but left turns are not permitted from this approach. The southbound approach consists of a shared left-turn/through lane and an exclusive right-turn lane. The northbound and southbound Route 18 approaches consist of an exclusive left-turn lane, two through lanes and a right-turn lane. The eastbound Union Street approach accommodates an exclusive left-turn lane and a shared through/right-turn lane. The westbound State Pier Driveway approach accommodates one general purpose lane.

This intersection is controlled by a five-phase signal. The first phase permits southbound MacArthur Street and northbound Route 18 right turns. The second phase is a protected phase for the northbound and southbound Route 18 left turns. The third phase permits the northbound and southbound through movements from MacArthur Street and Route 18. The fourth phase is an exclusive pedestrian phase upon push button activation. Finally, the fifth phase permits all movements from Union Street and State Pier Driveway. Right turns on red are not permitted for the southbound MacArthur Drive and eastbound Union Street approaches. Sidewalks are present along all approaches of the intersection. Crosswalks are provided across all approaches. Land uses at this intersection consist of residential and commercial to the west and a ferry terminal to the east.

Coggeshall Street intersects Purchase Street to form a four-legged, unsignalized intersection. All approaches consist of one general purpose lane and are STOP-controlled. Sidewalks are present on all sides of the intersection. Crosswalks are present across all approaches. Land uses at this intersection consist primarily of residential and commercial to the west and a school at the southwest corner of the intersection.

Route 18 Northbound and Coggeshall Street intersect to form a four-legged, signalized intersection. The northbound approach consists of an exclusive left-turn lane, one through lane and a right-turn lane. There is no southbound approach because Route 18 is one-way

northbound. The eastbound Coggeshall Street approach consists of one shared left-turn/through lane. The westbound Coggeshall Street approach accommodates one shared through/right-turn lane. The traffic signal operates on two phases: Route 18 northbound traffic proceeds; then Coggeshall Street eastbound and westbound traffic is released. Sidewalks are present on all approaches of the intersection except on the southern leg of the intersection. Crosswalks are present across all approaches. Metered parking is present on Route 18 north of the intersection. Land uses in the vicinity of this intersection are primarily commercial and residential to the north and undeveloped land with a parking lot to the south.

Route 18 Southbound and Coggeshall Street intersect to form a four-legged, signalized intersection. The southbound approach consists of a shared left-turn/through lane, one through lane and a right-turn lane. There is no northbound approach because Route 18 is one-way southbound. The eastbound Coggeshall Street approach consists of one shared through/right-turn lane. The westbound Coggeshall Street approach accommodates one shared left-turn/through lane. This intersection is controlled by a two-phase signal. The first phase permits southbound Route 18 movements. The second phase permits eastbound and westbound Coggeshall Street movements. Sidewalks and crosswalks are present on all approaches of the intersection except on the southern leg of the intersection. Land uses in the vicinity of this intersection consist of a church and residential buildings to the north and a community center to the south.

Coggeshall Street intersects North Front Street to form a four-legged unsignalized intersection. All approaches of the intersection consist of one general purpose lane. North Front Street is two-way south of the intersection and one-way north of the intersection. The northbound North Front Street approach is under STOP-control. Sidewalks are present along all approaches of the intersection. Crosswalks are located across all approaches. Land uses in the vicinity of this intersection are primarily commercial uses and a parking lot.

Coggeshall Street and Belleville Avenue intersect to form a four-legged, signalized intersection. The northbound Belleville Avenue approach includes a shared left-turn/through lane and an exclusive right-turn lane. The southbound Belleville Avenue approach consists of one shared left-turn/through and a shared through/right-turn lane. The eastbound Coggeshall Street approach accommodates one shared left-turn/through lane and a shared through/right-turn lane. The westbound Coggeshall Street approach consists of a shared left-turn/through lane and a right-turn lane. This intersection is controlled by a four-phase signal. The first phase is a lead phase for southbound Belleville Avenue movements. The second phase permits northbound and southbound Belleville Avenue movements. The third phase is an exclusive pedestrian phase upon push button activation. The fourth phase permits eastbound and westbound Coggeshall Street movements. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses in the vicinity of this intersection are primarily retail and commercial.

Purchase Street and Weld Street/Route 18 Off-Ramp intersect to form a four-legged unsignalized intersection. All approaches to the intersection consist of one general purpose lane except for the Route 18 off-ramp which operates as two lanes. All the approaches are under STOP-control. Sidewalks and crosswalks are present on all approaches. Land uses in the vicinity of this intersection are primarily residential, commercial and retail uses.

Logan Street intersects Purchase Street to form a three-legged, unsignalized intersection. All approaches consist of one general purpose lane. There is no traffic control. Sidewalks are

present along all of the approaches of the intersection. Land uses in the vicinity of this intersection are primarily commercial and retail.

Logan Street and Acushnet Avenue intersect to form a four-legged unsignalized intersection. Acushnet Avenue is a north-south roadway and Logan Street runs east-west. All approaches consist of one general purpose lane and there are no pavement-markings present on any of the approaches. The Logan Street approaches are under STOP-control. Sidewalks are present on all approaches. There are no crosswalks. A 12-foot 11-inch bridge vertical clearance sign is located on the southwest corner of the intersection. Land uses at this intersection consist primarily of commercial and residential to the east and undeveloped land to the west.

Logan Street and North Front Street/Herman Melville Boulevard intersect to form a three-legged unsignalized intersection. All the approaches consist of one general purpose lane. There is no signage, pavement markings or traffic control present at this intersection. Sidewalks are present on all approaches of the intersection. The pavement and sidewalks are in poor condition. Land uses at this intersection consist primarily of an auto body shop to the east and the Department of Social Services is located a few hundred feet to the east.

Wamsutta Street intersects North Front Street/Herman Melville Boulevard to form a three-legged unsignalized intersection. All the approaches consist of one general purpose lane. There is no signage, pavement markings or traffic control present at this intersection. Land uses at this intersection consist primarily of a parking lot and railroad dockyard to the west and the Mar-Lees Seafood production and distribution center is located to the east.

Wamsutta Street and Acushnet Avenue intersect to form a three-legged unsignalized intersection. The northbound Acushnet Avenue approach consists of a shared through/right-turn lane. The southbound Acushnet Avenue approach consists of a shared left-turn/through lane. The westbound Acushnet Avenue approach operates as a shared left-turn/right-turn lane. The Wamsutta Street approach is under STOP control. Sidewalks are present along Acushnet Avenue and the westbound side of Wamsutta Street. Land uses at this intersection consist primarily of a new residential development to the north and undeveloped land to the south.

Mount Pleasant intersects the Route 140 southbound ramps to form an unsignalized T-intersection. The northbound Mount Pleasant Street approach consists of a through lane and a channelized right-turn lane that provides access to Route 140 southbound. The southbound Mount Pleasant Street approach operates as a shared left-turn/through lane. The Route 140 southbound off-ramp approach consists of a left-turn lane and a channelized right-turn lane. The left-turns from southbound Route 140 off-ramp are under STOP control and the right turns yield to northbound Mount Pleasant traffic. Sidewalks are present along the northbound approach of Mount Pleasant Street. Land uses in the vicinity of this intersection are primarily residential and undeveloped land.

King's Highway and Route 140 northbound ramps intersect to form signalized T-intersection. The northbound King's Highway approach consists of a shared left-turn/through lane and a through lane. The southbound King's Highway approach operates as two through lanes and a channelized right-turn lane that provides access to Route 140 northbound. The Route 140 northbound off-ramp approach consists of a left-turn lane and a channelized right-turn lane. The right-turns yield to southbound King's Highway traffic.

This intersection is controlled by a three-phase signal. The first phase is a lead phase for northbound traffic. The second phase permits northbound and southbound King's Highway movements. The third phase permits left-turns from the Route 140 off-ramp. Sidewalks are present along the northbound approach of King's Highway. Land uses in the vicinity of this intersection are primarily commercial and retail.

Mount Pleasant Street intersects Jones Road/King's Highway to form a four-legged signalized intersection. This intersection is under construction and the traffic signals were turned off during the field visit. Due to construction activity and milled condition of the roadway pavement, lane configuration and crosswalk locations could not be determined. However, the roadway width is sufficient to accommodate two lanes on every approach. Land uses in the vicinity of this intersection are primarily residential.

Park Avenue and Church Street intersect to form a four-legged, unsignalized intersection. All approaches consist of one general purpose lane. Park Avenue is one-way from the west and two-way to the east. The eastbound and westbound Park Avenue approaches are under STOP control. There are no sidewalks or crosswalks present on any of the approaches. Land uses at this intersection are primarily commercial and residential.

Route 18 and Wood Street intersect to form a four-legged, signalized intersection. The northbound and southbound Route 18 approaches accommodate an exclusive left-turn lane and a shared through/right-turn lane. The eastbound and westbound Wood Street approaches consist of one general purpose lane. This intersection is controlled by a three-phase signal. The first phase permits northbound and southbound Route 18 movements. The second phase is an exclusive pedestrian phase upon push button activation. The third phase permits eastbound and westbound Wood Street movements. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses in the vicinity of this intersection are primarily retail and commercial.

Church Street and Irvington Street intersect to form a four-legged, unsignalized intersection. All approaches at this intersection consist of one general purpose lane and the westbound Irvington Street approach is one-way into the intersection. A driveway exists opposite Irvington Street which provides access to a tool supply store. There are no STOP signs present at any of the approaches. Sidewalks are present along Church Street approaches. Land uses at this intersection are commercial and residential.

Church Street and Nash Road intersect to form a four-legged, signalized intersection. All approaches of the intersection consist of one general purpose lane. This intersection is controlled by a two-phase signal. The first phase permits northbound and southbound Church Street movements. The second phase is for eastbound and westbound Nash Road traffic. During the field visit, there was a malfunction of the pedestrian push buttons as the pedestrian calls did not activate any pedestrian phase. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses in the vicinity of this intersection are primarily residential uses.

Church Street and Tarkiln Hill Road intersect to form a four-legged signalized intersection. The northbound Church Street approach accommodates an exclusive left-turn lane and a shared through/right-turn lane. The southbound Church Street approach consists of a shared left-turn/through lane and an exclusive right-turn lane. The eastbound and westbound approaches on Tarkiln Hill Road consist of an exclusive left-turn lane and a shared through/right-turn lane. This intersection is controlled by a two-phase signal. The first phase permits northbound and

southbound Church Street movements. The second phase permits eastbound and westbound Tarkiln Hill Road movements. There are no sidewalks or crosswalks present on any of the approaches. Land uses at this intersection are primarily commercial and retail.

King's Highway intersects Shaw's driveway to form a three-legged signalized intersection. The northbound Shaw's driveway approach accommodates an exclusive left-turn lane and an exclusive right-turn lane. The eastbound approach consists of a through lane and a shared through/right-turn lane. The westbound approach provides a through lane and a shared through/left-turn lane.

This intersection is controlled by a three-phase signal. The first phase allows the eastbound and westbound movements. The second phase is a lag phase for the westbound traffic. The third phase allows the northbound movements. Sidewalks are present along the westbound approach of King's Highway. Land uses in the vicinity of this intersection are primarily commercial and retail.

King's Highway intersects Stop & Shop driveway to form a four-legged signalized intersection. All the approaches in this intersection provide one shared through/left-turn lane and one shared through/right-turn lane. This intersection is controlled by a four-phase signal. The first phase is a lead phase for the westbound traffic. The second phase permits the eastbound and westbound movements. The third phase is a lag phase for the eastbound traffic. The fourth phase permits the northbound and southbound movements. Sidewalks are present along the eastbound approach of King's Highway. Land uses in the vicinity of this intersection are primarily commercial and retail.

King's Highway intersects Tarkiln Hill Road to form a three-legged unsignalized intersection. The King's Highway westbound approach provides one shared through/right-turn lane. The eastbound approach provides a shared through/left-turn lane, however, it operates as an exclusive through lane with a shared through-left-turn lane. The Tarkiln Hill Road southbound approach provides a wide shared left/right-turn lane, however it operates as an exclusive left-turn lane with an exclusive right-turn lane. Land uses in the vicinity of this intersection are primarily commercial and retail land uses.

Freetown

Inventory of Roadways and Intersections

The study area for this analysis focused on the segment of South Main Street (Route 79) between Copicut Road to the south and High Street to the north. The study area includes the Route 24/Route 79 interchange. A comprehensive field inventory of traffic conditions on the study area roadways and at study area intersections was conducted in October 2008. The field inventory consisted of data collected on existing roadway geometry, traffic volumes, and operating characteristics.

Roadways

The following key roadways within the vicinity of the site provide access to the proposed station.

Ridge Hill Road is a two-lane local street located east of the interchange of Route 24 and Route 79. It extends from the Mobile Gas station located off of South Main Street to the west to south of the interchange of Routes 24 and 79. Land uses along the vicinity of this street are entirely commercial uses.

South Main Street is a two-lane arterial roadway connecting Fall River to Freetown. It runs north-south extending from Fall River Country Club Road in the south to Water Street in the north, providing easy access to the proposed Freetown station. In between, it intersects with the Route 24 interchange providing direct access to Fall River to the south and to Taunton to the north. Land uses surrounding the vicinity of this roadway consist of a mix of commercial and residential uses.

Narrows Road is a two-lane local street in Freetown. It runs east-west extending from the densely populated Pine Island eastward to South Main Street. Its intersection with South Main Street is located north of the proposed Freetown station. Land uses along this local street are mainly residential.

Intersections

The following key intersections provide access to the proposed station.

South Main Street intersects Ridge Hill Road to form a four-legged, unsignalized intersection. All approaches consist of one general purpose lane. There are no pavement markings on Ridge Hill Road. The westbound Ridge Hill Road approach is under STOP control. Sidewalks are present along the northbound South Main Street approach. Land uses in the vicinity of this intersection include commercial uses to the north and undeveloped land to the south.

South Main Street and High Street intersect to form a three-legged, unsignalized intersection. All approaches to the intersection consist of one general purpose lane. The westbound High Street approach is under STOP control. Sidewalks are present along the northbound and southbound South Main Street approaches. A yellow painted crosswalk is present across the southbound South Main Street approach. Land uses in the vicinity of this intersection consist of residential uses to the south and a church to the north.

South Main Street and Narrows Road intersect to form a three-legged, unsignalized intersection. All approaches of the intersection consist of one general purpose lane. The Narrows Road approach is under STOP control. There are no sidewalks or crosswalks present at any of the approaches of the intersection. Land uses in the vicinity of this intersection are primarily residential uses to the north and vegetation to the south.

South Main Street and the Route 24 southbound ramps intersect to form an unsignalized T-intersection. The northbound South Main Street approach consists of a shared left-turn/through lane. The southbound South Main Street approach operates as through lane and a channelized right-turn lane that provides access to Route 24 southbound. The Route 24 southbound off-ramp approach consists of a left-turn lane and a channelized right-turn lane. The left-turns from southbound Route 24 off-ramp are under STOP control and the right turns yield to the southbound South Main Street traffic. A 14 feet 2 inches bridge vertical clearance sign is present along the northbound direction alerting truck traffic approaching the Route 24 overpass. Land in the vicinity of this intersection is primarily undeveloped.

South Main Street and the Route 24 southbound ramps intersect to form an unsignalized T-intersection. The northbound South Main Street approach consists of a through lane and a channelized right-turn lane that provides access to Route 24 northbound. The southbound South Main Street approach accommodates a shared left-turn/through lane. The Route 24 northbound off-ramp approach consists of a left-turn lane and a channelized right-turn lane. The left-turns from northbound Route 24 off-ramp is under STOP control and the right turns yield to the northbound South Main Street traffic. A 14 feet 2 inches bridge vertical clearance sign is present along the southbound direction alerting truck traffic approaching the Route 24 overpass. Land uses in the vicinity of this intersection are primarily undeveloped land.

South Main Street and Copicut Road intersect to form a three-legged, unsignalized intersection. All approaches of the intersection consist of one general purpose lane. The westbound Copicut Road approach is under STOP control. Sidewalks are present along the northbound South Main Street approach. Land uses in the vicinity of this intersection are primarily residential uses to the east and undeveloped land to the west.

Fall River

Inventory of Roadways and Intersections

A comprehensive field inventory of traffic conditions on the study area roadways and at study area intersections was conducted as part of the study. The field inventory consisted of data collected on existing roadway geometry, traffic volumes, and operating characteristics.

Roadways

The following key roadways provide access to the proposed station site.

President Avenue (Route 6) is a four-lane arterial roadway extending from South Davol Street and continuing east through Fall River providing direct access to Route 24 at Exit 5. President Avenue runs east-west just north of the proposed Fall River Depot station. Its intersection with South Davol Street provides access to the proposed the Fall River Depot station via a U-turn under Route 79. Land uses along President Avenue consist of commercial uses.

Davol Street traverses the study area in a north-south direction from Brightman Street to Broadway. Davol Street serves as a frontage route to Routes 138 and 79, which connects Route 24 with I-195. North Davol Street provides easy access to the proposed Fall River Depot station, south of President Avenue, while South Davol provides direct access to the proposed Battleship Cove station through its intersection with Anawan Street/Pocasset Street.

North Main Street is a minor arterial roadway traversing downtown Fall River. It runs north-south extending from the Fall River Country Club in the north to Central Street in the south. Its intersection with President Avenue is located just to the north of the proposed Fall River Depot station. On its southern end, North Main Street intersects with Central Street providing easy access to the proposed Battleship Cove station. Land uses along this road are a mix of commercial and residential.

Turner Street is a short two-lane local street. It runs east-west connecting North Davol Street to North Main Street. Its intersection with North Davol Street lies just to the south of the proposed Fall River Depot station, providing easy access to Routes 138 and 79 to the west and direct access to the center of town to the east. Land uses along this street are a mix of residential and commercial.

Intersections

The following key intersections provide access to the proposed stations:

Water Street and Anawan Street intersect to form a four-legged, unsignalized intersection. All approaches consist of one general purpose lane and the westbound Anawan Street approach is under STOP control. Sidewalks are present along all sides of the intersection. Crosswalks are present across all approaches. Land uses at this intersection are primarily commercial and industrial.

Ferry Street and Water Street (Ponta Delgada Street) intersect to form a slightly skewed three-legged, unsignalized intersection. All approaches consist of one general purpose lane and the eastbound Ferry Street approach is under STOP control. Sidewalks are present on both sides of Water Street and the eastbound side of Ferry Street. The southbound Water Street pavement is striped for parking. Land uses in the vicinity of this intersection are primarily commercial.

Anawan Street/Pocasset Street intersects Davol Street to form a five-legged, unsignalized intersection. All approaches consist of one general purpose lane and a concrete median separates Davol Street northbound and southbound movements. All approaches are under STOP control. Sidewalks are present on all approaches of the intersection except on the northeast corner of the intersection. A crosswalk runs diagonally across from the northwest corner of the intersection to the southeast corner. Land uses in the vicinity of this intersection include commercial, residential and an undeveloped area with a parking lot.

Davol Street and Central Street intersect to form a four-legged unsignalized intersection. The northbound and southbound Davol Street approaches consist of one general purpose lane. The Central Street westbound approach, which is under STOP control, is striped as two general purpose lanes and is one-way. Sidewalks are present on all approaches to the intersection. Crosswalks are located across Davol Street. A 14 feet 5 inches bridge height restriction sign is located on the southwest corner of the intersection. Land uses at this intersection are primarily commercial and residential.

North Main Street and President Avenue intersect to form a four-legged signalized intersection. The eastbound and westbound approaches on President Avenue accommodate an exclusive left lane and a shared through/right-turn lane. Right turns on red are not permitted for the westbound approach on President Avenue. The northbound and southbound approaches on North Main Street consist of one general purpose lane. The traffic signal operates on three phases. The first phase permits the northbound and southbound traffic concurrently, then the second phase is an exclusive pedestrian phase, and the third phase permits the eastbound and westbound traffic concurrently. Bus stops are located on both sides of North Main Street south of the intersection. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses at this intersection consist of residential and commercial uses.

North Davol Street and President Avenue intersects to form a four-legged signalized intersection. The northbound Davol Street approach is one-way and consists of a shared left-turn/through lane, a through lane and an exclusive right turn lane. The eastbound approach on President Avenue consists of two general-purpose lanes. The westbound President Avenue approach consists of a shared left-turn/through lane, a through lane, and a channelized right turn lane. This intersection is controlled by a four-phase signal, including an exclusive pedestrian phase. The first phase permits the northbound approach movements. The second phase is a lead phase for the eastbound left-turn traffic. The third phase accommodates the eastbound and westbound traffic concurrently, and finally, the fourth phase is the exclusive pedestrian phase. Crosswalks are present across all approaches of the intersection. Land uses at this intersection are retail and commercial.

South Davol Street and President Avenue intersect to form a four-legged signalized intersection. The southbound Davol Street approach is one-way and accommodates two general purpose lanes with a wide shoulder. The eastbound approach on President Avenue consists of a general purpose lane. The westbound President Avenue approach consists of two general purpose lanes. This intersection is controlled by a three-phase signal. The first phase permits all southbound movements. The second phase is a concurrent phase that permits the eastbound and westbound traffic with a permitted westbound left-turn. The third phase is an exclusive pedestrian phase. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses at this intersection consist of a public park area to the north and a power sub-station to the south.

Pearce Street and Davol Street intersect to form a three-legged, unsignalized intersection. Davol Street is one-way northbound and consists of two general purpose lanes. Pearce Street is one-way westbound and consists of one general purpose lane and is under STOP-control. Parking is permitted on both sides of Pearce Street. A crosswalk is present across Pearce Street. Land uses in the vicinity of this intersection consist primarily of commercial and retail uses.

Davol Street and Turner Street intersect to form a three-legged, unsignalized intersection. Davol Street is one-way and consists of two general purpose lanes. The Turner Street westbound approach consists of one general purpose lane and is under STOP-control. A crosswalk is present across Turner Street. Land in the vicinity of this intersection consist primarily of commercial uses and undeveloped areas.

South Davol Street U-turn at Route 138/79 Overpass. Davol Street southbound intersects with the U-turn ramp to provide access to the north on Davol Street. Davol Street consists of two general purpose lanes and the U-turn ramp consists of one lane. There is no STOP sign present controlling the U-turn merge. The U-turn ramp traffic yields to northbound Davol Street traffic. Land use is primarily undeveloped area near the intersection and water front to the west.

North Davol Street U-turn at Route 138/79 Overpass. Davol Street northbound intersects the U-turn ramp to provide access to the south on Davol Street. Davol Street consists of two general purpose lanes and the U-turn ramp accommodates one lane. The land uses in the vicinity of this intersection are primarily undeveloped land and a gas station.

Easton

Inventory of Roadways and Intersections

This section provides a description of major roadways and key intersections within the vicinity of the proposed Easton Village and North Easton stations.

Roadways

A comprehensive field inventory of traffic conditions on study area roadways was conducted as part of the study. The field inventory consisted of data collected on existing roadway geometry, traffic volumes, crash history, and operating characteristics. The following key roadways within the vicinity of the site provide access to the proposed station.

Route 138 (Washington Street) is a four-lane north-south arterial roadway, extending from Stoughton (to the north) to Taunton Center (to the south). Route 138 connects with I-93, I-495, Routes 106 and 140. Its intersection with Route 123 (Depot Street) provides key access to the Easton Village station. Land uses along this roadway include both residential and commercial.

Union Street is a two-lane local roadway extending east–west from Route 138 in Easton to Route 27, providing easy access to Route 24. Land uses along Union Street are mainly residential.

Elm Street is a two-lane local roadway which extends in a east–west direction from Pearl Street (Brockton) in the east to Main Street (Easton) in the west, just south of Canton Street. Along its entire length, land uses consist only of residential.

Main Street is a two-lane local roadway running east-west parallel to Elm Street. It extends from Lincoln Street, to the west, to Stonehill Street to the east. Its intersection with Route 138 provides easy access to Routes 123 and Route 24, as well as both of the proposed rail station locations in Easton. Land uses along this road are mainly commercial.

Route 123 (Belmont Street) is a two-lane east-west arterial roadway extending from Route 138 in Easton to Main Street in Brockton. In between, Belmont Street connects with Route 24, obtaining easy access to Routes 27 and 28. Its intersection with Route 138 (Washington Street) provides a key access point to both proposed rail stations in Easton.

Intersections

The following key intersections provide access to the proposed station sites.

Route 138 at Elm Street is a four-legged, slightly offset, unsignalized intersection. The northbound and southbound approaches consist of one general purpose lane and each have seven-foot shoulders on both sides of the roadway. The eastbound and westbound approaches consist of one general purpose lane and are under STOP control. No sidewalks or crosswalks are present at this intersection. Land uses in the vicinity are commercial and residential.

Route 138 intersects Belmont Street (Route 123) to form a four-legged signalized intersection. The northbound approach consists of a channelized right-turn, a through lane and a shared

through/left-turn lane. The southbound approach consists of a shared through/left-turn lane and a shared through/right-turn lane. The westbound approach consists of a shared through/right-turn lane and a left-turn only storage lane. The eastbound approach consists of a CVS driveway with one general purpose lane. The intersection operates with a two-phase signal. The first phase allows the eastbound and westbound movements followed by the northbound and southbound movements. Sidewalks are present an all approaches, except for the eastbound approach. Crosswalks are present only across the northbound and westbound approach. Land uses in the vicinity of this intersection are mainly commercial.

Route 138 intersects with Main Street to form a four-legged signalized intersection. The northbound and southbound approaches consist of an exclusive left-turn lane, an exclusive through lane and a shared through/right-turn lane. The posted speed limit on both these approaches is 40 mph. The westbound approach consists of an exclusive left-turn lane, an exclusive through lane and a shared through/right-turn lane and has a posted speed limit of 45 mph for the eastbound direction. The eastbound approach consists of an exclusive left-turn lane, an exclusive through lane and an exclusive right–turn lane, and has a posted speed limit of 35 mph for the westbound direction.

This intersection operates as a full-quadrant operation having concurrent pedestrian phases. The first phase allows the left turns from Route 138, followed by the through and right movements from Route 138. Phase three allows the left turns from Main Street, followed by the through and right movements from Main Street. Sidewalks are present on the right side of both approaches of Route 138 and on the north side of both approaches on Main Street. Crosswalks are present on the westbound and southbound approaches only. Land uses in the vicinity of this intersection are mainly commercial.

Elm Street intersects North Main Street to form an unsignalized T-type intersection. All approaches in this intersection consist of one general-purpose lane. The westbound approach is under STOP control. The posted speed limit for the westbound approach is 30 mph. A crosswalk is present on the northbound approach only. Sidewalks are present on all approaches. Land uses in the vicinity of this intersection are residential.

Barrows Street intersects Lincoln Street to form an unsignalized T-type intersection. The Barrows Street southbound approach has one general purpose lane under STOP control. Lincoln Street consists of the eastbound and westbound approaches, each having one general purpose lane. Crosswalks and are present across all approaches and sidewalks are present along each approach, except on the north side of the westbound approach. Land uses in the vicinity of the intersection are primarily residential.

Lincoln Street intersects with Main Street and Center Street to form a four-legged unsignalized intersection. The eastbound Lincoln Street approach has one general purpose lane under STOP control. A speed limit of 30 mph is posted on this approach for the westbound traffic. The Main Street westbound approach has one general purpose lane and a speed limit of 20 mph is posted on this approach for the eastbound traffic. The northbound Center Street approach consists of one general purpose lane under STOP control. A speed limit of 20 mph is posted on this approach for southbound traffic. The southbound North Main Street approach consists of one general purpose lane under STOP control. There are no posted speed limits. A median is located at the center of the intersection to separate the through movements from the right turns coming from Main Street (westbound approach). Crosswalks and sidewalks are present on the

northbound and westbound approaches only. Land uses in the vicinity of this intersection consist of commercial and residential

Union Street intersects Route 138 to form an unsignalized T-type intersection. Route 138 southbound approach has a shared through/right-turn lane and the northbound approach has a shared through/left-turn lane. Six-foot shoulders are present at both sides of both Route 138 approaches. The Union Street westbound approach consists of one shared left-turn/right-turn lane under STOP control. A 30-mph speed limit is posted on this approach. Crosswalks are present across the northbound approach only. No sidewalks are present on any approach. Land uses in the vicinity of this intersection are commercial and residential.

Roche Brothers Way intersects Route 138 to form a four-legged signalized intersection. The Route 138 northbound and southbound approaches both have a shared through/right-turn lane and a shared through/left-turn lane. A 45-mph speed limit is posted on the northbound approach. The Roche Brothers Way eastbound approach has an exclusive right-turn lane and a shared through/left-turn lane. A raised median separates eastbound and westbound traffic. The Stonehedge Village driveway is the westbound approach and has one general purpose lane.

This intersection currently operates with a four-phase signal. The first phase is a lead phase for the northbound movements with the southbound right-turns, followed by the southbound and northbound movements, simultaneously. The third phase is an exclusive pedestrian phase, followed by the eastbound and westbound movement, simultaneously. Crosswalks are not present on any approach and sidewalks are present along the south side of the eastbound approach. Land uses in the vicinity of this intersection are commercial and residential.

Roosevelt Circle intersects Route 138 to form a three-legged unsignalized intersection. The Route 138 northbound approach has a shared through/left-turn lane and the southbound approach has a shared through/right-turn lane. Roosevelt Circle is the eastbound approach with a shared left-turn/right-turn lane. Land uses near this intersection consist of a mix of residential, university-related uses and undeveloped areas.

Raynham

Inventory of Roadways and Intersections

This section provides a description of major roadways and key intersections within the vicinity of the proposed Raynham station.

Roadways

The following key roadways provide access to the proposed station site.

Route 138 (Broadway) is a state-owned, two-lane roadway which provides direct access to the proposed station site. Within the project study area, Route 138 extends in a north-south direction from Stoughton to Taunton. The roadway generally provides one 15-foot travel lane in each direction with 4- to 6-foot wide shoulders on each side of the roadway. Land uses along Route 138 include the Raynham-Taunton Greyhound Park as well as some other small commercial and industrial uses and residential property.

Route 106 (Foundry Street) is a state-owned, two-lane roadway located in Easton. Within the project study area, Route 106 extends in an east-west direction linking Mansfield to Bridgewater. The roadway generally provides one travel lane in each direction.

Interstate 495 (I-495) is part of the federal interstate highway system that is maintained by the Commonwealth of Massachusetts. I-495 is a six lane, divided circumferential highway traversing eastern Massachusetts from Salisbury to Wareham. Access to the proposed site from I-495 is provided via an interchange with Route 138, approximately two miles south of the proposed site.

Intersections

The following key intersections provide access to the proposed station site:

Route 138 and Route 106 intersect to form a four-legged signalized intersection. All approaches to the intersection consist of two general purpose lanes. The intersection is located in Easton but provides access to northern Raynham to the south and a Route 24 interchange to the east. The intersection is controlled by a two-phase signal. The first phase permits Route 106 eastbound and westbound movements. The second phase permits Route 138 northbound and southbound movements. Sidewalks are present along all approaches. There are no crosswalks across any of the approaches. Land uses in the vicinity of the intersection are primarily residential.

Route 138, Robinson Street and the Dog Track driveway intersect to form an unsignalized, slightly offset four-way intersection. The Route 138 northbound and southbound approaches, Robinson Street eastbound approach and the Dog Track driveway westbound approach provide one general purpose lane. The eastbound and westbound approaches are controlled by a STOP sign. No crosswalks or sidewalks are provided on any approach. Land uses in the vicinity of this intersection are predominantly undeveloped areas.

Route 138 at Wilbur Street is a three-legged unsignalized intersection located north of I-495 in Raynham. Route 138 runs north-south providing one-general purpose lane in each direction. The Wilbur Street runs westbound approach provides one general-purpose lane. There are no sidewalks present in this intersection, no crosswalks located across any of the three approaches, and no STOP sign installed on the Wilbur Street westbound approach although there is a STOP bar. Land uses in the vicinity of this intersection consisted primarily of residential with some commercial mixed in the area.

Route 138 at I-495 Northbound On and Off Ramps. Route 138 and I-495 intersect at a diamond interchange. The I-495 northbound off ramp intersects Route 138 from the east and the northbound on-ramp exits the intersection to the west. The intersection is unsignalized. The southbound Route 138 approach consists of two through lanes and a channelized right-turn lane. The northbound Route 138 approach accommodates two through lanes and an exclusive left-turn lane that provides access to northbound I-495. A concrete median divides Route 138. The I-495 northbound off-ramp provides a STOP-controlled left-turn lane and a channelized right-turn lane which yields to northbound Route 138 traffic. U-turns are not permitted on northbound Route 138. A sidewalk is present along northbound Route 138 and there are crosswalks across the I-495 northbound off-ramp. Land uses in the vicinity of this intersection are predominantly undeveloped areas.

Route 138 at I-495 Southbound On and Off Ramps. Route 138 and I-495 intersect at a diamond interchange. The I-495 southbound off ramp intersects Route 138 from the west and the southbound on-ramp exits the intersection to the east. The intersection is unsignalized. The northbound Route 138 approach consists of two through lanes and a channelized right-turn lane. The southbound Route 138 approach accommodates two through lanes and an exclusive left-turn lane that provides access to southbound I-495. A concrete median divides Route 138. The I-495 southbound off-ramp provides a STOP-controlled left-turn lane and a channelized right-turn lane which yields to southbound Route 138 traffic. U-turns are not permitted on southbound Route 138. A sidewalk is present along northbound Route 138 and there are crosswalks across the I-495 southbound on-ramp. Land uses in the vicinity of this intersection are predominantly undeveloped areas.

Route 138 and Carver Street intersect to form a four-legged signalized intersection. The northbound and southbound Route 138 approaches consist of two general purpose lanes. The eastbound Carver Street approach accommodates an exclusive left-turn lane and a shared through/right-turn lane. The westbound Carver Street approach consists of one general purpose lane. This intersection is controlled by a three-phase signal. The first phase is a lead for northbound Route 138 movements. The second phase permits all movements from northbound and southbound Route 138. The third phase is for eastbound and westbound Carver Street traffic. The only sidewalk is on the west side of Route 138 and the only crosswalk crosses the Carver Street eastbound approach. The land use in the vicinity of this intersection is predominantly commercial.

Route 138 and Center Street intersect to form a unsignalized T-type intersection. All approaches to the intersection consist of one general purpose lane. The Center Street approach is under STOP control. A wide driveway across from Center Street provides access to a retail establishment. Sidewalks are present along northbound and southbound Route 138 south of the intersection. There are no crosswalks located across any approaches. Land uses in the vicinity of this intersection include a gas station, an auto loan company, and the Granite & Marble Company.

Route 138 intersects Britton Street to form two T-type offset unsignalized intersections. All approaches consist of one general purpose lane except the eastbound Britton Street approach which accommodates a shared left-turn/through lane and a channelized right-turn lane. The Britton Street approaches are under STOP control. Sidewalks are present along the west side of Route 138 and on westbound Britton Street. There are no crosswalks located across any approaches. Land uses in the vicinity of this intersection include residential buildings and a gas station at the southeast corner of the intersection.

Taunton

Inventory of Roadways and Intersections

This section provides a description of major roadways and key intersections within the vicinity of the proposed Taunton commuter rail and Rapid Bus stations.

Roadways

The following key roadways provide access to the proposed stations.

Route 140 (County Street) extends in a northwest-southeast direction through Taunton Center. It goes to Norton in the northwest and to Freetown and New Bedford in the southeast. South of Route 24, the roadway is a limited access, four-lane divided highway. Route 140 connects with Route 24 approximately one-half mile south of the proposed station.

Hart Street extends in an east-west direction from Middleborough Avenue to Plain Street.

Route 138 (Broadway) extends in a north-south direction from Stoughton to Taunton. Route 138 would provide access to the Taunton Station site (via Arlington Street) for residents of the northern sections of Taunton. Within Taunton, Route 138 varies between a two-lane and a four-lane cross-section.

Route 44 extends in an east–west direction from Plymouth to Seekonk where it continues into Rhode Island. Route 44 would serve as the primary access route for commuters originating from the eastern and western sections of Taunton. Between Route 24 and Route 104, Route 44 is a four-lane roadway. West of Route 104, Route 44 narrows to a two-lane cross-section.

Washington Street extends in a north–south direction from west Raynham to Taunton Center. The two-lane roadway serves as a secondary collector roadway for those travelers accessing either the Downtown Taunton Station sites.

Arlington Street extends in a north–south direction from Route 44, passes by the Taunton Station site and Route 138, and terminates near Taunton Center. Arlington Street is named Purchase Street north of School Street. The Taunton Station will be accessed off of Arlington Street near its intersection with Route 44 (Dean Street).

Winter Street is a two-lane local road northwest-southeast roadway located northeast of the proposed Taunton station, in Taunton. It extends from Washington Street to the northwest to Bristol Avenue on the southeast, where it becomes Longmeadow Road, which provides direct access to Route 44.

Tremont Street is a two-lane arterial roadway serving as a segment of Route 140, and farther west as Route 118 in Taunton. It extends from western Taunton to Washington Street/Oak Street at the center of town. Its intersection with Washington Street/Oak Street lies just west of the proposed location for the Downtown Taunton station, providing easy access between the suburbs and the proposed rail station. Land uses in the vicinity of this roadway consist of a mix of residential uses as well as commercial uses.

Frederick Martin Parkway is a short two-lane east-west local roadway connecting Washington Street (Route 140) on its west end to Cohannet Street on its east end. This roadway would provide direct access to the proposed Downtown Taunton station, since its intersection with Washington Street is located just north of the proposed rail station. Land uses in the vicinity of this road are primarily commercial uses.

Intersections

The following key intersections provide access to the proposed station sites.

Route 140 and Hart Street intersect to form a four-legged signalized intersection. The northbound and southbound Route 140 approaches accommodate two general purpose lanes. The eastbound and westbound Hart Street approaches consist of a shared left-turn/through lane and an exclusive right-turn lane. This intersection is controlled by a three-phase signal. The first phase permits northbound and southbound Route 140 movements. The second phase is an exclusive pedestrian phase upon push button activation. The third phase permits eastbound and westbound Hart Street movements. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses at this intersection are primarily residential.

Route 140 and Route 24 northbound ramps intersect to form a three-legged, signalized intersection. The Route 140 northbound approach consists of two through lanes and a channelized right-turn lane. The southbound Route 140 approach consists of an exclusive left-turn lane and two through lanes. The northbound and southbound Route 140 traffic is separated by a concrete median. The Route 24 northbound off ramp to Route 140 northbound accommodates a channelized right-turn lane and is under a YIELD control. This intersection is controlled by a two-phase signal. The first phase is a lead phase for southbound traffic. The second phase permits northbound and southbound Route 140 movements. There are no sidewalks or crosswalks present at this intersection. Land use at this intersection consists primarily of undeveloped areas.

Route 140 and Route 24 southbound ramps intersect to form a three-legged, signalized intersection. The Route 140 southbound approach consists of two through lanes and a channelized right-turn lane. The northbound Route 140 approach consists of an exclusive left-turn lane and two through lanes. The northbound and southbound Route 140 traffic is separated by a concrete median. The Route 24 northbound off ramp accommodates an exclusive left-turn lane and a channelized right-turn lane. This intersection is controlled by a three-phase signal. The first phase permits Route 140 northbound and southbound movements. The second phase is a lagging phase for the northbound Route 140 movements. The third phase permits Route 24 southbound off-ramp left and right turns. Right turns on red are not permitted for the Route 24 off-ramp traffic. There are no sidewalks or crosswalks present at this intersection. Land use at this intersection consists primarily of thickly wooded areas.

Route 140 and Taunton Depot Drive intersect to form a four-legged, signalized intersection. The northbound Route 140 approach accommodates an exclusive left-turn lane, one through lane and a shared through/right-turn lane. The southbound Route 140 approach consists of a shared left-turn/through lane, a through lane and an exclusive right-turn lane. The eastbound Taunton Depot Drive consists of an exclusive left-turn lane, a shared left-turn/through lane and a single right-turn lane. The westbound driveway opposite Taunton Depot Drive serves a storage facility and consists of one general purpose lane.

This intersection is controlled by a four-phase signal. The first phase is a lead phase for the northbound Route 140 movements along with the right turns from Taunton Depot Drive. The second phase permits northbound and southbound Route 140 movements. The third phase is an exclusive pedestrian phase upon push button activation. The fourth phase permits movements from Taunton Depot Drive and the storage facility driveway. Sidewalks are present on all approaches of the intersection. Crosswalks are provided across driveway and the Route 140

southbound approach. Land uses in the vicinity of this intersection consist of residential uses to the east and a shopping complex to the west.

Route 140 northbound ramps intersect Stevens Street and Galleria Mall Drive to form a four-legged, signalized intersection. This intersection serves as a major connection from Route 140 northbound to the Galleria Mall. The northbound Stevens Street approach consists of a shared left-turn/through lane, one through lane and a channelized right-turn lane. The southbound Stevens Street approach consists of a shared through/left-turn lane and a shared through/right-turn lane. The eastbound Galleria Mall Drive approach accommodates shared through/left-turn lane and a through lane with a channelized right-turn lane. The Route 140 northbound off- ramp approach accommodates an exclusive left-turn lane, one through lane and a channelized right-turn lane. A concrete median provides directional separation for the traffic on the Route 140 on- and off-ramps and on Galleria Mall Drive.

This intersection is controlled by a four-phase signal. The first phase is a lead phase for the southbound Stevens Street movements. The second phase permits northbound and southbound Stevens Street movements. The third phase is an exclusive pedestrian phase upon push button activation. The fourth phase permits Galleria Mall Drive and Route 140 northbound off-ramp traffic. Sidewalks are present along Galleria Mall Drive. A crosswalk is provided across the southbound Stevens Street approach. Land uses in the vicinity of this intersection are primarily the Galleria Mall to the west and undeveloped areas.

Route 140 southbound ramps and Galleria Mall Driveway intersect County Street to form a four-legged, signalized intersection. The northbound and southbound County Street approaches accommodate a shared left-turn/through lane, one through lane and a channelized right-turn lane. The eastbound Galleria Mall Drive approach consists of two general purpose lanes. The Route 140 southbound off-ramp consists of a single right-turn only lane and is under YIELD control. Through movements and left turns are not permitted from this approach. This intersection is controlled by a two-phase signal. The first phase permits northbound and southbound County Street movements. The second phase is for Galleria Mall Drive traffic. There are no sidewalks or crosswalks present at this intersection. Land uses in the vicinity of this intersection are primarily the Galleria Mall to the west with undeveloped areas to the east.

Weir Street intersects Route 44/140 at the southeast corner of Taunton Green to form a four-legged signalized intersection. Circulation around Taunton Green is one-way in the counter clockwise direction. The eastbound Cohannet Street approach is one-way toward the intersection and consists of an exclusive left-turn lane, dual through lanes and one exclusive right-turn lane. The northbound Weir Street (Route 138) approach consists of one through lane and a right-turn lane. The westbound Route 44/140 (Main Street) approach consists of two channelized right-turn lanes. There is no southbound approach as Weir Street on the north side of the intersection is one-way northbound. Traffic at this intersection is controlled by a three-phase, pre-timed signal. The first phase permits northbound Weir Street and westbound Route 44/140 right-turns. The second phase is for eastbound Cohannet Street and the third is an exclusive pedestrian phase. Metered parking is provided along the south side of Cohannet Street, both sides of Route 44/140, and both sides of northbound Route 138. All four streets provide sidewalks and the three approaches to the intersection have crosswalks. Land uses in the vicinity of the intersection are primarily commercial and office.

Route 140/44 at Court Street/Route 138. A weave segment occurs at the northeast corner of the Taunton Green where traffic from Route 138 and Route 140/44 merge. The northbound Route 138/140/44 approach consists of two free-flow, exclusive left-turns onto Court Street and one free-flow through lane. The southbound Route 138 approach consists of one free-flow, exclusive right-turn lane onto Court Street. Court Street is one-way westbound away from the intersection. There are no controls at the intersection except a flashing yellow signal indicating that vehicles should yield to pedestrians. Metered parking is provided along both sides of Route 138/140/44 and the north side of Court Street. Sidewalks are located along both sides of Route 138/140/44 and Court Street. Crosswalks are present on all approaches but are in poor condition and only some are accessible. Land uses in the vicinity of the intersection are primarily commercial and office.

Taunton Green/Court Street at Post Office Square. This four-legged unsignalized intersection is at the northwest corner of Taunton Green. The westbound Court Street approach consists of one exclusive left-turn lane, a shared left-turn/through land and a channelized right-turn lane. There are no controls for this approach. The southbound Court Street approach has a single through/right-turn lane and is controlled by a YIELD sign. The eastbound Post Office Square approach has one right-turn lane and is under STOP control. Taunton Green is one-way southbound away from the intersection and accommodates three lanes. Metered parking is provided along both sides of Post Office Square and on the west side of Court Street. A bus stop is located in the vicinity of the intersection, at Downtown Court House. Sidewalks are present along both sides of Court Street and Post Office Square. Crosswalks are provided across all approaches. Land uses in the vicinity of the intersection are primarily commercial and office.

Taunton Green Street at Cohannet Street/Route 44. This four-legged unsignalized intersection is at the southwest corner of Taunton Green. The eastbound Cohannet Street approach has one through lane and one exclusive right-turn lane and is STOP controlled. Cohannet Street is one-way eastbound away from the intersection. The northbound Winthrop Street (Route 44) approach consists of one right-turn lane controlled by a YIELD sign. Left turns from Winthrop Street onto Cohannet Street are not allowed. The southbound Taunton Green approach has two exclusive left-turn lanes and a shared through/right-turn lane. There are no controls for this approach. Metered parking is provided along both sides of Cohannet Street and on the west side of Winthrop Street. Sidewalks are present along Winthrop Street and Cohannet Street approaches. Crosswalks are located across all approaches to the intersection. Land uses in the vicinity of the intersection are primarily commercial and offices.

Court Street intersects Washington Street from the east to form a signalized three- legged intersection. The Court Street westbound approach consists of an exclusive left-turn lane and one right-turn lane. The Washington Street northbound approach accommodates one through lane and an exclusive right-turn lane. The Washington Street southbound approach consists of an exclusive left-turn lane and a through lane. Traffic at the intersection is controlled by a two-phase pre-timed signal. A Washington Street northbound/southbound phase is followed by a Court Street eastbound phase. Pedestrians move concurrently with vehicular movements upon push button activation. Parking is not permitted along any of the approaches. A bus stop is located on the eastbound travel lane on Court Street. Sidewalks are located along both sides of Washington Street and Court Street. Crosswalks are present across all approaches of the intersection. Land uses in the vicinity of the intersection is primarily commercial and office uses.

Tremont Street intersects Washington Street (which becomes Oak Street south of the intersection) from the west to form a signalized T-type intersection. The Tremont Street approach consists of two-exclusive left-turn lanes and one channelized right-turn lane. The Washington Street southbound approach consists of a through lane and a shared through/right-turn lane while the Oak Street northbound approach consists of a shared left-turn/through lane and one through lane. Traffic at the intersection is controlled by a three-phase, pre-timed signal. The signal currently operates with a leading protected northbound left-turn/through phase, followed by a northbound/southbound phase. The third phase permits the eastbound movements. The pedestrians move concurrently with vehicular movements upon push button activation. Parking is not permitted along any of the approaches. Sidewalks and crosswalks are present on all approaches of the intersection. Land uses in the vicinity of the intersection are primarily commercial and undeveloped land with parking.

Oak Street intersects Lowell Street and Kilmer Street to form a four-legged, unsignalized intersection. All approaches at this intersection consist of one general purpose lane. A driveway exists adjacent to the Kilmer Street northbound approach which provides access to the Fire Department building. There are no STOP signs or stop bars present at any of the approaches. A non-operational beacon is present on Oak Street. The Kilmer Street and Lowell Street approaches are configured in a way that creates sight problems for vehicles turning onto Oak Street from these two approaches. Sidewalks are present along all approaches except on the Lowell Street approach. There are crosswalks located across Lowell Street and the southbound Oak Street approach. Land uses at this intersection include residential and an inactive fire station.

Frederick R. Martin Sr. Parkway (FRM Parkway) intersects Washington Street from the east while a private road that provides access to Mill Pond Apartments intersects Washington Street from the west to form an unsignalized four-way intersection. The FRM Parkway westbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane and is under STOP control. The Washington Street southbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The northbound Washington Street approach consists of a shared left-turn/through lane and a shared through/right-turn lane. The Mill Pond Apartments road is STOP sign controlled and has one general purpose lane. Parking is not permitted along any of the approaches. Sidewalks are located along both sides of Washington Street and FRM Parkway. No sidewalks are provided on Mill Pond Apartments driveway. Crosswalks are provided across all approaches but are in poor condition. Land uses in the vicinity of the intersection are primarily commercial and residential.

School Street intersects Purchase Street and Arlington Street to form a four-legged unsignalized intersection. All approaches to the intersection consist of one general purpose lane. The School Street Approaches are under STOP control. Sidewalks are present along all approaches of the intersection. There are1 no crosswalks present across any of the approaches. Land uses in the vicinity of this intersection are primarily residential.

Route 138 (Broadway) intersects Washington Street at a sharp angle to form a four-legged signalized intersection (St. Mary's Square). The Route 138 northbound approach consists of an exclusive left-turn lane and a shared through/right lane. The Route 138 southbound approach consists of one shared left-turn/through lane and a right-turn lane. Both the Washington Street northeast and southwest approaches consist of one general purpose lane. Randall Street intersects Route 138 just south of Washington Street and is STOP sign controlled.

This intersection is controlled by a two-phase signal. The first phase permits northbound and southbound Route 138 movements. The second phase permits northeast and southwest traffic on Washington Street. Pedestrians move concurrently with vehicular movements upon push button activation. Parking is permitted for thirty minutes on Broadway south of the intersection and along the eastbound lane on Randall Street. Sidewalks are located along both sides of Route 138 and Washington Street. Crosswalks are provided across all approaches. Land uses at this intersection are primarily commercial and residential.

Washington Street and Purchase Street intersect to form a four-legged signalized intersection. All approaches to the intersection consist of one general purpose lane. The Purchase Street approaches are under STOP control while the Washington Street approaches operate freely. Sidewalks and crosswalks are present along all approaches of the intersection. Land uses in the vicinity of this intersection are primarily residential.

Route 44 (Cape Highway) at Route 104 (Dean Street). Route 44 and Route 104 intersect to form a four-legged, signalized intersection. The eastbound Route 44 approach accommodates two general purpose lanes. The westbound Route 44 approach consists of a shared left-turn/through lane, a through lane and a channelized right-turn lane. The southbound Route 104 consists of a shared left-turn/through and an exclusive right-turn lane. The northbound driveway opposite the Route 104 approach consists of one general purpose lane.

This intersection is controlled by a three-phase signal. The first phase is a lead phase for the eastbound Route 44 movements with the right turns from Route 104 southbound overlapping. The second phase permits eastbound and westbound Route 44 movements. The third phase permits movements from Route 104 and the driveway. Pedestrian indications are present at the intersection but were not in operation. Sidewalks are present along the westbound Route 44 approach and a crosswalk is provided across Route 104. Land uses in the vicinity of this intersection are primarily commercial.

Longmeadow Road intersects Route 44 (Dean Street) from the north and Honorable Gordon Owen Parkway intersects Route 44 from the south to form a four-legged, signalized intersection. The eastbound Route 44 approach consists of an exclusive left-turn lane, two through lanes and a short, channelized right-turn lane. The westbound Route 44 approach consists of an exclusive left-turn lane, a through lane and a shared through/right lane. A concrete median provides directional separation for the traffic on Route 44. The northbound Honorable Gordon Owen Parkway accommodates one general purpose lane and a channelized right-turn lane. The southbound Longmeadow Road approach accommodates one general purpose lane. The right-turns on the eastbound and northbound approaches are under YIELD control.

This intersection is controlled by a four-phase signal. The first phase is a protected phase for the eastbound and westbound Route 44 left turns. The second phase permits eastbound and westbound Route 44 through and right turns. The third phase permits the Honorable Gordon Owen Parkway and Longmeadow Road traffic. The fourth phase is an exclusive pedestrian phase upon push button activation. Sidewalks and crosswalks are present on all approaches. Land uses in the vicinity of this intersection are primarily commercial and residential.

Arlington Street intersects Route 44 from the north to form a three-legged, Y-type signalized intersection. The westbound Route 44 approach consists of a shared through/right lane. The

eastbound Route 44 approach accommodates an exclusive left-turn lane and one through lane. The southbound Arlington Street approach consists of a shared left-turn/right-turn lane. This intersection is controlled by a two-phase signal. The first phase permits eastbound and westbound Route 44 movements. The second phase permits southbound Arlington Street left and right turns. Pedestrians move concurrently with vehicular movements upon push button activation. Sidewalks are present along the north side of the eastbound Route 44 approach and the Arlington Street corner of the intersection. The land use in the vicinity of this intersection is predominantly residential to the north and undeveloped area to the south.

Summer Street intersects Route 44 (Main Street and Church Green Street) from the southeast to form a five-legged intersection. Summer Street becomes Union Street north of the intersection and is one-way in the northbound direction, away from the intersection. The northbound Summer Street approach has a shared left-turn/through lane and a right-turn lane. The westbound Church Green approach has one through/right-turn lane while the eastbound Main Street approach has a single left-turn/through lane. Left turns are not permitted from the westbound Church Green approach. In addition, there is a free-flow channelized right-turn lane from the eastbound Main Street approach onto Summer Street.

Traffic at this signal is controlled by a two-phase pre-timed signal. The signal currently operates with a northbound Summer Street phase followed by the eastbound and westbound Main Street/Church Green movements. Pedestrians move concurrently with vehicles upon push button activation. Metered parking is provided along both sides of Church Green, the west side of Summer Street, the east side of Union Street and both sides of Main Street. Sidewalks and crosswalks are located on all approaches. Land uses near the intersection are predominantly commercial.

Spring Street, Church Green and Summer Street intersect to form a four-legged, signalized intersection. All four approaches have a single general purpose lane. Because the westbound Church Green approach is slightly skewed, it is wide enough to accommodate right turning vehicles separately from through and left-turning vehicles. The intersection is controlled by a two-phase signal that lets the Church Green and Spring Street approaches move in one phase and the Summer Street northbound and southbound approaches to move in another phase.

Route 140 (County Street) and Honorable Gordon Owen Parkway intersect to form a T-type signalized intersection. The westbound Route 140 approach consists of a through lane and a right-turn lane. The eastbound Route 44 approach accommodates a shared left-turn/through lane. The southbound Honorable Gordon Owen Parkway approach consists of a shared left-turn and right-turn lane. There is a driveway located across from the southbound approach serving a residential building. This intersection is controlled by a three-phase signal with video detection for all approaches. The first phase permits eastbound and westbound Route 140 movements. The second phase is an exclusive pedestrian phase upon push button activation. The third phase permits movement from the Honorable Gordon Owen Parkway and the residential driveway. Sidewalks are present along both sides of Route 140. There is a crosswalk across the westbound Route 140 and Owen Parkway approaches. The land use in the vicinity of this intersection is predominantly residential.

School Street and Winter Street intersect to form a four-legged unsignalized intersection. All approaches to the intersection consist of one general purpose lane. The School Street approaches are under STOP control. Sidewalks are present on all approaches of the intersection.

There are crosswalks located across all approaches except on Winter Street west of the intersection. Land uses in the vicinity of this intersection are primarily residential.

Norton

Inventory of Roadways and Intersections

This section provides a description of major roadways and key intersections within the vicinity of the proposed Barrowsville station.

Roadways

The following key roadways provide access to the proposed station.

South Worcester Street is a two-lane local road that connects Route 123 with Route 140. It runs north-south, intersecting with Route 123, John B. Scott Boulevard, and Barrows Street, among others. Its intersection with Barrows Street is just west of the proposed Barrowsville station. Land uses along this road are entirely residential.

Route 123/Old Colony Road is a two-to-four lane east-west arterial, extending from Route 106 in Raynham to I-95 in South Attleboro. It provides access to and from I-495 and intersects with South Worcester Street near the proposed rail station. Land uses along this road are a combination of residential and commercial.

Dean Street is a two-lane local roadway extending from South Worcester Street to Tremont Street. It runs north-south and intersects with John B. Scott Boulevard south of the proposed Barrowsville station. Land uses along this road are entirely residential.

Barrows Street is a two-lane local roadway, running east-west and extending from South Worcester Street on the west to Route 140 on the east. Barrows Street intersects with South Worcester Street, which lies just east of the proposed Barrowsville station. Land uses along this roadway are mainly residential.

Intersections

The following key intersections provide access to the proposed station.

South Worcester Street and North Worcester Street intersect Route 123 at a skewed angle to form a four-legged unsignalized intersection. The North and South Worcester Street approaches are slightly offset making it difficult for vehicles turning left into or out of these approaches. All approaches to the intersection consist of one general purpose lane. The intersection operates with red and yellow flashing indications. Flashing yellow indications are present for the eastbound and westbound Route 123 approaches. The northbound and southbound approaches have the flashing red indications. STOP signs are located on the South and North Worcester Street approaches. There are no sidewalks or crosswalks present at any of the approaches. The land use in the vicinity of this intersection is predominantly residential to the east and undeveloped areas to the west.

John B. Scott Boulevard at Harvey Street is a four-legged unsignalized intersection located south of the proposed Barrowsville station location. John B. Scott Boulevard, which is the major roadway, travels northwest and southeast, while Harvey Street runs in the northeast and southwest direction. All four approaches consist of one general purpose lane and are STOP sign controlled with a red-flashing beacon overhead facing each approach. No crosswalks and sidewalks are present on any of the approaches. Land uses around this intersection are entirely residential.

South Worcester Street intersects John B. Scott Boulevard and Sturdy Street to form a four-legged unsignalized intersection. All approaches to the intersection consist of one general purpose lane. STOP signs are located on all approaches except for the southbound South Worcester Street approach. An at-grade railroad crossing is located south of the intersection across John B. Scott Boulevard. There are no sidewalks or crosswalks present at any of the approaches. The land use in the vicinity of this intersection is predominantly residential and undeveloped.

John B. Scott Boulevard and Dean Street intersect to form a four-legged unsignalized intersection. All approaches to the intersection consist of one general purpose lane and are under STOP control. A flashing all red beacon is located at the intersection to reinforce the all-way STOP control. There are no sidewalks or crosswalks present at any of the approaches. The land use in the vicinity of this intersection is predominantly residential and undeveloped areas.

Barrows Street intersects South Worcester Street from the east to form an unsignalized T-type intersection. All approaches to the intersection consist of one general purpose lane. The westbound Barrows Street approach is under STOP-control. The Norton Fire Department is located at the northeast corner of the intersection. Sidewalks are present along the northbound South Worcester Street and westbound Barrows Street approaches. There are no crosswalks present at any of the approaches. The land uses in the vicinity of this intersection are mainly residential.

Appendix 4.1-E

Traffic Counts

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Sat 9/6/08 and Tues 9/9/08	81676	Fall River, MA

PRECISION DATA INDUSTRIES, LLC
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N/S: North Main Street
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	32	38	8	54	5	17	45	19	13	123	17	386
07:15 AM	15	35	31	14	59	11	21	53	24	7	93	42	405
07:30 AM	12	33	12	19	78	8	17	47	20	16	95	48	405
07:45 AM	21	49	34	16	79	20	16	49	24	14	128	22	472
Total	63	149	115	57	270	44	71	194	87	50	439	129	1668
08:00 AM	16	36	20	16	69	9	14	30	27	27	145	16	425
08:15 AM	14	41	34	15	58	14	17	57	24	21	138	14	447
08:30 AM	8	41	27	15	57	8	20	49	30	26	163	19	463
08:45 AM	14	26	26	22	69	8	12	43	17	17	143	15	412
Total	52	144	107	68	253	39	63	179	98	91	589	64	1747
Grand Total	115	293	222	125	523	83	134	373	185	141	1028	193	3415
Apprch %	18.3	46.5	35.2	17.1	71.5	11.4	19.4	53.9	26.7	10.4	75.5	14.2	
Total %	3.4	8.6	6.5	3.7	15.3	2.4	3.9	10.9	5.4	4.1	30.1	5.7	
Cars	110	280	212	125	513	82	123	352	174	137	1016	189	3313
% Cars	95.7	95.6	95.5	100	98.1	98.8	91.8	94.4	94.1	97.2	98.8	97.9	97
Heavy Vehicles	5	13	10	0	10	1	11	21	11	4	12	4	102
% Heavy Vehicles	4.3	4.4	4.5	0	1.9	1.2	8.2	5.6	5.9	2.8	1.2	2.1	3

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**21**	**49**	**34**	**104**	**16**	**79**	**20**	**115**	16	49	24	89	14	128	**22**	164	**472**
08:00 AM	16	36	20	72	16	69	9	94	14	30	27	71	**27**	145	16	188	425
08:15 AM	14	41	34	89	15	58	14	87	17	**57**	24	98	21	138	14	173	447
08:30 AM	8	41	27	76	15	57	8	80	**20**	49	**30**	**99**	26	**163**	19	**208**	463
Total Volume	59	167	115	341	62	263	51	376	67	185	105	357	88	574	71	733	1807
% App. Total	17.3	49	33.7		16.5	69.9	13.6		18.8	51.8	29.4		12	78.3	9.7		
PHF	.702	.852	.846	.820	.969	.832	.638	.817	.838	.811	.875	.902	.815	.880	.807	.881	.957
Cars	57	161	111	329	62	257	51	370	64	173	101	338	85	567	71	723	1760
% Cars	96.6	96.4	96.5	96.5	100	97.7	100	98.4	95.5	93.5	96.2	94.7	96.6	98.8	100	98.6	97.4
Heavy Vehicles	2	6	4	12	0	6	0	6	3	12	4	19	3	7	0	10	47
% Heavy Vehicles	3.4	3.6	3.5	3.5	0	2.3	0	1.6	4.5	6.5	3.8	5.3	3.4	1.2	0	1.4	2.6

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N/S: North Main Street
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	29	35	8	54	4	14	42	18	13	122	17	371
07:15 AM	13	34	29	14	58	11	19	51	21	7	92	39	388
07:30 AM	11	32	12	19	76	8	15	45	17	16	94	48	393
07:45 AM	20	47	32	16	77	20	14	44	24	14	124	22	454
Total	59	142	108	57	265	43	62	182	80	50	432	126	1606
08:00 AM	16	36	18	16	69	9	14	28	24	25	143	16	414
08:15 AM	14	37	34	15	56	14	16	54	24	20	137	14	435
08:30 AM	7	41	27	15	55	8	20	47	29	26	163	19	457
08:45 AM	14	24	25	22	68	8	11	41	17	16	141	14	401
Total	51	138	104	68	248	39	61	170	94	87	584	63	1707
Grand Total	110	280	212	125	513	82	123	352	174	137	1016	189	3313
Apprch %	18.3	46.5	35.2	17.4	71.2	11.4	19	54.2	26.8	10.2	75.7	14.1	
Total %	3.3	8.5	6.4	3.8	15.5	2.5	3.7	10.6	5.3	4.1	30.7	5.7	

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**20**	**47**	32	**99**	**16**	**77**	**20**	**113**	14	44	24	82	14	124	**22**	160	454
08:00 AM	16	36	18	70	16	69	9	94	14	28	24	66	25	143	16	184	414
08:15 AM	14	37	**34**	85	15	56	14	85	16	**54**	24	94	20	137	14	171	435
08:30 AM	7	41	27	75	15	55	8	78	**20**	47	**29**	**96**	**26**	**163**	19	**208**	**457**
Total Volume	57	161	111	329	62	257	51	370	64	173	101	338	85	567	71	723	1760
% App. Total	17.3	48.9	33.7		16.8	69.5	13.8		18.9	51.2	29.9		11.8	78.4	9.8		
PHF	.713	.856	.816	.831	.969	.834	.638	.819	.800	.801	.871	.880	.817	.870	.807	.869	.963

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File Name : 81676B-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	3	3	0	0	1	3	3	1	0	1	0	15
07:15 AM	2	1	2	0	1	0	2	2	3	0	1	3	17
07:30 AM	1	1	0	0	2	0	2	2	3	0	1	0	12
07:45 AM	1	2	2	0	2	0	2	5	0	0	4	0	18
Total	4	7	7	0	5	1	9	12	7	0	7	3	62
08:00 AM	0	0	2	0	0	0	0	2	3	2	2	0	11
08:15 AM	0	4	0	0	2	0	1	3	0	1	1	0	12
08:30 AM	1	0	0	0	2	0	0	2	1	0	0	0	6
08:45 AM	0	2	1	0	1	0	1	2	0	1	2	1	11
Total	1	6	3	0	5	0	2	9	4	4	5	1	40
Grand Total	5	13	10	0	10	1	11	21	11	4	12	4	102
Apprch %	17.9	46.4	35.7	0	90.9	9.1	25.6	48.8	25.6	20	60	20	
Total %	4.9	12.7	9.8	0	9.8	1	10.8	20.6	10.8	3.9	11.8	3.9	

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**3**	**3**	**6**	0	0	**1**	1	**3**	3	1	**7**	0	1	0	1	15
07:15 AM	**2**	1	2	5	0	1	0	1	2	2	**3**	7	0	1	**3**	**4**	17
07:30 AM	1	1	0	2	0	**2**	0	**2**	2	2	3	7	0	1	0	1	12
07:45 AM	1	2	2	5	0	2	0	2	2	**5**	0	7	0	**4**	0	4	**18**
Total Volume	4	7	7	18	0	5	1	6	9	12	7	28	0	7	3	10	62
% App. Total	22.2	38.9	38.9		0	83.3	16.7		32.1	42.9	25		0	70	30		
PHF	.500	.583	.583	.750	.000	.625	.250	.750	.750	.600	.583	1.000	.000	.438	.250	.625	.861

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Page No : 1

Groups Printed- Peds and Bicycles

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	15	0	0	0	4	0	0	0	2	0	0	0	2	23
07:15 AM	0	0	0	7	0	0	0	8	0	0	0	7	0	0	0	3	25
07:30 AM	0	0	0	6	0	0	0	6	0	0	0	14	0	0	0	5	31
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	29	0	0	0	18	0	0	0	23	0	0	0	10	80
08:00 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	5
08:15 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	5
08:30 AM	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	3
08:45 AM	0	0	0	0	0	1	0	2	0	0	0	2	0	0	0	0	5
Total	0	0	0	3	0	1	0	6	0	0	0	3	0	0	0	5	18
Grand Total	0	0	0	32	0	1	0	24	0	0	0	26	0	0	0	15	98
Apprch %	0	0	0	100	0	4	0	96	0	0	0	100	0	0	0	100	
Total %	0	0	0	32.7	0	1	0	24.5	0	0	0	26.5	0	0	0	15.3	

	North Main Street From North					President Avenue (Route 6) From East					North Main Street From South					President Avenue (Route 6) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	**15**	**15**	0	0	0	4	4	0	0	0	2	2	0	0	0	2	2	23
07:15 AM	0	0	0	7	7	0	0	0	**8**	**8**	0	0	0	7	7	0	0	0	3	3	25
07:30 AM	0	0	0	6	6	0	0	0	6	6	0	0	0	**14**	**14**	0	0	0	**5**	**5**	**31**
07:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	29	29	0	0	0	18	18	0	0	0	23	23	0	0	0	10	10	80
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.483	.483	.000	.000	.000	.563	.563	.000	.000	.000	.411	.411	.000	.000	.000	.500	.500	.645

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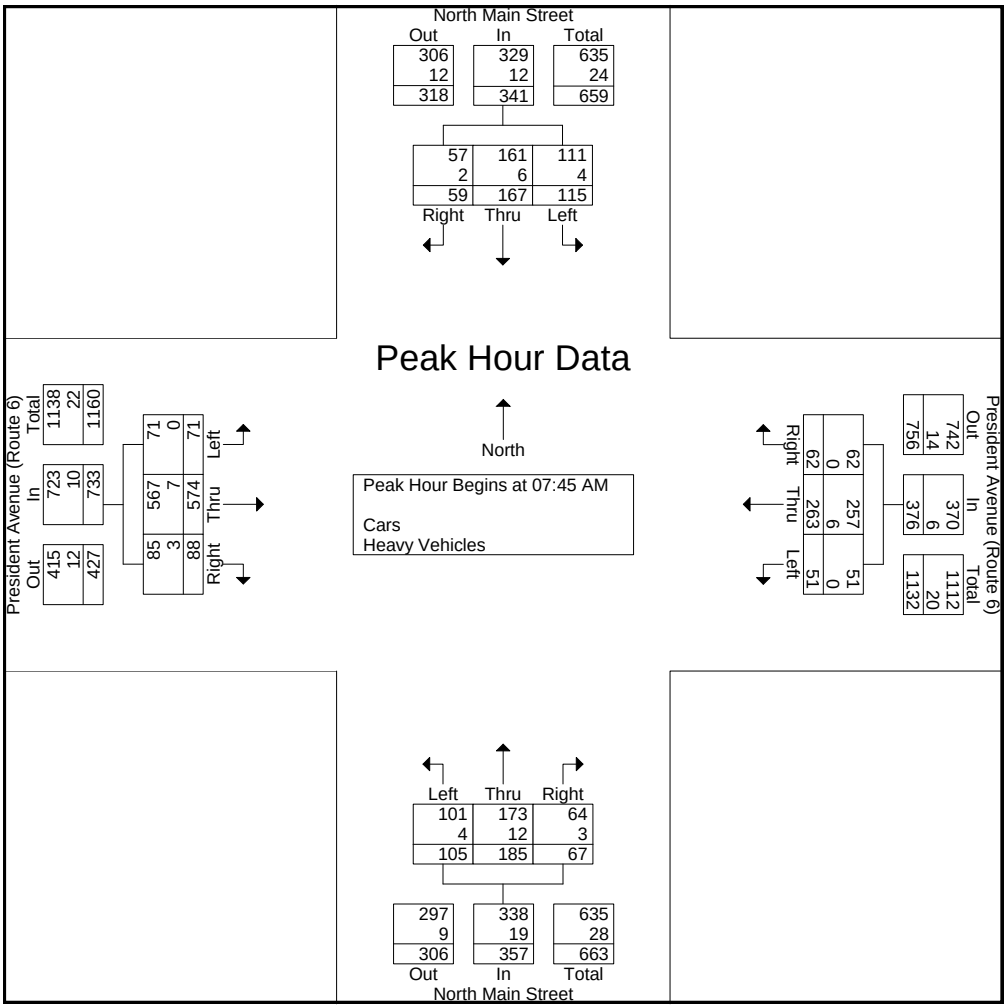
	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**21**	**49**	**34**	**104**	**16**	**79**	**20**	**115**	16	49	24	89	14	128	**22**	164	**472**
08:00 AM	16	36	20	72	16	69	9	94	14	30	27	71	**27**	145	16	188	425
08:15 AM	14	41	34	89	15	58	14	87	17	**57**	24	98	21	138	14	173	447
08:30 AM	8	41	27	76	15	57	8	80	**20**	49	**30**	**99**	26	**163**	19	**208**	463
Total Volume	59	167	115	341	62	263	51	376	67	185	105	357	88	574	71	733	1807
% App. Total	17.3	49	33.7		16.5	69.9	13.6		18.8	51.8	29.4		12	78.3	9.7		
PHF	.702	.852	.846	.820	.969	.832	.638	.817	.838	.811	.875	.902	.815	.880	.807	.881	.957
Cars	57	161	111	329	62	257	51	370	64	173	101	338	85	567	71	723	1760
% Cars	96.6	96.4	96.5	96.5	100	97.7	100	98.4	95.5	93.5	96.2	94.7	96.6	98.8	100	98.6	97.4
Heavy Vehicles	2	6	4	12	0	6	0	6	3	12	4	19	3	7	0	10	47
% Heavy Vehicles	3.4	3.6	3.5	3.5	0	2.3	0	1.6	4.5	6.5	3.8	5.3	3.4	1.2	0	1.4	2.6



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N/S: North Main Street
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-AAA
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	13	45	36	21	124	16	9	57	31	20	142	20	534
04:15 PM	24	40	42	16	109	13	23	54	37	26	131	21	536
04:30 PM	25	42	30	16	87	15	14	71	30	20	127	36	513
04:45 PM	21	53	32	9	79	18	12	54	23	36	118	25	480
Total	83	180	140	62	399	62	58	236	121	102	518	102	2063
05:00 PM	15	43	39	13	128	11	22	61	22	26	154	27	561
05:15 PM	19	38	29	19	111	10	24	46	26	30	154	23	529
05:30 PM	18	48	29	15	76	13	26	51	24	26	130	28	484
05:45 PM	29	41	22	16	98	8	19	59	21	23	103	18	457
Total	81	170	119	63	413	42	91	217	93	105	541	96	2031
Grand Total	164	350	259	125	812	104	149	453	214	207	1059	198	4094
Apprch %	21.2	45.3	33.5	12	78	10	18.3	55.5	26.2	14.1	72.3	13.5	
Total %	4	8.5	6.3	3.1	19.8	2.5	3.6	11.1	5.2	5.1	25.9	4.8	
Cars	158	338	256	123	803	101	147	436	212	203	1046	193	4016
% Cars	96.3	96.6	98.8	98.4	98.9	97.1	98.7	96.2	99.1	98.1	98.8	97.5	98.1
Heavy Vehicles	6	12	3	2	9	3	2	17	2	4	13	5	78
% Heavy Vehicles	3.7	3.4	1.2	1.6	1.1	2.9	1.3	3.8	0.9	1.9	1.2	2.5	1.9

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	24	40	**42**	**106**	**16**	109	13	138	**23**	54	**37**	114	26	131	21	178	536
04:30 PM	**25**	42	30	97	16	87	15	118	14	**71**	30	**115**	20	127	**36**	183	513
04:45 PM	21	**53**	32	106	9	79	**18**	106	12	54	23	89	**36**	118	25	179	480
05:00 PM	15	43	39	97	13	**128**	11	**152**	22	61	22	105	26	**154**	27	**207**	**561**
Total Volume	85	178	143	406	54	403	57	514	71	240	112	423	108	530	109	747	2090
% App. Total	20.9	43.8	35.2		10.5	78.4	11.1		16.8	56.7	26.5		14.5	71	14.6		
PHF	.850	.840	.851	.958	.844	.787	.792	.845	.772	.845	.757	.920	.750	.860	.757	.902	.931
Cars	84	174	142	400	53	399	54	506	71	237	111	419	105	524	106	735	2060
% Cars	98.8	97.8	99.3	98.5	98.1	99.0	94.7	98.4	100	98.8	99.1	99.1	97.2	98.9	97.2	98.4	98.6
Heavy Vehicles	1	4	1	6	1	4	3	8	0	3	1	4	3	6	3	12	30
% Heavy Vehicles	1.2	2.2	0.7	1.5	1.9	1.0	5.3	1.6	0	1.3	0.9	0.9	2.8	1.1	2.8	1.6	1.4

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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-AAA
Site Code : 10111.31
Start Date : 9/9/2008

Groups Printed- Cars

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	12	43	34	21	123	16	8	52	30	20	139	18	516
04:15 PM	23	39	41	16	107	13	23	54	36	26	129	20	527
04:30 PM	25	41	30	16	86	14	14	70	30	20	125	36	507
04:45 PM	21	51	32	8	78	17	12	52	23	34	118	24	470
Total	81	174	137	61	394	60	57	228	119	100	511	98	2020
05:00 PM	15	43	39	13	128	10	22	61	22	25	152	26	556
05:15 PM	19	37	29	19	108	10	23	42	26	30	154	23	520
05:30 PM	18	46	29	15	76	13	26	48	24	26	128	28	477
05:45 PM	25	38	22	15	97	8	19	57	21	22	101	18	443
Total	77	164	119	62	409	41	90	208	93	103	535	95	1996
Grand Total	158	338	256	123	803	101	147	436	212	203	1046	193	4016
Apprch %	21	44.9	34	12	78.2	9.8	18.5	54.8	26.7	14.1	72.5	13.4	
Total %	3.9	8.4	6.4	3.1	20	2.5	3.7	10.9	5.3	5.1	26	4.8	

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	23	39	**41**	103	**16**	107	13	136	**23**	54	**36**	113	26	129	20	175	527
04:30 PM	**25**	41	30	96	16	86	14	116	14	**70**	30	**114**	20	125	**36**	181	507
04:45 PM	21	**51**	32	**104**	8	78	**17**	103	12	52	23	87	**34**	118	24	176	470
05:00 PM	15	43	39	97	13	**128**	10	**151**	22	61	22	105	25	**152**	26	**203**	**556**
Total Volume	84	174	142	400	53	399	54	506	71	237	111	419	105	524	106	735	2060
% App. Total	21	43.5	35.5		10.5	78.9	10.7		16.9	56.6	26.5		14.3	71.3	14.4		
PHF	.840	.853	.866	.962	.828	.779	.794	.838	.772	.846	.771	.919	.772	.862	.736	.905	.926

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File Name : 81676B-AAA
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Main Street From North			President Avenue (Route 6) From East			North Main Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	2	2	0	1	0	1	5	1	0	3	2	18
04:15 PM	1	1	1	0	2	0	0	0	1	0	2	1	9
04:30 PM	0	1	0	0	1	1	0	1	0	0	2	0	6
04:45 PM	0	2	0	1	1	1	0	2	0	2	0	1	10
Total	2	6	3	1	5	2	1	8	2	2	7	4	43
05:00 PM	0	0	0	0	0	1	0	0	0	1	2	1	5
05:15 PM	0	1	0	0	3	0	1	4	0	0	0	0	9
05:30 PM	0	2	0	0	0	0	0	3	0	0	2	0	7
05:45 PM	4	3	0	1	1	0	0	2	0	1	2	0	14
Total	4	6	0	1	4	1	1	9	0	2	6	1	35
Grand Total	6	12	3	2	9	3	2	17	2	4	13	5	78
Apprch %	28.6	57.1	14.3	14.3	64.3	21.4	9.5	81	9.5	18.2	59.1	22.7	
Total %	7.7	15.4	3.8	2.6	11.5	3.8	2.6	21.8	2.6	5.1	16.7	6.4	

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**2**	**2**	**5**	0	1	0	1	**1**	**5**	**1**	**7**	0	**3**	**2**	**5**	**18**
04:15 PM	1	1	1	3	0	**2**	0	2	0	0	1	1	0	2	1	3	9
04:30 PM	0	1	0	1	0	1	**1**	2	0	1	0	1	0	2	0	2	6
04:45 PM	0	2	0	2	**1**	1	1	**3**	0	2	0	2	**2**	0	1	3	10
Total Volume	2	6	3	11	1	5	2	8	1	8	2	11	2	7	4	13	43
% App. Total	18.2	54.5	27.3		12.5	62.5	25		9.1	72.7	18.2		15.4	53.8	30.8		
PHF	.500	.750	.375	.550	.250	.625	.500	.667	.250	.400	.500	.393	.250	.583	.500	.650	.597

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File Name : 81676B-AAA
Site Code : 10111.31
Start Date : 9/9/2008

Groups Printed- Peds and Bicycles

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
04:15 PM	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	3
04:30 PM	0	0	0	1	0	0	0	5	0	0	0	1	0	0	0	3	10
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total	0	1	0	1	0	0	0	6	0	0	0	3	0	0	0	9	20
05:00 PM	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	5	8
05:15 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	6
05:30 PM	0	0	0	0	0	0	0	2	0	3	0	1	0	0	0	0	6
05:45 PM	0	1	0	1	0	0	0	1	0	0	0	3	0	0	0	7	13
Total	0	1	0	2	0	0	0	7	0	3	0	8	0	0	0	12	33
Grand Total	0	2	0	3	0	0	0	13	0	3	0	11	0	0	0	21	53
Apprch %	0	40	0	60	0	0	0	100	0	21.4	0	78.6	0	0	0	100	
Total %	0	3.8	0	5.7	0	0	0	24.5	0	5.7	0	20.8	0	0	0	39.6	

	North Main Street From North					President Avenue (Route 6) From East					North Main Street From South					President Avenue (Route 6) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**5**	**5**	**8**
05:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	0	0	0	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**6**
05:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**3**	**0**	**1**	**4**	0	0	0	0	0	6
05:45 PM	0	**1**	0	1	**2**	0	0	0	1	1	0	0	0	3	3	0	0	0	**7**	**7**	**13**
Total Volume	0	1	0	2	3	0	0	0	7	7	0	3	0	8	11	0	0	0	12	12	33
% App. Total	0	33.3	0	66.7		0	0	0	100		0	27.3	0	72.7		0	0	0	100		
PHF	.000	.250	.000	.500	.375	.000	.000	.000	.583	.583	.000	.250	.000	.667	.688	.000	.000	.000	.429	.429	.635

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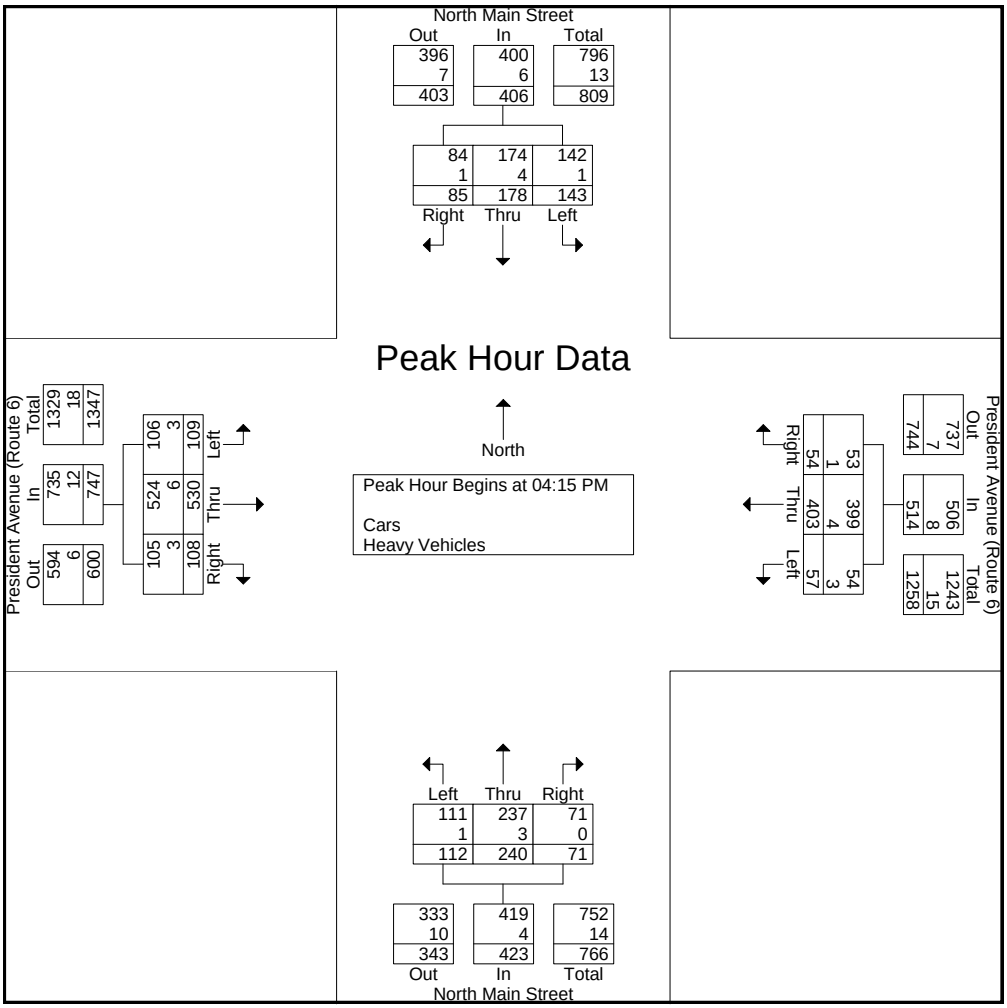
Page No : 1

	North Main Street From North				President Avenue (Route 6) From East				North Main Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	24	40	**42**	**106**	**16**	109	13	138	**23**	54	**37**	114	26	131	21	178	536
04:30 PM	**25**	42	30	97	16	87	15	118	14	**71**	30	**115**	20	127	**36**	183	513
04:45 PM	21	**53**	32	106	9	79	**18**	106	12	54	23	89	**36**	118	25	179	480
05:00 PM	15	43	39	97	13	**128**	11	**152**	22	61	22	105	26	**154**	27	**207**	**561**
Total Volume	85	178	143	406	54	403	57	514	71	240	112	423	108	530	109	747	2090
% App. Total	20.9	43.8	35.2		10.5	78.4	11.1		16.8	56.7	26.5		14.5	71	14.6		
PHF	.850	.840	.851	.958	.844	.787	.792	.845	.772	.845	.757	.920	.750	.860	.757	.902	.931
Cars	84	174	142	400	53	399	54	506	71	237	111	419	105	524	106	735	2060
% Cars	98.8	97.8	99.3	98.5	98.1	99.0	94.7	98.4	100	98.8	99.1	99.1	97.2	98.9	97.2	98.4	98.6
Heavy Vehicles	1	4	1	6	1	4	3	8	0	3	1	4	3	6	3	12	30
% Heavy Vehicles	1.2	2.2	0.7	1.5	1.9	1.0	5.3	1.6	0	1.3	0.9	0.9	2.8	1.1	2.8	1.6	1.4



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File Name : 81676B-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Davol Street From North			President Avenue (Route 6) From East			North Davol Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	40	63	0	63	80	14	0	91	2	353
07:15 AM	0	0	0	39	79	0	78	98	17	0	83	6	400
07:30 AM	0	0	0	34	89	0	71	120	23	0	74	7	418
07:45 AM	0	0	0	56	85	0	67	118	19	0	103	6	454
Total	0	0	0	169	316	0	279	416	73	0	351	21	1625
08:00 AM	0	0	0	61	55	0	53	103	20	0	118	4	414
08:15 AM	0	0	0	52	64	0	69	85	15	0	130	4	419
08:30 AM	0	0	0	57	34	0	61	75	15	0	136	11	389
08:45 AM	0	0	0	44	57	0	52	101	7	0	123	6	390
Total	0	0	0	214	210	0	235	364	57	0	507	25	1612
Grand Total	0	0	0	383	526	0	514	780	130	0	858	46	3237
Apprch %	0	0	0	42.1	57.9	0	36.1	54.8	9.1	0	94.9	5.1	
Total %	0	0	0	11.8	16.2	0	15.9	24.1	4	0	26.5	1.4	
Cars	0	0	0	371	515	0	507	755	127	0	847	40	3162
% Cars	0	0	0	96.9	97.9	0	98.6	96.8	97.7	0	98.7	87	97.7
Heavy Vehicles	0	0	0	12	11	0	7	25	3	0	11	6	75
% Heavy Vehicles	0	0	0	3.1	2.1	0	1.4	3.2	2.3	0	1.3	13	2.3

	North Davol Street From North				President Avenue (Route 6) From East				North Davol Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	34	**89**	0	123	**71**	**120**	**23**	**214**	0	74	**7**	81	418
07:45 AM	0	0	0	0	56	85	0	**141**	67	118	19	204	0	103	6	109	**454**
08:00 AM	0	0	0	0	**61**	55	0	116	53	103	20	176	0	118	4	122	414
08:15 AM	0	0	0	0	52	64	0	116	69	85	15	169	0	**130**	4	**134**	419
Total Volume	0	0	0	0	203	293	0	496	260	426	77	763	0	425	21	446	1705
% App. Total	0	0	0		40.9	59.1	0		34.1	55.8	10.1		0	95.3	4.7		
PHF	.000	.000	.000	.000	.832	.823	.000	.879	.915	.888	.837	.891	.000	.817	.750	.832	.939
Cars	0	0	0	0	195	284	0	479	258	416	76	750	0	419	17	436	1665
% Cars	0	0	0	0	96.1	96.9	0	96.6	99.2	97.7	98.7	98.3	0	98.6	81.0	97.8	97.7
Heavy Vehicles	0	0	0	0	8	9	0	17	2	10	1	13	0	6	4	10	40
% Heavy Vehicles	0	0	0	0	3.9	3.1	0	3.4	0.8	2.3	1.3	1.7	0	1.4	19.0	2.2	2.3

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File Name : 81676B-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	North Davol Street From North			President Avenue (Route 6) From East			North Davol Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	39	63	0	63	78	14	0	90	2	349
07:15 AM	0	0	0	39	77	0	75	91	16	0	80	6	384
07:30 AM	0	0	0	32	83	0	70	118	23	0	74	5	405
07:45 AM	0	0	0	52	83	0	66	114	19	0	102	5	441
Total	0	0	0	162	306	0	274	401	72	0	346	18	1579
08:00 AM	0	0	0	61	55	0	53	101	20	0	116	4	410
08:15 AM	0	0	0	50	63	0	69	83	14	0	127	3	409
08:30 AM	0	0	0	54	34	0	61	74	15	0	136	10	384
08:45 AM	0	0	0	44	57	0	50	96	6	0	122	5	380
Total	0	0	0	209	209	0	233	354	55	0	501	22	1583
Grand Total	0	0	0	371	515	0	507	755	127	0	847	40	3162
Apprch %	0	0	0	41.9	58.1	0	36.5	54.4	9.1	0	95.5	4.5	
Total %	0	0	0	11.7	16.3	0	16	23.9	4	0	26.8	1.3	

	North Davol Street From North				President Avenue (Route 6) From East				North Davol Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	32	**83**	0	115	**70**	**118**	**23**	**211**	0	74	**5**	79	405
07:45 AM	0	0	0	0	52	83	0	**135**	66	114	19	199	0	102	5	107	**441**
08:00 AM	0	0	0	0	**61**	55	0	116	53	101	20	174	0	116	4	120	410
08:15 AM	0	0	0	0	50	63	0	113	69	83	14	166	0	**127**	3	**130**	409
Total Volume	0	0	0	0	195	284	0	479	258	416	76	750	0	419	17	436	1665
% App. Total	0	0	0		40.7	59.3	0		34.4	55.5	10.1		0	96.1	3.9		
PHF	.000	.000	.000	.000	.799	.855	.000	.887	.921	.881	.826	.889	.000	.825	.850	.838	.944

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N/S: North Davol Street
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Davol Street From North			President Avenue (Route 6) From East			North Davol Street From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	1	0	0	0	2	0	0	1	0	4
07:15 AM	0	0	0	0	2	0	3	7	1	0	3	0	16
07:30 AM	0	0	0	2	6	0	1	2	0	0	0	2	13
07:45 AM	0	0	0	4	2	0	1	4	0	0	1	1	13
Total	0	0	0	7	10	0	5	15	1	0	5	3	46
08:00 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
08:15 AM	0	0	0	2	1	0	0	2	1	0	3	1	10
08:30 AM	0	0	0	3	0	0	0	1	0	0	0	1	5
08:45 AM	0	0	0	0	0	0	2	5	1	0	1	1	10
Total	0	0	0	5	1	0	2	10	2	0	6	3	29
Grand Total	0	0	0	12	11	0	7	25	3	0	11	6	75
Apprch %	0	0	0	52.2	47.8	0	20	71.4	8.6	0	64.7	35.3	
Total %	0	0	0	16	14.7	0	9.3	33.3	4	0	14.7	8	

	North Davol Street From North				President Avenue (Route 6) From East				North Davol Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	0	1	4
07:15 AM	0	0	0	0	0	2	0	2	**3**	**7**	**1**	**11**	0	**3**	0	**3**	**16**
07:30 AM	0	0	0	0	2	**6**	0	**8**	1	2	0	3	0	0	**2**	2	13
07:45 AM	0	0	0	0	**4**	2	0	6	1	4	0	5	0	1	1	2	13
Total Volume	0	0	0	0	7	10	0	17	5	15	1	21	0	5	3	8	46
% App. Total	0	0	0		41.2	58.8	0		23.8	71.4	4.8		0	62.5	37.5		
PHF	.000	.000	.000	.000	.438	.417	.000	.531	.417	.536	.250	.477	.000	.417	.375	.667	.719

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Davol Street From North				President Avenue (Route 6) From East				North Davol Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	2	0	0	6
07:15 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	3	0	0	0	0	0	0	0	2	0	0	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
08:45 AM	0	0	0	1	0	2	0	0	0	0	0	3	0	0	0	1	7
Total	0	0	0	2	0	2	0	1	0	0	0	3	0	0	0	2	10
Grand Total	0	0	0	5	0	5	0	1	0	0	0	3	0	2	0	2	18
Apprch %	0	0	0	100	0	83.3	0	16.7	0	0	0	100	0	50	0	50	
Total %	0	0	0	27.8	0	27.8	0	5.6	0	0	0	16.7	0	11.1	0	11.1	

	North Davol Street From North					President Avenue (Route 6) From East					North Davol Street From South					President Avenue (Route 6) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	**1**	**1**	2
08:45 AM	0	0	0	1	1	0	**2**	**0**	**0**	**2**	0	0	0	**3**	**3**	0	0	0	1	1	**7**
Total Volume	0	0	0	2	2	0	2	0	1	3	0	0	0	3	3	0	0	0	2	2	10
% App. Total	0	0	0	100		0	66.7	0	33.3		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.500	.500	.000	.250	.000	.250	.375	.000	.000	.000	.250	.250	.000	.000	.000	.500	.500	.357

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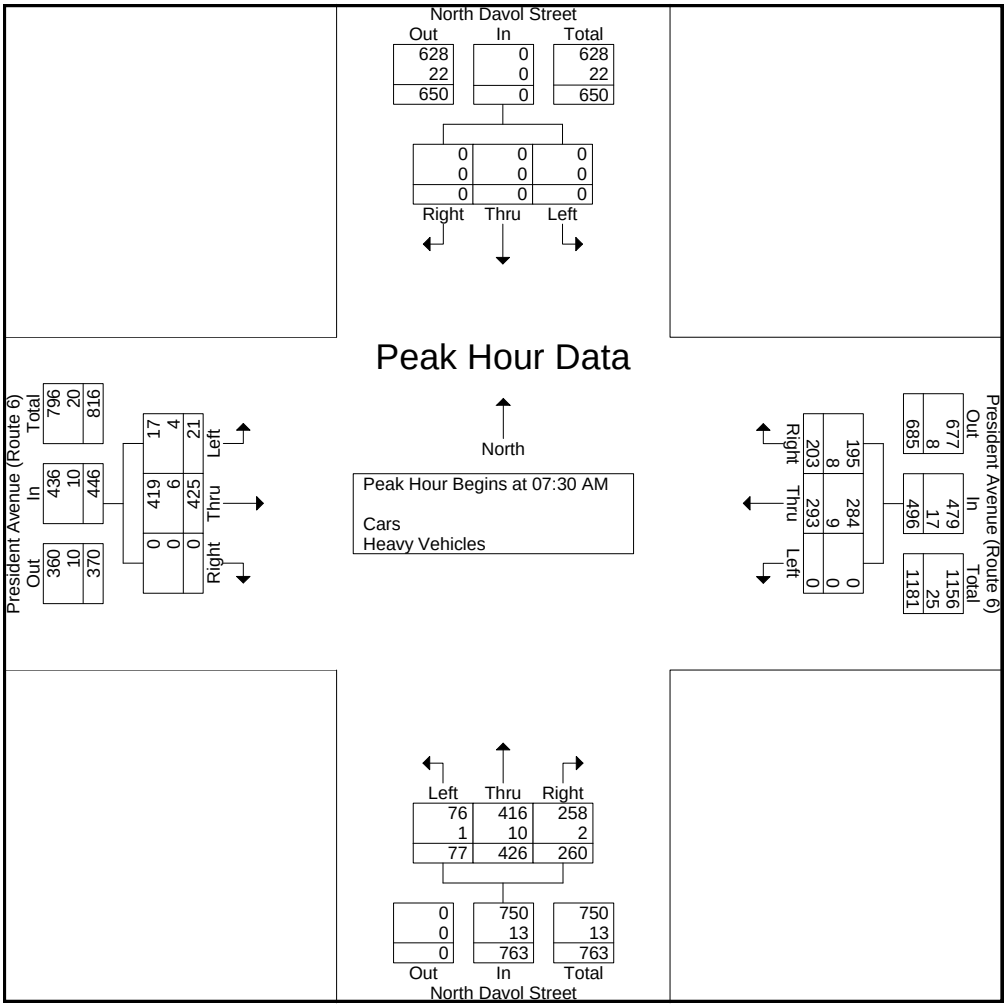
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	North Davol Street From North				President Avenue (Route 6) From East				North Davol Street From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	34	**89**	0	123	**71**	**120**	**23**	**214**	0	74	**7**	81	418
07:45 AM	0	0	0	0	56	85	0	**141**	67	118	19	204	0	103	6	109	**454**
08:00 AM	0	0	0	0	**61**	55	0	116	53	103	20	176	0	118	4	122	414
08:15 AM	0	0	0	0	52	64	0	116	69	85	15	169	0	**130**	4	**134**	419
Total Volume	0	0	0	0	203	293	0	496	260	426	77	763	0	425	21	446	1705
% App. Total	0	0	0		40.9	59.1	0		34.1	55.8	10.1		0	95.3	4.7		
PHF	.000	.000	.000	.000	.832	.823	.000	.879	.915	.888	.837	.891	.000	.817	.750	.832	.939
Cars	0	0	0	0	195	284	0	479	258	416	76	750	0	419	17	436	1665
% Cars	0	0	0	0	96.1	96.9	0	96.6	99.2	97.7	98.7	98.3	0	98.6	81.0	97.8	97.7
Heavy Vehicles	0	0	0	0	8	9	0	17	2	10	1	13	0	6	4	10	40
% Heavy Vehicles	0	0	0	0	3.9	3.1	0	3.4	0.8	2.3	1.3	1.7	0	1.4	19.0	2.2	2.3



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N/S: Davol Street NB
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North			President Avenue (Route 6) From East			Davol Street NB From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	90	80	0	72	120	21	0	111	7	501
04:15 PM	0	0	0	91	80	0	65	131	17	0	110	10	504
04:30 PM	0	0	0	84	73	0	67	175	20	0	109	11	539
04:45 PM	0	0	0	74	65	0	64	118	15	0	124	8	468
Total	0	0	0	339	298	0	268	544	73	0	454	36	2012
05:00 PM	0	0	0	89	51	0	78	145	12	0	133	5	513
05:15 PM	0	0	0	99	73	0	66	114	15	0	140	15	522
05:30 PM	0	0	0	64	57	0	56	102	14	0	106	10	409
05:45 PM	0	0	0	75	60	0	46	113	7	0	91	7	399
Total	0	0	0	327	241	0	246	474	48	0	470	37	1843
Grand Total	0	0	0	666	539	0	514	1018	121	0	924	73	3855
Apprch %	0	0	0	55.3	44.7	0	31.1	61.6	7.3	0	92.7	7.3	
Total %	0	0	0	17.3	14	0	13.3	26.4	3.1	0	24	1.9	
Cars	0	0	0	657	534	0	508	1006	120	0	914	71	3810
% Cars	0	0	0	98.6	99.1	0	98.8	98.8	99.2	0	98.9	97.3	98.8
Heavy Vehicles	0	0	0	9	5	0	6	12	1	0	10	2	45
% Heavy Vehicles	0	0	0	1.4	0.9	0	1.2	1.2	0.8	0	1.1	2.7	1.2

	Davol Street NB From North				President Avenue (Route 6) From East				Davol Street NB From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	84	**73**	0	157	67	**175**	**20**	**262**	0	109	11	120	**539**
04:45 PM	0	0	0	0	74	65	0	139	64	118	15	197	0	124	8	132	468
05:00 PM	0	0	0	0	89	51	0	140	**78**	145	12	235	0	133	5	138	513
05:15 PM	0	0	0	0	**99**	73	0	**172**	66	114	15	195	0	**140**	**15**	**155**	522
Total Volume	0	0	0	0	346	262	0	608	275	552	62	889	0	506	39	545	2042
% App. Total	0	0	0		56.9	43.1	0		30.9	62.1	7		0	92.8	7.2		
PHF	.000	.000	.000	.000	.874	.897	.000	.884	.881	.789	.775	.848	.000	.904	.650	.879	.947
Cars	0	0	0	0	341	261	0	602	275	547	61	883	0	502	38	540	2025
% Cars	0	0	0	0	98.6	99.6	0	99.0	100	99.1	98.4	99.3	0	99.2	97.4	99.1	99.2
Heavy Vehicles	0	0	0	0	5	1	0	6	0	5	1	6	0	4	1	5	17
% Heavy Vehicles	0	0	0	0	1.4	0.4	0	1.0	0	0.9	1.6	0.7	0	0.8	2.6	0.9	0.8

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North			President Avenue (Route 6) From East			Davol Street NB From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	89	79	0	69	118	21	0	111	7	494
04:15 PM	0	0	0	90	77	0	64	129	17	0	108	10	495
04:30 PM	0	0	0	83	72	0	67	174	20	0	108	10	534
04:45 PM	0	0	0	73	65	0	64	116	15	0	122	8	463
Total	0	0	0	335	293	0	264	537	73	0	449	35	1986
05:00 PM	0	0	0	89	51	0	78	143	12	0	132	5	510
05:15 PM	0	0	0	96	73	0	66	114	14	0	140	15	518
05:30 PM	0	0	0	64	57	0	56	102	14	0	105	9	407
05:45 PM	0	0	0	73	60	0	44	110	7	0	88	7	389
Total	0	0	0	322	241	0	244	469	47	0	465	36	1824
Grand Total	0	0	0	657	534	0	508	1006	120	0	914	71	3810
Apprch %	0	0	0	55.2	44.8	0	31.1	61.6	7.3	0	92.8	7.2	
Total %	0	0	0	17.2	14	0	13.3	26.4	3.1	0	24	1.9	

	Davol Street NB From North				President Avenue (Route 6) From East				Davol Street NB From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	83	72	0	155	67	**174**	**20**	**261**	0	108	10	118	**534**
04:45 PM	0	0	0	0	73	65	0	138	64	116	15	195	0	122	8	130	463
05:00 PM	0	0	0	0	89	51	0	140	**78**	143	12	233	0	132	5	137	510
05:15 PM	0	0	0	0	**96**	**73**	0	**169**	66	114	14	194	0	**140**	**15**	**155**	518
Total Volume	0	0	0	0	341	261	0	602	275	547	61	883	0	502	38	540	2025
% App. Total	0	0	0		56.6	43.4	0		31.1	61.9	6.9		0	93	7		
PHF	.000	.000	.000	.000	.888	.894	.000	.891	.881	.786	.763	.846	.000	.896	.633	.871	.948

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File Name : 81676B-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North			President Avenue (Route 6) From East			Davol Street NB From South			President Avenue (Route 6) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	1	1	0	3	2	0	0	0	0	7
04:15 PM	0	0	0	1	3	0	1	2	0	0	2	0	9
04:30 PM	0	0	0	1	1	0	0	1	0	0	1	1	5
04:45 PM	0	0	0	1	0	0	0	2	0	0	2	0	5
Total	0	0	0	4	5	0	4	7	0	0	5	1	26
05:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
05:15 PM	0	0	0	3	0	0	0	0	1	0	0	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	2
05:45 PM	0	0	0	2	0	0	2	3	0	0	3	0	10
Total	0	0	0	5	0	0	2	5	1	0	5	1	19
Grand Total	0	0	0	9	5	0	6	12	1	0	10	2	45
Apprch %	0	0	0	64.3	35.7	0	31.6	63.2	5.3	0	83.3	16.7	
Total %	0	0	0	20	11.1	0	13.3	26.7	2.2	0	22.2	4.4	

	Davol Street NB From North				President Avenue (Route 6) From East				Davol Street NB From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**1**	1	0	2	**3**	**2**	0	**5**	0	0	0	0	7
04:15 PM	0	0	0	0	1	**3**	0	**4**	1	2	0	3	0	**2**	0	**2**	**9**
04:30 PM	0	0	0	0	1	1	0	2	0	1	0	1	0	1	**1**	2	5
04:45 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	2	0	2	5
Total Volume	0	0	0	0	4	5	0	9	4	7	0	11	0	5	1	6	26
% App. Total	0	0	0		44.4	55.6	0		36.4	63.6	0		0	83.3	16.7		
PHF	.000	.000	.000	.000	1.000	.417	.000	.563	.333	.875	.000	.550	.000	.625	.250	.750	.722

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File Name : 81676B-BBB
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Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North				President Avenue (Route 6) From East				Davol Street NB From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	4	0	1	0	2	0	0	0	2	0	0	0	0	9
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0	0	4
Total	0	0	0	5	0	2	0	2	0	0	0	4	0	1	0	0	14
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
05:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	4	0	2	0	0	0	0	0	0	0	0	0	1	7
Grand Total	0	0	0	9	0	4	0	2	0	0	0	4	0	1	0	1	21
Apprch %	0	0	0	100	0	66.7	0	33.3	0	0	0	100	0	50	0	50	
Total %	0	0	0	42.9	0	19	0	9.5	0	0	0	19	0	4.8	0	4.8	

	Davol Street NB From North					President Avenue (Route 6) From East					Davol Street NB From South					President Avenue (Route 6) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	**4**	**4**	0	**1**	**0**	**2**	**3**	0	0	0	**2**	**2**	0	0	0	0	0	**9**
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	0	**1**	0	0	**1**	4
Total Volume	0	0	0	5	5	0	2	0	2	4	0	0	0	4	4	0	1	0	0	1	14
% App. Total	0	0	0	100		0	50	0	50		0	0	0	100		0	100	0	0		
PHF	.000	.000	.000	.313	.313	.000	.500	.000	.250	.333	.000	.000	.000	.500	.500	.000	.250	.000	.000	.250	.389

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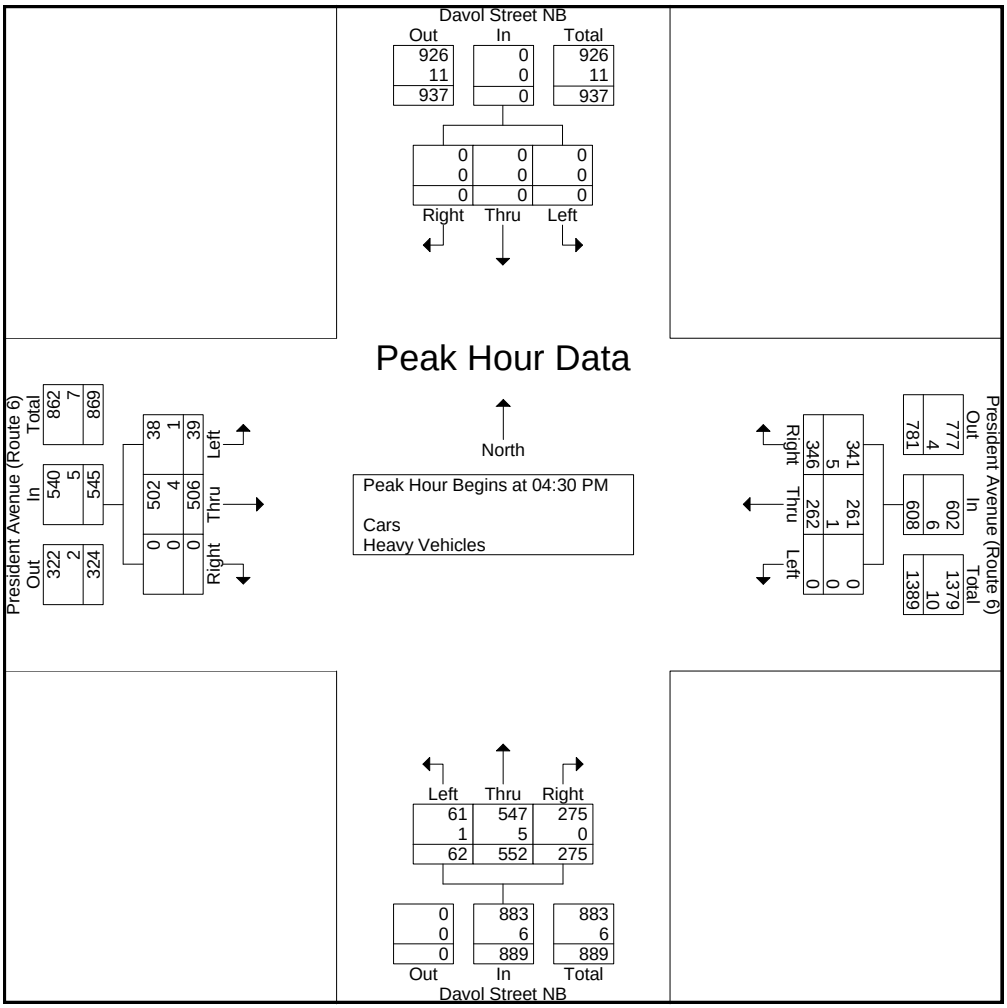
N/S: Davol Street NB
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North				President Avenue (Route 6) From East				Davol Street NB From South				President Avenue (Route 6) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	84	**73**	0	157	67	**175**	**20**	**262**	0	109	11	120	**539**
04:45 PM	0	0	0	0	74	65	0	139	64	118	15	197	0	124	8	132	468
05:00 PM	0	0	0	0	89	51	0	140	**78**	145	12	235	0	133	5	138	513
05:15 PM	0	0	0	0	**99**	73	0	**172**	66	114	15	195	0	**140**	**15**	**155**	522
Total Volume	0	0	0	0	346	262	0	608	275	552	62	889	0	506	39	545	2042
% App. Total	0	0	0		56.9	43.1	0		30.9	62.1	7		0	92.8	7.2		
PHF	.000	.000	.000	.000	.874	.897	.000	.884	.881	.789	.775	.848	.000	.904	.650	.879	.947
Cars	0	0	0	0	341	261	0	602	275	547	61	883	0	502	38	540	2025
% Cars	0	0	0	0	98.6	99.6	0	99.0	100	99.1	98.4	99.3	0	99.2	97.4	99.1	99.2
Heavy Vehicles	0	0	0	0	5	1	0	6	0	5	1	6	0	4	1	5	17
% Heavy Vehicles	0	0	0	0	1.4	0.4	0	1.0	0	0.9	1.6	0.7	0	0.8	2.6	0.9	0.8



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N/S: Davol Street SB
E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	83	91	0	3	71	0	0	0	3	1	0	252
07:15 AM	2	108	87	0	2	91	0	0	0	0	3	0	293
07:30 AM	0	104	80	0	5	104	0	0	0	1	1	0	295
07:45 AM	0	132	111	0	6	104	0	0	0	3	4	0	360
Total	2	427	369	0	16	370	0	0	0	7	9	0	1200
08:00 AM	1	107	126	0	3	74	0	0	0	1	3	0	315
08:15 AM	0	100	133	0	3	74	0	0	0	3	1	0	314
08:30 AM	0	96	144	0	7	45	0	0	0	1	3	0	296
08:45 AM	4	94	134	0	3	61	0	0	0	0	0	0	296
Total	5	397	537	0	16	254	0	0	0	5	7	0	1221
Grand Total	7	824	906	0	32	624	0	0	0	12	16	0	2421
Apprch %	0.4	47.4	52.2	0	4.9	95.1	0	0	0	42.9	57.1	0	
Total %	0.3	34	37.4	0	1.3	25.8	0	0	0	0.5	0.7	0	
Cars	7	813	890	0	32	611	0	0	0	12	16	0	2381
% Cars	100	98.7	98.2	0	100	97.9	0	0	0	100	100	0	98.3
Heavy Vehicles	0	11	16	0	0	13	0	0	0	0	0	0	40
% Heavy Vehicles	0	1.3	1.8	0	0	2.1	0	0	0	0	0	0	1.7

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**132**	111	**243**	0	6	**104**	**110**	0	0	0	0	**3**	**4**	0	**7**	**360**
08:00 AM	**1**	107	126	234	0	3	74	77	0	0	0	0	1	3	0	4	315
08:15 AM	0	100	133	233	0	3	74	77	0	0	0	0	3	1	0	4	314
08:30 AM	0	96	**144**	240	0	**7**	45	52	0	0	0	0	1	3	0	4	296
Total Volume	1	435	514	950	0	19	297	316	0	0	0	0	8	11	0	19	1285
% App. Total	0.1	45.8	54.1		0	6	94		0	0	0		42.1	57.9	0		
PHF	.250	.824	.892	.977	.000	.679	.714	.718	.000	.000	.000	.000	.667	.688	.000	.679	.892
Cars	1	425	506	932	0	19	290	309	0	0	0	0	8	11	0	19	1260
% Cars	100	97.7	98.4	98.1	0	100	97.6	97.8	0	0	0	0	100	100	0	100	98.1
Heavy Vehicles	0	10	8	18	0	0	7	7	0	0	0	0	0	0	0	0	25
% Heavy Vehicles	0	2.3	1.6	1.9	0	0	2.4	2.2	0	0	0	0	0	0	0	0	1.9

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	83	90	0	3	71	0	0	0	3	1	0	251
07:15 AM	2	107	84	0	2	90	0	0	0	0	3	0	288
07:30 AM	0	104	79	0	5	100	0	0	0	1	1	0	290
07:45 AM	0	132	110	0	6	101	0	0	0	3	4	0	356
Total	2	426	363	0	16	362	0	0	0	7	9	0	1185
08:00 AM	1	105	124	0	3	74	0	0	0	1	3	0	311
08:15 AM	0	97	129	0	3	70	0	0	0	3	1	0	303
08:30 AM	0	91	143	0	7	45	0	0	0	1	3	0	290
08:45 AM	4	94	131	0	3	60	0	0	0	0	0	0	292
Total	5	387	527	0	16	249	0	0	0	5	7	0	1196
Grand Total	7	813	890	0	32	611	0	0	0	12	16	0	2381
Apprch %	0.4	47.5	52	0	5	95	0	0	0	42.9	57.1	0	
Total %	0.3	34.1	37.4	0	1.3	25.7	0	0	0	0.5	0.7	0	

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	104	79	183	0	5	100	105	0	0	0	0	1	1	0	2	290
07:45 AM	0	**132**	110	**242**	0	**6**	**101**	**107**	0	0	0	0	**3**	**4**	0	**7**	**356**
08:00 AM	**1**	105	124	230	0	3	74	77	0	0	0	0	1	3	0	4	311
08:15 AM	0	97	**129**	226	0	3	70	73	0	0	0	0	3	1	0	4	303
Total Volume	1	438	442	881	0	17	345	362	0	0	0	0	8	9	0	17	1260
% App. Total	0.1	49.7	50.2		0	4.7	95.3		0	0	0		47.1	52.9	0		
PHF	.250	.830	.857	.910	.000	.708	.854	.846	.000	.000	.000	.000	.667	.563	.000	.607	.885

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	1	3	0	0	1	0	0	0	0	0	0	5
07:30 AM	0	0	1	0	0	4	0	0	0	0	0	0	5
07:45 AM	0	0	1	0	0	3	0	0	0	0	0	0	4
Total	0	1	6	0	0	8	0	0	0	0	0	0	15
08:00 AM	0	2	2	0	0	0	0	0	0	0	0	0	4
08:15 AM	0	3	4	0	0	4	0	0	0	0	0	0	11
08:30 AM	0	5	1	0	0	0	0	0	0	0	0	0	6
08:45 AM	0	0	3	0	0	1	0	0	0	0	0	0	4
Total	0	10	10	0	0	5	0	0	0	0	0	0	25
Grand Total	0	11	16	0	0	13	0	0	0	0	0	0	40
Apprch %	0	40.7	59.3	0	0	100	0	0	0	0	0	0	
Total %	0	27.5	40	0	0	32.5	0	0	0	0	0	0	

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	1	1	0	0	3	3	0	0	0	0	0	0	0	0	4
08:00 AM	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
08:15 AM	0	3	**4**	**7**	0	0	**4**	**4**	0	0	0	0	0	0	0	0	**11**
08:30 AM	0	**5**	1	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	10	8	18	0	0	7	7	0	0	0	0	0	0	0	0	25
% App. Total	0	55.6	44.4		0	0	100		0	0	0		0	0	0		
PHF	.000	.500	.500	.643	.000	.000	.438	.438	.000	.000	.000	.000	.000	.000	.000	.000	.568

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
07:15 AM	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	2	6
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	0	0	1	0	3	0	3	0	0	0	0	0	2	0	4	13
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	5	8
Total	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	9	14
Grand Total	0	0	0	2	0	3	0	4	0	0	0	3	0	2	0	13	27
Apprch %	0	0	0	100	0	42.9	0	57.1	0	0	0	100	0	13.3	0	86.7	
Total %	0	0	0	7.4	0	11.1	0	14.8	0	0	0	11.1	0	7.4	0	48.1	

	Davol Street SB From North					President Avenue (Route 6) From East					Davol Street SB From South					President Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:15 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	3
08:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	**5**	**5**	**8**
Total Volume	0	0	0	1	1	0	0	0	1	1	0	0	0	3	3	0	0	0	9	9	14
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.375	.375	.000	.000	.000	.450	.450	.438

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Client: VHB/J. Quitter

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Site Code : 10111.31
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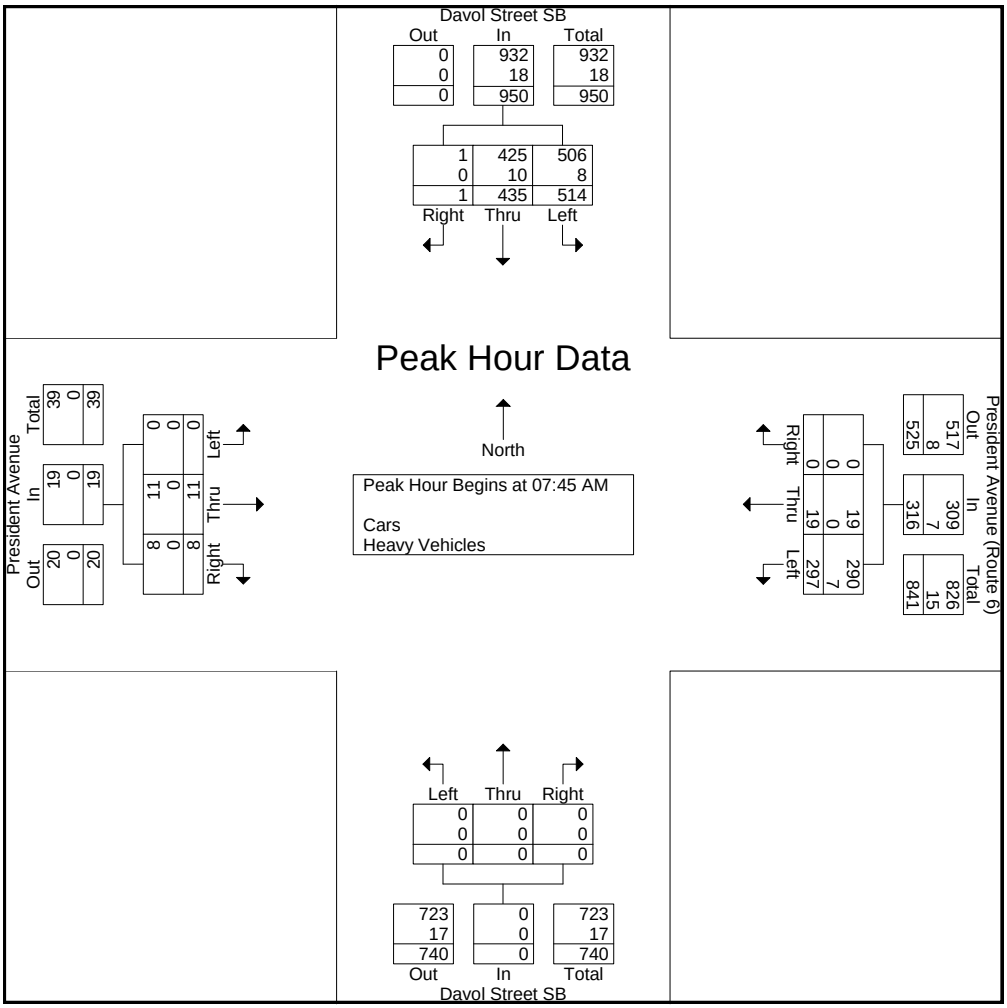
Page No : 1

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**132**	111	**243**	0	6	**104**	**110**	0	0	0	0	**3**	**4**	0	**7**	**360**
08:00 AM	**1**	107	126	234	0	3	74	77	0	0	0	0	1	3	0	4	315
08:15 AM	0	100	133	233	0	3	74	77	0	0	0	0	3	1	0	4	314
08:30 AM	0	96	**144**	240	0	**7**	45	52	0	0	0	0	1	3	0	4	296
Total Volume	1	435	514	950	0	19	297	316	0	0	0	0	8	11	0	19	1285
% App. Total	0.1	45.8	54.1		0	6	94		0	0	0		42.1	57.9	0		
PHF	.250	.824	.892	.977	.000	.679	.714	.718	.000	.000	.000	.000	.667	.688	.000	.679	.892
Cars	1	425	506	932	0	19	290	309	0	0	0	0	8	11	0	19	1260
% Cars	100	97.7	98.4	98.1	0	100	97.6	97.8	0	0	0	0	100	100	0	100	98.1
Heavy Vehicles	0	10	8	18	0	0	7	7	0	0	0	0	0	0	0	0	25
% Heavy Vehicles	0	2.3	1.6	1.9	0	0	2.4	2.2	0	0	0	0	0	0	0	0	1.9



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Client: VHB/J. Quitter

File Name : 81676B-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	118	102	0	2	88	0	0	0	3	4	0	318
04:15 PM	0	113	115	0	5	93	0	0	0	0	0	0	326
04:30 PM	0	131	133	0	0	87	0	0	0	0	0	0	351
04:45 PM	1	111	125	0	0	73	0	0	0	2	0	0	312
Total	2	473	475	0	7	341	0	0	0	5	4	0	1307
05:00 PM	0	143	136	0	1	76	0	0	0	0	1	0	357
05:15 PM	0	94	141	0	2	85	0	0	0	2	5	0	329
05:30 PM	0	84	114	0	3	68	0	0	0	0	1	0	270
05:45 PM	0	95	96	0	5	72	0	0	0	0	1	0	269
Total	0	416	487	0	11	301	0	0	0	2	8	0	1225
Grand Total	2	889	962	0	18	642	0	0	0	7	12	0	2532
Apprch %	0.1	48	51.9	0	2.7	97.3	0	0	0	36.8	63.2	0	
Total %	0.1	35.1	38	0	0.7	25.4	0	0	0	0.3	0.5	0	
Cars	2	870	951	0	18	636	0	0	0	7	12	0	2496
% Cars	100	97.9	98.9	0	100	99.1	0	0	0	100	100	0	98.6
Heavy Vehicles	0	19	11	0	0	6	0	0	0	0	0	0	36
% Heavy Vehicles	0	2.1	1.1	0	0	0.9	0	0	0	0	0	0	1.4

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	131	133	264	0	0	**87**	**87**	0	0	0	0	0	0	0	0	351
04:45 PM	**1**	111	125	237	0	0	73	73	0	0	0	0	**2**	0	0	2	312
05:00 PM	0	**143**	136	**279**	0	1	76	77	0	0	0	0	0	1	0	1	**357**
05:15 PM	0	94	**141**	235	0	**2**	85	87	0	0	0	0	2	**5**	0	**7**	329
Total Volume	1	479	535	1015	0	3	321	324	0	0	0	0	4	6	0	10	1349
% App. Total	0.1	47.2	52.7		0	0.9	99.1		0	0	0		40	60	0		
PHF	.250	.837	.949	.909	.000	.375	.922	.931	.000	.000	.000	.000	.500	.300	.000	.357	.945
Cars	1	465	529	995	0	3	320	323	0	0	0	0	4	6	0	10	1328
% Cars	100	97.1	98.9	98.0	0	100	99.7	99.7	0	0	0	0	100	100	0	100	98.4
Heavy Vehicles	0	14	6	20	0	0	1	1	0	0	0	0	0	0	0	0	21
% Heavy Vehicles	0	2.9	1.1	2.0	0	0	0.3	0.3	0	0	0	0	0	0	0	0	1.6

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	116	102	0	2	84	0	0	0	3	4	0	312
04:15 PM	0	112	114	0	5	92	0	0	0	0	0	0	323
04:30 PM	0	125	131	0	0	87	0	0	0	0	0	0	343
04:45 PM	1	109	123	0	0	73	0	0	0	2	0	0	308
Total	2	462	470	0	7	336	0	0	0	5	4	0	1286
05:00 PM	0	139	134	0	1	76	0	0	0	0	1	0	351
05:15 PM	0	92	141	0	2	84	0	0	0	2	5	0	326
05:30 PM	0	83	112	0	3	68	0	0	0	0	1	0	267
05:45 PM	0	94	94	0	5	72	0	0	0	0	1	0	266
Total	0	408	481	0	11	300	0	0	0	2	8	0	1210
Grand Total	2	870	951	0	18	636	0	0	0	7	12	0	2496
Apprch %	0.1	47.7	52.2	0	2.8	97.2	0	0	0	36.8	63.2	0	
Total %	0.1	34.9	38.1	0	0.7	25.5	0	0	0	0.3	0.5	0	

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	125	131	256	0	0	**87**	**87**	0	0	0	0	0	0	0	0	343
04:45 PM	**1**	109	123	233	0	0	73	73	0	0	0	0	**2**	0	0	2	308
05:00 PM	0	**139**	134	**273**	0	1	76	77	0	0	0	0	0	1	0	1	**351**
05:15 PM	0	92	**141**	233	0	**2**	84	86	0	0	0	0	2	**5**	0	**7**	326
Total Volume	1	465	529	995	0	3	320	323	0	0	0	0	4	6	0	10	1328
% App. Total	0.1	46.7	53.2		0	0.9	99.1		0	0	0		40	60	0		
PHF	.250	.836	.938	.911	.000	.375	.920	.928	.000	.000	.000	.000	.500	.300	.000	.357	.946

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E/W: President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street SB From North			President Avenue (Route 6) From East			Davol Street SB From South			President Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	0	4	0	0	0	0	0	0	6
04:15 PM	0	1	1	0	0	1	0	0	0	0	0	0	3
04:30 PM	0	6	2	0	0	0	0	0	0	0	0	0	8
04:45 PM	0	2	2	0	0	0	0	0	0	0	0	0	4
Total	0	11	5	0	0	5	0	0	0	0	0	0	21
05:00 PM	0	4	2	0	0	0	0	0	0	0	0	0	6
05:15 PM	0	2	0	0	0	1	0	0	0	0	0	0	3
05:30 PM	0	1	2	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	1	2	0	0	0	0	0	0	0	0	0	3
Total	0	8	6	0	0	1	0	0	0	0	0	0	15
Grand Total	0	19	11	0	0	6	0	0	0	0	0	0	36
Apprch %	0	63.3	36.7	0	0	100	0	0	0	0	0	0	
Total %	0	52.8	30.6	0	0	16.7	0	0	0	0	0	0	

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	**4**	**4**	0	0	0	0	0	0	0	0	6
04:15 PM	0	1	1	2	0	0	1	1	0	0	0	0	0	0	0	0	3
04:30 PM	0	**6**	**2**	**8**	0	0	0	0	0	0	0	0	0	0	0	0	**8**
04:45 PM	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	11	5	16	0	0	5	5	0	0	0	0	0	0	0	0	21
% App. Total	0	68.8	31.2		0	0	100		0	0	0		0	0	0		
PHF	.000	.458	.625	.500	.000	.000	.313	.313	.000	.000	.000	.000	.000	.000	.000	.000	.656

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Client: VHB/J. Quitter

File Name : 81676B-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
04:30 PM	0	0	0	6	0	1	0	1	0	0	0	0	0	0	0	0	8
04:45 PM	0	1	0	0	0	1	0	0	0	0	0	2	0	1	0	0	5
Total	0	1	0	7	0	2	0	1	0	0	0	2	0	1	0	1	15
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:30 PM	0	1	0	2	0	0	0	0	0	0	0	2	0	0	0	0	5
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	0	5	0	2	0	0	0	0	0	2	0	0	0	0	10
Grand Total	0	2	0	12	0	4	0	1	0	0	0	4	0	1	0	1	25
Apprch %	0	14.3	0	85.7	0	80	0	20	0	0	0	100	0	50	0	50	
Total %	0	8	0	48	0	16	0	4	0	0	0	16	0	4	0	4	

	Davol Street SB From North					President Avenue (Route 6) From East					Davol Street SB From South					President Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	**6**	**6**	0	**1**	**0**	**1**	**2**	0	0	0	0	0	0	0	0	0	0	**8**
04:45 PM	0	**1**	0	0	1	0	1	0	0	1	0	0	0	**2**	**2**	0	**1**	0	0	**1**	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	1	0	9	10	0	2	0	1	3	0	0	0	2	2	0	1	0	0	1	16
% App. Total	0	10	0	90		0	66.7	0	33.3		0	0	0	100		0	100	0	0		
PHF	.000	.250	.000	.375	.417	.000	.500	.000	.250	.375	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.500

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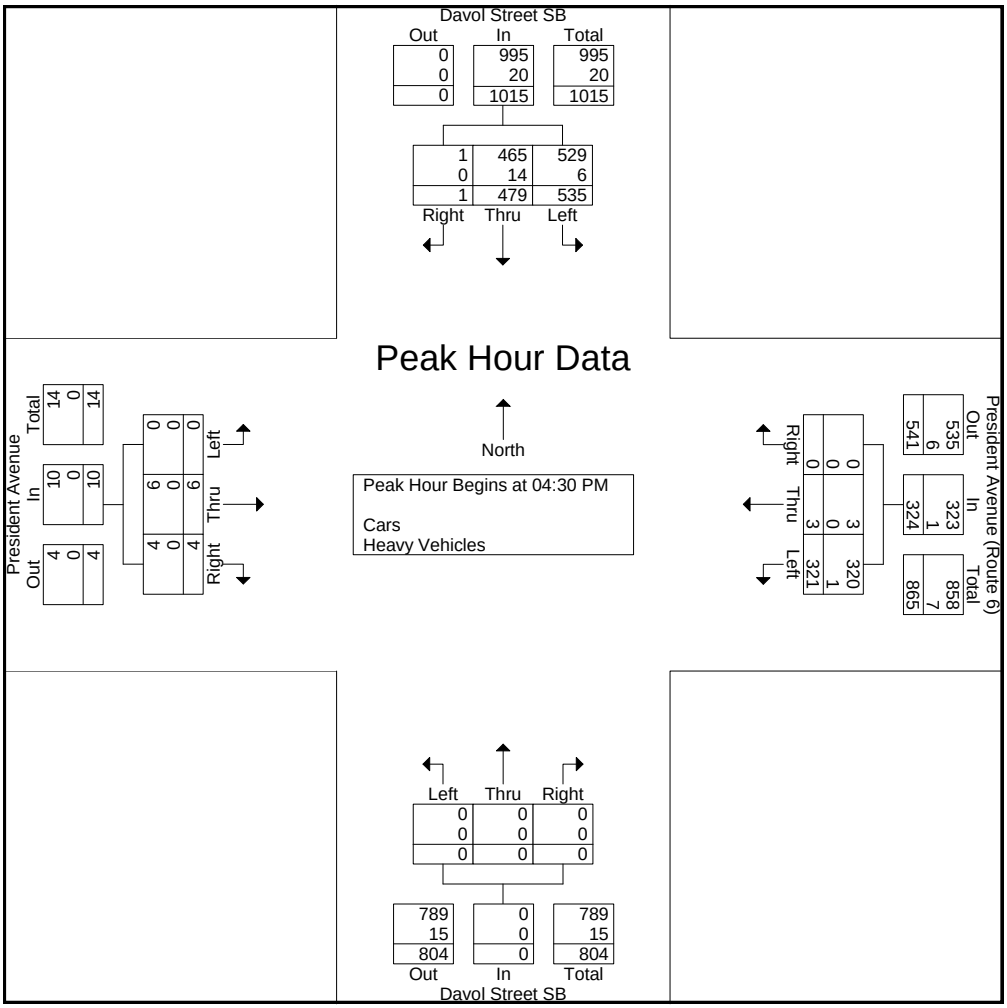
Client: VHB/J. Quitter

File Name : 81676B-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street SB From North				President Avenue (Route 6) From East				Davol Street SB From South				President Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	131	133	264	0	0	**87**	**87**	0	0	0	0	0	0	0	0	351
04:45 PM	**1**	111	125	237	0	0	73	73	0	0	0	0	**2**	0	0	2	312
05:00 PM	0	**143**	136	**279**	0	1	76	77	0	0	0	0	0	1	0	1	**357**
05:15 PM	0	94	**141**	235	0	**2**	85	87	0	0	0	0	2	**5**	0	**7**	329
Total Volume	1	479	535	1015	0	3	321	324	0	0	0	0	4	6	0	10	1349
% App. Total	0.1	47.2	52.7		0	0.9	99.1		0	0	0		40	60	0		
PHF	.250	.837	.949	.909	.000	.375	.922	.931	.000	.000	.000	.000	.500	.300	.000	.357	.945
Cars	1	465	529	995	0	3	320	323	0	0	0	0	4	6	0	10	1328
% Cars	100	97.1	98.9	98.0	0	100	99.7	99.7	0	0	0	0	100	100	0	100	98.4
Heavy Vehicles	0	14	6	20	0	0	1	1	0	0	0	0	0	0	0	0	21
% Heavy Vehicles	0	2.9	1.1	2.0	0	0	0.3	0.3	0	0	0	0	0	0	0	0	1.6



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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	13	0	0	148	161
07:15 AM	0	0	19	0	0	175	194
07:30 AM	0	0	18	0	1	188	207
07:45 AM	0	0	18	0	0	170	188
Total	0	0	68	0	1	681	750
08:00 AM	0	0	15	0	0	152	167
08:15 AM	0	0	9	0	0	147	156
08:30 AM	0	0	11	0	0	146	157
08:45 AM	0	0	8	0	0	142	150
Total	0	0	43	0	0	587	630
Grand Total	0	0	111	0	1	1268	1380
Apprch %	0	0	100	0	0.1	99.9	
Total %	0	0	8	0	0.1	91.9	
Cars	0	0	109	0	1	1221	1331
% Cars	0	0	98.2	0	100	96.3	96.4
Heavy Vehicles	0	0	2	0	0	47	49
% Heavy Vehicles	0	0	1.8	0	0	3.7	3.6

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**19**	0	**19**	0	175	175	194
07:30 AM	0	0	0	18	0	18	**1**	**188**	**189**	**207**
07:45 AM	**0**	**0**	**0**	**18**	**0**	**18**	**0**	**170**	**170**	**188**
08:00 AM	**0**	**0**	**0**	**15**	**0**	**15**	**0**	**152**	**152**	**167**
Total Volume	**0**	**0**	**0**	**70**	**0**	**70**	**1**	**685**	**686**	**756**
% App. Total	**0**	**0**		**100**	**0**		**0.1**	**99.9**		
PHF	**.000**	**.000**	**.000**	**.921**	**.000**	**.921**	**.250**	**.911**	**.907**	**.913**
Cars	**0**	**0**	**0**	**69**	**0**	**69**	**1**	**656**	**657**	**726**
% Cars	**0**	**0**	**0**	**98.6**	**0**	**98.6**	**100**	**95.8**	**95.8**	**96.0**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**29**	**29**	**30**
% Heavy Vehicles	**0**	**0**	**0**	**1.4**	**0**	**1.4**	**0**	**4.2**	**4.2**	**4.0**

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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	13	0	0	144	157
07:15 AM	0	0	18	0	0	164	182
07:30 AM	0	0	18	0	1	182	201
07:45 AM	0	0	18	0	0	163	181
Total	0	0	67	0	1	653	721
08:00 AM	0	0	15	0	0	147	162
08:15 AM	0	0	9	0	0	142	151
08:30 AM	0	0	10	0	0	143	153
08:45 AM	0	0	8	0	0	136	144
Total	0	0	42	0	0	568	610
Grand Total	0	0	109	0	1	1221	1331
Apprch %	0	0	100	0	0.1	99.9	
Total %	0	0	8.2	0	0.1	91.7	

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**18**	0	**18**	0	164	164	182
07:30 AM	0	0	0	18	0	18	**1**	**182**	**183**	**201**
07:45 AM	**0**	**0**	**0**	**18**	**0**	**18**	**0**	**163**	**163**	**181**
08:00 AM	**0**	**0**	**0**	**15**	**0**	**15**	**0**	**147**	**147**	**162**
Total Volume	**0**	**0**	**0**	**69**	**0**	**69**	**1**	**656**	**657**	**726**
% App. Total	**0**	**0**		**100**	**0**		**0.2**	**99.8**		
PHF	**.000**	**.000**	**.000**	**.958**	**.000**	**.958**	**.250**	**.901**	**.898**	**.903**

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File Name : 81676B-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	0	0	0	4	4
07:15 AM	0	0	1	0	0	11	12
07:30 AM	0	0	0	0	0	6	6
07:45 AM	0	0	0	0	0	7	7
Total	0	0	1	0	0	28	29
08:00 AM	0	0	0	0	0	5	5
08:15 AM	0	0	0	0	0	5	5
08:30 AM	0	0	1	0	0	3	4
08:45 AM	0	0	0	0	0	6	6
Total	0	0	1	0	0	19	20
Grand Total	0	0	2	0	0	47	49
Apprch %	0	0	100	0	0	100	
Total %	0	0	4.1	0	0	95.9	

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**1**	0	**1**	0	**11**	**11**	**12**
07:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**6**	**6**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**7**	**7**
08:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**5**
Total Volume	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**29**	**29**	**30**
% App. Total	**0**	**0**		**100**	**0**		**0**	**100**		
PHF	**.000**	**.000**	**.000**	**.250**	**.000**	**.250**	**.000**	**.659**	**.659**	**.625**

PRECISION
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N/S: Davol Street NB
E: Pearce Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	2	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	2	0	0	0	2
Apprch %	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	

	Davol Street NB From North				Pearce Street From East				Davol Street NB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	2	2	0	0	0	0	2
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

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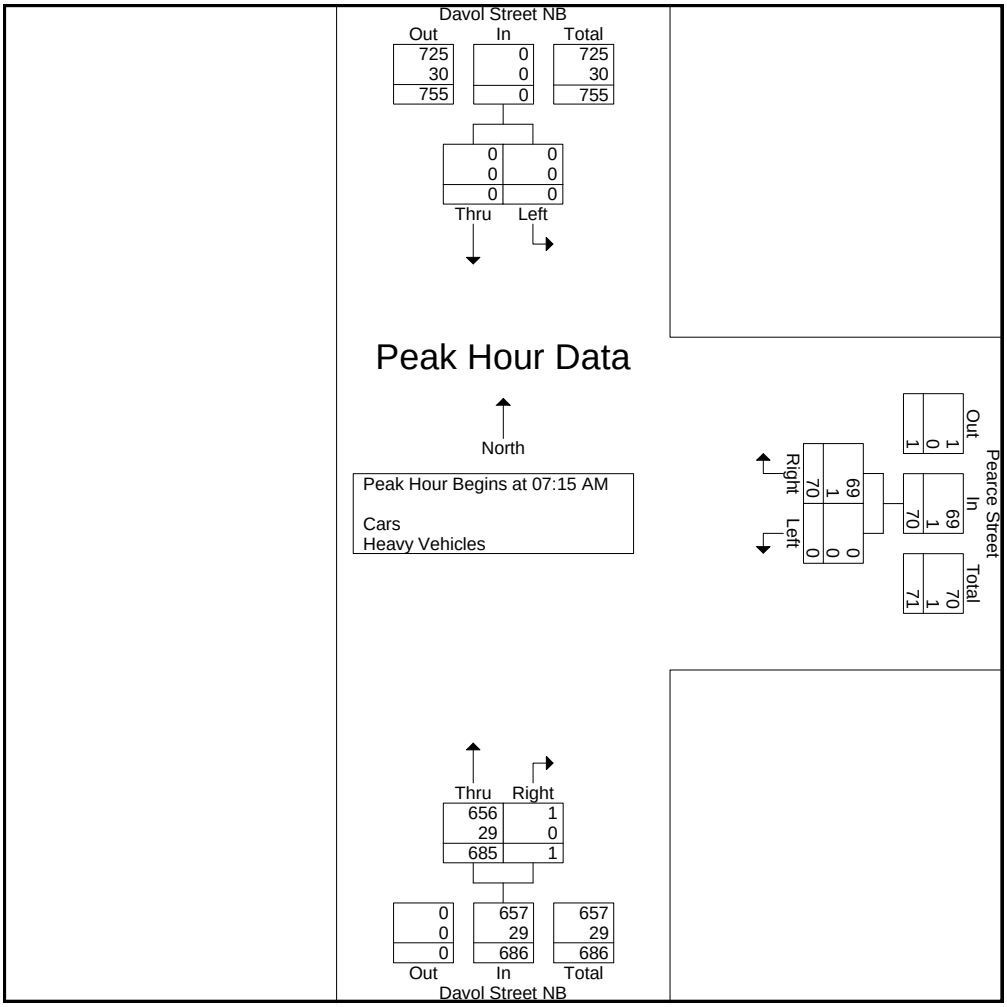
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**19**	0	**19**	0	175	175	194
07:30 AM	0	0	0	18	0	18	**1**	**188**	**189**	**207**
07:45 AM	**0**	**0**	**0**	**18**	**0**	**18**	**0**	**170**	**170**	**188**
08:00 AM	**0**	**0**	**0**	**15**	**0**	**15**	**0**	**152**	**152**	**167**
Total Volume	**0**	**0**	**0**	**70**	**0**	**70**	**1**	**685**	**686**	**756**
% App. Total	**0**	**0**		**100**	**0**		**0.1**	**99.9**		
PHF	**.000**	**.000**	**.000**	**.921**	**.000**	**.921**	**.250**	**.911**	**.907**	**.913**
Cars	**0**	**0**	**0**	**69**	**0**	**69**	**1**	**656**	**657**	**726**
% Cars	**0**	**0**	**0**	**98.6**	**0**	**98.6**	**100**	**95.8**	**95.8**	**96.0**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**29**	**29**	**30**
% Heavy Vehicles	**0**	**0**	**0**	**1.4**	**0**	**1.4**	**0**	**4.2**	**4.2**	**4.0**



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Client: VHB/J. Quitter

File Name : 81676B-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	15	0	0	222	237
04:15 PM	0	0	26	0	0	198	224
04:30 PM	0	0	15	0	0	248	263
04:45 PM	0	0	12	0	0	176	188
Total	0	0	68	0	0	844	912
05:00 PM	0	0	17	0	0	232	249
05:15 PM	0	0	12	0	0	182	194
05:30 PM	0	0	9	0	0	175	184
05:45 PM	0	0	11	0	1	158	170
Total	0	0	49	0	1	747	797
Grand Total	0	0	117	0	1	1591	1709
Apprch %	0	0	100	0	0.1	99.9	
Total %	0	0	6.8	0	0.1	93.1	
Cars	0	0	116	0	1	1568	1685
% Cars	0	0	99.1	0	100	98.6	98.6
Heavy Vehicles	0	0	1	0	0	23	24
% Heavy Vehicles	0	0	0.9	0	0	1.4	1.4

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	**26**	0	**26**	0	198	198	224
04:30 PM	0	0	0	15	0	15	0	**248**	**248**	**263**
04:45 PM	**0**	**0**	**0**	**12**	**0**	**12**	**0**	**176**	**176**	**188**
05:00 PM	**0**	**0**	**0**	**17**	**0**	**17**	**0**	**232**	**232**	**249**
Total Volume	**0**	**0**	**0**	**70**	**0**	**70**	**0**	**854**	**854**	**924**
% App. Total	**0**	**0**		**100**	**0**		**0**	**100**		
PHF	**.000**	**.000**	**.000**	**.673**	**.000**	**.673**	**.000**	**.861**	**.861**	**.878**
Cars	**0**	**0**	**0**	**69**	**0**	**69**	**0**	**845**	**845**	**914**
% Cars	**0**	**0**	**0**	**98.6**	**0**	**98.6**	**0**	**98.9**	**98.9**	**98.9**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**9**	**9**	**10**
% Heavy Vehicles	**0**	**0**	**0**	**1.4**	**0**	**1.4**	**0**	**1.1**	**1.1**	**1.1**

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File Name : 81676B-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	15	0	0	215	230
04:15 PM	0	0	26	0	0	193	219
04:30 PM	0	0	15	0	0	248	263
04:45 PM	0	0	12	0	0	174	186
Total	0	0	68	0	0	830	898
05:00 PM	0	0	16	0	0	230	246
05:15 PM	0	0	12	0	0	181	193
05:30 PM	0	0	9	0	0	174	183
05:45 PM	0	0	11	0	1	153	165
Total	0	0	48	0	1	738	787
Grand Total	0	0	116	0	1	1568	1685
Apprch %	0	0	100	0	0.1	99.9	
Total %	0	0	6.9	0	0.1	93.1	

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	**26**	0	**26**	0	193	193	219
04:30 PM	0	0	0	15	0	15	0	**248**	**248**	**263**
04:45 PM	**0**	**0**	**0**	**12**	**0**	**12**	**0**	**174**	**174**	**186**
05:00 PM	**0**	**0**	**0**	**16**	**0**	**16**	**0**	**230**	**230**	**246**
Total Volume	**0**	**0**	**0**	**69**	**0**	**69**	**0**	**845**	**845**	**914**
% App. Total	**0**	**0**		**100**	**0**		**0**	**100**		
PHF	**.000**	**.000**	**.000**	**.663**	**.000**	**.663**	**.000**	**.852**	**.852**	**.869**

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File Name : 81676B-DDD
Site Code : 10111.31
Start Date : 9/9/2008

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Pearce Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	0	0	0	7	7
04:15 PM	0	0	0	0	0	5	5
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	2	2
Total	0	0	0	0	0	14	14
05:00 PM	0	0	1	0	0	2	3
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	5	5
Total	0	0	1	0	0	9	10
Grand Total	0	0	1	0	0	23	24
Apprch %	0	0	100	0	0	100	
Total %	0	0	4.2	0	0	95.8	

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	7	7	7
04:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**5**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**
Total Volume	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**14**	**14**
% App. Total	**0**	**0**		**0**	**0**		**0**	**100**		
PHF	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.500**	**.500**	**.500**

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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2
05:00 PM	0	0	0	0	0	1	0	0	0	1
05:15 PM	0	0	0	0	0	1	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	3	0	0	0	3
Grand Total	0	0	0	0	0	5	0	0	0	5
Apprch %	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	

	Davol Street NB From North				Pearce Street From East				Davol Street NB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	3	3	0	0	0	0	3
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.750	.000	.000	.000	.000	.750

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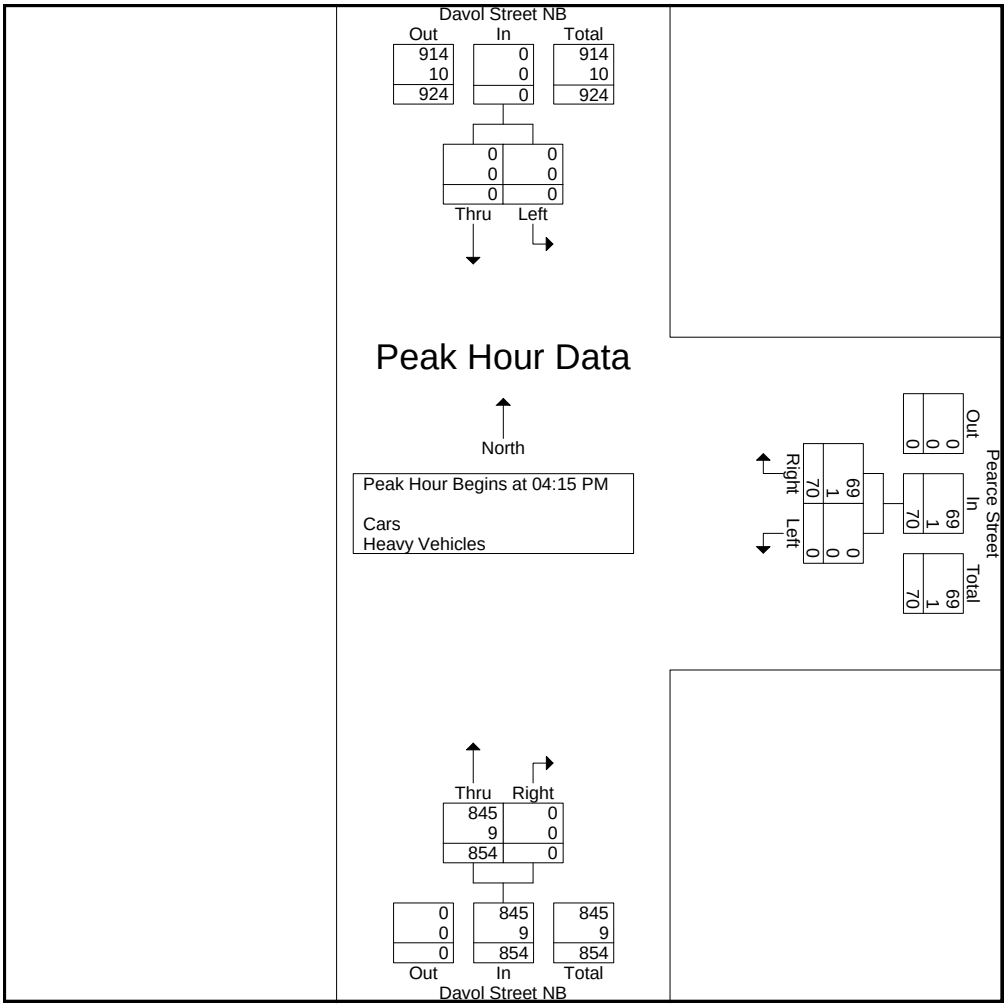
Page No : 1

	Davol Street NB From North			Pearce Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	**26**	0	**26**	0	198	198	224
04:30 PM	0	0	0	15	0	15	0	**248**	**248**	**263**
04:45 PM	**0**	**0**	**0**	**12**	**0**	**12**	**0**	**176**	**176**	**188**
05:00 PM	**0**	**0**	**0**	**17**	**0**	**17**	**0**	**232**	**232**	**249**
Total Volume	**0**	**0**	**0**	**70**	**0**	**70**	**0**	**854**	**854**	**924**
% App. Total	**0**	**0**		**100**	**0**		**0**	**100**		
PHF	**.000**	**.000**	**.000**	**.673**	**.000**	**.673**	**.000**	**.861**	**.861**	**.878**
Cars	**0**	**0**	**0**	**69**	**0**	**69**	**0**	**845**	**845**	**914**
% Cars	**0**	**0**	**0**	**98.6**	**0**	**98.6**	**0**	**98.9**	**98.9**	**98.9**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**9**	**9**	**10**
% Heavy Vehicles	**0**	**0**	**0**	**1.4**	**0**	**1.4**	**0**	**1.1**	**1.1**	**1.1**



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E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-E
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	1	0	27	149	177
07:15 AM	0	0	17	0	39	156	212
07:30 AM	0	0	12	0	35	180	227
07:45 AM	0	0	11	0	56	172	239
Total	0	0	41	0	157	657	855
08:00 AM	0	0	6	0	32	161	199
08:15 AM	0	0	1	0	43	145	189
08:30 AM	0	0	6	0	34	145	185
08:45 AM	0	0	6	0	28	136	170
Total	0	0	19	0	137	587	743
Grand Total	0	0	60	0	294	1244	1598
Apprch %	0	0	100	0	19.1	80.9	
Total %	0	0	3.8	0	18.4	77.8	
Cars	0	0	56	0	288	1201	1545
% Cars	0	0	93.3	0	98	96.5	96.7
Heavy Vehicles	0	0	4	0	6	43	53
% Heavy Vehicles	0	0	6.7	0	2	3.5	3.3

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**17**	0	**17**	39	156	195	212
07:30 AM	0	0	0	12	0	12	35	**180**	215	227
07:45 AM	0	0	0	11	0	11	**56**	172	**228**	**239**
08:00 AM	**0**	**0**	**0**	**6**	**0**	**6**	**32**	**161**	**193**	**199**
Total Volume	**0**	**0**	**0**	**46**	**0**	**46**	**162**	**669**	**831**	**877**
% App. Total	**0**	**0**		**100**	**0**		**19.5**	**80.5**		
PHF	**.000**	**.000**	**.000**	**.676**	**.000**	**.676**	**.723**	**.929**	**.911**	**.917**
Cars	**0**	**0**	**0**	**42**	**0**	**42**	**158**	**641**	**799**	**841**
% Cars	**0**	**0**	**0**	**91.3**	**0**	**91.3**	**97.5**	**95.8**	**96.1**	**95.9**
Heavy Vehicles	**0**	**0**	**0**	**4**	**0**	**4**	**4**	**28**	**32**	**36**
% Heavy Vehicles	**0**	**0**	**0**	**8.7**	**0**	**8.7**	**2.5**	**4.2**	**3.9**	**4.1**

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File Name : 81676B-E
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	1	0	27	145	173
07:15 AM	0	0	16	0	36	145	197
07:30 AM	0	0	10	0	35	176	221
07:45 AM	0	0	11	0	55	164	230
Total	0	0	38	0	153	630	821
08:00 AM	0	0	5	0	32	156	193
08:15 AM	0	0	1	0	43	143	187
08:30 AM	0	0	6	0	33	142	181
08:45 AM	0	0	6	0	27	130	163
Total	0	0	18	0	135	571	724
Grand Total	0	0	56	0	288	1201	1545
Apprch %	0	0	100	0	19.3	80.7	
Total %	0	0	3.6	0	18.6	77.7	

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**16**	0	**16**	36	145	181	197
07:30 AM	0	0	0	10	0	10	35	**176**	211	221
07:45 AM	0	0	0	11	0	11	**55**	164	**219**	**230**
08:00 AM	**0**	**0**	**0**	**5**	**0**	**5**	**32**	**156**	**188**	**193**
Total Volume	**0**	**0**	**0**	**42**	**0**	**42**	**158**	**641**	**799**	**841**
% App. Total	**0**	**0**		**100**	**0**		**19.8**	**80.2**		
PHF	**.000**	**.000**	**.000**	**.656**	**.000**	**.656**	**.718**	**.911**	**.912**	**.914**

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N/S: Davol Street NB
E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-E
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	0	0	0	4	4
07:15 AM	0	0	1	0	3	11	15
07:30 AM	0	0	2	0	0	4	6
07:45 AM	0	0	0	0	1	8	9
Total	0	0	3	0	4	27	34
08:00 AM	0	0	1	0	0	5	6
08:15 AM	0	0	0	0	0	2	2
08:30 AM	0	0	0	0	1	3	4
08:45 AM	0	0	0	0	1	6	7
Total	0	0	1	0	2	16	19
Grand Total	0	0	4	0	6	43	53
Apprch %	0	0	100	0	12.2	87.8	
Total %	0	0	7.5	0	11.3	81.1	

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	1	0	1	**3**	**11**	**14**	**15**
07:30 AM	**0**	**0**	**0**	**2**	0	**2**	0	4	4	6
07:45 AM	0	0	0	0	0	0	1	8	9	9
08:00 AM	0	0	0	1	0	1	0	5	5	6
Total Volume	0	0	0	4	0	4	4	28	32	36
% App. Total	0	0		100	0		12.5	87.5		
PHF	.000	.000	.000	.500	.000	.500	.333	.636	.571	.600

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N/S: Davol Street NB
E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-E
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	1	0	0	0	1
Apprch %	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	

	Davol Street NB From North				Turner Street From East				Davol Street NB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	1	0	0	0	0	1
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

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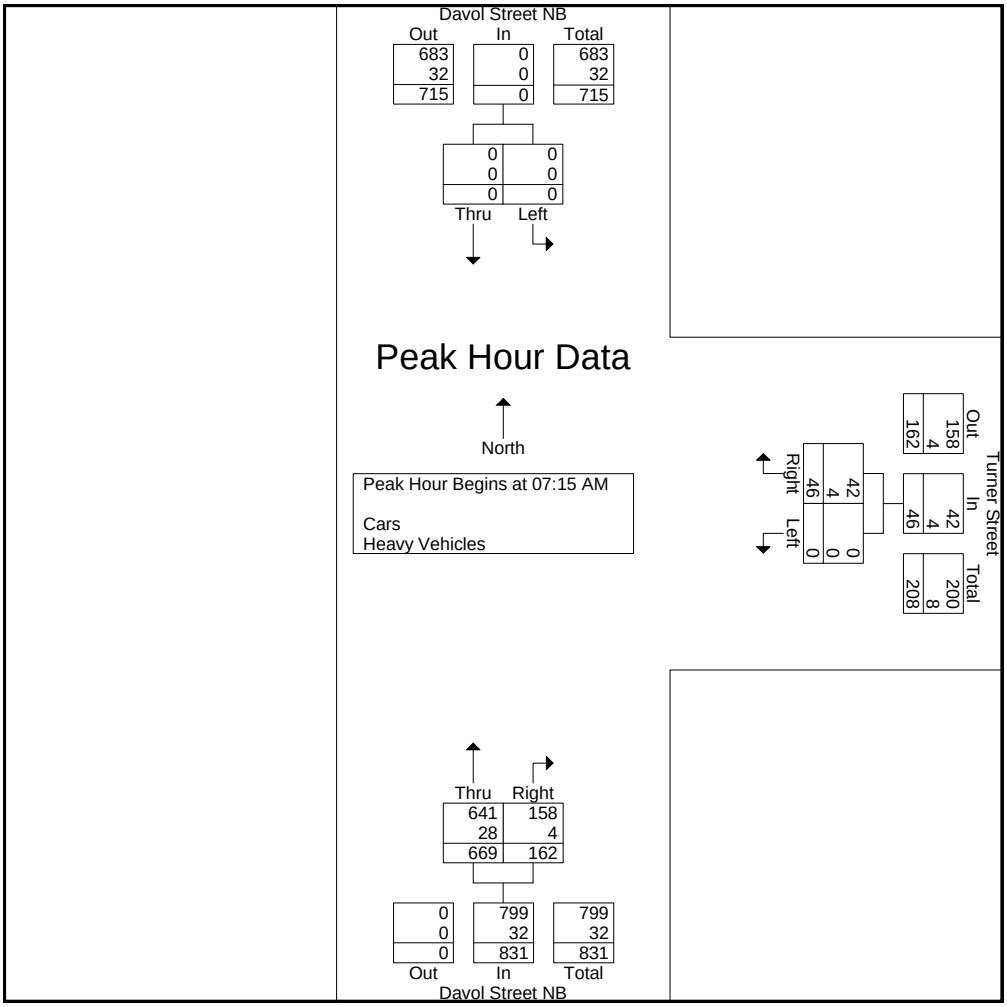
E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-E
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**17**	0	**17**	39	156	195	212
07:30 AM	0	0	0	12	0	12	35	**180**	215	227
07:45 AM	0	0	0	11	0	11	**56**	172	**228**	**239**
08:00 AM	**0**	**0**	**0**	**6**	**0**	**6**	**32**	**161**	**193**	**199**
Total Volume	**0**	**0**	**0**	**46**	**0**	**46**	**162**	**669**	**831**	**877**
% App. Total	**0**	**0**		**100**	**0**		**19.5**	**80.5**		
PHF	**.000**	**.000**	**.000**	**.676**	**.000**	**.676**	**.723**	**.929**	**.911**	**.917**
Cars	**0**	**0**	**0**	**42**	**0**	**42**	**158**	**641**	**799**	**841**
% Cars	**0**	**0**	**0**	**91.3**	**0**	**91.3**	**97.5**	**95.8**	**96.1**	**95.9**
Heavy Vehicles	**0**	**0**	**0**	**4**	**0**	**4**	**4**	**28**	**32**	**36**
% Heavy Vehicles	**0**	**0**	**0**	**8.7**	**0**	**8.7**	**2.5**	**4.2**	**3.9**	**4.1**



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E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-EEE
Site Code : 10111.31
Start Date : 9/9/2008

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	16	0	28	199	243
04:15 PM	0	0	15	0	30	187	232
04:30 PM	0	0	27	0	33	215	275
04:45 PM	0	0	8	0	27	166	201
Total	0	0	66	0	118	767	951
05:00 PM	0	0	10	0	27	212	249
05:15 PM	0	0	5	0	32	185	222
05:30 PM	0	0	9	0	18	156	183
05:45 PM	0	0	9	0	21	145	175
Total	0	0	33	0	98	698	829
Grand Total	0	0	99	0	216	1465	1780
Apprch %	0	0	100	0	12.8	87.2	
Total %	0	0	5.6	0	12.1	82.3	
Cars	0	0	98	0	215	1447	1760
% Cars	0	0	99	0	99.5	98.8	98.9
Heavy Vehicles	0	0	1	0	1	18	20
% Heavy Vehicles	0	0	1	0	0.5	1.2	1.1

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	15	0	15	30	187	217	232
04:30 PM	0	0	0	**27**	0	**27**	**33**	**215**	**248**	**275**
04:45 PM	**0**	**0**	**0**	**8**	**0**	**8**	**27**	**166**	**193**	**201**
05:00 PM	**0**	**0**	**0**	**10**	**0**	**10**	**27**	**212**	**239**	**249**
Total Volume	**0**	**0**	**0**	**60**	**0**	**60**	**117**	**780**	**897**	**957**
% App. Total	**0**	**0**		**100**	**0**		**13**	**87**		
PHF	**.000**	**.000**	**.000**	**.556**	**.000**	**.556**	**.886**	**.907**	**.904**	**.870**
Cars	**0**	**0**	**0**	**59**	**0**	**59**	**116**	**772**	**888**	**947**
% Cars	**0**	**0**	**0**	**98.3**	**0**	**98.3**	**99.1**	**99.0**	**99.0**	**99.0**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**8**	**9**	**10**
% Heavy Vehicles	**0**	**0**	**0**	**1.7**	**0**	**1.7**	**0.9**	**1.0**	**1.0**	**1.0**

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E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-EEE
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	16	0	28	194	238
04:15 PM	0	0	15	0	30	182	227
04:30 PM	0	0	27	0	32	214	273
04:45 PM	0	0	7	0	27	165	199
Total	0	0	65	0	117	755	937
05:00 PM	0	0	10	0	27	211	248
05:15 PM	0	0	5	0	32	184	221
05:30 PM	0	0	9	0	18	155	182
05:45 PM	0	0	9	0	21	142	172
Total	0	0	33	0	98	692	823
Grand Total	0	0	98	0	215	1447	1760
Apprch %	0	0	100	0	12.9	87.1	
Total %	0	0	5.6	0	12.2	82.2	

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	15	0	15	30	182	212	227
04:30 PM	0	0	0	**27**	0	**27**	**32**	**214**	**246**	**273**
04:45 PM	**0**	**0**	**0**	**7**	**0**	**7**	**27**	**165**	**192**	**199**
05:00 PM	**0**	**0**	**0**	**10**	**0**	**10**	**27**	**211**	**238**	**248**
Total Volume	**0**	**0**	**0**	**59**	**0**	**59**	**116**	**772**	**888**	**947**
% App. Total	**0**	**0**		**100**	**0**		**13.1**	**86.9**		
PHF	**.000**	**.000**	**.000**	**.546**	**.000**	**.546**	**.906**	**.902**	**.902**	**.867**

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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-EEE
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Turner Street From East		Davol Street NB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	0	0	0	5	5
04:15 PM	0	0	0	0	0	5	5
04:30 PM	0	0	0	0	1	1	2
04:45 PM	0	0	1	0	0	1	2
Total	0	0	1	0	1	12	14
05:00 PM	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	3	3
Total	0	0	0	0	0	6	6
Grand Total	0	0	1	0	1	18	20
Apprch %	0	0	100	0	5.3	94.7	
Total %	0	0	5	0	5	90	

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	**5**	**5**	**5**
04:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**5**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1	2	2
04:45 PM	0	0	0	**1**	0	**1**	0	1	1	2
Total Volume	0	0	0	1	0	1	1	12	13	14
% App. Total	0	0		100	0		7.7	92.3		
PHF	.000	.000	.000	.250	.000	.250	.250	.600	.650	.700

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E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-EEE
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	1	0	0	2
05:30 PM	0	0	0	0	0	1	0	0	0	1
05:45 PM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	3	1	0	0	4
Grand Total	0	0	0	0	0	4	1	0	0	5
Apprch %	0	0	0	0	0	100	100	0	0	
Total %	0	0	0	0	0	80	20	0	0	

	Davol Street NB From North				Turner Street From East				Davol Street NB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	**1**	**1**	**1**	0	0	**1**	**2**
05:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	3	3	1	0	0	1	4
% App. Total	0	0	0		0	0	100		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.750	.250	.000	.000	.250	.500

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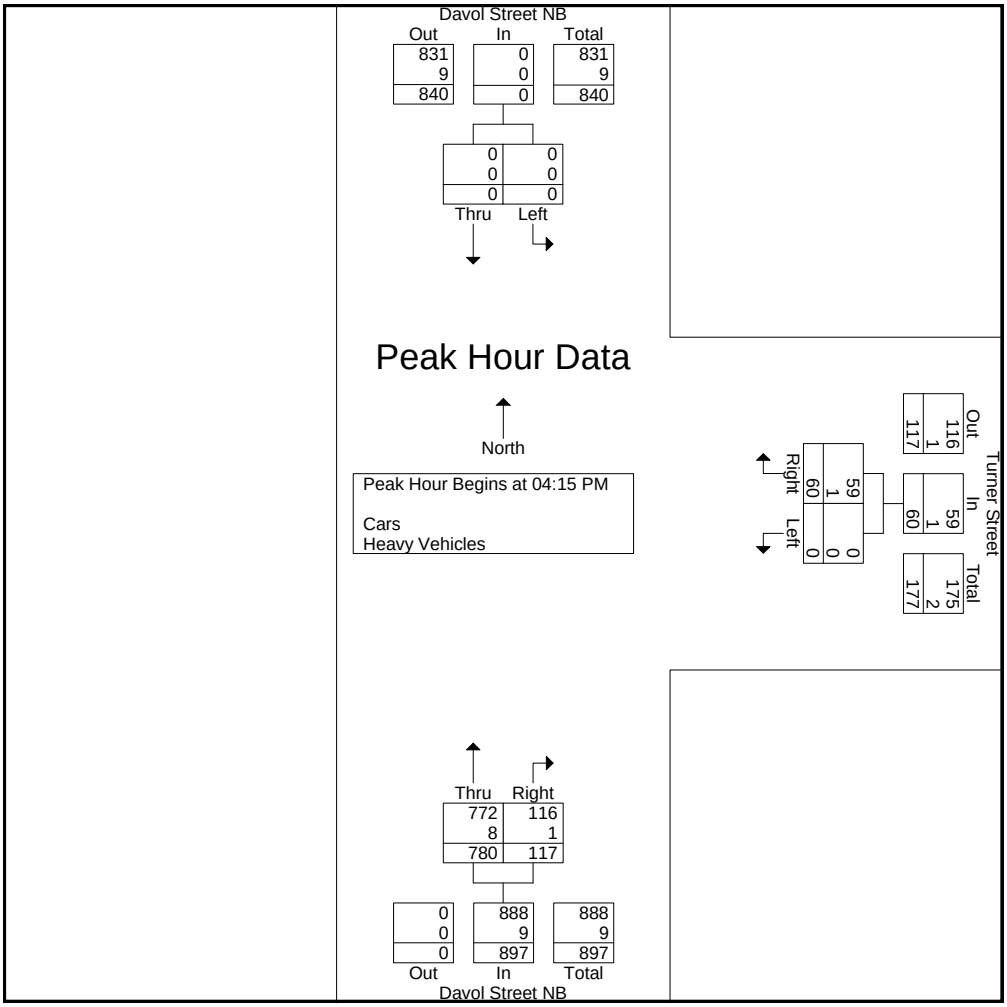
E: Turner Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-EEE
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North			Turner Street From East			Davol Street NB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	15	0	15	30	187	217	232
04:30 PM	0	0	0	**27**	0	**27**	**33**	**215**	**248**	**275**
04:45 PM	**0**	**0**	**0**	**8**	**0**	**8**	**27**	**166**	**193**	**201**
05:00 PM	**0**	**0**	**0**	**10**	**0**	**10**	**27**	**212**	**239**	**249**
Total Volume	**0**	**0**	**0**	**60**	**0**	**60**	**117**	**780**	**897**	**957**
% App. Total	**0**	**0**		**100**	**0**		**13**	**87**		
PHF	**.000**	**.000**	**.000**	**.556**	**.000**	**.556**	**.886**	**.907**	**.904**	**.870**
Cars	**0**	**0**	**0**	**59**	**0**	**59**	**116**	**772**	**888**	**947**
% Cars	**0**	**0**	**0**	**98.3**	**0**	**98.3**	**99.1**	**99.0**	**99.0**	**99.0**
Heavy Vehicles	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**8**	**9**	**10**
% Heavy Vehicles	**0**	**0**	**0**	**1.7**	**0**	**1.7**	**0.9**	**1.0**	**1.0**	**1.0**



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W: UTurn to/from Davol Street SB
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-F
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	0	160	5	0	14	179
07:15 AM	0	0	177	3	0	23	203
07:30 AM	0	0	198	4	0	19	221
07:45 AM	0	0	166	8	0	34	208
Total	0	0	701	20	0	90	811
08:00 AM	0	0	166	6	0	22	194
08:15 AM	0	0	146	10	0	29	185
08:30 AM	0	0	158	17	0	26	201
08:45 AM	0	0	141	6	0	18	165
Total	0	0	611	39	0	95	745
Grand Total	0	0	1312	59	0	185	1556
Apprch %	0	0	95.7	4.3	0	100	
Total %	0	0	84.3	3.8	0	11.9	
Cars	0	0	1270	54	0	182	1506
% Cars	0	0	96.8	91.5	0	98.4	96.8
Heavy Vehicles	0	0	42	5	0	3	50
% Heavy Vehicles	0	0	3.2	8.5	0	1.6	3.2

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	177	3	180	0	23	23	203
07:30 AM	0	0	0	**198**	4	**202**	0	19	19	**221**
07:45 AM	**0**	**0**	**0**	**166**	**8**	174	0	**34**	**34**	208
08:00 AM	0	0	0	166	6	172	0	22	22	194
Total Volume	0	0	0	707	21	728	0	98	98	826
% App. Total	0	0		97.1	2.9		0	100		
PHF	.000	.000	.000	.893	.656	.901	.000	.721	.721	.934
Cars	0	0	0	683	18	701	0	97	97	798
% Cars	0	0	0	96.6	85.7	96.3	0	99.0	99.0	96.6
Heavy Vehicles	0	0	0	24	3	27	0	1	1	28
% Heavy Vehicles	0	0	0	3.4	14.3	3.7	0	1.0	1.0	3.4

PRECISION
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N/S: Davol Street NB
W: UTurn to/from Davol Street SB
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-F
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	0	157	5	0	14	176
07:15 AM	0	0	166	1	0	23	190
07:30 AM	0	0	193	3	0	19	215
07:45 AM	0	0	162	8	0	33	203
Total	0	0	678	17	0	89	784
08:00 AM	0	0	162	6	0	22	190
08:15 AM	0	0	142	10	0	29	181
08:30 AM	0	0	154	16	0	25	195
08:45 AM	0	0	134	5	0	17	156
Total	0	0	592	37	0	93	722
Grand Total	0	0	1270	54	0	182	1506
Apprch %	0	0	95.9	4.1	0	100	
Total %	0	0	84.3	3.6	0	12.1	

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	166	1	167	0	23	23	190
07:30 AM	0	0	0	**193**	3	**196**	0	19	19	**215**
07:45 AM	**0**	**0**	**0**	**162**	**8**	170	0	**33**	**33**	203
08:00 AM	0	0	0	162	6	168	0	22	22	190
Total Volume	0	0	0	683	18	701	0	97	97	798
% App. Total	0	0		97.4	2.6		0	100		
PHF	.000	.000	.000	.885	.563	.894	.000	.735	.735	.928

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Client: VHB/J. Quitter

File Name : 81676B-F
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	0	3	0	0	0	3
07:15 AM	0	0	11	2	0	0	13
07:30 AM	0	0	5	1	0	0	6
07:45 AM	0	0	4	0	0	1	5
Total	0	0	23	3	0	1	27
08:00 AM	0	0	4	0	0	0	4
08:15 AM	0	0	4	0	0	0	4
08:30 AM	0	0	4	1	0	1	6
08:45 AM	0	0	7	1	0	1	9
Total	0	0	19	2	0	2	23
Grand Total	0	0	42	5	0	3	50
Apprch %	0	0	89.4	10.6	0	100	
Total %	0	0	84	10	0	6	

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	**11**	**2**	**13**	0	0	0	**13**
07:30 AM	**0**	**0**	**0**	**5**	**1**	**6**	**0**	**0**	**0**	**6**
07:45 AM	**0**	**0**	**0**	**4**	**0**	**4**	**0**	**1**	**1**	5
08:00 AM	0	0	0	4	0	4	0	0	0	4
Total Volume	0	0	0	24	3	27	0	1	1	28
% App. Total	0	0		88.9	11.1		0	100		
PHF	.000	.000	.000	.545	.375	.519	.000	.250	.250	.538

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File Name : 81676B-F
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	1	0	0	0	0	1	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	1	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	0	0	0	1	0	2
Apprch %	0	0	100	0	0	0	0	100	0	
Total %	0	0	50	0	0	0	0	50	0	

	Davol Street NB From North				Davol Street NB From South				UTurn to/from Davol Street SB From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	**1**	**1**	0	0	0	0	0	**1**	**0**	**1**	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	0	0	0	0	1	0	1	2
% App. Total	0	0	100		0	0	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250	.000	.250	.250

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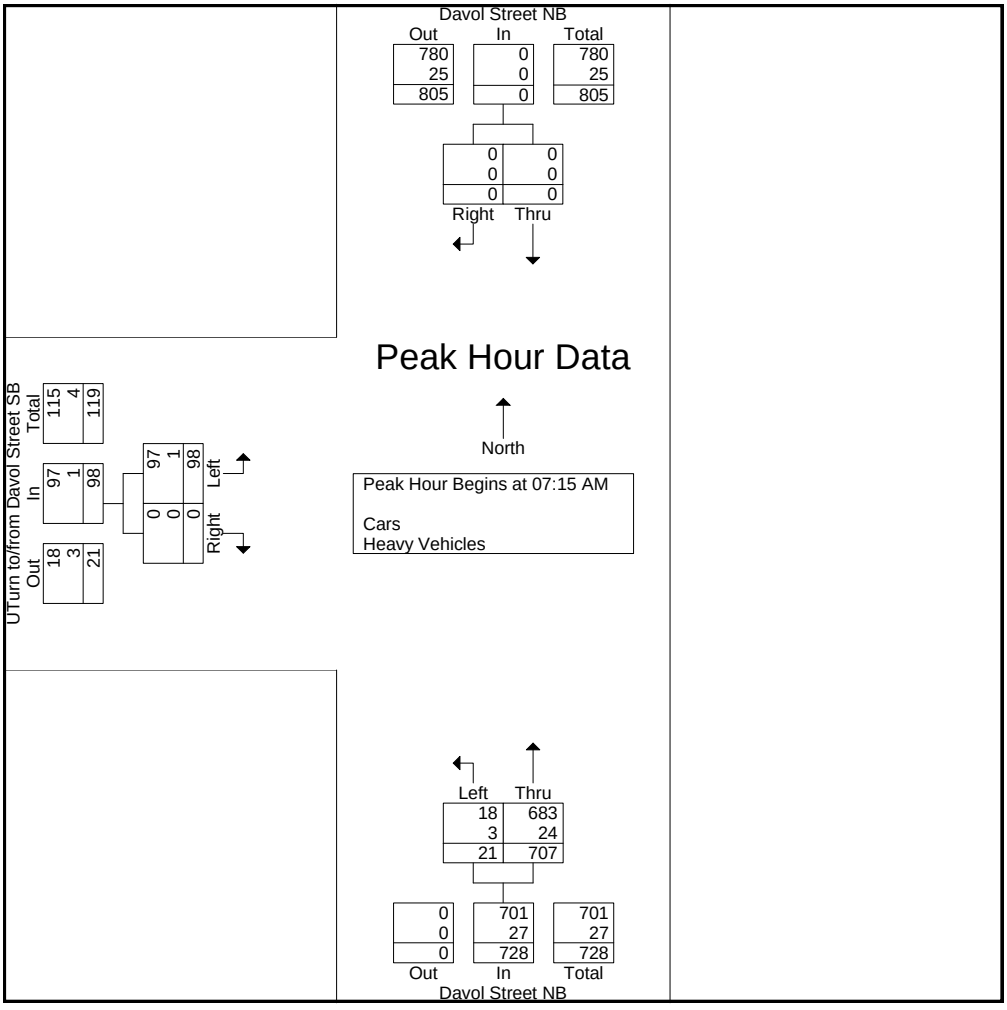
File Name : 81676B-F
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	177	3	180	0	23	23	203
07:30 AM	0	0	0	**198**	4	**202**	0	19	19	**221**
07:45 AM	**0**	**0**	**0**	**166**	**8**	174	0	**34**	**34**	208
08:00 AM	0	0	0	166	6	172	0	22	22	194
Total Volume	0	0	0	707	21	728	0	98	98	826
% App. Total	0	0		97.1	2.9		0	100		
PHF	.000	.000	.000	.893	.656	.901	.000	.721	.721	.934
Cars	0	0	0	683	18	701	0	97	97	798
% Cars	0	0	0	96.6	85.7	96.3	0	99.0	99.0	96.6
Heavy Vehicles	0	0	0	24	3	27	0	1	1	28
% Heavy Vehicles	0	0	0	3.4	14.3	3.7	0	1.0	1.0	3.4



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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-FFF
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	0	0	227	9	0	17	253
04:15 PM	0	0	194	10	0	13	217
04:30 PM	0	0	233	3	0	19	255
04:45 PM	0	0	164	6	0	19	189
Total	0	0	818	28	0	68	914
05:00 PM	0	0	232	2	0	20	254
05:15 PM	0	0	191	8	0	17	216
05:30 PM	0	0	165	3	0	12	180
05:45 PM	0	0	150	6	0	12	168
Total	0	0	738	19	0	61	818
Grand Total	0	0	1556	47	0	129	1732
Apprch %	0	0	97.1	2.9	0	100	
Total %	0	0	89.8	2.7	0	7.4	
Cars	0	0	1541	44	0	126	1711
% Cars	0	0	99	93.6	0	97.7	98.8
Heavy Vehicles	0	0	15	3	0	3	21
% Heavy Vehicles	0	0	1	6.4	0	2.3	1.2

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	194	**10**	204	0	13	13	217
04:30 PM	0	0	0	**233**	3	**236**	0	19	19	**255**
04:45 PM	**0**	**0**	**0**	**164**	**6**	**170**	**0**	**19**	**19**	**189**
05:00 PM	**0**	**0**	**0**	**232**	**2**	**234**	**0**	**20**	**20**	254
Total Volume	0	0	0	823	21	844	0	71	71	915
% App. Total	0	0		97.5	2.5		0	100		
PHF	.000	.000	.000	.883	.525	.894	.000	.888	.888	.897
Cars	0	0	0	817	19	836	0	69	69	905
% Cars	0	0	0	99.3	90.5	99.1	0	97.2	97.2	98.9
Heavy Vehicles	0	0	0	6	2	8	0	2	2	10
% Heavy Vehicles	0	0	0	0.7	9.5	0.9	0	2.8	2.8	1.1

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N/S: Davol Street NB
W: UTurn to/from Davol Street SB
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-FFF
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	0	0	222	8	0	17	247
04:15 PM	0	0	190	10	0	13	213
04:30 PM	0	0	233	2	0	17	252
04:45 PM	0	0	163	5	0	19	187
Total	0	0	808	25	0	66	899
05:00 PM	0	0	231	2	0	20	253
05:15 PM	0	0	191	8	0	16	215
05:30 PM	0	0	163	3	0	12	178
05:45 PM	0	0	148	6	0	12	166
Total	0	0	733	19	0	60	812
Grand Total	0	0	1541	44	0	126	1711
Apprch %	0	0	97.2	2.8	0	100	
Total %	0	0	90.1	2.6	0	7.4	

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	**233**	2	**235**	0	17	17	252
04:45 PM	0	0	0	163	5	168	0	19	19	187
05:00 PM	0	0	0	231	2	233	0	**20**	**20**	**253**
05:15 PM	**0**	**0**	**0**	**191**	**8**	199	0	16	16	215
Total Volume	0	0	0	818	17	835	0	72	72	907
% App. Total	0	0		98	2		0	100		
PHF	.000	.000	.000	.878	.531	.888	.000	.900	.900	.896

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File Name : 81676B-FFF
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB From North		Davol Street NB From South		UTurn to/from Davol Street SB From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	0	0	5	1	0	0	6
04:15 PM	0	0	4	0	0	0	4
04:30 PM	0	0	0	1	0	2	3
04:45 PM	0	0	1	1	0	0	2
Total	0	0	10	3	0	2	15
05:00 PM	0	0	1	0	0	0	1
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	2	0	0	0	2
05:45 PM	0	0	2	0	0	0	2
Total	0	0	5	0	0	1	6
Grand Total	0	0	15	3	0	3	21
Apprch %	0	0	83.3	16.7	0	100	
Total %	0	0	71.4	14.3	0	14.3	

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	**5**	**1**	**6**	0	0	0	**6**
04:15 PM	**0**	**0**	**0**	**4**	**0**	**4**	**0**	**0**	**0**	**4**
04:30 PM	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**2**	3
04:45 PM	0	0	0	1	1	2	0	0	0	2
Total Volume	0	0	0	10	3	13	0	2	2	15
% App. Total	0	0		76.9	23.1		0	100		
PHF	.000	.000	.000	.500	.750	.542	.000	.250	.250	.625

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File Name : 81676B-FFF
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	1	0	0	0	0	0	0	1
05:30 PM	0	0	1	0	0	0	0	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	0	0	0	0	1	3
Grand Total	0	0	2	0	0	0	0	1	2	5
Apprch %	0	0	100	0	0	0	0	33.3	66.7	
Total %	0	0	40	0	0	0	0	20	40	

	Davol Street NB From North				Davol Street NB From South				UTurn to/from Davol Street SB From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	**1**	**1**	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	1	1	0	0	0	0	0	0	**1**	**1**	**2**
Total Volume	0	0	2	2	0	0	0	0	0	1	1	2	4
% App. Total	0	0	100		0	0	0		0	50	50		
PHF	.000	.000	.500	.500	.000	.000	.000	.000	.000	.250	.250	.500	.500

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File Name : 81676B-FFF
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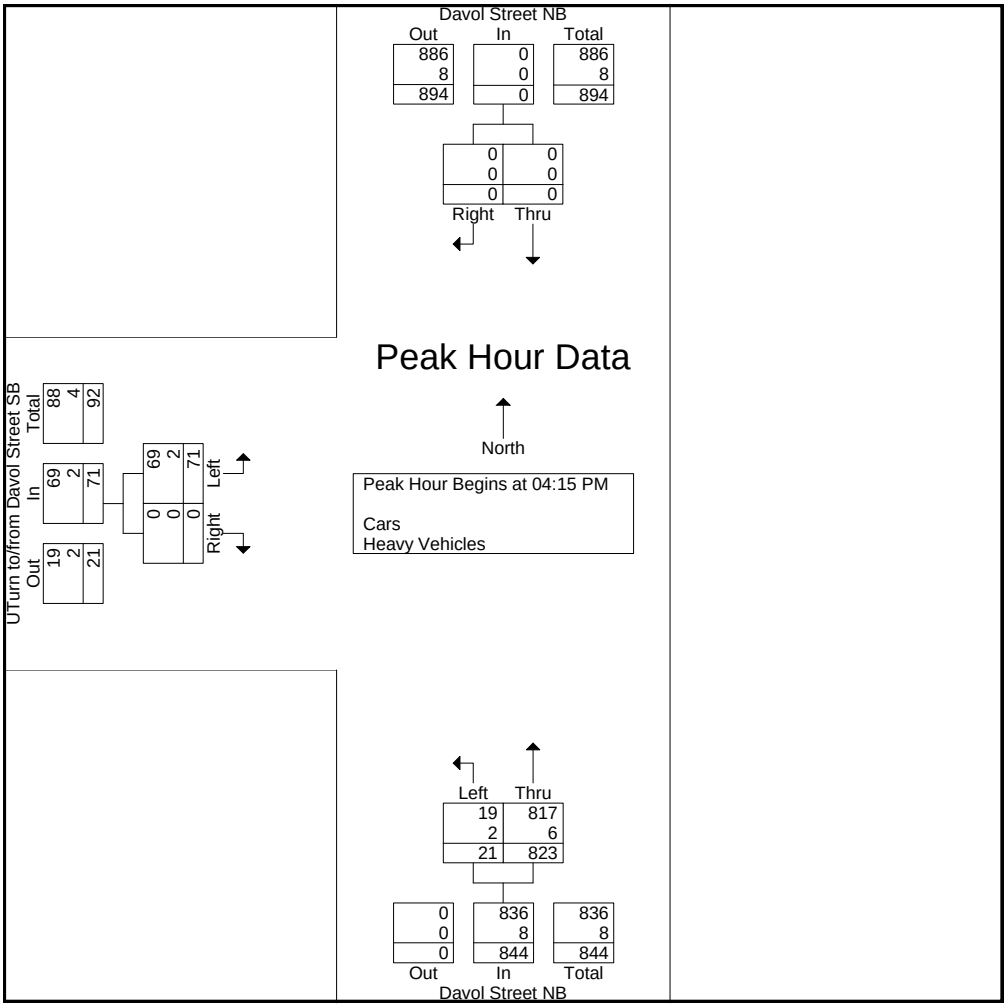
Start Date : 9/9/2008
Page No : 1

	Davol Street NB From North			Davol Street NB From South			UTurn to/from Davol Street SB From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	194	**10**	204	0	13	13	217
04:30 PM	0	0	0	**233**	3	**236**	0	19	19	**255**
04:45 PM	**0**	**0**	**0**	**164**	**6**	**170**	**0**	**19**	**19**	**189**
05:00 PM	**0**	**0**	**0**	**232**	**2**	**234**	**0**	**20**	**20**	254
Total Volume	0	0	0	823	21	844	0	71	71	915
% App. Total	0	0		97.5	2.5		0	100		
PHF	.000	.000	.000	.883	.525	.894	.000	.888	.888	.897
Cars	0	0	0	817	19	836	0	69	69	905
% Cars	0	0	0	99.3	90.5	99.1	0	97.2	97.2	98.9
Heavy Vehicles	0	0	0	6	2	8	0	2	2	10
% Heavy Vehicles	0	0	0	0.7	9.5	0.9	0	2.8	2.8	1.1



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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-G
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	144	15	0	5	0	0	164
07:15 AM	189	23	0	3	0	0	215
07:30 AM	182	19	0	5	0	0	206
07:45 AM	206	34	0	7	0	0	247
Total	721	91	0	20	0	0	832
08:00 AM	145	29	0	6	0	0	180
08:15 AM	159	24	0	11	0	0	194
08:30 AM	125	24	0	16	0	0	165
08:45 AM	136	18	0	6	0	0	160
Total	565	95	0	39	0	0	699
Grand Total	1286	186	0	59	0	0	1531
Apprch %	87.4	12.6	0	100	0	0	
Total %	84	12.1	0	3.9	0	0	
Cars	1264	183	0	54	0	0	1501
% Cars	98.3	98.4	0	91.5	0	0	98
Heavy Vehicles	22	3	0	5	0	0	30
% Heavy Vehicles	1.7	1.6	0	8.5	0	0	2

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	189	23	212	0	3	3	0	0	0	215
07:30 AM	182	19	201	0	5	5	0	0	0	206
07:45 AM	**206**	**34**	**240**	0	**7**	**7**	0	0	0	**247**
08:00 AM	**145**	**29**	**174**	**0**	**6**	**6**	**0**	**0**	**0**	**180**
Total Volume	**722**	**105**	**827**	**0**	**21**	**21**	**0**	**0**	**0**	**848**
% App. Total	**87.3**	**12.7**		**0**	**100**		**0**	**0**		
PHF	**.876**	**.772**	**.861**	**.000**	**.750**	**.750**	**.000**	**.000**	**.000**	**.858**
Cars	**713**	**104**	**817**	**0**	**18**	**18**	**0**	**0**	**0**	**835**
% Cars	**98.8**	**99.0**	**98.8**	**0**	**85.7**	**85.7**	**0**	**0**	**0**	**98.5**
Heavy Vehicles	**9**	**1**	**10**	**0**	**3**	**3**	**0**	**0**	**0**	**13**
% Heavy Vehicles	**1.2**	**1.0**	**1.2**	**0**	**14.3**	**14.3**	**0**	**0**	**0**	**1.5**

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N/S: Davol Street SB
E: UTurn to/from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676B-G
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	143	15	0	5	0	0	163
07:15 AM	186	23	0	1	0	0	210
07:30 AM	179	19	0	4	0	0	202
07:45 AM	204	33	0	7	0	0	244
Total	712	90	0	17	0	0	819
08:00 AM	144	29	0	6	0	0	179
08:15 AM	152	24	0	11	0	0	187
08:30 AM	123	23	0	15	0	0	161
08:45 AM	133	17	0	5	0	0	155
Total	552	93	0	37	0	0	682
Grand Total	1264	183	0	54	0	0	1501
Apprch %	87.4	12.6	0	100	0	0	
Total %	84.2	12.2	0	3.6	0	0	

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	186	23	209	0	1	1	0	0	0	210
07:30 AM	179	19	198	0	4	4	0	0	0	202
07:45 AM	**204**	**33**	**237**	0	**7**	**7**	0	0	0	**244**
08:00 AM	**144**	**29**	**173**	**0**	**6**	**6**	**0**	**0**	**0**	**179**
Total Volume	**713**	**104**	**817**	**0**	**18**	**18**	**0**	**0**	**0**	**835**
% App. Total	**87.3**	**12.7**		**0**	**100**		**0**	**0**		
PHF	**.874**	**.788**	**.862**	**.000**	**.643**	**.643**	**.000**	**.000**	**.000**	**.856**

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File Name : 81676B-G
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	1	0	0	0	0	0	1
07:15 AM	3	0	0	2	0	0	5
07:30 AM	3	0	0	1	0	0	4
07:45 AM	2	1	0	0	0	0	3
Total	9	1	0	3	0	0	13
08:00 AM	1	0	0	0	0	0	1
08:15 AM	7	0	0	0	0	0	7
08:30 AM	2	1	0	1	0	0	4
08:45 AM	3	1	0	1	0	0	5
Total	13	2	0	2	0	0	17
Grand Total	22	3	0	5	0	0	30
Apprch %	88	12	0	100	0	0	
Total %	73.3	10	0	16.7	0	0	

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	1	0	1	0	0	0	0	0	0	1
08:15 AM	**7**	0	**7**	0	0	0	0	0	0	**7**
08:30 AM	**2**	**1**	3	0	**1**	**1**	0	0	0	4
08:45 AM	3	1	4	0	1	1	0	0	0	5
Total Volume	13	2	15	0	2	2	0	0	0	17
% App. Total	86.7	13.3		0	100		0	0		
PHF	.464	.500	.536	.000	.500	.500	.000	.000	.000	.607

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File Name : 81676B-G
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	1	0	0	2	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	0	0	1	0	0	2	4
Apprch %	100	0	0	0	0	100	0	0	100	
Total %	25	0	0	0	0	25	0	0	50	

	Davol Street SB From North				UTurn to/from Davol Street NB From East				Davol Street SB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	**1**	**1**	0	0	**1**	**1**	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	1	1	0	0	2	2	3
% App. Total	0	0	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.500	.375

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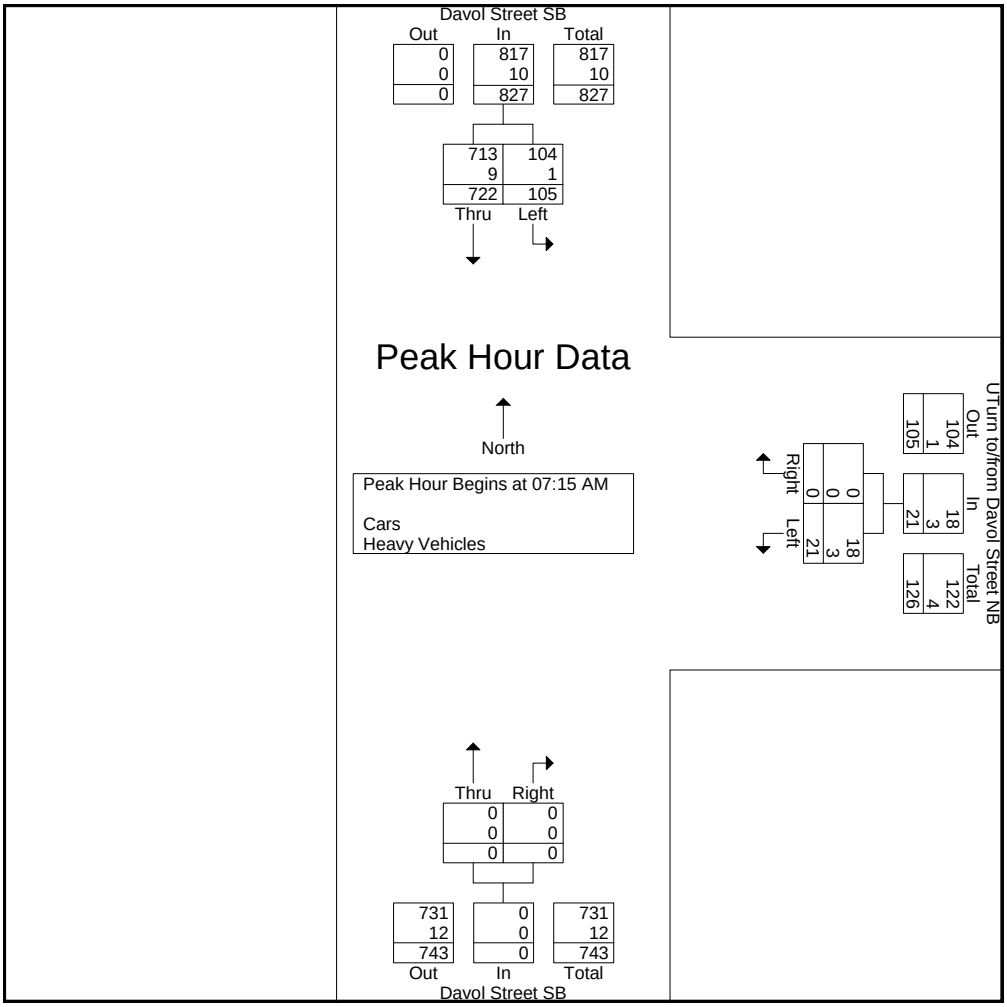
Start Date : 9/9/2008
Page No : 1

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	189	23	212	0	3	3	0	0	0	215
07:30 AM	182	19	201	0	5	5	0	0	0	206
07:45 AM	**206**	**34**	**240**	0	**7**	**7**	0	0	0	**247**
08:00 AM	**145**	**29**	**174**	**0**	**6**	**6**	**0**	**0**	**0**	**180**
Total Volume	**722**	**105**	**827**	**0**	**21**	**21**	**0**	**0**	**0**	**848**
% App. Total	**87.3**	**12.7**		**0**	**100**		**0**	**0**		
PHF	**.876**	**.772**	**.861**	**.000**	**.750**	**.750**	**.000**	**.000**	**.000**	**.858**
Cars	**713**	**104**	**817**	**0**	**18**	**18**	**0**	**0**	**0**	**835**
% Cars	**98.8**	**99.0**	**98.8**	**0**	**85.7**	**85.7**	**0**	**0**	**0**	**98.5**
Heavy Vehicles	**9**	**1**	**10**	**0**	**3**	**3**	**0**	**0**	**0**	**13**
% Heavy Vehicles	**1.2**	**1.0**	**1.2**	**0**	**14.3**	**14.3**	**0**	**0**	**0**	**1.5**



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File Name : 81676B-GGG
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	182	17	0	10	0	0	209
04:15 PM	187	14	0	10	0	0	211
04:30 PM	191	18	0	3	0	0	212
04:45 PM	161	20	0	6	0	0	187
Total	721	69	0	29	0	0	819
05:00 PM	198	22	0	1	0	0	221
05:15 PM	159	17	0	8	0	0	184
05:30 PM	143	11	0	3	0	0	157
05:45 PM	150	12	0	6	0	0	168
Total	650	62	0	18	0	0	730
Grand Total	1371	131	0	47	0	0	1549
Apprch %	91.3	8.7	0	100	0	0	
Total %	88.5	8.5	0	3	0	0	
Cars	1347	128	0	44	0	0	1519
% Cars	98.2	97.7	0	93.6	0	0	98.1
Heavy Vehicles	24	3	0	3	0	0	30
% Heavy Vehicles	1.8	2.3	0	6.4	0	0	1.9

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	187	14	201	0	**10**	**10**	0	0	0	211
04:30 PM	191	18	209	0	3	3	0	0	0	212
04:45 PM	161	20	181	0	6	6	0	0	0	187
05:00 PM	**198**	**22**	**220**	0	1	1	0	0	0	**221**
Total Volume	**737**	**74**	**811**	**0**	**20**	**20**	**0**	**0**	**0**	**831**
% App. Total	**90.9**	**9.1**		**0**	**100**		**0**	**0**		
PHF	**.931**	**.841**	**.922**	**.000**	**.500**	**.500**	**.000**	**.000**	**.000**	**.940**
Cars	**722**	**72**	**794**	**0**	**18**	**18**	**0**	**0**	**0**	**812**
% Cars	**98.0**	**97.3**	**97.9**	**0**	**90.0**	**90.0**	**0**	**0**	**0**	**97.7**
Heavy Vehicles	**15**	**2**	**17**	**0**	**2**	**2**	**0**	**0**	**0**	**19**
% Heavy Vehicles	**2.0**	**2.7**	**2.1**	**0**	**10.0**	**10.0**	**0**	**0**	**0**	**2.3**

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File Name : 81676B-GGG
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	178	17	0	9	0	0	204
04:15 PM	184	14	0	10	0	0	208
04:30 PM	186	16	0	2	0	0	204
04:45 PM	158	20	0	5	0	0	183
Total	706	67	0	26	0	0	799
05:00 PM	194	22	0	1	0	0	217
05:15 PM	156	16	0	8	0	0	180
05:30 PM	142	11	0	3	0	0	156
05:45 PM	149	12	0	6	0	0	167
Total	641	61	0	18	0	0	720
Grand Total	1347	128	0	44	0	0	1519
Apprch %	91.3	8.7	0	100	0	0	
Total %	88.7	8.4	0	2.9	0	0	

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	184	14	198	0	**10**	**10**	0	0	0	208
04:30 PM	186	16	202	0	2	2	0	0	0	204
04:45 PM	158	20	178	0	5	5	0	0	0	183
05:00 PM	**194**	**22**	**216**	0	1	1	0	0	0	**217**
Total Volume	**722**	**72**	**794**	**0**	**18**	**18**	**0**	**0**	**0**	**812**
% App. Total	**90.9**	**9.1**		**0**	**100**		**0**	**0**		
PHF	**.930**	**.818**	**.919**	**.000**	**.450**	**.450**	**.000**	**.000**	**.000**	**.935**

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File Name : 81676B-GGG
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street SB From North		UTurn to/from Davol Street NB From East		Davol Street SB From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	4	0	0	1	0	0	5
04:15 PM	3	0	0	0	0	0	3
04:30 PM	5	2	0	1	0	0	8
04:45 PM	3	0	0	1	0	0	4
Total	15	2	0	3	0	0	20
05:00 PM	4	0	0	0	0	0	4
05:15 PM	3	1	0	0	0	0	4
05:30 PM	1	0	0	0	0	0	1
05:45 PM	1	0	0	0	0	0	1
Total	9	1	0	0	0	0	10
Grand Total	24	3	0	3	0	0	30
Apprch %	88.9	11.1	0	100	0	0	
Total %	80	10	0	10	0	0	

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	4	0	4	0	**1**	**1**	0	0	0	5
04:15 PM	3	0	3	0	0	0	0	0	0	3
04:30 PM	**5**	**2**	**7**	0	1	1	0	0	0	**8**
04:45 PM	**3**	**0**	**3**	**0**	**1**	**1**	**0**	**0**	**0**	**4**
Total Volume	**15**	**2**	**17**	**0**	**3**	**3**	**0**	**0**	**0**	**20**
% App. Total	**88.2**	**11.8**		**0**	**100**		**0**	**0**		
PHF	**.750**	**.250**	**.607**	**.000**	**.750**	**.750**	**.000**	**.000**	**.000**	**.625**

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Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	1	0	0	0	0	0	0	0	0	1
04:45 PM	1	0	0	1	0	0	1	0	0	3
Total	2	0	0	1	0	0	1	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	1	2
05:30 PM	1	0	0	0	0	0	0	0	0	1
05:45 PM	3	0	0	0	0	0	0	0	1	4
Total	4	0	0	0	0	0	0	1	2	7
Grand Total	6	0	0	1	0	0	1	1	2	11
Apprch %	100	0	0	100	0	0	25	25	50	
Total %	54.5	0	0	9.1	0	0	9.1	9.1	18.2	

	Davol Street SB From North				UTurn to/from Davol Street NB From East				Davol Street SB From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	**1**	**1**	**2**	2
05:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
05:45 PM	**3**	0	0	**3**	0	0	0	0	0	0	1	1	**4**
Total Volume	4	0	0	4	0	0	0	0	0	1	2	3	7
% App. Total	100	0	0		0	0	0		0	33.3	66.7		
PHF	.333	.000	.000	.333	.000	.000	.000	.000	.000	.250	.500	.375	.438

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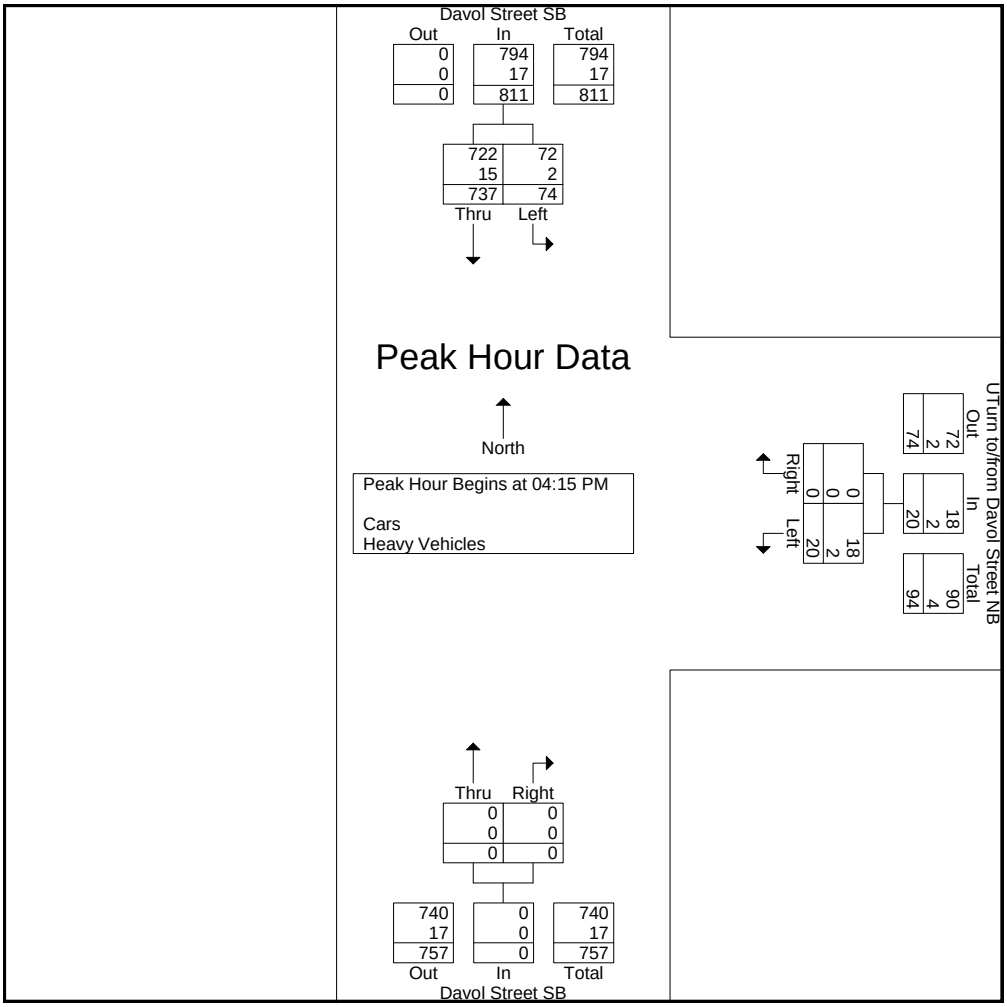
Page No : 1

	Davol Street SB From North			UTurn to/from Davol Street NB From East			Davol Street SB From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	187	14	201	0	**10**	**10**	0	0	0	211
04:30 PM	191	18	209	0	3	3	0	0	0	212
04:45 PM	161	20	181	0	6	6	0	0	0	187
05:00 PM	**198**	**22**	**220**	0	1	1	0	0	0	**221**
Total Volume	**737**	**74**	**811**	**0**	**20**	**20**	**0**	**0**	**0**	**831**
% App. Total	**90.9**	**9.1**		**0**	**100**		**0**	**0**		
PHF	**.931**	**.841**	**.922**	**.000**	**.500**	**.500**	**.000**	**.000**	**.000**	**.940**
Cars	**722**	**72**	**794**	**0**	**18**	**18**	**0**	**0**	**0**	**812**
% Cars	**98.0**	**97.3**	**97.9**	**0**	**90.0**	**90.0**	**0**	**0**	**0**	**97.7**
Heavy Vehicles	**15**	**2**	**17**	**0**	**2**	**2**	**0**	**0**	**0**	**19**
% Heavy Vehicles	**2.0**	**2.7**	**2.1**	**0**	**10.0**	**10.0**	**0**	**0**	**0**	**2.3**



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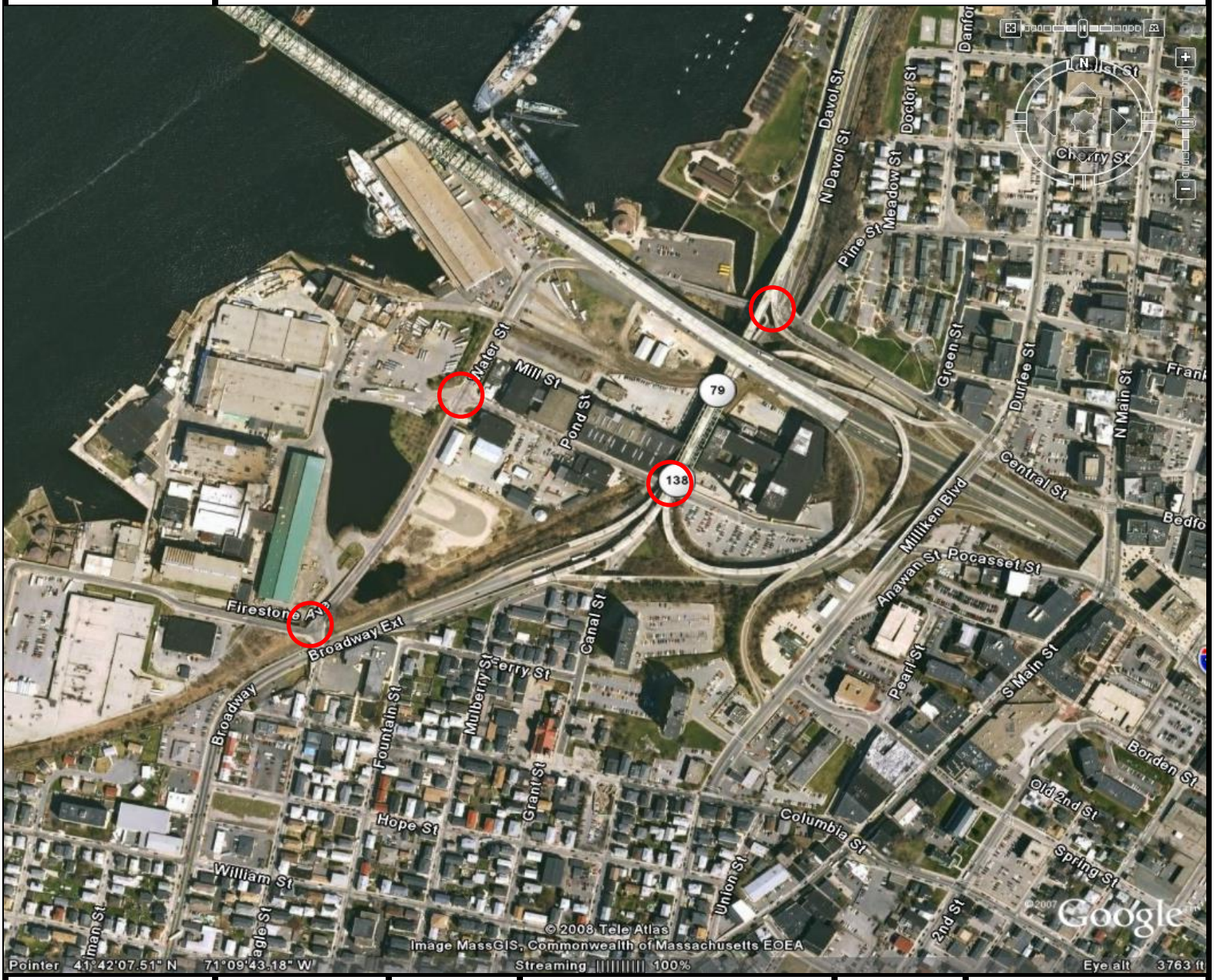
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Saturday 9/6/08 Tuesday 9/9/08	81676	Fall River, MA

PRECISION
D A T A
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N/S: Water Street
E/W: Ananwan Street/Tillotson Complex
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Water Street From North			Ananwan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	31	7	2	4	7	65	1	0	0	4	0	124
07:15 AM	6	33	6	0	3	6	82	1	1	0	2	1	141
07:30 AM	2	49	4	2	2	9	72	4	1	1	5	0	151
07:45 AM	11	37	7	3	1	14	67	2	2	1	8	0	153
Total	22	150	24	7	10	36	286	8	4	2	19	1	569
08:00 AM	3	29	4	2	2	8	68	4	2	0	5	0	127
08:15 AM	4	23	4	4	1	4	58	5	1	0	4	0	108
08:30 AM	5	19	8	3	2	5	44	6	2	0	4	0	98
08:45 AM	3	15	5	3	3	5	41	4	1	0	2	0	82
Total	15	86	21	12	8	22	211	19	6	0	15	0	415
Grand Total	37	236	45	19	18	58	497	27	10	2	34	1	984
Apprch %	11.6	74.2	14.2	20	18.9	61.1	93.1	5.1	1.9	5.4	91.9	2.7	
Total %	3.8	24	4.6	1.9	1.8	5.9	50.5	2.7	1	0.2	3.5	0.1	
Cars	35	232	43	19	18	58	478	27	10	2	31	1	954
% Cars	94.6	98.3	95.6	100	100	100	96.2	100	100	100	91.2	100	97
Heavy Vehicles	2	4	2	0	0	0	19	0	0	0	3	0	30
% Heavy Vehicles	5.4	1.7	4.4	0	0	0	3.8	0	0	0	8.8	0	3

	Water Street From North				Ananwan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	6	33	6	45	0	**3**	6	9	**82**	1	1	**84**	0	2	**1**	3	141
07:30 AM	2	**49**	4	**55**	2	2	9	13	72	**4**	1	77	**1**	5	0	6	151
07:45 AM	**11**	37	**7**	55	**3**	1	**14**	**18**	67	2	**2**	71	1	**8**	0	**9**	**153**
08:00 AM	3	29	4	36	2	2	8	12	68	4	2	74	0	5	0	5	127
Total Volume	22	148	21	191	7	8	37	52	289	11	6	306	2	20	1	23	572
% App. Total	11.5	77.5	11		13.5	15.4	71.2		94.4	3.6	2		8.7	87	4.3		
PHF	.500	.755	.750	.868	.583	.667	.661	.722	.881	.688	.750	.911	.500	.625	.250	.639	.935
Cars	21	146	20	187	7	8	37	52	277	11	6	294	2	17	1	20	553
% Cars	95.5	98.6	95.2	97.9	100	100	100	100	95.8	100	100	96.1	100	85.0	100	87.0	96.7
Heavy Vehicles	1	2	1	4	0	0	0	0	12	0	0	12	0	3	0	3	19
% Heavy Vehicles	4.5	1.4	4.8	2.1	0	0	0	0	4.2	0	0	3.9	0	15.0	0	13.0	3.3

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N/S: Water Street
E/W: Ananwan Street/Tillotson Complex
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Water Street From North			Ananwan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	31	7	2	4	7	62	1	0	0	4	0	121
07:15 AM	5	33	6	0	3	6	76	1	1	0	1	1	133
07:30 AM	2	49	4	2	2	9	70	4	1	1	4	0	148
07:45 AM	11	37	6	3	1	14	66	2	2	1	8	0	151
Total	21	150	23	7	10	36	274	8	4	2	17	1	553
08:00 AM	3	27	4	2	2	8	65	4	2	0	4	0	121
08:15 AM	4	21	3	4	1	4	56	5	1	0	4	0	103
08:30 AM	4	19	8	3	2	5	43	6	2	0	4	0	96
08:45 AM	3	15	5	3	3	5	40	4	1	0	2	0	81
Total	14	82	20	12	8	22	204	19	6	0	14	0	401
Grand Total	35	232	43	19	18	58	478	27	10	2	31	1	954
Apprch %	11.3	74.8	13.9	20	18.9	61.1	92.8	5.2	1.9	5.9	91.2	2.9	
Total %	3.7	24.3	4.5	2	1.9	6.1	50.1	2.8	1	0.2	3.2	0.1	

	Water Street From North				Ananwan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	3	31	**7**	41	2	**4**	7	13	62	1	0	63	0	4	0	4	121
07:15 AM	5	33	6	44	0	3	6	9	**76**	1	1	**78**	0	1	**1**	2	133
07:30 AM	2	**49**	4	**55**	2	2	9	13	70	**4**	1	75	**1**	4	0	5	148
07:45 AM	**11**	37	6	54	**3**	1	**14**	**18**	66	2	**2**	70	1	**8**	0	**9**	**151**
Total Volume	21	150	23	194	7	10	36	53	274	8	4	286	2	17	1	20	553
% App. Total	10.8	77.3	11.9		13.2	18.9	67.9		95.8	2.8	1.4		10	85	5		
PHF	.477	.765	.821	.882	.583	.625	.643	.736	.901	.500	.500	.917	.500	.531	.250	.556	.916

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Client: VHB/J. Quitter

File Name : 81676A-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Water Street From North			Ananwan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	3	0	0	0	0	0	3
07:15 AM	1	0	0	0	0	0	6	0	0	0	1	0	8
07:30 AM	0	0	0	0	0	0	2	0	0	0	1	0	3
07:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	2
Total	1	0	1	0	0	0	12	0	0	0	2	0	16
08:00 AM	0	2	0	0	0	0	3	0	0	0	1	0	6
08:15 AM	0	2	1	0	0	0	2	0	0	0	0	0	5
08:30 AM	1	0	0	0	0	0	1	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	1	4	1	0	0	0	7	0	0	0	1	0	14
Grand Total	2	4	2	0	0	0	19	0	0	0	3	0	30
Apprch %	25	50	25	0	0	0	100	0	0	0	100	0	
Total %	6.7	13.3	6.7	0	0	0	63.3	0	0	0	10	0	

	Water Street From North				Ananwan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**1**	0	0	1	0	0	0	0	**6**	0	0	**6**	0	**1**	0	**1**	**8**
07:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	1	3
07:45 AM	0	0	**1**	1	0	0	0	0	1	0	0	1	0	0	0	0	2
08:00 AM	0	**2**	0	**2**	0	0	0	0	3	0	0	3	0	1	0	1	6
Total Volume	1	2	1	4	0	0	0	0	12	0	0	12	0	3	0	3	19
% App. Total	25	50	25		0	0	0		100	0	0		0	100	0		
PHF	.250	.250	.250	.500	.000	.000	.000	.000	.500	.000	.000	.500	.000	.750	.000	.750	.594

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Client: VHB/J. Quitter

File Name : 81676A-A
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Water Street From North				Ananwan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	5	0	0	0	2	0	0	0	0	0	0	0	0	8
Total	0	1	0	5	0	0	0	2	0	0	0	0	0	0	0	0	8
08:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	3
08:15 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	2	7
08:30 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	3	15
Grand Total	0	1	0	5	0	0	0	14	0	0	0	0	0	0	0	3	23
Apprch %	0	16.7	0	83.3	0	0	0	100	0	0	0	0	0	0	0	100	
Total %	0	4.3	0	21.7	0	0	0	60.9	0	0	0	0	0	0	0	13	

	Water Street From North					Ananwan Street From East					Water Street From South					Tillotson Complex From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**1**	0	**5**	**6**	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	**8**
08:00 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	3
08:15 AM	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	**2**	**2**	7
08:30 AM	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	1	0	5	6	0	0	0	13	13	0	0	0	0	0	0	0	0	3	3	22
% App. Total	0	16.7	0	83.3		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.250	.000	.250	.250	.000	.000	.000	.650	.650	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.688

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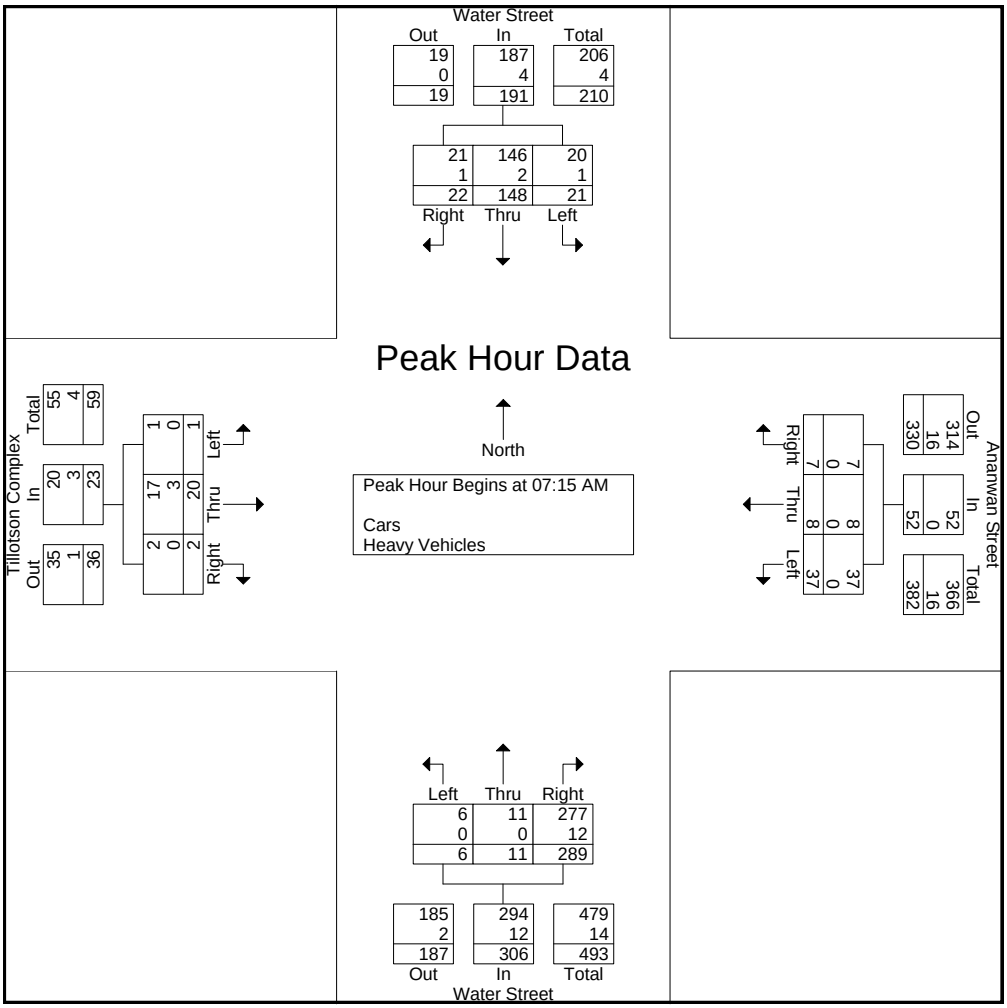
	Water Street From North				Ananwan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	6	33	6	45	0	**3**	6	9	**82**	1	1	**84**	0	2	**1**	3	141
07:30 AM	2	**49**	4	**55**	2	2	9	13	72	**4**	1	77	**1**	5	0	6	151
07:45 AM	**11**	37	**7**	55	**3**	1	**14**	**18**	67	2	**2**	71	1	**8**	0	**9**	**153**
08:00 AM	3	29	4	36	2	2	8	12	68	4	2	74	0	5	0	5	127
Total Volume	22	148	21	191	7	8	37	52	289	11	6	306	2	20	1	23	572
% App. Total	11.5	77.5	11		13.5	15.4	71.2		94.4	3.6	2		8.7	87	4.3		
PHF	.500	.755	.750	.868	.583	.667	.661	.722	.881	.688	.750	.911	.500	.625	.250	.639	.935
Cars	21	146	20	187	7	8	37	52	277	11	6	294	2	17	1	20	553
% Cars	95.5	98.6	95.2	97.9	100	100	100	100	95.8	100	100	96.1	100	85.0	100	87.0	96.7
Heavy Vehicles	1	2	1	4	0	0	0	0	12	0	0	12	0	3	0	3	19
% Heavy Vehicles	4.5	1.4	4.8	2.1	0	0	0	0	4.2	0	0	3.9	0	15.0	0	13.0	3.3



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N/S: Water Street
E/W: Anawan Street/Tillotson Complex
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-AAA
Site Code : 10111.31
Start Date : 9/9/2008

Groups Printed- Cars - Heavy Vehicles

	Water Street From North			Anawan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	50	5	1	4	28	43	1	0	0	11	0	143
04:15 PM	1	38	11	2	0	18	34	2	0	2	7	0	115
04:30 PM	4	51	10	0	1	14	40	0	1	0	8	0	129
04:45 PM	4	52	5	0	0	10	37	4	0	0	1	0	113
Total	9	191	31	3	5	70	154	7	1	2	27	0	500
05:00 PM	1	72	10	2	1	24	43	2	0	1	9	0	165
05:15 PM	1	40	9	0	0	15	32	1	0	0	4	0	102
05:30 PM	3	25	5	0	0	7	33	1	0	0	2	0	76
05:45 PM	1	31	2	0	0	10	15	0	0	0	3	0	62
Total	6	168	26	2	1	56	123	4	0	1	18	0	405
Grand Total	15	359	57	5	6	126	277	11	1	3	45	0	905
Apprch %	3.5	83.3	13.2	3.6	4.4	92	95.8	3.8	0.3	6.2	93.8	0	
Total %	1.7	39.7	6.3	0.6	0.7	13.9	30.6	1.2	0.1	0.3	5	0	
Cars	5	357	56	5	5	126	277	11	0	3	42	0	887
% Cars	33.3	99.4	98.2	100	83.3	100	100	100	0	100	93.3	0	98
Heavy Vehicles	10	2	1	0	1	0	0	0	1	0	3	0	18
% Heavy Vehicles	66.7	0.6	1.8	0	16.7	0	0	0	100	0	6.7	0	2

	Water Street From North				Anawan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	38	**11**	50	**2**	0	18	20	34	2	0	36	**2**	7	0	9	115
04:30 PM	**4**	51	10	65	0	**1**	14	15	40	0	**1**	41	0	8	0	8	129
04:45 PM	4	52	5	61	0	0	10	10	37	**4**	0	41	0	1	0	1	113
05:00 PM	1	**72**	10	**83**	2	1	**24**	**27**	**43**	2	0	**45**	1	**9**	0	**10**	**165**
Total Volume	10	213	36	259	4	2	66	72	154	8	1	163	3	25	0	28	522
% App. Total	3.9	82.2	13.9		5.6	2.8	91.7		94.5	4.9	0.6		10.7	89.3	0		
PHF	.625	.740	.818	.780	.500	.500	.688	.667	.895	.500	.250	.906	.375	.694	.000	.700	.791
Cars	4	212	35	251	4	2	66	72	154	8	0	162	3	23	0	26	511
% Cars	40.0	99.5	97.2	96.9	100	100	100	100	100	100	0	99.4	100	92.0	0	92.9	97.9
Heavy Vehicles	6	1	1	8	0	0	0	0	0	0	1	1	0	2	0	2	11
% Heavy Vehicles	60.0	0.5	2.8	3.1	0	0	0	0	0	0	100	0.6	0	8.0	0	7.1	2.1

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Groups Printed- Cars

	Water Street From North			Anawan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	49	5	1	3	28	43	1	0	0	10	0	140
04:15 PM	1	38	10	2	0	18	34	2	0	2	7	0	114
04:30 PM	2	51	10	0	1	14	40	0	0	0	8	0	126
04:45 PM	0	52	5	0	0	10	37	4	0	0	0	0	108
Total	3	190	30	3	4	70	154	7	0	2	25	0	488
05:00 PM	1	71	10	2	1	24	43	2	0	1	8	0	163
05:15 PM	0	40	9	0	0	15	32	1	0	0	4	0	101
05:30 PM	0	25	5	0	0	7	33	1	0	0	2	0	73
05:45 PM	1	31	2	0	0	10	15	0	0	0	3	0	62
Total	2	167	26	2	1	56	123	4	0	1	17	0	399
Grand Total	5	357	56	5	5	126	277	11	0	3	42	0	887
Apprch %	1.2	85.4	13.4	3.7	3.7	92.6	96.2	3.8	0	6.7	93.3	0	
Total %	0.6	40.2	6.3	0.6	0.6	14.2	31.2	1.2	0	0.3	4.7	0	

	Water Street From North				Anawan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	38	**10**	49	**2**	0	18	20	34	2	0	36	**2**	7	0	**9**	114
04:30 PM	**2**	51	10	63	0	**1**	14	15	40	0	0	40	0	**8**	0	8	126
04:45 PM	0	52	5	57	0	0	10	10	37	**4**	0	41	0	0	0	0	108
05:00 PM	1	**71**	10	**82**	2	1	**24**	**27**	**43**	2	0	**45**	1	8	0	9	**163**
Total Volume	4	212	35	251	4	2	66	72	154	8	0	162	3	23	0	26	511
% App. Total	1.6	84.5	13.9		5.6	2.8	91.7		95.1	4.9	0		11.5	88.5	0		
PHF	.500	.746	.875	.765	.500	.500	.688	.667	.895	.500	.000	.900	.375	.719	.000	.722	.784

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N/S: Water Street
E/W: Anawan Street/Tillotson Complex
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-AAA
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Water Street From North			Anawan Street From East			Water Street From South			Tillotson Complex From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	0	1	0	0	0	0	0	1	0	3
04:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
04:30 PM	2	0	0	0	0	0	0	0	1	0	0	0	3
04:45 PM	4	0	0	0	0	0	0	0	0	0	1	0	5
Total	6	1	1	0	1	0	0	0	1	0	2	0	12
05:00 PM	0	1	0	0	0	0	0	0	0	0	1	0	2
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	3	0	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	1	0	0	0	0	0	0	0	0	1	0	6
Grand Total	10	2	1	0	1	0	0	0	1	0	3	0	18
Apprch %	76.9	15.4	7.7	0	100	0	0	0	100	0	100	0	
Total %	55.6	11.1	5.6	0	5.6	0	0	0	5.6	0	16.7	0	

	Water Street From North				Anawan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**1**	0	1	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	3
04:15 PM	0	0	**1**	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	2	0	0	2	0	0	0	0	0	0	**1**	**1**	0	0	0	0	3
04:45 PM	**4**	0	0	**4**	0	0	0	0	0	0	0	0	0	1	0	1	**5**
Total Volume	6	1	1	8	0	1	0	1	0	0	1	1	0	2	0	2	12
% App. Total	75	12.5	12.5		0	100	0		0	0	100		0	100	0		
PHF	.375	.250	.250	.500	.000	.250	.000	.250	.000	.000	.250	.250	.000	.500	.000	.500	.600

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N/S: Water Street
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Client: VHB/J. Quitter

File Name : 81676A-AAA
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Water Street From North				Anawan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	3
Total	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	1	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	3	1	0	0	0	0	2	0	0	0	0	0	0	0	0	6
Total	0	3	1	0	0	0	0	2	0	1	0	0	0	0	0	0	7
Grand Total	0	4	1	0	0	0	0	7	0	1	0	0	0	0	0	1	14
Apprch %	0	80	20	0	0	0	0	100	0	100	0	0	0	0	0	100	
Total %	0	28.6	7.1	0	0	0	0	50	0	7.1	0	0	0	0	0	7.1	

	Water Street From North					Anawan Street From East					Water Street From South					Tillotson Complex From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	0	0	0	0	0	0	0	**3**
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	**1**	0	0	**1**	0	0	0	1	1	0	0	0	0	0	0	0	0	**1**	**1**	3
Total Volume	0	1	0	0	1	0	0	0	5	5	0	0	0	0	0	0	0	0	1	1	7
% App. Total	0	100	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.417	.417	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.583

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Client: VHB/J. Quitter

File Name : 81676A-AAA
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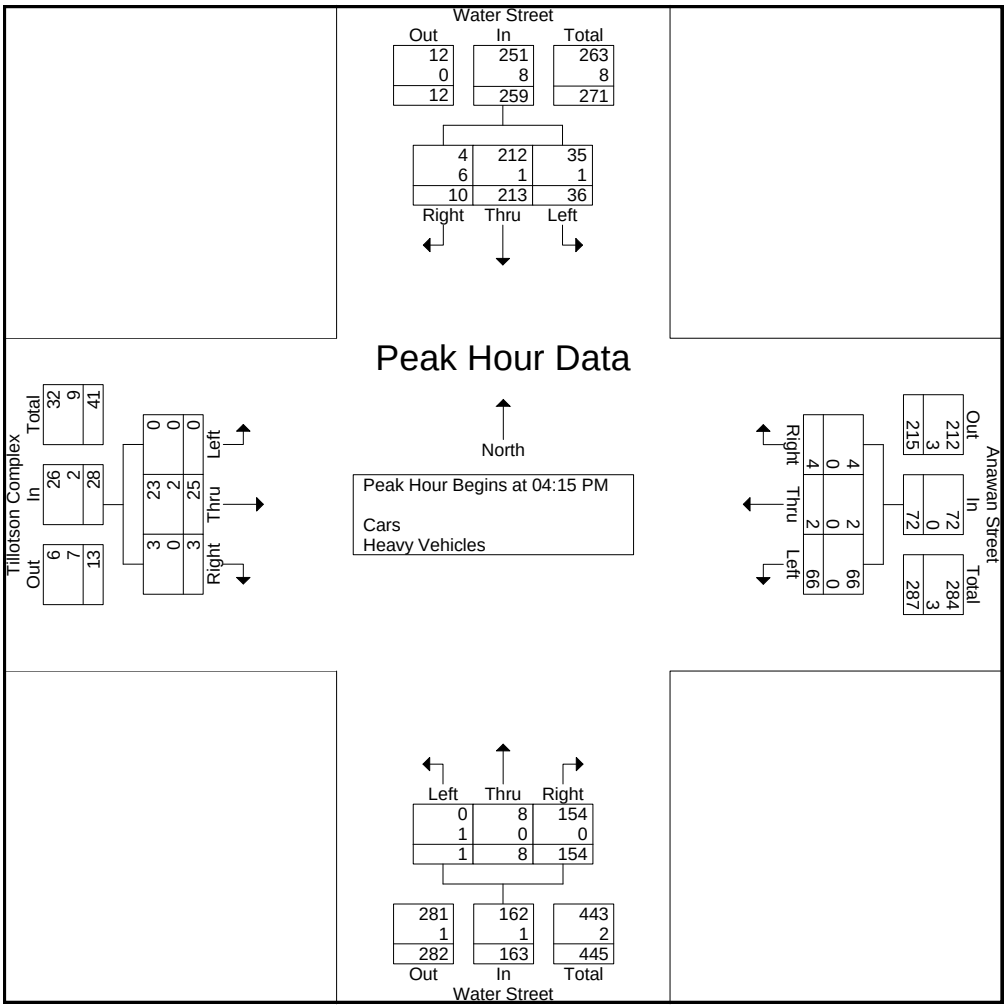
Page No : 1

	Water Street From North				Anawan Street From East				Water Street From South				Tillotson Complex From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	38	**11**	50	**2**	0	18	20	34	2	0	36	**2**	7	0	9	115
04:30 PM	**4**	51	10	65	0	**1**	14	15	40	0	**1**	41	0	8	0	8	129
04:45 PM	4	52	5	61	0	0	10	10	37	**4**	0	41	0	1	0	1	113
05:00 PM	1	**72**	10	**83**	2	1	**24**	**27**	**43**	2	0	**45**	1	**9**	0	**10**	**165**
Total Volume	10	213	36	259	4	2	66	72	154	8	1	163	3	25	0	28	522
% App. Total	3.9	82.2	13.9		5.6	2.8	91.7		94.5	4.9	0.6		10.7	89.3	0		
PHF	.625	.740	.818	.780	.500	.500	.688	.667	.895	.500	.250	.906	.375	.694	.000	.700	.791
Cars	4	212	35	251	4	2	66	72	154	8	0	162	3	23	0	26	511
% Cars	40.0	99.5	97.2	96.9	100	100	100	100	100	100	0	99.4	100	92.0	0	92.9	97.9
Heavy Vehicles	6	1	1	8	0	0	0	0	0	0	1	1	0	2	0	2	11
% Heavy Vehicles	60.0	0.5	2.8	3.1	0	0	0	0	0	0	100	0.6	0	8.0	0	7.1	2.1



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N/S: Water Street/Eagle Street
W: Ferry Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	34	3	4	3	15	59	118
07:15 AM	37	5	8	3	11	70	134
07:30 AM	55	5	9	2	13	65	149
07:45 AM	44	5	18	3	11	59	140
Total	170	18	39	11	50	253	541
08:00 AM	26	9	27	2	11	51	126
08:15 AM	25	2	11	3	9	52	102
08:30 AM	18	5	5	0	7	46	81
08:45 AM	19	2	5	5	5	36	72
Total	88	18	48	10	32	185	381
Grand Total	258	36	87	21	82	438	922
Apprch %	87.8	12.2	80.6	19.4	15.8	84.2	
Total %	28	3.9	9.4	2.3	8.9	47.5	
Cars	257	35	86	21	82	434	915
% Cars	99.6	97.2	98.9	100	100	99.1	99.2
Heavy Vehicles	1	1	1	0	0	4	7
% Heavy Vehicles	0.4	2.8	1.1	0	0	0.9	0.8

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	37	5	42	8	**3**	11	11	**70**	**81**	134
07:30 AM	**55**	5	**60**	9	2	11	**13**	65	78	**149**
07:45 AM	**44**	**5**	**49**	**18**	**3**	**21**	**11**	**59**	**70**	**140**
08:00 AM	**26**	**9**	35	**27**	2	**29**	11	51	62	126
Total Volume	162	24	186	62	10	72	46	245	291	549
% App. Total	87.1	12.9		86.1	13.9		15.8	84.2		
PHF	.736	.667	.775	.574	.833	.621	.885	.875	.898	.921
Cars	161	23	184	61	10	71	46	242	288	543
% Cars	99.4	95.8	98.9	98.4	100	98.6	100	98.8	99.0	98.9
Heavy Vehicles	1	1	2	1	0	1	0	3	3	6
% Heavy Vehicles	0.6	4.2	1.1	1.6	0	1.4	0	1.2	1.0	1.1

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N/S: Water Street/Eagle Street
W: Ferry Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	34	3	4	3	15	58	117
07:15 AM	37	4	8	3	11	70	133
07:30 AM	54	5	9	2	13	63	146
07:45 AM	44	5	18	3	11	59	140
Total	169	17	39	11	50	250	536
08:00 AM	26	9	26	2	11	50	124
08:15 AM	25	2	11	3	9	52	102
08:30 AM	18	5	5	0	7	46	81
08:45 AM	19	2	5	5	5	36	72
Total	88	18	47	10	32	184	379
Grand Total	257	35	86	21	82	434	915
Apprch %	88	12	80.4	19.6	15.9	84.1	
Total %	28.1	3.8	9.4	2.3	9	47.4	

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	37	4	41	8	**3**	11	11	**70**	**81**	133
07:30 AM	**54**	5	**59**	9	2	11	**13**	63	76	**146**
07:45 AM	**44**	**5**	**49**	**18**	**3**	**21**	**11**	**59**	**70**	**140**
08:00 AM	**26**	**9**	35	**26**	2	**28**	11	50	61	124
Total Volume	161	23	184	61	10	71	46	242	288	543
% App. Total	87.5	12.5		85.9	14.1		16	84		
PHF	.745	.639	.780	.587	.833	.634	.885	.864	.889	.930

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File Name : 81676A-B
Site Code : 10111.31
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Page No : 1

Groups Printed- Heavy Vehicles

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	0	0	0	0	1	1
07:15 AM	0	1	0	0	0	0	1
07:30 AM	1	0	0	0	0	2	3
07:45 AM	0	0	0	0	0	0	0
Total	1	1	0	0	0	3	5
08:00 AM	0	0	1	0	0	1	2
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	0	1	0	0	1	2
Grand Total	1	1	1	0	0	4	7
Apprch %	50	50	100	0	0	100	
Total %	14.3	14.3	14.3	0	0	57.1	

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	**1**	**1**	0	0	0	0	0	0	1
07:30 AM	**1**	0	1	0	0	0	0	**2**	**2**	**3**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 AM	**0**	**0**	**0**	**1**	0	**1**	0	1	1	2
Total Volume	1	1	2	1	0	1	0	3	3	6
% App. Total	50	50		100	0		0	100		
PHF	.250	.250	.500	.250	.000	.250	.000	.375	.375	.500

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File Name : 81676A-B
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	1	0	0	0	0	0	0	1
07:15 AM	0	0	1	0	0	4	0	0	0	5
07:30 AM	0	0	3	0	0	3	0	0	0	6
07:45 AM	1	0	8	0	0	4	0	0	0	13
Total	1	0	13	0	0	11	0	0	0	25
08:00 AM	0	0	0	0	0	7	0	1	0	8
08:15 AM	0	0	1	0	0	2	0	0	0	3
08:30 AM	0	0	0	0	0	1	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	10	0	1	0	12
Grand Total	1	0	14	0	0	21	0	1	0	37
Apprch %	6.7	0	93.3	0	0	100	0	100	0	
Total %	2.7	0	37.8	0	0	56.8	0	2.7	0	

	Water Street From North				Eagle Street From South				Ferry Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	1	1	0	0	4	4	0	0	0	0	5
07:30 AM	0	0	3	3	0	0	3	3	0	0	0	0	6
07:45 AM	**1**	0	**8**	**9**	0	0	4	4	0	0	0	0	**13**
08:00 AM	0	0	0	0	0	0	**7**	**7**	0	**1**	**0**	**1**	8
Total Volume	1	0	12	13	0	0	18	18	0	1	0	1	32
% App. Total	7.7	0	92.3		0	0	100		0	100	0		
PHF	.250	.000	.375	.361	.000	.000	.643	.643	.000	.250	.000	.250	.615

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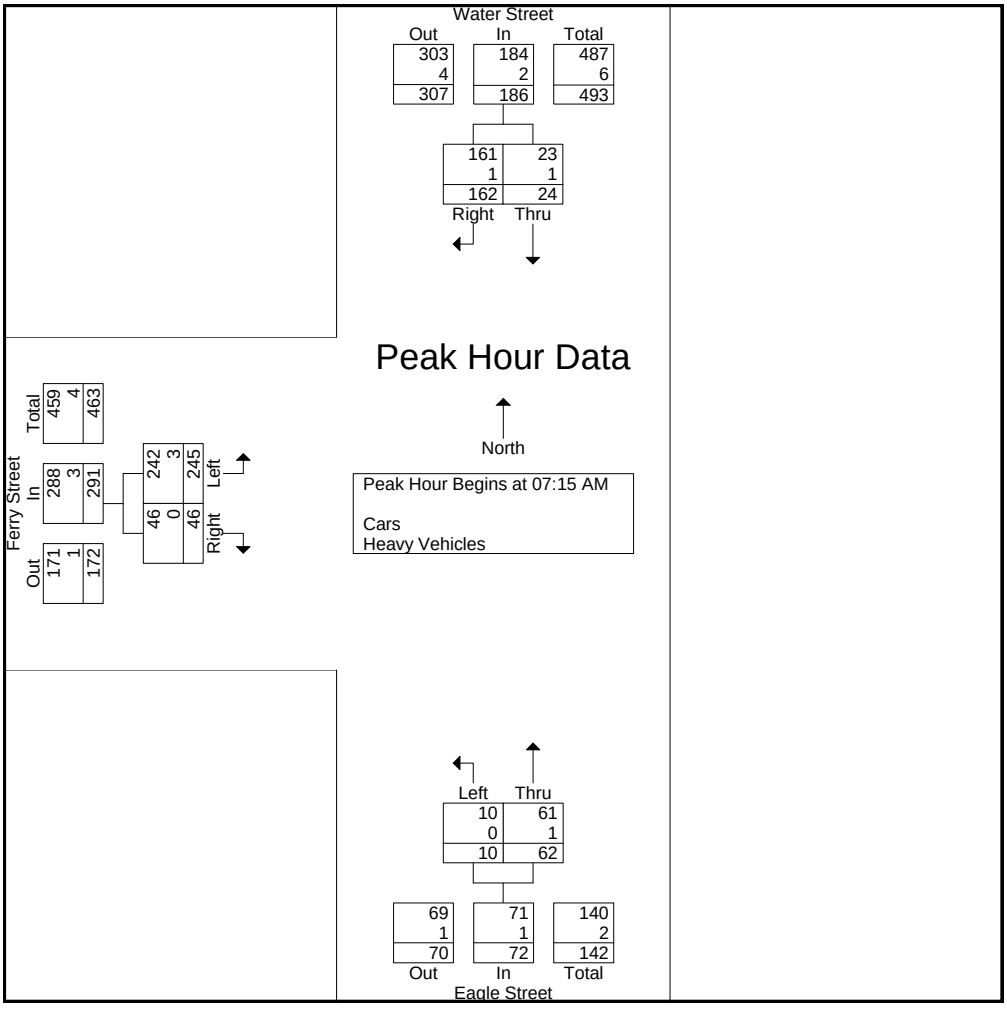
	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	37	5	42	8	**3**	11	11	**70**	**81**	134
07:30 AM	**55**	5	**60**	9	2	11	**13**	65	78	**149**
07:45 AM	**44**	**5**	**49**	**18**	**3**	**21**	**11**	**59**	**70**	**140**
08:00 AM	**26**	**9**	35	**27**	2	**29**	11	51	62	126
Total Volume	162	24	186	62	10	72	46	245	291	549
% App. Total	87.1	12.9		86.1	13.9		15.8	84.2		
PHF	.736	.667	.775	.574	.833	.621	.885	.875	.898	.921
Cars	161	23	184	61	10	71	46	242	288	543
% Cars	99.4	95.8	98.9	98.4	100	98.6	100	98.8	99.0	98.9
Heavy Vehicles	1	1	2	1	0	1	0	3	3	6
% Heavy Vehicles	0.6	4.2	1.1	1.6	0	1.4	0	1.2	1.0	1.1



PRECISION
D A T A
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N/S: Water Street/Eagle Street
W: Ferry Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	75	2	3	6	5	40	131
04:15 PM	51	4	2	5	4	31	97
04:30 PM	60	8	2	5	7	42	124
04:45 PM	57	5	4	3	10	36	115
Total	243	19	11	19	26	149	467
05:00 PM	86	8	6	2	7	38	147
05:15 PM	51	5	4	5	5	27	97
05:30 PM	31	1	3	2	6	32	75
05:45 PM	32	7	0	2	5	14	60
Total	200	21	13	11	23	111	379
Grand Total	443	40	24	30	49	260	846
Apprch %	91.7	8.3	44.4	55.6	15.9	84.1	
Total %	52.4	4.7	2.8	3.5	5.8	30.7	
Cars	440	39	24	30	49	257	839
% Cars	99.3	97.5	100	100	100	98.8	99.2
Heavy Vehicles	3	1	0	0	0	3	7
% Heavy Vehicles	0.7	2.5	0	0	0	1.2	0.8

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	51	4	55	2	**5**	7	4	31	35	97
04:30 PM	60	**8**	68	2	5	7	7	**42**	**49**	124
04:45 PM	57	5	62	4	3	7	**10**	36	46	115
05:00 PM	**86**	8	**94**	**6**	2	**8**	7	38	45	**147**
Total Volume	**254**	**25**	**279**	**14**	**15**	**29**	**28**	**147**	**175**	**483**
% App. Total	**91**	**9**		**48.3**	**51.7**		**16**	**84**		
PHF	**.738**	**.781**	**.742**	**.583**	**.750**	**.906**	**.700**	**.875**	**.893**	**.821**
Cars	**252**	**25**	**277**	**14**	**15**	**29**	**28**	**145**	**173**	**479**
% Cars	**99.2**	**100**	**99.3**	**100**	**100**	**100**	**100**	**98.6**	**98.9**	**99.2**
Heavy Vehicles	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**2**	**4**
% Heavy Vehicles	**0.8**	**0**	**0.7**	**0**	**0**	**0**	**0**	**1.4**	**1.1**	**0.8**

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File Name : 81676A-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	74	2	3	6	5	40	130
04:15 PM	50	4	2	5	4	30	95
04:30 PM	60	8	2	5	7	41	123
04:45 PM	57	5	4	3	10	36	115
Total	241	19	11	19	26	147	463
05:00 PM	85	8	6	2	7	38	146
05:15 PM	51	5	4	5	5	27	97
05:30 PM	31	0	3	2	6	31	73
05:45 PM	32	7	0	2	5	14	60
Total	199	20	13	11	23	110	376
Grand Total	440	39	24	30	49	257	839
Apprch %	91.9	8.1	44.4	55.6	16	84	
Total %	52.4	4.6	2.9	3.6	5.8	30.6	

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	60	**8**	68	2	**5**	7	7	**41**	**48**	123
04:45 PM	57	5	62	4	3	7	**10**	36	46	115
05:00 PM	**85**	8	**93**	**6**	2	8	7	38	45	**146**
05:15 PM	**51**	**5**	**56**	**4**	**5**	**9**	5	27	32	97
Total Volume	253	26	279	16	15	31	29	142	171	481
% App. Total	90.7	9.3		51.6	48.4		17	83		
PHF	.744	.813	.750	.667	.750	.861	.725	.866	.891	.824

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File Name : 81676A-BBB
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Water Street From North		Eagle Street From South		Ferry Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	1	0	0	0	0	0	1
04:15 PM	1	0	0	0	0	1	2
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0
Total	2	0	0	0	0	2	4
05:00 PM	1	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	1	2
05:45 PM	0	0	0	0	0	0	0
Total	1	1	0	0	0	1	3
Grand Total	3	1	0	0	0	3	7
Apprch %	75	25	0	0	0	100	
Total %	42.9	14.3	0	0	0	42.9	

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**1**	0	**1**	0	0	0	0	0	0	1
04:15 PM	1	0	1	0	0	0	0	**1**	**1**	**2**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Volume	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**2**	**4**
% App. Total	**100**	**0**		**0**	**0**		**0**	**100**		
PHF	**.500**	**.000**	**.500**	**.000**	**.000**	**.000**	**.000**	**.500**	**.500**	**.500**

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Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	1	0	1
04:45 PM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	1	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	2	0	0	0	0	0	0	1	0	3
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	66.7	0	0	0	0	0	0	33.3	0	

	Water Street From North				Eagle Street From South				Ferry Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	**1**
04:45 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	0	0	0	1	0	1	2
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500

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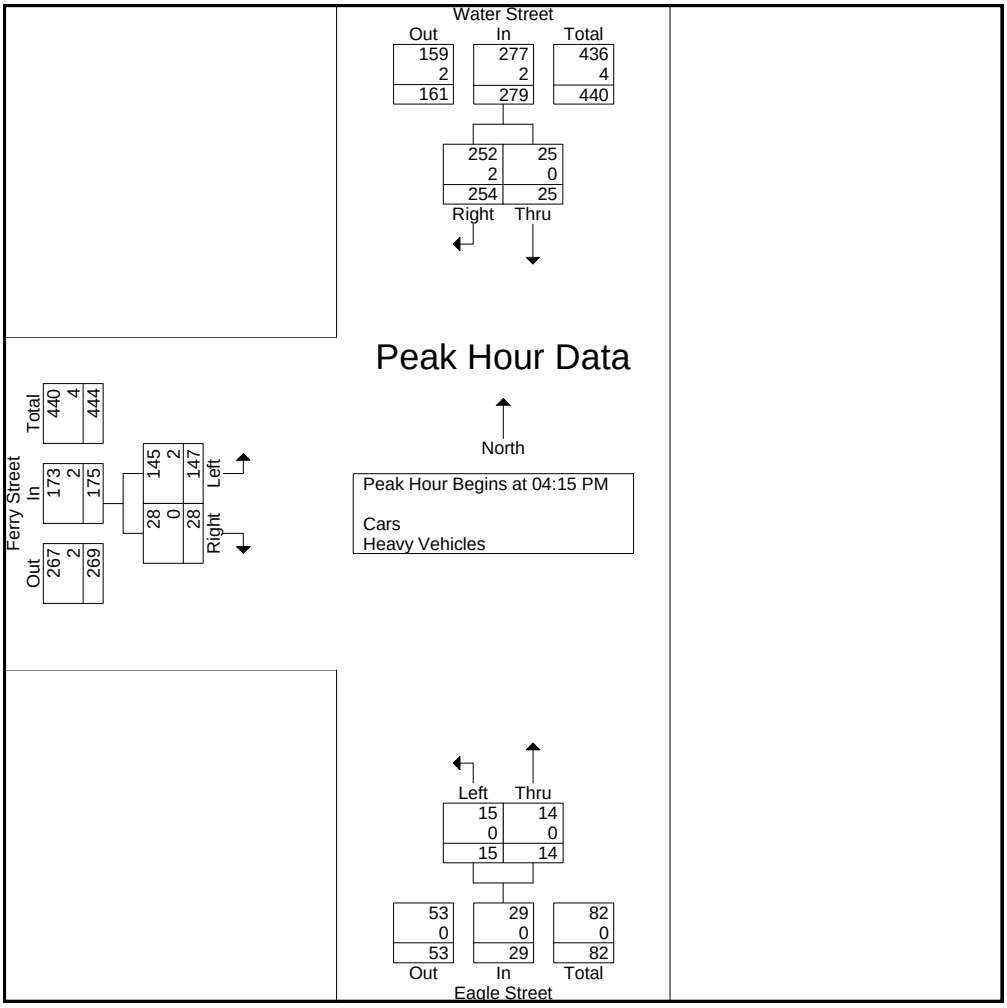
Start Date : 9/9/2008
Page No : 1

	Water Street From North			Eagle Street From South			Ferry Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	51	4	55	2	**5**	7	4	31	35	97
04:30 PM	60	**8**	68	2	5	7	7	**42**	**49**	124
04:45 PM	57	5	62	4	3	7	**10**	36	46	115
05:00 PM	**86**	8	**94**	**6**	2	**8**	7	38	45	**147**
Total Volume	**254**	**25**	**279**	**14**	**15**	**29**	**28**	**147**	**175**	**483**
% App. Total	**91**	**9**		**48.3**	**51.7**		**16**	**84**		
PHF	**.738**	**.781**	**.742**	**.583**	**.750**	**.906**	**.700**	**.875**	**.893**	**.821**
Cars	**252**	**25**	**277**	**14**	**15**	**29**	**28**	**145**	**173**	**479**
% Cars	**99.2**	**100**	**99.3**	**100**	**100**	**100**	**100**	**98.6**	**98.9**	**99.2**
Heavy Vehicles	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**2**	**4**
% Heavy Vehicles	**0.8**	**0**	**0.7**	**0**	**0**	**0**	**0**	**1.4**	**1.1**	**0.8**



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N/S: Davol Street/Columbia Street
E/W: Anawan Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	9	58	37	5	6	8	28	31	1	7	31	31	252
07:15 AM	5	67	48	8	4	12	15	20	3	5	33	51	271
07:30 AM	10	61	53	3	6	6	12	41	3	5	30	48	278
07:45 AM	6	91	64	4	12	4	19	41	2	12	35	38	328
Total	30	277	202	20	28	30	74	133	9	29	129	168	1129
08:00 AM	7	56	53	5	6	3	24	38	4	13	30	33	272
08:15 AM	3	66	51	5	5	8	24	35	4	8	30	27	266
08:30 AM	6	43	37	6	5	4	26	33	5	5	27	25	222
08:45 AM	4	54	37	4	8	3	30	32	1	4	28	16	221
Total	20	219	178	20	24	18	104	138	14	30	115	101	981
Grand Total	50	496	380	40	52	48	178	271	23	59	244	269	2110
Apprch %	5.4	53.6	41	28.6	37.1	34.3	37.7	57.4	4.9	10.3	42.7	47	
Total %	2.4	23.5	18	1.9	2.5	2.3	8.4	12.8	1.1	2.8	11.6	12.7	
Cars	49	482	377	38	50	47	175	268	23	41	233	256	2039
% Cars	98	97.2	99.2	95	96.2	97.9	98.3	98.9	100	69.5	95.5	95.2	96.6
Heavy Vehicles	1	14	3	2	2	1	3	3	0	18	11	13	71
% Heavy Vehicles	2	2.8	0.8	5	3.8	2.1	1.7	1.1	0	30.5	4.5	4.8	3.4

	Davol Street From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	67	48	120	**8**	4	**12**	**24**	15	20	3	38	5	33	**51**	**89**	271
07:30 AM	**10**	61	53	124	3	6	6	15	12	**41**	3	56	5	30	48	83	278
07:45 AM	6	**91**	**64**	**161**	4	**12**	4	20	19	41	2	62	12	**35**	38	85	**328**
08:00 AM	7	56	53	116	5	6	3	14	**24**	38	**4**	**66**	**13**	30	33	76	272
Total Volume	28	275	218	521	20	28	25	73	70	140	12	222	35	128	170	333	1149
% App. Total	5.4	52.8	41.8		27.4	38.4	34.2		31.5	63.1	5.4		10.5	38.4	51.1		
PHF	.700	.755	.852	.809	.625	.583	.521	.760	.729	.854	.750	.841	.673	.914	.833	.935	.876
Cars	28	270	218	516	19	27	24	70	68	140	12	220	24	120	158	302	1108
% Cars	100	98.2	100	99.0	95.0	96.4	96.0	95.9	97.1	100	100	99.1	68.6	93.8	92.9	90.7	96.4
Heavy Vehicles	0	5	0	5	1	1	1	3	2	0	0	2	11	8	12	31	41
% Heavy Vehicles	0	1.8	0	1.0	5.0	3.6	4.0	4.1	2.9	0	0	0.9	31.4	6.3	7.1	9.3	3.6

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Client: VHB/J. Quitter

File Name : 81676A-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	9	57	37	5	6	8	27	31	1	4	31	31	247
07:15 AM	5	67	48	7	3	12	14	20	3	3	30	48	260
07:30 AM	10	58	53	3	6	6	12	41	3	2	29	44	267
07:45 AM	6	90	64	4	12	4	18	41	2	8	34	36	319
Total	30	272	202	19	27	30	71	133	9	17	124	159	1093
08:00 AM	7	55	53	5	6	2	24	38	4	11	27	30	262
08:15 AM	3	62	49	5	5	8	24	35	4	6	28	27	256
08:30 AM	5	40	37	5	5	4	26	32	5	3	26	24	212
08:45 AM	4	53	36	4	7	3	30	30	1	4	28	16	216
Total	19	210	175	19	23	17	104	135	14	24	109	97	946
Grand Total	49	482	377	38	50	47	175	268	23	41	233	256	2039
Apprch %	5.4	53.1	41.5	28.1	37	34.8	37.6	57.5	4.9	7.7	44	48.3	
Total %	2.4	23.6	18.5	1.9	2.5	2.3	8.6	13.1	1.1	2	11.4	12.6	

	Davol Street From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	67	48	120	**7**	3	**12**	**22**	14	20	3	37	3	30	**48**	**81**	260
07:30 AM	**10**	58	53	121	3	6	6	15	12	**41**	3	56	2	29	44	75	267
07:45 AM	6	**90**	**64**	**160**	4	**12**	4	20	18	41	2	61	8	**34**	36	78	**319**
08:00 AM	7	55	53	115	5	6	2	13	**24**	38	**4**	**66**	**11**	27	30	68	262
Total Volume	28	270	218	516	19	27	24	70	68	140	12	220	24	120	158	302	1108
% App. Total	5.4	52.3	42.2		27.1	38.6	34.3		30.9	63.6	5.5		7.9	39.7	52.3		
PHF	.700	.750	.852	.806	.679	.563	.500	.795	.708	.854	.750	.833	.545	.882	.823	.932	.868

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File Name : 81676A-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	1	0	0	0	0	1	0	0	3	0	0	5
07:15 AM	0	0	0	1	1	0	1	0	0	2	3	3	11
07:30 AM	0	3	0	0	0	0	0	0	0	3	1	4	11
07:45 AM	0	1	0	0	0	0	1	0	0	4	1	2	9
Total	0	5	0	1	1	0	3	0	0	12	5	9	36
08:00 AM	0	1	0	0	0	1	0	0	0	2	3	3	10
08:15 AM	0	4	2	0	0	0	0	0	0	2	2	0	10
08:30 AM	1	3	0	1	0	0	0	1	0	2	1	1	10
08:45 AM	0	1	1	0	1	0	0	2	0	0	0	0	5
Total	1	9	3	1	1	1	0	3	0	6	6	4	35
Grand Total	1	14	3	2	2	1	3	3	0	18	11	13	71
Apprch %	5.6	77.8	16.7	40	40	20	50	50	0	42.9	26.2	31	
Total %	1.4	19.7	4.2	2.8	2.8	1.4	4.2	4.2	0	25.4	15.5	18.3	

	Davol Street From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	**1**	**1**	0	**2**	**1**	0	0	**1**	2	**3**	3	**8**	**11**
07:30 AM	0	**3**	0	**3**	0	0	0	0	0	0	0	0	3	1	**4**	8	11
07:45 AM	0	1	0	1	0	0	0	0	1	0	0	1	**4**	1	2	7	9
08:00 AM	0	1	0	1	0	0	**1**	1	0	0	0	0	2	3	3	8	10
Total Volume	0	5	0	5	1	1	1	3	2	0	0	2	11	8	12	31	41
% App. Total	0	100	0		33.3	33.3	33.3		100	0	0		35.5	25.8	38.7		
PHF	.000	.417	.000	.417	.250	.250	.250	.375	.500	.000	.000	.500	.688	.667	.750	.969	.932

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N/S: Davol Street/Columbia Street
E/W: Anawan Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
07:30 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	2	7
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	4
Total	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	5	13
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	5
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
Total	0	0	0	2	0	0	0	1	0	0	0	2	0	1	0	5	11
Grand Total	0	0	0	7	0	0	0	1	0	0	0	5	0	1	0	10	24
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	9.1	0	90.9	
Total %	0	0	0	29.2	0	0	0	4.2	0	0	0	20.8	0	4.2	0	41.7	

	Davol Street From North					Anawan Street From East					Columbia Street From South					Anawan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
07:30 AM	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**7**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	2	2	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	**1**	0	2	**3**	5
Total Volume	0	0	0	5	5	0	0	0	0	0	0	0	0	5	5	0	1	0	6	7	17
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	14.3	0	85.7		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.625	.625	.000	.250	.000	.750	.583	.607

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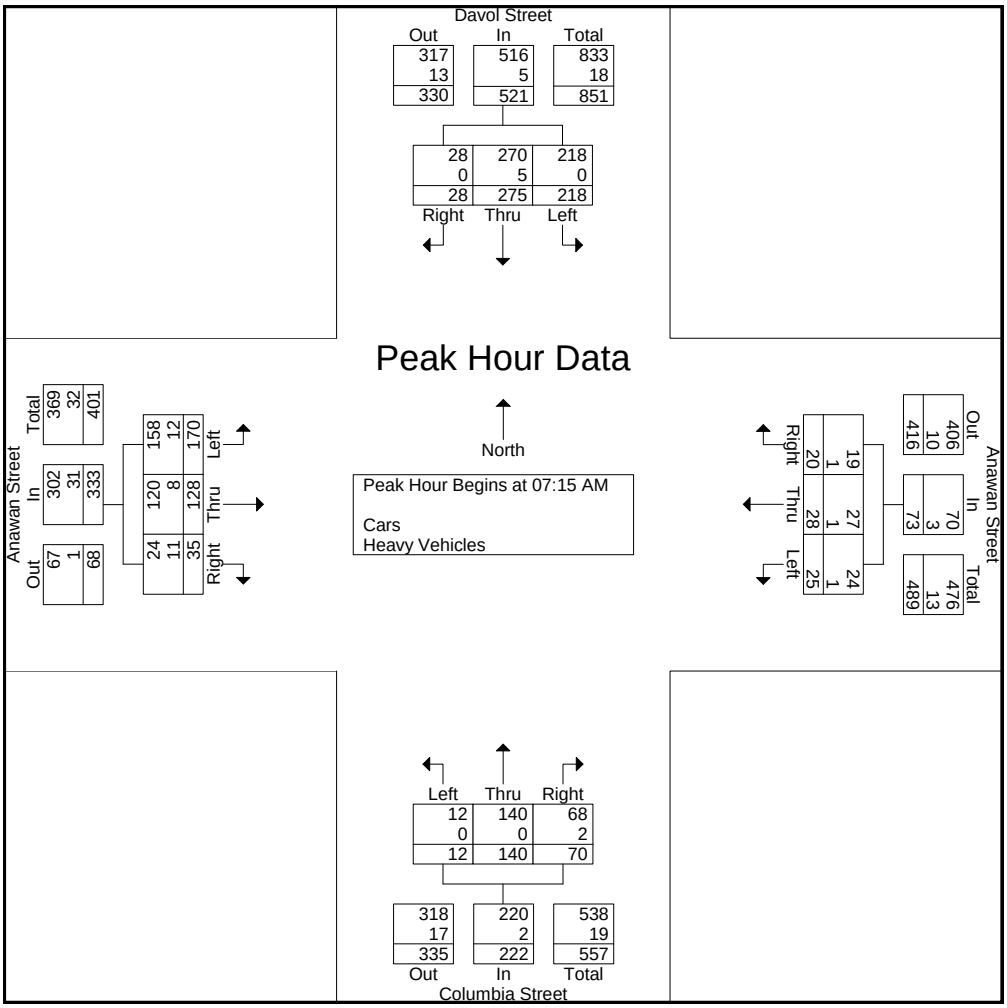
File Name : 81676A-C
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	67	48	120	**8**	4	**12**	**24**	15	20	3	38	5	33	**51**	**89**	271
07:30 AM	**10**	61	53	124	3	6	6	15	12	**41**	3	56	5	30	48	83	278
07:45 AM	6	**91**	**64**	**161**	4	**12**	4	20	19	41	2	62	12	**35**	38	85	**328**
08:00 AM	7	56	53	116	5	6	3	14	**24**	38	**4**	**66**	**13**	30	33	76	272
Total Volume	28	275	218	521	20	28	25	73	70	140	12	222	35	128	170	333	1149
% App. Total	5.4	52.8	41.8		27.4	38.4	34.2		31.5	63.1	5.4		10.5	38.4	51.1		
PHF	.700	.755	.852	.809	.625	.583	.521	.760	.729	.854	.750	.841	.673	.914	.833	.935	.876
Cars	28	270	218	516	19	27	24	70	68	140	12	220	24	120	158	302	1108
% Cars	100	98.2	100	99.0	95.0	96.4	96.0	95.9	97.1	100	100	99.1	68.6	93.8	92.9	90.7	96.4
Heavy Vehicles	0	5	0	5	1	1	1	3	2	0	0	2	11	8	12	31	41
% Heavy Vehicles	0	1.8	0	1.0	5.0	3.6	4.0	4.1	2.9	0	0	0.9	31.4	6.3	7.1	9.3	3.6



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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Sreet From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	13	103	43	14	14	35	23	35	1	18	25	29	353
04:15 PM	8	81	47	12	10	21	28	33	0	11	15	30	296
04:30 PM	6	89	39	12	8	30	20	40	1	15	26	27	313
04:45 PM	7	92	40	8	6	17	17	26	2	6	20	22	263
Total	34	365	169	46	38	103	88	134	4	50	86	108	1225
05:00 PM	12	94	42	22	14	25	20	47	3	18	22	29	348
05:15 PM	7	71	36	14	13	16	24	24	2	15	19	22	263
05:30 PM	6	74	32	15	2	9	17	40	0	4	21	17	237
05:45 PM	5	85	33	13	6	9	19	39	0	5	11	11	236
Total	30	324	143	64	35	59	80	150	5	42	73	79	1084
Grand Total	64	689	312	110	73	162	168	284	9	92	159	187	2309
Apprch %	6	64.7	29.3	31.9	21.2	47	36.4	61.6	2	21	36.3	42.7	
Total %	2.8	29.8	13.5	4.8	3.2	7	7.3	12.3	0.4	4	6.9	8.1	
Cars	64	677	309	110	70	162	166	281	9	90	157	183	2278
% Cars	100	98.3	99	100	95.9	100	98.8	98.9	100	97.8	98.7	97.9	98.7
Heavy Vehicles	0	12	3	0	3	0	2	3	0	2	2	4	31
% Heavy Vehicles	0	1.7	1	0	4.1	0	1.2	1.1	0	2.2	1.3	2.1	1.3

	Davol Sreet From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**13**	**103**	43	**159**	**14**	**14**	**35**	**63**	23	35	1	59	**18**	25	29	**72**	**353**
04:15 PM	8	81	**47**	136	12	10	21	43	**28**	33	0	**61**	11	15	**30**	56	296
04:30 PM	6	89	39	134	12	8	30	50	20	**40**	1	61	15	**26**	27	68	313
04:45 PM	7	92	40	139	8	6	17	31	17	26	**2**	45	6	20	22	48	263
Total Volume	34	365	169	568	46	38	103	187	88	134	4	226	50	86	108	244	1225
% App. Total	6	64.3	29.8		24.6	20.3	55.1		38.9	59.3	1.8		20.5	35.2	44.3		
PHF	.654	.886	.899	.893	.821	.679	.736	.742	.786	.838	.500	.926	.694	.827	.900	.847	.868
Cars	34	359	166	559	46	36	103	185	88	132	4	224	50	84	105	239	1207
% Cars	100	98.4	98.2	98.4	100	94.7	100	98.9	100	98.5	100	99.1	100	97.7	97.2	98.0	98.5
Heavy Vehicles	0	6	3	9	0	2	0	2	0	2	0	2	0	2	3	5	18
% Heavy Vehicles	0	1.6	1.8	1.6	0	5.3	0	1.1	0	1.5	0	0.9	0	2.3	2.8	2.0	1.5

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Client: VHB/J. Quitter

File Name : 81676A-CCC
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Sreet From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	13	102	42	14	13	35	23	34	1	18	25	28	348
04:15 PM	8	79	47	12	10	21	28	32	0	11	15	28	291
04:30 PM	6	87	38	12	7	30	20	40	1	15	25	27	308
04:45 PM	7	91	39	8	6	17	17	26	2	6	19	22	260
Total	34	359	166	46	36	103	88	132	4	50	84	105	1207
05:00 PM	12	92	42	22	14	25	20	46	3	16	22	29	343
05:15 PM	7	70	36	14	12	16	22	24	2	15	19	22	259
05:30 PM	6	73	32	15	2	9	17	40	0	4	21	16	235
05:45 PM	5	83	33	13	6	9	19	39	0	5	11	11	234
Total	30	318	143	64	34	59	78	149	5	40	73	78	1071
Grand Total	64	677	309	110	70	162	166	281	9	90	157	183	2278
Apprch %	6.1	64.5	29.4	32.2	20.5	47.4	36.4	61.6	2	20.9	36.5	42.6	
Total %	2.8	29.7	13.6	4.8	3.1	7.1	7.3	12.3	0.4	4	6.9	8	

	Davol Sreet From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**13**	**102**	42	**157**	**14**	**13**	**35**	**62**	23	34	1	58	**18**	**25**	**28**	**71**	**348**
04:15 PM	8	79	**47**	134	12	10	21	43	**28**	32	0	60	11	15	28	54	291
04:30 PM	6	87	38	131	12	7	30	49	20	**40**	1	**61**	15	25	27	67	308
04:45 PM	7	91	39	137	8	6	17	31	17	26	**2**	45	6	19	22	47	260
Total Volume	34	359	166	559	46	36	103	185	88	132	4	224	50	84	105	239	1207
% App. Total	6.1	64.2	29.7		24.9	19.5	55.7		39.3	58.9	1.8		20.9	35.1	43.9		
PHF	.654	.880	.883	.890	.821	.692	.736	.746	.786	.825	.500	.918	.694	.840	.938	.842	.867

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File Name : 81676A-CCC
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Page No : 1

Groups Printed- Heavy Vehicles

	Davol Sreet From North			Anawan Street From East			Columbia Street From South			Anawan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	1	0	1	0	0	1	0	0	0	1	5
04:15 PM	0	2	0	0	0	0	0	1	0	0	0	2	5
04:30 PM	0	2	1	0	1	0	0	0	0	0	1	0	5
04:45 PM	0	1	1	0	0	0	0	0	0	0	1	0	3
Total	0	6	3	0	2	0	0	2	0	0	2	3	18
05:00 PM	0	2	0	0	0	0	0	1	0	2	0	0	5
05:15 PM	0	1	0	0	1	0	2	0	0	0	0	0	4
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	2
05:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	6	0	0	1	0	2	1	0	2	0	1	13
Grand Total	0	12	3	0	3	0	2	3	0	2	2	4	31
Apprch %	0	80	20	0	100	0	40	60	0	25	25	50	
Total %	0	38.7	9.7	0	9.7	0	6.5	9.7	0	6.5	6.5	12.9	

	Davol Sreet From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	**1**	2	0	**1**	0	**1**	0	**1**	0	**1**	0	0	1	1	**5**
04:15 PM	0	**2**	0	2	0	0	0	0	0	1	0	1	0	0	**2**	**2**	5
04:30 PM	0	2	1	**3**	0	1	0	1	0	0	0	0	0	**1**	0	1	5
04:45 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	1	0	1	3
Total Volume	0	6	3	9	0	2	0	2	0	2	0	2	0	2	3	5	18
% App. Total	0	66.7	33.3		0	100	0		0	100	0		0	40	60		
PHF	.000	.750	.750	.750	.000	.500	.000	.500	.000	.500	.000	.500	.000	.500	.375	.625	.900

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File Name : 81676A-CCC
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Page No : 1

Groups Printed- Peds and Bicycles

	Davol Sreet From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	1	4	0	0	0	2	0	0	0	0	7
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	5	0	1	0	2	0	0	0	0	9
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	5
05:45 PM	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	7
Total	0	0	0	2	0	0	0	7	0	0	0	2	0	0	0	4	15
Grand Total	0	0	0	2	0	0	1	12	0	1	0	4	0	0	0	4	24
Apprch %	0	0	0	100	0	0	7.7	92.3	0	20	0	80	0	0	0	100	
Total %	0	0	0	8.3	0	0	4.2	50	0	4.2	0	16.7	0	0	0	16.7	

	Davol Sreet From North					Anawan Street From East					Columbia Street From South					Anawan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	1	1	2
05:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	**3**	**3**	5
05:45 PM	0	0	0	**2**	**2**	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	0	0	**7**
Total Volume	0	0	0	2	2	0	0	0	7	7	0	0	0	2	2	0	0	0	4	4	15
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.350	.350	.000	.000	.000	.500	.500	.000	.000	.000	.333	.333	.536

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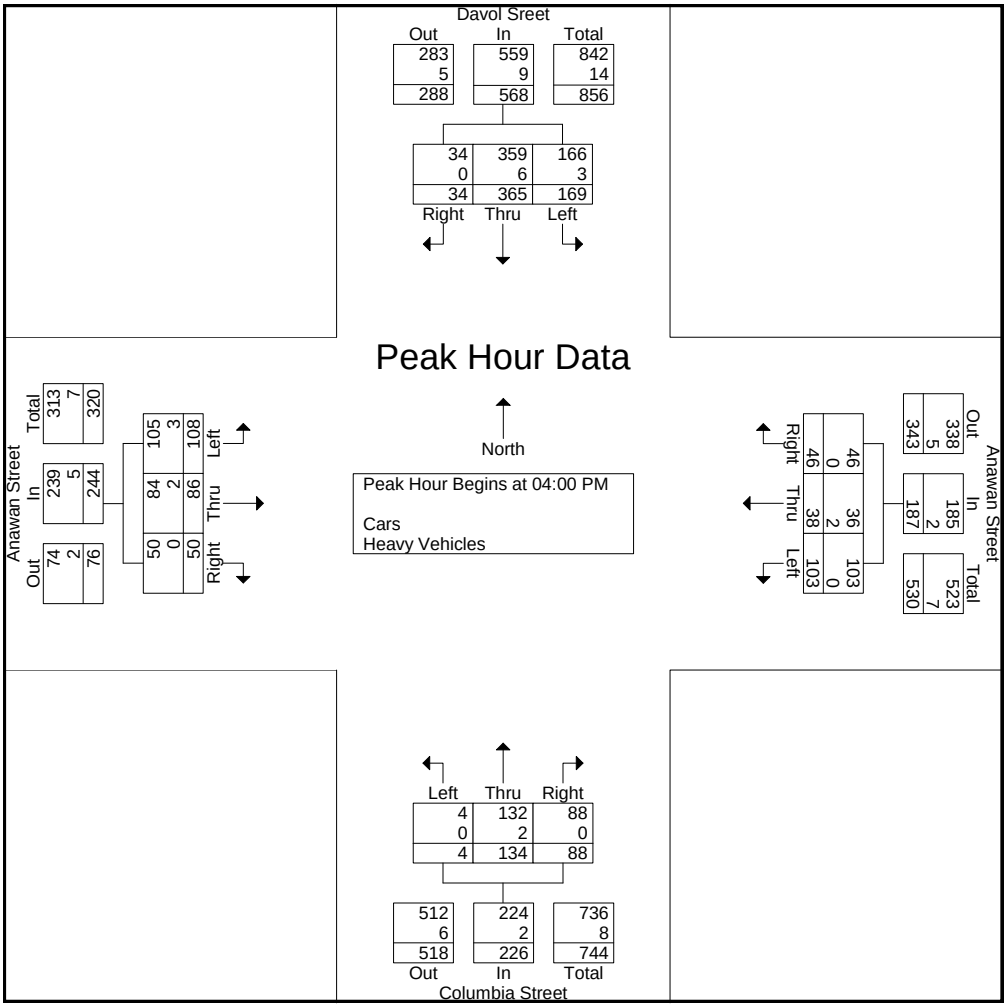
	Davol Sreet From North				Anawan Street From East				Columbia Street From South				Anawan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**13**	**103**	43	**159**	**14**	**14**	**35**	**63**	23	35	1	59	**18**	25	29	**72**	**353**
04:15 PM	8	81	**47**	136	12	10	21	43	**28**	33	0	**61**	11	15	**30**	56	296
04:30 PM	6	89	39	134	12	8	30	50	20	**40**	1	61	15	**26**	27	68	313
04:45 PM	7	92	40	139	8	6	17	31	17	26	**2**	45	6	20	22	48	263
Total Volume	34	365	169	568	46	38	103	187	88	134	4	226	50	86	108	244	1225
% App. Total	6	64.3	29.8		24.6	20.3	55.1		38.9	59.3	1.8		20.5	35.2	44.3		
PHF	.654	.886	.899	.893	.821	.679	.736	.742	.786	.838	.500	.926	.694	.827	.900	.847	.868
Cars	34	359	166	559	46	36	103	185	88	132	4	224	50	84	105	239	1207
% Cars	100	98.4	98.2	98.4	100	94.7	100	98.9	100	98.5	100	99.1	100	97.7	97.2	98.0	98.5
Heavy Vehicles	0	6	3	9	0	2	0	2	0	2	0	2	0	2	3	5	18
% Heavy Vehicles	0	1.6	1.8	1.6	0	5.3	0	1.1	0	1.5	0	0.9	0	2.3	2.8	2.0	1.5



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N/S: Davol Street
E/W: Central Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	16	88	0	21	18	14	0	67	0	0	0	0	224
07:15 AM	21	100	0	30	18	19	0	69	0	0	0	0	257
07:30 AM	14	116	0	44	37	17	0	87	0	1	0	0	316
07:45 AM	28	135	0	29	25	22	0	81	1	0	0	0	321
Total	79	439	0	124	98	72	0	304	1	1	0	0	1118
08:00 AM	14	91	0	24	19	12	0	60	1	0	0	0	221
08:15 AM	20	93	0	22	13	10	0	49	0	1	0	0	208
08:30 AM	10	65	0	30	19	13	0	55	2	0	0	1	195
08:45 AM	15	80	0	31	18	16	0	43	0	0	0	0	203
Total	59	329	0	107	69	51	0	207	3	1	0	1	827
Grand Total	138	768	0	231	167	123	0	511	4	2	0	1	1945
Apprch %	15.2	84.8	0	44.3	32.1	23.6	0	99.2	0.8	66.7	0	33.3	
Total %	7.1	39.5	0	11.9	8.6	6.3	0	26.3	0.2	0.1	0	0.1	
Cars	135	756	0	221	161	119	0	499	2	2	0	0	1895
% Cars	97.8	98.4	0	95.7	96.4	96.7	0	97.7	50	100	0	0	97.4
Heavy Vehicles	3	12	0	10	6	4	0	12	2	0	0	1	50
% Heavy Vehicles	2.2	1.6	0	4.3	3.6	3.3	0	2.3	50	0	0	100	2.6

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	16	88	0	104	21	18	14	53	0	67	0	67	0	0	0	0	224
07:15 AM	21	100	0	121	30	18	19	67	0	69	0	69	0	0	0	0	257
07:30 AM	14	116	0	130	**44**	**37**	17	**98**	0	**87**	0	**87**	**1**	0	0	**1**	316
07:45 AM	**28**	**135**	0	**163**	29	25	**22**	76	0	81	**1**	82	0	0	0	0	**321**
Total Volume	79	439	0	518	124	98	72	294	0	304	1	305	1	0	0	1	1118
% App. Total	15.3	84.7	0		42.2	33.3	24.5		0	99.7	0.3		100	0	0		
PHF	.705	.813	.000	.794	.705	.662	.818	.750	.000	.874	.250	.876	.250	.000	.000	.250	.871
Cars	78	436	0	514	118	97	70	285	0	298	0	298	1	0	0	1	1098
% Cars	98.7	99.3	0	99.2	95.2	99.0	97.2	96.9	0	98.0	0	97.7	100	0	0	100	98.2
Heavy Vehicles	1	3	0	4	6	1	2	9	0	6	1	7	0	0	0	0	20
% Heavy Vehicles	1.3	0.7	0	0.8	4.8	1.0	2.8	3.1	0	2.0	100	2.3	0	0	0	0	1.8

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City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	16	88	0	20	18	14	0	67	0	0	0	0	223
07:15 AM	20	100	0	28	18	19	0	68	0	0	0	0	253
07:30 AM	14	113	0	43	37	16	0	84	0	1	0	0	308
07:45 AM	28	135	0	27	24	21	0	79	0	0	0	0	314
Total	78	436	0	118	97	70	0	298	0	1	0	0	1098
08:00 AM	14	90	0	24	16	11	0	58	1	0	0	0	214
08:15 AM	19	88	0	21	13	10	0	49	0	1	0	0	201
08:30 AM	10	64	0	29	18	12	0	53	1	0	0	0	187
08:45 AM	14	78	0	29	17	16	0	41	0	0	0	0	195
Total	57	320	0	103	64	49	0	201	2	1	0	0	797
Grand Total	135	756	0	221	161	119	0	499	2	2	0	0	1895
Apprch %	15.2	84.8	0	44.1	32.1	23.8	0	99.6	0.4	100	0	0	
Total %	7.1	39.9	0	11.7	8.5	6.3	0	26.3	0.1	0.1	0	0	

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	16	88	0	104	20	18	14	52	0	67	0	67	0	0	0	0	223
07:15 AM	20	100	0	120	28	18	19	65	0	68	0	68	0	0	0	0	253
07:30 AM	14	113	0	127	**43**	**37**	16	**96**	0	**84**	0	**84**	**1**	0	0	**1**	308
07:45 AM	**28**	**135**	0	**163**	27	24	**21**	72	0	79	0	79	0	0	0	0	**314**
Total Volume	78	436	0	514	118	97	70	285	0	298	0	298	1	0	0	1	1098
% App. Total	15.2	84.8	0		41.4	34	24.6		0	100	0		100	0	0		
PHF	.696	.807	.000	.788	.686	.655	.833	.742	.000	.887	.000	.887	.250	.000	.000	.250	.874

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Client: VHB/J. Quitter

File Name : 81676A-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	1	0	0	2	0	0	0	1	0	0	0	0	4
07:30 AM	0	3	0	1	0	1	0	3	0	0	0	0	8
07:45 AM	0	0	0	2	1	1	0	2	1	0	0	0	7
Total	1	3	0	6	1	2	0	6	1	0	0	0	20
08:00 AM	0	1	0	0	3	1	0	2	0	0	0	0	7
08:15 AM	1	5	0	1	0	0	0	0	0	0	0	0	7
08:30 AM	0	1	0	1	1	1	0	2	1	0	0	1	8
08:45 AM	1	2	0	2	1	0	0	2	0	0	0	0	8
Total	2	9	0	4	5	2	0	6	1	0	0	1	30
Grand Total	3	12	0	10	6	4	0	12	2	0	0	1	50
Apprch %	20	80	0	50	30	20	0	85.7	14.3	0	0	100	
Total %	6	24	0	20	12	8	0	24	4	0	0	2	

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	1	0	1	0	**3**	**1**	**4**	0	**2**	0	2	0	0	0	0	7
08:15 AM	**1**	**5**	0	**6**	1	0	0	1	0	0	0	0	0	0	0	0	7
08:30 AM	0	1	0	1	1	1	1	3	0	2	**1**	**3**	0	0	**1**	**1**	**8**
08:45 AM	1	2	0	3	**2**	1	0	3	0	2	0	2	0	0	0	0	8
Total Volume	2	9	0	11	4	5	2	11	0	6	1	7	0	0	1	1	30
% App. Total	18.2	81.8	0		36.4	45.5	18.2		0	85.7	14.3		0	0	100		
PHF	.500	.450	.000	.458	.500	.417	.500	.688	.000	.750	.250	.583	.000	.000	.250	.250	.938

PRECISION
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Client: VHB/J. Quitter

File Name : 81676A-D
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	1	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	6	0	0	0	0	0	0	0	1	0	0	0	1	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	5
Grand Total	0	0	0	9	0	0	0	0	0	0	0	3	0	0	0	1	13
Apprch %	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0	100	
Total %	0	0	0	69.2	0	0	0	0	0	0	0	23.1	0	0	0	7.7	

	Davol Street NB/SB From North					Central Street From East					Davol Street From South					Central Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**6**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	1
Total Volume	0	0	0	6	6	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	8
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.300	.300	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.333

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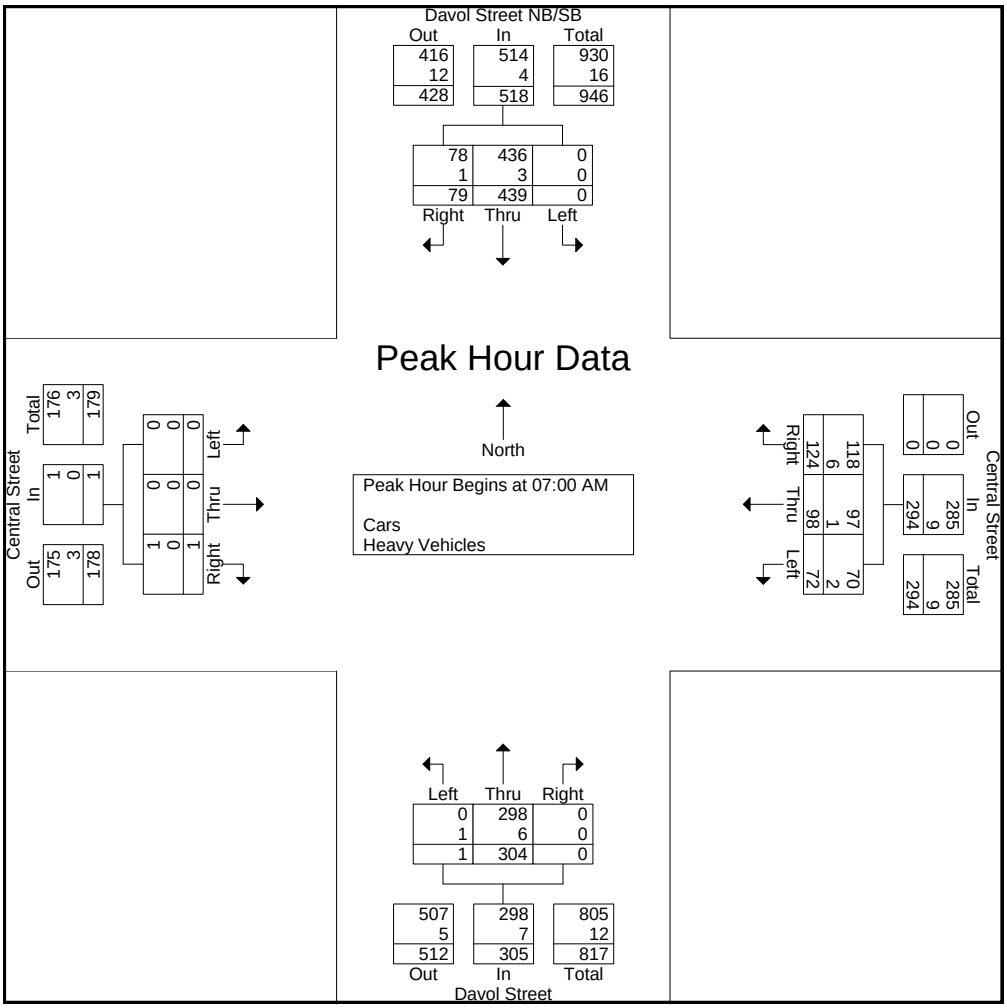
Page No : 1

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	16	88	0	104	21	18	14	53	0	67	0	67	0	0	0	0	224
07:15 AM	21	100	0	121	30	18	19	67	0	69	0	69	0	0	0	0	257
07:30 AM	14	116	0	130	**44**	**37**	17	**98**	0	**87**	0	**87**	**1**	0	0	**1**	316
07:45 AM	**28**	**135**	0	**163**	29	25	**22**	76	0	81	**1**	82	0	0	0	0	**321**
Total Volume	79	439	0	518	124	98	72	294	0	304	1	305	1	0	0	1	1118
% App. Total	15.3	84.7	0		42.2	33.3	24.5		0	99.7	0.3		100	0	0		
PHF	.705	.813	.000	.794	.705	.662	.818	.750	.000	.874	.250	.876	.250	.000	.000	.250	.871
Cars	78	436	0	514	118	97	70	285	0	298	0	298	1	0	0	1	1098
% Cars	98.7	99.3	0	99.2	95.2	99.0	97.2	96.9	0	98.0	0	97.7	100	0	0	100	98.2
Heavy Vehicles	1	3	0	4	6	1	2	9	0	6	1	7	0	0	0	0	20
% Heavy Vehicles	1.3	0.7	0	0.8	4.8	1.0	2.8	3.1	0	2.0	100	2.3	0	0	0	0	1.8



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Client: VHB/J. Quitter

File Name : 81676A-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	32	115	0	52	23	36	0	79	2	0	0	0	339
04:15 PM	20	114	0	53	22	19	0	75	1	1	0	0	305
04:30 PM	30	97	0	78	30	31	0	74	1	0	0	0	341
04:45 PM	30	97	0	61	27	36	0	59	0	0	0	0	310
Total	112	423	0	244	102	122	0	287	4	1	0	0	1295
05:00 PM	34	115	0	61	32	29	0	99	1	0	0	0	371
05:15 PM	28	88	0	50	18	30	0	62	0	0	0	0	276
05:30 PM	15	87	0	48	18	26	0	68	1	0	0	0	263
05:45 PM	15	98	0	37	20	18	0	58	1	0	0	0	247
Total	92	388	0	196	88	103	0	287	3	0	0	0	1157
Grand Total	204	811	0	440	190	225	0	574	7	1	0	0	2452
Apprch %	20.1	79.9	0	51.5	22.2	26.3	0	98.8	1.2	100	0	0	
Total %	8.3	33.1	0	17.9	7.7	9.2	0	23.4	0.3	0	0	0	
Cars	194	808	0	437	184	222	0	571	7	1	0	0	2424
% Cars	95.1	99.6	0	99.3	96.8	98.7	0	99.5	100	100	0	0	98.9
Heavy Vehicles	10	3	0	3	6	3	0	3	0	0	0	0	28
% Heavy Vehicles	4.9	0.4	0	0.7	3.2	1.3	0	0.5	0	0	0	0	1.1

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	20	114	0	134	53	22	19	94	0	75	**1**	76	**1**	0	0	**1**	305
04:30 PM	30	97	0	127	**78**	30	31	**139**	0	74	1	75	0	0	0	0	341
04:45 PM	30	97	0	127	61	27	**36**	124	0	59	0	59	0	0	0	0	310
05:00 PM	**34**	**115**	0	**149**	61	**32**	29	122	0	**99**	1	**100**	0	0	0	0	**371**
Total Volume	114	423	0	537	253	111	115	479	0	307	3	310	1	0	0	1	1327
% App. Total	21.2	78.8	0		52.8	23.2	24		0	99	1		100	0	0		
PHF	.838	.920	.000	.901	.811	.867	.799	.862	.000	.775	.750	.775	.250	.000	.000	.250	.894
Cars	107	421	0	528	252	107	113	472	0	304	3	307	1	0	0	1	1308
% Cars	93.9	99.5	0	98.3	99.6	96.4	98.3	98.5	0	99.0	100	99.0	100	0	0	100	98.6
Heavy Vehicles	7	2	0	9	1	4	2	7	0	3	0	3	0	0	0	0	19
% Heavy Vehicles	6.1	0.5	0	1.7	0.4	3.6	1.7	1.5	0	1.0	0	1.0	0	0	0	0	1.4

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Page No : 1

Groups Printed- Cars

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	31	115	0	52	23	36	0	79	2	0	0	0	338
04:15 PM	19	114	0	53	21	19	0	73	1	1	0	0	301
04:30 PM	25	96	0	78	30	31	0	74	1	0	0	0	335
04:45 PM	29	97	0	60	25	35	0	59	0	0	0	0	305
Total	104	422	0	243	99	121	0	285	4	1	0	0	1279
05:00 PM	34	114	0	61	31	28	0	98	1	0	0	0	367
05:15 PM	27	88	0	50	18	30	0	62	0	0	0	0	275
05:30 PM	14	87	0	47	16	26	0	68	1	0	0	0	259
05:45 PM	15	97	0	36	20	17	0	58	1	0	0	0	244
Total	90	386	0	194	85	101	0	286	3	0	0	0	1145
Grand Total	194	808	0	437	184	222	0	571	7	1	0	0	2424
Apprch %	19.4	80.6	0	51.8	21.8	26.3	0	98.8	1.2	100	0	0	
Total %	8	33.3	0	18	7.6	9.2	0	23.6	0.3	0	0	0	

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	19	**114**	0	133	53	21	19	93	0	73	**1**	74	**1**	0	0	**1**	301
04:30 PM	25	96	0	121	**78**	30	31	**139**	0	74	1	75	0	0	0	0	335
04:45 PM	29	97	0	126	60	25	**35**	120	0	59	0	59	0	0	0	0	305
05:00 PM	**34**	114	0	**148**	61	**31**	28	120	0	**98**	1	**99**	0	0	0	0	**367**
Total Volume	107	421	0	528	252	107	113	472	0	304	3	307	1	0	0	1	1308
% App. Total	20.3	79.7	0		53.4	22.7	23.9		0	99	1		100	0	0		
PHF	.787	.923	.000	.892	.808	.863	.807	.849	.000	.776	.750	.775	.250	.000	.000	.250	.891

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N/S: Davol Street
E/W: Central Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Davol Street NB/SB From North			Central Street From East			Davol Street From South			Central Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	1	0	0	0	1	0	0	2	0	0	0	0	4
04:30 PM	5	1	0	0	0	0	0	0	0	0	0	0	6
04:45 PM	1	0	0	1	2	1	0	0	0	0	0	0	5
Total	8	1	0	1	3	1	0	2	0	0	0	0	16
05:00 PM	0	1	0	0	1	1	0	1	0	0	0	0	4
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	1	0	0	1	2	0	0	0	0	0	0	0	4
05:45 PM	0	1	0	1	0	1	0	0	0	0	0	0	3
Total	2	2	0	2	3	2	0	1	0	0	0	0	12
Grand Total	10	3	0	3	6	3	0	3	0	0	0	0	28
Apprch %	76.9	23.1	0	25	50	25	0	100	0	0	0	0	
Total %	35.7	10.7	0	10.7	21.4	10.7	0	10.7	0	0	0	0	

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	0	0	1	0	1	0	1	0	**2**	0	**2**	0	0	0	0	4
04:30 PM	**5**	**1**	0	**6**	0	0	0	0	0	0	0	0	0	0	0	0	**6**
04:45 PM	1	0	0	1	**1**	**2**	**1**	**4**	0	0	0	0	0	0	0	0	5
05:00 PM	0	1	0	1	0	1	1	2	0	1	0	1	0	0	0	0	4
Total Volume	7	2	0	9	1	4	2	7	0	3	0	3	0	0	0	0	19
% App. Total	77.8	22.2	0		14.3	57.1	28.6		0	100	0		0	0	0		
PHF	.350	.500	.000	.375	.250	.500	.500	.438	.000	.375	.000	.375	.000	.000	.000	.000	.792

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E/W: Central Street
City, State: Fall River, MA
Client: VHB/J. Quitter

File Name : 81676A-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	3
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	4
Total	0	0	0	3	0	0	0	2	0	1	0	2	0	0	0	1	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	4
05:45 PM	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	2	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	8
Grand Total	2	0	0	5	0	0	0	2	0	1	0	4	0	0	0	3	17
Apprch %	28.6	0	0	71.4	0	0	0	100	0	20	0	80	0	0	0	100	
Total %	11.8	0	0	29.4	0	0	0	11.8	0	5.9	0	23.5	0	0	0	17.6	

	Davol Street NB/SB From North					Central Street From East					Davol Street From South					Central Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	**0**	**1**	**2**	0	0	0	0	0	3
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	1	1	0	0	0	**1**	**1**	**4**
Total Volume	0	0	0	3	3	0	0	0	2	2	0	1	0	2	3	0	0	0	1	1	9
% App. Total	0	0	0	100		0	0	0	100		0	33.3	0	66.7		0	0	0	100		
PHF	.000	.000	.000	.375	.375	.000	.000	.000	.500	.500	.000	.250	.000	.500	.375	.000	.000	.000	.250	.250	.563

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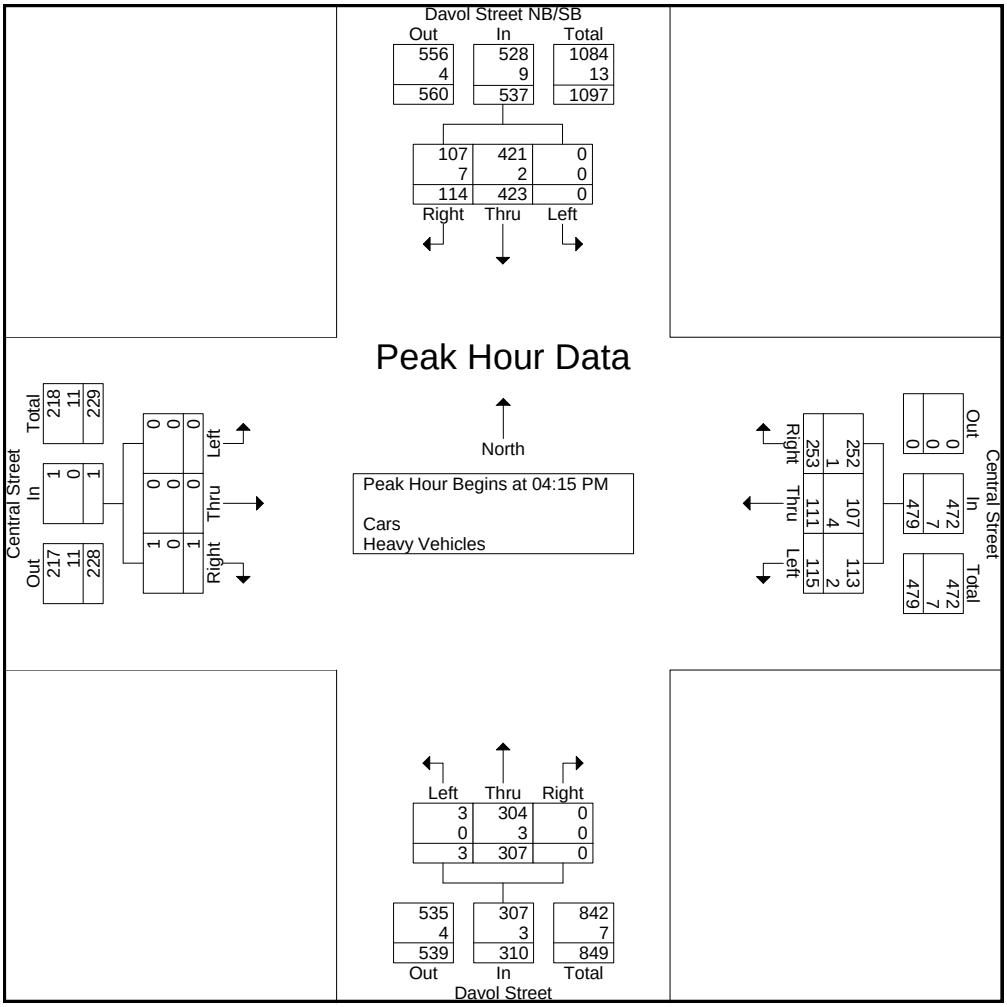
Client: VHB/J. Quitter

File Name : 81676A-DDD
Site Code : 10111.31
Start Date : 9/9/2008
Page No : 1

	Davol Street NB/SB From North				Central Street From East				Davol Street From South				Central Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	20	114	0	134	53	22	19	94	0	75	**1**	76	**1**	0	0	**1**	305
04:30 PM	30	97	0	127	**78**	30	31	**139**	0	74	1	75	0	0	0	0	341
04:45 PM	30	97	0	127	61	27	**36**	124	0	59	0	59	0	0	0	0	310
05:00 PM	**34**	**115**	0	**149**	61	**32**	29	122	0	**99**	1	**100**	0	0	0	0	**371**
Total Volume	114	423	0	537	253	111	115	479	0	307	3	310	1	0	0	1	1327
% App. Total	21.2	78.8	0		52.8	23.2	24		0	99	1		100	0	0		
PHF	.838	.920	.000	.901	.811	.867	.799	.862	.000	.775	.750	.775	.250	.000	.000	.250	.894
Cars	107	421	0	528	252	107	113	472	0	304	3	307	1	0	0	1	1308
% Cars	93.9	99.5	0	98.3	99.6	96.4	98.3	98.5	0	99.0	100	99.0	100	0	0	100	98.6
Heavy Vehicles	7	2	0	9	1	4	2	7	0	3	0	3	0	0	0	0	19
% Heavy Vehicles	6.1	0.5	0	1.7	0.4	3.6	1.7	1.5	0	1.0	0	1.0	0	0	0	0	1.4



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Sat 9/6/08 and Wed 9/10/08	81676	Freetown, MA

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N/S: Mobil Driveway/ Ridge Hill Road
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	23	0	1	1	112	5	1	0	3	6	80	13	245
07:15 AM	35	0	4	1	110	1	0	1	1	4	101	7	265
07:30 AM	45	0	3	0	116	4	3	0	5	5	120	7	308
07:45 AM	28	2	5	1	103	3	0	0	5	4	91	4	246
Total	131	2	13	3	441	13	4	1	14	19	392	31	1064
08:00 AM	31	1	3	0	101	5	3	0	4	4	81	12	245
08:15 AM	32	1	5	1	92	2	0	0	3	8	93	2	239
08:30 AM	18	0	5	0	86	3	4	2	8	5	67	5	203
08:45 AM	28	0	3	1	114	4	7	0	1	1	91	3	253
Total	109	2	16	2	393	14	14	2	16	18	332	22	940
Grand Total	240	4	29	5	834	27	18	3	30	37	724	53	2004
Apprch %	87.9	1.5	10.6	0.6	96.3	3.1	35.3	5.9	58.8	4.5	88.9	6.5	
Total %	12	0.2	1.4	0.2	41.6	1.3	0.9	0.1	1.5	1.8	36.1	2.6	
Cars	228	2	29	5	806	25	16	2	18	30	690	46	1897
% Cars	95	50	100	100	96.6	92.6	88.9	66.7	60	81.1	95.3	86.8	94.7
Heavy Vehicles	12	2	0	0	28	2	2	1	12	7	34	7	107
% Heavy Vehicles	5	50	0	0	3.4	7.4	11.1	33.3	40	18.9	4.7	13.2	5.3

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	1	24	**1**	112	**5**	118	1	0	3	4	**6**	80	**13**	99	245
07:15 AM	35	0	4	39	1	110	1	112	0	**1**	1	2	4	101	7	112	265
07:30 AM	**45**	0	3	**48**	0	**116**	4	**120**	**3**	0	**5**	**8**	5	**120**	7	**132**	**308**
07:45 AM	28	**2**	**5**	35	1	103	3	107	0	0	5	5	4	91	4	99	246
Total Volume	131	2	13	146	3	441	13	457	4	1	14	19	19	392	31	442	1064
% App. Total	89.7	1.4	8.9		0.7	96.5	2.8		21.1	5.3	73.7		4.3	88.7	7		
PHF	.728	.250	.650	.760	.750	.950	.650	.952	.333	.250	.700	.594	.792	.817	.596	.837	.864
Cars	127	1	13	141	3	430	12	445	3	1	11	15	15	376	27	418	1019
% Cars	96.9	50.0	100	96.6	100	97.5	92.3	97.4	75.0	100	78.6	78.9	78.9	95.9	87.1	94.6	95.8
Heavy Vehicles	4	1	0	5	0	11	1	12	1	0	3	4	4	16	4	24	45
% Heavy Vehicles	3.1	50.0	0	3.4	0	2.5	7.7	2.6	25.0	0	21.4	21.1	21.1	4.1	12.9	5.4	4.2

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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	23	0	1	1	110	5	1	0	3	6	78	12	240
07:15 AM	33	0	4	1	107	1	0	1	0	1	96	6	250
07:30 AM	44	0	3	0	112	3	2	0	3	4	114	6	291
07:45 AM	27	1	5	1	101	3	0	0	5	4	88	3	238
Total	127	1	13	3	430	12	3	1	11	15	376	27	1019
08:00 AM	29	1	3	0	97	4	3	0	2	4	78	11	232
08:15 AM	32	0	5	1	88	2	0	0	0	7	89	2	226
08:30 AM	14	0	5	0	83	3	4	1	4	3	62	4	183
08:45 AM	26	0	3	1	108	4	6	0	1	1	85	2	237
Total	101	1	16	2	376	13	13	1	7	15	314	19	878
Grand Total	228	2	29	5	806	25	16	2	18	30	690	46	1897
Apprch %	88	0.8	11.2	0.6	96.4	3	44.4	5.6	50	3.9	90.1	6	
Total %	12	0.1	1.5	0.3	42.5	1.3	0.8	0.1	0.9	1.6	36.4	2.4	

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	1	24	**1**	110	**5**	**116**	1	0	3	4	**6**	78	**12**	96	240
07:15 AM	33	0	4	37	1	107	1	109	0	**1**	0	1	1	96	6	103	250
07:30 AM	**44**	0	3	**47**	0	**112**	3	115	**2**	0	3	**5**	4	**114**	6	**124**	**291**
07:45 AM	27	**1**	**5**	33	1	101	3	105	0	0	**5**	5	4	88	3	95	238
Total Volume	127	1	13	141	3	430	12	445	3	1	11	15	15	376	27	418	1019
% App. Total	90.1	0.7	9.2		0.7	96.6	2.7		20	6.7	73.3		3.6	90	6.5		
PHF	.722	.250	.650	.750	.750	.960	.600	.959	.375	.250	.550	.750	.625	.825	.563	.843	.875

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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	2	0	0	0	0	0	2	1	5
07:15 AM	2	0	0	0	3	0	0	0	1	3	5	1	15
07:30 AM	1	0	0	0	4	1	1	0	2	1	6	1	17
07:45 AM	1	1	0	0	2	0	0	0	0	0	3	1	8
Total	4	1	0	0	11	1	1	0	3	4	16	4	45
08:00 AM	2	0	0	0	4	1	0	0	2	0	3	1	13
08:15 AM	0	1	0	0	4	0	0	0	3	1	4	0	13
08:30 AM	4	0	0	0	3	0	0	1	4	2	5	1	20
08:45 AM	2	0	0	0	6	0	1	0	0	0	6	1	16
Total	8	1	0	0	17	1	1	1	9	3	18	3	62
Grand Total	12	2	0	0	28	2	2	1	12	7	34	7	107
Apprch %	85.7	14.3	0	0	93.3	6.7	13.3	6.7	80	14.6	70.8	14.6	
Total %	11.2	1.9	0	0	26.2	1.9	1.9	0.9	11.2	6.5	31.8	6.5	

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	2	0	0	2	0	4	**1**	5	0	0	2	2	0	3	**1**	4	13
08:15 AM	0	**1**	0	1	0	4	0	4	0	0	3	3	1	4	0	5	13
08:30 AM	**4**	0	0	**4**	0	3	0	3	0	**1**	**4**	**5**	**2**	5	1	**8**	**20**
08:45 AM	2	0	0	2	0	**6**	0	**6**	**1**	0	0	1	0	**6**	1	7	16
Total Volume	8	1	0	9	0	17	1	18	1	1	9	11	3	18	3	24	62
% App. Total	88.9	11.1	0		0	94.4	5.6		9.1	9.1	81.8		12.5	75	12.5		
PHF	.500	.250	.000	.563	.000	.708	.250	.750	.250	.250	.563	.550	.375	.750	.750	.750	.775

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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	50	0	0	0	0	0	0	0	50	0	0	

	Mobil Driveway From North					South Main Street (Route 79) From East					Ridge Hill Road From South					South Main Street (Route 79) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

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N/S: Mobil Driveway/ Ridge Hill Road
E/W: South Main Street (Route 79)
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File Name : 81676F-A
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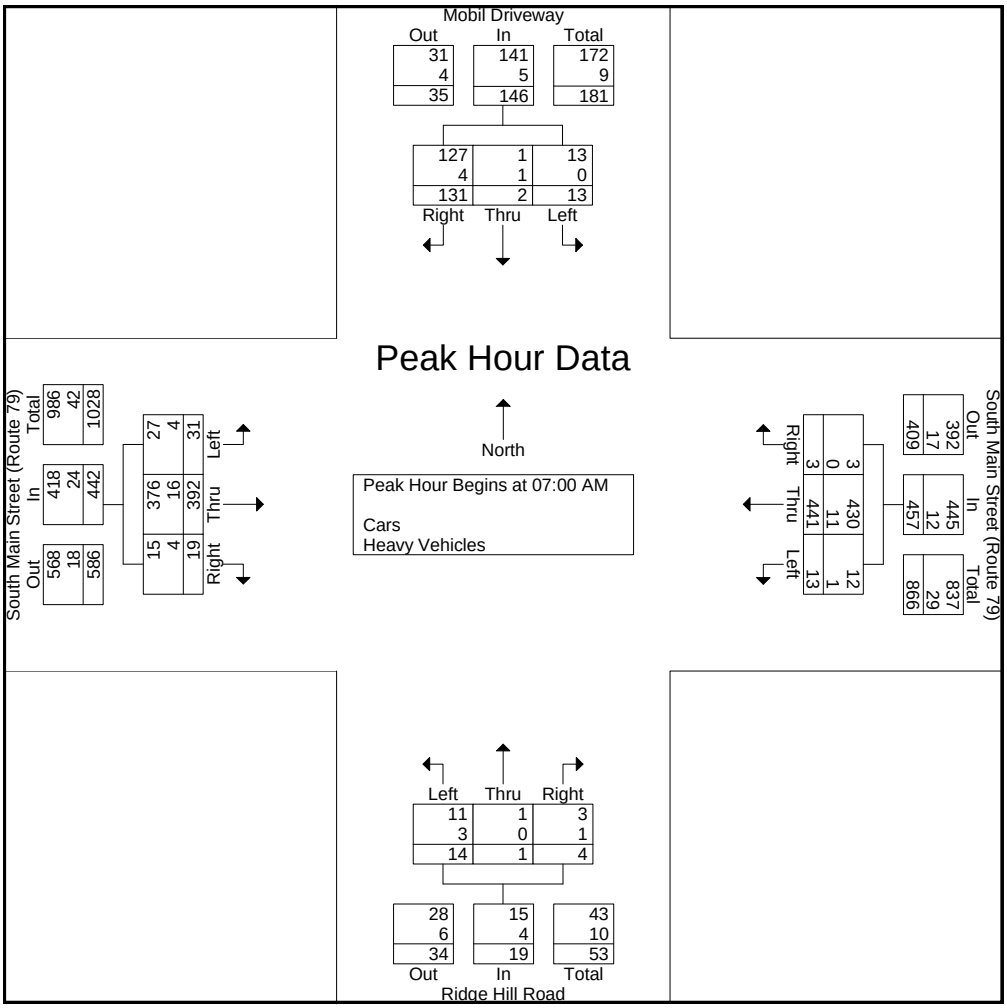
	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	1	24	**1**	112	**5**	118	1	0	3	4	**6**	80	**13**	99	245
07:15 AM	35	0	4	39	1	110	1	112	0	**1**	1	2	4	101	7	112	265
07:30 AM	**45**	0	3	**48**	0	**116**	4	**120**	**3**	0	**5**	**8**	5	**120**	7	**132**	**308**
07:45 AM	28	**2**	**5**	35	1	103	3	107	0	0	5	5	4	91	4	99	246
Total Volume	131	2	13	146	3	441	13	457	4	1	14	19	19	392	31	442	1064
% App. Total	89.7	1.4	8.9		0.7	96.5	2.8		21.1	5.3	73.7		4.3	88.7	7		
PHF	.728	.250	.650	.760	.750	.950	.650	.952	.333	.250	.700	.594	.792	.817	.596	.837	.864
Cars	127	1	13	141	3	430	12	445	3	1	11	15	15	376	27	418	1019
% Cars	96.9	50.0	100	96.6	100	97.5	92.3	97.4	75.0	100	78.6	78.9	78.9	95.9	87.1	94.6	95.8
Heavy Vehicles	4	1	0	5	0	11	1	12	1	0	3	4	4	16	4	24	45
% Heavy Vehicles	3.1	50.0	0	3.4	0	2.5	7.7	2.6	25.0	0	21.4	21.1	21.1	4.1	12.9	5.4	4.2



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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	11	0	1	0	86	2	2	2	7	9	104	4	228
04:15 PM	20	0	3	0	99	2	2	0	11	6	122	13	278
04:30 PM	23	0	1	1	79	2	4	0	8	6	129	10	263
04:45 PM	24	0	2	0	99	1	5	0	7	9	140	7	294
Total	78	0	7	1	363	7	13	2	33	30	495	34	1063
05:00 PM	14	1	1	0	113	2	6	0	5	4	122	5	273
05:15 PM	12	2	2	1	89	2	0	0	4	8	120	8	248
05:30 PM	11	0	2	0	82	2	3	0	5	6	121	8	240
05:45 PM	10	0	2	0	71	3	4	0	4	5	85	5	189
Total	47	3	7	1	355	9	13	0	18	23	448	26	950
Grand Total	125	3	14	2	718	16	26	2	51	53	943	60	2013
Apprch %	88	2.1	9.9	0.3	97.6	2.2	32.9	2.5	64.6	5	89.3	5.7	
Total %	6.2	0.1	0.7	0.1	35.7	0.8	1.3	0.1	2.5	2.6	46.8	3	
Cars	122	3	13	2	701	16	26	1	44	44	918	59	1949
% Cars	97.6	100	92.9	100	97.6	100	100	50	86.3	83	97.3	98.3	96.8
Heavy Vehicles	3	0	1	0	17	0	0	1	7	9	25	1	64
% Heavy Vehicles	2.4	0	7.1	0	2.4	0	0	50	13.7	17	2.7	1.7	3.2

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	20	0	**3**	23	0	99	**2**	101	2	0	**11**	**13**	6	122	**13**	141	278
04:30 PM	23	0	1	24	**1**	79	2	82	4	0	8	12	6	129	10	145	263
04:45 PM	**24**	0	2	**26**	0	99	1	100	5	0	7	12	**9**	**140**	7	**156**	**294**
05:00 PM	14	**1**	1	16	0	**113**	2	**115**	**6**	0	5	11	4	122	5	131	273
Total Volume	81	1	7	89	1	390	7	398	17	0	31	48	25	513	35	573	1108
% App. Total	91	1.1	7.9		0.3	98	1.8		35.4	0	64.6		4.4	89.5	6.1		
PHF	.844	.250	.583	.856	.250	.863	.875	.865	.708	.000	.705	.923	.694	.916	.673	.918	.942
Cars	80	1	6	87	1	378	7	386	17	0	26	43	20	498	35	553	1069
% Cars	98.8	100	85.7	97.8	100	96.9	100	97.0	100	0	83.9	89.6	80.0	97.1	100	96.5	96.5
Heavy Vehicles	1	0	1	2	0	12	0	12	0	0	5	5	5	15	0	20	39
% Heavy Vehicles	1.2	0	14.3	2.2	0	3.1	0	3.0	0	0	16.1	10.4	20.0	2.9	0	3.5	3.5

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N/S: Mobil Driveway/ Ridge Hill Road
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	9	0	1	0	84	2	2	1	6	6	100	3	214
04:15 PM	20	0	3	0	93	2	2	0	10	5	118	13	266
04:30 PM	23	0	1	1	77	2	4	0	7	6	125	10	256
04:45 PM	24	0	2	0	97	1	5	0	5	5	136	7	282
Total	76	0	7	1	351	7	13	1	28	22	479	33	1018
05:00 PM	13	1	0	0	111	2	6	0	4	4	119	5	265
05:15 PM	12	2	2	1	87	2	0	0	4	8	118	8	244
05:30 PM	11	0	2	0	82	2	3	0	4	5	120	8	237
05:45 PM	10	0	2	0	70	3	4	0	4	5	82	5	185
Total	46	3	6	1	350	9	13	0	16	22	439	26	931
Grand Total	122	3	13	2	701	16	26	1	44	44	918	59	1949
Apprch %	88.4	2.2	9.4	0.3	97.5	2.2	36.6	1.4	62	4.3	89.9	5.8	
Total %	6.3	0.2	0.7	0.1	36	0.8	1.3	0.1	2.3	2.3	47.1	3	

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	20	0	**3**	23	0	93	**2**	95	2	0	**10**	**12**	5	118	**13**	136	266
04:30 PM	23	0	1	24	**1**	77	2	80	4	0	7	11	**6**	125	10	141	256
04:45 PM	**24**	0	2	**26**	0	97	1	98	5	0	5	10	5	**136**	7	**148**	**282**
05:00 PM	13	**1**	0	14	0	**111**	2	**113**	**6**	0	4	10	4	119	5	128	265
Total Volume	80	1	6	87	1	378	7	386	17	0	26	43	20	498	35	553	1069
% App. Total	92	1.1	6.9		0.3	97.9	1.8		39.5	0	60.5		3.6	90.1	6.3		
PHF	.833	.250	.500	.837	.250	.851	.875	.854	.708	.000	.650	.896	.833	.915	.673	.934	.948

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Groups Printed- Heavy Vehicles

	Mobil Driveway From North			South Main Street (Route 79) From East			Ridge Hill Road From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	0	0	0	2	0	0	1	1	3	4	1	14
04:15 PM	0	0	0	0	6	0	0	0	1	1	4	0	12
04:30 PM	0	0	0	0	2	0	0	0	1	0	4	0	7
04:45 PM	0	0	0	0	2	0	0	0	2	4	4	0	12
Total	2	0	0	0	12	0	0	1	5	8	16	1	45
05:00 PM	1	0	1	0	2	0	0	0	1	0	3	0	8
05:15 PM	0	0	0	0	2	0	0	0	0	0	2	0	4
05:30 PM	0	0	0	0	0	0	0	0	1	1	1	0	3
05:45 PM	0	0	0	0	1	0	0	0	0	0	3	0	4
Total	1	0	1	0	5	0	0	0	2	1	9	0	19
Grand Total	3	0	1	0	17	0	0	1	7	9	25	1	64
Apprch %	75	0	25	0	100	0	0	12.5	87.5	25.7	71.4	2.9	
Total %	4.7	0	1.6	0	26.6	0	0	1.6	10.9	14.1	39.1	1.6	

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	0	0	**2**	0	2	0	2	0	**1**	1	**2**	3	**4**	**1**	**8**	**14**
04:15 PM	0	0	0	0	0	**6**	0	**6**	0	0	1	1	1	4	0	5	12
04:30 PM	0	0	0	0	0	2	0	2	0	0	1	1	0	4	0	4	7
04:45 PM	0	0	0	0	0	2	0	2	0	0	**2**	2	**4**	4	0	8	12
Total Volume	2	0	0	2	0	12	0	12	0	1	5	6	8	16	1	25	45
% App. Total	100	0	0		0	100	0		0	16.7	83.3		32	64	4		
PHF	.250	.000	.000	.250	.000	.500	.000	.500	.000	.250	.625	.750	.500	1.000	.250	.781	.804

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Groups Printed- Peds and Bicycles

	Mobil Driveway From North				South Main Street (Route 79) From East				Ridge Hill Road From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	4
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	1	0	1	0	0	0	3	0	1	0	5	11
Grand Total	0	0	0	0	0	1	0	1	0	0	0	6	0	2	0	5	15
Apprch %	0	0	0	0	0	50	0	50	0	0	0	100	0	28.6	0	71.4	
Total %	0	0	0	0	0	6.7	0	6.7	0	0	0	40	0	13.3	0	33.3	

	Mobil Driveway From North					South Main Street (Route 79) From East					Ridge Hill Road From South					South Main Street (Route 79) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	**1**	0	0	1	3
05:30 PM	0	0	0	0	0	0	**1**	**0**	**1**	**2**	0	0	0	1	1	0	0	0	1	1	**4**
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	1	0	1	2	0	0	0	3	3	0	1	0	5	6	11
% App. Total	0	0	0	0		0	50	0	50		0	0	0	100		0	16.7	0	83.3		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250	.000	.000	.000	.375	.375	.000	.250	.000	.417	.500	.688

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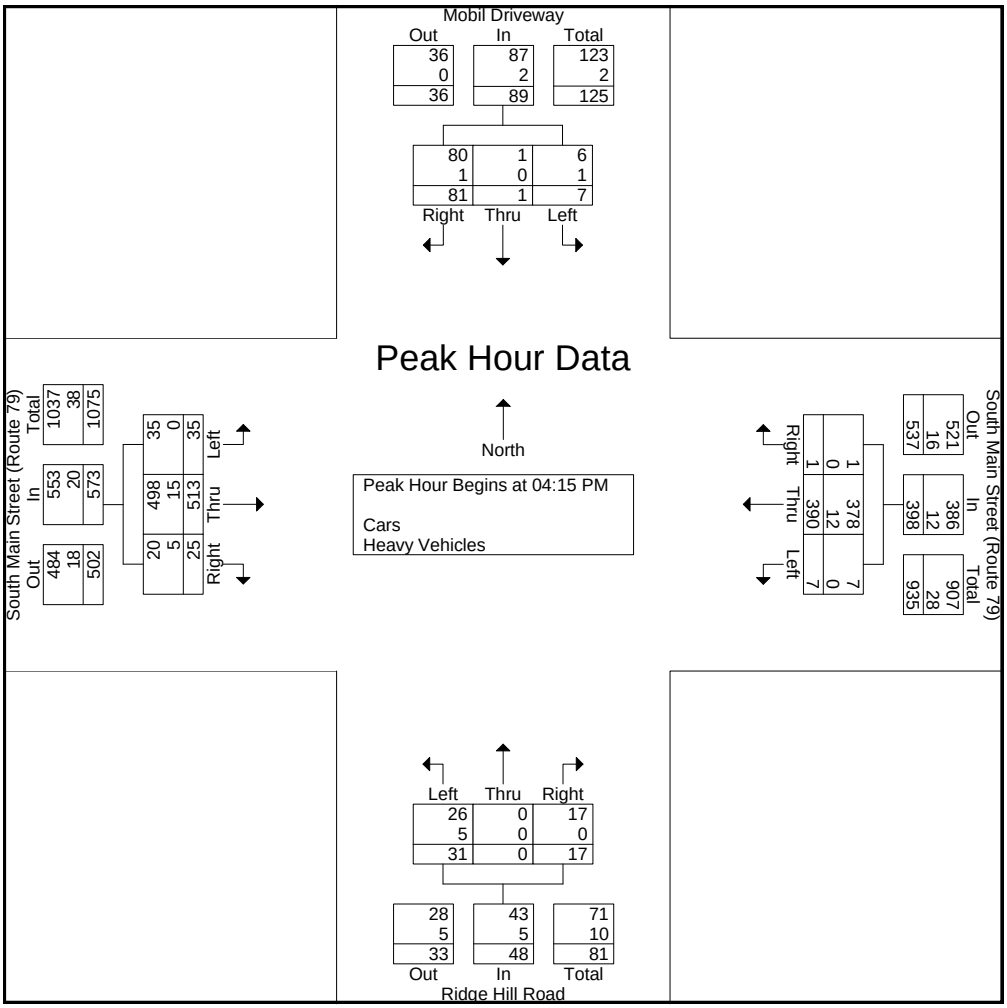
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	20	0	**3**	23	0	99	**2**	101	2	0	**11**	**13**	6	122	**13**	141	278
04:30 PM	23	0	1	24	**1**	79	2	82	4	0	8	12	6	129	10	145	263
04:45 PM	**24**	0	2	**26**	0	99	1	100	5	0	7	12	**9**	**140**	7	**156**	**294**
05:00 PM	14	**1**	1	16	0	**113**	2	**115**	**6**	0	5	11	4	122	5	131	273
Total Volume	81	1	7	89	1	390	7	398	17	0	31	48	25	513	35	573	1108
% App. Total	91	1.1	7.9		0.3	98	1.8		35.4	0	64.6		4.4	89.5	6.1		
PHF	.844	.250	.583	.856	.250	.863	.875	.865	.708	.000	.705	.923	.694	.916	.673	.918	.942
Cars	80	1	6	87	1	378	7	386	17	0	26	43	20	498	35	553	1069
% Cars	98.8	100	85.7	97.8	100	96.9	100	97.0	100	0	83.9	89.6	80.0	97.1	100	96.5	96.5
Heavy Vehicles	1	0	1	2	0	12	0	12	0	0	5	5	5	15	0	20	39
% Heavy Vehicles	1.2	0	14.3	2.2	0	3.1	0	3.0	0	0	16.1	10.4	20.0	2.9	0	3.5	3.5



PRECISION DATA INDUSTRIES, LLC
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N/S: Church Driveway/ High Street
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-B
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	122	1	3	0	4	0	75	0	205
07:15 AM	0	0	0	2	129	0	3	0	0	1	77	1	213
07:30 AM	0	0	0	0	127	1	3	0	2	0	86	0	219
07:45 AM	0	0	0	2	124	1	3	0	0	1	74	4	209
Total	0	0	0	4	502	3	12	0	6	2	312	5	846
08:00 AM	0	0	0	0	103	2	2	0	0	3	51	0	161
08:15 AM	0	0	0	2	97	1	1	0	2	1	78	2	184
08:30 AM	0	0	0	1	122	1	1	0	1	2	65	5	198
08:45 AM	0	0	0	8	108	1	3	0	1	0	83	4	208
Total	0	0	0	11	430	5	7	0	4	6	277	11	751
Grand Total	0	0	0	15	932	8	19	0	10	8	589	16	1597
Apprch %	0	0	0	1.6	97.6	0.8	65.5	0	34.5	1.3	96.1	2.6	
Total %	0	0	0	0.9	58.4	0.5	1.2	0	0.6	0.5	36.9	1	
Cars	0	0	0	15	909	2	16	0	8	7	566	15	1538
% Cars	0	0	0	100	97.5	25	84.2	0	80	87.5	96.1	93.8	96.3
Heavy Vehicles	0	0	0	0	23	6	3	0	2	1	23	1	59
% Heavy Vehicles	0	0	0	0	2.5	75	15.8	0	20	12.5	3.9	6.2	3.7

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	122	**1**	123	**3**	0	**4**	**7**	0	75	0	75	205
07:15 AM	0	0	0	0	**2**	**129**	0	**131**	3	0	0	3	**1**	77	1	79	213
07:30 AM	0	0	0	0	0	127	1	128	3	0	2	5	0	**86**	0	**86**	**219**
07:45 AM	0	0	0	0	2	124	1	127	3	0	0	3	1	74	**4**	79	209
Total Volume	0	0	0	0	4	502	3	509	12	0	6	18	2	312	5	319	846
% App. Total	0	0	0		0.8	98.6	0.6		66.7	0	33.3		0.6	97.8	1.6		
PHF	.000	.000	.000	.000	.500	.973	.750	.971	1.000	.000	.375	.643	.500	.907	.313	.927	.966
Cars	0	0	0	0	4	492	0	496	10	0	5	15	2	303	5	310	821
% Cars	0	0	0	0	100	98.0	0	97.4	83.3	0	83.3	83.3	100	97.1	100	97.2	97.0
Heavy Vehicles	0	0	0	0	0	10	3	13	2	0	1	3	0	9	0	9	25
% Heavy Vehicles	0	0	0	0	0	2.0	100	2.6	16.7	0	16.7	16.7	0	2.9	0	2.8	3.0

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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-B
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	120	0	3	0	4	0	74	0	201
07:15 AM	0	0	0	2	126	0	2	0	0	1	71	1	203
07:30 AM	0	0	0	0	126	0	3	0	1	0	86	0	216
07:45 AM	0	0	0	2	120	0	2	0	0	1	72	4	201
Total	0	0	0	4	492	0	10	0	5	2	303	5	821
08:00 AM	0	0	0	0	99	1	2	0	0	3	50	0	155
08:15 AM	0	0	0	2	95	0	0	0	1	0	77	2	177
08:30 AM	0	0	0	1	119	0	1	0	1	2	58	5	187
08:45 AM	0	0	0	8	104	1	3	0	1	0	78	3	198
Total	0	0	0	11	417	2	6	0	3	5	263	10	717
Grand Total	0	0	0	15	909	2	16	0	8	7	566	15	1538
Apprch %	0	0	0	1.6	98.2	0.2	66.7	0	33.3	1.2	96.3	2.6	
Total %	0	0	0	1	59.1	0.1	1	0	0.5	0.5	36.8	1	

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	120	0	120	**3**	0	**4**	**7**	0	74	0	74	201
07:15 AM	0	0	0	0	**2**	**126**	0	**128**	2	0	0	2	**1**	71	1	73	203
07:30 AM	0	0	0	0	0	126	0	126	3	0	1	4	0	**86**	0	**86**	**216**
07:45 AM	0	0	0	0	2	120	0	122	2	0	0	2	1	72	**4**	77	201
Total Volume	0	0	0	0	4	492	0	496	10	0	5	15	2	303	5	310	821
% App. Total	0	0	0		0.8	99.2	0		66.7	0	33.3		0.6	97.7	1.6		
PHF	.000	.000	.000	.000	.500	.976	.000	.969	.833	.000	.313	.536	.500	.881	.313	.901	.950

PRECISION
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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-B
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	2	1	0	0	0	0	1	0	4
07:15 AM	0	0	0	0	3	0	1	0	0	0	6	0	10
07:30 AM	0	0	0	0	1	1	0	0	1	0	0	0	3
07:45 AM	0	0	0	0	4	1	1	0	0	0	2	0	8
Total	0	0	0	0	10	3	2	0	1	0	9	0	25
08:00 AM	0	0	0	0	4	1	0	0	0	0	1	0	6
08:15 AM	0	0	0	0	2	1	1	0	1	1	1	0	7
08:30 AM	0	0	0	0	3	1	0	0	0	0	7	0	11
08:45 AM	0	0	0	0	4	0	0	0	0	0	5	1	10
Total	0	0	0	0	13	3	1	0	1	1	14	1	34
Grand Total	0	0	0	0	23	6	3	0	2	1	23	1	59
Apprch %	0	0	0	0	79.3	20.7	60	0	40	4	92	4	
Total %	0	0	0	0	39	10.2	5.1	0	3.4	1.7	39	1.7	

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	**4**	**1**	**5**	0	0	0	0	0	1	0	1	6
08:15 AM	0	0	0	0	0	2	1	3	**1**	0	**1**	**2**	**1**	1	0	2	7
08:30 AM	0	0	0	0	0	3	1	4	0	0	0	0	0	**7**	0	**7**	**11**
08:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	5	**1**	6	10
Total Volume	0	0	0	0	0	13	3	16	1	0	1	2	1	14	1	16	34
% App. Total	0	0	0		0	81.2	18.8		50	0	50		6.2	87.5	6.2		
PHF	.000	.000	.000	.000	.000	.813	.750	.800	.250	.000	.250	.250	.250	.500	.250	.571	.773

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N/S: Church Driveway/ High Street
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-B
Site Code : 10111.31
Start Date : 9/10/2008

Groups Printed- Peds and Bicycles

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Apprch %	0	0	0	0	0	0	0	100	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	50	0	0	0	50	0	0	0	0	

	Church Driveway From North					South Main Street (Route 79) From East					High Street From South					South Main Street (Route 79) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	**1**	0	0	0	0	0	**2**
Total Volume	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

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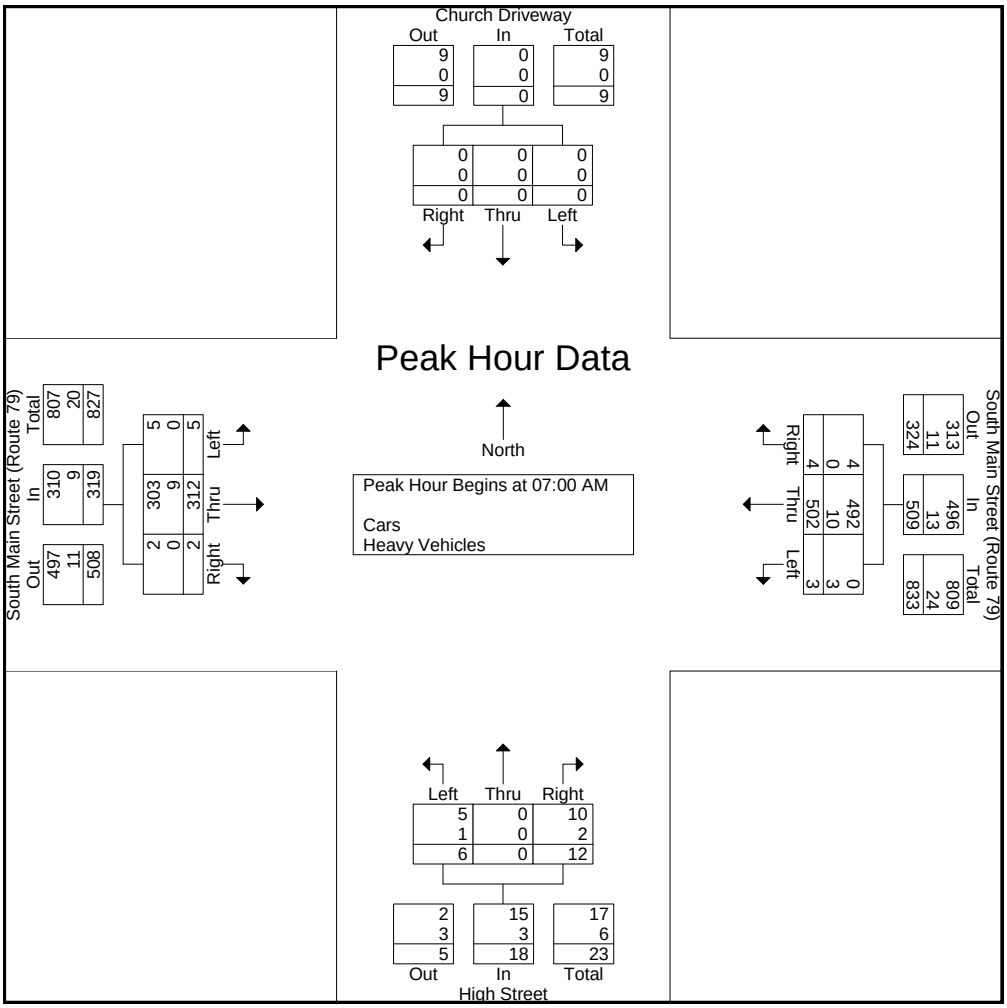
	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	122	**1**	123	**3**	0	**4**	**7**	0	75	0	75	205
07:15 AM	0	0	0	0	**2**	**129**	0	**131**	3	0	0	3	**1**	77	1	79	213
07:30 AM	0	0	0	0	0	127	1	128	3	0	2	5	0	**86**	0	**86**	**219**
07:45 AM	0	0	0	0	2	124	1	127	3	0	0	3	1	74	**4**	79	209
Total Volume	0	0	0	0	4	502	3	509	12	0	6	18	2	312	5	319	846
% App. Total	0	0	0		0.8	98.6	0.6		66.7	0	33.3		0.6	97.8	1.6		
PHF	.000	.000	.000	.000	.500	.973	.750	.971	1.000	.000	.375	.643	.500	.907	.313	.927	.966
Cars	0	0	0	0	4	492	0	496	10	0	5	15	2	303	5	310	821
% Cars	0	0	0	0	100	98.0	0	97.4	83.3	0	83.3	83.3	100	97.1	100	97.2	97.0
Heavy Vehicles	0	0	0	0	0	10	3	13	2	0	1	3	0	9	0	9	25
% Heavy Vehicles	0	0	0	0	0	2.0	100	2.6	16.7	0	16.7	16.7	0	2.9	0	2.8	3.0



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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-BBB
Site Code : 10111.31
Start Date : 9/10/2008

Groups Printed- Cars - Heavy Vehicles

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	100	7	3	0	0	1	110	0	221
04:15 PM	0	0	0	0	106	5	2	0	1	1	116	0	231
04:30 PM	0	0	0	1	86	2	3	0	0	4	133	0	229
04:45 PM	0	0	0	0	107	1	1	0	0	3	130	0	242
Total	0	0	0	1	399	15	9	0	1	9	489	0	923
05:00 PM	0	0	0	0	104	4	2	0	3	1	135	0	249
05:15 PM	1	0	0	2	102	2	3	0	3	1	132	2	248
05:30 PM	0	0	0	2	81	2	0	0	1	1	132	2	221
05:45 PM	1	0	0	39	78	3	0	0	0	0	83	11	215
Total	2	0	0	43	365	11	5	0	7	3	482	15	933
Grand Total	2	0	0	44	764	26	14	0	8	12	971	15	1856
Apprch %	100	0	0	5.3	91.6	3.1	63.6	0	36.4	1.2	97.3	1.5	
Total %	0.1	0	0	2.4	41.2	1.4	0.8	0	0.4	0.6	52.3	0.8	
Cars	2	0	0	43	750	24	12	0	8	12	956	14	1821
% Cars	100	0	0	97.7	98.2	92.3	85.7	0	100	100	98.5	93.3	98.1
Heavy Vehicles	0	0	0	1	14	2	2	0	0	0	15	1	35
% Heavy Vehicles	0	0	0	2.3	1.8	7.7	14.3	0	0	0	1.5	6.7	1.9

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	1	86	2	89	**3**	0	0	3	**4**	133	0	**137**	229
04:45 PM	0	0	0	0	0	**107**	1	**108**	1	0	0	1	3	130	0	133	242
05:00 PM	0	0	0	0	0	104	**4**	108	2	0	**3**	5	1	**135**	0	136	**249**
05:15 PM	**1**	0	0	**1**	**2**	102	2	106	3	0	3	**6**	1	132	**2**	135	248
Total Volume	1	0	0	1	3	399	9	411	9	0	6	15	9	530	2	541	968
% App. Total	100	0	0		0.7	97.1	2.2		60	0	40		1.7	98	0.4		
PHF	.250	.000	.000	.250	.375	.932	.563	.951	.750	.000	.500	.625	.563	.981	.250	.987	.972
Cars	1	0	0	1	2	392	8	402	9	0	6	15	9	521	1	531	949
% Cars	100	0	0	100	66.7	98.2	88.9	97.8	100	0	100	100	100	98.3	50.0	98.2	98.0
Heavy Vehicles	0	0	0	0	1	7	1	9	0	0	0	0	0	9	1	10	19
% Heavy Vehicles	0	0	0	0	33.3	1.8	11.1	2.2	0	0	0	0	0	1.7	50.0	1.8	2.0

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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-BBB
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	98	6	1	0	0	1	106	0	212
04:15 PM	0	0	0	0	102	5	2	0	1	1	115	0	226
04:30 PM	0	0	0	0	84	2	3	0	0	4	129	0	222
04:45 PM	0	0	0	0	104	0	1	0	0	3	128	0	236
Total	0	0	0	0	388	13	7	0	1	9	478	0	896
05:00 PM	0	0	0	0	103	4	2	0	3	1	133	0	246
05:15 PM	1	0	0	2	101	2	3	0	3	1	131	1	245
05:30 PM	0	0	0	2	80	2	0	0	1	1	131	2	219
05:45 PM	1	0	0	39	78	3	0	0	0	0	83	11	215
Total	2	0	0	43	362	11	5	0	7	3	478	14	925
Grand Total	2	0	0	43	750	24	12	0	8	12	956	14	1821
Apprch %	100	0	0	5.3	91.8	2.9	60	0	40	1.2	97.4	1.4	
Total %	0.1	0	0	2.4	41.2	1.3	0.7	0	0.4	0.7	52.5	0.8	

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	84	2	86	**3**	0	0	3	**4**	129	0	133	222
04:45 PM	0	0	0	0	0	**104**	0	104	1	0	0	1	3	128	0	131	236
05:00 PM	0	0	0	0	0	103	**4**	**107**	2	0	**3**	5	1	**133**	0	**134**	**246**
05:15 PM	**1**	0	0	**1**	**2**	101	2	105	3	0	3	**6**	1	131	**1**	133	245
Total Volume	1	0	0	1	2	392	8	402	9	0	6	15	9	521	1	531	949
% App. Total	100	0	0		0.5	97.5	2		60	0	40		1.7	98.1	0.2		
PHF	.250	.000	.000	.250	.250	.942	.500	.939	.750	.000	.500	.625	.563	.979	.250	.991	.964

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N/S: Church Driveway/ High Street
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-BBB
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Driveway From North			South Main Street (Route 79) From East			High Street From South			South Main Street (Route 79) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	2	1	2	0	0	0	4	0	9
04:15 PM	0	0	0	0	4	0	0	0	0	0	1	0	5
04:30 PM	0	0	0	1	2	0	0	0	0	0	4	0	7
04:45 PM	0	0	0	0	3	1	0	0	0	0	2	0	6
Total	0	0	0	1	11	2	2	0	0	0	11	0	27
05:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
05:15 PM	0	0	0	0	1	0	0	0	0	0	1	1	3
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	0	0	0	0	0	4	1	8
Grand Total	0	0	0	1	14	2	2	0	0	0	15	1	35
Apprch %	0	0	0	5.9	82.4	11.8	100	0	0	0	93.8	6.2	
Total %	0	0	0	2.9	40	5.7	5.7	0	0	0	42.9	2.9	

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	2	**1**	3	**2**	0	0	**2**	0	**4**	0	**4**	**9**
04:15 PM	0	0	0	0	0	**4**	0	**4**	0	0	0	0	0	1	0	1	5
04:30 PM	0	0	0	0	**1**	2	0	3	0	0	0	0	0	4	0	4	7
04:45 PM	0	0	0	0	0	3	1	4	0	0	0	0	0	2	0	2	6
Total Volume	0	0	0	0	1	11	2	14	2	0	0	2	0	11	0	11	27
% App. Total	0	0	0		7.1	78.6	14.3		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.688	.500	.875	.250	.000	.000	.250	.000	.688	.000	.688	.750

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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-BBB
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	3
Grand Total	0	0	0	2	0	1	0	0	0	0	1	0	0	1	0	2	7
Apprch %	0	0	0	100	0	100	0	0	0	0	100	0	0	33.3	0	66.7	
Total %	0	0	0	28.6	0	14.3	0	0	0	0	14.3	0	0	14.3	0	28.6	

	Church Driveway From North					South Main Street (Route 79) From East					High Street From South					South Main Street (Route 79) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**4**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	1
Total Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	5
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	33.3	0	66.7		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.375	.313

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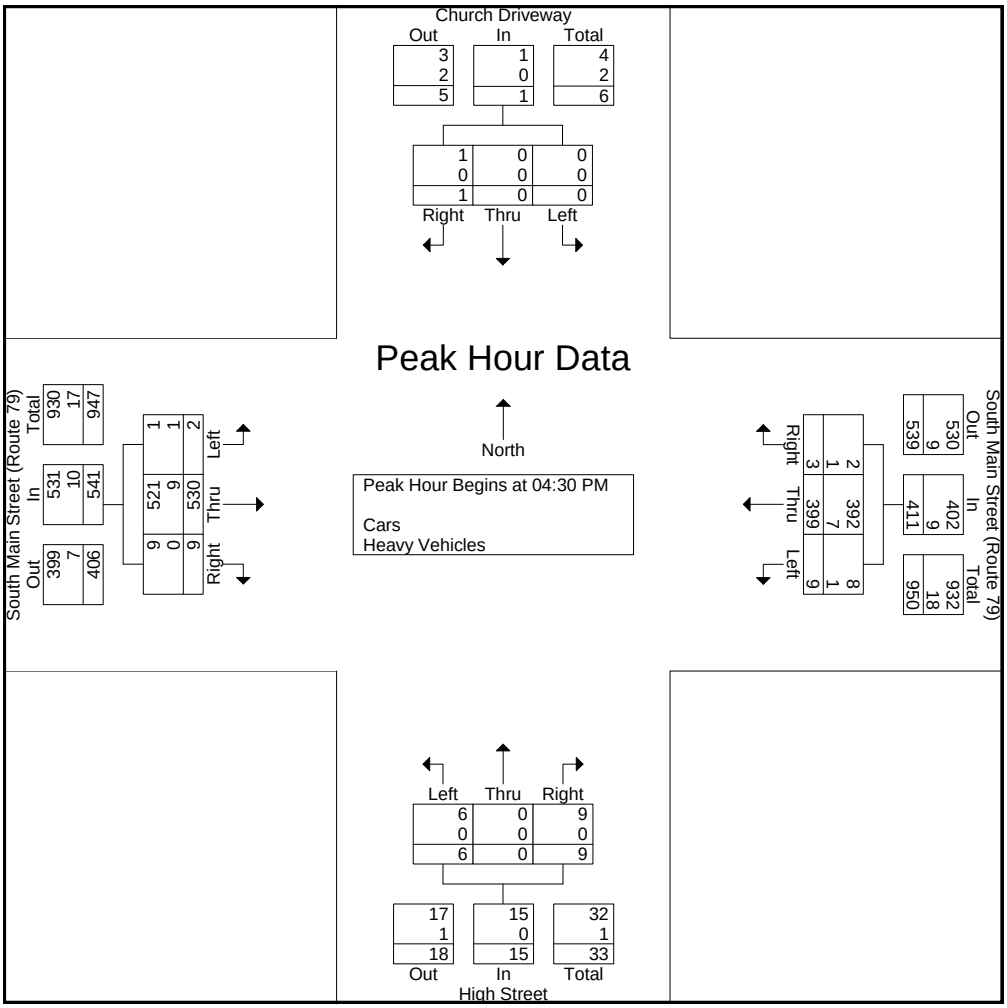
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	Church Driveway From North				South Main Street (Route 79) From East				High Street From South				South Main Street (Route 79) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	1	86	2	89	**3**	0	0	3	**4**	133	0	**137**	229
04:45 PM	0	0	0	0	0	**107**	1	**108**	1	0	0	1	3	130	0	133	242
05:00 PM	0	0	0	0	0	104	**4**	108	2	0	**3**	5	1	**135**	0	136	**249**
05:15 PM	**1**	0	0	**1**	**2**	102	2	106	3	0	3	**6**	1	132	**2**	135	248
Total Volume	1	0	0	1	3	399	9	411	9	0	6	15	9	530	2	541	968
% App. Total	100	0	0		0.7	97.1	2.2		60	0	40		1.7	98	0.4		
PHF	.250	.000	.000	.250	.375	.932	.563	.951	.750	.000	.500	.625	.563	.981	.250	.987	.972
Cars	1	0	0	1	2	392	8	402	9	0	6	15	9	521	1	531	949
% Cars	100	0	0	100	66.7	98.2	88.9	97.8	100	0	100	100	100	98.3	50.0	98.2	98.0
Heavy Vehicles	0	0	0	0	1	7	1	9	0	0	0	0	0	9	1	10	19
% Heavy Vehicles	0	0	0	0	33.3	1.8	11.1	2.2	0	0	0	0	0	1.7	50.0	1.8	2.0



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N: Narrows Road
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-C
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	2	37	16	41	41	2	139
07:15 AM	3	36	11	45	26	2	123
07:30 AM	1	28	27	44	54	4	158
07:45 AM	4	17	31	54	43	2	151
Total	10	118	85	184	164	10	571
08:00 AM	1	24	32	54	35	1	147
08:15 AM	4	42	27	43	32	2	150
08:30 AM	6	28	27	31	24	2	118
08:45 AM	0	32	18	39	30	0	119
Total	11	126	104	167	121	5	534
Grand Total	21	244	189	351	285	15	1105
Apprch %	7.9	92.1	35	65	95	5	
Total %	1.9	22.1	17.1	31.8	25.8	1.4	
Cars	17	229	168	306	221	12	953
% Cars	81	93.9	88.9	87.2	77.5	80	86.2
Heavy Vehicles	4	15	21	45	64	3	152
% Heavy Vehicles	19	6.1	11.1	12.8	22.5	20	13.8

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	1	28	29	27	44	71	**54**	**4**	**58**	**158**
07:45 AM	**4**	17	21	31	**54**	85	43	2	45	151
08:00 AM	1	24	25	**32**	54	**86**	35	1	36	147
08:15 AM	4	**42**	**46**	27	43	70	32	2	34	150
Total Volume	10	111	121	117	195	312	164	9	173	606
% App. Total	8.3	91.7		37.5	62.5		94.8	5.2		
PHF	.625	.661	.658	.914	.903	.907	.759	.563	.746	.959
Cars	9	100	109	108	171	279	128	8	136	524
% Cars	90.0	90.1	90.1	92.3	87.7	89.4	78.0	88.9	78.6	86.5
Heavy Vehicles	1	11	12	9	24	33	36	1	37	82
% Heavy Vehicles	10.0	9.9	9.9	7.7	12.3	10.6	22.0	11.1	21.4	13.5

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E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-C
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	1	37	14	34	36	1	123
07:15 AM	2	35	11	38	21	2	109
07:30 AM	1	27	26	38	44	4	140
07:45 AM	4	16	28	50	36	2	136
Total	8	115	79	160	137	9	508
08:00 AM	1	23	31	48	26	1	130
08:15 AM	3	34	23	35	22	1	118
08:30 AM	5	26	19	28	15	1	94
08:45 AM	0	31	16	35	21	0	103
Total	9	114	89	146	84	3	445
Grand Total	17	229	168	306	221	12	953
Apprch %	6.9	93.1	35.4	64.6	94.8	5.2	
Total %	1.8	24	17.6	32.1	23.2	1.3	

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	1	27	28	26	38	64	**44**	**4**	**48**	**140**
07:45 AM	**4**	16	20	28	**50**	78	36	2	38	136
08:00 AM	1	23	24	**31**	48	**79**	26	1	27	130
08:15 AM	3	**34**	**37**	23	35	58	22	1	23	118
Total Volume	9	100	109	108	171	279	128	8	136	524
% App. Total	8.3	91.7		38.7	61.3		94.1	5.9		
PHF	.563	.735	.736	.871	.855	.883	.727	.500	.708	.936

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Page No : 1

Groups Printed- Heavy Vehicles

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	1	0	2	7	5	1	16
07:15 AM	1	1	0	7	5	0	14
07:30 AM	0	1	1	6	10	0	18
07:45 AM	0	1	3	4	7	0	15
Total	2	3	6	24	27	1	63
08:00 AM	0	1	1	6	9	0	17
08:15 AM	1	8	4	8	10	1	32
08:30 AM	1	2	8	3	9	1	24
08:45 AM	0	1	2	4	9	0	16
Total	2	12	15	21	37	2	89
Grand Total	4	15	21	45	64	3	152
Apprch %	21.1	78.9	31.8	68.2	95.5	4.5	
Total %	2.6	9.9	13.8	29.6	42.1	2	

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	1	1	3	4	7	7	0	7	15
08:00 AM	0	1	1	1	6	7	9	0	9	17
08:15 AM	**1**	**8**	**9**	4	**8**	**12**	**10**	**1**	**11**	**32**
08:30 AM	**1**	**2**	**3**	**8**	3	11	9	1	10	24
Total Volume	2	12	14	16	21	37	35	2	37	88
% App. Total	14.3	85.7		43.2	56.8		94.6	5.4		
PHF	.500	.375	.389	.500	.656	.771	.875	.500	.841	.688

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File Name : 81676F-C
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Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1
Grand Total	0	1	0	0	0	0	0	0	1	2
Apprch %	0	100	0	0	0	0	0	0	100	
Total %	0	50	0	0	0	0	0	0	50	

	Narrows Road From North				South Main Street From East				South Main Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	**1**	**0**	**1**	0	0	0	0	0	0	0	0	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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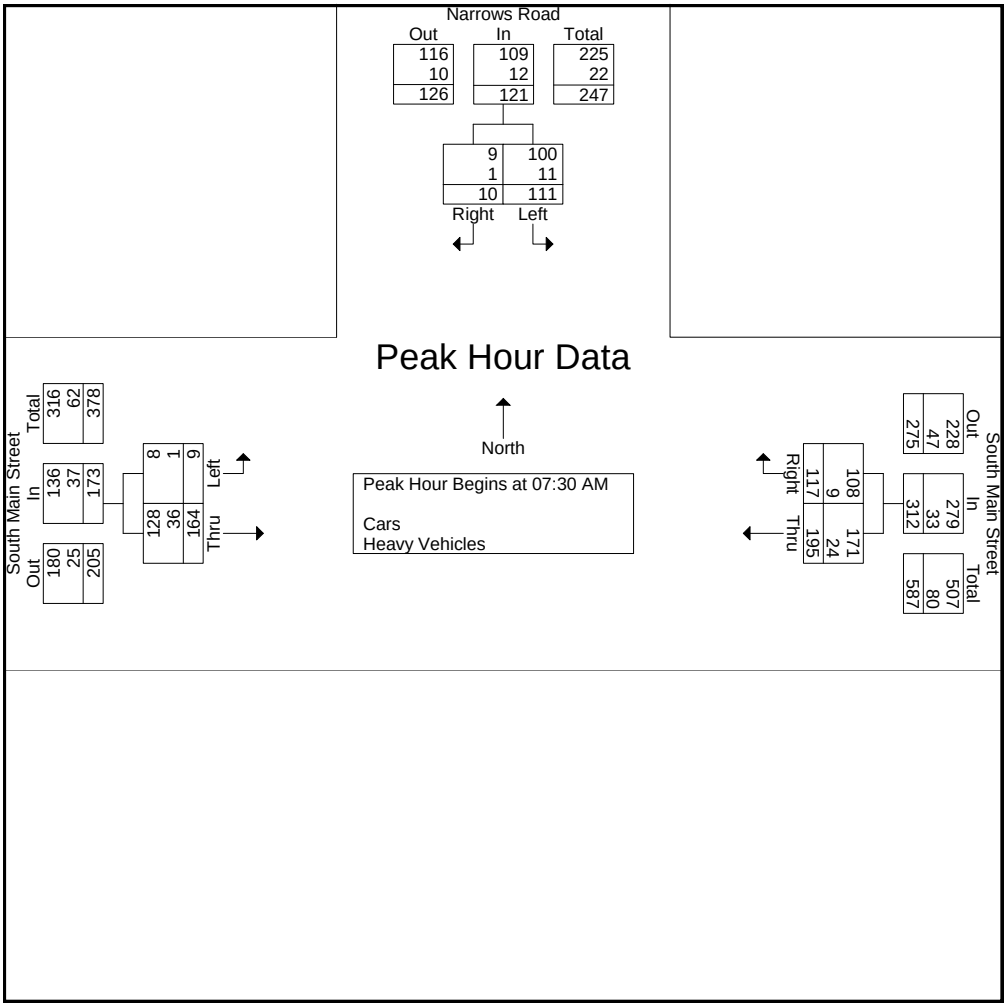
	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	1	28	29	27	44	71	**54**	**4**	**58**	**158**
07:45 AM	**4**	17	21	31	**54**	85	43	2	45	151
08:00 AM	1	24	25	**32**	54	**86**	35	1	36	147
08:15 AM	4	**42**	**46**	27	43	70	32	2	34	150
Total Volume	10	111	121	117	195	312	164	9	173	606
% App. Total	8.3	91.7		37.5	62.5		94.8	5.2		
PHF	.625	.661	.658	.914	.903	.907	.759	.563	.746	.959
Cars	9	100	109	108	171	279	128	8	136	524
% Cars	90.0	90.1	90.1	92.3	87.7	89.4	78.0	88.9	78.6	86.5
Heavy Vehicles	1	11	12	9	24	33	36	1	37	82
% Heavy Vehicles	10.0	9.9	9.9	7.7	12.3	10.6	22.0	11.1	21.4	13.5



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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	32	28	50	44	6	163
04:15 PM	4	31	35	59	39	4	172
04:30 PM	7	31	30	66	57	7	198
04:45 PM	1	23	20	65	49	5	163
Total	15	117	113	240	189	22	696
05:00 PM	3	24	34	55	54	6	176
05:15 PM	1	30	41	46	60	10	188
05:30 PM	5	22	24	39	46	1	137
05:45 PM	3	19	39	25	31	8	125
Total	12	95	138	165	191	25	626
Grand Total	27	212	251	405	380	47	1322
Apprch %	11.3	88.7	38.3	61.7	89	11	
Total %	2	16	19	30.6	28.7	3.6	
Cars	24	204	241	366	342	46	1223
% Cars	88.9	96.2	96	90.4	90	97.9	92.5
Heavy Vehicles	3	8	10	39	38	1	99
% Heavy Vehicles	11.1	3.8	4	9.6	10	2.1	7.5

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**7**	**31**	**38**	30	**66**	**96**	57	7	64	**198**
04:45 PM	**1**	**23**	**24**	**20**	**65**	**85**	**49**	**5**	**54**	**163**
05:00 PM	**3**	**24**	**27**	**34**	**55**	**89**	**54**	**6**	**60**	**176**
05:15 PM	**1**	**30**	**31**	**41**	46	87	**60**	**10**	**70**	188
Total Volume	12	108	120	125	232	357	220	28	248	725
% App. Total	10	90		35	65		88.7	11.3		
PHF	.429	.871	.789	.762	.879	.930	.917	.700	.886	.915
Cars	9	106	115	121	205	326	198	27	225	666
% Cars	75.0	98.1	95.8	96.8	88.4	91.3	90.0	96.4	90.7	91.9
Heavy Vehicles	3	2	5	4	27	31	22	1	23	59
% Heavy Vehicles	25.0	1.9	4.2	3.2	11.6	8.7	10.0	3.6	9.3	8.1

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N: Narrows Road
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	30	26	48	37	6	150
04:15 PM	4	28	31	57	36	4	160
04:30 PM	5	29	28	58	54	7	181
04:45 PM	1	23	19	59	41	5	148
Total	13	110	104	222	168	22	639
05:00 PM	2	24	34	45	48	6	159
05:15 PM	1	30	40	43	55	9	178
05:30 PM	5	22	24	33	41	1	126
05:45 PM	3	18	39	23	30	8	121
Total	11	94	137	144	174	24	584
Grand Total	24	204	241	366	342	46	1223
Apprch %	10.5	89.5	39.7	60.3	88.1	11.9	
Total %	2	16.7	19.7	29.9	28	3.8	

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**5**	29	**34**	28	58	**86**	54	7	61	**181**
04:45 PM	**1**	**23**	**24**	**19**	**59**	78	41	5	46	148
05:00 PM	2	24	26	34	45	79	48	6	54	159
05:15 PM	1	**30**	31	**40**	43	83	**55**	**9**	**64**	178
Total Volume	9	106	115	121	205	326	198	27	225	666
% App. Total	7.8	92.2		37.1	62.9		88	12		
PHF	.450	.883	.846	.756	.869	.948	.900	.750	.879	.920

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N: Narrows Road
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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Narrows Road From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	2	2	2	7	0	13
04:15 PM	0	3	4	2	3	0	12
04:30 PM	2	2	2	8	3	0	17
04:45 PM	0	0	1	6	8	0	15
Total	2	7	9	18	21	0	57
05:00 PM	1	0	0	10	6	0	17
05:15 PM	0	0	1	3	5	1	10
05:30 PM	0	0	0	6	5	0	11
05:45 PM	0	1	0	2	1	0	4
Total	1	1	1	21	17	1	42
Grand Total	3	8	10	39	38	1	99
Apprch %	27.3	72.7	20.4	79.6	97.4	2.6	
Total %	3	8.1	10.1	39.4	38.4	1	

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	**3**	3	**4**	2	6	3	0	3	12
04:30 PM	**2**	2	**4**	2	8	**10**	3	0	3	**17**
04:45 PM	**0**	**0**	**0**	**1**	**6**	**7**	**8**	0	**8**	15
05:00 PM	1	0	1	0	**10**	10	6	0	6	17
Total Volume	3	5	8	7	26	33	20	0	20	61
% App. Total	37.5	62.5		21.2	78.8		100	0		
PHF	.375	.417	.500	.438	.650	.825	.625	.000	.625	.897

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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	0	0	0	0	0	0	1
Apprch %	0	100	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	

	Narrows Road From North				South Main Street From East				South Main Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	**1**	**0**	**1**	0	0	0	0	0	0	0	0	**1**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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N: Narrows Road
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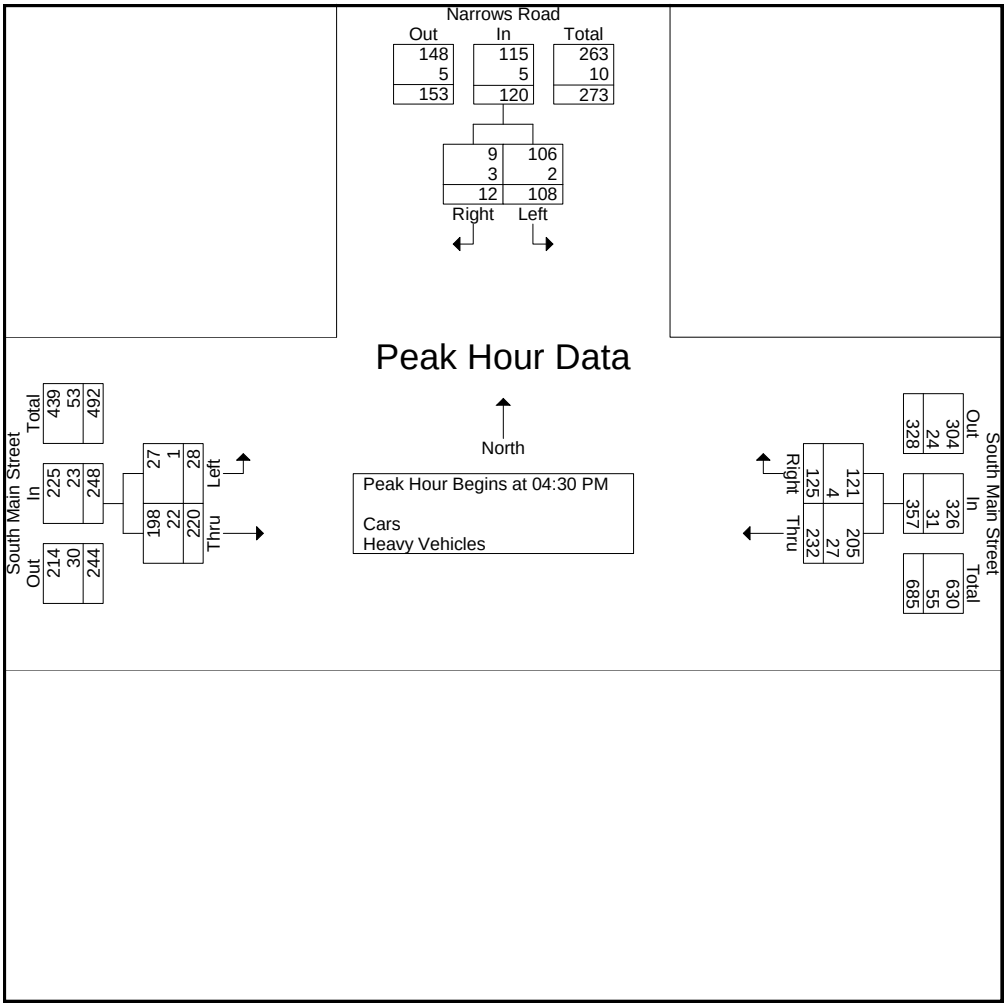
File Name : 81676F-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	Narrows Road From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**7**	**31**	**38**	30	**66**	**96**	57	7	64	**198**
04:45 PM	**1**	**23**	**24**	**20**	**65**	**85**	**49**	**5**	**54**	**163**
05:00 PM	**3**	**24**	**27**	**34**	**55**	**89**	**54**	**6**	**60**	**176**
05:15 PM	**1**	**30**	**31**	**41**	46	87	**60**	**10**	**70**	188
Total Volume	12	108	120	125	232	357	220	28	248	725
% App. Total	10	90		35	65		88.7	11.3		
PHF	.429	.871	.789	.762	.879	.930	.917	.700	.886	.915
Cars	9	106	115	121	205	326	198	27	225	666
% Cars	75.0	98.1	95.8	96.8	88.4	91.3	90.0	96.4	90.7	91.9
Heavy Vehicles	3	2	5	4	27	31	22	1	23	59
% Heavy Vehicles	25.0	1.9	4.2	3.2	11.6	8.7	10.0	3.6	9.3	8.1



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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	15	7	87	39	69	16	233
07:15 AM	13	8	91	45	43	21	221
07:30 AM	9	7	95	59	60	23	253
07:45 AM	17	4	54	67	48	8	198
Total	54	26	327	210	220	68	905
08:00 AM	15	6	64	70	51	12	218
08:15 AM	13	10	74	53	53	21	224
08:30 AM	12	4	62	44	39	15	176
08:45 AM	11	6	87	46	50	17	217
Total	51	26	287	213	193	65	835
Grand Total	105	52	614	423	413	133	1740
Apprch %	66.9	33.1	59.2	40.8	75.6	24.4	
Total %	6	3	35.3	24.3	23.7	7.6	
Cars	80	44	590	382	359	113	1568
% Cars	76.2	84.6	96.1	90.3	86.9	85	90.1
Heavy Vehicles	25	8	24	41	54	20	172
% Heavy Vehicles	23.8	15.4	3.9	9.7	13.1	15	9.9

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	15	7	**22**	87	39	126	**69**	16	**85**	233
07:15 AM	13	**8**	21	91	45	136	43	21	64	221
07:30 AM	9	7	16	**95**	59	**154**	60	**23**	83	**253**
07:45 AM	**17**	4	21	54	**67**	121	48	8	56	198
Total Volume	54	26	80	327	210	537	220	68	288	905
% App. Total	67.5	32.5		60.9	39.1		76.4	23.6		
PHF	.794	.813	.909	.861	.784	.872	.797	.739	.847	.894
Cars	41	22	63	319	185	504	195	62	257	824
% Cars	75.9	84.6	78.8	97.6	88.1	93.9	88.6	91.2	89.2	91.0
Heavy Vehicles	13	4	17	8	25	33	25	6	31	81
% Heavy Vehicles	24.1	15.4	21.3	2.4	11.9	6.1	11.4	8.8	10.8	9.0

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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	11	5	86	35	63	16	216
07:15 AM	7	6	87	37	39	20	196
07:30 AM	7	7	93	50	49	21	227
07:45 AM	16	4	53	63	44	5	185
Total	41	22	319	185	195	62	824
08:00 AM	10	5	60	67	45	8	195
08:15 AM	11	9	71	45	44	18	198
08:30 AM	9	2	58	40	34	11	154
08:45 AM	9	6	82	45	41	14	197
Total	39	22	271	197	164	51	744
Grand Total	80	44	590	382	359	113	1568
Apprch %	64.5	35.5	60.7	39.3	76.1	23.9	
Total %	5.1	2.8	37.6	24.4	22.9	7.2	

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	11	5	16	86	35	121	**63**	16	**79**	216
07:15 AM	7	6	13	87	37	124	39	20	59	196
07:30 AM	7	**7**	14	**93**	50	**143**	49	**21**	70	**227**
07:45 AM	**16**	4	**20**	53	**63**	116	44	5	49	185
Total Volume	41	22	63	319	185	504	195	62	257	824
% App. Total	65.1	34.9		63.3	36.7		75.9	24.1		
PHF	.641	.786	.788	.858	.734	.881	.774	.738	.813	.907

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N: Route 24 SB Ramps
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City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	4	2	1	4	6	0	17
07:15 AM	6	2	4	8	4	1	25
07:30 AM	2	0	2	9	11	2	26
07:45 AM	1	0	1	4	4	3	13
Total	13	4	8	25	25	6	81
08:00 AM	5	1	4	3	6	4	23
08:15 AM	2	1	3	8	9	3	26
08:30 AM	3	2	4	4	5	4	22
08:45 AM	2	0	5	1	9	3	20
Total	12	4	16	16	29	14	91
Grand Total	25	8	24	41	54	20	172
Apprch %	75.8	24.2	36.9	63.1	73	27	
Total %	14.5	4.7	14	23.8	31.4	11.6	

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**5**	1	**6**	4	3	7	6	**4**	10	23
08:15 AM	2	1	3	3	**8**	**11**	**9**	3	**12**	**26**
08:30 AM	**3**	**2**	5	4	4	8	5	4	9	22
08:45 AM	2	0	2	**5**	1	6	9	3	12	20
Total Volume	12	4	16	16	16	32	29	14	43	91
% App. Total	75	25		50	50		67.4	32.6		
PHF	.600	.500	.667	.800	.500	.727	.806	.875	.896	.875

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Client: VHB/ J. Quitter

File Name : 81676F-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	1	1	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	1	1	0	0	2
Apprch %	0	0	0	0	0	100	100	0	0	
Total %	0	0	0	0	0	50	50	0	0	

	Route 24 SB Ramps From North				South Main Street From East				South Main Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	1	1	0	0	1	2
% App. Total	0	0	0		0	0	100		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.000	.250	.500

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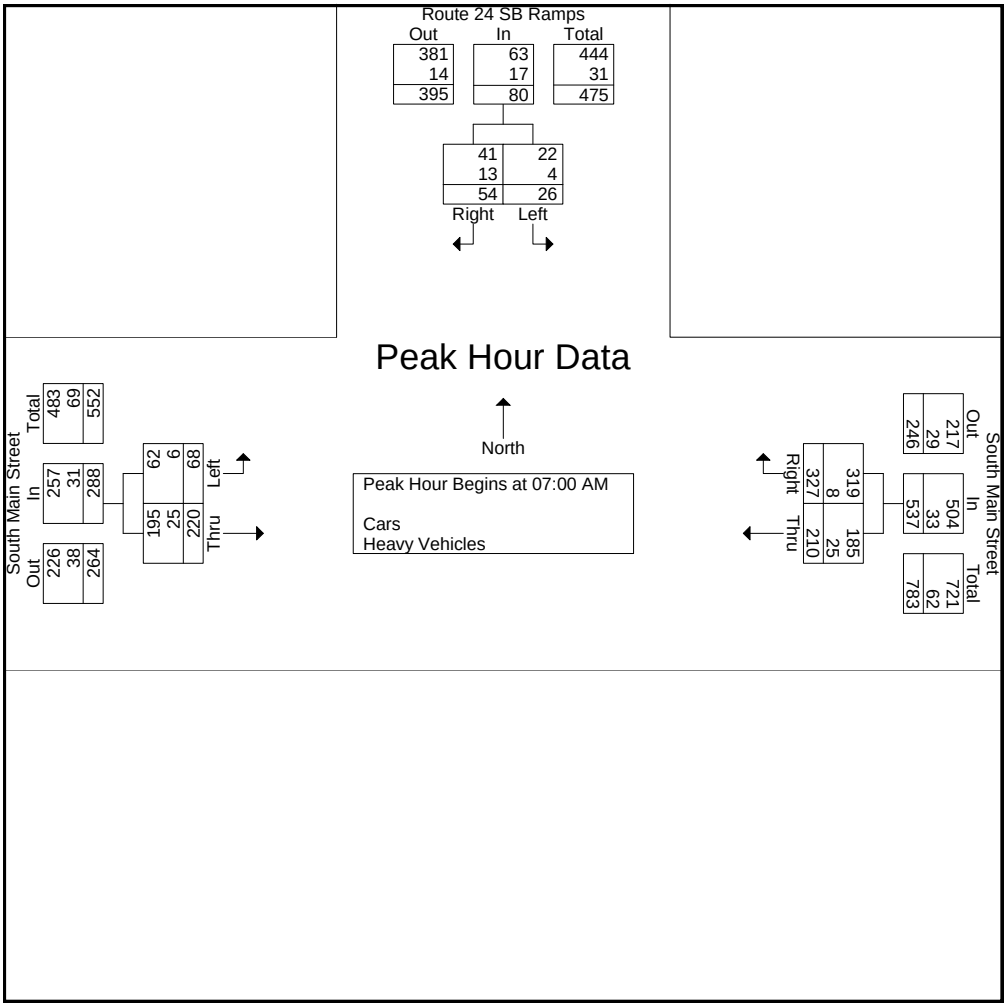
N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	15	7	**22**	87	39	126	**69**	16	**85**	233
07:15 AM	13	**8**	21	91	45	136	43	21	64	221
07:30 AM	9	7	16	**95**	59	**154**	60	**23**	83	**253**
07:45 AM	**17**	4	21	54	**67**	121	48	8	56	198
Total Volume	54	26	80	327	210	537	220	68	288	905
% App. Total	67.5	32.5		60.9	39.1		76.4	23.6		
PHF	.794	.813	.909	.861	.784	.872	.797	.739	.847	.894
Cars	41	22	63	319	185	504	195	62	257	824
% Cars	75.9	84.6	78.8	97.6	88.1	93.9	88.6	91.2	89.2	91.0
Heavy Vehicles	13	4	17	8	25	33	25	6	31	81
% Heavy Vehicles	24.1	15.4	21.3	2.4	11.9	6.1	11.4	8.8	10.8	9.0



PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	24	13	58	53	51	23	222
04:15 PM	24	16	60	71	59	11	241
04:30 PM	30	13	51	65	72	15	246
04:45 PM	17	10	61	74	67	8	237
Total	95	52	230	263	249	57	946
05:00 PM	19	7	72	66	51	22	237
05:15 PM	14	9	53	80	70	17	243
05:30 PM	10	6	50	50	58	11	185
05:45 PM	23	9	46	39	45	10	172
Total	66	31	221	235	224	60	837
Grand Total	161	83	451	498	473	117	1783
Apprch %	66	34	47.5	52.5	80.2	19.8	
Total %	9	4.7	25.3	27.9	26.5	6.6	
Cars	135	74	442	465	440	105	1661
% Cars	83.9	89.2	98	93.4	93	89.7	93.2
Heavy Vehicles	26	9	9	33	33	12	122
% Heavy Vehicles	16.1	10.8	2	6.6	7	10.3	6.8

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**30**	**13**	**43**	51	65	116	**72**	15	**87**	**246**
04:45 PM	**17**	**10**	**27**	**61**	**74**	**135**	**67**	**8**	**75**	**237**
05:00 PM	**19**	**7**	**26**	**72**	66	**138**	51	**22**	73	237
05:15 PM	14	9	23	53	**80**	133	70	17	87	243
Total Volume	80	39	119	237	285	522	260	62	322	963
% App. Total	67.2	32.8		45.4	54.6		80.7	19.3		
PHF	.667	.750	.692	.823	.891	.946	.903	.705	.925	.979
Cars	65	36	101	230	265	495	243	56	299	895
% Cars	81.3	92.3	84.9	97.0	93.0	94.8	93.5	90.3	92.9	92.9
Heavy Vehicles	15	3	18	7	20	27	17	6	23	68
% Heavy Vehicles	18.8	7.7	15.1	3.0	7.0	5.2	6.5	9.7	7.1	7.1

PRECISION
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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	19	9	58	46	46	20	198
04:15 PM	22	15	59	69	55	9	229
04:30 PM	27	12	51	61	69	15	235
04:45 PM	13	9	59	69	61	8	219
Total	81	45	227	245	231	52	881
05:00 PM	14	7	68	60	48	19	216
05:15 PM	11	8	52	75	65	14	225
05:30 PM	9	6	50	47	53	10	175
05:45 PM	20	8	45	38	43	10	164
Total	54	29	215	220	209	53	780
Grand Total	135	74	442	465	440	105	1661
Apprch %	64.6	35.4	48.7	51.3	80.7	19.3	
Total %	8.1	4.5	26.6	28	26.5	6.3	

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	22	**15**	37	59	**69**	**128**	55	9	64	229
04:30 PM	**27**	12	**39**	51	61	112	**69**	15	**84**	**235**
04:45 PM	**13**	**9**	**22**	**59**	**69**	**128**	**61**	**8**	**69**	**219**
05:00 PM	**14**	**7**	**21**	**68**	60	128	48	**19**	67	216
Total Volume	76	43	119	237	259	496	233	51	284	899
% App. Total	63.9	36.1		47.8	52.2		82	18		
PHF	.704	.717	.763	.871	.938	.969	.844	.671	.845	.956

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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Route 24 SB Ramps From North		South Main Street From East		South Main Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	5	4	0	7	5	3	24
04:15 PM	2	1	1	2	4	2	12
04:30 PM	3	1	0	4	3	0	11
04:45 PM	4	1	2	5	6	0	18
Total	14	7	3	18	18	5	65
05:00 PM	5	0	4	6	3	3	21
05:15 PM	3	1	1	5	5	3	18
05:30 PM	1	0	0	3	5	1	10
05:45 PM	3	1	1	1	2	0	8
Total	12	2	6	15	15	7	57
Grand Total	26	9	9	33	33	12	122
Apprch %	74.3	25.7	21.4	78.6	73.3	26.7	
Total %	21.3	7.4	7.4	27	27	9.8	

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	3	**1**	4	0	4	4	3	0	3	11
04:45 PM	4	1	**5**	2	5	7	**6**	0	6	18
05:00 PM	**5**	0	5	**4**	**6**	**10**	3	**3**	6	**21**
05:15 PM	**3**	**1**	**4**	**1**	**5**	**6**	**5**	**3**	**8**	18
Total Volume	15	3	18	7	20	27	17	6	23	68
% App. Total	83.3	16.7		25.9	74.1		73.9	26.1		
PHF	.750	.750	.900	.438	.833	.675	.708	.500	.719	.810

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N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	1	1	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	1	0	0	1
05:30 PM	0	0	0	0	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	2	0	0	0	2
Total	0	0	0	0	1	2	1	0	0	4
Grand Total	0	0	0	0	1	3	2	0	0	6
Apprch %	0	0	0	0	25	75	100	0	0	
Total %	0	0	0	0	16.7	50	33.3	0	0	

	Route 24 SB Ramps From North				South Main Street From East				South Main Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
05:30 PM	0	0	0	0	0	**1**	0	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	**2**
Total Volume	0	0	0	0	0	1	2	3	1	0	0	1	4
% App. Total	0	0	0		0	33.3	66.7		100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.375	.250	.000	.000	.250	.500

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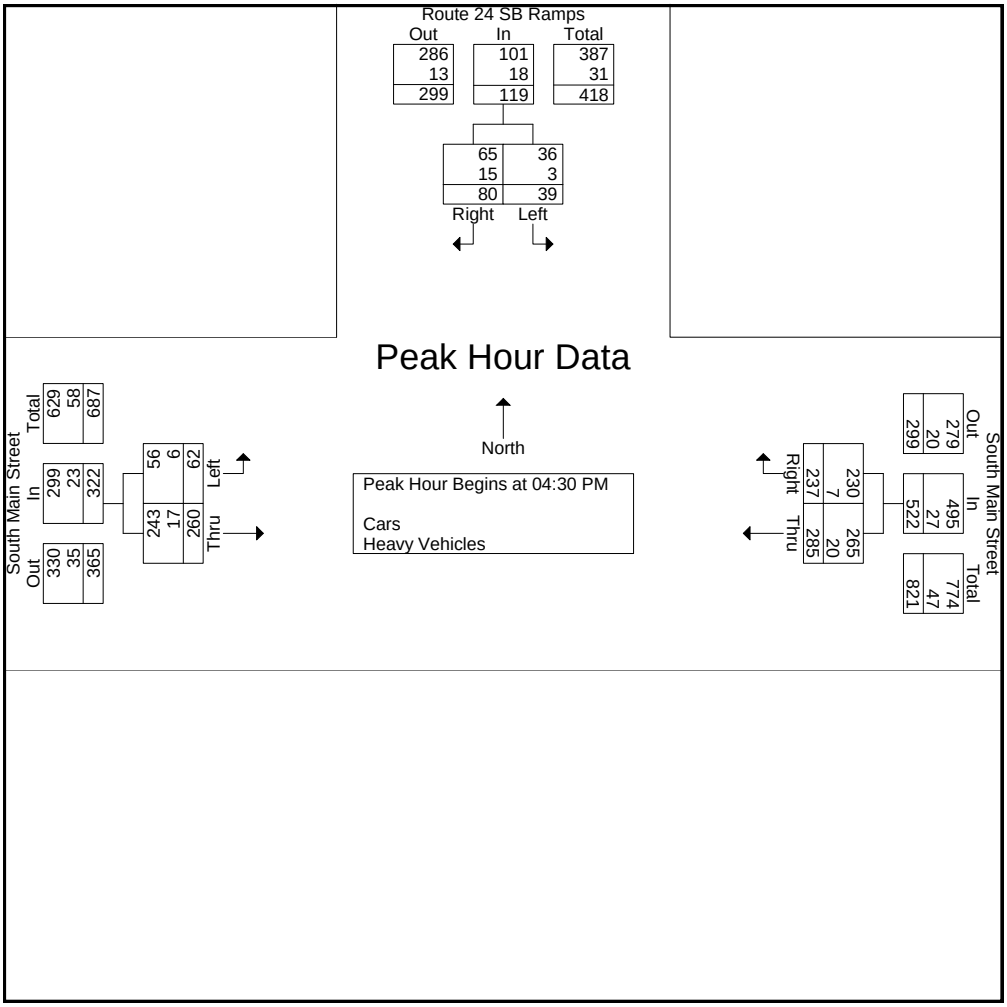
N: Route 24 SB Ramps
E/W: South Main Street
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	Route 24 SB Ramps From North			South Main Street From East			South Main Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**30**	**13**	**43**	51	65	116	**72**	15	**87**	**246**
04:45 PM	**17**	**10**	**27**	**61**	**74**	**135**	**67**	**8**	**75**	**237**
05:00 PM	**19**	**7**	**26**	**72**	66	**138**	51	**22**	73	237
05:15 PM	14	9	23	53	**80**	133	70	17	87	243
Total Volume	80	39	119	237	285	522	260	62	322	963
% App. Total	67.2	32.8		45.4	54.6		80.7	19.3		
PHF	.667	.750	.692	.823	.891	.946	.903	.705	.925	.979
Cars	65	36	101	230	265	495	243	56	299	895
% Cars	81.3	92.3	84.9	97.0	93.0	94.8	93.5	90.3	92.9	92.9
Heavy Vehicles	15	3	18	7	20	27	17	6	23	68
% Heavy Vehicles	18.8	7.7	15.1	3.0	7.0	5.2	6.5	9.7	7.1	7.1



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D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-E
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	120	16	55	12	26	46	275
07:15 AM	123	17	76	22	14	36	288
07:30 AM	135	29	92	19	23	42	340
07:45 AM	113	25	58	22	13	37	268
Total	491	87	281	75	76	161	1171
08:00 AM	111	27	58	30	16	39	281
08:15 AM	102	24	58	20	21	45	270
08:30 AM	93	14	45	15	12	28	207
08:45 AM	122	14	51	13	12	40	252
Total	428	79	212	78	61	152	1010
Grand Total	919	166	493	153	137	313	2181
Apprch %	84.7	15.3	76.3	23.7	30.4	69.6	
Total %	42.1	7.6	22.6	7	6.3	14.4	
Cars	886	146	470	115	97	289	2003
% Cars	96.4	88	95.3	75.2	70.8	92.3	91.8
Heavy Vehicles	33	20	23	38	40	24	178
% Heavy Vehicles	3.6	12	4.7	24.8	29.2	7.7	8.2

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	123	17	140	76	22	98	14	36	50	288
07:30 AM	**135**	**29**	**164**	**92**	19	**111**	**23**	**42**	**65**	**340**
07:45 AM	**113**	**25**	**138**	**58**	**22**	**80**	**13**	**37**	**50**	**268**
08:00 AM	**111**	**27**	**138**	**58**	**30**	88	16	39	55	281
Total Volume	482	98	580	284	93	377	66	154	220	1177
% App. Total	83.1	16.9		75.3	24.7		30	70		
PHF	.893	.845	.884	.772	.775	.849	.717	.917	.846	.865
Cars	465	88	553	270	69	339	46	143	189	1081
% Cars	96.5	89.8	95.3	95.1	74.2	89.9	69.7	92.9	85.9	91.8
Heavy Vehicles	17	10	27	14	24	38	20	11	31	96
% Heavy Vehicles	3.5	10.2	4.7	4.9	25.8	10.1	30.3	7.1	14.1	8.2

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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-E
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	119	14	54	7	20	44	258
07:15 AM	119	15	71	12	10	31	258
07:30 AM	129	26	88	13	16	39	311
07:45 AM	111	23	56	18	10	36	254
Total	478	78	269	50	56	150	1081
08:00 AM	106	24	55	26	10	37	258
08:15 AM	99	21	56	15	14	42	247
08:30 AM	87	11	40	13	8	24	183
08:45 AM	116	12	50	11	9	36	234
Total	408	68	201	65	41	139	922
Grand Total	886	146	470	115	97	289	2003
Apprch %	85.9	14.1	80.3	19.7	25.1	74.9	
Total %	44.2	7.3	23.5	5.7	4.8	14.4	

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	119	14	133	54	7	61	**20**	**44**	**64**	258
07:15 AM	119	15	134	71	12	83	10	31	41	258
07:30 AM	**129**	**26**	**155**	**88**	13	**101**	16	39	55	**311**
07:45 AM	**111**	**23**	**134**	**56**	**18**	74	10	36	46	254
Total Volume	478	78	556	269	50	319	56	150	206	1081
% App. Total	86	14		84.3	15.7		27.2	72.8		
PHF	.926	.750	.897	.764	.694	.790	.700	.852	.805	.869

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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-E
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	1	2	1	5	6	2	17
07:15 AM	4	2	5	10	4	5	30
07:30 AM	6	3	4	6	7	3	29
07:45 AM	2	2	2	4	3	1	14
Total	13	9	12	25	20	11	90
08:00 AM	5	3	3	4	6	2	23
08:15 AM	3	3	2	5	7	3	23
08:30 AM	6	3	5	2	4	4	24
08:45 AM	6	2	1	2	3	4	18
Total	20	11	11	13	20	13	88
Grand Total	33	20	23	38	40	24	178
Apprch %	62.3	37.7	37.7	62.3	62.5	37.5	
Total %	18.5	11.2	12.9	21.3	22.5	13.5	

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	4	2	6	**5**	**10**	**15**	4	**5**	9	**30**
07:30 AM	**6**	**3**	**9**	4	6	10	**7**	3	**10**	29
07:45 AM	2	2	4	2	4	6	3	1	4	14
08:00 AM	5	3	8	3	4	7	6	2	8	23
Total Volume	17	10	27	14	24	38	20	11	31	96
% App. Total	63	37		36.8	63.2		64.5	35.5		
PHF	.708	.833	.750	.700	.600	.633	.714	.550	.775	.800

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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-E
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	1	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	0	0	0	0	1	0	2
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	50	0	0	0	0	0	0	50	0	

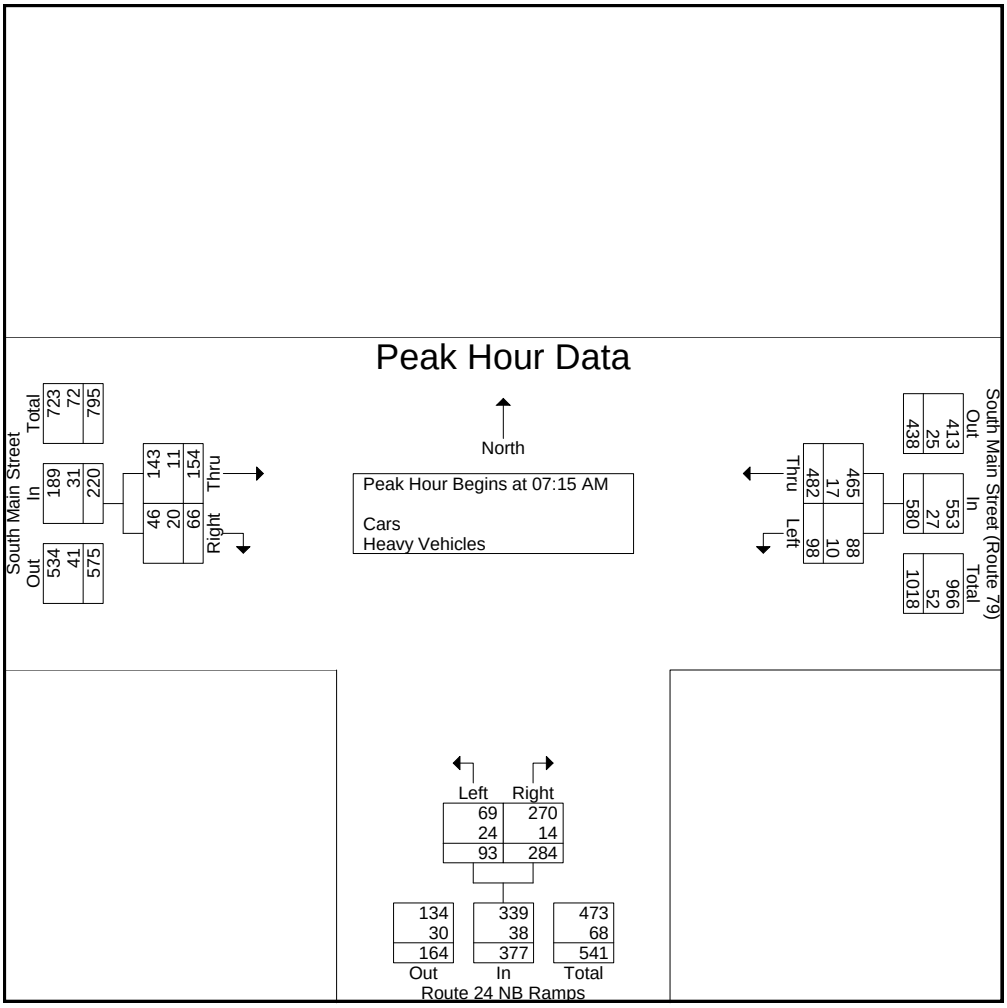
	South Main Street (Route 79) From East				Route 24 NB Ramps From South				South Main Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	**1**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-E
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	123	17	140	76	22	98	14	36	50	288
07:30 AM	**135**	**29**	**164**	**92**	19	**111**	**23**	**42**	**65**	**340**
07:45 AM	**113**	**25**	**138**	**58**	**22**	**80**	**13**	**37**	**50**	**268**
08:00 AM	**111**	**27**	**138**	**58**	**30**	88	16	39	55	281
Total Volume	482	98	580	284	93	377	66	154	220	1177
% App. Total	83.1	16.9		75.3	24.7		30	70		
PHF	.893	.845	.884	.772	.775	.849	.717	.917	.846	.865
Cars	465	88	553	270	69	339	46	143	189	1081
% Cars	96.5	89.8	95.3	95.1	74.2	89.9	69.7	92.9	85.9	91.8
Heavy Vehicles	17	10	27	14	24	38	20	11	31	96
% Heavy Vehicles	3.5	10.2	4.7	4.9	25.8	10.1	30.3	7.1	14.1	8.2



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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-EEE
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	92	10	77	24	24	42	269
04:15 PM	121	12	94	20	23	45	315
04:30 PM	96	14	82	18	22	64	296
04:45 PM	117	10	95	17	15	62	316
Total	426	46	348	79	84	213	1196
05:00 PM	120	10	92	15	21	39	297
05:15 PM	99	3	83	33	21	58	297
05:30 PM	88	11	85	15	16	46	261
05:45 PM	72	10	62	15	19	33	211
Total	379	34	322	78	77	176	1066
Grand Total	805	80	670	157	161	389	2262
Apprch %	91	9	81	19	29.3	70.7	
Total %	35.6	3.5	29.6	6.9	7.1	17.2	
Cars	783	75	658	131	133	373	2153
% Cars	97.3	93.8	98.2	83.4	82.6	95.9	95.2
Heavy Vehicles	22	5	12	26	28	16	109
% Heavy Vehicles	2.7	6.2	1.8	16.6	17.4	4.1	4.8

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**121**	12	**133**	94	**20**	**114**	**23**	45	68	315
04:30 PM	96	**14**	110	82	18	100	22	**64**	**86**	296
04:45 PM	117	10	127	**95**	17	112	15	62	77	**316**
05:00 PM	**120**	**10**	**130**	**92**	**15**	**107**	**21**	**39**	**60**	**297**
Total Volume	**454**	**46**	**500**	**363**	**70**	**433**	**81**	**210**	**291**	**1224**
% App. Total	**90.8**	**9.2**		**83.8**	**16.2**		**27.8**	**72.2**		
PHF	**.938**	**.821**	**.940**	**.955**	**.875**	**.950**	**.880**	**.820**	**.846**	**.968**
Cars	**438**	**44**	**482**	**355**	**57**	**412**	**69**	**201**	**270**	**1164**
% Cars	**96.5**	**95.7**	**96.4**	**97.8**	**81.4**	**95.2**	**85.2**	**95.7**	**92.8**	**95.1**
Heavy Vehicles	**16**	**2**	**18**	**8**	**13**	**21**	**12**	**9**	**21**	**60**
% Heavy Vehicles	**3.5**	**4.3**	**3.6**	**2.2**	**18.6**	**4.8**	**14.8**	**4.3**	**7.2**	**4.9**

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S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-EEE
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	89	8	74	20	18	38	247
04:15 PM	114	12	90	20	18	45	299
04:30 PM	94	14	80	15	21	62	286
04:45 PM	114	8	93	13	11	57	296
Total	411	42	337	68	68	202	1128
05:00 PM	116	10	92	9	19	37	283
05:15 PM	97	3	83	29	17	56	285
05:30 PM	88	10	84	12	11	46	251
05:45 PM	71	10	62	13	18	32	206
Total	372	33	321	63	65	171	1025
Grand Total	783	75	658	131	133	373	2153
Apprch %	91.3	8.7	83.4	16.6	26.3	73.7	
Total %	36.4	3.5	30.6	6.1	6.2	17.3	

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	114	12	**126**	90	**20**	**110**	18	45	63	**299**
04:30 PM	**94**	**14**	108	80	15	95	**21**	**62**	**83**	286
04:45 PM	114	8	122	**93**	13	106	11	57	68	296
05:00 PM	**116**	10	126	92	9	101	19	37	56	283
Total Volume	438	44	482	355	57	412	69	201	270	1164
% App. Total	90.9	9.1		86.2	13.8		25.6	74.4		
PHF	.944	.786	.956	.954	.713	.936	.821	.810	.813	.973

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E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-EEE
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Main Street (Route 79) From East		Route 24 NB Ramps From South		South Main Street From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	3	2	3	4	6	4	22
04:15 PM	7	0	4	0	5	0	16
04:30 PM	2	0	2	3	1	2	10
04:45 PM	3	2	2	4	4	5	20
Total	15	4	11	11	16	11	68
05:00 PM	4	0	0	6	2	2	14
05:15 PM	2	0	0	4	4	2	12
05:30 PM	0	1	1	3	5	0	10
05:45 PM	1	0	0	2	1	1	5
Total	7	1	1	15	12	5	41
Grand Total	22	5	12	26	28	16	109
Apprch %	81.5	18.5	31.6	68.4	63.6	36.4	
Total %	20.2	4.6	11	23.9	25.7	14.7	

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	3	**2**	5	3	**4**	**7**	**6**	4	**10**	**22**
04:15 PM	**7**	0	**7**	**4**	0	4	5	0	5	16
04:30 PM	2	0	2	2	3	5	1	2	3	10
04:45 PM	3	2	5	2	4	6	4	**5**	9	20
Total Volume	15	4	19	11	11	22	16	11	27	68
% App. Total	78.9	21.1		50	50		59.3	40.7		
PHF	.536	.500	.679	.688	.688	.786	.667	.550	.675	.773

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File Name : 81676F-EEE
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	3	0	1	0	4
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	0	1	0	4
05:00 PM	0	0	0	0	0	2	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	1
05:30 PM	1	0	0	0	0	2	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	4	0	1	0	6
Grand Total	1	0	0	0	0	7	0	2	0	10
Apprch %	100	0	0	0	0	100	0	100	0	
Total %	10	0	0	0	0	70	0	20	0	

	South Main Street (Route 79) From East				Route 24 NB Ramps From South				South Main Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	1
05:30 PM	**1**	0	0	**1**	0	0	2	2	0	0	0	0	**3**
Total Volume	1	0	0	1	0	0	4	4	0	1	0	1	6
% App. Total	100	0	0		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.500	.500	.000	.250	.000	.250	.500

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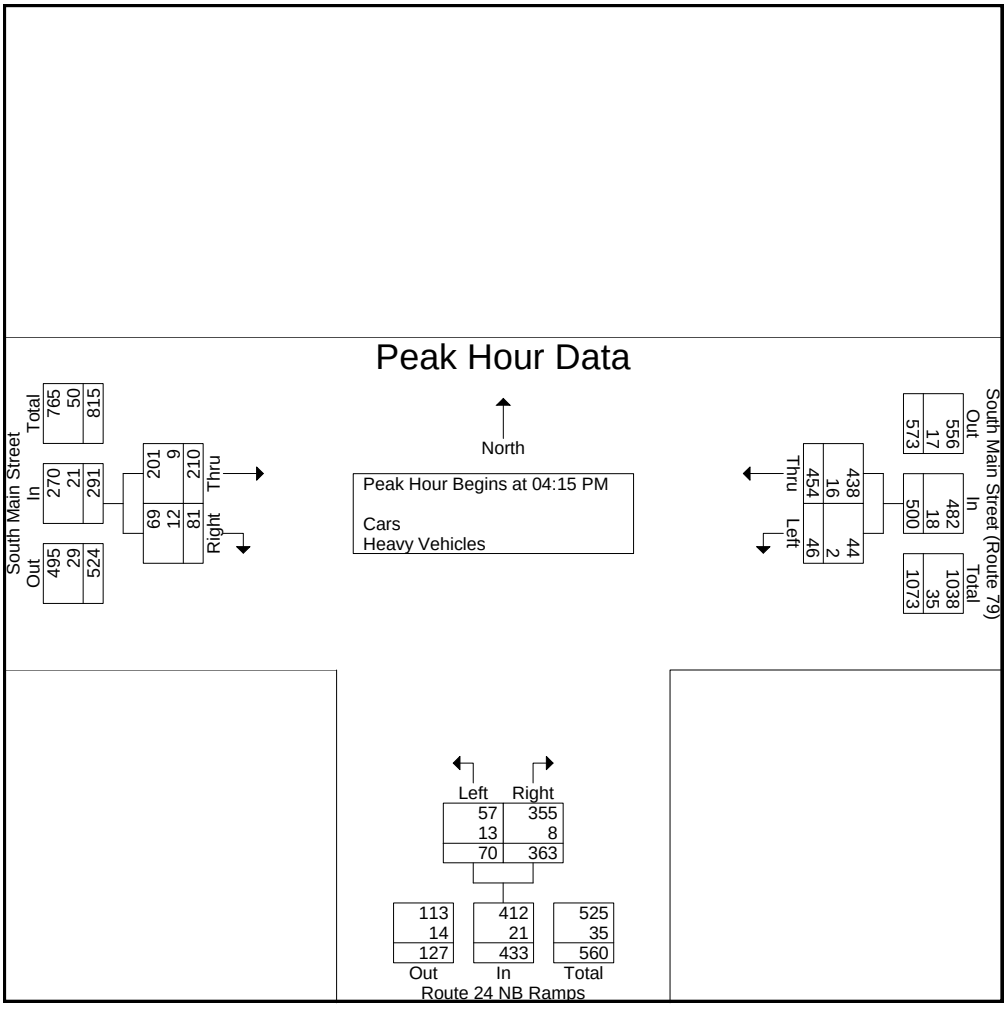
S: Route 24 NB Ramps
E/W: South Main Street (Route 79)
City, State: Freetown, MA
Client: VHB/ J. Quitter

File Name : 81676F-EEE
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	South Main Street (Route 79) From East			Route 24 NB Ramps From South			South Main Street From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**121**	12	**133**	94	**20**	**114**	**23**	45	68	315
04:30 PM	96	**14**	110	82	18	100	22	**64**	**86**	296
04:45 PM	117	10	127	**95**	17	112	15	62	77	**316**
05:00 PM	**120**	**10**	**130**	**92**	**15**	**107**	**21**	**39**	**60**	**297**
Total Volume	**454**	**46**	**500**	**363**	**70**	**433**	**81**	**210**	**291**	**1224**
% App. Total	**90.8**	**9.2**		**83.8**	**16.2**		**27.8**	**72.2**		
PHF	**.938**	**.821**	**.940**	**.955**	**.875**	**.950**	**.880**	**.820**	**.846**	**.968**
Cars	**438**	**44**	**482**	**355**	**57**	**412**	**69**	**201**	**270**	**1164**
% Cars	**96.5**	**95.7**	**96.4**	**97.8**	**81.4**	**95.2**	**85.2**	**95.7**	**92.8**	**95.1**
Heavy Vehicles	**16**	**2**	**18**	**8**	**13**	**21**	**12**	**9**	**21**	**60**
% Heavy Vehicles	**3.5**	**4.3**	**3.6**	**2.2**	**18.6**	**4.8**	**14.8**	**4.3**	**7.2**	**4.9**



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 9/24/08 and Sat 9/27/08	81676	Freetown, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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N/S: South Main Street
E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-F
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	45	1	0	0	0	45	91
07:15 AM	41	1	2	1	0	26	71
07:30 AM	51	1	4	0	0	58	114
07:45 AM	61	1	1	1	0	38	102
Total	198	4	7	2	0	167	378
08:00 AM	66	3	0	1	1	27	98
08:15 AM	53	0	0	2	0	25	80
08:30 AM	34	1	2	1	0	27	65
08:45 AM	33	2	1	1	0	22	59
Total	186	6	3	5	1	101	302
Grand Total	384	10	10	7	1	268	680
Apprch %	97.5	2.5	58.8	41.2	0.4	99.6	
Total %	56.5	1.5	1.5	1	0.1	39.4	
Cars	316	10	8	7	1	213	555
% Cars	82.3	100	80	100	100	79.5	81.6
Heavy Vehicles	68	0	2	0	0	55	125
% Heavy Vehicles	17.7	0	20	0	0	20.5	18.4

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	51	1	52	**4**	0	**4**	0	**58**	**58**	**114**
07:45 AM	**61**	**1**	**62**	**1**	**1**	**2**	**0**	**38**	**38**	**102**
08:00 AM	**66**	**3**	**69**	0	1	1	**1**	27	28	98
08:15 AM	53	0	53	0	**2**	2	0	25	25	80
Total Volume	231	5	236	5	4	9	1	148	149	394
% App. Total	97.9	2.1		55.6	44.4		0.7	99.3		
PHF	.875	.417	.855	.313	.500	.563	.250	.638	.642	.864
Cars	199	5	204	4	4	8	1	124	125	337
% Cars	86.1	100	86.4	80.0	100	88.9	100	83.8	83.9	85.5
Heavy Vehicles	32	0	32	1	0	1	0	24	24	57
% Heavy Vehicles	13.9	0	13.6	20.0	0	11.1	0	16.2	16.1	14.5

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N/S: South Main Street
E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-F
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	35	1	0	0	0	34	70
07:15 AM	36	1	2	1	0	21	61
07:30 AM	47	1	3	0	0	53	104
07:45 AM	56	1	1	1	0	30	89
Total	174	4	6	2	0	138	324
08:00 AM	54	3	0	1	1	22	81
08:15 AM	42	0	0	2	0	19	63
08:30 AM	25	1	1	1	0	19	47
08:45 AM	21	2	1	1	0	15	40
Total	142	6	2	5	1	75	231
Grand Total	316	10	8	7	1	213	555
Apprch %	96.9	3.1	53.3	46.7	0.5	99.5	
Total %	56.9	1.8	1.4	1.3	0.2	38.4	

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	47	1	48	**3**	0	**3**	0	**53**	**53**	**104**
07:45 AM	**56**	1	**57**	1	1	2	0	30	30	89
08:00 AM	54	**3**	57	0	1	1	**1**	22	23	81
08:15 AM	42	0	42	0	**2**	2	0	19	19	63
Total Volume	199	5	204	4	4	8	1	124	125	337
% App. Total	97.5	2.5		50	50		0.8	99.2		
PHF	.888	.417	.895	.333	.500	.667	.250	.585	.590	.810

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E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-F
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	10	0	0	0	0	11	21
07:15 AM	5	0	0	0	0	5	10
07:30 AM	4	0	1	0	0	5	10
07:45 AM	5	0	0	0	0	8	13
Total	24	0	1	0	0	29	54
08:00 AM	12	0	0	0	0	5	17
08:15 AM	11	0	0	0	0	6	17
08:30 AM	9	0	1	0	0	8	18
08:45 AM	12	0	0	0	0	7	19
Total	44	0	1	0	0	26	71
Grand Total	68	0	2	0	0	55	125
Apprch %	100	0	100	0	0	100	
Total %	54.4	0	1.6	0	0	44	

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**12**	0	**12**	0	0	0	0	5	5	17
08:15 AM	11	0	11	0	0	0	0	6	6	17
08:30 AM	9	0	9	**1**	0	**1**	0	**8**	**8**	18
08:45 AM	12	0	12	0	0	0	0	7	7	**19**
Total Volume	**44**	**0**	**44**	**1**	**0**	**1**	**0**	**26**	**26**	**71**
% App. Total	**100**	**0**		**100**	**0**		**0**	**100**		
PHF	**.917**	**.000**	**.917**	**.250**	**.000**	**.250**	**.000**	**.813**	**.813**	**.934**

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E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-F
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	2	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2
Grand Total	0	0	0	0	0	2	0	0	0	2
Apprch %	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	

	South Main Street From North				Copicut Road From East				South Main Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	**2**
Total Volume	0	0	0	0	0	0	2	2	0	0	0	0	2
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

PRECISION
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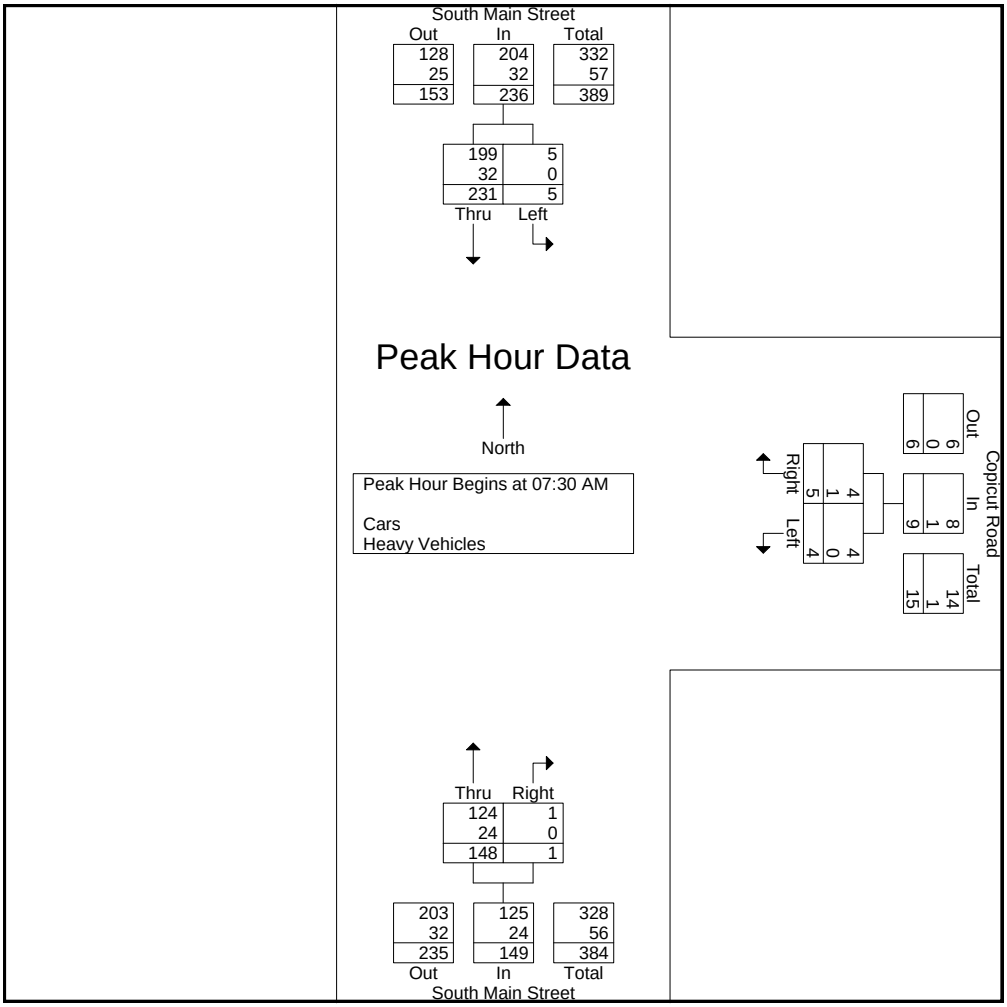
N/S: South Main Street
E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-F
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	51	1	52	**4**	0	**4**	0	**58**	**58**	**114**
07:45 AM	**61**	**1**	**62**	**1**	**1**	**2**	**0**	**38**	**38**	**102**
08:00 AM	**66**	**3**	**69**	0	1	1	**1**	27	28	98
08:15 AM	53	0	53	0	**2**	2	0	25	25	80
Total Volume	231	5	236	5	4	9	1	148	149	394
% App. Total	97.9	2.1		55.6	44.4		0.7	99.3		
PHF	.875	.417	.855	.313	.500	.563	.250	.638	.642	.864
Cars	199	5	204	4	4	8	1	124	125	337
% Cars	86.1	100	86.4	80.0	100	88.9	100	83.8	83.9	85.5
Heavy Vehicles	32	0	32	1	0	1	0	24	24	57
% Heavy Vehicles	13.9	0	13.6	20.0	0	11.1	0	16.2	16.1	14.5



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N/S: South Main Street
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City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-FFF
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	57	4	4	2	0	47	114
04:15 PM	54	0	1	1	0	49	105
04:30 PM	75	0	2	0	1	38	116
04:45 PM	54	1	3	3	1	46	108
Total	240	5	10	6	2	180	443
05:00 PM	33	1	1	0	1	46	82
05:15 PM	52	3	0	0	1	50	106
05:30 PM	33	3	1	1	3	51	92
05:45 PM	37	0	1	0	1	32	71
Total	155	7	3	1	6	179	351
Grand Total	395	12	13	7	8	359	794
Apprch %	97.1	2.9	65	35	2.2	97.8	
Total %	49.7	1.5	1.6	0.9	1	45.2	
Cars	343	10	12	7	7	317	696
% Cars	86.8	83.3	92.3	100	87.5	88.3	87.7
Heavy Vehicles	52	2	1	0	1	42	98
% Heavy Vehicles	13.2	16.7	7.7	0	12.5	11.7	12.3

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	57	**4**	61	**4**	2	**6**	0	47	47	114
04:15 PM	54	0	54	1	1	2	0	**49**	**49**	105
04:30 PM	**75**	0	**75**	2	0	2	**1**	38	39	**116**
04:45 PM	**54**	**1**	**55**	**3**	**3**	6	1	46	47	108
Total Volume	240	5	245	10	6	16	2	180	182	443
% App. Total	98	2		62.5	37.5		1.1	98.9		
PHF	.800	.313	.817	.625	.500	.667	.500	.918	.929	.955
Cars	218	4	222	9	6	15	2	158	160	397
% Cars	90.8	80.0	90.6	90.0	100	93.8	100	87.8	87.9	89.6
Heavy Vehicles	22	1	23	1	0	1	0	22	22	46
% Heavy Vehicles	9.2	20.0	9.4	10.0	0	6.3	0	12.2	12.1	10.4

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E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-FFF
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	48	3	4	2	0	36	93
04:15 PM	52	0	0	1	0	45	98
04:30 PM	70	0	2	0	1	35	108
04:45 PM	48	1	3	3	1	42	98
Total	218	4	9	6	2	158	397
05:00 PM	24	1	1	0	1	42	69
05:15 PM	43	3	0	0	1	42	89
05:30 PM	31	2	1	1	2	46	83
05:45 PM	27	0	1	0	1	29	58
Total	125	6	3	1	5	159	299
Grand Total	343	10	12	7	7	317	696
Apprch %	97.2	2.8	63.2	36.8	2.2	97.8	
Total %	49.3	1.4	1.7	1	1	45.5	

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	48	**3**	51	**4**	2	**6**	0	36	36	93
04:15 PM	52	0	52	0	1	1	0	**45**	**45**	98
04:30 PM	**70**	0	**70**	2	0	2	**1**	35	36	**108**
04:45 PM	**48**	**1**	**49**	**3**	**3**	6	1	42	43	98
Total Volume	218	4	222	9	6	15	2	158	160	397
% App. Total	98.2	1.8		60	40		1.2	98.8		
PHF	.779	.333	.793	.563	.500	.625	.500	.878	.889	.919

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N/S: South Main Street
E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-FFF
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Main Street From North		Copicut Road From East		South Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	9	1	0	0	0	11	21
04:15 PM	2	0	1	0	0	4	7
04:30 PM	5	0	0	0	0	3	8
04:45 PM	6	0	0	0	0	4	10
Total	22	1	1	0	0	22	46
05:00 PM	9	0	0	0	0	4	13
05:15 PM	9	0	0	0	0	8	17
05:30 PM	2	1	0	0	1	5	9
05:45 PM	10	0	0	0	0	3	13
Total	30	1	0	0	1	20	52
Grand Total	52	2	1	0	1	42	98
Apprch %	96.3	3.7	100	0	2.3	97.7	
Total %	53.1	2	1	0	1	42.9	

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	9	0	9	0	0	0	0	4	4	13
05:15 PM	9	0	9	0	0	0	0	**8**	**8**	**17**
05:30 PM	**2**	**1**	3	0	0	0	**1**	5	6	9
05:45 PM	**10**	0	**10**	0	0	0	0	3	3	13
Total Volume	30	1	31	0	0	0	1	20	21	52
% App. Total	96.8	3.2		0	0		4.8	95.2		
PHF	.750	.250	.775	.000	.000	.000	.250	.625	.656	.765

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N/S: South Main Street
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Client: VHB/J. Quitter

File Name : 81676F-FFF
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	0	0	0	0	1	0	1
Apprch %	0	0	0	0	0	0	0	100	0	
Total %	0	0	0	0	0	0	0	100	0	

	South Main Street From North				Copicut Road From East				South Main Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	**1**
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

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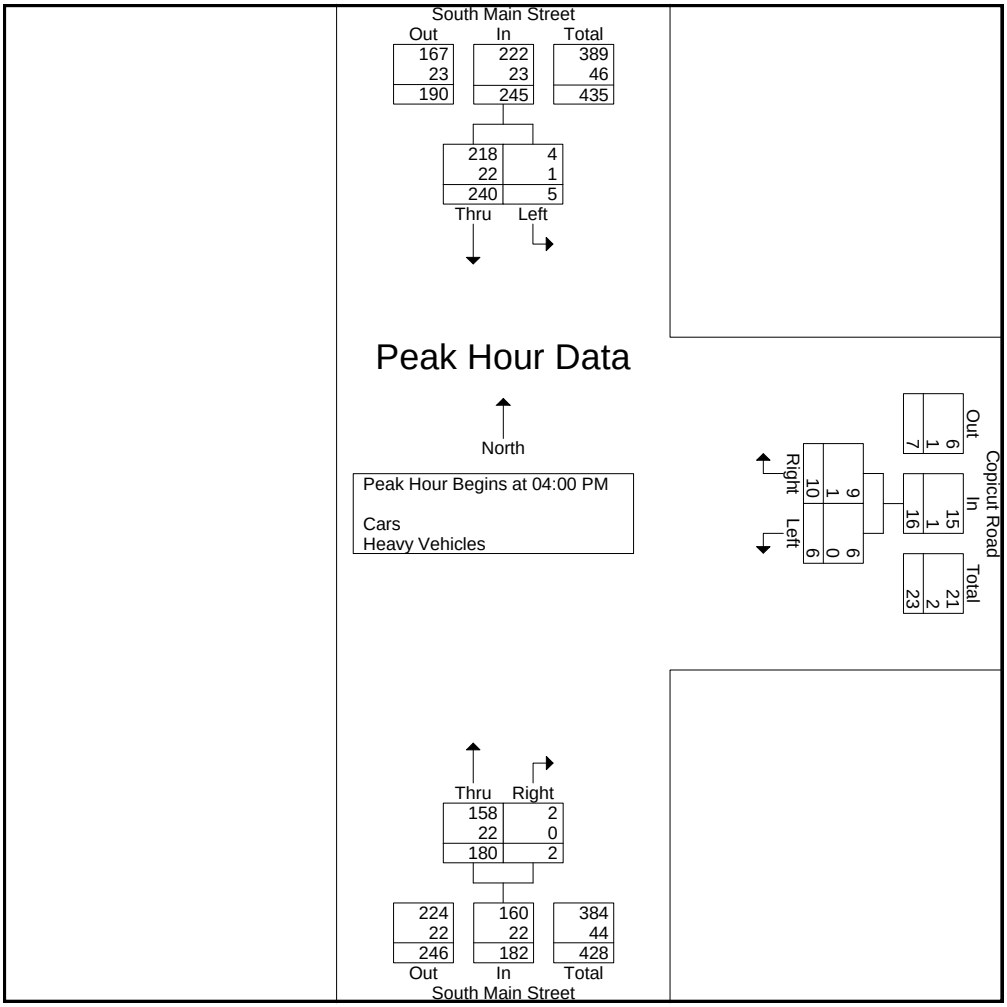
N/S: South Main Street
E: Copicut Road
City, State: Freetown, MA
Client: VHB/J. Quitter

File Name : 81676F-FFF
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	South Main Street From North			Copicut Road From East			South Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	57	**4**	61	**4**	2	**6**	0	47	47	114
04:15 PM	54	0	54	1	1	2	0	**49**	**49**	105
04:30 PM	**75**	0	**75**	2	0	2	**1**	38	39	**116**
04:45 PM	**54**	**1**	**55**	**3**	**3**	6	1	46	47	108
Total Volume	240	5	245	10	6	16	2	180	182	443
% App. Total	98	2		62.5	37.5		1.1	98.9		
PHF	.800	.313	.817	.625	.500	.667	.500	.918	.929	.955
Cars	218	4	222	9	6	15	2	158	160	397
% Cars	90.8	80.0	90.6	90.0	100	93.8	100	87.8	87.9	89.6
Heavy Vehicles	22	1	23	1	0	1	0	22	22	46
% Heavy Vehicles	9.2	20.0	9.4	10.0	0	6.3	0	12.2	12.1	10.4



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Tues 9/30/08 and Sat 10/18/08	81676	New Bedford, MA

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N/S: Purchase Street
E: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-A
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	46	24	15	4	64	27	180
07:15 AM	61	21	9	7	94	34	226
07:30 AM	69	24	12	9	91	35	240
07:45 AM	95	43	8	13	113	35	307
Total	271	112	44	33	362	131	953
08:00 AM	84	25	11	9	98	39	266
08:15 AM	98	31	13	13	104	63	322
08:30 AM	95	27	6	14	86	39	267
08:45 AM	94	39	2	10	81	67	293
Total	371	122	32	46	369	208	1148
Grand Total	642	234	76	79	731	339	2101
Apprch %	73.3	26.7	49	51	68.3	31.7	
Total %	30.6	11.1	3.6	3.8	34.8	16.1	
Cars	613	218	67	74	695	312	1979
% Cars	95.5	93.2	88.2	93.7	95.1	92	94.2
Heavy Vehicles	29	16	9	5	36	27	122
% Heavy Vehicles	4.5	6.8	11.8	6.3	4.9	8	5.8

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	95	**43**	**138**	8	13	21	**113**	35	148	307
08:00 AM	84	25	109	11	9	20	98	39	137	266
08:15 AM	**98**	31	129	**13**	13	**26**	104	**63**	**167**	**322**
08:30 AM	**95**	**27**	**122**	**6**	**14**	20	86	39	125	267
Total Volume	372	126	498	38	49	87	401	176	577	1162
% App. Total	74.7	25.3		43.7	56.3		69.5	30.5		
PHF	.949	.733	.902	.731	.875	.837	.887	.698	.864	.902
Cars	354	116	470	31	45	76	381	164	545	1091
% Cars	95.2	92.1	94.4	81.6	91.8	87.4	95.0	93.2	94.5	93.9
Heavy Vehicles	18	10	28	7	4	11	20	12	32	71
% Heavy Vehicles	4.8	7.9	5.6	18.4	8.2	12.6	5.0	6.8	5.5	6.1

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N/S: Purchase Street
E: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-A
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	42	22	15	4	63	23	169
07:15 AM	56	20	9	7	91	31	214
07:30 AM	68	23	10	9	85	33	228
07:45 AM	92	41	7	13	109	34	296
Total	258	106	41	33	348	121	907
08:00 AM	78	25	8	8	93	34	246
08:15 AM	94	28	11	11	99	60	303
08:30 AM	90	22	5	13	80	36	246
08:45 AM	93	37	2	9	75	61	277
Total	355	112	26	41	347	191	1072
Grand Total	613	218	67	74	695	312	1979
Apprch %	73.8	26.2	47.5	52.5	69	31	
Total %	31	11	3.4	3.7	35.1	15.8	

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	92	**41**	**133**	7	**13**	20	**109**	34	143	296
08:00 AM	78	25	103	8	8	16	93	34	127	246
08:15 AM	**94**	28	122	**11**	11	**22**	99	**60**	**159**	**303**
08:30 AM	**90**	**22**	**112**	**5**	**13**	**18**	**80**	**36**	**116**	**246**
Total Volume	**354**	**116**	**470**	**31**	**45**	**76**	**381**	**164**	**545**	**1091**
% App. Total	**75.3**	**24.7**		**40.8**	**59.2**		**69.9**	**30.1**		
PHF	**.941**	**.707**	**.883**	**.705**	**.865**	**.864**	**.874**	**.683**	**.857**	**.900**

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Client: VHB/J. Quitter

File Name : 81676 C-A
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	4	2	0	0	1	4	11
07:15 AM	5	1	0	0	3	3	12
07:30 AM	1	1	2	0	6	2	12
07:45 AM	3	2	1	0	4	1	11
Total	13	6	3	0	14	10	46
08:00 AM	6	0	3	1	5	5	20
08:15 AM	4	3	2	2	5	3	19
08:30 AM	5	5	1	1	6	3	21
08:45 AM	1	2	0	1	6	6	16
Total	16	10	6	5	22	17	76
Grand Total	29	16	9	5	36	27	122
Apprch %	64.4	35.6	64.3	35.7	57.1	42.9	
Total %	23.8	13.1	7.4	4.1	29.5	22.1	

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**6**	0	6	**3**	1	**4**	5	5	10	20
08:15 AM	4	3	7	2	**2**	4	5	3	8	19
08:30 AM	5	**5**	**10**	1	1	2	**6**	3	9	**21**
08:45 AM	**1**	**2**	**3**	**0**	**1**	**1**	**6**	**6**	**12**	16
Total Volume	16	10	26	6	5	11	22	17	39	76
% App. Total	61.5	38.5		54.5	45.5		56.4	43.6		
PHF	.667	.500	.650	.500	.625	.688	.917	.708	.813	.905

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N/S: Purchase Street
E: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-A
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	1	0	0	0	1
07:15 AM	0	0	1	0	0	0	0	1	0	2
07:30 AM	1	0	0	0	0	0	1	0	0	2
07:45 AM	0	0	0	0	0	2	0	2	0	4
Total	1	0	1	0	0	3	1	3	0	9
08:00 AM	0	0	0	0	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	3	0	0	4	7
08:30 AM	1	0	1	0	0	1	0	0	1	4
08:45 AM	2	0	1	0	0	9	0	0	0	12
Total	3	0	2	0	0	14	0	0	5	24
Grand Total	4	0	3	0	0	17	1	3	5	33
Apprch %	57.1	0	42.9	0	0	100	11.1	33.3	55.6	
Total %	12.1	0	9.1	0	0	51.5	3	9.1	15.2	

	Purchase Street From North				Hillman Street From East				Purchase Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	3	3	0	0	**4**	**4**	7
08:30 AM	1	0	**1**	**2**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**4**
08:45 AM	**2**	0	1	**3**	0	0	**9**	**9**	0	0	0	0	**12**
Total Volume	3	0	2	5	0	0	14	14	0	0	5	5	24
% App. Total	60	0	40		0	0	100		0	0	100		
PHF	.375	.000	.500	.417	.000	.000	.389	.389	.000	.000	.313	.313	.500

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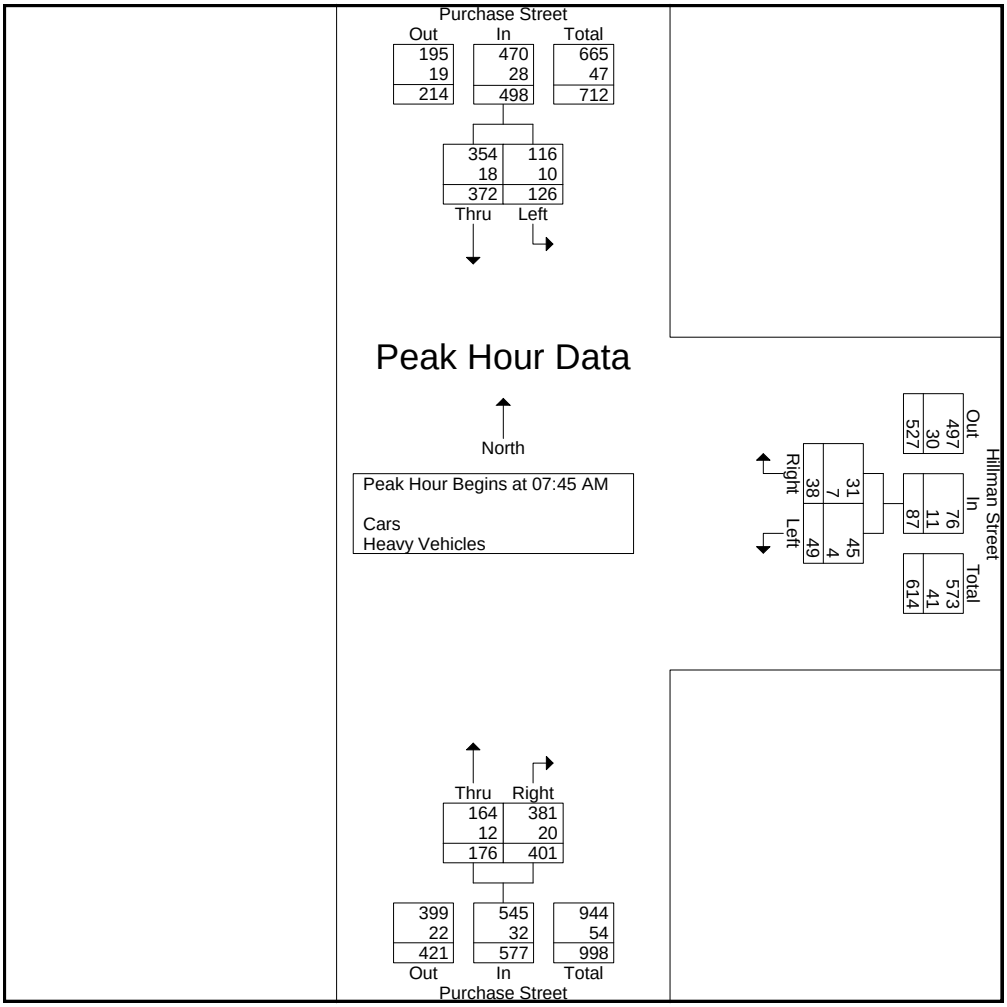
File Name : 81676 C-A
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	95	**43**	**138**	8	13	21	**113**	35	148	307
08:00 AM	84	25	109	11	9	20	98	39	137	266
08:15 AM	**98**	31	129	**13**	13	**26**	104	**63**	**167**	**322**
08:30 AM	**95**	**27**	**122**	**6**	**14**	20	86	39	125	267
Total Volume	372	126	498	38	49	87	401	176	577	1162
% App. Total	74.7	25.3		43.7	56.3		69.5	30.5		
PHF	.949	.733	.902	.731	.875	.837	.887	.698	.864	.902
Cars	354	116	470	31	45	76	381	164	545	1091
% Cars	95.2	92.1	94.4	81.6	91.8	87.4	95.0	93.2	94.5	93.9
Heavy Vehicles	18	10	28	7	4	11	20	12	32	71
% Heavy Vehicles	4.8	7.9	5.6	18.4	8.2	12.6	5.0	6.8	5.5	6.1



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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-AAA
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	114	38	19	22	145	87	425
04:15 PM	69	29	23	15	128	94	358
04:30 PM	75	25	21	36	153	88	398
04:45 PM	78	13	18	21	125	84	339
Total	336	105	81	94	551	353	1520
05:00 PM	67	38	15	21	103	86	330
05:15 PM	62	22	9	17	100	74	284
05:30 PM	86	15	10	8	104	70	293
05:45 PM	70	20	13	14	97	73	287
Total	285	95	47	60	404	303	1194
Grand Total	621	200	128	154	955	656	2714
Apprch %	75.6	24.4	45.4	54.6	59.3	40.7	
Total %	22.9	7.4	4.7	5.7	35.2	24.2	
Cars	601	195	123	147	933	639	2638
% Cars	96.8	97.5	96.1	95.5	97.7	97.4	97.2
Heavy Vehicles	20	5	5	7	22	17	76
% Heavy Vehicles	3.2	2.5	3.9	4.5	2.3	2.6	2.8

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**114**	**38**	**152**	19	22	41	145	87	232	**425**
04:15 PM	**69**	**29**	**98**	**23**	15	38	128	**94**	222	358
04:30 PM	75	25	100	21	**36**	**57**	**153**	88	**241**	398
04:45 PM	78	13	91	18	21	39	125	84	209	339
Total Volume	336	105	441	81	94	175	551	353	904	1520
% App. Total	76.2	23.8		46.3	53.7		61	39		
PHF	.737	.691	.725	.880	.653	.768	.900	.939	.938	.894
Cars	327	102	429	76	91	167	535	344	879	1475
% Cars	97.3	97.1	97.3	93.8	96.8	95.4	97.1	97.5	97.2	97.0
Heavy Vehicles	9	3	12	5	3	8	16	9	25	45
% Heavy Vehicles	2.7	2.9	2.7	6.2	3.2	4.6	2.9	2.5	2.8	3.0

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-AAA
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	109	37	16	21	141	87	411
04:15 PM	68	29	23	14	124	92	350
04:30 PM	73	25	19	35	147	84	383
04:45 PM	77	11	18	21	123	81	331
Total	327	102	76	91	535	344	1475
05:00 PM	65	36	15	19	102	84	321
05:15 PM	61	22	9	17	100	73	282
05:30 PM	80	15	10	7	103	68	283
05:45 PM	68	20	13	13	93	70	277
Total	274	93	47	56	398	295	1163
Grand Total	601	195	123	147	933	639	2638
Apprch %	75.5	24.5	45.6	54.4	59.4	40.6	
Total %	22.8	7.4	4.7	5.6	35.4	24.2	

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**109**	**37**	**146**	16	21	37	141	87	228	**411**
04:15 PM	**68**	**29**	**97**	**23**	14	37	124	**92**	216	350
04:30 PM	73	25	98	19	**35**	**54**	**147**	84	**231**	383
04:45 PM	77	11	88	18	21	39	123	81	204	331
Total Volume	327	102	429	76	91	167	535	344	879	1475
% App. Total	76.2	23.8		45.5	54.5		60.9	39.1		
PHF	.750	.689	.735	.826	.650	.773	.910	.935	.951	.897

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File Name : 81676 C-AAA
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North		Hillman Street From East		Purchase Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	5	1	3	1	4	0	14
04:15 PM	1	0	0	1	4	2	8
04:30 PM	2	0	2	1	6	4	15
04:45 PM	1	2	0	0	2	3	8
Total	9	3	5	3	16	9	45
05:00 PM	2	2	0	2	1	2	9
05:15 PM	1	0	0	0	0	1	2
05:30 PM	6	0	0	1	1	2	10
05:45 PM	2	0	0	1	4	3	10
Total	11	2	0	4	6	8	31
Grand Total	20	5	5	7	22	17	76
Apprch %	80	20	41.7	58.3	56.4	43.6	
Total %	26.3	6.6	6.6	9.2	28.9	22.4	

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**5**	1	**6**	**3**	**1**	**4**	4	0	4	14
04:15 PM	1	0	1	0	1	1	4	2	6	8
04:30 PM	2	0	2	2	1	3	**6**	**4**	**10**	**15**
04:45 PM	**1**	**2**	3	0	0	0	2	3	5	8
Total Volume	9	3	12	5	3	8	16	9	25	45
% App. Total	75	25		62.5	37.5		64	36		
PHF	.450	.375	.500	.417	.750	.500	.667	.563	.625	.750

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Client: VHB/J. Quitter

File Name : 81676 C-AAA
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	1	2
04:15 PM	0	0	0	0	0	4	0	0	0	4
04:30 PM	0	0	0	0	0	3	0	0	1	4
04:45 PM	0	0	0	0	0	2	0	2	0	4
Total	0	0	0	0	0	10	0	2	2	14
05:00 PM	0	0	0	0	0	4	0	0	1	5
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	0	0	4	0	0	0	5
05:45 PM	0	0	0	0	0	2	0	1	1	4
Total	0	0	1	0	0	10	0	1	2	14
Grand Total	0	0	1	0	0	20	0	3	4	28
Apprch %	0	0	100	0	0	100	0	42.9	57.1	
Total %	0	0	3.6	0	0	71.4	0	10.7	14.3	

	Purchase Street From North				Hillman Street From East				Purchase Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	0	0	0	0	0	0	**4**	**4**	0	0	0	0	4
04:30 PM	0	0	0	0	0	0	3	3	0	0	**1**	**1**	**4**
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**2**	**0**	**2**	4
05:00 PM	0	0	0	0	0	0	4	4	0	0	1	1	**5**
Total Volume	0	0	0	0	0	0	13	13	0	2	2	4	17
% App. Total	0	0	0		0	0	100		0	50	50		
PHF	.000	.000	.000	.000	.000	.000	.813	.813	.000	.250	.500	.500	.850

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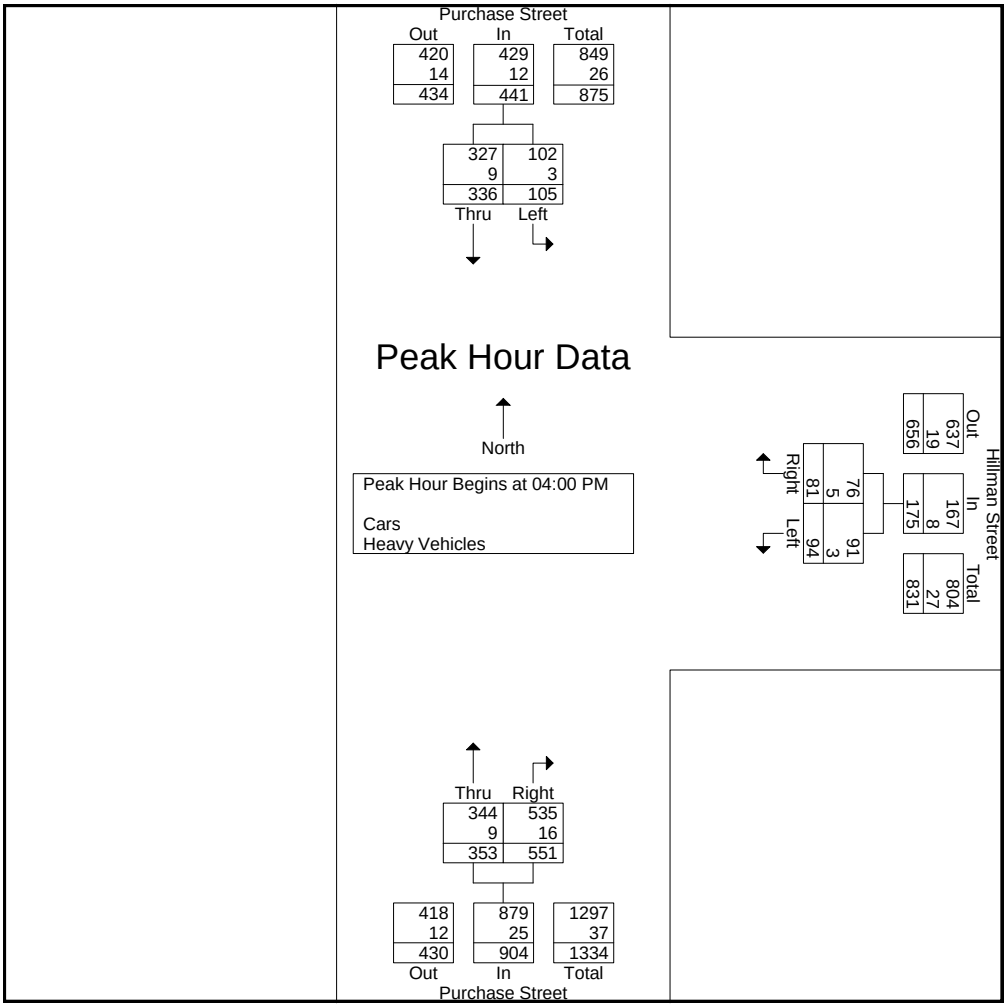
Start Date : 9/30/2008
Page No : 1

	Purchase Street From North			Hillman Street From East			Purchase Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**114**	**38**	**152**	19	22	41	145	87	232	**425**
04:15 PM	**69**	**29**	**98**	**23**	15	38	128	**94**	222	358
04:30 PM	75	25	100	21	**36**	**57**	**153**	88	**241**	398
04:45 PM	78	13	91	18	21	39	125	84	209	339
Total Volume	336	105	441	81	94	175	551	353	904	1520
% App. Total	76.2	23.8		46.3	53.7		61	39		
PHF	.737	.691	.725	.880	.653	.768	.900	.939	.938	.894
Cars	327	102	429	76	91	167	535	344	879	1475
% Cars	97.3	97.1	97.3	93.8	96.8	95.4	97.1	97.5	97.2	97.0
Heavy Vehicles	9	3	12	5	3	8	16	9	25	45
% Heavy Vehicles	2.7	2.9	2.7	6.2	3.2	4.6	2.9	2.5	2.8	3.0



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Client: VHB/J. Quitter

File Name : 81676 C-C
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	2	11	11	19	31	6	80
07:15 AM	7	3	10	22	40	6	88
07:30 AM	4	8	6	22	36	5	81
07:45 AM	6	3	11	30	53	7	110
Total	19	25	38	93	160	24	359
08:00 AM	9	6	12	27	32	8	94
08:15 AM	5	8	9	26	36	19	103
08:30 AM	6	6	12	23	36	13	96
08:45 AM	11	8	13	27	42	15	116
Total	31	28	46	103	146	55	409
Grand Total	50	53	84	196	306	79	768
Apprch %	48.5	51.5	30	70	79.5	20.5	
Total %	6.5	6.9	10.9	25.5	39.8	10.3	
Cars	48	48	74	163	283	78	694
% Cars	96	90.6	88.1	83.2	92.5	98.7	90.4
Heavy Vehicles	2	5	10	33	23	1	74
% Heavy Vehicles	4	9.4	11.9	16.8	7.5	1.3	9.6

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	9	6	15	12	**27**	39	32	8	40	94
08:15 AM	5	**8**	13	9	26	35	36	**19**	55	103
08:30 AM	6	6	12	12	23	35	36	13	49	96
08:45 AM	**11**	8	**19**	**13**	27	**40**	**42**	15	**57**	**116**
Total Volume	**31**	**28**	**59**	**46**	**103**	**149**	**146**	**55**	**201**	**409**
% App. Total	**52.5**	**47.5**		**30.9**	**69.1**		**72.6**	**27.4**		
PHF	**.705**	**.875**	**.776**	**.885**	**.954**	**.931**	**.869**	**.724**	**.882**	**.881**
Cars	**30**	**24**	**54**	**37**	**83**	**120**	**132**	**54**	**186**	**360**
% Cars	**96.8**	**85.7**	**91.5**	**80.4**	**80.6**	**80.5**	**90.4**	**98.2**	**92.5**	**88.0**
Heavy Vehicles	**1**	**4**	**5**	**9**	**20**	**29**	**14**	**1**	**15**	**49**
% Heavy Vehicles	**3.2**	**14.3**	**8.5**	**19.6**	**19.4**	**19.5**	**9.6**	**1.8**	**7.5**	**12.0**

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Client: VHB/J. Quitter

File Name : 81676 C-C
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	2	10	11	18	29	6	76
07:15 AM	7	3	10	20	38	6	84
07:30 AM	3	8	6	17	33	5	72
07:45 AM	6	3	10	25	51	7	102
Total	18	24	37	80	151	24	334
08:00 AM	9	4	12	19	30	8	82
08:15 AM	5	7	6	24	34	18	94
08:30 AM	5	6	10	18	32	13	84
08:45 AM	11	7	9	22	36	15	100
Total	30	24	37	83	132	54	360
Grand Total	48	48	74	163	283	78	694
Apprch %	50	50	31.2	68.8	78.4	21.6	
Total %	6.9	6.9	10.7	23.5	40.8	11.2	

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	6	3	9	10	**25**	**35**	**51**	7	**58**	**102**
08:00 AM	**9**	4	**13**	**12**	19	31	30	8	38	82
08:15 AM	5	**7**	12	6	24	30	34	**18**	52	94
08:30 AM	5	6	11	10	18	28	32	13	45	84
Total Volume	25	20	45	38	86	124	147	46	193	362
% App. Total	55.6	44.4		30.6	69.4		76.2	23.8		
PHF	.694	.714	.865	.792	.860	.886	.721	.639	.832	.887

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N/S: Acushnet Avenue/McArthur Drive
W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-C
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	1	0	1	2	0	4
07:15 AM	0	0	0	2	2	0	4
07:30 AM	1	0	0	5	3	0	9
07:45 AM	0	0	1	5	2	0	8
Total	1	1	1	13	9	0	25
08:00 AM	0	2	0	8	2	0	12
08:15 AM	0	1	3	2	2	1	9
08:30 AM	1	0	2	5	4	0	12
08:45 AM	0	1	4	5	6	0	16
Total	1	4	9	20	14	1	49
Grand Total	2	5	10	33	23	1	74
Apprch %	28.6	71.4	23.3	76.7	95.8	4.2	
Total %	2.7	6.8	13.5	44.6	31.1	1.4	

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	**2**	**2**	0	**8**	8	2	0	2	12
08:15 AM	0	1	1	3	2	5	2	**1**	3	9
08:30 AM	**1**	0	1	2	5	7	4	0	4	12
08:45 AM	0	1	1	**4**	5	**9**	**6**	0	**6**	**16**
Total Volume	**1**	**4**	**5**	**9**	**20**	**29**	**14**	**1**	**15**	**49**
% App. Total	**20**	**80**		**31**	**69**		**93.3**	**6.7**		
PHF	**.250**	**.500**	**.625**	**.563**	**.625**	**.806**	**.583**	**.250**	**.625**	**.766**

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N/S: Acushnet Avenue/McArthur Drive
W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-C
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	1	1	0	0	0	0	0	0	2
07:15 AM	0	1	0	1	0	0	1	1	0	4
07:30 AM	1	0	0	0	1	0	0	1	0	3
07:45 AM	0	1	0	0	0	0	0	0	0	1
Total	1	3	1	1	1	0	1	2	0	10
08:00 AM	0	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1
Grand Total	1	3	1	1	1	0	1	2	1	11
Apprch %	20	60	20	50	50	0	25	50	25	
Total %	9.1	27.3	9.1	9.1	9.1	0	9.1	18.2	9.1	

	Acushnet Avenue From North				McArthur Drive From South				Hillman Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	**1**	**1**	**2**	0	0	0	0	0	0	0	0	2
07:15 AM	0	1	0	1	**1**	0	0	**1**	**1**	**1**	**0**	**2**	**4**
07:30 AM	**1**	0	0	1	0	**1**	0	1	0	1	0	1	3
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	3	1	5	1	1	0	2	1	2	0	3	10
% App. Total	20	60	20		50	50	0		33.3	66.7	0		
PHF	.250	.750	.250	.625	.250	.250	.000	.500	.250	.500	.000	.375	.625

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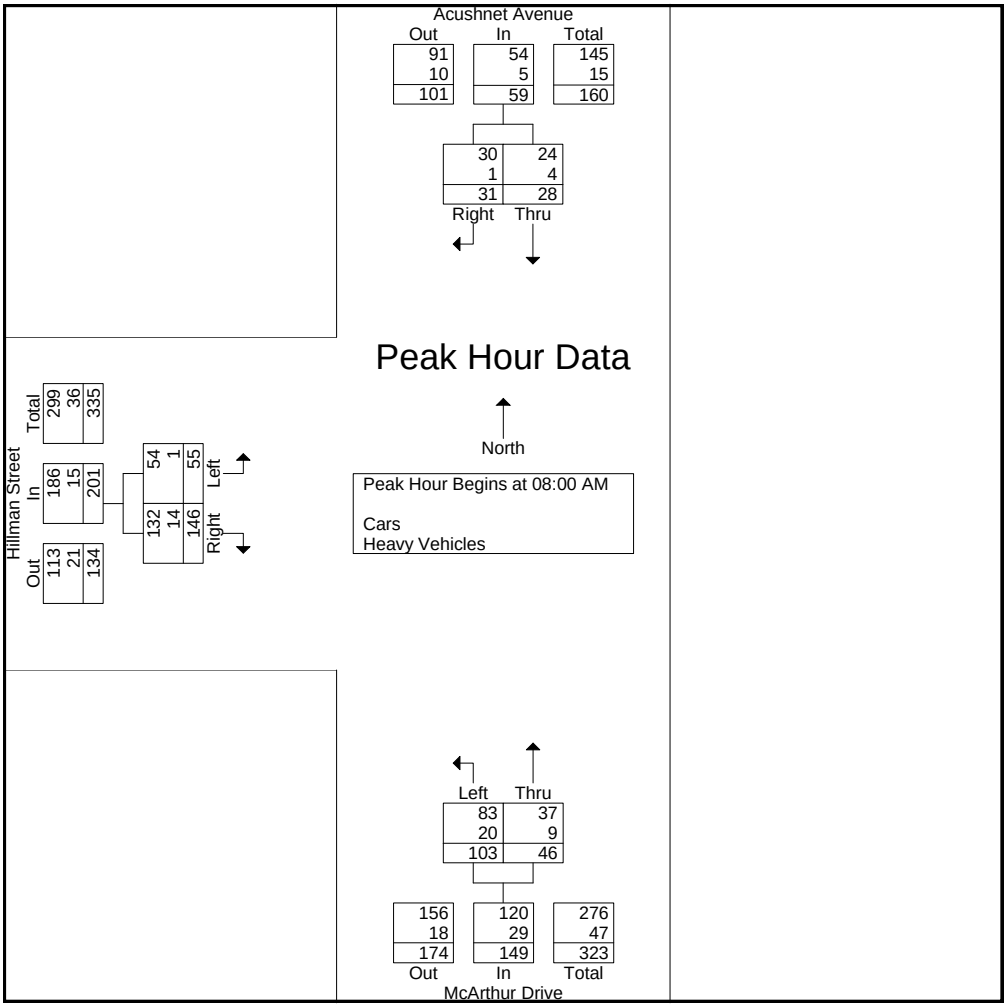
W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-C
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	9	6	15	12	**27**	39	32	8	40	94
08:15 AM	5	**8**	13	9	26	35	36	**19**	55	103
08:30 AM	6	6	12	12	23	35	36	13	49	96
08:45 AM	**11**	8	**19**	**13**	27	**40**	**42**	15	**57**	**116**
Total Volume	**31**	**28**	**59**	**46**	**103**	**149**	**146**	**55**	**201**	**409**
% App. Total	**52.5**	**47.5**		**30.9**	**69.1**		**72.6**	**27.4**		
PHF	**.705**	**.875**	**.776**	**.885**	**.954**	**.931**	**.869**	**.724**	**.882**	**.881**
Cars	**30**	**24**	**54**	**37**	**83**	**120**	**132**	**54**	**186**	**360**
% Cars	**96.8**	**85.7**	**91.5**	**80.4**	**80.6**	**80.5**	**90.4**	**98.2**	**92.5**	**88.0**
Heavy Vehicles	**1**	**4**	**5**	**9**	**20**	**29**	**14**	**1**	**15**	**49**
% Heavy Vehicles	**3.2**	**14.3**	**8.5**	**19.6**	**19.4**	**19.5**	**9.6**	**1.8**	**7.5**	**12.0**



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W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-CCC
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	16	17	7	51	44	12	147
04:15 PM	12	14	7	40	25	7	105
04:30 PM	20	16	9	50	42	14	151
04:45 PM	8	8	8	33	32	10	99
Total	56	55	31	174	143	43	502
05:00 PM	7	8	10	60	21	11	117
05:15 PM	10	1	7	26	19	2	65
05:30 PM	9	10	9	15	31	6	80
05:45 PM	9	8	6	26	18	2	69
Total	35	27	32	127	89	21	331
Grand Total	91	82	63	301	232	64	833
Apprch %	52.6	47.4	17.3	82.7	78.4	21.6	
Total %	10.9	9.8	7.6	36.1	27.9	7.7	
Cars	89	81	58	289	224	64	805
% Cars	97.8	98.8	92.1	96	96.6	100	96.6
Heavy Vehicles	2	1	5	12	8	0	28
% Heavy Vehicles	2.2	1.2	7.9	4	3.4	0	3.4

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	16	**17**	33	7	**51**	58	**44**	12	**56**	147
04:15 PM	12	14	26	7	40	47	25	7	32	105
04:30 PM	**20**	16	**36**	**9**	50	**59**	42	**14**	56	**151**
04:45 PM	**8**	**8**	**16**	**8**	**33**	**41**	**32**	**10**	**42**	**99**
Total Volume	**56**	**55**	**111**	**31**	**174**	**205**	**143**	**43**	**186**	**502**
% App. Total	**50.5**	**49.5**		**15.1**	**84.9**		**76.9**	**23.1**		
PHF	**.700**	**.809**	**.771**	**.861**	**.853**	**.869**	**.813**	**.768**	**.830**	**.831**
Cars	**54**	**54**	**108**	**27**	**166**	**193**	**135**	**43**	**178**	**479**
% Cars	**96.4**	**98.2**	**97.3**	**87.1**	**95.4**	**94.1**	**94.4**	**100**	**95.7**	**95.4**
Heavy Vehicles	**2**	**1**	**3**	**4**	**8**	**12**	**8**	**0**	**8**	**23**
% Heavy Vehicles	**3.6**	**1.8**	**2.7**	**12.9**	**4.6**	**5.9**	**5.6**	**0**	**4.3**	**4.6**

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W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-CCC
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	14	17	7	46	41	12	137
04:15 PM	12	14	5	39	23	7	100
04:30 PM	20	15	7	50	40	14	146
04:45 PM	8	8	8	31	31	10	96
Total	54	54	27	166	135	43	479
05:00 PM	7	8	10	57	21	11	114
05:15 PM	10	1	6	26	19	2	64
05:30 PM	9	10	9	14	31	6	79
05:45 PM	9	8	6	26	18	2	69
Total	35	27	31	123	89	21	326
Grand Total	89	81	58	289	224	64	805
Apprch %	52.4	47.6	16.7	83.3	77.8	22.2	
Total %	11.1	10.1	7.2	35.9	27.8	8	

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	14	**17**	31	7	46	53	**41**	12	53	137
04:15 PM	12	14	26	5	39	44	23	7	30	100
04:30 PM	**20**	15	**35**	7	**50**	**57**	40	**14**	**54**	**146**
04:45 PM	**8**	**8**	**16**	**8**	31	39	31	10	41	96
Total Volume	54	54	108	27	166	193	135	43	178	479
% App. Total	50	50		14	86		75.8	24.2		
PHF	.675	.794	.771	.844	.830	.846	.823	.768	.824	.820

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W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-CCC
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North		McArthur Drive From South		Hillman Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	2	0	0	5	3	0	10
04:15 PM	0	0	2	1	2	0	5
04:30 PM	0	1	2	0	2	0	5
04:45 PM	0	0	0	2	1	0	3
Total	2	1	4	8	8	0	23
05:00 PM	0	0	0	3	0	0	3
05:15 PM	0	0	1	0	0	0	1
05:30 PM	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0
Total	0	0	1	4	0	0	5
Grand Total	2	1	5	12	8	0	28
Apprch %	66.7	33.3	29.4	70.6	100	0	
Total %	7.1	3.6	17.9	42.9	28.6	0	

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**2**	0	**2**	0	**5**	**5**	**3**	0	**3**	**10**
04:15 PM	**0**	**0**	**0**	**2**	1	3	2	0	2	5
04:30 PM	0	**1**	1	2	0	2	2	0	2	5
04:45 PM	0	0	0	0	2	2	1	0	1	3
Total Volume	2	1	3	4	8	12	8	0	8	23
% App. Total	66.7	33.3		33.3	66.7		100	0		
PHF	.250	.250	.375	.500	.400	.600	.667	.000	.667	.575

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W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-CCC
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	0	0	0	1	0	0	0	0	1
04:15 PM	1	0	0	4	0	0	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	4	1	0	0	0	0	6
05:00 PM	0	0	0	3	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	0	0	0	0	3
Grand Total	1	0	0	7	1	0	0	0	0	9
Apprch %	100	0	0	87.5	12.5	0	0	0	0	
Total %	11.1	0	0	77.8	11.1	0	0	0	0	

	Acushnet Avenue From North				McArthur Drive From South				Hillman Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	**1**	0	0	**1**	**4**	0	0	**4**	0	0	0	0	**5**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total Volume	1	0	0	1	7	0	0	7	0	0	0	0	8
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.250	.000	.000	.250	.438	.000	.000	.438	.000	.000	.000	.000	.400

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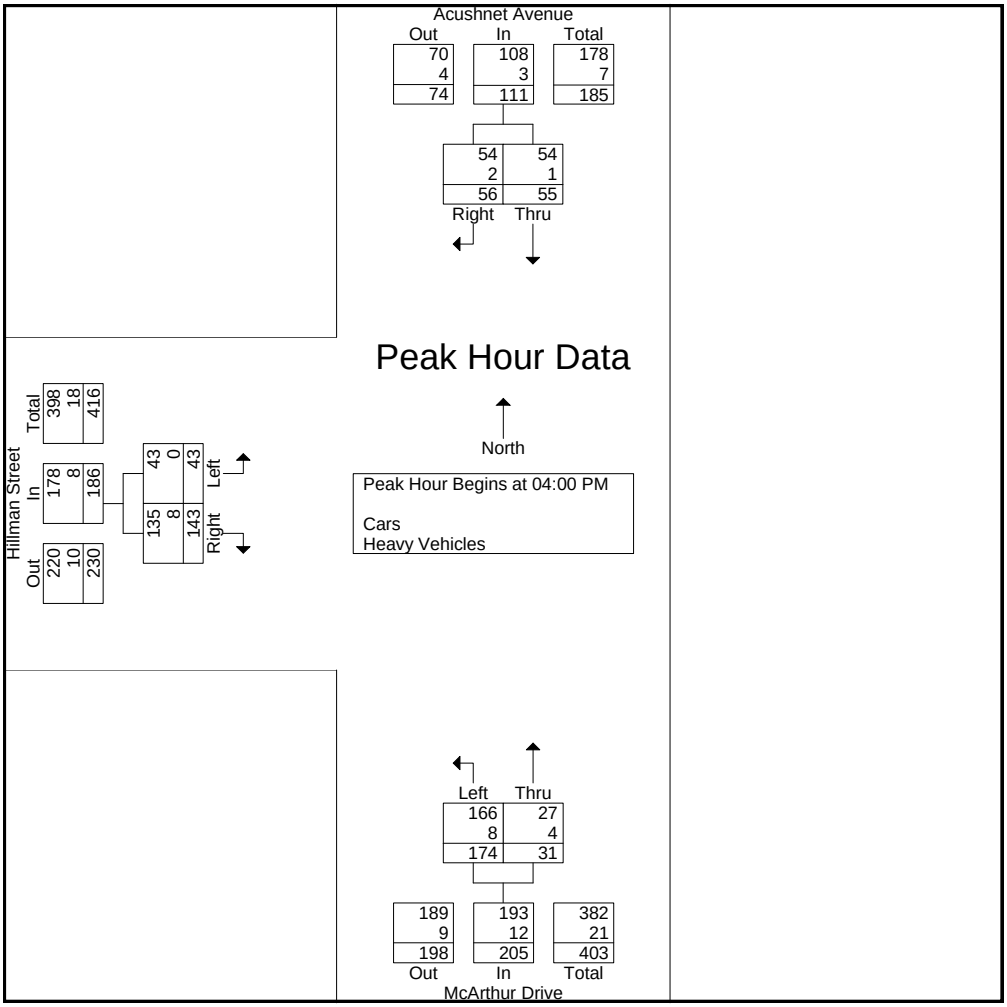
W: Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-CCC
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	Acushnet Avenue From North			McArthur Drive From South			Hillman Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	16	**17**	33	7	**51**	58	**44**	12	**56**	147
04:15 PM	12	14	26	7	40	47	25	7	32	105
04:30 PM	**20**	16	**36**	**9**	50	**59**	42	**14**	56	**151**
04:45 PM	**8**	**8**	**16**	**8**	**33**	**41**	**32**	**10**	**42**	**99**
Total Volume	**56**	**55**	**111**	**31**	**174**	**205**	**143**	**43**	**186**	**502**
% App. Total	**50.5**	**49.5**		**15.1**	**84.9**		**76.9**	**23.1**		
PHF	**.700**	**.809**	**.771**	**.861**	**.853**	**.869**	**.813**	**.768**	**.830**	**.831**
Cars	**54**	**54**	**108**	**27**	**166**	**193**	**135**	**43**	**178**	**479**
% Cars	**96.4**	**98.2**	**97.3**	**87.1**	**95.4**	**94.1**	**94.4**	**100**	**95.7**	**95.4**
Heavy Vehicles	**2**	**1**	**3**	**4**	**8**	**12**	**8**	**0**	**8**	**23**
% Heavy Vehicles	**3.6**	**1.8**	**2.7**	**12.9**	**4.6**	**5.9**	**5.6**	**0**	**4.3**	**4.6**



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N/S: McArthur Drive
E/W: Herman Melville Blvd/West Terminal
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-D
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	25	11	6	0	21	22	23	0	0	0	0	108
07:15 AM	0	33	14	4	0	43	16	27	1	0	0	0	138
07:30 AM	0	28	12	6	0	29	25	22	1	0	0	0	123
07:45 AM	2	31	26	12	0	27	21	31	2	1	0	1	154
Total	2	117	63	28	0	120	84	103	4	1	0	1	523
08:00 AM	0	27	11	10	0	26	24	31	0	0	0	0	129
08:15 AM	0	34	14	7	2	24	25	30	0	1	0	1	138
08:30 AM	0	38	7	4	0	35	25	29	0	0	0	0	138
08:45 AM	0	41	13	8	1	29	29	33	1	0	0	0	155
Total	0	140	45	29	3	114	103	123	1	1	0	1	560
Grand Total	2	257	108	57	3	234	187	226	5	2	0	2	1083
Apprch %	0.5	70	29.4	19.4	1	79.6	44.7	54.1	1.2	50	0	50	
Total %	0.2	23.7	10	5.3	0.3	21.6	17.3	20.9	0.5	0.2	0	0.2	
Cars	1	230	96	48	2	193	154	191	5	2	0	2	924
% Cars	50	89.5	88.9	84.2	66.7	82.5	82.4	84.5	100	100	0	100	85.3
Heavy Vehicles	1	27	12	9	1	41	33	35	0	0	0	0	159
% Heavy Vehicles	50	10.5	11.1	15.8	33.3	17.5	17.6	15.5	0	0	0	0	14.7

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	27	11	38	**10**	0	26	36	24	31	0	55	0	0	0	0	129
08:15 AM	0	34	**14**	48	7	**2**	24	33	25	30	0	55	**1**	0	**1**	**2**	138
08:30 AM	0	38	7	45	4	0	**35**	**39**	25	29	0	54	0	0	0	0	138
08:45 AM	0	**41**	13	**54**	8	1	29	38	**29**	**33**	**1**	**63**	0	0	0	0	**155**
Total Volume	0	140	45	185	29	3	114	146	103	123	1	227	1	0	1	2	560
% App. Total	0	75.7	24.3		19.9	2.1	78.1		45.4	54.2	0.4		50	0	50		
PHF	.000	.854	.804	.856	.725	.375	.814	.936	.888	.932	.250	.901	.250	.000	.250	.250	.903
Cars	0	120	39	159	25	2	93	120	87	97	1	185	1	0	1	2	466
% Cars	0	85.7	86.7	85.9	86.2	66.7	81.6	82.2	84.5	78.9	100	81.5	100	0	100	100	83.2
Heavy Vehicles	0	20	6	26	4	1	21	26	16	26	0	42	0	0	0	0	94
% Heavy Vehicles	0	14.3	13.3	14.1	13.8	33.3	18.4	17.8	15.5	21.1	0	18.5	0	0	0	0	16.8

PRECISION
D A T A
INDUSTRIES, LLC
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N/S: McArthur Drive
E/W: Herman Melville Blvd/West Terminal
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-D
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	22	10	5	0	20	20	23	0	0	0	0	100
07:15 AM	0	31	13	3	0	35	9	25	1	0	0	0	117
07:30 AM	0	26	10	6	0	22	21	17	1	0	0	0	103
07:45 AM	1	31	24	9	0	23	17	29	2	1	0	1	138
Total	1	110	57	23	0	100	67	94	4	1	0	1	458
08:00 AM	0	23	10	8	0	25	18	24	0	0	0	0	108
08:15 AM	0	28	14	6	2	22	21	25	0	1	0	1	120
08:30 AM	0	35	4	4	0	25	21	21	0	0	0	0	110
08:45 AM	0	34	11	7	0	21	27	27	1	0	0	0	128
Total	0	120	39	25	2	93	87	97	1	1	0	1	466
Grand Total	1	230	96	48	2	193	154	191	5	2	0	2	924
Apprch %	0.3	70.3	29.4	19.8	0.8	79.4	44	54.6	1.4	50	0	50	
Total %	0.1	24.9	10.4	5.2	0.2	20.9	16.7	20.7	0.5	0.2	0	0.2	

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**1**	31	**24**	**56**	**9**	0	23	32	17	**29**	**2**	**48**	**1**	0	**1**	**2**	**138**
08:00 AM	0	23	10	33	8	0	**25**	**33**	18	24	0	42	0	0	0	0	108
08:15 AM	0	28	14	42	6	**2**	22	30	**21**	25	0	46	1	0	1	2	120
08:30 AM	0	**35**	4	39	4	0	25	29	21	21	0	42	0	0	0	0	110
Total Volume	1	117	52	170	27	2	95	124	77	99	2	178	2	0	2	4	476
% App. Total	0.6	68.8	30.6		21.8	1.6	76.6		43.3	55.6	1.1		50	0	50		
PHF	.250	.836	.542	.759	.750	.250	.950	.939	.917	.853	.250	.927	.500	.000	.500	.500	.862

PRECISION
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N/S: McArthur Drive
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-D
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Heavy Vehicles

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	3	1	1	0	1	2	0	0	0	0	0	8
07:15 AM	0	2	1	1	0	8	7	2	0	0	0	0	21
07:30 AM	0	2	2	0	0	7	4	5	0	0	0	0	20
07:45 AM	1	0	2	3	0	4	4	2	0	0	0	0	16
Total	1	7	6	5	0	20	17	9	0	0	0	0	65
08:00 AM	0	4	1	2	0	1	6	7	0	0	0	0	21
08:15 AM	0	6	0	1	0	2	4	5	0	0	0	0	18
08:30 AM	0	3	3	0	0	10	4	8	0	0	0	0	28
08:45 AM	0	7	2	1	1	8	2	6	0	0	0	0	27
Total	0	20	6	4	1	21	16	26	0	0	0	0	94
Grand Total	1	27	12	9	1	41	33	35	0	0	0	0	159
Apprch %	2.5	67.5	30	17.6	2	80.4	48.5	51.5	0	0	0	0	
Total %	0.6	17	7.5	5.7	0.6	25.8	20.8	22	0	0	0	0	

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	4	1	5	**2**	0	1	3	**6**	7	0	**13**	0	0	0	0	21
08:15 AM	0	6	0	6	1	0	2	3	4	5	0	9	0	0	0	0	18
08:30 AM	0	3	**3**	6	0	0	**10**	**10**	4	**8**	0	12	0	0	0	0	**28**
08:45 AM	0	**7**	2	**9**	1	**1**	8	10	2	6	0	8	0	0	0	0	27
Total Volume	0	20	6	26	4	1	21	26	16	26	0	42	0	0	0	0	94
% App. Total	0	76.9	23.1		15.4	3.8	80.8		38.1	61.9	0		0	0	0		
PHF	.000	.714	.500	.722	.500	.250	.525	.650	.667	.813	.000	.808	.000	.000	.000	.000	.839

PRECISION
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Client: VHB/J. Quitter

File Name : 81676 C-D
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	2	0	0	0	0	0	9	0	0	0	0	0	0	0	0	11
07:45 AM	0	2	0	0	0	0	0	2	0	0	0	1	0	0	0	2	7
Total	0	5	0	0	0	0	0	11	0	0	0	1	0	0	0	2	19
08:00 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	5	11
Grand Total	0	6	0	0	0	0	0	16	0	0	0	1	0	0	0	7	30
Apprch %	0	100	0	0	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	20	0	0	0	0	0	53.3	0	0	0	3.3	0	0	0	23.3	

	McArthur Drive From North					Herman Melville Boulevard From East					McArthur Drive From South					West Terminal Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	**2**	0	0	**2**	0	0	0	**9**	**9**	0	0	0	0	0	0	0	0	0	0	**11**
07:45 AM	0	2	0	0	2	0	0	0	2	2	0	0	0	**1**	**1**	0	0	0	**2**	**2**	7
08:00 AM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	5
Total Volume	0	5	0	0	5	0	0	0	16	16	0	0	0	1	1	0	0	0	2	2	24
% App. Total	0	100	0	0		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.625	.000	.000	.625	.000	.000	.000	.444	.444	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.545

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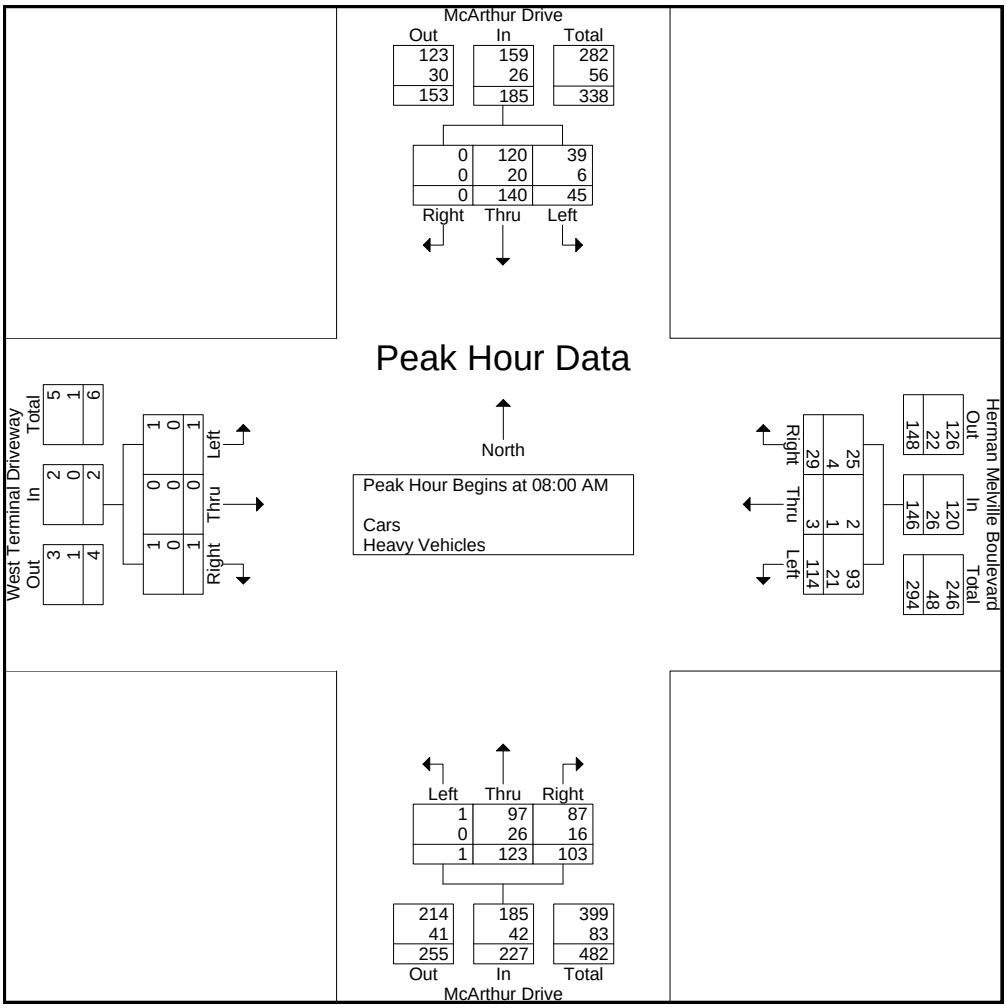
File Name : 81676 C-D
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	27	11	38	**10**	0	26	36	24	31	0	55	0	0	0	0	129
08:15 AM	0	34	**14**	48	7	**2**	24	33	25	30	0	55	**1**	0	**1**	**2**	138
08:30 AM	0	38	7	45	4	0	**35**	**39**	25	29	0	54	0	0	0	0	138
08:45 AM	0	**41**	13	**54**	8	1	29	38	**29**	**33**	**1**	**63**	0	0	0	0	**155**
Total Volume	0	140	45	185	29	3	114	146	103	123	1	227	1	0	1	2	560
% App. Total	0	75.7	24.3		19.9	2.1	78.1		45.4	54.2	0.4		50	0	50		
PHF	.000	.854	.804	.856	.725	.375	.814	.936	.888	.932	.250	.901	.250	.000	.250	.250	.903
Cars	0	120	39	159	25	2	93	120	87	97	1	185	1	0	1	2	466
% Cars	0	85.7	86.7	85.9	86.2	66.7	81.6	82.2	84.5	78.9	100	81.5	100	0	100	100	83.2
Heavy Vehicles	0	20	6	26	4	1	21	26	16	26	0	42	0	0	0	0	94
% Heavy Vehicles	0	14.3	13.3	14.1	13.8	33.3	18.4	17.8	15.5	21.1	0	18.5	0	0	0	0	16.8



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N/S: McArthur Drive
E/W: Herman Melville Blvd/West Terminal
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-DDD
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	54	12	15	0	30	18	41	0	0	0	0	170
04:15 PM	0	33	10	17	0	33	26	34	0	2	0	1	156
04:30 PM	0	41	4	21	0	44	19	36	0	1	0	1	167
04:45 PM	0	37	3	10	0	28	28	34	0	0	0	0	140
Total	0	165	29	63	0	135	91	145	0	3	0	2	633
05:00 PM	0	27	3	20	0	39	25	46	0	0	0	0	160
05:15 PM	0	25	3	6	0	26	19	26	0	0	0	0	105
05:30 PM	0	35	8	9	0	22	17	27	0	0	0	0	118
05:45 PM	0	15	1	8	0	22	12	10	0	0	0	0	68
Total	0	102	15	43	0	109	73	109	0	0	0	0	451
Grand Total	0	267	44	106	0	244	164	254	0	3	0	2	1084
Apprch %	0	85.9	14.1	30.3	0	69.7	39.2	60.8	0	60	0	40	
Total %	0	24.6	4.1	9.8	0	22.5	15.1	23.4	0	0.3	0	0.2	
Cars	0	261	41	98	0	237	162	247	0	2	0	2	1050
% Cars	0	97.8	93.2	92.5	0	97.1	98.8	97.2	0	66.7	0	100	96.9
Heavy Vehicles	0	6	3	8	0	7	2	7	0	1	0	0	34
% Heavy Vehicles	0	2.2	6.8	7.5	0	2.9	1.2	2.8	0	33.3	0	0	3.1

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**54**	**12**	**66**	15	0	30	45	18	**41**	0	59	0	0	0	0	**170**
04:15 PM	0	33	10	43	17	0	33	50	26	34	0	60	**2**	0	**1**	**3**	156
04:30 PM	0	41	4	45	**21**	0	**44**	**65**	19	36	0	55	1	0	1	2	167
04:45 PM	0	37	3	40	10	0	28	38	**28**	34	0	**62**	0	0	0	0	140
Total Volume	0	165	29	194	63	0	135	198	91	145	0	236	3	0	2	5	633
% App. Total	0	85.1	14.9		31.8	0	68.2		38.6	61.4	0		60	0	40		
PHF	.000	.764	.604	.735	.750	.000	.767	.762	.813	.884	.000	.952	.375	.000	.500	.417	.931
Cars	0	159	26	185	57	0	130	187	90	139	0	229	2	0	2	4	605
% Cars	0	96.4	89.7	95.4	90.5	0	96.3	94.4	98.9	95.9	0	97.0	66.7	0	100	80.0	95.6
Heavy Vehicles	0	6	3	9	6	0	5	11	1	6	0	7	1	0	0	1	28
% Heavy Vehicles	0	3.6	10.3	4.6	9.5	0	3.7	5.6	1.1	4.1	0	3.0	33.3	0	0	20.0	4.4

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File Name : 81676 C-DDD
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	53	10	12	0	28	18	39	0	0	0	0	160
04:15 PM	0	31	10	16	0	32	26	33	0	1	0	1	150
04:30 PM	0	39	3	20	0	42	19	35	0	1	0	1	160
04:45 PM	0	36	3	9	0	28	27	32	0	0	0	0	135
Total	0	159	26	57	0	130	90	139	0	2	0	2	605
05:00 PM	0	27	3	19	0	38	24	46	0	0	0	0	157
05:15 PM	0	25	3	6	0	26	19	25	0	0	0	0	104
05:30 PM	0	35	8	8	0	22	17	27	0	0	0	0	117
05:45 PM	0	15	1	8	0	21	12	10	0	0	0	0	67
Total	0	102	15	41	0	107	72	108	0	0	0	0	445
Grand Total	0	261	41	98	0	237	162	247	0	2	0	2	1050
Apprch %	0	86.4	13.6	29.3	0	70.7	39.6	60.4	0	50	0	50	
Total %	0	24.9	3.9	9.3	0	22.6	15.4	23.5	0	0.2	0	0.2	

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**53**	**10**	**63**	12	0	28	40	18	**39**	0	57	0	0	0	0	**160**
04:15 PM	0	31	10	41	16	0	32	48	26	33	0	**59**	**1**	0	**1**	**2**	150
04:30 PM	0	39	3	42	**20**	0	**42**	**62**	19	35	0	54	1	0	1	2	160
04:45 PM	0	36	3	39	9	0	28	37	**27**	32	0	59	0	0	0	0	135
Total Volume	0	159	26	185	57	0	130	187	90	139	0	229	2	0	2	4	605
% App. Total	0	85.9	14.1		30.5	0	69.5		39.3	60.7	0		50	0	50		
PHF	.000	.750	.650	.734	.713	.000	.774	.754	.833	.891	.000	.970	.500	.000	.500	.500	.945

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Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	McArthur Drive From North			Herman Melville Boulevard From East			McArthur Drive From South			West Terminal Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	2	3	0	2	0	2	0	0	0	0	10
04:15 PM	0	2	0	1	0	1	0	1	0	1	0	0	6
04:30 PM	0	2	1	1	0	2	0	1	0	0	0	0	7
04:45 PM	0	1	0	1	0	0	1	2	0	0	0	0	5
Total	0	6	3	6	0	5	1	6	0	1	0	0	28
05:00 PM	0	0	0	1	0	1	1	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	2	0	2	1	1	0	0	0	0	6
Grand Total	0	6	3	8	0	7	2	7	0	1	0	0	34
Apprch %	0	66.7	33.3	53.3	0	46.7	22.2	77.8	0	100	0	0	
Total %	0	17.6	8.8	23.5	0	20.6	5.9	20.6	0	2.9	0	0	

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	**2**	**3**	**3**	0	**2**	**5**	0	**2**	0	2	0	0	0	0	**10**
04:15 PM	0	**2**	0	2	1	0	1	2	0	1	0	1	**1**	0	0	**1**	6
04:30 PM	0	2	1	3	1	0	2	3	0	1	0	1	0	0	0	0	7
04:45 PM	0	1	0	1	1	0	0	1	**1**	2	0	**3**	0	0	0	0	5
Total Volume	0	6	3	9	6	0	5	11	1	6	0	7	1	0	0	1	28
% App. Total	0	66.7	33.3		54.5	0	45.5		14.3	85.7	0		100	0	0		
PHF	.000	.750	.375	.750	.500	.000	.625	.550	.250	.750	.000	.583	.250	.000	.000	.250	.700

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: McArthur Drive
E/W: Herman Melville Blvd/West Terminal
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-DDD
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	4	14
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	4
Total	0	2	0	2	0	0	2	2	5	5	0	0	0	0	0	4	22
05:00 PM	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	2	7
05:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	0	0	0	3	2	3	0	0	0	0	0	2	11
Grand Total	0	2	0	3	0	0	2	5	7	8	0	0	0	0	0	6	33
Apprch %	0	40	0	60	0	0	28.6	71.4	46.7	53.3	0	0	0	0	0	100	
Total %	0	6.1	0	9.1	0	0	6.1	15.2	21.2	24.2	0	0	0	0	0	18.2	

	McArthur Drive From North					Herman Melville Boulevard From East					McArthur Drive From South					West Terminal Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	**5**	**5**	**0**	**0**	**10**	0	0	0	**4**	**4**	**14**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	**2**	**2**	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	2	3	0	0	5	0	0	0	2	2	7
Total Volume	0	0	0	2	2	0	0	0	2	2	7	8	0	0	15	0	0	0	6	6	25
% App. Total	0	0	0	100		0	0	0	100		46.7	53.3	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.350	.400	.000	.000	.375	.000	.000	.000	.375	.375	.446

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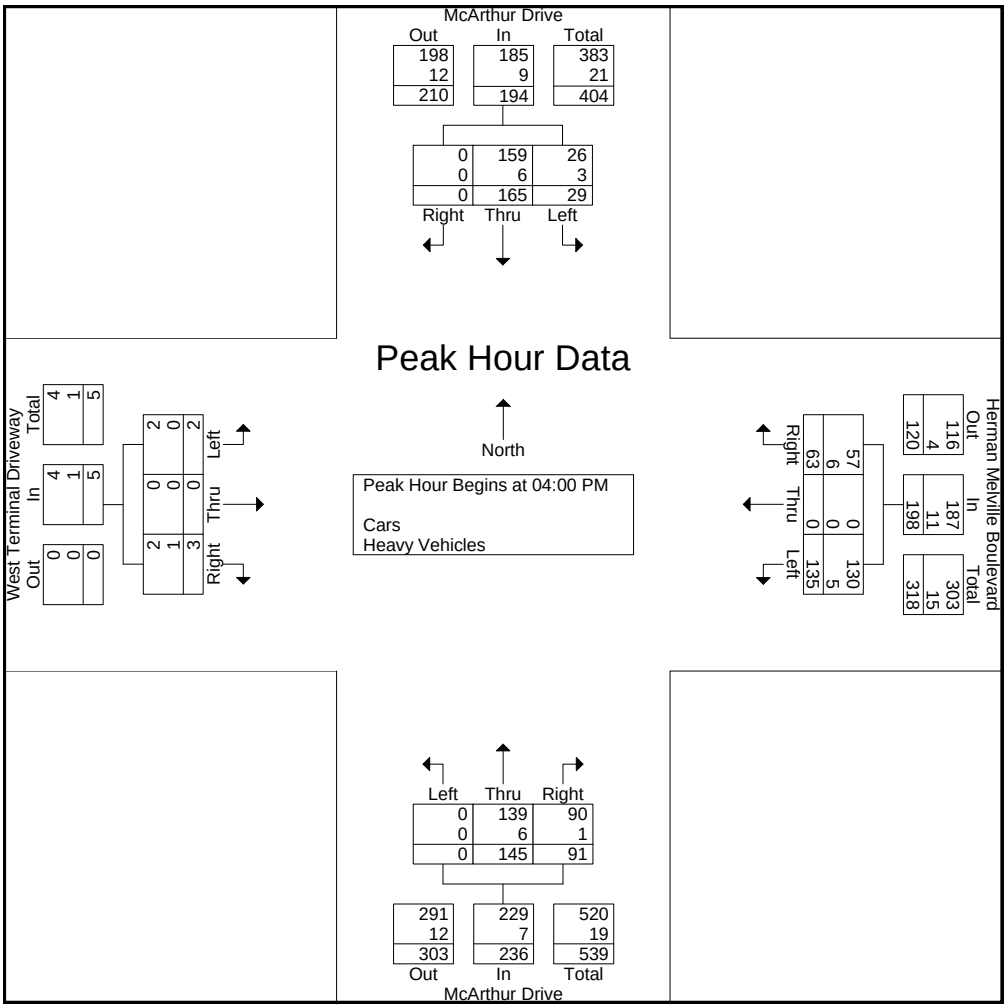
N/S: McArthur Drive
E/W: Herman Melville Blvd/West Terminal
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-DDD
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	McArthur Drive From North				Herman Melville Boulevard From East				McArthur Drive From South				West Terminal Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**54**	**12**	**66**	15	0	30	45	18	**41**	0	59	0	0	0	0	**170**
04:15 PM	0	33	10	43	17	0	33	50	26	34	0	60	**2**	0	**1**	**3**	156
04:30 PM	0	41	4	45	**21**	0	**44**	**65**	19	36	0	55	1	0	1	2	167
04:45 PM	0	37	3	40	10	0	28	38	**28**	34	0	**62**	0	0	0	0	140
Total Volume	0	165	29	194	63	0	135	198	91	145	0	236	3	0	2	5	633
% App. Total	0	85.1	14.9		31.8	0	68.2		38.6	61.4	0		60	0	40		
PHF	.000	.764	.604	.735	.750	.000	.767	.762	.813	.884	.000	.952	.375	.000	.500	.417	.931
Cars	0	159	26	185	57	0	130	187	90	139	0	229	2	0	2	4	605
% Cars	0	96.4	89.7	95.4	90.5	0	96.3	94.4	98.9	95.9	0	97.0	66.7	0	100	80.0	95.6
Heavy Vehicles	0	6	3	9	6	0	5	11	1	6	0	7	1	0	0	1	28
% Heavy Vehicles	0	3.6	10.3	4.6	9.5	0	3.7	5.6	1.1	4.1	0	3.0	33.3	0	0	20.0	4.4



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N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-E
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Mill Street/Kempton Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
07:00 AM	2	30	0	1	13	19	31	0	9	36	17	1	0	0	0	0	0	0	8	25	192
07:15 AM	13	29	0	10	31	50	77	0	13	35	17	3	0	0	0	0	1	0	19	42	340
07:30 AM	7	46	0	13	34	37	67	0	11	33	7	4	0	0	0	0	0	0	37	40	336
07:45 AM	14	55	0	14	50	53	112	0	15	45	9	7	0	0	0	0	0	0	48	51	473
Total	36	160	0	38	128	159	287	0	48	149	50	15	0	0	0	0	1	0	112	158	1341
08:00 AM	11	62	0	3	13	18	57	0	8	51	17	4	0	0	0	0	0	0	12	66	322
08:15 AM	6	79	0	23	43	44	125	0	5	64	13	6	0	0	0	0	1	0	43	53	505
08:30 AM	12	72	0	11	34	58	100	0	3	43	16	5	0	0	0	0	2	0	31	43	430
Grand Total	65	373	0	75	218	279	569	0	64	307	96	30	0	0	0	0	4	0	198	320	2598
Apprch %	12.7	72.7	0	14.6	20.5	26.2	53.4	0	12.9	61.8	19.3	6	0	0	0	0	0.8	0	37.9	61.3	
Total %	2.5	14.4	0	2.9	8.4	10.7	21.9	0	2.5	11.8	3.7	1.2	0	0	0	0	0.2	0	7.6	12.3	
Cars	57	355	0	73	210	272	548	0	61	288	87	30	0	0	0	0	4	0	195	305	2485
% Cars	87.7	95.2	0	97.3	96.3	97.5	96.3	0	95.3	93.8	90.6	100	0	0	0	0	100	0	98.5	95.3	95.7
Heavy Vehicles	8	18	0	2	8	7	21	0	3	19	9	0	0	0	0	0	0	0	3	15	113
% Heavy Vehicles	12.3	4.8	0	2.7	3.7	2.5	3.7	0	4.7	6.2	9.4	0	0	0	0	0	0	0	1.5	4.7	4.3

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Mill Street/Kempton Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	**14**	**55**	**0**	**14**	**83**	**50**	**53**	112	0	**215**	**15**	45	9	**7**	76	0	0	0	0	0	0	0	**48**	51	**99**	**473**
08:00 AM	11	62	0	3	76	13	18	57	0	88	8	51	**17**	**4**	**80**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**66**	**78**	**322**
08:15 AM	6	**79**	0	**23**	**108**	43	44	**125**	0	212	5	**64**	**13**	**6**	**88**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**43**	**53**	**97**	**505**
08:30 AM	12	72	0	11	95	34	**58**	100	0	192	3	43	16	5	67	0	0	0	0	0	**2**	**0**	**31**	**43**	**76**	**430**
Total Volume	43	268	0	51	362	140	173	394	0	707	31	203	55	22	311	0	0	0	0	0	3	0	134	213	350	1730
% App. Total	11.9	74	0	14.1		19.8	24.5	55.7				65.3	17.7	7.1		0	0	0	0		0.9	0	38.3	60.9		
PHF	.768	.848	.000	.554	.838	.700	.746	.788	.000	.822	.517	.793	.809	.786		.000	.000	.000	.000	.000	.375	.000	.698	.807	.884	.856
Cars	37	256				135	167	381				192	50	22	294	0	0	0	0	0	3	0	132	202	337	1656
% Cars	86.0	95.5		96.1	94.5	96.4	96.5	96.7			96.8	94.6	90.9	100							100	0	98.5	94.8	96.3	95.7
Heavy Vehicles																										
% Heavy Vehicles	14.0	4.5	0	3.9	5.5	3.6	3.5	3.3	0	3.4	3.2	5.4	9.1	0	5.5	0	0	0	0	0	0	0	1.5	5.2	3.7	4.3

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N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-E
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Mill Street/Kempton Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
07:00 AM	1	28	0	1	13	18	27	0	8	34	15	1	0	0	0	0	0	0	8	24	178
07:15 AM	12	26	0	10	29	50	75	0	13	33	16	3	0	0	0	0	1	0	19	41	328
07:30 AM	7	45	0	13	33	37	65	0	10	29	6	4	0	0	0	0	0	0	36	38	323
07:45 AM	12	53	0	14	47	50	111	0	15	43	8	7	0	0	0	0	0	0	48	50	458
Total	32	152	0	38	122	155	278	0	46	139	45	15	0	0	0	0	1	0	111	153	1287
08:00 AM	9	58	0	3	11	18	55	0	7	48	15	4	0	0	0	0	0	0	12	61	301
08:15 AM	5	76	0	21	43	43	121	0	5	61	12	6	0	0	0	0	1	0	42	52	488
08:30 AM	11	69	0	11	34	56	94	0	3	40	15	5	0	0	0	0	2	0	30	39	409
Grand Total	57	355	0	73	210	272	548	0	61	288	87	30	0	0	0	0	4	0	195	305	2485
Apprch %	11.8	73.2	0	15.1	20.4	26.4	53.2	0	13.1	61.8	18.7	6.4	0	0	0	0	0.8	0	38.7	60.5	
Total %	2.3	14.3	0	2.9	8.5	10.9	22.1	0	2.5	11.6	3.5	1.2	0	0	0	0	0.2	0	7.8	12.3	

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Mill Street/Kempton Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	**12**	**53**	**0**	**14**	**79**	**47**	**50**	111	0	**208**	**15**	43	8	**7**	73	0	0	0	0	0	0	0	**48**	50	**98**	**458**
08:00 AM	9	58	0	3	70	11	18	55	0	84	7	48	**15**	**4**	**74**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**61**	**73**	**301**
08:15 AM	5	**76**	0	**21**	**102**	43	43	**121**	0	207	5	**61**	**12**	**6**	**84**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**42**	**52**	**95**	**488**
08:30 AM	11	69	0	11	91	34	**56**	**94**	**0**	**184**	**3**	**40**	**15**	**5**	**63**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**30**	**39**	**71**	**409**
Total Volume	37	256	0	49	342	135	167	381	0	683	30	192	50	22	294	0	0	0	0	0	3	0	132	202	337	1656
% App. Total	10.8	74.9		14.3		19.8	24.5	55.8			10.2	65.3	17	7.5		0	0	0	0		0.9	0	39.2	59.9		
PHF	.771	.842	.000	.583	.838	.718	.746	.787	.000	.821	.500	.787	.833	.786		.000	.000	.000	.000	.000	.375	.000	.688	.828	.860	.848

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File Name : 81676 C-E
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Mill Street/Kempton Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
07:00 AM	1	2	0	0	0	1	4	0	1	2	2	0	0	0	0	0	0	0	0	1	14
07:15 AM	1	3	0	0	2	0	2	0	0	2	1	0	0	0	0	0	0	0	0	1	12
07:30 AM	0	1	0	0	1	0	2	0	1	4	1	0	0	0	0	0	0	0	1	2	13
07:45 AM	2	2	0	0	3	3	1	0	0	2	1	0	0	0	0	0	0	0	0	1	15
Total	4	8	0	0	6	4	9	0	2	10	5	0	0	0	0	0	0	0	1	5	54
08:00 AM	2	4	0	0	2	0	2	0	1	3	2	0	0	0	0	0	0	0	0	5	21
08:15 AM	1	3	0	2	0	1	4	0	0	3	1	0	0	0	0	0	0	0	1	1	17
08:30 AM	1	3	0	0	0	2	6	0	0	3	1	0	0	0	0	0	0	0	1	4	21
Grand Total	8	18	0	2	8	7	21	0	3	19	9	0	0	0	0	0	0	0	3	15	113
Apprch %	28.6	64.3	0	7.1	22.2	19.4	58.3	0	9.7	61.3	29	0	0	0	0	0	0	0	16.7	83.3	
Total %	7.1	15.9	0	1.8	7.1	6.2	18.6	0	2.7	16.8	8	0	0	0	0	0	0	0	2.7	13.3	

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Mill Street/Kempton Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	**2**	**2**	**0**	**0**	**4**	**3**	**3**	**1**	**0**	**7**	**0**	**2**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**15**
08:00 AM	2	**4**	0	0	**6**	2	0	2	0	4	**1**	**3**	**2**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**21**
08:15 AM	1	3	0	**2**	**6**	**0**	**1**	**4**	**0**	**5**	**0**	**3**	**1**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1	2	17
08:30 AM	1	3	0	0	4	0	2	**6**	0	**8**	**0**	**3**	**1**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**5**	**21**
Total Volume	6	12	0	2	20	5	6	13	0	24	1	11	5	0	17	0	0	0	0	0	0	0	2	11	13	74
% App. Total	30	60	0	10		20.8	25	54.2	0		5.9	64.7	29.4	0		0	0	0	0		0	0	15.4	84.6		
PHF	.750	.750	.000	.250	.833	.417	.500	.542	.000	.750	.250	.917	.625	.000		.000	.000	.000	.000	.000	.000	.000	.500	.550	.650	.881

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Client: VHB/J. Quitter

File Name : 81676 C-E
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Mill Street/Kempton Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	5
07:15 AM	0	0	0	0	0	0	0	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	6
07:30 AM	0	0	1	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
Total	0	0	1	0	0	0	0	0	0	10	1	1	0	0	2	0	0	0	0	2	0	0	0	0	4	21
08:00 AM	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	7
08:30 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	13
Grand Total	0	0	1	0	1	0	0	0	0	29	1	1	0	0	3	0	0	0	0	5	0	0	0	0	4	45
Apprch %	0	0	50	0	50	0	0	0	0	100	20	20	0	0	60	0	0	0	0	100	0	0	0	0	100	
Total %	0	0	2.2	0	2.2	0	0	0	0	64.4	2.2	2.2	0	0	6.7	0	0	0	0	11.1	0	0	0	0	8.9	

	Pleasant Street From North						Kempton Street (Route 6) From East						Pleasant Street From South						North 6th Street From Southwest						Mill Street/Kempton Street (Route 6) From West						
Start Time	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 07:45 AM																															
07:45 AM	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	6
08:00 AM	0	0	0	0	**1**	**1**	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	7
08:30 AM	0	0	0	0	0	0	0	0	0	0	**11**	**11**	0	0	0	0	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**13**
Total Volume	0	0	0	0	1	1	0	0	0	0	24	24	0	0	0	0	1	1	0	0	0	0	3	3	0	0	0	0	1	1	30
% App. Total	0	0	0	0	100		0	0	0	0	100		0	0	0	0	100		0	0	0	0	100		0	0	0	0	100		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.545	.545	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.750	.750	.000	.000	.000	.000	.250	.250	.577

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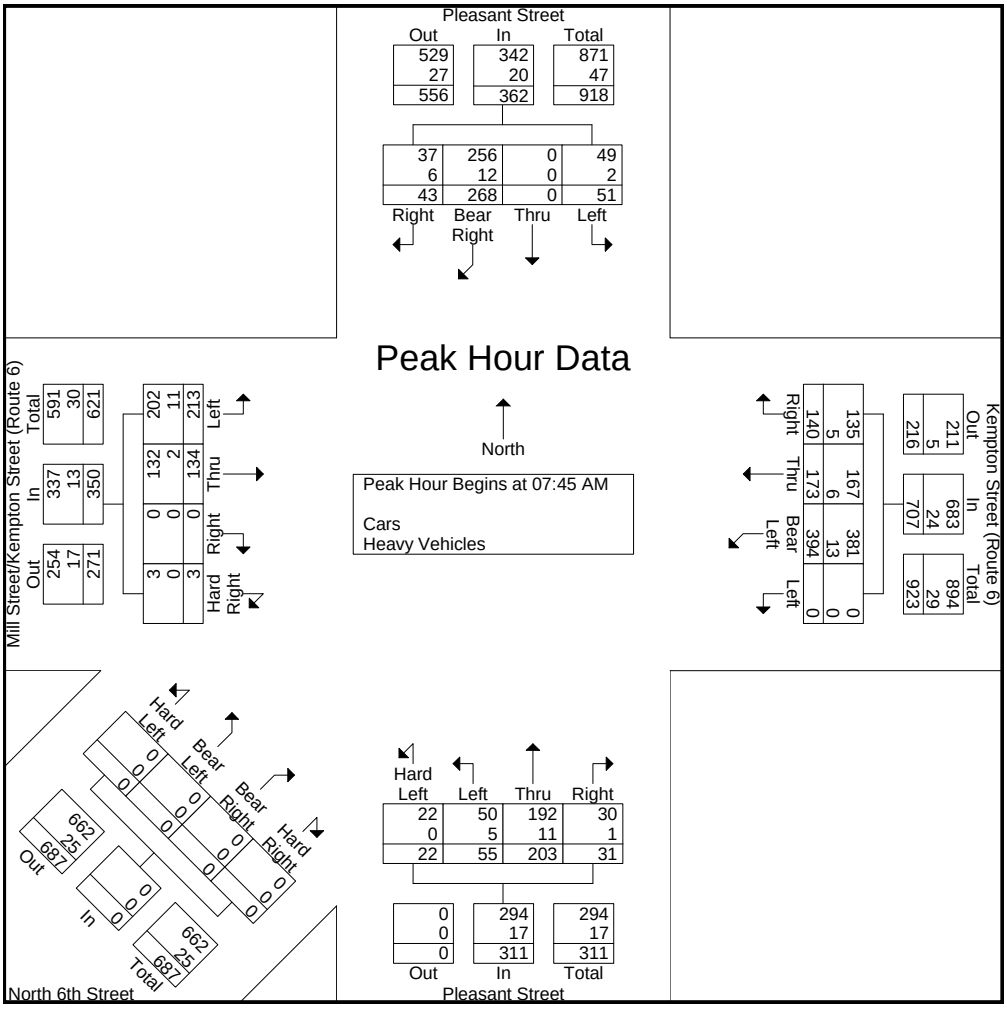
N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-E
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Mill Street/Kempton Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	**14**	**55**	**0**	**14**	**83**	**50**	**53**	112	0	**215**	**15**	45	9	**7**	76	0	0	0	0	0	0	0	**48**	51	**99**	**473**
08:00 AM	11	62	0	3	76	13	18	57	0	88	8	51	**17**	**4**	**80**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	12	**66**	**78**	**322**
08:15 AM	6	**79**	0	**23**	**108**	43	44	**125**	0	212	5	**64**	**13**	**6**	**88**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**43**	**53**	**97**	**505**
08:30 AM	12	72	0	11	95	34	**58**	100	0	192	3	43	16	5	67	0	0	0	0	0	**2**	**0**	**31**	**43**	**76**	**430**
Total Volume	43	268	0	51	362	140	173	394	0	707	31	203	55	22	311	0	0	0	0	0	3	0	134	213	350	1730
% App. Total	11.9	74	0	14.1		19.8	24.5	55.7				65.3	17.7	7.1		0	0	0	0		0.9	0	38.3	60.9		
PHF	.768	.848	.000	.554	.838	.700	.746	.788	.000	.822	.517	.793	.809	.786		.000	.000	.000	.000	.000	.375	.000	.698	.807	.884	.856
Cars	37	256				135	167	381				192	50	22	294	0	0	0	0	0	3	0	132	202	337	1656
% Cars	86.0	95.5		96.1	94.5	96.4	96.5	96.7			96.8	94.6	90.9	100							100	0	98.5	94.8	96.3	95.7
Heavy Vehicles																										
% Heavy Vehicles	14.0	4.5	0	3.9	5.5	3.6	3.5	3.3	0	3.4	3.2	5.4	9.1	0	5.5	0	0	0	0	0	0	0	1.5	5.2	3.7	4.3



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N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-EEE
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Kempton Street/Mill Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
04:00 PM	21	91	0	20	66	43	94	0	24	104	33	9	0	0	0	0	0	0	50	62	617
04:15 PM	7	77	0	18	56	47	63	0	10	120	34	4	0	0	0	0	1	0	45	68	550
04:30 PM	12	76	0	22	59	51	98	0	38	118	35	5	0	0	0	0	0	0	46	68	628
04:45 PM	8	65	0	19	47	56	91	0	26	88	30	7	0	0	0	0	0	0	45	53	535
Total	48	309	0	79	228	197	346	0	98	430	132	25	0	0	0	0	1	0	186	251	2330
05:00 PM	13	69	0	27	32	46	67	0	36	138	40	6	0	0	0	0	0	0	51	47	572
05:15 PM	8	38	0	9	26	35	54	0	19	78	18	2	0	0	0	0	0	0	57	45	389
05:30 PM	8	66	0	14	32	48	78	0	23	76	26	4	0	0	0	0	0	0	40	52	467
05:45 PM	5	60	0	14	31	35	60	0	12	72	21	2	0	0	0	0	0	0	42	47	401
Total	34	233	0	64	121	164	259	0	90	364	105	14	0	0	0	0	0	0	190	191	1829
Grand Total	82	542	0	143	349	361	605	0	188	794	237	39	0	0	0	0	1	0	376	442	4159
Apprch %	10.7	70.7	0	18.6	26.5	27.5	46	0	14.9	63.1	18.8	3.1	0	0	0	0	0.1	0	45.9	54	
Total %	2	13	0	3.4	8.4	8.7	14.5	0	4.5	19.1	5.7	0.9	0	0	0	0	0	0	9	10.6	
Cars	81	522	0	143	342	354	588	0	183	772	226	39	0	0	0	0	1	0	373	436	4060
% Cars	98.8	96.3	0	100	98	98.1	97.2	0	97.3	97.2	95.4	100	0	0	0	0	100	0	99.2	98.6	97.6
Heavy Vehicles	1	20	0	0	7	7	17	0	5	22	11	0	0	0	0	0	0	0	3	6	99
% Heavy Vehicles	1.2	3.7	0	0	2	1.9	2.8	0	2.7	2.8	4.6	0	0	0	0	0	0	0	0.8	1.4	2.4

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Kempton Street/Mill Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:00 PM																										
04:00 PM	**21**	**91**	0	20	**132**	**66**	**43**	**94**	**0**	**203**	**24**	104	33	**9**	170	0	0	0	0	0	0	0	**50**	62	112	617
04:15 PM	7	77	0	18	102	56	47	63	0	166	10	**120**	**34**	**4**	**168**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**45**	**68**	**114**	**550**
04:30 PM	12	76	0	**22**	**110**	**59**	**51**	**98**	0	**208**	**38**	118	**35**	**5**	**196**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**46**	**68**	**114**	**628**
04:45 PM	8	65	0	19	92	47	**56**	**91**	**0**	**194**	**26**	**88**	**30**	**7**	**151**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**45**	**53**	**98**	**535**
Total Volume	48	309	0	79	436	228	197	346	0	771	98	430	132	25	685	0	0	0	0	0	1	0	186	251	438	2330
% App. Total		70.9		18.1		29.6	25.6	44.9			14.3	62.8	19.3	3.6		0	0	0	0		0.2	0	42.5	57.3		
PHF	.571	.849	.000	.898	.826	.864	.879	.883	.000	.927	.645	.896	.943	.694		.000	.000	.000	.000	.000	.250	.000	.930	.923	.961	.928
Cars	47	299				222	195	333				417	125	25	662	0	0	0	0	0	1	0	184	248	433	2270
% Cars	97.9	96.8		100	97.5	97.4	99.0	96.2			96.9	97.0	94.7	100							100	0	98.9	98.8	98.9	97.4
Heavy Vehicles																										
% Heavy Vehicles	2.1	3.2	0	0	2.5	2.6	1.0	3.8	0	2.7	3.1	3.0	5.3	0	3.4	0	0	0	0	0	0	0	1.1	1.2	1.1	2.6

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E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-EEE
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Kempton Street/Mill Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
04:00 PM	20	88	0	20	64	42	89	0	23	100	31	9	0	0	0	0	0	0	50	61	597
04:15 PM	7	75	0	18	55	47	60	0	9	118	34	4	0	0	0	0	1	0	45	67	540
04:30 PM	12	72	0	22	57	50	95	0	37	114	32	5	0	0	0	0	0	0	44	67	607
04:45 PM	8	64	0	19	46	56	89	0	26	85	28	7	0	0	0	0	0	0	45	53	526
Total	47	299	0	79	222	195	333	0	95	417	125	25	0	0	0	0	1	0	184	248	2270
05:00 PM	13	66	0	27	32	45	65	0	35	136	39	6	0	0	0	0	0	0	50	45	559
05:15 PM	8	37	0	9	26	32	54	0	19	77	16	2	0	0	0	0	0	0	57	45	382
05:30 PM	8	62	0	14	32	47	77	0	22	73	25	4	0	0	0	0	0	0	40	51	455
05:45 PM	5	58	0	14	30	35	59	0	12	69	21	2	0	0	0	0	0	0	42	47	394
Total	34	223	0	64	120	159	255	0	88	355	101	14	0	0	0	0	0	0	189	188	1790
Grand Total	81	522	0	143	342	354	588	0	183	772	226	39	0	0	0	0	1	0	373	436	4060
Apprch %	10.9	70	0	19.2	26.6	27.6	45.8	0	15	63.3	18.5	3.2	0	0	0	0	0.1	0	46	53.8	
Total %	2	12.9	0	3.5	8.4	8.7	14.5	0	4.5	19	5.6	1	0	0	0	0	0	0	9.2	10.7	

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Kempton Street/Mill Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:00 PM																										
04:00 PM	**20**	**88**	0	20	**128**	**64**	**42**	**89**	**0**	**195**	**23**	100	31	**9**	163	0	0	0	0	0	0	0	**50**	61	111	597
04:15 PM	7	75	0	18	100	55	47	60	0	162	9	**118**	**34**	**4**	**165**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**45**	**67**	**113**	**540**
04:30 PM	12	72	0	**22**	**106**	**57**	**50**	**95**	0	**202**	**37**	114	32	5	**188**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**44**	**67**	**111**	**607**
04:45 PM	8	64	0	19	91	46	**56**	**89**	**0**	**191**	**26**	**85**	**28**	**7**	**146**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**45**	**53**	**98**	**526**
Total Volume	47	299	0	79	425	222	195	333	0	750	95	417	125	25	662	0	0	0	0	0	1	0	184	248	433	2270
% App. Total	11.1	70.4		18.6		29.6	26	44.4			14.4		18.9	3.8		0	0	0	0		0.2	0	42.5	57.3		
PHF	.588	.849	.000	.898	.830	.867	.871	.876	.000	.928	.642	.883	.919	.694		.000	.000	.000	.000	.000	.250	.000	.920	.925	.958	.935

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File Name : 81676 C-EEE
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Groups Printed- Heavy Vehicles

	Pleasant Street From North				Kempton Street (Route 6) From East				Pleasant Street From South				North 6th Street From Southwest				Kempton Street/Mill Street (Route 6) From West				
Start	Right	Bear Right	Thru	Left	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Int. Total
04:00 PM	1	3	0	0	2	1	5	0	1	4	2	0	0	0	0	0	0	0	0	1	20
04:15 PM	0	2	0	0	1	0	3	0	1	2	0	0	0	0	0	0	0	0	0	1	10
04:30 PM	0	4	0	0	2	1	3	0	1	4	3	0	0	0	0	0	0	0	2	1	21
04:45 PM	0	1	0	0	1	0	2	0	0	3	2	0	0	0	0	0	0	0	0	0	9
Total	1	10	0	0	6	2	13	0	3	13	7	0	0	0	0	0	0	0	2	3	60
05:00 PM	0	3	0	0	0	1	2	0	1	2	1	0	0	0	0	0	0	0	1	2	13
05:15 PM	0	1	0	0	0	3	0	0	0	1	2	0	0	0	0	0	0	0	0	0	7
05:30 PM	0	4	0	0	0	1	1	0	1	3	1	0	0	0	0	0	0	0	0	1	12
05:45 PM	0	2	0	0	1	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	7
Total	0	10	0	0	1	5	4	0	2	9	4	0	0	0	0	0	0	0	1	3	39
Grand Total	1	20	0	0	7	7	17	0	5	22	11	0	0	0	0	0	0	0	3	6	99
Apprch %	4.8	95.2	0	0	22.6	22.6	54.8	0	13.2	57.9	28.9	0	0	0	0	0	0	0	33.3	66.7	
Total %	1	20.2	0	0	7.1	7.1	17.2	0	5.1	22.2	11.1	0	0	0	0	0	0	0	3	6.1	

	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Kempton Street/Mill Street (Route 6) From West					
Start Time	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:00 PM																										
04:00 PM	**1**	**3**	**0**	**0**	**4**	**2**	**1**	**5**	0	**8**	**1**	**4**	**2**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**20**
04:15 PM	0	2	0	0	2	1	0	3	0	4	1	2	0	0	3	0	0	0	0	0	0	0	0	1	1	10
04:30 PM	0	**4**	0	0	4	2	1	3	0	6	1	4	**3**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	1	**3**	**21**
04:45 PM	0	1	0	0	1	1	0	2	0	3	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	9
Total Volume	1	10	0	0	11	6	2	13	0	21	3	13	7	0	23	0	0	0	0	0	0	0	2	3	5	60
% App. Total	9.1	90.9	0	0		28.6	9.5	61.9	0		13	56.5	30.4	0		0	0	0	0		0	0	40	60		
PHF	.250	.625	.000	.000	.688	.750	.500	.650	.000	.656	.750	.813	.583	.000		.000	.000	.000	.000	.000	.000	.000	.250	.750	.417	.714

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N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-EEE
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Kempton Street/Mill Street (Route 6) From West					Int. Total
	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	
04:00 PM	0	0	0	0	2	0	0	0	0	15	0	0	0	0	2	0	0	0	0	1	0	0	0	0	2	22
04:15 PM	0	0	1	0	0	0	0	0	0	12	0	1	0	0	0	0	0	0	0	2	0	0	0	0	5	21
04:30 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	13
04:45 PM	0	0	0	0	0	0	0	0	0	7	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	1	0	2	0	0	0	0	45	0	3	0	0	4	0	0	0	0	3	0	0	0	0	7	65
05:00 PM	0	0	0	0	0	0	0	0	0	6	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	9
05:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	0	6	14
05:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	6
Total	0	0	0	0	0	0	0	0	0	14	0	4	0	0	0	0	0	0	0	6	0	0	1	0	9	34
Grand Total	0	0	1	0	2	0	0	0	0	59	0	7	0	0	4	0	0	0	0	9	0	0	1	0	16	99
Apprch %	0	0	33.3	0	66.7	0	0	0	0	100	0	63.6	0	0	36.4	0	0	0	0	100	0	0	5.9	0	94.1	
Total %	0	0	1	0	2	0	0	0	0	59.6	0	7.1	0	0	4	0	0	0	0	9.1	0	0	1	0	16.2	

Start Time	Pleasant Street From North						Kempton Street (Route 6) From East						Pleasant Street From South						North 6th Street From Southwest						Kempton Street/Mill Street (Route 6) From West						Int. Total
	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 04:00 PM																															
04:00 PM	0	0	0	0	**2**	**2**	0	0	0	0	**15**	**15**	0	0	0	0	**2**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**2**	**22**
04:15 PM	0	0	**1**	0	0	1	0	0	0	0	12	12	0	1	0	0	0	1	0	0	0	0	**2**	**2**	0	0	0	0	**5**	**5**	21
04:30 PM	0	0	0	0	0	0	0	0	0	0	11	11	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	13
04:45 PM	0	0	0	0	0	0	0	0	0	0	7	7	0	**2**	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	9
Total Volume	0	0	1	0	2	3	0	0	0	0	45	45	0	3	0	0	4	7	0	0	0	0	3	3	0	0	0	0	7	7	65
% App. Total	0	0	33.3	0	66.7		0	0	0	0	100		0	42.9	0	0	57.1		0	0	0	0	100		0	0	0	0	100		
PHF	.000	.000	.250	.000	.250	.375	.000	.000	.000	.000	.750	.750	.000	.375	.000	.000	.500	.875	.000	.000	.000	.000	.375	.375	.000	.000	.000	.000	.350	.350	.739

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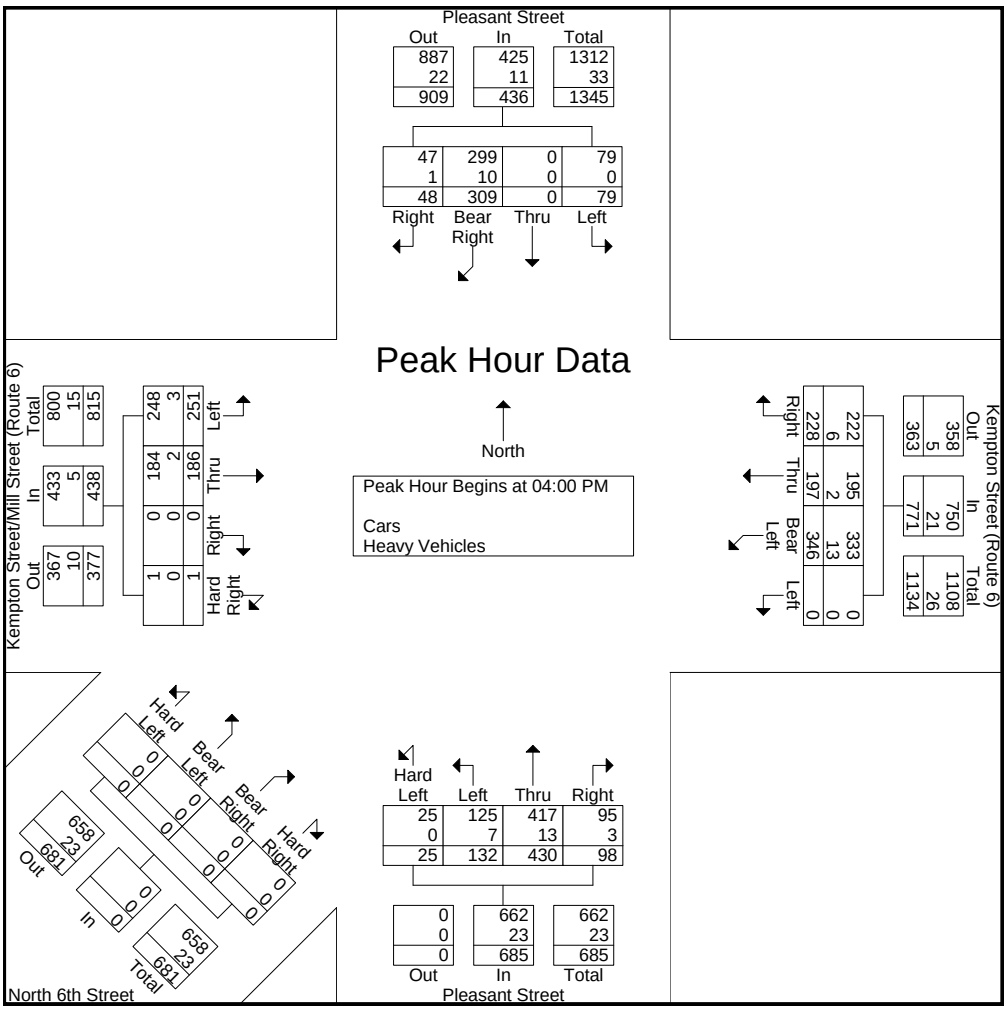
N/S/SW: Pleasant Street/North 6th Street
E/W: Kempton Street (Route 6)
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-EEE
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Start Time	Pleasant Street From North					Kempton Street (Route 6) From East					Pleasant Street From South					North 6th Street From Southwest					Kempton Street/Mill Street (Route 6) From West					
	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:00 PM																										
04:00 PM	**21**	**91**	0	20	**132**	**66**	**43**	**94**	**0**	**203**	**24**	104	33	**9**	170	0	0	0	0	0	0	0	**50**	62	112	617
04:15 PM	7	77	0	18	102	56	47	63	0	166	10	**120**	**34**	**4**	**168**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	45	**68**	**114**	**550**
04:30 PM	12	76	0	**22**	**110**	**59**	**51**	**98**	0	**208**	**38**	118	**35**	**5**	**196**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	46	**68**	**114**	**628**
04:45 PM	8	65	0	19	92	47	**56**	**91**	**0**	**194**	**26**	**88**	**30**	**7**	**151**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	45	**53**	**98**	**535**
Total Volume	48	309	0	79	436	228	197	346	0	771	98	430	132	25	685	0	0	0	0	0	1	0	186	251	438	2330
% App. Total		70.9		18.1		29.6	25.6	44.9			14.3	62.8	19.3	3.6		0	0	0	0		0.2	0	42.5	57.3		
PHF	.571	.849	.000	.898	.826	.864	.879	.883	.000	.927	.645	.896	.943	.694		.000	.000	.000	.000	.000	.250	.000	.930	.923	.961	.928
Cars	47	299				222	195	333				417	125	25	662	0	0	0	0	0	1	0	184	248	433	2270
% Cars	97.9	96.8		100	97.5	97.4	99.0	96.2			96.9	97.0	94.7	100							100	0	98.9	98.8	98.9	97.4
Heavy Vehicles																										
% Heavy Vehicles	2.1	3.2	0	0	2.5	2.6	1.0	3.8	0	2.7	3.1	3.0	5.3	0	3.4	0	0	0	0	0	0	0	1.1	1.2	1.1	2.6



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N/S: JFK Memorial Highway (Route 18)
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-F
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
07:00 AM	21	174	22	0	1	1	7	0	216	2	0	2	11	35	492
07:15 AM	27	208	25	0	0	5	5	9	216	6	0	7	12	46	566
07:30 AM	36	176	9	0	1	2	7	3	245	8	0	3	13	48	551
07:45 AM	53	235	20	0	1	2	7	6	251	4	0	11	12	55	657
Total	137	793	76	0	3	10	26	18	928	20	0	23	48	184	2266
08:00 AM	50	215	24	1	1	5	9	8	177	15	1	7	8	66	587
08:15 AM	63	196	24	1	3	4	9	7	230	9	0	9	18	64	637
08:30 AM	61	176	16	0	5	5	8	2	199	14	0	11	10	54	561
08:45 AM	63	174	22	0	4	6	7	3	195	17	0	11	16	59	577
Total	237	761	86	2	13	20	33	20	801	55	1	38	52	243	2362
Grand Total	374	1554	162	2	16	30	59	38	1729	75	1	61	100	427	4628
Apprch %	17.9	74.3	7.7	0.1	15.2	28.6	56.2	2.1	93.8	4.1	0.1	10.4	17	72.6	
Total %	8.1	33.6	3.5	0	0.3	0.6	1.3	0.8	37.4	1.6	0	1.3	2.2	9.2	
Cars	364	1469	148	1	14	27	52	36	1629	69	1	59	90	400	4359
% Cars	97.3	94.5	91.4	50	87.5	90	88.1	94.7	94.2	92	100	96.7	90	93.7	94.2
Heavy Vehicles	10	85	14	1	2	3	7	2	100	6	0	2	10	27	269
% Heavy Vehicles	2.7	5.5	8.6	50	12.5	10	11.9	5.3	5.8	8	0	3.3	10	6.3	5.8

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:45 AM																			
07:45 AM	53	**235**	20	0	**308**	1	2	7	10	6	**251**	4	0	**261**	**11**	12	55	78	**657**
08:00 AM	50	215	**24**	**1**	290	1	**5**	**9**	15	**8**	**177**	**15**	**1**	201	7	8	**66**	81	587
08:15 AM	**63**	196	24	1	284	3	4	9	16	7	230	9	0	246	9	**18**	64	**91**	637
08:30 AM	61	176	16	0	253	**5**	5	8	**18**	2	199	14	0	215	11	10	54	75	561
Total Volume	227	822	84	2	1135	10	16	33	59	23	857	42	1	923	38	48	239	325	2442
% App. Total	20	72.4	7.4	0.2		16.9	27.1	55.9		2.5	92.8	4.6	0.1		11.7	14.8	73.5		
PHF	.901	.874	.875	.500	.921	.500	.800	.917	.819	.719	.854	.700	.250	.884	.864	.667	.905	.893	.929
Cars	221	779	78	1	1079	9	15	31	55	22	796	39	1	858	37	45	221	303	2295
% Cars	97.4	94.8	92.9	50.0	95.1	90.0	93.8	93.9	93.2	95.7	92.9	92.9	100	93.0	97.4	93.8	92.5	93.2	94.0
Heavy Vehicles	6	43	6	1	56	1	1	2	4	1	61	3	0	65	1	3	18	22	147
% Heavy Vehicles	2.6	5.2	7.1	50.0	4.9	10.0	6.3	6.1	6.8	4.3	7.1	7.1	0	7.0	2.6	6.3	7.5	6.8	6.0

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N/S: JFK Memorial Highway (Route 18)
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-F
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
07:00 AM	19	160	20	0	0	1	5	0	207	2	0	2	11	35	462
07:15 AM	26	199	23	0	0	5	3	8	204	5	0	6	11	43	533
07:30 AM	36	169	7	0	1	2	7	3	233	7	0	3	11	46	525
07:45 AM	51	224	19	0	1	1	6	5	239	4	0	11	12	53	626
Total	132	752	69	0	2	9	21	16	883	18	0	22	45	177	2146
08:00 AM	50	208	21	0	1	5	9	8	169	13	1	7	6	60	558
08:15 AM	62	185	23	1	3	4	9	7	212	9	0	9	17	57	598
08:30 AM	58	162	15	0	4	5	7	2	176	13	0	10	10	51	513
08:45 AM	62	162	20	0	4	4	6	3	189	16	0	11	12	55	544
Total	232	717	79	1	12	18	31	20	746	51	1	37	45	223	2213
Grand Total	364	1469	148	1	14	27	52	36	1629	69	1	59	90	400	4359
Apprch %	18.4	74.1	7.5	0.1	15.1	29	55.9	2.1	93.9	4	0.1	10.7	16.4	72.9	
Total %	8.4	33.7	3.4	0	0.3	0.6	1.2	0.8	37.4	1.6	0	1.4	2.1	9.2	

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:30 AM																			
07:30 AM	36	169	7	0	212	1	2	7	10	3	233	7	0	243	3	11	46	60	525
07:45 AM	51	**224**	19	0	**294**	1	1	6	8	5	**239**	4	0	**248**	**11**	12	53	76	**626**
08:00 AM	50	208	21	0	279	1	**5**	**9**	15	**8**	**169**	**13**	**1**	191	7	6	**60**	73	558
08:15 AM	**62**	185	**23**	**1**	271	**3**	4	9	**16**	7	212	9	0	228	9	**17**	57	**83**	598
Total Volume	199	786	70	1	1056	6	12	31	49	23	853	33	1	910	30	46	216	292	2307
% App. Total	18.8	74.4	6.6	0.1		12.2	24.5	63.3		2.5	93.7	3.6	0.1		10.3	15.8	74		
PHF	.802	.877	.761	.250	.898	.500	.600	.861	.766	.719	.892	.635	.250	.917	.682	.676	.900	.880	.921

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Client: VHB/J. Quitter

File Name : 81676 C-F
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
07:00 AM	2	14	2	0	1	0	2	0	9	0	0	0	0	0	30
07:15 AM	1	9	2	0	0	0	2	1	12	1	0	1	1	3	33
07:30 AM	0	7	2	0	0	0	0	0	12	1	0	0	2	2	26
07:45 AM	2	11	1	0	0	1	1	1	12	0	0	0	0	2	31
Total	5	41	7	0	1	1	5	2	45	2	0	1	3	7	120
08:00 AM	0	7	3	1	0	0	0	0	8	2	0	0	2	6	29
08:15 AM	1	11	1	0	0	0	0	0	18	0	0	0	1	7	39
08:30 AM	3	14	1	0	1	0	1	0	23	1	0	1	0	3	48
08:45 AM	1	12	2	0	0	2	1	0	6	1	0	0	4	4	33
Total	5	44	7	1	1	2	2	0	55	4	0	1	7	20	149
Grand Total	10	85	14	1	2	3	7	2	100	6	0	2	10	27	269
Apprch %	9.1	77.3	12.7	0.9	16.7	25	58.3	1.9	92.6	5.6	0	5.1	25.6	69.2	
Total %	3.7	31.6	5.2	0.4	0.7	1.1	2.6	0.7	37.2	2.2	0	0.7	3.7	10	

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 08:00 AM																			
08:00 AM	0	7	**3**	**1**	11	0	0	0	0	0	8	**2**	**0**	**10**	**0**	**2**	**6**	**8**	29
08:15 AM	1	11	1	0	13	0	0	0	0	0	18	0	0	18	0	1	**7**	8	39
08:30 AM	**3**	**14**	1	0	**18**	**1**	0	**1**	2	0	**23**	1	0	**24**	**1**	0	3	4	**48**
08:45 AM	1	12	2	0	15	0	**2**	1	**3**	0	6	1	0	7	0	**4**	4	8	33
Total Volume	5	44	7	1	57	1	2	2	5	0	55	4	0	59	1	7	20	28	149
% App. Total	8.8	77.2	12.3	1.8		20	40	40		0	93.2	6.8	0		3.6	25	71.4		
PHF	.417	.786	.583	.250	.792	.250	.250	.500	.417	.000	.598	.500	.000	.615	.250	.438	.714	.875	.776

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Client: VHB/J. Quitter

File Name : 81676 C-F
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	JFK Memorial Highway (Route 18) From North				Union Street From East				JFK Memorial Highway (Route 18) From South				Union Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	2	0	0	0	0	0	0	0	2	0	2	0	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	7	0	1	0	0	0	0	0	1	0	0	0	0	9
08:30 AM	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	3
08:45 AM	0	0	0	19	0	0	0	0	0	0	0	5	0	0	0	3	27
Total	0	0	0	27	0	2	0	0	0	0	0	7	0	0	0	3	39
Grand Total	0	0	0	29	0	2	0	0	0	0	0	9	0	2	0	3	45
Apprch %	0	0	0	100	0	100	0	0	0	0	0	100	0	40	0	60	
Total %	0	0	0	64.4	0	4.4	0	0	0	0	0	20	0	4.4	0	6.7	

	JFK Memorial Highway (Route 18) From North					Union Street From East					JFK Memorial Highway (Route 18) From South					Union Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	7	7	0	**1**	**0**	**0**	**1**	0	0	0	1	1	0	0	0	0	0	9
08:30 AM	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	3
08:45 AM	0	0	0	**19**	**19**	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	**3**	**3**	**27**
Total Volume	0	0	0	27	27	0	2	0	0	2	0	0	0	7	7	0	0	0	3	3	39
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.355	.355	.000	.500	.000	.000	.500	.000	.000	.000	.350	.350	.000	.000	.000	.250	.250	.361

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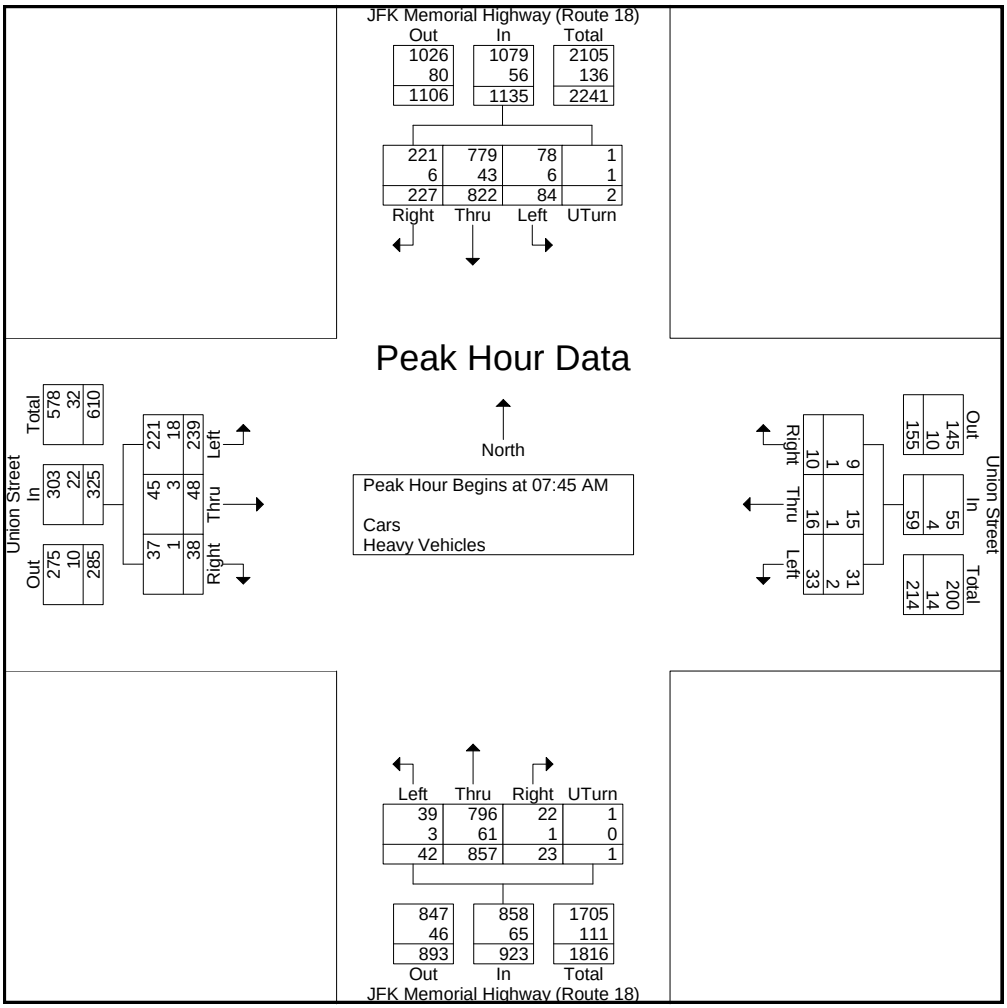
N/S: JFK Memorial Highway (Route 18)
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-F
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:45 AM																			
07:45 AM	53	**235**	20	0	**308**	1	2	7	10	6	**251**	4	0	**261**	**11**	12	55	78	**657**
08:00 AM	50	215	**24**	**1**	290	1	**5**	**9**	15	**8**	**177**	**15**	**1**	201	7	8	**66**	81	587
08:15 AM	**63**	196	24	1	284	3	4	9	16	7	230	9	0	246	9	**18**	64	**91**	637
08:30 AM	61	176	16	0	253	**5**	5	8	**18**	2	199	14	0	215	11	10	54	75	561
Total Volume	227	822	84	2	1135	10	16	33	59	23	857	42	1	923	38	48	239	325	2442
% App. Total	20	72.4	7.4	0.2		16.9	27.1	55.9		2.5	92.8	4.6	0.1		11.7	14.8	73.5		
PHF	.901	.874	.875	.500	.921	.500	.800	.917	.819	.719	.854	.700	.250	.884	.864	.667	.905	.893	.929
Cars	221	779	78	1	1079	9	15	31	55	22	796	39	1	858	37	45	221	303	2295
% Cars	97.4	94.8	92.9	50.0	95.1	90.0	93.8	93.9	93.2	95.7	92.9	92.9	100	93.0	97.4	93.8	92.5	93.2	94.0
Heavy Vehicles	6	43	6	1	56	1	1	2	4	1	61	3	0	65	1	3	18	22	147
% Heavy Vehicles	2.6	5.2	7.1	50.0	4.9	10.0	6.3	6.1	6.8	4.3	7.1	7.1	0	7.0	2.6	6.3	7.5	6.8	6.0



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N/S: JFK Memorial Highway (Route 18)
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-FFF
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
04:00 PM	33	267	10	1	6	9	18	5	268	12	2	15	8	75	729
04:15 PM	31	284	9	0	0	10	9	6	182	54	0	15	7	81	688
04:30 PM	38	279	5	1	5	9	18	3	256	9	0	13	9	80	725
04:45 PM	40	274	11	0	3	7	18	5	234	11	0	17	7	88	715
Total	142	1104	35	2	14	35	63	19	940	86	2	60	31	324	2857
05:00 PM	36	292	9	0	3	8	19	2	278	12	0	9	4	88	760
05:15 PM	48	323	6	0	1	5	6	0	258	10	1	11	9	81	759
05:30 PM	41	227	7	0	1	3	8	2	214	8	1	14	9	87	622
05:45 PM	40	237	6	1	1	5	14	1	183	4	0	11	8	59	570
Total	165	1079	28	1	6	21	47	5	933	34	2	45	30	315	2711
Grand Total	307	2183	63	3	20	56	110	24	1873	120	4	105	61	639	5568
Apprch %	12	85.4	2.5	0.1	10.8	30.1	59.1	1.2	92.7	5.9	0.2	13	7.6	79.4	
Total %	5.5	39.2	1.1	0.1	0.4	1	2	0.4	33.6	2.2	0.1	1.9	1.1	11.5	
Cars	303	2118	54	3	20	56	109	24	1799	119	4	103	59	630	5401
% Cars	98.7	97	85.7	100	100	100	99.1	100	96	99.2	100	98.1	96.7	98.6	97
Heavy Vehicles	4	65	9	0	0	0	1	0	74	1	0	2	2	9	167
% Heavy Vehicles	1.3	3	14.3	0	0	0	0.9	0	4	0.8	0	1.9	3.3	1.4	3

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	38	279	5	**1**	323	**5**	**9**	18	**32**	3	256	9	0	268	13	**9**	80	102	725
04:45 PM	40	274	**11**	0	325	3	7	18	28	**5**	**234**	**11**	**0**	**250**	**17**	7	**88**	**112**	715
05:00 PM	36	292	9	0	337	3	8	**19**	30	2	**278**	**12**	**0**	**292**	9	4	88	101	**760**
05:15 PM	**48**	**323**	6	0	**377**	1	5	6	12	0	258	10	**1**	269	11	9	81	101	759
Total Volume	162	1168	31	1	1362	12	29	61	102	10	1026	42	1	1079	50	29	337	416	2959
% App. Total	11.9	85.8	2.3	0.1		11.8	28.4	59.8		0.9	95.1	3.9	0.1		12	7	81		
PHF	.844	.904	.705	.250	.903	.600	.806	.803	.797	.500	.923	.875	.250	.924	.735	.806	.957	.929	.973
Cars	159	1131	26	1	1317	12	29	61	102	10	985	42	1	1038	50	29	332	411	2868
% Cars	98.1	96.8	83.9	100	96.7	100	100	100	100	100	96.0	100	100	96.2	100	100	98.5	98.8	96.9
Heavy Vehicles	3	37	5	0	45	0	0	0	0	0	41	0	0	41	0	0	5	5	91
% Heavy Vehicles	1.9	3.2	16.1	0	3.3	0	0	0	0	0	4.0	0	0	3.8	0	0	1.5	1.2	3.1

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E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-FFF
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
04:00 PM	33	259	9	1	6	9	17	5	255	12	2	15	8	75	706
04:15 PM	31	274	8	0	0	10	9	6	173	53	0	15	6	81	666
04:30 PM	37	266	4	1	5	9	18	3	244	9	0	13	9	77	695
04:45 PM	40	266	8	0	3	7	18	5	227	11	0	17	7	87	696
Total	141	1065	29	2	14	35	62	19	899	85	2	60	30	320	2763
05:00 PM	34	284	8	0	3	8	19	2	270	12	0	9	4	87	740
05:15 PM	48	315	6	0	1	5	6	0	244	10	1	11	9	81	737
05:30 PM	40	222	6	0	1	3	8	2	209	8	1	13	9	85	607
05:45 PM	40	232	5	1	1	5	14	1	177	4	0	10	7	57	554
Total	162	1053	25	1	6	21	47	5	900	34	2	43	29	310	2638
Grand Total	303	2118	54	3	20	56	109	24	1799	119	4	103	59	630	5401
Apprch %	12.2	85.5	2.2	0.1	10.8	30.3	58.9	1.2	92.4	6.1	0.2	13	7.4	79.5	
Total %	5.6	39.2	1	0.1	0.4	1	2	0.4	33.3	2.2	0.1	1.9	1.1	11.7	

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	37	266	4	**1**	308	**5**	**9**	18	**32**	3	244	9	0	256	13	**9**	77	99	695
04:45 PM	40	266	**8**	0	314	3	7	18	28	**5**	**227**	**11**	**0**	**243**	**17**	7	**87**	**111**	696
05:00 PM	34	284	8	0	326	3	8	**19**	30	2	**270**	**12**	**0**	**284**	9	4	87	100	**740**
05:15 PM	**48**	**315**	6	0	**369**	1	5	6	12	0	244	10	**1**	255	11	9	81	101	737
Total Volume	159	1131	26	1	1317	12	29	61	102	10	985	42	1	1038	50	29	332	411	2868
% App. Total	12.1	85.9	2	0.1		11.8	28.4	59.8		1	94.9	4	0.1		12.2	7.1	80.8		
PHF	.828	.898	.813	.250	.892	.600	.806	.803	.797	.500	.912	.875	.250	.914	.735	.806	.954	.926	.969

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Client: VHB/J. Quitter

File Name : 81676 C-FFF
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	JFK Memorial Highway (Route 18) From North				Union Street From East			JFK Memorial Highway (Route 18) From South				Union Street From West			
Start Time	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	UTurn	Right	Thru	Left	Int. Total
04:00 PM	0	8	1	0	0	0	1	0	13	0	0	0	0	0	23
04:15 PM	0	10	1	0	0	0	0	0	9	1	0	0	1	0	22
04:30 PM	1	13	1	0	0	0	0	0	12	0	0	0	0	3	30
04:45 PM	0	8	3	0	0	0	0	0	7	0	0	0	0	1	19
Total	1	39	6	0	0	0	1	0	41	1	0	0	1	4	94
05:00 PM	2	8	1	0	0	0	0	0	8	0	0	0	0	1	20
05:15 PM	0	8	0	0	0	0	0	0	14	0	0	0	0	0	22
05:30 PM	1	5	1	0	0	0	0	0	5	0	0	1	0	2	15
05:45 PM	0	5	1	0	0	0	0	0	6	0	0	1	1	2	16
Total	3	26	3	0	0	0	0	0	33	0	0	2	1	5	73
Grand Total	4	65	9	0	0	0	1	0	74	1	0	2	2	9	167
Apprch %	5.1	83.3	11.5	0	0	0	100	0	98.7	1.3	0	15.4	15.4	69.2	
Total %	2.4	38.9	5.4	0	0	0	0.6	0	44.3	0.6	0	1.2	1.2	5.4	

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:00 PM																			
04:00 PM	0	8	1	0	9	0	0	**1**	**1**	0	**13**	0	0	**13**	0	0	0	0	23
04:15 PM	0	10	1	0	11	0	0	0	0	0	9	**1**	**0**	**10**	**0**	**1**	0	1	22
04:30 PM	**1**	**13**	1	0	**15**	0	0	0	0	0	12	0	0	12	0	0	**3**	**3**	**30**
04:45 PM	0	8	**3**	0	11	0	0	0	0	0	7	0	0	7	0	0	1	1	19
Total Volume	1	39	6	0	46	0	0	1	1	0	41	1	0	42	0	1	4	5	94
% App. Total	2.2	84.8	13	0		0	0	100		0	97.6	2.4	0		0	20	80		
PHF	.250	.750	.500	.000	.767	.000	.000	.250	.250	.000	.788	.250	.000	.808	.000	.250	.333	.417	.783

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N/S: JFK Memorial Highway (Route 18)
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-FFF
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Peds and Bicycles

	JFK Memorial Highway (Route 18) From North				Union Street From East				JFK Memorial Highway (Route 18) From South				Union Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	3	0	2	0	0	0	0	0	4	0	0	0	1	10
04:15 PM	0	0	0	6	0	0	0	0	0	0	0	3	0	1	0	2	12
04:30 PM	0	0	0	5	0	1	0	0	0	0	0	2	0	0	0	0	8
04:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	16	0	3	0	0	0	0	0	9	0	1	0	3	32
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	2	7
Total	0	0	0	3	0	1	0	0	0	0	0	6	0	0	0	2	12
Grand Total	0	0	0	19	0	4	0	0	0	0	0	15	0	1	0	5	44
Apprch %	0	0	0	100	0	100	0	0	0	0	0	100	0	16.7	0	83.3	
Total %	0	0	0	43.2	0	9.1	0	0	0	0	0	34.1	0	2.3	0	11.4	

	JFK Memorial Highway (Route 18) From North					Union Street From East					JFK Memorial Highway (Route 18) From South					Union Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	3	3	0	**2**	**0**	**0**	**2**	0	0	0	**4**	**4**	0	0	0	1	1	10
04:15 PM	0	0	0	**6**	**6**	0	0	0	0	0	0	0	0	3	3	0	**1**	0	**2**	**3**	**12**
04:30 PM	0	0	0	5	5	0	1	0	0	1	0	0	0	2	2	0	0	0	0	0	8
04:45 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	16	16	0	3	0	0	3	0	0	0	9	9	0	1	0	3	4	32
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		0	25	0	75		
PHF	.000	.000	.000	.667	.667	.000	.375	.000	.000	.375	.000	.000	.000	.563	.563	.000	.250	.000	.375	.333	.667

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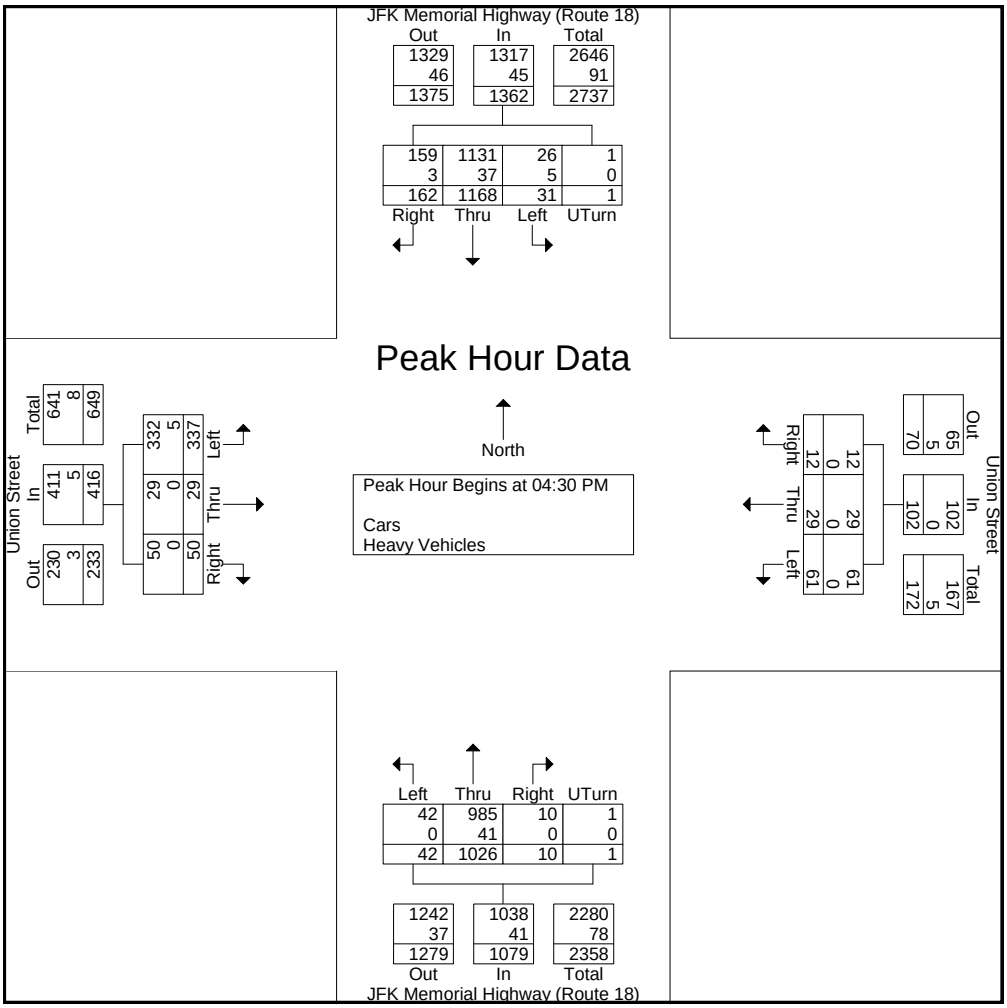
E/W: Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-FFF
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	JFK Memorial Highway (Route 18) From North					Union Street From East				JFK Memorial Highway (Route 18) From South					Union Street From West				
Start Time	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	38	279	5	**1**	323	**5**	**9**	18	**32**	3	256	9	0	268	13	**9**	80	102	725
04:45 PM	40	274	**11**	0	325	3	7	18	28	**5**	**234**	**11**	**0**	**250**	**17**	7	**88**	**112**	715
05:00 PM	36	292	9	0	337	3	8	**19**	30	2	**278**	**12**	**0**	**292**	9	4	88	101	**760**
05:15 PM	**48**	**323**	6	0	**377**	1	5	6	12	0	258	10	**1**	269	11	9	81	101	759
Total Volume	162	1168	31	1	1362	12	29	61	102	10	1026	42	1	1079	50	29	337	416	2959
% App. Total	11.9	85.8	2.3	0.1		11.8	28.4	59.8		0.9	95.1	3.9	0.1		12	7	81		
PHF	.844	.904	.705	.250	.903	.600	.806	.803	.797	.500	.923	.875	.250	.924	.735	.806	.957	.929	.973
Cars	159	1131	26	1	1317	12	29	61	102	10	985	42	1	1038	50	29	332	411	2868
% Cars	98.1	96.8	83.9	100	96.7	100	100	100	100	100	96.0	100	100	96.2	100	100	98.5	98.8	96.9
Heavy Vehicles	3	37	5	0	45	0	0	0	0	0	41	0	0	41	0	0	5	5	91
% Heavy Vehicles	1.9	3.2	16.1	0	3.3	0	0	0	0	0	4.0	0	0	3.8	0	0	1.5	1.2	3.1



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N/S: McArthur Drive
E/W: State Pier/Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-G
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Cars - Heavy Vehicles

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	6	39	2	0	3	1	0	37	0	25	1	6	120
07:15 AM	10	58	0	0	0	1	2	30	0	32	1	12	146
07:30 AM	7	42	2	0	3	1	1	40	0	9	9	7	121
07:45 AM	9	48	0	1	1	2	5	42	0	17	5	16	146
Total	32	187	4	1	7	5	8	149	0	83	16	41	533
08:00 AM	11	33	3	0	4	1	5	34	0	24	8	9	132
08:15 AM	13	39	4	0	3	2	5	34	0	27	6	17	150
08:30 AM	13	51	7	5	4	2	4	45	0	15	2	9	157
08:45 AM	14	54	3	1	7	6	4	42	0	16	8	18	173
Total	51	177	17	6	18	11	18	155	0	82	24	53	612
Grand Total	83	364	21	7	25	16	26	304	0	165	40	94	1145
Apprch %	17.7	77.8	4.5	14.6	52.1	33.3	7.9	92.1	0	55.2	13.4	31.4	
Total %	7.2	31.8	1.8	0.6	2.2	1.4	2.3	26.6	0	14.4	3.5	8.2	
Cars	77	319	15	5	19	13	25	254	0	157	32	81	997
% Cars	92.8	87.6	71.4	71.4	76	81.2	96.2	83.6	0	95.2	80	86.2	87.1
Heavy Vehicles	6	45	6	2	6	3	1	50	0	8	8	13	148
% Heavy Vehicles	7.2	12.4	28.6	28.6	24	18.8	3.8	16.4	0	4.8	20	13.8	12.9

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	11	33	3	47	0	4	1	5	**5**	34	0	39	24	**8**	9	41	132
08:15 AM	13	39	4	56	0	3	2	5	5	34	0	39	**27**	6	17	**50**	150
08:30 AM	13	51	**7**	**71**	**5**	4	2	11	4	**45**	0	**49**	15	2	9	26	157
08:45 AM	**14**	**54**	3	71	1	**7**	**6**	**14**	4	42	0	46	16	8	**18**	42	**173**
Total Volume	51	177	17	245	6	18	11	35	18	155	0	173	82	24	53	159	612
% App. Total	20.8	72.2	6.9		17.1	51.4	31.4		10.4	89.6	0		51.6	15.1	33.3		
PHF	.911	.819	.607	.863	.300	.643	.458	.625	.900	.861	.000	.883	.759	.750	.736	.795	.884
Cars	49	147	13	209	5	15	8	28	17	121	0	138	77	20	46	143	518
% Cars	96.1	83.1	76.5	85.3	83.3	83.3	72.7	80.0	94.4	78.1	0	79.8	93.9	83.3	86.8	89.9	84.6
Heavy Vehicles	2	30	4	36	1	3	3	7	1	34	0	35	5	4	7	16	94
% Heavy Vehicles	3.9	16.9	23.5	14.7	16.7	16.7	27.3	20.0	5.6	21.9	0	20.2	6.1	16.7	13.2	10.1	15.4

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-G
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Cars

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	38	1	0	1	1	0	36	0	24	1	5	112
07:15 AM	8	53	0	0	0	1	2	23	0	31	1	9	128
07:30 AM	7	36	1	0	3	1	1	36	0	8	6	7	106
07:45 AM	8	45	0	0	0	2	5	38	0	17	4	14	133
Total	28	172	2	0	4	5	8	133	0	80	12	35	479
08:00 AM	11	30	2	0	4	1	5	23	0	20	8	8	112
08:15 AM	13	32	4	0	3	2	5	26	0	27	4	16	132
08:30 AM	12	42	6	4	3	2	4	34	0	15	2	7	131
08:45 AM	13	43	1	1	5	3	3	38	0	15	6	15	143
Total	49	147	13	5	15	8	17	121	0	77	20	46	518
Grand Total	77	319	15	5	19	13	25	254	0	157	32	81	997
Apprch %	18.7	77.6	3.6	13.5	51.4	35.1	9	91	0	58.1	11.9	30	
Total %	7.7	32	1.5	0.5	1.9	1.3	2.5	25.5	0	15.7	3.2	8.1	

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	11	30	2	43	0	4	1	5	**5**	23	0	28	20	**8**	8	36	112
08:15 AM	**13**	32	4	49	0	3	2	5	5	26	0	31	**27**	4	**16**	**47**	132
08:30 AM	12	42	**6**	**60**	**4**	3	2	**9**	4	34	0	38	15	2	7	24	131
08:45 AM	13	**43**	1	57	1	**5**	**3**	9	3	**38**	0	**41**	15	6	15	36	**143**
Total Volume	49	147	13	209	5	15	8	28	17	121	0	138	77	20	46	143	518
% App. Total	23.4	70.3	6.2		17.9	53.6	28.6		12.3	87.7	0		53.8	14	32.2		
PHF	.942	.855	.542	.871	.313	.750	.667	.778	.850	.796	.000	.841	.713	.625	.719	.761	.906

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Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	1	1	0	2	0	0	1	0	1	0	1	8
07:15 AM	2	5	0	0	0	0	0	7	0	1	0	3	18
07:30 AM	0	6	1	0	0	0	0	4	0	1	3	0	15
07:45 AM	1	3	0	1	1	0	0	4	0	0	1	2	13
Total	4	15	2	1	3	0	0	16	0	3	4	6	54
08:00 AM	0	3	1	0	0	0	0	11	0	4	0	1	20
08:15 AM	0	7	0	0	0	0	0	8	0	0	2	1	18
08:30 AM	1	9	1	1	1	0	0	11	0	0	0	2	26
08:45 AM	1	11	2	0	2	3	1	4	0	1	2	3	30
Total	2	30	4	1	3	3	1	34	0	5	4	7	94
Grand Total	6	45	6	2	6	3	1	50	0	8	8	13	148
Apprch %	10.5	78.9	10.5	18.2	54.5	27.3	2	98	0	27.6	27.6	44.8	
Total %	4.1	30.4	4.1	1.4	4.1	2	0.7	33.8	0	5.4	5.4	8.8	

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	3	1	4	0	0	0	0	0	**11**	0	**11**	**4**	0	1	5	20
08:15 AM	0	7	0	7	0	0	0	0	0	8	0	8	0	**2**	1	3	18
08:30 AM	**1**	9	1	11	**1**	1	0	2	0	11	0	11	0	0	2	2	26
08:45 AM	1	**11**	**2**	**14**	0	**2**	**3**	**5**	**1**	4	0	5	1	2	**3**	**6**	**30**
Total Volume	2	30	4	36	1	3	3	7	1	34	0	35	5	4	7	16	94
% App. Total	5.6	83.3	11.1		14.3	42.9	42.9		2.9	97.1	0		31.2	25	43.8		
PHF	.500	.682	.500	.643	.250	.375	.250	.350	.250	.773	.000	.795	.313	.500	.583	.667	.783

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Site Code : 10111.31
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Page No : 1

Groups Printed- Peds and Bicycles

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	1	0	4
07:15 AM	0	0	0	0	0	0	0	3	0	5	0	1	0	0	0	0	9
07:30 AM	0	2	0	1	0	0	0	2	0	0	0	1	0	0	0	0	6
07:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
Total	0	5	0	1	0	0	0	7	0	5	0	2	0	0	2	0	22
08:00 AM	0	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	4
08:15 AM	1	1	0	4	0	0	1	2	0	0	0	1	0	0	0	0	10
08:30 AM	0	0	0	0	0	1	0	2	0	0	1	3	0	0	0	0	7
08:45 AM	0	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	11
Total	1	2	0	14	0	1	1	6	0	1	1	5	0	0	0	0	32
Grand Total	1	7	0	15	0	1	1	13	0	6	1	7	0	0	2	0	54
Apprch %	4.3	30.4	0	65.2	0	6.7	6.7	86.7	0	42.9	7.1	50	0	0	100	0	
Total %	1.9	13	0	27.8	0	1.9	1.9	24.1	0	11.1	1.9	13	0	0	3.7	0	

	McArthur Drive From North					State Pier From East					McArthur Drive From South					Union Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	**2**	2	0	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**4**
08:15 AM	**1**	**1**	0	4	6	0	0	**1**	**2**	**3**	0	0	0	1	1	0	0	0	0	0	10
08:30 AM	0	0	0	0	0	0	**1**	**0**	**2**	**3**	**0**	**0**	**1**	**3**	**4**	0	0	0	0	0	7
08:45 AM	0	1	0	**10**	**11**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**11**
Total Volume	1	2	0	14	17	0	1	1	6	8	0	1	1	5	7	0	0	0	0	0	32
% App. Total	5.9	11.8	0	82.4		0	12.5	12.5	75		0	14.3	14.3	71.4		0	0	0	0		
PHF	.250	.500	.000	.350	.386	.000	.250	.250	.750	.667	.000	.250	.250	.417	.438	.000	.000	.000	.000	.000	.727

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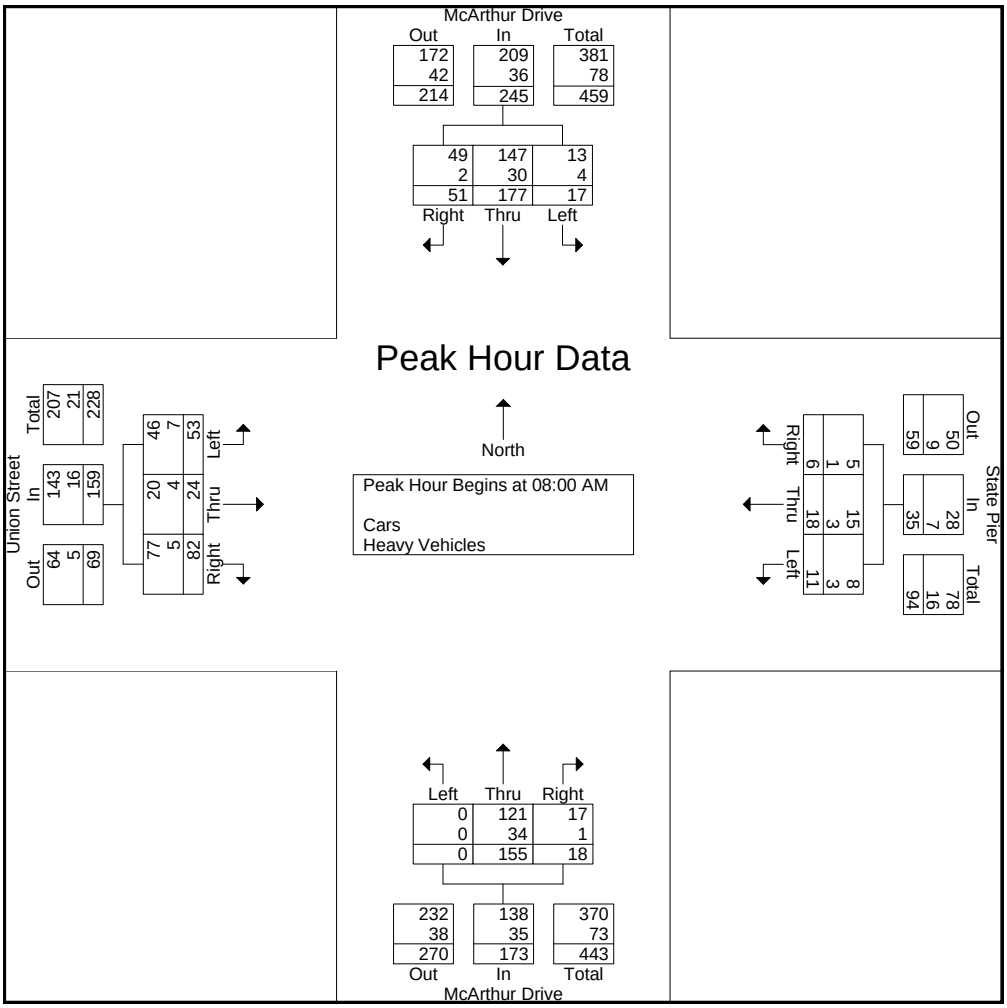
Client: VHB/J. Quitter

File Name : 81676 C-G
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	11	33	3	47	0	4	1	5	**5**	34	0	39	24	**8**	9	41	132
08:15 AM	13	39	4	56	0	3	2	5	5	34	0	39	**27**	6	17	**50**	150
08:30 AM	13	51	**7**	**71**	**5**	4	2	11	4	**45**	0	**49**	15	2	9	26	157
08:45 AM	**14**	**54**	3	71	1	**7**	**6**	**14**	4	42	0	46	16	8	**18**	42	**173**
Total Volume	51	177	17	245	6	18	11	35	18	155	0	173	82	24	53	159	612
% App. Total	20.8	72.2	6.9		17.1	51.4	31.4		10.4	89.6	0		51.6	15.1	33.3		
PHF	.911	.819	.607	.863	.300	.643	.458	.625	.900	.861	.000	.883	.759	.750	.736	.795	.884
Cars	49	147	13	209	5	15	8	28	17	121	0	138	77	20	46	143	518
% Cars	96.1	83.1	76.5	85.3	83.3	83.3	72.7	80.0	94.4	78.1	0	79.8	93.9	83.3	86.8	89.9	84.6
Heavy Vehicles	2	30	4	36	1	3	3	7	1	34	0	35	5	4	7	16	94
% Heavy Vehicles	3.9	16.9	23.5	14.7	16.7	16.7	27.3	20.0	5.6	21.9	0	20.2	6.1	16.7	13.2	10.1	15.4



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File Name : 81676 C-GGG
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	30	72	1	1	5	0	3	71	0	12	0	11	206
04:15 PM	17	42	0	0	3	0	1	45	0	8	2	11	129
04:30 PM	28	65	3	1	4	0	1	45	0	8	0	8	163
04:45 PM	22	57	3	2	3	2	0	38	1	9	2	12	151
Total	97	236	7	4	15	2	5	199	1	37	4	42	649
05:00 PM	24	48	0	1	6	1	5	63	0	9	2	4	163
05:15 PM	10	35	0	1	1	0	2	34	0	9	1	5	98
05:30 PM	13	47	0	1	1	0	1	30	0	9	1	7	110
05:45 PM	14	39	0	2	2	0	0	25	1	6	3	5	97
Total	61	169	0	5	10	1	8	152	1	33	7	21	468
Grand Total	158	405	7	9	25	3	13	351	2	70	11	63	1117
Apprch %	27.7	71.1	1.2	24.3	67.6	8.1	3.6	95.9	0.5	48.6	7.6	43.8	
Total %	14.1	36.3	0.6	0.8	2.2	0.3	1.2	31.4	0.2	6.3	1	5.6	
Cars	157	389	7	8	25	3	12	337	2	61	10	62	1073
% Cars	99.4	96	100	88.9	100	100	92.3	96	100	87.1	90.9	98.4	96.1
Heavy Vehicles	1	16	0	1	0	0	1	14	0	9	1	1	44
% Heavy Vehicles	0.6	4	0	11.1	0	0	7.7	4	0	12.9	9.1	1.6	3.9

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**30**	**72**	1	**103**	1	**5**	0	6	**3**	**71**	0	**74**	**12**	0	11	**23**	**206**
04:15 PM	17	42	0	59	0	3	0	3	1	45	0	46	8	**2**	11	21	129
04:30 PM	28	65	**3**	96	1	4	0	5	1	45	0	46	8	0	8	16	163
04:45 PM	22	57	3	82	**2**	3	**2**	**7**	0	38	**1**	39	9	2	**12**	23	151
Total Volume	97	236	7	340	4	15	2	21	5	199	1	205	37	4	42	83	649
% App. Total	28.5	69.4	2.1		19	71.4	9.5		2.4	97.1	0.5		44.6	4.8	50.6		
PHF	.808	.819	.583	.825	.500	.750	.250	.750	.417	.701	.250	.693	.771	.500	.875	.902	.788
Cars	96	223	7	326	3	15	2	20	4	188	1	193	31	3	42	76	615
% Cars	99.0	94.5	100	95.9	75.0	100	100	95.2	80.0	94.5	100	94.1	83.8	75.0	100	91.6	94.8
Heavy Vehicles	1	13	0	14	1	0	0	1	1	11	0	12	6	1	0	7	34
% Heavy Vehicles	1.0	5.5	0	4.1	25.0	0	0	4.8	20.0	5.5	0	5.9	16.2	25.0	0	8.4	5.2

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Page No : 1

Groups Printed- Cars

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	29	67	1	1	5	0	2	66	0	11	0	11	193
04:15 PM	17	40	0	0	3	0	1	42	0	6	2	11	122
04:30 PM	28	60	3	1	4	0	1	42	0	7	0	8	154
04:45 PM	22	56	3	1	3	2	0	38	1	7	1	12	146
Total	96	223	7	3	15	2	4	188	1	31	3	42	615
05:00 PM	24	47	0	1	6	1	5	62	0	8	2	4	160
05:15 PM	10	33	0	1	1	0	2	34	0	9	1	5	96
05:30 PM	13	47	0	1	1	0	1	29	0	8	1	7	108
05:45 PM	14	39	0	2	2	0	0	24	1	5	3	4	94
Total	61	166	0	5	10	1	8	149	1	30	7	20	458
Grand Total	157	389	7	8	25	3	12	337	2	61	10	62	1073
Apprch %	28.4	70.3	1.3	22.2	69.4	8.3	3.4	96	0.6	45.9	7.5	46.6	
Total %	14.6	36.3	0.7	0.7	2.3	0.3	1.1	31.4	0.2	5.7	0.9	5.8	

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**29**	**67**	1	**97**	**1**	**5**	0	**6**	**2**	**66**	0	**68**	**11**	0	11	**22**	**193**
04:15 PM	17	40	0	57	0	3	0	3	1	42	0	43	6	**2**	11	19	122
04:30 PM	28	60	**3**	91	1	4	0	5	1	42	0	43	7	0	8	15	154
04:45 PM	22	56	3	81	1	3	**2**	6	0	38	**1**	39	7	1	**12**	20	146
Total Volume	96	223	7	326	3	15	2	20	4	188	1	193	31	3	42	76	615
% App. Total	29.4	68.4	2.1		15	75	10		2.1	97.4	0.5		40.8	3.9	55.3		
PHF	.828	.832	.583	.840	.750	.750	.250	.833	.500	.712	.250	.710	.705	.375	.875	.864	.797

PRECISION
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N/S: McArthur Drive
E/W: State Pier/Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-GGG
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

Groups Printed- Heavy Vehicles

	McArthur Drive From North			State Pier From East			McArthur Drive From South			Union Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	5	0	0	0	0	1	5	0	1	0	0	13
04:15 PM	0	2	0	0	0	0	0	3	0	2	0	0	7
04:30 PM	0	5	0	0	0	0	0	3	0	1	0	0	9
04:45 PM	0	1	0	1	0	0	0	0	0	2	1	0	5
Total	1	13	0	1	0	0	1	11	0	6	1	0	34
05:00 PM	0	1	0	0	0	0	0	1	0	1	0	0	3
05:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	2
05:45 PM	0	0	0	0	0	0	0	1	0	1	0	1	3
Total	0	3	0	0	0	0	0	3	0	3	0	1	10
Grand Total	1	16	0	1	0	0	1	14	0	9	1	1	44
Apprch %	5.9	94.1	0	100	0	0	6.7	93.3	0	81.8	9.1	9.1	
Total %	2.3	36.4	0	2.3	0	0	2.3	31.8	0	20.5	2.3	2.3	

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**5**	0	**6**	0	0	0	0	**1**	**5**	0	**6**	1	0	0	1	**13**
04:15 PM	0	2	0	2	0	0	0	0	0	3	0	3	**2**	0	0	2	7
04:30 PM	0	5	0	5	0	0	0	0	0	3	0	3	1	0	0	1	9
04:45 PM	0	1	0	1	**1**	0	0	**1**	0	0	0	0	2	**1**	0	**3**	5
Total Volume	1	13	0	14	1	0	0	1	1	11	0	12	6	1	0	7	34
% App. Total	7.1	92.9	0		100	0	0		8.3	91.7	0		85.7	14.3	0		
PHF	.250	.650	.000	.583	.250	.000	.000	.250	.250	.550	.000	.500	.750	.250	.000	.583	.654

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N/S: McArthur Drive
E/W: State Pier/Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-GGG
Site Code : 10111.31
Start Date : 9/30/2008

Groups Printed- Peds and Bicycles

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	2	0	3	0	0	0	3	0	1	2	2	1	0	0	0	14
04:15 PM	0	3	0	3	1	0	1	4	0	10	0	3	1	0	0	1	27
04:30 PM	1	1	0	3	0	0	0	1	0	1	0	3	0	0	0	1	11
04:45 PM	0	1	0	5	0	0	0	0	0	1	0	0	0	0	0	0	7
Total	1	7	0	14	1	0	1	8	0	13	2	8	2	0	0	2	59
05:00 PM	0	1	0	2	0	0	0	0	0	5	0	0	0	0	0	0	8
05:15 PM	1	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	5
05:30 PM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	4
05:45 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	6
Total	1	1	0	4	0	0	0	6	0	8	0	3	0	0	0	0	23
Grand Total	2	8	0	18	1	0	1	14	0	21	2	11	2	0	0	2	82
Apprch %	7.1	28.6	0	64.3	6.2	0	6.2	87.5	0	61.8	5.9	32.4	50	0	0	50	
Total %	2.4	9.8	0	22	1.2	0	1.2	17.1	0	25.6	2.4	13.4	2.4	0	0	2.4	

	McArthur Drive From North					State Pier From East					McArthur Drive From South					Union Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	2	0	3	5	0	0	0	3	3	0	1	**2**	2	5	**1**	**0**	**0**	**0**	**1**	**14**
04:15 PM	**0**	**3**	0	3	**6**	**1**	0	**1**	**4**	**6**	0	**10**	**0**	**3**	**13**	1	0	0	**1**	**2**	**27**
04:30 PM	**1**	**1**	**0**	**3**	**5**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**3**	**4**	**0**	**0**	**0**	**1**	**1**	**11**
04:45 PM	**0**	**1**	**0**	**5**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**7**
Total Volume	1	7	0	14	22	1	0	1	8	10	0	13	2	8	23	2	0	0	2	4	59
% App. Total	4.5	31.8	0	63.6		10	0	10	80		0	56.5	8.7	34.8		50	0	0	50		
PHF	.250	.583	.000	.700	.917	.250	.000	.250	.500	.417	.000	.325	.250	.667	.442	.500	.000	.000	.500	.500	.546

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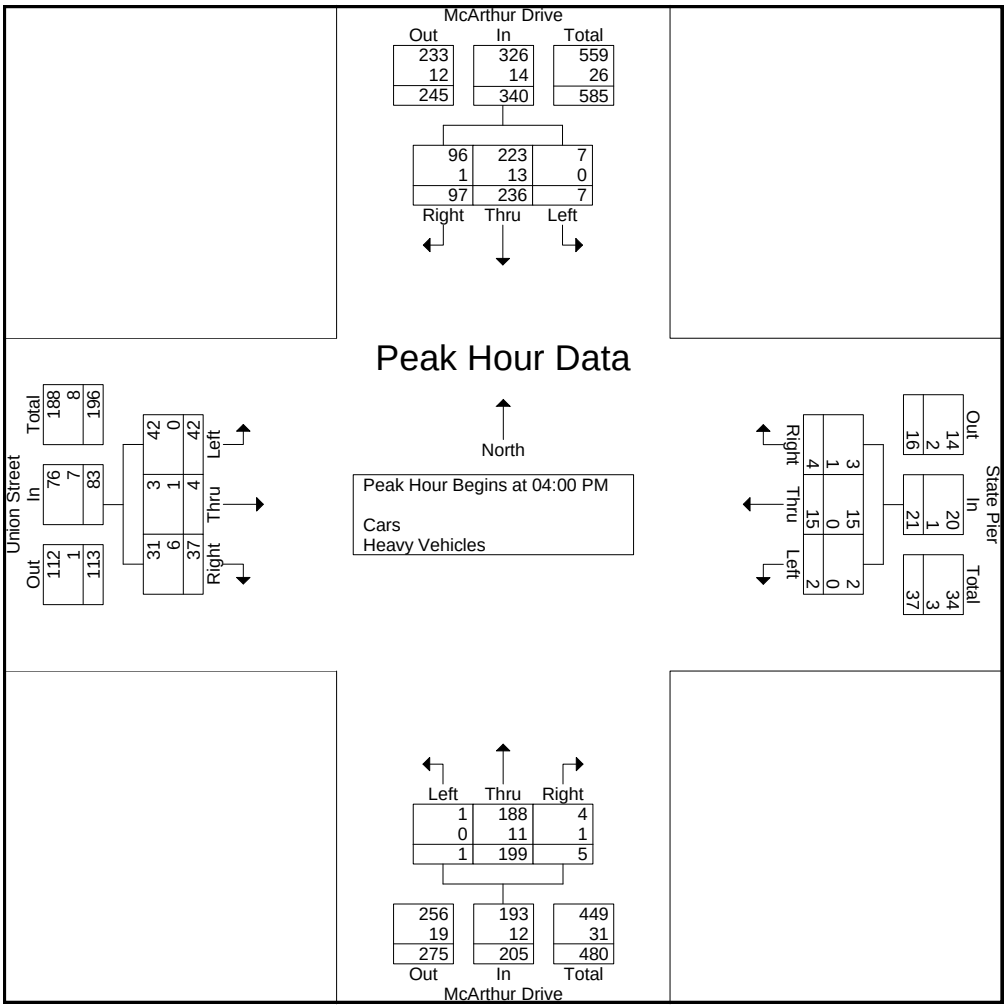
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 C-GGG
Site Code : 10111.31
Start Date : 9/30/2008
Page No : 1

	McArthur Drive From North				State Pier From East				McArthur Drive From South				Union Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**30**	**72**	1	**103**	1	**5**	0	6	**3**	**71**	0	**74**	**12**	0	11	**23**	**206**
04:15 PM	17	42	0	59	0	3	0	3	1	45	0	46	8	**2**	11	21	129
04:30 PM	28	65	**3**	96	1	4	0	5	1	45	0	46	8	0	8	16	163
04:45 PM	22	57	3	82	**2**	3	**2**	**7**	0	38	**1**	39	9	2	**12**	23	151
Total Volume	97	236	7	340	4	15	2	21	5	199	1	205	37	4	42	83	649
% App. Total	28.5	69.4	2.1		19	71.4	9.5		2.4	97.1	0.5		44.6	4.8	50.6		
PHF	.808	.819	.583	.825	.500	.750	.250	.750	.417	.701	.250	.693	.771	.500	.875	.902	.788
Cars	96	223	7	326	3	15	2	20	4	188	1	193	31	3	42	76	615
% Cars	99.0	94.5	100	95.9	75.0	100	100	95.2	80.0	94.5	100	94.1	83.8	75.0	100	91.6	94.8
Heavy Vehicles	1	13	0	14	1	0	0	1	1	11	0	12	6	1	0	7	34
% Heavy Vehicles	1.0	5.5	0	4.1	25.0	0	0	4.8	20.0	5.5	0	5.9	16.2	25.0	0	8.4	5.2



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 9/24/08 and Sat 9/27/08	81676	New Bedford, MA

PRECISION
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N/S: Purchase Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- A
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	23	8	9	23	5	4	29	2	1	29	3	137
07:15 AM	2	18	17	17	21	3	9	41	2	2	28	3	163
07:30 AM	2	28	17	22	28	4	9	45	2	0	41	4	202
07:45 AM	0	47	23	25	17	7	14	43	2	3	45	2	228
Total	5	116	65	73	89	19	36	158	8	6	143	12	730
08:00 AM	16	34	22	26	28	16	24	44	3	13	25	8	259
08:15 AM	0	29	31	21	26	4	9	38	5	6	50	7	226
08:30 AM	0	36	14	16	28	10	11	58	1	1	32	0	207
08:45 AM	3	35	19	23	29	6	11	61	5	6	17	0	215
Total	19	134	86	86	111	36	55	201	14	26	124	15	907
Grand Total	24	250	151	159	200	55	91	359	22	32	267	27	1637
Apprch %	5.6	58.8	35.5	38.4	48.3	13.3	19.3	76.1	4.7	9.8	81.9	8.3	
Total %	1.5	15.3	9.2	9.7	12.2	3.4	5.6	21.9	1.3	2	16.3	1.6	
Cars	19	223	141	149	193	51	89	338	18	30	257	26	1534
% Cars	79.2	89.2	93.4	93.7	96.5	92.7	97.8	94.2	81.8	93.8	96.3	96.3	93.7
Heavy Vehicles	5	27	10	10	7	4	2	21	4	2	10	1	103
% Heavy Vehicles	20.8	10.8	6.6	6.3	3.5	7.3	2.2	5.8	18.2	6.2	3.7	3.7	6.3

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**47**	23	70	25	17	7	49	14	43	2	59	3	45	2	50	228
08:00 AM	**16**	34	22	**72**	**26**	**28**	**16**	**70**	**24**	44	3	**71**	**13**	25	**8**	46	**259**
08:15 AM	0	29	**31**	60	21	26	4	51	9	38	**5**	52	6	**50**	7	**63**	226
08:30 AM	0	36	14	50	16	28	10	54	11	**58**	1	70	1	32	0	33	207
Total Volume	16	146	90	252	88	99	37	224	58	183	11	252	23	152	17	192	920
% App. Total	6.3	57.9	35.7		39.3	44.2	16.5		23	72.6	4.4		12	79.2	8.9		
PHF	.250	.777	.726	.875	.846	.884	.578	.800	.604	.789	.550	.887	.442	.760	.531	.762	.888
Cars	14	130	85	229	82	94	33	209	56	176	7	239	23	146	17	186	863
% Cars	87.5	89.0	94.4	90.9	93.2	94.9	89.2	93.3	96.6	96.2	63.6	94.8	100	96.1	100	96.9	93.8
Heavy Vehicles	2	16	5	23	6	5	4	15	2	7	4	13	0	6	0	6	57
% Heavy Vehicles	12.5	11.0	5.6	9.1	6.8	5.1	10.8	6.7	3.4	3.8	36.4	5.2	0	3.9	0	3.1	6.2

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N/S: Purchase Street
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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- A
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	23	7	7	23	5	4	27	2	0	29	2	129
07:15 AM	2	15	16	17	21	3	9	36	2	2	28	3	154
07:30 AM	1	25	15	21	27	4	9	43	2	0	37	4	188
07:45 AM	0	44	21	24	17	4	13	41	0	3	43	2	212
Total	3	107	59	69	88	16	35	147	6	5	137	11	683
08:00 AM	14	26	21	25	26	15	24	42	3	13	24	8	241
08:15 AM	0	26	31	19	25	4	9	36	3	6	50	7	216
08:30 AM	0	34	12	14	26	10	10	57	1	1	29	0	194
08:45 AM	2	30	18	22	28	6	11	56	5	5	17	0	200
Total	16	116	82	80	105	35	54	191	12	25	120	15	851
Grand Total	19	223	141	149	193	51	89	338	18	30	257	26	1534
Apprch %	5	58.2	36.8	37.9	49.1	13	20	76	4	9.6	82.1	8.3	
Total %	1.2	14.5	9.2	9.7	12.6	3.3	5.8	22	1.2	2	16.8	1.7	

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**44**	21	**65**	24	17	4	45	13	41	0	54	3	43	2	48	212
08:00 AM	**14**	26	21	61	**25**	**26**	**15**	**66**	**24**	42	**3**	**69**	**13**	24	**8**	45	**241**
08:15 AM	0	26	**31**	57	19	25	4	48	9	36	3	48	6	**50**	7	**63**	216
08:30 AM	0	34	12	46	14	26	10	50	10	**57**	1	68	1	29	0	30	194
Total Volume	14	130	85	229	82	94	33	209	56	176	7	239	23	146	17	186	863
% App. Total	6.1	56.8	37.1		39.2	45	15.8		23.4	73.6	2.9		12.4	78.5	9.1		
PHF	.250	.739	.685	.881	.820	.904	.550	.792	.583	.772	.583	.866	.442	.730	.531	.738	.895

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- A
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	0	1	2	0	0	0	2	0	1	0	1	8
07:15 AM	0	3	1	0	0	0	0	5	0	0	0	0	9
07:30 AM	1	3	2	1	1	0	0	2	0	0	4	0	14
07:45 AM	0	3	2	1	0	3	1	2	2	0	2	0	16
Total	2	9	6	4	1	3	1	11	2	1	6	1	47
08:00 AM	2	8	1	1	2	1	0	2	0	0	1	0	18
08:15 AM	0	3	0	2	1	0	0	2	2	0	0	0	10
08:30 AM	0	2	2	2	2	0	1	1	0	0	3	0	13
08:45 AM	1	5	1	1	1	0	0	5	0	1	0	0	15
Total	3	18	4	6	6	1	1	10	2	1	4	0	56
Grand Total	5	27	10	10	7	4	2	21	4	2	10	1	103
Apprch %	11.9	64.3	23.8	47.6	33.3	19	7.4	77.8	14.8	15.4	76.9	7.7	
Total %	4.9	26.2	9.7	9.7	6.8	3.9	1.9	20.4	3.9	1.9	9.7	1	

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	3	**2**	6	1	1	0	2	0	**2**	0	2	0	**4**	0	**4**	14
07:45 AM	0	3	2	5	1	0	**3**	**4**	**1**	2	**2**	**5**	0	2	0	2	16
08:00 AM	**2**	**8**	1	**11**	1	**2**	1	4	0	2	0	2	0	1	0	1	**18**
08:15 AM	0	3	0	3	**2**	1	0	3	0	2	2	4	0	0	0	0	10
Total Volume	3	17	5	25	5	4	4	13	1	8	4	13	0	7	0	7	58
% App. Total	12	68	20		38.5	30.8	30.8		7.7	61.5	30.8		0	100	0		
PHF	.375	.531	.625	.568	.625	.500	.333	.813	.250	1.000	.500	.650	.000	.438	.000	.438	.806

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File Name : 81676D- A
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	2	1	0	0	0	1	0	0	0	0	5
07:15 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	2	5
07:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	3
07:45 AM	0	0	0	5	0	0	0	0	0	0	0	13	0	0	0	13	31
Total	0	1	0	9	0	0	2	1	0	0	0	15	0	1	0	15	44
08:00 AM	0	0	0	9	0	0	0	8	0	0	0	69	0	0	0	24	110
08:15 AM	0	0	0	1	0	0	0	1	1	0	0	26	0	0	0	0	29
08:30 AM	0	0	0	2	0	0	0	1	0	0	0	3	0	0	0	7	13
08:45 AM	0	0	0	1	0	0	0	0	2	0	0	3	0	0	0	1	7
Total	0	0	0	13	0	0	0	10	3	0	0	101	0	0	0	32	159
Grand Total	0	1	0	22	0	0	2	11	3	0	0	116	0	1	0	47	203
Apprch %	0	4.3	0	95.7	0	0	15.4	84.6	2.5	0	0	97.5	0	2.1	0	97.9	
Total %	0	0.5	0	10.8	0	0	1	5.4	1.5	0	0	57.1	0	0.5	0	23.2	

	Purchase Street From North					Coggeshall Street From East					Purchase Street From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	5	5	0	0	0	0	0	0	0	0	13	13	0	0	0	13	13	31
08:00 AM	0	0	0	**9**	**9**	0	0	0	**8**	**8**	0	0	0	**69**	**69**	0	0	0	**24**	**24**	**110**
08:15 AM	0	0	0	1	1	0	0	0	1	1	**1**	**0**	**0**	**26**	**27**	**0**	**0**	**0**	**0**	**0**	**29**
08:30 AM	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**7**	**7**	**13**
Total Volume	0	0	0	17	17	0	0	0	10	10	1	0	0	111	112	0	0	0	44	44	183
% App. Total	0	0	0	100		0	0	0	100		0.9	0	0	99.1		0	0	0	100		
PHF	.000	.000	.000	.472	.472	.000	.000	.000	.313	.313	.250	.000	.000	.402	.406	.000	.000	.000	.458	.458	.416

PRECISION
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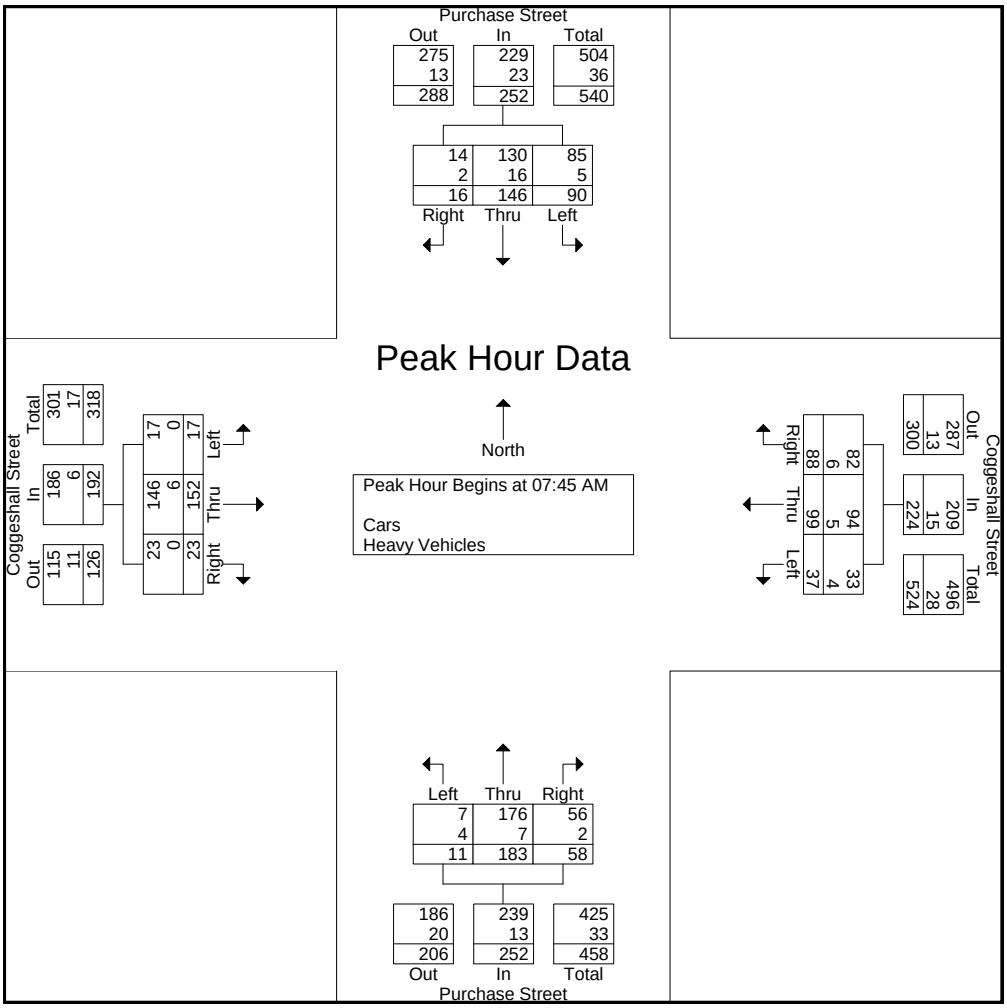
N/S: Purchase Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- A
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**47**	23	70	25	17	7	49	14	43	2	59	3	45	2	50	228
08:00 AM	**16**	34	22	**72**	**26**	**28**	**16**	**70**	**24**	44	3	**71**	**13**	25	**8**	46	**259**
08:15 AM	0	29	**31**	60	21	26	4	51	9	38	**5**	52	6	**50**	7	**63**	226
08:30 AM	0	36	14	50	16	28	10	54	11	**58**	1	70	1	32	0	33	207
Total Volume	16	146	90	252	88	99	37	224	58	183	11	252	23	152	17	192	920
% App. Total	6.3	57.9	35.7		39.3	44.2	16.5		23	72.6	4.4		12	79.2	8.9		
PHF	.250	.777	.726	.875	.846	.884	.578	.800	.604	.789	.550	.887	.442	.760	.531	.762	.888
Cars	14	130	85	229	82	94	33	209	56	176	7	239	23	146	17	186	863
% Cars	87.5	89.0	94.4	90.9	93.2	94.9	89.2	93.3	96.6	96.2	63.6	94.8	100	96.1	100	96.9	93.8
Heavy Vehicles	2	16	5	23	6	5	4	15	2	7	4	13	0	6	0	6	57
% Heavy Vehicles	12.5	11.0	5.6	9.1	6.8	5.1	10.8	6.7	3.4	3.8	36.4	5.2	0	3.9	0	3.1	6.2



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E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- AAA
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	51	27	29	32	7	23	96	10	3	35	2	316
04:15 PM	2	44	24	20	24	7	22	72	2	4	37	0	258
04:30 PM	2	53	26	27	35	3	23	63	7	2	22	1	264
04:45 PM	3	54	26	22	48	3	14	91	3	3	33	3	303
Total	8	202	103	98	139	20	82	322	22	12	127	6	1141
05:00 PM	5	47	27	19	32	4	17	69	14	1	30	0	265
05:15 PM	4	44	16	24	26	8	22	70	11	3	37	0	265
05:30 PM	0	46	19	22	38	8	18	61	3	0	21	2	238
05:45 PM	1	36	31	14	43	6	8	71	5	4	31	1	251
Total	10	173	93	79	139	26	65	271	33	8	119	3	1019
Grand Total	18	375	196	177	278	46	147	593	55	20	246	9	2160
Apprch %	3.1	63.7	33.3	35.3	55.5	9.2	18.5	74.6	6.9	7.3	89.5	3.3	
Total %	0.8	17.4	9.1	8.2	12.9	2.1	6.8	27.5	2.5	0.9	11.4	0.4	
Cars	18	360	191	173	278	46	144	565	54	19	244	9	2101
% Cars	100	96	97.4	97.7	100	100	98	95.3	98.2	95	99.2	100	97.3
Heavy Vehicles	0	15	5	4	0	0	3	28	1	1	2	0	59
% Heavy Vehicles	0	4	2.6	2.3	0	0	2	4.7	1.8	5	0.8	0	2.7

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	51	**27**	79	**29**	32	**7**	68	**23**	**96**	**10**	**129**	3	35	2	40	**316**
04:15 PM	2	44	24	70	20	24	7	51	22	72	2	96	**4**	**37**	0	**41**	258
04:30 PM	2	53	26	81	27	35	3	65	23	63	7	93	2	22	1	25	264
04:45 PM	**3**	**54**	26	**83**	22	**48**	3	**73**	14	91	3	108	3	33	**3**	39	303
Total Volume	8	202	103	313	98	139	20	257	82	322	22	426	12	127	6	145	1141
% App. Total	2.6	64.5	32.9		38.1	54.1	7.8		19.2	75.6	5.2		8.3	87.6	4.1		
PHF	.667	.935	.954	.943	.845	.724	.714	.880	.891	.839	.550	.826	.750	.858	.500	.884	.903
Cars	8	194	98	300	95	139	20	254	79	308	22	409	11	125	6	142	1105
% Cars	100	96.0	95.1	95.8	96.9	100	100	98.8	96.3	95.7	100	96.0	91.7	98.4	100	97.9	96.8
Heavy Vehicles	0	8	5	13	3	0	0	3	3	14	0	17	1	2	0	3	36
% Heavy Vehicles	0	4.0	4.9	4.2	3.1	0	0	1.2	3.7	4.3	0	4.0	8.3	1.6	0	2.1	3.2

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- AAA
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	49	27	29	32	7	22	94	10	3	35	2	311
04:15 PM	2	42	23	18	24	7	21	68	2	3	36	0	246
04:30 PM	2	51	25	27	35	3	22	60	7	2	21	1	256
04:45 PM	3	52	23	21	48	3	14	86	3	3	33	3	292
Total	8	194	98	95	139	20	79	308	22	11	125	6	1105
05:00 PM	5	47	27	19	32	4	17	66	13	1	30	0	261
05:15 PM	4	42	16	24	26	8	22	67	11	3	37	0	260
05:30 PM	0	43	19	22	38	8	18	58	3	0	21	2	232
05:45 PM	1	34	31	13	43	6	8	66	5	4	31	1	243
Total	10	166	93	78	139	26	65	257	32	8	119	3	996
Grand Total	18	360	191	173	278	46	144	565	54	19	244	9	2101
Apprch %	3.2	63.3	33.6	34.8	55.9	9.3	18.9	74	7.1	7	89.7	3.3	
Total %	0.9	17.1	9.1	8.2	13.2	2.2	6.9	26.9	2.6	0.9	11.6	0.4	

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	49	**27**	77	**29**	32	**7**	68	**22**	**94**	**10**	**126**	**3**	35	2	**40**	**311**
04:15 PM	2	42	23	67	18	24	7	49	21	68	2	91	3	**36**	0	39	246
04:30 PM	2	51	25	**78**	27	35	3	65	22	60	7	89	2	21	1	24	256
04:45 PM	**3**	**52**	23	78	21	**48**	3	**72**	14	86	3	103	3	33	**3**	39	292
Total Volume	8	194	98	300	95	139	20	254	79	308	22	409	11	125	6	142	1105
% App. Total	2.7	64.7	32.7		37.4	54.7	7.9		19.3	75.3	5.4		7.7	88	4.2		
PHF	.667	.933	.907	.962	.819	.724	.714	.882	.898	.819	.550	.812	.917	.868	.500	.888	.888

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- AAA
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			Coggeshall Street From East			Purchase Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	0	0	1	2	0	0	0	0	5
04:15 PM	0	2	1	2	0	0	1	4	0	1	1	0	12
04:30 PM	0	2	1	0	0	0	1	3	0	0	1	0	8
04:45 PM	0	2	3	1	0	0	0	5	0	0	0	0	11
Total	0	8	5	3	0	0	3	14	0	1	2	0	36
05:00 PM	0	0	0	0	0	0	0	3	1	0	0	0	4
05:15 PM	0	2	0	0	0	0	0	3	0	0	0	0	5
05:30 PM	0	3	0	0	0	0	0	3	0	0	0	0	6
05:45 PM	0	2	0	1	0	0	0	5	0	0	0	0	8
Total	0	7	0	1	0	0	0	14	1	0	0	0	23
Grand Total	0	15	5	4	0	0	3	28	1	1	2	0	59
Apprch %	0	75	25	100	0	0	9.4	87.5	3.1	33.3	66.7	0	
Total %	0	25.4	8.5	6.8	0	0	5.1	47.5	1.7	1.7	3.4	0	

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**2**	0	2	0	0	0	0	**1**	2	0	3	0	0	0	0	5
04:15 PM	0	2	1	3	**2**	0	0	**2**	1	4	0	**5**	**1**	**1**	0	**2**	**12**
04:30 PM	0	2	1	3	0	0	0	0	1	3	0	4	0	1	0	1	8
04:45 PM	0	2	**3**	**5**	1	0	0	1	0	**5**	0	5	0	0	0	0	11
Total Volume	0	8	5	13	3	0	0	3	3	14	0	17	1	2	0	3	36
% App. Total	0	61.5	38.5		100	0	0		17.6	82.4	0		33.3	66.7	0		
PHF	.000	1.000	.417	.650	.375	.000	.000	.375	.750	.700	.000	.850	.250	.500	.000	.375	.750

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- AAA
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	1	7
04:15 PM	0	0	0	1	0	0	0	4	1	1	0	5	0	0	0	0	12
04:30 PM	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	4
04:45 PM	0	2	0	2	0	1	0	1	0	2	0	1	0	0	0	2	11
Total	0	3	0	6	0	1	0	8	1	4	0	8	0	0	0	3	34
05:00 PM	0	0	0	2	0	1	0	5	0	0	0	0	0	1	0	1	10
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	1	0	1	0	2	0	1	0	1	0	4	0	1	0	0	11
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	1	0	3	0	3	0	7	0	1	0	5	0	2	0	1	23
Grand Total	0	4	0	9	0	4	0	15	1	5	0	13	0	2	0	4	57
Apprch %	0	30.8	0	69.2	0	21.1	0	78.9	5.3	26.3	0	68.4	0	33.3	0	66.7	
Total %	0	7	0	15.8	0	7	0	26.3	1.8	8.8	0	22.8	0	3.5	0	7	

	Purchase Street From North					Coggeshall Street From East					Purchase Street From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	1	1	0	0	0	4	4	**1**	**1**	**0**	**5**	**7**	0	0	0	0	0	**12**
04:30 PM	0	1	0	1	2	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	4
04:45 PM	0	**2**	0	**2**	**4**	0	**1**	**0**	**1**	**2**	**0**	**2**	**0**	**1**	**3**	**0**	**0**	**0**	**2**	**2**	11
05:00 PM	0	0	0	2	2	0	1	0	**5**	**6**	0	0	0	0	0	0	**1**	0	1	2	10
Total Volume	0	3	0	6	9	0	2	0	11	13	1	4	0	6	11	0	1	0	3	4	37
% App. Total	0	33.3	0	66.7		0	15.4	0	84.6		9.1	36.4	0	54.5		0	25	0	75		
PHF	.000	.375	.000	.750	.563	.000	.500	.000	.550	.542	.250	.500	.000	.300	.393	.000	.250	.000	.375	.500	.771

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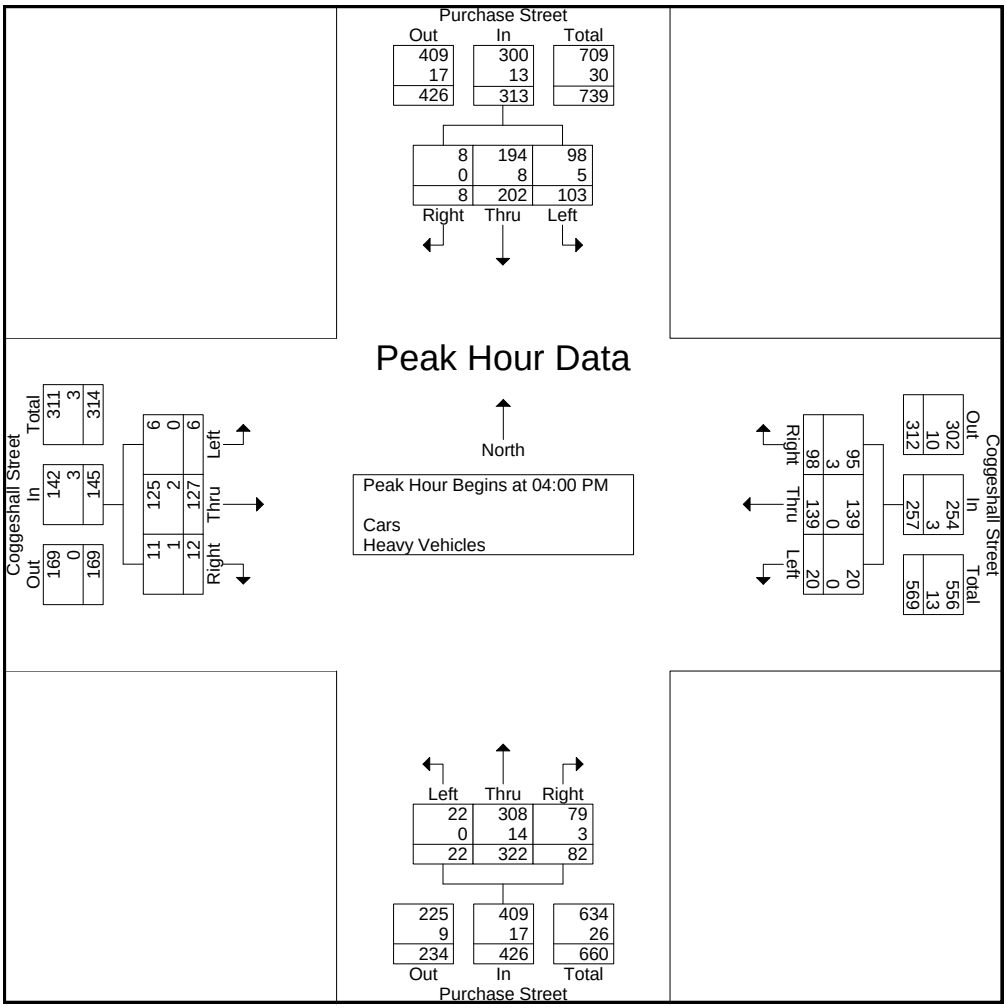
Client: VHB/ J. Quitter

File Name : 81676D- AAA
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Purchase Street From North				Coggeshall Street From East				Purchase Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	51	**27**	79	**29**	32	**7**	68	**23**	**96**	**10**	**129**	3	35	2	40	**316**
04:15 PM	2	44	24	70	20	24	7	51	22	72	2	96	**4**	**37**	0	**41**	258
04:30 PM	2	53	26	81	27	35	3	65	23	63	7	93	2	22	1	25	264
04:45 PM	**3**	**54**	26	**83**	22	**48**	3	**73**	14	91	3	108	3	33	**3**	39	303
Total Volume	8	202	103	313	98	139	20	257	82	322	22	426	12	127	6	145	1141
% App. Total	2.6	64.5	32.9		38.1	54.1	7.8		19.2	75.6	5.2		8.3	87.6	4.1		
PHF	.667	.935	.954	.943	.845	.724	.714	.880	.891	.839	.550	.826	.750	.858	.500	.884	.903
Cars	8	194	98	300	95	139	20	254	79	308	22	409	11	125	6	142	1105
% Cars	100	96.0	95.1	95.8	96.9	100	100	98.8	96.3	95.7	100	96.0	91.7	98.4	100	97.9	96.8
Heavy Vehicles	0	8	5	13	3	0	0	3	3	14	0	17	1	2	0	3	36
% Heavy Vehicles	0	4.0	4.9	4.2	3.1	0	0	1.2	3.7	4.3	0	4.0	8.3	1.6	0	2.1	3.2



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E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-B
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	1	5	0	1	0	1	0	0	0	0	0	0	0	3	11
07:15 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	4
07:30 AM	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	8
07:45 AM	0	0	0	3	0	0	0	5	0	0	0	0	0	0	0	0	8
Total	0	1	1	17	0	1	0	6	0	0	0	1	0	0	0	4	31
08:00 AM	0	0	1	4	0	1	0	0	0	0	0	2	0	0	0	6	14
08:15 AM	0	0	0	7	0	0	0	0	0	0	1	2	0	0	0	3	13
08:30 AM	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	1	5
08:45 AM	0	0	0	4	0	0	0	3	0	0	0	3	0	0	0	3	13
Total	0	0	1	17	0	1	0	3	0	0	1	9	0	0	0	13	45
Grand Total	0	1	2	34	0	2	0	9	0	0	1	10	0	0	0	17	76
Apprch %	0	2.7	5.4	91.9	0	18.2	0	81.8	0	0	9.1	90.9	0	0	0	100	
Total %	0	1.3	2.6	44.7	0	2.6	0	11.8	0	0	1.3	13.2	0	0	0	22.4	

	Ashley Boulevard (Route 18) From North					Coggshell Street From East					Route 18 SB Onramp From South					Coggshell Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	**1**	**4**	**5**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**6**	**6**	**14**
08:15 AM	0	0	0	**7**	**7**	0	0	0	0	0	0	0	**1**	2	**3**	0	0	0	3	3	13
08:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	5
08:45 AM	0	0	0	4	4	0	0	0	**3**	**3**	0	0	0	**3**	**3**	**0**	**0**	**0**	**3**	**3**	**13**
Total Volume	0	0	1	17	18	0	1	0	3	4	0	0	1	9	10	0	0	0	13	13	45
% App. Total	0	0	5.6	94.4		0	25	0	75		0	0	10	90		0	0	0	100		
PHF	.000	.000	.250	.607	.643	.000	.250	.000	.250	.333	.000	.000	.250	.750	.833	.000	.000	.000	.542	.542	.804

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-B
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	13	1	0	0	0	0	0	0	3	1	0	19
07:15 AM	0	7	2	0	0	3	0	0	0	0	1	0	13
07:30 AM	0	8	0	0	2	2	0	0	0	0	5	0	17
07:45 AM	1	2	1	0	4	2	0	0	0	0	5	0	15
Total	2	30	4	0	6	7	0	0	0	3	12	0	64
08:00 AM	1	8	2	0	4	1	0	0	0	1	1	0	18
08:15 AM	0	6	2	0	2	1	0	0	0	0	0	0	11
08:30 AM	0	6	3	0	4	0	0	0	0	1	3	0	17
08:45 AM	0	4	0	0	3	1	0	0	0	1	3	0	12
Total	1	24	7	0	13	3	0	0	0	3	7	0	58
Grand Total	3	54	11	0	19	10	0	0	0	6	19	0	122
Apprch %	4.4	79.4	16.2	0	65.5	34.5	0	0	0	24	76	0	
Total %	2.5	44.3	9	0	15.6	8.2	0	0	0	4.9	15.6	0	

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**1**	**13**	1	**15**	0	0	0	0	0	0	0	0	**3**	1	0	4	**19**
07:15 AM	0	7	**2**	9	0	0	**3**	3	0	0	0	0	0	1	0	1	13
07:30 AM	0	8	0	8	0	2	2	4	0	0	0	0	0	**5**	0	**5**	17
07:45 AM	1	2	1	4	0	**4**	2	**6**	0	0	0	0	0	5	0	5	15
Total Volume	2	30	4	36	0	6	7	13	0	0	0	0	3	12	0	15	64
% App. Total	5.6	83.3	11.1		0	46.2	53.8		0	0	0		20	80	0		
PHF	.500	.577	.500	.600	.000	.375	.583	.542	.000	.000	.000	.000	.250	.600	.000	.750	.842

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N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-B
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	125	26	0	31	25	0	0	0	11	32	0	254
07:15 AM	2	139	24	0	44	30	0	0	0	15	39	0	293
07:30 AM	9	140	29	0	41	35	0	0	0	16	37	0	307
07:45 AM	5	195	30	0	45	53	0	0	0	21	50	0	399
Total	20	599	109	0	161	143	0	0	0	63	158	0	1253
08:00 AM	11	142	27	0	41	45	0	0	0	15	47	0	328
08:15 AM	10	156	25	0	43	28	0	0	0	36	53	0	351
08:30 AM	13	150	24	0	43	43	0	0	0	15	30	0	318
08:45 AM	8	136	24	0	47	39	0	0	0	17	27	0	298
Total	42	584	100	0	174	155	0	0	0	83	157	0	1295
Grand Total	62	1183	209	0	335	298	0	0	0	146	315	0	2548
Apprch %	4.3	81.4	14.4	0	52.9	47.1	0	0	0	31.7	68.3	0	
Total %	2.4	46.4	8.2	0	13.1	11.7	0	0	0	5.7	12.4	0	

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	**195**	**30**	**230**	0	**45**	**53**	**98**	0	0	0	0	21	50	0	71	**399**
08:00 AM	11	142	27	180	0	41	45	86	0	0	0	0	15	47	0	62	328
08:15 AM	10	156	25	191	0	43	28	71	0	0	0	0	**36**	**53**	0	**89**	351
08:30 AM	**13**	150	24	187	0	43	43	86	0	0	0	0	15	30	0	45	318
Total Volume	39	643	106	788	0	172	169	341	0	0	0	0	87	180	0	267	1396
% App. Total	4.9	81.6	13.5		0	50.4	49.6		0	0	0		32.6	67.4	0		
PHF	.750	.824	.883	.857	.000	.956	.797	.870	.000	.000	.000	.000	.604	.849	.000	.750	.875

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N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-B
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	138	27	0	31	25	0	0	0	14	33	0	273
07:15 AM	2	146	26	0	44	33	0	0	0	15	40	0	306
07:30 AM	9	148	29	0	43	37	0	0	0	16	42	0	324
07:45 AM	6	197	31	0	49	55	0	0	0	21	55	0	414
Total	22	629	113	0	167	150	0	0	0	66	170	0	1317
08:00 AM	12	150	29	0	45	46	0	0	0	16	48	0	346
08:15 AM	10	162	27	0	45	29	0	0	0	36	53	0	362
08:30 AM	13	156	27	0	47	43	0	0	0	16	33	0	335
08:45 AM	8	140	24	0	50	40	0	0	0	18	30	0	310
Total	43	608	107	0	187	158	0	0	0	86	164	0	1353
Grand Total	65	1237	220	0	354	308	0	0	0	152	334	0	2670
Apprch %	4.3	81.3	14.5	0	53.5	46.5	0	0	0	31.3	68.7	0	
Total %	2.4	46.3	8.2	0	13.3	11.5	0	0	0	5.7	12.5	0	
Cars	62	1183	209	0	335	298	0	0	0	146	315	0	2548
% Cars	95.4	95.6	95	0	94.6	96.8	0	0	0	96.1	94.3	0	95.4
Heavy Vehicles	3	54	11	0	19	10	0	0	0	6	19	0	122
% Heavy Vehicles	4.6	4.4	5	0	5.4	3.2	0	0	0	3.9	5.7	0	4.6

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	6	**197**	**31**	**234**	0	**49**	**55**	**104**	0	0	0	0	21	**55**	0	76	**414**
08:00 AM	12	150	29	191	0	45	46	91	0	0	0	0	16	48	0	64	346
08:15 AM	10	162	27	199	0	45	29	74	0	0	0	0	**36**	53	0	**89**	362
08:30 AM	**13**	156	27	196	0	47	43	90	0	0	0	0	16	33	0	49	335
Total Volume	41	665	114	820	0	186	173	359	0	0	0	0	89	189	0	278	1457
% App. Total	5	81.1	13.9		0	51.8	48.2		0	0	0		32	68	0		
PHF	.788	.844	.919	.876	.000	.949	.786	.863	.000	.000	.000	.000	.618	.859	.000	.781	.880
Cars	39	643	106	788	0	172	169	341	0	0	0	0	87	180	0	267	1396
% Cars	95.1	96.7	93.0	96.1	0	92.5	97.7	95.0	0	0	0	0	97.8	95.2	0	96.0	95.8
Heavy Vehicles	2	22	8	32	0	14	4	18	0	0	0	0	2	9	0	11	61
% Heavy Vehicles	4.9	3.3	7.0	3.9	0	7.5	2.3	5.0	0	0	0	0	2.2	4.8	0	4.0	4.2

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N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

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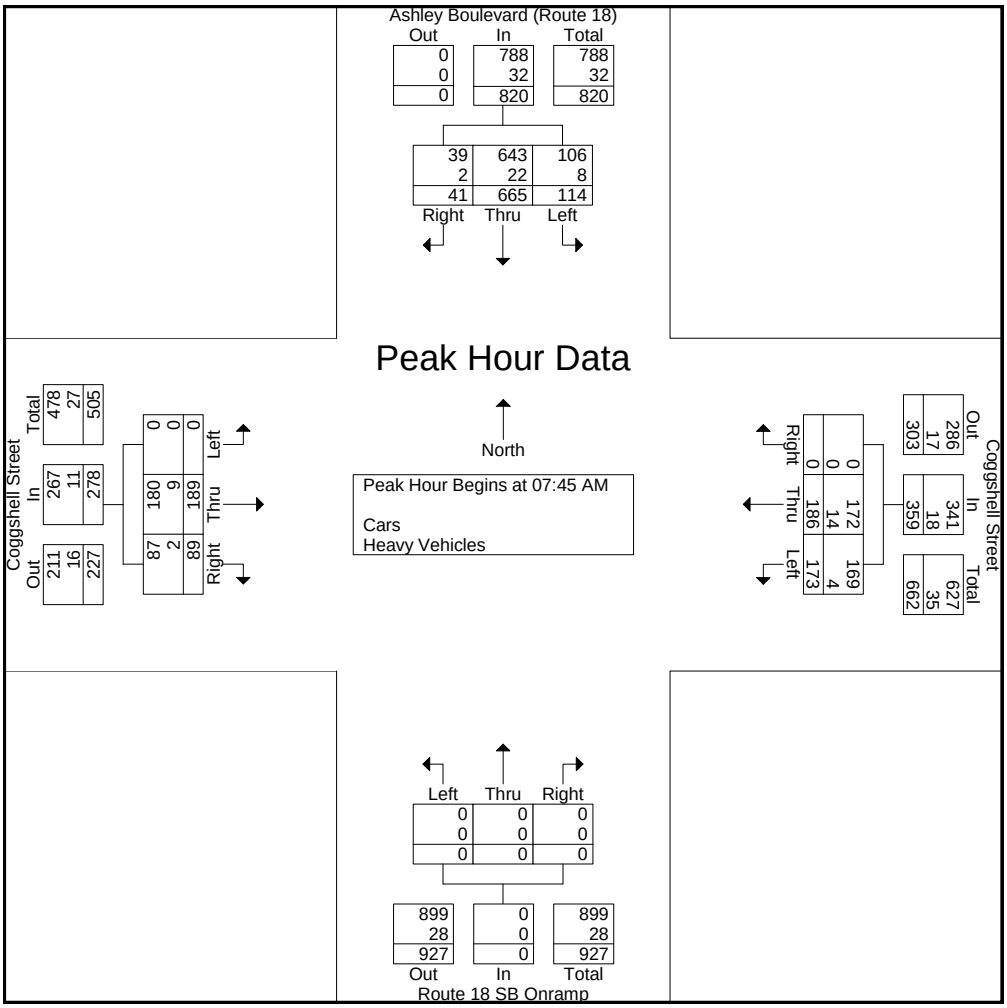
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	6	**197**	**31**	**234**	0	**49**	**55**	**104**	0	0	0	0	21	**55**	0	76	**414**
08:00 AM	12	150	29	191	0	45	46	91	0	0	0	0	16	48	0	64	346
08:15 AM	10	162	27	199	0	45	29	74	0	0	0	0	**36**	53	0	**89**	362
08:30 AM	**13**	156	27	196	0	47	43	90	0	0	0	0	16	33	0	49	335
Total Volume	41	665	114	820	0	186	173	359	0	0	0	0	89	189	0	278	1457
% App. Total	5	81.1	13.9		0	51.8	48.2		0	0	0		32	68	0		
PHF	.788	.844	.919	.876	.000	.949	.786	.863	.000	.000	.000	.000	.618	.859	.000	.781	.880
Cars	39	643	106	788	0	172	169	341	0	0	0	0	87	180	0	267	1396
% Cars	95.1	96.7	93.0	96.1	0	92.5	97.7	95.0	0	0	0	0	97.8	95.2	0	96.0	95.8
Heavy Vehicles	2	22	8	32	0	14	4	18	0	0	0	0	2	9	0	11	61
% Heavy Vehicles	4.9	3.3	7.0	3.9	0	7.5	2.3	5.0	0	0	0	0	2.2	4.8	0	4.0	4.2



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Page No : 1

Groups Printed- Peds and Bicycles

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	4	0	1	7
04:15 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
04:30 PM	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	2	7
04:45 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	2	5
Total	0	0	1	11	0	1	0	0	0	0	0	1	0	4	0	5	23
05:00 PM	0	1	2	2	0	3	0	0	0	0	0	3	0	1	0	4	16
05:15 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	4
05:30 PM	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	4
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	2	7	0	4	0	1	0	0	0	3	0	1	0	6	25
Grand Total	0	1	3	18	0	5	0	1	0	0	0	4	0	5	0	11	48
Apprch %	0	4.5	13.6	81.8	0	83.3	0	16.7	0	0	0	100	0	31.2	0	68.8	
Total %	0	2.1	6.2	37.5	0	10.4	0	2.1	0	0	0	8.3	0	10.4	0	22.9	

	Ashley Boulevard (Route 18) From North					Coggshell Street From East					Route 18 SB Onramp From South					Coggshell Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
04:30 PM	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**2**	**7**
04:45 PM	**0**	**0**	**0**	**2**	**2**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**5**
05:00 PM	**0**	**1**	**2**	**2**	**5**	0	**3**	**0**	**0**	**3**	0	0	0	**3**	**3**	0	**1**	0	**4**	**5**	**16**
Total Volume	0	1	2	12	15	0	4	0	0	4	0	0	0	4	4	0	1	0	8	9	32
% App. Total	0	6.7	13.3	80		0	100	0	0		0	0	0	100		0	11.1	0	88.9		
PHF	.000	.250	.250	.750	.750	.000	.333	.000	.000	.333	.000	.000	.000	.333	.333	.000	.250	.000	.500	.450	.500

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File Name : 81676 D-BBB
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	5	1	0	0	0	0	0	0	0	1	0	7
04:15 PM	0	2	1	0	1	1	0	0	0	2	1	0	8
04:30 PM	0	3	2	0	0	0	0	0	0	1	1	0	7
04:45 PM	0	3	2	0	1	1	0	0	0	1	3	0	11
Total	0	13	6	0	2	2	0	0	0	4	6	0	33
05:00 PM	0	3	0	0	0	0	0	0	0	0	1	0	4
05:15 PM	0	2	2	0	2	1	0	0	0	0	0	0	7
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	1	0	0	1	1	0	0	0	0	0	0	3
Total	0	7	2	0	3	2	0	0	0	0	1	0	15
Grand Total	0	20	8	0	5	4	0	0	0	4	7	0	48
Apprch %	0	71.4	28.6	0	55.6	44.4	0	0	0	36.4	63.6	0	
Total %	0	41.7	16.7	0	10.4	8.3	0	0	0	8.3	14.6	0	

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**5**	1	**6**	0	0	0	0	0	0	0	0	0	1	0	1	7
04:15 PM	0	2	1	3	0	**1**	**1**	**2**	0	0	0	0	**2**	1	0	3	8
04:30 PM	0	3	**2**	5	0	0	0	0	0	0	0	0	1	1	0	2	7
04:45 PM	0	3	2	5	0	1	1	2	0	0	0	0	1	**3**	0	**4**	**11**
Total Volume	0	13	6	19	0	2	2	4	0	0	0	0	4	6	0	10	33
% App. Total	0	68.4	31.6		0	50	50		0	0	0		40	60	0		
PHF	.000	.650	.750	.792	.000	.500	.500	.500	.000	.000	.000	.000	.500	.500	.000	.625	.750

PRECISION
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N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-BBB
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	6	155	28	0	57	34	0	0	0	29	50	0	359
04:15 PM	11	148	16	0	44	36	0	0	0	21	54	0	330
04:30 PM	22	146	23	0	55	40	0	0	0	13	47	0	346
04:45 PM	6	145	25	0	59	48	0	0	0	23	48	0	354
Total	45	594	92	0	215	158	0	0	0	86	199	0	1389
05:00 PM	5	180	26	0	41	47	0	0	0	20	44	0	363
05:15 PM	13	142	26	0	48	34	0	0	0	25	54	0	342
05:30 PM	13	154	17	0	49	35	0	0	0	16	34	0	318
05:45 PM	17	137	27	0	52	35	0	0	0	21	50	0	339
Total	48	613	96	0	190	151	0	0	0	82	182	0	1362
Grand Total	93	1207	188	0	405	309	0	0	0	168	381	0	2751
Apprch %	6.2	81.1	12.6	0	56.7	43.3	0	0	0	30.6	69.4	0	
Total %	3.4	43.9	6.8	0	14.7	11.2	0	0	0	6.1	13.8	0	

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**22**	146	23	191	0	55	40	95	0	0	0	0	13	47	0	60	346
04:45 PM	6	145	25	176	0	**59**	**48**	**107**	0	0	0	0	23	48	0	71	354
05:00 PM	5	**180**	**26**	**211**	0	41	47	88	0	0	0	0	20	44	0	64	**363**
05:15 PM	13	142	26	181	0	48	34	82	0	0	0	0	**25**	**54**	0	**79**	342
Total Volume	46	613	100	759	0	203	169	372	0	0	0	0	81	193	0	274	1405
% App. Total	6.1	80.8	13.2		0	54.6	45.4		0	0	0		29.6	70.4	0		
PHF	.523	.851	.962	.899	.000	.860	.880	.869	.000	.000	.000	.000	.810	.894	.000	.867	.968

PRECISION
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N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-BBB
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Coggshell Street From East			Route 18 SB Onramp From South			Coggshell Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	6	160	29	0	57	34	0	0	0	29	51	0	366
04:15 PM	11	150	17	0	45	37	0	0	0	23	55	0	338
04:30 PM	22	149	25	0	55	40	0	0	0	14	48	0	353
04:45 PM	6	148	27	0	60	49	0	0	0	24	51	0	365
Total	45	607	98	0	217	160	0	0	0	90	205	0	1422
05:00 PM	5	183	26	0	41	47	0	0	0	20	45	0	367
05:15 PM	13	144	28	0	50	35	0	0	0	25	54	0	349
05:30 PM	13	155	17	0	49	35	0	0	0	16	34	0	319
05:45 PM	17	138	27	0	53	36	0	0	0	21	50	0	342
Total	48	620	98	0	193	153	0	0	0	82	183	0	1377
Grand Total	93	1227	196	0	410	313	0	0	0	172	388	0	2799
Apprch %	6.1	80.9	12.9	0	56.7	43.3	0	0	0	30.7	69.3	0	
Total %	3.3	43.8	7	0	14.6	11.2	0	0	0	6.1	13.9	0	
Cars	93	1207	188	0	405	309	0	0	0	168	381	0	2751
% Cars	100	98.4	95.9	0	98.8	98.7	0	0	0	97.7	98.2	0	98.3
Heavy Vehicles	0	20	8	0	5	4	0	0	0	4	7	0	48
% Heavy Vehicles	0	1.6	4.1	0	1.2	1.3	0	0	0	2.3	1.8	0	1.7

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**22**	149	25	196	0	55	40	95	0	0	0	0	14	48	0	62	353
04:45 PM	6	148	27	181	0	**60**	**49**	**109**	0	0	0	0	24	51	0	75	365
05:00 PM	5	**183**	26	**214**	0	41	47	88	0	0	0	0	20	45	0	65	**367**
05:15 PM	13	144	**28**	185	0	50	35	85	0	0	0	0	**25**	**54**	0	**79**	349
Total Volume	46	624	106	776	0	206	171	377	0	0	0	0	83	198	0	281	1434
% App. Total	5.9	80.4	13.7		0	54.6	45.4		0	0	0		29.5	70.5	0		
PHF	.523	.852	.946	.907	.000	.858	.872	.865	.000	.000	.000	.000	.830	.917	.000	.889	.977
Cars	46	613	100	759	0	203	169	372	0	0	0	0	81	193	0	274	1405
% Cars	100	98.2	94.3	97.8	0	98.5	98.8	98.7	0	0	0	0	97.6	97.5	0	97.5	98.0
Heavy Vehicles	0	11	6	17	0	3	2	5	0	0	0	0	2	5	0	7	29
% Heavy Vehicles	0	1.8	5.7	2.2	0	1.5	1.2	1.3	0	0	0	0	2.4	2.5	0	2.5	2.0

PRECISION
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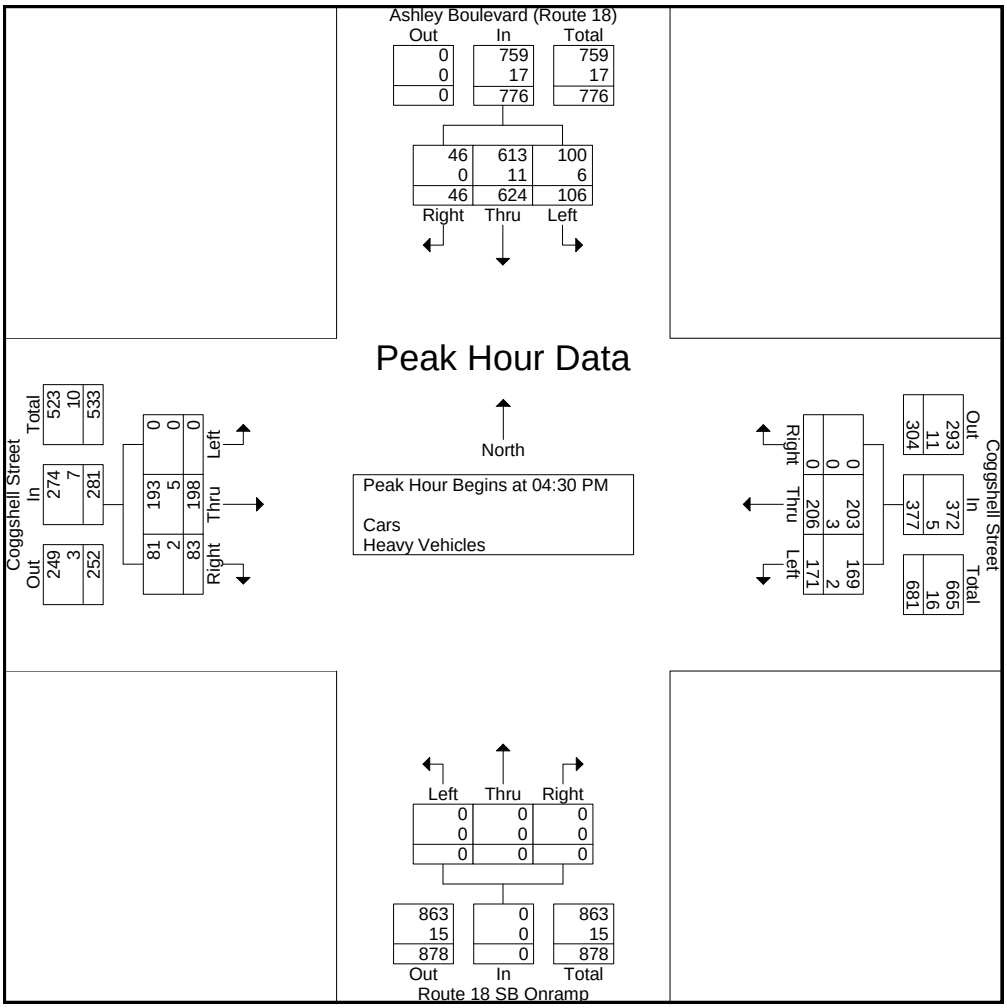
N/S: Ashley Boulevard/Route 18 On Ramp
E/W: Coggshell Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-BBB
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Ashley Boulevard (Route 18) From North				Coggshell Street From East				Route 18 SB Onramp From South				Coggshell Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**22**	149	25	196	0	55	40	95	0	0	0	0	14	48	0	62	353
04:45 PM	6	148	27	181	0	**60**	**49**	**109**	0	0	0	0	24	51	0	75	365
05:00 PM	5	**183**	26	**214**	0	41	47	88	0	0	0	0	20	45	0	65	**367**
05:15 PM	13	144	**28**	185	0	50	35	85	0	0	0	0	**25**	**54**	0	**79**	349
Total Volume	46	624	106	776	0	206	171	377	0	0	0	0	83	198	0	281	1434
% App. Total	5.9	80.4	13.7		0	54.6	45.4		0	0	0		29.5	70.5	0		
PHF	.523	.852	.946	.907	.000	.858	.872	.865	.000	.000	.000	.000	.830	.917	.000	.889	.977
Cars	46	613	100	759	0	203	169	372	0	0	0	0	81	193	0	274	1405
% Cars	100	98.2	94.3	97.8	0	98.5	98.8	98.7	0	0	0	0	97.6	97.5	0	97.5	98.0
Heavy Vehicles	0	11	6	17	0	3	2	5	0	0	0	0	2	5	0	7	29
% Heavy Vehicles	0	1.8	5.7	2.2	0	1.5	1.2	1.3	0	0	0	0	2.4	2.5	0	2.5	2.0



PRECISION
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N/S: Acushnet Ave(Rt 18)/Rt18 NB Offramp
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- C
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	8	50	0	30	66	16	0	58	4	232
07:15 AM	0	0	0	13	56	0	31	79	26	0	53	5	263
07:30 AM	0	0	0	9	62	0	39	90	16	0	59	9	284
07:45 AM	0	0	0	14	87	0	64	83	27	0	67	11	353
Total	0	0	0	44	255	0	164	318	85	0	237	29	1132
08:00 AM	0	0	0	12	74	0	60	67	17	0	60	13	303
08:15 AM	0	0	0	6	60	0	46	71	22	0	68	9	282
08:30 AM	0	0	0	16	79	0	51	65	15	0	57	10	293
08:45 AM	0	0	0	13	66	0	45	79	24	0	51	8	286
Total	0	0	0	47	279	0	202	282	78	0	236	40	1164
Grand Total	0	0	0	91	534	0	366	600	163	0	473	69	2296
Apprch %	0	0	0	14.6	85.4	0	32.4	53.1	14.4	0	87.3	12.7	
Total %	0	0	0	4	23.3	0	15.9	26.1	7.1	0	20.6	3	
Cars	0	0	0	85	512	0	352	543	152	0	443	66	2153
% Cars	0	0	0	93.4	95.9	0	96.2	90.5	93.3	0	93.7	95.7	93.8
Heavy Vehicles	0	0	0	6	22	0	14	57	11	0	30	3	143
% Heavy Vehicles	0	0	0	6.6	4.1	0	3.8	9.5	6.7	0	6.3	4.3	6.2

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	14	**87**	0	**101**	**64**	**83**	**27**	**174**	0	67	11	**78**	**353**
08:00 AM	0	0	0	0	12	74	0	86	60	67	17	144	0	60	**13**	73	303
08:15 AM	0	0	0	0	6	60	0	66	46	71	22	139	0	**68**	9	77	282
08:30 AM	0	0	0	0	**16**	79	0	95	51	65	15	131	0	57	10	67	293
Total Volume	0	0	0	0	48	300	0	348	221	286	81	588	0	252	43	295	1231
% App. Total	0	0	0		13.8	86.2	0		37.6	48.6	13.8		0	85.4	14.6		
PHF	.000	.000	.000	.000	.750	.862	.000	.861	.863	.861	.750	.845	.000	.926	.827	.946	.872
Cars	0	0	0	0	46	289	0	335	213	256	71	540	0	235	40	275	1150
% Cars	0	0	0	0	95.8	96.3	0	96.3	96.4	89.5	87.7	91.8	0	93.3	93.0	93.2	93.4
Heavy Vehicles	0	0	0	0	2	11	0	13	8	30	10	48	0	17	3	20	81
% Heavy Vehicles	0	0	0	0	4.2	3.7	0	3.7	3.6	10.5	12.3	8.2	0	6.7	7.0	6.8	6.6

PRECISION
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N/S: Acushnet Ave(Rt 18)/Rt18 NB Offramp
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- C
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	7	50	0	28	60	16	0	56	4	221
07:15 AM	0	0	0	12	51	0	30	72	25	0	50	5	245
07:30 AM	0	0	0	9	59	0	38	77	16	0	53	9	261
07:45 AM	0	0	0	14	84	0	64	77	21	0	62	9	331
Total	0	0	0	42	244	0	160	286	78	0	221	27	1058
08:00 AM	0	0	0	12	72	0	57	57	14	0	56	12	280
08:15 AM	0	0	0	5	58	0	45	63	21	0	67	9	268
08:30 AM	0	0	0	15	75	0	47	59	15	0	50	10	271
08:45 AM	0	0	0	11	63	0	43	78	24	0	49	8	276
Total	0	0	0	43	268	0	192	257	74	0	222	39	1095
Grand Total	0	0	0	85	512	0	352	543	152	0	443	66	2153
Apprch %	0	0	0	14.2	85.8	0	33.6	51.9	14.5	0	87	13	
Total %	0	0	0	3.9	23.8	0	16.3	25.2	7.1	0	20.6	3.1	

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	14	**84**	0	**98**	**64**	**77**	**21**	**162**	0	62	9	71	**331**
08:00 AM	0	0	0	0	12	72	0	84	57	57	14	128	0	56	**12**	68	280
08:15 AM	0	0	0	0	5	58	0	63	45	63	21	129	0	**67**	9	**76**	268
08:30 AM	0	0	0	0	**15**	75	0	90	47	59	15	121	0	50	10	60	271
Total Volume	0	0	0	0	46	289	0	335	213	256	71	540	0	235	40	275	1150
% App. Total	0	0	0		13.7	86.3	0		39.4	47.4	13.1		0	85.5	14.5		
PHF	.000	.000	.000	.000	.767	.860	.000	.855	.832	.831	.845	.833	.000	.877	.833	.905	.869

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Client: VHB/ J. Quitter

File Name : 81676D- C
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	1	0	0	2	6	0	0	2	0	11
07:15 AM	0	0	0	1	5	0	1	7	1	0	3	0	18
07:30 AM	0	0	0	0	3	0	1	13	0	0	6	0	23
07:45 AM	0	0	0	0	3	0	0	6	6	0	5	2	22
Total	0	0	0	2	11	0	4	32	7	0	16	2	74
08:00 AM	0	0	0	0	2	0	3	10	3	0	4	1	23
08:15 AM	0	0	0	1	2	0	1	8	1	0	1	0	14
08:30 AM	0	0	0	1	4	0	4	6	0	0	7	0	22
08:45 AM	0	0	0	2	3	0	2	1	0	0	2	0	10
Total	0	0	0	4	11	0	10	25	4	0	14	1	69
Grand Total	0	0	0	6	22	0	14	57	11	0	30	3	143
Apprch %	0	0	0	21.4	78.6	0	17.1	69.5	13.4	0	90.9	9.1	
Total %	0	0	0	4.2	15.4	0	9.8	39.9	7.7	0	21	2.1	

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	**1**	**5**	0	**6**	1	7	1	9	0	3	0	3	18
07:30 AM	0	0	0	0	0	3	0	3	1	**13**	0	14	0	**6**	0	6	**23**
07:45 AM	0	0	0	0	0	3	0	3	0	6	**6**	12	0	5	**2**	**7**	22
08:00 AM	0	0	0	0	0	2	0	2	**3**	10	3	**16**	0	4	1	5	23
Total Volume	0	0	0	0	1	13	0	14	5	36	10	51	0	18	3	21	86
% App. Total	0	0	0		7.1	92.9	0		9.8	70.6	19.6		0	85.7	14.3		
PHF	.000	.000	.000	.000	.250	.650	.000	.583	.417	.692	.417	.797	.000	.750	.375	.750	.935

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Client: VHB/ J. Quitter

File Name : 81676D- C
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	3	0	1	0	0	0	0	0	1	0	0	0	2	7
07:15 AM	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	10	16
07:30 AM	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	9	18
07:45 AM	0	0	1	2	0	0	0	0	0	0	0	2	0	0	0	14	19
Total	0	0	2	17	0	1	0	0	0	0	0	5	0	0	0	35	60
08:00 AM	0	0	0	6	0	1	0	1	0	0	0	0	0	0	0	10	18
08:15 AM	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	17	23
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	10	11
08:45 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	20	24
Total	0	0	0	16	0	1	0	1	0	0	0	0	0	1	0	57	76
Grand Total	0	0	2	33	0	2	0	1	0	0	0	5	0	1	0	92	136
Apprch %	0	0	5.7	94.3	0	66.7	0	33.3	0	0	0	100	0	1.1	0	98.9	
Total %	0	0	1.5	24.3	0	1.5	0	0.7	0	0	0	3.7	0	0.7	0	67.6	

	Acushnet Avenue (Route 18) From North					Coggeshall Street From East					Route 18 NB Offramp From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	**1**	**8**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	18
07:45 AM	0	0	1	2	3	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	14	14	19
08:00 AM	0	0	0	6	6	0	**1**	**0**	**1**	**2**	0	0	0	0	0	0	0	0	10	10	18
08:15 AM	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	**17**	**17**	**23**
Total Volume	0	0	2	22	24	0	1	0	1	2	0	0	0	2	2	0	0	0	50	50	78
% App. Total	0	0	8.3	91.7		0	50	0	50		0	0	0	100		0	0	0	100		
PHF	.000	.000	.500	.688	.667	.000	.250	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.735	.735	.848

PRECISION
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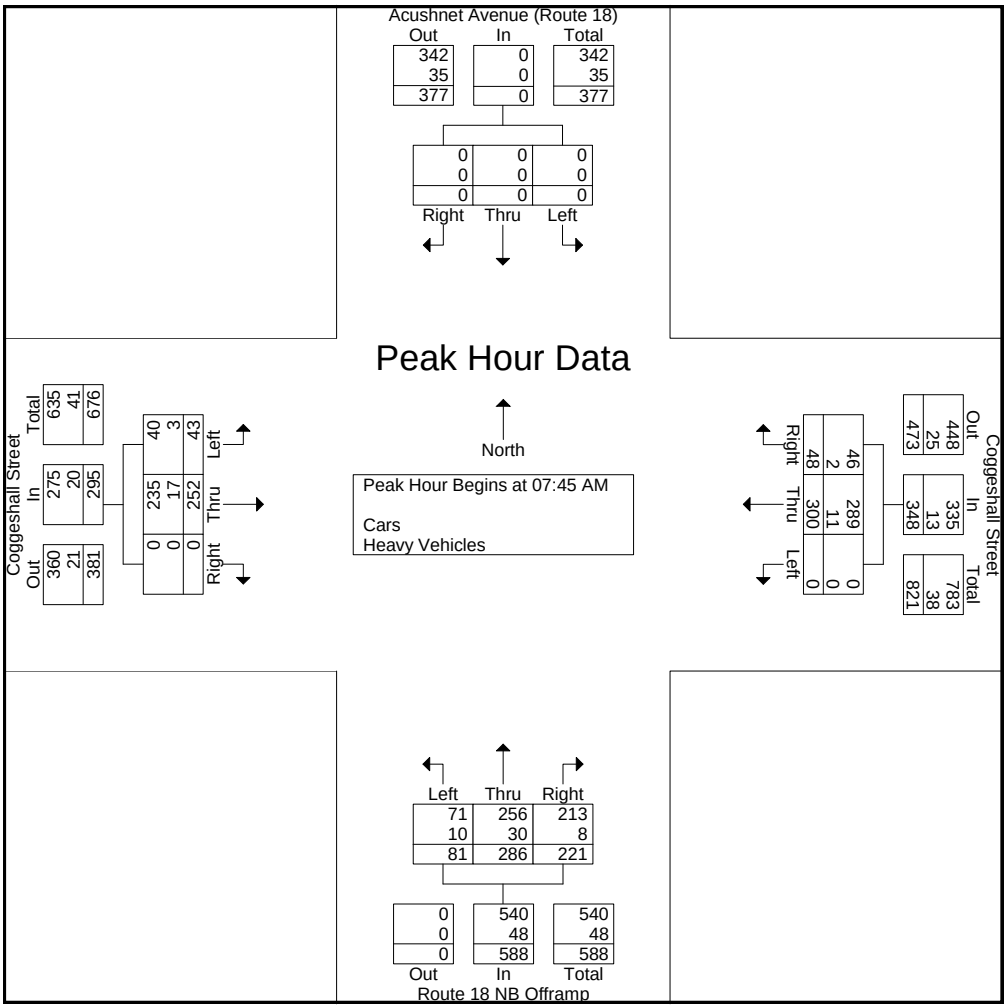
N/S: Acushnet Ave(Rt 18)/Rt18 NB Offramp
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- C
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	14	**87**	0	**101**	**64**	**83**	**27**	**174**	0	67	11	**78**	**353**
08:00 AM	0	0	0	0	12	74	0	86	60	67	17	144	0	60	**13**	73	303
08:15 AM	0	0	0	0	6	60	0	66	46	71	22	139	0	**68**	9	77	282
08:30 AM	0	0	0	0	**16**	79	0	95	51	65	15	131	0	57	10	67	293
Total Volume	0	0	0	0	48	300	0	348	221	286	81	588	0	252	43	295	1231
% App. Total	0	0	0		13.8	86.2	0		37.6	48.6	13.8		0	85.4	14.6		
PHF	.000	.000	.000	.000	.750	.862	.000	.861	.863	.861	.750	.845	.000	.926	.827	.946	.872
Cars	0	0	0	0	46	289	0	335	213	256	71	540	0	235	40	275	1150
% Cars	0	0	0	0	95.8	96.3	0	96.3	96.4	89.5	87.7	91.8	0	93.3	93.0	93.2	93.4
Heavy Vehicles	0	0	0	0	2	11	0	13	8	30	10	48	0	17	3	20	81
% Heavy Vehicles	0	0	0	0	4.2	3.7	0	3.7	3.6	10.5	12.3	8.2	0	6.7	7.0	6.8	6.6



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N/S: Acushnet Ave(Rt 18)/Rt18 NB Offramp
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- CCC
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	18	62	0	66	119	33	0	71	7	376
04:15 PM	0	0	0	25	65	0	84	105	17	0	62	11	369
04:30 PM	0	0	0	20	74	0	68	129	30	0	56	17	394
04:45 PM	0	0	0	18	71	0	63	94	33	0	56	11	346
Total	0	0	0	81	272	0	281	447	113	0	245	46	1485
05:00 PM	0	0	0	17	72	0	90	135	18	0	72	8	412
05:15 PM	0	0	0	19	49	0	82	119	24	0	74	11	378
05:30 PM	0	0	0	23	68	0	53	105	19	0	51	13	332
05:45 PM	0	0	0	18	74	0	55	118	22	0	69	15	371
Total	0	0	0	77	263	0	280	477	83	0	266	47	1493
Grand Total	0	0	0	158	535	0	561	924	196	0	511	93	2978
Apprch %	0	0	0	22.8	77.2	0	33.4	55	11.7	0	84.6	15.4	
Total %	0	0	0	5.3	18	0	18.8	31	6.6	0	17.2	3.1	
Cars	0	0	0	157	528	0	552	910	194	0	500	91	2932
% Cars	0	0	0	99.4	98.7	0	98.4	98.5	99	0	97.8	97.8	98.5
Heavy Vehicles	0	0	0	1	7	0	9	14	2	0	11	2	46
% Heavy Vehicles	0	0	0	0.6	1.3	0	1.6	1.5	1	0	2.2	2.2	1.5

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	**20**	**74**	0	**94**	68	129	30	227	0	56	**17**	73	394
04:45 PM	0	0	0	0	18	71	0	89	63	94	**33**	190	0	56	11	67	346
05:00 PM	0	0	0	0	17	72	0	89	**90**	**135**	18	**243**	0	72	8	80	**412**
05:15 PM	0	0	0	0	19	49	0	68	82	119	24	225	0	**74**	11	**85**	378
Total Volume	0	0	0	0	74	266	0	340	303	477	105	885	0	258	47	305	1530
% App. Total	0	0	0		21.8	78.2	0		34.2	53.9	11.9		0	84.6	15.4		
PHF	.000	.000	.000	.000	.925	.899	.000	.904	.842	.883	.795	.910	.000	.872	.691	.897	.928
Cars	0	0	0	0	74	264	0	338	299	469	104	872	0	250	46	296	1506
% Cars	0	0	0	0	100	99.2	0	99.4	98.7	98.3	99.0	98.5	0	96.9	97.9	97.0	98.4
Heavy Vehicles	0	0	0	0	0	2	0	2	4	8	1	13	0	8	1	9	24
% Heavy Vehicles	0	0	0	0	0	0.8	0	0.6	1.3	1.7	1.0	1.5	0	3.1	2.1	3.0	1.6

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E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- CCC
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	17	62	0	65	117	33	0	70	7	371
04:15 PM	0	0	0	25	63	0	80	103	17	0	60	10	358
04:30 PM	0	0	0	20	74	0	68	127	30	0	54	16	389
04:45 PM	0	0	0	18	71	0	63	91	33	0	53	11	340
Total	0	0	0	80	270	0	276	438	113	0	237	44	1458
05:00 PM	0	0	0	17	72	0	88	132	18	0	71	8	406
05:15 PM	0	0	0	19	47	0	80	119	23	0	72	11	371
05:30 PM	0	0	0	23	68	0	53	105	19	0	51	13	332
05:45 PM	0	0	0	18	71	0	55	116	21	0	69	15	365
Total	0	0	0	77	258	0	276	472	81	0	263	47	1474
Grand Total	0	0	0	157	528	0	552	910	194	0	500	91	2932
Apprch %	0	0	0	22.9	77.1	0	33.3	55	11.7	0	84.6	15.4	
Total %	0	0	0	5.4	18	0	18.8	31	6.6	0	17.1	3.1	

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	**20**	**74**	0	**94**	68	127	30	225	0	54	**16**	70	389
04:45 PM	0	0	0	0	18	71	0	89	63	91	**33**	187	0	53	11	64	340
05:00 PM	0	0	0	0	17	72	0	89	**88**	**132**	18	**238**	0	71	8	79	**406**
05:15 PM	0	0	0	0	19	47	0	66	80	119	23	222	0	**72**	11	**83**	371
Total Volume	0	0	0	0	74	264	0	338	299	469	104	872	0	250	46	296	1506
% App. Total	0	0	0		21.9	78.1	0		34.3	53.8	11.9		0	84.5	15.5		
PHF	.000	.000	.000	.000	.925	.892	.000	.899	.849	.888	.788	.916	.000	.868	.719	.892	.927

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E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- CCC
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue (Route 18) From North			Coggeshall Street From East			Route 18 NB Offramp From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	1	0	0	1	2	0	0	1	0	5
04:15 PM	0	0	0	0	2	0	4	2	0	0	2	1	11
04:30 PM	0	0	0	0	0	0	0	2	0	0	2	1	5
04:45 PM	0	0	0	0	0	0	0	3	0	0	3	0	6
Total	0	0	0	1	2	0	5	9	0	0	8	2	27
05:00 PM	0	0	0	0	0	0	2	3	0	0	1	0	6
05:15 PM	0	0	0	0	2	0	2	0	1	0	2	0	7
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	3	0	0	2	1	0	0	0	6
Total	0	0	0	0	5	0	4	5	2	0	3	0	19
Grand Total	0	0	0	1	7	0	9	14	2	0	11	2	46
Apprch %	0	0	0	12.5	87.5	0	36	56	8	0	84.6	15.4	
Total %	0	0	0	2.2	15.2	0	19.6	30.4	4.3	0	23.9	4.3	

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**2**	0	**2**	**4**	2	0	**6**	0	2	**1**	**3**	**11**
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	1	3	5
04:45 PM	0	0	0	0	0	0	0	0	0	**3**	0	3	0	**3**	0	3	6
05:00 PM	0	0	0	0	0	0	0	0	2	3	0	5	0	1	0	1	6
Total Volume	0	0	0	0	0	2	0	2	6	10	0	16	0	8	2	10	28
% App. Total	0	0	0		0	100	0		37.5	62.5	0		0	80	20		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.375	.833	.000	.667	.000	.667	.500	.833	.636

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E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- CCC
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	4	1	4	11
04:15 PM	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	8	15
04:30 PM	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	6	11
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	6
Total	0	0	0	9	0	0	0	0	0	0	0	4	1	4	3	22	43
05:00 PM	0	0	0	1	0	3	0	0	0	0	0	1	0	2	1	6	14
05:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	6
05:30 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	2	5
05:45 PM	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	10	15
Total	1	0	0	9	0	4	0	0	0	0	0	1	0	2	1	22	40
Grand Total	1	0	0	18	0	4	0	0	0	0	0	5	1	6	4	44	83
Apprch %	5.3	0	0	94.7	0	100	0	0	0	0	0	100	1.8	10.9	7.3	80	
Total %	1.2	0	0	21.7	0	4.8	0	0	0	0	0	6	1.2	7.2	4.8	53	

	Acushnet Avenue (Route 18) From North					Coggeshall Street From East					Route 18 NB Offramp From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	**4**	**4**	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	**8**	**8**	**15**
04:30 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	1	1	0	0	0	6	6	11
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**4**	**6**	**6**
05:00 PM	**0**	**0**	**0**	**1**	**1**	**0**	**3**	**0**	**0**	**3**	0	0	0	1	1	0	**2**	1	6	**9**	14
Total Volume	0	0	0	9	9	0	3	0	0	3	0	0	0	5	5	0	2	3	24	29	46
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		0	6.9	10.3	82.8		
PHF	.000	.000	.000	.563	.563	.000	.250	.000	.000	.250	.000	.000	.000	.417	.417	.000	.250	.375	.750	.806	.767

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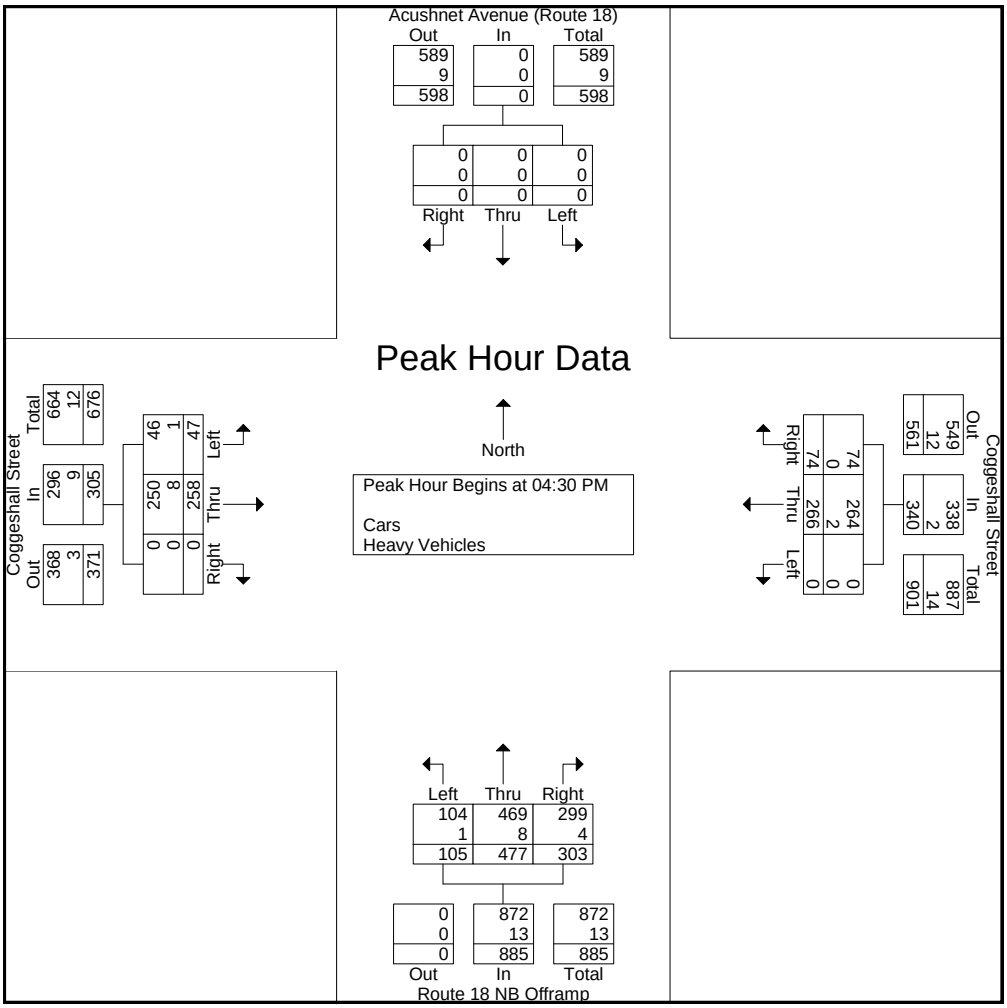
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- CCC
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Acushnet Avenue (Route 18) From North				Coggeshall Street From East				Route 18 NB Offramp From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	**20**	**74**	0	**94**	68	129	30	227	0	56	**17**	73	394
04:45 PM	0	0	0	0	18	71	0	89	63	94	**33**	190	0	56	11	67	346
05:00 PM	0	0	0	0	17	72	0	89	**90**	**135**	18	**243**	0	72	8	80	**412**
05:15 PM	0	0	0	0	19	49	0	68	82	119	24	225	0	**74**	11	**85**	378
Total Volume	0	0	0	0	74	266	0	340	303	477	105	885	0	258	47	305	1530
% App. Total	0	0	0		21.8	78.2	0		34.2	53.9	11.9		0	84.6	15.4		
PHF	.000	.000	.000	.000	.925	.899	.000	.904	.842	.883	.795	.910	.000	.872	.691	.897	.928
Cars	0	0	0	0	74	264	0	338	299	469	104	872	0	250	46	296	1506
% Cars	0	0	0	0	100	99.2	0	99.4	98.7	98.3	99.0	98.5	0	96.9	97.9	97.0	98.4
Heavy Vehicles	0	0	0	0	0	2	0	2	4	8	1	13	0	8	1	9	24
% Heavy Vehicles	0	0	0	0	0	0.8	0	0.6	1.3	1.7	1.0	1.5	0	3.1	2.1	3.0	1.6



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N/S: North Front Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- DDD
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	2	0	4	2	0	1	2	2	4	0	0	0	0	0	4	21
04:15 PM	0	2	0	11	0	2	0	3	0	8	1	2	0	2	0	9	40
04:30 PM	0	0	1	1	1	0	0	8	0	7	0	1	0	0	0	11	30
04:45 PM	0	0	0	2	0	1	0	1	0	2	0	1	0	0	0	3	10
Total	0	4	1	18	3	3	1	14	2	21	1	4	0	2	0	27	101
05:00 PM	0	0	0	5	0	1	0	2	0	4	0	0	0	0	0	10	22
05:15 PM	0	2	0	5	1	1	0	1	0	2	0	0	0	0	1	11	24
05:30 PM	0	3	0	7	0	0	0	0	0	1	0	0	1	0	0	13	25
05:45 PM	0	2	0	1	3	0	0	1	1	3	0	0	0	0	0	16	27
Total	0	7	0	18	4	2	0	4	1	10	0	0	1	0	1	50	98
Grand Total	0	11	1	36	7	5	1	18	3	31	1	4	1	2	1	77	199
Apprch %	0	22.9	2.1	75	22.6	16.1	3.2	58.1	7.7	79.5	2.6	10.3	1.2	2.5	1.2	95.1	
Total %	0	5.5	0.5	18.1	3.5	2.5	0.5	9	1.5	15.6	0.5	2	0.5	1	0.5	38.7	

	North Front Street From North					Coggeshall Street From East					North Front Street From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	**2**	0	**11**	**13**	0	**2**	**0**	**3**	**5**	**0**	**8**	**1**	**2**	**11**	0	**2**	0	9	**11**	**40**
04:30 PM	0	0	**1**	**1**	**2**	**1**	0	0	**8**	**9**	0	7	0	1	8	0	0	0	**11**	**11**	**30**
04:45 PM	**0**	**0**	**0**	**2**	**2**	**0**	**1**	**0**	**1**	**2**	**0**	**2**	**0**	**1**	**3**	**0**	**0**	**0**	**3**	**3**	**10**
05:00 PM	**0**	**0**	**0**	**5**	**5**	**0**	**1**	**0**	**2**	**3**	**0**	**4**	**0**	**0**	**4**	**0**	**0**	**0**	**10**	**10**	**22**
Total Volume	0	2	1	19	22	1	4	0	14	19	0	21	1	4	26	0	2	0	33	35	102
% App. Total	0	9.1	4.5	86.4		5.3	21.1	0	73.7		0	80.8	3.8	15.4		0	5.7	0	94.3		
PHF	.000	.250	.250	.432	.423	.250	.500	.000	.438	.528	.000	.656	.250	.500	.591	.000	.250	.000	.750	.795	.638

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N/S: North Front Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- DDD
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	1	1	0	0	0	0	1	1	4
04:15 PM	0	0	0	0	2	0	0	1	0	1	4	0	8
04:30 PM	0	0	0	0	0	0	2	1	0	0	1	0	4
04:45 PM	0	0	0	0	0	1	2	1	0	0	4	1	9
Total	0	0	0	0	3	2	4	3	0	1	10	2	25
05:00 PM	0	0	0	1	0	0	0	3	0	0	3	0	7
05:15 PM	0	0	0	0	1	0	1	1	0	1	2	0	6
05:30 PM	0	0	0	0	1	0	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	2	1	0	0	0	0	1	0	4
Total	0	0	0	1	4	1	2	4	0	1	6	0	19
Grand Total	0	0	0	1	7	3	6	7	0	2	16	2	44
Apprch %	0	0	0	9.1	63.6	27.3	46.2	53.8	0	10	80	10	
Total %	0	0	0	2.3	15.9	6.8	13.6	15.9	0	4.5	36.4	4.5	

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**2**	0	**2**	0	1	0	1	**1**	**4**	0	**5**	8
04:30 PM	0	0	0	0	0	0	0	0	**2**	1	0	**3**	0	1	0	1	4
04:45 PM	0	0	0	0	0	0	**1**	1	2	1	0	3	0	4	**1**	5	**9**
05:00 PM	0	0	0	0	**1**	0	0	1	0	**3**	0	3	0	3	0	3	7
Total Volume	0	0	0	0	1	2	1	4	4	6	0	10	1	12	1	14	28
% App. Total	0	0	0		25	50	25		40	60	0		7.1	85.7	7.1		
PHF	.000	.000	.000	.000	.250	.250	.250	.500	.500	.500	.000	.833	.250	.750	.250	.700	.778

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N/S: North Front Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- DDD
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	11	77	11	11	34	4	12	98	26	284
04:15 PM	0	0	0	10	70	19	10	29	4	13	94	25	274
04:30 PM	0	0	0	11	74	11	11	38	14	8	90	22	279
04:45 PM	0	0	0	11	89	9	17	25	4	5	86	21	267
Total	0	0	0	43	310	50	49	126	26	38	368	94	1104
05:00 PM	0	0	0	7	72	10	15	13	9	9	106	31	272
05:15 PM	0	0	0	11	67	10	16	22	2	12	112	28	280
05:30 PM	0	0	0	11	83	13	11	26	2	7	80	16	249
05:45 PM	0	0	0	15	85	8	10	21	4	11	98	16	268
Total	0	0	0	44	307	41	52	82	17	39	396	91	1069
Grand Total	0	0	0	87	617	91	101	208	43	77	764	185	2173
Apprch %	0	0	0	10.9	77.6	11.4	28.7	59.1	12.2	7.5	74.5	18	
Total %	0	0	0	4	28.4	4.2	4.6	9.6	2	3.5	35.2	8.5	

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**11**	77	11	99	11	34	4	49	12	**98**	**26**	**136**	**284**
04:15 PM	0	0	0	0	10	70	**19**	99	10	29	4	43	**13**	94	25	132	274
04:30 PM	0	0	0	0	11	74	11	96	11	**38**	**14**	**63**	8	90	22	120	279
04:45 PM	0	0	0	0	11	**89**	9	**109**	**17**	25	4	46	5	86	21	112	267
Total Volume	0	0	0	0	43	310	50	403	49	126	26	201	38	368	94	500	1104
% App. Total	0	0	0		10.7	76.9	12.4		24.4	62.7	12.9		7.6	73.6	18.8		
PHF	.000	.000	.000	.000	.977	.871	.658	.924	.721	.829	.464	.798	.731	.939	.904	.919	.972

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- DDD
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	11	78	12	11	34	4	12	99	27	288
04:15 PM	0	0	0	10	72	19	10	30	4	14	98	25	282
04:30 PM	0	0	0	11	74	11	13	39	14	8	91	22	283
04:45 PM	0	0	0	11	89	10	19	26	4	5	90	22	276
Total	0	0	0	43	313	52	53	129	26	39	378	96	1129
05:00 PM	0	0	0	8	72	10	15	16	9	9	109	31	279
05:15 PM	0	0	0	11	68	10	17	23	2	13	114	28	286
05:30 PM	0	0	0	11	84	13	12	26	2	7	80	16	251
05:45 PM	0	0	0	15	87	9	10	21	4	11	99	16	272
Total	0	0	0	45	311	42	54	86	17	40	402	91	1088
Grand Total	0	0	0	88	624	94	107	215	43	79	780	187	2217
Apprch %	0	0	0	10.9	77.4	11.7	29.3	58.9	11.8	7.6	74.6	17.9	
Total %	0	0	0	4	28.1	4.2	4.8	9.7	1.9	3.6	35.2	8.4	
Cars	0	0	0	87	617	91	101	208	43	77	764	185	2173
% Cars	0	0	0	98.9	98.9	96.8	94.4	96.7	100	97.5	97.9	98.9	98
Heavy Vehicles	0	0	0	1	7	3	6	7	0	2	16	2	44
% Heavy Vehicles	0	0	0	1.1	1.1	3.2	5.6	3.3	0	2.5	2.1	1.1	2

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**11**	78	12	101	11	34	4	49	12	**99**	**27**	**138**	**288**
04:15 PM	0	0	0	0	10	72	**19**	101	10	30	4	44	**14**	98	25	137	282
04:30 PM	0	0	0	0	11	74	11	96	13	**39**	**14**	**66**	8	91	22	121	283
04:45 PM	0	0	0	0	11	**89**	10	**110**	**19**	26	4	49	5	90	22	117	276
Total Volume	0	0	0	0	43	313	52	408	53	129	26	208	39	378	96	513	1129
% App. Total	0	0	0		10.5	76.7	12.7		25.5	62	12.5		7.6	73.7	18.7		
PHF	.000	.000	.000	.000	.977	.879	.684	.927	.697	.827	.464	.788	.696	.955	.889	.929	.980
Cars	0	0	0	0	43	310	50	403	49	126	26	201	38	368	94	500	1104
% Cars	0	0	0	0	100	99.0	96.2	98.8	92.5	97.7	100	96.6	97.4	97.4	97.9	97.5	97.8
Heavy Vehicles	0	0	0	0	0	3	2	5	4	3	0	7	1	10	2	13	25
% Heavy Vehicles	0	0	0	0	0	1.0	3.8	1.2	7.5	2.3	0	3.4	2.6	2.6	2.1	2.5	2.2

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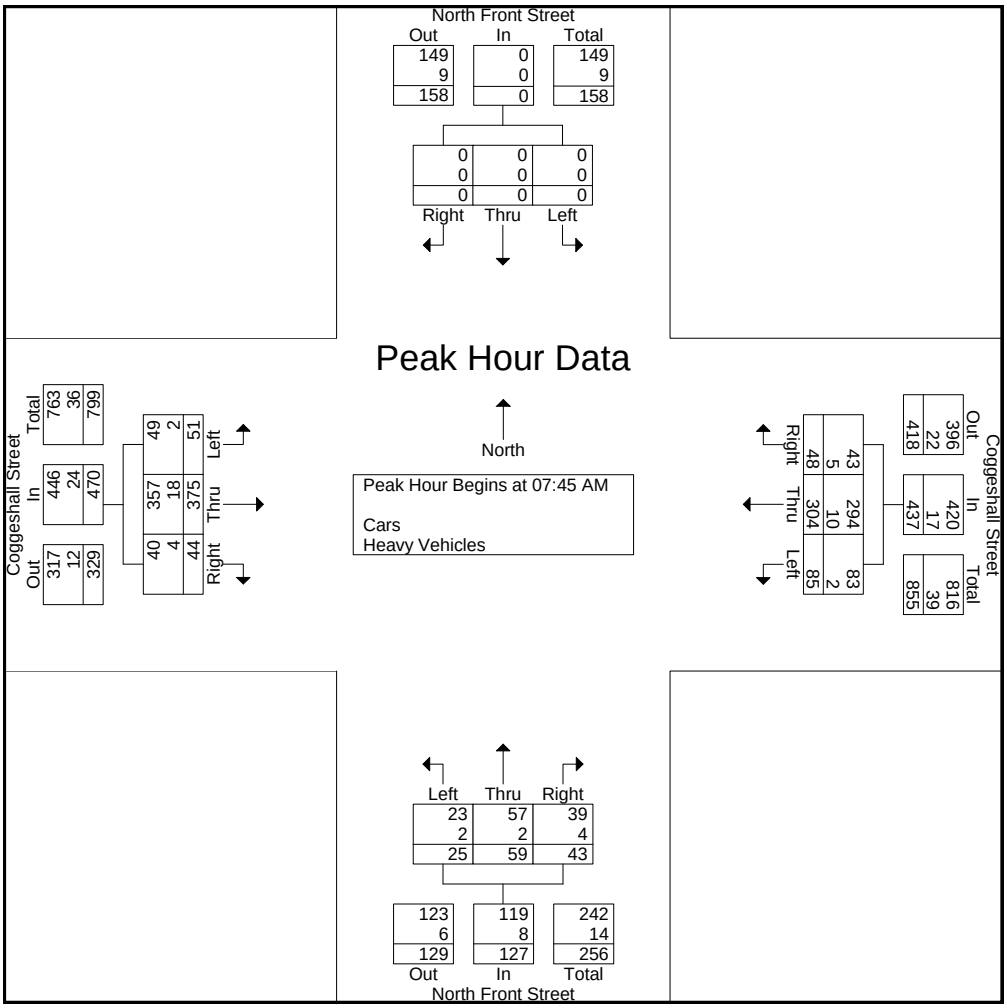
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- D
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	12	**89**	**29**	**130**	11	12	4	27	**15**	96	9	120	**277**
08:00 AM	0	0	0	0	**16**	68	21	105	8	14	**8**	30	10	**109**	13	**132**	267
08:15 AM	0	0	0	0	8	60	23	91	**12**	**17**	8	**37**	13	86	**17**	116	244
08:30 AM	0	0	0	0	12	87	12	111	12	16	5	33	6	84	12	102	246
Total Volume	0	0	0	0	48	304	85	437	43	59	25	127	44	375	51	470	1034
% App. Total	0	0	0		11	69.6	19.5		33.9	46.5	19.7		9.4	79.8	10.9		
PHF	.000	.000	.000	.000	.750	.854	.733	.840	.896	.868	.781	.858	.733	.860	.750	.890	.933
Cars	0	0	0	0	43	294	83	420	39	57	23	119	40	357	49	446	985
% Cars	0	0	0	0	89.6	96.7	97.6	96.1	90.7	96.6	92.0	93.7	90.9	95.2	96.1	94.9	95.3
Heavy Vehicles	0	0	0	0	5	10	2	17	4	2	2	8	4	18	2	24	49
% Heavy Vehicles	0	0	0	0	10.4	3.3	2.4	3.9	9.3	3.4	8.0	6.3	9.1	4.8	3.9	5.1	4.7



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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- D
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	3
07:15 AM	0	4	1	5	0	1	0	0	0	0	0	0	0	0	0	0	11
07:30 AM	0	8	0	5	0	0	1	2	0	0	0	0	0	0	0	0	16
07:45 AM	0	0	0	6	0	0	0	6	0	0	0	1	0	0	0	0	13
Total	0	12	1	17	0	2	1	9	0	0	0	1	0	0	0	0	43
08:00 AM	0	0	0	2	0	0	0	3	0	0	0	1	1	0	0	2	9
08:15 AM	0	0	0	6	0	0	0	7	0	0	0	0	0	0	0	1	14
08:30 AM	0	0	0	3	1	0	0	10	0	0	0	1	0	1	0	2	18
08:45 AM	0	0	0	2	0	0	0	0	0	1	0	2	0	0	0	1	6
Total	0	0	0	13	1	0	0	20	0	1	0	4	1	1	0	6	47
Grand Total	0	12	1	30	1	2	1	29	0	1	0	5	1	1	0	6	90
Apprch %	0	27.9	2.3	69.8	3	6.1	3	87.9	0	16.7	0	83.3	12.5	12.5	0	75	
Total %	0	13.3	1.1	33.3	1.1	2.2	1.1	32.2	0	1.1	0	5.6	1.1	1.1	0	6.7	

	North Front Street From North					Coggeshall Street From East					North Front Street From South					Coggeshall Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	**6**	**6**	0	0	0	6	6	0	0	0	**1**	**1**	0	0	0	0	0	13
08:00 AM	0	0	0	2	2	0	0	0	3	3	0	0	0	1	1	**1**	**0**	**0**	**2**	**3**	9
08:15 AM	0	0	0	6	6	0	0	0	7	7	0	0	0	0	0	0	0	0	1	1	14
08:30 AM	0	0	0	3	3	**1**	0	0	**10**	**11**	0	0	0	1	1	0	**1**	0	2	3	**18**
Total Volume	0	0	0	17	17	1	0	0	26	27	0	0	0	3	3	1	1	0	5	7	54
% App. Total	0	0	0	100		3.7	0	0	96.3		0	0	0	100		14.3	14.3	0	71.4		
PHF	.000	.000	.000	.708	.708	.250	.000	.000	.650	.614	.000	.000	.000	.750	.750	.250	.250	.000	.625	.583	.750

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- D
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	2	2	1	0	0	1	4	0	10
07:15 AM	0	0	0	0	5	2	0	0	0	1	1	0	9
07:30 AM	0	0	0	0	3	3	2	1	0	1	7	0	17
07:45 AM	0	0	0	0	2	2	1	0	0	2	3	1	11
Total	0	0	0	0	12	9	4	1	0	5	15	1	47
08:00 AM	0	0	0	2	1	0	2	1	1	1	7	0	15
08:15 AM	0	0	0	0	3	0	1	0	0	0	1	1	6
08:30 AM	0	0	0	3	4	0	0	1	1	1	7	0	17
08:45 AM	0	0	0	0	4	2	1	1	1	1	4	0	14
Total	0	0	0	5	12	2	4	3	3	3	19	1	52
Grand Total	0	0	0	5	24	11	8	4	3	8	34	2	99
Apprch %	0	0	0	12.5	60	27.5	53.3	26.7	20	18.2	77.3	4.5	
Total %	0	0	0	5.1	24.2	11.1	8.1	4	3	8.1	34.3	2	

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	**5**	2	**7**	0	0	0	0	1	1	0	2	9
07:30 AM	0	0	0	0	0	3	**3**	6	**2**	**1**	0	3	1	**7**	0	**8**	**17**
07:45 AM	0	0	0	0	0	2	2	4	1	0	0	1	**2**	3	**1**	6	11
08:00 AM	0	0	0	0	**2**	1	0	3	2	1	**1**	**4**	1	7	0	8	15
Total Volume	0	0	0	0	2	11	7	20	5	2	1	8	5	18	1	24	52
% App. Total	0	0	0		10	55	35		62.5	25	12.5		20.8	75	4.2		
PHF	.000	.000	.000	.000	.250	.550	.583	.714	.625	.500	.250	.500	.625	.643	.250	.750	.765

PRECISION
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N/S: North Front Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- D
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	10	49	15	2	11	2	9	72	3	173
07:15 AM	0	0	0	13	60	16	13	8	0	12	68	7	197
07:30 AM	0	0	0	4	67	27	12	7	4	13	82	9	225
07:45 AM	0	0	0	12	87	27	10	12	4	13	93	8	266
Total	0	0	0	39	263	85	37	38	10	47	315	27	861
08:00 AM	0	0	0	14	67	21	6	13	7	9	102	13	252
08:15 AM	0	0	0	8	57	23	11	17	8	13	85	16	238
08:30 AM	0	0	0	9	83	12	12	15	4	5	77	12	229
08:45 AM	0	0	0	10	66	32	11	9	3	10	74	12	227
Total	0	0	0	41	273	88	40	54	22	37	338	53	946
Grand Total	0	0	0	80	536	173	77	92	32	84	653	80	1807
Apprch %	0	0	0	10.1	67.9	21.9	38.3	45.8	15.9	10.3	79.9	9.8	
Total %	0	0	0	4.4	29.7	9.6	4.3	5.1	1.8	4.6	36.1	4.4	

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	12	**87**	**27**	**126**	10	12	4	26	**13**	93	8	114	**266**
08:00 AM	0	0	0	0	**14**	67	21	102	6	13	7	26	9	**102**	13	**124**	252
08:15 AM	0	0	0	0	8	57	23	88	11	**17**	**8**	**36**	13	85	**16**	114	238
08:30 AM	0	0	0	0	9	83	12	104	**12**	15	4	31	5	77	12	94	229
Total Volume	0	0	0	0	43	294	83	420	39	57	23	119	40	357	49	446	985
% App. Total	0	0	0		10.2	70	19.8		32.8	47.9	19.3		9	80	11		
PHF	.000	.000	.000	.000	.768	.845	.769	.833	.813	.838	.719	.826	.769	.875	.766	.899	.926

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N/S: North Front Street
E/W: Coggeshall Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- D
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Coggeshall Street From East			North Front Street From South			Coggeshall Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	10	51	17	3	11	2	10	76	3	183
07:15 AM	0	0	0	13	65	18	13	8	0	13	69	7	206
07:30 AM	0	0	0	4	70	30	14	8	4	14	89	9	242
07:45 AM	0	0	0	12	89	29	11	12	4	15	96	9	277
Total	0	0	0	39	275	94	41	39	10	52	330	28	908
08:00 AM	0	0	0	16	68	21	8	14	8	10	109	13	267
08:15 AM	0	0	0	8	60	23	12	17	8	13	86	17	244
08:30 AM	0	0	0	12	87	12	12	16	5	6	84	12	246
08:45 AM	0	0	0	10	70	34	12	10	4	11	78	12	241
Total	0	0	0	46	285	90	44	57	25	40	357	54	998
Grand Total	0	0	0	85	560	184	85	96	35	92	687	82	1906
Apprch %	0	0	0	10.3	67.6	22.2	39.4	44.4	16.2	10.7	79.8	9.5	
Total %	0	0	0	4.5	29.4	9.7	4.5	5	1.8	4.8	36	4.3	
Cars	0	0	0	80	536	173	77	92	32	84	653	80	1807
% Cars	0	0	0	94.1	95.7	94	90.6	95.8	91.4	91.3	95.1	97.6	94.8
Heavy Vehicles	0	0	0	5	24	11	8	4	3	8	34	2	99
% Heavy Vehicles	0	0	0	5.9	4.3	6	9.4	4.2	8.6	8.7	4.9	2.4	5.2

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	12	**89**	**29**	**130**	11	12	4	27	**15**	96	9	120	**277**
08:00 AM	0	0	0	0	**16**	68	21	105	8	14	**8**	30	10	**109**	13	**132**	267
08:15 AM	0	0	0	0	8	60	23	91	**12**	**17**	8	**37**	13	86	**17**	116	244
08:30 AM	0	0	0	0	12	87	12	111	12	16	5	33	6	84	12	102	246
Total Volume	0	0	0	0	48	304	85	437	43	59	25	127	44	375	51	470	1034
% App. Total	0	0	0		11	69.6	19.5		33.9	46.5	19.7		9.4	79.8	10.9		
PHF	.000	.000	.000	.000	.750	.854	.733	.840	.896	.868	.781	.858	.733	.860	.750	.890	.933
Cars	0	0	0	0	43	294	83	420	39	57	23	119	40	357	49	446	985
% Cars	0	0	0	0	89.6	96.7	97.6	96.1	90.7	96.6	92.0	93.7	90.9	95.2	96.1	94.9	95.3
Heavy Vehicles	0	0	0	0	5	10	2	17	4	2	2	8	4	18	2	24	49
% Heavy Vehicles	0	0	0	0	10.4	3.3	2.4	3.9	9.3	3.4	8.0	6.3	9.1	4.8	3.9	5.1	4.7

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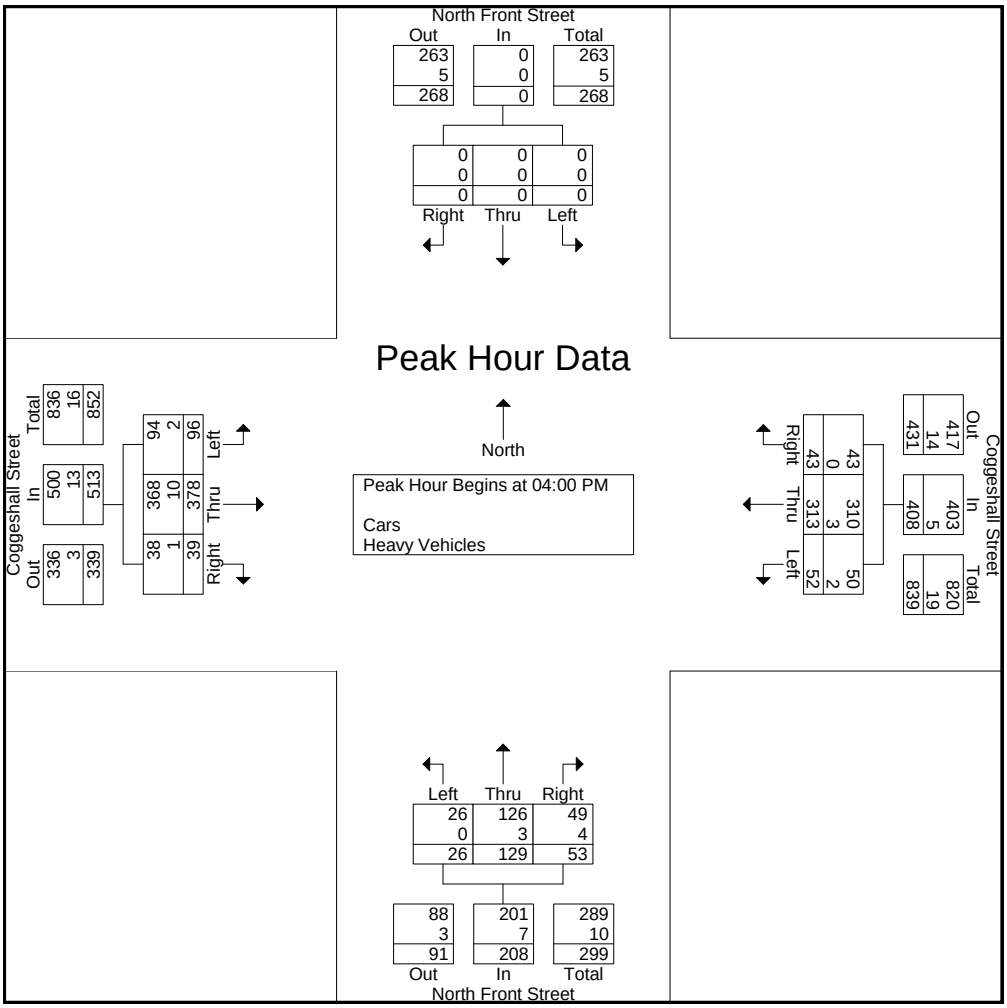
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- DDD
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	North Front Street From North				Coggeshall Street From East				North Front Street From South				Coggeshall Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**11**	78	12	101	11	34	4	49	12	**99**	**27**	**138**	**288**
04:15 PM	0	0	0	0	10	72	**19**	101	10	30	4	44	**14**	98	25	137	282
04:30 PM	0	0	0	0	11	74	11	96	13	**39**	**14**	**66**	8	91	22	121	283
04:45 PM	0	0	0	0	11	**89**	10	**110**	**19**	26	4	49	5	90	22	117	276
Total Volume	0	0	0	0	43	313	52	408	53	129	26	208	39	378	96	513	1129
% App. Total	0	0	0		10.5	76.7	12.7		25.5	62	12.5		7.6	73.7	18.7		
PHF	.000	.000	.000	.000	.977	.879	.684	.927	.697	.827	.464	.788	.696	.955	.889	.929	.980
Cars	0	0	0	0	43	310	50	403	49	126	26	201	38	368	94	500	1104
% Cars	0	0	0	0	100	99.0	96.2	98.8	92.5	97.7	100	96.6	97.4	97.4	97.9	97.5	97.8
Heavy Vehicles	0	0	0	0	0	3	2	5	4	3	0	7	1	10	2	13	25
% Heavy Vehicles	0	0	0	0	0	1.0	3.8	1.2	7.5	2.3	0	3.4	2.6	2.6	2.1	2.5	2.2



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N/S: Purchase Street
E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-G
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	8	32	0	2	15	12	0	37	11	4	0	1	122
07:15 AM	3	32	0	4	14	22	0	43	10	9	0	2	139
07:30 AM	3	36	0	5	17	17	0	48	12	9	0	2	149
07:45 AM	8	59	0	7	20	23	0	50	10	13	0	1	191
Total	22	159	0	18	66	74	0	178	43	35	0	6	601
08:00 AM	7	40	0	5	14	29	0	55	15	10	0	3	178
08:15 AM	6	47	0	4	11	26	0	45	7	13	0	0	159
08:30 AM	7	48	0	7	8	23	0	50	18	5	0	3	169
08:45 AM	3	51	0	11	16	20	0	61	12	8	0	3	185
Total	23	186	0	27	49	98	0	211	52	36	0	9	691
Grand Total	45	345	0	45	115	172	0	389	95	71	0	15	1292
Apprch %	11.5	88.5	0	13.6	34.6	51.8	0	80.4	19.6	82.6	0	17.4	
Total %	3.5	26.7	0	3.5	8.9	13.3	0	30.1	7.4	5.5	0	1.2	
Cars	42	315	0	42	109	159	0	361	88	68	0	15	1199
% Cars	93.3	91.3	0	93.3	94.8	92.4	0	92.8	92.6	95.8	0	100	92.8
Heavy Vehicles	3	30	0	3	6	13	0	28	7	3	0	0	93
% Heavy Vehicles	6.7	8.7	0	6.7	5.2	7.6	0	7.2	7.4	4.2	0	0	7.2

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**8**	**59**	0	**67**	**7**	**20**	23	**50**	0	50	10	60	**13**	0	1	**14**	**191**
08:00 AM	7	40	0	47	5	14	**29**	48	0	**55**	15	**70**	10	0	**3**	13	178
08:15 AM	6	47	0	53	4	11	26	41	0	45	7	52	13	0	0	13	159
08:30 AM	7	48	0	55	7	8	23	38	0	50	**18**	68	5	0	3	8	169
Total Volume	28	194	0	222	23	53	101	177	0	200	50	250	41	0	7	48	697
% App. Total	12.6	87.4	0		13	29.9	57.1		0	80	20		85.4	0	14.6		
PHF	.875	.822	.000	.828	.821	.663	.871	.885	.000	.909	.694	.893	.788	.000	.583	.857	.912
Cars	26	180	0	206	21	52	97	170	0	186	45	231	39	0	7	46	653
% Cars	92.9	92.8	0	92.8	91.3	98.1	96.0	96.0	0	93.0	90.0	92.4	95.1	0	100	95.8	93.7
Heavy Vehicles	2	14	0	16	2	1	4	7	0	14	5	19	2	0	0	2	44
% Heavy Vehicles	7.1	7.2	0	7.2	8.7	1.9	4.0	4.0	0	7.0	10.0	7.6	4.9	0	0	4.2	6.3

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E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-G
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	8	30	0	1	14	10	0	34	10	4	0	1	112
07:15 AM	3	28	0	4	13	18	0	39	9	8	0	2	124
07:30 AM	3	32	0	5	14	15	0	46	12	9	0	2	138
07:45 AM	8	55	0	7	20	22	0	45	9	13	0	1	180
Total	22	145	0	17	61	65	0	164	40	34	0	6	554
08:00 AM	6	35	0	4	13	28	0	53	13	9	0	3	164
08:15 AM	5	45	0	4	11	26	0	41	7	13	0	0	152
08:30 AM	7	45	0	6	8	21	0	47	16	4	0	3	157
08:45 AM	2	45	0	11	16	19	0	56	12	8	0	3	172
Total	20	170	0	25	48	94	0	197	48	34	0	9	645
Grand Total	42	315	0	42	109	159	0	361	88	68	0	15	1199
Apprch %	11.8	88.2	0	13.5	35.2	51.3	0	80.4	19.6	81.9	0	18.1	
Total %	3.5	26.3	0	3.5	9.1	13.3	0	30.1	7.3	5.7	0	1.3	

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**8**	**55**	0	**63**	**7**	**20**	22	**49**	0	45	9	54	**13**	0	1	**14**	**180**
08:00 AM	6	35	0	41	4	13	**28**	45	0	**53**	13	**66**	9	0	**3**	12	164
08:15 AM	5	45	0	50	4	11	26	41	0	41	7	48	13	0	0	13	152
08:30 AM	7	45	0	52	6	8	21	35	0	47	**16**	63	4	0	3	7	157
Total Volume	26	180	0	206	21	52	97	170	0	186	45	231	39	0	7	46	653
% App. Total	12.6	87.4	0		12.4	30.6	57.1		0	80.5	19.5		84.8	0	15.2		
PHF	.813	.818	.000	.817	.750	.650	.866	.867	.000	.877	.703	.875	.750	.000	.583	.821	.907

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-G
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	2	0	1	1	2	0	3	1	0	0	0	10
07:15 AM	0	4	0	0	1	4	0	4	1	1	0	0	15
07:30 AM	0	4	0	0	3	2	0	2	0	0	0	0	11
07:45 AM	0	4	0	0	0	1	0	5	1	0	0	0	11
Total	0	14	0	1	5	9	0	14	3	1	0	0	47
08:00 AM	1	5	0	1	1	1	0	2	2	1	0	0	14
08:15 AM	1	2	0	0	0	0	0	4	0	0	0	0	7
08:30 AM	0	3	0	1	0	2	0	3	2	1	0	0	12
08:45 AM	1	6	0	0	0	1	0	5	0	0	0	0	13
Total	3	16	0	2	1	4	0	14	4	2	0	0	46
Grand Total	3	30	0	3	6	13	0	28	7	3	0	0	93
Apprch %	9.1	90.9	0	13.6	27.3	59.1	0	80	20	100	0	0	
Total %	3.2	32.3	0	3.2	6.5	14	0	30.1	7.5	3.2	0	0	

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	4	0	4	0	1	**4**	**5**	0	4	1	5	**1**	0	0	**1**	**15**
07:30 AM	0	4	0	4	0	**3**	2	5	0	2	0	2	0	0	0	0	11
07:45 AM	0	4	0	4	0	0	1	1	0	**5**	1	**6**	0	0	0	0	11
08:00 AM	**1**	**5**	0	**6**	**1**	1	1	3	0	2	**2**	4	1	0	0	1	14
Total Volume	1	17	0	18	1	5	8	14	0	13	4	17	2	0	0	2	51
% App. Total	5.6	94.4	0		7.1	35.7	57.1		0	76.5	23.5		100	0	0		
PHF	.250	.850	.000	.750	.250	.417	.500	.700	.000	.650	.500	.708	.500	.000	.000	.500	.850

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-G
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	1	5
07:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	4	7
07:30 AM	0	1	0	0	0	0	0	4	0	1	0	0	3	0	0	0	9
07:45 AM	0	0	0	0	0	0	0	3	0	0	0	1	1	0	0	6	11
Total	0	3	0	1	0	0	0	9	0	1	0	2	5	0	0	11	32
08:00 AM	0	2	0	0	0	0	0	2	0	0	0	6	1	0	0	3	14
08:15 AM	0	0	0	1	0	0	0	3	0	1	0	0	0	0	0	5	10
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	5	8
08:45 AM	0	0	0	0	0	0	0	4	0	1	0	3	0	0	2	2	12
Total	0	2	0	1	0	0	0	9	0	2	0	10	2	1	2	15	44
Grand Total	0	5	0	2	0	0	0	18	0	3	0	12	7	1	2	26	76
Apprch %	0	71.4	0	28.6	0	0	0	100	0	20	0	80	19.4	2.8	5.6	72.2	
Total %	0	6.6	0	2.6	0	0	0	23.7	0	3.9	0	15.8	9.2	1.3	2.6	34.2	

	Purchase Street From North					Route 18 SB Offramp From East					Purchase Street From South					Weld Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	1	0	0	1	0	0	0	**4**	**4**	0	**1**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**3**	**9**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**6**	**7**	11
08:00 AM	0	**2**	0	0	**2**	0	0	0	2	2	0	0	0	**6**	**6**	1	0	0	3	4	**14**
08:15 AM	0	0	0	**1**	**1**	**0**	**0**	**0**	**3**	**3**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**5**	**10**
Total Volume	0	3	0	1	4	0	0	0	12	12	0	2	0	7	9	5	0	0	14	19	44
% App. Total	0	75	0	25		0	0	0	100		0	22.2	0	77.8		26.3	0	0	73.7		
PHF	.000	.375	.000	.250	.500	.000	.000	.000	.750	.750	.000	.500	.000	.292	.375	.417	.000	.000	.583	.679	.786

PRECISION
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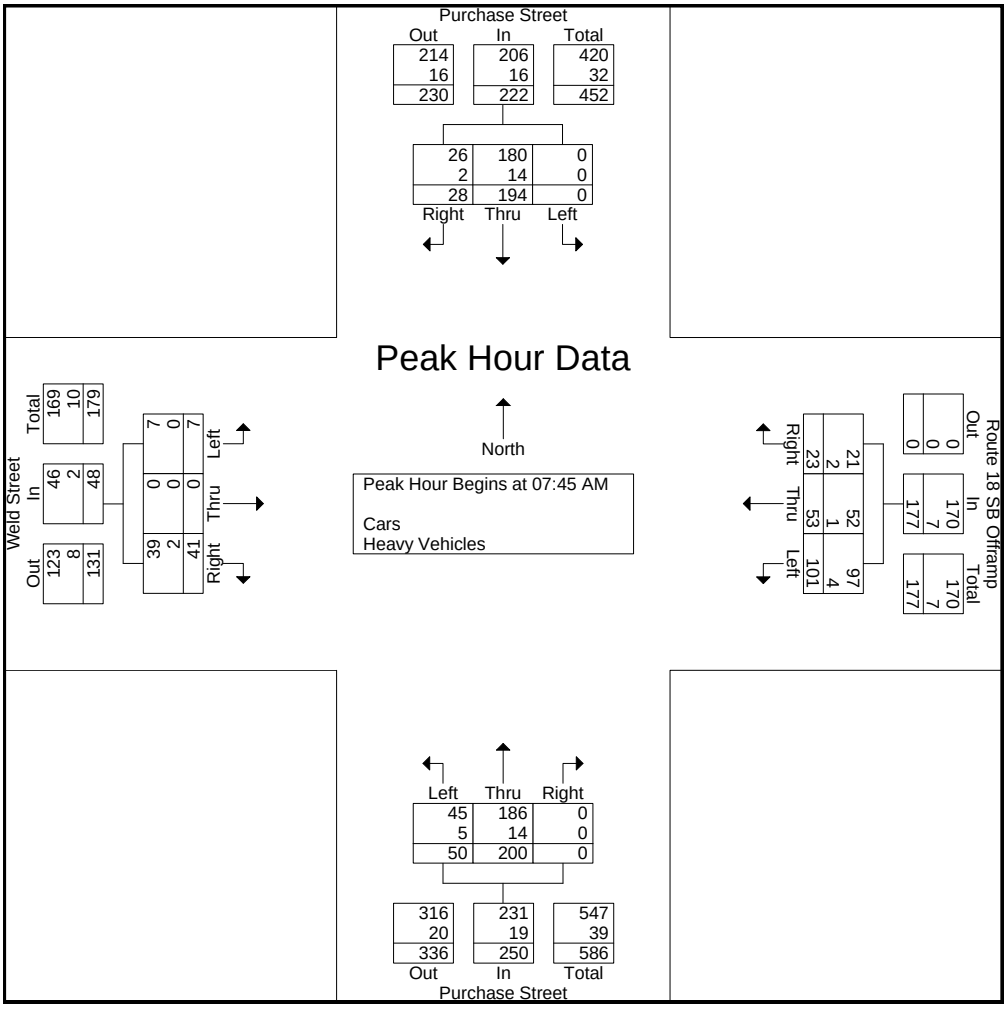
N/S: Purchase Street
E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-G
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**8**	**59**	0	**67**	**7**	**20**	23	**50**	0	50	10	60	**13**	0	1	**14**	**191**
08:00 AM	7	40	0	47	5	14	**29**	48	0	**55**	15	**70**	10	0	**3**	13	178
08:15 AM	6	47	0	53	4	11	26	41	0	45	7	52	13	0	0	13	159
08:30 AM	7	48	0	55	7	8	23	38	0	50	**18**	68	5	0	3	8	169
Total Volume	28	194	0	222	23	53	101	177	0	200	50	250	41	0	7	48	697
% App. Total	12.6	87.4	0		13	29.9	57.1		0	80	20		85.4	0	14.6		
PHF	.875	.822	.000	.828	.821	.663	.871	.885	.000	.909	.694	.893	.788	.000	.583	.857	.912
Cars	26	180	0	206	21	52	97	170	0	186	45	231	39	0	7	46	653
% Cars	92.9	92.8	0	92.8	91.3	98.1	96.0	96.0	0	93.0	90.0	92.4	95.1	0	100	95.8	93.7
Heavy Vehicles	2	14	0	16	2	1	4	7	0	14	5	19	2	0	0	2	44
% Heavy Vehicles	7.1	7.2	0	7.2	8.7	1.9	4.0	4.0	0	7.0	10.0	7.6	4.9	0	0	4.2	6.3



PRECISION DATA INDUSTRIES, LLC
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N/S: Purchase Street
E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-GGG
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	11	56	0	3	25	18	0	91	25	12	0	6	247
04:15 PM	13	50	0	7	21	25	0	79	21	11	0	6	233
04:30 PM	5	61	0	5	36	25	0	81	23	7	1	7	251
04:45 PM	11	64	0	13	34	16	0	89	25	13	0	7	272
Total	40	231	0	28	116	84	0	340	94	43	1	26	1003
05:00 PM	9	56	0	7	33	27	0	82	28	10	0	5	257
05:15 PM	4	53	0	8	23	24	0	82	20	10	0	4	228
05:30 PM	8	58	0	8	19	18	0	70	19	10	0	6	216
05:45 PM	4	45	0	10	21	18	0	62	14	5	0	5	184
Total	25	212	0	33	96	87	0	296	81	35	0	20	885
Grand Total	65	443	0	61	212	171	0	636	175	78	1	46	1888
Apprch %	12.8	87.2	0	13.7	47.7	38.5	0	78.4	21.6	62.4	0.8	36.8	
Total %	3.4	23.5	0	3.2	11.2	9.1	0	33.7	9.3	4.1	0.1	2.4	
Cars	65	421	0	56	208	166	0	611	174	75	1	45	1822
% Cars	100	95	0	91.8	98.1	97.1	0	96.1	99.4	96.2	100	97.8	96.5
Heavy Vehicles	0	22	0	5	4	5	0	25	1	3	0	1	66
% Heavy Vehicles	0	5	0	8.2	1.9	2.9	0	3.9	0.6	3.8	0	2.2	3.5

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**13**	50	0	63	7	21	25	53	0	79	21	100	11	0	6	17	233
04:30 PM	5	61	0	66	5	**36**	25	66	0	81	23	104	7	**1**	**7**	15	251
04:45 PM	11	**64**	0	**75**	**13**	34	16	63	0	**89**	25	**114**	**13**	0	7	**20**	**272**
05:00 PM	9	56	0	65	7	33	**27**	**67**	0	82	**28**	110	10	0	5	15	257
Total Volume	38	231	0	269	32	124	93	249	0	331	97	428	41	1	25	67	1013
% App. Total	14.1	85.9	0		12.9	49.8	37.3		0	77.3	22.7		61.2	1.5	37.3		
PHF	.731	.902	.000	.897	.615	.861	.861	.929	.000	.930	.866	.939	.788	.250	.893	.838	.931
Cars	38	220	0	258	28	122	91	241	0	317	96	413	40	1	25	66	978
% Cars	100	95.2	0	95.9	87.5	98.4	97.8	96.8	0	95.8	99.0	96.5	97.6	100	100	98.5	96.5
Heavy Vehicles	0	11	0	11	4	2	2	8	0	14	1	15	1	0	0	1	35
% Heavy Vehicles	0	4.8	0	4.1	12.5	1.6	2.2	3.2	0	4.2	1.0	3.5	2.4	0	0	1.5	3.5

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N/S: Purchase Street
E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-GGG
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	11	54	0	3	25	17	0	89	25	10	0	5	239
04:15 PM	13	46	0	6	20	24	0	75	21	10	0	6	221
04:30 PM	5	58	0	5	36	25	0	78	23	7	1	7	245
04:45 PM	11	62	0	11	34	16	0	84	24	13	0	7	262
Total	40	220	0	25	115	82	0	326	93	40	1	25	967
05:00 PM	9	54	0	6	32	26	0	80	28	10	0	5	250
05:15 PM	4	50	0	8	22	23	0	79	20	10	0	4	220
05:30 PM	8	54	0	8	19	18	0	68	19	10	0	6	210
05:45 PM	4	43	0	9	20	17	0	58	14	5	0	5	175
Total	25	201	0	31	93	84	0	285	81	35	0	20	855
Grand Total	65	421	0	56	208	166	0	611	174	75	1	45	1822
Apprch %	13.4	86.6	0	13	48.4	38.6	0	77.8	22.2	62	0.8	37.2	
Total %	3.6	23.1	0	3.1	11.4	9.1	0	33.5	9.5	4.1	0.1	2.5	

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**13**	46	0	59	6	20	24	50	0	75	21	96	10	0	6	16	221
04:30 PM	5	58	0	63	5	**36**	25	**66**	0	78	23	101	7	**1**	**7**	15	245
04:45 PM	11	**62**	0	**73**	**11**	34	16	61	0	**84**	24	**108**	**13**	0	7	**20**	**262**
05:00 PM	9	54	0	63	6	32	**26**	64	0	80	**28**	108	10	0	5	15	250
Total Volume	38	220	0	258	28	122	91	241	0	317	96	413	40	1	25	66	978
% App. Total	14.7	85.3	0		11.6	50.6	37.8		0	76.8	23.2		60.6	1.5	37.9		
PHF	.731	.887	.000	.884	.636	.847	.875	.913	.000	.943	.857	.956	.769	.250	.893	.825	.933

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E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-GGG
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Heavy Vehicles

	Purchase Street From North			Route 18 SB Offramp From East			Purchase Street From South			Weld Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	0	1	0	2	0	2	0	1	8
04:15 PM	0	4	0	1	1	1	0	4	0	1	0	0	12
04:30 PM	0	3	0	0	0	0	0	3	0	0	0	0	6
04:45 PM	0	2	0	2	0	0	0	5	1	0	0	0	10
Total	0	11	0	3	1	2	0	14	1	3	0	1	36
05:00 PM	0	2	0	1	1	1	0	2	0	0	0	0	7
05:15 PM	0	3	0	0	1	1	0	3	0	0	0	0	8
05:30 PM	0	4	0	0	0	0	0	2	0	0	0	0	6
05:45 PM	0	2	0	1	1	1	0	4	0	0	0	0	9
Total	0	11	0	2	3	3	0	11	0	0	0	0	30
Grand Total	0	22	0	5	4	5	0	25	1	3	0	1	66
Apprch %	0	100	0	35.7	28.6	35.7	0	96.2	3.8	75	0	25	
Total %	0	33.3	0	7.6	6.1	7.6	0	37.9	1.5	4.5	0	1.5	

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	**1**	1	0	2	0	2	**2**	0	**1**	**3**	8
04:15 PM	0	**4**	0	**4**	1	**1**	1	**3**	0	4	0	4	1	0	0	1	**12**
04:30 PM	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	6
04:45 PM	0	2	0	2	**2**	0	0	2	0	**5**	**1**	**6**	0	0	0	0	10
Total Volume	0	11	0	11	3	1	2	6	0	14	1	15	3	0	1	4	36
% App. Total	0	100	0		50	16.7	33.3		0	93.3	6.7		75	0	25		
PHF	.000	.688	.000	.688	.375	.250	.500	.500	.000	.700	.250	.625	.375	.000	.250	.333	.750

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N/S: Purchase Street
E/W: Route 18 SB Offramp/Weld Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-GGG
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	1	1	4	0	0	4	3	13
04:15 PM	0	0	0	1	0	0	0	3	0	1	1	12	0	0	0	1	19
04:30 PM	0	0	0	1	0	0	0	3	0	1	2	0	0	0	0	1	8
04:45 PM	0	2	0	1	0	0	0	2	0	1	0	2	0	0	2	2	12
Total	0	2	0	3	0	0	0	8	0	4	4	18	0	0	6	7	52
05:00 PM	0	0	0	4	0	0	1	4	2	0	0	0	0	0	0	6	17
05:15 PM	0	0	0	4	0	0	0	2	0	3	0	4	0	0	0	6	19
05:30 PM	0	0	0	2	0	0	1	1	0	0	0	4	0	0	0	3	11
05:45 PM	0	1	0	1	0	0	1	3	0	0	1	6	0	0	0	6	19
Total	0	1	0	11	0	0	3	10	2	3	1	14	0	0	0	21	66
Grand Total	0	3	0	14	0	0	3	18	2	7	5	32	0	0	6	28	118
Apprch %	0	17.6	0	82.4	0	0	14.3	85.7	4.3	15.2	10.9	69.6	0	0	17.6	82.4	
Total %	0	2.5	0	11.9	0	0	2.5	15.3	1.7	5.9	4.2	27.1	0	0	5.1	23.7	

	Purchase Street From North					Route 18 SB Offramp From East					Purchase Street From South					Weld Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	**4**	**4**	0	0	**1**	**4**	**5**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**6**	**6**	17
05:15 PM	0	0	0	4	4	0	0	0	2	2	0	**3**	**0**	**4**	**7**	0	0	0	6	6	**19**
05:30 PM	0	0	0	2	2	0	0	1	1	2	0	0	0	4	4	0	0	0	3	3	11
05:45 PM	0	**1**	0	1	2	0	0	1	3	4	0	0	**1**	**6**	**7**	**0**	**0**	**0**	**6**	**6**	**19**
Total Volume	0	1	0	11	12	0	0	3	10	13	2	3	1	14	20	0	0	0	21	21	66
% App. Total	0	8.3	0	91.7		0	0	23.1	76.9		10	15	5	70		0	0	0	100		
PHF	.000	.250	.000	.688	.750	.000	.000	.750	.625	.650	.250	.250	.250	.583	.714	.000	.000	.000	.875	.875	.868

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N/S: Purchase Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-GGG
Site Code : 10111.31
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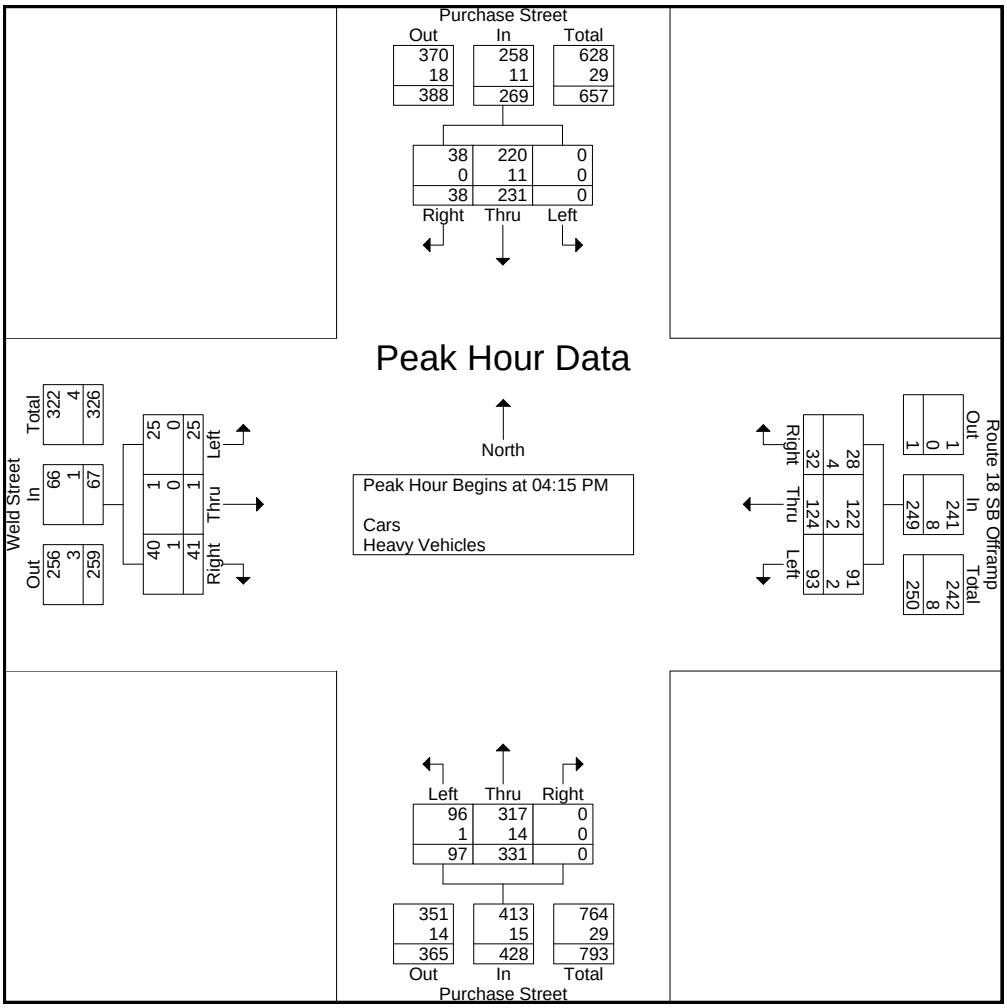
Page No : 1

	Purchase Street From North				Route 18 SB Offramp From East				Purchase Street From South				Weld Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**13**	50	0	63	7	21	25	53	0	79	21	100	11	0	6	17	233
04:30 PM	5	61	0	66	5	**36**	25	66	0	81	23	104	7	**1**	**7**	15	251
04:45 PM	11	**64**	0	**75**	**13**	34	16	63	0	**89**	25	**114**	**13**	0	7	**20**	**272**
05:00 PM	9	56	0	65	7	33	**27**	**67**	0	82	**28**	110	10	0	5	15	257
Total Volume	38	231	0	269	32	124	93	249	0	331	97	428	41	1	25	67	1013
% App. Total	14.1	85.9	0		12.9	49.8	37.3		0	77.3	22.7		61.2	1.5	37.3		
PHF	.731	.902	.000	.897	.615	.861	.861	.929	.000	.930	.866	.939	.788	.250	.893	.838	.931
Cars	38	220	0	258	28	122	91	241	0	317	96	413	40	1	25	66	978
% Cars	100	95.2	0	95.9	87.5	98.4	97.8	96.8	0	95.8	99.0	96.5	97.6	100	100	98.5	96.5
Heavy Vehicles	0	11	0	11	4	2	2	8	0	14	1	15	1	0	0	1	35
% Heavy Vehicles	0	4.8	0	4.1	12.5	1.6	2.2	3.2	0	4.2	1.0	3.5	2.4	0	0	1.5	3.5



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E/W: Logan Street/Driveway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-H
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	34	18	4	0	8	25	45	0	0	0	0	134
07:15 AM	1	36	26	5	0	9	28	48	0	0	0	0	153
07:30 AM	1	37	23	9	0	9	24	51	0	0	1	0	155
07:45 AM	0	68	27	10	1	7	30	55	0	0	0	0	198
Total	2	175	94	28	1	33	107	199	0	0	1	0	640
08:00 AM	1	59	19	15	0	8	35	60	0	0	0	0	197
08:15 AM	0	65	27	8	0	9	35	46	0	1	2	0	193
08:30 AM	0	61	15	8	0	11	17	63	0	0	0	0	175
08:45 AM	0	64	18	8	0	8	16	59	0	0	0	0	173
Total	1	249	79	39	0	36	103	228	0	1	2	0	738
Grand Total	3	424	173	67	1	69	210	427	0	1	3	0	1378
Apprch %	0.5	70.7	28.8	48.9	0.7	50.4	33	67	0	25	75	0	
Total %	0.2	30.8	12.6	4.9	0.1	5	15.2	31	0	0.1	0.2	0	
Cars	3	396	157	62	1	64	204	397	0	1	3	0	1288
% Cars	100	93.4	90.8	92.5	100	92.8	97.1	93	0	100	100	0	93.5
Heavy Vehicles	0	28	16	5	0	5	6	30	0	0	0	0	90
% Heavy Vehicles	0	6.6	9.2	7.5	0	7.2	2.9	7	0	0	0	0	6.5

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**68**	**27**	**95**	10	**1**	7	18	30	55	0	85	0	0	0	0	**198**
08:00 AM	**1**	59	19	79	**15**	0	8	**23**	**35**	60	0	**95**	0	0	0	0	197
08:15 AM	0	65	27	92	8	0	9	17	35	46	0	81	**1**	**2**	0	**3**	193
08:30 AM	0	61	15	76	8	0	**11**	19	17	**63**	0	80	0	0	0	0	175
Total Volume	1	253	88	342	41	1	35	77	117	224	0	341	1	2	0	3	763
% App. Total	0.3	74	25.7		53.2	1.3	45.5		34.3	65.7	0		33.3	66.7	0		
PHF	.250	.930	.815	.900	.683	.250	.795	.837	.836	.889	.000	.897	.250	.250	.000	.250	.963
Cars	1	240	82	323	38	1	33	72	112	208	0	320	1	2	0	3	718
% Cars	100	94.9	93.2	94.4	92.7	100	94.3	93.5	95.7	92.9	0	93.8	100	100	0	100	94.1
Heavy Vehicles	0	13	6	19	3	0	2	5	5	16	0	21	0	0	0	0	45
% Heavy Vehicles	0	5.1	6.8	5.6	7.3	0	5.7	6.5	4.3	7.1	0	6.2	0	0	0	0	5.9

PRECISION
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N/S: Purchase Street
E/W: Logan Street/Driveway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-H
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	5
07:30 AM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	1	6
07:45 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	4	9
Total	0	0	0	1	0	0	0	12	0	0	0	0	0	0	0	8	21
08:00 AM	0	0	1	4	0	0	0	4	0	0	0	0	0	0	0	1	10
08:15 AM	0	0	0	2	0	0	0	4	0	1	0	0	0	0	0	2	9
08:30 AM	0	0	1	4	0	0	0	4	1	0	0	0	0	0	0	2	12
08:45 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	8
Total	0	0	2	10	0	0	0	16	1	1	0	0	0	0	0	9	39
Grand Total	0	0	2	11	0	0	0	28	1	1	0	0	0	0	0	17	60
Apprch %	0	0	15.4	84.6	0	0	0	100	50	50	0	0	0	0	0	100	
Total %	0	0	3.3	18.3	0	0	0	46.7	1.7	1.7	0	0	0	0	0	28.3	

	Purchase Street From North					Logan Street From East					Purchase Street From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	**4**	**4**	9
08:00 AM	0	0	**1**	**4**	**5**	0	0	0	4	4	0	0	0	0	0	0	0	0	1	1	10
08:15 AM	0	0	0	2	2	0	0	0	4	4	0	**1**	**0**	**0**	**1**	0	0	0	2	2	9
08:30 AM	0	0	1	4	5	0	0	0	4	4	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**12**
Total Volume	0	0	2	10	12	0	0	0	17	17	1	1	0	0	2	0	0	0	9	9	40
% App. Total	0	0	16.7	83.3		0	0	0	100		50	50	0	0		0	0	0	100		
PHF	.000	.000	.500	.625	.600	.000	.000	.000	.850	.850	.250	.250	.000	.000	.500	.000	.000	.000	.563	.563	.833

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N/S: Purchase Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-H
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	31	17	4	0	7	24	42	0	0	0	0	125
07:15 AM	1	30	24	5	0	8	28	42	0	0	0	0	138
07:30 AM	1	34	20	8	0	8	24	49	0	0	1	0	145
07:45 AM	0	63	27	9	1	6	29	51	0	0	0	0	186
Total	2	158	88	26	1	29	105	184	0	0	1	0	594
08:00 AM	1	55	16	15	0	7	32	55	0	0	0	0	181
08:15 AM	0	63	27	8	0	9	34	42	0	1	2	0	186
08:30 AM	0	59	12	6	0	11	17	60	0	0	0	0	165
08:45 AM	0	61	14	7	0	8	16	56	0	0	0	0	162
Total	1	238	69	36	0	35	99	213	0	1	2	0	694
Grand Total	3	396	157	62	1	64	204	397	0	1	3	0	1288
Apprch %	0.5	71.2	28.2	48.8	0.8	50.4	33.9	66.1	0	25	75	0	
Total %	0.2	30.7	12.2	4.8	0.1	5	15.8	30.8	0	0.1	0.2	0	

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**63**	**27**	**90**	9	**1**	6	16	29	51	0	80	0	0	0	0	**186**
08:00 AM	**1**	55	16	72	**15**	0	7	**22**	32	55	0	**87**	0	0	0	0	181
08:15 AM	0	63	27	90	8	0	9	17	**34**	42	0	76	**1**	**2**	0	**3**	186
08:30 AM	0	59	12	71	6	0	**11**	17	17	**60**	0	77	0	0	0	0	165
Total Volume	1	240	82	323	38	1	33	72	112	208	0	320	1	2	0	3	718
% App. Total	0.3	74.3	25.4		52.8	1.4	45.8		35	65	0		33.3	66.7	0		
PHF	.250	.952	.759	.897	.633	.250	.750	.818	.824	.867	.000	.920	.250	.250	.000	.250	.965

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-H
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Heavy Vehicles

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	3	1	0	0	1	1	3	0	0	0	0	9
07:15 AM	0	6	2	0	0	1	0	6	0	0	0	0	15
07:30 AM	0	3	3	1	0	1	0	2	0	0	0	0	10
07:45 AM	0	5	0	1	0	1	1	4	0	0	0	0	12
Total	0	17	6	2	0	4	2	15	0	0	0	0	46
08:00 AM	0	4	3	0	0	1	3	5	0	0	0	0	16
08:15 AM	0	2	0	0	0	0	1	4	0	0	0	0	7
08:30 AM	0	2	3	2	0	0	0	3	0	0	0	0	10
08:45 AM	0	3	4	1	0	0	0	3	0	0	0	0	11
Total	0	11	10	3	0	1	4	15	0	0	0	0	44
Grand Total	0	28	16	5	0	5	6	30	0	0	0	0	90
Apprch %	0	63.6	36.4	50	0	50	16.7	83.3	0	0	0	0	
Total %	0	31.1	17.8	5.6	0	5.6	6.7	33.3	0	0	0	0	

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**6**	2	**8**	0	0	**1**	1	0	**6**	0	6	0	0	0	0	15
07:30 AM	0	3	**3**	6	**1**	0	1	**2**	0	2	0	2	0	0	0	0	10
07:45 AM	0	5	0	5	1	0	1	2	1	4	0	5	0	0	0	0	12
08:00 AM	0	4	3	7	0	0	1	1	**3**	5	0	**8**	0	0	0	0	**16**
Total Volume	0	18	8	26	2	0	4	6	4	17	0	21	0	0	0	0	53
% App. Total	0	69.2	30.8		33.3	0	66.7		19	81	0		0	0	0		
PHF	.000	.750	.667	.813	.500	.000	1.000	.750	.333	.708	.000	.656	.000	.000	.000	.000	.828

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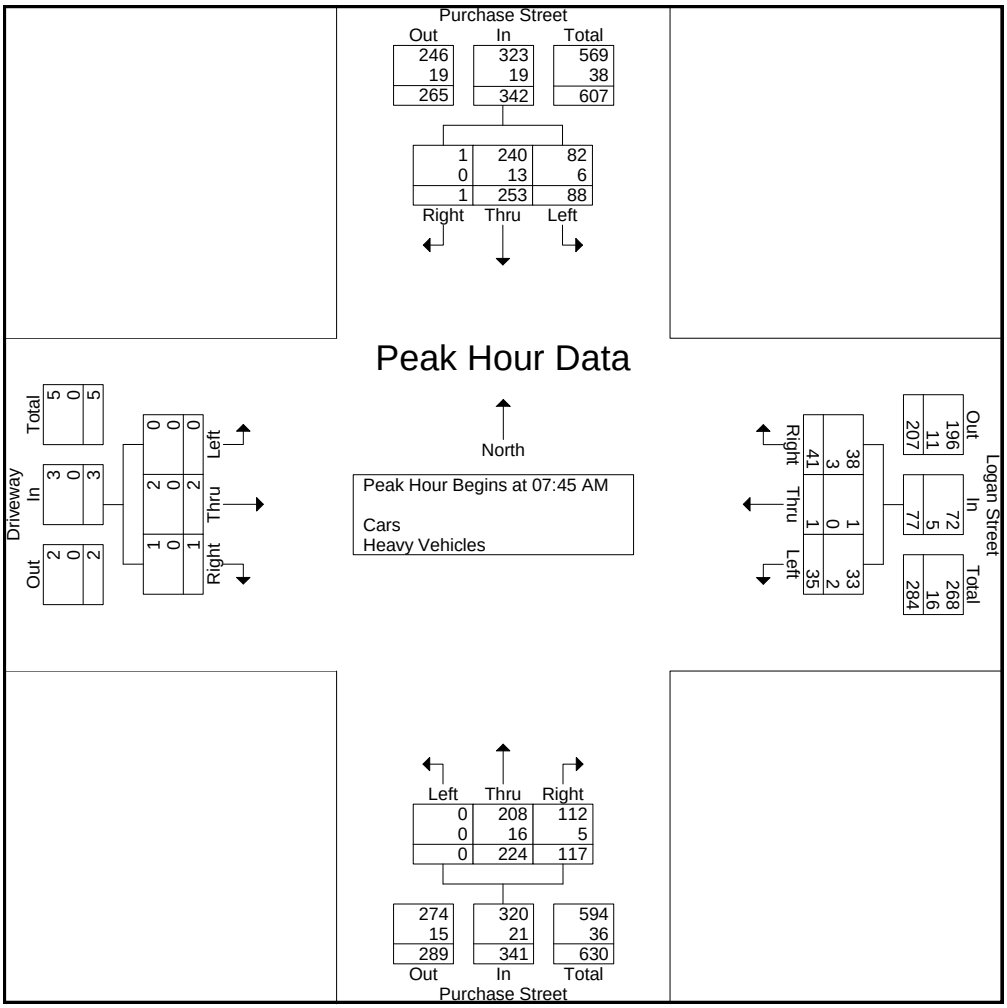
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-H
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**68**	**27**	**95**	10	**1**	7	18	30	55	0	85	0	0	0	0	**198**
08:00 AM	**1**	59	19	79	**15**	0	8	**23**	**35**	60	0	**95**	0	0	0	0	197
08:15 AM	0	65	27	92	8	0	9	17	35	46	0	81	**1**	**2**	0	**3**	193
08:30 AM	0	61	15	76	8	0	**11**	19	17	**63**	0	80	0	0	0	0	175
Total Volume	1	253	88	342	41	1	35	77	117	224	0	341	1	2	0	3	763
% App. Total	0.3	74	25.7		53.2	1.3	45.5		34.3	65.7	0		33.3	66.7	0		
PHF	.250	.930	.815	.900	.683	.250	.795	.837	.836	.889	.000	.897	.250	.250	.000	.250	.963
Cars	1	240	82	323	38	1	33	72	112	208	0	320	1	2	0	3	718
% Cars	100	94.9	93.2	94.4	92.7	100	94.3	93.5	95.7	92.9	0	93.8	100	100	0	100	94.1
Heavy Vehicles	0	13	6	19	3	0	2	5	5	16	0	21	0	0	0	0	45
% Heavy Vehicles	0	5.1	6.8	5.6	7.3	0	5.7	6.5	4.3	7.1	0	6.2	0	0	0	0	5.9



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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-HHH
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	6	0	0	0	10	0	1	0	5	0	0	0	2	24
04:15 PM	0	0	0	3	1	0	0	21	0	1	0	4	0	0	0	5	35
04:30 PM	0	0	0	3	0	0	0	21	0	0	0	1	0	0	0	3	28
04:45 PM	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	2	7
Total	0	0	0	12	1	0	0	56	0	2	0	11	0	0	0	12	94
05:00 PM	0	0	0	2	0	0	0	14	0	0	0	4	0	0	0	6	26
05:15 PM	0	0	0	3	0	0	0	9	0	0	0	5	0	0	0	4	21
05:30 PM	0	0	0	2	0	0	0	6	0	0	0	2	0	0	0	8	18
05:45 PM	0	2	0	1	0	0	0	7	0	0	0	0	0	0	0	2	12
Total	0	2	0	8	0	0	0	36	0	0	0	11	0	0	0	20	77
Grand Total	0	2	0	20	1	0	0	92	0	2	0	22	0	0	0	32	171
Apprch %	0	9.1	0	90.9	1.1	0	0	98.9	0	8.3	0	91.7	0	0	0	100	
Total %	0	1.2	0	11.7	0.6	0	0	53.8	0	1.2	0	12.9	0	0	0	18.7	

	Purchase Street From North					Logan Street From East					Purchase Street From South					Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	**3**	**3**	**1**	0	0	**21**	**22**	0	**1**	**0**	**4**	**5**	0	0	0	5	5	**35**
04:30 PM	0	0	0	3	3	0	0	0	21	21	0	0	0	1	1	0	0	0	3	3	28
04:45 PM	0	0	0	0	0	0	0	0	4	4	0	0	0	1	1	0	0	0	2	2	7
05:00 PM	0	0	0	2	2	0	0	0	14	14	0	0	0	4	4	0	0	0	**6**	**6**	26
Total Volume	0	0	0	8	8	1	0	0	60	61	0	1	0	10	11	0	0	0	16	16	96
% App. Total	0	0	0	100		1.6	0	0	98.4		0	9.1	0	90.9		0	0	0	100		
PHF	.000	.000	.000	.667	.667	.250	.000	.000	.714	.693	.000	.250	.000	.625	.550	.000	.000	.000	.667	.667	.686

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File Name : 81676 D-HHH
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Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	5	0	0	0	0	0	2	0	0	0	0	7
04:15 PM	0	3	2	1	0	1	1	3	0	0	0	0	11
04:30 PM	0	3	1	0	0	0	1	4	0	0	0	0	9
04:45 PM	0	2	1	0	0	0	0	5	0	0	0	0	8
Total	0	13	4	1	0	1	2	14	0	0	0	0	35
05:00 PM	0	3	0	1	0	0	1	1	0	0	0	0	6
05:15 PM	0	1	2	0	0	1	0	3	0	0	0	0	7
05:30 PM	0	3	2	1	0	0	1	1	0	0	0	0	8
05:45 PM	0	0	2	0	0	0	0	4	0	0	0	0	6
Total	0	7	6	2	0	1	2	9	0	0	0	0	27
Grand Total	0	20	10	3	0	2	4	23	0	0	0	0	62
Apprch %	0	66.7	33.3	60	0	40	14.8	85.2	0	0	0	0	
Total %	0	32.3	16.1	4.8	0	3.2	6.5	37.1	0	0	0	0	

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**5**	0	**5**	0	0	0	0	0	2	0	2	0	0	0	0	7
04:15 PM	0	3	**2**	5	**1**	0	**1**	**2**	**1**	3	0	4	0	0	0	0	**11**
04:30 PM	0	3	1	4	0	0	0	0	1	4	0	**5**	0	0	0	0	9
04:45 PM	0	2	1	3	0	0	0	0	0	**5**	0	5	0	0	0	0	8
Total Volume	0	13	4	17	1	0	1	2	2	14	0	16	0	0	0	0	35
% App. Total	0	76.5	23.5		50	0	50		12.5	87.5	0		0	0	0		
PHF	.000	.650	.500	.850	.250	.000	.250	.250	.500	.700	.000	.800	.000	.000	.000	.000	.795

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Groups Printed- Cars

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	80	10	22	1	14	24	95	0	0	1	1	249
04:15 PM	1	54	22	12	0	14	28	81	0	1	0	0	213
04:30 PM	0	80	10	14	0	12	28	85	1	0	1	0	231
04:45 PM	0	74	13	16	0	19	28	92	0	1	0	1	244
Total	2	288	55	64	1	59	108	353	1	2	2	2	937
05:00 PM	0	79	10	20	0	13	25	87	0	0	0	0	234
05:15 PM	0	64	18	16	0	9	23	81	1	0	0	1	213
05:30 PM	0	64	15	11	0	11	22	73	0	0	0	0	196
05:45 PM	1	51	10	6	0	11	19	67	0	0	0	0	165
Total	1	258	53	53	0	44	89	308	1	0	0	1	808
Grand Total	3	546	108	117	1	103	197	661	2	2	2	3	1745
Apprch %	0.5	83.1	16.4	52.9	0.5	46.6	22.9	76.9	0.2	28.6	28.6	42.9	
Total %	0.2	31.3	6.2	6.7	0.1	5.9	11.3	37.9	0.1	0.1	0.1	0.2	

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**80**	10	**91**	**22**	**1**	14	**37**	24	**95**	0	119	0	**1**	**1**	**2**	**249**
04:15 PM	1	54	**22**	77	12	0	14	26	**28**	81	0	109	**1**	0	0	1	213
04:30 PM	0	80	10	90	14	0	12	26	28	85	**1**	114	0	1	0	1	231
04:45 PM	0	74	13	87	16	0	**19**	35	28	92	0	**120**	1	0	1	2	244
Total Volume	2	288	55	345	64	1	59	124	108	353	1	462	2	2	2	6	937
% App. Total	0.6	83.5	15.9		51.6	0.8	47.6		23.4	76.4	0.2		33.3	33.3	33.3		
PHF	.500	.900	.625	.948	.727	.250	.776	.838	.964	.929	.250	.963	.500	.500	.500	.750	.941

PRECISION
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N/S: Purchase Street
E/W: Logan Street/Driveway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-HHH
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			Logan Street From East			Purchase Street From South			Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	85	10	22	1	14	24	97	0	0	1	1	256
04:15 PM	1	57	24	13	0	15	29	84	0	1	0	0	224
04:30 PM	0	83	11	14	0	12	29	89	1	0	1	0	240
04:45 PM	0	76	14	16	0	19	28	97	0	1	0	1	252
Total	2	301	59	65	1	60	110	367	1	2	2	2	972
05:00 PM	0	82	10	21	0	13	26	88	0	0	0	0	240
05:15 PM	0	65	20	16	0	10	23	84	1	0	0	1	220
05:30 PM	0	67	17	12	0	11	23	74	0	0	0	0	204
05:45 PM	1	51	12	6	0	11	19	71	0	0	0	0	171
Total	1	265	59	55	0	45	91	317	1	0	0	1	835
Grand Total	3	566	118	120	1	105	201	684	2	2	2	3	1807
Apprch %	0.4	82.4	17.2	53.1	0.4	46.5	22.7	77.1	0.2	28.6	28.6	42.9	
Total %	0.2	31.3	6.5	6.6	0.1	5.8	11.1	37.9	0.1	0.1	0.1	0.2	
Cars	3	546	108	117	1	103	197	661	2	2	2	3	1745
% Cars	100	96.5	91.5	97.5	100	98.1	98	96.6	100	100	100	100	96.6
Heavy Vehicles	0	20	10	3	0	2	4	23	0	0	0	0	62
% Heavy Vehicles	0	3.5	8.5	2.5	0	1.9	2	3.4	0	0	0	0	3.4

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**85**	10	**96**	**22**	**1**	14	**37**	24	**97**	0	121	0	**1**	**1**	**2**	**256**
04:15 PM	1	57	**24**	82	13	0	15	28	**29**	84	0	113	**1**	0	0	1	224
04:30 PM	0	83	11	94	14	0	12	26	29	89	**1**	119	0	1	0	1	240
04:45 PM	0	76	14	90	16	0	**19**	35	28	97	0	**125**	1	0	1	2	252
Total Volume	2	301	59	362	65	1	60	126	110	367	1	478	2	2	2	6	972
% App. Total	0.6	83.1	16.3		51.6	0.8	47.6		23	76.8	0.2		33.3	33.3	33.3		
PHF	.500	.885	.615	.943	.739	.250	.789	.851	.948	.946	.250	.956	.500	.500	.500	.750	.949
Cars	2	288	55	345	64	1	59	124	108	353	1	462	2	2	2	6	937
% Cars	100	95.7	93.2	95.3	98.5	100	98.3	98.4	98.2	96.2	100	96.7	100	100	100	100	96.4
Heavy Vehicles	0	13	4	17	1	0	1	2	2	14	0	16	0	0	0	0	35
% Heavy Vehicles	0	4.3	6.8	4.7	1.5	0	1.7	1.6	1.8	3.8	0	3.3	0	0	0	0	3.6

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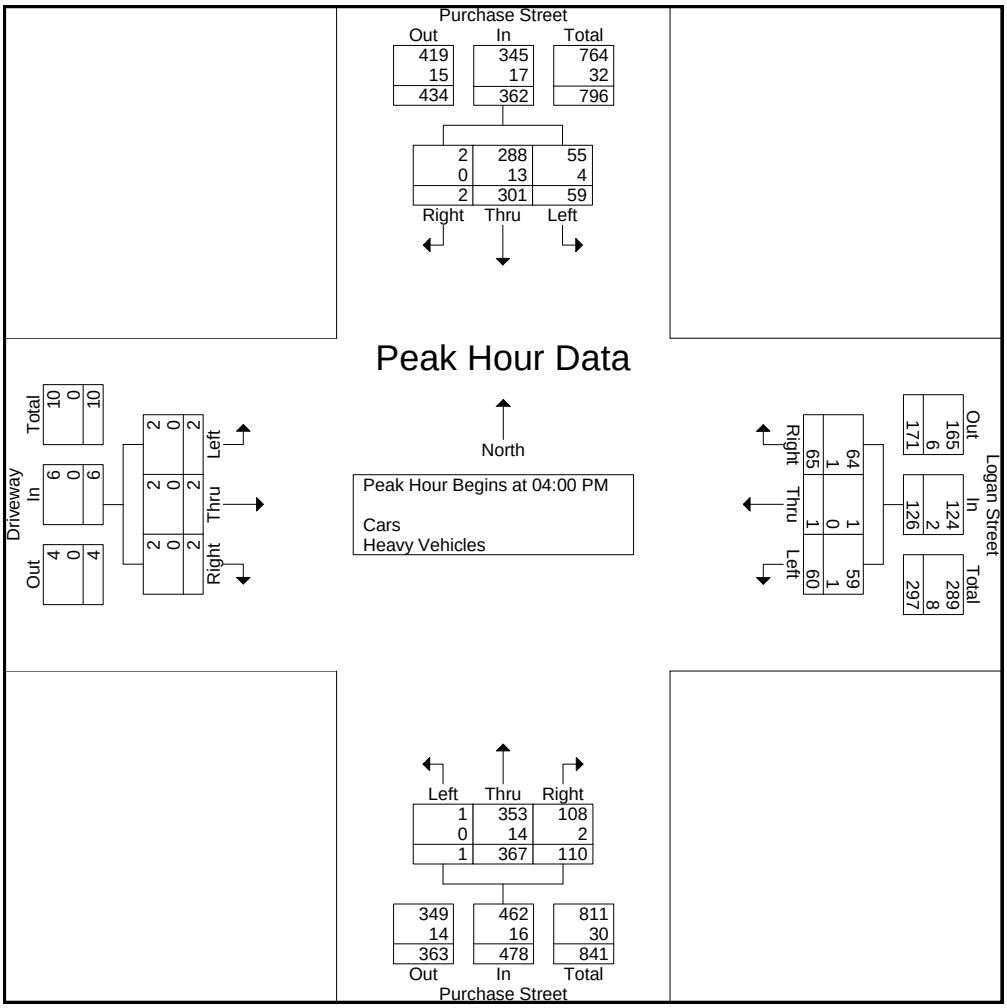
N/S: Purchase Street
E/W: Logan Street/Driveway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-HHH
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Purchase Street From North				Logan Street From East				Purchase Street From South				Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**85**	10	**96**	**22**	**1**	14	**37**	24	**97**	0	121	0	**1**	**1**	**2**	**256**
04:15 PM	1	57	**24**	82	13	0	15	28	**29**	84	0	113	**1**	0	0	1	224
04:30 PM	0	83	11	94	14	0	12	26	29	89	**1**	119	0	1	0	1	240
04:45 PM	0	76	14	90	16	0	**19**	35	28	97	0	**125**	1	0	1	2	252
Total Volume	2	301	59	362	65	1	60	126	110	367	1	478	2	2	2	6	972
% App. Total	0.6	83.1	16.3		51.6	0.8	47.6		23	76.8	0.2		33.3	33.3	33.3		
PHF	.500	.885	.615	.943	.739	.250	.789	.851	.948	.946	.250	.956	.500	.500	.500	.750	.949
Cars	2	288	55	345	64	1	59	124	108	353	1	462	2	2	2	6	937
% Cars	100	95.7	93.2	95.3	98.5	100	98.3	98.4	98.2	96.2	100	96.7	100	100	100	100	96.4
Heavy Vehicles	0	13	4	17	1	0	1	2	2	14	0	16	0	0	0	0	35
% Heavy Vehicles	0	4.3	6.8	4.7	1.5	0	1.7	1.6	1.8	3.8	0	3.3	0	0	0	0	3.6



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N/S: Acushnet Avenue
E/W: Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-J
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	2	0	3	8	3	5	5	2	8	33	1	70
07:15 AM	3	2	0	0	8	3	11	5	5	14	40	1	92
07:30 AM	1	2	0	0	13	5	2	6	4	10	28	5	76
07:45 AM	0	2	1	1	11	4	7	1	7	11	40	5	90
Total	4	8	1	4	40	15	25	17	18	43	141	12	328
08:00 AM	1	0	0	1	14	5	12	1	4	10	36	5	89
08:15 AM	0	1	0	0	14	4	12	0	1	17	40	6	95
08:30 AM	1	2	0	0	12	6	6	2	7	10	21	1	68
08:45 AM	1	1	0	0	6	1	3	5	5	8	23	2	55
Total	3	4	0	1	46	16	33	8	17	45	120	14	307
Grand Total	7	12	1	5	86	31	58	25	35	88	261	26	635
Apprch %	35	60	5	4.1	70.5	25.4	49.2	21.2	29.7	23.5	69.6	6.9	
Total %	1.1	1.9	0.2	0.8	13.5	4.9	9.1	3.9	5.5	13.9	41.1	4.1	
Cars	5	11	1	4	81	26	53	22	31	80	251	23	588
% Cars	71.4	91.7	100	80	94.2	83.9	91.4	88	88.6	90.9	96.2	88.5	92.6
Heavy Vehicles	2	1	0	1	5	5	5	3	4	8	10	3	47
% Heavy Vehicles	28.6	8.3	0	20	5.8	16.1	8.6	12	11.4	9.1	3.8	11.5	7.4

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	**2**	0	**3**	0	13	**5**	18	2	**6**	4	12	10	28	5	43	76
07:45 AM	0	2	**1**	3	**1**	11	4	16	7	1	**7**	15	11	**40**	5	56	90
08:00 AM	1	0	0	1	1	**14**	5	**20**	**12**	1	4	**17**	10	36	5	51	89
08:15 AM	0	1	0	1	0	14	4	18	12	0	1	13	**17**	40	**6**	**63**	**95**
Total Volume	2	5	1	8	2	52	18	72	33	8	16	57	48	144	21	213	350
% App. Total	25	62.5	12.5		2.8	72.2	25		57.9	14	28.1		22.5	67.6	9.9		
PHF	.500	.625	.250	.667	.500	.929	.900	.900	.688	.333	.571	.838	.706	.900	.875	.845	.921
Cars	1	4	1	6	2	49	15	66	31	7	15	53	44	139	19	202	327
% Cars	50.0	80.0	100	75.0	100	94.2	83.3	91.7	93.9	87.5	93.8	93.0	91.7	96.5	90.5	94.8	93.4
Heavy Vehicles	1	1	0	2	0	3	3	6	2	1	1	4	4	5	2	11	23
% Heavy Vehicles	50.0	20.0	0	25.0	0	5.8	16.7	8.3	6.1	12.5	6.3	7.0	8.3	3.5	9.5	5.2	6.6

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N/S: Acushnet Avenue
E/W: Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-J
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	2	0	2	7	3	5	4	2	7	33	1	66
07:15 AM	2	2	0	0	8	3	11	5	5	12	40	0	88
07:30 AM	0	2	0	0	12	3	2	6	4	8	27	5	69
07:45 AM	0	1	1	1	10	4	7	1	6	11	39	5	86
Total	2	7	1	3	37	13	25	16	17	38	139	11	309
08:00 AM	1	0	0	1	13	5	10	0	4	8	34	3	79
08:15 AM	0	1	0	0	14	3	12	0	1	17	39	6	93
08:30 AM	1	2	0	0	11	5	4	1	5	9	19	1	58
08:45 AM	1	1	0	0	6	0	2	5	4	8	20	2	49
Total	3	4	0	1	44	13	28	6	14	42	112	12	279
Grand Total	5	11	1	4	81	26	53	22	31	80	251	23	588
Apprch %	29.4	64.7	5.9	3.6	73	23.4	50	20.8	29.2	22.6	70.9	6.5	
Total %	0.9	1.9	0.2	0.7	13.8	4.4	9	3.7	5.3	13.6	42.7	3.9	

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**2**	0	**2**	0	12	3	15	2	**6**	4	12	8	27	5	40	69
07:45 AM	0	1	**1**	2	**1**	10	4	15	7	1	**6**	**14**	11	**39**	5	55	86
08:00 AM	**1**	0	0	1	1	13	**5**	**19**	10	0	4	14	8	34	3	45	79
08:15 AM	0	1	0	1	0	**14**	3	17	**12**	0	1	13	**17**	39	**6**	**62**	**93**
Total Volume	1	4	1	6	2	49	15	66	31	7	15	53	44	139	19	202	327
% App. Total	16.7	66.7	16.7		3	74.2	22.7		58.5	13.2	28.3		21.8	68.8	9.4		
PHF	.250	.500	.250	.750	.500	.875	.750	.868	.646	.292	.625	.946	.647	.891	.792	.815	.879

PRECISION
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N/S: Acushnet Avenue
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Client: VHB/J. Quitter

File Name : 81676 D-J
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	1	1	0	0	1	0	1	0	0	4
07:15 AM	1	0	0	0	0	0	0	0	0	2	0	1	4
07:30 AM	1	0	0	0	1	2	0	0	0	2	1	0	7
07:45 AM	0	1	0	0	1	0	0	0	1	0	1	0	4
Total	2	1	0	1	3	2	0	1	1	5	2	1	19
08:00 AM	0	0	0	0	1	0	2	1	0	2	2	2	10
08:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	2
08:30 AM	0	0	0	0	1	1	2	1	2	1	2	0	10
08:45 AM	0	0	0	0	0	1	1	0	1	0	3	0	6
Total	0	0	0	0	2	3	5	2	3	3	8	2	28
Grand Total	2	1	0	1	5	5	5	3	4	8	10	3	47
Apprch %	66.7	33.3	0	9.1	45.5	45.5	41.7	25	33.3	38.1	47.6	14.3	
Total %	4.3	2.1	0	2.1	10.6	10.6	10.6	6.4	8.5	17	21.3	6.4	

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	**1**	0	1	**2**	**1**	0	3	**2**	2	**2**	**6**	**10**
08:15 AM	0	0	0	0	0	0	**1**	1	0	0	0	0	0	1	0	1	2
08:30 AM	0	0	0	0	0	1	1	**2**	2	1	**2**	**5**	1	2	0	3	10
08:45 AM	0	0	0	0	0	0	1	1	1	0	1	2	0	**3**	0	3	6
Total Volume	0	0	0	0	0	2	3	5	5	2	3	10	3	8	2	13	28
% App. Total	0	0	0		0	40	60		50	20	30		23.1	61.5	15.4		
PHF	.000	.000	.000	.000	.000	.500	.750	.625	.625	.500	.375	.500	.375	.667	.250	.542	.700

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N/S: Acushnet Avenue
E/W: Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-J
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	3
Total	0	0	0	2	0	0	0	0	0	0	0	6	4	1	1	1	15
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	1	1	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	4
08:45 AM	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	5
Total	0	0	0	5	0	0	0	0	0	0	0	5	0	3	1	0	14
Grand Total	0	0	0	7	0	0	0	0	0	0	0	11	4	4	2	1	29
Apprch %	0	0	0	100	0	0	0	0	0	0	0	100	36.4	36.4	18.2	9.1	
Total %	0	0	0	24.1	0	0	0	0	0	0	0	37.9	13.8	13.8	6.9	3.4	

	Acushnet Avenue From North					Logan Street From East					Acushnet Avenue From South					Logan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	**1**	0	0	1	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**0**	**0**	**0**	**4**	4
07:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	1	1	0	0	**1**	**0**	**1**	**3**
08:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**1**	**1**	**0**	**2**	**5**
Total Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	7	7	4	2	2	0	8	16
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		50	25	25	0		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.583	.583	.250	.500	.500	.000	.500	.800

PRECISION
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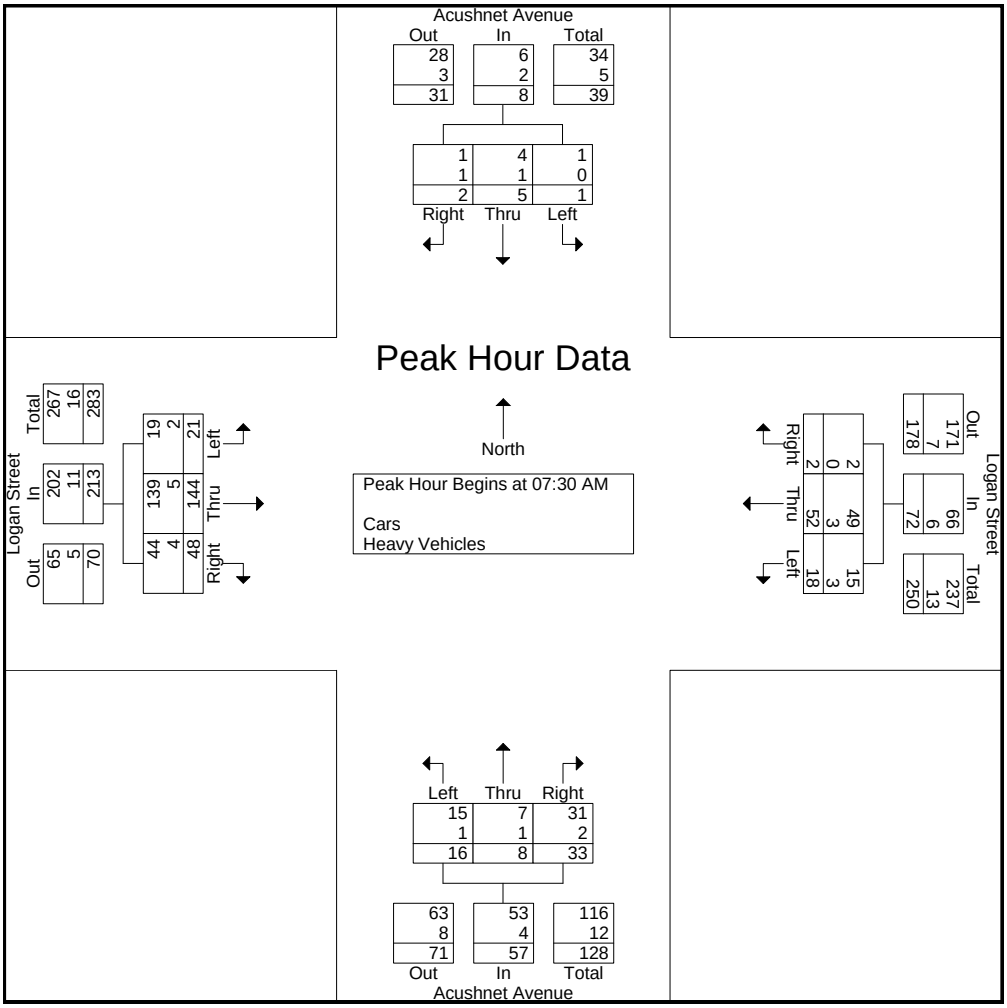
N/S: Acushnet Avenue
E/W: Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-J
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	**2**	0	**3**	0	13	**5**	18	2	**6**	4	12	10	28	5	43	76
07:45 AM	0	2	**1**	3	**1**	11	4	16	7	1	**7**	15	11	**40**	5	56	90
08:00 AM	1	0	0	1	1	**14**	5	**20**	**12**	1	4	**17**	10	36	5	51	89
08:15 AM	0	1	0	1	0	14	4	18	12	0	1	13	**17**	40	**6**	**63**	**95**
Total Volume	2	5	1	8	2	52	18	72	33	8	16	57	48	144	21	213	350
% App. Total	25	62.5	12.5		2.8	72.2	25		57.9	14	28.1		22.5	67.6	9.9		
PHF	.500	.625	.250	.667	.500	.929	.900	.900	.688	.333	.571	.838	.706	.900	.875	.845	.921
Cars	1	4	1	6	2	49	15	66	31	7	15	53	44	139	19	202	327
% Cars	50.0	80.0	100	75.0	100	94.2	83.3	91.7	93.9	87.5	93.8	93.0	91.7	96.5	90.5	94.8	93.4
Heavy Vehicles	1	1	0	2	0	3	3	6	2	1	1	4	4	5	2	11	23
% Heavy Vehicles	50.0	20.0	0	25.0	0	5.8	16.7	8.3	6.1	12.5	6.3	7.0	8.3	3.5	9.5	5.2	6.6



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N/S: Acushnet Avenue
E/W: Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-JJJ
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	0	0	0	28	15	6	6	7	7	29	1	100
04:15 PM	1	2	0	1	16	5	5	1	9	5	37	1	83
04:30 PM	1	1	0	0	14	3	9	4	7	7	32	6	84
04:45 PM	3	0	0	0	19	4	3	3	14	5	31	6	88
Total	6	3	0	1	77	27	23	14	37	24	129	14	355
05:00 PM	2	1	0	1	22	5	4	4	9	4	32	2	86
05:15 PM	0	0	0	0	23	7	2	3	4	9	32	2	82
05:30 PM	2	0	0	1	13	6	7	3	5	5	31	1	74
05:45 PM	1	0	0	0	13	2	7	4	2	5	24	1	59
Total	5	1	0	2	71	20	20	14	20	23	119	6	301
Grand Total	11	4	0	3	148	47	43	28	57	47	248	20	656
Apprch %	73.3	26.7	0	1.5	74.7	23.7	33.6	21.9	44.5	14.9	78.7	6.3	
Total %	1.7	0.6	0	0.5	22.6	7.2	6.6	4.3	8.7	7.2	37.8	3	
Cars	11	4	0	3	144	46	43	25	55	43	240	19	633
% Cars	100	100	0	100	97.3	97.9	100	89.3	96.5	91.5	96.8	95	96.5
Heavy Vehicles	0	0	0	0	4	1	0	3	2	4	8	1	23
% Heavy Vehicles	0	0	0	0	2.7	2.1	0	10.7	3.5	8.5	3.2	5	3.5

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	0	1	0	**28**	**15**	**43**	6	**6**	7	19	**7**	29	1	37	**100**
04:15 PM	1	**2**	0	**3**	**1**	16	5	22	5	1	9	15	5	**37**	1	43	83
04:30 PM	1	1	0	2	0	14	3	17	**9**	4	7	**20**	7	32	**6**	**45**	84
04:45 PM	**3**	0	0	3	0	19	4	23	3	3	**14**	20	5	31	6	42	88
Total Volume	6	3	0	9	1	77	27	105	23	14	37	74	24	129	14	167	355
% App. Total	66.7	33.3	0		1	73.3	25.7		31.1	18.9	50		14.4	77.2	8.4		
PHF	.500	.375	.000	.750	.250	.688	.450	.610	.639	.583	.661	.925	.857	.872	.583	.928	.888
Cars	6	3	0	9	1	75	26	102	23	12	36	71	22	126	14	162	344
% Cars	100	100	0	100	100	97.4	96.3	97.1	100	85.7	97.3	95.9	91.7	97.7	100	97.0	96.9
Heavy Vehicles	0	0	0	0	0	2	1	3	0	2	1	3	2	3	0	5	11
% Heavy Vehicles	0	0	0	0	0	2.6	3.7	2.9	0	14.3	2.7	4.1	8.3	2.3	0	3.0	3.1

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-JJJ
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	0	0	0	28	15	6	6	7	7	29	1	100
04:15 PM	1	2	0	1	14	4	5	1	8	4	35	1	76
04:30 PM	1	1	0	0	14	3	9	2	7	7	31	6	81
04:45 PM	3	0	0	0	19	4	3	3	14	4	31	6	87
Total	6	3	0	1	75	26	23	12	36	22	126	14	344
05:00 PM	2	1	0	1	22	5	4	3	8	4	31	1	82
05:15 PM	0	0	0	0	22	7	2	3	4	9	30	2	79
05:30 PM	2	0	0	1	12	6	7	3	5	4	29	1	70
05:45 PM	1	0	0	0	13	2	7	4	2	4	24	1	58
Total	5	1	0	2	69	20	20	13	19	21	114	5	289
Grand Total	11	4	0	3	144	46	43	25	55	43	240	19	633
Apprch %	73.3	26.7	0	1.6	74.6	23.8	35	20.3	44.7	14.2	79.5	6.3	
Total %	1.7	0.6	0	0.5	22.7	7.3	6.8	3.9	8.7	6.8	37.9	3	

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	0	1	0	**28**	**15**	**43**	6	**6**	7	19	**7**	29	1	37	**100**
04:15 PM	1	**2**	0	**3**	**1**	14	4	19	5	1	8	14	4	**35**	1	40	76
04:30 PM	1	1	0	2	0	14	3	17	**9**	2	7	18	7	31	**6**	**44**	81
04:45 PM	**3**	0	0	3	0	19	4	23	3	3	**14**	**20**	4	31	6	41	87
Total Volume	6	3	0	9	1	75	26	102	23	12	36	71	22	126	14	162	344
% App. Total	66.7	33.3	0		1	73.5	25.5		32.4	16.9	50.7		13.6	77.8	8.6		
PHF	.500	.375	.000	.750	.250	.670	.433	.593	.639	.500	.643	.888	.786	.900	.583	.920	.860

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Client: VHB/J. Quitter

File Name : 81676 D-JJJ
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North			Logan Street From East			Acushnet Avenue From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	2	1	0	0	1	1	2	0	7
04:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	2	1	0	2	1	2	3	0	11
05:00 PM	0	0	0	0	0	0	0	1	1	0	1	1	4
05:15 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
05:30 PM	0	0	0	0	1	0	0	0	0	1	2	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	2	0	0	1	1	2	5	1	12
Grand Total	0	0	0	0	4	1	0	3	2	4	8	1	23
Apprch %	0	0	0	0	80	20	0	60	40	30.8	61.5	7.7	
Total %	0	0	0	0	17.4	4.3	0	13	8.7	17.4	34.8	4.3	

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**2**	**1**	**3**	0	0	**1**	1	**1**	**2**	0	**3**	**7**
04:30 PM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	1	**1**	2	4
Total Volume	0	0	0	0	0	2	1	3	0	3	2	5	2	4	1	7	15
% App. Total	0	0	0		0	66.7	33.3		0	60	40		28.6	57.1	14.3		
PHF	.000	.000	.000	.000	.000	.250	.250	.250	.000	.375	.500	.625	.500	.500	.250	.583	.536

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 D-JJJ
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	2	1	0	2	0	0	0	0	0	0	0	2	0	0	0	0	7
04:15 PM	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	4
04:30 PM	0	0	0	5	0	0	0	0	0	0	3	1	1	1	0	0	11
04:45 PM	0	0	0	6	0	0	0	2	0	0	0	3	0	0	0	0	11
Total	2	1	0	14	0	0	0	2	0	0	4	8	1	1	0	0	33
05:00 PM	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	3	0	2	1	0	0	0	0	2	0	0	0	0	8
Grand Total	2	1	0	17	0	2	1	2	0	0	4	10	1	1	0	0	41
Apprch %	10	5	0	85	0	40	20	40	0	0	28.6	71.4	50	50	0	0	
Total %	4.9	2.4	0	41.5	0	4.9	2.4	4.9	0	0	9.8	24.4	2.4	2.4	0	0	

	Acushnet Avenue From North					Logan Street From East					Acushnet Avenue From South					Logan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**2**	**1**	0	2	5	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	7
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	4
04:30 PM	0	0	0	5	5	0	0	0	0	0	0	0	**3**	1	**4**	**1**	**1**	0	0	**2**	**11**
04:45 PM	0	0	0	**6**	**6**	0	0	0	**2**	**2**	0	0	0	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**11**
Total Volume	2	1	0	14	17	0	0	0	2	2	0	0	4	8	12	1	1	0	0	2	33
% App. Total	11.8	5.9	0	82.4		0	0	0	100		0	0	33.3	66.7		50	50	0	0		
PHF	.250	.250	.000	.583	.708	.000	.000	.000	.250	.250	.000	.000	.333	.667	.750	.250	.250	.000	.000	.250	.750

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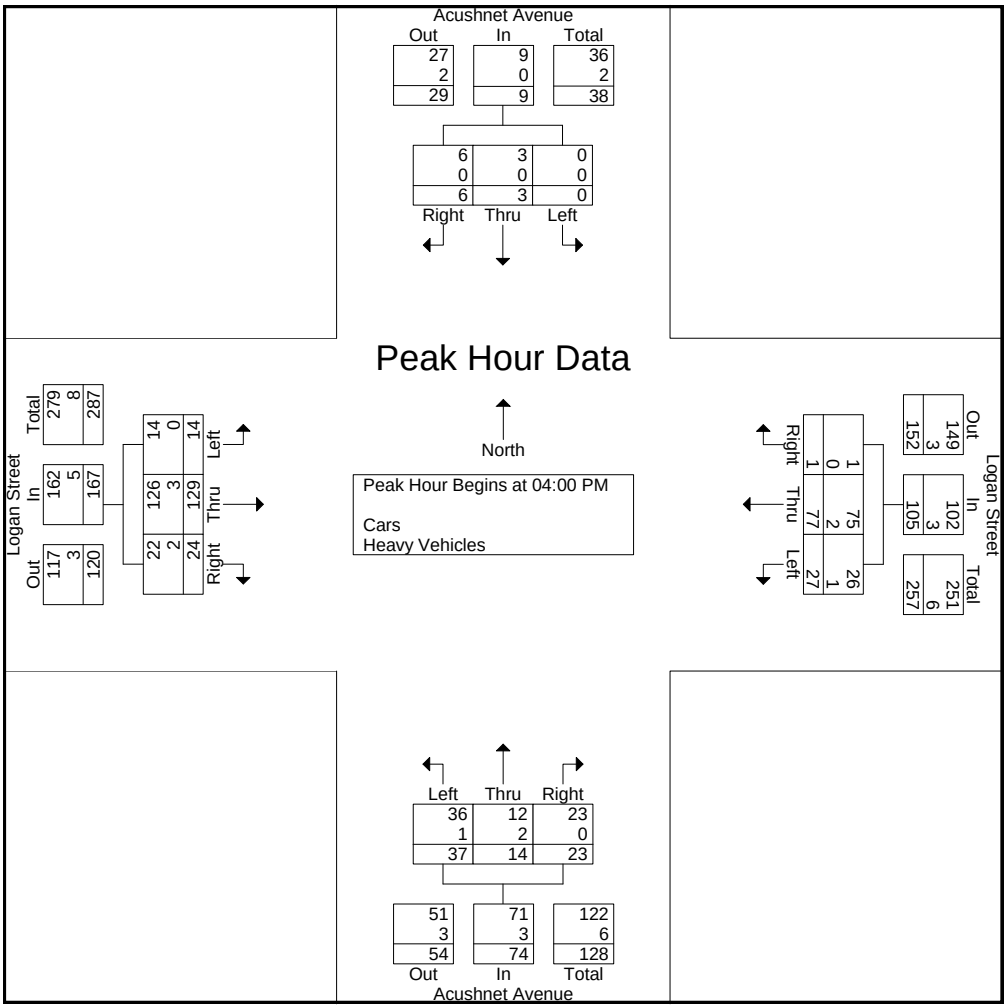
	Acushnet Avenue From North				Logan Street From East				Acushnet Avenue From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	0	1	0	**28**	**15**	**43**	6	**6**	7	19	**7**	29	1	37	**100**
04:15 PM	1	**2**	0	**3**	**1**	16	5	22	5	1	9	15	5	**37**	1	43	83
04:30 PM	1	1	0	2	0	14	3	17	**9**	4	7	**20**	7	32	**6**	**45**	84
04:45 PM	**3**	0	0	3	0	19	4	23	3	3	**14**	20	5	31	6	42	88
Total Volume	6	3	0	9	1	77	27	105	23	14	37	74	24	129	14	167	355
% App. Total	66.7	33.3	0		1	73.3	25.7		31.1	18.9	50		14.4	77.2	8.4		
PHF	.500	.375	.000	.750	.250	.688	.450	.610	.639	.583	.661	.925	.857	.872	.583	.928	.888
Cars	6	3	0	9	1	75	26	102	23	12	36	71	22	126	14	162	344
% Cars	100	100	0	100	100	97.4	96.3	97.1	100	85.7	97.3	95.9	91.7	97.7	100	97.0	96.9
Heavy Vehicles	0	0	0	0	0	2	1	3	0	2	1	3	2	3	0	5	11
% Heavy Vehicles	0	0	0	0	0	2.6	3.7	2.9	0	14.3	2.7	4.1	8.3	2.3	0	3.0	3.1



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E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- K
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	6	0	0	0	0	0	2	0	0	0	0	0	0	0	1	9
07:30 AM	0	13	0	0	0	0	0	1	0	0	0	0	0	0	0	2	16
07:45 AM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	2	5
Total	0	22	0	0	0	0	0	4	0	0	0	0	0	0	0	5	31
08:00 AM	0	2	0	0	0	0	0	5	0	0	0	1	0	0	0	5	13
08:15 AM	0	1	0	0	0	0	0	9	0	0	0	1	0	0	0	1	12
08:30 AM	0	0	0	3	0	0	0	2	0	0	0	0	1	1	0	0	7
08:45 AM	0	1	0	2	0	1	0	1	0	2	0	0	0	0	0	2	9
Total	0	4	0	5	0	1	0	17	0	2	0	2	1	1	0	8	41
Grand Total	0	26	0	5	0	1	0	21	0	2	0	2	1	1	0	13	72
Apprch %	0	83.9	0	16.1	0	4.5	0	95.5	0	50	0	50	6.7	6.7	0	86.7	
Total %	0	36.1	0	6.9	0	1.4	0	29.2	0	2.8	0	2.8	1.4	1.4	0	18.1	

	North Front Street From North					Driveway From East					North Front Street From South					Logan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	**13**	0	0	**13**	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	**16**
07:45 AM	0	2	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	5
08:00 AM	0	2	0	0	2	0	0	0	5	5	0	0	0	**1**	**1**	0	0	0	**5**	**5**	13
08:15 AM	0	1	0	0	1	0	0	0	**9**	**9**	0	0	0	1	1	0	0	0	1	1	12
Total Volume	0	18	0	0	18	0	0	0	16	16	0	0	0	2	2	0	0	0	10	10	46
% App. Total	0	100	0	0		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.346	.000	.000	.346	.000	.000	.000	.444	.444	.000	.000	.000	.500	.500	.000	.000	.000	.500	.500	.719

PRECISION
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N/S: North Front Street
E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- K
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	4	0	0	0	0	0	1	1	0	0	0	6
07:15 AM	1	6	0	0	0	0	0	2	0	0	0	0	9
07:30 AM	2	7	1	0	0	0	0	3	0	1	0	1	15
07:45 AM	2	4	0	2	0	0	1	3	1	0	0	2	15
Total	5	21	1	2	0	0	1	9	2	1	0	3	45
08:00 AM	1	4	0	0	0	0	1	5	0	2	0	5	18
08:15 AM	2	3	0	1	0	0	0	2	0	0	0	1	9
08:30 AM	1	8	1	0	0	0	0	5	0	1	0	6	22
08:45 AM	1	6	0	0	0	0	0	7	1	3	0	0	18
Total	5	21	1	1	0	0	1	19	1	6	0	12	67
Grand Total	10	42	2	3	0	0	2	28	3	7	0	15	112
Apprch %	18.5	77.8	3.7	100	0	0	6.1	84.8	9.1	31.8	0	68.2	
Total %	8.9	37.5	1.8	2.7	0	0	1.8	25	2.7	6.2	0	13.4	

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	4	0	5	0	0	0	0	**1**	5	0	6	2	0	5	**7**	18
08:15 AM	**2**	3	0	5	**1**	0	0	**1**	0	2	0	2	0	0	1	1	9
08:30 AM	1	**8**	**1**	**10**	0	0	0	0	0	5	0	5	1	0	**6**	7	**22**
08:45 AM	1	6	0	7	0	0	0	0	0	**7**	**1**	**8**	**3**	0	0	3	18
Total Volume	5	21	1	27	1	0	0	1	1	19	1	21	6	0	12	18	67
% App. Total	18.5	77.8	3.7		100	0	0		4.8	90.5	4.8		33.3	0	66.7		
PHF	.625	.656	.250	.675	.250	.000	.000	.250	.250	.679	.250	.656	.500	.000	.500	.643	.761

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N/S: North Front Street
E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- K
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	10	15	2	1	1	0	0	6	1	3	2	14	55
07:15 AM	8	41	4	2	2	0	1	15	1	4	1	34	113
07:30 AM	13	43	10	2	0	0	1	20	1	1	1	21	113
07:45 AM	15	48	13	3	0	1	1	20	1	3	5	33	143
Total	46	147	29	8	3	1	3	61	4	11	9	102	424
08:00 AM	13	42	15	2	2	0	2	24	2	2	5	35	144
08:15 AM	16	50	9	2	0	1	0	30	2	8	2	32	152
08:30 AM	9	30	18	4	3	1	1	39	0	1	4	19	129
08:45 AM	10	36	40	1	0	0	6	26	0	0	2	14	135
Total	48	158	82	9	5	2	9	119	4	11	13	100	560
Grand Total	94	305	111	17	8	3	12	180	8	22	22	202	984
Apprch %	18.4	59.8	21.8	60.7	28.6	10.7	6	90	4	8.9	8.9	82.1	
Total %	9.6	31	11.3	1.7	0.8	0.3	1.2	18.3	0.8	2.2	2.2	20.5	

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	15	48	13	**76**	3	0	**1**	4	1	20	1	22	3	**5**	33	41	143
08:00 AM	13	42	15	70	2	2	0	4	**2**	24	**2**	28	2	5	**35**	**42**	144
08:15 AM	**16**	**50**	9	75	2	0	1	3	0	30	2	32	**8**	2	32	42	**152**
08:30 AM	9	30	**18**	57	**4**	**3**	1	**8**	1	**39**	0	**40**	1	4	19	24	129
Total Volume	53	170	55	278	11	5	3	19	4	113	5	122	14	16	119	149	568
% App. Total	19.1	61.2	19.8		57.9	26.3	15.8		3.3	92.6	4.1		9.4	10.7	79.9		
PHF	.828	.850	.764	.914	.688	.417	.750	.594	.500	.724	.625	.763	.438	.800	.850	.887	.934

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N/S: North Front Street
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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- K
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	10	19	2	1	1	0	0	7	2	3	2	14	61
07:15 AM	9	47	4	2	2	0	1	17	1	4	1	34	122
07:30 AM	15	50	11	2	0	0	1	23	1	2	1	22	128
07:45 AM	17	52	13	5	0	1	2	23	2	3	5	35	158
Total	51	168	30	10	3	1	4	70	6	12	9	105	469
08:00 AM	14	46	15	2	2	0	3	29	2	4	5	40	162
08:15 AM	18	53	9	3	0	1	0	32	2	8	2	33	161
08:30 AM	10	38	19	4	3	1	1	44	0	2	4	25	151
08:45 AM	11	42	40	1	0	0	6	33	1	3	2	14	153
Total	53	179	83	10	5	2	10	138	5	17	13	112	627
Grand Total	104	347	113	20	8	3	14	208	11	29	22	217	1096
Apprch %	18.4	61.5	20	64.5	25.8	9.7	6	89.3	4.7	10.8	8.2	81	
Total %	9.5	31.7	10.3	1.8	0.7	0.3	1.3	19	1	2.6	2	19.8	
Cars	94	305	111	17	8	3	12	180	8	22	22	202	984
% Cars	90.4	87.9	98.2	85	100	100	85.7	86.5	72.7	75.9	100	93.1	89.8
Heavy Vehicles	10	42	2	3	0	0	2	28	3	7	0	15	112
% Heavy Vehicles	9.6	12.1	1.8	15	0	0	14.3	13.5	27.3	24.1	0	6.9	10.2

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	17	52	13	**82**	**5**	0	**1**	6	2	23	**2**	27	3	**5**	35	43	158
08:00 AM	14	46	15	75	2	2	0	4	**3**	29	2	34	4	5	**40**	**49**	**162**
08:15 AM	**18**	**53**	9	80	3	0	1	4	0	32	2	34	**8**	2	33	43	161
08:30 AM	10	38	**19**	67	4	**3**	1	**8**	1	**44**	0	**45**	2	4	25	31	151
Total Volume	59	189	56	304	14	5	3	22	6	128	6	140	17	16	133	166	632
% App. Total	19.4	62.2	18.4		63.6	22.7	13.6		4.3	91.4	4.3		10.2	9.6	80.1		
PHF	.819	.892	.737	.927	.700	.417	.750	.688	.500	.727	.750	.778	.531	.800	.831	.847	.975
Cars	53	170	55	278	11	5	3	19	4	113	5	122	14	16	119	149	568
% Cars	89.8	89.9	98.2	91.4	78.6	100	100	86.4	66.7	88.3	83.3	87.1	82.4	100	89.5	89.8	89.9
Heavy Vehicles	6	19	1	26	3	0	0	3	2	15	1	18	3	0	14	17	64
% Heavy Vehicles	10.2	10.1	1.8	8.6	21.4	0	0	13.6	33.3	11.7	16.7	12.9	17.6	0	10.5	10.2	10.1

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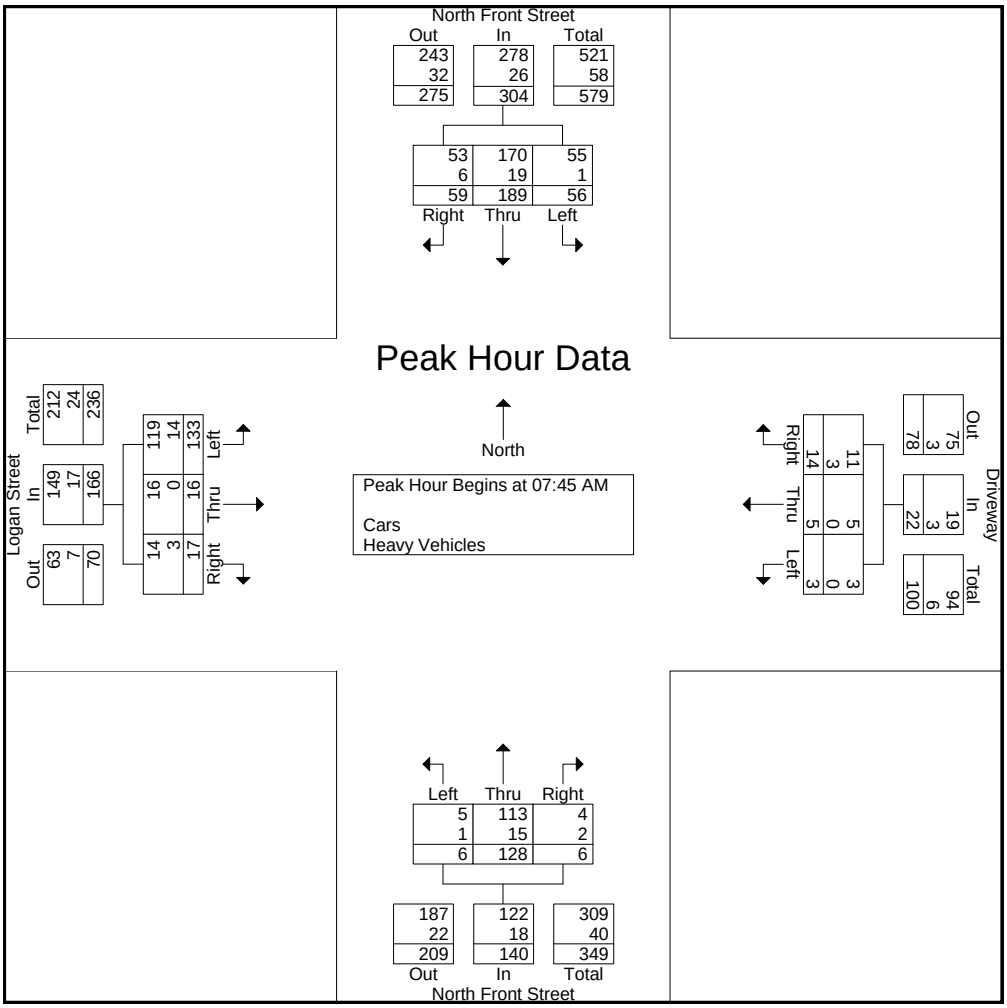
N/S: North Front Street
E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- K
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	17	52	13	**82**	**5**	0	**1**	6	2	23	**2**	27	3	**5**	35	43	158
08:00 AM	14	46	15	75	2	2	0	4	**3**	29	2	34	4	5	**40**	**49**	**162**
08:15 AM	**18**	**53**	9	80	3	0	1	4	0	32	2	34	**8**	2	33	43	161
08:30 AM	10	38	**19**	67	4	**3**	1	**8**	1	**44**	0	**45**	2	4	25	31	151
Total Volume	59	189	56	304	14	5	3	22	6	128	6	140	17	16	133	166	632
% App. Total	19.4	62.2	18.4		63.6	22.7	13.6		4.3	91.4	4.3		10.2	9.6	80.1		
PHF	.819	.892	.737	.927	.700	.417	.750	.688	.500	.727	.750	.778	.531	.800	.831	.847	.975
Cars	53	170	55	278	11	5	3	19	4	113	5	122	14	16	119	149	568
% Cars	89.8	89.9	98.2	91.4	78.6	100	100	86.4	66.7	88.3	83.3	87.1	82.4	100	89.5	89.8	89.9
Heavy Vehicles	6	19	1	26	3	0	0	3	2	15	1	18	3	0	14	17	64
% Heavy Vehicles	10.2	10.1	1.8	8.6	21.4	0	0	13.6	33.3	11.7	16.7	12.9	17.6	0	10.5	10.2	10.1



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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- KKK
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	1	0	0	0	4	0	10	0	2	0	0	0	1	19
04:15 PM	0	2	0	1	0	0	0	6	0	7	0	0	0	0	1	4	21
04:30 PM	0	0	0	5	0	0	0	5	0	7	0	1	0	0	0	1	19
04:45 PM	0	0	0	3	0	0	0	0	0	1	0	2	0	0	0	4	10
Total	0	3	0	10	0	0	0	15	0	25	0	5	0	0	1	10	69
05:00 PM	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	1	6
05:15 PM	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	5
05:30 PM	1	1	0	1	0	0	0	1	0	2	0	0	0	0	0	1	7
05:45 PM	0	2	0	0	0	0	0	1	0	8	0	0	0	0	0	0	11
Total	1	6	0	1	0	1	0	2	0	16	0	0	0	0	0	2	29
Grand Total	1	9	0	11	0	1	0	17	0	41	0	5	0	0	1	12	98
Apprch %	4.8	42.9	0	52.4	0	5.6	0	94.4	0	89.1	0	10.9	0	0	7.7	92.3	
Total %	1	9.2	0	11.2	0	1	0	17.3	0	41.8	0	5.1	0	0	1	12.2	

	North Front Street From North					Driveway From East					North Front Street From South					Logan Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	1	0	1	2	0	0	0	4	4	0	**10**	**0**	**2**	**12**	0	0	0	1	1	19
04:15 PM	0	**2**	0	1	3	0	0	0	**6**	**6**	0	7	0	0	7	0	0	**1**	**4**	**5**	**21**
04:30 PM	0	0	0	**5**	**5**	0	0	0	5	5	0	7	0	1	8	0	0	0	1	1	19
04:45 PM	0	0	0	3	3	0	0	0	0	0	0	1	0	2	3	0	0	0	4	4	10
Total Volume	0	3	0	10	13	0	0	0	15	15	0	25	0	5	30	0	0	1	10	11	69
% App. Total	0	23.1	0	76.9		0	0	0	100		0	83.3	0	16.7		0	0	9.1	90.9		
PHF	.000	.375	.000	.500	.650	.000	.000	.000	.625	.625	.000	.625	.000	.625	.625	.000	.000	.250	.625	.550	.821

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Client: VHB/ J. Quitter

File Name : 81676D- KKK
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	0	0	0	3	0	0	0	1	6
04:15 PM	0	1	0	0	0	0	0	1	0	0	0	1	3
04:30 PM	0	2	0	0	0	0	0	3	0	0	0	1	6
04:45 PM	0	4	0	0	0	0	0	4	0	0	0	1	9
Total	0	9	0	0	0	0	0	11	0	0	0	4	24
05:00 PM	0	4	0	0	0	0	0	0	0	0	0	1	5
05:15 PM	0	1	0	0	0	0	0	0	1	1	0	0	3
05:30 PM	0	1	0	1	0	0	0	0	1	0	1	1	5
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	6	0	1	0	0	0	1	2	1	1	2	14
Grand Total	0	15	0	1	0	0	0	12	2	1	1	6	38
Apprch %	0	100	0	100	0	0	0	85.7	14.3	12.5	12.5	75	
Total %	0	39.5	0	2.6	0	0	0	31.6	5.3	2.6	2.6	15.8	

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	**1**	**1**	6
04:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	1	1	3
04:30 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	1	1	6
04:45 PM	0	**4**	0	**4**	0	0	0	0	0	**4**	0	**4**	0	0	1	1	**9**
Total Volume	0	9	0	9	0	0	0	0	0	11	0	11	0	0	4	4	24
% App. Total	0	100	0		0	0	0		0	100	0		0	0	100		
PHF	.000	.563	.000	.563	.000	.000	.000	.000	.000	.688	.000	.688	.000	.000	1.000	1.000	.667

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- KKK
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	15	33	1	6	7	1	1	49	2	5	3	33	156
04:15 PM	7	32	1	9	4	0	0	43	2	2	5	29	134
04:30 PM	8	37	5	11	1	6	1	50	2	4	2	39	166
04:45 PM	13	21	2	19	10	2	1	43	1	1	3	30	146
Total	43	123	9	45	22	9	3	185	7	12	13	131	602
05:00 PM	12	29	2	22	8	9	1	39	3	1	3	26	155
05:15 PM	17	23	4	8	6	2	0	34	4	2	0	29	129
05:30 PM	10	27	2	7	4	2	1	28	2	4	1	28	116
05:45 PM	12	25	1	5	1	4	0	30	1	2	3	22	106
Total	51	104	9	42	19	17	2	131	10	9	7	105	506
Grand Total	94	227	18	87	41	26	5	316	17	21	20	236	1108
Apprch %	27.7	67	5.3	56.5	26.6	16.9	1.5	93.5	5	7.6	7.2	85.2	
Total %	8.5	20.5	1.6	7.9	3.7	2.3	0.5	28.5	1.5	1.9	1.8	21.3	

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**15**	33	1	49	6	7	1	14	**1**	49	**2**	52	**5**	3	33	41	156
04:15 PM	7	32	1	40	9	4	0	13	0	43	2	45	2	**5**	29	36	134
04:30 PM	8	**37**	**5**	**50**	11	1	**6**	18	1	**50**	2	**53**	4	2	**39**	**45**	**166**
04:45 PM	13	21	2	36	**19**	**10**	2	**31**	1	43	1	45	1	3	30	34	146
Total Volume	43	123	9	175	45	22	9	76	3	185	7	195	12	13	131	156	602
% App. Total	24.6	70.3	5.1		59.2	28.9	11.8		1.5	94.9	3.6		7.7	8.3	84		
PHF	.717	.831	.450	.875	.592	.550	.375	.613	.750	.925	.875	.920	.600	.650	.840	.867	.907

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N/S: North Front Street
E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- KKK
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Logan Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	15	35	1	6	7	1	1	52	2	5	3	34	162
04:15 PM	7	33	1	9	4	0	0	44	2	2	5	30	137
04:30 PM	8	39	5	11	1	6	1	53	2	4	2	40	172
04:45 PM	13	25	2	19	10	2	1	47	1	1	3	31	155
Total	43	132	9	45	22	9	3	196	7	12	13	135	626
05:00 PM	12	33	2	22	8	9	1	39	3	1	3	27	160
05:15 PM	17	24	4	8	6	2	0	34	5	3	0	29	132
05:30 PM	10	28	2	8	4	2	1	28	3	4	2	29	121
05:45 PM	12	25	1	5	1	4	0	31	1	2	3	22	107
Total	51	110	9	43	19	17	2	132	12	10	8	107	520
Grand Total	94	242	18	88	41	26	5	328	19	22	21	242	1146
Apprch %	26.6	68.4	5.1	56.8	26.5	16.8	1.4	93.2	5.4	7.7	7.4	84.9	
Total %	8.2	21.1	1.6	7.7	3.6	2.3	0.4	28.6	1.7	1.9	1.8	21.1	
Cars	94	227	18	87	41	26	5	316	17	21	20	236	1108
% Cars	100	93.8	100	98.9	100	100	100	96.3	89.5	95.5	95.2	97.5	96.7
Heavy Vehicles	0	15	0	1	0	0	0	12	2	1	1	6	38
% Heavy Vehicles	0	6.2	0	1.1	0	0	0	3.7	10.5	4.5	4.8	2.5	3.3

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**15**	35	1	51	6	7	1	14	**1**	52	**2**	55	**5**	3	34	42	162
04:15 PM	7	33	1	41	9	4	0	13	0	44	2	46	2	**5**	30	37	137
04:30 PM	8	**39**	**5**	**52**	11	1	**6**	18	1	**53**	2	**56**	4	2	**40**	**46**	**172**
04:45 PM	13	25	2	40	**19**	**10**	2	**31**	1	47	1	49	1	3	31	35	155
Total Volume	43	132	9	184	45	22	9	76	3	196	7	206	12	13	135	160	626
% App. Total	23.4	71.7	4.9		59.2	28.9	11.8		1.5	95.1	3.4		7.5	8.1	84.4		
PHF	.717	.846	.450	.885	.592	.550	.375	.613	.750	.925	.875	.920	.600	.650	.844	.870	.910
Cars	43	123	9	175	45	22	9	76	3	185	7	195	12	13	131	156	602
% Cars	100	93.2	100	95.1	100	100	100	100	100	94.4	100	94.7	100	100	97.0	97.5	96.2
Heavy Vehicles	0	9	0	9	0	0	0	0	0	11	0	11	0	0	4	4	24
% Heavy Vehicles	0	6.8	0	4.9	0	0	0	0	0	5.6	0	5.3	0	0	3.0	2.5	3.8

PRECISION
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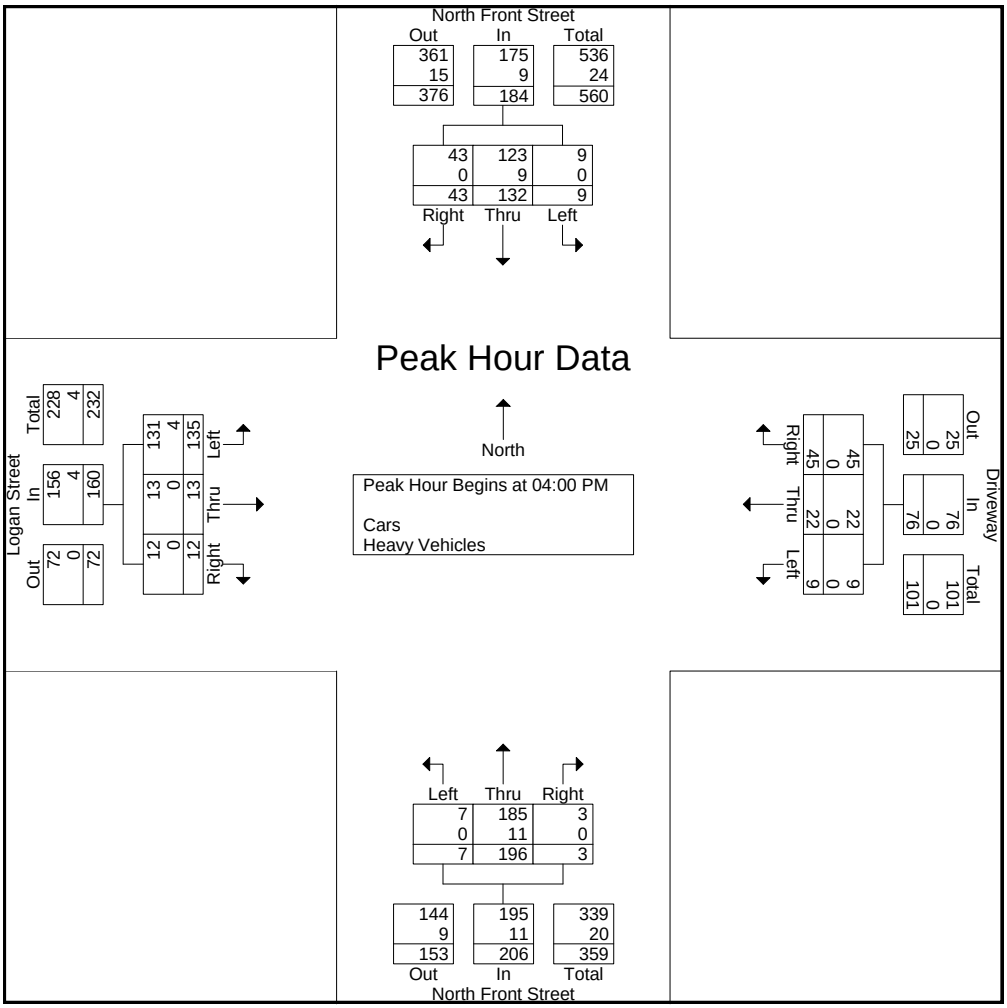
N/S: North Front Street
E/W: Driveway/ Logan Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- KKK
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	North Front Street From North				Driveway From East				North Front Street From South				Logan Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**15**	35	1	51	6	7	1	14	**1**	52	**2**	55	**5**	3	34	42	162
04:15 PM	7	33	1	41	9	4	0	13	0	44	2	46	2	**5**	30	37	137
04:30 PM	8	**39**	**5**	**52**	11	1	**6**	18	1	**53**	2	**56**	4	2	**40**	**46**	**172**
04:45 PM	13	25	2	40	**19**	**10**	2	**31**	1	47	1	49	1	3	31	35	155
Total Volume	43	132	9	184	45	22	9	76	3	196	7	206	12	13	135	160	626
% App. Total	23.4	71.7	4.9		59.2	28.9	11.8		1.5	95.1	3.4		7.5	8.1	84.4		
PHF	.717	.846	.450	.885	.592	.550	.375	.613	.750	.925	.875	.920	.600	.650	.844	.870	.910
Cars	43	123	9	175	45	22	9	76	3	185	7	195	12	13	131	156	602
% Cars	100	93.2	100	95.1	100	100	100	100	100	94.4	100	94.7	100	100	97.0	97.5	96.2
Heavy Vehicles	0	9	0	9	0	0	0	0	0	11	0	11	0	0	4	4	24
% Heavy Vehicles	0	6.8	0	4.9	0	0	0	0	0	5.6	0	5.3	0	0	3.0	2.5	3.8



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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- L
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	33	6	1	1	1	4	18	2	0	1	0	68
07:15 AM	0	55	3	0	0	1	1	17	0	0	0	1	78
07:30 AM	5	48	2	2	0	1	0	20	1	2	0	1	82
07:45 AM	3	43	6	2	0	2	8	22	1	1	0	1	89
Total	9	179	17	5	1	5	13	77	4	3	1	3	317
08:00 AM	6	42	1	1	0	0	3	27	1	2	0	5	88
08:15 AM	4	47	2	3	0	0	3	29	1	3	1	2	95
08:30 AM	7	25	2	3	0	3	3	32	0	1	0	2	78
08:45 AM	4	32	2	0	0	0	0	31	0	0	0	7	76
Total	21	146	7	7	0	3	9	119	2	6	1	16	337
Grand Total	30	325	24	12	1	8	22	196	6	9	2	19	654
Apprch %	7.9	85.8	6.3	57.1	4.8	38.1	9.8	87.5	2.7	30	6.7	63.3	
Total %	4.6	49.7	3.7	1.8	0.2	1.2	3.4	30	0.9	1.4	0.3	2.9	
Cars	27	296	17	9	1	7	20	172	5	8	2	18	582
% Cars	90	91.1	70.8	75	100	87.5	90.9	87.8	83.3	88.9	100	94.7	89
Heavy Vehicles	3	29	7	3	0	1	2	24	1	1	0	1	72
% Heavy Vehicles	10	8.9	29.2	25	0	12.5	9.1	12.2	16.7	11.1	0	5.3	11

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	**48**	2	**55**	2	0	1	3	0	20	**1**	21	2	0	1	3	82
07:45 AM	3	43	**6**	52	2	0	**2**	**4**	**8**	22	1	31	1	0	1	2	89
08:00 AM	**6**	42	1	49	1	0	0	1	3	27	1	31	2	0	**5**	**7**	88
08:15 AM	4	47	2	53	**3**	0	0	3	3	**29**	1	**33**	**3**	**1**	2	6	**95**
Total Volume	18	180	11	209	8	0	3	11	14	98	4	116	8	1	9	18	354
% App. Total	8.6	86.1	5.3		72.7	0	27.3		12.1	84.5	3.4		44.4	5.6	50		
PHF	.750	.938	.458	.950	.667	.000	.375	.688	.438	.845	1.000	.879	.667	.250	.450	.643	.932
Cars	18	171	5	194	7	0	3	10	13	88	3	104	7	1	9	17	325
% Cars	100	95.0	45.5	92.8	87.5	0	100	90.9	92.9	89.8	75.0	89.7	87.5	100	100	94.4	91.8
Heavy Vehicles	0	9	6	15	1	0	0	1	1	10	1	12	1	0	0	1	29
% Heavy Vehicles	0	5.0	54.5	7.2	12.5	0	0	9.1	7.1	10.2	25.0	10.3	12.5	0	0	5.6	8.2

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E/W: Driveway/ Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- L
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	25	5	0	1	1	3	14	2	0	1	0	53
07:15 AM	0	48	3	0	0	1	1	14	0	0	0	1	68
07:30 AM	5	44	0	1	0	1	0	17	0	1	0	1	70
07:45 AM	3	43	4	2	0	2	8	20	1	1	0	1	85
Total	9	160	12	3	1	5	12	65	3	2	1	3	276
08:00 AM	6	38	1	1	0	0	3	25	1	2	0	5	82
08:15 AM	4	46	0	3	0	0	2	26	1	3	1	2	88
08:30 AM	5	24	2	2	0	2	3	29	0	1	0	2	70
08:45 AM	3	28	2	0	0	0	0	27	0	0	0	6	66
Total	18	136	5	6	0	2	8	107	2	6	1	15	306
Grand Total	27	296	17	9	1	7	20	172	5	8	2	18	582
Apprch %	7.9	87.1	5	52.9	5.9	41.2	10.2	87.3	2.5	28.6	7.1	64.3	
Total %	4.6	50.9	2.9	1.5	0.2	1.2	3.4	29.6	0.9	1.4	0.3	3.1	

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	44	0	49	1	0	1	2	0	17	0	17	1	0	1	2	70
07:45 AM	3	43	**4**	**50**	2	0	**2**	**4**	**8**	20	**1**	**29**	1	0	1	2	85
08:00 AM	**6**	38	1	45	1	0	0	1	3	25	1	29	2	0	**5**	**7**	82
08:15 AM	4	**46**	0	50	**3**	0	0	3	2	**26**	1	29	**3**	**1**	2	6	**88**
Total Volume	18	171	5	194	7	0	3	10	13	88	3	104	7	1	9	17	325
% App. Total	9.3	88.1	2.6		70	0	30		12.5	84.6	2.9		41.2	5.9	52.9		
PHF	.750	.929	.313	.970	.583	.000	.375	.625	.406	.846	.750	.897	.583	.250	.450	.607	.923

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- L
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	8	1	1	0	0	1	4	0	0	0	0	15
07:15 AM	0	7	0	0	0	0	0	3	0	0	0	0	10
07:30 AM	0	4	2	1	0	0	0	3	1	1	0	0	12
07:45 AM	0	0	2	0	0	0	0	2	0	0	0	0	4
Total	0	19	5	2	0	0	1	12	1	1	0	0	41
08:00 AM	0	4	0	0	0	0	0	2	0	0	0	0	6
08:15 AM	0	1	2	0	0	0	1	3	0	0	0	0	7
08:30 AM	2	1	0	1	0	1	0	3	0	0	0	0	8
08:45 AM	1	4	0	0	0	0	0	4	0	0	0	1	10
Total	3	10	2	1	0	1	1	12	0	0	0	1	31
Grand Total	3	29	7	3	0	1	2	24	1	1	0	1	72
Apprch %	7.7	74.4	17.9	75	0	25	7.4	88.9	3.7	50	0	50	
Total %	4.2	40.3	9.7	4.2	0	1.4	2.8	33.3	1.4	1.4	0	1.4	

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**8**	1	**9**	**1**	0	0	**1**	**1**	**4**	0	**5**	0	0	0	0	**15**
07:15 AM	0	7	0	7	0	0	0	0	0	3	0	3	0	0	0	0	10
07:30 AM	0	4	**2**	6	1	0	0	1	0	3	**1**	4	**1**	0	0	**1**	12
07:45 AM	0	0	2	2	0	0	0	0	0	2	0	2	0	0	0	0	4
Total Volume	0	19	5	24	2	0	0	2	1	12	1	14	1	0	0	1	41
% App. Total	0	79.2	20.8		100	0	0		7.1	85.7	7.1		100	0	0		
PHF	.000	.594	.625	.667	.500	.000	.000	.500	.250	.750	.250	.700	.250	.000	.000	.250	.683

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- L
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	3	1	0	0	0	0	1	3	0	0	0	0	0	0	1	9
07:15 AM	0	1	3	1	0	0	0	0	1	0	0	0	0	0	0	1	7
07:30 AM	0	6	2	1	0	0	0	1	2	0	0	0	0	0	0	0	12
07:45 AM	0	5	1	1	0	0	0	1	0	0	0	0	0	0	0	0	8
Total	0	15	7	3	0	0	0	3	6	0	0	0	0	0	0	2	36
08:00 AM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
08:15 AM	0	1	1	1	0	0	1	3	0	0	0	0	0	0	0	1	8
08:30 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
08:45 AM	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	4
Total	0	4	3	1	0	0	1	6	0	1	0	0	0	0	0	1	17
Grand Total	0	19	10	4	0	0	1	9	6	1	0	0	0	0	0	3	53
Apprch %	0	57.6	30.3	12.1	0	0	10	90	85.7	14.3	0	0	0	0	0	100	
Total %	0	35.8	18.9	7.5	0	0	1.9	17	11.3	1.9	0	0	0	0	0	5.7	

	North Front Street From North					Driveway From East					North Front Street From South					Wamsutta Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	3	1	0	4	0	0	0	**1**	**1**	**3**	**0**	**0**	**0**	**3**	0	0	0	**1**	**1**	9
07:15 AM	0	1	**3**	**1**	**5**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**7**
07:30 AM	**0**	**6**	2	1	**9**	0	0	0	1	1	2	0	0	0	2	0	0	0	0	0	**12**
07:45 AM	0	5	1	1	7	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	8
Total Volume	0	15	7	3	25	0	0	0	3	3	6	0	0	0	6	0	0	0	2	2	36
% App. Total	0	60	28	12		0	0	0	100		100	0	0	0		0	0	0	100		
PHF	.000	.625	.583	.750	.694	.000	.000	.000	.750	.750	.500	.000	.000	.000	.500	.000	.000	.000	.500	.500	.750

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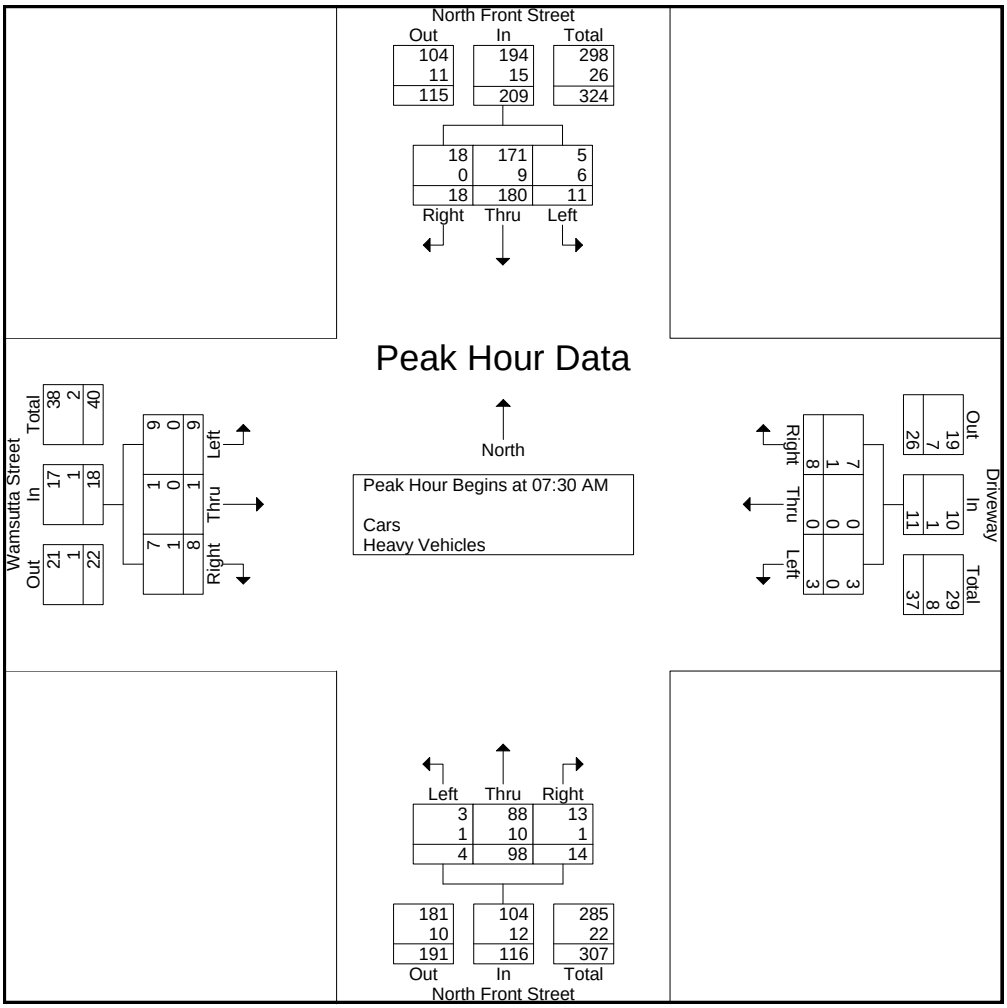
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: North Front Street
E/W: Driveway/ Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- L
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	**48**	2	**55**	2	0	1	3	0	20	**1**	21	2	0	1	3	82
07:45 AM	3	43	**6**	52	2	0	**2**	**4**	**8**	22	1	31	1	0	1	2	89
08:00 AM	**6**	42	1	49	1	0	0	1	3	27	1	31	2	0	**5**	**7**	88
08:15 AM	4	47	2	53	**3**	0	0	3	3	**29**	1	**33**	**3**	**1**	2	6	**95**
Total Volume	18	180	11	209	8	0	3	11	14	98	4	116	8	1	9	18	354
% App. Total	8.6	86.1	5.3		72.7	0	27.3		12.1	84.5	3.4		44.4	5.6	50		
PHF	.750	.938	.458	.950	.667	.000	.375	.688	.438	.845	1.000	.879	.667	.250	.450	.643	.932
Cars	18	171	5	194	7	0	3	10	13	88	3	104	7	1	9	17	325
% Cars	100	95.0	45.5	92.8	87.5	0	100	90.9	92.9	89.8	75.0	89.7	87.5	100	100	94.4	91.8
Heavy Vehicles	0	9	6	15	1	0	0	1	1	10	1	12	1	0	0	1	29
% Heavy Vehicles	0	5.0	54.5	7.2	12.5	0	0	9.1	7.1	10.2	25.0	10.3	12.5	0	0	5.6	8.2



PRECISION
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N/S: North Front Street
E/W: Driveway/ Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- LLL
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	37	2	5	0	2	2	44	1	1	0	3	101
04:15 PM	3	40	2	7	1	4	4	35	0	1	0	3	100
04:30 PM	0	49	2	5	0	3	1	49	0	3	0	4	116
04:45 PM	2	26	1	2	1	0	1	40	2	1	0	3	79
Total	9	152	7	19	2	9	8	168	3	6	0	13	396
05:00 PM	2	40	0	1	0	1	0	41	1	3	0	2	91
05:15 PM	1	29	1	2	0	0	1	31	0	1	0	2	68
05:30 PM	3	31	0	1	0	2	0	27	0	0	0	2	66
05:45 PM	2	28	0	3	0	0	0	20	1	0	0	2	56
Total	8	128	1	7	0	3	1	119	2	4	0	8	281
Grand Total	17	280	8	26	2	12	9	287	5	10	0	21	677
Apprch %	5.6	91.8	2.6	65	5	30	3	95.3	1.7	32.3	0	67.7	
Total %	2.5	41.4	1.2	3.8	0.3	1.8	1.3	42.4	0.7	1.5	0	3.1	
Cars	17	269	8	22	2	12	9	281	5	10	0	21	656
% Cars	100	96.1	100	84.6	100	100	100	97.9	100	100	0	100	96.9
Heavy Vehicles	0	11	0	4	0	0	0	6	0	0	0	0	21
% Heavy Vehicles	0	3.9	0	15.4	0	0	0	2.1	0	0	0	0	3.1

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**4**	37	**2**	43	5	0	2	7	2	44	1	47	1	0	3	4	101
04:15 PM	3	40	2	45	**7**	**1**	**4**	**12**	**4**	35	0	39	1	0	3	4	100
04:30 PM	0	**49**	2	**51**	5	0	3	8	1	**49**	0	**50**	**3**	0	**4**	**7**	**116**
04:45 PM	2	26	1	29	2	1	0	3	1	40	**2**	43	1	0	3	4	79
Total Volume	9	152	7	168	19	2	9	30	8	168	3	179	6	0	13	19	396
% App. Total	5.4	90.5	4.2		63.3	6.7	30		4.5	93.9	1.7		31.6	0	68.4		
PHF	.563	.776	.875	.824	.679	.500	.563	.625	.500	.857	.375	.895	.500	.000	.813	.679	.853
Cars	9	145	7	161	16	2	9	27	8	163	3	174	6	0	13	19	381
% Cars	100	95.4	100	95.8	84.2	100	100	90.0	100	97.0	100	97.2	100	0	100	100	96.2
Heavy Vehicles	0	7	0	7	3	0	0	3	0	5	0	5	0	0	0	0	15
% Heavy Vehicles	0	4.6	0	4.2	15.8	0	0	10.0	0	3.0	0	2.8	0	0	0	0	3.8

PRECISION
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N/S: North Front Street
E/W: Driveway/ Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- LLL
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	36	2	5	0	2	2	42	1	1	0	3	98
04:15 PM	3	36	2	6	1	4	4	34	0	1	0	3	94
04:30 PM	0	47	2	4	0	3	1	49	0	3	0	4	113
04:45 PM	2	26	1	1	1	0	1	38	2	1	0	3	76
Total	9	145	7	16	2	9	8	163	3	6	0	13	381
05:00 PM	2	37	0	1	0	1	0	41	1	3	0	2	88
05:15 PM	1	29	1	1	0	0	1	31	0	1	0	2	67
05:30 PM	3	30	0	1	0	2	0	26	0	0	0	2	64
05:45 PM	2	28	0	3	0	0	0	20	1	0	0	2	56
Total	8	124	1	6	0	3	1	118	2	4	0	8	275
Grand Total	17	269	8	22	2	12	9	281	5	10	0	21	656
Apprch %	5.8	91.5	2.7	61.1	5.6	33.3	3.1	95.3	1.7	32.3	0	67.7	
Total %	2.6	41	1.2	3.4	0.3	1.8	1.4	42.8	0.8	1.5	0	3.2	

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**4**	36	**2**	42	5	0	2	7	2	42	1	45	1	0	3	4	98
04:15 PM	3	36	2	41	**6**	**1**	**4**	**11**	**4**	34	0	38	1	0	3	4	94
04:30 PM	0	**47**	2	**49**	4	0	3	7	1	**49**	0	**50**	**3**	0	**4**	**7**	**113**
04:45 PM	2	26	1	29	1	1	0	2	1	38	**2**	41	1	0	3	4	76
Total Volume	9	145	7	161	16	2	9	27	8	163	3	174	6	0	13	19	381
% App. Total	5.6	90.1	4.3		59.3	7.4	33.3		4.6	93.7	1.7		31.6	0	68.4		
PHF	.563	.771	.875	.821	.667	.500	.563	.614	.500	.832	.375	.870	.500	.000	.813	.679	.843

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- LLL
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Front Street From North			Driveway From East			North Front Street From South			Wamsutta Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
04:15 PM	0	4	0	1	0	0	0	1	0	0	0	0	6
04:30 PM	0	2	0	1	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	1	0	0	0	2	0	0	0	0	3
Total	0	7	0	3	0	0	0	5	0	0	0	0	15
05:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4	0	1	0	0	0	1	0	0	0	0	6
Grand Total	0	11	0	4	0	0	0	6	0	0	0	0	21
Apprch %	0	100	0	100	0	0	0	100	0	0	0	0	
Total %	0	52.4	0	19	0	0	0	28.6	0	0	0	0	

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	0	0	0	**2**	0	**2**	0	0	0	0	3
04:15 PM	0	**4**	0	**4**	**1**	0	0	**1**	0	1	0	1	0	0	0	0	**6**
04:30 PM	0	2	0	2	1	0	0	1	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	0	0	0	3
Total Volume	0	7	0	7	3	0	0	3	0	5	0	5	0	0	0	0	15
% App. Total	0	100	0		100	0	0		0	100	0		0	0	0		
PHF	.000	.438	.000	.438	.750	.000	.000	.750	.000	.625	.000	.625	.000	.000	.000	.000	.625

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N/S: North Front Street
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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- LLL
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	1	4	0	1	0	0	5	0	0	0	0	0	0	12
04:15 PM	0	0	0	1	0	0	0	1	0	6	0	0	0	0	0	3	11
04:30 PM	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	1	7
04:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Total	0	1	0	2	4	0	1	2	0	18	0	0	0	0	0	4	32
05:00 PM	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	1	5
05:15 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	3
05:30 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3
05:45 PM	0	1	0	0	3	0	2	0	0	4	0	0	0	0	0	0	10
Total	0	2	1	0	3	1	2	0	0	9	0	0	0	1	0	2	21
Grand Total	0	3	1	2	7	1	3	2	0	27	0	0	0	1	0	6	53
Apprch %	0	50	16.7	33.3	53.8	7.7	23.1	15.4	0	100	0	0	0	14.3	0	85.7	
Total %	0	5.7	1.9	3.8	13.2	1.9	5.7	3.8	0	50.9	0	0	0	1.9	0	11.3	

	North Front Street From North					Driveway From East					North Front Street From South					Wamsutta Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**1**	0	**1**	**2**	**4**	0	**1**	**0**	**5**	0	5	0	0	5	0	0	0	0	0	**12**
04:15 PM	0	0	0	1	1	0	0	0	**1**	1	0	**6**	**0**	**0**	**6**	0	0	0	**3**	**3**	11
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	5	0	0	5	0	0	0	1	1	7
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total Volume	0	1	0	2	3	4	0	1	2	7	0	18	0	0	18	0	0	0	4	4	32
% App. Total	0	33.3	0	66.7		57.1	0	14.3	28.6		0	100	0	0		0	0	0	100		
PHF	.000	.250	.000	.500	.375	.250	.000	.250	.500	.350	.000	.750	.000	.000	.750	.000	.000	.000	.333	.333	.667

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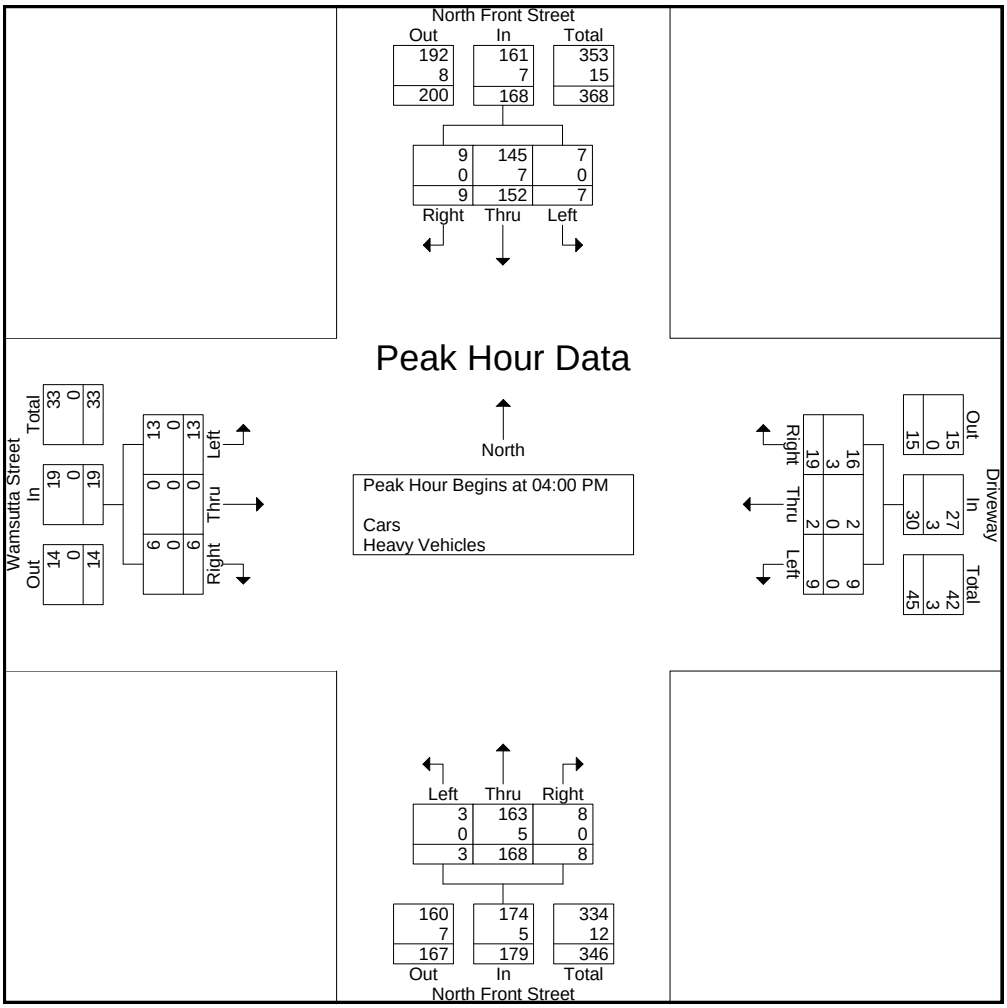
	North Front Street From North				Driveway From East				North Front Street From South				Wamsutta Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**4**	37	**2**	43	5	0	2	7	2	44	1	47	1	0	3	4	101
04:15 PM	3	40	2	45	**7**	**1**	**4**	**12**	**4**	35	0	39	1	0	3	4	100
04:30 PM	0	**49**	2	**51**	5	0	3	8	1	**49**	0	**50**	**3**	0	**4**	**7**	**116**
04:45 PM	2	26	1	29	2	1	0	3	1	40	**2**	43	1	0	3	4	79
Total Volume	9	152	7	168	19	2	9	30	8	168	3	179	6	0	13	19	396
% App. Total	5.4	90.5	4.2		63.3	6.7	30		4.5	93.9	1.7		31.6	0	68.4		
PHF	.563	.776	.875	.824	.679	.500	.563	.625	.500	.857	.375	.895	.500	.000	.813	.679	.853
Cars	9	145	7	161	16	2	9	27	8	163	3	174	6	0	13	19	381
% Cars	100	95.4	100	95.8	84.2	100	100	90.0	100	97.0	100	97.2	100	0	100	100	96.2
Heavy Vehicles	0	7	0	7	3	0	0	3	0	5	0	5	0	0	0	0	15
% Heavy Vehicles	0	4.6	0	4.2	15.8	0	0	10.0	0	3.0	0	2.8	0	0	0	0	3.8



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E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- M
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:15 AM	0	0	0	0	0	2	0	0	0	2
07:30 AM	4	0	0	0	0	1	0	0	0	5
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	4	0	0	0	0	3	0	0	0	7
08:00 AM	0	0	0	0	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1
Grand Total	4	0	0	0	0	4	0	0	0	8
Apprch %	100	0	0	0	0	100	0	0	0	
Total %	50	0	0	0	0	50	0	0	0	

	Acushnet Avenue From North				Wamsutta Street From East				Acushnet Avenue From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:30 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	2
07:30 AM	**4**	0	0	**4**	0	0	1	1	0	0	0	0	**5**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total Volume	4	0	0	4	0	0	4	4	0	0	0	0	8
% App. Total	100	0	0		0	0	100		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.500	.500	.000	.000	.000	.000	.400

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E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- M
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:15 AM	0	0	0	0	0	0	0
07:30 AM	2	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0
Total	2	0	0	0	0	0	2
08:00 AM	1	0	0	0	0	1	2
08:15 AM	0	0	0	0	1	0	1
08:30 AM	0	1	2	0	0	3	6
08:45 AM	0	0	0	0	0	0	0
Total	1	1	2	0	1	4	9
Grand Total	3	1	2	0	1	4	11
Apprch %	75	25	100	0	20	80	
Total %	27.3	9.1	18.2	0	9.1	36.4	

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	**1**	0	**1**	0	0	0	0	1	1	2
08:15 AM	0	0	0	0	0	0	**1**	0	1	1
08:30 AM	0	**1**	1	**2**	0	**2**	0	**3**	**3**	**6**
Total Volume	**1**	**1**	**2**	**2**	**0**	**2**	**1**	**4**	**5**	**9**
% App. Total	**50**	**50**		**100**	**0**		**20**	**80**		
PHF	**.250**	**.250**	**.500**	**.250**	**.000**	**.250**	**.250**	**.333**	**.417**	**.375**

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N/S: Acushnet Avenue
E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- M
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:15 AM	19	1	1	1	0	20	42
07:30 AM	12	3	0	4	1	11	31
07:45 AM	8	2	2	2	0	15	29
Total	39	6	3	7	1	46	102
08:00 AM	14	2	0	6	5	13	40
08:15 AM	16	6	1	5	3	12	43
08:30 AM	17	0	3	5	4	8	37
08:45 AM	15	1	2	4	4	9	35
Total	62	9	6	20	16	42	155
Grand Total	101	15	9	27	17	88	257
Apprch %	87.1	12.9	25	75	16.2	83.8	
Total %	39.3	5.8	3.5	10.5	6.6	34.2	

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	8	2	10	2	2	4	0	**15**	15	29
08:00 AM	14	2	16	0	**6**	6	**5**	13	**18**	40
08:15 AM	16	**6**	**22**	1	5	6	3	12	15	**43**
08:30 AM	**17**	0	17	**3**	5	**8**	4	8	12	37
Total Volume	55	10	65	6	18	24	12	48	60	149
% App. Total	84.6	15.4		25	75		20	80		
PHF	.809	.417	.739	.500	.750	.750	.600	.800	.833	.866

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N/S: Acushnet Avenue
E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- M
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:15 AM	19	1	1	1	0	20	42
07:30 AM	14	3	0	4	1	11	33
07:45 AM	8	2	2	2	0	15	29
Total	41	6	3	7	1	46	104
08:00 AM	15	2	0	6	5	14	42
08:15 AM	16	6	1	5	4	12	44
08:30 AM	17	1	5	5	4	11	43
08:45 AM	15	1	2	4	4	9	35
Total	63	10	8	20	17	46	164
Grand Total	104	16	11	27	18	92	268
Apprch %	86.7	13.3	28.9	71.1	16.4	83.6	
Total %	38.8	6	4.1	10.1	6.7	34.3	
Cars	101	15	9	27	17	88	257
% Cars	97.1	93.8	81.8	100	94.4	95.7	95.9
Heavy Vehicles	3	1	2	0	1	4	11
% Heavy Vehicles	2.9	6.2	18.2	0	5.6	4.3	4.1

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	8	2	10	2	2	4	0	**15**	15	29
08:00 AM	15	2	17	0	**6**	6	**5**	14	**19**	42
08:15 AM	16	**6**	**22**	1	5	6	4	12	16	**44**
08:30 AM	**17**	1	18	**5**	5	**10**	4	11	15	43
Total Volume	56	11	67	8	18	26	13	52	65	158
% App. Total	83.6	16.4		30.8	69.2		20	80		
PHF	.824	.458	.761	.400	.750	.650	.650	.867	.855	.898
Cars	55	10	65	6	18	24	12	48	60	149
% Cars	98.2	90.9	97.0	75.0	100	92.3	92.3	92.3	92.3	94.3
Heavy Vehicles	1	1	2	2	0	2	1	4	5	9
% Heavy Vehicles	1.8	9.1	3.0	25.0	0	7.7	7.7	7.7	7.7	5.7

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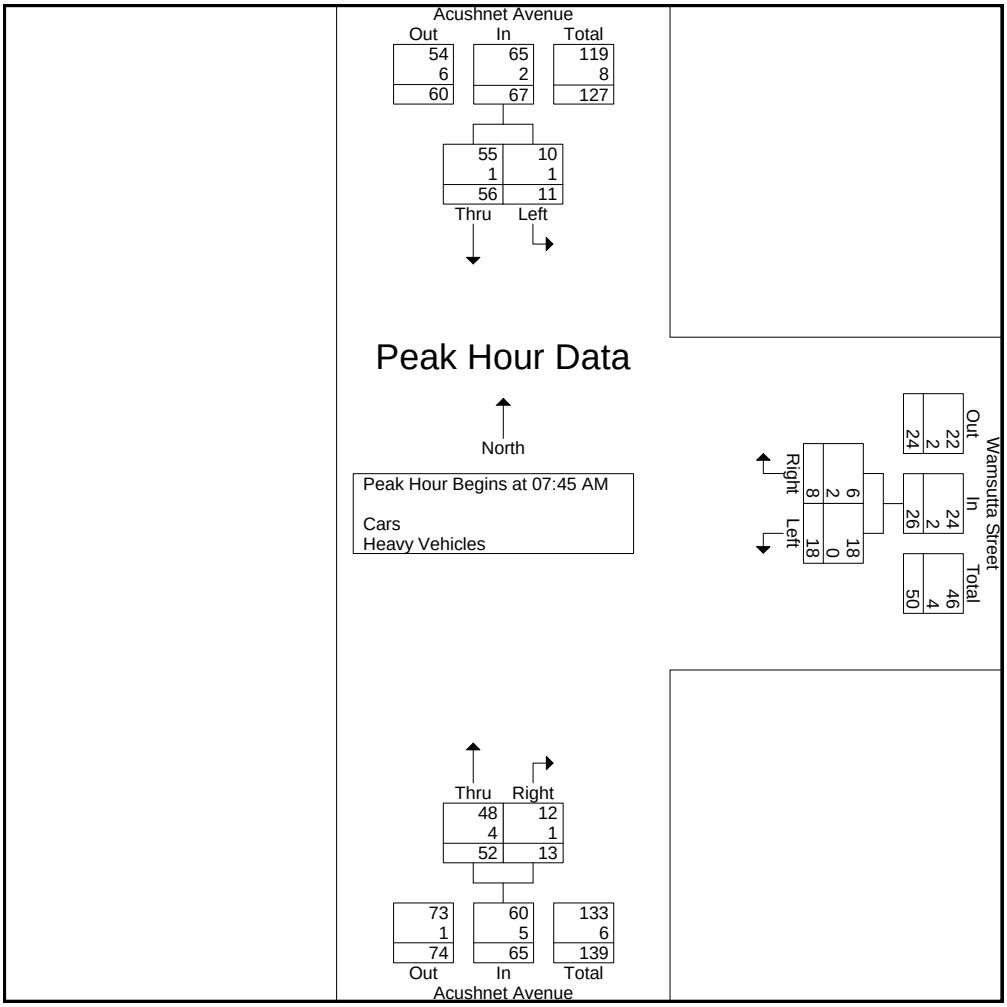
N/S: Acushnet Avenue
E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- M
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	8	2	10	2	2	4	0	**15**	15	29
08:00 AM	15	2	17	0	**6**	6	**5**	14	**19**	42
08:15 AM	16	**6**	**22**	1	5	6	4	12	16	**44**
08:30 AM	**17**	1	18	**5**	5	**10**	4	11	15	43
Total Volume	56	11	67	8	18	26	13	52	65	158
% App. Total	83.6	16.4		30.8	69.2		20	80		
PHF	.824	.458	.761	.400	.750	.650	.650	.867	.855	.898
Cars	55	10	65	6	18	24	12	48	60	149
% Cars	98.2	90.9	97.0	75.0	100	92.3	92.3	92.3	92.3	94.3
Heavy Vehicles	1	1	2	2	0	2	1	4	5	9
% Heavy Vehicles	1.8	9.1	3.0	25.0	0	7.7	7.7	7.7	7.7	5.7



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N/S: Acushnet Avenue
E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- MMM
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Cars - Heavy Vehicles

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	18	3	4	5	1	16	47
04:15 PM	10	1	5	3	4	10	33
04:30 PM	11	1	0	3	4	21	40
04:45 PM	8	1	6	3	2	14	34
Total	47	6	15	14	11	61	154
05:00 PM	8	2	0	2	1	16	29
05:15 PM	13	2	0	1	1	10	27
05:30 PM	11	0	0	2	3	17	33
05:45 PM	7	1	2	2	3	9	24
Total	39	5	2	7	8	52	113
Grand Total	86	11	17	21	19	113	267
Apprch %	88.7	11.3	44.7	55.3	14.4	85.6	
Total %	32.2	4.1	6.4	7.9	7.1	42.3	
Cars	81	11	17	21	19	110	259
% Cars	94.2	100	100	100	100	97.3	97
Heavy Vehicles	5	0	0	0	0	3	8
% Heavy Vehicles	5.8	0	0	0	0	2.7	3

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**18**	**3**	**21**	4	**5**	**9**	1	16	17	**47**
04:15 PM	**10**	**1**	**11**	**5**	**3**	**8**	**4**	10	14	33
04:30 PM	11	1	12	0	3	3	4	**21**	**25**	40
04:45 PM	8	1	9	**6**	3	9	2	14	16	34
Total Volume	47	6	53	15	14	29	11	61	72	154
% App. Total	88.7	11.3		51.7	48.3		15.3	84.7		
PHF	.653	.500	.631	.625	.700	.806	.688	.726	.720	.819
Cars	44	6	50	15	14	29	11	60	71	150
% Cars	93.6	100	94.3	100	100	100	100	98.4	98.6	97.4
Heavy Vehicles	3	0	3	0	0	0	0	1	1	4
% Heavy Vehicles	6.4	0	5.7	0	0	0	0	1.6	1.4	2.6

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E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- MMM
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Cars

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	18	3	4	5	1	16	47
04:15 PM	8	1	5	3	4	10	31
04:30 PM	11	1	0	3	4	20	39
04:45 PM	7	1	6	3	2	14	33
Total	44	6	15	14	11	60	150
05:00 PM	8	2	0	2	1	14	27
05:15 PM	13	2	0	1	1	10	27
05:30 PM	10	0	0	2	3	17	32
05:45 PM	6	1	2	2	3	9	23
Total	37	5	2	7	8	50	109
Grand Total	81	11	17	21	19	110	259
Apprch %	88	12	44.7	55.3	14.7	85.3	
Total %	31.3	4.2	6.6	8.1	7.3	42.5	

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**18**	**3**	**21**	4	**5**	**9**	1	16	17	**47**
04:15 PM	**8**	**1**	**9**	**5**	**3**	**8**	**4**	10	14	31
04:30 PM	11	1	12	0	3	3	4	**20**	**24**	39
04:45 PM	7	1	8	**6**	3	9	2	14	16	33
Total Volume	44	6	50	15	14	29	11	60	71	150
% App. Total	88	12		51.7	48.3		15.5	84.5		
PHF	.611	.500	.595	.625	.700	.806	.688	.750	.740	.798

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E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- MMM
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Acushnet Avenue From North		Wamsutta Street From East		Acushnet Avenue From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	1	1
04:45 PM	1	0	0	0	0	0	1
Total	3	0	0	0	0	1	4
05:00 PM	0	0	0	0	0	2	2
05:15 PM	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	0	0	1
05:45 PM	1	0	0	0	0	0	1
Total	2	0	0	0	0	2	4
Grand Total	5	0	0	0	0	3	8
Apprch %	100	0	0	0	0	100	
Total %	62.5	0	0	0	0	37.5	

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**2**	0	**2**	0	0	0	0	0	0	**2**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**
04:45 PM	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
05:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	2
Total Volume	3	0	3	0	0	0	0	3	3	6
% App. Total	100	0		0	0		0	100		
PHF	.375	.000	.375	.000	.000	.000	.000	.375	.375	.750

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City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- MMM
Site Code : 10111.31
Start Date : 9/24/2008

Groups Printed- Peds and Bicycles

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	2	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	1	0	1
04:30 PM	1	0	0	0	0	0	0	3	0	4
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	3	0	0	0	0	0	0	4	0	7
05:00 PM	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	2
Grand Total	4	0	0	0	1	0	0	4	0	9
Apprch %	100	0	0	0	100	0	0	100	0	
Total %	44.4	0	0	0	11.1	0	0	44.4	0	

	Acushnet Avenue From North				Wamsutta Street From East				Acushnet Avenue From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	**2**	0	0	**2**	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	1	0	0	1	0	0	0	0	0	**3**	**0**	**3**	**4**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	0	3	0	0	0	0	0	4	0	4	7
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.375	.000	.000	.375	.000	.000	.000	.000	.000	.333	.000	.333	.438

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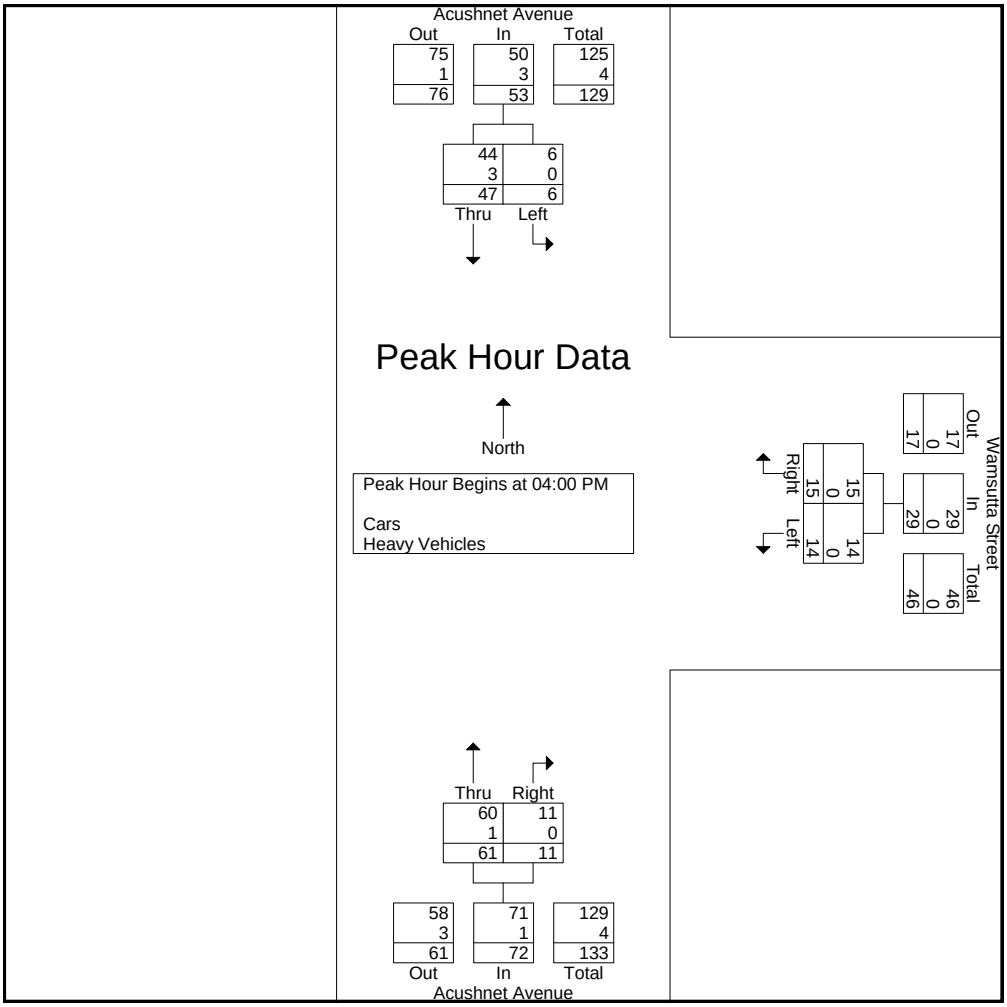
E: Wamsutta Street
City, State: New Bedford, MA
Client: VHB/ J. Quitter

File Name : 81676D- MMM
Site Code : 10111.31
Start Date : 9/24/2008
Page No : 1

	Acushnet Avenue From North			Wamsutta Street From East			Acushnet Avenue From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**18**	**3**	**21**	4	**5**	**9**	1	16	17	**47**
04:15 PM	**10**	**1**	**11**	**5**	**3**	**8**	**4**	10	14	33
04:30 PM	11	1	12	0	3	3	4	**21**	**25**	40
04:45 PM	8	1	9	**6**	3	9	2	14	16	34
Total Volume	47	6	53	15	14	29	11	61	72	154
% App. Total	88.7	11.3		51.7	48.3		15.3	84.7		
PHF	.653	.500	.631	.625	.700	.806	.688	.726	.720	.819
Cars	44	6	50	15	14	29	11	60	71	150
% Cars	93.6	100	94.3	100	100	100	100	98.4	98.6	97.4
Heavy Vehicles	3	0	3	0	0	0	0	1	1	4
% Heavy Vehicles	6.4	0	5.7	0	0	0	0	1.6	1.4	2.6



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Thurs 9/18/08 and Sat 10/18/08	81676	New Bedford, MA

PRECISION
D A T A
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Email: datarequests@pdillc.com

N/S: Mt. Pleasant Street
E: Route 140 SB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	63	8	7	36	94	48	256
07:15 AM	50	6	15	40	101	48	260
07:30 AM	51	21	17	40	105	62	296
07:45 AM	65	18	15	55	108	46	307
Total	229	53	54	171	408	204	1119
08:00 AM	53	12	7	27	71	44	214
08:15 AM	36	15	13	28	90	56	238
08:30 AM	42	9	12	37	64	42	206
08:45 AM	37	9	13	32	66	50	207
Total	168	45	45	124	291	192	865
Grand Total	397	98	99	295	699	396	1984
Apprch %	80.2	19.8	25.1	74.9	63.8	36.2	
Total %	20	4.9	5	14.9	35.2	20	
Cars	378	95	95	261	658	378	1865
% Cars	95.2	96.9	96	88.5	94.1	95.5	94
Heavy Vehicles	19	3	4	34	41	18	119
% Heavy Vehicles	4.8	3.1	4	11.5	5.9	4.5	6

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	63	8	71	7	36	43	94	48	142	256
07:15 AM	50	6	56	15	40	55	101	48	149	260
07:30 AM	51	**21**	72	**17**	40	57	105	**62**	**167**	296
07:45 AM	**65**	18	**83**	15	**55**	**70**	**108**	46	154	**307**
Total Volume	**229**	**53**	**282**	**54**	**171**	**225**	**408**	**204**	**612**	**1119**
% App. Total	**81.2**	**18.8**		**24**	**76**		**66.7**	**33.3**		
PHF	**.881**	**.631**	**.849**	**.794**	**.777**	**.804**	**.944**	**.823**	**.916**	**.911**
Cars	**216**	**51**	**267**	**52**	**160**	**212**	**383**	**192**	**575**	**1054**
% Cars	**94.3**	**96.2**	**94.7**	**96.3**	**93.6**	**94.2**	**93.9**	**94.1**	**94.0**	**94.2**
Heavy Vehicles	**13**	**2**	**15**	**2**	**11**	**13**	**25**	**12**	**37**	**65**
% Heavy Vehicles	**5.7**	**3.8**	**5.3**	**3.7**	**6.4**	**5.8**	**6.1**	**5.9**	**6.0**	**5.8**

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Mt. Pleasant Street
E: Route 140 SB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	58	8	7	35	88	42	238
07:15 AM	47	6	14	38	94	46	245
07:30 AM	48	19	16	37	102	58	280
07:45 AM	63	18	15	50	99	46	291
Total	216	51	52	160	383	192	1054
08:00 AM	51	11	6	25	63	42	198
08:15 AM	34	15	12	26	89	53	229
08:30 AM	42	9	12	25	60	42	190
08:45 AM	35	9	13	25	63	49	194
Total	162	44	43	101	275	186	811
Grand Total	378	95	95	261	658	378	1865
Apprch %	79.9	20.1	26.7	73.3	63.5	36.5	
Total %	20.3	5.1	5.1	14	35.3	20.3	

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	58	8	66	7	35	42	88	42	130	238
07:15 AM	47	6	53	14	38	52	94	46	140	245
07:30 AM	48	**19**	67	**16**	37	53	**102**	**58**	**160**	280
07:45 AM	**63**	18	**81**	15	**50**	**65**	99	46	145	**291**
Total Volume	**216**	**51**	**267**	**52**	**160**	**212**	**383**	**192**	**575**	**1054**
% App. Total	**80.9**	**19.1**		**24.5**	**75.5**		**66.6**	**33.4**		
PHF	**.857**	**.671**	**.824**	**.813**	**.800**	**.815**	**.939**	**.828**	**.898**	**.905**

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File Name : 81676 E-A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	5	0	0	1	6	6	18
07:15 AM	3	0	1	2	7	2	15
07:30 AM	3	2	1	3	3	4	16
07:45 AM	2	0	0	5	9	0	16
Total	13	2	2	11	25	12	65
08:00 AM	2	1	1	2	8	2	16
08:15 AM	2	0	1	2	1	3	9
08:30 AM	0	0	0	12	4	0	16
08:45 AM	2	0	0	7	3	1	13
Total	6	1	2	23	16	6	54
Grand Total	19	3	4	34	41	18	119
Apprch %	86.4	13.6	10.5	89.5	69.5	30.5	
Total %	16	2.5	3.4	28.6	34.5	15.1	

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**5**	0	**5**	0	1	1	6	**6**	**12**	**18**
07:15 AM	**3**	**0**	**3**	**1**	2	3	7	2	9	15
07:30 AM	3	**2**	5	1	3	4	3	4	7	16
07:45 AM	2	0	2	0	**5**	**5**	**9**	0	9	16
Total Volume	13	2	15	2	11	13	25	12	37	65
% App. Total	86.7	13.3		15.4	84.6		67.6	32.4		
PHF	.650	.250	.750	.500	.550	.650	.694	.500	.771	.903

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Client: VHB/J. Quitter

File Name : 81676 E-A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	2	0	0	0	0	0	0	0	0	2
07:30 AM	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	2	0	0	0	2
Total	3	0	0	0	0	2	0	0	0	5
08:00 AM	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	1	0	1
Total	1	0	0	0	0	0	0	1	0	2
Grand Total	4	0	0	0	0	2	0	1	0	7
Apprch %	100	0	0	0	0	100	0	100	0	
Total %	57.1	0	0	0	0	28.6	0	14.3	0	

	Mt. Pleasant Street From North				Route 140 SB Ramps From East				Mt. Pleasant Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	**2**	0	0	**2**	0	0	0	0	0	0	0	0	**2**
07:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	2
08:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	4	0	0	4	0	0	2	2	0	0	0	0	6
% App. Total	100	0	0		0	0	100		0	0	0		
PHF	.500	.000	.000	.500	.000	.000	.250	.250	.000	.000	.000	.000	.750

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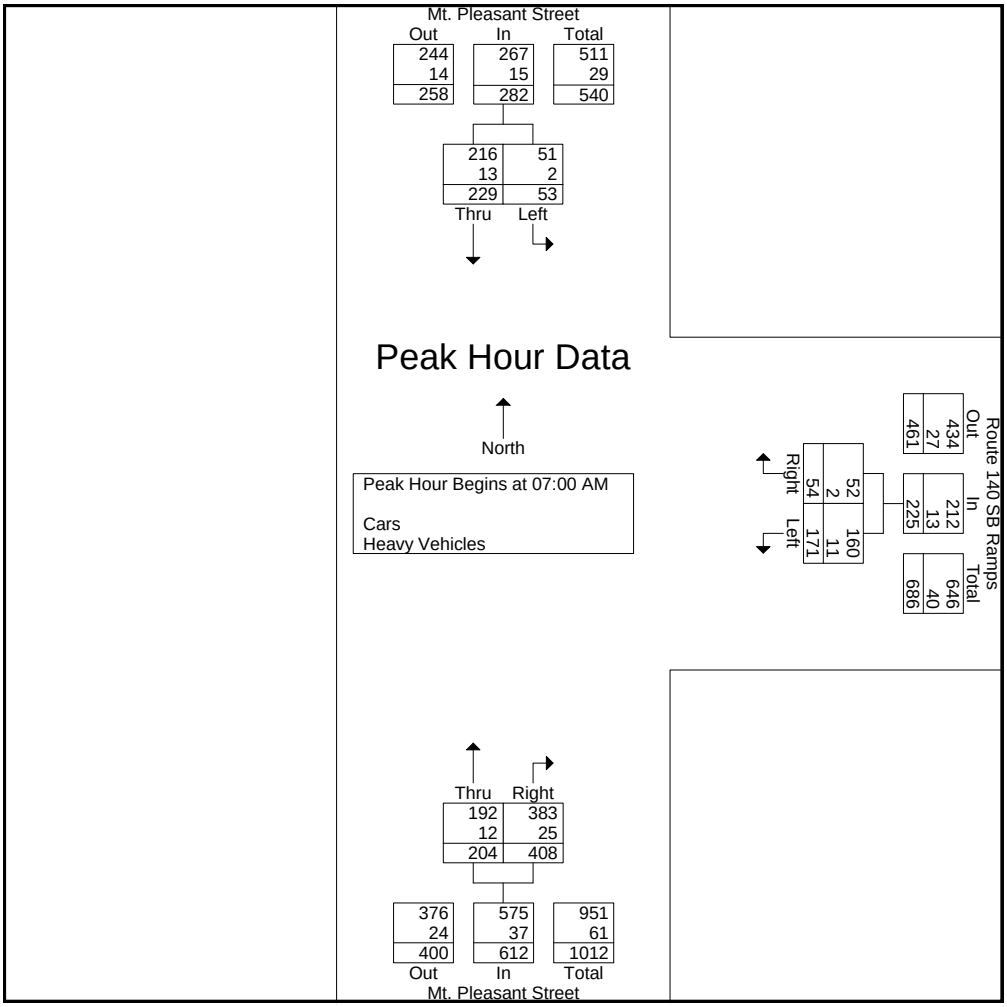
Start Date : 9/18/2008
Page No : 1

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	63	8	71	7	36	43	94	48	142	256
07:15 AM	50	6	56	15	40	55	101	48	149	260
07:30 AM	51	**21**	72	**17**	40	57	105	**62**	**167**	296
07:45 AM	**65**	18	**83**	15	**55**	**70**	**108**	46	154	**307**
Total Volume	**229**	**53**	**282**	**54**	**171**	**225**	**408**	**204**	**612**	**1119**
% App. Total	**81.2**	**18.8**		**24**	**76**		**66.7**	**33.3**		
PHF	**.881**	**.631**	**.849**	**.794**	**.777**	**.804**	**.944**	**.823**	**.916**	**.911**
Cars	**216**	**51**	**267**	**52**	**160**	**212**	**383**	**192**	**575**	**1054**
% Cars	**94.3**	**96.2**	**94.7**	**96.3**	**93.6**	**94.2**	**93.9**	**94.1**	**94.0**	**94.2**
Heavy Vehicles	**13**	**2**	**15**	**2**	**11**	**13**	**25**	**12**	**37**	**65**
% Heavy Vehicles	**5.7**	**3.8**	**5.3**	**3.7**	**6.4**	**5.8**	**6.1**	**5.9**	**6.0**	**5.8**



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File Name : 81676 E-AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	180	22	30	69	95	56	452
04:15 PM	120	8	28	61	100	55	372
04:30 PM	119	24	20	71	102	67	403
04:45 PM	68	12	18	52	100	70	320
Total	487	66	96	253	397	248	1547
05:00 PM	121	18	21	53	111	77	401
05:15 PM	84	14	18	62	123	73	374
05:30 PM	68	8	25	59	110	62	332
05:45 PM	76	27	16	50	89	68	326
Total	349	67	80	224	433	280	1433
Grand Total	836	133	176	477	830	528	2980
Apprch %	86.3	13.7	27	73	61.1	38.9	
Total %	28.1	4.5	5.9	16	27.9	17.7	
Cars	821	127	171	459	814	521	2913
% Cars	98.2	95.5	97.2	96.2	98.1	98.7	97.8
Heavy Vehicles	15	6	5	18	16	7	67
% Heavy Vehicles	1.8	4.5	2.8	3.8	1.9	1.3	2.2

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**180**	22	**202**	**30**	69	**99**	95	56	151	**452**
04:15 PM	**120**	**8**	**128**	**28**	**61**	**89**	**100**	**55**	**155**	**372**
04:30 PM	**119**	**24**	143	20	**71**	91	**102**	67	169	403
04:45 PM	68	12	80	18	52	70	100	**70**	**170**	320
Total Volume	487	66	553	96	253	349	397	248	645	1547
% App. Total	88.1	11.9		27.5	72.5		61.6	38.4		
PHF	.676	.688	.684	.800	.891	.881	.973	.886	.949	.856
Cars	478	62	540	93	246	339	388	243	631	1510
% Cars	98.2	93.9	97.6	96.9	97.2	97.1	97.7	98.0	97.8	97.6
Heavy Vehicles	9	4	13	3	7	10	9	5	14	37
% Heavy Vehicles	1.8	6.1	2.4	3.1	2.8	2.9	2.3	2.0	2.2	2.4

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File Name : 81676 E-AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	177	20	29	67	92	55	440
04:15 PM	116	8	26	60	98	54	362
04:30 PM	117	23	20	70	101	67	398
04:45 PM	68	11	18	49	97	67	310
Total	478	62	93	246	388	243	1510
05:00 PM	118	17	20	49	109	75	388
05:15 PM	82	14	18	60	122	73	369
05:30 PM	68	8	25	57	109	62	329
05:45 PM	75	26	15	47	86	68	317
Total	343	65	78	213	426	278	1403
Grand Total	821	127	171	459	814	521	2913
Apprch %	86.6	13.4	27.1	72.9	61	39	
Total %	28.2	4.4	5.9	15.8	27.9	17.9	

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**177**	20	**197**	**29**	67	**96**	92	55	147	**440**
04:15 PM	**116**	**8**	**124**	**26**	**60**	**86**	**98**	**54**	**152**	**362**
04:30 PM	**117**	**23**	140	20	**70**	90	**101**	**67**	**168**	398
04:45 PM	68	11	79	18	49	67	97	67	164	310
Total Volume	478	62	540	93	246	339	388	243	631	1510
% App. Total	88.5	11.5		27.4	72.6		61.5	38.5		
PHF	.675	.674	.685	.802	.879	.883	.960	.907	.939	.858

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File Name : 81676 E-AAA
Site Code : 10111.31
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Page No : 1

Groups Printed- Heavy Vehicles

	Mt. Pleasant Street From North		Route 140 SB Ramps From East		Mt. Pleasant Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	3	2	1	2	3	1	12
04:15 PM	4	0	2	1	2	1	10
04:30 PM	2	1	0	1	1	0	5
04:45 PM	0	1	0	3	3	3	10
Total	9	4	3	7	9	5	37
05:00 PM	3	1	1	4	2	2	13
05:15 PM	2	0	0	2	1	0	5
05:30 PM	0	0	0	2	1	0	3
05:45 PM	1	1	1	3	3	0	9
Total	6	2	2	11	7	2	30
Grand Total	15	6	5	18	16	7	67
Apprch %	71.4	28.6	21.7	78.3	69.6	30.4	
Total %	22.4	9	7.5	26.9	23.9	10.4	

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**4**	0	**4**	**2**	1	3	2	1	3	10
04:30 PM	2	**1**	3	0	1	1	1	0	1	5
04:45 PM	0	1	1	0	3	3	**3**	**3**	**6**	10
05:00 PM	3	1	4	1	**4**	**5**	2	2	4	**13**
Total Volume	**9**	**3**	**12**	**3**	**9**	**12**	**8**	**6**	**14**	**38**
% App. Total	**75**	**25**		**25**	**75**		**57.1**	**42.9**		
PHF	**.563**	**.750**	**.750**	**.375**	**.563**	**.600**	**.667**	**.500**	**.583**	**.731**

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File Name : 81676 E-AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	1	0	1
04:30 PM	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	1	0	3
05:00 PM	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	2	0	0	0	2
Total	0	0	0	0	0	2	0	1	0	3
Grand Total	1	0	0	0	0	3	0	2	0	6
Apprch %	100	0	0	0	0	100	0	100	0	
Total %	16.7	0	0	0	0	50	0	33.3	0	

	Mt. Pleasant Street From North				Route 140 SB Ramps From East				Mt. Pleasant Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**
04:15 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	1
04:30 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	1	1	0	1	0	1	3
% App. Total	100	0	0		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.250	.250	.000	.250	.000	.250	.750

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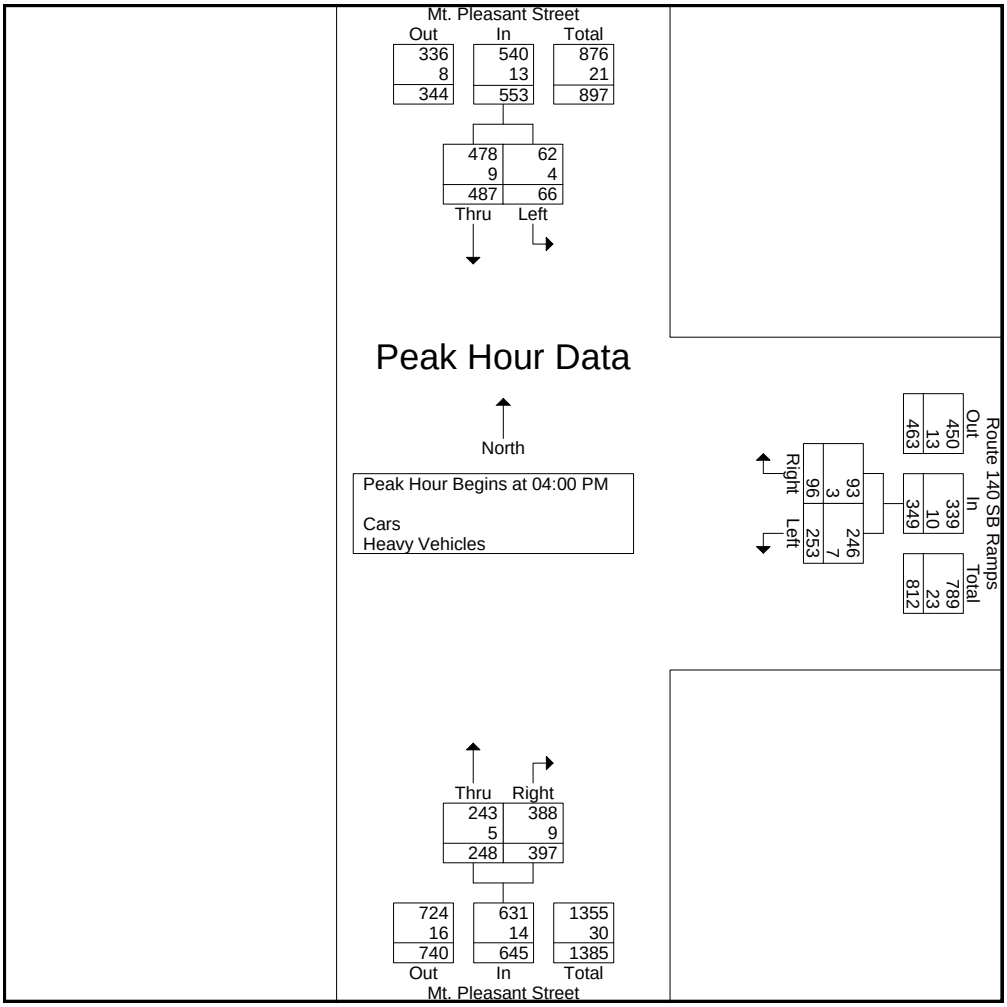
	Mt. Pleasant Street From North			Route 140 SB Ramps From East			Mt. Pleasant Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**180**	22	**202**	**30**	69	**99**	95	56	151	**452**
04:15 PM	**120**	**8**	**128**	**28**	**61**	**89**	**100**	**55**	**155**	**372**
04:30 PM	**119**	**24**	143	20	**71**	91	**102**	67	169	403
04:45 PM	68	12	80	18	52	70	100	**70**	**170**	320
Total Volume	487	66	553	96	253	349	397	248	645	1547
% App. Total	88.1	11.9		27.5	72.5		61.6	38.4		
PHF	.676	.688	.684	.800	.891	.881	.973	.886	.949	.856
Cars	478	62	540	93	246	339	388	243	631	1510
% Cars	98.2	93.9	97.6	96.9	97.2	97.1	97.7	98.0	97.8	97.6
Heavy Vehicles	9	4	13	3	7	10	9	5	14	37
% Heavy Vehicles	1.8	6.1	2.4	3.1	2.8	2.9	2.3	2.0	2.2	2.4



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N: Route 140 NB Ramps
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1
Apprch %	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	100	0	0	

	Route 140 NB Ramps From North				Kings Highway From East				Kings Highway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	1	0	0	1	1
% App. Total	0	0	0		0	0	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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N: Route 140 NB Ramps
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	3	4	1	12	8	6	34
07:15 AM	4	7	1	11	5	2	30
07:30 AM	1	1	1	4	3	1	11
07:45 AM	1	1	0	10	4	1	17
Total	9	13	3	37	20	10	92
08:00 AM	3	6	0	6	2	2	19
08:15 AM	0	2	0	5	5	2	14
08:30 AM	0	1	0	8	2	1	12
08:45 AM	1	3	1	6	1	2	14
Total	4	12	1	25	10	7	59
Grand Total	13	25	4	62	30	17	151
Apprch %	34.2	65.8	6.1	93.9	63.8	36.2	
Total %	8.6	16.6	2.6	41.1	19.9	11.3	

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	3	4	7	**1**	**12**	**13**	**8**	**6**	**14**	**34**
07:15 AM	**4**	**7**	**11**	1	11	12	5	2	7	30
07:30 AM	1	1	2	1	4	5	3	1	4	11
07:45 AM	1	1	2	0	10	10	4	1	5	17
Total Volume	9	13	22	3	37	40	20	10	30	92
% App. Total	40.9	59.1		7.5	92.5		66.7	33.3		
PHF	.563	.464	.500	.750	.771	.769	.625	.417	.536	.676

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File Name : 81676 E-B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	25	90	12	132	54	22	335
07:15 AM	25	134	13	137	68	19	396
07:30 AM	12	98	13	165	64	25	377
07:45 AM	29	89	16	167	69	17	387
Total	91	411	54	601	255	83	1495
08:00 AM	15	58	14	131	66	28	312
08:15 AM	18	68	11	146	54	15	312
08:30 AM	29	80	6	138	47	18	318
08:45 AM	24	65	16	138	76	25	344
Total	86	271	47	553	243	86	1286
Grand Total	177	682	101	1154	498	169	2781
Apprch %	20.6	79.4	8	92	74.7	25.3	
Total %	6.4	24.5	3.6	41.5	17.9	6.1	

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	25	90	115	12	132	144	54	22	76	335
07:15 AM	25	**134**	**159**	13	137	150	68	19	87	**396**
07:30 AM	**12**	**98**	**110**	**13**	**165**	**178**	**64**	**25**	**89**	377
07:45 AM	**29**	89	118	**16**	**167**	**183**	**69**	17	86	387
Total Volume	91	411	502	54	601	655	255	83	338	1495
% App. Total	18.1	81.9		8.2	91.8		75.4	24.6		
PHF	.784	.767	.789	.844	.900	.895	.924	.830	.949	.944

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City, State: New Bedford, MA
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File Name : 81676 E-B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	28	94	13	144	62	28	369
07:15 AM	29	141	14	148	73	21	426
07:30 AM	13	99	14	169	67	26	388
07:45 AM	30	90	16	177	73	18	404
Total	100	424	57	638	275	93	1587
08:00 AM	18	64	14	137	68	30	331
08:15 AM	18	70	11	151	59	17	326
08:30 AM	29	81	6	146	49	19	330
08:45 AM	25	68	17	144	77	27	358
Total	90	283	48	578	253	93	1345
Grand Total	190	707	105	1216	528	186	2932
Apprch %	21.2	78.8	7.9	92.1	73.9	26.1	
Total %	6.5	24.1	3.6	41.5	18	6.3	
Cars	177	682	101	1154	498	169	2781
% Cars	93.2	96.5	96.2	94.9	94.3	90.9	94.8
Heavy Vehicles	13	25	4	62	30	17	151
% Heavy Vehicles	6.8	3.5	3.8	5.1	5.7	9.1	5.2

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	28	94	122	13	144	157	62	**28**	90	369
07:15 AM	29	**141**	**170**	14	148	162	**73**	21	**94**	**426**
07:30 AM	**13**	**99**	**112**	**14**	**169**	**183**	**67**	**26**	**93**	**388**
07:45 AM	**30**	90	120	**16**	**177**	**193**	73	18	91	404
Total Volume	100	424	524	57	638	695	275	93	368	1587
% App. Total	19.1	80.9		8.2	91.8		74.7	25.3		
PHF	.833	.752	.771	.891	.901	.900	.942	.830	.979	.931
Cars	91	411	502	54	601	655	255	83	338	1495
% Cars	91.0	96.9	95.8	94.7	94.2	94.2	92.7	89.2	91.8	94.2
Heavy Vehicles	9	13	22	3	37	40	20	10	30	92
% Heavy Vehicles	9.0	3.1	4.2	5.3	5.8	5.8	7.3	10.8	8.2	5.8

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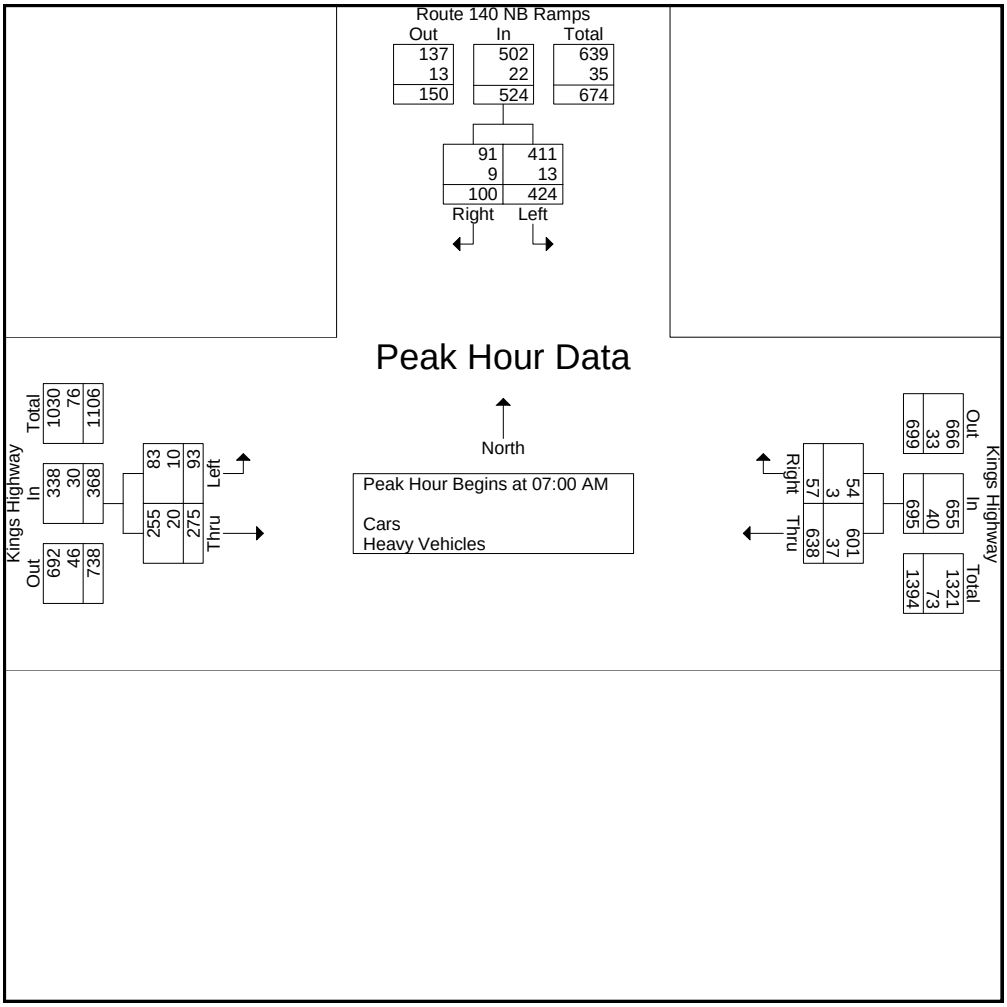
N: Route 140 NB Ramps
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	28	94	122	13	144	157	62	**28**	90	369
07:15 AM	29	**141**	**170**	14	148	162	**73**	21	**94**	**426**
07:30 AM	**13**	**99**	**112**	**14**	**169**	**183**	**67**	**26**	**93**	**388**
07:45 AM	**30**	90	120	**16**	**177**	**193**	73	18	91	404
Total Volume	100	424	524	57	638	695	275	93	368	1587
% App. Total	19.1	80.9		8.2	91.8		74.7	25.3		
PHF	.833	.752	.771	.891	.901	.900	.942	.830	.979	.931
Cars	91	411	502	54	601	655	255	83	338	1495
% Cars	91.0	96.9	95.8	94.7	94.2	94.2	92.7	89.2	91.8	94.2
Heavy Vehicles	9	13	22	3	37	40	20	10	30	92
% Heavy Vehicles	9.0	3.1	4.2	5.3	5.8	5.8	7.3	10.8	8.2	5.8



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File Name : 81676 E-BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	40	111	18	99	107	42	417
04:15 PM	50	119	23	187	154	39	572
04:30 PM	26	120	16	157	138	39	496
04:45 PM	41	116	31	135	97	27	447
Total	157	466	88	578	496	147	1932
05:00 PM	32	129	27	176	143	52	559
05:15 PM	34	127	31	187	111	40	530
05:30 PM	36	126	26	175	107	37	507
05:45 PM	19	113	34	177	133	24	500
Total	121	495	118	715	494	153	2096
Grand Total	278	961	206	1293	990	300	4028
Apprch %	22.4	77.6	13.7	86.3	76.7	23.3	
Total %	6.9	23.9	5.1	32.1	24.6	7.4	
Cars	275	943	199	1269	980	288	3954
% Cars	98.9	98.1	96.6	98.1	99	96	98.2
Heavy Vehicles	3	18	7	24	10	12	74
% Heavy Vehicles	1.1	1.9	3.4	1.9	1	4	1.8

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	32	**129**	161	27	176	203	**143**	**52**	**195**	**559**
05:15 PM	**34**	**127**	**161**	**31**	**187**	**218**	111	40	151	530
05:30 PM	**36**	126	**162**	26	175	201	107	37	144	507
05:45 PM	19	113	132	**34**	177	211	133	24	157	500
Total Volume	121	495	616	118	715	833	494	153	647	2096
% App. Total	19.6	80.4		14.2	85.8		76.4	23.6		
PHF	.840	.959	.951	.868	.956	.955	.864	.736	.829	.937
Cars	118	488	606	115	703	818	489	145	634	2058
% Cars	97.5	98.6	98.4	97.5	98.3	98.2	99.0	94.8	98.0	98.2
Heavy Vehicles	3	7	10	3	12	15	5	8	13	38
% Heavy Vehicles	2.5	1.4	1.6	2.5	1.7	1.8	1.0	5.2	2.0	1.8

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N: Route 140 NB Ramps
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-BBB
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	40	106	17	96	106	41	406
04:15 PM	50	118	20	184	153	37	562
04:30 PM	26	117	16	154	136	38	487
04:45 PM	41	114	31	132	96	27	441
Total	157	455	84	566	491	143	1896
05:00 PM	30	128	26	170	140	48	542
05:15 PM	34	126	31	187	109	37	524
05:30 PM	36	123	24	172	107	36	498
05:45 PM	18	111	34	174	133	24	494
Total	118	488	115	703	489	145	2058
Grand Total	275	943	199	1269	980	288	3954
Apprch %	22.6	77.4	13.6	86.4	77.3	22.7	
Total %	7	23.8	5	32.1	24.8	7.3	

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	30	**128**	158	26	170	196	**140**	**48**	**188**	**542**
05:15 PM	**34**	**126**	**160**	31	**187**	**218**	109	37	146	524
05:30 PM	**36**	123	159	24	172	196	107	36	143	498
05:45 PM	18	111	129	**34**	174	208	133	24	157	494
Total Volume	118	488	606	115	703	818	489	145	634	2058
% App. Total	19.5	80.5		14.1	85.9		77.1	22.9		
PHF	.819	.953	.947	.846	.940	.938	.873	.755	.843	.949

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File Name : 81676 E-BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Route 140 NB Ramps From North		Kings Highway From East		Kings Highway From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	5	1	3	1	1	11
04:15 PM	0	1	3	3	1	2	10
04:30 PM	0	3	0	3	2	1	9
04:45 PM	0	2	0	3	1	0	6
Total	0	11	4	12	5	4	36
05:00 PM	2	1	1	6	3	4	17
05:15 PM	0	1	0	0	2	3	6
05:30 PM	0	3	2	3	0	1	9
05:45 PM	1	2	0	3	0	0	6
Total	3	7	3	12	5	8	38
Grand Total	3	18	7	24	10	12	74
Apprch %	14.3	85.7	22.6	77.4	45.5	54.5	
Total %	4.1	24.3	9.5	32.4	13.5	16.2	

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	1	1	**3**	3	6	1	2	3	10
04:30 PM	0	**3**	**3**	0	3	3	2	1	3	9
04:45 PM	0	2	2	0	3	3	1	0	1	6
05:00 PM	**2**	1	3	1	**6**	**7**	**3**	**4**	**7**	**17**
Total Volume	**2**	**7**	**9**	**4**	**15**	**19**	**7**	**7**	**14**	**42**
% App. Total	**22.2**	**77.8**		**21.1**	**78.9**		**50**	**50**		
PHF	**.250**	**.583**	**.750**	**.333**	**.625**	**.679**	**.583**	**.438**	**.500**	**.618**

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File Name : 81676 E-BBB
Site Code : 10111.31
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Groups Printed- Peds and Bicycles

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	1	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	1	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	1	0	0	2
Apprch %	0	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	50	0	50	0	0	

	Route 140 NB Ramps From North				Kings Highway From East				Kings Highway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
04:30 PM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	1	0	0	1	2
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.250	.000	.000	.250	.500

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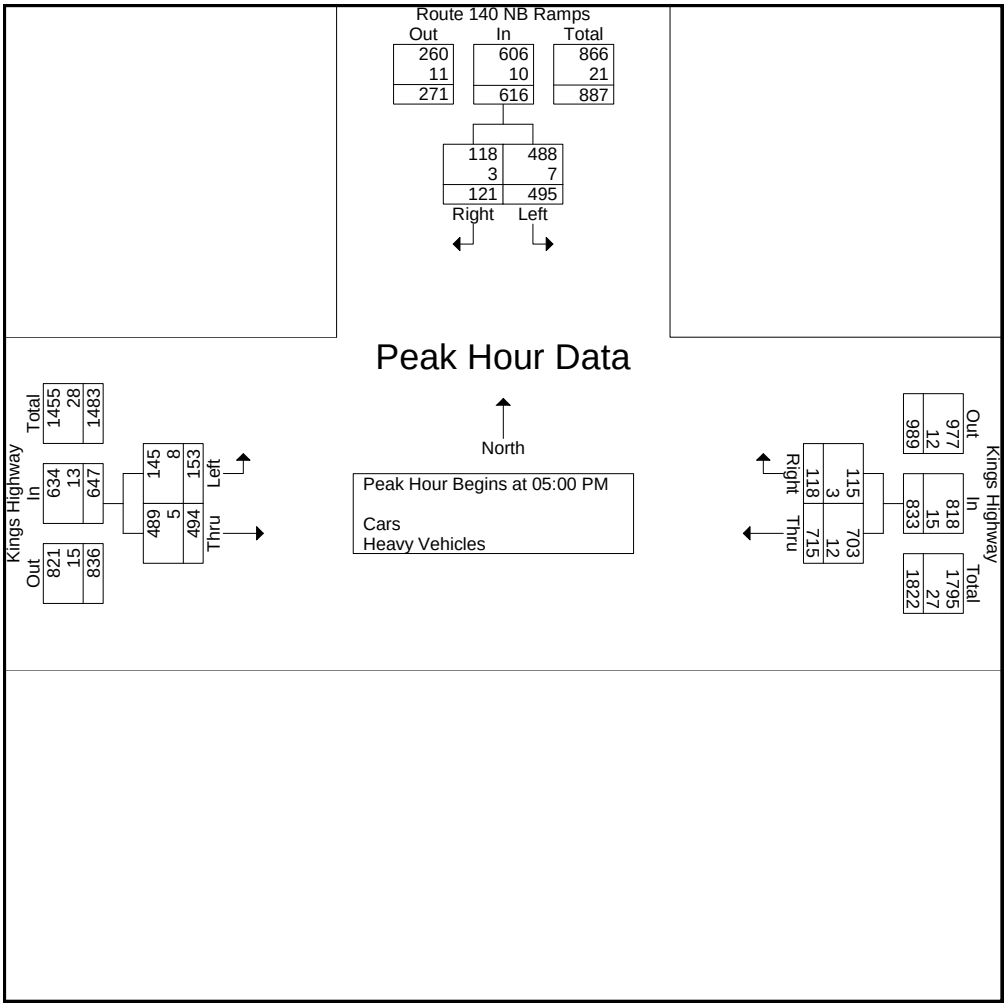
Start Date : 9/18/2008
Page No : 1

	Route 140 NB Ramps From North			Kings Highway From East			Kings Highway From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	32	**129**	161	27	176	203	**143**	**52**	**195**	**559**
05:15 PM	**34**	**127**	**161**	**31**	**187**	**218**	111	40	151	530
05:30 PM	**36**	126	**162**	26	175	201	107	37	144	507
05:45 PM	19	113	132	**34**	177	211	133	24	157	500
Total Volume	121	495	616	118	715	833	494	153	647	2096
% App. Total	19.6	80.4		14.2	85.8		76.4	23.6		
PHF	.840	.959	.951	.868	.956	.955	.864	.736	.829	.937
Cars	118	488	606	115	703	818	489	145	634	2058
% Cars	97.5	98.6	98.4	97.5	98.3	98.2	99.0	94.8	98.0	98.2
Heavy Vehicles	3	7	10	3	12	15	5	8	13	38
% Heavy Vehicles	2.5	1.4	1.6	2.5	1.7	1.8	1.0	5.2	2.0	1.8



PRECISION DATA INDUSTRIES, LLC
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N/S: Mt Pleasant Street
E/W: Kings Highway/Jones Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	46	53	117	1	44	38	19	0	2	1	0	322
07:15 AM	6	51	40	122	0	50	49	22	2	1	0	2	345
07:30 AM	0	46	48	137	1	34	52	18	1	1	2	2	342
07:45 AM	3	48	46	146	0	42	51	13	0	0	2	0	351
Total	10	191	187	522	2	170	190	72	3	4	5	4	1360
08:00 AM	0	52	51	100	1	28	38	17	0	1	1	0	289
08:15 AM	1	36	26	134	1	51	52	14	2	0	1	0	318
08:30 AM	1	50	28	78	2	30	42	26	0	0	1	1	259
08:45 AM	0	39	36	97	1	47	67	14	1	2	1	0	305
Total	2	177	141	409	5	156	199	71	3	3	4	1	1171
Grand Total	12	368	328	931	7	326	389	143	6	7	9	5	2531
Apprch %	1.7	52	46.3	73.7	0.6	25.8	72.3	26.6	1.1	33.3	42.9	23.8	
Total %	0.5	14.5	13	36.8	0.3	12.9	15.4	5.6	0.2	0.3	0.4	0.2	
Cars	9	333	304	886	6	295	358	123	6	7	8	5	2340
% Cars	75	90.5	92.7	95.2	85.7	90.5	92	86	100	100	88.9	100	92.5
Heavy Vehicles	3	35	24	45	1	31	31	20	0	0	1	0	191
% Heavy Vehicles	25	9.5	7.3	4.8	14.3	9.5	8	14	0	0	11.1	0	7.5

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	46	**53**	**100**	117	**1**	44	162	38	19	0	57	**2**	1	0	3	322
07:15 AM	**6**	**51**	40	97	122	0	**50**	172	49	**22**	**2**	**73**	1	0	**2**	3	345
07:30 AM	0	46	48	94	137	1	34	172	**52**	18	1	71	1	**2**	2	**5**	342
07:45 AM	3	48	46	97	**146**	0	42	**188**	51	13	0	64	0	2	0	2	**351**
Total Volume	10	191	187	388	522	2	170	694	190	72	3	265	4	5	4	13	1360
% App. Total	2.6	49.2	48.2		75.2	0.3	24.5		71.7	27.2	1.1		30.8	38.5	30.8		
PHF	.417	.936	.882	.970	.894	.500	.850	.923	.913	.818	.375	.908	.500	.625	.500	.650	.969
Cars	8	182	171	361	499	2	149	650	171	56	3	230	4	5	4	13	1254
% Cars	80.0	95.3	91.4	93.0	95.6	100	87.6	93.7	90.0	77.8	100	86.8	100	100	100	100	92.2
Heavy Vehicles	2	9	16	27	23	0	21	44	19	16	0	35	0	0	0	0	106
% Heavy Vehicles	20.0	4.7	8.6	7.0	4.4	0	12.4	6.3	10.0	22.2	0	13.2	0	0	0	0	7.8

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N/S: Mt Pleasant Street
E/W: Kings Highway/Jones Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	46	47	111	1	36	31	13	0	2	1	0	289
07:15 AM	6	47	36	117	0	43	44	16	2	1	0	2	314
07:30 AM	0	44	44	133	1	32	50	16	1	1	2	2	326
07:45 AM	1	45	44	138	0	38	46	11	0	0	2	0	325
Total	8	182	171	499	2	149	171	56	3	4	5	4	1254
08:00 AM	0	47	47	92	1	27	34	14	0	1	1	0	264
08:15 AM	0	35	24	129	1	48	48	14	2	0	1	0	302
08:30 AM	1	38	28	75	1	28	40	25	0	0	0	1	237
08:45 AM	0	31	34	91	1	43	65	14	1	2	1	0	283
Total	1	151	133	387	4	146	187	67	3	3	3	1	1086
Grand Total	9	333	304	886	6	295	358	123	6	7	8	5	2340
Apprch %	1.4	51.5	47.1	74.6	0.5	24.9	73.5	25.3	1.2	35	40	25	
Total %	0.4	14.2	13	37.9	0.3	12.6	15.3	5.3	0.3	0.3	0.3	0.2	

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	46	**47**	**94**	111	**1**	36	148	31	13	0	44	**2**	1	0	3	289
07:15 AM	**6**	**47**	36	89	117	0	**43**	160	44	**16**	**2**	62	1	0	**2**	3	314
07:30 AM	0	44	44	88	133	1	32	166	**50**	16	1	**67**	1	**2**	2	**5**	**326**
07:45 AM	1	45	44	90	**138**	0	38	**176**	46	11	0	57	0	2	0	2	325
Total Volume	8	182	171	361	499	2	149	650	171	56	3	230	4	5	4	13	1254
% App. Total	2.2	50.4	47.4		76.8	0.3	22.9		74.3	24.3	1.3		30.8	38.5	30.8		
PHF	.333	.968	.910	.960	.904	.500	.866	.923	.855	.875	.375	.858	.500	.625	.500	.650	.962

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File Name : 81676 E-C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	6	6	0	8	7	6	0	0	0	0	33
07:15 AM	0	4	4	5	0	7	5	6	0	0	0	0	31
07:30 AM	0	2	4	4	0	2	2	2	0	0	0	0	16
07:45 AM	2	3	2	8	0	4	5	2	0	0	0	0	26
Total	2	9	16	23	0	21	19	16	0	0	0	0	106
08:00 AM	0	5	4	8	0	1	4	3	0	0	0	0	25
08:15 AM	1	1	2	5	0	3	4	0	0	0	0	0	16
08:30 AM	0	12	0	3	1	2	2	1	0	0	1	0	22
08:45 AM	0	8	2	6	0	4	2	0	0	0	0	0	22
Total	1	26	8	22	1	10	12	4	0	0	1	0	85
Grand Total	3	35	24	45	1	31	31	20	0	0	1	0	191
Apprch %	4.8	56.5	38.7	58.4	1.3	40.3	60.8	39.2	0	0	100	0	
Total %	1.6	18.3	12.6	23.6	0.5	16.2	16.2	10.5	0	0	0.5	0	

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**6**	6	6	0	**8**	**14**	**7**	**6**	0	**13**	0	0	0	0	**33**
07:15 AM	0	**4**	4	**8**	5	0	7	12	5	6	0	11	0	0	0	0	31
07:30 AM	0	2	4	6	4	0	2	6	2	2	0	4	0	0	0	0	16
07:45 AM	**2**	3	2	7	**8**	0	4	12	5	2	0	7	0	0	0	0	26
Total Volume	2	9	16	27	23	0	21	44	19	16	0	35	0	0	0	0	106
% App. Total	7.4	33.3	59.3		52.3	0	47.7		54.3	45.7	0		0	0	0		
PHF	.250	.563	.667	.844	.719	.000	.656	.786	.679	.667	.000	.673	.000	.000	.000	.000	.803

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	4
07:15 AM	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	1	6
07:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
Total	0	2	1	5	0	0	0	0	0	0	0	2	0	0	0	4	14
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
Total	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	1	5
Grand Total	0	3	1	6	1	0	0	0	0	0	0	3	0	0	0	5	19
Apprch %	0	30	10	60	100	0	0	0	0	0	0	100	0	0	0	100	
Total %	0	15.8	5.3	31.6	5.3	0	0	0	0	0	0	15.8	0	0	0	26.3	

	Mt Pleasant Street From North					Kings Highway From East					Mt Pleasant Street From South					Jones Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	**2**	**2**	4
07:15 AM	0	**2**	0	**3**	**5**	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	**6**
07:30 AM	0	0	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
07:45 AM	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**
Total Volume	0	2	1	5	8	0	0	0	0	0	0	0	0	2	2	0	0	0	4	4	14
% App. Total	0	25	12.5	62.5		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.250	.250	.417	.400	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.500	.500	.583

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File Name : 81676 E-C
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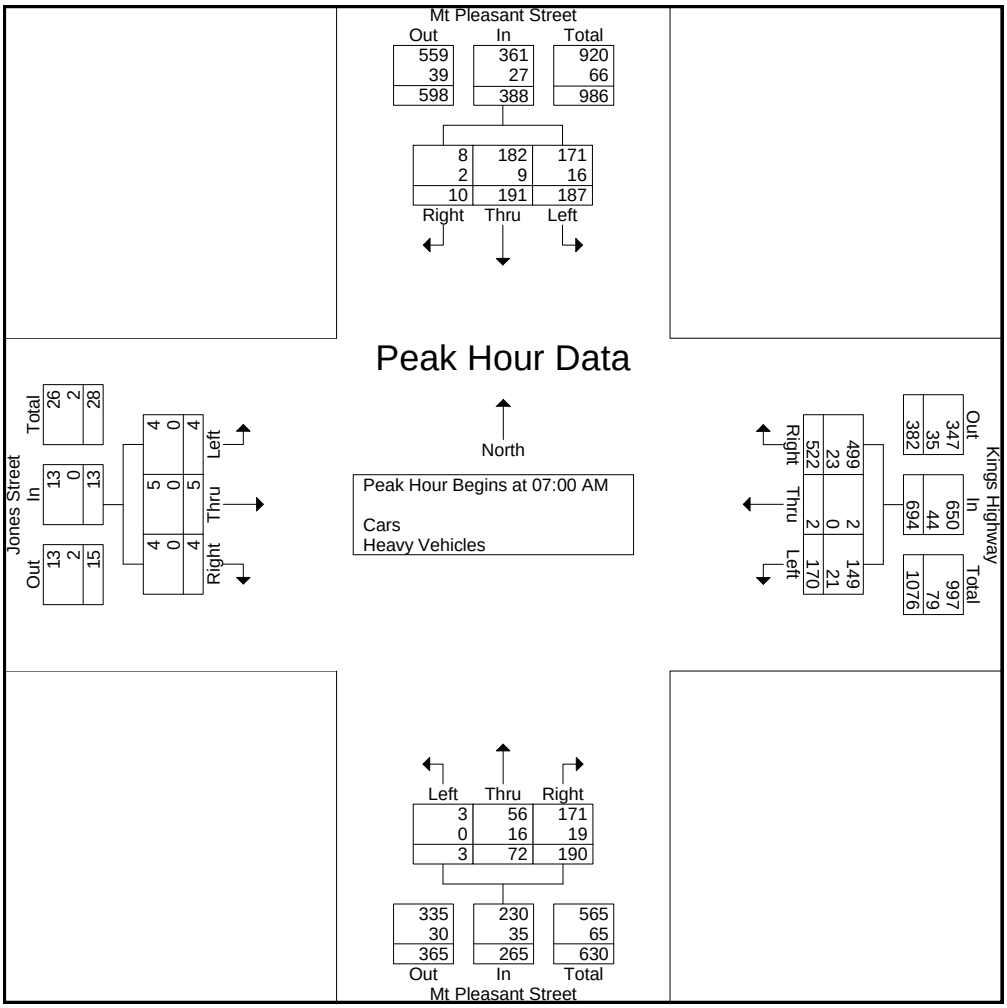
Page No : 1

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	46	**53**	**100**	117	**1**	44	162	38	19	0	57	**2**	1	0	3	322
07:15 AM	**6**	**51**	40	97	122	0	**50**	172	49	**22**	**2**	**73**	1	0	**2**	3	345
07:30 AM	0	46	48	94	137	1	34	172	**52**	18	1	71	1	**2**	2	**5**	342
07:45 AM	3	48	46	97	**146**	0	42	**188**	51	13	0	64	0	2	0	2	**351**
Total Volume	10	191	187	388	522	2	170	694	190	72	3	265	4	5	4	13	1360
% App. Total	2.6	49.2	48.2		75.2	0.3	24.5		71.7	27.2	1.1		30.8	38.5	30.8		
PHF	.417	.936	.882	.970	.894	.500	.850	.923	.913	.818	.375	.908	.500	.625	.500	.650	.969
Cars	8	182	171	361	499	2	149	650	171	56	3	230	4	5	4	13	1254
% Cars	80.0	95.3	91.4	93.0	95.6	100	87.6	93.7	90.0	77.8	100	86.8	100	100	100	100	92.2
Heavy Vehicles	2	9	16	27	23	0	21	44	19	16	0	35	0	0	0	0	106
% Heavy Vehicles	20.0	4.7	8.6	7.0	4.4	0	12.4	6.3	10.0	22.2	0	13.2	0	0	0	0	7.8



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Client: VHB/J. Quitter

File Name : 81676 E-CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	1	0	0	1	0	0	2	0	1	0	0	0	0	5
Apprch %	0	0	0	100	0	0	100	0	0	66.7	0	33.3	0	0	0	0	
Total %	0	0	0	20	0	0	20	0	0	40	0	20	0	0	0	0	

	Mt Pleasant Street From North					Kings Highway From East					Mt Pleasant Street From South					Jones Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	**1**	**0**	**1**	0	**1**	**0**	**1**	**2**	0	0	0	0	0	**3**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	1	0	2	0	1	3	0	0	0	0	0	4
% App. Total	0	0	0	0		0	0	100	0		0	66.7	0	33.3		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.500	.000	.250	.375	.000	.000	.000	.000	.000	.333

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File Name : 81676 E-CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	6	0	4	0	1	3	1	0	0	0	0	15
04:15 PM	0	5	1	3	0	2	3	1	0	0	0	0	15
04:30 PM	0	2	2	1	0	3	1	0	0	0	0	0	9
04:45 PM	0	3	1	4	0	0	2	1	0	0	0	0	11
Total	0	16	4	12	0	6	9	3	0	0	0	0	50
05:00 PM	0	5	3	3	0	3	3	1	0	0	0	0	18
05:15 PM	0	3	2	1	0	0	1	1	0	0	0	0	8
05:30 PM	0	2	0	1	0	1	2	0	0	0	0	0	6
05:45 PM	0	3	0	3	0	3	1	2	0	0	0	0	12
Total	0	13	5	8	0	7	7	4	0	0	0	0	44
Grand Total	0	29	9	20	0	13	16	7	0	0	0	0	94
Apprch %	0	76.3	23.7	60.6	0	39.4	69.6	30.4	0	0	0	0	
Total %	0	30.9	9.6	21.3	0	13.8	17	7.4	0	0	0	0	

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**5**	1	6	3	0	2	5	**3**	**1**	0	**4**	0	0	0	0	15
04:30 PM	0	2	2	4	1	0	**3**	4	1	0	0	1	0	0	0	0	9
04:45 PM	0	3	1	4	**4**	0	0	4	2	1	0	3	0	0	0	0	11
05:00 PM	0	5	**3**	**8**	3	0	3	**6**	3	1	0	4	0	0	0	0	**18**
Total Volume	0	15	7	22	11	0	8	19	9	3	0	12	0	0	0	0	53
% App. Total	0	68.2	31.8		57.9	0	42.1		75	25	0		0	0	0		
PHF	.000	.750	.583	.688	.688	.000	.667	.792	.750	.750	.000	.750	.000	.000	.000	.000	.736

PRECISION
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N/S: Mt Pleasant Street
E/W: Kings Highway/Jones Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	98	150	96	1	68	91	39	1	3	0	1	549
04:15 PM	0	76	101	114	1	72	101	35	1	0	0	0	501
04:30 PM	0	70	108	124	1	63	98	38	1	1	0	2	506
04:45 PM	0	54	55	122	4	59	97	38	2	2	1	3	437
Total	1	298	414	456	7	262	387	150	5	6	1	6	1993
05:00 PM	0	54	118	135	2	59	99	39	2	1	3	1	513
05:15 PM	2	65	80	149	0	79	100	35	2	2	0	2	516
05:30 PM	2	53	68	138	3	62	72	25	0	3	0	2	428
05:45 PM	1	50	66	131	0	73	97	26	0	0	4	0	448
Total	5	222	332	553	5	273	368	125	4	6	7	5	1905
Grand Total	6	520	746	1009	12	535	755	275	9	12	8	11	3898
Apprch %	0.5	40.9	58.6	64.8	0.8	34.4	72.7	26.5	0.9	38.7	25.8	35.5	
Total %	0.2	13.3	19.1	25.9	0.3	13.7	19.4	7.1	0.2	0.3	0.2	0.3	

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**98**	**150**	**249**	96	1	68	165	91	**39**	1	131	**3**	0	1	4	**549**
04:15 PM	0	76	101	177	114	1	**72**	187	**101**	35	1	**137**	0	0	0	0	501
04:30 PM	0	70	108	178	**124**	1	63	**188**	98	38	1	137	1	0	2	3	506
04:45 PM	0	54	55	109	122	**4**	59	185	97	38	**2**	137	2	**1**	**3**	**6**	437
Total Volume	1	298	414	713	456	7	262	725	387	150	5	542	6	1	6	13	1993
% App. Total	0.1	41.8	58.1		62.9	1	36.1		71.4	27.7	0.9		46.2	7.7	46.2		
PHF	.250	.760	.690	.716	.919	.438	.910	.964	.958	.962	.625	.989	.500	.250	.500	.542	.908

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N/S: Mt Pleasant Street
E/W: Kings Highway/Jones Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mt Pleasant Street From North			Kings Highway From East			Mt Pleasant Street From South			Jones Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	104	150	100	1	69	94	40	1	3	0	1	564
04:15 PM	0	81	102	117	1	74	104	36	1	0	0	0	516
04:30 PM	0	72	110	125	1	66	99	38	1	1	0	2	515
04:45 PM	0	57	56	126	4	59	99	39	2	2	1	3	448
Total	1	314	418	468	7	268	396	153	5	6	1	6	2043
05:00 PM	0	59	121	138	2	62	102	40	2	1	3	1	531
05:15 PM	2	68	82	150	0	79	101	36	2	2	0	2	524
05:30 PM	2	55	68	139	3	63	74	25	0	3	0	2	434
05:45 PM	1	53	66	134	0	76	98	28	0	0	4	0	460
Total	5	235	337	561	5	280	375	129	4	6	7	5	1949
Grand Total	6	549	755	1029	12	548	771	282	9	12	8	11	3992
Apprch %	0.5	41.9	57.6	64.8	0.8	34.5	72.6	26.6	0.8	38.7	25.8	35.5	
Total %	0.2	13.8	18.9	25.8	0.3	13.7	19.3	7.1	0.2	0.3	0.2	0.3	
Cars	6	520	746	1009	12	535	755	275	9	12	8	11	3898
% Cars	100	94.7	98.8	98.1	100	97.6	97.9	97.5	100	100	100	100	97.6
Heavy Vehicles	0	29	9	20	0	13	16	7	0	0	0	0	94
% Heavy Vehicles	0	5.3	1.2	1.9	0	2.4	2.1	2.5	0	0	0	0	2.4

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**104**	**150**	**255**	100	1	69	170	94	**40**	1	135	**3**	0	1	4	**564**
04:15 PM	0	81	102	183	117	1	**74**	**192**	**104**	36	1	**141**	0	0	0	0	516
04:30 PM	0	72	110	182	125	1	66	192	99	38	1	138	1	0	2	3	515
04:45 PM	0	57	56	113	**126**	**4**	59	189	99	39	**2**	140	2	**1**	**3**	**6**	448
Total Volume	1	314	418	733	468	7	268	743	396	153	5	554	6	1	6	13	2043
% App. Total	0.1	42.8	57		63	0.9	36.1		71.5	27.6	0.9		46.2	7.7	46.2		
PHF	.250	.755	.697	.719	.929	.438	.905	.967	.952	.956	.625	.982	.500	.250	.500	.542	.906
Cars	1	298	414	713	456	7	262	725	387	150	5	542	6	1	6	13	1993
% Cars	100	94.9	99.0	97.3	97.4	100	97.8	97.6	97.7	98.0	100	97.8	100	100	100	100	97.6
Heavy Vehicles	0	16	4	20	12	0	6	18	9	3	0	12	0	0	0	0	50
% Heavy Vehicles	0	5.1	1.0	2.7	2.6	0	2.2	2.4	2.3	2.0	0	2.2	0	0	0	0	2.4

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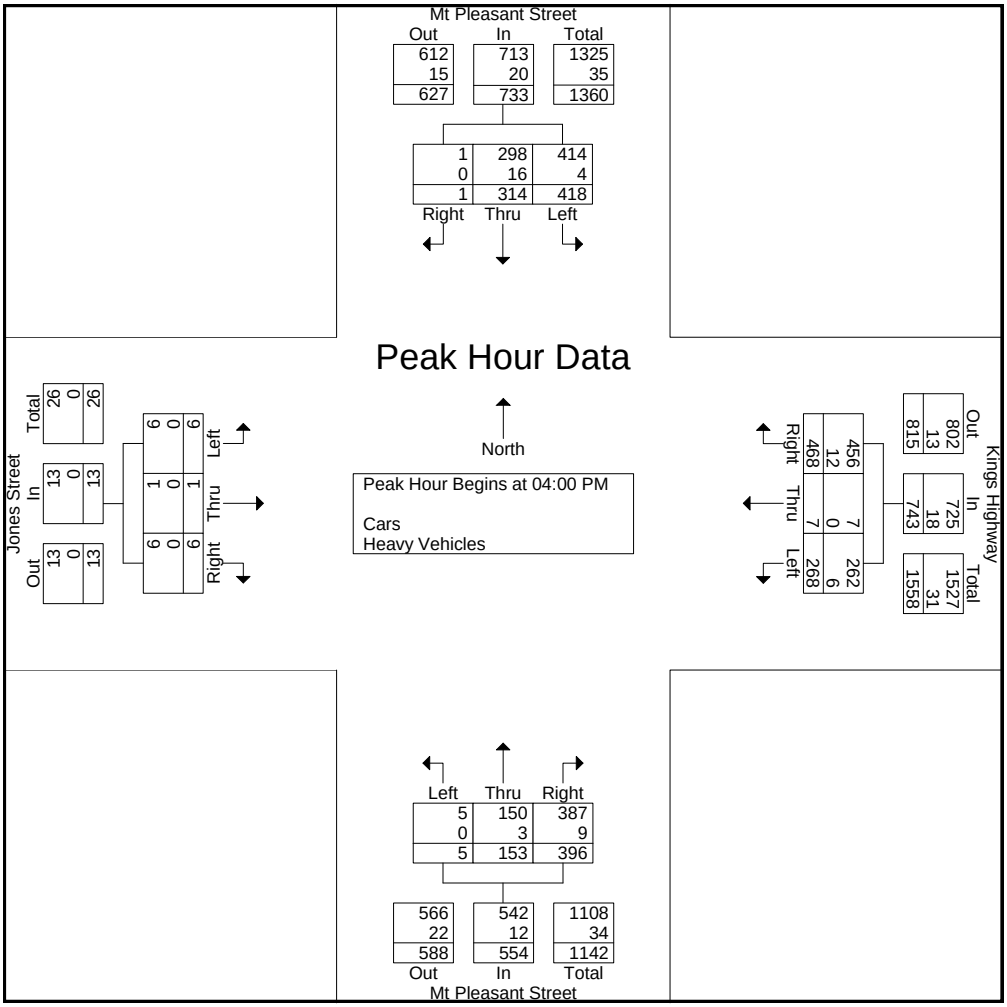
E/W: Kings Highway/Jones Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Mt Pleasant Street From North				Kings Highway From East				Mt Pleasant Street From South				Jones Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	**104**	**150**	**255**	100	1	69	170	94	**40**	1	135	**3**	0	1	4	**564**
04:15 PM	0	81	102	183	117	1	**74**	**192**	**104**	36	1	**141**	0	0	0	0	516
04:30 PM	0	72	110	182	125	1	66	192	99	38	1	138	1	0	2	3	515
04:45 PM	0	57	56	113	**126**	**4**	59	189	99	39	**2**	140	2	**1**	**3**	**6**	448
Total Volume	1	314	418	733	468	7	268	743	396	153	5	554	6	1	6	13	2043
% App. Total	0.1	42.8	57		63	0.9	36.1		71.5	27.6	0.9		46.2	7.7	46.2		
PHF	.250	.755	.697	.719	.929	.438	.905	.967	.952	.956	.625	.982	.500	.250	.500	.542	.906
Cars	1	298	414	713	456	7	262	725	387	150	5	542	6	1	6	13	1993
% Cars	100	94.9	99.0	97.3	97.4	100	97.8	97.6	97.7	98.0	100	97.8	100	100	100	100	97.6
Heavy Vehicles	0	16	4	20	12	0	6	18	9	3	0	12	0	0	0	0	50
% Heavy Vehicles	0	5.1	1.0	2.7	2.6	0	2.2	2.4	2.3	2.0	0	2.2	0	0	0	0	2.4



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N/S: Ashley Boulevard (Route 18)
E/W: Wood Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-E
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	74	7	17	21	10	3	112	2	1	12	3	267
07:15 AM	0	106	21	14	28	12	2	113	2	0	14	10	322
07:30 AM	3	123	7	13	28	29	10	126	4	1	22	7	373
07:45 AM	4	87	17	11	36	28	12	85	2	3	16	7	308
Total	12	390	52	55	113	79	27	436	10	5	64	27	1270
08:00 AM	5	103	10	14	28	8	13	67	2	3	26	7	286
08:15 AM	5	80	18	6	23	13	23	72	5	1	19	8	273
08:30 AM	3	83	13	9	26	6	10	58	1	2	15	4	230
08:45 AM	7	74	8	14	23	10	5	50	0	2	14	3	210
Total	20	340	49	43	100	37	51	247	8	8	74	22	999
Grand Total	32	730	101	98	213	116	78	683	18	13	138	49	2269
Apprch %	3.7	84.6	11.7	23	49.9	27.2	10	87.7	2.3	6.5	69	24.5	
Total %	1.4	32.2	4.5	4.3	9.4	5.1	3.4	30.1	0.8	0.6	6.1	2.2	
Cars	32	693	98	95	201	113	72	659	18	11	129	49	2170
% Cars	100	94.9	97	96.9	94.4	97.4	92.3	96.5	100	84.6	93.5	100	95.6
Heavy Vehicles	0	37	3	3	12	3	6	24	0	2	9	0	99
% Heavy Vehicles	0	5.1	3	3.1	5.6	2.6	7.7	3.5	0	15.4	6.5	0	4.4

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	106	**21**	127	**14**	28	12	54	2	113	2	117	0	14	**10**	24	322
07:30 AM	3	**123**	7	**133**	13	28	**29**	70	10	**126**	**4**	**140**	1	22	7	30	**373**
07:45 AM	4	87	17	108	11	**36**	28	**75**	12	85	2	99	**3**	16	7	26	308
08:00 AM	**5**	103	10	118	14	28	8	50	**13**	67	2	82	3	**26**	7	**36**	286
Total Volume	12	419	55	486	52	120	77	249	37	391	10	438	7	78	31	116	1289
% App. Total	2.5	86.2	11.3		20.9	48.2	30.9		8.4	89.3	2.3		6	67.2	26.7		
PHF	.600	.852	.655	.914	.929	.833	.664	.830	.712	.776	.625	.782	.583	.750	.775	.806	.864
Cars	12	396	53	461	51	112	75	238	32	381	10	423	5	71	31	107	1229
% Cars	100	94.5	96.4	94.9	98.1	93.3	97.4	95.6	86.5	97.4	100	96.6	71.4	91.0	100	92.2	95.3
Heavy Vehicles	0	23	2	25	1	8	2	11	5	10	0	15	2	7	0	9	60
% Heavy Vehicles	0	5.5	3.6	5.1	1.9	6.7	2.6	4.4	13.5	2.6	0	3.4	28.6	9.0	0	7.8	4.7

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E/W: Wood Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-E
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	69	7	16	18	10	3	105	2	1	12	3	251
07:15 AM	0	99	19	13	24	11	1	111	2	0	13	10	303
07:30 AM	3	118	7	13	28	29	8	124	4	0	20	7	361
07:45 AM	4	83	17	11	33	27	11	81	2	3	15	7	294
Total	12	369	50	53	103	77	23	421	10	4	60	27	1209
08:00 AM	5	96	10	14	27	8	12	65	2	2	23	7	271
08:15 AM	5	77	18	6	22	12	22	70	5	1	17	8	263
08:30 AM	3	82	13	8	26	6	10	54	1	2	15	4	224
08:45 AM	7	69	7	14	23	10	5	49	0	2	14	3	203
Total	20	324	48	42	98	36	49	238	8	7	69	22	961
Grand Total	32	693	98	95	201	113	72	659	18	11	129	49	2170
Apprch %	3.9	84.2	11.9	23.2	49.1	27.6	9.6	88	2.4	5.8	68.3	25.9	
Total %	1.5	31.9	4.5	4.4	9.3	5.2	3.3	30.4	0.8	0.5	5.9	2.3	

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	99	**19**	118	13	24	11	48	1	111	2	114	0	13	**10**	23	303
07:30 AM	3	**118**	7	**128**	13	28	**29**	70	8	**124**	**4**	**136**	0	20	7	27	**361**
07:45 AM	4	83	17	104	11	**33**	27	**71**	11	81	2	94	**3**	15	7	25	294
08:00 AM	**5**	96	10	111	**14**	27	8	49	**12**	65	2	79	2	**23**	7	**32**	271
Total Volume	12	396	53	461	51	112	75	238	32	381	10	423	5	71	31	107	1229
% App. Total	2.6	85.9	11.5		21.4	47.1	31.5		7.6	90.1	2.4		4.7	66.4	29		
PHF	.600	.839	.697	.900	.911	.848	.647	.838	.667	.768	.625	.778	.417	.772	.775	.836	.851

PRECISION
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File Name : 81676 E-E
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Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	5	0	1	3	0	0	7	0	0	0	0	16
07:15 AM	0	7	2	1	4	1	1	2	0	0	1	0	19
07:30 AM	0	5	0	0	0	0	2	2	0	1	2	0	12
07:45 AM	0	4	0	0	3	1	1	4	0	0	1	0	14
Total	0	21	2	2	10	2	4	15	0	1	4	0	61
08:00 AM	0	7	0	0	1	0	1	2	0	1	3	0	15
08:15 AM	0	3	0	0	1	1	1	2	0	0	2	0	10
08:30 AM	0	1	0	1	0	0	0	4	0	0	0	0	6
08:45 AM	0	5	1	0	0	0	0	1	0	0	0	0	7
Total	0	16	1	1	2	1	2	9	0	1	5	0	38
Grand Total	0	37	3	3	12	3	6	24	0	2	9	0	99
Apprch %	0	92.5	7.5	16.7	66.7	16.7	20	80	0	18.2	81.8	0	
Total %	0	37.4	3	3	12.1	3	6.1	24.2	0	2	9.1	0	

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	5	0	5	**1**	3	0	4	0	**7**	0	**7**	0	0	0	0	16
07:15 AM	0	**7**	**2**	**9**	1	**4**	**1**	**6**	1	2	0	3	0	1	0	1	**19**
07:30 AM	0	5	0	5	0	0	0	0	**2**	2	0	4	**1**	**2**	0	**3**	12
07:45 AM	0	4	0	4	0	3	1	4	1	4	0	5	0	1	0	1	14
Total Volume	0	21	2	23	2	10	2	14	4	15	0	19	1	4	0	5	61
% App. Total	0	91.3	8.7		14.3	71.4	14.3		21.1	78.9	0		20	80	0		
PHF	.000	.750	.250	.639	.500	.625	.500	.583	.500	.536	.000	.679	.250	.500	.000	.417	.803

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Page No : 1

Groups Printed- Peds and Bicycles

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	6	0	1	0	1	0	0	0	0	8
07:15 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	8
07:30 AM	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8
07:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	5
Total	0	0	0	1	0	0	0	19	0	1	0	1	0	0	0	7	29
08:00 AM	0	2	0	0	0	0	0	4	0	0	0	0	0	0	0	4	10
08:15 AM	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	5	10
08:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	5
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
Total	0	2	0	0	0	0	0	11	1	0	0	0	0	0	0	14	28
Grand Total	0	2	0	1	0	0	0	30	1	1	0	1	0	0	0	21	57
Apprch %	0	66.7	0	33.3	0	0	0	100	33.3	33.3	0	33.3	0	0	0	100	
Total %	0	3.5	0	1.8	0	0	0	52.6	1.8	1.8	0	1.8	0	0	0	36.8	

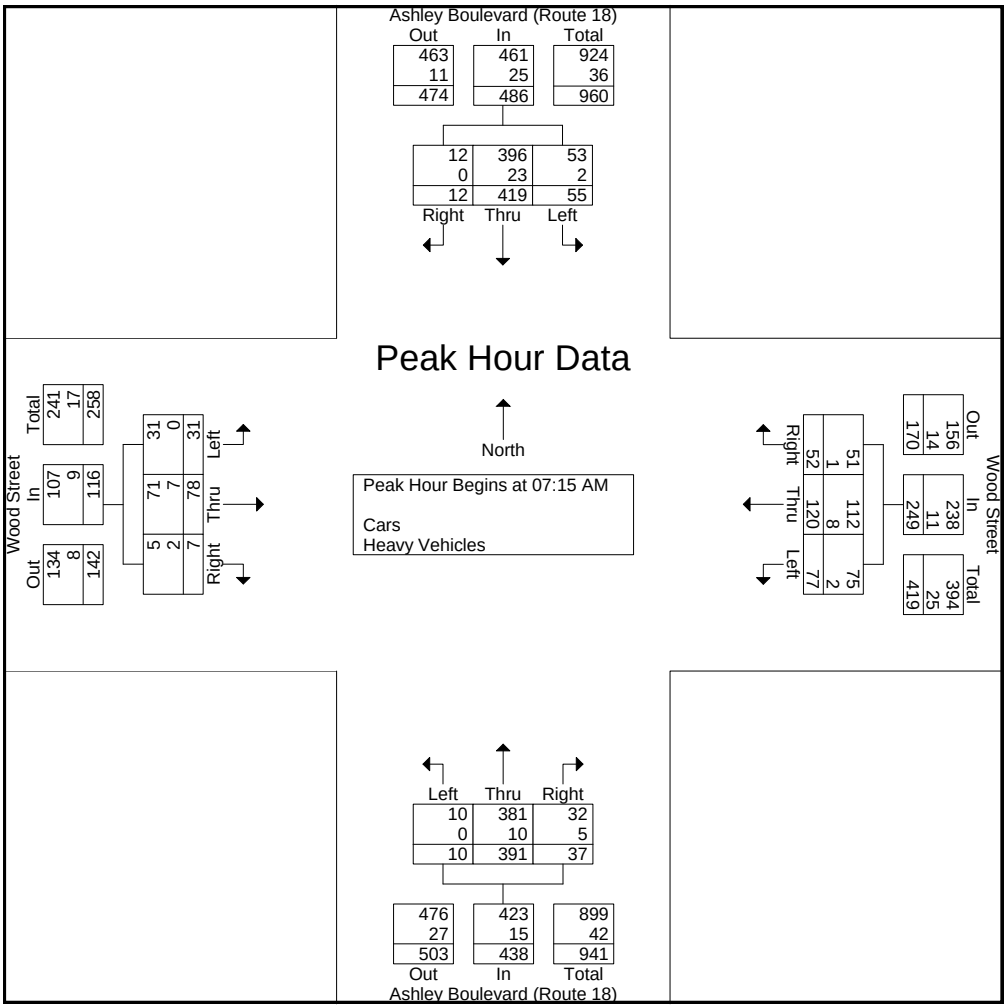
	Ashley Boulevard (Route 18) From North					Wood Street From East					Ashley Boulevard (Route 18) From South					Wood Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	**8**	**8**	0	0	0	0	0	0	0	0	0	0	8
07:45 AM	0	0	0	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**5**
08:00 AM	**0**	**2**	0	0	**2**	0	0	0	4	4	0	0	0	0	0	0	0	0	4	4	**10**
08:15 AM	0	0	0	0	0	0	0	0	4	4	**1**	**0**	**0**	**0**	**1**	0	0	0	**5**	**5**	10
Total Volume	0	2	0	1	3	0	0	0	17	17	1	0	0	0	1	0	0	0	12	12	33
% App. Total	0	66.7	0	33.3		0	0	0	100		100	0	0	0		0	0	0	100		
PHF	.000	.250	.000	.250	.375	.000	.000	.000	.531	.531	.250	.000	.000	.000	.250	.000	.000	.000	.600	.600	.825

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Ashley Boulevard (Route 18)
E/W: Wood Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-E
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	106	**21**	127	**14**	28	12	54	2	113	2	117	0	14	**10**	24	322
07:30 AM	3	**123**	7	**133**	13	28	**29**	70	10	**126**	**4**	**140**	1	22	7	30	**373**
07:45 AM	4	87	17	108	11	**36**	28	**75**	12	85	2	99	**3**	16	7	26	308
08:00 AM	**5**	103	10	118	14	28	8	50	**13**	67	2	82	3	**26**	7	**36**	286
Total Volume	12	419	55	486	52	120	77	249	37	391	10	438	7	78	31	116	1289
% App. Total	2.5	86.2	11.3		20.9	48.2	30.9		8.4	89.3	2.3		6	67.2	26.7		
PHF	.600	.852	.655	.914	.929	.833	.664	.830	.712	.776	.625	.782	.583	.750	.775	.806	.864
Cars	12	396	53	461	51	112	75	238	32	381	10	423	5	71	31	107	1229
% Cars	100	94.5	96.4	94.9	98.1	93.3	97.4	95.6	86.5	97.4	100	96.6	71.4	91.0	100	92.2	95.3
Heavy Vehicles	0	23	2	25	1	8	2	11	5	10	0	15	2	7	0	9	60
% Heavy Vehicles	0	5.5	3.6	5.1	1.9	6.7	2.6	4.4	13.5	2.6	0	3.4	28.6	9.0	0	7.8	4.7



PRECISION DATA INDUSTRIES, LLC
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N/S: Ashley Boulevard (Route 18)
E/W: Wood Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-EEE
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	121	31	9	30	13	18	110	4	4	39	6	389
04:15 PM	3	143	38	10	24	16	10	87	4	3	38	3	379
04:30 PM	5	120	16	9	28	6	14	80	3	0	40	3	324
04:45 PM	4	124	23	7	18	12	9	92	5	5	35	4	338
Total	16	508	108	35	100	47	51	369	16	12	152	16	1430
05:00 PM	0	119	18	15	22	14	17	80	6	3	36	6	336
05:15 PM	0	126	24	10	33	16	15	104	6	4	39	3	380
05:30 PM	2	144	25	9	17	23	27	91	7	4	28	5	382
05:45 PM	2	132	25	10	21	16	23	68	4	3	26	3	333
Total	4	521	92	44	93	69	82	343	23	14	129	17	1431
Grand Total	20	1029	200	79	193	116	133	712	39	26	281	33	2861
Apprch %	1.6	82.4	16	20.4	49.7	29.9	15	80.5	4.4	7.6	82.6	9.7	
Total %	0.7	36	7	2.8	6.7	4.1	4.6	24.9	1.4	0.9	9.8	1.2	
Cars	20	1008	197	78	188	115	130	693	39	26	276	32	2802
% Cars	100	98	98.5	98.7	97.4	99.1	97.7	97.3	100	100	98.2	97	97.9
Heavy Vehicles	0	21	3	1	5	1	3	19	0	0	5	1	59
% Heavy Vehicles	0	2	1.5	1.3	2.6	0.9	2.3	2.7	0	0	1.8	3	2.1

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	124	23	151	7	18	12	37	9	92	5	106	**5**	35	4	44	338
05:00 PM	0	119	18	137	**15**	22	14	51	17	80	6	103	3	36	**6**	45	336
05:15 PM	0	126	24	150	10	**33**	16	**59**	15	**104**	6	**125**	4	**39**	3	**46**	380
05:30 PM	2	**144**	**25**	**171**	9	17	**23**	49	**27**	91	**7**	125	4	28	5	37	**382**
Total Volume	6	513	90	609	41	90	65	196	68	367	24	459	16	138	18	172	1436
% App. Total	1	84.2	14.8		20.9	45.9	33.2		14.8	80	5.2		9.3	80.2	10.5		
PHF	.375	.891	.900	.890	.683	.682	.707	.831	.630	.882	.857	.918	.800	.885	.750	.935	.940
Cars	6	503	87	596	40	88	64	192	65	359	24	448	16	135	17	168	1404
% Cars	100	98.1	96.7	97.9	97.6	97.8	98.5	98.0	95.6	97.8	100	97.6	100	97.8	94.4	97.7	97.8
Heavy Vehicles	0	10	3	13	1	2	1	4	3	8	0	11	0	3	1	4	32
% Heavy Vehicles	0	1.9	3.3	2.1	2.4	2.2	1.5	2.0	4.4	2.2	0	2.4	0	2.2	5.6	2.3	2.2

PRECISION
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N/S: Ashley Boulevard (Route 18)
E/W: Wood Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-EEE
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	115	31	9	30	13	18	106	4	4	38	6	378
04:15 PM	3	140	38	10	23	16	10	84	4	3	38	3	372
04:30 PM	5	119	16	9	27	6	14	78	3	0	39	3	319
04:45 PM	4	123	22	7	17	12	8	91	5	5	35	4	333
Total	16	497	107	35	97	47	50	359	16	12	150	16	1402
05:00 PM	0	117	18	15	22	13	17	77	6	3	36	5	329
05:15 PM	0	122	22	10	32	16	15	103	6	4	37	3	370
05:30 PM	2	141	25	8	17	23	25	88	7	4	27	5	372
05:45 PM	2	131	25	10	20	16	23	66	4	3	26	3	329
Total	4	511	90	43	91	68	80	334	23	14	126	16	1400
Grand Total	20	1008	197	78	188	115	130	693	39	26	276	32	2802
Apprch %	1.6	82.3	16.1	20.5	49.3	30.2	15.1	80.4	4.5	7.8	82.6	9.6	
Total %	0.7	36	7	2.8	6.7	4.1	4.6	24.7	1.4	0.9	9.9	1.1	

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	123	22	149	7	17	12	36	8	91	5	104	**5**	35	4	**44**	333
05:00 PM	0	117	18	135	**15**	22	13	50	17	77	6	100	3	36	**5**	44	329
05:15 PM	0	122	22	144	10	**32**	16	**58**	15	**103**	6	**124**	4	**37**	3	44	370
05:30 PM	2	**141**	**25**	**168**	8	17	**23**	48	**25**	88	**7**	120	4	27	5	36	**372**
Total Volume	6	503	87	596	40	88	64	192	65	359	24	448	16	135	17	168	1404
% App. Total	1	84.4	14.6		20.8	45.8	33.3		14.5	80.1	5.4		9.5	80.4	10.1		
PHF	.375	.892	.870	.887	.667	.688	.696	.828	.650	.871	.857	.903	.800	.912	.850	.955	.944

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Groups Printed- Heavy Vehicles

	Ashley Boulevard (Route 18) From North			Wood Street From East			Ashley Boulevard (Route 18) From South			Wood Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	6	0	0	0	0	0	4	0	0	1	0	11
04:15 PM	0	3	0	0	1	0	0	3	0	0	0	0	7
04:30 PM	0	1	0	0	1	0	0	2	0	0	1	0	5
04:45 PM	0	1	1	0	1	0	1	1	0	0	0	0	5
Total	0	11	1	0	3	0	1	10	0	0	2	0	28
05:00 PM	0	2	0	0	0	1	0	3	0	0	0	1	7
05:15 PM	0	4	2	0	1	0	0	1	0	0	2	0	10
05:30 PM	0	3	0	1	0	0	2	3	0	0	1	0	10
05:45 PM	0	1	0	0	1	0	0	2	0	0	0	0	4
Total	0	10	2	1	2	1	2	9	0	0	3	1	31
Grand Total	0	21	3	1	5	1	3	19	0	0	5	1	59
Apprch %	0	87.5	12.5	14.3	71.4	14.3	13.6	86.4	0	0	83.3	16.7	
Total %	0	35.6	5.1	1.7	8.5	1.7	5.1	32.2	0	0	8.5	1.7	

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	1	1	2	0	**1**	0	**1**	1	1	0	2	0	0	0	0	5
05:00 PM	0	2	0	2	0	0	**1**	1	0	**3**	0	3	0	0	**1**	1	7
05:15 PM	0	**4**	**2**	**6**	0	1	0	1	0	1	0	1	0	**2**	0	**2**	**10**
05:30 PM	0	3	0	3	**1**	0	0	1	**2**	3	0	**5**	0	1	0	1	10
Total Volume	0	10	3	13	1	2	1	4	3	8	0	11	0	3	1	4	32
% App. Total	0	76.9	23.1		25	50	25		27.3	72.7	0		0	75	25		
PHF	.000	.625	.375	.542	.250	.500	.250	1.000	.375	.667	.000	.550	.000	.375	.250	.500	.800

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Groups Printed- Peds and Bicycles

	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
04:15 PM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	2	6
Total	0	1	0	3	0	0	0	3	0	0	0	4	0	0	0	3	14
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
05:15 PM	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	4
05:30 PM	0	1	0	0	0	0	0	2	0	1	0	0	0	0	0	0	4
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	0	0	0	4	0	3	0	1	0	0	0	1	11
Grand Total	0	3	0	3	0	0	0	7	0	3	0	5	0	0	0	4	25
Apprch %	0	50	0	50	0	0	0	100	0	37.5	0	62.5	0	0	0	100	
Total %	0	12	0	12	0	0	0	28	0	12	0	20	0	0	0	16	

	Ashley Boulevard (Route 18) From North					Wood Street From East					Ashley Boulevard (Route 18) From South					Wood Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	**2**	**2**	0	0	0	**2**	**2**	**6**
05:00 PM	0	0	0	0	0	0	0	0	1	1	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**
05:15 PM	**0**	**1**	0	0	**1**	0	0	0	0	0	0	1	0	1	2	0	0	0	1	1	4
05:30 PM	0	1	0	0	1	0	0	0	2	2	0	1	0	0	1	0	0	0	0	0	4
Total Volume	0	2	0	0	2	0	0	0	5	5	0	3	0	3	6	0	0	0	3	3	16
% App. Total	0	100	0	0		0	0	0	100		0	50	0	50		0	0	0	100		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.625	.625	.000	.750	.000	.375	.750	.000	.000	.000	.375	.375	.667

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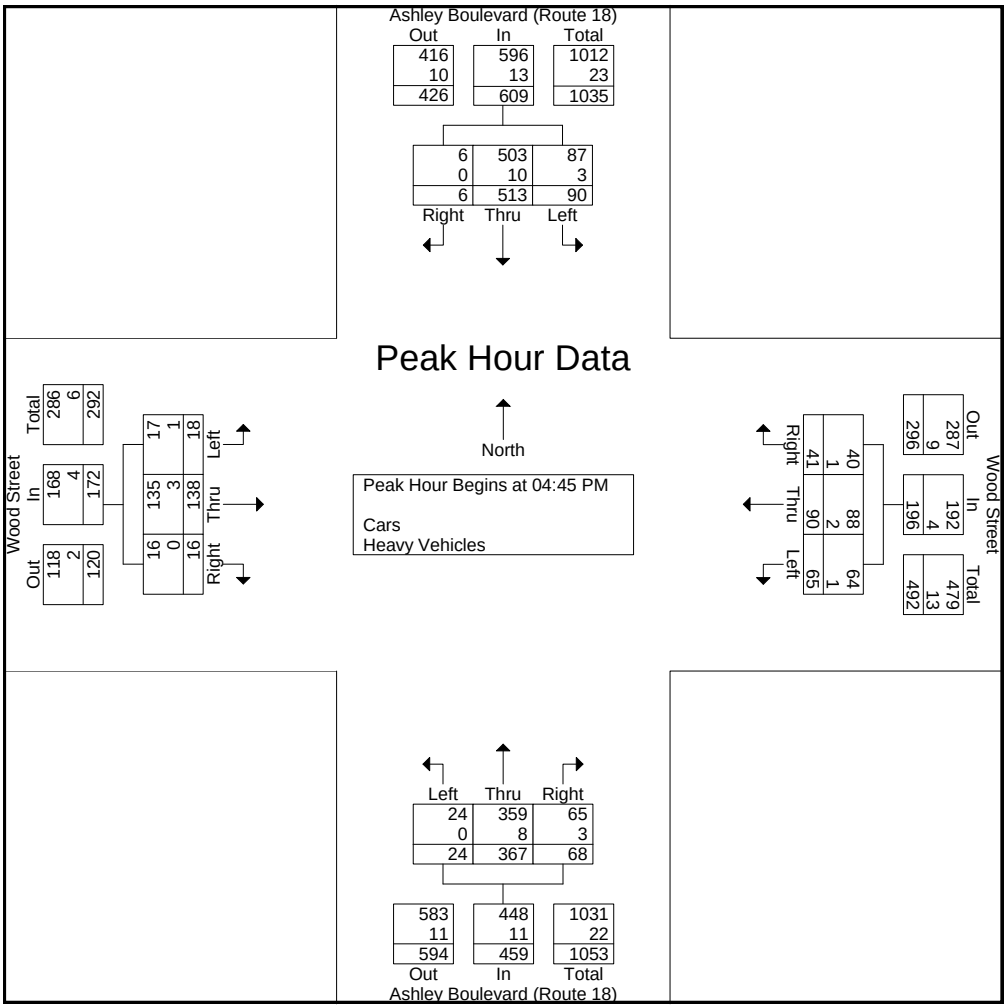
	Ashley Boulevard (Route 18) From North				Wood Street From East				Ashley Boulevard (Route 18) From South				Wood Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	124	23	151	7	18	12	37	9	92	5	106	**5**	35	4	44	338
05:00 PM	0	119	18	137	**15**	22	14	51	17	80	6	103	3	36	**6**	45	336
05:15 PM	0	126	24	150	10	**33**	16	**59**	15	**104**	6	**125**	4	**39**	3	**46**	380
05:30 PM	2	**144**	**25**	**171**	9	17	**23**	49	**27**	91	**7**	125	4	28	5	37	**382**
Total Volume	6	513	90	609	41	90	65	196	68	367	24	459	16	138	18	172	1436
% App. Total	1	84.2	14.8		20.9	45.9	33.2		14.8	80	5.2		9.3	80.2	10.5		
PHF	.375	.891	.900	.890	.683	.682	.707	.831	.630	.882	.857	.918	.800	.885	.750	.935	.940
Cars	6	503	87	596	40	88	64	192	65	359	24	448	16	135	17	168	1404
% Cars	100	98.1	96.7	97.9	97.6	97.8	98.5	98.0	95.6	97.8	100	97.6	100	97.8	94.4	97.7	97.8
Heavy Vehicles	0	10	3	13	1	2	1	4	3	8	0	11	0	3	1	4	32
% Heavy Vehicles	0	1.9	3.3	2.1	2.4	2.2	1.5	2.0	4.4	2.2	0	2.4	0	2.2	5.6	2.3	2.2



PRECISION DATA INDUSTRIES, LLC
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N/S: Church Street
E/W: Irvington Street/Western Tool Drwy
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	77	0	9	0	4	0	62	0	0	0	0	152
07:15 AM	1	85	0	5	1	6	0	81	0	0	0	0	179
07:30 AM	2	56	0	2	0	5	0	67	0	1	0	1	134
07:45 AM	5	94	0	8	0	6	0	86	0	1	0	1	201
Total	8	312	0	24	1	21	0	296	0	2	0	2	666
08:00 AM	3	83	0	5	0	0	0	61	0	1	0	2	155
08:15 AM	0	79	0	5	1	7	0	56	2	1	0	0	151
08:30 AM	2	69	0	1	0	11	1	58	2	0	0	3	147
08:45 AM	0	58	0	4	1	4	0	44	2	1	0	3	117
Total	5	289	0	15	2	22	1	219	6	3	0	8	570
Grand Total	13	601	0	39	3	43	1	515	6	5	0	10	1236
Apprch %	2.1	97.9	0	45.9	3.5	50.6	0.2	98.7	1.1	33.3	0	66.7	
Total %	1.1	48.6	0	3.2	0.2	3.5	0.1	41.7	0.5	0.4	0	0.8	
Cars	13	561	0	39	3	41	1	484	6	5	0	10	1163
% Cars	100	93.3	0	100	100	95.3	100	94	100	100	0	100	94.1
Heavy Vehicles	0	40	0	0	0	2	0	31	0	0	0	0	73
% Heavy Vehicles	0	6.7	0	0	0	4.7	0	6	0	0	0	0	5.9

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	85	0	86	5	**1**	**6**	12	0	81	0	81	0	0	0	0	179
07:30 AM	2	56	0	58	2	0	5	7	0	67	0	67	**1**	0	1	2	134
07:45 AM	**5**	**94**	0	**99**	**8**	0	6	**14**	0	**86**	0	**86**	1	0	1	2	**201**
08:00 AM	3	83	0	86	5	0	0	5	0	61	0	61	1	0	**2**	**3**	155
Total Volume	11	318	0	329	20	1	17	38	0	295	0	295	3	0	4	7	669
% App. Total	3.3	96.7	0		52.6	2.6	44.7		0	100	0		42.9	0	57.1		
PHF	.550	.846	.000	.831	.625	.250	.708	.679	.000	.858	.000	.858	.750	.000	.500	.583	.832
Cars	11	288	0	299	20	1	16	37	0	277	0	277	3	0	4	7	620
% Cars	100	90.6	0	90.9	100	100	94.1	97.4	0	93.9	0	93.9	100	0	100	100	92.7
Heavy Vehicles	0	30	0	30	0	0	1	1	0	18	0	18	0	0	0	0	49
% Heavy Vehicles	0	9.4	0	9.1	0	0	5.9	2.6	0	6.1	0	6.1	0	0	0	0	7.3

PRECISION
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	70	0	9	0	4	0	55	0	0	0	0	138
07:15 AM	1	78	0	5	1	6	0	78	0	0	0	0	169
07:30 AM	2	49	0	2	0	5	0	60	0	1	0	1	120
07:45 AM	5	84	0	8	0	5	0	82	0	1	0	1	186
Total	8	281	0	24	1	20	0	275	0	2	0	2	613
08:00 AM	3	77	0	5	0	0	0	57	0	1	0	2	145
08:15 AM	0	79	0	5	1	6	0	52	2	1	0	0	146
08:30 AM	2	68	0	1	0	11	1	56	2	0	0	3	144
08:45 AM	0	56	0	4	1	4	0	44	2	1	0	3	115
Total	5	280	0	15	2	21	1	209	6	3	0	8	550
Grand Total	13	561	0	39	3	41	1	484	6	5	0	10	1163
Apprch %	2.3	97.7	0	47	3.6	49.4	0.2	98.6	1.2	33.3	0	66.7	
Total %	1.1	48.2	0	3.4	0.3	3.5	0.1	41.6	0.5	0.4	0	0.9	

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**5**	**84**	0	**89**	**8**	0	5	**13**	0	**82**	0	**82**	**1**	0	1	2	**186**
08:00 AM	3	77	0	80	5	0	0	5	0	57	0	57	1	0	2	**3**	145
08:15 AM	0	79	0	79	5	**1**	6	12	0	52	**2**	54	1	0	0	1	146
08:30 AM	2	68	0	70	1	0	**11**	12	**1**	56	2	59	0	0	**3**	3	144
Total Volume	10	308	0	318	19	1	22	42	1	247	4	252	3	0	6	9	621
% App. Total	3.1	96.9	0		45.2	2.4	52.4		0.4	98	1.6		33.3	0	66.7		
PHF	.500	.917	.000	.893	.594	.250	.500	.808	.250	.753	.500	.768	.750	.000	.500	.750	.835

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File Name : 81676 E-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	7	0	0	0	0	0	7	0	0	0	0	14
07:15 AM	0	7	0	0	0	0	0	3	0	0	0	0	10
07:30 AM	0	7	0	0	0	0	0	7	0	0	0	0	14
07:45 AM	0	10	0	0	0	1	0	4	0	0	0	0	15
Total	0	31	0	0	0	1	0	21	0	0	0	0	53
08:00 AM	0	6	0	0	0	0	0	4	0	0	0	0	10
08:15 AM	0	0	0	0	0	1	0	4	0	0	0	0	5
08:30 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
08:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	9	0	0	0	1	0	10	0	0	0	0	20
Grand Total	0	40	0	0	0	2	0	31	0	0	0	0	73
Apprch %	0	100	0	0	0	100	0	100	0	0	0	0	
Total %	0	54.8	0	0	0	2.7	0	42.5	0	0	0	0	

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	7	0	7	0	0	0	0	0	**7**	0	**7**	0	0	0	0	14
07:15 AM	0	7	0	7	0	0	0	0	0	3	0	3	0	0	0	0	10
07:30 AM	0	7	0	7	0	0	0	0	0	7	0	7	0	0	0	0	14
07:45 AM	0	**10**	0	**10**	0	0	**1**	**1**	0	4	0	4	0	0	0	0	**15**
Total Volume	0	31	0	31	0	0	1	1	0	21	0	21	0	0	0	0	53
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.775	.000	.775	.000	.000	.250	.250	.000	.750	.000	.750	.000	.000	.000	.000	.883

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File Name : 81676 E-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	3
Grand Total	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	1	6
Apprch %	0	0	0	0	0	0	0	100	0	100	0	0	0	0	0	100	
Total %	0	0	0	0	0	0	0	33.3	0	50	0	0	0	0	0	16.7	

	Church Street From North					Irvington Street From East					Church Street From South					Western Tool Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	**2**	**0**	**0**	**2**	0	0	0	0	0	**3**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	1	1	0	2	0	0	2	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	100		0	100	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250

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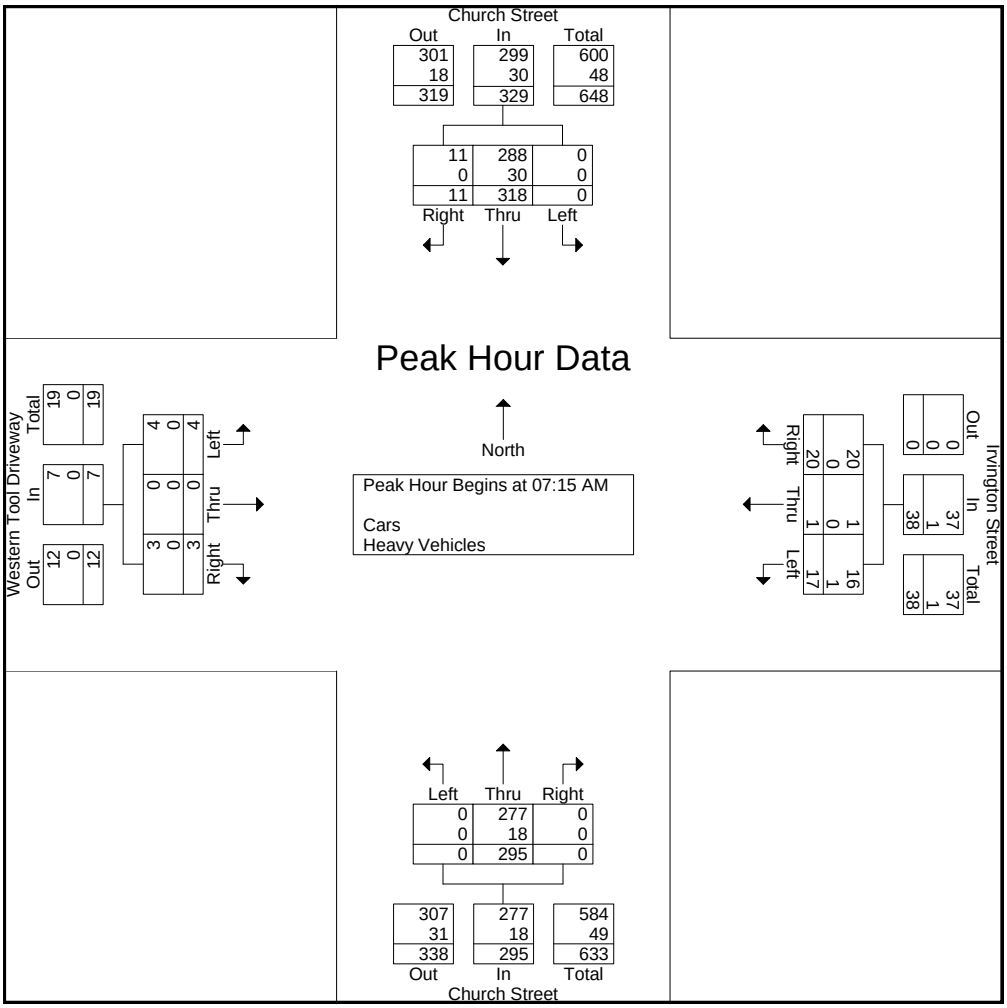
Page No : 1

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	85	0	86	5	**1**	**6**	12	0	81	0	81	0	0	0	0	179
07:30 AM	2	56	0	58	2	0	5	7	0	67	0	67	**1**	0	1	2	134
07:45 AM	**5**	**94**	0	**99**	**8**	0	6	**14**	0	**86**	0	**86**	1	0	1	2	**201**
08:00 AM	3	83	0	86	5	0	0	5	0	61	0	61	1	0	**2**	**3**	155
Total Volume	11	318	0	329	20	1	17	38	0	295	0	295	3	0	4	7	669
% App. Total	3.3	96.7	0		52.6	2.6	44.7		0	100	0		42.9	0	57.1		
PHF	.550	.846	.000	.831	.625	.250	.708	.679	.000	.858	.000	.858	.750	.000	.500	.583	.832
Cars	11	288	0	299	20	1	16	37	0	277	0	277	3	0	4	7	620
% Cars	100	90.6	0	90.9	100	100	94.1	97.4	0	93.9	0	93.9	100	0	100	100	92.7
Heavy Vehicles	0	30	0	30	0	0	1	1	0	18	0	18	0	0	0	0	49
% Heavy Vehicles	0	9.4	0	9.1	0	0	5.9	2.6	0	6.1	0	6.1	0	0	0	0	7.3



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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	120	0	7	3	6	0	99	1	0	2	1	240
04:15 PM	2	125	0	3	0	7	0	101	1	1	0	0	240
04:30 PM	2	105	0	2	0	5	0	72	2	1	0	3	192
04:45 PM	1	107	0	3	0	6	0	94	5	2	0	1	219
Total	6	457	0	15	3	24	0	366	9	4	2	5	891
05:00 PM	1	117	0	6	0	2	0	100	0	1	0	1	228
05:15 PM	1	120	0	7	0	9	0	102	0	1	0	0	240
05:30 PM	0	106	0	7	0	7	0	69	1	1	0	2	193
05:45 PM	0	79	0	3	2	5	0	72	0	1	0	0	162
Total	2	422	0	23	2	23	0	343	1	4	0	3	823
Grand Total	8	879	0	38	5	47	0	709	10	8	2	8	1714
Apprch %	0.9	99.1	0	42.2	5.6	52.2	0	98.6	1.4	44.4	11.1	44.4	
Total %	0.5	51.3	0	2.2	0.3	2.7	0	41.4	0.6	0.5	0.1	0.5	
Cars	8	864	0	37	5	46	0	693	9	8	2	8	1680
% Cars	100	98.3	0	97.4	100	97.9	0	97.7	90	100	100	100	98
Heavy Vehicles	0	15	0	1	0	1	0	16	1	0	0	0	34
% Heavy Vehicles	0	1.7	0	2.6	0	2.1	0	2.3	10	0	0	0	2

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	120	0	121	**7**	**3**	6	**16**	0	99	1	100	0	**2**	1	3	**240**
04:15 PM	**2**	**125**	0	**127**	3	0	**7**	10	0	**101**	1	**102**	1	0	0	1	240
04:30 PM	2	105	0	107	2	0	5	7	0	72	2	74	1	0	**3**	**4**	192
04:45 PM	1	107	0	108	3	0	6	9	0	94	**5**	99	**2**	0	1	3	219
Total Volume	6	457	0	463	15	3	24	42	0	366	9	375	4	2	5	11	891
% App. Total	1.3	98.7	0		35.7	7.1	57.1		0	97.6	2.4		36.4	18.2	45.5		
PHF	.750	.914	.000	.911	.536	.250	.857	.656	.000	.906	.450	.919	.500	.250	.417	.688	.928
Cars	6	447	0	453	14	3	23	40	0	358	8	366	4	2	5	11	870
% Cars	100	97.8	0	97.8	93.3	100	95.8	95.2	0	97.8	88.9	97.6	100	100	100	100	97.6
Heavy Vehicles	0	10	0	10	1	0	1	2	0	8	1	9	0	0	0	0	21
% Heavy Vehicles	0	2.2	0	2.2	6.7	0	4.2	4.8	0	2.2	11.1	2.4	0	0	0	0	2.4

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Page No : 1

Groups Printed- Cars

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	119	0	7	3	5	0	95	1	0	2	1	234
04:15 PM	2	122	0	3	0	7	0	99	1	1	0	0	235
04:30 PM	2	103	0	2	0	5	0	70	1	1	0	3	187
04:45 PM	1	103	0	2	0	6	0	94	5	2	0	1	214
Total	6	447	0	14	3	23	0	358	8	4	2	5	870
05:00 PM	1	117	0	6	0	2	0	99	0	1	0	1	227
05:15 PM	1	116	0	7	0	9	0	102	0	1	0	0	236
05:30 PM	0	106	0	7	0	7	0	65	1	1	0	2	189
05:45 PM	0	78	0	3	2	5	0	69	0	1	0	0	158
Total	2	417	0	23	2	23	0	335	1	4	0	3	810
Grand Total	8	864	0	37	5	46	0	693	9	8	2	8	1680
Apprch %	0.9	99.1	0	42	5.7	52.3	0	98.7	1.3	44.4	11.1	44.4	
Total %	0.5	51.4	0	2.2	0.3	2.7	0	41.2	0.5	0.5	0.1	0.5	

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	119	0	120	**7**	**3**	5	**15**	0	95	1	96	0	**2**	1	3	234
04:15 PM	**2**	**122**	0	**124**	3	0	**7**	10	0	**99**	1	**100**	1	0	0	1	**235**
04:30 PM	2	103	0	105	2	0	5	7	0	70	1	71	1	0	**3**	**4**	187
04:45 PM	1	103	0	104	2	0	6	8	0	94	**5**	99	**2**	0	1	3	214
Total Volume	6	447	0	453	14	3	23	40	0	358	8	366	4	2	5	11	870
% App. Total	1.3	98.7	0		35	7.5	57.5		0	97.8	2.2		36.4	18.2	45.5		
PHF	.750	.916	.000	.913	.500	.250	.821	.667	.000	.904	.400	.915	.500	.250	.417	.688	.926

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N/S: Church Street
E/W: Irvington Street/Western Tool Drwy
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-FFF
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Heavy Vehicles

	Church Street From North			Irvington Street From East			Church Street From South			Western Tool Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	0	0	1	0	4	0	0	0	0	6
04:15 PM	0	3	0	0	0	0	0	2	0	0	0	0	5
04:30 PM	0	2	0	0	0	0	0	2	1	0	0	0	5
04:45 PM	0	4	0	1	0	0	0	0	0	0	0	0	5
Total	0	10	0	1	0	1	0	8	1	0	0	0	21
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	4	0	0	0	0	0	0	0	0	0	0	4
05:30 PM	0	0	0	0	0	0	0	4	0	0	0	0	4
05:45 PM	0	1	0	0	0	0	0	3	0	0	0	0	4
Total	0	5	0	0	0	0	0	8	0	0	0	0	13
Grand Total	0	15	0	1	0	1	0	16	1	0	0	0	34
Apprch %	0	100	0	50	0	50	0	94.1	5.9	0	0	0	
Total %	0	44.1	0	2.9	0	2.9	0	47.1	2.9	0	0	0	

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	**1**	**1**	0	**4**	0	**4**	0	0	0	0	**6**
04:15 PM	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
04:30 PM	0	2	0	2	0	0	0	0	0	2	**1**	3	0	0	0	0	5
04:45 PM	0	**4**	0	**4**	**1**	0	0	1	0	0	0	0	0	0	0	0	5
Total Volume	0	10	0	10	1	0	1	2	0	8	1	9	0	0	0	0	21
% App. Total	0	100	0		50	0	50		0	88.9	11.1		0	0	0		
PHF	.000	.625	.000	.625	.250	.000	.250	.500	.000	.500	.250	.563	.000	.000	.000	.000	.875

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Client: VHB/J. Quitter

File Name : 81676 E-FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	100	
Total %	0	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	

	Church Street From North					Irvington Street From East					Church Street From South					Western Tool Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**2**	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

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File Name : 81676 E-FFF
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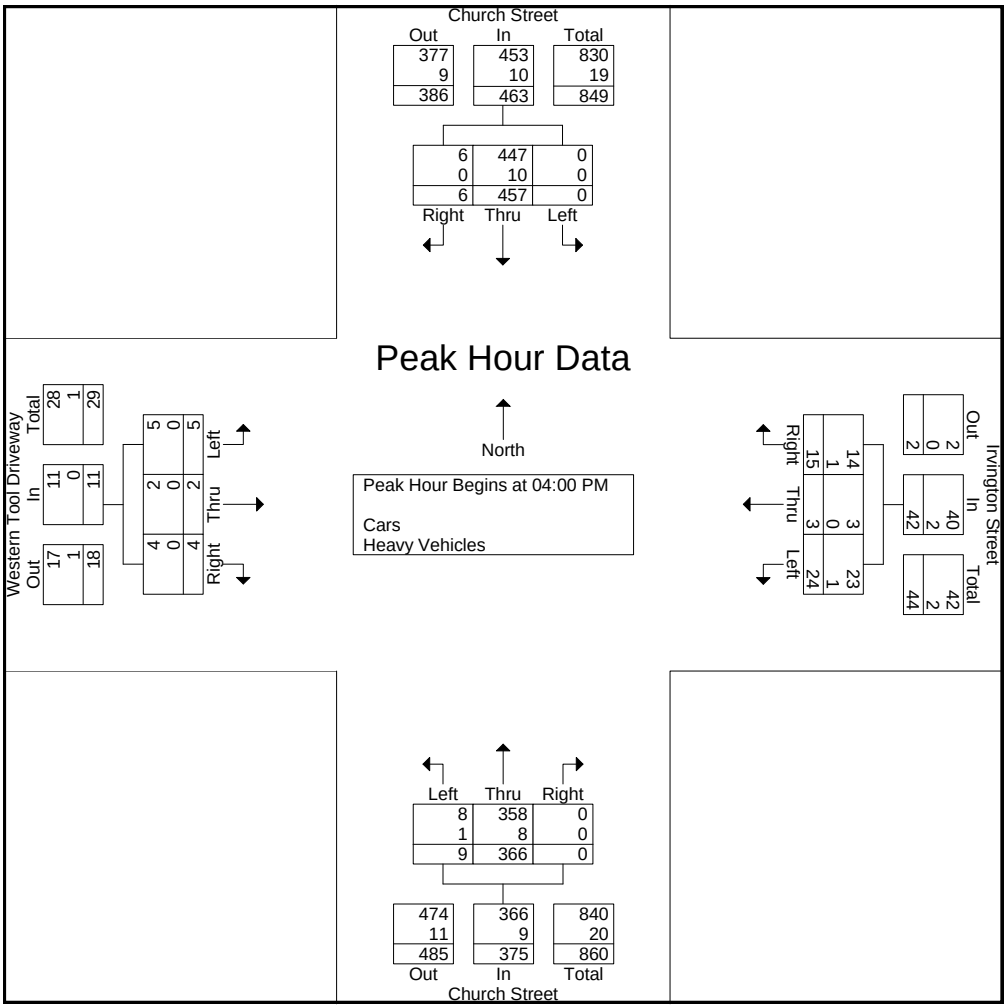
Start Date : 9/18/2008
Page No : 1

	Church Street From North				Irvington Street From East				Church Street From South				Western Tool Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	120	0	121	**7**	**3**	6	**16**	0	99	1	100	0	**2**	1	3	**240**
04:15 PM	**2**	**125**	0	**127**	3	0	**7**	10	0	**101**	1	**102**	1	0	0	1	240
04:30 PM	2	105	0	107	2	0	5	7	0	72	2	74	1	0	**3**	**4**	192
04:45 PM	1	107	0	108	3	0	6	9	0	94	**5**	99	**2**	0	1	3	219
Total Volume	6	457	0	463	15	3	24	42	0	366	9	375	4	2	5	11	891
% App. Total	1.3	98.7	0		35.7	7.1	57.1		0	97.6	2.4		36.4	18.2	45.5		
PHF	.750	.914	.000	.911	.536	.250	.857	.656	.000	.906	.450	.919	.500	.250	.417	.688	.928
Cars	6	447	0	453	14	3	23	40	0	358	8	366	4	2	5	11	870
% Cars	100	97.8	0	97.8	93.3	100	95.8	95.2	0	97.8	88.9	97.6	100	100	100	100	97.6
Heavy Vehicles	0	10	0	10	1	0	1	2	0	8	1	9	0	0	0	0	21
% Heavy Vehicles	0	2.2	0	2.2	6.7	0	4.2	4.8	0	2.2	11.1	2.4	0	0	0	0	2.4



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N/S: Church Street
E/W: Nash Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-G
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	40	41	4	7	63	4	3	24	7	8	42	22	265
07:15 AM	39	29	5	12	69	4	4	37	15	8	46	27	295
07:30 AM	38	40	4	7	60	10	7	29	17	7	53	26	298
07:45 AM	37	49	6	14	53	11	9	29	17	9	59	27	320
Total	154	159	19	40	245	29	23	119	56	32	200	102	1178
08:00 AM	34	40	15	11	64	10	9	21	20	7	65	25	321
08:15 AM	42	35	6	7	69	7	7	21	18	3	52	22	289
08:30 AM	28	33	9	6	60	13	1	23	7	6	56	14	256
08:45 AM	29	38	13	4	63	8	4	22	8	5	62	26	282
Total	133	146	43	28	256	38	21	87	53	21	235	87	1148
Grand Total	287	305	62	68	501	67	44	206	109	53	435	189	2326
Apprch %	43.9	46.6	9.5	10.7	78.8	10.5	12.3	57.4	30.4	7.8	64.3	27.9	
Total %	12.3	13.1	2.7	2.9	21.5	2.9	1.9	8.9	4.7	2.3	18.7	8.1	
Cars	267	281	58	68	482	63	42	200	104	49	405	157	2176
% Cars	93	92.1	93.5	100	96.2	94	95.5	97.1	95.4	92.5	93.1	83.1	93.6
Heavy Vehicles	20	24	4	0	19	4	2	6	5	4	30	32	150
% Heavy Vehicles	7	7.9	6.5	0	3.8	6	4.5	2.9	4.6	7.5	6.9	16.9	6.4

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**39**	29	5	73	12	**69**	4	**85**	4	**37**	15	**56**	8	46	**27**	81	295
07:30 AM	38	40	4	82	7	60	10	77	7	29	17	53	7	53	26	86	298
07:45 AM	37	**49**	6	**92**	**14**	53	**11**	78	**9**	29	17	55	**9**	59	27	95	320
08:00 AM	34	40	**15**	89	11	64	10	85	9	21	**20**	50	7	**65**	25	**97**	**321**
Total Volume	148	158	30	336	44	246	35	325	29	116	69	214	31	223	105	359	1234
% App. Total	44	47	8.9		13.5	75.7	10.8		13.6	54.2	32.2		8.6	62.1	29.2		
PHF	.949	.806	.500	.913	.786	.891	.795	.956	.806	.784	.863	.955	.861	.858	.972	.925	.961
Cars	135	145	28	308	44	237	33	314	27	113	68	208	28	207	86	321	1151
% Cars	91.2	91.8	93.3	91.7	100	96.3	94.3	96.6	93.1	97.4	98.6	97.2	90.3	92.8	81.9	89.4	93.3
Heavy Vehicles	13	13	2	28	0	9	2	11	2	3	1	6	3	16	19	38	83
% Heavy Vehicles	8.8	8.2	6.7	8.3	0	3.7	5.7	3.4	6.9	2.6	1.4	2.8	9.7	7.2	18.1	10.6	6.7

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N/S: Church Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-G
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	35	39	4	7	58	4	3	21	5	7	38	18	239
07:15 AM	35	28	5	12	64	4	4	37	15	8	42	22	276
07:30 AM	34	38	3	7	58	10	7	28	16	7	49	20	277
07:45 AM	34	43	5	14	51	10	8	28	17	8	56	23	297
Total	138	148	17	40	231	28	22	114	53	30	185	83	1089
08:00 AM	32	36	15	11	64	9	8	20	20	5	60	21	301
08:15 AM	40	30	6	7	66	6	7	21	18	3	49	20	273
08:30 AM	28	32	7	6	59	13	1	23	6	6	52	11	244
08:45 AM	29	35	13	4	62	7	4	22	7	5	59	22	269
Total	129	133	41	28	251	35	20	86	51	19	220	74	1087
Grand Total	267	281	58	68	482	63	42	200	104	49	405	157	2176
Apprch %	44.1	46.4	9.6	11.1	78.6	10.3	12.1	57.8	30.1	8	66.3	25.7	
Total %	12.3	12.9	2.7	3.1	22.2	2.9	1.9	9.2	4.8	2.3	18.6	7.2	

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**35**	28	5	68	12	**64**	4	80	4	**37**	15	**56**	**8**	42	22	72	276
07:30 AM	34	38	3	75	7	58	**10**	75	7	28	16	51	7	49	20	76	277
07:45 AM	34	**43**	5	82	**14**	51	10	75	**8**	28	17	53	8	56	**23**	**87**	297
08:00 AM	32	36	**15**	**83**	11	64	9	**84**	8	20	**20**	48	5	**60**	21	86	**301**
Total Volume	135	145	28	308	44	237	33	314	27	113	68	208	28	207	86	321	1151
% App. Total	43.8	47.1	9.1		14	75.5	10.5		13	54.3	32.7		8.7	64.5	26.8		
PHF	.964	.843	.467	.928	.786	.926	.825	.935	.844	.764	.850	.929	.875	.863	.935	.922	.956

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File Name : 81676 E-G
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Heavy Vehicles

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	2	0	0	5	0	0	3	2	1	4	4	26
07:15 AM	4	1	0	0	5	0	0	0	0	0	4	5	19
07:30 AM	4	2	1	0	2	0	0	1	1	0	4	6	21
07:45 AM	3	6	1	0	2	1	1	1	0	1	3	4	23
Total	16	11	2	0	14	1	1	5	3	2	15	19	89
08:00 AM	2	4	0	0	0	1	1	1	0	2	5	4	20
08:15 AM	2	5	0	0	3	1	0	0	0	0	3	2	16
08:30 AM	0	1	2	0	1	0	0	0	1	0	4	3	12
08:45 AM	0	3	0	0	1	1	0	0	1	0	3	4	13
Total	4	13	2	0	5	3	1	1	2	2	15	13	61
Grand Total	20	24	4	0	19	4	2	6	5	4	30	32	150
Apprch %	41.7	50	8.3	0	82.6	17.4	15.4	46.2	38.5	6.1	45.5	48.5	
Total %	13.3	16	2.7	0	12.7	2.7	1.3	4	3.3	2.7	20	21.3	

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**5**	2	0	7	0	**5**	0	**5**	0	**3**	**2**	**5**	**1**	**4**	4	9	**26**
07:15 AM	4	1	0	5	0	5	0	5	0	0	0	0	0	4	5	9	19
07:30 AM	4	2	**1**	7	0	2	0	2	0	1	1	2	0	4	**6**	**10**	21
07:45 AM	3	**6**	1	**10**	0	2	**1**	3	**1**	1	0	2	1	3	4	8	23
Total Volume	16	11	2	29	0	14	1	15	1	5	3	9	2	15	19	36	89
% App. Total	55.2	37.9	6.9		0	93.3	6.7		11.1	55.6	33.3		5.6	41.7	52.8		
PHF	.800	.458	.500	.725	.000	.700	.250	.750	.250	.417	.375	.450	.500	.938	.792	.900	.856

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File Name : 81676 E-G
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Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	5
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
Total	0	0	0	4	0	1	0	0	0	2	0	0	2	0	0	2	11
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
08:15 AM	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	6
Grand Total	0	0	0	5	0	1	0	0	0	3	0	0	2	1	0	5	17
Apprch %	0	0	0	100	0	100	0	0	0	100	0	0	25	12.5	0	62.5	
Total %	0	0	0	29.4	0	5.9	0	0	0	17.6	0	0	11.8	5.9	0	29.4	

	Church Street From North					Nash Road From East					Church Street From South					Nash Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	**3**	**3**	0	0	0	0	0	0	**2**	**0**	**0**	**2**	0	0	0	0	0	**5**
07:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**2**	**0**	**0**	**0**	**2**	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	1	1	2
Total Volume	0	0	0	4	4	0	1	0	0	1	0	2	0	0	2	2	0	0	2	4	11
% App. Total	0	0	0	100		0	100	0	0		0	100	0	0		50	0	0	50		
PHF	.000	.000	.000	.333	.333	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.250	.000	.000	.500	.500	.550

PRECISION
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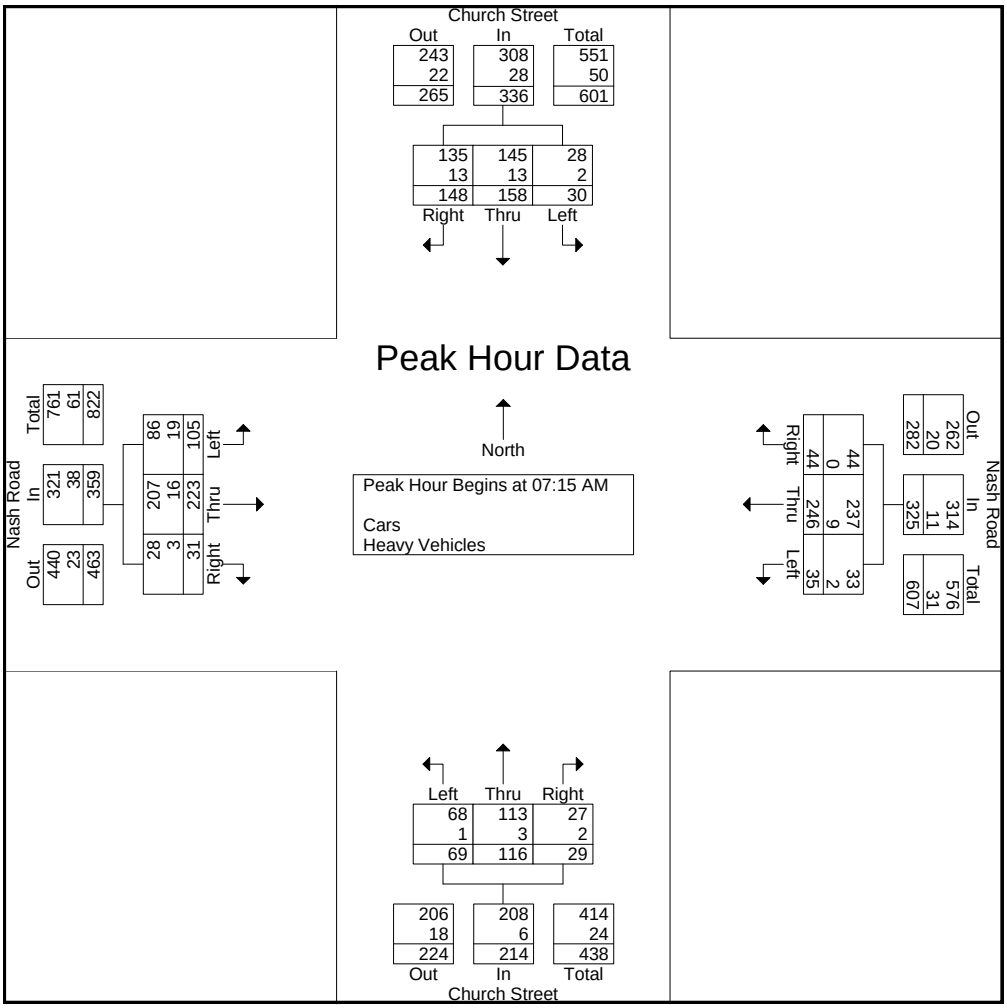
N/S: Church Street
E/W: Nash Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-G
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**39**	29	5	73	12	**69**	4	**85**	4	**37**	15	**56**	8	46	**27**	81	295
07:30 AM	38	40	4	82	7	60	10	77	7	29	17	53	7	53	26	86	298
07:45 AM	37	**49**	6	**92**	**14**	53	**11**	78	**9**	29	17	55	**9**	59	27	95	320
08:00 AM	34	40	**15**	89	11	64	10	85	9	21	**20**	50	7	**65**	25	**97**	**321**
Total Volume	148	158	30	336	44	246	35	325	29	116	69	214	31	223	105	359	1234
% App. Total	44	47	8.9		13.5	75.7	10.8		13.6	54.2	32.2		8.6	62.1	29.2		
PHF	.949	.806	.500	.913	.786	.891	.795	.956	.806	.784	.863	.955	.861	.858	.972	.925	.961
Cars	135	145	28	308	44	237	33	314	27	113	68	208	28	207	86	321	1151
% Cars	91.2	91.8	93.3	91.7	100	96.3	94.3	96.6	93.1	97.4	98.6	97.2	90.3	92.8	81.9	89.4	93.3
Heavy Vehicles	13	13	2	28	0	9	2	11	2	3	1	6	3	16	19	38	83
% Heavy Vehicles	8.8	8.2	6.7	8.3	0	3.7	5.7	3.4	6.9	2.6	1.4	2.8	9.7	7.2	18.1	10.6	6.7



PRECISION DATA INDUSTRIES, LLC
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N/S: Church Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-GGG
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	26	64	15	12	69	12	7	37	15	23	121	31	432
04:15 PM	37	59	20	9	53	10	10	45	14	16	88	31	392
04:30 PM	50	61	19	18	76	6	7	27	16	17	90	25	412
04:45 PM	32	50	16	18	68	11	6	51	13	19	103	25	412
Total	145	234	70	57	266	39	30	160	58	75	402	112	1648
05:00 PM	34	56	14	9	88	10	10	46	13	19	81	31	411
05:15 PM	37	59	18	4	69	10	5	38	15	22	98	26	401
05:30 PM	38	47	13	13	71	14	9	29	10	20	93	27	384
05:45 PM	38	44	8	22	67	5	7	31	16	18	78	27	361
Total	147	206	53	48	295	39	31	144	54	79	350	111	1557
Grand Total	292	440	123	105	561	78	61	304	112	154	752	223	3205
Apprch %	34.2	51.5	14.4	14.1	75.4	10.5	12.8	63.7	23.5	13.6	66.6	19.8	
Total %	9.1	13.7	3.8	3.3	17.5	2.4	1.9	9.5	3.5	4.8	23.5	7	
Cars	285	426	122	105	552	77	60	297	112	152	736	221	3145
% Cars	97.6	96.8	99.2	100	98.4	98.7	98.4	97.7	100	98.7	97.9	99.1	98.1
Heavy Vehicles	7	14	1	0	9	1	1	7	0	2	16	2	60
% Heavy Vehicles	2.4	3.2	0.8	0	1.6	1.3	1.6	2.3	0	1.3	2.1	0.9	1.9

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	26	**64**	15	105	12	69	**12**	93	7	37	15	59	**23**	**121**	**31**	**175**	**432**
04:15 PM	37	59	**20**	116	9	53	10	72	**10**	45	14	69	16	88	31	135	392
04:30 PM	**50**	61	19	**130**	**18**	**76**	6	**100**	7	27	**16**	50	17	90	25	132	412
04:45 PM	32	50	16	98	18	68	11	97	6	**51**	13	**70**	19	103	25	147	412
Total Volume	145	234	70	449	57	266	39	362	30	160	58	248	75	402	112	589	1648
% App. Total	32.3	52.1	15.6		15.7	73.5	10.8		12.1	64.5	23.4		12.7	68.3	19		
PHF	.725	.914	.875	.863	.792	.875	.813	.905	.750	.784	.906	.886	.815	.831	.903	.841	.954
Cars	141	224	70	435	57	259	38	354	29	155	58	242	74	391	111	576	1607
% Cars	97.2	95.7	100	96.9	100	97.4	97.4	97.8	96.7	96.9	100	97.6	98.7	97.3	99.1	97.8	97.5
Heavy Vehicles	4	10	0	14	0	7	1	8	1	5	0	6	1	11	1	13	41
% Heavy Vehicles	2.8	4.3	0	3.1	0	2.6	2.6	2.2	3.3	3.1	0	2.4	1.3	2.7	0.9	2.2	2.5

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N/S: Church Street
E/W: Nash Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-GGG
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	26	62	15	12	68	12	6	34	15	23	117	30	420
04:15 PM	34	54	20	9	53	10	10	44	14	15	85	31	379
04:30 PM	50	59	19	18	73	6	7	26	16	17	88	25	404
04:45 PM	31	49	16	18	65	10	6	51	13	19	101	25	404
Total	141	224	70	57	259	38	29	155	58	74	391	111	1607
05:00 PM	34	54	14	9	88	10	10	46	13	19	78	31	406
05:15 PM	36	57	18	4	68	10	5	38	15	21	98	26	396
05:30 PM	37	47	12	13	70	14	9	28	10	20	91	27	378
05:45 PM	37	44	8	22	67	5	7	30	16	18	78	26	358
Total	144	202	52	48	293	39	31	142	54	78	345	110	1538
Grand Total	285	426	122	105	552	77	60	297	112	152	736	221	3145
Apprch %	34.2	51.1	14.6	14.3	75.2	10.5	12.8	63.3	23.9	13.7	66.4	19.9	
Total %	9.1	13.5	3.9	3.3	17.6	2.4	1.9	9.4	3.6	4.8	23.4	7	

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**50**	**59**	**19**	**128**	**18**	73	6	97	7	26	**16**	49	17	88	25	130	404
04:45 PM	31	49	16	96	18	65	**10**	93	6	**51**	13	**70**	19	**101**	25	**145**	404
05:00 PM	34	54	14	102	9	**88**	10	**107**	**10**	46	13	69	19	78	**31**	128	**406**
05:15 PM	36	57	18	111	4	68	10	82	5	38	15	58	**21**	98	26	145	396
Total Volume	151	219	67	437	49	294	36	379	28	161	57	246	76	365	107	548	1610
% App. Total	34.6	50.1	15.3		12.9	77.6	9.5		11.4	65.4	23.2		13.9	66.6	19.5		
PHF	.755	.928	.882	.854	.681	.835	.900	.886	.700	.789	.891	.879	.905	.903	.863	.945	.991

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N/S: Church Street
E/W: Nash Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-GGG
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Heavy Vehicles

	Church Street From North			Nash Road From East			Church Street From South			Nash Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	1	0	1	3	0	0	4	1	12
04:15 PM	3	5	0	0	0	0	0	1	0	1	3	0	13
04:30 PM	0	2	0	0	3	0	0	1	0	0	2	0	8
04:45 PM	1	1	0	0	3	1	0	0	0	0	2	0	8
Total	4	10	0	0	7	1	1	5	0	1	11	1	41
05:00 PM	0	2	0	0	0	0	0	0	0	0	3	0	5
05:15 PM	1	2	0	0	1	0	0	0	0	1	0	0	5
05:30 PM	1	0	1	0	1	0	0	1	0	0	2	0	6
05:45 PM	1	0	0	0	0	0	0	1	0	0	0	1	3
Total	3	4	1	0	2	0	0	2	0	1	5	1	19
Grand Total	7	14	1	0	9	1	1	7	0	2	16	2	60
Apprch %	31.8	63.6	4.5	0	90	10	12.5	87.5	0	10	80	10	
Total %	11.7	23.3	1.7	0	15	1.7	1.7	11.7	0	3.3	26.7	3.3	

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	1	0	1	**1**	**3**	0	**4**	0	**4**	**1**	**5**	12
04:15 PM	**3**	**5**	0	**8**	0	0	0	0	0	1	0	1	**1**	3	0	4	**13**
04:30 PM	0	2	0	2	0	**3**	0	3	0	1	0	1	0	2	0	2	8
04:45 PM	1	1	0	2	0	3	**1**	**4**	0	0	0	0	0	2	0	2	8
Total Volume	4	10	0	14	0	7	1	8	1	5	0	6	1	11	1	13	41
% App. Total	28.6	71.4	0		0	87.5	12.5		16.7	83.3	0		7.7	84.6	7.7		
PHF	.333	.500	.000	.438	.000	.583	.250	.500	.250	.417	.000	.375	.250	.688	.250	.650	.788

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N/S: Church Street
E/W: Nash Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-GGG
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Peds and Bicycles

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
Total	0	0	1	1	0	0	0	0	0	0	3	0	1	0	0	1	7
05:00 PM	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	1	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Total	0	0	0	0	0	2	0	0	1	0	0	1	2	0	0	1	7
Grand Total	0	0	1	1	0	2	0	0	1	0	3	1	3	0	0	2	14
Apprch %	0	0	50	50	0	100	0	0	20	0	60	20	60	0	0	40	
Total %	0	0	7.1	7.1	0	14.3	0	0	7.1	0	21.4	7.1	21.4	0	0	14.3	

	Church Street From North					Nash Road From East					Church Street From South					Nash Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	**1**	**0**	**1**	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**0**	**1**	**2**	2
05:00 PM	0	0	0	0	0	0	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**1**	**5**
Total Volume	0	0	1	0	1	0	2	0	0	2	1	0	3	1	5	1	0	0	2	3	11
% App. Total	0	0	100	0		0	100	0	0		20	0	60	20		33.3	0	0	66.7		
PHF	.000	.000	.250	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.250	.417	.250	.000	.000	.500	.375	.550

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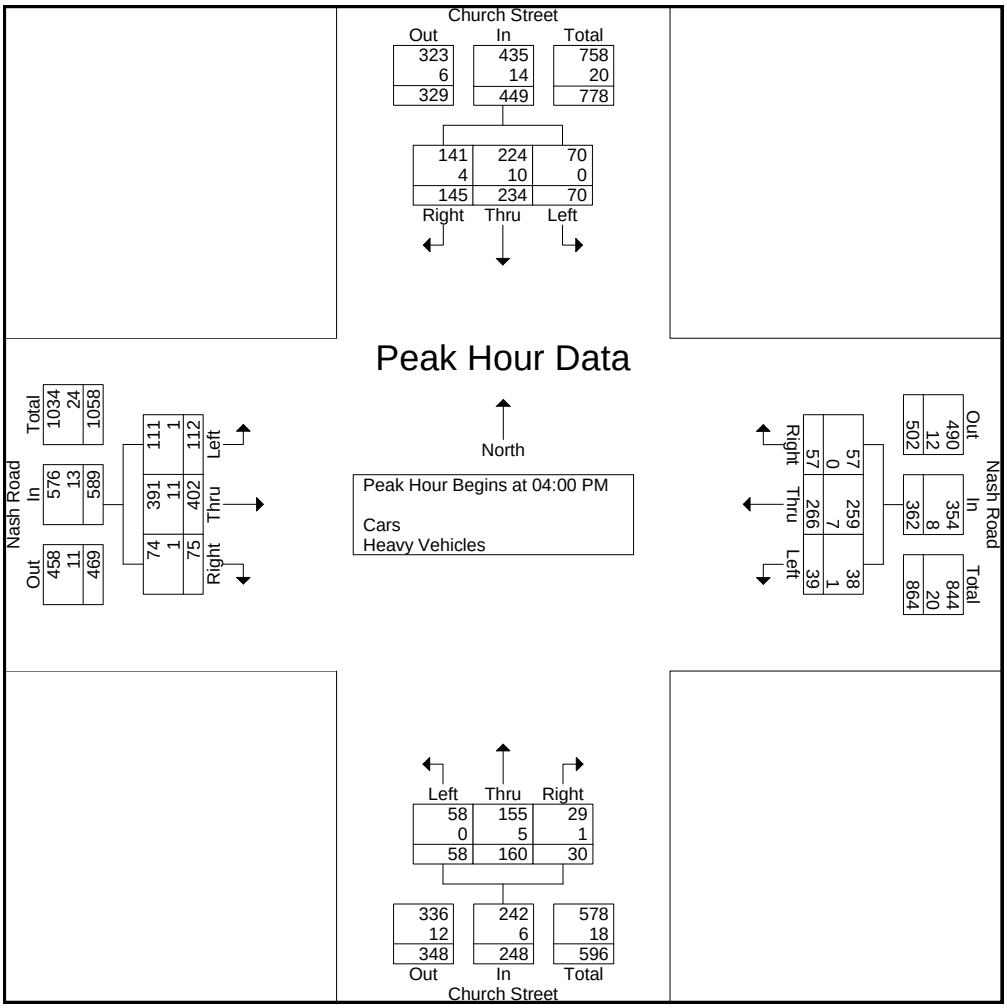
File Name : 81676 E-GGG
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Church Street From North				Nash Road From East				Church Street From South				Nash Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	26	**64**	15	105	12	69	**12**	93	7	37	15	59	**23**	**121**	**31**	**175**	**432**
04:15 PM	37	59	**20**	116	9	53	10	72	**10**	45	14	69	16	88	31	135	392
04:30 PM	**50**	61	19	**130**	**18**	**76**	6	**100**	7	27	**16**	50	17	90	25	132	412
04:45 PM	32	50	16	98	18	68	11	97	6	**51**	13	**70**	19	103	25	147	412
Total Volume	145	234	70	449	57	266	39	362	30	160	58	248	75	402	112	589	1648
% App. Total	32.3	52.1	15.6		15.7	73.5	10.8		12.1	64.5	23.4		12.7	68.3	19		
PHF	.725	.914	.875	.863	.792	.875	.813	.905	.750	.784	.906	.886	.815	.831	.903	.841	.954
Cars	141	224	70	435	57	259	38	354	29	155	58	242	74	391	111	576	1607
% Cars	97.2	95.7	100	96.9	100	97.4	97.4	97.8	96.7	96.9	100	97.6	98.7	97.3	99.1	97.8	97.5
Heavy Vehicles	4	10	0	14	0	7	1	8	1	5	0	6	1	11	1	13	41
% Heavy Vehicles	2.8	4.3	0	3.1	0	2.6	2.6	2.2	3.3	3.1	0	2.4	1.3	2.7	0.9	2.2	2.5



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N/S: Church Street
E/W: Tarkin Hill Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	32	8	5	101	7	7	57	40	3	100	24	399
07:15 AM	16	39	22	14	95	15	16	44	51	0	104	24	440
07:30 AM	23	41	15	22	129	12	7	57	50	1	92	21	470
07:45 AM	16	46	11	17	120	9	9	61	51	1	92	12	445
Total	70	158	56	58	445	43	39	219	192	5	388	81	1754
08:00 AM	20	33	10	18	94	6	8	45	58	0	60	16	368
08:15 AM	16	42	10	16	98	4	7	43	50	1	69	20	376
08:30 AM	30	33	15	10	107	7	10	26	37	0	63	8	346
08:45 AM	28	30	5	21	104	7	5	34	40	1	82	9	366
Total	94	138	40	65	403	24	30	148	185	2	274	53	1456
Grand Total	164	296	96	123	848	67	69	367	377	7	662	134	3210
Apprch %	29.5	53.2	17.3	11.8	81.7	6.5	8.5	45.1	46.4	0.9	82.4	16.7	
Total %	5.1	9.2	3	3.8	26.4	2.1	2.1	11.4	11.7	0.2	20.6	4.2	
Cars	163	280	85	120	824	55	69	354	374	6	640	125	3095
% Cars	99.4	94.6	88.5	97.6	97.2	82.1	100	96.5	99.2	85.7	96.7	93.3	96.4
Heavy Vehicles	1	16	11	3	24	12	0	13	3	1	22	9	115
% Heavy Vehicles	0.6	5.4	11.5	2.4	2.8	17.9	0	3.5	0.8	14.3	3.3	6.7	3.6

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	15	32	8	55	5	101	7	113	7	57	40	104	**3**	100	**24**	127	399
07:15 AM	16	39	**22**	77	14	95	**15**	124	**16**	44	**51**	111	0	**104**	24	**128**	440
07:30 AM	**23**	41	15	**79**	**22**	**129**	12	**163**	7	57	50	114	1	92	21	114	**470**
07:45 AM	16	**46**	11	73	17	120	9	146	9	**61**	51	**121**	1	92	12	105	445
Total Volume	70	158	56	284	58	445	43	546	39	219	192	450	5	388	81	474	1754
% App. Total	24.6	55.6	19.7		10.6	81.5	7.9		8.7	48.7	42.7		1.1	81.9	17.1		
PHF	.761	.859	.636	.899	.659	.862	.717	.837	.609	.898	.941	.930	.417	.933	.844	.926	.933
Cars	69	150	49	268	57	428	32	517	39	209	190	438	4	375	74	453	1676
% Cars	98.6	94.9	87.5	94.4	98.3	96.2	74.4	94.7	100	95.4	99.0	97.3	80.0	96.6	91.4	95.6	95.6
Heavy Vehicles	1	8	7	16	1	17	11	29	0	10	2	12	1	13	7	21	78
% Heavy Vehicles	1.4	5.1	12.5	5.6	1.7	3.8	25.6	5.3	0	4.6	1.0	2.7	20.0	3.4	8.6	4.4	4.4

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N/S: Church Street
E/W: Tarkin Hill Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	32	7	5	92	4	7	51	40	2	96	19	370
07:15 AM	16	35	18	14	90	8	16	43	50	0	98	24	412
07:30 AM	22	37	14	21	128	12	7	55	49	1	90	20	456
07:45 AM	16	46	10	17	118	8	9	60	51	1	91	11	438
Total	69	150	49	57	428	32	39	209	190	4	375	74	1676
08:00 AM	20	30	8	18	93	6	8	42	58	0	57	14	354
08:15 AM	16	40	9	15	96	4	7	43	50	1	67	20	368
08:30 AM	30	32	14	10	105	6	10	26	36	0	63	8	340
08:45 AM	28	28	5	20	102	7	5	34	40	1	78	9	357
Total	94	130	36	63	396	23	30	145	184	2	265	51	1419
Grand Total	163	280	85	120	824	55	69	354	374	6	640	125	3095
Apprch %	30.9	53	16.1	12	82.5	5.5	8.7	44.4	46.9	0.8	83	16.2	
Total %	5.3	9	2.7	3.9	26.6	1.8	2.2	11.4	12.1	0.2	20.7	4	

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	15	32	7	54	5	92	4	101	7	51	40	98	**2**	96	19	117	370
07:15 AM	16	35	**18**	69	14	90	8	112	**16**	43	50	109	0	**98**	**24**	**122**	412
07:30 AM	**22**	37	14	**73**	**21**	**128**	**12**	**161**	7	55	49	111	1	90	20	111	**456**
07:45 AM	16	**46**	10	72	17	118	8	143	9	**60**	**51**	**120**	1	91	11	103	438
Total Volume	69	150	49	268	57	428	32	517	39	209	190	438	4	375	74	453	1676
% App. Total	25.7	56	18.3		11	82.8	6.2		8.9	47.7	43.4		0.9	82.8	16.3		
PHF	.784	.815	.681	.918	.679	.836	.667	.803	.609	.871	.931	.913	.500	.957	.771	.928	.919

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File Name : 81676 E-H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	1	0	9	3	0	6	0	1	4	5	29
07:15 AM	0	4	4	0	5	7	0	1	1	0	6	0	28
07:30 AM	1	4	1	1	1	0	0	2	1	0	2	1	14
07:45 AM	0	0	1	0	2	1	0	1	0	0	1	1	7
Total	1	8	7	1	17	11	0	10	2	1	13	7	78
08:00 AM	0	3	2	0	1	0	0	3	0	0	3	2	14
08:15 AM	0	2	1	1	2	0	0	0	0	0	2	0	8
08:30 AM	0	1	1	0	2	1	0	0	1	0	0	0	6
08:45 AM	0	2	0	1	2	0	0	0	0	0	4	0	9
Total	0	8	4	2	7	1	0	3	1	0	9	2	37
Grand Total	1	16	11	3	24	12	0	13	3	1	22	9	115
Apprch %	3.6	57.1	39.3	7.7	61.5	30.8	0	81.2	18.8	3.1	68.8	28.1	
Total %	0.9	13.9	9.6	2.6	20.9	10.4	0	11.3	2.6	0.9	19.1	7.8	

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	1	1	0	**9**	3	**12**	0	**6**	0	**6**	**1**	4	**5**	**10**	**29**
07:15 AM	0	**4**	**4**	**8**	0	5	**7**	12	0	1	**1**	2	0	**6**	0	6	28
07:30 AM	**1**	4	1	6	**1**	1	0	2	0	2	1	3	0	2	1	3	14
07:45 AM	0	0	1	1	0	2	1	3	0	1	0	1	0	1	1	2	7
Total Volume	1	8	7	16	1	17	11	29	0	10	2	12	1	13	7	21	78
% App. Total	6.2	50	43.8		3.4	58.6	37.9		0	83.3	16.7		4.8	61.9	33.3		
PHF	.250	.500	.438	.500	.250	.472	.393	.604	.000	.417	.500	.500	.250	.542	.350	.525	.672

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File Name : 81676 E-H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	3
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	1	0	0	0	2	0	1	0	1	0	0	0	0	5
Apprch %	0	0	0	100	0	0	0	100	0	50	0	50	0	0	0	0	
Total %	0	0	0	20	0	0	0	40	0	20	0	20	0	0	0	0	

	Church Street From North					Tarkin Hill Road From East					Church Street From South					Tarkin Hill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	**0**	**0**	**1**	0	0	0	0	0	**2**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Volume	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	100		0	50	0	50		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.250	.000	.250	.500	.000	.000	.000	.000	.000	.375

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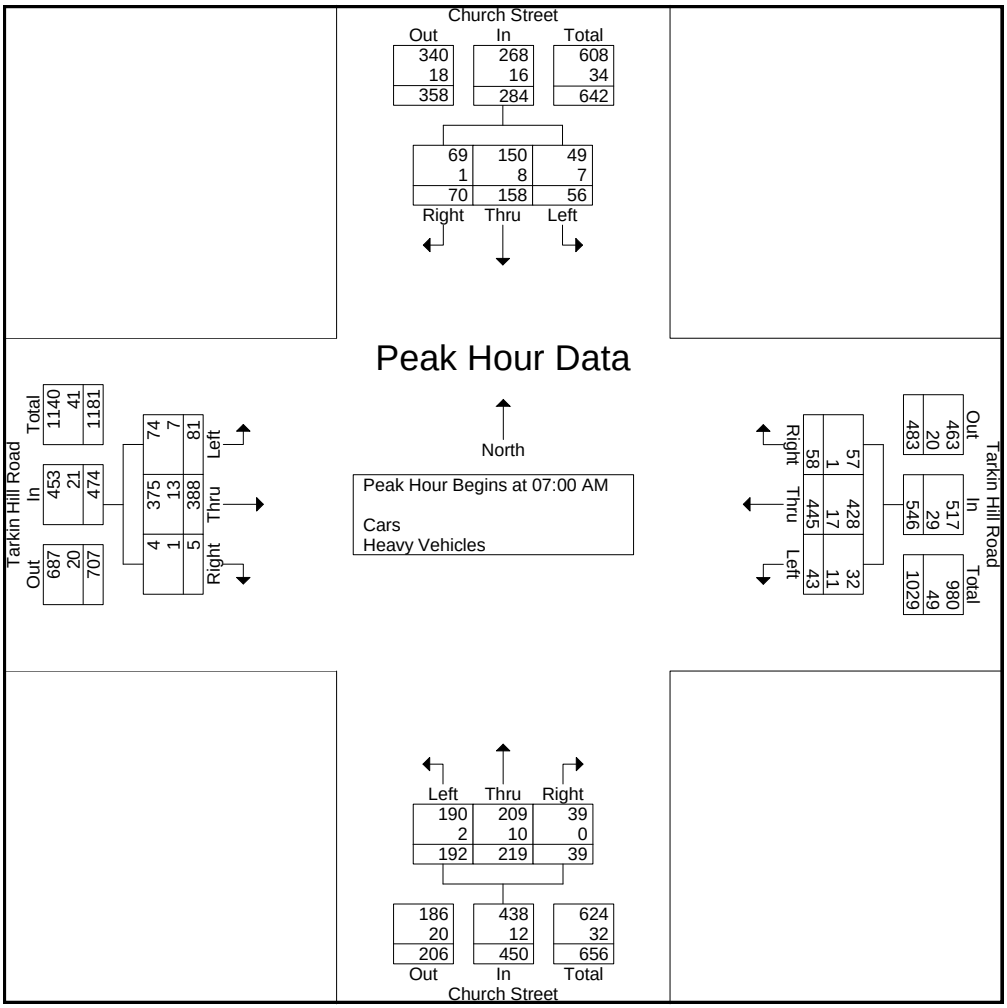
Page No : 1

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	15	32	8	55	5	101	7	113	7	57	40	104	**3**	100	**24**	127	399
07:15 AM	16	39	**22**	77	14	95	**15**	124	**16**	44	**51**	111	0	**104**	24	**128**	440
07:30 AM	**23**	41	15	**79**	**22**	**129**	12	**163**	7	57	50	114	1	92	21	114	**470**
07:45 AM	16	**46**	11	73	17	120	9	146	9	**61**	51	**121**	1	92	12	105	445
Total Volume	70	158	56	284	58	445	43	546	39	219	192	450	5	388	81	474	1754
% App. Total	24.6	55.6	19.7		10.6	81.5	7.9		8.7	48.7	42.7		1.1	81.9	17.1		
PHF	.761	.859	.636	.899	.659	.862	.717	.837	.609	.898	.941	.930	.417	.933	.844	.926	.933
Cars	69	150	49	268	57	428	32	517	39	209	190	438	4	375	74	453	1676
% Cars	98.6	94.9	87.5	94.4	98.3	96.2	74.4	94.7	100	95.4	99.0	97.3	80.0	96.6	91.4	95.6	95.6
Heavy Vehicles	1	8	7	16	1	17	11	29	0	10	2	12	1	13	7	21	78
% Heavy Vehicles	1.4	5.1	12.5	5.6	1.7	3.8	25.6	5.3	0	4.6	1.0	2.7	20.0	3.4	8.6	4.4	4.4



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File Name : 81676 E-HHH
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	31	72	19	8	100	10	26	53	61	3	133	31	547
04:15 PM	23	59	10	14	112	12	16	61	59	0	141	33	540
04:30 PM	22	62	20	29	99	6	12	44	41	0	132	24	491
04:45 PM	37	61	18	15	94	2	15	36	55	0	114	27	474
Total	113	254	67	66	405	30	69	194	216	3	520	115	2052
05:00 PM	36	72	26	8	139	7	13	51	64	0	123	33	572
05:15 PM	37	39	17	8	117	7	19	45	75	2	140	26	532
05:30 PM	31	48	18	4	121	9	21	28	70	0	121	27	498
05:45 PM	23	26	13	6	126	7	7	40	63	1	134	19	465
Total	127	185	74	26	503	30	60	164	272	3	518	105	2067
Grand Total	240	439	141	92	908	60	129	358	488	6	1038	220	4119
Apprch %	29.3	53.5	17.2	8.7	85.7	5.7	13.2	36.7	50.1	0.5	82.1	17.4	
Total %	5.8	10.7	3.4	2.2	22	1.5	3.1	8.7	11.8	0.1	25.2	5.3	
Cars	238	428	140	92	891	58	125	354	486	6	1028	217	4063
% Cars	99.2	97.5	99.3	100	98.1	96.7	96.9	98.9	99.6	100	99	98.6	98.6
Heavy Vehicles	2	11	1	0	17	2	4	4	2	0	10	3	56
% Heavy Vehicles	0.8	2.5	0.7	0	1.9	3.3	3.1	1.1	0.4	0	1	1.4	1.4

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	23	59	10	92	14	112	**12**	138	**16**	**61**	59	**136**	0	**141**	**33**	**174**	540
04:30 PM	22	62	20	104	**29**	99	6	134	12	44	41	97	0	132	24	156	491
04:45 PM	**37**	61	18	116	15	94	2	111	15	36	55	106	0	114	27	141	474
05:00 PM	36	**72**	**26**	**134**	8	**139**	7	**154**	13	51	**64**	128	0	123	33	156	**572**
Total Volume	118	254	74	446	66	444	27	537	56	192	219	467	0	510	117	627	2077
% App. Total	26.5	57	16.6		12.3	82.7	5		12	41.1	46.9		0	81.3	18.7		
PHF	.797	.882	.712	.832	.569	.799	.563	.872	.875	.787	.855	.858	.000	.904	.886	.901	.908
Cars	116	248	73	437	66	436	26	528	54	191	217	462	0	505	116	621	2048
% Cars	98.3	97.6	98.6	98.0	100	98.2	96.3	98.3	96.4	99.5	99.1	98.9	0	99.0	99.1	99.0	98.6
Heavy Vehicles	2	6	1	9	0	8	1	9	2	1	2	5	0	5	1	6	29
% Heavy Vehicles	1.7	2.4	1.4	2.0	0	1.8	3.7	1.7	3.6	0.5	0.9	1.1	0	1.0	0.9	1.0	1.4

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File Name : 81676 E-HHH
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Page No : 1

Groups Printed- Cars

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	31	69	19	8	98	9	25	51	61	3	132	29	535
04:15 PM	23	57	10	14	110	11	16	60	59	0	139	33	532
04:30 PM	22	62	20	29	98	6	10	44	39	0	130	24	484
04:45 PM	36	60	17	15	90	2	15	36	55	0	114	26	466
Total	112	248	66	66	396	28	66	191	214	3	515	112	2017
05:00 PM	35	69	26	8	138	7	13	51	64	0	122	33	566
05:15 PM	37	38	17	8	115	7	19	44	75	2	138	26	526
05:30 PM	31	47	18	4	117	9	20	28	70	0	119	27	490
05:45 PM	23	26	13	6	125	7	7	40	63	1	134	19	464
Total	126	180	74	26	495	30	59	163	272	3	513	105	2046
Grand Total	238	428	140	92	891	58	125	354	486	6	1028	217	4063
Apprch %	29.5	53.1	17.4	8.8	85.6	5.6	13	36.7	50.4	0.5	82.2	17.3	
Total %	5.9	10.5	3.4	2.3	21.9	1.4	3.1	8.7	12	0.1	25.3	5.3	

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	23	57	10	90	14	110	**11**	135	**16**	**60**	59	**135**	0	**139**	**33**	**172**	532
04:30 PM	22	62	20	104	**29**	98	6	133	10	44	39	93	0	130	24	154	484
04:45 PM	**36**	60	17	113	15	90	2	107	15	36	55	106	0	114	26	140	466
05:00 PM	35	**69**	**26**	**130**	8	**138**	7	**153**	13	51	**64**	128	0	122	33	155	**566**
Total Volume	116	248	73	437	66	436	26	528	54	191	217	462	0	505	116	621	2048
% App. Total	26.5	56.8	16.7		12.5	82.6	4.9		11.7	41.3	47		0	81.3	18.7		
PHF	.806	.899	.702	.840	.569	.790	.591	.863	.844	.796	.848	.856	.000	.908	.879	.903	.905

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N/S: Church Street
E/W: Tarkin Hill Road
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676 E-HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Street From North			Tarkin Hill Road From East			Church Street From South			Tarkin Hill Road From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	3	0	0	2	1	1	2	0	0	1	2	12
04:15 PM	0	2	0	0	2	1	0	1	0	0	2	0	8
04:30 PM	0	0	0	0	1	0	2	0	2	0	2	0	7
04:45 PM	1	1	1	0	4	0	0	0	0	0	0	1	8
Total	1	6	1	0	9	2	3	3	2	0	5	3	35
05:00 PM	1	3	0	0	1	0	0	0	0	0	1	0	6
05:15 PM	0	1	0	0	2	0	0	1	0	0	2	0	6
05:30 PM	0	1	0	0	4	0	1	0	0	0	2	0	8
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	1	5	0	0	8	0	1	1	0	0	5	0	21
Grand Total	2	11	1	0	17	2	4	4	2	0	10	3	56
Apprch %	14.3	78.6	7.1	0	89.5	10.5	40	40	20	0	76.9	23.1	
Total %	3.6	19.6	1.8	0	30.4	3.6	7.1	7.1	3.6	0	17.9	5.4	

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**3**	0	**3**	0	2	**1**	3	1	**2**	0	3	0	1	**2**	**3**	**12**
04:15 PM	0	2	0	2	0	2	1	3	0	1	0	1	0	**2**	0	2	8
04:30 PM	0	0	0	0	0	1	0	1	**2**	0	**2**	**4**	0	2	0	2	7
04:45 PM	**1**	1	**1**	3	0	**4**	0	**4**	0	0	0	0	0	0	1	1	8
Total Volume	1	6	1	8	0	9	2	11	3	3	2	8	0	5	3	8	35
% App. Total	12.5	75	12.5		0	81.8	18.2		37.5	37.5	25		0	62.5	37.5		
PHF	.250	.500	.250	.667	.000	.563	.500	.688	.375	.375	.250	.500	.000	.625	.375	.667	.729

PRECISION
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N/S: Church Street
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File Name : 81676 E-HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
Total	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	2	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
Grand Total	0	0	0	3	0	0	0	1	0	0	0	1	0	0	0	4	9
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	0	33.3	0	0	0	11.1	0	0	0	11.1	0	0	0	44.4	

	Church Street From North					Tarkin Hill Road From East					Church Street From South					Tarkin Hill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**3**
04:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	2
Total Volume	0	0	0	3	3	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	6
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.750	.750	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.500

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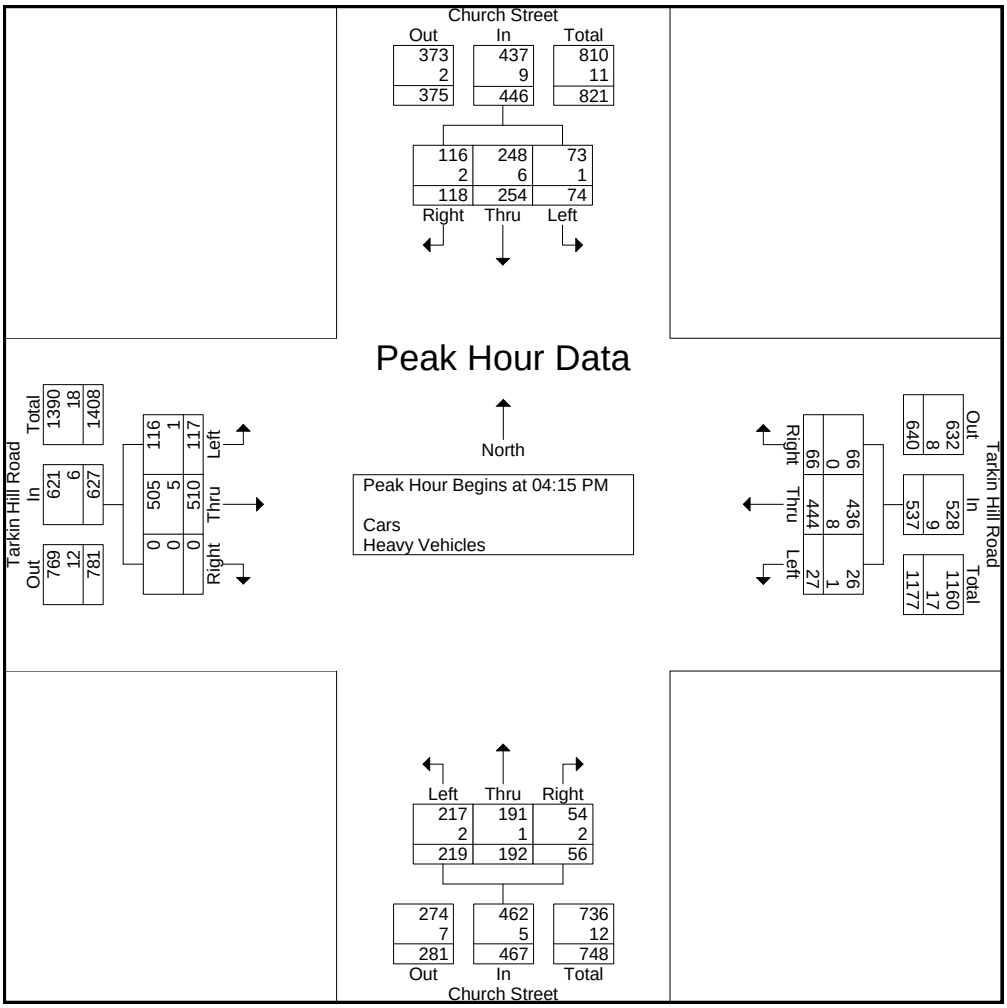
File Name : 81676 E-HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Church Street From North				Tarkin Hill Road From East				Church Street From South				Tarkin Hill Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	23	59	10	92	14	112	**12**	138	**16**	**61**	59	**136**	0	**141**	**33**	**174**	540
04:30 PM	22	62	20	104	**29**	99	6	134	12	44	41	97	0	132	24	156	491
04:45 PM	**37**	61	18	116	15	94	2	111	15	36	55	106	0	114	27	141	474
05:00 PM	36	**72**	**26**	**134**	8	**139**	7	**154**	13	51	**64**	128	0	123	33	156	**572**
Total Volume	118	254	74	446	66	444	27	537	56	192	219	467	0	510	117	627	2077
% App. Total	26.5	57	16.6		12.3	82.7	5		12	41.1	46.9		0	81.3	18.7		
PHF	.797	.882	.712	.832	.569	.799	.563	.872	.875	.787	.855	.858	.000	.904	.886	.901	.908
Cars	116	248	73	437	66	436	26	528	54	191	217	462	0	505	116	621	2048
% Cars	98.3	97.6	98.6	98.0	100	98.2	96.3	98.3	96.4	99.5	99.1	98.9	0	99.0	99.1	99.0	98.6
Heavy Vehicles	2	6	1	9	0	8	1	9	2	1	2	5	0	5	1	6	29
% Heavy Vehicles	1.7	2.4	1.4	2.0	0	1.8	3.7	1.7	3.6	0.5	0.9	1.1	0	1.0	0.9	1.0	1.4



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	N. Raveendran	10111.31	Wed 10/29 & Sat 11/1/08	81676	New Bedford, MA

PRECISION
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N/S: Church Street
E/W: Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-J
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	42	0	8	0	3	1	85	0	25	7	0	171
07:15 AM	0	41	1	8	0	3	7	95	0	38	20	0	213
07:30 AM	0	45	4	21	0	9	8	92	0	21	19	0	219
07:45 AM	0	63	2	12	0	8	8	108	0	38	23	0	262
Total	0	191	7	49	0	23	24	380	0	122	69	0	865
08:00 AM	0	55	4	9	0	0	4	100	0	40	13	0	225
08:15 AM	0	32	0	11	0	7	5	124	0	22	17	0	218
08:30 AM	0	39	2	14	0	6	4	84	0	27	10	0	186
08:45 AM	0	46	3	8	0	2	2	60	0	34	18	0	173
Total	0	172	9	42	0	15	15	368	0	123	58	0	802
Grand Total	0	363	16	91	0	38	39	748	0	245	127	0	1667
Apprch %	0	95.8	4.2	70.5	0	29.5	5	95	0	65.9	34.1	0	
Total %	0	21.8	1	5.5	0	2.3	2.3	44.9	0	14.7	7.6	0	
Cars	0	323	16	90	0	38	38	696	0	224	124	0	1549
% Cars	0	89	100	98.9	0	100	97.4	93	0	91.4	97.6	0	92.9
Heavy Vehicles	0	40	0	1	0	0	1	52	0	21	3	0	118
% Heavy Vehicles	0	11	0	1.1	0	0	2.6	7	0	8.6	2.4	0	7.1

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	45	**4**	49	**21**	0	**9**	**30**	**8**	92	0	100	21	19	0	40	219
07:45 AM	0	**63**	2	**65**	12	0	8	20	8	108	0	116	38	**23**	0	**61**	**262**
08:00 AM	0	55	4	59	9	0	0	9	4	100	0	104	**40**	13	0	53	225
08:15 AM	0	32	0	32	11	0	7	18	5	**124**	0	**129**	22	17	0	39	218
Total Volume	0	195	10	205	53	0	24	77	25	424	0	449	121	72	0	193	924
% App. Total	0	95.1	4.9		68.8	0	31.2		5.6	94.4	0		62.7	37.3	0		
PHF	.000	.774	.625	.788	.631	.000	.667	.642	.781	.855	.000	.870	.756	.783	.000	.791	.882
Cars	0	175	10	185	52	0	24	76	25	395	0	420	111	71	0	182	863
% Cars	0	89.7	100	90.2	98.1	0	100	98.7	100	93.2	0	93.5	91.7	98.6	0	94.3	93.4
Heavy Vehicles	0	20	0	20	1	0	0	1	0	29	0	29	10	1	0	11	61
% Heavy Vehicles	0	10.3	0	9.8	1.9	0	0	1.3	0	6.8	0	6.5	8.3	1.4	0	5.7	6.6

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Client: VHB/J. Quitter

File Name : 81676E-J
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Cars

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	38	0	8	0	3	1	72	0	24	7	0	153
07:15 AM	0	31	1	8	0	3	7	92	0	34	18	0	194
07:30 AM	0	38	4	20	0	9	8	88	0	20	19	0	206
07:45 AM	0	58	2	12	0	8	8	104	0	36	23	0	251
Total	0	165	7	48	0	23	24	356	0	114	67	0	804
08:00 AM	0	49	4	9	0	0	4	89	0	38	13	0	206
08:15 AM	0	30	0	11	0	7	5	114	0	17	16	0	200
08:30 AM	0	36	2	14	0	6	3	79	0	23	10	0	173
08:45 AM	0	43	3	8	0	2	2	58	0	32	18	0	166
Total	0	158	9	42	0	15	14	340	0	110	57	0	745
Grand Total	0	323	16	90	0	38	38	696	0	224	124	0	1549
Apprch %	0	95.3	4.7	70.3	0	29.7	5.2	94.8	0	64.4	35.6	0	
Total %	0	20.9	1	5.8	0	2.5	2.5	44.9	0	14.5	8	0	

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	38	**4**	42	**20**	0	**9**	**29**	**8**	88	0	96	20	19	0	39	206
07:45 AM	0	**58**	2	**60**	12	0	8	20	8	104	0	112	36	**23**	0	**59**	**251**
08:00 AM	0	49	4	53	9	0	0	9	4	89	0	93	**38**	13	0	51	206
08:15 AM	0	30	0	30	11	0	7	18	5	**114**	0	**119**	17	16	0	33	200
Total Volume	0	175	10	185	52	0	24	76	25	395	0	420	111	71	0	182	863
% App. Total	0	94.6	5.4		68.4	0	31.6		6	94	0		61	39	0		
PHF	.000	.754	.625	.771	.650	.000	.667	.655	.781	.866	.000	.882	.730	.772	.000	.771	.860

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File Name : 81676E-J
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	4	0	0	0	0	0	13	0	1	0	0	18
07:15 AM	0	10	0	0	0	0	0	3	0	4	2	0	19
07:30 AM	0	7	0	1	0	0	0	4	0	1	0	0	13
07:45 AM	0	5	0	0	0	0	0	4	0	2	0	0	11
Total	0	26	0	1	0	0	0	24	0	8	2	0	61
08:00 AM	0	6	0	0	0	0	0	11	0	2	0	0	19
08:15 AM	0	2	0	0	0	0	0	10	0	5	1	0	18
08:30 AM	0	3	0	0	0	0	1	5	0	4	0	0	13
08:45 AM	0	3	0	0	0	0	0	2	0	2	0	0	7
Total	0	14	0	0	0	0	1	28	0	13	1	0	57
Grand Total	0	40	0	1	0	0	1	52	0	21	3	0	118
Apprch %	0	100	0	100	0	0	1.9	98.1	0	87.5	12.5	0	
Total %	0	33.9	0	0.8	0	0	0.8	44.1	0	17.8	2.5	0	

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**10**	0	**10**	0	0	0	0	0	3	0	3	**4**	**2**	0	**6**	**19**
07:30 AM	0	7	0	7	**1**	0	0	**1**	0	4	0	4	1	0	0	1	13
07:45 AM	0	5	0	5	0	0	0	0	0	4	0	4	2	0	0	2	11
08:00 AM	0	6	0	6	0	0	0	0	0	**11**	0	**11**	2	0	0	2	19
Total Volume	0	28	0	28	1	0	0	1	0	22	0	22	9	2	0	11	62
% App. Total	0	100	0		100	0	0		0	100	0		81.8	18.2	0		
PHF	.000	.700	.000	.700	.250	.000	.000	.250	.000	.500	.000	.500	.563	.250	.000	.458	.816

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File Name : 81676E-J
Site Code : 10111.31
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Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3
Total	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	4
Grand Total	0	0	0	2	0	0	0	0	0	3	0	2	0	0	0	0	7
Apprch %	0	0	0	100	0	0	0	0	0	60	0	40	0	0	0	0	
Total %	0	0	0	28.6	0	0	0	0	0	42.9	0	28.6	0	0	0	0	

	Church Street From North					Park Avenue From East					Church Street From South					Park Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	**3**
Total Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.333

PRECISION
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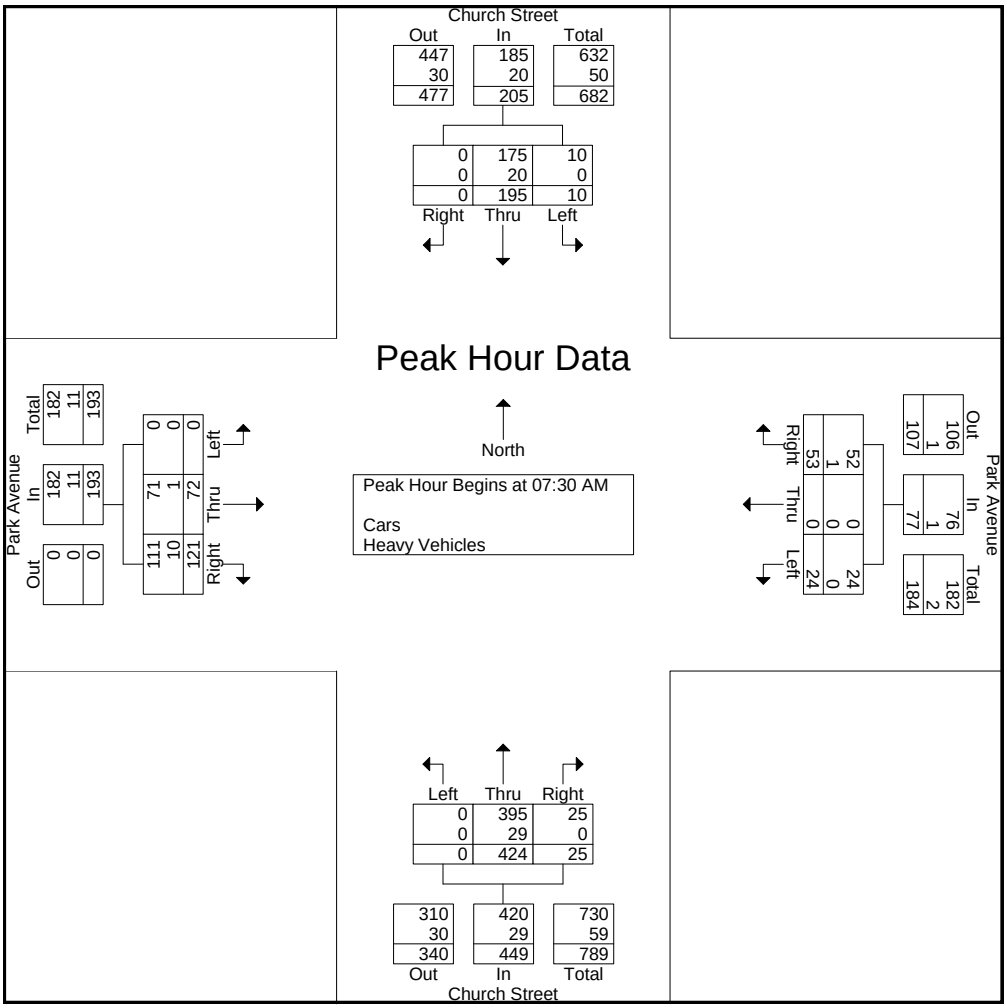
N/S: Church Street
E/W: Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-J
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	45	**4**	49	**21**	0	**9**	**30**	**8**	92	0	100	21	19	0	40	219
07:45 AM	0	**63**	2	**65**	12	0	8	20	8	108	0	116	38	**23**	0	**61**	**262**
08:00 AM	0	55	4	59	9	0	0	9	4	100	0	104	**40**	13	0	53	225
08:15 AM	0	32	0	32	11	0	7	18	5	**124**	0	**129**	22	17	0	39	218
Total Volume	0	195	10	205	53	0	24	77	25	424	0	449	121	72	0	193	924
% App. Total	0	95.1	4.9		68.8	0	31.2		5.6	94.4	0		62.7	37.3	0		
PHF	.000	.774	.625	.788	.631	.000	.667	.642	.781	.855	.000	.870	.756	.783	.000	.791	.882
Cars	0	175	10	185	52	0	24	76	25	395	0	420	111	71	0	182	863
% Cars	0	89.7	100	90.2	98.1	0	100	98.7	100	93.2	0	93.5	91.7	98.6	0	94.3	93.4
Heavy Vehicles	0	20	0	20	1	0	0	1	0	29	0	29	10	1	0	11	61
% Heavy Vehicles	0	10.3	0	9.8	1.9	0	0	1.3	0	6.8	0	6.5	8.3	1.4	0	5.7	6.6



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N/S: Church Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-JJJ
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	102	2	11	0	5	6	138	0	78	34	0	376
04:15 PM	0	70	3	9	0	2	3	96	0	82	42	3	310
04:30 PM	0	80	2	7	0	5	4	121	0	83	40	0	342
04:45 PM	0	69	0	9	0	3	6	113	0	83	47	1	331
Total	0	321	7	36	0	15	19	468	0	326	163	4	1359
05:00 PM	0	86	3	10	0	2	4	115	0	87	28	1	336
05:15 PM	0	58	2	6	0	1	4	100	0	97	29	0	297
05:30 PM	0	56	3	10	0	1	1	107	0	81	36	0	295
05:45 PM	0	39	1	13	0	2	4	89	0	55	35	1	239
Total	0	239	9	39	0	6	13	411	0	320	128	2	1167
Grand Total	0	560	16	75	0	21	32	879	0	646	291	6	2526
Apprch %	0	97.2	2.8	78.1	0	21.9	3.5	96.5	0	68.5	30.9	0.6	
Total %	0	22.2	0.6	3	0	0.8	1.3	34.8	0	25.6	11.5	0.2	
Cars	0	543	16	74	0	21	31	857	0	638	291	6	2477
% Cars	0	97	100	98.7	0	100	96.9	97.5	0	98.8	100	100	98.1
Heavy Vehicles	0	17	0	1	0	0	1	22	0	8	0	0	49
% Heavy Vehicles	0	3	0	1.3	0	0	3.1	2.5	0	1.2	0	0	1.9

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**102**	2	**104**	**11**	0	**5**	**16**	**6**	**138**	0	**144**	78	34	0	112	**376**
04:15 PM	0	70	**3**	73	9	0	2	11	3	96	0	99	82	42	**3**	127	310
04:30 PM	0	80	2	82	7	0	5	12	4	121	0	125	**83**	40	0	123	342
04:45 PM	0	69	0	69	9	0	3	12	6	113	0	119	83	**47**	1	**131**	331
Total Volume	0	321	7	328	36	0	15	51	19	468	0	487	326	163	4	493	1359
% App. Total	0	97.9	2.1		70.6	0	29.4		3.9	96.1	0		66.1	33.1	0.8		
PHF	.000	.787	.583	.788	.818	.000	.750	.797	.792	.848	.000	.845	.982	.867	.333	.941	.904
Cars	0	310	7	317	35	0	15	50	18	456	0	474	321	163	4	488	1329
% Cars	0	96.6	100	96.6	97.2	0	100	98.0	94.7	97.4	0	97.3	98.5	100	100	99.0	97.8
Heavy Vehicles	0	11	0	11	1	0	0	1	1	12	0	13	5	0	0	5	30
% Heavy Vehicles	0	3.4	0	3.4	2.8	0	0	2.0	5.3	2.6	0	2.7	1.5	0	0	1.0	2.2

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E/W: Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-JJJ
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Cars

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	98	2	11	0	5	6	137	0	76	34	0	369
04:15 PM	0	68	3	9	0	2	3	93	0	80	42	3	303
04:30 PM	0	78	2	7	0	5	4	115	0	82	40	0	333
04:45 PM	0	66	0	8	0	3	5	111	0	83	47	1	324
Total	0	310	7	35	0	15	18	456	0	321	163	4	1329
05:00 PM	0	84	3	10	0	2	4	111	0	85	28	1	328
05:15 PM	0	56	2	6	0	1	4	96	0	97	29	0	291
05:30 PM	0	55	3	10	0	1	1	105	0	80	36	0	291
05:45 PM	0	38	1	13	0	2	4	89	0	55	35	1	238
Total	0	233	9	39	0	6	13	401	0	317	128	2	1148
Grand Total	0	543	16	74	0	21	31	857	0	638	291	6	2477
Apprch %	0	97.1	2.9	77.9	0	22.1	3.5	96.5	0	68.2	31.1	0.6	
Total %	0	21.9	0.6	3	0	0.8	1.3	34.6	0	25.8	11.7	0.2	

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**98**	2	**100**	**11**	0	**5**	**16**	**6**	**137**	0	**143**	76	34	0	110	**369**
04:15 PM	0	68	**3**	71	9	0	2	11	3	93	0	96	80	42	**3**	125	303
04:30 PM	0	78	2	80	7	0	5	12	4	115	0	119	82	40	0	122	333
04:45 PM	0	66	0	66	8	0	3	11	5	111	0	116	**83**	**47**	1	**131**	324
Total Volume	0	310	7	317	35	0	15	50	18	456	0	474	321	163	4	488	1329
% App. Total	0	97.8	2.2		70	0	30		3.8	96.2	0		65.8	33.4	0.8		
PHF	.000	.791	.583	.793	.795	.000	.750	.781	.750	.832	.000	.829	.967	.867	.333	.931	.900

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-JJJ
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Church Street From North			Park Avenue From East			Church Street From South			Park Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	4	0	0	0	0	0	1	0	2	0	0	7
04:15 PM	0	2	0	0	0	0	0	3	0	2	0	0	7
04:30 PM	0	2	0	0	0	0	0	6	0	1	0	0	9
04:45 PM	0	3	0	1	0	0	1	2	0	0	0	0	7
Total	0	11	0	1	0	0	1	12	0	5	0	0	30
05:00 PM	0	2	0	0	0	0	0	4	0	2	0	0	8
05:15 PM	0	2	0	0	0	0	0	4	0	0	0	0	6
05:30 PM	0	1	0	0	0	0	0	2	0	1	0	0	4
05:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	6	0	0	0	0	0	10	0	3	0	0	19
Grand Total	0	17	0	1	0	0	1	22	0	8	0	0	49
Apprch %	0	100	0	100	0	0	4.3	95.7	0	100	0	0	
Total %	0	34.7	0	2	0	0	2	44.9	0	16.3	0	0	

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	2	0	2	0	0	0	0	0	3	0	3	**2**	0	0	**2**	7
04:30 PM	0	2	0	2	0	0	0	0	0	**6**	0	**6**	1	0	0	1	**9**
04:45 PM	0	**3**	0	**3**	**1**	0	0	**1**	**1**	2	0	3	0	0	0	0	7
05:00 PM	0	2	0	2	0	0	0	0	0	4	0	4	2	0	0	2	8
Total Volume	0	9	0	9	1	0	0	1	1	15	0	16	5	0	0	5	31
% App. Total	0	100	0		100	0	0		6.2	93.8	0		100	0	0		
PHF	.000	.750	.000	.750	.250	.000	.000	.250	.250	.625	.000	.667	.625	.000	.000	.625	.861

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City, State: New Bedford, MA
Client: VHB/J. Quitter

File Name : 81676E-JJJ
Site Code : 10111.31
Start Date : 10/29/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3
Total	0	4	0	0	0	0	0	0	0	0	0	2	0	1	0	1	8
05:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	4
Grand Total	0	4	0	3	0	0	0	0	0	0	0	2	0	2	0	1	12
Apprch %	0	57.1	0	42.9	0	0	0	0	0	0	0	100	0	66.7	0	33.3	
Total %	0	33.3	0	25	0	0	0	0	0	0	0	16.7	0	16.7	0	8.3	

	Church Street From North					Park Avenue From East					Church Street From South					Park Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**4**	0	0	**4**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	**1**	0	0	1	3
Total Volume	0	4	0	0	4	0	0	0	0	0	0	0	0	2	2	0	1	0	1	2	8
% App. Total	0	100	0	0		0	0	0	0		0	0	0	100		0	50	0	50		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.250	.000	.250	.500	.500

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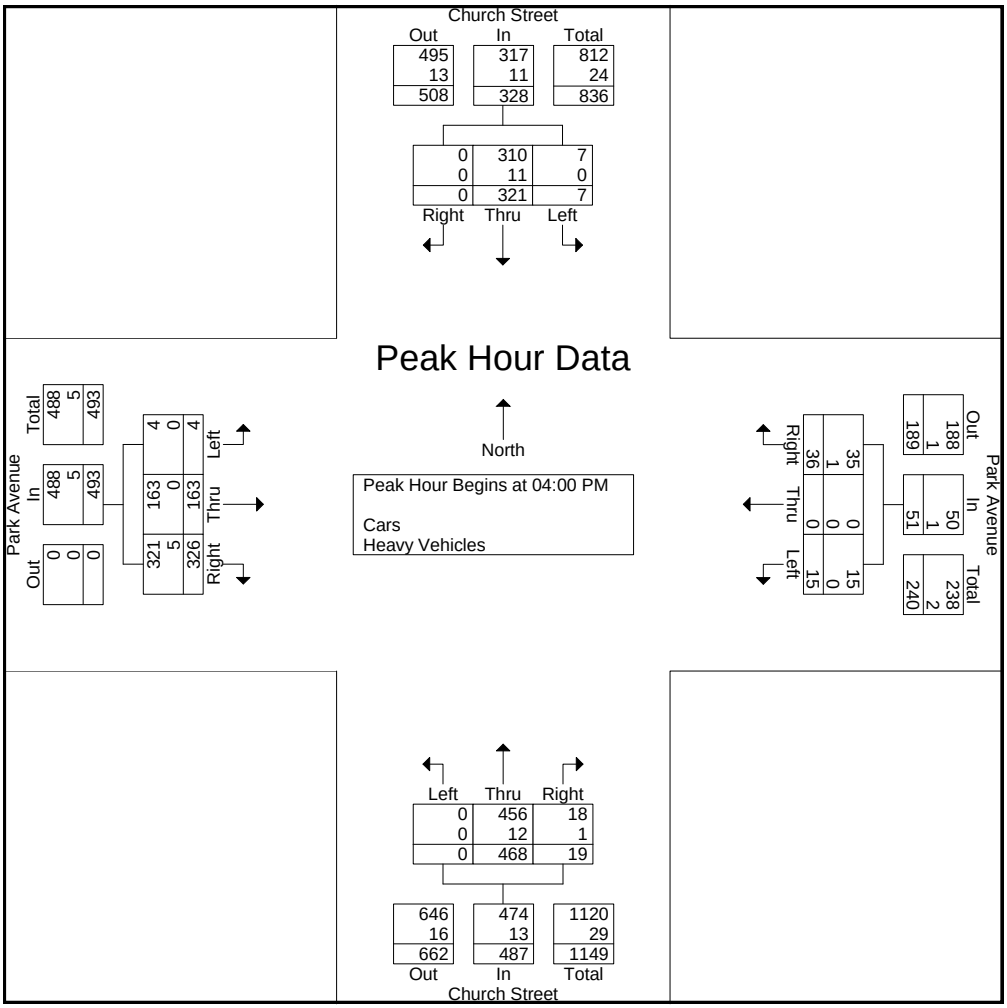
	Church Street From North				Park Avenue From East				Church Street From South				Park Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**102**	2	**104**	**11**	0	**5**	**16**	**6**	**138**	0	**144**	78	34	0	112	**376**
04:15 PM	0	70	**3**	73	9	0	2	11	3	96	0	99	82	42	**3**	127	310
04:30 PM	0	80	2	82	7	0	5	12	4	121	0	125	**83**	40	0	123	342
04:45 PM	0	69	0	69	9	0	3	12	6	113	0	119	83	**47**	1	**131**	331
Total Volume	0	321	7	328	36	0	15	51	19	468	0	487	326	163	4	493	1359
% App. Total	0	97.9	2.1		70.6	0	29.4		3.9	96.1	0		66.1	33.1	0.8		
PHF	.000	.787	.583	.788	.818	.000	.750	.797	.792	.848	.000	.845	.982	.867	.333	.941	.904
Cars	0	310	7	317	35	0	15	50	18	456	0	474	321	163	4	488	1329
% Cars	0	96.6	100	96.6	97.2	0	100	98.0	94.7	97.4	0	97.3	98.5	100	100	99.0	97.8
Heavy Vehicles	0	11	0	11	1	0	0	1	1	12	0	13	5	0	0	5	30
% Heavy Vehicles	0	3.4	0	3.4	2.8	0	0	2.0	5.3	2.6	0	2.7	1.5	0	0	1.0	2.2



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Traffic Counts with Precision

Client:	Engineer:	Site Code:	Date:	PDI Job Number:	City, State:
VHB	M. Reagan	10111.31	Tuesday 6/9/09	91912	New Bedford, MA

PRECISION DATA INDUSTRIES, LLC
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N/S: Stop & Shop Drwy/Plaza Drwy
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 A
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
07:00 AM	7	1	9	3	139	9	13	1	6	0	3	96	17	304
07:15 AM	17	1	6	9	135	5	11	0	9	0	9	151	14	367
07:30 AM	17	0	10	11	162	12	15	2	11	0	6	133	21	400
07:45 AM	12	3	9	9	155	22	13	3	4	0	9	129	22	390
Total	53	5	34	32	591	48	52	6	30	0	27	509	74	1461
08:00 AM	22	4	13	11	137	21	10	3	7	1	9	102	13	353
08:15 AM	10	1	11	7	160	31	17	0	7	0	9	94	19	366
08:30 AM	15	0	12	8	123	25	14	1	7	0	13	86	15	319
08:45 AM	21	3	16	13	117	32	17	1	5	0	19	112	20	376
Total	68	8	52	39	537	109	58	5	26	1	50	394	67	1414
Grand Total	121	13	86	71	1128	157	110	11	56	1	77	903	141	2875
Apprch %	55	5.9	39.1	5.2	83.2	11.6	61.8	6.2	31.5	0.6	6.9	80.6	12.6	
Total %	4.2	0.5	3	2.5	39.2	5.5	3.8	0.4	1.9	0	2.7	31.4	4.9	
Cars	120	12	86	71	1071	152	109	8	51	1	73	840	135	2729
% Cars	99.2	92.3	100	100	94.9	96.8	99.1	72.7	91.1	100	94.8	93	95.7	94.9
Heavy Vehicles	1	1	0	0	57	5	1	3	5	0	4	63	6	146
% Heavy Vehicles	0.8	7.7	0	0	5.1	3.2	0.9	27.3	8.9	0	5.2	7	4.3	5.1

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:15 AM																		
07:15 AM	17	1	6	24	9	135	5	149	11	0	9	0	20	**9**	**151**	14	**174**	367
07:30 AM	17	0	10	27	**11**	**162**	12	185	**15**	2	**11**	0	**28**	6	133	21	160	**400**
07:45 AM	12	3	9	24	9	155	**22**	**186**	13	**3**						**22**	160	390
08:00 AM	**22**	**4**	**13**	**39**	11	137	21	169	10	3	7	**1**						
Total Volume	68	8	38	114	40	589	60	689	49	8	31	1	89	33	515	70	618	1510
% App. Total	59.6	7	33.3		5.8	85.5	8.7		55.1	9	34.8	1.1		5.3	83.3	11.3		
PHF	.773	.500	.731	.731	.909	.909	.682	.926	.817	.667	.705	.250	.795	.917	.853	.795	.888	.944
Cars	68	7	38	113	40	563	58	661	48	5	28	1	82	30	485	67	582	1438
% Cars	100	87.5	100	99.1	100	95.6	96.7	95.9	98.0	62.5	90.3	100	92.1	90.9	94.2	95.7	94.2	95.2
Heavy Vehicles	0	1	0	1	0	26	2	28	1	3	3	0	7	3	30	3	36	72
% Heavy Vehicles	0	12.5	0	0.9	0	4.4	3.3	4.1	2.0	37.5	9.7	0	7.9	9.1	5.8	4.3	5.8	4.8

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N/S: Stop & Shop Drwy/Plaza Drwy
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 A
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
07:00 AM	6	1	9	3	127	8	13	1	5	0	2	87	17	279
07:15 AM	17	1	6	9	126	5	11	0	9	0	9	142	14	349
07:30 AM	17	0	10	11	155	10	15	1	10	0	4	122	21	376
07:45 AM	12	3	9	9	151	22	12	2	3	0	9	123	19	374
Total	52	5	34	32	559	45	51	4	27	0	24	474	71	1378
08:00 AM	22	3	13	11	131	21	10	2	6	1	8	98	13	339
08:15 AM	10	1	11	7	153	30	17	0	6	0	9	87	19	350
08:30 AM	15	0	12	8	117	25	14	1	7	0	13	79	14	305
08:45 AM	21	3	16	13	111	31	17	1	5	0	19	102	18	357
Total	68	7	52	39	512	107	58	4	24	1	49	366	64	1351
Grand Total	120	12	86	71	1071	152	109	8	51	1	73	840	135	2729
Apprch %	55	5.5	39.4	5.5	82.8	11.7	64.5	4.7	30.2	0.6	7	80.2	12.9	
Total %	4.4	0.4	3.2	2.6	39.2	5.6	4	0.3	1.9	0	2.7	30.8	4.9	

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30 AM																		
07:30 AM	17	0	10	27	**11**	**155**	10	176	15	1	**10**	0	**26**	4	122	**21**	147	**376**
07:45 AM	12	**3**	9	24	9	151	22	182	12	**2**				**9**	**123**	19	**151**	374
08:00 AM	**22**	3	**13**	**38**	11	131	21	163	10	2	6	**1**						
08:15 AM	**10**	**1**	**11**	**22**	**7**	**153**	**30**	**190**	**17**	0	6	0	23	9	87	19	115	350
Total Volume	61	7	43	111	38	590	83	711	54	5	25	1	85	30	430	72	532	1439
% App. Total	55	6.3	38.7		5.3	83	11.7		63.5	5.9	29.4	1.2		5.6	80.8	13.5		
PHF	.693	.583	.827	.730	.864	.952	.692	.936	.794	.625	.625	.250	.817	.833	.874	.857	.881	.957

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File Name : 91912 A
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
07:00 AM	1	0	0	0	12	1	0	0	1	0	1	9	0	25
07:15 AM	0	0	0	0	9	0	0	0	0	0	0	9	0	18
07:30 AM	0	0	0	0	7	2	0	1	1	0	2	11	0	24
07:45 AM	0	0	0	0	4	0	1	1	1	0	0	6	3	16
Total	1	0	0	0	32	3	1	2	3	0	3	35	3	83
08:00 AM	0	1	0	0	6	0	0	1	1	0	1	4	0	14
08:15 AM	0	0	0	0	7	1	0	0	1	0	0	7	0	16
08:30 AM	0	0	0	0	6	0	0	0	0	0	0	7	1	14
08:45 AM	0	0	0	0	6	1	0	0	0	0	0	10	2	19
Total	0	1	0	0	25	2	0	1	2	0	1	28	3	63
Grand Total	1	1	0	0	57	5	1	3	5	0	4	63	6	146
Apprch %	50	50	0	0	91.9	8.1	11.1	33.3	55.6	0	5.5	86.3	8.2	
Total %	0.7	0.7	0	0	39	3.4	0.7	2.1	3.4	0	2.7	43.2	4.1	

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	**1**	0	0	**1**	0	**12**	1	**13**	0	0	**1**	0	1	1	9	0	10	**25**
07:15 AM	0	0	0	0	0	9	0	9	0	0	0	0	0	0	9	0	9	18
07:30 AM	0	0	0	0	0	7	**2**	9	0	**1**				**2**	**11**	0	**13**	24
07:45 AM	0	0	0	0	0	4	0	4	**1**	1	1	0	**3**	0	6	**3**	9	16
Total Volume	1	0	0	1	0	32	3	35	1	2	3	0	6	3	35	3	41	83
% App. Total	100	0	0		0	91.4	8.6		16.7	33.3	50	0		7.3	85.4	7.3		
PHF	.250	.000	.000	.250	.000	.667	.375	.673	.250	.500	.750	.000	.500	.375	.795	.250	.788	.830

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File Name : 91912 A
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Peds and Bicycles

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South				Kings Highway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
Apprch %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	

	Stop & Shop Driveway From North					Kings Highway From East					Plaza Driveway From South					Kings Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.000	.000	.000	.000	.000	.375

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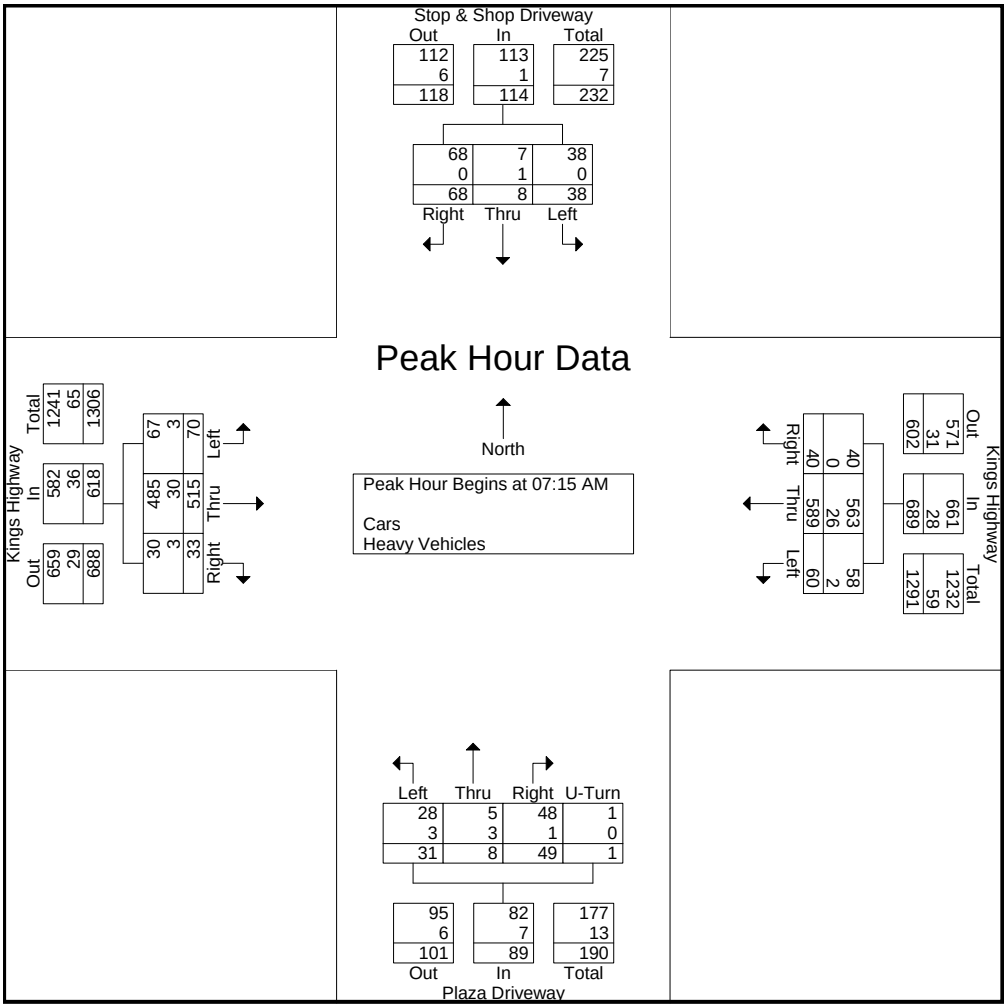
Start Date : 6/9/2009
Page No : 1

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:15 AM																		
07:15 AM	17	1	6	24	9	135	5	149	11	0	9	0	20	**9**	**151**	14	**174**	367
07:30 AM	17	0	10	27	**11**	**162**	12	185	**15**	2	**11**	0	**28**	6	133	21	160	**400**
07:45 AM	12	3	9	24	9	155	**22**	**186**	13	**3**						**22**	160	390
08:00 AM	**22**	**4**	**13**	**39**	11	137	21	169	10	3	7	**1**						
Total Volume	68	8	38	114	40	589	60	689	49	8	31	1	89	33	515	70	618	1510
% App. Total	59.6	7	33.3		5.8	85.5	8.7		55.1	9	34.8	1.1		5.3	83.3	11.3		
PHF	.773	.500	.731	.731	.909	.909	.682	.926	.817	.667	.705	.250	.795	.917	.853	.795	.888	.944
Cars	68	7	38	113	40	563	58	661	48	5	28	1	82	30	485	67	582	1438
% Cars	100	87.5	100	99.1	100	95.6	96.7	95.9	98.0	62.5	90.3	100	92.1	90.9	94.2	95.7	94.2	95.2
Heavy Vehicles	0	1	0	1	0	26	2	28	1	3	3	0	7	3	30	3	36	72
% Heavy Vehicles	0	12.5	0	0.9	0	4.4	3.3	4.1	2.0	37.5	9.7	0	7.9	9.1	5.8	4.3	5.8	4.8



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Client: VHB/M. Regan

File Name : 91912 AA
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
04:00 PM	45	5	34	15	133	38	45	8	23	0	27	180	39	592
04:15 PM	47	6	40	8	134	35	51	14	22	0	30	169	30	586
04:30 PM	38	3	35	12	137	48	65	10	25	0	28	160	35	596
04:45 PM	35	9	35	14	136	37	48	11	17	0	26	171	59	598
Total	165	23	144	49	540	158	209	43	87	0	111	680	163	2372
05:00 PM	44	10	43	17	123	35	51	7	19	0	25	164	39	577
05:15 PM	48	2	31	7	112	44	56	7	23	0	30	194	52	606
05:30 PM	52	8	27	17	123	32	53	3	36	0	32	145	52	580
05:45 PM	46	6	40	15	102	46	43	6	28	0	25	144	36	537
Total	190	26	141	56	460	157	203	23	106	0	112	647	179	2300
Grand Total	355	49	285	105	1000	315	412	66	193	0	223	1327	342	4672
Apprch %	51.5	7.1	41.4	7.4	70.4	22.2	61.4	9.8	28.8	0	11.8	70.1	18.1	
Total %	7.6	1	6.1	2.2	21.4	6.7	8.8	1.4	4.1	0	4.8	28.4	7.3	
Cars	353	49	284	105	985	313	411	66	189	0	223	1313	337	4628
% Cars	99.4	100	99.6	100	98.5	99.4	99.8	100	97.9	0	100	98.9	98.5	99.1
Heavy Vehicles	2	0	1	0	15	2	1	0	4	0	0	14	5	44
% Heavy Vehicles	0.6	0	0.4	0	1.5	0.6	0.2	0	2.1	0	0	1.1	1.5	0.9

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:30 PM																		
04:30 PM	38	3	35	76	12	**137**	**48**	**197**	**65**	10	**25**	0	**100**	28	160	35	223	596
04:45 PM	35	9	35	79	14	136	37	187	48	**11**						**59**	256	598
05:00 PM	44	**10**	**43**	**97**	**17**	123	35	175	51	7	19	0	77	25	164	39	228	577
05:15 PM	**48**	2	31	81	7	112	44	163	56	7	23	0	86	**30**	**194**	52	**276**	**606**
Total Volume	165	24	144	333	50	508	164	722	220	35	84	0	339	109	689	185	983	2377
% App. Total	49.5	7.2	43.2		6.9	70.4	22.7		64.9	10.3	24.8	0		11.1	70.1	18.8		
PHF	.859	.600	.837	.858	.735	.927	.854	.916	.846	.795	.840	.000	.848	.908	.888	.784	.890	.981
Cars	165	24	144	333	50	502	163	715	220	35	82	0	337	109	683	184	976	2361
% Cars	100	100	100	100	100	98.8	99.4	99.0	100	100	97.6	0	99.4	100	99.1	99.5	99.3	99.3
Heavy Vehicles	0	0	0	0	0	6	1	7	0	0	2	0	2	0	6	1	7	16
% Heavy Vehicles	0	0	0	0	0	1.2	0.6	1.0	0	0	2.4	0	0.6	0	0.9	0.5	0.7	0.7

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File Name : 91912 AA
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Page No : 1

Groups Printed- Cars

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
04:00 PM	44	5	34	15	131	38	45	8	22	0	27	177	38	584
04:15 PM	46	6	39	8	132	34	51	14	22	0	30	167	30	579
04:30 PM	38	3	35	12	135	47	65	10	24	0	28	158	35	590
04:45 PM	35	9	35	14	134	37	48	11	17	0	26	171	58	595
Total	163	23	143	49	532	156	209	43	85	0	111	673	161	2348
05:00 PM	44	10	43	17	123	35	51	7	18	0	25	161	39	573
05:15 PM	48	2	31	7	110	44	56	7	23	0	30	193	52	603
05:30 PM	52	8	27	17	121	32	52	3	35	0	32	143	50	572
05:45 PM	46	6	40	15	99	46	43	6	28	0	25	143	35	532
Total	190	26	141	56	453	157	202	23	104	0	112	640	176	2280
Grand Total	353	49	284	105	985	313	411	66	189	0	223	1313	337	4628
Apprch %	51.5	7.1	41.4	7.5	70.2	22.3	61.7	9.9	28.4	0	11.9	70.1	18	
Total %	7.6	1.1	6.1	2.3	21.3	6.8	8.9	1.4	4.1	0	4.8	28.4	7.3	

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:30 PM																		
04:30 PM	38	3	35	76	12	**135**	**47**	**194**	**65**	10	**24**	0	**99**	28	158	35	221	590
04:45 PM	35	9	35	79	14	134	37	185	48	**11**						**58**	255	595
05:00 PM	44	**10**	**43**	**97**	**17**	123	35	175	51	7	18	0	76	25	161	39	225	573
05:15 PM	**48**	2	31	81	7	110	44	161	56	7	23	0	86	**30**	**193**	52	**275**	**603**
Total Volume	165	24	144	333	50	502	163	715	220	35	82	0	337	109	683	184	976	2361
% App. Total	49.5	7.2	43.2		7	70.2	22.8		65.3	10.4	24.3	0		11.2	70	18.9		
PHF	.859	.600	.837	.858	.735	.930	.867	.921	.846	.795	.854	.000	.851	.908	.885	.793	.887	.979

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Page No : 1

Groups Printed- Heavy Vehicles

	Stop & Shop Driveway From North			Kings Highway From East			Plaza Driveway From South				Kings Highway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Int. Total
04:00 PM	1	0	0	0	2	0	0	0	1	0	0	3	1	8
04:15 PM	1	0	1	0	2	1	0	0	0	0	0	2	0	7
04:30 PM	0	0	0	0	2	1	0	0	1	0	0	2	0	6
04:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	1	3
Total	2	0	1	0	8	2	0	0	2	0	0	7	2	24
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	3	0	4
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	1	0	3
05:30 PM	0	0	0	0	2	0	1	0	1	0	0	2	2	8
05:45 PM	0	0	0	0	3	0	0	0	0	0	0	1	1	5
Total	0	0	0	0	7	0	1	0	2	0	0	7	3	20
Grand Total	2	0	1	0	15	2	1	0	4	0	0	14	5	44
Apprch %	66.7	0	33.3	0	88.2	11.8	20	0	80	0	0	73.7	26.3	
Total %	4.5	0	2.3	0	34.1	4.5	2.3	0	9.1	0	0	31.8	11.4	

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:00 PM																		
04:00 PM	**1**	0	0	1	0	**2**	0	2	0	0	**1**	0	**1**	0	**3**	**1**	**4**	**8**
04:15 PM	1	0	**1**	**2**	0	2	**1**	**3**	0	0	0	0	0	0	2	0	2	7
04:30 PM	0	0	0	0	0	2	1	3	0	0	1	0	1	0	2	0	2	6
04:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	1	3
Total Volume	2	0	1	3	0	8	2	10	0	0	2	0	2	0	7	2	9	24
% App. Total	66.7	0	33.3		0	80	20		0	0	100	0		0	77.8	22.2		
PHF	.500	.000	.250	.375	.000	1.000	.500	.833	.000	.000	.500	.000	.500	.000	.583	.500	.563	.750

PRECISION
D A T A
INDUSTRIES, LLC
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N/S: Stop & Shop Drwy/Plaza Drwy
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 AA
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Peds and Bicycles

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South				Kings Highway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	3
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	0	4
Apprch %	0	100	0	0	0	0	0	0	0	33.3	0	66.7	0	0	0	0	
Total %	0	25	0	0	0	0	0	0	0	25	0	50	0	0	0	0	

	Stop & Shop Driveway From North					Kings Highway From East					Plaza Driveway From South					Kings Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**2**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	**1**									
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	0		0	33.3	0	66.7		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.375	.000	.000	.000	.000	.000	.375

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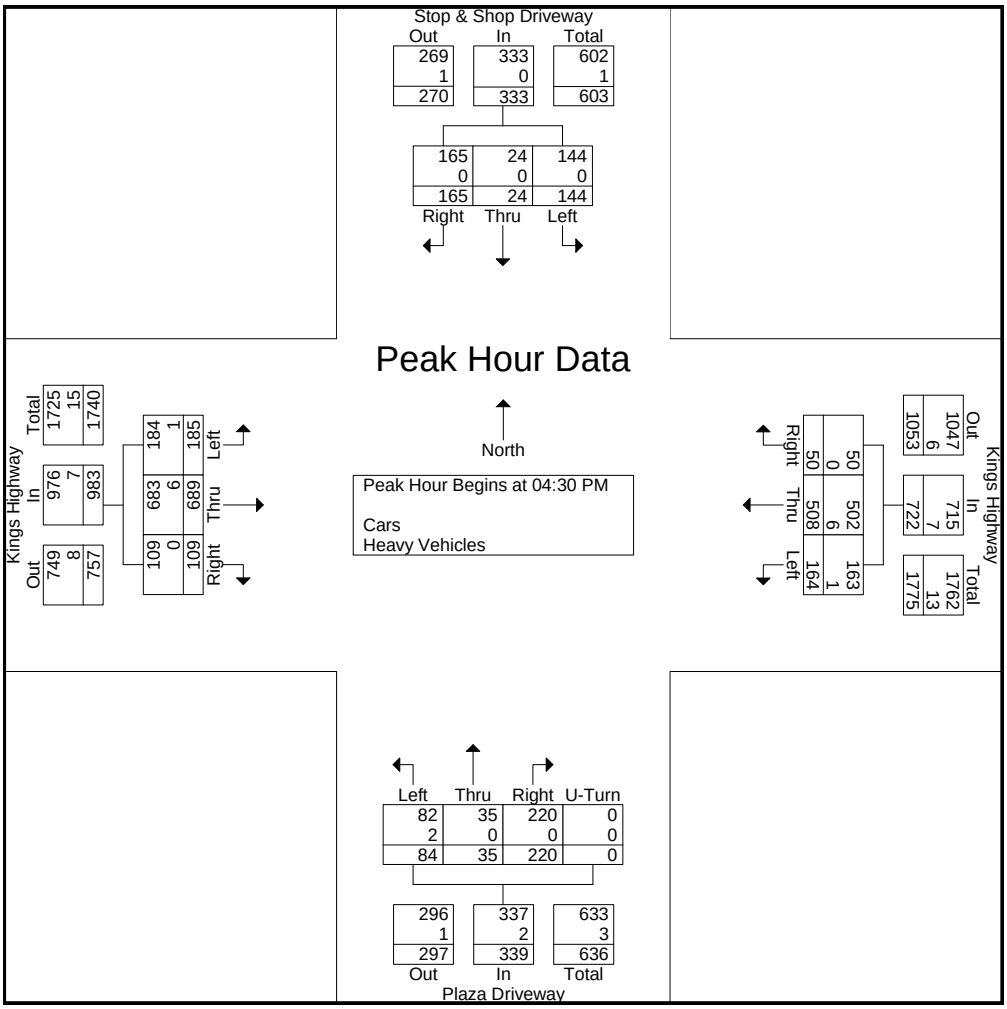
N/S: Stop & Shop Drwy/Plaza Drwy
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 AA
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

	Stop & Shop Driveway From North				Kings Highway From East				Plaza Driveway From South					Kings Highway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:30 PM																		
04:30 PM	38	3	35	76	12	**137**	**48**	**197**	**65**	10	**25**	0	**100**	28	160	35	223	596
04:45 PM	35	9	35	79	14	136	37	187	48	**11**						**59**	256	598
05:00 PM	44	**10**	**43**	**97**	**17**	123	35	175	51	7	19	0	77	25	164	39	228	577
05:15 PM	**48**	2	31	81	7	112	44	163	56	7	23	0	86	**30**	**194**	52	**276**	**606**
Total Volume	165	24	144	333	50	508	164	722	220	35	84	0	339	109	689	185	983	2377
% App. Total	49.5	7.2	43.2		6.9	70.4	22.7		64.9	10.3	24.8	0		11.1	70.1	18.8		
PHF	.859	.600	.837	.858	.735	.927	.854	.916	.846	.795	.840	.000	.848	.908	.888	.784	.890	.981
Cars	165	24	144	333	50	502	163	715	220	35	82	0	337	109	683	184	976	2361
% Cars	100	100	100	100	100	98.8	99.4	99.0	100	100	97.6	0	99.4	100	99.1	99.5	99.3	99.3
Heavy Vehicles	0	0	0	0	0	6	1	7	0	0	2	0	2	0	6	1	7	16
% Heavy Vehicles	0	0	0	0	0	1.2	0.6	1.0	0	0	2.4	0	0.6	0	0.9	0.5	0.7	0.7



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S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 B
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
07:00 AM	134	18	8	13	0	26	69	268
07:15 AM	155	12	10	14	2	13	82	288
07:30 AM	162	16	7	15	0	16	81	297
07:45 AM	182	20	13	20	0	20	99	354
Total	633	66	38	62	2	75	331	1207
08:00 AM	160	15	12	16	0	27	79	309
08:15 AM	170	32	7	32	0	36	75	352
08:30 AM	141	19	11	31	0	36	87	325
08:45 AM	148	28	9	31	0	42	92	350
Total	619	94	39	110	0	141	333	1336
Grand Total	1252	160	77	172	2	216	664	2543
Apprch %	88.7	11.3	30.7	68.5	0.8	24.5	75.5	
Total %	49.2	6.3	3	6.8	0.1	8.5	26.1	
Cars	1191	150	74	160	2	209	616	2402
% Cars	95.1	93.8	96.1	93	100	96.8	92.8	94.5
Heavy Vehicles	61	10	3	12	0	7	48	141
% Heavy Vehicles	4.9	6.2	3.9	7	0	3.2	7.2	5.5

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:45 AM											
07:45 AM	**182**	**20**	**202**	**13**	**20**	**0**	**33**	**20**	**99**	**119**	**354**
08:00 AM	160	15	175	12	16	0	28	27	79	106	309
08:15 AM	170	**32**	202	7	**32**	0	39	**36**	75	111	352
08:30 AM	141	19	160	11	31	0	**42**			**123**	
Total Volume	**653**	**86**	**739**	**43**	**99**	**0**	**142**	**119**	**340**	**459**	**1340**
% App. Total	**88.4**	**11.6**		**30.3**	**69.7**	**0**		**25.9**	**74.1**		
PHF	**.897**	**.672**	**.915**	**.827**	**.773**	**.000**	**.845**	**.826**	**.859**	**.933**	**.946**
Cars	**626**	**82**	**708**	**41**	**92**	**0**	**133**	**117**	**321**	**438**	**1279**
% Cars	**95.9**	**95.3**	**95.8**	**95.3**	**92.9**	**0**	**93.7**	**98.3**	**94.4**	**95.4**	**95.4**
Heavy Vehicles	**27**	**4**	**31**	**2**	**7**	**0**	**9**	**2**	**19**	**21**	**61**
% Heavy Vehicles	**4.1**	**4.7**	**4.2**	**4.7**	**7.1**	**0**	**6.3**	**1.7**	**5.6**	**4.6**	**4.6**

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Client: VHB/M. Regan

File Name : 91912 B
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
07:00 AM	117	18	8	12	0	26	60	241
07:15 AM	147	10	10	13	2	12	73	267
07:30 AM	158	14	6	14	0	13	73	278
07:45 AM	178	18	12	17	0	20	92	337
Total	600	60	36	56	2	71	298	1123
08:00 AM	150	14	11	16	0	26	76	293
08:15 AM	166	31	7	29	0	35	71	339
08:30 AM	132	19	11	30	0	36	82	310
08:45 AM	143	26	9	29	0	41	89	337
Total	591	90	38	104	0	138	318	1279
Grand Total	1191	150	74	160	2	209	616	2402
Apprch %	88.8	11.2	31.4	67.8	0.8	25.3	74.7	
Total %	49.6	6.2	3.1	6.7	0.1	8.7	25.6	

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:45 AM											
07:45 AM	**178**	**18**	**196**	**12**	**17**	**0**	**29**	**20**	**92**	**112**	**337**
08:00 AM	**150**	**14**	**164**	**11**	**16**	**0**	**27**	**26**	**76**	**102**	**293**
08:15 AM	**166**	**31**	**197**	**7**	**29**	**0**	**36**	**35**	**71**	**106**	**339**
08:30 AM	132	19	151	11	**30**	0	**41**	**36**	82	**118**	
Total Volume	**626**	**82**	**708**	**41**	**92**	**0**	**133**	**117**	**321**	**438**	**1279**
% App. Total	**88.4**	**11.6**		**30.8**	**69.2**	**0**		**26.7**	**73.3**		
PHF	**.879**	**.661**	**.898**	**.854**	**.767**	**.000**	**.811**	**.813**	**.872**	**.928**	**.943**

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S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 B
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
07:00 AM	17	0	0	1	0	0	9	27
07:15 AM	8	2	0	1	0	1	9	21
07:30 AM	4	2	1	1	0	3	8	19
07:45 AM	4	2	1	3	0	0	7	17
Total	33	6	2	6	0	4	33	84
08:00 AM	10	1	1	0	0	1	3	16
08:15 AM	4	1	0	3	0	1	4	13
08:30 AM	9	0	0	1	0	0	5	15
08:45 AM	5	2	0	2	0	1	3	13
Total	28	4	1	6	0	3	15	57
Grand Total	61	10	3	12	0	7	48	141
Apprch %	85.9	14.1	20	80	0	12.7	87.3	
Total %	43.3	7.1	2.1	8.5	0	5	34	

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:00 AM											
07:00 AM	**17**	**0**	**17**	**0**	**1**	**0**	**1**	**0**	**9**	**9**	**27**
07:15 AM	8	**2**	10	0	1	0	1	1	9	10	21
07:30 AM	4	2	6	**1**				**3**	8	**11**	
07:45 AM	**4**	**2**	**6**	**1**	**3**	0	**4**	**0**	**7**	**7**	**17**
Total Volume	**33**	**6**	**39**	**2**	**6**	**0**	**8**	**4**	**33**	**37**	**84**
% App. Total	**84.6**	**15.4**		**25**	**75**	**0**		**10.8**	**89.2**		
PHF	**.485**	**.750**	**.574**	**.500**	**.500**	**.000**	**.500**	**.333**	**.917**	**.841**	**.778**

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File Name : 91912 B
Site Code : 10111.31
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Page No : 1

Groups Printed- Peds and Bicycles

	Kings Highway From East			Shaws Plaza Driveway From South			Kings Highway From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	1	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	2	0	0	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	2	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2
Grand Total	0	0	0	0	0	4	0	0	1	5
Apprch %	0	0	0	0	0	100	0	0	100	
Total %	0	0	0	0	0	80	0	0	20	

	Kings Highway From East				Shaws Plaza Driveway From South				Kings Highway From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	**2**
Total Volume	0	0	0	0	0	0	3	3	0	0	1	1	4
% App. Total	0	0	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.375	.375	.000	.000	.250	.250	.500

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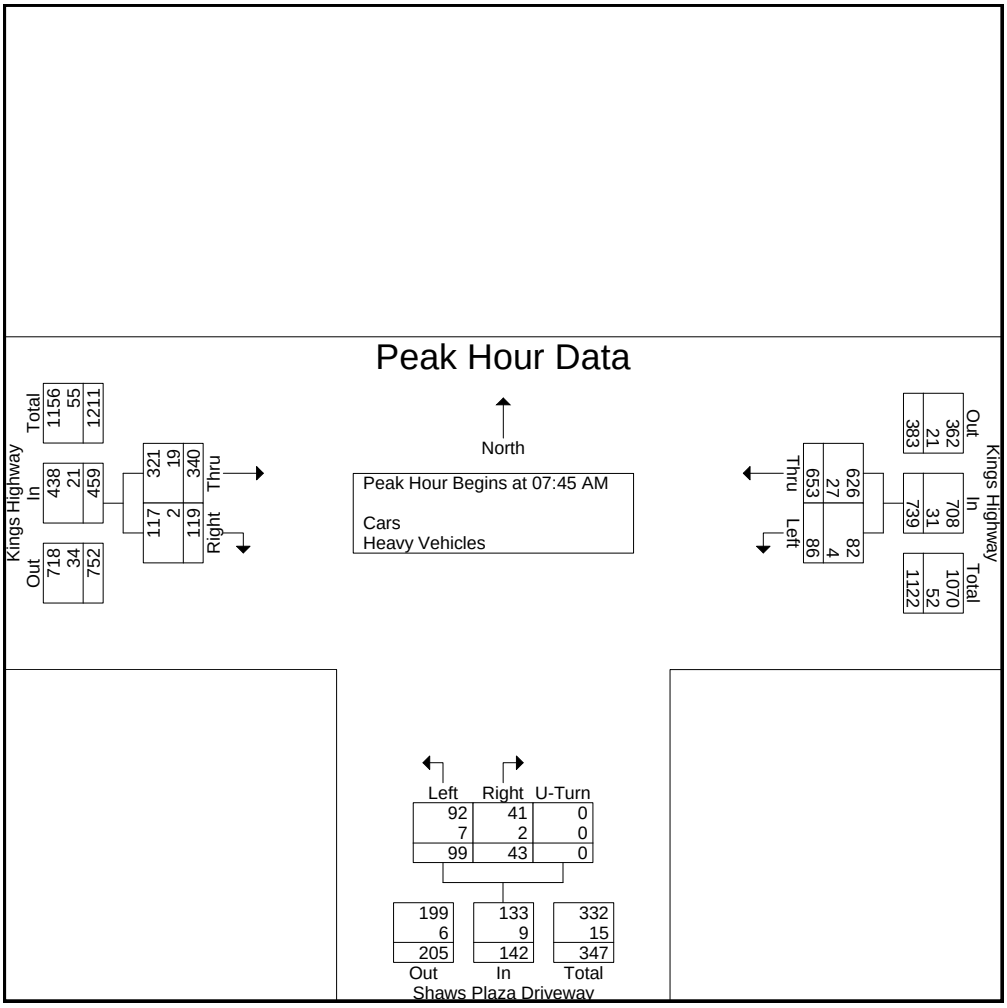
	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:45 AM											
07:45 AM	**182**	**20**	**202**	**13**	**20**	**0**	**33**	**20**	**99**	**119**	**354**
08:00 AM	160	15	175	12	16	0	28	27	79	106	309
08:15 AM	170	**32**	202	7	**32**	0	39	**36**	75	111	352
08:30 AM	141	19	160	11	31	0	**42**			**123**	
Total Volume	**653**	**86**	**739**	**43**	**99**	**0**	**142**	**119**	**340**	**459**	**1340**
% App. Total	**88.4**	**11.6**		**30.3**	**69.7**	**0**		**25.9**	**74.1**		
PHF	**.897**	**.672**	**.915**	**.827**	**.773**	**.000**	**.845**	**.826**	**.859**	**.933**	**.946**
Cars	**626**	**82**	**708**	**41**	**92**	**0**	**133**	**117**	**321**	**438**	**1279**
% Cars	**95.9**	**95.3**	**95.8**	**95.3**	**92.9**	**0**	**93.7**	**98.3**	**94.4**	**95.4**	**95.4**
Heavy Vehicles	**27**	**4**	**31**	**2**	**7**	**0**	**9**	**2**	**19**	**21**	**61**
% Heavy Vehicles	**4.1**	**4.7**	**4.2**	**4.7**	**7.1**	**0**	**6.3**	**1.7**	**5.6**	**4.6**	**4.6**



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E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 BB
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
04:00 PM	173	28	22	46	0	54	138	461
04:15 PM	181	38	24	33	2	58	132	468
04:30 PM	163	40	22	38	0	45	140	448
04:45 PM	178	36	21	35	0	65	151	486
Total	695	142	89	152	2	222	561	1863
05:00 PM	171	36	29	58	0	52	156	502
05:15 PM	141	39	30	48	0	53	143	454
05:30 PM	185	27	39	51	3	38	124	467
05:45 PM	148	30	30	55	0	54	114	431
Total	645	132	128	212	3	197	537	1854
Grand Total	1340	274	217	364	5	419	1098	3717
Apprch %	83	17	37	62.1	0.9	27.6	72.4	
Total %	36.1	7.4	5.8	9.8	0.1	11.3	29.5	
Cars	1324	272	216	360	5	416	1080	3673
% Cars	98.8	99.3	99.5	98.9	100	99.3	98.4	98.8
Heavy Vehicles	16	2	1	4	0	3	18	44
% Heavy Vehicles	1.2	0.7	0.5	1.1	0	0.7	1.6	1.2

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:45 PM											
04:45 PM	178	36	**214**	**21**	**35**	**0**	**56**	**65**	151	**216**	**486**
05:00 PM	**171**	**36**	**207**	**29**	**58**	0	87	52	**156**	**208**	**502**
05:15 PM	141	**39**	180	30	48	0	78	53	143	196	454
05:30 PM	**185**			**39**		**3**	**93**				
Total Volume	**675**	**138**	**813**	**119**	**192**	**3**	**314**	**208**	**574**	**782**	**1909**
% App. Total	**83**	**17**		**37.9**	**61.1**	**1**		**26.6**	**73.4**		
PHF	**.912**	**.885**	**.950**	**.763**	**.828**	**.250**	**.844**	**.800**	**.920**	**.905**	**.951**
Cars	**669**	**138**	**807**	**119**	**191**	**3**	**313**	**206**	**566**	**772**	**1892**
% Cars	**99.1**	**100**	**99.3**	**100**	**99.5**	**100**	**99.7**	**99.0**	**98.6**	**98.7**	**99.1**
Heavy Vehicles	**6**	**0**	**6**	**0**	**1**	**0**	**1**	**2**	**8**	**10**	**17**
% Heavy Vehicles	**0.9**	**0**	**0.7**	**0**	**0.5**	**0**	**0.3**	**1.0**	**1.4**	**1.3**	**0.9**

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 BB
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Cars

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
04:00 PM	172	27	22	46	0	54	134	455
04:15 PM	178	37	23	32	2	57	128	457
04:30 PM	160	40	22	37	0	45	138	442
04:45 PM	177	36	21	35	0	65	150	484
Total	687	140	88	150	2	221	550	1838
05:00 PM	170	36	29	57	0	51	153	496
05:15 PM	139	39	30	48	0	53	142	451
05:30 PM	183	27	39	51	3	37	121	461
05:45 PM	145	30	30	54	0	54	114	427
Total	637	132	128	210	3	195	530	1835
Grand Total	1324	272	216	360	5	416	1080	3673
Apprch %	83	17	37.2	62	0.9	27.8	72.2	
Total %	36	7.4	5.9	9.8	0.1	11.3	29.4	

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:45 PM											
04:45 PM	177	36	**213**	**21**	**35**	**0**	**56**	**65**	150	**215**	**484**
05:00 PM	**170**	**36**	**206**	**29**	**57**	0	86	51	**153**	**204**	**496**
05:15 PM	139	**39**	178	30	48	0	78	53	142	195	451
05:30 PM	**183**			**39**		**3**	**93**				
Total Volume	**669**	**138**	**807**	**119**	**191**	**3**	**313**	**206**	**566**	**772**	**1892**
% App. Total	**82.9**	**17.1**		**38**	**61**	**1**		**26.7**	**73.3**		
PHF	**.914**	**.885**	**.947**	**.763**	**.838**	**.250**	**.841**	**.792**	**.925**	**.898**	**.954**

PRECISION DATA INDUSTRIES, LLC
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S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 BB
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Kings Highway From East		Shaws Plaza Driveway From South			Kings Highway From West		
Start Time	Thru	Left	Right	Left	U-Turn	Right	Thru	Int. Total
04:00 PM	1	1	0	0	0	0	4	6
04:15 PM	3	1	1	1	0	1	4	11
04:30 PM	3	0	0	1	0	0	2	6
04:45 PM	1	0	0	0	0	0	1	2
Total	8	2	1	2	0	1	11	25
05:00 PM	1	0	0	1	0	1	3	6
05:15 PM	2	0	0	0	0	0	1	3
05:30 PM	2	0	0	0	0	1	3	6
05:45 PM	3	0	0	1	0	0	0	4
Total	8	0	0	2	0	2	7	19
Grand Total	16	2	1	4	0	3	18	44
Apprch %	88.9	11.1	20	80	0	14.3	85.7	
Total %	36.4	4.5	2.3	9.1	0	6.8	40.9	

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:00 PM											
04:00 PM	1	**1**	2	0	0	0	0	0	**4**	**4**	**6**
04:15 PM	**3**	**1**	**4**	**1**	**1**	0	**2**	**1**	4	**5**	**11**
04:30 PM	3	0	3	0	1	0	1	0	2	2	6
04:45 PM	1	0	1	0	0	0	0	0	1	1	2
Total Volume	8	2	10	1	2	0	3	1	11	12	25
% App. Total	80	20		33.3	66.7	0		8.3	91.7		
PHF	.667	.500	.625	.250	.500	.000	.375	.250	.688	.600	.568

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 BB
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

Groups Printed- Peds and Bicycles

	Kings Highway From East			Shaws Plaza Driveway From South			Kings Highway From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Kings Highway From East				Shaws Plaza Driveway From South				Kings Highway From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

PRECISION DATA INDUSTRIES, LLC
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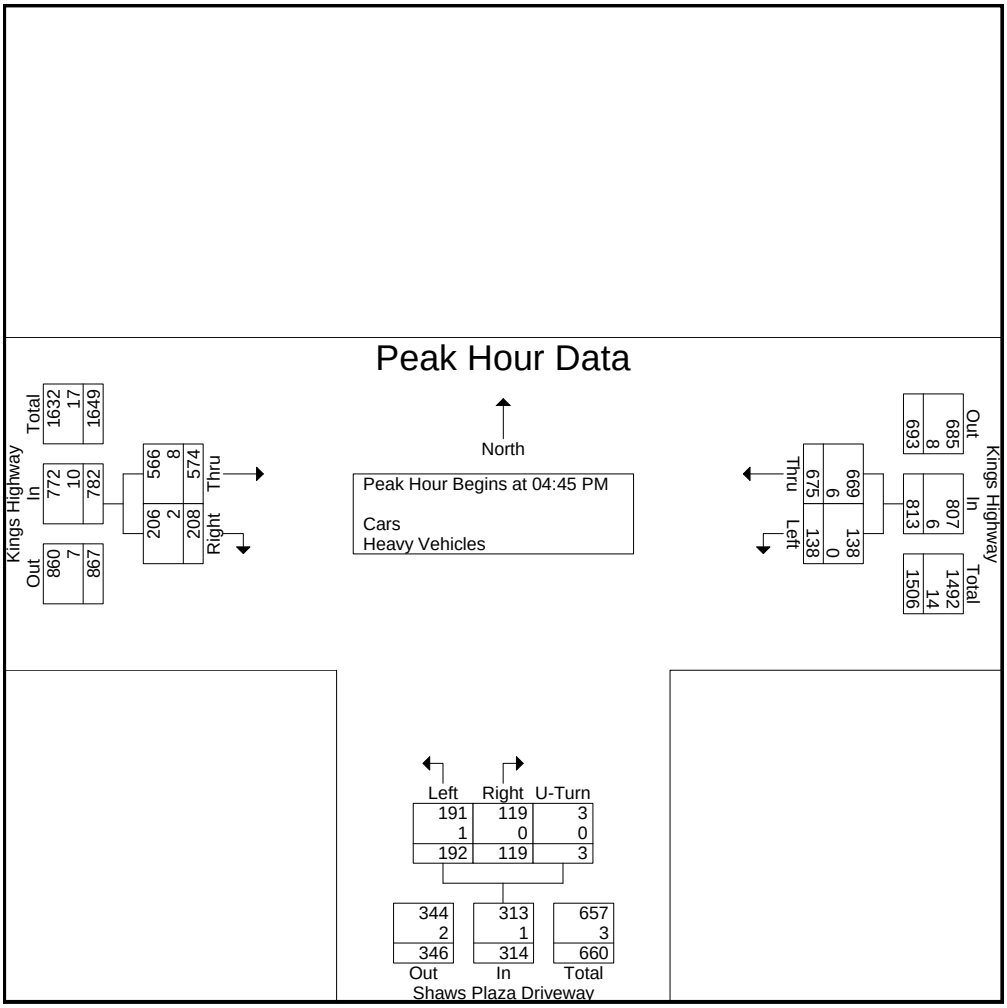
S: Shaws Plaza Driveway
E/W: Kings Highway
City, State: New Bedford, MA
Client: VHB/M. Regan

File Name : 91912 BB
Site Code : 10111.31
Start Date : 6/9/2009
Page No : 1

	Kings Highway From East			Shaws Plaza Driveway From South				Kings Highway From West			
Start Time	Thru	Left	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:45 PM											
04:45 PM	178	36	**214**	**21**	**35**	**0**	**56**	**65**	151	**216**	**486**
05:00 PM	**171**	**36**	**207**	**29**	**58**	0	87	52	**156**	**208**	**502**
05:15 PM	141	**39**	180	30	48	0	78	53	143	196	454
05:30 PM	**185**			**39**		**3**	**93**				
Total Volume	**675**	**138**	**813**	**119**	**192**	**3**	**314**	**208**	**574**	**782**	**1909**
% App. Total	**83**	**17**		**37.9**	**61.1**	**1**		**26.6**	**73.4**		
PHF	**.912**	**.885**	**.950**	**.763**	**.828**	**.250**	**.844**	**.800**	**.920**	**.905**	**.951**
Cars	**669**	**138**	**807**	**119**	**191**	**3**	**313**	**206**	**566**	**772**	**1892**
% Cars	**99.1**	**100**	**99.3**	**100**	**99.5**	**100**	**99.7**	**99.0**	**98.6**	**98.7**	**99.1**
Heavy Vehicles	**6**	**0**	**6**	**0**	**1**	**0**	**1**	**2**	**8**	**10**	**17**
% Heavy Vehicles	**0.9**	**0**	**0.7**	**0**	**0.5**	**0**	**0.3**	**1.0**	**1.4**	**1.3**	**0.9**



VHB, Inc.

Counter:
Counted By: N. Landrón
Weather: cloudy / 75 deg
Other:

File Name : TARKIL~2
Site Code : 09200911
Start Date : 6/10/2009
Page No : 1

Groups Printed- CARS

	Tarkiln Hill Rd From North					King's Highway From East					driveway From South					King's Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:45 AM	4	1	2	0	7	17	188	0	0	205	0	0	1	0	1	0	159	1	0	160	373
Total	4	1	2	0	7	17	188	0	0	205	0	0	1	0	1	0	159	1	0	160	373
08:00 AM	3	0	5	0	8	15	167	0	1	183	0	0	1	0	1	0	116	3	1	120	312
08:15 AM	4	0	1	0	5	16	163	0	0	179	1	0	0	0	1	1	130	2	1	134	319
08:30 AM	5	0	2	1	8	12	163	0	1	176	0	0	1	1	2	1	124	4	0	129	315
Grand Total	16	1	10	1	28	60	681	0	2	743	1	0	3	1	5	2	529	10	2	543	1319
Apprch %	57.1	3.6	35.7	3.6		8.1	91.7	0.0	0.3		20.0	0.0	60.0	20.0		0.4	97.4	1.8	0.4		
Total %	1.2	0.1	0.8	0.1	2.1	4.5	51.6	0.0	0.2	56.3	0.1	0.0	0.2	0.1	0.4	0.2	40.1	0.8	0.2	41.2	

VHB, Inc.

Counter:
Counted By: N. Landrón
Weather: cloudy / 75 deg
Other:

File Name : TARKIL~2
Site Code : 09200911
Start Date : 6/10/2009
Page No : 1

Groups Printed- HV - EB + SB

	Tarkiln Hill Rd From North					King's Highway From East					driveway From South					King's Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:45 AM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	12
Total	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	12
08:00 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
08:30 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
Grand Total	5	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	15	0	0	15	22
Apprch %	71.4	0.0	28.6	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	22.7	0.0	9.1	0.0	31.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.2	0.0	0.0	68.2	

VHB, Inc.

Counter:
Counted By: N. Landrón
Weather: cloudy / 75 deg
Other:

File Name : TARKIL~2
Site Code : 09200911
Start Date : 6/10/2009
Page No : 1

Groups Printed- HV - WB + NB

	Tarkiln Hill Rd From North					King's Highway From East					driveway From South					King's Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:45 AM	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	0	0	0	0	0	10
Total	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	0	0	0	0	0	10
08:00 AM	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	7
08:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
08:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Grand Total	0	0	1	0	1	0	23	0	0	23	0	0	2	0	2	0	0	0	0	0	26
Apprch %	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	3.8	0.0	3.8	0.0	88.5	0.0	0.0	88.5	0.0	0.0	7.7	0.0	7.7	0.0	0.0	0.0	0.0	0.0	

VHB, Inc.

File Name : TARKIL~1
Site Code : 00060409
Start Date : 6/4/2009
Page No : 1

Groups Printed- Unshifted

	From Tarkiln Hill Road From North					From South					From Kings Highway From East					From Kings Highway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	2	0	13	1	16	0	0	0	0	0	55	214	0	3	272	0	319	9	0	328	616
04:15 PM	5	0	9	0	14	0	0	0	0	0	35	178	0	0	213	0	291	11	0	302	529
04:30 PM	3	0	18	0	21	2	0	3	0	5	32	211	0	1	244	0	265	3	0	268	538
04:45 PM	5	0	11	0	16	0	0	0	0	0	32	210	0	0	242	0	286	8	2	296	554
Total	15	0	51	1	67	2	0	3	0	5	154	813	0	4	971	0	1161	31	2	1194	2237
05:00 PM	7	0	15	0	22	0	0	1	0	1	33	185	0	1	219	0	310	7	0	317	559
Grand Total	22	0	66	1	89	2	0	4	0	6	187	998	0	5	1190	0	1471	38	2	1511	2796
Apprch %	24.7	0.0	74.2	1.1		33.3	0.0	66.7	0.0		15.7	83.9	0.0	0.4		0.0	97.4	2.5	0.1		
Total %	0.8	0.0	2.4	0.0	3.2	0.1	0.0	0.1	0.0	0.2	6.7	35.7	0.0	0.2	42.6	0.0	52.6	1.4	0.1	54.0	

VHB, Inc.

Pleasant St at Rt 18 SB Exit Ramp
AM Peak Hour
7:45 - 8:45 AM

File Name : PURCHA~1
Site Code : 07092009
Start Date : 7/9/2009
Page No : 1

Groups Printed- Cars

	Purchase St From North					Rt 18 SB Exit Ramp From East					Purchase St From South					driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:45 AM	0	51	0	4	55	9	0	68	0	77	0	45	1	2	48	2	0	0	0	2	182
Total	0	51	0	4	55	9	0	68	0	77	0	45	1	2	48	2	0	0	0	2	182
08:00 AM	0	49	0	2	51	10	0	44	0	54	0	45	0	3	48	0	0	0	2	2	155
08:15 AM	0	66	0	5	71	10	4	51	0	65	0	51	0	2	53	1	0	0	3	4	193
08:30 AM	0	63	0	6	69	5	0	56	0	61	0	51	0	1	52	1	0	0	4	5	187
Grand Total	0	229	0	17	246	34	4	219	0	257	0	192	1	8	201	4	0	0	9	13	717
Apprch %	0.0	93.1	0.0	6.9		13.2	1.6	85.2	0.0		0.0	95.5	0.5	4.0		30.8	0.0	0.0	69.2		
Total %	0.0	31.9	0.0	2.4	34.3	4.7	0.6	30.5	0.0	35.8	0.0	26.8	0.1	1.1	28.0	0.6	0.0	0.0	1.3	1.8	

VHB, Inc.

Purchase St at Rt 18 SB Exit Ramp
PM Peak Hour
4:00 - 5:00 PM

File Name : PM_PUR~1
Site Code : 00070909
Start Date : 7/9/2009
Page No : 1

Groups Printed- Cars

	Purchase St From North					Rt 18 SB Exit Ramp From East					Purchase St From South					driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	1	73	0	6	80	14	2	50	0	66	0	99	4	5	108	0	0	1	0	1	255
04:15 PM	0	77	0	0	77	17	2	62	0	81	0	74	0	1	75	0	0	1	0	1	234
04:30 PM	0	71	0	2	73	11	2	52	0	65	0	98	1	3	102	0	0	0	0	0	240
04:45 PM	0	70	0	4	74	10	1	47	0	58	0	89	0	4	93	3	0	0	3	6	231
Total	1	291	0	12	304	52	7	211	0	270	0	360	5	13	378	3	0	2	3	8	960
Grand Total	1	291	0	12	304	52	7	211	0	270	0	360	5	13	378	3	0	2	3	8	960
Apprch %	0.3	95.7	0.0	3.9		19.3	2.6	78.1	0.0		0.0	95.2	1.3	3.4		37.5	0.0	25.0	37.5		
Total %	0.1	30.3	0.0	1.3	31.7	5.4	0.7	22.0	0.0	28.1	0.0	37.5	0.5	1.4	39.4	0.3	0.0	0.2	0.3	0.8	

VHB, Inc.

Purchase St at Rt 18 SB Exit Ramp
PM Peak Hour
4:00 - 5:00 PM

File Name : PM_PUR~1
Site Code : 00070909
Start Date : 7/9/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase St From North					Rt 18 SB Exit Ramp From East					Purchase St From South					driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	5
04:15 PM	0	1	0	0	1	0	0	3	0	3	0	5	0	0	5	0	0	0	0	0	9
04:30 PM	0	1	0	0	1	0	0	2	0	2	0	3	0	0	3	0	0	0	0	0	6
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	6	0	0	6	0	0	6	0	6	0	15	0	0	15	0	0	0	0	0	27
Grand Total	0	6	0	0	6	0	0	6	0	6	0	15	0	0	15	0	0	0	0	0	27
Apprch %	0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	22.2	0.0	0.0	22.2	0.0	0.0	22.2	0.0	22.2	0.0	55.6	0.0	0.0	55.6	0.0	0.0	0.0	0.0	0.0	

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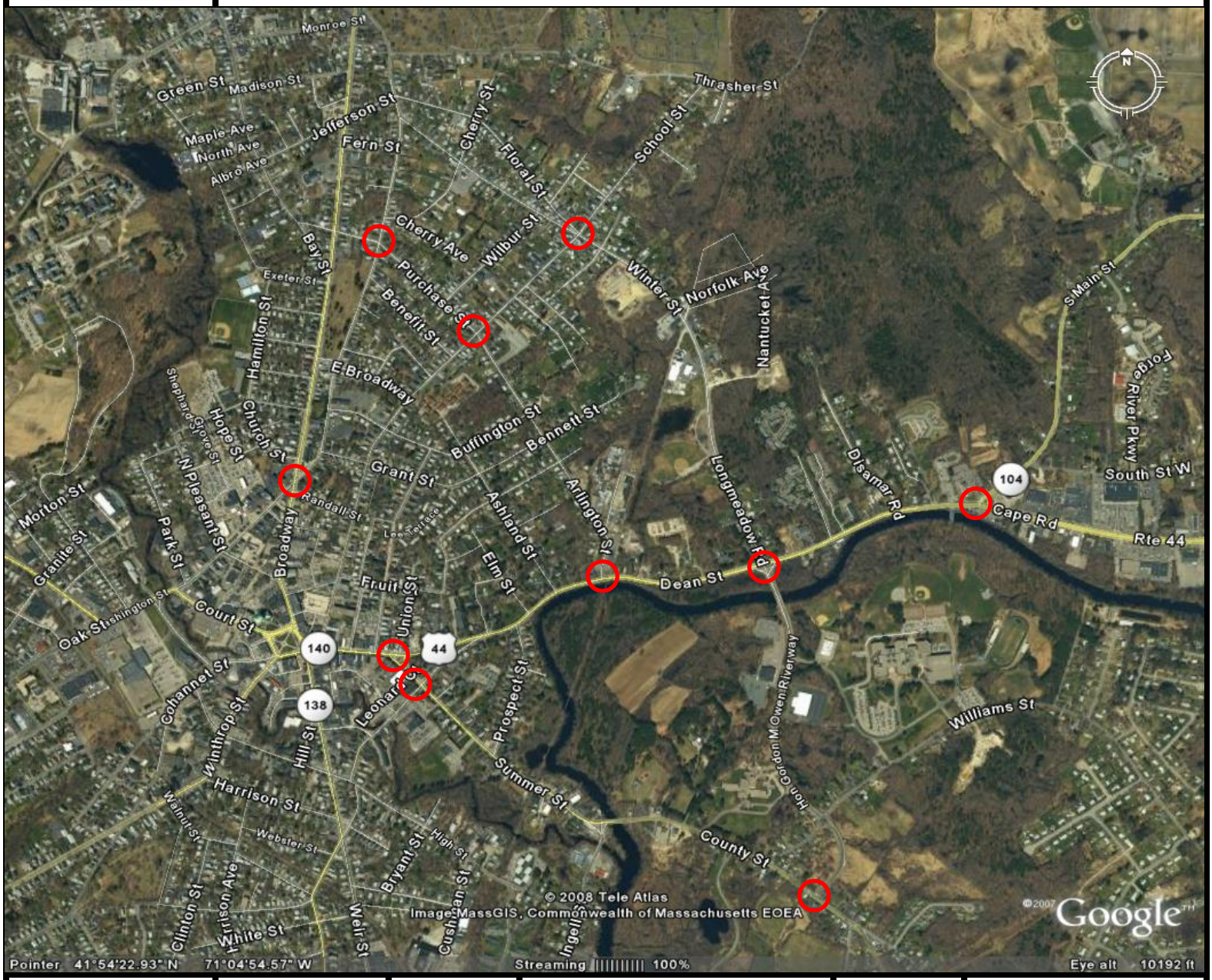
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 9/17/08 and Sat 9/20/08	81676	Taunton, MA

PRECISION DATA INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-A
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	27	4	3	6	3	0	16	1	9	16	6	92
07:15 AM	2	56	5	15	15	2	1	37	1	5	21	0	160
07:30 AM	1	63	6	20	13	4	2	44	4	5	14	5	181
07:45 AM	4	59	11	10	19	0	1	19	7	8	18	7	163
Total	8	205	26	48	53	9	4	116	13	27	69	18	596
08:00 AM	4	43	11	10	18	4	1	18	3	3	12	14	141
08:15 AM	5	45	9	8	23	0	2	18	4	5	14	6	139
08:30 AM	2	33	9	12	18	1	2	28	3	7	17	9	141
08:45 AM	6	50	13	6	20	2	3	15	2	8	14	5	144
Total	17	171	42	36	79	7	8	79	12	23	57	34	565
Grand Total	25	376	68	84	132	16	12	195	25	50	126	52	1161
Apprch %	5.3	80.2	14.5	36.2	56.9	6.9	5.2	84.1	10.8	21.9	55.3	22.8	
Total %	2.2	32.4	5.9	7.2	11.4	1.4	1	16.8	2.2	4.3	10.9	4.5	
Cars	25	362	60	81	122	16	11	192	25	49	119	52	1114
% Cars	100	96.3	88.2	96.4	92.4	100	91.7	98.5	100	98	94.4	100	96
Heavy Vehicles	0	14	8	3	10	0	1	3	0	1	7	0	47
% Heavy Vehicles	0	3.7	11.8	3.6	7.6	0	8.3	1.5	0	2	5.6	0	4

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	56	5	63	15	15	2	32	1	37	1	39	5	**21**	0	26	160
07:30 AM	1	**63**	6	70	**20**	13	**4**	**37**	**2**	**44**	4	**50**	5	14	5	24	**181**
07:45 AM	**4**	59	**11**	**74**	10	**19**	0	29	1	19	**7**	27	**8**	18	7	**33**	163
08:00 AM	4	43	11	58	10	18	4	32	1	18	3	22	3	12	**14**	29	141
Total Volume	11	221	33	265	55	65	10	130	5	118	15	138	21	65	26	112	645
% App. Total	4.2	83.4	12.5		42.3	50	7.7		3.6	85.5	10.9		18.8	58	23.2		
PHF	.688	.877	.750	.895	.688	.855	.625	.878	.625	.670	.536	.690	.656	.774	.464	.848	.891
Cars	11	216	31	258	55	63	10	128	5	115	15	135	20	63	26	109	630
% Cars	100	97.7	93.9	97.4	100	96.9	100	98.5	100	97.5	100	97.8	95.2	96.9	100	97.3	97.7
Heavy Vehicles	0	5	2	7	0	2	0	2	0	3	0	3	1	2	0	3	15
% Heavy Vehicles	0	2.3	6.1	2.6	0	3.1	0	1.5	0	2.5	0	2.2	4.8	3.1	0	2.7	2.3

PRECISION
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-A
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	27	4	3	5	3	0	16	1	9	13	6	88
07:15 AM	2	56	5	15	13	2	1	35	1	5	21	0	156
07:30 AM	1	61	5	20	13	4	2	44	4	5	14	5	178
07:45 AM	4	57	10	10	19	0	1	19	7	7	17	7	158
Total	8	201	24	48	50	9	4	114	13	26	65	18	580
08:00 AM	4	42	11	10	18	4	1	17	3	3	11	14	138
08:15 AM	5	44	6	7	19	0	2	18	4	5	14	6	130
08:30 AM	2	27	7	11	16	1	1	28	3	7	16	9	128
08:45 AM	6	48	12	5	19	2	3	15	2	8	13	5	138
Total	17	161	36	33	72	7	7	78	12	23	54	34	534
Grand Total	25	362	60	81	122	16	11	192	25	49	119	52	1114
Apprch %	5.6	81	13.4	37	55.7	7.3	4.8	84.2	11	22.3	54.1	23.6	
Total %	2.2	32.5	5.4	7.3	11	1.4	1	17.2	2.2	4.4	10.7	4.7	

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	56	5	63	15	13	2	30	1	35	1	37	5	**21**	0	26	156
07:30 AM	1	**61**	5	67	**20**	13	**4**	**37**	**2**	**44**	4	**50**	5	14	5	24	**178**
07:45 AM	**4**	57	10	**71**	10	**19**	0	29	1	19	**7**	27	**7**	17	7	**31**	158
08:00 AM	4	42	**11**	57	10	18	4	32	1	17	3	21	3	11	**14**	28	138
Total Volume	11	216	31	258	55	63	10	128	5	115	15	135	20	63	26	109	630
% App. Total	4.3	83.7	12		43	49.2	7.8		3.7	85.2	11.1		18.3	57.8	23.9		
PHF	.688	.885	.705	.908	.688	.829	.625	.865	.625	.653	.536	.675	.714	.750	.464	.879	.885

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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-A
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	3	0	4
07:15 AM	0	0	0	0	2	0	0	2	0	0	0	0	4
07:30 AM	0	2	1	0	0	0	0	0	0	0	0	0	3
07:45 AM	0	2	1	0	0	0	0	0	0	1	1	0	5
Total	0	4	2	0	3	0	0	2	0	1	4	0	16
08:00 AM	0	1	0	0	0	0	0	1	0	0	1	0	3
08:15 AM	0	1	3	1	4	0	0	0	0	0	0	0	9
08:30 AM	0	6	2	1	2	0	1	0	0	0	1	0	13
08:45 AM	0	2	1	1	1	0	0	0	0	0	1	0	6
Total	0	10	6	3	7	0	1	1	0	0	3	0	31
Grand Total	0	14	8	3	10	0	1	3	0	1	7	0	47
Apprch %	0	63.6	36.4	23.1	76.9	0	25	75	0	12.5	87.5	0	
Total %	0	29.8	17	6.4	21.3	0	2.1	6.4	0	2.1	14.9	0	

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	1	0	1	0	0	0	0	0	**1**	0	**1**	0	**1**	0	**1**	3
08:15 AM	0	1	**3**	4	**1**	**4**	0	**5**	0	0	0	0	0	0	0	0	9
08:30 AM	0	**6**	2	**8**	1	2	0	3	**1**	0	0	1	0	1	0	1	**13**
08:45 AM	0	2	1	3	1	1	0	2	0	0	0	0	0	1	0	1	6
Total Volume	0	10	6	16	3	7	0	10	1	1	0	2	0	3	0	3	31
% App. Total	0	62.5	37.5		30	70	0		50	50	0		0	100	0		
PHF	.000	.417	.500	.500	.750	.438	.000	.500	.250	.250	.000	.500	.000	.750	.000	.750	.596

PRECISION
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-A
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	5
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	1	0	0	2	0	0	0	1	0	1	0	3	9
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
08:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Total	0	0	1	2	0	1	0	0	0	0	0	1	0	0	0	2	7
Grand Total	0	0	1	3	1	1	0	2	0	0	0	2	0	1	0	5	16
Apprch %	0	0	25	75	25	25	0	50	0	0	0	100	0	16.7	0	83.3	
Total %	0	0	6.2	18.8	6.2	6.2	0	12.5	0	0	0	12.5	0	6.2	0	31.2	

	Purchase Street From North					School Street From East					Arlington Street From South					School Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	**2**	**2**	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	**1**	0	0	1	**2**	0	0	0	**1**	**1**	0	**1**	0	1	2	**5**
07:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	1	1	1	0	0	2	3	0	0	0	1	1	0	1	0	3	4	9
% App. Total	0	0	0	100		33.3	0	0	66.7		0	0	0	100		0	25	0	75		
PHF	.000	.000	.000	.250	.250	.250	.000	.000	.500	.375	.000	.000	.000	.250	.250	.000	.250	.000	.375	.500	.450

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-A
Site Code : 10111.31
Start Date : 9/17/2008
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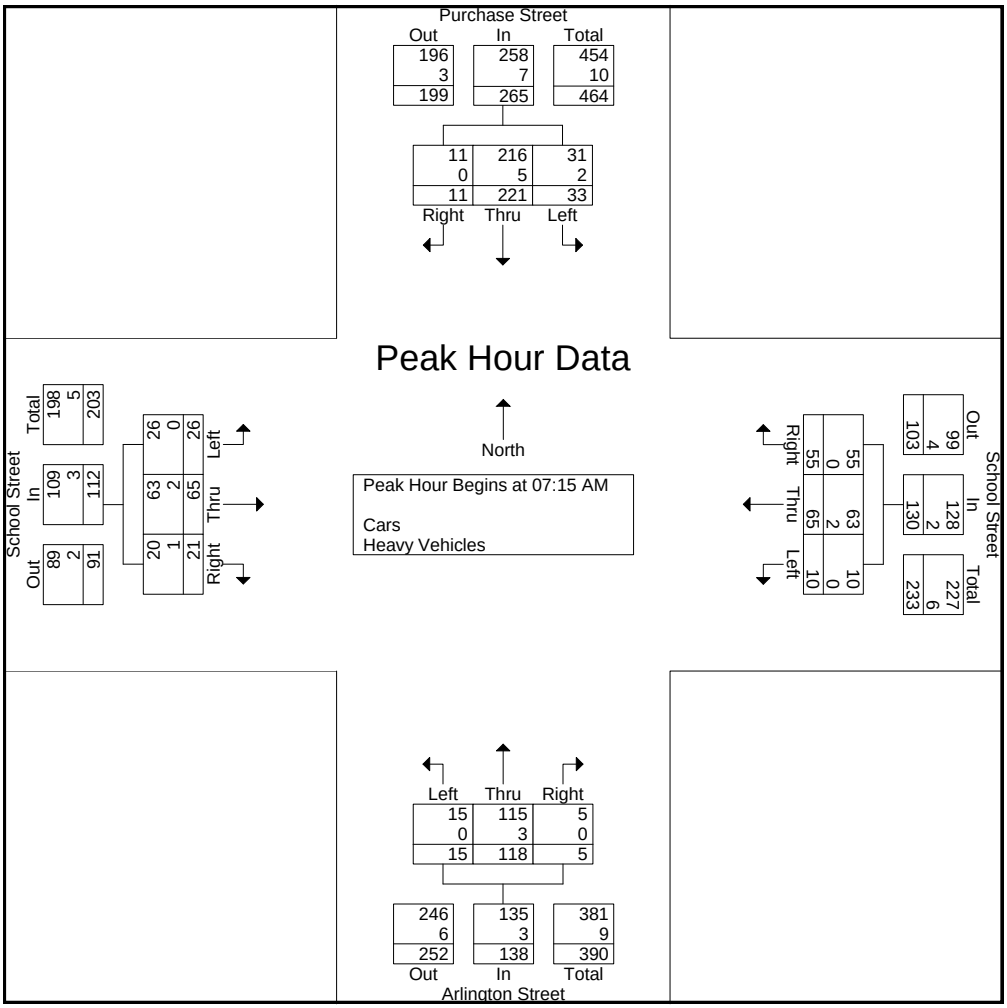
	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	56	5	63	15	15	2	32	1	37	1	39	5	**21**	0	26	160
07:30 AM	1	**63**	6	70	**20**	13	**4**	**37**	**2**	**44**	4	**50**	5	14	5	24	**181**
07:45 AM	**4**	59	**11**	**74**	10	**19**	0	29	1	19	**7**	27	**8**	18	7	**33**	163
08:00 AM	4	43	11	58	10	18	4	32	1	18	3	22	3	12	**14**	29	141
Total Volume	11	221	33	265	55	65	10	130	5	118	15	138	21	65	26	112	645
% App. Total	4.2	83.4	12.5		42.3	50	7.7		3.6	85.5	10.9		18.8	58	23.2		
PHF	.688	.877	.750	.895	.688	.855	.625	.878	.625	.670	.536	.690	.656	.774	.464	.848	.891
Cars	11	216	31	258	55	63	10	128	5	115	15	135	20	63	26	109	630
% Cars	100	97.7	93.9	97.4	100	96.9	100	98.5	100	97.5	100	97.8	95.2	96.9	100	97.3	97.7
Heavy Vehicles	0	5	2	7	0	2	0	2	0	3	0	3	1	2	0	3	15
% Heavy Vehicles	0	2.3	6.1	2.6	0	3.1	0	1.5	0	2.5	0	2.2	4.8	3.1	0	2.7	2.3



PRECISION
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-AAA
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Cars - Heavy Vehicles

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	77	15	19	37	7	5	39	1	3	25	4	233
04:15 PM	4	78	14	25	30	9	2	23	2	8	15	6	216
04:30 PM	3	77	12	9	36	3	2	15	3	10	13	9	192
04:45 PM	6	79	17	9	27	2	0	33	1	7	32	7	220
Total	14	311	58	62	130	21	9	110	7	28	85	26	861
05:00 PM	5	74	16	18	37	4	2	15	0	13	25	9	218
05:15 PM	3	43	7	15	24	3	3	15	5	8	18	3	147
05:30 PM	3	28	5	9	32	6	2	24	5	9	20	3	146
05:45 PM	0	33	3	5	31	5	3	12	3	6	18	12	131
Total	11	178	31	47	124	18	10	66	13	36	81	27	642
Grand Total	25	489	89	109	254	39	19	176	20	64	166	53	1503
Apprch %	4.1	81.1	14.8	27.1	63.2	9.7	8.8	81.9	9.3	22.6	58.7	18.7	
Total %	1.7	32.5	5.9	7.3	16.9	2.6	1.3	11.7	1.3	4.3	11	3.5	
Cars	25	478	88	108	248	39	19	176	20	62	163	52	1478
% Cars	100	97.8	98.9	99.1	97.6	100	100	100	100	96.9	98.2	98.1	98.3
Heavy Vehicles	0	11	1	1	6	0	0	0	0	2	3	1	25
% Heavy Vehicles	0	2.2	1.1	0.9	2.4	0	0	0	0	3.1	1.8	1.9	1.7

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	77	15	93	19	**37**	7	63	**5**	**39**	1	**45**	3	25	4	32	**233**
04:15 PM	4	78	14	96	**25**	30	**9**	**64**	2	23	2	27	8	15	6	29	216
04:30 PM	3	77	12	92	9	36	3	48	2	15	**3**	20	**10**	13	**9**	32	192
04:45 PM	**6**	**79**	**17**	**102**	9	27	2	38	0	33	1	34	7	**32**	7	**46**	220
Total Volume	14	311	58	383	62	130	21	213	9	110	7	126	28	85	26	139	861
% App. Total	3.7	81.2	15.1		29.1	61	9.9		7.1	87.3	5.6		20.1	61.2	18.7		
PHF	.583	.984	.853	.939	.620	.878	.583	.832	.450	.705	.583	.700	.700	.664	.722	.755	.924
Cars	14	304	58	376	62	128	21	211	9	110	7	126	28	83	25	136	849
% Cars	100	97.7	100	98.2	100	98.5	100	99.1	100	100	100	100	100	97.6	96.2	97.8	98.6
Heavy Vehicles	0	7	0	7	0	2	0	2	0	0	0	0	0	2	1	3	12
% Heavy Vehicles	0	2.3	0	1.8	0	1.5	0	0.9	0	0	0	0	0	2.4	3.8	2.2	1.4

PRECISION
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-AAA
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	74	15	19	37	7	5	39	1	3	25	4	230
04:15 PM	4	75	14	25	29	9	2	23	2	8	14	6	211
04:30 PM	3	77	12	9	35	3	2	15	3	10	13	8	190
04:45 PM	6	78	17	9	27	2	0	33	1	7	31	7	218
Total	14	304	58	62	128	21	9	110	7	28	83	25	849
05:00 PM	5	72	15	17	36	4	2	15	0	13	25	9	213
05:15 PM	3	43	7	15	22	3	3	15	5	8	18	3	145
05:30 PM	3	27	5	9	32	6	2	24	5	8	20	3	144
05:45 PM	0	32	3	5	30	5	3	12	3	5	17	12	127
Total	11	174	30	46	120	18	10	66	13	34	80	27	629
Grand Total	25	478	88	108	248	39	19	176	20	62	163	52	1478
Apprch %	4.2	80.9	14.9	27.3	62.8	9.9	8.8	81.9	9.3	22.4	58.8	18.8	
Total %	1.7	32.3	6	7.3	16.8	2.6	1.3	11.9	1.4	4.2	11	3.5	

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	74	15	90	19	**37**	7	**63**	**5**	**39**	1	**45**	3	25	4	32	**230**
04:15 PM	4	75	14	93	**25**	29	**9**	63	2	23	2	27	8	14	6	28	211
04:30 PM	3	77	12	92	9	35	3	47	2	15	**3**	20	**10**	13	**8**	31	190
04:45 PM	**6**	**78**	**17**	**101**	9	27	2	38	0	33	1	34	7	**31**	7	**45**	218
Total Volume	14	304	58	376	62	128	21	211	9	110	7	126	28	83	25	136	849
% App. Total	3.7	80.9	15.4		29.4	60.7	10		7.1	87.3	5.6		20.6	61	18.4		
PHF	.583	.974	.853	.931	.620	.865	.583	.837	.450	.705	.583	.700	.700	.669	.781	.756	.923

PRECISION
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N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-AAA
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Purchase Street From North			School Street From East			Arlington Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	3	0	0	1	0	0	0	0	0	1	0	5
04:30 PM	0	0	0	0	1	0	0	0	0	0	0	1	2
04:45 PM	0	1	0	0	0	0	0	0	0	0	1	0	2
Total	0	7	0	0	2	0	0	0	0	0	2	1	12
05:00 PM	0	2	1	1	1	0	0	0	0	0	0	0	5
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
05:30 PM	0	1	0	0	0	0	0	0	0	1	0	0	2
05:45 PM	0	1	0	0	1	0	0	0	0	1	1	0	4
Total	0	4	1	1	4	0	0	0	0	2	1	0	13
Grand Total	0	11	1	1	6	0	0	0	0	2	3	1	25
Apprch %	0	91.7	8.3	14.3	85.7	0	0	0	0	33.3	50	16.7	
Total %	0	44	4	4	24	0	0	0	0	8	12	4	

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**3**	0	**3**	0	**1**	0	1	0	0	0	0	0	**1**	0	**1**	**5**
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**1**	1	2
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
05:00 PM	0	2	**1**	3	**1**	1	0	**2**	0	0	0	0	0	0	0	0	5
Total Volume	0	6	1	7	1	3	0	4	0	0	0	0	0	2	1	3	14
% App. Total	0	85.7	14.3		25	75	0		0	0	0		0	66.7	33.3		
PHF	.000	.500	.250	.583	.250	.750	.000	.500	.000	.000	.000	.000	.000	.500	.250	.750	.700

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-AAA
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	3	0	2	0	0	6
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	0	1	0	3	0	2	0	0	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	0	5
05:45 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6
Total	0	0	0	0	0	6	0	0	0	0	0	2	0	3	3	0	14
Grand Total	0	1	0	0	0	6	0	0	0	1	0	5	0	5	3	0	21
Apprch %	0	100	0	0	0	100	0	0	0	16.7	0	83.3	0	62.5	37.5	0	
Total %	0	4.8	0	0	0	28.6	0	0	0	4.8	0	23.8	0	23.8	14.3	0	

	Purchase Street From North					School Street From East					Arlington Street From South					School Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	**3**	**0**	**0**	**3**	0	0	0	0	0	0	0	**2**	**0**	**2**	**5**
05:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0	0	**3**	**6**
Total Volume	0	0	0	0	0	0	6	0	0	6	0	0	0	2	2	0	3	3	0	6	14
% App. Total	0	0	0	0		0	100	0	0		0	0	0	100		0	50	50	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.500	.500	.000	.250	.375	.000	.500	.583

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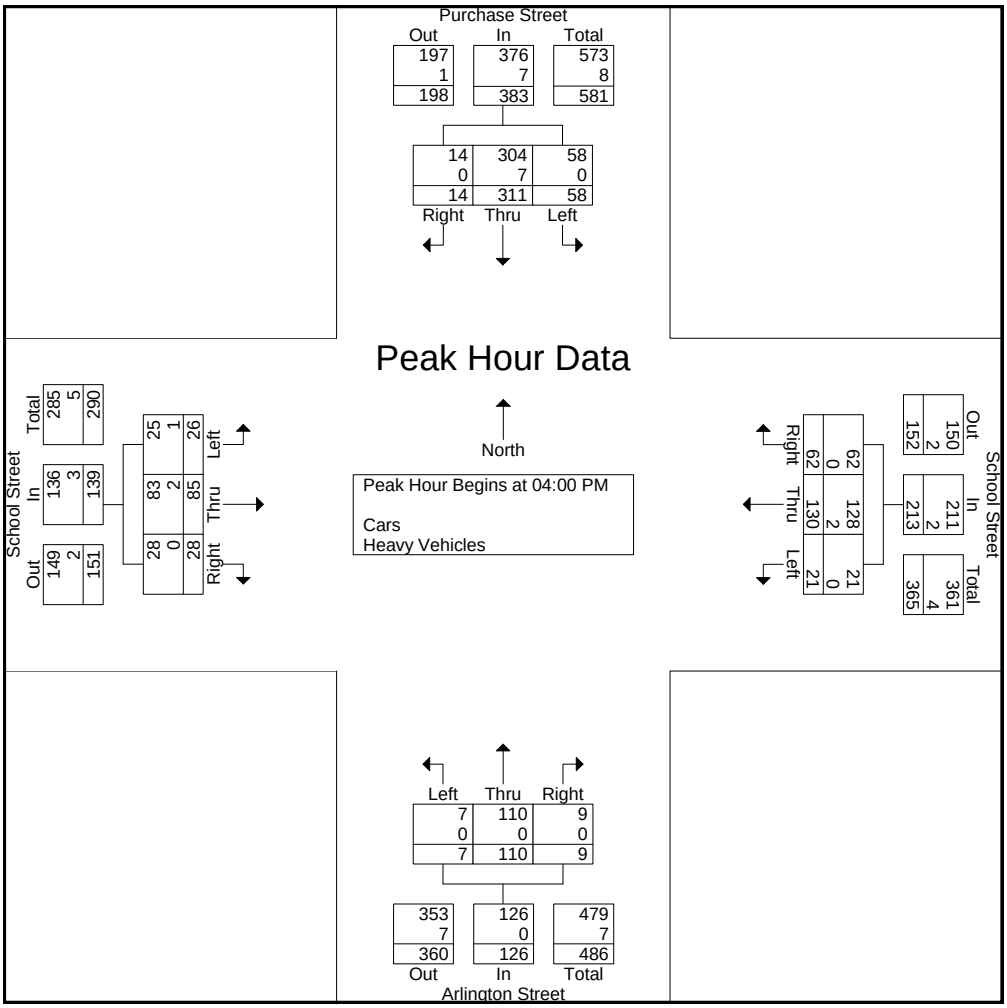
N/S: Purchase Street/Arlington Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-AAA
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Purchase Street From North				School Street From East				Arlington Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	77	15	93	19	**37**	7	63	**5**	**39**	1	**45**	3	25	4	32	**233**
04:15 PM	4	78	14	96	**25**	30	**9**	**64**	2	23	2	27	8	15	6	29	216
04:30 PM	3	77	12	92	9	36	3	48	2	15	**3**	20	**10**	13	**9**	32	192
04:45 PM	**6**	**79**	**17**	**102**	9	27	2	38	0	33	1	34	7	**32**	7	**46**	220
Total Volume	14	311	58	383	62	130	21	213	9	110	7	126	28	85	26	139	861
% App. Total	3.7	81.2	15.1		29.1	61	9.9		7.1	87.3	5.6		20.1	61.2	18.7		
PHF	.583	.984	.853	.939	.620	.878	.583	.832	.450	.705	.583	.700	.700	.664	.722	.755	.924
Cars	14	304	58	376	62	128	21	211	9	110	7	126	28	83	25	136	849
% Cars	100	97.7	100	98.2	100	98.5	100	99.1	100	100	100	100	100	97.6	96.2	97.8	98.6
Heavy Vehicles	0	7	0	7	0	2	0	2	0	0	0	0	0	2	1	3	12
% Heavy Vehicles	0	2.3	0	1.8	0	1.5	0	0.9	0	0	0	0	0	2.4	3.8	2.2	1.4



PRECISION DATA INDUSTRIES, LLC
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N/S: Broadway (Route 138)
E/W/SE: Washington Street/Randall Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-B
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	33	49	1	1	0	15	1	0	0	0	1	0	3	7	105	0	1	0	10	62	289
07:15 AM	46	83	3	2	1	14	2	0	0	2	1	1	3	4	124	2	1	1	32	64	386
07:30 AM	51	108	3	1	0	30	5	0	1	3	0	0	6	3	145	0	1	0	15	63	435
07:45 AM	63	81	0	0	0	32	7	0	1	2	4	2	8	4	116	0	0	0	17	61	398
Total	193	321	7	4	1	91	15	0	2	7	6	3	20	18	490	2	3	1	74	250	1508
08:00 AM	57	81	2	0	1	17	4	0	0	3	1	2	5	3	110	1	2	0	21	78	388
08:15 AM	53	69	1	0	1	18	3	1	0	0	0	5	7	8	97	1	0	0	14	59	337
08:30 AM	68	76	1	0	4	19	4	0	1	2	1	3	4	3	112	4	1	0	12	47	362
08:45 AM	63	98	1	2	0	19	3	0	0	4	1	3	5	8	108	1	0	0	23	60	399
Total	241	324	5	2	6	73	14	1	1	9	3	13	21	22	427	7	3	0	70	244	1486
Grand Total	434	645	12	6	7	164	29	1	3	16	9	16	41	40	917	9	6	1	144	494	2994
Apprch %	39.6	58.8	1.1	0.5	3.5	81.6	14.4	0.5	6.8	36.4	20.5	36.4	4.1	4	91.1	0.9	0.9	0.2	22.3	76.6	
Total %	14.5	21.5	0.4	0.2	0.2	5.5	1	0	0.1	0.5	0.3	0.5	1.4	1.3	30.6	0.3	0.2	0	4.8	16.5	
Cars	407	592	11	5	7	155	27	1	3	16	9	15	41	39	863	8	5	1	141	470	2816
% Cars	93.8	91.8	91.7	83.3	100	94.5	93.1	100	100	100	100	93.8	100	97.5	94.1	88.9	83.3	100	97.9	95.1	94.1
Heavy Vehicles	27	53	1	1	0	9	2	0	0	0	0	1	0	1	54	1	1	0	3	24	178
% Heavy Vehicles	6.2	8.2	8.3	16.7	0	5.5	6.9	0	0	0	0	6.2	0	2.5	5.9	11.1	16.7	0	2.1	4.9	5.9

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	46	83	**3**	**2**	**134**	**1**	**14**	**2**	**0**	**17**	**0**	**2**	**1**	**1**	**4**	**3**	**4**	124	**2**	**133**	**1**	**1**	**32**	64	98	386
07:30 AM	51	**108**	3	1	**163**	0	30	5	0	35	**1**	**3**	**0**	**0**	**4**	**6**	**3**	**145**	**0**	**154**	1	0	15	63	79	**435**
07:45 AM	**63**	**81**	**0**	**0**	**144**	**0**	**32**	**7**	0	**39**	**1**	**2**	**4**	**2**	**9**	**8**	**4**	116	0	128	0	0	17	61	78	398
08:00 AM	57	81	2	0	140	1	17	4	0	22	0	3	1	2	6	5	3	110	1	119	**2**	**0**	**21**	**78**	**101**	**388**
Total Volume	217	353	8	3	581	2	93	18	0	113	2	10	6	5	23	22	14	495	3	534	4	1	85	266	356	1607
% App. Total	37.3	60.8					82.3	15.9				43.5	26.1	21.7				92.7	0.6		1.1	0.3	23.9	74.7		
PHF	.861	.817	.667	.375	.891	.500	.727	.643	.000	.724	.500	.833	.375	.625		.688	.875	.853	.375	.867	.500	.250	.664	.853	.881	.924
Cars	208	330																467	3	506	3	1	83	254	341	1527
% Cars	95.9	93.5	87.5	66.7	94.1	100	98.9	94.4			100	100	100	80.0		100	100	94.3	100	94.8	75.0	100	97.6	95.5	95.8	95.0
Heavy Vehicles																										
% Heavy Vehicles	4.1	6.5	12.5	33.3	5.9	0	1.1	5.6	0	1.8	0	0	0	20.0	4.3	0	0	5.7	0	5.2	25.0	0	2.4	4.5	4.2	5.0

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File Name : 81676 K-B
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Cars

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	31	44	1	1	0	15	1	0	0	0	1	0	3	7	103	0	1	0	10	59	277
07:15 AM	45	79	3	1	1	14	2	0	0	2	1	1	3	4	117	2	1	1	31	60	368
07:30 AM	51	104	2	1	0	29	4	0	1	3	0	0	6	3	137	0	0	0	14	59	414
07:45 AM	62	73	0	0	0	32	7	0	1	2	4	1	8	4	109	0	0	0	17	59	379
Total	189	300	6	3	1	90	14	0	2	7	6	2	20	18	466	2	2	1	72	237	1438
08:00 AM	50	74	2	0	1	17	4	0	0	3	1	2	5	3	104	1	2	0	21	76	366
08:15 AM	50	64	1	0	1	17	3	1	0	0	0	5	7	8	87	1	0	0	13	55	313
08:30 AM	62	66	1	0	4	18	3	0	1	2	1	3	4	2	108	3	1	0	12	45	336
08:45 AM	56	88	1	2	0	13	3	0	0	4	1	3	5	8	98	1	0	0	23	57	363
Total	218	292	5	2	6	65	13	1	1	9	3	13	21	21	397	6	3	0	69	233	1378
Grand Total	407	592	11	5	7	155	27	1	3	16	9	15	41	39	863	8	5	1	141	470	2816
Apprch %	40.1	58.3	1.1	0.5	3.7	81.6	14.2	0.5	7	37.2	20.9	34.9	4.3	4.1	90.7	0.8	0.8	0.2	22.9	76.2	
Total %	14.5	21	0.4	0.2	0.2	5.5	1	0	0.1	0.6	0.3	0.5	1.5	1.4	30.6	0.3	0.2	0	5	16.7	

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	45	79	**3**	**1**	**128**	**1**	**14**	**2**	**0**	**17**	**0**	**2**	**1**	**1**	**4**	**3**	**4**	117	**2**	**126**	**1**	**1**	**31**	60	93	368
07:30 AM	51	**104**	2	1	**158**	0	29	4	0	33	**1**	**3**	**0**	**0**	**4**	**6**	**3**	**137**	**0**	**146**	0	0	14	59	73	**414**
07:45 AM	**62**	**73**	**0**	**0**	**135**	**0**	**32**	**7**	0	**39**	**1**	**2**	**4**	**1**	**8**	**8**	**4**	109	0	121	0	0	17	59	76	379
08:00 AM	50	74	2	0	126	1	17	4	0	22	0	3	1	**2**	6	5	3	104	1	113	**2**	**0**	**21**	**76**	**99**	**366**
Total Volume	208	330	7	2	547	2	92	17	0	111	2	10	6	4	22	22	14	467	3	506	3	1	83	254	341	1527
% App. Total		60.3					82.9	15.3				45.5	27.3	18.2				92.3	0.6		0.9	0.3	24.3	74.5		
PHF	.839	.793	.583	.500	.866	.500	.719	.607	.000	.712	.500	.833	.375	.500		.688	.875	.852	.375	.866	.375	.250	.669	.836	.861	.922

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N/S: Broadway (Route 138)
E/W/SE: Washington Street/Randall Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-B
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	2	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	12
07:15 AM	1	4	0	1	0	0	0	0	0	0	0	0	0	0	7	0	0	0	1	4	18
07:30 AM	0	4	1	0	0	1	1	0	0	0	0	0	0	0	8	0	1	0	1	4	21
07:45 AM	1	8	0	0	0	0	0	0	0	0	0	1	0	0	7	0	0	0	0	2	19
Total	4	21	1	1	0	1	1	0	0	0	0	1	0	0	24	0	1	0	2	13	70
08:00 AM	7	7	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	2	22
08:15 AM	3	5	0	0	0	1	0	0	0	0	0	0	0	0	10	0	0	0	1	4	24
08:30 AM	6	10	0	0	0	1	1	0	0	0	0	0	0	1	4	1	0	0	0	2	26
08:45 AM	7	10	0	0	0	6	0	0	0	0	0	0	0	0	10	0	0	0	0	3	36
Total	23	32	0	0	0	8	1	0	0	0	0	0	0	1	30	1	0	0	1	11	108
Grand Total	27	53	1	1	0	9	2	0	0	0	0	1	0	1	54	1	1	0	3	24	178
Apprch %	32.9	64.6	1.2	1.2	0	81.8	18.2	0	0	0	0	100	0	1.8	96.4	1.8	3.6	0	10.7	85.7	
Total %	15.2	29.8	0.6	0.6	0	5.1	1.1	0	0	0	0	0.6	0	0.6	30.3	0.6	0.6	0	1.7	13.5	

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	**7**	**7**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**6**	**0**	**0**	**0**	**2**	**2**	**22**
08:15 AM	3	5	0	0	8	0	1	0	0	1	0	0	0	0	0	0	0	**10**	**0**	**10**	0	0	**1**	**4**	**5**	**24**
08:30 AM	6	**10**	0	0	16	0	1	**1**	0	2	0	0	0	0	0	0	**1**	4	**1**	**6**	**0**	**0**	**0**	**2**	**2**	**26**
08:45 AM	7	10	0	0	**17**	0	**6**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**10**	**0**	**0**	**0**	**3**	**3**	**36**
Total Volume	23	32	0	0	55	0	8	1	0	9	0	0	0	0	0	0	1	30	1	32	0	0	1	11	12	108
% App. Total	41.8	58.2	0	0		0	88.9	11.1	0		0	0	0	0		0	3.1	93.8	3.1		0	0	8.3	91.7		
PHF	.821	.800	.000	.000	.809	.000	.333	.250	.000	.375	.000	.000	.000	.000		.000	.250	.750	.250	.800	.000	.000	.250	.688	.600	.750

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E/W/SE: Washington Street/Randall Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-B
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	2	0	0	0	0	2	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	10
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
07:45 AM	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	5	0	0	0	0	2	11
Total	0	0	0	0	4	0	0	0	0	3	0	0	0	0	4	0	0	0	0	9	0	0	0	0	3	23
08:00 AM	0	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	9
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
08:30 AM	1	0	0	0	3	0	0	0	0	0	0	0	0	0	7	0	0	0	0	4	0	0	0	0	0	15
08:45 AM	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	10
Total	1	1	0	0	8	0	1	0	0	1	0	0	0	0	7	0	0	0	0	13	0	0	0	0	5	37
Grand Total	1	1	0	0	12	0	1	0	0	4	0	0	0	0	11	0	0	0	0	22	0	0	0	0	8	60
Apprch %	7.1	7.1	0	0	85.7	0	20	0	0	80	0	0	0	0	100	0	0	0	0	100	0	0	0	0	100	
Total %	1.7	1.7	0	0	20	0	1.7	0	0	6.7	0	0	0	0	18.3	0	0	0	0	36.7	0	0	0	0	13.3	

	Broadway (Route 138) From North						Washington Street From East						Randall Street From Southeast						Broadway (Route 138) From South						Washington Street From West						
Start Time	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 07:45 AM																															
07:45 AM	0	0	0	0	2	2	0	0	0	**1**	1		0	0	0	0	1	1	0	0	0	0	**5**	**5**	0	0	0	0	2	2	11
08:00 AM	0	0	0	0	2	2	0	**1**	0	0	1	**2**	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	**4**	**4**	9
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3
08:30 AM	**1**	0	0	0	**3**	**4**	0	0	0	0	0	0	0	0	0	0	**7**	**7**	**0**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**15**
Total Volume	1	0	0	0	7	8	0	1	0	0	2	3	0	0	0	0	8	8	0	0	0	0	13	13	0	0	0	0	6	6	38
% App. Total	12.5	0	0	0	87.5		0	33.3	0	0	66.7		0	0	0	0	100		0	0	0	0	100		0	0	0	0	100		
PHF	.250	.000	.000	.000	.583	.500	.000	.250	.000	.000	.500	.375	.000	.000	.000	.000	.286	.286	.000	.000	.000	.000	.650	.650	.000	.000	.000	.000	.375	.375	.633

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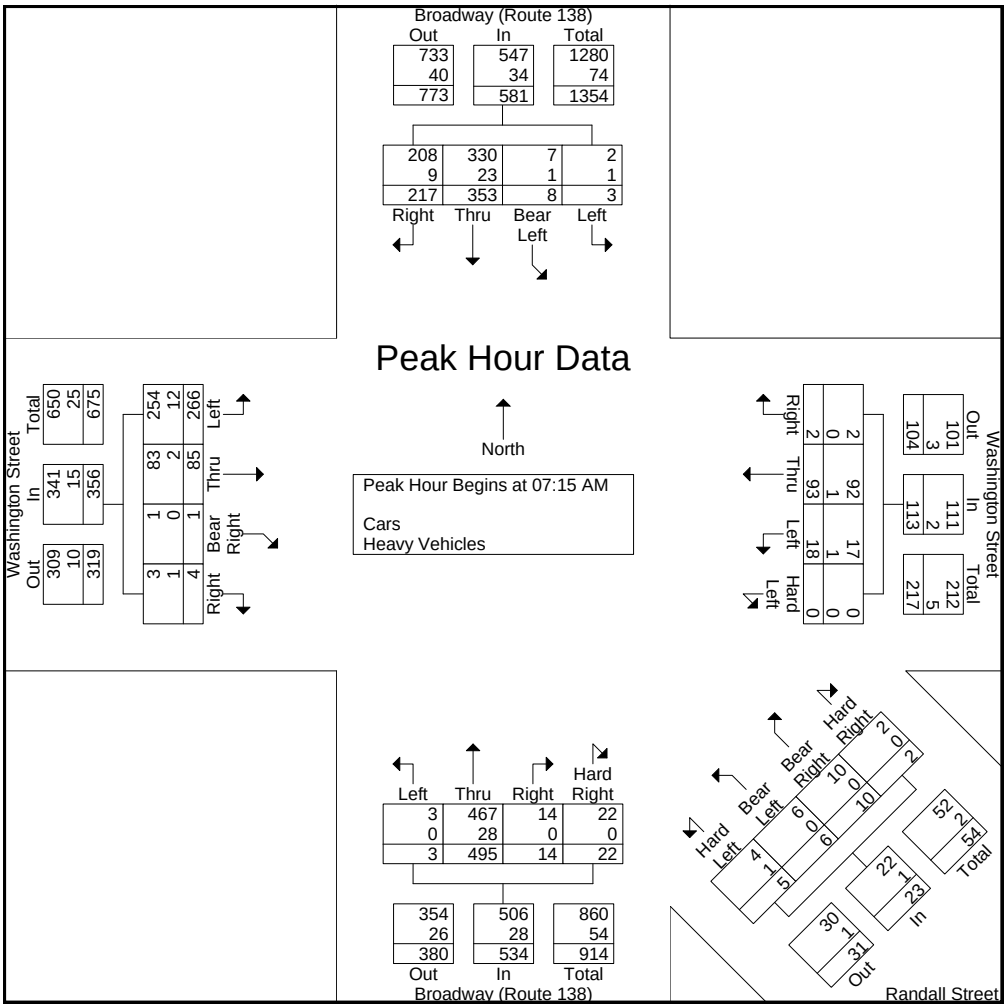
E/W/SE: Washington Street/Randall Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-B
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Start Time	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15 AM																										
07:15 AM	46	83	**3**	**2**	**134**	**1**	**14**	**2**	**0**	**17**	**0**	**2**	**1**	**1**	**4**	**3**	**4**	124	**2**	**133**	**1**	**1**	**32**	64	98	386
07:30 AM	51	**108**	3	1	**163**	0	30	5	0	35	**1**	**3**	**0**	**0**	**4**	**6**	**3**	**145**	**0**	**154**	1	0	15	63	79	**435**
07:45 AM	**63**	**81**	**0**	**0**	**144**	**0**	**32**	**7**	0	**39**	**1**	**2**	**4**	**2**	**9**	**8**	**4**	116	0	128	0	0	17	61	78	398
08:00 AM	57	81	2	0	140	1	17	4	0	22	0	3	1	2	6	5	3	110	1	119	**2**	**0**	**21**	**78**	**101**	**388**
Total Volume	217	353	8	3	581	2	93	18	0	113	2	10	6	5	23	22	14	495	3	534	4	1	85	266	356	1607
% App. Total	37.3	60.8					82.3	15.9				43.5	26.1	21.7				92.7	0.6		1.1	0.3	23.9	74.7		
PHF	.861	.817	.667	.375	.891	.500	.727	.643	.000	.724	.500	.833	.375	.625		.688	.875	.853	.375	.867	.500	.250	.664	.853	.881	.924
Cars	208	330																467	3	506	3	1	83	254	341	1527
% Cars	95.9	93.5	87.5	66.7	94.1	100	98.9	94.4			100	100	100	80.0		100	100	94.3	100	94.8	75.0	100	97.6	95.5	95.8	95.0
Heavy Vehicles																										
% Heavy Vehicles	4.1	6.5	12.5	33.3	5.9	0	1.1	5.6	0	1.8	0	0	0	20.0	4.3	0	0	5.7	0	5.2	25.0	0	2.4	4.5	4.2	5.0



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City, State: Tuanton, MA
Client: VHB/J. Quitter

File Name : 81676 K-BBB
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	86	112	3	0	0	40	10	0	0	2	0	1	3	7	125	2	2	0	42	73	508
04:15 PM	87	120	0	0	1	33	4	0	0	0	1	0	4	16	121	1	2	0	31	57	478
04:30 PM	95	112	2	1	0	34	11	0	0	3	1	2	3	12	126	2	2	1	40	70	517
04:45 PM	94	134	1	2	1	32	6	0	0	2	1	3	4	10	121	3	1	0	33	66	514
Total	362	478	6	3	2	139	31	0	0	7	3	6	14	45	493	8	7	1	146	266	2017
05:00 PM	99	115	0	19	0	40	12	0	1	4	0	1	5	15	114	1	0	0	36	77	539
05:15 PM	109	139	0	1	0	36	6	0	0	3	0	1	3	14	110	1	5	1	41	60	530
05:30 PM	103	120	0	0	0	28	5	0	0	0	1	0	3	8	102	0	1	1	27	46	445
05:45 PM	102	115	0	0	2	38	6	0	0	0	0	1	1	7	98	1	0	0	24	73	468
Total	413	489	0	20	2	142	29	0	1	7	1	3	12	44	424	3	6	2	128	256	1982
Grand Total	775	967	6	23	4	281	60	0	1	14	4	9	26	89	917	11	13	3	274	522	3999
Apprch %	43.8	54.6	0.3	1.3	1.2	81.4	17.4	0	3.6	50	14.3	32.1	2.5	8.5	87.9	1.1	1.6	0.4	33.7	64.3	
Total %	19.4	24.2	0.2	0.6	0.1	7	1.5	0	0	0.4	0.1	0.2	0.7	2.2	22.9	0.3	0.3	0.1	6.9	13.1	
Cars	751	931	6	21	3	275	59	0	1	14	4	9	24	88	889	9	13	3	268	510	3878
% Cars	96.9	96.3	100	91.3	75	97.9	98.3	0	100	100	100	100	92.3	98.9	96.9	81.8	100	100	97.8	97.7	97
Heavy Vehicles	24	36	0	2	1	6	1	0	0	0	0	0	2	1	28	2	0	0	6	12	121
% Heavy Vehicles	3.1	3.7	0	8.7	25	2.1	1.7	0	0	0	0	0	7.7	1.1	3.1	18.2	0	0	2.2	2.3	3

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	95	112	**2**	**1**	**210**	**0**	**34**	**11**	**0**	**45**	**0**	**3**	**1**	**2**	**6**	**3**	**12**	**126**	**2**	**143**	2	**1**	**40**	**70**	**113**	**517**
04:45 PM	94	134	1	2	231	**1**	**32**	**6**	**0**	**39**	**0**	**2**	**1**	**3**	6	4	10	121	**3**	**138**	**1**	**0**	**33**	**66**	**100**	**514**
05:00 PM	99	115	0	**19**	**233**	**0**	**40**	**12**	0	**52**	**1**	**4**	**0**	**1**	**6**	**5**	**15**	114	1	135	0	0	36	**77**	**113**	**539**
05:15 PM	**109**	**139**	0	1	**249**	0	36	6	0	42	0	3	0	1	4	3	14	110	1	128	**5**	**1**	**41**	60	107	530
Total Volume	397	500	3	23	923	1	142	35	0	178	1	12	2	7	22	15	51	471	7	544	8	2	150	273	433	2100
% App. Total		54.2					79.8	19.7				54.5	9.1	31.8				86.6	1.3		1.8	0.5	34.6			
PHF	.911	.899	.375	.303	.927	.250	.888	.729	.000	.856	.250	.750	.500	.583	.917	.750	.850	.935	.583	.951	.400	.500	.915	.886	.958	.974
Cars	384	482					139	35	0	174	1	12	2	7	22	13	50	458	5	526	8	2	148	267	425	2037
% Cars	96.7	96.4	100	91.3	96.4	0	97.9	100			100	100	100	100		86.7	98.0	97.2	71.4	96.7	100	100	98.7	97.8	98.2	97.0
Heavy Vehicles																										
% Heavy Vehicles	3.3	3.6	0	8.7	3.6	100	2.1	0	0	2.2	0	0	0	0	0	13.3	2.0	2.8	28.6	3.3	0	0	1.3	2.2	1.8	3.0

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Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	84	107	3	0	0	40	10	0	0	2	0	1	3	7	119	2	2	0	42	72	494
04:15 PM	85	115	0	0	1	32	3	0	0	0	1	0	4	16	113	1	2	0	29	54	456
04:30 PM	92	107	2	1	0	33	11	0	0	3	1	2	3	12	123	2	2	1	39	69	503
04:45 PM	89	129	1	2	0	32	6	0	0	2	1	3	3	10	118	1	1	0	33	66	497
Total	350	458	6	3	1	137	30	0	0	7	3	6	13	45	473	6	7	1	143	261	1950
05:00 PM	98	113	0	17	0	38	12	0	1	4	0	1	4	15	110	1	0	0	36	73	523
05:15 PM	105	133	0	1	0	36	6	0	0	3	0	1	3	13	107	1	5	1	40	59	514
05:30 PM	100	116	0	0	0	27	5	0	0	0	1	0	3	8	101	0	1	1	25	46	434
05:45 PM	98	111	0	0	2	37	6	0	0	0	0	1	1	7	98	1	0	0	24	71	457
Total	401	473	0	18	2	138	29	0	1	7	1	3	11	43	416	3	6	2	125	249	1928
Grand Total	751	931	6	21	3	275	59	0	1	14	4	9	24	88	889	9	13	3	268	510	3878
Apprch %	43.9	54.5	0.4	1.2	0.9	81.6	17.5	0	3.6	50	14.3	32.1	2.4	8.7	88	0.9	1.6	0.4	33.8	64.2	
Total %	19.4	24	0.2	0.5	0.1	7.1	1.5	0	0	0.4	0.1	0.2	0.6	2.3	22.9	0.2	0.3	0.1	6.9	13.2	

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	92	107	**2**	**1**	**202**	**0**	**33**	**11**	**0**	**44**	**0**	**3**	**1**	**2**	**6**	**3**	**12**	**123**	**2**	**140**	2	**1**	**39**	**69**	**111**	**503**
04:45 PM	89	129	1	2	221	0	32	6	0	38	0	2	1	**3**	6	3	10	118	1	132	1	0	33	66	100	497
05:00 PM	98	113	0	**17**	**228**	**0**	**38**	**12**	0	**50**	**1**	**4**	**0**	**1**	**6**	**4**	**15**	110	1	130	0	0	36	**73**	**109**	**523**
05:15 PM	**105**	**133**	0	1	**239**	0	36	6	0	42	0	3	0	1	4	3	13	107	1	124	**5**	**1**	**40**	59	105	514
Total Volume	384	482	3	21	890	0	139	35	0	174	1	12	2	7	22	13	50	458	5	526	8	2	148	267	425	2037
% App. Total	43.1	54.2					79.9	20.1				54.5	9.1	31.8				87.1	1		1.9	0.5	34.8	62.8		
PHF	.914	.906	.375	.309	.931	.000	.914	.729	.000	.870	.250	.750	.500	.583		.813	.833	.931	.625	.939	.400	.500	.925	.914	.957	.974

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N/S: Broadway (Route 138)
E/W/SE: Washington Street/Randall Street
City, State: Tuanton, MA
Client: VHB/J. Quitter

File Name : 81676 K-BBB
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North				Washington Street From East				Randall Street From Southeast				Broadway (Route 138) From South				Washington Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	2	5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	1	14
04:15 PM	2	5	0	0	0	1	1	0	0	0	0	0	0	0	8	0	0	0	2	3	22
04:30 PM	3	5	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	1	1	14
04:45 PM	5	5	0	0	1	0	0	0	0	0	0	0	1	0	3	2	0	0	0	0	17
Total	12	20	0	0	1	2	1	0	0	0	0	0	1	0	20	2	0	0	3	5	67
05:00 PM	1	2	0	2	0	2	0	0	0	0	0	0	1	0	4	0	0	0	0	4	16
05:15 PM	4	6	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	1	1	16
05:30 PM	3	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	11
05:45 PM	4	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	11
Total	12	16	0	2	0	4	0	0	0	0	0	0	1	1	8	0	0	0	3	7	54
Grand Total	24	36	0	2	1	6	1	0	0	0	0	0	2	1	28	2	0	0	6	12	121
Apprch %	38.7	58.1	0	3.2	12.5	75	12.5	0	0	0	0	0	6.1	3	84.8	6.1	0	0	33.3	66.7	
Total %	19.8	29.8	0	1.7	0.8	5	0.8	0	0	0	0	0	1.7	0.8	23.1	1.7	0	0	5	9.9	

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:15 PM																										
04:15 PM	2	**5**	0	0	7	0	1	**1**	0	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**8**	0	0	**2**	3	**5**	**22**
04:30 PM	3	5	0	0	8	0	1	0	0	1	0	0	0	0	0	0	0	3	0	3	0	0	1	1	2	14
04:45 PM	**5**	**5**	**0**	**0**	**10**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**2**	**6**	**0**	**0**	**0**	**0**	**0**	**17**
05:00 PM	1	2	0	**2**	**5**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**4**	**0**	**5**	**0**	**0**	**0**	**4**	**4**	**16**
Total Volume	11	17	0	2	30	1	4	1	0	6	0	0	0	0	0	2	0	18	2	22	0	0	3	8	11	69
% App. Total	36.7	56.7	0	6.7		16.7	66.7	16.7	0		0	0	0	0		9.1	0	81.8	9.1		0	0	27.3	72.7		
PHF	.550	.850	.000	.250	.750	.250	.500	.250	.000	.750	.000	.000	.000	.000		.500	.000	.563	.250	.688	.000	.000	.375	.500	.550	.784

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E/W/SE: Washington Street/Randall Street
City, State: Tuanton, MA
Client: VHB/J. Quitter

File Name : 81676 K-BBB
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
Start Time	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	1	1	0	0	1	0	1	0	0	1	0	0	0	0	2	0	0	0	0	4	0	0	0	0	0	11
04:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	7	0	0	0	0	1	0	0	1	0	2	14
04:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0	0	1	0	1	0	0	0	0	0	7
Total	1	1	0	0	1	0	1	2	0	6	0	0	0	0	12	0	0	1	0	6	0	0	1	0	2	34
05:00 PM	1	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	7
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1	0	0	4	0	0	0	0	1	10
05:45 PM	0	1	0	0	1	0	2	1	0	0	0	0	0	0	6	0	0	0	0	1	0	0	0	0	3	15
Total	2	2	0	0	4	0	2	1	0	1	0	0	0	0	9	0	2	0	0	6	0	0	0	0	4	33
Grand Total	3	3	0	0	5	0	3	3	0	7	0	0	0	0	21	0	2	1	0	12	0	0	1	0	6	67
Apprch %	27.3	27.3	0	0	45.5	0	23.1	23.1	0	53.8	0	0	0	0	100	0	13.3	6.7	0	80	0	0	14.3	0	85.7	
Total %	4.5	4.5	0	0	7.5	0	4.5	4.5	0	10.4	0	0	0	0	31.3	0	3	1.5	0	17.9	0	0	1.5	0	9	

	Broadway (Route 138) From North						Washington Street From East						Randall Street From Southeast						Broadway (Route 138) From South						Washington Street From West						
Start Time	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 04:15 PM																															
04:15 PM	**1**	**1**	0	0	1	**3**	0	**1**	0	0	1	2	0	0	0	0	2	2	0	0	0	0	**4**	**4**	0	0	0	0	0	0	11
04:30 PM	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	0	**7**	**7**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	0	**2**	**3**	**14**
04:45 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	3	3	0	0	**1**	0	1	2	0	0	0	0	0	0	7
05:00 PM	1	0	0	0	**2**	3	0	0	0	0	1	1	0	0	0	0	1	1	0	**1**	0	0	1	2	0	0	0	0	0	0	7
Total Volume	2	1	0	0	3	6	0	1	0	0	7	8	0	0	0	0	13	13	0	1	1	0	7	9	0	0	1	0	2	3	39
% App. Total	33.3	16.7	0	0	50		0	12.5	0	0	87.5		0	0	0	0	100		0	11.1	11.1	0	77.8		0	0	33.3	0	66.7		
PHF	.500	.250	.000	.000	.375	.500	.000	.250	.000	.000	.583	.667	.000	.000	.000	.000	.464	.464	.000	.250	.250	.000	.438	.563	.000	.000	.250	.000	.250	.250	.696

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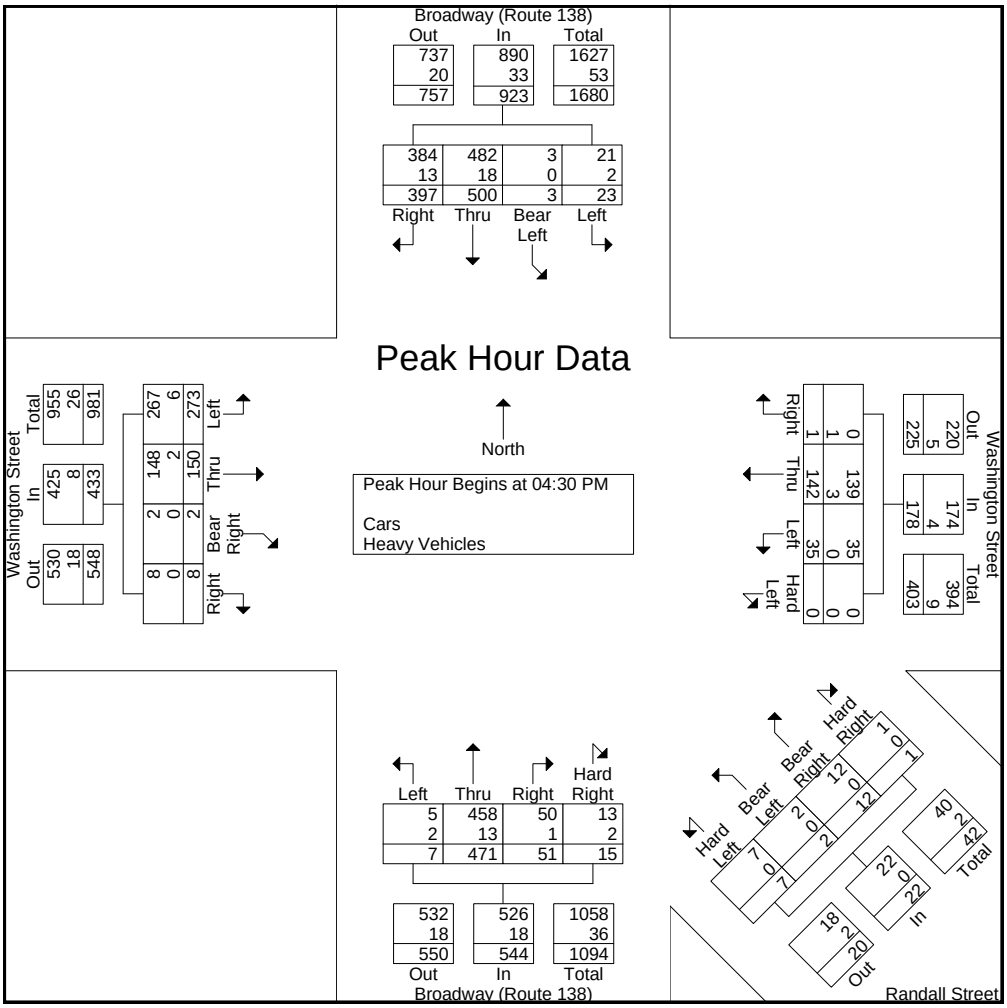
E/W/SE: Washington Street/Randall Street
City, State: Tuanton, MA
Client: VHB/J. Quitter

File Name : 81676 K-BBB
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Start Time	Broadway (Route 138) From North					Washington Street From East					Randall Street From Southeast					Broadway (Route 138) From South					Washington Street From West					
	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	95	112	**2**	**1**	**210**	**0**	**34**	**11**	**0**	**45**	**0**	**3**	**1**	**2**	**6**	**3**	**12**	**126**	**2**	**143**	2	**1**	**40**	**70**	**113**	**517**
04:45 PM	94	134	1	2	231	**1**	**32**	**6**	**0**	**39**	**0**	**2**	**1**	**3**	6	4	10	121	**3**	**138**	**1**	**0**	**33**	**66**	**100**	**514**
05:00 PM	99	115	0	**19**	**233**	**0**	**40**	**12**	0	**52**	**1**	**4**	**0**	**1**	**6**	**5**	**15**	114	1	135	0	0	36	**77**	**113**	**539**
05:15 PM	**109**	**139**	0	1	**249**	0	36	6	0	42	0	3	0	1	4	3	14	110	1	128	**5**	**1**	**41**	60	107	530
Total Volume	397	500	3	23	923	1	142	35	0	178	1	12	2	7	22	15	51	471	7	544	8	2	150	273	433	2100
% App. Total		54.2					79.8	19.7				54.5	9.1	31.8				86.6	1.3		1.8	0.5	34.6			
PHF	.911	.899	.375	.303	.927	.250	.888	.729	.000	.856	.250	.750	.500	.583	.917	.750	.850	.935	.583	.951	.400	.500	.915	.886	.958	.974
Cars	384	482					139	35	0	174	1	12	2	7	22	13	50	458	5	526	8	2	148	267	425	2037
% Cars	96.7	96.4	100	91.3	96.4	0	97.9	100			100	100	100	100		86.7	98.0	97.2	71.4	96.7	100	100	98.7	97.8	98.2	97.0
Heavy Vehicles																										
% Heavy Vehicles	3.3	3.6	0	8.7	3.6	100	2.1	0	0	2.2	0	0	0	0	0	13.3	2.0	2.8	28.6	3.3	0	0	1.3	2.2	1.8	3.0



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N/S: Washington Street
E/W: Purchase Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-C
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	15	4	12	12	3	6	13	1	2	28	1	99
07:15 AM	7	16	8	8	39	10	17	19	1	0	38	0	163
07:30 AM	2	13	27	11	49	6	11	16	0	0	22	0	157
07:45 AM	2	8	46	8	21	4	6	15	2	2	19	1	134
Total	13	52	85	39	121	23	40	63	4	4	107	2	553
08:00 AM	0	7	17	9	17	1	8	9	0	1	20	0	89
08:15 AM	3	16	27	6	20	3	7	14	0	0	22	1	119
08:30 AM	1	11	25	12	30	4	7	14	1	0	13	1	119
08:45 AM	2	16	28	3	14	5	10	11	2	3	17	0	111
Total	6	50	97	30	81	13	32	48	3	4	72	2	438
Grand Total	19	102	182	69	202	36	72	111	7	8	179	4	991
Apprch %	6.3	33.7	60.1	22.5	65.8	11.7	37.9	58.4	3.7	4.2	93.7	2.1	
Total %	1.9	10.3	18.4	7	20.4	3.6	7.3	11.2	0.7	0.8	18.1	0.4	
Cars	19	101	174	69	199	36	71	109	7	6	177	4	972
% Cars	100	99	95.6	100	98.5	100	98.6	98.2	100	75	98.9	100	98.1
Heavy Vehicles	0	1	8	0	3	0	1	2	0	2	2	0	19
% Heavy Vehicles	0	1	4.4	0	1.5	0	1.4	1.8	0	25	1.1	0	1.9

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	15	4	21	**12**	12	3	27	6	13	1	20	**2**	28	**1**	31	99
07:15 AM	**7**	**16**	8	31	8	39	**10**	57	**17**	**19**	1	**37**	0	**38**	0	**38**	**163**
07:30 AM	2	13	27	42	11	**49**	6	**66**	11	16	0	27	0	22	0	22	157
07:45 AM	2	8	**46**	**56**	8	21	4	33	6	15	**2**	23	2	19	1	22	134
Total Volume	13	52	85	150	39	121	23	183	40	63	4	107	4	107	2	113	553
% App. Total	8.7	34.7	56.7		21.3	66.1	12.6		37.4	58.9	3.7		3.5	94.7	1.8		
PHF	.464	.813	.462	.670	.813	.617	.575	.693	.588	.829	.500	.723	.500	.704	.500	.743	.848
Cars	13	51	83	147	39	120	23	182	40	63	4	107	3	107	2	112	548
% Cars	100	98.1	97.6	98.0	100	99.2	100	99.5	100	100	100	100	75.0	100	100	99.1	99.1
Heavy Vehicles	0	1	2	3	0	1	0	1	0	0	0	0	1	0	0	1	5
% Heavy Vehicles	0	1.9	2.4	2.0	0	0.8	0	0.5	0	0	0	0	25.0	0	0	0.9	0.9

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-C
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Cars

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	15	4	12	12	3	6	13	1	1	28	1	98
07:15 AM	7	15	8	8	38	10	17	19	1	0	38	0	161
07:30 AM	2	13	26	11	49	6	11	16	0	0	22	0	156
07:45 AM	2	8	45	8	21	4	6	15	2	2	19	1	133
Total	13	51	83	39	120	23	40	63	4	3	107	2	548
08:00 AM	0	7	17	9	17	1	8	9	0	1	20	0	89
08:15 AM	3	16	26	6	19	3	6	14	0	0	22	1	116
08:30 AM	1	11	21	12	29	4	7	14	1	0	12	1	113
08:45 AM	2	16	27	3	14	5	10	9	2	2	16	0	106
Total	6	50	91	30	79	13	31	46	3	3	70	2	424
Grand Total	19	101	174	69	199	36	71	109	7	6	177	4	972
Apprch %	6.5	34.4	59.2	22.7	65.5	11.8	38	58.3	3.7	3.2	94.7	2.1	
Total %	2	10.4	17.9	7.1	20.5	3.7	7.3	11.2	0.7	0.6	18.2	0.4	

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	**15**	4	21	**12**	12	3	27	6	13	1	20	1	28	**1**	30	98
07:15 AM	**7**	15	8	30	8	38	**10**	56	**17**	**19**	1	**37**	0	**38**	0	**38**	**161**
07:30 AM	2	13	26	41	11	**49**	6	**66**	11	16	0	27	0	22	0	22	156
07:45 AM	2	8	**45**	**55**	8	21	4	33	6	15	**2**	23	**2**	19	1	22	133
Total Volume	13	51	83	147	39	120	23	182	40	63	4	107	3	107	2	112	548
% App. Total	8.8	34.7	56.5		21.4	65.9	12.6		37.4	58.9	3.7		2.7	95.5	1.8		
PHF	.464	.850	.461	.668	.813	.612	.575	.689	.588	.829	.500	.723	.375	.704	.500	.737	.851

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-C
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
07:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	1	2	0	1	0	0	0	0	1	0	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	0	1	0	1	0	0	0	0	0	3
08:30 AM	0	0	4	0	1	0	0	0	0	0	1	0	6
08:45 AM	0	0	1	0	0	0	0	2	0	1	1	0	5
Total	0	0	6	0	2	0	1	2	0	1	2	0	14
Grand Total	0	1	8	0	3	0	1	2	0	2	2	0	19
Apprch %	0	11.1	88.9	0	100	0	33.3	66.7	0	50	50	0	
Total %	0	5.3	42.1	0	15.8	0	5.3	10.5	0	10.5	10.5	0	

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	1	0	**1**	0	**1**	**1**	0	0	1	0	0	0	0	3
08:30 AM	0	0	**4**	**4**	0	1	0	1	0	0	0	0	0	**1**	0	1	**6**
08:45 AM	0	0	1	1	0	0	0	0	0	**2**	0	**2**	**1**	1	0	**2**	5
Total Volume	0	0	6	6	0	2	0	2	1	2	0	3	1	2	0	3	14
% App. Total	0	0	100		0	100	0		33.3	66.7	0		33.3	66.7	0		
PHF	.000	.000	.375	.375	.000	.500	.000	.500	.250	.250	.000	.375	.250	.500	.000	.375	.583

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Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
07:15 AM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	5
07:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	3
07:45 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	3
Total	0	0	2	2	0	0	0	5	0	0	0	0	0	2	0	3	14
08:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
08:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	10
Grand Total	0	0	3	2	0	0	0	14	0	0	0	0	0	2	0	3	24
Apprch %	0	0	60	40	0	0	0	100	0	0	0	0	0	40	0	60	
Total %	0	0	12.5	8.3	0	0	0	58.3	0	0	0	0	0	8.3	0	12.5	

	Washington Street From North					Purchase Street From East					Washington Street From South					Purchase Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**2**	**2**	3
07:15 AM	0	0	0	**1**	**1**	**0**	**0**	**0**	**4**	**4**	0	0	0	0	0	0	0	0	0	0	**5**
07:30 AM	0	0	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0	0	2	3
07:45 AM	0	0	1	1	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
Total Volume	0	0	2	2	4	0	0	0	5	5	0	0	0	0	0	0	2	0	3	5	14
% App. Total	0	0	50	50		0	0	0	100		0	0	0	0		0	40	0	60		
PHF	.000	.000	.500	.500	.500	.000	.000	.000	.313	.313	.000	.000	.000	.000	.000	.000	.250	.000	.375	.625	.700

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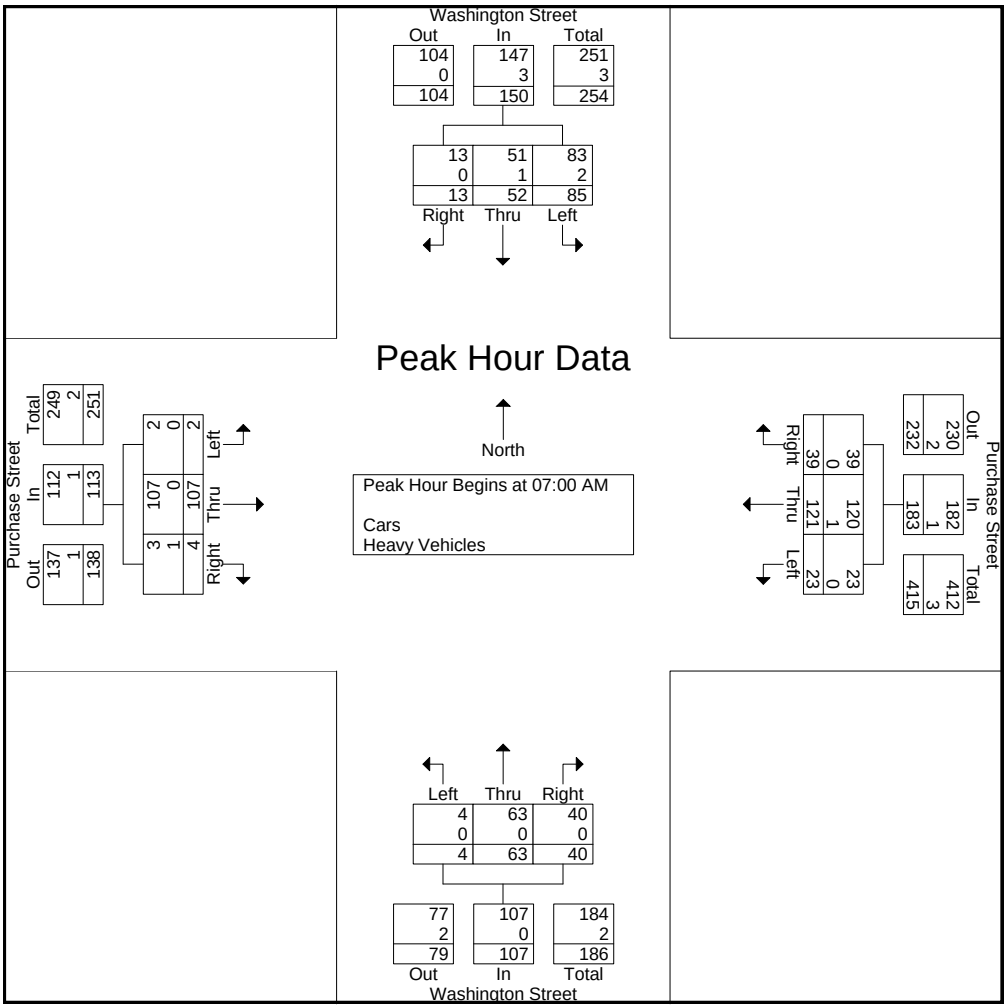
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	15	4	21	**12**	12	3	27	6	13	1	20	**2**	28	**1**	31	99
07:15 AM	**7**	**16**	8	31	8	39	**10**	57	**17**	**19**	1	**37**	0	**38**	0	**38**	**163**
07:30 AM	2	13	27	42	11	**49**	6	**66**	11	16	0	27	0	22	0	22	157
07:45 AM	2	8	**46**	**56**	8	21	4	33	6	15	**2**	23	2	19	1	22	134
Total Volume	13	52	85	150	39	121	23	183	40	63	4	107	4	107	2	113	553
% App. Total	8.7	34.7	56.7		21.3	66.1	12.6		37.4	58.9	3.7		3.5	94.7	1.8		
PHF	.464	.813	.462	.670	.813	.617	.575	.693	.588	.829	.500	.723	.500	.704	.500	.743	.848
Cars	13	51	83	147	39	120	23	182	40	63	4	107	3	107	2	112	548
% Cars	100	98.1	97.6	98.0	100	99.2	100	99.5	100	100	100	100	75.0	100	100	99.1	99.1
Heavy Vehicles	0	1	2	3	0	1	0	1	0	0	0	0	1	0	0	1	5
% Heavy Vehicles	0	1.9	2.4	2.0	0	0.8	0	0.5	0	0	0	0	25.0	0	0	0.9	0.9



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Client: VHB/J. Quitter

File Name : 81676 K-CCC
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	29	63	17	31	12	10	20	1	2	31	1	219
04:15 PM	2	22	61	9	24	11	15	16	2	2	21	1	186
04:30 PM	1	30	61	8	23	5	14	16	3	3	25	3	192
04:45 PM	1	28	75	10	20	12	8	17	1	0	16	0	188
Total	6	109	260	44	98	40	47	69	7	7	93	5	785
05:00 PM	2	22	33	5	17	11	12	18	2	1	21	2	146
05:15 PM	2	25	10	5	9	12	18	9	0	1	17	4	112
05:30 PM	0	32	7	9	19	4	6	10	1	3	16	0	107
05:45 PM	1	25	9	9	20	5	9	15	3	2	19	0	117
Total	5	104	59	28	65	32	45	52	6	7	73	6	482
Grand Total	11	213	319	72	163	72	92	121	13	14	166	11	1267
Apprch %	2	39.2	58.7	23.5	53.1	23.5	40.7	53.5	5.8	7.3	86.9	5.8	
Total %	0.9	16.8	25.2	5.7	12.9	5.7	7.3	9.6	1	1.1	13.1	0.9	
Cars	11	212	311	71	162	72	92	119	13	14	165	11	1253
% Cars	100	99.5	97.5	98.6	99.4	100	100	98.3	100	100	99.4	100	98.9
Heavy Vehicles	0	1	8	1	1	0	0	2	0	0	1	0	14
% Heavy Vehicles	0	0.5	2.5	1.4	0.6	0	0	1.7	0	0	0.6	0	1.1

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	29	63	94	**17**	**31**	**12**	**60**	10	**20**	1	31	2	**31**	1	**34**	**219**
04:15 PM	2	22	61	85	9	24	11	44	**15**	16	2	**33**	2	21	1	24	186
04:30 PM	1	**30**	61	92	8	23	5	36	14	16	**3**	33	**3**	25	**3**	31	192
04:45 PM	1	28	**75**	**104**	10	20	12	42	8	17	1	26	0	16	0	16	188
Total Volume	6	109	260	375	44	98	40	182	47	69	7	123	7	93	5	105	785
% App. Total	1.6	29.1	69.3		24.2	53.8	22		38.2	56.1	5.7		6.7	88.6	4.8		
PHF	.750	.908	.867	.901	.647	.790	.833	.758	.783	.863	.583	.932	.583	.750	.417	.772	.896
Cars	6	109	254	369	44	97	40	181	47	67	7	121	7	92	5	104	775
% Cars	100	100	97.7	98.4	100	99.0	100	99.5	100	97.1	100	98.4	100	98.9	100	99.0	98.7
Heavy Vehicles	0	0	6	6	0	1	0	1	0	2	0	2	0	1	0	1	10
% Heavy Vehicles	0	0	2.3	1.6	0	1.0	0	0.5	0	2.9	0	1.6	0	1.1	0	1.0	1.3

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Client: VHB/J. Quitter

File Name : 81676 K-CCC
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	29	61	17	31	12	10	20	1	2	30	1	216
04:15 PM	2	22	59	9	24	11	15	15	2	2	21	1	183
04:30 PM	1	30	61	8	22	5	14	15	3	3	25	3	190
04:45 PM	1	28	73	10	20	12	8	17	1	0	16	0	186
Total	6	109	254	44	97	40	47	67	7	7	92	5	775
05:00 PM	2	22	31	4	17	11	12	18	2	1	21	2	143
05:15 PM	2	25	10	5	9	12	18	9	0	1	17	4	112
05:30 PM	0	31	7	9	19	4	6	10	1	3	16	0	106
05:45 PM	1	25	9	9	20	5	9	15	3	2	19	0	117
Total	5	103	57	27	65	32	45	52	6	7	73	6	478
Grand Total	11	212	311	71	162	72	92	119	13	14	165	11	1253
Apprch %	2.1	39.7	58.2	23.3	53.1	23.6	41.1	53.1	5.8	7.4	86.8	5.8	
Total %	0.9	16.9	24.8	5.7	12.9	5.7	7.3	9.5	1	1.1	13.2	0.9	

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	29	61	92	**17**	**31**	**12**	**60**	10	**20**	1	31	2	**30**	1	**33**	**216**
04:15 PM	2	22	59	83	9	24	11	44	**15**	15	2	**32**	2	21	1	24	183
04:30 PM	1	**30**	61	92	8	22	5	35	14	15	**3**	32	**3**	25	**3**	31	190
04:45 PM	1	28	**73**	**102**	10	20	12	42	8	17	1	26	0	16	0	16	186
Total Volume	6	109	254	369	44	97	40	181	47	67	7	121	7	92	5	104	775
% App. Total	1.6	29.5	68.8		24.3	53.6	22.1		38.8	55.4	5.8		6.7	88.5	4.8		
PHF	.750	.908	.870	.904	.647	.782	.833	.754	.783	.838	.583	.945	.583	.767	.417	.788	.897

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File Name : 81676 K-CCC
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Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Purchase Street From East			Washington Street From South			Purchase Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	2	0	0	0	0	0	0	0	1	0	3
04:15 PM	0	0	2	0	0	0	0	1	0	0	0	0	3
04:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
04:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	2
Total	0	0	6	0	1	0	0	2	0	0	1	0	10
05:00 PM	0	0	2	1	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	2	1	0	0	0	0	0	0	0	0	4
Grand Total	0	1	8	1	1	0	0	2	0	0	1	0	14
Apprch %	0	11.1	88.9	50	50	0	0	100	0	0	100	0	
Total %	0	7.1	57.1	7.1	7.1	0	0	14.3	0	0	7.1	0	

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**3**
04:15 PM	0	0	2	2	0	0	0	0	0	**1**	0	**1**	0	0	0	0	3
04:30 PM	0	0	0	0	0	**1**	0	**1**	0	1	0	1	0	0	0	0	2
04:45 PM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	6	6	0	1	0	1	0	2	0	2	0	1	0	1	10
% App. Total	0	0	100		0	100	0		0	100	0		0	100	0		
PHF	.000	.000	.750	.750	.000	.250	.000	.250	.000	.500	.000	.500	.000	.250	.000	.250	.833

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File Name : 81676 K-CCC
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Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
04:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	3
05:00 PM	0	2	0	0	1	0	0	3	0	1	0	0	0	0	0	0	7
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	1	1	0	0	3	0	1	0	0	0	0	0	1	9
Grand Total	0	2	0	2	1	0	0	3	0	2	0	0	0	0	1	1	12
Apprch %	0	50	0	50	25	0	0	75	0	100	0	0	0	0	50	50	
Total %	0	16.7	0	16.7	8.3	0	0	25	0	16.7	0	0	0	0	8.3	8.3	

	Washington Street From North					Purchase Street From East					Washington Street From South					Purchase Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	**1**	**0**	**1**	2
04:30 PM	0	0	0	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
05:00 PM	**0**	**2**	0	0	**2**	**1**	0	0	**3**	**4**	0	1	0	0	1	0	0	0	0	0	**7**
Total Volume	0	2	0	1	3	1	0	0	3	4	0	2	0	0	2	0	0	1	0	1	10
% App. Total	0	66.7	0	33.3		25	0	0	75		0	100	0	0		0	0	100	0		
PHF	.000	.250	.000	.250	.375	.250	.000	.000	.250	.250	.000	.500	.000	.000	.500	.000	.000	.250	.000	.250	.357

PRECISION DATA INDUSTRIES, LLC
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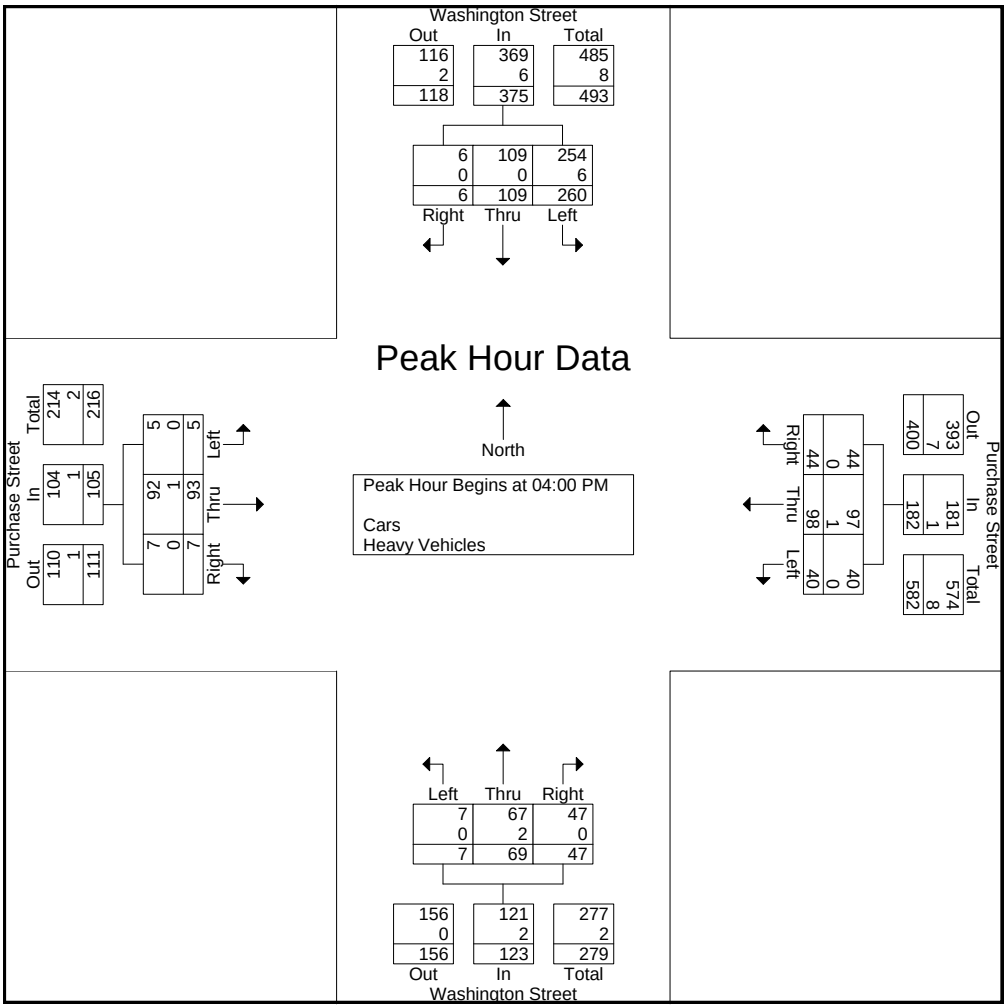
N/S: Washington Street
E/W: Purchase Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-CCC
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Washington Street From North				Purchase Street From East				Washington Street From South				Purchase Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	29	63	94	**17**	**31**	**12**	**60**	10	**20**	1	31	2	**31**	1	**34**	**219**
04:15 PM	2	22	61	85	9	24	11	44	**15**	16	2	**33**	2	21	1	24	186
04:30 PM	1	**30**	61	92	8	23	5	36	14	16	**3**	33	**3**	25	**3**	31	192
04:45 PM	1	28	**75**	**104**	10	20	12	42	8	17	1	26	0	16	0	16	188
Total Volume	6	109	260	375	44	98	40	182	47	69	7	123	7	93	5	105	785
% App. Total	1.6	29.1	69.3		24.2	53.8	22		38.2	56.1	5.7		6.7	88.6	4.8		
PHF	.750	.908	.867	.901	.647	.790	.833	.758	.783	.863	.583	.932	.583	.750	.417	.772	.896
Cars	6	109	254	369	44	97	40	181	47	67	7	121	7	92	5	104	775
% Cars	100	100	97.7	98.4	100	99.0	100	99.5	100	97.1	100	98.4	100	98.9	100	99.0	98.7
Heavy Vehicles	0	0	6	6	0	1	0	1	0	2	0	2	0	1	0	1	10
% Heavy Vehicles	0	0	2.3	1.6	0	1.0	0	0.5	0	2.9	0	1.6	0	1.1	0	1.0	1.3



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N/S: Dean Street (Rte 104)/Driveway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-D
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dean Street (Route 104) From North			Cape Road (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	35	0	4	2	145	0	0	0	0	0	206	37	429
07:15 AM	45	0	8	4	172	0	0	0	0	0	211	36	476
07:30 AM	41	1	8	5	189	0	0	0	0	1	282	46	573
07:45 AM	35	0	7	4	180	0	0	0	2	0	241	52	521
Total	156	1	27	15	686	0	0	0	2	1	940	171	1999
08:00 AM	49	1	7	7	154	0	0	0	0	0	219	36	473
08:15 AM	41	0	8	6	177	0	0	0	1	1	208	48	490
08:30 AM	36	1	8	8	172	0	1	0	0	1	234	28	489
08:45 AM	45	1	8	6	185	0	0	0	2	4	222	36	509
Total	171	3	31	27	688	0	1	0	3	6	883	148	1961
Grand Total	327	4	58	42	1374	0	1	0	5	7	1823	319	3960
Apprch %	84.1	1	14.9	3	97	0	16.7	0	83.3	0.3	84.8	14.8	
Total %	8.3	0.1	1.5	1.1	34.7	0	0	0	0.1	0.2	46	8.1	
Cars	314	4	55	39	1323	0	1	0	5	7	1762	309	3819
% Cars	96	100	94.8	92.9	96.3	0	100	0	100	100	96.7	96.9	96.4
Heavy Vehicles	13	0	3	3	51	0	0	0	0	0	61	10	141
% Heavy Vehicles	4	0	5.2	7.1	3.7	0	0	0	0	0	3.3	3.1	3.6

	Dean Street (Route 104) From North				Cape Road (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	41	**1**	**8**	50	5	**189**	0	**194**	0	0	0	0	**1**	**282**	46	**329**	**573**
07:45 AM	35	0	7	42	4	180	0	184	0	0	**2**	**2**	0	241	**52**	293	521
08:00 AM	**49**	1	7	**57**	**7**	154	0	161	0	0	0	0	0	219	36	255	473
08:15 AM	41	0	8	49	6	177	0	183	0	0	1	1	1	208	48	257	490
Total Volume	166	2	30	198	22	700	0	722	0	0	3	3	2	950	182	1134	2057
% App. Total	83.8	1	15.2		3	97	0		0	0	100		0.2	83.8	16		
PHF	.847	.500	.938	.868	.786	.926	.000	.930	.000	.000	.375	.375	.500	.842	.875	.862	.897
Cars	159	2	27	188	22	674	0	696	0	0	3	3	2	922	175	1099	1986
% Cars	95.8	100	90.0	94.9	100	96.3	0	96.4	0	0	100	100	100	97.1	96.2	96.9	96.5
Heavy Vehicles	7	0	3	10	0	26	0	26	0	0	0	0	0	28	7	35	71
% Heavy Vehicles	4.2	0	10.0	5.1	0	3.7	0	3.6	0	0	0	0	0	2.9	3.8	3.1	3.5

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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-D
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Dean Street (Route 104) From North			Cape Road (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	35	0	4	2	141	0	0	0	0	0	196	37	415
07:15 AM	44	0	8	4	163	0	0	0	0	0	204	36	459
07:30 AM	41	1	8	5	186	0	0	0	0	1	271	46	559
07:45 AM	33	0	6	4	173	0	0	0	2	0	234	48	500
Total	153	1	26	15	663	0	0	0	2	1	905	167	1933
08:00 AM	46	1	6	7	147	0	0	0	0	0	212	35	454
08:15 AM	39	0	7	6	168	0	0	0	1	1	205	46	473
08:30 AM	33	1	8	6	168	0	1	0	0	1	227	27	472
08:45 AM	43	1	8	5	177	0	0	0	2	4	213	34	487
Total	161	3	29	24	660	0	1	0	3	6	857	142	1886
Grand Total	314	4	55	39	1323	0	1	0	5	7	1762	309	3819
Apprch %	84.2	1.1	14.7	2.9	97.1	0	16.7	0	83.3	0.3	84.8	14.9	
Total %	8.2	0.1	1.4	1	34.6	0	0	0	0.1	0.2	46.1	8.1	

	Dean Street (Route 104) From North				Cape Road (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	41	**1**	**8**	50	5	**186**	0	**191**	0	0	0	0	**1**	**271**	46	**318**	**559**
07:45 AM	33	0	6	39	4	173	0	177	0	0	**2**	**2**	0	234	**48**	282	500
08:00 AM	**46**	1	6	**53**	**7**	147	0	154	0	0	0	0	0	212	35	247	454
08:15 AM	39	0	7	46	6	168	0	174	0	0	1	1	1	205	46	252	473
Total Volume	159	2	27	188	22	674	0	696	0	0	3	3	2	922	175	1099	1986
% App. Total	84.6	1.1	14.4		3.2	96.8	0		0	0	100		0.2	83.9	15.9		
PHF	.864	.500	.844	.887	.786	.906	.000	.911	.000	.000	.375	.375	.500	.851	.911	.864	.888

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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-D
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Dean Street (Route 104) From North			Cape Road (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	4	0	0	0	0	0	10	0	14
07:15 AM	1	0	0	0	9	0	0	0	0	0	7	0	17
07:30 AM	0	0	0	0	3	0	0	0	0	0	11	0	14
07:45 AM	2	0	1	0	7	0	0	0	0	0	7	4	21
Total	3	0	1	0	23	0	0	0	0	0	35	4	66
08:00 AM	3	0	1	0	7	0	0	0	0	0	7	1	19
08:15 AM	2	0	1	0	9	0	0	0	0	0	3	2	17
08:30 AM	3	0	0	2	4	0	0	0	0	0	7	1	17
08:45 AM	2	0	0	1	8	0	0	0	0	0	9	2	22
Total	10	0	2	3	28	0	0	0	0	0	26	6	75
Grand Total	13	0	3	3	51	0	0	0	0	0	61	10	141
Apprch %	81.2	0	18.8	5.6	94.4	0	0	0	0	0	85.9	14.1	
Total %	9.2	0	2.1	2.1	36.2	0	0	0	0	0	43.3	7.1	

	Dean Street (Route 104) From North				Cape Road (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**3**	0	**1**	**4**	0	7	0	7	0	0	0	0	0	7	1	8	19
08:15 AM	2	0	1	3	0	**9**	0	**9**	0	0	0	0	0	3	**2**	5	17
08:30 AM	3	0	0	3	**2**	4	0	6	0	0	0	0	0	7	1	8	17
08:45 AM	2	0	0	2	1	8	0	9	0	0	0	0	0	**9**	2	**11**	**22**
Total Volume	10	0	2	12	3	28	0	31	0	0	0	0	0	26	6	32	75
% App. Total	83.3	0	16.7		9.7	90.3	0		0	0	0		0	81.2	18.8		
PHF	.833	.000	.500	.750	.375	.778	.000	.861	.000	.000	.000	.000	.000	.722	.750	.727	.852

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N/S: Dean Street (Rte 104)/Driveway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-D
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Dean Street (Route 104) From North				Cape Road (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	2	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
08:15 AM	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	4
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	7
Grand Total	3	0	0	2	0	1	0	0	0	0	0	2	0	1	0	2	11
Apprch %	60	0	0	40	0	100	0	0	0	0	0	100	0	33.3	0	66.7	
Total %	27.3	0	0	18.2	0	9.1	0	0	0	0	0	18.2	0	9.1	0	18.2	

	Dean Street (Route 104) From North					Cape Road (Route 44) From East					Greenhouse Driveway From South					Dean Street (Route 44/104) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	**1**	**2**
08:15 AM	**1**	**0**	**0**	**1**	**2**	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	**4**
Total Volume	1	0	0	1	2	0	0	0	0	0	0	0	0	2	2	0	1	0	2	3	7
% App. Total	50	0	0	50		0	0	0	0		0	0	0	100		0	33.3	0	66.7		
PHF	.250	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.250	.000	.500	.750	.438

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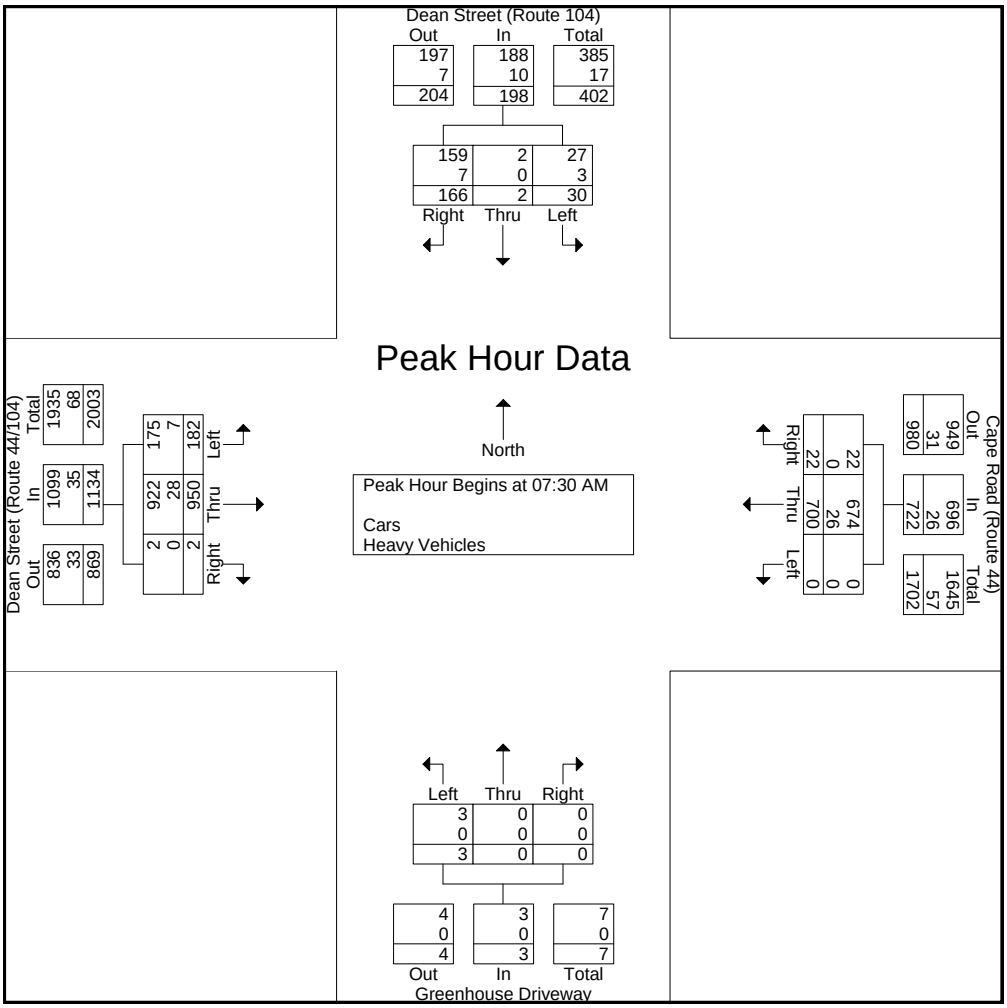
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-D
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Dean Street (Route 104) From North				Cape Road (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	41	**1**	**8**	50	5	**189**	0	**194**	0	0	0	0	**1**	**282**	46	**329**	**573**
07:45 AM	35	0	7	42	4	180	0	184	0	0	**2**	**2**	0	241	**52**	293	521
08:00 AM	**49**	1	7	**57**	**7**	154	0	161	0	0	0	0	0	219	36	255	473
08:15 AM	41	0	8	49	6	177	0	183	0	0	1	1	1	208	48	257	490
Total Volume	166	2	30	198	22	700	0	722	0	0	3	3	2	950	182	1134	2057
% App. Total	83.8	1	15.2		3	97	0		0	0	100		0.2	83.8	16		
PHF	.847	.500	.938	.868	.786	.926	.000	.930	.000	.000	.375	.375	.500	.842	.875	.862	.897
Cars	159	2	27	188	22	674	0	696	0	0	3	3	2	922	175	1099	1986
% Cars	95.8	100	90.0	94.9	100	96.3	0	96.4	0	0	100	100	100	97.1	96.2	96.9	96.5
Heavy Vehicles	7	0	3	10	0	26	0	26	0	0	0	0	0	28	7	35	71
% Heavy Vehicles	4.2	0	10.0	5.1	0	3.7	0	3.6	0	0	0	0	0	2.9	3.8	3.1	3.5



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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-DDD
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dean Street (Route 104) From North			Cape Highway (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	69	2	10	2	256	0	0	0	6	4	259	34	642
04:15 PM	61	3	15	7	292	0	0	3	6	3	253	33	676
04:30 PM	68	3	16	5	247	0	0	2	2	4	231	30	608
04:45 PM	66	5	12	2	240	0	2	4	3	7	233	38	612
Total	264	13	53	16	1035	0	2	9	17	18	976	135	2538
05:00 PM	73	2	17	2	211	0	2	3	6	6	248	33	603
05:15 PM	45	4	10	8	260	0	0	3	7	4	227	35	603
05:30 PM	70	2	10	3	279	0	0	2	4	2	239	44	655
05:45 PM	53	0	11	6	266	0	1	3	5	6	212	31	594
Total	241	8	48	19	1016	0	3	11	22	18	926	143	2455
Grand Total	505	21	101	35	2051	0	5	20	39	36	1902	278	4993
Apprch %	80.5	3.3	16.1	1.7	98.3	0	7.8	31.2	60.9	1.6	85.8	12.5	
Total %	10.1	0.4	2	0.7	41.1	0	0.1	0.4	0.8	0.7	38.1	5.6	
Cars	495	20	101	34	2022	0	5	19	39	36	1870	270	4911
% Cars	98	95.2	100	97.1	98.6	0	100	95	100	100	98.3	97.1	98.4
Heavy Vehicles	10	1	0	1	29	0	0	1	0	0	32	8	82
% Heavy Vehicles	2	4.8	0	2.9	1.4	0	0	5	0	0	1.7	2.9	1.6

	Dean Street (Route 104) From North				Cape Highway (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**69**	2	10	81	2	256	0	258	0	0	**6**	6	4	**259**	34	**297**	642
04:15 PM	61	3	15	79	**7**	**292**	0	**299**	0	3	6	**9**	3	253	33	289	**676**
04:30 PM	68	3	**16**	**87**	5	247	0	252	0	2	2	4	4	231	30	265	608
04:45 PM	66	**5**	12	83	2	240	0	242	**2**	**4**	3	9	**7**	233	**38**	278	612
Total Volume	264	13	53	330	16	1035	0	1051	2	9	17	28	18	976	135	1129	2538
% App. Total	80	3.9	16.1		1.5	98.5	0		7.1	32.1	60.7		1.6	86.4	12		
PHF	.957	.650	.828	.948	.571	.886	.000	.879	.250	.563	.708	.778	.643	.942	.888	.950	.939
Cars	258	13	53	324	15	1014	0	1029	2	9	17	28	18	957	129	1104	2485
% Cars	97.7	100	100	98.2	93.8	98.0	0	97.9	100	100	100	100	100	98.1	95.6	97.8	97.9
Heavy Vehicles	6	0	0	6	1	21	0	22	0	0	0	0	0	19	6	25	53
% Heavy Vehicles	2.3	0	0	1.8	6.3	2.0	0	2.1	0	0	0	0	0	1.9	4.4	2.2	2.1

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N/S: Dean Street (Route 104)/Driveway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-DDD
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Dean Street (Route 104) From North			Cape Highway (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	68	2	10	2	250	0	0	0	6	4	254	31	627
04:15 PM	60	3	15	6	288	0	0	3	6	3	248	32	664
04:30 PM	66	3	16	5	241	0	0	2	2	4	227	29	595
04:45 PM	64	5	12	2	235	0	2	4	3	7	228	37	599
Total	258	13	53	15	1014	0	2	9	17	18	957	129	2485
05:00 PM	72	2	17	2	209	0	2	3	6	6	243	33	595
05:15 PM	45	3	10	8	258	0	0	3	7	4	222	35	595
05:30 PM	69	2	10	3	278	0	0	1	4	2	236	44	649
05:45 PM	51	0	11	6	263	0	1	3	5	6	212	29	587
Total	237	7	48	19	1008	0	3	10	22	18	913	141	2426
Grand Total	495	20	101	34	2022	0	5	19	39	36	1870	270	4911
Apprch %	80.4	3.2	16.4	1.7	98.3	0	7.9	30.2	61.9	1.7	85.9	12.4	
Total %	10.1	0.4	2.1	0.7	41.2	0	0.1	0.4	0.8	0.7	38.1	5.5	

	Dean Street (Route 104) From North				Cape Highway (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**68**	2	10	80	2	250	0	252	0	0	**6**	6	4	**254**	31	**289**	627
04:15 PM	60	3	15	78	**6**	**288**	0	**294**	0	3	6	**9**	3	248	32	283	**664**
04:30 PM	66	3	**16**	**85**	5	241	0	246	0	2	2	4	4	227	29	260	595
04:45 PM	64	**5**	12	81	2	235	0	237	**2**	**4**	3	9	**7**	228	**37**	272	599
Total Volume	258	13	53	324	15	1014	0	1029	2	9	17	28	18	957	129	1104	2485
% App. Total	79.6	4	16.4		1.5	98.5	0		7.1	32.1	60.7		1.6	86.7	11.7		
PHF	.949	.650	.828	.953	.625	.880	.000	.875	.250	.563	.708	.778	.643	.942	.872	.955	.936

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N/S: Dean Street (Route 104)/Driveway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-DDD
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Dean Street (Route 104) From North			Cape Highway (Route 44) From East			Greenhouse Driveway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	0	0	0	6	0	0	0	0	0	5	3	15
04:15 PM	1	0	0	1	4	0	0	0	0	0	5	1	12
04:30 PM	2	0	0	0	6	0	0	0	0	0	4	1	13
04:45 PM	2	0	0	0	5	0	0	0	0	0	5	1	13
Total	6	0	0	1	21	0	0	0	0	0	19	6	53
05:00 PM	1	0	0	0	2	0	0	0	0	0	5	0	8
05:15 PM	0	1	0	0	2	0	0	0	0	0	5	0	8
05:30 PM	1	0	0	0	1	0	0	1	0	0	3	0	6
05:45 PM	2	0	0	0	3	0	0	0	0	0	0	2	7
Total	4	1	0	0	8	0	0	1	0	0	13	2	29
Grand Total	10	1	0	1	29	0	0	1	0	0	32	8	82
Apprch %	90.9	9.1	0	3.3	96.7	0	0	100	0	0	80	20	
Total %	12.2	1.2	0	1.2	35.4	0	0	1.2	0	0	39	9.8	

	Dean Street (Route 104) From North				Cape Highway (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	0	1	0	**6**	0	**6**	0	0	0	0	0	**5**	**3**	**8**	**15**
04:15 PM	1	0	0	1	**1**	4	0	5	0	0	0	0	0	5	1	6	12
04:30 PM	**2**	0	0	**2**	0	6	0	6	0	0	0	0	0	4	1	5	13
04:45 PM	2	0	0	2	0	5	0	5	0	0	0	0	0	5	1	6	13
Total Volume	6	0	0	6	1	21	0	22	0	0	0	0	0	19	6	25	53
% App. Total	100	0	0		4.5	95.5	0		0	0	0		0	76	24		
PHF	.750	.000	.000	.750	.250	.875	.000	.917	.000	.000	.000	.000	.000	.950	.500	.781	.883

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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-DDD
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	Dean Street (Route 104) From North				Cape Highway (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	5
Grand Total	0	0	0	5	0	2	0	3	0	0	0	0	0	0	0	0	10
Apprch %	0	0	0	100	0	40	0	60	0	0	0	0	0	0	0	0	
Total %	0	0	0	50	0	20	0	30	0	0	0	0	0	0	0	0	

	Dean Street (Route 104) From North					Cape Highway (Route 44) From East					Greenhouse Driveway From South					Dean Street (Route 44/104) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	**2**	**2**	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
05:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
05:15 PM	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**3**	**3**	0	0	0	0	0	0	0	0	0	0	**5**
Total Volume	0	0	0	4	4	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0	8
% App. Total	0	0	0	100		0	25	0	75		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.500	.500	.000	.250	.000	.250	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.400

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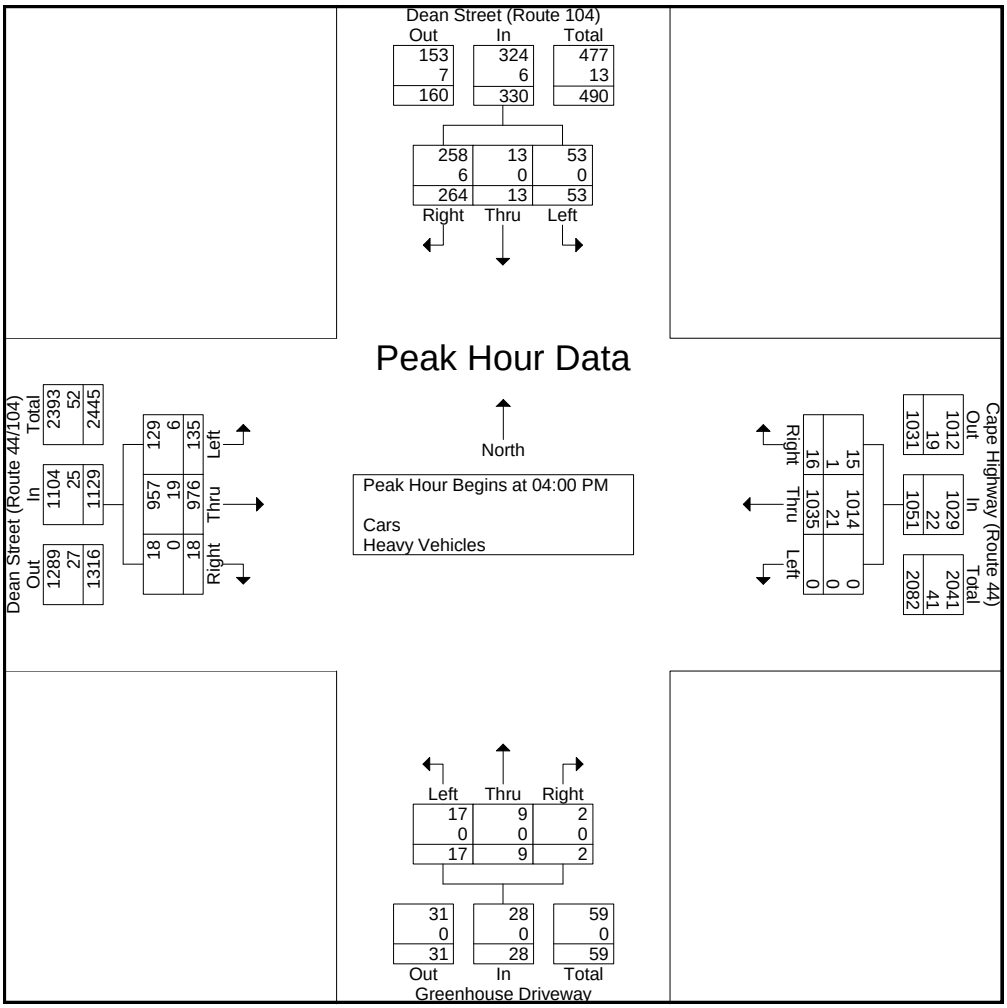
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-DDD
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Dean Street (Route 104) From North				Cape Highway (Route 44) From East				Greenhouse Driveway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**69**	2	10	81	2	256	0	258	0	0	**6**	6	4	**259**	34	**297**	642
04:15 PM	61	3	15	79	**7**	**292**	0	**299**	0	3	6	**9**	3	253	33	289	**676**
04:30 PM	68	3	**16**	**87**	5	247	0	252	0	2	2	4	4	231	30	265	608
04:45 PM	66	**5**	12	83	2	240	0	242	**2**	**4**	3	9	**7**	233	**38**	278	612
Total Volume	264	13	53	330	16	1035	0	1051	2	9	17	28	18	976	135	1129	2538
% App. Total	80	3.9	16.1		1.5	98.5	0		7.1	32.1	60.7		1.6	86.4	12		
PHF	.957	.650	.828	.948	.571	.886	.000	.879	.250	.563	.708	.778	.643	.942	.888	.950	.939
Cars	258	13	53	324	15	1014	0	1029	2	9	17	28	18	957	129	1104	2485
% Cars	97.7	100	100	98.2	93.8	98.0	0	97.9	100	100	100	100	100	98.1	95.6	97.8	97.9
Heavy Vehicles	6	0	0	6	1	21	0	22	0	0	0	0	0	19	6	25	53
% Heavy Vehicles	2.3	0	0	1.8	6.3	2.0	0	2.1	0	0	0	0	0	1.9	4.4	2.2	2.1



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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-E
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	61	29	25	103	60	56	60	11	74	157	0	640
07:15 AM	6	98	23	18	144	49	55	94	35	111	165	2	800
07:30 AM	5	46	43	30	165	38	70	98	38	70	209	2	814
07:45 AM	3	38	28	16	154	44	59	75	27	52	218	5	719
Total	18	243	123	89	566	191	240	327	111	307	749	9	2973
08:00 AM	1	28	26	25	146	44	76	69	12	38	181	2	648
08:15 AM	0	32	30	9	150	37	66	83	29	28	174	5	643
08:30 AM	2	35	25	34	132	46	69	48	16	32	181	8	628
08:45 AM	3	22	33	18	168	38	77	51	17	27	189	3	646
Total	6	117	114	86	596	165	288	251	74	125	725	18	2565
Grand Total	24	360	237	175	1162	356	528	578	185	432	1474	27	5538
Apprch %	3.9	58	38.2	10.3	68.6	21	40.9	44.8	14.3	22.3	76.3	1.4	
Total %	0.4	6.5	4.3	3.2	21	6.4	9.5	10.4	3.3	7.8	26.6	0.5	
Cars	19	338	225	172	1104	338	512	542	176	416	1428	20	5290
% Cars	79.2	93.9	94.9	98.3	95	94.9	97	93.8	95.1	96.3	96.9	74.1	95.5
Heavy Vehicles	5	22	12	3	58	18	16	36	9	16	46	7	248
% Heavy Vehicles	20.8	6.1	5.1	1.7	5	5.1	3	6.2	4.9	3.7	3.1	25.9	4.5

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**6**	**98**	23	**127**	18	144	**49**	211	55	94	35	184	**111**	165	2	278	800
07:30 AM	5	46	**43**	94	**30**	**165**	38	**233**	70	**98**	**38**	**206**	70	209	2	**281**	**814**
07:45 AM	3	38	28	69	16	154	44	214	59	75	27	161	52	**218**	**5**	275	719
08:00 AM	1	28	26	55	25	146	44	215	**76**	69	12	157	38	181	2	221	648
Total Volume	15	210	120	345	89	609	175	873	260	336	112	708	271	773	11	1055	2981
% App. Total	4.3	60.9	34.8		10.2	69.8	20		36.7	47.5	15.8		25.7	73.3	1		
PHF	.625	.536	.698	.679	.742	.923	.893	.937	.855	.857	.737	.859	.610	.886	.550	.939	.916
Cars	12	194	116	322	87	584	166	837	252	316	103	671	262	746	9	1017	2847
% Cars	80.0	92.4	96.7	93.3	97.8	95.9	94.9	95.9	96.9	94.0	92.0	94.8	96.7	96.5	81.8	96.4	95.5
Heavy Vehicles	3	16	4	23	2	25	9	36	8	20	9	37	9	27	2	38	134
% Heavy Vehicles	20.0	7.6	3.3	6.7	2.2	4.1	5.1	4.1	3.1	6.0	8.0	5.2	3.3	3.5	18.2	3.6	4.5

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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-E
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	60	27	25	94	58	56	58	11	74	150	0	615
07:15 AM	5	87	22	17	134	48	54	91	34	109	160	2	763
07:30 AM	4	44	43	30	162	37	69	89	33	69	200	2	782
07:45 AM	2	36	27	15	146	41	58	70	26	47	209	3	680
Total	13	227	119	87	536	184	237	308	104	299	719	7	2840
08:00 AM	1	27	24	25	142	40	71	66	10	37	177	2	622
08:15 AM	0	30	30	8	141	34	64	76	29	27	170	3	612
08:30 AM	2	32	21	34	127	44	65	44	16	29	177	5	596
08:45 AM	3	22	31	18	158	36	75	48	17	24	185	3	620
Total	6	111	106	85	568	154	275	234	72	117	709	13	2450
Grand Total	19	338	225	172	1104	338	512	542	176	416	1428	20	5290
Apprch %	3.3	58.1	38.7	10.7	68.4	20.9	41.6	44.1	14.3	22.3	76.6	1.1	
Total %	0.4	6.4	4.3	3.3	20.9	6.4	9.7	10.2	3.3	7.9	27	0.4	

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**5**	**87**	22	**114**	17	134	**48**	199	54	**91**	**34**	179	**109**	160	2	**271**	763
07:30 AM	4	44	**43**	91	**30**	**162**	37	**229**	69	89	33	**191**	69	200	2	271	**782**
07:45 AM	2	36	27	65	15	146	41	202	58	70	26	154	47	**209**	**3**	259	680
08:00 AM	1	27	24	52	25	142	40	207	**71**	66	10	147	37	177	2	216	622
Total Volume	12	194	116	322	87	584	166	837	252	316	103	671	262	746	9	1017	2847
% App. Total	3.7	60.2	36		10.4	69.8	19.8		37.6	47.1	15.4		25.8	73.4	0.9		
PHF	.600	.557	.674	.706	.725	.901	.865	.914	.887	.868	.757	.878	.601	.892	.750	.938	.910

PRECISION
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N/S: Longmeadow Rd/Gordon Owen Riverway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-E
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	1	2	0	9	2	0	2	0	0	7	0	25
07:15 AM	1	11	1	1	10	1	1	3	1	2	5	0	37
07:30 AM	1	2	0	0	3	1	1	9	5	1	9	0	32
07:45 AM	1	2	1	1	8	3	1	5	1	5	9	2	39
Total	5	16	4	2	30	7	3	19	7	8	30	2	133
08:00 AM	0	1	2	0	4	4	5	3	2	1	4	0	26
08:15 AM	0	2	0	1	9	3	2	7	0	1	4	2	31
08:30 AM	0	3	4	0	5	2	4	4	0	3	4	3	32
08:45 AM	0	0	2	0	10	2	2	3	0	3	4	0	26
Total	0	6	8	1	28	11	13	17	2	8	16	5	115
Grand Total	5	22	12	3	58	18	16	36	9	16	46	7	248
Apprch %	12.8	56.4	30.8	3.8	73.4	22.8	26.2	59	14.8	23.2	66.7	10.1	
Total %	2	8.9	4.8	1.2	23.4	7.3	6.5	14.5	3.6	6.5	18.5	2.8	

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**1**	**11**	1	**13**	**1**	**10**	1	**12**	1	3	1	5	2	5	0	7	37
07:30 AM	1	2	0	3	0	3	1	4	1	**9**	**5**	**15**	1	**9**	0	10	32
07:45 AM	1	2	1	4	1	8	3	12	1	5	1	7	**5**	9	**2**	**16**	**39**
08:00 AM	0	1	**2**	3	0	4	**4**	8	**5**	3	2	10	1	4	0	5	26
Total Volume	3	16	4	23	2	25	9	36	8	20	9	37	9	27	2	38	134
% App. Total	13	69.6	17.4		5.6	69.4	25		21.6	54.1	24.3		23.7	71.1	5.3		
PHF	.750	.364	.500	.442	.500	.625	.563	.750	.400	.556	.450	.617	.450	.750	.250	.594	.859

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N/S: Longmeadow Rd/Gordon Owen Riverway
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File Name : 81676 K-E
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
07:15 AM	0	1	0	1	0	1	0	0	0	0	0	1	1	0	0	6	11
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	4
07:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	3
Total	0	1	0	1	0	1	0	2	0	0	0	3	1	2	0	9	20
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	1	5
Grand Total	0	1	0	3	0	2	0	2	0	0	0	3	1	3	0	10	25
Apprch %	0	25	0	75	0	50	0	50	0	0	0	100	7.1	21.4	0	71.4	
Total %	0	4	0	12	0	8	0	8	0	0	0	12	4	12	0	40	

	Longmeadow Road From North					Dean Street (Route 44/104) From East					Gordon Owen Riverway From South					Dean Street (Route 44/104) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	1	1	2
07:15 AM	0	**1**	0	**1**	**2**	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**6**	**7**	**11**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	**1**	0	2	3	4
07:45 AM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	1	0	0	1	3
Total Volume	0	1	0	1	2	0	1	0	2	3	0	0	0	3	3	1	2	0	9	12	20
% App. Total	0	50	0	50		0	33.3	0	66.7		0	0	0	100		8.3	16.7	0	75		
PHF	.000	.250	.000	.250	.250	.000	.250	.000	.250	.375	.000	.000	.000	.750	.750	.250	.500	.000	.375	.429	.455

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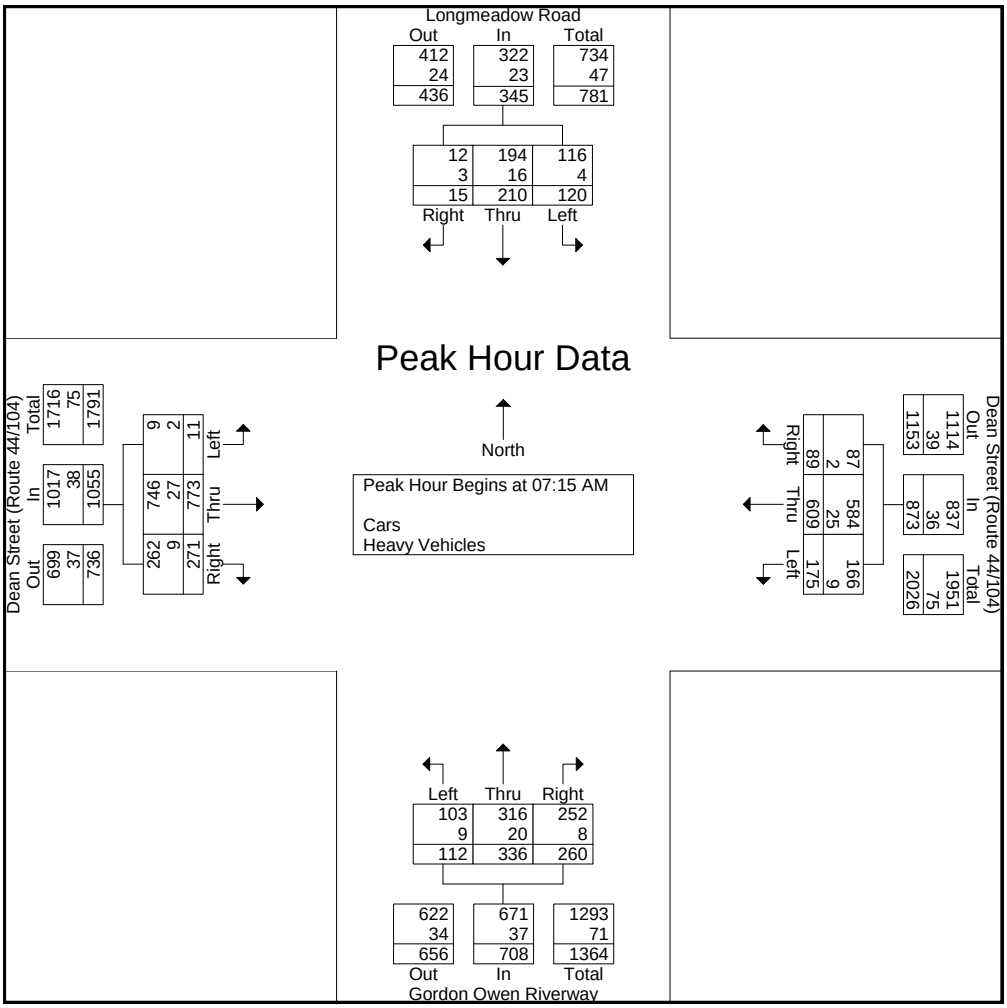
Page No : 1

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**6**	**98**	23	**127**	18	144	**49**	211	55	94	35	184	**111**	165	2	278	800
07:30 AM	5	46	**43**	94	**30**	**165**	38	**233**	70	**98**	**38**	**206**	70	209	2	**281**	**814**
07:45 AM	3	38	28	69	16	154	44	214	59	75	27	161	52	**218**	**5**	275	719
08:00 AM	1	28	26	55	25	146	44	215	**76**	69	12	157	38	181	2	221	648
Total Volume	15	210	120	345	89	609	175	873	260	336	112	708	271	773	11	1055	2981
% App. Total	4.3	60.9	34.8		10.2	69.8	20		36.7	47.5	15.8		25.7	73.3	1		
PHF	.625	.536	.698	.679	.742	.923	.893	.937	.855	.857	.737	.859	.610	.886	.550	.939	.916
Cars	12	194	116	322	87	584	166	837	252	316	103	671	262	746	9	1017	2847
% Cars	80.0	92.4	96.7	93.3	97.8	95.9	94.9	95.9	96.9	94.0	92.0	94.8	96.7	96.5	81.8	96.4	95.5
Heavy Vehicles	3	16	4	23	2	25	9	36	8	20	9	37	9	27	2	38	134
% Heavy Vehicles	20.0	7.6	3.3	6.7	2.2	4.1	5.1	4.1	3.1	6.0	8.0	5.2	3.3	3.5	18.2	3.6	4.5



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N/S: Longmeadow Road/Owen Riverway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-EEE
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon M. Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	54	30	63	190	86	58	89	16	58	196	2	843
04:15 PM	3	42	46	66	171	97	50	74	20	71	184	4	828
04:30 PM	3	72	38	51	178	97	53	83	20	97	200	5	897
04:45 PM	0	43	24	50	201	94	56	87	18	87	190	2	852
Total	7	211	138	230	740	374	217	333	74	313	770	13	3420
05:00 PM	6	68	36	41	181	95	49	71	10	79	206	0	842
05:15 PM	2	95	39	45	167	101	43	76	18	60	177	3	826
05:30 PM	4	103	52	59	192	102	57	95	10	30	161	10	875
05:45 PM	1	99	39	60	220	75	49	66	27	43	175	14	868
Total	13	365	166	205	760	373	198	308	65	212	719	27	3411
Grand Total	20	576	304	435	1500	747	415	641	139	525	1489	40	6831
Apprch %	2.2	64	33.8	16.2	55.9	27.9	34.7	53.6	11.6	25.6	72.5	1.9	
Total %	0.3	8.4	4.5	6.4	22	10.9	6.1	9.4	2	7.7	21.8	0.6	
Cars	20	568	300	426	1468	736	409	628	135	515	1446	40	6691
% Cars	100	98.6	98.7	97.9	97.9	98.5	98.6	98	97.1	98.1	97.1	100	98
Heavy Vehicles	0	8	4	9	32	11	6	13	4	10	43	0	140
% Heavy Vehicles	0	1.4	1.3	2.1	2.1	1.5	1.4	2	2.9	1.9	2.9	0	2

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon M. Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	54	30	85	63	190	86	339	**58**	**89**	16	**163**	58	196	2	256	843
04:15 PM	**3**	42	**46**	91	**66**	171	**97**	334	50	74	**20**	144	71	184	4	259	828
04:30 PM	3	**72**	38	**113**	51	178	97	326	53	83	20	156	**97**	**200**	**5**	**302**	**897**
04:45 PM	0	43	24	67	50	**201**	94	**345**	56	87	18	161	87	190	2	279	852
Total Volume	7	211	138	356	230	740	374	1344	217	333	74	624	313	770	13	1096	3420
% App. Total	2	59.3	38.8		17.1	55.1	27.8		34.8	53.4	11.9		28.6	70.3	1.2		
PHF	.583	.733	.750	.788	.871	.920	.964	.974	.935	.935	.925	.957	.807	.963	.650	.907	.953
Cars	7	208	136	351	223	717	366	1306	215	330	72	617	304	743	13	1060	3334
% Cars	100	98.6	98.6	98.6	97.0	96.9	97.9	97.2	99.1	99.1	97.3	98.9	97.1	96.5	100	96.7	97.5
Heavy Vehicles	0	3	2	5	7	23	8	38	2	3	2	7	9	27	0	36	86
% Heavy Vehicles	0	1.4	1.4	1.4	3.0	3.1	2.1	2.8	0.9	0.9	2.7	1.1	2.9	3.5	0	3.3	2.5

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E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-EEE
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Cars

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon M. Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	53	30	61	183	85	58	88	15	58	189	2	823
04:15 PM	3	40	45	62	166	97	50	74	20	68	180	4	809
04:30 PM	3	72	38	50	171	93	52	82	19	94	189	5	868
04:45 PM	0	43	23	50	197	91	55	86	18	84	185	2	834
Total	7	208	136	223	717	366	215	330	72	304	743	13	3334
05:00 PM	6	67	36	40	177	94	48	68	10	79	201	0	826
05:15 PM	2	93	37	45	166	100	42	75	18	60	171	3	812
05:30 PM	4	102	52	59	191	101	55	91	8	29	159	10	861
05:45 PM	1	98	39	59	217	75	49	64	27	43	172	14	858
Total	13	360	164	203	751	370	194	298	63	211	703	27	3357
Grand Total	20	568	300	426	1468	736	409	628	135	515	1446	40	6691
Apprch %	2.3	64	33.8	16.2	55.8	28	34.9	53.6	11.5	25.7	72.3	2	
Total %	0.3	8.5	4.5	6.4	21.9	11	6.1	9.4	2	7.7	21.6	0.6	

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon M. Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**6**	67	36	109	40	177	94	311	48	68	10	126	**79**	**201**	0	**280**	826
05:15 PM	2	93	37	132	45	166	100	311	42	75	18	135	60	171	3	234	812
05:30 PM	4	**102**	**52**	**158**	**59**	191	**101**	**351**	**55**	**91**	8	**154**	29	159	10	198	**861**
05:45 PM	1	98	39	138	59	**217**	75	351	49	64	**27**	140	43	172	**14**	229	858
Total Volume	13	360	164	537	203	751	370	1324	194	298	63	555	211	703	27	941	3357
% App. Total	2.4	67	30.5		15.3	56.7	27.9		35	53.7	11.4		22.4	74.7	2.9		
PHF	.542	.882	.788	.850	.860	.865	.916	.943	.882	.819	.583	.901	.668	.874	.482	.840	.975

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File Name : 81676 K-EEE
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Heavy Vehicles

	Longmeadow Road From North			Dean Street (Route 44/104) From East			Gordon M. Owen Riverway From South			Dean Street (Route 44/104) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	2	7	1	0	1	1	0	7	0	20
04:15 PM	0	2	1	4	5	0	0	0	0	3	4	0	19
04:30 PM	0	0	0	1	7	4	1	1	1	3	11	0	29
04:45 PM	0	0	1	0	4	3	1	1	0	3	5	0	18
Total	0	3	2	7	23	8	2	3	2	9	27	0	86
05:00 PM	0	1	0	1	4	1	1	3	0	0	5	0	16
05:15 PM	0	2	2	0	1	1	1	1	0	0	6	0	14
05:30 PM	0	1	0	0	1	1	2	4	2	1	2	0	14
05:45 PM	0	1	0	1	3	0	0	2	0	0	3	0	10
Total	0	5	2	2	9	3	4	10	2	1	16	0	54
Grand Total	0	8	4	9	32	11	6	13	4	10	43	0	140
Apprch %	0	66.7	33.3	17.3	61.5	21.2	26.1	56.5	17.4	18.9	81.1	0	
Total %	0	5.7	2.9	6.4	22.9	7.9	4.3	9.3	2.9	7.1	30.7	0	

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon M. Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	2	**7**	1	10	0	**1**	**1**	2	0	7	0	7	20
04:15 PM	0	**2**	**1**	**3**	**4**	5	0	9	0	0	0	0	**3**	4	0	7	19
04:30 PM	0	0	0	0	1	7	**4**	**12**	**1**	1	1	**3**	3	**11**	0	**14**	**29**
04:45 PM	0	0	1	1	0	4	3	7	1	1	0	2	3	5	0	8	18
Total Volume	0	3	2	5	7	23	8	38	2	3	2	7	9	27	0	36	86
% App. Total	0	60	40		18.4	60.5	21.1		28.6	42.9	28.6		25	75	0		
PHF	.000	.375	.500	.417	.438	.821	.500	.792	.500	.750	.500	.583	.750	.614	.000	.643	.741

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File Name : 81676 K-EEE
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Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon M. Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	2	5
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
04:45 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	3
Total	0	1	0	1	0	2	0	0	0	2	1	0	1	1	0	4	13
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	5
Total	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	3	8
Grand Total	0	1	0	5	0	2	0	1	0	2	1	0	1	1	0	7	21
Apprch %	0	16.7	0	83.3	0	66.7	0	33.3	0	66.7	33.3	0	11.1	11.1	0	77.8	
Total %	0	4.8	0	23.8	0	9.5	0	4.8	0	9.5	4.8	0	4.8	4.8	0	33.3	

	Longmeadow Road From North					Dean Street (Route 44/104) From East					Gordon M. Owen Riverway From South					Dean Street (Route 44/104) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**1**	0	0	**1**	0	**1**	**0**	**0**	**1**	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**5**
04:15 PM	0	0	0	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**3**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	0	0	2	2
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	1	**1**	0	**2**	0	0	0	0	0	3
Total Volume	0	1	0	1	2	0	2	0	0	2	0	2	1	0	3	1	1	0	4	6	13
% App. Total	0	50	0	50		0	100	0	0		0	66.7	33.3	0		16.7	16.7	0	66.7		
PHF	.000	.250	.000	.250	.500	.000	.500	.000	.000	.500	.000	.500	.250	.000	.375	.250	.250	.000	.500	.750	.650

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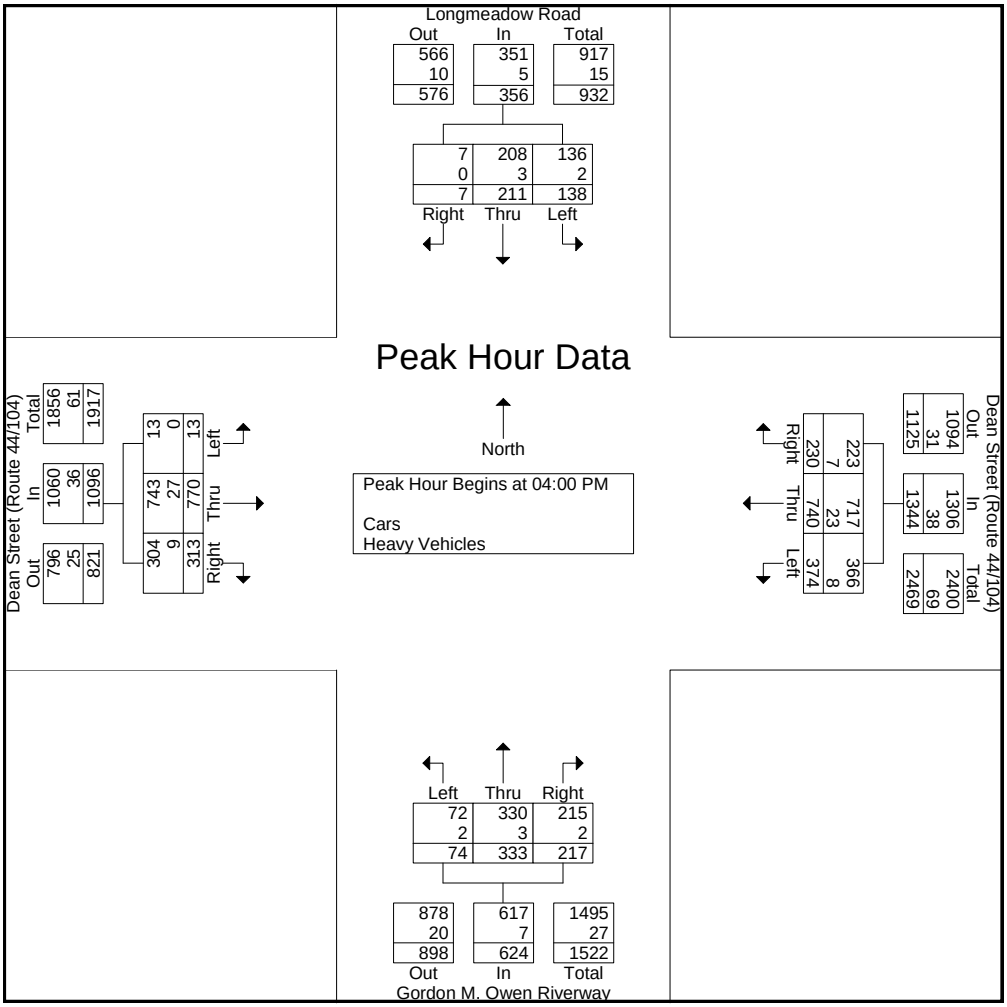
N/S: Longmeadow Road/Owen Riverway
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-EEE
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Longmeadow Road From North				Dean Street (Route 44/104) From East				Gordon M. Owen Riverway From South				Dean Street (Route 44/104) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	54	30	85	63	190	86	339	**58**	**89**	16	**163**	58	196	2	256	843
04:15 PM	**3**	42	**46**	91	**66**	171	**97**	334	50	74	**20**	144	71	184	4	259	828
04:30 PM	3	**72**	38	**113**	51	178	97	326	53	83	20	156	**97**	**200**	**5**	**302**	**897**
04:45 PM	0	43	24	67	50	**201**	94	**345**	56	87	18	161	87	190	2	279	852
Total Volume	7	211	138	356	230	740	374	1344	217	333	74	624	313	770	13	1096	3420
% App. Total	2	59.3	38.8		17.1	55.1	27.8		34.8	53.4	11.9		28.6	70.3	1.2		
PHF	.583	.733	.750	.788	.871	.920	.964	.974	.935	.935	.925	.957	.807	.963	.650	.907	.953
Cars	7	208	136	351	223	717	366	1306	215	330	72	617	304	743	13	1060	3334
% Cars	100	98.6	98.6	98.6	97.0	96.9	97.9	97.2	99.1	99.1	97.3	98.9	97.1	96.5	100	96.7	97.5
Heavy Vehicles	0	3	2	5	7	23	8	38	2	3	2	7	9	27	0	36	86
% Heavy Vehicles	0	1.4	1.4	1.4	3.0	3.1	2.1	2.8	0.9	0.9	2.7	1.1	2.9	3.5	0	3.3	2.5



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N: Arlington Street
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-F
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	6	59	13	101	194	8	381
07:15 AM	16	81	40	159	191	6	493
07:30 AM	11	69	36	178	214	15	523
07:45 AM	9	60	22	150	194	8	443
Total	42	269	111	588	793	37	1840
08:00 AM	13	55	12	139	166	1	386
08:15 AM	8	39	19	159	153	3	381
08:30 AM	7	49	23	151	177	6	413
08:45 AM	13	47	14	164	180	3	421
Total	41	190	68	613	676	13	1601
Grand Total	83	459	179	1201	1469	50	3441
Apprch %	15.3	84.7	13	87	96.7	3.3	
Total %	2.4	13.3	5.2	34.9	42.7	1.5	
Cars	74	442	175	1133	1399	45	3268
% Cars	89.2	96.3	97.8	94.3	95.2	90	95
Heavy Vehicles	9	17	4	68	70	5	173
% Heavy Vehicles	10.8	3.7	2.2	5.7	4.8	10	5

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**16**	**81**	**97**	**40**	159	199	191	6	197	493
07:30 AM	11	69	80	36	**178**	**214**	**214**	**15**	**229**	**523**
07:45 AM	**9**	**60**	**69**	**22**	**150**	**172**	**194**	**8**	**202**	**443**
08:00 AM	**13**	**55**	**68**	**12**	**139**	**151**	**166**	**1**	**167**	**386**
Total Volume	**49**	**265**	**314**	**110**	**626**	**736**	**765**	**30**	**795**	**1845**
% App. Total	**15.6**	**84.4**		**14.9**	**85.1**		**96.2**	**3.8**		
PHF	**.766**	**.818**	**.809**	**.688**	**.879**	**.860**	**.894**	**.500**	**.868**	**.882**
Cars	**43**	**255**	**298**	**107**	**594**	**701**	**725**	**29**	**754**	**1753**
% Cars	**87.8**	**96.2**	**94.9**	**97.3**	**94.9**	**95.2**	**94.8**	**96.7**	**94.8**	**95.0**
Heavy Vehicles	**6**	**10**	**16**	**3**	**32**	**35**	**40**	**1**	**41**	**92**
% Heavy Vehicles	**12.2**	**3.8**	**5.1**	**2.7**	**5.1**	**4.8**	**5.2**	**3.3**	**5.2**	**5.0**

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N: Arlington Street
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-F
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	5	59	13	92	187	7	363
07:15 AM	15	78	39	149	182	6	469
07:30 AM	10	66	35	170	203	14	498
07:45 AM	8	57	22	142	179	8	416
Total	38	260	109	553	751	35	1746
08:00 AM	10	54	11	133	161	1	370
08:15 AM	8	38	19	145	146	2	358
08:30 AM	5	44	23	147	169	5	393
08:45 AM	13	46	13	155	172	2	401
Total	36	182	66	580	648	10	1522
Grand Total	74	442	175	1133	1399	45	3268
Apprch %	14.3	85.7	13.4	86.6	96.9	3.1	
Total %	2.3	13.5	5.4	34.7	42.8	1.4	

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**15**	**78**	**93**	**39**	149	188	182	6	188	469
07:30 AM	10	66	76	35	**170**	**205**	**203**	**14**	**217**	**498**
07:45 AM	**8**	**57**	**65**	**22**	**142**	**164**	**179**	**8**	**187**	**416**
08:00 AM	**10**	**54**	**64**	**11**	**133**	**144**	**161**	**1**	**162**	**370**
Total Volume	**43**	**255**	**298**	**107**	**594**	**701**	**725**	**29**	**754**	**1753**
% App. Total	**14.4**	**85.6**		**15.3**	**84.7**		**96.2**	**3.8**		
PHF	**.717**	**.817**	**.801**	**.686**	**.874**	**.855**	**.893**	**.518**	**.869**	**.880**

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File Name : 81676 K-F
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	1	0	0	9	7	1	18
07:15 AM	1	3	1	10	9	0	24
07:30 AM	1	3	1	8	11	1	25
07:45 AM	1	3	0	8	15	0	27
Total	4	9	2	35	42	2	94
08:00 AM	3	1	1	6	5	0	16
08:15 AM	0	1	0	14	7	1	23
08:30 AM	2	5	0	4	8	1	20
08:45 AM	0	1	1	9	8	1	20
Total	5	8	2	33	28	3	79
Grand Total	9	17	4	68	70	5	173
Apprch %	34.6	65.4	5.6	94.4	93.3	6.7	
Total %	5.2	9.8	2.3	39.3	40.5	2.9	

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**1**	0	1	0	9	9	7	**1**	8	18
07:15 AM	1	**3**	**4**	**1**	**10**	**11**	9	0	9	24
07:30 AM	1	3	4	1	8	9	11	1	12	25
07:45 AM	1	3	4	0	8	8	**15**	0	**15**	**27**
Total Volume	**4**	**9**	**13**	**2**	**35**	**37**	**42**	**2**	**44**	**94**
% App. Total	**30.8**	**69.2**		**5.4**	**94.6**		**95.5**	**4.5**		
PHF	**1.000**	**.750**	**.813**	**.500**	**.875**	**.841**	**.700**	**.500**	**.733**	**.870**

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File Name : 81676 K-F
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	3	0	0	0	0	0	0	3
07:15 AM	0	0	2	0	1	0	3	0	0	6
07:30 AM	0	1	1	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	1	0	0	1
Total	0	1	6	0	1	0	4	0	0	12
08:00 AM	0	0	4	0	0	0	0	0	0	4
08:15 AM	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	1	0	0	0	0	0	0	1
08:45 AM	0	0	1	0	0	0	0	0	0	1
Total	0	0	6	0	1	0	0	0	0	7
Grand Total	0	1	12	0	2	0	4	0	0	19
Apprch %	0	7.7	92.3	0	100	0	100	0	0	
Total %	0	5.3	63.2	0	10.5	0	21.1	0	0	

	Arlington Street From North				Dean Street (Route 44/104) From East				Dean Street (Route 44/104) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	2	2	0	**1**	0	**1**	**3**	0	0	**3**	**6**
07:30 AM	0	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**
08:00 AM	**0**	**0**	**4**	**4**	0	0	0	0	0	0	0	0	4
Total Volume	0	1	7	8	0	1	0	1	4	0	0	4	13
% App. Total	0	12.5	87.5		0	100	0		100	0	0		
PHF	.000	.250	.438	.500	.000	.250	.000	.250	.333	.000	.000	.333	.542

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File Name : 81676 K-F
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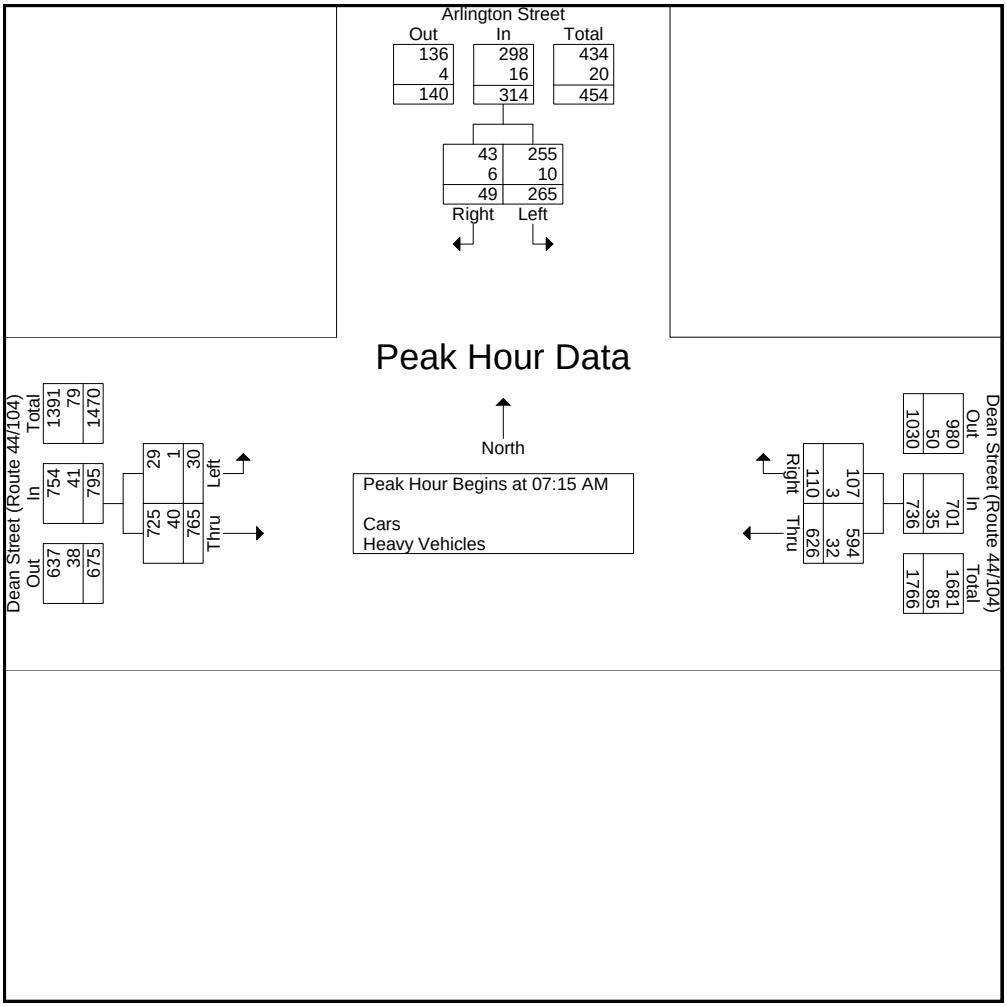
Start Date : 9/17/2008
Page No : 1

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**16**	**81**	**97**	**40**	159	199	191	6	197	493
07:30 AM	11	69	80	36	**178**	**214**	**214**	**15**	**229**	**523**
07:45 AM	**9**	**60**	**69**	**22**	**150**	**172**	**194**	**8**	**202**	**443**
08:00 AM	**13**	**55**	**68**	**12**	**139**	**151**	**166**	**1**	**167**	**386**
Total Volume	**49**	**265**	**314**	**110**	**626**	**736**	**765**	**30**	**795**	**1845**
% App. Total	**15.6**	**84.4**		**14.9**	**85.1**		**96.2**	**3.8**		
PHF	**.766**	**.818**	**.809**	**.688**	**.879**	**.860**	**.894**	**.500**	**.868**	**.882**
Cars	**43**	**255**	**298**	**107**	**594**	**701**	**725**	**29**	**754**	**1753**
% Cars	**87.8**	**96.2**	**94.9**	**97.3**	**94.9**	**95.2**	**94.8**	**96.7**	**94.8**	**95.0**
Heavy Vehicles	**6**	**10**	**16**	**3**	**32**	**35**	**40**	**1**	**41**	**92**
% Heavy Vehicles	**12.2**	**3.8**	**5.1**	**2.7**	**5.1**	**4.8**	**5.2**	**3.3**	**5.2**	**5.0**



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File Name : 81676 K-FFF
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	17	69	19	203	195	12	515
04:15 PM	19	88	27	172	185	0	491
04:30 PM	16	96	10	183	189	5	499
04:45 PM	16	92	29	174	174	7	492
Total	68	345	85	732	743	24	1997
05:00 PM	15	94	14	184	211	7	525
05:15 PM	10	50	29	195	172	4	460
05:30 PM	9	36	15	199	145	6	410
05:45 PM	6	44	20	204	168	3	445
Total	40	224	78	782	696	20	1840
Grand Total	108	569	163	1514	1439	44	3837
Apprch %	16	84	9.7	90.3	97	3	
Total %	2.8	14.8	4.2	39.5	37.5	1.1	
Cars	105	562	161	1483	1403	43	3757
% Cars	97.2	98.8	98.8	98	97.5	97.7	97.9
Heavy Vehicles	3	7	2	31	36	1	80
% Heavy Vehicles	2.8	1.2	1.2	2	2.5	2.3	2.1

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**19**	88	107	27	172	199	185	0	185	491
04:30 PM	16	**96**	**112**	10	183	193	189	5	194	499
04:45 PM	16	92	108	**29**	174	**203**	174	**7**	181	492
05:00 PM	15	94	109	14	**184**	198	**211**	7	**218**	**525**
Total Volume	**66**	**370**	**436**	**80**	**713**	**793**	**759**	**19**	**778**	**2007**
% App. Total	**15.1**	**84.9**		**10.1**	**89.9**		**97.6**	**2.4**		
PHF	**.868**	**.964**	**.973**	**.690**	**.969**	**.977**	**.899**	**.679**	**.892**	**.956**
Cars	**63**	**367**	**430**	**80**	**695**	**775**	**737**	**19**	**756**	**1961**
% Cars	**95.5**	**99.2**	**98.6**	**100**	**97.5**	**97.7**	**97.1**	**100**	**97.2**	**97.7**
Heavy Vehicles	**3**	**3**	**6**	**0**	**18**	**18**	**22**	**0**	**22**	**46**
% Heavy Vehicles	**4.5**	**0.8**	**1.4**	**0**	**2.5**	**2.3**	**2.9**	**0**	**2.8**	**2.3**

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N: Arlington Street
E/W: Dean Street (Route 44/104)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-FFF
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	17	66	19	195	192	12	501
04:15 PM	18	87	27	168	178	0	478
04:30 PM	16	96	10	176	179	5	482
04:45 PM	15	90	29	170	172	7	483
Total	66	339	85	709	721	24	1944
05:00 PM	14	94	14	181	208	7	518
05:15 PM	10	50	29	194	165	4	452
05:30 PM	9	35	14	198	144	6	406
05:45 PM	6	44	19	201	165	2	437
Total	39	223	76	774	682	19	1813
Grand Total	105	562	161	1483	1403	43	3757
Apprch %	15.7	84.3	9.8	90.2	97	3	
Total %	2.8	15	4.3	39.5	37.3	1.1	

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**18**	87	105	27	168	195	178	0	178	478
04:30 PM	16	**96**	**112**	10	176	186	179	5	184	482
04:45 PM	15	90	105	**29**	170	**199**	172	**7**	179	483
05:00 PM	14	94	108	14	**181**	195	**208**	7	**215**	**518**
Total Volume	**63**	**367**	**430**	**80**	**695**	**775**	**737**	**19**	**756**	**1961**
% App. Total	**14.7**	**85.3**		**10.3**	**89.7**		**97.5**	**2.5**		
PHF	**.875**	**.956**	**.960**	**.690**	**.960**	**.974**	**.886**	**.679**	**.879**	**.946**

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File Name : 81676 K-FFF
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Arlington Street From North		Dean Street (Route 44/104) From East		Dean Street (Route 44/104) From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	3	0	8	3	0	14
04:15 PM	1	1	0	4	7	0	13
04:30 PM	0	0	0	7	10	0	17
04:45 PM	1	2	0	4	2	0	9
Total	2	6	0	23	22	0	53
05:00 PM	1	0	0	3	3	0	7
05:15 PM	0	0	0	1	7	0	8
05:30 PM	0	1	1	1	1	0	4
05:45 PM	0	0	1	3	3	1	8
Total	1	1	2	8	14	1	27
Grand Total	3	7	2	31	36	1	80
Apprch %	30	70	6.1	93.9	97.3	2.7	
Total %	3.8	8.8	2.5	38.8	45	1.2	

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	**3**	**3**	0	**8**	**8**	3	0	3	14
04:15 PM	**1**	1	2	0	4	4	7	0	7	13
04:30 PM	0	0	0	0	7	7	**10**	0	**10**	**17**
04:45 PM	**1**	**2**	**3**	**0**	**4**	**4**	**2**	**0**	**2**	**9**
Total Volume	**2**	**6**	**8**	**0**	**23**	**23**	**22**	**0**	**22**	**53**
% App. Total	**25**	**75**		**0**	**100**		**100**	**0**		
PHF	**.500**	**.500**	**.667**	**.000**	**.719**	**.719**	**.550**	**.000**	**.550**	**.779**

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File Name : 81676 K-FFF
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	2	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	3	1	1	0	0	0	0	5
Total	0	2	3	1	2	0	1	0	0	9
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	1	0	0	0	0	0	0	1
Total	0	0	1	0	0	0	0	0	0	1
Grand Total	0	2	4	1	2	0	1	0	0	10
Apprch %	0	33.3	66.7	33.3	66.7	0	100	0	0	
Total %	0	20	40	10	20	0	10	0	0	

	Arlington Street From North				Dean Street (Route 44/104) From East				Dean Street (Route 44/104) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	**1**	0	1	0	0	0	0	1
04:15 PM	0	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0	0	**1**	1
04:45 PM	0	0	**3**	**3**	**1**	1	0	**2**	0	0	0	0	**5**
Total Volume	0	2	3	5	1	2	0	3	1	0	0	1	9
% App. Total	0	40	60		33.3	66.7	0		100	0	0		
PHF	.000	.250	.250	.417	.250	.500	.000	.375	.250	.000	.000	.250	.450

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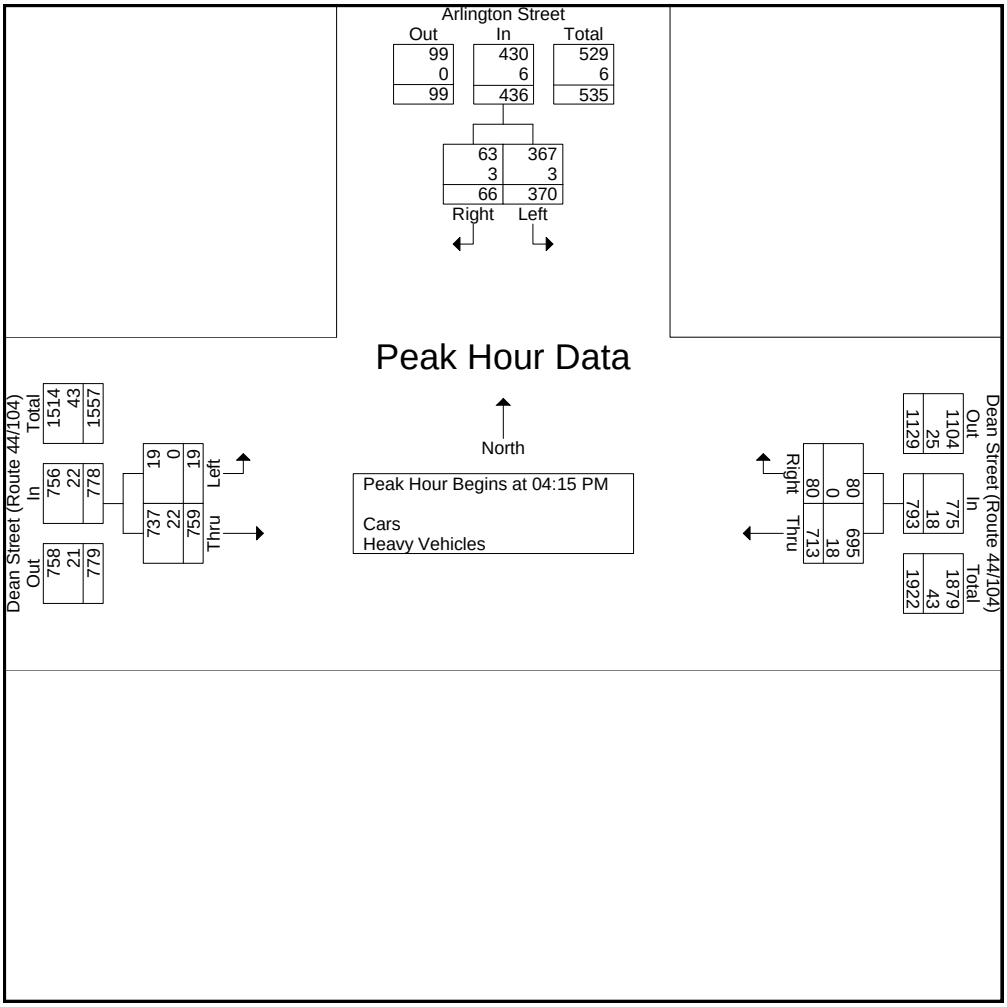
Start Date : 9/17/2008
Page No : 1

	Arlington Street From North			Dean Street (Route 44/104) From East			Dean Street (Route 44/104) From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**19**	88	107	27	172	199	185	0	185	491
04:30 PM	16	**96**	**112**	10	183	193	189	5	194	499
04:45 PM	16	92	108	**29**	174	**203**	174	**7**	181	492
05:00 PM	15	94	109	14	**184**	198	**211**	7	**218**	**525**
Total Volume	**66**	**370**	**436**	**80**	**713**	**793**	**759**	**19**	**778**	**2007**
% App. Total	**15.1**	**84.9**		**10.1**	**89.9**		**97.6**	**2.4**		
PHF	**.868**	**.964**	**.973**	**.690**	**.969**	**.977**	**.899**	**.679**	**.892**	**.956**
Cars	**63**	**367**	**430**	**80**	**695**	**775**	**737**	**19**	**756**	**1961**
% Cars	**95.5**	**99.2**	**98.6**	**100**	**97.5**	**97.7**	**97.1**	**100**	**97.2**	**97.7**
Heavy Vehicles	**3**	**3**	**6**	**0**	**18**	**18**	**22**	**0**	**22**	**46**
% Heavy Vehicles	**4.5**	**0.8**	**1.4**	**0**	**2.5**	**2.3**	**2.9**	**0**	**2.8**	**2.3**



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N/S: Union Street/Summer St (Route 140)
E/W: Church Green Street/Main Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-G
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Union Street From North			Church Green Street (Route 44/104) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	74	0	3	1	81	77	126	1	363
07:15 AM	0	0	0	0	99	0	4	2	106	69	142	5	427
07:30 AM	0	0	0	2	131	0	4	3	111	95	126	3	475
07:45 AM	0	0	0	5	128	0	5	4	104	56	133	1	436
Total	0	0	0	7	432	0	16	10	402	297	527	10	1701
08:00 AM	0	0	0	0	106	0	6	1	108	71	105	1	398
08:15 AM	0	0	0	1	114	0	5	6	95	59	115	3	398
08:30 AM	0	0	0	2	115	0	3	0	98	57	112	3	390
08:45 AM	0	0	0	1	109	0	5	4	89	66	132	2	408
Total	0	0	0	4	444	0	19	11	390	253	464	9	1594
Grand Total	0	0	0	11	876	0	35	21	792	550	991	19	3295
Apprch %	0	0	0	1.2	98.8	0	4.1	2.5	93.4	35.3	63.5	1.2	
Total %	0	0	0	0.3	26.6	0	1.1	0.6	24	16.7	30.1	0.6	
Cars	0	0	0	10	820	0	35	21	743	524	942	19	3114
% Cars	0	0	0	90.9	93.6	0	100	100	93.8	95.3	95.1	100	94.5
Heavy Vehicles	0	0	0	1	56	0	0	0	49	26	49	0	181
% Heavy Vehicles	0	0	0	9.1	6.4	0	0	0	6.2	4.7	4.9	0	5.5

	Union Street From North				Church Green Street (Route 44/104) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	99	0	99	4	2	106	112	69	**142**	**5**	216	427
07:30 AM	0	0	0	0	2	**131**	0	**133**	4	3	**111**	**118**	**95**	126	3	**224**	**475**
07:45 AM	0	0	0	0	**5**	128	0	133	5	**4**	104	113	56	133	1	190	436
08:00 AM	0	0	0	0	0	106	0	106	**6**	1	108	115	71	105	1	177	398
Total Volume	0	0	0	0	7	464	0	471	19	10	429	458	291	506	10	807	1736
% App. Total	0	0	0		1.5	98.5	0		4.1	2.2	93.7		36.1	62.7	1.2		
PHF	.000	.000	.000	.000	.350	.885	.000	.885	.792	.625	.966	.970	.766	.891	.500	.901	.914
Cars	0	0	0	0	6	435	0	441	19	10	401	430	276	479	10	765	1636
% Cars	0	0	0	0	85.7	93.8	0	93.6	100	100	93.5	93.9	94.8	94.7	100	94.8	94.2
Heavy Vehicles	0	0	0	0	1	29	0	30	0	0	28	28	15	27	0	42	100
% Heavy Vehicles	0	0	0	0	14.3	6.3	0	6.4	0	0	6.5	6.1	5.2	5.3	0	5.2	5.8

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Client: VHB/J. Quitter

File Name : 81676 K-G
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Union Street From North			Church Green Street (Route 44/104) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	66	0	3	1	76	74	121	1	342
07:15 AM	0	0	0	0	91	0	4	2	100	62	134	5	398
07:30 AM	0	0	0	2	123	0	4	3	105	90	119	3	449
07:45 AM	0	0	0	4	123	0	5	4	96	56	125	1	414
Total	0	0	0	6	403	0	16	10	377	282	499	10	1603
08:00 AM	0	0	0	0	98	0	6	1	100	68	101	1	375
08:15 AM	0	0	0	1	106	0	5	6	92	56	110	3	379
08:30 AM	0	0	0	2	112	0	3	0	92	55	108	3	375
08:45 AM	0	0	0	1	101	0	5	4	82	63	124	2	382
Total	0	0	0	4	417	0	19	11	366	242	443	9	1511
Grand Total	0	0	0	10	820	0	35	21	743	524	942	19	3114
Apprch %	0	0	0	1.2	98.8	0	4.4	2.6	93	35.3	63.4	1.3	
Total %	0	0	0	0.3	26.3	0	1.1	0.7	23.9	16.8	30.3	0.6	

	Union Street From North				Church Green Street (Route 44/104) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	91	0	91	4	2	100	106	62	**134**	**5**	201	398
07:30 AM	0	0	0	0	2	**123**	0	125	4	3	**105**	**112**	**90**	119	3	**212**	**449**
07:45 AM	0	0	0	0	**4**	123	0	**127**	5	**4**	96	105	56	125	1	182	414
08:00 AM	0	0	0	0	0	98	0	98	**6**	1	100	107	68	101	1	170	375
Total Volume	0	0	0	0	6	435	0	441	19	10	401	430	276	479	10	765	1636
% App. Total	0	0	0		1.4	98.6	0		4.4	2.3	93.3		36.1	62.6	1.3		
PHF	.000	.000	.000	.000	.375	.884	.000	.868	.792	.625	.955	.960	.767	.894	.500	.902	.911

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Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Union Street From North			Church Green Street (Route 44/104) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	8	0	0	0	5	3	5	0	21
07:15 AM	0	0	0	0	8	0	0	0	6	7	8	0	29
07:30 AM	0	0	0	0	8	0	0	0	6	5	7	0	26
07:45 AM	0	0	0	1	5	0	0	0	8	0	8	0	22
Total	0	0	0	1	29	0	0	0	25	15	28	0	98
08:00 AM	0	0	0	0	8	0	0	0	8	3	4	0	23
08:15 AM	0	0	0	0	8	0	0	0	3	3	5	0	19
08:30 AM	0	0	0	0	3	0	0	0	6	2	4	0	15
08:45 AM	0	0	0	0	8	0	0	0	7	3	8	0	26
Total	0	0	0	0	27	0	0	0	24	11	21	0	83
Grand Total	0	0	0	1	56	0	0	0	49	26	49	0	181
Apprch %	0	0	0	1.8	98.2	0	0	0	100	34.7	65.3	0	
Total %	0	0	0	0.6	30.9	0	0	0	27.1	14.4	27.1	0	

	Union Street From North				Church Green Street (Route 44/104) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	**8**	0	**8**	0	0	6	6	**7**	**8**	0	**15**	**29**
07:30 AM	0	0	0	0	0	8	0	8	0	0	6	6	5	7	0	12	26
07:45 AM	0	0	0	0	**1**	5	0	6	0	0	**8**	**8**	0	8	0	8	22
08:00 AM	0	0	0	0	0	8	0	8	0	0	8	8	3	4	0	7	23
Total Volume	0	0	0	0	1	29	0	30	0	0	28	28	15	27	0	42	100
% App. Total	0	0	0		3.3	96.7	0		0	0	100		35.7	64.3	0		
PHF	.000	.000	.000	.000	.250	.906	.000	.938	.000	.000	.875	.875	.536	.844	.000	.700	.862

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File Name : 81676 K-G
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Page No : 1

Groups Printed- Peds and Bicycles

	Union Street From North				Church Green Street (Route 44/104) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	3	0	0	0	5	0	0	0	2	0	0	0	0	10
07:15 AM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3
07:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Total	0	0	0	5	0	0	0	9	0	0	0	3	0	0	0	1	18
08:00 AM	0	0	0	4	0	0	0	0	0	2	0	0	0	0	0	0	6
08:15 AM	0	0	0	6	0	0	0	3	0	0	0	1	0	0	0	2	12
08:30 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	4
08:45 AM	0	0	0	2	0	1	0	3	0	0	1	0	0	0	0	0	7
Total	0	0	0	15	0	1	0	7	0	2	1	1	0	0	0	2	29
Grand Total	0	0	0	20	0	1	0	16	0	2	1	4	0	0	0	3	47
Apprch %	0	0	0	100	0	5.9	0	94.1	0	28.6	14.3	57.1	0	0	0	100	
Total %	0	0	0	42.6	0	2.1	0	34	0	4.3	2.1	8.5	0	0	0	6.4	

	Union Street From North					Church Green Street (Route 44/104) From East					Summer Street (Route 140) From South					Main Street (Route 44/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	4	4	0	0	0	0	0	0	**2**	**0**	**0**	**2**	0	0	0	0	0	6
08:15 AM	0	0	0	**6**	**6**	0	0	0	**3**	3	0	0	0	**1**	**1**	**0**	**0**	**0**	**2**	**2**	**12**
08:30 AM	0	0	0	3	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4
08:45 AM	0	0	0	2	2	0	**1**	**0**	**3**	**4**	0	0	**1**	0	1	0	0	0	0	0	7
Total Volume	0	0	0	15	15	0	1	0	7	8	0	2	1	1	4	0	0	0	2	2	29
% App. Total	0	0	0	100		0	12.5	0	87.5		0	50	25	25		0	0	0	100		
PHF	.000	.000	.000	.625	.625	.000	.250	.000	.583	.500	.000	.250	.250	.250	.500	.000	.000	.000	.250	.250	.604

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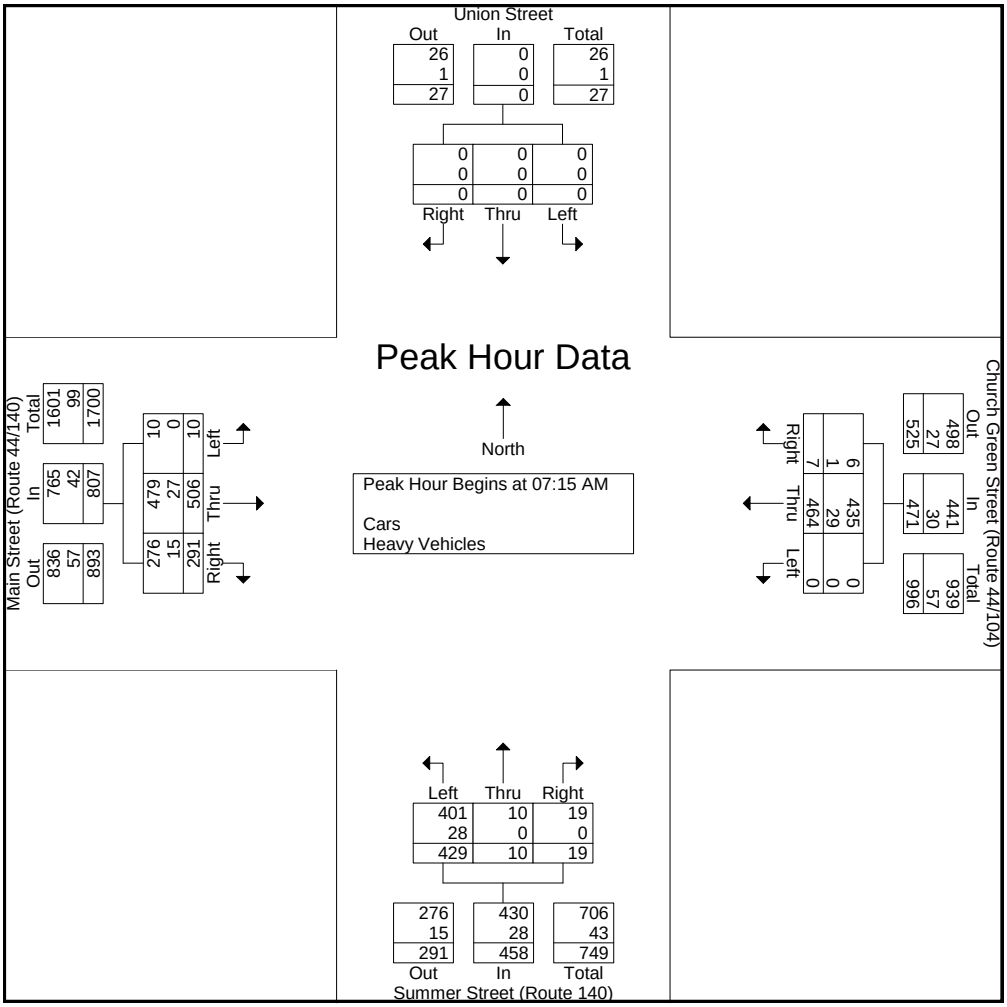
N/S: Union Street/Summer St (Route 140)
E/W: Church Green Street/Main Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-G
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Union Street From North				Church Green Street (Route 44/104) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	99	0	99	4	2	106	112	69	**142**	**5**	216	427
07:30 AM	0	0	0	0	2	**131**	0	**133**	4	3	**111**	**118**	**95**	126	3	**224**	**475**
07:45 AM	0	0	0	0	**5**	128	0	133	5	**4**	104	113	56	133	1	190	436
08:00 AM	0	0	0	0	0	106	0	106	**6**	1	108	115	71	105	1	177	398
Total Volume	0	0	0	0	7	464	0	471	19	10	429	458	291	506	10	807	1736
% App. Total	0	0	0		1.5	98.5	0		4.1	2.2	93.7		36.1	62.7	1.2		
PHF	.000	.000	.000	.000	.350	.885	.000	.885	.792	.625	.966	.970	.766	.891	.500	.901	.914
Cars	0	0	0	0	6	435	0	441	19	10	401	430	276	479	10	765	1636
% Cars	0	0	0	0	85.7	93.8	0	93.6	100	100	93.5	93.9	94.8	94.7	100	94.8	94.2
Heavy Vehicles	0	0	0	0	1	29	0	30	0	0	28	28	15	27	0	42	100
% Heavy Vehicles	0	0	0	0	14.3	6.3	0	6.4	0	0	6.5	6.1	5.2	5.3	0	5.2	5.8



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N/S: Union Street/Summer St (Route 140)
E/W: Church Green Street/Main Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-GGG
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Union Street From North			Church Green Street (Route 44) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	4	112	0	4	9	95	72	123	3	422
04:15 PM	0	0	0	5	126	0	2	8	105	83	118	2	449
04:30 PM	0	0	0	4	115	0	5	4	88	111	112	5	444
04:45 PM	0	0	0	4	142	0	2	7	93	87	108	3	446
Total	0	0	0	17	495	0	13	28	381	353	461	13	1761
05:00 PM	0	0	0	5	103	0	8	6	89	94	121	4	430
05:15 PM	0	0	0	1	138	0	3	10	95	83	110	3	443
05:30 PM	0	0	0	3	121	0	0	3	90	76	103	5	401
05:45 PM	0	0	0	3	119	0	2	8	86	77	111	3	409
Total	0	0	0	12	481	0	13	27	360	330	445	15	1683
Grand Total	0	0	0	29	976	0	26	55	741	683	906	28	3444
Apprch %	0	0	0	2.9	97.1	0	3.2	6.7	90.1	42.2	56	1.7	
Total %	0	0	0	0.8	28.3	0	0.8	1.6	21.5	19.8	26.3	0.8	
Cars	0	0	0	28	946	0	26	53	719	672	886	27	3357
% Cars	0	0	0	96.6	96.9	0	100	96.4	97	98.4	97.8	96.4	97.5
Heavy Vehicles	0	0	0	1	30	0	0	2	22	11	20	1	87
% Heavy Vehicles	0	0	0	3.4	3.1	0	0	3.6	3	1.6	2.2	3.6	2.5

	Union Street From North				Church Green Street (Route 44) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	**5**	126	0	131	2	**8**	**105**	**115**	83	118	2	203	**449**
04:30 PM	0	0	0	0	4	115	0	119	5	4	88	97	**111**	112	**5**	**228**	444
04:45 PM	0	0	0	0	4	**142**	0	**146**	2	7	93	102	87	108	3	198	446
05:00 PM	0	0	0	0	5	103	0	108	**8**	6	89	103	94	**121**	4	219	430
Total Volume	0	0	0	0	18	486	0	504	17	25	375	417	375	459	14	848	1769
% App. Total	0	0	0		3.6	96.4	0		4.1	6	89.9		44.2	54.1	1.7		
PHF	.000	.000	.000	.000	.900	.856	.000	.863	.531	.781	.893	.907	.845	.948	.700	.930	.985
Cars	0	0	0	0	18	467	0	485	17	24	366	407	370	446	13	829	1721
% Cars	0	0	0	0	100	96.1	0	96.2	100	96.0	97.6	97.6	98.7	97.2	92.9	97.8	97.3
Heavy Vehicles	0	0	0	0	0	19	0	19	0	1	9	10	5	13	1	19	48
% Heavy Vehicles	0	0	0	0	0	3.9	0	3.8	0	4.0	2.4	2.4	1.3	2.8	7.1	2.2	2.7

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-GGG
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Union Street From North			Church Green Street (Route 44) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	3	107	0	4	8	88	68	121	3	402
04:15 PM	0	0	0	5	121	0	2	7	99	82	113	2	431
04:30 PM	0	0	0	4	112	0	5	4	87	110	106	4	432
04:45 PM	0	0	0	4	138	0	2	7	91	87	107	3	439
Total	0	0	0	16	478	0	13	26	365	347	447	12	1704
05:00 PM	0	0	0	5	96	0	8	6	89	91	120	4	419
05:15 PM	0	0	0	1	136	0	3	10	92	82	108	3	435
05:30 PM	0	0	0	3	119	0	0	3	87	75	101	5	393
05:45 PM	0	0	0	3	117	0	2	8	86	77	110	3	406
Total	0	0	0	12	468	0	13	27	354	325	439	15	1653
Grand Total	0	0	0	28	946	0	26	53	719	672	886	27	3357
Apprch %	0	0	0	2.9	97.1	0	3.3	6.6	90.1	42.4	55.9	1.7	
Total %	0	0	0	0.8	28.2	0	0.8	1.6	21.4	20	26.4	0.8	

	Union Street From North				Church Green Street (Route 44) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	4	112	0	116	5	4	87	96	**110**	106	**4**	**220**	432
04:45 PM	0	0	0	0	4	**138**	0	**142**	2	7	91	100	87	107	3	197	**439**
05:00 PM	0	0	0	0	**5**	96	0	101	**8**	6	89	103	91	**120**	4	215	419
05:15 PM	0	0	0	0	1	136	0	137	3	**10**	**92**	**105**	82	108	3	193	435
Total Volume	0	0	0	0	14	482	0	496	18	27	359	404	370	441	14	825	1725
% App. Total	0	0	0		2.8	97.2	0		4.5	6.7	88.9		44.8	53.5	1.7		
PHF	.000	.000	.000	.000	.700	.873	.000	.873	.563	.675	.976	.962	.841	.919	.875	.938	.982

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Client: VHB/J. Quitter

File Name : 81676 K-GGG
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Union Street From North			Church Green Street (Route 44) From East			Summer Street (Route 140) From South			Main Street (Route 44/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	1	5	0	0	1	7	4	2	0	20
04:15 PM	0	0	0	0	5	0	0	1	6	1	5	0	18
04:30 PM	0	0	0	0	3	0	0	0	1	1	6	1	12
04:45 PM	0	0	0	0	4	0	0	0	2	0	1	0	7
Total	0	0	0	1	17	0	0	2	16	6	14	1	57
05:00 PM	0	0	0	0	7	0	0	0	0	3	1	0	11
05:15 PM	0	0	0	0	2	0	0	0	3	1	2	0	8
05:30 PM	0	0	0	0	2	0	0	0	3	1	2	0	8
05:45 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
Total	0	0	0	0	13	0	0	0	6	5	6	0	30
Grand Total	0	0	0	1	30	0	0	2	22	11	20	1	87
Apprch %	0	0	0	3.2	96.8	0	0	8.3	91.7	34.4	62.5	3.1	
Total %	0	0	0	1.1	34.5	0	0	2.3	25.3	12.6	23	1.1	

	Union Street From North				Church Green Street (Route 44) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**1**	**5**	0	**6**	0	**1**	**7**	**8**	**4**	2	0	6	**20**
04:15 PM	0	0	0	0	0	5	0	5	0	1	6	7	1	5	0	6	18
04:30 PM	0	0	0	0	0	3	0	3	0	0	1	1	1	**6**	**1**	**8**	12
04:45 PM	0	0	0	0	0	4	0	4	0	0	2	2	0	1	0	1	7
Total Volume	0	0	0	0	1	17	0	18	0	2	16	18	6	14	1	21	57
% App. Total	0	0	0		5.6	94.4	0		0	11.1	88.9		28.6	66.7	4.8		
PHF	.000	.000	.000	.000	.250	.850	.000	.750	.000	.500	.571	.563	.375	.583	.250	.656	.713

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-GGG
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	Union Street From North				Church Green Street (Route 44) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	6
04:15 PM	0	0	0	3	0	0	0	7	0	0	0	2	1	0	0	0	13
04:30 PM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	4
04:45 PM	0	0	0	1	0	0	0	10	0	0	0	5	0	0	0	1	17
Total	0	0	0	6	0	0	0	19	0	0	0	7	1	1	0	6	40
05:00 PM	0	0	0	1	0	0	0	8	0	0	0	2	0	0	0	1	12
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	3
Total	0	0	0	4	0	0	0	11	0	0	1	2	1	1	0	1	21
Grand Total	0	0	0	10	0	0	0	30	0	0	1	9	2	2	0	7	61
Apprch %	0	0	0	100	0	0	0	100	0	0	10	90	18.2	18.2	0	63.6	
Total %	0	0	0	16.4	0	0	0	49.2	0	0	1.6	14.8	3.3	3.3	0	11.5	

	Union Street From North					Church Green Street (Route 44) From East					Summer Street (Route 140) From South					Main Street (Route 44/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	**3**	**3**	0	0	0	7	7	0	0	0	2	2	**1**	**0**	**0**	**0**	**1**	13
04:30 PM	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4
04:45 PM	0	0	0	1	1	0	0	0	**10**	**10**	0	0	0	**5**	**5**	0	0	0	**1**	**1**	**17**
05:00 PM	0	0	0	1	1	0	0	0	8	8	0	0	0	2	2	0	0	0	1	1	12
Total Volume	0	0	0	7	7	0	0	0	27	27	0	0	0	9	9	1	0	0	2	3	46
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		33.3	0	0	66.7		
PHF	.000	.000	.000	.583	.583	.000	.000	.000	.675	.675	.000	.000	.000	.450	.450	.250	.000	.000	.500	.750	.676

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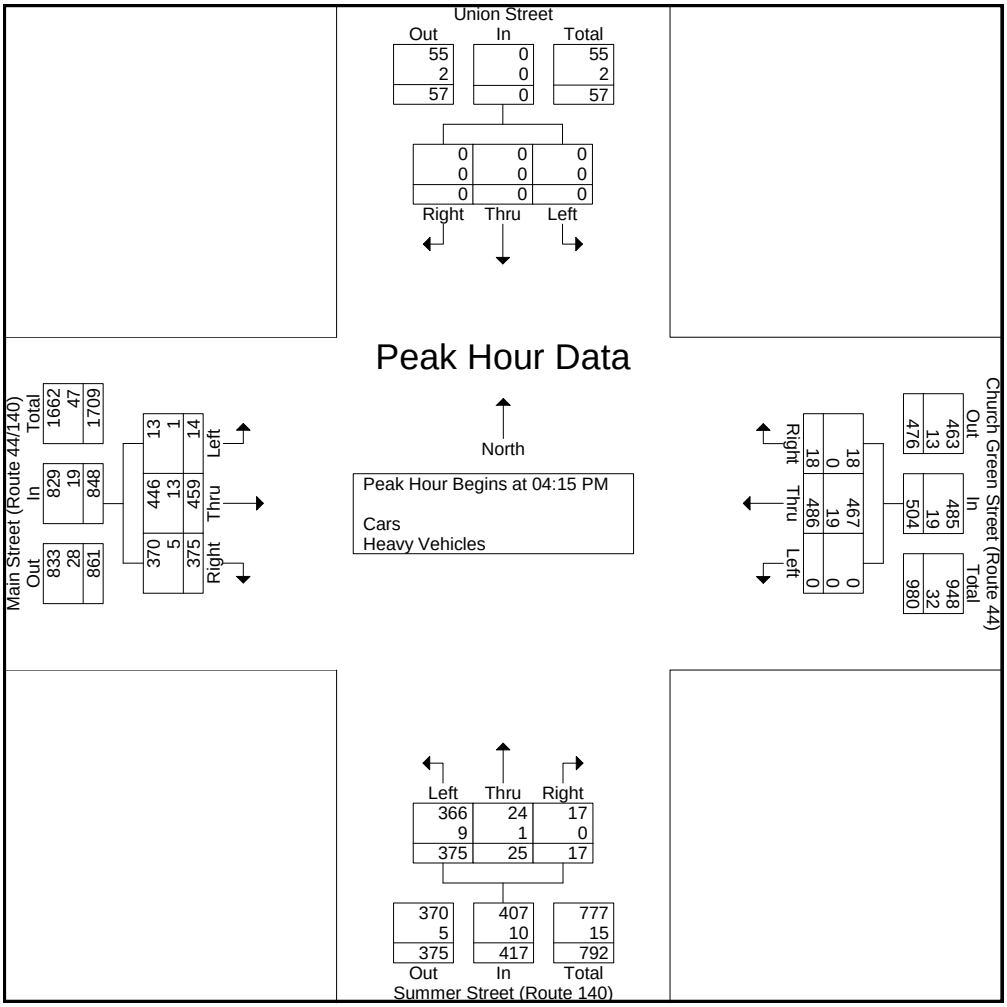
Start Date : 9/17/2008
Page No : 1

	Union Street From North				Church Green Street (Route 44) From East				Summer Street (Route 140) From South				Main Street (Route 44/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	**5**	126	0	131	2	**8**	**105**	**115**	83	118	2	203	**449**
04:30 PM	0	0	0	0	4	115	0	119	5	4	88	97	**111**	112	**5**	**228**	444
04:45 PM	0	0	0	0	4	**142**	0	**146**	2	7	93	102	87	108	3	198	446
05:00 PM	0	0	0	0	5	103	0	108	**8**	6	89	103	94	**121**	4	219	430
Total Volume	0	0	0	0	18	486	0	504	17	25	375	417	375	459	14	848	1769
% App. Total	0	0	0		3.6	96.4	0		4.1	6	89.9		44.2	54.1	1.7		
PHF	.000	.000	.000	.000	.900	.856	.000	.863	.531	.781	.893	.907	.845	.948	.700	.930	.985
Cars	0	0	0	0	18	467	0	485	17	24	366	407	370	446	13	829	1721
% Cars	0	0	0	0	100	96.1	0	96.2	100	96.0	97.6	97.6	98.7	97.2	92.9	97.8	97.3
Heavy Vehicles	0	0	0	0	0	19	0	19	0	1	9	10	5	13	1	19	48
% Heavy Vehicles	0	0	0	0	0	3.9	0	3.8	0	4.0	2.4	2.4	1.3	2.8	7.1	2.2	2.7



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E/W: Church Green Street/Spring Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-H
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	80	1	0	16	3	4	80	15	4	49	6	261
07:15 AM	8	57	1	3	36	9	5	104	9	13	49	3	297
07:30 AM	2	87	3	1	33	20	4	104	10	19	56	6	345
07:45 AM	5	43	3	3	28	2	3	107	15	14	42	7	272
Total	18	267	8	7	113	34	16	395	49	50	196	22	1175
08:00 AM	7	63	2	1	36	5	8	112	13	8	60	4	319
08:15 AM	3	54	4	1	39	2	4	101	14	13	46	7	288
08:30 AM	3	49	1	1	41	2	1	95	18	9	51	1	272
08:45 AM	7	52	1	2	59	1	4	90	22	11	57	8	314
Total	20	218	8	5	175	10	17	398	67	41	214	20	1193
Grand Total	38	485	16	12	288	44	33	793	116	91	410	42	2368
Apprch %	7.1	90	3	3.5	83.7	12.8	3.5	84.2	12.3	16.8	75.5	7.7	
Total %	1.6	20.5	0.7	0.5	12.2	1.9	1.4	33.5	4.9	3.8	17.3	1.8	
Cars	37	470	16	11	272	42	31	751	113	87	396	40	2266
% Cars	97.4	96.9	100	91.7	94.4	95.5	93.9	94.7	97.4	95.6	96.6	95.2	95.7
Heavy Vehicles	1	15	0	1	16	2	2	42	3	4	14	2	102
% Heavy Vehicles	2.6	3.1	0	8.3	5.6	4.5	6.1	5.3	2.6	4.4	3.4	4.8	4.3

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**8**	57	1	66	**3**	**36**	9	48	5	104	9	118	13	49	3	65	297
07:30 AM	2	**87**	**3**	**92**	1	33	**20**	**54**	4	104	10	118	**19**	56	6	**81**	**345**
07:45 AM	5	43	3	51	3	28	2	33	3	107	**15**	125	14	42	**7**	63	272
08:00 AM	7	63	2	72	1	36	5	42	**8**	**112**	13	**133**	8	**60**	4	72	319
Total Volume	22	250	9	281	8	133	36	177	20	427	47	494	54	207	20	281	1233
% App. Total	7.8	89	3.2		4.5	75.1	20.3		4	86.4	9.5		19.2	73.7	7.1		
PHF	.688	.718	.750	.764	.667	.924	.450	.819	.625	.953	.783	.929	.711	.863	.714	.867	.893
Cars	21	244	9	274	7	127	35	169	20	404	46	470	52	199	19	270	1183
% Cars	95.5	97.6	100	97.5	87.5	95.5	97.2	95.5	100	94.6	97.9	95.1	96.3	96.1	95.0	96.1	95.9
Heavy Vehicles	1	6	0	7	1	6	1	8	0	23	1	24	2	8	1	11	50
% Heavy Vehicles	4.5	2.4	0	2.5	12.5	4.5	2.8	4.5	0	5.4	2.1	4.9	3.7	3.9	5.0	3.9	4.1

PRECISION
D A T A
INDUSTRIES, LLC
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N/S: Summer Street (Route 140)
E/W: Church Green Street/Spring Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-H
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	78	1	0	14	3	3	76	14	3	49	6	250
07:15 AM	7	55	1	2	34	9	5	101	9	13	49	2	287
07:30 AM	2	84	3	1	33	19	4	99	10	19	54	6	334
07:45 AM	5	43	3	3	26	2	3	99	14	13	40	7	258
Total	17	260	8	6	107	33	15	375	47	48	192	21	1129
08:00 AM	7	62	2	1	34	5	8	105	13	7	56	4	304
08:15 AM	3	50	4	1	37	2	3	98	14	12	42	6	272
08:30 AM	3	47	1	1	39	1	1	91	18	9	49	1	261
08:45 AM	7	51	1	2	55	1	4	82	21	11	57	8	300
Total	20	210	8	5	165	9	16	376	66	39	204	19	1137
Grand Total	37	470	16	11	272	42	31	751	113	87	396	40	2266
Apprch %	7.1	89.9	3.1	3.4	83.7	12.9	3.5	83.9	12.6	16.6	75.7	7.6	
Total %	1.6	20.7	0.7	0.5	12	1.9	1.4	33.1	5	3.8	17.5	1.8	

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**7**	55	1	63	2	**34**	9	45	5	101	9	115	13	49	2	64	287
07:30 AM	2	**84**	**3**	**89**	1	33	**19**	**53**	4	99	10	113	**19**	54	6	**79**	**334**
07:45 AM	5	43	3	51	**3**	26	2	31	3	99	**14**	116	13	40	**7**	60	258
08:00 AM	7	62	2	71	1	34	5	40	**8**	**105**	13	**126**	7	**56**	4	67	304
Total Volume	21	244	9	274	7	127	35	169	20	404	46	470	52	199	19	270	1183
% App. Total	7.7	89.1	3.3		4.1	75.1	20.7		4.3	86	9.8		19.3	73.7	7		
PHF	.750	.726	.750	.770	.583	.934	.461	.797	.625	.962	.821	.933	.684	.888	.679	.854	.885

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-H
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	2	0	0	2	0	1	4	1	1	0	0	11
07:15 AM	1	2	0	1	2	0	0	3	0	0	0	1	10
07:30 AM	0	3	0	0	0	1	0	5	0	0	2	0	11
07:45 AM	0	0	0	0	2	0	0	8	1	1	2	0	14
Total	1	7	0	1	6	1	1	20	2	2	4	1	46
08:00 AM	0	1	0	0	2	0	0	7	0	1	4	0	15
08:15 AM	0	4	0	0	2	0	1	3	0	1	4	1	16
08:30 AM	0	2	0	0	2	1	0	4	0	0	2	0	11
08:45 AM	0	1	0	0	4	0	0	8	1	0	0	0	14
Total	0	8	0	0	10	1	1	22	1	2	10	1	56
Grand Total	1	15	0	1	16	2	2	42	3	4	14	2	102
Apprch %	6.2	93.8	0	5.3	84.2	10.5	4.3	89.4	6.4	20	70	10	
Total %	1	14.7	0	1	15.7	2	2	41.2	2.9	3.9	13.7	2	

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	3	0	3	0	0	**1**	1	0	5	0	5	0	2	0	2	11
07:45 AM	0	0	0	0	0	**2**	0	**2**	0	**8**	**1**	**9**	**1**	2	0	3	14
08:00 AM	0	1	0	1	0	2	0	2	0	7	0	7	1	**4**	0	5	15
08:15 AM	0	**4**	0	**4**	0	2	0	2	**1**	3	0	4	1	4	**1**	**6**	**16**
Total Volume	0	8	0	8	0	6	1	7	1	23	1	25	3	12	1	16	56
% App. Total	0	100	0		0	85.7	14.3		4	92	4		18.8	75	6.2		
PHF	.000	.500	.000	.500	.000	.750	.250	.875	.250	.719	.250	.694	.750	.750	.250	.667	.875

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-H
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	5
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	5
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	3	0	0	0	2	0	0	0	8	14
08:00 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
08:30 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	1	5
08:45 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	1	4
Total	0	0	0	5	0	0	0	6	0	0	0	1	0	0	0	2	14
Grand Total	0	0	0	6	0	0	0	9	0	0	0	3	0	0	0	10	28
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	0	21.4	0	0	0	32.1	0	0	0	10.7	0	0	0	35.7	

	Summer Street (Route 140) From North					Church Green Street From East					Summer Street (Route 140) From South					Spring Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	**3**	**3**	**5**
07:15 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	3	3	5
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	2	2	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	1	0	0	0	3	3	0	0	0	2	2	0	0	0	8	8	14
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.375	.375	.000	.000	.000	.500	.500	.000	.000	.000	.667	.667	.700

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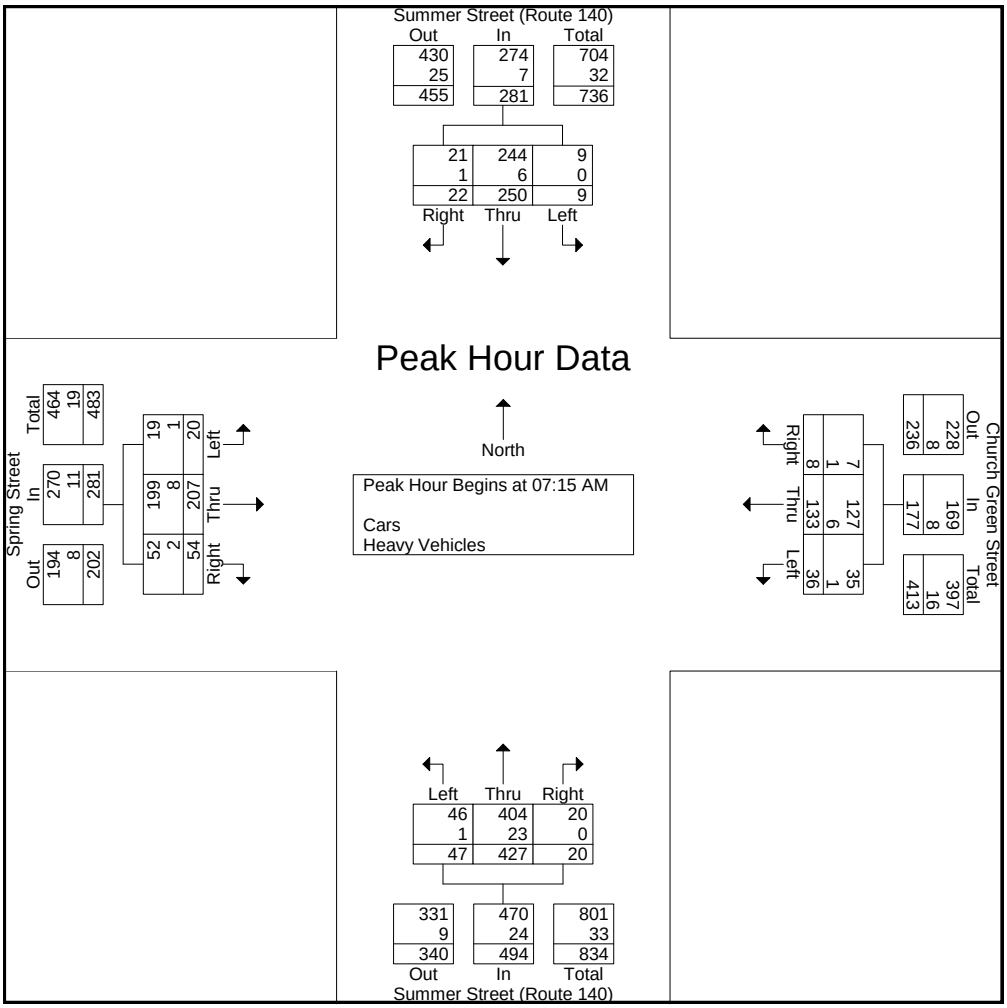
Client: VHB/J. Quitter

File Name : 81676 K-H
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**8**	57	1	66	**3**	**36**	9	48	5	104	9	118	13	49	3	65	297
07:30 AM	2	**87**	**3**	**92**	1	33	**20**	**54**	4	104	10	118	**19**	56	6	**81**	**345**
07:45 AM	5	43	3	51	3	28	2	33	3	107	**15**	125	14	42	**7**	63	272
08:00 AM	7	63	2	72	1	36	5	42	**8**	**112**	13	**133**	8	**60**	4	72	319
Total Volume	22	250	9	281	8	133	36	177	20	427	47	494	54	207	20	281	1233
% App. Total	7.8	89	3.2		4.5	75.1	20.3		4	86.4	9.5		19.2	73.7	7.1		
PHF	.688	.718	.750	.764	.667	.924	.450	.819	.625	.953	.783	.929	.711	.863	.714	.867	.893
Cars	21	244	9	274	7	127	35	169	20	404	46	470	52	199	19	270	1183
% Cars	95.5	97.6	100	97.5	87.5	95.5	97.2	95.5	100	94.6	97.9	95.1	96.3	96.1	95.0	96.1	95.9
Heavy Vehicles	1	6	0	7	1	6	1	8	0	23	1	24	2	8	1	11	50
% Heavy Vehicles	4.5	2.4	0	2.5	12.5	4.5	2.8	4.5	0	5.4	2.1	4.9	3.7	3.9	5.0	3.9	4.1



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N/S: Summer Street (Route 140)
E/W: Church Green Street/Spring Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-HHH
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	10	62	0	3	57	7	4	73	13	41	50	16	336
04:15 PM	8	73	0	3	58	3	1	106	16	23	46	10	347
04:30 PM	5	91	3	0	49	4	3	82	8	23	53	10	331
04:45 PM	12	85	4	3	51	3	3	92	11	22	42	13	341
Total	35	311	7	9	215	17	11	353	48	109	191	49	1355
05:00 PM	7	86	1	6	75	4	2	77	18	38	65	8	387
05:15 PM	6	86	0	4	54	3	1	99	15	18	50	8	344
05:30 PM	5	73	0	1	54	2	1	80	9	28	43	1	297
05:45 PM	2	70	3	3	54	1	3	79	7	11	44	11	288
Total	20	315	4	14	237	10	7	335	49	95	202	28	1316
Grand Total	55	626	11	23	452	27	18	688	97	204	393	77	2671
Apprch %	7.9	90.5	1.6	4.6	90	5.4	2.2	85.7	12.1	30.3	58.3	11.4	
Total %	2.1	23.4	0.4	0.9	16.9	1	0.7	25.8	3.6	7.6	14.7	2.9	
Cars	54	617	11	23	448	27	18	671	97	203	386	74	2629
% Cars	98.2	98.6	100	100	99.1	100	100	97.5	100	99.5	98.2	96.1	98.4
Heavy Vehicles	1	9	0	0	4	0	0	17	0	1	7	3	42
% Heavy Vehicles	1.8	1.4	0	0	0.9	0	0	2.5	0	0.5	1.8	3.9	1.6

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	8	73	0	81	3	58	3	64	1	**106**	16	**123**	23	46	10	79	347
04:30 PM	5	**91**	3	99	0	49	**4**	53	**3**	82	8	93	23	53	10	86	331
04:45 PM	**12**	85	**4**	**101**	3	51	3	57	3	92	11	106	22	42	**13**	77	341
05:00 PM	7	86	1	94	**6**	**75**	4	**85**	2	77	**18**	97	**38**	**65**	8	**111**	**387**
Total Volume	32	335	8	375	12	233	14	259	9	357	53	419	106	206	41	353	1406
% App. Total	8.5	89.3	2.1		4.6	90	5.4		2.1	85.2	12.6		30	58.4	11.6		
PHF	.667	.920	.500	.928	.500	.777	.875	.762	.750	.842	.736	.852	.697	.792	.788	.795	.908
Cars	31	331	8	370	12	231	14	257	9	350	53	412	105	202	40	347	1386
% Cars	96.9	98.8	100	98.7	100	99.1	100	99.2	100	98.0	100	98.3	99.1	98.1	97.6	98.3	98.6
Heavy Vehicles	1	4	0	5	0	2	0	2	0	7	0	7	1	4	1	6	20
% Heavy Vehicles	3.1	1.2	0	1.3	0	0.9	0	0.8	0	2.0	0	1.7	0.9	1.9	2.4	1.7	1.4

PRECISION
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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-HHH
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	10	59	0	3	56	7	4	67	13	41	48	15	323
04:15 PM	8	72	0	3	58	3	1	101	16	23	46	9	340
04:30 PM	5	90	3	0	49	4	3	81	8	22	50	10	325
04:45 PM	12	85	4	3	50	3	3	91	11	22	42	13	339
Total	35	306	7	9	213	17	11	340	48	108	186	47	1327
05:00 PM	6	84	1	6	74	4	2	77	18	38	64	8	382
05:15 PM	6	85	0	4	54	3	1	98	15	18	49	7	340
05:30 PM	5	72	0	1	54	2	1	77	9	28	43	1	293
05:45 PM	2	70	3	3	53	1	3	79	7	11	44	11	287
Total	19	311	4	14	235	10	7	331	49	95	200	27	1302
Grand Total	54	617	11	23	448	27	18	671	97	203	386	74	2629
Apprch %	7.9	90.5	1.6	4.6	90	5.4	2.3	85.4	12.3	30.6	58.2	11.2	
Total %	2.1	23.5	0.4	0.9	17	1	0.7	25.5	3.7	7.7	14.7	2.8	

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	8	72	0	80	3	58	3	64	1	**101**	16	**118**	23	46	9	78	340
04:30 PM	5	**90**	3	98	0	49	**4**	53	**3**	81	8	92	22	50	10	82	325
04:45 PM	**12**	85	**4**	**101**	3	50	3	56	3	91	11	105	22	42	**13**	77	339
05:00 PM	6	84	1	91	**6**	**74**	4	**84**	2	77	**18**	97	**38**	**64**	8	**110**	**382**
Total Volume	31	331	8	370	12	231	14	257	9	350	53	412	105	202	40	347	1386
% App. Total	8.4	89.5	2.2		4.7	89.9	5.4		2.2	85	12.9		30.3	58.2	11.5		
PHF	.646	.919	.500	.916	.500	.780	.875	.765	.750	.866	.736	.873	.691	.789	.769	.789	.907

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N/S: Summer Street (Route 140)
E/W: Church Green Street/Spring Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-HHH
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Summer Street (Route 140) From North			Church Green Street From East			Summer Street (Route 140) From South			Spring Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	3	0	0	1	0	0	6	0	0	2	1	13
04:15 PM	0	1	0	0	0	0	0	5	0	0	0	1	7
04:30 PM	0	1	0	0	0	0	0	1	0	1	3	0	6
04:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
Total	0	5	0	0	2	0	0	13	0	1	5	2	28
05:00 PM	1	2	0	0	1	0	0	0	0	0	1	0	5
05:15 PM	0	1	0	0	0	0	0	1	0	0	1	1	4
05:30 PM	0	1	0	0	0	0	0	3	0	0	0	0	4
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	1	4	0	0	2	0	0	4	0	0	2	1	14
Grand Total	1	9	0	0	4	0	0	17	0	1	7	3	42
Apprch %	10	90	0	0	100	0	0	100	0	9.1	63.6	27.3	
Total %	2.4	21.4	0	0	9.5	0	0	40.5	0	2.4	16.7	7.1	

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**3**	0	**3**	0	**1**	0	**1**	0	**6**	0	**6**	0	2	**1**	3	**13**
04:15 PM	0	1	0	1	0	0	0	0	0	5	0	5	0	0	1	1	7
04:30 PM	0	1	0	1	0	0	0	0	0	1	0	1	**1**	**3**	0	**4**	6
04:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
Total Volume	0	5	0	5	0	2	0	2	0	13	0	13	1	5	2	8	28
% App. Total	0	100	0		0	100	0		0	100	0		12.5	62.5	25		
PHF	.000	.417	.000	.417	.000	.500	.000	.500	.000	.542	.000	.542	.250	.417	.500	.500	.538

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-HHH
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3
04:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	8
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	6
04:45 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2	5
Total	0	0	0	1	0	0	0	4	0	0	0	7	0	0	0	10	22
05:00 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2	5
05:15 PM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	1	6
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	4	7
Total	0	0	0	2	0	0	0	4	0	0	0	5	0	0	0	8	19
Grand Total	0	0	0	3	0	0	0	8	0	0	0	12	0	0	0	18	41
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	0	7.3	0	0	0	19.5	0	0	0	29.3	0	0	0	43.9	

	Summer Street (Route 140) From North					Church Green Street From East					Summer Street (Route 140) From South					Spring Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	2	2	0	0	0	**4**	**4**	**8**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	3	3	6
04:45 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	0	0	0	2	2	5
05:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	0	0	0	2	2	5
Total Volume	0	0	0	0	0	0	0	0	6	6	0	0	0	7	7	0	0	0	11	11	24
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.000	.000	.000	.583	.583	.000	.000	.000	.688	.688	.750

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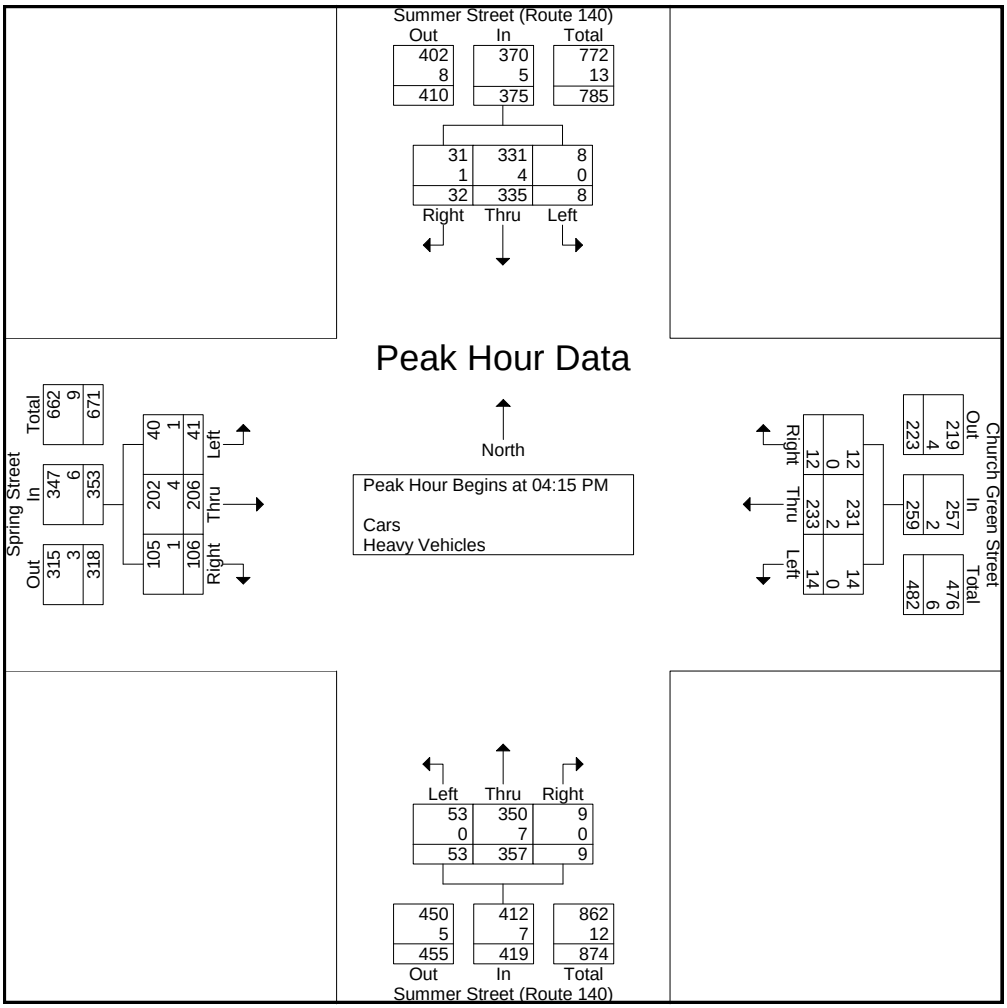
File Name : 81676 K-HHH
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Summer Street (Route 140) From North				Church Green Street From East				Summer Street (Route 140) From South				Spring Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	8	73	0	81	3	58	3	64	1	**106**	16	**123**	23	46	10	79	347
04:30 PM	5	**91**	3	99	0	49	**4**	53	**3**	82	8	93	23	53	10	86	331
04:45 PM	**12**	85	**4**	**101**	3	51	3	57	3	92	11	106	22	42	**13**	77	341
05:00 PM	7	86	1	94	**6**	**75**	4	**85**	2	77	**18**	97	**38**	**65**	8	**111**	**387**
Total Volume	32	335	8	375	12	233	14	259	9	357	53	419	106	206	41	353	1406
% App. Total	8.5	89.3	2.1		4.6	90	5.4		2.1	85.2	12.6		30	58.4	11.6		
PHF	.667	.920	.500	.928	.500	.777	.875	.762	.750	.842	.736	.852	.697	.792	.788	.795	.908
Cars	31	331	8	370	12	231	14	257	9	350	53	412	105	202	40	347	1386
% Cars	96.9	98.8	100	98.7	100	99.1	100	99.2	100	98.0	100	98.3	99.1	98.1	97.6	98.3	98.6
Heavy Vehicles	1	4	0	5	0	2	0	2	0	7	0	7	1	4	1	6	20
% Heavy Vehicles	3.1	1.2	0	1.3	0	0.9	0	0.8	0	2.0	0	1.7	0.9	1.9	2.4	1.7	1.4



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N/S: County Street (Route 140)
E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-J
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	79	2	1	66	61	135	344
07:15 AM	93	5	0	58	79	149	384
07:30 AM	109	1	2	61	68	164	405
07:45 AM	86	4	0	45	63	176	374
Total	367	12	3	230	271	624	1507
08:00 AM	91	2	1	44	64	128	330
08:15 AM	97	3	1	58	81	163	403
08:30 AM	101	1	0	50	59	149	360
08:45 AM	94	1	0	40	59	173	367
Total	383	7	2	192	263	613	1460
Grand Total	750	19	5	422	534	1237	2967
Apprch %	97.5	2.5	1.2	98.8	30.2	69.8	
Total %	25.3	0.6	0.2	14.2	18	41.7	
Cars	703	17	5	389	521	1160	2795
% Cars	93.7	89.5	100	92.2	97.6	93.8	94.2
Heavy Vehicles	47	2	0	33	13	77	172
% Heavy Vehicles	6.3	10.5	0	7.8	2.4	6.2	5.8

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**109**	1	**110**	**2**	**61**	**63**	68	164	232	**405**
07:45 AM	**86**	**4**	90	0	45	45	63	**176**	239	374
08:00 AM	91	2	93	1	44	45	64	128	192	330
08:15 AM	97	3	100	1	58	59	**81**	163	**244**	403
Total Volume	383	10	393	4	208	212	276	631	907	1512
% App. Total	97.5	2.5		1.9	98.1		30.4	69.6		
PHF	.878	.625	.893	.500	.852	.841	.852	.896	.929	.933
Cars	362	9	371	4	191	195	267	593	860	1426
% Cars	94.5	90.0	94.4	100	91.8	92.0	96.7	94.0	94.8	94.3
Heavy Vehicles	21	1	22	0	17	17	9	38	47	86
% Heavy Vehicles	5.5	10.0	5.6	0	8.2	8.0	3.3	6.0	5.2	5.7

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N/S: County Street (Route 140)
E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-J
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	74	2	1	62	59	127	325
07:15 AM	88	5	0	53	77	142	365
07:30 AM	103	1	2	55	64	152	377
07:45 AM	81	3	0	43	62	166	355
Total	346	11	3	213	262	587	1422
08:00 AM	87	2	1	41	61	120	312
08:15 AM	91	3	1	52	80	155	382
08:30 AM	89	0	0	45	59	140	333
08:45 AM	90	1	0	38	59	158	346
Total	357	6	2	176	259	573	1373
Grand Total	703	17	5	389	521	1160	2795
Apprch %	97.6	2.4	1.3	98.7	31	69	
Total %	25.2	0.6	0.2	13.9	18.6	41.5	

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**103**	1	**104**	**2**	**55**	**57**	64	152	216	377
07:45 AM	81	**3**	84	0	43	43	62	**166**	228	355
08:00 AM	87	2	89	1	41	42	61	120	181	312
08:15 AM	91	3	94	1	52	53	**80**	155	**235**	**382**
Total Volume	**362**	**9**	**371**	**4**	**191**	**195**	**267**	**593**	**860**	**1426**
% App. Total	**97.6**	**2.4**		**2.1**	**97.9**		**31**	**69**		
PHF	**.879**	**.750**	**.892**	**.500**	**.868**	**.855**	**.834**	**.893**	**.915**	**.933**

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File Name : 81676 K-J
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	5	0	0	4	2	8	19
07:15 AM	5	0	0	5	2	7	19
07:30 AM	6	0	0	6	4	12	28
07:45 AM	5	1	0	2	1	10	19
Total	21	1	0	17	9	37	85
08:00 AM	4	0	0	3	3	8	18
08:15 AM	6	0	0	6	1	8	21
08:30 AM	12	1	0	5	0	9	27
08:45 AM	4	0	0	2	0	15	21
Total	26	1	0	16	4	40	87
Grand Total	47	2	0	33	13	77	172
Apprch %	95.9	4.1	0	100	14.4	85.6	
Total %	27.3	1.2	0	19.2	7.6	44.8	

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**6**	0	**6**	0	**6**	**6**	**4**	**12**	**16**	**28**
07:45 AM	**5**	**1**	6	0	2	2	1	10	11	19
08:00 AM	4	0	4	0	3	3	3	8	11	18
08:15 AM	6	0	6	0	6	6	1	8	9	21
Total Volume	21	1	22	0	17	17	9	38	47	86
% App. Total	95.5	4.5		0	100		19.1	80.9		
PHF	.875	.250	.917	.000	.708	.708	.563	.792	.734	.768

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-J
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	1	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	2	0	2
Total	0	0	0	0	0	1	1	2	0	4
08:00 AM	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	0	0	0	0	2	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	3	0	1	0	4
Grand Total	0	0	0	0	0	4	1	3	0	8
Apprch %	0	0	0	0	0	100	25	75	0	
Total %	0	0	0	0	0	50	12.5	37.5	0	

	County Street (Route 140) From North				Gordon M. Owen Riverway From East				County Street (Route 140) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	0	0	0	0	**1**	**1**	**1**	0	0	1	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	**2**	**0**	**2**	2
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	1	1	1	3	0	4	5
% App. Total	0	0	0		0	0	100		25	75	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.250	.375	.000	.500	.625

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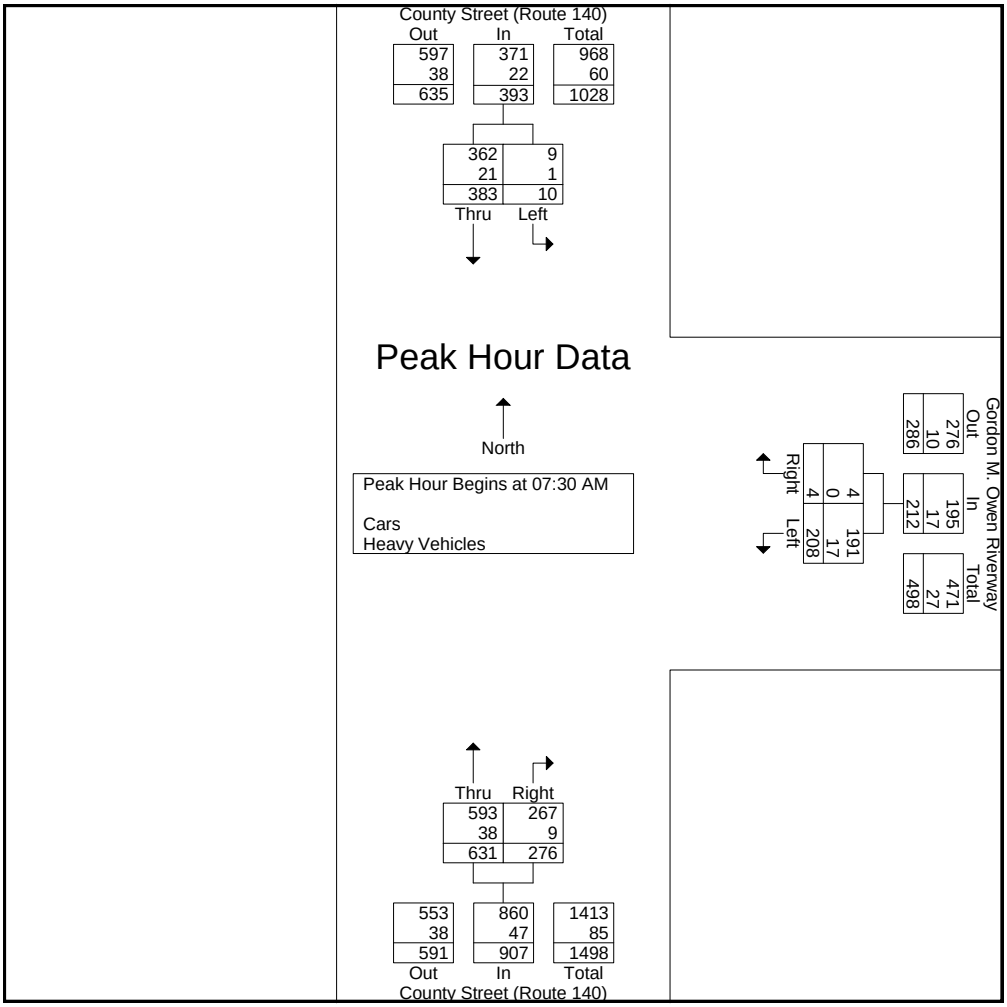
Start Date : 9/17/2008
Page No : 1

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**109**	1	**110**	**2**	**61**	**63**	68	164	232	**405**
07:45 AM	**86**	**4**	90	0	45	45	63	**176**	239	374
08:00 AM	91	2	93	1	44	45	64	128	192	330
08:15 AM	97	3	100	1	58	59	**81**	163	**244**	403
Total Volume	383	10	393	4	208	212	276	631	907	1512
% App. Total	97.5	2.5		1.9	98.1		30.4	69.6		
PHF	.878	.625	.893	.500	.852	.841	.852	.896	.929	.933
Cars	362	9	371	4	191	195	267	593	860	1426
% Cars	94.5	90.0	94.4	100	91.8	92.0	96.7	94.0	94.8	94.3
Heavy Vehicles	21	1	22	0	17	17	9	38	47	86
% Heavy Vehicles	5.5	10.0	5.6	0	8.2	8.0	3.3	6.0	5.2	5.7



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E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-JJJ
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	142	3	0	79	85	131	440
04:15 PM	140	3	0	95	74	130	442
04:30 PM	182	2	1	116	85	113	499
04:45 PM	157	2	0	103	91	128	481
Total	621	10	1	393	335	502	1862
05:00 PM	164	6	0	137	75	143	525
05:15 PM	134	2	2	96	85	121	440
05:30 PM	134	0	0	94	80	105	413
05:45 PM	126	7	1	100	70	107	411
Total	558	15	3	427	310	476	1789
Grand Total	1179	25	4	820	645	978	3651
Apprch %	97.9	2.1	0.5	99.5	39.7	60.3	
Total %	32.3	0.7	0.1	22.5	17.7	26.8	
Cars	1162	25	3	811	640	944	3585
% Cars	98.6	100	75	98.9	99.2	96.5	98.2
Heavy Vehicles	17	0	1	9	5	34	66
% Heavy Vehicles	1.4	0	25	1.1	0.8	3.5	1.8

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	140	3	143	0	95	95	74	130	204	442
04:30 PM	**182**	2	**184**	**1**	116	117	85	113	198	499
04:45 PM	157	2	159	0	103	103	**91**	128	**219**	481
05:00 PM	164	**6**	170	0	**137**	**137**	75	**143**	218	**525**
Total Volume	**643**	**13**	**656**	**1**	**451**	**452**	**325**	**514**	**839**	**1947**
% App. Total	**98**	**2**		**0.2**	**99.8**		**38.7**	**61.3**		
PHF	**.883**	**.542**	**.891**	**.250**	**.823**	**.825**	**.893**	**.899**	**.958**	**.927**
Cars	**632**	**13**	**645**	**0**	**445**	**445**	**323**	**499**	**822**	**1912**
% Cars	**98.3**	**100**	**98.3**	**0**	**98.7**	**98.5**	**99.4**	**97.1**	**98.0**	**98.2**
Heavy Vehicles	**11**	**0**	**11**	**1**	**6**	**7**	**2**	**15**	**17**	**35**
% Heavy Vehicles	**1.7**	**0**	**1.7**	**100**	**1.3**	**1.5**	**0.6**	**2.9**	**2.0**	**1.8**

PRECISION DATA INDUSTRIES, LLC
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N/S: County Street (Route 140)
E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-JJJ
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	140	3	0	78	84	124	429
04:15 PM	138	3	0	94	74	123	432
04:30 PM	180	2	0	114	84	111	491
04:45 PM	155	2	0	101	90	125	473
Total	613	10	0	387	332	483	1825
05:00 PM	159	6	0	136	75	140	516
05:15 PM	133	2	2	95	83	114	429
05:30 PM	131	0	0	93	80	103	407
05:45 PM	126	7	1	100	70	104	408
Total	549	15	3	424	308	461	1760
Grand Total	1162	25	3	811	640	944	3585
Apprch %	97.9	2.1	0.4	99.6	40.4	59.6	
Total %	32.4	0.7	0.1	22.6	17.9	26.3	

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	138	3	141	0	94	94	74	123	197	432
04:30 PM	**180**	2	**182**	0	114	114	84	111	195	491
04:45 PM	155	2	157	0	101	101	**90**	125	**215**	473
05:00 PM	159	**6**	165	0	**136**	**136**	75	**140**	215	**516**
Total Volume	**632**	**13**	**645**	**0**	**445**	**445**	**323**	**499**	**822**	**1912**
% App. Total	**98**	**2**		**0**	**100**		**39.3**	**60.7**		
PHF	**.878**	**.542**	**.886**	**.000**	**.818**	**.818**	**.897**	**.891**	**.956**	**.926**

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E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-JJJ
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		Gordon M. Owen Riverway From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	2	0	0	1	1	7	11
04:15 PM	2	0	0	1	0	7	10
04:30 PM	2	0	1	2	1	2	8
04:45 PM	2	0	0	2	1	3	8
Total	8	0	1	6	3	19	37
05:00 PM	5	0	0	1	0	3	9
05:15 PM	1	0	0	1	2	7	11
05:30 PM	3	0	0	1	0	2	6
05:45 PM	0	0	0	0	0	3	3
Total	9	0	0	3	2	15	29
Grand Total	17	0	1	9	5	34	66
Apprch %	100	0	10	90	12.8	87.2	
Total %	25.8	0	1.5	13.6	7.6	51.5	

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**2**	0	**2**	0	1	1	**1**	**7**	**8**	**11**
04:15 PM	**2**	**0**	**2**	**0**	**1**	**1**	**0**	**7**	**7**	**10**
04:30 PM	**2**	**0**	**2**	**1**	**2**	**3**	1	2	3	8
04:45 PM	2	0	2	0	2	2	1	3	4	8
Total Volume	8	0	8	1	6	7	3	19	22	37
% App. Total	100	0		14.3	85.7		13.6	86.4		
PHF	1.000	.000	1.000	.250	.750	.583	.750	.679	.688	.841

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N/S: County Street (Route 140)
E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-JJJ
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	1	1	0	0	2
04:45 PM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	1	1	2	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	2
Grand Total	1	0	0	0	0	2	1	3	0	7
Apprch %	100	0	0	0	0	100	25	75	0	
Total %	14.3	0	0	0	0	28.6	14.3	42.9	0	

	County Street (Route 140) From North				Gordon M. Owen Riverway From East				County Street (Route 140) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	**2**	**0**	**2**	**2**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	**1**	**1**	**1**	0	0	1	2
04:45 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	1	1	1	2	0	3	5
% App. Total	100	0	0		0	0	100		33.3	66.7	0		
PHF	.250	.000	.000	.250	.000	.000	.250	.250	.250	.250	.000	.375	.625

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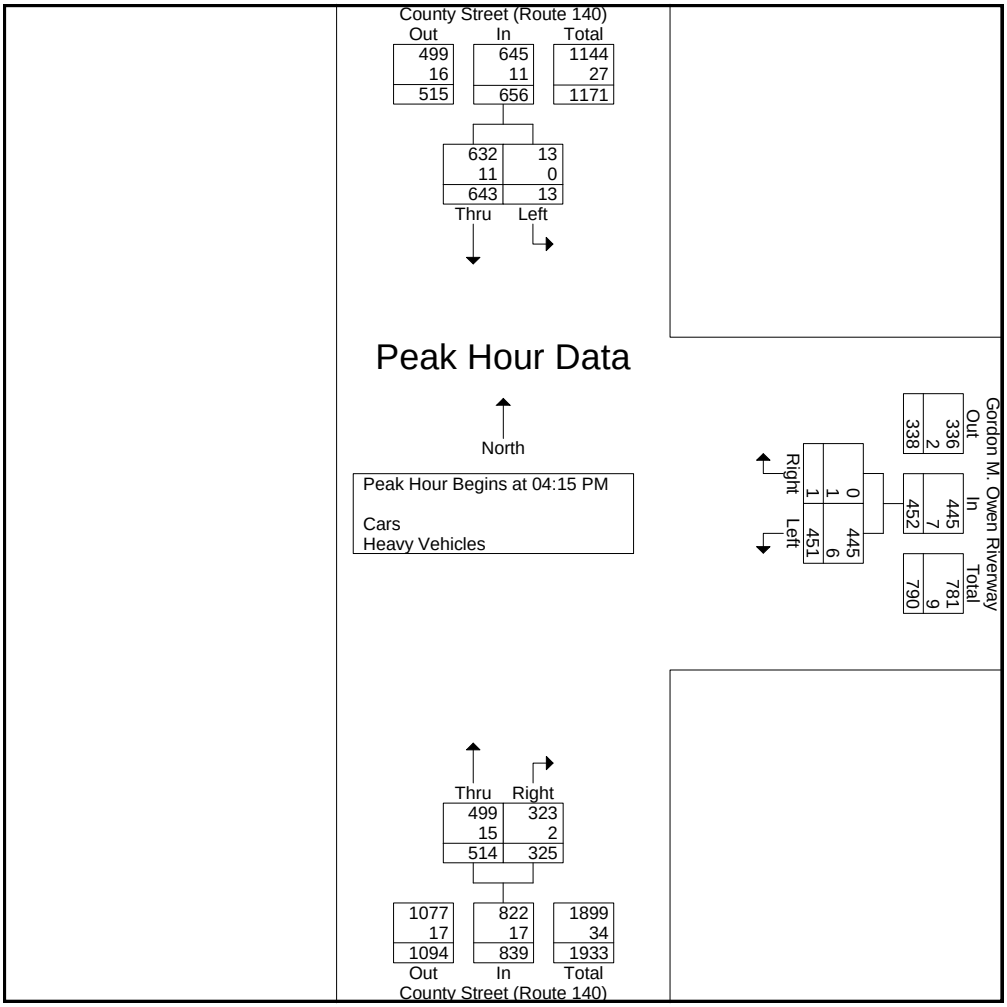
E: Gordon M. Owen Riverway
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-JJJ
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	County Street (Route 140) From North			Gordon M. Owen Riverway From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	140	3	143	0	95	95	74	130	204	442
04:30 PM	**182**	2	**184**	**1**	116	117	85	113	198	499
04:45 PM	157	2	159	0	103	103	**91**	128	**219**	481
05:00 PM	164	**6**	170	0	**137**	**137**	75	**143**	218	**525**
Total Volume	**643**	**13**	**656**	**1**	**451**	**452**	**325**	**514**	**839**	**1947**
% App. Total	**98**	**2**		**0.2**	**99.8**		**38.7**	**61.3**		
PHF	**.883**	**.542**	**.891**	**.250**	**.823**	**.825**	**.893**	**.899**	**.958**	**.927**
Cars	**632**	**13**	**645**	**0**	**445**	**445**	**323**	**499**	**822**	**1912**
% Cars	**98.3**	**100**	**98.3**	**0**	**98.7**	**98.5**	**99.4**	**97.1**	**98.0**	**98.2**
Heavy Vehicles	**11**	**0**	**11**	**1**	**6**	**7**	**2**	**15**	**17**	**35**
% Heavy Vehicles	**1.7**	**0**	**1.7**	**100**	**1.3**	**1.5**	**0.6**	**2.9**	**2.0**	**1.8**



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N/S: Winter Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-K
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Cars - Heavy Vehicles

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	86	0	2	2	6	3	65	6	13	3	5	196
07:15 AM	3	102	3	1	6	3	3	106	18	17	11	3	276
07:30 AM	2	55	2	3	9	2	10	96	27	12	8	9	235
07:45 AM	5	30	3	4	13	11	2	80	12	16	10	4	190
Total	15	273	8	10	30	22	18	347	63	58	32	21	897
08:00 AM	2	32	4	3	10	5	7	72	12	13	5	7	172
08:15 AM	1	29	0	5	10	3	9	77	13	18	6	5	176
08:30 AM	2	38	1	3	15	4	6	61	15	19	9	6	179
08:45 AM	4	39	2	5	9	0	5	63	13	16	9	3	168
Total	9	138	7	16	44	12	27	273	53	66	29	21	695
Grand Total	24	411	15	26	74	34	45	620	116	124	61	42	1592
Apprch %	5.3	91.3	3.3	19.4	55.2	25.4	5.8	79.4	14.9	54.6	26.9	18.5	
Total %	1.5	25.8	0.9	1.6	4.6	2.1	2.8	38.9	7.3	7.8	3.8	2.6	
Cars	20	397	14	25	72	29	36	598	112	115	56	41	1515
% Cars	83.3	96.6	93.3	96.2	97.3	85.3	80	96.5	96.6	92.7	91.8	97.6	95.2
Heavy Vehicles	4	14	1	1	2	5	9	22	4	9	5	1	77
% Heavy Vehicles	16.7	3.4	6.7	3.8	2.7	14.7	20	3.5	3.4	7.3	8.2	2.4	4.8

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**5**	86	0	91	2	2	6	10	3	65	6	74	13	3	5	21	196
07:15 AM	3	**102**	**3**	**108**	1	6	3	10	3	**106**	18	127	**17**	**11**	3	**31**	**276**
07:30 AM	2	55	2	59	3	9	2	14	**10**	96	**27**	**133**	12	8	**9**	29	235
07:45 AM	5	30	3	38	**4**	**13**	**11**	**28**	2	80	12	94	16	10	4	30	190
Total Volume	15	273	8	296	10	30	22	62	18	347	63	428	58	32	21	111	897
% App. Total	5.1	92.2	2.7		16.1	48.4	35.5		4.2	81.1	14.7		52.3	28.8	18.9		
PHF	.750	.669	.667	.685	.625	.577	.500	.554	.450	.818	.583	.805	.853	.727	.583	.895	.813
Cars	14	262	7	283	10	30	19	59	14	336	61	411	56	30	20	106	859
% Cars	93.3	96.0	87.5	95.6	100	100	86.4	95.2	77.8	96.8	96.8	96.0	96.6	93.8	95.2	95.5	95.8
Heavy Vehicles	1	11	1	13	0	0	3	3	4	11	2	17	2	2	1	5	38
% Heavy Vehicles	6.7	4.0	12.5	4.4	0	0	13.6	4.8	22.2	3.2	3.2	4.0	3.4	6.3	4.8	4.5	4.2

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N/S: Winter Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-K
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	84	0	2	2	5	3	63	5	13	3	5	189
07:15 AM	3	95	3	1	6	3	3	104	18	16	10	3	265
07:30 AM	2	54	2	3	9	2	7	92	26	12	8	8	225
07:45 AM	5	29	2	4	13	9	1	77	12	15	9	4	180
Total	14	262	7	10	30	19	14	336	61	56	30	20	859
08:00 AM	2	32	4	3	10	4	6	68	12	12	5	7	165
08:15 AM	0	29	0	5	9	2	7	73	12	15	6	5	163
08:30 AM	1	38	1	2	14	4	5	59	14	17	7	6	168
08:45 AM	3	36	2	5	9	0	4	62	13	15	8	3	160
Total	6	135	7	15	42	10	22	262	51	59	26	21	656
Grand Total	20	397	14	25	72	29	36	598	112	115	56	41	1515
Apprch %	4.6	92.1	3.2	19.8	57.1	23	4.8	80.2	15	54.2	26.4	19.3	
Total %	1.3	26.2	0.9	1.7	4.8	1.9	2.4	39.5	7.4	7.6	3.7	2.7	

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	4	84	0	88	2	2	5	9	3	63	5	71	13	3	5	21	189
07:15 AM	3	**95**	**3**	**101**	1	6	3	10	3	**104**	18	**125**	**16**	**10**	3	**29**	**265**
07:30 AM	2	54	2	58	3	9	2	14	**7**	92	**26**	125	12	8	**8**	28	225
07:45 AM	**5**	29	2	36	**4**	**13**	**9**	**26**	1	77	12	90	15	9	4	28	180
Total Volume	14	262	7	283	10	30	19	59	14	336	61	411	56	30	20	106	859
% App. Total	4.9	92.6	2.5		16.9	50.8	32.2		3.4	81.8	14.8		52.8	28.3	18.9		
PHF	.700	.689	.583	.700	.625	.577	.528	.567	.500	.808	.587	.822	.875	.750	.625	.914	.810

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N/S: Winter Street
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Client: VHB/J. Quitter

File Name : 81676 K-K
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Heavy Vehicles

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	2	0	0	0	1	0	2	1	0	0	0	7
07:15 AM	0	7	0	0	0	0	0	2	0	1	1	0	11
07:30 AM	0	1	0	0	0	0	3	4	1	0	0	1	10
07:45 AM	0	1	1	0	0	2	1	3	0	1	1	0	10
Total	1	11	1	0	0	3	4	11	2	2	2	1	38
08:00 AM	0	0	0	0	0	1	1	4	0	1	0	0	7
08:15 AM	1	0	0	0	1	1	2	4	1	3	0	0	13
08:30 AM	1	0	0	1	1	0	1	2	1	2	2	0	11
08:45 AM	1	3	0	0	0	0	1	1	0	1	1	0	8
Total	3	3	0	1	2	2	5	11	2	7	3	0	39
Grand Total	4	14	1	1	2	5	9	22	4	9	5	1	77
Apprch %	21.1	73.7	5.3	12.5	25	62.5	25.7	62.9	11.4	60	33.3	6.7	
Total %	5.2	18.2	1.3	1.3	2.6	6.5	11.7	28.6	5.2	11.7	6.5	1.3	

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**1**	**1**	**2**	0	0	**2**	**2**	1	3	0	4	1	1	0	2	10
08:00 AM	0	0	0	0	0	0	1	1	1	**4**	0	5	1	0	0	1	7
08:15 AM	**1**	0	0	1	0	**1**	1	2	**2**	4	**1**	**7**	**3**	0	0	3	**13**
08:30 AM	1	0	0	1	**1**	1	0	2	1	2	1	4	2	**2**	0	**4**	11
Total Volume	2	1	1	4	1	2	4	7	5	13	2	20	7	3	0	10	41
% App. Total	50	25	25		14.3	28.6	57.1		25	65	10		70	30	0		
PHF	.500	.250	.250	.500	.250	.500	.500	.875	.625	.813	.500	.714	.583	.375	.000	.625	.788

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File Name : 81676 K-K
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Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	4	9
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	4	11
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	1	6
08:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	2	0	0	0	2	0	0	0	3	0	0	0	1	8
Grand Total	0	0	0	2	0	0	0	9	0	0	0	3	0	0	0	5	19
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	0	10.5	0	0	0	47.4	0	0	0	15.8	0	0	0	26.3	

	Winter Street From North					School Street From East					Winter Street From South					School Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	**4**	**4**	**9**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	4	4	11
% App. Total	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.350	.350	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.306

PRECISION
D A T A
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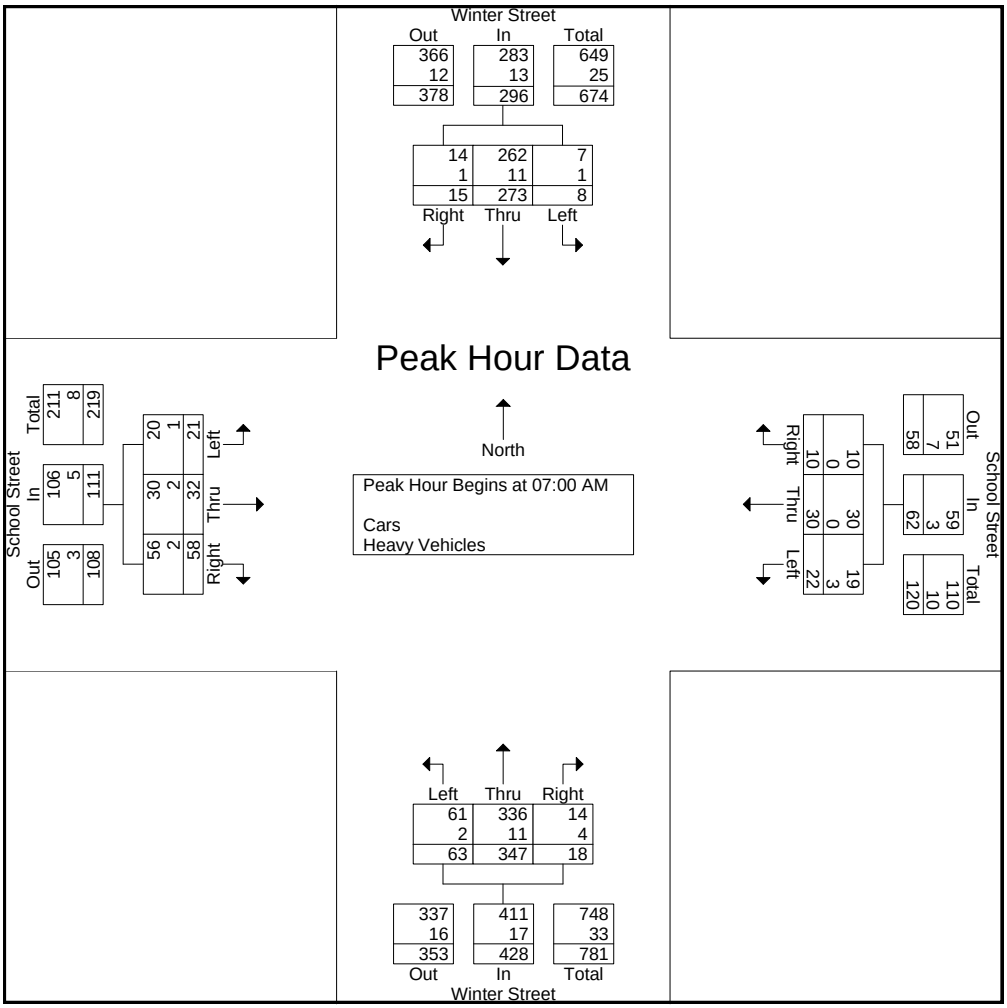
N/S: Winter Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-K
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**5**	86	0	91	2	2	6	10	3	65	6	74	13	3	5	21	196
07:15 AM	3	**102**	**3**	**108**	1	6	3	10	3	**106**	18	127	**17**	**11**	3	**31**	**276**
07:30 AM	2	55	2	59	3	9	2	14	**10**	96	**27**	**133**	12	8	**9**	29	235
07:45 AM	5	30	3	38	**4**	**13**	**11**	**28**	2	80	12	94	16	10	4	30	190
Total Volume	15	273	8	296	10	30	22	62	18	347	63	428	58	32	21	111	897
% App. Total	5.1	92.2	2.7		16.1	48.4	35.5		4.2	81.1	14.7		52.3	28.8	18.9		
PHF	.750	.669	.667	.685	.625	.577	.500	.554	.450	.818	.583	.805	.853	.727	.583	.895	.813
Cars	14	262	7	283	10	30	19	59	14	336	61	411	56	30	20	106	859
% Cars	93.3	96.0	87.5	95.6	100	100	86.4	95.2	77.8	96.8	96.8	96.0	96.6	93.8	95.2	95.5	95.8
Heavy Vehicles	1	11	1	13	0	0	3	3	4	11	2	17	2	2	1	5	38
% Heavy Vehicles	6.7	4.0	12.5	4.4	0	0	13.6	4.8	22.2	3.2	3.2	4.0	3.4	6.3	4.8	4.5	4.2



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N/S: Winter Street
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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-KKK
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	46	1	1	20	4	7	106	43	25	10	6	271
04:15 PM	1	57	0	4	18	3	9	108	51	17	5	6	279
04:30 PM	4	60	2	1	14	13	9	101	39	19	9	10	281
04:45 PM	4	41	1	6	14	4	5	86	37	26	19	4	247
Total	11	204	4	12	66	24	30	401	170	87	43	26	1078
05:00 PM	6	83	2	5	12	5	2	85	41	20	10	7	278
05:15 PM	4	113	1	6	19	6	6	97	29	12	6	9	308
05:30 PM	7	143	1	1	9	5	5	105	32	17	6	2	333
05:45 PM	6	111	2	3	10	6	6	104	31	14	4	9	306
Total	23	450	6	15	50	22	19	391	133	63	26	27	1225
Grand Total	34	654	10	27	116	46	49	792	303	150	69	53	2303
Apprch %	4.9	93.7	1.4	14.3	61.4	24.3	4.3	69.2	26.5	55.1	25.4	19.5	
Total %	1.5	28.4	0.4	1.2	5	2	2.1	34.4	13.2	6.5	3	2.3	
Cars	33	646	10	27	115	45	47	782	297	146	69	52	2269
% Cars	97.1	98.8	100	100	99.1	97.8	95.9	98.7	98	97.3	100	98.1	98.5
Heavy Vehicles	1	8	0	0	1	1	2	10	6	4	0	1	34
% Heavy Vehicles	2.9	1.2	0	0	0.9	2.2	4.1	1.3	2	2.7	0	1.9	1.5

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	83	**2**	91	5	12	5	22	2	85	**41**	128	**20**	**10**	7	**37**	278
05:15 PM	4	113	1	118	**6**	**19**	**6**	**31**	**6**	97	29	132	12	6	**9**	27	308
05:30 PM	**7**	**143**	1	**151**	1	9	5	15	5	**105**	32	**142**	17	6	2	25	**333**
05:45 PM	6	111	2	119	3	10	6	19	6	104	31	141	14	4	9	27	306
Total Volume	23	450	6	479	15	50	22	87	19	391	133	543	63	26	27	116	1225
% App. Total	4.8	93.9	1.3		17.2	57.5	25.3		3.5	72	24.5		54.3	22.4	23.3		
PHF	.821	.787	.750	.793	.625	.658	.917	.702	.792	.931	.811	.956	.788	.650	.750	.784	.920
Cars	22	445	6	473	15	50	21	86	19	386	129	534	61	26	27	114	1207
% Cars	95.7	98.9	100	98.7	100	100	95.5	98.9	100	98.7	97.0	98.3	96.8	100	100	98.3	98.5
Heavy Vehicles	1	5	0	6	0	0	1	1	0	5	4	9	2	0	0	2	18
% Heavy Vehicles	4.3	1.1	0	1.3	0	0	4.5	1.1	0	1.3	3.0	1.7	3.2	0	0	1.7	1.5

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N/S: Winter Street
E/W: School Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-KKK
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Cars

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	44	1	1	20	4	7	105	42	25	10	6	267
04:15 PM	1	56	0	4	18	3	8	107	50	17	5	5	274
04:30 PM	4	60	2	1	13	13	9	99	39	18	9	10	277
04:45 PM	4	41	1	6	14	4	4	85	37	25	19	4	244
Total	11	201	4	12	65	24	28	396	168	85	43	25	1062
05:00 PM	5	83	2	5	12	4	2	84	40	19	10	7	273
05:15 PM	4	112	1	6	19	6	6	97	27	12	6	9	305
05:30 PM	7	141	1	1	9	5	5	101	32	17	6	2	327
05:45 PM	6	109	2	3	10	6	6	104	30	13	4	9	302
Total	22	445	6	15	50	21	19	386	129	61	26	27	1207
Grand Total	33	646	10	27	115	45	47	782	297	146	69	52	2269
Apprch %	4.8	93.8	1.5	14.4	61.5	24.1	4.2	69.4	26.4	54.7	25.8	19.5	
Total %	1.5	28.5	0.4	1.2	5.1	2	2.1	34.5	13.1	6.4	3	2.3	

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	83	**2**	90	5	12	4	21	2	84	**40**	126	**19**	**10**	7	**36**	273
05:15 PM	4	112	1	117	**6**	**19**	**6**	**31**	**6**	97	27	130	12	6	**9**	27	305
05:30 PM	**7**	**141**	1	**149**	1	9	5	15	5	101	32	138	17	6	2	25	**327**
05:45 PM	6	109	2	117	3	10	6	19	6	**104**	30	**140**	13	4	9	26	302
Total Volume	22	445	6	473	15	50	21	86	19	386	129	534	61	26	27	114	1207
% App. Total	4.7	94.1	1.3		17.4	58.1	24.4		3.6	72.3	24.2		53.5	22.8	23.7		
PHF	.786	.789	.750	.794	.625	.658	.875	.694	.792	.928	.806	.954	.803	.650	.750	.792	.923

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File Name : 81676 K-KKK
Site Code : 10111.31
Start Date : 9/17/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Winter Street From North			School Street From East			Winter Street From South			School Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	0	0	0	1	1	0	0	0	4
04:15 PM	0	1	0	0	0	0	1	1	1	0	0	1	5
04:30 PM	0	0	0	0	1	0	0	2	0	1	0	0	4
04:45 PM	0	0	0	0	0	0	1	1	0	1	0	0	3
Total	0	3	0	0	1	0	2	5	2	2	0	1	16
05:00 PM	1	0	0	0	0	1	0	1	1	1	0	0	5
05:15 PM	0	1	0	0	0	0	0	0	2	0	0	0	3
05:30 PM	0	2	0	0	0	0	0	4	0	0	0	0	6
05:45 PM	0	2	0	0	0	0	0	0	1	1	0	0	4
Total	1	5	0	0	0	1	0	5	4	2	0	0	18
Grand Total	1	8	0	0	1	1	2	10	6	4	0	1	34
Apprch %	11.1	88.9	0	0	50	50	11.1	55.6	33.3	80	0	20	
Total %	2.9	23.5	0	0	2.9	2.9	5.9	29.4	17.6	11.8	0	2.9	

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**1**	0	0	1	0	0	**1**	**1**	0	1	1	2	**1**	0	0	**1**	5
05:15 PM	0	1	0	1	0	0	0	0	0	0	**2**	2	0	0	0	0	3
05:30 PM	0	**2**	0	**2**	0	0	0	0	0	**4**	0	**4**	0	0	0	0	**6**
05:45 PM	0	2	0	2	0	0	0	0	0	0	1	1	1	0	0	1	4
Total Volume	1	5	0	6	0	0	1	1	0	5	4	9	2	0	0	2	18
% App. Total	16.7	83.3	0		0	0	100		0	55.6	44.4		100	0	0		
PHF	.250	.625	.000	.750	.000	.000	.250	.250	.000	.313	.500	.563	.500	.000	.000	.500	.750

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 K-KKK
Site Code : 10111.31
Start Date : 9/17/2008

Groups Printed- Peds and Bicycles

	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
04:30 PM	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
04:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
Total	1	1	0	5	0	0	0	0	0	0	0	0	0	0	0	4	11
05:00 PM	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	4	9
Total	1	0	3	4	2	0	0	0	0	0	0	0	0	0	0	6	16
Grand Total	2	1	3	9	2	0	0	0	0	0	0	0	0	0	0	10	27
Apprch %	13.3	6.7	20	60	100	0	0	0	0	0	0	0	0	0	0	100	
Total %	7.4	3.7	11.1	33.3	7.4	0	0	0	0	0	0	0	0	0	0	37	

	Winter Street From North					School Street From East					Winter Street From South					School Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**1**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
05:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**
05:30 PM	**0**	**0**	**0**	**0**	**0**	**2**	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	**3**	**2**	**5**	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**4**	**9**
Total Volume	1	0	3	4	8	2	0	0	0	2	0	0	0	0	0	0	0	0	6	6	16
% App. Total	12.5	0	37.5	50		100	0	0	0		0	0	0	0		0	0	0	100		
PHF	.250	.000	.250	.500	.400	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.444

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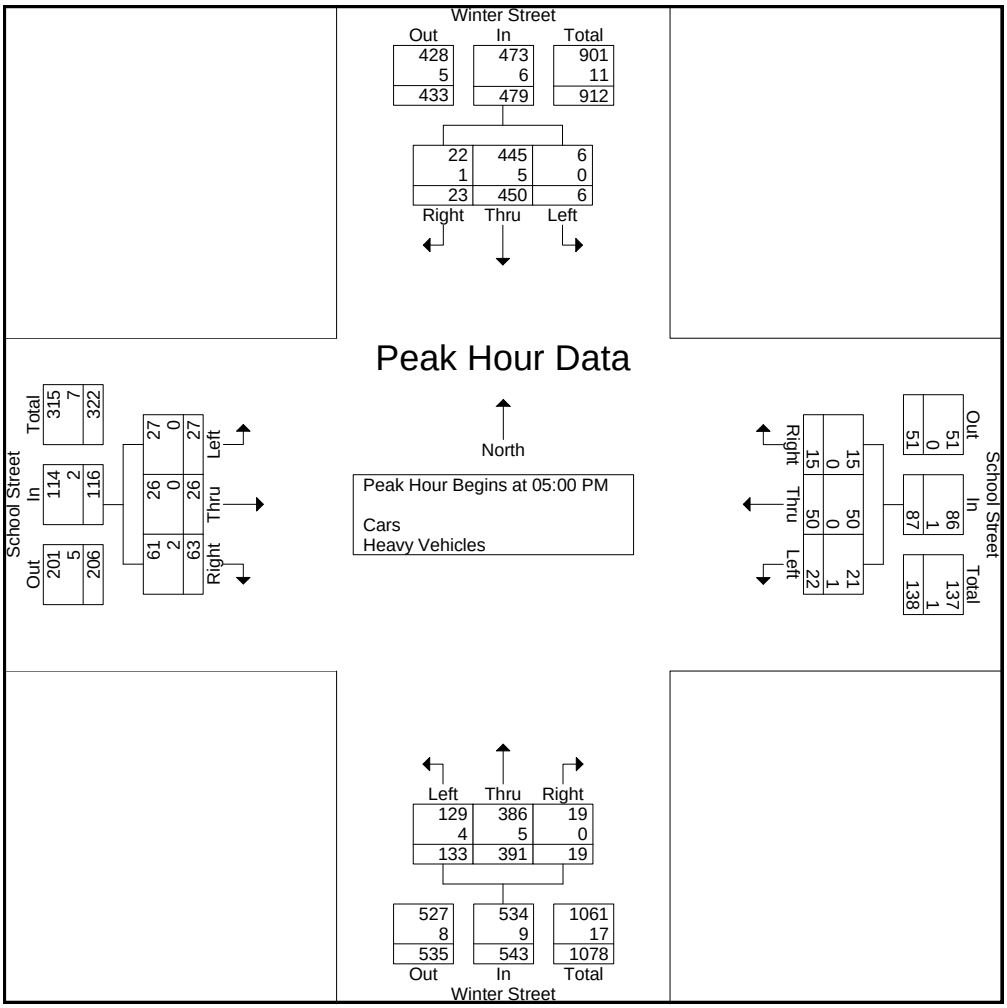
	Winter Street From North				School Street From East				Winter Street From South				School Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	83	**2**	91	5	12	5	22	2	85	**41**	128	**20**	**10**	7	**37**	278
05:15 PM	4	113	1	118	**6**	**19**	**6**	**31**	**6**	97	29	132	12	6	**9**	27	308
05:30 PM	**7**	**143**	1	**151**	1	9	5	15	5	**105**	32	**142**	17	6	2	25	**333**
05:45 PM	6	111	2	119	3	10	6	19	6	104	31	141	14	4	9	27	306
Total Volume	23	450	6	479	15	50	22	87	19	391	133	543	63	26	27	116	1225
% App. Total	4.8	93.9	1.3		17.2	57.5	25.3		3.5	72	24.5		54.3	22.4	23.3		
PHF	.821	.787	.750	.793	.625	.658	.917	.702	.792	.931	.811	.956	.788	.650	.750	.784	.920
Cars	22	445	6	473	15	50	21	86	19	386	129	534	61	26	27	114	1207
% Cars	95.7	98.9	100	98.7	100	100	95.5	98.9	100	98.7	97.0	98.3	96.8	100	100	98.3	98.5
Heavy Vehicles	1	5	0	6	0	0	1	1	0	5	4	9	2	0	0	2	18
% Heavy Vehicles	4.3	1.1	0	1.3	0	0	4.5	1.1	0	1.3	3.0	1.7	3.2	0	0	1.7	1.5



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 10/1/08 and Sat 9/27/08	81676	Taunton, MA

PRECISION DATA INDUSTRIES, LLC
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E/W: Main Street/Taunton Green
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-B
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Main Street (Route 44/140) From East			Taunton Green (Route 44/138/140) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	40	0	0	52	93	0	0	95	4	0	0	0	284
07:15 AM	90	0	0	55	116	0	0	95	14	0	0	0	370
07:30 AM	91	0	0	89	148	0	0	103	16	0	0	0	447
07:45 AM	95	0	0	82	140	0	0	89	19	0	0	0	425
Total	316	0	0	278	497	0	0	382	53	0	0	0	1526
08:00 AM	85	0	0	77	146	0	0	73	16	0	0	0	397
08:15 AM	76	0	0	65	143	0	0	70	23	0	0	0	377
08:30 AM	100	0	0	88	128	0	0	76	13	0	0	0	405
08:45 AM	97	0	0	71	142	0	0	88	21	0	0	0	419
Total	358	0	0	301	559	0	0	307	73	0	0	0	1598
Grand Total	674	0	0	579	1056	0	0	689	126	0	0	0	3124
Apprch %	100	0	0	35.4	64.6	0	0	84.5	15.5	0	0	0	
Total %	21.6	0	0	18.5	33.8	0	0	22.1	4	0	0	0	

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	91	0	0	91	**89**	**148**	0	**237**	0	**103**	16	**119**	0	0	0	0	**447**
07:45 AM	**95**	0	0	**95**	82	140	0	222	0	89	19	108	0	0	0	0	425
08:00 AM	85	0	0	85	77	146	0	223	0	73	16	89	0	0	0	0	397
08:15 AM	76	0	0	76	65	143	0	208	0	70	**23**	93	0	0	0	0	377
Total Volume	347	0	0	347	313	577	0	890	0	335	74	409	0	0	0	0	1646
% App. Total	100	0	0		35.2	64.8	0		0	81.9	18.1		0	0	0		
PHF	.913	.000	.000	.913	.879	.975	.000	.939	.000	.813	.804	.859	.000	.000	.000	.000	.921

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File Name : 81676 H-B
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Main Street (Route 44/140) From East			Taunton Green (Route 44/138/140) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	0	0	1	5	0	0	3	1	0	0	0	13
07:15 AM	3	0	0	2	17	0	0	5	3	0	0	0	30
07:30 AM	5	0	0	1	9	0	0	7	2	0	0	0	24
07:45 AM	3	0	1	4	10	0	0	6	1	0	0	0	25
Total	14	0	1	8	41	0	0	21	7	0	0	0	92
08:00 AM	9	0	0	1	10	0	0	4	1	0	0	0	25
08:15 AM	8	0	0	3	6	0	0	4	2	0	0	0	23
08:30 AM	5	0	0	4	11	0	0	4	3	0	0	0	27
08:45 AM	6	0	0	1	10	0	0	11	1	0	0	0	29
Total	28	0	0	9	37	0	0	23	7	0	0	0	104
Grand Total	42	0	1	17	78	0	0	44	14	0	0	0	196
Apprch %	97.7	0	2.3	17.9	82.1	0	0	75.9	24.1	0	0	0	
Total %	21.4	0	0.5	8.7	39.8	0	0	22.4	7.1	0	0	0	

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	0	0	3	2	**17**	0	**19**	0	5	**3**	8	0	0	0	0	**30**
07:30 AM	5	0	0	5	1	9	0	10	0	**7**	2	**9**	0	0	0	0	24
07:45 AM	3	0	**1**	4	**4**	10	0	14	0	6	1	7	0	0	0	0	25
08:00 AM	**9**	0	0	**9**	1	10	0	11	0	4	1	5	0	0	0	0	25
Total Volume	20	0	1	21	8	46	0	54	0	22	7	29	0	0	0	0	104
% App. Total	95.2	0	4.8		14.8	85.2	0		0	75.9	24.1		0	0	0		
PHF	.556	.000	.250	.583	.500	.676	.000	.711	.000	.786	.583	.806	.000	.000	.000	.000	.867

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File Name : 81676 H-B
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	6
07:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	4
07:45 AM	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	1	0	0	12	1	0	0	0	0	1	0	0	0	0	0	4	19
08:00 AM	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
08:15 AM	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	4	11
08:30 AM	0	0	0	12	0	1	0	0	0	0	0	0	0	0	0	1	14
08:45 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	30	0	1	0	0	0	0	0	0	0	0	0	5	36
Grand Total	1	0	0	42	1	1	0	0	0	1	0	0	0	0	0	9	55
Apprch %	2.3	0	0	97.7	50	50	0	0	0	100	0	0	0	0	0	100	
Total %	1.8	0	0	76.4	1.8	1.8	0	0	0	1.8	0	0	0	0	0	16.4	

	Broadway (Route 138) From North					Main Street (Route 44/140) From East					Taunton Green (Route 44/138/140) From South					Taunton Green (Route 44/138/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
08:00 AM	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
08:15 AM	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**4**	11
08:30 AM	0	0	0	**12**	**12**	0	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	1	1	**14**
Total Volume	0	0	0	33	33	0	1	0	0	1	0	0	0	0	0	0	0	0	5	5	39
% App. Total	0	0	0	100		0	100	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.688	.688	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.313	.313	.696

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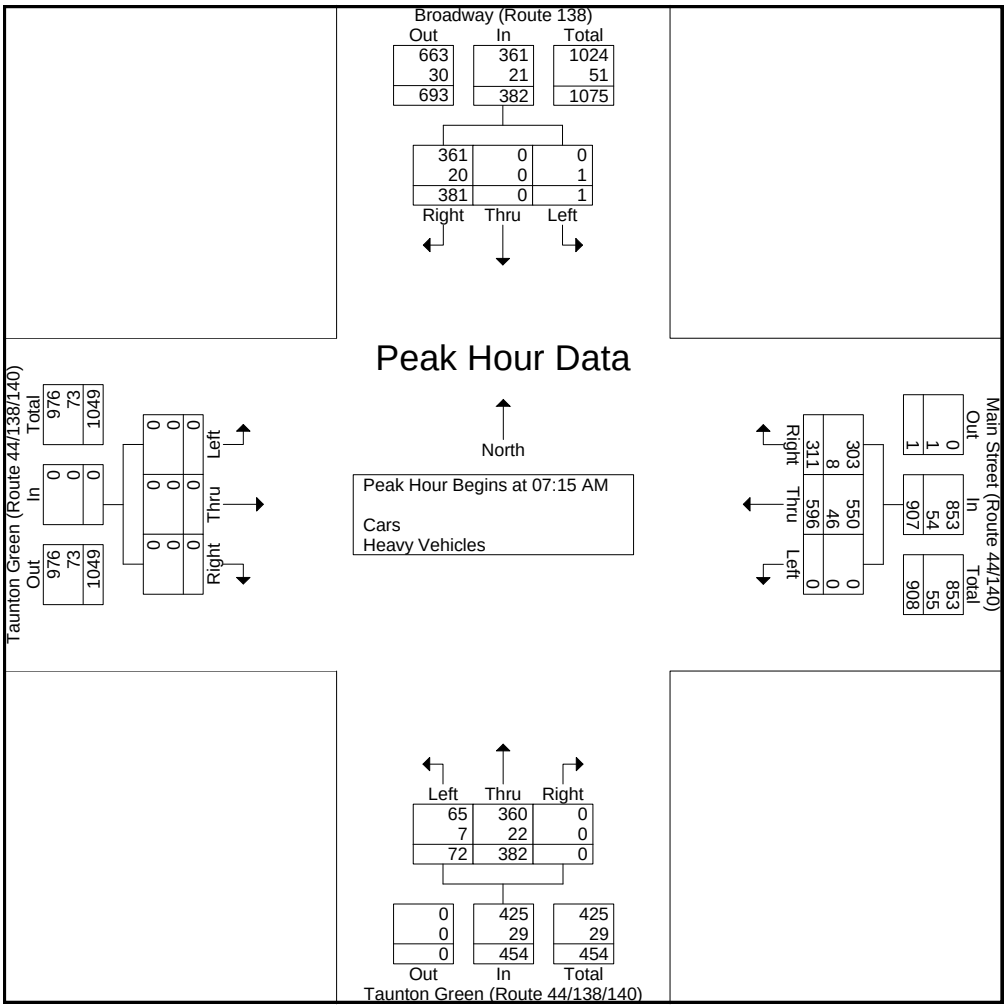
Start Date : 10/1/2008
Page No : 1

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	93	0	0	93	57	133	0	190	0	100	17	117	0	0	0	0	400
07:30 AM	96	0	0	96	**90**	**157**	0	**247**	0	**110**	18	**128**	0	0	0	0	**471**
07:45 AM	**98**	0	**1**	**99**	86	150	0	236	0	95	**20**	115	0	0	0	0	450
08:00 AM	94	0	0	94	78	156	0	234	0	77	17	94	0	0	0	0	422
Total Volume	381	0	1	382	311	596	0	907	0	382	72	454	0	0	0	0	1743
% App. Total	99.7	0	0.3		34.3	65.7	0		0	84.1	15.9		0	0	0		
PHF	.972	.000	.250	.965	.864	.949	.000	.918	.000	.868	.900	.887	.000	.000	.000	.000	.925
Cars	361	0	0	361	303	550	0	853	0	360	65	425	0	0	0	0	1639
% Cars	94.8	0	0	94.5	97.4	92.3	0	94.0	0	94.2	90.3	93.6	0	0	0	0	94.0
Heavy Vehicles	20	0	1	21	8	46	0	54	0	22	7	29	0	0	0	0	104
% Heavy Vehicles	5.2	0	100	5.5	2.6	7.7	0	6.0	0	5.8	9.7	6.4	0	0	0	0	6.0



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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Main Street (Route 44/140) From East			Taunton Green (Route 44/138/140) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	123	0	0	68	168	0	0	64	25	0	0	0	448
04:15 PM	128	0	0	66	211	0	0	65	14	0	0	0	484
04:30 PM	143	0	0	70	179	0	0	62	30	0	0	0	484
04:45 PM	145	0	0	65	193	0	0	69	19	0	0	0	491
Total	539	0	0	269	751	0	0	260	88	0	0	0	1907
05:00 PM	102	0	0	75	217	0	0	58	21	0	0	0	473
05:15 PM	70	0	0	52	239	0	0	76	24	0	0	0	461
05:30 PM	138	0	0	66	198	0	0	64	14	0	0	0	480
05:45 PM	148	0	0	55	182	0	0	71	25	0	0	0	481
Total	458	0	0	248	836	0	0	269	84	0	0	0	1895
Grand Total	997	0	0	517	1587	0	0	529	172	0	0	0	3802
Apprch %	100	0	0	24.6	75.4	0	0	75.5	24.5	0	0	0	
Total %	26.2	0	0	13.6	41.7	0	0	13.9	4.5	0	0	0	
Cars	978	0	0	513	1554	0	0	520	168	0	0	0	3733
% Cars	98.1	0	0	99.2	97.9	0	0	98.3	97.7	0	0	0	98.2
Heavy Vehicles	19	0	0	4	33	0	0	9	4	0	0	0	69
% Heavy Vehicles	1.9	0	0	0.8	2.1	0	0	1.7	2.3	0	0	0	1.8

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	128	0	0	128	66	211	0	277	0	65	14	79	0	0	0	0	484
04:30 PM	143	0	0	143	70	179	0	249	0	62	**30**	**92**	0	0	0	0	484
04:45 PM	**145**	0	0	**145**	65	193	0	258	0	**69**	19	88	0	0	0	0	**491**
05:00 PM	102	0	0	102	**75**	**217**	0	**292**	0	58	21	79	0	0	0	0	473
Total Volume	518	0	0	518	276	800	0	1076	0	254	84	338	0	0	0	0	1932
% App. Total	100	0	0		25.7	74.3	0		0	75.1	24.9		0	0	0		
PHF	.893	.000	.000	.893	.920	.922	.000	.921	.000	.920	.700	.918	.000	.000	.000	.000	.984
Cars	507	0	0	507	274	785	0	1059	0	249	84	333	0	0	0	0	1899
% Cars	97.9	0	0	97.9	99.3	98.1	0	98.4	0	98.0	100	98.5	0	0	0	0	98.3
Heavy Vehicles	11	0	0	11	2	15	0	17	0	5	0	5	0	0	0	0	33
% Heavy Vehicles	2.1	0	0	2.1	0.7	1.9	0	1.6	0	2.0	0	1.5	0	0	0	0	1.7

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Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Main Street (Route 44/140) From East			Taunton Green (Route 44/138/140) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	116	0	0	67	164	0	0	63	23	0	0	0	433
04:15 PM	125	0	0	65	204	0	0	63	14	0	0	0	471
04:30 PM	139	0	0	70	178	0	0	62	30	0	0	0	479
04:45 PM	141	0	0	65	187	0	0	67	19	0	0	0	479
Total	521	0	0	267	733	0	0	255	86	0	0	0	1862
05:00 PM	102	0	0	74	216	0	0	57	21	0	0	0	470
05:15 PM	70	0	0	52	232	0	0	76	23	0	0	0	453
05:30 PM	138	0	0	65	196	0	0	63	13	0	0	0	475
05:45 PM	147	0	0	55	177	0	0	69	25	0	0	0	473
Total	457	0	0	246	821	0	0	265	82	0	0	0	1871
Grand Total	978	0	0	513	1554	0	0	520	168	0	0	0	3733
Apprch %	100	0	0	24.8	75.2	0	0	75.6	24.4	0	0	0	
Total %	26.2	0	0	13.7	41.6	0	0	13.9	4.5	0	0	0	

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	125	0	0	125	65	204	0	269	0	63	14	77	0	0	0	0	471
04:30 PM	139	0	0	139	70	178	0	248	0	62	**30**	**92**	0	0	0	0	**479**
04:45 PM	**141**	0	0	**141**	65	187	0	252	0	**67**	19	86	0	0	0	0	479
05:00 PM	102	0	0	102	**74**	**216**	0	**290**	0	57	21	78	0	0	0	0	470
Total Volume	507	0	0	507	274	785	0	1059	0	249	84	333	0	0	0	0	1899
% App. Total	100	0	0		25.9	74.1	0		0	74.8	25.2		0	0	0		
PHF	.899	.000	.000	.899	.926	.909	.000	.913	.000	.929	.700	.905	.000	.000	.000	.000	.991

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Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Main Street (Route 44/140) From East			Taunton Green (Route 44/138/140) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	7	0	0	1	4	0	0	1	2	0	0	0	15
04:15 PM	3	0	0	1	7	0	0	2	0	0	0	0	13
04:30 PM	4	0	0	0	1	0	0	0	0	0	0	0	5
04:45 PM	4	0	0	0	6	0	0	2	0	0	0	0	12
Total	18	0	0	2	18	0	0	5	2	0	0	0	45
05:00 PM	0	0	0	1	1	0	0	1	0	0	0	0	3
05:15 PM	0	0	0	0	7	0	0	0	1	0	0	0	8
05:30 PM	0	0	0	1	2	0	0	1	1	0	0	0	5
05:45 PM	1	0	0	0	5	0	0	2	0	0	0	0	8
Total	1	0	0	2	15	0	0	4	2	0	0	0	24
Grand Total	19	0	0	4	33	0	0	9	4	0	0	0	69
Apprch %	100	0	0	10.8	89.2	0	0	69.2	30.8	0	0	0	
Total %	27.5	0	0	5.8	47.8	0	0	13	5.8	0	0	0	

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**7**	0	0	**7**	**1**	4	0	5	0	1	**2**	**3**	0	0	0	0	**15**
04:15 PM	3	0	0	3	1	**7**	0	**8**	0	**2**	0	2	0	0	0	0	13
04:30 PM	4	0	0	4	0	1	0	1	0	0	0	0	0	0	0	0	5
04:45 PM	4	0	0	4	0	6	0	6	0	2	0	2	0	0	0	0	12
Total Volume	18	0	0	18	2	18	0	20	0	5	2	7	0	0	0	0	45
% App. Total	100	0	0		10	90	0		0	71.4	28.6		0	0	0		
PHF	.643	.000	.000	.643	.500	.643	.000	.625	.000	.625	.250	.583	.000	.000	.000	.000	.750

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

N/S: Broadway/Taunton Green
E/W: Main Street/Taunton Green
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-BBB
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	0	6
04:15 PM	0	0	0	9	0	0	0	0	0	0	0	2	0	0	0	6	17
04:30 PM	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	2	9
04:45 PM	0	0	0	7	0	0	0	0	0	0	0	5	0	0	0	4	16
Total	0	0	0	24	0	0	0	0	0	0	0	12	0	0	0	12	48
05:00 PM	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	2	11
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	5
05:30 PM	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	1	10
05:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	4	7
Total	0	0	0	23	0	0	0	0	0	0	0	1	0	0	0	9	33
Grand Total	0	0	0	47	0	0	0	0	0	0	0	13	0	0	0	21	81
Apprch %	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0	100	
Total %	0	0	0	58	0	0	0	0	0	0	0	16	0	0	0	25.9	

	Broadway (Route 138) From North					Main Street (Route 44/140) From East					Taunton Green (Route 44/138/140) From South					Taunton Green (Route 44/138/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	**9**	**9**	0	0	0	0	0	0	0	0	2	2	0	0	0	**6**	**6**	**17**
04:30 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	3	3	0	0	0	2	2	9
04:45 PM	0	0	0	7	7	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	4	4	16
05:00 PM	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	11
Total Volume	0	0	0	29	29	0	0	0	0	0	0	0	0	10	10	0	0	0	14	14	53
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.806	.806	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.583	.583	.779

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N/S: Broadway/Taunton Green
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City, State: Taunton, MA
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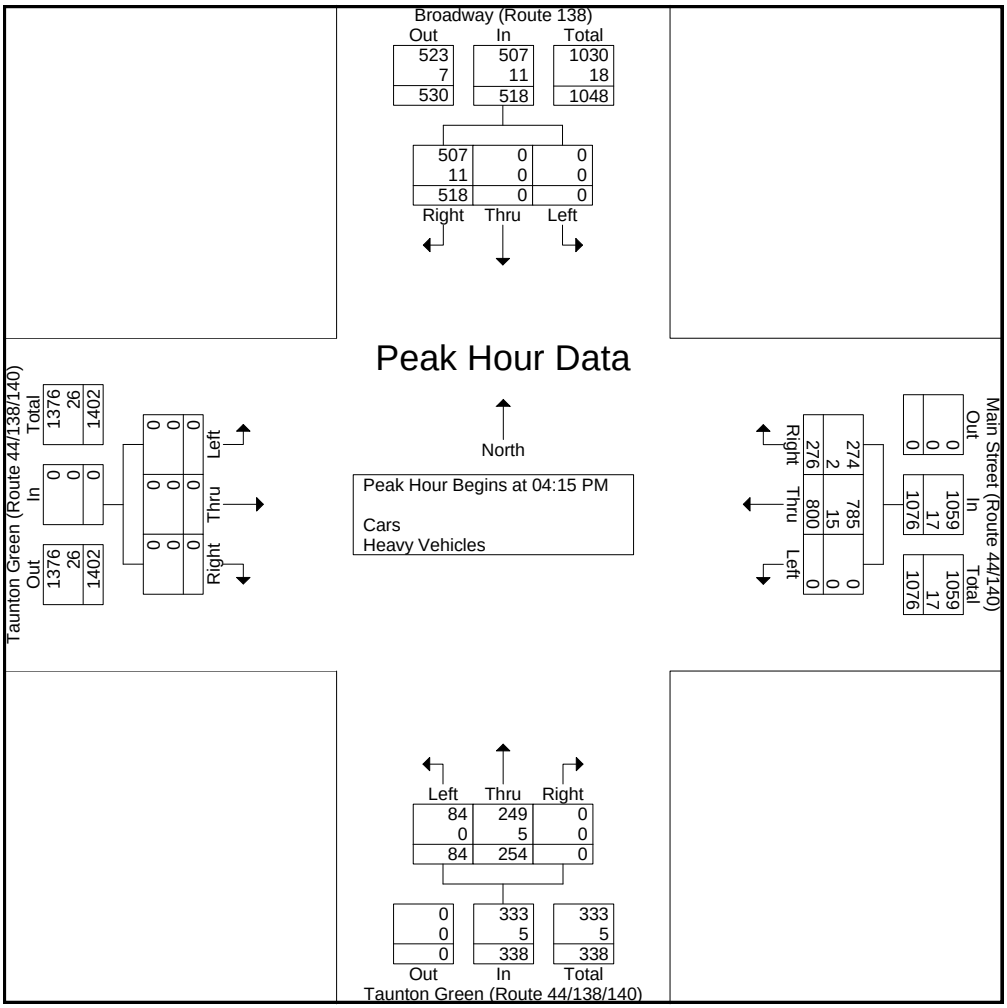
File Name : 81676 H-BBB
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Broadway (Route 138) From North				Main Street (Route 44/140) From East				Taunton Green (Route 44/138/140) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	128	0	0	128	66	211	0	277	0	65	14	79	0	0	0	0	484
04:30 PM	143	0	0	143	70	179	0	249	0	62	**30**	**92**	0	0	0	0	484
04:45 PM	**145**	0	0	**145**	65	193	0	258	0	**69**	19	88	0	0	0	0	**491**
05:00 PM	102	0	0	102	**75**	**217**	0	**292**	0	58	21	79	0	0	0	0	473
Total Volume	518	0	0	518	276	800	0	1076	0	254	84	338	0	0	0	0	1932
% App. Total	100	0	0		25.7	74.3	0		0	75.1	24.9		0	0	0		
PHF	.893	.000	.000	.893	.920	.922	.000	.921	.000	.920	.700	.918	.000	.000	.000	.000	.984
Cars	507	0	0	507	274	785	0	1059	0	249	84	333	0	0	0	0	1899
% Cars	97.9	0	0	97.9	99.3	98.1	0	98.4	0	98.0	100	98.5	0	0	0	0	98.3
Heavy Vehicles	11	0	0	11	2	15	0	17	0	5	0	5	0	0	0	0	33
% Heavy Vehicles	2.1	0	0	2.1	0.7	1.9	0	1.6	0	2.0	0	1.5	0	0	0	0	1.7



PRECISION
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N/S: Court Street/Taunton Green
E/W: Taunton Green/Post Office Square
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-C
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Cars - Heavy Vehicles

	Court Street (Route 140) From North			Taunton Green From East			Taunton Green From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	83	0	61	13	79	0	0	0	3	0	0	240
07:15 AM	0	75	0	86	8	145	0	0	0	2	0	0	316
07:30 AM	0	68	0	101	11	142	0	0	0	1	0	0	323
07:45 AM	1	67	0	108	16	153	0	0	0	2	0	0	347
Total	2	293	0	356	48	519	0	0	0	8	0	0	1226
08:00 AM	0	55	0	87	21	158	0	0	0	6	0	0	327
08:15 AM	0	67	0	93	11	141	0	0	0	4	0	0	316
08:30 AM	2	63	0	73	16	175	0	0	0	4	0	0	333
08:45 AM	4	68	0	79	21	176	0	0	0	5	0	0	353
Total	6	253	0	332	69	650	0	0	0	19	0	0	1329
Grand Total	8	546	0	688	117	1169	0	0	0	27	0	0	2555
Apprch %	1.4	98.6	0	34.9	5.9	59.2	0	0	0	100	0	0	
Total %	0.3	21.4	0	26.9	4.6	45.8	0	0	0	1.1	0	0	
Cars	8	522	0	637	116	1084	0	0	0	27	0	0	2394
% Cars	100	95.6	0	92.6	99.1	92.7	0	0	0	100	0	0	93.7
Heavy Vehicles	0	24	0	51	1	85	0	0	0	0	0	0	161
% Heavy Vehicles	0	4.4	0	7.4	0.9	7.3	0	0	0	0	0	0	6.3

	Court Street (Route 140) From North				Taunton Green From East				Taunton Green From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	55	0	55	87	**21**	158	266	0	0	0	0	**6**	0	0	**6**	327
08:15 AM	0	67	0	67	**93**	11	141	245	0	0	0	0	4	0	0	4	316
08:30 AM	2	63	0	65	73	16	175	264	0	0	0	0	4	0	0	4	333
08:45 AM	**4**	**68**	0	**72**	79	21	**176**	**276**	0	0	0	0	5	0	0	5	**353**
Total Volume	6	253	0	259	332	69	650	1051	0	0	0	0	19	0	0	19	1329
% App. Total	2.3	97.7	0		31.6	6.6	61.8		0	0	0		100	0	0		
PHF	.375	.930	.000	.899	.892	.821	.923	.952	.000	.000	.000	.000	.792	.000	.000	.792	.941
Cars	6	246	0	252	307	69	602	978	0	0	0	0	19	0	0	19	1249
% Cars	100	97.2	0	97.3	92.5	100	92.6	93.1	0	0	0	0	100	0	0	100	94.0
Heavy Vehicles	0	7	0	7	25	0	48	73	0	0	0	0	0	0	0	0	80
% Heavy Vehicles	0	2.8	0	2.7	7.5	0	7.4	6.9	0	0	0	0	0	0	0	0	6.0

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E/W: Taunton Green/Post Office Square
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-C
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Court Street (Route 140) From North			Taunton Green From East			Taunton Green From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	80	0	58	13	72	0	0	0	3	0	0	227
07:15 AM	0	68	0	79	7	130	0	0	0	2	0	0	286
07:30 AM	0	64	0	92	11	133	0	0	0	1	0	0	301
07:45 AM	1	64	0	101	16	147	0	0	0	2	0	0	331
Total	2	276	0	330	47	482	0	0	0	8	0	0	1145
08:00 AM	0	54	0	81	21	145	0	0	0	6	0	0	307
08:15 AM	0	64	0	87	11	131	0	0	0	4	0	0	297
08:30 AM	2	62	0	65	16	163	0	0	0	4	0	0	312
08:45 AM	4	66	0	74	21	163	0	0	0	5	0	0	333
Total	6	246	0	307	69	602	0	0	0	19	0	0	1249
Grand Total	8	522	0	637	116	1084	0	0	0	27	0	0	2394
Apprch %	1.5	98.5	0	34.7	6.3	59	0	0	0	100	0	0	
Total %	0.3	21.8	0	26.6	4.8	45.3	0	0	0	1.1	0	0	

	Court Street (Route 140) From North				Taunton Green From East				Taunton Green From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	54	0	54	81	**21**	145	247	0	0	0	0	**6**	0	0	**6**	307
08:15 AM	0	64	0	64	**87**	11	131	229	0	0	0	0	4	0	0	4	297
08:30 AM	2	62	0	64	65	16	**163**	244	0	0	0	0	4	0	0	4	312
08:45 AM	**4**	**66**	0	**70**	74	21	163	**258**	0	0	0	0	5	0	0	5	**333**
Total Volume	6	246	0	252	307	69	602	978	0	0	0	0	19	0	0	19	1249
% App. Total	2.4	97.6	0		31.4	7.1	61.6		0	0	0		100	0	0		
PHF	.375	.932	.000	.900	.882	.821	.923	.948	.000	.000	.000	.000	.792	.000	.000	.792	.938

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Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Court Street (Route 140) From North			Taunton Green From East			Taunton Green From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	3	0	3	0	7	0	0	0	0	0	0	13
07:15 AM	0	7	0	7	1	15	0	0	0	0	0	0	30
07:30 AM	0	4	0	9	0	9	0	0	0	0	0	0	22
07:45 AM	0	3	0	7	0	6	0	0	0	0	0	0	16
Total	0	17	0	26	1	37	0	0	0	0	0	0	81
08:00 AM	0	1	0	6	0	13	0	0	0	0	0	0	20
08:15 AM	0	3	0	6	0	10	0	0	0	0	0	0	19
08:30 AM	0	1	0	8	0	12	0	0	0	0	0	0	21
08:45 AM	0	2	0	5	0	13	0	0	0	0	0	0	20
Total	0	7	0	25	0	48	0	0	0	0	0	0	80
Grand Total	0	24	0	51	1	85	0	0	0	0	0	0	161
Apprch %	0	100	0	37.2	0.7	62	0	0	0	0	0	0	
Total %	0	14.9	0	31.7	0.6	52.8	0	0	0	0	0	0	

	Court Street (Route 140) From North				Taunton Green From East				Taunton Green From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**7**	0	**7**	7	**1**	**15**	**23**	0	0	0	0	0	0	0	0	**30**
07:30 AM	0	4	0	4	**9**	0	9	18	0	0	0	0	0	0	0	0	22
07:45 AM	0	3	0	3	7	0	6	13	0	0	0	0	0	0	0	0	16
08:00 AM	0	1	0	1	6	0	13	19	0	0	0	0	0	0	0	0	20
Total Volume	0	15	0	15	29	1	43	73	0	0	0	0	0	0	0	0	88
% App. Total	0	100	0		39.7	1.4	58.9		0	0	0		0	0	0		
PHF	.000	.536	.000	.536	.806	.250	.717	.793	.000	.000	.000	.000	.000	.000	.000	.000	.733

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Page No : 1

Groups Printed- Peds and Bicycles

	Court Street (Route 140) From North				Taunton Green From East				Taunton Green From South				Post Office Square From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	3
07:45 AM	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	4
Total	0	0	2	4	0	1	0	0	0	0	0	0	0	0	2	0	9
08:00 AM	0	0	6	0	0	0	0	0	0	0	0	1	0	0	0	1	8
08:15 AM	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1	9
08:30 AM	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	5
08:45 AM	0	0	7	0	0	0	0	0	0	0	0	1	0	0	0	4	12
Total	0	0	25	0	0	0	0	0	0	0	0	2	0	0	0	7	34
Grand Total	0	0	27	4	0	1	0	0	0	0	0	2	0	0	2	7	43
Apprch %	0	0	87.1	12.9	0	100	0	0	0	0	0	100	0	0	22.2	77.8	
Total %	0	0	62.8	9.3	0	2.3	0	0	0	0	0	4.7	0	0	4.7	16.3	

	Court Street (Route 140) From North					Taunton Green From East					Taunton Green From South					Post Office Square From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	6	0	6	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	1	1	8
08:15 AM	0	0	**8**	**0**	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	9
08:30 AM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5
08:45 AM	0	0	7	0	7	0	0	0	0	0	0	0	0	1	1	0	0	0	**4**	**4**	**12**
Total Volume	0	0	25	0	25	0	0	0	0	0	0	0	0	2	2	0	0	0	7	7	34
% App. Total	0	0	100	0		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.781	.000	.781	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.438	.438	.708

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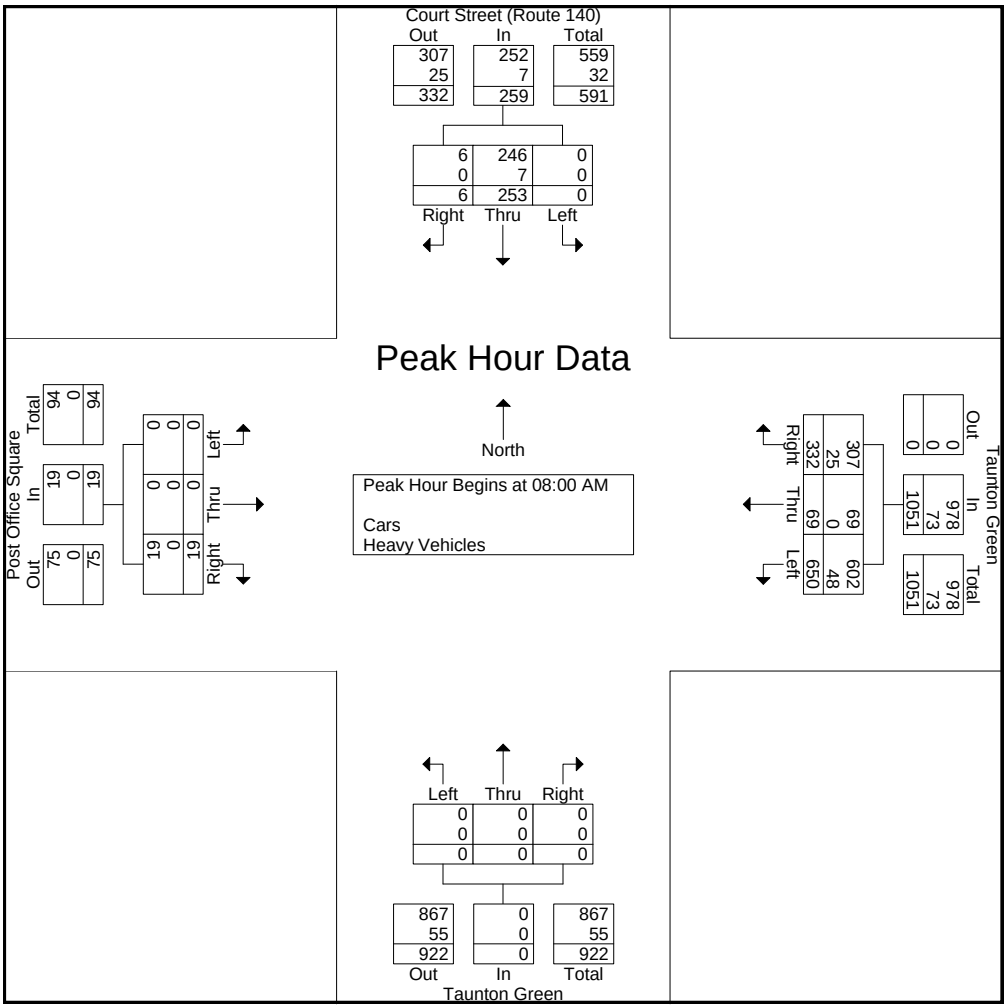
	Court Street (Route 140) From North				Taunton Green From East				Taunton Green From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	55	0	55	87	**21**	158	266	0	0	0	0	**6**	0	0	**6**	327
08:15 AM	0	67	0	67	**93**	11	141	245	0	0	0	0	4	0	0	4	316
08:30 AM	2	63	0	65	73	16	175	264	0	0	0	0	4	0	0	4	333
08:45 AM	**4**	**68**	0	**72**	79	21	**176**	**276**	0	0	0	0	5	0	0	5	**353**
Total Volume	6	253	0	259	332	69	650	1051	0	0	0	0	19	0	0	19	1329
% App. Total	2.3	97.7	0		31.6	6.6	61.8		0	0	0		100	0	0		
PHF	.375	.930	.000	.899	.892	.821	.923	.952	.000	.000	.000	.000	.792	.000	.000	.792	.941
Cars	6	246	0	252	307	69	602	978	0	0	0	0	19	0	0	19	1249
% Cars	100	97.2	0	97.3	92.5	100	92.6	93.1	0	0	0	0	100	0	0	100	94.0
Heavy Vehicles	0	7	0	7	25	0	48	73	0	0	0	0	0	0	0	0	80
% Heavy Vehicles	0	2.8	0	2.7	7.5	0	7.4	6.9	0	0	0	0	0	0	0	0	6.0



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N/S: Court Street/Taunton Green
E/W: Taunton Green/Post Office Square
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-CCC
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Court Street (Route 140) From North			Taunton Green (Route 44/138/140) From East			Taunton Green (Route 44/138/140) From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	81	0	85	44	225	0	0	0	12	0	0	451
04:15 PM	3	77	0	88	24	225	0	0	0	7	0	0	424
04:30 PM	6	80	0	72	34	210	0	0	0	4	0	0	406
04:45 PM	4	79	0	86	33	251	0	0	0	6	0	0	459
Total	17	317	0	331	135	911	0	0	0	29	0	0	1740
05:00 PM	7	88	1	102	30	215	0	0	0	7	0	0	450
05:15 PM	3	100	0	104	26	195	0	0	0	4	0	0	432
05:30 PM	3	83	0	77	37	243	0	0	0	4	0	0	447
05:45 PM	1	70	0	70	24	252	0	0	0	2	0	0	419
Total	14	341	1	353	117	905	0	0	0	17	0	0	1748
Grand Total	31	658	1	684	252	1816	0	0	0	46	0	0	3488
Apprch %	4.5	95.4	0.1	24.9	9.2	66	0	0	0	100	0	0	
Total %	0.9	18.9	0	19.6	7.2	52.1	0	0	0	1.3	0	0	
Cars	31	645	1	669	250	1779	0	0	0	46	0	0	3421
% Cars	100	98	100	97.8	99.2	98	0	0	0	100	0	0	98.1
Heavy Vehicles	0	13	0	15	2	37	0	0	0	0	0	0	67
% Heavy Vehicles	0	2	0	2.2	0.8	2	0	0	0	0	0	0	1.9

	Court Street (Route 140) From North				Taunton Green (Route 44/138/140) From East				Taunton Green (Route 44/138/140) From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	4	79	0	83	86	33	**251**	**370**	0	0	0	0	6	0	0	6	**459**
05:00 PM	**7**	88	**1**	96	102	30	215	347	0	0	0	0	**7**	0	0	**7**	450
05:15 PM	3	**100**	0	**103**	**104**	26	195	325	0	0	0	0	4	0	0	4	432
05:30 PM	3	83	0	86	77	**37**	243	357	0	0	0	0	4	0	0	4	447
Total Volume	17	350	1	368	369	126	904	1399	0	0	0	0	21	0	0	21	1788
% App. Total	4.6	95.1	0.3		26.4	9	64.6		0	0	0		100	0	0		
PHF	.607	.875	.250	.893	.887	.851	.900	.945	.000	.000	.000	.000	.750	.000	.000	.750	.974
Cars	17	343	1	361	361	125	893	1379	0	0	0	0	21	0	0	21	1761
% Cars	100	98.0	100	98.1	97.8	99.2	98.8	98.6	0	0	0	0	100	0	0	100	98.5
Heavy Vehicles	0	7	0	7	8	1	11	20	0	0	0	0	0	0	0	0	27
% Heavy Vehicles	0	2.0	0	1.9	2.2	0.8	1.2	1.4	0	0	0	0	0	0	0	0	1.5

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File Name : 81676 H-CCC
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Court Street (Route 140) From North			Taunton Green (Route 44/138/140) From East			Taunton Green (Route 44/138/140) From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	80	0	83	44	216	0	0	0	12	0	0	439
04:15 PM	3	75	0	85	23	219	0	0	0	7	0	0	412
04:30 PM	6	79	0	71	34	203	0	0	0	4	0	0	397
04:45 PM	4	77	0	85	33	244	0	0	0	6	0	0	449
Total	17	311	0	324	134	882	0	0	0	29	0	0	1697
05:00 PM	7	87	1	100	30	214	0	0	0	7	0	0	446
05:15 PM	3	98	0	101	26	192	0	0	0	4	0	0	424
05:30 PM	3	81	0	75	36	243	0	0	0	4	0	0	442
05:45 PM	1	68	0	69	24	248	0	0	0	2	0	0	412
Total	14	334	1	345	116	897	0	0	0	17	0	0	1724
Grand Total	31	645	1	669	250	1779	0	0	0	46	0	0	3421
Apprch %	4.6	95.3	0.1	24.8	9.3	65.9	0	0	0	100	0	0	
Total %	0.9	18.9	0	19.6	7.3	52	0	0	0	1.3	0	0	

	Court Street (Route 140) From North				Taunton Green (Route 44/138/140) From East				Taunton Green (Route 44/138/140) From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	4	77	0	81	85	33	**244**	**362**	0	0	0	0	6	0	0	6	**449**
05:00 PM	**7**	87	**1**	95	100	30	214	344	0	0	0	0	**7**	0	0	**7**	446
05:15 PM	3	**98**	0	**101**	**101**	26	192	319	0	0	0	0	4	0	0	4	424
05:30 PM	3	81	0	84	75	**36**	243	354	0	0	0	0	4	0	0	4	442
Total Volume	17	343	1	361	361	125	893	1379	0	0	0	0	21	0	0	21	1761
% App. Total	4.7	95	0.3		26.2	9.1	64.8		0	0	0		100	0	0		
PHF	.607	.875	.250	.894	.894	.868	.915	.952	.000	.000	.000	.000	.750	.000	.000	.750	.981

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File Name : 81676 H-CCC
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Court Street (Route 140) From North			Taunton Green (Route 44/138/140) From East			Taunton Green (Route 44/138/140) From South			Post Office Square From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	2	0	9	0	0	0	0	0	0	12
04:15 PM	0	2	0	3	1	6	0	0	0	0	0	0	12
04:30 PM	0	1	0	1	0	7	0	0	0	0	0	0	9
04:45 PM	0	2	0	1	0	7	0	0	0	0	0	0	10
Total	0	6	0	7	1	29	0	0	0	0	0	0	43
05:00 PM	0	1	0	2	0	1	0	0	0	0	0	0	4
05:15 PM	0	2	0	3	0	3	0	0	0	0	0	0	8
05:30 PM	0	2	0	2	1	0	0	0	0	0	0	0	5
05:45 PM	0	2	0	1	0	4	0	0	0	0	0	0	7
Total	0	7	0	8	1	8	0	0	0	0	0	0	24
Grand Total	0	13	0	15	2	37	0	0	0	0	0	0	67
Apprch %	0	100	0	27.8	3.7	68.5	0	0	0	0	0	0	
Total %	0	19.4	0	22.4	3	55.2	0	0	0	0	0	0	

	Court Street (Route 140) From North				Taunton Green (Route 44/138/140) From East				Taunton Green (Route 44/138/140) From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	2	0	**9**	**11**	0	0	0	0	0	0	0	0	**12**
04:15 PM	0	**2**	0	**2**	**3**	**1**	6	10	0	0	0	0	0	0	0	0	12
04:30 PM	0	1	0	1	1	0	7	8	0	0	0	0	0	0	0	0	9
04:45 PM	0	2	0	2	1	0	7	8	0	0	0	0	0	0	0	0	10
Total Volume	0	6	0	6	7	1	29	37	0	0	0	0	0	0	0	0	43
% App. Total	0	100	0		18.9	2.7	78.4		0	0	0		0	0	0		
PHF	.000	.750	.000	.750	.583	.250	.806	.841	.000	.000	.000	.000	.000	.000	.000	.000	.896

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Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Court Street (Route 140) From North				Taunton Green (Route 44/138/140) From East				Taunton Green (Route 44/138/140) From South				Post Office Square From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	2	8
04:15 PM	0	0	0	11	0	1	0	0	0	0	0	0	1	0	0	10	23
04:30 PM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	6	14
04:45 PM	0	0	0	8	0	0	0	0	0	0	0	4	0	0	1	10	23
Total	0	0	0	33	0	1	0	0	0	0	0	4	1	0	1	28	68
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	4
05:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
05:30 PM	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	13
05:45 PM	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	1	5
Total	0	0	0	16	3	0	0	1	0	0	0	2	0	0	0	3	25
Grand Total	0	0	0	49	3	1	0	1	0	0	0	6	1	0	1	31	93
Apprch %	0	0	0	100	60	20	0	20	0	0	0	100	3	0	3	93.9	
Total %	0	0	0	52.7	3.2	1.1	0	1.1	0	0	0	6.5	1.1	0	1.1	33.3	

	Court Street (Route 140) From North					Taunton Green (Route 44/138/140) From East					Taunton Green (Route 44/138/140) From South					Post Office Square From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	8
04:15 PM	0	0	0	**11**	**11**	0	**1**	**0**	**0**	**1**	0	0	0	0	0	**1**	**0**	**0**	**10**	**11**	**23**
04:30 PM	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	14
04:45 PM	0	0	0	8	8	0	0	0	0	0	0	0	0	**4**	**4**	0	0	**1**	**10**	**11**	**23**
Total Volume	0	0	0	33	33	0	1	0	0	1	0	0	0	4	4	1	0	1	28	30	68
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		3.3	0	3.3	93.3		
PHF	.000	.000	.000	.750	.750	.000	.250	.000	.000	.250	.000	.000	.000	.250	.250	.250	.000	.250	.700	.682	.739

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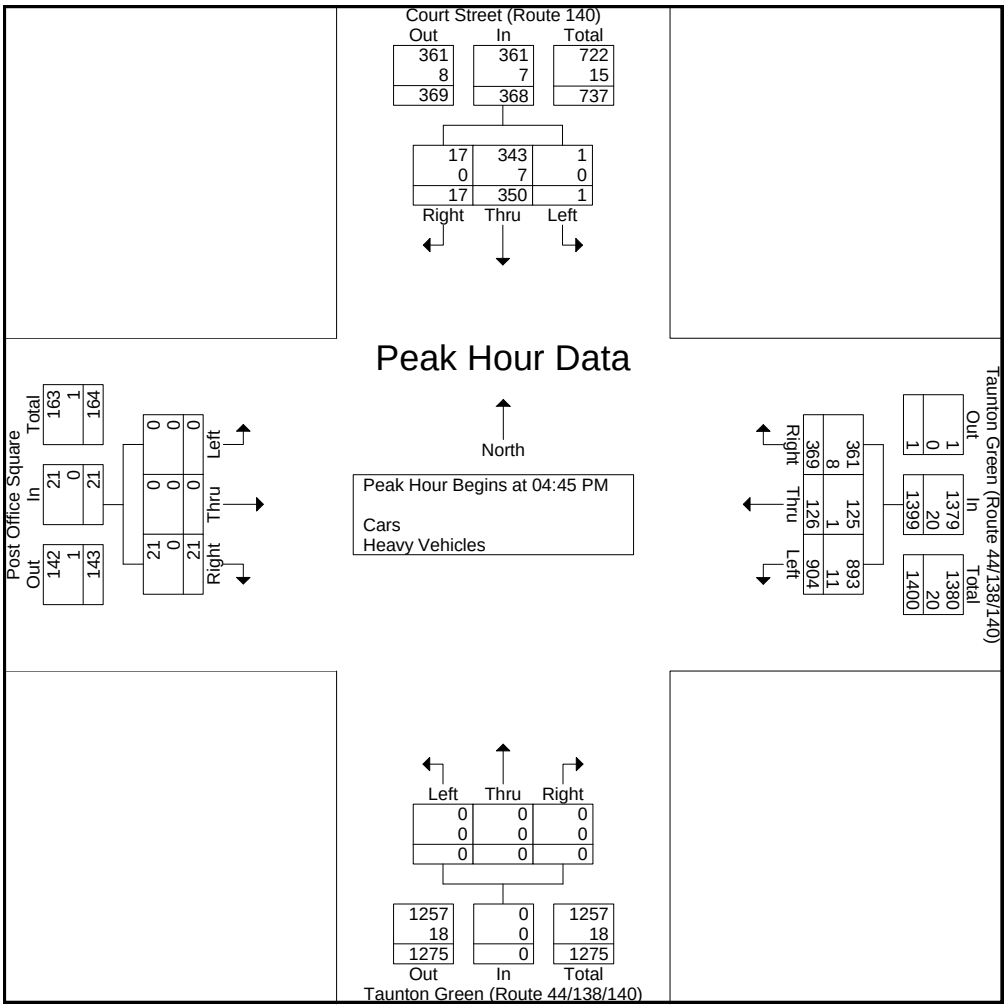
Page No : 1

	Court Street (Route 140) From North				Taunton Green (Route 44/138/140) From East				Taunton Green (Route 44/138/140) From South				Post Office Square From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	4	79	0	83	86	33	**251**	**370**	0	0	0	0	6	0	0	6	**459**
05:00 PM	**7**	88	**1**	96	102	30	215	347	0	0	0	0	**7**	0	0	**7**	450
05:15 PM	3	**100**	0	**103**	**104**	26	195	325	0	0	0	0	4	0	0	4	432
05:30 PM	3	83	0	86	77	**37**	243	357	0	0	0	0	4	0	0	4	447
Total Volume	17	350	1	368	369	126	904	1399	0	0	0	0	21	0	0	21	1788
% App. Total	4.6	95.1	0.3		26.4	9	64.6		0	0	0		100	0	0		
PHF	.607	.875	.250	.893	.887	.851	.900	.945	.000	.000	.000	.000	.750	.000	.000	.750	.974
Cars	17	343	1	361	361	125	893	1379	0	0	0	0	21	0	0	21	1761
% Cars	100	98.0	100	98.1	97.8	99.2	98.8	98.6	0	0	0	0	100	0	0	100	98.5
Heavy Vehicles	0	7	0	7	8	1	11	20	0	0	0	0	0	0	0	0	27
% Heavy Vehicles	0	2.0	0	1.9	2.2	0.8	1.2	1.4	0	0	0	0	0	0	0	0	1.5



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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-D
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	11	35	124	0	0	0	88	0	0	3	31	0	292
07:15 AM	24	54	157	0	0	0	104	0	1	3	32	0	375
07:30 AM	21	42	157	0	0	0	111	0	0	3	34	0	368
07:45 AM	17	53	144	0	0	0	126	0	0	1	33	0	374
Total	73	184	582	0	0	0	429	0	1	10	130	0	1409
08:00 AM	22	72	109	0	0	0	69	6	2	1	30	0	311
08:15 AM	23	58	136	0	0	0	90	12	3	4	34	0	360
08:30 AM	31	57	154	0	0	0	108	0	2	5	49	0	406
08:45 AM	36	62	157	0	0	0	113	4	0	6	43	0	421
Total	112	249	556	0	0	0	380	22	7	16	156	0	1498
Grand Total	185	433	1138	0	0	0	809	22	8	26	286	0	2907
Apprch %	10.5	24.7	64.8	0	0	0	96.4	2.6	1	8.3	91.7	0	
Total %	6.4	14.9	39.1	0	0	0	27.8	0.8	0.3	0.9	9.8	0	
Cars	179	383	1081	0	0	0	757	22	7	25	266	0	2720
% Cars	96.8	88.5	95	0	0	0	93.6	100	87.5	96.2	93	0	93.6
Heavy Vehicles	6	50	57	0	0	0	52	0	1	1	20	0	187
% Heavy Vehicles	3.2	11.5	5	0	0	0	6.4	0	12.5	3.8	7	0	6.4

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	22	**72**	109	203	0	0	0	0	69	6	2	77	1	30	0	31	311
08:15 AM	23	58	136	217	0	0	0	0	90	**12**	**3**	105	4	34	0	38	360
08:30 AM	31	57	154	242	0	0	0	0	108	0	2	110	5	**49**	0	**54**	406
08:45 AM	**36**	62	**157**	**255**	0	0	0	0	**113**	4	0	**117**	**6**	43	0	49	**421**
Total Volume	112	249	556	917	0	0	0	0	380	22	7	409	16	156	0	172	1498
% App. Total	12.2	27.2	60.6		0	0	0		92.9	5.4	1.7		9.3	90.7	0		
PHF	.778	.865	.885	.899	.000	.000	.000	.000	.841	.458	.583	.874	.667	.796	.000	.796	.890
Cars	110	219	532	861	0	0	0	0	353	22	7	382	15	147	0	162	1405
% Cars	98.2	88.0	95.7	93.9	0	0	0	0	92.9	100	100	93.4	93.8	94.2	0	94.2	93.8
Heavy Vehicles	2	30	24	56	0	0	0	0	27	0	0	27	1	9	0	10	93
% Heavy Vehicles	1.8	12.0	4.3	6.1	0	0	0	0	7.1	0	0	6.6	6.3	5.8	0	5.8	6.2

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Client: VHB/J. Quitter

File Name : 81676 H-D
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	11	30	119	0	0	0	84	0	0	3	29	0	276
07:15 AM	22	48	142	0	0	0	96	0	0	3	30	0	341
07:30 AM	19	38	149	0	0	0	105	0	0	3	27	0	341
07:45 AM	17	48	139	0	0	0	119	0	0	1	33	0	357
Total	69	164	549	0	0	0	404	0	0	10	119	0	1315
08:00 AM	21	63	105	0	0	0	63	6	2	1	28	0	289
08:15 AM	23	53	125	0	0	0	88	12	3	4	33	0	341
08:30 AM	30	48	151	0	0	0	96	0	2	5	45	0	377
08:45 AM	36	55	151	0	0	0	106	4	0	5	41	0	398
Total	110	219	532	0	0	0	353	22	7	15	147	0	1405
Grand Total	179	383	1081	0	0	0	757	22	7	25	266	0	2720
Apprch %	10.9	23.3	65.8	0	0	0	96.3	2.8	0.9	8.6	91.4	0	
Total %	6.6	14.1	39.7	0	0	0	27.8	0.8	0.3	0.9	9.8	0	

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	21	**63**	105	189	0	0	0	0	63	6	2	71	1	28	0	29	289
08:15 AM	23	53	125	201	0	0	0	0	88	**12**	**3**	103	4	33	0	37	341
08:30 AM	30	48	**151**	229	0	0	0	0	96	0	2	98	**5**	**45**	0	**50**	377
08:45 AM	**36**	55	151	**242**	0	0	0	0	**106**	4	0	**110**	5	41	0	46	**398**
Total Volume	110	219	532	861	0	0	0	0	353	22	7	382	15	147	0	162	1405
% App. Total	12.8	25.4	61.8		0	0	0		92.4	5.8	1.8		9.3	90.7	0		
PHF	.764	.869	.881	.889	.000	.000	.000	.000	.833	.458	.583	.868	.750	.817	.000	.810	.883

PRECISION
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E/W: Taunton Green/Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-D
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	5	5	0	0	0	4	0	0	0	2	0	16
07:15 AM	2	6	15	0	0	0	8	0	1	0	2	0	34
07:30 AM	2	4	8	0	0	0	6	0	0	0	7	0	27
07:45 AM	0	5	5	0	0	0	7	0	0	0	0	0	17
Total	4	20	33	0	0	0	25	0	1	0	11	0	94
08:00 AM	1	9	4	0	0	0	6	0	0	0	2	0	22
08:15 AM	0	5	11	0	0	0	2	0	0	0	1	0	19
08:30 AM	1	9	3	0	0	0	12	0	0	0	4	0	29
08:45 AM	0	7	6	0	0	0	7	0	0	1	2	0	23
Total	2	30	24	0	0	0	27	0	0	1	9	0	93
Grand Total	6	50	57	0	0	0	52	0	1	1	20	0	187
Apprch %	5.3	44.2	50.4	0	0	0	98.1	0	1.9	4.8	95.2	0	
Total %	3.2	26.7	30.5	0	0	0	27.8	0	0.5	0.5	10.7	0	

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**2**	6	**15**	**23**	0	0	0	0	**8**	0	**1**	**9**	0	2	0	2	**34**
07:30 AM	2	4	8	14	0	0	0	0	6	0	0	6	0	**7**	0	**7**	27
07:45 AM	0	5	5	10	0	0	0	0	7	0	0	7	0	0	0	0	17
08:00 AM	1	**9**	4	14	0	0	0	0	6	0	0	6	0	2	0	2	22
Total Volume	5	24	32	61	0	0	0	0	27	0	1	28	0	11	0	11	100
% App. Total	8.2	39.3	52.5		0	0	0		96.4	0	3.6		0	100	0		
PHF	.625	.667	.533	.663	.000	.000	.000	.000	.844	.000	.250	.778	.000	.393	.000	.393	.735

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File Name : 81676 H-D
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	4
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0	0	4
Total	0	0	0	4	0	1	0	0	0	0	0	6	0	2	0	0	13
08:00 AM	0	0	0	6	0	0	0	0	0	0	0	4	0	0	0	1	11
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5
08:30 AM	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	6
08:45 AM	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	1	6
Total	0	0	0	10	0	0	0	0	0	0	0	16	0	0	0	2	28
Grand Total	0	0	0	14	0	1	0	0	0	0	0	22	0	2	0	2	41
Apprch %	0	0	0	100	0	100	0	0	0	0	0	100	0	50	0	50	
Total %	0	0	0	34.1	0	2.4	0	0	0	0	0	53.7	0	4.9	0	4.9	

	Taunton Green (Route 44/138/140) From North					Taunton Green (Route 44/138/140) From East					Winthrop Street (Route 44) From South					Cohannet Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	**6**	**6**	0	0	0	0	0	0	0	0	4	4	0	0	0	**1**	**1**	**11**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**	**5**	0	0	0	0	0	5
08:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	6
08:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	3	3	0	0	0	1	1	6
Total Volume	0	0	0	10	10	0	0	0	0	0	0	0	0	16	16	0	0	0	2	2	28
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.417	.417	.000	.000	.000	.000	.000	.000	.000	.000	.800	.800	.000	.000	.000	.500	.500	.636

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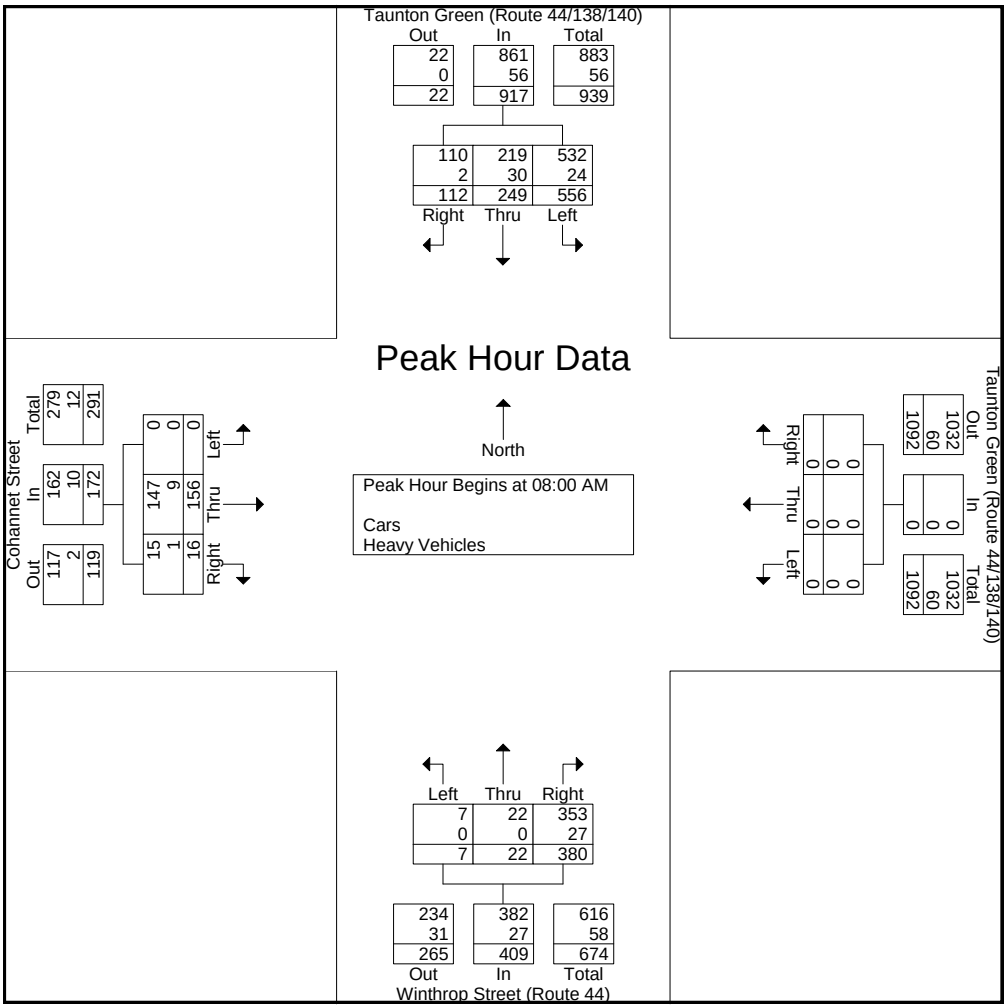
Page No : 1

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	22	**72**	109	203	0	0	0	0	69	6	2	77	1	30	0	31	311
08:15 AM	23	58	136	217	0	0	0	0	90	**12**	**3**	105	4	34	0	38	360
08:30 AM	31	57	154	242	0	0	0	0	108	0	2	110	5	**49**	0	**54**	406
08:45 AM	**36**	62	**157**	**255**	0	0	0	0	**113**	4	0	**117**	**6**	43	0	49	**421**
Total Volume	112	249	556	917	0	0	0	0	380	22	7	409	16	156	0	172	1498
% App. Total	12.2	27.2	60.6		0	0	0		92.9	5.4	1.7		9.3	90.7	0		
PHF	.778	.865	.885	.899	.000	.000	.000	.000	.841	.458	.583	.874	.667	.796	.000	.796	.890
Cars	110	219	532	861	0	0	0	0	353	22	7	382	15	147	0	162	1405
% Cars	98.2	88.0	95.7	93.9	0	0	0	0	92.9	100	100	93.4	93.8	94.2	0	94.2	93.8
Heavy Vehicles	2	30	24	56	0	0	0	0	27	0	0	27	1	9	0	10	93
% Heavy Vehicles	1.8	12.0	4.3	6.1	0	0	0	0	7.1	0	0	6.6	6.3	5.8	0	5.8	6.2



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File Name : 81676 H-DDD
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	31	125	177	0	0	0	96	0	1	4	62	0	496
04:15 PM	19	108	186	0	0	0	100	0	1	6	58	0	478
04:30 PM	17	100	183	0	0	0	103	0	0	7	67	0	477
04:45 PM	33	111	193	0	0	0	101	0	2	11	59	0	510
Total	100	444	739	0	0	0	400	0	4	28	246	0	1961
05:00 PM	25	113	177	0	0	0	97	0	3	9	68	0	492
05:15 PM	26	102	191	0	0	0	98	0	1	4	55	0	477
05:30 PM	24	107	191	0	0	0	87	0	0	9	49	0	467
05:45 PM	12	134	182	0	0	0	77	0	0	5	43	0	453
Total	87	456	741	0	0	0	359	0	4	27	215	0	1889
Grand Total	187	900	1480	0	0	0	759	0	8	55	461	0	3850
Apprch %	7.3	35.1	57.7	0	0	0	99	0	1	10.7	89.3	0	
Total %	4.9	23.4	38.4	0	0	0	19.7	0	0.2	1.4	12	0	
Cars	185	869	1453	0	0	0	737	0	8	54	443	0	3749
% Cars	98.9	96.6	98.2	0	0	0	97.1	0	100	98.2	96.1	0	97.4
Heavy Vehicles	2	31	27	0	0	0	22	0	0	1	18	0	101
% Heavy Vehicles	1.1	3.4	1.8	0	0	0	2.9	0	0	1.8	3.9	0	2.6

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	31	**125**	177	333	0	0	0	0	96	0	1	97	4	62	0	66	496
04:15 PM	19	108	186	313	0	0	0	0	100	0	1	101	6	58	0	64	478
04:30 PM	17	100	183	300	0	0	0	0	**103**	0	0	**103**	7	**67**	0	**74**	477
04:45 PM	**33**	111	**193**	**337**	0	0	0	0	101	0	**2**	103	**11**	59	0	70	**510**
Total Volume	100	444	739	1283	0	0	0	0	400	0	4	404	28	246	0	274	1961
% App. Total	7.8	34.6	57.6		0	0	0		99	0	1		10.2	89.8	0		
PHF	.758	.888	.957	.952	.000	.000	.000	.000	.971	.000	.500	.981	.636	.918	.000	.926	.961
Cars	98	420	725	1243	0	0	0	0	387	0	4	391	27	238	0	265	1899
% Cars	98.0	94.6	98.1	96.9	0	0	0	0	96.8	0	100	96.8	96.4	96.7	0	96.7	96.8
Heavy Vehicles	2	24	14	40	0	0	0	0	13	0	0	13	1	8	0	9	62
% Heavy Vehicles	2.0	5.4	1.9	3.1	0	0	0	0	3.3	0	0	3.2	3.6	3.3	0	3.3	3.2

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Site Code : 10111.31
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Page No : 1

Groups Printed- Cars

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	31	117	174	0	0	0	92	0	1	4	60	0	479
04:15 PM	19	102	182	0	0	0	98	0	1	6	56	0	464
04:30 PM	17	95	179	0	0	0	99	0	0	7	66	0	463
04:45 PM	31	106	190	0	0	0	98	0	2	10	56	0	493
Total	98	420	725	0	0	0	387	0	4	27	238	0	1899
05:00 PM	25	111	175	0	0	0	94	0	3	9	64	0	481
05:15 PM	26	99	188	0	0	0	96	0	1	4	53	0	467
05:30 PM	24	107	189	0	0	0	84	0	0	9	47	0	460
05:45 PM	12	132	176	0	0	0	76	0	0	5	41	0	442
Total	87	449	728	0	0	0	350	0	4	27	205	0	1850
Grand Total	185	869	1453	0	0	0	737	0	8	54	443	0	3749
Apprch %	7.4	34.7	58	0	0	0	98.9	0	1.1	10.9	89.1	0	
Total %	4.9	23.2	38.8	0	0	0	19.7	0	0.2	1.4	11.8	0	

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	17	95	179	291	0	0	0	0	**99**	0	0	99	7	**66**	0	**73**	463
04:45 PM	**31**	106	**190**	**327**	0	0	0	0	98	0	2	**100**	**10**	56	0	66	**493**
05:00 PM	25	**111**	175	311	0	0	0	0	94	0	**3**	97	9	64	0	73	481
05:15 PM	26	99	188	313	0	0	0	0	96	0	1	97	4	53	0	57	467
Total Volume	99	411	732	1242	0	0	0	0	387	0	6	393	30	239	0	269	1904
% App. Total	8	33.1	58.9		0	0	0		98.5	0	1.5		11.2	88.8	0		
PHF	.798	.926	.963	.950	.000	.000	.000	.000	.977	.000	.500	.983	.750	.905	.000	.921	.966

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Page No : 1

Groups Printed- Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Taunton Green (Route 44/138/140) From East			Winthrop Street (Route 44) From South			Cohannet Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	8	3	0	0	0	4	0	0	0	2	0	17
04:15 PM	0	6	4	0	0	0	2	0	0	0	2	0	14
04:30 PM	0	5	4	0	0	0	4	0	0	0	1	0	14
04:45 PM	2	5	3	0	0	0	3	0	0	1	3	0	17
Total	2	24	14	0	0	0	13	0	0	1	8	0	62
05:00 PM	0	2	2	0	0	0	3	0	0	0	4	0	11
05:15 PM	0	3	3	0	0	0	2	0	0	0	2	0	10
05:30 PM	0	0	2	0	0	0	3	0	0	0	2	0	7
05:45 PM	0	2	6	0	0	0	1	0	0	0	2	0	11
Total	0	7	13	0	0	0	9	0	0	0	10	0	39
Grand Total	2	31	27	0	0	0	22	0	0	1	18	0	101
Apprch %	3.3	51.7	45	0	0	0	100	0	0	5.3	94.7	0	
Total %	2	30.7	26.7	0	0	0	21.8	0	0	1	17.8	0	

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**8**	3	**11**	0	0	0	0	**4**	0	0	**4**	0	2	0	2	**17**
04:15 PM	0	6	**4**	10	0	0	0	0	2	0	0	2	0	2	0	2	14
04:30 PM	0	5	4	9	0	0	0	0	4	0	0	4	0	1	0	1	14
04:45 PM	**2**	5	3	10	0	0	0	0	3	0	0	3	**1**	**3**	0	**4**	17
Total Volume	2	24	14	40	0	0	0	0	13	0	0	13	1	8	0	9	62
% App. Total	5	60	35		0	0	0		100	0	0		11.1	88.9	0		
PHF	.250	.750	.875	.909	.000	.000	.000	.000	.813	.000	.000	.813	.250	.667	.000	.563	.912

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Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	4	0	0	0	1	1	0	0	11	0	1	0	3	22
04:15 PM	0	0	1	2	0	0	1	3	2	0	0	5	1	0	0	9	24
04:30 PM	1	0	0	2	0	0	1	0	0	0	1	5	0	0	0	6	16
04:45 PM	0	1	0	1	0	1	0	0	1	0	1	1	0	0	0	3	9
Total	1	2	1	9	0	1	2	4	4	0	2	22	1	1	0	21	71
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	6	0	0	0	3	10
05:15 PM	0	0	0	0	0	0	0	2	2	0	0	5	0	1	0	6	16
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	4
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	1	0	3	7
Total	0	0	0	1	0	0	0	3	3	0	0	15	0	2	0	13	37
Grand Total	1	2	1	10	0	1	2	7	7	0	2	37	1	3	0	34	108
Apprch %	7.1	14.3	7.1	71.4	0	10	20	70	15.2	0	4.3	80.4	2.6	7.9	0	89.5	
Total %	0.9	1.9	0.9	9.3	0	0.9	1.9	6.5	6.5	0	1.9	34.3	0.9	2.8	0	31.5	

	Taunton Green (Route 44/138/140) From North					Taunton Green (Route 44/138/140) From East					Winthrop Street (Route 44) From South					Cohannet Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**1**	0	**4**	**5**	0	0	0	1	1	1	0	0	**11**	**12**	0	**1**	0	3	4	22
04:15 PM	0	0	**1**	**2**	**3**	**0**	**0**	**1**	**3**	**4**	**2**	**0**	**0**	**5**	**7**	**1**	**0**	**0**	**9**	**10**	**24**
04:30 PM	**1**	**0**	**0**	**2**	**3**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	5	6	0	0	0	6	6	16
04:45 PM	0	1	0	1	2	0	**1**	**0**	**0**	**1**	**1**	**0**	**1**	**1**	**3**	**0**	**0**	**0**	**3**	**3**	**9**
Total Volume	1	2	1	9	13	0	1	2	4	7	4	0	2	22	28	1	1	0	21	23	71
% App. Total	7.7	15.4	7.7	69.2		0	14.3	28.6	57.1		14.3	0	7.1	78.6		4.3	4.3	0	91.3		
PHF	.250	.500	.250	.563	.650	.000	.250	.500	.333	.438	.500	.000	.500	.500	.583	.250	.250	.000	.583	.575	.740

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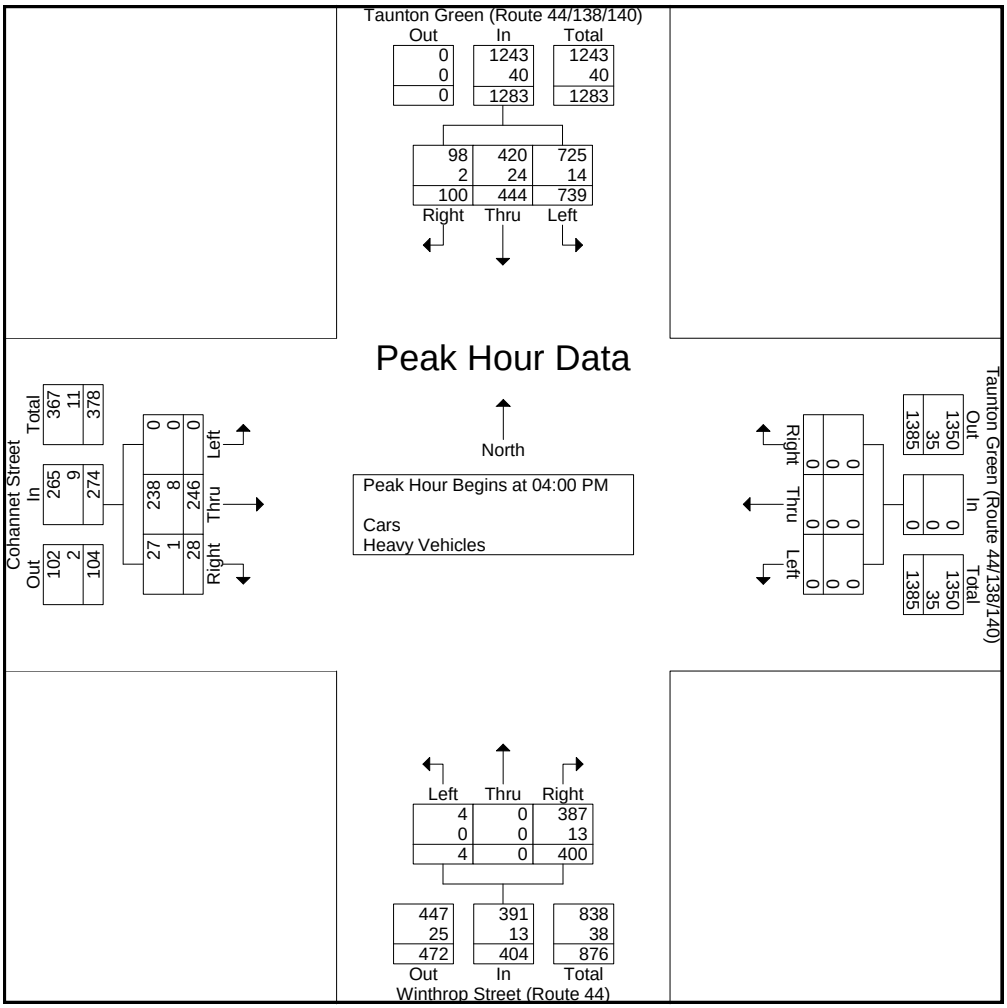
N/S: Taunton Green/Winthrop Street
E/W: Taunton Green/Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-DDD
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Taunton Green (Route 44/138/140) From North				Taunton Green (Route 44/138/140) From East				Winthrop Street (Route 44) From South				Cohannet Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	31	**125**	177	333	0	0	0	0	96	0	1	97	4	62	0	66	496
04:15 PM	19	108	186	313	0	0	0	0	100	0	1	101	6	58	0	64	478
04:30 PM	17	100	183	300	0	0	0	0	**103**	0	0	**103**	7	**67**	0	**74**	477
04:45 PM	**33**	111	**193**	**337**	0	0	0	0	101	0	**2**	103	**11**	59	0	70	**510**
Total Volume	100	444	739	1283	0	0	0	0	400	0	4	404	28	246	0	274	1961
% App. Total	7.8	34.6	57.6		0	0	0		99	0	1		10.2	89.8	0		
PHF	.758	.888	.957	.952	.000	.000	.000	.000	.971	.000	.500	.981	.636	.918	.000	.926	.961
Cars	98	420	725	1243	0	0	0	0	387	0	4	391	27	238	0	265	1899
% Cars	98.0	94.6	98.1	96.9	0	0	0	0	96.8	0	100	96.8	96.4	96.7	0	96.7	96.8
Heavy Vehicles	2	24	14	40	0	0	0	0	13	0	0	13	1	8	0	9	62
% Heavy Vehicles	2.0	5.4	1.9	3.1	0	0	0	0	3.3	0	0	3.2	3.6	3.3	0	3.3	3.2



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N/S: Apartment Drive/Court St (Rte 140)
E/W: Washington Street/Route 140
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-E
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Cars - Heavy Vehicles

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	68	5	5	3	68	86	115	0	350
07:15 AM	0	0	0	0	72	9	10	1	78	74	170	0	414
07:30 AM	0	0	0	0	118	8	6	0	89	69	162	0	452
07:45 AM	0	0	0	0	87	6	1	0	103	63	131	0	391
Total	0	0	0	0	345	28	22	4	338	292	578	0	1607
08:00 AM	0	0	0	0	115	11	2	0	74	53	126	2	383
08:15 AM	0	0	0	0	83	6	4	0	81	56	116	1	347
08:30 AM	0	0	0	0	101	9	10	0	59	69	118	0	366
08:45 AM	0	0	0	0	99	11	3	0	68	64	123	0	368
Total	0	0	0	0	398	37	19	0	282	242	483	3	1464
Grand Total	0	0	0	0	743	65	41	4	620	534	1061	3	3071
Apprch %	0	0	0	0	92	8	6.2	0.6	93.2	33.4	66.4	0.2	
Total %	0	0	0	0	24.2	2.1	1.3	0.1	20.2	17.4	34.5	0.1	
Cars	0	0	0	0	705	63	39	4	567	513	1027	3	2921
% Cars	0	0	0	0	94.9	96.9	95.1	100	91.5	96.1	96.8	100	95.1
Heavy Vehicles	0	0	0	0	38	2	2	0	53	21	34	0	150
% Heavy Vehicles	0	0	0	0	5.1	3.1	4.9	0	8.5	3.9	3.2	0	4.9

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	72	9	81	**10**	**1**	78	89	**74**	**170**	0	**244**	414
07:30 AM	0	0	0	0	0	**118**	8	**126**	6	0	89	95	69	162	0	231	**452**
07:45 AM	0	0	0	0	0	87	6	93	1	0	**103**	**104**	63	131	0	194	391
08:00 AM	0	0	0	0	0	115	**11**	126	2	0	74	76	53	126	**2**	181	383
Total Volume	0	0	0	0	0	392	34	426	19	1	344	364	259	589	2	850	1640
% App. Total	0	0	0		0	92	8		5.2	0.3	94.5		30.5	69.3	0.2		
PHF	.000	.000	.000	.000	.000	.831	.773	.845	.475	.250	.835	.875	.875	.866	.250	.871	.907
Cars	0	0	0	0	0	379	34	413	19	1	314	334	249	574	2	825	1572
% Cars	0	0	0	0	0	96.7	100	96.9	100	100	91.3	91.8	96.1	97.5	100	97.1	95.9
Heavy Vehicles	0	0	0	0	0	13	0	13	0	0	30	30	10	15	0	25	68
% Heavy Vehicles	0	0	0	0	0	3.3	0	3.1	0	0	8.7	8.2	3.9	2.5	0	2.9	4.1

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E/W: Washington Street/Route 140
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-E
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	64	5	4	3	66	83	110	0	335
07:15 AM	0	0	0	0	70	9	10	1	67	69	165	0	391
07:30 AM	0	0	0	0	115	8	6	0	83	66	159	0	437
07:45 AM	0	0	0	0	84	6	1	0	96	62	129	0	378
Total	0	0	0	0	333	28	21	4	312	280	563	0	1541
08:00 AM	0	0	0	0	110	11	2	0	68	52	121	2	366
08:15 AM	0	0	0	0	79	5	3	0	76	54	108	1	326
08:30 AM	0	0	0	0	96	9	10	0	50	67	115	0	347
08:45 AM	0	0	0	0	87	10	3	0	61	60	120	0	341
Total	0	0	0	0	372	35	18	0	255	233	464	3	1380
Grand Total	0	0	0	0	705	63	39	4	567	513	1027	3	2921
Apprch %	0	0	0	0	91.8	8.2	6.4	0.7	93	33.2	66.6	0.2	
Total %	0	0	0	0	24.1	2.2	1.3	0.1	19.4	17.6	35.2	0.1	

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	70	9	79	**10**	**1**	67	78	**69**	**165**	0	**234**	391
07:30 AM	0	0	0	0	0	**115**	8	**123**	6	0	83	89	66	159	0	225	**437**
07:45 AM	0	0	0	0	0	84	6	90	1	0	**96**	**97**	62	129	0	191	378
08:00 AM	0	0	0	0	0	110	**11**	121	2	0	68	70	52	121	**2**	175	366
Total Volume	0	0	0	0	0	379	34	413	19	1	314	334	249	574	2	825	1572
% App. Total	0	0	0		0	91.8	8.2		5.7	0.3	94		30.2	69.6	0.2		
PHF	.000	.000	.000	.000	.000	.824	.773	.839	.475	.250	.818	.861	.902	.870	.250	.881	.899

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File Name : 81676 H-E
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	4	0	1	0	2	3	5	0	15
07:15 AM	0	0	0	0	2	0	0	0	11	5	5	0	23
07:30 AM	0	0	0	0	3	0	0	0	6	3	3	0	15
07:45 AM	0	0	0	0	3	0	0	0	7	1	2	0	13
Total	0	0	0	0	12	0	1	0	26	12	15	0	66
08:00 AM	0	0	0	0	5	0	0	0	6	1	5	0	17
08:15 AM	0	0	0	0	4	1	1	0	5	2	8	0	21
08:30 AM	0	0	0	0	5	0	0	0	9	2	3	0	19
08:45 AM	0	0	0	0	12	1	0	0	7	4	3	0	27
Total	0	0	0	0	26	2	1	0	27	9	19	0	84
Grand Total	0	0	0	0	38	2	2	0	53	21	34	0	150
Apprch %	0	0	0	0	95	5	3.6	0	96.4	38.2	61.8	0	
Total %	0	0	0	0	25.3	1.3	1.3	0	35.3	14	22.7	0	

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	5	0	5	0	0	6	6	1	5	0	6	17
08:15 AM	0	0	0	0	0	4	**1**	5	**1**	0	5	6	2	**8**	0	**10**	21
08:30 AM	0	0	0	0	0	5	0	5	0	0	**9**	**9**	2	3	0	5	19
08:45 AM	0	0	0	0	0	**12**	1	**13**	0	0	7	7	**4**	3	0	7	**27**
Total Volume	0	0	0	0	0	26	2	28	1	0	27	28	9	19	0	28	84
% App. Total	0	0	0		0	92.9	7.1		3.6	0	96.4		32.1	67.9	0		
PHF	.000	.000	.000	.000	.000	.542	.500	.538	.250	.000	.750	.778	.563	.594	.000	.700	.778

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File Name : 81676 H-E
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
07:30 AM	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	0	5
07:45 AM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	10	0	1	0	0	0	0	1	3	0	0	0	0	15
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	3
08:15 AM	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	2	7
08:30 AM	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	0	6
08:45 AM	0	0	0	11	0	0	0	2	0	0	0	1	1	0	0	5	20
Total	0	0	0	19	0	0	0	2	0	0	0	5	2	1	0	7	36
Grand Total	0	0	0	29	0	1	0	2	0	0	1	8	2	1	0	7	51
Apprch %	0	0	0	100	0	33.3	0	66.7	0	0	11.1	88.9	20	10	0	70	
Total %	0	0	0	56.9	0	2	0	3.9	0	0	2	15.7	3.9	2	0	13.7	

	Apartment Driveway From North					Washington Street From East					Court Street (Route 140) From South					Washington Street (Route 140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	2	3
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	2	2	7
08:30 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	6
08:45 AM	0	0	0	**11**	**11**	0	0	0	**2**	**2**	0	0	0	1	1	1	0	0	**5**	**6**	**20**
Total Volume	0	0	0	19	19	0	0	0	2	2	0	0	0	5	5	2	1	0	7	10	36
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		20	10	0	70		
PHF	.000	.000	.000	.432	.432	.000	.000	.000	.250	.250	.000	.000	.000	.625	.625	.500	.250	.000	.350	.417	.450

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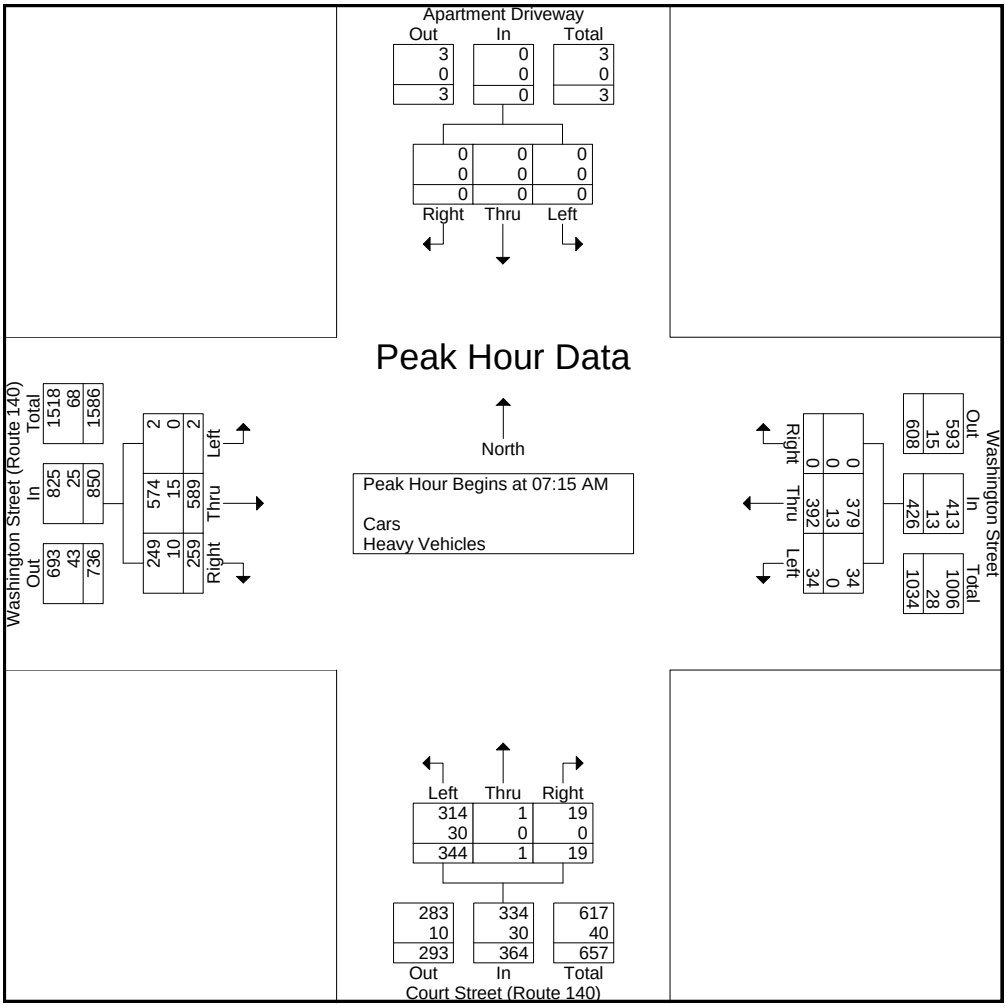
	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	72	9	81	**10**	**1**	78	89	**74**	**170**	0	**244**	414
07:30 AM	0	0	0	0	0	**118**	8	**126**	6	0	89	95	69	162	0	231	**452**
07:45 AM	0	0	0	0	0	87	6	93	1	0	**103**	**104**	63	131	0	194	391
08:00 AM	0	0	0	0	0	115	**11**	126	2	0	74	76	53	126	**2**	181	383
Total Volume	0	0	0	0	0	392	34	426	19	1	344	364	259	589	2	850	1640
% App. Total	0	0	0		0	92	8		5.2	0.3	94.5		30.5	69.3	0.2		
PHF	.000	.000	.000	.000	.000	.831	.773	.845	.475	.250	.835	.875	.875	.866	.250	.871	.907
Cars	0	0	0	0	0	379	34	413	19	1	314	334	249	574	2	825	1572
% Cars	0	0	0	0	0	96.7	100	96.9	100	100	91.3	91.8	96.1	97.5	100	97.1	95.9
Heavy Vehicles	0	0	0	0	0	13	0	13	0	0	30	30	10	15	0	25	68
% Heavy Vehicles	0	0	0	0	0	3.3	0	3.1	0	0	8.7	8.2	3.9	2.5	0	2.9	4.1



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N/S: Apartment Dr/Court Street (Rte 140)
E/W: Washington Street/Route 140
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-EEE
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	182	8	1	0	95	57	134	0	477
04:15 PM	0	0	0	0	177	7	8	0	102	53	156	0	503
04:30 PM	0	0	0	0	167	15	4	0	109	53	106	0	454
04:45 PM	0	0	0	0	148	15	3	0	92	70	131	0	459
Total	0	0	0	0	674	45	16	0	398	233	527	0	1893
05:00 PM	0	0	0	0	156	13	3	0	112	53	149	0	486
05:15 PM	0	0	0	0	171	18	5	0	103	48	106	0	451
05:30 PM	0	0	0	0	162	8	1	0	104	57	124	0	456
05:45 PM	0	0	0	0	155	11	1	0	86	60	105	0	418
Total	0	0	0	0	644	50	10	0	405	218	484	0	1811
Grand Total	0	0	0	0	1318	95	26	0	803	451	1011	0	3704
Apprch %	0	0	0	0	93.3	6.7	3.1	0	96.9	30.8	69.2	0	
Total %	0	0	0	0	35.6	2.6	0.7	0	21.7	12.2	27.3	0	
Cars	0	0	0	0	1298	91	26	0	778	441	996	0	3630
% Cars	0	0	0	0	98.5	95.8	100	0	96.9	97.8	98.5	0	98
Heavy Vehicles	0	0	0	0	20	4	0	0	25	10	15	0	74
% Heavy Vehicles	0	0	0	0	1.5	4.2	0	0	3.1	2.2	1.5	0	2

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**177**	7	**184**	**8**	0	102	110	53	**156**	0	**209**	**503**
04:30 PM	0	0	0	0	0	167	**15**	182	4	0	109	113	53	106	0	159	454
04:45 PM	0	0	0	0	0	148	15	163	3	0	92	95	**70**	131	0	201	459
05:00 PM	0	0	0	0	0	156	13	169	3	0	**112**	**115**	53	149	0	202	486
Total Volume	0	0	0	0	0	648	50	698	18	0	415	433	229	542	0	771	1902
% App. Total	0	0	0		0	92.8	7.2		4.2	0	95.8		29.7	70.3	0		
PHF	.000	.000	.000	.000	.000	.915	.833	.948	.563	.000	.926	.941	.818	.869	.000	.922	.945
Cars	0	0	0	0	0	639	46	685	18	0	404	422	225	535	0	760	1867
% Cars	0	0	0	0	0	98.6	92.0	98.1	100	0	97.3	97.5	98.3	98.7	0	98.6	98.2
Heavy Vehicles	0	0	0	0	0	9	4	13	0	0	11	11	4	7	0	11	35
% Heavy Vehicles	0	0	0	0	0	1.4	8.0	1.9	0	0	2.7	2.5	1.7	1.3	0	1.4	1.8

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Client: VHB/J. Quitter

File Name : 81676 H-EEE
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	179	8	1	0	89	57	131	0	465
04:15 PM	0	0	0	0	174	7	8	0	97	52	154	0	492
04:30 PM	0	0	0	0	164	12	4	0	108	53	105	0	446
04:45 PM	0	0	0	0	145	14	3	0	89	68	129	0	448
Total	0	0	0	0	662	41	16	0	383	230	519	0	1851
05:00 PM	0	0	0	0	156	13	3	0	110	52	147	0	481
05:15 PM	0	0	0	0	170	18	5	0	99	46	105	0	443
05:30 PM	0	0	0	0	158	8	1	0	102	55	122	0	446
05:45 PM	0	0	0	0	152	11	1	0	84	58	103	0	409
Total	0	0	0	0	636	50	10	0	395	211	477	0	1779
Grand Total	0	0	0	0	1298	91	26	0	778	441	996	0	3630
Apprch %	0	0	0	0	93.4	6.6	3.2	0	96.8	30.7	69.3	0	
Total %	0	0	0	0	35.8	2.5	0.7	0	21.4	12.1	27.4	0	

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**174**	7	**181**	**8**	0	97	105	52	**154**	0	**206**	**492**
04:30 PM	0	0	0	0	0	164	12	176	4	0	108	112	53	105	0	158	446
04:45 PM	0	0	0	0	0	145	**14**	159	3	0	89	92	**68**	129	0	197	448
05:00 PM	0	0	0	0	0	156	13	169	3	0	**110**	**113**	52	147	0	199	481
Total Volume	0	0	0	0	0	639	46	685	18	0	404	422	225	535	0	760	1867
% App. Total	0	0	0		0	93.3	6.7		4.3	0	95.7		29.6	70.4	0		
PHF	.000	.000	.000	.000	.000	.918	.821	.946	.563	.000	.918	.934	.827	.869	.000	.922	.949

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File Name : 81676 H-EEE
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Apartment Driveway From North			Washington Street From East			Court Street (Route 140) From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	6	0	3	0	12
04:15 PM	0	0	0	0	3	0	0	0	5	1	2	0	11
04:30 PM	0	0	0	0	3	3	0	0	1	0	1	0	8
04:45 PM	0	0	0	0	3	1	0	0	3	2	2	0	11
Total	0	0	0	0	12	4	0	0	15	3	8	0	42
05:00 PM	0	0	0	0	0	0	0	0	2	1	2	0	5
05:15 PM	0	0	0	0	1	0	0	0	4	2	1	0	8
05:30 PM	0	0	0	0	4	0	0	0	2	2	2	0	10
05:45 PM	0	0	0	0	3	0	0	0	2	2	2	0	9
Total	0	0	0	0	8	0	0	0	10	7	7	0	32
Grand Total	0	0	0	0	20	4	0	0	25	10	15	0	74
Apprch %	0	0	0	0	83.3	16.7	0	0	100	40	60	0	
Total %	0	0	0	0	27	5.4	0	0	33.8	13.5	20.3	0	

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	**3**	0	3	0	0	**6**	**6**	0	**3**	0	3	**12**
04:15 PM	0	0	0	0	0	3	0	3	0	0	5	5	1	2	0	3	11
04:30 PM	0	0	0	0	0	3	**3**	**6**	0	0	1	1	0	1	0	1	8
04:45 PM	0	0	0	0	0	3	1	4	0	0	3	3	**2**	2	0	**4**	11
Total Volume	0	0	0	0	0	12	4	16	0	0	15	15	3	8	0	11	42
% App. Total	0	0	0		0	75	25		0	0	100		27.3	72.7	0		
PHF	.000	.000	.000	.000	.000	1.000	.333	.667	.000	.000	.625	.625	.375	.667	.000	.688	.875

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File Name : 81676 H-EEE
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2	6
04:15 PM	0	0	0	6	0	1	0	0	0	0	0	1	0	2	0	1	11
04:30 PM	0	0	0	9	0	2	0	0	0	0	0	0	0	0	0	0	11
04:45 PM	0	0	0	9	0	1	0	0	0	0	0	2	1	1	0	2	16
Total	0	0	0	28	0	4	0	0	0	0	0	3	1	3	0	5	44
05:00 PM	0	0	0	6	0	0	0	0	0	0	0	2	0	0	0	4	12
05:15 PM	0	0	0	13	0	1	0	0	0	0	0	0	0	0	0	2	16
05:30 PM	0	0	0	9	0	0	0	0	0	0	0	0	0	1	0	1	11
05:45 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	1	5
Total	0	0	0	31	0	1	0	0	0	0	0	2	0	2	0	8	44
Grand Total	0	0	0	59	0	5	0	0	0	0	0	5	1	5	0	13	88
Apprch %	0	0	0	100	0	100	0	0	0	0	0	100	5.3	26.3	0	68.4	
Total %	0	0	0	67	0	5.7	0	0	0	0	0	5.7	1.1	5.7	0	14.8	

	Apartment Driveway From North					Washington Street From East					Court Street (Route 140) From South					Washington Street (Route 140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	9	9	0	**2**	**0**	**0**	**2**	0	0	0	0	0	0	0	0	0	0	11
04:45 PM	0	0	0	9	9	0	1	0	0	1	0	0	0	**2**	**2**	**1**	**1**	0	2	**4**	**16**
05:00 PM	0	0	0	6	6	0	0	0	0	0	0	0	0	2	2	0	0	0	**4**	**4**	**12**
05:15 PM	**0**	**0**	**0**	**13**	**13**	0	1	0	0	1	0	0	0	0	0	0	0	0	2	2	16
Total Volume	0	0	0	37	37	0	4	0	0	4	0	0	0	4	4	1	1	0	8	10	55
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		10	10	0	80		
PHF	.000	.000	.000	.712	.712	.000	.500	.000	.000	.500	.000	.000	.000	.500	.500	.250	.250	.000	.500	.625	.859

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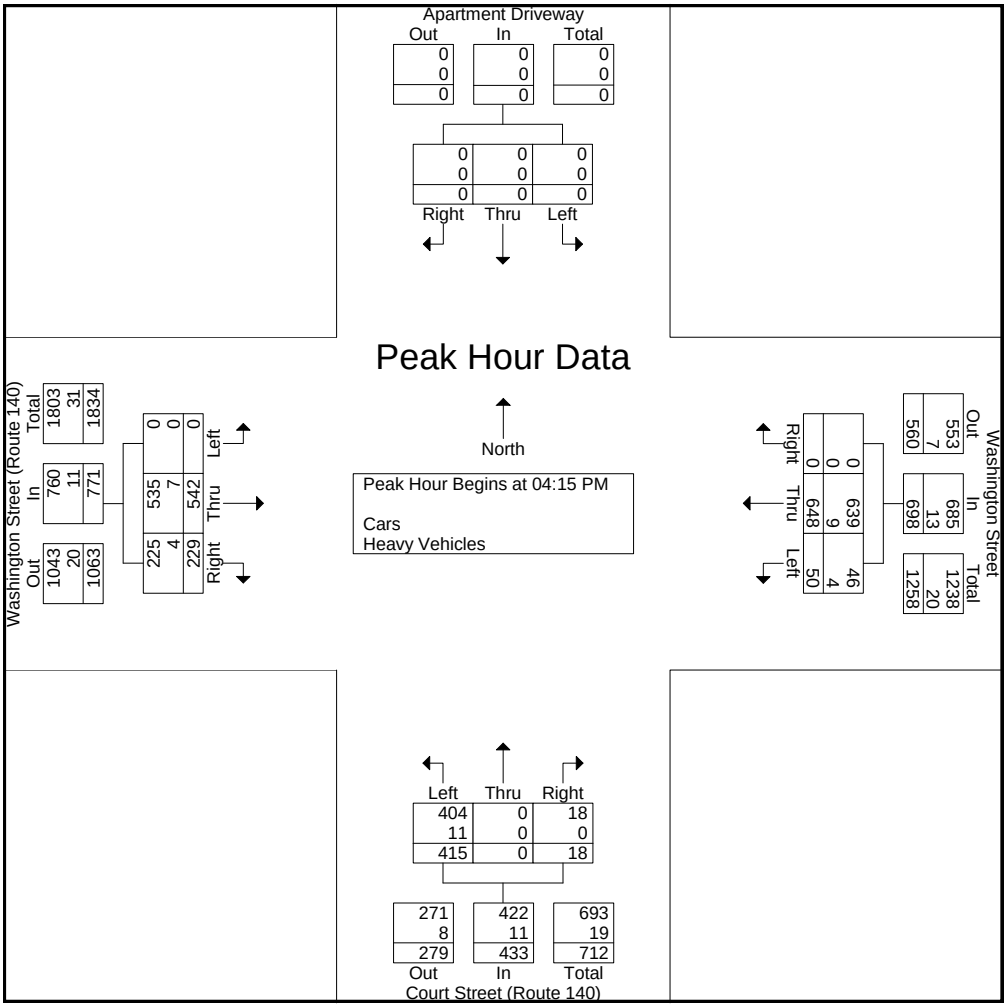
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Apartment Driveway From North				Washington Street From East				Court Street (Route 140) From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**177**	7	**184**	**8**	0	102	110	53	**156**	0	**209**	**503**
04:30 PM	0	0	0	0	0	167	**15**	182	4	0	109	113	53	106	0	159	454
04:45 PM	0	0	0	0	0	148	15	163	3	0	92	95	**70**	131	0	201	459
05:00 PM	0	0	0	0	0	156	13	169	3	0	**112**	**115**	53	149	0	202	486
Total Volume	0	0	0	0	0	648	50	698	18	0	415	433	229	542	0	771	1902
% App. Total	0	0	0		0	92.8	7.2		4.2	0	95.8		29.7	70.3	0		
PHF	.000	.000	.000	.000	.000	.915	.833	.948	.563	.000	.926	.941	.818	.869	.000	.922	.945
Cars	0	0	0	0	0	639	46	685	18	0	404	422	225	535	0	760	1867
% Cars	0	0	0	0	0	98.6	92.0	98.1	100	0	97.3	97.5	98.3	98.7	0	98.6	98.2
Heavy Vehicles	0	0	0	0	0	9	4	13	0	0	11	11	4	7	0	11	35
% Heavy Vehicles	0	0	0	0	0	1.4	8.0	1.9	0	0	2.7	2.5	1.7	1.3	0	1.4	1.8



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N/S: Tremont Street (Route 140)/Plaza Dr
E/W: Washington St (Rte 140)/Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-F
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	7	35	108	64	37	4	13	26	6	8	90	14	412
07:15 AM	12	33	117	76	36	10	13	28	6	18	97	24	470
07:30 AM	10	44	104	100	56	6	13	31	12	12	101	16	505
07:45 AM	11	31	107	96	63	8	17	30	7	11	93	17	491
Total	40	143	436	336	192	28	56	115	31	49	381	71	1878
08:00 AM	17	40	102	80	77	5	8	31	12	13	72	22	479
08:15 AM	18	37	101	69	48	9	18	20	4	23	87	14	448
08:30 AM	13	34	108	43	47	17	12	33	5	21	77	18	428
08:45 AM	5	45	87	95	45	11	9	27	5	22	83	15	449
Total	53	156	398	287	217	42	47	111	26	79	319	69	1804
Grand Total	93	299	834	623	409	70	103	226	57	128	700	140	3682
Apprch %	7.6	24.4	68	56.5	37.1	6.4	26.7	58.5	14.8	13.2	72.3	14.5	
Total %	2.5	8.1	22.7	16.9	11.1	1.9	2.8	6.1	1.5	3.5	19	3.8	
Cars	83	289	794	571	379	68	96	223	52	125	672	128	3480
% Cars	89.2	96.7	95.2	91.7	92.7	97.1	93.2	98.7	91.2	97.7	96	91.4	94.5
Heavy Vehicles	10	10	40	52	30	2	7	3	5	3	28	12	202
% Heavy Vehicles	10.8	3.3	4.8	8.3	7.3	2.9	6.8	1.3	8.8	2.3	4	8.6	5.5

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	12	33	**117**	**162**	76	36	**10**	122	13	28	6	47	**18**	97	**24**	**139**	470
07:30 AM	10	**44**	104	158	**100**	56	6	162	13	**31**	**12**	**56**	12	**101**	16	129	**505**
07:45 AM	11	31	107	149	96	63	8	**167**	**17**	30	7	54	11	93	17	121	491
08:00 AM	**17**	40	102	159	80	**77**	5	162	8	31	12	51	13	72	22	107	479
Total Volume	50	148	430	628	352	232	29	613	51	120	37	208	54	363	79	496	1945
% App. Total	8	23.6	68.5		57.4	37.8	4.7		24.5	57.7	17.8		10.9	73.2	15.9		
PHF	.735	.841	.919	.969	.880	.753	.725	.918	.750	.968	.771	.929	.750	.899	.823	.892	.963
Cars	45	142	412	599	325	217	28	570	46	119	34	199	51	348	73	472	1840
% Cars	90.0	95.9	95.8	95.4	92.3	93.5	96.6	93.0	90.2	99.2	91.9	95.7	94.4	95.9	92.4	95.2	94.6
Heavy Vehicles	5	6	18	29	27	15	1	43	5	1	3	9	3	15	6	24	105
% Heavy Vehicles	10.0	4.1	4.2	4.6	7.7	6.5	3.4	7.0	9.8	0.8	8.1	4.3	5.6	4.1	7.6	4.8	5.4

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Client: VHB/J. Quitter

File Name : 81676 H-F
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	34	104	63	34	4	12	24	5	8	85	14	391
07:15 AM	11	32	110	70	32	10	12	28	5	17	92	21	440
07:30 AM	10	43	97	93	54	5	11	31	12	11	98	15	480
07:45 AM	11	27	105	88	60	8	17	30	5	10	91	16	468
Total	36	136	416	314	180	27	52	113	27	46	366	66	1779
08:00 AM	13	40	100	74	71	5	6	30	12	13	67	21	452
08:15 AM	16	37	95	63	45	9	17	20	3	23	84	12	424
08:30 AM	13	31	105	37	43	17	12	33	5	21	75	15	407
08:45 AM	5	45	78	83	40	10	9	27	5	22	80	14	418
Total	47	153	378	257	199	41	44	110	25	79	306	62	1701
Grand Total	83	289	794	571	379	68	96	223	52	125	672	128	3480
Apprch %	7.1	24.8	68.1	56.1	37.2	6.7	25.9	60.1	14	13.5	72.6	13.8	
Total %	2.4	8.3	22.8	16.4	10.9	2	2.8	6.4	1.5	3.6	19.3	3.7	

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	11	32	**110**	**153**	70	32	**10**	112	12	28	5	45	**17**	92	**21**	**130**	440
07:30 AM	10	**43**	97	150	**93**	54	5	152	11	**31**	**12**	**54**	11	**98**	15	124	**480**
07:45 AM	11	27	105	143	88	60	8	**156**	**17**	30	5	52	10	91	16	117	468
08:00 AM	**13**	40	100	153	74	**71**	5	150	6	30	12	48	13	67	21	101	452
Total Volume	45	142	412	599	325	217	28	570	46	119	34	199	51	348	73	472	1840
% App. Total	7.5	23.7	68.8		57	38.1	4.9		23.1	59.8	17.1		10.8	73.7	15.5		
PHF	.865	.826	.936	.979	.874	.764	.700	.913	.676	.960	.708	.921	.750	.888	.869	.908	.958

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E/W: Washington St (Rte 140)/Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-F
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	1	4	1	3	0	1	2	1	0	5	0	21
07:15 AM	1	1	7	6	4	0	1	0	1	1	5	3	30
07:30 AM	0	1	7	7	2	1	2	0	0	1	3	1	25
07:45 AM	0	4	2	8	3	0	0	0	2	1	2	1	23
Total	4	7	20	22	12	1	4	2	4	3	15	5	99
08:00 AM	4	0	2	6	6	0	2	1	0	0	5	1	27
08:15 AM	2	0	6	6	3	0	1	0	1	0	3	2	24
08:30 AM	0	3	3	6	4	0	0	0	0	0	2	3	21
08:45 AM	0	0	9	12	5	1	0	0	0	0	3	1	31
Total	6	3	20	30	18	1	3	1	1	0	13	7	103
Grand Total	10	10	40	52	30	2	7	3	5	3	28	12	202
Apprch %	16.7	16.7	66.7	61.9	35.7	2.4	46.7	20	33.3	7	65.1	27.9	
Total %	5	5	19.8	25.7	14.9	1	3.5	1.5	2.5	1.5	13.9	5.9	

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	1	**7**	**9**	6	4	0	10	1	0	1	2	**1**	**5**	**3**	**9**	**30**
07:30 AM	0	1	7	8	7	2	**1**	10	**2**	0	0	2	1	3	1	5	25
07:45 AM	0	**4**	2	6	**8**	3	0	11	0	0	**2**	2	1	2	1	4	23
08:00 AM	**4**	0	2	6	6	**6**	0	**12**	2	**1**	0	**3**	0	5	1	6	27
Total Volume	5	6	18	29	27	15	1	43	5	1	3	9	3	15	6	24	105
% App. Total	17.2	20.7	62.1		62.8	34.9	2.3		55.6	11.1	33.3		12.5	62.5	25		
PHF	.313	.375	.643	.806	.844	.625	.250	.896	.625	.250	.375	.750	.750	.750	.500	.667	.875

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Client: VHB/J. Quitter

File Name : 81676 H-F
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	4
07:15 AM	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3
07:45 AM	0	0	0	5	0	0	0	0	0	0	0	1	0	1	0	1	8
Total	0	0	0	8	0	0	0	2	0	0	1	5	0	1	0	2	19
08:00 AM	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4
08:30 AM	0	0	0	1	0	0	0	2	0	0	0	4	0	0	0	0	7
08:45 AM	0	0	0	4	0	0	0	0	1	0	0	1	0	0	0	3	9
Total	0	0	1	6	0	0	0	2	1	0	0	7	0	0	0	6	23
Grand Total	0	0	1	14	0	0	0	4	1	0	1	12	0	1	0	8	42
Apprch %	0	0	6.7	93.3	0	0	0	100	7.1	0	7.1	85.7	0	11.1	0	88.9	
Total %	0	0	2.4	33.3	0	0	0	9.5	2.4	0	2.4	28.6	0	2.4	0	19	

	Tremont Street (Route 140) From North					Washington Street (Route 140) From East					Plaza Driveway From South					Oak Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**
08:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**3**	4
08:30 AM	0	0	0	1	1	0	0	0	**2**	**2**	0	0	0	**4**	**4**	0	0	0	0	0	7
08:45 AM	0	0	0	**4**	**4**	0	0	0	0	0	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**3**	**3**	**9**
Total Volume	0	0	1	6	7	0	0	0	2	2	1	0	0	7	8	0	0	0	6	6	23
% App. Total	0	0	14.3	85.7		0	0	0	100		12.5	0	0	87.5		0	0	0	100		
PHF	.000	.000	.250	.375	.438	.000	.000	.000	.250	.250	.250	.000	.000	.438	.500	.000	.000	.000	.500	.500	.639

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Client: VHB/J. Quitter

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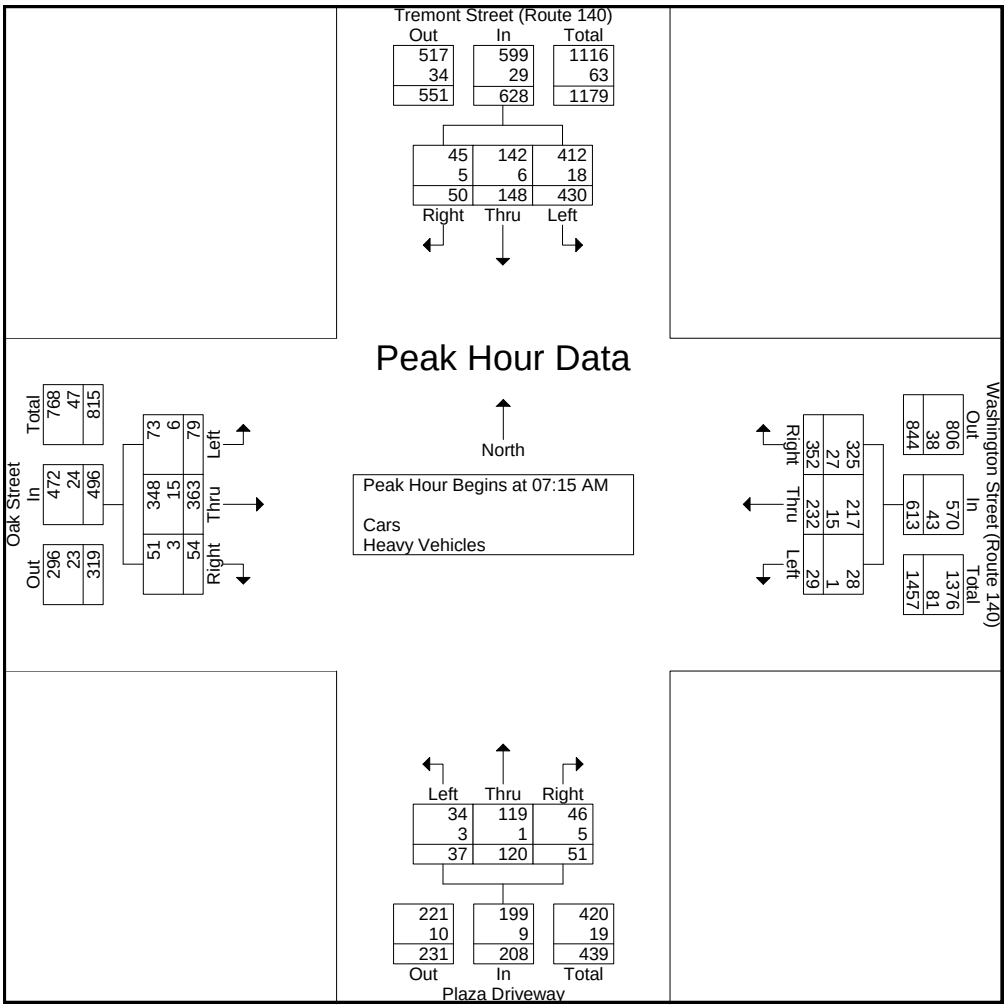
Start Date : 10/1/2008
Page No : 1

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	12	33	**117**	**162**	76	36	**10**	122	13	28	6	47	**18**	97	**24**	**139**	470
07:30 AM	10	**44**	104	158	**100**	56	6	162	13	**31**	**12**	**56**	12	**101**	16	129	**505**
07:45 AM	11	31	107	149	96	63	8	**167**	**17**	30	7	54	11	93	17	121	491
08:00 AM	**17**	40	102	159	80	**77**	5	162	8	31	12	51	13	72	22	107	479
Total Volume	50	148	430	628	352	232	29	613	51	120	37	208	54	363	79	496	1945
% App. Total	8	23.6	68.5		57.4	37.8	4.7		24.5	57.7	17.8		10.9	73.2	15.9		
PHF	.735	.841	.919	.969	.880	.753	.725	.918	.750	.968	.771	.929	.750	.899	.823	.892	.963
Cars	45	142	412	599	325	217	28	570	46	119	34	199	51	348	73	472	1840
% Cars	90.0	95.9	95.8	95.4	92.3	93.5	96.6	93.0	90.2	99.2	91.9	95.7	94.4	95.9	92.4	95.2	94.6
Heavy Vehicles	5	6	18	29	27	15	1	43	5	1	3	9	3	15	6	24	105
% Heavy Vehicles	10.0	4.1	4.2	4.6	7.7	6.5	3.4	7.0	9.8	0.8	8.1	4.3	5.6	4.1	7.6	4.8	5.4



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Client: VHB/J. Quitter

File Name : 81676 H-FFF
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	20	36	116	125	77	9	16	32	3	12	67	22	535
04:15 PM	29	44	118	143	93	7	10	39	8	14	81	21	607
04:30 PM	22	50	108	115	101	11	8	35	2	9	67	24	552
04:45 PM	24	34	124	116	63	6	7	21	9	21	76	24	525
Total	95	164	466	499	334	33	41	127	22	56	291	91	2219
05:00 PM	21	35	129	115	81	9	11	28	7	12	76	30	554
05:15 PM	29	51	107	107	87	8	7	43	7	7	58	12	523
05:30 PM	26	50	125	101	81	8	8	37	4	9	70	27	546
05:45 PM	20	40	86	97	79	7	8	31	6	10	64	20	468
Total	96	176	447	420	328	32	34	139	24	38	268	89	2091
Grand Total	191	340	913	919	662	65	75	266	46	94	559	180	4310
Apprch %	13.2	23.5	63.2	55.8	40.2	3.9	19.4	68.7	11.9	11.3	67.1	21.6	
Total %	4.4	7.9	21.2	21.3	15.4	1.5	1.7	6.2	1.1	2.2	13	4.2	
Cars	185	335	900	897	636	64	74	264	46	94	534	176	4205
% Cars	96.9	98.5	98.6	97.6	96.1	98.5	98.7	99.2	100	100	95.5	97.8	97.6
Heavy Vehicles	6	5	13	22	26	1	1	2	0	0	25	4	105
% Heavy Vehicles	3.1	1.5	1.4	2.4	3.9	1.5	1.3	0.8	0	0	4.5	2.2	2.4

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**29**	44	118	**191**	**143**	93	7	**243**	10	**39**	8	**57**	14	**81**	21	116	**607**
04:30 PM	22	**50**	108	180	115	**101**	**11**	227	8	35	2	45	9	67	24	100	552
04:45 PM	24	34	124	182	116	63	6	185	7	21	**9**	37	**21**	76	24	**121**	525
05:00 PM	21	35	**129**	185	115	81	9	205	**11**	28	7	46	12	76	**30**	118	554
Total Volume	96	163	479	738	489	338	33	860	36	123	26	185	56	300	99	455	2238
% App. Total	13	22.1	64.9		56.9	39.3	3.8		19.5	66.5	14.1		12.3	65.9	21.8		
PHF	.828	.815	.928	.966	.855	.837	.750	.885	.818	.788	.722	.811	.667	.926	.825	.940	.922
Cars	94	160	473	727	480	326	33	839	35	121	26	182	56	283	96	435	2183
% Cars	97.9	98.2	98.7	98.5	98.2	96.4	100	97.6	97.2	98.4	100	98.4	100	94.3	97.0	95.6	97.5
Heavy Vehicles	2	3	6	11	9	12	0	21	1	2	0	3	0	17	3	20	55
% Heavy Vehicles	2.1	1.8	1.3	1.5	1.8	3.6	0	2.4	2.8	1.6	0	1.6	0	5.7	3.0	4.4	2.5

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Page No : 1

Groups Printed- Cars

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	17	36	115	119	71	9	16	32	3	12	65	21	516
04:15 PM	28	44	115	140	91	7	10	39	8	14	76	21	593
04:30 PM	22	48	108	114	98	11	7	34	2	9	64	22	539
04:45 PM	23	34	122	113	58	6	7	20	9	21	73	23	509
Total	90	162	460	486	318	33	40	125	22	56	278	87	2157
05:00 PM	21	34	128	113	79	9	11	28	7	12	70	30	542
05:15 PM	29	51	104	105	86	7	7	43	7	7	55	12	513
05:30 PM	25	50	124	98	77	8	8	37	4	9	69	27	536
05:45 PM	20	38	84	95	76	7	8	31	6	10	62	20	457
Total	95	173	440	411	318	31	34	139	24	38	256	89	2048
Grand Total	185	335	900	897	636	64	74	264	46	94	534	176	4205
Apprch %	13	23.6	63.4	56.2	39.8	4	19.3	68.8	12	11.7	66.4	21.9	
Total %	4.4	8	21.4	21.3	15.1	1.5	1.8	6.3	1.1	2.2	12.7	4.2	

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**28**	44	115	**187**	**140**	91	7	**238**	10	**39**	8	**57**	14	**76**	21	111	**593**
04:30 PM	22	**48**	108	178	114	**98**	**11**	223	7	34	2	43	9	64	22	95	539
04:45 PM	23	34	122	179	113	58	6	177	7	20	**9**	36	**21**	73	23	**117**	509
05:00 PM	21	34	**128**	183	113	79	9	201	**11**	28	7	46	12	70	**30**	112	542
Total Volume	94	160	473	727	480	326	33	839	35	121	26	182	56	283	96	435	2183
% App. Total	12.9	22	65.1		57.2	38.9	3.9		19.2	66.5	14.3		12.9	65.1	22.1		
PHF	.839	.833	.924	.972	.857	.832	.750	.881	.795	.776	.722	.798	.667	.931	.800	.929	.920

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Page No : 1

Groups Printed- Heavy Vehicles

	Tremont Street (Route 140) From North			Washington Street (Route 140) From East			Plaza Driveway From South			Oak Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	0	1	6	6	0	0	0	0	0	2	1	19
04:15 PM	1	0	3	3	2	0	0	0	0	0	5	0	14
04:30 PM	0	2	0	1	3	0	1	1	0	0	3	2	13
04:45 PM	1	0	2	3	5	0	0	1	0	0	3	1	16
Total	5	2	6	13	16	0	1	2	0	0	13	4	62
05:00 PM	0	1	1	2	2	0	0	0	0	0	6	0	12
05:15 PM	0	0	3	2	1	1	0	0	0	0	3	0	10
05:30 PM	1	0	1	3	4	0	0	0	0	0	1	0	10
05:45 PM	0	2	2	2	3	0	0	0	0	0	2	0	11
Total	1	3	7	9	10	1	0	0	0	0	12	0	43
Grand Total	6	5	13	22	26	1	1	2	0	0	25	4	105
Apprch %	25	20.8	54.2	44.9	53.1	2	33.3	66.7	0	0	86.2	13.8	
Total %	5.7	4.8	12.4	21	24.8	1	1	1.9	0	0	23.8	3.8	

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**3**	0	1	**4**	**6**	**6**	0	**12**	0	0	0	0	0	2	1	3	**19**
04:15 PM	1	0	**3**	4	3	2	0	5	0	0	0	0	0	**5**	0	**5**	14
04:30 PM	0	**2**	0	2	1	3	0	4	**1**	**1**	0	**2**	0	3	**2**	5	13
04:45 PM	1	0	2	3	3	5	0	8	0	1	0	1	0	3	1	4	16
Total Volume	5	2	6	13	13	16	0	29	1	2	0	3	0	13	4	17	62
% App. Total	38.5	15.4	46.2		44.8	55.2	0		33.3	66.7	0		0	76.5	23.5		
PHF	.417	.250	.500	.813	.542	.667	.000	.604	.250	.500	.000	.375	.000	.650	.500	.850	.816

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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Tremont Street (Route 140)/Plaza Dr
E/W: Washington St (Rte 140)/Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-FFF
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	1	0	0	0	15	0	0	1	5	1	0	0	5	29
04:15 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	2	0	0	5
04:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	3
04:45 PM	0	0	0	5	0	0	0	6	0	0	0	6	0	2	0	1	20
Total	0	1	0	7	0	0	0	25	0	0	1	11	1	4	0	7	57
05:00 PM	0	0	0	2	0	0	1	5	0	1	0	4	0	0	0	2	15
05:15 PM	0	1	0	3	1	1	0	0	0	1	0	0	0	1	0	1	9
05:30 PM	0	0	0	5	0	0	0	0	0	0	0	1	1	0	0	0	7
05:45 PM	0	0	0	2	0	0	0	3	0	0	1	1	0	1	0	0	8
Total	0	1	0	12	1	1	1	8	0	2	1	6	1	2	0	3	39
Grand Total	0	2	0	19	1	1	1	33	0	2	2	17	2	6	0	10	96
Apprch %	0	9.5	0	90.5	2.8	2.8	2.8	91.7	0	9.5	9.5	81	11.1	33.3	0	55.6	
Total %	0	2.1	0	19.8	1	1	1	34.4	0	2.1	2.1	17.7	2.1	6.2	0	10.4	

	Tremont Street (Route 140) From North					Washington Street (Route 140) From East					Plaza Driveway From South					Oak Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**1**	0	1	2	0	0	0	**15**	**15**	0	0	**1**	5	**6**	**1**	**0**	**0**	**5**	**6**	**29**
04:15 PM	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	0	**2**	0	0	2	5
04:30 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	3
04:45 PM	0	0	0	**5**	**5**	0	0	0	6	6	0	0	0	**6**	**6**	**0**	**2**	**0**	**1**	**3**	**20**
Total Volume	0	1	0	7	8	0	0	0	25	25	0	0	1	11	12	1	4	0	7	12	57
% App. Total	0	12.5	0	87.5		0	0	0	100		0	0	8.3	91.7		8.3	33.3	0	58.3		
PHF	.000	.250	.000	.350	.400	.000	.000	.000	.417	.417	.000	.000	.250	.458	.500	.250	.500	.000	.350	.500	.491

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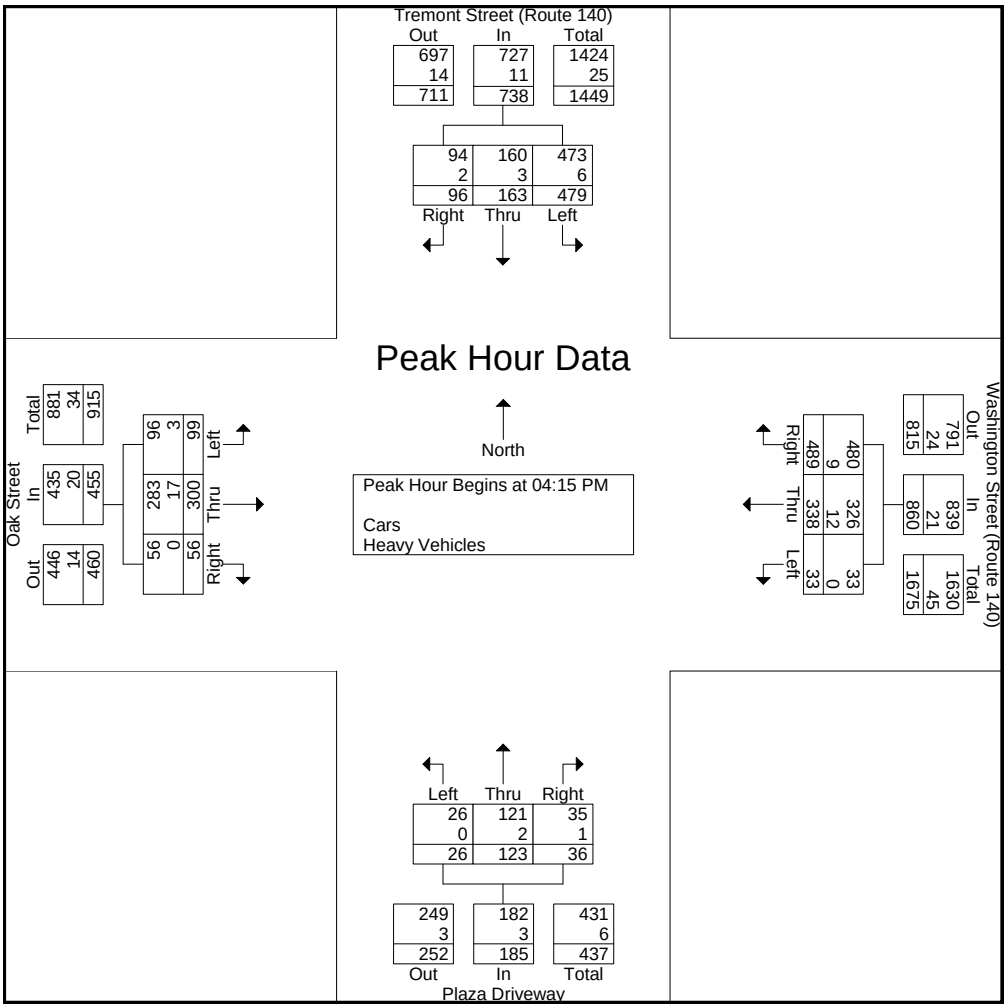
Page No : 1

	Tremont Street (Route 140) From North				Washington Street (Route 140) From East				Plaza Driveway From South				Oak Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**29**	44	118	**191**	**143**	93	7	**243**	10	**39**	8	**57**	14	**81**	21	116	**607**
04:30 PM	22	**50**	108	180	115	**101**	**11**	227	8	35	2	45	9	67	24	100	552
04:45 PM	24	34	124	182	116	63	6	185	7	21	**9**	37	**21**	76	24	**121**	525
05:00 PM	21	35	**129**	185	115	81	9	205	**11**	28	7	46	12	76	**30**	118	554
Total Volume	96	163	479	738	489	338	33	860	36	123	26	185	56	300	99	455	2238
% App. Total	13	22.1	64.9		56.9	39.3	3.8		19.5	66.5	14.1		12.3	65.9	21.8		
PHF	.828	.815	.928	.966	.855	.837	.750	.885	.818	.788	.722	.811	.667	.926	.825	.940	.922
Cars	94	160	473	727	480	326	33	839	35	121	26	182	56	283	96	435	2183
% Cars	97.9	98.2	98.7	98.5	98.2	96.4	100	97.6	97.2	98.4	100	98.4	100	94.3	97.0	95.6	97.5
Heavy Vehicles	2	3	6	11	9	12	0	21	1	2	0	3	0	17	3	20	55
% Heavy Vehicles	2.1	1.8	1.3	1.5	1.8	3.6	0	2.4	2.8	1.6	0	1.6	0	5.7	3.0	4.4	2.5



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E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-G
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
07:00 AM	2	14	1	0	0	1	1	16	32	64	1	3	135
07:15 AM	5	17	0	0	0	0	1	14	35	105	0	4	181
07:30 AM	0	24	4	0	0	0	4	16	43	77	0	4	172
07:45 AM	4	20	2	1	0	2	8	21	34	86	1	4	183
Total	11	75	7	1	0	3	14	67	144	332	2	15	671
08:00 AM	1	31	0	0	0	3	6	23	53	64	2	1	184
08:15 AM	3	23	1	1	0	2	0	15	38	60	1	2	146
08:30 AM	3	17	0	0	0	4	1	12	44	69	0	1	151
08:45 AM	2	21	0	0	0	1	0	6	38	85	0	2	155
Total	9	92	1	1	0	10	7	56	173	278	3	6	636
Grand Total	20	167	8	2	0	13	21	123	317	610	5	21	1307
Apprch %	10.3	85.6	4.1	13.3	0	86.7	4.6	26.7	68.8	95.9	0.8	3.3	
Total %	1.5	12.8	0.6	0.2	0	1	1.6	9.4	24.3	46.7	0.4	1.6	
Cars	18	162	6	0	0	12	21	106	299	598	5	20	1247
% Cars	90	97	75	0	0	92.3	100	86.2	94.3	98	100	95.2	95.4
Heavy Vehicles	2	5	2	2	0	1	0	17	18	12	0	1	60
% Heavy Vehicles	10	3	25	100	0	7.7	0	13.8	5.7	2	0	4.8	4.6

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**5**	17	0	22	0	0	0	0	1	14	35	50	**105**	0	**4**	**109**	181
07:30 AM	0	24	**4**	28	0	0	0	0	4	16	43	63	77	0	4	81	172
07:45 AM	4	20	2	26	**1**	0	2	**3**	**8**	21	34	63	86	1	4	91	183
08:00 AM	1	**31**	0	**32**	0	0	**3**	3	6	**23**	**53**	**82**	64	**2**	1	67	**184**
Total Volume	10	92	6	108	1	0	5	6	19	74	165	258	332	3	13	348	720
% App. Total	9.3	85.2	5.6		16.7	0	83.3		7.4	28.7	64		95.4	0.9	3.7		
PHF	.500	.742	.375	.844	.250	.000	.417	.500	.594	.804	.778	.787	.790	.375	.813	.798	.978
Cars	8	89	5	102	0	0	5	5	19	64	155	238	328	3	12	343	688
% Cars	80.0	96.7	83.3	94.4	0	0	100	83.3	100	86.5	93.9	92.2	98.8	100	92.3	98.6	95.6
Heavy Vehicles	2	3	1	6	1	0	0	1	0	10	10	20	4	0	1	5	32
% Heavy Vehicles	20.0	3.3	16.7	5.6	100	0	0	16.7	0	13.5	6.1	7.8	1.2	0	7.7	1.4	4.4

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Client: VHB/J. Quitter

File Name : 81676 H-G
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
07:00 AM	2	14	1	0	0	1	1	13	30	63	1	3	129
07:15 AM	4	16	0	0	0	0	1	13	33	104	0	4	175
07:30 AM	0	24	3	0	0	0	4	15	42	76	0	3	167
07:45 AM	4	19	2	0	0	2	8	18	32	86	1	4	176
Total	10	73	6	0	0	3	14	59	137	329	2	14	647
08:00 AM	0	30	0	0	0	3	6	18	48	62	2	1	170
08:15 AM	3	22	0	0	0	2	0	13	35	59	1	2	137
08:30 AM	3	16	0	0	0	4	1	11	43	65	0	1	144
08:45 AM	2	21	0	0	0	0	0	5	36	83	0	2	149
Total	8	89	0	0	0	9	7	47	162	269	3	6	600
Grand Total	18	162	6	0	0	12	21	106	299	598	5	20	1247
Apprch %	9.7	87.1	3.2	0	0	100	4.9	24.9	70.2	96	0.8	3.2	
Total %	1.4	13	0.5	0	0	1	1.7	8.5	24	48	0.4	1.6	

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**4**	16	0	20	0	0	0	0	1	13	33	47	**104**	0	**4**	**108**	175
07:30 AM	0	24	**3**	27	0	0	0	0	4	15	42	61	76	0	3	79	167
07:45 AM	4	19	2	25	0	0	2	2	**8**	**18**	32	58	86	1	4	91	**176**
08:00 AM	0	**30**	0	**30**	0	0	**3**	**3**	6	18	**48**	**72**	62	**2**	1	65	170
Total Volume	8	89	5	102	0	0	5	5	19	64	155	238	328	3	12	343	688
% App. Total	7.8	87.3	4.9		0	0	100		8	26.9	65.1		95.6	0.9	3.5		
PHF	.500	.742	.417	.850	.000	.000	.417	.417	.594	.889	.807	.826	.788	.375	.750	.794	.977

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Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0	3	2	1	0	0	6
07:15 AM	1	1	0	0	0	0	0	1	2	1	0	0	6
07:30 AM	0	0	1	0	0	0	0	1	1	1	0	1	5
07:45 AM	0	1	0	1	0	0	0	3	2	0	0	0	7
Total	1	2	1	1	0	0	0	8	7	3	0	1	24
08:00 AM	1	1	0	0	0	0	0	5	5	2	0	0	14
08:15 AM	0	1	1	1	0	0	0	2	3	1	0	0	9
08:30 AM	0	1	0	0	0	0	0	1	1	4	0	0	7
08:45 AM	0	0	0	0	0	1	0	1	2	2	0	0	6
Total	1	3	1	1	0	1	0	9	11	9	0	0	36
Grand Total	2	5	2	2	0	1	0	17	18	12	0	1	60
Apprch %	22.2	55.6	22.2	66.7	0	33.3	0	48.6	51.4	92.3	0	7.7	
Total %	3.3	8.3	3.3	3.3	0	1.7	0	28.3	30	20	0	1.7	

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**1**	0	1	**1**	0	0	**1**	0	3	2	5	0	0	0	0	7
08:00 AM	**1**	1	0	**2**	0	0	0	0	0	**5**	**5**	**10**	2	0	0	2	**14**
08:15 AM	0	1	**1**	2	1	0	0	1	0	2	3	5	1	0	0	1	9
08:30 AM	0	1	0	1	0	0	0	0	0	1	1	2	**4**	0	0	**4**	7
Total Volume	1	4	1	6	2	0	0	2	0	11	11	22	7	0	0	7	37
% App. Total	16.7	66.7	16.7		100	0	0		0	50	50		100	0	0		
PHF	.250	1.000	.250	.750	.500	.000	.000	.500	.000	.550	.550	.550	.438	.000	.000	.438	.661

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Groups Printed- Peds and Bicycles

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	Thru	Bear Left	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	6	0	0	0	0	7
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	2	6	1	0	0	0	9
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3
Grand Total	0	0	0	1	0	0	0	0	0	0	2	8	1	0	0	0	12
Apprch %	0	0	0	100	0	0	0	0	0	0	20	80	100	0	0	0	
Total %	0	0	0	8.3	0	0	0	0	0	0	16.7	66.7	8.3	0	0	0	

	Kilmer Avenue From North					Lowell Street From Northeast					Oak Street From East					Oak Street From West					
Start Time	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	Thru	Bear Left	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**6**	**7**	0	0	0	0	0	**7**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	**1**	**0**	**0**	**0**	**1**	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	2	6	8	1	0	0	0	1	9
% App. Total	0	0	0	0		0	0	0	0		0	0	25	75		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.250	.286	.250	.000	.000	.000	.250	.321

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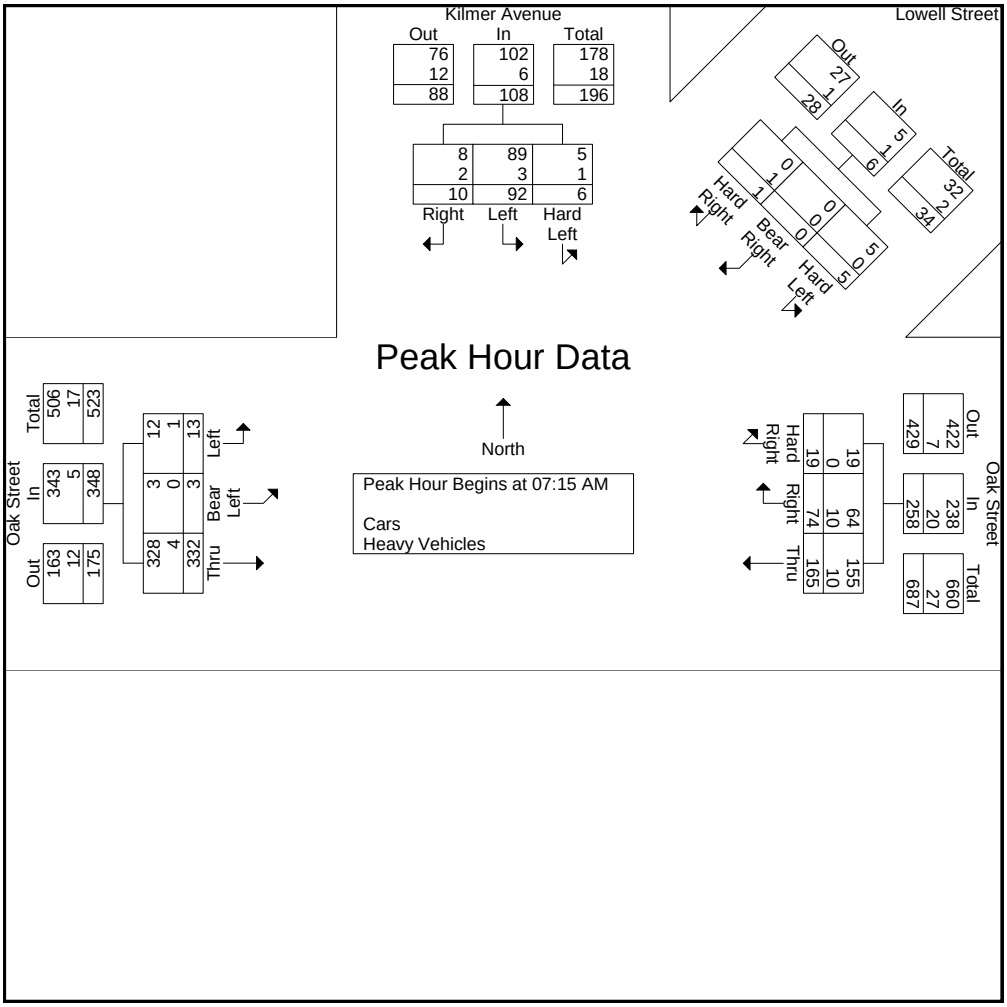
	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**5**	17	0	22	0	0	0	0	1	14	35	50	**105**	0	**4**	**109**	181
07:30 AM	0	24	**4**	28	0	0	0	0	4	16	43	63	77	0	4	81	172
07:45 AM	4	20	2	26	**1**	0	2	**3**	**8**	21	34	63	86	1	4	91	183
08:00 AM	1	**31**	0	**32**	0	0	**3**	3	6	**23**	**53**	**82**	64	**2**	1	67	**184**
Total Volume	10	92	6	108	1	0	5	6	19	74	165	258	332	3	13	348	720
% App. Total	9.3	85.2	5.6		16.7	0	83.3		7.4	28.7	64		95.4	0.9	3.7		
PHF	.500	.742	.375	.844	.250	.000	.417	.500	.594	.804	.778	.787	.790	.375	.813	.798	.978
Cars	8	89	5	102	0	0	5	5	19	64	155	238	328	3	12	343	688
% Cars	80.0	96.7	83.3	94.4	0	0	100	83.3	100	86.5	93.9	92.2	98.8	100	92.3	98.6	95.6
Heavy Vehicles	2	3	1	6	1	0	0	1	0	10	10	20	4	0	1	5	32
% Heavy Vehicles	20.0	3.3	16.7	5.6	100	0	0	16.7	0	13.5	6.1	7.8	1.2	0	7.7	1.4	4.4



PRECISION DATA INDUSTRIES, LLC
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N/NE: Kilmer Avenue/Lowell Street
E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Heavy Vehicles

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
04:00 PM	0	3	0	0	0	0	0	3	3	1	0	0	10
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
04:45 PM	0	1	0	0	0	0	0	2	0	5	0	0	8
Total	0	6	0	0	0	0	0	5	4	6	0	0	21
05:00 PM	0	0	0	0	0	0	0	1	2	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	1	3	0	0	0	5
Grand Total	0	7	0	0	0	0	0	6	7	6	0	0	26
Apprch %	0	100	0	0	0	0	0	46.2	53.8	100	0	0	
Total %	0	26.9	0	0	0	0	0	23.1	26.9	23.1	0	0	

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**3**	0	**3**	0	0	0	0	0	**3**	**3**	**6**	1	0	0	1	**10**
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:45 PM	0	1	0	1	0	0	0	0	0	2	0	2	**5**	0	0	**5**	8
Total Volume	0	6	0	6	0	0	0	0	0	5	4	9	6	0	0	6	21
% App. Total	0	100	0		0	0	0		0	55.6	44.4		100	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.417	.333	.375	.300	.000	.000	.300	.525

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N/NE: Kilmer Avenue/Lowell Street
E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
04:00 PM	1	30	0	0	0	0	1	27	77	44	0	3	183
04:15 PM	4	18	0	0	0	1	0	29	87	45	1	5	190
04:30 PM	5	17	0	0	0	0	0	22	94	38	0	3	179
04:45 PM	3	19	1	0	0	1	0	18	70	68	1	9	190
Total	13	84	1	0	0	2	1	96	328	195	2	20	742
05:00 PM	8	23	0	0	0	0	0	10	90	52	0	2	185
05:15 PM	3	14	0	0	0	0	1	20	88	43	1	1	171
05:30 PM	4	15	0	0	0	0	1	12	81	63	1	2	179
05:45 PM	4	11	0	0	0	0	1	15	57	51	0	3	142
Total	19	63	0	0	0	0	3	57	316	209	2	8	677
Grand Total	32	147	1	0	0	2	4	153	644	404	4	28	1419
Apprch %	17.8	81.7	0.6	0	0	100	0.5	19.1	80.4	92.7	0.9	6.4	
Total %	2.3	10.4	0.1	0	0	0.1	0.3	10.8	45.4	28.5	0.3	2	
Cars	32	140	1	0	0	2	4	147	637	398	4	28	1393
% Cars	100	95.2	100	0	0	100	100	96.1	98.9	98.5	100	100	98.2
Heavy Vehicles	0	7	0	0	0	0	0	6	7	6	0	0	26
% Heavy Vehicles	0	4.8	0	0	0	0	0	3.9	1.1	1.5	0	0	1.8

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	4	18	0	22	0	0	**1**	**1**	0	**29**	87	**116**	45	**1**	5	51	**190**
04:30 PM	5	17	0	22	0	0	0	0	0	22	**94**	116	38	0	3	41	179
04:45 PM	3	19	**1**	23	0	0	1	1	0	18	70	88	**68**	1	**9**	**78**	190
05:00 PM	**8**	**23**	0	**31**	0	0	0	0	0	10	90	100	52	0	2	54	185
Total Volume	20	77	1	98	0	0	2	2	0	79	341	420	203	2	19	224	744
% App. Total	20.4	78.6	1		0	0	100		0	18.8	81.2		90.6	0.9	8.5		
PHF	.625	.837	.250	.790	.000	.000	.500	.500	.000	.681	.907	.905	.746	.500	.528	.718	.979
Cars	20	74	1	95	0	0	2	2	0	76	338	414	198	2	19	219	730
% Cars	100	96.1	100	96.9	0	0	100	100	0	96.2	99.1	98.6	97.5	100	100	97.8	98.1
Heavy Vehicles	0	3	0	3	0	0	0	0	0	3	3	6	5	0	0	5	14
% Heavy Vehicles	0	3.9	0	3.1	0	0	0	0	0	3.8	0.9	1.4	2.5	0	0	2.2	1.9

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N/NE: Kilmer Avenue/Lowell Street
E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Cars

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
04:00 PM	1	27	0	0	0	0	1	24	74	43	0	3	173
04:15 PM	4	17	0	0	0	1	0	29	87	45	1	5	189
04:30 PM	5	16	0	0	0	0	0	22	93	38	0	3	177
04:45 PM	3	18	1	0	0	1	0	16	70	63	1	9	182
Total	13	78	1	0	0	2	1	91	324	189	2	20	721
05:00 PM	8	23	0	0	0	0	0	9	88	52	0	2	182
05:15 PM	3	14	0	0	0	0	1	20	88	43	1	1	171
05:30 PM	4	14	0	0	0	0	1	12	80	63	1	2	177
05:45 PM	4	11	0	0	0	0	1	15	57	51	0	3	142
Total	19	62	0	0	0	0	3	56	313	209	2	8	672
Grand Total	32	140	1	0	0	2	4	147	637	398	4	28	1393
Apprch %	18.5	80.9	0.6	0	0	100	0.5	18.7	80.8	92.6	0.9	6.5	
Total %	2.3	10.1	0.1	0	0	0.1	0.3	10.6	45.7	28.6	0.3	2	

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	4	17	0	21	0	0	**1**	**1**	0	**29**	87	**116**	45	**1**	5	51	**189**
04:30 PM	5	16	0	21	0	0	0	0	0	22	**93**	115	38	0	3	41	177
04:45 PM	3	18	**1**	22	0	0	1	1	0	16	70	86	**63**	1	**9**	**73**	182
05:00 PM	**8**	**23**	0	**31**	0	0	0	0	0	9	88	97	52	0	2	54	182
Total Volume	20	74	1	95	0	0	2	2	0	76	338	414	198	2	19	219	730
% App. Total	21.1	77.9	1.1		0	0	100		0	18.4	81.6		90.4	0.9	8.7		
PHF	.625	.804	.250	.766	.000	.000	.500	.500	.000	.655	.909	.892	.786	.500	.528	.750	.966

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N/NE: Kilmer Avenue/Lowell Street
E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Heavy Vehicles

	Kilmer Avenue From North			Lowell Street From Northeast			Oak Street From East			Oak Street From West			
Start Time	Right	Left	Hard Left	Hard Right	Bear Right	Hard Left	Hard Right	Right	Thru	Thru	Bear Left	Left	Int. Total
04:00 PM	0	3	0	0	0	0	0	3	3	1	0	0	10
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
04:45 PM	0	1	0	0	0	0	0	2	0	5	0	0	8
Total	0	6	0	0	0	0	0	5	4	6	0	0	21
05:00 PM	0	0	0	0	0	0	0	1	2	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	1	3	0	0	0	5
Grand Total	0	7	0	0	0	0	0	6	7	6	0	0	26
Apprch %	0	100	0	0	0	0	0	46.2	53.8	100	0	0	
Total %	0	26.9	0	0	0	0	0	23.1	26.9	23.1	0	0	

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**3**	0	**3**	0	0	0	0	0	**3**	**3**	**6**	1	0	0	1	**10**
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:45 PM	0	1	0	1	0	0	0	0	0	2	0	2	**5**	0	0	**5**	8
Total Volume	0	6	0	6	0	0	0	0	0	5	4	9	6	0	0	6	21
% App. Total	0	100	0		0	0	0		0	55.6	44.4		100	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.417	.333	.375	.300	.000	.000	.300	.525

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E/W: Oak Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008

Groups Printed- Peds and Bicycles

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	Thru	Bear Left	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0	4
Total	0	1	0	1	0	0	0	0	0	0	0	7	1	0	0	0	10
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Total	0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	6
Grand Total	0	5	0	1	0	0	0	0	0	0	0	9	1	0	0	0	16
Apprch %	0	83.3	0	16.7	0	0	0	0	0	0	0	100	100	0	0	0	
Total %	0	31.2	0	6.2	0	0	0	0	0	0	0	56.2	6.2	0	0	0	

	Kilmer Avenue From North					Lowell Street From Northeast					Oak Street From East					Oak Street From West					
Start Time	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	Thru	Bear Left	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**4**	**1**	**0**	**0**	**0**	**1**	**5**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	**1**	0	**1**	**2**	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
Total Volume	0	1	0	1	2	0	0	0	0	0	0	0	0	7	7	1	0	0	0	1	10
% App. Total	0	50	0	50		0	0	0	0		0	0	0	100		100	0	0	0		
PHF	.000	.250	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.438	.438	.250	.000	.000	.000	.250	.500

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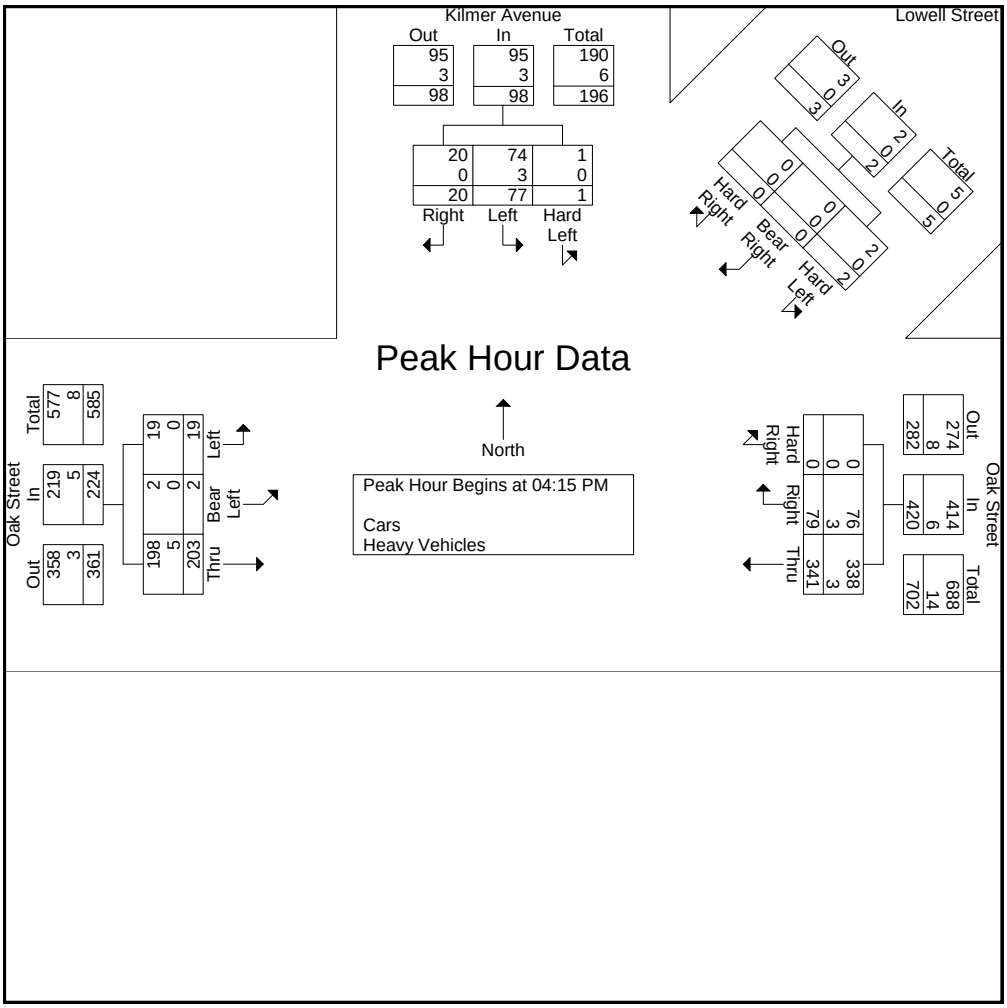
File Name : 81676 H-GGG
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Kilmer Avenue From North				Lowell Street From Northeast				Oak Street From East				Oak Street From West				
Start Time	Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Hard Left	App. Total	Hard Right	Right	Thru	App. Total	Thru	Bear Left	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	4	18	0	22	0	0	**1**	**1**	0	**29**	87	**116**	45	**1**	5	51	**190**
04:30 PM	5	17	0	22	0	0	0	0	0	22	**94**	116	38	0	3	41	179
04:45 PM	3	19	**1**	23	0	0	1	1	0	18	70	88	**68**	1	**9**	**78**	190
05:00 PM	**8**	**23**	0	**31**	0	0	0	0	0	10	90	100	52	0	2	54	185
Total Volume	20	77	1	98	0	0	2	2	0	79	341	420	203	2	19	224	744
% App. Total	20.4	78.6	1		0	0	100		0	18.8	81.2		90.6	0.9	8.5		
PHF	.625	.837	.250	.790	.000	.000	.500	.500	.000	.681	.907	.905	.746	.500	.528	.718	.979
Cars	20	74	1	95	0	0	2	2	0	76	338	414	198	2	19	219	730
% Cars	100	96.1	100	96.9	0	0	100	100	0	96.2	99.1	98.6	97.5	100	100	97.8	98.1
Heavy Vehicles	0	3	0	3	0	0	0	0	0	3	3	6	5	0	0	5	14
% Heavy Vehicles	0	3.9	0	3.1	0	0	0	0	0	3.8	0.9	1.4	2.5	0	0	2.2	1.9



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N/S: Mill Pond Dr/Frederick Martin Prky
E/W: Washington Street (Route 140)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-H
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	0	0	117	14	21	0	13	48	180	0	395
07:15 AM	0	1	1	1	129	20	34	0	13	34	207	0	440
07:30 AM	0	0	0	2	173	31	40	0	23	41	184	0	494
07:45 AM	1	0	2	1	164	26	27	0	30	39	160	1	451
Total	3	1	3	4	583	91	122	0	79	162	731	1	1780
08:00 AM	0	0	0	0	160	21	29	0	22	35	150	0	417
08:15 AM	0	0	1	0	140	23	24	0	22	51	154	2	417
08:30 AM	1	1	1	0	138	26	31	0	12	42	157	0	409
08:45 AM	1	0	0	0	134	24	45	0	27	39	148	1	419
Total	2	1	2	0	572	94	129	0	83	167	609	3	1662
Grand Total	5	2	5	4	1155	185	251	0	162	329	1340	4	3442
Apprch %	41.7	16.7	41.7	0.3	85.9	13.8	60.8	0	39.2	19.7	80.1	0.2	
Total %	0.1	0.1	0.1	0.1	33.6	5.4	7.3	0	4.7	9.6	38.9	0.1	
Cars	5	2	5	4	1072	175	245	0	150	288	1292	4	3242
% Cars	100	100	100	100	92.8	94.6	97.6	0	92.6	87.5	96.4	100	94.2
Heavy Vehicles	0	0	0	0	83	10	6	0	12	41	48	0	200
% Heavy Vehicles	0	0	0	0	7.2	5.4	2.4	0	7.4	12.5	3.6	0	5.8

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**1**	1	2	1	129	20	150	34	0	13	47	34	**207**	0	**241**	440
07:30 AM	0	0	0	0	**2**	**173**	**31**	**206**	**40**	0	23	**63**	**41**	184	0	225	**494**
07:45 AM	**1**	0	**2**	**3**	1	164	26	191	27	0	**30**	57	39	160	**1**	200	451
08:00 AM	0	0	0	0	0	160	21	181	29	0	22	51	35	150	0	185	417
Total Volume	1	1	3	5	4	626	98	728	130	0	88	218	149	701	1	851	1802
% App. Total	20	20	60		0.5	86	13.5		59.6	0	40.4		17.5	82.4	0.1		
PHF	.250	.250	.375	.417	.500	.905	.790	.883	.813	.000	.733	.865	.909	.847	.250	.883	.912
Cars	1	1	3	5	4	586	93	683	126	0	80	206	127	682	1	810	1704
% Cars	100	100	100	100	100	93.6	94.9	93.8	96.9	0	90.9	94.5	85.2	97.3	100	95.2	94.6
Heavy Vehicles	0	0	0	0	0	40	5	45	4	0	8	12	22	19	0	41	98
% Heavy Vehicles	0	0	0	0	0	6.4	5.1	6.2	3.1	0	9.1	5.5	14.8	2.7	0	4.8	5.4

PRECISION DATA INDUSTRIES, LLC
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N/S: Mill Pond Dr/Frederick Martin Prky
E/W: Washington Street (Route 140)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-H
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	0	0	112	13	21	0	13	44	171	0	376
07:15 AM	0	1	1	1	119	18	33	0	12	26	200	0	411
07:30 AM	0	0	0	2	162	31	39	0	21	32	179	0	466
07:45 AM	1	0	2	1	155	25	26	0	26	37	158	1	432
Total	3	1	3	4	548	87	119	0	72	139	708	1	1685
08:00 AM	0	0	0	0	150	19	28	0	21	32	145	0	395
08:15 AM	0	0	1	0	131	23	23	0	19	47	145	2	391
08:30 AM	1	1	1	0	126	25	30	0	12	37	154	0	387
08:45 AM	1	0	0	0	117	21	45	0	26	33	140	1	384
Total	2	1	2	0	524	88	126	0	78	149	584	3	1557
Grand Total	5	2	5	4	1072	175	245	0	150	288	1292	4	3242
Apprch %	41.7	16.7	41.7	0.3	85.7	14	62	0	38	18.2	81.6	0.3	
Total %	0.2	0.1	0.2	0.1	33.1	5.4	7.6	0	4.6	8.9	39.9	0.1	

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**1**	1	2	1	119	18	138	33	0	12	45	26	**200**	0	**226**	411
07:30 AM	0	0	0	0	**2**	**162**	**31**	**195**	**39**	0	21	**60**	32	179	0	211	**466**
07:45 AM	**1**	0	**2**	**3**	1	155	25	181	26	0	**26**	52	**37**	158	**1**	196	432
08:00 AM	0	0	0	0	0	150	19	169	28	0	21	49	32	145	0	177	395
Total Volume	1	1	3	5	4	586	93	683	126	0	80	206	127	682	1	810	1704
% App. Total	20	20	60		0.6	85.8	13.6		61.2	0	38.8		15.7	84.2	0.1		
PHF	.250	.250	.375	.417	.500	.904	.750	.876	.808	.000	.769	.858	.858	.853	.250	.896	.914

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File Name : 81676 H-H
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	5	1	0	0	0	4	9	0	19
07:15 AM	0	0	0	0	10	2	1	0	1	8	7	0	29
07:30 AM	0	0	0	0	11	0	1	0	2	9	5	0	28
07:45 AM	0	0	0	0	9	1	1	0	4	2	2	0	19
Total	0	0	0	0	35	4	3	0	7	23	23	0	95
08:00 AM	0	0	0	0	10	2	1	0	1	3	5	0	22
08:15 AM	0	0	0	0	9	0	1	0	3	4	9	0	26
08:30 AM	0	0	0	0	12	1	1	0	0	5	3	0	22
08:45 AM	0	0	0	0	17	3	0	0	1	6	8	0	35
Total	0	0	0	0	48	6	3	0	5	18	25	0	105
Grand Total	0	0	0	0	83	10	6	0	12	41	48	0	200
Apprch %	0	0	0	0	89.2	10.8	33.3	0	66.7	46.1	53.9	0	
Total %	0	0	0	0	41.5	5	3	0	6	20.5	24	0	

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	10	2	12	**1**	0	1	2	3	5	0	8	22
08:15 AM	0	0	0	0	0	9	0	9	1	0	**3**	**4**	4	**9**	0	13	26
08:30 AM	0	0	0	0	0	12	1	13	1	0	0	1	5	3	0	8	22
08:45 AM	0	0	0	0	0	**17**	**3**	**20**	0	0	1	1	**6**	8	0	**14**	**35**
Total Volume	0	0	0	0	0	48	6	54	3	0	5	8	18	25	0	43	105
% App. Total	0	0	0		0	88.9	11.1		37.5	0	62.5		41.9	58.1	0		
PHF	.000	.000	.000	.000	.000	.706	.500	.675	.750	.000	.417	.500	.750	.694	.000	.768	.750

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File Name : 81676 H-H
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	1	8
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
07:30 AM	0	0	0	4	0	0	0	0	0	0	0	0	1	0	0	0	5
07:45 AM	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	4
Total	0	0	0	11	0	0	0	0	0	0	1	4	1	0	0	1	18
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	3
08:15 AM	0	0	0	3	0	0	0	0	0	0	0	4	0	0	0	0	7
08:30 AM	0	0	0	3	0	0	0	0	0	0	0	4	0	0	0	1	8
08:45 AM	0	0	0	7	0	0	0	1	0	0	0	4	0	1	0	1	14
Total	0	0	0	14	0	0	0	1	0	0	0	13	0	2	0	2	32
Grand Total	0	0	0	25	0	0	0	1	0	0	1	17	1	2	0	3	50
Apprch %	0	0	0	100	0	0	0	100	0	0	5.6	94.4	16.7	33.3	0	50	
Total %	0	0	0	50	0	0	0	2	0	0	2	34	2	4	0	6	

	Mill Pond Apartments Driveway From North					Washington Street (Route 140) From East					Frederick Martin Sr Parkway From South					Washington Street (Route 140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	**1**	0	0	1	3
08:15 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	**4**	**4**	0	0	0	0	0	7
08:30 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	4	4	0	0	0	**1**	**1**	**8**
08:45 AM	**0**	**0**	**0**	**7**	**7**	0	0	0	**1**	**1**	0	0	0	4	4	0	1	0	1	**2**	**14**
Total Volume	0	0	0	14	14	0	0	0	1	1	0	0	0	13	13	0	2	0	2	4	32
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	50	0	50		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.250	.250	.000	.000	.000	.813	.813	.000	.500	.000	.500	.500	.571

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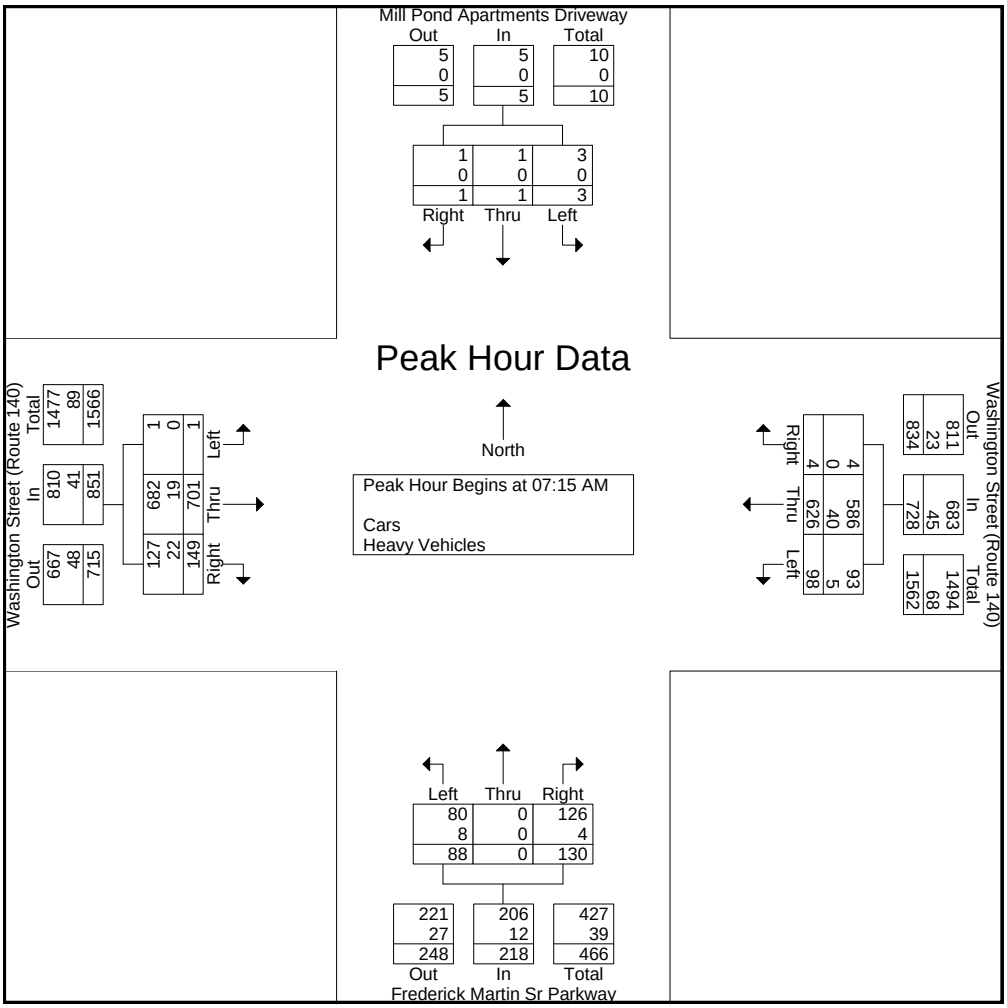
Start Date : 10/1/2008
Page No : 1

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**1**	1	2	1	129	20	150	34	0	13	47	34	**207**	0	**241**	440
07:30 AM	0	0	0	0	**2**	**173**	**31**	**206**	**40**	0	23	**63**	**41**	184	0	225	**494**
07:45 AM	**1**	0	**2**	**3**	1	164	26	191	27	0	**30**	57	39	160	**1**	200	451
08:00 AM	0	0	0	0	0	160	21	181	29	0	22	51	35	150	0	185	417
Total Volume	1	1	3	5	4	626	98	728	130	0	88	218	149	701	1	851	1802
% App. Total	20	20	60		0.5	86	13.5		59.6	0	40.4		17.5	82.4	0.1		
PHF	.250	.250	.375	.417	.500	.905	.790	.883	.813	.000	.733	.865	.909	.847	.250	.883	.912
Cars	1	1	3	5	4	586	93	683	126	0	80	206	127	682	1	810	1704
% Cars	100	100	100	100	100	93.6	94.9	93.8	96.9	0	90.9	94.5	85.2	97.3	100	95.2	94.6
Heavy Vehicles	0	0	0	0	0	40	5	45	4	0	8	12	22	19	0	41	98
% Heavy Vehicles	0	0	0	0	0	6.4	5.1	6.2	3.1	0	9.1	5.5	14.8	2.7	0	4.8	5.4



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File Name : 81676 H-HHH
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	1	0	207	53	34	1	20	74	157	2	549
04:15 PM	0	0	0	0	210	57	40	0	22	62	172	1	564
04:30 PM	0	0	0	0	219	56	33	0	24	63	134	1	530
04:45 PM	1	1	0	1	190	52	48	0	21	70	166	0	550
Total	1	1	1	1	826	218	155	1	87	269	629	4	2193
05:00 PM	2	0	0	0	186	64	42	1	21	104	143	0	563
05:15 PM	1	0	0	1	178	61	21	0	31	53	133	0	479
05:30 PM	0	0	1	0	206	50	25	0	16	55	174	3	530
05:45 PM	1	0	0	1	177	63	26	0	16	52	143	1	480
Total	4	0	1	2	747	238	114	1	84	264	593	4	2052
Grand Total	5	1	2	3	1573	456	269	2	171	533	1222	8	4245
Apprch %	62.5	12.5	25	0.1	77.4	22.4	60.9	0.5	38.7	30.2	69.3	0.5	
Total %	0.1	0	0	0.1	37.1	10.7	6.3	0	4	12.6	28.8	0.2	
Cars	5	1	2	3	1531	454	267	2	164	512	1197	8	4146
% Cars	100	100	100	100	97.3	99.6	99.3	100	95.9	96.1	98	100	97.7
Heavy Vehicles	0	0	0	0	42	2	2	0	7	21	25	0	99
% Heavy Vehicles	0	0	0	0	2.7	0.4	0.7	0	4.1	3.9	2	0	2.3

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	210	57	267	40	0	22	62	62	**172**	**1**	235	**564**
04:30 PM	0	0	0	0	0	**219**	56	**275**	33	0	**24**	57	63	134	1	198	530
04:45 PM	1	**1**	0	**2**	**1**	190	52	243	**48**	0	21	**69**	70	166	0	236	550
05:00 PM	**2**	0	0	2	0	186	**64**	250	42	**1**	21	64	**104**	143	0	**247**	563
Total Volume	3	1	0	4	1	805	229	1035	163	1	88	252	299	615	2	916	2207
% App. Total	75	25	0		0.1	77.8	22.1		64.7	0.4	34.9		32.6	67.1	0.2		
PHF	.375	.250	.000	.500	.250	.919	.895	.941	.849	.250	.917	.913	.719	.894	.500	.927	.978
Cars	3	1	0	4	1	786	227	1014	163	1	87	251	290	601	2	893	2162
% Cars	100	100	0	100	100	97.6	99.1	98.0	100	100	98.9	99.6	97.0	97.7	100	97.5	98.0
Heavy Vehicles	0	0	0	0	0	19	2	21	0	0	1	1	9	14	0	23	45
% Heavy Vehicles	0	0	0	0	0	2.4	0.9	2.0	0	0	1.1	0.4	3.0	2.3	0	2.5	2.0

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Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	1	0	198	53	34	1	19	72	155	2	535
04:15 PM	0	0	0	0	204	56	40	0	22	60	166	1	549
04:30 PM	0	0	0	0	215	55	33	0	24	61	133	1	522
04:45 PM	1	1	0	1	184	52	48	0	20	69	163	0	539
Total	1	1	1	1	801	216	155	1	85	262	617	4	2145
05:00 PM	2	0	0	0	183	64	42	1	21	100	139	0	552
05:15 PM	1	0	0	1	173	61	21	0	30	49	130	0	466
05:30 PM	0	0	1	0	201	50	25	0	15	52	171	3	518
05:45 PM	1	0	0	1	173	63	24	0	13	49	140	1	465
Total	4	0	1	2	730	238	112	1	79	250	580	4	2001
Grand Total	5	1	2	3	1531	454	267	2	164	512	1197	8	4146
Apprch %	62.5	12.5	25	0.2	77	22.8	61.7	0.5	37.9	29.8	69.7	0.5	
Total %	0.1	0	0	0.1	36.9	11	6.4	0	4	12.3	28.9	0.2	

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	204	56	260	40	0	22	62	60	**166**	**1**	227	549
04:30 PM	0	0	0	0	0	**215**	55	**270**	33	0	**24**	57	61	133	1	195	522
04:45 PM	1	**1**	0	**2**	**1**	184	52	237	**48**	0	20	**68**	69	163	0	232	539
05:00 PM	**2**	0	0	2	0	183	**64**	247	42	**1**	21	64	**100**	139	0	**239**	**552**
Total Volume	3	1	0	4	1	786	227	1014	163	1	87	251	290	601	2	893	2162
% App. Total	75	25	0		0.1	77.5	22.4		64.9	0.4	34.7		32.5	67.3	0.2		
PHF	.375	.250	.000	.500	.250	.914	.887	.939	.849	.250	.906	.923	.725	.905	.500	.934	.979

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Page No : 1

Groups Printed- Heavy Vehicles

	Mill Pond Apartments Driveway From North			Washington Street (Route 140) From East			Frederick Martin Sr Parkway From South			Washington Street (Route 140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	9	0	0	0	1	2	2	0	14
04:15 PM	0	0	0	0	6	1	0	0	0	2	6	0	15
04:30 PM	0	0	0	0	4	1	0	0	0	2	1	0	8
04:45 PM	0	0	0	0	6	0	0	0	1	1	3	0	11
Total	0	0	0	0	25	2	0	0	2	7	12	0	48
05:00 PM	0	0	0	0	3	0	0	0	0	4	4	0	11
05:15 PM	0	0	0	0	5	0	0	0	1	4	3	0	13
05:30 PM	0	0	0	0	5	0	0	0	1	3	3	0	12
05:45 PM	0	0	0	0	4	0	2	0	3	3	3	0	15
Total	0	0	0	0	17	0	2	0	5	14	13	0	51
Grand Total	0	0	0	0	42	2	2	0	7	21	25	0	99
Apprch %	0	0	0	0	95.5	4.5	22.2	0	77.8	45.7	54.3	0	
Total %	0	0	0	0	42.4	2	2	0	7.1	21.2	25.3	0	

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	**4**	**4**	0	**8**	11
05:15 PM	0	0	0	0	0	**5**	0	**5**	0	0	1	1	4	3	0	7	13
05:30 PM	0	0	0	0	0	5	0	5	0	0	1	1	3	3	0	6	12
05:45 PM	0	0	0	0	0	4	0	4	**2**	0	**3**	**5**	3	3	0	6	**15**
Total Volume	0	0	0	0	0	17	0	17	2	0	5	7	14	13	0	27	51
% App. Total	0	0	0		0	100	0		28.6	0	71.4		51.9	48.1	0		
PHF	.000	.000	.000	.000	.000	.850	.000	.850	.250	.000	.417	.350	.875	.813	.000	.844	.850

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N/S: Mill Pond Dr/Frederick Martin Prky
E/W: Washington Street (Route 140)
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-HHH
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	14	0	0	0	1	0	0	0	0	0	0	0	2	17
04:15 PM	0	0	0	8	0	1	0	1	1	0	0	0	1	1	0	0	13
04:30 PM	0	0	0	10	0	1	0	6	0	0	0	1	0	0	0	2	20
04:45 PM	0	0	0	14	0	0	0	0	0	0	0	5	0	2	0	0	21
Total	0	0	0	46	0	2	0	8	1	0	0	6	1	3	0	4	71
05:00 PM	0	0	0	5	0	0	1	0	0	0	1	0	0	0	0	0	7
05:15 PM	0	0	0	4	0	1	0	0	0	0	0	1	0	0	0	0	6
05:30 PM	0	0	0	7	0	0	0	1	0	0	0	2	0	0	0	0	10
05:45 PM	0	0	0	5	0	4	0	0	0	0	0	3	0	0	0	0	12
Total	0	0	0	21	0	5	1	1	0	0	1	6	0	0	0	0	35
Grand Total	0	0	0	67	0	7	1	9	1	0	1	12	1	3	0	4	106
Apprch %	0	0	0	100	0	41.2	5.9	52.9	7.1	0	7.1	85.7	12.5	37.5	0	50	
Total %	0	0	0	63.2	0	6.6	0.9	8.5	0.9	0	0.9	11.3	0.9	2.8	0	3.8	

	Mill Pond Apartments Driveway From North					Washington Street (Route 140) From East					Frederick Martin Sr Parkway From South					Washington Street (Route 140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	**14**	**14**	0	0	0	1	1	0	0	0	0	0	0	0	0	**2**	**2**	17
04:15 PM	0	0	0	8	8	0	**1**	**0**	**1**	**2**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**2**	**13**
04:30 PM	**0**	**0**	**0**	**10**	**10**	**0**	**1**	**0**	**6**	**7**	0	0	0	1	1	0	0	0	2	2	20
04:45 PM	0	0	0	14	14	0	0	0	0	0	0	0	0	**5**	**5**	0	**2**	0	0	2	**21**
Total Volume	0	0	0	46	46	0	2	0	8	10	1	0	0	6	7	1	3	0	4	8	71
% App. Total	0	0	0	100		0	20	0	80		14.3	0	0	85.7		12.5	37.5	0	50		
PHF	.000	.000	.000	.821	.821	.000	.500	.000	.333	.357	.250	.000	.000	.300	.350	.250	.375	.000	.500	1.000	.845

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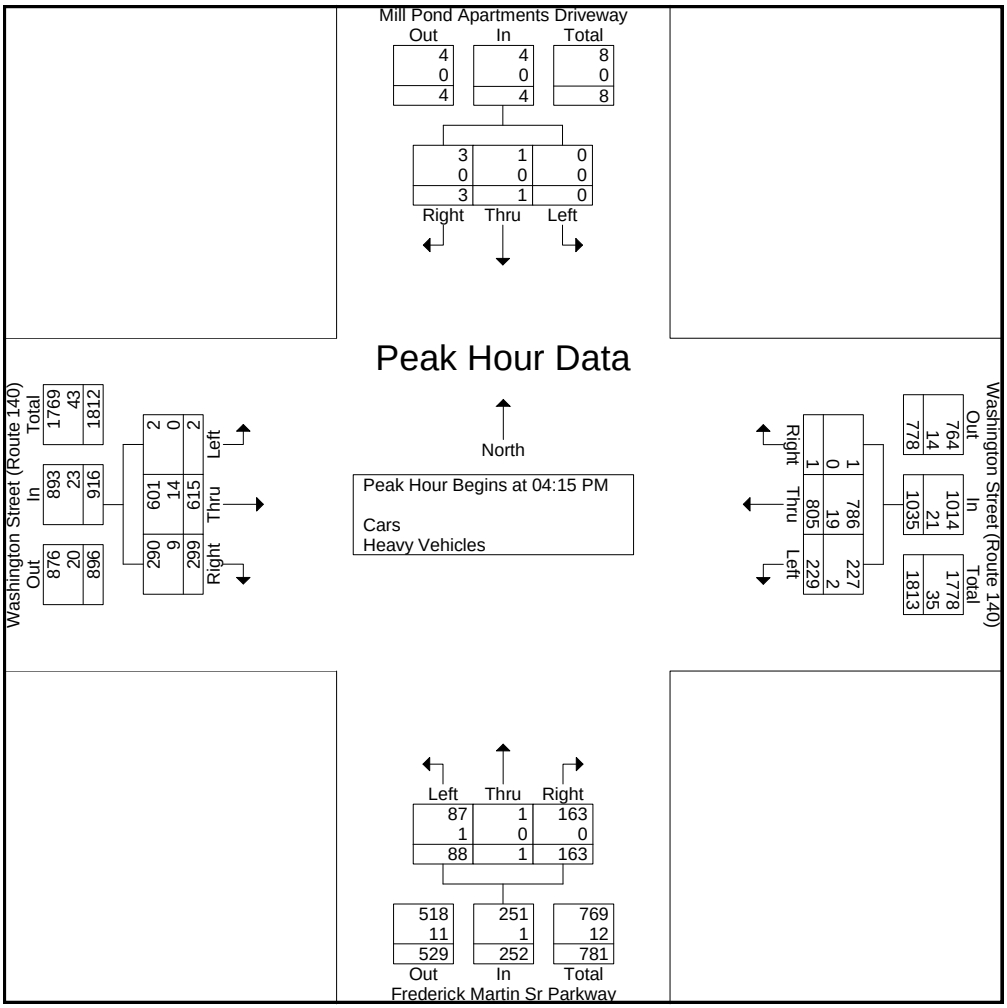
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-HHH
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Mill Pond Apartments Driveway From North				Washington Street (Route 140) From East				Frederick Martin Sr Parkway From South				Washington Street (Route 140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	210	57	267	40	0	22	62	62	**172**	**1**	235	**564**
04:30 PM	0	0	0	0	0	**219**	56	**275**	33	0	**24**	57	63	134	1	198	530
04:45 PM	1	**1**	0	**2**	**1**	190	52	243	**48**	0	21	**69**	70	166	0	236	550
05:00 PM	**2**	0	0	2	0	186	**64**	250	42	**1**	21	64	**104**	143	0	**247**	563
Total Volume	3	1	0	4	1	805	229	1035	163	1	88	252	299	615	2	916	2207
% App. Total	75	25	0		0.1	77.8	22.1		64.7	0.4	34.9		32.6	67.1	0.2		
PHF	.375	.250	.000	.500	.250	.919	.895	.941	.849	.250	.917	.913	.719	.894	.500	.927	.978
Cars	3	1	0	4	1	786	227	1014	163	1	87	251	290	601	2	893	2162
% Cars	100	100	0	100	100	97.6	99.1	98.0	100	100	98.9	99.6	97.0	97.7	100	97.5	98.0
Heavy Vehicles	0	0	0	0	0	19	2	21	0	0	1	1	9	14	0	23	45
% Heavy Vehicles	0	0	0	0	0	2.4	0.9	2.0	0	0	1.1	0.4	3.0	2.3	0	2.5	2.0



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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-A
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	12	72	0	30	174	37	325
07:15 AM	0	0	0	0	0	0	21	72	0	49	193	41	376
07:30 AM	0	0	0	0	0	0	15	81	0	40	190	49	375
07:45 AM	0	0	0	0	0	0	31	70	0	51	201	46	399
Total	0	0	0	0	0	0	79	295	0	170	758	173	1475
08:00 AM	0	0	0	0	0	0	18	55	0	39	147	34	293
08:15 AM	0	0	0	0	0	0	17	52	0	52	156	51	328
08:30 AM	0	0	0	0	0	0	33	58	0	55	174	64	384
08:45 AM	0	0	0	0	0	0	42	66	0	62	177	65	412
Total	0	0	0	0	0	0	110	231	0	208	654	214	1417
Grand Total	0	0	0	0	0	0	189	526	0	378	1412	387	2892
Apprch %	0	0	0	0	0	0	26.4	73.6	0	17.4	64.9	17.8	
Total %	0	0	0	0	0	0	6.5	18.2	0	13.1	48.8	13.4	
Cars	0	0	0	0	0	0	171	490	0	339	1336	365	2701
% Cars	0	0	0	0	0	0	90.5	93.2	0	89.7	94.6	94.3	93.4
Heavy Vehicles	0	0	0	0	0	0	18	36	0	39	76	22	191
% Heavy Vehicles	0	0	0	0	0	0	9.5	6.8	0	10.3	5.4	5.7	6.6

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	12	72	0	84	30	174	37	241	325
07:15 AM	0	0	0	0	0	0	0	0	21	72	0	93	49	193	41	283	376
07:30 AM	0	0	0	0	0	0	0	0	15	**81**	0	96	40	190	**49**	279	375
07:45 AM	0	0	0	0	0	0	0	0	**31**	70	0	**101**	**51**	**201**	46	**298**	**399**
Total Volume	0	0	0	0	0	0	0	0	79	295	0	374	170	758	173	1101	1475
% App. Total	0	0	0		0	0	0		21.1	78.9	0		15.4	68.8	15.7		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.637	.910	.000	.926	.833	.943	.883	.924	.924
Cars	0	0	0	0	0	0	0	0	73	280	0	353	151	722	161	1034	1387
% Cars	0	0	0	0	0	0	0	0	92.4	94.9	0	94.4	88.8	95.3	93.1	93.9	94.0
Heavy Vehicles	0	0	0	0	0	0	0	0	6	15	0	21	19	36	12	67	88
% Heavy Vehicles	0	0	0	0	0	0	0	0	7.6	5.1	0	5.6	11.2	4.7	6.9	6.1	6.0

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-A
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	12	70	0	27	169	35	313
07:15 AM	0	0	0	0	0	0	20	69	0	41	181	38	349
07:30 AM	0	0	0	0	0	0	14	77	0	36	178	45	350
07:45 AM	0	0	0	0	0	0	27	64	0	47	194	43	375
Total	0	0	0	0	0	0	73	280	0	151	722	161	1387
08:00 AM	0	0	0	0	0	0	17	50	0	35	136	33	271
08:15 AM	0	0	0	0	0	0	14	47	0	44	148	50	303
08:30 AM	0	0	0	0	0	0	31	55	0	52	162	60	360
08:45 AM	0	0	0	0	0	0	36	58	0	57	168	61	380
Total	0	0	0	0	0	0	98	210	0	188	614	204	1314
Grand Total	0	0	0	0	0	0	171	490	0	339	1336	365	2701
Apprch %	0	0	0	0	0	0	25.9	74.1	0	16.6	65.5	17.9	
Total %	0	0	0	0	0	0	6.3	18.1	0	12.6	49.5	13.5	

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	12	70	0	82	27	169	35	231	313
07:15 AM	0	0	0	0	0	0	0	0	20	69	0	89	41	181	38	260	349
07:30 AM	0	0	0	0	0	0	0	0	14	**77**	0	**91**	36	178	**45**	259	350
07:45 AM	0	0	0	0	0	0	0	0	**27**	64	0	91	**47**	**194**	43	**284**	**375**
Total Volume	0	0	0	0	0	0	0	0	73	280	0	353	151	722	161	1034	1387
% App. Total	0	0	0		0	0	0		20.7	79.3	0		14.6	69.8	15.6		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.676	.909	.000	.970	.803	.930	.894	.910	.925

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File Name : 81676 H-A
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0	2	0	3	5	2	12
07:15 AM	0	0	0	0	0	0	1	3	0	8	12	3	27
07:30 AM	0	0	0	0	0	0	1	4	0	4	12	4	25
07:45 AM	0	0	0	0	0	0	4	6	0	4	7	3	24
Total	0	0	0	0	0	0	6	15	0	19	36	12	88
08:00 AM	0	0	0	0	0	0	1	5	0	4	11	1	22
08:15 AM	0	0	0	0	0	0	3	5	0	8	8	1	25
08:30 AM	0	0	0	0	0	0	2	3	0	3	12	4	24
08:45 AM	0	0	0	0	0	0	6	8	0	5	9	4	32
Total	0	0	0	0	0	0	12	21	0	20	40	10	103
Grand Total	0	0	0	0	0	0	18	36	0	39	76	22	191
Apprch %	0	0	0	0	0	0	33.3	66.7	0	28.5	55.5	16.1	
Total %	0	0	0	0	0	0	9.4	18.8	0	20.4	39.8	11.5	

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	1	5	0	6	4	11	1	16	22
08:15 AM	0	0	0	0	0	0	0	0	3	5	0	8	**8**	8	1	17	25
08:30 AM	0	0	0	0	0	0	0	0	2	3	0	5	3	**12**	**4**	**19**	24
08:45 AM	0	0	0	0	0	0	0	0	**6**	**8**	0	**14**	5	9	4	18	**32**
Total Volume	0	0	0	0	0	0	0	0	12	21	0	33	20	40	10	70	103
% App. Total	0	0	0		0	0	0		36.4	63.6	0		28.6	57.1	14.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.656	.000	.589	.625	.833	.625	.921	.805

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Groups Printed- Peds and Bicycles

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	1	5
07:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	8
Total	0	0	0	2	0	0	0	3	0	1	0	6	0	0	1	5	18
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	5
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3
Total	0	0	0	0	0	0	0	2	0	0	0	7	0	0	0	4	13
Grand Total	0	0	0	2	0	0	0	5	0	1	0	13	0	0	1	9	31
Apprch %	0	0	0	100	0	0	0	100	0	7.1	0	92.9	0	0	10	90	
Total %	0	0	0	6.5	0	0	0	16.1	0	3.2	0	41.9	0	0	3.2	29	

	Taunton Green (Route 44/138/140) From North					Main Street (Route 44/140) From East					Weir Street (Route 138) From South					Taunton Green (Route 44/138/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	**2**	**2**	0	0	0	**1**	**1**	0	0	0	1	1	0	0	0	1	1	5
07:15 AM	0	0	0	0	0	0	0	0	1	1	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**
07:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**3**
07:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	0	0	0	**3**	**3**	**8**
Total Volume	0	0	0	2	2	0	0	0	3	3	0	1	0	6	7	0	0	1	5	6	18
% App. Total	0	0	0	100		0	0	0	100		0	14.3	0	85.7		0	0	16.7	83.3		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.750	.750	.000	.250	.000	.300	.350	.000	.000	.250	.417	.500	.563

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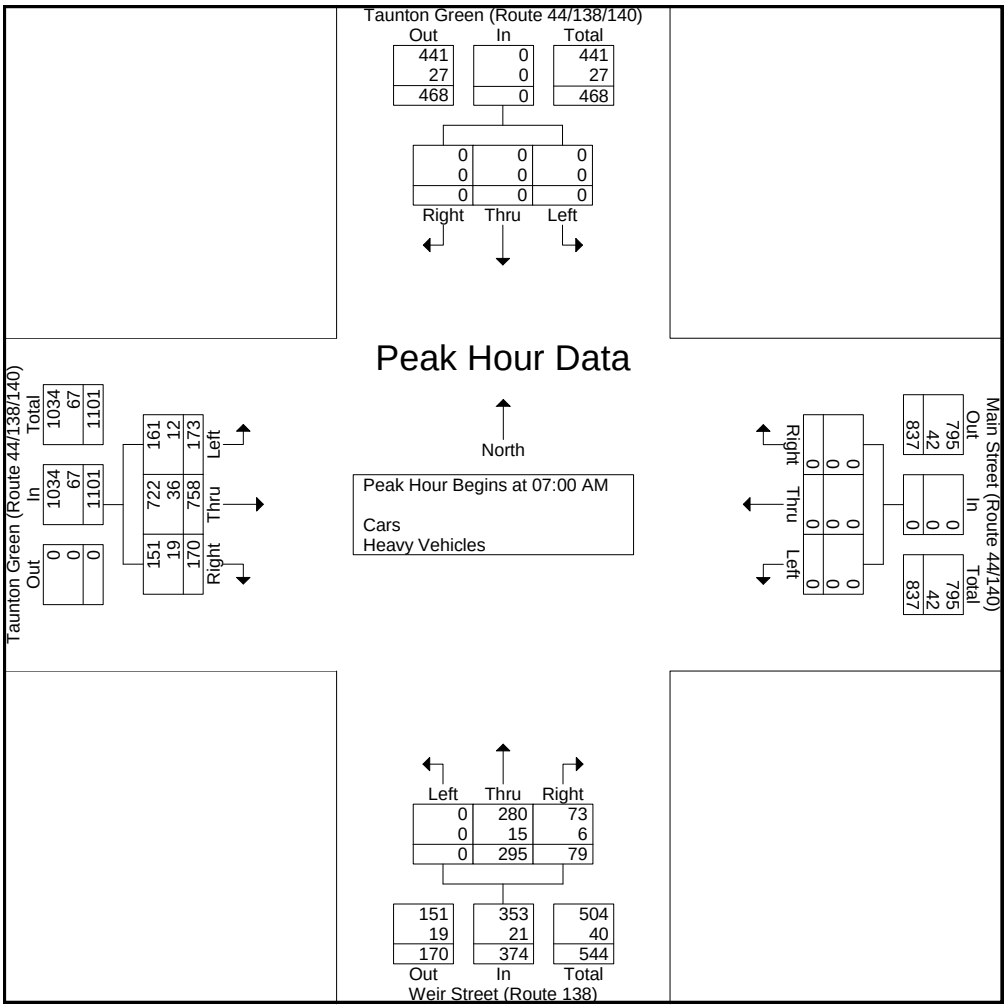
N/S: Taunton Green/Weir Street
E/W: Main Street/Taunton Green
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-A
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	12	72	0	84	30	174	37	241	325
07:15 AM	0	0	0	0	0	0	0	0	21	72	0	93	49	193	41	283	376
07:30 AM	0	0	0	0	0	0	0	0	15	**81**	0	96	40	190	**49**	279	375
07:45 AM	0	0	0	0	0	0	0	0	**31**	70	0	**101**	**51**	**201**	46	**298**	**399**
Total Volume	0	0	0	0	0	0	0	0	79	295	0	374	170	758	173	1101	1475
% App. Total	0	0	0		0	0	0		21.1	78.9	0		15.4	68.8	15.7		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.637	.910	.000	.926	.833	.943	.883	.924	.924
Cars	0	0	0	0	0	0	0	0	73	280	0	353	151	722	161	1034	1387
% Cars	0	0	0	0	0	0	0	0	92.4	94.9	0	94.4	88.8	95.3	93.1	93.9	94.0
Heavy Vehicles	0	0	0	0	0	0	0	0	6	15	0	21	19	36	12	67	88
% Heavy Vehicles	0	0	0	0	0	0	0	0	7.6	5.1	0	5.6	11.2	4.7	6.9	6.1	6.0



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N/S: Taunton Green/Weir Street
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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-AAA
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	24	47	0	77	209	43	400
04:15 PM	0	0	0	0	0	0	17	48	0	75	206	39	385
04:30 PM	0	0	0	0	0	0	34	55	0	90	228	41	448
04:45 PM	0	0	0	0	0	0	37	40	0	80	220	38	415
Total	0	0	0	0	0	0	112	190	0	322	863	161	1648
05:00 PM	0	0	0	0	0	0	35	47	0	74	200	44	400
05:15 PM	0	0	0	0	0	0	29	48	0	85	203	42	407
05:30 PM	0	0	0	0	0	0	29	40	0	87	198	39	393
05:45 PM	0	0	0	0	0	0	19	54	0	73	185	35	366
Total	0	0	0	0	0	0	112	189	0	319	786	160	1566
Grand Total	0	0	0	0	0	0	224	379	0	641	1649	321	3214
Apprch %	0	0	0	0	0	0	37.1	62.9	0	24.5	63.2	12.3	
Total %	0	0	0	0	0	0	7	11.8	0	19.9	51.3	10	
Cars	0	0	0	0	0	0	219	369	0	626	1600	316	3130
% Cars	0	0	0	0	0	0	97.8	97.4	0	97.7	97	98.4	97.4
Heavy Vehicles	0	0	0	0	0	0	5	10	0	15	49	5	84
% Heavy Vehicles	0	0	0	0	0	0	2.2	2.6	0	2.3	3	1.6	2.6

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	34	**55**	0	**89**	**90**	**228**	41	**359**	**448**
04:45 PM	0	0	0	0	0	0	0	0	**37**	40	0	77	80	220	38	338	415
05:00 PM	0	0	0	0	0	0	0	0	35	47	0	82	74	200	**44**	318	400
05:15 PM	0	0	0	0	0	0	0	0	29	48	0	77	85	203	42	330	407
Total Volume	0	0	0	0	0	0	0	0	135	190	0	325	329	851	165	1345	1670
% App. Total	0	0	0		0	0	0		41.5	58.5	0		24.5	63.3	12.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.912	.864	.000	.913	.914	.933	.938	.937	.932
Cars	0	0	0	0	0	0	0	0	133	187	0	320	322	822	164	1308	1628
% Cars	0	0	0	0	0	0	0	0	98.5	98.4	0	98.5	97.9	96.6	99.4	97.2	97.5
Heavy Vehicles	0	0	0	0	0	0	0	0	2	3	0	5	7	29	1	37	42
% Heavy Vehicles	0	0	0	0	0	0	0	0	1.5	1.6	0	1.5	2.1	3.4	0.6	2.8	2.5

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N/S: Taunton Green/Weir Street
E/W: Main Street/Taunton Green
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-AAA
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Cars

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	23	44	0	74	203	43	387
04:15 PM	0	0	0	0	0	0	16	47	0	74	201	37	375
04:30 PM	0	0	0	0	0	0	34	55	0	88	221	41	439
04:45 PM	0	0	0	0	0	0	37	39	0	78	216	37	407
Total	0	0	0	0	0	0	110	185	0	314	841	158	1608
05:00 PM	0	0	0	0	0	0	33	45	0	73	188	44	383
05:15 PM	0	0	0	0	0	0	29	48	0	83	197	42	399
05:30 PM	0	0	0	0	0	0	29	39	0	86	194	38	386
05:45 PM	0	0	0	0	0	0	18	52	0	70	180	34	354
Total	0	0	0	0	0	0	109	184	0	312	759	158	1522
Grand Total	0	0	0	0	0	0	219	369	0	626	1600	316	3130
Apprch %	0	0	0	0	0	0	37.2	62.8	0	24.6	62.9	12.4	
Total %	0	0	0	0	0	0	7	11.8	0	20	51.1	10.1	

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	34	**55**	0	**89**	**88**	**221**	41	**350**	**439**
04:45 PM	0	0	0	0	0	0	0	0	**37**	39	0	76	78	216	37	331	407
05:00 PM	0	0	0	0	0	0	0	0	33	45	0	78	73	188	**44**	305	383
05:15 PM	0	0	0	0	0	0	0	0	29	48	0	77	83	197	42	322	399
Total Volume	0	0	0	0	0	0	0	0	133	187	0	320	322	822	164	1308	1628
% App. Total	0	0	0		0	0	0		41.6	58.4	0		24.6	62.8	12.5		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.899	.850	.000	.899	.915	.930	.932	.934	.927

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-AAA
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Taunton Green (Route 44/138/140) From North			Main Street (Route 44/140) From East			Weir Street (Route 138) From South			Taunton Green (Route 44/138/140) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	1	3	0	3	6	0	13
04:15 PM	0	0	0	0	0	0	1	1	0	1	5	2	10
04:30 PM	0	0	0	0	0	0	0	0	0	2	7	0	9
04:45 PM	0	0	0	0	0	0	0	1	0	2	4	1	8
Total	0	0	0	0	0	0	2	5	0	8	22	3	40
05:00 PM	0	0	0	0	0	0	2	2	0	1	12	0	17
05:15 PM	0	0	0	0	0	0	0	0	0	2	6	0	8
05:30 PM	0	0	0	0	0	0	0	1	0	1	4	1	7
05:45 PM	0	0	0	0	0	0	1	2	0	3	5	1	12
Total	0	0	0	0	0	0	3	5	0	7	27	2	44
Grand Total	0	0	0	0	0	0	5	10	0	15	49	5	84
Apprch %	0	0	0	0	0	0	33.3	66.7	0	21.7	71	7.2	
Total %	0	0	0	0	0	0	6	11.9	0	17.9	58.3	6	

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	2	1	5	**2**	8	10
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**2**	7	0	9	9
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	2	4	1	7	8
05:00 PM	0	0	0	0	0	0	0	0	**2**	**2**	0	**4**	1	**12**	0	**13**	**17**
Total Volume	0	0	0	0	0	0	0	0	3	4	0	7	6	28	3	37	44
% App. Total	0	0	0		0	0	0		42.9	57.1	0		16.2	75.7	8.1		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.375	.500	.000	.438	.750	.583	.375	.712	.647

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E/W: Main Street/Taunton Green
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 H-AAA
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	2	14
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	7
Total	0	0	0	1	0	0	0	0	0	0	0	23	0	0	0	5	29
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	5	11
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	7	0	0	0	1	9
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	4	7
Total	0	0	0	1	0	0	0	1	0	0	0	17	0	2	0	10	31
Grand Total	0	0	0	2	0	0	0	1	0	0	0	40	0	2	0	15	60
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	11.8	0	88.2	
Total %	0	0	0	3.3	0	0	0	1.7	0	0	0	66.7	0	3.3	0	25	

	Taunton Green (Route 44/138/140) From North					Main Street (Route 44/140) From East					Weir Street (Route 138) From South					Taunton Green (Route 44/138/140) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	3	3	0	0	0	3	3	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	**5**	**5**	**11**
05:15 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**7**	**7**	0	0	0	1	1	9
05:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	**1**	0	0	1	4
Total Volume	0	0	0	2	2	0	0	0	1	1	0	0	0	18	18	0	1	0	9	10	31
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	10	0	90		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.250	.250	.000	.000	.000	.643	.643	.000	.250	.000	.450	.500	.705

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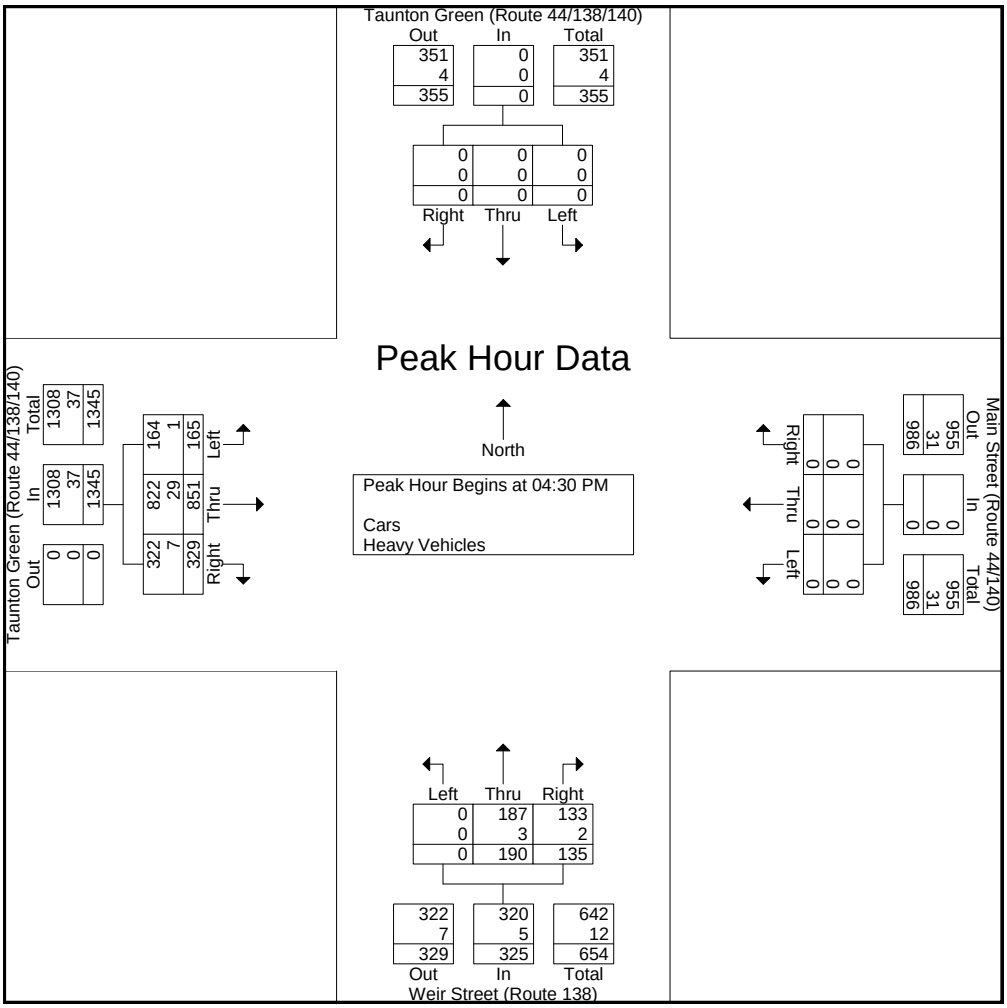
File Name : 81676 H-AAA
Site Code : 10111.31
Start Date : 10/1/2008
Page No : 1

	Taunton Green (Route 44/138/140) From North				Main Street (Route 44/140) From East				Weir Street (Route 138) From South				Taunton Green (Route 44/138/140) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	34	**55**	0	**89**	**90**	**228**	41	**359**	**448**
04:45 PM	0	0	0	0	0	0	0	0	**37**	40	0	77	80	220	38	338	415
05:00 PM	0	0	0	0	0	0	0	0	35	47	0	82	74	200	**44**	318	400
05:15 PM	0	0	0	0	0	0	0	0	29	48	0	77	85	203	42	330	407
Total Volume	0	0	0	0	0	0	0	0	135	190	0	325	329	851	165	1345	1670
% App. Total	0	0	0		0	0	0		41.5	58.5	0		24.5	63.3	12.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.912	.864	.000	.913	.914	.933	.938	.937	.932
Cars	0	0	0	0	0	0	0	0	133	187	0	320	322	822	164	1308	1628
% Cars	0	0	0	0	0	0	0	0	98.5	98.4	0	98.5	97.9	96.6	99.4	97.2	97.5
Heavy Vehicles	0	0	0	0	0	0	0	0	2	3	0	5	7	29	1	37	42
% Heavy Vehicles	0	0	0	0	0	0	0	0	1.5	1.6	0	1.5	2.1	3.4	0.6	2.8	2.5



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Thurs 9/11/08 and Sat 9/13/08	81676	Taunton, MA

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N/S: County Street (Route 140)
E/W: Hart Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-A
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North			Hart Street From East			County Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	122	18	32	18	26	17	120	26	64	36	6	488
07:15 AM	1	81	24	48	21	37	12	129	35	72	44	8	512
07:30 AM	3	138	28	60	32	22	17	146	31	61	35	5	578
07:45 AM	2	97	23	56	21	25	12	159	27	55	33	6	516
Total	9	438	93	196	92	110	58	554	119	252	148	25	2094
08:00 AM	2	82	11	57	26	29	15	139	33	44	29	4	471
08:15 AM	0	97	19	50	16	22	12	118	15	47	16	8	420
08:30 AM	2	92	16	44	14	14	12	105	32	40	31	8	410
08:45 AM	4	92	25	49	23	21	11	130	21	40	20	4	440
Total	8	363	71	200	79	86	50	492	101	171	96	24	1741
Grand Total	17	801	164	396	171	196	108	1046	220	423	244	49	3835
Apprch %	1.7	81.6	16.7	51.9	22.4	25.7	7.9	76.1	16	59.1	34.1	6.8	
Total %	0.4	20.9	4.3	10.3	4.5	5.1	2.8	27.3	5.7	11	6.4	1.3	
Cars	15	747	147	386	163	192	106	1001	210	413	234	49	3663
% Cars	88.2	93.3	89.6	97.5	95.3	98	98.1	95.7	95.5	97.6	95.9	100	95.5
Heavy Vehicles	2	54	17	10	8	4	2	45	10	10	10	0	172
% Heavy Vehicles	11.8	6.7	10.4	2.5	4.7	2	1.9	4.3	4.5	2.4	4.1	0	4.5

	County Street (Route 140) From North				Hart Street From East				County Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**3**	122	18	143	32	18	26	76	**17**	120	26	163	64	36	6	106	488
07:15 AM	1	81	24	106	48	21	**37**	106	12	129	**35**	176	**72**	**44**	**8**	**124**	512
07:30 AM	3	**138**	**28**	**169**	**60**	**32**	22	**114**	17	146	31	194	61	35	5	101	**578**
07:45 AM	2	97	23	122	56	21	25	102	12	**159**	27	**198**	55	33	6	94	516
Total Volume	9	438	93	540	196	92	110	398	58	554	119	731	252	148	25	425	2094
% App. Total	1.7	81.1	17.2		49.2	23.1	27.6		7.9	75.8	16.3		59.3	34.8	5.9		
PHF	.750	.793	.830	.799	.817	.719	.743	.873	.853	.871	.850	.923	.875	.841	.781	.857	.906
Cars	8	411	85	504	193	90	109	392	57	527	114	698	249	141	25	415	2009
% Cars	88.9	93.8	91.4	93.3	98.5	97.8	99.1	98.5	98.3	95.1	95.8	95.5	98.8	95.3	100	97.6	95.9
Heavy Vehicles	1	27	8	36	3	2	1	6	1	27	5	33	3	7	0	10	85
% Heavy Vehicles	11.1	6.2	8.6	6.7	1.5	2.2	0.9	1.5	1.7	4.9	4.2	4.5	1.2	4.7	0	2.4	4.1

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N/S: County Street (Route 140)
E/W: Hart Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-A
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North			Hart Street From East			County Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	112	18	32	17	26	17	118	25	64	36	6	474
07:15 AM	1	78	20	46	21	36	12	125	34	71	42	8	494
07:30 AM	2	131	25	60	31	22	17	135	29	61	34	5	552
07:45 AM	2	90	22	55	21	25	11	149	26	53	29	6	489
Total	8	411	85	193	90	109	57	527	114	249	141	25	2009
08:00 AM	2	75	10	54	23	29	15	133	32	41	28	4	446
08:15 AM	0	94	17	50	14	22	12	112	15	45	16	8	405
08:30 AM	2	86	12	43	14	13	12	102	29	40	29	8	390
08:45 AM	3	81	23	46	22	19	10	127	20	38	20	4	413
Total	7	336	62	193	73	83	49	474	96	164	93	24	1654
Grand Total	15	747	147	386	163	192	106	1001	210	413	234	49	3663
Apprch %	1.7	82.2	16.2	52.1	22	25.9	8	76	15.9	59.3	33.6	7	
Total %	0.4	20.4	4	10.5	4.4	5.2	2.9	27.3	5.7	11.3	6.4	1.3	

	County Street (Route 140) From North				Hart Street From East				County Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**3**	112	18	133	32	17	26	75	**17**	118	25	160	64	36	6	106	474
07:15 AM	1	78	20	99	46	21	**36**	103	12	125	**34**	171	**71**	**42**	**8**	**121**	494
07:30 AM	2	**131**	**25**	**158**	**60**	**31**	22	**113**	17	135	29	181	61	34	5	100	**552**
07:45 AM	2	90	22	114	55	21	25	101	11	**149**	26	**186**	53	29	6	88	489
Total Volume	8	411	85	504	193	90	109	392	57	527	114	698	249	141	25	415	2009
% App. Total	1.6	81.5	16.9		49.2	23	27.8		8.2	75.5	16.3		60	34	6		
PHF	.667	.784	.850	.797	.804	.726	.757	.867	.838	.884	.838	.938	.877	.839	.781	.857	.910

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N/S: County Street (Route 140)
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Client: VHB/J. Quitter

File Name : 81676 G-A
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North			Hart Street From East			County Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	10	0	0	1	0	0	2	1	0	0	0	14
07:15 AM	0	3	4	2	0	1	0	4	1	1	2	0	18
07:30 AM	1	7	3	0	1	0	0	11	2	0	1	0	26
07:45 AM	0	7	1	1	0	0	1	10	1	2	4	0	27
Total	1	27	8	3	2	1	1	27	5	3	7	0	85
08:00 AM	0	7	1	3	3	0	0	6	1	3	1	0	25
08:15 AM	0	3	2	0	2	0	0	6	0	2	0	0	15
08:30 AM	0	6	4	1	0	1	0	3	3	0	2	0	20
08:45 AM	1	11	2	3	1	2	1	3	1	2	0	0	27
Total	1	27	9	7	6	3	1	18	5	7	3	0	87
Grand Total	2	54	17	10	8	4	2	45	10	10	10	0	172
Apprch %	2.7	74	23.3	45.5	36.4	18.2	3.5	78.9	17.5	50	50	0	
Total %	1.2	31.4	9.9	5.8	4.7	2.3	1.2	26.2	5.8	5.8	5.8	0	

	County Street (Route 140) From North				Hart Street From East				County Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	3	**4**	7	2	0	**1**	3	0	4	1	5	1	2	0	3	18
07:30 AM	**1**	**7**	3	**11**	0	1	0	1	0	**11**	**2**	**13**	0	1	0	1	26
07:45 AM	0	7	1	8	1	0	0	1	**1**	10	1	12	2	**4**	0	**6**	**27**
08:00 AM	0	7	1	8	**3**	**3**	0	**6**	0	6	1	7	**3**	1	0	4	25
Total Volume	1	24	9	34	6	4	1	11	1	31	5	37	6	8	0	14	96
% App. Total	2.9	70.6	26.5		54.5	36.4	9.1		2.7	83.8	13.5		42.9	57.1	0		
PHF	.250	.857	.563	.773	.500	.333	.250	.458	.250	.705	.625	.712	.500	.500	.000	.583	.889

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Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North				Hart Street From East				County Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
08:00 AM	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	4
08:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	5	0	2	0	1	0	0	0	0	0	0	0	0	8
Grand Total	0	0	0	7	0	2	0	2	0	0	0	0	0	0	0	0	11
Apprch %	0	0	0	100	0	50	0	50	0	0	0	0	0	0	0	0	
Total %	0	0	0	63.6	0	18.2	0	18.2	0	0	0	0	0	0	0	0	

	County Street (Route 140) From North					Hart Street From East					County Street (Route 140) From South					Hart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	1	1	0	**2**	**0**	**1**	**3**	0	0	0	0	0	0	0	0	0	0	**4**
08:15 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	5	5	0	2	0	2	4	0	0	0	0	0	0	0	0	0	0	9
% App. Total	0	0	0	100		0	50	0	50		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.625	.625	.000	.250	.000	.500	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.563

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Site Code : 10111.31
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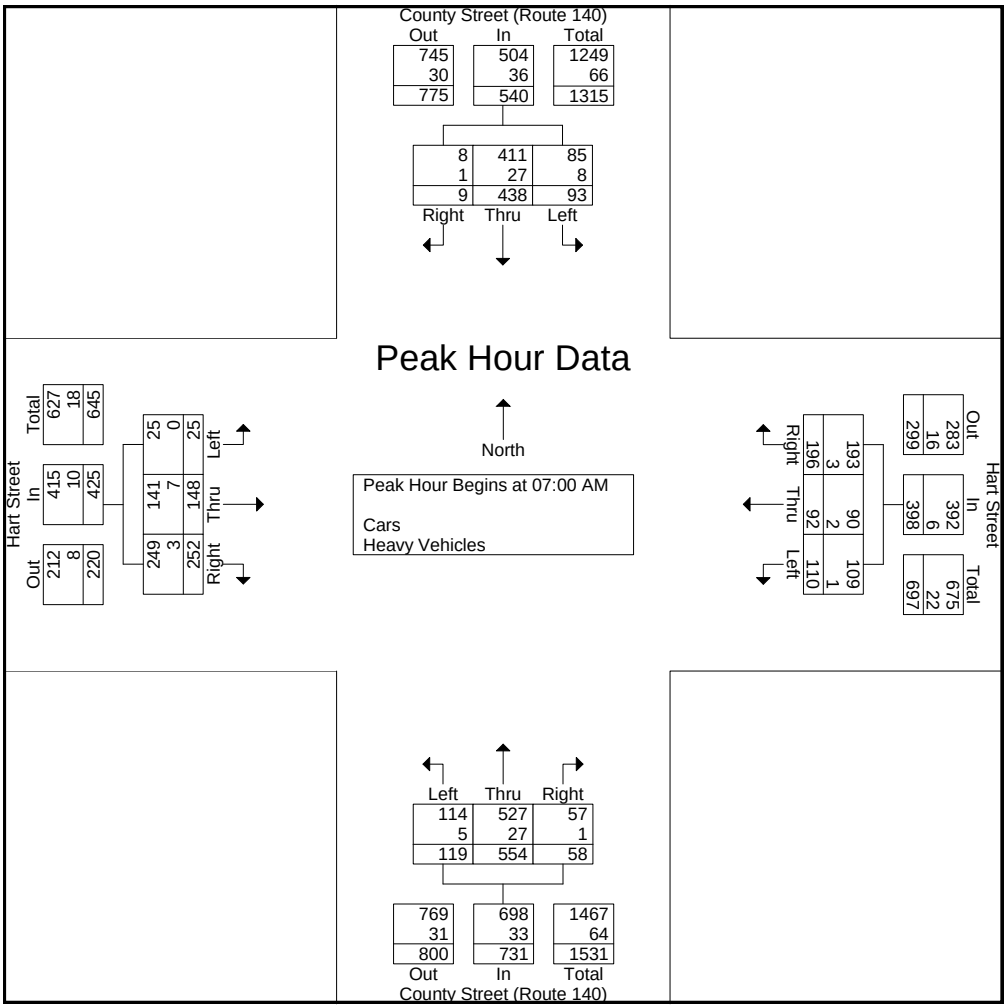
Page No : 1

	County Street (Route 140) From North				Hart Street From East				County Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**3**	122	18	143	32	18	26	76	**17**	120	26	163	64	36	6	106	488
07:15 AM	1	81	24	106	48	21	**37**	106	12	129	**35**	176	**72**	**44**	**8**	**124**	512
07:30 AM	3	**138**	**28**	**169**	**60**	**32**	22	**114**	17	146	31	194	61	35	5	101	**578**
07:45 AM	2	97	23	122	56	21	25	102	12	**159**	27	**198**	55	33	6	94	516
Total Volume	9	438	93	540	196	92	110	398	58	554	119	731	252	148	25	425	2094
% App. Total	1.7	81.1	17.2		49.2	23.1	27.6		7.9	75.8	16.3		59.3	34.8	5.9		
PHF	.750	.793	.830	.799	.817	.719	.743	.873	.853	.871	.850	.923	.875	.841	.781	.857	.906
Cars	8	411	85	504	193	90	109	392	57	527	114	698	249	141	25	415	2009
% Cars	88.9	93.8	91.4	93.3	98.5	97.8	99.1	98.5	98.3	95.1	95.8	95.5	98.8	95.3	100	97.6	95.9
Heavy Vehicles	1	27	8	36	3	2	1	6	1	27	5	33	3	7	0	10	85
% Heavy Vehicles	11.1	6.2	8.6	6.7	1.5	2.2	0.9	1.5	1.7	4.9	4.2	4.5	1.2	4.7	0	2.4	4.1



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File Name : 81676 G-AAA
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Country Street (Route 140) From North			Hart Street From East			Country Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	161	28	33	32	23	21	160	55	42	20	8	586
04:15 PM	1	195	16	38	37	24	19	146	51	51	31	10	619
04:30 PM	2	205	32	44	31	28	25	178	50	26	23	3	647
04:45 PM	4	204	32	36	38	20	30	162	55	18	12	6	617
Total	10	765	108	151	138	95	95	646	211	137	86	27	2469
05:00 PM	3	213	17	40	38	28	35	145	62	58	29	18	686
05:15 PM	1	224	25	48	46	20	33	170	45	73	43	8	736
05:30 PM	5	176	34	39	38	27	17	143	57	65	34	10	645
05:45 PM	5	198	22	58	35	21	27	137	53	75	46	12	689
Total	14	811	98	185	157	96	112	595	217	271	152	48	2756
Grand Total	24	1576	206	336	295	191	207	1241	428	408	238	75	5225
Apprch %	1.3	87.3	11.4	40.9	35.9	23.2	11	66.2	22.8	56.6	33	10.4	
Total %	0.5	30.2	3.9	6.4	5.6	3.7	4	23.8	8.2	7.8	4.6	1.4	
Cars	24	1540	203	334	291	186	206	1228	419	404	234	75	5144
% Cars	100	97.7	98.5	99.4	98.6	97.4	99.5	99	97.9	99	98.3	100	98.4
Heavy Vehicles	0	36	3	2	4	5	1	13	9	4	4	0	81
% Heavy Vehicles	0	2.3	1.5	0.6	1.4	2.6	0.5	1	2.1	1	1.7	0	1.6

	Country Street (Route 140) From North				Hart Street From East				Country Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	213	17	233	40	38	**28**	106	**35**	145	**62**	242	58	29	**18**	105	686
05:15 PM	1	**224**	25	**250**	48	**46**	20	**114**	33	**170**	45	**248**	73	43	8	124	**736**
05:30 PM	**5**	176	**34**	215	39	38	27	104	17	143	57	217	65	34	10	109	645
05:45 PM	5	198	22	225	**58**	35	21	114	27	137	53	217	**75**	**46**	12	**133**	689
Total Volume	14	811	98	923	185	157	96	438	112	595	217	924	271	152	48	471	2756
% App. Total	1.5	87.9	10.6		42.2	35.8	21.9		12.1	64.4	23.5		57.5	32.3	10.2		
PHF	.700	.905	.721	.923	.797	.853	.857	.961	.800	.875	.875	.931	.903	.826	.667	.885	.936
Cars	14	800	98	912	184	155	94	433	111	586	212	909	268	149	48	465	2719
% Cars	100	98.6	100	98.8	99.5	98.7	97.9	98.9	99.1	98.5	97.7	98.4	98.9	98.0	100	98.7	98.7
Heavy Vehicles	0	11	0	11	1	2	2	5	1	9	5	15	3	3	0	6	37
% Heavy Vehicles	0	1.4	0	1.2	0.5	1.3	2.1	1.1	0.9	1.5	2.3	1.6	1.1	2.0	0	1.3	1.3

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File Name : 81676 G-AAA
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Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	Country Street (Route 140) From North			Hart Street From East			Country Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	156	27	33	31	22	21	159	53	42	20	8	575
04:15 PM	1	178	14	38	37	24	19	146	51	50	30	10	598
04:30 PM	2	204	32	43	31	26	25	175	49	26	23	3	639
04:45 PM	4	202	32	36	37	20	30	162	54	18	12	6	613
Total	10	740	105	150	136	92	95	642	207	136	85	27	2425
05:00 PM	3	212	17	40	37	28	34	143	62	56	29	18	679
05:15 PM	1	217	25	47	46	18	33	166	44	73	42	8	720
05:30 PM	5	176	34	39	37	27	17	141	55	65	33	10	639
05:45 PM	5	195	22	58	35	21	27	136	51	74	45	12	681
Total	14	800	98	184	155	94	111	586	212	268	149	48	2719
Grand Total	24	1540	203	334	291	186	206	1228	419	404	234	75	5144
Apprch %	1.4	87.2	11.5	41.2	35.9	22.9	11.1	66.3	22.6	56.7	32.8	10.5	
Total %	0.5	29.9	3.9	6.5	5.7	3.6	4	23.9	8.1	7.9	4.5	1.5	

	Country Street (Route 140) From North				Hart Street From East				Country Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	212	17	232	40	37	**28**	105	**34**	143	**62**	239	56	29	**18**	103	679
05:15 PM	1	**217**	25	**243**	47	**46**	18	111	33	**166**	44	**243**	73	42	8	123	**720**
05:30 PM	**5**	176	**34**	215	39	37	27	103	17	141	55	213	65	33	10	108	639
05:45 PM	5	195	22	222	**58**	35	21	**114**	27	136	51	214	**74**	**45**	12	**131**	681
Total Volume	14	800	98	912	184	155	94	433	111	586	212	909	268	149	48	465	2719
% App. Total	1.5	87.7	10.7		42.5	35.8	21.7		12.2	64.5	23.3		57.6	32	10.3		
PHF	.700	.922	.721	.938	.793	.842	.839	.950	.816	.883	.855	.935	.905	.828	.667	.887	.944

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File Name : 81676 G-AAA
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Groups Printed- Heavy Vehicles

	Country Street (Route 140) From North			Hart Street From East			Country Street (Route 140) From South			Hart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	5	1	0	1	1	0	1	2	0	0	0	11
04:15 PM	0	17	2	0	0	0	0	0	0	1	1	0	21
04:30 PM	0	1	0	1	0	2	0	3	1	0	0	0	8
04:45 PM	0	2	0	0	1	0	0	0	1	0	0	0	4
Total	0	25	3	1	2	3	0	4	4	1	1	0	44
05:00 PM	0	1	0	0	1	0	1	2	0	2	0	0	7
05:15 PM	0	7	0	1	0	2	0	4	1	0	1	0	16
05:30 PM	0	0	0	0	1	0	0	2	2	0	1	0	6
05:45 PM	0	3	0	0	0	0	0	1	2	1	1	0	8
Total	0	11	0	1	2	2	1	9	5	3	3	0	37
Grand Total	0	36	3	2	4	5	1	13	9	4	4	0	81
Apprch %	0	92.3	7.7	18.2	36.4	45.5	4.3	56.5	39.1	50	50	0	
Total %	0	44.4	3.7	2.5	4.9	6.2	1.2	16	11.1	4.9	4.9	0	

	Country Street (Route 140) From North				Hart Street From East				Country Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	5	1	6	0	**1**	1	2	0	1	**2**	3	0	0	0	0	11
04:15 PM	0	**17**	**2**	**19**	0	0	0	0	0	0	0	0	**1**	**1**	0	**2**	**21**
04:30 PM	0	1	0	1	**1**	0	**2**	**3**	0	**3**	1	**4**	0	0	0	0	8
04:45 PM	0	2	0	2	0	1	0	1	0	0	1	1	0	0	0	0	4
Total Volume	0	25	3	28	1	2	3	6	0	4	4	8	1	1	0	2	44
% App. Total	0	89.3	10.7		16.7	33.3	50		0	50	50		50	50	0		
PHF	.000	.368	.375	.368	.250	.500	.375	.500	.000	.333	.500	.500	.250	.250	.000	.250	.524

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P.O. Box 301 Berlin, MA 01503
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N/S: County Street (Route 140)
E/W: Hart Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-AAA
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Country Street (Route 140) From North				Hart Street From East				Country Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
Total	0	0	0	2	0	0	0	3	1	0	0	0	0	0	0	0	6
Grand Total	0	1	0	2	0	0	0	3	1	1	0	0	0	0	0	0	8
Apprch %	0	33.3	0	66.7	0	0	0	100	50	50	0	0	0	0	0	0	
Total %	0	12.5	0	25	0	0	0	37.5	12.5	12.5	0	0	0	0	0	0	

	Country Street (Route 140) From North					Hart Street From East					Country Street (Route 140) From South					Hart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**0**	**0**	**1**	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	**2**	**2**	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**3**
Total Volume	0	0	0	2	2	0	0	0	3	3	1	0	0	0	1	0	0	0	0	0	6
% App. Total	0	0	0	100		0	0	0	100		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.750	.750	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.500

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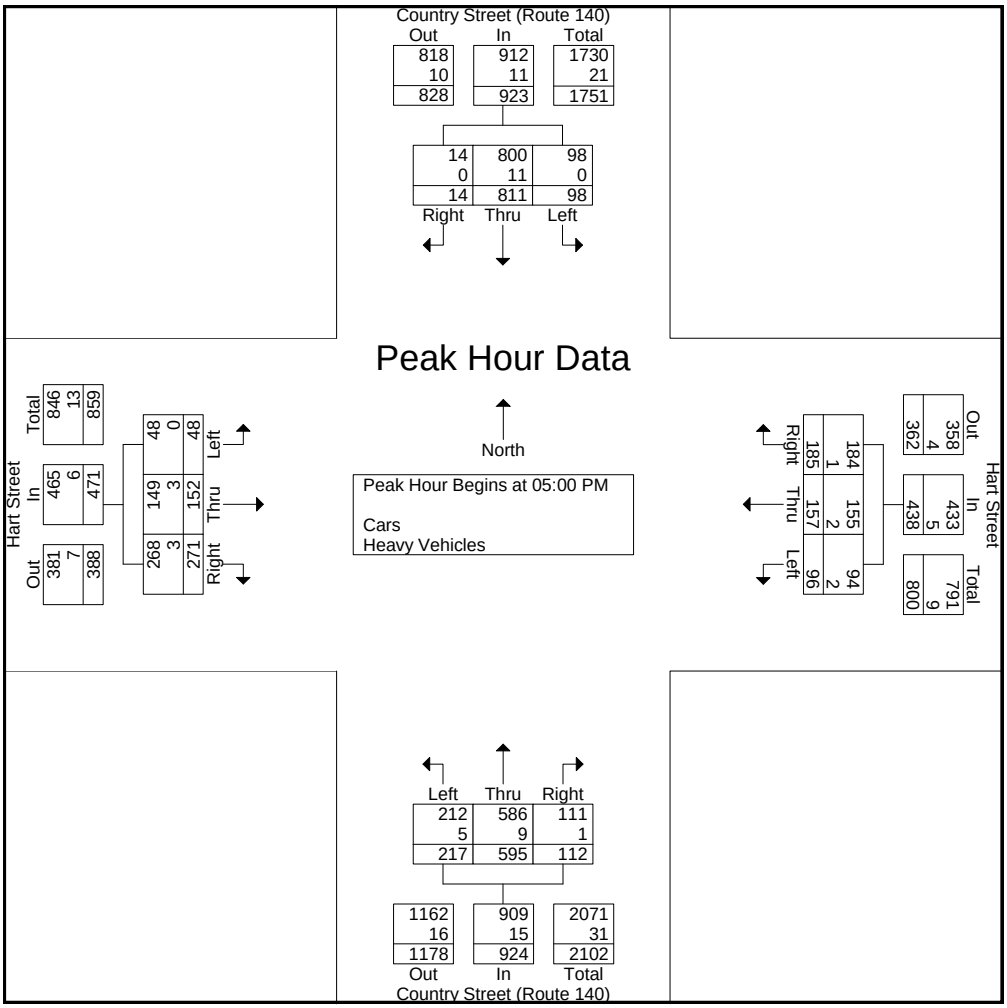
File Name : 81676 G-AAA
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

	Country Street (Route 140) From North				Hart Street From East				Country Street (Route 140) From South				Hart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	213	17	233	40	38	**28**	106	**35**	145	**62**	242	58	29	**18**	105	686
05:15 PM	1	**224**	25	**250**	48	**46**	20	**114**	33	**170**	45	**248**	73	43	8	124	**736**
05:30 PM	**5**	176	**34**	215	39	38	27	104	17	143	57	217	65	34	10	109	645
05:45 PM	5	198	22	225	**58**	35	21	114	27	137	53	217	**75**	**46**	12	**133**	689
Total Volume	14	811	98	923	185	157	96	438	112	595	217	924	271	152	48	471	2756
% App. Total	1.5	87.9	10.6		42.2	35.8	21.9		12.1	64.4	23.5		57.5	32.3	10.2		
PHF	.700	.905	.721	.923	.797	.853	.857	.961	.800	.875	.875	.931	.903	.826	.667	.885	.936
Cars	14	800	98	912	184	155	94	433	111	586	212	909	268	149	48	465	2719
% Cars	100	98.6	100	98.8	99.5	98.7	97.9	98.9	99.1	98.5	97.7	98.4	98.9	98.0	100	98.7	98.7
Heavy Vehicles	0	11	0	11	1	2	2	5	1	9	5	15	3	3	0	6	37
% Heavy Vehicles	0	1.4	0	1.2	0.5	1.3	2.1	1.1	0.9	1.5	2.3	1.6	1.1	2.0	0	1.3	1.3



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D A T A
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N/S: Country Street (Route 140)
E: Route 24 NB Ramps
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-B
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	224	48	51	0	296	109	728
07:15 AM	242	63	74	0	312	167	858
07:30 AM	247	73	63	0	279	137	799
07:45 AM	214	65	73	0	263	145	760
Total	927	249	261	0	1150	558	3145
08:00 AM	206	68	62	0	239	113	688
08:15 AM	229	41	46	0	217	106	639
08:30 AM	240	45	54	0	216	114	669
08:45 AM	195	37	42	0	225	116	615
Total	870	191	204	0	897	449	2611
Grand Total	1797	440	465	0	2047	1007	5756
Apprch %	80.3	19.7	100	0	67	33	
Total %	31.2	7.6	8.1	0	35.6	17.5	
Cars	1626	406	453	0	1912	936	5333
% Cars	90.5	92.3	97.4	0	93.4	92.9	92.7
Heavy Vehicles	171	34	12	0	135	71	423
% Heavy Vehicles	9.5	7.7	2.6	0	6.6	7.1	7.3

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	224	48	272	51	0	51	296	109	405	728
07:15 AM	242	63	305	**74**	0	**74**	**312**	**167**	**479**	**858**
07:30 AM	**247**	**73**	**320**	63	0	63	279	137	416	799
07:45 AM	214	65	279	73	0	73	263	145	408	760
Total Volume	927	249	1176	261	0	261	1150	558	1708	3145
% App. Total	78.8	21.2		100	0		67.3	32.7		
PHF	.938	.853	.919	.882	.000	.882	.921	.835	.891	.916
Cars	854	235	1089	257	0	257	1083	522	1605	2951
% Cars	92.1	94.4	92.6	98.5	0	98.5	94.2	93.5	94.0	93.8
Heavy Vehicles	73	14	87	4	0	4	67	36	103	194
% Heavy Vehicles	7.9	5.6	7.4	1.5	0	1.5	5.8	6.5	6.0	6.2

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N/S: Country Street (Route 140)
E: Route 24 NB Ramps
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-B
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	206	44	51	0	275	103	679
07:15 AM	225	59	74	0	295	155	808
07:30 AM	226	70	60	0	260	128	744
07:45 AM	197	62	72	0	253	136	720
Total	854	235	257	0	1083	522	2951
08:00 AM	184	61	62	0	222	102	631
08:15 AM	198	39	44	0	204	98	583
08:30 AM	215	40	51	0	202	106	614
08:45 AM	175	31	39	0	201	108	554
Total	772	171	196	0	829	414	2382
Grand Total	1626	406	453	0	1912	936	5333
Apprch %	80	20	100	0	67.1	32.9	
Total %	30.5	7.6	8.5	0	35.9	17.6	

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	206	44	250	51	0	51	275	103	378	679
07:15 AM	225	59	284	**74**	0	**74**	**295**	**155**	**450**	**808**
07:30 AM	**226**	**70**	**296**	60	0	60	260	128	388	744
07:45 AM	197	62	259	72	0	72	253	136	389	720
Total Volume	854	235	1089	257	0	257	1083	522	1605	2951
% App. Total	78.4	21.6		100	0		67.5	32.5		
PHF	.945	.839	.920	.868	.000	.868	.918	.842	.892	.913

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File Name : 81676 G-B
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	18	4	0	0	21	6	49
07:15 AM	17	4	0	0	17	12	50
07:30 AM	21	3	3	0	19	9	55
07:45 AM	17	3	1	0	10	9	40
Total	73	14	4	0	67	36	194
08:00 AM	22	7	0	0	17	11	57
08:15 AM	31	2	2	0	13	8	56
08:30 AM	25	5	3	0	14	8	55
08:45 AM	20	6	3	0	24	8	61
Total	98	20	8	0	68	35	229
Grand Total	171	34	12	0	135	71	423
Apprch %	83.4	16.6	100	0	65.5	34.5	
Total %	40.4	8	2.8	0	31.9	16.8	

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	22	**7**	29	0	0	0	17	**11**	28	57
08:15 AM	**31**	2	**33**	2	0	2	13	8	21	56
08:30 AM	25	5	30	**3**	0	**3**	14	8	22	55
08:45 AM	20	6	26	3	0	3	**24**	8	**32**	**61**
Total Volume	**98**	**20**	**118**	**8**	**0**	**8**	**68**	**35**	**103**	**229**
% App. Total	**83.1**	**16.9**		**100**	**0**		**66**	**34**		
PHF	**.790**	**.714**	**.894**	**.667**	**.000**	**.667**	**.708**	**.795**	**.805**	**.939**

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City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-B
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) From North				Route 24 NB Ramps From East				County Street (Route 140) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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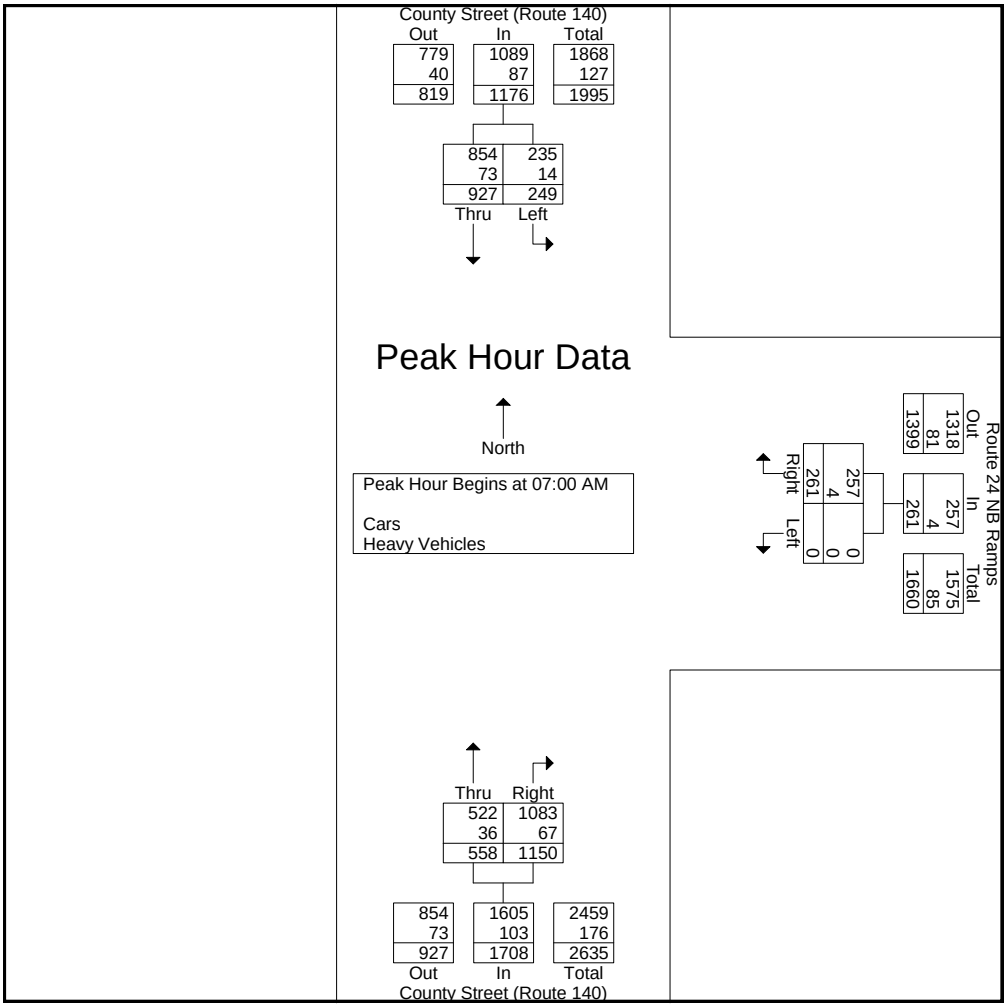
Page No : 1

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	224	48	272	51	0	51	296	109	405	728
07:15 AM	242	63	305	**74**	0	**74**	**312**	**167**	**479**	**858**
07:30 AM	**247**	**73**	**320**	63	0	63	279	137	416	799
07:45 AM	214	65	279	73	0	73	263	145	408	760
Total Volume	927	249	1176	261	0	261	1150	558	1708	3145
% App. Total	78.8	21.2		100	0		67.3	32.7		
PHF	.938	.853	.919	.882	.000	.882	.921	.835	.891	.916
Cars	854	235	1089	257	0	257	1083	522	1605	2951
% Cars	92.1	94.4	92.6	98.5	0	98.5	94.2	93.5	94.0	93.8
Heavy Vehicles	73	14	87	4	0	4	67	36	103	194
% Heavy Vehicles	7.9	5.6	7.4	1.5	0	1.5	5.8	6.5	6.0	6.2



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Client: VHB/J. Quitter

File Name : 81676 G-BBB
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	500	57	63	0	180	192	992
04:15 PM	571	39	53	0	185	169	1017
04:30 PM	541	35	59	0	181	183	999
04:45 PM	564	35	62	0	165	204	1030
Total	2176	166	237	0	711	748	4038
05:00 PM	537	51	59	0	186	185	1018
05:15 PM	528	56	56	0	186	161	987
05:30 PM	461	34	64	0	188	177	924
05:45 PM	407	38	45	0	172	176	838
Total	1933	179	224	0	732	699	3767
Grand Total	4109	345	461	0	1443	1447	7805
Apprch %	92.3	7.7	100	0	49.9	50.1	
Total %	52.6	4.4	5.9	0	18.5	18.5	
Cars	3998	325	454	0	1360	1405	7542
% Cars	97.3	94.2	98.5	0	94.2	97.1	96.6
Heavy Vehicles	111	20	7	0	83	42	263
% Heavy Vehicles	2.7	5.8	1.5	0	5.8	2.9	3.4

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**571**	39	**610**	53	0	53	185	169	354	1017
04:30 PM	541	35	576	59	0	59	181	183	364	999
04:45 PM	564	35	599	**62**	0	**62**	165	**204**	369	**1030**
05:00 PM	**537**	**51**	588	59	0	59	**186**	185	**371**	1018
Total Volume	2213	160	2373	233	0	233	717	741	1458	4064
% App. Total	93.3	6.7		100	0		49.2	50.8		
PHF	.969	.784	.973	.940	.000	.940	.964	.908	.982	.986
Cars	2139	151	2290	229	0	229	675	722	1397	3916
% Cars	96.7	94.4	96.5	98.3	0	98.3	94.1	97.4	95.8	96.4
Heavy Vehicles	74	9	83	4	0	4	42	19	61	148
% Heavy Vehicles	3.3	5.6	3.5	1.7	0	1.7	5.9	2.6	4.2	3.6

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N/S: County Street (Route 140)
E: Route 24 NB Ramps
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-BBB
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	493	53	61	0	167	182	956
04:15 PM	552	37	53	0	177	164	983
04:30 PM	527	34	58	0	164	177	960
04:45 PM	544	31	60	0	157	200	992
Total	2116	155	232	0	665	723	3891
05:00 PM	516	49	58	0	177	181	981
05:15 PM	513	53	55	0	177	158	956
05:30 PM	452	32	64	0	181	174	903
05:45 PM	401	36	45	0	160	169	811
Total	1882	170	222	0	695	682	3651
Grand Total	3998	325	454	0	1360	1405	7542
Apprch %	92.5	7.5	100	0	49.2	50.8	
Total %	53	4.3	6	0	18	18.6	

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**552**	37	**589**	53	0	53	**177**	164	341	983
04:30 PM	527	34	561	58	0	58	164	177	341	960
04:45 PM	544	31	575	**60**	0	**60**	157	**200**	357	**992**
05:00 PM	**516**	**49**	565	58	0	58	177	181	**358**	981
Total Volume	2139	151	2290	229	0	229	675	722	1397	3916
% App. Total	93.4	6.6		100	0		48.3	51.7		
PHF	.969	.770	.972	.954	.000	.954	.953	.903	.976	.987

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File Name : 81676 G-BBB
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		Route 24 NB Ramps From East		County Street (Route 140) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	7	4	2	0	13	10	36
04:15 PM	19	2	0	0	8	5	34
04:30 PM	14	1	1	0	17	6	39
04:45 PM	20	4	2	0	8	4	38
Total	60	11	5	0	46	25	147
05:00 PM	21	2	1	0	9	4	37
05:15 PM	15	3	1	0	9	3	31
05:30 PM	9	2	0	0	7	3	21
05:45 PM	6	2	0	0	12	7	27
Total	51	9	2	0	37	17	116
Grand Total	111	20	7	0	83	42	263
Apprch %	84.7	15.3	100	0	66.4	33.6	
Total %	42.2	7.6	2.7	0	31.6	16	

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	19	2	21	0	0	0	8	5	13	34
04:30 PM	14	1	15	1	0	1	**17**	**6**	**23**	**39**
04:45 PM	**20**	**4**	**24**	**2**	0	**2**	8	4	12	38
05:00 PM	**21**	2	23	1	0	1	9	4	13	37
Total Volume	74	9	83	4	0	4	42	19	61	148
% App. Total	89.2	10.8		100	0		68.9	31.1		
PHF	.881	.563	.865	.500	.000	.500	.618	.792	.663	.949

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File Name : 81676 G-BBB
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) From North				Route 24 NB Ramps From East				County Street (Route 140) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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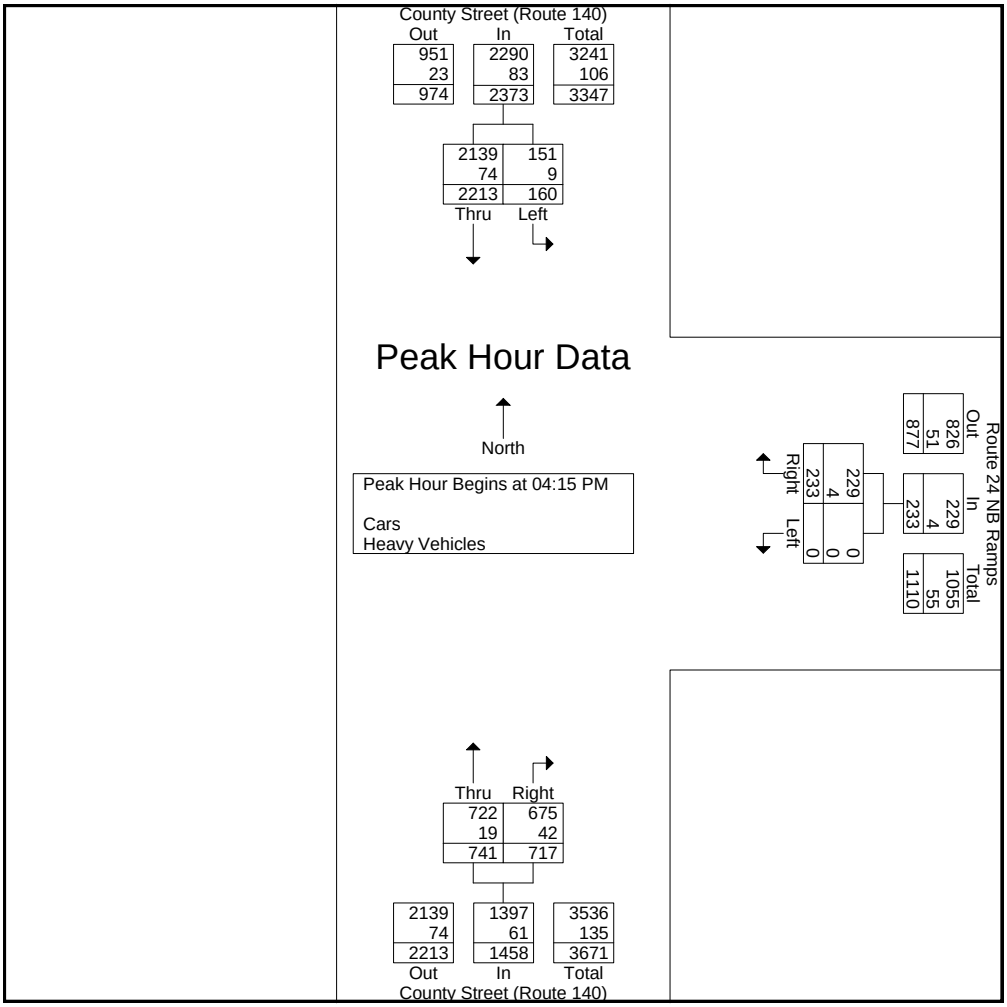
Start Date : 9/11/2008
Page No : 1

	County Street (Route 140) From North			Route 24 NB Ramps From East			County Street (Route 140) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**571**	39	**610**	53	0	53	185	169	354	1017
04:30 PM	541	35	576	59	0	59	181	183	364	999
04:45 PM	564	35	599	**62**	0	**62**	165	**204**	369	**1030**
05:00 PM	**537**	**51**	588	59	0	59	**186**	185	**371**	1018
Total Volume	2213	160	2373	233	0	233	717	741	1458	4064
% App. Total	93.3	6.7		100	0		49.2	50.8		
PHF	.969	.784	.973	.940	.000	.940	.964	.908	.982	.986
Cars	2139	151	2290	229	0	229	675	722	1397	3916
% Cars	96.7	94.4	96.5	98.3	0	98.3	94.1	97.4	95.8	96.4
Heavy Vehicles	74	9	83	4	0	4	42	19	61	148
% Heavy Vehicles	3.3	5.6	3.5	1.7	0	1.7	5.9	2.6	4.2	3.6



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W: Route 24 SB Ramps
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-C
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	55	160	158	11	117	48	549
07:15 AM	44	141	200	27	161	76	649
07:30 AM	68	175	182	24	155	52	656
07:45 AM	62	134	204	10	146	46	602
Total	229	610	744	72	579	222	2456
08:00 AM	52	137	152	16	141	27	525
08:15 AM	51	120	148	13	153	33	518
08:30 AM	53	130	153	20	164	31	551
08:45 AM	42	111	140	12	120	36	461
Total	198	498	593	61	578	127	2055
Grand Total	427	1108	1337	133	1157	349	4511
Apprch %	27.8	72.2	91	9	76.8	23.2	
Total %	9.5	24.6	29.6	2.9	25.6	7.7	
Cars	413	1039	1277	110	1030	319	4188
% Cars	96.7	93.8	95.5	82.7	89	91.4	92.8
Heavy Vehicles	14	69	60	23	127	30	323
% Heavy Vehicles	3.3	6.2	4.5	17.3	11	8.6	7.2

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	55	160	215	158	11	169	117	48	165	549
07:15 AM	44	141	185	200	**27**	**227**	**161**	**76**	**237**	649
07:30 AM	**68**	**175**	**243**	182	24	206	155	52	207	**656**
07:45 AM	**62**	**134**	**196**	**204**	10	214	146	46	192	602
Total Volume	229	610	839	744	72	816	579	222	801	2456
% App. Total	27.3	72.7		91.2	8.8		72.3	27.7		
PHF	.842	.871	.863	.912	.667	.899	.899	.730	.845	.936
Cars	221	584	805	716	59	775	524	210	734	2314
% Cars	96.5	95.7	95.9	96.2	81.9	95.0	90.5	94.6	91.6	94.2
Heavy Vehicles	8	26	34	28	13	41	55	12	67	142
% Heavy Vehicles	3.5	4.3	4.1	3.8	18.1	5.0	9.5	5.4	8.4	5.8

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N/S: Country Street (Route 140)
W: Route 24 SB Ramps
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-C
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	52	155	153	9	106	45	520
07:15 AM	42	136	192	22	146	73	611
07:30 AM	65	165	175	20	139	51	615
07:45 AM	62	128	196	8	133	41	568
Total	221	584	716	59	524	210	2314
08:00 AM	52	123	143	15	128	26	487
08:15 AM	51	113	140	10	128	24	466
08:30 AM	52	124	147	15	142	27	507
08:45 AM	37	95	131	11	108	32	414
Total	192	455	561	51	506	109	1874
Grand Total	413	1039	1277	110	1030	319	4188
Apprch %	28.4	71.6	92.1	7.9	76.4	23.6	
Total %	9.9	24.8	30.5	2.6	24.6	7.6	

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	52	155	207	153	9	162	106	45	151	520
07:15 AM	42	136	178	192	**22**	**214**	**146**	**73**	**219**	611
07:30 AM	**65**	**165**	**230**	175	20	195	139	51	190	**615**
07:45 AM	**62**	**128**	**190**	**196**	8	204	133	41	174	568
Total Volume	221	584	805	716	59	775	524	210	734	2314
% App. Total	27.5	72.5		92.4	7.6		71.4	28.6		
PHF	.850	.885	.875	.913	.670	.905	.897	.719	.838	.941

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File Name : 81676 G-C
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	3	5	5	2	11	3	29
07:15 AM	2	5	8	5	15	3	38
07:30 AM	3	10	7	4	16	1	41
07:45 AM	0	6	8	2	13	5	34
Total	8	26	28	13	55	12	142
08:00 AM	0	14	9	1	13	1	38
08:15 AM	0	7	8	3	25	9	52
08:30 AM	1	6	6	5	22	4	44
08:45 AM	5	16	9	1	12	4	47
Total	6	43	32	10	72	18	181
Grand Total	14	69	60	23	127	30	323
Apprch %	16.9	83.1	72.3	27.7	80.9	19.1	
Total %	4.3	21.4	18.6	7.1	39.3	9.3	

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	14	14	**9**	1	10	13	1	14	38
08:15 AM	0	7	7	8	3	**11**	**25**	**9**	**34**	**52**
08:30 AM	**1**	**6**	**7**	**6**	**5**	11	22	4	26	44
08:45 AM	**5**	**16**	**21**	9	1	10	12	4	16	47
Total Volume	6	43	49	32	10	42	72	18	90	181
% App. Total	12.2	87.8		76.2	23.8		80	20		
PHF	.300	.672	.583	.889	.500	.955	.720	.500	.662	.870

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File Name : 81676 G-C
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) From North				County Street (Route 140) From South				Route 24 SB Ramps From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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File Name : 81676 G-C
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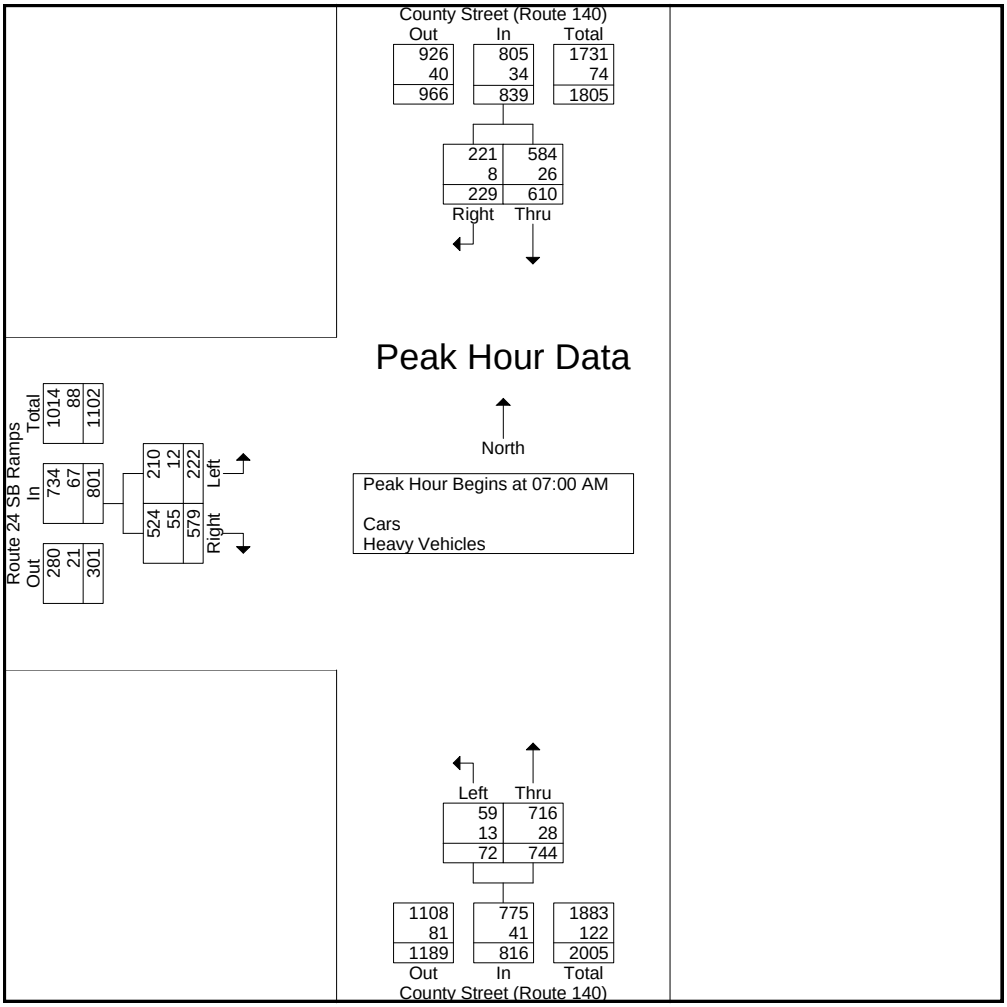
Start Date : 9/11/2008
Page No : 1

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	55	160	215	158	11	169	117	48	165	549
07:15 AM	44	141	185	200	**27**	**227**	**161**	**76**	**237**	649
07:30 AM	**68**	**175**	**243**	182	24	206	155	52	207	**656**
07:45 AM	**62**	**134**	**196**	**204**	10	214	146	46	192	602
Total Volume	229	610	839	744	72	816	579	222	801	2456
% App. Total	27.3	72.7		91.2	8.8		72.3	27.7		
PHF	.842	.871	.863	.912	.667	.899	.899	.730	.845	.936
Cars	221	584	805	716	59	775	524	210	734	2314
% Cars	96.5	95.7	95.9	96.2	81.9	95.0	90.5	94.6	91.6	94.2
Heavy Vehicles	8	26	34	28	13	41	55	12	67	142
% Heavy Vehicles	3.5	4.3	4.1	3.8	18.1	5.0	9.5	5.4	8.4	5.8



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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-CCC
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	81	213	184	59	340	55	932
04:15 PM	77	265	194	46	340	55	977
04:30 PM	74	219	190	47	348	62	940
04:45 PM	78	248	206	64	334	73	1003
Total	310	945	774	216	1362	245	3852
05:00 PM	89	268	200	47	317	50	971
05:15 PM	77	242	178	43	339	85	964
05:30 PM	76	219	190	44	267	49	845
05:45 PM	61	207	177	34	241	51	771
Total	303	936	745	168	1164	235	3551
Grand Total	613	1881	1519	384	2526	480	7403
Apprch %	24.6	75.4	79.8	20.2	84	16	
Total %	8.3	25.4	20.5	5.2	34.1	6.5	
Cars	605	1838	1473	381	2439	465	7201
% Cars	98.7	97.7	97	99.2	96.6	96.9	97.3
Heavy Vehicles	8	43	46	3	87	15	202
% Heavy Vehicles	1.3	2.3	3	0.8	3.4	3.1	2.7

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	77	265	342	194	46	240	340	55	395	977
04:30 PM	74	219	293	190	47	237	**348**	62	**410**	940
04:45 PM	78	248	326	**206**	**64**	**270**	334	**73**	407	**1003**
05:00 PM	**89**	**268**	**357**	200	47	247	317	50	367	971
Total Volume	318	1000	1318	790	204	994	1339	240	1579	3891
% App. Total	24.1	75.9		79.5	20.5		84.8	15.2		
PHF	.893	.933	.923	.959	.797	.920	.962	.822	.963	.970
Cars	313	976	1289	767	203	970	1281	235	1516	3775
% Cars	98.4	97.6	97.8	97.1	99.5	97.6	95.7	97.9	96.0	97.0
Heavy Vehicles	5	24	29	23	1	24	58	5	63	116
% Heavy Vehicles	1.6	2.4	2.2	2.9	0.5	2.4	4.3	2.1	4.0	3.0

PRECISION DATA INDUSTRIES, LLC
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N/S: County Street (Route 140)
W: Route 24 SB Ramps
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-CCC
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	80	209	175	57	333	47	901
04:15 PM	76	256	189	45	327	53	946
04:30 PM	74	216	184	47	338	62	921
04:45 PM	74	240	199	64	317	72	966
Total	304	921	747	213	1315	234	3734
05:00 PM	89	264	195	47	299	48	942
05:15 PM	76	233	174	43	328	83	937
05:30 PM	76	216	186	44	260	49	831
05:45 PM	60	204	171	34	237	51	757
Total	301	917	726	168	1124	231	3467
Grand Total	605	1838	1473	381	2439	465	7201
Apprch %	24.8	75.2	79.4	20.6	84	16	
Total %	8.4	25.5	20.5	5.3	33.9	6.5	

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	76	256	332	189	45	234	327	53	380	946
04:30 PM	74	216	290	184	47	231	**338**	62	**400**	921
04:45 PM	74	240	314	**199**	**64**	**263**	317	**72**	389	**966**
05:00 PM	**89**	**264**	**353**	195	47	242	299	48	347	942
Total Volume	313	976	1289	767	203	970	1281	235	1516	3775
% App. Total	24.3	75.7		79.1	20.9		84.5	15.5		
PHF	.879	.924	.913	.964	.793	.922	.947	.816	.948	.977

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File Name : 81676 G-CCC
Site Code : 10111.31
Start Date : 9/11/2008

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North		County Street (Route 140) From South		Route 24 SB Ramps From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	1	4	9	2	7	8	31
04:15 PM	1	9	5	1	13	2	31
04:30 PM	0	3	6	0	10	0	19
04:45 PM	4	8	7	0	17	1	37
Total	6	24	27	3	47	11	118
05:00 PM	0	4	5	0	18	2	29
05:15 PM	1	9	4	0	11	2	27
05:30 PM	0	3	4	0	7	0	14
05:45 PM	1	3	6	0	4	0	14
Total	2	19	19	0	40	4	84
Grand Total	8	43	46	3	87	15	202
Apprch %	15.7	84.3	93.9	6.1	85.3	14.7	
Total %	4	21.3	22.8	1.5	43.1	7.4	

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	1	4	5	**9**	**2**	**11**	7	**8**	15	31
04:15 PM	1	**9**	10	5	1	6	13	2	15	31
04:30 PM	0	3	3	6	0	6	10	0	10	19
04:45 PM	**4**	8	**12**	7	0	7	**17**	1	**18**	**37**
Total Volume	**6**	**24**	**30**	**27**	**3**	**30**	**47**	**11**	**58**	**118**
% App. Total	**20**	**80**		**90**	**10**		**81**	**19**		
PHF	**.375**	**.667**	**.625**	**.750**	**.375**	**.682**	**.691**	**.344**	**.806**	**.797**

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File Name : 81676 G-CCC
Site Code : 10111.31
Start Date : 9/11/2008

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) From North				County Street (Route 140) From South				Route 24 SB Ramps From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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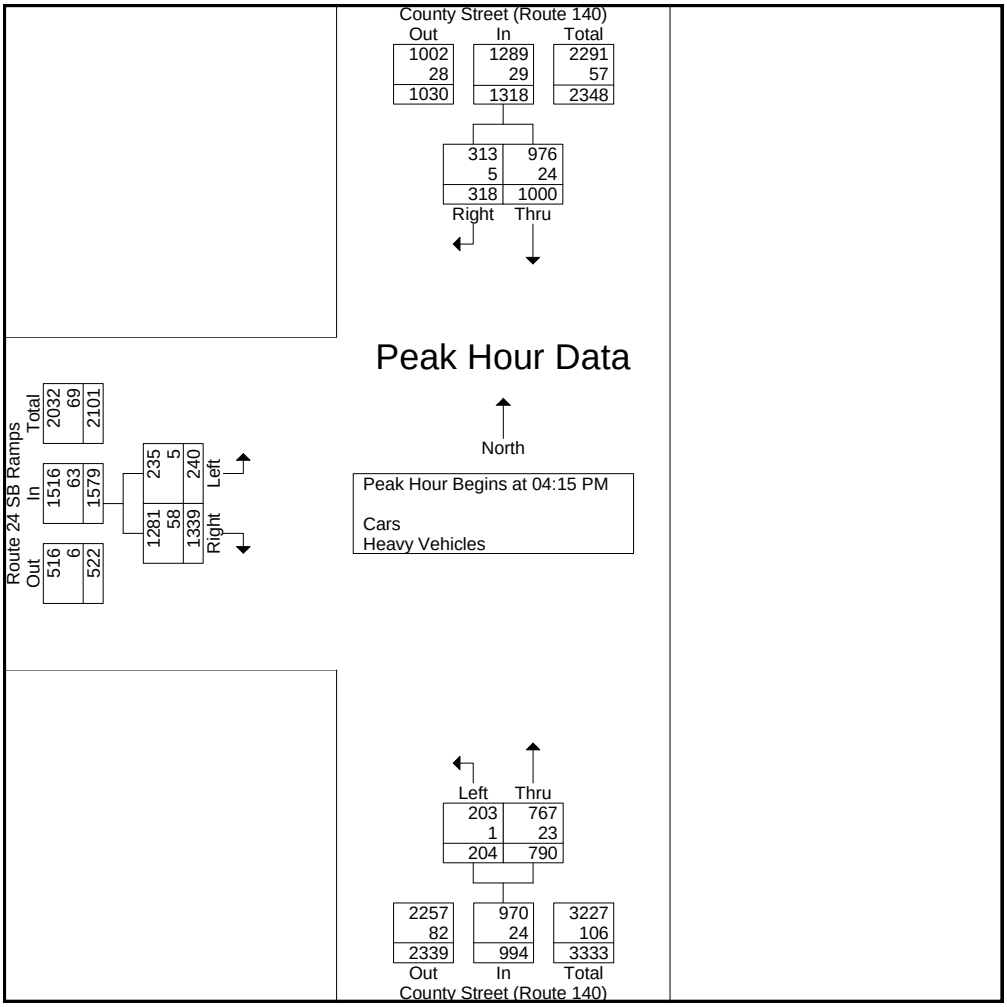
Page No : 1

	County Street (Route 140) From North			County Street (Route 140) From South			Route 24 SB Ramps From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	77	265	342	194	46	240	340	55	395	977
04:30 PM	74	219	293	190	47	237	**348**	62	**410**	940
04:45 PM	78	248	326	**206**	**64**	**270**	334	**73**	407	**1003**
05:00 PM	**89**	**268**	**357**	200	47	247	317	50	367	971
Total Volume	318	1000	1318	790	204	994	1339	240	1579	3891
% App. Total	24.1	75.9		79.5	20.5		84.8	15.2		
PHF	.893	.933	.923	.959	.797	.920	.962	.822	.963	.970
Cars	313	976	1289	767	203	970	1281	235	1516	3775
% Cars	98.4	97.6	97.8	97.1	99.5	97.6	95.7	97.9	96.0	97.0
Heavy Vehicles	5	24	29	23	1	24	58	5	63	116
% Heavy Vehicles	1.6	2.4	2.2	2.9	0.5	2.4	4.3	2.1	4.0	3.0



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E/W: USA Storage Dr/Taunton Depot Drive
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-E
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	16	191	0	0	0	1	2	134	18	18	0	8	388
07:15 AM	16	205	0	0	0	0	0	160	24	13	0	12	430
07:30 AM	31	205	1	0	0	1	0	184	19	23	0	12	476
07:45 AM	34	175	0	0	0	1	0	181	15	11	0	15	432
Total	97	776	1	0	0	3	2	659	76	65	0	47	1726
08:00 AM	40	142	0	0	0	0	0	145	24	20	0	16	387
08:15 AM	33	149	0	0	0	0	0	133	19	21	0	19	374
08:30 AM	27	137	0	0	0	0	0	139	21	16	0	22	362
08:45 AM	39	129	0	1	0	1	2	136	24	17	0	18	367
Total	139	557	0	1	0	1	2	553	88	74	0	75	1490
Grand Total	236	1333	1	1	0	4	4	1212	164	139	0	122	3216
Apprch %	15	84.9	0.1	20	0	80	0.3	87.8	11.9	53.3	0	46.7	
Total %	7.3	41.4	0	0	0	0.1	0.1	37.7	5.1	4.3	0	3.8	
Cars	225	1269	1	1	0	4	3	1156	158	134	0	115	3066
% Cars	95.3	95.2	100	100	0	100	75	95.4	96.3	96.4	0	94.3	95.3
Heavy Vehicles	11	64	0	0	0	0	1	56	6	5	0	7	150
% Heavy Vehicles	4.7	4.8	0	0	0	0	25	4.6	3.7	3.6	0	5.7	4.7

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	16	191	0	207	0	0	**1**	**1**	**2**	134	18	154	18	0	8	26	388
07:15 AM	16	**205**	0	221	0	0	0	0	0	160	**24**	184	13	0	12	25	430
07:30 AM	31	205	**1**	**237**	0	0	1	1	0	**184**	19	**203**	**23**	0	12	**35**	**476**
07:45 AM	**34**	175	0	209	0	0	1	1	0	181	15	196	11	0	**15**	26	432
Total Volume	97	776	1	874	0	0	3	3	2	659	76	737	65	0	47	112	1726
% App. Total	11.1	88.8	0.1		0	0	100		0.3	89.4	10.3		58	0	42		
PHF	.713	.946	.250	.922	.000	.000	.750	.750	.250	.895	.792	.908	.707	.000	.783	.800	.907
Cars	91	750	1	842	0	0	3	3	1	626	75	702	62	0	42	104	1651
% Cars	93.8	96.6	100	96.3	0	0	100	100	50.0	95.0	98.7	95.3	95.4	0	89.4	92.9	95.7
Heavy Vehicles	6	26	0	32	0	0	0	0	1	33	1	35	3	0	5	8	75
% Heavy Vehicles	6.2	3.4	0	3.7	0	0	0	0	50.0	5.0	1.3	4.7	4.6	0	10.6	7.1	4.3

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N/S: Country Street (Route 140)
E/W: USA Storage Dr/Taunton Depot Drive
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-E
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	14	183	0	0	0	1	1	131	17	18	0	8	373
07:15 AM	14	202	0	0	0	0	0	155	24	13	0	10	418
07:30 AM	30	199	1	0	0	1	0	170	19	21	0	10	451
07:45 AM	33	166	0	0	0	1	0	170	15	10	0	14	409
Total	91	750	1	0	0	3	1	626	75	62	0	42	1651
08:00 AM	38	130	0	0	0	0	0	138	24	20	0	16	366
08:15 AM	33	143	0	0	0	0	0	128	16	19	0	19	358
08:30 AM	26	129	0	0	0	0	0	135	19	16	0	21	346
08:45 AM	37	117	0	1	0	1	2	129	24	17	0	17	345
Total	134	519	0	1	0	1	2	530	83	72	0	73	1415
Grand Total	225	1269	1	1	0	4	3	1156	158	134	0	115	3066
Apprch %	15.1	84.9	0.1	20	0	80	0.2	87.8	12	53.8	0	46.2	
Total %	7.3	41.4	0	0	0	0.1	0.1	37.7	5.2	4.4	0	3.8	

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	14	183	0	197	0	0	**1**	**1**	**1**	131	17	149	18	0	8	26	373
07:15 AM	14	**202**	0	216	0	0	0	0	0	155	**24**	179	13	0	10	23	418
07:30 AM	30	199	**1**	**230**	0	0	1	1	0	**170**	19	**189**	**21**	0	10	**31**	**451**
07:45 AM	**33**	166	0	199	0	0	1	1	0	170	15	185	10	0	**14**	24	409
Total Volume	91	750	1	842	0	0	3	3	1	626	75	702	62	0	42	104	1651
% App. Total	10.8	89.1	0.1		0	0	100		0.1	89.2	10.7		59.6	0	40.4		
PHF	.689	.928	.250	.915	.000	.000	.750	.750	.250	.921	.781	.929	.738	.000	.750	.839	.915

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Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	8	0	0	0	0	1	3	1	0	0	0	15
07:15 AM	2	3	0	0	0	0	0	5	0	0	0	2	12
07:30 AM	1	6	0	0	0	0	0	14	0	2	0	2	25
07:45 AM	1	9	0	0	0	0	0	11	0	1	0	1	23
Total	6	26	0	0	0	0	1	33	1	3	0	5	75
08:00 AM	2	12	0	0	0	0	0	7	0	0	0	0	21
08:15 AM	0	6	0	0	0	0	0	5	3	2	0	0	16
08:30 AM	1	8	0	0	0	0	0	4	2	0	0	1	16
08:45 AM	2	12	0	0	0	0	0	7	0	0	0	1	22
Total	5	38	0	0	0	0	0	23	5	2	0	2	75
Grand Total	11	64	0	0	0	0	1	56	6	5	0	7	150
Apprch %	14.7	85.3	0	0	0	0	1.6	88.9	9.5	41.7	0	58.3	
Total %	7.3	42.7	0	0	0	0	0.7	37.3	4	3.3	0	4.7	

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	6	0	7	0	0	0	0	0	**14**	0	**14**	**2**	0	**2**	**4**	**25**
07:45 AM	1	9	0	10	0	0	0	0	0	11	0	11	1	0	1	2	23
08:00 AM	**2**	**12**	0	**14**	0	0	0	0	0	7	0	7	0	0	0	0	21
08:15 AM	0	6	0	6	0	0	0	0	0	5	**3**	8	2	0	0	2	16
Total Volume	4	33	0	37	0	0	0	0	0	37	3	40	5	0	3	8	85
% App. Total	10.8	89.2	0		0	0	0		0	92.5	7.5		62.5	0	37.5		
PHF	.500	.688	.000	.661	.000	.000	.000	.000	.000	.661	.250	.714	.625	.000	.375	.500	.850

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File Name : 81676 G-E
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Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
Apprch %	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	
Total %	0	0	0	66.7	0	0	0	33.3	0	0	0	0	0	0	0	0	

	County Street (Route 140) From North					USA Storage Driveway From East					County Street (Route 140) From South					Taunton Depot Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	1	1	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	**2**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375

PRECISION DATA INDUSTRIES, LLC
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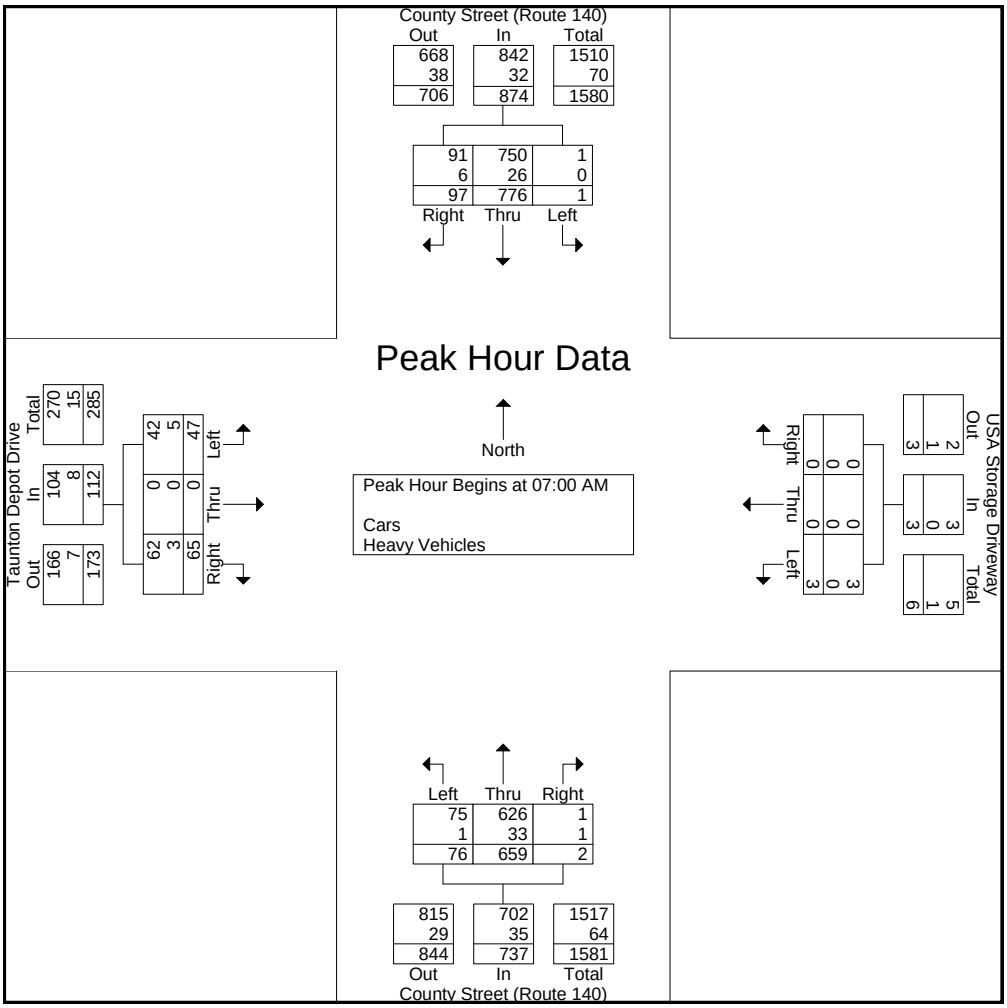
N/S: Country Street (Route 140)
E/W: USA Storage Dr/Taunton Depot Drive
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-E
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	16	191	0	207	0	0	**1**	**1**	**2**	134	18	154	18	0	8	26	388
07:15 AM	16	**205**	0	221	0	0	0	0	0	160	**24**	184	13	0	12	25	430
07:30 AM	31	205	**1**	**237**	0	0	1	1	0	**184**	19	**203**	**23**	0	12	**35**	**476**
07:45 AM	**34**	175	0	209	0	0	1	1	0	181	15	196	11	0	**15**	26	432
Total Volume	97	776	1	874	0	0	3	3	2	659	76	737	65	0	47	112	1726
% App. Total	11.1	88.8	0.1		0	0	100		0.3	89.4	10.3		58	0	42		
PHF	.713	.946	.250	.922	.000	.000	.750	.750	.250	.895	.792	.908	.707	.000	.783	.800	.907
Cars	91	750	1	842	0	0	3	3	1	626	75	702	62	0	42	104	1651
% Cars	93.8	96.6	100	96.3	0	0	100	100	50.0	95.0	98.7	95.3	95.4	0	89.4	92.9	95.7
Heavy Vehicles	6	26	0	32	0	0	0	0	1	33	1	35	3	0	5	8	75
% Heavy Vehicles	6.2	3.4	0	3.7	0	0	0	0	50.0	5.0	1.3	4.7	4.6	0	10.6	7.1	4.3



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N/S: County Street (Route 140)
E/W: USA Storage Dr/Taunton Depot Drive
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-EEE
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	53	186	0	1	0	1	0	188	36	46	0	57	568
04:15 PM	73	192	0	0	0	2	0	161	48	55	0	57	588
04:30 PM	56	203	0	0	0	1	0	205	34	56	1	63	619
04:45 PM	59	207	0	0	0	0	0	191	57	51	2	43	610
Total	241	788	0	1	0	4	0	745	175	208	3	220	2385
05:00 PM	60	210	1	1	0	1	0	197	44	57	0	64	635
05:15 PM	73	223	0	1	1	1	0	190	59	54	0	57	659
05:30 PM	65	179	0	0	0	0	0	168	65	59	0	48	584
05:45 PM	72	208	0	0	0	0	0	154	72	48	1	62	617
Total	270	820	1	2	1	2	0	709	240	218	1	231	2495
Grand Total	511	1608	1	3	1	6	0	1454	415	426	4	451	4880
Apprch %	24.1	75.8	0	30	10	60	0	77.8	22.2	48.4	0.5	51.2	
Total %	10.5	33	0	0.1	0	0.1	0	29.8	8.5	8.7	0.1	9.2	
Cars	505	1566	1	3	1	6	0	1435	413	422	4	446	4802
% Cars	98.8	97.4	100	100	100	100	0	98.7	99.5	99.1	100	98.9	98.4
Heavy Vehicles	6	42	0	0	0	0	0	19	2	4	0	5	78
% Heavy Vehicles	1.2	2.6	0	0	0	0	0	1.3	0.5	0.9	0	1.1	1.6

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	56	203	0	259	0	0	**1**	1	0	**205**	34	239	56	1	63	120	619
04:45 PM	59	207	0	266	0	0	0	0	0	191	57	248	51	**2**	43	96	610
05:00 PM	60	210	**1**	271	**1**	0	1	2	0	197	44	241	**57**	0	**64**	**121**	635
05:15 PM	**73**	**223**	0	**296**	1	**1**	1	**3**	0	190	**59**	**249**	54	0	57	111	**659**
Total Volume	248	843	1	1092	2	1	3	6	0	783	194	977	218	3	227	448	2523
% App. Total	22.7	77.2	0.1		33.3	16.7	50		0	80.1	19.9		48.7	0.7	50.7		
PHF	.849	.945	.250	.922	.500	.250	.750	.500	.000	.955	.822	.981	.956	.375	.887	.926	.957
Cars	245	820	1	1066	2	1	3	6	0	771	194	965	217	3	223	443	2480
% Cars	98.8	97.3	100	97.6	100	100	100	100	0	98.5	100	98.8	99.5	100	98.2	98.9	98.3
Heavy Vehicles	3	23	0	26	0	0	0	0	0	12	0	12	1	0	4	5	43
% Heavy Vehicles	1.2	2.7	0	2.4	0	0	0	0	0	1.5	0	1.2	0.5	0	1.8	1.1	1.7

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-EEE
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	53	178	0	1	0	1	0	184	35	45	0	57	554
04:15 PM	70	186	0	0	0	2	0	161	48	54	0	57	578
04:30 PM	56	198	0	0	0	1	0	201	34	55	1	61	607
04:45 PM	57	204	0	0	0	0	0	189	57	51	2	42	602
Total	236	766	0	1	0	4	0	735	174	205	3	217	2341
05:00 PM	60	207	1	1	0	1	0	193	44	57	0	63	627
05:15 PM	72	211	0	1	1	1	0	188	59	54	0	57	644
05:30 PM	65	178	0	0	0	0	0	167	64	58	0	47	579
05:45 PM	72	204	0	0	0	0	0	152	72	48	1	62	611
Total	269	800	1	2	1	2	0	700	239	217	1	229	2461
Grand Total	505	1566	1	3	1	6	0	1435	413	422	4	446	4802
Apprch %	24.4	75.6	0	30	10	60	0	77.7	22.3	48.4	0.5	51.1	
Total %	10.5	32.6	0	0.1	0	0.1	0	29.9	8.6	8.8	0.1	9.3	

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	56	198	0	254	0	0	**1**	1	0	**201**	34	235	55	1	61	117	607
04:45 PM	57	204	0	261	0	0	0	0	0	189	57	246	51	**2**	42	95	602
05:00 PM	60	207	**1**	268	**1**	0	1	2	0	193	44	237	**57**	0	**63**	**120**	627
05:15 PM	**72**	**211**	0	**283**	1	**1**	1	**3**	0	188	**59**	**247**	54	0	57	111	**644**
Total Volume	245	820	1	1066	2	1	3	6	0	771	194	965	217	3	223	443	2480
% App. Total	23	76.9	0.1		33.3	16.7	50		0	79.9	20.1		49	0.7	50.3		
PHF	.851	.972	.250	.942	.500	.250	.750	.500	.000	.959	.822	.977	.952	.375	.885	.923	.963

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Client: VHB/J. Quitter

File Name : 81676 G-EEE
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) From North			USA Storage Driveway From East			County Street (Route 140) From South			Taunton Depot Drive From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	8	0	0	0	0	0	4	1	1	0	0	14
04:15 PM	3	6	0	0	0	0	0	0	0	1	0	0	10
04:30 PM	0	5	0	0	0	0	0	4	0	1	0	2	12
04:45 PM	2	3	0	0	0	0	0	2	0	0	0	1	8
Total	5	22	0	0	0	0	0	10	1	3	0	3	44
05:00 PM	0	3	0	0	0	0	0	4	0	0	0	1	8
05:15 PM	1	12	0	0	0	0	0	2	0	0	0	0	15
05:30 PM	0	1	0	0	0	0	0	1	1	1	0	1	5
05:45 PM	0	4	0	0	0	0	0	2	0	0	0	0	6
Total	1	20	0	0	0	0	0	9	1	1	0	2	34
Grand Total	6	42	0	0	0	0	0	19	2	4	0	5	78
Apprch %	12.5	87.5	0	0	0	0	0	90.5	9.5	44.4	0	55.6	
Total %	7.7	53.8	0	0	0	0	0	24.4	2.6	5.1	0	6.4	

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**8**	0	8	0	0	0	0	0	**4**	**1**	**5**	**1**	0	0	1	**14**
04:15 PM	**3**	6	0	**9**	0	0	0	0	0	0	0	0	1	0	0	1	10
04:30 PM	0	5	0	5	0	0	0	0	0	4	0	4	1	0	**2**	**3**	12
04:45 PM	2	3	0	5	0	0	0	0	0	2	0	2	0	0	1	1	8
Total Volume	5	22	0	27	0	0	0	0	0	10	1	11	3	0	3	6	44
% App. Total	18.5	81.5	0		0	0	0		0	90.9	9.1		50	0	50		
PHF	.417	.688	.000	.750	.000	.000	.000	.000	.000	.625	.250	.550	.750	.000	.375	.500	.786

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Client: VHB/J. Quitter

File Name : 81676 G-EEE
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	5
04:15 PM	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	3
04:30 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4
Total	0	0	0	4	0	0	0	5	0	1	0	2	0	0	0	3	15
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:15 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	5
Total	0	0	0	5	0	0	0	2	0	1	0	0	0	0	0	0	8
Grand Total	0	0	0	9	0	0	0	7	0	2	0	2	0	0	0	3	23
Apprch %	0	0	0	100	0	0	0	100	0	50	0	50	0	0	0	100	
Total %	0	0	0	39.1	0	0	0	30.4	0	8.7	0	8.7	0	0	0	13	

	County Street (Route 140) From North					USA Storage Driveway From East					County Street (Route 140) From South					Taunton Depot Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	**3**	**3**	**5**
04:15 PM	0	0	0	1	1	0	0	0	1	1	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**
04:30 PM	**0**	**0**	**0**	**2**	**2**	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	**2**	**2**	0	0	0	0	0	4
Total Volume	0	0	0	4	4	0	0	0	5	5	0	1	0	2	3	0	0	0	3	3	15
% App. Total	0	0	0	100		0	0	0	100		0	33.3	0	66.7		0	0	0	100		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.625	.625	.000	.250	.000	.250	.375	.000	.000	.000	.250	.250	.750

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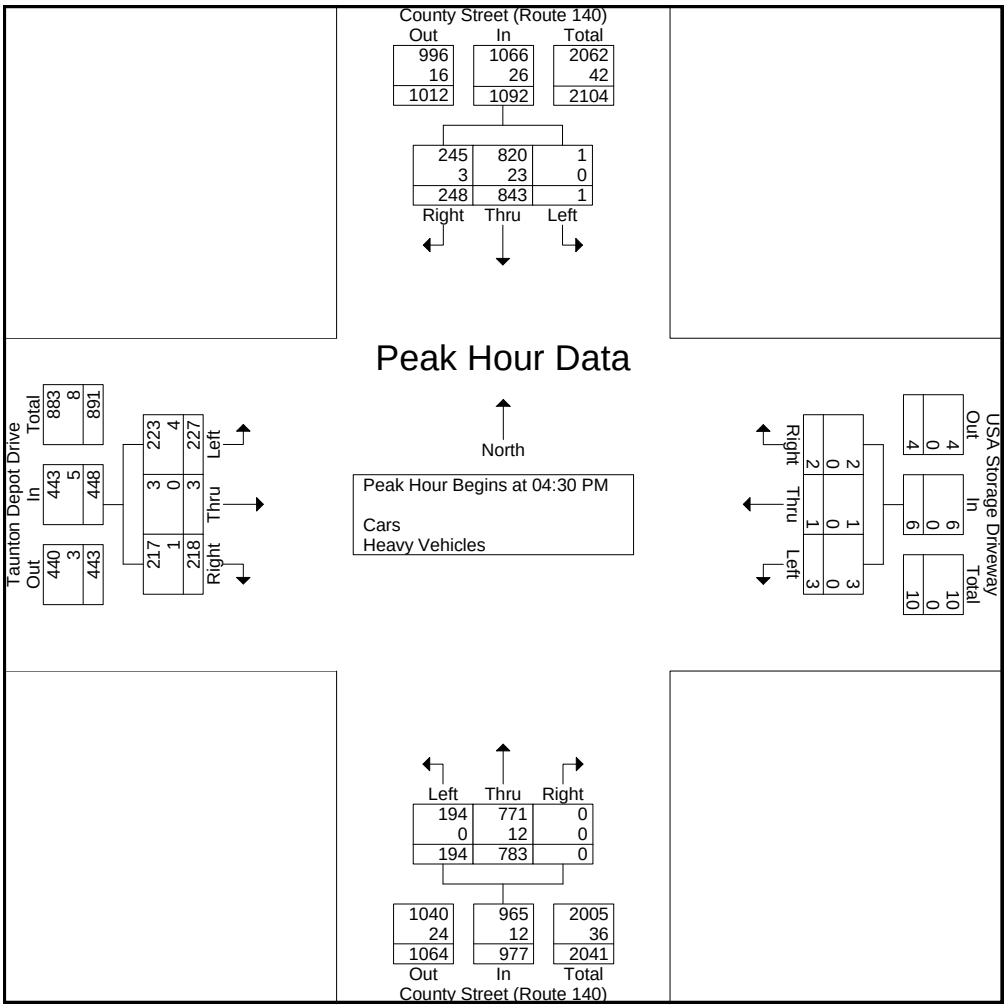
	County Street (Route 140) From North				USA Storage Driveway From East				County Street (Route 140) From South				Taunton Depot Drive From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	56	203	0	259	0	0	**1**	1	0	**205**	34	239	56	1	63	120	619
04:45 PM	59	207	0	266	0	0	0	0	0	191	57	248	51	**2**	43	96	610
05:00 PM	60	210	**1**	271	**1**	0	1	2	0	197	44	241	**57**	0	**64**	**121**	635
05:15 PM	**73**	**223**	0	**296**	1	**1**	1	**3**	0	190	**59**	**249**	54	0	57	111	**659**
Total Volume	248	843	1	1092	2	1	3	6	0	783	194	977	218	3	227	448	2523
% App. Total	22.7	77.2	0.1		33.3	16.7	50		0	80.1	19.9		48.7	0.7	50.7		
PHF	.849	.945	.250	.922	.500	.250	.750	.500	.000	.955	.822	.981	.956	.375	.887	.926	.957
Cars	245	820	1	1066	2	1	3	6	0	771	194	965	217	3	223	443	2480
% Cars	98.8	97.3	100	97.6	100	100	100	100	0	98.5	100	98.8	99.5	100	98.2	98.9	98.3
Heavy Vehicles	3	23	0	26	0	0	0	0	0	12	0	12	1	0	4	5	43
% Heavy Vehicles	1.2	2.7	0	2.4	0	0	0	0	0	1.5	0	1.2	0.5	0	1.8	1.1	1.7



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N/S: Silver City Mall/Route 140 NB Ramps
E/W: Stevens Street
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-F
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	3	2	9	26	15	3	5	17	40	0	120
07:15 AM	0	0	1	0	13	26	25	1	2	15	52	1	136
07:30 AM	1	3	1	1	13	29	21	2	1	16	57	0	145
07:45 AM	0	3	0	5	17	11	33	2	1	19	63	0	154
Total	1	6	5	8	52	92	94	8	9	67	212	1	555
08:00 AM	0	0	0	2	14	14	31	1	5	19	37	0	123
08:15 AM	0	1	1	3	12	10	10	4	3	11	53	0	108
08:30 AM	0	1	3	4	13	23	14	5	6	16	57	0	142
08:45 AM	1	1	2	6	21	16	18	11	4	21	41	1	143
Total	1	3	6	15	60	63	73	21	18	67	188	1	516
Grand Total	2	9	11	23	112	155	167	29	27	134	400	2	1071
Apprch %	9.1	40.9	50	7.9	38.6	53.4	74.9	13	12.1	25	74.6	0.4	
Total %	0.2	0.8	1	2.1	10.5	14.5	15.6	2.7	2.5	12.5	37.3	0.2	
Cars	2	9	10	21	108	140	163	27	22	119	367	2	990
% Cars	100	100	90.9	91.3	96.4	90.3	97.6	93.1	81.5	88.8	91.8	100	92.4
Heavy Vehicles	0	0	1	2	4	15	4	2	5	15	33	0	81
% Heavy Vehicles	0	0	9.1	8.7	3.6	9.7	2.4	6.9	18.5	11.2	8.2	0	7.6

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	**1**	1	0	13	26	39	25	1	2	28	15	52	**1**	68	136
07:30 AM	**1**	**3**	1	**5**	1	13	**29**	**43**	21	**2**	1	24	16	57	0	73	145
07:45 AM	0	3	0	3	**5**	**17**	11	33	**33**	2	1	36	**19**	**63**	0	**82**	**154**
08:00 AM	0	0	0	0	2	14	14	30	31	1	**5**	**37**	19	37	0	56	123
Total Volume	1	6	2	9	8	57	80	145	110	6	9	125	69	209	1	279	558
% App. Total	11.1	66.7	22.2		5.5	39.3	55.2		88	4.8	7.2		24.7	74.9	0.4		
PHF	.250	.500	.500	.450	.400	.838	.690	.843	.833	.750	.450	.845	.908	.829	.250	.851	.906
Cars	1	6	2	9	8	55	71	134	107	6	6	119	60	194	1	255	517
% Cars	100	100	100	100	100	96.5	88.8	92.4	97.3	100	66.7	95.2	87.0	92.8	100	91.4	92.7
Heavy Vehicles	0	0	0	0	0	2	9	11	3	0	3	6	9	15	0	24	41
% Heavy Vehicles	0	0	0	0	0	3.5	11.3	7.6	2.7	0	33.3	4.8	13.0	7.2	0	8.6	7.3

PRECISION DATA INDUSTRIES, LLC
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N/S: Silver City Mall/Route 140 NB Ramps
E/W: Stevens Street
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-F
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	3	2	9	26	15	2	5	16	37	0	115
07:15 AM	0	0	1	0	13	21	24	1	2	15	49	1	127
07:30 AM	1	3	1	1	13	26	19	2	0	14	53	0	133
07:45 AM	0	3	0	5	17	11	33	2	1	15	59	0	146
Total	1	6	5	8	52	84	91	7	8	60	198	1	521
08:00 AM	0	0	0	2	12	13	31	1	3	16	33	0	111
08:15 AM	0	1	0	2	11	9	10	4	3	9	49	0	98
08:30 AM	0	1	3	4	13	21	13	5	5	14	50	0	129
08:45 AM	1	1	2	5	20	13	18	10	3	20	37	1	131
Total	1	3	5	13	56	56	72	20	14	59	169	1	469
Grand Total	2	9	10	21	108	140	163	27	22	119	367	2	990
Apprch %	9.5	42.9	47.6	7.8	40.1	52	76.9	12.7	10.4	24.4	75.2	0.4	
Total %	0.2	0.9	1	2.1	10.9	14.1	16.5	2.7	2.2	12	37.1	0.2	

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**3**	3	2	9	**26**	37	15	**2**	**5**	22	**16**	37	0	53	115
07:15 AM	0	0	1	1	0	13	21	34	24	1	2	27	15	49	**1**	65	127
07:30 AM	**1**	**3**	1	**5**	1	13	26	**40**	19	2	0	21	14	53	0	67	133
07:45 AM	0	3	0	3	**5**	**17**	11	33	**33**	2	1	**36**	15	**59**	0	**74**	**146**
Total Volume	1	6	5	12	8	52	84	144	91	7	8	106	60	198	1	259	521
% App. Total	8.3	50	41.7		5.6	36.1	58.3		85.8	6.6	7.5		23.2	76.4	0.4		
PHF	.250	.500	.417	.600	.400	.765	.808	.900	.689	.875	.400	.736	.938	.839	.250	.875	.892

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Client: VHB/J.Quitter

File Name : 81676 G-F
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	1	3	0	5
07:15 AM	0	0	0	0	0	5	1	0	0	0	3	0	9
07:30 AM	0	0	0	0	0	3	2	0	1	2	4	0	12
07:45 AM	0	0	0	0	0	0	0	0	0	4	4	0	8
Total	0	0	0	0	0	8	3	1	1	7	14	0	34
08:00 AM	0	0	0	0	2	1	0	0	2	3	4	0	12
08:15 AM	0	0	1	1	1	1	0	0	0	2	4	0	10
08:30 AM	0	0	0	0	0	2	1	0	1	2	7	0	13
08:45 AM	0	0	0	1	1	3	0	1	1	1	4	0	12
Total	0	0	1	2	4	7	1	1	4	8	19	0	47
Grand Total	0	0	1	2	4	15	4	2	5	15	33	0	81
Apprch %	0	0	100	9.5	19	71.4	36.4	18.2	45.5	31.2	68.8	0	
Total %	0	0	1.2	2.5	4.9	18.5	4.9	2.5	6.2	18.5	40.7	0	

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	**2**	1	3	0	0	**2**	**2**	**3**	4	0	7	12
08:15 AM	0	0	**1**	**1**	**1**	1	1	3	0	0	0	0	2	4	0	6	10
08:30 AM	0	0	0	0	0	0	2	2	**1**	0	1	2	2	**7**	0	**9**	**13**
08:45 AM	0	0	0	0	1	1	**3**	**5**	0	**1**	1	2	1	4	0	5	12
Total Volume	0	0	1	1	2	4	7	13	1	1	4	6	8	19	0	27	47
% App. Total	0	0	100		15.4	30.8	53.8		16.7	16.7	66.7		29.6	70.4	0		
PHF	.000	.000	.250	.250	.500	.500	.583	.650	.250	.250	.500	.750	.667	.679	.000	.750	.904

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File Name : 81676 G-F
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Silver City Mall Entrance From North					Stevens Street From East					Route 140 NB Ramps From South					Stevens Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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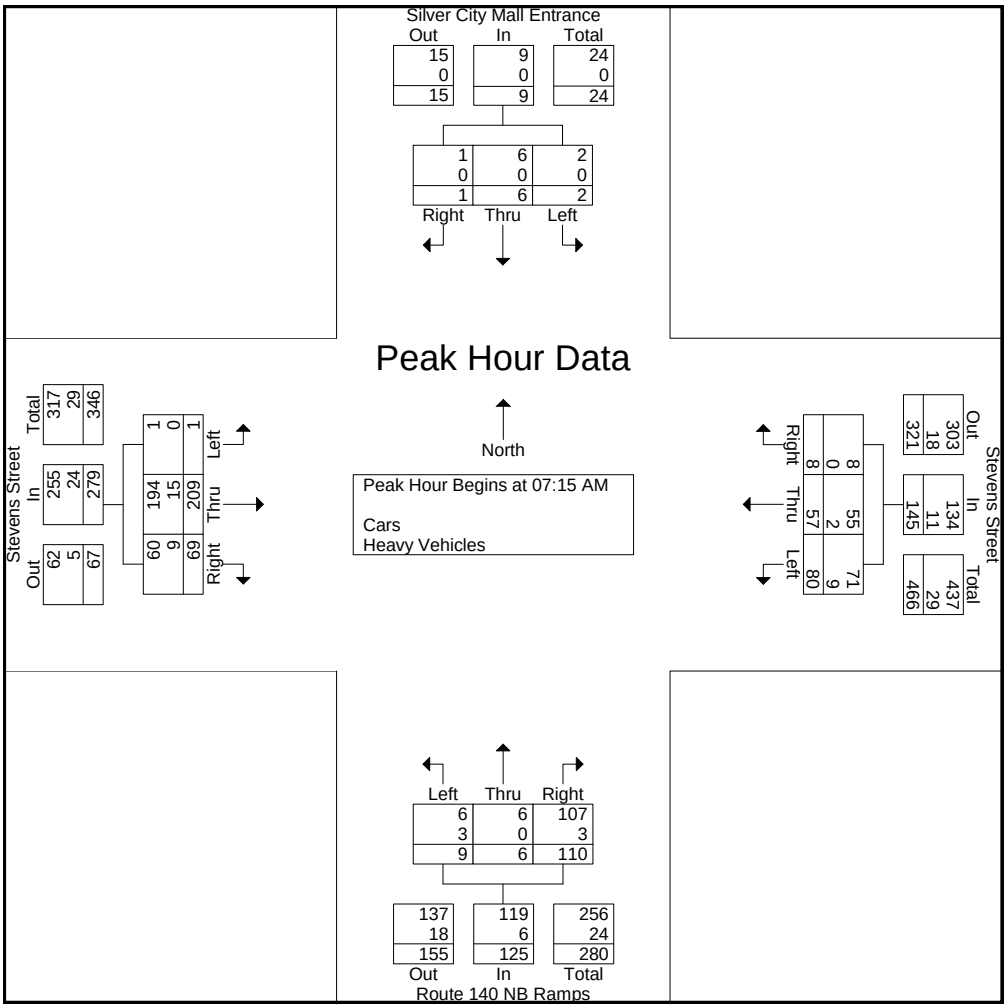
Page No : 1

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	**1**	1	0	13	26	39	25	1	2	28	15	52	**1**	68	136
07:30 AM	**1**	**3**	1	**5**	1	13	**29**	**43**	21	**2**	1	24	16	57	0	73	145
07:45 AM	0	3	0	3	**5**	**17**	11	33	**33**	2	1	36	**19**	**63**	0	**82**	**154**
08:00 AM	0	0	0	0	2	14	14	30	31	1	**5**	**37**	19	37	0	56	123
Total Volume	1	6	2	9	8	57	80	145	110	6	9	125	69	209	1	279	558
% App. Total	11.1	66.7	22.2		5.5	39.3	55.2		88	4.8	7.2		24.7	74.9	0.4		
PHF	.250	.500	.500	.450	.400	.838	.690	.843	.833	.750	.450	.845	.908	.829	.250	.851	.906
Cars	1	6	2	9	8	55	71	134	107	6	6	119	60	194	1	255	517
% Cars	100	100	100	100	100	96.5	88.8	92.4	97.3	100	66.7	95.2	87.0	92.8	100	91.4	92.7
Heavy Vehicles	0	0	0	0	0	2	9	11	3	0	3	6	9	15	0	24	41
% Heavy Vehicles	0	0	0	0	0	3.5	11.3	7.6	2.7	0	33.3	4.8	13.0	7.2	0	8.6	7.3



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N/S: Silver City Mall/Route 140 NB Ramps
E/W: Stevens Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-FFF
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	15	9	7	34	37	13	12	9	63	43	0	243
04:15 PM	0	16	14	6	31	31	10	5	4	77	29	0	223
04:30 PM	3	14	7	12	50	55	10	13	7	74	30	0	275
04:45 PM	0	22	10	11	36	34	14	12	7	77	52	2	277
Total	4	67	40	36	151	157	47	42	27	291	154	2	1018
05:00 PM	3	28	11	4	59	58	11	12	12	78	56	0	332
05:15 PM	3	19	5	14	43	38	11	15	5	66	56	0	275
05:30 PM	2	28	11	15	47	47	12	9	6	63	50	1	291
05:45 PM	0	35	16	17	37	34	15	22	9	59	41	0	285
Total	8	110	43	50	186	177	49	58	32	266	203	1	1183
Grand Total	12	177	83	86	337	334	96	100	59	557	357	3	2201
Apprch %	4.4	65.1	30.5	11.4	44.5	44.1	37.6	39.2	23.1	60.7	38.9	0.3	
Total %	0.5	8	3.8	3.9	15.3	15.2	4.4	4.5	2.7	25.3	16.2	0.1	
Cars	12	176	83	84	335	332	92	99	56	549	331	3	2152
% Cars	100	99.4	100	97.7	99.4	99.4	95.8	99	94.9	98.6	92.7	100	97.8
Heavy Vehicles	0	1	0	2	2	2	4	1	3	8	26	0	49
% Heavy Vehicles	0	0.6	0	2.3	0.6	0.6	4.2	1	5.1	1.4	7.3	0	2.2

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	22	10	32	11	36	34	81	**14**	12	7	33	77	52	**2**	131	277
05:00 PM	**3**	**28**	**11**	**42**	4	**59**	**58**	**121**	11	12	**12**	**35**	**78**	**56**	0	**134**	**332**
05:15 PM	3	19	5	27	14	43	38	95	11	**15**	5	31	66	56	0	122	275
05:30 PM	2	28	11	41	**15**	47	47	109	12	9	6	27	63	50	1	114	291
Total Volume	8	97	37	142	44	185	177	406	48	48	30	126	284	214	3	501	1175
% App. Total	5.6	68.3	26.1		10.8	45.6	43.6		38.1	38.1	23.8		56.7	42.7	0.6		
PHF	.667	.866	.841	.845	.733	.784	.763	.839	.857	.800	.625	.900	.910	.955	.375	.935	.885
Cars	8	97	37	142	43	184	176	403	46	47	28	121	280	202	3	485	1151
% Cars	100	100	100	100	97.7	99.5	99.4	99.3	95.8	97.9	93.3	96.0	98.6	94.4	100	96.8	98.0
Heavy Vehicles	0	0	0	0	1	1	1	3	2	1	2	5	4	12	0	16	24
% Heavy Vehicles	0	0	0	0	2.3	0.5	0.6	0.7	4.2	2.1	6.7	4.0	1.4	5.6	0	3.2	2.0

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File Name : 81676 G-FFF
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	15	9	7	34	37	13	12	9	61	36	0	234
04:15 PM	0	16	14	5	30	31	9	5	3	76	28	0	217
04:30 PM	3	14	7	12	50	54	10	13	7	74	26	0	270
04:45 PM	0	22	10	11	35	34	14	12	7	77	47	2	271
Total	4	67	40	35	149	156	46	42	26	288	137	2	992
05:00 PM	3	28	11	4	59	58	11	12	10	78	53	0	327
05:15 PM	3	19	5	13	43	38	11	14	5	63	55	0	269
05:30 PM	2	28	11	15	47	46	10	9	6	62	47	1	284
05:45 PM	0	34	16	17	37	34	14	22	9	58	39	0	280
Total	8	109	43	49	186	176	46	57	30	261	194	1	1160
Grand Total	12	176	83	84	335	332	92	99	56	549	331	3	2152
Apprch %	4.4	64.9	30.6	11.2	44.6	44.2	37.2	40.1	22.7	62.2	37.5	0.3	
Total %	0.6	8.2	3.9	3.9	15.6	15.4	4.3	4.6	2.6	25.5	15.4	0.1	

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	22	10	32	11	35	34	80	**14**	12	7	**33**	77	47	**2**	126	271
05:00 PM	**3**	**28**	**11**	**42**	4	**59**	**58**	**121**	11	12	**10**	33	**78**	53	0	**131**	**327**
05:15 PM	3	19	5	27	13	43	38	94	11	**14**	5	30	63	**55**	0	118	269
05:30 PM	2	28	11	41	**15**	47	46	108	10	9	6	25	62	47	1	110	284
Total Volume	8	97	37	142	43	184	176	403	46	47	28	121	280	202	3	485	1151
% App. Total	5.6	68.3	26.1		10.7	45.7	43.7		38	38.8	23.1		57.7	41.6	0.6		
PHF	.667	.866	.841	.845	.717	.780	.759	.833	.821	.839	.700	.917	.897	.918	.375	.926	.880

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: Silver City Mall/Route 140 NB Ramps
E/W: Stevens Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-FFF
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Silver City Mall Entrance From North			Stevens Street From East			Route 140 NB Ramps From South			Stevens Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	2	7	0	9
04:15 PM	0	0	0	1	1	0	1	0	1	1	1	0	6
04:30 PM	0	0	0	0	0	1	0	0	0	0	4	0	5
04:45 PM	0	0	0	0	1	0	0	0	0	0	5	0	6
Total	0	0	0	1	2	1	1	0	1	3	17	0	26
05:00 PM	0	0	0	0	0	0	0	0	2	0	3	0	5
05:15 PM	0	0	0	1	0	0	0	1	0	3	1	0	6
05:30 PM	0	0	0	0	0	1	2	0	0	1	3	0	7
05:45 PM	0	1	0	0	0	0	1	0	0	1	2	0	5
Total	0	1	0	1	0	1	3	1	2	5	9	0	23
Grand Total	0	1	0	2	2	2	4	1	3	8	26	0	49
Apprch %	0	100	0	33.3	33.3	33.3	50	12.5	37.5	23.5	76.5	0	
Total %	0	2	0	4.1	4.1	4.1	8.2	2	6.1	16.3	53.1	0	

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**7**	0	**9**	**9**
04:15 PM	0	0	0	0	**1**	**1**	0	**2**	**1**	0	**1**	**2**	1	1	0	2	6
04:30 PM	0	0	0	0	0	0	**1**	1	0	0	0	0	0	4	0	4	5
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	5	0	5	6
Total Volume	0	0	0	0	1	2	1	4	1	0	1	2	3	17	0	20	26
% App. Total	0	0	0		25	50	25		50	0	50		15	85	0		
PHF	.000	.000	.000	.000	.250	.500	.250	.500	.250	.000	.250	.250	.375	.607	.000	.556	.722

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E/W: Stevens Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-FFF
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	4
Apprch %	0	0	100	0	100	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	25	0	50	0	0	0	0	0	0	25	0	0	0	0	

	Silver City Mall Entrance From North					Stevens Street From East					Route 140 NB Ramps From South					Stevens Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	**1**	**0**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	1	0	1	2	0	0	0	2	0	0	0	1	1	0	0	0	0	0	4
% App. Total	0	0	100	0		100	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.250	.000	.250	.250	.000	.000	.000	.250	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.500

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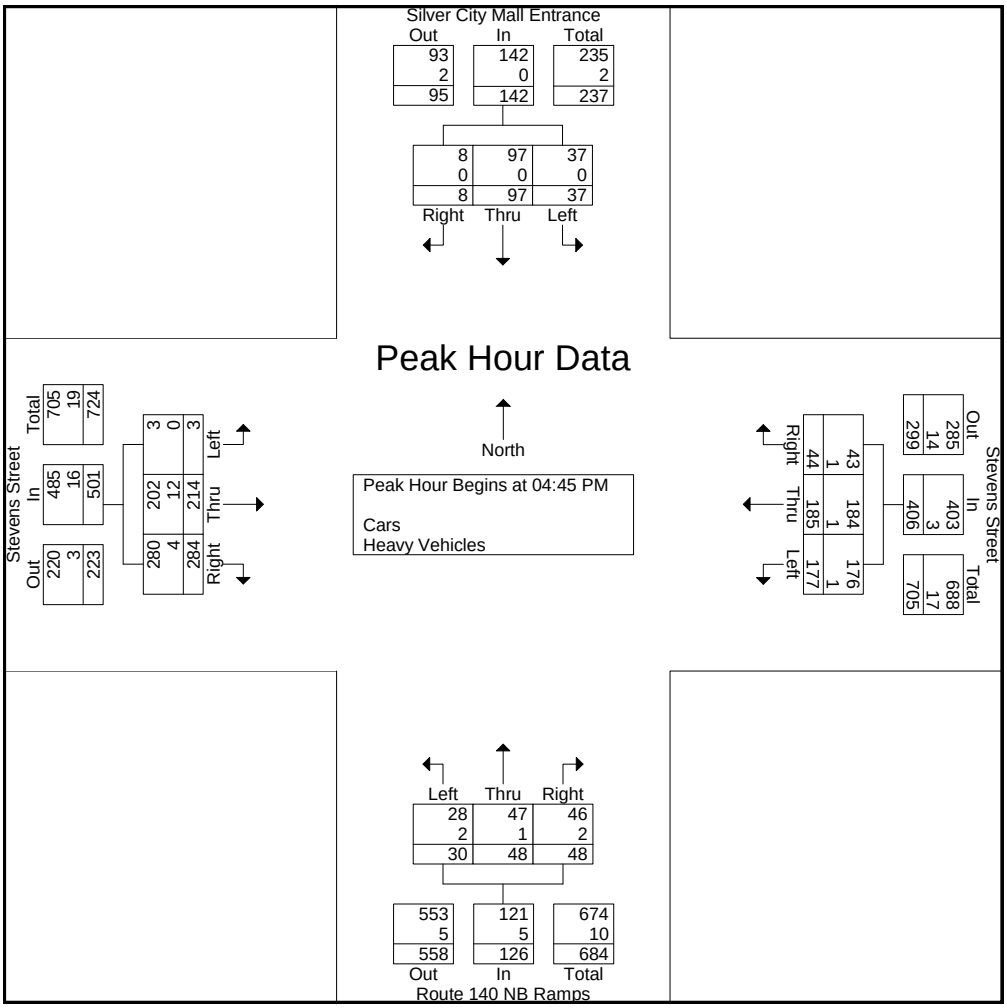
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-FFF
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

	Silver City Mall Entrance From North				Stevens Street From East				Route 140 NB Ramps From South				Stevens Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	22	10	32	11	36	34	81	**14**	12	7	33	77	52	**2**	131	277
05:00 PM	**3**	**28**	**11**	**42**	4	**59**	**58**	**121**	11	12	**12**	**35**	**78**	**56**	0	**134**	**332**
05:15 PM	3	19	5	27	14	43	38	95	11	**15**	5	31	66	56	0	122	275
05:30 PM	2	28	11	41	**15**	47	47	109	12	9	6	27	63	50	1	114	291
Total Volume	8	97	37	142	44	185	177	406	48	48	30	126	284	214	3	501	1175
% App. Total	5.6	68.3	26.1		10.8	45.6	43.6		38.1	38.1	23.8		56.7	42.7	0.6		
PHF	.667	.866	.841	.845	.733	.784	.763	.839	.857	.800	.625	.900	.910	.955	.375	.935	.885
Cars	8	97	37	142	43	184	176	403	46	47	28	121	280	202	3	485	1151
% Cars	100	100	100	100	97.7	99.5	99.4	99.3	95.8	97.9	93.3	96.0	98.6	94.4	100	96.8	98.0
Heavy Vehicles	0	0	0	0	1	1	1	3	2	1	2	5	4	12	0	16	24
% Heavy Vehicles	0	0	0	0	2.3	0.5	0.6	0.7	4.2	2.1	6.7	4.0	1.4	5.6	0	3.2	2.0



PRECISION
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N/S: County Street
E/W: Route 140 SB Ramps/Silver City Mall
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-G
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	20	10	10	29	0	0	0	21	0	0	0	5	95
07:15 AM	12	8	11	37	0	0	0	31	2	1	1	3	106
07:30 AM	22	13	14	39	0	0	0	26	8	6	2	2	132
07:45 AM	15	14	12	52	0	0	0	25	2	0	2	6	128
Total	69	45	47	157	0	0	0	103	12	7	5	16	461
08:00 AM	25	13	11	32	0	0	0	20	2	1	3	6	113
08:15 AM	31	12	6	41	0	0	0	15	3	0	1	4	113
08:30 AM	20	4	8	45	0	0	0	22	2	0	2	8	111
08:45 AM	38	9	13	26	0	0	0	31	9	3	2	1	132
Total	114	38	38	144	0	0	0	88	16	4	8	19	469
Grand Total	183	83	85	301	0	0	0	191	28	11	13	35	930
Apprch %	52.1	23.6	24.2	100	0	0	0	87.2	12.8	18.6	22	59.3	
Total %	19.7	8.9	9.1	32.4	0	0	0	20.5	3	1.2	1.4	3.8	
Cars	173	77	75	270	0	0	0	182	23	8	11	23	842
% Cars	94.5	92.8	88.2	89.7	0	0	0	95.3	82.1	72.7	84.6	65.7	90.5
Heavy Vehicles	10	6	10	31	0	0	0	9	5	3	2	12	88
% Heavy Vehicles	5.5	7.2	11.8	10.3	0	0	0	4.7	17.9	27.3	15.4	34.3	9.5

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	22	13	**14**	**49**	39	0	0	39	0	**26**	**8**	**34**	**6**	2	2	**10**	**132**
07:45 AM	15	**14**	12	41	**52**	0	0	**52**	0	25	2	27	0	2	**6**	8	128
08:00 AM	25	13	11	49	32	0	0	32	0	20	2	22	1	**3**	6	10	113
08:15 AM	**31**	12	6	49	41	0	0	41	0	15	3	18	0	1	4	5	113
Total Volume	93	52	43	188	164	0	0	164	0	86	15	101	7	8	18	33	486
% App. Total	49.5	27.7	22.9		100	0	0		0	85.1	14.9		21.2	24.2	54.5		
PHF	.750	.929	.768	.959	.788	.000	.000	.788	.000	.827	.469	.743	.292	.667	.750	.825	.920
Cars	84	48	36	168	146	0	0	146	0	83	10	93	4	6	9	19	426
% Cars	90.3	92.3	83.7	89.4	89.0	0	0	89.0	0	96.5	66.7	92.1	57.1	75.0	50.0	57.6	87.7
Heavy Vehicles	9	4	7	20	18	0	0	18	0	3	5	8	3	2	9	14	60
% Heavy Vehicles	9.7	7.7	16.3	10.6	11.0	0	0	11.0	0	3.5	33.3	7.9	42.9	25.0	50.0	42.4	12.3

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E/W: Route 140 SB Ramps/Silver City Mall
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-G
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	20	9	10	25	0	0	0	21	0	0	0	3	88
07:15 AM	12	8	11	34	0	0	0	30	2	1	1	3	102
07:30 AM	18	11	11	35	0	0	0	26	3	3	2	1	110
07:45 AM	14	13	11	47	0	0	0	25	2	0	0	2	114
Total	64	41	43	141	0	0	0	102	7	4	3	9	414
08:00 AM	23	12	9	28	0	0	0	17	2	1	3	4	99
08:15 AM	29	12	5	36	0	0	0	15	3	0	1	2	103
08:30 AM	20	4	8	40	0	0	0	21	2	0	2	7	104
08:45 AM	37	8	10	25	0	0	0	27	9	3	2	1	122
Total	109	36	32	129	0	0	0	80	16	4	8	14	428
Grand Total	173	77	75	270	0	0	0	182	23	8	11	23	842
Apprch %	53.2	23.7	23.1	100	0	0	0	88.8	11.2	19	26.2	54.8	
Total %	20.5	9.1	8.9	32.1	0	0	0	21.6	2.7	1	1.3	2.7	

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	23	**12**	9	44	28	0	0	28	0	17	2	19	1	**3**	4	8	99
08:15 AM	29	12	5	46	36	0	0	36	0	15	3	18	0	1	2	3	103
08:30 AM	20	4	8	32	**40**	0	0	**40**	0	21	2	23	0	2	**7**	**9**	104
08:45 AM	**37**	8	**10**	**55**	25	0	0	25	0	**27**	**9**	**36**	**3**	2	1	6	**122**
Total Volume	109	36	32	177	129	0	0	129	0	80	16	96	4	8	14	26	428
% App. Total	61.6	20.3	18.1		100	0	0		0	83.3	16.7		15.4	30.8	53.8		
PHF	.736	.750	.800	.805	.806	.000	.000	.806	.000	.741	.444	.667	.333	.667	.500	.722	.877

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Client: VHB/J.Quitter

File Name : 81676 G-G
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	1	0	4	0	0	0	0	0	0	0	2	7
07:15 AM	0	0	0	3	0	0	0	1	0	0	0	0	4
07:30 AM	4	2	3	4	0	0	0	0	5	3	0	1	22
07:45 AM	1	1	1	5	0	0	0	0	0	0	2	4	14
Total	5	4	4	16	0	0	0	1	5	3	2	7	47
08:00 AM	2	1	2	4	0	0	0	3	0	0	0	2	14
08:15 AM	2	0	1	5	0	0	0	0	0	0	0	2	10
08:30 AM	0	0	0	5	0	0	0	1	0	0	0	1	7
08:45 AM	1	1	3	1	0	0	0	4	0	0	0	0	10
Total	5	2	6	15	0	0	0	8	0	0	0	5	41
Grand Total	10	6	10	31	0	0	0	9	5	3	2	12	88
Apprch %	38.5	23.1	38.5	100	0	0	0	64.3	35.7	17.6	11.8	70.6	
Total %	11.4	6.8	11.4	35.2	0	0	0	10.2	5.7	3.4	2.3	13.6	

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**4**	**2**	**3**	**9**	4	0	0	4	0	0	**5**	**5**	**3**	0	1	4	**22**
07:45 AM	1	1	1	3	**5**	0	0	**5**	0	0	0	0	0	**2**	**4**	**6**	14
08:00 AM	2	1	2	5	4	0	0	4	0	**3**	0	3	0	0	2	2	14
08:15 AM	2	0	1	3	5	0	0	5	0	0	0	0	0	0	2	2	10
Total Volume	9	4	7	20	18	0	0	18	0	3	5	8	3	2	9	14	60
% App. Total	45	20	35		100	0	0		0	37.5	62.5		21.4	14.3	64.3		
PHF	.563	.500	.583	.556	.900	.000	.000	.900	.000	.250	.250	.400	.250	.250	.563	.583	.682

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File Name : 81676 G-G
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	

	County Street From North					Route 140 SB Ramps From East					County Street From South					Silver City Mall Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

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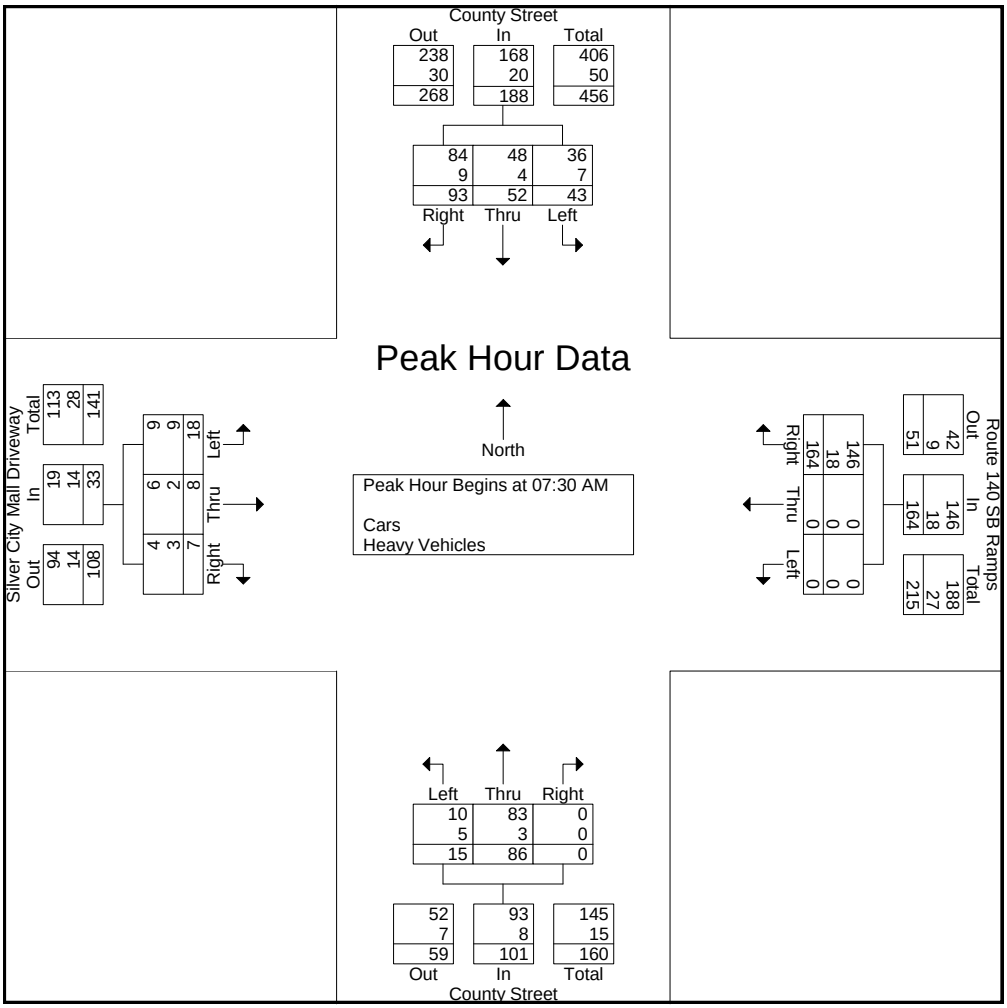
N/S: County Street
E/W: Route 140 SB Ramps/Silver City Mall
City, State: Taunton, MA
Client: VHB/J.Quitter

File Name : 81676 G-G
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	22	13	**14**	**49**	39	0	0	39	0	**26**	**8**	**34**	**6**	2	2	**10**	**132**
07:45 AM	15	**14**	12	41	**52**	0	0	**52**	0	25	2	27	0	2	**6**	8	128
08:00 AM	25	13	11	49	32	0	0	32	0	20	2	22	1	**3**	6	10	113
08:15 AM	**31**	12	6	49	41	0	0	41	0	15	3	18	0	1	4	5	113
Total Volume	93	52	43	188	164	0	0	164	0	86	15	101	7	8	18	33	486
% App. Total	49.5	27.7	22.9		100	0	0		0	85.1	14.9		21.2	24.2	54.5		
PHF	.750	.929	.768	.959	.788	.000	.000	.788	.000	.827	.469	.743	.292	.667	.750	.825	.920
Cars	84	48	36	168	146	0	0	146	0	83	10	93	4	6	9	19	426
% Cars	90.3	92.3	83.7	89.4	89.0	0	0	89.0	0	96.5	66.7	92.1	57.1	75.0	50.0	57.6	87.7
Heavy Vehicles	9	4	7	20	18	0	0	18	0	3	5	8	3	2	9	14	60
% Heavy Vehicles	9.7	7.7	16.3	10.6	11.0	0	0	11.0	0	3.5	33.3	7.9	42.9	25.0	50.0	42.4	12.3



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N/S: County Street
E/W: Route 140 SB Ramps/Silver City Mall
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-GGG
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	105	27	27	25	0	0	0	24	2	5	31	66	312
04:15 PM	96	30	30	19	0	0	0	9	0	4	49	72	309
04:30 PM	125	35	38	25	0	0	0	16	10	17	31	66	363
04:45 PM	110	31	20	34	0	0	0	14	8	11	37	84	349
Total	436	123	115	103	0	0	0	63	20	37	148	288	1333
05:00 PM	106	41	48	30	0	0	0	22	6	14	35	78	380
05:15 PM	91	41	26	38	0	0	0	19	10	13	24	62	324
05:30 PM	100	30	27	24	0	0	0	21	7	6	27	69	311
05:45 PM	92	20	24	24	0	0	0	25	5	9	18	60	277
Total	389	132	125	116	0	0	0	87	28	42	104	269	1292
Grand Total	825	255	240	219	0	0	0	150	48	79	252	557	2625
Apprch %	62.5	19.3	18.2	100	0	0	0	75.8	24.2	8.9	28.4	62.7	
Total %	31.4	9.7	9.1	8.3	0	0	0	5.7	1.8	3	9.6	21.2	
Cars	810	253	235	199	0	0	0	150	47	79	244	546	2563
% Cars	98.2	99.2	97.9	90.9	0	0	0	100	97.9	100	96.8	98	97.6
Heavy Vehicles	15	2	5	20	0	0	0	0	1	0	8	11	62
% Heavy Vehicles	1.8	0.8	2.1	9.1	0	0	0	0	2.1	0	3.2	2	2.4

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**125**	35	38	**198**	25	0	0	25	0	16	**10**	26	**17**	31	66	114	363
04:45 PM	110	31	20	161	34	0	0	34	0	14	8	22	11	**37**	**84**	**132**	349
05:00 PM	106	**41**	**48**	195	30	0	0	30	0	**22**	6	28	14	35	78	127	**380**
05:15 PM	91	41	26	158	**38**	0	0	**38**	0	19	10	**29**	13	24	62	99	324
Total Volume	432	148	132	712	127	0	0	127	0	71	34	105	55	127	290	472	1416
% App. Total	60.7	20.8	18.5		100	0	0		0	67.6	32.4		11.7	26.9	61.4		
PHF	.864	.902	.688	.899	.836	.000	.000	.836	.000	.807	.850	.905	.809	.858	.863	.894	.932
Cars	423	148	129	700	116	0	0	116	0	71	34	105	55	123	286	464	1385
% Cars	97.9	100	97.7	98.3	91.3	0	0	91.3	0	100	100	100	100	96.9	98.6	98.3	97.8
Heavy Vehicles	9	0	3	12	11	0	0	11	0	0	0	0	0	4	4	8	31
% Heavy Vehicles	2.1	0	2.3	1.7	8.7	0	0	8.7	0	0	0	0	0	3.1	1.4	1.7	2.2

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N/S: County Street
E/W: Route 140 SB Ramps/Silver City Mall
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-GGG
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	103	27	26	21	0	0	0	24	2	5	31	64	303
04:15 PM	94	29	29	17	0	0	0	9	0	4	47	71	300
04:30 PM	124	35	38	22	0	0	0	16	10	17	29	65	356
04:45 PM	108	31	19	30	0	0	0	14	8	11	35	83	339
Total	429	122	112	90	0	0	0	63	20	37	142	283	1298
05:00 PM	104	41	46	27	0	0	0	22	6	14	35	78	373
05:15 PM	87	41	26	37	0	0	0	19	10	13	24	60	317
05:30 PM	99	29	27	23	0	0	0	21	6	6	26	65	302
05:45 PM	91	20	24	22	0	0	0	25	5	9	17	60	273
Total	381	131	123	109	0	0	0	87	27	42	102	263	1265
Grand Total	810	253	235	199	0	0	0	150	47	79	244	546	2563
Apprch %	62.4	19.5	18.1	100	0	0	0	76.1	23.9	9.1	28.1	62.8	
Total %	31.6	9.9	9.2	7.8	0	0	0	5.9	1.8	3.1	9.5	21.3	

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**124**	35	38	**197**	22	0	0	22	0	16	**10**	26	**17**	29	65	111	356
04:45 PM	108	31	19	158	30	0	0	30	0	14	8	22	11	**35**	**83**	**129**	339
05:00 PM	104	**41**	**46**	191	27	0	0	27	0	**22**	6	28	14	35	78	127	**373**
05:15 PM	87	41	26	154	**37**	0	0	**37**	0	19	10	**29**	13	24	60	97	317
Total Volume	423	148	129	700	116	0	0	116	0	71	34	105	55	123	286	464	1385
% App. Total	60.4	21.1	18.4		100	0	0		0	67.6	32.4		11.9	26.5	61.6		
PHF	.853	.902	.701	.888	.784	.000	.000	.784	.000	.807	.850	.905	.809	.879	.861	.899	.928

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-GGG
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street From North			Route 140 SB Ramps From East			County Street From South			Silver City Mall Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	0	1	4	0	0	0	0	0	0	0	2	9
04:15 PM	2	1	1	2	0	0	0	0	0	0	2	1	9
04:30 PM	1	0	0	3	0	0	0	0	0	0	2	1	7
04:45 PM	2	0	1	4	0	0	0	0	0	0	2	1	10
Total	7	1	3	13	0	0	0	0	0	0	6	5	35
05:00 PM	2	0	2	3	0	0	0	0	0	0	0	0	7
05:15 PM	4	0	0	1	0	0	0	0	0	0	0	2	7
05:30 PM	1	1	0	1	0	0	0	0	1	0	1	4	9
05:45 PM	1	0	0	2	0	0	0	0	0	0	1	0	4
Total	8	1	2	7	0	0	0	0	1	0	2	6	27
Grand Total	15	2	5	20	0	0	0	0	1	0	8	11	62
Apprch %	68.2	9.1	22.7	100	0	0	0	0	100	0	42.1	57.9	
Total %	24.2	3.2	8.1	32.3	0	0	0	0	1.6	0	12.9	17.7	

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	0	**1**	3	**4**	0	0	**4**	0	0	0	0	0	0	**2**	2	9
04:15 PM	2	**1**	1	**4**	2	0	0	2	0	0	0	0	0	**2**	1	**3**	9
04:30 PM	1	0	0	1	3	0	0	3	0	0	0	0	0	2	1	3	7
04:45 PM	2	0	1	3	4	0	0	4	0	0	0	0	0	2	1	3	**10**
Total Volume	7	1	3	11	13	0	0	13	0	0	0	0	0	6	5	11	35
% App. Total	63.6	9.1	27.3		100	0	0		0	0	0		0	54.5	45.5		
PHF	.875	.250	.750	.688	.813	.000	.000	.813	.000	.000	.000	.000	.000	.750	.625	.917	.875

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File Name : 81676 G-GGG
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	

	County Street From North					Route 140 SB Ramps From East					County Street From South					Silver City Mall Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250

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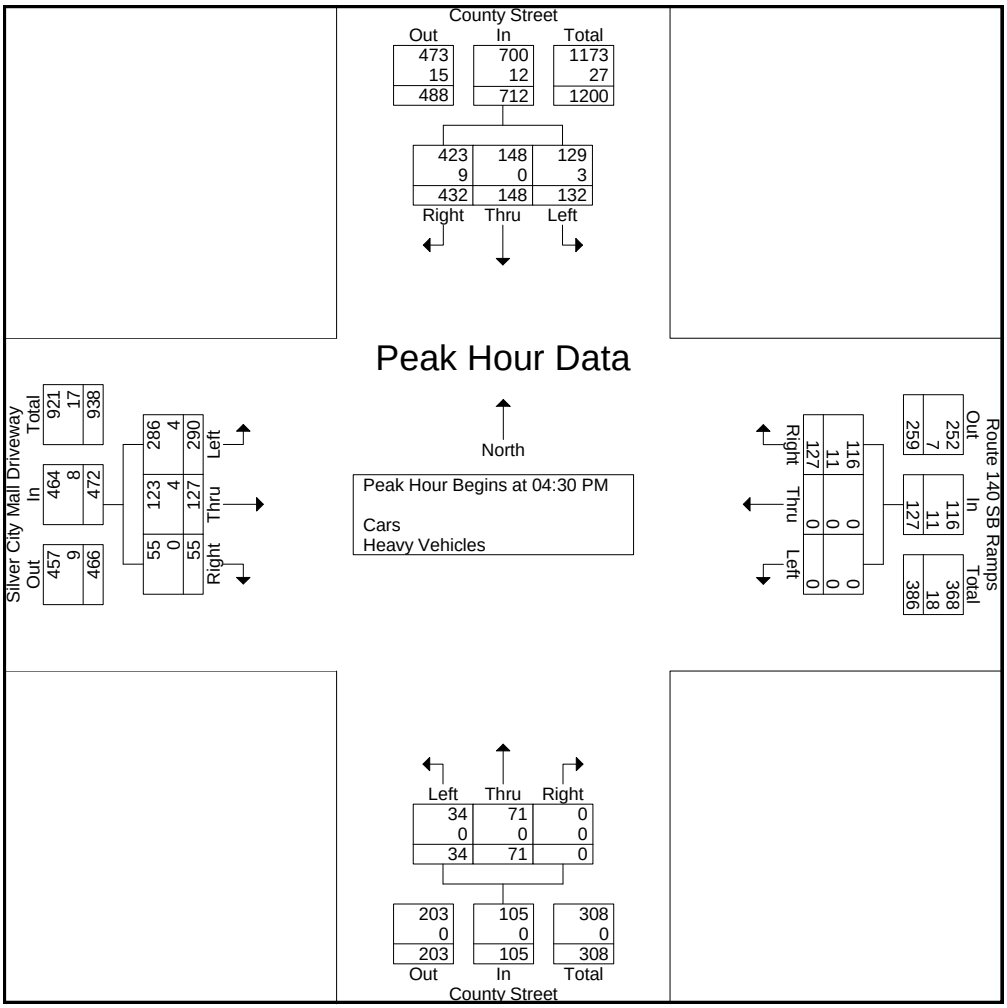
	County Street From North				Route 140 SB Ramps From East				County Street From South				Silver City Mall Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**125**	35	38	**198**	25	0	0	25	0	16	**10**	26	**17**	31	66	114	363
04:45 PM	110	31	20	161	34	0	0	34	0	14	8	22	11	**37**	**84**	**132**	349
05:00 PM	106	**41**	**48**	195	30	0	0	30	0	**22**	6	28	14	35	78	127	**380**
05:15 PM	91	41	26	158	**38**	0	0	**38**	0	19	10	**29**	13	24	62	99	324
Total Volume	432	148	132	712	127	0	0	127	0	71	34	105	55	127	290	472	1416
% App. Total	60.7	20.8	18.5		100	0	0		0	67.6	32.4		11.7	26.9	61.4		
PHF	.864	.902	.688	.899	.836	.000	.000	.836	.000	.807	.850	.905	.809	.858	.863	.894	.932
Cars	423	148	129	700	116	0	0	116	0	71	34	105	55	123	286	464	1385
% Cars	97.9	100	97.7	98.3	91.3	0	0	91.3	0	100	100	100	100	96.9	98.6	98.3	97.8
Heavy Vehicles	9	0	3	12	11	0	0	11	0	0	0	0	0	4	4	8	31
% Heavy Vehicles	2.1	0	2.3	1.7	8.7	0	0	8.7	0	0	0	0	0	3.1	1.4	1.7	2.2



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N: County Street (Route 140) SB Offramp
E/W: Stevens Street/County Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-H
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	26	0	0	0	0	0	26
07:15 AM	17	0	0	0	0	0	17
07:30 AM	33	0	0	0	0	0	33
07:45 AM	23	0	0	0	0	0	23
Total	99	0	0	0	0	0	99
08:00 AM	30	0	0	0	0	0	30
08:15 AM	33	0	0	0	0	0	33
08:30 AM	15	0	0	0	0	0	15
08:45 AM	31	0	0	0	0	0	31
Total	109	0	0	0	0	0	109
Grand Total	208	0	0	0	0	0	208
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	
Cars	192	0	0	0	0	0	192
% Cars	92.3	0	0	0	0	0	92.3
Heavy Vehicles	16	0	0	0	0	0	16
% Heavy Vehicles	7.7	0	0	0	0	0	7.7

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**33**	0	**33**	0	0	0	0	0	0	**33**
07:45 AM	**23**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**23**
08:00 AM	**30**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**30**
08:15 AM	**33**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**0**	**33**
Total Volume	**119**	**0**	**119**	**0**	**0**	**0**	**0**	**0**	**0**	**119**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.902**	**.000**	**.902**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.902**
Cars	**105**	**0**	**105**	**0**	**0**	**0**	**0**	**0**	**0**	**105**
% Cars	**88.2**	**0**	**88.2**	**0**	**0**	**0**	**0**	**0**	**0**	**88.2**
Heavy Vehicles	**14**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**14**
% Heavy Vehicles	**11.8**	**0**	**11.8**	**0**	**0**	**0**	**0**	**0**	**0**	**11.8**

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N: County Street (Route 140) SB Offramp
E/W: Stevens Street/County Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-H
Site Code : 10111.31
Start Date : 9/11/2008

Groups Printed- Cars

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	25	0	0	0	0	0	25
07:15 AM	17	0	0	0	0	0	17
07:30 AM	25	0	0	0	0	0	25
07:45 AM	20	0	0	0	0	0	20
Total	87	0	0	0	0	0	87
08:00 AM	29	0	0	0	0	0	29
08:15 AM	31	0	0	0	0	0	31
08:30 AM	15	0	0	0	0	0	15
08:45 AM	30	0	0	0	0	0	30
Total	105	0	0	0	0	0	105
Grand Total	192	0	0	0	0	0	192
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	25	0	25	0	0	0	0	0	0	25
07:45 AM	20	0	20	0	0	0	0	0	0	20
08:00 AM	29	0	29	0	0	0	0	0	0	29
08:15 AM	**31**	0	**31**	0	0	0	0	0	0	**31**
Total Volume	**105**	**0**	**105**	**0**	**0**	**0**	**0**	**0**	**0**	**105**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.847**	**.000**	**.847**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.847**

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E/W: Stevens Street/County Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-H
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	1	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0
07:30 AM	8	0	0	0	0	0	8
07:45 AM	3	0	0	0	0	0	3
Total	12	0	0	0	0	0	12
08:00 AM	1	0	0	0	0	0	1
08:15 AM	2	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0
08:45 AM	1	0	0	0	0	0	1
Total	4	0	0	0	0	0	4
Grand Total	16	0	0	0	0	0	16
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**8**	0	**8**	0	0	0	0	0	0	**8**
07:45 AM	**3**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
08:00 AM	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
08:15 AM	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Total Volume	**14**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**14**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.438**	**.000**	**.438**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.438**

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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-H
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) SB Offramp From North				Stevens Street From East				County Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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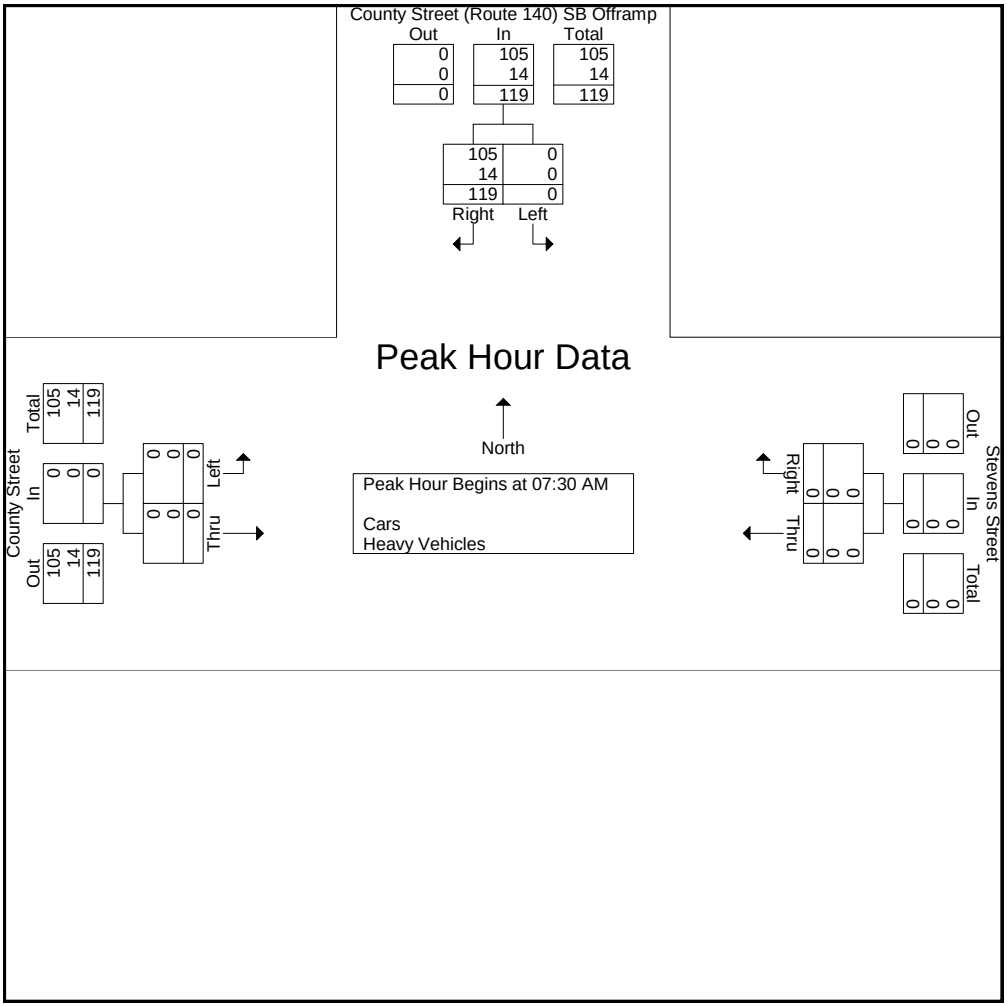
File Name : 81676 G-H
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**33**	0	**33**	0	0	0	0	0	0	**33**
07:45 AM	**23**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**23**
08:00 AM	**30**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**30**
08:15 AM	**33**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**0**	**33**
Total Volume	**119**	**0**	**119**	**0**	**0**	**0**	**0**	**0**	**0**	**119**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.902**	**.000**	**.902**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.902**
Cars	**105**	**0**	**105**	**0**	**0**	**0**	**0**	**0**	**0**	**105**
% Cars	**88.2**	**0**	**88.2**	**0**	**0**	**0**	**0**	**0**	**0**	**88.2**
Heavy Vehicles	**14**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**14**
% Heavy Vehicles	**11.8**	**0**	**11.8**	**0**	**0**	**0**	**0**	**0**	**0**	**11.8**



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City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-HHH
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	112	0	0	0	0	0	112
04:15 PM	124	0	0	0	0	0	124
04:30 PM	136	0	0	0	0	0	136
04:45 PM	116	0	0	0	0	0	116
Total	488	0	0	0	0	0	488
05:00 PM	127	0	0	0	0	0	127
05:15 PM	105	0	0	0	0	0	105
05:30 PM	106	0	0	0	0	0	106
05:45 PM	85	0	0	0	0	0	85
Total	423	0	0	0	0	0	423
Grand Total	911	0	0	0	0	0	911
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	
Cars	894	0	0	0	0	0	894
% Cars	98.1	0	0	0	0	0	98.1
Heavy Vehicles	17	0	0	0	0	0	17
% Heavy Vehicles	1.9	0	0	0	0	0	1.9

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	124	0	124	0	0	0	0	0	0	124
04:30 PM	**136**	0	**136**	0	0	0	0	0	0	**136**
04:45 PM	**116**	**0**	**116**	**0**	**0**	**0**	**0**	**0**	**0**	**116**
05:00 PM	**127**	**0**	**127**	**0**	**0**	**0**	**0**	**0**	**0**	**127**
Total Volume	**503**	**0**	**503**	**0**	**0**	**0**	**0**	**0**	**0**	**503**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.925**	**.000**	**.925**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.925**
Cars	**496**	**0**	**496**	**0**	**0**	**0**	**0**	**0**	**0**	**496**
% Cars	**98.6**	**0**	**98.6**	**0**	**0**	**0**	**0**	**0**	**0**	**98.6**
Heavy Vehicles	**7**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
% Heavy Vehicles	**1.4**	**0**	**1.4**	**0**	**0**	**0**	**0**	**0**	**0**	**1.4**

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N: County Street (Route 140) SB Offramp
E/W: Stevens Street/County Street
City, State: Taunton, MA
Client: VHB/J. Quitter

File Name : 81676 G-HHH
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Cars

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	109	0	0	0	0	0	109
04:15 PM	122	0	0	0	0	0	122
04:30 PM	135	0	0	0	0	0	135
04:45 PM	114	0	0	0	0	0	114
Total	480	0	0	0	0	0	480
05:00 PM	125	0	0	0	0	0	125
05:15 PM	101	0	0	0	0	0	101
05:30 PM	104	0	0	0	0	0	104
05:45 PM	84	0	0	0	0	0	84
Total	414	0	0	0	0	0	414
Grand Total	894	0	0	0	0	0	894
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	122	0	122	0	0	0	0	0	0	122
04:30 PM	**135**	0	**135**	0	0	0	0	0	0	**135**
04:45 PM	**114**	**0**	**114**	**0**	**0**	**0**	**0**	**0**	**0**	**114**
05:00 PM	**125**	**0**	**125**	**0**	**0**	**0**	**0**	**0**	**0**	**125**
Total Volume	**496**	**0**	**496**	**0**	**0**	**0**	**0**	**0**	**0**	**496**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.919**	**.000**	**.919**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.919**

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File Name : 81676 G-HHH
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Heavy Vehicles

	County Street (Route 140) SB Offramp From North		Stevens Street From East		County Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	0	0	0	0	0	3
04:15 PM	2	0	0	0	0	0	2
04:30 PM	1	0	0	0	0	0	1
04:45 PM	2	0	0	0	0	0	2
Total	8	0	0	0	0	0	8
05:00 PM	2	0	0	0	0	0	2
05:15 PM	4	0	0	0	0	0	4
05:30 PM	2	0	0	0	0	0	2
05:45 PM	1	0	0	0	0	0	1
Total	9	0	0	0	0	0	9
Grand Total	17	0	0	0	0	0	17
Apprch %	100	0	0	0	0	0	
Total %	100	0	0	0	0	0	

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	2	0	2	0	0	0	0	0	0	2
05:00 PM	2	0	2	0	0	0	0	0	0	2
05:15 PM	**4**	0	**4**	0	0	0	0	0	0	**4**
05:30 PM	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Total Volume	**10**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**10**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.625**	**.000**	**.625**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.625**

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File Name : 81676 G-HHH
Site Code : 10111.31
Start Date : 9/11/2008
Page No : 1

Groups Printed- Peds and Bicycles

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	County Street (Route 140) SB Offramp From North				Stevens Street From East				County Street From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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File Name : 81676 G-HHH
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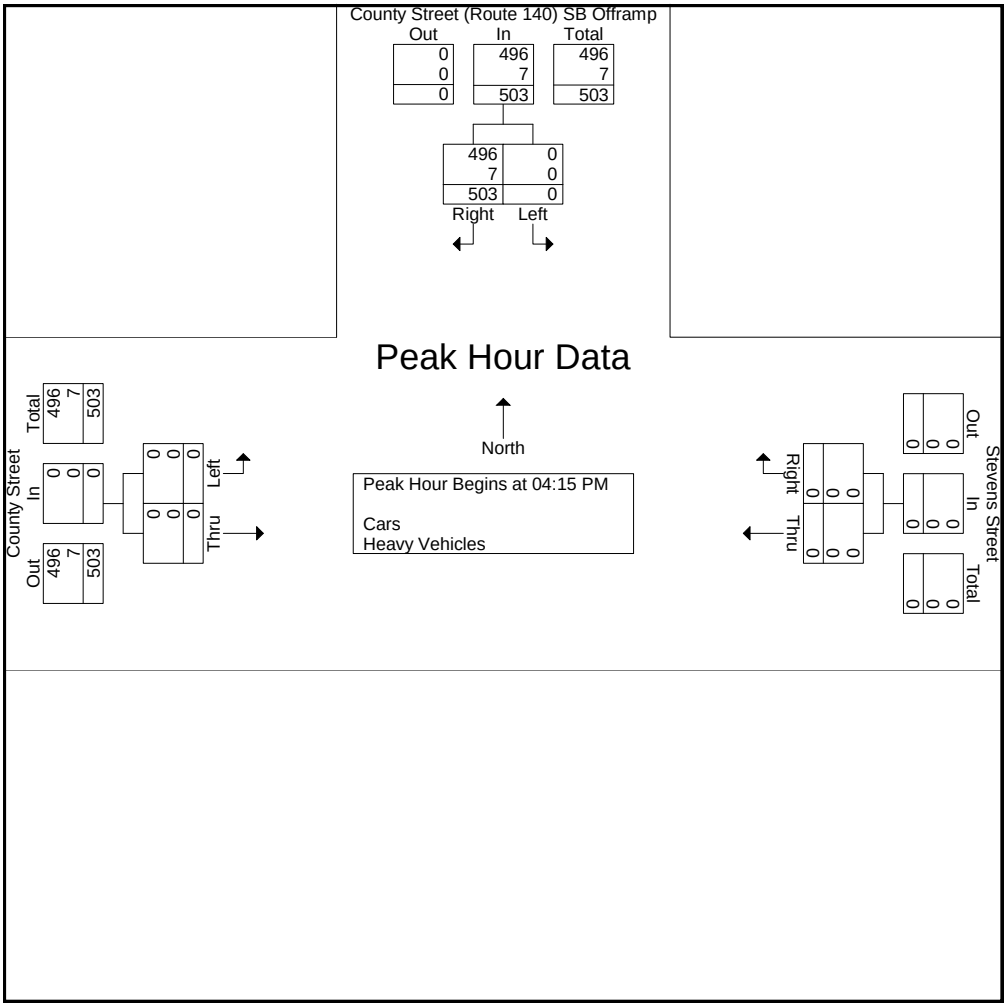
Page No : 1

	County Street (Route 140) SB Offramp From North			Stevens Street From East			County Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	124	0	124	0	0	0	0	0	0	124
04:30 PM	**136**	0	**136**	0	0	0	0	0	0	**136**
04:45 PM	**116**	**0**	**116**	**0**	**0**	**0**	**0**	**0**	**0**	**116**
05:00 PM	**127**	**0**	**127**	**0**	**0**	**0**	**0**	**0**	**0**	**127**
Total Volume	**503**	**0**	**503**	**0**	**0**	**0**	**0**	**0**	**0**	**503**
% App. Total	**100**	**0**		**0**	**0**		**0**	**0**		
PHF	**.925**	**.000**	**.925**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.925**
Cars	**496**	**0**	**496**	**0**	**0**	**0**	**0**	**0**	**0**	**496**
% Cars	**98.6**	**0**	**98.6**	**0**	**0**	**0**	**0**	**0**	**0**	**98.6**
Heavy Vehicles	**7**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
% Heavy Vehicles	**1.4**	**0**	**1.4**	**0**	**0**	**0**	**0**	**0**	**0**	**1.4**



Project: ***South Coast Rail - SCR***

Project #: 1011.00

Turning Movement Counts

Location: **Mozzone Blvd. at County St./Rt. 140**

City, State: Taunton, MA

Date: 3/19/2009

Time: 7:15 AM - 8:15 AM

Observer: N. Landrón

N/S: Route 140(County Street)

W: Mozzone Boulevard

Groups Printed - Cars - Heavy Vehicles

	Rt. 140/County St. From North			Rt. 140/County St. From South			Mozzone Blvd. From West			Intersection
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Total
7:15 AM	6	162	0	0	250	4	2	0	0	424
7:30 AM	4	222	0	0	242	2	7	0	0	477
7:45 AM	4	188	0	0	220	14	4	0	3	433
8:00 AM	7	154	0	0	187	17	3	0	1	369
Total	21	726	0	0	899	37	16	0	4	1703

Groups Printed - Heavy Vehicles

	Rt. 140/County St. From North			Rt. 140/County St. From South			Mozzone Blvd. From West			Intersection
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Total
7:15 AM						1				1
7:30 AM	1						3			4
7:45 AM	1					1	2		1	5
8:00 AM						1	2			3
Total	2	0	0	0	0	3	7	0	1	13
HV %	9.5%	0.0%			0.0%	8.1%	43.8%		25.0%	0.8%

PRECISION DATA INDUSTRIES, LLC
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Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Thurs 9/18/08 and Sat 9/20/08	81676	Raynham, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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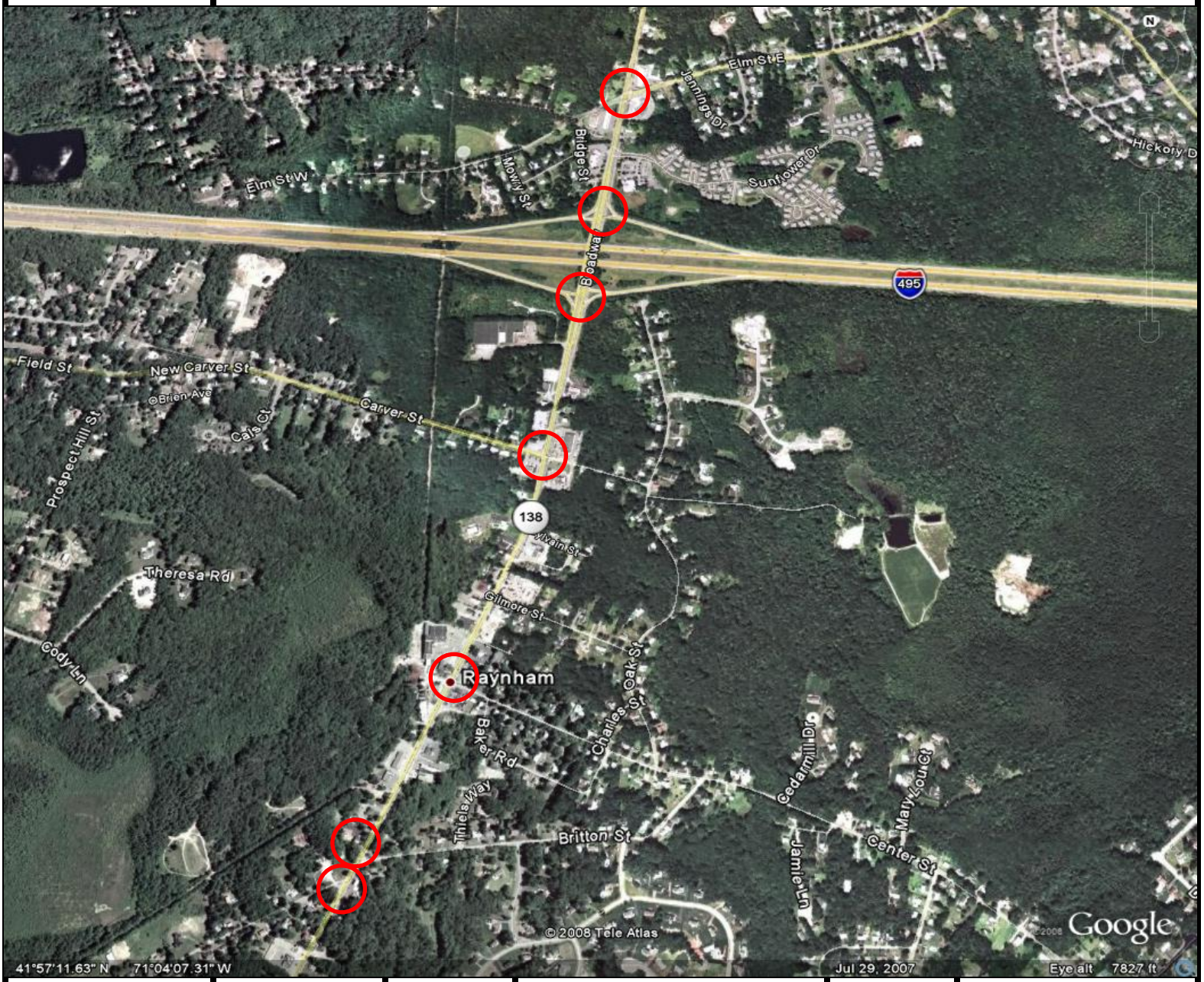
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Thurs 9/18/08 and Sat 9/20/08	81676	Raynham, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- A
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars - Heavy Vehicles

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	24	40	13	48	83	30	80	133	15	12	70	23	571
07:15 AM	38	36	19	46	92	43	73	203	20	5	90	26	691
07:30 AM	25	43	19	30	74	51	94	195	13	7	105	16	672
07:45 AM	18	43	28	29	81	39	103	175	9	2	77	20	624
Total	105	162	79	153	330	163	350	706	57	26	342	85	2558
08:00 AM	8	39	32	36	58	35	86	163	2	5	70	13	547
08:15 AM	9	36	12	29	43	28	67	140	6	11	70	13	464
08:30 AM	8	32	26	29	51	48	63	121	7	6	71	15	477
08:45 AM	10	49	26	19	49	33	73	103	8	7	66	17	460
Total	35	156	96	113	201	144	289	527	23	29	277	58	1948
Grand Total	140	318	175	266	531	307	639	1233	80	55	619	143	4506
Apprch %	22.1	50.2	27.6	24.1	48.1	27.8	32.7	63.2	4.1	6.7	75.8	17.5	
Total %	3.1	7.1	3.9	5.9	11.8	6.8	14.2	27.4	1.8	1.2	13.7	3.2	
Cars	127	283	161	251	476	270	618	1190	79	47	602	135	4239
% Cars	90.7	89	92	94.4	89.6	87.9	96.7	96.5	98.8	85.5	97.3	94.4	94.1
Heavy Vehicles	13	35	14	15	55	37	21	43	1	8	17	8	267
% Heavy Vehicles	9.3	11	8	5.6	10.4	12.1	3.3	3.5	1.2	14.5	2.7	5.6	5.9

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	24	40	13	77	**48**	83	30	161	80	133	15	228	**12**	70	23	105	571
07:15 AM	**38**	36	19	**93**	46	**92**	43	**181**	73	**203**	**20**	296	5	90	**26**	121	**691**
07:30 AM	25	**43**	19	87	30	74	**51**	155	94	195	13	**302**	7	**105**	16	**128**	672
07:45 AM	18	43	**28**	89	29	81	39	149	**103**	175	9	287	2	77	20	99	624
Total Volume	105	162	79	346	153	330	163	646	350	706	57	1113	26	342	85	453	2558
% App. Total	30.3	46.8	22.8		23.7	51.1	25.2		31.4	63.4	5.1		5.7	75.5	18.8		
PHF	.691	.942	.705	.930	.797	.897	.799	.892	.850	.869	.713	.921	.542	.814	.817	.885	.925
Cars	96	142	75	313	147	296	148	591	342	685	57	1084	21	337	82	440	2428
% Cars	91.4	87.7	94.9	90.5	96.1	89.7	90.8	91.5	97.7	97.0	100	97.4	80.8	98.5	96.5	97.1	94.9
Heavy Vehicles	9	20	4	33	6	34	15	55	8	21	0	29	5	5	3	13	130
% Heavy Vehicles	8.6	12.3	5.1	9.5	3.9	10.3	9.2	8.5	2.3	3.0	0	2.6	19.2	1.5	3.5	2.9	5.1

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	18	35	12	46	70	30	78	131	15	8	70	21	534
07:15 AM	37	30	18	43	85	40	72	198	20	5	90	26	664
07:30 AM	24	39	19	29	71	41	93	185	13	6	102	16	638
07:45 AM	17	38	26	29	70	37	99	171	9	2	75	19	592
Total	96	142	75	147	296	148	342	685	57	21	337	82	2428
08:00 AM	8	34	28	32	54	30	86	158	2	4	69	12	517
08:15 AM	7	31	11	28	37	25	65	138	6	11	66	12	437
08:30 AM	7	30	23	25	46	43	57	114	6	4	68	12	435
08:45 AM	9	46	24	19	43	24	68	95	8	7	62	17	422
Total	31	141	86	104	180	122	276	505	22	26	265	53	1811
Grand Total	127	283	161	251	476	270	618	1190	79	47	602	135	4239
Apprch %	22.2	49.6	28.2	25.2	47.7	27.1	32.8	63.1	4.2	6	76.8	17.2	
Total %	3	6.7	3.8	5.9	11.2	6.4	14.6	28.1	1.9	1.1	14.2	3.2	

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	18	35	12	65	**46**	70	30	146	78	131	15	224	**8**	70	21	99	534
07:15 AM	**37**	30	18	**85**	43	**85**	40	**168**	72	**198**	**20**	290	5	90	**26**	121	**664**
07:30 AM	24	**39**	19	82	29	71	**41**	141	93	185	13	**291**	6	**102**	16	**124**	638
07:45 AM	17	38	**26**	81	29	70	37	136	**99**	171	9	279	2	75	19	96	592
Total Volume	96	142	75	313	147	296	148	591	342	685	57	1084	21	337	82	440	2428
% App. Total	30.7	45.4	24		24.9	50.1	25		31.5	63.2	5.3		4.8	76.6	18.6		
PHF	.649	.910	.721	.921	.799	.871	.902	.879	.864	.865	.713	.931	.656	.826	.788	.887	.914

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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	6	5	1	2	13	0	2	2	0	4	0	2	37
07:15 AM	1	6	1	3	7	3	1	5	0	0	0	0	27
07:30 AM	1	4	0	1	3	10	1	10	0	1	3	0	34
07:45 AM	1	5	2	0	11	2	4	4	0	0	2	1	32
Total	9	20	4	6	34	15	8	21	0	5	5	3	130
08:00 AM	0	5	4	4	4	5	0	5	0	1	1	1	30
08:15 AM	2	5	1	1	6	3	2	2	0	0	4	1	27
08:30 AM	1	2	3	4	5	5	6	7	1	2	3	3	42
08:45 AM	1	3	2	0	6	9	5	8	0	0	4	0	38
Total	4	15	10	9	21	22	13	22	1	3	12	5	137
Grand Total	13	35	14	15	55	37	21	43	1	8	17	8	267
Apprch %	21	56.5	22.6	14	51.4	34.6	32.3	66.2	1.5	24.2	51.5	24.2	
Total %	4.9	13.1	5.2	5.6	20.6	13.9	7.9	16.1	0.4	3	6.4	3	

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	**5**	**4**	**9**	**4**	4	5	13	0	5	0	5	1	1	1	3	30
08:15 AM	**2**	5	1	8	1	**6**	3	10	2	2	0	4	0	**4**	1	5	27
08:30 AM	1	2	3	6	4	5	5	14	**6**	7	**1**	**14**	**2**	3	**3**	**8**	**42**
08:45 AM	1	3	2	6	0	6	**9**	**15**	5	**8**	0	13	0	4	0	4	38
Total Volume	4	15	10	29	9	21	22	52	13	22	1	36	3	12	5	20	137
% App. Total	13.8	51.7	34.5		17.3	40.4	42.3		36.1	61.1	2.8		15	60	25		
PHF	.500	.750	.625	.806	.563	.875	.611	.867	.542	.688	.250	.643	.375	.750	.417	.625	.815

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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	3
Grand Total	0	0	0	1	0	0	0	1	0	0	0	4	0	0	0	0	6
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	0	
Total %	0	0	0	16.7	0	0	0	16.7	0	0	0	66.7	0	0	0	0	

	Turnpike Street (Route 138) From North					Foundry Street (Route 106) From East					Turnpike Street (Route 138) From South					Foundry Street (Route 106) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	0	0	**3**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

PRECISION
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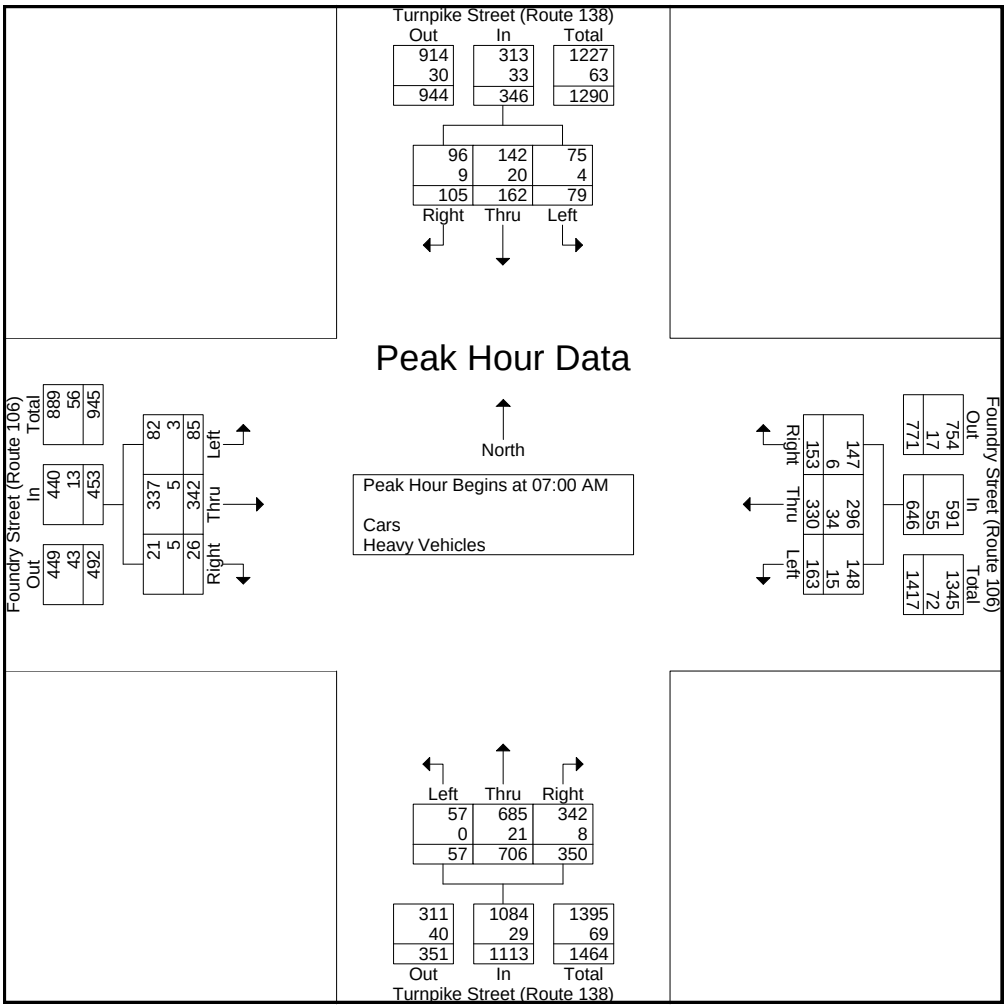
N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- A
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	24	40	13	77	**48**	83	30	161	80	133	15	228	**12**	70	23	105	571
07:15 AM	**38**	36	19	**93**	46	**92**	43	**181**	73	**203**	**20**	296	5	90	**26**	121	**691**
07:30 AM	25	**43**	19	87	30	74	**51**	155	94	195	13	**302**	7	**105**	16	**128**	672
07:45 AM	18	43	**28**	89	29	81	39	149	**103**	175	9	287	2	77	20	99	624
Total Volume	105	162	79	346	153	330	163	646	350	706	57	1113	26	342	85	453	2558
% App. Total	30.3	46.8	22.8		23.7	51.1	25.2		31.4	63.4	5.1		5.7	75.5	18.8		
PHF	.691	.942	.705	.930	.797	.897	.799	.892	.850	.869	.713	.921	.542	.814	.817	.885	.925
Cars	96	142	75	313	147	296	148	591	342	685	57	1084	21	337	82	440	2428
% Cars	91.4	87.7	94.9	90.5	96.1	89.7	90.8	91.5	97.7	97.0	100	97.4	80.8	98.5	96.5	97.1	94.9
Heavy Vehicles	9	20	4	33	6	34	15	55	8	21	0	29	5	5	3	13	130
% Heavy Vehicles	8.6	12.3	5.1	9.5	3.9	10.3	9.2	8.5	2.3	3.0	0	2.6	19.2	1.5	3.5	2.9	5.1



PRECISION
D A T A
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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- AAA
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars - Heavy Vehicles

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	15	139	30	37	84	123	63	66	11	5	71	17	661
04:15 PM	26	145	39	21	82	88	53	77	19	10	77	22	659
04:30 PM	35	153	18	23	103	114	29	66	16	5	53	18	633
04:45 PM	18	139	31	21	84	100	52	72	15	10	45	19	606
Total	94	576	118	102	353	425	197	281	61	30	246	76	2559
05:00 PM	21	168	31	30	101	77	49	90	25	12	60	7	671
05:15 PM	38	150	35	25	106	104	44	63	13	12	75	28	693
05:30 PM	32	140	39	32	89	110	67	73	14	10	63	21	690
05:45 PM	26	106	27	22	100	76	55	71	23	18	71	18	613
Total	117	564	132	109	396	367	215	297	75	52	269	74	2667
Grand Total	211	1140	250	211	749	792	412	578	136	82	515	150	5226
Apprch %	13.2	71.2	15.6	12	42.8	45.2	36.6	51.3	12.1	11	68.9	20.1	
Total %	4	21.8	4.8	4	14.3	15.2	7.9	11.1	2.6	1.6	9.9	2.9	
Cars	203	1113	234	195	728	753	391	547	136	79	508	145	5032
% Cars	96.2	97.6	93.6	92.4	97.2	95.1	94.9	94.6	100	96.3	98.6	96.7	96.3
Heavy Vehicles	8	27	16	16	21	39	21	31	0	3	7	5	194
% Heavy Vehicles	3.8	2.4	6.4	7.6	2.8	4.9	5.1	5.4	0	3.7	1.4	3.3	3.7

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	21	**168**	31	220	30	101	77	208	49	**90**	**25**	**164**	12	60	7	79	671
05:15 PM	**38**	150	35	**223**	25	**106**	104	**235**	44	63	13	120	12	**75**	**28**	**115**	**693**
05:30 PM	32	140	**39**	211	**32**	89	**110**	231	**67**	73	14	154	10	63	21	94	690
05:45 PM	26	106	27	159	22	100	76	198	55	71	23	149	**18**	71	18	107	613
Total Volume	117	564	132	813	109	396	367	872	215	297	75	587	52	269	74	395	2667
% App. Total	14.4	69.4	16.2		12.5	45.4	42.1		36.6	50.6	12.8		13.2	68.1	18.7		
PHF	.770	.839	.846	.911	.852	.934	.834	.928	.802	.825	.750	.895	.722	.897	.661	.859	.962
Cars	115	552	124	791	97	387	348	832	204	283	75	562	50	267	74	391	2576
% Cars	98.3	97.9	93.9	97.3	89.0	97.7	94.8	95.4	94.9	95.3	100	95.7	96.2	99.3	100	99.0	96.6
Heavy Vehicles	2	12	8	22	12	9	19	40	11	14	0	25	2	2	0	4	91
% Heavy Vehicles	1.7	2.1	6.1	2.7	11.0	2.3	5.2	4.6	5.1	4.7	0	4.3	3.8	0.7	0	1.0	3.4

PRECISION
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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	12	135	26	37	82	117	60	62	11	5	71	17	635
04:15 PM	25	138	35	19	79	82	52	73	19	10	73	21	626
04:30 PM	33	152	18	22	99	114	26	63	16	5	52	17	617
04:45 PM	18	136	31	20	81	92	49	66	15	9	45	16	578
Total	88	561	110	98	341	405	187	264	61	29	241	71	2456
05:00 PM	21	164	30	25	99	73	46	86	25	12	59	7	647
05:15 PM	38	148	34	23	104	99	42	62	13	10	75	28	676
05:30 PM	31	135	35	30	85	104	64	66	14	10	62	21	657
05:45 PM	25	105	25	19	99	72	52	69	23	18	71	18	596
Total	115	552	124	97	387	348	204	283	75	50	267	74	2576
Grand Total	203	1113	234	195	728	753	391	547	136	79	508	145	5032
Apprch %	13.1	71.8	15.1	11.6	43.4	44.9	36.4	50.9	12.7	10.8	69.4	19.8	
Total %	4	22.1	4.7	3.9	14.5	15	7.8	10.9	2.7	1.6	10.1	2.9	

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	21	**164**	30	215	25	99	73	197	46	**86**	**25**	**157**	12	59	7	78	647
05:15 PM	**38**	148	34	**220**	23	**104**	99	**226**	42	62	13	117	10	**75**	**28**	**113**	**676**
05:30 PM	31	135	**35**	201	**30**	85	**104**	219	**64**	66	14	144	10	62	21	93	657
05:45 PM	25	105	25	155	19	99	72	190	52	69	23	144	**18**	71	18	107	596
Total Volume	115	552	124	791	97	387	348	832	204	283	75	562	50	267	74	391	2576
% App. Total	14.5	69.8	15.7		11.7	46.5	41.8		36.3	50.4	13.3		12.8	68.3	18.9		
PHF	.757	.841	.886	.899	.808	.930	.837	.920	.797	.823	.750	.895	.694	.890	.661	.865	.953

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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Turnpike Street (Route 138) From North			Foundry Street (Route 106) From East			Turnpike Street (Route 138) From South			Foundry Street (Route 106) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	4	4	0	2	6	3	4	0	0	0	0	26
04:15 PM	1	7	4	2	3	6	1	4	0	0	4	1	33
04:30 PM	2	1	0	1	4	0	3	3	0	0	1	1	16
04:45 PM	0	3	0	1	3	8	3	6	0	1	0	3	28
Total	6	15	8	4	12	20	10	17	0	1	5	5	103
05:00 PM	0	4	1	5	2	4	3	4	0	0	1	0	24
05:15 PM	0	2	1	2	2	5	2	1	0	2	0	0	17
05:30 PM	1	5	4	2	4	6	3	7	0	0	1	0	33
05:45 PM	1	1	2	3	1	4	3	2	0	0	0	0	17
Total	2	12	8	12	9	19	11	14	0	2	2	0	91
Grand Total	8	27	16	16	21	39	21	31	0	3	7	5	194
Apprch %	15.7	52.9	31.4	21.1	27.6	51.3	40.4	59.6	0	20	46.7	33.3	
Total %	4.1	13.9	8.2	8.2	10.8	20.1	10.8	16	0	1.5	3.6	2.6	

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**3**	4	**4**	11	0	2	6	8	**3**	4	0	7	0	0	0	0	26
04:15 PM	1	**7**	4	**12**	**2**	3	6	11	1	4	0	5	0	**4**	1	**5**	**33**
04:30 PM	2	1	0	3	1	**4**	0	5	3	3	0	6	0	1	1	2	16
04:45 PM	0	3	0	3	1	3	**8**	**12**	3	**6**	0	**9**	**1**	0	**3**	4	28
Total Volume	6	15	8	29	4	12	20	36	10	17	0	27	1	5	5	11	103
% App. Total	20.7	51.7	27.6		11.1	33.3	55.6		37	63	0		9.1	45.5	45.5		
PHF	.500	.536	.500	.604	.500	.750	.625	.750	.833	.708	.000	.750	.250	.313	.417	.550	.780

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N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
Total	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
Grand Total	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	4	6
Apprch %	0	100	0	0	0	0	0	0	0	0	0	100	0	0	0	100	
Total %	0	16.7	0	0	0	0	0	0	0	0	0	16.7	0	0	0	66.7	

	Turnpike Street (Route 138) From North					Foundry Street (Route 106) From East					Turnpike Street (Route 138) From South					Foundry Street (Route 106) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.375

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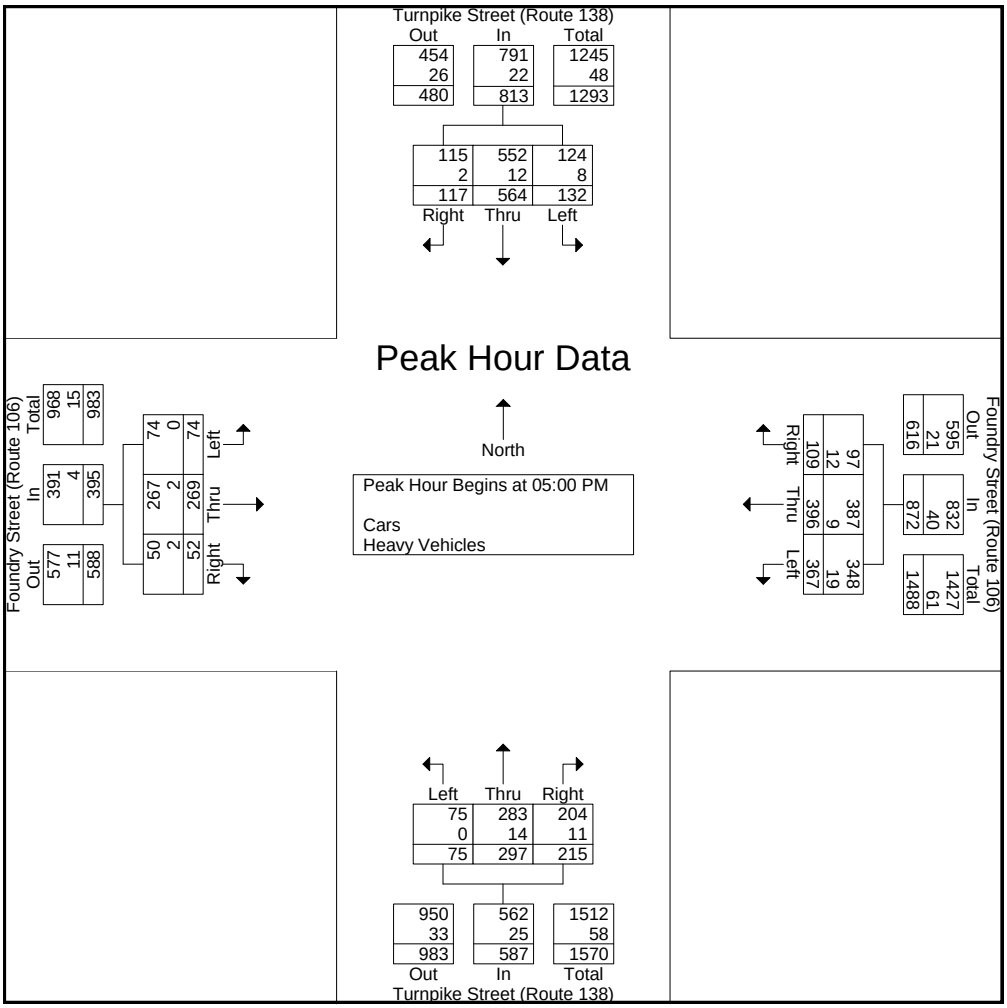
N/S: Turnpike Street (Route 138)
E/W: Foundry Street (Route 106)
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- AAA
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Turnpike Street (Route 138) From North				Foundry Street (Route 106) From East				Turnpike Street (Route 138) From South				Foundry Street (Route 106) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	21	**168**	31	220	30	101	77	208	49	**90**	**25**	**164**	12	60	7	79	671
05:15 PM	**38**	150	35	**223**	25	**106**	104	**235**	44	63	13	120	12	**75**	**28**	**115**	**693**
05:30 PM	32	140	**39**	211	**32**	89	**110**	231	**67**	73	14	154	10	63	21	94	690
05:45 PM	26	106	27	159	22	100	76	198	55	71	23	149	**18**	71	18	107	613
Total Volume	117	564	132	813	109	396	367	872	215	297	75	587	52	269	74	395	2667
% App. Total	14.4	69.4	16.2		12.5	45.4	42.1		36.6	50.6	12.8		13.2	68.1	18.7		
PHF	.770	.839	.846	.911	.852	.934	.834	.928	.802	.825	.750	.895	.722	.897	.661	.859	.962
Cars	115	552	124	791	97	387	348	832	204	283	75	562	50	267	74	391	2576
% Cars	98.3	97.9	93.9	97.3	89.0	97.7	94.8	95.4	94.9	95.3	100	95.7	96.2	99.3	100	99.0	96.6
Heavy Vehicles	2	12	8	22	12	9	19	40	11	14	0	25	2	2	0	4	91
% Heavy Vehicles	1.7	2.1	6.1	2.7	11.0	2.3	5.2	4.6	5.1	4.7	0	4.3	3.8	0.7	0	1.0	3.4



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N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	69	0	1	2	0	286	358
07:15 AM	98	0	3	1	2	293	397
07:30 AM	103	0	1	1	1	272	378
07:45 AM	81	0	0	1	2	309	393
Total	351	0	5	5	5	1160	1526
08:00 AM	84	0	1	1	3	245	334
08:15 AM	92	0	3	4	3	217	319
08:30 AM	80	1	1	3	2	194	281
08:45 AM	90	1	2	1	8	170	272
Total	346	2	7	9	16	826	1206
Grand Total	697	2	12	14	21	1986	2732
Apprch %	99.7	0.3	46.2	53.8	1	99	
Total %	25.5	0.1	0.4	0.5	0.8	72.7	
Cars	622	2	11	12	18	1921	2586
% Cars	89.2	100	91.7	85.7	85.7	96.7	94.7
Heavy Vehicles	75	0	1	2	3	65	146
% Heavy Vehicles	10.8	0	8.3	14.3	14.3	3.3	5.3

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	69	0	69	1	**2**	3	0	286	286	358
07:15 AM	98	0	98	**3**	1	**4**	**2**	293	295	**397**
07:30 AM	**103**	0	**103**	1	1	2	1	272	273	378
07:45 AM	81	0	81	0	1	1	2	**309**	**311**	393
Total Volume	351	0	351	5	5	10	5	1160	1165	1526
% App. Total	100	0		50	50		0.4	99.6		
PHF	.852	.000	.852	.417	.625	.625	.625	.939	.936	.961
Cars	310	0	310	5	5	10	4	1126	1130	1450
% Cars	88.3	0	88.3	100	100	100	80.0	97.1	97.0	95.0
Heavy Vehicles	41	0	41	0	0	0	1	34	35	76
% Heavy Vehicles	11.7	0	11.7	0	0	0	20.0	2.9	3.0	5.0

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E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	63	0	1	2	0	276	342
07:15 AM	86	0	3	1	2	285	377
07:30 AM	91	0	1	1	1	264	358
07:45 AM	70	0	0	1	1	301	373
Total	310	0	5	5	4	1126	1450
08:00 AM	74	0	1	0	2	240	317
08:15 AM	84	0	3	3	3	209	302
08:30 AM	77	1	1	3	1	185	268
08:45 AM	77	1	1	1	8	161	249
Total	312	2	6	7	14	795	1136
Grand Total	622	2	11	12	18	1921	2586
Apprch %	99.7	0.3	47.8	52.2	0.9	99.1	
Total %	24.1	0.1	0.4	0.5	0.7	74.3	

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	63	0	63	1	**2**	3	0	276	276	342
07:15 AM	86	0	86	**3**	1	**4**	**2**	285	287	**377**
07:30 AM	**91**	0	**91**	1	1	2	1	264	265	358
07:45 AM	70	0	70	0	1	1	1	**301**	**302**	373
Total Volume	310	0	310	5	5	10	4	1126	1130	1450
% App. Total	100	0		50	50		0.4	99.6		
PHF	.852	.000	.852	.417	.625	.625	.500	.935	.935	.962

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File Name : 81676L- B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	6	0	0	0	0	10	16
07:15 AM	12	0	0	0	0	8	20
07:30 AM	12	0	0	0	0	8	20
07:45 AM	11	0	0	0	1	8	20
Total	41	0	0	0	1	34	76
08:00 AM	10	0	0	1	1	5	17
08:15 AM	8	0	0	1	0	8	17
08:30 AM	3	0	0	0	1	9	13
08:45 AM	13	0	1	0	0	9	23
Total	34	0	1	2	2	31	70
Grand Total	75	0	1	2	3	65	146
Apprch %	100	0	33.3	66.7	4.4	95.6	
Total %	51.4	0	0.7	1.4	2.1	44.5	

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**12**	0	**12**	0	0	0	0	**8**	8	**20**
07:30 AM	**12**	**0**	**12**	**0**	**0**	**0**	**0**	**8**	**8**	**20**
07:45 AM	**11**	**0**	**11**	**0**	**0**	**0**	**1**	8	**9**	20
08:00 AM	10	0	10	0	**1**	**1**	1	5	6	17
Total Volume	45	0	45	0	1	1	2	29	31	77
% App. Total	100	0		0	100		6.5	93.5		
PHF	.938	.000	.938	.000	.250	.250	.500	.906	.861	.963

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Client: VHB/ J. Quitter

File Name : 81676L- B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	4	0	0	2	0	0	2	8
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	0	0	2	0	0	2	8
Grand Total	0	0	4	0	0	2	0	0	3	9
Apprch %	0	0	100	0	0	100	0	0	100	
Total %	0	0	44.4	0	0	22.2	0	0	33.3	

	Turnpike Street (Route 138) From North				Wilbur Street From East				Turnpike Street (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	**4**	**4**	0	0	**2**	**2**	0	0	**2**	**2**	**8**
Total Volume	0	0	4	4	0	0	2	2	0	0	3	3	9
% App. Total	0	0	100		0	0	100		0	0	100		
PHF	.000	.000	.250	.250	.000	.000	.250	.250	.000	.000	.375	.375	.281

PRECISION
D A T A
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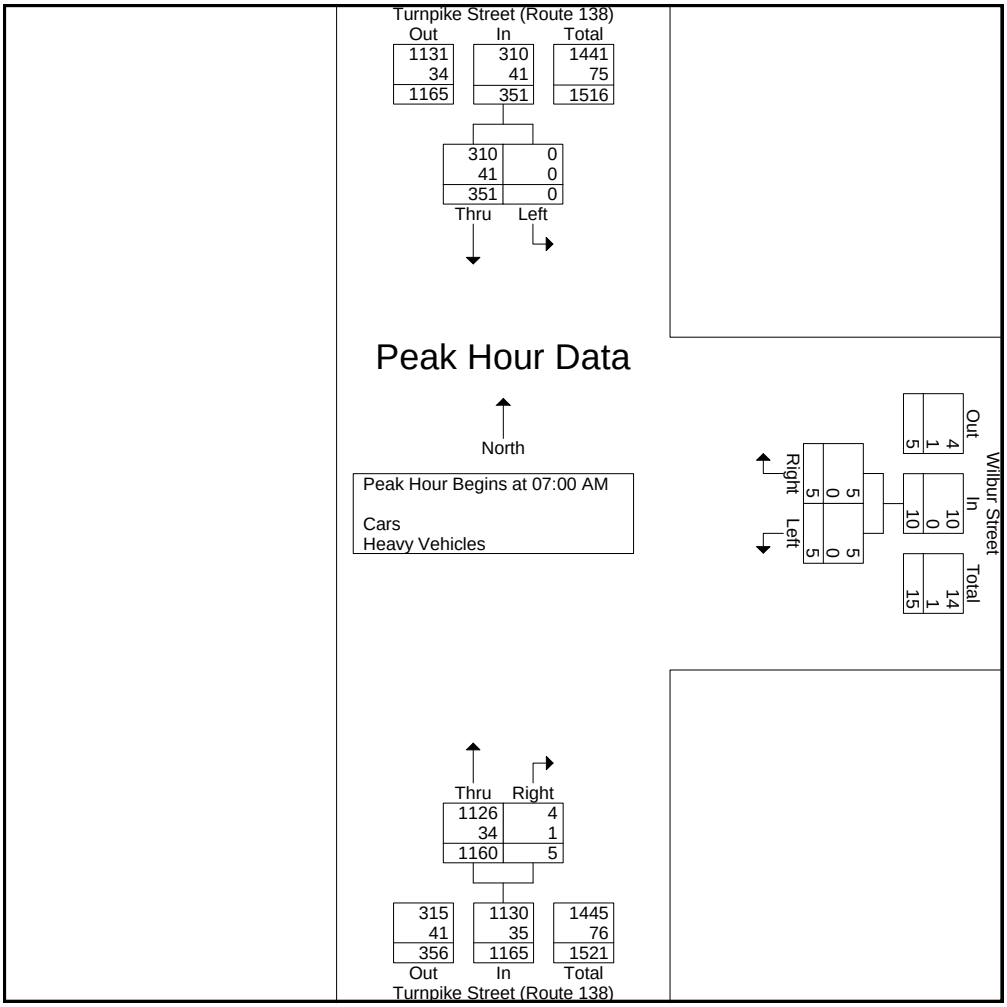
N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- B
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	69	0	69	1	**2**	3	0	286	286	358
07:15 AM	98	0	98	**3**	1	**4**	**2**	293	295	**397**
07:30 AM	**103**	0	**103**	1	1	2	1	272	273	378
07:45 AM	81	0	81	0	1	1	2	**309**	**311**	393
Total Volume	351	0	351	5	5	10	5	1160	1165	1526
% App. Total	100	0		50	50		0.4	99.6		
PHF	.852	.000	.852	.417	.625	.625	.625	.939	.936	.961
Cars	310	0	310	5	5	10	4	1126	1130	1450
% Cars	88.3	0	88.3	100	100	100	80.0	97.1	97.0	95.0
Heavy Vehicles	41	0	41	0	0	0	1	34	35	76
% Heavy Vehicles	11.7	0	11.7	0	0	0	20.0	2.9	3.0	5.0



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N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	273	1	1	2	5	129	411
04:15 PM	289	4	2	1	2	119	417
04:30 PM	256	0	0	1	1	142	400
04:45 PM	272	2	0	1	3	139	417
Total	1090	7	3	5	11	529	1645
05:00 PM	248	3	1	0	3	143	398
05:15 PM	258	3	0	2	1	137	401
05:30 PM	264	3	3	4	4	144	422
05:45 PM	207	1	2	1	4	127	342
Total	977	10	6	7	12	551	1563
Grand Total	2067	17	9	12	23	1080	3208
Apprch %	99.2	0.8	42.9	57.1	2.1	97.9	
Total %	64.4	0.5	0.3	0.4	0.7	33.7	
Cars	2019	17	9	12	23	1005	3085
% Cars	97.7	100	100	100	100	93.1	96.2
Heavy Vehicles	48	0	0	0	0	75	123
% Heavy Vehicles	2.3	0	0	0	0	6.9	3.8

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	273	1	274	1	**2**	**3**	**5**	129	134	411
04:15 PM	**289**	**4**	**293**	**2**	1	3	2	119	121	**417**
04:30 PM	**256**	**0**	**256**	**0**	**1**	**1**	**1**	**142**	**143**	400
04:45 PM	272	2	274	0	1	1	3	139	142	417
Total Volume	1090	7	1097	3	5	8	11	529	540	1645
% App. Total	99.4	0.6		37.5	62.5		2	98		
PHF	.943	.438	.936	.375	.625	.667	.550	.931	.944	.986
Cars	1061	7	1068	3	5	8	11	484	495	1571
% Cars	97.3	100	97.4	100	100	100	100	91.5	91.7	95.5
Heavy Vehicles	29	0	29	0	0	0	0	45	45	74
% Heavy Vehicles	2.7	0	2.6	0	0	0	0	8.5	8.3	4.5

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N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	266	1	1	2	5	116	391
04:15 PM	278	4	2	1	2	107	394
04:30 PM	253	0	0	1	1	129	384
04:45 PM	264	2	0	1	3	132	402
Total	1061	7	3	5	11	484	1571
05:00 PM	243	3	1	0	3	135	385
05:15 PM	252	3	0	2	1	132	390
05:30 PM	261	3	3	4	4	133	408
05:45 PM	202	1	2	1	4	121	331
Total	958	10	6	7	12	521	1514
Grand Total	2019	17	9	12	23	1005	3085
Apprch %	99.2	0.8	42.9	57.1	2.2	97.8	
Total %	65.4	0.6	0.3	0.4	0.7	32.6	

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**264**	2	**266**	0	1	1	3	132	135	402
05:00 PM	243	**3**	246	1	0	1	3	**135**	**138**	385
05:15 PM	252	3	255	0	2	2	1	132	133	390
05:30 PM	261	3	264	**3**	**4**	**7**	**4**	133	137	**408**
Total Volume	**1020**	**11**	**1031**	**4**	**7**	**11**	**11**	**532**	**543**	**1585**
% App. Total	**98.9**	**1.1**		**36.4**	**63.6**		**2**	**98**		
PHF	**.966**	**.917**	**.969**	**.333**	**.438**	**.393**	**.688**	**.985**	**.984**	**.971**

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N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Turnpike Street (Route 138) From North		Wilbur Street From East		Turnpike Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	7	0	0	0	0	13	20
04:15 PM	11	0	0	0	0	12	23
04:30 PM	3	0	0	0	0	13	16
04:45 PM	8	0	0	0	0	7	15
Total	29	0	0	0	0	45	74
05:00 PM	5	0	0	0	0	8	13
05:15 PM	6	0	0	0	0	5	11
05:30 PM	3	0	0	0	0	11	14
05:45 PM	5	0	0	0	0	6	11
Total	19	0	0	0	0	30	49
Grand Total	48	0	0	0	0	75	123
Apprch %	100	0	0	0	0	100	
Total %	39	0	0	0	0	61	

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	7	0	7	0	0	0	0	**13**	**13**	20
04:15 PM	**11**	0	**11**	0	0	0	0	12	12	**23**
04:30 PM	**3**	**0**	**3**	**0**	**0**	**0**	**0**	**13**	**13**	**16**
04:45 PM	**8**	**0**	**8**	**0**	**0**	**0**	**0**	**7**	**7**	**15**
Total Volume	**29**	**0**	**29**	**0**	**0**	**0**	**0**	**45**	**45**	**74**
% App. Total	**100**	**0**		**0**	**0**		**0**	**100**		
PHF	**.659**	**.000**	**.659**	**.000**	**.000**	**.000**	**.000**	**.865**	**.865**	**.804**

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N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- BBB
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Turnpike Street (Route 138) From North				Wilbur Street From East				Turnpike Street (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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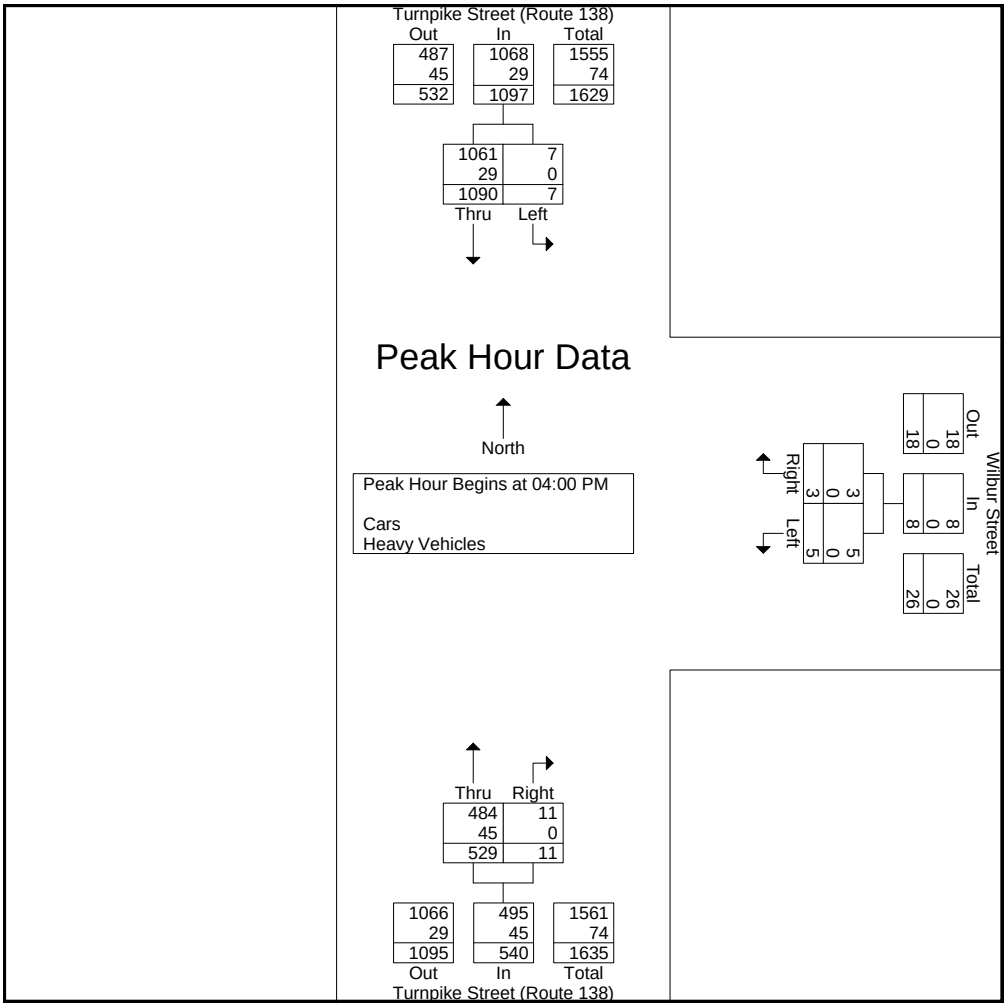
N/S: Turnpike Street (Route 138)
E: Wilbur Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- BBB
Site Code : 10111.31
Start Date : 9/18/2008

	Turnpike Street (Route 138) From North			Wilbur Street From East			Turnpike Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	273	1	274	1	**2**	**3**	**5**	129	134	411
04:15 PM	**289**	**4**	**293**	**2**	1	3	2	119	121	**417**
04:30 PM	**256**	**0**	**256**	**0**	**1**	**1**	**1**	**142**	**143**	400
04:45 PM	272	2	274	0	1	1	3	139	142	417
Total Volume	1090	7	1097	3	5	8	11	529	540	1645
% App. Total	99.4	0.6		37.5	62.5		2	98		
PHF	.943	.438	.936	.375	.625	.667	.550	.931	.944	.986
Cars	1061	7	1068	3	5	8	11	484	495	1571
% Cars	97.3	100	97.4	100	100	100	100	91.5	91.7	95.5
Heavy Vehicles	29	0	29	0	0	0	0	45	45	74
% Heavy Vehicles	2.7	0	2.6	0	0	0	0	8.5	8.3	4.5



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N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- C
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	7	63	15	5	1	26	58	252	1	4	5	12	449
07:15 AM	10	67	7	15	2	58	50	269	1	6	4	6	495
07:30 AM	8	99	6	18	0	77	41	239	5	6	5	10	514
07:45 AM	1	80	7	18	0	43	41	289	0	11	7	7	504
Total	26	309	35	56	3	204	190	1049	7	27	21	35	1962
08:00 AM	2	99	2	15	0	41	34	233	2	7	3	2	440
08:15 AM	1	106	1	16	1	43	50	186	1	3	1	1	410
08:30 AM	0	63	2	11	1	61	45	195	4	7	1	2	392
08:45 AM	1	88	4	11	0	51	33	161	5	6	1	3	364
Total	4	356	9	53	2	196	162	775	12	23	6	8	1606
Grand Total	30	665	44	109	5	400	352	1824	19	50	27	43	3568
Apprch %	4.1	90	6	21.2	1	77.8	16	83.1	0.9	41.7	22.5	35.8	
Total %	0.8	18.6	1.2	3.1	0.1	11.2	9.9	51.1	0.5	1.4	0.8	1.2	
Cars	28	583	40	98	4	374	341	1746	15	46	25	42	3342
% Cars	93.3	87.7	90.9	89.9	80	93.5	96.9	95.7	78.9	92	92.6	97.7	93.7
Heavy Vehicles	2	82	4	11	1	26	11	78	4	4	2	1	226
% Heavy Vehicles	6.7	12.3	9.1	10.1	20	6.5	3.1	4.3	21.1	8	7.4	2.3	6.3

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	7	63	**15**	85	5	1	26	32	**58**	252	1	311	4	5	**12**	21	449
07:15 AM	**10**	67	7	84	15	**2**	58	75	50	269	1	320	6	4	6	16	495
07:30 AM	8	**99**	6	**113**	**18**	0	**77**	**95**	41	239	**5**	285	6	5	10	21	**514**
07:45 AM	1	80	7	88	18	0	43	61	41	**289**	0	**330**	**11**	**7**	7	**25**	504
Total Volume	26	309	35	370	56	3	204	263	190	1049	7	1246	27	21	35	83	1962
% App. Total	7	83.5	9.5		21.3	1.1	77.6		15.2	84.2	0.6		32.5	25.3	42.2		
PHF	.650	.780	.583	.819	.778	.375	.662	.692	.819	.907	.350	.944	.614	.750	.729	.830	.954
Cars	24	266	31	321	49	3	193	245	185	1017	6	1208	26	20	35	81	1855
% Cars	92.3	86.1	88.6	86.8	87.5	100	94.6	93.2	97.4	96.9	85.7	97.0	96.3	95.2	100	97.6	94.5
Heavy Vehicles	2	43	4	49	7	0	11	18	5	32	1	38	1	1	0	2	107
% Heavy Vehicles	7.7	13.9	11.4	13.2	12.5	0	5.4	6.8	2.6	3.1	14.3	3.0	3.7	4.8	0	2.4	5.5

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N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	6	56	14	4	1	26	55	242	1	4	5	12	426
07:15 AM	9	56	7	12	2	53	49	261	0	6	4	6	465
07:30 AM	8	86	4	16	0	72	40	234	5	6	5	10	486
07:45 AM	1	68	6	17	0	42	41	280	0	10	6	7	478
Total	24	266	31	49	3	193	185	1017	6	26	20	35	1855
08:00 AM	2	89	2	15	0	40	34	221	2	6	2	2	415
08:15 AM	1	94	1	14	1	41	48	177	1	3	1	0	382
08:30 AM	0	59	2	9	0	56	42	181	1	7	1	2	360
08:45 AM	1	75	4	11	0	44	32	150	5	4	1	3	330
Total	4	317	9	49	1	181	156	729	9	20	5	7	1487
Grand Total	28	583	40	98	4	374	341	1746	15	46	25	42	3342
Apprch %	4.3	89.6	6.1	20.6	0.8	78.6	16.2	83.1	0.7	40.7	22.1	37.2	
Total %	0.8	17.4	1.2	2.9	0.1	11.2	10.2	52.2	0.4	1.4	0.7	1.3	

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	6	56	**14**	76	4	1	26	31	**55**	242	1	298	4	5	**12**	21	426
07:15 AM	**9**	56	7	72	12	**2**	53	67	49	261	0	310	6	4	6	16	465
07:30 AM	8	**86**	4	**98**	16	0	**72**	**88**	40	234	**5**	279	6	5	10	21	**486**
07:45 AM	1	68	6	75	**17**	0	42	59	41	**280**	0	**321**	**10**	**6**	7	**23**	478
Total Volume	24	266	31	321	49	3	193	245	185	1017	6	1208	26	20	35	81	1855
% App. Total	7.5	82.9	9.7		20	1.2	78.8		15.3	84.2	0.5		32.1	24.7	43.2		
PHF	.667	.773	.554	.819	.721	.375	.670	.696	.841	.908	.300	.941	.650	.833	.729	.880	.954

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- C
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	7	1	1	0	0	3	10	0	0	0	0	23
07:15 AM	1	11	0	3	0	5	1	8	1	0	0	0	30
07:30 AM	0	13	2	2	0	5	1	5	0	0	0	0	28
07:45 AM	0	12	1	1	0	1	0	9	0	1	1	0	26
Total	2	43	4	7	0	11	5	32	1	1	1	0	107
08:00 AM	0	10	0	0	0	1	0	12	0	1	1	0	25
08:15 AM	0	12	0	2	0	2	2	9	0	0	0	1	28
08:30 AM	0	4	0	2	1	5	3	14	3	0	0	0	32
08:45 AM	0	13	0	0	0	7	1	11	0	2	0	0	34
Total	0	39	0	4	1	15	6	46	3	3	1	1	119
Grand Total	2	82	4	11	1	26	11	78	4	4	2	1	226
Apprch %	2.3	93.2	4.5	28.9	2.6	68.4	11.8	83.9	4.3	57.1	28.6	14.3	
Total %	0.9	36.3	1.8	4.9	0.4	11.5	4.9	34.5	1.8	1.8	0.9	0.4	

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	10	0	10	0	0	1	1	0	12	0	12	1	**1**	0	**2**	25
08:15 AM	0	12	0	12	**2**	0	2	4	2	9	0	11	0	0	**1**	1	28
08:30 AM	0	4	0	4	2	**1**	5	**8**	**3**	**14**	**3**	**20**	0	0	0	0	32
08:45 AM	0	**13**	0	**13**	0	0	**7**	7	1	11	0	12	**2**	0	0	2	**34**
Total Volume	0	39	0	39	4	1	15	20	6	46	3	55	3	1	1	5	119
% App. Total	0	100	0		20	5	75		10.9	83.6	5.5		60	20	20		
PHF	.000	.750	.000	.750	.500	.250	.536	.625	.500	.821	.250	.688	.375	.250	.250	.625	.875

PRECISION
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N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- C
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Apprch %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	

	Broadway (Route 138) From North					Elm Street East From East					Broadway (Route 138) From South					Elm Street West From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

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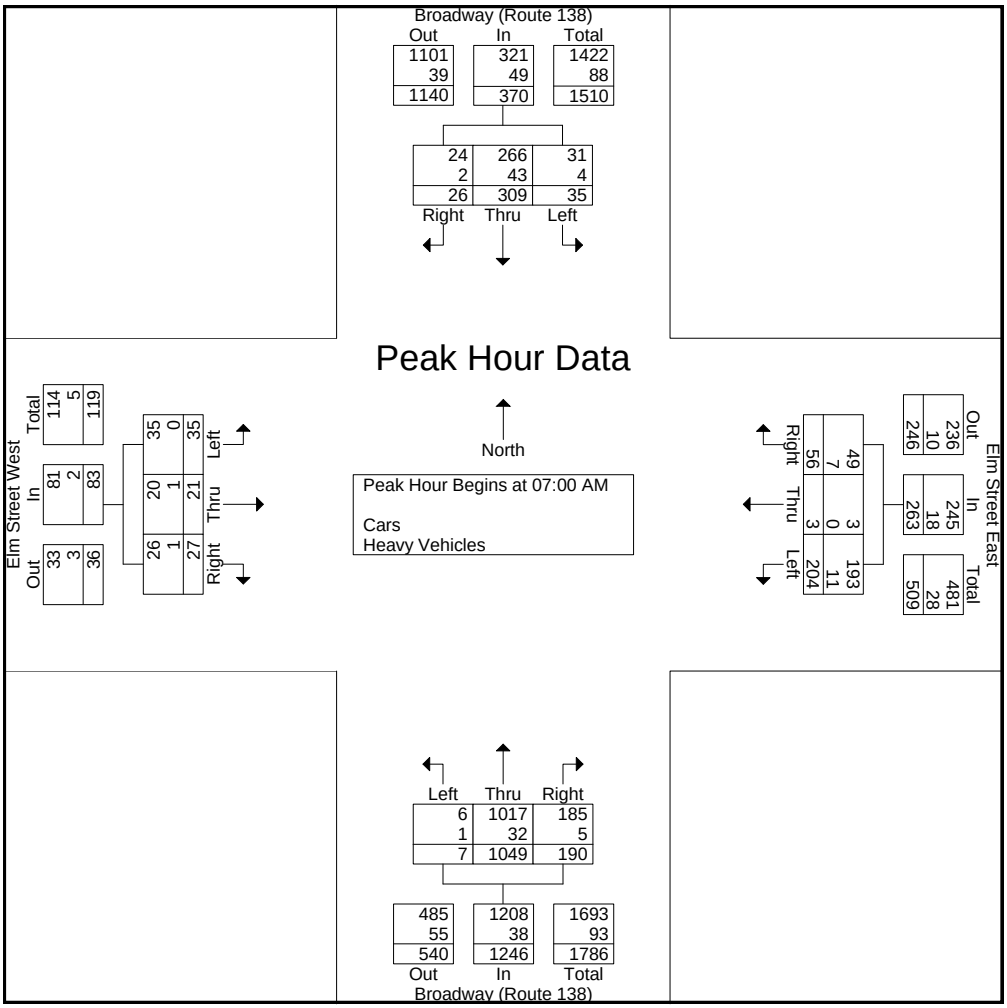
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	7	63	**15**	85	5	1	26	32	**58**	252	1	311	4	5	**12**	21	449
07:15 AM	**10**	67	7	84	15	**2**	58	75	50	269	1	320	6	4	6	16	495
07:30 AM	8	**99**	6	**113**	**18**	0	**77**	**95**	41	239	**5**	285	6	5	10	21	**514**
07:45 AM	1	80	7	88	18	0	43	61	41	**289**	0	**330**	**11**	**7**	7	**25**	504
Total Volume	26	309	35	370	56	3	204	263	190	1049	7	1246	27	21	35	83	1962
% App. Total	7	83.5	9.5		21.3	1.1	77.6		15.2	84.2	0.6		32.5	25.3	42.2		
PHF	.650	.780	.583	.819	.778	.375	.662	.692	.819	.907	.350	.944	.614	.750	.729	.830	.954
Cars	24	266	31	321	49	3	193	245	185	1017	6	1208	26	20	35	81	1855
% Cars	92.3	86.1	88.6	86.8	87.5	100	94.6	93.2	97.4	96.9	85.7	97.0	96.3	95.2	100	97.6	94.5
Heavy Vehicles	2	43	4	49	7	0	11	18	5	32	1	38	1	1	0	2	107
% Heavy Vehicles	7.7	13.9	11.4	13.2	12.5	0	5.4	6.8	2.6	3.1	14.3	3.0	3.7	4.8	0	2.4	5.5



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N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	6	267	15	6	3	68	49	120	8	5	0	1	548
04:15 PM	2	281	11	7	6	66	59	117	5	6	1	4	565
04:30 PM	4	216	28	3	3	65	64	144	12	7	5	5	556
04:45 PM	3	255	10	8	5	89	67	121	9	9	3	6	585
Total	15	1019	64	24	17	288	239	502	34	27	9	16	2254
05:00 PM	2	224	7	2	3	72	74	127	4	6	2	2	525
05:15 PM	4	245	10	5	5	80	83	147	7	7	2	1	596
05:30 PM	7	237	12	10	3	77	69	145	9	13	4	2	588
05:45 PM	3	194	10	9	1	61	59	131	6	3	5	4	486
Total	16	900	39	26	12	290	285	550	26	29	13	9	2195
Grand Total	31	1919	103	50	29	578	524	1052	60	56	22	25	4449
Apprch %	1.5	93.5	5	7.6	4.4	88	32	64.3	3.7	54.4	21.4	24.3	
Total %	0.7	43.1	2.3	1.1	0.7	13	11.8	23.6	1.3	1.3	0.5	0.6	
Cars	28	1868	95	47	28	562	511	979	57	54	22	22	4273
% Cars	90.3	97.3	92.2	94	96.6	97.2	97.5	93.1	95	96.4	100	88	96
Heavy Vehicles	3	51	8	3	1	16	13	73	3	2	0	3	176
% Heavy Vehicles	9.7	2.7	7.8	6	3.4	2.8	2.5	6.9	5	3.6	0	12	4

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	**255**	10	**268**	8	**5**	**89**	**102**	67	121	**9**	197	9	3	**6**	18	585
05:00 PM	2	224	7	233	2	3	72	77	74	127	4	205	6	2	2	10	525
05:15 PM	4	245	10	259	5	5	80	90	**83**	**147**	7	**237**	7	2	1	10	**596**
05:30 PM	**7**	237	**12**	256	**10**	3	77	90	69	145	9	223	**13**	**4**	2	**19**	588
Total Volume	16	961	39	1016	25	16	318	359	293	540	29	862	35	11	11	57	2294
% App. Total	1.6	94.6	3.8		7	4.5	88.6		34	62.6	3.4		61.4	19.3	19.3		
PHF	.571	.942	.813	.948	.625	.800	.893	.880	.883	.918	.806	.909	.673	.688	.458	.750	.962
Cars	16	938	38	992	25	16	312	353	286	507	29	822	34	11	10	55	2222
% Cars	100	97.6	97.4	97.6	100	100	98.1	98.3	97.6	93.9	100	95.4	97.1	100	90.9	96.5	96.9
Heavy Vehicles	0	23	1	24	0	0	6	6	7	33	0	40	1	0	1	2	72
% Heavy Vehicles	0	2.4	2.6	2.4	0	0	1.9	1.7	2.4	6.1	0	4.6	2.9	0	9.1	3.5	3.1

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N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	261	12	6	3	64	48	110	7	5	0	1	521
04:15 PM	2	270	8	5	5	64	57	107	5	5	1	3	532
04:30 PM	3	208	28	3	3	62	61	131	10	7	5	5	526
04:45 PM	3	247	10	8	5	88	67	114	9	9	3	5	568
Total	12	986	58	22	16	278	233	462	31	26	9	14	2147
05:00 PM	2	219	6	2	3	69	69	117	4	6	2	2	501
05:15 PM	4	240	10	5	5	79	82	140	7	7	2	1	582
05:30 PM	7	232	12	10	3	76	68	136	9	12	4	2	571
05:45 PM	3	191	9	8	1	60	59	124	6	3	5	3	472
Total	16	882	37	25	12	284	278	517	26	28	13	8	2126
Grand Total	28	1868	95	47	28	562	511	979	57	54	22	22	4273
Apprch %	1.4	93.8	4.8	7.4	4.4	88.2	33	63.3	3.7	55.1	22.4	22.4	
Total %	0.7	43.7	2.2	1.1	0.7	13.2	12	22.9	1.3	1.3	0.5	0.5	

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	**247**	10	**260**	8	**5**	**88**	**101**	67	114	**9**	190	9	3	**5**	17	568
05:00 PM	2	219	6	227	2	3	69	74	69	117	4	190	6	2	2	10	501
05:15 PM	4	240	10	254	5	5	79	89	**82**	**140**	7	**229**	7	2	1	10	**582**
05:30 PM	**7**	232	**12**	251	**10**	3	76	89	68	136	9	213	**12**	**4**	2	**18**	571
Total Volume	16	938	38	992	25	16	312	353	286	507	29	822	34	11	10	55	2222
% App. Total	1.6	94.6	3.8		7.1	4.5	88.4		34.8	61.7	3.5		61.8	20	18.2		
PHF	.571	.949	.792	.954	.625	.800	.886	.874	.872	.905	.806	.897	.708	.688	.500	.764	.954

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File Name : 81676L- CCC
Site Code : 10111.31
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Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Elm Street East From East			Broadway (Route 138) From South			Elm Street West From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	6	3	0	0	4	1	10	1	0	0	0	27
04:15 PM	0	11	3	2	1	2	2	10	0	1	0	1	33
04:30 PM	1	8	0	0	0	3	3	13	2	0	0	0	30
04:45 PM	0	8	0	0	0	1	0	7	0	0	0	1	17
Total	3	33	6	2	1	10	6	40	3	1	0	2	107
05:00 PM	0	5	1	0	0	3	5	10	0	0	0	0	24
05:15 PM	0	5	0	0	0	1	1	7	0	0	0	0	14
05:30 PM	0	5	0	0	0	1	1	9	0	1	0	0	17
05:45 PM	0	3	1	1	0	1	0	7	0	0	0	1	14
Total	0	18	2	1	0	6	7	33	0	1	0	1	69
Grand Total	3	51	8	3	1	16	13	73	3	2	0	3	176
Apprch %	4.8	82.3	12.9	15	5	80	14.6	82	3.4	40	0	60	
Total %	1.7	29	4.5	1.7	0.6	9.1	7.4	41.5	1.7	1.1	0	1.7	

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	6	**3**	11	0	0	**4**	4	1	10	1	12	0	0	0	0	27
04:15 PM	0	**11**	3	**14**	**2**	**1**	2	**5**	2	10	0	12	**1**	0	**1**	**2**	**33**
04:30 PM	1	8	0	9	0	0	3	3	**3**	**13**	**2**	**18**	0	0	0	0	30
04:45 PM	0	8	0	8	0	0	1	1	0	7	0	7	0	0	1	1	17
Total Volume	3	33	6	42	2	1	10	13	6	40	3	49	1	0	2	3	107
% App. Total	7.1	78.6	14.3		15.4	7.7	76.9		12.2	81.6	6.1		33.3	0	66.7		
PHF	.375	.750	.500	.750	.250	.250	.625	.650	.500	.769	.375	.681	.250	.000	.500	.375	.811

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File Name : 81676L- CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	3
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	3
Grand Total	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	1	4
Apprch %	0	0	100	0	0	100	0	0	100	0	0	0	0	0	0	100	
Total %	0	0	25	0	0	25	0	0	25	0	0	0	0	0	0	25	

	Broadway (Route 138) From North					Elm Street East From East					Broadway (Route 138) From South					Elm Street West From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	**1**	**0**	**1**	0	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	**1**	**1**	**3**
Total Volume	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	3
% App. Total	0	0	100	0		0	100	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.250	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250

PRECISION
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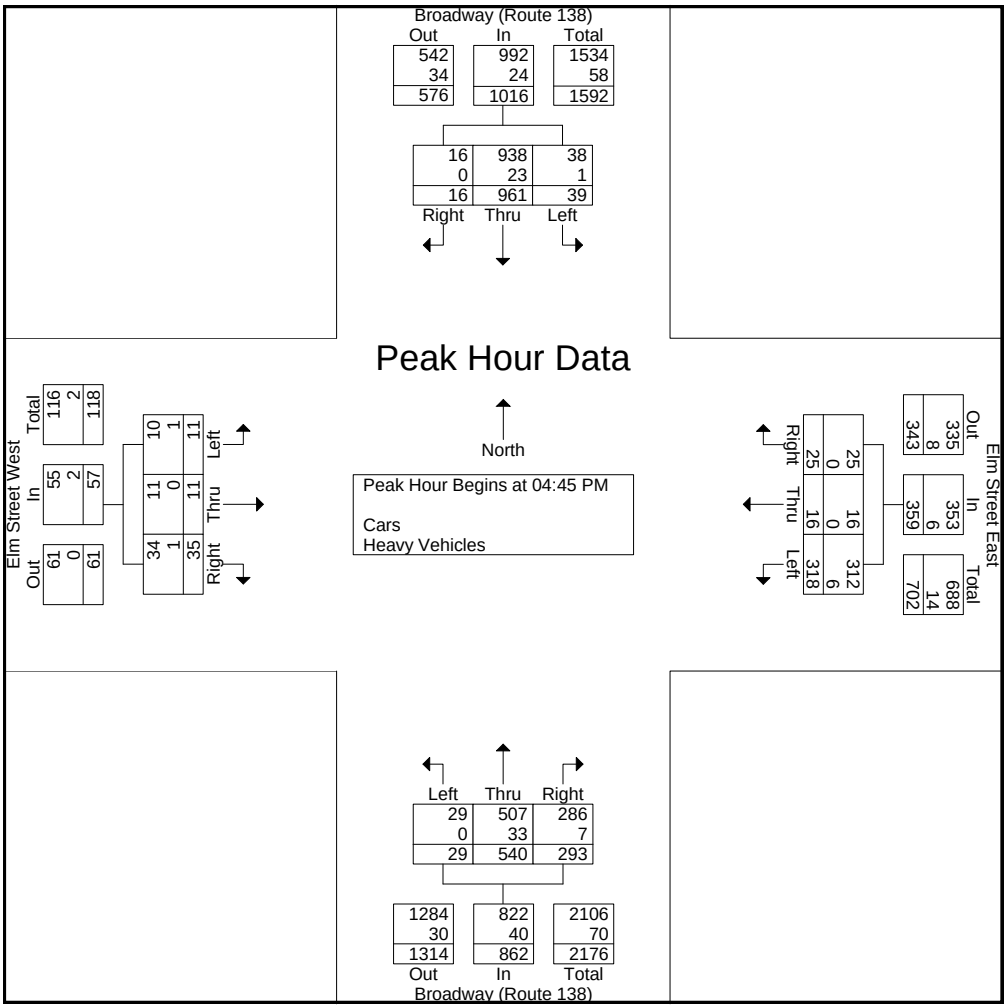
N/S: Broadway (Route 138)
E/W: Elm Street East/Elm Street West
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- CCC
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				Elm Street East From East				Broadway (Route 138) From South				Elm Street West From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	**255**	10	**268**	8	**5**	**89**	**102**	67	121	**9**	197	9	3	**6**	18	585
05:00 PM	2	224	7	233	2	3	72	77	74	127	4	205	6	2	2	10	525
05:15 PM	4	245	10	259	5	5	80	90	**83**	**147**	7	**237**	7	2	1	10	**596**
05:30 PM	**7**	237	**12**	256	**10**	3	77	90	69	145	9	223	**13**	**4**	2	**19**	588
Total Volume	16	961	39	1016	25	16	318	359	293	540	29	862	35	11	11	57	2294
% App. Total	1.6	94.6	3.8		7	4.5	88.6		34	62.6	3.4		61.4	19.3	19.3		
PHF	.571	.942	.813	.948	.625	.800	.893	.880	.883	.918	.806	.909	.673	.688	.458	.750	.962
Cars	16	938	38	992	25	16	312	353	286	507	29	822	34	11	10	55	2222
% Cars	100	97.6	97.4	97.6	100	100	98.1	98.3	97.6	93.9	100	95.4	97.1	100	90.9	96.5	96.9
Heavy Vehicles	0	23	1	24	0	0	6	6	7	33	0	40	1	0	1	2	72
% Heavy Vehicles	0	2.4	2.6	2.4	0	0	1.9	1.7	2.4	6.1	0	4.6	2.9	0	9.1	3.5	3.1



PRECISION
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N/S: Broadway (Route 38)
E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- D
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	67	10	0	0	0	56	334	0	27	0	53	547
07:15 AM	0	108	11	0	0	0	57	339	0	36	0	62	613
07:30 AM	0	121	24	0	0	0	54	322	0	32	0	47	600
07:45 AM	0	99	17	0	0	0	44	317	0	51	0	72	600
Total	0	395	62	0	0	0	211	1312	0	146	0	234	2360
08:00 AM	0	112	16	0	0	0	48	257	0	55	0	52	540
08:15 AM	0	121	17	0	0	0	42	225	0	44	0	67	516
08:30 AM	0	120	11	0	0	0	51	210	0	38	0	60	490
08:45 AM	0	121	9	0	0	0	47	198	0	45	0	45	465
Total	0	474	53	0	0	0	188	890	0	182	0	224	2011
Grand Total	0	869	115	0	0	0	399	2202	0	328	0	458	4371
Apprch %	0	88.3	11.7	0	0	0	15.3	84.7	0	41.7	0	58.3	
Total %	0	19.9	2.6	0	0	0	9.1	50.4	0	7.5	0	10.5	
Cars	0	798	102	0	0	0	379	2116	0	292	0	426	4113
% Cars	0	91.8	88.7	0	0	0	95	96.1	0	89	0	93	94.1
Heavy Vehicles	0	71	13	0	0	0	20	86	0	36	0	32	258
% Heavy Vehicles	0	8.2	11.3	0	0	0	5	3.9	0	11	0	7	5.9

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	67	10	77	0	0	0	0	56	334	0	390	27	0	53	80	547
07:15 AM	0	108	11	119	0	0	0	0	**57**	**339**	0	**396**	36	0	62	98	**613**
07:30 AM	0	**121**	**24**	**145**	0	0	0	0	54	322	0	376	32	0	47	79	600
07:45 AM	0	99	17	116	0	0	0	0	44	317	0	361	**51**	0	**72**	**123**	600
Total Volume	0	395	62	457	0	0	0	0	211	1312	0	1523	146	0	234	380	2360
% App. Total	0	86.4	13.6		0	0	0		13.9	86.1	0		38.4	0	61.6		
PHF	.000	.816	.646	.788	.000	.000	.000	.000	.925	.968	.000	.961	.716	.000	.813	.772	.962
Cars	0	365	57	422	0	0	0	0	205	1275	0	1480	133	0	221	354	2256
% Cars	0	92.4	91.9	92.3	0	0	0	0	97.2	97.2	0	97.2	91.1	0	94.4	93.2	95.6
Heavy Vehicles	0	30	5	35	0	0	0	0	6	37	0	43	13	0	13	26	104
% Heavy Vehicles	0	7.6	8.1	7.7	0	0	0	0	2.8	2.8	0	2.8	8.9	0	5.6	6.8	4.4

PRECISION
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N/S: Broadway (Route 38)
E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- D
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	62	9	0	0	0	53	321	0	24	0	51	520
07:15 AM	0	99	11	0	0	0	55	326	0	35	0	59	585
07:30 AM	0	113	21	0	0	0	54	315	0	30	0	43	576
07:45 AM	0	91	16	0	0	0	43	313	0	44	0	68	575
Total	0	365	57	0	0	0	205	1275	0	133	0	221	2256
08:00 AM	0	103	13	0	0	0	44	245	0	50	0	45	500
08:15 AM	0	109	13	0	0	0	39	220	0	39	0	61	481
08:30 AM	0	112	11	0	0	0	48	190	0	31	0	56	448
08:45 AM	0	109	8	0	0	0	43	186	0	39	0	43	428
Total	0	433	45	0	0	0	174	841	0	159	0	205	1857
Grand Total	0	798	102	0	0	0	379	2116	0	292	0	426	4113
Apprch %	0	88.7	11.3	0	0	0	15.2	84.8	0	40.7	0	59.3	
Total %	0	19.4	2.5	0	0	0	9.2	51.4	0	7.1	0	10.4	

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	62	9	71	0	0	0	0	53	321	0	374	24	0	51	75	520
07:15 AM	0	99	11	110	0	0	0	0	**55**	**326**	0	**381**	35	0	59	94	**585**
07:30 AM	0	**113**	**21**	**134**	0	0	0	0	54	315	0	369	30	0	43	73	576
07:45 AM	0	91	16	107	0	0	0	0	43	313	0	356	**44**	0	**68**	**112**	575
Total Volume	0	365	57	422	0	0	0	0	205	1275	0	1480	133	0	221	354	2256
% App. Total	0	86.5	13.5		0	0	0		13.9	86.1	0		37.6	0	62.4		
PHF	.000	.808	.679	.787	.000	.000	.000	.000	.932	.978	.000	.971	.756	.000	.813	.790	.964

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E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- D
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	5	1	0	0	0	3	13	0	3	0	2	27
07:15 AM	0	9	0	0	0	0	2	13	0	1	0	3	28
07:30 AM	0	8	3	0	0	0	0	7	0	2	0	4	24
07:45 AM	0	8	1	0	0	0	1	4	0	7	0	4	25
Total	0	30	5	0	0	0	6	37	0	13	0	13	104
08:00 AM	0	9	3	0	0	0	4	12	0	5	0	7	40
08:15 AM	0	12	4	0	0	0	3	5	0	5	0	6	35
08:30 AM	0	8	0	0	0	0	3	20	0	7	0	4	42
08:45 AM	0	12	1	0	0	0	4	12	0	6	0	2	37
Total	0	41	8	0	0	0	14	49	0	23	0	19	154
Grand Total	0	71	13	0	0	0	20	86	0	36	0	32	258
Apprch %	0	84.5	15.5	0	0	0	18.9	81.1	0	52.9	0	47.1	
Total %	0	27.5	5	0	0	0	7.8	33.3	0	14	0	12.4	

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	9	3	12	0	0	0	0	**4**	12	0	16	5	0	**7**	**12**	40
08:15 AM	0	**12**	**4**	**16**	0	0	0	0	3	5	0	8	5	0	6	11	35
08:30 AM	0	8	0	8	0	0	0	0	3	**20**	0	**23**	**7**	0	4	11	**42**
08:45 AM	0	12	1	13	0	0	0	0	4	12	0	16	6	0	2	8	37
Total Volume	0	41	8	49	0	0	0	0	14	49	0	63	23	0	19	42	154
% App. Total	0	83.7	16.3		0	0	0		22.2	77.8	0		54.8	0	45.2		
PHF	.000	.854	.500	.766	.000	.000	.000	.000	.875	.613	.000	.685	.821	.000	.679	.875	.917

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E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- D
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Broadway (Route 138) From North					I-495 SB On Ramp From East					Broadway (Route 138) From South					I-495 SB Off Ramp From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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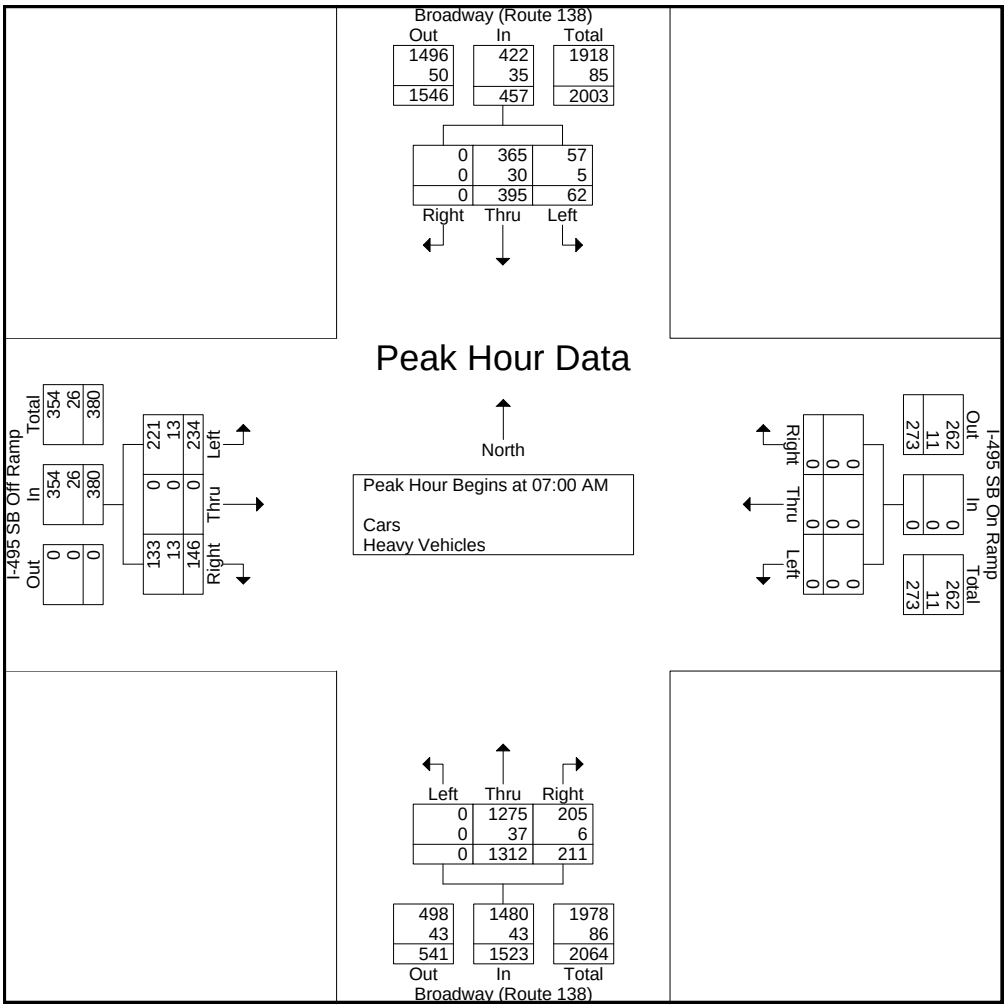
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- D
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	67	10	77	0	0	0	0	56	334	0	390	27	0	53	80	547
07:15 AM	0	108	11	119	0	0	0	0	**57**	**339**	0	**396**	36	0	62	98	**613**
07:30 AM	0	**121**	**24**	**145**	0	0	0	0	54	322	0	376	32	0	47	79	600
07:45 AM	0	99	17	116	0	0	0	0	44	317	0	361	**51**	0	**72**	**123**	600
Total Volume	0	395	62	457	0	0	0	0	211	1312	0	1523	146	0	234	380	2360
% App. Total	0	86.4	13.6		0	0	0		13.9	86.1	0		38.4	0	61.6		
PHF	.000	.816	.646	.788	.000	.000	.000	.000	.925	.968	.000	.961	.716	.000	.813	.772	.962
Cars	0	365	57	422	0	0	0	0	205	1275	0	1480	133	0	221	354	2256
% Cars	0	92.4	91.9	92.3	0	0	0	0	97.2	97.2	0	97.2	91.1	0	94.4	93.2	95.6
Heavy Vehicles	0	30	5	35	0	0	0	0	6	37	0	43	13	0	13	26	104
% Heavy Vehicles	0	7.6	8.1	7.7	0	0	0	0	2.8	2.8	0	2.8	8.9	0	5.6	6.8	4.4



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City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- DDD
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	266	40	0	0	0	59	170	0	64	0	41	640
04:15 PM	0	269	39	0	0	0	48	163	0	66	0	41	626
04:30 PM	0	261	23	0	0	0	39	205	0	82	0	51	661
04:45 PM	0	284	22	0	0	0	42	195	0	105	0	43	691
Total	0	1080	124	0	0	0	188	733	0	317	0	176	2618
05:00 PM	0	284	26	0	0	0	44	203	0	107	0	56	720
05:15 PM	0	286	24	0	0	0	48	210	0	129	0	48	745
05:30 PM	0	270	23	0	0	0	39	196	0	159	0	58	745
05:45 PM	0	234	26	0	0	0	33	165	0	86	0	60	604
Total	0	1074	99	0	0	0	164	774	0	481	0	222	2814
Grand Total	0	2154	223	0	0	0	352	1507	0	798	0	398	5432
Apprch %	0	90.6	9.4	0	0	0	18.9	81.1	0	66.7	0	33.3	
Total %	0	39.7	4.1	0	0	0	6.5	27.7	0	14.7	0	7.3	
Cars	0	2112	217	0	0	0	339	1451	0	778	0	366	5263
% Cars	0	98.1	97.3	0	0	0	96.3	96.3	0	97.5	0	92	96.9
Heavy Vehicles	0	42	6	0	0	0	13	56	0	20	0	32	169
% Heavy Vehicles	0	1.9	2.7	0	0	0	3.7	3.7	0	2.5	0	8	3.1

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	284	22	306	0	0	0	0	42	195	0	237	105	0	43	148	691
05:00 PM	0	284	**26**	**310**	0	0	0	0	44	203	0	247	107	0	56	163	720
05:15 PM	0	**286**	24	310	0	0	0	0	**48**	**210**	0	**258**	129	0	48	177	**745**
05:30 PM	0	270	23	293	0	0	0	0	39	196	0	235	**159**	0	**58**	**217**	745
Total Volume	0	1124	95	1219	0	0	0	0	173	804	0	977	500	0	205	705	2901
% App. Total	0	92.2	7.8		0	0	0		17.7	82.3	0		70.9	0	29.1		
PHF	.000	.983	.913	.983	.000	.000	.000	.000	.901	.957	.000	.947	.786	.000	.884	.812	.973
Cars	0	1103	90	1193	0	0	0	0	169	777	0	946	491	0	189	680	2819
% Cars	0	98.1	94.7	97.9	0	0	0	0	97.7	96.6	0	96.8	98.2	0	92.2	96.5	97.2
Heavy Vehicles	0	21	5	26	0	0	0	0	4	27	0	31	9	0	16	25	82
% Heavy Vehicles	0	1.9	5.3	2.1	0	0	0	0	2.3	3.4	0	3.2	1.8	0	7.8	3.5	2.8

PRECISION
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N/S: Broadway (Route 138)
E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- DDD
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	261	40	0	0	0	56	160	0	59	0	38	614
04:15 PM	0	265	39	0	0	0	46	153	0	65	0	39	607
04:30 PM	0	253	23	0	0	0	36	198	0	78	0	44	632
04:45 PM	0	279	21	0	0	0	40	187	0	103	0	40	670
Total	0	1058	123	0	0	0	178	698	0	305	0	161	2523
05:00 PM	0	277	26	0	0	0	43	194	0	104	0	52	696
05:15 PM	0	279	21	0	0	0	47	204	0	127	0	44	722
05:30 PM	0	268	22	0	0	0	39	192	0	157	0	53	731
05:45 PM	0	230	25	0	0	0	32	163	0	85	0	56	591
Total	0	1054	94	0	0	0	161	753	0	473	0	205	2740
Grand Total	0	2112	217	0	0	0	339	1451	0	778	0	366	5263
Apprch %	0	90.7	9.3	0	0	0	18.9	81.1	0	68	0	32	
Total %	0	40.1	4.1	0	0	0	6.4	27.6	0	14.8	0	7	

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	**279**	21	300	0	0	0	0	40	187	0	227	103	0	40	143	670
05:00 PM	0	277	**26**	**303**	0	0	0	0	43	194	0	237	104	0	52	156	696
05:15 PM	0	279	21	300	0	0	0	0	**47**	**204**	0	**251**	127	0	44	171	722
05:30 PM	0	268	22	290	0	0	0	0	39	192	0	231	**157**	0	**53**	**210**	**731**
Total Volume	0	1103	90	1193	0	0	0	0	169	777	0	946	491	0	189	680	2819
% App. Total	0	92.5	7.5		0	0	0		17.9	82.1	0		72.2	0	27.8		
PHF	.000	.988	.865	.984	.000	.000	.000	.000	.899	.952	.000	.942	.782	.000	.892	.810	.964

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N/S: Broadway (Route 138)
E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- DDD
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			I-495 SB On Ramp From East			Broadway (Route 138) From South			I-495 SB Off Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	5	0	0	0	0	3	10	0	5	0	3	26
04:15 PM	0	4	0	0	0	0	2	10	0	1	0	2	19
04:30 PM	0	8	0	0	0	0	3	7	0	4	0	7	29
04:45 PM	0	5	1	0	0	0	2	8	0	2	0	3	21
Total	0	22	1	0	0	0	10	35	0	12	0	15	95
05:00 PM	0	7	0	0	0	0	1	9	0	3	0	4	24
05:15 PM	0	7	3	0	0	0	1	6	0	2	0	4	23
05:30 PM	0	2	1	0	0	0	0	4	0	2	0	5	14
05:45 PM	0	4	1	0	0	0	1	2	0	1	0	4	13
Total	0	20	5	0	0	0	3	21	0	8	0	17	74
Grand Total	0	42	6	0	0	0	13	56	0	20	0	32	169
Apprch %	0	87.5	12.5	0	0	0	18.8	81.2	0	38.5	0	61.5	
Total %	0	24.9	3.6	0	0	0	7.7	33.1	0	11.8	0	18.9	

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**8**	0	8	0	0	0	0	**3**	7	0	**10**	**4**	0	**7**	**11**	**29**
04:45 PM	0	5	1	6	0	0	0	0	2	8	0	10	2	0	3	5	21
05:00 PM	0	7	0	7	0	0	0	0	1	**9**	0	10	3	0	4	7	24
05:15 PM	0	7	**3**	**10**	0	0	0	0	1	6	0	7	2	0	4	6	23
Total Volume	0	27	4	31	0	0	0	0	7	30	0	37	11	0	18	29	97
% App. Total	0	87.1	12.9		0	0	0		18.9	81.1	0		37.9	0	62.1		
PHF	.000	.844	.333	.775	.000	.000	.000	.000	.583	.833	.000	.925	.688	.000	.643	.659	.836

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E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- DDD
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Grand Total	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	4
Apprch %	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
Total %	0	25	0	0	0	0	0	0	0	75	0	0	0	0	0	0	

	Broadway (Route 138) From North					I-495 SB On Ramp From East					Broadway (Route 138) From South					I-495 SB Off Ramp From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	**2**	**0**	**0**	**2**	0	0	0	0	0	**3**
Total Volume	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250

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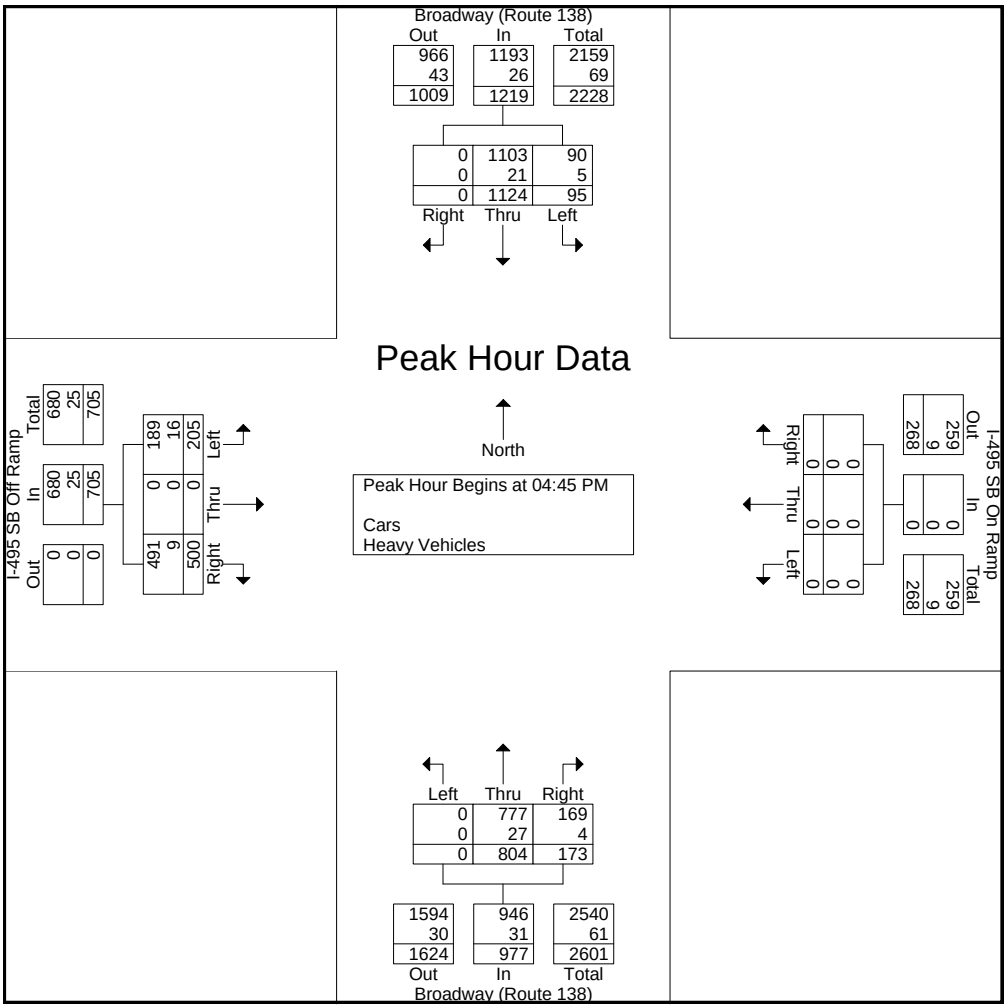
N/S: Broadway (Route 138)
E/W: I-495 SB On Ramp/ I-495 SB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- DDD
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				I-495 SB On Ramp From East				Broadway (Route 138) From South				I-495 SB Off Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	284	22	306	0	0	0	0	42	195	0	237	105	0	43	148	691
05:00 PM	0	284	**26**	**310**	0	0	0	0	44	203	0	247	107	0	56	163	720
05:15 PM	0	**286**	24	310	0	0	0	0	**48**	**210**	0	**258**	129	0	48	177	**745**
05:30 PM	0	270	23	293	0	0	0	0	39	196	0	235	**159**	0	**58**	**217**	745
Total Volume	0	1124	95	1219	0	0	0	0	173	804	0	977	500	0	205	705	2901
% App. Total	0	92.2	7.8		0	0	0		17.7	82.3	0		70.9	0	29.1		
PHF	.000	.983	.913	.983	.000	.000	.000	.000	.901	.957	.000	.947	.786	.000	.884	.812	.973
Cars	0	1103	90	1193	0	0	0	0	169	777	0	946	491	0	189	680	2819
% Cars	0	98.1	94.7	97.9	0	0	0	0	97.7	96.6	0	96.8	98.2	0	92.2	96.5	97.2
Heavy Vehicles	0	21	5	26	0	0	0	0	4	27	0	31	9	0	16	25	82
% Heavy Vehicles	0	1.9	5.3	2.1	0	0	0	0	2.3	3.4	0	3.2	1.8	0	7.8	3.5	2.8



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E/W: I-495 NB Off Ramp/ I-495 NB On Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	50	85	0	35	0	24	0	285	72	0	0	0	551
07:15 AM	54	102	0	49	0	19	0	343	78	0	0	0	645
07:30 AM	85	117	0	37	0	36	0	316	85	0	0	0	676
07:45 AM	55	96	0	43	0	23	0	295	58	0	0	0	570
Total	244	400	0	164	0	102	0	1239	293	0	0	0	2442
08:00 AM	55	98	0	49	0	24	0	262	46	0	0	0	534
08:15 AM	43	109	0	36	0	21	0	233	55	0	0	0	497
08:30 AM	44	105	0	32	0	21	0	235	44	0	0	0	481
08:45 AM	42	100	0	30	0	33	0	223	43	0	0	0	471
Total	184	412	0	147	0	99	0	953	188	0	0	0	1983
Grand Total	428	812	0	311	0	201	0	2192	481	0	0	0	4425
Apprch %	34.5	65.5	0	60.7	0	39.3	0	82	18	0	0	0	
Total %	9.7	18.4	0	7	0	4.5	0	49.5	10.9	0	0	0	
Cars	382	750	0	306	0	180	0	2117	439	0	0	0	4174
% Cars	89.3	92.4	0	98.4	0	89.6	0	96.6	91.3	0	0	0	94.3
Heavy Vehicles	46	62	0	5	0	21	0	75	42	0	0	0	251
% Heavy Vehicles	10.7	7.6	0	1.6	0	10.4	0	3.4	8.7	0	0	0	5.7

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	50	85	0	135	35	0	24	59	0	285	72	357	0	0	0	0	551
07:15 AM	54	102	0	156	**49**	0	19	68	0	**343**	78	**421**	0	0	0	0	645
07:30 AM	**85**	**117**	0	**202**	37	0	**36**	**73**	0	316	**85**	401	0	0	0	0	**676**
07:45 AM	55	96	0	151	43	0	23	66	0	295	58	353	0	0	0	0	570
Total Volume	244	400	0	644	164	0	102	266	0	1239	293	1532	0	0	0	0	2442
% App. Total	37.9	62.1	0		61.7	0	38.3		0	80.9	19.1		0	0	0		
PHF	.718	.855	.000	.797	.837	.000	.708	.911	.000	.903	.862	.910	.000	.000	.000	.000	.903
Cars	217	370	0	587	163	0	93	256	0	1208	274	1482	0	0	0	0	2325
% Cars	88.9	92.5	0	91.1	99.4	0	91.2	96.2	0	97.5	93.5	96.7	0	0	0	0	95.2
Heavy Vehicles	27	30	0	57	1	0	9	10	0	31	19	50	0	0	0	0	117
% Heavy Vehicles	11.1	7.5	0	8.9	0.6	0	8.8	3.8	0	2.5	6.5	3.3	0	0	0	0	4.8

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E/W: I-495 NB Off Ramp/ I-495 NB On Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	43	81	0	35	0	22	0	275	66	0	0	0	522
07:15 AM	49	94	0	48	0	17	0	335	71	0	0	0	614
07:30 AM	76	107	0	37	0	35	0	310	80	0	0	0	645
07:45 AM	49	88	0	43	0	19	0	288	57	0	0	0	544
Total	217	370	0	163	0	93	0	1208	274	0	0	0	2325
08:00 AM	51	90	0	49	0	21	0	250	39	0	0	0	500
08:15 AM	38	100	0	35	0	19	0	225	52	0	0	0	469
08:30 AM	41	101	0	32	0	16	0	220	36	0	0	0	446
08:45 AM	35	89	0	27	0	31	0	214	38	0	0	0	434
Total	165	380	0	143	0	87	0	909	165	0	0	0	1849
Grand Total	382	750	0	306	0	180	0	2117	439	0	0	0	4174
Apprch %	33.7	66.3	0	63	0	37	0	82.8	17.2	0	0	0	
Total %	9.2	18	0	7.3	0	4.3	0	50.7	10.5	0	0	0	

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	43	81	0	124	35	0	22	57	0	275	66	341	0	0	0	0	522
07:15 AM	49	94	0	143	**48**	0	17	65	0	**335**	71	**406**	0	0	0	0	614
07:30 AM	**76**	**107**	0	**183**	37	0	**35**	**72**	0	310	**80**	390	0	0	0	0	**645**
07:45 AM	49	88	0	137	43	0	19	62	0	288	57	345	0	0	0	0	544
Total Volume	217	370	0	587	163	0	93	256	0	1208	274	1482	0	0	0	0	2325
% App. Total	37	63	0		63.7	0	36.3		0	81.5	18.5		0	0	0		
PHF	.714	.864	.000	.802	.849	.000	.664	.889	.000	.901	.856	.913	.000	.000	.000	.000	.901

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Broadway (Route 138)
E/W: I-495 NB Off Ramp/ I-495 NB On Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	7	4	0	0	0	2	0	10	6	0	0	0	29
07:15 AM	5	8	0	1	0	2	0	8	7	0	0	0	31
07:30 AM	9	10	0	0	0	1	0	6	5	0	0	0	31
07:45 AM	6	8	0	0	0	4	0	7	1	0	0	0	26
Total	27	30	0	1	0	9	0	31	19	0	0	0	117
08:00 AM	4	8	0	0	0	3	0	12	7	0	0	0	34
08:15 AM	5	9	0	1	0	2	0	8	3	0	0	0	28
08:30 AM	3	4	0	0	0	5	0	15	8	0	0	0	35
08:45 AM	7	11	0	3	0	2	0	9	5	0	0	0	37
Total	19	32	0	4	0	12	0	44	23	0	0	0	134
Grand Total	46	62	0	5	0	21	0	75	42	0	0	0	251
Apprch %	42.6	57.4	0	19.2	0	80.8	0	64.1	35.9	0	0	0	
Total %	18.3	24.7	0	2	0	8.4	0	29.9	16.7	0	0	0	

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	4	8	0	12	0	0	3	3	0	12	7	19	0	0	0	0	34
08:15 AM	5	9	0	14	1	0	2	3	0	8	3	11	0	0	0	0	28
08:30 AM	3	4	0	7	0	0	**5**	**5**	0	**15**	**8**	**23**	0	0	0	0	35
08:45 AM	**7**	**11**	0	**18**	**3**	0	2	5	0	9	5	14	0	0	0	0	**37**
Total Volume	19	32	0	51	4	0	12	16	0	44	23	67	0	0	0	0	134
% App. Total	37.3	62.7	0		25	0	75		0	65.7	34.3		0	0	0		
PHF	.679	.727	.000	.708	.333	.000	.600	.800	.000	.733	.719	.728	.000	.000	.000	.000	.905

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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N/S: Broadway (Route 138)
E/W: I-495 NB Off Ramp/ I-495 NB On Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Broadway (Route 138) From North					I-495 NB Off Ramp From East					Broadway (Route 138) From South					I-495 NB On Ramp From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

PRECISION
D A T A
INDUSTRIES, LLC
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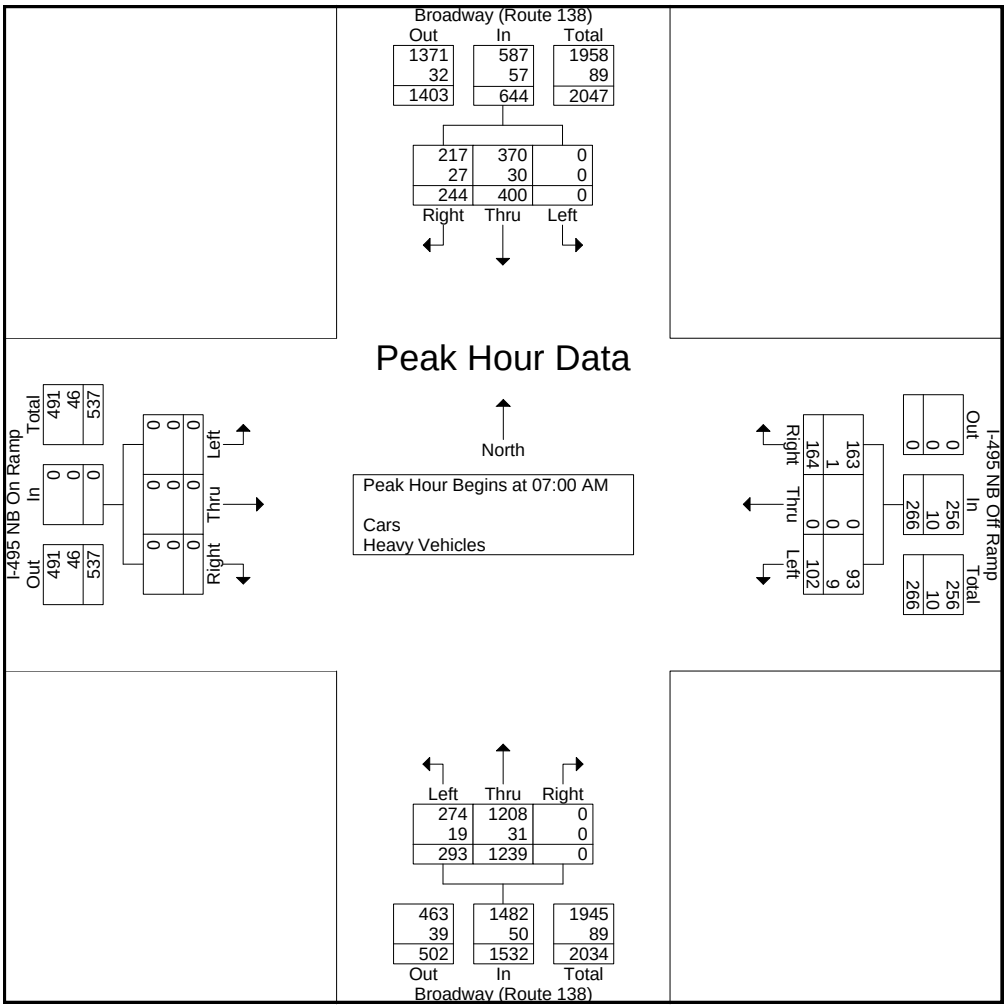
N/S: Broadway (Route 138)
E/W: I-495 NB Off Ramp/ I-495 NB On Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L-F
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	50	85	0	135	35	0	24	59	0	285	72	357	0	0	0	0	551
07:15 AM	54	102	0	156	**49**	0	19	68	0	**343**	78	**421**	0	0	0	0	645
07:30 AM	**85**	**117**	0	**202**	37	0	**36**	**73**	0	316	**85**	401	0	0	0	0	**676**
07:45 AM	55	96	0	151	43	0	23	66	0	295	58	353	0	0	0	0	570
Total Volume	244	400	0	644	164	0	102	266	0	1239	293	1532	0	0	0	0	2442
% App. Total	37.9	62.1	0		61.7	0	38.3		0	80.9	19.1		0	0	0		
PHF	.718	.855	.000	.797	.837	.000	.708	.911	.000	.903	.862	.910	.000	.000	.000	.000	.903
Cars	217	370	0	587	163	0	93	256	0	1208	274	1482	0	0	0	0	2325
% Cars	88.9	92.5	0	91.1	99.4	0	91.2	96.2	0	97.5	93.5	96.7	0	0	0	0	95.2
Heavy Vehicles	27	30	0	57	1	0	9	10	0	31	19	50	0	0	0	0	117
% Heavy Vehicles	11.1	7.5	0	8.9	0.6	0	8.8	3.8	0	2.5	6.5	3.3	0	0	0	0	4.8



PRECISION DATA INDUSTRIES, LLC
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N/S: Broadway (Route 138)
E/W: I-495 NB On Ramp/ I-495 NB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	55	270	0	25	2	32	0	178	21	0	0	0	583
04:15 PM	55	276	0	32	0	31	0	173	23	0	0	0	590
04:30 PM	70	253	0	22	0	35	0	232	28	0	0	0	640
04:45 PM	47	264	0	15	0	29	0	190	20	0	0	0	565
Total	227	1063	0	94	2	127	0	773	92	0	0	0	2378
05:00 PM	66	269	0	20	1	33	0	228	25	0	0	0	642
05:15 PM	61	266	0	37	0	38	0	234	27	0	0	0	663
05:30 PM	57	257	0	36	0	25	0	242	28	0	0	0	645
05:45 PM	55	222	0	24	0	29	0	198	29	0	0	0	557
Total	239	1014	0	117	1	125	0	902	109	0	0	0	2507
Grand Total	466	2077	0	211	3	252	0	1675	201	0	0	0	4885
Apprch %	18.3	81.7	0	45.3	0.6	54.1	0	89.3	10.7	0	0	0	
Total %	9.5	42.5	0	4.3	0.1	5.2	0	34.3	4.1	0	0	0	
Cars	444	2040	0	204	3	242	0	1598	190	0	0	0	4721
% Cars	95.3	98.2	0	96.7	100	96	0	95.4	94.5	0	0	0	96.6
Heavy Vehicles	22	37	0	7	0	10	0	77	11	0	0	0	164
% Heavy Vehicles	4.7	1.8	0	3.3	0	4	0	4.6	5.5	0	0	0	3.4

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	47	264	0	311	15	0	29	44	0	190	20	210	0	0	0	0	565
05:00 PM	**66**	**269**	0	**335**	20	**1**	33	54	0	228	25	253	0	0	0	0	642
05:15 PM	61	266	0	327	**37**	0	**38**	**75**	0	234	27	261	0	0	0	0	**663**
05:30 PM	57	257	0	314	36	0	25	61	0	**242**	**28**	**270**	0	0	0	0	645
Total Volume	231	1056	0	1287	108	1	125	234	0	894	100	994	0	0	0	0	2515
% App. Total	17.9	82.1	0		46.2	0.4	53.4		0	89.9	10.1		0	0	0		
PHF	.875	.981	.000	.960	.730	.250	.822	.780	.000	.924	.893	.920	.000	.000	.000	.000	.948
Cars	225	1039	0	1264	105	1	120	226	0	858	94	952	0	0	0	0	2442
% Cars	97.4	98.4	0	98.2	97.2	100	96.0	96.6	0	96.0	94.0	95.8	0	0	0	0	97.1
Heavy Vehicles	6	17	0	23	3	0	5	8	0	36	6	42	0	0	0	0	73
% Heavy Vehicles	2.6	1.6	0	1.8	2.8	0	4.0	3.4	0	4.0	6.0	4.2	0	0	0	0	2.9

N/S: Broadway (Route 138)
E/W: I-495 NB On Ramp/ I-495 NB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	52	265	0	24	2	31	0	166	19	0	0	0	559
04:15 PM	48	269	0	30	0	31	0	163	21	0	0	0	562
04:30 PM	65	247	0	22	0	32	0	219	27	0	0	0	612
04:45 PM	43	261	0	15	0	27	0	180	19	0	0	0	545
Total	208	1042	0	91	2	121	0	728	86	0	0	0	2278
05:00 PM	66	263	0	18	1	33	0	218	23	0	0	0	622
05:15 PM	61	261	0	37	0	35	0	227	24	0	0	0	645
05:30 PM	55	254	0	35	0	25	0	233	28	0	0	0	630
05:45 PM	54	220	0	23	0	28	0	192	29	0	0	0	546
Total	236	998	0	113	1	121	0	870	104	0	0	0	2443
Grand Total	444	2040	0	204	3	242	0	1598	190	0	0	0	4721
Apprch %	17.9	82.1	0	45.4	0.7	53.9	0	89.4	10.6	0	0	0	
Total %	9.4	43.2	0	4.3	0.1	5.1	0	33.8	4	0	0	0	

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**66**	**263**	0	**329**	18	**1**	33	52	0	218	23	241	0	0	0	0	622
05:15 PM	61	261	0	322	**37**	0	**35**	**72**	0	227	24	251	0	0	0	0	**645**
05:30 PM	55	254	0	309	35	0	25	60	0	**233**	28	**261**	0	0	0	0	630
05:45 PM	54	220	0	274	23	0	28	51	0	192	**29**	221	0	0	0	0	546
Total Volume	236	998	0	1234	113	1	121	235	0	870	104	974	0	0	0	0	2443
% App. Total	19.1	80.9	0		48.1	0.4	51.5		0	89.3	10.7		0	0	0		
PHF	.894	.949	.000	.938	.764	.250	.864	.816	.000	.933	.897	.933	.000	.000	.000	.000	.947

N/S: Broadway (Route 138)
E/W: I-495 NB On Ramp/ I-495 NB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			I-495 NB Off Ramp From East			Broadway (Route 138) From South			I-495 NB On Ramp From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	5	0	1	0	1	0	12	2	0	0	0	24
04:15 PM	7	7	0	2	0	0	0	10	2	0	0	0	28
04:30 PM	5	6	0	0	0	3	0	13	1	0	0	0	28
04:45 PM	4	3	0	0	0	2	0	10	1	0	0	0	20
Total	19	21	0	3	0	6	0	45	6	0	0	0	100
05:00 PM	0	6	0	2	0	0	0	10	2	0	0	0	20
05:15 PM	0	5	0	0	0	3	0	7	3	0	0	0	18
05:30 PM	2	3	0	1	0	0	0	9	0	0	0	0	15
05:45 PM	1	2	0	1	0	1	0	6	0	0	0	0	11
Total	3	16	0	4	0	4	0	32	5	0	0	0	64
Grand Total	22	37	0	7	0	10	0	77	11	0	0	0	164
Apprch %	37.3	62.7	0	41.2	0	58.8	0	87.5	12.5	0	0	0	
Total %	13.4	22.6	0	4.3	0	6.1	0	47	6.7	0	0	0	

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	3	5	0	8	1	0	1	2	0	12	**2**	**14**	0	0	0	0	24
04:15 PM	**7**	**7**	0	**14**	**2**	0	0	2	0	10	2	12	0	0	0	0	**28**
04:30 PM	5	6	0	11	0	0	**3**	**3**	0	**13**	1	14	0	0	0	0	28
04:45 PM	4	3	0	7	0	0	2	2	0	10	1	11	0	0	0	0	20
Total Volume	19	21	0	40	3	0	6	9	0	45	6	51	0	0	0	0	100
% App. Total	47.5	52.5	0		33.3	0	66.7		0	88.2	11.8		0	0	0		
PHF	.679	.750	.000	.714	.375	.000	.500	.750	.000	.865	.750	.911	.000	.000	.000	.000	.893

N/S: Broadway (Route 138)
E/W: I-495 NB On Ramp/ I-495 NB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

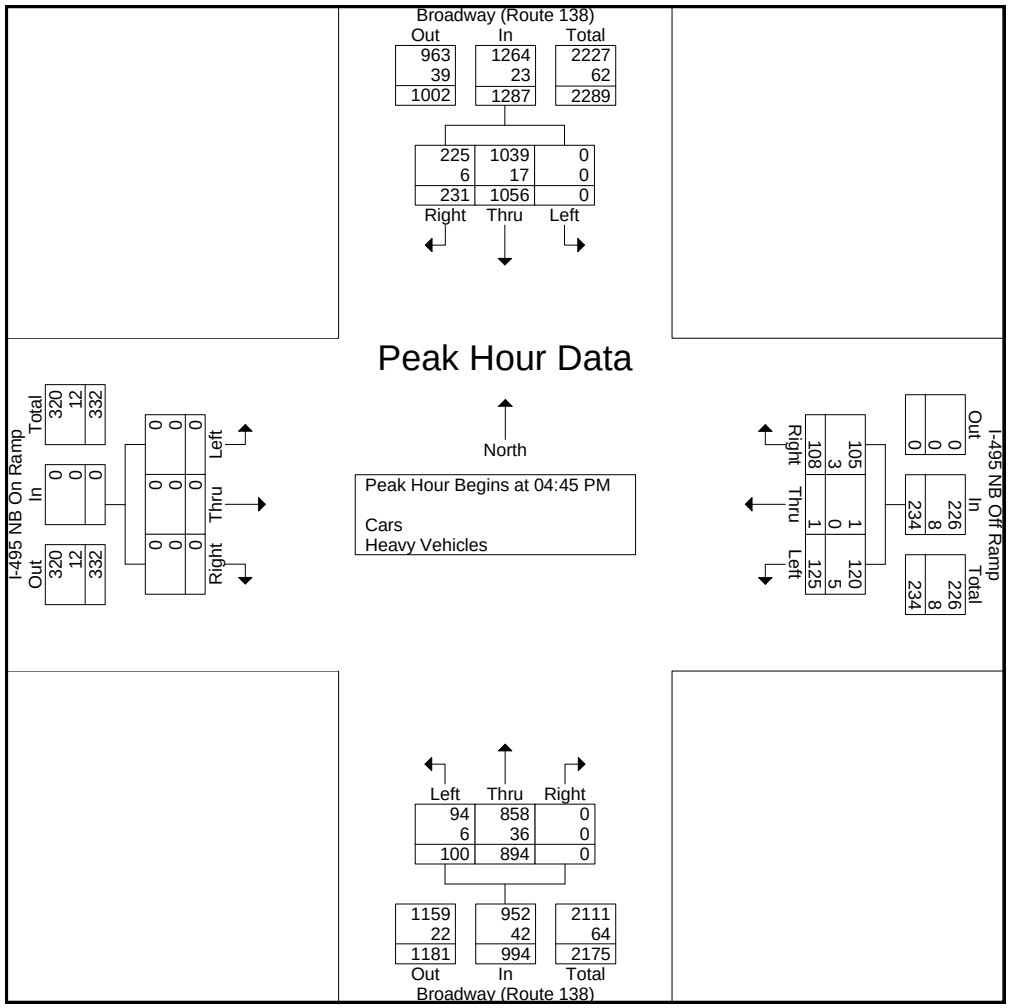
	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Total	0	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Grand Total	0	3	0	0	0	0	0	1	0	3	0	0	0	0	0	0	7
Apprch %	0	100	0	0	0	0	0	100	0	100	0	0	0	0	0	0	
Total %	0	42.9	0	0	0	0	0	14.3	0	42.9	0	0	0	0	0	0	

	Broadway (Route 138) From North					I-495 NB Off Ramp From East					Broadway (Route 138) From South					I-495 NB On Ramp From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	**2**	0	0	**2**	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	0	0	0	**3**
Total Volume	0	2	0	0	2	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	4
% App. Total	0	100	0	0		0	0	0	100		0	100	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.333

N/S: Broadway (Route 138)
E/W: I-495 NB On Ramp/ I-495 NB Off Ramp
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- FFF
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				I-495 NB Off Ramp From East				Broadway (Route 138) From South				I-495 NB On Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	47	264	0	311	15	0	29	44	0	190	20	210	0	0	0	0	565
05:00 PM	**66**	**269**	0	**335**	20	**1**	33	54	0	228	25	253	0	0	0	0	642
05:15 PM	61	266	0	327	**37**	0	**38**	**75**	0	234	27	261	0	0	0	0	**663**
05:30 PM	57	257	0	314	36	0	25	61	0	**242**	**28**	**270**	0	0	0	0	645
Total Volume	231	1056	0	1287	108	1	125	234	0	894	100	994	0	0	0	0	2515
% App. Total	17.9	82.1	0		46.2	0.4	53.4		0	89.9	10.1		0	0	0		
PHF	.875	.981	.000	.960	.730	.250	.822	.780	.000	.924	.893	.920	.000	.000	.000	.000	.948
Cars	225	1039	0	1264	105	1	120	226	0	858	94	952	0	0	0	0	2442
% Cars	97.4	98.4	0	98.2	97.2	100	96.0	96.6	0	96.0	94.0	95.8	0	0	0	0	97.1
Heavy Vehicles	6	17	0	23	3	0	5	8	0	36	6	42	0	0	0	0	73
% Heavy Vehicles	2.6	1.6	0	1.8	2.8	0	4.0	3.4	0	4.0	6.0	4.2	0	0	0	0	2.9



PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- H
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	10	89	14	31	5	4	1	298	11	8	3	57	531
07:15 AM	11	124	1	27	15	2	0	291	5	11	7	58	552
07:30 AM	15	122	4	34	9	5	2	281	9	6	7	42	536
07:45 AM	10	120	24	29	12	3	0	267	11	7	7	43	533
Total	46	455	43	121	41	14	3	1137	36	32	24	200	2152
08:00 AM	14	130	8	27	10	3	1	218	19	12	1	45	488
08:15 AM	12	124	11	26	6	4	2	188	6	18	8	34	439
08:30 AM	9	132	6	17	4	5	0	182	15	11	9	34	424
08:45 AM	13	134	11	13	7	6	4	190	6	12	5	29	430
Total	48	520	36	83	27	18	7	778	46	53	23	142	1781
Grand Total	94	975	79	204	68	32	10	1915	82	85	47	342	3933
Apprch %	8.2	84.9	6.9	67.1	22.4	10.5	0.5	95.4	4.1	17.9	9.9	72.2	
Total %	2.4	24.8	2	5.2	1.7	0.8	0.3	48.7	2.1	2.2	1.2	8.7	
Cars	92	891	74	201	66	31	9	1827	77	82	45	339	3734
% Cars	97.9	91.4	93.7	98.5	97.1	96.9	90	95.4	93.9	96.5	95.7	99.1	94.9
Heavy Vehicles	2	84	5	3	2	1	1	88	5	3	2	3	199
% Heavy Vehicles	2.1	8.6	6.3	1.5	2.9	3.1	10	4.6	6.1	3.5	4.3	0.9	5.1

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	10	89	14	113	31	5	4	40	1	**298**	**11**	**310**	8	3	57	68	531
07:15 AM	11	**124**	1	136	27	**15**	2	44	0	291	5	296	**11**	**7**	**58**	**76**	**552**
07:30 AM	**15**	122	4	141	**34**	9	**5**	**48**	**2**	281	9	292	6	7	42	55	536
07:45 AM	10	120	**24**	**154**	29	12	3	44	0	267	11	278	7	7	43	57	533
Total Volume	46	455	43	544	121	41	14	176	3	1137	36	1176	32	24	200	256	2152
% App. Total	8.5	83.6	7.9		68.8	23.3	8		0.3	96.7	3.1		12.5	9.4	78.1		
PHF	.767	.917	.448	.883	.890	.683	.700	.917	.375	.954	.818	.948	.727	.857	.862	.842	.975
Cars	46	421	40	507	120	40	14	174	3	1100	35	1138	30	23	200	253	2072
% Cars	100	92.5	93.0	93.2	99.2	97.6	100	98.9	100	96.7	97.2	96.8	93.8	95.8	100	98.8	96.3
Heavy Vehicles	0	34	3	37	1	1	0	2	0	37	1	38	2	1	0	3	80
% Heavy Vehicles	0	7.5	7.0	6.8	0.8	2.4	0	1.1	0	3.3	2.8	3.2	6.3	4.2	0	1.2	3.7

PRECISION
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INDUSTRIES, LLC
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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	10	81	14	30	5	4	1	285	11	6	2	57	506
07:15 AM	11	117	1	27	15	2	0	277	4	11	7	58	530
07:30 AM	15	111	4	34	9	5	2	275	9	6	7	42	519
07:45 AM	10	112	21	29	11	3	0	263	11	7	7	43	517
Total	46	421	40	120	40	14	3	1100	35	30	23	200	2072
08:00 AM	14	117	8	27	10	3	1	206	18	11	1	44	460
08:15 AM	12	110	10	24	5	3	1	182	4	18	7	34	410
08:30 AM	8	121	6	17	4	5	0	161	14	11	9	33	389
08:45 AM	12	122	10	13	7	6	4	178	6	12	5	28	403
Total	46	470	34	81	26	17	6	727	42	52	22	139	1662
Grand Total	92	891	74	201	66	31	9	1827	77	82	45	339	3734
Apprch %	8.7	84.3	7	67.4	22.1	10.4	0.5	95.5	4	17.6	9.7	72.7	
Total %	2.5	23.9	2	5.4	1.8	0.8	0.2	48.9	2.1	2.2	1.2	9.1	

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	10	81	14	105	30	5	4	39	1	**285**	**11**	**297**	6	2	57	65	506
07:15 AM	11	**117**	1	129	27	**15**	2	44	0	277	4	281	**11**	**7**	**58**	**76**	**530**
07:30 AM	**15**	111	4	130	**34**	9	**5**	**48**	**2**	275	9	286	6	7	42	55	519
07:45 AM	10	112	**21**	**143**	29	11	3	43	0	263	11	274	7	7	43	57	517
Total Volume	46	421	40	507	120	40	14	174	3	1100	35	1138	30	23	200	253	2072
% App. Total	9.1	83	7.9		69	23	8		0.3	96.7	3.1		11.9	9.1	79.1		
PHF	.767	.900	.476	.886	.882	.667	.700	.906	.375	.965	.795	.958	.682	.821	.862	.832	.977

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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	8	0	1	0	0	0	13	0	2	1	0	25
07:15 AM	0	7	0	0	0	0	0	14	1	0	0	0	22
07:30 AM	0	11	0	0	0	0	0	6	0	0	0	0	17
07:45 AM	0	8	3	0	1	0	0	4	0	0	0	0	16
Total	0	34	3	1	1	0	0	37	1	2	1	0	80
08:00 AM	0	13	0	0	0	0	0	12	1	1	0	1	28
08:15 AM	0	14	1	2	1	1	1	6	2	0	1	0	29
08:30 AM	1	11	0	0	0	0	0	21	1	0	0	1	35
08:45 AM	1	12	1	0	0	0	0	12	0	0	0	1	27
Total	2	50	2	2	1	1	1	51	4	1	1	3	119
Grand Total	2	84	5	3	2	1	1	88	5	3	2	3	199
Apprch %	2.2	92.3	5.5	50	33.3	16.7	1.1	93.6	5.3	37.5	25	37.5	
Total %	1	42.2	2.5	1.5	1	0.5	0.5	44.2	2.5	1.5	1	1.5	

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	13	0	13	0	0	0	0	0	12	1	13	**1**	0	**1**	**2**	28
08:15 AM	0	**14**	**1**	**15**	**2**	**1**	**1**	**4**	**1**	6	**2**	9	0	**1**	0	1	29
08:30 AM	**1**	11	0	12	0	0	0	0	0	**21**	1	**22**	0	0	1	1	**35**
08:45 AM	1	12	1	14	0	0	0	0	0	12	0	12	0	0	1	1	27
Total Volume	2	50	2	54	2	1	1	4	1	51	4	56	1	1	3	5	119
% App. Total	3.7	92.6	3.7		50	25	25		1.8	91.1	7.1		20	20	60		
PHF	.500	.893	.500	.900	.250	.250	.250	.250	.250	.607	.500	.636	.250	.250	.750	.625	.850

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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

	Broadway (Route 138) From North					Carver Street From East					Broadway (Route 138) From South					Carver Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	**3**	0	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

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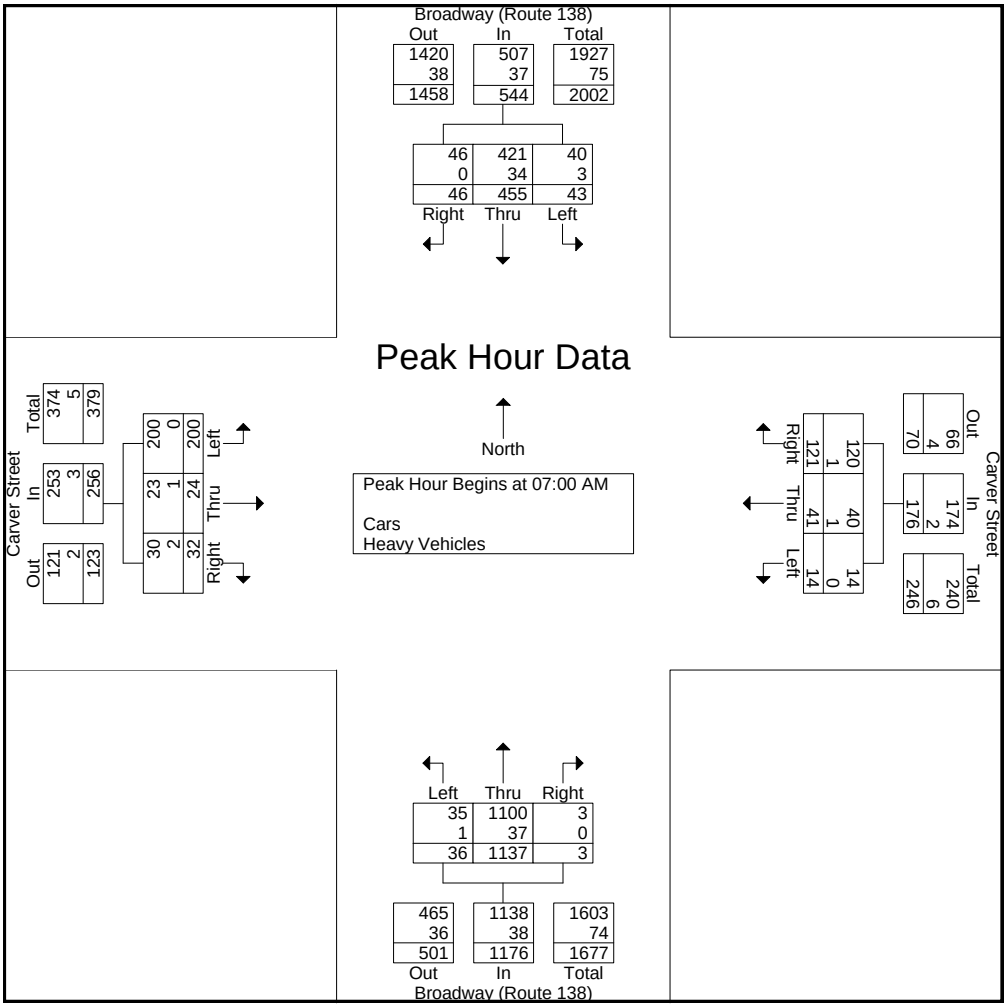
N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- H
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	10	89	14	113	31	5	4	40	1	**298**	**11**	**310**	8	3	57	68	531
07:15 AM	11	**124**	1	136	27	**15**	2	44	0	291	5	296	**11**	**7**	**58**	**76**	**552**
07:30 AM	**15**	122	4	141	**34**	9	**5**	**48**	**2**	281	9	292	6	7	42	55	536
07:45 AM	10	120	**24**	**154**	29	12	3	44	0	267	11	278	7	7	43	57	533
Total Volume	46	455	43	544	121	41	14	176	3	1137	36	1176	32	24	200	256	2152
% App. Total	8.5	83.6	7.9		68.8	23.3	8		0.3	96.7	3.1		12.5	9.4	78.1		
PHF	.767	.917	.448	.883	.890	.683	.700	.917	.375	.954	.818	.948	.727	.857	.862	.842	.975
Cars	46	421	40	507	120	40	14	174	3	1100	35	1138	30	23	200	253	2072
% Cars	100	92.5	93.0	93.2	99.2	97.6	100	98.9	100	96.7	97.2	96.8	93.8	95.8	100	98.8	96.3
Heavy Vehicles	0	34	3	37	1	1	0	2	0	37	1	38	2	1	0	3	80
% Heavy Vehicles	0	7.5	7.0	6.8	0.8	2.4	0	1.1	0	3.3	2.8	3.2	6.3	4.2	0	1.2	3.7



PRECISION
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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	24	274	13	13	14	9	2	175	11	21	15	29	600
04:15 PM	45	278	17	14	11	6	4	157	11	24	21	25	613
04:30 PM	39	295	10	18	15	10	1	179	9	22	14	43	655
04:45 PM	75	286	23	6	15	13	3	156	13	20	23	40	673
Total	183	1133	63	51	55	38	10	667	44	87	73	137	2541
05:00 PM	37	306	32	8	18	15	8	187	5	24	22	30	692
05:15 PM	53	326	16	8	22	19	22	170	23	12	16	39	726
05:30 PM	42	326	27	13	11	7	6	155	11	24	20	37	679
05:45 PM	40	253	18	19	17	13	6	154	17	24	14	21	596
Total	172	1211	93	48	68	54	42	666	56	84	72	127	2693
Grand Total	355	2344	156	99	123	92	52	1333	100	171	145	264	5234
Apprch %	12.4	82.1	5.5	31.5	39.2	29.3	3.5	89.8	6.7	29.5	25	45.5	
Total %	6.8	44.8	3	1.9	2.4	1.8	1	25.5	1.9	3.3	2.8	5	
Cars	355	2283	156	95	121	91	51	1276	100	171	145	260	5104
% Cars	100	97.4	100	96	98.4	98.9	98.1	95.7	100	100	100	98.5	97.5
Heavy Vehicles	0	61	0	4	2	1	1	57	0	0	0	4	130
% Heavy Vehicles	0	2.6	0	4	1.6	1.1	1.9	4.3	0	0	0	1.5	2.5

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**75**	286	23	384	6	15	13	34	3	156	13	172	20	**23**	**40**	**83**	673
05:00 PM	37	306	**32**	375	8	18	15	41	8	**187**	5	200	**24**	22	30	76	692
05:15 PM	53	**326**	16	**395**	8	**22**	**19**	**49**	**22**	170	**23**	**215**	12	16	39	67	**726**
05:30 PM	42	326	27	395	**13**	11	7	31	6	155	11	172	24	20	37	81	679
Total Volume	207	1244	98	1549	35	66	54	155	39	668	52	759	80	81	146	307	2770
% App. Total	13.4	80.3	6.3		22.6	42.6	34.8		5.1	88	6.9		26.1	26.4	47.6		
PHF	.690	.954	.766	.980	.673	.750	.711	.791	.443	.893	.565	.883	.833	.880	.913	.925	.954
Cars	207	1215	98	1520	33	66	54	153	38	641	52	731	80	81	144	305	2709
% Cars	100	97.7	100	98.1	94.3	100	100	98.7	97.4	96.0	100	96.3	100	100	98.6	99.3	97.8
Heavy Vehicles	0	29	0	29	2	0	0	2	1	27	0	28	0	0	2	2	61
% Heavy Vehicles	0	2.3	0	1.9	5.7	0	0	1.3	2.6	4.0	0	3.7	0	0	1.4	0.7	2.2

PRECISION
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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	24	264	13	13	14	8	2	166	11	21	15	28	579
04:15 PM	45	273	17	13	10	6	4	146	11	24	21	25	595
04:30 PM	39	283	10	17	15	10	1	171	9	22	14	42	633
04:45 PM	75	279	23	6	15	13	3	145	13	20	23	40	655
Total	183	1099	63	49	54	37	10	628	44	87	73	135	2462
05:00 PM	37	297	32	8	18	15	8	178	5	24	22	29	673
05:15 PM	53	317	16	8	22	19	21	164	23	12	16	39	710
05:30 PM	42	322	27	11	11	7	6	154	11	24	20	36	671
05:45 PM	40	248	18	19	16	13	6	152	17	24	14	21	588
Total	172	1184	93	46	67	54	41	648	56	84	72	125	2642
Grand Total	355	2283	156	95	121	91	51	1276	100	171	145	260	5104
Apprch %	12.7	81.7	5.6	30.9	39.4	29.6	3.6	89.4	7	29.7	25.2	45.1	
Total %	7	44.7	3.1	1.9	2.4	1.8	1	25	2	3.4	2.8	5.1	

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**75**	279	23	377	6	15	13	34	3	145	13	161	20	**23**	**40**	**83**	655
05:00 PM	37	297	**32**	366	8	18	15	41	8	**178**	5	191	**24**	22	29	75	673
05:15 PM	53	317	16	386	8	**22**	**19**	**49**	**21**	164	**23**	**208**	12	16	39	67	**710**
05:30 PM	42	**322**	27	**391**	**11**	11	7	29	6	154	11	171	24	20	36	80	671
Total Volume	207	1215	98	1520	33	66	54	153	38	641	52	731	80	81	144	305	2709
% App. Total	13.6	79.9	6.4		21.6	43.1	35.3		5.2	87.7	7.1		26.2	26.6	47.2		
PHF	.690	.943	.766	.972	.750	.750	.711	.781	.452	.900	.565	.879	.833	.880	.900	.919	.954

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N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Carver Street From East			Broadway (Route 138) From South			Carver Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	10	0	0	0	1	0	9	0	0	0	1	21
04:15 PM	0	5	0	1	1	0	0	11	0	0	0	0	18
04:30 PM	0	12	0	1	0	0	0	8	0	0	0	1	22
04:45 PM	0	7	0	0	0	0	0	11	0	0	0	0	18
Total	0	34	0	2	1	1	0	39	0	0	0	2	79
05:00 PM	0	9	0	0	0	0	0	9	0	0	0	1	19
05:15 PM	0	9	0	0	0	0	1	6	0	0	0	0	16
05:30 PM	0	4	0	2	0	0	0	1	0	0	0	1	8
05:45 PM	0	5	0	0	1	0	0	2	0	0	0	0	8
Total	0	27	0	2	1	0	1	18	0	0	0	2	51
Grand Total	0	61	0	4	2	1	1	57	0	0	0	4	130
Apprch %	0	100	0	57.1	28.6	14.3	1.7	98.3	0	0	0	100	
Total %	0	46.9	0	3.1	1.5	0.8	0.8	43.8	0	0	0	3.1	

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	10	0	10	0	0	**1**	1	0	9	0	9	0	0	**1**	**1**	21
04:15 PM	0	5	0	5	**1**	**1**	0	**2**	0	**11**	0	**11**	0	0	0	0	18
04:30 PM	0	**12**	0	**12**	1	0	0	1	0	8	0	8	0	0	1	1	**22**
04:45 PM	0	7	0	7	0	0	0	0	0	11	0	11	0	0	0	0	18
Total Volume	0	34	0	34	2	1	1	4	0	39	0	39	0	0	2	2	79
% App. Total	0	100	0		50	25	25		0	100	0		0	0	100		
PHF	.000	.708	.000	.708	.500	.250	.250	.500	.000	.886	.000	.886	.000	.000	.500	.500	.898

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City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	6
Total	0	0	0	6	0	0	0	0	0	0	0	0	0	0	1	1	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:45 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	3
Total	0	1	0	0	0	0	1	0	0	0	0	0	0	2	0	2	6
Grand Total	0	1	0	6	0	0	1	0	0	0	0	0	0	2	1	3	14
Apprch %	0	14.3	0	85.7	0	0	100	0	0	0	0	0	0	33.3	16.7	50	
Total %	0	7.1	0	42.9	0	0	7.1	0	0	0	0	0	0	14.3	7.1	21.4	

	Broadway (Route 138) From North					Carver Street From East					Broadway (Route 138) From South					Carver Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	**5**	**5**	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	**6**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	2
Total Volume	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4	9
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	25	25	50		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250	.500	.375

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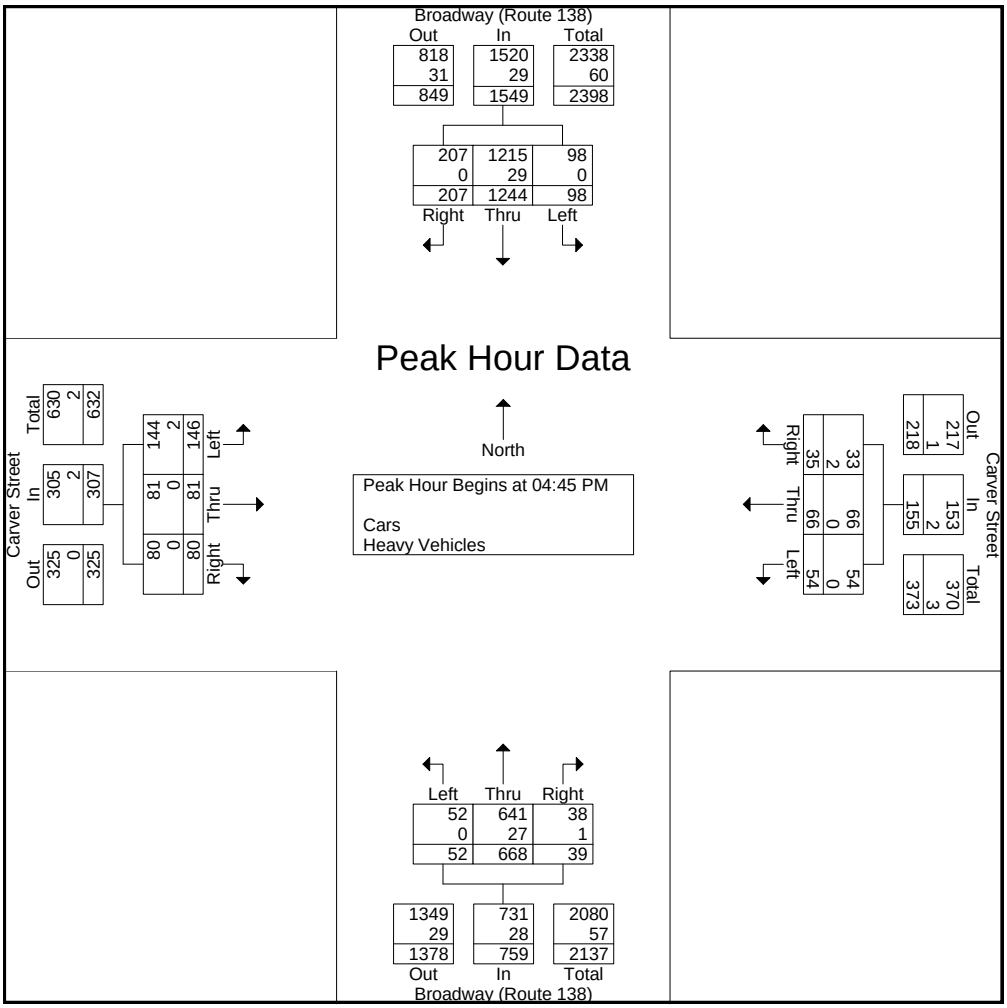
N/S: Broadway (Route 138)
E/W: Carver Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- HHH
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				Carver Street From East				Broadway (Route 138) From South				Carver Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**75**	286	23	384	6	15	13	34	3	156	13	172	20	**23**	**40**	**83**	673
05:00 PM	37	306	**32**	375	8	18	15	41	8	**187**	5	200	**24**	22	30	76	692
05:15 PM	53	**326**	16	**395**	8	**22**	**19**	**49**	**22**	170	**23**	**215**	12	16	39	67	**726**
05:30 PM	42	326	27	395	**13**	11	7	31	6	155	11	172	24	20	37	81	679
Total Volume	207	1244	98	1549	35	66	54	155	39	668	52	759	80	81	146	307	2770
% App. Total	13.4	80.3	6.3		22.6	42.6	34.8		5.1	88	6.9		26.1	26.4	47.6		
PHF	.690	.954	.766	.980	.673	.750	.711	.791	.443	.893	.565	.883	.833	.880	.913	.925	.954
Cars	207	1215	98	1520	33	66	54	153	38	641	52	731	80	81	144	305	2709
% Cars	100	97.7	100	98.1	94.3	100	100	98.7	97.4	96.0	100	96.3	100	100	98.6	99.3	97.8
Heavy Vehicles	0	29	0	29	2	0	0	2	1	27	0	28	0	0	2	2	61
% Heavy Vehicles	0	2.3	0	1.9	5.7	0	0	1.3	2.6	4.0	0	3.7	0	0	1.4	0.7	2.2



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N/S: Broadway (Route 138)
E/W: Center Street/ Broadway Gardens
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- J
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	85	14	30	0	2	8	269	0	0	0	0	408
07:15 AM	0	104	23	34	0	5	4	255	2	0	0	0	427
07:30 AM	0	110	18	30	0	5	12	278	0	0	0	0	453
07:45 AM	1	113	31	36	0	5	12	244	0	0	0	0	442
Total	1	412	86	130	0	17	36	1046	2	0	0	0	1730
08:00 AM	0	118	11	32	0	4	5	219	0	0	0	0	389
08:15 AM	1	124	17	25	0	5	3	180	1	0	0	0	356
08:30 AM	0	128	17	29	0	7	6	180	0	0	0	1	368
08:45 AM	0	129	20	50	0	5	3	180	1	0	0	1	389
Total	1	499	65	136	0	21	17	759	2	0	0	2	1502
Grand Total	2	911	151	266	0	38	53	1805	4	0	0	2	3232
Apprch %	0.2	85.6	14.2	87.5	0	12.5	2.8	96.9	0.2	0	0	100	
Total %	0.1	28.2	4.7	8.2	0	1.2	1.6	55.8	0.1	0	0	0.1	
Cars	2	821	136	259	0	34	48	1703	2	0	0	2	3007
% Cars	100	90.1	90.1	97.4	0	89.5	90.6	94.3	50	0	0	100	93
Heavy Vehicles	0	90	15	7	0	4	5	102	2	0	0	0	225
% Heavy Vehicles	0	9.9	9.9	2.6	0	10.5	9.4	5.7	50	0	0	0	7

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	85	14	99	30	0	2	32	8	269	0	277	0	0	0	0	408
07:15 AM	0	104	23	127	34	0	**5**	39	4	255	**2**	261	0	0	0	0	427
07:30 AM	0	110	18	128	30	0	5	35	**12**	**278**	0	**290**	0	0	0	0	**453**
07:45 AM	**1**	**113**	**31**	**145**	**36**	0	5	**41**	12	244	0	256	0	0	0	0	442
Total Volume	1	412	86	499	130	0	17	147	36	1046	2	1084	0	0	0	0	1730
% App. Total	0.2	82.6	17.2		88.4	0	11.6		3.3	96.5	0.2		0	0	0		
PHF	.250	.912	.694	.860	.903	.000	.850	.896	.750	.941	.250	.934	.000	.000	.000	.000	.955
Cars	1	379	77	457	127	0	16	143	34	1003	1	1038	0	0	0	0	1638
% Cars	100	92.0	89.5	91.6	97.7	0	94.1	97.3	94.4	95.9	50.0	95.8	0	0	0	0	94.7
Heavy Vehicles	0	33	9	42	3	0	1	4	2	43	1	46	0	0	0	0	92
% Heavy Vehicles	0	8.0	10.5	8.4	2.3	0	5.9	2.7	5.6	4.1	50.0	4.2	0	0	0	0	5.3

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N/S: Broadway (Route 138)
E/W: Center Street/ Broadway Gardens
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- J
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	74	12	30	0	2	8	252	0	0	0	0	378
07:15 AM	0	101	20	33	0	5	3	241	1	0	0	0	404
07:30 AM	0	101	16	29	0	4	12	269	0	0	0	0	431
07:45 AM	1	103	29	35	0	5	11	241	0	0	0	0	425
Total	1	379	77	127	0	16	34	1003	1	0	0	0	1638
08:00 AM	0	106	9	32	0	3	5	209	0	0	0	0	364
08:15 AM	1	104	14	24	0	4	2	170	1	0	0	0	320
08:30 AM	0	113	17	28	0	6	4	157	0	0	0	1	326
08:45 AM	0	119	19	48	0	5	3	164	0	0	0	1	359
Total	1	442	59	132	0	18	14	700	1	0	0	2	1369
Grand Total	2	821	136	259	0	34	48	1703	2	0	0	2	3007
Apprch %	0.2	85.6	14.2	88.4	0	11.6	2.7	97.1	0.1	0	0	100	
Total %	0.1	27.3	4.5	8.6	0	1.1	1.6	56.6	0.1	0	0	0.1	

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	74	12	86	30	0	2	32	8	252	0	260	0	0	0	0	378
07:15 AM	0	101	20	121	33	0	**5**	38	3	241	**1**	245	0	0	0	0	404
07:30 AM	0	101	16	117	29	0	4	33	**12**	**269**	0	**281**	0	0	0	0	**431**
07:45 AM	**1**	**103**	**29**	**133**	**35**	0	5	**40**	11	241	0	252	0	0	0	0	425
Total Volume	1	379	77	457	127	0	16	143	34	1003	1	1038	0	0	0	0	1638
% App. Total	0.2	82.9	16.8		88.8	0	11.2		3.3	96.6	0.1		0	0	0		
PHF	.250	.920	.664	.859	.907	.000	.800	.894	.708	.932	.250	.923	.000	.000	.000	.000	.950

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Client: VHB/ J. Quitter

File Name : 81676L- J
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	11	2	0	0	0	0	17	0	0	0	0	30
07:15 AM	0	3	3	1	0	0	1	14	1	0	0	0	23
07:30 AM	0	9	2	1	0	1	0	9	0	0	0	0	22
07:45 AM	0	10	2	1	0	0	1	3	0	0	0	0	17
Total	0	33	9	3	0	1	2	43	1	0	0	0	92
08:00 AM	0	12	2	0	0	1	0	10	0	0	0	0	25
08:15 AM	0	20	3	1	0	1	1	10	0	0	0	0	36
08:30 AM	0	15	0	1	0	1	2	23	0	0	0	0	42
08:45 AM	0	10	1	2	0	0	0	16	1	0	0	0	30
Total	0	57	6	4	0	3	3	59	1	0	0	0	133
Grand Total	0	90	15	7	0	4	5	102	2	0	0	0	225
Apprch %	0	85.7	14.3	63.6	0	36.4	4.6	93.6	1.8	0	0	0	
Total %	0	40	6.7	3.1	0	1.8	2.2	45.3	0.9	0	0	0	

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	9	2	11	**1**	0	**1**	**2**	0	9	0	9	0	0	0	0	22
07:45 AM	0	10	2	12	1	0	0	1	**1**	3	0	4	0	0	0	0	17
08:00 AM	0	12	2	14	0	0	1	1	0	**10**	0	10	0	0	0	0	25
08:15 AM	0	**20**	**3**	**23**	1	0	1	2	1	10	0	**11**	0	0	0	0	**36**
Total Volume	0	51	9	60	3	0	3	6	2	32	0	34	0	0	0	0	100
% App. Total	0	85	15		50	0	50		5.9	94.1	0		0	0	0		
PHF	.000	.638	.750	.652	.750	.000	.750	.750	.500	.800	.000	.773	.000	.000	.000	.000	.694

PRECISION
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N/S: Broadway (Route 138)
E/W: Center Street/ Broadway Gardens
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- J
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Broadway (Route 138) From North					Center Street From East					Broadway (Route 138) From South					Broadway Gardens From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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N/S: Broadway (Route 138)
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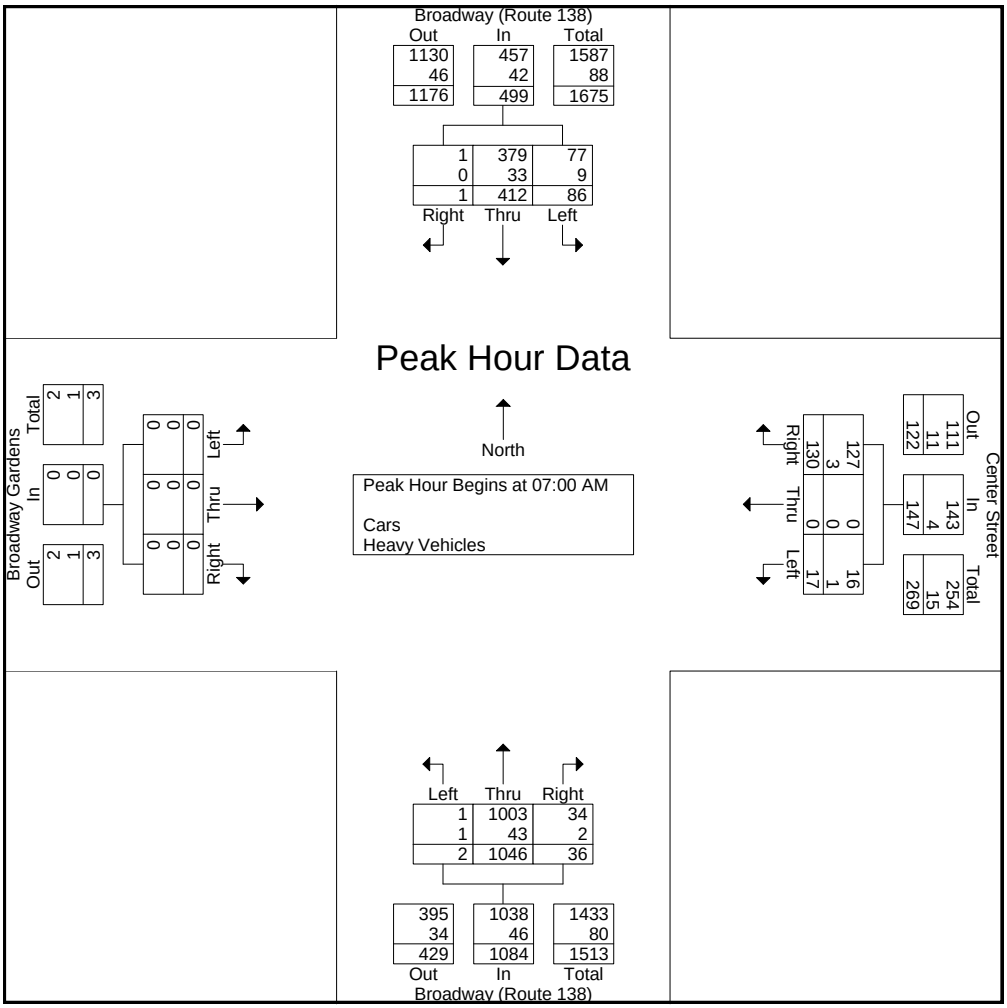
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- J
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	85	14	99	30	0	2	32	8	269	0	277	0	0	0	0	408
07:15 AM	0	104	23	127	34	0	**5**	39	4	255	**2**	261	0	0	0	0	427
07:30 AM	0	110	18	128	30	0	5	35	**12**	**278**	0	**290**	0	0	0	0	**453**
07:45 AM	**1**	**113**	**31**	**145**	**36**	0	5	**41**	12	244	0	256	0	0	0	0	442
Total Volume	1	412	86	499	130	0	17	147	36	1046	2	1084	0	0	0	0	1730
% App. Total	0.2	82.6	17.2		88.4	0	11.6		3.3	96.5	0.2		0	0	0		
PHF	.250	.912	.694	.860	.903	.000	.850	.896	.750	.941	.250	.934	.000	.000	.000	.000	.955
Cars	1	379	77	457	127	0	16	143	34	1003	1	1038	0	0	0	0	1638
% Cars	100	92.0	89.5	91.6	97.7	0	94.1	97.3	94.4	95.9	50.0	95.8	0	0	0	0	94.7
Heavy Vehicles	0	33	9	42	3	0	1	4	2	43	1	46	0	0	0	0	92
% Heavy Vehicles	0	8.0	10.5	8.4	2.3	0	5.9	2.7	5.6	4.1	50.0	4.2	0	0	0	0	5.3



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N/S: Broadway (Route 138)
E/W: Center Street/ Broadway Gardens
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- JJJ
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	230	44	23	0	10	15	167	0	0	0	0	489
04:15 PM	0	248	63	29	0	8	10	136	0	0	0	0	494
04:30 PM	0	267	62	19	0	6	12	173	0	0	0	0	539
04:45 PM	0	283	61	23	0	5	14	173	0	0	0	0	559
Total	0	1028	230	94	0	29	51	649	0	0	0	0	2081
05:00 PM	0	291	72	25	0	7	8	173	0	0	0	1	577
05:15 PM	0	276	79	30	0	8	7	189	0	0	0	0	589
05:30 PM	0	276	80	20	0	7	7	137	0	2	0	0	529
05:45 PM	0	243	68	20	0	3	7	143	0	0	0	1	485
Total	0	1086	299	95	0	25	29	642	0	2	0	2	2180
Grand Total	0	2114	529	189	0	54	80	1291	0	2	0	2	4261
Apprch %	0	80	20	77.8	0	22.2	5.8	94.2	0	50	0	50	
Total %	0	49.6	12.4	4.4	0	1.3	1.9	30.3	0	0	0	0	
Cars	0	2062	515	176	0	51	73	1249	0	2	0	2	4130
% Cars	0	97.5	97.4	93.1	0	94.4	91.2	96.7	0	100	0	100	96.9
Heavy Vehicles	0	52	14	13	0	3	7	42	0	0	0	0	131
% Heavy Vehicles	0	2.5	2.6	6.9	0	5.6	8.8	3.3	0	0	0	0	3.1

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	267	62	329	19	0	6	25	12	173	0	185	0	0	0	0	539
04:45 PM	0	283	61	344	23	0	5	28	**14**	173	0	187	0	0	0	0	559
05:00 PM	0	**291**	72	**363**	25	0	7	32	8	173	0	181	0	0	**1**	**1**	577
05:15 PM	0	276	**79**	355	**30**	0	**8**	**38**	7	**189**	0	**196**	0	0	0	0	**589**
Total Volume	0	1117	274	1391	97	0	26	123	41	708	0	749	0	0	1	1	2264
% App. Total	0	80.3	19.7		78.9	0	21.1		5.5	94.5	0		0	0	100		
PHF	.000	.960	.867	.958	.808	.000	.813	.809	.732	.937	.000	.955	.000	.000	.250	.250	.961
Cars	0	1090	267	1357	91	0	24	115	37	685	0	722	0	0	1	1	2195
% Cars	0	97.6	97.4	97.6	93.8	0	92.3	93.5	90.2	96.8	0	96.4	0	0	100	100	97.0
Heavy Vehicles	0	27	7	34	6	0	2	8	4	23	0	27	0	0	0	0	69
% Heavy Vehicles	0	2.4	2.6	2.4	6.2	0	7.7	6.5	9.8	3.2	0	3.6	0	0	0	0	3.0

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N/S: Broadway (Route 138)
E/W: Center Street/ Broadway Gardens
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- JJJ
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	221	41	19	0	10	13	162	0	0	0	0	466
04:15 PM	0	242	62	26	0	8	10	126	0	0	0	0	474
04:30 PM	0	260	58	19	0	5	11	167	0	0	0	0	520
04:45 PM	0	277	61	20	0	4	12	164	0	0	0	0	538
Total	0	1000	222	84	0	27	46	619	0	0	0	0	1998
05:00 PM	0	284	70	23	0	7	8	168	0	0	0	1	561
05:15 PM	0	269	78	29	0	8	6	186	0	0	0	0	576
05:30 PM	0	272	78	20	0	6	7	136	0	2	0	0	521
05:45 PM	0	237	67	20	0	3	6	140	0	0	0	1	474
Total	0	1062	293	92	0	24	27	630	0	2	0	2	2132
Grand Total	0	2062	515	176	0	51	73	1249	0	2	0	2	4130
Apprch %	0	80	20	77.5	0	22.5	5.5	94.5	0	50	0	50	
Total %	0	49.9	12.5	4.3	0	1.2	1.8	30.2	0	0	0	0	

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	277	61	338	20	0	4	24	**12**	164	0	176	0	0	0	0	538
05:00 PM	0	**284**	70	**354**	23	0	7	30	8	168	0	176	0	0	**1**	1	561
05:15 PM	0	269	**78**	347	**29**	0	**8**	**37**	6	**186**	0	**192**	0	0	0	0	**576**
05:30 PM	0	272	78	350	20	0	6	26	7	136	0	143	**2**	0	0	**2**	521
Total Volume	0	1102	287	1389	92	0	25	117	33	654	0	687	2	0	1	3	2196
% App. Total	0	79.3	20.7		78.6	0	21.4		4.8	95.2	0		66.7	0	33.3		
PHF	.000	.970	.920	.981	.793	.000	.781	.791	.688	.879	.000	.895	.250	.000	.250	.375	.953

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N/S: Broadway (Route 138)
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City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- JJJ
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North			Center Street From East			Broadway (Route 138) From South			Broadway Gardens From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	9	3	4	0	0	2	5	0	0	0	0	23
04:15 PM	0	6	1	3	0	0	0	10	0	0	0	0	20
04:30 PM	0	7	4	0	0	1	1	6	0	0	0	0	19
04:45 PM	0	6	0	3	0	1	2	9	0	0	0	0	21
Total	0	28	8	10	0	2	5	30	0	0	0	0	83
05:00 PM	0	7	2	2	0	0	0	5	0	0	0	0	16
05:15 PM	0	7	1	1	0	0	1	3	0	0	0	0	13
05:30 PM	0	4	2	0	0	1	0	1	0	0	0	0	8
05:45 PM	0	6	1	0	0	0	1	3	0	0	0	0	11
Total	0	24	6	3	0	1	2	12	0	0	0	0	48
Grand Total	0	52	14	13	0	3	7	42	0	0	0	0	131
Apprch %	0	78.8	21.2	81.2	0	18.8	14.3	85.7	0	0	0	0	
Total %	0	39.7	10.7	9.9	0	2.3	5.3	32.1	0	0	0	0	

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**9**	3	**12**	**4**	0	0	**4**	**2**	5	0	7	0	0	0	0	**23**
04:15 PM	0	6	1	7	3	0	0	3	0	**10**	0	10	0	0	0	0	20
04:30 PM	0	7	**4**	11	0	0	**1**	1	1	6	0	7	0	0	0	0	19
04:45 PM	0	6	0	6	3	0	1	4	2	9	0	**11**	0	0	0	0	21
Total Volume	0	28	8	36	10	0	2	12	5	30	0	35	0	0	0	0	83
% App. Total	0	77.8	22.2		83.3	0	16.7		14.3	85.7	0		0	0	0		
PHF	.000	.778	.500	.750	.625	.000	.500	.750	.625	.750	.000	.795	.000	.000	.000	.000	.902

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Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	100	
Total %	0	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	

	Broadway (Route 138) From North					Center Street From East					Broadway (Route 138) From South					Broadway Gardens From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	**2**	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Total Volume	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

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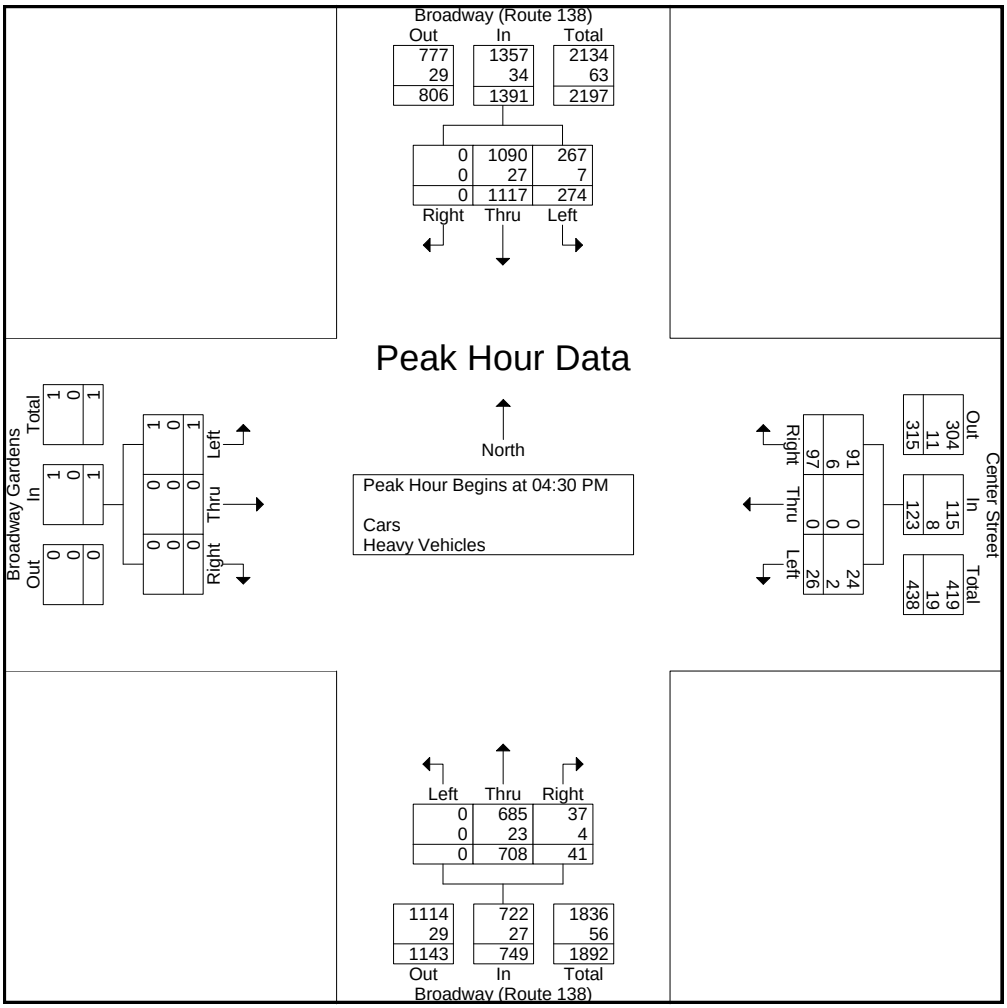
Page No : 1

	Broadway (Route 138) From North				Center Street From East				Broadway (Route 138) From South				Broadway Gardens From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	267	62	329	19	0	6	25	12	173	0	185	0	0	0	0	539
04:45 PM	0	283	61	344	23	0	5	28	**14**	173	0	187	0	0	0	0	559
05:00 PM	0	**291**	72	**363**	25	0	7	32	8	173	0	181	0	0	**1**	**1**	577
05:15 PM	0	276	**79**	355	**30**	0	**8**	**38**	7	**189**	0	**196**	0	0	0	0	**589**
Total Volume	0	1117	274	1391	97	0	26	123	41	708	0	749	0	0	1	1	2264
% App. Total	0	80.3	19.7		78.9	0	21.1		5.5	94.5	0		0	0	100		
PHF	.000	.960	.867	.958	.808	.000	.813	.809	.732	.937	.000	.955	.000	.000	.250	.250	.961
Cars	0	1090	267	1357	91	0	24	115	37	685	0	722	0	0	1	1	2195
% Cars	0	97.6	97.4	97.6	93.8	0	92.3	93.5	90.2	96.8	0	96.4	0	0	100	100	97.0
Heavy Vehicles	0	27	7	34	6	0	2	8	4	23	0	27	0	0	0	0	69
% Heavy Vehicles	0	2.4	2.6	2.4	6.2	0	7.7	6.5	9.8	3.2	0	3.6	0	0	0	0	3.0



PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Broadway (Route 138)
E: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- K
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	92	0	3	6	3	276	380
07:15 AM	105	0	4	10	1	265	385
07:30 AM	111	1	10	5	3	273	403
07:45 AM	107	1	8	5	6	241	368
Total	415	2	25	26	13	1055	1536
08:00 AM	124	1	6	4	6	203	344
08:15 AM	119	3	8	5	11	168	314
08:30 AM	142	2	9	7	3	189	352
08:45 AM	122	4	3	3	8	176	316
Total	507	10	26	19	28	736	1326
Grand Total	922	12	51	45	41	1791	2862
Apprch %	98.7	1.3	53.1	46.9	2.2	97.8	
Total %	32.2	0.4	1.8	1.6	1.4	62.6	
Cars	837	12	49	43	40	1686	2667
% Cars	90.8	100	96.1	95.6	97.6	94.1	93.2
Heavy Vehicles	85	0	2	2	1	105	195
% Heavy Vehicles	9.2	0	3.9	4.4	2.4	5.9	6.8

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	92	0	92	3	6	9	3	**276**	**279**	380
07:15 AM	105	0	105	4	**10**	14	1	265	266	385
07:30 AM	**111**	**1**	**112**	**10**	5	**15**	3	273	276	**403**
07:45 AM	**107**	**1**	**108**	**8**	**5**	**13**	**6**	241	247	368
Total Volume	415	2	417	25	26	51	13	1055	1068	1536
% App. Total	99.5	0.5		49	51		1.2	98.8		
PHF	.935	.500	.931	.625	.650	.850	.542	.956	.957	.953
Cars	380	2	382	25	25	50	12	1012	1024	1456
% Cars	91.6	100	91.6	100	96.2	98.0	92.3	95.9	95.9	94.8
Heavy Vehicles	35	0	35	0	1	1	1	43	44	80
% Heavy Vehicles	8.4	0	8.4	0	3.8	2.0	7.7	4.1	4.1	5.2

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N/S: Broadway (Route 138)
E: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- K
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	80	0	3	6	3	261	353
07:15 AM	103	0	4	9	1	249	366
07:30 AM	102	1	10	5	3	264	385
07:45 AM	95	1	8	5	5	238	352
Total	380	2	25	25	12	1012	1456
08:00 AM	114	1	5	4	6	193	323
08:15 AM	100	3	8	5	11	157	284
08:30 AM	127	2	8	6	3	159	305
08:45 AM	116	4	3	3	8	165	299
Total	457	10	24	18	28	674	1211
Grand Total	837	12	49	43	40	1686	2667
Apprch %	98.6	1.4	53.3	46.7	2.3	97.7	
Total %	31.4	0.4	1.8	1.6	1.5	63.2	

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	80	0	80	3	6	9	3	261	264	353
07:15 AM	**103**	0	**103**	4	**9**	13	1	249	250	366
07:30 AM	102	**1**	103	**10**	5	**15**	3	**264**	**267**	**385**
07:45 AM	**95**	**1**	**96**	**8**	**5**	**13**	**5**	238	243	352
Total Volume	380	2	382	25	25	50	12	1012	1024	1456
% App. Total	99.5	0.5		50	50		1.2	98.8		
PHF	.922	.500	.927	.625	.694	.833	.600	.958	.959	.945

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File Name : 81676L- K
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	12	0	0	0	0	15	27
07:15 AM	2	0	0	1	0	16	19
07:30 AM	9	0	0	0	0	9	18
07:45 AM	12	0	0	0	1	3	16
Total	35	0	0	1	1	43	80
08:00 AM	10	0	1	0	0	10	21
08:15 AM	19	0	0	0	0	11	30
08:30 AM	15	0	1	1	0	30	47
08:45 AM	6	0	0	0	0	11	17
Total	50	0	2	1	0	62	115
Grand Total	85	0	2	2	1	105	195
Apprch %	100	0	50	50	0.9	99.1	
Total %	43.6	0	1	1	0.5	53.8	

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	10	0	10	**1**	0	1	0	10	10	21
08:15 AM	**19**	0	**19**	0	0	0	0	11	11	30
08:30 AM	15	0	15	1	**1**	**2**	0	**30**	**30**	**47**
08:45 AM	**6**	**0**	**6**	**0**	**0**	**0**	**0**	**11**	**11**	**17**
Total Volume	**50**	**0**	**50**	**2**	**1**	**3**	**0**	**62**	**62**	**115**
% App. Total	**100**	**0**		**66.7**	**33.3**		**0**	**100**		
PHF	**.658**	**.000**	**.658**	**.500**	**.250**	**.375**	**.000**	**.517**	**.517**	**.612**

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Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Broadway (Route 138) From North				Britton Street From East				Broadway (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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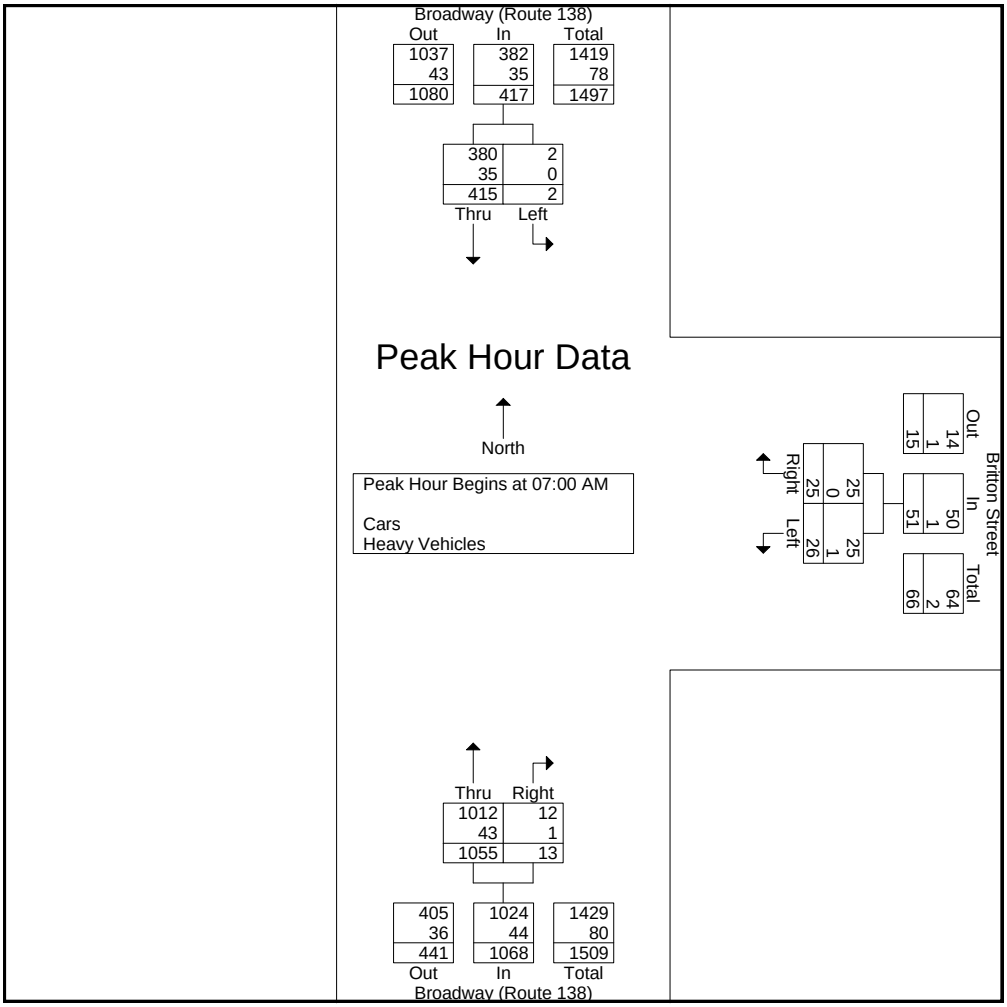
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- K
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	92	0	92	3	6	9	3	**276**	**279**	380
07:15 AM	105	0	105	4	**10**	14	1	265	266	385
07:30 AM	**111**	**1**	**112**	**10**	5	**15**	3	273	276	**403**
07:45 AM	**107**	**1**	**108**	**8**	**5**	**13**	**6**	241	247	368
Total Volume	415	2	417	25	26	51	13	1055	1068	1536
% App. Total	99.5	0.5		49	51		1.2	98.8		
PHF	.935	.500	.931	.625	.650	.850	.542	.956	.957	.953
Cars	380	2	382	25	25	50	12	1012	1024	1456
% Cars	91.6	100	91.6	100	96.2	98.0	92.3	95.9	95.9	94.8
Heavy Vehicles	35	0	35	0	1	1	1	43	44	80
% Heavy Vehicles	8.4	0	8.4	0	3.8	2.0	7.7	4.1	4.1	5.2



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N/S: Broadway (Route 138)
E: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- KKK
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	251	2	7	10	7	170	447
04:15 PM	272	2	1	5	9	144	433
04:30 PM	269	5	4	10	12	175	475
04:45 PM	277	6	7	10	7	178	485
Total	1069	15	19	35	35	667	1840
05:00 PM	295	6	6	7	9	172	495
05:15 PM	291	5	3	3	6	206	514
05:30 PM	279	6	3	12	5	137	442
05:45 PM	253	6	1	6	7	150	423
Total	1118	23	13	28	27	665	1874
Grand Total	2187	38	32	63	62	1332	3714
Apprch %	98.3	1.7	33.7	66.3	4.4	95.6	
Total %	58.9	1	0.9	1.7	1.7	35.9	
Cars	2134	37	30	62	62	1289	3614
% Cars	97.6	97.4	93.8	98.4	100	96.8	97.3
Heavy Vehicles	53	1	2	1	0	43	100
% Heavy Vehicles	2.4	2.6	6.2	1.6	0	3.2	2.7

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	269	5	274	4	**10**	14	**12**	175	187	475
04:45 PM	277	**6**	283	**7**	10	**17**	7	178	185	485
05:00 PM	**295**	6	**301**	6	7	13	9	172	181	495
05:15 PM	291	5	296	3	3	6	6	**206**	**212**	**514**
Total Volume	**1132**	**22**	**1154**	**20**	**30**	**50**	**34**	**731**	**765**	**1969**
% App. Total	**98.1**	**1.9**		**40**	**60**		**4.4**	**95.6**		
PHF	**.959**	**.917**	**.958**	**.714**	**.750**	**.735**	**.708**	**.887**	**.902**	**.958**
Cars	**1105**	**21**	**1126**	**19**	**29**	**48**	**34**	**708**	**742**	**1916**
% Cars	**97.6**	**95.5**	**97.6**	**95.0**	**96.7**	**96.0**	**100**	**96.9**	**97.0**	**97.3**
Heavy Vehicles	**27**	**1**	**28**	**1**	**1**	**2**	**0**	**23**	**23**	**53**
% Heavy Vehicles	**2.4**	**4.5**	**2.4**	**5.0**	**3.3**	**4.0**	**0**	**3.1**	**3.0**	**2.7**

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E: Britton Street
City, State: Raynham, MA
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File Name : 81676L- KKK
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	242	2	6	10	7	165	432
04:15 PM	266	2	1	5	9	133	416
04:30 PM	262	5	4	9	12	169	461
04:45 PM	270	5	7	10	7	169	468
Total	1040	14	18	34	35	636	1777
05:00 PM	288	6	5	7	9	168	483
05:15 PM	285	5	3	3	6	202	504
05:30 PM	274	6	3	12	5	136	436
05:45 PM	247	6	1	6	7	147	414
Total	1094	23	12	28	27	653	1837
Grand Total	2134	37	30	62	62	1289	3614
Apprch %	98.3	1.7	32.6	67.4	4.6	95.4	
Total %	59	1	0.8	1.7	1.7	35.7	

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	262	5	267	4	9	13	**12**	169	181	461
04:45 PM	270	5	275	**7**	**10**	**17**	7	169	176	468
05:00 PM	**288**	**6**	**294**	5	7	12	9	168	177	483
05:15 PM	285	5	290	3	3	6	6	**202**	**208**	**504**
Total Volume	**1105**	**21**	**1126**	**19**	**29**	**48**	**34**	**708**	**742**	**1916**
% App. Total	**98.1**	**1.9**		**39.6**	**60.4**		**4.6**	**95.4**		
PHF	**.959**	**.875**	**.957**	**.679**	**.725**	**.706**	**.708**	**.876**	**.892**	**.950**

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File Name : 81676L- KKK
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North		Britton Street From East		Broadway (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	9	0	1	0	0	5	15
04:15 PM	6	0	0	0	0	11	17
04:30 PM	7	0	0	1	0	6	14
04:45 PM	7	1	0	0	0	9	17
Total	29	1	1	1	0	31	63
05:00 PM	7	0	1	0	0	4	12
05:15 PM	6	0	0	0	0	4	10
05:30 PM	5	0	0	0	0	1	6
05:45 PM	6	0	0	0	0	3	9
Total	24	0	1	0	0	12	37
Grand Total	53	1	2	1	0	43	100
Apprch %	98.1	1.9	66.7	33.3	0	100	
Total %	53	1	2	1	0	43	

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**9**	0	**9**	**1**	0	**1**	0	5	5	15
04:15 PM	6	0	6	0	0	0	0	**11**	**11**	**17**
04:30 PM	**7**	**0**	**7**	**0**	**1**	1	0	6	6	14
04:45 PM	7	**1**	8	0	0	0	0	9	9	17
Total Volume	29	1	30	1	1	2	0	31	31	63
% App. Total	96.7	3.3		50	50		0	100		
PHF	.806	.250	.833	.250	.250	.500	.000	.705	.705	.926

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File Name : 81676L- KKK
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	1	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	2	0	0	0	0	0	0	0	0	2
Total	2	0	0	0	0	0	0	0	0	2
Grand Total	2	0	0	0	0	1	0	0	0	3
Apprch %	100	0	0	0	0	100	0	0	0	
Total %	66.7	0	0	0	0	33.3	0	0	0	

	Broadway (Route 138) From North				Britton Street From East				Broadway (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	**2**	0	0	**2**	0	0	0	0	0	0	0	0	**2**
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	2
% App. Total	100	0	0		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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N/S: Broadway (Route 138)
E: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

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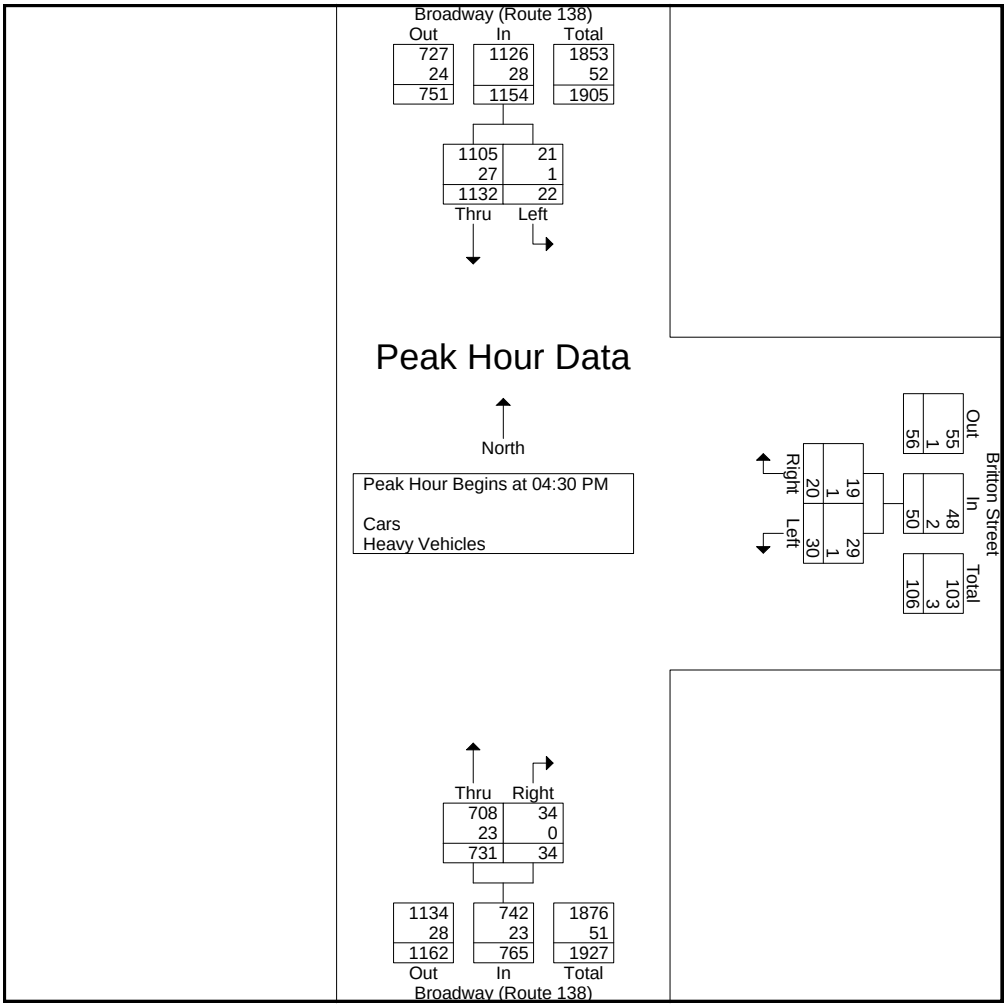
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North			Britton Street From East			Broadway (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	269	5	274	4	**10**	14	**12**	175	187	475
04:45 PM	277	**6**	283	**7**	10	**17**	7	178	185	485
05:00 PM	**295**	6	**301**	6	7	13	9	172	181	495
05:15 PM	291	5	296	3	3	6	6	**206**	**212**	**514**
Total Volume	**1132**	**22**	**1154**	**20**	**30**	**50**	**34**	**731**	**765**	**1969**
% App. Total	**98.1**	**1.9**		**40**	**60**		**4.4**	**95.6**		
PHF	**.959**	**.917**	**.958**	**.714**	**.750**	**.735**	**.708**	**.887**	**.902**	**.958**
Cars	**1105**	**21**	**1126**	**19**	**29**	**48**	**34**	**708**	**742**	**1916**
% Cars	**97.6**	**95.5**	**97.6**	**95.0**	**96.7**	**96.0**	**100**	**96.9**	**97.0**	**97.3**
Heavy Vehicles	**27**	**1**	**28**	**1**	**1**	**2**	**0**	**23**	**23**	**53**
% Heavy Vehicles	**2.4**	**4.5**	**2.4**	**5.0**	**3.3**	**4.0**	**0**	**3.1**	**3.0**	**2.7**



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W: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- L
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	1	89	243	0	2	10	345
07:15 AM	0	117	253	0	3	3	376
07:30 AM	1	110	259	0	1	7	378
07:45 AM	1	111	230	2	0	8	352
Total	3	427	985	2	6	28	1451
08:00 AM	5	131	198	2	1	3	340
08:15 AM	2	124	158	0	2	9	295
08:30 AM	6	147	186	0	0	5	344
08:45 AM	4	121	179	0	2	4	310
Total	17	523	721	2	5	21	1289
Grand Total	20	950	1706	4	11	49	2740
Apprch %	2.1	97.9	99.8	0.2	18.3	81.7	
Total %	0.7	34.7	62.3	0.1	0.4	1.8	
Cars	16	876	1633	4	10	49	2588
% Cars	80	92.2	95.7	100	90.9	100	94.5
Heavy Vehicles	4	74	73	0	1	0	152
% Heavy Vehicles	20	7.8	4.3	0	9.1	0	5.5

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**1**	89	90	243	0	243	2	**10**	**12**	345
07:15 AM	0	**117**	**117**	253	0	253	**3**	3	6	376
07:30 AM	1	110	111	**259**	0	**259**	1	7	8	**378**
07:45 AM	**1**	**111**	**112**	**230**	**2**	232	0	8	8	352
Total Volume	3	427	430	985	2	987	6	28	34	1451
% App. Total	0.7	99.3		99.8	0.2		17.6	82.4		
PHF	.750	.912	.919	.951	.250	.953	.500	.700	.708	.960
Cars	2	399	401	965	2	967	6	28	34	1402
% Cars	66.7	93.4	93.3	98.0	100	98.0	100	100	100	96.6
Heavy Vehicles	1	28	29	20	0	20	0	0	0	49
% Heavy Vehicles	33.3	6.6	6.7	2.0	0	2.0	0	0	0	3.4

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File Name : 81676L- L
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	1	81	233	0	2	10	327
07:15 AM	0	116	248	0	3	3	370
07:30 AM	0	101	257	0	1	7	366
07:45 AM	1	101	227	2	0	8	339
Total	2	399	965	2	6	28	1402
08:00 AM	5	120	189	2	1	3	320
08:15 AM	1	108	150	0	1	9	269
08:30 AM	5	134	158	0	0	5	302
08:45 AM	3	115	171	0	2	4	295
Total	14	477	668	2	4	21	1186
Grand Total	16	876	1633	4	10	49	2588
Apprch %	1.8	98.2	99.8	0.2	16.9	83.1	
Total %	0.6	33.8	63.1	0.2	0.4	1.9	

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**1**	81	82	233	0	233	2	**10**	**12**	327
07:15 AM	0	**116**	**116**	248	0	248	**3**	3	6	**370**
07:30 AM	**0**	**101**	**101**	**257**	0	**257**	1	7	8	366
07:45 AM	1	101	102	227	**2**	229	0	8	8	339
Total Volume	2	399	401	965	2	967	6	28	34	1402
% App. Total	0.5	99.5		99.8	0.2		17.6	82.4		
PHF	.500	.860	.864	.939	.250	.941	.500	.700	.708	.947

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Site Code : 10111.31
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Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	8	10	0	0	0	18
07:15 AM	0	1	5	0	0	0	6
07:30 AM	1	9	2	0	0	0	12
07:45 AM	0	10	3	0	0	0	13
Total	1	28	20	0	0	0	49
08:00 AM	0	11	9	0	0	0	20
08:15 AM	1	16	8	0	1	0	26
08:30 AM	1	13	28	0	0	0	42
08:45 AM	1	6	8	0	0	0	15
Total	3	46	53	0	1	0	103
Grand Total	4	74	73	0	1	0	152
Apprch %	5.1	94.9	100	0	100	0	
Total %	2.6	48.7	48	0	0.7	0	

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	11	11	9	0	9	0	0	0	20
08:15 AM	**1**	**16**	**17**	8	0	8	**1**	0	**1**	26
08:30 AM	1	13	14	**28**	0	**28**	0	0	0	**42**
08:45 AM	**1**	**6**	**7**	**8**	**0**	**8**	**0**	**0**	**0**	**15**
Total Volume	**3**	**46**	**49**	**53**	**0**	**53**	**1**	**0**	**1**	**103**
% App. Total	**6.1**	**93.9**		**100**	**0**		**100**	**0**		
PHF	**.750**	**.719**	**.721**	**.473**	**.000**	**.473**	**.250**	**.000**	**.250**	**.613**

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Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	0	0	1	1
Apprch %	0	0	0	0	0	0	0	0	100	
Total %	0	0	0	0	0	0	0	0	100	

	Broadway (Route 138) From North				Broadway (Route 138) From South				Britton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	1
% App. Total	0	0	0		0	0	0		0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250

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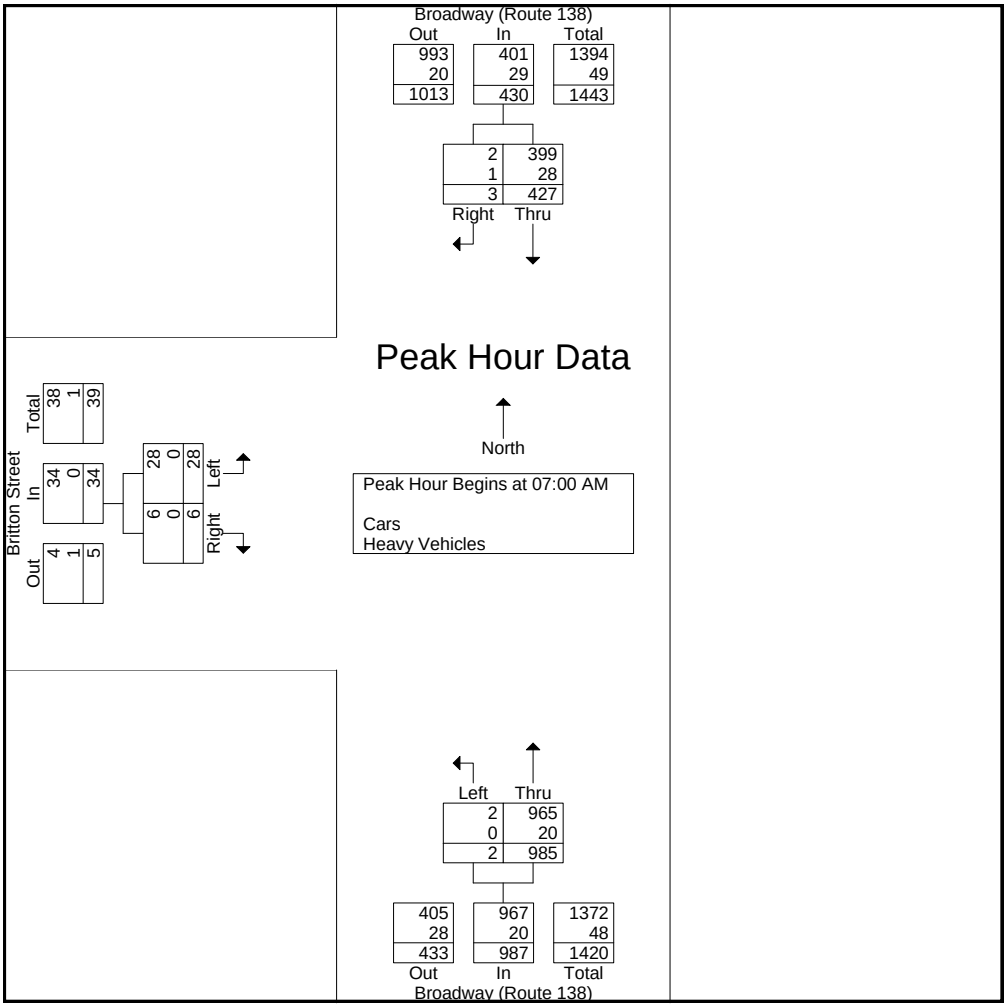
File Name : 81676L- L
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**1**	89	90	243	0	243	2	**10**	**12**	345
07:15 AM	0	**117**	**117**	253	0	253	**3**	3	6	376
07:30 AM	1	110	111	**259**	0	**259**	1	7	8	**378**
07:45 AM	**1**	**111**	**112**	**230**	**2**	232	0	8	8	352
Total Volume	3	427	430	985	2	987	6	28	34	1451
% App. Total	0.7	99.3		99.8	0.2		17.6	82.4		
PHF	.750	.912	.919	.951	.250	.953	.500	.700	.708	.960
Cars	2	399	401	965	2	967	6	28	34	1402
% Cars	66.7	93.4	93.3	98.0	100	98.0	100	100	100	96.6
Heavy Vehicles	1	28	29	20	0	20	0	0	0	49
% Heavy Vehicles	33.3	6.6	6.7	2.0	0	2.0	0	0	0	3.4



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City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- LLL
Site Code : 10111.31
Start Date : 9/18/2008

Groups Printed- Cars - Heavy Vehicles

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	6	244	163	0	4	3	420
04:15 PM	5	252	158	2	0	3	420
04:30 PM	6	271	175	1	0	5	458
04:45 PM	6	273	179	2	1	5	466
Total	23	1040	675	5	5	16	1764
05:00 PM	8	289	171	3	1	5	477
05:15 PM	10	266	194	2	2	5	479
05:30 PM	11	273	138	0	2	2	426
05:45 PM	11	241	146	0	0	2	400
Total	40	1069	649	5	5	14	1782
Grand Total	63	2109	1324	10	10	30	3546
Apprch %	2.9	97.1	99.3	0.7	25	75	
Total %	1.8	59.5	37.3	0.3	0.3	0.8	
Cars	63	2056	1282	9	10	30	3450
% Cars	100	97.5	96.8	90	100	100	97.3
Heavy Vehicles	0	53	42	1	0	0	96
% Heavy Vehicles	0	2.5	3.2	10	0	0	2.7

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	6	271	277	175	1	176	0	**5**	5	458
04:45 PM	6	273	279	179	2	181	1	5	6	466
05:00 PM	8	**289**	**297**	171	**3**	174	1	5	6	477
05:15 PM	**10**	266	276	**194**	2	**196**	**2**	5	**7**	**479**
Total Volume	**30**	**1099**	**1129**	**719**	**8**	**727**	**4**	**20**	**24**	**1880**
% App. Total	**2.7**	**97.3**		**98.9**	**1.1**		**16.7**	**83.3**		
PHF	**.750**	**.951**	**.950**	**.927**	**.667**	**.927**	**.500**	**1.000**	**.857**	**.981**
Cars	**30**	**1072**	**1102**	**698**	**7**	**705**	**4**	**20**	**24**	**1831**
% Cars	**100**	**97.5**	**97.6**	**97.1**	**87.5**	**97.0**	**100**	**100**	**100**	**97.4**
Heavy Vehicles	**0**	**27**	**27**	**21**	**1**	**22**	**0**	**0**	**0**	**49**
% Heavy Vehicles	**0**	**2.5**	**2.4**	**2.9**	**12.5**	**3.0**	**0**	**0**	**0**	**2.6**

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Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Cars

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	6	235	157	0	4	3	405
04:15 PM	5	244	148	2	0	3	402
04:30 PM	6	262	170	0	0	5	443
04:45 PM	6	267	171	2	1	5	452
Total	23	1008	646	4	5	16	1702
05:00 PM	8	284	167	3	1	5	468
05:15 PM	10	259	190	2	2	5	468
05:30 PM	11	268	137	0	2	2	420
05:45 PM	11	237	142	0	0	2	392
Total	40	1048	636	5	5	14	1748
Grand Total	63	2056	1282	9	10	30	3450
Apprch %	3	97	99.3	0.7	25	75	
Total %	1.8	59.6	37.2	0.3	0.3	0.9	

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	6	262	268	170	0	170	0	**5**	5	443
04:45 PM	6	267	273	171	2	173	1	5	6	452
05:00 PM	8	**284**	**292**	167	**3**	170	1	5	6	**468**
05:15 PM	**10**	259	269	**190**	2	**192**	**2**	5	**7**	468
Total Volume	30	1072	1102	698	7	705	4	20	24	1831
% App. Total	2.7	97.3		99	1		16.7	83.3		
PHF	.750	.944	.943	.918	.583	.918	.500	1.000	.857	.978

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City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- LLL
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Broadway (Route 138) From North		Broadway (Route 138) From South		Britton Street From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	0	9	6	0	0	0	15
04:15 PM	0	8	10	0	0	0	18
04:30 PM	0	9	5	1	0	0	15
04:45 PM	0	6	8	0	0	0	14
Total	0	32	29	1	0	0	62
05:00 PM	0	5	4	0	0	0	9
05:15 PM	0	7	4	0	0	0	11
05:30 PM	0	5	1	0	0	0	6
05:45 PM	0	4	4	0	0	0	8
Total	0	21	13	0	0	0	34
Grand Total	0	53	42	1	0	0	96
Apprch %	0	100	97.7	2.3	0	0	
Total %	0	55.2	43.8	1	0	0	

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	**9**	**9**	6	0	6	0	0	0	15
04:15 PM	0	8	8	**10**	0	**10**	0	0	0	**18**
04:30 PM	**0**	**9**	**9**	**5**	**1**	6	0	0	0	15
04:45 PM	0	6	6	8	0	8	0	0	0	14
Total Volume	0	32	32	29	1	30	0	0	0	62
% App. Total	0	100		96.7	3.3		0	0		
PHF	.000	.889	.889	.725	.250	.750	.000	.000	.000	.861

PRECISION
D A T A
INDUSTRIES, LLC
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N/S: Broadway (Route 138)
W: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- LLL
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	1	2
Grand Total	0	1	0	0	0	0	0	0	2	3
Apprch %	0	100	0	0	0	0	0	0	100	
Total %	0	33.3	0	0	0	0	0	0	66.7	

	Broadway (Route 138) From North				Broadway (Route 138) From South				Britton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	2	2	2
% App. Total	0	0	0		0	0	0		0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.500

PRECISION
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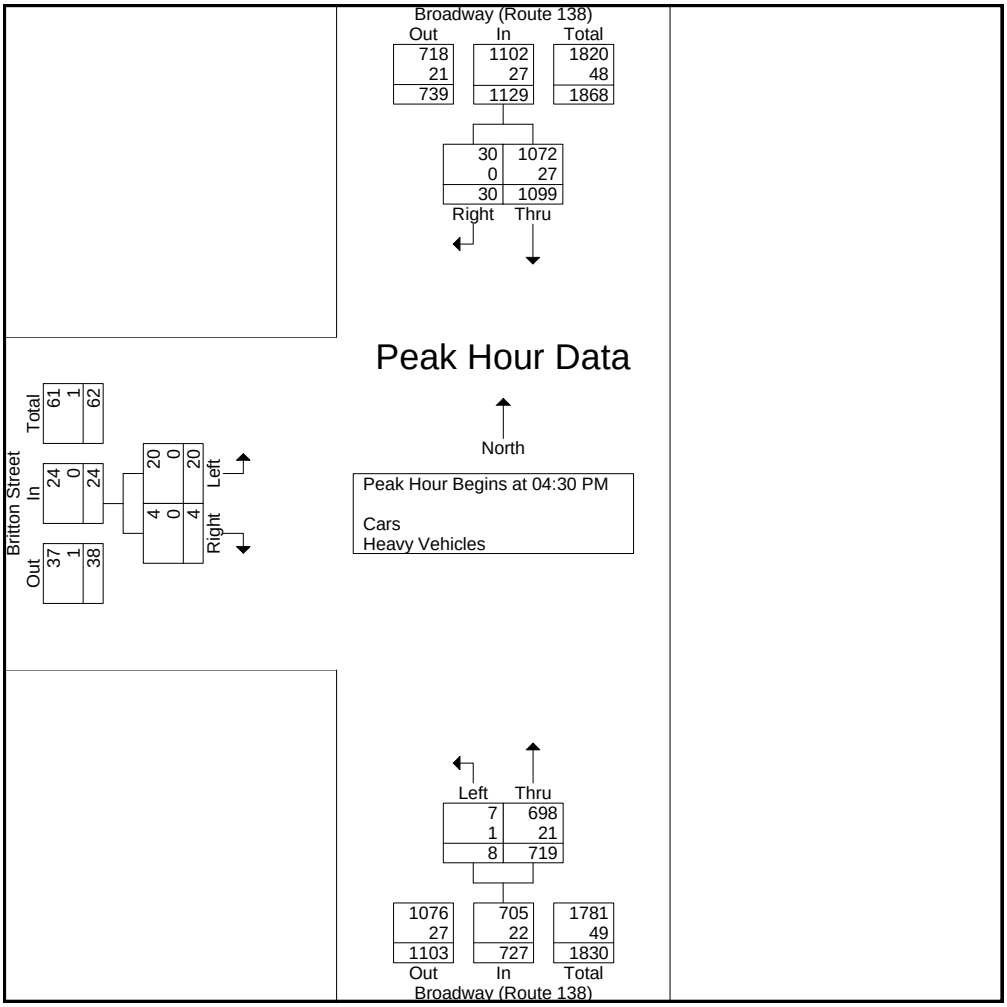
N/S: Broadway (Route 138)
W: Britton Street
City, State: Raynham, MA
Client: VHB/ J. Quitter

File Name : 81676L- LLL
Site Code : 10111.31
Start Date : 9/18/2008
Page No : 1

	Broadway (Route 138) From North			Broadway (Route 138) From South			Britton Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	6	271	277	175	1	176	0	**5**	5	458
04:45 PM	6	273	279	179	2	181	1	5	6	466
05:00 PM	8	**289**	**297**	171	**3**	174	1	5	6	477
05:15 PM	**10**	266	276	**194**	2	**196**	**2**	5	**7**	**479**
Total Volume	**30**	**1099**	**1129**	**719**	**8**	**727**	**4**	**20**	**24**	**1880**
% App. Total	**2.7**	**97.3**		**98.9**	**1.1**		**16.7**	**83.3**		
PHF	**.750**	**.951**	**.950**	**.927**	**.667**	**.927**	**.500**	**1.000**	**.857**	**.981**
Cars	**30**	**1072**	**1102**	**698**	**7**	**705**	**4**	**20**	**24**	**1831**
% Cars	**100**	**97.5**	**97.6**	**97.1**	**87.5**	**97.0**	**100**	**100**	**100**	**97.4**
Heavy Vehicles	**0**	**27**	**27**	**21**	**1**	**22**	**0**	**0**	**0**	**49**
% Heavy Vehicles	**0**	**2.5**	**2.4**	**2.9**	**12.5**	**3.0**	**0**	**0**	**0**	**2.6**



VHB *Computations*

Project: SCR | Project # 10111.00
Location: Raynham | Sheet 1 of 1
Calculated by: N.L. | Date: June / 2009
Checked by: | Date:
Title Rt 138 @ Robinson St / Dog Track driveway

Time 7:00 AM - 8:00 AM & 4:45 PM - 5:45 PM

TMCs:

	From North Route 138			From South Route 138			From East Robinson Street			From West Dog Track driveway		
	R	T	L	R	T	L	R	T	L	R	T	L
AM	0	325	5	0	1125	40	20	0	0	24	0	4
(HV%)		(12%)			(3%)	(11%)				(50%)		(75%)
PM	2	1000	10	2	555	32	13	0	2	40	0	3
(HV%)		(2%)			(5%)	(6%)	(8%)					(33%)

*(HV%) = Percent of Heavy Vehicles.
* movements not showing (HV%) mean no heavy vehicles during the count period.

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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 9/10/08 and Sat 9/25/08	81676	Norton, MA

PRECISION DATA INDUSTRIES, LLC
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N/S: N. Worcester St/South Worcester St.
E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	16	13	12	52	22	28	28	23	23	51	5	278
07:15 AM	1	18	29	13	63	12	28	21	33	27	95	2	342
07:30 AM	4	16	14	8	67	10	36	37	45	31	92	4	364
07:45 AM	3	11	7	9	65	13	27	26	29	29	69	4	292
Total	13	61	63	42	247	57	119	112	130	110	307	15	1276
08:00 AM	3	10	13	16	89	12	19	21	51	36	71	3	344
08:15 AM	2	7	11	9	88	8	11	30	48	25	71	5	315
08:30 AM	2	8	7	14	81	9	13	14	26	25	61	4	264
08:45 AM	5	5	6	7	68	18	43	15	29	21	56	5	278
Total	12	30	37	46	326	47	86	80	154	107	259	17	1201
Grand Total	25	91	100	88	573	104	205	192	284	217	566	32	2477
Apprch %	11.6	42.1	46.3	11.5	74.9	13.6	30.1	28.2	41.7	26.6	69.4	3.9	
Total %	1	3.7	4	3.6	23.1	4.2	8.3	7.8	11.5	8.8	22.9	1.3	
Cars	24	85	91	81	548	89	192	180	281	211	546	32	2360
% Cars	96	93.4	91	92	95.6	85.6	93.7	93.8	98.9	97.2	96.5	100	95.3
Heavy Vehicles	1	6	9	7	25	15	13	12	3	6	20	0	117
% Heavy Vehicles	4	6.6	9	8	4.4	14.4	6.3	6.2	1.1	2.8	3.5	0	4.7

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**18**	**29**	**48**	13	63	12	88	28	21	33	82	27	**95**	2	124	342
07:30 AM	**4**	16	14	34	8	67	10	85	**36**	**37**	45	**118**	31	92	**4**	**127**	**364**
07:45 AM	3	11	7	21	9	65	**13**	87	27	26	29	82	29	69	4	102	292
08:00 AM	3	10	13	26	**16**	**89**	12	**117**	19	21	**51**	91	**36**	71	3	110	344
Total Volume	11	55	63	129	46	284	47	377	110	105	158	373	123	327	13	463	1342
% App. Total	8.5	42.6	48.8		12.2	75.3	12.5		29.5	28.2	42.4		26.6	70.6	2.8		
PHF	.688	.764	.543	.672	.719	.798	.904	.806	.764	.709	.775	.790	.854	.861	.813	.911	.922
Cars	10	50	55	115	43	274	41	358	104	100	156	360	120	317	13	450	1283
% Cars	90.9	90.9	87.3	89.1	93.5	96.5	87.2	95.0	94.5	95.2	98.7	96.5	97.6	96.9	100	97.2	95.6
Heavy Vehicles	1	5	8	14	3	10	6	19	6	5	2	13	3	10	0	13	59
% Heavy Vehicles	9.1	9.1	12.7	10.9	6.5	3.5	12.8	5.0	5.5	4.8	1.3	3.5	2.4	3.1	0	2.8	4.4

PRECISION
D A T A
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N/S: N. Worcester St/South Worcester St.
E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	5	16	13	12	51	21	28	27	23	23	49	5	273
07:15 AM	1	16	26	11	59	12	26	20	33	26	91	2	323
07:30 AM	4	14	12	8	64	8	34	35	43	30	92	4	348
07:45 AM	2	11	6	9	65	12	26	25	29	28	66	4	283
Total	12	57	57	40	239	53	114	107	128	107	298	15	1227
08:00 AM	3	9	11	15	86	9	18	20	51	36	68	3	329
08:15 AM	2	7	11	8	85	8	10	29	47	23	71	5	306
08:30 AM	2	7	7	12	75	5	10	12	26	25	57	4	242
08:45 AM	5	5	5	6	63	14	40	12	29	20	52	5	256
Total	12	28	34	41	309	36	78	73	153	104	248	17	1133
Grand Total	24	85	91	81	548	89	192	180	281	211	546	32	2360
Apprch %	12	42.5	45.5	11.3	76.3	12.4	29.4	27.6	43	26.7	69.2	4.1	
Total %	1	3.6	3.9	3.4	23.2	3.8	8.1	7.6	11.9	8.9	23.1	1.4	

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**16**	**26**	**43**	11	59	**12**	82	26	20	33	79	26	91	2	119	323
07:30 AM	**4**	14	12	30	8	64	8	80	**34**	**35**	43	**112**	30	**92**	**4**	**126**	**348**
07:45 AM	2	11	6	19	9	65	12	86	26	25	29	80	28	66	4	98	283
08:00 AM	3	9	11	23	**15**	**86**	9	**110**	18	20	**51**	89	**36**	68	3	107	329
Total Volume	10	50	55	115	43	274	41	358	104	100	156	360	120	317	13	450	1283
% App. Total	8.7	43.5	47.8		12	76.5	11.5		28.9	27.8	43.3		26.7	70.4	2.9		
PHF	.625	.781	.529	.669	.717	.797	.854	.814	.765	.714	.765	.804	.833	.861	.813	.893	.922

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City, State: Norton, MA
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File Name : 81676I-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	1	1	0	1	0	0	2	0	5
07:15 AM	0	2	3	2	4	0	2	1	0	1	4	0	19
07:30 AM	0	2	2	0	3	2	2	2	2	1	0	0	16
07:45 AM	1	0	1	0	0	1	1	1	0	1	3	0	9
Total	1	4	6	2	8	4	5	5	2	3	9	0	49
08:00 AM	0	1	2	1	3	3	1	1	0	0	3	0	15
08:15 AM	0	0	0	1	3	0	1	1	1	2	0	0	9
08:30 AM	0	1	0	2	6	4	3	2	0	0	4	0	22
08:45 AM	0	0	1	1	5	4	3	3	0	1	4	0	22
Total	0	2	3	5	17	11	8	7	1	3	11	0	68
Grand Total	1	6	9	7	25	15	13	12	3	6	20	0	117
Apprch %	6.2	37.5	56.2	14.9	53.2	31.9	46.4	42.9	10.7	23.1	76.9	0	
Total %	0.9	5.1	7.7	6	21.4	12.8	11.1	10.3	2.6	5.1	17.1	0	

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	**1**	**2**	**3**	1	3	3	7	1	1	0	2	0	3	0	3	15
08:15 AM	0	0	0	0	1	3	0	4	1	1	**1**	3	**2**	0	0	2	9
08:30 AM	0	1	0	1	**2**	**6**	**4**	**12**	**3**	2	0	5	0	**4**	0	4	**22**
08:45 AM	0	0	1	1	1	5	4	10	3	**3**	0	**6**	1	4	0	**5**	22
Total Volume	0	2	3	5	5	17	11	33	8	7	1	16	3	11	0	14	68
% App. Total	0	40	60		15.2	51.5	33.3		50	43.8	6.2		21.4	78.6	0		
PHF	.000	.500	.375	.417	.625	.708	.688	.688	.667	.583	.250	.667	.375	.688	.000	.700	.773

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File Name : 81676I-A
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	

	North Worcester Street From North					West Main Street (Route 123) From East					South Worcester Street From South					Old Colony Road (Route 123) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

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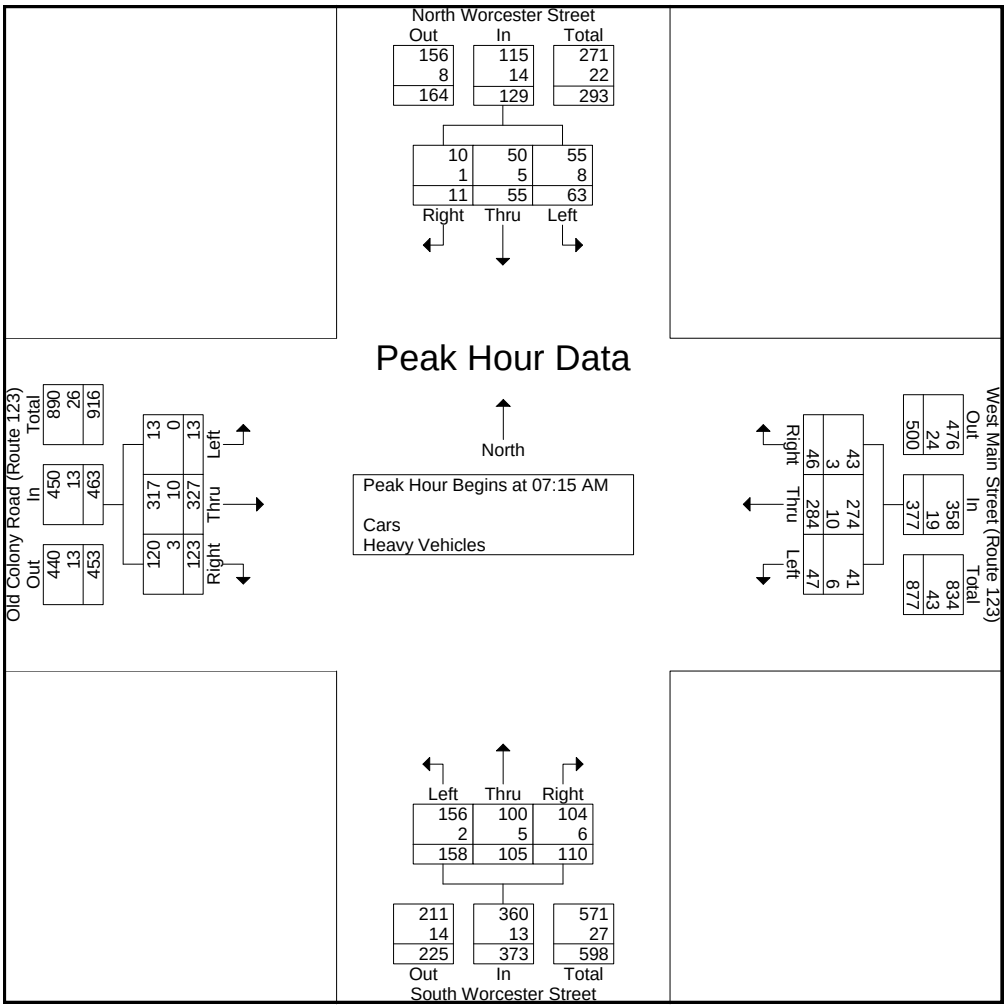
	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**18**	**29**	**48**	13	63	12	88	28	21	33	82	27	**95**	2	124	342
07:30 AM	**4**	16	14	34	8	67	10	85	**36**	**37**	45	**118**	31	92	**4**	**127**	**364**
07:45 AM	3	11	7	21	9	65	**13**	87	27	26	29	82	29	69	4	102	292
08:00 AM	3	10	13	26	**16**	**89**	12	**117**	19	21	**51**	91	**36**	71	3	110	344
Total Volume	11	55	63	129	46	284	47	377	110	105	158	373	123	327	13	463	1342
% App. Total	8.5	42.6	48.8		12.2	75.3	12.5		29.5	28.2	42.4		26.6	70.6	2.8		
PHF	.688	.764	.543	.672	.719	.798	.904	.806	.764	.709	.775	.790	.854	.861	.813	.911	.922
Cars	10	50	55	115	43	274	41	358	104	100	156	360	120	317	13	450	1283
% Cars	90.9	90.9	87.3	89.1	93.5	96.5	87.2	95.0	94.5	95.2	98.7	96.5	97.6	96.9	100	97.2	95.6
Heavy Vehicles	1	5	8	14	3	10	6	19	6	5	2	13	3	10	0	13	59
% Heavy Vehicles	9.1	9.1	12.7	10.9	6.5	3.5	12.8	5.0	5.5	4.8	1.3	3.5	2.4	3.1	0	2.8	4.4



PRECISION
D A T A
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Email: datarequests@pdillc.com

N/S: N. Worcester St/South Worcester St.
E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	19	10	19	79	36	19	16	30	51	78	1	361
04:15 PM	3	27	16	17	85	38	26	14	40	41	71	0	378
04:30 PM	2	33	8	15	97	26	25	21	36	70	75	2	410
04:45 PM	6	37	19	15	95	31	28	16	35	60	90	5	437
Total	14	116	53	66	356	131	98	67	141	222	314	8	1586
05:00 PM	5	29	18	27	83	31	29	13	26	46	100	5	412
05:15 PM	5	41	16	15	106	44	21	14	40	47	99	1	449
05:30 PM	4	23	15	18	72	49	17	18	28	42	80	3	369
05:45 PM	6	32	14	21	95	37	22	16	39	50	65	4	401
Total	20	125	63	81	356	161	89	61	133	185	344	13	1631
Grand Total	34	241	116	147	712	292	187	128	274	407	658	21	3217
Apprch %	8.7	61.6	29.7	12.8	61.9	25.4	31.7	21.7	46.5	37.5	60.6	1.9	
Total %	1.1	7.5	3.6	4.6	22.1	9.1	5.8	4	8.5	12.7	20.5	0.7	
Cars	33	241	114	147	700	289	184	126	269	402	643	21	3169
% Cars	97.1	100	98.3	100	98.3	99	98.4	98.4	98.2	98.8	97.7	100	98.5
Heavy Vehicles	1	0	2	0	12	3	3	2	5	5	15	0	48
% Heavy Vehicles	2.9	0	1.7	0	1.7	1	1.6	1.6	1.8	1.2	2.3	0	1.5

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	33	8	43	15	97	26	138	25	**21**	36	**82**	**70**	75	2	147	410
04:45 PM	**6**	37	**19**	**62**	15	95	31	141	28	16	35	79	60	90	**5**	**155**	437
05:00 PM	5	29	18	52	**27**	83	31	141	**29**	13	26	68	46	**100**	5	151	412
05:15 PM	5	**41**	16	62	15	**106**	**44**	**165**	21	14	**40**	75	47	99	1	147	**449**
Total Volume	18	140	61	219	72	381	132	585	103	64	137	304	223	364	13	600	1708
% App. Total	8.2	63.9	27.9		12.3	65.1	22.6		33.9	21.1	45.1		37.2	60.7	2.2		
PHF	.750	.854	.803	.883	.667	.899	.750	.886	.888	.762	.856	.927	.796	.910	.650	.968	.951
Cars	17	140	61	218	72	373	131	576	102	63	135	300	222	356	13	591	1685
% Cars	94.4	100	100	99.5	100	97.9	99.2	98.5	99.0	98.4	98.5	98.7	99.6	97.8	100	98.5	98.7
Heavy Vehicles	1	0	0	1	0	8	1	9	1	1	2	4	1	8	0	9	23
% Heavy Vehicles	5.6	0	0	0.5	0	2.1	0.8	1.5	1.0	1.6	1.5	1.3	0.4	2.2	0	1.5	1.3

PRECISION
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N/S: N. Worcester St/South Worcester St.
E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	3	19	10	19	77	35	18	15	29	48	74	1	348
04:15 PM	3	27	14	17	83	38	25	14	39	41	69	0	370
04:30 PM	2	33	8	15	96	26	24	20	35	69	74	2	404
04:45 PM	5	37	19	15	89	30	28	16	35	60	89	5	428
Total	13	116	51	66	345	129	95	65	138	218	306	8	1550
05:00 PM	5	29	18	27	83	31	29	13	25	46	97	5	408
05:15 PM	5	41	16	15	105	44	21	14	40	47	96	1	445
05:30 PM	4	23	15	18	72	49	17	18	28	41	79	3	367
05:45 PM	6	32	14	21	95	36	22	16	38	50	65	4	399
Total	20	125	63	81	355	160	89	61	131	184	337	13	1619
Grand Total	33	241	114	147	700	289	184	126	269	402	643	21	3169
Apprch %	8.5	62.1	29.4	12.9	61.6	25.4	31.8	21.8	46.5	37.7	60.3	2	
Total %	1	7.6	3.6	4.6	22.1	9.1	5.8	4	8.5	12.7	20.3	0.7	

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	33	8	43	15	96	26	137	24	**20**	35	**79**	**69**	74	2	145	404
04:45 PM	**5**	37	**19**	61	15	89	30	134	28	16	35	79	60	89	**5**	**154**	428
05:00 PM	5	29	18	52	**27**	83	31	141	**29**	13	25	67	46	**97**	5	148	408
05:15 PM	5	**41**	16	**62**	15	**105**	**44**	**164**	21	14	**40**	75	47	96	1	144	**445**
Total Volume	17	140	61	218	72	373	131	576	102	63	135	300	222	356	13	591	1685
% App. Total	7.8	64.2	28		12.5	64.8	22.7		34	21	45		37.6	60.2	2.2		
PHF	.850	.854	.803	.879	.667	.888	.744	.878	.879	.788	.844	.949	.804	.918	.650	.959	.947

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E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	North Worcester Street From North			West Main Street (Route 123) From East			South Worcester Street From South			Old Colony Road (Route 123) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	2	1	1	1	1	3	4	0	13
04:15 PM	0	0	2	0	2	0	1	0	1	0	2	0	8
04:30 PM	0	0	0	0	1	0	1	1	1	1	1	0	6
04:45 PM	1	0	0	0	6	1	0	0	0	0	1	0	9
Total	1	0	2	0	11	2	3	2	3	4	8	0	36
05:00 PM	0	0	0	0	0	0	0	0	1	0	3	0	4
05:15 PM	0	0	0	0	1	0	0	0	0	0	3	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	2
05:45 PM	0	0	0	0	0	1	0	0	1	0	0	0	2
Total	0	0	0	0	1	1	0	0	2	1	7	0	12
Grand Total	1	0	2	0	12	3	3	2	5	5	15	0	48
Apprch %	33.3	0	66.7	0	80	20	30	20	50	25	75	0	
Total %	2.1	0	4.2	0	25	6.2	6.2	4.2	10.4	10.4	31.2	0	

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	2	**1**	3	**1**	**1**	**1**	**3**	**3**	**4**	0	**7**	**13**
04:15 PM	0	0	**2**	**2**	0	2	0	2	1	0	1	2	0	2	0	2	8
04:30 PM	0	0	0	0	0	1	0	1	1	1	1	3	1	1	0	2	6
04:45 PM	**1**	0	0	1	0	**6**	1	**7**	0	0	0	0	0	1	0	1	9
Total Volume	1	0	2	3	0	11	2	13	3	2	3	8	4	8	0	12	36
% App. Total	33.3	0	66.7		0	84.6	15.4		37.5	25	37.5		33.3	66.7	0		
PHF	.250	.000	.250	.375	.000	.458	.500	.464	.750	.500	.750	.667	.333	.500	.000	.429	.692

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E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	4
Grand Total	0	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	5
Apprch %	0	50	0	50	0	0	0	0	50	50	0	0	100	0	0	0	
Total %	0	20	0	20	0	0	0	0	20	20	0	0	20	0	0	0	

	North Worcester Street From North					West Main Street (Route 123) From East					South Worcester Street From South					Old Colony Road (Route 123) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**0**	**0**	**1**	1
05:15 PM	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	0	0	0	1
Total Volume	0	1	0	1	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
% App. Total	0	50	0	50		0	0	0	0		0	100	0	0		100	0	0	0		
PHF	.000	.250	.000	.250	.500	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250	.000	.000	.000	.250	1.000

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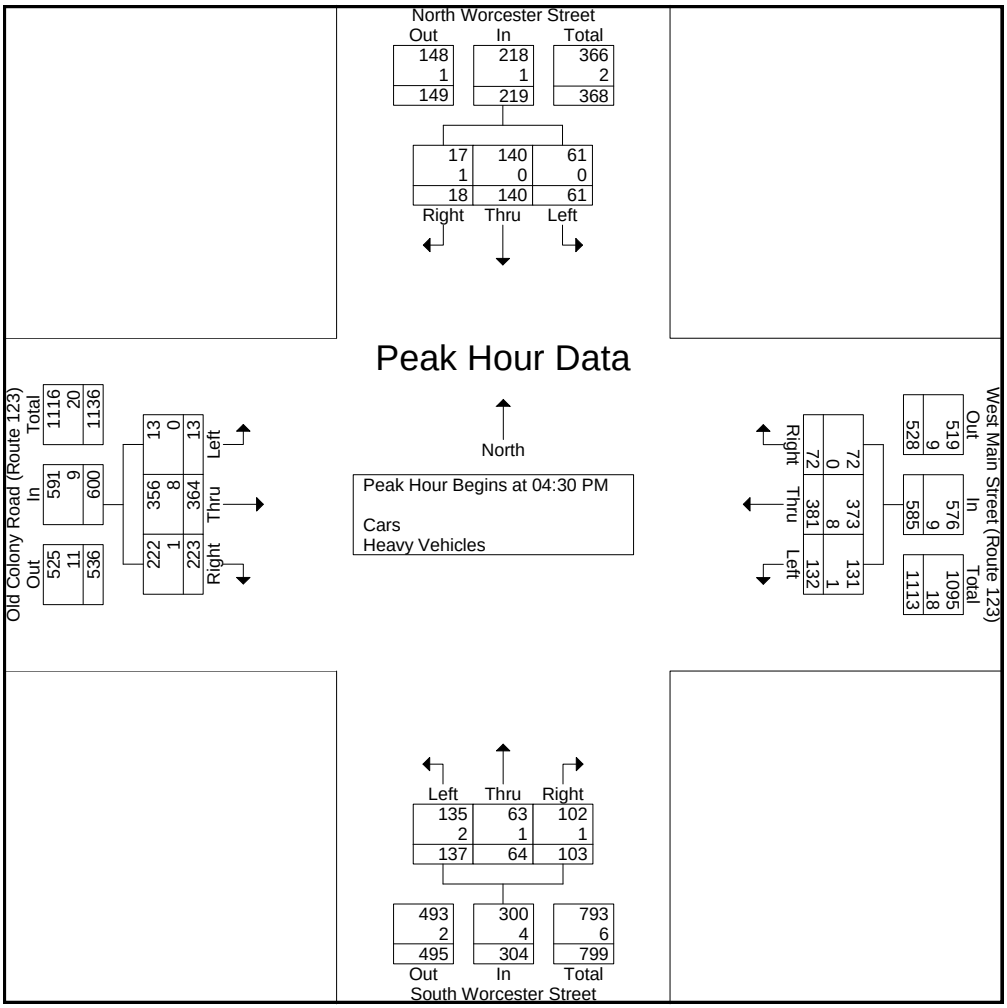
E/W: W. Main St/Old Colony Rd (Rte 123)
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-AAA
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	North Worcester Street From North				West Main Street (Route 123) From East				South Worcester Street From South				Old Colony Road (Route 123) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	33	8	43	15	97	26	138	25	**21**	36	**82**	**70**	75	2	147	410
04:45 PM	**6**	37	**19**	**62**	15	95	31	141	28	16	35	79	60	90	**5**	**155**	437
05:00 PM	5	29	18	52	**27**	83	31	141	**29**	13	26	68	46	**100**	5	151	412
05:15 PM	5	**41**	16	62	15	**106**	**44**	**165**	21	14	**40**	75	47	99	1	147	**449**
Total Volume	18	140	61	219	72	381	132	585	103	64	137	304	223	364	13	600	1708
% App. Total	8.2	63.9	27.9		12.3	65.1	22.6		33.9	21.1	45.1		37.2	60.7	2.2		
PHF	.750	.854	.803	.883	.667	.899	.750	.886	.888	.762	.856	.927	.796	.910	.650	.968	.951
Cars	17	140	61	218	72	373	131	576	102	63	135	300	222	356	13	591	1685
% Cars	94.4	100	100	99.5	100	97.9	99.2	98.5	99.0	98.4	98.5	98.7	99.6	97.8	100	98.5	98.7
Heavy Vehicles	1	0	0	1	0	8	1	9	1	1	2	4	1	8	0	9	23
% Heavy Vehicles	5.6	0	0	0.5	0	2.1	0.8	1.5	1.0	1.6	1.5	1.3	0.4	2.2	0	1.5	1.3



PRECISION DATA INDUSTRIES, LLC
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N/S: Harvey Street
E/W: John Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-B
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	0	2	38	0	2	0	0	1	34	2	81
07:15 AM	2	0	0	0	50	1	3	0	5	0	36	1	98
07:30 AM	3	0	1	1	52	0	1	0	3	2	46	0	109
07:45 AM	1	0	1	0	47	3	4	1	2	1	42	0	102
Total	8	0	2	3	187	4	10	1	10	4	158	3	390
08:00 AM	1	0	2	0	53	2	1	0	4	1	47	0	111
08:15 AM	1	0	1	1	45	0	4	0	2	0	33	0	87
08:30 AM	1	0	0	0	23	0	4	0	3	2	28	0	61
08:45 AM	1	0	0	0	35	3	2	0	3	1	31	0	76
Total	4	0	3	1	156	5	11	0	12	4	139	0	335
Grand Total	12	0	5	4	343	9	21	1	22	8	297	3	725
Apprch %	70.6	0	29.4	1.1	96.3	2.5	47.7	2.3	50	2.6	96.4	1	
Total %	1.7	0	0.7	0.6	47.3	1.2	2.9	0.1	3	1.1	41	0.4	
Cars	12	0	3	0	334	8	20	1	15	3	279	3	678
% Cars	100	0	60	0	97.4	88.9	95.2	100	68.2	37.5	93.9	100	93.5
Heavy Vehicles	0	0	2	4	9	1	1	0	7	5	18	0	47
% Heavy Vehicles	0	0	40	100	2.6	11.1	4.8	0	31.8	62.5	6.1	0	6.5

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	0	0	2	0	50	1	51	3	0	**5**	**8**	0	36	**1**	37	98
07:30 AM	**3**	0	1	**4**	**1**	52	0	53	1	0	3	4	**2**	46	0	**48**	109
07:45 AM	1	0	1	2	0	47	**3**	50	**4**	**1**	2	7	1	42	0	43	102
08:00 AM	1	0	**2**	3	0	**53**	2	**55**	1	0	4	5	1	**47**	0	48	**111**
Total Volume	7	0	4	11	1	202	6	209	9	1	14	24	4	171	1	176	420
% App. Total	63.6	0	36.4		0.5	96.7	2.9		37.5	4.2	58.3		2.3	97.2	0.6		
PHF	.583	.000	.500	.688	.250	.953	.500	.950	.563	.250	.700	.750	.500	.910	.250	.917	.946
Cars	7	0	2	9	0	195	5	200	8	1	9	18	0	163	1	164	391
% Cars	100	0	50.0	81.8	0	96.5	83.3	95.7	88.9	100	64.3	75.0	0	95.3	100	93.2	93.1
Heavy Vehicles	0	0	2	2	1	7	1	9	1	0	5	6	4	8	0	12	29
% Heavy Vehicles	0	0	50.0	18.2	100	3.5	16.7	4.3	11.1	0	35.7	25.0	100	4.7	0	6.8	6.9

PRECISION
D A T A
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N/S: Harvey Street
E/W: John Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-B
Site Code : 10111.31
Start Date : 9/10/2008

Groups Printed- Cars

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	0	0	38	0	2	0	0	1	33	2	78
07:15 AM	2	0	0	0	49	1	3	0	5	0	35	1	96
07:30 AM	3	0	0	0	48	0	1	0	2	0	44	0	98
07:45 AM	1	0	1	0	46	3	4	1	2	0	40	0	98
Total	8	0	1	0	181	4	10	1	9	1	152	3	370
08:00 AM	1	0	1	0	52	1	0	0	0	0	44	0	99
08:15 AM	1	0	1	0	45	0	4	0	2	0	30	0	83
08:30 AM	1	0	0	0	21	0	4	0	2	1	24	0	53
08:45 AM	1	0	0	0	35	3	2	0	2	1	29	0	73
Total	4	0	2	0	153	4	10	0	6	2	127	0	308
Grand Total	12	0	3	0	334	8	20	1	15	3	279	3	678
Apprch %	80	0	20	0	97.7	2.3	55.6	2.8	41.7	1.1	97.9	1.1	
Total %	1.8	0	0.4	0	49.3	1.2	2.9	0.1	2.2	0.4	41.2	0.4	

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	0	0	2	0	49	1	50	3	0	**5**	**8**	0	35	**1**	36	96
07:30 AM	**3**	0	0	**3**	0	48	0	48	1	0	2	3	0	**44**	0	**44**	98
07:45 AM	1	0	**1**	2	0	46	**3**	49	**4**	**1**	2	7	0	40	0	40	98
08:00 AM	1	0	1	2	0	**52**	1	**53**	0	0	0	0	0	44	0	44	**99**
Total Volume	7	0	2	9	0	195	5	200	8	1	9	18	0	163	1	164	391
% App. Total	77.8	0	22.2		0	97.5	2.5		44.4	5.6	50		0	99.4	0.6		
PHF	.583	.000	.500	.750	.000	.938	.417	.943	.500	.250	.450	.563	.000	.926	.250	.932	.987

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File Name : 81676I-B
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	0	0	1	0	3
07:15 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
07:30 AM	0	0	1	1	4	0	0	0	1	2	2	0	11
07:45 AM	0	0	0	0	1	0	0	0	0	1	2	0	4
Total	0	0	1	3	6	0	0	0	1	3	6	0	20
08:00 AM	0	0	1	0	1	1	1	0	4	1	3	0	12
08:15 AM	0	0	0	1	0	0	0	0	0	0	3	0	4
08:30 AM	0	0	0	0	2	0	0	0	1	1	4	0	8
08:45 AM	0	0	0	0	0	0	0	0	1	0	2	0	3
Total	0	0	1	1	3	1	1	0	6	2	12	0	27
Grand Total	0	0	2	4	9	1	1	0	7	5	18	0	47
Apprch %	0	0	100	28.6	64.3	7.1	12.5	0	87.5	21.7	78.3	0	
Total %	0	0	4.3	8.5	19.1	2.1	2.1	0	14.9	10.6	38.3	0	

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	**1**	**1**	**1**	**4**	0	**5**	0	0	1	1	**2**	2	0	**4**	11
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1	2	0	3	4
08:00 AM	0	0	1	1	0	1	**1**	2	**1**	0	**4**	**5**	1	**3**	0	4	**12**
08:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0	3	4
Total Volume	0	0	2	2	2	6	1	9	1	0	5	6	4	10	0	14	31
% App. Total	0	0	100		22.2	66.7	11.1		16.7	0	83.3		28.6	71.4	0		
PHF	.000	.000	.500	.500	.500	.375	.250	.450	.250	.000	.313	.300	.500	.833	.000	.875	.646

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Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Harvey Street From North					John Scott Boulevard From East					Harvey Street From South					John Scott Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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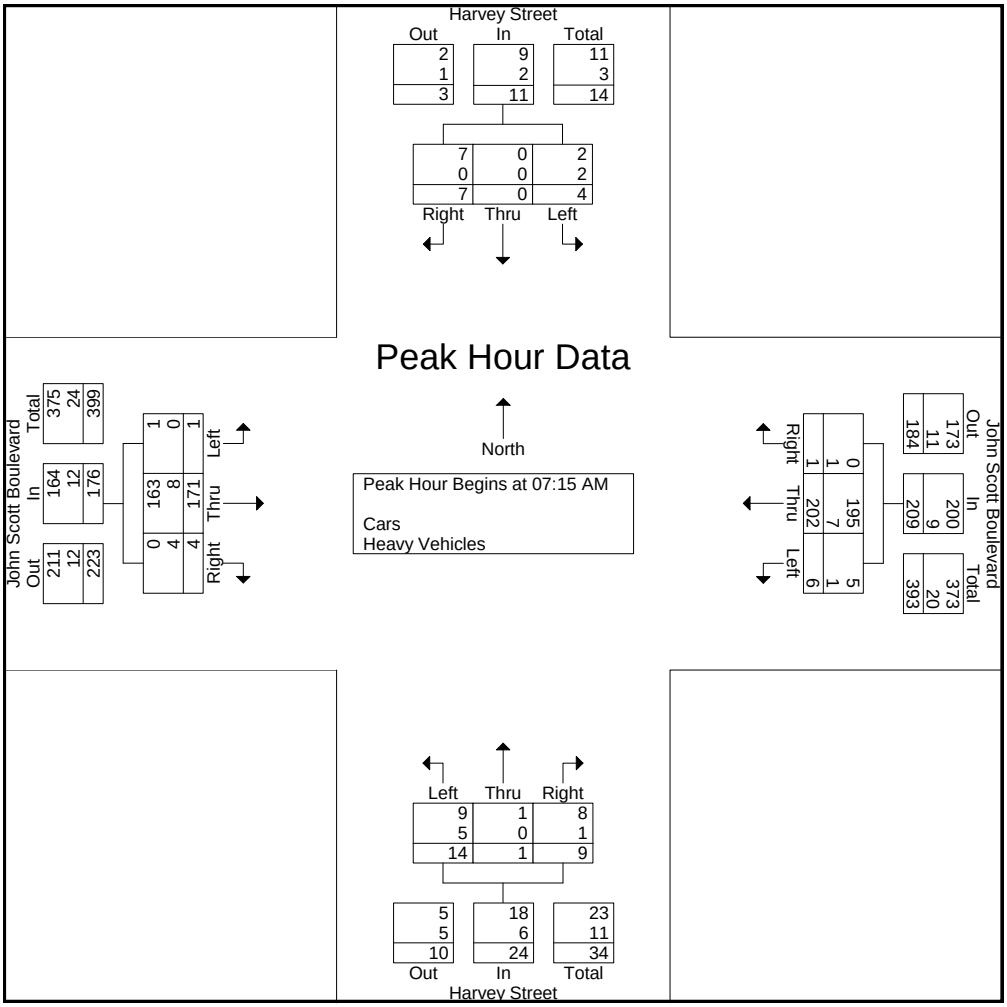
Start Date : 9/10/2008
Page No : 1

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	0	0	2	0	50	1	51	3	0	**5**	**8**	0	36	**1**	37	98
07:30 AM	**3**	0	1	**4**	**1**	52	0	53	1	0	3	4	**2**	46	0	**48**	109
07:45 AM	1	0	1	2	0	47	**3**	50	**4**	**1**	2	7	1	42	0	43	102
08:00 AM	1	0	**2**	3	0	**53**	2	**55**	1	0	4	5	1	**47**	0	48	**111**
Total Volume	7	0	4	11	1	202	6	209	9	1	14	24	4	171	1	176	420
% App. Total	63.6	0	36.4		0.5	96.7	2.9		37.5	4.2	58.3		2.3	97.2	0.6		
PHF	.583	.000	.500	.688	.250	.953	.500	.950	.563	.250	.700	.750	.500	.910	.250	.917	.946
Cars	7	0	2	9	0	195	5	200	8	1	9	18	0	163	1	164	391
% Cars	100	0	50.0	81.8	0	96.5	83.3	95.7	88.9	100	64.3	75.0	0	95.3	100	93.2	93.1
Heavy Vehicles	0	0	2	2	1	7	1	9	1	0	5	6	4	8	0	12	29
% Heavy Vehicles	0	0	50.0	18.2	100	3.5	16.7	4.3	11.1	0	35.7	25.0	100	4.7	0	6.8	6.9



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Client: VHB/J. Quitter

File Name : 81676I-BBB
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	1	36	6	0	1	4	2	59	2	113
04:15 PM	1	2	0	0	48	2	1	1	1	3	39	0	98
04:30 PM	0	0	0	0	50	3	1	2	0	3	84	0	143
04:45 PM	1	0	0	1	39	2	1	0	1	5	70	1	121
Total	2	4	0	2	173	13	3	4	6	13	252	3	475
05:00 PM	0	1	0	0	40	1	1	0	2	3	57	1	106
05:15 PM	3	0	0	0	44	6	1	2	1	2	72	5	136
05:30 PM	0	2	1	0	55	5	2	3	0	1	51	1	121
05:45 PM	0	2	0	0	28	5	0	1	2	2	45	3	88
Total	3	5	1	0	167	17	4	6	5	8	225	10	451
Grand Total	5	9	1	2	340	30	7	10	11	21	477	13	926
Apprch %	33.3	60	6.7	0.5	91.4	8.1	25	35.7	39.3	4.1	93.3	2.5	
Total %	0.5	1	0.1	0.2	36.7	3.2	0.8	1.1	1.2	2.3	51.5	1.4	
Cars	5	8	1	2	335	30	7	10	10	19	465	13	905
% Cars	100	88.9	100	100	98.5	100	100	100	90.9	90.5	97.5	100	97.7
Heavy Vehicles	0	1	0	0	5	0	0	0	1	2	12	0	21
% Heavy Vehicles	0	11.1	0	0	1.5	0	0	0	9.1	9.5	2.5	0	2.3

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	**50**	3	**53**	**1**	**2**	0	3	3	**84**	0	**87**	**143**
04:45 PM	1	0	0	1	**1**	39	2	42	1	0	1	2	**5**	70	1	76	121
05:00 PM	0	**1**	0	1	0	40	1	41	1	0	**2**	3	3	57	1	61	106
05:15 PM	**3**	0	0	**3**	0	44	**6**	50	1	2	1	**4**	2	72	**5**	79	136
Total Volume	4	1	0	5	1	173	12	186	4	4	4	12	13	283	7	303	506
% App. Total	80	20	0		0.5	93	6.5		33.3	33.3	33.3		4.3	93.4	2.3		
PHF	.333	.250	.000	.417	.250	.865	.500	.877	1.000	.500	.500	.750	.650	.842	.350	.871	.885
Cars	4	1	0	5	1	170	12	183	4	4	3	11	12	280	7	299	498
% Cars	100	100	0	100	100	98.3	100	98.4	100	100	75.0	91.7	92.3	98.9	100	98.7	98.4
Heavy Vehicles	0	0	0	0	0	3	0	3	0	0	1	1	1	3	0	4	8
% Heavy Vehicles	0	0	0	0	0	1.7	0	1.6	0	0	25.0	8.3	7.7	1.1	0	1.3	1.6

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File Name : 81676I-BBB
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Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	1	36	6	0	1	4	1	52	2	105
04:15 PM	1	1	0	0	47	2	1	1	1	3	38	0	95
04:30 PM	0	0	0	0	49	3	1	2	0	3	83	0	141
04:45 PM	1	0	0	1	37	2	1	0	1	4	69	1	117
Total	2	3	0	2	169	13	3	4	6	11	242	3	458
05:00 PM	0	1	0	0	40	1	1	0	1	3	56	1	104
05:15 PM	3	0	0	0	44	6	1	2	1	2	72	5	136
05:30 PM	0	2	1	0	54	5	2	3	0	1	51	1	120
05:45 PM	0	2	0	0	28	5	0	1	2	2	44	3	87
Total	3	5	1	0	166	17	4	6	4	8	223	10	447
Grand Total	5	8	1	2	335	30	7	10	10	19	465	13	905
Apprch %	35.7	57.1	7.1	0.5	91.3	8.2	25.9	37	37	3.8	93.6	2.6	
Total %	0.6	0.9	0.1	0.2	37	3.3	0.8	1.1	1.1	2.1	51.4	1.4	

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	**49**	3	**52**	**1**	**2**	0	3	3	**83**	0	**86**	**141**
04:45 PM	1	0	0	1	**1**	37	2	40	1	0	**1**	2	**4**	69	1	74	117
05:00 PM	0	**1**	0	1	0	40	1	41	1	0	1	2	3	56	1	60	104
05:15 PM	**3**	0	0	**3**	0	44	**6**	50	1	2	1	**4**	2	72	**5**	79	136
Total Volume	4	1	0	5	1	170	12	183	4	4	3	11	12	280	7	299	498
% App. Total	80	20	0		0.5	92.9	6.6		36.4	36.4	27.3		4	93.6	2.3		
PHF	.333	.250	.000	.417	.250	.867	.500	.880	1.000	.500	.750	.688	.750	.843	.350	.869	.883

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Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Harvey Street From North			John Scott Boulevard From East			Harvey Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	1	7	0	8
04:15 PM	0	1	0	0	1	0	0	0	0	0	1	0	3
04:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
04:45 PM	0	0	0	0	2	0	0	0	0	1	1	0	4
Total	0	1	0	0	4	0	0	0	0	2	10	0	17
05:00 PM	0	0	0	0	0	0	0	0	1	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	1	0	0	0	1	0	2	0	4
Grand Total	0	1	0	0	5	0	0	0	1	2	12	0	21
Apprch %	0	100	0	0	100	0	0	0	100	14.3	85.7	0	
Total %	0	4.8	0	0	23.8	0	0	0	4.8	9.5	57.1	0	

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**7**	0	**8**	**8**
04:15 PM	0	**1**	0	**1**	0	1	0	1	0	0	0	0	0	1	0	1	3
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:45 PM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	1	1	0	2	4
Total Volume	0	1	0	1	0	4	0	4	0	0	0	0	2	10	0	12	17
% App. Total	0	100	0		0	100	0		0	0	0		16.7	83.3	0		
PHF	.000	.250	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.500	.357	.000	.375	.531

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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Harvey Street
E/W: John Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-BBB
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	1	0	1	0	2	0	0	0	0	0	1	0	0	5
Total	0	0	0	1	0	2	0	2	0	0	0	0	0	1	0	0	6
Grand Total	0	0	0	1	0	2	0	2	0	0	0	0	0	2	0	0	7
Apprch %	0	0	0	100	0	50	0	50	0	0	0	0	0	100	0	0	
Total %	0	0	0	14.3	0	28.6	0	28.6	0	0	0	0	0	28.6	0	0	

	Harvey Street From North					John Scott Boulevard From East					Harvey Street From South					John Scott Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
05:45 PM	**0**	**0**	**0**	**1**	**1**	0	1	0	**2**	**3**	0	0	0	0	0	0	**1**	0	0	**1**	**5**
Total Volume	0	0	0	1	1	0	2	0	2	4	0	0	0	0	0	0	1	0	0	1	6
% App. Total	0	0	0	100		0	50	0	50		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.250	.250	.000	.500	.000	.250	.333	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.300

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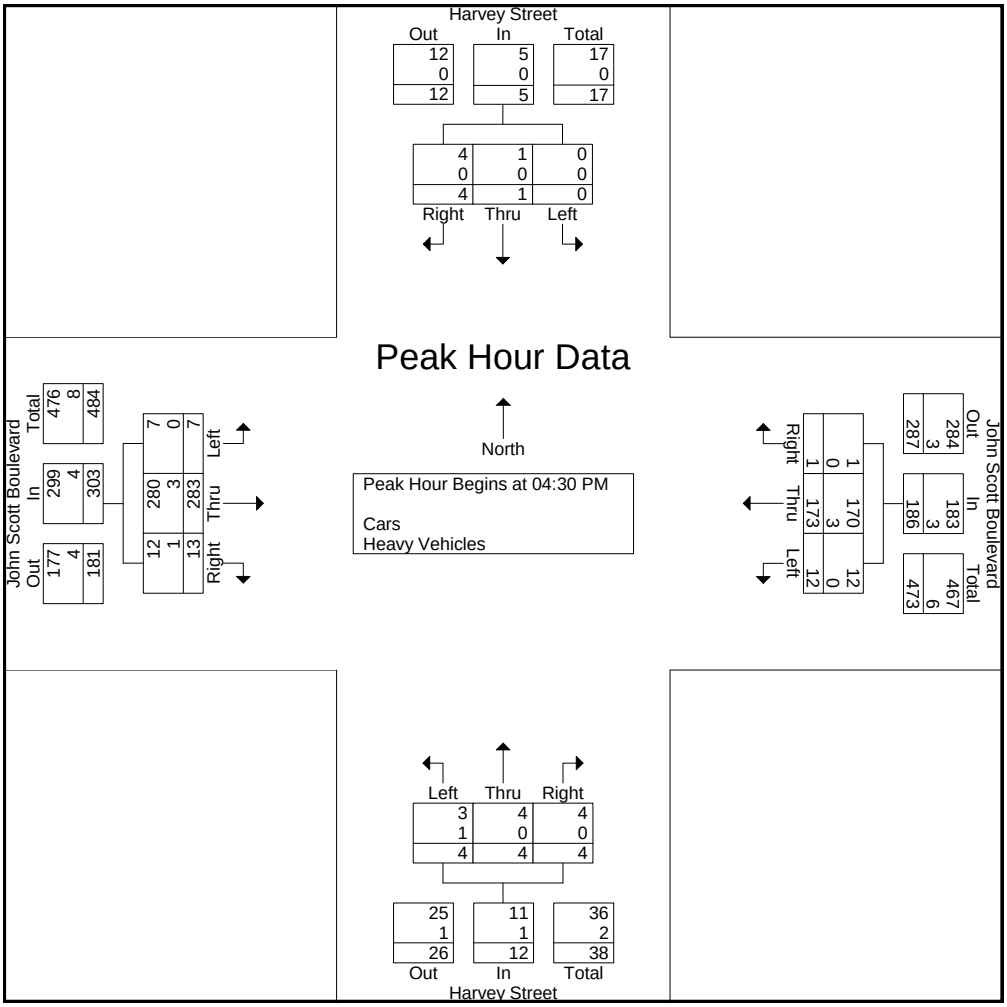
Page No : 1

	Harvey Street From North				John Scott Boulevard From East				Harvey Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	**50**	3	**53**	**1**	**2**	0	3	3	**84**	0	**87**	**143**
04:45 PM	1	0	0	1	**1**	39	2	42	1	0	1	2	**5**	70	1	76	121
05:00 PM	0	**1**	0	1	0	40	1	41	1	0	**2**	3	3	57	1	61	106
05:15 PM	**3**	0	0	**3**	0	44	**6**	50	1	2	1	**4**	2	72	**5**	79	136
Total Volume	4	1	0	5	1	173	12	186	4	4	4	12	13	283	7	303	506
% App. Total	80	20	0		0.5	93	6.5		33.3	33.3	33.3		4.3	93.4	2.3		
PHF	.333	.250	.000	.417	.250	.865	.500	.877	1.000	.500	.500	.750	.650	.842	.350	.871	.885
Cars	4	1	0	5	1	170	12	183	4	4	3	11	12	280	7	299	498
% Cars	100	100	0	100	100	98.3	100	98.4	100	100	75.0	91.7	92.3	98.9	100	98.7	98.4
Heavy Vehicles	0	0	0	0	0	3	0	3	0	0	1	1	1	3	0	4	8
% Heavy Vehicles	0	0	0	0	0	1.7	0	1.6	0	0	25.0	8.3	7.7	1.1	0	1.3	1.6



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Client: VHB/J. Quitter

File Name : 81676I-C
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	44	12	7	0	2	10	70	1	2	2	2	152
07:15 AM	0	45	2	11	0	1	22	83	0	0	0	0	164
07:30 AM	0	53	9	9	0	2	13	98	0	1	1	0	186
07:45 AM	0	48	11	16	0	4	13	67	0	1	1	1	162
Total	0	190	34	43	0	9	58	318	1	4	4	3	664
08:00 AM	0	57	8	9	1	2	21	84	0	3	0	1	186
08:15 AM	0	42	6	15	0	1	10	75	2	0	1	1	153
08:30 AM	0	34	10	16	2	4	4	52	0	0	0	0	122
08:45 AM	0	37	8	13	1	2	9	68	0	2	1	0	141
Total	0	170	32	53	4	9	44	279	2	5	2	2	602
Grand Total	0	360	66	96	4	18	102	597	3	9	6	5	1266
Apprch %	0	84.5	15.5	81.4	3.4	15.3	14.5	85	0.4	45	30	25	
Total %	0	28.4	5.2	7.6	0.3	1.4	8.1	47.2	0.2	0.7	0.5	0.4	
Cars	0	337	62	93	3	15	99	574	3	8	6	5	1205
% Cars	0	93.6	93.9	96.9	75	83.3	97.1	96.1	100	88.9	100	100	95.2
Heavy Vehicles	0	23	4	3	1	3	3	23	0	1	0	0	61
% Heavy Vehicles	0	6.4	6.1	3.1	25	16.7	2.9	3.9	0	11.1	0	0	4.8

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	45	2	47	11	0	1	12	**22**	83	0	105	0	0	0	0	164
07:30 AM	0	53	9	62	9	0	2	11	13	**98**	0	**111**	1	**1**	0	2	**186**
07:45 AM	0	48	**11**	59	**16**	0	**4**	**20**	13	67	0	80	1	1	**1**	3	162
08:00 AM	0	**57**	8	**65**	9	**1**	2	12	21	84	0	105	**3**	0	1	**4**	186
Total Volume	0	203	30	233	45	1	9	55	69	332	0	401	5	2	2	9	698
% App. Total	0	87.1	12.9		81.8	1.8	16.4		17.2	82.8	0		55.6	22.2	22.2		
PHF	.000	.890	.682	.896	.703	.250	.563	.688	.784	.847	.000	.903	.417	.500	.500	.563	.938
Cars	0	189	29	218	44	1	7	52	68	321	0	389	5	2	2	9	668
% Cars	0	93.1	96.7	93.6	97.8	100	77.8	94.5	98.6	96.7	0	97.0	100	100	100	100	95.7
Heavy Vehicles	0	14	1	15	1	0	2	3	1	11	0	12	0	0	0	0	30
% Heavy Vehicles	0	6.9	3.3	6.4	2.2	0	22.2	5.5	1.4	3.3	0	3.0	0	0	0	0	4.3

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File Name : 81676I-C
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Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	44	11	7	0	1	10	70	1	2	2	2	150
07:15 AM	0	41	2	11	0	1	22	81	0	0	0	0	158
07:30 AM	0	50	8	9	0	1	13	92	0	1	1	0	175
07:45 AM	0	46	11	15	0	3	13	66	0	1	1	1	157
Total	0	181	32	42	0	6	58	309	1	4	4	3	640
08:00 AM	0	52	8	9	1	2	20	82	0	3	0	1	178
08:15 AM	0	39	6	15	0	1	10	71	2	0	1	1	146
08:30 AM	0	30	8	15	1	4	3	47	0	0	0	0	108
08:45 AM	0	35	8	12	1	2	8	65	0	1	1	0	133
Total	0	156	30	51	3	9	41	265	2	4	2	2	565
Grand Total	0	337	62	93	3	15	99	574	3	8	6	5	1205
Apprch %	0	84.5	15.5	83.8	2.7	13.5	14.6	84.9	0.4	42.1	31.6	26.3	
Total %	0	28	5.1	7.7	0.2	1.2	8.2	47.6	0.2	0.7	0.5	0.4	

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	41	2	43	11	0	1	12	**22**	81	0	103	0	0	0	0	158
07:30 AM	0	50	8	58	9	0	1	10	13	**92**	0	**105**	1	**1**	0	2	175
07:45 AM	0	46	**11**	57	**15**	0	**3**	**18**	13	66	0	79	1	1	**1**	3	157
08:00 AM	0	**52**	8	**60**	9	**1**	2	12	20	82	0	102	**3**	0	1	**4**	**178**
Total Volume	0	189	29	218	44	1	7	52	68	321	0	389	5	2	2	9	668
% App. Total	0	86.7	13.3		84.6	1.9	13.5		17.5	82.5	0		55.6	22.2	22.2		
PHF	.000	.909	.659	.908	.733	.250	.583	.722	.773	.872	.000	.926	.417	.500	.500	.563	.938

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Page No : 1

Groups Printed- Heavy Vehicles

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	2
07:15 AM	0	4	0	0	0	0	0	2	0	0	0	0	6
07:30 AM	0	3	1	0	0	1	0	6	0	0	0	0	11
07:45 AM	0	2	0	1	0	1	0	1	0	0	0	0	5
Total	0	9	2	1	0	3	0	9	0	0	0	0	24
08:00 AM	0	5	0	0	0	0	1	2	0	0	0	0	8
08:15 AM	0	3	0	0	0	0	0	4	0	0	0	0	7
08:30 AM	0	4	2	1	1	0	1	5	0	0	0	0	14
08:45 AM	0	2	0	1	0	0	1	3	0	1	0	0	8
Total	0	14	2	2	1	0	3	14	0	1	0	0	37
Grand Total	0	23	4	3	1	3	3	23	0	1	0	0	61
Apprch %	0	85.2	14.8	42.9	14.3	42.9	11.5	88.5	0	100	0	0	
Total %	0	37.7	6.6	4.9	1.6	4.9	4.9	37.7	0	1.6	0	0	

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	**5**	0	5	0	0	0	0	**1**	2	0	3	0	0	0	0	8
08:15 AM	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0	7
08:30 AM	0	4	**2**	**6**	**1**	**1**	0	**2**	1	**5**	0	**6**	0	0	0	0	**14**
08:45 AM	0	2	0	2	1	0	0	1	1	3	0	4	**1**	0	0	**1**	8
Total Volume	0	14	2	16	2	1	0	3	3	14	0	17	1	0	0	1	37
% App. Total	0	87.5	12.5		66.7	33.3	0		17.6	82.4	0		100	0	0		
PHF	.000	.700	.250	.667	.500	.250	.000	.375	.750	.700	.000	.708	.250	.000	.000	.250	.661

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Groups Printed- Peds and Bicycles

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3
Grand Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3
Apprch %	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	100	
Total %	0	0	0	33.3	0	0	0	33.3	0	0	0	0	0	0	0	33.3	

	South Worcester Street From North					South Worcester Street From East					John Scott Boulevard From South					Sturdy Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**2**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
% App. Total	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.375

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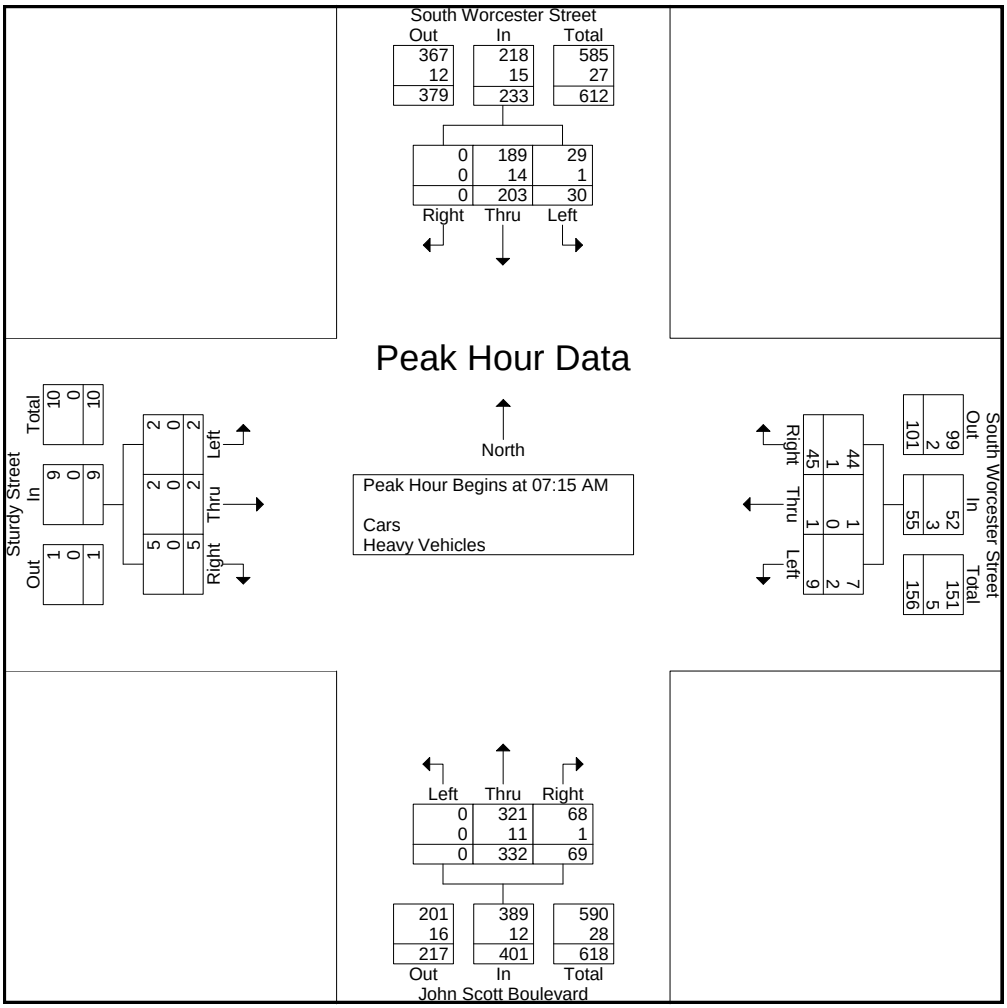
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	45	2	47	11	0	1	12	**22**	83	0	105	0	0	0	0	164
07:30 AM	0	53	9	62	9	0	2	11	13	**98**	0	**111**	1	**1**	0	2	**186**
07:45 AM	0	48	**11**	59	**16**	0	**4**	**20**	13	67	0	80	1	1	**1**	3	162
08:00 AM	0	**57**	8	**65**	9	**1**	2	12	21	84	0	105	**3**	0	1	**4**	186
Total Volume	0	203	30	233	45	1	9	55	69	332	0	401	5	2	2	9	698
% App. Total	0	87.1	12.9		81.8	1.8	16.4		17.2	82.8	0		55.6	22.2	22.2		
PHF	.000	.890	.682	.896	.703	.250	.563	.688	.784	.847	.000	.903	.417	.500	.500	.563	.938
Cars	0	189	29	218	44	1	7	52	68	321	0	389	5	2	2	9	668
% Cars	0	93.1	96.7	93.6	97.8	100	77.8	94.5	98.6	96.7	0	97.0	100	100	100	100	95.7
Heavy Vehicles	0	14	1	15	1	0	2	3	1	11	0	12	0	0	0	0	30
% Heavy Vehicles	0	6.9	3.3	6.4	2.2	0	22.2	5.5	1.4	3.3	0	3.0	0	0	0	0	4.3



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E/W: S. Worcester Street/Sturdy Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	82	24	15	2	3	4	51	2	1	0	1	185
04:15 PM	1	86	15	10	0	5	7	59	10	2	1	1	197
04:30 PM	3	118	18	33	0	9	6	49	2	2	0	0	240
04:45 PM	0	103	24	18	0	8	7	53	0	0	0	0	213
Total	4	389	81	76	2	25	24	212	14	5	1	2	835
05:00 PM	1	91	15	15	0	6	12	60	2	0	0	1	203
05:15 PM	0	121	13	13	2	9	5	61	3	2	1	1	231
05:30 PM	0	95	8	19	3	6	7	61	4	1	0	0	204
05:45 PM	0	105	11	16	0	14	7	55	1	0	0	0	209
Total	1	412	47	63	5	35	31	237	10	3	1	2	847
Grand Total	5	801	128	139	7	60	55	449	24	8	2	4	1682
Apprch %	0.5	85.8	13.7	67.5	3.4	29.1	10.4	85	4.5	57.1	14.3	28.6	
Total %	0.3	47.6	7.6	8.3	0.4	3.6	3.3	26.7	1.4	0.5	0.1	0.2	
Cars	5	790	127	137	7	59	53	439	24	8	2	4	1655
% Cars	100	98.6	99.2	98.6	100	98.3	96.4	97.8	100	100	100	100	98.4
Heavy Vehicles	0	11	1	2	0	1	2	10	0	0	0	0	27
% Heavy Vehicles	0	1.4	0.8	1.4	0	1.7	3.6	2.2	0	0	0	0	1.6

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**3**	118	18	**139**	**33**	0	**9**	**42**	6	49	2	57	**2**	0	0	2	**240**
04:45 PM	0	103	**24**	127	18	0	8	26	7	53	0	60	0	0	0	0	213
05:00 PM	1	91	15	107	15	0	6	21	**12**	60	2	**74**	0	0	**1**	1	203
05:15 PM	0	**121**	13	134	13	**2**	9	24	5	**61**	**3**	69	2	**1**	1	**4**	231
Total Volume	4	433	70	507	79	2	32	113	30	223	7	260	4	1	2	7	887
% App. Total	0.8	85.4	13.8		69.9	1.8	28.3		11.5	85.8	2.7		57.1	14.3	28.6		
PHF	.333	.895	.729	.912	.598	.250	.889	.673	.625	.914	.583	.878	.500	.250	.500	.438	.924
Cars	4	430	70	504	78	2	31	111	30	219	7	256	4	1	2	7	878
% Cars	100	99.3	100	99.4	98.7	100	96.9	98.2	100	98.2	100	98.5	100	100	100	100	99.0
Heavy Vehicles	0	3	0	3	1	0	1	2	0	4	0	4	0	0	0	0	9
% Heavy Vehicles	0	0.7	0	0.6	1.3	0	3.1	1.8	0	1.8	0	1.5	0	0	0	0	1.0

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N/S: S. Worcester Street/John Scott Blvd
E/W: S. Worcester Street/Sturdy Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	78	24	14	2	3	3	48	2	1	0	1	176
04:15 PM	1	84	14	10	0	5	6	57	10	2	1	1	191
04:30 PM	3	116	18	32	0	9	6	49	2	2	0	0	237
04:45 PM	0	102	24	18	0	8	7	51	0	0	0	0	210
Total	4	380	80	74	2	25	22	205	14	5	1	2	814
05:00 PM	1	91	15	15	0	5	12	58	2	0	0	1	200
05:15 PM	0	121	13	13	2	9	5	61	3	2	1	1	231
05:30 PM	0	94	8	19	3	6	7	61	4	1	0	0	203
05:45 PM	0	104	11	16	0	14	7	54	1	0	0	0	207
Total	1	410	47	63	5	34	31	234	10	3	1	2	841
Grand Total	5	790	127	137	7	59	53	439	24	8	2	4	1655
Apprch %	0.5	85.7	13.8	67.5	3.4	29.1	10.3	85.1	4.7	57.1	14.3	28.6	
Total %	0.3	47.7	7.7	8.3	0.4	3.6	3.2	26.5	1.5	0.5	0.1	0.2	

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**3**	116	18	**137**	**32**	0	**9**	**41**	6	49	2	57	**2**	0	0	2	**237**
04:45 PM	0	102	**24**	126	18	0	8	26	7	51	0	58	0	0	0	0	210
05:00 PM	1	91	15	107	15	0	5	20	**12**	58	2	**72**	0	0	**1**	1	200
05:15 PM	0	**121**	13	134	13	**2**	9	24	5	**61**	**3**	69	2	**1**	1	**4**	231
Total Volume	4	430	70	504	78	2	31	111	30	219	7	256	4	1	2	7	878
% App. Total	0.8	85.3	13.9		70.3	1.8	27.9		11.7	85.5	2.7		57.1	14.3	28.6		
PHF	.333	.888	.729	.920	.609	.250	.861	.677	.625	.898	.583	.889	.500	.250	.500	.438	.926

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Client: VHB/J. Quitter

File Name : 81676I-CCC
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Worcester Street From North			South Worcester Street From East			John Scott Boulevard From South			Sturdy Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	4	0	1	0	0	1	3	0	0	0	0	9
04:15 PM	0	2	1	0	0	0	1	2	0	0	0	0	6
04:30 PM	0	2	0	1	0	0	0	0	0	0	0	0	3
04:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
Total	0	9	1	2	0	0	2	7	0	0	0	0	21
05:00 PM	0	0	0	0	0	1	0	2	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	2	0	0	0	1	0	3	0	0	0	0	6
Grand Total	0	11	1	2	0	1	2	10	0	0	0	0	27
Apprch %	0	91.7	8.3	66.7	0	33.3	16.7	83.3	0	0	0	0	
Total %	0	40.7	3.7	7.4	0	3.7	7.4	37	0	0	0	0	

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**4**	0	**4**	**1**	0	0	**1**	**1**	**3**	0	**4**	0	0	0	0	**9**
04:15 PM	0	2	**1**	3	0	0	0	0	1	2	0	3	0	0	0	0	6
04:30 PM	0	2	0	2	1	0	0	1	0	0	0	0	0	0	0	0	3
04:45 PM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
Total Volume	0	9	1	10	2	0	0	2	2	7	0	9	0	0	0	0	21
% App. Total	0	90	10		100	0	0		22.2	77.8	0		0	0	0		
PHF	.000	.563	.250	.625	.500	.000	.000	.500	.500	.583	.000	.563	.000	.000	.000	.000	.583

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Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
05:45 PM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	0	3	0	0	0	0	0	0	0	3	0	0	0	2	0	0	8
Grand Total	0	4	0	0	0	0	0	0	0	3	0	0	0	2	0	0	9
Apprch %	0	100	0	0	0	0	0	0	0	100	0	0	0	100	0	0	
Total %	0	44.4	0	0	0	0	0	0	0	33.3	0	0	0	22.2	0	0	

	South Worcester Street From North					South Worcester Street From East					John Scott Boulevard From South					Sturdy Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	**2**	0	0	**2**	**3**
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	**2**	**0**	**0**	**2**	0	0	0	0	0	3
Total Volume	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	2	0	0	2	8
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	100	0	0		
PHF	.000	.750	.000	.000	.750	.000	.000	.000	.000	.000	.000	.375	.000	.000	.375	.000	.250	.000	.000	.250	.667

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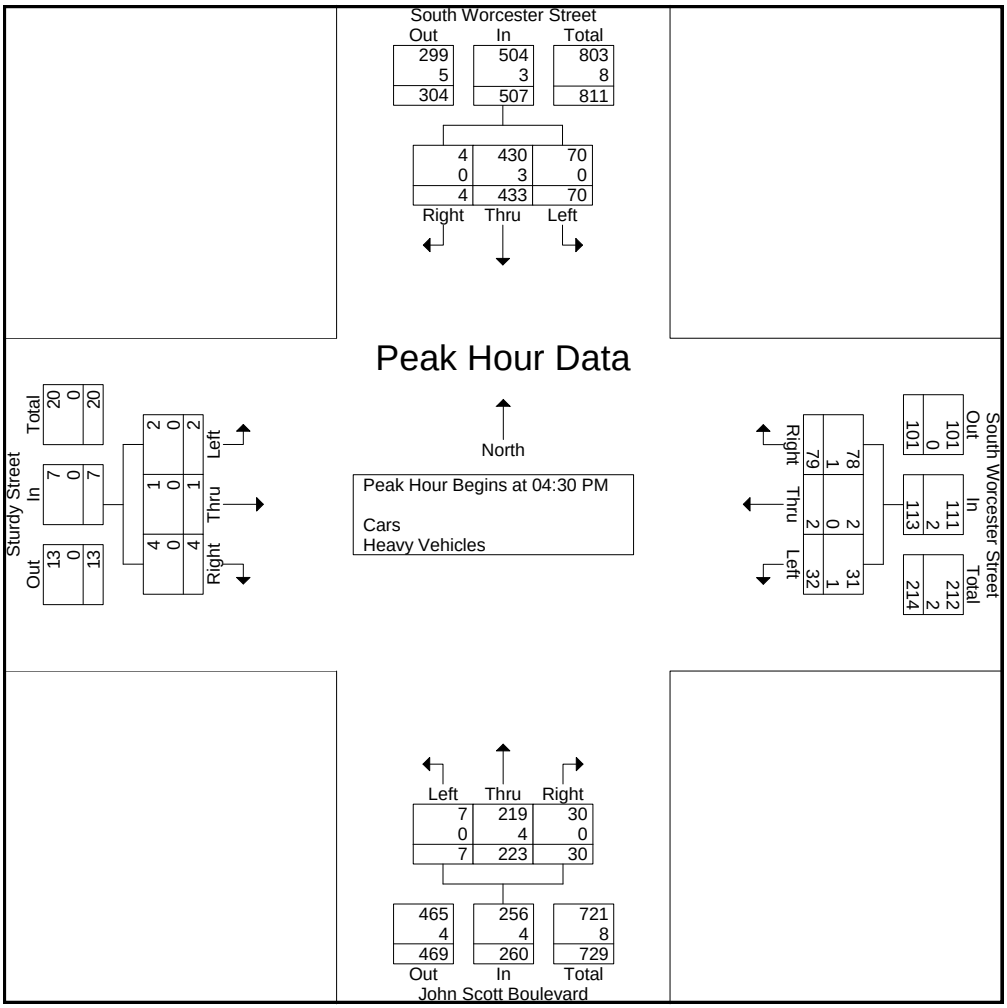
Page No : 1

	South Worcester Street From North				South Worcester Street From East				John Scott Boulevard From South				Sturdy Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**3**	118	18	**139**	**33**	0	**9**	**42**	6	49	2	57	**2**	0	0	2	**240**
04:45 PM	0	103	**24**	127	18	0	8	26	7	53	0	60	0	0	0	0	213
05:00 PM	1	91	15	107	15	0	6	21	**12**	60	2	**74**	0	0	**1**	1	203
05:15 PM	0	**121**	13	134	13	**2**	9	24	5	**61**	**3**	69	2	**1**	1	**4**	231
Total Volume	4	433	70	507	79	2	32	113	30	223	7	260	4	1	2	7	887
% App. Total	0.8	85.4	13.8		69.9	1.8	28.3		11.5	85.8	2.7		57.1	14.3	28.6		
PHF	.333	.895	.729	.912	.598	.250	.889	.673	.625	.914	.583	.878	.500	.250	.500	.438	.924
Cars	4	430	70	504	78	2	31	111	30	219	7	256	4	1	2	7	878
% Cars	100	99.3	100	99.4	98.7	100	96.9	98.2	100	98.2	100	98.5	100	100	100	100	99.0
Heavy Vehicles	0	3	0	3	1	0	1	2	0	4	0	4	0	0	0	0	9
% Heavy Vehicles	0	0.7	0	0.6	1.3	0	3.1	1.8	0	1.8	0	1.5	0	0	0	0	1.0



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E/W: S. Worcester Street/Sturdy Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	10	1	2	23	0	3	39	16	4	32	1	131
07:15 AM	0	7	1	3	40	3	1	45	12	6	33	1	152
07:30 AM	0	12	3	2	31	1	0	34	19	6	33	1	142
07:45 AM	0	9	3	3	40	1	1	28	11	4	44	0	144
Total	0	38	8	10	134	5	5	146	58	20	142	3	569
08:00 AM	2	7	1	2	38	1	3	35	11	3	43	3	149
08:15 AM	1	9	2	5	33	1	2	31	10	5	32	1	132
08:30 AM	0	9	0	2	15	1	2	22	3	4	27	0	85
08:45 AM	4	6	1	3	20	1	1	21	16	12	17	1	103
Total	7	31	4	12	106	4	8	109	40	24	119	5	469
Grand Total	7	69	12	22	240	9	13	255	98	44	261	8	1038
Apprch %	8	78.4	13.6	8.1	88.6	3.3	3.6	69.7	26.8	14.1	83.4	2.6	
Total %	0.7	6.6	1.2	2.1	23.1	0.9	1.3	24.6	9.4	4.2	25.1	0.8	
Cars	5	64	12	20	232	6	12	248	95	40	250	6	990
% Cars	71.4	92.8	100	90.9	96.7	66.7	92.3	97.3	96.9	90.9	95.8	75	95.4
Heavy Vehicles	2	5	0	2	8	3	1	7	3	4	11	2	48
% Heavy Vehicles	28.6	7.2	0	9.1	3.3	33.3	7.7	2.7	3.1	9.1	4.2	25	4.6

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	7	1	8	**3**	**40**	**3**	**46**	1	**45**	12	**58**	**6**	33	1	40	**152**
07:30 AM	0	**12**	**3**	**15**	2	31	1	34	0	34	**19**	53	6	33	1	40	142
07:45 AM	0	9	3	12	3	40	1	44	1	28	11	40	4	**44**	0	48	144
08:00 AM	**2**	7	1	10	2	38	1	41	**3**	35	11	49	3	43	**3**	**49**	149
Total Volume	2	35	8	45	10	149	6	165	5	142	53	200	19	153	5	177	587
% App. Total	4.4	77.8	17.8		6.1	90.3	3.6		2.5	71	26.5		10.7	86.4	2.8		
PHF	.250	.729	.667	.750	.833	.931	.500	.897	.417	.789	.697	.862	.792	.869	.417	.903	.965
Cars	1	33	8	42	10	144	5	159	5	139	51	195	18	147	3	168	564
% Cars	50.0	94.3	100	93.3	100	96.6	83.3	96.4	100	97.9	96.2	97.5	94.7	96.1	60.0	94.9	96.1
Heavy Vehicles	1	2	0	3	0	5	1	6	0	3	2	5	1	6	2	9	23
% Heavy Vehicles	50.0	5.7	0	6.7	0	3.4	16.7	3.6	0	2.1	3.8	2.5	5.3	3.9	40.0	5.1	3.9

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Client: VHB/J. Quitter

File Name : 81676I-D
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	9	1	2	22	0	3	39	16	3	32	1	128
07:15 AM	0	6	1	3	39	2	1	44	12	6	32	1	147
07:30 AM	0	12	3	2	28	1	0	33	18	6	31	1	135
07:45 AM	0	8	3	3	39	1	1	28	11	3	43	0	140
Total	0	35	8	10	128	4	5	144	57	18	138	3	550
08:00 AM	1	7	1	2	38	1	3	34	10	3	41	1	142
08:15 AM	0	9	2	3	33	0	2	30	9	4	31	1	124
08:30 AM	0	8	0	2	14	1	1	20	3	3	25	0	77
08:45 AM	4	5	1	3	19	0	1	20	16	12	15	1	97
Total	5	29	4	10	104	2	7	104	38	22	112	3	440
Grand Total	5	64	12	20	232	6	12	248	95	40	250	6	990
Apprch %	6.2	79	14.8	7.8	89.9	2.3	3.4	69.9	26.8	13.5	84.5	2	
Total %	0.5	6.5	1.2	2	23.4	0.6	1.2	25.1	9.6	4	25.3	0.6	

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	6	1	7	**3**	**39**	**2**	**44**	1	**44**	12	**57**	**6**	32	**1**	39	**147**
07:30 AM	0	**12**	**3**	**15**	2	28	1	31	0	33	**18**	51	6	31	1	38	135
07:45 AM	0	8	3	11	3	39	1	43	1	28	11	40	3	**43**	0	**46**	140
08:00 AM	**1**	7	1	9	2	38	1	41	**3**	34	10	47	3	41	1	45	142
Total Volume	1	33	8	42	10	144	5	159	5	139	51	195	18	147	3	168	564
% App. Total	2.4	78.6	19		6.3	90.6	3.1		2.6	71.3	26.2		10.7	87.5	1.8		
PHF	.250	.688	.667	.700	.833	.923	.625	.903	.417	.790	.708	.855	.750	.855	.750	.913	.959

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N/S: S. Worcester Street/John Scott Blvd
E/W: S. Worcester Street/Sturdy Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-D
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	1	0	0	1	0	0	0	0	1	0	0	3
07:15 AM	0	1	0	0	1	1	0	1	0	0	1	0	5
07:30 AM	0	0	0	0	3	0	0	1	1	0	2	0	7
07:45 AM	0	1	0	0	1	0	0	0	0	1	1	0	4
Total	0	3	0	0	6	1	0	2	1	2	4	0	19
08:00 AM	1	0	0	0	0	0	0	1	1	0	2	2	7
08:15 AM	1	0	0	2	0	1	0	1	1	1	1	0	8
08:30 AM	0	1	0	0	1	0	1	2	0	1	2	0	8
08:45 AM	0	1	0	0	1	1	0	1	0	0	2	0	6
Total	2	2	0	2	2	2	1	5	2	2	7	2	29
Grand Total	2	5	0	2	8	3	1	7	3	4	11	2	48
Apprch %	28.6	71.4	0	15.4	61.5	23.1	9.1	63.6	27.3	23.5	64.7	11.8	
Total %	4.2	10.4	0	4.2	16.7	6.2	2.1	14.6	6.2	8.3	22.9	4.2	

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**1**	0	0	**1**	0	0	0	0	0	1	**1**	2	0	**2**	**2**	**4**	7
08:15 AM	1	0	0	1	**2**	0	**1**	**3**	0	1	1	2	**1**	1	0	2	**8**
08:30 AM	0	**1**	0	1	0	**1**	0	1	**1**	**2**	0	**3**	1	2	0	3	8
08:45 AM	0	1	0	1	0	1	1	2	0	1	0	1	0	2	0	2	6
Total Volume	2	2	0	4	2	2	2	6	1	5	2	8	2	7	2	11	29
% App. Total	50	50	0		33.3	33.3	33.3		12.5	62.5	25		18.2	63.6	18.2		
PHF	.500	.500	.000	1.000	.250	.500	.500	.500	.250	.625	.500	.667	.500	.875	.250	.688	.906

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File Name : 81676I-D
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Start Date : 9/10/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Grand Total	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	3
Apprch %	0	0	0	100	0	0	0	0	0	0	100	0	0	0	0	100	
Total %	0	0	0	33.3	0	0	0	0	0	0	33.3	0	0	0	0	33.3	

	Dean Street From North					John Scott Boulevard From East					Dean Street From South					John Scott Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	1
Total Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.500

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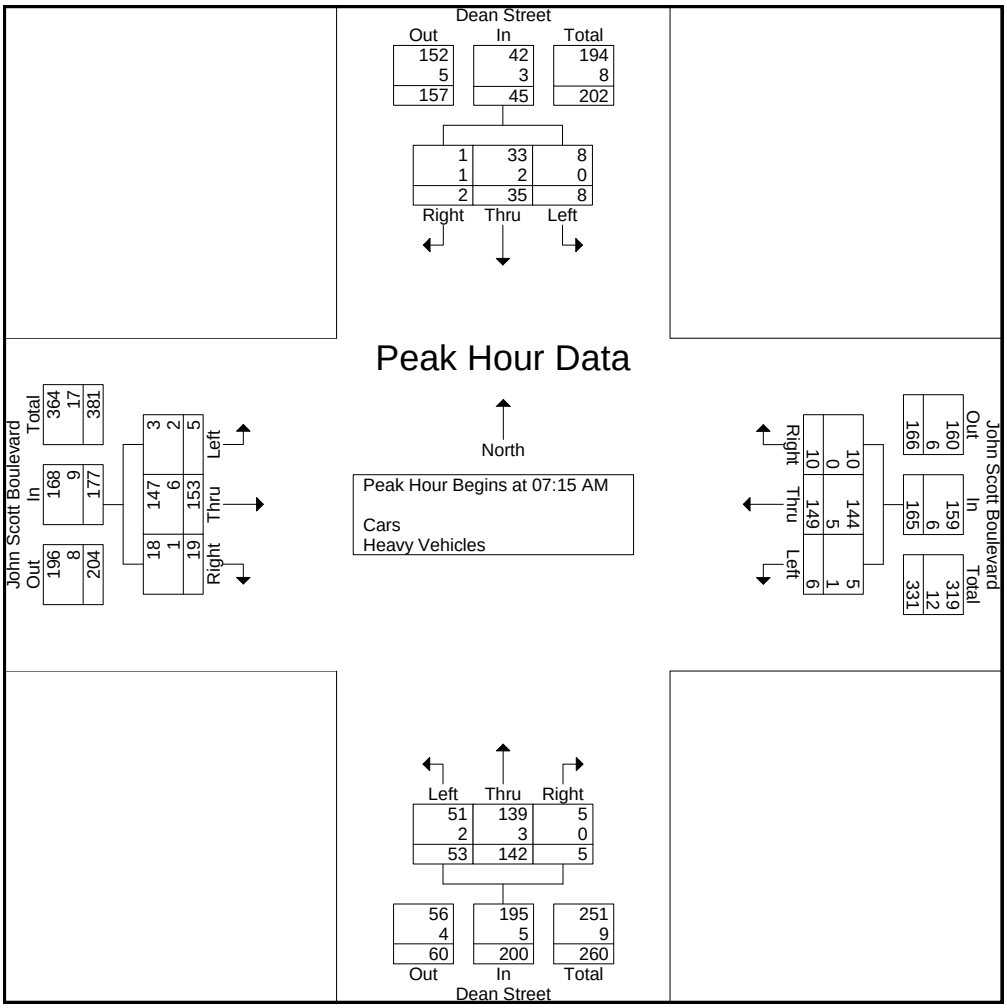
Page No : 1

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	7	1	8	**3**	**40**	**3**	**46**	1	**45**	12	**58**	**6**	33	1	40	**152**
07:30 AM	0	**12**	**3**	**15**	2	31	1	34	0	34	**19**	53	6	33	1	40	142
07:45 AM	0	9	3	12	3	40	1	44	1	28	11	40	4	**44**	0	48	144
08:00 AM	**2**	7	1	10	2	38	1	41	**3**	35	11	49	3	43	**3**	**49**	149
Total Volume	2	35	8	45	10	149	6	165	5	142	53	200	19	153	5	177	587
% App. Total	4.4	77.8	17.8		6.1	90.3	3.6		2.5	71	26.5		10.7	86.4	2.8		
PHF	.250	.729	.667	.750	.833	.931	.500	.897	.417	.789	.697	.862	.792	.869	.417	.903	.965
Cars	1	33	8	42	10	144	5	159	5	139	51	195	18	147	3	168	564
% Cars	50.0	94.3	100	93.3	100	96.6	83.3	96.4	100	97.9	96.2	97.5	94.7	96.1	60.0	94.9	96.1
Heavy Vehicles	1	2	0	3	0	5	1	6	0	3	2	5	1	6	2	9	23
% Heavy Vehicles	50.0	5.7	0	6.7	0	3.4	16.7	3.6	0	2.1	3.8	2.5	5.3	3.9	40.0	5.1	3.9



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N/S: Dean Street
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City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	25	2	4	35	2	3	11	10	13	42	1	149
04:15 PM	1	24	3	2	39	5	1	10	4	13	25	1	128
04:30 PM	1	30	4	2	40	5	1	19	9	17	60	2	190
04:45 PM	1	32	1	5	29	3	4	11	7	27	45	0	165
Total	4	111	10	13	143	15	9	51	30	70	172	4	632
05:00 PM	0	30	4	5	41	4	2	16	7	15	40	0	164
05:15 PM	1	28	3	1	37	3	2	14	8	27	39	1	164
05:30 PM	1	35	1	2	46	4	1	22	9	18	40	0	179
05:45 PM	0	30	5	1	32	1	1	27	7	20	30	0	154
Total	2	123	13	9	156	12	6	79	31	80	149	1	661
Grand Total	6	234	23	22	299	27	15	130	61	150	321	5	1293
Apprch %	2.3	89	8.7	6.3	85.9	7.8	7.3	63.1	29.6	31.5	67.4	1.1	
Total %	0.5	18.1	1.8	1.7	23.1	2.1	1.2	10.1	4.7	11.6	24.8	0.4	
Cars	6	231	22	21	296	25	11	130	61	147	316	5	1271
% Cars	100	98.7	95.7	95.5	99	92.6	73.3	100	100	98	98.4	100	98.3
Heavy Vehicles	0	3	1	1	3	2	4	0	0	3	5	0	22
% Heavy Vehicles	0	1.3	4.3	4.5	1	7.4	26.7	0	0	2	1.6	0	1.7

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	30	**4**	**35**	2	40	**5**	47	1	**19**	**9**	**29**	17	**60**	**2**	**79**	**190**
04:45 PM	1	**32**	1	34	**5**	29	3	37	**4**	11	7	22	**27**	45	0	72	165
05:00 PM	0	30	4	34	5	**41**	4	**50**	2	16	7	25	15	40	0	55	164
05:15 PM	1	28	3	32	1	37	3	41	2	14	8	24	27	39	1	67	164
Total Volume	3	120	12	135	13	147	15	175	9	60	31	100	86	184	3	273	683
% App. Total	2.2	88.9	8.9		7.4	84	8.6		9	60	31		31.5	67.4	1.1		
PHF	.750	.938	.750	.964	.650	.896	.750	.875	.563	.789	.861	.862	.796	.767	.375	.864	.899
Cars	3	119	12	134	13	145	14	172	6	60	31	97	86	181	3	270	673
% Cars	100	99.2	100	99.3	100	98.6	93.3	98.3	66.7	100	100	97.0	100	98.4	100	98.9	98.5
Heavy Vehicles	0	1	0	1	0	2	1	3	3	0	0	3	0	3	0	3	10
% Heavy Vehicles	0	0.8	0	0.7	0	1.4	6.7	1.7	33.3	0	0	3.0	0	1.6	0	1.1	1.5

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File Name : 81676I-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

Groups Printed- Cars

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	24	2	4	35	2	2	11	10	10	41	1	143
04:15 PM	1	24	3	1	38	4	1	10	4	13	24	1	124
04:30 PM	1	30	4	2	40	5	1	19	9	17	59	2	189
04:45 PM	1	32	1	5	27	3	2	11	7	27	44	0	160
Total	4	110	10	12	140	14	6	51	30	67	168	4	616
05:00 PM	0	30	4	5	41	4	1	16	7	15	39	0	162
05:15 PM	1	27	3	1	37	2	2	14	8	27	39	1	162
05:30 PM	1	35	1	2	46	4	1	22	9	18	40	0	179
05:45 PM	0	29	4	1	32	1	1	27	7	20	30	0	152
Total	2	121	12	9	156	11	5	79	31	80	148	1	655
Grand Total	6	231	22	21	296	25	11	130	61	147	316	5	1271
Apprch %	2.3	89.2	8.5	6.1	86.5	7.3	5.4	64.4	30.2	31.4	67.5	1.1	
Total %	0.5	18.2	1.7	1.7	23.3	2	0.9	10.2	4.8	11.6	24.9	0.4	

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	30	**4**	**35**	2	40	**5**	47	1	**19**	**9**	**29**	17	**59**	**2**	**78**	**189**
04:45 PM	1	**32**	1	34	**5**	27	3	35	**2**	11	7	20	**27**	44	0	71	160
05:00 PM	0	30	4	34	5	**41**	4	**50**	1	16	7	24	15	39	0	54	162
05:15 PM	1	27	3	31	1	37	2	40	2	14	8	24	27	39	1	67	162
Total Volume	3	119	12	134	13	145	14	172	6	60	31	97	86	181	3	270	673
% App. Total	2.2	88.8	9		7.6	84.3	8.1		6.2	61.9	32		31.9	67	1.1		
PHF	.750	.930	.750	.957	.650	.884	.700	.860	.750	.789	.861	.836	.796	.767	.375	.865	.890

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File Name : 81676I-DDD
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Page No : 1

Groups Printed- Heavy Vehicles

	Dean Street From North			John Scott Boulevard From East			Dean Street From South			John Scott Boulevard From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	0	0	0	1	0	0	3	1	0	6
04:15 PM	0	0	0	1	1	1	0	0	0	0	1	0	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	2	0	2	0	0	0	1	0	5
Total	0	1	0	1	3	1	3	0	0	3	4	0	16
05:00 PM	0	0	0	0	0	0	1	0	0	0	1	0	2
05:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	1	0	0	0	0	0	0	0	0	0	2
Total	0	2	1	0	0	1	1	0	0	0	1	0	6
Grand Total	0	3	1	1	3	2	4	0	0	3	5	0	22
Apprch %	0	75	25	16.7	50	33.3	100	0	0	37.5	62.5	0	
Total %	0	13.6	4.5	4.5	13.6	9.1	18.2	0	0	13.6	22.7	0	

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**1**	0	**1**	0	0	0	0	1	0	0	1	**3**	**1**	0	**4**	**6**
04:15 PM	0	0	0	0	**1**	1	**1**	**3**	0	0	0	0	0	1	0	1	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	**2**	0	2	**2**	0	0	**2**	0	1	0	1	5
Total Volume	0	1	0	1	1	3	1	5	3	0	0	3	3	4	0	7	16
% App. Total	0	100	0		20	60	20		100	0	0		42.9	57.1	0		
PHF	.000	.250	.000	.250	.250	.375	.250	.417	.375	.000	.000	.375	.250	1.000	.000	.438	.667

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Page No : 1

Groups Printed- Peds and Bicycles

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	0	0	0	0	0	0	1	0	0	1	0	0	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	2	0	0	0	1	0	0	0	1	0	0	0	1	0	0	5
Total	0	2	0	0	0	2	0	0	0	4	0	0	0	1	0	0	9
Grand Total	0	5	0	0	0	2	0	0	0	5	0	0	1	1	0	0	14
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	50	50	0	0	
Total %	0	35.7	0	0	0	14.3	0	0	0	35.7	0	0	7.1	7.1	0	0	

	Dean Street From North					John Scott Boulevard From East					Dean Street From South					John Scott Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	**3**	**0**	**0**	**3**	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	**2**	0	0	**2**	0	1	0	0	1	0	1	0	0	1	0	**1**	0	0	**1**	**5**
Total Volume	0	2	0	0	2	0	2	0	0	2	0	4	0	0	4	0	1	0	0	1	9
% App. Total	0	100	0	0		0	100	0	0		0	100	0	0		0	100	0	0		
PHF	.000	.250	.000	.000	.250	.000	.500	.000	.000	.500	.000	.333	.000	.000	.333	.000	.250	.000	.000	.250	.450

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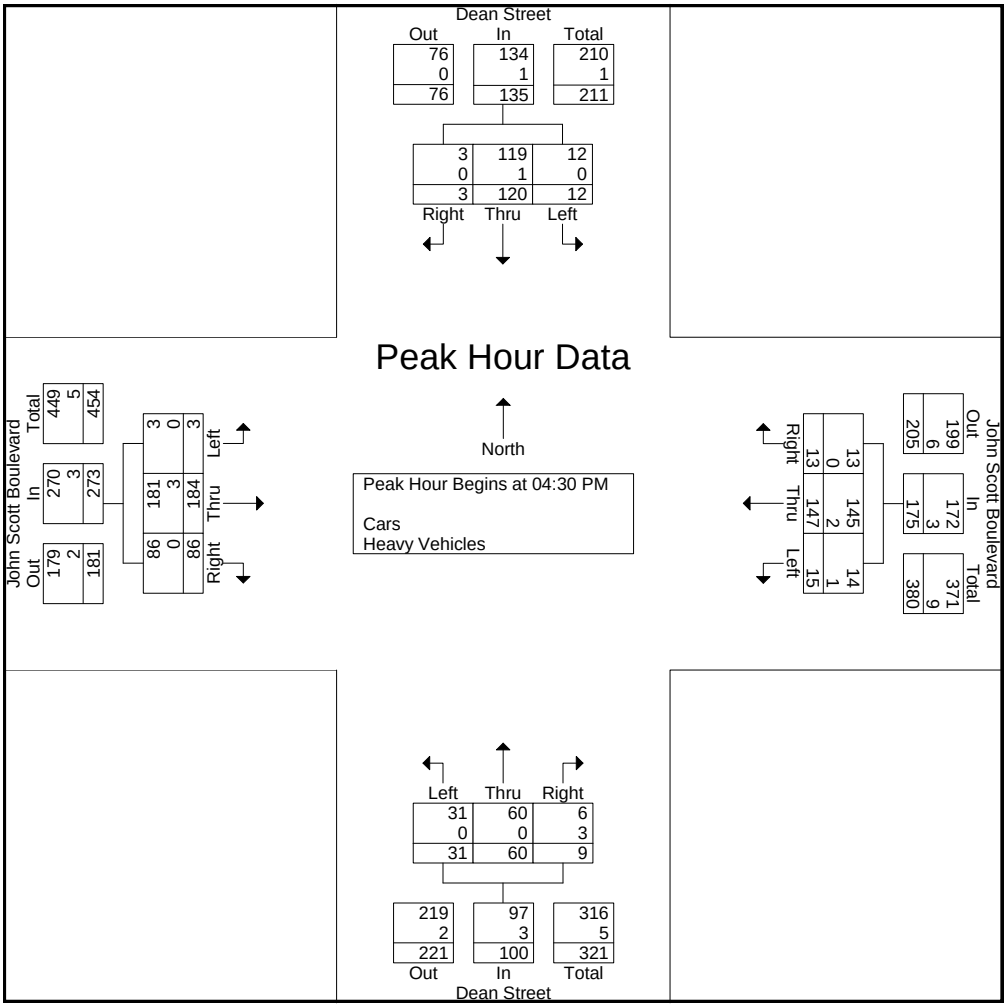
N/S: Dean Street
E/W: John Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-DDD
Site Code : 10111.31
Start Date : 9/10/2008
Page No : 1

	Dean Street From North				John Scott Boulevard From East				Dean Street From South				John Scott Boulevard From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	30	**4**	**35**	2	40	**5**	47	1	**19**	**9**	**29**	17	**60**	**2**	**79**	**190**
04:45 PM	1	**32**	1	34	**5**	29	3	37	**4**	11	7	22	**27**	45	0	72	165
05:00 PM	0	30	4	34	5	**41**	4	**50**	2	16	7	25	15	40	0	55	164
05:15 PM	1	28	3	32	1	37	3	41	2	14	8	24	27	39	1	67	164
Total Volume	3	120	12	135	13	147	15	175	9	60	31	100	86	184	3	273	683
% App. Total	2.2	88.9	8.9		7.4	84	8.6		9	60	31		31.5	67.4	1.1		
PHF	.750	.938	.750	.964	.650	.896	.750	.875	.563	.789	.861	.862	.796	.767	.375	.864	.899
Cars	3	119	12	134	13	145	14	172	6	60	31	97	86	181	3	270	673
% Cars	100	99.2	100	99.3	100	98.6	93.3	98.3	66.7	100	100	97.0	100	98.4	100	98.9	98.5
Heavy Vehicles	0	1	0	1	0	2	1	3	3	0	0	3	0	3	0	3	10
% Heavy Vehicles	0	0.8	0	0.7	0	1.4	6.7	1.7	33.3	0	0	3.0	0	1.6	0	1.1	1.5



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N/S: South Worcester Street
E: Barrows Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-E
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	5	2	6	7	18	21	59
07:15 AM	8	7	32	8	14	69	138
07:30 AM	10	5	11	9	18	38	91
07:45 AM	11	14	10	9	6	36	86
Total	34	28	59	33	56	164	374
08:00 AM	12	3	26	10	19	39	109
08:15 AM	10	5	13	3	14	20	65
08:30 AM	14	1	6	2	18	28	69
08:45 AM	7	3	9	3	7	14	43
Total	43	12	54	18	58	101	286
Grand Total	77	40	113	51	114	265	660
Apprch %	65.8	34.2	68.9	31.1	30.1	69.9	
Total %	11.7	6.1	17.1	7.7	17.3	40.2	
Cars	69	39	108	47	107	254	624
% Cars	89.6	97.5	95.6	92.2	93.9	95.8	94.5
Heavy Vehicles	8	1	5	4	7	11	36
% Heavy Vehicles	10.4	2.5	4.4	7.8	6.1	4.2	5.5

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	8	7	15	**32**	8	**40**	14	**69**	**83**	**138**
07:30 AM	**10**	**5**	**15**	**11**	**9**	**20**	**18**	**38**	**56**	**91**
07:45 AM	**11**	**14**	**25**	10	9	19	6	36	42	86
08:00 AM	**12**	3	15	26	**10**	36	**19**	39	58	109
Total Volume	41	29	70	79	36	115	57	182	239	424
% App. Total	58.6	41.4		68.7	31.3		23.8	76.2		
PHF	.854	.518	.700	.617	.900	.719	.750	.659	.720	.768
Cars	38	29	67	76	33	109	53	178	231	407
% Cars	92.7	100	95.7	96.2	91.7	94.8	93.0	97.8	96.7	96.0
Heavy Vehicles	3	0	3	3	3	6	4	4	8	17
% Heavy Vehicles	7.3	0	4.3	3.8	8.3	5.2	7.0	2.2	3.3	4.0

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City, State: Norton, MA
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File Name : 81676I-E
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Cars

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	4	2	6	6	18	19	55
07:15 AM	7	7	31	7	12	69	133
07:30 AM	10	5	11	9	17	36	88
07:45 AM	9	14	8	7	5	36	79
Total	30	28	56	29	52	160	355
08:00 AM	12	3	26	10	19	37	107
08:15 AM	10	5	12	3	12	18	60
08:30 AM	11	1	5	2	17	26	62
08:45 AM	6	2	9	3	7	13	40
Total	39	11	52	18	55	94	269
Grand Total	69	39	108	47	107	254	624
Apprch %	63.9	36.1	69.7	30.3	29.6	70.4	
Total %	11.1	6.2	17.3	7.5	17.1	40.7	

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	7	7	14	**31**	7	**38**	12	**69**	**81**	**133**
07:30 AM	**10**	**5**	**15**	**11**	**9**	**20**	**17**	**36**	**53**	**88**
07:45 AM	**9**	**14**	**23**	8	7	15	5	36	41	79
08:00 AM	**12**	3	15	26	**10**	36	**19**	37	56	107
Total Volume	38	29	67	76	33	109	53	178	231	407
% App. Total	56.7	43.3		69.7	30.3		22.9	77.1		
PHF	.792	.518	.728	.613	.825	.717	.697	.645	.713	.765

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Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	1	0	0	1	0	2	4
07:15 AM	1	0	1	1	2	0	5
07:30 AM	0	0	0	0	1	2	3
07:45 AM	2	0	2	2	1	0	7
Total	4	0	3	4	4	4	19
08:00 AM	0	0	0	0	0	2	2
08:15 AM	0	0	1	0	2	2	5
08:30 AM	3	0	1	0	1	2	7
08:45 AM	1	1	0	0	0	1	3
Total	4	1	2	0	3	7	17
Grand Total	8	1	5	4	7	11	36
Apprch %	88.9	11.1	55.6	44.4	38.9	61.1	
Total %	22.2	2.8	13.9	11.1	19.4	30.6	

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	2	0	2	**2**	**2**	**4**	1	0	1	**7**
08:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2	2
08:15 AM	0	0	0	1	0	1	**2**	2	**4**	5
08:30 AM	**3**	0	**3**	1	0	1	1	2	3	7
Total Volume	5	0	5	4	2	6	4	6	10	21
% App. Total	100	0		66.7	33.3		40	60		
PHF	.417	.000	.417	.500	.250	.375	.500	.750	.625	.750

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Site Code : 10111.31
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Page No : 1

Groups Printed- Peds and Bicycles

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	3	0	0	2	0	0	0	5
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	1	0	2	0	0	0	6
08:00 AM	0	0	0	0	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	2
Grand Total	0	0	3	1	0	3	0	1	0	8
Apprch %	0	0	100	25	0	75	0	100	0	
Total %	0	0	37.5	12.5	0	37.5	0	12.5	0	

	South Worcester Street From North				Barrows Street From East				South Worcester Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	**3**	**3**	0	0	**2**	**2**	0	0	0	0	**5**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	**1**	0	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	3	3	1	0	2	3	0	0	0	0	6
% App. Total	0	0	100		33.3	0	66.7		0	0	0		
PHF	.000	.000	.250	.250	.250	.000	.250	.375	.000	.000	.000	.000	.300

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File Name : 81676I-E
Site Code : 10111.31
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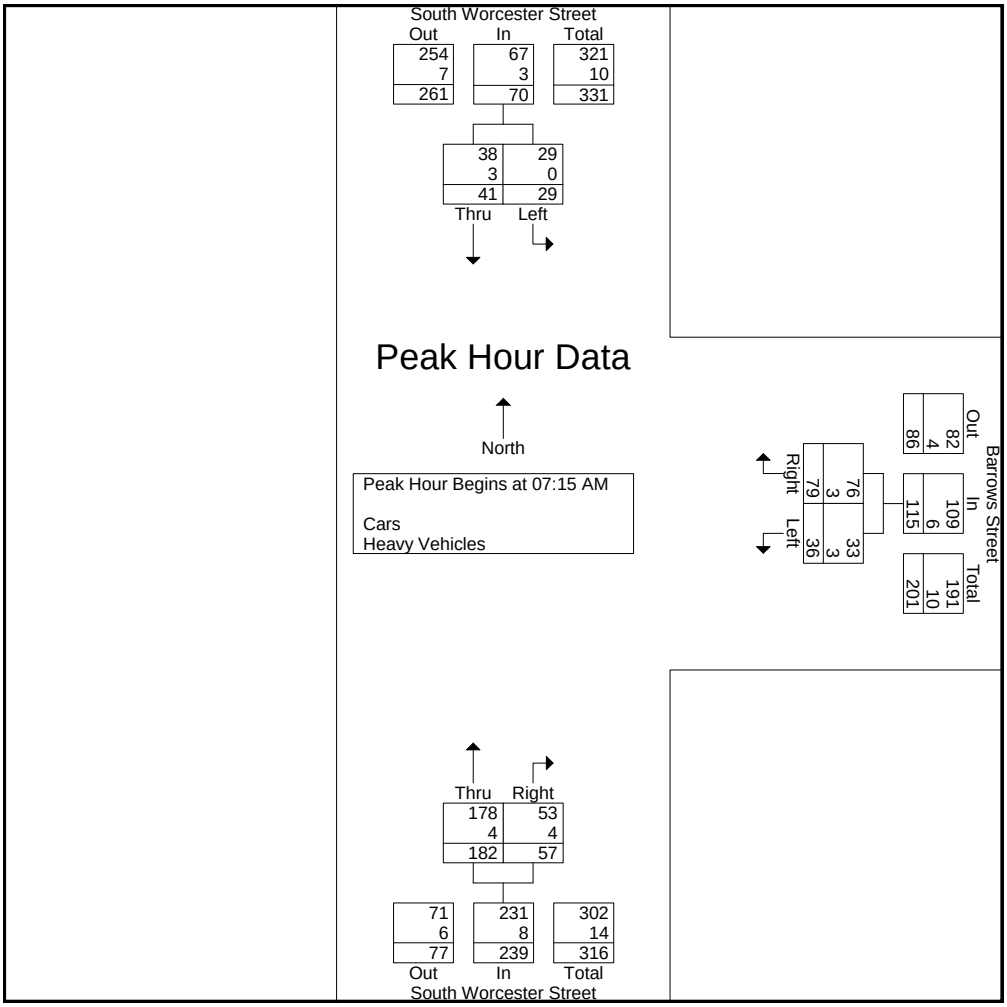
Page No : 1

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	8	7	15	**32**	8	**40**	14	**69**	**83**	**138**
07:30 AM	**10**	**5**	**15**	**11**	**9**	**20**	**18**	**38**	**56**	**91**
07:45 AM	**11**	**14**	**25**	10	9	19	6	36	42	86
08:00 AM	**12**	3	15	26	**10**	36	**19**	39	58	109
Total Volume	41	29	70	79	36	115	57	182	239	424
% App. Total	58.6	41.4		68.7	31.3		23.8	76.2		
PHF	.854	.518	.700	.617	.900	.719	.750	.659	.720	.768
Cars	38	29	67	76	33	109	53	178	231	407
% Cars	92.7	100	95.7	96.2	91.7	94.8	93.0	97.8	96.7	96.0
Heavy Vehicles	3	0	3	3	3	6	4	4	8	17
% Heavy Vehicles	7.3	0	4.3	3.8	8.3	5.2	7.0	2.2	3.3	4.0



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Client: VHB/J. Quitter

File Name : 81676I-EEE
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	34	5	13	14	11	14	91
04:15 PM	31	7	10	14	7	18	87
04:30 PM	38	10	6	22	14	18	108
04:45 PM	24	7	11	22	12	22	98
Total	127	29	40	72	44	72	384
05:00 PM	25	11	16	27	13	29	121
05:15 PM	41	12	14	28	12	25	132
05:30 PM	37	16	7	16	17	21	114
05:45 PM	37	10	10	22	9	21	109
Total	140	49	47	93	51	96	476
Grand Total	267	78	87	165	95	168	860
Apprch %	77.4	22.6	34.5	65.5	36.1	63.9	
Total %	31	9.1	10.1	19.2	11	19.5	
Cars	264	76	85	162	92	165	844
% Cars	98.9	97.4	97.7	98.2	96.8	98.2	98.1
Heavy Vehicles	3	2	2	3	3	3	16
% Heavy Vehicles	1.1	2.6	2.3	1.8	3.2	1.8	1.9

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	25	11	36	**16**	27	**43**	13	**29**	**42**	121
05:15 PM	**41**	12	**53**	14	**28**	42	12	25	37	**132**
05:30 PM	**37**	**16**	53	7	16	23	**17**	21	38	114
05:45 PM	37	10	47	10	22	32	9	21	30	109
Total Volume	140	49	189	47	93	140	51	96	147	476
% App. Total	74.1	25.9		33.6	66.4		34.7	65.3		
PHF	.854	.766	.892	.734	.830	.814	.750	.828	.875	.902
Cars	140	49	189	45	92	137	50	95	145	471
% Cars	100	100	100	95.7	98.9	97.9	98.0	99.0	98.6	98.9
Heavy Vehicles	0	0	0	2	1	3	1	1	2	5
% Heavy Vehicles	0	0	0	4.3	1.1	2.1	2.0	1.0	1.4	1.1

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Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Cars

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	33	4	13	13	10	13	86
04:15 PM	29	6	10	13	6	18	82
04:30 PM	38	10	6	22	14	17	107
04:45 PM	24	7	11	22	12	22	98
Total	124	27	40	70	42	70	373
05:00 PM	25	11	14	27	13	29	119
05:15 PM	41	12	14	27	11	24	129
05:30 PM	37	16	7	16	17	21	114
05:45 PM	37	10	10	22	9	21	109
Total	140	49	45	92	50	95	471
Grand Total	264	76	85	162	92	165	844
Apprch %	77.6	22.4	34.4	65.6	35.8	64.2	
Total %	31.3	9	10.1	19.2	10.9	19.5	

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	25	11	36	**14**	**27**	**41**	13	**29**	**42**	119
05:15 PM	**41**	12	**53**	14	27	41	11	24	35	**129**
05:30 PM	**37**	**16**	53	7	16	23	**17**	21	38	114
05:45 PM	37	10	47	10	22	32	9	21	30	109
Total Volume	140	49	189	45	92	137	50	95	145	471
% App. Total	74.1	25.9		32.8	67.2		34.5	65.5		
PHF	.854	.766	.892	.804	.852	.835	.735	.819	.863	.913

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File Name : 81676I-EEE
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Heavy Vehicles

	South Worcester Street From North		Barrows Street From East		South Worcester Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	1	1	0	1	1	1	5
04:15 PM	2	1	0	1	1	0	5
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0
Total	3	2	0	2	2	2	11
05:00 PM	0	0	2	0	0	0	2
05:15 PM	0	0	0	1	1	1	3
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	2	1	1	1	5
Grand Total	3	2	2	3	3	3	16
Apprch %	60	40	40	60	50	50	
Total %	18.8	12.5	12.5	18.8	18.8	18.8	

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	1	**1**	2	0	**1**	**1**	**1**	**1**	**2**	**5**
04:15 PM	**2**	1	**3**	0	1	1	1	0	1	5
04:30 PM	0	0	0	0	0	0	0	1	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	3	2	5	0	2	2	2	2	4	11
% App. Total	60	40		0	100		50	50		
PHF	.375	.500	.417	.000	.500	.500	.500	.500	.500	.550

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: South Worcester Street
E: Barrows Street
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-EEE
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

Groups Printed- Peds and Bicycles

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	1	0	2	0	0	1	0	0	0	4
04:15 PM	0	0	0	0	0	2	0	1	1	4
04:30 PM	0	0	1	2	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	3	2	0	3	0	1	1	11
05:00 PM	0	0	0	0	0	2	0	0	0	2
05:15 PM	0	0	1	0	0	2	0	0	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	4	0	0	0	5
Grand Total	1	0	4	2	0	7	0	1	1	16
Apprch %	20	0	80	22.2	0	77.8	0	50	50	
Total %	6.2	0	25	12.5	0	43.8	0	6.2	6.2	

	South Worcester Street From North				Barrows Street From East				South Worcester Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	**1**	0	**2**	**3**	0	0	1	1	0	0	0	0	**4**
04:15 PM	0	0	0	0	0	0	**2**	**2**	0	**1**	**1**	**2**	4
04:30 PM	0	0	1	1	**2**	0	0	2	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	3	4	2	0	3	5	0	1	1	2	11
% App. Total	25	0	75		40	0	60		0	50	50		
PHF	.250	.000	.375	.333	.250	.000	.375	.625	.000	.250	.250	.250	.688

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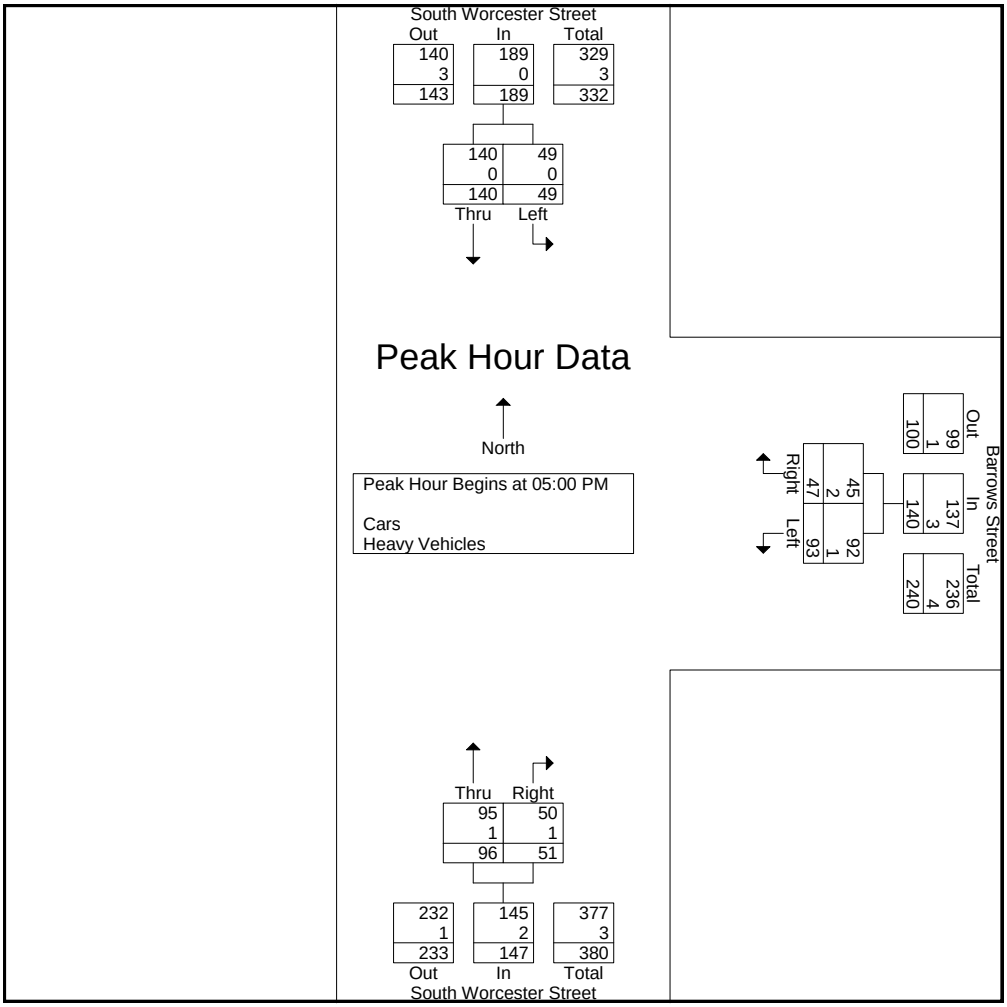
City, State: Norton, MA
Client: VHB/J. Quitter

File Name : 81676I-EEE
Site Code : 10111.31
Start Date : 9/25/2008
Page No : 1

	South Worcester Street From North			Barrows Street From East			South Worcester Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	25	11	36	**16**	27	**43**	13	**29**	**42**	121
05:15 PM	**41**	12	**53**	14	**28**	42	12	25	37	**132**
05:30 PM	**37**	**16**	53	7	16	23	**17**	21	38	114
05:45 PM	37	10	47	10	22	32	9	21	30	109
Total Volume	140	49	189	47	93	140	51	96	147	476
% App. Total	74.1	25.9		33.6	66.4		34.7	65.3		
PHF	.854	.766	.892	.734	.830	.814	.750	.828	.875	.902
Cars	140	49	189	45	92	137	50	95	145	471
% Cars	100	100	100	95.7	98.9	97.9	98.0	99.0	98.6	98.9
Heavy Vehicles	0	0	0	2	1	3	1	1	2	5
% Heavy Vehicles	0	0	0	4.3	1.1	2.1	2.0	1.0	1.4	1.1



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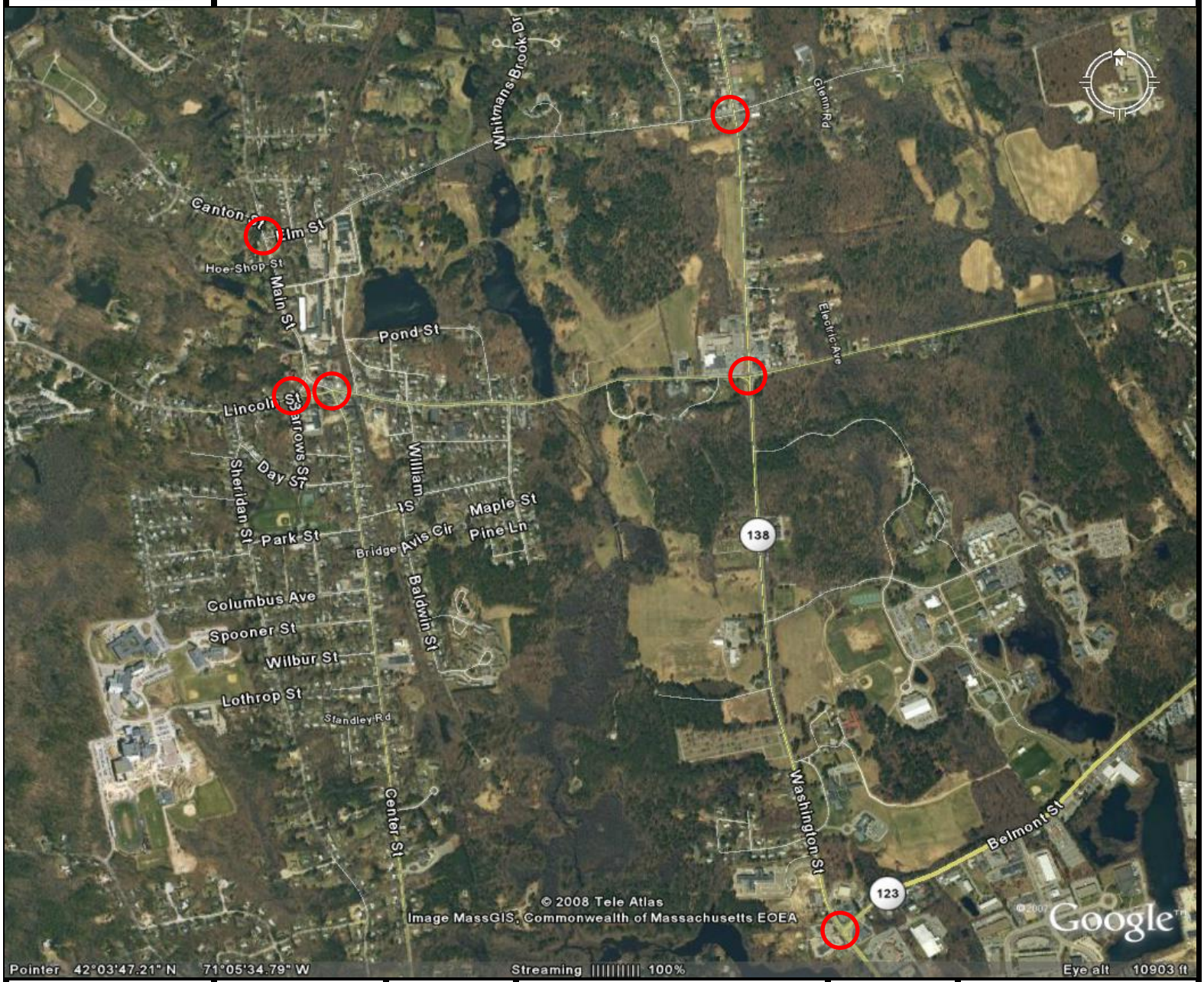
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Sat 9/13/08 and Tues 9/23/08	81676	Easton, MA

PRECISION DATA INDUSTRIES, LLC
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N/S: Washington Street (Route 138)
E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	124	2	2	4	7	5	213	4	11	7	22	416
07:15 AM	12	89	0	5	2	1	5	267	7	7	9	25	429
07:30 AM	9	78	0	8	2	1	7	314	7	6	7	33	472
07:45 AM	8	105	1	4	7	6	1	266	7	10	7	16	438
Total	44	396	3	19	15	15	18	1060	25	34	30	96	1755
08:00 AM	12	93	0	6	2	2	4	298	6	9	9	17	458
08:15 AM	10	127	1	4	6	0	2	199	11	8	7	26	401
08:30 AM	13	112	4	11	3	2	4	176	6	6	5	20	362
08:45 AM	27	116	4	8	2	5	10	157	16	17	8	31	401
Total	62	448	9	29	13	9	20	830	39	40	29	94	1622
Grand Total	106	844	12	48	28	24	38	1890	64	74	59	190	3377
Apprch %	11	87.7	1.2	48	28	24	1.9	94.9	3.2	22.9	18.3	58.8	
Total %	3.1	25	0.4	1.4	0.8	0.7	1.1	56	1.9	2.2	1.7	5.6	
Cars	99	802	11	46	26	24	38	1825	62	72	54	187	3246
% Cars	93.4	95	91.7	95.8	92.9	100	100	96.6	96.9	97.3	91.5	98.4	96.1
Heavy Vehicles	7	42	1	2	2	0	0	65	2	2	5	3	131
% Heavy Vehicles	6.6	5	8.3	4.2	7.1	0	0	3.4	3.1	2.7	8.5	1.6	3.9

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**12**	89	0	101	5	2	1	8	5	267	**7**	279	7	**9**	25	41	429
07:30 AM	9	78	0	87	**8**	2	1	11	**7**	**314**	7	**328**	6	7	**33**	**46**	**472**
07:45 AM	8	**105**	**1**	**114**	4	**7**	**6**	**17**	1	266	7	274	**10**	7	16	33	438
08:00 AM	12	93	0	105	6	2	2	10	4	298	6	308	9	9	17	35	458
Total Volume	41	365	1	407	23	13	10	46	17	1145	27	1189	32	32	91	155	1797
% App. Total	10.1	89.7	0.2		50	28.3	21.7		1.4	96.3	2.3		20.6	20.6	58.7		
PHF	.854	.869	.250	.893	.719	.464	.417	.676	.607	.912	.964	.906	.800	.889	.689	.842	.952
Cars	38	353	1	392	22	11	10	43	17	1109	26	1152	31	31	91	153	1740
% Cars	92.7	96.7	100	96.3	95.7	84.6	100	93.5	100	96.9	96.3	96.9	96.9	96.9	100	98.7	96.8
Heavy Vehicles	3	12	0	15	1	2	0	3	0	36	1	37	1	1	0	2	57
% Heavy Vehicles	7.3	3.3	0	3.7	4.3	15.4	0	6.5	0	3.1	3.7	3.1	3.1	3.1	0	1.3	3.2

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N/S: Washington Street (Route 138)
E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	15	115	2	2	4	7	5	211	4	11	6	22	404
07:15 AM	11	86	0	5	2	1	5	263	6	7	9	25	420
07:30 AM	9	76	0	7	2	1	7	302	7	6	7	33	457
07:45 AM	7	101	1	4	5	6	1	259	7	9	7	16	423
Total	42	378	3	18	13	15	18	1035	24	33	29	96	1704
08:00 AM	11	90	0	6	2	2	4	285	6	9	8	17	440
08:15 AM	10	117	0	4	6	0	2	189	11	8	7	26	380
08:30 AM	12	105	4	11	3	2	4	168	6	5	3	18	341
08:45 AM	24	112	4	7	2	5	10	148	15	17	7	30	381
Total	57	424	8	28	13	9	20	790	38	39	25	91	1542
Grand Total	99	802	11	46	26	24	38	1825	62	72	54	187	3246
Apprch %	10.9	87.9	1.2	47.9	27.1	25	2	94.8	3.2	23	17.3	59.7	
Total %	3	24.7	0.3	1.4	0.8	0.7	1.2	56.2	1.9	2.2	1.7	5.8	

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**11**	86	0	97	5	2	1	8	5	263	6	274	7	**9**	25	41	420
07:30 AM	9	76	0	85	**7**	2	1	10	**7**	**302**	**7**	**316**	6	7	**33**	**46**	**457**
07:45 AM	7	**101**	**1**	**109**	4	**5**	**6**	**15**	1	259	7	267	**9**	7	16	32	423
08:00 AM	11	90	0	101	6	2	2	10	4	285	6	295	9	8	17	34	440
Total Volume	38	353	1	392	22	11	10	43	17	1109	26	1152	31	31	91	153	1740
% App. Total	9.7	90.1	0.3		51.2	25.6	23.3		1.5	96.3	2.3		20.3	20.3	59.5		
PHF	.864	.874	.250	.899	.786	.550	.417	.717	.607	.918	.929	.911	.861	.861	.689	.832	.952

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	9	0	0	0	0	0	2	0	0	1	0	12
07:15 AM	1	3	0	0	0	0	0	4	1	0	0	0	9
07:30 AM	0	2	0	1	0	0	0	12	0	0	0	0	15
07:45 AM	1	4	0	0	2	0	0	7	0	1	0	0	15
Total	2	18	0	1	2	0	0	25	1	1	1	0	51
08:00 AM	1	3	0	0	0	0	0	13	0	0	1	0	18
08:15 AM	0	10	1	0	0	0	0	10	0	0	0	0	21
08:30 AM	1	7	0	0	0	0	0	8	0	1	2	2	21
08:45 AM	3	4	0	1	0	0	0	9	1	0	1	1	20
Total	5	24	1	1	0	0	0	40	1	1	4	3	80
Grand Total	7	42	1	2	2	0	0	65	2	2	5	3	131
Apprch %	14	84	2	50	50	0	0	97	3	20	50	30	
Total %	5.3	32.1	0.8	1.5	1.5	0	0	49.6	1.5	1.5	3.8	2.3	

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	3	0	4	0	0	0	0	0	**13**	0	**13**	0	1	0	1	18
08:15 AM	0	**10**	**1**	**11**	0	0	0	0	0	10	0	10	0	0	0	0	**21**
08:30 AM	1	7	0	8	0	0	0	0	0	8	0	8	**1**	**2**	**2**	**5**	21
08:45 AM	**3**	4	0	7	**1**	0	0	**1**	0	9	**1**	10	0	1	1	2	20
Total Volume	5	24	1	30	1	0	0	1	0	40	1	41	1	4	3	8	80
% App. Total	16.7	80	3.3		100	0	0		0	97.6	2.4		12.5	50	37.5		
PHF	.417	.600	.250	.682	.250	.000	.000	.250	.000	.769	.250	.788	.250	.500	.375	.400	.952

PRECISION
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File Name : 81676 M-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	4
Grand Total	0	1	0	0	0	0	0	2	0	0	0	1	0	1	0	0	5
Apprch %	0	100	0	0	0	0	0	100	0	0	0	100	0	100	0	0	
Total %	0	20	0	0	0	0	0	40	0	0	0	20	0	20	0	0	

	Washington Street (Route 138) From North					Elm Street From East					Washington Street (Route 138) From South					Elm Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	**1**	0	0	**1**	**2**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	1	1	0	0	0	1	1	0	1	0	0	1	4
% App. Total	0	100	0	0		0	0	0	100		0	0	0	100		0	100	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.500

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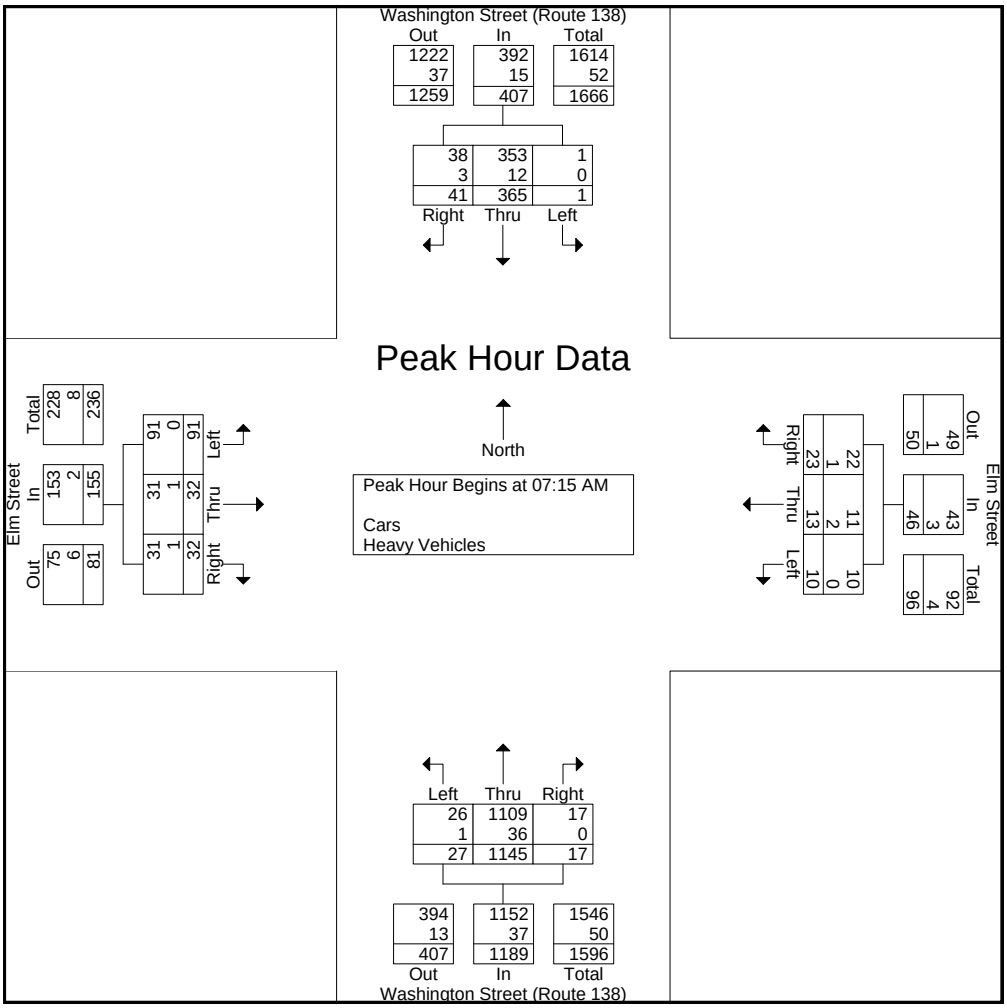
	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**12**	89	0	101	5	2	1	8	5	267	**7**	279	7	**9**	25	41	429
07:30 AM	9	78	0	87	**8**	2	1	11	**7**	**314**	7	**328**	6	7	**33**	**46**	**472**
07:45 AM	8	**105**	**1**	**114**	4	**7**	**6**	**17**	1	266	7	274	**10**	7	16	33	438
08:00 AM	12	93	0	105	6	2	2	10	4	298	6	308	9	9	17	35	458
Total Volume	41	365	1	407	23	13	10	46	17	1145	27	1189	32	32	91	155	1797
% App. Total	10.1	89.7	0.2		50	28.3	21.7		1.4	96.3	2.3		20.6	20.6	58.7		
PHF	.854	.869	.250	.893	.719	.464	.417	.676	.607	.912	.964	.906	.800	.889	.689	.842	.952
Cars	38	353	1	392	22	11	10	43	17	1109	26	1152	31	31	91	153	1740
% Cars	92.7	96.7	100	96.3	95.7	84.6	100	93.5	100	96.9	96.3	96.9	96.9	96.9	100	98.7	96.8
Heavy Vehicles	3	12	0	15	1	2	0	3	0	36	1	37	1	1	0	2	57
% Heavy Vehicles	7.3	3.3	0	3.7	4.3	15.4	0	6.5	0	3.1	3.7	3.1	3.1	3.1	0	1.3	3.2



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E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	35	185	5	10	6	1	5	150	14	8	6	15	440
04:15 PM	31	199	4	7	5	3	5	139	11	4	7	20	435
04:30 PM	26	195	10	4	10	2	8	144	6	15	3	12	435
04:45 PM	38	212	9	8	10	3	9	128	12	6	6	12	453
Total	130	791	28	29	31	9	27	561	43	33	22	59	1763
05:00 PM	24	188	2	11	10	7	8	167	13	5	4	19	458
05:15 PM	44	217	5	7	9	6	6	157	12	11	3	9	486
05:30 PM	46	259	4	8	14	3	2	124	20	6	4	21	511
05:45 PM	29	214	5	6	7	4	12	122	11	14	2	17	443
Total	143	878	16	32	40	20	28	570	56	36	13	66	1898
Grand Total	273	1669	44	61	71	29	55	1131	99	69	35	125	3661
Apprch %	13.7	84	2.2	37.9	44.1	18	4.3	88	7.7	30.1	15.3	54.6	
Total %	7.5	45.6	1.2	1.7	1.9	0.8	1.5	30.9	2.7	1.9	1	3.4	
Cars	271	1626	43	60	71	29	54	1103	97	65	35	123	3577
% Cars	99.3	97.4	97.7	98.4	100	100	98.2	97.5	98	94.2	100	98.4	97.7
Heavy Vehicles	2	43	1	1	0	0	1	28	2	4	0	2	84
% Heavy Vehicles	0.7	2.6	2.3	1.6	0	0	1.8	2.5	2	5.8	0	1.6	2.3

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	38	212	**9**	259	8	10	3	21	**9**	128	12	149	6	**6**	12	24	453
05:00 PM	24	188	2	214	**11**	10	**7**	**28**	8	**167**	13	**188**	5	4	19	28	458
05:15 PM	44	217	5	266	7	9	6	22	6	157	12	175	**11**	3	9	23	486
05:30 PM	**46**	**259**	4	**309**	8	**14**	3	25	2	124	**20**	146	6	4	**21**	**31**	**511**
Total Volume	152	876	20	1048	34	43	19	96	25	576	57	658	28	17	61	106	1908
% App. Total	14.5	83.6	1.9		35.4	44.8	19.8		3.8	87.5	8.7		26.4	16	57.5		
PHF	.826	.846	.556	.848	.773	.768	.679	.857	.694	.862	.713	.875	.636	.708	.726	.855	.933
Cars	151	855	20	1026	33	43	19	95	24	558	56	638	27	17	60	104	1863
% Cars	99.3	97.6	100	97.9	97.1	100	100	99.0	96.0	96.9	98.2	97.0	96.4	100	98.4	98.1	97.6
Heavy Vehicles	1	21	0	22	1	0	0	1	1	18	1	20	1	0	1	2	45
% Heavy Vehicles	0.7	2.4	0	2.1	2.9	0	0	1.0	4.0	3.1	1.8	3.0	3.6	0	1.6	1.9	2.4

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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N/S: Washington Street (Route 138)
E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	35	179	5	10	6	1	5	145	13	7	6	15	427
04:15 PM	30	192	3	7	5	3	5	137	11	4	7	20	424
04:30 PM	26	190	10	4	10	2	8	143	6	13	3	11	426
04:45 PM	38	207	9	8	10	3	8	123	12	6	6	12	442
Total	129	768	27	29	31	9	26	548	42	30	22	58	1719
05:00 PM	24	182	2	10	10	7	8	162	12	5	4	18	444
05:15 PM	44	214	5	7	9	6	6	154	12	10	3	9	479
05:30 PM	45	252	4	8	14	3	2	119	20	6	4	21	498
05:45 PM	29	210	5	6	7	4	12	120	11	14	2	17	437
Total	142	858	16	31	40	20	28	555	55	35	13	65	1858
Grand Total	271	1626	43	60	71	29	54	1103	97	65	35	123	3577
Apprch %	14	83.8	2.2	37.5	44.4	18.1	4.3	88	7.7	29.1	15.7	55.2	
Total %	7.6	45.5	1.2	1.7	2	0.8	1.5	30.8	2.7	1.8	1	3.4	

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	38	207	**9**	254	8	10	3	21	**8**	123	12	143	6	**6**	12	24	442
05:00 PM	24	182	2	208	**10**	10	**7**	**27**	8	**162**	12	**182**	5	4	18	27	444
05:15 PM	44	214	5	263	7	9	6	22	6	154	12	172	**10**	3	9	22	479
05:30 PM	**45**	**252**	4	**301**	8	**14**	3	25	2	119	**20**	141	6	4	**21**	**31**	**498**
Total Volume	151	855	20	1026	33	43	19	95	24	558	56	638	27	17	60	104	1863
% App. Total	14.7	83.3	1.9		34.7	45.3	20		3.8	87.5	8.8		26	16.3	57.7		
PHF	.839	.848	.556	.852	.825	.768	.679	.880	.750	.861	.700	.876	.675	.708	.714	.839	.935

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N/S: Washington Street (Route 138)
E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Elm Street From East			Washington Street (Route 138) From South			Elm Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	6	0	0	0	0	0	5	1	1	0	0	13
04:15 PM	1	7	1	0	0	0	0	2	0	0	0	0	11
04:30 PM	0	5	0	0	0	0	0	1	0	2	0	1	9
04:45 PM	0	5	0	0	0	0	1	5	0	0	0	0	11
Total	1	23	1	0	0	0	1	13	1	3	0	1	44
05:00 PM	0	6	0	1	0	0	0	5	1	0	0	1	14
05:15 PM	0	3	0	0	0	0	0	3	0	1	0	0	7
05:30 PM	1	7	0	0	0	0	0	5	0	0	0	0	13
05:45 PM	0	4	0	0	0	0	0	2	0	0	0	0	6
Total	1	20	0	1	0	0	0	15	1	1	0	1	40
Grand Total	2	43	1	1	0	0	1	28	2	4	0	2	84
Apprch %	4.3	93.5	2.2	100	0	0	3.2	90.3	6.5	66.7	0	33.3	
Total %	2.4	51.2	1.2	1.2	0	0	1.2	33.3	2.4	4.8	0	2.4	

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**1**	**7**	**1**	**9**	0	0	0	0	0	2	0	2	0	0	0	0	11
04:30 PM	0	5	0	5	0	0	0	0	0	1	0	1	**2**	0	**1**	**3**	9
04:45 PM	0	5	0	5	0	0	0	0	**1**	**5**	0	**6**	0	0	0	0	11
05:00 PM	0	6	0	6	**1**	0	0	**1**	0	5	**1**	6	0	0	1	1	**14**
Total Volume	1	23	1	25	1	0	0	1	1	13	1	15	2	0	2	4	45
% App. Total	4	92	4		100	0	0		6.7	86.7	6.7		50	0	50		
PHF	.250	.821	.250	.694	.250	.000	.000	.250	.250	.650	.250	.625	.250	.000	.500	.333	.804

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E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	3	7
Grand Total	0	1	0	0	0	0	0	0	0	2	0	1	0	1	0	3	8
Apprch %	0	100	0	0	0	0	0	0	0	66.7	0	33.3	0	25	0	75	
Total %	0	12.5	0	0	0	0	0	0	0	25	0	12.5	0	12.5	0	37.5	

	Washington Street (Route 138) From North					Elm Street From East					Washington Street (Route 138) From South					Elm Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
05:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**
05:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	0	1	**2**	**3**
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**	**2**	0	0	0	0	0	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	2	0	1	3	0	1	0	3	4	7
% App. Total	0	0	0	0		0	0	0	0		0	66.7	0	33.3		0	25	0	75		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.250	.375	.000	.250	.000	.750	.500	.583

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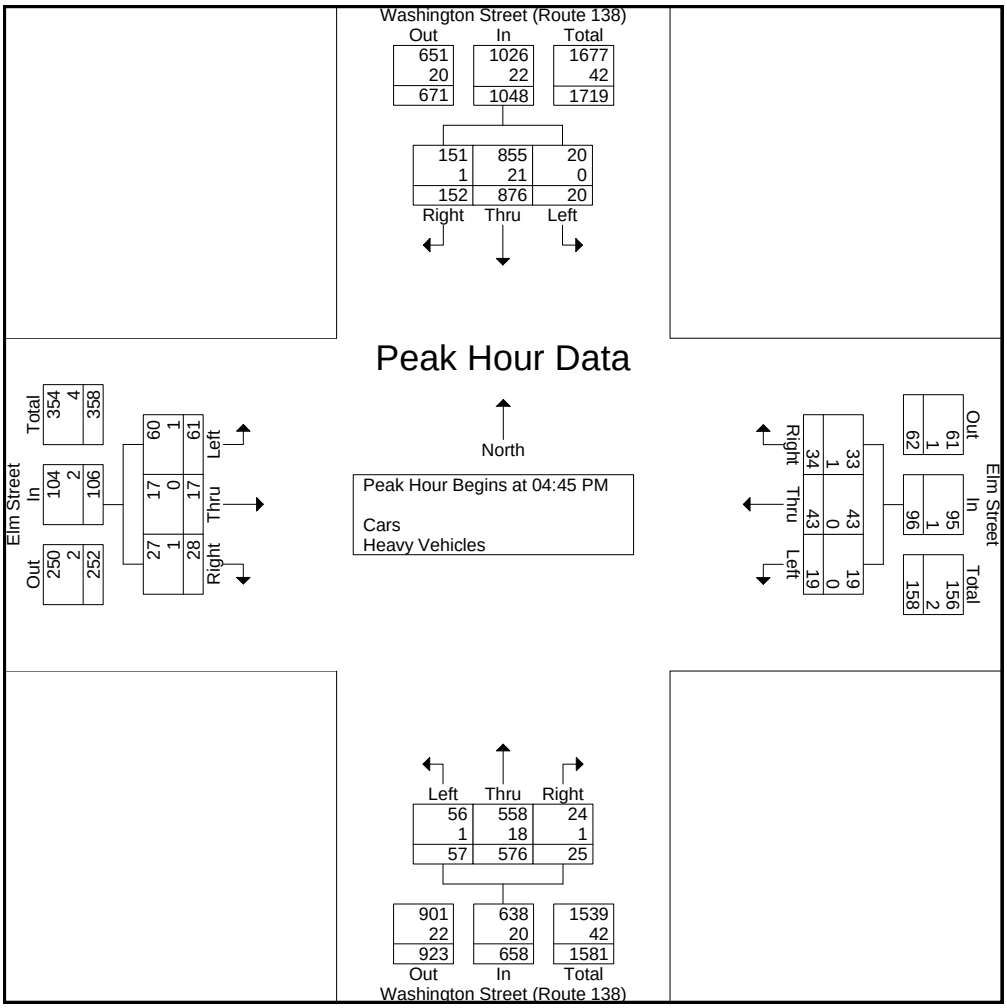
N/S: Washington Street (Route 138)
E/W: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Elm Street From East				Washington Street (Route 138) From South				Elm Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	38	212	**9**	259	8	10	3	21	**9**	128	12	149	6	**6**	12	24	453
05:00 PM	24	188	2	214	**11**	10	**7**	**28**	8	**167**	13	**188**	5	4	19	28	458
05:15 PM	44	217	5	266	7	9	6	22	6	157	12	175	**11**	3	9	23	486
05:30 PM	**46**	**259**	4	**309**	8	**14**	3	25	2	124	**20**	146	6	4	**21**	**31**	**511**
Total Volume	152	876	20	1048	34	43	19	96	25	576	57	658	28	17	61	106	1908
% App. Total	14.5	83.6	1.9		35.4	44.8	19.8		3.8	87.5	8.7		26.4	16	57.5		
PHF	.826	.846	.556	.848	.773	.768	.679	.857	.694	.862	.713	.875	.636	.708	.726	.855	.933
Cars	151	855	20	1026	33	43	19	95	24	558	56	638	27	17	60	104	1863
% Cars	99.3	97.6	100	97.9	97.1	100	100	99.0	96.0	96.9	98.2	97.0	96.4	100	98.4	98.1	97.6
Heavy Vehicles	1	21	0	22	1	0	0	1	1	18	1	20	1	0	1	2	45
% Heavy Vehicles	0.7	2.4	0	2.1	2.9	0	0	1.0	4.0	3.1	1.8	3.0	3.6	0	1.6	1.9	2.4



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N/S: Washington Street (Route 138)
E/W: Belmont Street (Rte 123)/CVS Drive
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	66	39	29	2	36	95	134	2	2	2	0	408
07:15 AM	0	73	38	31	1	59	103	156	2	0	1	2	466
07:30 AM	1	59	47	59	4	68	113	173	2	1	3	2	532
07:45 AM	0	63	39	42	4	61	104	142	3	2	6	0	466
Total	2	261	163	161	11	224	415	605	9	5	12	4	1872
08:00 AM	1	70	49	47	4	48	87	175	6	1	4	4	496
08:15 AM	3	66	60	45	2	45	110	112	3	3	4	2	455
08:30 AM	4	67	44	31	3	50	118	120	7	5	1	0	450
08:45 AM	6	68	50	40	7	42	62	118	8	4	11	3	419
Total	14	271	203	163	16	185	377	525	24	13	20	9	1820
Grand Total	16	532	366	324	27	409	792	1130	33	18	32	13	3692
Apprch %	1.8	58.2	40	42.6	3.6	53.8	40.5	57.8	1.7	28.6	50.8	20.6	
Total %	0.4	14.4	9.9	8.8	0.7	11.1	21.5	30.6	0.9	0.5	0.9	0.4	
Cars	16	496	342	281	25	384	767	1085	32	18	30	12	3488
% Cars	100	93.2	93.4	86.7	92.6	93.9	96.8	96	97	100	93.8	92.3	94.5
Heavy Vehicles	0	36	24	43	2	25	25	45	1	0	2	1	204
% Heavy Vehicles	0	6.8	6.6	13.3	7.4	6.1	3.2	4	3	0	6.2	7.7	5.5

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**73**	38	111	31	1	59	91	103	156	2	261	0	1	2	3	466
07:30 AM	**1**	59	47	107	**59**	**4**	**68**	**131**	**113**	173	2	**288**	1	3	2	6	**532**
07:45 AM	0	63	39	102	42	4	61	107	104	142	3	249	**2**	**6**	0	8	466
08:00 AM	1	70	**49**	**120**	47	4	48	99	87	**175**	**6**	268	1	4	**4**	**9**	496
Total Volume	2	265	173	440	179	13	236	428	407	646	13	1066	4	14	8	26	1960
% App. Total	0.5	60.2	39.3		41.8	3	55.1		38.2	60.6	1.2		15.4	53.8	30.8		
PHF	.500	.908	.883	.917	.758	.813	.868	.817	.900	.923	.542	.925	.500	.583	.500	.722	.921
Cars	2	252	166	420	156	11	228	395	394	627	13	1034	4	13	7	24	1873
% Cars	100	95.1	96.0	95.5	87.2	84.6	96.6	92.3	96.8	97.1	100	97.0	100	92.9	87.5	92.3	95.6
Heavy Vehicles	0	13	7	20	23	2	8	33	13	19	0	32	0	1	1	2	87
% Heavy Vehicles	0	4.9	4.0	4.5	12.8	15.4	3.4	7.7	3.2	2.9	0	3.0	0	7.1	12.5	7.7	4.4

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	58	34	26	2	36	94	131	2	2	2	0	388
07:15 AM	0	72	35	27	1	57	101	153	2	0	1	2	451
07:30 AM	1	55	47	48	2	65	110	167	2	1	3	1	502
07:45 AM	0	61	36	38	4	61	97	138	3	2	5	0	445
Total	2	246	152	139	9	219	402	589	9	5	11	3	1786
08:00 AM	1	64	48	43	4	45	86	169	6	1	4	4	475
08:15 AM	3	62	56	41	2	38	108	107	3	3	4	2	429
08:30 AM	4	61	39	26	3	48	113	110	7	5	1	0	417
08:45 AM	6	63	47	32	7	34	58	110	7	4	10	3	381
Total	14	250	190	142	16	165	365	496	23	13	19	9	1702
Grand Total	16	496	342	281	25	384	767	1085	32	18	30	12	3488
Apprch %	1.9	58.1	40	40.7	3.6	55.7	40.7	57.6	1.7	30	50	20	
Total %	0.5	14.2	9.8	8.1	0.7	11	22	31.1	0.9	0.5	0.9	0.3	

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**72**	35	107	27	1	57	85	101	153	2	256	0	1	2	3	451
07:30 AM	**1**	55	47	103	**48**	2	**65**	**115**	**110**	167	2	**279**	1	3	1	5	**502**
07:45 AM	0	61	36	97	38	**4**	61	103	97	138	3	238	**2**	**5**	0	7	445
08:00 AM	1	64	**48**	**113**	43	4	45	92	86	**169**	**6**	261	1	4	**4**	**9**	475
Total Volume	2	252	166	420	156	11	228	395	394	627	13	1034	4	13	7	24	1873
% App. Total	0.5	60	39.5		39.5	2.8	57.7		38.1	60.6	1.3		16.7	54.2	29.2		
PHF	.500	.875	.865	.929	.813	.688	.877	.859	.895	.928	.542	.927	.500	.650	.438	.667	.933

PRECISION DATA INDUSTRIES, LLC
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N/S: Washington Street (Route 138)
E/W: Belmont Street (Rte 123)/CVS Drive
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	8	5	3	0	0	1	3	0	0	0	0	20
07:15 AM	0	1	3	4	0	2	2	3	0	0	0	0	15
07:30 AM	0	4	0	11	2	3	3	6	0	0	0	1	30
07:45 AM	0	2	3	4	0	0	7	4	0	0	1	0	21
Total	0	15	11	22	2	5	13	16	0	0	1	1	86
08:00 AM	0	6	1	4	0	3	1	6	0	0	0	0	21
08:15 AM	0	4	4	4	0	7	2	5	0	0	0	0	26
08:30 AM	0	6	5	5	0	2	5	10	0	0	0	0	33
08:45 AM	0	5	3	8	0	8	4	8	1	0	1	0	38
Total	0	21	13	21	0	20	12	29	1	0	1	0	118
Grand Total	0	36	24	43	2	25	25	45	1	0	2	1	204
Apprch %	0	60	40	61.4	2.9	35.7	35.2	63.4	1.4	0	66.7	33.3	
Total %	0	17.6	11.8	21.1	1	12.3	12.3	22.1	0.5	0	1	0.5	

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	**6**	1	7	4	0	3	7	1	6	0	7	0	0	0	0	21
08:15 AM	0	4	4	8	4	0	7	11	2	5	0	7	0	0	0	0	26
08:30 AM	0	6	**5**	**11**	5	0	2	7	**5**	**10**	0	**15**	0	0	0	0	33
08:45 AM	0	5	3	8	**8**	0	**8**	**16**	4	8	**1**	13	0	**1**	0	**1**	**38**
Total Volume	0	21	13	34	21	0	20	41	12	29	1	42	0	1	0	1	118
% App. Total	0	61.8	38.2		51.2	0	48.8		28.6	69	2.4		0	100	0		
PHF	.000	.875	.650	.773	.656	.000	.625	.641	.600	.725	.250	.700	.000	.250	.000	.250	.776

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-B
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	4
Apprch %	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	100	
Total %	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	75	

	Washington Street (Route 138) From North					Belmont Street (Route 123) From East					Washington Street (Route 138/123) From South					CVS Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**2**	**2**	**3**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	4
% App. Total	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.333

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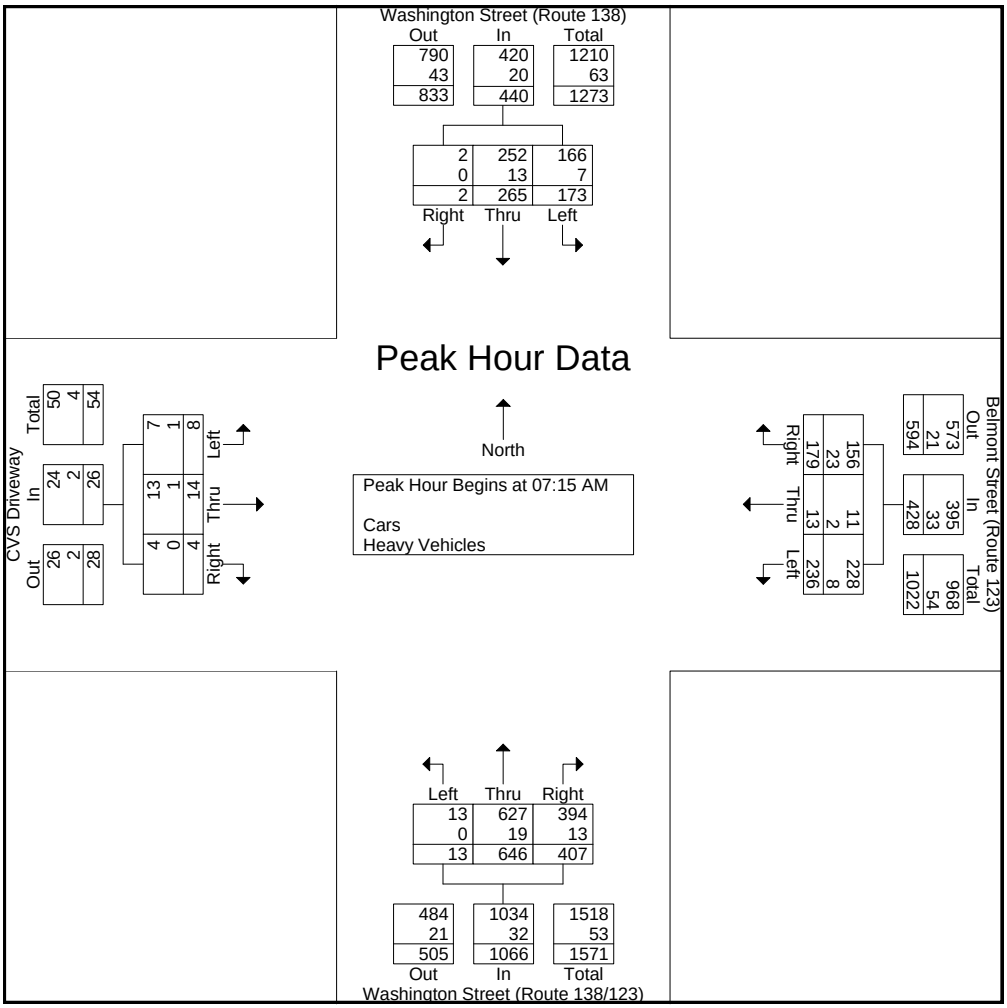
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**73**	38	111	31	1	59	91	103	156	2	261	0	1	2	3	466
07:30 AM	**1**	59	47	107	**59**	**4**	**68**	**131**	**113**	173	2	**288**	1	3	2	6	**532**
07:45 AM	0	63	39	102	42	4	61	107	104	142	3	249	**2**	**6**	0	8	466
08:00 AM	1	70	**49**	**120**	47	4	48	99	87	**175**	**6**	268	1	4	**4**	**9**	496
Total Volume	2	265	173	440	179	13	236	428	407	646	13	1066	4	14	8	26	1960
% App. Total	0.5	60.2	39.3		41.8	3	55.1		38.2	60.6	1.2		15.4	53.8	30.8		
PHF	.500	.908	.883	.917	.758	.813	.868	.817	.900	.923	.542	.925	.500	.583	.500	.722	.921
Cars	2	252	166	420	156	11	228	395	394	627	13	1034	4	13	7	24	1873
% Cars	100	95.1	96.0	95.5	87.2	84.6	96.6	92.3	96.8	97.1	100	97.0	100	92.9	87.5	92.3	95.6
Heavy Vehicles	0	13	7	20	23	2	8	33	13	19	0	32	0	1	1	2	87
% Heavy Vehicles	0	4.9	4.0	4.5	12.8	15.4	3.4	7.7	3.2	2.9	0	3.0	0	7.1	12.5	7.7	4.4



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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	10	142	37	47	4	129	59	103	7	16	6	1	561
04:15 PM	8	137	36	28	15	112	73	78	8	9	8	11	523
04:30 PM	5	159	35	32	14	107	63	96	3	15	4	5	538
04:45 PM	6	144	40	29	5	115	68	99	3	18	6	10	543
Total	29	582	148	136	38	463	263	376	21	58	24	27	2165
05:00 PM	7	150	53	46	9	139	78	98	5	12	1	7	605
05:15 PM	13	159	54	49	11	134	74	90	9	18	12	3	626
05:30 PM	5	129	59	39	10	99	68	77	7	20	5	9	527
05:45 PM	6	146	51	48	6	105	58	82	5	15	3	7	532
Total	31	584	217	182	36	477	278	347	26	65	21	26	2290
Grand Total	60	1166	365	318	74	940	541	723	47	123	45	53	4455
Apprch %	3.8	73.3	22.9	23.9	5.6	70.6	41.3	55.1	3.6	55.7	20.4	24	
Total %	1.3	26.2	8.2	7.1	1.7	21.1	12.1	16.2	1.1	2.8	1	1.2	
Cars	60	1135	351	310	74	925	530	700	47	123	45	53	4353
% Cars	100	97.3	96.2	97.5	100	98.4	98	96.8	100	100	100	100	97.7
Heavy Vehicles	0	31	14	8	0	15	11	23	0	0	0	0	102
% Heavy Vehicles	0	2.7	3.8	2.5	0	1.6	2	3.2	0	0	0	0	2.3

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	5	**159**	35	199	32	**14**	107	153	63	96	3	162	15	4	5	24	538
04:45 PM	6	144	40	190	29	5	115	149	68	**99**	3	170	**18**	6	**10**	**34**	543
05:00 PM	7	150	53	210	46	9	**139**	**194**	**78**	98	5	**181**	12	1	7	20	605
05:15 PM	**13**	159	**54**	**226**	**49**	11	134	194	74	90	**9**	173	18	**12**	3	33	**626**
Total Volume	31	612	182	825	156	39	495	690	283	383	20	686	63	23	25	111	2312
% App. Total	3.8	74.2	22.1		22.6	5.7	71.7		41.3	55.8	2.9		56.8	20.7	22.5		
PHF	.596	.962	.843	.913	.796	.696	.890	.889	.907	.967	.556	.948	.875	.479	.625	.816	.923
Cars	31	600	174	805	154	39	487	680	275	368	20	663	63	23	25	111	2259
% Cars	100	98.0	95.6	97.6	98.7	100	98.4	98.6	97.2	96.1	100	96.6	100	100	100	100	97.7
Heavy Vehicles	0	12	8	20	2	0	8	10	8	15	0	23	0	0	0	0	53
% Heavy Vehicles	0	2.0	4.4	2.4	1.3	0	1.6	1.4	2.8	3.9	0	3.4	0	0	0	0	2.3

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	10	138	36	46	4	127	56	100	7	16	6	1	547
04:15 PM	8	132	35	27	15	108	73	75	8	9	8	11	509
04:30 PM	5	156	33	32	14	106	57	93	3	15	4	5	523
04:45 PM	6	143	38	27	5	112	67	95	3	18	6	10	530
Total	29	569	142	132	38	453	253	363	21	58	24	27	2109
05:00 PM	7	147	50	46	9	137	77	94	5	12	1	7	592
05:15 PM	13	154	53	49	11	132	74	86	9	18	12	3	614
05:30 PM	5	122	55	38	10	99	68	76	7	20	5	9	514
05:45 PM	6	143	51	45	6	104	58	81	5	15	3	7	524
Total	31	566	209	178	36	472	277	337	26	65	21	26	2244
Grand Total	60	1135	351	310	74	925	530	700	47	123	45	53	4353
Apprch %	3.9	73.4	22.7	23.7	5.7	70.7	41.5	54.8	3.7	55.7	20.4	24	
Total %	1.4	26.1	8.1	7.1	1.7	21.2	12.2	16.1	1.1	2.8	1	1.2	

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	5	**156**	33	194	32	**14**	106	152	57	93	3	153	15	4	5	24	523
04:45 PM	6	143	38	187	27	5	112	144	67	**95**	3	165	**18**	6	**10**	**34**	530
05:00 PM	7	147	50	204	46	9	**137**	**192**	**77**	94	5	**176**	12	1	7	20	592
05:15 PM	**13**	154	**53**	**220**	**49**	11	132	192	74	86	**9**	169	18	**12**	3	33	**614**
Total Volume	31	600	174	805	154	39	487	680	275	368	20	663	63	23	25	111	2259
% App. Total	3.9	74.5	21.6		22.6	5.7	71.6		41.5	55.5	3		56.8	20.7	22.5		
PHF	.596	.962	.821	.915	.786	.696	.889	.885	.893	.968	.556	.942	.875	.479	.625	.816	.920

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Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Belmont Street (Route 123) From East			Washington Street (Route 138/123) From South			CVS Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	4	1	1	0	2	3	3	0	0	0	0	14
04:15 PM	0	5	1	1	0	4	0	3	0	0	0	0	14
04:30 PM	0	3	2	0	0	1	6	3	0	0	0	0	15
04:45 PM	0	1	2	2	0	3	1	4	0	0	0	0	13
Total	0	13	6	4	0	10	10	13	0	0	0	0	56
05:00 PM	0	3	3	0	0	2	1	4	0	0	0	0	13
05:15 PM	0	5	1	0	0	2	0	4	0	0	0	0	12
05:30 PM	0	7	4	1	0	0	0	1	0	0	0	0	13
05:45 PM	0	3	0	3	0	1	0	1	0	0	0	0	8
Total	0	18	8	4	0	5	1	10	0	0	0	0	46
Grand Total	0	31	14	8	0	15	11	23	0	0	0	0	102
Apprch %	0	68.9	31.1	34.8	0	65.2	32.4	67.6	0	0	0	0	
Total %	0	30.4	13.7	7.8	0	14.7	10.8	22.5	0	0	0	0	

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	4	1	5	1	0	2	3	3	3	0	6	0	0	0	0	14
04:15 PM	0	**5**	1	**6**	1	0	**4**	**5**	0	3	0	3	0	0	0	0	14
04:30 PM	0	3	**2**	5	0	0	1	1	**6**	3	0	**9**	0	0	0	0	**15**
04:45 PM	0	1	2	3	**2**	0	3	5	1	**4**	0	5	0	0	0	0	13
Total Volume	0	13	6	19	4	0	10	14	10	13	0	23	0	0	0	0	56
% App. Total	0	68.4	31.6		28.6	0	71.4		43.5	56.5	0		0	0	0		
PHF	.000	.650	.750	.792	.500	.000	.625	.700	.417	.813	.000	.639	.000	.000	.000	.000	.933

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Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	5
04:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	1	3	0	0	0	3	0	0	0	1	9
05:00 PM	0	0	0	0	0	0	0	7	0	0	0	8	0	0	0	0	15
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	7	0	1	0	8	0	0	0	3	19
Grand Total	0	1	0	0	0	0	1	10	0	1	0	11	0	0	0	4	28
Apprch %	0	100	0	0	0	0	9.1	90.9	0	8.3	0	91.7	0	0	0	100	
Total %	0	3.6	0	0	0	0	3.6	35.7	0	3.6	0	39.3	0	0	0	14.3	

	Washington Street (Route 138) From North					Belmont Street (Route 123) From East					Washington Street (Route 138/123) From South					CVS Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	2	2	0	0	0	0	0	5
04:45 PM	0	0	0	0	0	0	0	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
05:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**7**	0	0	0	**8**	**8**	0	0	0	0	0	**15**
Total Volume	0	1	0	0	1	0	0	1	10	11	0	0	0	11	11	0	0	0	0	0	23
% App. Total	0	100	0	0		0	0	9.1	90.9		0	0	0	100		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.250	.357	.393	.000	.000	.000	.344	.344	.000	.000	.000	.000	.000	.383

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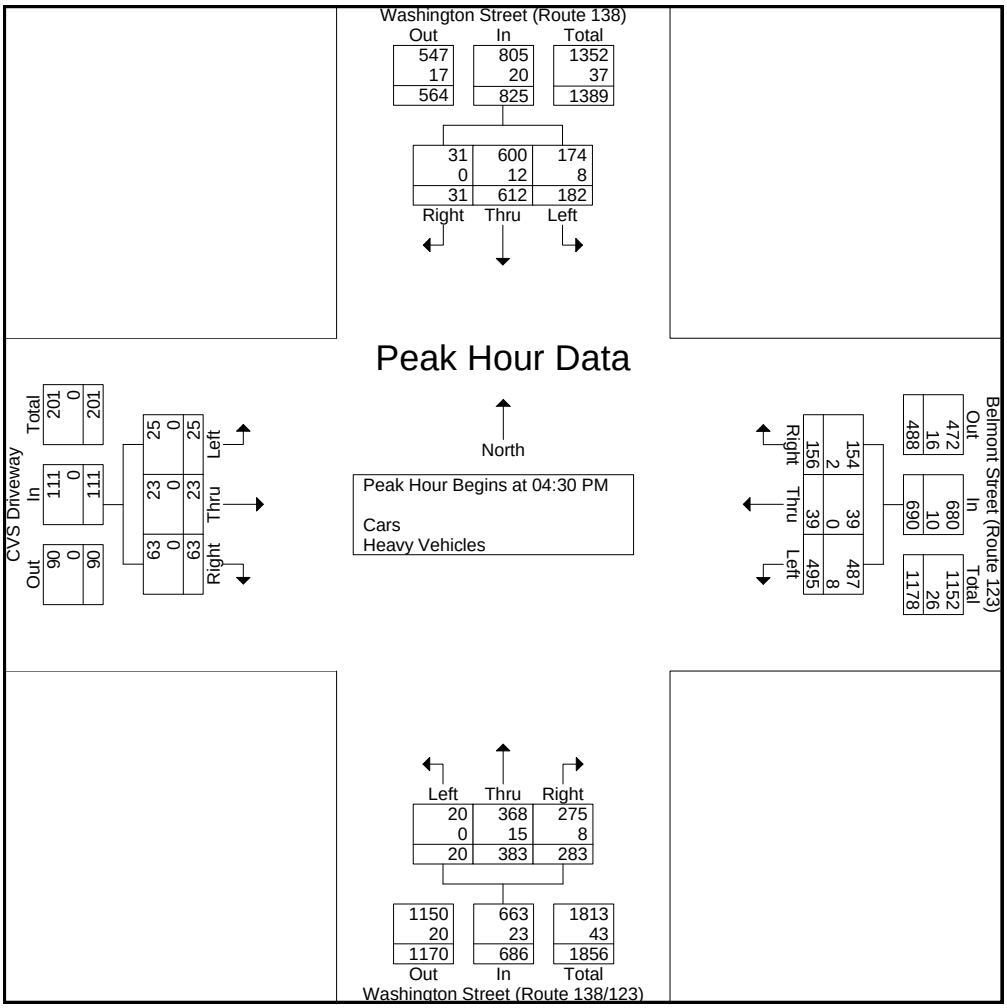
N/S: Washington Street (Route 138)
E/W: Belmont Street (Rte 123)/CVS Drive
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Belmont Street (Route 123) From East				Washington Street (Route 138/123) From South				CVS Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	5	**159**	35	199	32	**14**	107	153	63	96	3	162	15	4	5	24	538
04:45 PM	6	144	40	190	29	5	115	149	68	**99**	3	170	**18**	6	**10**	**34**	543
05:00 PM	7	150	53	210	46	9	**139**	**194**	**78**	98	5	**181**	12	1	7	20	605
05:15 PM	**13**	159	**54**	**226**	**49**	11	134	194	74	90	**9**	173	18	**12**	3	33	**626**
Total Volume	31	612	182	825	156	39	495	690	283	383	20	686	63	23	25	111	2312
% App. Total	3.8	74.2	22.1		22.6	5.7	71.7		41.3	55.8	2.9		56.8	20.7	22.5		
PHF	.596	.962	.843	.913	.796	.696	.890	.889	.907	.967	.556	.948	.875	.479	.625	.816	.923
Cars	31	600	174	805	154	39	487	680	275	368	20	663	63	23	25	111	2259
% Cars	100	98.0	95.6	97.6	98.7	100	98.4	98.6	97.2	96.1	100	96.6	100	100	100	100	97.7
Heavy Vehicles	0	12	8	20	2	0	8	10	8	15	0	23	0	0	0	0	53
% Heavy Vehicles	0	2.0	4.4	2.4	1.3	0	1.6	1.4	2.8	3.9	0	3.4	0	0	0	0	2.3



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N/S: Washington Street (Route 138)
E/W: Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-C
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	53	69	6	20	32	9	13	128	25	21	63	59	498
07:15 AM	18	77	10	22	27	11	13	151	28	36	91	90	574
07:30 AM	11	55	14	25	26	5	14	175	23	41	97	97	583
07:45 AM	13	72	23	35	36	4	10	153	25	48	74	75	568
Total	95	273	53	102	121	29	50	607	101	146	325	321	2223
08:00 AM	16	82	18	28	38	10	6	185	30	46	67	79	605
08:15 AM	20	94	14	19	25	14	7	105	45	85	67	65	560
08:30 AM	23	77	28	17	27	7	9	104	34	46	60	56	488
08:45 AM	22	86	18	20	42	8	5	101	44	59	42	65	512
Total	81	339	78	84	132	39	27	495	153	236	236	265	2165
Grand Total	176	612	131	186	253	68	77	1102	254	382	561	586	4388
Apprch %	19.2	66.6	14.3	36.7	49.9	13.4	5.4	76.9	17.7	25	36.7	38.3	
Total %	4	13.9	3	4.2	5.8	1.5	1.8	25.1	5.8	8.7	12.8	13.4	
Cars	169	579	125	176	240	62	74	1047	234	364	556	573	4199
% Cars	96	94.6	95.4	94.6	94.9	91.2	96.1	95	92.1	95.3	99.1	97.8	95.7
Heavy Vehicles	7	33	6	10	13	6	3	55	20	18	5	13	189
% Heavy Vehicles	4	5.4	4.6	5.4	5.1	8.8	3.9	5	7.9	4.7	0.9	2.2	4.3

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**18**	77	10	105	22	27	**11**	60	13	151	28	192	36	91	90	217	574
07:30 AM	11	55	14	80	25	26	5	56	**14**	175	23	212	41	**97**	**97**	**235**	583
07:45 AM	13	72	**23**	108	**35**	36	4	75	10	153	25	188	**48**	74	75	197	568
08:00 AM	16	**82**	18	**116**	28	**38**	10	**76**	6	**185**	**30**	**221**	46	67	79	192	**605**
Total Volume	58	286	65	409	110	127	30	267	43	664	106	813	171	329	341	841	2330
% App. Total	14.2	69.9	15.9		41.2	47.6	11.2		5.3	81.7	13		20.3	39.1	40.5		
PHF	.806	.872	.707	.881	.786	.836	.682	.878	.768	.897	.883	.920	.891	.848	.879	.895	.963
Cars	57	276	62	395	103	119	27	249	42	630	102	774	164	326	335	825	2243
% Cars	98.3	96.5	95.4	96.6	93.6	93.7	90.0	93.3	97.7	94.9	96.2	95.2	95.9	99.1	98.2	98.1	96.3
Heavy Vehicles	1	10	3	14	7	8	3	18	1	34	4	39	7	3	6	16	87
% Heavy Vehicles	1.7	3.5	4.6	3.4	6.4	6.3	10.0	6.7	2.3	5.1	3.8	4.8	4.1	0.9	1.8	1.9	3.7

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N/S: Washington Street (Route 138)
E/W: Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-C
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	51	64	6	18	31	8	13	126	22	19	63	59	480
07:15 AM	18	75	8	20	26	9	12	148	25	34	91	88	554
07:30 AM	11	54	14	23	26	5	14	162	22	41	97	95	564
07:45 AM	12	70	22	32	34	3	10	146	25	46	72	74	546
Total	92	263	50	93	117	25	49	582	94	140	323	316	2144
08:00 AM	16	77	18	28	33	10	6	174	30	43	66	78	579
08:15 AM	19	89	12	18	23	13	6	100	42	81	67	64	534
08:30 AM	21	70	28	17	26	7	9	97	31	44	59	52	461
08:45 AM	21	80	17	20	41	7	4	94	37	56	41	63	481
Total	77	316	75	83	123	37	25	465	140	224	233	257	2055
Grand Total	169	579	125	176	240	62	74	1047	234	364	556	573	4199
Apprch %	19.4	66.3	14.3	36.8	50.2	13	5.5	77.3	17.3	24.4	37.2	38.4	
Total %	4	13.8	3	4.2	5.7	1.5	1.8	24.9	5.6	8.7	13.2	13.6	

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**18**	75	8	101	20	26	9	55	12	148	25	185	34	91	88	213	554
07:30 AM	11	54	14	79	23	26	5	54	**14**	162	22	198	41	**97**	**95**	**233**	564
07:45 AM	12	70	**22**	104	**32**	**34**	3	69	10	146	25	181	**46**	72	74	192	546
08:00 AM	16	**77**	18	**111**	28	33	**10**	**71**	6	**174**	**30**	**210**	43	66	78	187	**579**
Total Volume	57	276	62	395	103	119	27	249	42	630	102	774	164	326	335	825	2243
% App. Total	14.4	69.9	15.7		41.4	47.8	10.8		5.4	81.4	13.2		19.9	39.5	40.6		
PHF	.792	.896	.705	.890	.805	.875	.675	.877	.750	.905	.850	.921	.891	.840	.882	.885	.968

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Client: VHB/J. Quitter

File Name : 81676 M-C
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	5	0	2	1	1	0	2	3	2	0	0	18
07:15 AM	0	2	2	2	1	2	1	3	3	2	0	2	20
07:30 AM	0	1	0	2	0	0	0	13	1	0	0	2	19
07:45 AM	1	2	1	3	2	1	0	7	0	2	2	1	22
Total	3	10	3	9	4	4	1	25	7	6	2	5	79
08:00 AM	0	5	0	0	5	0	0	11	0	3	1	1	26
08:15 AM	1	5	2	1	2	1	1	5	3	4	0	1	26
08:30 AM	2	7	0	0	1	0	0	7	3	2	1	4	27
08:45 AM	1	6	1	0	1	1	1	7	7	3	1	2	31
Total	4	23	3	1	9	2	2	30	13	12	3	8	110
Grand Total	7	33	6	10	13	6	3	55	20	18	5	13	189
Apprch %	15.2	71.7	13	34.5	44.8	20.7	3.8	70.5	25.6	50	13.9	36.1	
Total %	3.7	17.5	3.2	5.3	6.9	3.2	1.6	29.1	10.6	9.5	2.6	6.9	

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	5	0	5	0	**5**	0	**5**	0	**11**	0	11	3	**1**	1	5	26
08:15 AM	1	5	**2**	8	**1**	2	**1**	4	**1**	5	3	9	**4**	0	1	5	26
08:30 AM	**2**	**7**	0	**9**	0	1	0	1	0	7	3	10	2	1	**4**	**7**	27
08:45 AM	1	6	1	8	0	1	1	2	1	7	**7**	**15**	3	1	2	6	**31**
Total Volume	4	23	3	30	1	9	2	12	2	30	13	45	12	3	8	23	110
% App. Total	13.3	76.7	10		8.3	75	16.7		4.4	66.7	28.9		52.2	13	34.8		
PHF	.500	.821	.375	.833	.250	.450	.500	.600	.500	.682	.464	.750	.750	.750	.500	.821	.887

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N/S: Washington Street (Route 138)
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Client: VHB/J. Quitter

File Name : 81676 M-C
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	4
Grand Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	4
Apprch %	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0	100	
Total %	0	25	0	0	0	25	0	0	0	0	0	0	0	0	0	50	

	Washington Street (Route 138) From North					Main Street From East					Washington Street (Route 138) From South					Main Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	**2**	**2**	**3**
08:30 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	2	2	4
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.333

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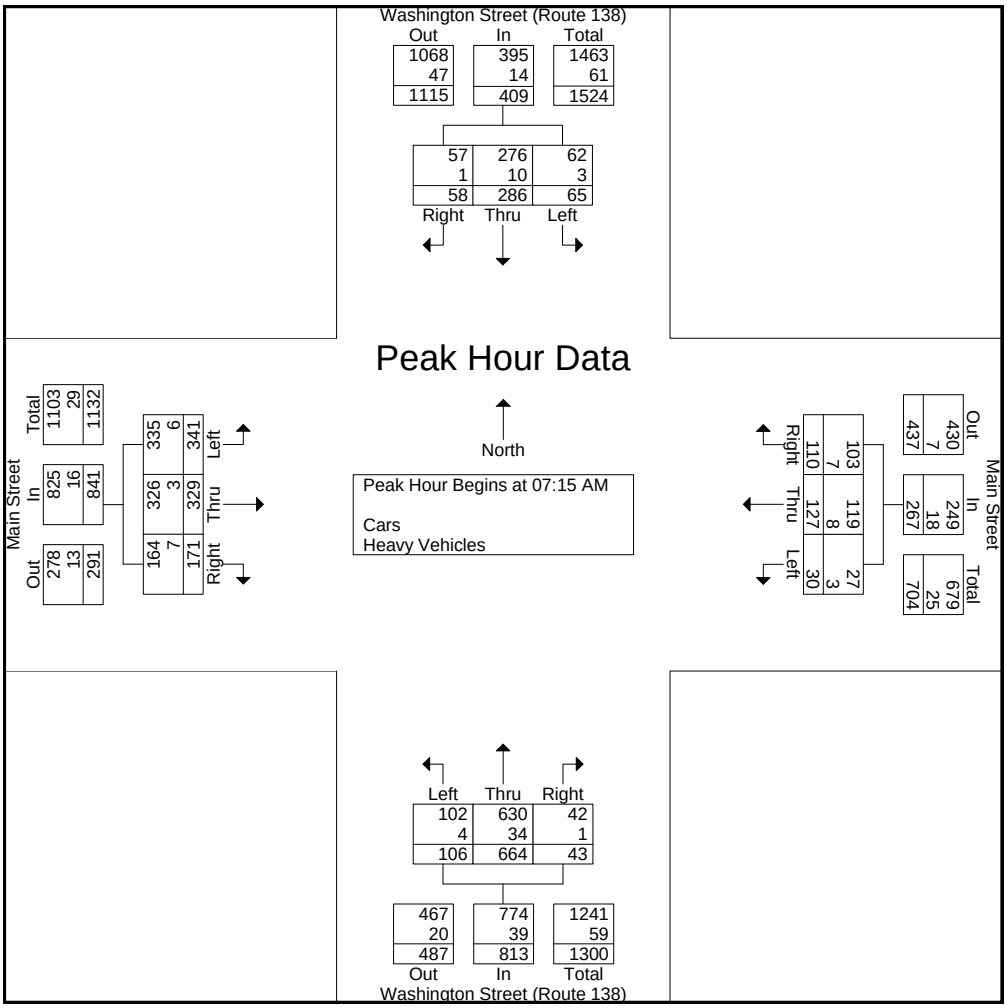
Page No : 1

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**18**	77	10	105	22	27	**11**	60	13	151	28	192	36	91	90	217	574
07:30 AM	11	55	14	80	25	26	5	56	**14**	175	23	212	41	**97**	**97**	**235**	583
07:45 AM	13	72	**23**	108	**35**	36	4	75	10	153	25	188	**48**	74	75	197	568
08:00 AM	16	**82**	18	**116**	28	**38**	10	**76**	6	**185**	**30**	**221**	46	67	79	192	**605**
Total Volume	58	286	65	409	110	127	30	267	43	664	106	813	171	329	341	841	2330
% App. Total	14.2	69.9	15.9		41.2	47.6	11.2		5.3	81.7	13		20.3	39.1	40.5		
PHF	.806	.872	.707	.881	.786	.836	.682	.878	.768	.897	.883	.920	.891	.848	.879	.895	.963
Cars	57	276	62	395	103	119	27	249	42	630	102	774	164	326	335	825	2243
% Cars	98.3	96.5	95.4	96.6	93.6	93.7	90.0	93.3	97.7	94.9	96.2	95.2	95.9	99.1	98.2	98.1	96.3
Heavy Vehicles	1	10	3	14	7	8	3	18	1	34	4	39	7	3	6	16	87
% Heavy Vehicles	1.7	3.5	4.6	3.4	6.4	6.3	10.0	6.7	2.3	5.1	3.8	4.8	4.1	0.9	1.8	1.9	3.7



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N/S: Washington Street (Route 138)
E/W: Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-CCC
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	46	112	23	21	86	17	17	88	67	47	52	51	627
04:15 PM	65	126	31	16	81	12	17	81	64	40	47	41	621
04:30 PM	55	120	39	28	75	13	17	93	60	38	51	27	616
04:45 PM	61	121	28	19	92	14	15	89	41	46	46	40	612
Total	227	479	121	84	334	56	66	351	232	171	196	159	2476
05:00 PM	53	120	27	19	83	12	10	110	51	69	53	44	651
05:15 PM	65	136	32	21	87	31	9	96	52	47	35	48	659
05:30 PM	68	143	40	22	62	11	10	82	50	37	46	31	602
05:45 PM	65	150	26	16	98	14	7	89	46	42	30	37	620
Total	251	549	125	78	330	68	36	377	199	195	164	160	2532
Grand Total	478	1028	246	162	664	124	102	728	431	366	360	319	5008
Apprch %	27.3	58.7	14	17.1	69.9	13.1	8.1	57.7	34.2	35	34.4	30.5	
Total %	9.5	20.5	4.9	3.2	13.3	2.5	2	14.5	8.6	7.3	7.2	6.4	
Cars	471	992	234	160	658	122	102	704	420	356	355	312	4886
% Cars	98.5	96.5	95.1	98.8	99.1	98.4	100	96.7	97.4	97.3	98.6	97.8	97.6
Heavy Vehicles	7	36	12	2	6	2	0	24	11	10	5	7	122
% Heavy Vehicles	1.5	3.5	4.9	1.2	0.9	1.6	0	3.3	2.6	2.7	1.4	2.2	2.4

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	55	120	**39**	214	**28**	75	13	116	**17**	93	**60**	170	38	51	27	116	616
04:45 PM	61	121	28	210	19	**92**	14	125	15	89	41	145	46	46	40	132	612
05:00 PM	53	120	27	200	19	83	12	114	10	**110**	51	**171**	**69**	**53**	44	**166**	651
05:15 PM	**65**	**136**	32	**233**	21	87	**31**	**139**	9	96	52	157	47	35	**48**	130	**659**
Total Volume	234	497	126	857	87	337	70	494	51	388	204	643	200	185	159	544	2538
% App. Total	27.3	58	14.7		17.6	68.2	14.2		7.9	60.3	31.7		36.8	34	29.2		
PHF	.900	.914	.808	.920	.777	.916	.565	.888	.750	.882	.850	.940	.725	.873	.828	.819	.963
Cars	228	480	119	827	86	334	69	489	51	372	197	620	195	184	155	534	2470
% Cars	97.4	96.6	94.4	96.5	98.9	99.1	98.6	99.0	100	95.9	96.6	96.4	97.5	99.5	97.5	98.2	97.3
Heavy Vehicles	6	17	7	30	1	3	1	5	0	16	7	23	5	1	4	10	68
% Heavy Vehicles	2.6	3.4	5.6	3.5	1.1	0.9	1.4	1.0	0	4.1	3.4	3.6	2.5	0.5	2.5	1.8	2.7

PRECISION
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N/S: Washington Street (Route 138)
E/W: Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-CCC
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Cars

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	45	108	22	21	85	16	17	84	67	47	52	51	615
04:15 PM	65	121	29	16	80	12	17	80	61	38	45	39	603
04:30 PM	54	115	35	28	75	13	17	91	57	35	50	27	597
04:45 PM	58	118	27	19	90	13	15	84	41	45	46	37	593
Total	222	462	113	84	330	54	66	339	226	165	193	154	2408
05:00 PM	52	114	26	18	83	12	10	106	48	69	53	43	634
05:15 PM	64	133	31	21	86	31	9	91	51	46	35	48	646
05:30 PM	68	137	38	21	61	11	10	79	50	35	44	31	585
05:45 PM	65	146	26	16	98	14	7	89	45	41	30	36	613
Total	249	530	121	76	328	68	36	365	194	191	162	158	2478
Grand Total	471	992	234	160	658	122	102	704	420	356	355	312	4886
Apprch %	27.8	58.5	13.8	17	70	13	8.3	57.4	34.3	34.8	34.7	30.5	
Total %	9.6	20.3	4.8	3.3	13.5	2.5	2.1	14.4	8.6	7.3	7.3	6.4	

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	52	114	26	192	18	83	12	113	**10**	**106**	48	**164**	**69**	**53**	43	**165**	634
05:15 PM	64	133	31	228	**21**	86	**31**	**138**	9	91	**51**	151	46	35	**48**	129	**646**
05:30 PM	**68**	137	**38**	**243**	21	61	11	93	10	79	50	139	35	44	31	110	585
05:45 PM	65	**146**	26	237	16	**98**	14	128	7	89	45	141	41	30	36	107	613
Total Volume	249	530	121	900	76	328	68	472	36	365	194	595	191	162	158	511	2478
% App. Total	27.7	58.9	13.4		16.1	69.5	14.4		6.1	61.3	32.6		37.4	31.7	30.9		
PHF	.915	.908	.796	.926	.905	.837	.548	.855	.900	.861	.951	.907	.692	.764	.823	.774	.959

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E/W: Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-CCC
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Main Street From East			Washington Street (Route 138) From South			Main Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	1	4	1	0	1	1	0	4	0	0	0	0	12
04:15 PM	0	5	2	0	1	0	0	1	3	2	2	2	18
04:30 PM	1	5	4	0	0	0	0	2	3	3	1	0	19
04:45 PM	3	3	1	0	2	1	0	5	0	1	0	3	19
Total	5	17	8	0	4	2	0	12	6	6	3	5	68
05:00 PM	1	6	1	1	0	0	0	4	3	0	0	1	17
05:15 PM	1	3	1	0	1	0	0	5	1	1	0	0	13
05:30 PM	0	6	2	1	1	0	0	3	0	2	2	0	17
05:45 PM	0	4	0	0	0	0	0	0	1	1	0	1	7
Total	2	19	4	2	2	0	0	12	5	4	2	2	54
Grand Total	7	36	12	2	6	2	0	24	11	10	5	7	122
Apprch %	12.7	65.5	21.8	20	60	20	0	68.6	31.4	45.5	22.7	31.8	
Total %	5.7	29.5	9.8	1.6	4.9	1.6	0	19.7	9	8.2	4.1	5.7	

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	5	2	7	0	1	0	1	0	1	**3**	4	2	**2**	2	**6**	18
04:30 PM	1	5	**4**	**10**	0	0	0	0	0	2	3	5	**3**	1	0	4	**19**
04:45 PM	**3**	3	1	7	0	**2**	**1**	**3**	0	**5**	0	5	1	0	**3**	4	19
05:00 PM	1	**6**	1	8	**1**	0	0	1	0	4	3	**7**	0	0	1	1	17
Total Volume	5	19	8	32	1	3	1	5	0	12	9	21	6	3	6	15	73
% App. Total	15.6	59.4	25		20	60	20		0	57.1	42.9		40	20	40		
PHF	.417	.792	.500	.800	.250	.375	.250	.417	.000	.600	.750	.750	.500	.375	.500	.625	.961

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-CCC
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3
05:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	3
Grand Total	0	0	0	2	0	0	0	0	0	1	0	0	2	1	0	0	6
Apprch %	0	0	0	100	0	0	0	0	0	100	0	0	66.7	33.3	0	0	
Total %	0	0	0	33.3	0	0	0	0	0	16.7	0	0	33.3	16.7	0	0	

	Washington Street (Route 138) From North					Main Street From East					Washington Street (Route 138) From South					Main Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	0	0	**3**	**3**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	5
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		66.7	33.3	0	0		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.417

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City, State: Easton, MA
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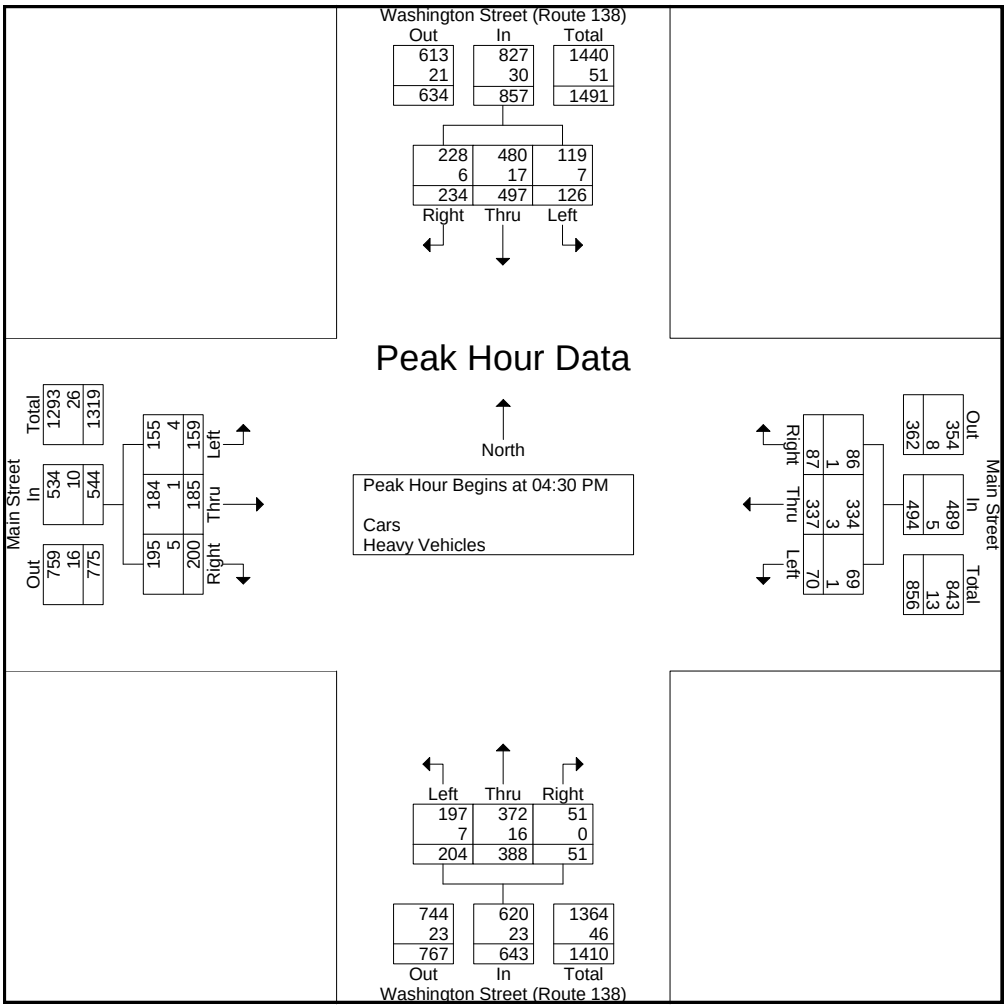
File Name : 81676 M-CCC
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Main Street From East				Washington Street (Route 138) From South				Main Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	55	120	**39**	214	**28**	75	13	116	**17**	93	**60**	170	38	51	27	116	616
04:45 PM	61	121	28	210	19	**92**	14	125	15	89	41	145	46	46	40	132	612
05:00 PM	53	120	27	200	19	83	12	114	10	**110**	51	**171**	**69**	**53**	44	**166**	651
05:15 PM	**65**	**136**	32	**233**	21	87	**31**	**139**	9	96	52	157	47	35	**48**	130	**659**
Total Volume	234	497	126	857	87	337	70	494	51	388	204	643	200	185	159	544	2538
% App. Total	27.3	58	14.7		17.6	68.2	14.2		7.9	60.3	31.7		36.8	34	29.2		
PHF	.900	.914	.808	.920	.777	.916	.565	.888	.750	.882	.850	.940	.725	.873	.828	.819	.963
Cars	228	480	119	827	86	334	69	489	51	372	197	620	195	184	155	534	2470
% Cars	97.4	96.6	94.4	96.5	98.9	99.1	98.6	99.0	100	95.9	96.6	96.4	97.5	99.5	97.5	98.2	97.3
Heavy Vehicles	6	17	7	30	1	3	1	5	0	16	7	23	5	1	4	10	68
% Heavy Vehicles	2.6	3.4	5.6	3.5	1.1	0.9	1.4	1.0	0	4.1	3.4	3.6	2.5	0.5	2.5	1.8	2.7



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N/S: Main Street/Center Street
E/W: Main Street/Lincoln Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-D
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	13	15	12	43	78	70	10	4	3	68	1	319
07:15 AM	1	14	19	7	30	42	144	12	0	1	100	5	375
07:30 AM	0	6	22	12	18	22	111	18	3	3	119	0	334
07:45 AM	0	8	17	17	28	35	89	10	0	6	113	1	324
Total	3	41	73	48	119	177	414	50	7	13	400	7	1352
08:00 AM	2	9	24	21	26	38	98	14	3	4	91	1	331
08:15 AM	0	17	23	19	39	27	111	17	0	3	102	1	359
08:30 AM	0	15	24	18	37	41	68	11	2	7	76	2	301
08:45 AM	1	13	17	19	36	32	84	17	8	5	87	2	321
Total	3	54	88	77	138	138	361	59	13	19	356	6	1312
Grand Total	6	95	161	125	257	315	775	109	20	32	756	13	2664
Apprch %	2.3	36.3	61.5	17.9	36.9	45.2	85.7	12.1	2.2	4	94.4	1.6	
Total %	0.2	3.6	6	4.7	9.6	11.8	29.1	4.1	0.8	1.2	28.4	0.5	
Cars	6	83	156	109	242	300	760	106	18	31	745	13	2569
% Cars	100	87.4	96.9	87.2	94.2	95.2	98.1	97.2	90	96.9	98.5	100	96.4
Heavy Vehicles	0	12	5	16	15	15	15	3	2	1	11	0	95
% Heavy Vehicles	0	12.6	3.1	12.8	5.8	4.8	1.9	2.8	10	3.1	1.5	0	3.6

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**14**	19	34	7	**30**	**42**	79	**144**	12	0	**156**	1	100	**5**	106	**375**
07:30 AM	0	6	22	28	12	18	22	52	111	**18**	**3**	132	3	**119**	0	**122**	334
07:45 AM	0	8	17	25	17	28	35	80	89	10	0	99	**6**	113	1	120	324
08:00 AM	**2**	9	**24**	**35**	**21**	26	38	**85**	98	14	3	115	4	91	1	96	331
Total Volume	3	37	82	122	57	102	137	296	442	54	6	502	14	423	7	444	1364
% App. Total	2.5	30.3	67.2		19.3	34.5	46.3		88	10.8	1.2		3.2	95.3	1.6		
PHF	.375	.661	.854	.871	.679	.850	.815	.871	.767	.750	.500	.804	.583	.889	.350	.910	.909
Cars	3	31	79	113	50	98	131	279	435	53	5	493	14	416	7	437	1322
% Cars	100	83.8	96.3	92.6	87.7	96.1	95.6	94.3	98.4	98.1	83.3	98.2	100	98.3	100	98.4	96.9
Heavy Vehicles	0	6	3	9	7	4	6	17	7	1	1	9	0	7	0	7	42
% Heavy Vehicles	0	16.2	3.7	7.4	12.3	3.9	4.4	5.7	1.6	1.9	16.7	1.8	0	1.7	0	1.6	3.1

PRECISION
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N/S: Main Street/Center Street
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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-D
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	12	15	12	41	74	70	9	4	2	67	1	309
07:15 AM	1	12	18	6	27	41	144	12	0	1	98	5	365
07:30 AM	0	5	22	10	18	22	108	18	2	3	117	0	325
07:45 AM	0	8	16	14	27	33	86	10	0	6	111	1	312
Total	3	37	71	42	113	170	408	49	6	12	393	7	1311
08:00 AM	2	6	23	20	26	35	97	13	3	4	90	1	320
08:15 AM	0	14	23	15	36	26	107	17	0	3	101	1	343
08:30 AM	0	14	23	14	33	39	66	10	1	7	74	2	283
08:45 AM	1	12	16	18	34	30	82	17	8	5	87	2	312
Total	3	46	85	67	129	130	352	57	12	19	352	6	1258
Grand Total	6	83	156	109	242	300	760	106	18	31	745	13	2569
Apprch %	2.4	33.9	63.7	16.7	37.2	46.1	86	12	2	3.9	94.4	1.6	
Total %	0.2	3.2	6.1	4.2	9.4	11.7	29.6	4.1	0.7	1.2	29	0.5	

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**12**	18	**31**	6	**27**	**41**	74	**144**	12	0	**156**	1	98	**5**	104	**365**
07:30 AM	0	5	22	27	10	18	22	50	108	**18**	2	128	3	**117**	0	**120**	325
07:45 AM	0	8	16	24	14	27	33	74	86	10	0	96	**6**	111	1	118	312
08:00 AM	**2**	6	**23**	31	**20**	26	35	**81**	97	13	**3**	113	4	90	1	95	320
Total Volume	3	31	79	113	50	98	131	279	435	53	5	493	14	416	7	437	1322
% App. Total	2.7	27.4	69.9		17.9	35.1	47		88.2	10.8	1		3.2	95.2	1.6		
PHF	.375	.646	.859	.911	.625	.907	.799	.861	.755	.736	.417	.790	.583	.889	.350	.910	.905

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E/W: Main Street/Lincoln Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-D
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	1	0	0	2	4	0	1	0	1	1	0	10
07:15 AM	0	2	1	1	3	1	0	0	0	0	2	0	10
07:30 AM	0	1	0	2	0	0	3	0	1	0	2	0	9
07:45 AM	0	0	1	3	1	2	3	0	0	0	2	0	12
Total	0	4	2	6	6	7	6	1	1	1	7	0	41
08:00 AM	0	3	1	1	0	3	1	1	0	0	1	0	11
08:15 AM	0	3	0	4	3	1	4	0	0	0	1	0	16
08:30 AM	0	1	1	4	4	2	2	1	1	0	2	0	18
08:45 AM	0	1	1	1	2	2	2	0	0	0	0	0	9
Total	0	8	3	10	9	8	9	2	1	0	4	0	54
Grand Total	0	12	5	16	15	15	15	3	2	1	11	0	95
Apprch %	0	70.6	29.4	34.8	32.6	32.6	75	15	10	8.3	91.7	0	
Total %	0	12.6	5.3	16.8	15.8	15.8	15.8	3.2	2.1	1.1	11.6	0	

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	**1**	1	3	1	2	6	3	0	0	3	0	**2**	0	**2**	12
08:00 AM	0	**3**	1	**4**	1	0	**3**	4	1	**1**	0	2	0	1	0	1	11
08:15 AM	0	3	0	3	**4**	3	1	8	**4**	0	0	**4**	0	1	0	1	16
08:30 AM	0	1	1	2	4	**4**	2	**10**	2	1	**1**	4	0	2	0	2	**18**
Total Volume	0	7	3	10	12	8	8	28	10	2	1	13	0	6	0	6	57
% App. Total	0	70	30		42.9	28.6	28.6		76.9	15.4	7.7		0	100	0		
PHF	.000	.583	.750	.625	.750	.500	.667	.700	.625	.500	.250	.813	.000	.750	.000	.750	.792

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Page No : 1

Groups Printed- Peds and Bicycles

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	2	0	0	0	1	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3
Total	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	5
Grand Total	0	0	0	1	0	0	1	4	0	0	0	2	0	0	0	1	9
Apprch %	0	0	0	100	0	0	20	80	0	0	0	100	0	0	0	100	
Total %	0	0	0	11.1	0	0	11.1	44.4	0	0	0	22.2	0	0	0	11.1	

	Main Street From North					Main Street From East					Center Street From South					Lincoln Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	**1**	**3**
Total Volume	0	0	0	1	1	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1	5
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.417

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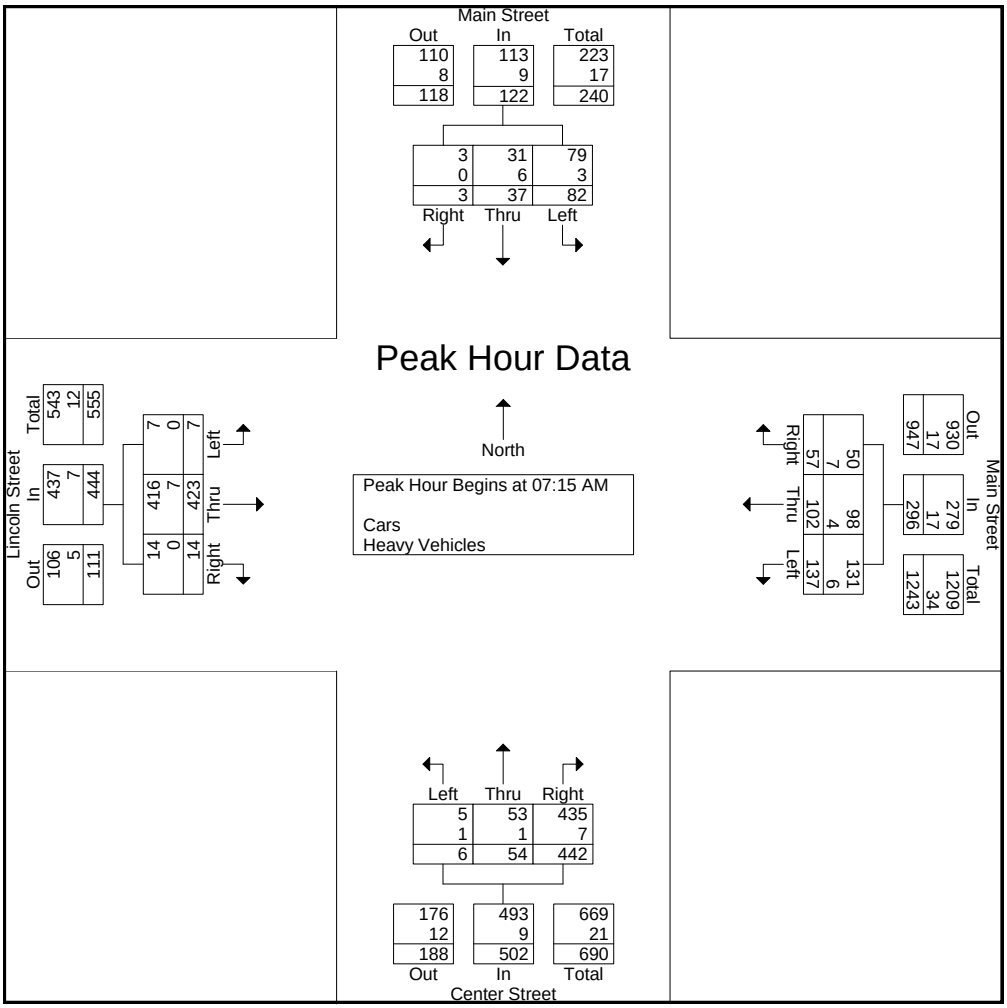
Page No : 1

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**14**	19	34	7	**30**	**42**	79	**144**	12	0	**156**	1	100	**5**	106	**375**
07:30 AM	0	6	22	28	12	18	22	52	111	**18**	**3**	132	3	**119**	0	**122**	334
07:45 AM	0	8	17	25	17	28	35	80	89	10	0	99	**6**	113	1	120	324
08:00 AM	**2**	9	**24**	**35**	**21**	26	38	**85**	98	14	3	115	4	91	1	96	331
Total Volume	3	37	82	122	57	102	137	296	442	54	6	502	14	423	7	444	1364
% App. Total	2.5	30.3	67.2		19.3	34.5	46.3		88	10.8	1.2		3.2	95.3	1.6		
PHF	.375	.661	.854	.871	.679	.850	.815	.871	.767	.750	.500	.804	.583	.889	.350	.910	.909
Cars	3	31	79	113	50	98	131	279	435	53	5	493	14	416	7	437	1322
% Cars	100	83.8	96.3	92.6	87.7	96.1	95.6	94.3	98.4	98.1	83.3	98.2	100	98.3	100	98.4	96.9
Heavy Vehicles	0	6	3	9	7	4	6	17	7	1	1	9	0	7	0	7	42
% Heavy Vehicles	0	16.2	3.7	7.4	12.3	3.9	4.4	5.7	1.6	1.9	16.7	1.8	0	1.7	0	1.6	3.1



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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-DDD
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	18	20	24	91	55	61	7	4	8	61	1	350
04:15 PM	1	15	21	17	104	87	49	8	5	7	52	2	368
04:30 PM	4	17	13	23	76	74	38	7	3	1	62	0	318
04:45 PM	2	18	19	30	98	106	54	10	2	5	54	0	398
Total	7	68	73	94	369	322	202	32	14	21	229	3	1434
05:00 PM	4	12	13	17	88	89	47	9	0	7	41	2	329
05:15 PM	3	16	19	30	83	93	45	7	3	3	37	1	340
05:30 PM	3	19	17	14	84	77	38	13	8	6	54	3	336
05:45 PM	1	17	13	26	92	87	35	19	4	4	45	2	345
Total	11	64	62	87	347	346	165	48	15	20	177	8	1350
Grand Total	18	132	135	181	716	668	367	80	29	41	406	11	2784
Apprch %	6.3	46.3	47.4	11.6	45.8	42.7	77.1	16.8	6.1	9	88.6	2.4	
Total %	0.6	4.7	4.8	6.5	25.7	24	13.2	2.9	1	1.5	14.6	0.4	
Cars	17	124	128	176	707	661	357	78	28	38	398	11	2723
% Cars	94.4	93.9	94.8	97.2	98.7	99	97.3	97.5	96.6	92.7	98	100	97.8
Heavy Vehicles	1	8	7	5	9	7	10	2	1	3	8	0	61
% Heavy Vehicles	5.6	6.1	5.2	2.8	1.3	1	2.7	2.5	3.4	7.3	2	0	2.2

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**18**	20	38	24	91	55	170	**61**	7	4	**72**	**8**	61	1	**70**	350
04:15 PM	1	15	**21**	37	17	**104**	87	208	49	8	**5**	62	7	52	**2**	61	368
04:30 PM	**4**	17	13	34	23	76	74	173	38	7	3	48	1	**62**	0	63	318
04:45 PM	2	18	19	**39**	**30**	98	**106**	**234**	54	**10**	2	66	5	54	0	59	**398**
Total Volume	7	68	73	148	94	369	322	785	202	32	14	248	21	229	3	253	1434
% App. Total	4.7	45.9	49.3		12	47	41		81.5	12.9	5.6		8.3	90.5	1.2		
PHF	.438	.944	.869	.949	.783	.887	.759	.839	.828	.800	.700	.861	.656	.923	.375	.904	.901
Cars	7	62	69	138	91	362	318	771	196	31	14	241	18	223	3	244	1394
% Cars	100	91.2	94.5	93.2	96.8	98.1	98.8	98.2	97.0	96.9	100	97.2	85.7	97.4	100	96.4	97.2
Heavy Vehicles	0	6	4	10	3	7	4	14	6	1	0	7	3	6	0	9	40
% Heavy Vehicles	0	8.8	5.5	6.8	3.2	1.9	1.2	1.8	3.0	3.1	0	2.8	14.3	2.6	0	3.6	2.8

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File Name : 81676 M-DDD
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	17	20	23	90	54	59	7	4	7	60	1	342
04:15 PM	1	11	19	17	102	86	48	8	5	6	50	2	355
04:30 PM	4	17	12	21	75	73	37	7	3	0	61	0	310
04:45 PM	2	17	18	30	95	105	52	9	2	5	52	0	387
Total	7	62	69	91	362	318	196	31	14	18	223	3	1394
05:00 PM	4	12	13	17	87	88	47	9	0	7	41	2	327
05:15 PM	3	15	19	29	83	91	45	7	3	3	37	1	336
05:30 PM	3	19	14	14	84	77	34	13	7	6	53	3	327
05:45 PM	0	16	13	25	91	87	35	18	4	4	44	2	339
Total	10	62	59	85	345	343	161	47	14	20	175	8	1329
Grand Total	17	124	128	176	707	661	357	78	28	38	398	11	2723
Apprch %	6.3	46.1	47.6	11.4	45.8	42.8	77.1	16.8	6	8.5	89	2.5	
Total %	0.6	4.6	4.7	6.5	26	24.3	13.1	2.9	1	1.4	14.6	0.4	

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**17**	**20**	**37**	23	90	54	167	**59**	7	4	**70**	**7**	60	1	**68**	342
04:15 PM	1	11	19	31	17	**102**	86	205	48	8	**5**	61	6	50	**2**	58	355
04:30 PM	**4**	17	12	33	21	75	73	169	37	7	3	47	0	**61**	0	61	310
04:45 PM	2	17	18	37	**30**	95	**105**	**230**	52	**9**	2	63	5	52	0	57	**387**
Total Volume	7	62	69	138	91	362	318	771	196	31	14	241	18	223	3	244	1394
% App. Total	5.1	44.9	50		11.8	47	41.2		81.3	12.9	5.8		7.4	91.4	1.2		
PHF	.438	.912	.863	.932	.758	.887	.757	.838	.831	.861	.700	.861	.643	.914	.375	.897	.901

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Page No : 1

Groups Printed- Heavy Vehicles

	Main Street From North			Main Street From East			Center Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	1	1	1	2	0	0	1	1	0	8
04:15 PM	0	4	2	0	2	1	1	0	0	1	2	0	13
04:30 PM	0	0	1	2	1	1	1	0	0	1	1	0	8
04:45 PM	0	1	1	0	3	1	2	1	0	0	2	0	11
Total	0	6	4	3	7	4	6	1	0	3	6	0	40
05:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	2
05:15 PM	0	1	0	1	0	2	0	0	0	0	0	0	4
05:30 PM	0	0	3	0	0	0	4	0	1	0	1	0	9
05:45 PM	1	1	0	1	1	0	0	1	0	0	1	0	6
Total	1	2	3	2	2	3	4	1	1	0	2	0	21
Grand Total	1	8	7	5	9	7	10	2	1	3	8	0	61
Apprch %	6.2	50	43.8	23.8	42.9	33.3	76.9	15.4	7.7	27.3	72.7	0	
Total %	1.6	13.1	11.5	8.2	14.8	11.5	16.4	3.3	1.6	4.9	13.1	0	

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	1	1	**1**	3	**2**	0	0	2	**1**	1	0	2	8
04:15 PM	0	**4**	**2**	**6**	0	2	1	3	1	0	0	1	1	**2**	0	**3**	**13**
04:30 PM	0	0	1	1	**2**	1	1	**4**	1	0	0	1	1	1	0	2	8
04:45 PM	0	1	1	2	0	**3**	1	4	2	**1**	0	**3**	0	2	0	2	11
Total Volume	0	6	4	10	3	7	4	14	6	1	0	7	3	6	0	9	40
% App. Total	0	60	40		21.4	50	28.6		85.7	14.3	0		33.3	66.7	0		
PHF	.000	.375	.500	.417	.375	.583	1.000	.875	.750	.250	.000	.583	.750	.750	.000	.750	.769

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Groups Printed- Peds and Bicycles

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	6
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	2	0	0	0	6	0	1	0	0	10
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	1	0	2	0	0	0	6	0	2	0	0	11
Apprch %	0	0	0	0	0	33.3	0	66.7	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	0	9.1	0	18.2	0	0	0	54.5	0	18.2	0	0	

	Main Street From North					Main Street From East					Center Street From South					Lincoln Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	1	1	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**5**	0	0	0	0	0	**6**
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**1**	0	0	**1**	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	2	3	0	0	0	6	6	0	1	0	0	1	10
% App. Total	0	0	0	0		0	33.3	0	66.7		0	0	0	100		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.500	.750	.000	.000	.000	.300	.300	.000	.250	.000	.000	.250	.417

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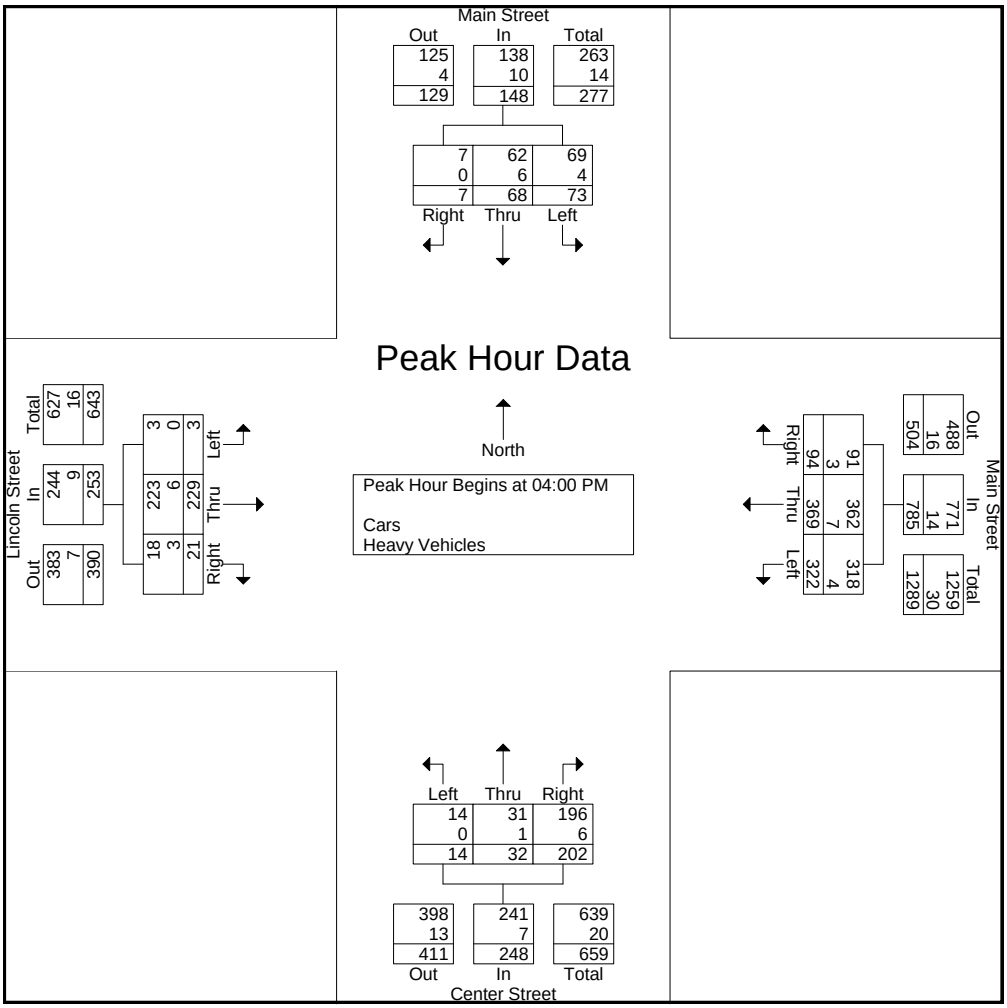
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-DDD
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Main Street From North				Main Street From East				Center Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**18**	20	38	24	91	55	170	**61**	7	4	**72**	**8**	61	1	**70**	350
04:15 PM	1	15	**21**	37	17	**104**	87	208	49	8	**5**	62	7	52	**2**	61	368
04:30 PM	**4**	17	13	34	23	76	74	173	38	7	3	48	1	**62**	0	63	318
04:45 PM	2	18	19	**39**	**30**	98	**106**	**234**	54	**10**	2	66	5	54	0	59	**398**
Total Volume	7	68	73	148	94	369	322	785	202	32	14	248	21	229	3	253	1434
% App. Total	4.7	45.9	49.3		12	47	41		81.5	12.9	5.6		8.3	90.5	1.2		
PHF	.438	.944	.869	.949	.783	.887	.759	.839	.828	.800	.700	.861	.656	.923	.375	.904	.901
Cars	7	62	69	138	91	362	318	771	196	31	14	241	18	223	3	244	1394
% Cars	100	91.2	94.5	93.2	96.8	98.1	98.8	98.2	97.0	96.9	100	97.2	85.7	97.4	100	96.4	97.2
Heavy Vehicles	0	6	4	10	3	7	4	14	6	1	0	7	3	6	0	9	40
% Heavy Vehicles	0	8.8	5.5	6.8	3.2	1.9	1.2	1.8	3.0	3.1	0	2.8	14.3	2.6	0	3.6	2.8



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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-E
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	38	0	0	0	45	0	2	1	2	0	73	24	185
07:15 AM	29	0	0	0	30	0	1	0	0	0	105	46	211
07:30 AM	10	0	0	0	22	0	1	1	0	0	117	32	183
07:45 AM	12	0	0	0	27	0	2	0	0	0	123	22	186
Total	89	0	0	0	124	0	6	2	2	0	418	124	765
08:00 AM	16	0	1	0	26	0	1	1	0	0	100	35	180
08:15 AM	15	1	1	1	34	0	5	3	1	0	102	26	189
08:30 AM	13	0	1	1	36	0	2	1	0	0	85	20	159
08:45 AM	16	0	0	0	45	0	1	3	2	0	93	26	186
Total	60	1	3	2	141	0	9	8	3	0	380	107	714
Grand Total	149	1	3	2	265	0	15	10	5	0	798	231	1479
Apprch %	97.4	0.7	2	0.7	99.3	0	50	33.3	16.7	0	77.6	22.4	
Total %	10.1	0.1	0.2	0.1	17.9	0	1	0.7	0.3	0	54	15.6	
Cars	142	1	3	1	254	0	15	10	4	0	787	224	1441
% Cars	95.3	100	100	50	95.8	0	100	100	80	0	98.6	97	97.4
Heavy Vehicles	7	0	0	1	11	0	0	0	1	0	11	7	38
% Heavy Vehicles	4.7	0	0	50	4.2	0	0	0	20	0	1.4	3	2.6

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**38**	0	0	**38**	0	**45**	0	**45**	**2**	**1**	**2**	**5**	0	73	24	97	185
07:15 AM	29	0	0	29	0	30	0	30	1	0	0	1	0	105	**46**	**151**	**211**
07:30 AM	10	0	0	10	0	22	0	22	1	1	0	2	0	117	32	149	183
07:45 AM	12	0	0	12	0	27	0	27	2	0	0	2	0	**123**	22	145	186
Total Volume	89	0	0	89	0	124	0	124	6	2	2	10	0	418	124	542	765
% App. Total	100	0	0		0	100	0		60	20	20		0	77.1	22.9		
PHF	.586	.000	.000	.586	.000	.689	.000	.689	.750	.500	.250	.500	.000	.850	.674	.897	.906
Cars	88	0	0	88	0	117	0	117	6	2	2	10	0	412	120	532	747
% Cars	98.9	0	0	98.9	0	94.4	0	94.4	100	100	100	100	0	98.6	96.8	98.2	97.6
Heavy Vehicles	1	0	0	1	0	7	0	7	0	0	0	0	0	6	4	10	18
% Heavy Vehicles	1.1	0	0	1.1	0	5.6	0	5.6	0	0	0	0	0	1.4	3.2	1.8	2.4

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E/W: Lincoln Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-E
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Cars

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	37	0	0	0	43	0	2	1	2	0	71	22	178
07:15 AM	29	0	0	0	27	0	1	0	0	0	104	46	207
07:30 AM	10	0	0	0	21	0	1	1	0	0	116	32	181
07:45 AM	12	0	0	0	26	0	2	0	0	0	121	20	181
Total	88	0	0	0	117	0	6	2	2	0	412	120	747
08:00 AM	15	0	1	0	26	0	1	1	0	0	98	34	176
08:15 AM	14	1	1	1	34	0	5	3	1	0	101	24	185
08:30 AM	10	0	1	0	34	0	2	1	0	0	83	20	151
08:45 AM	15	0	0	0	43	0	1	3	1	0	93	26	182
Total	54	1	3	1	137	0	9	8	2	0	375	104	694
Grand Total	142	1	3	1	254	0	15	10	4	0	787	224	1441
Apprch %	97.3	0.7	2.1	0.4	99.6	0	51.7	34.5	13.8	0	77.8	22.2	
Total %	9.9	0.1	0.2	0.1	17.6	0	1	0.7	0.3	0	54.6	15.5	

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**37**	0	0	**37**	0	**43**	0	**43**	**2**	**1**	**2**	**5**	0	71	22	93	178
07:15 AM	29	0	0	29	0	27	0	27	1	0	0	1	0	104	**46**	**150**	**207**
07:30 AM	10	0	0	10	0	21	0	21	1	1	0	2	0	116	32	148	181
07:45 AM	12	0	0	12	0	26	0	26	2	0	0	2	0	**121**	20	141	181
Total Volume	88	0	0	88	0	117	0	117	6	2	2	10	0	412	120	532	747
% App. Total	100	0	0		0	100	0		60	20	20		0	77.4	22.6		
PHF	.595	.000	.000	.595	.000	.680	.000	.680	.750	.500	.250	.500	.000	.851	.652	.887	.902

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-E
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Heavy Vehicles

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	1	0	0	0	2	0	0	0	0	0	2	2	7
07:15 AM	0	0	0	0	3	0	0	0	0	0	1	0	4
07:30 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
07:45 AM	0	0	0	0	1	0	0	0	0	0	2	2	5
Total	1	0	0	0	7	0	0	0	0	0	6	4	18
08:00 AM	1	0	0	0	0	0	0	0	0	0	2	1	4
08:15 AM	1	0	0	0	0	0	0	0	0	0	1	2	4
08:30 AM	3	0	0	1	2	0	0	0	0	0	2	0	8
08:45 AM	1	0	0	0	2	0	0	0	1	0	0	0	4
Total	6	0	0	1	4	0	0	0	1	0	5	3	20
Grand Total	7	0	0	1	11	0	0	0	1	0	11	7	38
Apprch %	100	0	0	8.3	91.7	0	0	0	100	0	61.1	38.9	
Total %	18.4	0	0	2.6	28.9	0	0	0	2.6	0	28.9	18.4	

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	**2**	**4**	5
08:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	2	1	3	4
08:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	2	3	4
08:30 AM	**3**	0	0	**3**	**1**	**2**	0	**3**	0	0	0	0	0	2	0	2	**8**
Total Volume	5	0	0	5	1	3	0	4	0	0	0	0	0	7	5	12	21
% App. Total	100	0	0		25	75	0		0	0	0		0	58.3	41.7		
PHF	.417	.000	.000	.417	.250	.375	.000	.333	.000	.000	.000	.000	.000	.875	.625	.750	.656

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Client: VHB/J. Quitter

File Name : 81676 M-E
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
Grand Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6	7
Apprch %	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	100	
Total %	0	0	0	14.3	0	0	0	0	0	0	0	0	0	0	0	85.7	

	Barrows Street From North					Lincoln Street From East					Barrows Street From South					Lincoln Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	**3**
Total Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	6
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417	.417	.500

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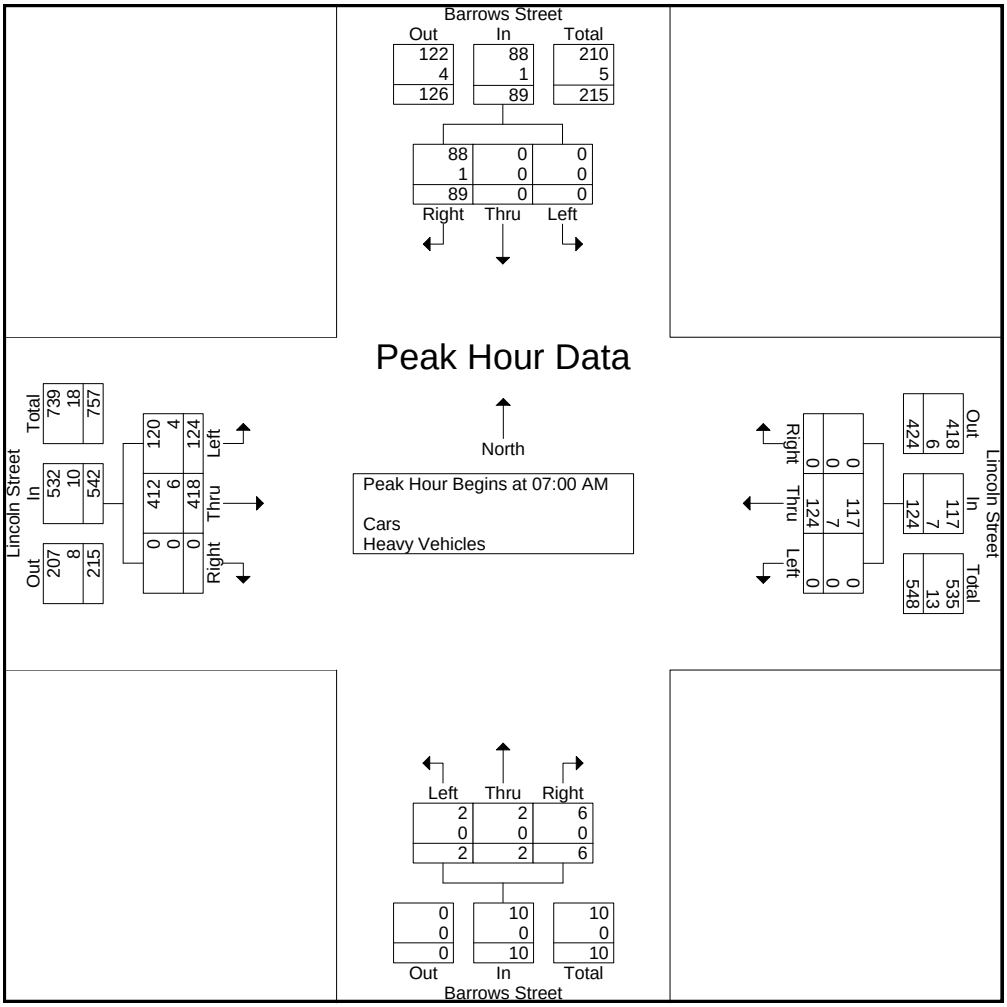
Page No : 1

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**38**	0	0	**38**	0	**45**	0	**45**	**2**	**1**	**2**	**5**	0	73	24	97	185
07:15 AM	29	0	0	29	0	30	0	30	1	0	0	1	0	105	**46**	**151**	**211**
07:30 AM	10	0	0	10	0	22	0	22	1	1	0	2	0	117	32	149	183
07:45 AM	12	0	0	12	0	27	0	27	2	0	0	2	0	**123**	22	145	186
Total Volume	89	0	0	89	0	124	0	124	6	2	2	10	0	418	124	542	765
% App. Total	100	0	0		0	100	0		60	20	20		0	77.1	22.9		
PHF	.586	.000	.000	.586	.000	.689	.000	.689	.750	.500	.250	.500	.000	.850	.674	.897	.906
Cars	88	0	0	88	0	117	0	117	6	2	2	10	0	412	120	532	747
% Cars	98.9	0	0	98.9	0	94.4	0	94.4	100	100	100	100	0	98.6	96.8	98.2	97.6
Heavy Vehicles	1	0	0	1	0	7	0	7	0	0	0	0	0	6	4	10	18
% Heavy Vehicles	1.1	0	0	1.1	0	5.6	0	5.6	0	0	0	0	0	1.4	3.2	1.8	2.4



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File Name : 81676 M-EEE
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	28	0	1	0	94	0	4	2	2	0	65	24	220
04:15 PM	30	0	1	0	108	0	6	0	4	0	55	20	224
04:30 PM	31	0	1	1	78	0	4	1	1	0	57	14	188
04:45 PM	40	0	2	1	96	0	4	1	2	0	52	10	208
Total	129	0	5	2	376	0	18	4	9	0	229	68	840
05:00 PM	36	0	0	2	113	0	6	1	2	0	56	14	230
05:15 PM	43	0	0	0	101	0	4	1	3	0	56	16	224
05:30 PM	47	0	0	0	96	0	2	0	3	0	64	22	234
05:45 PM	41	0	0	0	94	0	5	2	1	0	52	15	210
Total	167	0	0	2	404	0	17	4	9	0	228	67	898
Grand Total	296	0	5	4	780	0	35	8	18	0	457	135	1738
Apprch %	98.3	0	1.7	0.5	99.5	0	57.4	13.1	29.5	0	77.2	22.8	
Total %	17	0	0.3	0.2	44.9	0	2	0.5	1	0	26.3	7.8	
Cars	295	0	5	4	772	0	35	7	18	0	449	134	1719
% Cars	99.7	0	100	100	99	0	100	87.5	100	0	98.2	99.3	98.9
Heavy Vehicles	1	0	0	0	8	0	0	1	0	0	8	1	19
% Heavy Vehicles	0.3	0	0	0	1	0	0	12.5	0	0	1.8	0.7	1.1

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	36	0	0	36	**2**	**113**	0	**115**	**6**	1	2	**9**	0	56	14	70	230
05:15 PM	43	0	0	43	0	101	0	101	4	1	**3**	8	0	56	16	72	224
05:30 PM	**47**	0	0	**47**	0	96	0	96	2	0	3	5	0	**64**	**22**	**86**	**234**
05:45 PM	41	0	0	41	0	94	0	94	5	**2**	1	8	0	52	15	67	210
Total Volume	167	0	0	167	2	404	0	406	17	4	9	30	0	228	67	295	898
% App. Total	100	0	0		0.5	99.5	0		56.7	13.3	30		0	77.3	22.7		
PHF	.888	.000	.000	.888	.250	.894	.000	.883	.708	.500	.750	.833	.000	.891	.761	.858	.959
Cars	167	0	0	167	2	402	0	404	17	3	9	29	0	226	67	293	893
% Cars	100	0	0	100	100	99.5	0	99.5	100	75.0	100	96.7	0	99.1	100	99.3	99.4
Heavy Vehicles	0	0	0	0	0	2	0	2	0	1	0	1	0	2	0	2	5
% Heavy Vehicles	0	0	0	0	0	0.5	0	0.5	0	25.0	0	3.3	0	0.9	0	0.7	0.6

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E/W: Lincoln Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-EEE
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	28	0	1	0	94	0	4	2	2	0	63	24	218
04:15 PM	29	0	1	0	106	0	6	0	4	0	53	19	218
04:30 PM	31	0	1	1	77	0	4	1	1	0	55	14	185
04:45 PM	40	0	2	1	93	0	4	1	2	0	52	10	205
Total	128	0	5	2	370	0	18	4	9	0	223	67	826
05:00 PM	36	0	0	2	112	0	6	1	2	0	56	14	229
05:15 PM	43	0	0	0	101	0	4	1	3	0	56	16	224
05:30 PM	47	0	0	0	95	0	2	0	3	0	63	22	232
05:45 PM	41	0	0	0	94	0	5	1	1	0	51	15	208
Total	167	0	0	2	402	0	17	3	9	0	226	67	893
Grand Total	295	0	5	4	772	0	35	7	18	0	449	134	1719
Apprch %	98.3	0	1.7	0.5	99.5	0	58.3	11.7	30	0	77	23	
Total %	17.2	0	0.3	0.2	44.9	0	2	0.4	1	0	26.1	7.8	

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	36	0	0	36	**2**	**112**	0	**114**	**6**	**1**	2	**9**	0	56	14	70	229
05:15 PM	43	0	0	43	0	101	0	101	4	1	**3**	8	0	56	16	72	224
05:30 PM	**47**	0	0	**47**	0	95	0	95	2	0	3	5	0	**63**	**22**	**85**	**232**
05:45 PM	41	0	0	41	0	94	0	94	5	1	1	7	0	51	15	66	208
Total Volume	167	0	0	167	2	402	0	404	17	3	9	29	0	226	67	293	893
% App. Total	100	0	0		0.5	99.5	0		58.6	10.3	31		0	77.1	22.9		
PHF	.888	.000	.000	.888	.250	.897	.000	.886	.708	.750	.750	.806	.000	.897	.761	.862	.962

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File Name : 81676 M-EEE
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Barrows Street From North			Lincoln Street From East			Barrows Street From South			Lincoln Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	1	0	0	0	2	0	0	0	0	0	2	1	6
04:30 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
04:45 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
Total	1	0	0	0	6	0	0	0	0	0	6	1	14
05:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	0	0	0	0	2	0	0	1	0	0	2	0	5
Grand Total	1	0	0	0	8	0	0	1	0	0	8	1	19
Apprch %	100	0	0	0	100	0	0	100	0	0	88.9	11.1	
Total %	5.3	0	0	0	42.1	0	0	5.3	0	0	42.1	5.3	

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	2	2
04:15 PM	**1**	0	0	**1**	0	2	0	2	0	0	0	0	0	2	**1**	**3**	**6**
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
04:45 PM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	3
Total Volume	1	0	0	1	0	6	0	6	0	0	0	0	0	6	1	7	14
% App. Total	100	0	0		0	100	0		0	0	0		0	85.7	14.3		
PHF	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.750	.250	.583	.583

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File Name : 81676 M-EEE
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	1	6
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	5	0	1	0	0	7
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
Total	0	0	0	0	0	1	0	1	0	0	0	13	0	1	0	1	17
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	3	6
Grand Total	0	0	0	0	0	1	0	1	1	0	0	15	0	1	0	4	23
Apprch %	0	0	0	0	0	50	0	50	6.2	0	0	93.8	0	20	0	80	
Total %	0	0	0	0	0	4.3	0	4.3	4.3	0	0	65.2	0	4.3	0	17.4	

	Barrows Street From North					Lincoln Street From East					Barrows Street From South					Lincoln Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	**1**	**0**	**0**	**1**	0	0	0	4	4	0	0	0	**1**	**1**	6
04:30 PM	0	0	0	0	0	0	0	0	**1**	1	0	0	0	**5**	**5**	0	**1**	0	0	1	**7**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	1	0	1	2	0	0	0	13	13	0	1	0	1	2	17
% App. Total	0	0	0	0		0	50	0	50		0	0	0	100		0	50	0	50		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.500	.000	.000	.000	.650	.650	.000	.250	.000	.250	.500	.607

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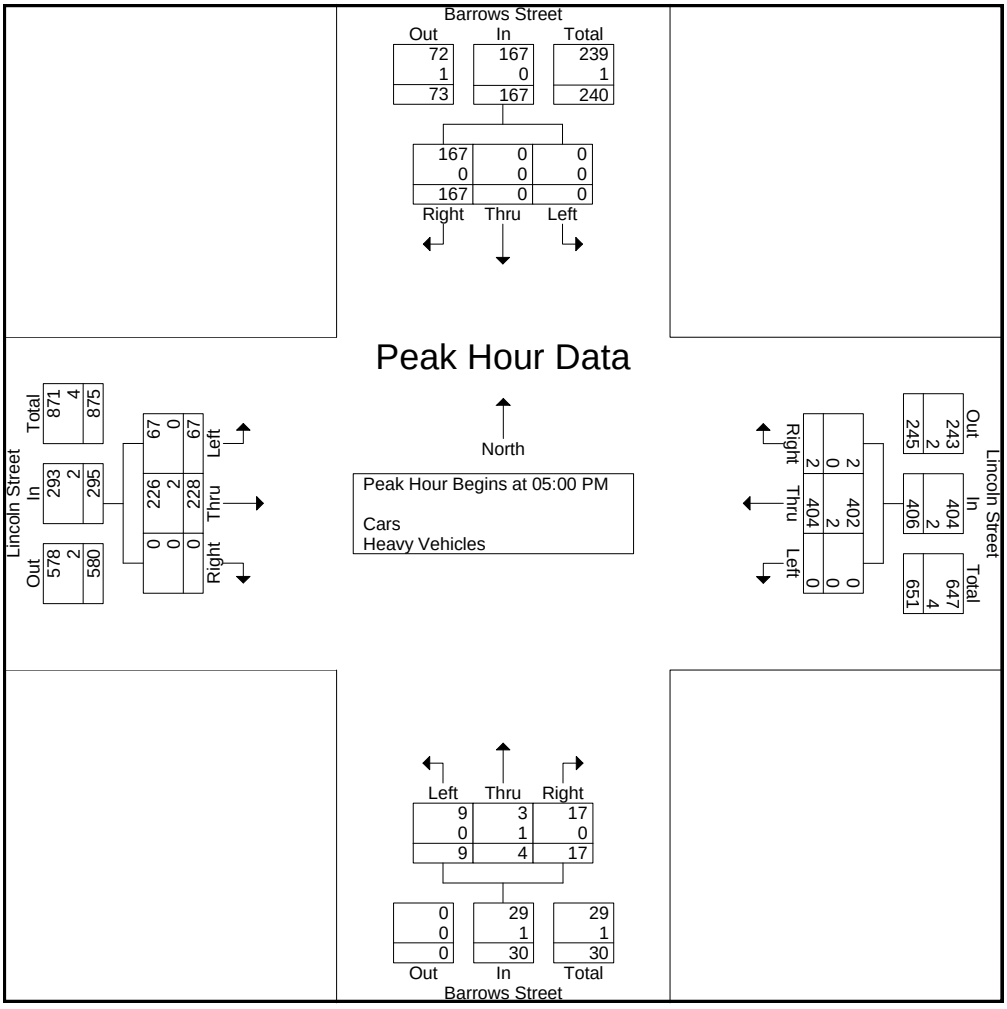
Page No : 1

	Barrows Street From North				Lincoln Street From East				Barrows Street From South				Lincoln Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	36	0	0	36	**2**	**113**	0	**115**	**6**	1	2	**9**	0	56	14	70	230
05:15 PM	43	0	0	43	0	101	0	101	4	1	**3**	8	0	56	16	72	224
05:30 PM	**47**	0	0	**47**	0	96	0	96	2	0	3	5	0	**64**	**22**	**86**	**234**
05:45 PM	41	0	0	41	0	94	0	94	5	**2**	1	8	0	52	15	67	210
Total Volume	167	0	0	167	2	404	0	406	17	4	9	30	0	228	67	295	898
% App. Total	100	0	0		0.5	99.5	0		56.7	13.3	30		0	77.3	22.7		
PHF	.888	.000	.000	.888	.250	.894	.000	.883	.708	.500	.750	.833	.000	.891	.761	.858	.959
Cars	167	0	0	167	2	402	0	404	17	3	9	29	0	226	67	293	893
% Cars	100	0	0	100	100	99.5	0	99.5	100	75.0	100	96.7	0	99.1	100	99.3	99.4
Heavy Vehicles	0	0	0	0	0	2	0	2	0	1	0	1	0	2	0	2	5
% Heavy Vehicles	0	0	0	0	0	0.5	0	0.5	0	25.0	0	3.3	0	0.9	0	0.7	0.6



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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-F
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	43	11	4	22	13	24	117
07:15 AM	49	14	3	12	27	40	145
07:30 AM	26	13	8	5	22	38	112
07:45 AM	26	6	4	10	13	30	89
Total	144	44	19	49	75	132	463
08:00 AM	40	10	0	11	26	34	121
08:15 AM	36	10	7	12	21	35	121
08:30 AM	39	13	4	7	20	25	108
08:45 AM	30	16	12	8	25	27	118
Total	145	49	23	38	92	121	468
Grand Total	289	93	42	87	167	253	931
Apprch %	75.7	24.3	32.6	67.4	39.8	60.2	
Total %	31	10	4.5	9.3	17.9	27.2	
Cars	273	91	39	81	156	235	875
% Cars	94.5	97.8	92.9	93.1	93.4	92.9	94
Heavy Vehicles	16	2	3	6	11	18	56
% Heavy Vehicles	5.5	2.2	7.1	6.9	6.6	7.1	6

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**40**	10	50	0	11	11	**26**	34	**60**	**121**
08:15 AM	**36**	**10**	**46**	**7**	**12**	19	21	**35**	56	121
08:30 AM	39	13	**52**	4	7	11	20	25	45	108
08:45 AM	30	**16**	46	**12**	8	**20**	25	27	52	118
Total Volume	145	49	194	23	38	61	92	121	213	468
% App. Total	74.7	25.3		37.7	62.3		43.2	56.8		
PHF	.906	.766	.933	.479	.792	.763	.885	.864	.888	.967
Cars	134	47	181	21	33	54	86	110	196	431
% Cars	92.4	95.9	93.3	91.3	86.8	88.5	93.5	90.9	92.0	92.1
Heavy Vehicles	11	2	13	2	5	7	6	11	17	37
% Heavy Vehicles	7.6	4.1	6.7	8.7	13.2	11.5	6.5	9.1	8.0	7.9

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File Name : 81676 M-F
Site Code : 10111.31
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Page No : 1

Groups Printed- Cars

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	42	11	4	22	10	23	112
07:15 AM	47	14	2	12	27	39	141
07:30 AM	25	13	8	5	20	36	107
07:45 AM	25	6	4	9	13	27	84
Total	139	44	18	48	70	125	444
08:00 AM	36	9	0	9	26	30	110
08:15 AM	32	10	7	10	21	34	114
08:30 AM	38	12	4	6	17	21	98
08:45 AM	28	16	10	8	22	25	109
Total	134	47	21	33	86	110	431
Grand Total	273	91	39	81	156	235	875
Apprch %	75	25	32.5	67.5	39.9	60.1	
Total %	31.2	10.4	4.5	9.3	17.8	26.9	

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	42	11	53	4	**22**	**26**	10	23	33	112
07:15 AM	**47**	**14**	**61**	2	12	14	**27**	**39**	**66**	**141**
07:30 AM	**25**	**13**	**38**	**8**	5	13	20	36	56	107
07:45 AM	25	6	31	4	9	13	13	27	40	84
Total Volume	139	44	183	18	48	66	70	125	195	444
% App. Total	76	24		27.3	72.7		35.9	64.1		
PHF	.739	.786	.750	.563	.545	.635	.648	.801	.739	.787

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Page No : 1

Groups Printed- Heavy Vehicles

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	1	0	0	0	3	1	5
07:15 AM	2	0	1	0	0	1	4
07:30 AM	1	0	0	0	2	2	5
07:45 AM	1	0	0	1	0	3	5
Total	5	0	1	1	5	7	19
08:00 AM	4	1	0	2	0	4	11
08:15 AM	4	0	0	2	0	1	7
08:30 AM	1	1	0	1	3	4	10
08:45 AM	2	0	2	0	3	2	9
Total	11	2	2	5	6	11	37
Grand Total	16	2	3	6	11	18	56
Apprch %	88.9	11.1	33.3	66.7	37.9	62.1	
Total %	28.6	3.6	5.4	10.7	19.6	32.1	

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**4**	**1**	**5**	0	**2**	**2**	0	**4**	4	**11**
08:15 AM	**4**	**0**	**4**	**0**	**2**	**2**	**0**	**1**	**1**	**7**
08:30 AM	**1**	**1**	**2**	**0**	**1**	**1**	**3**	4	**7**	10
08:45 AM	2	0	2	**2**	0	2	3	2	5	9
Total Volume	11	2	13	2	5	7	6	11	17	37
% App. Total	84.6	15.4		28.6	71.4		35.3	64.7		
PHF	.688	.500	.650	.250	.625	.875	.500	.688	.607	.841

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Page No : 1

Groups Printed- Peds and Bicycles

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	2	2
07:15 AM	0	0	0	1	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	2	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	1	1
08:45 AM	0	0	1	0	0	0	0	0	0	1
Total	0	0	1	0	0	0	0	0	1	2
Grand Total	0	0	1	1	0	0	0	0	3	5
Apprch %	0	0	100	100	0	0	0	0	100	
Total %	0	0	20	20	0	0	0	0	60	

	Main Street From North				Elm Street From East				Main Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**2**
07:15 AM	0	0	0	0	**1**	0	0	**1**	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	2	2	3
% App. Total	0	0	0		100	0	0		0	0	100		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.250	.250	.375

PRECISION
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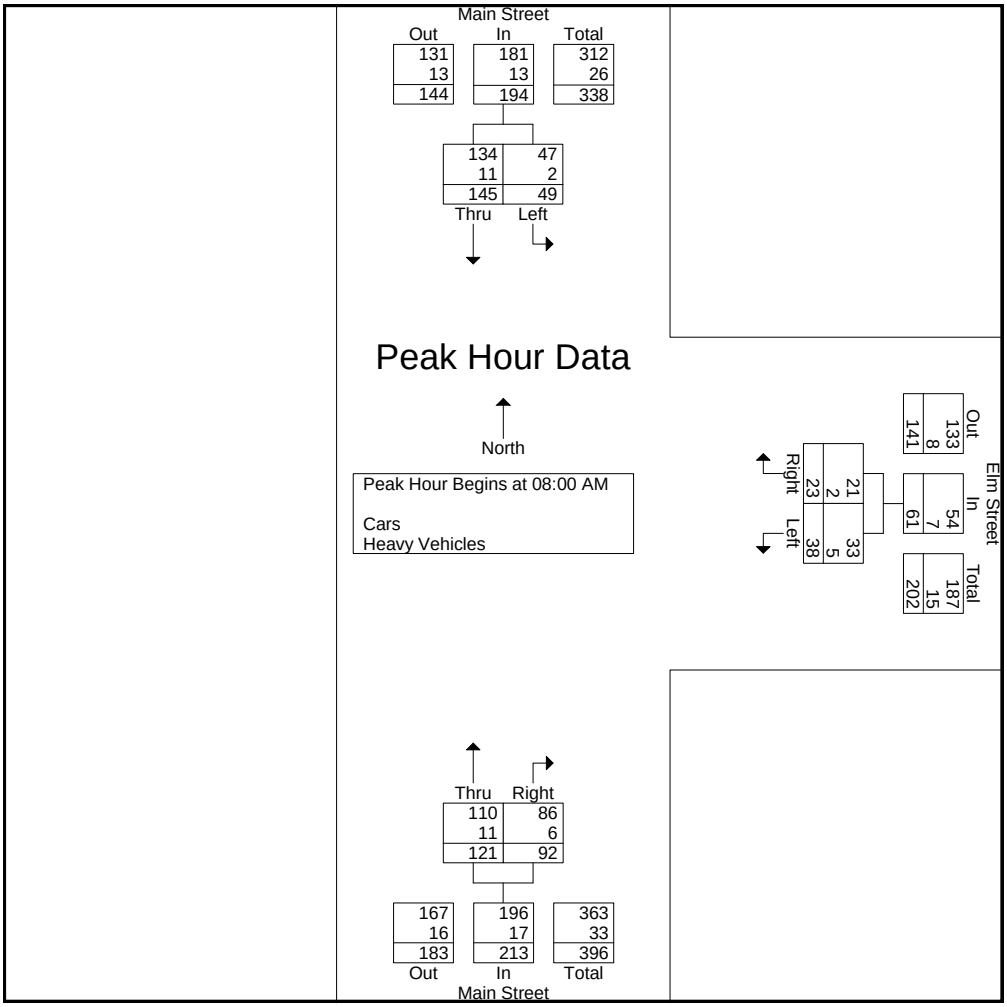
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-F
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**40**	10	50	0	11	11	**26**	34	**60**	**121**
08:15 AM	**36**	**10**	**46**	**7**	**12**	19	21	**35**	56	121
08:30 AM	39	13	**52**	4	7	11	20	25	45	108
08:45 AM	30	**16**	46	**12**	8	**20**	25	27	52	118
Total Volume	145	49	194	23	38	61	92	121	213	468
% App. Total	74.7	25.3		37.7	62.3		43.2	56.8		
PHF	.906	.766	.933	.479	.792	.763	.885	.864	.888	.967
Cars	134	47	181	21	33	54	86	110	196	431
% Cars	92.4	95.9	93.3	91.3	86.8	88.5	93.5	90.9	92.0	92.1
Heavy Vehicles	11	2	13	2	5	7	6	11	17	37
% Heavy Vehicles	7.6	4.1	6.7	8.7	13.2	11.5	6.5	9.1	8.0	7.9



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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-FFF
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	38	10	15	24	16	36	139
04:15 PM	39	13	11	21	16	19	119
04:30 PM	25	6	11	29	13	29	113
04:45 PM	37	12	19	30	6	35	139
Total	139	41	56	104	51	119	510
05:00 PM	42	8	25	22	18	35	150
05:15 PM	38	5	20	35	9	46	153
05:30 PM	42	9	29	35	18	36	169
05:45 PM	35	15	10	25	19	33	137
Total	157	37	84	117	64	150	609
Grand Total	296	78	140	221	115	269	1119
Apprch %	79.1	20.9	38.8	61.2	29.9	70.1	
Total %	26.5	7	12.5	19.7	10.3	24	
Cars	282	78	138	217	111	262	1088
% Cars	95.3	100	98.6	98.2	96.5	97.4	97.2
Heavy Vehicles	14	0	2	4	4	7	31
% Heavy Vehicles	4.7	0	1.4	1.8	3.5	2.6	2.8

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	37	**12**	49	19	30	49	6	35	41	139
05:00 PM	**42**	8	50	25	22	47	**18**	35	53	150
05:15 PM	38	5	43	20	**35**	55	9	**46**	**55**	153
05:30 PM	42	9	**51**	**29**	35	**64**	18	36	54	**169**
Total Volume	**159**	**34**	**193**	**93**	**122**	**215**	**51**	**152**	**203**	**611**
% App. Total	**82.4**	**17.6**		**43.3**	**56.7**		**25.1**	**74.9**		
PHF	**.946**	**.708**	**.946**	**.802**	**.871**	**.840**	**.708**	**.826**	**.923**	**.904**
Cars	**153**	**34**	**187**	**92**	**120**	**212**	**51**	**150**	**201**	**600**
% Cars	**96.2**	**100**	**96.9**	**98.9**	**98.4**	**98.6**	**100**	**98.7**	**99.0**	**98.2**
Heavy Vehicles	**6**	**0**	**6**	**1**	**2**	**3**	**0**	**2**	**2**	**11**
% Heavy Vehicles	**3.8**	**0**	**3.1**	**1.1**	**1.6**	**1.4**	**0**	**1.3**	**1.0**	**1.8**

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-FFF
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	37	10	14	24	15	36	136
04:15 PM	33	13	11	19	14	17	107
04:30 PM	25	6	11	29	13	28	112
04:45 PM	36	12	19	30	6	34	137
Total	131	41	55	102	48	115	492
05:00 PM	41	8	25	22	18	35	149
05:15 PM	38	5	20	35	9	45	152
05:30 PM	38	9	28	33	18	36	162
05:45 PM	34	15	10	25	18	31	133
Total	151	37	83	115	63	147	596
Grand Total	282	78	138	217	111	262	1088
Apprch %	78.3	21.7	38.9	61.1	29.8	70.2	
Total %	25.9	7.2	12.7	19.9	10.2	24.1	

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	36	**12**	48	19	30	49	6	34	40	137
05:00 PM	**41**	8	**49**	25	22	47	**18**	35	53	149
05:15 PM	38	5	43	20	**35**	55	9	**45**	**54**	152
05:30 PM	38	9	47	**28**	33	**61**	18	36	54	**162**
Total Volume	**153**	**34**	**187**	**92**	**120**	**212**	**51**	**150**	**201**	**600**
% App. Total	**81.8**	**18.2**		**43.4**	**56.6**		**25.4**	**74.6**		
PHF	**.933**	**.708**	**.954**	**.821**	**.857**	**.869**	**.708**	**.833**	**.931**	**.926**

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File Name : 81676 M-FFF
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Main Street From North		Elm Street From East		Main Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	1	0	1	0	1	0	3
04:15 PM	6	0	0	2	2	2	12
04:30 PM	0	0	0	0	0	1	1
04:45 PM	1	0	0	0	0	1	2
Total	8	0	1	2	3	4	18
05:00 PM	1	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	1	1
05:30 PM	4	0	1	2	0	0	7
05:45 PM	1	0	0	0	1	2	4
Total	6	0	1	2	1	3	13
Grand Total	14	0	2	4	4	7	31
Apprch %	100	0	33.3	66.7	36.4	63.6	
Total %	45.2	0	6.5	12.9	12.9	22.6	

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	1	0	1	**1**	0	1	1	0	1	3
04:15 PM	**6**	0	**6**	0	**2**	**2**	**2**	**2**	**4**	**12**
04:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**
04:45 PM	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**2**
Total Volume	**8**	**0**	**8**	**1**	**2**	**3**	**3**	**4**	**7**	**18**
% App. Total	**100**	**0**		**33.3**	**66.7**		**42.9**	**57.1**		
PHF	**.333**	**.000**	**.333**	**.250**	**.250**	**.375**	**.375**	**.500**	**.438**	**.375**

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Client: VHB/J. Quitter

File Name : 81676 M-FFF
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Peds and Bicycles

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	1	1
04:15 PM	0	0	1	0	0	0	0	0	2	3
04:30 PM	0	0	0	0	0	0	0	0	2	2
04:45 PM	0	0	2	0	0	0	0	0	0	2
Total	0	0	3	0	0	0	0	0	5	8
05:00 PM	0	0	0	0	0	0	0	0	2	2
05:15 PM	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	1	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	4	5
Grand Total	0	0	3	1	0	0	0	0	9	13
Apprch %	0	0	100	100	0	0	0	0	100	
Total %	0	0	23.1	7.7	0	0	0	0	69.2	

	Main Street From North				Elm Street From East				Main Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	0	0	1	1	0	0	0	0	0	0	**2**	**2**	**3**
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	2	2
04:45 PM	0	0	**2**	**2**	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	2	2	2
Total Volume	0	0	3	3	0	0	0	0	0	0	6	6	9
% App. Total	0	0	100		0	0	0		0	0	100		
PHF	.000	.000	.375	.375	.000	.000	.000	.000	.000	.000	.750	.750	.750

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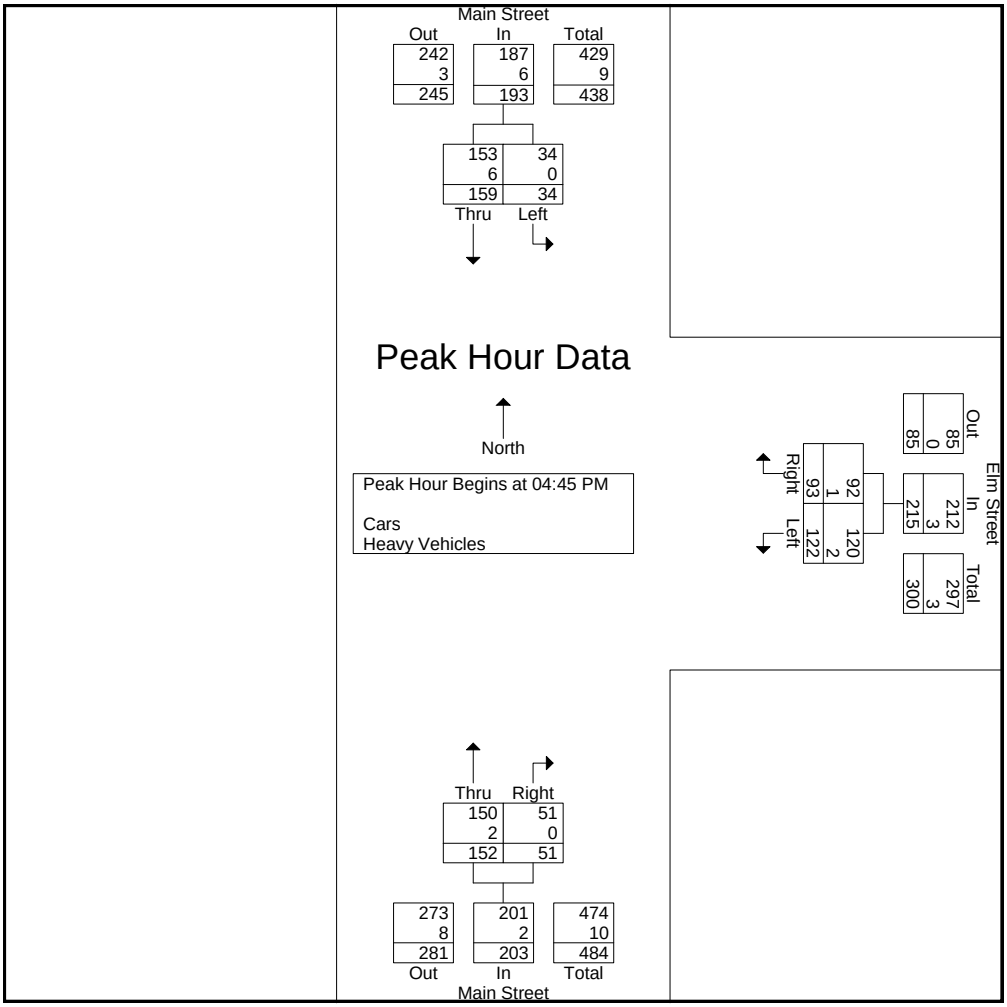
N/S: Main Street
E: Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 M-FFF
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Main Street From North			Elm Street From East			Main Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	37	**12**	49	19	30	49	6	35	41	139
05:00 PM	**42**	8	50	25	22	47	**18**	35	53	150
05:15 PM	38	5	43	20	**35**	55	9	**46**	**55**	153
05:30 PM	42	9	**51**	**29**	35	**64**	18	36	54	**169**
Total Volume	**159**	**34**	**193**	**93**	**122**	**215**	**51**	**152**	**203**	**611**
% App. Total	**82.4**	**17.6**		**43.3**	**56.7**		**25.1**	**74.9**		
PHF	**.946**	**.708**	**.946**	**.802**	**.871**	**.840**	**.708**	**.826**	**.923**	**.904**
Cars	**153**	**34**	**187**	**92**	**120**	**212**	**51**	**150**	**201**	**600**
% Cars	**96.2**	**100**	**96.9**	**98.9**	**98.4**	**98.6**	**100**	**98.7**	**99.0**	**98.2**
Heavy Vehicles	**6**	**0**	**6**	**1**	**2**	**3**	**0**	**2**	**2**	**11**
% Heavy Vehicles	**3.8**	**0**	**3.1**	**1.1**	**1.6**	**1.4**	**0**	**1.3**	**1.0**	**1.8**



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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/23/08 and Sat 10/4/08	81676	Easton, MA

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N/S: Washington Street (Route 138)
E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	108	10	16	17	48	205	404
07:15 AM	78	13	15	23	51	240	420
07:30 AM	72	15	29	10	60	288	474
07:45 AM	100	25	28	12	70	225	460
Total	358	63	88	62	229	958	1758
08:00 AM	84	16	11	16	55	255	437
08:15 AM	114	19	26	14	70	165	408
08:30 AM	97	25	22	20	60	149	373
08:45 AM	115	15	32	32	46	139	379
Total	410	75	91	82	231	708	1597
Grand Total	768	138	179	144	460	1666	3355
Apprch %	84.8	15.2	55.4	44.6	21.6	78.4	
Total %	22.9	4.1	5.3	4.3	13.7	49.7	
Cars	723	136	172	141	453	1605	3230
% Cars	94.1	98.6	96.1	97.9	98.5	96.3	96.3
Heavy Vehicles	45	2	7	3	7	61	125
% Heavy Vehicles	5.9	1.4	3.9	2.1	1.5	3.7	3.7

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	78	13	91	15	**23**	38	51	240	291	420
07:30 AM	72	15	87	**29**	10	39	60	**288**	**348**	**474**
07:45 AM	**100**	**25**	**125**	28	12	**40**	**70**	225	295	460
08:00 AM	84	16	100	11	16	27	55	255	310	437
Total Volume	334	69	403	83	61	144	236	1008	1244	1791
% App. Total	82.9	17.1		57.6	42.4		19	81		
PHF	.835	.690	.806	.716	.663	.900	.843	.875	.894	.945
Cars	317	67	384	79	61	140	232	975	1207	1731
% Cars	94.9	97.1	95.3	95.2	100	97.2	98.3	96.7	97.0	96.6
Heavy Vehicles	17	2	19	4	0	4	4	33	37	60
% Heavy Vehicles	5.1	2.9	4.7	4.8	0	2.8	1.7	3.3	3.0	3.4

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N/S: Washington Street (Route 138)
E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	100	10	16	16	48	203	393
07:15 AM	73	13	15	23	51	239	414
07:30 AM	71	14	29	10	59	274	457
07:45 AM	95	24	25	12	68	220	444
Total	339	61	85	61	226	936	1708
08:00 AM	78	16	10	16	54	242	416
08:15 AM	105	19	24	14	70	155	387
08:30 AM	89	25	21	20	57	143	355
08:45 AM	112	15	32	30	46	129	364
Total	384	75	87	80	227	669	1522
Grand Total	723	136	172	141	453	1605	3230
Apprch %	84.2	15.8	55	45	22	78	
Total %	22.4	4.2	5.3	4.4	14	49.7	

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	73	13	86	15	**23**	38	51	239	290	414
07:30 AM	71	14	85	**29**	10	**39**	59	**274**	**333**	**457**
07:45 AM	**95**	**24**	**119**	25	12	37	**68**	220	288	444
08:00 AM	78	16	94	10	16	26	54	242	296	416
Total Volume	317	67	384	79	61	140	232	975	1207	1731
% App. Total	82.6	17.4		56.4	43.6		19.2	80.8		
PHF	.834	.698	.807	.681	.663	.897	.853	.890	.906	.947

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E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	8	0	0	1	0	2	11
07:15 AM	5	0	0	0	0	1	6
07:30 AM	1	1	0	0	1	14	17
07:45 AM	5	1	3	0	2	5	16
Total	19	2	3	1	3	22	50
08:00 AM	6	0	1	0	1	13	21
08:15 AM	9	0	2	0	0	10	21
08:30 AM	8	0	1	0	3	6	18
08:45 AM	3	0	0	2	0	10	15
Total	26	0	4	2	4	39	75
Grand Total	45	2	7	3	7	61	125
Apprch %	95.7	4.3	70	30	10.3	89.7	
Total %	36	1.6	5.6	2.4	5.6	48.8	

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	5	**1**	6	**3**	0	**3**	2	5	7	16
08:00 AM	6	0	6	1	0	1	1	**13**	**14**	**21**
08:15 AM	**9**	0	**9**	2	0	2	0	10	10	21
08:30 AM	8	0	8	1	0	1	**3**	6	9	18
Total Volume	28	1	29	7	0	7	6	34	40	76
% App. Total	96.6	3.4		100	0		15	85		
PHF	.778	.250	.806	.583	.000	.583	.500	.654	.714	.905

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N/S: Washington Street (Route 138)
E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	0	0	0	0	0	0	1
Apprch %	100	0	0	0	0	0	0	0	0	
Total %	100	0	0	0	0	0	0	0	0	

	Washington Street (Route 138) From North				Union Street From East				Washington Street (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	**1**
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1
% App. Total	100	0	0		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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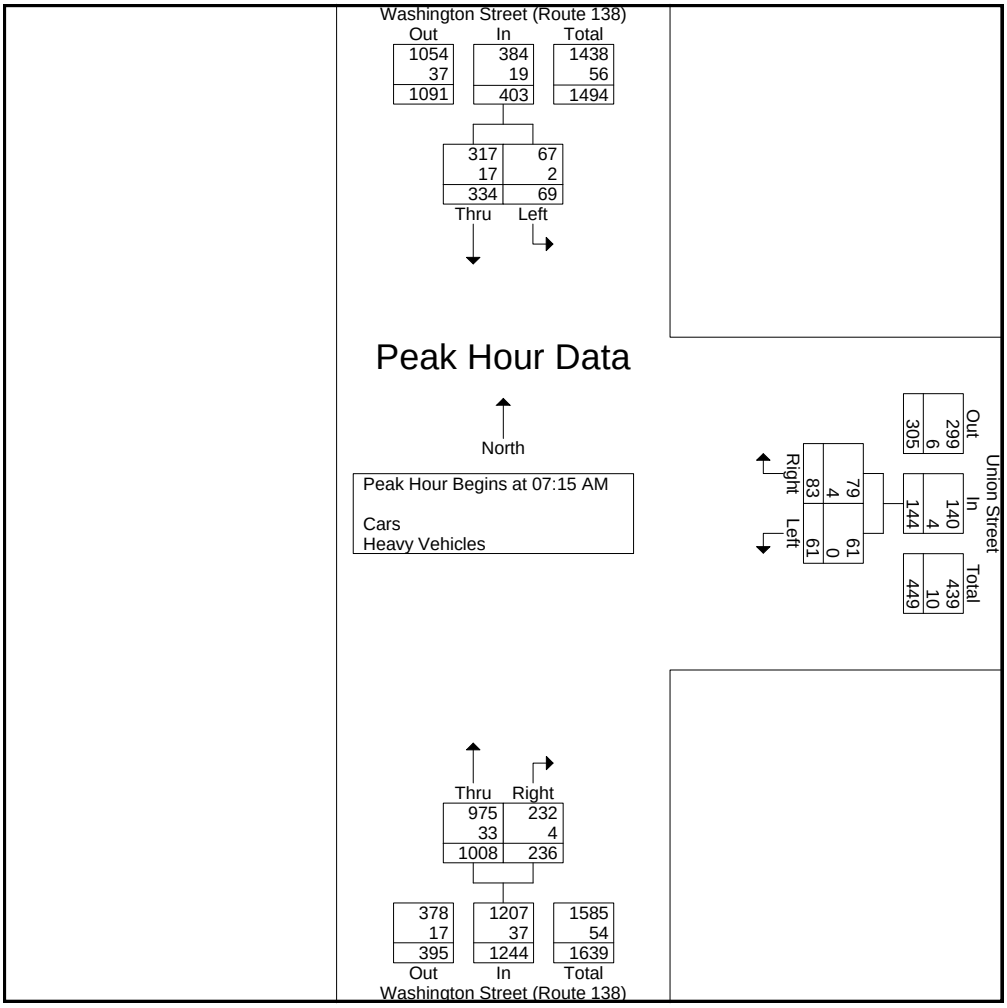
File Name : 81676 N-A
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	78	13	91	15	**23**	38	51	240	291	420
07:30 AM	72	15	87	**29**	10	39	60	**288**	**348**	**474**
07:45 AM	**100**	**25**	**125**	28	12	**40**	**70**	225	295	460
08:00 AM	84	16	100	11	16	27	55	255	310	437
Total Volume	334	69	403	83	61	144	236	1008	1244	1791
% App. Total	82.9	17.1		57.6	42.4		19	81		
PHF	.835	.690	.806	.716	.663	.900	.843	.875	.894	.945
Cars	317	67	384	79	61	140	232	975	1207	1731
% Cars	94.9	97.1	95.3	95.2	100	97.2	98.3	96.7	97.0	96.6
Heavy Vehicles	17	2	19	4	0	4	4	33	37	60
% Heavy Vehicles	5.1	2.9	4.7	4.8	0	2.8	1.7	3.3	3.0	3.4



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N/S: Washington Street (Route 138)
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Client: VHB/J. Quitter

File Name : 81676 N-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	178	32	29	39	39	126	443
04:15 PM	202	30	29	32	29	117	439
04:30 PM	185	29	16	41	35	126	432
04:45 PM	222	27	23	43	32	111	458
Total	787	118	97	155	135	480	1772
05:00 PM	192	31	33	36	46	149	487
05:15 PM	209	35	36	52	33	125	490
05:30 PM	272	27	23	34	33	120	509
05:45 PM	197	34	41	34	35	111	452
Total	870	127	133	156	147	505	1938
Grand Total	1657	245	230	311	282	985	3710
Apprch %	87.1	12.9	42.5	57.5	22.3	77.7	
Total %	44.7	6.6	6.2	8.4	7.6	26.5	
Cars	1619	243	229	308	280	963	3642
% Cars	97.7	99.2	99.6	99	99.3	97.8	98.2
Heavy Vehicles	38	2	1	3	2	22	68
% Heavy Vehicles	2.3	0.8	0.4	1	0.7	2.2	1.8

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	222	27	249	23	43	66	32	111	143	458
05:00 PM	192	31	223	33	36	69	**46**	**149**	**195**	487
05:15 PM	209	**35**	244	**36**	**52**	**88**	33	125	158	490
05:30 PM	**272**	27	**299**	23	34	57	33	120	153	**509**
Total Volume	**895**	**120**	**1015**	**115**	**165**	**280**	**144**	**505**	**649**	**1944**
% App. Total	**88.2**	**11.8**		**41.1**	**58.9**		**22.2**	**77.8**		
PHF	**.823**	**.857**	**.849**	**.799**	**.793**	**.795**	**.783**	**.847**	**.832**	**.955**
Cars	**875**	**119**	**994**	**114**	**165**	**279**	**144**	**491**	**635**	**1908**
% Cars	**97.8**	**99.2**	**97.9**	**99.1**	**100**	**99.6**	**100**	**97.2**	**97.8**	**98.1**
Heavy Vehicles	**20**	**1**	**21**	**1**	**0**	**1**	**0**	**14**	**14**	**36**
% Heavy Vehicles	**2.2**	**0.8**	**2.1**	**0.9**	**0**	**0.4**	**0**	**2.8**	**2.2**	**1.9**

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Client: VHB/J. Quitter

File Name : 81676 N-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	175	32	29	37	38	122	433
04:15 PM	194	29	29	32	29	115	428
04:30 PM	181	29	16	40	35	124	425
04:45 PM	219	26	22	43	32	106	448
Total	769	116	96	152	134	467	1734
05:00 PM	186	31	33	36	46	146	478
05:15 PM	206	35	36	52	33	122	484
05:30 PM	264	27	23	34	33	117	498
05:45 PM	194	34	41	34	34	111	448
Total	850	127	133	156	146	496	1908
Grand Total	1619	243	229	308	280	963	3642
Apprch %	86.9	13.1	42.6	57.4	22.5	77.5	
Total %	44.5	6.7	6.3	8.5	7.7	26.4	

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	219	26	245	22	43	65	32	106	138	448
05:00 PM	186	31	217	33	36	69	**46**	**146**	**192**	478
05:15 PM	206	**35**	241	**36**	**52**	**88**	33	122	155	484
05:30 PM	**264**	27	**291**	23	34	57	33	117	150	**498**
Total Volume	**875**	**119**	**994**	**114**	**165**	**279**	**144**	**491**	**635**	**1908**
% App. Total	**88**	**12**		**40.9**	**59.1**		**22.7**	**77.3**		
PHF	**.829**	**.850**	**.854**	**.792**	**.793**	**.793**	**.783**	**.841**	**.827**	**.958**

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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North		Union Street From East		Washington Street (Route 138) From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	3	0	0	2	1	4	10
04:15 PM	8	1	0	0	0	2	11
04:30 PM	4	0	0	1	0	2	7
04:45 PM	3	1	1	0	0	5	10
Total	18	2	1	3	1	13	38
05:00 PM	6	0	0	0	0	3	9
05:15 PM	3	0	0	0	0	3	6
05:30 PM	8	0	0	0	0	3	11
05:45 PM	3	0	0	0	1	0	4
Total	20	0	0	0	1	9	30
Grand Total	38	2	1	3	2	22	68
Apprch %	95	5	25	75	8.3	91.7	
Total %	55.9	2.9	1.5	4.4	2.9	32.4	

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	3	0	3	0	**2**	**2**	**1**	4	**5**	10
04:15 PM	**8**	**1**	**9**	0	0	0	0	2	2	**11**
04:30 PM	**4**	**0**	**4**	**0**	**1**	**1**	**0**	**2**	**2**	**7**
04:45 PM	**3**	**1**	**4**	**1**	0	1	0	**5**	5	10
Total Volume	18	2	20	1	3	4	1	13	14	38
% App. Total	90	10		25	75		7.1	92.9		
PHF	.563	.500	.556	.250	.375	.500	.250	.650	.700	.864

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E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-AAA
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	2	0	2
Grand Total	0	0	0	0	0	0	0	2	0	2
Apprch %	0	0	0	0	0	0	0	100	0	
Total %	0	0	0	0	0	0	0	100	0	

	Washington Street (Route 138) From North				Union Street From East				Washington Street (Route 138) From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	**1**
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.500

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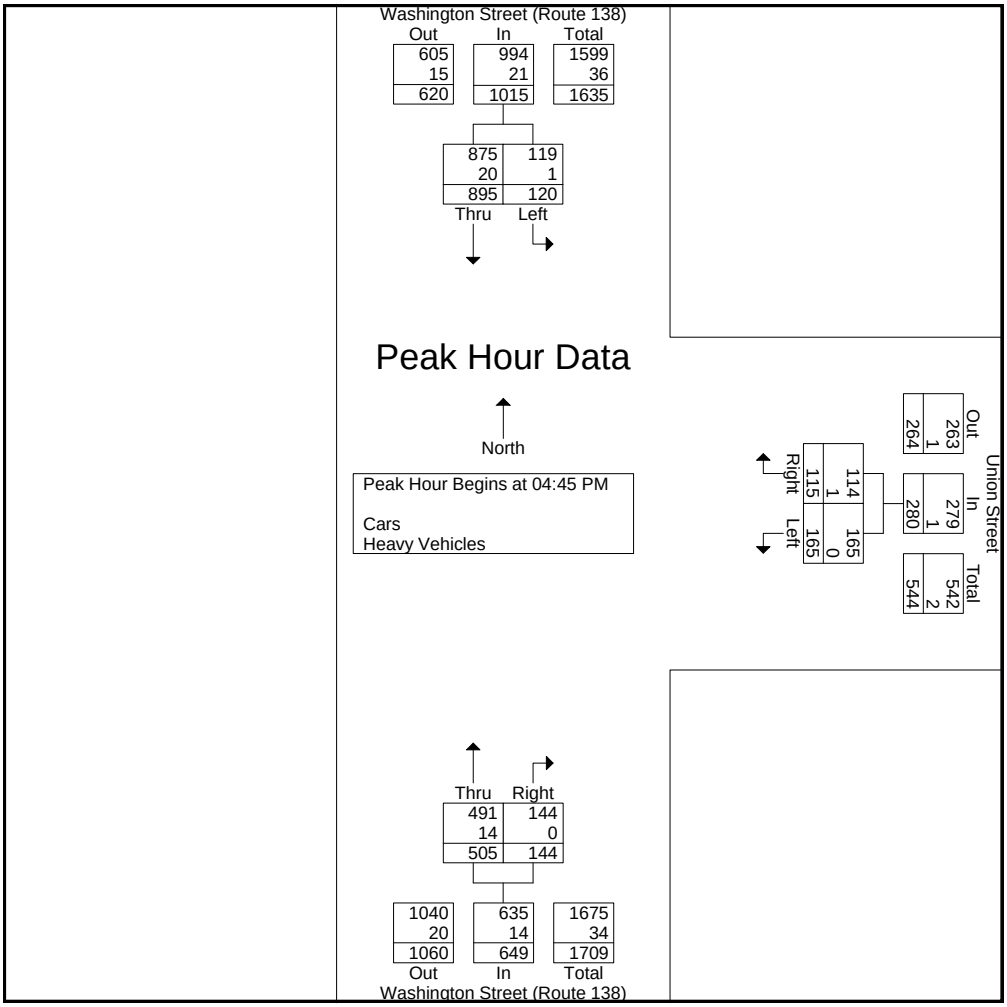
E: Union Street
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-AAA
Site Code : 10111.31
Start Date : 9/23/2008

	Washington Street (Route 138) From North			Union Street From East			Washington Street (Route 138) From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	222	27	249	23	43	66	32	111	143	458
05:00 PM	192	31	223	33	36	69	**46**	**149**	**195**	487
05:15 PM	209	**35**	244	**36**	**52**	**88**	33	125	158	490
05:30 PM	**272**	27	**299**	23	34	57	33	120	153	**509**
Total Volume	**895**	**120**	**1015**	**115**	**165**	**280**	**144**	**505**	**649**	**1944**
% App. Total	**88.2**	**11.8**		**41.1**	**58.9**		**22.2**	**77.8**		
PHF	**.823**	**.857**	**.849**	**.799**	**.793**	**.795**	**.783**	**.847**	**.832**	**.955**
Cars	**875**	**119**	**994**	**114**	**165**	**279**	**144**	**491**	**635**	**1908**
% Cars	**97.8**	**99.2**	**97.9**	**99.1**	**100**	**99.6**	**100**	**97.2**	**97.8**	**98.1**
Heavy Vehicles	**20**	**1**	**21**	**1**	**0**	**1**	**0**	**14**	**14**	**36**
% Heavy Vehicles	**2.2**	**0.8**	**2.1**	**0.9**	**0**	**0.4**	**0**	**2.8**	**2.2**	**1.9**



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N/S: Washington Street (Route 138)
E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	20	85	0	0	0	0	1	195	33	16	0	15	365
07:15 AM	19	71	0	0	0	1	0	217	37	12	0	22	379
07:30 AM	15	83	0	1	0	0	1	286	35	10	0	18	449
07:45 AM	33	85	2	1	0	0	0	208	53	22	0	20	424
Total	87	324	2	2	0	1	2	906	158	60	0	75	1617
08:00 AM	20	69	0	1	0	1	0	205	50	18	0	15	379
08:15 AM	30	101	0	0	0	0	0	156	43	24	0	22	376
08:30 AM	24	80	0	1	0	1	0	120	48	33	0	19	326
08:45 AM	23	94	0	1	0	0	2	126	54	43	0	21	364
Total	97	344	0	3	0	2	2	607	195	118	0	77	1445
Grand Total	184	668	2	5	0	3	4	1513	353	178	0	152	3062
Apprch %	21.5	78.2	0.2	62.5	0	37.5	0.2	80.9	18.9	53.9	0	46.1	
Total %	6	21.8	0.1	0.2	0	0.1	0.1	49.4	11.5	5.8	0	5	
Cars	174	641	2	5	0	3	4	1459	336	164	0	148	2936
% Cars	94.6	96	100	100	0	100	100	96.4	95.2	92.1	0	97.4	95.9
Heavy Vehicles	10	27	0	0	0	0	0	54	17	14	0	4	126
% Heavy Vehicles	5.4	4	0	0	0	0	0	3.6	4.8	7.9	0	2.6	4.1

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	71	0	90	0	0	**1**	1	0	217	37	254	12	0	**22**	34	379
07:30 AM	15	83	0	98	**1**	0	0	1	**1**	**286**	35	**322**	10	0	18	28	**449**
07:45 AM	**33**	**85**	**2**	**120**	1	0	0	1	0	208	**53**	261	**22**	0	20	**42**	424
08:00 AM	20	69	0	89	1	0	1	**2**	0	205	50	255	18	0	15	33	379
Total Volume	87	308	2	397	3	0	2	5	1	916	175	1092	62	0	75	137	1631
% App. Total	21.9	77.6	0.5		60	0	40		0.1	83.9	16		45.3	0	54.7		
PHF	.659	.906	.250	.827	.750	.000	.500	.625	.250	.801	.825	.848	.705	.000	.852	.815	.908
Cars	82	296	2	380	3	0	2	5	1	890	169	1060	58	0	72	130	1575
% Cars	94.3	96.1	100	95.7	100	0	100	100	100	97.2	96.6	97.1	93.5	0	96.0	94.9	96.6
Heavy Vehicles	5	12	0	17	0	0	0	0	0	26	6	32	4	0	3	7	56
% Heavy Vehicles	5.7	3.9	0	4.3	0	0	0	0	0	2.8	3.4	2.9	6.5	0	4.0	5.1	3.4

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N/S: Washington Street (Route 138)
E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-B
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Cars

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	18	79	0	0	0	0	1	190	32	14	0	15	349
07:15 AM	16	68	0	0	0	1	0	216	37	12	0	21	371
07:30 AM	14	82	0	1	0	0	1	274	35	9	0	17	433
07:45 AM	33	81	2	1	0	0	0	202	50	20	0	20	409
Total	81	310	2	2	0	1	2	882	154	55	0	73	1562
08:00 AM	19	65	0	1	0	1	0	198	47	17	0	14	362
08:15 AM	29	95	0	0	0	0	0	149	39	23	0	22	357
08:30 AM	22	77	0	1	0	1	0	112	45	28	0	18	304
08:45 AM	23	94	0	1	0	0	2	118	51	41	0	21	351
Total	93	331	0	3	0	2	2	577	182	109	0	75	1374
Grand Total	174	641	2	5	0	3	4	1459	336	164	0	148	2936
Apprch %	21.3	78.5	0.2	62.5	0	37.5	0.2	81.1	18.7	52.6	0	47.4	
Total %	5.9	21.8	0.1	0.2	0	0.1	0.1	49.7	11.4	5.6	0	5	

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	16	68	0	84	0	0	**1**	1	0	216	37	253	12	0	**21**	33	371
07:30 AM	14	**82**	0	96	**1**	0	0	1	**1**	**274**	35	**310**	9	0	17	26	**433**
07:45 AM	**33**	81	**2**	**116**	1	0	0	1	0	202	**50**	252	**20**	0	20	**40**	409
08:00 AM	19	65	0	84	1	0	1	**2**	0	198	47	245	17	0	14	31	362
Total Volume	82	296	2	380	3	0	2	5	1	890	169	1060	58	0	72	130	1575
% App. Total	21.6	77.9	0.5		60	0	40		0.1	84	15.9		44.6	0	55.4		
PHF	.621	.902	.250	.819	.750	.000	.500	.625	.250	.812	.845	.855	.725	.000	.857	.813	.909

PRECISION
D A T A
INDUSTRIES, LLC
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N/S: Washington Street (Route 138)
E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-B
Site Code : 10111.31
Start Date : 9/23/2008

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	6	0	0	0	0	0	5	1	2	0	0	16
07:15 AM	3	3	0	0	0	0	0	1	0	0	0	1	8
07:30 AM	1	1	0	0	0	0	0	12	0	1	0	1	16
07:45 AM	0	4	0	0	0	0	0	6	3	2	0	0	15
Total	6	14	0	0	0	0	0	24	4	5	0	2	55
08:00 AM	1	4	0	0	0	0	0	7	3	1	0	1	17
08:15 AM	1	6	0	0	0	0	0	7	4	1	0	0	19
08:30 AM	2	3	0	0	0	0	0	8	3	5	0	1	22
08:45 AM	0	0	0	0	0	0	0	8	3	2	0	0	13
Total	4	13	0	0	0	0	0	30	13	9	0	2	71
Grand Total	10	27	0	0	0	0	0	54	17	14	0	4	126
Apprch %	27	73	0	0	0	0	0	76.1	23.9	77.8	0	22.2	
Total %	7.9	21.4	0	0	0	0	0	42.9	13.5	11.1	0	3.2	

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	4	0	4	0	0	0	0	0	6	3	9	2	0	0	2	15
08:00 AM	1	4	0	5	0	0	0	0	0	7	3	10	1	0	**1**	2	17
08:15 AM	1	**6**	0	**7**	0	0	0	0	0	7	**4**	**11**	1	0	0	1	19
08:30 AM	**2**	3	0	5	0	0	0	0	0	**8**	3	11	**5**	0	1	**6**	**22**
Total Volume	4	17	0	21	0	0	0	0	0	28	13	41	9	0	2	11	73
% App. Total	19	81	0		0	0	0		0	68.3	31.7		81.8	0	18.2		
PHF	.500	.708	.000	.750	.000	.000	.000	.000	.000	.875	.813	.932	.450	.000	.500	.458	.830

PRECISION
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N/S: Washington Street (Route 138)
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City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Apprch %	0	33.3	0	66.7	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	0	33.3	0	66.7	0	0	0	0	0	0	0	0	0	0	0	0	

	Washington Street (Route 138) From North					Stonehedge Village From East					Washington Street (Route 138) From South					Roache Brothers Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
08:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	33.3	0	66.7		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.500	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750

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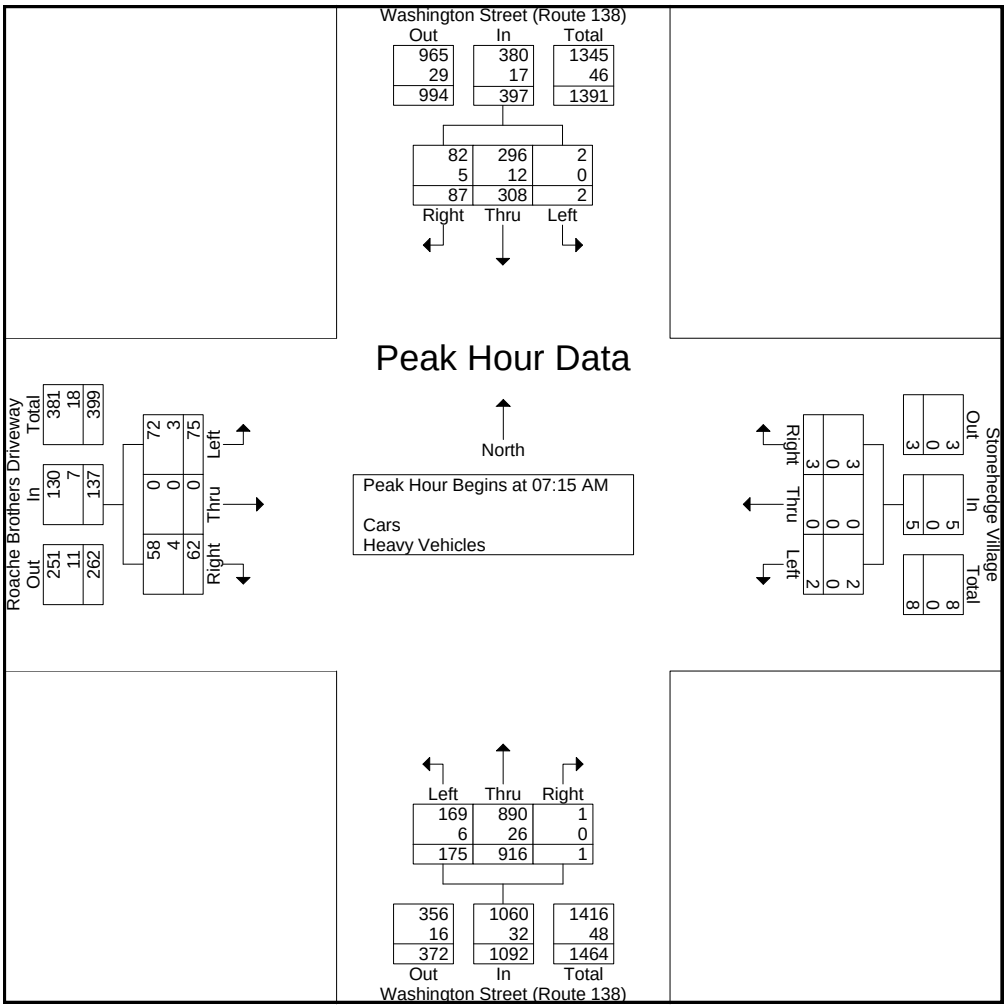
Client: VHB/J. Quitter

File Name : 81676 N-B
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	71	0	90	0	0	**1**	1	0	217	37	254	12	0	**22**	34	379
07:30 AM	15	83	0	98	**1**	0	0	1	**1**	**286**	35	**322**	10	0	18	28	**449**
07:45 AM	**33**	**85**	**2**	**120**	1	0	0	1	0	208	**53**	261	**22**	0	20	**42**	424
08:00 AM	20	69	0	89	1	0	1	**2**	0	205	50	255	18	0	15	33	379
Total Volume	87	308	2	397	3	0	2	5	1	916	175	1092	62	0	75	137	1631
% App. Total	21.9	77.6	0.5		60	0	40		0.1	83.9	16		45.3	0	54.7		
PHF	.659	.906	.250	.827	.750	.000	.500	.625	.250	.801	.825	.848	.705	.000	.852	.815	.908
Cars	82	296	2	380	3	0	2	5	1	890	169	1060	58	0	72	130	1575
% Cars	94.3	96.1	100	95.7	100	0	100	100	100	97.2	96.6	97.1	93.5	0	96.0	94.9	96.6
Heavy Vehicles	5	12	0	17	0	0	0	0	0	26	6	32	4	0	3	7	56
% Heavy Vehicles	5.7	3.9	0	4.3	0	0	0	0	0	2.8	3.4	2.9	6.5	0	4.0	5.1	3.4



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E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	26	138	1	0	0	1	1	99	48	68	0	32	414
04:15 PM	25	165	0	0	0	2	0	88	51	58	0	21	410
04:30 PM	31	153	0	0	0	0	0	116	35	68	0	32	435
04:45 PM	26	192	1	0	0	0	0	85	43	66	0	19	432
Total	108	648	2	0	0	3	1	388	177	260	0	104	1691
05:00 PM	24	150	0	0	0	0	1	133	51	69	0	16	444
05:15 PM	45	175	0	0	0	0	0	119	41	73	0	25	478
05:30 PM	34	202	1	0	0	1	4	90	40	62	0	23	457
05:45 PM	32	170	2	2	0	0	0	116	49	63	0	26	460
Total	135	697	3	2	0	1	5	458	181	267	0	90	1839
Grand Total	243	1345	5	2	0	4	6	846	358	527	0	194	3530
Apprch %	15.3	84.4	0.3	33.3	0	66.7	0.5	69.9	29.6	73.1	0	26.9	
Total %	6.9	38.1	0.1	0.1	0	0.1	0.2	24	10.1	14.9	0	5.5	
Cars	240	1316	5	2	0	4	6	824	354	522	0	193	3466
% Cars	98.8	97.8	100	100	0	100	100	97.4	98.9	99.1	0	99.5	98.2
Heavy Vehicles	3	29	0	0	0	0	0	22	4	5	0	1	64
% Heavy Vehicles	1.2	2.2	0	0	0	0	0	2.6	1.1	0.9	0	0.5	1.8

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	24	150	0	174	0	0	0	0	1	**133**	**51**	**185**	69	0	16	85	444
05:15 PM	**45**	175	0	220	0	0	0	0	0	119	41	160	**73**	0	25	**98**	**478**
05:30 PM	34	**202**	1	**237**	0	0	**1**	1	**4**	90	40	134	62	0	23	85	457
05:45 PM	32	170	**2**	204	**2**	0	0	**2**	0	116	49	165	63	0	**26**	89	460
Total Volume	135	697	3	835	2	0	1	3	5	458	181	644	267	0	90	357	1839
% App. Total	16.2	83.5	0.4		66.7	0	33.3		0.8	71.1	28.1		74.8	0	25.2		
PHF	.750	.863	.375	.881	.250	.000	.250	.375	.313	.861	.887	.870	.914	.000	.865	.911	.962
Cars	133	682	3	818	2	0	1	3	5	448	180	633	264	0	90	354	1808
% Cars	98.5	97.8	100	98.0	100	0	100	100	100	97.8	99.4	98.3	98.9	0	100	99.2	98.3
Heavy Vehicles	2	15	0	17	0	0	0	0	0	10	1	11	3	0	0	3	31
% Heavy Vehicles	1.5	2.2	0	2.0	0	0	0	0	0	2.2	0.6	1.7	1.1	0	0	0.8	1.7

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E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	26	135	1	0	0	1	1	96	47	68	0	32	407
04:15 PM	25	158	0	0	0	2	0	86	51	57	0	21	400
04:30 PM	30	150	0	0	0	0	0	114	34	67	0	31	426
04:45 PM	26	191	1	0	0	0	0	80	42	66	0	19	425
Total	107	634	2	0	0	3	1	376	174	258	0	103	1658
05:00 PM	23	145	0	0	0	0	1	129	50	68	0	16	432
05:15 PM	45	173	0	0	0	0	0	116	41	71	0	25	471
05:30 PM	34	197	1	0	0	1	4	87	40	62	0	23	449
05:45 PM	31	167	2	2	0	0	0	116	49	63	0	26	456
Total	133	682	3	2	0	1	5	448	180	264	0	90	1808
Grand Total	240	1316	5	2	0	4	6	824	354	522	0	193	3466
Apprch %	15.4	84.3	0.3	33.3	0	66.7	0.5	69.6	29.9	73	0	27	
Total %	6.9	38	0.1	0.1	0	0.1	0.2	23.8	10.2	15.1	0	5.6	

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	23	145	0	168	0	0	0	0	1	**129**	**50**	**180**	68	0	16	84	432
05:15 PM	**45**	173	0	218	0	0	0	0	0	116	41	157	**71**	0	25	**96**	**471**
05:30 PM	34	**197**	1	**232**	0	0	**1**	1	**4**	87	40	131	62	0	23	85	449
05:45 PM	31	167	**2**	200	**2**	0	0	**2**	0	116	49	165	63	0	**26**	89	456
Total Volume	133	682	3	818	2	0	1	3	5	448	180	633	264	0	90	354	1808
% App. Total	16.3	83.4	0.4		66.7	0	33.3		0.8	70.8	28.4		74.6	0	25.4		
PHF	.739	.865	.375	.881	.250	.000	.250	.375	.313	.868	.900	.879	.930	.000	.865	.922	.960

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Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Stonehedge Village From East			Washington Street (Route 138) From South			Roache Brothers Driveway From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	3	0	0	0	0	0	3	1	0	0	0	7
04:15 PM	0	7	0	0	0	0	0	2	0	1	0	0	10
04:30 PM	1	3	0	0	0	0	0	2	1	1	0	1	9
04:45 PM	0	1	0	0	0	0	0	5	1	0	0	0	7
Total	1	14	0	0	0	0	0	12	3	2	0	1	33
05:00 PM	1	5	0	0	0	0	0	4	1	1	0	0	12
05:15 PM	0	2	0	0	0	0	0	3	0	2	0	0	7
05:30 PM	0	5	0	0	0	0	0	3	0	0	0	0	8
05:45 PM	1	3	0	0	0	0	0	0	0	0	0	0	4
Total	2	15	0	0	0	0	0	10	1	3	0	0	31
Grand Total	3	29	0	0	0	0	0	22	4	5	0	1	64
Apprch %	9.4	90.6	0	0	0	0	0	84.6	15.4	83.3	0	16.7	
Total %	4.7	45.3	0	0	0	0	0	34.4	6.2	7.8	0	1.6	

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**7**	0	**7**	0	0	0	0	0	2	0	2	**1**	0	0	1	10
04:30 PM	**1**	3	0	4	0	0	0	0	0	2	**1**	3	1	0	**1**	**2**	9
04:45 PM	0	1	0	1	0	0	0	0	0	**5**	1	**6**	0	0	0	0	7
05:00 PM	1	5	0	6	0	0	0	0	0	4	1	5	1	0	0	1	**12**
Total Volume	2	16	0	18	0	0	0	0	0	13	3	16	3	0	1	4	38
% App. Total	11.1	88.9	0		0	0	0		0	81.2	18.8		75	0	25		
PHF	.500	.571	.000	.643	.000	.000	.000	.000	.000	.650	.750	.667	.750	.000	.250	.500	.792

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Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Total	1	0	0	0	0	0	0	2	0	0	0	2	0	0	1	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Grand Total	1	0	0	0	0	0	0	2	0	2	0	2	0	0	1	0	8
Apprch %	100	0	0	0	0	0	0	100	0	50	0	50	0	0	100	0	
Total %	12.5	0	0	0	0	0	0	25	0	25	0	25	0	0	12.5	0	

	Washington Street (Route 138) From North					Stonehedge Village From East					Washington Street (Route 138) From South					Roache Brothers Driveway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**1**	**0**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**	**1**	1
04:30 PM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	**1**	**1**	0	0	0	0	0	**2**
04:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2
Total Volume	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	0	0	1	0	1	6
% App. Total	100	0	0	0		0	0	0	100		0	0	0	100		0	0	100	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.000	.500	.500	.000	.000	.000	.500	.500	.000	.000	.250	.000	.250	.750

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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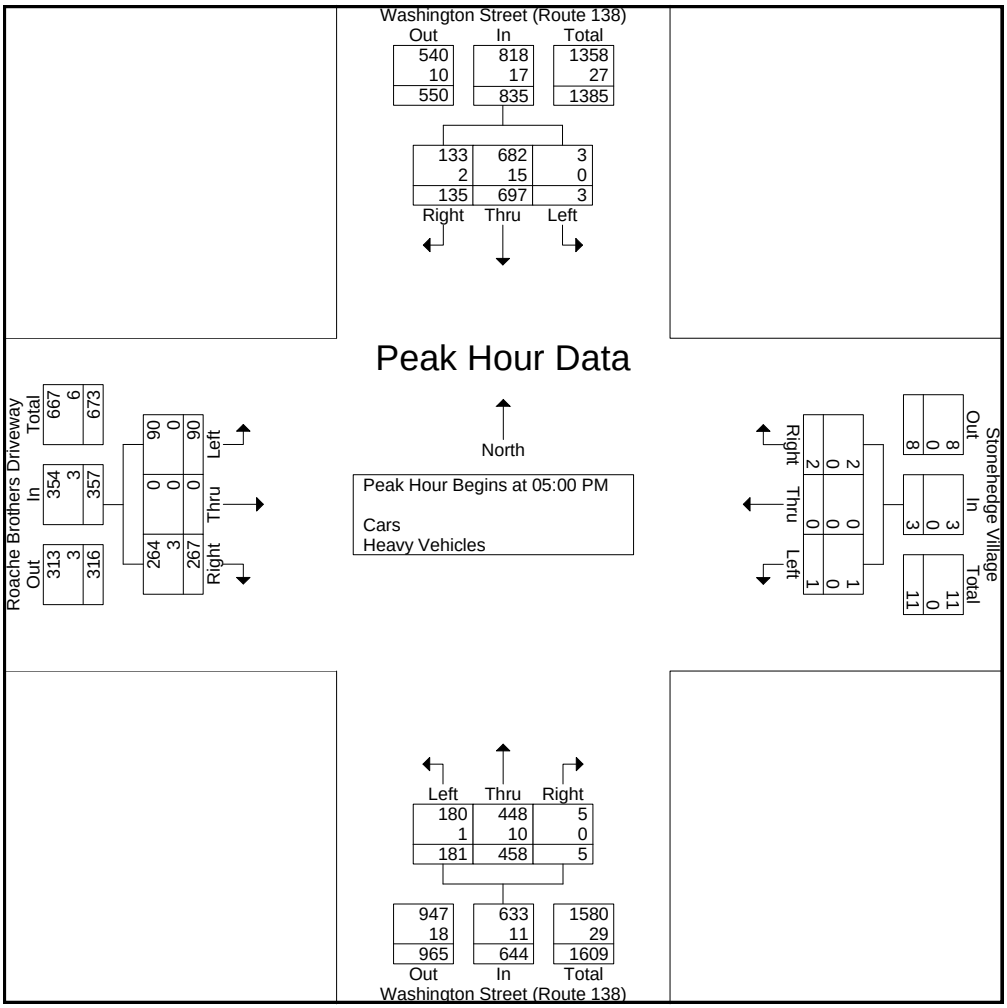
Email: datarequests@pdillc.com

N/S: Washington Street (Route 138)
E/W: Stonehedge Village/Roache Brothers
City, State: Easton, MA
Client: VHB/J. Quitter

File Name : 81676 N-BBB
Site Code : 10111.31
Start Date : 9/23/2008
Page No : 1

	Washington Street (Route 138) From North				Stonehedge Village From East				Washington Street (Route 138) From South				Roache Brothers Driveway From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	24	150	0	174	0	0	0	0	1	**133**	**51**	**185**	69	0	16	85	444
05:15 PM	**45**	175	0	220	0	0	0	0	0	119	41	160	**73**	0	25	**98**	**478**
05:30 PM	34	**202**	1	**237**	0	0	**1**	1	**4**	90	40	134	62	0	23	85	457
05:45 PM	32	170	**2**	204	**2**	0	0	**2**	0	116	49	165	63	0	**26**	89	460
Total Volume	135	697	3	835	2	0	1	3	5	458	181	644	267	0	90	357	1839
% App. Total	16.2	83.5	0.4		66.7	0	33.3		0.8	71.1	28.1		74.8	0	25.2		
PHF	.750	.863	.375	.881	.250	.000	.250	.375	.313	.861	.887	.870	.914	.000	.865	.911	.962
Cars	133	682	3	818	2	0	1	3	5	448	180	633	264	0	90	354	1808
% Cars	98.5	97.8	100	98.0	100	0	100	100	100	97.8	99.4	98.3	98.9	0	100	99.2	98.3
Heavy Vehicles	2	15	0	17	0	0	0	0	0	10	1	11	3	0	0	3	31
% Heavy Vehicles	1.5	2.2	0	2.0	0	0	0	0	0	2.2	0.6	1.7	1.1	0	0	0.8	1.7



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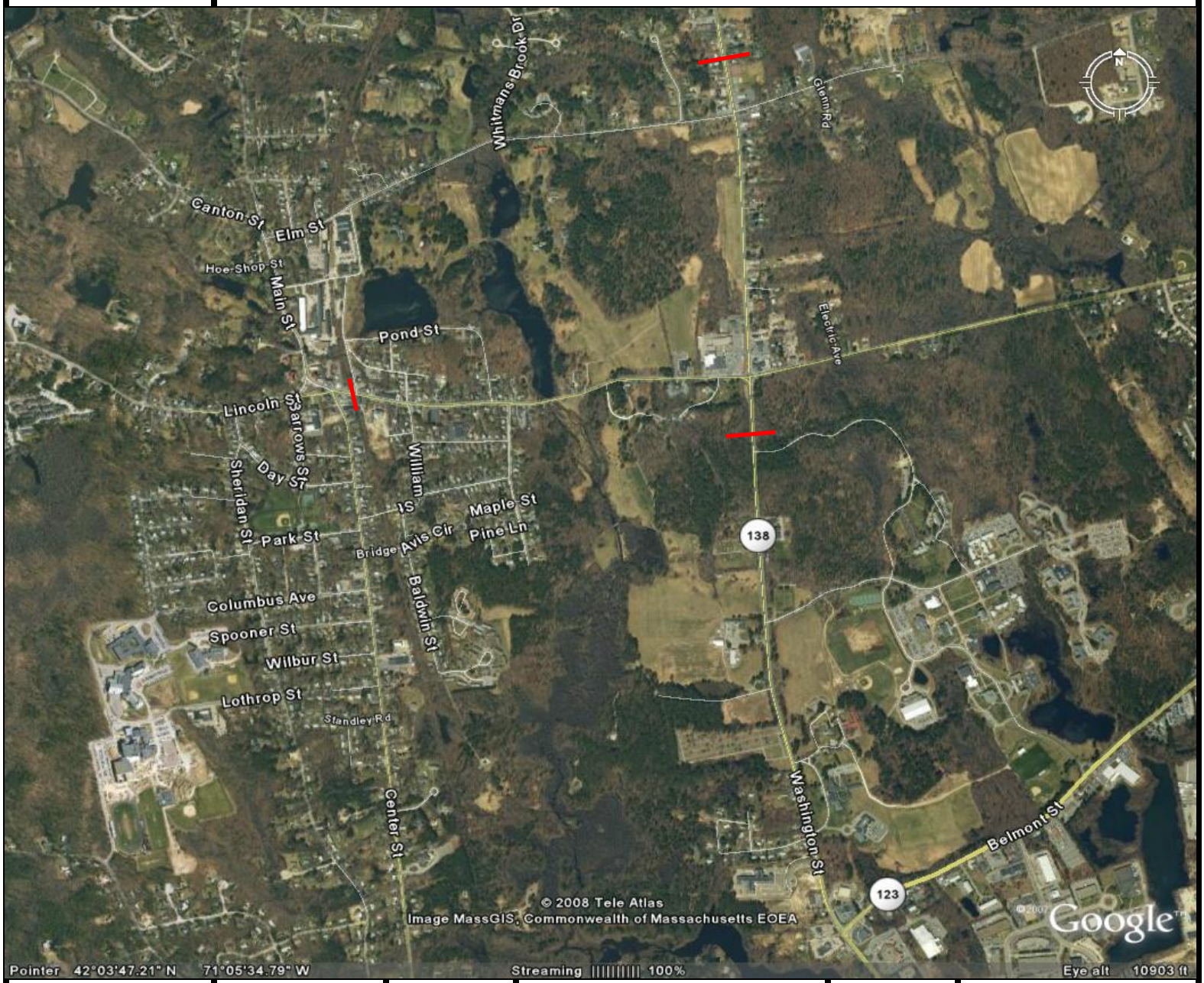
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Easton, MA

Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 M-A volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	12		138		17		123		29		261		
12:15	7		130		7		124		14		254		
12:30	5		122		7		136		12		258		
12:45	10	34	147	537	7	38	144	527	17	72	291	1064	
01:00	6		129		11		129		17		258		
01:15	3		131		6		122		9		253		
01:30	0		132		4		127		4		259		
01:45	7	16	100	492	4	25	115	493	11	41	215	985	
02:00	3		123		6		104		9		227		
02:15	1		121		3		152		4		273		
02:30	0		145		7		148		7		293		
02:45	2	6	193	582	6	22	151	555	8	28	344	1137	
03:00	3		174		2		130		5		304		
03:15	4		151		3		127		7		278		
03:30	3		180		3		131		6		311		
03:45	1	11	177	682	3	11	122	510	4	22	299	1192	
04:00	3		166		4		164		7		330		
04:15	7		187		6		133		13		320		
04:30	9		218		10		149		19		367		
04:45	3	22	193	764	13	33	140	586	16	55	333	1350	
05:00	16		192		13		187		29		379		
05:15	22		167		42		158		64		325		
05:30	36		207		40		131		76		338		
05:45	42	116	179	745	54	149	145	621	96	265	324	1366	
06:00	35		160		83		128		118		288		
06:15	50		144		112		116		162		260		
06:30	78		142		139		104		217		246		
06:45	89	252	106	552	147	481	109	457	236	733	215	1009	
07:00	107		110		164		92		271		202		
07:15	105		97		197		76		302		173		
07:30	114		81		227		63		341		144		
07:45	95	421	69	357	235	823	63	294	330	1244	132	651	
08:00	120		65		246		70		366		135		
08:15	147		63		227		51		374		114		
08:30	116		66		244		51		360		117		
08:45	180	563	56	250	195	912	45	217	375	1475	101	467	
09:00	94		51		141		56		235		107		
09:15	117		43		101		45		218		88		
09:30	96		34		121		33		217		67		
09:45	137	444	33	161	126	489	31	165	263	933	64	326	
10:00	114		33		98		37		212		70		
10:15	117		21		120		20		237		41		
10:30	114		20		98		26		212		46		
10:45	105	450	15	89	125	441	26	109	230	891	41	198	
11:00	130		21		103		24		233		45		
11:15	128		20		118		23		246		43		
11:30	128		20		109		16		237		36		
11:45	121	507	10	71	118	448	12	75	239	955	22	146	
Total	2842		5282		3872		4609		6714		9891		
Percent	42.3%		53.4%		57.7%		46.6%						
Day Total		8124				8481				16605			
Peak	08:00		04:15		07:45		04:30		08:00		04:30		
Vol.	563		790		952		634		1475		1404		
P.H.F.	0.782		0.906		0.967		0.848		0.983		0.926		

PRECISION
D A T A
INDUSTRIES, LLC
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		151		14		136		23		287		
12:15	9		131		8		119		17		250		
12:30	9		135		17		131		26		266		
12:45	5	32	135	552	6	45	117	503	11	77	252	1055	
01:00	4		131		9		135		13		266		
01:15	5		138		3		145		8		283		
01:30	3		142		7		142		10		284		
01:45	4	16	145	556	1	20	132	554	5	36	277	1110	
02:00	5		154		3		114		8		268		
02:15	4		169		7		133		11		302		
02:30	3		146		2		156		5		302		
02:45	2	14	159	628	1	13	130	533	3	27	289	1161	
03:00	0		158		1		166		1		324		
03:15	1		166		1		152		2		318		
03:30	4		139		2		154		6		293		
03:45	3	8	206	669	6	10	153	625	9	18	359	1294	
04:00	0		185		4		144		4		329		
04:15	6		211		5		122		11		333		
04:30	12		187		14		169		26		356		
04:45	3	21	185	768	6	29	165	600	9	50	350	1368	
05:00	13		187		26		187		39		374		
05:15	15		185		29		162		44		347		
05:30	27		196		43		165		70		361		
05:45	47	102	204	772	51	149	143	657	98	251	347	1429	
06:00	35		188		75		127		110		315		
06:15	40		158		122		105		162		263		
06:30	70		153		163		103		233		256		
06:45	91	236	112	611	157	517	119	454	248	753	231	1065	
07:00	108		148		205		100		313		248		
07:15	118		97		196		102		314		199		
07:30	123		82		220		114		343		196		
07:45	135	484	95	422	211	832	102	418	346	1316	197	840	
08:00	142		69		192		94		334		163		
08:15	165		61		171		73		336		134		
08:30	158		57		186		65		344		122		
08:45	146	611	50	237	135	684	69	301	281	1295	119	538	
09:00	111		51		159		55		270		106		
09:15	139		56		134		52		273		108		
09:30	100		33		122		50		222		83		
09:45	101	451	36	176	145	560	30	187	246	1011	66	363	
10:00	136		36		108		32		244		68		
10:15	116		31		106		25		222		56		
10:30	106		25		99		33		205		58		
10:45	133	491	15	107	99	412	32	122	232	903	47	229	
11:00	130		16		111		24		241		40		
11:15	136		15		121		23		257		38		
11:30	144		26		123		17		267		43		
11:45	157	567	14	71	139	494	18	82	296	1061	32	153	
Total	3033		5569		3765		5036		6798		10605		
Percent	44.6%		52.5%		55.4%		47.5%						
Day Total		8602				8801				17403			
Peak	08:00		03:45		07:00		04:30		07:45		04:45		
Vol.	611		789		832		683		1360		1432		
P.H.F.	0.926		0.935		0.945		0.913		0.983		0.957		

PRECISION
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	0	1	4	8	15	3	1	1	1	0	34	50	46
01:00	0	0	0	0	1	2	7	4	1	0	0	1	0	16	48	44
02:00	0	0	0	0	0	0	3	3	0	0	0	0	0	6	46	44
03:00	0	0	0	0	0	2	6	3	0	0	0	0	0	11	45	42
04:00	0	0	0	1	2	3	10	4	2	0	0	0	0	22	47	42
05:00	0	0	0	2	9	38	49	13	5	0	0	0	0	116	45	40
06:00	0	1	0	0	13	69	126	39	3	1	0	0	0	252	45	41
07:00	1	0	5	0	23	130	192	62	4	3	1	0	0	421	45	41
08:00	1	0	13	9	45	217	222	50	3	2	0	1	0	563	44	39
09:00	0	0	1	3	19	156	195	65	5	0	0	0	0	444	45	41
10:00	0	1	0	1	13	155	201	61	13	4	0	0	1	450	45	41
11:00	0	0	0	2	39	163	238	59	6	0	0	0	0	507	44	40
12 PM	0	0	0	3	18	195	249	60	11	1	0	0	0	537	44	41
13:00	0	2	9	34	68	174	171	32	2	0	0	0	0	492	43	38
14:00	0	0	0	5	57	221	243	50	6	0	0	0	0	582	44	40
15:00	0	0	1	13	49	287	268	55	9	0	0	0	0	682	44	39
16:00	0	0	0	7	78	334	281	58	6	0	0	0	0	764	44	39
17:00	0	0	0	12	62	286	318	57	8	2	0	0	0	745	44	40
18:00	0	0	0	0	12	188	259	84	7	2	0	0	0	552	45	41
19:00	0	0	0	5	15	118	160	56	1	2	0	0	0	357	45	41
20:00	0	0	0	1	8	88	118	31	4	0	0	0	0	250	44	41
21:00	0	0	0	0	6	36	83	32	4	0	0	0	0	161	46	42
22:00	0	0	0	0	8	20	38	21	1	1	0	0	0	89	47	41
23:00	0	0	0	0	3	22	31	8	5	1	0	1	0	71	46	42
Total	2	4	29	98	549	2908	3476	922	109	20	2	4	1	8124		
%	0.0%	0.0%	0.4%	1.2%	6.8%	35.8%	42.8%	11.3%	1.3%	0.2%	0.0%	0.0%	0.0%			
AM Peak	07:00	06:00	08:00	08:00	08:00	08:00	11:00	09:00	10:00	10:00	00:00	00:00	10:00	08:00		
Vol.	1	1	13	9	45	217	238	65	13	4	1	1	1	563		
PM Peak		13:00	13:00	13:00	16:00	16:00	17:00	18:00	12:00	17:00		23:00		16:00		
Vol.		2	9	34	78	334	318	84	11	2		1		764		

Pecent

15th Percentile : 35 MPH
50th Percentile : 40 MPH
85th Percentile : 44 MPH
95th Percentile : 48 MPH

Stats

10 MPH Pace Speed : 35-44 MPH
Number in Pace : 6384
Percent in Pace : 78.6%
Number of Vehicles > 40 MPH : 3838
Percent of Vehicles > 40 MPH : 47.2%
Mean Speed(Average) : 40 MPH

PRECISION
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	0	1	6	13	8	4	0	0	0	0	32	48	43
01:00	0	0	0	0	0	2	8	5	1	0	0	0	0	16	48	43
02:00	0	0	0	0	1	5	4	1	3	0	0	0	0	14	50	42
03:00	0	0	0	0	1	2	3	2	0	0	0	0	0	8	45	41
04:00	0	0	0	0	2	3	8	7	0	1	0	0	0	21	47	43
05:00	0	0	0	0	6	40	44	9	2	1	0	0	0	102	44	40
06:00	0	0	0	0	11	64	119	31	10	1	0	0	0	236	45	41
07:00	0	**1**	1	8	26	169	216	46	**15**	**2**	0	0	0	484	44	40
08:00	0	0	**2**	**9**	**71**	204	**275**	46	4	0	0	0	0	**611**	44	39
09:00	0	0	0	1	18	133	223	**62**	13	1	0	0	0	451	45	41
10:00	0	0	2	6	33	**218**	191	37	3	1	0	0	0	491	44	39
11:00	0	0	0	8	51	215	226	56	10	1	0	0	0	567	44	40
12 PM	0	0	0	1	22	213	246	59	10	1	0	0	0	552	44	40
13:00	0	0	0	3	18	177	253	**88**	14	2	1	0	0	556	46	41
14:00	0	0	0	2	34	217	283	79	7	4	**2**	0	0	628	44	41
15:00	0	0	0	**11**	52	273	251	65	14	2	0	**1**	0	669	44	40
16:00	0	0	0	0	51	264	**359**	79	14	1	0	0	0	768	44	40
17:00	0	0	0	2	**60**	**312**	304	82	8	3	1	0	0	**772**	44	40
18:00	0	0	0	0	28	202	295	69	**15**	2	0	0	0	611	44	41
19:00	0	0	0	2	35	150	170	52	12	1	0	0	0	422	45	40
20:00	0	0	0	1	12	79	102	32	10	1	0	0	0	237	45	41
21:00	0	0	0	0	5	31	94	36	5	**5**	0	0	0	176	47	43
22:00	0	0	0	0	3	29	44	23	6	2	0	0	0	107	47	42
23:00	0	0	0	0	2	11	36	17	5	0	0	0	0	71	47	43
Total	0	1	5	54	543	3019	3767	991	185	32	4	1	0	8602		
%	0.0%	0.0%	0.1%	0.6%	6.3%	35.1%	43.8%	11.5%	2.2%	0.4%	0.0%	0.0%	0.0%			
AM Peak		07:00	08:00	08:00	08:00	10:00	08:00	09:00	07:00	07:00				08:00		
Vol.		1	2	9	71	218	275	62	15	2				611		
PM Peak				15:00	17:00	17:00	16:00	13:00	18:00	21:00	14:00	15:00		17:00		
Vol.				11	60	312	359	88	15	5	2	1		772		

Pecent

15th Percentile :	36 MPH
50th Percentile :	40 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6786
Percent in Pace :	78.9%
Number of Vehicles > 40 MPH :	4226
Percent of Vehicles > 40 MPH :	49.1%
Mean Speed(Average) :	40 MPH

PRECISION DATA INDUSTRIES, LLC
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	1	0	8	14	13	2	0	0	0	0	38	47	43
01:00	0	0	0	0	0	7	9	6	2	1	0	0	0	25	48	43
02:00	0	0	0	0	2	5	9	5	1	0	0	0	0	22	47	42
03:00	0	0	0	0	0	1	2	4	2	1	**1**	0	0	11	51	48
04:00	0	0	0	0	2	7	11	8	4	1	0	0	0	33	49	43
05:00	0	0	0	0	7	25	77	34	**5**	1	0	0	0	149	47	42
06:00	0	0	1	20	50	173	**180**	**51**	4	**2**	0	0	0	481	44	39
07:00	**5**	13	34	91	177	**320**	162	20	1	0	0	0	0	823	41	35
08:00	5	**28**	**50**	**109**	**292**	307	115	5	1	0	0	0	0	**912**	39	33
09:00	0	0	1	2	63	225	161	32	5	0	0	0	0	489	43	39
10:00	1	0	2	7	66	202	144	17	2	0	0	0	0	441	43	38
11:00	0	0	0	20	62	211	138	14	2	0	0	0	**1**	448	43	38
12 PM	0	0	0	11	101	261	130	22	2	0	0	0	0	527	42	38
13:00	0	0	**1**	**32**	**153**	209	92	6	0	0	0	0	0	493	41	36
14:00	0	0	0	9	125	277	129	14	1	0	0	0	0	555	42	37
15:00	0	0	0	14	106	249	123	17	0	**1**	0	0	0	510	42	37
16:00	0	0	1	27	118	265	158	16	1	0	0	0	0	586	42	37
17:00	0	0	0	6	143	**301**	151	19	1	0	0	0	0	**621**	42	37
18:00	0	0	0	0	62	202	**162**	**27**	4	0	0	0	0	457	43	39
19:00	0	0	0	3	23	124	121	21	2	0	0	0	0	294	44	39
20:00	0	0	0	3	35	78	79	19	3	0	0	0	0	217	44	39
21:00	0	0	0	0	13	57	63	24	**7**	1	0	0	0	165	46	41
22:00	0	0	0	0	15	40	41	11	2	0	0	0	0	109	44	39
23:00	0	0	0	0	10	24	32	6	2	1	0	0	0	75	44	40
Total	11	41	90	355	1625	3578	2303	411	56	9	1	0	1	8481		
%	0.1%	0.5%	1.1%	4.2%	19.2%	42.2%	27.2%	4.8%	0.7%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	08:00	07:00	06:00	06:00	05:00	06:00	03:00		11:00	08:00		
Vol.	5	28	50	109	292	320	180	51	5	2	1		1	912		
PM Peak			13:00	13:00	13:00	17:00	18:00	18:00	21:00	15:00				17:00		
Vol.			1	32	153	301	162	27	7	1				621		

Pecent

15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	43 MPH
95th Percentile :	45 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	5881
Percent in Pace :	69.3%
Number of Vehicles > 40 MPH :	2320
Percent of Vehicles > 40 MPH :	27.4%
Mean Speed(Average) :	37 MPH

PRECISION
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	0	4	12	18	7	4	0	0	0	0	45	46	41
01:00	0	0	0	0	2	7	9	2	0	0	0	0	0	20	43	40
02:00	0	0	0	0	1	6	2	1	1	1	0	**1**	0	13	54	43
03:00	0	0	0	0	1	2	3	2	2	0	0	0	0	10	49	43
04:00	0	0	0	0	0	4	9	13	3	0	0	0	0	29	49	45
05:00	0	0	0	2	10	40	58	34	4	1	0	0	0	149	47	41
06:00	0	0	0	10	47	180	**219**	**54**	**7**	0	0	0	0	517	44	40
07:00	**4**	1	9	**44**	**187**	**370**	168	43	6	0	0	0	0	**832**	42	37
08:00	1	**11**	**14**	30	156	293	157	20	2	0	0	0	0	684	42	36
09:00	0	0	0	5	80	268	170	35	2	0	0	0	0	560	43	38
10:00	0	0	0	9	78	182	121	20	0	0	**1**	1	0	412	43	38
11:00	0	0	1	7	68	216	172	24	2	**3**	0	1	0	494	43	39
12 PM	0	0	0	6	72	215	177	30	3	0	0	0	0	503	43	39
13:00	0	0	0	4	108	248	159	32	3	0	0	0	0	554	43	38
14:00	0	0	0	**26**	81	251	153	19	3	0	0	0	0	533	43	38
15:00	0	0	3	5	**116**	323	156	21	1	0	0	0	0	625	42	38
16:00	0	0	0	13	92	272	**187**	**33**	3	0	0	0	0	600	43	38
17:00	0	0	4	13	106	**353**	157	21	3	0	0	0	0	**657**	42	37
18:00	0	0	1	6	64	184	163	33	3	0	0	0	0	454	43	39
19:00	0	**1**	**6**	14	88	157	134	17	1	0	0	0	0	418	43	37
20:00	0	0	0	2	23	125	127	22	2	0	0	0	0	301	44	39
21:00	0	0	0	1	17	77	62	22	**8**	0	0	0	0	187	45	40
22:00	0	0	0	0	10	42	51	15	3	**1**	0	0	0	122	45	40
23:00	0	0	0	0	5	25	29	17	6	0	0	0	0	82	47	42
Total	5	13	38	197	1416	3852	2661	537	72	6	1	3	0	8801		
%	0.1%	0.1%	0.4%	2.2%	16.1%	43.8%	30.2%	6.1%	0.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	07:00	07:00	07:00	06:00	06:00	06:00	11:00	10:00	02:00		07:00		
Vol.	4	11	14	44	187	370	219	54	7	3	1	1		832		
PM Peak		19:00	19:00	14:00	15:00	17:00	16:00	16:00	21:00	22:00				17:00		
Vol.		1	6	26	116	353	187	33	8	1				657		

Pecent

15th Percentile : 33 MPH
50th Percentile : 38 MPH
85th Percentile : 43 MPH
95th Percentile : 46 MPH

Stats

10 MPH Pace Speed : 35-44 MPH
Number in Pace : 6513
Percent in Pace : 74.0%
Number of Vehicles > 40 MPH : 2747
Percent of Vehicles > 40 MPH : 31.2%
Mean Speed(Average) : 38 MPH

PRECISION
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	29	3	1	0	0	0	0	1	0	0	0	0	34
01:00	1	14	1	0	0	0	0	0	0	0	0	0	0	16
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	7	4	0	0	0	0	0	0	0	0	0	0	11
04:00	0	13	9	0	0	0	0	0	0	0	0	0	0	22
05:00	0	63	35	3	13	0	0	2	0	0	0	0	0	116
06:00	4	184	45	5	11	2	0	0	1	0	0	0	0	252
07:00	2	340	60	1	12	5	0	0	1	0	0	0	0	421
08:00	7	455	76	5	14	3	1	0	2	0	0	0	0	563
09:00	2	327	79	2	21	6	1	2	3	1	0	0	0	444
10:00	4	325	90	3	18	5	0	4	1	0	0	0	0	450
11:00	3	394	80	2	18	6	0	2	2	0	0	0	0	507
12 PM	3	421	84	6	16	7	0	0	0	0	0	0	0	537
13:00	4	361	89	2	20	7	0	5	4	0	0	0	0	492
14:00	0	435	108	5	23	6	1	3	1	0	0	0	0	582
15:00	0	536	113	7	18	3	0	3	1	1	0	0	0	682
16:00	3	594	137	1	26	0	0	1	1	1	0	0	0	764
17:00	5	603	119	2	12	1	0	3	0	0	0	0	0	745
18:00	1	469	73	1	7	0	0	0	1	0	0	0	0	552
19:00	0	306	40	1	6	3	0	1	0	0	0	0	0	357
20:00	0	206	38	0	6	0	0	0	0	0	0	0	0	250
21:00	1	135	24	0	1	0	0	0	0	0	0	0	0	161
22:00	0	79	9	0	1	0	0	0	0	0	0	0	0	89
23:00	0	57	13	0	1	0	0	0	0	0	0	0	0	71
Total	40	6359	1329	47	244	54	3	26	19	3	0	0	0	8124
Percent	0.5%	78.3%	16.4%	0.6%	3.0%	0.7%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	10:00	06:00	09:00	09:00	08:00	10:00	09:00	09:00				08:00
Vol.	7	455	90	5	21	6	1	4	3	1				563
PM Peak	17:00	17:00	16:00	15:00	16:00	12:00	14:00	13:00	13:00	15:00				16:00
Vol.	5	603	137	7	26	7	1	5	4	1				764

PRECISION
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Washington Street (Route 138)
south of Main Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-A class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	27	5	0	0	0	0	0	0	0	0	0	0	32
01:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
02:00	0	12	1	0	1	0	0	0	0	0	0	0	0	14
03:00	0	4	3	1	0	0	0	0	0	0	0	0	0	8
04:00	0	14	5	0	1	1	0	0	0	0	0	0	0	21
05:00	0	57	35	0	9	0	0	0	1	0	0	0	0	102
06:00	2	169	48	3	11	1	0	0	2	0	0	0	0	236
07:00	2	388	73	4	12	3	0	1	1	0	0	0	0	484
08:00	10	474	98	3	15	7	1	1	2	0	0	0	0	611
09:00	3	348	76	2	9	5	0	4	4	0	0	0	0	451
10:00	4	359	98	5	16	5	1	1	2	0	0	0	0	491
11:00	2	435	86	4	22	6	3	6	2	1	0	0	0	567
12 PM	1	433	92	3	16	4	0	2	1	0	0	0	0	552
13:00	8	416	103	0	15	9	1	2	2	0	0	0	0	556
14:00	6	456	126	4	20	7	0	5	4	0	0	0	0	628
15:00	4	514	124	4	18	3	1	1	0	0	0	0	0	669
16:00	7	610	128	4	14	1	0	3	1	0	0	0	0	768
17:00	5	649	97	1	14	2	0	4	0	0	0	0	0	772
18:00	3	512	79	2	11	2	0	1	1	0	0	0	0	611
19:00	1	354	52	1	9	1	0	0	4	0	0	0	0	422
20:00	2	200	30	1	3	0	0	0	1	0	0	0	0	237
21:00	1	152	22	0	1	0	0	0	0	0	0	0	0	176
22:00	0	91	15	0	1	0	0	0	0	0	0	0	0	107
23:00	0	66	5	0	0	0	0	0	0	0	0	0	0	71
Total	61	6754	1403	42	218	57	7	31	28	1	0	0	0	8602
Percent	0.7%	78.5%	16.3%	0.5%	2.5%	0.7%	0.1%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	10:00	11:00	08:00	11:00	11:00	09:00	11:00				08:00
Vol.	10	474	98	5	22	7	3	6	4	1				611
PM Peak	13:00	17:00	16:00	14:00	14:00	13:00	13:00	14:00	14:00					17:00
Vol.	8	649	128	4	20	9	1	5	4					772

PRECISION
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south of Main Street
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Client: VHB/J. Quitter

81676 M-A class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	32	6	0	0	0	0	0	0	0	0	0	0	38
01:00	0	19	5	0	0	0	0	1	0	0	0	0	0	25
02:00	0	15	5	0	2	0	0	0	0	0	0	0	0	22
03:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
04:00	0	26	5	0	0	1	0	0	1	0	0	0	0	33
05:00	0	101	34	0	9	2	0	2	1	0	0	0	0	149
06:00	1	380	74	3	19	2	0	2	0	0	0	0	0	481
07:00	2	672	110	7	19	3	0	8	2	0	0	0	0	823
08:00	7	702	139	8	31	6	6	6	6	0	0	0	1	912
09:00	4	365	82	3	32	1	0	1	1	0	0	0	0	489
10:00	3	338	69	2	18	6	1	2	2	0	0	0	0	441
11:00	2	347	75	3	10	3	2	5	1	0	0	0	0	448
12 PM	2	426	70	3	18	4	0	2	2	0	0	0	0	527
13:00	0	401	69	3	12	5	0	2	1	0	0	0	0	493
14:00	2	460	77	3	7	5	0	0	1	0	0	0	0	555
15:00	2	420	66	4	13	1	0	2	1	0	1	0	0	510
16:00	5	496	71	2	8	1	0	2	1	0	0	0	0	586
17:00	0	543	69	1	5	1	0	1	1	0	0	0	0	621
18:00	3	384	64	0	5	0	0	1	0	0	0	0	0	457
19:00	1	244	42	1	6	0	0	0	0	0	0	0	0	294
20:00	0	182	29	0	6	0	0	0	0	0	0	0	0	217
21:00	0	151	11	0	3	0	0	0	0	0	0	0	0	165
22:00	1	101	7	0	0	0	0	0	0	0	0	0	0	109
23:00	0	65	8	0	1	0	0	1	0	0	0	0	0	75
Total	35	6878	1190	43	224	41	9	38	21	0	1	0	1	8481
Percent	0.4%	81.1%	14.0%	0.5%	2.6%	0.5%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	08:00	09:00	08:00	08:00	07:00	08:00				08:00	08:00
Vol.	7	702	139	8	32	6	6	8	6				1	912
PM Peak	16:00	17:00	14:00	15:00	12:00	13:00		12:00	12:00		15:00			17:00
Vol.	5	543	77	4	18	5		2	2		1			621

PRECISION
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81676 M-A class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	32	11	0	2	0	0	0	0	0	0	0	0	45
01:00	0	17	1	0	2	0	0	0	0	0	0	0	0	20
02:00	0	9	1	1	2	0	0	0	0	0	0	0	0	13
03:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
04:00	0	18	9	0	2	0	0	0	0	0	0	0	0	29
05:00	1	104	33	0	7	1	0	0	3	0	0	0	0	149
06:00	4	398	94	6	11	3	0	1	0	0	0	0	0	517
07:00	4	678	108	4	22	1	5	8	2	0	0	0	0	832
08:00	3	540	103	3	23	4	0	6	2	0	0	0	0	684
09:00	2	432	85	2	26	6	1	3	3	0	0	0	0	560
10:00	0	307	73	1	19	5	1	3	3	0	0	0	0	412
11:00	3	380	78	2	21	2	3	1	4	0	0	0	0	494
12 PM	2	400	70	2	18	7	0	3	1	0	0	0	0	503
13:00	1	443	85	3	12	4	0	1	5	0	0	0	0	554
14:00	1	431	73	2	15	7	0	2	2	0	0	0	0	533
15:00	3	501	91	2	18	5	0	5	0	0	0	0	0	625
16:00	6	522	64	2	6	0	0	0	0	0	0	0	0	600
17:00	7	568	66	0	13	0	1	1	1	0	0	0	0	657
18:00	4	394	46	0	6	4	0	0	0	0	0	0	0	454
19:00	0	365	46	0	4	0	0	1	2	0	0	0	0	418
20:00	0	264	36	0	1	0	0	0	0	0	0	0	0	301
21:00	2	166	18	0	1	0	0	0	0	0	0	0	0	187
22:00	0	108	14	0	0	0	0	0	0	0	0	0	0	122
23:00	0	71	10	0	0	0	0	1	0	0	0	0	0	82
Total	43	7155	1218	30	231	49	11	36	28	0	0	0	0	8801
Percent	0.5%	81.3%	13.8%	0.3%	2.6%	0.6%	0.1%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	06:00	09:00	09:00	07:00	07:00	11:00					07:00
Vol.	4	678	108	6	26	6	5	8	4					832
PM Peak	17:00	17:00	15:00	13:00	12:00	12:00	17:00	15:00	13:00					17:00
Vol.	7	568	91	3	18	7	1	5	5					657

Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 M-B volume
Site Code: 10111.31

Start	NB				SB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	14		138		10		154		24		292		
12:15	8		130		10		153		18		283		
12:30	6		125		11		110		17		235		
12:45	5	33	148	541	6	37	143	560	11	70	291	1101	
01:00	4		137		5		137		9		274		
01:15	7		121		7		148		14		269		
01:30	2		129		1		140		3		269		
01:45	3	16	130	517	5	18	137	562	8	34	267	1079	
02:00	6		102		4		141		10		243		
02:15	3		143		2		153		5		296		
02:30	8		158		2		157		10		315		
02:45	2	19	162	565	1	9	169	620	3	28	331	1185	
03:00	4		163		3		166		7		329		
03:15	3		129		5		182		8		311		
03:30	7		132		5		190		12		322		
03:45	6	20	129	553	4	17	205	743	10	37	334	1296	
04:00	7		139		2		235		9		374		
04:15	6		155		4		244		10		399		
04:30	12		166		6		270		18		436		
04:45	25	50	142	602	4	16	276	1025	29	66	418	1627	
05:00	26		155		6		228		32		383		
05:15	39		191		20		249		59		440		
05:30	71		128		35		254		106		382		
05:45	78	214	123	597	41	102	258	989	119	316	381	1586	
06:00	108		130		30		214		138		344		
06:15	149		137		40		230		189		367		
06:30	223		111		63		212		286		323		
06:45	232	712	109	487	76	209	203	859	308	921	312	1346	
07:00	210		109		107		124		317		233		
07:15	276		82		95		130		371		212		
07:30	364		73		88		100		452		173		
07:45	296	1146	69	333	119	409	79	433	415	1555	148	766	
08:00	314		50		86		82		400		132		
08:15	343		60		103		97		446		157		
08:30	287		65		109		74		396		139		
08:45	272	1216	40	215	105	403	67	320	377	1619	107	535	
09:00	236		45		117		74		353		119		
09:15	161		43		108		67		269		110		
09:30	160		40		108		55		268		95		
09:45	151	708	26	154	114	447	39	235	265	1155	65	389	
10:00	134		24		129		42		263		66		
10:15	121		21		133		38		254		59		
10:30	118		25		135		26		253		51		
10:45	142	515	24	94	118	515	29	135	260	1030	53	229	
11:00	132		21		126		19		258		40		
11:15	119		18		114		19		233		37		
11:30	121		16		144		30		265		46		
11:45	113	485	9	64	143	527	18	86	256	1012	27	150	
Total	5134		4722		2709		6567		7843		11289		
Percent	65.5%		41.8%		34.5%		58.2%						
Day Total		9856				9276				19132			
Peak	07:30		04:30		11:00		04:00		07:30		04:30		
Vol.	1317		654		527		1025		1713		1677		
P.H.F.	0.905		0.856		0.915		0.928		0.947		0.953		

Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 M-B volume
Site Code: 10111.31

Start	NB				SB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	7		134		10		152		17		286		
12:15	5		150		11		160		16		310		
12:30	12		132		13		137		25		269		
12:45	6	30	137	553	5	39	160	609	11	69	297	1162	
01:00	4		133		8		130		12		263		
01:15	4		122		6		140		10		262		
01:30	5		151		1		141		6		292		
01:45	3	16	137	543	6	21	164	575	9	37	301	1118	
02:00	3		142		4		159		7		301		
02:15	2		166		0		177		2		343		
02:30	6		160		2		154		8		314		
02:45	0	11	172	640	3	9	167	657	3	20	339	1297	
03:00	3		149		0		171		3		320		
03:15	0		150		4		203		4		353		
03:30	5		163		3		189		8		352		
03:45	8	16	153	615	3	10	205	768	11	26	358	1383	
04:00	7		166		1		215		8		381		
04:15	5		145		2		248		7		393		
04:30	12		159		12		258		24		417		
04:45	15	39	161	631	5	20	246	967	20	59	407	1598	
05:00	32		190		9		225		41		415		
05:15	35		164		12		244		47		408		
05:30	59		155		20		254		79		409		
05:45	73	199	127	636	30	71	247	970	103	270	374	1606	
06:00	112		150		38		192		150		342		
06:15	170		124		31		235		201		359		
06:30	207		93		62		208		269		301		
06:45	258	747	115	482	80	211	174	809	338	958	289	1291	
07:00	245		122		112		165		357		287		
07:15	311		82		103		138		414		220		
07:30	322		96		98		128		420		224		
07:45	335	1213	99	399	106	419	93	524	441	1632	192	923	
08:00	289		82		121		104		410		186		
08:15	262		85		132		81		394		166		
08:30	235		71		130		90		365		161		
08:45	225	1011	57	295	129	512	81	356	354	1523	138	651	
09:00	215		59		96		65		311		124		
09:15	181		52		101		73		282		125		
09:30	150		49		116		46		266		95		
09:45	167	713	37	197	110	423	52	236	277	1136	89	433	
10:00	157		31		107		40		264		71		
10:15	130		23		108		36		238		59		
10:30	100		34		117		29		217		63		
10:45	140	527	24	112	142	474	22	127	282	1001	46	239	
11:00	103		20		136		22		239		42		
11:15	129		24		144		28		273		52		
11:30	125		10		141		25		266		35		
11:45	104	461	12	66	138	559	20	95	242	1020	32	161	
Total	4983		5169		2768		6693		7751		11862		
Percent	64.3%		43.6%		35.7%		56.4%						
Day Total		10152				9461				19613			
Peak	07:15		04:30		10:45		04:15		07:15		04:30		
Vol.	1257		674		563		977		1685		1647		
P.H.F.	0.938		0.887		0.977		0.947		0.955		0.987		

PRECISION
D A T A
INDUSTRIES, LLC
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	2	1	6	9	11	2	2	0	0	0	33	49	43
01:00	0	0	0	0	2	2	2	8	2	0	0	0	0	16	49	44
02:00	0	0	0	1	2	3	6	5	2	0	0	0	0	19	48	42
03:00	0	0	0	2	3	2	3	5	2	2	0	**1**	0	20	54	44
04:00	0	0	0	1	5	5	10	15	11	2	1	0	0	50	52	45
05:00	0	0	0	4	12	26	62	88	15	**4**	**3**	0	0	214	49	44
06:00	17	11	12	20	63	105	244	**203**	**33**	2	2	0	0	712	48	40
07:00	9	5	14	22	132	339	**479**	130	15	0	0	0	0	1145	44	39
08:00	**27**	**36**	**56**	**119**	**326**	**445**	175	32	1	0	0	0	0	**1217**	40	34
09:00	1	2	2	14	86	215	278	98	11	1	0	0	0	708	45	40
10:00	0	4	3	16	57	158	207	62	8	0	0	0	0	515	44	39
11:00	0	4	4	20	73	157	161	61	5	0	0	0	0	485	44	39
12 PM	1	3	5	19	88	195	178	46	6	0	0	0	0	541	44	38
13:00	0	1	4	22	98	193	147	47	5	0	0	0	0	517	44	38
14:00	2	2	5	19	88	210	181	54	3	0	0	0	0	564	44	38
15:00	1	3	3	17	66	218	177	56	**9**	**4**	0	0	0	554	44	39
16:00	**3**	**5**	3	21	**118**	200	**192**	54	6	0	0	0	0	**602**	44	38
17:00	2	0	**12**	**26**	105	**244**	162	41	5	0	0	0	0	597	43	37
18:00	1	0	0	11	69	151	184	**62**	9	0	0	0	0	487	44	39
19:00	0	0	1	7	44	90	137	48	5	1	0	0	0	333	45	40
20:00	1	0	1	3	13	49	98	42	8	0	0	0	0	215	46	41
21:00	2	1	1	3	18	26	56	40	4	3	0	0	0	154	47	41
22:00	0	0	0	4	5	6	44	29	6	0	0	0	0	94	48	43
23:00	0	0	0	3	4	4	28	21	4	0	0	0	0	64	48	43
Total	67	77	126	376	1478	3049	3220	1258	177	21	6	1	0	9856		
%	0.7%	0.8%	1.3%	3.8%	15.0%	30.9%	32.7%	12.8%	1.8%	0.2%	0.1%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	07:00	06:00	06:00	05:00	05:00	03:00		08:00		
Vol.	27	36	56	119	326	445	479	203	33	4	3	1		1217		
PM Peak	16:00	16:00	17:00	17:00	16:00	17:00	16:00	18:00	15:00	15:00				16:00		
Vol.	3	5	12	26	118	244	192	62	9	4				602		

Pecent

15th Percentile :	32 MPH
50th Percentile :	39 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6269
Percent in Pace :	63.6%
Number of Vehicles > 40 MPH :	4039
Percent of Vehicles > 40 MPH :	41.0%
Mean Speed(Average) :	39 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	1	0	6	10	8	4	1	0	0	0	30	49	43
01:00	0	0	1	2	1	1	7	3	1	0	0	0	0	16	46	39
02:00	1	0	0	1	2	1	3	2	1	0	0	0	0	11	45	36
03:00	0	0	0	2	2	3	1	3	3	2	0	0	0	16	52	43
04:00	0	0	0	2	1	2	10	13	9	1	0	**1**	0	39	52	46
05:00	0	0	0	2	14	25	57	72	18	**10**	**1**	0	0	199	49	44
06:00	2	**4**	6	14	37	181	270	**183**	**46**	2	1	0	0	746	48	42
07:00	0	1	4	8	107	**481**	**494**	108	10	1	0	0	0	**1214**	44	39
08:00	**3**	3	3	**46**	**175**	409	315	55	2	0	0	0	0	1011	43	38
09:00	1	2	3	27	108	251	240	71	9	0	0	0	**1**	713	44	39
10:00	2	0	4	12	73	165	214	52	4	0	0	0	1	527	44	39
11:00	1	1	**14**	37	86	121	148	49	3	0	0	0	0	460	44	37
12 PM	**4**	2	**15**	**43**	**120**	171	146	43	9	1	0	0	0	554	43	37
13:00	0	2	3	14	73	186	190	66	7	**2**	0	0	0	543	44	39
14:00	2	**3**	2	24	100	**251**	191	61	6	0	0	0	0	**640**	44	38
15:00	0	1	5	8	70	217	**238**	70	6	0	0	0	0	615	44	39
16:00	2	1	3	10	75	217	214	**91**	**17**	1	0	0	0	631	45	40
17:00	0	2	9	17	80	228	232	60	8	0	0	0	0	636	44	39
18:00	2	3	4	8	52	147	183	75	8	0	0	0	0	482	45	40
19:00	0	1	0	6	62	142	127	53	8	0	0	0	0	399	45	39
20:00	1	1	2	6	28	73	129	51	4	0	0	0	0	295	45	40
21:00	0	0	1	2	17	44	74	42	16	1	0	0	0	197	48	42
22:00	0	0	0	0	8	16	40	36	11	1	0	0	0	112	49	43
23:00	0	0	0	0	1	11	18	28	6	2	0	0	0	66	49	44
Total	21	27	79	292	1292	3349	3551	1295	216	25	2	1	2	10152		
%	0.2%	0.3%	0.8%	2.9%	12.7%	33.0%	35.0%	12.8%	2.1%	0.2%	0.0%	0.0%	0.0%			
AM Peak	08:00	06:00	11:00	08:00	08:00	07:00	07:00	06:00	06:00	05:00	05:00	04:00	09:00	07:00		
Vol.	3	4	14	46	175	481	494	183	46	10	1	1	1	1214		
PM Peak	12:00	14:00	12:00	12:00	12:00	14:00	15:00	16:00	16:00	13:00				14:00		
Vol.	4	3	15	43	120	251	238	91	17	2				640		

Pecent

15th Percentile :	34 MPH
50th Percentile :	40 MPH
85th Percentile :	45 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6900
Percent in Pace :	68.0%
Number of Vehicles > 40 MPH :	4381
Percent of Vehicles > 40 MPH :	43.2%
Mean Speed(Average) :	39 MPH

PRECISION
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Washington Street (Route 138)
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81676 M-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	0	3	4	10	11	6	**3**	0	0	0	37	51	45
01:00	0	0	1	0	2	1	3	6	3	2	0	0	0	18	51	44
02:00	0	0	0	0	0	3	0	5	1	0	0	0	0	9	49	44
03:00	0	0	0	0	0	3	6	5	3	0	0	0	0	17	49	44
04:00	0	0	0	1	1	2	3	4	5	0	0	0	0	16	52	45
05:00	0	0	0	0	10	13	42	28	**9**	0	0	0	0	102	48	43
06:00	3	**3**	4	5	15	40	87	43	8	0	**1**	0	0	209	47	40
07:00	1	0	3	5	34	123	**185**	**52**	6	0	0	0	0	409	44	40
08:00	**6**	1	**25**	**15**	74	149	103	23	7	0	0	0	0	403	43	36
09:00	0	0	2	10	57	186	156	32	2	1	0	0	0	446	43	39
10:00	2	1	2	3	73	210	181	42	1	1	0	0	0	516	44	39
11:00	1	1	5	13	**94**	**252**	133	28	0	0	0	0	0	**527**	43	37
12 PM	5	6	10	39	135	220	132	12	0	0	0	0	0	559	42	36
13:00	2	3	6	40	135	237	116	23	1	0	0	0	0	563	42	36
14:00	5	7	21	44	120	223	**160**	37	3	0	0	0	0	620	43	36
15:00	0	3	18	71	199	295	126	28	3	0	0	0	0	743	41	36
16:00	5	5	**41**	**140**	**315**	371	135	13	0	0	0	0	0	**1025**	39	34
17:00	**9**	**9**	25	119	297	**397**	122	11	0	0	0	0	0	989	39	34
18:00	0	7	17	52	265	352	133	31	2	0	0	0	0	859	41	36
19:00	0	2	8	13	70	152	146	39	2	1	0	0	0	433	44	38
20:00	0	1	2	9	52	87	136	32	1	0	0	0	0	320	44	39
21:00	0	2	2	7	32	57	71	**58**	6	0	0	0	0	235	47	40
22:00	0	0	0	2	6	42	47	31	5	**2**	0	0	0	135	47	42
23:00	0	0	0	2	6	13	30	24	**10**	0	**1**	0	0	86	49	43
Total	39	51	192	590	1995	3432	2263	618	84	10	2	0	0	9276		
%	0.4%	0.5%	2.1%	6.4%	21.5%	37.0%	24.4%	6.7%	0.9%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	06:00	08:00	08:00	11:00	11:00	07:00	07:00	05:00	00:00	06:00			11:00		
Vol.	6	3	25	15	94	252	185	52	9	3	1			527		
PM Peak	17:00	17:00	16:00	16:00	16:00	17:00	14:00	21:00	23:00	22:00	23:00			16:00		
Vol.	9	9	41	140	315	397	160	58	10	2	1			1025		

Pecent

15th Percentile : 31 MPH
50th Percentile : 37 MPH
85th Percentile : 43 MPH
95th Percentile : 47 MPH

Stats

10 MPH Pace Speed : 35-44 MPH
Number in Pace : 5695
Percent in Pace : 61.4%
Number of Vehicles > 40 MPH : 2524
Percent of Vehicles > 40 MPH : 27.2%
Mean Speed(Average) : 37 MPH

PRECISION
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	1	5	6	8	8	8	**3**	0	0	0	39	52	44
01:00	0	0	0	0	1	1	6	9	3	0	**1**	0	0	21	50	46
02:00	0	0	0	1	0	1	3	2	2	0	0	0	0	9	50	43
03:00	0	0	0	0	1	1	3	3	2	0	0	0	0	10	47	44
04:00	0	0	0	0	1	1	3	6	8	1	0	0	0	20	52	48
05:00	0	0	0	0	5	9	29	20	7	1	0	0	0	71	49	43
06:00	0	1	2	4	6	43	93	49	**13**	0	0	0	0	211	47	42
07:00	0	0	1	3	36	153	164	**54**	7	1	0	0	0	419	44	40
08:00	0	0	6	22	**84**	176	**168**	51	5	0	0	0	0	512	44	38
09:00	1	0	6	**40**	75	156	118	24	3	0	0	0	0	423	43	37
10:00	1	1	4	19	66	**208**	140	33	2	0	0	0	0	474	43	38
11:00	**62**	**22**	**38**	20	65	163	156	32	1	0	0	0	0	**559**	43	33
12 PM	**23**	**20**	**33**	**79**	123	226	87	18	0	0	0	0	0	609	40	33
13:00	1	1	2	18	111	231	169	**41**	1	0	0	0	0	575	43	38
14:00	1	1	10	20	126	285	181	32	0	1	0	0	0	657	43	37
15:00	3	6	32	50	164	287	192	33	1	0	0	0	0	768	42	36
16:00	0	4	13	29	**246**	376	**260**	38	1	0	0	0	0	967	42	37
17:00	6	10	26	76	204	**390**	232	24	2	0	0	0	0	**970**	42	36
18:00	2	1	14	28	164	357	207	32	3	0	**1**	0	0	809	42	37
19:00	1	1	5	28	104	191	152	34	7	1	0	0	0	524	43	38
20:00	1	1	2	15	68	114	117	31	7	0	0	0	0	356	44	38
21:00	0	0	1	7	33	60	86	38	9	2	0	0	0	236	46	40
22:00	0	0	0	8	10	19	47	34	6	**3**	0	0	0	127	48	42
23:00	0	0	0	0	9	22	23	25	**13**	3	0	0	0	95	50	43
Total	102	69	195	468	1707	3476	2644	671	111	16	2	0	0	9461		
%	1.1%	0.7%	2.1%	4.9%	18.0%	36.7%	27.9%	7.1%	1.2%	0.2%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	09:00	08:00	10:00	08:00	07:00	06:00	00:00	01:00			11:00		
Vol.	62	22	38	40	84	208	168	54	13	3	1			559		
PM Peak	12:00	12:00	12:00	12:00	16:00	17:00	16:00	13:00	23:00	22:00	18:00			17:00		
Vol.	23	20	33	79	246	390	260	41	13	3	1			970		

Pecent

15th Percentile :	31 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	47 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6120
Percent in Pace :	64.7%
Number of Vehicles > 40 MPH :	2915
Percent of Vehicles > 40 MPH :	30.8%
Mean Speed(Average) :	37 MPH

PRECISION
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	28	5	0	0	0	0	0	0	0	0	0	0	33
01:00	0	11	3	0	1	0	0	1	0	0	0	0	0	16
02:00	0	11	6	0	2	0	0	0	0	0	0	0	0	19
03:00	0	12	7	1	0	0	0	0	0	0	0	0	0	20
04:00	0	33	13	0	3	1	0	0	0	0	0	0	0	50
05:00	2	132	56	0	17	3	0	2	2	0	0	0	0	214
06:00	3	490	174	6	32	4	0	2	1	0	0	0	0	712
07:00	2	847	243	3	40	2	0	7	1	0	0	0	0	1145
08:00	5	765	347	13	60	7	6	7	6	0	0	0	1	1217
09:00	5	446	207	3	31	6	0	6	4	0	0	0	0	708
10:00	0	324	150	4	25	6	1	3	2	0	0	0	0	515
11:00	3	319	134	2	19	3	2	2	1	0	0	0	0	485
12 PM	0	362	141	3	25	6	0	3	1	0	0	0	0	541
13:00	2	349	130	4	21	7	0	3	1	0	0	0	0	517
14:00	1	371	155	6	21	8	0	2	0	0	0	0	0	564
15:00	4	372	152	2	16	4	0	3	1	0	0	0	0	554
16:00	4	435	137	2	14	8	0	1	1	0	0	0	0	602
17:00	5	440	129	1	16	5	0	1	0	0	0	0	0	597
18:00	2	336	132	0	14	2	0	1	0	0	0	0	0	487
19:00	1	229	84	1	17	1	0	0	0	0	0	0	0	333
20:00	1	151	56	0	7	0	0	0	0	0	0	0	0	215
21:00	0	120	28	0	6	0	0	0	0	0	0	0	0	154
22:00	0	72	19	0	3	0	0	0	0	0	0	0	0	94
23:00	0	55	7	0	1	0	0	1	0	0	0	0	0	64
Total	40	6710	2515	51	391	73	9	45	21	0	0	0	1	9856
Percent	0.4%	68.1%	25.5%	0.5%	4.0%	0.7%	0.1%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00				08:00	08:00
Vol.	5	847	347	13	60	7	6	7	6				1	1217
PM Peak	17:00	17:00	14:00	14:00	12:00	14:00		12:00	12:00					16:00
Vol.	5	440	155	6	25	8		3	1					602

PRECISION
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	20	8	0	2	0	0	0	0	0	0	0	0	30
01:00	0	10	4	1	1	0	0	0	0	0	0	0	0	16
02:00	0	7	2	0	1	0	0	0	1	0	0	0	0	11
03:00	0	9	6	1	0	0	0	0	0	0	0	0	0	16
04:00	0	22	14	0	3	0	0	0	0	0	0	0	0	39
05:00	4	117	56	0	21	0	0	0	1	0	0	0	0	199
06:00	4	517	186	8	28	1	0	1	1	0	0	0	0	746
07:00	7	893	254	1	43	3	4	6	3	0	0	0	0	1214
08:00	3	688	254	5	38	13	2	5	3	0	0	0	0	1011
09:00	4	460	200	5	34	7	1	2	0	0	0	0	0	713
10:00	5	330	139	3	31	8	1	4	6	0	0	0	0	527
11:00	4	288	132	1	27	2	2	3	1	0	0	0	0	460
12 PM	5	358	136	3	32	11	1	7	1	0	0	0	0	554
13:00	2	363	137	4	27	7	0	2	1	0	0	0	0	543
14:00	7	420	162	6	33	8	0	2	1	1	0	0	0	640
15:00	4	414	163	1	22	8	0	0	3	0	0	0	0	615
16:00	4	454	148	1	16	7	0	1	0	0	0	0	0	631
17:00	7	453	150	0	18	7	1	0	0	0	0	0	0	636
18:00	9	339	116	1	12	4	0	0	1	0	0	0	0	482
19:00	4	281	95	0	14	4	0	0	1	0	0	0	0	399
20:00	3	213	71	0	7	0	0	1	0	0	0	0	0	295
21:00	2	158	34	1	2	0	0	0	0	0	0	0	0	197
22:00	1	93	17	0	1	0	0	0	0	0	0	0	0	112
23:00	0	53	11	0	1	0	0	1	0	0	0	0	0	66
Total	79	6960	2495	42	414	90	12	35	24	1	0	0	0	10152
Percent	0.8%	68.6%	24.6%	0.4%	4.1%	0.9%	0.1%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	07:00	08:00	07:00	07:00	10:00					07:00
Vol.	7	893	254	8	43	13	4	6	6					1214
PM Peak	18:00	16:00	15:00	14:00	14:00	12:00	12:00	12:00	15:00	14:00				14:00
Vol.	9	454	163	6	33	11	1	7	3	1				640

PRECISION
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	29	6	1	0	0	0	0	1	0	0	0	0	37
01:00	2	13	1	0	1	0	0	1	0	0	0	0	0	18
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	12	4	0	0	1	0	0	0	0	0	0	0	17
04:00	0	8	7	0	1	0	0	0	0	0	0	0	0	16
05:00	0	55	30	2	13	0	0	2	0	0	0	0	0	102
06:00	8	143	41	4	10	2	0	0	1	0	0	0	0	209
07:00	3	310	76	2	9	6	0	1	2	0	0	0	0	409
08:00	4	321	57	5	9	5	0	1	1	0	0	0	0	403
09:00	5	299	99	5	27	8	0	0	3	0	0	0	0	446
10:00	5	355	120	5	21	6	0	3	1	0	0	0	0	516
11:00	2	373	117	2	21	5	0	4	3	0	0	0	0	527
12 PM	4	419	109	4	16	4	0	2	1	0	0	0	0	559
13:00	5	388	130	4	23	10	0	1	2	0	0	0	0	563
14:00	3	447	140	3	19	2	1	3	1	1	0	0	0	620
15:00	3	552	146	9	25	1	0	6	1	0	0	0	0	743
16:00	4	778	204	3	28	3	0	4	1	0	0	0	0	1025
17:00	7	769	187	2	21	2	0	1	0	0	0	0	0	989
18:00	2	697	140	2	14	2	0	1	1	0	0	0	0	859
19:00	3	341	73	1	11	1	0	3	0	0	0	0	0	433
20:00	1	266	42	0	10	0	0	1	0	0	0	0	0	320
21:00	1	194	39	0	1	0	0	0	0	0	0	0	0	235
22:00	1	116	16	0	2	0	0	0	0	0	0	0	0	135
23:00	0	61	22	0	2	0	0	1	0	0	0	0	0	86
Total	63	6954	1807	54	284	58	1	35	19	1	0	0	0	9276
Percent	0.7%	75.0%	19.5%	0.6%	3.1%	0.6%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	10:00	08:00	09:00	09:00		11:00	09:00					11:00
Vol.	8	373	120	5	27	8		4	3					527
PM Peak	17:00	16:00	16:00	15:00	16:00	13:00	14:00	15:00	13:00	14:00				16:00
Vol.	7	778	204	9	28	10	1	6	2	1				1025

PRECISION
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Washington Street (Route 138)
north of Elm Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	28	10	0	1	0	0	0	0	0	0	0	0	39
01:00	0	15	4	0	2	0	0	0	0	0	0	0	0	21
02:00	0	7	1	0	0	0	0	0	1	0	0	0	0	9
03:00	0	7	1	1	1	0	0	0	0	0	0	0	0	10
04:00	0	11	7	0	1	1	0	0	0	0	0	0	0	20
05:00	0	41	23	0	7	0	0	0	0	0	0	0	0	71
06:00	6	158	34	1	11	1	0	0	0	0	0	0	0	211
07:00	6	315	73	5	15	3	0	1	1	0	0	0	0	419
08:00	5	385	90	2	17	10	1	2	0	0	0	0	0	512
09:00	4	304	89	2	10	6	1	3	3	1	0	0	0	423
10:00	3	319	110	3	24	10	1	1	3	0	0	0	0	474
11:00	7	400	111	4	21	6	2	4	4	0	0	0	0	559
12 PM	3	457	112	2	23	9	0	1	2	0	0	0	0	609
13:00	6	411	122	5	23	7	1	0	0	0	0	0	0	575
14:00	9	464	144	3	25	7	0	2	3	0	0	0	0	657
15:00	5	575	140	7	30	4	0	5	2	0	0	0	0	768
16:00	7	711	206	2	33	3	0	3	2	0	0	0	0	967
17:00	6	808	126	1	25	2	0	2	0	0	0	0	0	970
18:00	3	648	133	2	19	2	0	1	1	0	0	0	0	809
19:00	3	420	83	3	11	0	0	1	3	0	0	0	0	524
20:00	2	289	55	1	7	1	0	1	0	0	0	0	0	356
21:00	1	198	29	0	7	1	0	0	0	0	0	0	0	236
22:00	1	109	17	0	0	0	0	0	0	0	0	0	0	127
23:00	0	75	18	0	1	0	0	1	0	0	0	0	0	95
Total	77	7155	1738	44	314	73	6	28	25	1	0	0	0	9461
Percent	0.8%	75.6%	18.4%	0.5%	3.3%	0.8%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	07:00	10:00	08:00	11:00	11:00	11:00	09:00				11:00
Vol.	7	400	111	5	24	10	2	4	4	1				559
PM Peak	14:00	17:00	16:00	15:00	16:00	12:00	13:00	15:00	14:00					17:00
Vol.	9	808	206	7	33	9	1	5	3					970

Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 M-C volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	10		116		11		105		21		221		
12:15	5		100		10		97		15		197		
12:30	5		92		6		95		11		187		
12:45	2	22	109	417	11	38	92	389	13	60	201	806	
01:00	2		95		5		113		7		208		
01:15	5		95		3		102		8		197		
01:30	2		107		3		110		5		217		
01:45	3	12	96	393	3	14	111	436	6	26	207	829	
02:00	5		84		3		112		8		196		
02:15	2		109		1		96		3		205		
02:30	5		117		0		113		5		230		
02:45	3	15	103	413	2	6	138	459	5	21	241	872	
03:00	3		124		3		136		6		260		
03:15	2		102		4		135		6		237		
03:30	5		101		3		159		8		260		
03:45	8	18	107	434	5	15	185	615	13	33	292	1049	
04:00	6		113		2		178		8		291		
04:15	4		104		4		202		8		306		
04:30	13		120		6		220		19		340		
04:45	21	44	111	448	3	15	222	822	24	59	333	1270	
05:00	17		126		8		203		25		329		
05:15	43		127		21		192		64		319		
05:30	56		118		30		251		86		369		
05:45	68	184	101	472	30	89	214	860	98	273	315	1332	
06:00	105		122		32		180		137		302		
06:15	129		97		49		188		178		285		
06:30	204		91		57		160		261		251		
06:45	187	625	76	386	76	214	108	636	263	839	184	1022	
07:00	185		87		82		105		267		192		
07:15	220		53		91		102		311		155		
07:30	313		64		97		60		410		124		
07:45	260	978	49	253	101	371	58	325	361	1349	107	578	
08:00	279		51		92		59		371		110		
08:15	278		42		125		70		403		112		
08:30	234		31		100		48		334		79		
08:45	236	1027	28	152	109	426	50	227	345	1453	78	379	
09:00	153		45		106		57		259		102		
09:15	100		30		89		49		189		79		
09:30	104		37		94		37		198		74		
09:45	103	460	25	137	108	397	33	176	211	857	58	313	
10:00	87		23		98		26		185		49		
10:15	93		19		93		32		186		51		
10:30	84		18		102		20		186		38		
10:45	87	351	17	77	100	393	19	97	187	744	36	174	
11:00	84		11		79		18		163		29		
11:15	88		16		85		23		173		39		
11:30	85		16		101		18		186		34		
11:45	108	365	4	47	92	357	14	73	200	722	18	120	
Total	4101		3629		2335		5115		6436		8744		
Percent	63.7%		41.5%		36.3%		58.5%						
Day Total		7730				7450				15180			
Peak	07:30		04:30		08:15		04:45		07:30		04:45		
Vol.	1130		484		440		868		1545		1350		
P.H.F.	0.903		0.953		0.880		0.865		0.942		0.915		

PRECISION
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Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	6		99		12		107		18		206		
12:15	3		112		8		113		11		225		
12:30	9		94		9		94		18		188		
12:45	6	24	86	391	8	37	99	413	14	61	185	804	
01:00	3		98		6		96		9		194		
01:15	4		90		3		101		7		191		
01:30	5		100		3		107		8		207		
01:45	3	15	106	394	5	17	116	420	8	32	222	814	
02:00	2		101		4		97		6		198		
02:15	3		115		2		128		5		243		
02:30	4		139		1		126		5		265		
02:45	0	9	106	461	2	9	119	470	2	18	225	931	
03:00	3		117		1		148		4		265		
03:15	1		110		1		162		2		272		
03:30	4		102		3		177		7		279		
03:45	4	12	121	450	2	7	188	675	6	19	309	1125	
04:00	7		140		2		142		9		282		
04:15	5		105		4		212		9		317		
04:30	13		148		11		187		24		335		
04:45	10	35	124	517	3	20	214	755	13	55	338	1272	
05:00	26		156		7		179		33		335		
05:15	39		132		14		199		53		331		
05:30	51		125		22		229		73		354		
05:45	62	178	100	513	30	73	179	786	92	251	279	1299	
06:00	100		103		29		184		129		287		
06:15	151		96		31		162		182		258		
06:30	197		75		70		173		267		248		
06:45	215	663	89	363	85	215	125	644	300	878	214	1007	
07:00	213		90		88		134		301		224		
07:15	248		80		94		99		342		179		
07:30	272		84		98		85		370		169		
07:45	250	983	57	311	106	386	81	399	356	1369	138	710	
08:00	232		59		92		62		324		121		
08:15	202		75		116		63		318		138		
08:30	167		45		114		68		281		113		
08:45	185	786	56	235	100	422	39	232	285	1208	95	467	
09:00	149		41		75		49		224		90		
09:15	125		42		98		47		223		89		
09:30	94		34		97		43		191		77		
09:45	111	479	29	146	96	366	35	174	207	845	64	320	
10:00	96		32		96		30		192		62		
10:15	79		20		87		30		166		50		
10:30	76		23		93		20		169		43		
10:45	91	342	18	93	89	365	16	96	180	707	34	189	
11:00	72		13		107		17		179		30		
11:15	89		19		109		23		198		42		
11:30	92		9		105		18		197		27		
11:45	123	376	11	52	110	431	12	70	233	807	23	122	
Total	3902		3926		2348		5134		6250		9060		
Percent	62.4%		43.3%		37.6%		56.7%						
Day Total		7828				7482				15310			
Peak	07:15		04:30		11:00		04:45		07:15		04:45		
Vol.	1002		560		431		821		1392		1358		
P.H.F.	0.921		0.897		0.929		0.896		0.941		0.959		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	0	0	2	7	7	1	3	**2**	0	0	22	56	47
01:00	0	0	0	0	0	3	2	3	3	0	1	0	0	12	51	46
02:00	0	0	0	0	1	1	5	6	2	0	0	0	0	15	49	44
03:00	0	0	0	0	0	3	3	5	5	1	0	**1**	0	18	53	48
04:00	0	0	0	0	0	6	6	16	9	4	2	1	0	44	54	48
05:00	0	0	0	1	2	18	39	81	34	**8**	1	0	0	184	52	46
06:00	0	0	0	8	44	114	221	**177**	**54**	5	2	0	0	625	49	43
07:00	0	0	**2**	32	**124**	259	359	174	27	0	0	0	0	977	46	40
08:00	**1**	0	0	**33**	117	**302**	**416**	137	16	5	1	0	0	**1028**	45	40
09:00	0	0	0	9	36	168	163	73	9	1	1	0	0	460	45	40
10:00	0	0	1	8	33	114	127	59	9	0	0	0	0	351	46	40
11:00	0	0	0	8	45	133	123	41	15	0	0	0	0	365	45	40
12 PM	0	**1**	1	3	30	**192**	136	39	14	1	0	0	0	417	44	40
13:00	0	0	2	11	**65**	158	116	38	2	0	0	**1**	0	393	44	38
14:00	**1**	0	**6**	**19**	35	151	136	52	10	**2**	0	0	0	412	45	39
15:00	0	0	2	2	64	166	145	47	9	0	0	0	0	435	44	39
16:00	1	0	3	9	58	144	153	**70**	9	1	0	0	0	448	45	40
17:00	0	0	6	1	40	162	**182**	59	**21**	1	0	0	0	**472**	45	40
18:00	0	0	3	4	35	127	145	56	15	0	**1**	0	0	386	46	40
19:00	0	0	0	1	21	96	95	34	6	0	0	0	0	253	45	40
20:00	0	0	2	1	12	36	61	32	5	2	0	0	**1**	152	47	41
21:00	0	0	0	2	14	42	52	19	6	2	0	0	0	137	46	41
22:00	0	0	0	0	5	16	27	24	5	0	0	0	0	77	48	42
23:00	0	0	0	0	0	5	20	11	9	2	0	0	0	47	51	45
Total	3	1	28	152	781	2418	2739	1260	295	38	11	3	1	7730		
%	0.0%	0.0%	0.4%	2.0%	10.1%	31.3%	35.4%	16.3%	3.8%	0.5%	0.1%	0.0%	0.0%			
AM Peak	08:00		07:00	08:00	07:00	08:00	08:00	06:00	06:00	05:00	00:00	03:00		08:00		
Vol.	1		2	33	124	302	416	177	54	8	2	1		1028		
PM Peak	14:00	12:00	14:00	14:00	13:00	12:00	17:00	16:00	17:00	14:00	18:00	13:00	20:00	17:00		
Vol.	1	1	6	19	65	192	182	70	21	2	1	1	1	472		

Pecent

15th Percentile :	35 MPH
50th Percentile :	40 MPH
85th Percentile :	46 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	5157
Percent in Pace :	66.7%
Number of Vehicles > 40 MPH :	3799
Percent of Vehicles > 40 MPH :	49.1%
Mean Speed(Average) :	40 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	0	0	2	9	6	6	1	0	0	0	24	51	46
01:00	0	0	0	0	0	4	7	2	2	0	0	0	0	15	49	43
02:00	0	0	0	0	1	1	3	3	1	0	0	0	0	9	47	43
03:00	0	0	0	0	0	2	1	5	4	0	0	0	0	12	51	46
04:00	0	0	0	0	0	2	4	12	15	2	0	0	0	35	53	49
05:00	0	0	0	1	6	14	38	78	31	**10**	0	0	0	178	52	46
06:00	0	0	8	4	22	141	241	**189**	**43**	10	**3**	0	0	661	48	43
07:00	0	**5**	**12**	**20**	110	**299**	**350**	172	13	2	0	**1**	0	**984**	46	40
08:00	**1**	1	1	17	**118**	236	266	123	21	3	0	0	0	787	46	40
09:00	0	0	1	5	55	150	181	70	16	1	0	0	0	479	46	40
10:00	0	1	0	5	25	99	139	61	10	2	0	0	0	342	46	41
11:00	0	0	0	8	35	126	137	58	8	3	1	0	0	376	46	40
12 PM	0	0	1	10	**59**	132	130	47	10	2	0	0	0	391	44	39
13:00	**1**	0	1	9	45	133	138	57	7	2	1	0	0	394	45	40
14:00	1	0	0	4	53	171	169	51	11	1	0	0	0	461	44	40
15:00	0	**1**	1	7	57	127	170	70	15	2	0	0	0	450	46	40
16:00	1	0	**7**	**12**	49	173	**182**	**74**	**17**	1	0	0	0	**516**	45	40
17:00	1	0	1	7	52	**207**	158	69	16	2	0	**1**	0	514	45	40
18:00	0	1	0	5	42	117	131	54	10	2	0	0	0	362	46	40
19:00	1	0	0	6	36	133	91	39	6	0	0	0	0	312	44	39
20:00	0	0	0	1	15	78	84	48	6	1	**2**	0	0	235	47	41
21:00	0	0	0	2	12	28	52	34	11	**6**	1	0	0	146	49	43
22:00	0	0	0	0	1	10	40	31	11	0	0	0	0	93	49	44
23:00	0	0	0	0	0	4	13	26	8	1	0	0	0	52	50	46
Total	6	9	33	123	793	2389	2734	1379	298	54	8	2	0	7828		
%	0.1%	0.1%	0.4%	1.6%	10.1%	30.5%	34.9%	17.6%	3.8%	0.7%	0.1%	0.0%	0.0%			
AM Peak	08:00	07:00	07:00	07:00	08:00	07:00	07:00	06:00	06:00	05:00	06:00	07:00		07:00		
Vol.	1	5	12	20	118	299	350	189	43	10	3	1		984		
PM Peak	13:00	15:00	16:00	16:00	12:00	17:00	16:00	16:00	16:00	21:00	20:00	17:00		16:00		
Vol.	1	1	7	12	59	207	182	74	17	6	2	1		516		

Pecent

15th Percentile :	35 MPH
50th Percentile :	41 MPH
85th Percentile :	47 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	5123
Percent in Pace :	65.4%
Number of Vehicles > 40 MPH :	3928
Percent of Vehicles > 40 MPH :	50.2%
Mean Speed(Average) :	40 MPH

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	**1**	**2**	0	0	1	4	12	12	4	**2**	0	0	0	38	49	42
01:00	0	2	0	0	1	1	4	3	2	1	0	0	0	14	50	40
02:00	0	0	0	0	0	1	2	2	1	0	0	0	0	6	46	44
03:00	0	0	1	0	1	2	5	5	1	0	0	0	0	15	48	42
04:00	0	0	0	1	1	0	1	10	2	0	0	0	0	15	49	45
05:00	0	0	0	1	3	20	28	26	**11**	0	0	0	0	89	49	43
06:00	0	0	0	1	14	55	83	50	9	2	0	0	0	214	47	42
07:00	0	0	1	8	36	115	144	**58**	8	1	0	0	0	371	45	40
08:00	0	0	1	9	37	**171**	**154**	46	7	1	0	0	0	**426**	44	39
09:00	0	0	**3**	**13**	43	147	151	32	7	1	0	0	0	397	44	39
10:00	0	0	1	12	**66**	135	122	52	5	0	0	0	0	393	44	39
11:00	0	0	0	8	48	142	122	34	3	0	0	0	0	357	44	39
12 PM	0	0	3	10	56	161	127	25	5	**2**	0	0	0	389	43	38
13:00	1	0	6	31	80	187	102	25	4	0	0	0	0	436	43	37
14:00	0	0	2	16	85	185	134	33	3	1	0	0	0	459	43	38
15:00	1	6	11	59	105	214	176	40	2	1	0	0	0	615	43	37
16:00	4	**18**	37	65	154	**311**	183	44	5	0	0	0	0	821	42	36
17:00	**7**	18	**43**	**73**	**187**	291	**200**	40	2	0	0	0	0	**861**	42	35
18:00	1	6	22	55	100	187	194	**67**	3	1	0	0	0	636	44	37
19:00	0	1	3	16	55	107	108	31	4	0	0	0	0	325	44	38
20:00	0	0	2	11	23	73	78	34	6	0	0	0	0	227	45	40
21:00	0	0	0	1	16	35	79	32	**13**	0	0	0	0	176	47	42
22:00	0	0	0	0	5	26	34	24	6	2	0	0	0	97	48	42
23:00	0	0	0	2	1	9	24	31	4	2	0	0	0	73	49	44
Total	15	53	136	392	1118	2579	2267	756	117	17	0	0	0	7450		
%	0.2%	0.7%	1.8%	5.3%	15.0%	34.6%	30.4%	10.1%	1.6%	0.2%	0.0%	0.0%	0.0%			
AM Peak	00:00	00:00	09:00	09:00	10:00	08:00	08:00	07:00	05:00	00:00				08:00		
Vol.	1	2	3	13	66	171	154	58	11	2				426		
PM Peak	17:00	16:00	17:00	17:00	17:00	16:00	17:00	18:00	21:00	12:00				17:00		
Vol.	7	18	43	73	187	311	200	67	13	2				861		

Pecent

15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	4846
Percent in Pace :	65.0%
Number of Vehicles > 40 MPH :	2703
Percent of Vehicles > 40 MPH :	36.3%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
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Washington Street (Route 138)
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City, State: Easton, MA
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81676 M-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	**2**	0	0	0	0	5	14	7	7	**2**	0	0	0	37	51	43
01:00	0	2	0	1	0	1	9	3	1	0	0	0	0	17	45	39
02:00	1	0	2	0	0	0	3	3	0	0	0	0	0	9	46	34
03:00	0	0	0	0	0	1	0	3	3	0	0	0	0	7	51	47
04:00	0	0	0	0	0	0	4	10	5	1	0	0	0	20	52	48
05:00	0	0	0	0	1	17	29	20	4	1	**1**	0	0	73	48	43
06:00	0	2	1	10	17	38	80	53	11	2	1	0	0	215	48	41
07:00	0	**3**	2	10	46	90	**167**	63	5	0	0	0	0	386	45	40
08:00	1	0	**5**	**16**	39	115	167	**67**	**12**	0	0	0	0	422	46	40
09:00	0	0	0	3	51	143	121	41	7	0	0	0	0	366	44	39
10:00	0	0	0	14	47	89	144	65	6	0	0	0	0	365	46	40
11:00	0	0	3	10	**59**	**164**	144	48	3	0	0	0	0	**431**	44	39
12 PM	1	4	1	22	62	151	128	43	1	0	0	0	0	413	44	38
13:00	0	4	3	7	53	141	154	48	8	**2**	0	0	0	420	44	39
14:00	1	0	9	28	57	151	146	**69**	**9**	0	0	0	0	470	45	39
15:00	2	**13**	16	57	132	209	200	41	3	2	0	0	0	675	43	37
16:00	1	3	10	36	139	256	**240**	61	9	0	0	0	0	755	44	38
17:00	**5**	3	**20**	**59**	**155**	**262**	225	53	4	0	0	0	0	**786**	43	37
18:00	1	3	11	31	132	199	207	56	4	0	0	0	0	644	44	38
19:00	0	2	8	24	58	159	105	41	2	0	0	0	0	399	44	38
20:00	0	0	1	10	31	77	67	40	5	0	**1**	0	0	232	46	39
21:00	0	0	1	1	17	38	74	34	7	1	1	0	0	174	47	41
22:00	0	1	0	2	6	11	29	35	9	2	1	0	0	96	49	44
23:00	0	0	0	0	0	6	25	30	7	2	0	0	0	70	49	45
Total	15	40	93	341	1102	2323	2482	934	132	15	5	0	0	7482		
%	0.2%	0.5%	1.2%	4.6%	14.7%	31.0%	33.2%	12.5%	1.8%	0.2%	0.1%	0.0%	0.0%			
AM Peak	00:00	07:00	08:00	08:00	11:00	11:00	07:00	08:00	08:00	00:00	05:00			11:00		
Vol.	2	3	5	16	59	164	167	67	12	2	1			431		
PM Peak	17:00	15:00	17:00	17:00	17:00	17:00	16:00	14:00	14:00	13:00	20:00			17:00		
Vol.	5	13	20	59	155	262	240	69	9	2	1			786		

Pecent

15th Percentile :	32 MPH
50th Percentile :	39 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	4805
Percent in Pace :	64.2%
Number of Vehicles > 40 MPH :	3071
Percent of Vehicles > 40 MPH :	41.0%
Mean Speed(Average) :	39 MPH

PRECISION
D A T A
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Washington Street (Route 138)
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Client: VHB/J. Quitter

81676 M-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	18	4	0	0	0	0	0	0	0	0	0	0	22
01:00	0	6	5	0	0	0	0	1	0	0	0	0	0	12
02:00	0	8	4	0	3	0	0	0	0	0	0	0	0	15
03:00	0	10	6	1	1	0	0	0	0	0	0	0	0	18
04:00	0	28	11	0	4	0	0	1	0	0	0	0	0	44
05:00	1	115	48	1	13	3	0	1	2	0	0	0	0	184
06:00	3	455	115	7	31	2	0	11	1	0	0	0	0	625
07:00	0	783	136	4	37	3	0	11	0	2	0	1	0	977
08:00	9	715	209	12	58	5	1	9	9	1	0	0	0	1028
09:00	1	291	123	3	32	4	0	4	2	0	0	0	0	460
10:00	0	233	87	4	19	3	0	4	1	0	0	0	0	351
11:00	3	263	77	3	16	1	0	1	1	0	0	0	0	365
12 PM	3	299	84	2	19	6	0	3	1	0	0	0	0	417
13:00	0	285	84	2	14	2	0	5	1	0	0	0	0	393
14:00	1	292	89	5	14	6	0	3	0	0	0	1	1	412
15:00	1	327	90	3	11	1	0	1	1	0	0	0	0	435
16:00	4	346	78	2	13	3	0	1	1	0	0	0	0	448
17:00	1	380	75	2	9	2	0	0	3	0	0	0	0	472
18:00	1	307	68	1	6	3	0	0	0	0	0	0	0	386
19:00	1	195	41	2	12	1	0	1	0	0	0	0	0	253
20:00	0	118	27	0	7	0	0	0	0	0	0	0	0	152
21:00	1	104	25	0	6	1	0	0	0	0	0	0	0	137
22:00	0	62	11	0	4	0	0	0	0	0	0	0	0	77
23:00	0	40	5	0	1	0	0	1	0	0	0	0	0	47
Total	30	5680	1502	54	330	46	1	58	23	3	0	2	1	7730
Percent	0.4%	73.5%	19.4%	0.7%	4.3%	0.6%	0.0%	0.8%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	08:00	08:00	08:00	08:00	06:00	08:00	07:00		07:00		08:00
Vol.	9	783	209	12	58	5	1	11	9	2		1		1028
PM Peak	16:00	17:00	15:00	14:00	12:00	12:00		13:00	17:00			14:00	14:00	17:00
Vol.	4	380	90	5	19	6		5	3			1	1	472

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	14	7	0	3	0	0	0	0	0	0	0	0	24
01:00	0	10	3	1	1	0	0	0	0	0	0	0	0	15
02:00	0	6	0	0	2	0	0	0	1	0	0	0	0	9
03:00	0	5	6	1	0	0	0	0	0	0	0	0	0	12
04:00	0	17	13	0	5	0	0	0	0	0	0	0	0	35
05:00	3	108	46	0	20	0	0	0	1	0	0	0	0	178
06:00	5	500	117	7	27	1	0	3	1	0	0	0	0	661
07:00	6	766	158	2	32	2	0	15	2	1	0	0	0	984
08:00	2	571	159	5	31	9	1	6	2	0	0	1	0	787
09:00	2	322	109	4	34	3	0	3	0	2	0	0	0	479
10:00	3	216	87	3	26	2	0	2	3	0	0	0	0	342
11:00	1	242	100	3	23	3	0	2	1	0	0	0	1	376
12 PM	3	276	80	3	21	6	0	0	2	0	0	0	0	391
13:00	1	281	77	4	23	4	0	1	3	0	0	0	0	394
14:00	4	324	100	4	23	3	0	2	1	0	0	0	0	461
15:00	2	329	93	1	15	6	0	2	2	0	0	0	0	450
16:00	4	394	101	1	11	1	0	3	1	0	0	0	0	516
17:00	6	399	83	0	20	3	1	0	2	0	0	0	0	514
18:00	8	291	44	1	13	3	0	2	0	0	0	0	0	362
19:00	2	246	52	0	9	1	0	1	1	0	0	0	0	312
20:00	1	180	48	0	5	1	0	0	0	0	0	0	0	235
21:00	2	126	14	1	3	0	0	0	0	0	0	0	0	146
22:00	0	74	18	0	1	0	0	0	0	0	0	0	0	93
23:00	0	42	8	0	1	0	0	1	0	0	0	0	0	52
Total	55	5739	1523	41	349	48	2	43	23	3	0	1	1	7828
Percent	0.7%	73.3%	19.5%	0.5%	4.5%	0.6%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	06:00	09:00	08:00	08:00	07:00	10:00	09:00		08:00	11:00	07:00
Vol.	6	766	159	7	34	9	1	15	3	2		1	1	984
PM Peak	18:00	17:00	16:00	13:00	13:00	12:00	17:00	16:00	13:00					16:00
Vol.	8	399	101	4	23	6	1	3	3					516

PRECISION
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Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	30	5	1	0	1	0	0	1	0	0	0	0	38
01:00	1	10	1	0	1	0	0	1	0	0	0	0	0	14
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	9	5	0	1	0	0	0	0	0	0	0	0	15
04:00	0	9	6	0	0	0	0	0	0	0	0	0	0	15
05:00	0	48	22	2	16	0	0	1	0	0	0	0	0	89
06:00	0	145	51	3	11	2	0	0	2	0	0	0	0	214
07:00	0	290	55	4	17	4	0	0	1	0	0	0	0	371
08:00	1	343	58	2	16	3	0	3	0	0	0	0	0	426
09:00	2	273	88	4	22	4	0	1	3	0	0	0	0	397
10:00	3	270	88	3	26	0	0	2	1	0	0	0	0	393
11:00	3	248	83	1	18	2	0	1	1	0	0	0	0	357
12 PM	2	272	93	4	14	1	0	1	1	0	1	0	0	389
13:00	2	316	88	3	20	4	1	1	1	0	0	0	0	436
14:00	1	322	100	5	25	1	1	3	1	0	0	0	0	459
15:00	1	454	122	6	23	3	0	5	1	0	0	0	0	615
16:00	1	609	171	2	29	2	0	6	1	0	0	0	0	821
17:00	2	657	172	2	21	3	0	4	0	0	0	0	0	861
18:00	0	529	85	2	17	1	0	0	2	0	0	0	0	636
19:00	3	258	49	1	9	2	0	3	0	0	0	0	0	325
20:00	0	189	28	1	9	0	0	0	0	0	0	0	0	227
21:00	0	145	27	0	4	0	0	0	0	0	0	0	0	176
22:00	0	80	15	0	2	0	0	0	0	0	0	0	0	97
23:00	0	52	17	0	3	0	0	1	0	0	0	0	0	73
Total	22	5564	1429	46	304	33	2	33	16	0	1	0	0	7450
Percent	0.3%	74.7%	19.2%	0.6%	4.1%	0.4%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	09:00	07:00	10:00	07:00		08:00	09:00					08:00
Vol.	3	343	88	4	26	4		3	3					426
PM Peak	19:00	17:00	17:00	15:00	16:00	13:00	13:00	16:00	18:00		12:00			17:00
Vol.	3	657	172	6	29	4	1	6	2		1			861

PRECISION
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Washington Street (Route 138)
north of Roache Bros. Driveway
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	28	9	0	0	0	0	0	0	0	0	0	0	37
01:00	0	13	3	0	0	1	0	0	0	0	0	0	0	17
02:00	1	7	0	0	0	1	0	0	0	0	0	0	0	9
03:00	0	4	1	1	1	0	0	0	0	0	0	0	0	7
04:00	0	13	6	0	0	1	0	0	0	0	0	0	0	20
05:00	0	39	24	0	10	0	0	0	0	0	0	0	0	73
06:00	2	155	42	2	12	0	0	1	1	0	0	0	0	215
07:00	1	303	60	2	16	2	0	0	2	0	0	0	0	386
08:00	3	312	76	3	22	3	1	1	1	0	0	0	0	422
09:00	5	262	68	3	18	3	1	1	5	0	0	0	0	366
10:00	2	248	91	1	16	2	0	2	2	1	0	0	0	365
11:00	2	294	91	5	23	6	1	5	3	1	0	0	0	431
12 PM	2	291	95	2	18	2	0	0	3	0	0	0	0	413
13:00	4	295	96	3	18	2	1	0	1	0	0	0	0	420
14:00	5	325	107	5	22	2	0	1	3	0	0	0	0	470
15:00	5	490	143	7	26	2	0	2	0	0	0	0	0	675
16:00	5	572	148	0	22	0	0	6	2	0	0	0	0	755
17:00	4	617	123	1	33	6	0	2	0	0	0	0	0	786
18:00	4	513	100	3	21	1	0	1	1	0	0	0	0	644
19:00	2	310	68	4	13	0	0	1	1	0	0	0	0	399
20:00	1	179	44	1	7	0	0	0	0	0	0	0	0	232
21:00	1	147	23	0	3	0	0	0	0	0	0	0	0	174
22:00	1	77	18	0	0	0	0	0	0	0	0	0	0	96
23:00	0	54	13	0	2	0	0	1	0	0	0	0	0	70
Total	50	5548	1449	43	303	34	4	24	25	2	0	0	0	7482
Percent	0.7%	74.2%	19.4%	0.6%	4.0%	0.5%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	10:00	11:00	11:00	11:00	08:00	11:00	09:00	10:00				11:00
Vol.	5	312	91	5	23	6	1	5	5	1				431
PM Peak	14:00	17:00	16:00	15:00	17:00	17:00	13:00	16:00	12:00					17:00
Vol.	5	617	148	7	33	6	1	6	3					786

PRECISION
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Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-D volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	10		91		4		100		14		191		
12:15	7		93		8		92		15		185		
12:30	6		101		3		96		9		197		
12:45	7	30	101	386	0	15	105	393	7	45	206	779	
01:00	6		103		1		91		7		194		
01:15	6		90		2		84		8		174		
01:30	1		95		2		86		3		181		
01:45	2	15	101	389	0	5	71	332	2	20	172	721	
02:00	0		99		0		83		0		182		
02:15	1		107		0		105		1		212		
02:30	3		118		1		119		4		237		
02:45	0	4	116	440	1	2	124	431	1	6	240	871	
03:00	1		132		2		120		3		252		
03:15	0		109		0		128		0		237		
03:30	2		136		2		124		4		260		
03:45	1	4	121	498	0	4	102	474	1	8	223	972	
04:00	3		157		3		96		6		253		
04:15	5		145		5		104		10		249		
04:30	3		156		10		80		13		236		
04:45	1	12	168	626	15	33	94	374	16	45	262	1000	
05:00	4		185		11		113		15		298		
05:15	10		194		30		95		40		289		
05:30	16		152		47		103		63		255		
05:45	18	48	150	681	35	123	111	422	53	171	261	1103	
06:00	29		127		69		105		98		232		
06:15	31		128		76		89		107		217		
06:30	44		135		124		69		168		204		
06:45	68	172	160	550	144	413	68	331	212	585	228	881	
07:00	116		93		173		72		289		165		
07:15	84		89		227		57		311		146		
07:30	69		69		214		50		283		119		
07:45	75	344	73	324	194	808	48	227	269	1152	121	551	
08:00	66		68		214		44		280		112		
08:15	71		69		205		53		276		122		
08:30	76		61		165		58		241		119		
08:45	65	278	67	265	203	787	28	183	268	1065	95	448	
09:00	86		63		150		32		236		95		
09:15	71		49		118		26		189		75		
09:30	81		35		95		17		176		52		
09:45	88	326	38	185	117	480	28	103	205	806	66	288	
10:00	72		43		88		15		160		58		
10:15	93		23		88		18		181		41		
10:30	76		21		63		15		139		36		
10:45	80	321	21	108	88	327	10	58	168	648	31	166	
11:00	70		24		98		10		168		34		
11:15	99		17		92		10		191		27		
11:30	71		17		104		22		175		39		
11:45	97	337	18	76	94	388	3	45	191	725	21	121	
Total	1891		4528		3385		3373		5276		7901		
Percent	35.8%		57.3%		64.2%		42.7%						
Day Total		6419				6758				13177			
Peak	07:00		04:30		07:15		02:45		07:00		04:45		
Vol.	344		703		849		496		1152		1104		
P.H.F.	0.741		0.906		0.935		0.969		0.926		0.926		

Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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81676 M-D volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	11		128		6		86		17		214		
12:15	8		85		2		86		10		171		
12:30	5		90		1		99		6		189		
12:45	7	31	116	419	2	11	116	387	9	42	232	806	
01:00	6		112		1		112		7		224		
01:15	4		98		4		106		8		204		
01:30	4		90		0		95		4		185		
01:45	2	16	118	418	1	6	100	413	3	22	218	831	
02:00	2		116		1		118		3		234		
02:15	2		115		2		126		4		241		
02:30	4		130		3		121		7		251		
02:45	0	8	151	512	1	7	129	494	1	15	280	1006	
03:00	4		133		0		101		4		234		
03:15	1		138		1		113		2		251		
03:30	1		133		5		132		6		265		
03:45	1	7	128	532	3	9	137	483	4	16	265	1015	
04:00	2		137		2		117		4		254		
04:15	3		162		6		96		9		258		
04:30	4		186		7		105		11		291		
04:45	1	10	153	638	10	25	114	432	11	35	267	1070	
05:00	6		178		19		126		25		304		
05:15	20		170		26		131		46		301		
05:30	10		175		33		105		43		280		
05:45	12	48	156	679	32	110	132	494	44	158	288	1173	
06:00	25		149		70		143		95		292		
06:15	33		160		88		91		121		251		
06:30	46		146		124		99		170		245		
06:45	80	184	135	590	127	409	81	414	207	593	216	1004	
07:00	101		119		155		86		256		205		
07:15	66		106		238		72		304		178		
07:30	67		110		232		72		299		182		
07:45	67	301	97	432	218	843	77	307	285	1144	174	739	
08:00	71		91		221		42		292		133		
08:15	64		84		220		62		284		146		
08:30	70		82		173		43		243		125		
08:45	76	281	75	332	193	807	42	189	269	1088	117	521	
09:00	95		70		147		31		242		101		
09:15	66		55		121		40		187		95		
09:30	67		38		111		17		178		55		
09:45	71	299	46	209	125	504	21	109	196	803	67	318	
10:00	85		35		101		16		186		51		
10:15	71		21		84		17		155		38		
10:30	69		29		84		8		153		37		
10:45	87	312	24	109	82	351	14	55	169	663	38	164	
11:00	94		23		103		8		197		31		
11:15	82		20		100		15		182		35		
11:30	85		16		101		21		186		37		
11:45	86	347	18	77	107	411	8	52	193	758	26	129	
Total	1844		4947		3493		3829		5337		8776		
Percent	34.6%		56.4%		65.4%		43.6%						
Day Total		6791				7322				14113			
Peak	10:45		04:30		07:15		05:15		07:15		05:00		
Vol.	348		687		909		511		1180		1173		
P.H.F.	0.926		0.923		0.955		0.893		0.970		0.965		

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Main Street
east of Center Street
City, State: Easton, MA
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81676 M-D speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	1	1	14	11	2	**1**	0	0	0	0	0	0	30	33	29
01:00	0	0	3	7	4	1	0	0	0	0	0	0	0	15	32	28
02:00	0	2	1	0	0	1	0	0	0	0	0	0	0	4	20	22
03:00	0	0	3	1	0	0	0	0	0	0	0	0	0	4	22	22
04:00	0	0	1	3	7	1	0	0	0	0	0	0	0	12	33	30
05:00	0	1	7	14	19	**7**	0	0	0	0	0	0	0	48	34	30
06:00	3	4	33	80	**44**	7	1	0	0	0	0	0	0	172	32	27
07:00	16	21	108	**157**	42	0	0	0	0	0	0	0	0	**344**	29	25
08:00	**18**	20	103	106	31	0	0	0	0	0	0	0	0	278	29	24
09:00	13	28	148	113	20	4	0	0	0	0	0	0	0	326	28	24
10:00	10	24	143	131	13	0	0	0	0	0	0	0	0	321	28	24
11:00	16	**36**	**153**	113	19	0	0	0	0	0	0	0	0	337	28	23
12 PM	12	53	187	115	18	1	0	0	0	0	0	0	0	386	28	23
13:00	8	37	149	166	28	1	0	0	0	0	0	0	0	389	29	24
14:00	15	47	187	165	23	3	0	0	0	0	0	0	0	440	28	23
15:00	11	53	234	173	24	2	**1**	0	0	0	0	0	0	498	28	23
16:00	14	**82**	264	227	36	3	0	0	0	0	0	0	0	626	28	23
17:00	**28**	60	**280**	**289**	24	0	0	0	0	0	0	0	0	**681**	28	23
18:00	9	50	232	233	25	1	0	0	0	0	0	0	0	550	28	24
19:00	5	18	109	152	38	2	0	0	0	0	0	0	0	324	29	25
20:00	2	15	69	132	**45**	2	0	0	0	0	0	0	0	265	30	26
21:00	4	16	38	94	30	3	0	0	0	0	0	0	0	185	30	26
22:00	2	2	15	67	18	**4**	0	0	0	0	0	0	0	108	31	27
23:00	1	2	15	37	17	4	0	0	0	0	0	0	0	76	32	27
Total	187	572	2483	2589	536	49	3	0	0	0	0	0	0	6419		
%	2.9%	8.9%	38.7%	40.3%	8.4%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	11:00	07:00	06:00	05:00	00:00							07:00		
Vol.	18	36	153	157	44	7	1							344		
PM Peak	17:00	16:00	17:00	17:00	20:00	22:00	15:00							17:00		
Vol.	28	82	280	289	45	4	1							681		

Pecent

15th Percentile :	20 MPH
50th Percentile :	24 MPH
85th Percentile :	29 MPH
95th Percentile :	32 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	5072
Percent in Pace :	79.0%
Number of Vehicles > 25 MPH :	2659
Percent of Vehicles > 25 MPH :	41.4%
Mean Speed(Average) :	24 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-D speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	18	10	2	0	0	0	0	0	0	0	31	33	29
01:00	1	2	1	5	6	1	0	0	0	0	0	0	0	16	33	27
02:00	0	1	2	2	2	0	0	**1**	0	0	0	0	0	8	31	29
03:00	0	1	2	1	0	2	**1**	0	0	0	0	0	0	7	36	28
04:00	0	0	3	3	4	0	0	0	0	0	0	0	0	10	31	28
05:00	1	1	5	16	20	5	0	0	0	0	0	0	0	48	34	29
06:00	0	4	38	81	**50**	**11**	0	0	0	0	0	0	0	184	33	28
07:00	6	13	92	137	49	4	0	0	0	0	0	0	0	301	30	26
08:00	8	15	81	146	30	1	0	0	0	0	0	0	0	281	29	25
09:00	**18**	**58**	**156**	62	5	0	0	0	0	0	0	0	0	299	26	21
10:00	9	31	136	116	16	4	0	0	0	0	0	0	0	312	28	24
11:00	9	35	115	**163**	25	0	0	0	0	0	0	0	0	**347**	29	24
12 PM	17	54	175	154	17	2	0	0	0	0	0	0	0	419	28	23
13:00	16	29	186	148	38	1	0	0	0	0	0	0	0	418	29	24
14:00	12	48	226	195	28	3	0	0	0	0	0	0	0	512	28	24
15:00	17	**66**	233	196	20	0	0	0	0	0	0	0	0	532	28	23
16:00	**18**	61	234	282	43	0	0	0	0	0	0	0	0	638	29	24
17:00	16	53	**279**	**301**	30	0	0	0	0	0	0	0	0	**679**	28	24
18:00	16	51	221	250	**51**	1	0	0	0	0	0	0	0	590	29	24
19:00	13	29	148	213	28	1	0	0	0	0	0	0	0	432	29	24
20:00	8	21	92	174	36	1	0	0	0	0	0	0	0	332	29	25
21:00	6	13	53	107	27	2	1	0	0	0	0	0	0	209	29	25
22:00	0	5	13	55	28	6	**2**	0	0	0	0	0	0	109	33	28
23:00	1	1	7	35	25	**8**	0	0	0	0	0	0	0	77	34	29
Total	192	592	2499	2860	588	55	4	1	0	0	0	0	0	6791		
%	2.8%	8.7%	36.8%	42.1%	8.7%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	11:00	06:00	06:00	03:00	02:00						11:00		
Vol.	18	58	156	163	50	11	1	1						347		
PM Peak	16:00	15:00	17:00	17:00	18:00	23:00	22:00							17:00		
Vol.	18	66	279	301	51	8	2							679		

Pecent

15th Percentile : 20 MPH
50th Percentile : 25 MPH
85th Percentile : 29 MPH
95th Percentile : 32 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 5359
Percent in Pace : 78.9%
Number of Vehicles > 25 MPH : 2936
Percent of Vehicles > 25 MPH : 43.2%
Mean Speed(Average) : 24 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-D speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	1	0	0	9	4	1	0	0	0	0	0	0	0	15	32	27
01:00	0	1	3	1	0	0	0	0	0	0	0	0	0	5	22	21
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
03:00	0	0	2	2	0	0	0	0	0	0	0	0	0	4	25	24
04:00	0	1	12	16	4	0	0	0	0	0	0	0	0	33	29	26
05:00	2	3	48	58	10	**2**	0	0	0	0	0	0	0	123	29	25
06:00	2	23	174	196	17	1	0	0	0	0	0	0	0	413	28	24
07:00	10	105	**427**	**248**	**18**	0	0	0	0	0	0	0	0	**808**	27	23
08:00	**37**	**197**	412	133	8	0	0	0	0	0	0	0	0	787	25	21
09:00	32	92	253	98	5	0	0	0	0	0	0	0	0	480	26	21
10:00	10	51	163	92	11	0	0	0	0	0	0	0	0	327	27	23
11:00	12	85	214	74	3	0	0	0	0	0	0	0	0	388	26	22
12 PM	11	**95**	231	53	3	0	0	0	0	0	0	0	0	393	24	21
13:00	19	63	160	79	11	0	0	0	0	0	0	0	0	332	27	22
14:00	16	69	248	91	7	0	0	0	0	0	0	0	0	431	26	22
15:00	18	64	**258**	123	11	0	0	0	0	0	0	0	0	**474**	27	22
16:00	13	43	188	118	11	**1**	0	0	0	0	0	0	0	374	28	23
17:00	15	55	199	**133**	**20**	0	0	0	0	0	0	0	0	422	28	23
18:00	**21**	38	173	96	3	0	0	0	0	0	0	0	0	331	27	22
19:00	12	25	115	67	8	0	0	0	0	0	0	0	0	227	27	23
20:00	2	24	101	54	2	0	0	0	0	0	0	0	0	183	27	23
21:00	2	8	46	41	6	0	0	0	0	0	0	0	0	103	28	24
22:00	1	3	26	25	2	1	0	0	0	0	0	0	0	58	28	24
23:00	0	2	15	25	3	0	0	0	0	0	0	0	0	45	29	25
Total	236	1048	3469	1832	167	6	0	0	0	0	0	0	0	6758		
%	3.5%	15.5%	51.3%	27.1%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	07:00	07:00	05:00								07:00		
Vol.	37	197	427	248	18	2								808		
PM Peak	18:00	12:00	15:00	17:00	17:00	16:00								15:00		
Vol.	21	95	258	133	20	1								474		

Pecent

15th Percentile : 18 MPH
50th Percentile : 23 MPH
85th Percentile : 27 MPH
95th Percentile : 29 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 5301
Percent in Pace : 78.4%
Number of Vehicles > 25 MPH : 1638
Percent of Vehicles > 25 MPH : 24.2%
Mean Speed(Average) : 22 MPH

PRECISION
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Main Street
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Client: VHB/J. Quitter

81676 M-D speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	1	0	3	6	1	0	0	0	0	0	0	0	0	11	28	24
01:00	0	1	2	2	0	**1**	0	0	0	0	0	0	0	6	26	25
02:00	0	2	0	4	1	0	0	0	0	0	0	0	0	7	28	24
03:00	0	0	6	3	0	0	0	0	0	0	0	0	0	9	26	23
04:00	0	3	13	8	1	0	0	0	0	0	0	0	0	25	27	23
05:00	1	6	36	58	8	1	0	0	0	0	0	0	0	110	29	25
06:00	5	25	155	193	**31**	0	0	0	0	0	0	0	0	409	29	25
07:00	21	104	**467**	**230**	21	0	0	0	0	0	0	0	0	**843**	27	23
08:00	16	114	457	208	12	0	0	0	0	0	0	0	0	807	27	22
09:00	**34**	**175**	263	32	0	0	0	0	0	0	0	0	0	504	24	20
10:00	13	67	194	75	2	0	0	0	0	0	0	0	0	351	26	22
11:00	12	60	218	110	11	0	0	0	0	0	0	0	0	411	27	22
12 PM	17	67	210	85	8	0	0	0	0	0	0	0	0	387	27	22
13:00	11	**69**	214	114	5	0	0	0	0	0	0	0	0	413	27	22
14:00	15	69	282	118	10	0	0	0	0	0	0	0	0	**494**	27	22
15:00	17	45	253	**148**	**18**	2	0	0	0	0	0	0	0	483	28	23
16:00	13	51	201	146	17	**4**	0	0	0	0	0	0	0	432	28	23
17:00	15	60	**289**	122	7	1	0	0	0	0	0	0	0	494	27	22
18:00	**19**	57	207	116	15	0	0	0	0	0	0	0	0	414	27	22
19:00	15	44	139	103	6	0	0	0	0	0	0	0	0	307	27	22
20:00	4	14	81	76	13	1	0	0	0	0	0	0	0	189	29	24
21:00	3	7	40	44	13	1	0	**1**	0	0	0	0	0	109	29	25
22:00	0	3	15	28	8	1	0	0	0	0	0	0	0	55	30	26
23:00	1	1	9	33	8	0	0	0	0	0	0	0	0	52	29	26
Total	233	1044	3754	2062	216	12	0	1	0	0	0	0	0	7322		
%	3.2%	14.3%	51.3%	28.2%	3.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	07:00	07:00	06:00	01:00								07:00		
Vol.	34	175	467	230	31	1								843		
PM Peak	18:00	13:00	17:00	15:00	15:00	16:00		21:00						14:00		
Vol.	19	69	289	148	18	4		1						494		

Pecent

15th Percentile : 19 MPH
50th Percentile : 23 MPH
85th Percentile : 27 MPH
95th Percentile : 29 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 5816
Percent in Pace : 79.4%
Number of Vehicles > 25 MPH : 1878
Percent of Vehicles > 25 MPH : 25.6%
Mean Speed(Average) : 23 MPH

PRECISION
D A T A
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Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	26	3	0	1	0	0	0	0	0	0	0	0	30
01:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	11	0	0	1	0	0	0	0	0	0	0	0	12
05:00	1	30	15	0	2	0	0	0	0	0	0	0	0	48
06:00	2	142	24	0	3	1	0	0	0	0	0	0	0	172
07:00	3	271	44	1	16	8	0	0	1	0	0	0	0	344
08:00	2	206	58	1	6	4	0	1	0	0	0	0	0	278
09:00	3	238	57	4	20	2	0	1	1	0	0	0	0	326
10:00	4	240	59	0	13	3	0	2	0	0	0	0	0	321
11:00	3	261	61	1	7	2	0	1	1	0	0	0	0	337
12 PM	5	318	48	2	10	2	0	1	0	0	0	0	0	386
13:00	6	309	58	3	10	3	0	0	0	0	0	0	0	389
14:00	3	376	50	0	7	4	0	0	0	0	0	0	0	440
15:00	4	410	70	1	11	2	0	0	0	0	0	0	0	498
16:00	7	530	76	1	8	1	0	3	0	0	0	0	0	626
17:00	3	592	78	0	8	0	0	0	0	0	0	0	0	681
18:00	5	474	59	0	5	5	0	1	1	0	0	0	0	550
19:00	2	277	39	0	5	1	0	0	0	0	0	0	0	324
20:00	0	229	31	0	4	0	0	1	0	0	0	0	0	265
21:00	1	162	21	0	1	0	0	0	0	0	0	0	0	185
22:00	0	98	10	0	0	0	0	0	0	0	0	0	0	108
23:00	0	65	11	0	0	0	0	0	0	0	0	0	0	76
Total	54	5288	872	14	138	38	0	11	4	0	0	0	0	6419
Percent	0.8%	82.4%	13.6%	0.2%	2.1%	0.6%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	11:00	09:00	09:00	07:00		10:00	07:00					07:00
Vol.	4	271	61	4	20	8		2	1					344
PM Peak	16:00	17:00	17:00	13:00	15:00	18:00		16:00	18:00					17:00
Vol.	7	592	78	3	11	5		3	1					681

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Main Street
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81676 M-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	27	4	0	0	0	0	0	0	0	0	0	0	31
01:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
04:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
05:00	0	35	10	1	2	0	0	0	0	0	0	0	0	48
06:00	2	157	20	1	3	1	0	0	0	0	0	0	0	184
07:00	4	243	39	2	9	3	0	1	0	0	0	0	0	301
08:00	2	205	50	3	18	3	0	0	0	0	0	0	0	281
09:00	5	234	45	2	5	7	0	0	1	0	0	0	0	299
10:00	1	246	52	0	11	0	0	2	0	0	0	0	0	312
11:00	5	272	57	0	9	1	0	2	1	0	0	0	0	347
12 PM	5	323	63	3	16	5	0	3	1	0	0	0	0	419
13:00	4	317	72	2	15	2	1	5	0	0	0	0	0	418
14:00	9	427	58	1	7	7	0	3	0	0	0	0	0	512
15:00	8	431	73	1	9	4	0	5	0	0	1	0	0	532
16:00	6	550	68	1	6	4	0	3	0	0	0	0	0	638
17:00	13	579	69	0	11	6	0	1	0	0	0	0	0	679
18:00	5	512	62	0	7	2	0	1	1	0	0	0	0	590
19:00	0	385	43	0	2	1	0	1	0	0	0	0	0	432
20:00	1	284	41	0	3	2	0	1	0	0	0	0	0	332
21:00	1	181	24	0	3	0	0	0	0	0	0	0	0	209
22:00	0	97	12	0	0	0	0	0	0	0	0	0	0	109
23:00	0	68	9	0	0	0	0	0	0	0	0	0	0	77
Total	71	5609	876	17	136	48	1	28	4	0	1	0	0	6791
Percent	1.0%	82.6%	12.9%	0.3%	2.0%	0.7%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	08:00	08:00	09:00		10:00	09:00					11:00
Vol.	5	272	57	3	18	7		2	1					347
PM Peak	17:00	17:00	15:00	12:00	12:00	14:00	13:00	13:00	12:00		15:00			17:00
Vol.	13	579	73	3	16	7	1	5	1		1			679

PRECISION
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81676 M-D class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	14	1	0	0	0	0	0	0	0	0	0	0	15
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	26	5	0	2	0	0	0	0	0	0	0	0	33
05:00	1	84	31	0	6	0	0	1	0	0	0	0	0	123
06:00	2	342	66	0	3	0	0	0	0	0	0	0	0	413
07:00	7	705	81	0	12	1	0	2	0	0	0	0	0	808
08:00	3	665	100	3	13	2	0	1	0	0	0	0	0	787
09:00	2	401	63	2	11	0	0	0	1	0	0	0	0	480
10:00	4	275	36	1	7	3	0	1	0	0	0	0	0	327
11:00	3	312	61	0	11	1	0	0	0	0	0	0	0	388
12 PM	1	320	55	2	10	3	0	1	1	0	0	0	0	393
13:00	4	263	55	1	6	1	0	1	1	0	0	0	0	332
14:00	4	348	56	3	17	1	0	2	0	0	0	0	0	431
15:00	2	398	67	2	4	1	0	0	0	0	0	0	0	474
16:00	6	322	39	0	7	0	0	0	0	0	0	0	0	374
17:00	4	353	58	1	5	1	0	0	0	0	0	0	0	422
18:00	7	275	42	0	6	1	0	0	0	0	0	0	0	331
19:00	1	194	29	0	3	0	0	0	0	0	0	0	0	227
20:00	1	160	17	0	5	0	0	0	0	0	0	0	0	183
21:00	0	92	10	0	1	0	0	0	0	0	0	0	0	103
22:00	0	50	7	0	1	0	0	0	0	0	0	0	0	58
23:00	0	43	1	0	1	0	0	0	0	0	0	0	0	45
Total	52	5651	881	15	132	15	0	9	3	0	0	0	0	6758
Percent	0.8%	83.6%	13.0%	0.2%	2.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	08:00	08:00	10:00		07:00	09:00					07:00
Vol.	7	705	100	3	13	3		2	1					808
PM Peak	18:00	15:00	15:00	14:00	14:00	12:00		14:00	12:00					15:00
Vol.	7	398	67	3	17	3		2	1					474

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Main Street
east of Center Street
City, State: Easton, MA
Client: VHB/J. Quitter

81676 M-D class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	10	1	0	0	0	0	0	0	0	0	0	0	11
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
04:00	0	16	8	0	1	0	0	0	0	0	0	0	0	25
05:00	0	75	29	0	5	0	0	0	1	0	0	0	0	110
06:00	3	336	62	2	4	1	0	1	0	0	0	0	0	409
07:00	5	716	107	0	10	1	0	1	2	1	0	0	0	843
08:00	5	678	106	3	11	1	0	3	0	0	0	0	0	807
09:00	11	422	59	1	10	1	0	0	0	0	0	0	0	504
10:00	5	274	57	1	12	1	0	1	0	0	0	0	0	351
11:00	3	315	76	0	11	3	0	2	1	0	0	0	0	411
12 PM	4	303	61	2	8	6	0	3	0	0	0	0	0	387
13:00	5	319	74	1	9	3	0	2	0	0	0	0	0	413
14:00	6	407	65	1	10	5	0	0	0	0	0	0	0	494
15:00	9	388	68	3	12	1	0	2	0	0	0	0	0	483
16:00	4	362	58	1	4	2	0	1	0	0	0	0	0	432
17:00	10	406	67	0	7	3	0	0	0	1	0	0	0	494
18:00	5	350	53	0	3	2	0	1	0	0	0	0	0	414
19:00	1	257	41	0	6	2	0	0	0	0	0	0	0	307
20:00	5	152	27	0	5	0	0	0	0	0	0	0	0	189
21:00	0	92	14	0	2	1	0	0	0	0	0	0	0	109
22:00	0	48	6	0	1	0	0	0	0	0	0	0	0	55
23:00	0	49	2	0	1	0	0	0	0	0	0	0	0	52
Total	81	5993	1045	15	132	33	0	17	4	2	0	0	0	7322
Percent	1.1%	81.8%	14.3%	0.2%	1.8%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	08:00	10:00	11:00		08:00	07:00	07:00				07:00
Vol.	11	716	107	3	12	3		3	2	1				843
PM Peak	17:00	14:00	13:00	15:00	15:00	12:00		12:00		17:00				14:00
Vol.	10	407	74	3	12	6		3		1				494

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Fall River, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/16/08 thru Wed 9/17/08	81676	Fall River, MA

Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 B-B volume
Site Code: 10111.31

Start Time	NB A.M.		P.M.				Tue 09-Sep-08
12:00	14		81				
12:15	12		86				
12:30	5		98				
12:45	8	39	78	343			
01:00	4		85				
01:15	3		85				
01:30	7		100				
01:45	4	18	85	355			
02:00	7		109				
02:15	0		103				
02:30	1		101				
02:45	3	11	136	449			
03:00	3		116				
03:15	5		111				
03:30	0		125				
03:45	7	15	136	488			
04:00	5		133				
04:15	4		136				
04:30	10		142				
04:45	19	38	117	528			
05:00	23		127				
05:15	34		138				
05:30	21		142				
05:45	31	109	118	525			
06:00	40		124				
06:15	62		117				
06:30	73		106				
06:45	88	263	109	456			
07:00	66		83				
07:15	96		80				
07:30	89		63				
07:45	112	363	82	308			
08:00	106		76				
08:15	92		66				
08:30	82		62				
08:45	97	377	51	255			
09:00	76		53				
09:15	75		46				
09:30	83		45				
09:45	82	316	39	183			
10:00	71		35				
10:15	66		30				
10:30	75		32				
10:45	81	293	26	123			
11:00	86		23				
11:15	86		22				
11:30	89		24				
11:45	77	338	23	92			
Total	2180		4105				
Percent			100.0%		0.0%	0.0%	
Day Total		6285					
Peak	07:15		03:45				
Vol.	403		547				
P.H.F.	0.900		0.963				

Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 B-B volume
Site Code: 10111.31

Start Time	NB A.M.		P.M.				Wed 10-Sep-08
12:00	10		85				
12:15	15		76				
12:30	4		76				
12:45	14	43	84	321			
01:00	8		87				
01:15	4		72				
01:30	5		66				
01:45	6	23	93	318			
02:00	3		112				
02:15	2		107				
02:30	1		115				
02:45	1	7	146	480			
03:00	3		121				
03:15	2		120				
03:30	0		119				
03:45	8	13	131	491			
04:00	6		138				
04:15	4		147				
04:30	13		135				
04:45	20	43	141	561			
05:00	31		150				
05:15	28		155				
05:30	21		139				
05:45	24	104	147	591			
06:00	48		128				
06:15	47		134				
06:30	59		107				
06:45	100	254	98	467			
07:00	89		90				
07:15	92		74				
07:30	114		95				
07:45	140	435	65	324			
08:00	119		82				
08:15	90		72				
08:30	84		67				
08:45	101	394	66	287			
09:00	81		77				
09:15	78		51				
09:30	71		53				
09:45	71	301	35	216			
10:00	57		41				
10:15	80		29				
10:30	71		27				
10:45	78	286	29	126			
11:00	72		18				
11:15	75		25				
11:30	90		21				
11:45	90	327	20	84			
Total	2230		4266				
Percent			100.0%		0.0%	0.0%	
Day Total		6496					
Peak	07:15		05:00				
Vol.	465		591				
P.H.F.	0.830		0.953				

PRECISION
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Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	0	0	4	4	13	9	5	2	2	0	39	57	50
01:00	0	0	0	1	0	1	3	6	3	4	0	0	0	18	55	48
02:00	0	0	0	0	0	0	1	4	5	1	0	0	0	11	53	50
03:00	0	0	0	**2**	1	0	0	2	6	3	0	1	0	15	56	48
04:00	0	0	0	0	0	1	9	11	8	6	2	1	0	38	56	49
05:00	**2**	0	0	0	1	6	21	34	23	12	7	1	**2**	109	56	48
06:00	0	0	0	1	0	12	58	89	57	33	**9**	**3**	1	263	55	48
07:00	0	0	0	0	3	17	86	111	**94**	**44**	4	3	1	363	54	48
08:00	0	0	0	0	5	24	**101**	**117**	79	43	5	3	0	**377**	54	47
09:00	0	0	0	0	7	21	93	95	64	28	5	3	0	316	54	47
10:00	0	0	0	1	**11**	**38**	72	93	52	18	6	1	1	293	53	46
11:00	0	0	0	0	9	38	95	96	63	31	4	2	0	338	53	46
12 PM	0	0	3	3	20	36	89	107	58	21	5	1	0	343	52	45
13:00	0	0	0	8	35	56	99	89	51	14	2	1	0	355	51	43
14:00	0	0	0	6	**38**	**94**	147	110	41	11	2	0	0	449	49	42
15:00	0	0	0	5	29	82	177	125	49	19	2	0	0	488	49	43
16:00	0	0	0	7	21	73	158	**157**	82	27	2	0	**1**	**528**	51	45
17:00	1	0	0	**13**	10	63	**184**	142	79	27	2	**4**	0	525	52	45
18:00	0	0	0	2	7	50	113	148	**83**	**44**	**6**	3	0	456	54	47
19:00	0	0	0	0	10	23	86	106	62	20	1	0	0	308	52	46
20:00	0	0	**4**	0	4	30	74	69	53	18	2	0	1	255	53	46
21:00	0	0	0	1	4	13	47	61	30	19	6	2	0	183	54	47
22:00	0	0	0	0	1	12	13	44	30	18	2	3	0	123	56	49
23:00	**2**	0	0	0	3	4	35	25	10	12	1	0	0	92	54	45
Total	5	0	7	50	219	698	1765	1854	1091	478	77	34	7	6285		
%	0.1%	0.0%	0.1%	0.8%	3.5%	11.1%	28.1%	29.5%	17.4%	7.6%	1.2%	0.5%	0.1%			
AM Peak	05:00			03:00	10:00	10:00	08:00	08:00	07:00	07:00	06:00	06:00	05:00	08:00		
Vol.	2			2	11	38	101	117	94	44	9	3	2	377		
PM Peak	23:00		20:00	17:00	14:00	14:00	17:00	16:00	18:00	18:00	18:00	17:00	16:00	16:00		
Vol.	2		4	13	38	94	184	157	83	44	6	4	1	528		

Pecent

15th Percentile : 39 MPH
50th Percentile : 46 MPH
85th Percentile : 53 MPH
95th Percentile : 57 MPH

Stats

10 MPH Pace Speed : 40-49 MPH
Number in Pace : 3619
Percent in Pace : 57.6%
Number of Vehicles > 45 MPH : 3170
Percent of Vehicles > 45 MPH : 50.4%
Mean Speed(Average) : 46 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	**2**	0	3	7	9	18	4	0	0	0	43	54	48
01:00	0	0	0	0	1	2	7	4	4	3	1	1	0	23	56	48
02:00	0	0	0	0	0	0	4	0	1	0	1	1	0	7	64	49
03:00	0	0	0	0	1	0	1	4	3	3	0	1	0	13	56	50
04:00	0	0	0	0	0	2	10	9	15	5	2	0	0	43	55	49
05:00	0	0	0	0	1	5	26	36	20	15	1	0	0	104	54	48
06:00	0	0	0	2	1	26	52	95	38	33	2	4	1	254	55	47
07:00	0	0	0	0	**10**	28	81	**155**	**99**	**48**	**9**	3	**2**	**435**	54	48
08:00	0	0	0	0	4	**32**	**98**	115	83	48	8	**5**	1	394	55	48
09:00	0	0	0	0	4	27	70	97	67	29	4	2	1	301	54	47
10:00	0	0	0	0	2	22	94	99	47	17	4	1	0	286	52	46
11:00	0	0	0	0	4	23	96	110	58	33	0	3	0	327	53	47
12 PM	0	0	0	**4**	7	25	85	105	69	20	4	1	**1**	321	53	46
13:00	0	0	0	0	10	36	89	91	63	25	4	0	0	318	53	46
14:00	0	0	0	1	**21**	67	128	141	79	36	**6**	1	0	480	53	45
15:00	0	0	0	0	7	46	128	162	101	40	4	**3**	0	491	53	47
16:00	1	0	0	2	6	55	**161**	**187**	100	45	2	2	0	561	53	46
17:00	0	0	0	3	19	**81**	147	186	**102**	**48**	2	3	0	**591**	53	46
18:00	0	0	0	2	13	46	132	134	98	41	1	0	0	467	53	46
19:00	**2**	0	0	2	7	38	114	81	61	14	3	2	0	324	52	45
20:00	0	0	0	0	6	41	78	94	50	13	4	1	0	287	52	45
21:00	0	0	0	0	1	15	55	72	44	26	2	1	0	216	54	47
22:00	0	0	0	0	0	8	32	42	28	14	0	2	0	126	54	48
23:00	0	0	0	0	1	5	17	29	11	14	5	2	0	84	57	49
Total	3	0	0	18	126	633	1712	2057	1259	574	69	39	6	6496		
%	0.0%	0.0%	0.0%	0.3%	1.9%	9.7%	26.4%	31.7%	19.4%	8.8%	1.1%	0.6%	0.1%			
AM Peak				00:00	07:00	08:00	08:00	07:00	07:00	07:00	07:00	08:00	07:00	07:00		
Vol.				2	10	32	98	155	99	48	9	5	2	435		
PM Peak	19:00			12:00	14:00	17:00	16:00	16:00	17:00	17:00	14:00	15:00	12:00	17:00		
Vol.	2			4	21	81	161	187	102	48	6	3	1	591		

Pecent

15th Percentile :	40 MPH
50th Percentile :	46 MPH
85th Percentile :	53 MPH
95th Percentile :	58 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	3769
Percent in Pace :	58.0%
Number of Vehicles > 45 MPH :	3592
Percent of Vehicles > 45 MPH :	55.3%
Mean Speed(Average) :	47 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	33	5	0	1	0	0	0	0	0	0	0	0	39
01:00	0	17	1	0	0	0	0	0	0	0	0	0	0	18
02:00	0	9	1	0	1	0	0	0	0	0	0	0	0	11
03:00	1	9	4	0	0	1	0	0	0	0	0	0	0	15
04:00	0	22	13	0	3	0	0	0	0	0	0	0	0	38
05:00	0	67	29	0	13	0	0	0	0	0	0	0	0	109
06:00	1	177	72	0	9	0	0	4	0	0	0	0	0	263
07:00	1	268	80	0	13	0	0	0	1	0	0	0	0	363
08:00	0	282	78	1	15	0	0	1	0	0	0	0	0	377
09:00	3	204	83	0	23	1	0	2	0	0	0	0	0	316
10:00	2	209	62	1	14	0	0	4	0	1	0	0	0	293
11:00	1	234	89	2	11	0	0	0	1	0	0	0	0	338
12 PM	3	256	72	0	7	0	0	4	1	0	0	0	0	343
13:00	2	266	72	0	14	0	0	1	0	0	0	0	0	355
14:00	2	339	83	1	21	0	0	2	1	0	0	0	0	449
15:00	1	372	100	0	12	0	0	3	0	0	0	0	0	488
16:00	1	400	112	0	14	0	0	1	0	0	0	0	0	528
17:00	0	408	104	1	11	0	0	0	1	0	0	0	0	525
18:00	0	353	88	0	13	0	0	2	0	0	0	0	0	456
19:00	0	235	65	1	5	0	0	1	0	0	1	0	0	308
20:00	1	206	43	0	4	1	0	0	0	0	0	0	0	255
21:00	0	149	32	0	2	0	0	0	0	0	0	0	0	183
22:00	0	108	13	0	2	0	0	0	0	0	0	0	0	123
23:00	0	79	11	0	2	0	0	0	0	0	0	0	0	92
Total	19	4702	1312	7	210	3	0	25	5	1	1	0	0	6285
Percent	0.3%	74.8%	20.9%	0.1%	3.3%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	11:00	11:00	09:00	03:00		06:00	07:00	10:00				08:00
Vol.	3	282	89	2	23	1		4	1	1				377
PM Peak	12:00	17:00	16:00	14:00	14:00	20:00		12:00	12:00		19:00			16:00
Vol.	3	408	112	1	21	1		4	1		1			528

PRECISION
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Route 79 NB Off Ramp
north of President Avenue (Route 6)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	38	5	0	0	0	0	0	0	0	0	0	0	43
01:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
02:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
03:00	0	8	5	0	0	0	0	0	0	0	0	0	0	13
04:00	0	25	14	0	4	0	0	0	0	0	0	0	0	43
05:00	0	62	33	0	9	0	0	0	0	0	0	0	0	104
06:00	3	168	69	1	11	0	0	2	0	0	0	0	0	254
07:00	3	319	95	0	18	0	0	0	0	0	0	0	0	435
08:00	0	274	99	0	18	0	0	2	1	0	0	0	0	394
09:00	0	197	83	1	17	1	0	2	0	0	0	0	0	301
10:00	1	200	77	0	7	0	0	1	0	0	0	0	0	286
11:00	4	239	69	0	13	0	0	2	0	0	0	0	0	327
12 PM	1	236	67	0	15	0	0	2	0	0	0	0	0	321
13:00	3	244	57	1	9	0	0	2	1	1	0	0	0	318
14:00	1	357	100	0	16	0	0	5	1	0	0	0	0	480
15:00	2	355	119	0	10	0	0	5	0	0	0	0	0	491
16:00	6	419	120	0	16	0	0	0	0	0	0	0	0	561
17:00	8	458	102	0	21	0	0	2	0	0	0	0	0	591
18:00	2	353	99	0	12	0	0	1	0	0	0	0	0	467
19:00	4	230	78	0	11	0	0	1	0	0	0	0	0	324
20:00	1	237	38	0	11	0	0	0	0	0	0	0	0	287
21:00	0	172	39	0	5	0	0	0	0	0	0	0	0	216
22:00	1	103	17	0	5	0	0	0	0	0	0	0	0	126
23:00	0	71	12	0	1	0	0	0	0	0	0	0	0	84
Total	40	4791	1400	3	230	1	0	27	3	1	0	0	0	6496
Percent	0.6%	73.8%	21.6%	0.0%	3.5%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	08:00	06:00	07:00	09:00		06:00	08:00					07:00
Vol.	4	319	99	1	18	1		2	1					435
PM Peak	17:00	17:00	16:00	13:00	17:00			14:00	13:00	13:00				17:00
Vol.	8	458	120	1	21			5	1	1				591

UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 B-C volume
Site Code: 10111.31

Start Time	A.M.	SB UTurn to NB	P.M.				Tue 09-Sep-08
12:00	1		17				
12:15	2		13				
12:30	3		22				
12:45	1	7	16	68			
01:00	3		11				
01:15	0		11				
01:30	1		21				
01:45	0	4	20	63			
02:00	0		17				
02:15	0		23				
02:30	0		22				
02:45	0	0	13	75			
03:00	0		9				
03:15	0		20				
03:30	0		18				
03:45	1	1	24	71			
04:00	2		16				
04:15	2		14				
04:30	1		17				
04:45	2	7	22	69			
05:00	1		20				
05:15	3		23				
05:30	4		14				
05:45	2	10	13	70			
06:00	10		16				
06:15	13		18				
06:30	14		11				
06:45	12	49	13	58			
07:00	15		8				
07:15	22		12				
07:30	19		7				
07:45	37	93	6	33			
08:00	24		10				
08:15	30		7				
08:30	27		8				
08:45	20	101	5	30			
09:00	23		3				
09:15	12		4				
09:30	19		3				
09:45	14	68	2	12			
10:00	23		5				
10:15	15		5				
10:30	15		2				
10:45	18	71	4	16			
11:00	10		3				
11:15	7		4				
11:30	12		2				
11:45	19	48	0	9			
Total	459		574				
Percent			100.0%		0.0%	0.0%	
Day Total		1033					
Peak	07:45		01:45				
Vol.	118		82				
P.H.F.	0.797		0.891				

UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

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81676 B-C volume
Site Code: 10111.31

Start Time	A.M.	SB UTurn to NB	P.M.				Wed 10-Sep-08
12:00	0		15				
12:15	1		4				
12:30	1		19				
12:45	2	4	17	55			
01:00	0		12				
01:15	0		13				
01:30	1		19				
01:45	0	1	12	56			
02:00	1		17				
02:15	0		20				
02:30	0		18				
02:45	1	2	11	66			
03:00	0		13				
03:15	3		26				
03:30	0		13				
03:45	1	4	15	67			
04:00	1		28				
04:15	0		24				
04:30	1		19				
04:45	3	5	19	90			
05:00	2		17				
05:15	3		13				
05:30	6		12				
05:45	3	14	21	63			
06:00	13		9				
06:15	12		17				
06:30	7		14				
06:45	13	45	9	49			
07:00	15		19				
07:15	15		9				
07:30	25		8				
07:45	34	89	7	43			
08:00	29		12				
08:15	44		7				
08:30	19		5				
08:45	25	117	4	28			
09:00	15		5				
09:15	15		6				
09:30	14		5				
09:45	22	66	7	23			
10:00	14		9				
10:15	13		2				
10:30	21		3				
10:45	14	62	2	16			
11:00	11		3				
11:15	23		3				
11:30	14		4				
11:45	13	61	3	13			
Total	470		569				
Percent			100.0%		0.0%	0.0%	
Day Total		1039					
Peak	07:30		04:00				
Vol.	132		90				
P.H.F.	0.750		0.804				

PRECISION
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UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-C speed
Site Code: 10111.31

SB UTurn to NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	5	2	0	0	0	0	0	0	0	0	0	0	7	20	18
01:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4	16	16
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
04:00	1	4	2	0	0	0	0	0	0	0	0	0	0	7	20	17
05:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10	18	17
06:00	2	41	6	0	0	0	0	0	0	0	0	0	0	49	19	17
07:00	5	66	**22**	0	0	0	0	0	0	0	0	0	0	93	21	18
08:00	5	**75**	20	**1**	0	0	0	0	0	0	0	0	0	**101**	21	18
09:00	1	61	6	0	0	0	0	0	0	0	0	0	0	68	19	17
10:00	**11**	45	14	1	0	0	0	0	0	0	0	0	0	71	21	17
11:00	0	37	11	0	0	0	0	0	0	0	0	0	0	48	21	18
12 PM	5	53	10	0	0	0	0	0	0	0	0	0	0	68	19	17
13:00	2	52	9	0	0	0	0	0	0	0	0	0	0	63	19	18
14:00	**7**	51	**17**	0	0	0	0	0	0	0	0	0	0	**75**	21	18
15:00	2	**58**	10	**1**	0	0	0	0	0	0	0	0	0	71	19	18
16:00	4	52	13	0	0	0	0	0	0	0	0	0	0	69	20	18
17:00	5	49	15	1	0	0	0	0	0	0	0	0	0	70	21	18
18:00	0	52	6	0	0	0	0	0	0	0	0	0	0	58	19	17
19:00	1	26	6	0	0	0	0	0	0	0	0	0	0	33	20	18
20:00	3	22	5	0	0	0	0	0	0	0	0	0	0	30	19	17
21:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12	20	18
22:00	1	13	2	0	0	0	0	0	0	0	0	0	0	16	19	17
23:00	1	7	1	0	0	0	0	0	0	0	0	0	0	9	19	17
Total	57	791	181	4	0	0	0	0	0	0	0	0	0	1033		
%	5.5%	76.6%	17.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	07:00	08:00										08:00		
Vol.	11	75	22	1										101		
PM Peak	14:00	15:00	14:00	15:00										14:00		
Vol.	7	58	17	1										75		

Pecent

15th Percentile :	15 MPH
50th Percentile :	17 MPH
85th Percentile :	20 MPH
95th Percentile :	23 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	972
Percent in Pace :	94.1%
Number of Vehicles > 20 MPH :	148
Percent of Vehicles > 20 MPH :	14.3%
Mean Speed(Average) :	17 MPH

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UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-C speed
Site Code: 10111.31

SB UTurn to NB

Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
09/10/0																
8	1	2	1	0	0	0	0	0	0	0	0	0	0	4	16	16
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2	16	16
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4	17	17
04:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5	18	17
05:00	0	14	0	0	0	0	0	0	0	0	0	0	0	14	18	17
06:00	1	36	8	0	0	0	0	0	0	0	0	0	0	45	20	18
07:00	1	64	23	1	0	0	0	0	0	0	0	0	0	89	22	18
08:00	5	**83**	**28**	1	0	0	0	0	0	0	0	0	0	**117**	21	18
09:00	**7**	42	15	**2**	0	0	0	0	0	0	0	0	0	66	22	18
10:00	4	51	6	1	0	0	0	0	0	0	0	0	0	62	19	17
11:00	7	40	14	0	0	0	0	0	0	0	0	0	0	61	21	17
12 PM	1	37	16	**1**	0	0	0	0	0	0	0	0	0	55	22	18
13:00	**7**	40	9	0	0	0	0	0	0	0	0	0	0	56	20	17
14:00	3	49	14	0	0	0	0	0	0	0	0	0	0	66	21	18
15:00	4	46	17	0	0	0	0	0	0	0	0	0	0	67	21	18
16:00	1	**70**	**19**	0	0	0	0	0	0	0	0	0	0	**90**	21	18
17:00	1	46	15	1	0	0	0	0	0	0	0	0	0	63	22	18
18:00	1	45	3	0	0	0	0	0	0	0	0	0	0	49	19	17
19:00	3	26	14	0	0	0	0	0	0	0	0	0	0	43	22	18
20:00	0	25	3	0	0	0	0	0	0	0	0	0	0	28	19	17
21:00	3	13	7	0	0	0	0	0	0	0	0	0	0	23	21	18
22:00	1	11	4	0	0	0	0	0	0	0	0	0	0	16	21	18
23:00	0	9	4	0	0	0	0	0	0	0	0	0	0	13	21	18
Total	51	760	221	7	0	0	0	0	0	0	0	0	0	1039		
%	4.9%	73.1%	21.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	08:00	09:00										08:00		
Vol.	7	83	28	2										117		
PM Peak	13:00	16:00	16:00	12:00										16:00		
Vol.	7	70	19	1										90		

Pecent

15th Percentile :	15 MPH
50th Percentile :	18 MPH
85th Percentile :	21 MPH
95th Percentile :	23 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	981
Percent in Pace :	94.4%
Number of Vehicles > 20 MPH :	183
Percent of Vehicles > 20 MPH :	17.6%
Mean Speed(Average) :	18 MPH

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UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-C class
Site Code: 10111.31

SB UTurn to NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	6	1	0	0	0	0	0	0	0	0	0	0	7
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
05:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
06:00	2	43	4	0	0	0	0	0	0	0	0	0	0	49
07:00	3	79	10	1	0	0	0	0	0	0	0	0	0	93
08:00	7	90	4	0	0	0	0	0	0	0	0	0	0	101
09:00	0	61	6	0	1	0	0	0	0	0	0	0	0	68
10:00	4	62	4	0	1	0	0	0	0	0	0	0	0	71
11:00	1	43	2	0	2	0	0	0	0	0	0	0	0	48
12 PM	2	59	6	0	0	0	0	1	0	0	0	0	0	68
13:00	2	53	7	0	0	0	0	1	0	0	0	0	0	63
14:00	4	64	7	0	0	0	0	0	0	0	0	0	0	75
15:00	2	62	5	0	1	0	0	1	0	0	0	0	0	71
16:00	1	63	5	0	0	0	0	0	0	0	0	0	0	69
17:00	8	58	4	0	0	0	0	0	0	0	0	0	0	70
18:00	1	54	3	0	0	0	0	0	0	0	0	0	0	58
19:00	0	31	2	0	0	0	0	0	0	0	0	0	0	33
20:00	0	28	2	0	0	0	0	0	0	0	0	0	0	30
21:00	1	11	0	0	0	0	0	0	0	0	0	0	0	12
22:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
23:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
Total	38	910	76	1	5	0	0	3	0	0	0	0	0	1033
Percent	3.7%	88.1%	7.4%	0.1%	0.5%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	07:00	07:00	11:00									08:00
Vol.	7	90	10	1	2									101
PM Peak	17:00	14:00	13:00		15:00			12:00						14:00
Vol.	8	64	7		1			1						75

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UTurn Ramp from Davol Street SB
to Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-C class
Site Code: 10111.31

SB UTurn to NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
05:00	0	11	3	0	0	0	0	0	0	0	0	0	0	14
06:00	3	38	4	0	0	0	0	0	0	0	0	0	0	45
07:00	4	73	10	0	0	0	0	1	1	0	0	0	0	89
08:00	7	104	6	0	0	0	0	0	0	0	0	0	0	117
09:00	4	55	6	0	1	0	0	0	0	0	0	0	0	66
10:00	4	55	2	0	1	0	0	0	0	0	0	0	0	62
11:00	1	52	5	1	1	0	0	1	0	0	0	0	0	61
12 PM	4	47	4	0	0	0	0	0	0	0	0	0	0	55
13:00	0	51	5	0	0	0	0	0	0	0	0	0	0	56
14:00	0	56	8	0	2	0	0	0	0	0	0	0	0	66
15:00	2	61	3	0	1	0	0	0	0	0	0	0	0	67
16:00	0	82	7	0	0	0	0	1	0	0	0	0	0	90
17:00	1	58	4	0	0	0	0	0	0	0	0	0	0	63
18:00	1	44	2	0	2	0	0	0	0	0	0	0	0	49
19:00	1	40	2	0	0	0	0	0	0	0	0	0	0	43
20:00	0	27	1	0	0	0	0	0	0	0	0	0	0	28
21:00	0	22	1	0	0	0	0	0	0	0	0	0	0	23
22:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
23:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
Total	32	920	74	1	8	0	0	3	1	0	0	0	0	1039
Percent	3.1%	88.5%	7.1%	0.1%	0.8%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	07:00	11:00	09:00			07:00	07:00					08:00
Vol.	7	104	10	1	1			1	1					117
PM Peak	12:00	16:00	14:00		14:00			16:00						16:00
Vol.	4	82	8		2			1						90

Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
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81676 B-D volume
Site Code: 10111.31

Start Time	A.M.	NB	P.M.				Tue 09-Sep-08
12:00	5		55				
12:15	11		50				
12:30	3		49				
12:45	4	23	59	213			
01:00	3		60				
01:15	2		51				
01:30	5		44				
01:45	2	12	50	205			
02:00	2		63				
02:15	2		62				
02:30	1		63				
02:45	3	8	45	233			
03:00	0		57				
03:15	1		56				
03:30	2		67				
03:45	2	5	54	234			
04:00	1		80				
04:15	5		77				
04:30	9		74				
04:45	12	27	55	286			
05:00	8		65				
05:15	13		65				
05:30	10		50				
05:45	16	47	41	221			
06:00	24		40				
06:15	35		57				
06:30	36		43				
06:45	55	150	33	173			
07:00	56		35				
07:15	58		35				
07:30	69		36				
07:45	72	255	35	141			
08:00	53		31				
08:15	68		35				
08:30	64		27				
08:45	57	242	24	117			
09:00	42		23				
09:15	49		25				
09:30	37		20				
09:45	43	171	24	92			
10:00	44		14				
10:15	60		14				
10:30	47		20				
10:45	37	188	17	65			
11:00	36		15				
11:15	51		20				
11:30	45		11				
11:45	51	183	2	48			
Total	1311		2028				
Percent			100.0%		0.0%	0.0%	
Day Total		3339					
Peak	07:30		04:00				
Vol.	262		286				
P.H.F.	0.910		0.894				

Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 B-D volume
Site Code: 10111.31

Start Time	A.M.	NB	P.M.				Wed 10-Sep-08
12:00	3		42				
12:15	8		49				
12:30	4		44				
12:45	2	17	37	172			
01:00	6		43				
01:15	3		54				
01:30	2		47				
01:45	5	16	53	197			
02:00	1		48				
02:15	2		58				
02:30	4		66				
02:45	1	8	64	236			
03:00	1		48				
03:15	2		68				
03:30	3		59				
03:45	5	11	67	242			
04:00	2		79				
04:15	6		59				
04:30	5		81				
04:45	13	26	74	293			
05:00	9		72				
05:15	11		72				
05:30	16		53				
05:45	15	51	62	259			
06:00	23		49				
06:15	34		47				
06:30	32		53				
06:45	43	132	42	191			
07:00	57		52				
07:15	65		64				
07:30	68		33				
07:45	74	264	35	184			
08:00	73		34				
08:15	60		35				
08:30	58		49				
08:45	54	245	30	148			
09:00	63		28				
09:15	52		26				
09:30	32		15				
09:45	44	191	24	93			
10:00	51		16				
10:15	41		16				
10:30	38		20				
10:45	48	178	17	69			
11:00	50		20				
11:15	44		15				
11:30	46		10				
11:45	44	184	17	62			
Total	1323		2146				
Percent			100.0%		0.0%	0.0%	
Day Total		3469					
Peak	07:15		04:30				
Vol.	280		299				
P.H.F.	0.946		0.923				

PRECISION
D A T A
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Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	1	3	5	5	5	2	2	0	0	0	0	23	48	37
01:00	0	1	0	2	4	1	2	1	1	0	0	0	0	12	41	35
02:00	0	0	0	0	1	2	2	3	0	0	0	0	0	8	46	42
03:00	0	0	0	0	0	3	2	0	0	0	0	0	0	5	40	38
04:00	0	0	0	3	1	7	7	8	1	0	0	0	0	27	47	41
05:00	0	0	1	3	6	16	9	9	2	1	0	0	0	47	47	39
06:00	0	**3**	4	16	33	41	33	18	1	1	0	0	0	150	44	37
07:00	0	1	6	**36**	**64**	**60**	57	**27**	4	0	0	0	0	**255**	44	36
08:00	0	2	9	36	54	57	**62**	14	**5**	**3**	0	0	0	242	43	36
09:00	0	1	6	31	39	48	33	12	1	0	0	0	0	171	42	35
10:00	0	2	**10**	26	46	55	38	9	1	1	0	0	0	188	42	35
11:00	0	1	4	24	58	56	27	12	1	0	0	0	0	183	42	35
12 PM	0	0	11	35	61	53	38	11	2	**2**	0	0	0	213	42	35
13:00	**3**	**6**	**20**	33	46	53	34	4	**5**	1	0	0	0	205	41	33
14:00	0	3	17	**47**	58	59	37	10	2	0	0	0	0	233	41	34
15:00	0	0	9	34	71	59	35	22	4	0	0	0	0	234	43	35
16:00	0	3	20	39	**73**	**74**	**57**	17	2	0	0	**1**	0	**286**	42	35
17:00	0	1	4	26	51	55	55	**24**	5	0	0	0	0	221	44	37
18:00	0	1	2	17	36	48	40	22	5	1	0	1	0	173	45	38
19:00	0	0	4	13	39	46	20	15	3	1	0	0	0	141	44	37
20:00	0	0	0	10	27	35	29	12	3	1	0	0	0	117	44	38
21:00	0	0	2	12	26	32	14	3	3	0	0	0	0	92	41	36
22:00	0	1	1	7	16	19	13	5	2	1	0	0	0	65	43	37
23:00	0	0	1	3	8	17	11	8	0	0	0	0	0	48	45	38
Total	3	26	132	456	823	901	660	268	55	13	0	2	0	3339		
%	0.1%	0.8%	4.0%	13.7%	24.6%	27.0%	19.8%	8.0%	1.6%	0.4%	0.0%	0.1%	0.0%			
AM Peak		06:00	10:00	07:00	07:00	07:00	08:00	07:00	08:00	08:00				07:00		
Vol.		3	10	36	64	60	62	27	5	3				255		
PM Peak	13:00	13:00	13:00	14:00	16:00	16:00	16:00	17:00	13:00	12:00		16:00		16:00		
Vol.	3	6	20	47	73	74	57	24	5	2		1		286		

Pecent

15th Percentile :	28 MPH
50th Percentile :	36 MPH
85th Percentile :	43 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1724
Percent in Pace :	51.6%
Number of Vehicles > 35 MPH :	1718
Percent of Vehicles > 35 MPH :	51.5%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	2	6	4	4	0	1	0	0	0	0	17	41	36
01:00	0	0	0	0	3	6	6	1	0	0	0	0	0	16	43	39
02:00	0	0	0	0	3	2	1	2	0	0	0	0	0	8	45	37
03:00	0	0	0	1	1	4	4	1	0	0	0	0	0	11	42	39
04:00	0	0	1	4	0	10	7	2	1	**1**	0	0	0	26	44	38
05:00	0	0	0	2	8	17	12	8	4	0	0	0	0	51	46	40
06:00	0	0	8	11	28	37	35	11	2	0	0	0	0	132	43	37
07:00	**1**	0	11	27	53	**83**	**62**	**23**	2	1	0	0	0	**263**	43	36
08:00	1	**2**	10	**36**	54	76	46	17	3	1	0	0	0	246	43	35
09:00	0	0	**13**	26	53	47	40	8	3	1	0	0	0	191	42	35
10:00	0	1	5	17	37	69	38	9	2	0	0	0	0	178	42	36
11:00	0	0	9	13	**56**	56	33	12	**5**	0	0	0	0	184	43	36
12 PM	0	0	8	25	37	58	30	11	2	1	0	0	0	172	42	36
13:00	0	0	6	31	57	62	33	4	3	1	0	0	0	197	41	35
14:00	0	0	6	**36**	**65**	79	37	10	3	0	0	0	0	236	41	35
15:00	1	6	9	16	53	73	57	24	2	0	0	0	0	241	44	36
16:00	**2**	4	7	29	65	**91**	**63**	26	5	1	**1**	0	0	**294**	44	36
17:00	0	3	**11**	29	57	67	52	**29**	**7**	**4**	0	0	0	259	45	37
18:00	0	**7**	9	16	42	52	39	20	3	3	0	0	0	191	44	36
19:00	0	0	5	26	34	50	48	15	5	1	0	0	0	184	44	37
20:00	0	0	3	10	46	42	34	11	1	1	0	0	0	148	43	37
21:00	0	0	1	6	22	28	22	9	5	0	0	0	0	93	44	38
22:00	0	0	1	8	15	19	19	6	1	0	0	0	0	69	43	37
23:00	0	1	1	3	17	22	14	4	0	0	0	0	0	62	42	36
Total	5	24	124	374	812	1054	736	263	60	16	1	0	0	3469		
%	0.1%	0.7%	3.6%	10.8%	23.4%	30.4%	21.2%	7.6%	1.7%	0.5%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	09:00	08:00	11:00	07:00	07:00	07:00	11:00	04:00				07:00		
Vol.	1	2	13	36	56	83	62	23	5	1				263		
PM Peak	16:00	18:00	17:00	14:00	14:00	16:00	16:00	17:00	17:00	17:00	16:00			16:00		
Vol.	2	7	11	36	65	91	63	29	7	4	1			294		

Pecent

15th Percentile :	29 MPH
50th Percentile :	36 MPH
85th Percentile :	43 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1866
Percent in Pace :	53.8%
Number of Vehicles > 35 MPH :	1919
Percent of Vehicles > 35 MPH :	55.3%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	22	1	0	0	0	0	0	0	0	0	0	0	23
01:00	0	9	1	0	1	0	0	1	0	0	0	0	0	12
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
04:00	0	16	7	0	4	0	0	0	0	0	0	0	0	27
05:00	0	26	11	0	9	0	0	1	0	0	0	0	0	47
06:00	0	109	30	0	9	0	0	2	0	0	0	0	0	150
07:00	1	200	35	1	15	1	0	1	1	0	0	0	0	255
08:00	1	212	20	0	7	0	0	2	0	0	0	0	0	242
09:00	0	146	22	0	2	0	0	1	0	0	0	0	0	171
10:00	0	149	25	2	7	0	0	3	2	0	0	0	0	188
11:00	0	149	22	1	8	0	0	3	0	0	0	0	0	183
12 PM	0	172	30	1	5	1	0	3	1	0	0	0	0	213
13:00	1	163	33	0	4	0	0	4	0	0	0	0	0	205
14:00	0	190	35	1	6	0	0	1	0	0	0	0	0	233
15:00	0	187	36	0	9	0	0	2	0	0	0	0	0	234
16:00	1	224	50	1	8	1	0	0	0	1	0	0	0	286
17:00	0	195	20	0	6	0	0	0	0	0	0	0	0	221
18:00	0	144	27	1	1	0	0	0	0	0	0	0	0	173
19:00	1	114	22	0	3	0	0	1	0	0	0	0	0	141
20:00	0	103	14	0	0	0	0	0	0	0	0	0	0	117
21:00	0	86	6	0	0	0	0	0	0	0	0	0	0	92
22:00	0	60	4	0	1	0	0	0	0	0	0	0	0	65
23:00	0	41	7	0	0	0	0	0	0	0	0	0	0	48
Total	5	2726	462	8	105	3	0	25	4	1	0	0	0	3339
Percent	0.1%	81.6%	13.8%	0.2%	3.1%	0.1%	0.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	10:00	07:00	07:00		10:00	10:00					07:00
Vol.	1	212	35	2	15	1		3	2					255
PM Peak	13:00	16:00	16:00	12:00	15:00	12:00		13:00	12:00	16:00				16:00
Vol.	1	224	50	1	9	1		4	1	1				286

PRECISION
D A T A
INDUSTRIES, LLC
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Route 79 NB Off Ramp
south of UTurn to Davol Street (SB)
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 B-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	16	1	0	0	0	0	0	0	0	0	0	0	17
01:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
02:00	0	4	4	0	0	0	0	0	0	0	0	0	0	8
03:00	0	8	2	0	1	0	0	0	0	0	0	0	0	11
04:00	0	16	6	0	4	0	0	0	0	0	0	0	0	26
05:00	0	24	15	0	9	0	0	2	1	0	0	0	0	51
06:00	0	93	28	2	6	1	0	2	0	0	0	0	0	132
07:00	1	218	32	2	7	0	0	1	2	0	0	0	0	263
08:00	0	197	41	0	6	0	0	2	0	0	0	0	0	246
09:00	0	142	39	0	7	0	0	1	2	0	0	0	0	191
10:00	0	141	31	0	5	0	0	0	1	0	0	0	0	178
11:00	0	141	31	2	8	0	0	2	0	0	0	0	0	184
12 PM	0	151	15	1	4	0	0	1	0	0	0	0	0	172
13:00	0	162	24	0	7	2	0	1	1	0	0	0	0	197
14:00	0	193	29	2	6	2	0	3	1	0	0	0	0	236
15:00	0	200	36	1	1	0	0	2	0	1	0	0	0	241
16:00	0	241	40	2	9	1	0	1	0	0	0	0	0	294
17:00	1	220	30	2	5	0	0	1	0	0	0	0	0	259
18:00	2	163	23	0	3	0	0	0	0	0	0	0	0	191
19:00	0	159	21	0	3	1	0	0	0	0	0	0	0	184
20:00	5	130	12	0	1	0	0	0	0	0	0	0	0	148
21:00	1	79	10	0	3	0	0	0	0	0	0	0	0	93
22:00	0	62	6	0	1	0	0	0	0	0	0	0	0	69
23:00	0	58	3	0	1	0	0	0	0	0	0	0	0	62
Total	10	2833	480	14	97	7	0	19	8	1	0	0	0	3469
Percent	0.3%	81.7%	13.8%	0.4%	2.8%	0.2%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	06:00	05:00	06:00		05:00	07:00					07:00
Vol.	1	218	41	2	9	1		2	2					263
PM Peak	20:00	16:00	16:00	14:00	16:00	13:00		14:00	13:00	15:00				16:00
Vol.	5	241	40	2	9	2		3	1	1				294

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 10/8/08 thru Fri 10/10/08	81676 B	Fall River, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Fall River, MA

UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 A-A volume
Site Code: 10111.31

Start Time	A.M.	NB to SB UTurn	P.M.				Tue 09-Sep-08
12:00	1		13				
12:15	0		11				
12:30	0		8				
12:45	0	1	13	45			
01:00	0		8				
01:15	0		11				
01:30	0		7				
01:45	0	0	3	29			
02:00	0		12				
02:15	0		0				
02:30	1		4				
02:45	1	2	6	22			
03:00	0		5				
03:15	0		8				
03:30	0		5				
03:45	1	1	8	26			
04:00	0		10				
04:15	0		10				
04:30	2		4				
04:45	0	2	10	34			
05:00	0		1				
05:15	0		8				
05:30	2		4				
05:45	1	3	5	18			
06:00	2		7				
06:15	4		0				
06:30	5		6				
06:45	9	20	6	19			
07:00	3		4				
07:15	6		4				
07:30	4		4				
07:45	8	21	0	12			
08:00	4		3				
08:15	13		6				
08:30	14		2				
08:45	8	39	8	19			
09:00	7		0				
09:15	8		2				
09:30	7		3				
09:45	8	30	4	9			
10:00	7		1				
10:15	8		2				
10:30	8		0				
10:45	10	33	1	4			
11:00	5		0				
11:15	14		2				
11:30	5		0				
11:45	4	28	0	2			
Total	180		239				
Percent			100.0%		0.0%	0.0%	
Day Total		419					
Peak	08:15		12:00				
Vol.	42		45				
P.H.F.	0.750		0.865				

UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
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81676 A-A volume
Site Code: 10111.31

Start Time	A.M.	NB to SB UTurn	P.M.		Wed 10-Sep-08
12:00	0		7		
12:15	1		12		
12:30	2		4		
12:45	0	3	8	31	
01:00	1		11		
01:15	1		10		
01:30	0		6		
01:45	0	2	8	35	
02:00	0		10		
02:15	0		6		
02:30	1		10		
02:45	0	1	6	32	
03:00	0		8		
03:15	0		9		
03:30	0		9		
03:45	1	1	14	40	
04:00	1		14		
04:15	4		8		
04:30	1		9		
04:45	2	8	11	42	
05:00	1		12		
05:15	4		21		
05:30	0		6		
05:45	2	7	12	51	
06:00	3		11		
06:15	3		5		
06:30	2		4		
06:45	2	10	11	31	
07:00	3		13		
07:15	7		11		
07:30	8		4		
07:45	11	29	5	33	
08:00	12		4		
08:15	11		7		
08:30	7		3		
08:45	14	44	1	15	
09:00	14		0		
09:15	12		2		
09:30	4		2		
09:45	11	41	4	8	
10:00	6		3		
10:15	13		4		
10:30	7		2		
10:45	7	33	2	11	
11:00	10		1		
11:15	7		0		
11:30	12		0		
11:45	5	34	1	2	
Total	213		331		
Percent			100.0%	0.0%	0.0%
Day Total		544			
Peak	08:30		04:30		
Vol.	47		53		
P.H.F.	0.839		0.631		

PRECISION
D A T A
INDUSTRIES, LLC
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UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 A-A speed
Site Code: 10111.31

NB to SB UTurn

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0 8	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2	16	16
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
05:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3	17	16
06:00	6	11	3	0	0	0	0	0	0	0	0	0	0	20	19	16
07:00	2	16	3	0	0	0	0	0	0	0	0	0	0	21	19	17
08:00	4	**31**	4	0	0	0	0	0	0	0	0	0	0	**39**	19	17
09:00	2	25	3	0	0	0	0	0	0	0	0	0	0	30	19	17
10:00	**8**	19	**6**	0	0	0	0	0	0	0	0	0	0	33	20	16
11:00	4	21	3	0	0	0	0	0	0	0	0	0	0	28	19	17
12 PM	**8**	**32**	5	0	0	0	0	0	0	0	0	0	0	**45**	19	16
13:00	2	21	6	0	0	0	0	0	0	0	0	0	0	29	20	18
14:00	2	18	2	0	0	0	0	0	0	0	0	0	0	22	19	17
15:00	4	17	5	0	0	0	0	0	0	0	0	0	0	26	20	17
16:00	7	19	**8**	0	0	0	0	0	0	0	0	0	0	34	21	17
17:00	1	13	4	0	0	0	0	0	0	0	0	0	0	18	20	18
18:00	2	15	2	0	0	0	0	0	0	0	0	0	0	19	19	17
19:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12	19	17
20:00	2	12	5	0	0	0	0	0	0	0	0	0	0	19	21	18
21:00	1	4	4	0	0	0	0	0	0	0	0	0	0	9	22	19
22:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4	16	16
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
Total	56	297	66	0	0	0	0	0	0	0	0	0	0	419		
%	13.4%	70.9%	15.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	10:00											08:00		
Vol.	8	31	6											39		
PM Peak	12:00	12:00	16:00											12:00		
Vol.	8	32	8											45		

Pecent

15th Percentile :	15 MPH
50th Percentile :	17 MPH
85th Percentile :	20 MPH
95th Percentile :	23 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	363
Percent in Pace :	86.6%
Number of Vehicles > 20 MPH :	52
Percent of Vehicles > 20 MPH :	12.4%
Mean Speed(Average) :	17 MPH

PRECISION
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UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 A-A speed
Site Code: 10111.31

NB to SB UTurn

Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
09/10/0																
8	1	1	1	0	0	0	0	0	0	0	0	0	0	3	20	18
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2	16	16
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
04:00	4	2	2	0	0	0	0	0	0	0	0	0	0	8	20	11
05:00	3	3	1	0	0	0	0	0	0	0	0	0	0	7	17	15
06:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10	19	17
07:00	3	21	4	**1**	0	0	0	0	0	0	0	0	0	29	20	17
08:00	6	**31**	7	0	0	0	0	0	0	0	0	0	0	**44**	19	17
09:00	**11**	22	**8**	0	0	0	0	0	0	0	0	0	0	41	20	16
10:00	7	25	1	0	0	0	0	0	0	0	0	0	0	33	19	16
11:00	9	22	3	0	0	0	0	0	0	0	0	0	0	34	19	15
12 PM	1	24	6	0	0	0	0	0	0	0	0	0	0	31	20	18
13:00	5	25	5	0	0	0	0	0	0	0	0	0	0	35	19	17
14:00	5	21	6	0	0	0	0	0	0	0	0	0	0	32	20	17
15:00	**7**	24	9	0	0	0	0	0	0	0	0	0	0	40	21	17
16:00	6	26	**10**	0	0	0	0	0	0	0	0	0	0	42	21	17
17:00	5	**37**	9	0	0	0	0	0	0	0	0	0	0	**51**	20	17
18:00	5	20	6	0	0	0	0	0	0	0	0	0	0	31	20	17
19:00	3	24	6	0	0	0	0	0	0	0	0	0	0	33	20	17
20:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15	21	18
21:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8	19	17
22:00	1	7	3	0	0	0	0	0	0	0	0	0	0	11	20	18
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
Total	82	366	95	1	0	0	0	0	0	0	0	0	0	544		
%	15.1%	67.3%	17.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	09:00	07:00										08:00		
Vol.	11	31	8	1										44		
PM Peak	15:00	17:00	16:00											17:00		
Vol.	7	37	10											51		

Pecent

15th Percentile :	14 MPH
50th Percentile :	17 MPH
85th Percentile :	20 MPH
95th Percentile :	23 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	461
Percent in Pace :	84.7%
Number of Vehicles > 20 MPH :	77
Percent of Vehicles > 20 MPH :	14.2%
Mean Speed(Average) :	16 MPH

PRECISION
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UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 A-A class
Site Code: 10111.31

NB to SB UTurn

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
06:00	1	8	8	0	1	1	0	0	0	1	0	0	0	20
07:00	0	12	6	0	3	0	0	0	0	0	0	0	0	21
08:00	1	24	10	0	4	0	0	0	0	0	0	0	0	39
09:00	0	22	8	0	0	0	0	0	0	0	0	0	0	30
10:00	3	18	7	1	1	2	0	1	0	0	0	0	0	33
11:00	1	20	4	0	2	1	0	0	0	0	0	0	0	28
12 PM	1	28	10	0	6	0	0	0	0	0	0	0	0	45
13:00	1	17	7	0	4	0	0	0	0	0	0	0	0	29
14:00	0	17	3	0	2	0	0	0	0	0	0	0	0	22
15:00	0	17	5	2	2	0	0	0	0	0	0	0	0	26
16:00	4	17	10	0	2	1	0	0	0	0	0	0	0	34
17:00	0	17	1	0	0	0	0	0	0	0	0	0	0	18
18:00	0	15	2	1	1	0	0	0	0	0	0	0	0	19
19:00	0	10	1	0	0	0	0	1	0	0	0	0	0	12
20:00	0	16	3	0	0	0	0	0	0	0	0	0	0	19
21:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
22:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	12	279	88	4	28	5	0	2	0	1	0	0	0	419
Percent	2.9%	66.6%	21.0%	1.0%	6.7%	1.2%	0.0%	0.5%	0.0%	0.2%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	08:00	10:00	08:00	10:00		10:00		06:00				08:00
Vol.	3	24	10	1	4	2		1		1				39
PM Peak	16:00	12:00	12:00	15:00	12:00	16:00		19:00						12:00
Vol.	4	28	10	2	6	1		1						45

PRECISION
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UTurn Ramp to Davol Street SB
from Davol Street NB
City, State: Fall River, MA
Client: VHB/J. Quitter

81676 A-A class
Site Code: 10111.31

NB to SB UTurn

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	5	2	0	0	1	0	0	0	0	0	0	0	8
05:00	1	3	0	0	1	1	0	0	1	0	0	0	0	7
06:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
07:00	1	22	3	0	2	1	0	0	0	0	0	0	0	29
08:00	0	27	13	0	3	0	0	1	0	0	0	0	0	44
09:00	2	29	5	0	3	2	0	0	0	0	0	0	0	41
10:00	1	24	6	1	0	1	0	0	0	0	0	0	0	33
11:00	1	23	7	0	2	1	0	0	0	0	0	0	0	34
12 PM	0	29	1	0	1	0	0	0	0	0	0	0	0	31
13:00	0	29	5	0	1	0	0	0	0	0	0	0	0	35
14:00	2	21	5	0	4	0	0	0	0	0	0	0	0	32
15:00	3	29	4	0	2	0	0	1	1	0	0	0	0	40
16:00	0	37	4	1	0	0	0	0	0	0	0	0	0	42
17:00	1	44	5	1	0	0	0	0	0	0	0	0	0	51
18:00	0	28	3	0	0	0	0	0	0	0	0	0	0	31
19:00	0	30	3	0	0	0	0	0	0	0	0	0	0	33
20:00	1	14	0	0	0	0	0	0	0	0	0	0	0	15
21:00	1	7	0	0	0	0	0	0	0	0	0	0	0	8
22:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	14	425	72	3	19	7	0	2	2	0	0	0	0	544
Percent	2.6%	78.1%	13.2%	0.6%	3.5%	1.3%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	09:00	08:00	10:00	08:00	09:00		08:00	05:00					08:00
Vol.	2	29	13	1	3	2		1	1					44
PM Peak	15:00	17:00	13:00	16:00	14:00			15:00	15:00					17:00
Vol.	3	44	5	1	4			1	1					51

PRECISION DATA INDUSTRIES, LLC
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Sat 9/6/08 and Wed 9/10/08	81676	Freetown, MA

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
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81676 F-A volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	14		75		8		52		22		127		
12:15	15		64		5		45		20		109		
12:30	9		81		8		38		17		119		
12:45	8	46	94	314	7	28	52	187	15	74	146	501	
01:00	9		92		6		45		15		137		
01:15	5		78		10		54		15		132		
01:30	7		96		22		68		29		164		
01:45	10	31	76	342	23	61	55	222	33	92	131	564	
02:00	7		97		5		40		12		137		
02:15	6		86		8		60		14		146		
02:30	2		102		9		71		11		173		
02:45	8	23	149	434	8	30	84	255	16	53	233	689	
03:00	7		123		14		78		21		201		
03:15	5		101		3		75		8		176		
03:30	5		102		9		74		14		176		
03:45	14	31	134	460	7	33	79	306	21	64	213	766	
04:00	9		121		4		66		13		187		
04:15	17		122		12		68		29		190		
04:30	19		151		14		68		33		219		
04:45	29	74	149	543	23	53	84	286	52	127	233	829	
05:00	31		123		40		72		71		195		
05:15	30		108		22		68		52		176		
05:30	35		111		31		58		66		169		
05:45	54	150	85	427	23	116	43	241	77	266	128	668	
06:00	62		62		41		51		103		113		
06:15	84		86		54		46		138		132		
06:30	96		89		56		43		152		132		
06:45	117	359	58	295	62	213	34	174	179	572	92	469	
07:00	137		64		77		36		214		100		
07:15	129		58		68		28		197		86		
07:30	134		51		61		45		195		96		
07:45	168	568	55	228	41	247	29	138	209	815	84	366	
08:00	155		44		67		23		222		67		
08:15	125		55		61		18		186		73		
08:30	127		51		61		23		188		74		
08:45	131	538	39	189	52	241	19	83	183	779	58	272	
09:00	118		35		58		17		176		52		
09:15	89		36		37		25		126		61		
09:30	96		37		44		16		140		53		
09:45	76	379	34	142	46	185	16	74	122	564	50	216	
10:00	61		26		52		33		113		59		
10:15	73		30		44		20		117		50		
10:30	71		55		45		30		116		85		
10:45	71	276	28	139	39	180	23	106	110	456	51	245	
11:00	63		21		29		12		92		33		
11:15	80		15		40		11		120		26		
11:30	65		14		38		6		103		20		
11:45	84	292	16	66	42	149	14	43	126	441	30	109	
Total	2767		3579		1536		2115		4303		5694		
Percent	64.3%		62.9%		35.7%		37.1%						
Day Total		6346				3651				9997			
Peak	07:15		04:15		06:45		02:45		07:15		04:15		
Vol.	586		545		268		311		823		837		
P.H.F.	0.872		0.902		0.870		0.926		0.927		0.898		

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

PRECISION
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81676 F-A volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	8		80		12		56		20		136		
12:15	7		71		5		51		12		122		
12:30	8		92		4		59		12		151		
12:45	7	30	94	337	4	25	55	221	11	55	149	558	
01:00	5		88		4		51		9		139		
01:15	5		98		3		65		8		163		
01:30	3		90		23		89		26		179		
01:45	9	22	100	376	29	59	53	258	38	81	153	634	
02:00	0		68		16		53		16		121		
02:15	6		109		8		78		14		187		
02:30	3		87		4		64		7		151		
02:45	7	16	127	391	1	29	50	245	8	45	177	636	
03:00	3		118		4		57		7		175		
03:15	5		111		6		74		11		185		
03:30	7		99		2		61		9		160		
03:45	5	20	113	441	6	18	64	256	11	38	177	697	
04:00	11		123		4		63		15		186		
04:15	14		131		12		59		26		190		
04:30	15		127		11		74		26		201		
04:45	25	65	122	503	22	49	83	279	47	114	205	782	
05:00	29		132		28		80		57		212		
05:15	15		122		19		69		34		191		
05:30	32		132		28		70		60		202		
05:45	64	140	99	485	35	110	59	278	99	250	158	763	
06:00	70		84		40		51		110		135		
06:15	65		87		40		51		105		138		
06:30	84		94		52		49		136		143		
06:45	123	342	77	342	66	198	39	190	189	540	116	532	
07:00	137		64		69		50		206		114		
07:15	138		67		67		41		205		108		
07:30	151		65		55		43		206		108		
07:45	153	579	65	261	64	255	37	171	217	834	102	432	
08:00	125		53		67		27		192		80		
08:15	140		44		50		25		190		69		
08:30	113		58		53		27		166		85		
08:45	126	504	45	200	56	226	16	95	182	730	61	295	
09:00	114		43		58		29		172		72		
09:15	105		47		51		19		156		66		
09:30	84		34		41		12		125		46		
09:45	91	394	49	173	43	193	16	76	134	587	65	249	
10:00	77		35		27		28		104		63		
10:15	76		46		45		29		121		75		
10:30	48		61		54		30		102		91		
10:45	105	306	41	183	53	179	31	118	158	485	72	301	
11:00	81		23		50		15		131		38		
11:15	65		23		38		22		103		45		
11:30	68		18		46		13		114		31		
11:45	89	303	14	78	51	185	19	69	140	488	33	147	
Total	2721		3770		1526		2256		4247		6026		
Percent	64.1%		62.6%		35.9%		37.4%						
Day Total		6491				3782				10273			
Peak	07:00		04:15		06:45		04:30		07:00		04:45		
Vol.	579		512		257		306		834		810		
P.H.F.	0.946		0.970		0.931		0.922		0.961		0.955		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	3	8	11	11	10	3	0	0	0	0	0	46	42	35
01:00	0	0	3	8	9	5	3	2	**1**	0	0	0	0	31	40	33
02:00	0	1	1	9	5	5	1	1	0	0	0	0	0	23	38	31
03:00	0	0	1	4	9	14	2	1	0	0	0	0	0	31	38	34
04:00	0	0	2	8	29	25	7	2	1	0	0	0	0	74	39	34
05:00	0	**2**	6	10	53	57	20	2	0	0	0	0	0	150	39	35
06:00	0	0	5	26	130	154	40	3	1	0	0	0	0	359	39	35
07:00	0	0	**14**	**55**	202	**232**	55	**9**	0	0	0	0	0	**567**	39	35
08:00	0	0	4	44	**207**	198	**76**	8	1	0	0	0	0	538	40	35
09:00	0	0	6	33	143	152	40	6	0	0	0	0	0	380	39	35
10:00	0	0	7	14	105	109	38	2	1	0	0	0	0	276	39	35
11:00	0	0	3	29	105	104	47	2	1	0	0	0	0	291	40	35
12 PM	0	**2**	4	26	92	133	54	3	1	0	0	0	0	315	40	35
13:00	0	1	6	43	123	109	55	5	0	0	0	0	0	342	40	35
14:00	0	1	3	41	166	154	58	9	**2**	0	0	0	0	434	40	35
15:00	**1**	1	10	**52**	174	157	57	7	1	0	0	0	0	460	39	34
16:00	0	2	**12**	52	**185**	**195**	**81**	**15**	0	0	0	0	0	**542**	40	35
17:00	0	0	2	23	167	153	71	11	1	0	0	0	0	428	41	36
18:00	1	0	5	21	86	120	49	11	2	0	0	0	0	295	41	36
19:00	0	0	4	19	77	90	32	6	0	0	0	0	0	228	40	35
20:00	1	1	6	19	46	67	40	9	0	0	0	0	0	189	42	36
21:00	0	1	7	13	37	50	27	6	0	**1**	0	0	0	142	42	35
22:00	0	0	0	11	26	58	39	5	0	0	0	0	0	139	42	37
23:00	0	2	3	9	18	21	8	5	0	0	0	0	0	66	41	34
Total	3	14	117	577	2205	2373	910	133	13	1	0	0	0	6346		
%	0.0%	0.2%	1.8%	9.1%	34.7%	37.4%	14.3%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak		05:00	07:00	07:00	08:00	07:00	08:00	07:00	01:00					07:00		
Vol.		2	14	55	207	232	76	9	1					567		
PM Peak	15:00	12:00	16:00	15:00	16:00	16:00	16:00	16:00	14:00	21:00				16:00		
Vol.	1	2	12	52	185	195	81	15	2	1				542		

Pecent

15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4578
Percent in Pace :	72.1%
Number of Vehicles > 35 MPH :	2955
Percent of Vehicles > 35 MPH :	46.6%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	3	10	10	5	0	**1**	0	0	0	0	30	40	35
01:00	0	0	2	5	6	5	2	2	0	0	0	0	0	22	43	33
02:00	0	0	0	1	6	2	6	0	1	0	0	0	0	16	43	37
03:00	0	0	4	5	5	3	2	1	0	0	0	0	0	20	37	31
04:00	0	1	5	11	19	18	8	3	0	0	0	0	0	65	40	33
05:00	0	0	5	10	49	52	17	**6**	1	0	0	0	0	140	40	35
06:00	2	1	4	43	144	117	24	6	1	0	0	0	0	342	39	34
07:00	7	0	**24**	**83**	**288**	156	19	1	0	0	0	0	0	**578**	37	32
08:00	0	0	4	74	211	**172**	39	4	0	0	0	0	0	504	39	34
09:00	1	2	8	40	166	132	**42**	3	1	0	0	0	0	395	39	34
10:00	**8**	**6**	6	44	104	103	29	5	1	0	0	0	0	306	39	33
11:00	0	1	10	48	129	92	22	1	0	0	0	0	0	303	38	33
12 PM	**7**	0	16	49	125	104	33	3	0	0	0	0	0	337	39	33
13:00	0	2	2	37	111	163	52	9	0	0	0	0	0	376	40	35
14:00	3	**3**	4	27	115	148	**79**	12	0	0	0	0	0	391	41	36
15:00	0	0	9	34	148	163	69	**14**	**4**	0	0	0	0	441	41	35
16:00	0	0	2	48	**206**	**193**	47	7	0	0	0	0	0	**503**	39	35
17:00	0	0	**25**	**57**	198	162	41	2	0	0	0	0	0	485	39	33
18:00	0	0	7	32	130	122	40	9	2	0	0	0	0	342	39	35
19:00	0	0	2	18	83	101	46	7	3	**1**	0	0	0	261	41	36
20:00	0	0	0	15	59	73	44	7	2	0	0	0	0	200	42	36
21:00	3	0	6	15	40	63	29	13	3	0	**1**	0	0	173	43	36
22:00	0	0	1	7	37	82	47	9	0	0	0	0	0	183	42	37
23:00	0	0	3	6	22	23	19	5	0	0	0	0	0	78	42	36
Total	31	16	150	712	2411	2259	761	129	20	1	1	0	0	6491		
%	0.5%	0.2%	2.3%	11.0%	37.1%	34.8%	11.7%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	07:00	07:00	07:00	08:00	09:00	05:00	00:00					07:00		
Vol.	8	6	24	83	288	172	42	6	1					578		
PM Peak	12:00	14:00	17:00	17:00	16:00	16:00	14:00	15:00	15:00	19:00	21:00			16:00		
Vol.	7	3	25	57	206	193	79	14	4	1	1			503		

Pecent

15th Percentile :	30 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4670
Percent in Pace :	71.9%
Number of Vehicles > 35 MPH :	2719
Percent of Vehicles > 35 MPH :	41.9%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	4	3	9	7	4	1	0	0	0	0	0	28	40	33
01:00	0	0	4	8	18	24	7	0	0	0	0	0	0	61	39	34
02:00	0	0	7	4	9	6	3	0	**1**	0	0	0	0	30	38	31
03:00	0	0	2	11	15	4	1	0	0	0	0	0	0	33	34	31
04:00	0	1	7	15	12	14	4	0	0	0	0	0	0	53	38	31
05:00	0	0	15	10	42	33	**14**	2	0	0	0	0	0	116	39	33
06:00	0	**6**	11	36	82	66	10	1	1	0	0	0	0	213	38	32
07:00	0	2	**17**	40	95	**78**	13	2	0	0	0	0	0	**247**	38	33
08:00	0	2	8	**44**	**102**	69	14	2	0	0	0	0	0	241	38	33
09:00	0	6	8	40	79	40	11	0	0	0	0	0	0	184	37	32
10:00	0	2	10	24	79	50	13	**3**	0	0	0	0	0	181	38	33
11:00	0	2	16	25	57	37	10	2	0	0	0	0	0	149	38	32
12 PM	0	0	5	49	69	53	11	0	0	0	0	0	0	187	38	32
13:00	0	**6**	12	**65**	89	45	5	0	0	0	0	0	0	222	36	31
14:00	0	4	**17**	48	108	62	16	0	0	0	0	0	0	255	38	32
15:00	**1**	3	15	55	**137**	76	**18**	1	0	0	0	0	0	**306**	38	32
16:00	0	2	9	52	121	**85**	16	1	0	0	0	0	0	286	38	33
17:00	0	0	6	36	100	82	16	1	0	0	0	0	0	241	38	33
18:00	0	1	7	34	64	51	17	0	0	0	0	0	0	174	39	33
19:00	0	0	4	19	41	60	13	1	0	0	0	0	0	138	39	34
20:00	1	0	3	9	27	34	9	0	0	0	0	0	0	83	39	34
21:00	0	0	7	11	22	20	9	**5**	0	0	0	0	0	74	41	34
22:00	0	1	7	13	31	38	13	3	0	0	0	0	0	106	39	34
23:00	0	0	3	4	13	13	10	0	0	0	0	0	0	43	41	35
Total	2	38	204	655	1421	1047	257	25	2	0	0	0	0	3651		
%	0.1%	1.0%	5.6%	17.9%	38.9%	28.7%	7.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		06:00	07:00	08:00	08:00	07:00	05:00	10:00	02:00					07:00		
Vol.		6	17	44	102	78	14	3	1					247		
PM Peak	15:00	13:00	14:00	13:00	15:00	16:00	15:00	21:00						15:00		
Vol.	1	6	17	65	137	85	18	5						306		

Pecent

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	2468
Percent in Pace :	67.6%
Number of Vehicles > 35 MPH :	1121
Percent of Vehicles > 35 MPH :	30.7%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	3	8	7	5	2	0	0	0	0	0	0	25	37	31
01:00	0	0	1	13	29	12	4	0	0	0	0	0	0	59	37	32
02:00	0	0	3	10	13	2	1	0	0	0	0	0	0	29	34	30
03:00	0	0	1	11	4	1	1	0	0	0	0	0	0	18	32	29
04:00	0	1	5	5	21	14	2	1	0	0	0	0	0	49	38	32
05:00	0	1	4	9	33	51	12	0	0	0	0	0	0	110	39	35
06:00	0	0	10	28	86	**58**	**14**	2	0	0	0	0	0	198	38	33
07:00	1	**7**	**21**	46	**111**	57	11	1	0	0	0	0	0	**255**	37	31
08:00	0	3	15	**57**	86	52	12	1	0	0	0	0	0	226	37	32
09:00	0	0	10	36	80	49	14	**4**	0	0	0	0	0	193	38	33
10:00	**13**	4	13	24	68	44	12	1	0	0	0	0	0	179	38	30
11:00	0	4	14	40	85	36	5	1	0	0	0	0	0	185	36	31
12 PM	0	5	**29**	61	76	41	8	1	0	0	0	0	0	221	36	30
13:00	0	2	15	**77**	98	54	12	0	0	0	0	0	0	258	37	31
14:00	0	0	20	59	92	56	16	2	0	0	0	0	0	245	38	32
15:00	**1**	2	8	32	102	**91**	18	2	0	0	0	0	0	256	38	33
16:00	0	2	14	45	**131**	66	**20**	1	0	0	0	0	0	**279**	38	33
17:00	0	0	18	64	114	74	7	1	0	0	0	0	0	278	37	32
18:00	0	3	10	20	70	65	20	2	0	0	0	0	0	190	39	34
19:00	0	4	12	22	70	41	19	**3**	0	0	0	0	0	171	39	33
20:00	1	**9**	2	11	24	34	12	1	**1**	0	0	0	0	95	39	33
21:00	0	0	6	11	26	23	10	0	0	0	0	0	0	76	39	33
22:00	0	0	5	25	31	41	16	0	0	0	0	0	0	118	39	34
23:00	1	4	4	10	18	24	8	0	0	0	0	0	0	69	39	32
Total	17	51	243	724	1475	991	256	24	1	0	0	0	0	3782		
%	0.4%	1.3%	6.4%	19.1%	39.0%	26.2%	6.8%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	07:00	08:00	07:00	06:00	06:00	09:00						07:00		
Vol.	13	7	21	57	111	58	14	4						255		
PM Peak	15:00	20:00	12:00	13:00	16:00	15:00	16:00	19:00	20:00					16:00		
Vol.	1	9	29	77	131	91	20	3	1					279		

Pecent

15th Percentile :	26 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	2466
Percent in Pace :	65.2%
Number of Vehicles > 35 MPH :	1073
Percent of Vehicles > 35 MPH :	28.4%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	27	8	1	1	0	0	0	7	0	0	0	1	46
01:00	1	14	2	0	2	3	0	1	8	0	0	0	0	31
02:00	2	5	4	4	1	1	0	0	4	2	0	0	0	23
03:00	0	14	6	2	4	1	0	0	3	1	0	0	0	31
04:00	1	51	12	1	2	0	0	1	5	1	0	0	0	74
05:00	1	93	39	1	9	2	0	0	4	1	0	0	0	150
06:00	6	236	82	1	20	7	0	2	3	1	0	0	1	359
07:00	4	411	111	1	25	0	0	3	10	2	0	0	0	567
08:00	3	386	106	0	32	2	0	1	8	0	0	0	0	538
09:00	1	257	90	1	15	3	1	4	5	1	0	0	2	380
10:00	1	178	71	4	12	0	0	2	6	2	0	0	0	276
11:00	3	179	63	1	22	2	0	3	17	0	1	0	0	291
12 PM	2	204	76	2	10	3	1	4	8	4	0	0	1	315
13:00	5	203	84	0	30	4	0	1	14	1	0	0	0	342
14:00	2	304	81	3	25	2	1	2	11	1	0	0	2	434
15:00	5	291	122	7	21	5	0	2	6	0	0	0	1	460
16:00	6	383	114	0	20	6	0	2	8	3	0	0	0	542
17:00	2	311	85	1	18	3	0	0	7	1	0	0	0	428
18:00	3	206	61	1	16	1	0	2	4	0	0	0	1	295
19:00	1	153	54	1	6	0	1	0	10	1	0	0	1	228
20:00	2	126	41	0	5	2	1	1	7	3	0	0	1	189
21:00	2	97	21	0	7	2	0	0	13	0	0	0	0	142
22:00	1	102	28	0	5	1	0	0	2	0	0	0	0	139
23:00	2	50	3	0	0	4	2	0	5	0	0	0	0	66
Total	57	4281	1364	32	308	54	7	31	175	25	1	0	11	6346
Percent	0.9%	67.5%	21.5%	0.5%	4.9%	0.9%	0.1%	0.5%	2.8%	0.4%	0.0%	0.0%	0.2%	
AM Peak	06:00	07:00	07:00	02:00	08:00	06:00	09:00	09:00	11:00	02:00	11:00		09:00	07:00
Vol.	6	411	111	4	32	7	1	4	17	2	1		2	567
PM Peak	16:00	16:00	15:00	15:00	13:00	16:00	23:00	12:00	13:00	12:00			14:00	16:00
Vol.	6	383	122	7	30	6	2	4	14	4			2	542

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 F-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	20	4	0	0	0	0	0	4	2	0	0	0	30
01:00	0	10	3	1	1	0	0	0	7	0	0	0	0	22
02:00	0	9	3	0	1	0	0	0	3	0	0	0	0	16
03:00	0	7	3	2	1	0	0	1	5	1	0	0	0	20
04:00	1	39	9	1	5	1	0	0	8	0	0	0	1	65
05:00	1	82	41	0	10	1	0	0	2	3	0	0	0	140
06:00	3	218	82	2	24	2	0	3	7	0	0	0	1	342
07:00	10	418	93	6	25	9	2	3	12	0	0	0	0	578
08:00	3	349	96	4	28	11	0	3	10	0	0	0	0	504
09:00	6	255	103	3	17	2	0	3	5	1	0	0	0	395
10:00	10	193	68	4	17	2	2	0	9	1	0	0	0	306
11:00	4	193	60	3	19	3	1	6	13	1	0	0	0	303
12 PM	5	224	72	5	16	3	0	2	9	1	0	0	0	337
13:00	4	254	85	3	16	3	0	4	7	0	0	0	0	376
14:00	2	274	75	2	18	2	0	1	15	2	0	0	0	391
15:00	8	302	100	5	16	4	1	1	3	1	0	0	0	441
16:00	12	353	111	1	9	8	0	1	8	0	0	0	0	503
17:00	16	332	94	0	20	6	1	0	13	2	0	0	1	485
18:00	8	248	61	2	17	2	0	0	4	0	0	0	0	342
19:00	11	176	52	0	16	1	0	1	3	1	0	0	0	261
20:00	3	143	44	0	3	2	0	0	5	0	0	0	0	200
21:00	5	124	23	0	6	1	0	1	9	3	0	0	1	173
22:00	7	144	28	0	2	0	0	1	1	0	0	0	0	183
23:00	1	56	7	1	7	0	0	0	6	0	0	0	0	78
Total	120	4423	1317	45	294	63	7	31	168	19	0	0	4	6491
Percent	1.8%	68.1%	20.3%	0.7%	4.5%	1.0%	0.1%	0.5%	2.6%	0.3%	0.0%	0.0%	0.1%	
AM Peak	07:00	07:00	09:00	07:00	08:00	08:00	07:00	11:00	11:00	05:00			04:00	07:00
Vol.	10	418	103	6	28	11	2	6	13	3			1	578
PM Peak	17:00	16:00	16:00	12:00	17:00	16:00	15:00	13:00	14:00	21:00			17:00	16:00
Vol.	16	353	111	5	20	8	1	4	15	3			1	503

PRECISION
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South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

81676 F-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	12	5	0	0	1	0	0	9	0	0	0	0	28
01:00	1	49	3	0	1	1	0	0	6	0	0	0	0	61
02:00	0	14	3	1	0	1	0	0	11	0	0	0	0	30
03:00	1	16	1	2	1	2	0	0	10	0	0	0	0	33
04:00	2	26	7	0	2	3	0	0	9	3	0	0	1	53
05:00	1	73	24	1	7	3	0	1	6	0	0	0	0	116
06:00	3	139	47	2	4	5	0	1	12	0	0	0	0	213
07:00	5	177	36	2	4	8	0	0	14	1	0	0	0	247
08:00	2	165	45	1	9	3	0	4	12	0	0	0	0	241
09:00	3	114	37	4	7	1	0	0	18	0	0	0	0	184
10:00	2	101	37	4	10	3	0	1	23	0	0	0	0	181
11:00	1	96	23	2	6	7	0	1	13	0	0	0	0	149
12 PM	2	134	29	3	5	2	0	0	12	0	0	0	0	187
13:00	4	134	40	0	8	9	0	6	20	1	0	0	0	222
14:00	6	170	48	2	9	6	0	0	14	0	0	0	0	255
15:00	5	196	73	2	8	8	0	0	13	1	0	0	0	306
16:00	4	210	45	3	7	4	0	0	13	0	0	0	0	286
17:00	5	188	30	2	2	3	1	2	8	0	0	0	0	241
18:00	3	135	22	0	3	3	0	0	8	0	0	0	0	174
19:00	0	105	20	1	3	1	0	2	6	0	0	0	0	138
20:00	0	62	11	0	1	0	0	0	9	0	0	0	0	83
21:00	0	48	9	0	5	0	0	0	12	0	0	0	0	74
22:00	2	80	11	0	1	2	0	1	9	0	0	0	0	106
23:00	0	32	4	0	1	0	0	0	6	0	0	0	0	43
Total	53	2476	610	32	104	76	1	19	273	6	0	0	1	3651
Percent	1.5%	67.8%	16.7%	0.9%	2.8%	2.1%	0.0%	0.5%	7.5%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	06:00	09:00	10:00	07:00		08:00	10:00	04:00			04:00	07:00
Vol.	5	177	47	4	10	8		4	23	3			1	247
PM Peak	14:00	16:00	15:00	12:00	14:00	13:00	17:00	13:00	13:00	13:00				15:00
Vol.	6	210	73	3	9	9	1	6	20	1				306

South Main Street (Route 79) between
Route 24 NB and SB Ramps
City, State: Freetown, MA
Client: VHB/J. Quitter

PRECISION
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INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 F-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	12	4	0	0	0	0	0	9	0	0	0	0	25
01:00	0	44	6	0	2	0	0	0	7	0	0	0	0	59
02:00	0	12	3	0	0	1	0	0	13	0	0	0	0	29
03:00	0	7	0	1	1	1	0	0	8	0	0	0	0	18
04:00	0	27	8	0	0	3	0	0	10	1	0	0	0	49
05:00	1	68	30	0	3	0	0	0	6	1	0	0	1	110
06:00	2	125	46	5	7	5	0	0	8	0	0	0	0	198
07:00	6	175	42	0	8	7	0	2	15	0	0	0	0	255
08:00	2	159	38	1	6	3	1	1	14	1	0	0	0	226
09:00	1	115	49	2	5	3	0	1	17	0	0	0	0	193
10:00	6	112	33	1	8	4	0	2	12	1	0	0	0	179
11:00	4	120	26	4	11	6	0	0	14	0	0	0	0	185
12 PM	4	150	42	1	3	4	0	1	15	1	0	0	0	221
13:00	4	180	37	3	9	6	0	1	17	1	0	0	0	258
14:00	2	159	45	2	7	2	0	2	26	0	0	0	0	245
15:00	4	171	52	3	10	3	0	1	11	1	0	0	0	256
16:00	4	200	49	3	7	3	1	1	11	0	0	0	0	279
17:00	6	211	45	1	3	3	0	0	9	0	0	0	0	278
18:00	8	135	32	1	4	3	0	0	7	0	0	0	0	190
19:00	7	122	20	0	5	2	1	1	13	0	0	0	0	171
20:00	5	71	9	0	2	4	0	0	4	0	0	0	0	95
21:00	2	58	6	0	0	1	0	1	8	0	0	0	0	76
22:00	3	91	11	0	0	0	0	0	13	0	0	0	0	118
23:00	3	44	8	0	4	3	0	1	6	0	0	0	0	69
Total	74	2568	641	28	105	67	3	15	273	7	0	0	1	3782
Percent	2.0%	67.9%	16.9%	0.7%	2.8%	1.8%	0.1%	0.4%	7.2%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	06:00	11:00	07:00	08:00	07:00	09:00	04:00			05:00	07:00
Vol.	6	175	49	5	11	7	1	2	17	1			1	255
PM Peak	18:00	17:00	15:00	13:00	15:00	13:00	16:00	14:00	14:00	12:00				16:00
Vol.	8	211	52	3	10	6	1	2	26	1				279

PRECISION DATA INDUSTRIES, LLC
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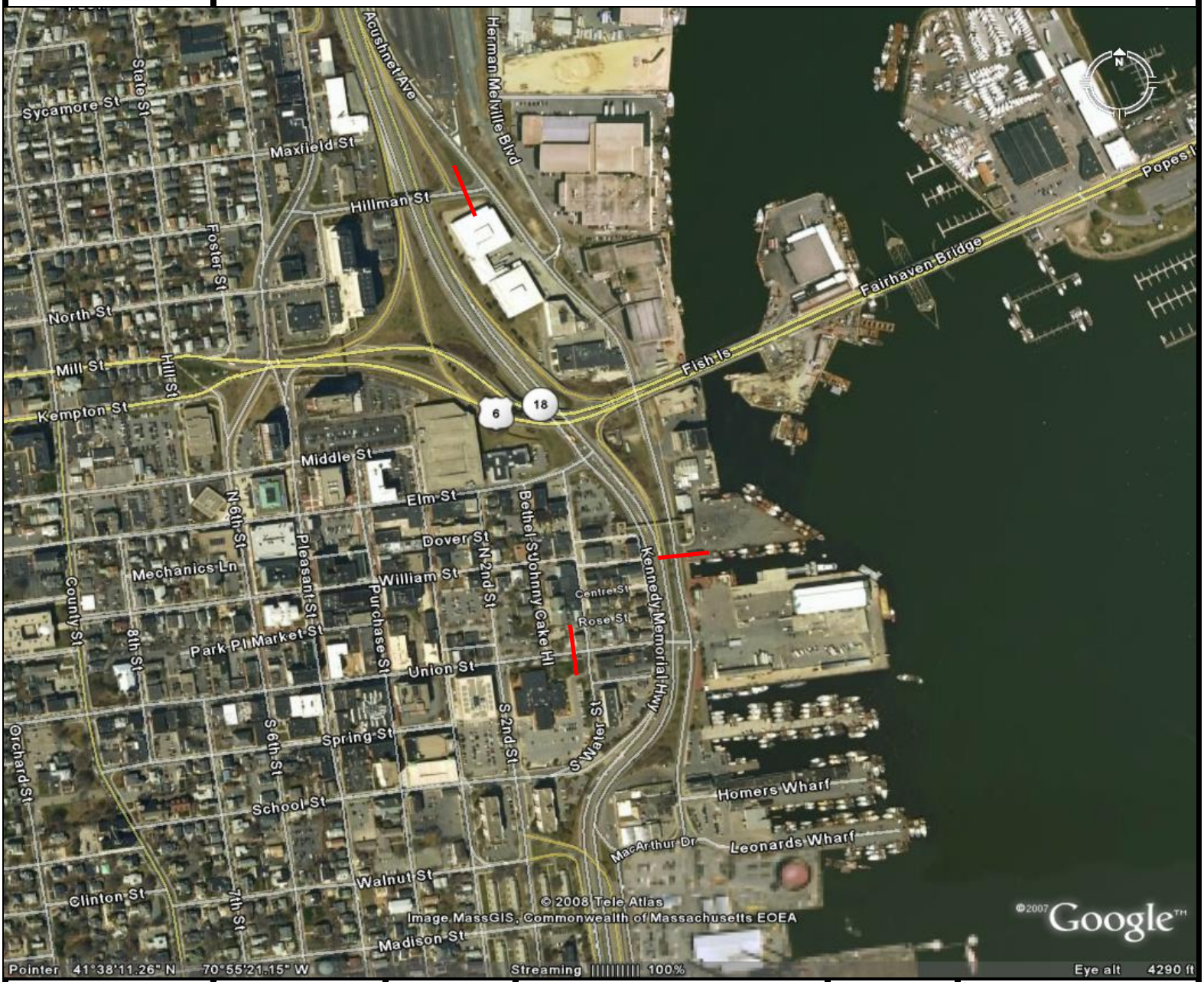
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/23/08 thru Wed 9/24/08	81676	New Bedford, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A volume
Site Code: 10111.31

Start	WB				EB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		53		1		48		2		101		
12:15	2		49		2		57		4		106		
12:30	1		42		1		56		2		98		
12:45	2	6	46	190	1	5	61	222	3	11	107	412	
01:00	2		40		6		70		8		110		
01:15	2		41		1		40		3		81		
01:30	1		52		2		64		3		116		
01:45	0	5	44	177	2	11	57	231	2	16	101	408	
02:00	0		49		0		50		0		99		
02:15	0		43		3		37		3		80		
02:30	3		61		2		53		5		114		
02:45	1	4	42	195	1	6	59	199	2	10	101	394	
03:00	2		66		0		61		2		127		
03:15	0		46		1		40		1		86		
03:30	0		70		5		46		5		116		
03:45	1	3	48	230	5	11	33	180	6	14	81	410	
04:00	0		76		4		53		4		129		
04:15	1		55		7		33		8		88		
04:30	1		62		5		36		6		98		
04:45	3	5	42	235	7	23	32	154	10	28	74	389	
05:00	3		74		11		37		14		111		
05:15	1		33		6		29		7		62		
05:30	7		31		24		23		31		54		
05:45	3	14	36	174	27	68	22	111	30	82	58	285	
06:00	6		31		19		35		25		66		
06:15	8		41		16		19		24		60		
06:30	12		30		27		24		39		54		
06:45	26	52	21	123	51	113	20	98	77	165	41	221	
07:00	18		17		26		14		44		31		
07:15	19		11		52		13		71		24		
07:30	26		20		42		13		68		33		
07:45	33	96	13	61	53	173	17	57	86	269	30	118	
08:00	35		14		49		14		84		28		
08:15	38		14		55		19		93		33		
08:30	39		10		59		11		98		21		
08:45	33	145	11	49	52	215	7	51	85	360	18	100	
09:00	29		7		35		17		64		24		
09:15	33		17		48		16		81		33		
09:30	36		8		53		5		89		13		
09:45	39	137	10	42	60	196	10	48	99	333	20	90	
10:00	43		17		40		10		83		27		
10:15	46		11		62		9		108		20		
10:30	43		10		50		3		93		13		
10:45	53	185	5	43	49	201	5	27	102	386	10	70	
11:00	51		7		44		7		95		14		
11:15	33		3		45		4		78		7		
11:30	66		3		53		1		119		4		
11:45	45	195	2	15	56	198	1	13	101	393	3	28	
Total	847		1534		1220		1391		2067		2925		
Percent	41.0%		52.4%		59.0%		47.6%						
Day Total			2381				2611				4992		
Peak	10:45		03:30		07:45		00:15		10:15		02:45		
Vol.	203		249		216		244		398		430		
P.H.F.	0.769		0.819		0.915		0.871		0.921		0.846		

Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 C-A volume
Site Code: 10111.31

Start	WB				EB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		57		0		44		2		101		
12:15	0		43		0		39		0		82		
12:30	4		53		2		72		6		125		
12:45	2	8	45	198	0	2	54	209	2	10	99	407	
01:00	0		42		2		65		2		107		
01:15	0		32		0		47		0		79		
01:30	0		38		0		55		0		93		
01:45	2	2	59	171	2	4	49	216	4	6	108	387	
02:00	0		46		0		48		0		94		
02:15	3		46		0		40		3		86		
02:30	3		50		4		50		7		100		
02:45	1	7	64	206	3	7	48	186	4	14	112	392	
03:00	0		53		0		51		0		104		
03:15	2		54		0		44		2		98		
03:30	0		71		2		45		2		116		
03:45	0	2	45	223	3	5	43	183	3	7	88	406	
04:00	0		66		2		33		2		99		
04:15	1		55		2		39		3		94		
04:30	0		56		5		58		5		114		
04:45	0	1	42	219	8	17	35	165	8	18	77	384	
05:00	3		60		5		40		8		100		
05:15	3		40		4		29		7		69		
05:30	7		33		17		40		24		73		
05:45	4	17	32	165	18	44	32	141	22	61	64	306	
06:00	6		24		23		21		29		45		
06:15	15		29		21		32		36		61		
06:30	16		35		31		20		47		55		
06:45	22	59	22	110	48	123	18	91	70	182	40	201	
07:00	13		13		24		19		37		32		
07:15	27		19		47		18		74		37		
07:30	25		26		50		16		75		42		
07:45	31	96	21	79	51	172	15	68	82	268	36	147	
08:00	28		20		46		16		74		36		
08:15	43		10		57		15		100		25		
08:30	30		13		55		13		85		26		
08:45	41	142	15	58	63	221	8	52	104	363	23	110	
09:00	38		11		52		8		90		19		
09:15	31		12		53		16		84		28		
09:30	29		10		44		5		73		15		
09:45	34	132	11	44	46	195	10	39	80	327	21	83	
10:00	41		16		72		9		113		25		
10:15	51		5		30		4		81		9		
10:30	41		8		46		8		87		16		
10:45	47	180	6	35	44	192	4	25	91	372	10	60	
11:00	41		6		56		3		97		9		
11:15	38		5		34		6		72		11		
11:30	36		3		53		2		89		5		
11:45	50	165	7	21	52	195	2	13	102	360	9	34	
Total	811		1529		1177		1388		1988		2917		
Percent	40.8%		52.4%		59.2%		47.6%						
Day Total		2340				2565				4905			
Peak	10:00		02:45		08:15		00:30		08:15		02:45		
Vol.	180		242		227		238		379		430		
P.H.F.	0.882		0.852		0.901		0.826		0.911		0.927		

PRECISION
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Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	1	2	2	1	0	0	0	0	0	0	0	0	6	26	24
01:00	0	2	2	1	0	0	0	0	0	0	0	0	0	5	21	21
02:00	2	0	2	0	0	0	0	0	0	0	0	0	0	4	20	11
03:00	0	0	1	1	1	0	0	0	0	0	0	0	0	3	30	28
04:00	1	0	2	0	2	0	0	0	0	0	0	0	0	5	30	21
05:00	2	1	8	2	1	0	0	0	0	0	0	0	0	14	25	20
06:00	10	6	21	13	2	0	0	0	0	0	0	0	0	52	27	20
07:00	11	33	29	21	2	0	0	0	0	0	0	0	0	96	26	20
08:00	13	38	71	19	**4**	0	0	0	0	0	0	0	0	145	25	20
09:00	13	38	59	23	4	0	0	0	0	0	0	0	0	137	26	20
10:00	18	47	**93**	23	4	0	0	0	0	0	0	0	0	185	24	20
11:00	**24**	**54**	77	**39**	1	0	0	0	0	0	0	0	0	**195**	26	20
12 PM	22	66	81	18	3	0	0	0	0	0	0	0	0	190	24	19
13:00	20	43	73	35	6	0	0	0	0	0	0	0	0	177	26	21
14:00	14	63	74	39	5	0	0	0	0	0	0	0	0	195	26	21
15:00	8	**71**	103	**44**	3	**1**	0	0	0	0	0	0	0	230	26	21
16:00	**23**	62	**105**	36	**7**	1	0	0	0	0	0	0	0	**234**	26	20
17:00	14	55	80	22	4	0	0	0	0	0	0	0	0	175	24	20
18:00	2	38	60	20	3	0	0	0	0	0	0	0	0	123	26	21
19:00	6	18	20	17	0	0	0	0	0	0	0	0	0	61	26	21
20:00	4	14	16	14	1	0	0	0	0	0	0	0	0	49	27	21
21:00	3	8	20	10	1	0	0	0	0	0	0	0	0	42	27	22
22:00	1	9	22	10	1	0	0	0	0	0	0	0	0	43	27	22
23:00	1	1	8	3	1	0	0	0	0	0	0	0	0	14	26	22
Total	212	668	1029	412	57	2	0	0	0	0	0	0	0	2380		
%	8.9%	28.1%	43.2%	17.3%	2.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	11:00	08:00									11:00		
Vol.	24	54	93	39	4									195		
PM Peak	16:00	15:00	16:00	15:00	16:00	15:00								16:00		
Vol.	23	71	105	44	7	1								234		

Pecent

15th Percentile :	16 MPH
50th Percentile :	21 MPH
85th Percentile :	26 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	1697
Percent in Pace :	71.3%
Number of Vehicles > 25 MPH :	388
Percent of Vehicles > 25 MPH :	16.3%
Mean Speed(Average) :	20 MPH

PRECISION
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Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	1	0	6	2	0	0	0	0	0	0	0	0	0	9	25	20
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
02:00	0	1	4	1	1	0	0	0	0	0	0	0	0	7	29	23
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	30	25
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
05:00	1	3	11	1	1	0	0	0	0	0	0	0	0	17	24	22
06:00	7	14	26	10	2	0	0	0	0	0	0	0	0	59	26	21
07:00	11	29	32	21	**3**	0	0	0	0	0	0	0	0	96	27	20
08:00	8	44	54	**33**	3	0	0	0	0	0	0	0	0	142	27	21
09:00	10	45	55	20	2	0	0	0	0	0	0	0	0	132	25	20
10:00	**29**	45	**73**	31	2	0	0	0	0	0	0	0	0	**180**	25	19
11:00	12	**69**	56	25	3	0	0	0	0	0	0	0	0	165	25	20
12 PM	**20**	69	77	29	3	0	0	0	0	0	0	0	0	198	25	20
13:00	16	53	70	26	6	0	0	0	0	0	0	0	0	171	25	20
14:00	15	55	97	36	3	0	0	0	0	0	0	0	0	206	25	21
15:00	10	**76**	94	34	**8**	0	0	0	0	0	0	0	0	**222**	26	21
16:00	15	63	**98**	**37**	6	**1**	0	0	0	0	0	0	0	220	26	21
17:00	5	54	77	28	1	0	0	0	0	0	0	0	0	165	25	21
18:00	10	30	42	26	2	0	0	0	0	0	0	0	0	110	26	21
19:00	1	27	33	17	1	0	0	0	0	0	0	0	0	79	26	21
20:00	3	14	22	17	2	0	0	0	0	0	0	0	0	58	27	22
21:00	2	12	16	14	0	0	0	0	0	0	0	0	0	44	27	22
22:00	1	10	15	9	0	0	0	0	0	0	0	0	0	35	26	22
23:00	0	6	10	3	2	0	0	0	0	0	0	0	0	21	26	22
Total	177	720	971	420	52	1	0	0	0	0	0	0	0	2341		
%	7.6%	30.8%	41.5%	17.9%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	10:00	08:00	07:00									10:00		
Vol.	29	69	73	33	3									180		
PM Peak	12:00	15:00	16:00	16:00	15:00	16:00								15:00		
Vol.	20	76	98	37	8	1								222		

Pecent

15th Percentile :	16 MPH
50th Percentile :	21 MPH
85th Percentile :	26 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	1691
Percent in Pace :	72.2%
Number of Vehicles > 25 MPH :	389
Percent of Vehicles > 25 MPH :	16.6%
Mean Speed(Average) :	20 MPH

PRECISION
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Hillman Street
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City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	2	3	0	0	0	0	0	0	0	0	0	0	5	21	20
01:00	5	2	2	2	0	0	0	0	0	0	0	0	0	11	24	14
02:00	1	1	3	1	0	0	0	0	0	0	0	0	0	6	22	20
03:00	2	3	3	3	0	0	0	0	0	0	0	0	0	11	25	21
04:00	3	5	13	2	0	0	0	0	0	0	0	0	0	23	24	20
05:00	7	19	31	**10**	**1**	0	0	0	0	0	0	0	0	68	25	20
06:00	8	47	51	7	0	0	0	0	0	0	0	0	0	113	23	19
07:00	22	73	70	8	0	0	0	0	0	0	0	0	0	173	23	18
08:00	30	83	**91**	10	1	0	0	0	0	0	0	0	0	**215**	23	18
09:00	**33**	83	71	9	0	0	0	0	0	0	0	0	0	196	23	18
10:00	33	76	83	9	0	0	0	0	0	0	0	0	0	201	23	18
11:00	23	**86**	79	10	0	0	0	0	0	0	0	0	0	198	23	18
12 PM	**45**	81	92	4	0	0	0	0	0	0	0	0	0	222	23	17
13:00	39	79	**103**	9	**1**	0	0	0	0	0	0	0	0	**231**	23	18
14:00	24	**92**	75	7	0	0	0	0	0	0	0	0	0	198	23	18
15:00	18	58	93	**12**	0	0	0	0	0	0	0	0	0	181	24	19
16:00	9	51	85	8	1	0	0	0	0	0	0	0	0	154	24	20
17:00	7	45	51	8	0	0	0	0	0	0	0	0	0	111	24	20
18:00	3	39	51	5	0	0	0	0	0	0	0	0	0	98	23	20
19:00	0	21	33	3	0	0	0	0	0	0	0	0	0	57	23	20
20:00	0	28	19	4	0	0	0	0	0	0	0	0	0	51	23	20
21:00	5	18	22	3	0	0	0	0	0	0	0	0	0	48	23	19
22:00	2	9	13	3	0	0	0	0	0	0	0	0	0	27	24	20
23:00	0	4	7	2	0	0	0	0	0	0	0	0	0	13	24	21
Total	319	1005	1144	139	4	0	0	0	0	0	0	0	0	2611		
%	12.2%	38.5%	43.8%	5.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	08:00	05:00	05:00									08:00		
Vol.	33	86	91	10	1									215		
PM Peak	12:00	14:00	13:00	15:00	13:00									13:00		
Vol.	45	92	103	12	1									231		

Pecent

15th Percentile : 15 MPH
50th Percentile : 19 MPH
85th Percentile : 23 MPH
95th Percentile : 25 MPH

Stats

10 MPH Pace Speed : 15-24 MPH
Number in Pace : 2149
Percent in Pace : 82.3%
Number of Vehicles > 25 MPH : 115
Percent of Vehicles > 25 MPH : 4.4%
Mean Speed(Average) : 19 MPH

PRECISION
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81676 C-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	1	0	1	0	0	0	0	0	0	0	0	0	2	25	20
01:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4	20	20
02:00	2	2	3	0	0	0	0	0	0	0	0	0	0	7	21	18
03:00	0	2	2	1	0	0	0	0	0	0	0	0	0	5	21	21
04:00	0	5	12	0	0	0	0	0	0	0	0	0	0	17	23	20
05:00	1	9	30	4	0	0	0	0	0	0	0	0	0	44	24	21
06:00	17	49	48	7	**1**	0	0	0	0	0	0	0	0	122	23	18
07:00	17	63	82	10	1	0	0	0	0	0	0	0	0	173	24	19
08:00	20	81	**105**	**15**	0	0	0	0	0	0	0	0	0	**221**	24	19
09:00	36	79	76	4	0	0	0	0	0	0	0	0	0	195	23	17
10:00	**37**	60	86	9	0	0	0	0	0	0	0	0	0	192	23	18
11:00	26	**85**	75	9	0	0	0	0	0	0	0	0	0	195	23	18
12 PM	29	81	88	**11**	0	0	0	0	0	0	0	0	0	209	23	18
13:00	**36**	**83**	93	4	0	0	0	0	0	0	0	0	0	**216**	23	18
14:00	21	54	**101**	9	**1**	0	0	0	0	0	0	0	0	186	24	19
15:00	24	74	79	6	0	0	0	0	0	0	0	0	0	183	23	18
16:00	17	67	76	5	0	0	0	0	0	0	0	0	0	165	23	19
17:00	13	70	54	4	0	0	0	0	0	0	0	0	0	141	23	18
18:00	3	51	35	2	0	0	0	0	0	0	0	0	0	91	23	19
19:00	3	25	38	2	0	0	0	0	0	0	0	0	0	68	23	20
20:00	2	25	24	1	0	0	0	0	0	0	0	0	0	52	23	19
21:00	0	23	13	3	0	0	0	0	0	0	0	0	0	39	23	19
22:00	1	11	12	1	0	0	0	0	0	0	0	0	0	25	23	20
23:00	1	1	11	0	0	0	0	0	0	0	0	0	0	13	23	21
Total	306	1003	1145	108	3	0	0	0	0	0	0	0	0	2565		
%	11.9%	39.1%	44.6%	4.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	08:00	08:00	06:00									08:00		
Vol.	37	85	105	15	1									221		
PM Peak	13:00	13:00	14:00	12:00	14:00									13:00		
Vol.	36	83	101	11	1									216		

Pecent

15th Percentile :	15 MPH
50th Percentile :	19 MPH
85th Percentile :	23 MPH
95th Percentile :	24 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	2148
Percent in Pace :	83.7%
Number of Vehicles > 25 MPH :	89
Percent of Vehicles > 25 MPH :	3.5%
Mean Speed(Average) :	19 MPH

PRECISION
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Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	2	3	0	1	0	0	0	0	0	0	0	0	6
01:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
02:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
03:00	0	0	2	0	1	0	0	0	0	0	0	0	0	3
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
05:00	1	11	2	0	0	0	0	0	0	0	0	0	0	14
06:00	1	30	14	1	3	0	0	0	1	2	0	0	0	52
07:00	2	45	30	1	13	3	0	1	1	0	0	0	0	96
08:00	4	72	38	2	22	3	0	3	1	0	0	0	0	145
09:00	1	63	48	2	19	2	0	0	2	0	0	0	0	137
10:00	4	89	49	2	29	4	3	4	0	1	0	0	0	185
11:00	4	97	58	2	31	0	1	2	0	0	0	0	0	195
12 PM	4	99	58	4	23	0	0	1	1	0	0	0	0	190
13:00	6	87	46	2	30	3	0	1	2	0	0	0	0	177
14:00	3	97	50	4	29	5	0	4	3	0	0	0	0	195
15:00	4	123	69	1	27	5	0	0	0	0	0	1	0	230
16:00	2	137	62	0	28	3	0	2	0	0	0	0	0	234
17:00	2	110	50	3	9	1	0	0	0	0	0	0	0	175
18:00	1	70	37	0	15	0	0	0	0	0	0	0	0	123
19:00	0	41	13	1	5	1	0	0	0	0	0	0	0	61
20:00	0	33	13	0	3	0	0	0	0	0	0	0	0	49
21:00	1	26	12	0	2	1	0	0	0	0	0	0	0	42
22:00	0	26	13	0	3	1	0	0	0	0	0	0	0	43
23:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
Total	40	1278	673	25	295	32	4	18	11	3	0	1	0	2380
Percent	1.7%	53.7%	28.3%	1.1%	12.4%	1.3%	0.2%	0.8%	0.5%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	08:00	11:00	10:00	10:00	10:00	09:00	06:00				11:00
Vol.	4	97	58	2	31	4	3	4	2	2				195
PM Peak	13:00	16:00	15:00	12:00	13:00	14:00		14:00	14:00			15:00		16:00
Vol.	6	137	69	4	30	5		4	3			1		234

PRECISION
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81676 C-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	5	4	0	0	0	0	0	0	0	0	0	0	9
01:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2
02:00	0	3	3	0	1	0	0	0	0	0	0	0	0	7
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	1	10	5	0	1	0	0	0	0	0	0	0	0	17
06:00	3	24	19	1	8	3	0	1	0	0	0	0	0	59
07:00	1	48	22	4	19	0	0	1	1	0	0	0	0	96
08:00	1	67	48	1	22	3	0	0	0	0	0	0	0	142
09:00	3	50	45	2	24	4	0	3	1	0	0	0	0	132
10:00	5	78	62	4	26	4	0	0	0	0	0	0	1	180
11:00	1	86	56	3	11	5	1	0	2	0	0	0	0	165
12 PM	4	97	58	1	31	3	1	2	1	0	0	0	0	198
13:00	2	80	61	1	20	3	0	3	1	0	0	0	0	171
14:00	2	96	68	6	27	4	0	1	1	0	0	0	1	206
15:00	3	105	67	5	37	3	2	0	0	0	0	0	0	222
16:00	8	96	83	0	29	1	0	2	1	0	0	0	0	220
17:00	4	85	59	1	15	1	0	0	0	0	0	0	0	165
18:00	2	59	35	0	12	2	0	0	0	0	0	0	0	110
19:00	1	47	22	0	8	1	0	0	0	0	0	0	0	79
20:00	0	35	17	0	6	0	0	0	0	0	0	0	0	58
21:00	1	24	16	1	2	0	0	0	0	0	0	0	0	44
22:00	0	22	10	0	3	0	0	0	0	0	0	0	0	35
23:00	0	9	11	0	1	0	0	0	0	0	0	0	0	21
Total	42	1128	774	30	303	37	4	13	8	0	0	0	2	2341
Percent	1.8%	48.2%	33.1%	1.3%	12.9%	1.6%	0.2%	0.6%	0.3%	0.0%	0.0%	0.0%	0.1%	
AM Peak	10:00	11:00	10:00	07:00	10:00	11:00	11:00	09:00	11:00				10:00	10:00
Vol.	5	86	62	4	26	5	1	3	2				1	180
PM Peak	16:00	15:00	16:00	14:00	15:00	14:00	15:00	13:00	12:00				14:00	15:00
Vol.	8	105	83	6	37	4	2	3	1				1	222

PRECISION
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EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	3	4	1	0	1	2	0	0	0	0	0	0	0	11
02:00	0	5	0	0	0	1	0	0	0	0	0	0	0	6
03:00	1	4	4	0	1	1	0	0	0	0	0	0	0	11
04:00	2	14	6	1	0	0	0	0	0	0	0	0	0	23
05:00	5	45	14	0	1	2	0	0	1	0	0	0	0	68
06:00	1	84	25	0	2	1	0	0	0	0	0	0	0	113
07:00	4	123	35	2	5	4	0	0	0	0	0	0	0	173
08:00	6	143	47	3	11	2	0	1	2	0	0	0	0	215
09:00	6	132	39	0	10	8	0	0	1	0	0	0	0	196
10:00	6	132	44	1	11	5	0	2	0	0	0	0	0	201
11:00	7	132	45	2	7	4	0	1	0	0	0	0	0	198
12 PM	7	164	34	3	8	4	0	1	1	0	0	0	0	222
13:00	7	162	41	1	12	5	0	2	1	0	0	0	0	231
14:00	5	145	32	1	11	2	0	1	1	0	0	0	0	198
15:00	3	143	22	1	7	3	0	2	0	0	0	0	0	181
16:00	1	130	13	1	6	3	0	0	0	0	0	0	0	154
17:00	1	91	17	0	2	0	0	0	0	0	0	0	0	111
18:00	1	82	14	1	0	0	0	0	0	0	0	0	0	98
19:00	0	48	8	0	1	0	0	0	0	0	0	0	0	57
20:00	0	44	7	0	0	0	0	0	0	0	0	0	0	51
21:00	0	42	5	0	0	1	0	0	0	0	0	0	0	48
22:00	0	24	2	0	1	0	0	0	0	0	0	0	0	27
23:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
Total	66	1909	457	17	97	48	0	10	7	0	0	0	0	2611
Percent	2.5%	73.1%	17.5%	0.7%	3.7%	1.8%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	08:00	08:00	08:00	09:00		10:00	08:00					08:00
Vol.	7	143	47	3	11	8		2	2					215
PM Peak	12:00	12:00	13:00	12:00	13:00	13:00		13:00	12:00					13:00
Vol.	7	164	41	3	12	5		2	1					231

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Hillman Street
west of Acushnet Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	1	4	0	0	0	2	0	0	0	0	0	0	0	7
03:00	0	1	3	0	1	0	0	0	0	0	0	0	0	5
04:00	0	11	5	0	0	1	0	0	0	0	0	0	0	17
05:00	0	32	12	0	0	0	0	0	0	0	0	0	0	44
06:00	1	85	30	0	5	1	0	0	0	0	0	0	0	122
07:00	5	122	37	1	5	2	0	1	0	0	0	0	0	173
08:00	1	162	44	0	12	1	0	1	0	0	0	0	0	221
09:00	10	126	30	2	16	10	0	1	0	0	0	0	0	195
10:00	5	131	40	4	7	4	0	1	0	0	0	0	0	192
11:00	5	134	46	2	5	3	0	0	0	0	0	0	0	195
12 PM	4	148	47	1	3	6	0	0	0	0	0	0	0	209
13:00	1	159	38	2	9	3	0	4	0	0	0	0	0	216
14:00	6	134	36	0	6	2	0	0	1	0	0	0	1	186
15:00	5	143	19	1	9	5	0	1	0	0	0	0	0	183
16:00	4	134	20	0	4	2	0	0	1	0	0	0	0	165
17:00	3	125	10	0	3	0	0	0	0	0	0	0	0	141
18:00	2	70	17	0	1	0	0	1	0	0	0	0	0	91
19:00	0	63	3	0	2	0	0	0	0	0	0	0	0	68
20:00	2	46	4	0	0	0	0	0	0	0	0	0	0	52
21:00	0	37	2	0	0	0	0	0	0	0	0	0	0	39
22:00	0	22	2	0	1	0	0	0	0	0	0	0	0	25
23:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
Total	55	1905	448	13	89	42	0	10	2	0	0	0	1	2565
Percent	2.1%	74.3%	17.5%	0.5%	3.5%	1.6%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	11:00	10:00	09:00	09:00		07:00						08:00
Vol.	10	162	46	4	16	10		1						221
PM Peak	14:00	13:00	12:00	13:00	13:00	12:00		13:00	14:00				14:00	13:00
Vol.	6	159	47	2	9	6		4	1				1	216

PRECISION
D A T A
INDUSTRIES, LLC
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McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B volume
Site Code: 10111.31

Start	SB				NB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	5		81		5		69		10		150		
12:15	5		65		4		45		9		110		
12:30	3		75		1		61		4		136		
12:45	2	15	64	285	2	12	59	234	4	27	123	519	
01:00	3		73		1		60		4		133		
01:15	2		77		1		59		3		136		
01:30	5		75		1		59		6		134		
01:45	2	12	57	282	1	4	54	232	3	16	111	514	
02:00	1		89		0		63		1		152		
02:15	6		69		1		62		7		131		
02:30	2		86		1		60		3		146		
02:45	1	10	82	326	0	2	63	248	1	12	145	574	
03:00	0		92		0		83		0		175		
03:15	0		75		0		59		0		134		
03:30	2		82		1		85		3		167		
03:45	3	5	68	317	1	2	54	281	4	7	122	598	
04:00	2		107		3		80		5		187		
04:15	5		68		3		59		8		127		
04:30	11		81		4		60		15		141		
04:45	9	27	72	328	12	22	51	250	21	49	123	578	
05:00	6		61		11		77		17		138		
05:15	5		54		6		44		11		98		
05:30	24		59		12		35		36		94		
05:45	22	57	57	231	18	47	46	202	40	104	103	433	
06:00	26		50		26		29		52		79		
06:15	25		51		24		35		49		86		
06:30	32		38		35		40		67		78		
06:45	68	151	36	175	55	140	26	130	123	291	62	305	
07:00	42		28		41		24		83		52		
07:15	63		24		33		26		96		50		
07:30	48		27		37		17		85		44		
07:45	49	202	27	106	53	164	30	97	102	366	57	203	
08:00	44		28		55		20		99		48		
08:15	62		27		71		19		133		46		
08:30	71		22		60		11		131		33		
08:45	71	248	21	98	61	247	16	66	132	495	37	164	
09:00	59		16		51		19		110		35		
09:15	65		11		41		9		106		20		
09:30	65		14		40		12		105		26		
09:45	69	258	9	50	58	190	12	52	127	448	21	102	
10:00	65		24		53		13		118		37		
10:15	60		10		49		7		109		17		
10:30	74		8		72		11		146		19		
10:45	76	275	8	50	52	226	6	37	128	501	14	87	
11:00	72		9		50		8		122		17		
11:15	65		7		52		5		117		12		
11:30	70		9		61		2		131		11		
11:45	75	282	2	27	54	217	5	20	129	499	7	47	
Total	1542		2275		1273		1849		2815		4124		
Percent	54.8%		55.2%		45.2%		44.8%						
Day Total		3817				3122				6939			
Peak	10:30		02:30		08:00		02:45		10:30		02:45		
Vol.	287		335		247		290		513		621		
P.H.F.	0.944		0.910		0.870		0.853		0.878		0.887		

McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 C-B volume
Site Code: 10111.31

Start	SB				NB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		83		3		55		5		138		
12:15	2		57		4		50		6		107		
12:30	3		83		2		63		5		146		
12:45	3	10	71	294	2	11	62	230	5	21	133	524	
01:00	4		81		0		49		4		130		
01:15	2		65		0		46		2		111		
01:30	1		73		0		51		1		124		
01:45	3	10	70	289	2	2	53	199	5	12	123	488	
02:00	2		77		1		52		3		129		
02:15	2		55		0		63		2		118		
02:30	1		76		3		55		4		131		
02:45	2	7	71	279	0	4	81	251	2	11	152	530	
03:00	2		67		0		53		2		120		
03:15	1		49		0		56		1		105		
03:30	1		107		1		76		2		183		
03:45	2	6	87	310	0	1	71	256	2	7	158	566	
04:00	1		73		3		53		4		126		
04:15	4		70		4		63		8		133		
04:30	8		97		3		55		11		152		
04:45	11	24	62	302	6	16	47	218	17	40	109	520	
05:00	3		74		13		67		16		141		
05:15	2		60		6		47		8		107		
05:30	16		56		10		35		26		91		
05:45	27	48	63	253	21	50	47	196	48	98	110	449	
06:00	24		44		15		42		39		86		
06:15	35		57		32		42		67		99		
06:30	50		39		28		31		78		70		
06:45	49	158	39	179	50	125	37	152	99	283	76	331	
07:00	43		36		48		26		91		62		
07:15	55		28		44		17		99		45		
07:30	60		26		34		32		94		58		
07:45	50	208	19	109	57	183	29	104	107	391	48	213	
08:00	57		31		58		23		115		54		
08:15	64		23		64		14		128		37		
08:30	71		17		59		12		130		29		
08:45	71	263	15	86	54	235	11	60	125	498	26	146	
09:00	42		15		50		12		92		27		
09:15	71		20		56		16		127		36		
09:30	76		13		64		4		140		17		
09:45	61	250	13	61	52	222	15	47	113	472	28	108	
10:00	64		16		49		10		113		26		
10:15	51		11		57		5		108		16		
10:30	65		12		47		12		112		24		
10:45	58	238	8	47	61	214	6	33	119	452	14	80	
11:00	62		5		59		8		121		13		
11:15	51		7		60		2		111		9		
11:30	80		5		41		7		121		12		
11:45	76	269	5	22	53	213	1	18	129	482	6	40	
Total	1491		2231		1276		1764		2767		3995		
Percent	53.9%		55.8%		46.1%		44.2%						
Day Total			3722				3040				6762		
Peak	09:15		03:30		07:45		02:45		08:00		03:30		
Vol.	272		337		238		266		498		600		
P.H.F.	0.895		0.787		0.930		0.821		0.958		0.820		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	0	1	8	5	1	0	0	0	0	0	0	15	38	34
01:00	0	0	0	1	6	3	1	1	0	0	0	0	0	12	37	35
02:00	0	0	1	1	2	4	1	1	0	0	0	0	0	10	38	36
03:00	0	0	0	1	1	3	0	0	0	0	0	0	0	5	36	34
04:00	1	1	1	1	13	7	3	0	0	0	0	0	0	27	38	33
05:00	0	0	4	9	21	16	7	0	0	0	0	0	0	57	39	33
06:00	1	3	7	42	67	27	4	0	0	0	0	0	0	151	36	31
07:00	0	3	9	49	97	27	**14**	**2**	**1**	0	0	0	0	202	37	32
08:00	3	**15**	36	71	78	40	5	0	0	0	0	0	0	248	35	29
09:00	**6**	9	**56**	79	68	32	8	0	0	0	0	0	0	258	35	28
10:00	4	12	47	**98**	85	19	8	1	0	0	0	0	0	274	34	28
11:00	2	15	34	72	**112**	**41**	6	1	0	0	0	0	0	**283**	35	30
12 PM	1	11	30	90	103	46	3	1	0	0	0	0	0	285	35	30
13:00	2	**16**	28	74	103	**53**	6	0	0	0	0	0	0	282	36	30
14:00	2	8	37	**119**	113	41	6	0	0	0	0	0	0	326	34	29
15:00	1	5	29	93	**141**	42	5	1	0	0	0	0	0	317	34	30
16:00	1	10	**46**	97	120	40	10	**4**	0	0	0	0	0	**328**	35	30
17:00	**3**	2	12	58	97	45	**13**	1	0	0	0	0	0	231	37	31
18:00	0	1	8	34	89	38	3	1	0	0	0	0	0	174	36	32
19:00	0	2	1	15	52	31	4	2	0	0	0	0	0	107	38	33
20:00	0	0	4	21	53	16	4	0	0	0	0	0	0	98	36	32
21:00	0	0	0	6	25	13	6	0	0	0	0	0	0	50	38	34
22:00	0	1	1	6	23	7	9	2	**1**	0	0	0	0	50	41	34
23:00	0	0	3	5	6	9	3	1	0	0	0	0	0	27	39	33
Total	27	114	394	1043	1483	605	130	19	2	0	0	0	0	3817		
%	0.7%	3.0%	10.3%	27.3%	38.9%	15.9%	3.4%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	09:00	10:00	11:00	11:00	07:00	07:00	07:00					11:00		
Vol.	6	15	56	98	112	41	14	2	1					283		
PM Peak	17:00	13:00	16:00	14:00	15:00	13:00	17:00	16:00	22:00					16:00		
Vol.	3	16	46	119	141	53	13	4	1					328		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2526
Percent in Pace :	66.2%
Number of Vehicles > 30 MPH :	1942
Percent of Vehicles > 30 MPH :	50.9%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
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McArthur Drive
north of Union Street
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81676 C-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	2	3	1	3	0	0	0	0	0	0	10	40	34
01:00	0	0	1	5	3	1	0	0	0	0	0	0	0	10	31	29
02:00	0	0	1	1	2	2	1	0	0	0	0	0	0	7	36	33
03:00	0	0	0	2	1	2	1	0	0	0	0	0	0	6	36	33
04:00	0	0	1	2	11	7	3	0	0	0	0	0	0	24	38	34
05:00	0	0	3	11	18	13	3	0	0	0	0	0	0	48	37	32
06:00	0	3	7	36	66	34	**10**	**2**	0	0	0	0	0	158	38	32
07:00	0	3	10	60	**100**	24	9	2	0	0	0	0	0	208	35	31
08:00	0	5	24	80	92	**54**	7	1	0	0	0	0	0	263	37	31
09:00	0	6	**41**	74	93	28	7	1	0	0	0	0	0	250	34	29
10:00	**2**	**11**	24	73	85	36	6	1	0	0	0	0	0	238	35	30
11:00	1	11	36	**86**	97	31	6	1	0	0	0	0	0	**269**	34	29
12 PM	4	3	**34**	**90**	112	42	7	2	0	0	0	0	0	294	35	30
13:00	**6**	**12**	27	71	113	51	9	0	0	0	0	0	0	289	36	30
14:00	3	7	25	89	98	49	8	0	0	0	0	0	0	279	36	30
15:00	1	4	22	85	**135**	**56**	6	1	0	0	0	0	0	**310**	36	31
16:00	1	10	21	68	126	56	**16**	3	0	**1**	0	0	0	302	37	31
17:00	0	1	10	62	114	50	13	2	0	0	0	0	0	252	37	32
18:00	1	2	9	37	91	35	5	0	0	0	0	0	0	180	36	31
19:00	0	0	8	31	43	20	7	0	0	0	0	0	0	109	37	31
20:00	0	0	4	21	41	14	2	**4**	0	0	0	0	0	86	37	32
21:00	0	0	0	8	33	17	1	1	**1**	0	0	0	0	61	37	33
22:00	0	1	3	9	15	14	4	1	0	0	0	0	0	47	38	33
23:00	0	0	1	2	6	8	5	0	0	0	0	0	0	22	41	35
Total	19	79	313	1005	1498	645	139	22	1	1	0	0	0	3722		
%	0.5%	2.1%	8.4%	27.0%	40.2%	17.3%	3.7%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	09:00	11:00	07:00	08:00	06:00	06:00						11:00		
Vol.	2	11	41	86	100	54	10	2						269		
PM Peak	13:00	13:00	12:00	12:00	15:00	15:00	16:00	20:00	21:00	16:00				15:00		
Vol.	6	12	34	90	135	56	16	4	1	1				310		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2503
Percent in Pace :	67.2%
Number of Vehicles > 30 MPH :	2006
Percent of Vehicles > 30 MPH :	53.9%
Mean Speed(Average) :	31 MPH

PRECISION
D A T A
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McArthur Drive
north of Union Street
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Client: VHB/J. Quitter

81676 C-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	2	2	3	4	1	0	0	0	0	0	0	12	37	32
01:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4	36	36
02:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2	35	30
03:00	0	0	0	0	0	1	0	1	0	0	0	0	0	2	45	40
04:00	0	1	0	3	9	5	3	1	0	0	0	0	0	22	40	34
05:00	1	2	0	7	20	15	2	0	0	0	0	0	0	47	38	32
06:00	0	8	10	28	55	**34**	4	1	0	0	0	0	0	140	37	31
07:00	0	8	20	45	51	31	**7**	**2**	0	0	0	0	0	164	37	30
08:00	1	11	30	**75**	**93**	30	7	0	0	0	0	0	0	**247**	34	29
09:00	2	10	44	69	46	18	1	0	0	0	0	0	0	190	33	27
10:00	**6**	**21**	**46**	65	62	21	4	1	0	0	0	0	0	226	34	27
11:00	1	12	27	71	75	26	5	0	0	0	0	0	0	217	34	29
12 PM	0	3	32	88	79	22	**10**	0	0	0	0	0	0	234	34	29
13:00	2	4	14	**98**	85	24	5	0	0	0	0	0	0	232	34	30
14:00	2	**9**	**37**	90	73	26	10	1	0	0	0	0	0	248	34	29
15:00	**8**	4	22	96	**114**	32	4	0	**1**	0	0	0	0	**281**	34	29
16:00	0	4	24	68	97	**46**	10	1	0	0	0	0	0	250	36	31
17:00	0	6	12	59	89	33	3	0	0	0	0	0	0	202	35	30
18:00	0	4	11	32	40	35	6	**2**	0	0	0	0	0	130	38	32
19:00	2	0	4	23	45	21	2	0	0	0	0	0	0	97	36	31
20:00	0	0	6	17	20	19	4	0	0	0	0	0	0	66	38	32
21:00	0	1	5	5	19	16	5	1	0	0	0	0	0	52	39	33
22:00	0	1	1	4	11	13	6	1	0	0	0	0	0	37	40	35
23:00	0	0	2	2	5	7	4	0	0	0	0	0	0	20	40	34
Total	25	109	349	948	1092	482	104	12	1	0	0	0	0	3122		
%	0.8%	3.5%	11.2%	30.4%	35.0%	15.4%	3.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	08:00	08:00	06:00	07:00	07:00						08:00		
Vol.	6	21	46	75	93	34	7	2						247		
PM Peak	15:00	14:00	14:00	13:00	15:00	16:00	12:00	18:00	15:00					15:00		
Vol.	8	9	37	98	114	46	10	2	1					281		

Pecent

15th Percentile :	24 MPH
50th Percentile :	30 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2040
Percent in Pace :	65.3%
Number of Vehicles > 30 MPH :	1472
Percent of Vehicles > 30 MPH :	47.1%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	0	1	6	3	1	0	0	0	0	0	0	11	36	33
01:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2	26	26
02:00	0	0	0	0	1	1	2	0	0	0	0	0	0	4	40	38
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	40	40
04:00	0	0	0	2	9	3	2	0	0	0	0	0	0	16	37	33
05:00	1	3	2	7	17	14	5	1	0	0	0	0	0	50	38	32
06:00	0	1	7	24	57	31	5	0	0	0	0	0	0	125	37	32
07:00	**7**	9	12	40	64	39	**10**	1	**1**	0	0	0	0	183	37	31
08:00	1	10	19	64	**92**	**41**	7	1	0	0	0	0	0	**235**	36	30
09:00	1	11	31	70	77	29	3	0	0	0	0	0	0	222	34	29
10:00	3	**15**	30	79	60	19	6	**2**	0	0	0	0	0	214	34	28
11:00	0	8	**39**	**82**	51	24	8	0	1	0	0	0	0	213	35	29
12 PM	0	7	16	66	**94**	39	6	**2**	0	0	0	0	0	230	36	31
13:00	0	7	24	60	71	31	3	2	0	**1**	0	0	0	199	35	30
14:00	0	2	**36**	**97**	86	25	4	1	0	0	0	0	0	251	34	29
15:00	0	**11**	24	85	82	47	6	1	0	0	0	0	0	**256**	36	30
16:00	**1**	2	18	44	87	57	8	0	**1**	0	0	0	0	218	37	32
17:00	0	3	16	27	71	**64**	**13**	2	0	0	0	0	0	196	38	33
18:00	0	5	14	43	58	27	3	1	0	0	**1**	0	0	152	36	30
19:00	0	2	7	25	42	15	12	1	0	0	0	0	0	104	38	32
20:00	0	0	3	14	30	7	6	0	0	0	0	0	0	60	36	32
21:00	0	1	2	8	20	12	3	1	0	0	0	0	0	47	38	33
22:00	0	0	1	7	11	10	4	0	0	0	0	0	0	33	39	33
23:00	0	0	0	3	6	5	3	1	0	0	0	0	0	18	40	35
Total	14	97	301	850	1092	543	121	17	3	1	1	0	0	3040		
%	0.5%	3.2%	9.9%	28.0%	35.9%	17.9%	4.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	11:00	11:00	08:00	08:00	07:00	10:00	07:00					08:00		
Vol.	7	15	39	82	92	41	10	2	1					235		
PM Peak	16:00	15:00	14:00	14:00	12:00	17:00	17:00	12:00	16:00	13:00	18:00			15:00		
Vol.	1	11	36	97	94	64	13	2	1	1	1			256		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1942
Percent in Pace :	63.9%
Number of Vehicles > 30 MPH :	1559
Percent of Vehicles > 30 MPH :	51.3%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	1	13	1	0	0	0	0	0	0	0	0	0	0	15
01:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	1	3	0	1	0	0	0	0	0	0	0	0	5
04:00	1	21	4	0	1	0	0	0	0	0	0	0	0	27
05:00	0	41	15	0	1	0	0	0	0	0	0	0	0	57
06:00	2	94	40	2	9	2	0	2	0	0	0	0	0	151
07:00	0	122	56	4	15	1	0	2	2	0	0	0	0	202
08:00	2	152	67	7	18	2	0	0	0	0	0	0	0	248
09:00	3	143	75	5	23	7	0	1	1	0	0	0	0	258
10:00	4	142	77	10	31	4	0	6	0	0	0	0	0	274
11:00	3	169	76	6	21	4	0	2	1	0	0	0	1	283
12 PM	3	178	77	6	15	2	0	3	1	0	0	0	0	285
13:00	5	174	64	7	24	1	0	4	3	0	0	0	0	282
14:00	8	196	80	5	32	0	0	4	1	0	0	0	0	326
15:00	5	205	81	4	16	3	0	2	1	0	0	0	0	317
16:00	6	236	67	1	15	0	0	1	1	0	0	0	1	328
17:00	0	180	47	0	4	0	0	0	0	0	0	0	0	231
18:00	1	127	42	1	3	0	0	0	0	0	0	0	0	174
19:00	0	78	22	1	6	0	0	0	0	0	0	0	0	107
20:00	1	80	15	0	1	0	0	1	0	0	0	0	0	98
21:00	0	43	7	0	0	0	0	0	0	0	0	0	0	50
22:00	1	41	6	0	2	0	0	0	0	0	0	0	0	50
23:00	0	21	5	0	1	0	0	0	0	0	0	0	0	27
Total	46	2475	931	59	239	26	0	28	11	0	0	0	2	3817
Percent	1.2%	64.8%	24.4%	1.5%	6.3%	0.7%	0.0%	0.7%	0.3%	0.0%	0.0%	0.0%	0.1%	
AM Peak	10:00	11:00	10:00	10:00	10:00	09:00		10:00	07:00				11:00	11:00
Vol.	4	169	77	10	31	7		6	2				1	283
PM Peak	14:00	16:00	15:00	13:00	14:00	15:00		13:00	13:00				16:00	16:00
Vol.	8	236	81	7	32	3		4	3				1	328

PRECISION
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McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	8	1	0	1	0	0	0	0	0	0	0	0	10
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	1	4	0	1	0	0	0	0	0	0	0	0	6
04:00	1	18	3	0	1	1	0	0	0	0	0	0	0	24
05:00	0	36	12	0	0	0	0	0	0	0	0	0	0	48
06:00	3	99	45	3	5	0	0	3	0	0	0	0	0	158
07:00	3	129	52	4	18	1	0	1	0	0	0	0	0	208
08:00	0	166	61	7	24	4	0	0	1	0	0	0	0	263
09:00	0	130	83	9	24	1	0	1	2	0	0	0	0	250
10:00	1	135	74	4	18	2	0	1	3	0	0	0	0	238
11:00	3	152	84	5	21	3	0	0	1	0	0	0	0	269
12 PM	3	181	76	4	27	0	0	1	2	0	0	0	0	294
13:00	3	186	80	3	13	3	0	0	1	0	0	0	0	289
14:00	4	163	79	7	19	2	0	5	0	0	0	0	0	279
15:00	5	211	52	6	28	2	0	3	2	1	0	0	0	310
16:00	3	214	64	1	14	2	0	2	2	0	0	0	0	302
17:00	3	183	55	0	9	2	0	0	0	0	0	0	0	252
18:00	4	124	44	1	6	0	0	0	1	0	0	0	0	180
19:00	0	84	22	1	2	0	0	0	0	0	0	0	0	109
20:00	1	69	13	0	3	0	0	0	0	0	0	0	0	86
21:00	0	51	9	0	1	0	0	0	0	0	0	0	0	61
22:00	1	39	6	0	1	0	0	0	0	0	0	0	0	47
23:00	0	16	5	0	1	0	0	0	0	0	0	0	0	22
Total	38	2411	925	55	237	23	0	17	15	1	0	0	0	3722
Percent	1.0%	64.8%	24.9%	1.5%	6.4%	0.6%	0.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	11:00	09:00	08:00	08:00		06:00	10:00					11:00
Vol.	3	166	84	9	24	4		3	3					269
PM Peak	15:00	16:00	13:00	14:00	15:00	13:00		14:00	12:00	15:00				15:00
Vol.	5	214	80	7	28	3		5	2	1				310

PRECISION
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McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	6	5	0	1	0	0	0	0	0	0	0	0	12
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	19	2	1	0	0	0	0	0	0	0	0	0	22
05:00	1	34	10	0	1	1	0	0	0	0	0	0	0	47
06:00	1	103	26	1	6	1	0	0	1	0	0	0	1	140
07:00	3	86	47	4	21	1	0	1	1	0	0	0	0	164
08:00	2	149	66	3	23	2	0	1	1	0	0	0	0	247
09:00	4	106	47	3	25	2	0	1	2	0	0	0	0	190
10:00	2	124	68	5	20	4	0	1	2	0	0	0	0	226
11:00	4	121	65	1	20	3	0	2	1	0	0	0	0	217
12 PM	2	137	65	5	23	0	0	2	0	0	0	0	0	234
13:00	1	129	60	7	31	1	0	1	2	0	0	0	0	232
14:00	3	149	55	3	32	2	0	4	0	0	0	0	0	248
15:00	2	175	66	2	30	3	0	3	0	0	0	0	0	281
16:00	2	169	58	3	16	1	0	0	1	0	0	0	0	250
17:00	2	157	38	0	5	0	0	0	0	0	0	0	0	202
18:00	3	96	23	0	7	0	0	1	0	0	0	0	0	130
19:00	2	77	16	0	2	0	0	0	0	0	0	0	0	97
20:00	1	52	10	1	2	0	0	0	0	0	0	0	0	66
21:00	1	37	13	0	1	0	0	0	0	0	0	0	0	52
22:00	0	27	9	0	1	0	0	0	0	0	0	0	0	37
23:00	0	17	1	0	2	0	0	0	0	0	0	0	0	20
Total	36	1978	750	39	269	21	0	17	11	0	0	0	1	3122
Percent	1.2%	63.4%	24.0%	1.2%	8.6%	0.7%	0.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	10:00	10:00	09:00	10:00		11:00	09:00				06:00	08:00
Vol.	4	149	68	5	25	4		2	2				1	247
PM Peak	14:00	15:00	15:00	13:00	14:00	15:00		14:00	13:00					15:00
Vol.	3	175	66	7	32	3		4	2					281

PRECISION
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McArthur Drive
north of Union Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	7	3	0	0	1	0	0	0	0	0	0	0	11
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	12	4	0	0	0	0	0	0	0	0	0	0	16
05:00	1	38	9	1	0	1	0	0	0	0	0	0	0	50
06:00	0	90	26	1	7	0	0	0	1	0	0	0	0	125
07:00	0	104	49	5	20	1	0	3	1	0	0	0	0	183
08:00	1	131	73	5	21	1	0	2	1	0	0	0	0	235
09:00	0	111	69	7	28	1	0	4	2	0	0	0	0	222
10:00	0	114	64	3	25	1	0	3	4	0	0	0	0	214
11:00	1	123	58	6	17	3	0	0	5	0	0	0	0	213
12 PM	2	144	57	1	24	2	0	0	0	0	0	0	0	230
13:00	1	111	51	6	22	2	0	2	3	1	0	0	0	199
14:00	2	149	66	6	20	4	0	2	2	0	0	0	0	251
15:00	1	173	48	6	22	1	1	3	0	1	0	0	0	256
16:00	1	146	55	1	15	0	0	0	0	0	0	0	0	218
17:00	3	152	38	0	3	0	0	0	0	0	0	0	0	196
18:00	4	98	39	0	7	0	0	4	0	0	0	0	0	152
19:00	2	78	20	0	4	0	0	0	0	0	0	0	0	104
20:00	0	49	8	0	2	0	0	1	0	0	0	0	0	60
21:00	0	35	8	0	4	0	0	0	0	0	0	0	0	47
22:00	0	24	5	0	4	0	0	0	0	0	0	0	0	33
23:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
Total	19	1909	755	48	245	18	1	24	19	2	0	0	0	3040
Percent	0.6%	62.8%	24.8%	1.6%	8.1%	0.6%	0.0%	0.8%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	05:00	08:00	08:00	09:00	09:00	11:00		09:00	11:00					08:00
Vol.	1	131	73	7	28	3		4	5					235
PM Peak	18:00	15:00	14:00	13:00	12:00	14:00	15:00	18:00	13:00	13:00				15:00
Vol.	4	173	66	6	24	4	1	4	3	1				256

PRECISION
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P.O. Box 301 Berlin, MA 01503
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Union Street
west of JFK Highway (Route 18)
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-C volume
Site Code: 10111.31

Start	EB				WB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	15		103		9		52		24		155		
12:15	7		91		4		56		11		147		
12:30	9		100		3		46		12		146		
12:45	3	34	107	401	0	16	64	218	3	50	171	619	
01:00	8		110		2		36		10		146		
01:15	3		84		2		50		5		134		
01:30	2		100		1		50		3		150		
01:45	2	15	86	380	2	7	56	192	4	22	142	572	
02:00	3		95		1		42		4		137		
02:15	3		102		1		59		4		161		
02:30	2		102		1		48		3		150		
02:45	3	11	109	408	1	4	37	186	4	15	146	594	
03:00	6		102		1		43		7		145		
03:15	2		103		0		52		2		155		
03:30	4		83		1		50		5		133		
03:45	1	13	106	394	2	4	48	193	3	17	154	587	
04:00	3		106		0		48		3		154		
04:15	4		108		1		41		5		149		
04:30	5		96		3		32		8		128		
04:45	10	22	78	388	1	5	44	165	11	27	122	553	
05:00	13		116		0		37		13		153		
05:15	22		110		3		48		25		158		
05:30	24		90		4		30		28		120		
05:45	23	82	105	421	7	14	35	150	30	96	140	571	
06:00	43		108		14		38		57		146		
06:15	53		91		8		51		61		142		
06:30	62		91		11		43		73		134		
06:45	51	209	83	373	20	53	40	172	71	262	123	545	
07:00	48		77		25		28		73		105		
07:15	73		74		22		22		95		96		
07:30	80		72		29		29		109		101		
07:45	83	284	66	289	47	123	24	103	130	407	90	392	
08:00	98		62		55		15		153		77		
08:15	102		58		63		20		165		78		
08:30	81		67		74		13		155		80		
08:45	94	375	33	220	69	261	16	64	163	636	49	284	
09:00	75		54		55		11		130		65		
09:15	79		50		46		9		125		59		
09:30	95		41		42		15		137		56		
09:45	96	345	35	180	52	195	9	44	148	540	44	224	
10:00	84		37		47		10		131		47		
10:15	100		29		44		13		144		42		
10:30	78		16		50		9		128		25		
10:45	83	345	15	97	52	193	9	41	135	538	24	138	
11:00	85		28		40		9		125		37		
11:15	95		20		48		6		143		26		
11:30	132		22		42		9		174		31		
11:45	113	425	8	78	42	172	2	26	155	597	10	104	
Total	2160		3629		1047		1554		3207		5183		
Percent	67.4%		70.0%		32.6%		30.0%						
Day Total		5789				2601				8390			
Peak	11:00		05:00		08:00		12:00		08:00		12:00		
Vol.	425		421		261		218		636		619		
P.H.F.	0.805		0.907		0.882		0.852		0.964		0.905		

Union Street
west of JFK Highway (Route 18)
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 C-C volume
Site Code: 10111.31

Start	EB				WB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	7		92		7		36		14		128		
12:15	13		91		3		50		16		141		
12:30	7		102		9		46		16		148		
12:45	4	31	112	397	2	21	53	185	6	52	165	582	
01:00	6		114		7		33		13		147		
01:15	10		94		3		50		13		144		
01:30	8		99		3		47		11		146		
01:45	9	33	100	407	6	19	49	179	15	52	149	586	
02:00	7		102		1		45		8		147		
02:15	5		93		3		43		8		136		
02:30	1		104		1		40		2		144		
02:45	10	23	119	418	2	7	48	176	12	30	167	594	
03:00	0		100		0		39		0		139		
03:15	2		110		0		45		2		155		
03:30	3		120		0		35		3		155		
03:45	1	6	111	441	1	1	49	168	2	7	160	609	
04:00	4		92		0		37		4		129		
04:15	5		100		0		47		5		147		
04:30	6		90		2		36		8		126		
04:45	11	26	91	373	3	5	44	164	14	31	135	537	
05:00	16		115		3		43		19		158		
05:15	17		115		2		43		19		158		
05:30	21		100		4		32		25		132		
05:45	27	81	119	449	14	23	41	159	41	104	160	608	
06:00	51		110		12		35		63		145		
06:15	45		90		8		36		53		126		
06:30	64		98		12		39		76		137		
06:45	68	228	98	396	18	50	41	151	86	278	139	547	
07:00	51		91		19		41		70		132		
07:15	71		58		29		23		100		81		
07:30	79		83		32		24		111		107		
07:45	91	292	61	293	46	126	25	113	137	418	86	406	
08:00	83		53		42		14		125		67		
08:15	103		50		46		19		149		69		
08:30	99		63		80		19		179		82		
08:45	82	367	47	213	86	254	15	67	168	621	62	280	
09:00	77		62		48		16		125		78		
09:15	84		41		36		12		120		53		
09:30	92		42		50		17		142		59		
09:45	80	333	30	175	40	174	20	65	120	507	50	240	
10:00	90		54		35		17		125		71		
10:15	90		36		29		14		119		50		
10:30	119		40		38		12		157		52		
10:45	94	393	28	158	48	150	14	57	142	543	42	215	
11:00	86		30		42		8		128		38		
11:15	103		21		39		10		142		31		
11:30	103		22		47		8		150		30		
11:45	105	397	17	90	50	178	8	34	155	575	25	124	
Total	2210		3810		1008		1518		3218		5328		
Percent	68.7%		71.5%		31.3%		28.5%						
Day Total		6020				2526				8546			
Peak	10:30		02:45		08:15		01:15		08:00		02:45		
Vol.	402		449		260		191		621		616		
P.H.F.	0.845		0.935		0.756		0.901		0.867		0.922		

PRECISION
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Union Street
west of JFK Highway (Route 18)
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	1	13	16	4	0	0	0	0	0	0	0	0	34	29	25
01:00	1	3	2	9	0	0	0	0	0	0	0	0	0	15	28	23
02:00	1	3	2	5	0	0	0	0	0	0	0	0	0	11	27	22
03:00	0	0	5	7	0	1	0	0	0	0	0	0	0	13	28	25
04:00	0	4	6	10	2	0	0	0	0	0	0	0	0	22	29	24
05:00	9	13	29	26	5	0	0	0	0	0	0	0	0	82	28	22
06:00	6	46	87	57	**11**	**2**	0	0	0	0	0	0	0	209	28	23
07:00	26	69	110	**71**	7	1	0	0	0	0	0	0	0	284	27	21
08:00	84	114	**147**	28	2	0	0	0	0	0	0	0	0	375	24	18
09:00	81	123	111	27	3	0	0	0	0	0	0	0	0	345	23	17
10:00	90	114	121	19	1	0	0	0	0	0	0	0	0	345	23	17
11:00	**163**	**132**	121	8	0	1	0	0	0	0	0	0	0	**425**	22	15
12 PM	142	120	**129**	9	1	0	0	0	0	0	0	0	0	401	23	15
13:00	104	**141**	118	14	3	0	0	0	0	0	0	0	0	380	23	16
14:00	**204**	76	122	6	0	0	0	0	0	0	0	0	0	408	22	14
15:00	162	105	121	6	0	0	0	0	0	0	0	0	0	394	22	15
16:00	148	116	118	5	0	**1**	0	0	0	0	0	0	0	388	22	15
17:00	183	104	123	10	1	0	0	0	0	0	0	0	0	**421**	22	15
18:00	127	118	117	10	1	0	0	0	0	0	0	0	0	373	23	16
19:00	31	94	124	37	3	0	0	0	0	0	0	0	0	289	24	20
20:00	20	61	102	35	2	0	0	0	0	0	0	0	0	220	25	20
21:00	10	38	81	**44**	7	0	0	0	0	0	0	0	0	180	27	22
22:00	6	17	48	22	4	0	0	0	0	0	0	0	0	97	27	22
23:00	2	6	34	28	**8**	0	0	0	0	0	0	0	0	78	29	24
Total	1600	1618	1991	509	65	6	0	0	0	0	0	0	0	5789		
%	27.6%	27.9%	34.4%	8.8%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	08:00	07:00	06:00	06:00								11:00		
Vol.	163	132	147	71	11	2								425		
PM Peak	14:00	13:00	12:00	21:00	23:00	16:00								17:00		
Vol.	204	141	129	44	8	1								421		

Pecent

15th Percentile :	8 MPH
50th Percentile :	18 MPH
85th Percentile :	24 MPH
95th Percentile :	27 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	3609
Percent in Pace :	62.3%
Number of Vehicles > 25 MPH :	478
Percent of Vehicles > 25 MPH :	8.3%
Mean Speed(Average) :	17 MPH

PRECISION
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Union Street
west of JFK Highway (Route 18)
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	3	4	8	15	1	0	0	0	0	0	0	0	0	31	28	23
01:00	1	5	7	18	2	0	0	0	0	0	0	0	0	33	28	24
02:00	1	4	9	9	0	0	0	0	0	0	0	0	0	23	27	23
03:00	0	2	0	4	0	0	0	0	0	0	0	0	0	6	27	23
04:00	1	2	10	11	2	0	0	0	0	0	0	0	0	26	28	24
05:00	7	8	28	28	**10**	0	0	0	0	0	0	0	0	81	29	24
06:00	11	43	90	**76**	6	**2**	0	0	0	0	0	0	0	228	28	22
07:00	37	64	131	54	6	0	0	0	0	0	0	0	0	292	26	20
08:00	50	105	**160**	45	7	0	0	0	0	0	0	0	0	367	24	19
09:00	47	88	146	48	4	0	0	0	0	0	0	0	0	333	25	20
10:00	53	**151**	152	33	4	0	0	0	0	0	0	0	0	393	24	19
11:00	**110**	110	151	21	4	1	0	0	0	0	0	0	0	**397**	23	17
12 PM	98	136	128	32	3	0	0	0	0	0	0	0	0	397	23	17
13:00	84	149	**155**	17	2	0	0	0	0	0	0	0	0	407	23	17
14:00	145	134	128	11	0	0	0	0	0	0	0	0	0	418	22	15
15:00	140	139	150	11	1	0	0	0	0	0	0	0	0	441	23	16
16:00	**158**	88	114	13	0	0	0	0	0	0	0	0	0	373	23	15
17:00	141	**171**	123	13	0	0	**1**	0	0	0	0	0	0	**449**	22	16
18:00	107	138	123	27	1	0	0	0	0	0	0	0	0	396	23	17
19:00	69	74	121	28	1	0	0	0	0	0	0	0	0	293	24	18
20:00	11	53	117	30	2	0	0	0	0	0	0	0	0	213	24	21
21:00	6	41	87	**37**	**4**	0	0	0	0	0	0	0	0	175	26	22
22:00	17	35	77	25	4	0	0	0	0	0	0	0	0	158	25	20
23:00	2	20	38	25	4	**1**	0	0	0	0	0	0	0	90	28	23
Total	1299	1764	2253	631	68	4	1	0	0	0	0	0	0	6020		
%	21.6%	29.3%	37.4%	10.5%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	10:00	08:00	06:00	05:00	06:00								11:00		
Vol.	110	151	160	76	10	2								397		
PM Peak	16:00	17:00	13:00	21:00	21:00	23:00	17:00							17:00		
Vol.	158	171	155	37	4	1	1							449		

Pecent

15th Percentile :	10 MPH
50th Percentile :	19 MPH
85th Percentile :	24 MPH
95th Percentile :	28 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	4017
Percent in Pace :	66.7%
Number of Vehicles > 25 MPH :	577
Percent of Vehicles > 25 MPH :	9.6%
Mean Speed(Average) :	18 MPH

PRECISION
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Union Street
west of JFK Highway (Route 18)
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81676 C-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	1	2	8	5	0	0	0	0	0	0	0	0	16	32	27
01:00	0	0	4	2	1	0	0	0	0	0	0	0	0	7	26	24
02:00	0	0	0	2	2	0	0	0	0	0	0	0	0	4	30	30
03:00	0	0	1	2	1	0	0	0	0	0	0	0	0	4	26	26
04:00	0	0	1	2	2	0	0	0	0	0	0	0	0	5	30	28
05:00	2	0	6	6	0	0	0	0	0	0	0	0	0	14	27	21
06:00	2	5	19	19	7	1	0	0	0	0	0	0	0	53	29	25
07:00	6	18	36	51	**11**	1	0	0	0	0	0	0	0	123	29	24
08:00	4	**76**	**117**	**57**	4	**2**	**1**	0	0	0	0	0	0	**261**	27	22
09:00	18	44	87	36	10	0	0	0	0	0	0	0	0	195	27	21
10:00	**22**	67	68	28	7	1	0	0	0	0	0	0	0	193	26	20
11:00	22	55	74	20	1	0	0	0	0	0	0	0	0	172	24	19
12 PM	19	**85**	88	22	4	0	0	0	0	0	0	0	0	**218**	24	20
13:00	**21**	55	87	22	5	**2**	0	0	0	0	0	0	0	192	24	20
14:00	5	58	**91**	29	2	1	0	0	0	0	0	0	0	186	25	21
15:00	8	66	89	27	3	0	0	0	0	0	0	0	0	193	25	21
16:00	14	48	68	**32**	3	0	0	0	0	0	0	0	0	165	26	20
17:00	10	47	73	17	3	0	0	0	0	0	0	0	0	150	24	20
18:00	6	55	77	27	**7**	0	0	0	0	0	0	0	0	172	26	21
19:00	4	14	46	32	7	0	0	0	0	0	0	0	0	103	28	23
20:00	4	13	26	15	6	0	0	0	0	0	0	0	0	64	28	22
21:00	0	8	13	18	4	1	0	0	0	0	0	0	0	44	29	24
22:00	6	3	12	15	4	1	0	0	0	0	0	0	0	41	29	22
23:00	0	5	10	8	3	0	0	0	0	0	0	0	0	26	28	24
Total	173	723	1095	497	102	10	1	0	0	0	0	0	0	2601		
%	6.7%	27.8%	42.1%	19.1%	3.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	08:00	08:00	07:00	08:00	08:00							08:00		
Vol.	22	76	117	57	11	2	1							261		
PM Peak	13:00	12:00	14:00	16:00	18:00	13:00								12:00		
Vol.	21	85	91	32	7	2								218		

Pecent

15th Percentile :	16 MPH
50th Percentile :	21 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	1818
Percent in Pace :	69.9%
Number of Vehicles > 25 MPH :	510
Percent of Vehicles > 25 MPH :	19.6%
Mean Speed(Average) :	21 MPH

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81676 C-C speed
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WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	1	3	8	5	4	0	0	0	0	0	0	0	0	21	30	24
01:00	1	2	4	6	5	1	0	0	0	0	0	0	0	19	32	26
02:00	0	2	0	4	1	0	0	0	0	0	0	0	0	7	28	24
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
04:00	0	1	0	4	0	0	0	0	0	0	0	0	0	5	27	24
05:00	0	2	9	8	4	0	0	0	0	0	0	0	0	23	30	25
06:00	1	7	19	18	3	2	0	0	0	0	0	0	0	50	28	24
07:00	3	27	44	37	**12**	**3**	0	0	0	0	0	0	0	126	29	23
08:00	12	**64**	**120**	50	8	0	0	0	0	0	0	0	0	**254**	26	21
09:00	4	32	80	**52**	6	0	0	0	0	0	0	0	0	174	27	23
10:00	4	38	68	34	5	1	0	0	0	0	0	0	0	150	27	22
11:00	**13**	47	86	30	2	0	0	0	0	0	0	0	0	178	25	21
12 PM	11	47	**80**	**38**	6	**3**	0	0	0	0	0	0	0	**185**	27	22
13:00	**16**	44	75	36	7	1	0	0	0	0	0	0	0	179	27	21
14:00	15	**59**	80	22	0	0	0	0	0	0	0	0	0	176	24	20
15:00	9	47	66	38	8	0	0	0	0	0	0	0	0	168	27	22
16:00	4	57	71	29	3	0	0	0	0	0	0	0	0	164	26	21
17:00	9	51	72	23	4	0	0	0	0	0	0	0	0	159	25	21
18:00	3	26	80	31	**11**	0	0	0	0	0	0	0	0	151	27	23
19:00	11	20	57	20	5	0	0	0	0	0	0	0	0	113	26	21
20:00	2	20	29	12	3	1	0	0	0	0	0	0	0	67	26	22
21:00	7	15	22	15	6	0	0	0	0	0	0	0	0	65	28	22
22:00	2	6	28	17	4	0	0	0	0	0	0	0	0	57	28	23
23:00	3	10	8	9	4	0	0	0	0	0	0	0	0	34	28	22
Total	131	627	1107	538	111	12	0	0	0	0	0	0	0	2526		
%	5.2%	24.8%	43.8%	21.3%	4.4%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	08:00	09:00	07:00	07:00								08:00		
Vol.	13	64	120	52	12	3								254		
PM Peak	13:00	14:00	12:00	12:00	18:00	12:00								12:00		
Vol.	16	59	80	38	11	3								185		

Pecent

15th Percentile :	16 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	1734
Percent in Pace :	68.6%
Number of Vehicles > 25 MPH :	553
Percent of Vehicles > 25 MPH :	21.9%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Union Street
west of JFK Highway (Route 18)
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 C-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	1	32	1	0	0	0	0	0	0	0	0	0	0	34
01:00	0	13	1	0	1	0	0	0	0	0	0	0	0	15
02:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
03:00	0	10	2	1	0	0	0	0	0	0	0	0	0	13
04:00	0	20	1	0	0	1	0	0	0	0	0	0	0	22
05:00	0	72	7	0	3	0	0	0	0	0	0	0	0	82
06:00	1	187	18	1	0	1	0	1	0	0	0	0	0	209
07:00	2	237	38	1	4	2	0	0	0	0	0	0	0	284
08:00	2	317	40	3	9	2	0	2	0	0	0	0	0	375
09:00	0	293	43	1	2	4	0	0	1	0	0	0	1	345
10:00	3	307	30	1	4	0	0	0	0	0	0	0	0	345
11:00	5	380	28	1	9	0	0	2	0	0	0	0	0	425
12 PM	4	361	26	0	6	0	0	3	1	0	0	0	0	401
13:00	3	335	37	0	3	1	0	1	0	0	0	0	0	380
14:00	3	370	24	1	6	1	0	2	1	0	0	0	0	408
15:00	1	353	26	1	8	0	0	4	1	0	0	0	0	394
16:00	6	351	25	0	5	0	0	1	0	0	0	0	0	388
17:00	4	386	24	0	5	0	0	2	0	0	0	0	0	421
18:00	3	347	19	1	2	0	0	0	0	1	0	0	0	373
19:00	1	269	17	0	2	0	0	0	0	0	0	0	0	289
20:00	0	206	13	0	0	0	0	1	0	0	0	0	0	220
21:00	0	173	7	0	0	0	0	0	0	0	0	0	0	180
22:00	0	90	6	0	0	0	0	1	0	0	0	0	0	97
23:00	1	72	4	0	0	1	0	0	0	0	0	0	0	78
Total	40	5192	437	12	69	13	0	20	4	1	0	0	1	5789
Percent	0.7%	89.7%	7.5%	0.2%	1.2%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	08:00	08:00	09:00		08:00	09:00				09:00	11:00
Vol.	5	380	43	3	9	4		2	1				1	425
PM Peak	16:00	17:00	13:00	14:00	15:00	13:00		15:00	12:00	18:00				17:00
Vol.	6	386	37	1	8	1		4	1	1				421

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EB

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09/24/0														
8	0	30	1	0	0	0	0	0	0	0	0	0	0	31
01:00	0	31	1	0	0	1	0	0	0	0	0	0	0	33
02:00	0	21	1	0	1	0	0	0	0	0	0	0	0	23
03:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
04:00	1	22	3	0	0	0	0	0	0	0	0	0	0	26
05:00	0	72	6	0	1	1	1	0	0	0	0	0	0	81
06:00	0	207	19	1	0	1	0	0	0	0	0	0	0	228
07:00	1	245	35	1	7	2	0	1	0	0	0	0	0	292
08:00	0	320	32	1	10	0	0	3	0	1	0	0	0	367
09:00	3	282	40	1	6	0	0	1	0	0	0	0	0	333
10:00	3	353	32	1	2	1	0	0	1	0	0	0	0	393
11:00	5	339	41	1	7	1	0	1	2	0	0	0	0	397
12 PM	2	357	32	0	2	3	0	1	0	0	0	0	0	397
13:00	3	360	35	1	5	0	0	3	0	0	0	0	0	407
14:00	1	374	31	3	5	0	0	4	0	0	0	0	0	418
15:00	6	391	34	0	7	0	0	3	0	0	0	0	0	441
16:00	1	339	26	2	3	0	0	0	0	0	1	1	0	373
17:00	4	413	30	0	1	1	0	0	0	0	0	0	0	449
18:00	4	359	30	0	2	0	0	1	0	0	0	0	0	396
19:00	3	267	21	0	2	0	0	0	0	0	0	0	0	293
20:00	2	195	12	0	3	0	0	0	1	0	0	0	0	213
21:00	0	165	9	0	0	1	0	0	0	0	0	0	0	175
22:00	0	153	3	0	1	1	0	0	0	0	0	0	0	158
23:00	1	86	3	0	0	0	0	0	0	0	0	0	0	90
Total	40	5387	477	12	65	13	1	18	4	1	1	1	0	6020
Percent	0.7%	89.5%	7.9%	0.2%	1.1%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	06:00	08:00	07:00	05:00	08:00	11:00	08:00				11:00
Vol.	5	353	41	1	10	2	1	3	2	1				397
PM Peak	15:00	17:00	13:00	14:00	15:00	12:00		14:00	20:00		16:00	16:00		17:00
Vol.	6	413	35	3	7	3		4	1		1	1		449

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Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	13	3	0	0	0	0	0	0	0	0	0	0	16
01:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	1	3	0	1	0	0	0	0	0	0	0	0	5
05:00	0	11	2	0	0	0	0	0	1	0	0	0	0	14
06:00	0	42	7	0	4	0	0	0	0	0	0	0	0	53
07:00	0	95	23	1	4	0	0	0	0	0	0	0	0	123
08:00	0	218	35	0	7	0	0	1	0	0	0	0	0	261
09:00	0	154	32	1	7	1	0	0	0	0	0	0	0	195
10:00	2	157	33	0	1	0	0	0	0	0	0	0	0	193
11:00	0	142	25	2	3	0	0	0	0	0	0	0	0	172
12 PM	0	183	26	1	6	0	0	2	0	0	0	0	0	218
13:00	0	164	20	1	5	1	0	1	0	0	0	0	0	192
14:00	0	149	30	2	5	0	0	0	0	0	0	0	0	186
15:00	0	165	23	1	2	0	0	2	0	0	0	0	0	193
16:00	0	142	20	0	3	0	0	0	0	0	0	0	0	165
17:00	0	133	13	0	1	2	0	1	0	0	0	0	0	150
18:00	0	150	17	0	5	0	0	0	0	0	0	0	0	172
19:00	0	87	13	1	2	0	0	0	0	0	0	0	0	103
20:00	0	55	7	0	2	0	0	0	0	0	0	0	0	64
21:00	0	38	6	0	0	0	0	0	0	0	0	0	0	44
22:00	0	37	4	0	0	0	0	0	0	0	0	0	0	41
23:00	0	20	6	0	0	0	0	0	0	0	0	0	0	26
Total	2	2169	349	10	59	4	0	7	1	0	0	0	0	2601
Percent	0.1%	83.4%	13.4%	0.4%	2.3%	0.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	08:00	11:00	08:00	09:00		08:00	05:00					08:00
Vol.	2	218	35	2	7	1		1	1					261
PM Peak		12:00	14:00	14:00	12:00	17:00		12:00						12:00
Vol.		183	30	2	6	2		2						218

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WB

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09/24/0														
8	0	21	0	0	0	0	0	0	0	0	0	0	0	21
01:00	0	18	0	0	1	0	0	0	0	0	0	0	0	19
02:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	1	0	1	0	0	0	0	0	0	0	0	5
05:00	0	21	1	0	1	0	0	0	0	0	0	0	0	23
06:00	0	33	13	1	3	0	0	0	0	0	0	0	0	50
07:00	2	99	18	1	5	0	0	1	0	0	0	0	0	126
08:00	0	218	30	0	3	1	0	2	0	0	0	0	0	254
09:00	0	138	30	1	5	0	0	0	0	0	0	0	0	174
10:00	0	120	24	0	6	0	0	0	0	0	0	0	0	150
11:00	0	143	28	0	6	0	0	1	0	0	0	0	0	178
12 PM	0	159	21	0	5	0	0	0	0	0	0	0	0	185
13:00	0	152	23	0	3	0	0	1	0	0	0	0	0	179
14:00	0	138	32	1	2	0	0	3	0	0	0	0	0	176
15:00	0	140	20	0	6	0	0	2	0	0	0	0	0	168
16:00	0	140	19	1	3	1	0	0	0	0	0	0	0	164
17:00	0	139	13	0	6	1	0	0	0	0	0	0	0	159
18:00	0	128	19	0	4	0	0	0	0	0	0	0	0	151
19:00	3	97	10	0	3	0	0	0	0	0	0	0	0	113
20:00	0	56	10	0	1	0	0	0	0	0	0	0	0	67
21:00	0	54	11	0	0	0	0	0	0	0	0	0	0	65
22:00	0	51	5	0	1	0	0	0	0	0	0	0	0	57
23:00	0	27	4	0	2	0	0	1	0	0	0	0	0	34
Total	5	2099	335	5	68	3	0	11	0	0	0	0	0	2526
Percent	0.2%	83.1%	13.3%	0.2%	2.7%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	06:00	10:00	08:00		08:00						08:00
Vol.	2	218	30	1	6	1		2						254
PM Peak	19:00	12:00	14:00	14:00	15:00	16:00		14:00						12:00
Vol.	3	159	32	1	6	1		3						185

PRECISION DATA INDUSTRIES, LLC
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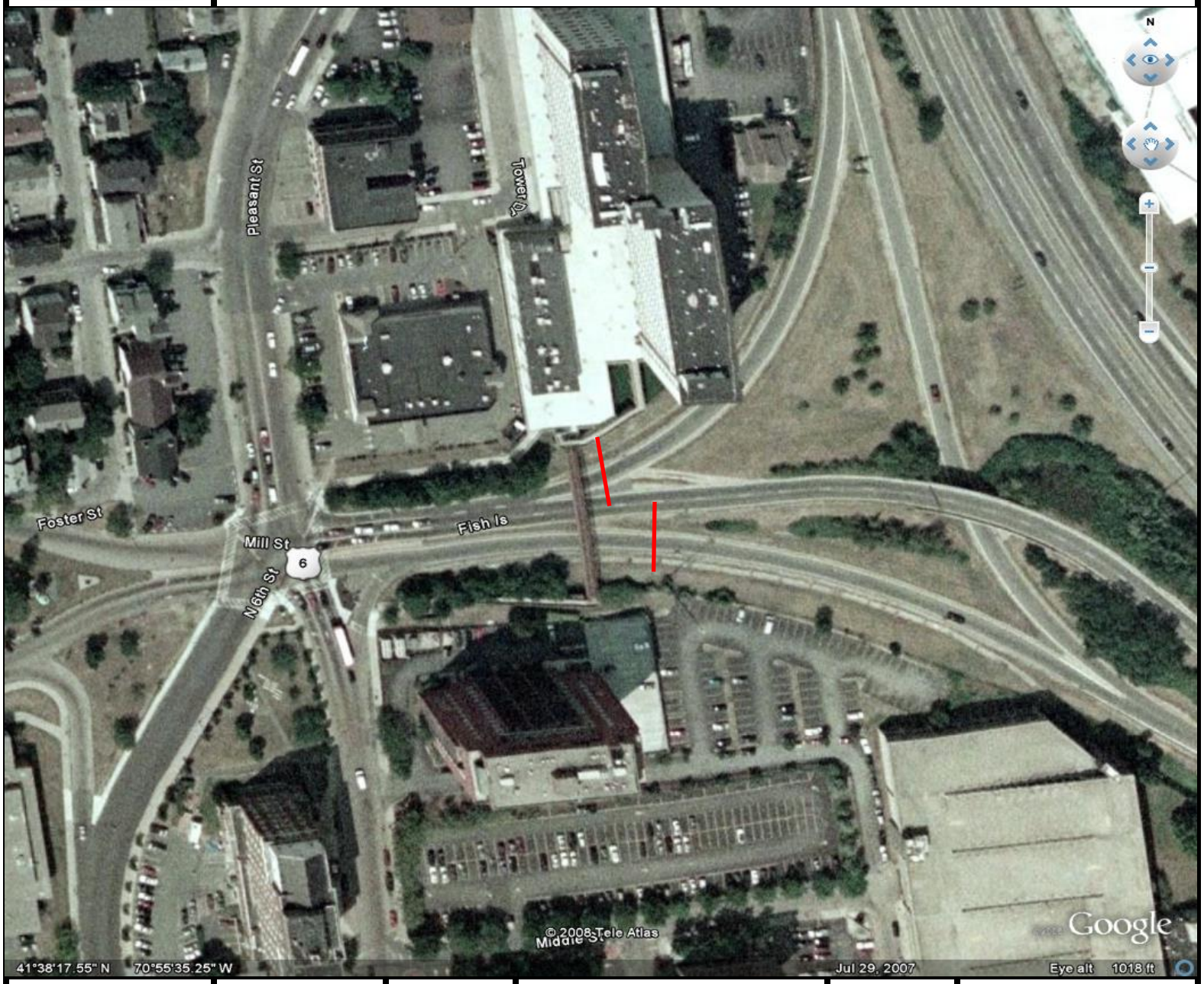
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/15 thru Thurs 10/16/08	81676 C-D	New Bedford, MA

Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION
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INDUSTRIES, LLC
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81676 C-D1 volume
Site Code: 10111.31

Start	WB LL				EB Ramp				Combined				15-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		47		15		113		24		160		
12:15	6		19		5		58		11		77		
12:30	7		77		8		74		15		151		
12:45	4	26	69	212	7	35	86	331	11	61	155	543	
01:00	4		63		5		83		9		146		
01:15	1		8		5		55		6		63		
01:30	3		82		4		66		7		148		
01:45	4	12	70	223	6	20	82	286	10	32	152	509	
02:00	1		74		3		97		4		171		
02:15	1		20		4		43		5		63		
02:30	1		84		2		99		3		183		
02:45	3	6	73	251	3	12	92	331	6	18	165	582	
03:00	4		63		1		116		5		179		
03:15	2		14		6		50		8		64		
03:30	3		75		1		98		4		173		
03:45	3	12	51	203	1	9	102	366	4	21	153	569	
04:00	5		63		0		123		5		186		
04:15	1		51		3		85		4		136		
04:30	4		68		3		123		7		191		
04:45	3	13	58	240	3	9	83	414	6	22	141	654	
05:00	5		57		10		112		15		169		
05:15	12		16		11		52		23		68		
05:30	9		56		9		93		18		149		
05:45	12	38	45	174	13	43	66	323	25	81	111	497	
06:00	7		44		8		55		15		99		
06:15	15		28		14		45		29		73		
06:30	26		67		28		73		54		140		
06:45	34	82	40	179	36	86	46	219	70	168	86	398	
07:00	10		45		14		61		24		106		
07:15	38		41		47		46		85		87		
07:30	44		41		58		52		102		93		
07:45	59	151	38	165	60	179	36	195	119	330	74	360	
08:00	21		19		27		31		48		50		
08:15	52		32		81		32		133		64		
08:30	67		35		72		40		139		75		
08:45	69	209	21	107	59	239	20	123	128	448	41	230	
09:00	7		16		39		36		46		52		
09:15	53		19		66		27		119		46		
09:30	52		14		66		25		118		39		
09:45	52	164	20	69	57	228	25	113	109	392	45	182	
10:00	2		16		44		16		46		32		
10:15	51		15		66		27		117		42		
10:30	53		7		81		13		134		20		
10:45	54	160	18	56	76	267	19	75	130	427	37	131	
11:00	54		2		67		11		121		13		
11:15	1		18		48		14		49		32		
11:30	69		4		92		12		161		16		
11:45	56	180	9	33	92	299	14	51	148	479	23	84	
Total	1053		1912		1426		2827		2479		4739		
Percent	42.5%		40.3%		57.5%		59.7%						
Day Total		2965				4253				7218			
Peak	10:15		02:00		11:00		03:45		10:15		03:45		
Vol.	212		251		299		433		502		666		
P.H.F.	0.768		0.747		0.813		0.880		0.903		0.872		

Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
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81676 C-D1 volume
Site Code: 10111.31

Start	WB LL				EB Ramp				Combined				16-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	4		56		6		105		10		161		
12:15	9		11		4		55		13		66		
12:30	1		68		8		81		9		149		
12:45	0	14	68	203	7	25	94	335	7	39	162	538	
01:00	2		58		2		82		4		140		
01:15	3		18		5		55		8		73		
01:30	3		64		3		68		6		132		
01:45	6	14	71	211	5	15	76	281	11	29	147	492	
02:00	0		75		1		86		1		161		
02:15	0		25		5		55		5		80		
02:30	2		66		4		83		6		149		
02:45	7	9	58	224	1	11	97	321	8	20	155	545	
03:00	2		58		1		82		3		140		
03:15	2		15		7		54		9		69		
03:30	3		60		4		84		7		144		
03:45	2	9	87	220	2	14	105	325	4	23	192	545	
04:00	2		59		0		113		2		172		
04:15	0		46		3		109		3		155		
04:30	2		74		3		113		5		187		
04:45	2	6	53	232	2	8	96	431	4	14	149	663	
05:00	4		59		6		97		10		156		
05:15	8		7		8		47		16		54		
05:30	10		79		11		76		21		155		
05:45	4	26	60	205	12	37	80	300	16	63	140	505	
06:00	6		53		12		76		18		129		
06:15	14		27		14		48		28		75		
06:30	25		63		29		69		54		132		
06:45	36	81	48	191	51	106	53	246	87	187	101	437	
07:00	13		24		14		39		27		63		
07:15	29		49		44		42		73		91		
07:30	52		33		60		34		112		67		
07:45	70	164	31	137	71	189	32	147	141	353	63	284	
08:00	14		27		26		39		40		66		
08:15	53		35		62		48		115		83		
08:30	64		26		57		39		121		65		
08:45	57	188	28	116	59	204	25	151	116	392	53	267	
09:00	36		30		48		23		84		53		
09:15	38		27		73		26		111		53		
09:30	51		15		57		27		108		42		
09:45	51	176	20	92	72	250	21	97	123	426	41	189	
10:00	6		23		44		22		50		45		
10:15	59		23		66		24		125		47		
10:30	41		20		76		16		117		36		
10:45	6	112	8	74	51	237	17	79	57	349	25	153	
11:00	66		16		73		13		139		29		
11:15	18		10		63		13		81		23		
11:30	77		4		84		10		161		14		
11:45	57	218	7	37	87	307	11	47	144	525	18	84	
Total	1017		1942		1403		2760		2420		4702		
Percent	42.0%		41.3%		58.0%		58.7%						
Day Total			2959				4163				7122		
Peak	11:00		03:45		11:00		03:45		11:00		03:45		
Vol.	218		266		307		440		525		706		
P.H.F.	0.708		0.764		0.882		0.973		0.815		0.919		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 speed
Site Code: 10111.31

WB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	1	1	10	13	1	0	0	0	0	0	0	26	38	34
01:00	0	0	0	3	6	2	1	0	0	0	0	0	0	12	35	32
02:00	0	0	0	1	2	2	1	0	0	0	0	0	0	6	36	34
03:00	0	0	0	0	4	7	0	0	**1**	0	0	0	0	12	38	36
04:00	0	0	0	3	2	6	2	0	0	0	0	0	0	13	39	34
05:00	0	0	0	3	19	15	1	0	0	0	0	0	0	38	38	34
06:00	0	0	2	12	35	27	5	**1**	0	0	0	0	0	82	38	33
07:00	1	2	10	33	63	37	5	0	0	0	0	0	0	151	37	31
08:00	4	**20**	**18**	**54**	**75**	35	3	0	0	0	0	0	0	**209**	35	29
09:00	7	6	10	37	52	**43**	**9**	0	0	0	0	0	0	164	37	30
10:00	7	11	18	24	59	32	8	0	1	0	0	0	0	160	37	30
11:00	**14**	10	14	38	63	32	8	1	0	0	0	0	0	180	36	29
12 PM	18	19	23	46	59	41	6	0	0	0	0	0	0	212	36	28
13:00	**43**	29	30	39	48	27	6	0	0	0	0	0	0	222	34	24
14:00	30	**31**	**35**	**70**	52	26	8	0	0	0	0	0	0	**252**	34	25
15:00	23	19	34	41	50	22	11	**3**	0	0	0	0	0	203	36	26
16:00	7	14	23	48	**80**	**54**	**13**	1	0	0	0	0	0	240	37	30
17:00	21	6	16	39	49	35	8	0	0	0	0	0	0	174	37	28
18:00	15	6	15	31	47	53	12	0	0	0	0	0	0	179	38	30
19:00	0	0	4	35	79	39	6	1	0	**1**	0	0	0	165	37	32
20:00	0	1	3	23	44	25	10	1	0	0	0	0	0	107	38	33
21:00	0	0	0	9	30	25	4	1	0	0	0	0	0	69	38	34
22:00	0	0	1	15	18	20	2	0	0	0	0	0	0	56	38	33
23:00	3	3	4	3	9	6	2	3	0	0	0	0	0	33	39	30
Total	193	177	261	608	955	624	132	12	2	1	0	0	0	2965		
%	6.5%	6.0%	8.8%	20.5%	32.2%	21.0%	4.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	08:00	08:00	08:00	09:00	09:00	06:00	03:00					08:00		
Vol.	14	20	18	54	75	43	9	1	1					209		
PM Peak	13:00	14:00	14:00	14:00	16:00	16:00	16:00	15:00		19:00				14:00		
Vol.	43	31	35	70	80	54	13	3		1				252		

Pecent

15th Percentile : 21 MPH
50th Percentile : 31 MPH
85th Percentile : 37 MPH
95th Percentile : 39 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 1579
Percent in Pace : 53.3%
Number of Vehicles > 30 MPH : 1535
Percent of Vehicles > 30 MPH : 51.8%
Mean Speed(Average) : 29 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 speed
Site Code: 10111.31

WB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	3	7	3	0	**1**	0	0	0	0	0	14	36	33
01:00	0	0	0	2	9	2	1	0	0	0	0	0	0	14	35	32
02:00	0	0	0	0	3	6	0	0	0	0	0	0	0	9	38	35
03:00	0	1	0	1	4	1	2	0	0	0	0	0	0	9	40	32
04:00	0	0	0	3	2	0	1	0	0	0	0	0	0	6	31	30
05:00	0	0	1	3	10	9	3	0	0	0	0	0	0	26	38	34
06:00	0	0	3	11	35	26	5	1	0	0	0	0	0	81	38	33
07:00	12	14	13	38	54	30	2	1	0	0	0	0	0	164	36	28
08:00	5	8	17	**45**	**69**	38	6	0	0	0	0	0	0	188	36	30
09:00	0	4	13	34	68	**47**	**10**	0	0	0	0	0	0	176	38	32
10:00	**16**	10	12	19	30	19	5	1	0	0	0	0	0	112	36	27
11:00	16	**22**	**36**	41	63	33	7	0	0	0	0	0	0	**218**	35	27
12 PM	18	17	23	49	58	33	5	0	0	0	0	0	0	203	36	27
13:00	10	9	30	**65**	61	33	2	1	0	0	0	0	0	211	35	28
14:00	18	13	**32**	51	74	31	5	0	0	0	0	0	0	224	35	27
15:00	**72**	**32**	29	34	34	16	3	0	0	0	0	0	0	220	32	20
16:00	3	9	24	56	**82**	**48**	10	0	0	0	0	0	0	**232**	37	30
17:00	16	19	15	42	73	33	7	0	0	0	0	0	0	205	36	28
18:00	11	7	20	42	73	32	4	**2**	0	0	0	0	0	191	36	29
19:00	5	5	11	33	47	33	3	0	0	0	0	0	0	137	37	30
20:00	0	0	3	21	48	33	**11**	0	0	0	0	0	0	116	38	33
21:00	0	0	0	11	37	38	6	0	0	0	0	0	0	92	38	34
22:00	0	0	1	5	34	28	6	0	0	0	0	0	0	74	38	34
23:00	0	0	0	2	19	15	1	1	0	0	0	0	0	38	38	34
Total	202	170	283	611	994	587	105	8	0	0	0	0	0	2960		
%	6.8%	5.7%	9.6%	20.6%	33.6%	19.8%	3.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	08:00	08:00	09:00	09:00	00:00						11:00		
Vol.	16	22	36	45	69	47	10	1						218		
PM Peak	15:00	15:00	14:00	13:00	16:00	16:00	20:00	18:00						16:00		
Vol.	72	32	32	65	82	48	11	2						232		

Pecent

15th Percentile :	21 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1605
Percent in Pace :	54.2%
Number of Vehicles > 30 MPH :	1495
Percent of Vehicles > 30 MPH :	50.5%
Mean Speed(Average) :	29 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 speed
Site Code: 10111.31

EB Ramp

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	4	11	17	3	0	0	0	0	0	0	35	39	35
01:00	0	0	0	3	6	6	4	**1**	0	0	0	0	0	20	41	35
02:00	0	0	0	0	6	4	2	0	0	0	0	0	0	12	38	35
03:00	0	0	0	1	5	2	1	0	0	0	0	0	0	9	36	33
04:00	0	0	0	1	3	5	0	0	0	0	0	0	0	9	38	35
05:00	0	0	0	3	19	17	4	0	0	0	0	0	0	43	39	34
06:00	0	0	1	5	36	39	4	1	0	0	0	0	0	86	38	34
07:00	0	0	0	12	67	93	7	0	0	0	0	0	0	179	38	35
08:00	0	0	0	10	110	96	**23**	0	0	0	0	0	0	239	39	35
09:00	0	0	**3**	12	117	82	12	1	0	0	0	0	0	227	38	34
10:00	0	0	2	15	117	117	17	0	0	0	0	0	0	268	38	34
11:00	0	0	1	**20**	**131**	**123**	23	1	0	0	0	0	0	**299**	39	34
12 PM	0	0	3	**29**	137	144	16	2	0	0	0	0	0	331	38	34
13:00	0	0	**5**	24	123	124	9	0	0	0	0	0	0	285	38	34
14:00	0	0	1	15	150	141	20	**3**	**1**	0	0	0	0	331	39	35
15:00	0	0	3	22	163	152	**25**	1	0	0	0	0	0	366	39	34
16:00	0	0	2	17	**195**	**180**	20	1	0	0	0	0	0	**415**	38	34
17:00	0	0	2	12	173	121	15	0	0	0	0	0	0	323	38	34
18:00	0	0	1	7	115	79	16	1	0	0	0	0	0	219	38	34
19:00	0	0	0	11	100	68	15	1	0	0	0	0	0	195	38	34
20:00	0	0	0	8	62	45	8	0	0	0	0	0	0	123	38	34
21:00	0	0	1	4	61	40	7	0	0	0	0	0	0	113	38	34
22:00	0	0	1	1	32	37	4	0	0	0	0	0	0	75	38	35
23:00	0	0	0	5	21	21	4	0	0	0	0	0	0	51	38	34
Total	0	0	26	241	1960	1753	259	13	1	0	0	0	0	4253		
%	0.0%	0.0%	0.6%	5.7%	46.1%	41.2%	6.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			09:00	11:00	11:00	11:00	08:00	01:00						11:00		
Vol.			3	20	131	123	23	1						299		
PM Peak			13:00	12:00	16:00	16:00	15:00	14:00	14:00					16:00		
Vol.			5	29	195	180	25	3	1					415		

Pecent

15th Percentile :	30 MPH
50th Percentile :	34 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	3713
Percent in Pace :	87.3%
Number of Vehicles > 30 MPH :	3594
Percent of Vehicles > 30 MPH :	84.5%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
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Kempton Street east of
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City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 speed
Site Code: 10111.31

EB Ramp

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	16	6	3	0	0	0	0	0	0	25	38	34
01:00	0	0	0	2	4	7	2	0	0	0	0	0	0	15	39	35
02:00	0	0	0	0	4	7	0	0	0	0	0	0	0	11	37	35
03:00	0	0	0	1	7	5	1	0	0	0	0	0	0	14	38	34
04:00	0	0	0	0	4	3	1	0	0	0	0	0	0	8	37	34
05:00	0	0	1	2	16	14	4	0	0	0	0	0	0	37	38	34
06:00	0	0	0	7	45	47	5	1	**1**	0	0	0	0	106	38	35
07:00	0	0	**2**	4	88	83	11	1	0	0	0	0	0	189	38	35
08:00	0	0	2	10	99	80	13	0	0	0	0	0	0	204	38	34
09:00	0	0	1	29	128	76	15	1	0	0	0	0	0	250	38	34
10:00	0	**1**	1	**40**	110	67	15	**3**	0	0	0	0	0	237	38	33
11:00	0	0	1	24	**162**	**99**	**20**	1	0	0	0	0	0	**307**	38	34
12 PM	0	1	9	**38**	184	89	14	0	0	0	0	0	0	335	37	33
13:00	0	0	0	18	149	100	12	1	0	**1**	0	0	0	281	38	34
14:00	0	0	0	19	159	134	9	0	0	0	0	0	0	321	38	34
15:00	**5**	**2**	**11**	33	154	113	6	1	0	0	0	0	0	325	38	33
16:00	0	0	0	16	**203**	**191**	**18**	**3**	0	0	0	0	0	**431**	38	35
17:00	0	0	1	20	135	125	17	2	0	0	0	0	0	300	38	34
18:00	0	0	2	15	133	86	9	1	0	0	0	0	0	246	38	34
19:00	0	0	0	7	73	58	6	3	0	0	0	0	0	147	38	34
20:00	0	0	0	2	66	68	12	2	**1**	0	0	0	0	151	39	35
21:00	0	0	0	4	37	43	13	0	0	0	0	0	0	97	39	35
22:00	0	0	0	3	38	31	7	0	0	0	0	0	0	79	39	35
23:00	0	0	0	3	8	29	7	0	0	0	0	0	0	47	39	36
Total	5	4	31	297	2022	1561	220	20	2	1	0	0	0	4163		
%	0.1%	0.1%	0.7%	7.1%	48.6%	37.5%	5.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		10:00	07:00	10:00	11:00	11:00	11:00	10:00	06:00					11:00		
Vol.		1	2	40	162	99	20	3	1					307		
PM Peak	15:00	15:00	15:00	12:00	16:00	16:00	16:00	16:00	20:00	13:00				16:00		
Vol.	5	2	11	38	203	191	18	3	1	1				431		

Pecent

15th Percentile : 30 MPH
50th Percentile : 34 MPH
85th Percentile : 38 MPH
95th Percentile : 40 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 3583
Percent in Pace : 86.1%
Number of Vehicles > 30 MPH : 3421
Percent of Vehicles > 30 MPH : 82.2%
Mean Speed(Average) : 34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 class
Site Code: 10111.31

WB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	24	2	0	0	0	0	0	0	0	0	0	0	26
01:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
02:00	0	3	2	0	1	0	0	0	0	0	0	0	0	6
03:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
04:00	0	9	3	0	1	0	0	0	0	0	0	0	0	13
05:00	0	35	3	0	0	0	0	0	0	0	0	0	0	38
06:00	0	65	15	0	2	0	0	0	0	0	0	0	0	82
07:00	0	122	22	1	5	0	0	0	1	0	0	0	0	151
08:00	0	186	17	1	5	0	0	0	0	0	0	0	0	209
09:00	1	137	23	0	3	0	0	0	0	0	0	0	0	164
10:00	1	119	27	0	11	1	0	1	0	0	0	0	0	160
11:00	1	152	22	1	4	0	0	0	0	0	0	0	0	180
12 PM	4	172	30	0	6	0	0	0	0	0	0	0	0	212
13:00	2	187	25	0	6	0	0	1	0	0	0	1	0	222
14:00	1	209	35	2	3	0	0	2	0	0	0	0	0	252
15:00	1	168	29	1	3	0	0	1	0	0	0	0	0	203
16:00	1	201	28	0	9	0	0	1	0	0	0	0	0	240
17:00	3	141	25	0	5	0	0	0	0	0	0	0	0	174
18:00	2	150	25	0	2	0	0	0	0	0	0	0	0	179
19:00	0	152	12	0	1	0	0	0	0	0	0	0	0	165
20:00	0	92	13	0	1	0	0	1	0	0	0	0	0	107
21:00	0	60	6	0	3	0	0	0	0	0	0	0	0	69
22:00	0	52	3	0	1	0	0	0	0	0	0	0	0	56
23:00	0	28	5	0	0	0	0	0	0	0	0	0	0	33
Total	17	2484	376	6	72	1	0	7	1	0	0	1	0	2965
Percent	0.6%	83.8%	12.7%	0.2%	2.4%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	10:00	07:00	10:00	10:00		10:00	07:00					08:00
Vol.	1	186	27	1	11	1		1	1					209
PM Peak	12:00	14:00	14:00	14:00	16:00			14:00				13:00		14:00
Vol.	4	209	35	2	9			2				1		252

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 class
Site Code: 10111.31

WB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	14	0	0	0	0	0	0	0	0	0	0	0	14
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	21	5	0	0	0	0	0	0	0	0	0	0	26
06:00	0	66	14	0	1	0	0	0	0	0	0	0	0	81
07:00	0	135	22	1	4	1	0	1	0	0	0	0	0	164
08:00	0	155	24	0	6	0	0	2	1	0	0	0	0	188
09:00	2	131	35	1	5	1	0	1	0	0	0	0	0	176
10:00	1	90	13	0	7	0	0	1	0	0	0	0	0	112
11:00	0	189	20	0	7	1	0	1	0	0	0	0	0	218
12 PM	1	174	21	0	5	1	0	1	0	0	0	0	0	203
13:00	0	186	19	0	5	0	0	0	0	1	0	0	0	211
14:00	0	186	31	0	5	0	0	1	1	0	0	0	0	224
15:00	1	191	22	1	5	0	0	0	0	0	0	0	0	220
16:00	2	193	30	1	4	0	0	2	0	0	0	0	0	232
17:00	0	188	12	1	3	0	0	1	0	0	0	0	0	205
18:00	0	168	23	0	0	0	0	0	0	0	0	0	0	191
19:00	1	125	10	0	0	0	0	1	0	0	0	0	0	137
20:00	0	99	16	0	1	0	0	0	0	0	0	0	0	116
21:00	0	78	11	0	3	0	0	0	0	0	0	0	0	92
22:00	0	69	5	0	0	0	0	0	0	0	0	0	0	74
23:00	0	33	4	0	1	0	0	0	0	0	0	0	0	38
Total	8	2526	340	5	62	4	0	12	2	1	0	0	0	2960
Percent	0.3%	85.3%	11.5%	0.2%	2.1%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	09:00	07:00	10:00	07:00		08:00	08:00					11:00
Vol.	2	189	35	1	7	1		2	1					218
PM Peak	16:00	16:00	14:00	15:00	12:00	12:00		16:00	14:00	13:00				16:00
Vol.	2	193	31	1	5	1		2	1	1				232

PRECISION
D A T A
INDUSTRIES, LLC
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 class
Site Code: 10111.31

EB Ramp

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	27	8	0	0	0	0	0	0	0	0	0	0	35
01:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
02:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
03:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
04:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
05:00	0	35	7	0	1	0	0	0	0	0	0	0	0	43
06:00	1	71	11	0	2	0	0	1	0	0	0	0	0	86
07:00	1	141	31	2	4	0	0	0	0	0	0	0	0	179
08:00	0	189	39	1	9	0	0	1	0	0	0	0	0	239
09:00	0	174	41	1	9	0	0	1	1	0	0	0	0	227
10:00	2	217	39	1	8	0	0	1	0	0	0	0	0	268
11:00	3	238	43	0	13	0	0	2	0	0	0	0	0	299
12 PM	6	273	37	2	11	2	0	0	0	0	0	0	0	331
13:00	4	231	41	2	6	0	0	1	0	0	0	0	0	285
14:00	2	282	35	1	8	0	0	1	2	0	0	0	0	331
15:00	4	310	43	0	8	0	0	1	0	0	0	0	0	366
16:00	2	350	54	0	9	0	0	0	0	0	0	0	0	415
17:00	2	262	53	0	5	0	0	1	0	0	0	0	0	323
18:00	1	193	20	0	5	0	0	0	0	0	0	0	0	219
19:00	0	172	19	0	3	0	0	0	0	1	0	0	0	195
20:00	1	104	16	0	1	0	0	1	0	0	0	0	0	123
21:00	0	103	8	0	2	0	0	0	0	0	0	0	0	113
22:00	0	68	7	0	0	0	0	0	0	0	0	0	0	75
23:00	0	42	9	0	0	0	0	0	0	0	0	0	0	51
Total	29	3524	569	10	104	2	0	11	3	1	0	0	0	4253
Percent	0.7%	82.9%	13.4%	0.2%	2.4%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	07:00	11:00			11:00	09:00					11:00
Vol.	3	238	43	2	13			2	1					299
PM Peak	12:00	16:00	16:00	12:00	12:00	12:00		13:00	14:00	19:00				16:00
Vol.	6	350	54	2	11	2		1	2	1				415

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D1 class
Site Code: 10111.31

EB Ramp

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	22	3	0	0	0	0	0	0	0	0	0	0	25
01:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
02:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
03:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
04:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
05:00	0	28	7	0	1	0	0	1	0	0	0	0	0	37
06:00	1	84	18	0	3	0	0	0	0	0	0	0	0	106
07:00	1	149	33	0	5	0	0	1	0	0	0	0	0	189
08:00	0	164	32	1	6	0	0	0	1	0	0	0	0	204
09:00	1	186	46	3	10	0	0	3	1	0	0	0	0	250
10:00	2	185	39	1	8	1	0	1	0	0	0	0	0	237
11:00	0	252	44	1	6	1	0	2	1	0	0	0	0	307
12 PM	1	284	41	3	4	0	0	2	0	0	0	0	0	335
13:00	1	245	26	1	5	1	0	1	1	0	0	0	0	281
14:00	0	273	39	2	6	0	0	1	0	0	0	0	0	321
15:00	1	287	29	0	8	0	0	0	0	0	0	0	0	325
16:00	0	370	49	0	10	1	0	1	0	0	0	0	0	431
17:00	0	271	24	1	4	0	0	0	0	0	0	0	0	300
18:00	0	211	31	1	2	1	0	0	0	0	0	0	0	246
19:00	0	129	15	0	3	0	0	0	0	0	0	0	0	147
20:00	2	132	14	0	2	0	0	1	0	0	0	0	0	151
21:00	0	91	5	0	1	0	0	0	0	0	0	0	0	97
22:00	0	75	4	0	0	0	0	0	0	0	0	0	0	79
23:00	0	40	7	0	0	0	0	0	0	0	0	0	0	47
Total	10	3520	512	14	84	5	0	14	4	0	0	0	0	4163
Percent	0.2%	84.6%	12.3%	0.3%	2.0%	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	09:00	09:00	09:00	10:00		09:00	08:00					11:00
Vol.	2	252	46	3	10	1		3	1					307
PM Peak	20:00	16:00	16:00	12:00	16:00	13:00		12:00	13:00					16:00
Vol.	2	370	49	3	10	1		2	1					431

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 volume
Site Code: 10111.31

Start	WB RL				Rte 18 Offramp				Combined				15-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	8		74		5		28		13		102		
12:15	5		18		4		31		9		49		
12:30	6		91		4		39		10		130		
12:45	2	21	98	281	1	14	38	136	3	35	136	417	
01:00	8		71		2		39		10		110		
01:15	5		16		2		28		7		44		
01:30	1		109		1		32		2		141		
01:45	9	23	83	279	0	5	47	146	9	28	130	425	
02:00	4		107		2		33		6		140		
02:15	1		28		0		52		1		80		
02:30	2		101		1		31		3		132		
02:45	1	8	76	312	2	5	41	157	3	13	117	469	
03:00	1		95		0		32		1		127		
03:15	2		22		0		38		2		60		
03:30	4		84		2		30		6		114		
03:45	0	7	89	290	2	4	41	141	2	11	130	431	
04:00	0		104		1		24		1		128		
04:15	5		81		0		46		5		127		
04:30	7		92		0		39		7		131		
04:45	7	19	66	343	1	2	37	146	8	21	103	489	
05:00	3		86		3		33		6		119		
05:15	9		15		4		37		13		52		
05:30	13		68		9		38		22		106		
05:45	16	41	54	223	10	26	22	130	26	67	76	353	
06:00	9		66		11		40		20		106		
06:15	24		27		15		34		39		61		
06:30	33		72		13		25		46		97		
06:45	62	128	55	220	31	70	27	126	93	198	82	346	
07:00	16		44		31		23		47		67		
07:15	65		48		32		21		97		69		
07:30	73		41		52		22		125		63		
07:45	74	228	50	183	60	175	23	89	134	403	73	272	
08:00	17		8		60		16		77		24		
08:15	79		39		54		15		133		54		
08:30	65		31		70		22		135		53		
08:45	65	226	34	112	57	241	16	69	122	467	50	181	
09:00	9		34		54		12		63		46		
09:15	73		35		41		13		114		48		
09:30	71		15		31		5		102		20		
09:45	76	229	22	106	40	166	3	33	116	395	25	139	
10:00	10		20		51		13		61		33		
10:15	73		12		42		10		115		22		
10:30	73		4		30		12		103		16		
10:45	70	226	19	55	28	151	10	45	98	377	29	100	
11:00	71		4		34		7		105		11		
11:15	16		14		35		10		51		24		
11:30	76		9		33		8		109		17		
11:45	76	239	9	36	37	139	3	28	113	378	12	64	
Total	1395		2440		998		1246		2393		3686		
Percent	58.3%		66.2%		41.7%		33.8%						
Day Total		3835				2244				6079			
Peak	10:15		03:45		07:45		01:30		07:45		03:45		
Vol.	287		366		244		164		479		516		
P.H.F.	0.908		0.880		0.871		0.788		0.887		0.985		

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 volume
Site Code: 10111.31

Start	WB RL				Rte 18 Offramp				Combined				16-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	2		79		5		41		7		120		
12:15	4		21		1		33		5		54		
12:30	1		84		6		28		7		112		
12:45	3	10	77	261	2	14	42	144	5	24	119	405	
01:00	5		91		4		29		9		120		
01:15	4		23		7		48		11		71		
01:30	3		92		1		31		4		123		
01:45	2	14	77	283	0	12	46	154	2	26	123	437	
02:00	1		69		0		38		1		107		
02:15	6		20		1		37		7		57		
02:30	3		106		0		34		3		140		
02:45	2	12	76	271	0	1	44	153	2	13	120	424	
03:00	3		80		0		32		3		112		
03:15	3		22		2		45		5		67		
03:30	1		56		2		36		3		92		
03:45	3	10	113	271	1	5	30	143	4	15	143	414	
04:00	2		90		1		40		3		130		
04:15	1		69		0		42		1		111		
04:30	4		97		0		39		4		136		
04:45	6	13	76	332	2	3	39	160	8	16	115	492	
05:00	2		83		4		34		6		117		
05:15	4		14		2		38		6		52		
05:30	13		95		8		22		21		117		
05:45	17	36	69	261	14	28	38	132	31	64	107	393	
06:00	19		60		10		26		29		86		
06:15	16		19		10		34		26		53		
06:30	36		91		16		33		52		124		
06:45	69	140	59	229	33	69	27	120	102	209	86	349	
07:00	6		24		38		25		44		49		
07:15	68		51		32		22		100		73		
07:30	65		41		56		11		121		52		
07:45	72	211	49	165	57	183	25	83	129	394	74	248	
08:00	14		42		62		18		76		60		
08:15	80		50		57		20		137		70		
08:30	65		19		52		15		117		34		
08:45	70	229	39	150	68	239	10	63	138	468	49	213	
09:00	57		34		51		14		108		48		
09:15	53		34		43		17		96		51		
09:30	54		22		43		12		97		34		
09:45	68	232	12	102	43	180	15	58	111	412	27	160	
10:00	19		20		36		10		55		30		
10:15	71		20		34		15		105		35		
10:30	73		15		34		10		107		25		
10:45	8	171	9	64	45	149	8	43	53	320	17	107	
11:00	77		15		27		6		104		21		
11:15	19		10		35		8		54		18		
11:30	115		6		33		8		148		14		
11:45	75	286	10	41	43	138	6	28	118	424	16	69	
Total	1364		2430		1021		1281		2385		3711		
Percent	57.2%		65.5%		42.8%		34.5%						
Day Total		3794				2302				6096			
Peak	11:00		03:45		08:00		01:15		08:15		03:45		
Vol.	286		369		239		163		500		520		
P.H.F.	0.622		0.816		0.879		0.849		0.906		0.909		

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 speed
Site Code: 10111.31

WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	2	6	12	1	0	0	0	0	0	0	21	38	35
01:00	0	0	0	3	12	8	0	0	0	0	0	0	0	23	37	33
02:00	0	0	0	0	3	4	1	0	0	0	0	0	0	8	38	36
03:00	0	0	0	0	4	2	1	0	0	0	0	0	0	7	36	34
04:00	0	1	0	2	9	6	1	0	0	0	0	0	0	19	37	33
05:00	0	0	0	7	12	14	7	**1**	0	0	0	0	0	41	40	35
06:00	4	0	6	24	57	30	7	0	0	0	0	0	0	128	37	31
07:00	16	14	33	60	62	**34**	**8**	1	0	0	0	0	0	228	36	28
08:00	**33**	**36**	**52**	49	37	14	5	0	0	0	0	0	0	226	32	23
09:00	14	15	37	**66**	61	30	4	1	**1**	0	0	0	0	229	35	27
10:00	18	16	32	63	61	29	6	0	0	0	0	0	0	225	35	27
11:00	26	13	43	60	**64**	27	6	1	0	0	0	0	0	**240**	34	26
12 PM	50	27	55	67	47	31	4	0	0	0	0	0	0	281	34	24
13:00	66	33	71	53	44	11	1	0	0	0	0	0	0	279	31	21
14:00	**69**	**54**	**94**	56	26	11	2	0	0	0	0	0	0	312	29	20
15:00	52	34	88	44	47	21	2	2	0	0	0	0	0	290	32	23
16:00	32	26	48	**87**	**87**	**49**	**10**	**4**	0	0	0	0	0	**343**	36	27
17:00	21	25	44	52	55	23	3	0	0	0	0	0	0	223	34	26
18:00	23	15	37	45	66	25	5	3	**1**	0	0	0	0	220	35	27
19:00	4	5	10	41	81	33	7	1	1	0	0	0	0	183	37	31
20:00	0	2	7	28	55	16	4	0	0	0	0	0	0	112	35	31
21:00	0	0	5	28	41	22	10	0	0	0	0	0	0	106	38	32
22:00	0	0	1	13	19	19	2	1	0	0	0	0	0	55	38	33
23:00	0	1	1	11	9	11	3	0	0	0	0	0	0	36	38	32
Total	428	317	664	861	965	482	100	15	3	0	0	0	0	3835		
%	11.2%	8.3%	17.3%	22.5%	25.2%	12.6%	2.6%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	09:00	11:00	07:00	07:00	05:00	09:00					11:00		
Vol.	33	36	52	66	64	34	8	1	1					240		
PM Peak	14:00	14:00	14:00	16:00	16:00	16:00	16:00	16:00	18:00					16:00		
Vol.	69	54	94	87	87	49	10	4	1					343		

Pecent

15th Percentile :	17 MPH
50th Percentile :	27 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1826
Percent in Pace :	47.6%
Number of Vehicles > 30 MPH :	1372
Percent of Vehicles > 30 MPH :	35.8%
Mean Speed(Average) :	26 MPH

PRECISION
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81676 C-D2 speed
Site Code: 10111.31

WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	6	3	1	0	0	0	0	0	0	0	10	31	29
01:00	0	0	0	2	7	3	2	0	0	0	0	0	0	14	37	33
02:00	0	0	0	2	7	3	0	0	0	0	0	0	0	12	35	32
03:00	0	0	0	1	7	1	1	0	0	0	0	0	0	10	34	33
04:00	0	0	0	0	6	7	0	0	0	0	0	0	0	13	37	35
05:00	0	0	2	7	13	11	3	0	0	0	0	0	0	36	38	33
06:00	0	0	6	29	59	36	7	**3**	0	0	0	0	0	140	38	33
07:00	23	18	44	38	53	30	5	0	0	0	0	0	0	211	35	26
08:00	19	10	44	61	64	27	3	1	0	0	0	0	0	229	34	27
09:00	11	19	34	57	**66**	**40**	2	1	**1**	0	0	0	0	231	36	28
10:00	19	19	23	37	49	21	3	1	0	0	0	0	0	172	34	26
11:00	**44**	**27**	**65**	**62**	56	23	**8**	1	0	0	0	0	0	**286**	33	24
12 PM	40	22	63	49	60	24	2	1	0	0	0	0	0	261	33	24
13:00	42	24	68	77	55	14	3	0	0	0	0	0	0	283	32	24
14:00	42	31	63	48	67	18	2	0	0	0	0	0	0	271	33	24
15:00	**78**	40	**81**	30	35	6	1	0	0	0	0	0	0	271	30	19
16:00	28	**42**	74	**95**	58	30	4	1	0	0	0	0	0	**332**	33	25
17:00	35	32	65	46	58	22	3	0	0	0	0	0	0	261	33	24
18:00	10	19	32	65	63	**32**	**6**	**2**	0	0	0	0	0	229	35	28
19:00	7	7	20	61	39	27	4	0	0	0	0	0	0	165	35	28
20:00	0	1	1	45	**68**	30	5	0	0	0	0	0	0	150	36	32
21:00	0	0	2	20	49	25	6	0	0	0	0	0	0	102	38	33
22:00	0	0	2	12	31	15	4	0	0	0	0	0	0	64	37	33
23:00	0	0	0	5	16	17	2	1	0	0	0	0	0	41	38	34
Total	398	311	689	855	989	463	76	12	1	0	0	0	0	3794		
%	10.5%	8.2%	18.2%	22.5%	26.1%	12.2%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	09:00	09:00	11:00	06:00	09:00					11:00		
Vol.	44	27	65	62	66	40	8	3	1					286		
PM Peak	15:00	16:00	15:00	16:00	20:00	18:00	18:00	18:00						16:00		
Vol.	78	42	81	95	68	32	6	2						332		

Pecent

15th Percentile :	17 MPH
50th Percentile :	27 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1844
Percent in Pace :	48.6%
Number of Vehicles > 30 MPH :	1343
Percent of Vehicles > 30 MPH :	35.4%
Mean Speed(Average) :	26 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 speed
Site Code: 10111.31

Rte 18 Offramp

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	4	3	4	2	1	0	0	0	0	0	0	14	35	29
01:00	0	1	2	0	2	0	0	0	0	0	0	0	0	5	30	24
02:00	0	0	2	1	0	1	0	**1**	0	0	0	0	0	5	35	29
03:00	0	0	0	1	3	0	0	0	0	0	0	0	0	4	31	30
04:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2	26	26
05:00	0	0	5	9	10	2	0	0	0	0	0	0	0	26	33	29
06:00	2	4	14	24	22	4	0	0	0	0	0	0	0	70	33	27
07:00	24	22	43	46	**34**	5	1	0	0	0	0	0	0	175	31	23
08:00	**32**	**43**	**68**	57	31	**9**	1	0	0	0	0	0	0	**241**	30	22
09:00	12	15	47	**59**	25	7	0	1	0	0	0	0	0	166	31	25
10:00	20	14	35	48	33	1	0	0	0	0	0	0	0	151	31	23
11:00	18	17	26	45	25	5	**3**	0	0	0	0	0	0	139	32	24
12 PM	19	20	41	32	19	3	**1**	**1**	0	0	0	0	0	136	30	23
13:00	28	23	52	29	9	4	1	0	0	0	0	0	0	146	28	21
14:00	**37**	**27**	**53**	24	14	2	0	0	0	0	0	0	0	**157**	28	19
15:00	24	20	30	32	**26**	**9**	0	0	0	0	0	0	0	141	32	23
16:00	30	21	35	**46**	12	2	0	0	0	0	0	0	0	146	29	21
17:00	14	23	41	30	19	3	0	0	0	0	0	0	0	130	30	22
18:00	18	18	29	38	19	4	0	0	0	0	0	0	0	126	30	23
19:00	6	6	21	33	20	3	0	0	0	0	0	0	0	89	32	26
20:00	0	5	14	23	21	5	1	0	0	0	0	0	0	69	33	28
21:00	0	1	10	6	13	2	1	0	0	0	0	0	0	33	33	28
22:00	0	5	7	13	16	4	0	0	0	0	0	0	0	45	33	28
23:00	0	0	8	10	7	3	0	0	0	0	0	0	0	28	33	28
Total	284	285	587	611	384	80	10	3	0	0	0	0	0	2244		
%	12.7%	12.7%	26.2%	27.2%	17.1%	3.6%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	09:00	07:00	08:00	11:00	02:00						08:00		
Vol.	32	43	68	59	34	9	3	1						241		
PM Peak	14:00	14:00	14:00	16:00	15:00	15:00	12:00	12:00						14:00		
Vol.	37	27	53	46	26	9	1	1						157		

Pecent

15th Percentile :	15 MPH
50th Percentile :	24 MPH
85th Percentile :	31 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	1198
Percent in Pace :	53.4%
Number of Vehicles > 30 MPH :	400
Percent of Vehicles > 30 MPH :	17.8%
Mean Speed(Average) :	23 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 speed
Site Code: 10111.31

Rte 18 Offramp

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	1	0	4	6	0	**2**	**1**	0	0	0	0	0	14	40	32
01:00	0	0	0	9	3	0	0	0	0	0	0	0	0	12	30	28
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
03:00	0	0	2	2	1	0	0	0	0	0	0	0	0	5	26	26
04:00	0	1	1	1	0	0	0	0	0	0	0	0	0	3	25	23
05:00	0	2	6	11	6	3	0	0	0	0	0	0	0	28	33	27
06:00	1	5	19	24	16	4	0	0	0	0	0	0	0	69	32	26
07:00	23	21	59	47	30	2	1	0	0	0	0	0	0	183	30	23
08:00	**27**	**44**	**63**	**61**	**35**	**9**	0	0	0	0	0	0	0	**239**	31	23
09:00	23	34	46	53	18	6	0	0	0	0	0	0	0	180	29	22
10:00	10	16	43	43	28	6	1	1	0	0	0	0	0	148	32	25
11:00	21	16	43	28	23	7	1	0	0	0	0	0	0	139	31	23
12 PM	19	20	44	**42**	18	1	0	0	0	0	0	0	0	144	29	22
13:00	19	27	43	42	15	**7**	0	**1**	0	0	0	0	0	154	29	23
14:00	22	**33**	42	38	16	2	0	0	0	0	0	0	0	153	29	21
15:00	27	14	46	31	21	4	0	0	0	0	0	0	0	143	30	22
16:00	**28**	33	**49**	34	11	5	0	0	0	0	0	0	0	**160**	28	21
17:00	8	21	43	37	19	3	1	0	0	0	0	0	0	132	30	24
18:00	10	19	27	31	**29**	4	0	0	0	0	0	0	0	120	32	24
19:00	0	6	15	33	22	4	**3**	0	0	0	0	0	0	83	33	28
20:00	1	6	15	21	18	2	0	0	0	0	0	0	0	63	32	26
21:00	0	5	12	21	15	3	1	1	0	0	0	0	0	58	33	27
22:00	0	1	7	19	12	3	1	0	0	0	0	0	0	43	33	28
23:00	0	1	6	11	8	0	2	0	0	0	0	0	0	28	32	28
Total	239	326	632	643	370	75	13	4	0	0	0	0	0	2302		
%	10.4%	14.2%	27.5%	27.9%	16.1%	3.3%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	00:00	00:00						08:00		
Vol.	27	44	63	61	35	9	2	1						239		
PM Peak	16:00	14:00	16:00	12:00	18:00	13:00	19:00	13:00						16:00		
Vol.	28	33	49	42	29	7	3	1						160		

Pecent

15th Percentile :	16 MPH
50th Percentile :	24 MPH
85th Percentile :	31 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	1275
Percent in Pace :	55.4%
Number of Vehicles > 30 MPH :	388
Percent of Vehicles > 30 MPH :	16.9%
Mean Speed(Average) :	23 MPH

PRECISION
D A T A
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 class
Site Code: 10111.31

WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	15	6	0	0	0	0	0	0	0	0	0	0	21
01:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	12	5	0	1	0	0	1	0	0	0	0	0	19
05:00	0	22	18	0	1	0	0	0	0	0	0	0	0	41
06:00	1	89	33	1	4	0	0	0	0	0	0	0	0	128
07:00	1	169	46	2	6	1	0	2	0	1	0	0	0	228
08:00	5	169	39	0	11	0	0	1	0	0	0	1	0	226
09:00	2	161	54	1	9	0	0	2	0	0	0	0	0	229
10:00	1	142	68	1	11	0	0	1	1	0	0	0	0	225
11:00	1	177	46	2	10	0	0	3	1	0	0	0	0	240
12 PM	4	210	48	0	15	2	0	2	0	0	0	0	0	281
13:00	1	216	47	1	11	1	0	2	0	0	0	0	0	279
14:00	3	240	52	1	11	1	0	4	0	0	0	0	0	312
15:00	1	222	48	1	15	0	0	1	1	1	0	0	0	290
16:00	2	239	82	2	17	0	0	1	0	0	0	0	0	343
17:00	2	181	32	1	7	0	0	0	0	0	0	0	0	223
18:00	0	171	43	0	5	1	0	0	0	0	0	0	0	220
19:00	1	140	35	0	6	0	0	1	0	0	0	0	0	183
20:00	0	90	17	0	5	0	0	0	0	0	0	0	0	112
21:00	2	92	10	0	1	0	0	1	0	0	0	0	0	106
22:00	2	42	11	0	0	0	0	0	0	0	0	0	0	55
23:00	0	29	6	0	1	0	0	0	0	0	0	0	0	36
Total	29	2861	751	13	147	6	0	22	3	2	0	1	0	3835
Percent	0.8%	74.6%	19.6%	0.3%	3.8%	0.2%	0.0%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	10:00	07:00	08:00	07:00		11:00	10:00	07:00		08:00		11:00
Vol.	5	177	68	2	11	1		3	1	1		1		240
PM Peak	12:00	14:00	16:00	16:00	16:00	12:00		14:00	15:00	15:00				16:00
Vol.	4	240	82	2	17	2		4	1	1				343

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 class
Site Code: 10111.31

WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	10	4	0	0	0	0	0	0	0	0	0	0	14
02:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
03:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
04:00	0	8	4	0	1	0	0	0	0	0	0	0	0	13
05:00	0	23	8	0	3	0	0	2	0	0	0	0	0	36
06:00	1	102	32	1	4	0	0	0	0	0	0	0	0	140
07:00	0	155	43	3	8	0	0	1	1	0	0	0	0	211
08:00	0	161	57	0	9	0	0	1	1	0	0	0	0	229
09:00	1	153	63	0	12	2	0	0	0	0	0	0	0	231
10:00	2	111	42	2	13	1	0	0	1	0	0	0	0	172
11:00	0	211	59	0	10	3	0	2	1	0	0	0	0	286
12 PM	1	198	45	0	11	0	0	3	2	1	0	0	0	261
13:00	2	225	41	0	10	0	0	5	0	0	0	0	0	283
14:00	3	206	47	0	11	1	0	3	0	0	0	0	0	271
15:00	3	216	41	0	8	0	0	2	1	0	0	0	0	271
16:00	1	271	50	1	6	0	0	1	0	2	0	0	0	332
17:00	0	208	46	0	4	0	0	3	0	0	0	0	0	261
18:00	0	186	33	1	7	0	0	2	0	0	0	0	0	229
19:00	0	134	27	0	4	0	0	0	0	0	0	0	0	165
20:00	0	125	22	0	3	0	0	0	0	0	0	0	0	150
21:00	0	82	16	0	3	0	0	0	1	0	0	0	0	102
22:00	0	49	14	0	1	0	0	0	0	0	0	0	0	64
23:00	0	37	3	0	1	0	0	0	0	0	0	0	0	41
Total	14	2900	700	8	129	7	0	25	8	3	0	0	0	3794
Percent	0.4%	76.4%	18.5%	0.2%	3.4%	0.2%	0.0%	0.7%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	09:00	07:00	10:00	11:00		05:00	07:00					11:00
Vol.	2	211	63	3	13	3		2	1					286
PM Peak	14:00	16:00	16:00	16:00	12:00	14:00		13:00	12:00	16:00				16:00
Vol.	3	271	50	1	11	1		5	2	2				332

PRECISION
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Kempton Street east of
Pleasant Street
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 class
Site Code: 10111.31

Rte 18 Offramp

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	1	12	1	0	0	0	0	0	0	0	0	0	0	14
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	3	1	0	1	0	0	0	0	0	0	0	0	5
03:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
05:00	0	20	2	2	1	0	0	0	1	0	0	0	0	26
06:00	0	56	11	1	2	0	0	0	0	0	0	0	0	70
07:00	0	143	24	1	5	1	0	1	0	0	0	0	0	175
08:00	4	197	27	2	8	2	0	0	1	0	0	0	0	241
09:00	0	128	27	0	9	0	0	1	1	0	0	0	0	166
10:00	0	124	18	2	2	1	1	2	1	0	0	0	0	151
11:00	0	112	22	0	3	0	0	2	0	0	0	0	0	139
12 PM	3	106	17	2	3	2	1	0	2	0	0	0	0	136
13:00	2	123	11	1	5	1	1	2	0	0	0	0	0	146
14:00	3	135	16	0	2	1	0	0	0	0	0	0	0	157
15:00	4	112	22	0	2	0	0	0	1	0	0	0	0	141
16:00	0	126	18	1	1	0	0	0	0	0	0	0	0	146
17:00	1	117	9	0	1	1	0	1	0	0	0	0	0	130
18:00	1	112	8	2	2	0	0	0	1	0	0	0	0	126
19:00	2	77	10	0	0	0	0	0	0	0	0	0	0	89
20:00	1	59	7	1	0	1	0	0	0	0	0	0	0	69
21:00	0	27	4	0	2	0	0	0	0	0	0	0	0	33
22:00	1	38	4	0	1	0	0	1	0	0	0	0	0	45
23:00	0	26	2	0	0	0	0	0	0	0	0	0	0	28
Total	23	1860	263	15	52	10	3	10	8	0	0	0	0	2244
Percent	1.0%	82.9%	11.7%	0.7%	2.3%	0.4%	0.1%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	05:00	09:00	08:00	10:00	10:00	05:00					08:00
Vol.	4	197	27	2	9	2	1	2	1					241
PM Peak	15:00	14:00	15:00	12:00	13:00	12:00	12:00	13:00	12:00					14:00
Vol.	4	135	22	2	5	2	1	2	2					157

PRECISION
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Kempton Street east of
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City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 C-D2 class
Site Code: 10111.31

Rte 18 Offramp

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	11	3	0	0	0	0	0	0	0	0	0	0	14
01:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	1	0	1	1	0	0	0	0	0	0	0	0	3
05:00	0	22	2	1	0	1	0	0	1	1	0	0	0	28
06:00	0	52	13	2	0	0	0	1	1	0	0	0	0	69
07:00	1	143	27	1	5	2	0	0	3	1	0	0	0	183
08:00	2	202	24	1	7	1	0	1	1	0	0	0	0	239
09:00	0	150	24	1	2	0	0	0	2	1	0	0	0	180
10:00	1	116	20	2	4	1	0	2	2	0	0	0	0	148
11:00	3	121	10	2	1	1	0	0	1	0	0	0	0	139
12 PM	1	122	16	2	3	0	0	0	0	0	0	0	0	144
13:00	1	130	14	2	5	0	1	0	1	0	0	0	0	154
14:00	1	118	24	1	4	0	0	2	3	0	0	0	0	153
15:00	3	123	11	0	3	2	0	0	1	0	0	0	0	143
16:00	1	138	18	1	2	0	0	0	0	0	0	0	0	160
17:00	0	117	13	2	0	0	0	0	0	0	0	0	0	132
18:00	2	100	14	2	2	0	0	0	0	0	0	0	0	120
19:00	0	68	14	1	0	0	0	0	0	0	0	0	0	83
20:00	0	56	6	1	0	0	0	0	0	0	0	0	0	63
21:00	0	49	8	0	0	0	0	0	1	0	0	0	0	58
22:00	0	33	8	1	1	0	0	0	0	0	0	0	0	43
23:00	0	25	3	0	0	0	0	0	0	0	0	0	0	28
Total	16	1915	272	24	40	8	1	6	17	3	0	0	0	2302
Percent	0.7%	83.2%	11.8%	1.0%	1.7%	0.3%	0.0%	0.3%	0.7%	0.1%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	07:00	06:00	08:00	07:00		10:00	07:00	05:00				08:00
Vol.	3	202	27	2	7	2		2	3	1				239
PM Peak	15:00	16:00	14:00	12:00	13:00	15:00	13:00	14:00	14:00					16:00
Vol.	3	138	24	2	5	2	1	2	3					160

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/23/08 thru Wed 9/24/08	81676	New Bedford, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-A volume
Site Code: 10111.31

Start	EB				WB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	16		123		10		66		26		189		
12:15	11		110		14		65		25		175		
12:30	11		98		10		57		21		155		
12:45	16	54	96	427	12	46	64	252	28	100	160	679	
01:00	14		104		18		68		32		172		
01:15	12		102		4		79		16		181		
01:30	4		96		5		74		9		170		
01:45	4	34	95	397	11	38	73	294	15	72	168	691	
02:00	5		97		4		69		9		166		
02:15	2		116		5		80		7		196		
02:30	9		105		5		64		14		169		
02:45	5	21	113	431	7	21	90	303	12	42	203	734	
03:00	8		135		7		58		15		193		
03:15	1		111		6		65		7		176		
03:30	5		129		3		75		8		204		
03:45	8	22	121	496	5	21	91	289	13	43	212	785	
04:00	8		142		5		72		13		214		
04:15	10		149		4		77		14		226		
04:30	24		124		10		81		34		205		
04:45	21	63	109	524	9	28	73	303	30	91	182	827	
05:00	22		129		7		74		29		203		
05:15	29		128		10		64		39		192		
05:30	65		100		26		65		91		165		
05:45	55	171	90	447	25	68	67	270	80	239	157	717	
06:00	68		118		35		63		103		181		
06:15	89		124		37		83		126		207		
06:30	113		95		52		71		165		166		
06:45	131	401	91	428	44	168	61	278	175	569	152	706	
07:00	113		104		64		60		177		164		
07:15	91		69		64		63		155		132		
07:30	116		96		54		45		170		141		
07:45	100	420	60	329	83	265	46	214	183	685	106	543	
08:00	108		76		86		42		194		118		
08:15	123		59		86		50		209		109		
08:30	108		59		54		52		162		111		
08:45	73	412	78	272	77	303	56	200	150	715	134	472	
09:00	116		51		68		67		184		118		
09:15	85		58		66		49		151		107		
09:30	90		57		60		37		150		94		
09:45	95	386	37	203	50	244	36	189	145	630	73	392	
10:00	87		24		78		37		165		61		
10:15	82		39		85		40		167		79		
10:30	74		33		62		23		136		56		
10:45	84	327	24	120	64	289	16	116	148	616	40	236	
11:00	97		27		63		20		160		47		
11:15	101		18		60		15		161		33		
11:30	110		14		67		20		177		34		
11:45	98	406	11	70	59	249	15	70	157	655	26	140	
Total	2717		4144		1740		2778		4457		6922		
Percent	61.0%		59.9%		39.0%		40.1%						
Day Total		6861				4518				11379			
Peak	06:45		03:30		07:30		03:45		07:30		03:45		
Vol.	451		541		309		321		756		857		
P.H.F.	0.861		0.908		0.898		0.882		0.904		0.948		

Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 D-A volume
Site Code: 10111.31

Start	EB				WB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	12		102		16		71		28		173		
12:15	12		107		14		84		26		191		
12:30	13		73		10		82		23		155		
12:45	16	53	81	363	13	53	90	327	29	106	171	690	
01:00	6		79		13		73		19		152		
01:15	16		91		7		80		23		171		
01:30	10		90		8		62		18		152		
01:45	7	39	88	348	6	34	77	292	13	73	165	640	
02:00	16		94		12		82		28		176		
02:15	7		93		7		86		14		179		
02:30	5		121		8		67		13		188		
02:45	10	38	103	411	9	36	76	311	19	74	179	722	
03:00	4		111		6		68		10		179		
03:15	2		118		4		79		6		197		
03:30	2		121		4		95		6		216		
03:45	4	12	130	480	11	25	81	323	15	37	211	803	
04:00	6		136		4		76		10		212		
04:15	8		145		6		70		14		215		
04:30	21		103		7		81		28		184		
04:45	30	65	115	499	7	24	93	320	37	89	208	819	
05:00	31		139		11		68		42		207		
05:15	39		143		11		61		50		204		
05:30	67		111		22		89		89		200		
05:45	62	199	113	506	20	64	71	289	82	263	184	795	
06:00	78		115		31		81		109		196		
06:15	97		105		47		67		144		172		
06:30	112		107		41		71		153		178		
06:45	118	405	80	407	55	174	76	295	173	579	156	702	
07:00	90		111		50		56		140		167		
07:15	75		110		72		63		147		173		
07:30	114		91		66		56		180		147		
07:45	117	396	59	371	78	266	61	236	195	662	120	607	
08:00	119		62		73		63		192		125		
08:15	110		67		66		61		176		128		
08:30	98		64		86		48		184		112		
08:45	95	422	61	254	70	295	32	204	165	717	93	458	
09:00	80		71		66		43		146		114		
09:15	94		56		53		52		147		108		
09:30	89		61		55		25		144		86		
09:45	93	356	54	242	65	239	45	165	158	595	99	407	
10:00	82		42		54		48		136		90		
10:15	82		42		56		37		138		79		
10:30	106		37		56		26		162		63		
10:45	57	327	24	145	66	232	26	137	123	559	50	282	
11:00	93		33		65		28		158		61		
11:15	106		26		74		24		180		50		
11:30	99		15		71		17		170		32		
11:45	121	419	14	88	51	261	18	87	172	680	32	175	
Total	2731		4114		1703		2986		4434		7100		
Percent	61.6%		57.9%		38.4%		42.1%						
Day Total		6845				4689				11534			
Peak	07:30		03:30		07:45		03:15		07:45		03:30		
Vol.	460		532		303		331		747		854		
P.H.F.	0.966		0.917		0.881		0.871		0.958		0.988		

PRECISION
D A T A
INDUSTRIES, LLC
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Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	2	4	16	21	7	3	**1**	0	0	0	0	0	0	54	31	26
01:00	0	3	8	14	8	0	1	0	0	0	0	0	0	34	31	27
02:00	0	2	8	6	2	3	0	0	0	0	0	0	0	21	34	26
03:00	0	1	6	9	5	1	0	0	0	0	0	0	0	22	32	27
04:00	1	13	16	19	8	**6**	0	0	0	0	0	0	0	63	32	25
05:00	7	24	57	50	**27**	5	1	0	0	0	0	0	0	171	31	24
06:00	25	101	184	74	16	1	0	0	0	0	0	0	0	401	27	21
07:00	14	77	**203**	97	23	5	1	0	0	0	0	0	0	**420**	28	23
08:00	25	96	179	90	20	2	0	0	0	0	0	0	0	412	27	22
09:00	18	90	179	81	17	1	0	0	0	0	0	0	0	386	27	22
10:00	15	41	133	**107**	26	4	1	0	0	0	0	0	0	327	29	23
11:00	**36**	**119**	153	77	21	0	0	0	0	0	0	0	0	406	27	21
12 PM	60	136	176	49	5	1	0	0	0	0	0	0	0	427	24	19
13:00	62	104	182	37	10	2	0	0	0	0	0	0	0	397	24	19
14:00	51	83	197	84	13	2	1	0	0	0	0	0	0	431	27	21
15:00	70	123	232	59	12	0	0	0	0	0	0	0	0	496	24	20
16:00	90	154	208	54	16	2	0	0	0	0	0	0	0	524	24	19
17:00	62	129	177	70	8	1	0	0	0	0	0	0	0	447	25	20
18:00	64	145	157	51	11	0	0	0	0	0	0	0	0	428	24	19
19:00	19	67	145	84	10	4	0	0	0	0	0	0	0	329	27	22
20:00	10	48	117	81	13	3	0	0	0	0	0	0	0	272	28	23
21:00	6	19	59	86	24	6	3	0	0	0	0	0	0	203	30	25
22:00	1	8	34	51	23	3	0	0	0	0	0	0	0	120	31	26
23:00	0	5	24	19	20	1	1	0	0	0	0	0	0	70	32	26
Total	638	1592	2850	1370	345	56	10	0	0	0	0	0	0	6861		
%	9.3%	23.2%	41.5%	20.0%	5.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	07:00	10:00	05:00	04:00	00:00							07:00		
Vol.	36	119	203	107	27	6	1							420		
PM Peak	16:00	16:00	15:00	21:00	21:00	21:00	21:00							16:00		
Vol.	90	154	232	86	24	6	3							524		

Pecent

15th Percentile : 16 MPH
50th Percentile : 22 MPH
85th Percentile : 27 MPH
95th Percentile : 30 MPH

Stats

10 MPH Pace Speed : 15-24 MPH
Number in Pace : 4442
Percent in Pace : 64.7%
Number of Vehicles > 25 MPH : 1507
Percent of Vehicles > 25 MPH : 22.0%
Mean Speed(Average) : 21 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Coggeshall Street
west of North Front Street
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81676 D-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	1	13	21	12	**5**	1	0	0	0	0	0	0	53	33	28
01:00	0	3	10	10	11	2	**3**	0	0	0	0	0	0	39	34	28
02:00	1	1	8	15	9	4	0	0	0	0	0	0	0	38	33	28
03:00	1	0	0	6	3	2	0	0	0	0	0	0	0	12	32	27
04:00	0	5	16	25	13	4	1	**1**	0	0	0	0	0	65	32	27
05:00	8	36	54	65	**32**	3	1	0	0	0	0	0	0	199	30	24
06:00	27	114	151	84	24	4	0	1	0	0	0	0	0	405	28	21
07:00	26	81	158	**105**	20	4	2	0	0	0	0	0	0	396	28	22
08:00	**32**	76	**184**	104	23	2	1	0	0	0	0	0	0	**422**	28	22
09:00	4	71	155	104	20	2	0	0	0	0	0	0	0	356	28	23
10:00	14	44	153	84	28	2	2	0	0	0	0	0	0	327	28	23
11:00	24	**117**	173	87	17	1	0	0	0	0	0	0	0	419	27	21
12 PM	31	95	164	61	12	0	0	0	0	0	0	0	0	363	26	21
13:00	38	79	162	59	10	0	0	0	0	0	0	0	0	348	26	20
14:00	38	95	174	**83**	21	0	0	0	0	0	0	0	0	411	27	21
15:00	**89**	112	205	61	12	1	0	0	0	0	0	0	0	480	25	19
16:00	64	121	**226**	75	12	1	0	0	0	0	0	0	0	499	25	20
17:00	63	**165**	195	74	8	1	0	0	0	0	0	0	0	**506**	25	20
18:00	89	107	154	47	10	0	0	0	0	0	0	0	0	407	24	18
19:00	32	93	172	68	6	0	0	0	0	0	0	0	0	371	26	21
20:00	9	51	121	56	16	1	0	0	0	0	0	0	0	254	28	22
21:00	8	31	89	81	**27**	**6**	0	0	0	0	0	0	0	242	29	24
22:00	4	9	42	61	22	4	**3**	0	0	0	0	0	0	145	31	26
23:00	0	0	27	39	19	2	1	0	0	0	0	0	0	88	32	27
Total	602	1507	2806	1475	387	51	15	2	0	0	0	0	0	6845		
%	8.8%	22.0%	41.0%	21.5%	5.7%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	08:00	07:00	05:00	00:00	01:00	04:00						08:00		
Vol.	32	117	184	105	32	5	3	1						422		
PM Peak	15:00	17:00	16:00	14:00	21:00	21:00	22:00							17:00		
Vol.	89	165	226	83	27	6	3							506		

Pecent

15th Percentile : 16 MPH
50th Percentile : 22 MPH
85th Percentile : 28 MPH
95th Percentile : 31 MPH

Stats

10 MPH Pace Speed : 15-24 MPH
Number in Pace : 4313
Percent in Pace : 63.0%
Number of Vehicles > 25 MPH : 1635
Percent of Vehicles > 25 MPH : 23.9%
Mean Speed(Average) : 21 MPH

PRECISION
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Coggeshall Street
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81676 D-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	1	1	10	19	11	**3**	0	**1**	0	0	0	0	0	46	33	28
01:00	0	0	9	16	8	1	**2**	0	**2**	0	0	0	0	38	33	29
02:00	0	1	4	7	8	1	0	0	0	0	0	0	0	21	32	28
03:00	2	0	6	6	3	2	1	1	0	0	0	0	0	21	35	26
04:00	0	2	7	8	8	2	1	0	0	0	0	0	0	28	33	28
05:00	2	8	19	25	11	3	0	0	0	0	0	0	0	68	31	25
06:00	4	25	73	50	13	3	0	0	0	0	0	0	0	168	29	24
07:00	6	47	125	67	17	3	0	0	0	0	0	0	0	265	28	23
08:00	3	**58**	142	**87**	11	2	0	0	0	0	0	0	0	**303**	28	23
09:00	8	49	123	53	10	0	1	0	0	0	0	0	0	244	27	22
10:00	**12**	51	123	79	**23**	1	0	0	0	0	0	0	0	289	28	23
11:00	7	45	**144**	49	4	0	0	0	0	0	0	0	0	249	26	22
12 PM	10	70	126	40	5	1	0	0	0	0	0	0	0	252	25	21
13:00	9	69	162	43	10	1	0	0	0	0	0	0	0	294	26	22
14:00	3	55	165	**69**	8	3	0	0	0	0	0	0	0	**303**	27	23
15:00	17	67	158	41	5	1	0	0	0	0	0	0	0	289	25	21
16:00	22	61	**170**	39	10	0	**1**	0	0	0	0	0	0	303	25	21
17:00	18	64	145	35	7	1	0	0	0	0	0	0	0	270	25	21
18:00	**23**	**75**	134	39	7	0	0	0	0	0	0	0	0	278	25	20
19:00	9	61	96	36	11	1	0	0	0	0	0	0	0	214	27	21
20:00	2	30	85	66	15	2	0	0	0	0	0	0	0	200	28	24
21:00	4	35	70	53	**23**	4	0	0	0	0	0	0	0	189	29	24
22:00	2	12	41	41	15	4	1	0	0	0	0	0	0	116	30	25
23:00	2	5	17	28	12	**6**	0	0	0	0	0	0	0	70	32	26
Total	166	891	2154	996	255	45	7	2	2	0	0	0	0	4518		
%	3.7%	19.7%	47.7%	22.0%	5.6%	1.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	11:00	08:00	10:00	00:00	01:00	00:00	01:00					08:00		
Vol.	12	58	144	87	23	3	2	1	2					303		
PM Peak	18:00	18:00	16:00	14:00	21:00	23:00	16:00							14:00		
Vol.	23	75	170	69	23	6	1							303		

Pecent

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3150
Percent in Pace :	69.7%
Number of Vehicles > 25 MPH :	1107
Percent of Vehicles > 25 MPH :	24.5%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	4	7	26	10	3	**2**	**1**	0	0	0	0	0	53	33	28
01:00	0	1	5	15	11	2	0	0	0	0	0	0	0	34	33	28
02:00	0	2	7	12	12	3	0	0	0	0	0	0	0	36	33	28
03:00	0	1	6	7	7	2	1	0	**1**	0	0	0	0	25	34	29
04:00	0	5	2	11	5	1	0	0	0	0	0	0	0	24	31	26
05:00	0	7	15	23	10	**8**	1	0	0	0	0	0	0	64	34	27
06:00	3	38	76	46	10	1	0	0	0	0	0	0	0	174	28	23
07:00	2	51	126	**68**	**19**	0	0	0	0	0	0	0	0	266	28	23
08:00	**20**	**57**	**149**	60	9	0	0	0	0	0	0	0	0	**295**	27	21
09:00	4	49	112	59	13	2	0	0	0	0	0	0	0	239	28	23
10:00	1	57	109	53	12	0	0	0	0	0	0	0	0	232	27	22
11:00	8	54	138	48	13	0	0	0	0	0	0	0	0	261	27	22
12 PM	17	86	158	55	11	0	0	0	0	0	0	0	0	**327**	26	21
13:00	13	65	143	59	9	**2**	0	**1**	0	0	0	0	0	292	27	22
14:00	9	64	149	**70**	16	2	**1**	0	0	0	0	0	0	311	27	22
15:00	13	62	**175**	65	8	0	0	0	0	0	0	0	0	323	26	22
16:00	15	77	162	57	9	0	0	0	0	0	0	0	0	320	26	21
17:00	14	68	148	50	9	0	0	0	0	0	0	0	0	289	26	21
18:00	**25**	**93**	131	35	11	0	0	0	0	0	0	0	0	295	25	20
19:00	10	72	101	41	10	2	0	0	0	0	0	0	0	236	27	21
20:00	5	39	96	52	10	2	0	0	0	0	0	0	0	204	28	23
21:00	2	18	74	58	12	1	0	0	0	0	0	0	0	165	28	24
22:00	1	20	44	49	**20**	2	0	0	0	0	**1**	0	0	137	30	25
23:00	0	4	29	37	14	2	1	0	0	0	0	0	0	87	31	26
Total	162	994	2162	1056	270	35	6	2	1	0	1	0	0	4689		
%	3.5%	21.2%	46.1%	22.5%	5.8%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	07:00	05:00	00:00	00:00	03:00					08:00		
Vol.	20	57	149	68	19	8	2	1	1					295		
PM Peak	18:00	18:00	15:00	14:00	22:00	13:00	14:00	13:00			22:00			12:00		
Vol.	25	93	175	70	20	2	1	1			1			327		

Pecent

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3218
Percent in Pace :	68.6%
Number of Vehicles > 25 MPH :	1159
Percent of Vehicles > 25 MPH :	24.7%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	2	45	7	0	0	0	0	0	0	0	0	0	0	54
01:00	1	28	4	0	1	0	0	0	0	0	0	0	0	34
02:00	0	17	0	0	3	0	0	0	1	0	0	0	0	21
03:00	0	16	3	0	2	1	0	0	0	0	0	0	0	22
04:00	1	44	14	0	4	0	0	0	0	0	0	0	0	63
05:00	2	126	34	0	5	3	0	1	0	0	0	0	0	171
06:00	5	311	50	6	19	8	0	0	2	0	0	0	0	401
07:00	3	301	88	3	14	8	0	3	0	0	0	0	0	420
08:00	1	319	66	2	17	4	0	2	1	0	0	0	0	412
09:00	5	261	94	1	19	4	0	2	0	0	0	0	0	386
10:00	4	227	72	3	14	4	0	1	2	0	0	0	0	327
11:00	13	293	71	1	20	5	0	3	0	0	0	0	0	406
12 PM	6	325	71	1	15	5	0	3	1	0	0	0	0	427
13:00	9	294	74	1	13	5	0	1	0	0	0	0	0	397
14:00	9	325	72	3	16	3	0	3	0	0	0	0	0	431
15:00	14	363	87	1	21	4	0	6	0	0	0	0	0	496
16:00	9	407	79	1	17	5	0	4	1	1	0	0	0	524
17:00	9	348	77	1	11	1	0	0	0	0	0	0	0	447
18:00	4	344	62	3	10	4	0	0	1	0	0	0	0	428
19:00	5	264	50	1	9	0	0	0	0	0	0	0	0	329
20:00	2	223	36	0	4	7	0	0	0	0	0	0	0	272
21:00	2	154	41	0	5	1	0	0	0	0	0	0	0	203
22:00	0	100	16	0	2	2	0	0	0	0	0	0	0	120
23:00	1	47	18	0	3	1	0	0	0	0	0	0	0	70
Total	107	5182	1186	28	244	75	0	29	9	1	0	0	0	6861
Percent	1.6%	75.5%	17.3%	0.4%	3.6%	1.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	09:00	06:00	11:00	06:00		07:00	06:00					07:00
Vol.	13	319	94	6	20	8		3	2					420
PM Peak	15:00	16:00	15:00	14:00	15:00	20:00		15:00	12:00	16:00				16:00
Vol.	14	407	87	3	21	7		6	1	1				524

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Coggeshall Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	1	33	18	0	1	0	0	0	0	0	0	0	0	53
01:00	0	23	14	0	1	1	0	0	0	0	0	0	0	39
02:00	0	30	6	0	2	0	0	0	0	0	0	0	0	38
03:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
04:00	0	35	19	0	10	1	0	0	0	0	0	0	0	65
05:00	5	137	41	1	13	2	0	0	0	0	0	0	0	199
06:00	2	300	71	3	15	12	0	1	1	0	0	0	0	405
07:00	5	287	68	3	23	8	0	1	0	0	1	0	0	396
08:00	4	304	82	1	18	9	0	2	2	0	0	0	0	422
09:00	2	227	99	2	21	2	0	1	2	0	0	0	0	356
10:00	2	218	74	2	24	4	0	2	1	0	0	0	0	327
11:00	13	304	79	1	15	4	0	3	0	0	0	0	0	419
12 PM	4	265	80	1	7	4	0	2	0	0	0	0	0	363
13:00	6	274	55	1	7	2	0	1	1	1	0	0	0	348
14:00	9	308	72	3	13	2	0	4	0	0	0	0	0	411
15:00	11	361	79	2	17	6	0	3	1	0	0	0	0	480
16:00	9	389	78	0	18	2	0	3	0	0	0	0	0	499
17:00	11	404	72	0	14	1	0	2	1	1	0	0	0	506
18:00	5	327	62	2	7	3	0	1	0	0	0	0	0	407
19:00	10	289	55	1	10	4	0	1	0	0	0	0	1	371
20:00	3	194	44	2	4	7	0	0	0	0	0	0	0	254
21:00	3	190	42	0	7	0	0	0	0	0	0	0	0	242
22:00	2	118	20	1	1	2	0	1	0	0	0	0	0	145
23:00	0	68	17	0	1	2	0	0	0	0	0	0	0	88
Total	107	5095	1248	26	250	78	0	28	9	2	1	0	1	6845
Percent	1.6%	74.4%	18.2%	0.4%	3.7%	1.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	09:00	06:00	10:00	06:00		11:00	08:00		07:00			08:00
Vol.	13	304	99	3	24	12		3	2		1			422
PM Peak	15:00	17:00	12:00	14:00	16:00	20:00		14:00	13:00	13:00			19:00	17:00
Vol.	11	404	80	3	18	7		4	1	1			1	506

PRECISION
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west of North Front Street
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81676 D-A class
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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	1	31	11	0	3	0	0	0	0	0	0	0	0	46
01:00	1	27	9	0	1	0	0	0	0	0	0	0	0	38
02:00	0	12	8	0	1	0	0	0	0	0	0	0	0	21
03:00	0	13	6	1	1	0	0	0	0	0	0	0	0	21
04:00	0	21	4	0	2	0	0	1	0	0	0	0	0	28
05:00	0	45	15	0	6	1	0	1	0	0	0	0	0	68
06:00	0	121	37	0	9	0	0	1	0	0	0	0	0	168
07:00	1	188	48	1	24	0	0	3	0	0	0	0	0	265
08:00	1	222	57	1	19	0	0	3	0	0	0	0	0	303
09:00	0	170	54	2	17	0	0	1	0	0	0	0	0	244
10:00	2	210	54	1	19	1	0	2	0	0	0	0	0	289
11:00	2	176	56	0	14	0	0	1	0	0	0	0	0	249
12 PM	0	202	33	3	12	2	0	0	0	0	0	0	0	252
13:00	0	219	61	2	9	2	0	1	0	0	0	0	0	294
14:00	2	231	52	2	13	1	0	1	1	0	0	0	0	303
15:00	2	237	40	2	8	0	0	0	0	0	0	0	0	289
16:00	0	251	40	1	9	1	0	1	0	0	0	0	0	303
17:00	1	213	50	0	6	0	0	0	0	0	0	0	0	270
18:00	7	216	48	0	5	0	0	2	0	0	0	0	0	278
19:00	0	186	24	0	4	0	0	0	0	0	0	0	0	214
20:00	1	150	38	1	10	0	0	0	0	0	0	0	0	200
21:00	0	154	30	0	5	0	0	0	0	0	0	0	0	189
22:00	0	89	22	0	5	0	0	0	0	0	0	0	0	116
23:00	0	51	15	0	4	0	0	0	0	0	0	0	0	70
Total	21	3435	812	17	206	8	0	18	1	0	0	0	0	4518
Percent	0.5%	76.0%	18.0%	0.4%	4.6%	0.2%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	08:00	09:00	07:00	05:00		07:00						08:00
Vol.	2	222	57	2	24	1		3						303
PM Peak	18:00	16:00	13:00	12:00	14:00	12:00		18:00	14:00					14:00
Vol.	7	251	61	3	13	2		2	1					303

PRECISION
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Coggeshall Street
west of North Front Street
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Client: VHB/J. Quitter

81676 D-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	39	14	0	0	0	0	0	0	0	0	0	0	53
01:00	0	21	13	0	0	0	0	0	0	0	0	0	0	34
02:00	0	23	10	0	3	0	0	0	0	0	0	0	0	36
03:00	1	16	7	0	0	1	0	0	0	0	0	0	0	25
04:00	0	16	3	1	3	0	0	1	0	0	0	0	0	24
05:00	0	43	16	0	5	0	0	0	0	0	0	0	0	64
06:00	0	133	31	0	8	0	1	1	0	0	0	0	0	174
07:00	1	216	33	0	13	0	0	2	1	0	0	0	0	266
08:00	1	219	63	1	10	1	0	0	0	0	0	0	0	295
09:00	0	165	56	2	12	2	0	2	0	0	0	0	0	239
10:00	0	174	42	3	12	1	0	0	0	0	0	0	0	232
11:00	3	190	56	1	11	0	0	0	0	0	0	0	0	261
12 PM	2	248	65	0	9	1	0	0	1	0	0	1	0	327
13:00	2	199	75	1	13	0	0	2	0	0	0	0	0	292
14:00	4	230	56	3	14	2	0	2	0	0	0	0	0	311
15:00	1	254	52	1	14	0	0	1	0	0	0	0	0	323
16:00	3	249	54	1	11	2	0	0	0	0	0	0	0	320
17:00	2	234	44	0	7	0	0	2	0	0	0	0	0	289
18:00	4	240	42	0	8	0	0	1	0	0	0	0	0	295
19:00	2	188	40	1	5	0	0	0	0	0	0	0	0	236
20:00	0	158	33	1	8	1	0	3	0	0	0	0	0	204
21:00	5	125	27	1	6	0	0	0	1	0	0	0	0	165
22:00	0	109	20	0	7	0	0	1	0	0	0	0	0	137
23:00	0	67	18	0	2	0	0	0	0	0	0	0	0	87
Total	31	3556	870	17	181	11	1	18	3	0	0	1	0	4689
Percent	0.7%	75.8%	18.6%	0.4%	3.9%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	08:00	10:00	07:00	09:00	06:00	07:00	07:00					08:00
Vol.	3	219	63	3	13	2	1	2	1					295
PM Peak	21:00	15:00	13:00	14:00	14:00	14:00		20:00	12:00			12:00		12:00
Vol.	5	254	75	3	14	2		3	1			1		327

Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 D-B volume
Site Code: 10111.31

Start	NB				SB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	17		100		12		77		29		177		
12:15	9		116		5		70		14		186		
12:30	5		109		10		78		15		187		
12:45	10	41	98	423	6	33	78	303	16	74	176	726	
01:00	8		100		6		67		14		167		
01:15	9		90		5		76		14		166		
01:30	1		105		3		58		4		163		
01:45	5	23	89	384	4	18	73	274	9	41	162	658	
02:00	4		95		4		72		8		167		
02:15	4		109		4		62		8		171		
02:30	6		94		2		58		8		152		
02:45	4	18	106	404	4	14	77	269	8	32	183	673	
03:00	4		111		4		91		8		202		
03:15	2		106		7		79		9		185		
03:30	4		104		6		90		10		194		
03:45	6	16	116	437	4	21	86	346	10	37	202	783	
04:00	5		98		5		106		10		204		
04:15	8		98		6		87		14		185		
04:30	9		118		2		100		11		218		
04:45	17	39	92	406	11	24	104	397	28	63	196	803	
05:00	29		110		13		87		42		197		
05:15	19		74		20		99		39		173		
05:30	29		86		23		84		52		170		
05:45	30	107	77	347	17	73	67	337	47	180	144	684	
06:00	37		78		32		68		69		146		
06:15	41		81		35		68		76		149		
06:30	59		77		46		60		105		137		
06:45	48	185	93	329	47	160	76	272	95	345	169	601	
07:00	70		73		58		59		128		132		
07:15	66		78		44		51		110		129		
07:30	71		65		56		58		127		123		
07:45	89	296	56	272	71	229	36	204	160	525	92	476	
08:00	82		60		93		63		175		123		
08:15	69		51		75		47		144		98		
08:30	93		59		67		39		160		98		
08:45	68	312	47	217	68	303	31	180	136	615	78	397	
09:00	69		55		69		37		138		92		
09:15	74		43		57		30		131		73		
09:30	87		30		71		21		158		51		
09:45	88	318	33	161	74	271	27	115	162	589	60	276	
10:00	77		27		63		26		140		53		
10:15	81		24		77		25		158		49		
10:30	90		38		67		18		157		56		
10:45	82	330	28	117	68	275	19	88	150	605	47	205	
11:00	82		26		73		21		155		47		
11:15	82		23		71		24		153		47		
11:30	92		12		66		12		158		24		
11:45	126	382	20	81	69	279	7	64	195	661	27	145	
Total	2067		3578		1700		2849		3767		6427		
Percent	54.9%		55.7%		45.1%		44.3%						
Day Total		5645				4549				10194			
Peak	11:00		03:00		07:45		04:00		11:00		03:45		
Vol.	382		437		306		397		661		809		
P.H.F.	0.758		0.942		0.823		0.936		0.847		0.928		

Purchase Street
south of Logan Street
City, State: New Bedford, MA
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81676 D-B volume
Site Code: 10111.31

Start	NB				SB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	11		108		11		63		22		171		
12:15	8		86		8		71		16		157		
12:30	5		113		7		50		12		163		
12:45	8	32	90	397	4	30	37	221	12	62	127	618	
01:00	10		99		6		68		16		167		
01:15	11		81		3		89		14		170		
01:30	3		83		1		88		4		171		
01:45	4	28	121	384	7	17	87	332	11	45	208	716	
02:00	6		87		6		69		12		156		
02:15	8		101		2		77		10		178		
02:30	3		107		6		64		9		171		
02:45	3	20	96	391	4	18	82	292	7	38	178	683	
03:00	0		100		6		78		6		178		
03:15	5		88		8		92		13		180		
03:30	5		90		4		97		9		187		
03:45	5	15	95	373	2	20	94	361	7	35	189	734	
04:00	13		109		4		88		17		197		
04:15	10		101		5		74		15		175		
04:30	12		116		5		95		17		211		
04:45	11	46	112	438	6	20	96	353	17	66	208	791	
05:00	19		108		10		101		29		209		
05:15	21		103		10		83		31		186		
05:30	30		93		22		82		52		175		
05:45	32	102	86	390	23	65	65	331	55	167	151	721	
06:00	39		79		16		66		55		145		
06:15	40		73		29		85		69		158		
06:30	51		66		49		75		100		141		
06:45	65	195	91	309	44	138	62	288	109	333	153	597	
07:00	68		82		41		61		109		143		
07:15	73		76		49		52		122		128		
07:30	73		77		54		52		127		129		
07:45	80	294	44	279	75	219	46	211	155	513	90	490	
08:00	97		64		68		42		165		106		
08:15	80		52		77		48		157		100		
08:30	76		77		69		49		145		126		
08:45	77	330	46	239	71	285	40	179	148	615	86	418	
09:00	82		58		76		29		158		87		
09:15	65		46		72		28		137		74		
09:30	94		36		55		42		149		78		
09:45	80	321	38	178	66	269	17	116	146	590	55	294	
10:00	78		34		58		23		136		57		
10:15	98		26		63		26		161		52		
10:30	85		30		77		22		162		52		
10:45	91	352	22	112	41	239	18	89	132	591	40	201	
11:00	79		20		63		14		142		34		
11:15	97		23		41		19		138		42		
11:30	113		14		55		9		168		23		
11:45	119	408	12	69	62	221	9	51	181	629	21	120	
Total	2143		3559		1541		2824		3684		6383		
Percent	58.2%		55.8%		41.8%		44.2%						
Day Total		5702				4365				10067			
Peak	11:00		04:30		08:15		04:30		11:00		04:30		
Vol.	408		439		293		375		629		814		
P.H.F.	0.857		0.946		0.951		0.928		0.869		0.964		

PRECISION
D A T A
INDUSTRIES, LLC
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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	3	8	22	7	**1**	0	0	0	0	0	0	0	41	30	26
01:00	0	1	9	12	1	0	0	0	0	0	0	0	0	23	28	25
02:00	0	1	3	13	1	0	0	0	0	0	0	0	0	18	28	26
03:00	0	2	2	10	2	0	0	0	0	0	0	0	0	16	29	26
04:00	0	7	12	16	4	0	0	0	0	0	0	0	0	39	29	24
05:00	1	4	51	42	8	1	0	0	0	0	0	0	0	107	29	25
06:00	0	14	90	71	10	0	0	0	0	0	0	0	0	185	28	24
07:00	1	17	146	**117**	14	1	0	0	0	0	0	0	0	296	28	24
08:00	0	24	160	110	**18**	0	0	0	0	0	0	0	0	312	28	24
09:00	11	70	166	65	6	0	0	0	0	0	0	0	0	318	26	22
10:00	8	73	160	79	9	1	0	0	0	0	0	0	0	330	27	22
11:00	**17**	**101**	**200**	57	6	1	0	0	0	0	0	0	0	**382**	25	21
12 PM	49	**121**	201	47	5	0	0	0	0	0	0	0	0	423	24	20
13:00	29	103	200	48	4	0	0	0	0	0	0	0	0	384	24	20
14:00	**55**	94	202	51	2	0	0	0	0	0	0	0	0	404	24	20
15:00	44	104	208	76	4	1	0	0	0	0	0	0	0	**437**	25	20
16:00	21	96	**225**	58	6	0	0	0	0	0	0	0	0	406	25	21
17:00	12	42	174	**109**	10	0	0	0	0	0	0	0	0	347	28	23
18:00	9	45	168	95	10	2	0	0	0	0	0	0	0	329	28	23
19:00	1	25	129	103	**14**	0	0	0	0	0	0	0	0	272	28	24
20:00	0	12	99	97	8	1	0	0	0	0	0	0	0	217	28	24
21:00	0	7	69	74	10	1	0	0	0	0	0	0	0	161	29	25
22:00	0	4	38	64	10	1	0	0	0	0	0	0	0	117	29	26
23:00	0	5	21	38	14	**3**	0	0	0	0	0	0	0	81	31	26
Total	258	975	2741	1474	183	14	0	0	0	0	0	0	0	5645		
%	4.6%	17.3%	48.6%	26.1%	3.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	07:00	08:00	00:00								11:00		
Vol.	17	101	200	117	18	1								382		
PM Peak	14:00	12:00	16:00	17:00	19:00	23:00								15:00		
Vol.	55	121	225	109	14	3								437		

Pecent

15th Percentile :	18 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	4215
Percent in Pace :	74.7%
Number of Vehicles > 25 MPH :	1376
Percent of Vehicles > 25 MPH :	24.4%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	9	14	8	1	0	0	0	0	0	0	0	32	31	27
01:00	0	1	5	14	6	**2**	0	0	0	0	0	0	0	28	32	27
02:00	0	0	9	8	3	0	0	0	0	0	0	0	0	20	29	25
03:00	0	1	2	11	1	0	0	0	0	0	0	0	0	15	29	26
04:00	0	1	19	20	5	1	0	0	0	0	0	0	0	46	29	26
05:00	0	4	32	57	8	1	0	0	0	0	0	0	0	102	29	26
06:00	3	16	83	83	9	1	0	0	0	0	0	0	0	195	28	24
07:00	4	13	104	**142**	**30**	1	0	0	0	0	0	0	0	294	29	25
08:00	10	36	163	110	9	2	0	0	0	0	0	0	0	330	28	23
09:00	3	85	184	44	4	1	0	0	0	0	0	0	0	321	25	21
10:00	15	68	202	62	5	0	0	0	0	0	0	0	0	352	26	21
11:00	**41**	**103**	**217**	44	1	1	0	0	0	0	0	**1**	0	**408**	24	20
12 PM	56	**128**	187	24	2	0	0	0	0	0	0	0	0	397	24	19
13:00	16	108	200	59	1	0	0	0	0	0	0	0	0	384	25	21
14:00	18	105	205	59	3	**1**	0	0	0	0	0	0	0	391	25	21
15:00	30	90	181	66	6	0	0	0	0	0	0	0	0	373	26	21
16:00	**58**	76	**219**	82	3	0	0	0	0	0	0	0	0	**438**	26	20
17:00	11	53	206	115	4	1	0	0	0	0	0	0	0	390	27	23
18:00	2	21	146	**118**	**21**	0	0	**1**	0	0	0	0	0	309	28	24
19:00	2	27	133	103	13	1	0	0	0	0	0	0	0	279	28	24
20:00	11	31	116	73	7	1	0	0	0	0	0	0	0	239	27	23
21:00	4	19	81	64	9	1	0	0	0	0	0	0	0	178	28	24
22:00	0	7	50	51	3	0	**1**	0	0	0	0	0	0	112	28	24
23:00	0	3	18	37	10	1	0	0	0	0	0	0	0	69	30	26
Total	284	996	2771	1460	171	17	1	1	0	0	0	1	0	5702		
%	5.0%	17.5%	48.6%	25.6%	3.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	07:00	07:00	01:00						11:00		11:00		
Vol.	41	103	217	142	30	2						1		408		
PM Peak	16:00	12:00	16:00	18:00	18:00	14:00	22:00	18:00						16:00		
Vol.	58	128	219	118	21	1	1	1						438		

Pecent

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	4231
Percent in Pace :	74.2%
Number of Vehicles > 25 MPH :	1359
Percent of Vehicles > 25 MPH :	23.8%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	1	1	13	17	1	0	0	0	0	0	0	0	0	33	28	24
01:00	0	1	5	9	2	1	0	0	0	0	0	0	0	18	29	26
02:00	0	1	0	12	1	0	0	0	0	0	0	0	0	14	29	26
03:00	0	0	10	8	2	1	0	0	0	0	0	0	0	21	29	25
04:00	0	2	9	10	3	0	0	0	0	0	0	0	0	24	29	25
05:00	4	6	34	22	6	1	0	0	0	0	0	0	0	73	28	24
06:00	3	8	56	77	15	1	0	0	0	0	0	0	0	160	29	25
07:00	1	16	101	81	**27**	**3**	0	0	0	0	0	0	0	229	29	25
08:00	11	43	135	**93**	21	0	0	0	0	0	0	0	0	**303**	28	23
09:00	**24**	52	138	48	8	1	0	0	0	0	0	0	0	271	26	21
10:00	8	55	**168**	39	5	0	0	0	0	0	0	0	0	275	25	22
11:00	6	**56**	158	50	8	1	0	0	0	0	0	0	0	279	26	22
12 PM	19	102	147	31	4	0	0	0	0	0	0	0	0	303	24	20
13:00	13	58	144	53	6	0	0	0	0	0	0	0	0	274	26	21
14:00	11	90	135	27	5	1	0	0	0	0	0	0	0	269	24	21
15:00	**35**	**112**	156	37	6	0	0	0	0	0	0	0	0	346	24	20
16:00	28	96	**220**	48	5	0	0	0	0	0	0	0	0	**397**	24	20
17:00	4	69	178	**75**	10	1	0	0	0	0	0	0	0	337	27	22
18:00	0	59	159	40	**11**	**3**	0	0	0	0	0	0	0	272	26	22
19:00	3	24	100	71	6	0	0	0	0	0	0	0	0	204	28	23
20:00	1	20	90	59	9	1	0	0	0	0	0	0	0	180	28	24
21:00	1	9	48	45	11	0	0	0	**1**	0	0	0	0	115	29	25
22:00	0	11	34	34	6	3	0	0	0	0	0	0	0	88	29	24
23:00	0	1	21	35	6	0	**1**	0	0	0	0	0	0	64	29	26
Total	173	892	2259	1021	184	18	1	0	1	0	0	0	0	4549		
%	3.8%	19.6%	49.7%	22.4%	4.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	10:00	08:00	07:00	07:00								08:00		
Vol.	24	56	168	93	27	3								303		
PM Peak	15:00	15:00	16:00	17:00	18:00	18:00	23:00		21:00					16:00		
Vol.	35	112	220	75	11	3	1		1					397		

Pecent

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3280
Percent in Pace :	72.1%
Number of Vehicles > 25 MPH :	1020
Percent of Vehicles > 25 MPH :	22.4%
Mean Speed(Average) :	22 MPH

PRECISION
D A T A
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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	1	8	12	6	**3**	0	0	0	0	0	0	0	30	32	27
01:00	0	1	3	9	4	0	0	0	0	0	0	0	0	17	30	27
02:00	0	0	4	12	2	0	0	0	0	0	0	0	0	18	29	26
03:00	0	1	5	9	4	1	0	0	0	0	0	0	0	20	31	27
04:00	0	2	5	8	5	0	0	0	0	0	0	0	0	20	31	26
05:00	1	5	23	27	8	1	0	0	0	0	0	0	0	65	29	25
06:00	3	4	48	68	15	0	0	0	0	0	0	0	0	138	29	25
07:00	2	13	82	**102**	**18**	2	0	0	0	0	0	0	0	219	29	25
08:00	1	40	139	87	16	2	0	0	0	0	0	0	0	**285**	28	23
09:00	9	**65**	**149**	41	5	0	0	0	0	0	0	0	0	269	25	21
10:00	13	62	123	37	3	1	0	0	0	0	0	0	0	239	25	21
11:00	**15**	57	110	33	5	1	0	0	0	0	0	0	0	221	25	21
12 PM	23	72	104	20	2	0	0	0	0	0	0	0	0	221	24	19
13:00	19	97	175	39	2	0	0	0	0	0	0	0	0	332	24	20
14:00	11	85	146	44	6	0	0	0	0	0	0	0	0	292	25	21
15:00	**24**	**107**	164	61	5	0	0	0	0	0	0	0	0	**361**	25	21
16:00	20	80	**197**	51	4	1	0	0	0	0	0	0	0	353	25	21
17:00	6	62	188	66	8	1	0	0	0	0	0	0	0	331	26	22
18:00	2	26	163	**86**	10	1	0	0	0	0	0	0	0	288	28	23
19:00	5	17	116	61	**12**	0	0	0	0	0	0	0	0	211	28	23
20:00	1	38	87	48	5	0	0	0	0	0	0	0	0	179	27	22
21:00	0	7	63	43	3	0	0	0	0	0	0	0	0	116	28	24
22:00	0	8	44	33	4	0	0	0	0	0	0	0	0	89	28	24
23:00	1	6	15	20	7	**2**	0	0	0	0	0	0	0	51	30	25
Total	156	856	2161	1017	159	16	0	0	0	0	0	0	0	4365		
%	3.6%	19.6%	49.5%	23.3%	3.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	09:00	07:00	07:00	00:00								08:00		
Vol.	15	65	149	102	18	3								285		
PM Peak	15:00	15:00	16:00	18:00	19:00	23:00								15:00		
Vol.	24	107	197	86	12	2								361		

Pecent

15th Percentile :	17 MPH
50th Percentile :	22 MPH
85th Percentile :	27 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3178
Percent in Pace :	72.8%
Number of Vehicles > 25 MPH :	988
Percent of Vehicles > 25 MPH :	22.6%
Mean Speed(Average) :	22 MPH

PRECISION
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Purchase Street
south of Logan Street
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Client: VHB/J. Quitter

81676 D-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	36	4	0	1	0	0	0	0	0	0	0	0	41
01:00	0	13	10	0	0	0	0	0	0	0	0	0	0	23
02:00	0	15	3	0	0	0	0	0	0	0	0	0	0	18
03:00	0	6	5	0	5	0	0	0	0	0	0	0	0	16
04:00	0	29	10	0	0	0	0	0	0	0	0	0	0	39
05:00	0	78	24	0	3	2	0	0	0	0	0	0	0	107
06:00	1	137	33	5	8	1	0	0	0	0	0	0	0	185
07:00	1	204	67	8	13	3	0	0	0	0	0	0	0	296
08:00	1	222	69	6	12	1	0	1	0	0	0	0	0	312
09:00	2	228	62	7	17	1	0	1	0	0	0	0	0	318
10:00	3	228	73	4	20	0	0	2	0	0	0	0	0	330
11:00	3	275	81	3	18	0	0	2	0	0	0	0	0	382
12 PM	4	315	81	4	17	2	0	0	0	0	0	0	0	423
13:00	6	271	82	7	17	0	0	1	0	0	0	0	0	384
14:00	2	297	76	6	20	1	0	2	0	0	0	0	0	404
15:00	5	314	84	9	23	0	0	2	0	0	0	0	0	437
16:00	4	301	76	4	15	3	0	3	0	0	0	0	0	406
17:00	2	265	63	5	12	0	0	0	0	0	0	0	0	347
18:00	5	251	66	0	7	0	0	0	0	0	0	0	0	329
19:00	1	206	60	0	4	0	0	1	0	0	0	0	0	272
20:00	0	175	39	0	2	0	0	1	0	0	0	0	0	217
21:00	1	120	33	0	7	0	0	0	0	0	0	0	0	161
22:00	0	88	24	0	4	1	0	0	0	0	0	0	0	117
23:00	0	70	10	0	1	0	0	0	0	0	0	0	0	81
Total	41	4144	1135	68	226	15	0	16	0	0	0	0	0	5645
Percent	0.7%	73.4%	20.1%	1.2%	4.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	07:00	10:00	07:00		10:00						11:00
Vol.	3	275	81	8	20	3		2						382
PM Peak	13:00	12:00	15:00	15:00	15:00	16:00		16:00						15:00
Vol.	6	315	84	9	23	3		3						437

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	24	8	0	0	0	0	0	0	0	0	0	0	32
01:00	0	19	9	0	0	0	0	0	0	0	0	0	0	28
02:00	0	14	5	0	1	0	0	0	0	0	0	0	0	20
03:00	0	8	4	0	3	0	0	0	0	0	0	0	0	15
04:00	0	29	14	0	3	0	0	0	0	0	0	0	0	46
05:00	0	66	28	1	7	0	0	0	0	0	0	0	0	102
06:00	1	129	49	7	7	1	0	1	0	0	0	0	0	195
07:00	1	203	62	10	17	1	0	0	0	0	0	0	0	294
08:00	3	217	89	9	11	0	0	1	0	0	0	0	0	330
09:00	1	222	71	6	18	2	0	1	0	0	0	0	0	321
10:00	2	234	76	7	27	1	1	3	1	0	0	0	0	352
11:00	5	295	82	5	19	0	0	2	0	0	0	0	0	408
12 PM	1	295	77	6	16	0	0	2	0	0	0	0	0	397
13:00	1	283	79	5	13	1	0	2	0	0	0	0	0	384
14:00	6	264	89	9	18	3	1	1	0	0	0	0	0	391
15:00	2	256	84	10	20	1	0	0	0	0	0	0	0	373
16:00	2	324	87	4	19	1	0	1	0	0	0	0	0	438
17:00	3	288	82	5	12	0	0	0	0	0	0	0	0	390
18:00	2	230	64	0	12	0	0	1	0	0	0	0	0	309
19:00	2	212	57	0	8	0	0	0	0	0	0	0	0	279
20:00	2	195	39	0	3	0	0	0	0	0	0	0	0	239
21:00	2	139	31	1	5	0	0	0	0	0	0	0	0	178
22:00	2	89	18	0	3	0	0	0	0	0	0	0	0	112
23:00	0	56	10	0	3	0	0	0	0	0	0	0	0	69
Total	38	4091	1214	85	245	11	2	15	1	0	0	0	0	5702
Percent	0.7%	71.7%	21.3%	1.5%	4.3%	0.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	08:00	07:00	10:00	09:00	10:00	10:00	10:00					11:00
Vol.	5	295	89	10	27	2	1	3	1					408
PM Peak	14:00	16:00	14:00	15:00	15:00	14:00	14:00	12:00						16:00
Vol.	6	324	89	10	20	3	1	2						438

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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	27	6	0	0	0	0	0	0	0	0	0	0	33
01:00	0	14	3	0	1	0	0	0	0	0	0	0	0	18
02:00	0	12	1	0	1	0	0	0	0	0	0	0	0	14
03:00	0	13	6	0	2	0	0	0	0	0	0	0	0	21
04:00	0	17	4	0	2	1	0	0	0	0	0	0	0	24
05:00	0	56	12	0	5	0	0	0	0	0	0	0	0	73
06:00	0	118	30	3	6	1	0	2	0	0	0	0	0	160
07:00	1	158	43	8	17	1	0	0	1	0	0	0	0	229
08:00	0	253	37	3	9	0	0	1	0	0	0	0	0	303
09:00	0	191	60	3	17	0	0	0	0	0	0	0	0	271
10:00	3	205	48	6	11	0	0	1	1	0	0	0	0	275
11:00	4	213	51	3	7	1	0	0	0	0	0	0	0	279
12 PM	2	243	42	4	10	1	0	1	0	0	0	0	0	303
13:00	4	202	53	5	6	2	0	2	0	0	0	0	0	274
14:00	3	207	44	5	10	0	0	0	0	0	0	0	0	269
15:00	3	269	54	4	14	0	0	2	0	0	0	0	0	346
16:00	3	322	55	4	13	0	0	0	0	0	0	0	0	397
17:00	1	279	45	5	7	0	0	0	0	0	0	0	0	337
18:00	5	209	53	3	1	0	0	1	0	0	0	0	0	272
19:00	1	165	34	0	4	0	0	0	0	0	0	0	0	204
20:00	1	153	18	0	6	1	0	1	0	0	0	0	0	180
21:00	1	95	17	0	2	0	0	0	0	0	0	0	0	115
22:00	0	69	18	0	1	0	0	0	0	0	0	0	0	88
23:00	0	52	11	0	1	0	0	0	0	0	0	0	0	64
Total	32	3542	745	56	153	8	0	11	2	0	0	0	0	4549
Percent	0.7%	77.9%	16.4%	1.2%	3.4%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	09:00	07:00	07:00	04:00		06:00	07:00					08:00
Vol.	4	253	60	8	17	1		2	1					303
PM Peak	18:00	16:00	16:00	13:00	15:00	13:00		13:00						16:00
Vol.	5	322	55	5	14	2		2						397

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Purchase Street
south of Logan Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	1	19	10	0	0	0	0	0	0	0	0	0	0	30
01:00	0	12	5	0	0	0	0	0	0	0	0	0	0	17
02:00	0	11	6	0	1	0	0	0	0	0	0	0	0	18
03:00	0	13	5	0	2	0	0	0	0	0	0	0	0	20
04:00	0	13	4	0	2	1	0	0	0	0	0	0	0	20
05:00	1	37	19	0	7	0	0	1	0	0	0	0	0	65
06:00	2	87	34	7	7	0	0	1	0	0	0	0	0	138
07:00	2	155	39	5	16	2	0	0	0	0	0	0	0	219
08:00	2	221	41	2	15	1	0	3	0	0	0	0	0	285
09:00	1	196	54	5	12	0	0	1	0	0	0	0	0	269
10:00	1	173	47	6	12	0	0	0	0	0	0	0	0	239
11:00	2	173	38	5	3	0	0	0	0	0	0	0	0	221
12 PM	3	166	37	3	9	0	0	2	0	1	0	0	0	221
13:00	7	258	52	6	6	1	0	2	0	0	0	0	0	332
14:00	3	238	33	2	15	1	0	0	0	0	0	0	0	292
15:00	2	282	56	7	9	0	0	3	2	0	0	0	0	361
16:00	3	282	56	3	8	0	0	1	0	0	0	0	0	353
17:00	0	259	58	5	8	0	0	1	0	0	0	0	0	331
18:00	2	233	42	3	8	0	0	0	0	0	0	0	0	288
19:00	5	172	29	0	5	0	0	0	0	0	0	0	0	211
20:00	1	144	32	0	2	0	0	0	0	0	0	0	0	179
21:00	0	97	19	0	0	0	0	0	0	0	0	0	0	116
22:00	1	65	20	0	3	0	0	0	0	0	0	0	0	89
23:00	0	39	9	0	3	0	0	0	0	0	0	0	0	51
Total	39	3345	745	59	153	6	0	15	2	1	0	0	0	4365
Percent	0.9%	76.6%	17.1%	1.4%	3.5%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	09:00	06:00	07:00	07:00		08:00						08:00
Vol.	2	221	54	7	16	2		3						285
PM Peak	13:00	15:00	17:00	15:00	14:00	13:00		15:00	15:00	12:00				15:00
Vol.	7	282	58	7	15	1		3	2	1				361

Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

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81676 D-C volume
Site Code: 10111.31

Start	WB				EB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		19		2		36		3		55		
12:15	0		23		0		38		0		61		
12:30	1		20		0		36		1		56		
12:45	0	2	27	89	2	4	36	146	2	6	63	235	
01:00	0		12		2		32		2		44		
01:15	2		15		0		31		2		46		
01:30	0		12		0		26		0		38		
01:45	0	2	19	58	2	4	25	114	2	6	44	172	
02:00	1		18		0		22		1		40		
02:15	1		21		2		29		3		50		
02:30	0		12		3		32		3		44		
02:45	0	2	25	76	0	5	32	115	0	7	57	191	
03:00	0		14		1		40		1		54		
03:15	0		22		0		30		0		52		
03:30	1		21		0		37		1		58		
03:45	0	1	20	77	1	2	30	137	1	3	50	214	
04:00	1		20		5		33		6		53		
04:15	0		10		5		29		5		39		
04:30	1		17		4		32		5		49		
04:45	2	4	19	66	8	22	28	122	10	26	47	188	
05:00	1		21		12		40		13		61		
05:15	3		19		9		21		12		40		
05:30	4		13		10		26		14		39		
05:45	5	13	11	64	12	43	23	110	17	56	34	174	
06:00	7		16		15		34		22		50		
06:15	7		14		21		18		28		32		
06:30	7		12		31		24		38		36		
06:45	7	28	8	50	28	95	25	101	35	123	33	151	
07:00	11		7		28		23		39		30		
07:15	16		2		27		15		43		17		
07:30	14		12		37		20		51		32		
07:45	14	55	7	28	58	150	14	72	72	205	21	100	
08:00	20		7		36		7		56		14		
08:15	19		7		42		10		61		17		
08:30	22		8		40		11		62		19		
08:45	16	77	5	27	21	139	9	37	37	216	14	64	
09:00	17		7		27		10		44		17		
09:15	14		3		30		7		44		10		
09:30	11		5		20		7		31		12		
09:45	16	58	4	19	30	107	4	28	46	165	8	47	
10:00	19		4		24		6		43		10		
10:15	9		3		16		16		25		19		
10:30	18		3		30		8		48		11		
10:45	14	60	2	12	22	92	6	36	36	152	8	48	
11:00	19		1		25		4		44		5		
11:15	9		0		26		5		35		5		
11:30	9		1		21		2		30		3		
11:45	18	55	1	3	36	108	5	16	54	163	6	19	
Total	357		569		771		1034		1128		1603		
Percent	31.6%		35.5%		68.4%		64.5%						
Day Total		926				1805				2731			
Peak	08:00		12:00		07:45		12:00		07:45		12:00		
Vol.	77		89		176		146		251		235		
P.H.F.	0.875		0.824		0.759		0.961		0.872		0.933		

Logan Street
west of North Front Street
City, State: New Bedford, MA
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81676 D-C volume
Site Code: 10111.31

Start	WB				EB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		31		3		22		5		53		
12:15	3		19		2		31		5		50		
12:30	1		16		1		41		2		57		
12:45	0	6	17	83	1	7	45	139	1	13	62	222	
01:00	3		18		4		33		7		51		
01:15	0		13		0		27		0		40		
01:30	0		12		0		35		0		47		
01:45	1	4	12	55	1	5	38	133	2	9	50	188	
02:00	2		18		2		31		4		49		
02:15	1		18		1		25		2		43		
02:30	0		16		1		39		1		55		
02:45	0	3	14	66	0	4	36	131	0	7	50	197	
03:00	0		26		0		31		0		57		
03:15	2		22		0		30		2		52		
03:30	0		20		3		33		3		53		
03:45	0	2	20	88	2	5	32	126	2	7	52	214	
04:00	2		21		3		44		5		65		
04:15	0		24		3		39		3		63		
04:30	0		12		4		47		4		59		
04:45	3	5	24	81	6	16	32	162	9	21	56	243	
05:00	0		23		6		34		6		57		
05:15	3		29		9		30		12		59		
05:30	3		18		10		32		13		50		
05:45	7	13	15	85	15	40	29	125	22	53	44	210	
06:00	7		12		18		27		25		39		
06:15	4		18		26		23		30		41		
06:30	8		16		34		18		42		34		
06:45	8	27	8	54	33	111	29	97	41	138	37	151	
07:00	16		13		23		19		39		32		
07:15	14		7		34		16		48		23		
07:30	24		9		35		20		59		29		
07:45	15	69	7	36	44	136	13	68	59	205	20	104	
08:00	20		11		45		11		65		22		
08:15	21		6		44		13		65		19		
08:30	17		5		28		21		45		26		
08:45	10	68	8	30	24	141	10	55	34	209	18	85	
09:00	16		6		31		11		47		17		
09:15	20		2		22		9		42		11		
09:30	13		5		23		9		36		14		
09:45	20	69	9	22	30	106	9	38	50	175	18	60	
10:00	8		3		18		8		26		11		
10:15	13		3		19		6		32		9		
10:30	17		4		19		7		36		11		
10:45	18	56	3	13	27	83	11	32	45	139	14	45	
11:00	11		1		32		7		43		8		
11:15	20		2		33		3		53		5		
11:30	18		3		24		5		42		8		
11:45	24	73	2	8	36	125	4	19	60	198	6	27	
Total	395		621		779		1125		1174		1746		
Percent	33.6%		35.6%		66.4%		64.4%						
Day Total			1016				1904				2920		
Peak	07:30		04:45		07:30		03:45		07:30		04:00		
Vol.	80		94		168		162		248		243		
P.H.F.	0.833		0.810		0.933		0.862		0.954		0.935		

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Logan Street
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81676 D-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0 8	0	0	0	0	2	0	0	0	0	0	0	0	0	2	31	30
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	31	30
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	31	30
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25	25
04:00	0	0	2	1	1	0	0	0	0	0	0	0	0	4	29	25
05:00	0	3	8	2	0	0	0	0	0	0	0	0	0	13	24	21
06:00	0	2	8	12	6	0	0	0	0	0	0	0	0	28	30	26
07:00	0	**6**	**15**	21	10	1	**1**	0	0	0	0	0	0	54	31	26
08:00	0	4	13	**41**	15	**5**	0	0	0	0	0	0	0	**78**	32	27
09:00	**1**	1	8	28	**16**	3	1	0	0	0	0	0	0	58	33	28
10:00	0	3	14	28	10	5	0	0	0	0	0	0	0	60	32	27
11:00	0	6	9	24	13	3	0	0	0	0	0	0	0	55	32	27
12 PM	**5**	**11**	**23**	37	10	3	0	0	0	0	0	0	0	**89**	29	25
13:00	2	4	16	27	7	2	0	0	0	0	0	0	0	58	29	25
14:00	4	5	20	31	14	2	0	0	0	0	0	0	0	76	31	25
15:00	1	1	16	**39**	14	**6**	0	0	0	0	0	0	0	77	32	27
16:00	1	1	12	25	**22**	5	0	0	0	0	0	0	0	66	33	28
17:00	0	0	15	29	20	0	0	0	0	0	0	0	0	64	32	27
18:00	0	2	6	26	11	5	0	0	0	0	0	0	0	50	33	28
19:00	1	1	6	11	5	4	0	0	0	0	0	0	0	28	34	27
20:00	0	0	4	16	6	1	0	0	0	0	0	0	0	27	31	28
21:00	0	0	2	7	9	1	0	0	0	0	0	0	0	19	33	29
22:00	0	0	2	6	3	1	0	0	0	0	0	0	0	12	31	28
23:00	0	0	1	0	2	0	0	0	0	0	0	0	0	3	31	27
Total	15	50	200	412	200	47	2	0	0	0	0	0	0	926		
%	1.6%	5.4%	21.6%	44.5%	21.6%	5.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	07:00	08:00	09:00	08:00	07:00							08:00		
Vol.	1	6	15	41	16	5	1							78		
PM Peak	12:00	12:00	12:00	15:00	16:00	15:00								12:00		
Vol.	5	11	23	39	22	6								89		

Pecent

15th Percentile :	21 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	35 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	612
Percent in Pace :	66.1%
Number of Vehicles > 25 MPH :	578
Percent of Vehicles > 25 MPH :	62.4%
Mean Speed(Average) :	27 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	3	1	1	0	0	0	0	0	0	0	6	34	28
01:00	1	0	0	0	2	1	0	0	0	0	0	0	0	4	31	24
02:00	0	0	2	0	1	0	0	0	0	0	0	0	0	3	30	24
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30	30
04:00	0	1	0	1	3	0	0	0	0	0	0	0	0	5	31	27
05:00	0	1	4	5	3	0	0	0	0	0	0	0	0	13	30	26
06:00	1	2	3	12	8	1	0	0	0	0	0	0	0	27	32	27
07:00	**5**	1	16	**27**	**17**	3	0	0	0	0	0	0	0	69	32	26
08:00	4	3	**26**	24	8	3	0	0	0	0	0	0	0	68	30	24
09:00	2	2	20	26	15	**4**	0	0	0	0	0	0	0	69	32	27
10:00	1	7	18	20	8	1	**1**	0	0	0	0	0	0	56	30	25
11:00	3	**8**	25	24	13	0	0	0	0	0	0	0	0	**73**	30	24
12 PM	**17**	**19**	19	18	8	1	**1**	0	0	0	0	0	0	83	29	20
13:00	0	1	11	25	15	3	0	0	0	0	0	0	0	55	33	28
14:00	0	4	15	25	20	2	0	0	0	0	0	0	0	66	32	27
15:00	1	5	14	**38**	**28**	1	1	0	0	0	0	0	0	**88**	32	27
16:00	0	2	10	36	26	**6**	0	**1**	0	0	0	0	0	81	33	29
17:00	0	1	**20**	38	20	5	1	0	0	0	0	0	0	85	33	28
18:00	0	6	9	25	13	1	0	0	0	0	0	0	0	54	31	26
19:00	0	2	10	14	9	0	0	1	0	0	0	0	0	36	32	27
20:00	0	0	5	16	7	2	0	0	0	0	0	0	0	30	31	28
21:00	0	0	5	4	8	4	1	0	0	0	0	0	0	22	36	30
22:00	0	0	1	7	5	0	0	0	0	0	0	0	0	13	32	28
23:00	0	1	2	3	2	0	0	0	0	0	0	0	0	8	30	26
Total	35	66	236	392	241	39	5	2	0	0	0	0	0	1016		
%	3.4%	6.5%	23.2%	38.6%	23.7%	3.8%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	08:00	07:00	07:00	09:00	10:00							11:00		
Vol.	5	8	26	27	17	4	1							73		
PM Peak	12:00	12:00	17:00	15:00	15:00	16:00	12:00	16:00						15:00		
Vol.	17	19	20	38	28	6	1	1						88		

Pecent

15th Percentile :	21 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	24-33 MPH
Number in Pace :	633
Percent in Pace :	62.3%
Number of Vehicles > 25 MPH :	600
Percent of Vehicles > 25 MPH :	59.1%
Mean Speed(Average) :	26 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	2	0	1	0	0	0	0	0	0	0	4	26	28
01:00	0	0	0	0	4	0	0	0	0	0	0	0	0	4	32	32
02:00	0	0	0	0	3	1	1	0	0	0	0	0	0	5	39	34
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30	30
04:00	1	0	3	8	7	3	0	0	0	0	0	0	0	22	34	28
05:00	0	0	3	18	16	3	**3**	0	0	0	0	0	0	43	34	30
06:00	0	5	10	41	28	9	2	0	0	0	0	0	0	95	34	29
07:00	**2**	2	**20**	54	**62**	10	0	0	0	0	0	0	0	**150**	33	29
08:00	0	3	7	**55**	54	**18**	1	0	**1**	0	0	0	0	139	34	30
09:00	0	5	6	48	39	9	0	0	0	0	0	0	0	107	33	29
10:00	0	2	13	39	29	8	1	0	0	0	0	0	0	92	33	29
11:00	0	**7**	13	51	31	6	0	0	0	0	0	0	0	108	33	28
12 PM	2	**10**	**30**	46	**50**	8	0	0	0	0	0	0	0	**146**	33	27
13:00	**3**	7	28	47	21	6	2	0	0	0	0	0	0	114	32	26
14:00	2	5	23	40	29	12	3	**1**	0	0	0	0	0	115	34	28
15:00	0	7	23	**52**	39	**15**	1	0	0	0	0	0	0	137	34	28
16:00	1	1	24	43	38	12	3	0	0	0	0	0	0	122	34	29
17:00	0	1	17	31	43	15	3	0	0	0	0	0	0	110	35	30
18:00	0	0	12	41	40	7	1	0	0	0	0	0	0	101	34	29
19:00	0	0	12	27	22	7	**4**	0	0	0	0	0	0	72	34	29
20:00	0	1	2	15	12	6	1	0	0	0	0	0	0	37	35	30
21:00	0	0	2	13	10	2	1	0	0	0	0	0	0	28	34	30
22:00	0	0	2	9	18	4	1	1	**1**	0	0	0	0	36	36	32
23:00	0	0	1	5	5	4	1	0	0	0	0	0	0	16	37	32
Total	11	56	252	686	601	166	29	2	2	0	0	0	0	1805		
%	0.6%	3.1%	14.0%	38.0%	33.3%	9.2%	1.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	07:00	08:00	07:00	08:00	05:00		08:00					07:00		
Vol.	2	7	20	55	62	18	3		1					150		
PM Peak	13:00	12:00	12:00	15:00	12:00	15:00	19:00	14:00	22:00					12:00		
Vol.	3	10	30	52	50	15	4	1	1					146		

Pecent

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1287
Percent in Pace :	71.3%
Number of Vehicles > 25 MPH :	1348
Percent of Vehicles > 25 MPH :	74.7%
Mean Speed(Average) :	29 MPH

PRECISION
D A T A
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Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	2	3	1	0	0	0	0	0	0	0	7	32	30
01:00	0	1	0	1	3	0	0	0	0	0	0	0	0	5	31	27
02:00	0	0	0	3	1	0	0	0	0	0	0	0	0	4	27	27
03:00	0	0	0	1	2	2	0	0	0	0	0	0	0	5	35	33
04:00	0	0	2	8	5	1	0	0	0	0	0	0	0	16	33	28
05:00	0	1	2	19	15	3	0	0	0	0	0	0	0	40	33	29
06:00	4	2	11	**56**	25	11	**2**	0	0	0	0	0	0	111	34	28
07:00	0	1	14	50	**50**	**19**	2	0	0	0	0	0	0	136	35	30
08:00	6	6	29	52	39	9	0	0	0	0	0	0	0	**141**	33	27
09:00	4	4	28	31	27	10	2	0	0	0	0	0	0	106	34	27
10:00	**8**	5	22	27	15	6	0	0	0	0	0	0	0	83	32	25
11:00	2	**13**	**37**	52	21	0	0	0	0	0	0	0	0	125	30	25
12 PM	**7**	**23**	**31**	51	20	7	0	0	0	0	0	0	0	139	31	25
13:00	0	7	20	54	37	13	2	0	0	0	0	0	0	133	34	28
14:00	1	2	22	50	48	7	1	0	0	0	0	0	0	131	33	28
15:00	4	5	17	45	50	5	0	0	0	0	0	0	0	126	33	28
16:00	0	4	18	**64**	**56**	**17**	**3**	0	0	0	0	0	0	**162**	34	29
17:00	1	1	13	47	44	16	1	**2**	0	0	0	0	0	125	34	30
18:00	0	7	7	39	34	7	3	0	0	0	0	0	0	97	34	29
19:00	0	1	9	21	31	5	1	0	0	0	0	0	0	68	34	29
20:00	0	1	9	25	13	5	1	0	**1**	0	0	0	0	55	34	29
21:00	0	1	5	15	11	6	0	0	0	0	0	0	0	38	34	29
22:00	0	0	2	13	11	5	1	0	0	0	0	0	0	32	35	30
23:00	0	0	2	6	8	3	0	0	0	0	0	0	0	19	34	30
Total	37	85	301	732	569	158	19	2	1	0	0	0	0	1904		
%	1.9%	4.5%	15.8%	38.4%	29.9%	8.3%	1.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	06:00	07:00	07:00	06:00							08:00		
Vol.	8	13	37	56	50	19	2							141		
PM Peak	12:00	12:00	12:00	16:00	16:00	16:00	16:00	17:00	20:00					16:00		
Vol.	7	23	31	64	56	17	3	2	1					162		

Pecent

15th Percentile :	22 MPH
50th Percentile :	28 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1301
Percent in Pace :	68.3%
Number of Vehicles > 25 MPH :	1334
Percent of Vehicles > 25 MPH :	70.1%
Mean Speed(Average) :	28 MPH

Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 D-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	1	0	0	0	1	0	0	0	0	0	0	0	2
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	0	0	0	1	0	0	0	0	0	0	0	4
05:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
06:00	0	23	5	0	0	0	0	0	0	0	0	0	0	28
07:00	1	39	9	1	4	0	0	0	0	0	0	0	0	54
08:00	1	53	19	2	3	0	0	0	0	0	0	0	0	78
09:00	0	40	16	0	1	1	0	0	0	0	0	0	0	58
10:00	0	34	21	1	3	1	0	0	0	0	0	0	0	60
11:00	0	40	8	0	7	0	0	0	0	0	0	0	0	55
12 PM	1	63	17	1	5	2	0	0	0	0	0	0	0	89
13:00	1	40	12	1	3	1	0	0	0	0	0	0	0	58
14:00	1	58	14	0	2	1	0	0	0	0	0	0	0	76
15:00	0	63	11	0	2	0	0	1	0	0	0	0	0	77
16:00	0	53	10	0	3	0	0	0	0	0	0	0	0	66
17:00	0	52	11	0	1	0	0	0	0	0	0	0	0	64
18:00	0	41	8	0	1	0	0	0	0	0	0	0	0	50
19:00	1	18	9	0	0	0	0	0	0	0	0	0	0	28
20:00	1	22	2	0	2	0	0	0	0	0	0	0	0	27
21:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
22:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	7	690	176	6	38	8	0	1	0	0	0	0	0	926
Percent	0.8%	74.5%	19.0%	0.6%	4.1%	0.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	10:00	08:00	11:00	01:00								08:00
Vol.	1	53	21	2	7	1								78
PM Peak	12:00	12:00	12:00	12:00	12:00	12:00		15:00						12:00
Vol.	1	63	17	1	5	2		1						89

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Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	6	0	0	0	0	0	0	0	0	0	0	0	6
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	0	0	0	1	0	0	0	0	0	0	0	5
05:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
06:00	0	24	3	0	0	0	0	0	0	0	0	0	0	27
07:00	2	47	14	1	5	0	0	0	0	0	0	0	0	69
08:00	0	44	18	2	4	0	0	0	0	0	0	0	0	68
09:00	0	47	15	0	6	1	0	0	0	0	0	0	0	69
10:00	0	33	19	0	3	1	0	0	0	0	0	0	0	56
11:00	1	52	13	2	3	1	0	1	0	0	0	0	0	73
12 PM	2	56	20	0	3	1	0	1	0	0	0	0	0	83
13:00	0	44	8	1	2	0	0	0	0	0	0	0	0	55
14:00	0	54	10	0	2	0	0	0	0	0	0	0	0	66
15:00	0	72	12	1	2	1	0	0	0	0	0	0	0	88
16:00	0	66	14	1	0	0	0	0	0	0	0	0	0	81
17:00	2	69	12	0	2	0	0	0	0	0	0	0	0	85
18:00	2	43	8	0	1	0	0	0	0	0	0	0	0	54
19:00	0	27	9	0	0	0	0	0	0	0	0	0	0	36
20:00	1	27	1	0	1	0	0	0	0	0	0	0	0	30
21:00	0	19	2	0	1	0	0	0	0	0	0	0	0	22
22:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
Total	10	773	182	8	35	6	0	2	0	0	0	0	0	1016
Percent	1.0%	76.1%	17.9%	0.8%	3.4%	0.6%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	10:00	08:00	09:00	04:00		11:00						11:00
Vol.	2	52	19	2	6	1		1						73
PM Peak	12:00	15:00	12:00	13:00	12:00	12:00		12:00						15:00
Vol.	2	72	20	1	3	1		1						88

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City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	3	1	0	1	0	0	0	0	0	0	0	0	5
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
04:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
05:00	0	35	7	0	1	0	0	0	0	0	0	0	0	43
06:00	1	71	20	1	2	0	0	0	0	0	0	0	0	95
07:00	1	104	33	1	11	0	0	0	0	0	0	0	0	150
08:00	1	97	30	0	8	2	0	1	0	0	0	0	0	139
09:00	0	72	24	2	8	1	0	0	0	0	0	0	0	107
10:00	0	64	20	1	7	0	0	0	0	0	0	0	0	92
11:00	0	70	27	2	5	2	0	2	0	0	0	0	0	108
12 PM	2	103	33	2	5	0	0	1	0	0	0	0	0	146
13:00	1	85	23	1	2	1	0	1	0	0	0	0	0	114
14:00	0	86	17	2	8	1	0	1	0	0	0	0	0	115
15:00	1	90	37	2	7	0	0	0	0	0	0	0	0	137
16:00	1	89	26	0	6	0	0	0	0	0	0	0	0	122
17:00	1	80	25	0	4	0	0	0	0	0	0	0	0	110
18:00	3	77	19	0	2	0	0	0	0	0	0	0	0	101
19:00	0	53	19	0	0	0	0	0	0	0	0	0	0	72
20:00	0	30	7	0	0	0	0	0	0	0	0	0	0	37
21:00	0	24	2	0	2	0	0	0	0	0	0	0	0	28
22:00	0	29	7	0	0	0	0	0	0	0	0	0	0	36
23:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
Total	12	1303	383	14	80	7	0	6	0	0	0	0	0	1805
Percent	0.7%	72.2%	21.2%	0.8%	4.4%	0.4%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	09:00	07:00	08:00		11:00						07:00
Vol.	1	104	33	2	11	2		2						150
PM Peak	18:00	12:00	15:00	12:00	14:00	13:00		12:00						12:00
Vol.	3	103	37	2	8	1		1						146

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Logan Street
west of North Front Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	6	1	0	0	0	0	0	0	0	0	0	0	7
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
04:00	0	11	4	0	1	0	0	0	0	0	0	0	0	16
05:00	0	30	9	0	1	0	0	0	0	0	0	0	0	40
06:00	2	79	26	1	1	2	0	0	0	0	0	0	0	111
07:00	0	97	33	1	5	0	0	0	0	0	0	0	0	136
08:00	0	98	32	2	7	2	0	0	0	0	0	0	0	141
09:00	2	66	26	2	7	2	0	0	1	0	0	0	0	106
10:00	2	55	18	1	7	0	0	0	0	0	0	0	0	83
11:00	0	77	39	0	6	2	0	1	0	0	0	0	0	125
12 PM	1	95	36	0	7	0	0	0	0	0	0	0	0	139
13:00	0	87	30	5	7	3	0	1	0	0	0	0	0	133
14:00	0	89	35	1	6	0	0	0	0	0	0	0	0	131
15:00	1	77	35	2	8	2	0	1	0	0	0	0	0	126
16:00	0	115	39	1	7	0	0	0	0	0	0	0	0	162
17:00	1	98	21	0	5	0	0	0	0	0	0	0	0	125
18:00	1	80	15	0	1	0	0	0	0	0	0	0	0	97
19:00	0	59	8	0	1	0	0	0	0	0	0	0	0	68
20:00	0	43	11	0	1	0	0	0	0	0	0	0	0	55
21:00	0	34	4	0	0	0	0	0	0	0	0	0	0	38
22:00	0	26	6	0	0	0	0	0	0	0	0	0	0	32
23:00	0	16	3	0	0	0	0	0	0	0	0	0	0	19
Total	10	1351	432	16	78	13	0	3	1	0	0	0	0	1904
Percent	0.5%	71.0%	22.7%	0.8%	4.1%	0.7%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	11:00	08:00	08:00	06:00		11:00	09:00					08:00
Vol.	2	98	39	2	7	2		1	1					141
PM Peak	12:00	16:00	16:00	13:00	15:00	13:00		13:00						16:00
Vol.	1	115	39	5	8	3		1						162

Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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81676 D-D volume
Site Code: 10111.31

Start	NB				SB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	2		24		0		27		2		51		
12:15	0		26		0		21		0		47		
12:30	1		25		1		17		2		42		
12:45	0	3	24	99	1	2	27	92	1	5	51	191	
01:00	3		26		1		18		4		44		
01:15	0		25		3		26		3		51		
01:30	0		19		0		15		0		34		
01:45	0	3	20	90	0	4	15	74	0	7	35	164	
02:00	0		22		0		13		0		35		
02:15	2		27		1		25		3		52		
02:30	2		32		0		24		2		56		
02:45	0	4	26	107	0	1	21	83	0	5	47	190	
03:00	0		26		0		22		0		48		
03:15	0		18		0		31		0		49		
03:30	1		22		0		18		1		40		
03:45	1	2	19	85	0	0	17	88	1	2	36	173	
04:00	0		20		1		31		1		51		
04:15	2		16		0		20		2		36		
04:30	0		16		1		25		1		41		
04:45	3	5	12	64	0	2	12	88	3	7	24	152	
05:00	0		21		1		23		1		44		
05:15	3		4		2		18		5		22		
05:30	3		7		1		14		4		21		
05:45	4	10	11	43	7	11	14	69	11	21	25	112	
06:00	7		13		2		11		9		24		
06:15	9		7		2		9		11		16		
06:30	4		5		7		10		11		15		
06:45	5	25	12	37	11	22	6	36	16	47	18	73	
07:00	11		7		6		13		17		20		
07:15	23		14		10		4		33		18		
07:30	10		5		11		9		21		14		
07:45	22	66	6	32	10	37	4	30	32	103	10	62	
08:00	20		8		8		2		28		10		
08:15	27		5		9		3		36		8		
08:30	23		2		18		4		41		6		
08:45	23	93	5	20	13	48	5	14	36	141	10	34	
09:00	14		14		13		1		27		15		
09:15	20		2		11		5		31		7		
09:30	18		1		15		1		33		2		
09:45	30	82	1	18	22	61	2	9	52	143	3	27	
10:00	24		3		21		2		45		5		
10:15	20		0		16		2		36		2		
10:30	29		4		17		7		46		11		
10:45	22	95	1	8	19	73	1	12	41	168	2	20	
11:00	14		1		18		3		32		4		
11:15	22		2		9		1		31		3		
11:30	20		0		19		2		39		2		
11:45	16	72	3	6	22	68	1	7	38	140	4	13	
Total	460		609		329		602		789		1211		
Percent	58.3%		50.3%		41.7%		49.7%						
Day Total		1069				931				2000			
Peak	09:45		02:15		09:45		02:30		09:45		02:15		
Vol.	103		111		76		98		179		203		
P.H.F.	0.858		0.867		0.864		0.790		0.861		0.906		

PRECISION
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D volume
Site Code: 10111.31

Start	NB				SB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	0		21		0		36		0		57		
12:15	0		20		0		24		0		44		
12:30	0		30		1		30		1		60		
12:45	0	0	24	95	0	1	20	110	0	1	44	205	
01:00	0		22		0		17		0		39		
01:15	0		28		0		21		0		49		
01:30	0		26		0		17		0		43		
01:45	0	0	18	94	0	0	29	84	0	0	47	178	
02:00	0		17		0		15		0		32		
02:15	0		20		0		17		0		37		
02:30	0		22		0		23		0		45		
02:45	0	0	18	77	0	0	16	71	0	0	34	148	
03:00	0		25		0		13		0		38		
03:15	0		18		0		22		0		40		
03:30	1		23		0		12		1		35		
03:45	0	1	18	84	0	0	18	65	0	1	36	149	
04:00	0		16		0		26		0		42		
04:15	1		17		1		12		2		29		
04:30	0		14		0		29		0		43		
04:45	3	4	11	58	1	2	15	82	4	6	26	140	
05:00	0		15		2		13		2		28		
05:15	2		13		2		14		4		27		
05:30	3		18		0		15		3		33		
05:45	4	9	12	58	9	13	8	50	13	22	20	108	
06:00	7		9		0		5		7		14		
06:15	10		11		7		2		17		13		
06:30	7		8		8		9		15		17		
06:45	10	34	14	42	5	20	8	24	15	54	22	66	
07:00	11		8		11		5		22		13		
07:15	22		8		9		5		31		13		
07:30	14		8		12		4		26		12		
07:45	12	59	8	32	17	49	4	18	29	108	12	50	
08:00	19		7		9		6		28		13		
08:15	28		2		14		4		42		6		
08:30	18		1		22		7		40		8		
08:45	20	85	6	16	19	64	4	21	39	149	10	37	
09:00	21		5		11		3		32		8		
09:15	22		3		9		4		31		7		
09:30	14		4		14		4		28		8		
09:45	24	81	3	15	15	49	3	14	39	130	6	29	
10:00	26		1		16		1		42		2		
10:15	25		1		18		1		43		2		
10:30	18		4		17		2		35		6		
10:45	17	86	2	8	28	79	2	6	45	165	4	14	
11:00	32		2		15		1		47		3		
11:15	19		0		12		1		31		1		
11:30	22		0		22		3		44		3		
11:45	18	91	2	4	26	75	3	8	44	166	5	12	
Total	450		583		352		553		802		1136		
Percent	56.1%		51.3%		43.9%		48.7%						
Day Total		1033				905				1938			
Peak	09:45		00:30		10:00		12:00		10:15		12:00		
Vol.	93		104		79		110		170		205		
P.H.F.	0.894		0.867		0.705		0.764		0.904		0.854		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	0	0	0	3	0	0	0	0	0	0	0	3	37	36
01:00	**2**	0	0	0	0	1	0	0	0	0	0	0	0	3	35	13
02:00	0	0	0	1	1	1	0	1	0	0	0	0	0	4	35	36
03:00	0	0	1	0	0	0	1	0	0	0	0	0	0	2	40	30
04:00	0	0	0	1	1	1	2	0	0	0	0	0	0	5	40	37
05:00	0	0	2	3	2	1	2	0	0	0	0	0	0	10	39	31
06:00	0	0	0	1	5	14	3	2	0	0	0	0	0	25	40	37
07:00	0	0	0	5	20	24	**12**	**5**	0	0	0	0	0	66	42	36
08:00	0	0	0	9	31	**41**	**9**	**3**	**0**	**0**	**0**	**0**	**0**	**93**	**39**	**35**
09:00	**0**	**0**	**1**	**7**	**31**	**32**	**8**	**3**	**0**	**0**	**0**	**0**	**0**	**82**	**39**	**35**
10:00	**0**	**2**	**5**	**16**	**36**	**24**	**10**	**2**	**0**	**0**	**0**	**0**	**0**	**95**	**39**	**33**
11:00	**1**	**0**	**1**	**7**	**22**	**29**	**10**	**2**	**0**	**0**	**0**	**0**	**0**	**72**	**40**	**35**
12 PM	**0**	**0**	**0**	**12**	**37**	**38**	**11**	**1**	**0**	**0**	**0**	**0**	**0**	**99**	**39**	**35**
13:00	**0**	**1**	**2**	**11**	**45**	**22**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**90**	**38**	**33**
14:00	**0**	**1**	**1**	**8**	**29**	**47**	**19**	**2**	**0**	**0**	**0**	**0**	**0**	**107**	**41**	**36**
15:00	**0**	**2**	**2**	**5**	**23**	**37**	**14**	**2**	**0**	**0**	**0**	**0**	**0**	**85**	**40**	**35**
16:00	**0**	**0**	**1**	**4**	**25**	**22**	**11**	**1**	**0**	**0**	**0**	**0**	**0**	**64**	**40**	**35**
17:00	**0**	**0**	**0**	**4**	**15**	**14**	**7**	**2**	**1**	**0**	**0**	**0**	**0**	**43**	**41**	**36**
18:00	**0**	**0**	**1**	**6**	**10**	**14**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**37**	**39**	**35**
19:00	**0**	**1**	**0**	**2**	**7**	**15**	**4**	**3**	**0**	**0**	**0**	**0**	**0**	**32**	**41**	**36**
20:00	**0**	**1**	**2**	**4**	**5**	**6**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**38**	**32**
21:00	**0**	**1**	**1**	**1**	**7**	**5**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**18**	**39**	**34**
22:00	**0**	**0**	**0**	**1**	**2**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**8**	**45**	**37**
23:00	**0**	**0**	**1**	**0**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**37**	**33**
Total	**3**	**9**	**21**	**108**	**355**	**398**	**138**	**34**	**3**	**0**	**0**	**0**	**0**	**1069**		
%	**0.3%**	**0.8%**	**2.0%**	**10.1%**	**33.2%**	**37.2%**	**12.9%**	**3.2%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**			
AM Peak	**01:00**	**10:00**	**10:00**	**10:00**	**10:00**	**08:00**	**07:00**	**07:00**						**10:00**		
Vol.	**2**	**2**	**5**	**16**	**36**	**41**	**12**	**5**						**95**		
PM Peak		**15:00**	**13:00**	**12:00**	**13:00**	**14:00**	**14:00**	**19:00**	**13:00**					**14:00**		
Vol.		**2**	**2**	**12**	**45**	**47**	**19**	**3**	**1**					**107**		

Pecent

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 753
Percent in Pace : 70.4%
Number of Vehicles > 35 MPH : 493
Percent of Vehicles > 35 MPH : 46.1%
Mean Speed(Average) : 35 MPH

PRECISION
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Acushnet Avenue
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81676 D-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15	15
04:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4	36	36
05:00	0	0	2	2	3	0	1	1	0	0	0	0	0	9	44	32
06:00	0	0	0	7	8	12	4	3	0	0	0	0	0	34	41	35
07:00	0	0	0	6	17	21	10	**4**	**1**	0	0	0	0	59	42	36
08:00	0	0	1	9	25	**35**	**13**	1	1	0	0	0	0	85	40	35
09:00	0	0	2	**13**	35	22	6	2	1	0	0	0	0	81	39	34
10:00	0	1	4	9	**39**	25	8	0	0	0	0	0	0	86	38	33
11:00	0	**2**	**5**	7	29	34	13	1	0	0	0	0	0	**91**	39	34
12 PM	0	0	1	**12**	**31**	**37**	11	3	0	0	0	0	0	**95**	39	35
13:00	0	0	**3**	9	29	29	**20**	**4**	0	0	0	0	0	94	42	36
14:00	0	**1**	0	8	24	26	16	2	0	0	0	0	0	77	41	35
15:00	0	1	2	5	20	36	15	4	**1**	0	0	0	0	84	42	36
16:00	0	0	0	0	17	27	12	1	1	0	0	0	0	58	41	37
17:00	0	0	0	10	15	25	5	2	1	0	0	0	0	58	39	35
18:00	0	1	0	7	15	14	5	0	0	0	0	0	0	42	39	34
19:00	0	0	0	3	12	12	5	0	0	0	0	0	0	32	39	35
20:00	0	0	0	3	5	6	2	0	0	0	0	0	0	16	39	34
21:00	**1**	1	2	2	3	5	0	1	0	0	0	0	0	15	38	31
22:00	0	0	0	0	3	4	1	0	0	0	0	0	0	8	38	36
23:00	0	0	0	1	1	1	1	0	0	0	0	0	0	4	39	36
Total	1	8	22	113	332	373	149	29	6	0	0	0	0	1033		
%	0.1%	0.8%	2.1%	10.9%	32.1%	36.1%	14.4%	2.8%	0.6%	0.0%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	09:00	10:00	08:00	08:00	07:00	07:00					11:00		
Vol.		2	5	13	39	35	13	4	1					91		
PM Peak	21:00	14:00	13:00	12:00	12:00	12:00	13:00	13:00	15:00					12:00		
Vol.	1	1	3	12	31	37	20	4	1					95		

Pecent

15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	705
Percent in Pace :	68.2%
Number of Vehicles > 35 MPH :	482
Percent of Vehicles > 35 MPH :	46.7%
Mean Speed(Average) :	35 MPH

PRECISION
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81676 D-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30	30
01:00	0	0	0	0	3	0	1	0	0	0	0	0	0	4	32	33
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25	25
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	1	0	0	1	0	0	0	0	0	2	45	38
05:00	0	0	1	4	2	1	2	1	0	0	0	0	0	11	40	32
06:00	0	0	2	3	7	6	3	0	**1**	0	0	0	0	22	40	34
07:00	**1**	0	0	2	12	10	8	**3**	1	0	0	0	0	37	42	36
08:00	0	0	0	4	15	**20**	7	2	0	0	0	0	0	48	40	36
09:00	0	0	**3**	7	21	17	**10**	3	0	0	0	0	0	61	41	35
10:00	0	0	3	**18**	24	17	9	2	0	0	0	0	0	**73**	39	33
11:00	0	0	3	17	**25**	15	7	1	0	0	0	0	0	68	39	33
12 PM	0	**1**	**5**	11	**36**	23	9	**6**	**1**	0	0	0	0	**92**	40	34
13:00	**1**	0	0	10	34	19	7	2	1	0	0	0	0	74	39	34
14:00	0	0	3	10	35	20	10	4	1	0	0	0	0	83	41	34
15:00	0	0	2	9	29	**40**	6	2	0	0	0	0	0	88	39	35
16:00	1	0	0	7	25	37	**14**	4	0	0	0	0	0	88	41	36
17:00	0	0	1	**12**	19	20	13	3	1	0	0	0	0	69	42	35
18:00	0	0	0	7	6	13	7	2	1	0	0	0	0	36	42	36
19:00	0	1	0	1	14	9	3	1	1	0	0	0	0	30	39	35
20:00	0	0	0	1	8	3	2	0	0	0	0	0	0	14	37	34
21:00	0	0	0	1	3	3	1	0	1	0	0	0	0	9	40	36
22:00	0	0	0	3	5	4	0	0	0	0	0	0	0	12	36	32
23:00	0	0	0	1	2	4	0	0	0	0	0	0	0	7	37	35
Total	3	2	23	130	327	281	119	37	9	0	0	0	0	931		
%	0.3%	0.2%	2.5%	14.0%	35.1%	30.2%	12.8%	4.0%	1.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00		09:00	10:00	11:00	08:00	09:00	07:00	06:00					10:00		
Vol.	1		3	18	25	20	10	3	1					73		
PM Peak	13:00	12:00	12:00	17:00	12:00	15:00	16:00	12:00	12:00					12:00		
Vol.	1	1	5	12	36	40	14	6	1					92		

Pecent

15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	608
Percent in Pace :	65.3%
Number of Vehicles > 35 MPH :	389
Percent of Vehicles > 35 MPH :	41.8%
Mean Speed(Average) :	34 MPH

PRECISION
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INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30	30
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	1	0	0	1	0	0	0	0	0	2	45	38
05:00	0	**1**	0	4	2	3	2	1	0	0	0	0	0	13	40	32
06:00	0	0	1	4	3	6	4	2	0	0	0	0	0	20	42	35
07:00	0	1	0	4	18	11	6	**6**	**3**	0	0	0	0	49	45	37
08:00	0	0	0	4	19	23	**15**	1	1	**1**	0	0	0	64	42	37
09:00	0	0	0	7	13	12	13	4	0	0	0	0	0	49	43	36
10:00	0	0	2	**20**	21	**24**	9	2	1	0	0	0	0	**79**	39	34
11:00	0	0	**6**	15	**23**	22	7	2	0	0	0	0	0	75	39	33
12 PM	0	**1**	**2**	**22**	**32**	40	10	3	0	0	0	0	0	**110**	39	34
13:00	0	0	1	15	29	23	14	2	0	0	0	0	0	84	40	34
14:00	0	0	0	6	27	23	11	3	**1**	0	0	0	0	71	41	36
15:00	0	1	1	7	13	28	10	**5**	0	0	0	0	0	65	42	36
16:00	0	0	1	6	10	**46**	**18**	0	1	0	0	0	0	82	41	37
17:00	0	0	2	3	13	19	12	1	0	0	0	0	0	50	41	36
18:00	0	1	1	2	7	8	5	0	0	0	0	0	0	24	40	35
19:00	0	0	1	0	6	9	1	1	0	0	0	0	0	18	38	35
20:00	0	0	0	1	9	6	4	0	0	**1**	0	0	0	21	41	36
21:00	0	0	2	3	4	3	1	1	0	0	0	0	0	14	37	32
22:00	0	0	0	1	3	2	0	0	0	0	0	0	0	6	35	32
23:00	0	0	0	3	2	2	1	0	0	0	0	0	0	8	36	32
Total	0	5	20	127	256	310	143	35	7	2	0	0	0	905		
%	0.0%	0.6%	2.2%	14.0%	28.3%	34.3%	15.8%	3.9%	0.8%	0.2%	0.0%	0.0%	0.0%			
AM Peak		05:00	11:00	10:00	11:00	10:00	08:00	07:00	07:00	08:00				10:00		
Vol.		1	6	20	23	24	15	6	3	1				79		
PM Peak		12:00	12:00	12:00	12:00	16:00	16:00	15:00	14:00	20:00				12:00		
Vol.		1	2	22	32	46	18	5	1	1				110		

Pecent

15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	566
Percent in Pace :	62.5%
Number of Vehicles > 35 MPH :	435
Percent of Vehicles > 35 MPH :	48.1%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	2	1	0	0	0	0	0	0	0	0	0	0	3
01:00	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	3	0	0	0	1	0	0	0	0	0	0	0	4
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
05:00	0	3	2	0	1	0	0	0	2	2	0	0	0	10
06:00	0	18	7	0	0	0	0	0	0	0	0	0	0	25
07:00	0	42	19	1	2	1	0	0	1	0	0	0	0	66
08:00	2	57	28	0	5	0	0	0	1	0	0	0	0	93
09:00	3	51	17	2	8	0	0	0	1	0	0	0	0	82
10:00	2	59	21	2	7	0	0	0	3	1	0	0	0	95
11:00	1	44	20	1	4	0	0	1	1	0	0	0	0	72
12 PM	1	69	22	1	4	0	0	1	1	0	0	0	0	99
13:00	0	55	24	1	8	0	0	0	2	0	0	0	0	90
14:00	2	77	17	1	7	0	0	1	2	0	0	0	0	107
15:00	3	64	14	0	2	0	0	0	2	0	0	0	0	85
16:00	0	46	14	0	3	1	0	0	0	0	0	0	0	64
17:00	1	29	12	0	1	0	0	0	0	0	0	0	0	43
18:00	3	28	5	0	1	0	0	0	0	0	0	0	0	37
19:00	0	25	6	0	1	0	0	0	0	0	0	0	0	32
20:00	0	17	2	0	0	1	0	0	0	0	0	0	0	20
21:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
22:00	1	7	0	0	0	0	0	0	0	0	0	0	0	8
23:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
Total	21	721	238	9	54	4	0	3	16	3	0	0	0	1069
Percent	2.0%	67.4%	22.3%	0.8%	5.1%	0.4%	0.0%	0.3%	1.5%	0.3%	0.0%	0.0%	0.0%	
AM Peak	09:00	10:00	08:00	09:00	09:00	02:00		11:00	10:00	05:00				10:00
Vol.	3	59	28	2	8	1		1	3	2				95
PM Peak	15:00	14:00	13:00	12:00	13:00	16:00		12:00	13:00					14:00
Vol.	3	77	24	1	8	1		1	2					107

PRECISION
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
05:00	1	3	2	0	0	1	0	0	1	1	0	0	0	9
06:00	0	20	10	0	2	1	0	0	1	0	0	0	0	34
07:00	0	41	15	0	1	0	1	0	1	0	0	0	0	59
08:00	1	57	19	0	6	0	0	0	2	0	0	0	0	85
09:00	1	51	18	1	5	1	0	0	4	0	0	0	0	81
10:00	1	54	17	6	7	0	0	0	0	1	0	0	0	86
11:00	2	53	23	1	8	1	0	0	3	0	0	0	0	91
12 PM	1	59	26	2	5	1	0	1	0	0	0	0	0	95
13:00	2	61	25	1	4	1	0	0	0	0	0	0	0	94
14:00	0	52	17	1	5	1	0	0	0	1	0	0	0	77
15:00	2	55	19	1	5	1	0	1	0	0	0	0	0	84
16:00	0	43	12	0	3	0	0	0	0	0	0	0	0	58
17:00	2	48	6	0	2	0	0	0	0	0	0	0	0	58
18:00	2	32	6	0	1	1	0	0	0	0	0	0	0	42
19:00	0	22	9	0	1	0	0	0	0	0	0	0	0	32
20:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
21:00	0	12	1	0	1	1	0	0	0	0	0	0	0	15
22:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
23:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
Total	15	688	233	13	56	10	1	2	12	3	0	0	0	1033
Percent	1.5%	66.6%	22.6%	1.3%	5.4%	1.0%	0.1%	0.2%	1.2%	0.3%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	11:00	10:00	11:00	05:00	07:00		09:00	05:00				11:00
Vol.	2	57	23	6	8	1	1		4	1				91
PM Peak	13:00	13:00	12:00	12:00	12:00	12:00		12:00		14:00				12:00
Vol.	2	61	26	2	5	1		1		1				95

PRECISION
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	1	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	7	2	0	0	0	0	0	2	0	0	0	0	11
06:00	0	12	5	0	1	0	0	0	1	3	0	0	0	22
07:00	1	28	7	0	1	0	0	0	0	0	0	0	0	37
08:00	1	17	19	3	5	0	0	1	2	0	0	0	0	48
09:00	2	38	15	2	4	0	0	0	0	0	0	0	0	61
10:00	0	37	23	2	7	1	0	0	2	1	0	0	0	73
11:00	1	47	15	2	2	0	0	0	1	0	0	0	0	68
12 PM	1	62	18	2	7	1	0	0	1	0	0	0	0	92
13:00	3	48	16	1	5	1	0	0	0	0	0	0	0	74
14:00	3	54	21	0	3	1	0	0	1	0	0	0	0	83
15:00	3	63	17	0	4	0	0	0	1	0	0	0	0	88
16:00	1	75	9	2	1	0	0	0	0	0	0	0	0	88
17:00	0	56	11	1	0	1	0	0	0	0	0	0	0	69
18:00	0	28	8	0	0	0	0	0	0	0	0	0	0	36
19:00	0	23	5	0	2	0	0	0	0	0	0	0	0	30
20:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
21:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
22:00	0	8	2	0	1	1	0	0	0	0	0	0	0	12
23:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
Total	16	636	198	15	43	6	0	1	12	4	0	0	0	931
Percent	1.7%	68.3%	21.3%	1.6%	4.6%	0.6%	0.0%	0.1%	1.3%	0.4%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	10:00	08:00	10:00	10:00		08:00	05:00	06:00				10:00
Vol.	2	47	23	3	7	1		1	2	3				73
PM Peak	13:00	16:00	14:00	12:00	12:00	12:00			12:00					12:00
Vol.	3	75	21	2	7	1			1					92

PRECISION
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Acushnet Avenue
north of Hillman Street
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 D-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	9	2	0	0	0	0	0	2	0	0	0	0	13
06:00	0	16	2	0	0	0	0	0	1	1	0	0	0	20
07:00	1	33	9	1	3	2	0	0	0	0	0	0	0	49
08:00	0	37	19	1	5	1	0	0	1	0	0	0	0	64
09:00	0	32	12	0	4	0	0	0	1	0	0	0	0	49
10:00	1	42	22	3	7	1	0	0	2	1	0	0	0	79
11:00	0	47	17	2	6	0	0	0	3	0	0	0	0	75
12 PM	0	72	29	2	3	1	0	1	2	0	0	0	0	110
13:00	0	60	20	1	0	0	0	2	1	0	0	0	0	84
14:00	1	52	13	0	3	1	0	0	1	0	0	0	0	71
15:00	0	41	20	1	2	0	0	1	0	0	0	0	0	65
16:00	1	64	16	0	1	0	0	0	0	0	0	0	0	82
17:00	1	34	15	0	0	0	0	0	0	0	0	0	0	50
18:00	1	16	6	0	0	1	0	0	0	0	0	0	0	24
19:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
20:00	0	17	4	0	0	0	0	0	0	0	0	0	0	21
21:00	0	10	3	0	1	0	0	0	0	0	0	0	0	14
22:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
23:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
Total	6	611	215	11	35	7	0	4	14	2	0	0	0	905
Percent	0.7%	67.5%	23.8%	1.2%	3.9%	0.8%	0.0%	0.4%	1.5%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	10:00	10:00	10:00	07:00			11:00	06:00				10:00
Vol.	1	47	22	3	7	2			3	1				79
PM Peak	14:00	12:00	12:00	12:00	12:00	12:00		13:00	12:00					12:00
Vol.	1	72	29	2	3	1		2	2					110

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/23/08 thru Wed 9/24/08	81676	New Bedford, MA

Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

81676 E-A1 volume
Site Code: 10111.31

Start	Right Lane				Left Lane				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	13		94		6		33		19		127		
12:15	7		113		3		55		10		168		
12:30	9		118		3		29		12		147		
12:45	7	36	121	446	3	15	40	157	10	51	161	603	
01:00	3		143		3		28		6		171		
01:15	3		98		0		37		3		135		
01:30	3		119		2		37		5		156		
01:45	5	14	98	458	3	8	35	137	8	22	133	595	
02:00	4		100		0		31		4		131		
02:15	1		119		1		36		2		155		
02:30	1		137		0		29		1		166		
02:45	5	11	150	506	2	3	33	129	7	14	183	635	
03:00	5		142		2		47		7		189		
03:15	6		135		2		42		8		177		
03:30	2		142		2		36		4		178		
03:45	3	16	136	555	2	8	37	162	5	24	173	717	
04:00	11		147		3		39		14		186		
04:15	5		117		1		34		6		151		
04:30	9		125		5		45		14		170		
04:45	22	47	130	519	4	13	30	148	26	60	160	667	
05:00	20		143		5		35		25		178		
05:15	24		123		6		30		30		153		
05:30	30		131		9		36		39		167		
05:45	36	110	138	535	9	29	40	141	45	139	178	676	
06:00	43		123		10		37		53		160		
06:15	67		105		13		35		80		140		
06:30	71		108		26		39		97		147		
06:45	87	268	109	445	19	68	28	139	106	336	137	584	
07:00	94		98		34		31		128		129		
07:15	126		99		34		27		160		126		
07:30	150		91		39		27		189		118		
07:45	136	506	76	364	27	134	24	109	163	640	100	473	
08:00	117		85		24		20		141		105		
08:15	136		68		27		21		163		89		
08:30	131		52		31		27		162		79		
08:45	105	489	49	254	33	115	13	81	138	604	62	335	
09:00	93		80		30		22		123		102		
09:15	104		69		23		18		127		87		
09:30	100		42		21		14		121		56		
09:45	104	401	36	227	32	106	13	67	136	507	49	294	
10:00	107		36		30		9		137		45		
10:15	102		29		30		12		132		41		
10:30	113		30		30		11		143		41		
10:45	104	426	11	106	37	127	5	37	141	553	16	143	
11:00	99		20		31		11		130		31		
11:15	106		24		37		10		143		34		
11:30	121		11		30		6		151		17		
11:45	111	437	17	72	32	130	2	29	143	567	19	101	
Total	2761		4487		756		1336		3517		5823		
Percent	78.5%		77.1%		21.5%		22.9%						
Day Total		7248				2092				9340			
Peak	07:30		02:45		10:30		03:00		07:30		02:45		
Vol.	539		569		135		162		656		727		
P.H.F.	0.898		0.948		0.865		0.862		0.868		0.962		

Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 E-A1 volume
Site Code: 10111.31

Start	Right Lane				Left Lane				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	8		124		2		34		10		158		
12:15	7		151		2		43		9		194		
12:30	11		126		3		40		14		166		
12:45	7	33	107	508	5	12	34	151	12	45	141	659	
01:00	13		141		7		30		20		171		
01:15	2		127		3		29		5		156		
01:30	4		126		0		31		4		157		
01:45	2	21	98	492	2	12	30	120	4	33	128	612	
02:00	1		107		0		27		1		134		
02:15	3		114		0		24		3		138		
02:30	2		144		0		41		2		185		
02:45	1	7	158	523	1	1	31	123	2	8	189	646	
03:00	5		152		1		36		6		188		
03:15	1		163		1		36		2		199		
03:30	4		131		3		35		7		166		
03:45	4	14	128	574	0	5	37	144	4	19	165	718	
04:00	7		122		2		44		9		166		
04:15	4		137		3		42		7		179		
04:30	12		126		3		38		15		164		
04:45	19	42	129	514	7	15	30	154	26	57	159	668	
05:00	25		144		7		27		32		171		
05:15	33		118		4		26		37		144		
05:30	29		147		11		38		40		185		
05:45	41	128	122	531	7	29	32	123	48	157	154	654	
06:00	44		116		11		48		55		164		
06:15	61		115		10		30		71		145		
06:30	81		118		25		38		106		156		
06:45	79	265	107	456	22	68	24	140	101	333	131	596	
07:00	111		92		22		32		133		124		
07:15	116		79		29		27		145		106		
07:30	136		69		35		34		171		103		
07:45	119	482	76	316	37	123	22	115	156	605	98	431	
08:00	134		76		32		21		166		97		
08:15	129		63		37		14		166		77		
08:30	113		64		32		15		145		79		
08:45	119	495	67	270	45	146	17	67	164	641	84	337	
09:00	108		64		26		17		134		81		
09:15	104		58		22		17		126		75		
09:30	104		51		28		24		132		75		
09:45	99	415	48	221	26	102	13	71	125	517	61	292	
10:00	107		32		30		11		137		43		
10:15	114		21		29		11		143		32		
10:30	109		28		26		5		135		33		
10:45	98	428	22	103	35	120	6	33	133	548	28	136	
11:00	87		26		30		10		117		36		
11:15	106		17		30		8		136		25		
11:30	116		14		35		4		151		18		
11:45	96	405	19	76	31	126	10	32	127	531	29	108	
Total	2735		4584		759		1273		3494		5857		
Percent	78.3%		78.3%		21.7%		21.7%						
Day Total		7319				2032				9351			
Peak	07:30		02:30		08:00		03:45		07:30		02:30		
Vol.	518		617		146		161		659		761		
P.H.F.	0.952		0.946		0.811		0.915		0.963		0.956		

PRECISION
D A T A
INDUSTRIES, LLC
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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 speed
Site Code: 10111.31

Right Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	5	17	9	3	1	0	0	0	0	0	36	38	33
01:00	1	1	0	3	2	6	1	0	0	0	0	0	0	14	38	31
02:00	0	0	0	2	3	2	2	2	0	0	0	0	0	11	44	37
03:00	0	0	2	3	6	2	2	1	0	0	0	0	0	16	40	33
04:00	0	2	1	11	11	8	9	4	**1**	0	0	0	0	47	43	34
05:00	0	0	10	17	46	21	10	**6**	0	0	0	0	0	110	39	33
06:00	5	23	55	80	63	32	8	2	0	0	0	0	0	268	35	28
07:00	**57**	**76**	**139**	117	74	40	3	0	0	0	0	0	0	**506**	32	24
08:00	34	42	104	136	**116**	48	8	0	1	0	0	0	0	489	34	26
09:00	20	37	77	125	98	34	8	2	0	0	0	0	0	401	34	27
10:00	22	36	70	**141**	103	39	**15**	0	0	0	0	0	0	426	34	27
11:00	22	36	89	128	100	**50**	10	2	0	0	0	0	0	437	34	27
12 PM	29	53	109	123	88	33	10	1	0	0	0	0	0	446	33	25
13:00	26	48	105	119	103	**50**	5	1	0	**1**	0	0	0	458	34	26
14:00	**71**	92	158	123	45	14	3	0	0	0	0	0	0	506	29	22
15:00	56	**100**	**176**	129	77	16	0	1	0	0	0	0	0	**555**	30	23
16:00	31	71	156	124	**104**	31	2	0	0	0	0	0	0	519	32	25
17:00	53	68	168	**132**	95	16	3	0	0	0	0	0	0	535	31	24
18:00	39	52	116	129	82	21	6	0	0	0	0	0	0	445	32	24
19:00	21	31	114	129	47	18	3	1	0	0	0	0	0	364	31	25
20:00	7	24	56	92	52	19	3	1	0	0	0	0	0	254	33	27
21:00	2	9	41	77	75	16	6	1	0	0	0	0	0	227	34	28
22:00	0	1	8	24	41	23	6	**3**	0	0	0	0	0	106	38	32
23:00	0	0	2	15	26	13	**12**	3	**1**	0	0	0	0	72	41	34
Total	496	802	1757	1984	1474	561	138	32	3	1	0	0	0	7248		
%	6.8%	11.1%	24.2%	27.4%	20.3%	7.7%	1.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	10:00	08:00	11:00	10:00	05:00	04:00					07:00		
Vol.	57	76	139	141	116	50	15	6	1					506		
PM Peak	14:00	15:00	15:00	17:00	16:00	13:00	23:00	22:00	23:00	13:00				15:00		
Vol.	71	100	176	132	104	50	12	3	1	1				555		

Pecent

15th Percentile :	18 MPH
50th Percentile :	26 MPH
85th Percentile :	33 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3741
Percent in Pace :	51.6%
Number of Vehicles > 35 MPH :	622
Percent of Vehicles > 35 MPH :	8.6%
Mean Speed(Average) :	26 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 speed
Site Code: 10111.31

Right Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	7	11	9	4	1	0	0	0	0	0	33	39	34
01:00	0	0	2	9	4	3	2	1	0	0	0	0	0	21	37	31
02:00	0	0	1	3	0	1	2	0	0	0	0	0	0	7	40	32
03:00	0	0	0	2	6	3	3	0	0	0	0	0	0	14	40	35
04:00	0	1	1	8	14	5	9	3	**1**	0	0	0	0	42	43	35
05:00	0	5	10	22	46	34	7	**4**	0	0	0	0	0	128	38	32
06:00	13	14	43	71	75	35	**11**	3	0	0	0	0	0	265	36	28
07:00	**61**	**71**	**142**	107	81	15	4	1	0	0	0	0	0	482	31	23
08:00	23	29	102	**139**	**150**	43	8	0	0	0	0	0	0	**494**	34	27
09:00	12	35	86	104	126	**44**	8	1	0	0	0	0	0	416	34	27
10:00	29	49	88	118	95	39	8	2	0	0	0	0	0	428	34	26
11:00	25	43	98	115	81	36	6	1	0	0	0	0	0	405	33	26
12 PM	33	67	133	146	**96**	30	2	1	0	0	0	0	0	508	32	25
13:00	46	66	129	138	90	18	4	1	0	0	0	0	0	492	32	24
14:00	53	70	161	**147**	69	21	1	1	0	0	0	0	0	523	30	23
15:00	55	**96**	**225**	134	55	9	0	0	0	0	0	0	0	**574**	29	22
16:00	59	76	165	115	73	21	4	1	0	0	0	0	0	514	31	23
17:00	**64**	84	157	136	76	12	1	0	0	0	0	0	0	530	30	23
18:00	25	57	139	122	82	27	2	**3**	0	0	0	0	0	457	32	25
19:00	6	21	74	125	60	24	5	0	1	0	0	0	0	316	33	27
20:00	1	11	65	96	66	26	3	2	0	0	0	0	0	270	34	28
21:00	1	7	27	75	69	**36**	4	2	0	0	0	0	0	221	36	30
22:00	1	1	7	30	35	18	**8**	1	**2**	0	0	0	0	103	38	32
23:00	0	0	8	12	28	18	6	2	2	0	0	0	0	76	39	33
Total	507	803	1864	1981	1488	527	112	31	6	0	0	0	0	7319		
%	6.9%	11.0%	25.5%	27.1%	20.3%	7.2%	1.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	08:00	09:00	06:00	05:00	04:00					08:00		
Vol.	61	71	142	139	150	44	11	4	1					494		
PM Peak	17:00	15:00	15:00	14:00	12:00	21:00	22:00	18:00	22:00					15:00		
Vol.	64	96	225	147	96	36	8	3	2					574		

Pecent

15th Percentile :	18 MPH
50th Percentile :	26 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3845
Percent in Pace :	52.5%
Number of Vehicles > 35 MPH :	570
Percent of Vehicles > 35 MPH :	7.8%
Mean Speed(Average) :	25 MPH

PRECISION
D A T A
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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 speed
Site Code: 10111.31

Left Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	1	8	4	0	1	0	0	0	0	0	15	37	33
01:00	0	0	1	2	0	2	0	2	**1**	0	0	0	0	8	46	36
02:00	0	0	0	0	0	2	0	1	0	0	0	0	0	3	45	39
03:00	0	0	0	1	1	3	1	1	1	0	0	0	0	8	49	39
04:00	0	0	0	1	3	4	3	1	0	**1**	0	0	0	13	42	38
05:00	0	0	0	1	7	13	5	2	0	1	0	0	0	29	43	38
06:00	0	0	6	26	15	15	5	1	0	0	0	0	0	68	38	31
07:00	0	1	**34**	30	36	**29**	2	1	0	0	0	0	0	**133**	36	29
08:00	0	1	17	29	29	23	10	**7**	0	0	0	0	0	116	39	32
09:00	**2**	**2**	7	28	29	23	12	3	0	0	0	0	0	106	39	32
10:00	0	2	16	**43**	37	22	7	0	0	0	0	0	0	127	36	30
11:00	0	1	10	31	**43**	29	**14**	1	1	0	0	0	0	130	39	32
12 PM	0	1	19	49	**52**	**28**	6	1	**1**	0	0	0	0	157	36	31
13:00	0	2	19	38	47	21	**9**	0	1	0	0	0	0	137	37	31
14:00	0	2	**48**	40	23	9	6	0	1	0	0	0	0	129	34	27
15:00	0	2	47	**52**	38	12	8	2	1	0	0	0	0	**162**	34	28
16:00	0	1	34	37	39	28	5	**3**	1	0	0	0	0	148	37	30
17:00	0	2	40	50	30	12	4	2	1	0	0	0	0	141	34	28
18:00	0	**4**	31	41	31	24	5	3	0	0	0	0	0	139	37	29
19:00	**1**	0	17	50	26	9	4	1	0	0	**1**	0	0	109	34	29
20:00	0	1	8	22	30	13	5	0	1	0	0	0	0	80	37	31
21:00	0	1	3	20	25	15	4	0	0	0	0	0	0	68	37	32
22:00	0	0	0	2	20	9	4	2	0	0	0	0	0	37	39	35
23:00	0	1	0	2	10	13	2	0	1	0	0	0	0	29	39	35
Total	3	24	358	596	579	362	121	35	11	2	1	0	0	2092		
%	0.1%	1.1%	17.1%	28.5%	27.7%	17.3%	5.8%	1.7%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	07:00	10:00	11:00	07:00	11:00	08:00	01:00	04:00				07:00		
Vol.	2	2	34	43	43	29	14	7	1	1				133		
PM Peak	19:00	18:00	14:00	15:00	12:00	12:00	13:00	16:00	12:00		19:00			15:00		
Vol.	1	4	48	52	52	28	9	3	1		1			162		

Pecent

15th Percentile :	24 MPH
50th Percentile :	30 MPH
85th Percentile :	37 MPH
95th Percentile :	42 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1175
Percent in Pace :	56.2%
Number of Vehicles > 35 MPH :	459
Percent of Vehicles > 35 MPH :	21.9%
Mean Speed(Average) :	30 MPH

PRECISION
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Kings Highway WB lanes
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City, State: New Bedford, MA
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81676 E-A1 speed
Site Code: 10111.31

Left Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	0	5	4	1	1	0	0	0	0	0	12	38	35
01:00	0	0	0	2	4	4	1	1	0	0	0	0	0	12	38	35
02:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	40	40
03:00	0	0	0	2	1	1	0	0	1	0	0	0	0	5	35	34
04:00	0	0	0	1	2	6	4	1	1	0	0	0	0	15	43	39
05:00	0	0	1	4	9	9	4	2	0	0	0	0	0	29	41	35
06:00	0	0	7	18	20	15	2	4	**2**	0	0	0	0	68	39	33
07:00	**3**	**1**	**39**	27	35	11	5	1	0	**1**	0	0	0	123	34	28
08:00	2	1	17	29	**46**	**34**	8	**9**	0	0	0	0	0	**146**	39	32
09:00	0	0	11	26	31	22	**10**	2	0	0	0	0	0	102	39	32
10:00	0	0	15	**44**	36	13	10	2	0	0	0	0	0	120	37	30
11:00	0	0	18	42	34	23	9	0	0	0	0	0	0	126	37	30
12 PM	0	3	32	47	40	**22**	6	1	0	0	0	0	0	151	36	29
13:00	0	0	18	38	41	16	5	2	0	0	0	0	0	120	36	30
14:00	0	0	29	36	24	20	**13**	1	0	0	0	0	0	123	38	30
15:00	0	**4**	42	**52**	36	8	2	0	0	0	0	0	0	144	33	27
16:00	**1**	3	**51**	36	39	15	6	**3**	0	0	0	0	0	**154**	35	28
17:00	0	4	32	39	34	10	4	0	0	0	0	0	0	123	34	28
18:00	0	1	25	46	41	21	5	0	1	0	0	0	0	140	36	30
19:00	0	0	10	42	**45**	14	2	1	1	0	0	0	0	115	35	30
20:00	0	0	5	24	26	10	2	0	0	0	0	0	0	67	35	30
21:00	0	0	4	11	36	13	4	0	**2**	0	0	0	0	70	37	33
22:00	0	0	0	11	6	14	2	1	0	0	0	0	0	34	38	33
23:00	0	0	1	6	16	7	2	0	0	0	0	0	0	32	36	32
Total	6	17	358	583	607	312	108	32	8	1	0	0	0	2032		
%	0.3%	0.8%	17.6%	28.7%	29.9%	15.4%	5.3%	1.6%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	10:00	08:00	08:00	09:00	08:00	06:00	07:00				08:00		
Vol.	3	1	39	44	46	34	10	9	2	1				146		
PM Peak	16:00	15:00	16:00	15:00	19:00	12:00	14:00	16:00	21:00					16:00		
Vol.	1	4	51	52	45	22	13	3	2					154		

Pecent

15th Percentile :	23 MPH
50th Percentile :	30 MPH
85th Percentile :	37 MPH
95th Percentile :	42 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1190
Percent in Pace :	58.6%
Number of Vehicles > 35 MPH :	398
Percent of Vehicles > 35 MPH :	19.6%
Mean Speed(Average) :	30 MPH

PRECISION
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INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 class
Site Code: 10111.31

Right Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	21	12	0	2	0	0	0	1	0	0	0	0	36
01:00	0	11	1	0	2	0	0	0	0	0	0	0	0	14
02:00	0	8	2	0	1	0	0	0	0	0	0	0	0	11
03:00	0	9	5	1	1	0	0	0	0	0	0	0	0	16
04:00	0	26	14	0	7	0	0	0	0	0	0	0	0	47
05:00	0	58	34	2	15	1	0	0	0	0	0	0	0	110
06:00	3	175	57	1	27	0	0	3	2	0	0	0	0	268
07:00	2	360	104	5	28	2	0	4	1	0	0	0	0	506
08:00	6	339	107	3	26	2	0	5	1	0	0	0	0	489
09:00	1	272	97	4	24	0	1	0	2	0	0	0	0	401
10:00	2	290	102	2	26	2	0	2	0	0	0	0	0	426
11:00	1	293	103	2	30	4	0	2	2	0	0	0	0	437
12 PM	3	314	98	2	24	3	0	1	1	0	0	0	0	446
13:00	7	319	99	2	26	1	0	4	0	0	0	0	0	458
14:00	7	359	112	2	15	3	0	7	1	0	0	0	0	506
15:00	3	385	127	4	30	0	0	6	0	0	0	0	0	555
16:00	3	381	101	1	27	1	0	4	1	0	0	0	0	519
17:00	2	379	120	2	28	0	0	3	1	0	0	0	0	535
18:00	3	321	93	3	23	0	0	2	0	0	0	0	0	445
19:00	2	266	83	0	11	1	0	1	0	0	0	0	0	364
20:00	0	184	59	0	9	0	0	1	0	1	0	0	0	254
21:00	0	161	55	1	9	0	0	1	0	0	0	0	0	227
22:00	1	75	24	0	5	0	0	0	1	0	0	0	0	106
23:00	0	63	9	0	0	0	0	0	0	0	0	0	0	72
Total	46	5069	1618	37	396	20	1	46	14	1	0	0	0	7248
Percent	0.6%	69.9%	22.3%	0.5%	5.5%	0.3%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	07:00	11:00	11:00	09:00	08:00	06:00					07:00
Vol.	6	360	107	5	30	4	1	5	2					506
PM Peak	13:00	15:00	15:00	15:00	15:00	12:00		14:00	12:00	20:00				15:00
Vol.	7	385	127	4	30	3		7	1	1				555

PRECISION
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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 class
Site Code: 10111.31

Right Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	24	7	0	2	0	0	0	0	0	0	0	0	33
01:00	1	18	1	0	1	0	0	0	0	0	0	0	0	21
02:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
03:00	0	8	4	0	2	0	0	0	0	0	0	0	0	14
04:00	0	23	12	0	7	0	0	0	0	0	0	0	0	42
05:00	0	72	34	1	20	0	0	1	0	0	0	0	0	128
06:00	4	188	46	0	26	0	0	0	0	1	0	0	0	265
07:00	1	359	81	4	28	0	1	7	1	0	0	0	0	482
08:00	2	323	125	4	35	1	0	3	1	0	0	0	0	494
09:00	4	269	104	4	30	1	0	1	2	1	0	0	0	416
10:00	2	301	92	3	26	0	0	3	1	0	0	0	0	428
11:00	1	275	101	2	22	0	0	4	0	0	0	0	0	405
12 PM	6	353	115	3	25	2	0	2	2	0	0	0	0	508
13:00	2	363	106	1	14	1	1	3	1	0	0	0	0	492
14:00	4	366	116	5	25	0	0	5	2	0	0	0	0	523
15:00	3	434	119	1	15	0	0	2	0	0	0	0	0	574
16:00	2	369	113	2	27	0	0	0	1	0	0	0	0	514
17:00	2	378	124	1	18	0	0	7	0	0	0	0	0	530
18:00	1	319	110	1	21	0	0	4	1	0	0	0	0	457
19:00	4	219	76	0	17	0	0	0	0	0	0	0	0	316
20:00	0	188	67	0	15	0	0	0	0	0	0	0	0	270
21:00	1	176	38	1	5	0	0	0	0	0	0	0	0	221
22:00	0	61	38	1	3	0	0	0	0	0	0	0	0	103
23:00	0	57	17	0	2	0	0	0	0	0	0	0	0	76
Total	40	5148	1648	34	386	5	2	42	12	2	0	0	0	7319
Percent	0.5%	70.3%	22.5%	0.5%	5.3%	0.1%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	08:00	07:00	08:00	08:00	07:00	07:00	09:00	06:00				08:00
Vol.	4	359	125	4	35	1	1	7	2	1				494
PM Peak	12:00	15:00	17:00	14:00	16:00	12:00	13:00	17:00	12:00					15:00
Vol.	6	434	124	5	27	2	1	7	2					574

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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 class
Site Code: 10111.31

Left Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	9	5	0	1	0	0	0	0	0	0	0	0	15
01:00	0	4	1	0	3	0	0	0	0	0	0	0	0	8
02:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
03:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
04:00	0	8	4	0	1	0	0	0	0	0	0	0	0	13
05:00	0	19	3	0	7	0	0	0	0	0	0	0	0	29
06:00	0	46	15	0	7	0	0	0	0	0	0	0	0	68
07:00	0	88	25	9	8	0	0	3	0	0	0	0	0	133
08:00	0	82	26	0	6	0	0	2	0	0	0	0	0	116
09:00	1	66	22	2	13	1	0	0	1	0	0	0	0	106
10:00	0	80	37	3	6	0	0	1	0	0	0	0	0	127
11:00	0	86	35	1	8	0	0	0	0	0	0	0	0	130
12 PM	0	109	34	3	9	0	0	2	0	0	0	0	0	157
13:00	1	97	30	1	6	1	0	1	0	0	0	0	0	137
14:00	1	95	23	0	10	0	0	0	0	0	0	0	0	129
15:00	0	115	37	3	7	0	0	0	0	0	0	0	0	162
16:00	0	112	32	1	3	0	0	0	0	0	0	0	0	148
17:00	0	109	24	0	7	0	0	1	0	0	0	0	0	141
18:00	0	105	31	0	3	0	0	0	0	0	0	0	0	139
19:00	0	77	26	0	6	0	0	0	0	0	0	0	0	109
20:00	0	57	16	0	7	0	0	0	0	0	0	0	0	80
21:00	0	54	10	0	4	0	0	0	0	0	0	0	0	68
22:00	0	30	7	0	0	0	0	0	0	0	0	0	0	37
23:00	0	25	4	0	0	0	0	0	0	0	0	0	0	29
Total	3	1481	450	23	122	2	0	10	1	0	0	0	0	2092
Percent	0.1%	70.8%	21.5%	1.1%	5.8%	0.1%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	10:00	07:00	09:00	09:00		07:00	09:00					07:00
Vol.	1	88	37	9	13	1		3	1					133
PM Peak	13:00	15:00	15:00	12:00	14:00	13:00		12:00						15:00
Vol.	1	115	37	3	10	1		2						162

PRECISION
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Kings Highway WB lanes
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A1 class
Site Code: 10111.31

Left Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	11	0	0	1	0	0	0	0	0	0	0	0	12
01:00	0	8	1	1	2	0	0	0	0	0	0	0	0	12
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
04:00	0	6	7	0	2	0	0	0	0	0	0	0	0	15
05:00	0	18	3	0	8	0	0	0	0	0	0	0	0	29
06:00	0	49	13	0	5	0	0	1	0	0	0	0	0	68
07:00	0	86	24	6	7	0	0	0	0	0	0	0	0	123
08:00	1	92	42	1	8	1	0	1	0	0	0	0	0	146
09:00	0	59	33	1	7	0	0	2	0	0	0	0	0	102
10:00	0	79	33	2	6	0	0	0	0	0	0	0	0	120
11:00	0	86	33	1	6	0	0	0	0	0	0	0	0	126
12 PM	0	95	38	4	13	1	0	0	0	0	0	0	0	151
13:00	0	79	35	1	5	0	0	0	0	0	0	0	0	120
14:00	0	85	27	1	7	1	0	2	0	0	0	0	0	123
15:00	0	114	23	3	4	0	0	0	0	0	0	0	0	144
16:00	1	111	30	1	11	0	0	0	0	0	0	0	0	154
17:00	0	89	29	0	5	0	0	0	0	0	0	0	0	123
18:00	0	97	38	0	5	0	0	0	0	0	0	0	0	140
19:00	0	87	24	0	3	0	0	1	0	0	0	0	0	115
20:00	0	53	11	0	3	0	0	0	0	0	0	0	0	67
21:00	0	55	13	0	2	0	0	0	0	0	0	0	0	70
22:00	0	24	9	0	1	0	0	0	0	0	0	0	0	34
23:00	0	28	3	0	1	0	0	0	0	0	0	0	0	32
Total	2	1414	472	22	112	3	0	7	0	0	0	0	0	2032
Percent	0.1%	69.6%	23.2%	1.1%	5.5%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	05:00	08:00		09:00						08:00
Vol.	1	92	42	6	8	1		2						146
PM Peak	16:00	15:00	12:00	12:00	12:00	12:00		14:00						16:00
Vol.	1	114	38	4	13	1		2						154

Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION
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81676 E-A2 volume
Site Code: 10111.31

Start	Right Lane				Left Lane				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	15		140		8		51		23		191		
12:15	11		99		7		43		18		142		
12:30	7		105		4		60		11		165		
12:45	6	39	128	472	6	25	57	211	12	64	185	683	
01:00	3		108		3		41		6		149		
01:15	3		116		3		55		6		171		
01:30	2		101		0		53		2		154		
01:45	0	8	106	431	2	8	44	193	2	16	150	624	
02:00	2		123		2		50		4		173		
02:15	4		131		6		48		10		179		
02:30	0		135		3		60		3		195		
02:45	2	8	126	515	2	13	52	210	4	21	178	725	
03:00	2		117		4		49		6		166		
03:15	1		93		3		46		4		139		
03:30	2		142		2		51		4		193		
03:45	0	5	144	496	2	11	63	209	2	16	207	705	
04:00	3		130		1		60		4		190		
04:15	3		134		1		66		4		200		
04:30	5		133		3		53		8		186		
04:45	23	34	143	540	13	18	58	237	36	52	201	777	
05:00	10		123		9		61		19		184		
05:15	14		151		17		66		31		217		
05:30	21		138		9		64		30		202		
05:45	18	63	130	542	11	46	57	248	29	109	187	790	
06:00	39		141		10		57		49		198		
06:15	35		140		12		59		47		199		
06:30	48		130		16		52		64		182		
06:45	80	202	110	521	34	72	44	212	114	274	154	733	
07:00	92		95		32		40		124		135		
07:15	136		101		42		42		178		143		
07:30	107		80		49		29		156		109		
07:45	117	452	73	349	47	170	32	143	164	622	105	492	
08:00	94		71		44		33		138		104		
08:15	85		86		47		37		132		123		
08:30	88		57		38		34		126		91		
08:45	90	357	59	273	35	164	34	138	125	521	93	411	
09:00	79		49		29		27		108		76		
09:15	74		61		27		25		101		86		
09:30	108		48		40		20		148		68		
09:45	94	355	49	207	32	128	24	96	126	483	73	303	
10:00	99		17		31		17		130		34		
10:15	125		19		40		20		165		39		
10:30	122		17		43		13		165		30		
10:45	107	453	12	65	44	158	20	70	151	611	32	135	
11:00	132		38		37		12		169		50		
11:15	96		20		49		9		145		29		
11:30	122		24		41		19		163		43		
11:45	105	455	15	97	53	180	12	52	158	635	27	149	
Total	2431		4508		993		2019		3424		6527		
Percent	71.0%		69.1%		29.0%		30.9%						
Day Total		6939				3012				9951			
Peak	10:15		05:15		07:30		04:45		10:15		04:45		
Vol.	486		560		187		249		650		804		
P.H.F.	0.920		0.927		0.954		0.943		0.962		0.926		

Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

PRECISION
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81676 E-A2 volume
Site Code: 10111.31

Start	Right Lane				Left Lane				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	13		119		9		49		22		168		
12:15	8		118		13		48		21		166		
12:30	3		115		6		46		9		161		
12:45	7	31	114	466	6	34	59	202	13	65	173	668	
01:00	6		115		5		45		11		160		
01:15	1		121		3		48		4		169		
01:30	2		114		6		56		8		170		
01:45	2	11	116	466	2	16	40	189	4	27	156	655	
02:00	0		122		1		51		1		173		
02:15	3		144		4		54		7		198		
02:30	4		127		4		62		8		189		
02:45	0	7	117	510	0	9	46	213	0	16	163	723	
03:00	3		111		2		45		5		156		
03:15	1		129		2		55		3		184		
03:30	1		127		3		57		4		184		
03:45	3	8	130	497	2	9	60	217	5	17	190	714	
04:00	1		126		1		61		2		187		
04:15	2		131		0		65		2		196		
04:30	9		134		7		59		16		193		
04:45	11	23	114	505	8	16	65	250	19	39	179	755	
05:00	16		122		11		50		27		172		
05:15	17		121		8		53		25		174		
05:30	17		129		9		42		26		171		
05:45	31	81	131	503	11	39	55	200	42	120	186	703	
06:00	37		127		16		49		53		176		
06:15	30		134		14		69		44		203		
06:30	57		113		13		52		70		165		
06:45	65	189	117	491	31	74	48	218	96	263	165	709	
07:00	98		108		30		52		128		160		
07:15	137		109		48		28		185		137		
07:30	128		86		48		24		176		110		
07:45	132	495	89	392	47	173	30	134	179	668	119	526	
08:00	98		82		28		46		126		128		
08:15	89		88		35		37		124		125		
08:30	96		76		40		26		136		102		
08:45	90	373	44	290	35	138	32	141	125	511	76	431	
09:00	77		57		34		28		111		85		
09:15	83		57		39		25		122		82		
09:30	74		45		32		29		106		74		
09:45	95	329	50	209	43	148	20	102	138	477	70	311	
10:00	97		44		47		22		144		66		
10:15	93		40		41		15		134		55		
10:30	100		31		35		18		135		49		
10:45	101	391	16	131	36	159	8	63	137	550	24	194	
11:00	106		16		41		17		147		33		
11:15	117		18		46		20		163		38		
11:30	102		15		50		20		152		35		
11:45	133	458	13	62	45	182	13	70	178	640	26	132	
Total	2396		4522		997		1999		3393		6521		
Percent	70.6%		69.3%		29.4%		30.7%						
Day Total		6918				2996				9914			
Peak	07:00		03:45		11:00		04:00		07:00		03:45		
Vol.	495		521		182		250		668		766		
P.H.F.	0.903		0.972		0.910		0.962		0.903		0.977		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 speed
Site Code: 10111.31

Right Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	1	3	8	13	11	3	0	0	0	0	0	0	39	38	32
01:00	0	0	0	3	2	2	1	0	0	0	0	0	0	8	36	32
02:00	0	0	0	1	1	4	1	1	0	0	0	0	0	8	44	37
03:00	0	0	1	0	1	2	1	0	0	0	0	0	0	5	36	33
04:00	0	0	1	5	14	10	4	0	0	0	0	0	0	34	39	34
05:00	0	1	4	14	21	10	**12**	1	0	0	0	0	0	63	41	33
06:00	3	10	32	61	67	**22**	2	**4**	0	0	0	0	0	201	34	29
07:00	**53**	69	110	**119**	**76**	20	6	0	0	0	0	0	0	453	32	23
08:00	22	42	103	104	59	20	6	1	0	0	0	0	0	357	32	25
09:00	30	43	92	102	65	17	6	0	0	0	0	0	0	355	32	25
10:00	51	77	135	111	61	17	1	0	0	0	0	0	0	453	30	23
11:00	53	**78**	**156**	101	50	15	1	1	0	0	0	0	0	**455**	29	22
12 PM	69	99	160	85	45	13	1	0	0	0	0	0	0	472	29	21
13:00	53	77	133	**110**	53	5	0	0	0	0	0	0	0	431	29	22
14:00	85	120	204	68	32	3	3	0	0	0	0	0	0	515	27	20
15:00	87	120	201	68	16	3	1	0	0	0	0	0	0	496	25	19
16:00	101	**128**	207	74	28	2	0	0	0	0	0	0	0	540	26	19
17:00	84	123	**218**	86	22	5	3	1	0	0	0	0	0	**542**	27	20
18:00	**102**	126	178	72	34	5	1	2	0	0	0	0	0	520	27	20
19:00	22	49	104	106	57	11	1	0	0	0	0	0	0	350	31	24
20:00	7	24	81	95	46	13	5	1	0	0	0	0	0	272	32	26
21:00	4	11	48	61	**58**	20	5	0	**1**	0	0	0	0	208	34	28
22:00	0	0	4	19	27	11	2	1	1	0	0	0	0	65	36	32
23:00	0	0	5	27	31	**22**	**8**	**3**	1	0	0	0	0	97	39	33
Total	826	1198	2180	1500	879	263	74	16	3	0	0	0	0	6939		
%	11.9%	17.3%	31.4%	21.6%	12.7%	3.8%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	11:00	07:00	07:00	06:00	05:00	06:00						11:00		
Vol.	53	78	156	119	76	22	12	4						455		
PM Peak	18:00	16:00	17:00	13:00	21:00	23:00	23:00	23:00	21:00					17:00		
Vol.	102	128	218	110	58	22	8	3	1					542		

Pecent

15th Percentile :	15 MPH
50th Percentile :	23 MPH
85th Percentile :	31 MPH
95th Percentile :	35 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3680
Percent in Pace :	53.0%
Number of Vehicles > 30 MPH :	1059
Percent of Vehicles > 30 MPH :	15.3%
Mean Speed(Average) :	23 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 speed
Site Code: 10111.31

Right Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	3	4	12	9	2	0	0	**1**	0	0	0	31	38	33
01:00	0	0	0	0	7	4	0	0	0	0	0	0	0	11	36	33
02:00	0	0	1	1	1	1	1	1	0	1	0	0	0	7	45	39
03:00	0	0	0	1	6	1	0	0	0	0	0	0	0	8	34	32
04:00	0	0	0	3	10	6	4	0	0	0	0	0	0	23	40	34
05:00	0	0	1	13	25	21	**16**	**4**	**1**	0	0	0	0	81	42	35
06:00	5	6	37	48	47	30	16	0	0	0	0	0	0	189	37	29
07:00	55	68	135	**118**	**79**	**35**	4	0	0	0	**1**	0	0	**495**	32	24
08:00	36	41	96	111	56	25	5	3	0	0	0	0	0	373	32	25
09:00	32	41	92	86	57	17	3	1	0	0	0	0	0	329	32	24
10:00	48	72	121	90	49	10	1	0	0	0	0	0	0	391	30	22
11:00	**56**	**86**	**143**	99	65	8	1	0	0	0	0	0	0	458	30	22
12 PM	69	112	172	69	36	7	0	0	0	0	0	0	0	465	27	20
13:00	86	119	155	66	34	5	1	**1**	0	0	0	0	0	467	27	20
14:00	84	111	177	87	43	7	1	0	0	0	0	0	0	**510**	28	20
15:00	80	119	182	80	25	8	2	0	0	0	0	0	0	496	27	20
16:00	**87**	**141**	199	63	13	3	0	0	0	0	0	0	0	506	25	19
17:00	85	129	**200**	76	12	1	0	0	0	0	0	0	0	503	25	19
18:00	77	96	161	104	46	6	0	0	0	0	0	0	0	490	28	21
19:00	56	55	119	**107**	43	12	1	0	0	0	0	0	0	393	29	22
20:00	21	39	85	85	49	6	5	0	0	0	0	0	0	290	31	24
21:00	4	6	37	76	**66**	17	2	1	0	0	0	0	0	209	34	28
22:00	0	3	22	43	39	**18**	**6**	0	0	0	0	0	0	131	35	29
23:00	0	1	7	14	18	15	6	0	**1**	0	0	0	0	62	39	32
Total	881	1245	2145	1444	838	272	77	11	2	2	1	0	0	6918		
%	12.7%	18.0%	31.0%	20.9%	12.1%	3.9%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	07:00	07:00	07:00	05:00	05:00	05:00	00:00	07:00			07:00		
Vol.	56	86	143	118	79	35	16	4	1	1	1			495		
PM Peak	16:00	16:00	17:00	19:00	21:00	22:00	22:00	13:00	23:00					14:00		
Vol.	87	141	200	107	66	18	6	1	1					510		

Pecent

15th Percentile : 15 MPH
50th Percentile : 23 MPH
85th Percentile : 30 MPH
95th Percentile : 35 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 3589
Percent in Pace : 51.9%
Number of Vehicles > 30 MPH : 1035
Percent of Vehicles > 30 MPH : 15.0%
Mean Speed(Average) : 22 MPH

PRECISION
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INDUSTRIES, LLC
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 speed
Site Code: 10111.31

Left Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	7	12	5	0	0	0	0	0	0	0	25	35	31
01:00	0	0	0	1	7	0	0	0	0	0	0	0	0	8	33	31
02:00	0	0	2	4	6	0	1	0	0	0	0	0	0	13	33	30
03:00	0	0	1	2	4	4	0	0	0	0	0	0	0	11	36	32
04:00	0	0	2	3	9	4	0	0	0	0	0	0	0	18	35	31
05:00	0	1	4	12	16	10	**2**	**1**	0	0	0	0	0	46	37	31
06:00	0	1	14	30	22	3	2	0	0	0	0	0	0	72	33	28
07:00	**2**	6	47	70	32	**12**	1	0	0	0	0	0	0	170	32	27
08:00	0	7	45	67	**38**	6	1	0	0	0	0	0	0	164	32	27
09:00	0	8	36	57	20	6	1	0	0	0	0	0	0	128	31	26
10:00	2	8	66	66	15	1	0	0	0	0	0	0	0	158	29	25
11:00	0	**15**	**73**	**71**	17	4	0	0	0	0	0	0	0	**180**	29	25
12 PM	2	16	108	64	15	4	**1**	**1**	0	0	0	0	0	211	29	24
13:00	1	17	79	**72**	22	2	0	0	0	0	0	0	0	193	29	25
14:00	3	28	105	52	18	4	0	0	0	0	0	0	0	210	28	24
15:00	**4**	**29**	109	48	17	2	0	0	0	0	0	0	0	209	28	23
16:00	3	24	136	57	17	0	0	0	0	0	0	0	0	237	28	23
17:00	3	24	**138**	60	21	2	0	0	0	0	0	0	0	**248**	28	24
18:00	3	28	109	54	18	0	0	0	0	0	0	0	0	212	28	23
19:00	0	4	52	64	21	2	0	0	0	0	0	0	0	143	30	26
20:00	0	7	46	63	17	4	1	0	0	0	0	0	0	138	30	26
21:00	0	2	28	46	19	1	0	0	0	0	0	0	0	96	31	26
22:00	0	0	8	26	**28**	**7**	0	1	0	0	0	0	0	70	34	30
23:00	0	0	3	18	26	4	0	1	0	0	0	0	0	52	34	30
Total	23	225	1212	1014	437	87	10	4	0	0	0	0	0	3012		
%	0.8%	7.5%	40.2%	33.7%	14.5%	2.9%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	11:00	11:00	08:00	07:00	05:00	05:00						11:00		
Vol.	2	15	73	71	38	12	2	1						180		
PM Peak	15:00	15:00	17:00	13:00	22:00	22:00	12:00	12:00						17:00		
Vol.	4	29	138	72	28	7	1	1						248		

Pecent

15th Percentile :	20 MPH
50th Percentile :	25 MPH
85th Percentile :	30 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	2226
Percent in Pace :	73.9%
Number of Vehicles > 30 MPH :	450
Percent of Vehicles > 30 MPH :	14.9%
Mean Speed(Average) :	25 MPH

PRECISION
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 speed
Site Code: 10111.31

Left Lane

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	1	7	20	6	0	0	0	0	0	0	0	34	35	32
01:00	0	1	1	5	7	1	1	0	0	0	0	0	0	16	34	30
02:00	0	0	0	4	1	3	0	0	**1**	0	0	0	0	9	37	33
03:00	0	0	0	1	4	1	0	**3**	0	0	0	0	0	9	46	36
04:00	0	0	0	5	8	2	1	0	0	0	0	0	0	16	35	31
05:00	0	0	0	9	15	9	**6**	0	0	0	0	0	0	39	39	33
06:00	0	0	14	23	28	4	4	0	0	0	0	0	0	73	34	29
07:00	1	**11**	58	60	**31**	**10**	2	0	1	0	0	0	0	174	32	26
08:00	1	6	39	58	22	10	1	1	0	0	0	0	0	138	32	27
09:00	0	4	44	61	28	8	2	0	0	0	0	0	0	147	32	27
10:00	0	6	68	65	17	4	0	0	0	0	0	0	0	160	29	25
11:00	**3**	10	**71**	**72**	22	3	1	0	0	0	0	0	0	**182**	29	25
12 PM	3	18	97	66	17	1	0	0	0	0	0	0	0	202	29	24
13:00	4	19	87	62	16	1	0	0	0	0	0	0	0	189	29	24
14:00	4	20	113	54	16	6	0	0	0	0	0	0	0	213	28	24
15:00	5	23	126	49	13	1	0	0	0	0	0	0	0	217	27	23
16:00	5	**27**	**143**	54	16	5	0	0	0	0	0	0	0	**250**	28	23
17:00	**7**	22	112	44	13	2	0	0	0	0	0	0	0	200	28	23
18:00	2	19	88	**85**	18	5	0	0	0	0	0	0	0	217	29	25
19:00	0	4	62	52	13	4	0	0	0	0	0	0	0	135	29	25
20:00	1	7	53	50	26	4	0	0	0	0	0	0	0	141	31	26
21:00	0	2	20	48	24	**7**	1	0	0	0	0	0	0	102	33	28
22:00	0	1	6	23	**28**	4	1	0	0	0	0	0	0	63	34	29
23:00	0	2	8	23	28	5	**2**	**2**	0	0	0	0	0	70	34	30
Total	36	202	1211	980	431	106	22	6	2	0	0	0	0	2996		
%	1.2%	6.7%	40.4%	32.7%	14.4%	3.5%	0.7%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	07:00	11:00	11:00	07:00	07:00	05:00	03:00	02:00					11:00		
Vol.	3	11	71	72	31	10	6	3	1					182		
PM Peak	17:00	16:00	16:00	18:00	22:00	21:00	23:00	23:00						16:00		
Vol.	7	27	143	85	28	7	2	2						250		

Pecent

15th Percentile :	20 MPH
50th Percentile :	25 MPH
85th Percentile :	31 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	2191
Percent in Pace :	73.1%
Number of Vehicles > 30 MPH :	480
Percent of Vehicles > 30 MPH :	16.0%
Mean Speed(Average) :	25 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 class
Site Code: 10111.31

Right Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	20	19	0	0	0	0	0	0	0	0	0	0	39
01:00	0	3	5	0	0	0	0	0	0	0	0	0	0	8
02:00	0	2	4	0	2	0	0	0	0	0	0	0	0	8
03:00	0	2	1	0	2	0	0	0	0	0	0	0	0	5
04:00	0	12	15	0	7	0	0	0	0	0	0	0	0	34
05:00	0	21	27	0	15	0	0	0	0	0	0	0	0	63
06:00	2	100	75	4	19	0	0	0	1	0	0	0	0	201
07:00	2	205	181	9	45	1	0	8	1	1	0	0	0	453
08:00	1	161	155	3	27	0	0	10	0	0	0	0	0	357
09:00	1	163	156	2	26	0	1	6	0	0	0	0	0	355
10:00	2	225	178	4	34	3	0	7	0	0	0	0	0	453
11:00	2	246	176	1	23	1	0	5	0	1	0	0	0	455
12 PM	3	259	161	2	38	1	0	8	0	0	0	0	0	472
13:00	3	207	179	2	28	3	0	9	0	0	0	0	0	431
14:00	1	281	184	4	30	0	0	14	0	0	0	1	0	515
15:00	0	274	182	3	22	0	0	15	0	0	0	0	0	496
16:00	0	286	192	2	39	1	0	18	1	0	1	0	0	540
17:00	1	284	214	0	23	0	0	20	0	0	0	0	0	542
18:00	3	292	180	0	36	0	0	9	0	0	0	0	0	520
19:00	0	190	136	0	22	0	0	2	0	0	0	0	0	350
20:00	0	151	97	0	23	0	0	1	0	0	0	0	0	272
21:00	1	114	83	1	8	0	0	0	1	0	0	0	0	208
22:00	0	33	25	0	7	0	0	0	0	0	0	0	0	65
23:00	1	43	48	0	5	0	0	0	0	0	0	0	0	97
Total	23	3574	2673	37	481	10	1	132	4	2	1	1	0	6939
Percent	0.3%	51.5%	38.5%	0.5%	6.9%	0.1%	0.0%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	07:00	07:00	07:00	10:00	09:00	08:00	06:00	07:00				11:00
Vol.	2	246	181	9	45	3	1	10	1	1				455
PM Peak	12:00	18:00	17:00	14:00	16:00	13:00		17:00	16:00		16:00	14:00		17:00
Vol.	3	292	214	4	39	3		20	1		1	1		542

PRECISION
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 class
Site Code: 10111.31

Right Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	12	16	0	2	1	0	0	0	0	0	0	0	31
01:00	0	5	5	1	0	0	0	0	0	0	0	0	0	11
02:00	0	1	4	0	2	0	0	0	0	0	0	0	0	7
03:00	0	4	2	0	2	0	0	0	0	0	0	0	0	8
04:00	0	7	12	0	4	0	0	0	0	0	0	0	0	23
05:00	0	31	31	0	19	0	0	0	0	0	0	0	0	81
06:00	0	79	87	1	21	0	0	0	1	0	0	0	0	189
07:00	4	261	171	10	45	0	0	4	0	0	0	0	0	495
08:00	1	156	165	2	40	1	0	8	0	0	0	0	0	373
09:00	4	162	131	1	28	1	0	2	0	0	0	0	0	329
10:00	3	188	149	2	40	0	0	8	1	0	0	0	0	391
11:00	0	237	171	5	33	1	0	9	1	1	0	0	0	458
12 PM	2	257	169	1	24	0	0	12	0	0	0	0	0	465
13:00	7	257	153	4	36	1	0	9	0	0	0	0	0	467
14:00	4	287	171	2	33	1	0	12	0	0	0	0	0	510
15:00	2	283	158	1	36	0	0	16	0	0	0	0	0	496
16:00	3	280	163	3	36	1	1	18	0	1	0	0	0	506
17:00	0	310	155	1	25	0	0	11	0	1	0	0	0	503
18:00	2	272	170	1	28	0	0	15	1	1	0	0	0	490
19:00	0	213	153	0	21	0	0	6	0	0	0	0	0	393
20:00	0	146	123	0	18	0	0	2	0	1	0	0	0	290
21:00	2	123	76	2	6	0	0	0	0	0	0	0	0	209
22:00	0	74	50	1	6	0	0	0	0	0	0	0	0	131
23:00	0	32	23	0	7	0	0	0	0	0	0	0	0	62
Total	34	3677	2508	38	512	7	1	132	4	5	0	0	0	6918
Percent	0.5%	53.2%	36.3%	0.5%	7.4%	0.1%	0.0%	1.9%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	00:00		11:00	06:00	11:00				07:00
Vol.	4	261	171	10	45	1		9	1	1				495
PM Peak	13:00	17:00	14:00	13:00	13:00	13:00	16:00	16:00	18:00	16:00				14:00
Vol.	7	310	171	4	36	1	1	18	1	1				510

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 class
Site Code: 10111.31

Left Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	24	1	0	0	0	0	0	0	0	0	0	0	25
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	6	1	1	4	0	0	1	0	0	0	0	0	13
03:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
04:00	0	13	3	0	2	0	0	0	0	0	0	0	0	18
05:00	1	26	14	1	2	2	0	0	0	0	0	0	0	46
06:00	0	58	9	1	4	0	0	0	0	0	0	0	0	72
07:00	1	139	23	1	5	1	0	0	0	0	0	0	0	170
08:00	0	125	27	3	7	2	0	0	0	0	0	0	0	164
09:00	0	91	23	2	9	1	0	1	1	0	0	0	0	128
10:00	1	136	14	1	5	1	0	0	0	0	0	0	0	158
11:00	0	149	23	1	5	1	0	0	1	0	0	0	0	180
12 PM	0	174	24	1	8	0	0	3	1	0	0	0	0	211
13:00	1	154	26	2	6	2	0	0	2	0	0	0	0	193
14:00	0	180	17	2	7	1	0	1	1	1	0	0	0	210
15:00	0	183	15	1	8	1	0	1	0	0	0	0	0	209
16:00	1	203	29	0	2	1	0	0	1	0	0	0	0	237
17:00	0	225	21	0	2	0	0	0	0	0	0	0	0	248
18:00	0	185	19	2	5	1	0	0	0	0	0	0	0	212
19:00	0	131	10	0	2	0	0	0	0	0	0	0	0	143
20:00	0	113	23	0	2	0	0	0	0	0	0	0	0	138
21:00	0	86	9	0	0	0	0	0	1	0	0	0	0	96
22:00	0	62	8	0	0	0	0	0	0	0	0	0	0	70
23:00	0	46	6	0	0	0	0	0	0	0	0	0	0	52
Total	5	2526	347	19	85	14	0	7	8	1	0	0	0	3012
Percent	0.2%	83.9%	11.5%	0.6%	2.8%	0.5%	0.0%	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	11:00	08:00	08:00	09:00	05:00		02:00	09:00					11:00
Vol.	1	149	27	3	9	2		1	1					180
PM Peak	13:00	17:00	16:00	13:00	12:00	13:00		12:00	13:00	14:00				17:00
Vol.	1	225	29	2	8	2		3	2	1				248

PRECISION
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Kings Highway (EB lanes)
east of Route 140 NB Ramps
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-A2 class
Site Code: 10111.31

Left Lane

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	32	2	0	0	0	0	0	0	0	0	0	0	34
01:00	0	14	1	0	1	0	0	0	0	0	0	0	0	16
02:00	0	8	0	0	1	0	0	0	0	0	0	0	0	9
03:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
04:00	0	9	7	0	0	0	0	0	0	0	0	0	0	16
05:00	0	24	12	0	3	0	0	0	0	0	0	0	0	39
06:00	0	55	13	1	4	0	0	0	0	0	0	0	0	73
07:00	0	138	26	3	4	1	0	1	1	0	0	0	0	174
08:00	0	107	21	4	4	1	0	0	1	0	0	0	0	138
09:00	0	112	25	3	6	0	0	1	0	0	0	0	0	147
10:00	0	130	21	0	7	0	0	1	1	0	0	0	0	160
11:00	2	146	25	1	5	1	0	1	1	0	0	0	0	182
12 PM	0	172	23	2	5	0	0	0	0	0	0	0	0	202
13:00	0	156	25	1	5	1	0	0	1	0	0	0	0	189
14:00	1	182	25	0	4	0	0	0	1	0	0	0	0	213
15:00	0	191	15	1	7	1	0	1	1	0	0	0	0	217
16:00	0	217	28	1	4	0	0	0	0	0	0	0	0	250
17:00	0	180	13	1	5	0	0	1	0	0	0	0	0	200
18:00	0	202	12	0	1	0	0	2	0	0	0	0	0	217
19:00	0	123	10	1	1	0	0	0	0	0	0	0	0	135
20:00	0	125	13	1	2	0	0	0	0	0	0	0	0	141
21:00	0	85	17	0	0	0	0	0	0	0	0	0	0	102
22:00	0	58	5	0	0	0	0	0	0	0	0	0	0	63
23:00	0	64	5	0	1	0	0	0	0	0	0	0	0	70
Total	3	2536	346	20	71	5	0	8	7	0	0	0	0	2996
Percent	0.1%	84.6%	11.5%	0.7%	2.4%	0.2%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	07:00	08:00	10:00	07:00		07:00	07:00					11:00
Vol.	2	146	26	4	7	1		1	1					182
PM Peak	14:00	16:00	16:00	12:00	15:00	13:00		18:00	13:00					16:00
Vol.	1	217	28	2	7	1		2	1					250

PRECISION
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B volume
Site Code: 10111.31

Start	SB				NB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	18		87		5		108		23		195		
12:15	12		99		5		82		17		181		
12:30	4		93		5		86		9		179		
12:45	4	38	83	362	2	17	88	364	6	55	171	726	
01:00	14		101		4		73		18		174		
01:15	3		98		0		90		3		188		
01:30	0		78		7		93		7		171		
01:45	3	20	81	358	2	13	89	345	5	33	170	703	
02:00	1		87		2		113		3		200		
02:15	2		105		2		90		4		195		
02:30	1		115		0		136		1		251		
02:45	4	8	127	434	2	6	110	449	6	14	237	883	
03:00	5		119		0		115		5		234		
03:15	5		120		3		95		8		215		
03:30	5		152		4		129		9		281		
03:45	4	19	113	504	1	8	132	471	5	27	245	975	
04:00	6		140		6		140		12		280		
04:15	4		149		7		102		11		251		
04:30	3		149		12		99		15		248		
04:45	16	29	125	563	19	44	115	456	35	73	240	1019	
05:00	14		137		28		134		42		271		
05:15	8		122		49		110		57		232		
05:30	22		97		51		98		73		195		
05:45	22	66	120	476	43	171	93	435	65	237	213	911	
06:00	32		110		33		81		65		191		
06:15	32		100		55		96		87		196		
06:30	43		100		79		70		122		170		
06:45	63	170	81	391	93	260	74	321	156	430	155	712	
07:00	71		81		78		74		149		155		
07:15	94		85		119		54		213		139		
07:30	82		77		101		66		183		143		
07:45	102	349	59	302	92	390	48	242	194	739	107	544	
08:00	96		61		98		53		194		114		
08:15	61		46		106		48		167		94		
08:30	72		38		78		36		150		74		
08:45	54	283	42	187	90	372	25	162	144	655	67	349	
09:00	61		43		60		26		121		69		
09:15	62		51		66		44		128		95		
09:30	52		41		58		25		110		66		
09:45	77	252	34	169	96	280	39	134	173	532	73	303	
10:00	68		32		69		22		137		54		
10:15	85		13		63		28		148		41		
10:30	63		25		83		26		146		51		
10:45	75	291	14	84	71	286	12	88	146	577	26	172	
11:00	74		29		82		11		156		40		
11:15	83		23		80		16		163		39		
11:30	96		14		86		11		182		25		
11:45	85	338	13	79	72	320	2	40	157	658	15	119	
Total	1863		3909		2167		3507		4030		7416		
Percent	46.2%		52.7%		53.8%		47.3%						
Day Total		5772				5674				11446			
Peak	07:15		04:00		07:15		03:30		07:15		03:30		
Vol.	374		563		410		503		784		1057		
P.H.F.	0.917		0.945		0.861		0.898		0.920		0.940		

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B volume
Site Code: 10111.31

Start	SB				NB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	17		115		7		102		24		217		
12:15	12		87		10		109		22		196		
12:30	14		91		1		88		15		179		
12:45	11	54	87	380	3	21	92	391	14	75	179	771	
01:00	9		89		5		86		14		175		
01:15	4		83		2		85		6		168		
01:30	3		85		1		94		4		179		
01:45	2	18	74	331	2	10	98	363	4	28	172	694	
02:00	6		87		1		105		7		192		
02:15	6		107		1		94		7		201		
02:30	1		93		1		147		2		240		
02:45	7	20	136	423	4	7	110	456	11	27	246	879	
03:00	2		117		0		133		2		250		
03:15	3		137		1		112		4		249		
03:30	1		147		6		119		7		266		
03:45	6	12	137	538	5	12	108	472	11	24	245	1010	
04:00	1		125		3		137		4		262		
04:15	6		136		7		114		13		250		
04:30	6		156		13		114		19		270		
04:45	19	32	132	549	16	39	112	477	35	71	244	1026	
05:00	11		135		26		120		37		255		
05:15	11		134		30		97		41		231		
05:30	12		147		46		103		58		250		
05:45	25	59	94	510	44	146	93	413	69	205	187	923	
06:00	30		86		30		86		60		172		
06:15	31		95		54		82		85		177		
06:30	50		86		76		88		126		174		
06:45	65	176	89	356	89	249	70	326	154	425	159	682	
07:00	71		87		97		63		168		150		
07:15	84		72		107		59		191		131		
07:30	89		73		116		57		205		130		
07:45	105	349	88	320	109	429	58	237	214	778	146	557	
08:00	92		60		96		40		188		100		
08:15	68		55		142		43		210		98		
08:30	50		45		91		39		141		84		
08:45	78	288	41	201	78	407	31	153	156	695	72	354	
09:00	68		44		66		36		134		80		
09:15	61		42		74		41		135		83		
09:30	72		36		63		40		135		76		
09:45	59	260	38	160	66	269	24	141	125	529	62	301	
10:00	75		42		75		19		150		61		
10:15	67		29		67		22		134		51		
10:30	76		24		66		16		142		40		
10:45	69	287	17	112	71	279	20	77	140	566	37	189	
11:00	76		27		76		12		152		39		
11:15	78		27		77		15		155		42		
11:30	79		9		90		4		169		13		
11:45	100	333	17	80	90	333	11	42	190	666	28	122	
Total	1888		3960		2201		3548		4089		7508		
Percent	46.2%		52.7%		53.8%		47.3%						
Day Total		5848				5749				11597			
Peak	07:15		04:15		07:30		02:30		07:30		03:45		
Vol.	370		559		463		502		817		1027		
P.H.F.	0.881		0.896		0.815		0.854		0.954		0.951		

PRECISION
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	15	8	11	1	**2**	0	0	0	0	0	38	38	32
01:00	0	0	1	5	11	3	0	0	0	0	0	0	0	20	34	31
02:00	0	0	1	2	4	1	0	0	0	0	0	0	0	8	33	30
03:00	0	0	3	6	8	1	1	0	0	0	0	0	0	19	33	30
04:00	0	0	1	11	8	8	1	0	0	0	0	0	0	29	37	31
05:00	0	0	7	23	28	8	0	0	0	0	0	0	0	66	34	30
06:00	1	1	13	64	66	24	1	0	0	0	0	0	0	170	34	30
07:00	0	4	33	155	107	45	5	0	0	0	0	0	0	349	34	29
08:00	0	6	34	125	93	22	2	1	0	0	0	0	0	283	34	29
09:00	2	1	46	103	81	16	1	2	0	0	0	0	0	252	33	28
10:00	1	5	64	127	63	29	2	0	0	0	0	0	0	291	33	28
11:00	3	12	63	166	74	19	1	0	0	0	0	0	0	338	32	27
12 PM	2	12	64	162	102	16	4	0	0	0	0	0	0	362	33	28
13:00	0	6	61	169	98	22	1	0	0	0	0	0	0	357	33	28
14:00	1	2	89	223	97	21	1	0	0	1	0	0	0	435	32	28
15:00	1	8	101	252	115	26	1	0	0	0	0	0	0	504	32	27
16:00	6	14	98	289	138	16	1	1	0	0	0	0	0	563	32	27
17:00	1	4	59	244	127	41	0	0	0	0	0	0	0	476	33	28
18:00	0	3	69	188	110	17	3	1	0	0	0	0	0	391	33	28
19:00	1	5	47	120	99	25	5	0	0	0	0	0	0	302	34	29
20:00	0	3	31	74	57	16	6	0	0	0	0	0	0	187	34	29
21:00	0	1	23	64	61	15	5	0	0	0	0	0	0	169	34	29
22:00	1	0	11	26	33	10	3	0	0	0	0	0	0	84	34	30
23:00	0	0	7	26	30	15	1	0	0	0	0	0	0	79	36	31
Total	20	87	927	2639	1618	427	46	7	0	1	0	0	0	5772		
%	0.3%	1.5%	16.1%	45.7%	28.0%	7.4%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	11:00	07:00	07:00	07:00	00:00						07:00		
Vol.	3	12	64	166	107	45	5	2						349		
PM Peak	16:00	16:00	15:00	16:00	16:00	17:00	20:00	16:00		14:00				16:00		
Vol.	6	14	101	289	138	41	6	1		1				563		

Pecent

15th Percentile :	24 MPH
50th Percentile :	28 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4257
Percent in Pace :	73.8%
Number of Vehicles > 30 MPH :	1775
Percent of Vehicles > 30 MPH :	30.8%
Mean Speed(Average) :	28 MPH

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81676 E-B speed
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SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	6	16	19	9	3	**1**	0	0	0	0	0	54	37	31
01:00	0	0	3	7	4	3	1	0	0	0	0	0	0	18	35	29
02:00	**1**	0	3	10	5	1	0	0	0	0	0	0	0	20	32	27
03:00	0	0	0	3	8	0	1	0	0	0	0	0	0	12	33	31
04:00	0	0	2	9	11	7	2	1	0	0	0	0	0	32	37	32
05:00	0	0	3	14	26	13	3	0	0	0	0	0	0	59	37	32
06:00	0	7	18	49	65	34	3	0	0	0	0	0	0	176	36	30
07:00	1	7	32	**157**	**104**	**44**	**4**	0	0	0	0	0	0	**349**	34	29
08:00	1	**10**	41	102	93	38	3	0	0	0	0	0	0	288	34	29
09:00	0	5	44	124	72	14	1	0	0	0	0	0	0	260	33	28
10:00	0	8	62	119	83	13	2	0	0	0	0	0	0	287	33	28
11:00	0	7	**70**	156	81	16	3	0	0	0	0	0	0	333	33	28
12 PM	**3**	10	86	192	72	16	1	0	0	0	0	0	0	380	32	27
13:00	3	6	68	162	74	15	3	0	0	0	0	0	0	331	32	27
14:00	1	11	71	224	98	17	1	0	0	0	0	0	0	423	32	27
15:00	3	**16**	**102**	**263**	126	26	2	0	0	0	0	0	0	538	32	27
16:00	1	9	92	260	**151**	32	3	1	0	0	0	0	0	**549**	33	28
17:00	0	10	69	249	145	**34**	0	**2**	0	0	0	0	0	509	33	28
18:00	0	2	56	159	104	34	1	0	0	0	0	0	0	356	34	29
19:00	0	1	57	139	95	27	2	0	0	0	0	0	0	321	33	28
20:00	0	1	25	84	73	13	**5**	0	0	0	0	0	0	201	34	29
21:00	0	1	19	68	49	19	4	0	0	0	0	0	0	160	34	29
22:00	0	1	16	45	31	17	2	0	0	0	0	0	0	112	35	29
23:00	0	0	12	25	25	12	4	2	0	0	0	0	0	80	36	30
Total	14	112	957	2636	1614	454	54	7	0	0	0	0	0	5848		
%	0.2%	1.9%	16.4%	45.1%	27.6%	7.8%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	02:00	08:00	11:00	07:00	07:00	07:00	07:00	00:00						07:00		
Vol.	1	10	70	157	104	44	4	1						349		
PM Peak	12:00	15:00	15:00	15:00	16:00	17:00	20:00	17:00						16:00		
Vol.	3	16	102	263	151	34	5	2						549		

Pecent

15th Percentile :	23 MPH
50th Percentile :	28 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4250
Percent in Pace :	72.7%
Number of Vehicles > 30 MPH :	1806
Percent of Vehicles > 30 MPH :	30.9%
Mean Speed(Average) :	28 MPH

PRECISION
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	1	6	6	3	0	1	0	0	0	0	0	17	35	31
01:00	0	1	3	3	3	3	0	0	0	0	0	0	0	13	35	29
02:00	0	0	1	0	2	0	3	0	0	0	0	0	0	6	41	34
03:00	0	0	1	2	4	0	1	0	0	0	0	0	0	8	33	31
04:00	0	0	2	14	14	7	5	**2**	0	0	0	0	0	44	39	32
05:00	0	0	13	55	59	37	5	2	0	0	0	0	0	171	37	31
06:00	0	0	28	68	100	50	**11**	2	0	**1**	0	0	0	260	37	31
07:00	2	**10**	**59**	**141**	108	**62**	8	0	0	0	0	0	0	**390**	35	29
08:00	2	4	52	129	**144**	33	6	1	0	0	0	0	0	371	34	29
09:00	**5**	10	38	102	83	37	5	1	0	0	0	0	0	281	35	29
10:00	4	10	54	106	72	35	5	0	0	0	0	0	0	286	34	28
11:00	4	9	59	123	90	27	6	2	0	0	0	0	0	320	34	28
12 PM	7	11	59	127	111	43	3	**2**	0	0	0	0	0	363	34	28
13:00	3	7	56	119	127	31	3	0	0	0	0	0	0	346	34	29
14:00	4	17	**92**	**197**	112	21	4	2	0	0	0	0	0	449	33	27
15:00	7	**21**	92	193	126	28	4	0	0	0	0	0	0	**471**	33	27
16:00	**11**	12	70	179	**146**	31	6	1	0	0	0	0	0	456	33	28
17:00	6	12	65	154	137	**51**	9	0	**1**	0	0	0	0	435	34	29
18:00	2	11	59	115	94	30	**10**	0	0	0	0	0	0	321	34	29
19:00	0	2	31	119	74	12	4	0	0	0	0	0	0	242	33	29
20:00	0	3	17	47	74	19	2	0	0	0	0	0	0	162	34	30
21:00	0	0	23	35	48	23	4	1	0	0	0	0	0	134	36	30
22:00	0	1	9	26	30	14	6	2	0	0	0	0	0	88	37	31
23:00	0	0	2	6	17	9	4	1	0	**1**	0	0	0	40	39	34
Total	57	141	886	2066	1781	606	114	20	1	2	0	0	0	5674		
%	1.0%	2.5%	15.6%	36.4%	31.4%	10.7%	2.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	07:00	07:00	08:00	07:00	06:00	04:00		06:00				07:00		
Vol.	5	10	59	141	144	62	11	2		1				390		
PM Peak	16:00	15:00	14:00	14:00	16:00	17:00	18:00	12:00	17:00	23:00				15:00		
Vol.	11	21	92	197	146	51	10	2	1	1				471		

Pecent

15th Percentile :	23 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	3847
Percent in Pace :	67.8%
Number of Vehicles > 30 MPH :	2167
Percent of Vehicles > 30 MPH :	38.2%
Mean Speed(Average) :	29 MPH

PRECISION
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	3	4	7	3	2	**1**	**1**	0	0	0	0	21	40	33
01:00	0	0	1	2	2	4	1	0	0	0	0	0	0	10	37	33
02:00	0	0	0	3	2	1	1	0	0	0	0	0	0	7	39	31
03:00	0	0	0	4	4	2	1	1	0	0	0	0	0	12	36	33
04:00	0	0	5	4	12	12	5	1	0	0	0	0	0	39	39	33
05:00	1	0	17	36	44	36	**11**	0	1	0	0	0	0	146	38	31
06:00	0	2	20	77	93	**46**	10	1	0	0	0	0	0	249	37	31
07:00	3	6	62	**171**	**152**	27	7	1	0	0	0	0	0	**429**	34	29
08:00	**10**	**14**	**76**	147	118	34	8	0	0	0	0	0	0	407	34	28
09:00	3	6	44	93	82	38	3	0	0	0	0	0	0	269	35	29
10:00	8	13	39	100	90	26	3	0	0	0	0	0	0	279	34	28
11:00	0	6	57	124	109	33	3	0	0	0	0	0	0	332	34	29
12 PM	6	10	66	152	117	38	3	0	0	0	0	0	0	392	34	28
13:00	5	17	71	141	98	30	0	**1**	0	0	0	0	0	363	33	28
14:00	**15**	**29**	**119**	167	100	23	3	0	0	0	0	0	0	456	32	26
15:00	2	14	87	**218**	124	24	3	0	0	0	0	0	0	472	33	28
16:00	13	13	96	185	133	34	3	0	0	0	0	0	0	**477**	33	27
17:00	2	9	49	147	**148**	**50**	**8**	0	0	0	0	0	0	413	34	29
18:00	1	4	38	114	126	38	5	0	0	0	0	0	0	326	34	30
19:00	0	4	25	99	83	26	0	0	0	0	0	0	0	237	34	29
20:00	1	3	17	53	55	18	5	1	0	0	0	0	0	153	35	30
21:00	0	2	13	45	51	27	3	0	0	0	0	0	0	141	36	30
22:00	0	1	11	24	19	15	7	0	0	0	0	0	0	77	38	31
23:00	0	1	3	8	9	15	3	0	**2**	**1**	0	0	0	42	39	34
Total	70	154	919	2118	1778	600	98	7	4	1	0	0	0	5749		
%	1.2%	2.7%	16.0%	36.8%	30.9%	10.4%	1.7%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	07:00	06:00	05:00	00:00	00:00					07:00		
Vol.	10	14	76	171	152	46	11	1	1					429		
PM Peak	14:00	14:00	14:00	15:00	17:00	17:00	17:00	13:00	23:00	23:00				16:00		
Vol.	15	29	119	218	148	50	8	1	2	1				477		

Pecent

15th Percentile :	23 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	3896
Percent in Pace :	67.8%
Number of Vehicles > 30 MPH :	2132
Percent of Vehicles > 30 MPH :	37.1%
Mean Speed(Average) :	29 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	35	2	0	1	0	0	0	0	0	0	0	0	38
01:00	0	19	0	0	1	0	0	0	0	0	0	0	0	20
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	15	3	0	1	0	0	0	0	0	0	0	0	19
04:00	0	19	7	0	2	1	0	0	0	0	0	0	0	29
05:00	0	56	9	0	0	0	0	0	1	0	0	0	0	66
06:00	3	139	20	1	4	3	0	0	0	0	0	0	0	170
07:00	6	252	57	13	13	7	1	0	0	0	0	0	0	349
08:00	5	217	43	4	10	2	0	2	0	0	0	0	0	283
09:00	2	185	42	1	12	4	0	3	2	0	1	0	0	252
10:00	2	229	43	3	11	1	0	2	0	0	0	0	0	291
11:00	2	274	43	1	10	3	0	2	3	0	0	0	0	338
12 PM	5	292	43	3	11	2	0	6	0	0	0	0	0	362
13:00	1	294	51	0	5	4	0	1	1	0	0	0	0	357
14:00	8	344	53	8	14	2	0	5	1	0	0	0	0	435
15:00	7	419	41	9	18	6	0	3	1	0	0	0	0	504
16:00	8	463	71	2	12	1	0	6	0	0	0	0	0	563
17:00	3	413	44	1	10	2	0	3	0	0	0	0	0	476
18:00	4	330	52	0	4	0	0	1	0	0	0	0	0	391
19:00	5	264	30	0	3	0	0	0	0	0	0	0	0	302
20:00	2	166	17	0	2	0	0	0	0	0	0	0	0	187
21:00	2	154	10	0	2	1	0	0	0	0	0	0	0	169
22:00	0	69	15	0	0	0	0	0	0	0	0	0	0	84
23:00	1	72	6	0	0	0	0	0	0	0	0	0	0	79
Total	66	4727	703	46	146	39	1	34	9	0	1	0	0	5772
Percent	1.1%	81.9%	12.2%	0.8%	2.5%	0.7%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	07:00	07:00	07:00	07:00	07:00	09:00	11:00		09:00			07:00
Vol.	6	274	57	13	13	7	1	3	3		1			349
PM Peak	14:00	16:00	16:00	15:00	15:00	15:00		12:00	13:00					16:00
Vol.	8	463	71	9	18	6		6	1					563

PRECISION
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Church Street
south of Park Avenue
City, State: New Bedford, MA
Client: VHB/J. Quitter

81676 E-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	48	6	0	0	0	0	0	0	0	0	0	0	54
01:00	0	18	0	0	0	0	0	0	0	0	0	0	0	18
02:00	0	14	2	0	0	0	0	0	1	3	0	0	0	20
03:00	0	7	5	0	0	0	0	0	0	0	0	0	0	12
04:00	0	22	5	0	3	1	0	0	0	1	0	0	0	32
05:00	0	45	12	0	2	0	0	0	0	0	0	0	0	59
06:00	2	142	21	0	5	5	0	0	1	0	0	0	0	176
07:00	9	257	52	11	9	9	0	1	1	0	0	0	0	349
08:00	2	212	55	4	11	1	0	3	0	0	0	0	0	288
09:00	2	199	45	1	9	2	0	1	1	0	0	0	0	260
10:00	3	221	42	1	14	2	0	2	2	0	0	0	0	287
11:00	2	255	55	2	14	2	0	3	0	0	0	0	0	333
12 PM	5	297	57	2	14	2	0	2	1	0	0	0	0	380
13:00	3	271	47	0	6	3	0	1	0	0	0	0	0	331
14:00	5	345	46	6	12	5	0	4	0	0	0	0	0	423
15:00	7	440	57	5	24	0	0	4	1	0	0	0	0	538
16:00	7	451	75	1	11	2	0	1	0	1	0	0	0	549
17:00	4	440	51	0	8	5	0	0	0	1	0	0	0	509
18:00	4	306	40	1	4	1	0	0	0	0	0	0	0	356
19:00	5	283	28	0	4	0	0	1	0	0	0	0	0	321
20:00	4	172	19	1	5	0	0	0	0	0	0	0	0	201
21:00	0	145	14	0	1	0	0	0	0	0	0	0	0	160
22:00	0	103	8	0	1	0	0	0	0	0	0	0	0	112
23:00	1	70	7	0	2	0	0	0	0	0	0	0	0	80
Total	65	4763	749	35	159	40	0	23	8	6	0	0	0	5848
Percent	1.1%	81.4%	12.8%	0.6%	2.7%	0.7%	0.0%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	07:00	10:00	07:00		08:00	10:00	02:00				07:00
Vol.	9	257	55	11	14	9		3	2	3				349
PM Peak	15:00	16:00	16:00	14:00	15:00	14:00		14:00	12:00	16:00				16:00
Vol.	7	451	75	6	24	5		4	1	1				549

PRECISION
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81676 E-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	13	3	0	1	0	0	0	0	0	0	0	0	17
01:00	0	10	2	0	1	0	0	0	0	0	0	0	0	13
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
04:00	0	29	15	0	0	0	0	0	0	0	0	0	0	44
05:00	0	116	41	2	8	0	0	3	1	0	0	0	0	171
06:00	1	210	32	4	10	1	0	1	0	0	0	0	1	260
07:00	6	306	53	14	8	2	0	1	0	0	0	0	0	390
08:00	2	278	71	2	15	2	0	1	0	0	0	0	0	371
09:00	0	216	42	5	14	2	0	2	0	0	0	0	0	281
10:00	3	208	59	2	6	2	1	5	0	0	0	0	0	286
11:00	2	239	62	2	9	2	0	3	1	0	0	0	0	320
12 PM	4	289	52	2	11	2	0	1	1	0	0	0	1	363
13:00	3	263	63	5	8	1	0	2	1	0	0	0	0	346
14:00	7	338	68	22	7	4	0	2	0	1	0	0	0	449
15:00	6	370	69	4	11	8	0	2	1	0	0	0	0	471
16:00	5	354	74	0	16	3	0	3	0	0	0	0	1	456
17:00	4	350	64	4	10	3	0	0	0	0	0	0	0	435
18:00	4	263	48	0	4	2	0	0	0	0	0	0	0	321
19:00	2	202	35	0	2	0	0	1	0	0	0	0	0	242
20:00	0	136	26	0	0	0	0	0	0	0	0	0	0	162
21:00	1	118	15	0	0	0	0	0	0	0	0	0	0	134
22:00	0	76	11	0	1	0	0	0	0	0	0	0	0	88
23:00	0	35	3	0	1	0	0	1	0	0	0	0	0	40
Total	50	4431	910	68	143	34	1	28	5	1	0	0	3	5674
Percent	0.9%	78.1%	16.0%	1.2%	2.5%	0.6%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.1%	
AM Peak	07:00	07:00	08:00	07:00	08:00	07:00	10:00	10:00	05:00				06:00	07:00
Vol.	6	306	71	14	15	2	1	5	1				1	390
PM Peak	14:00	15:00	16:00	14:00	16:00	15:00		16:00	12:00	14:00			12:00	15:00
Vol.	7	370	74	22	16	8		3	1	1			1	471

PRECISION
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81676 E-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	18	3	0	0	0	0	0	0	0	0	0	0	21
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
04:00	1	30	8	0	0	0	0	0	0	0	0	0	0	39
05:00	0	103	34	2	3	0	0	4	0	0	0	0	0	146
06:00	3	204	30	4	7	0	1	0	0	0	0	0	0	249
07:00	5	328	69	15	8	1	0	2	1	0	0	0	0	429
08:00	2	312	73	2	9	5	0	1	2	0	1	0	0	407
09:00	3	194	53	1	13	1	0	1	3	0	0	0	0	269
10:00	4	201	51	3	12	2	0	2	3	1	0	0	0	279
11:00	0	264	49	3	11	1	1	2	0	1	0	0	0	332
12 PM	1	304	64	3	14	3	0	3	0	0	0	0	0	392
13:00	3	286	49	3	15	3	0	3	1	0	0	0	0	363
14:00	3	347	64	22	14	1	0	4	1	0	0	0	0	456
15:00	4	367	79	5	11	3	0	3	0	0	0	0	0	472
16:00	2	375	75	0	17	6	0	2	0	0	0	0	0	477
17:00	5	340	55	1	7	2	0	3	0	0	0	0	0	413
18:00	2	269	48	0	3	3	0	1	0	0	0	0	0	326
19:00	2	211	22	0	2	0	0	0	0	0	0	0	0	237
20:00	0	123	25	0	2	2	0	1	0	0	0	0	0	153
21:00	0	128	11	0	1	0	0	1	0	0	0	0	0	141
22:00	0	68	8	0	1	0	0	0	0	0	0	0	0	77
23:00	0	38	3	0	1	0	0	0	0	0	0	0	0	42
Total	40	4536	876	64	151	33	2	33	11	2	1	0	0	5749
Percent	0.7%	78.9%	15.2%	1.1%	2.6%	0.6%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	07:00	09:00	08:00	06:00	05:00	09:00	10:00	08:00			07:00
Vol.	5	328	73	15	13	5	1	4	3	1	1			429
PM Peak	17:00	16:00	15:00	14:00	16:00	16:00		14:00	13:00					16:00
Vol.	5	375	79	22	17	6		4	1					477

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/16/08 thru Wed 9/17/08	81676	Norton, MA

South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 I-A volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	14		52		6		61		20		113		
12:15	2		57		3		52		5		109		
12:30	4		51		5		53		9		104		
12:45	5	25	51	211	2	16	47	213	7	41	98	424	
01:00	8		49		2		40		10		89		
01:15	5		59		3		29		8		88		
01:30	2		38		2		45		4		83		
01:45	2	17	45	191	1	8	36	150	3	25	81	341	
02:00	2		53		1		57		3		110		
02:15	3		50		8		49		11		99		
02:30	2		72		9		67		11		139		
02:45	2	9	61	236	2	20	47	220	4	29	108	456	
03:00	4		51		1		48		5		99		
03:15	5		73		6		51		11		124		
03:30	4		110		2		70		6		180		
03:45	2	15	112	346	3	12	42	211	5	27	154	557	
04:00	5		123		4		80		9		203		
04:15	4		99		10		70		14		169		
04:30	11		135		22		66		33		201		
04:45	7	27	111	468	19	55	61	277	26	82	172	745	
05:00	6		99		30		72		36		171		
05:15	20		120		33		76		53		196		
05:30	19		127		44		65		63		192		
05:45	35	80	94	440	57	164	60	273	92	244	154	713	
06:00	25		101		50		57		75		158		
06:15	29		84		72		73		101		157		
06:30	47		62		110		61		157		123		
06:45	59	160	80	327	82	314	80	271	141	474	160	598	
07:00	57		79		89		46		146		125		
07:15	69		64		101		36		170		100		
07:30	61		50		107		45		168		95		
07:45	76	263	49	242	110	407	28	155	186	670	77	397	
08:00	71		36		102		18		173		54		
08:15	50		40		89		37		139		77		
08:30	35		49		61		20		96		69		
08:45	46	202	41	166	73	325	26	101	119	527	67	267	
09:00	52		37		85		51		137		88		
09:15	61		40		50		26		111		66		
09:30	42		31		58		20		100		51		
09:45	37	192	33	141	50	243	17	114	87	435	50	255	
10:00	44		27		52		14		96		41		
10:15	48		24		49		14		97		38		
10:30	47		18		39		13		86		31		
10:45	42	181	13	82	46	186	19	60	88	367	32	142	
11:00	38		14		44		16		82		30		
11:15	35		16		39		6		74		22		
11:30	46		10		50		8		96		18		
11:45	46	165	7	47	41	174	4	34	87	339	11	81	
Total	1336		2897		1924		2079		3260		4976		
Percent	41.0%		58.2%		59.0%		41.8%						
Day Total		4233				4003				8236			
Peak	07:15		03:45		07:15		04:00		07:15		04:00		
Vol.	277		469		420		277		697		745		
P.H.F.	0.911		0.869		0.955		0.866		0.937		0.917		

South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 I-A volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	10		61		12		57		22		118		
12:15	7		53		4		48		11		101		
12:30	4		58		7		42		11		100		
12:45	4	25	44	216	6	29	42	189	10	54	86	405	
01:00	8		53		0		57		8		110		
01:15	5		50		2		50		7		100		
01:30	5		45		3		39		8		84		
01:45	1	19	47	195	1	6	51	197	2	25	98	392	
02:00	1		59		5		54		6		113		
02:15	2		55		10		54		12		109		
02:30	3		77		9		61		12		138		
02:45	1	7	75	266	4	28	57	226	5	35	132	492	
03:00	6		81		9		57		15		138		
03:15	6		85		2		62		8		147		
03:30	4		146		5		84		9		230		
03:45	2	18	108	420	7	23	71	274	9	41	179	694	
04:00	4		105		4		69		8		174		
04:15	8		103		13		76		21		179		
04:30	10		138		17		77		27		215		
04:45	12	34	130	476	18	52	73	295	30	86	203	771	
05:00	5		104		23		77		28		181		
05:15	17		133		28		76		45		209		
05:30	18		104		50		78		68		182		
05:45	34	74	121	462	47	148	68	299	81	222	189	761	
06:00	22		88		65		61		87		149		
06:15	31		95		78		61		109		156		
06:30	49		72		94		70		143		142		
06:45	58	160	78	333	94	331	69	261	152	491	147	594	
07:00	55		70		80		43		135		113		
07:15	50		55		93		49		143		104		
07:30	62		64		109		44		171		108		
07:45	58	225	61	250	89	371	39	175	147	596	100	425	
08:00	62		39		92		23		154		62		
08:15	49		44		90		22		139		66		
08:30	44		51		68		23		112		74		
08:45	47	202	30	164	78	328	19	87	125	530	49	251	
09:00	36		37		84		21		120		58		
09:15	52		39		57		23		109		62		
09:30	48		29		77		19		125		48		
09:45	50	186	35	140	46	264	8	71	96	450	43	211	
10:00	41		23		48		15		89		38		
10:15	39		25		33		16		72		41		
10:30	42		20		32		12		74		32		
10:45	41	163	17	85	46	159	9	52	87	322	26	137	
11:00	37		19		51		16		88		35		
11:15	39		16		52		7		91		23		
11:30	41		10		41		6		82		16		
11:45	51	168	9	54	38	182	8	37	89	350	17	91	
Total	1281		3061		1921		2163		3202		5224		
Percent	40.0%		58.6%		60.0%		41.4%						
Day Total		4342				4084				8426			
Peak	07:15		04:30		07:15		04:45		07:15		04:30		
Vol.	232		505		383		304		615		808		
P.H.F.	0.935		0.915		0.878		0.974		0.899		0.940		

PRECISION
D A T A
INDUSTRIES, LLC
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South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-A speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	1	1	8	11	4	0	0	0	0	0	0	25	39	35
01:00	0	0	0	0	4	9	3	1	0	0	0	0	0	17	40	37
02:00	0	0	0	0	3	4	2	0	0	0	0	0	0	9	40	36
03:00	0	0	0	0	4	2	5	2	**1**	0	1	0	0	15	46	41
04:00	0	0	0	2	4	11	8	2	0	0	0	0	0	27	42	38
05:00	0	0	0	12	23	33	9	3	0	0	0	0	0	80	39	35
06:00	0	1	2	8	59	75	15	0	0	0	0	0	0	160	39	35
07:00	2	5	3	27	85	116	24	1	0	0	0	0	0	263	39	34
08:00	2	0	3	42	65	68	21	1	0	0	0	0	0	202	39	33
09:00	0	1	5	26	77	66	16	1	0	0	0	0	0	192	39	34
10:00	0	3	2	20	82	53	20	1	0	0	0	0	0	181	39	34
11:00	0	0	1	26	56	61	21	0	0	0	0	0	0	165	39	34
12 PM	0	0	3	21	90	72	22	3	0	0	0	0	0	211	39	34
13:00	1	1	1	24	67	72	22	2	1	0	0	0	0	191	39	34
14:00	0	1	8	26	79	90	31	1	0	0	0	0	0	236	39	34
15:00	2	1	11	36	134	134	25	3	0	0	0	0	0	346	39	34
16:00	1	1	9	43	189	179	45	1	0	0	0	0	0	468	39	34
17:00	0	0	2	29	184	179	44	2	0	0	0	0	0	440	39	35
18:00	0	0	0	34	151	108	32	2	0	0	0	0	0	327	39	34
19:00	1	0	4	36	106	85	8	2	0	0	0	0	0	242	38	33
20:00	0	0	5	15	78	54	13	1	0	0	0	0	0	166	38	34
21:00	1	0	4	14	57	48	16	1	0	0	0	0	0	141	39	34
22:00	0	1	2	7	32	31	6	3	0	0	0	0	0	82	39	34
23:00	0	0	1	11	11	16	6	2	0	0	0	0	0	47	40	34
Total	10	15	67	460	1648	1577	418	35	2	0	1	0	0	4233		
%	0.2%	0.4%	1.6%	10.9%	38.9%	37.3%	9.9%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	09:00	08:00	07:00	07:00	07:00	05:00	03:00		03:00			07:00		
Vol.	2	5	5	42	85	116	24	3	1		1			263		
PM Peak	15:00	13:00	15:00	16:00	16:00	16:00	16:00	12:00	13:00					16:00		
Vol.	2	1	11	43	189	179	45	3	1					468		

Pecent

15th Percentile : 30 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 3225
Percent in Pace : 76.2%
Number of Vehicles > 35 MPH : 1717
Percent of Vehicles > 35 MPH : 40.6%
Mean Speed(Average) : 34 MPH

PRECISION
D A T A
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South Worcester Street
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81676 I-A speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	3	7	10	3	1	0	0	0	0	0	25	39	35
01:00	0	0	0	1	8	9	1	0	0	0	0	0	0	19	38	35
02:00	0	0	0	0	3	3	0	1	0	0	0	0	0	7	37	36
03:00	0	0	0	0	3	8	7	0	0	0	0	0	0	18	41	38
04:00	0	0	0	1	6	13	13	1	0	0	0	0	0	34	42	38
05:00	0	0	1	10	33	22	6	2	0	0	0	0	0	74	39	34
06:00	0	**1**	1	3	62	73	17	**3**	0	0	0	0	0	160	39	35
07:00	0	0	2	11	59	**110**	**41**	2	0	0	0	0	0	**225**	40	36
08:00	0	1	**5**	23	49	82	37	3	**2**	0	0	0	0	202	41	35
09:00	0	0	2	**37**	56	67	23	1	0	0	0	0	0	186	39	34
10:00	0	0	4	20	**64**	55	17	2	0	0	0	0	**1**	163	39	34
11:00	0	1	1	22	53	72	18	1	0	0	0	0	0	168	39	35
12 PM	0	0	3	31	84	80	18	0	0	0	0	0	0	216	39	34
13:00	0	1	7	30	64	74	18	1	0	0	0	0	0	195	39	34
14:00	3	4	6	32	106	87	28	0	0	0	0	0	0	266	39	33
15:00	**7**	**5**	**18**	**75**	168	118	29	0	0	0	0	0	0	420	38	32
16:00	0	0	6	46	**222**	168	33	1	0	0	0	0	0	**476**	38	34
17:00	0	1	3	32	177	**209**	**37**	2	0	**1**	0	0	0	462	39	35
18:00	1	0	2	34	124	148	23	1	0	0	0	0	0	333	39	34
19:00	3	0	1	45	102	83	15	1	0	0	0	0	0	250	38	33
20:00	0	0	0	15	60	70	19	0	0	0	0	0	0	164	39	35
21:00	0	0	1	17	49	49	23	1	0	0	0	0	0	140	40	35
22:00	0	0	0	11	31	28	14	1	0	0	0	0	0	85	40	35
23:00	0	0	0	0	15	21	14	**4**	0	0	0	0	0	54	43	38
Total	14	14	64	499	1605	1659	454	29	2	1	0	0	1	4342		
%	0.3%	0.3%	1.5%	11.5%	37.0%	38.2%	10.5%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		06:00	08:00	09:00	10:00	07:00	07:00	06:00	08:00				10:00	07:00		
Vol.		1	5	37	64	110	41	3	2				1	225		
PM Peak	15:00	15:00	15:00	15:00	16:00	17:00	17:00	23:00		17:00				16:00		
Vol.	7	5	18	75	222	209	37	4		1				476		

Pecent

15th Percentile : 30 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 3264
Percent in Pace : 75.2%
Number of Vehicles > 35 MPH : 1814
Percent of Vehicles > 35 MPH : 41.8%
Mean Speed(Average) : 34 MPH

PRECISION
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81676 I-A speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	2	3	8	3	0	0	0	0	0	0	0	16	35	31
01:00	0	0	0	3	3	1	0	**1**	0	0	0	0	0	8	35	32
02:00	0	0	1	8	9	0	2	0	0	0	0	0	0	20	33	30
03:00	0	0	0	2	6	4	0	0	0	0	0	0	0	12	36	33
04:00	0	0	2	13	23	13	4	0	0	0	0	0	0	55	37	32
05:00	0	0	3	49	70	34	7	1	0	0	0	0	0	164	37	32
06:00	**2**	1	6	68	153	78	6	0	0	0	0	0	0	314	37	32
07:00	0	0	9	**74**	**214**	**103**	7	0	0	0	0	0	0	**407**	37	32
08:00	0	1	9	47	176	85	6	1	0	0	0	0	0	325	37	32
09:00	1	**3**	**11**	58	122	39	**8**	1	0	0	0	0	0	243	36	31
10:00	0	0	7	40	100	34	5	0	0	0	0	0	0	186	36	32
11:00	1	1	4	38	88	39	3	0	0	0	0	0	0	174	36	32
12 PM	0	**1**	**11**	45	112	40	4	0	0	0	0	0	0	213	36	31
13:00	0	1	7	33	63	41	4	**1**	0	0	0	0	0	150	37	32
14:00	0	0	1	30	136	49	3	1	0	0	0	0	0	220	36	33
15:00	0	1	3	42	89	70	6	0	0	0	0	0	0	211	38	33
16:00	0	0	5	**58**	147	64	3	0	0	0	0	0	0	**277**	36	32
17:00	**1**	1	3	43	146	72	6	1	0	0	0	0	0	273	37	33
18:00	0	0	3	39	**149**	**74**	6	0	0	0	0	0	0	271	37	33
19:00	0	0	3	22	95	31	4	0	0	0	0	0	0	155	36	32
20:00	0	1	1	24	49	24	2	0	0	0	0	0	0	101	37	32
21:00	0	0	6	26	60	13	**8**	1	0	0	0	0	0	114	36	32
22:00	0	0	1	24	26	9	0	0	0	0	0	0	0	60	34	31
23:00	0	0	1	13	16	4	0	0	0	0	0	0	0	34	34	30
Total	5	11	99	802	2060	924	94	8	0	0	0	0	0	4003		
%	0.1%	0.3%	2.5%	20.0%	51.5%	23.1%	2.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	09:00	09:00	07:00	07:00	07:00	09:00	01:00						07:00		
Vol.	2	3	11	74	214	103	8	1						407		
PM Peak	17:00	12:00	12:00	16:00	18:00	18:00	21:00	13:00						16:00		
Vol.	1	1	11	58	149	74	8	1						277		

Pecent

15th Percentile :	28 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	2984
Percent in Pace :	74.5%
Number of Vehicles > 35 MPH :	841
Percent of Vehicles > 35 MPH :	21.0%
Mean Speed(Average) :	32 MPH

PRECISION
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INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-A speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	6	16	4	3	0	0	0	0	0	0	29	37	33
01:00	0	0	0	2	3	1	0	0	0	0	0	0	0	6	32	31
02:00	0	0	0	9	16	3	0	0	0	0	0	0	0	28	34	31
03:00	0	0	0	3	12	7	1	0	0	0	0	0	0	23	37	33
04:00	0	0	4	15	24	9	0	0	0	0	0	0	0	52	35	31
05:00	0	**1**	9	46	66	21	4	**1**	0	0	0	0	0	148	35	31
06:00	0	0	2	56	179	88	6	0	0	0	0	0	0	331	37	33
07:00	**1**	1	3	**69**	**200**	89	8	0	0	0	0	0	0	**371**	37	32
08:00	0	0	5	47	161	**103**	**12**	0	0	0	0	0	0	328	38	33
09:00	1	1	**13**	53	128	61	7	0	0	0	0	0	0	264	37	32
10:00	0	0	4	35	79	36	4	1	0	0	0	0	0	159	37	32
11:00	0	1	7	43	98	30	3	0	0	0	0	0	0	182	35	31
12 PM	**1**	**2**	4	28	108	41	4	**1**	0	0	0	0	0	189	37	32
13:00	0	0	9	41	112	28	6	1	0	0	0	0	0	197	35	32
14:00	0	2	9	49	120	39	7	0	0	0	0	0	0	226	36	32
15:00	0	0	**13**	50	138	65	**8**	0	0	0	0	0	0	274	37	32
16:00	0	0	9	**51**	**168**	60	6	1	0	0	0	0	0	295	36	32
17:00	0	0	2	50	161	**80**	5	0	**1**	0	0	0	0	**299**	37	33
18:00	0	0	5	50	139	60	6	1	0	0	0	0	0	261	37	32
19:00	0	0	1	41	87	42	4	0	0	0	0	0	0	175	37	32
20:00	0	0	3	22	40	19	3	0	0	0	0	0	0	87	37	32
21:00	0	0	0	11	43	17	0	0	0	0	0	0	0	71	36	32
22:00	0	0	0	12	27	13	0	0	0	0	0	0	0	52	36	32
23:00	0	0	0	12	17	7	1	0	0	0	0	0	0	37	35	31
Total	3	8	102	801	2142	923	98	6	1	0	0	0	0	4084		
%	0.1%	0.2%	2.5%	19.6%	52.4%	22.6%	2.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	05:00	09:00	07:00	07:00	08:00	08:00	05:00						07:00		
Vol.	1	1	13	69	200	103	12	1						371		
PM Peak	12:00	12:00	15:00	16:00	16:00	17:00	15:00	12:00	17:00					17:00		
Vol.	1	2	13	51	168	80	8	1	1					299		

Pecent

15th Percentile :	28 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	3065
Percent in Pace :	75.0%
Number of Vehicles > 35 MPH :	843
Percent of Vehicles > 35 MPH :	20.6%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-A class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	21	3	0	0	0	0	0	1	0	0	0	0	25
01:00	0	11	5	0	1	0	0	0	0	0	0	0	0	17
02:00	0	8	0	0	1	0	0	0	0	0	0	0	0	9
03:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
04:00	0	21	4	0	1	0	0	1	0	0	0	0	0	27
05:00	0	70	9	1	0	0	0	0	0	0	0	0	0	80
06:00	2	124	27	2	1	1	2	0	1	0	0	0	0	160
07:00	1	209	38	2	6	5	0	1	1	0	0	0	0	263
08:00	3	147	44	3	5	0	0	0	0	0	0	0	0	202
09:00	2	139	39	2	4	2	0	1	3	0	0	0	0	192
10:00	0	126	43	1	7	2	0	1	1	0	0	0	0	181
11:00	3	120	31	1	4	2	0	4	0	0	0	0	0	165
12 PM	2	157	36	2	9	2	0	3	0	0	0	0	0	211
13:00	1	139	36	1	11	1	0	2	0	0	0	0	0	191
14:00	2	181	37	3	5	0	0	8	0	0	0	0	0	236
15:00	4	280	50	5	5	0	0	2	0	0	0	0	0	346
16:00	1	414	47	0	6	0	0	0	0	0	0	0	0	468
17:00	2	365	63	0	7	1	0	2	0	0	0	0	0	440
18:00	0	274	47	0	5	0	0	1	0	0	0	0	0	327
19:00	1	213	28	0	0	0	0	0	0	0	0	0	0	242
20:00	1	138	23	0	1	1	0	1	1	0	0	0	0	166
21:00	0	132	9	0	0	0	0	0	0	0	0	0	0	141
22:00	1	71	9	1	0	0	0	0	0	0	0	0	0	82
23:00	0	40	7	0	0	0	0	0	0	0	0	0	0	47
Total	26	3411	639	24	79	17	2	27	8	0	0	0	0	4233
Percent	0.6%	80.6%	15.1%	0.6%	1.9%	0.4%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	08:00	10:00	07:00	06:00	11:00	09:00					07:00
Vol.	3	209	44	3	7	5	2	4	3					263
PM Peak	15:00	16:00	17:00	15:00	13:00	12:00		14:00	20:00					16:00
Vol.	4	414	63	5	11	2		8	1					468

PRECISION
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South Worcester Street
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Client: VHB/J. Quitter

81676 I-A class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	19	6	0	0	0	0	0	0	0	0	0	0	25
01:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
02:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
03:00	0	12	6	0	0	0	0	0	0	0	0	0	0	18
04:00	0	25	7	0	1	0	0	0	1	0	0	0	0	34
05:00	0	63	9	0	1	0	0	0	1	0	0	0	0	74
06:00	3	120	34	1	2	0	0	0	0	0	0	0	0	160
07:00	3	181	32	2	4	2	0	1	0	0	0	0	0	225
08:00	4	151	35	3	3	4	0	1	1	0	0	0	0	202
09:00	4	139	30	1	6	2	0	2	2	0	0	0	0	186
10:00	2	118	31	1	6	1	0	3	1	0	0	0	0	163
11:00	1	126	31	1	4	3	0	2	0	0	0	0	0	168
12 PM	6	153	42	5	6	1	0	3	0	0	0	0	0	216
13:00	1	156	24	0	6	2	0	4	2	0	0	0	0	195
14:00	1	206	42	3	7	3	0	4	0	0	0	0	0	266
15:00	6	322	71	5	11	2	0	3	0	0	0	0	0	420
16:00	9	389	66	1	7	1	0	3	0	0	0	0	0	476
17:00	7	388	62	0	4	1	0	0	0	0	0	0	0	462
18:00	5	283	43	0	2	0	0	0	0	0	0	0	0	333
19:00	6	217	25	0	1	1	0	0	0	0	0	0	0	250
20:00	2	138	21	0	2	0	0	1	0	0	0	0	0	164
21:00	1	128	10	1	0	0	0	0	0	0	0	0	0	140
22:00	4	76	5	0	0	0	0	0	0	0	0	0	0	85
23:00	0	46	8	0	0	0	0	0	0	0	0	0	0	54
Total	65	3476	645	24	74	23	0	27	8	0	0	0	0	4342
Percent	1.5%	80.1%	14.9%	0.6%	1.7%	0.5%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	08:00	09:00	08:00		10:00	09:00					07:00
Vol.	4	181	35	3	6	4		3	2					225
PM Peak	16:00	16:00	15:00	12:00	15:00	14:00		13:00	13:00					16:00
Vol.	9	389	71	5	11	3		4	2					476

PRECISION
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South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-A class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	14	2	0	0	0	0	0	0	0	0	0	0	16
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	17	2	0	1	0	0	0	0	0	0	0	0	20
03:00	0	8	3	0	0	0	0	1	0	0	0	0	0	12
04:00	0	37	12	0	1	0	0	5	0	0	0	0	0	55
05:00	2	105	38	0	14	0	0	5	0	0	0	0	0	164
06:00	4	204	80	1	21	0	0	4	0	0	0	0	0	314
07:00	1	263	107	2	31	2	0	0	1	0	0	0	0	407
08:00	0	228	72	3	21	1	0	0	0	0	0	0	0	325
09:00	2	135	79	4	17	2	0	2	2	0	0	0	0	243
10:00	0	111	57	1	14	1	0	2	0	0	0	0	0	186
11:00	1	106	53	0	12	1	0	1	0	0	0	0	0	174
12 PM	3	128	66	3	12	1	0	0	0	0	0	0	0	213
13:00	1	83	48	2	14	1	0	0	1	0	0	0	0	150
14:00	1	139	62	0	16	1	0	1	0	0	0	0	0	220
15:00	0	141	56	4	9	1	0	0	0	0	0	0	0	211
16:00	0	190	68	2	17	0	0	0	0	0	0	0	0	277
17:00	1	198	62	0	11	1	0	0	0	0	0	0	0	273
18:00	1	176	81	0	12	1	0	0	0	0	0	0	0	271
19:00	0	105	44	0	6	0	0	0	0	0	0	0	0	155
20:00	0	74	21	0	6	0	0	0	0	0	0	0	0	101
21:00	1	96	15	1	1	0	0	0	0	0	0	0	0	114
22:00	0	44	15	0	1	0	0	0	0	0	0	0	0	60
23:00	0	23	10	0	1	0	0	0	0	0	0	0	0	34
Total	18	2632	1054	23	238	13	0	21	4	0	0	0	0	4003
Percent	0.4%	65.8%	26.3%	0.6%	5.9%	0.3%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	09:00	07:00	07:00		04:00	09:00					07:00
Vol.	4	263	107	4	31	2		5	2					407
PM Peak	12:00	17:00	18:00	15:00	16:00	12:00		14:00	13:00					16:00
Vol.	3	198	81	4	17	1		1	1					277

PRECISION
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South Worcester Street
north of John B. Scott Boulevard
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-A class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	25	4	0	0	0	0	0	0	0	0	0	0	29
01:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
02:00	0	27	1	0	0	0	0	0	0	0	0	0	0	28
03:00	0	15	8	0	0	0	0	0	0	0	0	0	0	23
04:00	0	33	12	0	3	0	0	4	0	0	0	0	0	52
05:00	4	81	44	1	13	0	0	5	0	0	0	0	0	148
06:00	4	226	78	1	18	1	0	3	0	0	0	0	0	331
07:00	4	251	90	3	21	0	1	1	0	0	0	0	0	371
08:00	4	228	77	2	11	5	0	1	0	0	0	0	0	328
09:00	1	159	76	11	12	2	1	2	0	0	0	0	0	264
10:00	1	98	46	1	13	0	0	0	0	0	0	0	0	159
11:00	2	111	45	3	15	4	0	2	0	0	0	0	0	182
12 PM	0	117	55	1	11	2	1	2	0	0	0	0	0	189
13:00	4	124	55	1	11	1	0	1	0	0	0	0	0	197
14:00	1	144	54	1	19	1	1	2	3	0	0	0	0	226
15:00	2	174	68	5	22	2	0	1	0	0	0	0	0	274
16:00	3	206	67	1	15	3	0	0	0	0	0	0	0	295
17:00	4	206	76	0	12	0	0	1	0	0	0	0	0	299
18:00	5	178	72	1	5	0	0	0	0	0	0	0	0	261
19:00	3	125	41	0	6	0	0	0	0	0	0	0	0	175
20:00	1	62	20	0	4	0	0	0	0	0	0	0	0	87
21:00	0	52	17	1	1	0	0	0	0	0	0	0	0	71
22:00	1	41	9	0	0	0	0	1	0	0	0	0	0	52
23:00	1	28	7	0	1	0	0	0	0	0	0	0	0	37
Total	45	2715	1024	33	213	21	4	26	3	0	0	0	0	4084
Percent	1.1%	66.5%	25.1%	0.8%	5.2%	0.5%	0.1%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	07:00	09:00	07:00	08:00	07:00	05:00						07:00
Vol.	4	251	90	11	21	5	1	5						371
PM Peak	18:00	16:00	17:00	15:00	15:00	16:00	12:00	12:00	14:00					17:00
Vol.	5	206	76	5	22	3	1	2	3					299

West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 I-B volume
Site Code: 10111.31

Start	EB				WB				Combined				16-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	12		83		11		77		23		160		
12:15	6		87		7		88		13		175		
12:30	3		93		7		95		10		188		
12:45	8	29	70	333	8	33	93	353	16	62	163	686	
01:00	5		93		9		91		14		184		
01:15	4		81		4		81		8		162		
01:30	2		88		6		77		8		165		
01:45	3	14	91	353	1	20	90	339	4	34	181	692	
02:00	1		90		4		89		5		179		
02:15	4		91		1		109		5		200		
02:30	0		122		6		96		6		218		
02:45	1	6	113	416	4	15	105	399	5	21	218	815	
03:00	3		95		1		117		4		212		
03:15	4		83		0		140		4		223		
03:30	6		148		0		125		6		273		
03:45	2	15	114	440	2	3	134	516	4	18	248	956	
04:00	3		101		5		146		8		247		
04:15	10		114		5		124		15		238		
04:30	13		112		4		166		17		278		
04:45	21	47	130	457	13	27	127	563	34	74	257	1020	
05:00	21		123		14		146		35		269		
05:15	24		139		26		146		50		285		
05:30	39		141		28		153		67		294		
05:45	38	122	92	495	20	88	167	612	58	210	259	1107	
06:00	56		88		34		146		90		234		
06:15	67		108		53		118		120		226		
06:30	94		101		61		125		155		226		
06:45	101	318	65	362	86	234	167	556	187	552	232	918	
07:00	120		93		86		135		206		228		
07:15	171		68		69		83		240		151		
07:30	115		69		94		95		209		164		
07:45	132	538	97	327	74	323	71	384	206	861	168	711	
08:00	109		81		101		80		210		161		
08:15	99		75		106		59		205		134		
08:30	112		54		119		52		231		106		
08:45	100	420	53	263	110	436	59	250	210	856	112	513	
09:00	114		50		112		52		226		102		
09:15	89		29		85		31		174		60		
09:30	77		33		81		37		158		70		
09:45	104	384	30	142	87	365	25	145	191	749	55	287	
10:00	83		32		73		33		156		65		
10:15	91		21		89		32		180		53		
10:30	84		24		69		29		153		53		
10:45	92	350	15	92	81	312	20	114	173	662	35	206	
11:00	80		16		89		21		169		37		
11:15	87		17		75		15		162		32		
11:30	86		13		93		19		179		32		
11:45	95	348	12	58	91	348	10	65	186	696	22	123	
Total	2591		3738		2204		4296		4795		8034		
Percent	54.0%		46.5%		46.0%		53.5%						
Day Total		6329				6500				12829			
Peak	07:00		04:45		08:15		05:00		08:15		05:00		
Vol.	538		533		447		612		872		1107		
P.H.F.	0.787		0.945		0.939		0.916		0.944		0.941		

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B volume
Site Code: 10111.31

Start	EB				WB				Combined				17-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	8		82		15		98		23		180		
12:15	7		86		3		61		10		147		
12:30	8		85		10		90		18		175		
12:45	8	31	86	339	4	32	73	322	12	63	159	661	
01:00	1		76		6		97		7		173		
01:15	2		75		4		81		6		156		
01:30	3		85		6		76		9		161		
01:45	0	6	73	309	4	20	87	341	4	26	160	650	
02:00	2		109		2		90		4		199		
02:15	3		103		0		114		3		217		
02:30	1		96		1		124		2		220		
02:45	4	10	111	419	3	6	130	458	7	16	241	877	
03:00	2		108		1		112		3		220		
03:15	7		102		4		137		11		239		
03:30	5		122		1		141		6		263		
03:45	3	17	132	464	2	8	139	529	5	25	271	993	
04:00	10		128		9		110		19		238		
04:15	10		113		7		142		17		255		
04:30	15		119		6		139		21		258		
04:45	12	47	130	490	12	34	145	536	24	81	275	1026	
05:00	21		121		12		149		33		270		
05:15	29		144		21		144		50		288		
05:30	41		115		25		167		66		282		
05:45	31	122	110	490	19	77	146	606	50	199	256	1096	
06:00	50		100		21		157		71		257		
06:15	54		89		47		141		101		230		
06:30	73		102		70		154		143		256		
06:45	111	288	95	386	73	211	139	591	184	499	234	977	
07:00	100		86		84		105		184		191		
07:15	137		81		73		88		210		169		
07:30	116		91		79		84		195		175		
07:45	123	476	81	339	86	322	79	356	209	798	160	695	
08:00	105		59		98		57		203		116		
08:15	80		52		117		67		197		119		
08:30	101		49		78		86		179		135		
08:45	97	383	45	205	99	392	54	264	196	775	99	469	
09:00	109		47		112		47		221		94		
09:15	107		34		78		46		185		80		
09:30	92		35		89		38		181		73		
09:45	99	407	40	156	83	362	35	166	182	769	75	322	
10:00	80		29		84		33		164		62		
10:15	92		19		81		35		173		54		
10:30	100		14		90		30		190		44		
10:45	81	353	17	79	75	330	28	126	156	683	45	205	
11:00	87		7		83		14		170		21		
11:15	89		6		72		21		161		27		
11:30	72		22		111		18		183		40		
11:45	92	340	8	43	82	348	14	67	174	688	22	110	
Total	2480		3719		2142		4362		4622		8081		
Percent	53.7%		46.0%		46.3%		54.0%						
Day Total		6199				6504				12703			
Peak	07:15		04:30		08:15		05:15		07:15		04:45		
Vol.	481		514		406		614		817		1115		
P.H.F.	0.878		0.892		0.868		0.919		0.973		0.968		

PRECISION
D A T A
INDUSTRIES, LLC
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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	0	3	9	15	1	0	**1**	0	0	0	29	44	40
01:00	0	0	0	0	1	3	5	3	2	0	0	0	0	14	47	43
02:00	0	0	0	0	1	3	2	0	0	0	0	0	0	6	40	37
03:00	0	0	0	0	2	1	8	0	3	1	0	0	0	15	51	43
04:00	0	0	1	4	4	9	19	6	4	0	0	0	0	47	46	40
05:00	0	0	0	7	23	32	46	12	2	0	0	0	0	122	44	39
06:00	0	1	1	15	62	92	125	20	1	0	1	0	0	318	43	38
07:00	2	1	21	30	119	228	116	19	2	0	0	0	0	538	42	36
08:00	0	1	10	32	111	161	94	11	0	0	0	0	0	420	42	36
09:00	0	5	36	25	85	133	84	15	1	0	0	0	0	384	42	35
10:00	2	2	9	25	69	142	89	12	0	0	0	0	0	350	42	36
11:00	3	2	10	24	60	142	99	8	0	0	0	0	0	348	42	36
12 PM	3	4	9	21	84	131	70	10	1	0	0	0	0	333	42	36
13:00	3	2	8	23	90	143	73	11	0	0	0	0	0	353	42	36
14:00	0	2	9	26	87	166	111	11	3	0	0	0	1	416	42	37
15:00	1	8	36	47	114	138	83	12	1	0	0	0	0	440	41	34
16:00	1	2	13	37	80	173	132	17	2	0	0	0	0	457	43	37
17:00	3	1	14	46	123	179	117	12	0	0	0	0	0	495	42	36
18:00	5	2	13	34	88	126	82	11	1	0	0	0	0	362	42	35
19:00	1	12	36	31	75	114	53	5	0	0	0	0	0	327	40	33
20:00	4	11	41	21	57	71	50	8	0	0	0	0	0	263	41	33
21:00	0	0	1	2	24	62	45	7	1	0	0	0	0	142	43	38
22:00	1	0	1	3	9	31	35	11	1	0	0	0	0	92	44	39
23:00	0	0	0	0	6	8	29	13	1	1	0	0	0	58	46	42
Total	29	56	269	453	1377	2297	1582	235	26	3	1	0	1	6329		
%	0.5%	0.9%	4.3%	7.2%	21.8%	36.3%	25.0%	3.7%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	09:00	08:00	07:00	07:00	06:00	06:00	04:00	00:00	06:00			07:00		
Vol.	3	5	36	32	119	228	125	20	4	1	1			538		
PM Peak	18:00	19:00	20:00	15:00	17:00	17:00	16:00	16:00	14:00	23:00			14:00	17:00		
Vol.	5	12	41	47	123	179	132	17	3	1			1	495		

Pecent

15th Percentile :	30 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3879
Percent in Pace :	61.3%
Number of Vehicles > 35 MPH :	3685
Percent of Vehicles > 35 MPH :	58.2%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	1	2	11	14	2	1	0	0	0	0	31	43	40
01:00	0	0	0	0	1	1	3	1	0	0	0	0	0	6	42	40
02:00	0	0	0	0	1	2	4	3	0	0	0	0	0	10	45	42
03:00	0	0	0	0	1	4	10	2	0	0	0	0	0	17	44	41
04:00	0	0	0	2	7	10	14	11	1	**2**	0	0	0	47	47	41
05:00	1	0	0	7	23	31	36	23	0	1	0	0	0	122	46	39
06:00	0	1	2	16	48	96	99	23	3	0	0	0	0	288	44	38
07:00	**2**	1	19	21	**92**	**164**	**141**	30	**5**	1	0	0	0	**476**	43	37
08:00	0	2	16	29	70	118	122	24	2	0	0	0	0	383	43	37
09:00	1	**7**	**35**	**47**	78	126	90	20	3	0	0	0	0	407	42	35
10:00	0	0	3	9	51	124	132	**32**	2	0	0	0	0	353	44	39
11:00	1	0	7	21	53	131	108	16	3	0	0	0	0	340	43	37
12 PM	1	5	6	24	57	123	103	18	2	0	0	0	0	339	43	37
13:00	1	1	10	19	42	108	106	19	**3**	0	0	0	0	309	43	38
14:00	0	5	15	22	71	171	120	15	0	0	0	0	0	419	42	37
15:00	2	8	40	41	102	169	85	16	1	0	0	0	0	464	41	35
16:00	3	3	22	29	89	**185**	**143**	16	0	0	0	0	0	**490**	42	36
17:00	2	1	26	**48**	**121**	147	124	**20**	1	0	0	0	0	490	42	36
18:00	4	3	19	38	98	133	83	5	1	**2**	0	0	0	386	41	35
19:00	**6**	**9**	**49**	24	78	105	67	1	0	0	0	0	0	339	41	33
20:00	1	3	10	9	33	77	66	6	0	0	0	0	0	205	43	37
21:00	1	1	0	3	16	64	58	12	0	0	0	**1**	0	156	44	39
22:00	0	0	1	3	12	21	31	9	2	0	0	0	0	79	44	39
23:00	0	0	0	0	5	13	20	5	0	0	0	0	0	43	44	40
Total	26	50	280	413	1151	2134	1779	329	30	6	0	1	0	6199		
%	0.4%	0.8%	4.5%	6.7%	18.6%	34.4%	28.7%	5.3%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	09:00	09:00	07:00	07:00	07:00	10:00	07:00	04:00				07:00		
Vol.	2	7	35	47	92	164	141	32	5	2				476		
PM Peak	19:00	19:00	19:00	17:00	17:00	16:00	16:00	17:00	13:00	18:00		21:00		16:00		
Vol.	6	9	49	48	121	185	143	20	3	2		1		490		

Pecent

15th Percentile :	30 MPH
50th Percentile :	37 MPH
85th Percentile :	43 MPH
95th Percentile :	45 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3913
Percent in Pace :	63.1%
Number of Vehicles > 35 MPH :	3852
Percent of Vehicles > 35 MPH :	62.1%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	1	0	0	6	15	10	1	0	0	0	0	0	33	42	37
01:00	1	0	0	1	3	11	3	1	0	0	0	0	0	20	40	35
02:00	0	0	0	0	1	11	3	0	0	0	0	0	0	15	40	37
03:00	0	0	0	0	0	2	1	0	0	0	0	0	0	3	40	37
04:00	0	0	1	3	1	9	10	3	0	0	0	0	0	27	44	38
05:00	1	0	1	5	13	47	18	3	0	0	0	0	0	88	41	36
06:00	1	3	9	22	66	100	30	3	0	0	0	0	0	234	39	35
07:00	6	10	23	31	86	136	27	**4**	0	0	0	0	0	323	39	33
08:00	1	18	**31**	**49**	**142**	**154**	**35**	4	**1**	0	0	0	**1**	**436**	39	33
09:00	**15**	**23**	29	46	124	103	23	2	0	0	0	0	0	365	38	31
10:00	3	5	15	26	112	129	19	2	0	**1**	0	0	0	312	38	34
11:00	0	8	21	36	128	135	19	1	0	0	0	0	0	348	38	33
12 PM	7	5	23	68	134	94	21	1	0	0	0	0	0	353	38	32
13:00	6	7	18	67	121	103	16	1	0	0	0	0	0	339	38	32
14:00	2	8	21	58	130	160	19	1	0	0	0	0	0	399	38	33
15:00	7	25	60	79	203	123	19	0	0	0	0	0	0	516	37	31
16:00	3	18	25	110	197	**186**	24	0	0	0	0	0	0	563	38	32
17:00	**15**	30	**67**	**131**	**223**	121	23	1	**1**	0	0	0	0	**612**	37	30
18:00	15	**60**	67	84	194	118	18	0	0	0	0	0	0	556	37	29
19:00	6	19	36	41	166	101	15	0	0	0	0	0	0	384	37	31
20:00	1	1	5	29	114	81	19	0	0	0	0	0	0	250	38	33
21:00	0	0	1	6	49	73	11	**5**	0	0	0	0	0	145	39	36
22:00	0	0	1	4	31	50	**28**	0	0	0	0	0	0	114	41	36
23:00	0	0	1	2	14	29	16	2	0	**1**	0	0	0	65	42	37
Total	90	241	455	898	2258	2091	427	35	2	2	0	0	1	6500		
%	1.4%	3.7%	7.0%	13.8%	34.7%	32.2%	6.6%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00	10:00			08:00	08:00		
Vol.	15	23	31	49	142	154	35	4	1	1			1	436		
PM Peak	17:00	18:00	17:00	17:00	17:00	16:00	22:00	21:00	17:00	23:00				17:00		
Vol.	15	60	67	131	223	186	28	5	1	1				612		

Pecent

15th Percentile :	26 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4349
Percent in Pace :	66.9%
Number of Vehicles > 35 MPH :	2139
Percent of Vehicles > 35 MPH :	32.9%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	1	10	10	7	2	**2**	0	0	0	0	32	43	38
01:00	0	0	0	1	2	12	2	2	1	0	0	0	0	20	44	38
02:00	0	0	0	0	2	1	3	0	0	0	0	0	0	6	41	37
03:00	0	0	0	0	3	2	3	0	0	0	0	0	0	8	41	37
04:00	0	0	0	0	3	19	7	**4**	1	0	0	0	0	34	44	39
05:00	0	1	2	2	13	32	25	2	0	0	0	0	0	77	42	37
06:00	0	6	6	22	49	95	30	3	0	0	0	0	0	211	40	35
07:00	3	11	21	32	64	132	**58**	1	0	0	0	0	0	322	40	34
08:00	5	11	**24**	**53**	**144**	112	41	1	0	0	0	0	**1**	**392**	39	33
09:00	**8**	**19**	22	44	117	119	31	2	0	0	0	0	0	362	39	32
10:00	0	4	13	21	104	**157**	30	1	0	0	0	0	0	330	39	34
11:00	4	8	20	38	123	129	26	0	0	0	0	0	0	348	38	33
12 PM	3	2	12	39	112	130	23	1	0	0	0	0	0	322	39	33
13:00	0	4	13	53	126	118	**25**	**2**	0	0	0	0	0	341	38	33
14:00	6	13	25	72	167	157	17	1	0	0	0	0	0	458	38	32
15:00	9	39	47	104	189	132	9	0	0	0	0	0	0	529	37	30
16:00	5	14	27	72	209	**188**	20	1	0	0	0	0	0	536	38	32
17:00	**22**	32	**60**	115	**238**	119	18	1	1	0	0	0	0	**606**	36	30
18:00	19	**46**	56	**121**	222	108	18	1	0	0	0	0	0	591	36	29
19:00	1	5	13	56	174	90	16	0	0	0	0	0	**1**	356	37	32
20:00	1	1	3	12	134	94	17	0	**2**	0	0	0	0	264	38	34
21:00	0	2	1	9	38	100	16	0	0	0	0	0	0	166	39	35
22:00	0	0	2	5	39	55	23	2	0	0	0	0	0	126	41	36
23:00	0	0	0	2	11	35	15	2	2	0	0	0	0	67	42	38
Total	86	218	367	874	2293	2146	480	29	9	0	0	0	2	6504		
%	1.3%	3.4%	5.6%	13.4%	35.3%	33.0%	7.4%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	08:00	08:00	08:00	10:00	07:00	04:00	00:00				08:00	08:00		
Vol.	8	19	24	53	144	157	58	4	2				1	392		
PM Peak	17:00	18:00	17:00	18:00	17:00	16:00	13:00	13:00	20:00				19:00	17:00		
Vol.	22	46	60	121	238	188	25	2	2				1	606		

Pecent

15th Percentile : 26 MPH
50th Percentile : 33 MPH
85th Percentile : 38 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 4439
Percent in Pace : 68.3%
Number of Vehicles > 35 MPH : 2236
Percent of Vehicles > 35 MPH : 34.4%
Mean Speed(Average) : 32 MPH

PRECISION
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east of North Worcester Street
City, State: Norton, MA
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81676 I-B class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	24	5	0	0	0	0	0	0	0	0	0	0	29
01:00	0	11	3	0	0	0	0	0	0	0	0	0	0	14
02:00	0	4	0	0	2	0	0	0	0	0	0	0	0	6
03:00	0	11	3	0	1	0	0	0	0	0	0	0	0	15
04:00	0	24	17	2	4	0	0	0	0	0	0	0	0	47
05:00	1	73	40	0	8	0	0	0	0	0	0	0	0	122
06:00	0	228	64	1	24	0	0	1	0	0	0	0	0	318
07:00	2	398	103	4	22	1	0	6	2	0	0	0	0	538
08:00	0	307	90	4	16	1	0	1	1	0	0	0	0	420
09:00	2	233	108	10	25	1	0	4	1	0	0	0	0	384
10:00	3	222	89	2	27	4	0	2	1	0	0	0	0	350
11:00	1	249	62	4	22	2	0	5	3	0	0	0	0	348
12 PM	4	238	65	1	18	4	0	2	1	0	0	0	0	333
13:00	3	245	83	4	14	0	0	3	1	0	0	0	0	353
14:00	2	297	87	3	23	1	0	1	2	0	0	0	0	416
15:00	1	320	91	10	15	0	0	2	1	0	0	0	0	440
16:00	3	332	91	4	25	0	0	2	0	0	0	0	0	457
17:00	4	368	106	3	13	1	0	0	0	0	0	0	0	495
18:00	9	261	70	0	21	0	0	1	0	0	0	0	0	362
19:00	3	237	72	0	15	0	0	0	0	0	0	0	0	327
20:00	1	204	55	0	3	0	0	0	0	0	0	0	0	263
21:00	0	118	20	1	3	0	0	0	0	0	0	0	0	142
22:00	0	72	16	0	4	0	0	0	0	0	0	0	0	92
23:00	0	45	11	0	2	0	0	0	0	0	0	0	0	58
Total	39	4521	1351	53	307	15	0	30	13	0	0	0	0	6329
Percent	0.6%	71.4%	21.3%	0.8%	4.9%	0.2%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	09:00	09:00	10:00	10:00		07:00	11:00					07:00
Vol.	3	398	108	10	27	4		6	3					538
PM Peak	18:00	17:00	17:00	15:00	16:00	12:00		13:00	14:00					17:00
Vol.	9	368	106	10	25	4		3	2					495

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	0	20	10	0	1	0	0	0	0	0	0	0	0	31
01:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
02:00	0	6	1	0	3	0	0	0	0	0	0	0	0	10
03:00	0	11	4	0	2	0	0	0	0	0	0	0	0	17
04:00	1	27	14	2	2	0	0	1	0	0	0	0	0	47
05:00	1	75	39	1	5	0	0	1	0	0	0	0	0	122
06:00	2	203	64	2	14	1	0	2	0	0	0	0	0	288
07:00	3	360	86	5	17	0	0	3	2	0	0	0	0	476
08:00	0	282	82	4	13	2	0	0	0	0	0	0	0	383
09:00	2	255	110	11	23	1	0	4	1	0	0	0	0	407
10:00	0	253	77	4	16	1	0	2	0	0	0	0	0	353
11:00	1	226	85	2	25	0	0	1	0	0	0	0	0	340
12 PM	3	245	70	3	12	3	0	3	0	0	0	0	0	339
13:00	3	211	60	6	22	2	0	4	1	0	0	0	0	309
14:00	0	298	98	3	16	1	0	3	0	0	0	0	0	419
15:00	4	314	113	11	20	0	0	0	2	0	0	0	0	464
16:00	5	364	98	2	19	1	0	1	0	0	0	0	0	490
17:00	5	372	92	3	17	0	0	1	0	0	0	0	0	490
18:00	6	307	57	1	14	1	0	0	0	0	0	0	0	386
19:00	1	251	71	0	14	1	0	1	0	0	0	0	0	339
20:00	1	159	37	1	6	0	0	0	1	0	0	0	0	205
21:00	0	128	21	0	6	0	0	1	0	0	0	0	0	156
22:00	1	67	10	0	1	0	0	0	0	0	0	0	0	79
23:00	0	36	6	0	1	0	0	0	0	0	0	0	0	43
Total	39	4474	1307	61	269	14	0	28	7	0	0	0	0	6199
Percent	0.6%	72.2%	21.1%	1.0%	4.3%	0.2%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	09:00	11:00	08:00		09:00	07:00					07:00
Vol.	3	360	110	11	25	2		4	2					476
PM Peak	18:00	17:00	15:00	15:00	13:00	12:00		13:00	15:00					16:00
Vol.	6	372	113	11	22	3		4	2					490

PRECISION
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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	29	4	0	0	0	0	0	0	0	0	0	0	33
01:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
02:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	20	5	1	0	0	0	0	1	0	0	0	0	27
05:00	1	61	17	0	8	0	0	1	0	0	0	0	0	88
06:00	0	173	45	3	9	1	0	0	3	0	0	0	0	234
07:00	5	244	53	3	10	0	0	4	4	0	0	0	0	323
08:00	1	345	68	8	10	4	0	0	0	0	0	0	0	436
09:00	1	271	66	5	11	2	0	5	4	0	0	0	0	365
10:00	1	232	57	3	12	1	0	4	2	0	0	0	0	312
11:00	0	282	48	1	9	1	0	3	4	0	0	0	0	348
12 PM	3	263	64	2	16	1	0	2	1	0	1	0	0	353
13:00	2	272	51	1	5	2	0	1	5	0	0	0	0	339
14:00	3	321	52	1	15	3	0	2	2	0	0	0	0	399
15:00	3	386	94	8	21	2	0	2	0	0	0	0	0	516
16:00	1	479	60	5	12	4	0	2	0	0	0	0	0	563
17:00	5	516	73	0	12	4	0	2	0	0	0	0	0	612
18:00	4	470	69	1	9	0	0	0	2	0	1	0	0	556
19:00	2	327	49	1	4	1	0	0	0	0	0	0	0	384
20:00	5	222	21	0	1	1	0	0	0	0	0	0	0	250
21:00	1	130	13	0	1	0	0	0	0	0	0	0	0	145
22:00	1	99	11	0	3	0	0	0	0	0	0	0	0	114
23:00	1	52	10	0	2	0	0	0	0	0	0	0	0	65
Total	40	5227	935	43	170	27	0	28	28	0	2	0	0	6500
Percent	0.6%	80.4%	14.4%	0.7%	2.6%	0.4%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	08:00	10:00	08:00		09:00	07:00					08:00
Vol.	5	345	68	8	12	4		5	4					436
PM Peak	17:00	17:00	15:00	15:00	15:00	16:00		12:00	13:00		12:00			17:00
Vol.	5	516	94	8	21	4		2	5		1			612

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West Main Street (Route 123)
east of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-B class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	0	27	4	0	1	0	0	0	0	0	0	0	0	32
01:00	0	18	1	0	0	0	0	0	1	0	0	0	0	20
02:00	0	1	4	0	1	0	0	0	0	0	0	0	0	6
03:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
04:00	0	26	5	1	1	0	0	1	0	0	0	0	0	34
05:00	1	48	16	0	10	1	0	1	0	0	0	0	0	77
06:00	3	156	39	3	5	2	0	1	2	0	0	0	0	211
07:00	2	257	46	4	9	0	0	3	1	0	0	0	0	322
08:00	5	299	62	5	20	1	0	0	0	0	0	0	0	392
09:00	3	269	70	5	11	3	0	1	0	0	0	0	0	362
10:00	2	247	58	3	13	2	0	2	3	0	0	0	0	330
11:00	1	264	61	5	13	1	0	0	3	0	0	0	0	348
12 PM	2	252	46	1	16	1	0	4	0	0	0	0	0	322
13:00	0	264	51	4	15	2	0	4	1	0	0	0	0	341
14:00	2	378	56	3	10	2	0	0	7	0	0	0	0	458
15:00	4	403	96	9	14	2	0	1	0	0	0	0	0	529
16:00	6	441	72	1	11	1	0	3	1	0	0	0	0	536
17:00	2	521	68	0	10	3	0	1	1	0	0	0	0	606
18:00	6	512	67	1	3	0	0	1	1	0	0	0	0	591
19:00	3	302	45	1	3	1	0	1	0	0	0	0	0	356
20:00	1	227	30	1	4	0	0	1	0	0	0	0	0	264
21:00	0	145	18	0	3	0	0	0	0	0	0	0	0	166
22:00	2	108	14	0	2	0	0	0	0	0	0	0	0	126
23:00	0	56	8	0	3	0	0	0	0	0	0	0	0	67
Total	45	5226	940	47	178	22	0	25	21	0	0	0	0	6504
Percent	0.7%	80.4%	14.5%	0.7%	2.7%	0.3%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	09:00	08:00	08:00	09:00		07:00	10:00					08:00
Vol.	5	299	70	5	20	3		3	3					392
PM Peak	16:00	17:00	15:00	15:00	12:00	17:00		12:00	14:00					17:00
Vol.	6	521	96	9	16	3		4	7					606

Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 I-C volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	15		82		9		92		24		174		
12:15	13		93		7		95		20		188		
12:30	6		80		8		113		14		193		
12:45	4	38	81	336	8	32	93	393	12	70	174	729	
01:00	7		76		7		98		14		174		
01:15	7		86		9		87		16		173		
01:30	6		95		4		79		10		174		
01:45	3	23	78	335	3	23	72	336	6	46	150	671	
02:00	2		80		3		67		5		147		
02:15	1		99		2		77		3		176		
02:30	17		94		4		89		21		183		
02:45	1	21	89	362	4	13	125	358	5	34	214	720	
03:00	1		95		5		109		6		204		
03:15	2		108		1		100		3		208		
03:30	3		119		8		113		11		232		
03:45	4	10	102	424	6	20	137	459	10	30	239	883	
04:00	8		101		5		138		13		239		
04:15	9		120		6		114		15		234		
04:30	14		111		12		124		26		235		
04:45	22	53	127	459	24	47	151	527	46	100	278	986	
05:00	25		103		12		131		37		234		
05:15	28		125		18		133		46		258		
05:30	49		117		31		157		80		274		
05:45	50	152	113	458	49	110	133	554	99	262	246	1012	
06:00	33		125		46		100		79		225		
06:15	64		102		45		110		109		212		
06:30	67		103		74		80		141		183		
06:45	96	260	92	422	113	278	107	397	209	538	199	819	
07:00	104		71		101		74		205		145		
07:15	98		81		139		91		237		172		
07:30	111		81		108		64		219		145		
07:45	114	427	66	299	138	486	72	301	252	913	138	600	
08:00	116		47		121		59		237		106		
08:15	148		45		109		44		257		89		
08:30	125		46		90		41		215		87		
08:45	122	511	38	176	94	414	42	186	216	925	80	362	
09:00	112		46		81		42		193		88		
09:15	113		42		112		56		225		98		
09:30	88		49		78		58		166		107		
09:45	98	411	27	164	98	369	51	207	196	780	78	371	
10:00	75		27		74		31		149		58		
10:15	97		31		87		22		184		53		
10:30	79		22		96		16		175		38		
10:45	76	327	19	99	82	339	18	87	158	666	37	186	
11:00	87		30		88		22		175		52		
11:15	87		23		73		23		160		46		
11:30	84		17		95		18		179		35		
11:45	79	337	6	76	89	345	11	74	168	682	17	150	
Total	2570		3610		2476		3879		5046		7489		
Percent	50.9%		48.2%		49.1%		51.8%						
Day Total			6180				6355				12535		
Peak	08:00		05:15		07:15		04:45		07:30		04:45		
Vol.	511		480		506		572		965		1044		
P.H.F.	0.863		0.960		0.910		0.911		0.939		0.939		

Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
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81676 I-C volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		91		8		84		17		175		
12:15	14		77		16		99		30		176		
12:30	12		97		9		99		21		196		
12:45	4	39	79	344	4	37	86	368	8	76	165	712	
01:00	3		77		4		81		7		158		
01:15	5		96		6		81		11		177		
01:30	6		85		7		116		13		201		
01:45	5	19	83	341	2	19	100	378	7	38	183	719	
02:00	2		90		3		95		5		185		
02:15	10		90		2		87		12		177		
02:30	15		111		4		118		19		229		
02:45	8	35	106	397	3	12	118	418	11	47	224	815	
03:00	5		92		4		116		9		208		
03:15	9		81		8		125		17		206		
03:30	2		125		4		135		6		260		
03:45	6	22	129	427	9	25	139	515	15	47	268	942	
04:00	8		108		3		153		11		261		
04:15	7		126		10		116		17		242		
04:30	8		129		9		141		17		270		
04:45	19	42	134	497	27	49	165	575	46	91	299	1072	
05:00	17		123		16		138		33		261		
05:15	25		122		13		151		38		273		
05:30	48		117		28		137		76		254		
05:45	51	141	131	493	57	114	125	551	108	255	256	1044	
06:00	42		111		38		100		80		211		
06:15	58		104		57		103		115		207		
06:30	73		101		68		75		141		176		
06:45	101	274	119	435	105	268	90	368	206	542	209	803	
07:00	113		83		88		93		201		176		
07:15	103		59		120		95		223		154		
07:30	104		60		121		52		225		112		
07:45	118	438	64	266	118	447	72	312	236	885	136	578	
08:00	120		68		106		69		226		137		
08:15	142		45		109		82		251		127		
08:30	125		56		114		54		239		110		
08:45	138	525	48	217	81	410	69	274	219	935	117	491	
09:00	103		37		81		42		184		79		
09:15	118		33		108		60		226		93		
09:30	85		39		78		41		163		80		
09:45	108	414	28	137	101	368	45	188	209	782	73	325	
10:00	76		25		77		31		153		56		
10:15	74		36		82		18		156		54		
10:30	78		24		67		22		145		46		
10:45	74	302	23	108	90	316	27	98	164	618	50	206	
11:00	96		15		88		12		184		27		
11:15	95		18		95		25		190		43		
11:30	107		17		77		18		184		35		
11:45	103	401	15	65	91	351	15	70	194	752	30	135	
Total	2652		3727		2416		4115		5068		7842		
Percent	52.3%		47.5%		47.7%		52.5%						
Day Total		6379				6531				12910			
Peak	08:00		04:15		07:15		04:30		07:45		04:30		
Vol.	525		512		465		595		952		1103		
P.H.F.	0.924		0.955		0.961		0.902		0.948		0.922		

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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	6	11	14	7	0	0	0	0	0	0	38	40	35
01:00	0	0	2	2	6	8	5	0	0	0	0	0	0	23	41	35
02:00	0	0	0	2	11	7	1	0	0	0	0	0	0	21	37	33
03:00	0	0	0	2	4	2	0	2	0	0	0	0	0	10	36	34
04:00	0	1	1	8	20	8	9	**5**	**1**	0	0	0	0	53	43	35
05:00	0	1	4	21	56	49	19	2	0	0	0	0	0	152	39	34
06:00	0	1	4	30	81	97	41	5	1	0	0	0	0	260	40	35
07:00	0	**3**	7	26	135	204	48	4	0	0	0	0	0	427	39	35
08:00	0	2	**12**	37	**179**	**229**	**49**	3	0	0	0	0	0	**511**	39	35
09:00	0	2	6	**42**	152	166	37	5	0	0	0	**1**	0	411	39	34
10:00	0	0	4	29	113	146	33	2	0	0	0	0	0	327	39	35
11:00	0	1	5	33	108	155	33	1	1	0	0	0	0	337	39	35
12 PM	0	1	6	21	132	135	40	1	0	0	0	0	0	336	39	35
13:00	0	0	3	37	122	140	32	1	0	0	0	0	0	335	39	34
14:00	0	0	4	24	123	174	32	4	**1**	0	0	0	0	362	39	35
15:00	0	**3**	**10**	**48**	157	169	33	4	0	0	0	0	0	424	39	34
16:00	0	1	8	47	**185**	183	31	4	0	0	0	0	0	**459**	39	34
17:00	0	2	4	30	169	205	**43**	**5**	0	0	0	0	0	458	39	35
18:00	0	0	2	16	149	**221**	30	4	0	0	0	0	0	422	39	35
19:00	0	0	2	20	98	148	30	1	0	0	0	0	0	299	39	35
20:00	0	0	1	12	52	88	22	1	0	0	0	0	0	176	39	35
21:00	0	0	2	17	46	74	23	2	0	0	0	0	0	164	39	35
22:00	0	0	0	14	35	28	20	2	0	0	0	0	0	99	41	35
23:00	0	0	0	10	30	29	6	1	0	0	0	0	0	76	39	34
Total	0	18	87	534	2174	2679	624	59	4	0	0	1	0	6180		
%	0.0%	0.3%	1.4%	8.6%	35.2%	43.3%	10.1%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		07:00	08:00	09:00	08:00	08:00	08:00	04:00	04:00			09:00		08:00		
Vol.		3	12	42	179	229	49	5	1			1		511		
PM Peak		15:00	15:00	15:00	16:00	18:00	17:00	17:00	14:00					16:00		
Vol.		3	10	48	185	221	43	5	1					459		

Pecent

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 4853
Percent in Pace : 78.5%
Number of Vehicles > 35 MPH : 2831
Percent of Vehicles > 35 MPH : 45.8%
Mean Speed(Average) : 35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	5	14	15	5	0	0	0	0	0	0	39	39	35
01:00	0	0	0	2	6	7	3	1	0	0	0	0	0	19	40	36
02:00	0	0	0	7	17	8	3	0	0	0	0	0	0	35	37	33
03:00	0	0	0	1	10	9	1	1	0	0	0	0	0	22	38	35
04:00	0	0	1	7	14	13	6	0	**1**	0	0	0	0	42	40	34
05:00	0	0	7	26	41	42	22	3	0	0	0	0	0	141	40	34
06:00	1	0	1	35	92	106	34	5	0	0	0	0	0	274	39	35
07:00	**2**	1	**9**	28	139	210	44	4	1	0	0	0	0	438	39	35
08:00	0	1	7	27	**158**	**234**	**91**	**6**	1	0	0	0	0	**525**	40	36
09:00	0	1	9	**39**	143	178	42	2	0	0	0	0	0	414	39	35
10:00	0	**2**	6	15	99	142	34	3	1	0	0	0	0	302	39	35
11:00	1	0	4	33	124	191	44	4	0	0	0	0	0	401	39	35
12 PM	0	**3**	2	18	95	186	36	4	0	0	0	0	0	344	39	35
13:00	0	2	**9**	28	123	134	39	4	**2**	0	0	0	0	341	39	35
14:00	0	1	5	26	119	181	**59**	**6**	0	0	0	0	0	397	40	36
15:00	0	2	8	37	159	173	45	3	0	0	0	0	0	427	39	35
16:00	0	2	5	29	187	**237**	37	0	0	0	0	0	0	**497**	39	35
17:00	0	1	4	**38**	**218**	191	36	4	1	0	0	0	0	493	39	34
18:00	0	1	2	23	138	230	37	4	0	0	0	0	0	435	39	35
19:00	0	1	3	11	97	117	36	1	0	0	0	0	0	266	39	35
20:00	0	0	2	11	47	116	36	3	1	**1**	0	0	0	217	40	36
21:00	0	0	1	5	40	67	19	5	0	0	0	0	0	137	40	36
22:00	0	0	0	3	29	49	27	0	0	0	0	0	0	108	41	37
23:00	0	0	0	6	12	32	9	5	1	0	0	0	0	65	42	37
Total	4	18	85	460	2121	2868	745	68	9	1	0	0	0	6379		
%	0.1%	0.3%	1.3%	7.2%	33.2%	45.0%	11.7%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	07:00	09:00	08:00	08:00	08:00	08:00	04:00					08:00		
Vol.	2	2	9	39	158	234	91	6	1					525		
PM Peak		12:00	13:00	17:00	17:00	16:00	14:00	14:00	13:00	20:00				16:00		
Vol.		3	9	38	218	237	59	6	2	1				497		

Pecent

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 4989
Percent in Pace : 78.2%
Number of Vehicles > 35 MPH : 3117
Percent of Vehicles > 35 MPH : 48.9%
Mean Speed(Average) : 35 MPH

PRECISION
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INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	0	2	18	9	3	0	0	0	0	0	32	43	39
01:00	0	0	0	1	9	5	4	4	0	0	0	0	0	23	45	37
02:00	0	0	0	0	3	5	5	0	0	0	0	0	0	13	42	38
03:00	0	0	0	0	4	7	6	3	0	0	0	0	0	20	44	39
04:00	0	0	0	1	6	23	10	4	**3**	0	0	0	0	47	44	39
05:00	0	0	0	1	25	51	27	6	0	0	0	0	0	110	42	38
06:00	0	0	1	**24**	45	128	75	5	0	0	0	0	0	278	42	37
07:00	0	0	0	21	105	**274**	**80**	6	0	0	0	0	0	**486**	40	36
08:00	0	0	5	8	**123**	203	66	**9**	0	0	0	0	0	414	40	36
09:00	0	2	**8**	21	97	174	65	2	0	0	0	0	0	369	40	36
10:00	0	**5**	6	7	79	171	64	7	0	0	0	0	0	339	41	36
11:00	0	0	1	15	111	151	65	2	0	0	0	0	0	345	41	36
12 PM	0	0	3	25	108	187	**65**	**5**	0	0	0	0	0	393	40	36
13:00	0	0	2	22	102	171	37	2	0	0	0	0	0	336	39	35
14:00	0	1	**9**	13	86	191	58	0	0	0	0	0	0	358	40	36
15:00	0	0	1	**30**	158	219	48	2	**1**	0	0	0	0	459	39	35
16:00	0	0	1	23	**214**	243	44	2	0	0	0	0	0	527	39	35
17:00	0	**2**	4	26	190	**263**	65	4	0	0	0	0	0	**554**	39	35
18:00	0	0	0	13	130	198	55	1	0	0	0	0	0	397	39	36
19:00	0	0	0	18	93	150	37	3	0	0	0	0	0	301	39	36
20:00	0	0	0	5	61	86	32	2	0	0	0	0	0	186	40	36
21:00	0	0	0	9	58	106	29	5	0	0	0	0	0	207	40	36
22:00	0	0	0	3	17	48	17	2	0	0	0	0	0	87	41	37
23:00	0	0	0	1	22	34	14	3	0	0	0	0	0	74	41	37
Total	0	10	41	287	1848	3106	977	82	4	0	0	0	0	6355		
%	0.0%	0.2%	0.6%	4.5%	29.1%	48.9%	15.4%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		10:00	09:00	06:00	08:00	07:00	07:00	08:00	04:00					07:00		
Vol.		5	8	24	123	274	80	9	3					486		
PM Peak		17:00	14:00	15:00	16:00	17:00	12:00	12:00	15:00					17:00		
Vol.		2	9	30	214	263	65	5	1					554		

Pecent

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4954
Percent in Pace :	78.0%
Number of Vehicles > 35 MPH :	3547
Percent of Vehicles > 35 MPH :	55.8%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	1	7	17	10	2	0	0	0	0	0	37	42	38
01:00	0	0	0	0	4	12	2	0	**1**	0	0	0	0	19	39	37
02:00	0	0	0	0	2	3	5	2	0	0	0	0	0	12	44	40
03:00	0	0	0	0	3	12	6	4	0	0	0	0	0	25	44	39
04:00	0	0	0	0	8	22	13	6	0	0	0	0	0	49	44	39
05:00	0	0	4	2	19	47	34	7	0	**1**	0	0	0	114	43	38
06:00	0	0	0	4	47	141	68	**8**	0	0	0	0	0	268	42	38
07:00	**7**	**3**	**8**	**25**	100	212	**85**	7	0	0	0	0	0	**447**	41	36
08:00	0	0	2	9	91	**223**	76	8	1	0	0	0	0	410	41	37
09:00	0	0	0	13	92	184	77	2	0	0	0	0	0	368	41	36
10:00	0	1	6	14	**104**	158	30	3	0	0	0	0	0	316	39	35
11:00	0	0	3	20	89	185	51	3	0	0	0	0	0	351	40	36
12 PM	0	1	2	19	97	192	52	5	0	0	0	0	0	368	40	36
13:00	**2**	**9**	3	25	113	168	55	3	0	0	0	0	0	378	40	35
14:00	0	2	7	**32**	104	202	65	**6**	0	0	0	0	0	418	40	36
15:00	0	1	5	23	171	269	45	1	0	0	0	0	0	515	39	35
16:00	1	1	**10**	27	**200**	267	**68**	1	0	0	0	0	0	**575**	39	35
17:00	0	0	5	32	166	**284**	61	3	0	0	0	0	0	551	39	35
18:00	2	1	5	13	77	196	68	6	0	0	0	0	0	368	41	36
19:00	0	0	2	18	100	139	50	2	**1**	0	0	0	0	312	40	36
20:00	0	0	0	11	92	140	29	2	0	0	0	0	0	274	39	36
21:00	0	0	0	3	33	114	37	1	0	0	0	0	0	188	41	37
22:00	0	0	0	3	12	50	28	5	0	0	0	0	0	98	42	38
23:00	0	0	0	0	10	41	16	3	0	0	0	0	0	70	42	38
Total	12	19	62	294	1741	3278	1031	90	3	1	0	0	0	6531		
%	0.2%	0.3%	0.9%	4.5%	26.7%	50.2%	15.8%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	10:00	08:00	07:00	06:00	01:00	05:00				07:00		
Vol.	7	3	8	25	104	223	85	8	1	1				447		
PM Peak	13:00	13:00	16:00	14:00	16:00	17:00	16:00	14:00	19:00					16:00		
Vol.	2	9	10	32	200	284	68	6	1					575		

Pecent

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	5019
Percent in Pace :	76.8%
Number of Vehicles > 35 MPH :	3747
Percent of Vehicles > 35 MPH :	57.4%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	35	3	0	0	0	0	0	0	0	0	0	0	38
01:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
02:00	0	19	2	0	0	0	0	0	0	0	0	0	0	21
03:00	0	6	2	0	1	0	0	1	0	0	0	0	0	10
04:00	0	42	8	1	0	0	0	2	0	0	0	0	0	53
05:00	3	101	31	0	8	1	0	8	0	0	0	0	0	152
06:00	3	198	47	1	4	2	0	3	2	0	0	0	0	260
07:00	1	334	77	4	5	3	0	2	1	0	0	0	0	427
08:00	1	396	85	2	18	8	0	0	1	0	0	0	0	511
09:00	5	301	68	3	20	4	0	6	4	0	0	0	0	411
10:00	2	231	68	1	19	3	0	2	1	0	0	0	0	327
11:00	3	248	66	0	15	2	0	3	0	0	0	0	0	337
12 PM	4	256	60	2	9	2	0	3	0	0	0	0	0	336
13:00	1	261	62	2	6	2	0	1	0	0	0	0	0	335
14:00	2	277	65	2	9	5	0	2	0	0	0	0	0	362
15:00	5	309	86	2	16	3	0	2	1	0	0	0	0	424
16:00	4	359	81	2	10	1	0	1	1	0	0	0	0	459
17:00	4	368	68	1	9	5	1	2	0	0	0	0	0	458
18:00	0	339	67	1	9	5	0	0	1	0	0	0	0	422
19:00	0	247	44	1	6	1	0	0	0	0	0	0	0	299
20:00	0	154	20	0	1	0	0	0	1	0	0	0	0	176
21:00	1	134	27	0	1	0	0	0	1	0	0	0	0	164
22:00	0	86	12	0	1	0	0	0	0	0	0	0	0	99
23:00	0	65	11	0	0	0	0	0	0	0	0	0	0	76
Total	39	4785	1064	25	167	47	1	38	14	0	0	0	0	6180
Percent	0.6%	77.4%	17.2%	0.4%	2.7%	0.8%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	07:00	09:00	08:00		05:00	09:00					08:00
Vol.	5	396	85	4	20	8		8	4					511
PM Peak	15:00	17:00	15:00	12:00	15:00	14:00	17:00	12:00	15:00					16:00
Vol.	5	368	86	2	16	5	1	3	1					459

PRECISION
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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	33	5	0	1	0	0	0	0	0	0	0	0	39
01:00	0	17	1	0	0	0	0	0	1	0	0	0	0	19
02:00	0	33	2	0	0	0	0	0	0	0	0	0	0	35
03:00	0	18	3	0	1	0	0	0	0	0	0	0	0	22
04:00	0	26	11	0	0	0	0	3	2	0	0	0	0	42
05:00	2	89	31	1	10	1	0	7	0	0	0	0	0	141
06:00	4	209	50	0	4	1	0	4	2	0	0	0	0	274
07:00	4	349	72	3	6	2	0	1	1	0	0	0	0	438
08:00	4	422	82	2	12	1	0	0	2	0	0	0	0	525
09:00	6	292	81	6	20	0	0	7	2	0	0	0	0	414
10:00	2	232	51	1	13	2	0	0	1	0	0	0	0	302
11:00	8	291	78	2	18	3	0	1	0	0	0	0	0	401
12 PM	2	273	54	2	10	1	0	1	0	0	1	0	0	344
13:00	3	252	67	1	12	4	0	2	0	0	0	0	0	341
14:00	2	295	81	3	11	1	0	3	1	0	0	0	0	397
15:00	5	309	91	2	13	2	0	3	2	0	0	0	0	427
16:00	4	406	71	2	9	4	0	1	0	0	0	0	0	497
17:00	7	405	68	0	10	2	1	0	0	0	0	0	0	493
18:00	7	339	80	1	6	2	0	0	0	0	0	0	0	435
19:00	3	217	44	0	1	1	0	0	0	0	0	0	0	266
20:00	3	177	30	1	5	0	0	1	0	0	0	0	0	217
21:00	1	111	24	0	0	0	0	0	1	0	0	0	0	137
22:00	1	93	13	0	0	0	0	1	0	0	0	0	0	108
23:00	2	52	10	0	0	0	0	0	1	0	0	0	0	65
Total	70	4940	1100	27	162	27	1	35	16	0	1	0	0	6379
Percent	1.1%	77.4%	17.2%	0.4%	2.5%	0.4%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	08:00	09:00	09:00	11:00		05:00	04:00					08:00
Vol.	8	422	82	6	20	3		7	2					525
PM Peak	17:00	16:00	15:00	14:00	15:00	13:00	17:00	14:00	15:00		12:00			16:00
Vol.	7	406	91	3	13	4	1	3	2		1			497

PRECISION
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	25	6	0	0	0	0	0	0	0	0	0	0	32
01:00	0	19	3	0	1	0	0	0	0	0	0	0	0	23
02:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
03:00	0	16	4	0	0	0	0	0	0	0	0	0	0	20
04:00	0	34	9	1	2	0	0	1	0	0	0	0	0	47
05:00	0	83	22	0	0	4	0	0	1	0	0	0	0	110
06:00	3	209	54	0	7	3	0	2	0	0	0	0	0	278
07:00	2	411	57	2	8	6	0	0	0	0	0	0	0	486
08:00	2	338	58	4	8	2	0	2	0	0	0	0	0	414
09:00	2	286	52	3	16	6	0	1	3	0	0	0	0	369
10:00	1	261	61	2	7	0	0	3	4	0	0	0	0	339
11:00	2	258	61	1	13	4	0	4	2	0	0	0	0	345
12 PM	2	316	59	0	7	3	0	5	1	0	0	0	0	393
13:00	1	263	47	3	14	1	0	5	2	0	0	0	0	336
14:00	0	282	60	2	5	1	0	7	1	0	0	0	0	358
15:00	1	376	65	2	8	2	0	5	0	0	0	0	0	459
16:00	0	438	67	2	14	3	0	2	1	0	0	0	0	527
17:00	1	475	63	2	6	3	0	4	0	0	0	0	0	554
18:00	2	336	46	0	10	1	0	0	2	0	0	0	0	397
19:00	1	256	38	0	5	0	0	1	0	0	0	0	0	301
20:00	0	166	16	0	2	0	0	1	1	0	0	0	0	186
21:00	1	185	20	0	1	0	0	0	0	0	0	0	0	207
22:00	0	75	12	0	0	0	0	0	0	0	0	0	0	87
23:00	1	62	9	0	1	0	0	0	1	0	0	0	0	74
Total	23	5182	890	24	135	39	0	43	19	0	0	0	0	6355
Percent	0.4%	81.5%	14.0%	0.4%	2.1%	0.6%	0.0%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	10:00	08:00	09:00	07:00		11:00	10:00					07:00
Vol.	3	411	61	4	16	6		4	4					486
PM Peak	12:00	17:00	16:00	13:00	13:00	12:00		14:00	13:00					17:00
Vol.	2	475	67	3	14	3		7	2					554

PRECISION
D A T A
INDUSTRIES, LLC
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Old Colony Road (Route 123)
west of North Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	31	6	0	0	0	0	0	0	0	0	0	0	37
01:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
02:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
03:00	0	17	7	0	0	1	0	0	0	0	0	0	0	25
04:00	0	34	9	1	2	1	0	0	2	0	0	0	0	49
05:00	1	85	22	0	4	1	0	0	0	1	0	0	0	114
06:00	2	205	52	0	6	2	0	1	0	0	0	0	0	268
07:00	4	371	56	1	11	2	0	0	2	0	0	0	0	447
08:00	6	339	47	2	11	2	0	3	0	0	0	0	0	410
09:00	3	296	48	3	14	3	0	0	0	0	0	0	1	368
10:00	3	253	46	1	8	1	0	3	1	0	0	0	0	316
11:00	3	292	43	0	8	2	0	2	1	0	0	0	0	351
12 PM	6	290	58	3	6	1	0	3	1	0	0	0	0	368
13:00	8	300	48	1	13	2	0	5	1	0	0	0	0	378
14:00	2	342	58	1	9	2	0	4	0	0	0	0	0	418
15:00	6	398	86	2	13	5	0	4	1	0	0	0	0	515
16:00	9	456	91	0	13	3	0	3	0	0	0	0	0	575
17:00	5	453	79	3	8	2	0	1	0	0	0	0	0	551
18:00	3	309	45	0	9	1	0	1	0	0	0	0	0	368
19:00	1	273	33	0	4	1	0	0	0	0	0	0	0	312
20:00	4	232	32	0	5	0	0	1	0	0	0	0	0	274
21:00	2	167	18	1	0	0	0	0	0	0	0	0	0	188
22:00	4	80	12	0	1	0	0	0	1	0	0	0	0	98
23:00	1	66	2	0	0	0	0	0	1	0	0	0	0	70
Total	73	5312	905	19	146	32	0	31	11	1	0	0	1	6531
Percent	1.1%	81.3%	13.9%	0.3%	2.2%	0.5%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	09:00	09:00	09:00		08:00	04:00	05:00			09:00	07:00
Vol.	6	371	56	3	14	3		3	2	1			1	447
PM Peak	16:00	16:00	16:00	12:00	13:00	15:00		13:00	12:00					16:00
Vol.	9	456	91	3	13	5		5	1					575

Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

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81676 I-D volume
Site Code: 10111.31

Start	NB				SB				Combined				16-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		15		1		16		2		31		
12:15	1		14		2		11		3		25		
12:30	0		14		2		13		2		27		
12:45	0	2	10	53	0	5	6	46	0	7	16	99	
01:00	3		13		2		11		5		24		
01:15	1		11		2		18		3		29		
01:30	0		13		2		15		2		28		
01:45	0	4	16	53	1	7	9	53	1	11	25	106	
02:00	0		10		1		15		1		25		
02:15	0		18		2		18		2		36		
02:30	0		10		9		20		9		30		
02:45	0	0	14	52	0	12	13	66	0	12	27	118	
03:00	0		13		0		23		0		36		
03:15	0		12		0		20		0		32		
03:30	1		12		1		36		2		48		
03:45	2	3	24	61	0	1	19	98	2	4	43	159	
04:00	2		14		0		28		2		42		
04:15	1		20		0		31		1		51		
04:30	2		17		1		43		3		60		
04:45	5	10	22	73	1	2	37	139	6	12	59	212	
05:00	5		22		0		40		5		62		
05:15	8		19		1		50		9		69		
05:30	19		26		1		39		20		65		
05:45	25	57	20	87	3	5	34	163	28	62	54	250	
06:00	24		20		5		30		29		50		
06:15	23		18		1		28		24		46		
06:30	43		16		6		25		49		41		
06:45	41	131	23	77	14	26	18	101	55	157	41	178	
07:00	35		17		9		22		44		39		
07:15	54		13		12		17		66		30		
07:30	37		16		22		16		59		32		
07:45	37	163	5	51	15	58	19	74	52	221	24	125	
08:00	39		10		13		11		52		21		
08:15	28		10		9		16		37		26		
08:30	24		2		10		16		34		18		
08:45	31	122	3	25	14	46	13	56	45	168	16	81	
09:00	17		0		11		9		28		9		
09:15	20		5		8		7		28		12		
09:30	13		7		8		6		21		13		
09:45	20	70	3	15	9	36	7	29	29	106	10	44	
10:00	13		7		14		7		27		14		
10:15	12		3		13		8		25		11		
10:30	16		2		18		3		34		5		
10:45	14	55	1	13	13	58	8	26	27	113	9	39	
11:00	14		1		13		5		27		6		
11:15	15		5		7		4		22		9		
11:30	18		0		18		3		36		3		
11:45	20	67	2	8	18	56	5	17	38	123	7	25	
Total	684		568		312		868		996		1436		
Percent	68.7%		39.6%		31.3%		60.4%						
Day Total			1252				1180				2432		
Peak	06:30		04:45		07:15		04:30		07:15		04:45		
Vol.	173		89		62		170		229		255		
P.H.F.	0.801		0.856		0.705		0.850		0.867		0.924		

Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 I-D volume
Site Code: 10111.31

Start	NB				SB				Combined				17-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	0		12		5		12		5		24		
12:15	1		15		3		12		4		27		
12:30	3		23		5		17		8		40		
12:45	1	5	20	70	1	14	17	58	2	19	37	128	
01:00	1		18		0		13		1		31		
01:15	0		13		0		6		0		19		
01:30	0		10		1		20		1		30		
01:45	0	1	14	55	0	1	9	48	0	2	23	103	
02:00	0		11		1		17		1		28		
02:15	0		19		0		14		0		33		
02:30	0		19		13		26		13		45		
02:45	0	0	15	64	1	15	18	75	1	15	33	139	
03:00	0		17		0		23		0		40		
03:15	1		11		0		21		1		32		
03:30	2		21		0		35		2		56		
03:45	2	5	23	72	0	0	23	102	2	5	46	174	
04:00	2		20		0		28		2		48		
04:15	2		15		1		33		3		48		
04:30	2		13		1		40		3		53		
04:45	5	11	30	78	1	3	29	130	6	14	59	208	
05:00	1		24		1		35		2		59		
05:15	9		22		3		49		12		71		
05:30	18		17		1		45		19		62		
05:45	22	50	19	82	4	9	36	165	26	59	55	247	
06:00	24		15		3		48		27		63		
06:15	21		20		3		39		24		59		
06:30	36		18		4		25		40		43		
06:45	32	113	11	64	13	23	25	137	45	136	36	201	
07:00	32		8		11		32		43		40		
07:15	39		12		13		23		52		35		
07:30	32		20		14		15		46		35		
07:45	29	132	8	48	11	49	18	88	40	181	26	136	
08:00	37		21		8		14		45		35		
08:15	20		6		13		8		33		14		
08:30	27		7		9		16		36		23		
08:45	27	111	7	41	9	39	12	50	36	150	19	91	
09:00	22		10		6		5		28		15		
09:15	15		7		6		9		21		16		
09:30	15		8		11		10		26		18		
09:45	11	63	1	26	9	32	5	29	20	95	6	55	
10:00	17		5		13		6		30		11		
10:15	30		5		13		10		43		15		
10:30	16		3		10		3		26		6		
10:45	12	75	2	15	8	44	3	22	20	119	5	37	
11:00	5		0		9		2		14		2		
11:15	12		2		12		2		24		4		
11:30	13		1		17		1		30		2		
11:45	12	42	2	5	13	51	3	8	25	93	5	13	
Total	608		620		280		912		888		1532		
Percent	68.5%		40.5%		31.5%		59.5%						
Day Total		1228				1192				2420			
Peak	06:30		04:45		06:45		05:15		06:45		04:45		
Vol.	139		93		51		178		186		251		
P.H.F.	0.891		0.775		0.911		0.908		0.894		0.884		

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Dean Street
north of Harvey Street
City, State: Norton, MA
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81676 I-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30	30
01:00	0	0	1	0	1	1	1	0	0	0	0	0	0	4	39	33
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	40	38
04:00	0	0	0	0	1	6	2	0	**1**	0	0	0	0	10	40	38
05:00	0	0	0	1	14	30	10	**2**	0	0	0	0	0	57	41	37
06:00	0	**1**	0	3	38	68	19	1	0	**1**	0	0	0	131	40	36
07:00	0	0	0	**8**	**43**	**87**	**23**	2	0	0	0	0	0	**163**	40	36
08:00	0	0	**7**	7	29	59	20	0	0	0	0	0	0	122	40	35
09:00	0	0	1	6	21	32	9	1	0	0	0	0	0	70	39	35
10:00	0	0	0	3	24	22	6	0	0	0	0	0	0	55	39	35
11:00	0	0	3	7	18	32	7	0	0	0	0	0	0	67	39	35
12 PM	0	**1**	1	2	15	29	5	0	0	0	0	0	0	53	39	35
13:00	0	0	0	**8**	**28**	16	1	0	0	0	0	0	0	53	37	33
14:00	0	1	0	1	16	20	**13**	1	0	0	0	0	0	52	41	36
15:00	1	0	2	3	23	26	6	0	0	0	0	0	0	61	39	34
16:00	0	0	**3**	8	22	30	10	0	0	0	0	0	0	73	39	35
17:00	**2**	1	2	5	26	**38**	9	**3**	**1**	0	0	0	0	**87**	39	35
18:00	0	0	3	3	26	32	11	2	0	0	0	0	0	77	40	35
19:00	0	0	2	5	13	23	7	1	0	0	0	0	0	51	39	35
20:00	0	0	1	2	12	9	1	0	0	0	0	0	0	25	37	33
21:00	0	0	0	2	5	7	1	0	0	0	0	0	0	15	38	34
22:00	0	0	1	0	6	2	2	1	1	0	0	0	0	13	41	36
23:00	0	0	0	2	2	3	0	1	0	0	0	0	0	8	37	35
Total	3	4	27	77	385	573	164	15	3	1	0	0	0	1252		
%	0.2%	0.3%	2.2%	6.2%	30.8%	45.8%	13.1%	1.2%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak		06:00	08:00	07:00	07:00	07:00	07:00	05:00	04:00	06:00				07:00		
Vol.		1	7	8	43	87	23	2	1	1				163		
PM Peak	17:00	12:00	16:00	13:00	13:00	17:00	14:00	17:00	17:00					17:00		
Vol.	2	1	3	8	28	38	13	3	1					87		

Pecent

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	39 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	958
Percent in Pace :	76.5%
Number of Vehicles > 35 MPH :	641
Percent of Vehicles > 35 MPH :	51.2%
Mean Speed(Average) :	35 MPH

PRECISION
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Dean Street
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81676 I-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	0	2	2	1	0	0	0	0	0	0	5	36	36
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	3	1	1	0	0	0	0	0	0	5	39	34
04:00	0	0	0	0	3	5	3	0	0	0	0	0	0	11	40	37
05:00	0	0	0	1	19	19	11	0	0	0	0	0	0	50	40	36
06:00	0	**1**	0	5	**43**	51	11	1	**1**	0	0	0	0	113	39	35
07:00	0	0	0	5	28	**70**	**29**	0	0	0	0	0	0	**132**	41	37
08:00	0	0	**3**	**6**	28	56	17	1	0	0	0	0	0	111	40	36
09:00	0	0	2	6	16	29	10	0	0	0	0	0	0	63	40	35
10:00	0	0	0	6	26	30	11	**2**	0	0	0	0	0	75	40	35
11:00	**1**	1	1	1	10	18	9	1	0	0	0	0	0	42	41	35
12 PM	0	0	1	**10**	25	25	7	**2**	0	0	0	0	0	70	39	34
13:00	0	0	0	3	18	29	4	1	0	0	0	0	0	55	39	35
14:00	0	**1**	1	5	24	25	6	2	0	0	0	0	0	64	39	35
15:00	0	1	**5**	3	21	34	8	0	0	0	0	0	0	72	39	34
16:00	0	0	1	2	21	**39**	**14**	1	0	0	0	0	0	78	40	36
17:00	0	0	2	6	**30**	33	10	1	0	0	0	0	0	**82**	39	35
18:00	0	0	0	5	25	25	8	1	0	0	0	0	0	64	39	35
19:00	0	1	1	4	17	21	4	0	0	0	0	0	0	48	39	34
20:00	0	0	0	2	11	25	2	1	0	0	0	0	0	41	39	36
21:00	0	0	0	3	5	13	4	0	**1**	0	0	0	0	26	40	36
22:00	0	0	1	1	5	3	3	2	0	0	0	0	0	15	42	36
23:00	0	0	0	0	0	2	2	0	0	**1**	0	0	0	5	41	43
Total	1	5	18	74	380	556	175	16	2	1	0	0	0	1228		
%	0.1%	0.4%	1.5%	6.0%	30.9%	45.3%	14.3%	1.3%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	06:00	08:00	08:00	06:00	07:00	07:00	10:00	06:00					07:00		
Vol.	1	1	3	6	43	70	29	2	1					132		
PM Peak		14:00	15:00	12:00	17:00	16:00	16:00	12:00	21:00	23:00				17:00		
Vol.		1	5	10	30	39	14	2	1	1				82		

Pecent

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	936
Percent in Pace :	76.2%
Number of Vehicles > 35 MPH :	638
Percent of Vehicles > 35 MPH :	52.0%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	0	0	2	1	1	**1**	0	0	0	0	5	49	43
01:00	0	0	0	0	0	3	2	2	0	0	0	0	0	7	45	41
02:00	0	0	0	0	2	1	5	4	0	0	0	0	0	12	46	41
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
04:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	45	44
05:00	0	0	**1**	0	1	1	2	0	0	0	0	0	0	5	40	35
06:00	0	0	0	0	4	10	9	3	0	0	0	0	0	26	43	39
07:00	0	0	0	1	7	**23**	16	**10**	1	0	0	0	0	**58**	45	40
08:00	**1**	0	0	**3**	14	9	14	5	0	0	0	0	0	46	43	37
09:00	0	0	0	1	11	15	7	2	0	0	0	0	0	36	41	37
10:00	0	0	0	3	13	22	**18**	2	0	0	0	0	0	58	42	37
11:00	0	0	0	2	**17**	19	17	1	0	0	0	0	0	56	42	37
12 PM	0	0	0	0	13	21	10	2	0	0	0	0	0	46	42	37
13:00	0	0	1	3	14	22	10	2	1	0	0	0	0	53	42	36
14:00	0	0	0	2	16	24	17	**7**	0	0	0	0	0	66	43	38
15:00	**1**	0	0	5	10	39	40	3	0	0	0	0	0	98	43	38
16:00	0	0	0	4	**25**	70	36	4	0	0	0	0	0	139	42	37
17:00	1	0	**2**	3	21	**75**	**53**	7	1	0	0	0	0	**163**	43	38
18:00	0	0	0	3	22	50	21	5	0	0	0	0	0	101	42	37
19:00	0	**1**	1	**8**	15	28	17	1	**2**	0	0	0	0	73	42	36
20:00	0	0	0	0	13	26	13	5	0	0	0	0	0	57	42	38
21:00	0	0	0	1	5	13	7	3	0	0	0	0	0	29	43	38
22:00	0	0	0	2	5	10	7	2	0	0	0	0	0	26	42	37
23:00	0	0	0	2	3	1	7	2	2	0	0	0	0	17	48	40
Total	3	1	5	43	231	485	330	74	8	0	0	0	0	1180		
%	0.3%	0.1%	0.4%	3.6%	19.6%	41.1%	28.0%	6.3%	0.7%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00		05:00	08:00	11:00	07:00	10:00	07:00	00:00					07:00		
Vol.	1		1	3	17	23	18	10	1					58		
PM Peak	15:00	19:00	17:00	19:00	16:00	17:00	17:00	14:00	19:00					17:00		
Vol.	1	1	2	8	25	75	53	7	2					163		

Pecent

15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	46 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	815
Percent in Pace :	69.1%
Number of Vehicles > 35 MPH :	800
Percent of Vehicles > 35 MPH :	67.8%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	0	1	8	2	0	**1**	**2**	0	0	0	14	54	41
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
02:00	0	0	0	0	0	3	2	**8**	1	1	0	0	0	15	49	45
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	2	0	1	0	0	0	0	3	50	44
05:00	0	**1**	**1**	1	1	4	1	0	0	0	0	0	0	9	38	32
06:00	0	1	0	0	0	14	5	2	1	0	0	0	0	23	44	38
07:00	0	0	0	0	**14**	16	15	4	0	0	0	0	0	49	43	38
08:00	0	0	0	1	4	15	**18**	1	0	0	0	0	0	39	43	39
09:00	0	0	0	2	10	11	5	3	1	0	0	0	0	32	43	37
10:00	0	1	0	3	11	17	11	1	0	0	0	0	0	44	41	36
11:00	0	0	1	**5**	10	**18**	12	4	1	0	0	0	0	**51**	43	37
12 PM	0	0	**1**	2	12	16	21	5	1	0	0	0	0	58	44	38
13:00	0	0	0	1	17	18	11	1	0	0	0	0	0	48	41	36
14:00	0	0	0	1	12	29	24	6	**3**	0	0	0	0	75	44	39
15:00	0	0	0	4	14	51	26	6	1	0	0	0	0	102	43	38
16:00	0	0	0	5	20	58	**42**	4	1	0	0	0	0	130	43	38
17:00	0	0	1	**7**	**38**	**65**	41	**10**	3	0	0	0	0	**165**	43	37
18:00	0	0	0	1	24	65	39	8	0	0	0	0	0	137	43	38
19:00	0	0	1	5	15	35	28	3	1	0	0	0	0	88	43	37
20:00	0	0	0	2	8	22	13	3	2	0	0	0	0	50	43	38
21:00	0	0	0	1	2	16	5	4	0	0	0	**1**	0	29	45	40
22:00	0	0	0	1	6	9	5	1	0	0	0	0	0	22	42	37
23:00	0	0	0	0	1	3	2	1	0	**1**	0	0	0	8	45	40
Total	0	3	5	42	220	494	330	75	18	4	0	1	0	1192		
%	0.0%	0.3%	0.4%	3.5%	18.5%	41.4%	27.7%	6.3%	1.5%	0.3%	0.0%	0.1%	0.0%			
AM Peak		05:00	05:00	11:00	07:00	11:00	08:00	02:00	00:00	00:00				11:00		
Vol.		1	1	5	14	18	18	8	1	2				51		
PM Peak			12:00	17:00	17:00	17:00	16:00	17:00	14:00	23:00		21:00		17:00		
Vol.			1	7	38	65	42	10	3	1		1		165		

Pecent

15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	47 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	824
Percent in Pace :	69.1%
Number of Vehicles > 35 MPH :	823
Percent of Vehicles > 35 MPH :	69.0%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
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Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
04:00	0	4	6	0	0	0	0	0	0	0	0	0	0	10
05:00	0	36	18	0	3	0	0	0	0	0	0	0	0	57
06:00	1	98	26	0	6	0	0	0	0	0	0	0	0	131
07:00	1	129	29	1	2	0	0	1	0	0	0	0	0	163
08:00	0	99	15	2	3	2	0	1	0	0	0	0	0	122
09:00	0	46	16	1	4	2	0	1	0	0	0	0	0	70
10:00	0	40	8	0	5	1	0	1	0	0	0	0	0	55
11:00	0	45	16	0	4	2	0	0	0	0	0	0	0	67
12 PM	0	36	16	0	1	0	0	0	0	0	0	0	0	53
13:00	1	30	15	0	5	1	0	1	0	0	0	0	0	53
14:00	0	35	14	1	1	0	0	1	0	0	0	0	0	52
15:00	1	49	10	0	1	0	0	0	0	0	0	0	0	61
16:00	0	53	18	1	1	0	0	0	0	0	0	0	0	73
17:00	1	74	10	0	1	0	0	1	0	0	0	0	0	87
18:00	1	55	18	0	2	0	0	1	0	0	0	0	0	77
19:00	0	43	8	0	0	0	0	0	0	0	0	0	0	51
20:00	0	19	6	0	0	0	0	0	0	0	0	0	0	25
21:00	1	12	2	0	0	0	0	0	0	0	0	0	0	15
22:00	1	9	3	0	0	0	0	0	0	0	0	0	0	13
23:00	0	6	1	0	1	0	0	0	0	0	0	0	0	8
Total	8	925	257	6	40	8	0	8	0	0	0	0	0	1252
Percent	0.6%	73.9%	20.5%	0.5%	3.2%	0.6%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	08:00	06:00	08:00		07:00						07:00
Vol.	1	129	29	2	6	2		1						163
PM Peak	13:00	17:00	16:00	14:00	13:00	13:00		13:00						17:00
Vol.	1	74	18	1	5	1		1						87

PRECISION
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Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
04:00	0	5	6	0	0	0	0	0	0	0	0	0	0	11
05:00	0	36	12	0	2	0	0	0	0	0	0	0	0	50
06:00	0	80	27	1	5	0	0	0	0	0	0	0	0	113
07:00	1	105	23	0	3	0	0	0	0	0	0	0	0	132
08:00	0	96	10	1	3	0	0	1	0	0	0	0	0	111
09:00	0	41	17	2	2	0	0	1	0	0	0	0	0	63
10:00	0	58	14	1	2	0	0	0	0	0	0	0	0	75
11:00	0	26	12	0	4	0	0	0	0	0	0	0	0	42
12 PM	0	48	19	0	1	0	0	2	0	0	0	0	0	70
13:00	2	36	12	0	5	0	0	0	0	0	0	0	0	55
14:00	0	43	17	1	3	0	0	0	0	0	0	0	0	64
15:00	1	55	15	0	1	0	0	0	0	0	0	0	0	72
16:00	2	59	15	2	0	0	0	0	0	0	0	0	0	78
17:00	0	62	19	0	1	0	0	0	0	0	0	0	0	82
18:00	2	46	12	0	3	0	0	1	0	0	0	0	0	64
19:00	0	35	12	0	1	0	0	0	0	0	0	0	0	48
20:00	2	30	7	0	2	0	0	0	0	0	0	0	0	41
21:00	0	24	2	0	0	0	0	0	0	0	0	0	0	26
22:00	1	13	1	0	0	0	0	0	0	0	0	0	0	15
23:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
Total	11	910	256	8	38	0	0	5	0	0	0	0	0	1228
Percent	0.9%	74.1%	20.8%	0.7%	3.1%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	06:00	09:00	06:00			08:00						07:00
Vol.	1	105	27	2	5			1						132
PM Peak	13:00	17:00	12:00	16:00	13:00			12:00						17:00
Vol.	2	62	19	2	5			2						82

PRECISION
D A T A
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Dean Street
north of Harvey Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	4	1	0	0	0	0	0	0	0	0	0	0	5
01:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
02:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
05:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
06:00	0	21	2	1	2	0	0	0	0	0	0	0	0	26
07:00	0	42	14	0	1	1	0	0	0	0	0	0	0	58
08:00	1	26	12	3	3	1	0	0	0	0	0	0	0	46
09:00	0	24	9	0	2	1	0	0	0	0	0	0	0	36
10:00	1	32	21	0	3	0	0	1	0	0	0	0	0	58
11:00	0	33	17	0	6	0	0	0	0	0	0	0	0	56
12 PM	1	32	12	0	1	0	0	0	0	0	0	0	0	46
13:00	0	31	18	0	0	2	0	2	0	0	0	0	0	53
14:00	0	42	18	1	4	0	0	1	0	0	0	0	0	66
15:00	2	55	34	3	4	0	0	0	0	0	0	0	0	98
16:00	1	87	40	2	8	0	0	1	0	0	0	0	0	139
17:00	0	126	34	0	3	0	0	0	0	0	0	0	0	163
18:00	0	74	22	0	5	0	0	0	0	0	0	0	0	101
19:00	0	59	11	0	3	0	0	0	0	0	0	0	0	73
20:00	0	47	8	0	2	0	0	0	0	0	0	0	0	57
21:00	0	22	6	0	1	0	0	0	0	0	0	0	0	29
22:00	0	23	3	0	0	0	0	0	0	0	0	0	0	26
23:00	0	16	1	0	0	0	0	0	0	0	0	0	0	17
Total	6	817	288	10	49	5	0	5	0	0	0	0	0	1180
Percent	0.5%	69.2%	24.4%	0.8%	4.2%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	10:00	08:00	11:00	07:00		10:00						07:00
Vol.	1	42	21	3	6	1		1						58
PM Peak	15:00	17:00	16:00	15:00	16:00	13:00		13:00						17:00
Vol.	2	126	40	3	8	2		2						163

PRECISION
D A T A
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Dean Street
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81676 I-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	0	11	3	0	0	0	0	0	0	0	0	0	0	14
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	10	4	0	1	0	0	0	0	0	0	0	0	15
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	1	0	0	0	0	0	3
05:00	0	7	1	0	0	0	0	0	1	0	0	0	0	9
06:00	1	19	2	0	1	0	0	0	0	0	0	0	0	23
07:00	0	33	14	0	2	0	0	0	0	0	0	0	0	49
08:00	1	24	9	3	1	0	0	0	0	1	0	0	0	39
09:00	0	21	8	0	2	0	0	1	0	0	0	0	0	32
10:00	1	26	16	0	1	0	0	0	0	0	0	0	0	44
11:00	0	33	13	1	4	0	0	0	0	0	0	0	0	51
12 PM	1	31	25	0	1	0	0	0	0	0	0	0	0	58
13:00	1	33	12	0	1	1	0	0	0	0	0	0	0	48
14:00	1	51	21	1	1	0	0	0	0	0	0	0	0	75
15:00	1	63	33	2	3	0	0	0	0	0	0	0	0	102
16:00	0	88	32	1	9	0	0	0	0	0	0	0	0	130
17:00	3	124	34	0	4	0	0	0	0	0	0	0	0	165
18:00	1	102	30	0	4	0	0	0	0	0	0	0	0	137
19:00	0	64	21	0	3	0	0	0	0	0	0	0	0	88
20:00	0	37	10	1	2	0	0	0	0	0	0	0	0	50
21:00	0	22	5	0	2	0	0	0	0	0	0	0	0	29
22:00	1	17	4	0	0	0	0	0	0	0	0	0	0	22
23:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
Total	12	826	298	9	42	1	0	2	1	1	0	0	0	1192
Percent	1.0%	69.3%	25.0%	0.8%	3.5%	0.1%	0.0%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	10:00	08:00	11:00			04:00	05:00	08:00				11:00
Vol.	1	33	16	3	4			1	1	1				51
PM Peak	17:00	17:00	17:00	15:00	16:00	13:00								17:00
Vol.	3	124	34	2	9	1								165

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Barrows Street
east of South Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-E class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
04:00	0	4	5	0	0	0	0	0	0	0	0	0	0	9
05:00	1	25	7	1	1	0	0	0	0	0	0	0	0	35
06:00	2	58	19	0	4	1	0	0	0	0	0	0	0	84
07:00	0	80	16	1	1	1	0	1	0	0	0	0	0	100
08:00	1	69	8	0	3	3	0	1	0	0	0	0	0	85
09:00	0	38	11	0	2	3	0	0	0	0	0	0	0	54
10:00	0	39	6	0	3	1	0	1	0	0	0	0	0	50
11:00	1	37	14	0	3	1	0	0	0	0	0	0	0	56
12 PM	1	34	19	1	3	0	0	0	0	0	0	0	0	58
13:00	2	33	18	0	3	2	0	2	0	0	0	0	0	60
14:00	2	49	14	2	1	1	0	0	0	0	0	0	0	69
15:00	3	53	10	2	2	2	0	0	0	0	0	0	0	72
16:00	1	60	16	0	2	0	0	0	0	0	0	0	0	79
17:00	2	80	18	0	2	0	0	1	0	0	0	0	0	103
18:00	2	61	21	0	0	0	0	0	0	0	0	0	0	84
19:00	0	39	17	0	3	0	0	0	0	0	0	0	0	59
20:00	0	36	12	0	1	0	0	0	0	0	0	0	0	49
21:00	1	17	1	0	0	0	0	0	0	0	0	0	0	19
22:00	3	19	4	0	0	0	0	0	0	0	0	0	0	26
23:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
Total	22	846	238	7	34	15	0	6	0	0	0	0	0	1168
Percent	1.9%	72.4%	20.4%	0.6%	2.9%	1.3%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	06:00	05:00	06:00	08:00		07:00						07:00
Vol.	2	80	19	1	4	3		1						100
PM Peak	15:00	17:00	18:00	14:00	12:00	13:00		13:00						17:00
Vol.	3	80	21	2	3	2		2						103

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EB

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09/17/0														
8	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
04:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
05:00	2	20	7	1	0	0	0	0	0	0	0	0	0	30
06:00	1	56	13	1	3	1	0	0	0	0	0	0	0	75
07:00	1	58	13	0	2	2	0	0	0	0	0	0	0	76
08:00	3	76	11	0	0	0	0	0	0	0	0	0	0	90
09:00	2	32	15	1	2	2	0	1	0	0	0	0	0	55
10:00	1	36	11	1	2	1	0	0	0	0	0	0	0	52
11:00	1	35	8	0	2	0	0	0	0	0	0	0	0	46
12 PM	1	43	15	1	3	0	0	2	0	0	0	0	0	65
13:00	3	47	9	0	7	0	0	0	0	0	0	0	0	66
14:00	0	52	9	1	2	1	0	1	0	0	0	0	0	66
15:00	1	67	13	2	1	0	0	1	0	0	0	0	0	85
16:00	1	53	14	0	2	0	0	0	0	0	0	0	0	70
17:00	2	68	15	0	2	0	0	0	0	0	0	0	0	87
18:00	2	72	21	0	1	0	0	0	0	0	0	0	0	96
19:00	2	47	9	0	1	0	0	0	0	0	0	0	0	59
20:00	1	28	10	0	1	0	0	0	0	0	0	0	0	40
21:00	1	22	3	0	0	0	0	0	0	0	0	0	0	26
22:00	3	27	0	0	0	0	0	0	0	0	0	0	0	30
23:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
Total	28	861	203	8	31	7	0	5	0	0	0	0	0	1143
Percent	2.4%	75.3%	17.8%	0.7%	2.7%	0.6%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	09:00	05:00	06:00	07:00		09:00						08:00
Vol.	3	76	15	1	3	2		1						90
PM Peak	13:00	18:00	18:00	15:00	13:00	14:00		12:00						18:00
Vol.	3	72	21	2	7	1		2						96

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
06:00	3	35	7	0	1	0	0	0	0	0	0	0	0	46
07:00	1	78	24	3	2	1	0	0	0	0	0	0	0	109
08:00	1	54	21	2	2	1	0	0	0	0	0	0	0	81
09:00	0	33	6	1	2	2	0	0	0	0	0	0	0	44
10:00	1	41	9	0	1	1	0	1	0	0	0	0	0	54
11:00	0	46	16	0	4	0	0	0	0	0	0	0	0	66
12 PM	1	36	11	1	3	0	0	0	0	0	0	0	0	52
13:00	1	38	18	0	0	2	0	2	1	0	0	0	0	62
14:00	0	52	18	4	1	0	0	0	0	0	0	0	0	75
15:00	2	71	24	3	5	0	0	0	0	0	0	0	0	105
16:00	1	98	28	2	4	0	0	3	0	0	0	0	0	136
17:00	0	112	25	0	0	0	0	0	0	0	0	0	0	137
18:00	0	75	20	0	1	0	0	0	0	0	0	0	0	96
19:00	0	69	10	0	3	0	0	0	0	0	0	0	0	82
20:00	1	43	5	0	1	0	0	0	0	0	0	0	0	50
21:00	0	28	8	0	0	0	0	0	0	0	0	0	0	36
22:00	0	20	2	0	0	0	0	0	0	0	0	0	0	22
23:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
Total	12	962	256	16	30	7	0	6	1	0	0	0	0	1290
Percent	0.9%	74.6%	19.8%	1.2%	2.3%	0.5%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	11:00	09:00		10:00						07:00
Vol.	3	78	24	3	4	2		1						109
PM Peak	15:00	17:00	16:00	14:00	15:00	13:00		16:00	13:00					17:00
Vol.	2	112	28	4	5	2		3	1					137

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09/17/0														
8	1	11	2	0	0	0	0	0	0	0	0	0	0	14
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	1	4	4	0	0	0	0	0	0	0	0	0	0	9
06:00	2	28	7	0	1	0	0	0	0	0	0	0	0	38
07:00	0	52	16	3	0	0	0	0	0	0	0	0	0	71
08:00	0	64	17	2	5	0	0	0	0	1	0	0	0	89
09:00	0	38	10	2	0	0	0	1	0	0	0	0	0	51
10:00	1	56	12	0	3	1	0	0	0	0	0	0	0	73
11:00	0	48	9	0	2	0	0	0	0	0	0	0	0	59
12 PM	0	44	17	0	4	1	0	0	0	0	0	0	0	66
13:00	0	46	11	0	2	1	0	0	0	0	0	0	0	60
14:00	1	62	12	4	2	0	0	0	0	0	0	0	0	81
15:00	0	68	25	5	3	1	0	0	0	0	0	0	0	102
16:00	0	96	22	0	5	0	0	0	0	0	0	0	0	123
17:00	1	118	22	0	0	0	0	0	0	0	0	0	0	141
18:00	1	88	19	0	2	0	0	0	0	0	0	0	0	110
19:00	0	57	9	0	2	0	0	0	0	0	0	0	0	68
20:00	0	39	12	0	3	0	0	0	0	0	0	0	0	54
21:00	1	23	3	0	1	0	0	0	0	0	0	0	0	28
22:00	1	20	4	0	0	0	0	0	0	0	0	0	0	25
23:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
Total	10	979	236	16	35	4	0	1	0	1	0	0	0	1282
Percent	0.8%	76.4%	18.4%	1.2%	2.7%	0.3%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	07:00	08:00	10:00		09:00		08:00				08:00
Vol.	2	64	17	3	5	1		1		1				89
PM Peak	14:00	17:00	15:00	15:00	16:00	12:00								17:00
Vol.	1	118	25	5	5	1								141

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EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	2	2	0	0	0	0	0	0	0	0	4	30	30
01:00	0	0	1	1	1	1	0	0	0	0	0	0	0	4	34	30
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	3	0	0	0	0	0	0	0	0	3	32	31
04:00	0	1	1	0	7	0	0	0	0	0	0	0	0	9	33	29
05:00	0	**3**	6	3	15	8	0	0	0	0	0	0	0	35	36	30
06:00	0	3	3	**18**	46	12	0	**1**	**1**	0	0	0	0	84	35	31
07:00	0	1	2	11	51	31	4	0	0	0	0	0	0	100	38	33
08:00	1	0	11	16	46	10	1	0	0	0	0	0	0	85	34	30
09:00	1	1	1	10	30	10	1	0	0	0	0	0	0	54	36	31
10:00	2	0	2	13	27	6	0	0	0	0	0	0	0	50	34	30
11:00	0	0	2	17	25	11	1	0	0	0	0	0	0	56	36	31
12 PM	1	0	3	19	22	12	0	1	0	0	0	0	0	58	36	31
13:00	1	2	4	23	20	9	1	0	0	0	0	0	0	60	35	30
14:00	0	1	1	17	35	14	1	0	0	0	0	0	0	69	36	32
15:00	0	1	3	13	45	8	1	0	1	0	0	0	0	72	34	31
16:00	1	0	4	16	37	17	4	0	0	0	0	0	0	79	37	32
17:00	0	0	0	30	55	17	1	0	0	0	0	0	0	103	35	31
18:00	0	0	5	21	44	12	0	2	0	0	0	0	0	84	35	31
19:00	2	1	4	25	22	5	0	0	0	0	0	0	0	59	33	28
20:00	1	4	6	17	18	3	0	0	0	0	0	0	0	49	33	28
21:00	0	2	2	4	8	2	0	1	0	0	0	0	0	19	34	30
22:00	0	0	1	7	12	6	0	0	0	0	0	0	0	26	35	31
23:00	0	0	1	1	2	2	0	0	0	0	0	0	0	6	35	32
Total	10	20	63	284	573	196	15	5	2	0	0	0	0	1168		
%	0.9%	1.7%	5.4%	24.3%	49.1%	16.8%	1.3%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	05:00	08:00	06:00	07:00	07:00	07:00	06:00	06:00					07:00		
Vol.	2	3	11	18	51	31	4	1	1					100		
PM Peak	19:00	20:00	20:00	17:00	17:00	16:00	16:00	18:00	15:00					17:00		
Vol.	2	4	6	30	55	17	4	2	1					103		

Pecent

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	857
Percent in Pace :	73.4%
Number of Vehicles > 30 MPH :	676
Percent of Vehicles > 30 MPH :	57.9%
Mean Speed(Average) :	31 MPH

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Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	**2**	0	0	0	1	2	0	0	0	0	0	0	0	5	35	22
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	35	34
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30	30
03:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	32
04:00	0	1	1	1	3	1	1	0	0	0	0	0	0	8	39	30
05:00	0	1	**4**	2	17	6	0	0	0	0	0	0	0	30	35	31
06:00	0	**3**	4	17	41	8	2	0	0	0	0	0	0	75	34	31
07:00	0	0	0	**18**	39	17	2	0	0	0	0	0	0	76	36	32
08:00	2	0	4	13	**44**	**25**	2	0	0	0	0	0	0	**90**	37	32
09:00	0	0	2	8	27	18	0	0	0	0	0	0	0	55	37	33
10:00	2	1	2	17	21	9	0	0	0	0	0	0	0	52	35	29
11:00	1	0	1	7	23	11	**3**	0	0	0	0	0	0	46	37	32
12 PM	1	1	4	23	25	8	**3**	0	0	0	0	0	0	65	35	30
13:00	0	1	**5**	16	34	7	3	0	0	0	0	0	0	66	34	31
14:00	0	0	3	21	31	10	1	0	0	0	0	0	0	66	35	31
15:00	**2**	0	5	19	43	15	1	0	0	0	0	0	0	85	35	31
16:00	0	0	3	16	35	**16**	0	0	0	0	0	0	0	70	36	32
17:00	0	0	1	25	45	14	1	0	0	0	0	0	**1**	87	35	32
18:00	0	0	4	**33**	**46**	13	0	0	0	0	0	0	0	**96**	34	31
19:00	0	1	4	19	28	7	0	0	0	0	0	0	0	59	34	30
20:00	0	0	2	13	22	3	0	0	0	0	0	0	0	40	34	30
21:00	0	0	4	8	9	4	1	0	0	0	0	0	0	26	35	30
22:00	2	**5**	5	6	7	2	2	0	0	0	0	**1**	0	30	34	28
23:00	0	1	1	3	2	2	0	0	0	0	0	0	0	9	35	29
Total	12	15	59	285	548	200	22	0	0	0	0	1	1	1143		
%	1.0%	1.3%	5.2%	24.9%	47.9%	17.5%	1.9%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%			
AM Peak	00:00	06:00	05:00	07:00	08:00	08:00	11:00							08:00		
Vol.	2	3	4	18	44	25	3							90		
PM Peak	15:00	22:00	13:00	18:00	18:00	16:00	12:00					22:00	17:00	18:00		
Vol.	2	5	5	33	46	16	3					1	1	96		

Pecent

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	833
Percent in Pace :	72.9%
Number of Vehicles > 30 MPH :	662
Percent of Vehicles > 30 MPH :	57.9%
Mean Speed(Average) :	31 MPH

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Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	0	2	0	0	**1**	0	0	0	0	0	3	45	35
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
02:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30	30
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
04:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35	35
05:00	0	**1**	2	1	7	2	1	0	0	0	0	0	0	14	35	30
06:00	0	1	1	13	17	11	3	0	0	0	0	0	0	46	37	32
07:00	0	1	**4**	10	**42**	**45**	7	0	0	0	0	0	0	**109**	38	34
08:00	1	1	2	12	30	21	**13**	1	0	0	0	0	0	81	40	34
09:00	**3**	1	0	3	24	11	2	0	0	0	0	0	0	44	37	31
10:00	0	1	1	9	21	17	5	0	0	0	0	0	0	54	38	33
11:00	0	1	3	**14**	23	22	3	0	0	0	0	0	0	66	38	32
12 PM	0	1	2	11	18	20	0	0	0	0	0	0	0	52	37	32
13:00	1	4	**4**	9	25	15	3	**1**	0	0	0	0	0	62	38	31
14:00	0	3	2	12	27	26	5	0	0	0	0	0	0	75	38	33
15:00	2	4	2	11	51	30	5	0	0	0	0	0	0	105	38	32
16:00	0	1	4	14	**70**	41	**6**	0	0	0	0	0	0	136	38	33
17:00	0	0	0	12	61	**59**	5	0	0	0	0	0	0	**137**	38	34
18:00	0	4	1	**23**	39	24	5	0	0	0	0	0	0	96	37	32
19:00	0	0	3	21	43	12	3	0	0	0	0	0	0	82	35	31
20:00	0	0	1	13	17	15	4	0	0	0	0	0	0	50	38	33
21:00	**3**	**5**	0	2	11	10	5	0	0	0	0	0	0	36	39	31
22:00	2	1	1	2	6	9	1	0	0	0	0	0	0	22	38	30
23:00	0	1	0	2	4	6	2	0	0	0	0	0	0	15	39	34
Total	12	31	33	195	539	399	78	3	0	0	0	0	0	1290		
%	0.9%	2.4%	2.6%	15.1%	41.8%	30.9%	6.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	05:00	07:00	11:00	07:00	07:00	08:00	00:00						07:00		
Vol.	3	1	4	14	42	45	13	1						109		
PM Peak	21:00	21:00	13:00	18:00	16:00	17:00	16:00	13:00						17:00		
Vol.	3	5	4	23	70	59	6	1						137		

Pecent

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	938
Percent in Pace :	72.7%
Number of Vehicles > 30 MPH :	911
Percent of Vehicles > 30 MPH :	70.6%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Barrows Street
east of South Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

81676 I-E speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	3	5	1	3	**2**	0	0	0	0	0	14	42	36
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	31	30
02:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4	31	31
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	1	1	2	0	0	0	0	0	0	4	40	38
05:00	**1**	0	0	2	5	1	0	0	0	0	0	0	0	9	34	28
06:00	0	1	0	3	23	9	2	0	0	0	0	0	0	38	37	33
07:00	0	1	3	8	24	24	**11**	0	0	0	0	0	0	71	39	34
08:00	0	2	0	10	**37**	**35**	5	0	0	0	0	0	0	**89**	38	34
09:00	1	0	0	10	24	12	3	1	0	0	0	0	0	51	37	32
10:00	0	**3**	**4**	**17**	31	14	4	0	0	0	0	0	0	73	37	31
11:00	0	1	1	7	25	17	8	0	0	0	0	0	0	59	39	34
12 PM	0	1	1	9	28	19	**8**	0	0	0	0	0	0	66	39	34
13:00	0	1	8	8	23	12	8	0	0	0	0	0	0	60	39	32
14:00	0	2	2	19	33	19	6	0	0	0	0	0	0	81	38	32
15:00	0	**6**	1	18	42	29	6	0	0	0	0	0	0	102	38	32
16:00	**1**	2	**9**	12	46	46	7	0	0	0	0	0	0	123	38	33
17:00	0	0	1	15	**68**	**49**	8	0	0	0	0	0	0	**141**	38	34
18:00	0	1	1	**20**	54	29	5	0	0	0	0	0	0	110	37	33
19:00	0	2	1	11	33	20	1	0	0	0	0	0	0	68	37	32
20:00	0	0	4	10	20	17	3	0	0	0	0	0	0	54	38	32
21:00	0	3	1	4	13	5	1	**1**	0	0	0	0	0	28	37	31
22:00	1	3	1	4	9	5	1	1	0	0	0	0	0	25	37	30
23:00	0	2	0	1	3	3	1	0	0	0	0	0	0	10	36	31
Total	4	31	38	192	551	368	93	5	0	0	0	0	0	1282		
%	0.3%	2.4%	3.0%	15.0%	43.0%	28.7%	7.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	10:00	10:00	10:00	08:00	08:00	07:00	00:00						08:00		
Vol.	1	3	4	17	37	35	11	2						89		
PM Peak	16:00	15:00	16:00	18:00	17:00	17:00	12:00	21:00						17:00		
Vol.	1	6	9	20	68	49	8	1						141		

Pecent

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	919
Percent in Pace :	71.7%
Number of Vehicles > 30 MPH :	906
Percent of Vehicles > 30 MPH :	70.7%
Mean Speed(Average) :	33 MPH

Barrows Street
east of South Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 I-E volume
Site Code: 10111.31

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		16-Sep-08 Tue
12:00	1		15		0		10		1		25		
12:15	3		9		2		13		5		22		
12:30	0		12		1		13		1		25		
12:45	0	4	22	58	0	3	16	52	0	7	38	110	
01:00	2		15		0		18		2		33		
01:15	0		17		0		16		0		33		
01:30	0		11		1		14		1		25		
01:45	2	4	17	60	0	1	14	62	2	5	31	122	
02:00	0		14		1		25		1		39		
02:15	0		22		1		15		1		37		
02:30	0		15		0		19		0		34		
02:45	0	0	18	69	0	2	16	75	0	2	34	144	
03:00	0		12		1		22		1		34		
03:15	0		22		0		25		0		47		
03:30	2		19		0		36		2		55		
03:45	1	3	19	72	0	1	22	105	1	4	41	177	
04:00	1		19		0		34		1		53		
04:15	1		23		0		29		1		52		
04:30	1		19		0		36		1		55		
04:45	6	9	18	79	1	1	37	136	7	10	55	215	
05:00	4		26		6		39		10		65		
05:15	6		27		1		40		7		67		
05:30	11		24		3		30		14		54		
05:45	14	35	26	103	4	14	28	137	18	49	54	240	
06:00	11		19		6		24		17		43		
06:15	13		23		8		17		21		40		
06:30	34		16		11		21		45		37		
06:45	26	84	26	84	21	46	34	96	47	130	60	180	
07:00	27		14		21		24		48		38		
07:15	18		20		38		24		56		44		
07:30	36		14		29		18		65		32		
07:45	19	100	11	59	21	109	16	82	40	209	27	141	
08:00	25		21		29		14		54		35		
08:15	23		14		18		13		41		27		
08:30	17		6		14		11		31		17		
08:45	20	85	8	49	20	81	12	50	40	166	20	99	
09:00	16		2		14		9		30		11		
09:15	13		4		10		7		23		11		
09:30	18		8		6		12		24		20		
09:45	7	54	5	19	14	44	8	36	21	98	13	55	
10:00	9		11		9		6		18		17		
10:15	13		10		10		5		23		15		
10:30	15		1		18		3		33		4		
10:45	13	50	4	26	17	54	8	22	30	104	12	48	
11:00	13		0		11		7		24		7		
11:15	9		4		10		2		19		6		
11:30	17		0		21		2		38		2		
11:45	17	56	2	6	24	66	4	15	41	122	6	21	
Total	484		684		422		868		906		1552		
Percent	53.4%		44.1%		46.6%		55.9%						
Day Total		1168				1290				2458			
Peak	06:45		05:00		07:15		04:30		06:45		04:30		
Vol.	107		103		117		152		216		242		
P.H.F.	0.743		0.954		0.770		0.950		0.831		0.903		

Barrows Street
east of South Worcester Street
City, State: Norton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 I-E volume
Site Code: 10111.31

Start	EB				WB				Combined				17-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	1		14		4		17		5		31		
12:15	2		14		5		11		7		25		
12:30	2		18		4		17		6		35		
12:45	0	5	19	65	1	14	21	66	1	19	40	131	
01:00	0		12		0		19		0		31		
01:15	0		18		1		11		1		29		
01:30	0		21		1		15		1		36		
01:45	2	2	15	66	0	2	15	60	2	4	30	126	
02:00	1		9		1		18		2		27		
02:15	0		13		1		19		1		32		
02:30	0		21		1		26		1		47		
02:45	0	1	23	66	1	4	18	81	1	5	41	147	
03:00	0		21		0		26		0		47		
03:15	1		19		0		30		1		49		
03:30	2		21		0		24		2		45		
03:45	1	4	24	85	0	0	22	102	1	4	46	187	
04:00	3		15		0		31		3		46		
04:15	3		9		1		23		4		32		
04:30	0		19		0		34		0		53		
04:45	2	8	27	70	3	4	35	123	5	12	62	193	
05:00	3		26		4		33		7		59		
05:15	3		24		2		42		5		66		
05:30	11		24		1		34		12		58		
05:45	13	30	13	87	2	9	32	141	15	39	45	228	
06:00	19		19		5		26		24		45		
06:15	12		33		9		28		21		61		
06:30	22		22		9		32		31		54		
06:45	22	75	22	96	15	38	24	110	37	113	46	206	
07:00	19		16		17		27		36		43		
07:15	18		10		21		17		39		27		
07:30	22		20		13		9		35		29		
07:45	17	76	13	59	20	71	15	68	37	147	28	127	
08:00	23		16		22		7		45		23		
08:15	20		9		26		14		46		23		
08:30	19		8		23		16		42		24		
08:45	28	90	7	40	18	89	17	54	46	179	24	94	
09:00	15		10		18		8		33		18		
09:15	17		4		10		8		27		12		
09:30	11		8		7		5		18		13		
09:45	12	55	4	26	16	51	7	28	28	106	11	54	
10:00	15		16		19		10		34		26		
10:15	13		6		26		10		39		16		
10:30	13		4		15		2		28		6		
10:45	11	52	4	30	13	73	3	25	24	125	7	55	
11:00	7		0		10		5		17		5		
11:15	11		3		14		3		25		6		
11:30	16		3		21		1		37		4		
11:45	12	46	3	9	14	59	1	10	26	105	4	19	
Total	444		699		414		868		858		1567		
Percent	51.7%		44.6%		48.3%		55.4%						
Day Total		1143				1282				2425			
Peak	08:00		04:45		07:45		04:30		08:00		04:45		
Vol.	90		101		91		144		179		245		
P.H.F.	0.804		0.935		0.875		0.857		0.973		0.928		

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Raynham, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Volume
Site Code: 10111.31

Start	NB				SB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	18		101		21		104		39		205		
12:15	6		120		19		90		25		210		
12:30	8		119		15		103		23		222		
12:45	13	45	98	438	8	63	109	406	21	108	207	844	
01:00	13		101		10		134		23		235		
01:15	14		98		10		114		24		212		
01:30	18		98		9		137		27		235		
01:45	8	53	119	416	1	30	122	507	9	83	241	923	
02:00	10		118		7		116		17		234		
02:15	2		98		10		134		12		232		
02:30	11		133		2		125		13		258		
02:45	7	30	136	485	4	23	177	552	11	53	313	1037	
03:00	9		99		7		150		16		249		
03:15	11		113		4		184		15		297		
03:30	12		105		8		164		20		269		
03:45	16	48	94	411	11	30	207	705	27	78	301	1116	
04:00	14		111		4		213		18		324		
04:15	20		115		5		233		25		348		
04:30	24		112		6		226		30		338		
04:45	50	108	137	475	10	25	262	934	60	133	399	1409	
05:00	43		121		20		259		63		380		
05:15	88		136		13		310		101		446		
05:30	84		98		27		273		111		371		
05:45	135	350	111	466	27	87	180	1022	162	437	291	1488	
06:00	163		93		26		194		189		287		
06:15	160		84		47		191		207		275		
06:30	192		91		56		170		248		261		
06:45	237	752	80	348	72	201	135	690	309	953	215	1038	
07:00	245		60		69		105		314		165		
07:15	257		62		65		126		322		188		
07:30	253		60		101		105		354		165		
07:45	285	1040	59	241	84	319	83	419	369	1359	142	660	
08:00	244		60		70		77		314		137		
08:15	235		37		78		71		313		108		
08:30	221		40		68		70		289		110		
08:45	202	902	53	190	99	315	62	280	301	1217	115	470	
09:00	146		55		96		61		242		116		
09:15	129		38		86		46		215		84		
09:30	113		35		83		51		196		86		
09:45	117	505	37	165	99	364	49	207	216	869	86	372	
10:00	100		35		75		41		175		76		
10:15	102		29		99		40		201		69		
10:30	99		23		91		40		190		63		
10:45	95	396	26	113	100	365	30	151	195	761	56	264	
11:00	87		24		85		28		172		52		
11:15	88		29		85		26		173		55		
11:30	97		19		95		28		192		47		
11:45	100	372	24	96	89	354	31	113	189	726	55	209	
Total	4601		3844		2176		5986		6777		9830		
Percent	67.9%		39.1%		32.1%		60.9%						
Day Total		8445				8162				16607			
Peak	07:00		04:30		10:15		04:45		07:00		04:45		
Vol.	1040		506		375		1104		1359		1596		
P.H.F.	0.912		0.923		0.938		0.890		0.921		0.895		

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Volume
Site Code: 10111.31

Start	NB				SB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	14		111		15		145		29		256		
12:15	8		112		20		144		28		256		
12:30	10		104		15		125		25		229		
12:45	13	45	84	411	9	59	109	523	22	104	193	934	
01:00	11		94		6		126		17		220		
01:15	10		127		17		110		27		237		
01:30	19		110		15		110		34		220		
01:45	10	50	111	442	7	45	124	470	17	95	235	912	
02:00	7		127		4		137		11		264		
02:15	6		128		10		130		16		258		
02:30	6		134		0		134		6		268		
02:45	2	21	122	511	5	19	177	578	7	40	299	1089	
03:00	6		93		4		147		10		240		
03:15	7		124		3		200		10		324		
03:30	9		155		3		179		12		334		
03:45	13	35	134	506	6	16	236	762	19	51	370	1268	
04:00	18		115		5		204		23		319		
04:15	13		147		3		252		16		399		
04:30	26		128		9		225		35		353		
04:45	40	97	147	537	12	29	249	930	52	126	396	1467	
05:00	40		133		9		241		49		374		
05:15	75		133		20		265		95		398		
05:30	91		133		25		230		116		363		
05:45	143	349	104	503	38	92	223	959	181	441	327	1462	
06:00	168		121		44		192		212		313		
06:15	157		93		46		201		203		294		
06:30	218		99		61		159		279		258		
06:45	264	807	73	386	60	211	158	710	324	1018	231	1096	
07:00	218		82		69		112		287		194		
07:15	262		88		86		112		348		200		
07:30	299		62		105		120		404		182		
07:45	325	1104	51	283	92	352	94	438	417	1456	145	721	
08:00	299		76		88		88		387		164		
08:15	269		64		95		89		364		153		
08:30	216		42		68		77		284		119		
08:45	178	962	38	220	115	366	63	317	293	1328	101	537	
09:00	157		42		90		66		247		108		
09:15	131		48		86		57		217		105		
09:30	126		42		107		64		233		106		
09:45	126	540	35	167	88	371	52	239	214	911	87	406	
10:00	115		37		84		35		199		72		
10:15	100		21		92		55		192		76		
10:30	97		28		81		46		178		74		
10:45	102	414	25	111	91	348	32	168	193	762	57	279	
11:00	90		23		108		36		198		59		
11:15	72		22		92		37		164		59		
11:30	97		27		102		25		199		52		
11:45	88	347	24	96	136	438	30	128	224	785	54	224	
Total	4771		4173		2346		6222		7117		10395		
Percent	67.0%		40.1%		33.0%		59.9%						
Day Total		8944				8568				17512			
Peak	07:30		04:15		11:00		04:45		07:30		04:45		
Vol.	1192		555		438		985		1572		1531		
P.H.F.	0.917		0.944		0.805		0.929		0.942		0.962		

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	Ave. Speed
09/09/ 08	0	0	0	0	0	7	10	15	11	2	0	0	0	45	46
01:00	0	0	1	0	1	9	9	17	14	1	0	0	1	53	46
02:00	0	0	0	0	0	1	4	10	13	2	0	0	0	30	49
03:00	1	0	0	0	0	0	5	21	14	6	1	0	0	48	48
04:00	0	0	0	0	0	2	10	47	29	16	3	1	0	108	50
05:00	1	0	0	0	1	2	43	168	112	16	6	1	0	350	49
06:00	10	0	0	0	0	26	217	397	89	12	1	0	0	752	45
07:00	29	0	0	0	1	88	464	389	64	4	1	0	0	1040	43
08:00	23	0	0	0	18	61	353	362	75	8	1	0	1	902	44
09:00	20	0	0	2	5	39	201	183	50	4	1	0	0	505	43
10:00	19	0	0	0	8	26	137	162	38	6	0	0	0	396	43
11:00	10	0	0	0	14	48	135	122	36	7	0	0	0	372	43
12 PM	16	0	0	0	1	28	164	185	37	7	0	0	0	438	44
13:00	17	0	0	0	34	80	146	105	29	3	2	0	0	416	41
14:00	21	0	0	1	14	59	208	154	28	0	0	0	0	485	42
15:00	23	0	0	1	19	50	189	102	24	3	0	0	0	411	41
16:00	49	0	0	0	9	73	166	128	45	5	0	0	0	475	40
17:00	34	0	0	0	0	35	185	168	40	2	2	0	0	466	42
18:00	26	0	0	1	10	31	124	121	25	10	0	0	0	348	42
19:00	4	0	0	0	3	33	81	91	25	4	0	0	0	241	44
20:00	5	0	0	0	1	20	71	69	19	3	1	1	0	190	44
21:00	3	0	0	0	0	21	56	61	15	8	1	0	0	165	44
22:00	1	0	0	0	0	6	29	47	24	6	0	0	0	113	46
23:00	0	0	0	0	2	11	36	33	12	2	0	0	0	96	44
Total	312	0	1	5	141	756	3043	3157	868	137	20	3	2	8445	
Percent	3.7%	0.0%	0.0%	0.1%	1.7%	9.0%	36.0%	37.4%	10.3%	1.6%	0.2%	0.0%	0.0%		

%ile Speed

15th Percentile :	40 MPH
50th Percentile :	44 MPH
85th Percentile :	49 MPH
95th Percentile :	53 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	6200
Percent in Pace :	73.4%
Number of Vehicles > 45 MPH :	3555
Percent of Vehicles > 45 MPH :	42.1%
Mean Speed(Average) :	43 MPH

PRECISION
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Turnpike Street (Route 138)
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Client: VHB/J. Quitter

81676L-A Speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	Ave. Speed
09/10/ 08	1	0	0	0	0	6	16	12	9	1	0	0	0	45	44
01:00	1	0	0	0	4	4	13	20	7	1	0	0	0	50	44
02:00	0	0	0	0	0	4	6	8	3	0	0	0	0	21	44
03:00	0	0	0	0	0	0	5	15	12	2	1	0	0	35	49
04:00	0	0	0	0	0	1	11	43	28	10	4	0	0	97	49
05:00	1	0	0	1	0	1	65	151	101	24	4	1	0	349	48
06:00	15	0	0	0	6	16	184	380	175	27	3	1	0	807	46
07:00	26	0	0	6	22	72	399	466	105	7	1	0	0	1104	44
08:00	26	0	0	0	3	42	311	457	114	9	0	0	0	962	45
09:00	12	0	0	0	0	20	149	252	98	9	0	0	0	540	45
10:00	16	0	0	0	3	43	133	161	51	6	1	0	0	414	43
11:00	10	0	0	0	5	18	124	130	49	10	1	0	0	347	44
12 PM	17	0	0	0	7	25	138	177	40	6	1	0	0	411	43
13:00	20	0	0	5	11	49	166	150	34	6	1	0	0	442	42
14:00	23	0	0	2	28	56	195	165	33	8	1	0	0	511	42
15:00	34	0	0	5	7	63	167	186	37	6	1	0	0	506	42
16:00	44	0	0	1	12	49	216	159	47	8	1	0	0	537	41
17:00	29	0	0	0	2	30	119	244	67	12	0	0	0	503	44
18:00	16	0	0	0	4	21	106	167	64	8	0	0	0	386	44
19:00	5	0	0	1	4	34	104	93	36	5	1	0	0	283	44
20:00	5	0	0	0	3	11	74	88	32	6	1	0	0	220	45
21:00	1	0	0	0	0	10	50	66	34	3	2	1	0	167	46
22:00	0	0	0	0	0	4	28	39	27	8	4	1	0	111	48
23:00	2	0	0	0	2	6	25	33	23	3	2	0	0	96	46
Total	304	0	0	21	123	585	2804	3662	1226	185	30	4	0	8944	
Percent	3.4%	0.0%	0.0%	0.2%	1.4%	6.5%	31.4%	40.9%	13.7%	2.1%	0.3%	0.0%	0.0%		

%ile Speed

15th Percentile :	40 MPH
50th Percentile :	45 MPH
85th Percentile :	50 MPH
95th Percentile :	54 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	6466
Percent in Pace :	72.3%
Number of Vehicles > 45 MPH :	4374
Percent of Vehicles > 45 MPH :	48.9%
Mean Speed(Average) :	44 MPH

PRECISION
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Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	Ave. Speed
09/09/ 08	1	0	0	0	0	0	4	27	20	9	2	0	0	63	49
01:00	0	0	0	0	0	2	6	10	8	3	1	0	0	30	48
02:00	0	0	0	0	0	0	1	11	7	1	2	1	0	23	51
03:00	1	0	0	0	0	0	5	6	8	8	1	0	1	30	50
04:00	0	0	0	0	0	1	1	9	6	5	3	0	0	25	51
05:00	1	0	0	0	0	2	13	42	21	6	2	0	0	87	48
06:00	14	0	0	0	0	3	45	100	37	2	0	0	0	201	44
07:00	33	0	0	0	3	17	71	125	64	5	1	0	0	319	42
08:00	16	0	0	0	0	18	120	118	38	5	0	0	0	315	43
09:00	22	0	0	0	4	31	109	142	49	7	0	0	0	364	43
10:00	19	0	0	0	4	13	127	159	42	1	0	0	0	365	43
11:00	8	0	0	0	9	34	140	135	22	6	0	0	0	354	43
12 PM	14	0	0	0	7	44	156	132	49	4	0	0	0	406	43
13:00	15	0	0	0	5	88	201	165	30	3	0	0	0	507	42
14:00	26	0	0	0	5	69	207	209	31	5	0	0	0	552	42
15:00	29	0	0	3	12	116	244	256	41	4	0	0	0	705	42
16:00	45	0	0	1	14	143	429	262	39	1	0	0	0	934	41
17:00	47	0	0	0	2	127	432	359	52	3	0	0	0	1022	42
18:00	24	0	0	1	18	37	238	301	68	3	0	0	0	690	43
19:00	8	0	0	0	0	23	169	159	52	8	0	0	0	419	44
20:00	4	0	0	0	0	7	67	151	42	8	1	0	0	280	46
21:00	3	0	0	0	0	10	45	95	42	9	2	1	0	207	46
22:00	1	0	0	0	1	2	24	62	48	12	0	0	1	151	48
23:00	0	0	0	0	1	6	27	50	26	3	0	0	0	113	47
Total	331	0	0	5	85	793	2881	3085	842	121	15	2	2	8162	
Percent	4.1%	0.0%	0.0%	0.1%	1.0%	9.7%	35.3%	37.8%	10.3%	1.5%	0.2%	0.0%	0.0%		

%ile Speed

15th Percentile :	40 MPH
50th Percentile :	44 MPH
85th Percentile :	49 MPH
95th Percentile :	53 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	5966
Percent in Pace :	73.1%
Number of Vehicles > 45 MPH :	3450
Percent of Vehicles > 45 MPH :	42.3%
Mean Speed(Average) :	43 MPH

PRECISION
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81676L-A Speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	Ave. Speed
09/10/ 08	1	0	0	0	0	2	8	23	19	5	1	0	0	59	48
01:00	0	0	0	0	0	1	9	17	11	5	1	0	1	45	49
02:00	0	0	0	0	0	1	8	6	1	2	1	0	0	19	46
03:00	0	0	0	0	0	1	3	7	2	3	0	0	0	16	48
04:00	0	0	0	0	0	3	4	10	7	4	0	1	0	29	48
05:00	8	0	0	0	0	0	17	36	21	7	2	1	0	92	45
06:00	9	0	0	0	0	6	44	90	51	9	2	0	0	211	46
07:00	35	0	0	5	9	20	79	134	61	8	1	0	0	352	42
08:00	19	0	0	0	0	20	141	151	32	3	0	0	0	366	43
09:00	11	0	0	0	7	33	116	156	47	1	0	0	0	371	44
10:00	12	0	0	0	0	19	113	152	41	9	2	0	0	348	44
11:00	13	0	0	2	5	23	142	180	63	10	0	0	0	438	44
12 PM	22	0	0	0	3	20	167	238	60	10	1	2	0	523	44
13:00	20	0	0	0	8	51	144	182	57	4	4	0	0	470	43
14:00	35	0	0	0	0	37	176	245	81	3	1	0	0	578	43
15:00	32	0	0	3	3	45	273	312	90	4	0	0	0	762	43
16:00	50	0	0	0	6	46	295	414	109	9	1	0	0	930	43
17:00	33	0	0	0	3	68	291	417	128	17	2	0	0	959	44
18:00	33	0	1	0	0	24	226	301	107	17	1	0	0	710	44
19:00	12	0	0	0	0	21	119	183	87	12	4	0	0	438	45
20:00	7	0	0	0	0	6	51	132	99	18	4	0	0	317	47
21:00	2	0	0	0	0	4	48	101	70	10	2	2	0	239	48
22:00	0	0	0	0	0	10	21	48	67	18	4	0	0	168	49
23:00	0	0	0	0	0	0	18	47	48	10	3	1	1	128	50
Total	354	0	1	10	44	461	2513	3582	1359	198	37	7	2	8568	
Percent	4.1%	0.0%	0.0%	0.1%	0.5%	5.4%	29.3%	41.8%	15.9%	2.3%	0.4%	0.1%	0.0%		

%ile Speed

15th Percentile :	40 MPH
50th Percentile :	46 MPH
85th Percentile :	51 MPH
95th Percentile :	54 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	6095
Percent in Pace :	71.1%
Number of Vehicles > 45 MPH :	4468
Percent of Vehicles > 45 MPH :	52.1%
Mean Speed(Average) :	44 MPH

PRECISION
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Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	35	3	2	0	1	0	1	3	0	0	0	0	45
01:00	0	37	10	0	2	0	0	0	4	0	0	0	0	53
02:00	0	19	4	0	4	1	0	1	0	0	1	0	0	30
03:00	0	28	9	0	4	2	0	1	4	0	0	0	0	48
04:00	1	85	10	0	6	3	0	2	1	0	0	0	0	108
05:00	3	263	66	2	4	3	0	3	3	0	2	1	0	350
06:00	3	591	131	2	12	3	0	6	3	1	0	0	0	752
07:00	0	871	127	9	15	5	0	5	7	0	0	1	0	1040
08:00	6	762	106	2	9	6	0	3	7	1	0	0	0	902
09:00	1	420	59	2	13	4	1	1	4	0	0	0	0	505
10:00	0	312	53	2	15	6	0	3	5	0	0	0	0	396
11:00	6	271	52	3	15	10	0	5	8	1	1	0	0	372
12 PM	1	347	57	3	14	6	0	2	7	0	0	0	1	438
13:00	2	328	60	3	8	7	0	2	6	0	0	0	0	416
14:00	2	377	68	5	11	6	0	5	10	0	1	0	0	485
15:00	1	322	50	5	14	6	0	6	7	0	0	0	0	411
16:00	4	410	45	2	3	2	0	7	2	0	0	0	0	475
17:00	4	397	45	5	7	2	0	4	2	0	0	0	0	466
18:00	3	299	34	3	5	1	0	2	1	0	0	0	0	348
19:00	1	200	23	0	10	4	0	2	1	0	0	0	0	241
20:00	2	154	28	0	3	1	0	2	0	0	0	0	0	190
21:00	1	135	21	0	1	1	0	2	4	0	0	0	0	165
22:00	0	99	10	0	1	0	0	0	3	0	0	0	0	113
23:00	0	80	11	0	0	1	0	2	2	0	0	0	0	96
Total	41	6842	1082	50	176	81	1	67	94	3	5	2	1	8445
Percent	0.5%	81.0%	12.8%	0.6%	2.1%	1.0%	0.0%	0.8%	1.1%	0.0%	0.1%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	07:00	07:00	11:00	09:00	06:00	11:00	06:00	05:00	05:00		07:00
Vol.	6	871	131	9	15	10	1	6	8	1	2	1		1040
PM Peak	16:00	16:00	14:00	14:00	12:00	13:00		16:00	14:00		14:00		12:00	14:00
Vol.	4	410	68	5	14	7		7	10		1		1	485

PRECISION
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81676L-A Class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	1	34	6	0	1	0	0	2	1	0	0	0	0	45
01:00	0	40	3	0	3	0	0	1	3	0	0	0	0	50
02:00	0	12	1	0	3	0	0	3	2	0	0	0	0	21
03:00	0	19	10	0	2	0	0	0	2	0	2	0	0	35
04:00	1	74	15	0	2	2	0	2	1	0	0	0	0	97
05:00	7	246	74	1	8	2	0	3	6	1	1	0	0	349
06:00	0	621	139	5	22	5	0	10	5	0	0	0	0	807
07:00	8	896	152	7	17	5	2	9	7	0	1	0	0	1104
08:00	2	791	128	3	16	11	0	6	5	0	0	0	0	962
09:00	2	439	66	1	18	7	0	5	2	0	0	0	0	540
10:00	4	334	53	1	13	4	0	2	2	1	0	0	0	414
11:00	4	271	49	2	7	3	0	5	6	0	0	0	0	347
12 PM	5	324	55	1	7	8	0	3	7	1	0	0	0	411
13:00	0	343	62	5	19	6	0	1	6	0	0	0	0	442
14:00	10	394	69	8	7	5	0	8	10	0	0	0	0	511
15:00	8	408	57	5	11	6	1	5	5	0	0	0	0	506
16:00	3	448	56	7	13	2	0	5	2	1	0	0	0	537
17:00	6	432	49	4	5	0	0	5	2	0	0	0	0	503
18:00	4	325	39	3	5	4	0	6	0	0	0	0	0	386
19:00	4	238	21	1	9	3	0	5	2	0	0	0	0	283
20:00	0	177	32	1	6	2	0	1	1	0	0	0	0	220
21:00	2	143	18	0	1	0	0	2	1	0	0	0	0	167
22:00	1	92	7	1	3	2	0	2	3	0	0	0	0	111
23:00	0	87	5	0	0	0	0	2	2	0	0	0	0	96
Total	72	7188	1166	56	198	77	3	93	83	4	4	0	0	8944
Percent	0.8%	80.4%	13.0%	0.6%	2.2%	0.9%	0.0%	1.0%	0.9%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	06:00	08:00	07:00	06:00	07:00	05:00	03:00			07:00
Vol.	8	896	152	7	22	11	2	10	7	1	2			1104
PM Peak	14:00	16:00	14:00	14:00	13:00	12:00	15:00	14:00	14:00	12:00				16:00
Vol.	10	448	69	8	19	8	1	8	10	1				537

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	48	5	1	2	2	0	1	3	0	0	0	0	63
01:00	0	20	2	1	0	1	0	1	4	0	1	0	0	30
02:00	2	11	3	0	1	1	0	0	5	0	0	0	0	23
03:00	0	20	3	1	2	3	0	1	0	0	0	0	0	30
04:00	0	14	2	0	1	3	0	0	5	0	0	0	0	25
05:00	0	47	21	2	9	5	0	1	2	0	0	0	0	87
06:00	1	146	33	4	6	4	0	6	1	0	0	0	0	201
07:00	3	236	47	2	15	5	0	9	2	0	0	0	0	319
08:00	2	224	43	6	20	8	0	8	3	0	0	1	0	315
09:00	2	263	56	6	20	6	0	4	7	0	0	0	0	364
10:00	2	267	53	8	13	13	0	2	7	0	0	0	0	365
11:00	2	255	65	4	10	9	1	4	3	0	0	0	1	354
12 PM	3	306	59	7	10	8	0	5	8	0	0	0	0	406
13:00	3	369	81	5	27	8	0	3	11	0	0	0	0	507
14:00	1	429	82	2	14	13	0	6	5	0	0	0	0	552
15:00	0	541	118	3	25	6	0	4	8	0	0	0	0	705
16:00	5	777	123	5	18	3	0	1	2	0	0	0	0	934
17:00	4	864	128	3	19	2	0	2	0	0	0	0	0	1022
18:00	6	581	81	5	10	1	0	2	4	0	0	0	0	690
19:00	0	343	63	3	9	0	0	1	0	0	0	0	0	419
20:00	0	245	23	2	3	1	0	1	4	0	0	1	0	280
21:00	0	183	15	0	4	1	0	1	2	0	1	0	0	207
22:00	0	126	17	0	1	1	0	3	1	0	1	1	0	151
23:00	0	93	11	1	2	0	0	4	2	0	0	0	0	113
Total	37	6408	1134	71	241	104	1	70	89	0	3	3	1	8162
Percent	0.5%	78.5%	13.9%	0.9%	3.0%	1.3%	0.0%	0.9%	1.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	10:00	11:00	10:00	08:00	10:00	11:00	07:00	09:00		01:00	08:00	11:00	10:00
Vol.	3	267	65	8	20	13	1	9	7		1	1	1	365
PM Peak	18:00	17:00	17:00	12:00	13:00	14:00		14:00	13:00		21:00	20:00		17:00
Vol.	6	864	128	7	27	13		6	11		1	1		1022

PRECISION
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INDUSTRIES, LLC
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Turnpike Street (Route 138)
north of Dog Track
City, State: Raynham, MA
Client: VHB/J. Quitter

81676L-A Class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	50	3	0	2	0	0	1	3	0	0	0	0	59
01:00	0	33	2	2	0	1	0	1	5	0	1	0	0	45
02:00	0	12	1	0	1	0	0	0	5	0	0	0	0	19
03:00	0	10	1	1	0	2	0	0	2	0	0	0	0	16
04:00	0	18	2	0	2	2	0	0	5	0	0	0	0	29
05:00	1	50	24	1	8	3	0	0	3	2	0	0	0	92
06:00	3	143	43	4	10	4	0	3	1	0	0	0	0	211
07:00	4	262	54	3	12	6	2	7	2	0	0	0	0	352
08:00	1	268	51	5	18	5	0	10	8	0	0	0	0	366
09:00	4	250	71	7	18	9	0	5	6	0	1	0	0	371
10:00	2	263	55	4	14	4	0	3	3	0	0	0	0	348
11:00	6	330	71	3	12	8	0	1	7	0	0	0	0	438
12 PM	2	410	69	2	21	11	1	3	4	0	0	0	0	523
13:00	4	355	74	5	14	5	0	6	7	0	0	0	0	470
14:00	5	458	83	8	11	5	1	3	3	0	1	0	0	578
15:00	4	598	113	4	22	7	0	6	8	0	0	0	0	762
16:00	10	738	147	3	24	3	0	3	2	0	0	0	0	930
17:00	13	787	130	3	14	6	0	4	1	0	0	0	1	959
18:00	5	593	90	3	8	2	0	6	3	0	0	0	0	710
19:00	4	357	60	2	13	0	0	1	1	0	0	0	0	438
20:00	1	262	41	2	4	1	0	1	4	0	1	0	0	317
21:00	1	186	35	3	8	0	0	3	3	0	0	0	0	239
22:00	1	143	18	0	3	0	0	1	1	0	1	0	0	168
23:00	1	100	17	1	1	2	0	3	3	0	0	0	0	128
Total	72	6676	1255	66	240	86	4	71	90	2	5	0	1	8568
Percent	0.8%	77.9%	14.6%	0.8%	2.8%	1.0%	0.0%	0.8%	1.1%	0.0%	0.1%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	09:00	08:00	09:00	07:00	08:00	08:00	05:00	01:00			11:00
Vol.	6	330	71	7	18	9	2	10	8	2	1			438
PM Peak	17:00	17:00	16:00	14:00	16:00	12:00	12:00	13:00	15:00		14:00		17:00	17:00
Vol.	13	787	147	8	24	11	1	6	8		1		1	959

PRECISION DATA INDUSTRIES, LLC
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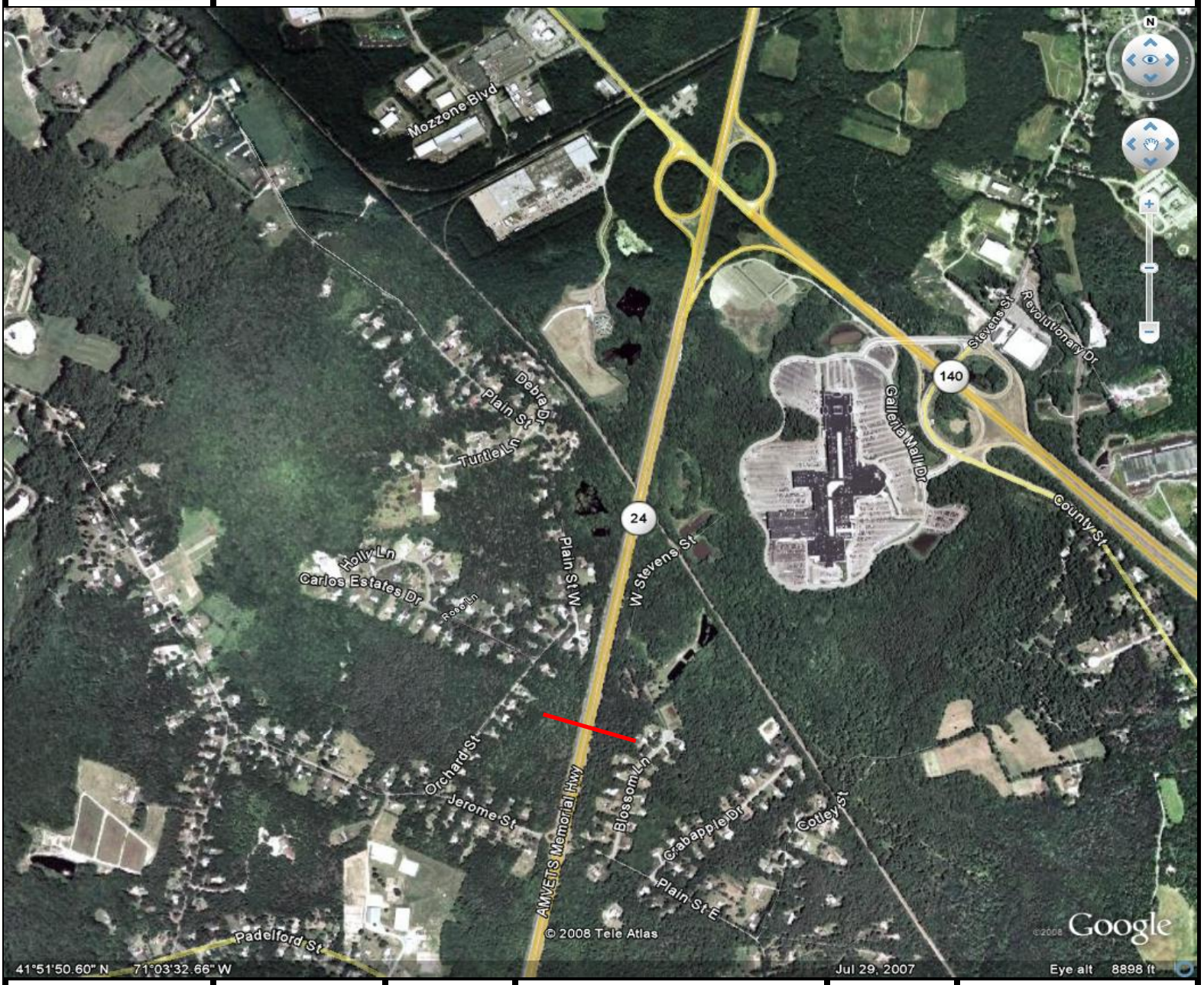
Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Wed 10/8/08 thru Fri 10/10/08	81676 Q	Freetown, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/15/08 thru Thur 10/16/08	81676	Berkley, MA

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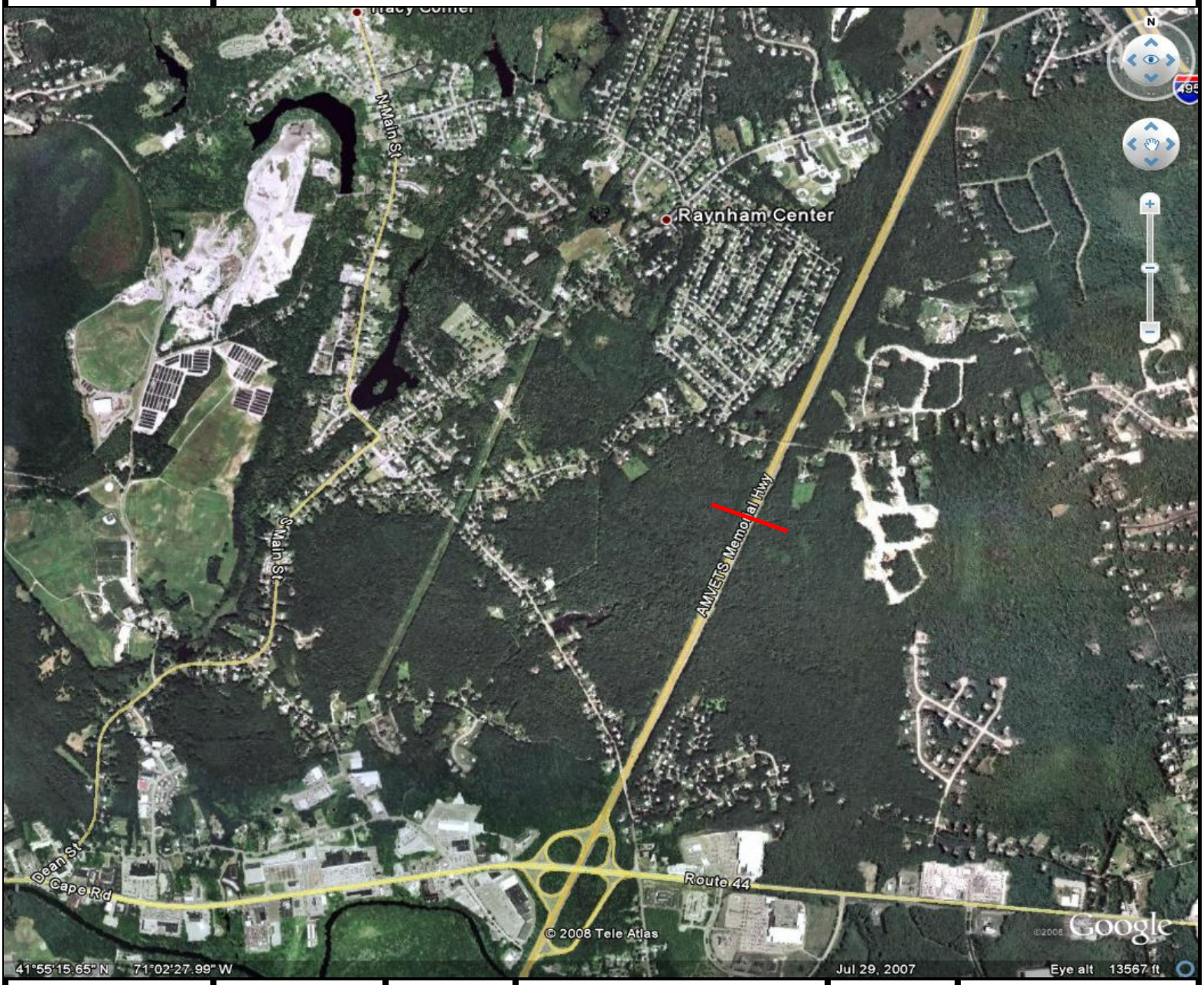
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

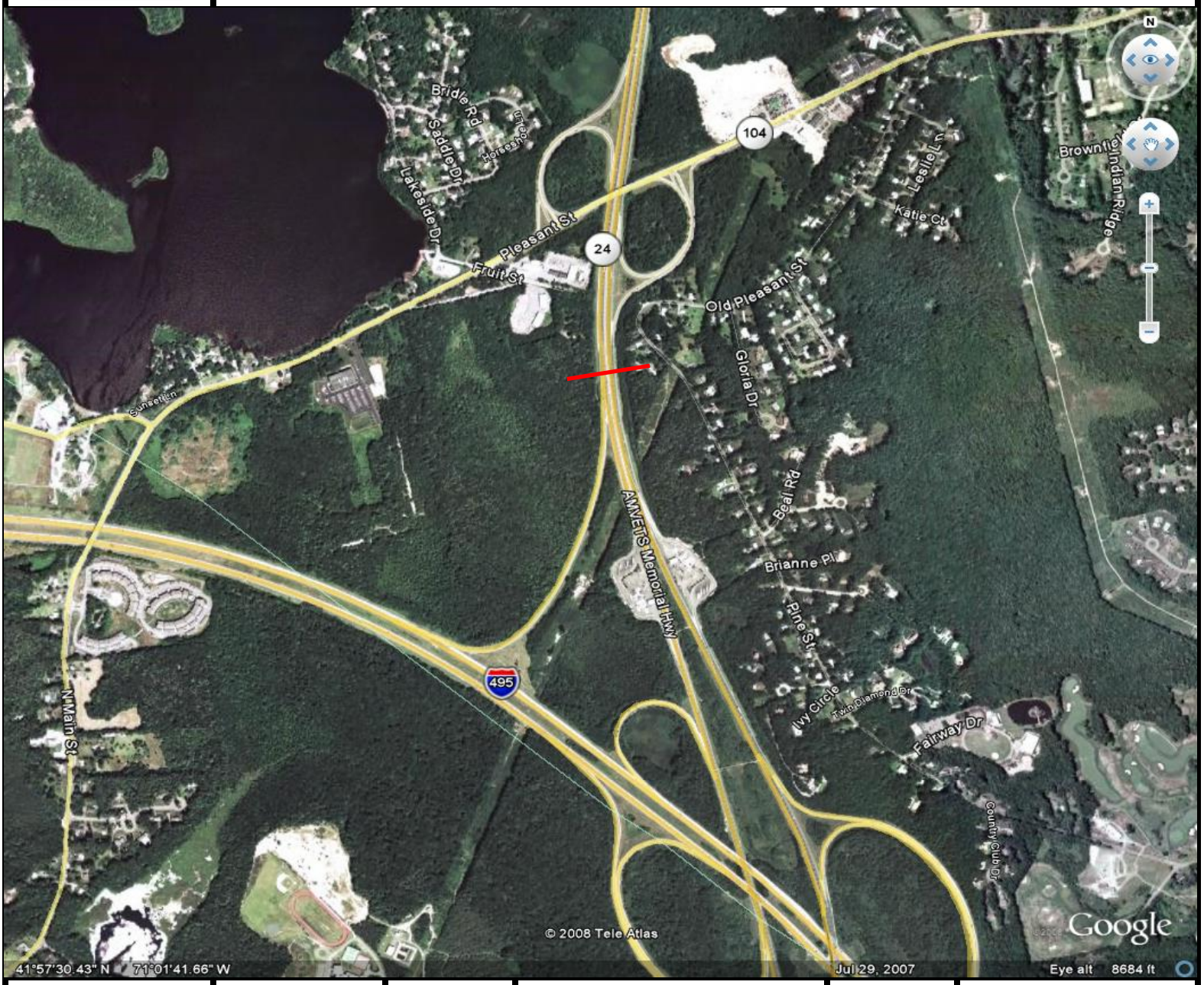
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/15/08 thru Thur 10/16/08	81676	Raynham, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/22 thru Thurs 10/23/08	81676	Bridgewater, MA

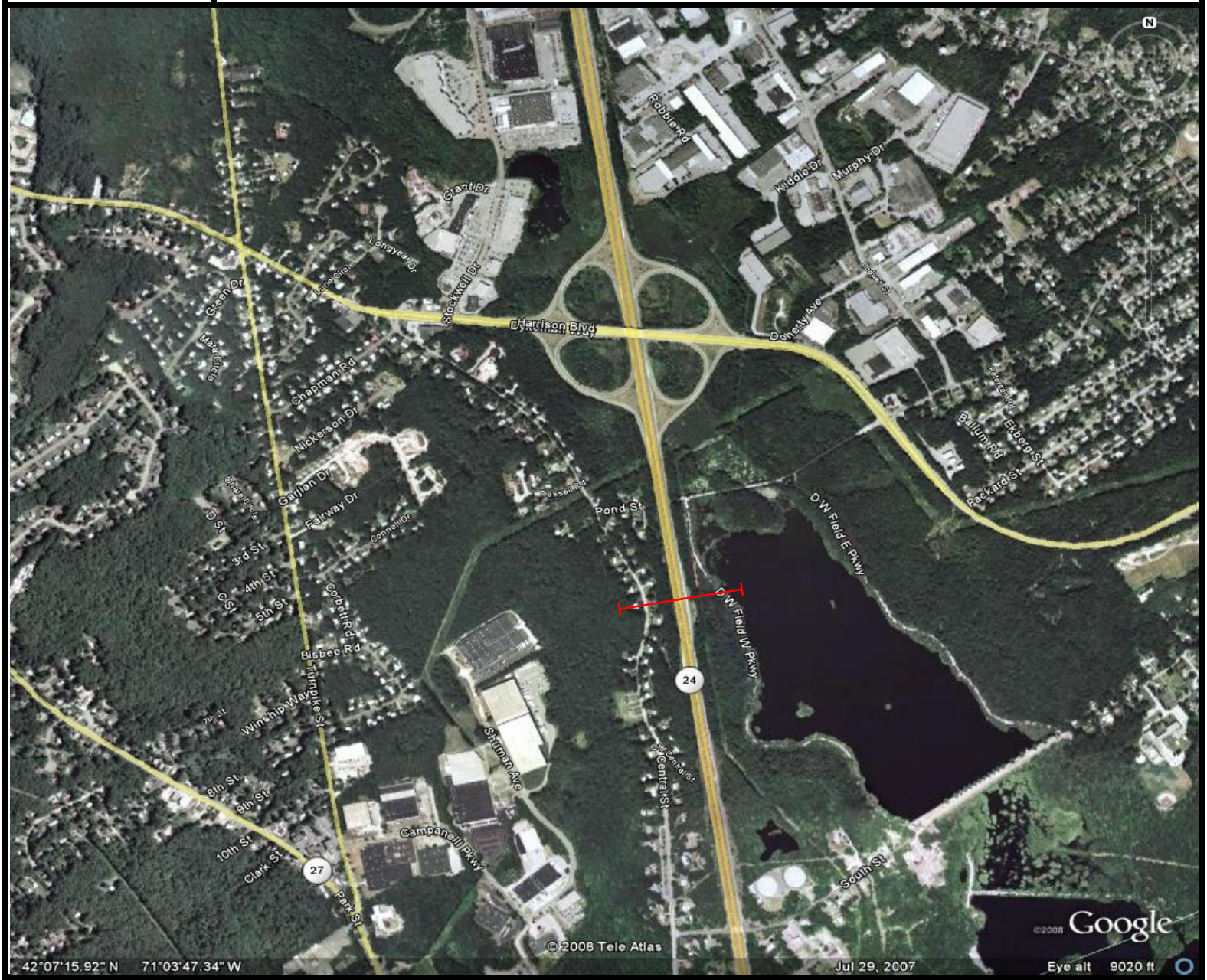
PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/22 thru Thurs 10/23/08	81676	Brockton,MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	N. Raveendran	10111.31	Wed 11/5 thru Thurs 11/6/08	81676	Avon, MA

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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	N. Raveendran	10111.31	Wed 11/5 thru Thurs 11/6/08	81676	Randolph, MA

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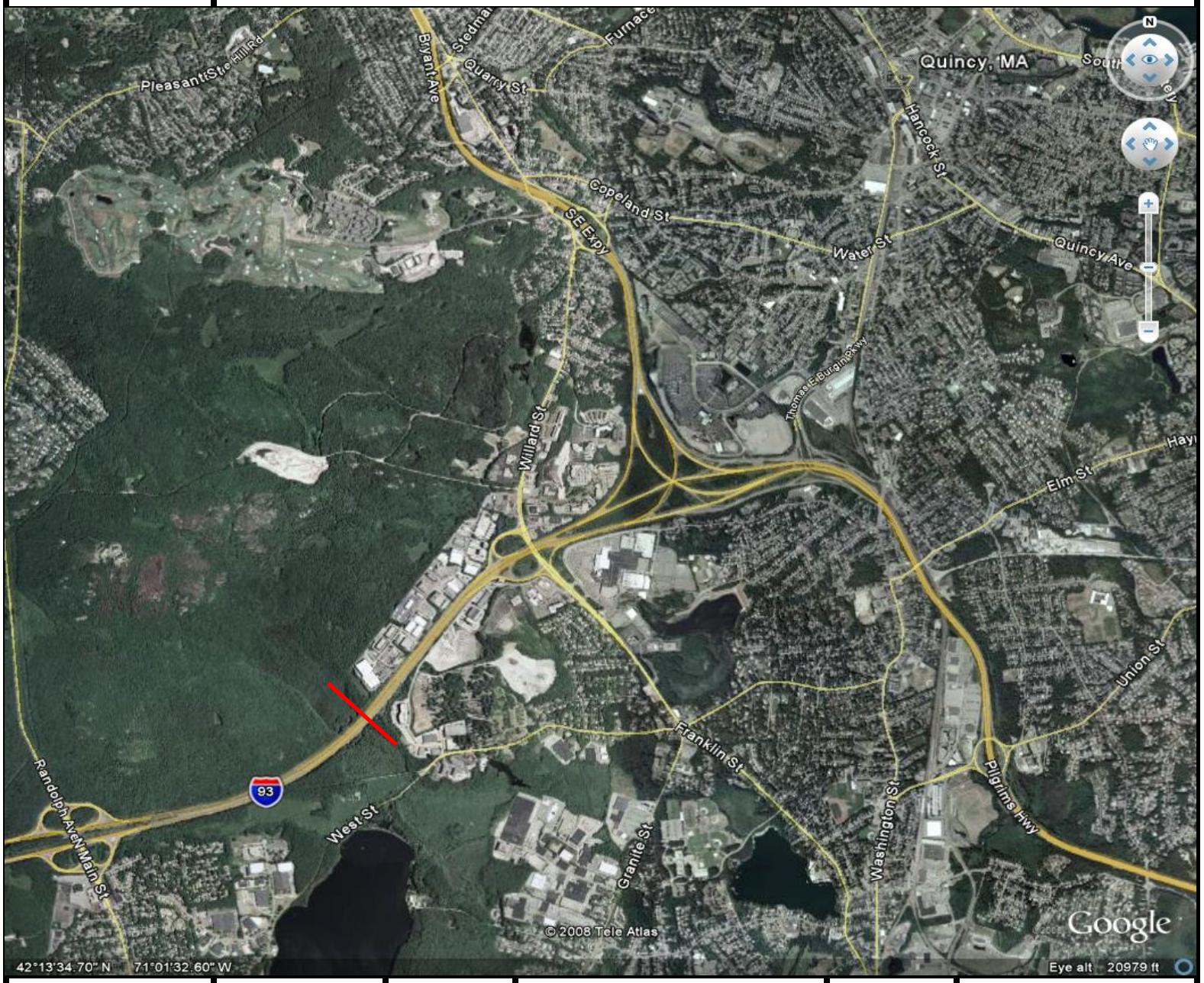
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

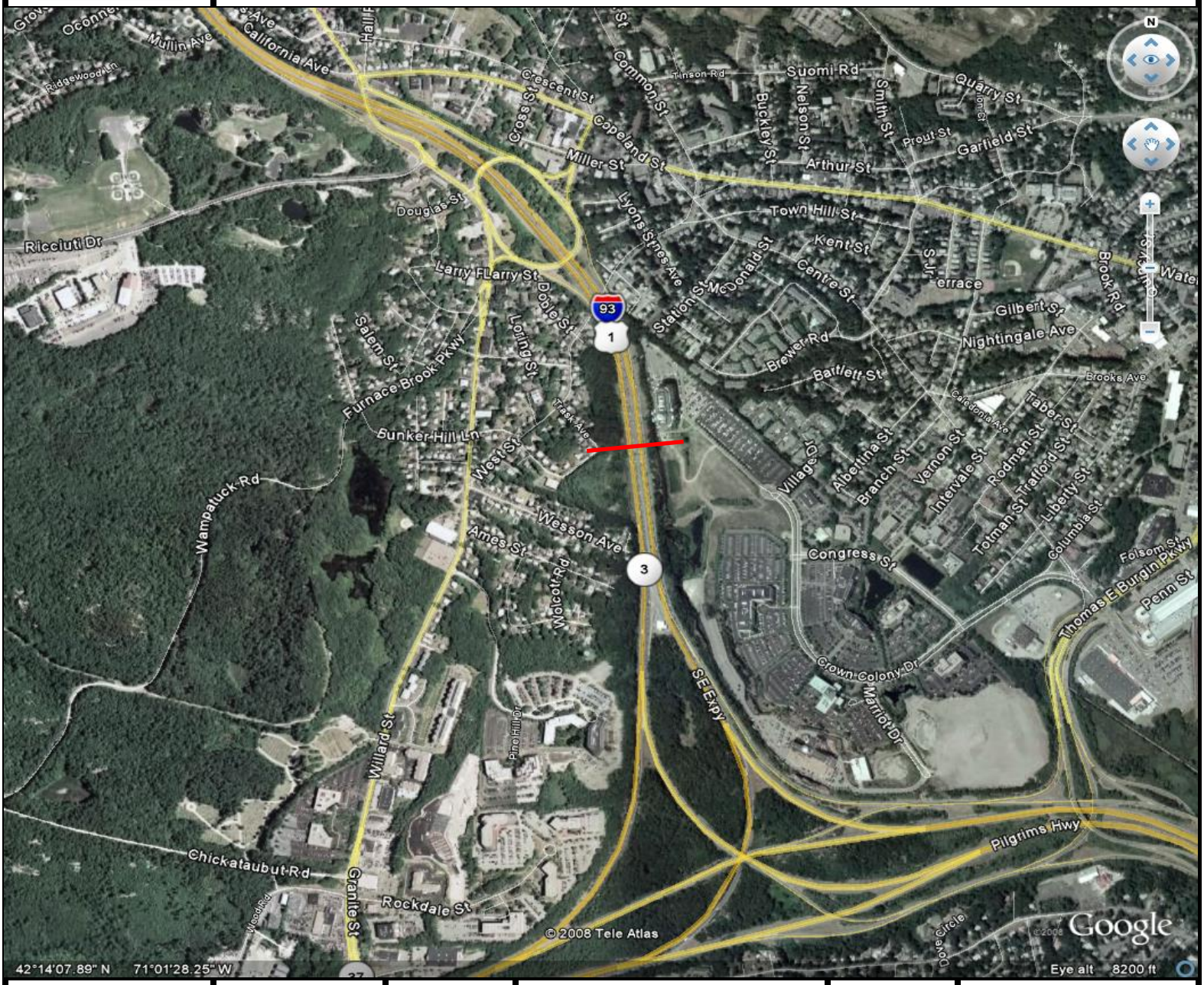
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Tues 10/28/08 thru Wed 10/29/08	81676	Braintree, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

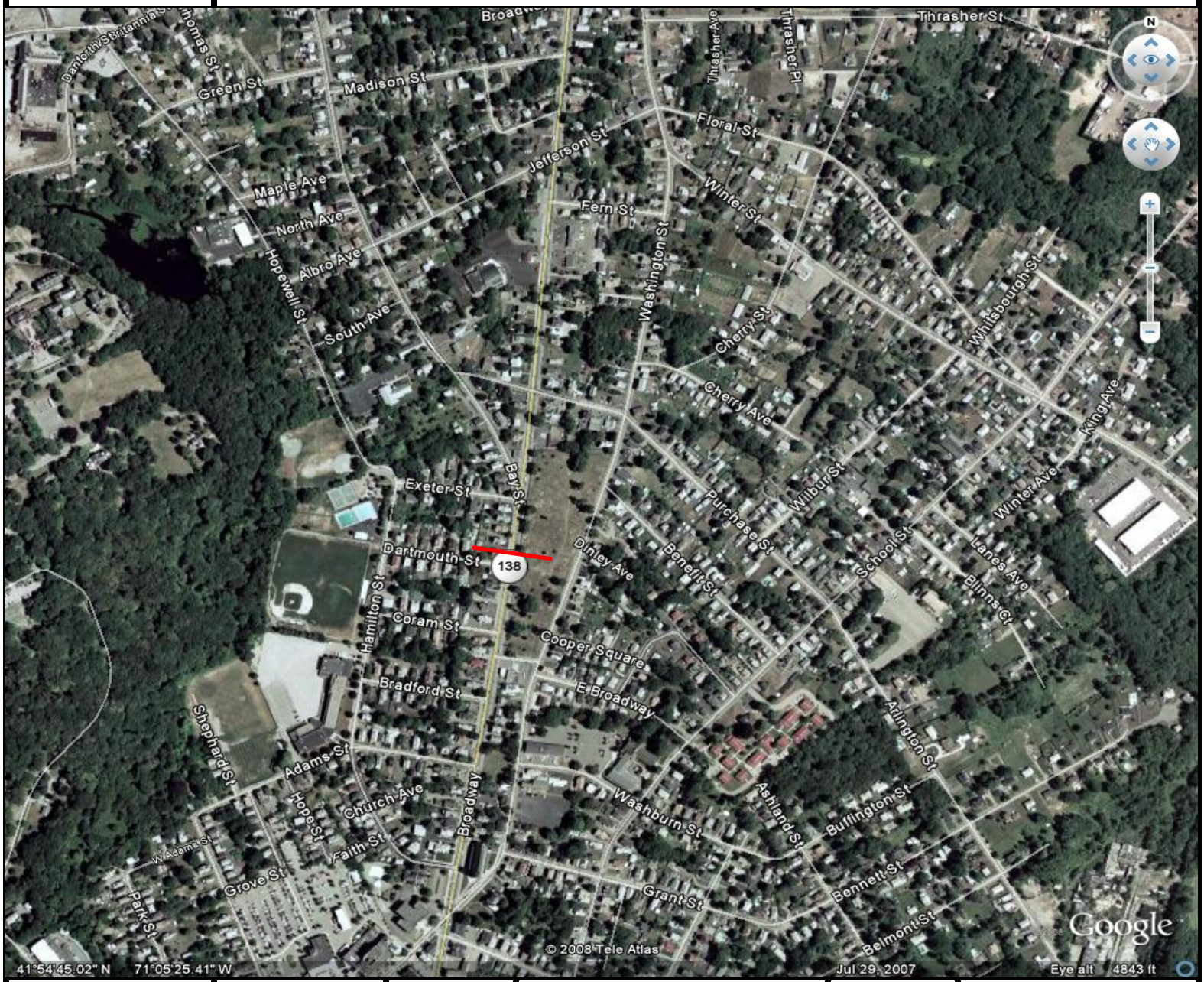
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Tues 10/28/08 thru Wed 10/29/08	81676	Quincy, MA

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/16/08 thru Wed 9/17/08	81676	Taunton, MA

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C volume
Site Code: 10111.31

Start	NB				SB				Combined				16-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	16		151		28		162		44		313		
12:15	17		149		24		154		41		303		
12:30	22		128		21		149		43		277		
12:45	6	61	159	587	14	87	169	634	20	148	328	1221	
01:00	8		158		18		160		26		318		
01:15	13		144		21		148		34		292		
01:30	8		158		16		168		24		326		
01:45	12	41	149	609	9	64	187	663	21	105	336	1272	
02:00	7		172		7		162		14		334		
02:15	7		137		13		197		20		334		
02:30	16		144		14		209		30		353		
02:45	6	36	115	568	11	45	195	763	17	81	310	1331	
03:00	4		154		8		189		12		343		
03:15	12		172		7		197		19		369		
03:30	19		156		13		201		32		357		
03:45	11	46	145	627	1	29	222	809	12	75	367	1436	
04:00	11		175		7		225		18		400		
04:15	19		165		9		218		28		383		
04:30	28		180		15		221		43		401		
04:45	25	83	176	696	17	48	211	875	42	131	387	1571	
05:00	57		170		21		234		78		404		
05:15	77		127		40		239		117		366		
05:30	105		120		28		236		133		356		
05:45	117	356	125	542	44	133	222	931	161	489	347	1473	
06:00	133		138		61		192		194		330		
06:15	176		135		71		191		247		326		
06:30	149		131		104		157		253		288		
06:45	156	614	117	521	105	341	168	708	261	955	285	1229	
07:00	166		125		104		157		270		282		
07:15	165		120		158		137		323		257		
07:30	208		102		175		127		383		229		
07:45	168	707	88	435	160	597	117	538	328	1304	205	973	
08:00	148		84		159		111		307		195		
08:15	132		89		175		96		307		185		
08:30	156		75		185		109		341		184		
08:45	144	580	66	314	216	735	77	393	360	1315	143	707	
09:00	158		79		152		89		310		168		
09:15	133		63		141		64		274		127		
09:30	139		59		155		79		294		138		
09:45	121	551	60	261	163	611	69	301	284	1162	129	562	
10:00	119		40		153		68		272		108		
10:15	144		50		158		50		302		100		
10:30	134		42		151		48		285		90		
10:45	149	546	42	174	160	622	54	220	309	1168	96	394	
11:00	135		32		179		49		314		81		
11:15	129		38		159		41		288		79		
11:30	163		29		170		33		333		62		
11:45	140	567	22	121	137	645	19	142	277	1212	41	263	
Total	4188		5455		3957		6977		8145		12432		
Percent	51.4%		43.9%		48.6%		56.1%						
Day Total		9643				10934				20577			
Peak	07:00		04:00		08:00		05:00		07:15		04:15		
Vol.	707		696		735		931		1341		1575		
P.H.F.	0.850		0.967		0.851		0.974		0.875		0.975		

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C volume
Site Code: 10111.31

Start	NB				SB				Combined				17-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	20		156		33		138		53		294		
12:15	20		134		29		160		49		294		
12:30	18		143		27		148		45		291		
12:45	11	69	154	587	18	107	171	617	29	176	325	1204	
01:00	15		152		13		143		28		295		
01:15	11		155		17		173		28		328		
01:30	8		139		15		171		23		310		
01:45	10	44	135	581	10	55	184	671	20	99	319	1252	
02:00	10		169		6		175		16		344		
02:15	9		154		13		175		22		329		
02:30	8		159		8		193		16		352		
02:45	5	32	145	627	10	37	211	754	15	69	356	1381	
03:00	6		156		5		184		11		340		
03:15	8		172		5		179		13		351		
03:30	13		172		7		200		20		372		
03:45	10	37	151	651	10	27	225	788	20	64	376	1439	
04:00	14		181		7		217		21		398		
04:15	21		150		10		220		31		370		
04:30	34		187		24		216		58		403		
04:45	29	98	165	683	18	59	228	881	47	157	393	1564	
05:00	42		148		17		236		59		384		
05:15	73		141		31		241		104		382		
05:30	135		131		45		226		180		357		
05:45	107	357	152	572	51	144	240	943	158	501	392	1515	
06:00	109		155		53		179		162		334		
06:15	152		150		72		181		224		331		
06:30	186		116		85		157		271		273		
06:45	170	617	109	530	108	318	171	688	278	935	280	1218	
07:00	160		134		115		171		275		305		
07:15	151		104		192		145		343		249		
07:30	188		119		165		142		353		261		
07:45	164	663	105	462	165	637	118	576	329	1300	223	1038	
08:00	170		97		156		107		326		204		
08:15	153		89		165		107		318		196		
08:30	157		87		180		109		337		196		
08:45	165	645	81	354	196	697	89	412	361	1342	170	766	
09:00	134		70		162		95		296		165		
09:15	120		60		148		92		268		152		
09:30	108		74		164		76		272		150		
09:45	112	474	57	261	147	621	79	342	259	1095	136	603	
10:00	159		56		133		62		292		118		
10:15	138		63		150		57		288		120		
10:30	148		42		144		49		292		91		
10:45	132	577	36	197	153	580	56	224	285	1157	92	421	
11:00	129		34		156		52		285		86		
11:15	124		25		150		38		274		63		
11:30	152		34		152		31		304		65		
11:45	145	550	27	120	162	620	29	150	307	1170	56	270	
Total	4163		5625		3902		7046		8065		12671		
Percent	51.6%		44.4%		48.4%		55.6%						
Day Total			9788				10948				20736		
Peak	07:30		04:00		08:15		05:00		07:15		04:00		
Vol.	675		683		703		943		1351		1564		
P.H.F.	0.898		0.913		0.897		0.978		0.957		0.970		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	4	18	22	13	2	1	0	0	**1**	0	61	42	37
01:00	0	0	0	3	13	15	8	1	1	0	0	0	0	41	41	36
02:00	0	0	0	1	8	17	9	1	0	0	0	0	0	36	42	37
03:00	0	0	0	4	13	16	6	7	0	0	0	0	0	46	44	37
04:00	1	0	1	0	12	30	29	8	**2**	0	0	0	0	83	44	39
05:00	0	0	0	8	89	164	**85**	9	1	0	0	0	0	356	42	37
06:00	0	1	1	24	204	**284**	85	**14**	1	0	0	0	0	614	40	36
07:00	**6**	**9**	**24**	**149**	291	200	24	4	0	0	0	0	0	**707**	38	32
08:00	4	4	20	127	281	120	21	3	0	0	0	0	0	580	37	32
09:00	0	1	7	90	269	153	30	1	0	0	0	0	0	551	38	33
10:00	2	2	18	99	261	143	21	0	0	0	0	0	0	546	37	32
11:00	0	0	7	72	**297**	162	26	1	1	**1**	0	0	0	567	38	33
12 PM	1	3	7	97	264	**180**	31	4	0	0	0	0	0	587	38	33
13:00	2	1	4	86	318	166	29	3	0	0	0	0	0	609	38	33
14:00	1	**6**	**21**	129	245	139	25	2	0	0	0	0	0	568	37	32
15:00	2	2	10	149	308	131	22	3	0	0	0	0	0	627	37	32
16:00	0	1	18	**167**	**327**	163	19	1	0	0	0	0	0	**696**	37	32
17:00	**3**	2	14	94	264	136	26	3	0	0	0	0	0	542	38	32
18:00	0	0	3	52	259	173	30	3	**1**	0	0	0	0	521	38	34
19:00	0	1	1	42	204	143	**38**	5	0	1	0	0	0	435	39	34
20:00	0	0	4	20	141	109	38	1	0	1	0	0	0	314	39	35
21:00	1	0	1	14	112	94	31	**6**	0	**2**	0	0	0	261	39	35
22:00	0	0	0	5	61	71	29	6	1	1	0	0	0	174	41	36
23:00	0	0	0	6	28	56	25	5	0	1	0	0	0	121	42	37
Total	23	33	161	1442	4287	2887	700	93	9	7	0	1	0	9643		
%	0.2%	0.3%	1.7%	15.0%	44.5%	29.9%	7.3%	1.0%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	11:00	06:00	05:00	06:00	04:00	11:00		00:00		07:00		
Vol.	6	9	24	149	297	284	85	14	2	1		1		707		
PM Peak	17:00	14:00	14:00	16:00	16:00	12:00	19:00	21:00	18:00	21:00				16:00		
Vol.	3	6	21	167	327	180	38	6	1	2				696		

Pecent

15th Percentile :	29 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	7174
Percent in Pace :	74.4%
Number of Vehicles > 35 MPH :	3119
Percent of Vehicles > 35 MPH :	32.3%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	3	18	34	8	4	1	**1**	0	0	0	69	41	37
01:00	0	1	1	7	11	12	7	4	1	0	0	0	0	44	42	35
02:00	1	0	0	0	6	13	8	4	0	0	0	0	0	32	43	37
03:00	0	0	0	1	4	23	5	2	**2**	0	0	0	0	37	42	38
04:00	0	0	1	2	13	41	27	11	2	1	0	0	0	98	44	39
05:00	0	0	0	8	55	168	**109**	**15**	2	0	0	0	0	357	43	38
06:00	1	1	3	39	180	**280**	104	8	1	0	0	0	0	617	40	36
07:00	**12**	**7**	**22**	76	276	236	27	6	1	0	0	0	0	**663**	38	33
08:00	0	3	1	53	**289**	228	65	6	0	0	0	0	0	645	39	34
09:00	0	1	0	35	206	184	42	6	0	0	0	0	0	474	39	35
10:00	2	0	1	70	271	191	39	3	0	0	0	0	0	577	38	34
11:00	2	3	6	**81**	272	164	21	0	1	0	0	0	0	550	38	33
12 PM	2	1	6	107	288	157	22	3	**1**	0	0	0	0	587	37	33
13:00	1	0	13	63	279	**188**	35	2	0	0	0	0	0	581	38	33
14:00	**5**	7	18	**138**	277	160	20	2	0	0	0	0	0	627	37	32
15:00	3	**9**	**26**	120	315	157	17	4	0	0	0	0	0	651	37	32
16:00	1	0	6	106	**363**	184	21	2	0	0	0	0	0	**683**	37	33
17:00	0	2	17	95	284	150	23	1	0	0	0	0	0	572	37	33
18:00	1	3	8	79	288	129	20	1	1	0	0	0	0	530	37	33
19:00	0	0	0	57	241	132	30	2	0	0	0	0	0	462	38	34
20:00	1	1	3	34	138	139	33	4	1	0	0	0	0	354	39	34
21:00	0	0	3	10	106	109	31	2	0	0	0	0	0	261	39	35
22:00	0	2	0	16	69	73	32	4	1	0	0	0	0	197	40	35
23:00	0	0	0	7	22	48	**37**	**5**	1	0	0	0	0	120	43	38
Total	32	41	135	1207	4271	3200	783	101	16	2	0	0	0	9788		
%	0.3%	0.4%	1.4%	12.3%	43.6%	32.7%	8.0%	1.0%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	11:00	08:00	06:00	05:00	05:00	03:00	00:00				07:00		
Vol.	12	7	22	81	289	280	109	15	2	1				663		
PM Peak	14:00	15:00	15:00	14:00	16:00	13:00	23:00	23:00	12:00					16:00		
Vol.	5	9	26	138	363	188	37	5	1					683		

Pecent

15th Percentile :	30 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	7471
Percent in Pace :	76.3%
Number of Vehicles > 35 MPH :	3462
Percent of Vehicles > 35 MPH :	35.4%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	2	8	25	37	13	1	0	0	**1**	0	0	87	40	35
01:00	0	0	5	6	21	22	8	**2**	0	0	0	0	0	64	39	34
02:00	0	0	1	18	12	9	5	0	0	0	0	0	0	45	38	32
03:00	0	0	0	4	14	9	2	0	0	0	0	0	0	29	38	33
04:00	0	0	2	9	16	14	5	2	0	0	0	0	0	48	39	34
05:00	0	1	4	17	45	52	12	2	0	0	0	0	0	133	39	34
06:00	0	0	14	69	144	**96**	**16**	1	**1**	0	0	0	0	341	38	33
07:00	**31**	13	91	198	195	59	10	0	0	0	0	0	0	597	34	28
08:00	15	**48**	**211**	**294**	141	24	2	0	0	0	0	0	0	**735**	31	26
09:00	12	23	84	247	210	26	9	0	0	0	0	0	0	611	33	28
10:00	2	6	73	281	209	45	5	1	0	0	0	0	0	622	33	29
11:00	2	10	90	243	**242**	51	7	0	0	0	0	0	0	645	34	29
12 PM	3	9	64	255	241	53	7	2	0	0	0	0	0	634	34	29
13:00	9	17	54	253	251	65	13	1	0	0	0	0	0	663	34	29
14:00	19	**22**	**131**	338	213	36	4	0	0	0	0	0	0	763	33	27
15:00	9	6	128	337	281	40	8	0	0	0	0	0	0	809	33	28
16:00	9	6	111	345	**343**	58	2	0	1	0	0	0	0	875	33	29
17:00	**22**	17	85	**421**	321	59	6	0	0	0	0	0	0	**931**	33	28
18:00	12	11	84	254	269	69	8	0	0	**1**	0	0	0	708	34	29
19:00	3	0	27	187	235	74	10	0	1	1	0	0	0	538	35	31
20:00	3	6	19	89	164	**95**	16	1	0	0	0	0	0	393	37	32
21:00	1	1	8	57	130	76	**21**	4	**3**	0	0	0	0	301	38	33
22:00	1	0	5	32	83	76	18	3	1	0	0	**1**	0	220	39	34
23:00	0	0	5	15	53	53	11	**5**	0	0	0	0	0	142	39	34
Total	153	196	1298	3977	3858	1198	218	25	7	2	1	1	0	10934		
%	1.4%	1.8%	11.9%	36.4%	35.3%	11.0%	2.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	11:00	06:00	06:00	01:00	06:00		00:00			08:00		
Vol.	31	48	211	294	242	96	16	2	1		1			735		
PM Peak	17:00	14:00	14:00	17:00	16:00	20:00	21:00	23:00	21:00	18:00		22:00		17:00		
Vol.	22	22	131	421	343	95	21	5	3	1		1		931		

Pecent

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	7835
Percent in Pace :	71.7%
Number of Vehicles > 35 MPH :	1212
Percent of Vehicles > 35 MPH :	11.1%
Mean Speed(Average) :	29 MPH

PRECISION
D A T A
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Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	3	1	3	14	34	39	11	1	**1**	0	0	0	0	107	39	33
01:00	2	0	1	10	23	14	3	2	0	0	0	0	0	55	38	32
02:00	0	0	0	6	10	15	3	3	0	0	0	0	0	37	39	35
03:00	0	0	0	2	8	12	4	1	0	0	0	0	0	27	40	36
04:00	0	0	6	4	11	25	11	2	0	0	0	0	0	59	41	35
05:00	0	1	4	18	40	62	13	**5**	0	0	**1**	0	0	144	39	35
06:00	0	2	6	60	120	107	**22**	1	0	0	0	0	0	318	38	33
07:00	**47**	9	**89**	160	248	76	7	1	0	0	0	0	0	637	34	28
08:00	2	2	61	182	**290**	**141**	16	3	0	0	0	0	0	**697**	36	31
09:00	1	**16**	60	189	269	74	9	3	0	0	0	0	0	621	34	30
10:00	2	1	49	191	260	70	6	1	0	0	0	0	0	580	34	30
11:00	3	7	49	**208**	279	63	7	3	1	0	0	0	0	620	34	30
12 PM	6	3	28	220	284	66	8	2	0	0	0	0	0	617	34	30
13:00	8	9	60	270	249	64	10	1	0	0	0	0	0	671	34	29
14:00	14	31	103	314	253	37	2	0	0	0	0	0	0	754	33	28
15:00	**46**	**49**	145	305	194	41	7	1	0	0	0	0	0	788	33	26
16:00	12	21	121	327	**334**	60	6	0	0	0	0	0	0	881	33	29
17:00	30	47	**161**	**374**	269	53	6	3	0	0	0	0	0	**943**	33	27
18:00	5	9	61	265	276	63	7	1	**1**	0	0	0	0	688	34	29
19:00	7	2	47	232	231	49	8	0	0	0	0	0	0	576	34	29
20:00	0	1	16	90	178	**97**	**26**	4	0	0	0	0	0	412	38	32
21:00	2	2	13	83	141	83	15	3	0	0	0	0	0	342	37	32
22:00	3	0	4	48	71	72	20	**6**	0	0	0	0	0	224	39	33
23:00	0	1	3	22	42	59	20	2	0	**1**	0	0	0	150	39	35
Total	193	214	1090	3594	4114	1442	247	49	3	1	1	0	0	10948		
%	1.8%	2.0%	10.0%	32.8%	37.6%	13.2%	2.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	07:00	11:00	08:00	08:00	06:00	05:00	00:00		05:00			08:00		
Vol.	47	16	89	208	290	141	22	5	1		1			697		
PM Peak	15:00	15:00	17:00	17:00	16:00	20:00	20:00	22:00	18:00	23:00				17:00		
Vol.	46	49	161	374	334	97	26	6	1	1				943		

Pecent

15th Percentile : 25 MPH
50th Percentile : 30 MPH
85th Percentile : 35 MPH
95th Percentile : 39 MPH

Stats

10 MPH Pace Speed : 25-34 MPH
Number in Pace : 7708
Percent in Pace : 70.4%
Number of Vehicles > 35 MPH : 1454
Percent of Vehicles > 35 MPH : 13.3%
Mean Speed(Average) : 30 MPH

PRECISION
D A T A
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Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	0	49	9	0	3	0	0	0	0	0	0	0	0	61
01:00	0	30	10	0	1	0	0	0	0	0	0	0	0	41
02:00	0	28	7	0	1	0	0	0	0	0	0	0	0	36
03:00	0	32	7	0	6	0	0	1	0	0	0	0	0	46
04:00	2	51	27	0	2	1	0	0	0	0	0	0	0	83
05:00	5	267	70	3	10	1	0	0	0	0	0	0	0	356
06:00	5	460	120	6	15	4	0	3	1	0	0	0	0	614
07:00	2	565	103	6	18	5	0	5	2	1	0	0	0	707
08:00	3	467	79	7	16	2	0	4	2	0	0	0	0	580
09:00	2	444	85	3	7	5	0	3	2	0	0	0	0	551
10:00	1	422	99	3	15	1	0	4	1	0	0	0	0	546
11:00	3	459	73	3	19	2	0	5	3	0	0	0	0	567
12 PM	4	481	79	1	14	1	0	5	2	0	0	0	0	587
13:00	4	505	66	2	21	4	0	6	1	0	0	0	0	609
14:00	4	447	90	3	17	0	0	4	2	1	0	0	0	568
15:00	3	505	94	10	12	1	0	1	1	0	0	0	0	627
16:00	2	581	100	2	8	1	0	2	0	0	0	0	0	696
17:00	6	474	51	2	8	1	0	0	0	0	0	0	0	542
18:00	3	447	60	0	10	0	0	1	0	0	0	0	0	521
19:00	6	383	36	1	7	0	0	1	0	1	0	0	0	435
20:00	3	265	39	0	6	0	0	1	0	0	0	0	0	314
21:00	1	231	25	0	4	0	0	0	0	0	0	0	0	261
22:00	3	144	23	0	2	0	0	2	0	0	0	0	0	174
23:00	1	101	15	0	3	0	0	1	0	0	0	0	0	121
Total	63	7838	1367	52	225	29	0	49	17	3	0	0	0	9643
Percent	0.7%	81.3%	14.2%	0.5%	2.3%	0.3%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	06:00	08:00	11:00	07:00		07:00	11:00	07:00				07:00
Vol.	5	565	120	7	19	5		5	3	1				707
PM Peak	17:00	16:00	16:00	15:00	13:00	13:00		13:00	12:00	14:00				16:00
Vol.	6	581	100	10	21	4		6	2	1				696

PRECISION
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Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	1	60	5	0	3	0	0	0	0	0	0	0	0	69
01:00	0	37	4	0	3	0	0	0	0	0	0	0	0	44
02:00	0	23	6	0	3	0	0	0	0	0	0	0	0	32
03:00	0	26	9	0	2	0	0	0	0	0	0	0	0	37
04:00	3	65	26	0	2	1	0	0	1	0	0	0	0	98
05:00	2	264	76	2	11	1	0	0	1	0	0	0	0	357
06:00	5	456	130	4	18	0	0	1	3	0	0	0	0	617
07:00	5	526	103	9	14	1	0	3	1	1	0	0	0	663
08:00	4	499	102	6	27	6	0	1	0	0	0	0	0	645
09:00	2	377	71	4	16	3	0	1	0	0	0	0	0	474
10:00	2	460	83	4	21	4	0	1	1	1	0	0	0	577
11:00	4	463	55	4	20	0	0	4	0	0	0	0	0	550
12 PM	4	483	70	9	16	4	0	1	0	0	0	0	0	587
13:00	7	457	84	1	25	4	0	1	2	0	0	0	0	581
14:00	1	496	93	4	21	4	0	5	2	0	0	1	0	627
15:00	1	531	94	9	15	0	0	1	0	0	0	0	0	651
16:00	3	571	81	1	19	2	0	6	0	0	0	0	0	683
17:00	7	486	64	3	10	0	0	1	1	0	0	0	0	572
18:00	11	445	62	1	9	1	0	0	1	0	0	0	0	530
19:00	4	401	49	0	6	2	0	0	0	0	0	0	0	462
20:00	11	301	35	0	4	1	0	1	1	0	0	0	0	354
21:00	3	228	28	0	2	0	0	0	0	0	0	0	0	261
22:00	4	167	26	0	0	0	0	0	0	0	0	0	0	197
23:00	1	104	15	0	0	0	0	0	0	0	0	0	0	120
Total	85	7926	1371	61	267	34	0	27	14	2	0	1	0	9788
Percent	0.9%	81.0%	14.0%	0.6%	2.7%	0.3%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	06:00	07:00	08:00	08:00		11:00	06:00	07:00				07:00
Vol.	5	526	130	9	27	6		4	3	1				663
PM Peak	18:00	16:00	15:00	12:00	13:00	12:00		16:00	13:00			14:00		16:00
Vol.	11	571	94	9	25	4		6	2			1		683

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	1	76	8	0	0	0	0	1	1	0	0	0	0	87
01:00	2	55	5	0	1	1	0	0	0	0	0	0	0	64
02:00	0	42	3	0	0	0	0	0	0	0	0	0	0	45
03:00	0	24	3	0	0	1	0	0	1	0	0	0	0	29
04:00	0	37	7	1	2	0	0	1	0	0	0	0	0	48
05:00	1	105	18	0	7	1	0	0	1	0	0	0	0	133
06:00	2	278	39	3	12	3	0	2	2	0	0	0	0	341
07:00	2	530	44	2	7	6	0	5	1	0	0	0	0	597
08:00	1	658	49	3	16	1	0	4	2	0	0	1	0	735
09:00	4	529	50	2	14	4	0	4	4	0	0	0	0	611
10:00	2	540	57	5	9	3	0	3	3	0	0	0	0	622
11:00	5	557	57	0	11	4	0	5	6	0	0	0	0	645
12 PM	1	561	51	1	11	3	0	4	2	0	0	0	0	634
13:00	1	582	60	0	13	2	0	4	1	0	0	0	0	663
14:00	1	678	52	3	16	5	0	4	4	0	0	0	0	763
15:00	2	724	55	2	10	1	0	8	7	0	0	0	0	809
16:00	2	782	72	3	11	2	0	2	1	0	0	0	0	875
17:00	8	826	84	2	9	0	0	2	0	0	0	0	0	931
18:00	5	647	43	4	7	0	0	2	0	0	0	0	0	708
19:00	5	490	38	2	2	0	0	1	0	0	0	0	0	538
20:00	3	354	30	0	4	1	0	1	0	0	0	0	0	393
21:00	2	277	17	0	3	0	0	2	0	0	0	0	0	301
22:00	1	202	15	1	0	0	0	1	0	0	0	0	0	220
23:00	1	123	14	1	2	0	0	1	0	0	0	0	0	142
Total	52	9677	871	35	167	38	0	57	36	0	0	1	0	10934
Percent	0.5%	88.5%	8.0%	0.3%	1.5%	0.3%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	10:00	10:00	08:00	07:00		07:00	11:00			08:00		08:00
Vol.	5	658	57	5	16	6		5	6			1		735
PM Peak	17:00	17:00	17:00	18:00	14:00	14:00		15:00	15:00					17:00
Vol.	8	826	84	4	16	5		8	7					931

PRECISION
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INDUSTRIES, LLC
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Broadway (Route 138)
south of Bay Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 S-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	1	91	10	1	3	0	0	1	0	0	0	0	0	107
01:00	1	50	3	0	0	1	0	0	0	0	0	0	0	55
02:00	1	29	5	0	2	0	0	0	0	0	0	0	0	37
03:00	0	21	2	0	4	0	0	0	0	0	0	0	0	27
04:00	0	45	9	1	4	0	0	0	0	0	0	0	0	59
05:00	1	113	22	0	5	1	0	2	0	0	0	0	0	144
06:00	0	262	42	2	8	2	0	2	0	0	0	0	0	318
07:00	0	565	49	2	13	6	0	2	0	0	0	0	0	637
08:00	2	602	61	5	16	5	0	6	0	0	0	0	0	697
09:00	4	522	63	5	18	5	1	2	1	0	0	0	0	621
10:00	3	497	53	2	16	3	0	3	3	0	0	0	0	580
11:00	3	517	71	6	11	5	0	3	4	0	0	0	0	620
12 PM	2	552	52	1	7	0	0	2	1	0	0	0	0	617
13:00	8	586	55	0	13	5	0	2	1	1	0	0	0	671
14:00	6	673	63	2	8	0	0	2	0	0	0	0	0	754
15:00	4	680	72	4	19	4	0	4	0	1	0	0	0	788
16:00	8	769	90	2	7	3	0	2	0	0	0	0	0	881
17:00	11	831	84	2	8	1	0	1	2	2	1	0	0	943
18:00	8	624	46	2	8	0	0	0	0	0	0	0	0	688
19:00	5	523	43	3	2	0	0	0	0	0	0	0	0	576
20:00	3	369	38	1	0	1	0	0	0	0	0	0	0	412
21:00	7	307	26	1	0	1	0	0	0	0	0	0	0	342
22:00	1	197	26	0	0	0	0	0	0	0	0	0	0	224
23:00	0	136	11	1	2	0	0	0	0	0	0	0	0	150
Total	79	9561	996	43	174	43	1	34	12	4	1	0	0	10948
Percent	0.7%	87.3%	9.1%	0.4%	1.6%	0.4%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	11:00	11:00	09:00	07:00	09:00	08:00	11:00					08:00
Vol.	4	602	71	6	18	6	1	6	4					697
PM Peak	17:00	17:00	16:00	15:00	15:00	13:00		15:00	17:00	17:00	17:00			17:00
Vol.	11	831	90	4	19	5		4	2	2	1			943

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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Traffic Counts with Precision

Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/16/08 thru Wed 9/17/08	81676	Easton, MA

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 T-C volume
Site Code: 10111.31

Start	SB				NB				Combined				16-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	17		88		23		111		40		199		
12:15	17		113		10		93		27		206		
12:30	12		102		9		101		21		203		
12:45	5	51	109	412	11	53	106	411	16	104	215	823	
01:00	19		123		11		102		30		225		
01:15	10		114		14		110		24		224		
01:30	4		114		20		125		24		239		
01:45	6	39	125	476	10	55	133	470	16	94	258	946	
02:00	5		137		6		116		11		253		
02:15	8		135		7		117		15		252		
02:30	3		150		11		120		14		270		
02:45	5	21	156	578	11	35	125	478	16	56	281	1056	
03:00	5		186		6		104		11		290		
03:15	6		188		8		131		14		319		
03:30	9		217		12		146		21		363		
03:45	6	26	223	814	18	44	86	467	24	70	309	1281	
04:00	8		222		8		120		16		342		
04:15	7		221		26		106		33		327		
04:30	7		238		32		142		39		380		
04:45	12	34	258	939	50	116	140	508	62	150	398	1447	
05:00	15		256		56		126		71		382		
05:15	24		256		72		128		96		384		
05:30	26		276		107		107		133		383		
05:45	20	85	201	989	154	389	104	465	174	474	305	1454	
06:00	38		182		173		107		211		289		
06:15	54		151		185		92		239		243		
06:30	67		162		249		82		316		244		
06:45	54	213	134	629	279	886	96	377	333	1099	230	1006	
07:00	72		120		239		89		311		209		
07:15	84		114		265		79		349		193		
07:30	92		97		282		66		374		163		
07:45	81	329	90	421	288	1074	56	290	369	1403	146	711	
08:00	83		63		221		73		304		136		
08:15	79		73		224		55		303		128		
08:30	83		76		197		36		280		112		
08:45	102	347	58	270	217	859	37	201	319	1206	95	471	
09:00	102		54		138		50		240		104		
09:15	87		52		120		43		207		95		
09:30	86		56		122		37		208		93		
09:45	83	358	38	200	145	525	45	175	228	883	83	375	
10:00	90		52		79		35		169		87		
10:15	87		29		96		32		183		61		
10:30	97		42		102		33		199		75		
10:45	93	367	28	151	88	365	23	123	181	732	51	274	
11:00	86		30		105		20		191		50		
11:15	98		29		92		22		190		51		
11:30	103		20		123		8		226		28		
11:45	100	387	20	99	111	431	12	62	211	818	32	161	
Total	2257		5978		4832		4027		7089		10005		
Percent	31.8%		59.8%		68.2%		40.2%						
Day Total		8235				8859				17094			
Peak	11:00		04:45		07:00		04:30		07:00		04:45		
Vol.	387		1046		1074		536		1403		1547		
P.H.F.	0.939		0.947		0.932		0.944		0.938		0.972		

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 T-C volume
Site Code: 10111.31

Start	SB				NB				Combined				17-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	23		150		20		95		43		245		
12:15	24		165		11		104		35		269		
12:30	13		114		9		93		22		207		
12:45	8	68	109	538	16	56	106	398	24	124	215	936	
01:00	10		126		9		106		19		232		
01:15	17		111		11		113		28		224		
01:30	4		127		29		105		33		232		
01:45	5	36	95	459	9	58	123	447	14	94	218	906	
02:00	13		119		4		110		17		229		
02:15	7		148		4		139		11		287		
02:30	7		165		14		124		21		289		
02:45	3	30	161	593	3	25	129	502	6	55	290	1095	
03:00	4		178		5		120		9		298		
03:15	2		179		9		142		11		321		
03:30	7		220		9		128		16		348		
03:45	4	17	207	784	22	45	158	548	26	62	365	1332	
04:00	6		227		9		149		15		376		
04:15	10		223		18		144		28		367		
04:30	6		263		38		130		44		393		
04:45	7	29	239	952	46	111	151	574	53	140	390	1526	
05:00	17		238		56		130		73		368		
05:15	29		268		72		156		101		424		
05:30	22		257		106		128		128		385		
05:45	30	98	195	958	167	401	115	529	197	499	310	1487	
06:00	42		177		136		120		178		297		
06:15	54		173		181		121		235		294		
06:30	68		147		239		76		307		223		
06:45	72	236	125	622	263	819	72	389	335	1055	197	1011	
07:00	68		155		242		74		310		229		
07:15	89		144		257		70		346		214		
07:30	103		97		280		68		383		165		
07:45	84	344	87	483	268	1047	64	276	352	1391	151	759	
08:00	90		78		233		59		323		137		
08:15	92		92		226		63		318		155		
08:30	73		91		203		62		276		153		
08:45	86	341	75	336	197	859	57	241	283	1200	132	577	
09:00	108		63		124		56		232		119		
09:15	81		54		120		44		201		98		
09:30	87		50		106		52		193		102		
09:45	87	363	52	219	115	465	40	192	202	828	92	411	
10:00	85		61		105		40		190		101		
10:15	95		38		110		36		205		74		
10:30	106		43		116		31		222		74		
10:45	86	372	44	186	103	434	25	132	189	806	69	318	
11:00	111		36		89		19		200		55		
11:15	98		26		112		23		210		49		
11:30	124		22		98		20		222		42		
11:45	106	439	25	109	98	397	20	82	204	836	45	191	
Total	2373		6239		4717		4310		7090		10549		
Percent	33.5%		59.1%		66.5%		40.9%						
Day Total		8612				9027				17639			
Peak	11:00		04:30		07:00		03:45		07:15		04:30		
Vol.	439		1008		1047		581		1404		1575		
P.H.F.	0.885		0.940		0.935		0.919		0.916		0.929		

PRECISION
D A T A
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Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	0	1	5	21	15	8	1	0	0	0	51	50	45
01:00	0	0	0	1	0	6	14	15	2	1	0	0	0	39	48	44
02:00	0	0	0	0	1	4	9	6	1	0	0	0	0	21	47	42
03:00	0	0	0	0	1	6	7	5	6	1	0	0	0	26	51	44
04:00	0	0	0	0	2	9	13	8	1	0	**1**	0	0	34	47	42
05:00	0	0	0	0	1	10	36	30	7	1	0	0	0	85	49	44
06:00	**3**	**2**	2	3	6	31	97	57	10	2	0	0	0	213	48	42
07:00	0	1	**22**	**5**	**17**	61	138	69	**14**	1	1	0	0	329	47	40
08:00	1	2	7	3	17	84	162	64	7	0	0	0	0	347	46	41
09:00	0	0	0	0	15	66	175	90	12	0	0	0	0	358	47	42
10:00	0	0	0	0	16	71	178	86	14	2	0	0	0	367	47	42
11:00	1	1	0	1	11	**89**	**184**	**91**	5	**4**	0	0	0	**387**	47	42
12 PM	0	0	0	5	23	90	202	80	12	0	0	0	0	412	46	41
13:00	0	1	0	2	26	110	224	97	14	2	0	0	0	476	47	42
14:00	1	3	9	12	38	132	227	138	15	2	**1**	0	0	578	47	41
15:00	**6**	**9**	**22**	**18**	**53**	203	349	130	**23**	1	0	0	0	814	46	40
16:00	0	0	0	1	43	226	475	166	23	**5**	0	0	0	939	46	42
17:00	0	0	1	4	39	**272**	**489**	**167**	13	3	0	**1**	0	**989**	46	41
18:00	0	0	2	2	15	159	295	139	14	3	0	0	0	629	47	42
19:00	0	0	0	1	17	115	198	80	8	1	1	0	0	421	46	41
20:00	0	1	0	1	8	47	131	70	9	3	0	0	0	270	47	42
21:00	0	0	0	0	7	35	100	44	12	2	0	0	0	200	48	43
22:00	0	0	0	0	3	25	70	40	11	2	0	0	0	151	48	43
23:00	0	0	0	0	1	10	48	26	9	4	1	0	0	99	49	44
Total	12	20	65	59	361	1866	3842	1713	250	41	5	1	0	8235		
%	0.1%	0.2%	0.8%	0.7%	4.4%	22.7%	46.7%	20.8%	3.0%	0.5%	0.1%	0.0%	0.0%			
AM Peak	06:00	06:00	07:00	07:00	07:00	11:00	11:00	11:00	07:00	11:00	04:00			11:00		
Vol.	3	2	22	5	17	89	184	91	14	4	1			387		
PM Peak	15:00	15:00	15:00	15:00	15:00	17:00	17:00	17:00	15:00	16:00	14:00	17:00		17:00		
Vol.	6	9	22	18	53	272	489	167	23	5	1	1		989		

Pecent

15th Percentile :	36 MPH
50th Percentile :	42 MPH
85th Percentile :	47 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	5708
Percent in Pace :	69.3%
Number of Vehicles > 40 MPH :	5083
Percent of Vehicles > 40 MPH :	61.7%
Mean Speed(Average) :	41 MPH

PRECISION
D A T A
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Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	0	0	1	10	30	15	9	2	**1**	0	0	68	50	44
01:00	0	0	0	0	1	6	15	5	8	1	0	0	0	36	51	44
02:00	0	0	0	0	3	5	10	10	1	0	0	0	**1**	30	48	43
03:00	0	0	0	0	0	5	7	2	1	1	0	**1**	0	17	46	44
04:00	0	0	0	0	2	5	12	8	2	0	0	0	0	29	47	42
05:00	0	0	0	0	0	11	54	27	5	1	0	0	0	98	48	43
06:00	**1**	**4**	**4**	**6**	8	46	107	47	12	0	1	0	0	236	47	41
07:00	0	0	0	6	13	61	155	84	**24**	1	0	0	0	344	48	42
08:00	0	0	0	3	**23**	70	147	81	16	1	0	0	0	341	47	42
09:00	0	0	0	0	14	62	179	96	11	0	1	0	0	363	47	42
10:00	0	0	0	2	13	78	166	91	16	**5**	1	0	0	372	48	42
11:00	0	0	0	2	20	**121**	**187**	**99**	10	0	0	0	0	**439**	47	41
12 PM	0	2	3	8	29	125	256	100	9	**5**	1	0	0	538	46	41
13:00	0	1	1	7	36	142	166	94	10	2	0	0	0	459	46	41
14:00	0	0	7	9	29	158	267	103	17	2	1	0	0	593	46	41
15:00	**5**	**10**	**20**	**40**	**90**	198	293	109	18	1	0	0	0	784	45	39
16:00	0	0	0	9	54	211	470	**186**	19	3	0	0	0	952	46	41
17:00	0	0	0	20	31	**236**	**490**	153	**27**	1	0	0	0	**958**	46	41
18:00	0	1	3	4	22	127	301	142	18	2	**2**	0	0	622	47	42
19:00	0	0	1	0	13	160	209	84	12	3	0	0	**1**	483	46	41
20:00	0	0	0	0	8	90	149	78	11	0	0	0	0	336	47	42
21:00	0	0	0	0	8	44	107	52	8	0	0	0	0	219	47	42
22:00	0	0	0	0	13	29	77	53	11	3	0	0	0	186	48	43
23:00	0	0	0	1	0	18	42	38	8	1	0	**1**	0	109	49	44
Total	6	18	39	117	431	2018	3896	1757	283	35	8	2	2	8612		
%	0.1%	0.2%	0.5%	1.4%	5.0%	23.4%	45.2%	20.4%	3.3%	0.4%	0.1%	0.0%	0.0%			
AM Peak	06:00	06:00	06:00	06:00	08:00	11:00	11:00	11:00	07:00	10:00	00:00	03:00	02:00	11:00		
Vol.	1	4	4	6	23	121	187	99	24	5	1	1	1	439		
PM Peak	15:00	15:00	15:00	15:00	15:00	17:00	17:00	16:00	17:00	12:00	18:00	23:00	19:00	17:00		
Vol.	5	10	20	40	90	236	490	186	27	5	2	1	1	958		

Pecent

15th Percentile :	36 MPH
50th Percentile :	42 MPH
85th Percentile :	47 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	5914
Percent in Pace :	68.7%
Number of Vehicles > 40 MPH :	5203
Percent of Vehicles > 40 MPH :	60.4%
Mean Speed(Average) :	41 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/16/0																
8	0	0	0	0	1	8	19	21	4	0	0	0	0	53	48	44
01:00	0	0	0	0	1	4	26	17	4	**3**	0	0	0	55	49	44
02:00	0	0	0	1	2	3	13	12	3	1	0	0	0	35	49	43
03:00	0	0	0	0	0	2	23	12	4	1	**2**	0	0	44	49	45
04:00	0	0	0	0	2	5	48	42	15	3	1	0	0	116	50	45
05:00	0	0	0	0	4	37	167	**164**	**16**	1	0	0	0	389	48	44
06:00	0	0	4	24	58	310	381	104	4	1	0	0	0	886	44	40
07:00	**16**	**26**	**29**	**50**	**182**	**446**	289	35	1	0	0	0	0	**1074**	42	36
08:00	1	6	11	5	63	315	**405**	53	0	0	0	0	0	859	44	39
09:00	0	0	0	0	43	134	257	85	6	0	0	0	0	525	45	41
10:00	2	0	2	2	24	100	190	40	5	0	0	0	0	365	44	40
11:00	0	0	3	3	24	129	226	45	1	0	0	0	0	431	44	40
12 PM	0	0	0	7	19	122	205	55	3	0	0	0	0	411	44	41
13:00	0	0	0	2	22	148	249	45	4	0	0	0	0	470	44	40
14:00	**1**	**1**	**3**	**13**	**68**	149	202	39	2	0	0	0	0	478	44	39
15:00	0	0	3	4	24	**155**	236	44	1	0	0	0	0	467	44	40
16:00	0	0	0	0	17	142	**263**	**82**	4	0	0	0	0	**508**	45	41
17:00	0	0	0	2	14	127	256	63	3	0	0	0	0	465	44	41
18:00	0	1	0	0	5	95	212	55	8	1	0	0	0	377	45	41
19:00	0	0	0	4	20	76	135	53	2	0	0	0	0	290	45	41
20:00	0	0	0	1	9	71	94	24	1	1	0	0	0	201	44	40
21:00	1	0	0	0	5	40	92	27	**9**	1	0	0	0	175	46	42
22:00	0	0	0	0	0	17	63	32	8	**3**	0	0	0	123	48	44
23:00	0	0	0	0	0	10	35	11	5	1	0	0	0	62	48	43
Total	21	34	55	118	607	2645	4086	1160	113	17	3	0	0	8859		
%	0.2%	0.4%	0.6%	1.3%	6.9%	29.9%	46.1%	13.1%	1.3%	0.2%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	07:00	07:00	08:00	05:00	05:00	01:00	03:00			07:00		
Vol.	16	26	29	50	182	446	405	164	16	3	2			1074		
PM Peak	14:00	14:00	14:00	14:00	14:00	15:00	16:00	16:00	21:00	22:00				16:00		
Vol.	1	1	3	13	68	155	263	82	9	3				508		

Pecent

15th Percentile :	35 MPH
50th Percentile :	41 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6731
Percent in Pace :	76.0%
Number of Vehicles > 40 MPH :	4561
Percent of Vehicles > 40 MPH :	51.5%
Mean Speed(Average) :	40 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/17/0																
8	0	0	1	0	3	10	18	18	5	1	0	0	0	56	49	43
01:00	0	0	0	0	1	8	22	22	4	1	0	0	0	58	48	44
02:00	0	0	0	0	0	2	10	11	2	0	0	0	0	25	48	45
03:00	0	0	0	0	0	4	15	19	5	**2**	0	0	0	45	49	45
04:00	0	0	0	0	1	14	36	46	12	2	0	0	0	111	49	45
05:00	0	0	0	0	3	49	173	**152**	**22**	2	0	0	0	401	48	44
06:00	**1**	0	**2**	7	54	207	**419**	122	7	0	0	0	0	819	45	41
07:00	0	0	2	36	**139**	**421**	395	53	1	0	0	0	0	**1047**	43	38
08:00	0	**1**	0	**37**	123	307	335	56	0	0	0	0	0	859	43	38
09:00	0	0	0	5	15	121	252	67	4	1	0	0	0	465	45	41
10:00	0	0	0	0	24	103	236	69	2	0	0	0	0	434	45	41
11:00	0	0	0	8	20	109	204	54	2	0	0	0	0	397	44	41
12 PM	0	1	0	0	14	108	214	58	2	**1**	0	0	0	398	45	41
13:00	0	0	0	1	32	168	205	36	5	0	0	0	0	447	44	40
14:00	0	0	4	21	41	**207**	190	39	0	0	0	0	0	502	44	39
15:00	0	**2**	**7**	**25**	**75**	200	198	40	1	0	0	0	0	548	43	38
16:00	0	0	0	2	23	194	**283**	68	4	0	0	0	0	**574**	44	41
17:00	0	0	1	2	24	165	260	**74**	3	0	0	0	0	529	44	41
18:00	0	0	0	1	10	110	195	67	4	1	**1**	0	0	389	46	41
19:00	0	0	0	0	11	84	146	34	1	0	0	0	0	276	44	41
20:00	0	0	0	0	11	74	109	39	**7**	1	0	0	0	241	46	41
21:00	0	0	0	1	5	34	109	37	5	1	0	0	0	192	46	42
22:00	0	0	0	0	3	30	58	38	3	0	0	0	0	132	47	42
23:00	0	0	0	0	4	11	39	22	6	0	0	0	0	82	48	43
Total	1	4	17	146	636	2740	4121	1241	107	13	1	0	0	9027		
%	0.0%	0.0%	0.2%	1.6%	7.0%	30.4%	45.7%	13.7%	1.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	06:00	08:00	06:00	08:00	07:00	07:00	06:00	05:00	05:00	03:00				07:00		
Vol.	1	1	2	37	139	421	419	152	22	2				1047		
PM Peak		15:00	15:00	15:00	15:00	14:00	16:00	17:00	20:00	12:00	18:00			16:00		
Vol.		2	7	25	75	207	283	74	7	1	1			574		

Pecent

15th Percentile :	36 MPH
50th Percentile :	41 MPH
85th Percentile :	45 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6861
Percent in Pace :	76.0%
Number of Vehicles > 40 MPH :	4658
Percent of Vehicles > 40 MPH :	51.6%
Mean Speed(Average) :	40 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	1	38	5	1	1	1	0	2	2	0	0	0	0	51
01:00	1	28	4	0	2	1	0	0	2	0	1	0	0	39
02:00	0	11	1	0	3	1	0	0	5	0	0	0	0	21
03:00	1	15	4	1	2	2	0	0	1	0	0	0	0	26
04:00	0	19	2	0	2	4	0	1	6	0	0	0	0	34
05:00	1	59	16	2	6	1	0	0	0	0	0	0	0	85
06:00	0	145	43	3	10	4	0	4	4	0	0	0	0	213
07:00	2	259	41	4	12	4	1	3	3	0	0	0	0	329
08:00	3	257	57	5	17	0	2	2	3	1	0	0	0	347
09:00	5	231	81	5	21	5	1	4	4	0	1	0	0	358
10:00	2	244	79	7	20	6	1	0	8	0	0	0	0	367
11:00	4	275	70	6	21	6	0	2	3	0	0	0	0	387
12 PM	5	295	70	9	15	10	0	3	5	0	0	0	0	412
13:00	2	344	83	7	17	10	2	5	6	0	0	0	0	476
14:00	8	436	83	8	26	6	4	3	4	0	0	0	0	578
15:00	6	641	126	4	21	7	1	5	3	0	0	0	0	814
16:00	12	758	128	3	24	3	0	6	5	0	0	0	0	939
17:00	12	809	138	5	14	7	1	1	2	0	0	0	0	989
18:00	9	531	62	4	15	1	0	4	3	0	0	0	0	629
19:00	4	333	68	2	9	2	0	2	1	0	0	0	0	421
20:00	0	224	38	1	1	0	0	1	4	0	1	0	0	270
21:00	0	171	23	1	2	0	0	0	1	0	1	1	0	200
22:00	1	123	21	1	0	1	0	2	2	0	0	0	0	151
23:00	1	80	11	0	2	0	0	1	4	0	0	0	0	99
Total	80	6326	1254	79	263	82	13	51	81	1	4	1	0	8235
Percent	1.0%	76.8%	15.2%	1.0%	3.2%	1.0%	0.2%	0.6%	1.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	09:00	10:00	09:00	10:00	08:00	06:00	10:00	08:00	01:00			11:00
Vol.	5	275	81	7	21	6	2	4	8	1	1			387
PM Peak	16:00	17:00	17:00	12:00	14:00	12:00	14:00	16:00	13:00		20:00	21:00		17:00
Vol.	12	809	138	9	26	10	4	6	6		1	1		989

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	3	51	7	0	2	0	0	1	4	0	0	0	0	68
01:00	0	28	0	2	1	1	0	1	1	0	1	1	0	36
02:00	1	17	4	0	3	1	0	1	3	0	0	0	0	30
03:00	0	10	3	1	0	2	1	0	0	0	0	0	0	17
04:00	0	13	6	0	4	3	0	0	3	0	0	0	0	29
05:00	0	67	20	2	6	1	0	0	2	0	0	0	0	98
06:00	0	159	43	7	11	5	0	5	6	0	0	0	0	236
07:00	2	258	65	4	7	4	0	2	2	0	0	0	0	344
08:00	1	248	58	4	18	4	1	3	4	0	0	0	0	341
09:00	2	249	61	12	25	7	0	4	3	0	0	0	0	363
10:00	3	263	56	3	29	5	2	5	4	2	0	0	0	372
11:00	1	317	81	7	16	6	0	3	8	0	0	0	0	439
12 PM	8	411	81	5	21	5	0	4	3	0	0	0	0	538
13:00	3	346	80	7	12	6	0	3	2	0	0	0	0	459
14:00	6	450	105	6	17	5	0	1	3	0	0	0	0	593
15:00	6	616	103	11	28	13	0	2	5	0	0	0	0	784
16:00	9	763	142	5	22	5	1	4	1	0	0	0	0	952
17:00	14	787	118	6	20	6	0	6	1	0	0	0	0	958
18:00	10	501	82	1	18	1	0	4	5	0	0	0	0	622
19:00	7	388	70	6	6	0	0	3	3	0	0	0	0	483
20:00	6	276	40	1	4	3	0	1	3	0	2	0	0	336
21:00	1	178	34	2	1	0	0	1	1	0	0	1	0	219
22:00	2	167	14	0	2	1	0	0	0	0	0	0	0	186
23:00	1	96	6	1	0	0	0	2	3	0	0	0	0	109
Total	86	6659	1279	93	273	84	5	56	70	2	3	2	0	8612
Percent	1.0%	77.3%	14.9%	1.1%	3.2%	1.0%	0.1%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	00:00	11:00	11:00	09:00	10:00	09:00	10:00	06:00	11:00	10:00	01:00	01:00		11:00
Vol.	3	317	81	12	29	7	2	5	8	2	1	1		439
PM Peak	17:00	17:00	16:00	15:00	15:00	15:00	16:00	17:00	15:00		20:00	21:00		17:00
Vol.	14	787	142	11	28	13	1	6	5		2	1		958

PRECISION
D A T A
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Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

81676 T-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/16/0														
8	1	43	3	1	1	0	0	2	2	0	0	0	0	53
01:00	0	42	3	0	5	1	0	1	3	0	0	0	0	55
02:00	1	19	4	0	5	2	0	3	1	0	0	0	0	35
03:00	1	19	8	0	5	2	0	2	5	0	2	0	0	44
04:00	3	79	20	1	6	2	0	1	4	0	0	0	0	116
05:00	9	267	94	2	14	0	0	0	2	0	0	1	0	389
06:00	10	680	153	5	16	9	0	6	6	0	1	0	0	886
07:00	6	869	157	8	20	6	0	4	3	0	1	0	0	1074
08:00	7	696	110	5	22	9	0	6	4	0	0	0	0	859
09:00	6	405	85	7	13	4	0	2	3	0	0	0	0	525
10:00	5	253	69	6	20	3	0	3	5	1	0	0	0	365
11:00	4	312	73	2	19	9	0	6	5	0	0	1	0	431
12 PM	3	308	62	4	16	8	0	5	5	0	0	0	0	411
13:00	2	362	73	3	17	4	0	3	6	0	0	0	0	470
14:00	4	352	69	7	17	12	0	6	10	1	0	0	0	478
15:00	5	369	57	6	16	8	0	4	2	0	0	0	0	467
16:00	2	410	62	4	18	8	0	3	1	0	0	0	0	508
17:00	1	399	52	3	4	2	1	2	1	0	0	0	0	465
18:00	5	315	41	2	10	2	0	1	1	0	0	0	0	377
19:00	3	235	39	2	8	1	0	1	1	0	0	0	0	290
20:00	1	166	26	0	5	2	0	0	1	0	0	0	0	201
21:00	1	145	24	0	1	0	0	1	3	0	0	0	0	175
22:00	1	97	17	0	3	4	0	1	0	0	0	0	0	123
23:00	0	49	10	0	1	0	0	0	2	0	0	0	0	62
Total	81	6891	1311	68	262	98	1	63	76	2	4	2	0	8859
Percent	0.9%	77.8%	14.8%	0.8%	3.0%	1.1%	0.0%	0.7%	0.9%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	08:00	06:00		06:00	06:00	10:00	03:00	05:00		07:00
Vol.	10	869	157	8	22	9		6	6	1	2	1		1074
PM Peak	15:00	16:00	13:00	14:00	16:00	14:00	17:00	14:00	14:00	14:00				16:00
Vol.	5	410	73	7	18	12	1	6	10	1				508

PRECISION
D A T A
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Turnpike Street (Route 138) south of
Foundry Street (Route 106)
City, State: Easton, MA
Client: VHB/ J. Quitter

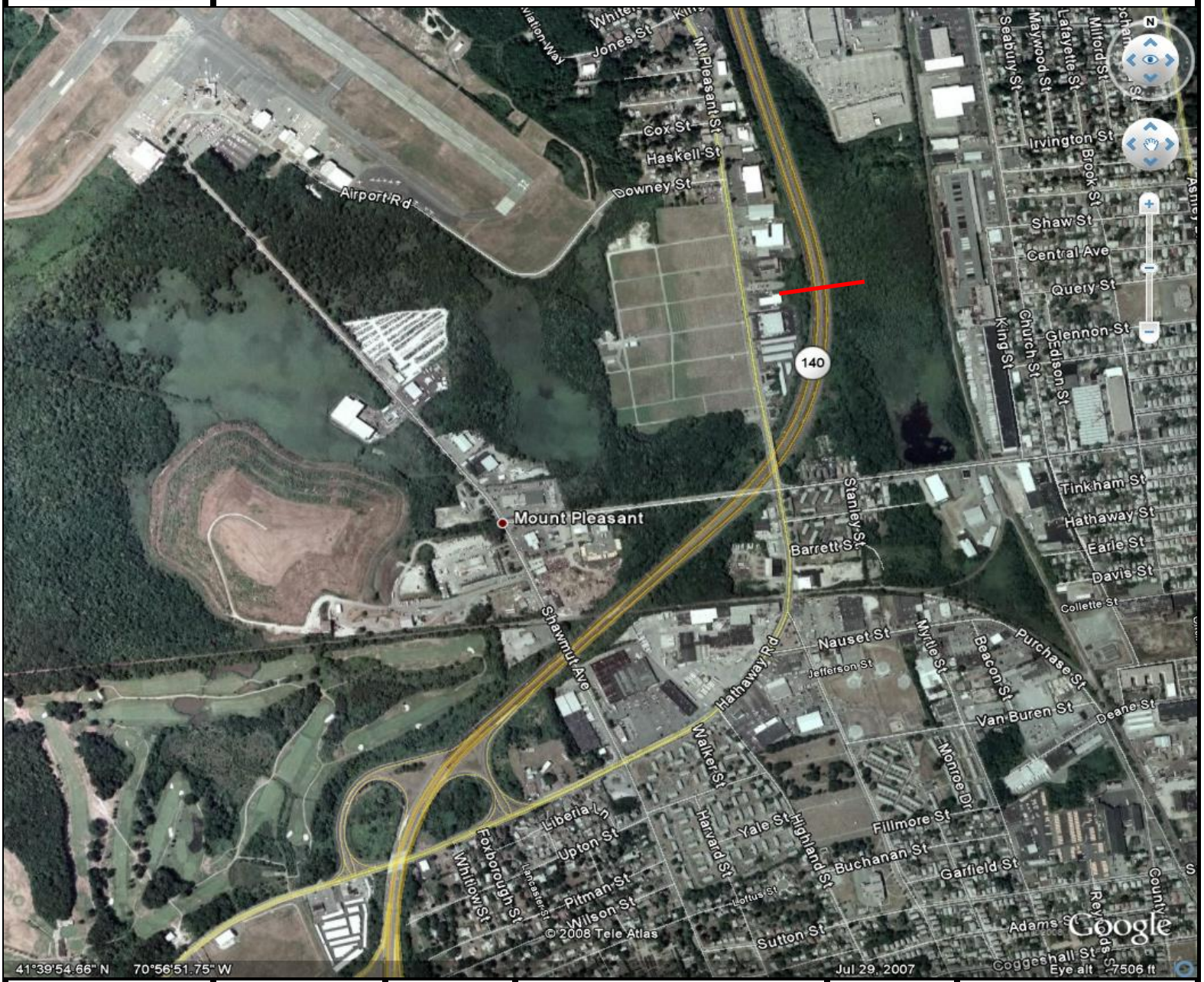
81676 T-C class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/17/0														
8	0	43	5	1	1	0	0	4	1	0	0	1	0	56
01:00	0	44	4	0	5	0	0	1	4	0	0	0	0	58
02:00	0	10	6	0	5	0	0	3	1	0	0	0	0	25
03:00	1	22	11	0	5	1	0	0	4	0	1	0	0	45
04:00	6	73	23	0	4	0	0	3	1	0	1	0	0	111
05:00	6	275	99	2	14	3	0	1	1	0	0	0	0	401
06:00	2	640	138	4	15	8	0	4	8	0	0	0	0	819
07:00	5	828	168	10	22	7	0	5	1	1	0	0	0	1047
08:00	4	698	114	5	17	9	0	6	5	1	0	0	0	859
09:00	4	344	80	4	15	2	1	7	7	1	0	0	0	465
10:00	5	314	77	4	20	5	0	1	5	3	0	0	0	434
11:00	3	292	59	7	22	5	0	7	2	0	0	0	0	397
12 PM	3	295	63	6	18	2	0	6	5	0	0	0	0	398
13:00	5	331	66	7	23	7	0	5	3	0	0	0	0	447
14:00	2	380	81	6	17	6	0	5	5	0	0	0	0	502
15:00	2	442	65	8	15	8	0	5	3	0	0	0	0	548
16:00	6	469	64	5	15	7	0	5	2	0	0	1	0	574
17:00	5	449	57	4	5	3	0	3	3	0	0	0	0	529
18:00	9	321	40	3	12	2	0	1	1	0	0	0	0	389
19:00	1	225	40	1	5	2	0	1	1	0	0	0	0	276
20:00	2	202	30	2	3	1	0	0	1	0	0	0	0	241
21:00	4	162	23	0	1	0	0	1	1	0	0	0	0	192
22:00	0	111	12	0	3	1	0	1	3	0	1	0	0	132
23:00	0	65	13	0	3	1	0	0	0	0	0	0	0	82
Total	75	7035	1338	79	265	80	1	75	68	6	3	2	0	9027
Percent	0.8%	77.9%	14.8%	0.9%	2.9%	0.9%	0.0%	0.8%	0.8%	0.1%	0.0%	0.0%	0.0%	
AM Peak	04:00	07:00	07:00	07:00	07:00	08:00	09:00	09:00	06:00	10:00	03:00	00:00		07:00
Vol.	6	828	168	10	22	9	1	7	8	3	1	1		1047
PM Peak	18:00	16:00	14:00	15:00	13:00	15:00		12:00	12:00		22:00	16:00		16:00
Vol.	9	469	81	8	23	8		6	5		1	1		574

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/15/08 thru Thur 10/16/08	81676	New Bedford, MA

Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 Q-B1 volume
Site Code: 10111.31

Start Time	A.M.	NB	P.M.				Wed 15-Oct-08
12:00	51		287				
12:15	41		324				
12:30	27		276				
12:45	20	139	341	1228			
01:00	30		329				
01:15	18		301				
01:30	12		318				
01:45	13	73	328	1276			
02:00	20		359				
02:15	7		455				
02:30	18		414				
02:45	14	59	448	1676			
03:00	22		461				
03:15	22		495				
03:30	22		490				
03:45	31	97	461	1907			
04:00	36		500				
04:15	68		485				
04:30	112		535				
04:45	154	370	524	2044			
05:00	179		501				
05:15	264		538				
05:30	310		514				
05:45	334	1087	467	2020			
06:00	287		430				
06:15	367		401				
06:30	420		382				
06:45	473	1547	341	1554			
07:00	452		279				
07:15	554		284				
07:30	526		245				
07:45	527	2059	222	1030			
08:00	428		209				
08:15	421		233				
08:30	385		217				
08:45	388	1622	197	856			
09:00	315		210				
09:15	320		174				
09:30	261		164				
09:45	285	1181	159	707			
10:00	277		148				
10:15	275		148				
10:30	248		108				
10:45	309	1109	100	504			
11:00	304		90				
11:15	325		85				
11:30	306		84				
11:45	274	1209	57	316			
Total	10552		15118				
Percent			100.0%		0.0%	0.0%	
Day Total		25670					
Peak	07:00		04:30				
Vol.	2059		2098				
P.H.F.	0.929		0.975				

Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

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81676 Q-B1 volume
Site Code: 10111.31

Start Time	A.M.	NB	P.M.				Thu 16-Oct-08
12:00	46		328				
12:15	40		347				
12:30	40		315				
12:45	31	157	335	1325			
01:00	25		346				
01:15	21		366				
01:30	28		325				
01:45	16	90	359	1396			
02:00	24		413				
02:15	20		406				
02:30	22		473				
02:45	15	81	451	1743			
03:00	11		459				
03:15	26		487				
03:30	12		467				
03:45	23	72	459	1872			
04:00	39		471				
04:15	74		470				
04:30	100		500				
04:45	145	358	471	1912			
05:00	215		531				
05:15	241		572				
05:30	272		456				
05:45	314	1042	406	1965			
06:00	271		376				
06:15	373		379				
06:30	418		324				
06:45	496	1558	312	1391			
07:00	441		313				
07:15	524		282				
07:30	491		277				
07:45	503	1959	253	1125			
08:00	476		261				
08:15	452		248				
08:30	402		229				
08:45	371	1701	188	926			
09:00	307		167				
09:15	290		185				
09:30	277		162				
09:45	283	1157	155	669			
10:00	279		133				
10:15	271		127				
10:30	287		125				
10:45	317	1154	118	503			
11:00	300		86				
11:15	313		77				
11:30	291		85				
11:45	301	1205	74	322			
Total	10534		15149				
Percent			100.0%		0.0%	0.0%	
Day Total		25683					
Peak	07:15		04:30				
Vol.	1994		2074				
P.H.F.	0.951		0.906				

PRECISION
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Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B1 speed
Site Code: 10111.31

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	1	3	14	37	41	21	10	9	2	1	139	76	68
01:00	0	0	0	2	1	9	11	21	18	5	4	1	1	73	75	69
02:00	0	**2**	0	0	3	7	18	7	15	3	2	2	0	59	75	66
03:00	0	0	0	2	5	13	15	33	15	8	2	3	1	97	75	67
04:00	0	1	1	3	4	26	81	98	75	53	18	8	2	370	78	69
05:00	1	0	0	1	18	67	177	288	268	190	57	13	5	1085	78	70
06:00	1	0	1	7	21	91	216	417	388	301	77	23	5	1548	78	71
07:00	3	0	**5**	4	**42**	**133**	**325**	**450**	**512**	**417**	**133**	**25**	**9**	**2058**	79	71
08:00	1	0	2	3	31	100	290	414	351	318	94	15	4	1623	78	70
09:00	**4**	0	0	**9**	26	121	265	260	250	177	58	9	2	1181	77	69
10:00	2	0	1	7	31	124	276	283	197	133	40	11	5	1110	76	68
11:00	2	1	1	2	27	96	307	322	230	164	43	12	2	1209	77	68
12 PM	**4**	0	1	5	20	103	274	327	253	175	48	13	5	1228	77	69
13:00	1	0	1	0	13	98	241	378	277	193	53	15	6	1276	77	70
14:00	1	0	0	1	27	**161**	333	464	343	242	76	20	8	1676	77	69
15:00	2	0	1	3	28	151	330	556	421	299	84	**25**	6	1906	78	70
16:00	1	0	0	2	31	95	**387**	**583**	**497**	320	104	21	4	**2045**	78	70
17:00	3	0	0	1	20	92	371	577	483	**332**	**111**	21	**9**	2020	78	70
18:00	1	0	**3**	**11**	**44**	160	351	436	311	177	46	10	3	1553	76	68
19:00	0	0	3	7	34	99	261	284	188	118	28	6	3	1031	75	68
20:00	0	0	1	10	27	96	215	232	161	81	20	9	4	856	75	67
21:00	0	0	1	4	25	80	168	198	135	60	25	7	3	706	75	68
22:00	0	0	0	4	16	45	116	145	97	54	22	5	1	505	76	68
23:00	0	0	0	3	8	30	81	89	64	27	10	4	0	316	75	68
Total	27	4	22	92	505	2011	5146	6903	5570	3857	1164	280	89	25670		
%	0.1%	0.0%	0.1%	0.4%	2.0%	7.8%	20.0%	26.9%	21.7%	15.0%	4.5%	1.1%	0.3%			
AM Peak	09:00	02:00	07:00	09:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00		
Vol.	4	2	5	9	42	133	325	450	512	417	133	25	9	2058		
PM Peak	12:00		18:00	18:00	18:00	14:00	16:00	16:00	16:00	17:00	17:00	15:00	17:00	16:00		
Vol.	4		3	11	44	161	387	583	497	332	111	25	9	2045		

Pecent

15th Percentile :	62 MPH
50th Percentile :	69 MPH
85th Percentile :	77 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	66-75 MPH
Number in Pace :	12473
Percent in Pace :	48.6%
Number of Vehicles > 65 MPH :	17863
Percent of Vehicles > 65 MPH :	69.6%
Mean Speed(Average) :	69 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B1 speed
Site Code: 10111.31

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	1	2	6	18	41	35	30	16	4	2	2	157	75	68
01:00	0	0	0	1	3	8	23	30	13	8	4	0	0	90	74	67
02:00	1	0	0	0	4	6	20	24	15	8	3	0	0	81	75	67
03:00	0	0	0	1	2	10	19	17	12	8	2	0	1	72	75	67
04:00	0	0	0	2	11	29	79	74	84	50	21	5	2	357	78	69
05:00	**3**	1	0	3	10	62	167	257	253	196	64	17	**10**	1043	79	71
06:00	3	0	0	3	28	112	256	373	382	271	106	16	7	1557	79	70
07:00	2	0	0	4	28	117	**325**	**437**	**487**	**378**	**149**	23	10	**1960**	79	71
08:00	1	1	0	3	18	109	260	415	397	326	126	**36**	9	1701	79	71
09:00	1	0	0	0	20	75	250	303	251	170	60	21	6	1157	78	70
10:00	3	0	**3**	0	32	88	241	314	219	175	60	14	5	1154	78	69
11:00	1	**2**	1	**6**	**46**	**156**	325	327	194	107	35	2	2	1204	75	67
12 PM	4	0	0	1	22	84	268	380	285	189	67	22	4	1326	78	70
13:00	2	0	1	2	20	93	276	390	311	214	53	25	9	1396	78	70
14:00	4	**1**	0	2	22	**162**	333	470	361	278	81	24	5	1743	78	69
15:00	**9**	1	0	3	39	156	352	524	397	282	89	16	4	1872	77	69
16:00	5	0	0	0	27	90	389	**571**	415	286	**92**	25	**11**	1911	78	70
17:00	4	0	0	0	15	122	**402**	491	**472**	**339**	87	**26**	8	**1966**	78	70
18:00	0	0	1	4	30	145	348	379	246	181	47	6	3	1390	76	68
19:00	0	0	**3**	**9**	**42**	141	313	295	185	105	21	8	3	1125	75	67
20:00	1	0	0	1	28	105	246	219	187	104	26	8	2	927	76	68
21:00	0	0	2	5	24	72	182	182	107	74	14	6	1	669	75	67
22:00	0	0	1	4	32	67	121	146	74	43	8	4	3	503	74	66
23:00	1	0	1	2	5	42	86	72	66	30	10	5	2	322	75	68
Total	45	6	14	58	514	2069	5322	6725	5443	3838	1229	311	109	25683		
%	0.2%	0.0%	0.1%	0.2%	2.0%	8.1%	20.7%	26.2%	21.2%	14.9%	4.8%	1.2%	0.4%			
AM Peak	05:00	11:00	10:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00	07:00	08:00	05:00	07:00		
Vol.	3	2	3	6	46	156	325	437	487	378	149	36	10	1960		
PM Peak	15:00	14:00	19:00	19:00	19:00	14:00	17:00	16:00	17:00	17:00	16:00	17:00	16:00	17:00		
Vol.	9	1	3	9	42	162	402	571	472	339	92	26	11	1966		

Pecent

15th Percentile :	62 MPH
50th Percentile :	69 MPH
85th Percentile :	78 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	66-75 MPH
Number in Pace :	12168
Percent in Pace :	47.4%
Number of Vehicles > 65 MPH :	17655
Percent of Vehicles > 65 MPH :	68.7%
Mean Speed(Average) :	70 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B1 class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	103	28	1	1	1	0	1	4	0	0	0	0	139
01:00	0	52	14	1	2	1	0	1	2	0	0	0	0	73
02:00	0	41	10	0	4	0	0	2	2	0	0	0	0	59
03:00	0	63	23	2	6	0	0	2	1	0	0	0	0	97
04:00	1	222	84	8	47	3	0	4	1	0	0	0	0	370
05:00	6	631	288	9	130	4	0	10	5	1	0	1	0	1085
06:00	9	1022	359	16	109	8	0	14	8	0	1	1	1	1548
07:00	8	1387	477	26	109	4	1	22	16	6	2	0	0	2058
08:00	7	1023	420	24	95	11	2	17	22	0	1	0	1	1623
09:00	6	706	319	22	82	13	2	13	15	2	1	0	0	1181
10:00	2	680	303	23	65	11	2	12	11	1	0	0	0	1110
11:00	8	750	289	26	75	11	3	19	25	2	0	1	0	1209
12 PM	4	765	329	22	65	7	1	14	20	1	0	0	0	1228
13:00	4	806	314	26	83	14	1	14	12	1	0	1	0	1276
14:00	8	1095	398	25	88	13	1	30	16	0	1	0	1	1676
15:00	11	1254	459	17	115	9	0	27	12	0	2	0	0	1906
16:00	7	1403	454	12	127	10	0	20	4	3	1	1	3	2045
17:00	7	1382	481	8	110	5	0	19	4	3	0	1	0	2020
18:00	3	1113	336	7	70	5	0	12	5	1	1	0	0	1553
19:00	4	721	244	3	45	1	0	11	1	1	0	0	0	1031
20:00	2	604	204	2	36	1	0	6	0	0	1	0	0	856
21:00	5	540	127	2	28	0	0	4	0	0	0	0	0	706
22:00	2	388	95	2	14	1	0	2	0	1	0	0	0	505
23:00	2	228	75	1	6	0	0	4	0	0	0	0	0	316
Total	106	16979	6130	285	1512	133	13	280	186	23	11	6	6	25670
Percent	0.4%	66.1%	23.9%	1.1%	5.9%	0.5%	0.1%	1.1%	0.7%	0.1%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	05:00	09:00	11:00	07:00	11:00	07:00	07:00	05:00	06:00	07:00
Vol.	9	1387	477	26	130	13	3	22	25	6	2	1	1	2058
PM Peak	15:00	16:00	17:00	13:00	16:00	13:00	12:00	14:00	12:00	16:00	15:00	13:00	16:00	16:00
Vol.	11	1403	481	26	127	14	1	30	20	3	2	1	3	2045

PRECISION
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Route 140 (NB) north of
Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B1 class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	123	23	3	5	1	0	1	0	0	0	0	0	157
01:00	0	63	16	0	5	1	0	1	4	0	0	0	0	90
02:00	2	51	15	2	8	0	0	2	1	0	0	0	0	81
03:00	0	45	17	1	5	0	0	2	2	0	0	0	0	72
04:00	0	191	105	7	45	1	0	4	3	1	0	0	0	357
05:00	5	615	282	6	121	6	0	6	1	1	0	0	0	1043
06:00	6	1025	361	14	118	7	1	18	5	1	0	0	1	1557
07:00	5	1329	441	28	110	6	0	25	10	3	3	0	0	1960
08:00	1	1103	440	20	89	11	0	17	15	2	1	1	1	1701
09:00	2	706	303	20	93	8	1	11	12	1	0	0	0	1157
10:00	7	715	274	29	80	8	0	19	19	3	0	0	0	1154
11:00	3	755	292	23	89	8	2	13	18	1	0	0	0	1204
12 PM	9	867	283	21	88	9	0	26	18	5	0	0	0	1326
13:00	2	907	329	23	82	16	0	25	11	0	0	1	0	1396
14:00	5	1108	422	36	115	12	0	31	13	1	0	0	0	1743
15:00	8	1282	419	13	99	11	1	27	11	0	1	0	0	1872
16:00	9	1280	453	11	112	8	0	29	6	1	2	0	0	1911
17:00	8	1382	444	8	90	6	0	20	3	4	1	0	0	1966
18:00	5	1016	294	8	56	1	0	8	0	1	1	0	0	1390
19:00	0	835	226	3	50	2	0	7	1	0	1	0	0	1125
20:00	1	663	216	1	41	1	0	4	0	0	0	0	0	927
21:00	0	505	133	1	24	0	0	3	3	0	0	0	0	669
22:00	0	374	112	0	16	0	0	1	0	0	0	0	0	503
23:00	0	224	86	1	10	0	0	0	1	0	0	0	0	322
Total	79	17164	5986	279	1551	123	5	300	157	25	10	2	2	25683
Percent	0.3%	66.8%	23.3%	1.1%	6.0%	0.5%	0.0%	1.2%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	10:00	05:00	08:00	11:00	07:00	10:00	07:00	07:00	08:00	06:00	07:00
Vol.	7	1329	441	29	121	11	2	25	19	3	3	1	1	1960
PM Peak	12:00	17:00	16:00	14:00	14:00	13:00	15:00	14:00	12:00	12:00	16:00	13:00		17:00
Vol.	9	1382	453	36	115	16	1	31	18	5	2	1		1966

Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 Q-B2 volume
Site Code: 10111.31

Start Time	A.M.	SB	P.M.				Wed 15-Oct-08
12:00	99		333				
12:15	47		318				
12:30	40		349				
12:45	35	221	319	1319			
01:00	31		319				
01:15	26		304				
01:30	30		316				
01:45	16	103	339	1278			
02:00	26		371				
02:15	15		354				
02:30	15		465				
02:45	10	66	485	1675			
03:00	13		507				
03:15	15		521				
03:30	18		576				
03:45	23	69	505	2109			
04:00	25		528				
04:15	20		489				
04:30	34		584				
04:45	30	109	517	2118			
05:00	59		557				
05:15	71		538				
05:30	113		521				
05:45	123	366	469	2085			
06:00	165		507				
06:15	230		466				
06:30	309		447				
06:45	371	1075	381	1801			
07:00	422		311				
07:15	532		325				
07:30	553		271				
07:45	575	2082	261	1168			
08:00	490		227				
08:15	478		216				
08:30	452		248				
08:45	424	1844	199	890			
09:00	342		180				
09:15	331		215				
09:30	302		139				
09:45	314	1289	146	680			
10:00	290		180				
10:15	273		121				
10:30	339		107				
10:45	358	1260	121	529			
11:00	313		150				
11:15	285		100				
11:30	283		95				
11:45	315	1196	73	418			
Total	9680		16070				
Percent			100.0%		0.0%	0.0%	
Day Total		25750					
Peak	07:15		04:30				
Vol.	2150		2196				
P.H.F.	0.935		0.940				

Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION
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INDUSTRIES, LLC
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81676 Q-B2 volume
Site Code: 10111.31

Start Time	A.M.	SB	P.M.				Thu 16-Oct-08
12:00	97		333				
12:15	54		322				
12:30	44		322				
12:45	37	232	281	1258			
01:00	29		333				
01:15	21		323				
01:30	37		311				
01:45	14	101	336	1303			
02:00	18		356				
02:15	19		359				
02:30	17		398				
02:45	14	68	499	1612			
03:00	14		463				
03:15	16		509				
03:30	22		588				
03:45	19	71	538	2098			
04:00	21		549				
04:15	24		547				
04:30	33		588				
04:45	58	136	504	2188			
05:00	37		587				
05:15	57		574				
05:30	99		539				
05:45	141	334	508	2208			
06:00	193		493				
06:15	251		431				
06:30	369		391				
06:45	387	1200	381	1696			
07:00	445		340				
07:15	534		277				
07:30	580		269				
07:45	571	2130	246	1132			
08:00	484		223				
08:15	464		183				
08:30	483		171				
08:45	493	1924	185	762			
09:00	380		189				
09:15	357		176				
09:30	346		169				
09:45	332	1415	156	690			
10:00	322		176				
10:15	309		144				
10:30	327		142				
10:45	307	1265	129	591			
11:00	320		124				
11:15	314		105				
11:30	300		76				
11:45	334	1268	72	377			
Total	10144		15915				
Percent			100.0%		0.0%	0.0%	
Day Total		26059					
Peak	07:15		04:30				
Vol.	2169		2253				
P.H.F.	0.935		0.958				

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B2 speed
Site Code: 10111.31

SB

Start	1	36	41	46	51	56	61	66	71	76	81	86	91	Total	85th	Ave
Time	35	40	45	50	55	60	65	70	75	80	85	90	9999		% ile	Speed
10/15/0																
8	0	0	1	0	17	38	68	53	30	10	3	0	1	221	72	65
01:00	0	0	0	1	7	23	37	14	16	1	3	0	1	103	72	64
02:00	0	0	0	0	8	11	13	23	10	1	0	0	0	66	71	64
03:00	0	0	0	4	8	17	19	12	8	1	0	0	0	69	70	62
04:00	0	0	2	4	9	16	29	31	12	4	2	0	0	109	71	64
05:00	1	0	0	6	29	78	94	98	43	14	3	0	0	366	71	64
06:00	0	0	0	2	67	206	347	301	117	26	5	2	**2**	1075	70	64
07:00	7	1	1	20	**118**	**353**	**608**	**660**	**272**	33	7	1	1	**2082**	71	64
08:00	12	0	2	9	85	291	566	601	229	**43**	5	0	1	1844	71	65
09:00	26	2	0	12	70	239	376	362	168	23	**10**	1	0	1289	71	63
10:00	35	2	1	10	54	273	394	326	130	24	10	0	1	1260	70	63
11:00	**58**	**19**	**34**	**25**	55	219	343	284	121	24	10	**4**	0	1196	70	61
12 PM	49	0	1	11	71	250	403	333	166	30	5	0	0	1319	71	63
13:00	57	0	**3**	**15**	70	228	413	339	112	31	6	**4**	0	1278	70	62
14:00	79	**1**	2	12	103	315	505	445	173	33	5	2	0	1675	70	62
15:00	101	0	1	13	77	292	642	**698**	231	**44**	**9**	1	0	2109	70	63
16:00	85	0	1	9	**110**	**361**	**669**	616	237	25	5	0	0	**2118**	70	62
17:00	95	1	0	7	94	332	580	690	**238**	40	7	1	0	2085	70	63
18:00	**108**	0	0	10	74	317	588	487	178	31	5	1	2	1801	70	62
19:00	78	0	0	9	57	181	390	304	122	20	3	1	**3**	1168	70	61
20:00	65	0	1	4	56	166	285	213	75	23	1	0	1	890	70	60
21:00	60	0	0	6	32	137	196	163	52	28	5	1	0	680	70	60
22:00	33	0	0	5	23	85	158	133	63	20	6	2	1	529	71	62
23:00	29	1	0	5	9	76	112	127	45	13	1	0	0	418	70	61
Total	978	27	50	199	1303	4504	7835	7313	2848	542	116	21	14	25750		
%	3.8%	0.1%	0.2%	0.8%	5.1%	17.5%	30.4%	28.4%	11.1%	2.1%	0.5%	0.1%	0.1%			
AM Peak	11:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00	07:00	08:00	09:00	11:00	06:00	07:00		
Vol.	58	19	34	25	118	353	608	660	272	43	10	4	2	2082		
PM Peak	18:00	14:00	13:00	13:00	16:00	16:00	16:00	15:00	17:00	15:00	15:00	13:00	19:00	16:00		
Vol.	108	1	3	15	110	361	669	698	238	44	9	4	3	2118		

Pecent

15th Percentile :	57 MPH
50th Percentile :	64 MPH
85th Percentile :	70 MPH
95th Percentile :	74 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	15148
Percent in Pace :	58.8%
Number of Vehicles > 65 MPH :	10854
Percent of Vehicles > 65 MPH :	42.2%
Mean Speed(Average) :	63 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

81676 Q-B2 speed
Site Code: 10111.31

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	15	0	1	3	15	44	57	58	29	6	2	1	**1**	232	71	61
01:00	8	0	0	2	6	26	26	21	10	2	0	0	0	101	70	59
02:00	3	0	1	0	9	5	17	27	5	1	0	0	0	68	70	61
03:00	3	0	0	6	7	18	19	14	3	1	0	0	0	71	68	59
04:00	5	0	1	6	12	33	35	23	18	3	0	0	0	136	71	60
05:00	20	0	1	2	21	58	93	93	38	6	2	0	0	334	70	61
06:00	87	0	1	8	40	201	382	340	111	24	6	0	0	1200	70	61
07:00	**137**	0	2	12	82	**356**	**656**	**622**	**230**	24	9	0	0	**2130**	70	62
08:00	120	0	4	17	**98**	323	595	520	217	25	4	0	1	1924	70	61
09:00	98	0	0	14	71	237	419	380	153	**30**	**12**	1	0	1415	70	61
10:00	111	0	**6**	**21**	83	254	361	290	107	24	8	0	0	1265	70	59
11:00	63	**2**	3	14	67	277	412	275	133	16	3	**3**	0	1268	70	61
12 PM	57	0	2	**19**	103	269	361	303	109	28	7	0	0	1258	70	61
13:00	52	**1**	2	19	61	255	435	306	136	32	4	0	0	1303	70	62
14:00	63	0	2	14	**104**	294	488	417	194	27	7	1	1	1612	70	62
15:00	57	0	**3**	13	85	**365**	**682**	620	232	31	7	3	0	2098	70	63
16:00	82	0	1	9	72	296	680	698	303	41	5	1	0	2188	71	63
17:00	**94**	0	1	10	74	316	615	**727**	**307**	**55**	7	2	0	**2208**	71	63
18:00	80	1	0	5	67	279	522	525	176	32	6	1	**2**	1696	70	63
19:00	68	0	0	4	39	177	344	308	151	30	**9**	2	0	1132	71	62
20:00	50	0	0	4	28	106	206	202	124	27	7	**6**	2	762	73	63
21:00	64	0	0	6	27	118	199	158	81	27	7	2	1	690	71	61
22:00	46	0	2	4	25	91	176	150	64	25	5	2	1	591	71	61
23:00	0	0	1	1	24	50	117	97	59	20	7	1	0	377	73	66
Total	1383	4	34	213	1220	4448	7897	7174	2990	537	124	26	9	26059		
%	5.3%	0.0%	0.1%	0.8%	4.7%	17.1%	30.3%	27.5%	11.5%	2.1%	0.5%	0.1%	0.0%			
AM Peak	07:00	11:00	10:00	10:00	08:00	07:00	07:00	07:00	07:00	09:00	09:00	11:00	00:00	07:00		
Vol.	137	2	6	21	98	356	656	622	230	30	12	3	1	2130		
PM Peak	17:00	13:00	15:00	12:00	14:00	15:00	15:00	17:00	17:00	17:00	19:00	20:00	18:00	17:00		
Vol.	94	1	3	19	104	365	682	727	307	55	9	6	2	2208		

Pecent

15th Percentile :	57 MPH
50th Percentile :	64 MPH
85th Percentile :	70 MPH
95th Percentile :	74 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	15071
Percent in Pace :	57.8%
Number of Vehicles > 65 MPH :	10860
Percent of Vehicles > 65 MPH :	41.7%
Mean Speed(Average) :	62 MPH

Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 Q-B2 class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	189	27	0	2	1	0	1	1	0	0	0	0	221
01:00	0	89	9	1	1	0	0	1	1	0	1	0	0	103
02:00	0	54	8	1	0	1	0	1	1	0	0	0	0	66
03:00	1	55	8	1	2	1	0	1	0	0	0	0	0	69
04:00	0	79	16	2	5	3	0	3	1	0	0	0	0	109
05:00	1	251	81	4	20	2	0	6	0	1	0	0	0	366
06:00	4	835	164	8	24	9	1	13	11	2	2	1	1	1075
07:00	12	1724	219	11	49	25	1	24	7	6	2	0	2	2082
08:00	15	1555	180	7	34	17	3	20	11	2	0	0	0	1844
09:00	14	1028	157	15	35	8	1	15	12	2	1	0	1	1289
10:00	19	1008	150	13	29	5	1	15	15	2	0	0	3	1260
11:00	11	973	132	5	33	11	0	14	11	2	1	0	3	1196
12 PM	7	1090	148	8	22	11	1	14	15	2	0	0	1	1319
13:00	12	1043	145	7	29	12	3	16	10	1	0	0	0	1278
14:00	16	1360	202	14	28	15	3	21	9	5	1	0	1	1675
15:00	21	1780	230	10	25	17	2	19	3	1	0	0	1	2109
16:00	25	1755	264	6	31	5	0	18	6	4	1	0	3	2118
17:00	14	1803	188	10	29	5	0	17	11	3	0	0	5	2085
18:00	32	1540	177	3	23	9	0	8	6	1	0	2	0	1801
19:00	14	1004	115	4	14	5	0	5	5	2	0	0	0	1168
20:00	7	775	90	2	10	1	0	3	0	0	0	0	2	890
21:00	7	606	52	2	8	4	0	0	1	0	0	0	0	680
22:00	3	476	39	1	5	1	0	1	2	1	0	0	0	529
23:00	5	363	43	1	2	2	0	1	0	1	0	0	0	418
Total	240	21435	2844	136	460	170	16	237	139	38	9	3	23	25750
Percent	0.9%	83.2%	11.0%	0.5%	1.8%	0.7%	0.1%	0.9%	0.5%	0.1%	0.0%	0.0%	0.1%	
AM Peak	10:00	07:00	07:00	09:00	07:00	07:00	08:00	07:00	10:00	07:00	06:00	06:00	10:00	07:00
Vol.	19	1724	219	15	49	25	3	24	15	6	2	1	3	2082
PM Peak	18:00	17:00	16:00	14:00	16:00	15:00	13:00	14:00	12:00	14:00	14:00	18:00	17:00	16:00
Vol.	32	1803	264	14	31	17	3	21	15	5	1	2	5	2118

Route 140 SB
north of Hathaway Road Ramps
City, State: New Bedford, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 Q-B2 class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	205	20	3	0	0	0	1	1	1	0	0	0	232
01:00	0	88	6	1	1	2	0	1	1	0	1	0	0	101
02:00	1	55	7	0	3	0	0	1	1	0	0	0	0	68
03:00	0	61	6	0	3	0	0	0	1	0	0	0	0	71
04:00	0	101	23	1	3	2	0	1	4	1	0	0	0	136
05:00	4	240	61	4	13	2	1	1	6	2	0	0	0	334
06:00	9	959	159	7	26	9	0	10	15	4	0	0	2	1200
07:00	5	1819	177	13	42	24	1	25	16	4	3	0	1	2130
08:00	11	1647	176	11	39	12	1	19	4	2	0	0	2	1924
09:00	4	1145	164	13	30	18	0	23	13	4	0	0	1	1415
10:00	16	1037	128	11	28	16	1	12	11	3	1	0	1	1265
11:00	15	1021	146	12	29	12	0	14	9	4	1	0	5	1268
12 PM	11	1030	128	7	23	14	2	19	16	4	1	0	3	1258
13:00	11	1072	144	13	23	18	0	8	9	2	1	0	2	1303
14:00	7	1355	164	16	18	17	1	18	8	6	1	0	1	1612
15:00	24	1763	215	8	23	32	0	19	7	4	1	0	2	2098
16:00	21	1813	266	3	29	20	0	22	10	1	0	1	2	2188
17:00	12	1904	214	7	22	23	0	14	8	0	1	1	2	2208
18:00	3	1488	160	3	19	6	1	11	2	2	0	0	1	1696
19:00	8	994	105	1	9	6	0	4	4	0	1	0	0	1132
20:00	4	671	76	0	5	3	0	2	1	0	0	0	0	762
21:00	1	630	50	1	5	1	0	0	2	0	0	0	0	690
22:00	0	527	48	2	8	0	0	3	2	1	0	0	0	591
23:00	1	328	39	1	3	1	0	2	2	0	0	0	0	377
Total	169	21953	2682	138	404	238	8	230	153	45	12	2	25	26059
Percent	0.6%	84.2%	10.3%	0.5%	1.6%	0.9%	0.0%	0.9%	0.6%	0.2%	0.0%	0.0%	0.1%	
AM Peak	10:00	07:00	07:00	07:00	07:00	07:00	05:00	07:00	07:00	06:00	07:00		11:00	07:00
Vol.	16	1819	177	13	42	24	1	25	16	4	3		5	2130
PM Peak	15:00	17:00	16:00	14:00	16:00	15:00	12:00	16:00	12:00	14:00	12:00	16:00	12:00	17:00
Vol.	24	1904	266	16	29	32	2	22	16	6	1	1	3	2208

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 G-C volume
Site Code: 10111.31

Start Time	A.M.	EB	P.M.				Wed 15-Oct-08
12:00	59		163				
12:15	53		182				
12:30	49		199				
12:45	24	185	213	757			
01:00	30		202				
01:15	26		220				
01:30	20		200				
01:45	23	99	205	827			
02:00	16		234				
02:15	25		258				
02:30	21		284				
02:45	8	70	305	1081			
03:00	15		307				
03:15	9		325				
03:30	13		369				
03:45	12	49	412	1413			
04:00	14		420				
04:15	14		447				
04:30	20		424				
04:45	24	72	411	1702			
05:00	26		428				
05:15	43		433				
05:30	58		385				
05:45	56	183	438	1684			
06:00	81		405				
06:15	90		337				
06:30	126		299				
06:45	157	454	285	1326			
07:00	167		211				
07:15	208		215				
07:30	213		193				
07:45	226	814	173	792			
08:00	184		162				
08:15	200		161				
08:30	166		168				
08:45	148	698	142	633			
09:00	132		146				
09:15	171		131				
09:30	166		152				
09:45	137	606	101	530			
10:00	156		93				
10:15	144		91				
10:30	178		77				
10:45	174	652	80	341			
11:00	173		51				
11:15	169		59				
11:30	170		68				
11:45	195	707	62	240			
Total	4589		11326				
Percent			100.0%		0.0%	0.0%	
Day Total		15915					
Peak	07:15		04:15				
Vol.	831		1710				
P.H.F.	0.919		0.956				

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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81676 G-C volume
Site Code: 10111.31

Start Time	A.M.	EB	P.M.				Thu 16-Oct-08
12:00	53		179				
12:15	56		198				
12:30	54		190				
12:45	32	195	228	795			
01:00	29		186				
01:15	28		200				
01:30	24		205				
01:45	19	100	219	810			
02:00	18		228				
02:15	26		288				
02:30	15		277				
02:45	14	73	307	1100			
03:00	8		336				
03:15	11		374				
03:30	14		371				
03:45	17	50	418	1499			
04:00	13		427				
04:15	14		463				
04:30	28		426				
04:45	25	80	457	1773			
05:00	20		371				
05:15	34		445				
05:30	44		400				
05:45	58	156	382	1598			
06:00	70		314				
06:15	89		326				
06:30	136		332				
06:45	141	436	271	1243			
07:00	175		190				
07:15	197		238				
07:30	212		199				
07:45	219	803	167	794			
08:00	197		153				
08:15	194		175				
08:30	188		154				
08:45	179	758	146	628			
09:00	156		139				
09:15	151		129				
09:30	147		146				
09:45	146	600	116	530			
10:00	144		95				
10:15	151		99				
10:30	151		81				
10:45	163	609	80	355			
11:00	177		60				
11:15	172		87				
11:30	178		66				
11:45	202	729	60	273			
Total	4589		11398				
Percent			100.0%		0.0%	0.0%	
Day Total		15987					
Peak	07:15		04:00				
Vol.	825		1773				
P.H.F.	0.942		0.957				

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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	58	9	0	3	0	0	0	2	0	0	0	0	72
01:00	2	42	4	0	4	1	0	0	4	0	0	0	0	57
02:00	0	26	8	0	1	0	0	3	5	0	0	0	0	43
03:00	1	64	16	1	7	0	0	0	3	0	0	0	0	92
04:00	2	208	78	7	32	2	0	3	2	0	0	0	0	334
05:00	4	660	375	10	122	3	0	12	7	0	0	0	0	1193
06:00	9	984	301	10	79	8	1	12	2	0	0	0	0	1406
07:00	11	1310	200	16	49	10	8	13	3	0	0	0	0	1620
08:00	6	1121	180	14	49	6	9	12	5	0	0	0	0	1402
09:00	7	740	154	12	37	15	3	10	9	0	0	0	0	987
10:00	3	601	137	11	44	8	1	9	2	0	0	0	0	816
11:00	18	601	137	12	40	12	3	13	10	1	0	0	0	847
12 PM	13	588	107	18	44	10	4	7	13	0	0	0	0	804
13:00	6	594	128	23	40	8	0	13	5	0	0	0	0	817
14:00	4	688	166	15	54	7	5	10	3	0	0	0	0	952
15:00	5	695	151	11	44	4	5	5	11	0	0	0	0	931
16:00	1	789	141	13	29	3	4	15	2	0	0	0	0	997
17:00	6	808	132	7	20	5	2	3	3	0	0	0	0	986
18:00	14	607	87	4	25	2	0	1	3	0	0	0	0	743
19:00	3	394	82	2	12	1	0	1	2	0	0	0	0	497
20:00	1	322	45	0	8	0	0	1	1	0	0	0	0	378
21:00	1	247	38	0	3	1	0	0	2	0	0	0	0	292
22:00	0	200	15	0	1	0	0	1	1	0	0	0	0	218
23:00	1	112	13	0	0	1	0	0	0	0	0	0	0	127
Total	118	12459	2704	186	747	107	45	144	100	1	0	0	0	16611
Percent	0.7%	75.0%	16.3%	1.1%	4.5%	0.6%	0.3%	0.9%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	05:00	07:00	05:00	09:00	08:00	07:00	11:00	11:00				07:00
Vol.	18	1310	375	16	122	15	9	13	10	1				1620
PM Peak	18:00	17:00	14:00	13:00	14:00	12:00	14:00	16:00	12:00					16:00
Vol.	14	808	166	23	54	10	5	15	13					997

PRECISION
D A T A
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

Direction 2

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:00	10	0	0	0	0	0	0	0	0	0	0	0	0	10	8	6
06:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
07:00	**13**	0	0	0	0	0	0	0	0	0	0	0	0	**13**	11	7
08:00	6	0	0	0	0	0	0	0	0	0	0	0	0	6	5	4
09:00	7	0	0	0	0	0	0	0	0	0	0	0	0	7	6	4
10:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
11:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
12 PM	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
13:00	4	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2
14:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
15:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
16:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
17:00	**7**	0	0	0	0	0	0	0	0	0	0	0	0	**7**	6	4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	74	0	0	0	0	0	0	0	0	0	0	0	0	74		
%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00													07:00		
Vol.	13													13		
PM Peak	17:00													17:00		
Vol.	7													7		

Pecent

15th Percentile :	4 MPH
50th Percentile :	17 MPH
85th Percentile :	30 MPH
95th Percentile :	33 MPH

Stats

10 MPH Pace Speed :	1-10 MPH
Number in Pace :	24
Percent in Pace :	32.4%
Number of Vehicles > 65 MPH :	0
Percent of Vehicles > 65 MPH :	0.0%
Mean Speed(Average) :	17 MPH

PRECISION DATA INDUSTRIES, LLC
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

Direction 2

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:00	8	0	0	0	0	0	0	0	0	0	0	0	0	8	7	4
06:00	10	0	0	0	0	0	0	0	0	0	0	0	0	10	8	6
07:00	**17**	0	0	0	0	0	0	0	0	0	0	0	0	**17**	14	9
08:00	9	0	0	0	0	0	0	0	0	0	0	0	0	9	8	5
09:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
10:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
11:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
12 PM	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1	41	41
13:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
14:00	**7**	0	0	0	0	0	0	0	0	0	0	0	0	**7**	6	4
15:00	4	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2
16:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
17:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
18:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
19:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
20:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	81	0	1	0	0	0	0	0	0	0	0	0	0	82		
%	98.8%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00													07:00		
Vol.	17													17		
PM Peak	14:00		12:00											14:00		
Vol.	7		1											7		

Pecent

15th Percentile :	4 MPH
50th Percentile :	15 MPH
85th Percentile :	30 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	1-10 MPH
Number in Pace :	30
Percent in Pace :	36.6%
Number of Vehicles > 65 MPH :	0
Percent of Vehicles > 65 MPH :	0.0%
Mean Speed(Average) :	17 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

WB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	3	9	17	16	11	4	1	0	0	61	73	66
01:00	1	0	0	2	2	3	19	19	5	2	0	0	0	53	70	64
02:00	0	0	0	0	2	5	14	18	4	2	1	0	0	46	70	66
03:00	0	0	0	3	3	10	25	25	14	5	1	2	0	88	73	66
04:00	4	0	0	1	8	28	79	87	73	23	12	0	1	316	75	67
05:00	55	0	0	0	12	81	233	283	257	183	62	6	2	1174	78	67
06:00	**63**	0	0	0	21	**125**	**272**	316	292	216	65	18	3	1391	78	67
07:00	63	0	0	2	**24**	96	272	**364**	**330**	**276**	110	12	5	**1554**	79	68
08:00	53	0	0	0	20	80	229	330	274	222	**121**	**37**	4	1370	79	69
09:00	47	0	0	3	17	77	213	243	205	117	41	14	6	983	77	67
10:00	48	0	0	**5**	21	74	151	202	177	87	46	15	5	831	77	66
11:00	49	0	0	1	11	46	191	233	128	88	35	18	**11**	811	77	66
12 PM	**51**	0	1	3	20	58	176	208	158	101	31	16	6	829	77	66
13:00	42	0	0	1	**21**	68	169	220	181	105	**59**	**17**	1	884	78	67
14:00	42	0	1	2	14	78	210	195	168	116	59	13	**7**	905	78	67
15:00	41	0	0	1	14	57	218	233	183	105	36	13	1	902	76	67
16:00	49	0	0	2	12	75	213	**288**	187	**139**	56	13	2	1036	77	67
17:00	44	0	0	0	5	87	**250**	256	**225**	137	47	7	4	**1062**	77	67
18:00	24	**1**	0	**4**	17	**101**	243	204	150	74	15	3	1	837	74	65
19:00	12	0	1	4	14	69	126	157	81	30	11	3	0	508	73	65
20:00	1	0	0	1	11	49	102	104	58	30	9	1	0	366	74	67
21:00	4	0	0	2	13	44	79	71	42	15	5	1	3	279	73	65
22:00	2	0	**2**	2	12	33	57	65	37	9	5	1	1	226	73	65
23:00	2	0	0	1	5	20	37	37	24	7	1	0	0	134	73	65
Total	697	1	5	40	302	1373	3595	4174	3264	2093	829	210	63	16646		
%	4.2%	0.0%	0.0%	0.2%	1.8%	8.2%	21.6%	25.1%	19.6%	12.6%	5.0%	1.3%	0.4%			
AM Peak	06:00			10:00	07:00	06:00	06:00	07:00	07:00	07:00	08:00	08:00	11:00	07:00		
Vol.	63			5	24	125	272	364	330	276	121	37	11	1554		
PM Peak	12:00	18:00	22:00	18:00	13:00	18:00	17:00	16:00	17:00	16:00	13:00	13:00	14:00	17:00		
Vol.	51	1	2	4	21	101	250	288	225	139	59	17	7	1062		

Pecent

15th Percentile :	61 MPH
50th Percentile :	68 MPH
85th Percentile :	77 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	7769
Percent in Pace :	46.7%
Number of Vehicles > 65 MPH :	10633
Percent of Vehicles > 65 MPH :	63.9%
Mean Speed(Average) :	67 MPH

PRECISION
D A T A
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

WB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	1	0	0	1	1	17	18	20	8	2	3	1	0	72	72	65
01:00	2	0	0	3	3	6	18	19	4	1	1	0	0	57	69	62
02:00	2	0	0	3	1	7	11	11	6	1	0	1	0	43	71	62
03:00	0	0	1	3	2	15	30	26	9	5	1	0	0	92	71	65
04:00	6	0	1	1	9	35	82	99	65	25	5	4	2	334	74	66
05:00	53	0	0	6	14	73	224	300	272	186	51	12	2	1193	77	67
06:00	63	0	0	7	25	**125**	268	320	300	207	74	14	3	1406	78	67
07:00	**79**	0	0	1	24	108	**293**	320	**407**	**266**	**103**	18	1	**1620**	78	68
08:00	70	0	0	3	**28**	99	245	**331**	272	240	90	20	4	1402	78	68
09:00	53	0	1	4	23	77	207	240	196	104	55	**21**	**6**	987	77	66
10:00	43	**1**	0	3	23	77	181	208	137	96	33	10	4	816	77	66
11:00	48	0	**2**	**8**	20	73	191	222	160	76	31	14	2	847	75	65
12 PM	47	**1**	0	**8**	24	77	195	222	137	62	23	6	2	804	74	64
13:00	46	0	0	1	20	71	188	218	146	80	31	13	3	817	76	65
14:00	**55**	0	**2**	1	**27**	88	196	239	207	96	33	6	2	952	75	65
15:00	39	0	0	4	23	**108**	**237**	198	171	96	37	14	4	931	76	66
16:00	44	0	0	3	20	75	188	259	**216**	116	**56**	**15**	5	**997**	77	67
17:00	26	0	0	4	12	43	202	**276**	207	**146**	50	15	5	986	78	69
18:00	14	0	0	2	8	53	169	222	170	71	25	3	**6**	743	75	68
19:00	2	1	0	3	16	60	145	141	82	29	16	1	1	497	74	66
20:00	3	0	0	1	11	40	92	118	74	27	12	0	0	378	74	67
21:00	2	0	2	2	12	41	85	62	49	27	6	2	2	292	75	66
22:00	2	0	0	4	9	20	65	60	43	5	7	2	1	218	73	66
23:00	0	0	0	1	9	9	40	36	22	8	2	0	0	127	73	66
Total	700	3	9	77	364	1397	3570	4167	3360	1972	745	192	55	16611		
%	4.2%	0.0%	0.1%	0.5%	2.2%	8.4%	21.5%	25.1%	20.2%	11.9%	4.5%	1.2%	0.3%			
AM Peak	07:00	10:00	11:00	11:00	08:00	06:00	07:00	08:00	07:00	07:00	07:00	09:00	09:00	07:00		
Vol.	79	1	2	8	28	125	293	331	407	266	103	21	6	1620		
PM Peak	14:00	12:00	14:00	12:00	14:00	15:00	15:00	17:00	16:00	17:00	16:00	16:00	18:00	16:00		
Vol.	55	1	2	8	27	108	237	276	216	146	56	15	6	997		

Pecent

15th Percentile :	60 MPH
50th Percentile :	68 MPH
85th Percentile :	77 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	7737
Percent in Pace :	46.6%
Number of Vehicles > 65 MPH :	10491
Percent of Vehicles > 65 MPH :	63.2%
Mean Speed(Average) :	67 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D volume
Site Code: 10111.31

Start Time	A.M.	WB	P.M.				Thu 16-Oct-08
12:00	17		207				
12:15	16		224				
12:30	13		193				
12:45	15	61	205	829			
01:00	15		193				
01:15	10		239				
01:30	15		201				
01:45	13	53	250	883			
02:00	13		199				
02:15	11		249				
02:30	5		236				
02:45	17	46	221	905			
03:00	15		201				
03:15	17		231				
03:30	33		238				
03:45	23	88	232	902			
04:00	37		232				
04:15	52		264				
04:30	104		284				
04:45	123	316	256	1036			
05:00	187		245				
05:15	285		293				
05:30	344		265				
05:45	358	1174	259	1062			
06:00	336		220				
06:15	339		218				
06:30	348		219				
06:45	368	1391	180	837			
07:00	327		159				
07:15	406		142				
07:30	420		99				
07:45	401	1554	108	508			
08:00	344		81				
08:15	339		98				
08:30	341		101				
08:45	346	1370	87	367			
09:00	260		85				
09:15	266		65				
09:30	228		70				
09:45	229	983	58	278			
10:00	189		76				
10:15	243		66				
10:30	208		47				
10:45	191	831	37	226			
11:00	215		28				
11:15	200		39				
11:30	183		37				
11:45	214	812	30	134			
Total	8679		7967				
Percent			100.0%		0.0%	0.0%	
Day Total		16646					
Peak	07:15		04:30				
Vol.	1571		1078				
P.H.F.	0.935		0.920				

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 G-D volume
Site Code: 10111.31

Start Time	A.M.	WB	P.M.				Wed 15-Oct-08
12:00	21		191				
12:15	24		211				
12:30	17		203				
12:45	10	72	199	804			
01:00	22		185				
01:15	10		199				
01:30	18		190				
01:45	7	57	243	817			
02:00	9		227				
02:15	7		258				
02:30	13		240				
02:45	14	43	227	952			
03:00	18		215				
03:15	12		232				
03:30	23		229				
03:45	39	92	255	931			
04:00	35		230				
04:15	66		225				
04:30	101		258				
04:45	132	334	284	997			
05:00	187		236				
05:15	304		251				
05:30	346		275				
05:45	357	1194	225	987			
06:00	322		191				
06:15	320		224				
06:30	365		157				
06:45	398	1405	171	743			
07:00	370		138				
07:15	434		138				
07:30	401		123				
07:45	416	1621	97	496			
08:00	369		96				
08:15	344		100				
08:30	326		94				
08:45	362	1401	88	378			
09:00	251		88				
09:15	280		74				
09:30	233		61				
09:45	223	987	69	292			
10:00	203		74				
10:15	200		57				
10:30	223		46				
10:45	190	816	41	218			
11:00	202		26				
11:15	221		37				
11:30	223		41				
11:45	201	847	23	127			
Total	8869		7742				
Percent			100.0%		0.0%	0.0%	
Day Total		16611					
Peak	07:00		04:45				
Vol.	1621		1046				
P.H.F.	0.934		0.921				

PRECISION DATA INDUSTRIES, LLC
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Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	173	15	1	1	3	0	1	0	0	0	0	0	195
01:00	2	86	8	0	3	1	0	0	0	0	0	0	0	100
02:00	1	63	6	0	1	2	0	0	0	0	0	0	0	73
03:00	1	40	4	0	2	1	0	0	2	0	0	0	0	50
04:00	3	60	10	0	3	3	0	0	1	0	0	0	0	80
05:00	5	121	18	0	2	5	0	1	3	1	0	0	0	156
06:00	7	338	53	2	6	14	0	6	8	1	0	0	0	435
07:00	22	657	55	1	18	27	2	10	11	1	0	0	0	804
08:00	14	633	48	5	15	31	0	7	5	0	0	0	0	758
09:00	23	466	48	3	15	30	0	2	13	0	0	0	0	600
10:00	32	458	48	3	16	40	1	4	6	0	1	0	0	609
11:00	29	554	67	4	32	29	1	7	6	0	0	0	0	729
12 PM	22	606	77	4	33	33	0	8	10	0	0	1	1	795
13:00	24	638	75	6	27	28	0	5	6	0	0	0	1	810
14:00	17	900	108	8	30	18	1	7	8	0	1	2	0	1100
15:00	17	1274	134	3	32	24	1	7	5	2	0	0	0	1499
16:00	21	1522	161	1	24	18	1	18	4	1	0	0	1	1772
17:00	16	1434	105	2	17	13	1	8	2	1	0	0	0	1599
18:00	8	1118	74	5	15	10	0	4	6	1	0	0	2	1243
19:00	1	719	61	2	4	4	1	2	0	0	0	0	0	794
20:00	6	575	37	0	2	6	0	0	2	0	0	0	0	628
21:00	6	496	20	2	1	5	0	0	0	0	0	0	0	530
22:00	2	329	19	0	1	3	0	1	0	0	0	0	0	355
23:00	2	241	25	1	1	1	0	0	2	0	0	0	0	273
Total	282	13501	1276	53	301	349	9	98	100	8	2	3	5	15987
Percent	1.8%	84.4%	8.0%	0.3%	1.9%	2.2%	0.1%	0.6%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	11:00	08:00	11:00	10:00	07:00	07:00	09:00	05:00	10:00			07:00
Vol.	32	657	67	5	32	40	2	10	13	1	1			804
PM Peak	13:00	16:00	16:00	14:00	12:00	12:00	14:00	16:00	12:00	15:00	14:00	14:00	18:00	16:00
Vol.	24	1522	161	8	33	33	1	18	10	2	1	2	2	1772

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	1	156	21	0	4	1	0	1	1	0	0	0	0	185
01:00	3	79	7	1	2	4	0	0	1	1	1	0	0	99
02:00	1	54	10	0	1	1	0	0	3	0	0	0	0	70
03:00	0	40	5	1	2	0	0	0	1	0	0	0	0	49
04:00	2	47	11	0	3	3	0	3	3	0	0	0	0	72
05:00	4	123	33	1	5	5	0	9	3	0	0	0	0	183
06:00	4	311	80	5	22	8	0	7	13	2	0	0	0	452
07:00	12	600	113	12	33	22	1	9	14	0	0	0	0	816
08:00	9	521	94	13	24	19	1	6	11	0	0	0	0	698
09:00	13	414	100	14	29	16	0	6	13	1	0	0	0	606
10:00	12	436	108	15	31	20	0	11	19	0	0	0	0	652
11:00	16	487	101	15	32	28	2	11	14	0	0	0	1	707
12 PM	14	551	113	10	33	11	0	15	9	0	0	0	1	757
13:00	19	608	115	9	20	28	1	9	16	0	1	0	0	826
14:00	16	873	113	9	20	29	1	15	6	0	0	0	0	1082
15:00	14	1144	180	4	21	27	1	12	9	0	0	0	0	1412
16:00	22	1431	173	4	29	21	2	12	8	0	0	0	1	1703
17:00	24	1490	116	5	22	16	0	7	4	0	0	0	0	1684
18:00	17	1184	84	3	17	12	1	6	1	1	0	0	0	1326
19:00	10	699	69	4	4	5	0	1	0	0	0	0	0	792
20:00	1	586	31	1	3	5	0	4	2	0	0	0	0	633
21:00	4	483	30	3	3	4	0	2	1	0	0	0	0	530
22:00	3	319	8	1	3	4	0	2	1	0	0	0	0	341
23:00	3	221	10	1	1	3	0	0	1	0	0	0	0	240
Total	224	12857	1725	131	364	292	10	148	154	5	2	0	3	15915
Percent	1.4%	80.8%	10.8%	0.8%	2.3%	1.8%	0.1%	0.9%	1.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	10:00	07:00	11:00	11:00	10:00	10:00	06:00	01:00		11:00	07:00
Vol.	16	600	113	15	33	28	2	11	19	2	1		1	816
PM Peak	17:00	17:00	15:00	12:00	12:00	14:00	16:00	12:00	13:00	18:00	13:00		12:00	16:00
Vol.	24	1490	180	10	33	29	2	15	16	1	1		1	1703

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C speed
Site Code: 10111.31

EB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	6	14	20	48	59	35	10	2	0	1	195	73	66
01:00	0	0	0	4	2	16	45	18	13	2	0	0	0	100	70	64
02:00	0	0	0	1	7	9	26	20	8	1	1	0	0	73	70	64
03:00	0	0	0	0	2	14	22	11	0	0	0	0	1	50	67	63
04:00	0	0	0	2	8	17	22	15	10	5	1	0	0	80	72	64
05:00	0	0	0	2	12	36	41	41	17	3	1	**2**	1	156	71	64
06:00	1	0	0	7	28	92	141	113	39	12	2	0	0	435	70	64
07:00	1	0	2	**15**	**59**	**173**	**265**	184	**85**	17	2	1	0	**804**	70	63
08:00	1	0	0	9	46	159	250	**204**	69	**18**	2	0	0	758	70	64
09:00	1	0	1	12	56	145	204	116	46	15	2	2	0	600	69	63
10:00	**2**	0	**3**	11	48	143	205	133	39	17	**4**	2	**2**	609	69	63
11:00	0	0	0	12	50	146	246	170	85	16	3	0	1	729	70	64
12 PM	1	0	0	**17**	**74**	153	261	190	75	21	3	0	0	795	70	63
13:00	**2**	0	2	7	40	163	262	217	91	23	2	1	0	810	70	64
14:00	0	0	**4**	10	44	184	381	302	138	**32**	5	0	0	1100	71	65
15:00	2	0	1	15	67	**257**	533	452	148	22	2	0	0	1499	70	64
16:00	2	0	1	10	61	233	**626**	**630**	174	29	6	0	0	**1772**	70	65
17:00	2	0	0	9	52	255	485	548	**223**	22	3	0	0	1599	71	65
18:00	0	0	0	4	40	200	403	389	174	28	4	1	0	1243	71	65
19:00	0	0	0	2	36	148	251	232	102	20	3	0	0	794	71	65
20:00	0	0	0	3	19	115	206	185	80	15	4	1	0	628	71	65
21:00	0	0	1	2	30	96	168	144	70	12	6	1	0	530	71	65
22:00	0	0	0	1	11	66	115	98	50	9	3	1	**1**	355	72	65
23:00	0	0	0	1	8	20	76	91	52	14	**8**	**3**	0	273	74	67
Total	15	0	15	162	814	2860	5282	4562	1823	363	69	15	7	15987		
%	0.1%	0.0%	0.1%	1.0%	5.1%	17.9%	33.0%	28.5%	11.4%	2.3%	0.4%	0.1%	0.0%			
AM Peak	10:00		10:00	07:00	07:00	07:00	07:00	08:00	07:00	08:00	10:00	05:00	10:00	07:00		
Vol.	2		3	15	59	173	265	204	85	18	4	2	2	804		
PM Peak	13:00		14:00	12:00	12:00	15:00	16:00	16:00	17:00	14:00	23:00	23:00	22:00	16:00		
Vol.	2		4	17	74	257	626	630	223	32	8	3	1	1772		

Pecent

15th Percentile :	58 MPH
50th Percentile :	64 MPH
85th Percentile :	70 MPH
95th Percentile :	75 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	9844
Percent in Pace :	61.6%
Number of Vehicles > 65 MPH :	6839
Percent of Vehicles > 65 MPH :	42.8%
Mean Speed(Average) :	64 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C speed
Site Code: 10111.31

EB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	3	7	22	52	47	43	9	1	1	0	185	73	66
01:00	0	0	0	0	10	21	38	19	9	1	0	1	0	99	69	63
02:00	0	0	0	1	4	11	29	15	6	2	2	0	0	70	70	64
03:00	0	0	0	0	0	8	18	12	5	3	1	1	1	49	74	67
04:00	0	0	0	1	2	11	26	19	8	4	1	0	0	72	71	65
05:00	0	0	0	3	11	31	42	57	25	11	1	1	1	183	73	66
06:00	0	0	0	8	18	59	120	125	78	30	9	3	2	452	74	66
07:00	0	**2**	0	3	26	84	**199**	**231**	**160**	79	**27**	2	**3**	**816**	75	68
08:00	0	0	0	8	16	89	175	168	133	**83**	18	**7**	1	698	76	68
09:00	0	0	0	3	24	82	185	140	112	51	6	2	1	606	74	66
10:00	0	0	**3**	**10**	**41**	103	180	178	92	39	5	1	0	652	73	65
11:00	0	0	1	9	30	**117**	195	175	127	39	12	1	1	707	73	66
12 PM	1	0	1	8	46	112	230	210	99	36	8	**6**	0	757	72	65
13:00	**2**	**1**	**3**	**19**	**71**	182	215	208	93	22	8	2	0	826	71	63
14:00	0	0	0	5	48	161	342	305	157	51	8	4	**1**	1082	72	66
15:00	0	0	0	12	44	215	427	407	242	**62**	3	0	0	1412	72	66
16:00	2	0	0	4	44	228	548	**577**	**248**	46	4	2	0	**1703**	71	66
17:00	1	0	0	3	47	**246**	**549**	576	219	39	3	1	0	1684	71	65
18:00	1	0	0	1	43	234	434	393	183	34	3	0	0	1326	71	65
19:00	0	0	1	2	34	141	279	221	89	21	4	0	0	792	70	65
20:00	0	0	0	5	42	113	231	166	66	9	1	0	0	633	70	64
21:00	0	0	2	6	18	94	197	123	69	12	**9**	0	0	530	71	65
22:00	0	0	0	6	14	44	114	104	42	11	2	3	1	341	71	65
23:00	1	0	0	2	9	34	91	72	23	6	0	2	0	240	70	65
Total	8	3	11	122	649	2442	4916	4548	2328	700	136	40	12	15915		
%	0.1%	0.0%	0.1%	0.8%	4.1%	15.3%	30.9%	28.6%	14.6%	4.4%	0.9%	0.3%	0.1%			
AM Peak		07:00	10:00	10:00	10:00	11:00	07:00	07:00	07:00	08:00	07:00	08:00	07:00	07:00		
Vol.		2	3	10	41	117	199	231	160	83	27	7	3	816		
PM Peak	13:00	13:00	13:00	13:00	13:00	17:00	17:00	16:00	16:00	15:00	21:00	12:00	14:00	16:00		
Vol.	2	1	3	19	71	246	549	577	248	62	9	6	1	1703		

Pecent

15th Percentile :	59 MPH
50th Percentile :	65 MPH
85th Percentile :	72 MPH
95th Percentile :	76 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	9464
Percent in Pace :	59.5%
Number of Vehicles > 65 MPH :	7764
Percent of Vehicles > 65 MPH :	48.8%
Mean Speed(Average) :	66 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	48	8	0	1	0	0	2	1	0	0	0	0	61
01:00	0	40	5	2	1	1	0	1	3	0	0	0	0	53
02:00	1	33	10	0	0	1	0	1	0	0	0	0	0	46
03:00	0	58	16	1	9	0	0	0	4	0	0	0	0	88
04:00	0	188	82	9	30	3	0	2	2	0	0	0	0	316
05:00	5	672	349	8	118	9	0	12	1	0	0	0	0	1174
06:00	6	974	316	8	61	10	0	10	6	0	0	0	0	1391
07:00	12	1227	227	12	40	14	0	14	8	0	0	0	0	1554
08:00	4	1095	176	11	52	8	0	16	8	0	0	0	0	1370
09:00	4	743	161	14	45	9	0	3	4	0	0	0	0	983
10:00	2	619	134	11	44	6	0	8	6	1	0	0	0	831
11:00	7	573	139	14	53	7	0	13	4	1	0	0	0	811
12 PM	7	595	128	20	48	6	2	13	10	0	0	0	0	829
13:00	8	633	155	22	45	5	0	11	5	0	0	0	0	884
14:00	6	649	160	20	44	9	0	16	1	0	0	0	0	905
15:00	3	696	146	10	39	3	0	4	1	0	0	0	0	902
16:00	6	814	147	8	47	6	0	8	0	0	0	0	0	1036
17:00	2	859	154	8	30	2	0	6	1	0	0	0	0	1062
18:00	2	682	115	4	28	4	0	2	0	0	0	0	0	837
19:00	0	420	67	3	15	0	0	3	0	0	0	0	0	508
20:00	1	310	43	0	9	1	0	1	1	0	0	0	0	366
21:00	0	226	47	0	5	0	0	0	1	0	0	0	0	279
22:00	0	197	26	0	1	0	0	1	1	0	0	0	0	226
23:00	0	115	16	1	1	0	0	0	1	0	0	0	0	134
Total	77	12466	2827	186	766	104	2	147	69	2	0	0	0	16646
Percent	0.5%	74.9%	17.0%	1.1%	4.6%	0.6%	0.0%	0.9%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	05:00	09:00	05:00	07:00		08:00	07:00	10:00				07:00
Vol.	12	1227	349	14	118	14		16	8	1				1554
PM Peak	13:00	17:00	14:00	13:00	12:00	14:00	12:00	14:00	12:00					17:00
Vol.	8	859	160	22	48	9	2	16	10					1062

PRECISION DATA INDUSTRIES, LLC
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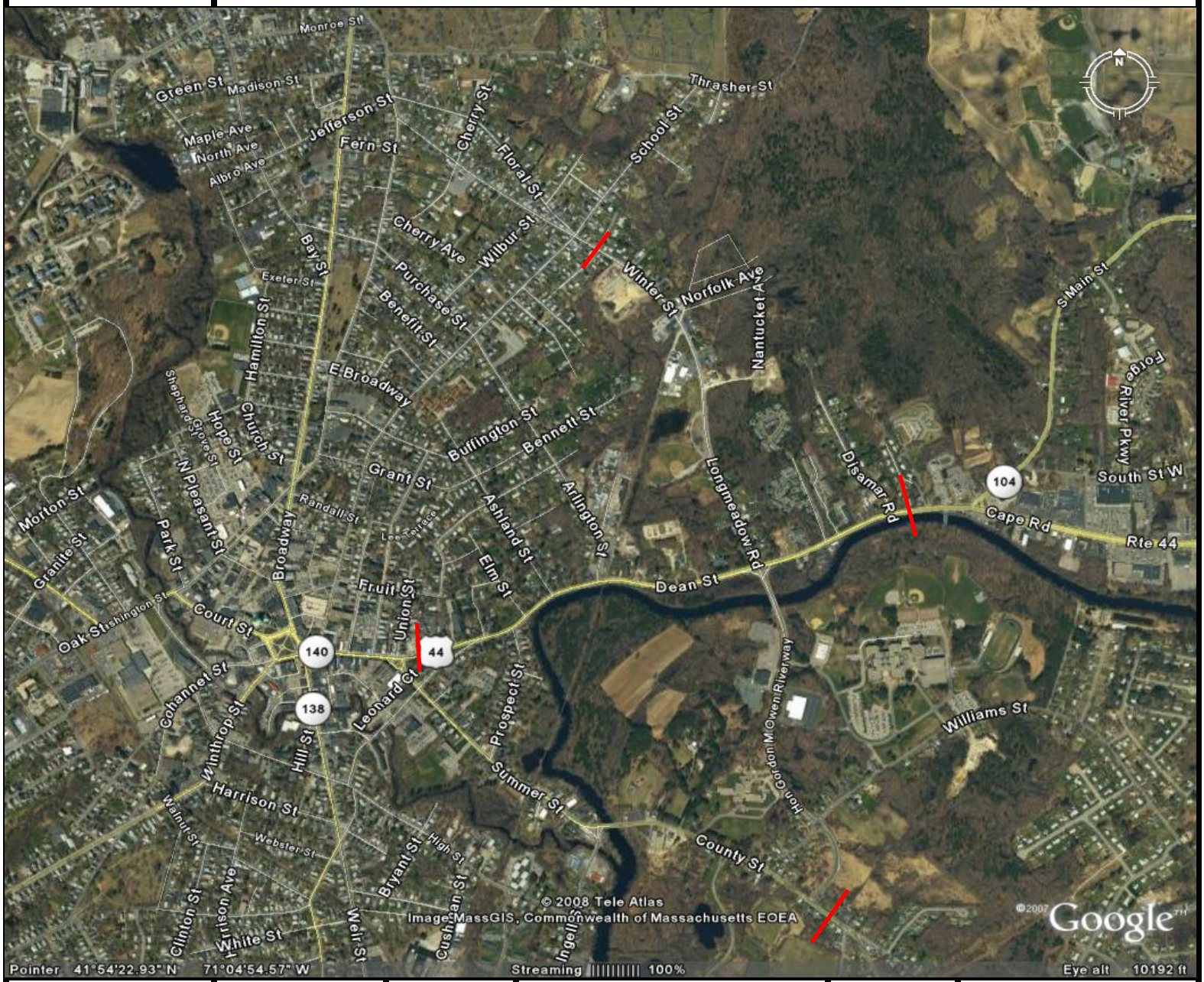
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Taunton, MA

Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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81676 K-A volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	42		214		25		234		67		448		
12:15	40		235		15		233		55		468		
12:30	20		268		11		232		31		500		
12:45	28	130	223	940	13	64	248	947	41	194	471	1887	
01:00	23		242		16		239		39		481		
01:15	16		242		16		220		32		462		
01:30	13		239		9		209		22		448		
01:45	14	66	252	975	8	49	211	879	22	115	463	1854	
02:00	9		259		14		245		23		504		
02:15	12		227		11		237		23		464		
02:30	6		263		7		254		13		517		
02:45	9	36	241	990	9	41	271	1007	18	77	512	1997	
03:00	7		217		8		211		15		428		
03:15	16		239		11		199		27		438		
03:30	5		256		15		219		20		475		
03:45	8	36	262	974	21	55	246	875	29	91	508	1849	
04:00	14		263		17		242		31		505		
04:15	14		264		28		257		42		521		
04:30	14		217		52		192		66		409		
04:45	14	56	225	969	58	155	215	906	72	211	440	1875	
05:00	15		195		72		195		87		390		
05:15	36		210		104		116		140		326		
05:30	37		289		136		223		173		512		
05:45	52	140	281	975	134	446	236	770	186	586	517	1745	
06:00	57		255		152		222		209		477		
06:15	102		290		207		184		309		474		
06:30	125		277		204		198		329		475		
06:45	137	421	263	1085	223	786	176	780	360	1207	439	1865	
07:00	151		249		255		156		406		405		
07:15	200		232		255		170		455		402		
07:30	205		242		255		156		460		398		
07:45	175	731	209	932	261	1026	154	636	436	1757	363	1568	
08:00	167		187		203		115		370		302		
08:15	224		163		262		106		486		269		
08:30	230		167		222		97		452		264		
08:45	242	863	129	646	259	946	92	410	501	1809	221	1056	
09:00	192		147		241		123		433		270		
09:15	206		135		236		87		442		222		
09:30	190		123		226		79		416		202		
09:45	210	798	97	502	224	927	75	364	434	1725	172	866	
10:00	206		95		226		78		432		173		
10:15	226		72		227		63		453		135		
10:30	210		90		225		61		435		151		
10:45	232	874	70	327	211	889	42	244	443	1763	112	571	
11:00	211		92		216		54		427		146		
11:15	223		70		230		25		453		95		
11:30	233		43		249		35		482		78		
11:45	211	878	44	249	244	939	20	134	455	1817	64	383	
Total	5029		9564		6323		7952		11352		17516		
Percent	44.3%		54.6%		55.7%		45.4%						
Day Total		14593				14275				28868			
Peak	10:45		05:30		07:00		02:00		08:15		03:30		
Vol.	899		1115		1026		1007		1872		2009		
P.H.F.	0.929		0.961		0.983		0.929		0.934		0.964		

Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

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81676 K-A volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	40		226		16		241		56		467		
12:15	36		250		10		205		46		455		
12:30	35		248		14		247		49		495		
12:45	16	127	233	957	13	53	245	938	29	180	478	1895	
01:00	19		245		4		206		23		451		
01:15	17		236		14		226		31		462		
01:30	9		242		14		229		23		471		
01:45	15	60	219	942	6	38	211	872	21	98	430	1814	
02:00	13		230		14		198		27		428		
02:15	13		196		8		196		21		392		
02:30	8		179		8		155		16		334		
02:45	8	42	183	788	13	43	177	726	21	85	360	1514	
03:00	8		155		11		174		19		329		
03:15	13		175		13		182		26		357		
03:30	7		227		15		193		22		420		
03:45	5	33	247	804	15	54	166	715	20	87	413	1519	
04:00	11		244		13		220		24		464		
04:15	12		256		25		203		37		459		
04:30	14		249		42		201		56		450		
04:45	16	53	229	978	60	140	202	826	76	193	431	1804	
05:00	16		206		68		183		84		389		
05:15	28		216		98		129		126		345		
05:30	45		289		131		181		176		470		
05:45	47	136	258	969	164	461	231	724	211	597	489	1693	
06:00	51		273		152		243		203		516		
06:15	83		277		204		217		287		494		
06:30	129		259		213		211		342		470		
06:45	135	398	274	1083	247	816	198	869	382	1214	472	1952	
07:00	168		267		251		198		419		465		
07:15	203		228		233		168		436		396		
07:30	198		278		285		162		483		440		
07:45	179	748	238	1011	287	1056	144	672	466	1804	382	1683	
08:00	191		246		232		130		423		376		
08:15	212		261		225		135		437		396		
08:30	193		225		270		143		463		368		
08:45	207	803	208	940	279	1006	144	552	486	1809	352	1492	
09:00	192		206		246		157		438		363		
09:15	175		162		230		106		405		268		
09:30	212		145		227		92		439		237		
09:45	200	779	119	632	235	938	78	433	435	1717	197	1065	
10:00	184		132		240		81		424		213		
10:15	196		97		239		57		435		154		
10:30	206		97		233		84		439		181		
10:45	214	800	86	412	214	926	56	278	428	1726	142	690	
11:00	214		80		209		52		423		132		
11:15	203		82		228		38		431		120		
11:30	203		57		261		31		464		88		
11:45	215	835	45	264	227	925	28	149	442	1760	73	413	
Total	4814		9780		6456		7754		11270		17534		
Percent	42.7%		55.8%		57.3%		44.2%						
Day Total		14594				14210				28804			
Peak	10:30		05:30		07:00		12:00		08:15		05:30		
Vol.	837		1097		1056		938		1824		1969		
P.H.F.	0.978		0.949		0.920		0.949		0.938		0.954		

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0 8	0	0	4	2	16	59	39	6	3	**1**	0	0	0	130	43	38
01:00	0	0	0	2	6	22	25	8	3	0	0	0	0	66	45	40
02:00	0	0	0	0	5	13	13	4	1	0	0	0	0	36	44	40
03:00	0	1	0	2	7	12	10	3	1	0	0	0	0	36	44	37
04:00	0	0	0	1	3	19	25	7	0	1	0	0	0	56	44	40
05:00	0	0	2	2	14	53	42	24	3	0	0	0	0	140	46	40
06:00	0	1	4	11	57	178	127	42	1	0	0	0	0	421	44	38
07:00	4	8	28	103	215	226	126	17	4	0	0	0	0	731	41	34
08:00	8	9	49	154	296	251	85	10	1	0	0	0	0	863	39	33
09:00	0	2	37	148	306	233	57	13	2	0	0	0	0	798	38	33
10:00	0	6	63	207	367	183	42	6	0	0	0	0	0	874	37	32
11:00	1	2	51	233	346	199	42	3	1	0	0	0	0	878	37	32
12 PM	0	10	127	289	342	148	21	3	0	0	0	0	0	940	36	30
13:00	4	41	203	356	254	96	16	4	0	0	0	0	1	975	34	28
14:00	3	17	165	362	291	138	12	2	0	0	0	0	0	990	35	29
15:00	23	67	304	291	190	81	18	0	0	0	0	0	0	974	33	26
16:00	28	71	229	299	220	98	23	1	0	0	0	0	0	969	34	27
17:00	33	134	236	215	247	89	17	3	1	0	0	0	0	975	34	26
18:00	0	10	99	303	367	244	57	5	0	0	0	0	0	1085	37	31
19:00	0	3	43	182	370	271	54	7	2	0	0	0	0	932	38	33
20:00	0	0	3	49	236	261	79	17	1	0	0	0	0	646	39	35
21:00	0	0	0	21	117	236	106	19	2	1	0	0	0	502	42	37
22:00	0	0	0	3	53	141	108	18	2	2	0	0	0	327	43	39
23:00	0	1	2	3	39	116	67	20	0	1	0	0	0	249	43	38
Total	104	383	1649	3238	4364	3367	1211	242	28	6	0	0	1	14593		
%	0.7%	2.6%	11.3%	22.2%	29.9%	23.1%	8.3%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	10:00	11:00	10:00	08:00	06:00	06:00	07:00	00:00				11:00		
Vol.	8	9	63	233	367	251	127	42	4	1				878		
PM Peak	17:00	17:00	15:00	14:00	19:00	19:00	22:00	23:00	19:00	22:00			13:00	18:00		
Vol.	33	134	304	362	370	271	108	20	2	2			1	1085		

Pecent

15th Percentile : 25 MPH
50th Percentile : 32 MPH
85th Percentile : 38 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 7731
Percent in Pace : 53.0%
Number of Vehicles > 35 MPH : 4181
Percent of Vehicles > 35 MPH : 28.7%
Mean Speed(Average) : 31 MPH

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81676 K-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	1	1	1	13	57	36	16	2	0	0	0	0	127	44	39
01:00	0	0	1	5	10	24	16	4	0	0	0	0	0	60	43	37
02:00	0	0	0	2	2	18	13	5	1	**1**	0	0	0	42	45	40
03:00	0	1	0	4	5	10	9	4	0	0	0	0	0	33	43	37
04:00	0	0	0	2	8	19	18	5	1	0	0	0	0	53	44	39
05:00	0	1	1	2	28	44	45	13	2	0	0	0	0	136	44	38
06:00	0	1	7	22	54	178	98	**32**	**5**	1	0	0	0	398	43	38
07:00	0	2	24	93	210	265	**132**	20	1	1	0	0	0	748	41	35
08:00	**4**	**7**	**59**	137	274	208	93	19	2	0	0	0	0	803	39	33
09:00	0	7	21	102	287	**270**	74	17	0	1	0	0	0	779	39	34
10:00	0	3	41	155	290	238	68	5	0	0	0	0	0	800	38	33
11:00	0	4	50	**167**	**339**	224	43	7	1	0	0	0	0	**835**	38	32
12 PM	2	9	83	274	334	206	44	4	1	0	0	0	0	957	37	31
13:00	10	35	207	347	215	105	22	1	0	0	0	0	0	942	34	28
14:00	35	96	**363**	208	74	11	1	0	0	0	0	0	0	788	29	23
15:00	34	79	358	249	63	19	2	0	0	0	0	0	0	804	29	24
16:00	30	81	266	291	201	93	15	1	0	0	0	0	0	978	34	26
17:00	**66**	**132**	305	255	161	45	5	0	0	0	0	0	0	969	32	24
18:00	1	7	102	**356**	**411**	173	27	5	0	**1**	0	0	0	**1083**	36	30
19:00	0	12	82	202	395	252	62	6	0	0	0	0	0	1011	38	32
20:00	0	7	18	156	326	**323**	99	10	1	0	0	0	0	940	39	34
21:00	0	2	11	65	213	248	78	11	**3**	1	0	0	0	632	39	35
22:00	0	0	0	8	64	190	**117**	**29**	3	1	0	0	0	412	43	38
23:00	0	0	6	13	49	107	71	13	3	1	**1**	0	0	264	43	37
Total	182	487	2006	3116	4026	3327	1188	227	26	8	1	0	0	14594		
%	1.2%	3.3%	13.7%	21.4%	27.6%	22.8%	8.1%	1.6%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	11:00	11:00	09:00	07:00	06:00	06:00	02:00				11:00		
Vol.	4	7	59	167	339	270	132	32	5	1				835		
PM Peak	17:00	17:00	14:00	18:00	18:00	20:00	22:00	22:00	21:00	18:00	23:00			18:00		
Vol.	66	132	363	356	411	323	117	29	3	1	1			1083		

Pecent

15th Percentile :	23 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	7353
Percent in Pace :	50.4%
Number of Vehicles > 35 MPH :	4111
Percent of Vehicles > 35 MPH :	28.2%
Mean Speed(Average) :	31 MPH

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81676 K-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	1	7	35	18	3	0	0	0	0	0	64	42	38
01:00	0	0	1	3	15	20	9	0	**1**	0	0	0	0	49	41	36
02:00	0	0	0	1	6	24	7	3	0	0	0	0	0	41	41	38
03:00	0	0	2	0	10	23	17	3	0	0	0	0	0	55	43	37
04:00	1	2	0	2	31	66	45	7	1	0	0	0	0	155	43	37
05:00	0	1	5	7	75	210	**129**	**18**	1	0	0	0	0	446	43	38
06:00	0	1	3	76	311	**325**	66	4	0	0	0	0	0	786	39	34
07:00	**7**	**19**	66	217	**457**	230	30	0	0	0	0	0	0	**1026**	37	31
08:00	1	7	**73**	236	402	197	27	3	0	0	0	0	0	946	37	31
09:00	0	9	47	231	446	178	15	1	0	0	0	0	0	927	36	31
10:00	5	5	57	264	388	154	14	2	0	0	0	0	0	889	36	31
11:00	1	5	72	**320**	406	119	16	0	0	0	0	0	0	939	34	30
12 PM	5	16	77	358	**380**	99	11	1	0	0	0	0	0	947	34	30
13:00	3	21	104	358	316	71	6	0	0	0	0	0	0	879	34	29
14:00	4	17	112	**418**	368	83	4	1	0	0	0	0	0	**1007**	34	29
15:00	**15**	**46**	190	322	242	56	3	1	0	0	0	0	0	875	33	27
16:00	4	20	**201**	327	279	69	6	0	0	0	0	0	0	906	33	28
17:00	5	25	186	212	223	109	9	1	0	0	0	0	0	770	35	28
18:00	0	1	22	180	344	**212**	19	2	0	0	0	0	0	780	37	32
19:00	0	0	1	119	319	169	26	1	1	0	0	0	0	636	37	33
20:00	0	0	1	20	181	168	**37**	3	0	0	0	0	0	410	39	35
21:00	0	1	1	31	128	164	36	3	0	0	0	0	0	364	39	35
22:00	0	0	4	5	73	122	35	**4**	1	0	0	0	0	244	40	36
23:00	0	0	1	1	31	78	20	1	**2**	0	0	0	0	134	40	37
Total	51	196	1226	3709	5438	2981	605	62	7	0	0	0	0	14275		
%	0.4%	1.4%	8.6%	26.0%	38.1%	20.9%	4.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	11:00	07:00	06:00	05:00	05:00	01:00					07:00		
Vol.	7	19	73	320	457	325	129	18	1					1026		
PM Peak	15:00	15:00	16:00	14:00	12:00	18:00	20:00	22:00	23:00					14:00		
Vol.	15	46	201	418	380	212	37	4	2					1007		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	9147
Percent in Pace :	64.1%
Number of Vehicles > 35 MPH :	3058
Percent of Vehicles > 35 MPH :	21.4%
Mean Speed(Average) :	31 MPH

PRECISION
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INDUSTRIES, LLC
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	1	0	1	15	25	10	0	1	0	0	0	0	53	41	36
01:00	0	0	0	1	17	14	5	1	0	0	0	0	0	38	39	35
02:00	0	0	0	3	8	11	14	6	1	0	0	0	0	43	45	39
03:00	0	0	1	1	12	29	8	3	0	0	0	0	0	54	41	37
04:00	0	0	0	6	16	61	41	**15**	1	0	0	0	0	140	44	39
05:00	0	0	2	8	57	240	**139**	12	**2**	**1**	0	0	0	461	43	38
06:00	2	4	21	119	276	**300**	92	2	0	0	0	0	0	816	39	34
07:00	0	17	38	199	**488**	267	43	4	0	0	0	0	0	**1056**	37	32
08:00	0	6	53	199	438	269	40	0	1	0	0	0	0	1006	37	32
09:00	0	5	44	190	450	227	21	1	0	0	0	0	0	938	37	32
10:00	8	14	59	213	442	168	22	0	0	0	0	0	0	926	36	31
11:00	**9**	**19**	**70**	**294**	399	122	11	1	0	0	0	0	0	925	34	30
12 PM	1	21	75	265	**408**	157	11	0	0	0	0	0	0	**938**	35	30
13:00	7	34	292	**322**	188	27	2	0	0	0	0	0	0	872	32	26
14:00	**24**	**96**	**359**	168	66	13	0	0	0	0	0	0	0	726	29	23
15:00	22	64	299	208	98	22	2	0	0	0	0	0	0	715	30	24
16:00	8	23	140	257	307	81	10	0	0	0	0	0	0	826	34	29
17:00	3	26	190	221	210	68	6	0	0	0	0	0	0	724	34	28
18:00	2	10	31	204	395	186	37	4	0	0	0	0	0	869	37	32
19:00	0	5	16	88	366	176	20	1	0	0	0	0	0	672	37	33
20:00	1	0	11	48	272	192	23	5	0	0	0	0	0	552	38	34
21:00	0	0	2	23	174	**195**	35	4	0	0	0	0	0	433	39	35
22:00	0	1	2	16	61	148	**40**	**9**	**1**	0	0	0	0	278	40	36
23:00	0	0	1	0	39	75	31	2	1	0	0	0	0	149	41	37
Total	87	346	1706	3054	5202	3073	663	70	8	1	0	0	0	14210		
%	0.6%	2.4%	12.0%	21.5%	36.6%	21.6%	4.7%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	07:00	06:00	05:00	04:00	05:00	05:00				07:00		
Vol.	9	19	70	294	488	300	139	15	2	1				1056		
PM Peak	14:00	14:00	14:00	13:00	12:00	21:00	22:00	22:00	22:00					12:00		
Vol.	24	96	359	322	408	195	40	9	1					938		

Pecent

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	40 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	8275
Percent in Pace :	58.2%
Number of Vehicles > 35 MPH :	3200
Percent of Vehicles > 35 MPH :	22.5%
Mean Speed(Average) :	31 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	108	18	0	2	0	0	1	1	0	0	0	0	130
01:00	0	59	4	0	2	0	0	0	1	0	0	0	0	66
02:00	0	29	4	0	1	1	0	0	1	0	0	0	0	36
03:00	1	25	6	0	3	0	0	0	1	0	0	0	0	36
04:00	0	42	12	0	2	0	0	0	0	0	0	0	0	56
05:00	2	87	37	0	8	2	0	1	3	0	0	0	0	140
06:00	4	299	81	4	15	8	0	3	6	1	0	0	0	421
07:00	8	564	118	3	20	10	1	5	1	1	0	0	0	731
08:00	3	689	145	2	17	3	0	3	1	0	0	0	0	863
09:00	4	602	145	3	22	13	1	6	2	0	0	0	0	798
10:00	6	656	158	4	26	13	1	6	4	0	0	0	0	874
11:00	15	653	155	2	23	14	0	10	6	0	0	0	0	878
12 PM	15	744	131	5	26	9	1	6	3	0	0	0	0	940
13:00	16	728	168	4	29	17	0	9	4	0	0	0	0	975
14:00	9	771	163	2	19	18	0	7	1	0	0	0	0	990
15:00	17	760	157	2	19	12	0	6	0	1	0	0	0	974
16:00	19	783	130	0	16	13	0	6	2	0	0	0	0	969
17:00	16	820	107	0	16	10	0	4	2	0	0	0	0	975
18:00	8	914	136	0	15	5	0	5	2	0	0	0	0	1085
19:00	3	775	126	0	18	9	0	0	1	0	0	0	0	932
20:00	4	539	86	1	8	3	0	4	1	0	0	0	0	646
21:00	0	435	62	0	3	1	0	1	0	0	0	0	0	502
22:00	0	284	40	0	3	0	0	0	0	0	0	0	0	327
23:00	1	207	30	7	1	1	0	0	2	0	0	0	0	249
Total	151	11573	2219	39	314	162	4	83	45	3	0	0	0	14593
Percent	1.0%	79.3%	15.2%	0.3%	2.2%	1.1%	0.0%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	10:00	06:00	10:00	11:00	07:00	11:00	06:00	06:00				11:00
Vol.	15	689	158	4	26	14	1	10	6	1				878
PM Peak	16:00	18:00	13:00	23:00	13:00	14:00	12:00	13:00	13:00	15:00				18:00
Vol.	19	914	168	7	29	18	1	9	4	1				1085

PRECISION
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	105	22	0	0	0	0	0	0	0	0	0	0	127
01:00	0	47	11	0	1	0	0	0	1	0	0	0	0	60
02:00	0	35	4	0	1	0	0	1	1	0	0	0	0	42
03:00	0	20	11	0	1	0	0	0	1	0	0	0	0	33
04:00	0	40	4	0	2	2	0	0	4	1	0	0	0	53
05:00	2	85	36	2	6	2	0	2	1	0	0	0	0	136
06:00	6	279	90	3	13	4	0	1	2	0	0	0	0	398
07:00	10	572	126	5	16	10	1	5	3	0	0	0	0	748
08:00	10	619	130	3	23	10	0	5	2	1	0	0	0	803
09:00	5	583	149	5	24	6	1	4	2	0	0	0	0	779
10:00	9	609	145	5	18	8	0	2	4	0	0	0	0	800
11:00	9	650	143	0	18	9	0	2	4	0	0	0	0	835
12 PM	10	747	163	2	18	8	0	6	3	0	0	0	0	957
13:00	14	747	133	4	22	11	0	5	5	0	0	0	1	942
14:00	14	655	90	3	10	9	0	5	1	0	1	0	0	788
15:00	13	636	118	3	15	11	0	7	1	0	0	0	0	804
16:00	18	785	137	1	17	15	0	5	0	0	0	0	0	978
17:00	20	832	95	0	7	7	0	6	2	0	0	0	0	969
18:00	29	892	137	1	13	8	0	3	0	0	0	0	0	1083
19:00	7	836	140	3	17	5	0	3	0	0	0	0	0	1011
20:00	10	777	126	2	10	3	0	6	6	0	0	0	0	940
21:00	6	530	83	0	10	2	0	1	0	0	0	0	0	632
22:00	2	342	57	1	6	2	0	2	0	0	0	0	0	412
23:00	1	229	29	0	3	1	0	0	1	0	0	0	0	264
Total	195	11652	2179	43	271	133	2	71	44	2	1	0	1	14594
Percent	1.3%	79.8%	14.9%	0.3%	1.9%	0.9%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	09:00	07:00	09:00	07:00	07:00	07:00	04:00	04:00				11:00
Vol.	10	650	149	5	24	10	1	5	4	1				835
PM Peak	18:00	18:00	12:00	13:00	13:00	16:00		15:00	20:00		14:00		13:00	18:00
Vol.	29	892	163	4	22	15		7	6		1		1	1083

PRECISION
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	49	9	0	4	0	0	0	1	0	0	0	0	64
01:00	0	41	3	0	2	0	0	1	2	0	0	0	0	49
02:00	0	31	3	0	2	1	0	0	3	1	0	0	0	41
03:00	0	47	3	0	2	2	0	0	1	0	0	0	0	55
04:00	0	115	32	0	6	1	0	1	0	0	0	0	0	155
05:00	2	332	93	2	13	0	0	0	4	0	0	0	0	446
06:00	2	589	139	4	24	8	0	1	19	0	0	0	0	786
07:00	3	862	118	4	17	11	0	6	5	0	0	0	0	1026
08:00	5	802	98	2	24	5	0	2	7	0	1	0	0	946
09:00	2	766	116	4	20	10	0	3	6	0	0	0	0	927
10:00	9	739	104	2	18	8	0	4	5	0	0	0	0	889
11:00	13	784	103	1	22	10	0	4	2	0	0	0	0	939
12 PM	8	800	95	5	25	8	0	4	2	0	0	0	0	947
13:00	11	752	84	3	15	5	1	5	3	0	0	0	0	879
14:00	19	844	103	3	19	7	1	7	4	0	0	0	0	1007
15:00	11	738	95	2	20	3	0	4	2	0	0	0	0	875
16:00	17	781	82	2	15	2	0	5	2	0	0	0	0	906
17:00	19	679	59	2	11	0	0	0	0	0	0	0	0	770
18:00	6	686	70	0	14	3	0	0	0	1	0	0	0	780
19:00	9	546	66	0	11	0	0	3	1	0	0	0	0	636
20:00	2	372	31	0	3	2	0	0	0	0	0	0	0	410
21:00	3	313	39	0	3	1	0	4	1	0	0	0	0	364
22:00	2	215	23	0	4	0	0	0	0	0	0	0	0	244
23:00	0	118	12	1	1	0	0	1	1	0	0	0	0	134
Total	144	12001	1580	37	295	87	2	55	71	2	1	0	0	14275
Percent	1.0%	84.1%	11.1%	0.3%	2.1%	0.6%	0.0%	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	06:00	06:00	06:00	07:00		07:00	06:00	02:00	08:00			07:00
Vol.	13	862	139	4	24	11		6	19	1	1			1026
PM Peak	14:00	14:00	14:00	12:00	12:00	12:00	13:00	14:00	14:00	18:00				14:00
Vol.	19	844	103	5	25	8	1	7	4	1				1007

PRECISION
D A T A
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Dean Street (Route 44)
west of River Road
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 K-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	49	3	0	0	1	0	0	0	0	0	0	0	53
01:00	0	31	5	0	0	0	0	1	1	0	0	0	0	38
02:00	2	30	3	0	2	1	0	0	3	2	0	0	0	43
03:00	0	44	8	0	0	0	0	1	0	1	0	0	0	54
04:00	2	102	30	1	1	2	0	0	2	0	0	0	0	140
05:00	4	346	93	1	12	1	0	1	3	0	0	0	0	461
06:00	6	633	137	1	12	9	0	3	15	0	0	0	0	816
07:00	11	872	132	7	21	5	0	3	5	0	0	0	0	1056
08:00	13	833	123	6	14	4	0	9	4	0	0	0	0	1006
09:00	6	788	119	1	13	8	0	0	3	0	0	0	0	938
10:00	5	769	120	1	14	11	2	1	3	0	0	0	0	926
11:00	15	785	81	5	17	5	1	10	6	0	0	0	0	925
12 PM	15	787	103	4	15	8	0	4	2	0	0	0	0	938
13:00	13	721	101	2	12	9	0	4	8	1	0	0	1	872
14:00	16	637	52	5	7	6	0	3	0	0	0	0	0	726
15:00	14	611	69	0	13	1	0	5	2	0	0	0	0	715
16:00	15	723	70	0	11	3	0	2	1	0	1	0	0	826
17:00	13	652	41	0	13	2	0	3	0	0	0	0	0	724
18:00	11	774	68	0	12	3	0	1	0	0	0	0	0	869
19:00	8	581	69	0	11	3	0	0	0	0	0	0	0	672
20:00	8	482	51	1	7	1	0	2	0	0	0	0	0	552
21:00	4	378	39	0	6	3	0	1	2	0	0	0	0	433
22:00	2	244	25	0	4	2	0	1	0	0	0	0	0	278
23:00	2	129	13	1	3	0	0	0	1	0	0	0	0	149
Total	185	12001	1555	36	220	88	3	55	61	4	1	0	1	14210
Percent	1.3%	84.5%	10.9%	0.3%	1.5%	0.6%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	06:00	07:00	07:00	10:00	10:00	11:00	06:00	02:00				07:00
Vol.	15	872	137	7	21	11	2	10	15	2				1056
PM Peak	14:00	12:00	12:00	14:00	12:00	13:00		15:00	13:00	13:00	16:00		13:00	12:00
Vol.	16	787	103	5	15	9		5	8	1	1		1	938

Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 K-B volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	8		54		8		81		16		135		
12:15	9		51		7		89		16		140		
12:30	5		55		7		96		12		151		
12:45	2	24	56	216	6	28	83	349	8	52	139	565	
01:00	5		57		6		78		11		135		
01:15	2		50		9		77		11		127		
01:30	7		58		5		95		12		153		
01:45	1	15	79	244	7	27	77	327	8	42	156	571	
02:00	5		69		3		119		8		188		
02:15	5		96		6		127		11		223		
02:30	2		89		4		116		6		205		
02:45	3	15	81	335	3	16	143	505	6	31	224	840	
03:00	4		91		3		116		7		207		
03:15	1		83		5		117		6		200		
03:30	4		129		2		108		6		237		
03:45	3	12	110	413	4	14	141	482	7	26	251	895	
04:00	2		129		7		129		9		258		
04:15	7		106		5		118		12		224		
04:30	21		124		11		125		32		249		
04:45	18	48	148	507	10	33	130	502	28	81	278	1009	
05:00	9		124		10		123		19		247		
05:15	12		121		27		138		39		259		
05:30	24		142		26		108		50		250		
05:45	37	82	122	509	36	99	91	460	73	181	213	969	
06:00	36		98		37		99		73		197		
06:15	50		102		48		97		98		199		
06:30	82		77		77		83		159		160		
06:45	85	253	78	355	57	219	90	369	142	472	168	724	
07:00	114		68		88		80		202		148		
07:15	122		62		118		69		240		131		
07:30	84		71		140		62		224		133		
07:45	98	418	61	262	86	432	72	283	184	850	133	545	
08:00	73		48		98		69		171		117		
08:15	66		50		100		75		166		125		
08:30	59		34		85		56		144		90		
08:45	74	272	33	165	80	363	49	249	154	635	82	414	
09:00	43		49		68		61		111		110		
09:15	49		41		61		42		110		83		
09:30	45		25		74		39		119		64		
09:45	53	190	25	140	64	267	34	176	117	457	59	316	
10:00	52		16		57		39		109		55		
10:15	61		20		60		34		121		54		
10:30	48		20		61		34		109		54		
10:45	54	215	21	77	84	262	25	132	138	477	46	209	
11:00	55		20		66		21		121		41		
11:15	61		9		65		17		126		26		
11:30	64		12		75		14		139		26		
11:45	52	232	11	52	72	278	11	63	124	510	22	115	
Total	1776		3275		2038		3897		3814		7172		
Percent	46.6%		45.7%		53.4%		54.3%						
Day Total		5051				5935				10986			
Peak	07:00		04:45		07:15		04:30		07:00		04:45		
Vol.	418		535		442		516		850		1034		
P.H.F.	0.857		0.904		0.789		0.935		0.885		0.930		

Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 K-B volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		61		8		65		17		126		
12:15	8		68		12		93		20		161		
12:30	6		58		9		81		15		139		
12:45	8	31	66	253	5	34	68	307	13	65	134	560	
01:00	6		81		5		75		11		156		
01:15	7		75		5		79		12		154		
01:30	4		84		4		98		8		182		
01:45	1	18	85	325	6	20	83	335	7	38	168	660	
02:00	4		73		4		112		8		185		
02:15	1		82		5		136		6		218		
02:30	2		109		3		125		5		234		
02:45	2	9	96	360	1	13	127	500	3	22	223	860	
03:00	3		90		4		122		7		212		
03:15	5		99		2		130		7		229		
03:30	6		112		1		127		7		239		
03:45	5	19	103	404	3	10	140	519	8	29	243	923	
04:00	1		106		1		147		2		253		
04:15	5		113		10		124		15		237		
04:30	18		156		7		130		25		286		
04:45	17	41	146	521	8	26	134	535	25	67	280	1056	
05:00	14		154		15		127		29		281		
05:15	14		154		23		114		37		268		
05:30	19		145		37		110		56		255		
05:45	36	83	156	609	39	114	121	472	75	197	277	1081	
06:00	32		135		31		124		63		259		
06:15	55		118		48		109		103		227		
06:30	77		111		76		99		153		210		
06:45	90	254	99	463	61	216	99	431	151	470	198	894	
07:00	112		87		88		112		200		199		
07:15	93		71		123		106		216		177		
07:30	62		83		146		89		208		172		
07:45	86	353	74	315	94	451	76	383	180	804	150	698	
08:00	69		50		109		103		178		153		
08:15	60		43		110		91		170		134		
08:30	59		59		77		64		136		123		
08:45	62	250	65	217	84	380	73	331	146	630	138	548	
09:00	56		47		82		81		138		128		
09:15	49		37		69		61		118		98		
09:30	45		49		81		43		126		92		
09:45	66	216	31	164	66	298	43	228	132	514	74	392	
10:00	69		27		68		43		137		70		
10:15	52		29		76		37		128		66		
10:30	51		24		76		34		127		58		
10:45	60	232	28	108	68	288	28	142	128	520	56	250	
11:00	57		21		72		24		129		45		
11:15	57		17		80		22		137		39		
11:30	52		10		90		25		142		35		
11:45	78	244	11	59	81	323	12	83	159	567	23	142	
Total	1750		3798		2173		4266		3923		8064		
Percent	44.6%		47.1%		55.4%		52.9%						
Day Total		5548				6439				11987			
Peak	06:30		04:30		07:15		03:15		07:00		04:30		
Vol.	372		610		472		544		804		1115		
P.H.F.	0.830		0.978		0.808		0.925		0.931		0.975		

PRECISION
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Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	1	2	7	8	4	**2**	0	0	0	0	0	24	41	36
01:00	1	0	0	1	6	5	2	0	0	0	0	0	0	15	39	32
02:00	0	1	1	1	7	4	0	1	0	0	0	0	0	15	37	32
03:00	0	1	0	2	4	4	0	1	0	0	0	0	0	12	37	33
04:00	0	0	1	7	15	21	3	1	0	0	0	0	0	48	39	34
05:00	0	3	5	10	41	19	4	0	0	0	0	0	0	82	37	32
06:00	0	3	8	34	120	73	14	1	0	0	0	0	0	253	38	33
07:00	15	9	25	86	206	74	2	1	0	0	0	0	0	418	35	30
08:00	4	7	25	89	108	38	1	0	0	0	0	0	0	272	34	29
09:00	2	5	18	44	95	25	1	0	0	0	0	0	0	190	34	30
10:00	1	3	24	67	87	32	1	0	0	0	0	0	0	215	35	30
11:00	0	1	19	84	103	22	1	1	0	0	0	0	0	231	34	30
12 PM	1	2	11	64	116	18	5	0	0	0	0	0	0	217	34	30
13:00	0	3	12	75	108	40	3	1	0	0	0	0	0	242	35	31
14:00	1	1	13	78	162	75	7	0	0	0	0	0	0	337	37	32
15:00	1	1	20	86	222	75	6	2	0	0	0	0	0	413	36	32
16:00	1	4	14	95	282	105	6	0	0	0	0	0	0	507	36	32
17:00	0	4	4	93	265	135	8	0	0	0	0	0	0	509	37	32
18:00	1	1	8	49	197	92	4	3	0	0	0	0	0	355	37	33
19:00	1	1	0	32	148	75	5	0	0	0	0	0	0	262	37	33
20:00	1	1	1	31	84	40	6	1	0	0	0	0	0	165	37	32
21:00	0	1	3	26	65	41	3	0	1	0	0	0	0	140	37	33
22:00	1	0	3	8	26	29	9	1	0	0	0	0	0	77	39	34
23:00	0	0	2	8	17	21	2	2	0	0	0	0	0	52	38	34
Total	31	52	218	1072	2491	1071	97	18	1	0	0	0	0	5051		
%	0.6%	1.0%	4.3%	21.2%	49.3%	21.2%	1.9%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	07:00	07:00	06:00	00:00						07:00		
Vol.	15	9	25	89	206	74	14	2						418		
PM Peak	12:00	16:00	15:00	16:00	16:00	17:00	22:00	18:00	21:00					17:00		
Vol.	1	4	20	95	282	135	9	3	1					509		

Pecent

15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	26-35 MPH
Number in Pace :	3564
Percent in Pace :	70.6%
Number of Vehicles > 30 MPH :	3179
Percent of Vehicles > 30 MPH :	62.9%
Mean Speed(Average) :	32 MPH

PRECISION
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Winter Street
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81676 K-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	3	1	3	16	4	4	0	0	0	0	0	0	31	38	32
01:00	0	0	0	4	3	6	3	**2**	0	0	0	0	0	18	41	36
02:00	0	0	1	1	4	1	1	1	0	0	0	0	0	9	44	34
03:00	0	2	1	4	3	7	1	1	0	0	0	0	0	19	38	32
04:00	0	1	0	3	15	13	8	1	0	0	0	0	0	41	41	35
05:00	0	3	7	12	34	24	1	2	0	0	0	0	0	83	37	32
06:00	0	3	4	20	118	**92**	**16**	1	0	0	0	0	0	254	38	34
07:00	**9**	**6**	**39**	69	**163**	60	7	0	0	0	0	0	0	**353**	36	30
08:00	0	2	19	69	113	43	4	0	0	0	0	0	0	250	35	31
09:00	1	6	15	71	110	13	0	0	0	0	0	0	0	216	34	29
10:00	0	6	9	**86**	100	28	3	0	0	0	0	0	0	232	34	30
11:00	1	1	8	56	135	40	2	0	0	0	0	0	0	243	35	31
12 PM	1	1	11	75	117	41	7	1	0	0	0	0	0	254	36	31
13:00	0	0	6	66	165	76	10	1	**1**	0	0	0	0	325	37	32
14:00	1	**8**	**23**	71	157	90	8	1	0	0	0	0	0	359	37	32
15:00	**2**	4	22	84	207	76	8	1	0	0	0	0	0	404	36	31
16:00	1	4	17	**101**	282	108	9	0	0	0	0	0	0	522	36	32
17:00	1	1	10	62	**336**	**178**	**18**	**3**	0	0	0	0	0	**609**	37	33
18:00	0	5	7	67	268	106	9	1	0	0	0	0	0	463	37	32
19:00	1	1	10	59	171	63	10	0	0	0	0	0	0	315	36	32
20:00	0	5	4	35	110	54	9	0	0	0	0	0	0	217	37	32
21:00	0	2	6	28	78	41	7	2	0	0	0	0	0	164	37	32
22:00	0	1	1	14	51	37	4	0	0	0	0	0	0	108	38	33
23:00	0	2	0	2	24	23	7	1	0	0	0	0	0	59	39	35
Total	18	67	221	1062	2780	1224	156	19	1	0	0	0	0	5548		
%	0.3%	1.2%	4.0%	19.1%	50.1%	22.1%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	10:00	07:00	06:00	06:00	01:00						07:00		
Vol.	9	6	39	86	163	92	16	2						353		
PM Peak	15:00	14:00	14:00	16:00	17:00	17:00	17:00	17:00	13:00					17:00		
Vol.	2	8	23	101	336	178	18	3	1					609		

Pecent

15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4004
Percent in Pace :	72.2%
Number of Vehicles > 30 MPH :	3624
Percent of Vehicles > 30 MPH :	65.3%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
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Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	1	6	11	8	2	0	0	0	0	0	28	42	38
01:00	0	0	0	0	9	11	5	2	0	0	0	0	0	27	42	37
02:00	1	0	1	2	3	6	3	0	0	0	0	0	0	16	40	33
03:00	0	0	0	1	5	5	3	0	0	0	0	0	0	14	40	36
04:00	0	0	0	1	4	17	11	0	0	0	0	0	0	33	42	38
05:00	1	1	0	7	24	44	15	**6**	**1**	0	0	0	0	99	42	36
06:00	0	0	3	18	87	**90**	**20**	1	0	0	0	0	0	219	39	35
07:00	2	7	31	123	**178**	74	17	0	0	0	0	0	0	**432**	36	31
08:00	**8**	**27**	**54**	**136**	115	19	3	0	0	0	0	0	0	362	33	27
09:00	1	8	27	100	97	33	2	0	0	0	0	0	0	268	34	29
10:00	3	13	27	91	110	17	0	0	0	0	0	0	0	261	33	29
11:00	1	10	31	84	116	33	4	0	0	0	0	0	0	279	34	30
12 PM	4	19	42	116	134	30	3	0	0	0	0	0	0	348	34	29
13:00	3	2	32	93	148	44	6	0	0	0	0	0	0	328	35	30
14:00	**7**	**24**	**65**	123	196	73	16	0	0	0	0	0	0	**504**	35	30
15:00	7	21	61	121	181	81	11	0	0	0	0	0	0	483	36	30
16:00	3	17	43	**142**	201	82	13	1	0	0	0	0	0	502	36	30
17:00	3	4	31	104	**227**	79	10	1	**1**	0	0	0	0	460	36	31
18:00	0	9	16	67	176	**86**	11	**2**	1	0	0	0	0	368	37	32
19:00	0	2	3	44	151	71	13	0	0	0	0	0	0	284	37	33
20:00	1	1	9	26	103	82	**25**	2	0	0	0	0	0	249	39	34
21:00	0	1	6	18	79	59	12	1	0	0	0	0	0	176	38	33
22:00	0	0	6	6	41	56	21	2	0	0	0	0	0	132	40	35
23:00	0	0	0	4	26	21	9	2	1	0	0	0	0	63	41	35
Total	45	166	488	1428	2417	1124	241	22	4	0	0	0	0	5935		
%	0.8%	2.8%	8.2%	24.1%	40.7%	18.9%	4.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	07:00	06:00	06:00	05:00	05:00					07:00		
Vol.	8	27	54	136	178	90	20	6	1					432		
PM Peak	14:00	14:00	14:00	16:00	17:00	18:00	20:00	18:00	17:00					14:00		
Vol.	7	24	65	142	227	86	25	2	1					504		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	3845
Percent in Pace :	64.8%
Number of Vehicles > 30 MPH :	3324
Percent of Vehicles > 30 MPH :	56.0%
Mean Speed(Average) :	31 MPH

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81676 K-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	5	12	12	3	0	**1**	0	0	0	0	34	39	34
01:00	0	0	0	0	6	12	2	0	0	0	0	0	0	20	39	36
02:00	0	0	0	1	2	5	4	1	0	0	0	0	0	13	42	38
03:00	0	0	0	1	4	1	4	0	0	0	0	0	0	10	41	36
04:00	0	0	0	0	1	10	13	1	1	0	0	0	0	26	43	40
05:00	1	5	1	9	33	41	21	2	1	0	0	0	0	114	41	35
06:00	0	1	3	21	81	**73**	**26**	**9**	1	**1**	0	0	0	216	40	35
07:00	**32**	**24**	**47**	116	165	62	5	0	0	0	0	0	0	**451**	34	28
08:00	0	15	23	118	**175**	45	4	0	0	0	0	0	0	380	34	30
09:00	1	4	23	97	134	34	5	0	0	0	0	0	0	298	34	30
10:00	5	6	31	109	99	35	2	1	0	0	0	0	0	288	34	29
11:00	5	5	38	**121**	119	33	2	0	0	0	0	0	0	323	34	29
12 PM	1	9	35	93	130	32	7	0	0	0	0	0	0	307	34	30
13:00	2	6	30	70	136	75	15	1	0	0	0	0	0	335	37	31
14:00	**14**	**30**	37	102	236	75	5	1	0	0	0	0	0	500	35	30
15:00	10	9	**54**	136	220	81	9	0	0	0	0	0	0	519	35	30
16:00	1	7	48	**150**	**242**	78	7	2	0	0	0	0	0	**535**	35	30
17:00	3	13	24	109	190	**114**	16	3	0	0	0	0	0	472	37	31
18:00	6	11	27	97	169	92	**28**	1	0	0	0	0	0	431	37	31
19:00	0	0	36	70	173	93	11	0	0	0	0	0	0	383	37	32
20:00	1	3	11	41	142	105	25	3	0	0	0	0	0	331	38	33
21:00	0	0	5	24	88	87	20	3	**1**	0	0	0	0	228	39	34
22:00	0	0	1	6	42	64	26	2	1	0	0	0	0	142	41	36
23:00	0	0	0	4	27	32	16	**4**	0	0	0	0	0	83	42	36
Total	82	148	475	1500	2626	1291	276	34	6	1	0	0	0	6439		
%	1.3%	2.3%	7.4%	23.3%	40.8%	20.0%	4.3%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	11:00	08:00	06:00	06:00	06:00	00:00	06:00				07:00		
Vol.	32	24	47	121	175	73	26	9	1	1				451		
PM Peak	14:00	14:00	15:00	16:00	16:00	17:00	18:00	23:00	21:00					16:00		
Vol.	14	30	54	150	242	114	28	4	1					535		

Pecent

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4126
Percent in Pace :	64.1%
Number of Vehicles > 30 MPH :	3708
Percent of Vehicles > 30 MPH :	57.6%
Mean Speed(Average) :	31 MPH

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81676 K-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	21	2	0	0	0	0	0	0	0	0	0	0	24
01:00	0	12	1	0	2	0	0	0	0	0	0	0	0	15
02:00	1	12	0	0	2	0	0	0	0	0	0	0	0	15
03:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
04:00	0	37	11	0	0	0	0	0	0	0	0	0	0	48
05:00	0	61	18	0	3	0	0	0	0	0	0	0	0	82
06:00	2	176	61	0	11	1	0	2	0	0	0	0	0	253
07:00	5	311	65	10	16	5	1	2	3	0	0	0	0	418
08:00	2	206	50	0	10	2	0	2	0	0	0	0	0	272
09:00	1	145	27	1	11	2	0	2	1	0	0	0	0	190
10:00	0	157	43	0	12	1	0	2	0	0	0	0	0	215
11:00	1	168	45	1	10	2	0	1	3	0	0	0	0	231
12 PM	1	182	24	2	5	2	0	0	1	0	0	0	0	217
13:00	1	176	49	6	7	2	0	0	1	0	0	0	0	242
14:00	4	238	69	9	14	2	0	1	0	0	0	0	0	337
15:00	2	324	71	0	14	1	0	1	0	0	0	0	0	413
16:00	5	409	82	0	9	2	0	0	0	0	0	0	0	507
17:00	3	420	77	0	8	1	0	0	0	0	0	0	0	509
18:00	2	297	48	0	6	1	0	1	0	0	0	0	0	355
19:00	1	223	34	0	3	0	0	1	0	0	0	0	0	262
20:00	1	147	16	0	1	0	0	0	0	0	0	0	0	165
21:00	0	125	13	0	2	0	0	0	0	0	0	0	0	140
22:00	0	68	9	0	0	0	0	0	0	0	0	0	0	77
23:00	0	46	5	0	1	0	0	0	0	0	0	0	0	52
Total	33	3972	821	29	147	24	1	15	9	0	0	0	0	5051
Percent	0.7%	78.6%	16.3%	0.6%	2.9%	0.5%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	07:00	07:00	06:00	07:00					07:00
Vol.	5	311	65	10	16	5	1	2	3					418
PM Peak	16:00	17:00	16:00	14:00	14:00	12:00		14:00	12:00					17:00
Vol.	5	420	82	9	14	2		1	1					509

PRECISION
D A T A
INDUSTRIES, LLC
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Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	26	4	0	1	0	0	0	0	0	0	0	0	31
01:00	0	16	2	0	0	0	0	0	0	0	0	0	0	18
02:00	1	7	0	0	1	0	0	0	0	0	0	0	0	9
03:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
04:00	0	32	8	0	0	0	0	1	0	0	0	0	0	41
05:00	1	60	17	1	2	0	0	1	1	0	0	0	0	83
06:00	2	187	57	0	7	1	0	0	0	0	0	0	0	254
07:00	3	274	54	11	6	1	1	2	1	0	0	0	0	353
08:00	4	195	36	2	10	2	0	0	1	0	0	0	0	250
09:00	1	165	44	0	4	1	0	0	1	0	0	0	0	216
10:00	0	183	36	0	9	3	0	1	0	0	0	0	0	232
11:00	2	181	51	1	7	1	0	0	0	0	0	0	0	243
12 PM	1	191	50	2	7	2	0	0	1	0	0	0	0	254
13:00	1	247	51	5	13	6	0	2	0	0	0	0	0	325
14:00	0	290	45	12	10	2	0	0	0	0	0	0	0	359
15:00	5	305	77	0	14	1	0	1	1	0	0	0	0	404
16:00	6	423	77	2	10	2	0	2	0	0	0	0	0	522
17:00	6	501	88	1	11	1	0	1	0	0	0	0	0	609
18:00	6	390	60	0	6	1	0	0	0	0	0	0	0	463
19:00	1	260	52	0	1	1	0	0	0	0	0	0	0	315
20:00	1	186	23	0	5	2	0	0	0	0	0	0	0	217
21:00	1	140	20	0	2	0	0	1	0	0	0	0	0	164
22:00	1	95	12	0	0	0	0	0	0	0	0	0	0	108
23:00	0	56	3	0	0	0	0	0	0	0	0	0	0	59
Total	43	4427	869	37	126	27	1	12	6	0	0	0	0	5548
Percent	0.8%	79.8%	15.7%	0.7%	2.3%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	07:00	08:00	10:00	07:00	07:00	05:00					07:00
Vol.	4	274	57	11	10	3	1	2	1					353
PM Peak	16:00	17:00	17:00	14:00	15:00	13:00		13:00	12:00					17:00
Vol.	6	501	88	12	14	6		2	1					609

PRECISION
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Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	23	4	0	1	0	0	0	0	0	0	0	0	28
01:00	1	19	6	0	1	0	0	0	0	0	0	0	0	27
02:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
03:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
04:00	0	22	9	0	2	0	0	0	0	0	0	0	0	33
05:00	0	68	25	0	2	0	0	2	2	0	0	0	0	99
06:00	1	162	45	2	4	2	0	0	3	0	0	0	0	219
07:00	5	327	73	7	16	3	0	0	1	0	0	0	0	432
08:00	0	269	66	7	13	2	0	3	2	0	0	0	0	362
09:00	1	188	52	3	16	2	0	2	3	1	0	0	0	268
10:00	0	193	50	2	12	0	0	3	1	0	0	0	0	261
11:00	1	213	44	1	17	1	0	1	1	0	0	0	0	279
12 PM	1	276	53	3	11	3	0	1	0	0	0	0	0	348
13:00	0	251	58	0	13	0	0	4	2	0	0	0	0	328
14:00	3	398	84	6	12	0	0	1	0	0	0	0	0	504
15:00	0	369	94	4	13	3	0	0	0	0	0	0	0	483
16:00	1	396	89	2	9	2	0	3	0	0	0	0	0	502
17:00	2	389	57	0	12	0	0	0	0	0	0	0	0	460
18:00	1	317	45	0	3	0	0	2	0	0	0	0	0	368
19:00	0	242	38	0	4	0	0	0	0	0	0	0	0	284
20:00	0	209	37	0	3	0	0	0	0	0	0	0	0	249
21:00	0	147	28	0	1	0	0	0	0	0	0	0	0	176
22:00	0	111	20	0	1	0	0	0	0	0	0	0	0	132
23:00	0	56	7	0	0	0	0	0	0	0	0	0	0	63
Total	17	4671	988	37	166	18	0	22	15	1	0	0	0	5935
Percent	0.3%	78.7%	16.6%	0.6%	2.8%	0.3%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	11:00	07:00		08:00	06:00	09:00				07:00
Vol.	5	327	73	7	17	3		3	3	1				432
PM Peak	14:00	14:00	15:00	14:00	13:00	12:00		13:00	13:00					14:00
Vol.	3	398	94	6	13	3		4	2					504

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Winter Street
just south of King Avenue
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	31	2	0	1	0	0	0	0	0	0	0	0	34
01:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
02:00	0	10	3	0	0	0	0	0	0	0	0	0	0	13
03:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
04:00	0	20	5	0	1	0	0	0	0	0	0	0	0	26
05:00	0	77	29	0	4	2	0	0	2	0	0	0	0	114
06:00	2	166	38	0	10	0	0	0	0	0	0	0	0	216
07:00	2	347	85	5	9	1	1	0	1	0	0	0	0	451
08:00	0	272	77	7	19	3	0	2	0	0	0	0	0	380
09:00	1	229	53	2	9	2	0	2	0	0	0	0	0	298
10:00	0	220	55	0	8	1	0	1	3	0	0	0	0	288
11:00	1	251	53	2	12	2	0	2	0	0	0	0	0	323
12 PM	0	254	39	1	7	3	0	1	2	0	0	0	0	307
13:00	0	260	57	5	9	2	0	0	1	0	0	0	1	335
14:00	0	401	74	9	9	2	0	3	2	0	0	0	0	500
15:00	2	408	89	5	11	3	0	1	0	0	0	0	0	519
16:00	1	419	97	1	12	2	0	2	1	0	0	0	0	535
17:00	1	379	81	0	10	0	0	1	0	0	0	0	0	472
18:00	3	344	73	3	7	0	0	1	0	0	0	0	0	431
19:00	0	309	68	0	4	1	0	1	0	0	0	0	0	383
20:00	0	275	49	0	5	1	0	1	0	0	0	0	0	331
21:00	0	176	51	0	1	0	0	0	0	0	0	0	0	228
22:00	0	119	19	0	3	1	0	0	0	0	0	0	0	142
23:00	0	65	16	0	2	0	0	0	0	0	0	0	0	83
Total	13	5054	1121	40	153	26	1	18	12	0	0	0	1	6439
Percent	0.2%	78.5%	17.4%	0.6%	2.4%	0.4%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	08:00	08:00	08:00	07:00	08:00	10:00					07:00
Vol.	2	347	85	7	19	3	1	2	3					451
PM Peak	18:00	16:00	16:00	14:00	16:00	12:00		14:00	12:00				13:00	16:00
Vol.	3	419	97	9	12	3		3	2				1	535

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

PRECISION
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81676 K-C volume
Site Code: 10111.31

Start	EB				WB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	21		169		29		158		50		327		
12:15	11		153		26		166		37		319		
12:30	6		156		20		186		26		342		
12:45	9	47	175	653	14	89	164	674	23	136	339	1327	
01:00	10		164		14		172		24		336		
01:15	12		141		11		153		23		294		
01:30	7		144		10		157		17		301		
01:45	7	36	131	580	10	45	161	643	17	81	292	1223	
02:00	9		166		7		174		16		340		
02:15	7		147		5		173		12		320		
02:30	2		143		5		187		7		330		
02:45	7	25	162	618	5	22	162	696	12	47	324	1314	
03:00	5		163		3		183		8		346		
03:15	10		145		16		176		26		321		
03:30	12		147		3		168		15		315		
03:45	10	37	168	623	6	28	199	726	16	65	367	1349	
04:00	13		155		4		172		17		327		
04:15	17		143		14		183		31		326		
04:30	31		163		8		156		39		319		
04:45	32	93	166	627	11	37	178	689	43	130	344	1316	
05:00	44		159		13		169		57		328		
05:15	69		154		26		195		95		349		
05:30	73		142		29		190		102		332		
05:45	79	265	139	594	45	113	176	730	124	378	315	1324	
06:00	76		143		44		174		120		317		
06:15	118		98		67		194		185		292		
06:30	111		128		85		139		196		267		
06:45	138	443	83	452	92	288	168	675	230	731	251	1127	
07:00	203		94		101		159		304		253		
07:15	174		105		129		137		303		242		
07:30	137		99		170		121		307		220		
07:45	185	699	88	386	165	565	140	557	350	1264	228	943	
08:00	134		65		146		113		280		178		
08:15	151		73		159		93		310		166		
08:30	139		50		183		114		322		164		
08:45	166	590	66	254	196	684	78	398	362	1274	144	652	
09:00	135		69		161		94		296		163		
09:15	162		53		154		85		316		138		
09:30	142		55		144		64		286		119		
09:45	145	584	50	227	141	600	63	306	286	1184	113	533	
10:00	143		56		133		54		276		110		
10:15	159		32		151		41		310		73		
10:30	143		43		155		46		298		89		
10:45	128	573	27	158	153	592	52	193	281	1165	79	351	
11:00	133		41		165		51		298		92		
11:15	160		22		139		62		299		84		
11:30	138		29		148		36		286		65		
11:45	183	614	19	111	159	611	29	178	342	1225	48	289	
Total	4006		5283		3674		6465		7680		11748		
Percent	52.2%		45.0%		47.8%		55.0%						
Day Total		9289				10139				19428			
Peak	07:00		12:00		08:15		05:15		08:30		04:45		
Vol.	699		653		699		735		1296		1353		
P.H.F.	0.861		0.933		0.892		0.942		0.895		0.922		

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

PRECISION DATA INDUSTRIES, LLC
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81676 K-C volume
Site Code: 10111.31

Start	EB				WB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	11		178		31		152		42		330		
12:15	11		150		17		151		28		301		
12:30	10		138		19		136		29		274		
12:45	8	40	137	603	21	88	118	557	29	128	255	1160	
01:00	4		130		10		131		14		261		
01:15	11		132		13		154		24		286		
01:30	11		133		7		180		18		313		
01:45	5	31	157	552	11	41	163	628	16	72	320	1180	
02:00	7		155		10		168		17		323		
02:15	6		155		9		192		15		347		
02:30	3		153		5		170		8		323		
02:45	8	24	148	611	4	28	194	724	12	52	342	1335	
03:00	9		177		8		182		17		359		
03:15	7		155		12		159		19		314		
03:30	4		150		4		204		8		354		
03:45	9	29	151	633	2	26	198	743	11	55	349	1376	
04:00	10		162		8		199		18		361		
04:15	13		150		11		178		24		328		
04:30	30		177		10		180		40		357		
04:45	30	83	165	654	13	42	188	745	43	125	353	1399	
05:00	36		189		7		151		43		340		
05:15	67		137		21		180		88		317		
05:30	83		149		40		184		123		333		
05:45	90	276	160	635	37	105	182	697	127	381	342	1332	
06:00	93		156		32		174		125		330		
06:15	107		139		51		144		158		283		
06:30	130		125		82		146		212		271		
06:45	149	479	116	536	98	263	189	653	247	742	305	1189	
07:00	169		117		98		154		267		271		
07:15	200		91		115		128		315		219		
07:30	159		84		152		150		311		234		
07:45	157	685	81	373	152	517	151	583	309	1202	232	956	
08:00	132		89		147		112		279		201		
08:15	138		92		143		140		281		232		
08:30	164		72		155		149		319		221		
08:45	161	595	81	334	163	608	122	523	324	1203	203	857	
09:00	152		75		145		126		297		201		
09:15	147		65		130		109		277		174		
09:30	157		68		132		86		289		154		
09:45	139	595	45	253	146	553	78	399	285	1148	123	652	
10:00	146		54		143		76		289		130		
10:15	154		39		127		77		281		116		
10:30	167		55		137		50		304		105		
10:45	144	611	30	178	130	537	64	267	274	1148	94	445	
11:00	166		39		152		56		318		95		
11:15	150		32		147		57		297		89		
11:30	160		28		150		43		310		71		
11:45	163	639	18	117	150	599	34	190	313	1238	52	307	
Total	4087		5479		3407		6709		7494		12188		
Percent	54.5%		45.0%		45.5%		55.0%						
Day Total			9566				10116				19682		
Peak	07:00		04:15		08:00		03:30		11:00		04:00		
Vol.	685		681		608		779		1238		1399		
P.H.F.	0.856		0.901		0.933		0.955		0.955		0.969		

PRECISION
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Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	4	9	18	13	3	0	0	0	0	0	0	47	37	32
01:00	0	0	2	12	14	8	0	0	0	0	0	0	0	36	36	31
02:00	0	0	1	1	12	11	0	0	0	0	0	0	0	25	37	34
03:00	0	0	3	9	11	13	1	0	0	0	0	0	0	37	37	32
04:00	0	0	2	24	30	31	6	0	0	0	0	0	0	93	38	33
05:00	0	0	7	48	128	65	**17**	0	0	0	0	0	0	265	38	33
06:00	0	0	5	98	213	**113**	13	0	0	0	0	0	**1**	443	37	32
07:00	**1**	3	**72**	248	**318**	54	3	0	0	0	0	0	0	**699**	34	30
08:00	1	6	43	185	277	73	5	0	0	0	0	0	0	590	34	30
09:00	0	3	67	200	253	61	0	0	0	0	0	0	0	584	34	30
10:00	1	2	44	**279**	202	37	8	0	0	0	0	0	0	573	33	29
11:00	1	**8**	60	231	271	40	3	0	0	0	0	0	0	614	34	29
12 PM	1	2	44	262	**308**	33	3	0	0	0	0	0	0	**653**	33	30
13:00	0	3	45	257	253	19	3	0	0	0	0	0	0	580	33	29
14:00	**14**	**11**	**56**	**305**	204	28	0	0	0	0	0	0	0	618	33	28
15:00	1	10	45	282	257	24	4	0	0	0	0	0	0	623	33	29
16:00	0	2	42	239	306	34	4	0	0	0	0	0	0	627	34	30
17:00	0	1	21	208	299	**60**	5	0	0	0	0	0	0	594	34	30
18:00	0	0	12	136	242	58	4	0	0	0	0	0	0	452	34	31
19:00	0	0	23	163	165	28	**7**	0	0	0	0	0	0	386	34	30
20:00	0	0	7	84	120	37	6	0	0	0	0	0	0	254	35	31
21:00	0	0	10	61	112	39	5	0	0	0	0	0	0	227	36	31
22:00	0	0	6	29	76	42	5	0	0	0	0	0	0	158	37	32
23:00	0	1	6	18	53	31	2	0	0	0	0	0	0	111	37	32
Total	20	52	627	3388	4142	952	107	0	0	0	0	0	1	9289		
%	0.2%	0.6%	6.7%	36.5%	44.6%	10.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	07:00	10:00	07:00	06:00	05:00						06:00	07:00		
Vol.	1	8	72	279	318	113	17						1	699		
PM Peak	14:00	14:00	14:00	14:00	12:00	17:00	19:00							12:00		
Vol.	14	11	56	305	308	60	7							653		

Pecent

15th Percentile :	26 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	7530
Percent in Pace :	81.1%
Number of Vehicles > 30 MPH :	4373
Percent of Vehicles > 30 MPH :	47.1%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	10	20	6	3	0	0	0	0	0	0	40	36	32
01:00	0	0	0	14	13	3	1	0	0	0	0	0	0	31	34	30
02:00	0	0	2	2	11	7	2	0	0	0	0	0	0	24	37	33
03:00	0	0	1	4	13	8	3	0	0	0	0	0	0	29	38	33
04:00	0	0	4	13	35	25	4	**2**	0	0	0	0	0	83	38	33
05:00	1	2	4	65	114	71	**18**	1	0	0	0	0	0	276	38	32
06:00	1	0	3	116	254	**93**	10	1	**1**	0	0	0	0	479	36	32
07:00	**12**	8	42	211	**339**	71	2	0	0	0	0	0	0	**685**	34	30
08:00	4	7	54	237	254	35	3	1	0	0	0	0	0	595	33	29
09:00	1	**13**	75	272	214	20	0	0	0	0	0	0	0	595	33	28
10:00	1	7	**89**	299	189	25	1	0	0	0	0	0	0	611	33	28
11:00	2	1	55	**311**	244	25	1	0	0	0	0	0	0	639	33	29
12 PM	**92**	20	**103**	203	156	28	1	0	0	0	0	0	0	603	33	25
13:00	33	**27**	89	220	167	15	1	0	0	0	0	0	0	552	32	26
14:00	2	9	77	286	206	30	1	0	0	0	0	0	0	611	33	28
15:00	2	10	81	**306**	204	29	1	0	0	0	0	0	0	633	33	28
16:00	5	4	33	201	**321**	84	6	0	0	0	0	0	0	**654**	34	30
17:00	1	0	33	205	305	**86**	5	0	0	0	0	0	0	635	34	31
18:00	1	2	18	178	251	74	**11**	1	0	0	0	0	0	536	35	31
19:00	0	0	10	123	199	38	3	0	0	0	0	0	0	373	34	31
20:00	0	0	15	90	181	40	7	1	0	0	0	0	0	334	34	31
21:00	1	0	11	70	130	37	3	1	0	0	0	0	0	253	35	31
22:00	0	0	3	46	74	46	7	**2**	0	0	0	0	0	178	37	32
23:00	0	0	6	19	59	30	2	1	0	0	0	0	0	117	37	32
Total	159	110	809	3501	3953	926	96	11	1	0	0	0	0	9566		
%	1.7%	1.1%	8.5%	36.6%	41.3%	9.7%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	10:00	11:00	07:00	06:00	05:00	04:00	06:00					07:00		
Vol.	12	13	89	311	339	93	18	2	1					685		
PM Peak	12:00	13:00	12:00	15:00	16:00	17:00	18:00	22:00						16:00		
Vol.	92	27	103	306	321	86	11	2						654		

Pecent

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	7454
Percent in Pace :	77.9%
Number of Vehicles > 30 MPH :	4196
Percent of Vehicles > 30 MPH :	43.9%
Mean Speed(Average) :	29 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	13	43	27	3	**3**	0	0	0	0	0	89	38	34
01:00	0	0	1	5	15	20	3	1	0	0	0	0	0	45	39	34
02:00	0	0	0	1	10	9	0	2	0	0	0	0	0	22	38	35
03:00	0	3	0	2	12	7	4	0	0	0	0	0	0	28	39	32
04:00	0	0	0	3	13	16	4	1	0	0	0	0	0	37	39	35
05:00	0	0	5	13	45	45	5	0	0	0	0	0	0	113	38	33
06:00	**1**	1	2	15	153	**98**	**16**	0	**2**	0	0	0	0	288	38	34
07:00	1	1	27	165	295	72	4	0	0	0	0	0	0	565	34	31
08:00	0	1	**32**	213	**381**	56	0	1	0	0	0	0	0	**684**	34	30
09:00	1	**8**	24	251	242	70	4	0	0	0	0	0	0	600	34	30
10:00	1	3	31	**263**	254	40	0	0	0	0	0	0	0	592	34	29
11:00	0	3	18	205	316	65	3	1	0	0	0	0	0	611	34	31
12 PM	1	0	28	266	321	52	6	0	0	0	0	0	0	674	34	30
13:00	1	**22**	**74**	284	228	34	0	0	0	0	0	0	0	643	33	28
14:00	**2**	6	60	**356**	241	29	2	0	0	0	0	0	0	696	33	29
15:00	1	13	27	288	355	39	3	0	0	0	0	0	0	726	34	30
16:00	2	9	37	219	364	56	2	0	0	0	0	0	0	689	34	30
17:00	0	2	23	241	392	67	5	0	0	0	0	0	0	**730**	34	31
18:00	0	3	13	174	**398**	84	2	0	**1**	0	0	0	0	675	34	31
19:00	1	0	9	145	321	72	9	0	0	0	0	0	0	557	34	31
20:00	0	1	11	95	204	77	9	**1**	0	0	0	0	0	398	36	32
21:00	0	1	4	35	163	**90**	**13**	0	0	0	0	0	0	306	38	33
22:00	0	0	1	24	101	56	10	1	0	0	0	0	0	193	38	33
23:00	0	0	1	20	92	56	8	1	0	0	0	0	0	178	38	33
Total	12	77	428	3296	4959	1237	115	12	3	0	0	0	0	10139		
%	0.1%	0.8%	4.2%	32.5%	48.9%	12.2%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	09:00	08:00	10:00	08:00	06:00	06:00	00:00	06:00					08:00		
Vol.	1	8	32	263	381	98	16	3	2					684		
PM Peak	14:00	13:00	13:00	14:00	18:00	21:00	21:00	20:00	18:00					17:00		
Vol.	2	22	74	356	398	90	13	1	1					730		

Pecent

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	8255
Percent in Pace :	81.4%
Number of Vehicles > 30 MPH :	5334
Percent of Vehicles > 30 MPH :	52.6%
Mean Speed(Average) :	31 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	0	8	39	32	8	**1**	0	0	0	0	0	88	39	34
01:00	0	0	0	10	18	10	3	0	0	0	0	0	0	41	38	33
02:00	0	0	2	2	8	11	4	1	0	0	0	0	0	28	40	35
03:00	0	1	1	2	11	9	1	0	**1**	0	0	0	0	26	38	34
04:00	0	0	0	12	12	13	4	0	1	0	0	0	0	42	39	34
05:00	**1**	0	6	17	38	34	8	1	0	0	0	0	0	105	38	33
06:00	0	0	1	31	149	**72**	**9**	1	0	0	0	0	0	263	37	33
07:00	0	2	**27**	147	277	62	2	0	0	0	0	0	0	517	34	31
08:00	0	3	21	**198**	315	69	1	1	0	0	0	0	0	**608**	34	31
09:00	0	2	12	187	296	55	0	1	0	0	0	0	0	553	34	31
10:00	1	1	26	180	281	45	3	0	0	0	0	0	0	537	34	30
11:00	0	**6**	20	195	**321**	53	3	0	0	**1**	0	0	0	599	34	30
12 PM	2	10	62	199	240	43	1	0	0	0	0	0	0	557	34	29
13:00	0	3	47	248	274	52	4	0	0	0	0	0	0	628	34	30
14:00	3	8	51	**310**	296	53	3	0	0	0	0	0	0	724	34	29
15:00	**30**	**22**	**91**	279	266	53	2	0	0	0	0	0	0	743	33	28
16:00	0	4	33	283	363	54	8	0	0	0	0	0	0	**745**	34	30
17:00	0	4	22	175	**387**	**104**	5	0	0	0	0	0	0	697	35	31
18:00	1	2	19	210	337	77	6	1	0	0	0	0	0	653	34	31
19:00	0	1	8	162	324	80	8	0	0	0	0	0	0	583	35	31
20:00	0	1	12	136	275	83	**16**	0	0	0	0	0	0	523	36	32
21:00	1	2	7	76	226	78	8	1	0	0	0	0	0	399	36	32
22:00	0	2	4	37	126	91	6	1	0	0	0	0	0	267	38	33
23:00	0	2	2	22	90	56	14	**3**	**1**	0	0	0	0	190	38	34
Total	39	76	474	3126	4969	1289	127	12	3	1	0	0	0	10116		
%	0.4%	0.8%	4.7%	30.9%	49.1%	12.7%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	11:00	07:00	08:00	11:00	06:00	06:00	00:00	03:00	11:00				08:00		
Vol.	1	6	27	198	321	72	9	1	1	1				608		
PM Peak	15:00	15:00	15:00	14:00	17:00	17:00	20:00	23:00	23:00					16:00		
Vol.	30	22	91	310	387	104	16	3	1					745		

Pecent

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	8095
Percent in Pace :	80.0%
Number of Vehicles > 30 MPH :	5407
Percent of Vehicles > 30 MPH :	53.4%
Mean Speed(Average) :	31 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	33	9	0	3	0	0	0	1	0	0	0	0	47
01:00	0	25	5	1	3	0	0	1	1	0	0	0	0	36
02:00	1	15	4	0	1	1	0	0	3	0	0	0	0	25
03:00	0	23	10	0	1	2	0	0	1	0	0	0	0	37
04:00	2	54	27	1	8	0	0	1	0	0	0	0	0	93
05:00	0	168	64	3	27	0	0	0	2	0	0	0	1	265
06:00	2	285	102	5	22	5	0	4	17	0	0	0	1	443
07:00	6	534	106	5	28	10	0	7	3	0	0	0	0	699
08:00	3	455	94	6	23	4	0	2	3	0	0	0	0	590
09:00	2	423	122	4	16	5	0	5	6	1	0	0	0	584
10:00	5	413	106	2	27	8	1	8	3	0	0	0	0	573
11:00	9	453	112	0	28	7	0	4	1	0	0	0	0	614
12 PM	4	485	110	8	35	7	0	4	0	0	0	0	0	653
13:00	6	412	117	5	28	5	0	4	3	0	0	0	0	580
14:00	3	452	116	7	26	6	0	4	4	0	0	0	0	618
15:00	6	469	107	5	27	4	0	3	2	0	0	0	0	623
16:00	3	494	98	4	20	4	0	3	1	0	0	0	0	627
17:00	6	466	96	1	18	5	0	2	0	0	0	0	0	594
18:00	0	367	62	0	18	5	0	0	0	0	0	0	0	452
19:00	4	282	77	0	19	0	0	3	1	0	0	0	0	386
20:00	0	209	37	0	6	1	0	1	0	0	0	0	0	254
21:00	1	168	47	0	4	1	0	3	3	0	0	0	0	227
22:00	0	121	28	0	9	0	0	0	0	0	0	0	0	158
23:00	0	87	20	1	1	0	0	1	1	0	0	0	0	111
Total	64	6893	1676	58	398	80	1	60	56	1	0	0	2	9289
Percent	0.7%	74.2%	18.0%	0.6%	4.3%	0.9%	0.0%	0.6%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	09:00	08:00	07:00	07:00	10:00	10:00	06:00	09:00			05:00	07:00
Vol.	9	534	122	6	28	10	1	8	17	1			1	699
PM Peak	13:00	16:00	13:00	12:00	12:00	12:00		12:00	14:00					12:00
Vol.	6	494	117	8	35	7		4	4					653

Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

81676 K-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	37	1	0	2	0	0	0	0	0	0	0	0	40
01:00	0	22	7	1	0	0	0	1	0	0	0	0	0	31
02:00	0	14	3	0	1	0	0	0	4	2	0	0	0	24
03:00	0	20	7	0	0	0	0	1	1	0	0	0	0	29
04:00	1	52	19	2	6	1	0	0	2	0	0	0	0	83
05:00	1	165	77	1	27	2	0	0	3	0	0	0	0	276
06:00	6	313	111	1	23	7	0	1	17	0	0	0	0	479
07:00	4	510	129	6	23	6	0	5	2	0	0	0	0	685
08:00	2	438	120	6	14	4	0	6	5	0	0	0	0	595
09:00	12	427	117	3	24	8	0	2	2	0	0	0	0	595
10:00	5	462	111	4	18	7	0	3	1	0	0	0	0	611
11:00	6	469	129	5	18	3	1	4	4	0	0	0	0	639
12 PM	6	464	102	1	16	5	0	4	4	0	0	0	1	603
13:00	10	405	91	2	25	9	0	2	8	0	0	0	0	552
14:00	8	463	105	5	15	10	0	2	3	0	0	0	0	611
15:00	11	457	122	3	27	2	1	7	3	0	0	0	0	633
16:00	7	493	117	1	24	5	0	4	3	0	0	0	0	654
17:00	4	504	103	1	18	2	0	1	2	0	0	0	0	635
18:00	5	404	101	1	17	2	0	4	2	0	0	0	0	536
19:00	3	292	57	0	18	3	0	0	0	0	0	0	0	373
20:00	4	263	50	0	15	0	0	2	0	0	0	0	0	334
21:00	5	204	34	1	6	1	0	1	1	0	0	0	0	253
22:00	1	143	25	0	5	1	0	1	2	0	0	0	0	178
23:00	1	91	20	1	3	0	0	0	1	0	0	0	0	117
Total	102	7112	1758	45	345	78	2	51	70	2	0	0	1	9566
Percent	1.1%	74.3%	18.4%	0.5%	3.6%	0.8%	0.0%	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	07:00	05:00	09:00	11:00	08:00	06:00	02:00				07:00
Vol.	12	510	129	6	27	8	1	6	17	2				685
PM Peak	15:00	17:00	15:00	14:00	15:00	14:00	15:00	15:00	13:00				12:00	16:00
Vol.	11	504	122	5	27	10	1	7	8				1	654

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	67	18	0	1	0	0	1	1	0	0	0	0	89
01:00	1	37	4	0	2	0	0	0	1	0	0	0	0	45
02:00	0	17	2	0	1	1	0	0	1	0	0	0	0	22
03:00	0	18	7	0	2	0	0	0	1	0	0	0	0	28
04:00	0	24	11	0	2	0	0	0	0	0	0	0	0	37
05:00	0	67	27	1	13	2	0	0	3	0	0	0	0	113
06:00	10	199	55	3	13	4	1	2	1	0	0	0	0	288
07:00	10	423	84	3	28	9	2	3	2	1	0	0	0	565
08:00	9	528	108	2	20	11	2	3	1	0	0	0	0	684
09:00	10	431	109	2	29	7	3	1	8	0	0	0	0	600
10:00	11	431	103	7	18	8	1	9	1	1	0	1	1	592
11:00	5	439	122	3	19	10	1	5	5	1	0	0	1	611
12 PM	5	514	113	6	20	9	0	5	1	0	0	0	1	674
13:00	15	452	113	2	32	13	3	7	2	3	0	0	1	643
14:00	16	519	118	2	22	11	1	4	3	0	0	0	0	696
15:00	7	551	126	3	20	12	1	5	1	0	0	0	0	726
16:00	4	545	108	0	16	9	0	1	5	1	0	0	0	689
17:00	9	585	104	0	15	9	1	4	2	1	0	0	0	730
18:00	13	528	106	0	15	10	0	2	1	0	0	0	0	675
19:00	5	440	84	0	19	7	0	0	1	0	0	0	1	557
20:00	2	324	55	1	11	3	0	2	0	0	0	0	0	398
21:00	1	251	50	0	1	2	0	0	1	0	0	0	0	306
22:00	0	165	22	0	5	1	0	0	0	0	0	0	0	193
23:00	0	145	21	6	3	2	0	0	1	0	0	0	0	178
Total	134	7700	1670	41	327	140	16	54	43	8	0	1	5	10139
Percent	1.3%	75.9%	16.5%	0.4%	3.2%	1.4%	0.2%	0.5%	0.4%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	11:00	10:00	09:00	08:00	09:00	10:00	09:00	07:00		10:00	10:00	08:00
Vol.	11	528	122	7	29	11	3	9	8	1		1	1	684
PM Peak	14:00	17:00	15:00	12:00	13:00	13:00	13:00	13:00	16:00	13:00			12:00	17:00
Vol.	16	585	126	6	32	13	3	7	5	3			1	730

PRECISION
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Dean Street (Route 44) between
Prospect Street and Church Green Street
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	68	17	1	1	1	0	0	0	0	0	0	0	88
01:00	0	35	5	0	0	0	0	1	0	0	0	0	0	41
02:00	0	24	2	0	0	0	0	1	1	0	0	0	0	28
03:00	1	18	4	0	2	0	0	0	0	0	0	0	1	26
04:00	1	30	2	0	2	1	1	0	2	1	0	0	2	42
05:00	3	62	30	1	6	2	0	1	0	0	0	0	0	105
06:00	3	191	44	1	17	5	1	0	1	0	0	0	0	263
07:00	12	384	87	9	16	5	0	1	2	1	0	0	0	517
08:00	6	468	98	1	18	9	2	2	3	0	0	0	1	608
09:00	11	401	100	3	20	8	1	7	1	1	0	0	0	553
10:00	11	392	103	4	16	3	0	5	3	0	0	0	0	537
11:00	6	434	120	2	22	9	1	2	3	0	0	0	0	599
12 PM	15	422	87	3	18	5	0	4	1	0	0	0	2	557
13:00	13	460	121	5	16	3	3	5	2	0	0	0	0	628
14:00	9	554	133	2	11	9	1	2	1	2	0	0	0	724
15:00	25	560	127	3	21	3	0	3	0	0	0	0	1	743
16:00	10	561	128	4	27	11	0	4	0	0	0	0	0	745
17:00	11	540	122	0	13	6	0	4	1	0	0	0	0	697
18:00	22	505	96	1	15	9	0	3	1	0	0	0	1	653
19:00	11	461	86	2	15	7	0	1	0	0	0	0	0	583
20:00	5	408	85	3	13	5	0	1	1	2	0	0	0	523
21:00	4	312	71	0	9	3	0	0	0	0	0	0	0	399
22:00	6	216	37	1	2	4	0	1	0	0	0	0	0	267
23:00	4	148	32	0	4	0	0	0	2	0	0	0	0	190
Total	189	7654	1737	46	284	108	10	48	25	7	0	0	8	10116
Percent	1.9%	75.7%	17.2%	0.5%	2.8%	1.1%	0.1%	0.5%	0.2%	0.1%	0.0%	0.0%	0.1%	
AM Peak	07:00	08:00	11:00	07:00	11:00	08:00	08:00	09:00	08:00	04:00			04:00	08:00
Vol.	12	468	120	9	22	9	2	7	3	1			2	608
PM Peak	15:00	16:00	14:00	13:00	16:00	16:00	13:00	13:00	13:00	14:00			12:00	16:00
Vol.	25	561	133	5	27	11	3	5	2	2			2	745

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	21		156		19		152		40		308		
12:15	15		158		13		137		28		295		
12:30	14		153		12		169		26		322		
12:45	21	71	175	642	9	53	169	627	30	124	344	1269	
01:00	3		147		9		153		12		300		
01:15	7		165		8		175		15		340		
01:30	11		140		10		184		21		324		
01:45	8	29	136	588	12	39	164	676	20	68	300	1264	
02:00	8		182		8		169		16		351		
02:15	8		182		11		183		19		365		
02:30	2		157		7		230		9		387		
02:45	10	28	159	680	7	33	172	754	17	61	331	1434	
03:00	2		178		12		194		14		372		
03:15	4		187		9		189		13		376		
03:30	6		199		7		183		13		382		
03:45	12	24	212	776	11	39	177	743	23	63	389	1519	
04:00	8		215		14		176		22		391		
04:15	7		209		11		178		18		387		
04:30	27		230		20		167		47		397		
04:45	25	67	231	885	22	67	161	682	47	134	392	1567	
05:00	23		252		35		166		58		418		
05:15	24		232		38		171		62		403		
05:30	44		225		66		173		110		398		
05:45	41	132	196	905	67	206	174	684	108	338	370	1589	
06:00	58		170		81		151		139		321		
06:15	68		160		120		167		188		327		
06:30	100		159		165		147		265		306		
06:45	107	333	149	638	173	539	146	611	280	872	295	1249	
07:00	124		121		192		131		316		252		
07:15	135		160		214		117		349		277		
07:30	158		149		210		120		368		269		
07:45	128	545	136	566	223	839	108	476	351	1384	244	1042	
08:00	112		104		198		88		310		192		
08:15	144		110		184		123		328		233		
08:30	127		79		196		96		323		175		
08:45	128	511	63	356	176	754	88	395	304	1265	151	751	
09:00	114		114		159		84		273		198		
09:15	122		81		156		81		278		162		
09:30	116		62		131		91		247		153		
09:45	122	474	53	310	151	597	66	322	273	1071	119	632	
10:00	136		55		143		66		279		121		
10:15	151		42		131		57		282		99		
10:30	120		41		131		55		251		96		
10:45	138	545	26	164	141	546	42	220	279	1091	68	384	
11:00	163		48		135		41		298		89		
11:15	161		37		158		30		319		67		
11:30	149		42		170		26		319		68		
11:45	164	637	22	149	152	615	21	118	316	1252	43	267	
Total	3396		6659		4327		6308		7723		12967		
Percent	44.0%		51.4%		56.0%		48.6%						
Day Total		10055				10635				20690			
Peak	11:00		04:30		07:15		02:30		07:00		04:45		
Vol.	637		945		845		785		1384		1611		
P.H.F.	0.971		0.938		0.947		0.853		0.940		0.964		

PRECISION
D A T A
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	24		169		16		151		40		320		
12:15	16		173		11		185		27		358		
12:30	13		171		9		165		22		336		
12:45	12	65	161	674	11	47	187	688	23	112	348	1362	
01:00	6		174		12		161		18		335		
01:15	7		161		11		181		18		342		
01:30	7		143		8		196		15		339		
01:45	7	27	175	653	11	42	174	712	18	69	349	1365	
02:00	6		178		13		190		19		368		
02:15	6		202		5		168		11		370		
02:30	3		160		5		220		8		380		
02:45	4	19	148	688	4	27	193	771	8	46	341	1459	
03:00	8		219		12		198		20		417		
03:15	9		219		10		196		19		415		
03:30	10		192		9		195		19		387		
03:45	9	36	217	847	10	41	198	787	19	77	415	1634	
04:00	7		204		7		188		14		392		
04:15	6		231		15		176		21		407		
04:30	26		241		16		170		42		411		
04:45	23	62	218	894	33	71	173	707	56	133	391	1601	
05:00	24		251		28		172		52		423		
05:15	25		235		47		207		72		442		
05:30	42		249		69		160		111		409		
05:45	51	142	256	991	71	215	172	711	122	357	428	1702	
06:00	56		221		74		182		130		403		
06:15	66		210		136		167		202		377		
06:30	98		171		154		178		252		349		
06:45	120	340	164	766	184	548	206	733	304	888	370	1499	
07:00	100		166		200		135		300		301		
07:15	156		153		189		126		345		279		
07:30	158		148		208		160		366		308		
07:45	129	543	136	603	224	821	135	556	353	1364	271	1159	
08:00	124		134		211		122		335		256		
08:15	132		131		198		129		330		260		
08:30	130		143		171		111		301		254		
08:45	120	506	131	539	227	807	113	475	347	1313	244	1014	
09:00	131		126		143		82		274		208		
09:15	123		102		156		87		279		189		
09:30	126		83		158		78		284		161		
09:45	158	538	60	371	170	627	76	323	328	1165	136	694	
10:00	138		51		127		68		265		119		
10:15	151		69		137		53		288		122		
10:30	165		54		156		56		321		110		
10:45	133	587	35	209	167	587	44	221	300	1174	79	430	
11:00	128		48		153		35		281		83		
11:15	142		38		133		28		275		66		
11:30	146		54		168		31		314		85		
11:45	183	599	23	163	140	594	23	117	323	1193	46	280	
Total	3464		7398		4427		6801		7891		14199		
Percent	43.9%		52.1%		56.1%		47.9%						
Day Total		10862				11228				22090			
Peak	09:45		05:00		07:30		02:30		07:15		05:00		
Vol.	612		991		841		807		1399		1702		
P.H.F.	0.927		0.968		0.939		0.917		0.956		0.963		

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	2	3	16	36	10	4	0	0	0	0	0	0	71	36	31
01:00	0	2	1	5	12	9	0	0	0	0	0	0	0	29	37	31
02:00	0	1	1	5	11	7	3	0	0	0	0	0	0	28	38	32
03:00	0	0	1	5	12	5	0	**1**	0	0	0	0	0	24	36	32
04:00	0	3	1	16	28	12	**6**	1	0	0	0	0	0	67	38	32
05:00	0	2	5	46	60	15	4	0	0	0	0	0	0	132	34	31
06:00	0	4	20	109	155	**44**	1	0	0	0	0	0	0	333	34	30
07:00	**9**	**24**	90	245	163	14	0	0	0	0	0	0	0	545	32	27
08:00	1	12	72	246	161	17	2	0	0	0	0	0	0	511	33	28
09:00	6	16	50	209	173	19	0	1	0	0	0	0	0	474	33	28
10:00	0	16	75	255	**178**	21	0	0	0	0	0	0	0	545	33	28
11:00	3	20	**116**	**324**	162	11	1	0	0	0	0	0	0	**637**	32	27
12 PM	1	20	146	304	156	15	0	0	0	0	0	0	0	642	32	27
13:00	5	22	115	305	126	14	1	0	0	0	0	0	0	588	32	27
14:00	5	28	180	365	96	5	1	0	0	0	0	0	0	680	29	26
15:00	4	27	163	438	143	1	0	0	0	0	0	0	0	776	30	26
16:00	10	38	**236**	**456**	135	10	0	0	0	0	0	0	0	885	30	26
17:00	**17**	**62**	221	445	157	3	0	0	0	0	0	0	0	**905**	30	26
18:00	1	45	94	309	**160**	**29**	0	0	0	0	0	0	0	638	32	27
19:00	1	31	81	289	145	18	1	0	0	0	0	0	0	566	32	27
20:00	0	23	49	147	117	20	0	0	0	0	0	0	0	356	33	28
21:00	0	19	28	132	107	24	0	0	0	0	0	0	0	310	33	28
22:00	1	6	15	57	63	21	1	0	0	0	0	0	0	164	34	29
23:00	0	9	7	35	75	20	**3**	0	0	0	0	0	0	149	35	30
Total	64	432	1770	4763	2631	364	28	3	0	0	0	0	0	10055		
%	0.6%	4.3%	17.6%	47.4%	26.2%	3.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	11:00	11:00	10:00	06:00	04:00	03:00						11:00		
Vol.	9	24	116	324	178	44	6	1						637		
PM Peak	17:00	17:00	16:00	16:00	18:00	18:00	23:00							17:00		
Vol.	17	62	236	456	160	29	3							905		

Pecent

15th Percentile :	22 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	7394
Percent in Pace :	73.5%
Number of Vehicles > 30 MPH :	2499
Percent of Vehicles > 30 MPH :	24.9%
Mean Speed(Average) :	27 MPH

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	5	6	22	22	9	1	0	0	0	0	0	0	65	34	29
01:00	0	0	0	10	10	5	2	0	0	0	0	0	0	27	37	32
02:00	0	0	1	2	8	5	3	0	0	0	0	0	0	19	39	34
03:00	0	1	2	6	16	11	0	0	0	0	0	0	0	36	37	32
04:00	0	2	3	11	29	13	**4**	0	0	0	0	0	0	62	37	32
05:00	0	4	6	42	67	20	3	0	0	0	0	0	0	142	35	31
06:00	0	4	23	109	167	**34**	3	0	0	0	0	0	0	340	34	30
07:00	**2**	20	88	213	**198**	18	4	0	0	0	0	0	0	543	33	28
08:00	2	9	35	251	185	22	2	0	0	0	0	0	0	506	33	29
09:00	0	9	77	245	189	16	2	0	0	0	0	0	0	538	33	28
10:00	0	9	66	**301**	193	18	0	0	0	0	0	0	0	587	33	28
11:00	0	**22**	**117**	297	155	8	0	0	0	0	0	0	0	**599**	32	27
12 PM	2	23	128	335	170	16	0	0	0	0	0	0	0	674	32	27
13:00	3	22	90	336	**181**	19	2	0	0	0	0	0	0	653	32	28
14:00	11	31	197	342	101	6	0	0	0	0	0	0	0	688	30	26
15:00	**14**	44	**221**	443	121	4	0	0	0	0	0	0	0	847	29	26
16:00	7	26	180	491	179	10	0	0	**1**	0	0	0	0	894	31	27
17:00	8	**60**	206	**579**	134	4	0	0	0	0	0	0	0	**991**	29	26
18:00	3	36	136	403	175	13	0	0	0	0	0	0	0	766	32	27
19:00	4	36	101	298	152	9	**3**	0	0	0	0	0	0	603	32	27
20:00	0	30	88	261	150	7	3	0	0	0	0	0	0	539	32	27
21:00	1	23	55	184	94	14	0	0	0	0	0	0	0	371	32	27
22:00	0	8	27	76	81	14	3	0	0	0	0	0	0	209	34	29
23:00	0	11	10	42	72	**25**	3	0	0	0	0	0	0	163	35	30
Total	57	435	1863	5299	2849	320	38	0	1	0	0	0	0	10862		
%	0.5%	4.0%	17.2%	48.8%	26.2%	2.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	11:00	10:00	07:00	06:00	04:00							11:00		
Vol.	2	22	117	301	198	34	4							599		
PM Peak	15:00	17:00	15:00	17:00	13:00	23:00	19:00		16:00					17:00		
Vol.	14	60	221	579	181	25	3		1					991		

Pecent

15th Percentile :	23 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	8148
Percent in Pace :	75.0%
Number of Vehicles > 30 MPH :	2638
Percent of Vehicles > 30 MPH :	24.3%
Mean Speed(Average) :	27 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	2	3	5	20	19	4	0	0	0	0	0	53	43	38
01:00	0	0	2	3	3	17	9	4	**1**	0	0	0	0	39	43	38
02:00	0	0	0	0	9	9	13	2	0	0	0	0	0	33	43	38
03:00	0	1	1	0	5	19	10	3	0	0	0	0	0	39	43	37
04:00	0	4	2	3	7	22	24	4	1	0	0	0	0	67	43	37
05:00	0	0	12	19	42	85	41	**7**	0	0	0	0	0	206	41	36
06:00	0	2	23	65	146	**211**	**85**	7	0	0	0	0	0	539	40	35
07:00	0	11	**100**	**192**	**323**	185	25	2	1	0	0	0	0	**839**	37	31
08:00	**6**	**12**	53	161	301	181	36	4	0	0	0	0	0	754	37	32
09:00	1	5	26	82	242	184	53	3	1	0	0	0	0	597	39	33
10:00	2	6	16	88	192	183	55	3	1	0	0	0	0	546	39	33
11:00	1	6	33	102	265	168	35	5	0	0	0	0	0	615	38	33
12 PM	1	7	33	124	248	180	32	2	0	0	0	0	0	627	38	32
13:00	0	8	62	185	248	149	20	4	0	0	0	0	0	676	37	31
14:00	4	9	**94**	**256**	271	112	8	0	0	0	0	0	0	**754**	35	30
15:00	**8**	9	70	209	**294**	135	18	0	0	0	0	0	0	743	36	30
16:00	5	**10**	72	182	247	136	30	0	0	0	0	0	0	682	37	31
17:00	2	7	59	139	285	160	32	0	0	0	0	0	0	684	37	32
18:00	0	6	41	108	189	**214**	**51**	2	0	0	0	0	0	611	39	33
19:00	0	4	17	79	203	135	35	3	0	0	0	0	0	476	38	33
20:00	0	2	18	50	156	150	16	3	0	0	0	0	0	395	38	33
21:00	0	0	11	29	124	118	36	4	0	0	0	0	0	322	39	34
22:00	0	1	10	14	46	94	44	**11**	0	0	0	0	0	220	42	36
23:00	0	0	4	8	23	59	20	3	0	0	0	**1**	0	118	41	36
Total	30	110	761	2101	3874	2926	747	80	5	0	0	1	0	10635		
%	0.3%	1.0%	7.2%	19.8%	36.4%	27.5%	7.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	07:00	07:00	06:00	06:00	05:00	01:00					07:00		
Vol.	6	12	100	192	323	211	85	7	1					839		
PM Peak	15:00	16:00	14:00	14:00	15:00	18:00	18:00	22:00				23:00		14:00		
Vol.	8	10	94	256	294	214	51	11				1		754		

Pecent

15th Percentile :	26 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	6800
Percent in Pace :	63.9%
Number of Vehicles > 30 MPH :	6858
Percent of Vehicles > 30 MPH :	64.5%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	4	7	19	12	4	0	0	0	0	0	47	43	37
01:00	0	0	1	2	11	16	9	2	1	0	0	0	0	42	42	37
02:00	0	0	1	0	1	10	12	2	1	0	0	0	0	27	44	39
03:00	0	0	0	0	6	19	15	1	0	0	0	0	0	41	43	38
04:00	0	3	2	2	12	24	17	**11**	0	0	0	0	0	71	44	37
05:00	0	2	12	18	49	90	33	8	**3**	0	0	0	0	215	41	35
06:00	1	2	31	47	178	212	**70**	7	0	0	0	0	0	548	39	34
07:00	**10**	**19**	**92**	**176**	278	213	29	4	0	0	0	0	0	**821**	37	31
08:00	3	10	62	138	**315**	217	58	4	0	0	0	0	0	807	38	32
09:00	2	5	24	91	226	**221**	55	3	0	0	0	0	0	627	39	33
10:00	0	2	23	73	244	186	55	3	1	0	0	0	0	587	39	34
11:00	0	5	24	121	219	191	30	3	0	**1**	0	0	0	594	38	33
12 PM	**5**	14	42	132	258	**205**	31	1	0	0	0	0	0	688	38	32
13:00	2	15	41	146	**302**	177	29	0	0	0	0	0	0	712	37	32
14:00	5	**16**	**107**	222	268	130	21	2	0	0	0	0	0	771	36	30
15:00	5	9	98	**255**	294	116	8	2	0	0	0	0	0	**787**	35	30
16:00	5	5	56	149	268	188	34	2	0	0	0	0	0	707	38	32
17:00	4	7	76	192	262	149	18	3	0	0	0	0	0	711	37	31
18:00	0	4	30	168	298	195	36	1	1	0	0	0	0	733	38	32
19:00	0	8	39	98	236	149	26	0	0	0	0	0	0	556	38	32
20:00	0	1	26	90	209	127	21	1	0	0	0	0	0	475	38	32
21:00	0	1	7	30	108	136	39	2	0	0	0	0	0	323	39	35
22:00	0	1	5	19	59	87	**41**	**7**	**2**	0	0	0	0	221	41	36
23:00	0	1	1	5	24	50	29	7	0	0	0	0	0	117	42	37
Total	42	130	801	2178	4132	3127	728	80	9	1	0	0	0	11228		
%	0.4%	1.2%	7.1%	19.4%	36.8%	27.9%	6.5%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	08:00	09:00	06:00	04:00	05:00	11:00				07:00		
Vol.	10	19	92	176	315	221	70	11	3	1				821		
PM Peak	12:00	14:00	14:00	15:00	13:00	12:00	22:00	22:00	22:00					15:00		
Vol.	5	16	107	255	302	205	41	7	2					787		

Pecent

15th Percentile :	26 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	7259
Percent in Pace :	64.7%
Number of Vehicles > 30 MPH :	7250
Percent of Vehicles > 30 MPH :	64.6%
Mean Speed(Average) :	32 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	3	61	6	0	1	0	0	0	0	0	0	0	0	71
01:00	0	27	2	0	0	0	0	0	0	0	0	0	0	29
02:00	1	25	1	0	0	0	0	0	1	0	0	0	0	28
03:00	0	19	3	0	2	0	0	0	0	0	0	0	0	24
04:00	0	53	10	1	3	0	0	0	0	0	0	0	0	67
05:00	2	97	22	2	5	2	0	0	1	1	0	0	0	132
06:00	6	243	63	3	8	2	0	3	5	0	0	0	0	333
07:00	9	444	57	8	17	6	0	0	3	1	0	0	0	545
08:00	11	398	71	2	19	7	0	3	0	0	0	0	0	511
09:00	4	370	71	3	16	7	0	1	2	0	0	0	0	474
10:00	3	441	70	4	14	7	0	1	5	0	0	0	0	545
11:00	5	522	82	2	15	6	0	3	2	0	0	0	0	637
12 PM	11	511	81	2	21	10	0	3	3	0	0	0	0	642
13:00	6	490	65	0	14	8	0	2	3	0	0	0	0	588
14:00	3	557	92	7	8	6	0	3	4	0	0	0	0	680
15:00	5	667	84	1	11	4	0	2	2	0	0	0	0	776
16:00	12	758	96	1	10	7	0	0	1	0	0	0	0	885
17:00	9	788	86	1	10	8	0	3	0	0	0	0	0	905
18:00	3	565	65	0	4	1	0	0	0	0	0	0	0	638
19:00	3	504	50	0	8	0	0	1	0	0	0	0	0	566
20:00	1	312	37	1	3	2	0	0	0	0	0	0	0	356
21:00	3	276	26	0	4	0	0	1	0	0	0	0	0	310
22:00	1	138	18	0	3	2	0	2	0	0	0	0	0	164
23:00	0	136	10	0	3	0	0	0	0	0	0	0	0	149
Total	101	8402	1168	38	199	85	0	28	32	2	0	0	0	10055
Percent	1.0%	83.6%	11.6%	0.4%	2.0%	0.8%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	07:00	08:00	08:00		06:00	06:00	05:00				11:00
Vol.	11	522	82	8	19	7		3	5	1				637
PM Peak	16:00	17:00	16:00	14:00	12:00	12:00		12:00	14:00					17:00
Vol.	12	788	96	7	21	10		3	4					905

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	54	11	0	0	0	0	0	0	0	0	0	0	65
01:00	0	22	4	0	0	1	0	0	0	0	0	0	0	27
02:00	0	18	0	0	1	0	0	0	0	0	0	0	0	19
03:00	0	28	8	0	0	0	0	0	0	0	0	0	0	36
04:00	1	49	5	2	3	0	0	2	0	0	0	0	0	62
05:00	0	109	25	1	2	1	0	1	3	0	0	0	0	142
06:00	3	256	58	2	8	7	0	4	2	0	0	0	0	340
07:00	6	448	59	11	9	5	0	3	2	0	0	0	0	543
08:00	12	415	54	3	10	9	0	2	1	0	0	0	0	506
09:00	7	436	69	3	14	4	0	2	3	0	0	0	0	538
10:00	8	479	79	3	10	5	0	0	3	0	0	0	0	587
11:00	9	513	58	0	12	5	0	2	0	0	0	0	0	599
12 PM	13	560	72	3	15	6	0	3	2	0	0	0	0	674
13:00	6	543	72	3	16	5	0	5	3	0	0	0	0	653
14:00	12	578	70	7	11	7	0	2	1	0	0	0	0	688
15:00	14	708	103	0	10	10	0	2	0	0	0	0	0	847
16:00	7	781	87	0	12	7	0	0	0	0	0	0	0	894
17:00	16	865	91	2	6	10	0	0	0	0	0	1	0	991
18:00	13	668	71	1	9	3	0	0	1	0	0	0	0	766
19:00	2	528	58	0	8	5	0	2	0	0	0	0	0	603
20:00	4	478	49	0	6	2	0	0	0	0	0	0	0	539
21:00	3	328	31	1	3	1	0	3	1	0	0	0	0	371
22:00	2	189	18	0	0	0	0	0	0	0	0	0	0	209
23:00	1	152	8	1	1	0	0	0	0	0	0	0	0	163
Total	139	9205	1160	43	166	93	0	33	22	0	0	1	0	10862
Percent	1.3%	84.7%	10.7%	0.4%	1.5%	0.9%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	10:00	07:00	09:00	08:00		06:00	05:00					11:00
Vol.	12	513	79	11	14	9		4	3					599
PM Peak	17:00	17:00	15:00	14:00	13:00	15:00		13:00	13:00			17:00		17:00
Vol.	16	865	103	7	16	10		5	3			1		991

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	27	19	0	6	0	0	0	0	0	0	0	0	53
01:00	0	23	13	0	3	0	0	0	0	0	0	0	0	39
02:00	0	14	15	1	2	0	0	0	1	0	0	0	0	33
03:00	0	14	18	1	5	1	0	0	0	0	0	0	0	39
04:00	2	28	25	0	12	0	0	0	0	0	0	0	0	67
05:00	0	91	85	0	30	0	0	0	0	0	0	0	0	206
06:00	5	256	191	2	75	6	0	2	2	0	0	0	0	539
07:00	4	484	258	17	61	7	0	7	0	0	1	0	0	839
08:00	5	404	258	7	66	7	0	5	2	0	0	0	0	754
09:00	1	297	214	6	70	1	0	6	1	1	0	0	0	597
10:00	1	257	215	6	60	3	0	2	1	1	0	0	0	546
11:00	1	318	214	5	61	8	0	3	5	0	0	0	0	615
12 PM	4	330	218	5	60	5	0	4	1	0	0	0	0	627
13:00	3	348	246	4	66	2	0	4	3	0	0	0	0	676
14:00	4	407	245	8	72	9	0	6	1	1	0	1	0	754
15:00	4	442	220	2	61	10	0	3	1	0	0	0	0	743
16:00	4	414	206	6	46	3	0	3	0	0	0	0	0	682
17:00	4	442	198	2	34	2	0	2	0	0	0	0	0	684
18:00	4	330	225	1	48	3	0	0	0	0	0	0	0	611
19:00	2	283	155	0	32	4	0	0	0	0	0	0	0	476
20:00	1	199	166	2	26	1	0	0	0	0	0	0	0	395
21:00	0	176	129	0	15	2	0	0	0	0	0	0	0	322
22:00	0	133	67	0	20	0	0	0	0	0	0	0	0	220
23:00	1	56	55	0	6	0	0	0	0	0	0	0	0	118
Total	51	5773	3655	75	937	74	0	47	18	3	1	1	0	10635
Percent	0.5%	54.3%	34.4%	0.7%	8.8%	0.7%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	06:00	11:00		07:00	11:00	09:00	07:00			07:00
Vol.	5	484	258	17	75	8		7	5	1	1			839
PM Peak	12:00	15:00	13:00	14:00	14:00	15:00		14:00	13:00	14:00		14:00		14:00
Vol.	4	442	246	8	72	10		6	3	1		1		754

PRECISION
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County Street (Route 140)
between Linden Street and Owen Riverway
City, State: Taunton, MA
Client: VHB/ J. Quitter

81676 K-D class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	23	22	0	2	0	0	0	0	0	0	0	0	47
01:00	0	26	12	1	3	0	0	0	0	0	0	0	0	42
02:00	0	10	14	1	2	0	0	0	0	0	0	0	0	27
03:00	0	23	8	1	9	0	0	0	0	0	0	0	0	41
04:00	1	30	31	0	8	1	0	0	0	0	0	0	0	71
05:00	3	113	68	3	23	2	0	3	0	0	0	0	0	215
06:00	4	292	174	2	67	6	0	2	1	0	0	0	0	548
07:00	2	477	268	10	56	3	0	4	1	0	0	0	0	821
08:00	4	442	252	10	84	6	1	6	2	0	0	0	0	807
09:00	3	305	243	8	59	3	0	3	3	0	0	0	0	627
10:00	2	296	227	4	48	3	0	5	2	0	0	0	0	587
11:00	3	318	200	5	56	5	0	5	2	0	0	0	0	594
12 PM	5	384	227	4	60	1	0	5	2	0	0	0	0	688
13:00	2	386	249	7	57	6	0	5	0	0	0	0	0	712
14:00	8	440	247	8	52	5	0	7	3	1	0	0	0	771
15:00	4	483	223	7	62	3	0	5	0	0	0	0	0	787
16:00	3	419	210	5	59	5	0	6	0	0	0	0	0	707
17:00	7	443	215	1	38	5	0	2	0	0	0	0	0	711
18:00	7	425	253	2	40	4	0	2	0	0	0	0	0	733
19:00	6	317	197	0	31	1	0	3	1	0	0	0	0	556
20:00	3	258	181	0	30	1	0	2	0	0	0	0	0	475
21:00	3	193	115	0	11	1	0	0	0	0	0	0	0	323
22:00	0	142	69	0	10	0	0	0	0	0	0	0	0	221
23:00	0	65	44	1	7	0	0	0	0	0	0	0	0	117
Total	70	6310	3749	80	874	61	1	65	17	1	0	0	0	11228
Percent	0.6%	56.2%	33.4%	0.7%	7.8%	0.5%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	08:00	06:00	08:00	08:00	09:00					07:00
Vol.	4	477	268	10	84	6	1	6	3					821
PM Peak	14:00	15:00	18:00	14:00	15:00	13:00		14:00	14:00	14:00				15:00
Vol.	8	483	253	8	62	6		7	3	1				787

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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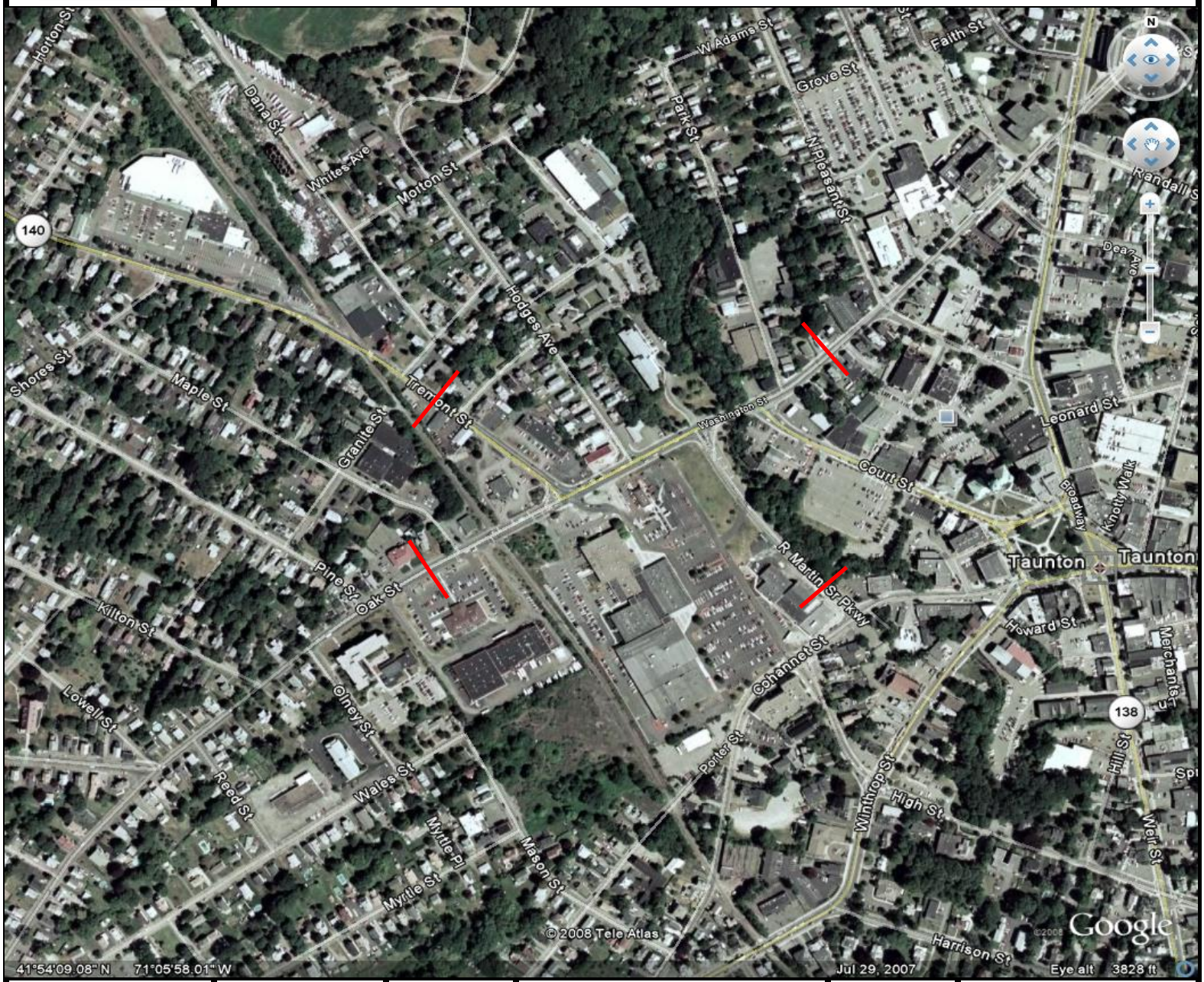
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	J. Quitter	10111.31	Tues 9/9/08 thru Wed 9/10/08	81676	Taunton, MA

Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 H-A volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	11		82		2		65		13		147		
12:15	10		73		15		87		25		160		
12:30	6		65		3		94		9		159		
12:45	7	34	66	286	6	26	88	334	13	60	154	620	
01:00	2		81		8		87		10		168		
01:15	12		88		6		91		18		179		
01:30	3		92		10		84		13		176		
01:45	4	21	70	331	4	28	81	343	8	49	151	674	
02:00	7		73		6		88		13		161		
02:15	4		95		8		91		12		186		
02:30	5		85		8		100		13		185		
02:45	2	18	91	344	4	26	99	378	6	44	190	722	
03:00	3		107		3		92		6		199		
03:15	1		93		5		98		6		191		
03:30	5		77		3		102		8		179		
03:45	4	13	81	358	6	17	118	410	10	30	199	768	
04:00	5		100		5		82		10		182		
04:15	1		119		9		84		10		203		
04:30	4		118		13		98		17		216		
04:45	9	19	112	449	11	38	86	350	20	57	198	799	
05:00	5		130		31		105		36		235		
05:15	10		109		19		69		29		178		
05:30	7		104		41		88		48		192		
05:45	14	36	109	452	53	144	81	343	67	180	190	795	
06:00	17		93		65		68		82		161		
06:15	28		78		73		65		101		143		
06:30	34		97		89		78		123		175		
06:45	32	111	72	340	102	329	69	280	134	440	141	620	
07:00	39		61		116		63		155		124		
07:15	57		70		144		75		201		145		
07:30	66		64		123		61		189		125		
07:45	60	222	53	248	109	492	52	251	169	714	105	499	
08:00	70		54		128		49		198		103		
08:15	72		59		104		41		176		100		
08:30	68		46		111		38		179		84		
08:45	73	283	47	206	106	449	32	160	179	732	79	366	
09:00	59		49		85		34		144		83		
09:15	70		55		82		32		152		87		
09:30	72		39		85		30		157		69		
09:45	78	279	29	172	89	341	23	119	167	620	52	291	
10:00	74		38		84		29		158		67		
10:15	61		34		74		23		135		57		
10:30	68		32		94		27		162		59		
10:45	77	280	25	129	86	338	37	116	163	618	62	245	
11:00	65		34		102		24		167		58		
11:15	66		21		111		23		177		44		
11:30	65		25		89		16		154		41		
11:45	71	267	15	95	82	384	9	72	153	651	24	167	
Total	1583		3410		2612		3156		4195		6566		
Percent	37.7%		51.9%		62.3%		48.1%						
Day Total			4993				5768				10761		
Peak	09:15		04:15		07:15		03:00		07:15		04:15		
Vol.	294		479		504		410		757		852		
P.H.F.	0.942		0.921		0.875		0.869		0.942		0.906		

Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 H-A volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		93		11		95		20		188		
12:15	14		93		5		94		19		187		
12:30	12		98		8		110		20		208		
12:45	7	42	89	373	3	27	89	388	10	69	178	761	
01:00	12		96		7		70		19		166		
01:15	4		88		4		88		8		176		
01:30	3		65		5		82		8		147		
01:45	5	24	82	331	9	25	100	340	14	49	182	671	
02:00	5		84		4		102		9		186		
02:15	4		99		6		89		10		188		
02:30	6		84		2		108		8		192		
02:45	4	19	103	370	2	14	119	418	6	33	222	788	
03:00	2		98		4		113		6		211		
03:15	4		122		3		100		7		222		
03:30	2		102		6		87		8		189		
03:45	4	12	109	431	1	14	95	395	5	26	204	826	
04:00	1		118		4		83		5		201		
04:15	4		125		13		81		17		206		
04:30	1		115		13		107		14		222		
04:45	4	10	111	469	9	39	100	371	13	49	211	840	
05:00	4		99		27		81		31		180		
05:15	11		135		23		108		34		243		
05:30	6		119		37		119		43		238		
05:45	12	33	106	459	56	143	100	408	68	176	206	867	
06:00	23		112		81		87		104		199		
06:15	27		87		61		74		88		161		
06:30	36		95		95		90		131		185		
06:45	32	118	88	382	121	358	66	317	153	476	154	699	
07:00	55		92		109		67		164		159		
07:15	54		82		132		67		186		149		
07:30	60		72		126		69		186		141		
07:45	82	251	90	336	105	472	60	263	187	723	150	599	
08:00	85		70		135		45		220		115		
08:15	70		60		108		49		178		109		
08:30	65		78		110		49		175		127		
08:45	54	274	62	270	102	455	41	184	156	729	103	454	
09:00	78		49		101		32		179		81		
09:15	63		43		86		31		149		74		
09:30	70		50		100		31		170		81		
09:45	82	293	36	178	94	381	29	123	176	674	65	301	
10:00	56		43		95		32		151		75		
10:15	72		27		78		24		150		51		
10:30	78		23		103		25		181		48		
10:45	64	270	23	116	86	362	28	109	150	632	51	225	
11:00	81		24		87		13		168		37		
11:15	65		29		81		13		146		42		
11:30	68		17		85		7		153		24		
11:45	69	283	18	88	84	337	9	42	153	620	27	130	
Total	1629		3803		2627		3358		4256		7161		
Percent	38.3%		53.1%		61.7%		46.9%						
Day Total		5432				5985				11417			
Peak	07:45		05:15		07:15		02:30		07:15		05:15		
Vol.	302		472		498		440		779		886		
P.H.F.	0.888		0.874		0.922		0.924		0.885		0.912		

PRECISION
D A T A
INDUSTRIES, LLC
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	0	4	14	12	4	0	0	0	0	0	0	34	39	34
01:00	0	0	0	3	6	8	2	**2**	0	0	0	0	0	21	43	36
02:00	1	1	2	4	6	3	0	1	0	0	0	0	0	18	35	30
03:00	0	0	0	4	4	3	2	0	0	0	0	0	0	13	37	33
04:00	0	2	0	2	7	7	1	0	0	0	0	0	0	19	37	32
05:00	0	3	0	8	15	8	2	0	0	0	0	0	0	36	37	31
06:00	2	6	3	20	52	27	1	0	0	0	0	0	0	111	36	31
07:00	**7**	**15**	14	67	87	26	6	0	0	0	0	0	0	222	34	29
08:00	2	7	**19**	78	**132**	**41**	3	1	0	0	0	0	0	**283**	35	30
09:00	2	4	16	97	123	31	5	1	0	0	0	0	0	279	34	30
10:00	4	11	18	**106**	101	34	6	0	0	0	0	0	0	280	34	29
11:00	4	6	15	93	107	31	**11**	0	0	0	0	0	0	267	35	30
12 PM	2	4	21	95	133	30	1	0	0	0	0	0	0	286	34	30
13:00	7	13	25	120	117	42	7	0	0	0	0	0	0	331	34	29
14:00	7	10	15	133	127	48	4	0	0	0	0	0	0	344	34	30
15:00	2	6	13	123	166	45	3	0	0	0	0	0	0	358	34	30
16:00	4	10	32	176	165	53	8	0	0	0	0	0	0	448	34	30
17:00	5	12	39	160	180	49	7	1	0	0	0	0	0	453	34	29
18:00	5	17	13	104	135	59	7	0	0	0	0	0	0	340	36	30
19:00	9	8	21	65	109	29	7	0	0	0	0	0	0	248	34	29
20:00	1	5	5	59	94	35	6	0	0	1	0	0	0	206	36	31
21:00	4	2	4	40	82	36	3	1	0	0	0	0	0	172	36	31
22:00	0	1	6	34	55	29	3	1	0	0	0	0	0	129	37	32
23:00	0	0	4	18	39	26	8	0	0	0	0	0	0	95	38	33
Total	68	143	285	1613	2056	712	107	8	0	1	0	0	0	4993		
%	1.4%	2.9%	5.7%	32.3%	41.2%	14.3%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	10:00	08:00	08:00	11:00	01:00						08:00		
Vol.	7	15	19	106	132	41	11	2						283		
PM Peak	19:00	18:00	17:00	16:00	17:00	18:00	16:00	17:00		20:00				17:00		
Vol.	9	17	39	176	180	59	8	1		1				453		

Pecent

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	3669
Percent in Pace :	73.5%
Number of Vehicles > 30 MPH :	2472
Percent of Vehicles > 30 MPH :	49.5%
Mean Speed(Average) :	30 MPH

PRECISION
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	8	15	15	3	0	0	0	0	0	0	42	38	33
01:00	0	0	0	3	9	9	2	1	0	0	0	0	0	24	38	35
02:00	0	0	2	4	8	5	0	0	0	0	0	0	0	19	36	31
03:00	0	0	2	4	3	1	2	0	0	0	0	0	0	12	39	30
04:00	0	1	0	2	2	3	1	1	0	0	0	0	0	10	37	34
05:00	2	3	2	8	12	5	1	0	0	0	0	0	0	33	35	29
06:00	**4**	**8**	0	21	66	16	3	0	0	0	0	0	0	118	35	30
07:00	1	4	10	71	112	44	8	1	0	0	0	0	0	251	36	31
08:00	1	5	6	82	118	**53**	**9**	0	0	0	0	0	0	274	36	31
09:00	2	5	10	92	**133**	46	5	0	0	0	0	0	0	**293**	35	31
10:00	4	8	9	77	125	44	3	0	0	0	0	0	0	270	35	30
11:00	3	7	**19**	**109**	108	31	4	**2**	0	0	0	0	0	283	34	30
12 PM	**13**	15	21	126	151	39	7	1	0	0	0	0	0	373	34	29
13:00	4	7	23	95	137	60	3	1	**1**	0	0	0	0	331	36	30
14:00	2	9	27	127	148	54	3	0	0	0	0	0	0	370	35	30
15:00	6	9	31	144	184	48	**9**	0	0	0	0	0	0	431	34	30
16:00	0	**16**	**36**	**160**	196	56	4	1	0	0	0	0	0	**469**	34	30
17:00	3	8	16	142	**201**	**83**	6	0	0	0	0	0	0	459	36	31
18:00	6	11	25	115	168	54	2	1	0	0	0	0	0	382	34	30
19:00	6	6	23	110	144	38	7	**2**	0	0	0	0	0	336	34	30
20:00	0	4	15	97	105	43	4	0	1	**1**	0	0	0	270	35	31
21:00	0	2	3	26	106	33	7	0	0	1	0	0	0	178	36	32
22:00	0	1	3	27	55	24	6	0	0	0	0	0	0	116	37	32
23:00	0	0	3	10	37	30	8	0	0	0	0	0	0	88	39	34
Total	57	129	287	1660	2343	834	107	11	2	2	0	0	0	5432		
%	1.0%	2.4%	5.3%	30.6%	43.1%	15.4%	2.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	11:00	11:00	09:00	08:00	08:00	11:00						09:00		
Vol.	4	8	19	109	133	53	9	2						293		
PM Peak	12:00	16:00	16:00	16:00	17:00	17:00	15:00	19:00	13:00	20:00				16:00		
Vol.	13	16	36	160	201	83	9	2	1	1				469		

Pecent

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4003
Percent in Pace :	73.7%
Number of Vehicles > 30 MPH :	2830
Percent of Vehicles > 30 MPH :	52.1%
Mean Speed(Average) :	30 MPH

PRECISION
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	1	8	10	3	3	**1**	0	0	0	0	0	26	39	32
01:00	0	0	1	9	13	5	0	0	0	0	0	0	0	28	35	31
02:00	0	2	2	8	9	5	0	0	0	0	0	0	0	26	35	30
03:00	0	0	2	2	10	3	0	0	0	0	0	0	0	17	34	31
04:00	0	0	5	11	12	8	2	0	0	0	0	0	0	38	36	31
05:00	2	8	16	25	55	25	**12**	0	0	0	0	0	0	143	38	31
06:00	2	8	16	59	166	**71**	7	1	0	0	0	0	0	330	36	31
07:00	2	8	**43**	128	**243**	67	1	0	0	0	0	0	0	**492**	34	30
08:00	**6**	**15**	31	149	194	51	3	0	0	0	0	0	0	449	34	30
09:00	1	5	31	124	151	25	4	0	0	0	0	0	0	341	34	29
10:00	6	10	28	117	142	32	3	0	0	0	0	0	0	338	34	29
11:00	1	9	34	**151**	165	22	2	0	0	0	0	0	0	384	33	29
12 PM	2	8	25	102	**170**	23	4	0	0	0	0	0	0	334	34	30
13:00	3	13	32	126	124	36	**7**	**1**	0	0	0	0	0	342	34	29
14:00	2	11	39	129	143	50	5	0	0	0	0	0	0	379	34	30
15:00	1	**18**	**46**	**148**	162	34	1	0	0	0	0	0	0	**410**	34	29
16:00	2	14	20	99	154	**54**	7	0	0	0	0	0	0	350	35	30
17:00	6	11	33	113	149	29	0	1	0	0	0	0	0	342	34	29
18:00	4	9	13	76	127	43	7	0	**1**	0	0	0	0	280	35	30
19:00	6	7	16	69	113	39	2	0	0	0	0	0	0	252	35	30
20:00	6	4	15	45	63	24	3	0	0	0	0	0	0	160	35	29
21:00	4	5	5	21	64	19	1	0	0	0	0	0	0	119	35	30
22:00	6	3	9	25	53	19	1	0	0	0	0	0	0	116	35	29
23:00	**7**	2	4	20	29	9	1	0	0	0	0	0	0	72	34	28
Total	69	170	467	1764	2521	696	76	4	1	0	0	0	0	5768		
%	1.2%	2.9%	8.1%	30.6%	43.7%	12.1%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	11:00	07:00	06:00	05:00	00:00						07:00		
Vol.	6	15	43	151	243	71	12	1						492		
PM Peak	23:00	15:00	15:00	15:00	12:00	16:00	13:00	13:00	18:00					15:00		
Vol.	7	18	46	148	170	54	7	1	1					410		

Pecent

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4285
Percent in Pace :	74.3%
Number of Vehicles > 30 MPH :	2793
Percent of Vehicles > 30 MPH :	48.4%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	1	10	8	5	3	0	0	0	0	0	0	27	38	32
01:00	2	0	2	4	10	6	0	**1**	0	0	0	0	0	25	36	30
02:00	0	0	1	3	6	2	2	0	0	0	0	0	0	14	39	33
03:00	0	0	1	4	6	2	1	0	0	0	0	0	0	14	35	31
04:00	1	0	5	10	12	9	2	0	0	0	0	0	0	39	37	30
05:00	0	2	13	20	57	43	**7**	1	0	0	0	0	0	143	38	32
06:00	0	11	27	78	185	53	4	0	0	0	0	0	0	358	35	31
07:00	**11**	**15**	31	126	212	**73**	4	0	0	0	0	0	0	**472**	35	30
08:00	7	10	30	116	**225**	64	2	0	0	0	0	0	0	454	34	30
09:00	7	12	39	120	155	45	4	0	0	0	0	0	0	382	34	29
10:00	3	10	29	124	167	28	1	0	0	0	0	0	0	362	34	29
11:00	1	11	**40**	**134**	118	30	3	0	0	0	0	0	0	337	34	29
12 PM	5	10	**52**	116	150	45	**9**	0	0	0	0	0	0	387	34	29
13:00	1	6	25	121	153	29	4	**1**	0	0	0	0	0	340	34	30
14:00	**7**	**14**	49	143	173	32	1	0	0	0	0	0	0	**419**	34	29
15:00	5	13	29	**150**	157	37	3	0	0	**1**	0	0	0	395	34	29
16:00	1	11	41	114	159	45	0	0	0	0	0	0	0	371	34	29
17:00	6	13	33	122	**176**	**52**	6	0	0	0	0	0	0	408	34	30
18:00	6	8	24	86	147	43	3	0	0	0	0	0	0	317	34	30
19:00	7	7	13	105	104	23	4	0	0	0	0	0	0	263	34	29
20:00	4	7	16	52	76	23	5	1	0	0	0	0	0	184	35	30
21:00	1	4	12	36	40	26	3	0	**1**	0	0	0	0	123	37	30
22:00	1	3	4	31	50	15	5	0	0	0	0	0	0	109	36	31
23:00	0	0	1	8	19	13	1	0	0	0	0	0	0	42	37	33
Total	76	167	518	1833	2565	743	77	4	1	1	0	0	0	5985		
%	1.3%	2.8%	8.7%	30.6%	42.9%	12.4%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	11:00	11:00	08:00	07:00	05:00	01:00						07:00		
Vol.	11	15	40	134	225	73	7	1						472		
PM Peak	14:00	14:00	12:00	15:00	17:00	17:00	12:00	13:00	21:00	15:00				14:00		
Vol.	7	14	52	150	176	52	9	1	1	1				419		

Pecent

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	4398
Percent in Pace :	73.5%
Number of Vehicles > 30 MPH :	2878
Percent of Vehicles > 30 MPH :	48.1%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	26	4	0	2	0	0	1	0	0	0	0	0	34
01:00	0	19	1	0	1	0	0	0	0	0	0	0	0	21
02:00	0	16	1	0	0	1	0	0	0	0	0	0	0	18
03:00	0	10	1	0	2	0	0	0	0	0	0	0	0	13
04:00	0	10	9	0	0	0	0	0	0	0	0	0	0	19
05:00	0	24	10	0	1	1	0	0	0	0	0	0	0	36
06:00	0	79	24	0	7	1	0	0	0	0	0	0	0	111
07:00	0	145	59	4	7	4	0	2	1	0	0	0	0	222
08:00	1	209	56	2	9	4	1	1	0	0	0	0	0	283
09:00	0	203	58	0	11	5	0	2	0	0	0	0	0	279
10:00	3	212	51	1	10	2	0	1	0	0	0	0	0	280
11:00	1	207	45	0	10	3	0	1	0	0	0	0	0	267
12 PM	0	222	57	0	6	1	0	0	0	0	0	0	0	286
13:00	3	252	63	3	9	0	0	1	0	0	0	0	0	331
14:00	1	257	73	2	9	1	0	1	0	0	0	0	0	344
15:00	3	262	81	1	9	1	0	1	0	0	0	0	0	358
16:00	3	351	79	0	11	4	0	0	0	0	0	0	0	448
17:00	5	346	89	0	8	4	0	0	1	0	0	0	0	453
18:00	2	272	55	0	9	1	0	1	0	0	0	0	0	340
19:00	1	215	30	0	2	0	0	0	0	0	0	0	0	248
20:00	0	159	38	0	9	0	0	0	0	0	0	0	0	206
21:00	0	139	30	0	2	0	0	1	0	0	0	0	0	172
22:00	0	108	20	0	1	0	0	0	0	0	0	0	0	129
23:00	0	78	15	0	2	0	0	0	0	0	0	0	0	95
Total	24	3821	949	13	137	33	1	13	2	0	0	0	0	4993
Percent	0.5%	76.5%	19.0%	0.3%	2.7%	0.7%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	07:00	07:00	09:00	09:00	08:00	07:00	07:00					08:00
Vol.	3	212	59	4	11	5	1	2	1					283
PM Peak	17:00	16:00	17:00	13:00	16:00	16:00		13:00	17:00					17:00
Vol.	5	351	89	3	11	4		1	1					453

PRECISION
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	33	9	0	0	0	0	0	0	0	0	0	0	42
01:00	1	19	3	0	1	0	0	0	0	0	0	0	0	24
02:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
03:00	0	8	2	0	2	0	0	0	0	0	0	0	0	12
04:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
05:00	0	18	9	0	5	1	0	0	0	0	0	0	0	33
06:00	0	89	21	0	5	3	0	0	0	0	0	0	0	118
07:00	2	179	56	4	8	1	0	1	0	0	0	0	0	251
08:00	1	203	54	3	8	3	2	0	0	0	0	0	0	274
09:00	1	218	64	0	5	4	0	1	0	0	0	0	0	293
10:00	3	203	52	0	10	1	0	1	0	0	0	0	0	270
11:00	3	219	49	2	8	2	0	0	0	0	0	0	0	283
12 PM	2	294	58	0	11	7	0	1	0	0	0	0	0	373
13:00	1	256	49	2	20	3	0	0	0	0	0	0	0	331
14:00	2	292	61	1	8	3	0	3	0	0	0	0	0	370
15:00	2	326	88	2	9	2	1	1	0	0	0	0	0	431
16:00	3	349	96	1	14	3	0	0	3	0	0	0	0	469
17:00	7	358	82	0	10	0	0	2	0	0	0	0	0	459
18:00	3	312	58	0	6	2	0	1	0	0	0	0	0	382
19:00	3	275	44	2	11	1	0	0	0	0	0	0	0	336
20:00	3	227	37	0	3	0	0	0	0	0	0	0	0	270
21:00	4	142	26	0	5	0	0	1	0	0	0	0	0	178
22:00	0	95	16	0	4	1	0	0	0	0	0	0	0	116
23:00	0	74	13	0	1	0	0	0	0	0	0	0	0	88
Total	41	4212	953	17	154	37	3	12	3	0	0	0	0	5432
Percent	0.8%	77.5%	17.5%	0.3%	2.8%	0.7%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	09:00	07:00	10:00	09:00	08:00	07:00						09:00
Vol.	3	219	64	4	10	4	2	1						293
PM Peak	17:00	17:00	16:00	13:00	13:00	12:00	15:00	14:00	16:00					16:00
Vol.	7	358	96	2	20	7	1	3	3					469

PRECISION
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	22	2	2	0	0	0	0	0	0	0	0	0	26
01:00	0	22	3	0	3	0	0	0	0	0	0	0	0	28
02:00	0	24	1	0	1	0	0	0	0	0	0	0	0	26
03:00	0	12	2	0	3	0	0	0	0	0	0	0	0	17
04:00	0	35	3	0	0	0	0	0	0	0	0	0	0	38
05:00	1	104	24	2	11	0	0	1	0	0	0	0	0	143
06:00	2	240	64	4	20	0	0	0	0	0	0	0	0	330
07:00	1	395	74	6	14	1	0	0	1	0	0	0	0	492
08:00	2	362	58	2	23	2	0	0	0	0	0	0	0	449
09:00	0	275	49	5	11	1	0	0	0	0	0	0	0	341
10:00	1	259	54	3	16	3	0	2	0	0	0	0	0	338
11:00	1	317	49	2	15	0	0	0	0	0	0	0	0	384
12 PM	0	276	43	1	14	0	0	0	0	0	0	0	0	334
13:00	2	275	45	3	15	1	0	1	0	0	0	0	0	342
14:00	0	297	66	5	7	3	0	1	0	0	0	0	0	379
15:00	1	327	59	4	15	3	0	1	0	0	0	0	0	410
16:00	3	278	48	3	16	0	0	2	0	0	0	0	0	350
17:00	7	289	38	0	7	1	0	0	0	0	0	0	0	342
18:00	1	238	30	2	9	0	0	0	0	0	0	0	0	280
19:00	2	208	39	0	3	0	0	0	0	0	0	0	0	252
20:00	0	135	20	1	4	0	0	0	0	0	0	0	0	160
21:00	1	111	7	0	0	0	0	0	0	0	0	0	0	119
22:00	1	96	19	0	0	0	0	0	0	0	0	0	0	116
23:00	2	62	5	0	2	1	0	0	0	0	0	0	0	72
Total	28	4659	802	45	209	16	0	8	1	0	0	0	0	5768
Percent	0.5%	80.8%	13.9%	0.8%	3.6%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	07:00	08:00	10:00		10:00	07:00					07:00
Vol.	2	395	74	6	23	3		2	1					492
PM Peak	17:00	15:00	14:00	14:00	16:00	14:00		16:00						15:00
Vol.	7	327	66	5	16	3		2						410

PRECISION
D A T A
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Oak Street west of
Maple Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-A class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	22	5	0	0	0	0	0	0	0	0	0	0	27
01:00	0	21	3	0	1	0	0	0	0	0	0	0	0	25
02:00	0	14	0	0	0	0	0	0	0	0	0	0	0	14
03:00	0	12	0	0	2	0	0	0	0	0	0	0	0	14
04:00	0	33	5	0	1	0	0	0	0	0	0	0	0	39
05:00	1	108	25	1	8	0	0	0	0	0	0	0	0	143
06:00	1	265	68	5	17	1	0	1	0	0	0	0	0	358
07:00	3	371	76	6	13	3	0	0	0	0	0	0	0	472
08:00	2	359	70	2	17	1	0	3	0	0	0	0	0	454
09:00	4	309	47	2	19	1	0	0	0	0	0	0	0	382
10:00	4	299	45	1	12	1	0	0	0	0	0	0	0	362
11:00	0	263	52	2	16	1	0	3	0	0	0	0	0	337
12 PM	2	309	56	1	16	1	0	2	0	0	0	0	0	387
13:00	1	270	50	2	16	1	0	0	0	0	0	0	0	340
14:00	2	349	52	3	11	0	0	2	0	0	0	0	0	419
15:00	2	324	50	4	15	0	0	0	0	0	0	0	0	395
16:00	2	298	53	1	15	1	0	1	0	0	0	0	0	371
17:00	5	331	48	5	16	3	0	0	0	0	0	0	0	408
18:00	2	273	28	0	13	0	0	1	0	0	0	0	0	317
19:00	3	222	32	0	6	0	0	0	0	0	0	0	0	263
20:00	0	157	23	1	3	0	0	0	0	0	0	0	0	184
21:00	1	105	11	0	5	0	0	0	1	0	0	0	0	123
22:00	1	95	11	0	1	1	0	0	0	0	0	0	0	109
23:00	0	39	2	0	1	0	0	0	0	0	0	0	0	42
Total	36	4848	812	36	224	15	0	13	1	0	0	0	0	5985
Percent	0.6%	81.0%	13.6%	0.6%	3.7%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	07:00	09:00	07:00		08:00						07:00
Vol.	4	371	76	6	19	3		3						472
PM Peak	17:00	14:00	12:00	17:00	12:00	17:00		12:00	21:00					14:00
Vol.	5	349	56	5	16	3		2	1					419

Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 H-B volume
Site Code: 10111.31

Start	SB				NB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	11		109		22		115		33		224		
12:15	15		118		14		122		29		240		
12:30	8		130		12		121		20		251		
12:45	11	45	116	473	10	58	125	483	21	103	241	956	
01:00	4		126		10		137		14		263		
01:15	6		138		6		130		12		268		
01:30	3		129		3		144		6		273		
01:45	5	18	124	517	11	30	125	536	16	48	249	1053	
02:00	3		127		2		148		5		275		
02:15	8		139		9		156		17		295		
02:30	1		139		3		136		4		275		
02:45	5	17	170	575	8	22	128	568	13	39	298	1143	
03:00	4		137		9		137		13		274		
03:15	8		129		13		125		21		254		
03:30	7		142		11		133		18		275		
03:45	5	24	132	540	13	46	150	545	18	70	282	1085	
04:00	9		125		13		160		22		285		
04:15	4		153		17		163		21		316		
04:30	21		164		19		166		40		330		
04:45	25	59	181	623	14	63	183	672	39	122	364	1295	
05:00	32		144		34		177		66		321		
05:15	27		152		37		186		64		338		
05:30	38		165		57		133		95		298		
05:45	47	144	153	614	57	185	129	625	104	329	282	1239	
06:00	40		126		57		110		97		236		
06:15	70		121		89		124		159		245		
06:30	96		108		108		112		204		220		
06:45	116	322	101	456	110	364	134	480	226	686	235	936	
07:00	130		108		124		124		254		232		
07:15	179		102		122		95		301		197		
07:30	174		77		143		105		317		182		
07:45	158	641	105	392	148	537	112	436	306	1178	217	828	
08:00	148		58		97		92		245		150		
08:15	157		53		93		87		250		140		
08:30	171		52		105		87		276		139		
08:45	151	627	42	205	104	399	60	326	255	1026	102	531	
09:00	123		74		100		72		223		146		
09:15	122		46		124		40		246		86		
09:30	120		31		99		50		219		81		
09:45	142	507	31	182	103	426	50	212	245	933	81	394	
10:00	109		44		102		39		211		83		
10:15	110		20		97		29		207		49		
10:30	113		23		108		37		221		60		
10:45	123	455	23	110	114	421	35	140	237	876	58	250	
11:00	124		26		109		23		233		49		
11:15	119		24		132		27		251		51		
11:30	97		22		127		29		224		51		
11:45	112	452	12	84	143	511	18	97	255	963	30	181	
Total	3311		4771		3062		5120		6373		9891		
Percent	52.0%		48.2%		48.0%		51.8%						
Day Total		8082				8182				16264			
Peak	07:15		04:15		07:00		04:30		07:00		04:30		
Vol.	659		642		537		712		1178		1353		
P.H.F.	0.920		0.887		0.907		0.957		0.929		0.929		

Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 H-B volume
Site Code: 10111.31

Start	SB				NB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		140		14		151		23		291		
12:15	13		108		12		144		25		252		
12:30	6		107		10		127		16		234		
12:45	8	36	124	479	9	45	130	552	17	81	254	1031	
01:00	2		129		2		160		4		289		
01:15	8		139		9		133		17		272		
01:30	5		141		6		107		11		248		
01:45	4	19	132	541	5	22	149	549	9	41	281	1090	
02:00	3		141		5		144		8		285		
02:15	6		148		8		132		14		280		
02:30	4		140		6		131		10		271		
02:45	9	22	161	590	4	23	140	547	13	45	301	1137	
03:00	7		157		7		139		14		296		
03:15	16		130		10		144		26		274		
03:30	8		146		13		155		21		301		
03:45	8	39	135	568	13	43	142	580	21	82	277	1148	
04:00	7		179		16		156		23		335		
04:15	9		172		13		170		22		342		
04:30	11		165		11		163		22		328		
04:45	21	48	167	683	27	67	169	658	48	115	336	1341	
05:00	25		162		30		188		55		350		
05:15	27		172		41		175		68		347		
05:30	37		178		55		142		92		320		
05:45	64	153	184	696	68	194	164	669	132	347	348	1365	
06:00	51		177		65		146		116		323		
06:15	69		163		74		126		143		289		
06:30	90		121		115		141		205		262		
06:45	125	335	144	605	103	357	124	537	228	692	268	1142	
07:00	148		120		111		142		259		262		
07:15	151		137		151		116		302		253		
07:30	188		91		136		124		324		215		
07:45	155	642	74	422	168	566	144	526	323	1208	218	948	
08:00	164		81		105		87		269		168		
08:15	169		92		93		87		262		179		
08:30	152		65		105		102		257		167		
08:45	150	635	58	296	143	446	78	354	293	1081	136	650	
09:00	141		68		117		71		258		139		
09:15	119		51		119		66		238		117		
09:30	127		53		99		63		226		116		
09:45	125	512	32	204	116	451	54	254	241	963	86	458	
10:00	120		52		120		65		240		117		
10:15	131		37		111		41		242		78		
10:30	116		34		115		31		231		65		
10:45	135	502	24	147	125	471	39	176	260	973	63	323	
11:00	143		25		122		23		265		48		
11:15	115		26		124		26		239		52		
11:30	98		19		132		28		230		47		
11:45	125	481	20	90	126	504	24	101	251	985	44	191	
Total	3424		5321		3189		5503		6613		10824		
Percent	51.8%		49.2%		48.2%		50.8%						
Day Total		8745				8692				17437			
Peak	07:30		05:15		07:00		04:30		07:15		05:00		
Vol.	676		711		566		695		1218		1365		
P.H.F.	0.899		0.966		0.842		0.924		0.940		0.975		

PRECISION
D A T A
INDUSTRIES, LLC
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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	5	9	12	12	5	**2**	0	0	0	0	0	45	39	33
01:00	0	0	1	3	8	4	2	0	0	0	0	0	0	18	37	33
02:00	0	0	0	0	6	7	4	0	0	0	0	0	0	17	40	36
03:00	1	1	1	3	8	7	2	1	0	0	0	0	0	24	38	32
04:00	0	0	1	12	19	20	5	2	0	0	0	0	0	59	39	34
05:00	0	0	7	29	61	43	4	0	0	0	0	0	0	144	37	32
06:00	0	2	19	93	131	**64**	**11**	2	0	0	0	0	0	322	37	31
07:00	9	25	121	**271**	161	50	3	1	0	0	0	0	0	**641**	33	28
08:00	**20**	**29**	**134**	233	**172**	38	1	0	0	0	0	0	0	627	33	27
09:00	0	3	67	241	161	31	4	0	0	0	0	0	0	507	33	29
10:00	2	15	83	169	138	43	5	0	0	0	0	0	0	455	34	28
11:00	7	23	70	193	122	30	7	0	0	0	0	0	0	452	33	28
12 PM	3	39	103	172	126	30	0	0	0	0	0	0	0	473	33	27
13:00	2	10	87	251	142	23	2	0	0	0	0	0	0	517	33	28
14:00	3	17	115	**303**	123	12	2	0	0	0	0	0	0	575	32	27
15:00	4	15	121	276	105	19	0	0	0	0	0	0	0	540	32	27
16:00	**10**	**48**	**129**	254	157	22	2	**1**	0	0	0	0	0	**623**	32	27
17:00	4	12	68	259	**208**	**60**	3	0	0	0	0	0	0	614	34	29
18:00	1	2	30	176	179	53	**14**	1	0	0	0	0	0	456	34	30
19:00	0	4	37	150	155	44	2	0	0	0	0	0	0	392	34	30
20:00	0	1	9	60	84	42	9	0	0	0	0	0	0	205	37	31
21:00	0	2	11	56	71	35	6	1	0	0	0	0	0	182	37	31
22:00	0	1	3	23	45	33	4	0	**1**	0	0	0	0	110	37	33
23:00	0	2	3	12	37	26	4	0	0	0	0	0	0	84	38	33
Total	66	251	1225	3248	2431	748	101	11	1	0	0	0	0	8082		
%	0.8%	3.1%	15.2%	40.2%	30.1%	9.3%	1.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	08:00	06:00	06:00	00:00						07:00		
Vol.	20	29	134	271	172	64	11	2						641		
PM Peak	16:00	16:00	16:00	14:00	17:00	17:00	18:00	16:00	22:00					16:00		
Vol.	10	48	129	303	208	60	14	1	1					623		

Pecent

15th Percentile :	23 MPH
50th Percentile :	28 MPH
85th Percentile :	34 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	5679
Percent in Pace :	70.3%
Number of Vehicles > 30 MPH :	2805
Percent of Vehicles > 30 MPH :	34.7%
Mean Speed(Average) :	28 MPH

PRECISION
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INDUSTRIES, LLC
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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	3	10	11	9	3	0	0	0	0	0	0	36	38	32
01:00	0	0	0	8	5	5	1	0	0	0	0	0	0	19	37	31
02:00	1	1	1	1	8	9	1	0	0	0	0	0	0	22	38	33
03:00	0	2	0	6	12	13	4	**2**	0	0	0	0	0	39	39	34
04:00	0	1	2	5	23	14	3	0	0	0	0	0	0	48	38	33
05:00	0	1	10	28	73	31	8	1	0	0	**1**	0	0	153	37	32
06:00	0	2	20	90	145	**67**	**11**	0	0	0	0	0	0	335	36	31
07:00	10	16	**123**	**268**	189	33	3	0	0	0	0	0	0	**642**	33	28
08:00	**11**	26	103	220	**225**	44	6	0	0	0	0	0	0	635	33	28
09:00	0	23	49	228	180	30	2	0	0	0	0	0	0	512	33	28
10:00	0	**27**	97	217	132	22	7	0	0	0	0	0	0	502	33	27
11:00	2	7	62	191	175	38	4	2	0	0	0	0	0	481	34	29
12 PM	3	10	67	225	147	26	1	0	0	0	0	0	0	479	33	28
13:00	5	14	83	231	166	36	6	0	0	0	0	0	0	541	33	28
14:00	9	33	129	279	119	20	1	0	0	0	0	0	0	590	32	26
15:00	**13**	**39**	87	242	148	36	2	1	0	0	0	0	0	568	33	27
16:00	3	25	**149**	274	190	38	4	0	0	0	0	0	0	683	33	28
17:00	4	21	121	**294**	205	**49**	2	0	0	0	0	0	0	**696**	33	28
18:00	1	11	87	253	**216**	35	1	1	0	0	0	0	0	605	33	28
19:00	0	1	34	205	149	30	1	1	0	0	**1**	0	0	422	33	29
20:00	0	6	22	98	114	47	7	**2**	0	0	0	0	0	296	36	30
21:00	1	0	17	39	103	41	3	0	0	0	0	0	0	204	36	31
22:00	0	0	5	38	68	32	4	0	0	0	0	0	0	147	36	32
23:00	0	1	4	15	33	27	**10**	0	0	0	0	0	0	90	39	33
Total	63	267	1275	3465	2836	732	95	10	0	0	2	0	0	8745		
%	0.7%	3.1%	14.6%	39.6%	32.4%	8.4%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	10:00	07:00	07:00	08:00	06:00	06:00	03:00			05:00			07:00		
Vol.	11	27	123	268	225	67	11	2			1			642		
PM Peak	15:00	15:00	16:00	17:00	18:00	17:00	23:00	20:00			19:00			17:00		
Vol.	13	39	149	294	216	49	10	2			1			696		

Pecent

15th Percentile :	23 MPH
50th Percentile :	28 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	6301
Percent in Pace :	72.1%
Number of Vehicles > 30 MPH :	3107
Percent of Vehicles > 30 MPH :	35.5%
Mean Speed(Average) :	28 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	1	9	21	18	6	**3**	0	0	0	0	0	58	39	34
01:00	0	1	2	5	15	5	1	1	0	0	0	0	0	30	36	32
02:00	0	0	2	2	5	12	1	0	0	0	0	0	0	22	38	34
03:00	0	1	2	4	17	17	5	0	0	0	0	0	0	46	39	34
04:00	0	0	3	10	29	19	2	0	0	0	0	0	0	63	37	32
05:00	3	4	14	24	87	44	8	1	0	0	0	0	0	185	37	32
06:00	3	2	6	85	**187**	**69**	**10**	2	0	0	0	0	0	364	36	32
07:00	7	**32**	**87**	208	167	34	2	0	0	0	0	0	0	**537**	33	28
08:00	**8**	10	68	165	117	27	3	1	0	0	0	0	0	399	33	28
09:00	5	20	51	199	127	22	2	0	0	0	0	0	0	426	33	28
10:00	3	12	74	188	112	30	2	0	0	0	0	0	0	421	33	28
11:00	0	7	86	**248**	148	20	2	0	0	0	0	0	0	511	33	28
12 PM	12	17	86	216	132	18	2	0	0	0	0	0	0	483	32	27
13:00	5	13	100	274	129	13	0	**1**	0	0	0	0	0	535	32	27
14:00	12	11	92	299	141	13	1	0	0	0	0	0	0	569	32	27
15:00	**16**	**26**	118	242	122	19	1	1	0	0	0	0	0	545	32	26
16:00	8	20	**139**	305	169	28	3	0	0	0	0	0	0	**672**	32	27
17:00	7	6	69	**313**	192	35	3	0	0	0	0	0	0	625	33	28
18:00	0	5	45	181	**201**	**46**	2	0	0	0	0	0	0	480	34	30
19:00	0	4	50	207	149	23	3	0	0	0	0	0	0	436	33	29
20:00	0	2	19	120	140	41	4	0	0	0	0	0	0	326	34	30
21:00	1	4	10	80	88	22	**6**	1	0	0	0	0	0	212	34	30
22:00	3	4	6	34	68	21	4	0	0	0	0	0	0	140	35	31
23:00	0	0	6	24	47	15	5	0	0	0	0	0	0	97	36	31
Total	93	201	1136	3442	2610	611	78	11	0	0	0	0	0	8182		
%	1.1%	2.5%	13.9%	42.1%	31.9%	7.5%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	07:00	11:00	06:00	06:00	06:00	00:00						07:00		
Vol.	8	32	87	248	187	69	10	3						537		
PM Peak	15:00	15:00	16:00	17:00	18:00	18:00	21:00	13:00						16:00		
Vol.	16	26	139	313	201	46	6	1						672		

Pecent

15th Percentile :	24 MPH
50th Percentile :	28 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	6052
Percent in Pace :	74.0%
Number of Vehicles > 30 MPH :	2788
Percent of Vehicles > 30 MPH :	34.1%
Mean Speed(Average) :	28 MPH

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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	2	11	13	16	3	0	0	0	0	0	0	45	38	33
01:00	0	1	2	4	8	4	2	1	0	0	0	0	0	22	38	32
02:00	0	0	0	6	9	5	3	0	0	0	0	0	0	23	39	33
03:00	0	0	3	8	16	13	2	1	0	0	0	0	0	43	38	33
04:00	0	0	3	19	27	16	1	1	0	0	0	0	0	67	37	32
05:00	1	5	8	54	84	36	4	2	0	0	0	0	0	194	36	31
06:00	0	2	14	86	**185**	**58**	**9**	**3**	0	0	0	0	0	357	36	32
07:00	**11**	**29**	95	236	162	32	1	0	0	0	0	0	0	**566**	33	27
08:00	9	24	77	174	133	26	3	0	0	0	0	0	0	446	33	27
09:00	2	23	70	219	121	12	3	1	0	0	0	0	0	451	32	27
10:00	7	9	**102**	221	111	20	1	0	0	0	0	0	0	471	32	27
11:00	2	6	71	**251**	151	21	2	0	0	0	0	0	0	504	33	28
12 PM	6	20	89	277	133	25	2	0	0	0	0	0	0	552	32	27
13:00	2	9	122	265	136	13	2	0	0	0	0	0	0	549	32	27
14:00	9	**38**	113	247	118	19	**3**	0	0	0	0	0	0	547	32	26
15:00	6	27	121	272	135	18	1	0	0	0	0	0	0	580	32	27
16:00	**11**	24	**155**	301	154	12	0	0	0	0	0	0	0	657	32	27
17:00	2	24	81	**344**	**192**	24	2	0	0	0	0	0	0	**669**	33	28
18:00	4	12	76	224	192	27	3	0	0	0	0	0	0	538	33	28
19:00	0	9	85	224	175	30	2	0	0	0	0	0	0	525	33	28
20:00	0	0	31	148	133	**38**	3	**2**	0	0	0	0	0	355	34	30
21:00	5	3	14	89	120	22	1	0	0	0	0	0	0	254	34	29
22:00	0	4	5	52	81	33	1	0	0	0	0	0	0	176	36	31
23:00	0	0	4	22	45	24	3	2	**1**	0	0	0	0	101	37	32
Total	77	269	1343	3754	2634	544	57	13	1	0	0	0	0	8692		
%	0.9%	3.1%	15.5%	43.2%	30.3%	6.3%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	10:00	11:00	06:00	06:00	06:00	06:00						07:00		
Vol.	11	29	102	251	185	58	9	3						566		
PM Peak	16:00	14:00	16:00	17:00	17:00	20:00	14:00	20:00	23:00					17:00		
Vol.	11	38	155	344	192	38	3	2	1					669		

Pecent

15th Percentile :	23 MPH
50th Percentile :	28 MPH
85th Percentile :	33 MPH
95th Percentile :	36 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	6388
Percent in Pace :	73.5%
Number of Vehicles > 30 MPH :	2722
Percent of Vehicles > 30 MPH :	31.3%
Mean Speed(Average) :	28 MPH

PRECISION
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Tremont Street (Route 140)
north of Washington Street
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Client: VHB/J. Quitter

81676 H-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	36	7	0	2	0	0	0	0	0	0	0	0	45
01:00	0	17	1	0	0	0	0	0	0	0	0	0	0	18
02:00	0	15	2	0	0	0	0	0	0	0	0	0	0	17
03:00	0	11	10	0	3	0	0	0	0	0	0	0	0	24
04:00	0	44	13	0	1	1	0	0	0	0	0	0	0	59
05:00	1	93	39	5	6	0	0	0	0	0	0	0	0	144
06:00	1	221	70	4	17	4	0	4	1	0	0	0	0	322
07:00	8	473	128	15	10	4	0	2	1	0	0	0	0	641
08:00	1	471	120	3	20	3	0	5	3	0	1	0	0	627
09:00	2	371	111	3	15	4	0	0	1	0	0	0	0	507
10:00	7	330	89	1	19	5	0	3	1	0	0	0	0	455
11:00	4	317	96	2	21	7	0	3	1	1	0	0	0	452
12 PM	4	357	76	4	19	8	0	4	1	0	0	0	0	473
13:00	4	384	89	7	25	2	0	6	0	0	0	0	0	517
14:00	9	411	115	8	17	10	1	3	1	0	0	0	0	575
15:00	4	404	111	2	19	0	0	0	0	0	0	0	0	540
16:00	2	481	120	0	11	6	0	3	0	0	0	0	0	623
17:00	4	486	107	1	12	2	1	1	0	0	0	0	0	614
18:00	2	360	76	2	14	1	0	1	0	0	0	0	0	456
19:00	1	315	67	0	7	1	0	1	0	0	0	0	0	392
20:00	1	164	33	0	4	2	0	1	0	0	0	0	0	205
21:00	3	139	35	0	4	1	0	0	0	0	0	0	0	182
22:00	0	87	21	0	0	1	0	0	1	0	0	0	0	110
23:00	0	67	14	1	2	0	0	0	0	0	0	0	0	84
Total	58	6054	1550	58	248	62	2	37	11	1	1	0	0	8082
Percent	0.7%	74.9%	19.2%	0.7%	3.1%	0.8%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	11:00	11:00		08:00	08:00	11:00	08:00			07:00
Vol.	8	473	128	15	21	7		5	3	1	1			641
PM Peak	14:00	17:00	16:00	14:00	13:00	14:00	14:00	13:00	12:00					16:00
Vol.	9	486	120	8	25	10	1	6	1					623

Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

81676 H-B class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	30	5	0	0	1	0	0	0	0	0	0	0	36
01:00	0	13	5	0	0	0	0	0	1	0	0	0	0	19
02:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
03:00	0	22	13	0	4	0	0	0	0	0	0	0	0	39
04:00	0	34	13	0	1	0	0	0	0	0	0	0	0	48
05:00	0	113	31	2	4	1	0	1	1	0	0	0	0	153
06:00	2	241	71	5	10	2	0	1	3	0	0	0	0	335
07:00	9	474	121	13	15	5	0	4	1	0	0	0	0	642
08:00	5	470	120	5	27	7	0	0	1	0	0	0	0	635
09:00	3	382	106	3	11	4	0	2	1	0	0	0	0	512
10:00	1	374	108	2	12	3	0	1	1	0	0	0	0	502
11:00	5	370	79	2	14	9	0	1	1	0	0	0	0	481
12 PM	5	361	86	2	12	9	0	3	1	0	0	0	0	479
13:00	3	404	90	5	28	9	0	0	2	0	0	0	0	541
14:00	6	433	118	13	11	5	0	2	2	0	0	0	0	590
15:00	11	419	109	2	18	7	0	2	0	0	0	0	0	568
16:00	12	528	114	0	19	6	0	4	0	0	0	0	0	683
17:00	11	535	133	0	11	2	0	4	0	0	0	0	0	696
18:00	6	480	102	0	10	2	0	4	0	0	0	1	0	605
19:00	4	338	69	0	11	0	0	0	0	0	0	0	0	422
20:00	2	240	43	0	7	1	0	2	1	0	0	0	0	296
21:00	6	164	30	1	3	0	0	0	0	0	0	0	0	204
22:00	0	130	16	0	1	0	0	0	0	0	0	0	0	147
23:00	0	75	11	0	2	0	0	1	1	0	0	0	0	90
Total	91	6648	1597	55	231	73	0	32	17	0	0	1	0	8745
Percent	1.0%	76.0%	18.3%	0.6%	2.6%	0.8%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	08:00	11:00		07:00	06:00					07:00
Vol.	9	474	121	13	27	9		4	3					642
PM Peak	16:00	17:00	17:00	14:00	13:00	12:00		16:00	13:00			18:00		17:00
Vol.	12	535	133	13	28	9		4	2			1		696

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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	1	47	10	0	0	0	0	0	0	0	0	0	0	58
01:00	0	28	1	0	1	0	0	0	0	0	0	0	0	30
02:00	0	16	4	1	1	0	0	0	0	0	0	0	0	22
03:00	0	33	13	0	0	0	0	0	0	0	0	0	0	46
04:00	1	40	22	0	0	0	0	0	0	0	0	0	0	63
05:00	0	113	54	0	13	3	0	1	1	0	0	0	0	185
06:00	3	268	76	2	11	3	0	1	0	0	0	0	0	364
07:00	4	393	104	10	18	6	1	1	0	0	0	0	0	537
08:00	5	278	80	14	15	4	0	2	1	0	0	0	0	399
09:00	2	288	93	16	19	5	0	3	0	0	0	0	0	426
10:00	1	314	83	0	15	4	0	2	2	0	0	0	0	421
11:00	5	386	103	3	11	3	0	0	0	0	0	0	0	511
12 PM	2	371	79	4	14	8	0	5	0	0	0	0	0	483
13:00	2	410	93	2	20	4	0	3	1	0	0	0	0	535
14:00	10	420	110	4	13	8	0	3	1	0	0	0	0	569
15:00	2	410	99	8	19	3	0	3	1	0	0	0	0	545
16:00	9	520	124	9	10	0	0	0	0	0	0	0	0	672
17:00	8	517	80	2	16	2	0	0	0	0	0	0	0	625
18:00	2	397	72	0	8	1	0	0	0	0	0	0	0	480
19:00	1	353	79	0	3	0	0	0	0	0	0	0	0	436
20:00	0	272	49	0	4	1	0	0	0	0	0	0	0	326
21:00	1	182	28	0	1	0	0	0	0	0	0	0	0	212
22:00	0	121	17	0	2	0	0	0	0	0	0	0	0	140
23:00	1	81	14	0	1	0	0	0	0	0	0	0	0	97
Total	60	6258	1487	75	215	55	1	24	7	0	0	0	0	8182
Percent	0.7%	76.5%	18.2%	0.9%	2.6%	0.7%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	09:00	09:00	07:00	07:00	09:00	10:00					07:00
Vol.	5	393	104	16	19	6	1	3	2					537
PM Peak	14:00	16:00	16:00	16:00	13:00	12:00		12:00	13:00					16:00
Vol.	10	520	124	9	20	8		5	1					672

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Tremont Street (Route 140)
north of Washington Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-B class
Site Code: 10111.31

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	36	9	0	0	0	0	0	0	0	0	0	0	45
01:00	0	18	3	0	1	0	0	0	0	0	0	0	0	22
02:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
03:00	0	30	12	0	1	0	0	0	0	0	0	0	0	43
04:00	0	40	24	0	2	0	0	0	1	0	0	0	0	67
05:00	3	126	49	1	11	3	0	1	0	0	0	0	0	194
06:00	6	261	76	1	8	3	0	2	0	0	0	0	0	357
07:00	5	415	108	14	15	4	1	3	1	0	0	0	0	566
08:00	3	301	99	10	21	7	0	3	2	0	0	0	0	446
09:00	3	333	79	7	18	6	0	5	0	0	0	0	0	451
10:00	4	346	96	5	16	2	0	1	1	0	0	0	0	471
11:00	9	375	102	1	14	2	0	1	0	0	0	0	0	504
12 PM	4	443	77	4	17	2	1	3	1	0	0	0	0	552
13:00	9	390	120	2	18	5	0	2	3	0	0	0	0	549
14:00	2	437	86	3	12	4	0	3	0	0	0	0	0	547
15:00	5	437	110	11	12	3	0	1	1	0	0	0	0	580
16:00	7	520	100	7	16	5	0	0	2	0	0	0	0	657
17:00	6	535	111	2	12	1	0	2	0	0	0	0	0	669
18:00	10	420	97	1	6	4	0	0	0	0	0	0	0	538
19:00	4	425	86	0	7	1	0	1	1	0	0	0	0	525
20:00	3	283	65	0	4	0	0	0	0	0	0	0	0	355
21:00	1	208	42	0	3	0	0	0	0	0	0	0	0	254
22:00	1	154	21	0	0	0	0	0	0	0	0	0	0	176
23:00	1	82	15	0	3	0	0	0	0	0	0	0	0	101
Total	86	6634	1591	69	217	52	2	28	13	0	0	0	0	8692
Percent	1.0%	76.3%	18.3%	0.8%	2.5%	0.6%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	07:00	08:00	08:00	07:00	09:00	08:00					07:00
Vol.	9	415	108	14	21	7	1	5	2					566
PM Peak	18:00	17:00	13:00	15:00	13:00	13:00	12:00	12:00	13:00					17:00
Vol.	10	535	120	11	18	5	1	3	3					669

PRECISION
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C volume
Site Code: 10111.31

Start	WB				EB				Combined				09-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	17		104		9		117		26		221		
12:15	11		104		7		93		18		197		
12:30	11		103		8		110		19		213		
12:45	11	50	103	414	5	29	128	448	16	79	231	862	
01:00	10		116		11		110		21		226		
01:15	11		111		6		113		17		224		
01:30	7		131		5		112		12		243		
01:45	2	30	115	473	2	24	101	436	4	54	216	909	
02:00	10		154		6		110		16		264		
02:15	5		150		5		100		10		250		
02:30	5		115		9		136		14		251		
02:45	4	24	109	528	4	24	120	466	8	48	229	994	
03:00	8		151		2		104		10		255		
03:15	7		159		7		108		14		267		
03:30	10		149		5		106		15		255		
03:45	6	31	143	602	6	20	112	430	12	51	255	1032	
04:00	10		157		10		96		20		253		
04:15	8		142		7		114		15		256		
04:30	11		145		8		118		19		263		
04:45	14	43	170	614	11	36	90	418	25	79	260	1032	
05:00	12		158		28		99		40		257		
05:15	15		172		30		84		45		256		
05:30	32		138		51		97		83		235		
05:45	21	80	129	597	60	169	111	391	81	249	240	988	
06:00	27		112		59		110		86		222		
06:15	42		129		78		81		120		210		
06:30	48		108		98		77		146		185		
06:45	35	152	104	453	126	361	66	334	161	513	170	787	
07:00	50		93		139		71		189		164		
07:15	68		86		163		76		231		162		
07:30	106		93		149		58		255		151		
07:45	88	312	100	372	149	600	56	261	237	912	156	633	
08:00	89		75		115		39		204		114		
08:15	80		64		122		49		202		113		
08:30	100		52		143		34		243		86		
08:45	130	399	46	237	121	501	32	154	251	900	78	391	
09:00	98		61		106		43		204		104		
09:15	97		40		103		39		200		79		
09:30	105		40		96		31		201		71		
09:45	110	410	39	180	119	424	22	135	229	834	61	315	
10:00	99		27		118		30		217		57		
10:15	93		39		94		24		187		63		
10:30	119		33		115		25		234		58		
10:45	107	418	31	130	115	442	40	119	222	860	71	249	
11:00	91		35		124		29		215		64		
11:15	114		29		115		20		229		49		
11:30	114		32		108		17		222		49		
11:45	98	417	13	109	126	473	11	77	224	890	24	186	
Total	2366		4709		3103		3669		5469		8378		
Percent	43.3%		56.2%		56.7%		43.8%						
Day Total		7075				6772				13847			
Peak	10:30		04:30		07:00		02:30		07:15		04:15		
Vol.	431		645		600		468		927		1036		
P.H.F.	0.905		0.938		0.920		0.860		0.909		0.970		

PRECISION
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C volume
Site Code: 10111.31

Start	WB				EB				Combined				10-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	22		121		11		123		33		244		
12:15	16		123		8		111		24		234		
12:30	13		120		1		108		14		228		
12:45	7	58	133	497	7	27	114	456	14	85	247	953	
01:00	4		132		7		91		11		223		
01:15	8		116		6		116		14		232		
01:30	1		99		4		100		5		199		
01:45	9	22	117	464	7	24	97	404	16	46	214	868	
02:00	4		154		2		116		6		270		
02:15	5		131		6		103		11		234		
02:30	3		118		7		116		10		234		
02:45	4	16	118	521	4	19	137	472	8	35	255	993	
03:00	6		144		3		110		9		254		
03:15	8		156		7		128		15		284		
03:30	9		173		3		113		12		286		
03:45	3	26	151	624	7	20	117	468	10	46	268	1092	
04:00	8		179		6		95		14		274		
04:15	4		160		11		112		15		272		
04:30	11		172		12		100		23		272		
04:45	14	37	150	661	6	35	112	419	20	72	262	1080	
05:00	8		158		26		97		34		255		
05:15	8		163		26		91		34		254		
05:30	23		148		39		133		62		281		
05:45	29	68	171	640	58	149	96	417	87	217	267	1057	
06:00	29		142		68		130		97		272		
06:15	40		115		84		78		124		193		
06:30	58		107		109		108		167		215		
06:45	55	182	118	482	132	393	87	403	187	575	205	885	
07:00	66		111		120		81		186		192		
07:15	64		105		156		89		220		194		
07:30	100		107		171		81		271		188		
07:45	105	335	99	422	141	588	50	301	246	923	149	723	
08:00	89		82		129		56		218		138		
08:15	94		69		125		45		219		114		
08:30	103		65		126		50		229		115		
08:45	99	385	82	298	107	487	39	190	206	872	121	488	
09:00	91		52		118		32		209		84		
09:15	101		61		129		38		230		99		
09:30	116		59		109		36		225		95		
09:45	104	412	51	223	106	462	35	141	210	874	86	364	
10:00	101		43		108		40		209		83		
10:15	102		34		117		27		219		61		
10:30	98		29		114		28		212		57		
10:45	105	406	36	142	116	455	26	121	221	861	62	263	
11:00	103		32		114		20		217		52		
11:15	101		27		107		21		208		48		
11:30	111		33		114		11		225		44		
11:45	97	412	28	120	114	449	16	68	211	861	44	188	
Total	2359		5094		3108		3860		5467		8954		
Percent	43.1%		56.9%		56.9%		43.1%						
Day Total		7453				6968				14421			
Peak	09:30		03:30		07:15		02:30		07:15		03:15		
Vol.	423		663		597		491		955		1112		
P.H.F.	0.912		0.926		0.873		0.896		0.881		0.972		

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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	5	17	21	5	**2**	0	0	0	0	0	0	50	34	30
01:00	0	1	2	8	11	6	1	**1**	0	0	0	0	0	30	36	31
02:00	1	0	4	4	12	1	1	1	0	0	0	0	0	24	34	30
03:00	0	1	6	8	11	4	1	0	0	0	0	0	0	31	34	29
04:00	0	1	9	16	10	7	0	0	0	0	0	0	0	43	35	28
05:00	0	1	11	29	21	**17**	1	0	0	0	0	0	0	80	36	30
06:00	1	1	22	54	65	9	0	0	0	0	0	0	0	152	33	29
07:00	0	5	71	154	71	11	0	0	0	0	0	0	0	312	32	27
08:00	**4**	**26**	96	175	**86**	11	1	0	0	0	0	0	0	399	32	26
09:00	4	22	119	182	74	9	0	0	0	0	0	0	0	410	31	26
10:00	1	20	126	**187**	83	1	0	0	0	0	0	0	0	**418**	31	26
11:00	4	23	**173**	173	42	2	0	0	0	0	0	0	0	417	29	25
12 PM	2	23	148	183	53	5	0	0	0	0	0	0	0	414	29	25
13:00	6	39	173	196	55	3	0	0	0	0	0	0	0	472	29	25
14:00	26	49	226	170	54	4	0	0	0	0	0	0	0	529	29	24
15:00	25	61	**253**	**214**	47	2	0	0	0	0	0	0	0	602	29	24
16:00	**54**	**76**	221	192	65	5	0	0	0	0	0	0	0	**613**	29	23
17:00	52	70	178	214	78	6	0	0	0	0	0	0	0	598	29	23
18:00	13	15	108	203	**100**	11	3	0	0	0	0	0	0	453	32	26
19:00	6	11	85	173	82	14	1	0	0	0	0	0	0	372	32	27
20:00	2	2	35	103	71	**21**	3	0	0	0	0	0	0	237	34	29
21:00	1	5	21	76	57	18	2	0	0	0	0	0	0	180	34	29
22:00	0	1	13	44	53	17	1	**1**	0	0	0	0	0	130	34	30
23:00	0	0	13	39	39	13	**5**	0	0	0	0	0	0	109	35	30
Total	202	453	2118	2814	1261	202	22	3	0	0	0	0	0	7075		
%	2.9%	6.4%	29.9%	39.8%	17.8%	2.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	11:00	10:00	08:00	05:00	00:00	01:00						10:00		
Vol.	4	26	173	187	86	17	2	1						418		
PM Peak	16:00	16:00	15:00	15:00	18:00	20:00	23:00	22:00						16:00		
Vol.	54	76	253	214	100	21	5	1						613		

Pecent

15th Percentile : 20 MPH
50th Percentile : 26 MPH
85th Percentile : 31 MPH
95th Percentile : 34 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 4932
Percent in Pace : 69.7%
Number of Vehicles > 25 MPH : 3739
Percent of Vehicles > 25 MPH : 52.8%
Mean Speed(Average) : 26 MPH

PRECISION DATA INDUSTRIES, LLC
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C speed
Site Code: 10111.31

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	3	22	25	7	1	0	0	0	0	0	0	58	34	30
01:00	0	0	1	6	6	7	2	0	0	0	0	0	0	22	38	33
02:00	0	0	2	7	5	2	0	0	0	0	0	0	0	16	34	29
03:00	0	1	0	12	8	4	1	0	0	0	0	0	0	26	35	30
04:00	0	1	6	11	11	8	0	0	0	0	0	0	0	37	35	30
05:00	0	1	9	15	28	14	0	**1**	0	0	0	0	0	68	36	31
06:00	0	1	21	67	72	**18**	**3**	0	0	0	0	0	0	182	34	30
07:00	1	15	62	161	77	18	1	0	0	0	0	0	0	335	32	27
08:00	**9**	**22**	**114**	169	62	8	1	0	0	0	0	0	0	385	30	26
09:00	3	19	95	203	**81**	11	0	0	0	0	0	0	0	**412**	31	27
10:00	4	21	106	199	68	7	1	0	0	0	0	0	0	406	31	26
11:00	3	15	88	**214**	80	11	0	1	0	0	0	0	0	412	31	27
12 PM	4	21	148	**238**	76	10	0	0	0	0	0	0	0	497	30	26
13:00	4	23	117	213	92	14	1	0	0	0	0	0	0	464	31	26
14:00	17	42	179	210	66	5	2	0	0	0	0	0	0	521	29	25
15:00	31	70	238	228	49	8	0	0	0	0	0	0	0	624	29	24
16:00	66	106	**308**	142	37	2	0	0	0	0	0	0	0	**661**	27	21
17:00	**69**	**108**	202	181	71	9	0	0	0	0	0	0	0	640	29	22
18:00	9	18	128	198	**113**	15	1	0	0	0	0	0	0	482	32	26
19:00	1	15	99	196	98	11	2	0	0	0	0	0	0	422	32	27
20:00	1	9	39	127	99	18	3	**1**	**1**	0	0	0	0	298	33	29
21:00	1	3	28	91	81	18	1	0	0	0	0	0	0	223	34	29
22:00	0	4	6	62	50	**19**	1	0	0	0	0	0	0	142	34	30
23:00	0	1	13	38	50	13	**4**	1	0	0	0	0	0	120	34	30
Total	223	516	2012	3010	1405	257	25	4	1	0	0	0	0	7453		
%	3.0%	6.9%	27.0%	40.4%	18.9%	3.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	11:00	09:00	06:00	06:00	05:00						09:00		
Vol.	9	22	114	214	81	18	3	1						412		
PM Peak	17:00	17:00	16:00	12:00	18:00	22:00	23:00	20:00	20:00					16:00		
Vol.	69	108	308	238	113	19	4	1	1					661		

Pecent

15th Percentile :	20 MPH
50th Percentile :	26 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	5022
Percent in Pace :	67.4%
Number of Vehicles > 25 MPH :	4100
Percent of Vehicles > 25 MPH :	55.0%
Mean Speed(Average) :	26 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/09/0																
8	0	0	2	11	10	4	0	**2**	0	0	0	0	0	29	36	31
01:00	0	0	4	8	8	4	0	0	0	0	0	0	0	24	34	30
02:00	0	0	4	13	5	0	1	1	0	0	0	0	0	24	32	29
03:00	0	0	4	9	4	2	1	0	0	0	0	0	0	20	33	28
04:00	0	2	5	12	10	7	0	0	0	0	0	0	0	36	35	29
05:00	2	2	22	75	58	8	**2**	0	0	0	0	0	0	169	33	28
06:00	4	11	78	167	**89**	**11**	0	0	0	0	0	0	0	360	32	27
07:00	15	69	**220**	**226**	68	2	0	0	0	0	0	0	0	**600**	29	24
08:00	14	67	180	211	25	5	0	0	0	0	0	0	0	502	28	24
09:00	9	40	177	157	36	4	1	0	0	0	0	0	0	424	29	24
10:00	20	68	181	140	31	2	0	0	0	0	0	0	0	442	28	23
11:00	**27**	**103**	214	106	19	4	0	0	0	0	0	0	0	473	27	22
12 PM	8	66	194	158	19	2	0	0	0	0	0	0	0	447	28	23
13:00	12	58	173	**167**	24	3	0	0	0	0	0	0	0	437	28	24
14:00	**36**	**75**	**216**	121	17	1	0	0	0	0	0	0	0	**466**	27	22
15:00	16	64	187	139	23	1	0	0	0	0	0	0	0	430	28	23
16:00	13	31	186	164	19	5	0	0	0	0	0	0	0	418	28	24
17:00	15	34	155	149	35	2	**1**	0	0	0	0	0	0	391	29	24
18:00	4	12	105	164	**43**	6	0	0	0	0	0	0	0	334	29	26
19:00	0	16	73	128	37	7	0	0	0	0	0	0	0	261	30	26
20:00	2	9	41	69	28	5	0	0	0	0	0	0	0	154	31	26
21:00	1	5	21	63	38	6	1	0	0	0	0	0	0	135	33	28
22:00	0	0	11	73	32	3	0	0	0	0	0	0	0	119	32	28
23:00	0	2	10	34	21	**10**	0	0	0	0	0	0	0	77	34	29
Total	198	734	2463	2564	699	104	7	3	0	0	0	0	0	6772		
%	2.9%	10.8%	36.4%	37.9%	10.3%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	07:00	07:00	06:00	06:00	05:00	00:00						07:00		
Vol.	27	103	220	226	89	11	2	2						600		
PM Peak	14:00	14:00	14:00	13:00	18:00	23:00	17:00							14:00		
Vol.	36	75	216	167	43	10	1							466		

Pecent

15th Percentile : 20 MPH
50th Percentile : 24 MPH
85th Percentile : 29 MPH
95th Percentile : 33 MPH

Stats

10 MPH Pace Speed : 20-29 MPH
Number in Pace : 5027
Percent in Pace : 74.2%
Number of Vehicles > 25 MPH : 2864
Percent of Vehicles > 25 MPH : 42.3%
Mean Speed(Average) : 24 MPH

PRECISION
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C speed
Site Code: 10111.31

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/0																
8	0	0	4	10	11	2	0	0	0	0	0	0	0	27	33	29
01:00	0	0	3	10	5	4	**2**	0	0	0	0	0	0	24	36	30
02:00	0	0	5	7	4	1	2	0	0	0	0	0	0	19	33	29
03:00	0	0	4	6	7	3	0	0	0	0	0	0	0	20	34	29
04:00	0	0	3	14	13	5	0	0	0	0	0	0	0	35	34	30
05:00	0	0	27	53	46	**21**	1	**1**	0	0	0	0	0	149	35	29
06:00	1	8	116	171	**81**	14	1	0	0	0	0	0	0	392	32	27
07:00	**34**	62	**200**	**226**	60	7	0	0	0	0	0	0	0	**589**	29	24
08:00	20	**66**	192	157	46	6	0	0	0	0	0	0	0	487	29	24
09:00	19	26	189	177	49	2	0	0	0	0	0	0	0	462	29	24
10:00	11	54	182	162	43	3	0	0	0	0	0	0	0	455	29	24
11:00	12	39	140	216	38	4	0	0	0	0	0	0	0	449	29	25
12 PM	10	**67**	**226**	133	19	1	0	0	0	0	0	0	0	456	28	23
13:00	5	27	139	**189**	41	3	0	0	0	0	0	0	0	404	29	25
14:00	**21**	54	221	149	26	1	0	0	0	0	0	0	0	**472**	28	23
15:00	18	50	214	150	31	5	0	0	0	0	0	0	0	468	28	23
16:00	15	36	212	130	26	0	0	0	0	0	0	0	0	419	28	23
17:00	7	38	179	151	35	7	0	0	0	0	0	0	0	417	29	24
18:00	12	27	163	156	43	2	0	0	0	0	0	0	0	403	29	24
19:00	1	34	91	128	41	6	0	0	0	0	0	0	0	301	30	25
20:00	0	6	50	80	**45**	**8**	**1**	0	0	0	0	0	0	190	32	27
21:00	0	8	26	60	42	5	0	0	0	0	0	0	0	141	32	27
22:00	0	1	20	66	27	7	0	0	0	0	0	0	0	121	32	28
23:00	0	1	9	35	18	4	1	0	0	0	0	0	0	68	33	28
Total	186	604	2615	2636	797	121	8	1	0	0	0	0	0	6968		
%	2.7%	8.7%	37.5%	37.8%	11.4%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	07:00	07:00	06:00	05:00	01:00	05:00						07:00		
Vol.	34	66	200	226	81	21	2	1						589		
PM Peak	14:00	12:00	12:00	13:00	20:00	20:00	20:00							14:00		
Vol.	21	67	226	189	45	8	1							472		

Pecent

15th Percentile :	20 MPH
50th Percentile :	25 MPH
85th Percentile :	29 MPH
95th Percentile :	33 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	5251
Percent in Pace :	75.4%
Number of Vehicles > 25 MPH :	3035
Percent of Vehicles > 25 MPH :	43.6%
Mean Speed(Average) :	25 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	38	11	0	0	0	0	1	0	0	0	0	0	50
01:00	0	23	5	0	2	0	0	0	0	0	0	0	0	30
02:00	0	16	7	0	1	0	0	0	0	0	0	0	0	24
03:00	0	23	6	0	2	0	0	0	0	0	0	0	0	31
04:00	0	29	11	0	3	0	0	0	0	0	0	0	0	43
05:00	1	48	25	1	3	0	0	1	1	0	0	0	0	80
06:00	2	98	43	1	7	1	0	0	0	0	0	0	0	152
07:00	0	222	71	2	10	5	1	0	1	0	0	0	0	312
08:00	2	285	75	12	17	6	0	2	0	0	0	0	0	399
09:00	2	306	74	4	22	2	0	0	0	0	0	0	0	410
10:00	5	319	72	0	19	3	0	0	0	0	0	0	0	418
11:00	5	311	82	1	13	4	0	0	1	0	0	0	0	417
12 PM	4	310	86	1	10	2	0	1	0	0	0	0	0	414
13:00	3	355	88	2	17	4	0	2	1	0	0	0	0	472
14:00	4	405	98	2	17	3	0	0	0	0	0	0	0	529
15:00	6	449	115	5	22	2	0	2	0	0	1	0	0	602
16:00	4	488	99	0	17	2	0	2	1	0	0	0	0	613
17:00	3	481	96	1	16	0	0	1	0	0	0	0	0	598
18:00	3	361	69	4	13	3	0	0	0	0	0	0	0	453
19:00	1	312	51	2	6	0	0	0	0	0	0	0	0	372
20:00	1	186	39	2	9	0	0	0	0	0	0	0	0	237
21:00	0	151	28	0	1	0	0	0	0	0	0	0	0	180
22:00	1	101	25	0	2	1	0	0	0	0	0	0	0	130
23:00	0	90	18	0	1	0	0	0	0	0	0	0	0	109
Total	47	5407	1294	40	230	38	1	12	5	0	1	0	0	7075
Percent	0.7%	76.4%	18.3%	0.6%	3.3%	0.5%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	08:00	09:00	08:00	07:00	08:00	05:00					10:00
Vol.	5	319	82	12	22	6	1	2	1					418
PM Peak	15:00	16:00	15:00	15:00	15:00	13:00		13:00	13:00		15:00			16:00
Vol.	6	488	115	5	22	4		2	1		1			613

PRECISION
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Washington Street
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Client: VHB/J. Quitter

81676 H-C class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	45	12	0	1	0	0	0	0	0	0	0	0	58
01:00	1	16	3	1	1	0	0	0	0	0	0	0	0	22
02:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
03:00	0	19	7	0	0	0	0	0	0	0	0	0	0	26
04:00	0	22	13	0	2	0	0	0	0	0	0	0	0	37
05:00	1	36	23	1	6	0	0	1	0	0	0	0	0	68
06:00	3	128	39	1	7	2	0	1	1	0	0	0	0	182
07:00	5	241	73	1	12	1	0	2	0	0	0	0	0	335
08:00	2	290	60	11	17	5	0	0	0	0	0	0	0	385
09:00	2	303	79	3	17	4	0	4	0	0	0	0	0	412
10:00	1	295	82	5	19	3	0	0	1	0	0	0	0	406
11:00	4	310	86	1	10	1	0	0	0	0	0	0	0	412
12 PM	4	381	86	1	20	4	0	1	0	0	0	0	0	497
13:00	3	357	79	5	14	4	0	1	1	0	0	0	0	464
14:00	4	405	86	2	21	1	0	1	1	0	0	0	0	521
15:00	5	473	111	8	18	7	2	0	0	0	0	0	0	624
16:00	2	533	102	0	14	3	0	5	1	0	1	0	0	661
17:00	9	497	112	2	13	5	0	2	0	0	0	0	0	640
18:00	5	394	70	1	11	1	0	0	0	0	0	0	0	482
19:00	2	336	66	3	14	1	0	0	0	0	0	0	0	422
20:00	1	245	41	3	8	0	0	0	0	0	0	0	0	298
21:00	2	182	33	0	5	0	0	1	0	0	0	0	0	223
22:00	0	113	21	1	7	0	0	0	0	0	0	0	0	142
23:00	0	103	16	0	1	0	0	0	0	0	0	0	0	120
Total	56	5739	1301	50	238	42	2	19	5	0	1	0	0	7453
Percent	0.8%	77.0%	17.5%	0.7%	3.2%	0.6%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	08:00	10:00	08:00		09:00	06:00					09:00
Vol.	5	310	86	11	19	5		4	1					412
PM Peak	17:00	16:00	17:00	15:00	14:00	15:00	15:00	16:00	13:00		16:00			16:00
Vol.	9	533	112	8	21	7	2	5	1		1			661

PRECISION
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81676 H-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/09/0														
8	0	24	3	0	2	0	0	0	0	0	0	0	0	29
01:00	0	19	2	0	3	0	0	0	0	0	0	0	0	24
02:00	1	20	3	0	0	0	0	0	0	0	0	0	0	24
03:00	0	15	3	0	1	1	0	0	0	0	0	0	0	20
04:00	0	33	3	0	0	0	0	0	0	0	0	0	0	36
05:00	0	120	41	2	6	0	0	0	0	0	0	0	0	169
06:00	2	279	68	3	6	1	0	1	0	0	0	0	0	360
07:00	1	505	72	5	12	3	0	1	1	0	0	0	0	600
08:00	4	413	68	2	12	1	0	2	0	0	0	0	0	502
09:00	3	358	50	1	9	1	0	2	0	0	0	0	0	424
10:00	3	370	56	1	8	1	0	3	0	0	0	0	0	442
11:00	3	401	54	1	9	1	0	3	0	0	0	1	0	473
12 PM	5	369	55	2	9	4	0	3	0	0	0	0	0	447
13:00	1	364	53	2	15	2	0	0	0	0	0	0	0	437
14:00	2	392	57	0	11	2	0	1	1	0	0	0	0	466
15:00	1	343	68	1	15	1	0	1	0	0	0	0	0	430
16:00	4	350	52	1	9	2	0	0	0	0	0	0	0	418
17:00	0	349	34	2	4	2	0	0	0	0	0	0	0	391
18:00	1	286	37	2	7	1	0	0	0	0	0	0	0	334
19:00	0	232	25	0	4	0	0	0	0	0	0	0	0	261
20:00	0	132	16	0	4	1	0	1	0	0	0	0	0	154
21:00	0	121	10	0	3	0	0	1	0	0	0	0	0	135
22:00	1	104	13	0	1	0	0	0	0	0	0	0	0	119
23:00	1	69	6	0	1	0	0	0	0	0	0	0	0	77
Total	33	5668	849	25	151	24	0	19	2	0	0	1	0	6772
Percent	0.5%	83.7%	12.5%	0.4%	2.2%	0.4%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	07:00	07:00	07:00		10:00	07:00			11:00		07:00
Vol.	4	505	72	5	12	3		3	1			1		600
PM Peak	12:00	14:00	15:00	12:00	13:00	12:00		12:00	14:00					14:00
Vol.	5	392	68	2	15	4		3	1					466

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street
east of Park Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/0														
8	0	25	2	0	0	0	0	0	0	0	0	0	0	27
01:00	0	20	4	0	0	0	0	0	0	0	0	0	0	24
02:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
03:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
04:00	0	27	7	0	1	0	0	0	0	0	0	0	0	35
05:00	0	112	33	1	2	0	0	1	0	0	0	0	0	149
06:00	2	314	59	5	9	1	0	2	0	0	0	0	0	392
07:00	5	500	65	5	9	3	0	2	0	0	0	0	0	589
08:00	1	404	65	1	10	3	0	3	0	0	0	0	0	487
09:00	0	398	52	3	7	2	0	0	0	0	0	0	0	462
10:00	0	388	58	0	6	1	0	2	0	0	0	0	0	455
11:00	2	365	62	5	11	2	0	2	0	0	0	0	0	449
12 PM	1	395	44	1	7	4	0	4	0	0	0	0	0	456
13:00	1	352	39	1	9	1	0	1	0	0	0	0	0	404
14:00	4	406	49	2	7	2	0	2	0	0	0	0	0	472
15:00	2	391	59	2	10	1	0	3	0	0	0	0	0	468
16:00	2	372	38	0	4	0	0	3	0	0	0	0	0	419
17:00	5	364	40	0	8	0	0	0	0	0	0	0	0	417
18:00	1	345	45	1	8	2	0	1	0	0	0	0	0	403
19:00	1	260	33	0	6	1	0	0	0	0	0	0	0	301
20:00	0	170	19	0	1	0	0	0	0	0	0	0	0	190
21:00	0	125	12	0	4	0	0	0	0	0	0	0	0	141
22:00	0	110	8	1	2	0	0	0	0	0	0	0	0	121
23:00	0	61	3	0	3	1	0	0	0	0	0	0	0	68
Total	27	5936	803	28	124	24	0	26	0	0	0	0	0	6968
Percent	0.4%	85.2%	11.5%	0.4%	1.8%	0.3%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	11:00	07:00		08:00						07:00
Vol.	5	500	65	5	11	3		3						589
PM Peak	17:00	14:00	15:00	14:00	15:00	12:00		12:00						14:00
Vol.	5	406	59	2	10	4		4						472

Frederick Martin Sr. Parkway
north of Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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81676 H-D volume
Site Code: 10111.31

Start	SB				NB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	9		84		5		47		14		131		
12:15	5		82		7		41		12		123		
12:30	8		60		1		50		9		110		
12:45	4	26	62	288	3	16	53	191	7	42	115	479	
01:00	9		77		4		48		13		125		
01:15	6		69		4		41		10		110		
01:30	5		70		0		57		5		127		
01:45	3	23	73	289	4	12	47	193	7	35	120	482	
02:00	3		99		1		45		4		144		
02:15	2		99		5		56		7		155		
02:30	3		100		5		60		8		160		
02:45	2	10	92	390	5	16	55	216	7	26	147	606	
03:00	1		130		1		46		2		176		
03:15	4		126		5		47		9		173		
03:30	8		120		3		68		11		188		
03:45	5	18	120	496	3	12	62	223	8	30	182	719	
04:00	2		112		7		56		9		168		
04:15	2		109		3		43		5		152		
04:30	10		97		6		66		16		163		
04:45	7	21	133	451	8	24	59	224	15	45	192	675	
05:00	8		119		15		53		23		172		
05:15	11		106		20		43		31		149		
05:30	8		110		26		45		34		155		
05:45	22	49	112	447	30	91	45	186	52	140	157	633	
06:00	21		82		23		38		44		120		
06:15	27		78		35		31		62		109		
06:30	35		72		51		50		86		122		
06:45	44	127	69	301	58	167	32	151	102	294	101	452	
07:00	63		60		36		39		99		99		
07:15	60		54		44		28		104		82		
07:30	63		64		63		36		126		100		
07:45	75	261	59	237	70	213	23	126	145	474	82	363	
08:00	64		53		53		26		117		79		
08:15	84		35		63		28		147		63		
08:30	81		28		52		22		133		50		
08:45	77	306	37	153	58	226	22	98	135	532	59	251	
09:00	62		32		74		24		136		56		
09:15	67		25		57		17		124		42		
09:30	62		22		41		25		103		47		
09:45	96	287	23	102	39	211	17	83	135	498	40	185	
10:00	74		20		40		22		114		42		
10:15	64		21		57		7		121		28		
10:30	62		21		46		19		108		40		
10:45	66	266	17	79	50	193	14	62	116	459	31	141	
11:00	82		27		46		14		128		41		
11:15	86		19		45		14		131		33		
11:30	74		13		55		4		129		17		
11:45	81	323	10	69	43	189	5	37	124	512	15	106	
Total	1717		3302		1370		1790		3087		5092		
Percent	55.6%		64.8%		44.4%		35.2%						
Day Total			5019				3160				8179		
Peak	11:00		03:00		07:30		03:15		08:15		03:00		
Vol.	323		496		249		233		551		719		
P.H.F.	0.939		0.954		0.889		0.857		0.937		0.956		

PRECISION
D A T A
INDUSTRIES, LLC
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Frederick Martin Sr. Parkway
north of Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-D volume
Site Code: 10111.31

Start	SB				NB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	9		72		11		40		20		112		
12:15	9		52		9		58		18		110		
12:30	8		82		5		58		13		140		
12:45	8	34	77	283	7	32	61	217	15	66	138	500	
01:00	6		67		5		52		11		119		
01:15	7		62		7		36		14		98		
01:30	4		65		2		54		6		119		
01:45	7	24	81	275	2	16	38	180	9	40	119	455	
02:00	3		98		2		54		5		152		
02:15	2		96		1		42		3		138		
02:30	0		93		4		47		4		140		
02:45	5	10	109	396	6	13	93	236	11	23	202	632	
03:00	4		124		2		56		6		180		
03:15	5		123		2		59		7		182		
03:30	7		112		3		61		10		173		
03:45	6	22	111	470	4	11	68	244	10	33	179	714	
04:00	2		110		3		65		5		175		
04:15	2		95		2		53		4		148		
04:30	9		128		6		54		15		182		
04:45	9	22	125	458	17	28	39	211	26	50	164	669	
05:00	10		105		7		58		17		163		
05:15	11		118		24		55		35		173		
05:30	13		110		20		56		33		166		
05:45	24	58	111	444	25	76	43	212	49	134	154	656	
06:00	20		92		26		27		46		119		
06:15	19		71		31		48		50		119		
06:30	26		77		44		39		70		116		
06:45	46	111	68	308	36	137	53	167	82	248	121	475	
07:00	61		66		42		48		103		114		
07:15	60		66		44		36		104		102		
07:30	65		56		65		34		130		90		
07:45	75	261	62	250	65	216	43	161	140	477	105	411	
08:00	70		49		48		37		118		86		
08:15	85		42		44		30		129		72		
08:30	75		48		42		28		117		76		
08:45	64	294	35	174	65	199	20	115	129	493	55	289	
09:00	79		28		75		25		154		53		
09:15	66		22		48		34		114		56		
09:30	76		35		43		24		119		59		
09:45	100	321	30	115	41	207	18	101	141	528	48	216	
10:00	74		23		48		16		122		39		
10:15	59		22		39		16		98		38		
10:30	68		16		38		19		106		35		
10:45	67	268	15	76	41	166	21	72	108	434	36	148	
11:00	70		25		67		10		137		35		
11:15	74		16		54		12		128		28		
11:30	69		13		48		7		117		20		
11:45	74	287	15	69	44	213	13	42	118	500	28	111	
Total	1712		3318		1314		1958		3026		5276		
Percent	56.6%		62.9%		43.4%		37.1%						
Day Total		5030				3272				8302			
Peak	09:00		04:30		08:45		02:45		08:15		02:45		
Vol.	321		476		231		269		529		737		
P.H.F.	0.803		0.930		0.770		0.723		0.859		0.912		

PRECISION
D A T A
INDUSTRIES, LLC
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Frederick Martin Sr. Parkway
north of Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	4	12	6	3	**1**	0	0	0	0	0	0	26	34	29
01:00	0	1	3	13	6	0	0	0	0	0	0	0	0	23	31	27
02:00	0	0	3	3	4	0	0	0	0	0	0	0	0	10	31	28
03:00	1	0	1	12	4	0	0	0	0	0	0	0	0	18	30	26
04:00	0	0	3	8	9	1	0	0	0	0	0	0	0	21	33	29
05:00	0	1	9	24	14	1	0	0	0	0	0	0	0	49	32	27
06:00	0	4	16	64	41	2	0	0	0	0	0	0	0	127	32	28
07:00	3	12	40	124	**74**	8	0	0	0	0	0	0	0	261	32	27
08:00	8	14	61	153	61	**9**	0	0	0	0	0	0	0	306	31	26
09:00	**24**	12	74	114	59	4	0	0	0	0	0	0	0	287	31	25
10:00	1	**19**	75	127	40	4	0	0	0	0	0	0	0	266	30	26
11:00	2	9	**86**	**173**	48	5	0	0	0	0	0	0	0	**323**	30	26
12 PM	5	**25**	57	133	64	3	1	0	0	0	0	0	0	288	31	26
13:00	3	12	63	131	66	**14**	0	0	0	0	0	0	0	289	32	27
14:00	9	19	80	201	76	5	0	0	0	0	0	0	0	390	31	26
15:00	**21**	18	**129**	**248**	76	4	0	0	0	0	0	0	0	**496**	30	25
16:00	12	19	99	219	**93**	9	0	0	0	0	0	0	0	451	31	26
17:00	7	25	112	213	81	9	0	0	0	0	0	0	0	447	31	26
18:00	1	4	39	167	82	7	1	0	0	0	0	0	0	301	32	28
19:00	0	11	54	126	41	3	**2**	0	0	0	0	0	0	237	31	26
20:00	0	2	22	90	35	4	0	0	0	0	0	0	0	153	32	28
21:00	0	1	7	58	34	2	0	0	0	0	0	0	0	102	32	28
22:00	0	0	6	42	26	5	0	0	0	0	0	0	0	79	33	29
23:00	0	0	11	32	22	2	2	0	0	0	0	0	0	69	33	28
Total	97	208	1054	2487	1062	104	7	0	0	0	0	0	0	5019		
%	1.9%	4.1%	21.0%	49.6%	21.2%	2.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	11:00	11:00	07:00	08:00	00:00							11:00		
Vol.	24	19	86	173	74	9	1							323		
PM Peak	15:00	12:00	15:00	15:00	16:00	13:00	19:00							15:00		
Vol.	21	25	129	248	93	14	2							496		

Pecent

15th Percentile :	22 MPH
50th Percentile :	27 MPH
85th Percentile :	31 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	3549
Percent in Pace :	70.7%
Number of Vehicles > 30 MPH :	960
Percent of Vehicles > 30 MPH :	19.1%
Mean Speed(Average) :	26 MPH

PRECISION
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Frederick Martin Sr. Parkway
north of Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-D speed
Site Code: 10111.31

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	6	18	8	2	0	0	0	0	0	0	0	34	32	28
01:00	0	0	3	9	12	0	0	0	0	0	0	0	0	24	32	29
02:00	0	0	0	7	2	1	0	0	0	0	0	0	0	10	30	28
03:00	0	0	1	17	3	1	0	0	0	0	0	0	0	22	30	28
04:00	0	0	8	8	5	0	**1**	0	0	0	0	0	0	22	32	27
05:00	0	2	19	18	19	0	0	0	0	0	0	0	0	58	32	27
06:00	0	0	17	57	34	2	1	0	0	0	0	0	0	111	32	28
07:00	2	5	44	140	60	**10**	0	0	0	0	0	0	0	261	32	27
08:00	5	11	74	135	**62**	6	1	0	0	0	0	0	0	294	31	26
09:00	**16**	**22**	**85**	140	49	9	0	0	0	0	0	0	0	**321**	30	25
10:00	2	19	81	124	41	1	0	0	0	0	0	0	0	268	30	25
11:00	1	14	74	**158**	39	1	0	0	0	0	0	0	0	287	29	26
12 PM	2	15	65	142	57	2	0	0	0	0	0	0	0	283	31	26
13:00	2	7	62	139	62	3	0	0	0	0	0	0	0	275	31	27
14:00	4	24	93	196	74	5	0	0	0	0	0	0	0	396	31	26
15:00	9	18	**130**	**217**	87	**8**	**1**	0	0	0	0	0	0	**470**	31	26
16:00	**14**	**44**	120	199	79	2	0	0	0	0	0	0	0	458	30	25
17:00	7	31	108	196	**94**	7	1	0	0	0	0	0	0	444	31	26
18:00	3	2	52	164	83	4	0	0	0	0	0	0	0	308	32	27
19:00	0	6	51	137	51	5	0	0	0	0	0	0	0	250	31	27
20:00	0	1	44	96	31	2	0	0	0	0	0	0	0	174	30	27
21:00	0	0	9	69	34	3	0	0	0	0	0	0	0	115	32	28
22:00	0	0	7	37	26	6	0	0	0	0	0	0	0	76	33	29
23:00	0	0	4	33	25	7	0	0	0	0	0	0	0	69	34	29
Total	67	221	1157	2456	1037	87	5	0	0	0	0	0	0	5030		
%	1.3%	4.4%	23.0%	48.8%	20.6%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	11:00	08:00	07:00	04:00							09:00		
Vol.	16	22	85	158	62	10	1							321		
PM Peak	16:00	16:00	15:00	15:00	17:00	15:00	15:00							15:00		
Vol.	14	44	130	217	94	8	1							470		

Pecent

15th Percentile :	22 MPH
50th Percentile :	27 MPH
85th Percentile :	31 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	20-29 MPH
Number in Pace :	3613
Percent in Pace :	71.8%
Number of Vehicles > 30 MPH :	921
Percent of Vehicles > 30 MPH :	18.3%
Mean Speed(Average) :	26 MPH

PRECISION
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INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Frederick Martin Sr. Parkway
north of Cohannet Street
City, State: Taunton, MA
Client: VHB/J. Quitter

81676 H-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/23/0																
8	0	0	3	6	4	0	**2**	**1**	0	0	0	0	0	16	40	30
01:00	0	0	4	5	3	0	0	0	0	0	0	0	0	12	30	26
02:00	0	2	1	10	3	0	0	0	0	0	0	0	0	16	30	26
03:00	1	1	3	4	3	0	0	0	0	0	0	0	0	12	30	25
04:00	0	1	4	14	4	1	0	0	0	0	0	0	0	24	30	27
05:00	0	2	16	51	19	3	0	0	0	0	0	0	0	91	31	27
06:00	0	2	14	121	28	1	1	0	0	0	0	0	0	167	30	27
07:00	0	3	19	121	**63**	**7**	0	0	0	0	0	0	0	213	32	28
08:00	**2**	1	22	**132**	62	7	0	0	0	0	0	0	0	**226**	32	28
09:00	2	**15**	**64**	92	35	2	1	0	0	0	0	0	0	211	30	26
10:00	0	3	62	101	25	2	0	0	0	0	0	0	0	193	29	26
11:00	0	1	36	92	55	5	0	0	0	0	0	0	0	189	32	28
12 PM	**1**	**7**	36	101	42	4	0	0	0	0	0	0	0	191	31	27
13:00	1	2	43	104	38	5	0	0	0	0	0	0	0	193	31	27
14:00	0	5	**46**	112	48	5	0	0	0	0	0	0	0	216	32	27
15:00	1	0	41	**120**	52	**9**	0	0	0	0	0	0	0	223	32	28
16:00	0	2	45	117	**57**	3	0	0	0	0	0	0	0	**224**	32	27
17:00	0	0	21	105	55	5	0	0	0	0	0	0	0	186	32	28
18:00	0	4	24	79	38	6	0	0	0	0	0	0	0	151	32	28
19:00	0	5	26	72	19	3	**1**	0	0	0	0	0	0	126	30	27
20:00	0	1	15	48	28	6	0	0	0	0	0	0	0	98	33	28
21:00	0	1	13	44	24	1	0	0	0	0	0	0	0	83	32	28
22:00	1	1	10	39	9	0	1	0	**1**	0	0	0	0	62	30	27
23:00	0	1	4	22	10	0	0	0	0	0	0	0	0	37	31	28
Total	9	60	572	1712	724	75	6	1	1	0	0	0	0	3160		
%	0.3%	1.9%	18.1%	54.2%	22.9%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	09:00	09:00	08:00	07:00	07:00	00:00	00:00						08:00		
Vol.	2	15	64	132	63	7	2	1						226		
PM Peak	12:00	12:00	14:00	15:00	16:00	15:00	19:00		22:00					16:00		
Vol.	1	7	46	120	57	9	1		1					224		

Pecent

15th Percentile :	23 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2436
Percent in Pace :	77.1%
Number of Vehicles > 30 MPH :	662
Percent of Vehicles > 30 MPH :	20.9%
Mean Speed(Average) :	27 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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north of Cohannet Street
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81676 H-D speed
Site Code: 10111.31

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/24/0																
8	0	0	6	19	6	1	0	0	0	0	0	0	0	32	30	27
01:00	0	0	1	10	5	0	0	0	0	0	0	0	0	16	32	28
02:00	0	1	2	7	3	0	0	0	0	0	0	0	0	13	30	27
03:00	0	0	3	2	6	0	0	0	0	0	0	0	0	11	32	28
04:00	0	1	6	16	5	0	0	0	0	0	0	0	0	28	30	27
05:00	0	5	18	35	18	0	0	0	0	0	0	0	0	76	31	26
06:00	0	0	19	78	38	2	0	0	0	0	0	0	0	137	32	28
07:00	0	3	14	**139**	50	**9**	**1**	0	0	0	0	0	0	**216**	32	28
08:00	0	2	29	112	**52**	4	0	0	0	0	0	0	0	199	32	28
09:00	0	5	47	106	43	6	0	0	0	0	0	0	0	207	31	27
10:00	**1**	7	46	77	31	4	0	0	0	0	0	0	0	166	31	26
11:00	1	**13**	**57**	120	21	1	0	0	0	0	0	0	0	213	29	26
12 PM	**1**	4	**45**	123	38	6	0	0	0	0	0	0	0	217	31	27
13:00	0	4	38	100	35	3	0	0	0	0	0	0	0	180	31	27
14:00	0	1	37	**143**	47	**8**	0	0	0	0	0	0	0	236	31	27
15:00	1	**8**	35	139	**59**	2	0	0	0	0	0	0	0	**244**	31	27
16:00	1	3	28	119	53	6	**1**	0	0	0	0	0	0	211	32	28
17:00	0	2	31	123	48	7	1	0	0	0	0	0	0	212	32	28
18:00	1	1	25	100	36	4	0	0	0	0	0	0	0	167	31	27
19:00	0	3	36	92	26	4	0	0	0	0	0	0	0	161	30	27
20:00	0	1	24	66	22	1	1	0	0	0	0	0	0	115	31	27
21:00	0	4	21	54	22	0	0	0	0	0	0	0	0	101	31	27
22:00	0	0	5	47	20	0	0	0	0	0	0	0	0	72	32	28
23:00	0	1	5	24	6	6	0	0	0	0	0	0	0	42	34	28
Total	6	69	578	1851	690	74	4	0	0	0	0	0	0	3272		
%	0.2%	2.1%	17.7%	56.6%	21.1%	2.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	07:00	08:00	07:00	07:00							07:00		
Vol.	1	13	57	139	52	9	1							216		
PM Peak	12:00	15:00	12:00	14:00	15:00	14:00	16:00							15:00		
Vol.	1	8	45	143	59	8	1							244		

Pecent

15th Percentile :	23 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2541
Percent in Pace :	77.7%
Number of Vehicles > 30 MPH :	630
Percent of Vehicles > 30 MPH :	19.3%
Mean Speed(Average) :	27 MPH

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81676 H-D class
Site Code: 10111.31

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	23	3	0	0	0	0	0	0	0	0	0	0	26
01:00	0	22	1	0	0	0	0	0	0	0	0	0	0	23
02:00	0	7	2	0	1	0	0	0	0	0	0	0	0	10
03:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
04:00	0	17	4	0	0	0	0	0	0	0	0	0	0	21
05:00	0	39	7	1	1	1	0	0	0	0	0	0	0	49
06:00	3	85	32	2	4	0	0	0	1	0	0	0	0	127
07:00	2	194	34	14	13	1	0	2	1	0	0	0	0	261
08:00	1	227	55	5	11	2	0	2	3	0	0	0	0	306
09:00	0	223	40	4	13	3	0	2	2	0	0	0	0	287
10:00	0	210	36	3	7	3	0	3	4	0	0	0	0	266
11:00	1	252	51	3	8	3	0	3	2	0	0	0	0	323
12 PM	1	242	31	0	7	3	0	3	1	0	0	0	0	288
13:00	1	226	48	3	9	1	0	0	1	0	0	0	0	289
14:00	2	302	53	13	16	3	0	1	0	0	0	0	0	390
15:00	3	405	68	5	9	1	0	5	0	0	0	0	0	496
16:00	0	375	66	1	7	1	0	1	0	0	0	0	0	451
17:00	7	364	62	0	10	2	0	2	0	0	0	0	0	447
18:00	2	252	42	0	5	0	0	0	0	0	0	0	0	301
19:00	1	198	33	0	3	0	0	1	1	0	0	0	0	237
20:00	0	130	21	1	1	0	0	0	0	0	0	0	0	153
21:00	0	98	4	0	0	0	0	0	0	0	0	0	0	102
22:00	0	71	7	0	1	0	0	0	0	0	0	0	0	79
23:00	0	65	4	0	0	0	0	0	0	0	0	0	0	69
Total	24	4040	709	55	126	24	0	25	16	0	0	0	0	5019
Percent	0.5%	80.5%	14.1%	1.1%	2.5%	0.5%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	08:00	07:00	07:00	09:00		10:00	10:00					11:00
Vol.	3	252	55	14	13	3		3	4					323
PM Peak	17:00	15:00	15:00	14:00	14:00	12:00		15:00	12:00					15:00
Vol.	7	405	68	13	16	3		5	1					496

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	30	3	0	1	0	0	0	0	0	0	0	0	34
01:00	0	19	5	0	0	0	0	0	0	0	0	0	0	24
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	16	6	0	0	0	0	0	0	0	0	0	0	22
04:00	0	18	3	0	1	0	0	0	0	0	0	0	0	22
05:00	1	48	7	1	0	0	0	0	0	0	0	0	1	58
06:00	0	78	27	2	2	0	0	1	1	0	0	0	0	111
07:00	2	198	40	13	7	1	0	0	0	0	0	0	0	261
08:00	1	226	42	5	12	3	0	2	3	0	0	0	0	294
09:00	4	249	46	4	10	5	0	2	1	0	0	0	0	321
10:00	3	216	32	0	7	3	0	3	4	0	0	0	0	268
11:00	3	219	45	2	11	2	0	3	1	0	1	0	0	287
12 PM	0	229	41	0	7	4	0	1	1	0	0	0	0	283
13:00	2	221	35	3	10	1	0	2	1	0	0	0	0	275
14:00	3	317	48	12	11	1	0	3	0	1	0	0	0	396
15:00	3	385	62	6	9	4	1	0	0	0	0	0	0	470
16:00	4	369	68	1	8	5	0	2	0	1	0	0	0	458
17:00	5	369	56	0	11	1	0	2	0	0	0	0	0	444
18:00	5	256	43	1	3	0	0	0	0	0	0	0	0	308
19:00	2	211	31	0	4	1	0	1	0	0	0	0	0	250
20:00	4	143	23	0	1	0	0	1	2	0	0	0	0	174
21:00	0	100	14	0	1	0	0	0	0	0	0	0	0	115
22:00	0	71	4	0	1	0	0	0	0	0	0	0	0	76
23:00	1	60	8	0	0	0	0	0	0	0	0	0	0	69
Total	43	4057	690	50	117	31	1	23	14	2	1	0	1	5030
Percent	0.9%	80.7%	13.7%	1.0%	2.3%	0.6%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	09:00	09:00	07:00	08:00	09:00		10:00	10:00		11:00		05:00	09:00
Vol.	4	249	46	13	12	5		3	4		1		1	321
PM Peak	17:00	15:00	16:00	14:00	14:00	16:00	15:00	14:00	20:00	14:00				15:00
Vol.	5	385	68	12	11	5	1	3	2	1				470

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Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	1	11	3	0	0	1	0	0	0	0	0	0	0	16
01:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
02:00	0	11	3	1	0	1	0	0	0	0	0	0	0	16
03:00	3	4	4	0	0	1	0	0	0	0	0	0	0	12
04:00	3	16	5	0	0	0	0	0	0	0	0	0	0	24
05:00	2	62	18	0	4	5	0	0	0	0	0	0	0	91
06:00	12	118	32	1	1	2	0	1	0	0	0	0	0	167
07:00	4	169	31	4	3	2	0	0	0	0	0	0	0	213
08:00	10	179	30	3	2	2	0	0	0	0	0	0	0	226
09:00	6	160	34	5	1	4	0	1	0	0	0	0	0	211
10:00	5	162	20	0	3	2	0	0	1	0	0	0	0	193
11:00	4	147	28	0	8	1	0	1	0	0	0	0	0	189
12 PM	2	162	22	0	3	0	1	0	1	0	0	0	0	191
13:00	4	156	26	1	2	1	1	1	0	0	0	1	0	193
14:00	7	168	35	1	2	3	0	0	0	0	0	0	0	216
15:00	3	176	35	3	4	1	0	1	0	0	0	0	0	223
16:00	8	177	32	3	2	2	0	0	0	0	0	0	0	224
17:00	5	161	19	0	0	1	0	0	0	0	0	0	0	186
18:00	4	127	17	0	1	1	0	1	0	0	0	0	0	151
19:00	4	105	15	0	0	2	0	0	0	0	0	0	0	126
20:00	2	89	7	0	0	0	0	0	0	0	0	0	0	98
21:00	1	73	8	0	1	0	0	0	0	0	0	0	0	83
22:00	3	53	5	0	0	0	0	1	0	0	0	0	0	62
23:00	1	34	2	0	0	0	0	0	0	0	0	0	0	37
Total	94	2530	433	22	37	32	2	7	2	0	0	1	0	3160
Percent	3.0%	80.1%	13.7%	0.7%	1.2%	1.0%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	09:00	09:00	11:00	05:00		06:00	10:00					08:00
Vol.	12	179	34	5	8	5		1	1					226
PM Peak	16:00	16:00	14:00	15:00	15:00	14:00	12:00	13:00	12:00			13:00		16:00
Vol.	8	177	35	3	4	3	1	1	1			1		224

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09/24/0														
8	0	28	4	0	0	0	0	0	0	0	0	0	0	32
01:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
02:00	0	10	2	0	1	0	0	0	0	0	0	0	0	13
03:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
04:00	0	21	7	0	0	0	0	0	0	0	0	0	0	28
05:00	4	51	16	0	2	3	0	0	0	0	0	0	0	76
06:00	5	108	20	0	1	2	0	0	1	0	0	0	0	137
07:00	10	169	20	6	5	3	0	2	1	0	0	0	0	216
08:00	6	153	35	2	1	1	0	1	0	0	0	0	0	199
09:00	8	161	28	3	4	2	0	0	1	0	0	0	0	207
10:00	6	142	12	0	3	2	0	1	0	0	0	0	0	166
11:00	2	178	23	1	4	5	0	0	0	0	0	0	0	213
12 PM	3	183	22	0	6	1	0	1	0	0	0	0	1	217
13:00	2	152	20	1	2	2	0	1	0	0	0	0	0	180
14:00	6	194	24	2	7	3	0	0	0	0	0	0	0	236
15:00	5	187	38	2	8	2	2	0	0	0	0	0	0	244
16:00	8	166	30	3	2	2	0	0	0	0	0	0	0	211
17:00	5	187	17	2	1	0	0	0	0	0	0	0	0	212
18:00	5	133	25	0	1	3	0	0	0	0	0	0	0	167
19:00	2	131	24	0	3	0	0	1	0	0	0	0	0	161
20:00	1	94	11	0	7	2	0	0	0	0	0	0	0	115
21:00	3	76	19	0	0	3	0	0	0	0	0	0	0	101
22:00	2	61	6	0	1	2	0	0	0	0	0	0	0	72
23:00	2	32	8	0	0	0	0	0	0	0	0	0	0	42
Total	85	2640	415	22	59	38	2	7	3	0	0	0	1	3272
Percent	2.6%	80.7%	12.7%	0.7%	1.8%	1.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	08:00	07:00	07:00	11:00		07:00	06:00					07:00
Vol.	10	178	35	6	5	5		2	1					216
PM Peak	16:00	14:00	15:00	16:00	15:00	14:00	15:00	12:00					12:00	15:00
Vol.	8	194	38	3	8	3	2	1					1	244

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
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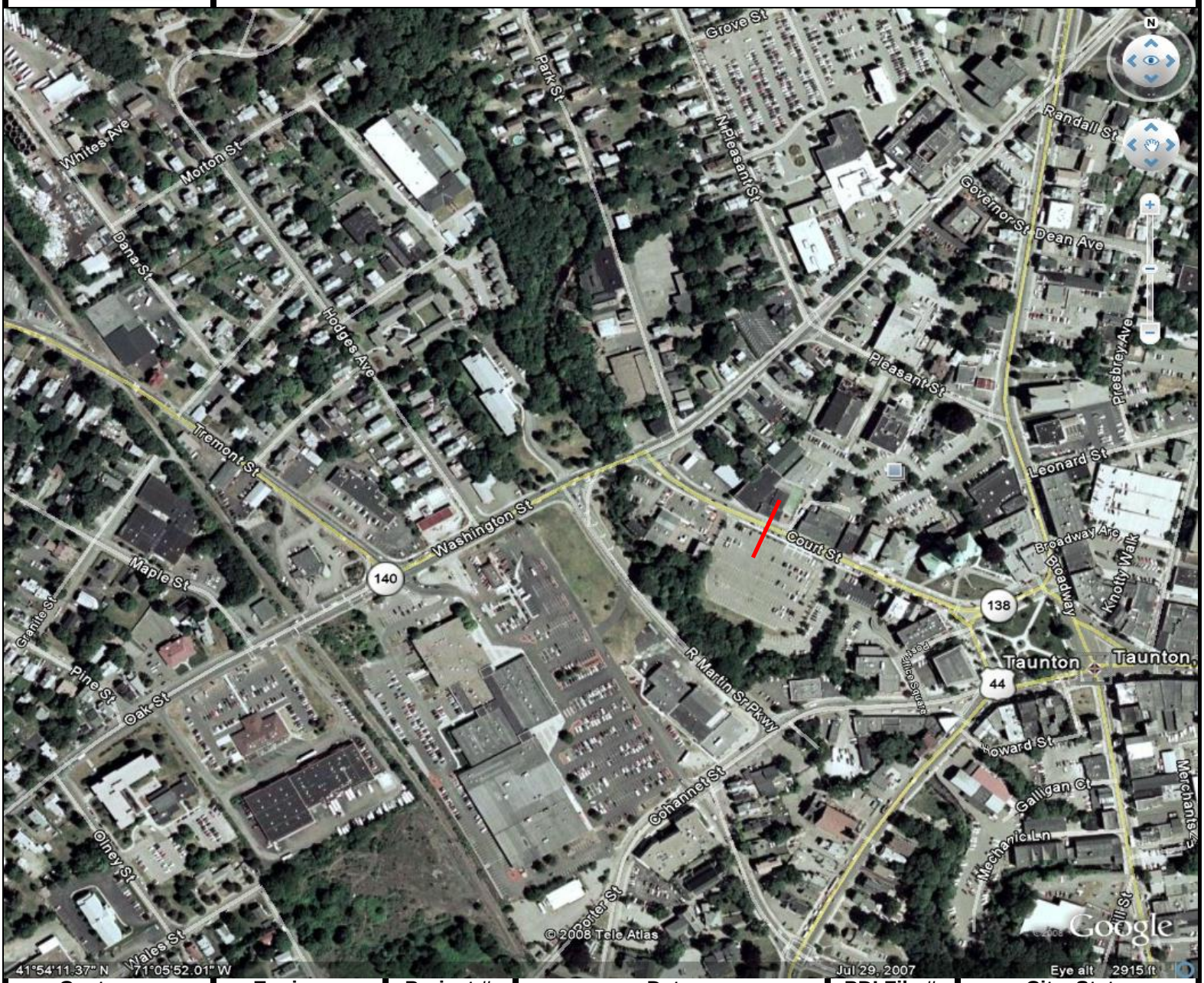
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	M. Pompili	TBA	Tues 9/23/08 thru Wed 9/24/08	81705	Taunton, MA

Court Street (Route 140)
south of Washington Street
City, State: Taunton, MA
Client: VHB/M. Pompili

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81705 BB volume
Site Code: TBA

Start	NB				SB				Combined				23-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	12		84		4		43		16		127		
12:15	24		77		6		52		30		129		
12:30	8		67		8		39		16		106		
12:45	4	48	80	308	2	20	42	176	6	68	122	484	
01:00	10		65		1		48		11		113		
01:15	2		64		3		61		5		125		
01:30	5		65		2		57		7		122		
01:45	5	22	66	260	2	8	56	222	7	30	122	482	
02:00	3		81		0		63		3		144		
02:15	3		86		4		71		7		157		
02:30	2		89		0		56		2		145		
02:45	3	11	96	352	1	5	70	260	4	16	166	612	
03:00	1		86		3		69		4		155		
03:15	6		79		3		69		9		148		
03:30	3		91		4		51		7		142		
03:45	6	16	78	334	4	14	66	255	10	30	144	589	
04:00	4		90		4		54		8		144		
04:15	2		87		6		56		8		143		
04:30	9		95		10		48		19		143		
04:45	3	18	78	350	11	31	60	218	14	49	138	568	
05:00	11		83		16		72		27		155		
05:15	5		106		11		70		16		176		
05:30	18		81		12		60		30		141		
05:45	23	57	80	350	32	71	78	280	55	128	158	630	
06:00	21		68		30		80		51		148		
06:15	38		74		25		62		63		136		
06:30	55		73		34		44		89		117		
06:45	63	177	91	306	48	137	55	241	111	314	146	547	
07:00	75		77		55		43		130		120		
07:15	74		93		80		47		154		140		
07:30	66		74		65		59		131		133		
07:45	89	304	73	317	71	271	42	191	160	575	115	508	
08:00	96		76		84		35		180		111		
08:15	61		72		61		40		122		112		
08:30	31		56		78		22		109		78		
08:45	88	276	46	250	73	296	33	130	161	572	79	380	
09:00	74		45		71		26		145		71		
09:15	76		48		68		21		144		69		
09:30	69		33		65		19		134		52		
09:45	68	287	30	156	68	272	24	90	136	559	54	246	
10:00	76		29		70		19		146		48		
10:15	67		36		61		15		128		51		
10:30	74		26		55		13		129		39		
10:45	84	301	26	117	43	229	8	55	127	530	34	172	
11:00	74		23		59		5		133		28		
11:15	75		19		56		24		131		43		
11:30	79		21		58		14		137		35		
11:45	73	301	11	74	55	228	5	48	128	529	16	122	
Total	1818		3174		1582		2166		3400		5340		
Percent	53.5%		59.4%		46.5%		40.6%						
Day Total			4992				3748				8740		
Peak	07:15		04:30		07:15		05:15		07:15		05:00		
Vol.	325		362		300		288		625		630		
P.H.F.	0.846		0.854		0.893		0.900		0.868		0.895		

Court Street (Route 140)
south of Washington Street
City, State: Taunton, MA
Client: VHB/M. Pompili

PRECISION DATA INDUSTRIES, LLC
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81705 BB volume
Site Code: TBA

Start	NB				SB				Combined				24-Sep-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	16		86		5		56		21		142		
12:15	9		79		8		51		17		130		
12:30	14		87		5		51		19		138		
12:45	7	46	89	341	4	22	49	207	11	68	138	548	
01:00	9		75		1		64		10		139		
01:15	7		76		4		44		11		120		
01:30	4		74		1		55		5		129		
01:45	3	23	87	312	5	11	56	219	8	34	143	531	
02:00	4		83		4		53		8		136		
02:15	2		69		1		54		3		123		
02:30	3		80		1		68		4		148		
02:45	2	11	88	320	4	10	69	244	6	21	157	564	
03:00	3		68		1		54		4		122		
03:15	7		92		2		82		9		174		
03:30	5		85		2		57		7		142		
03:45	6	21	87	332	7	12	52	245	13	33	139	577	
04:00	2		85		2		59		4		144		
04:15	7		95		3		69		10		164		
04:30	6		82		9		58		15		140		
04:45	7	22	88	350	7	21	61	247	14	43	149	597	
05:00	7		87		8		47		15		134		
05:15	4		86		18		62		22		148		
05:30	19		92		13		73		32		165		
05:45	27	57	74	339	27	66	64	246	54	123	138	585	
06:00	27		95		28		61		55		156		
06:15	24		79		34		71		58		150		
06:30	53		69		29		55		82		124		
06:45	56	160	89	332	47	138	65	252	103	298	154	584	
07:00	73		89		63		55		136		144		
07:15	72		94		73		52		145		146		
07:30	102		80		72		43		174		123		
07:45	87	334	71	334	58	266	64	214	145	600	135	548	
08:00	94		61		73		41		167		102		
08:15	88		61		61		48		149		109		
08:30	69		37		64		39		133		76		
08:45	67	318	50	209	74	272	27	155	141	590	77	364	
09:00	83		49		70		27		153		76		
09:15	83		55		64		28		147		83		
09:30	81		58		52		22		133		80		
09:45	61	308	38	200	64	250	19	96	125	558	57	296	
10:00	85		32		49		20		134		52		
10:15	65		46		59		14		124		60		
10:30	87		29		43		13		130		42		
10:45	89	326	31	138	61	212	17	64	150	538	48	202	
11:00	75		24		60		14		135		38		
11:15	79		18		56		18		135		36		
11:30	67		19		55		16		122		35		
11:45	90	311	8	69	43	214	8	56	133	525	16	125	
Total	1937		3276		1494		2245		3431		5521		
Percent	56.5%		59.3%		43.5%		40.7%						
Day Total		5213				3739				8952			
Peak	07:30		04:45		07:15		02:30		07:30		05:30		
Vol.	371		353		276		273		635		609		
P.H.F.	0.909		0.929		0.945		0.832		0.912		0.923		

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

Court Street (Route 140)
south of Washington Street
City, State: Taunton, MA
Client: VHB/M. Pompili

81705 BB class
Site Code: TBA

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	36	11	0	1	0	0	0	0	0	0	0	0	48
01:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
02:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
03:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
04:00	0	12	6	0	0	0	0	0	0	0	0	0	0	18
05:00	0	36	13	0	4	2	0	2	0	0	0	0	0	57
06:00	2	123	43	0	3	3	0	2	1	0	0	0	0	177
07:00	1	231	48	6	11	4	0	1	2	0	0	0	0	304
08:00	0	212	38	4	11	5	3	0	3	0	0	0	0	276
09:00	2	201	54	9	13	5	1	1	1	0	0	0	0	287
10:00	0	243	37	2	9	4	2	2	2	0	0	0	0	301
11:00	0	226	48	2	19	3	0	2	1	0	0	0	0	301
12 PM	2	229	56	1	15	2	0	3	0	0	0	0	0	308
13:00	2	204	41	0	8	2	0	2	1	0	0	0	0	260
14:00	4	259	66	2	12	5	0	3	1	0	0	0	0	352
15:00	2	257	62	0	9	2	0	2	0	0	0	0	0	334
16:00	2	288	47	4	6	1	0	0	2	0	0	0	0	350
17:00	4	288	48	2	6	1	0	0	0	0	0	0	1	350
18:00	2	260	31	1	8	2	0	1	0	0	0	0	0	305
19:00	2	261	48	3	3	0	0	1	0	0	0	0	0	318
20:00	2	213	32	0	2	0	0	1	0	0	0	0	0	250
21:00	0	136	19	0	1	0	0	0	0	0	0	0	0	156
22:00	0	103	13	0	1	0	0	0	0	0	0	0	0	117
23:00	0	69	4	0	1	0	0	0	0	0	0	0	0	74
Total	27	3930	771	36	143	41	6	23	14	0	0	0	1	4992
Percent	0.5%	78.7%	15.4%	0.7%	2.9%	0.8%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	10:00	09:00	09:00	11:00	08:00	08:00	05:00	08:00					07:00
Vol.	2	243	54	9	19	5	3	2	3					304
PM Peak	14:00	16:00	14:00	16:00	12:00	14:00		12:00	16:00				17:00	14:00
Vol.	4	288	66	4	15	5		3	2				1	352

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Court Street (Route 140)
south of Washington Street
City, State: Taunton, MA
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81705 BB class
Site Code: TBA

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/24/0														
8	0	40	6	0	0	0	0	0	0	0	0	0	0	46
01:00	0	18	5	0	0	0	0	0	0	0	0	0	0	23
02:00	0	7	3	0	1	0	0	0	0	0	0	0	0	11
03:00	0	16	5	0	0	0	0	0	0	0	0	0	0	21
04:00	0	15	2	0	4	0	0	0	1	0	0	0	0	22
05:00	1	37	16	0	3	0	0	0	0	0	0	0	0	57
06:00	3	120	28	1	2	4	0	2	0	0	0	0	0	160
07:00	2	248	50	4	14	5	0	4	6	0	0	1	0	334
08:00	1	252	44	3	10	3	1	1	2	0	0	1	0	318
09:00	1	232	50	8	11	3	1	1	1	0	0	0	0	308
10:00	0	245	55	2	13	1	3	4	3	0	0	0	0	326
11:00	1	241	49	1	15	1	1	0	2	0	0	0	0	311
12 PM	0	260	60	0	11	4	0	4	2	0	0	0	0	341
13:00	3	249	42	4	10	2	0	1	0	1	0	0	0	312
14:00	4	248	50	2	11	4	0	1	0	0	0	0	0	320
15:00	6	263	49	0	7	4	0	3	0	0	0	0	0	332
16:00	5	293	40	1	6	3	0	2	0	0	0	0	0	350
17:00	6	287	29	3	10	1	0	2	1	0	0	0	0	339
18:00	2	285	34	0	7	2	0	1	0	0	0	0	1	332
19:00	2	284	39	0	6	0	0	2	1	0	0	0	0	334
20:00	1	169	34	1	2	1	0	1	0	0	0	0	0	209
21:00	1	168	29	1	1	0	0	0	0	0	0	0	0	200
22:00	0	123	14	0	1	0	0	0	0	0	0	0	0	138
23:00	0	63	5	0	1	0	0	0	0	0	0	0	0	69
Total	39	4163	738	31	146	38	6	29	19	1	0	2	1	5213
Percent	0.7%	79.9%	14.2%	0.6%	2.8%	0.7%	0.1%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	10:00	09:00	11:00	07:00	10:00	07:00	07:00			07:00		07:00
Vol.	3	252	55	8	15	5	3	4	6			1		334
PM Peak	15:00	16:00	12:00	13:00	12:00	12:00		12:00	12:00	13:00			18:00	16:00
Vol.	6	293	60	4	11	4		4	2	1			1	350

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SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/23/0														
8	0	19	1	0	0	0	0	0	0	0	0	0	0	20
01:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
03:00	1	8	4	0	1	0	0	0	0	0	0	0	0	14
04:00	0	23	8	0	0	0	0	0	0	0	0	0	0	31
05:00	0	49	15	3	3	0	0	1	0	0	0	0	0	71
06:00	1	101	25	4	3	1	0	2	0	0	0	0	0	137
07:00	1	237	25	4	1	2	0	0	1	0	0	0	0	271
08:00	1	249	33	1	8	2	0	1	1	0	0	0	0	296
09:00	3	221	40	0	4	1	0	2	1	0	0	0	0	272
10:00	0	205	17	0	6	1	0	0	0	0	0	0	0	229
11:00	4	192	25	2	3	1	0	1	0	0	0	0	0	228
12 PM	0	143	23	0	4	1	0	2	2	0	1	0	0	176
13:00	0	185	26	2	3	5	0	1	0	0	0	0	0	222
14:00	5	214	37	3	1	0	0	0	0	0	0	0	0	260
15:00	1	213	36	0	3	1	0	0	1	0	0	0	0	255
16:00	2	199	16	0	1	0	0	0	0	0	0	0	0	218
17:00	6	244	28	0	1	1	0	0	0	0	0	0	0	280
18:00	5	205	30	0	1	0	0	0	0	0	0	0	0	241
19:00	2	162	23	0	4	0	0	0	0	0	0	0	0	191
20:00	1	112	13	0	4	0	0	0	0	0	0	0	0	130
21:00	0	78	9	0	3	0	0	0	0	0	0	0	0	90
22:00	0	51	3	0	0	0	0	1	0	0	0	0	0	55
23:00	0	45	3	0	0	0	0	0	0	0	0	0	0	48
Total	33	3168	440	19	54	16	0	11	6	0	1	0	0	3748
Percent	0.9%	84.5%	11.7%	0.5%	1.4%	0.4%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	09:00	06:00	08:00	07:00		06:00	07:00					08:00
Vol.	4	249	40	4	8	2		2	1					296
PM Peak	17:00	17:00	14:00	14:00	12:00	13:00		12:00	12:00		12:00			17:00
Vol.	6	244	37	3	4	5		2	2		1			280

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09/24/0														
8	0	22	0	0	0	0	0	0	0	0	0	0	0	22
01:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
02:00	0	9	0	0	0	0	0	0	1	0	0	0	0	10
03:00	0	8	3	0	1	0	0	0	0	0	0	0	0	12
04:00	0	14	5	0	1	0	0	1	0	0	0	0	0	21
05:00	0	50	11	0	2	0	0	2	1	0	0	0	0	66
06:00	0	102	24	3	3	2	0	3	1	0	0	0	0	138
07:00	1	230	26	4	2	2	0	1	0	0	0	0	0	266
08:00	3	229	32	0	5	2	0	1	0	0	0	0	0	272
09:00	6	210	26	1	5	1	0	1	0	0	0	0	0	250
10:00	3	166	31	0	9	1	0	0	2	0	0	0	0	212
11:00	1	171	33	2	7	0	0	0	0	0	0	0	0	214
12 PM	1	182	18	0	5	1	0	0	0	0	0	0	0	207
13:00	1	190	21	2	2	2	0	1	0	0	0	0	0	219
14:00	3	210	25	3	2	1	0	0	0	0	0	0	0	244
15:00	1	219	21	1	1	1	0	1	0	0	0	0	0	245
16:00	7	216	22	0	1	1	0	0	0	0	0	0	0	247
17:00	1	219	21	0	4	0	0	1	0	0	0	0	0	246
18:00	3	229	18	0	2	0	0	0	0	0	0	0	0	252
19:00	0	184	26	0	4	0	0	0	0	0	0	0	0	214
20:00	3	134	17	0	1	0	0	0	0	0	0	0	0	155
21:00	0	82	14	0	0	0	0	0	0	0	0	0	0	96
22:00	0	60	4	0	0	0	0	0	0	0	0	0	0	64
23:00	0	49	5	0	2	0	0	0	0	0	0	0	0	56
Total	34	3194	405	16	59	14	0	12	5	0	0	0	0	3739
Percent	0.9%	85.4%	10.8%	0.4%	1.6%	0.4%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	11:00	07:00	10:00	06:00		06:00	10:00					08:00
Vol.	6	230	33	4	9	2		3	2					272
PM Peak	16:00	18:00	19:00	14:00	12:00	13:00		13:00						18:00
Vol.	7	229	26	3	5	2		1						252

PRECISION DATA INDUSTRIES, LLC
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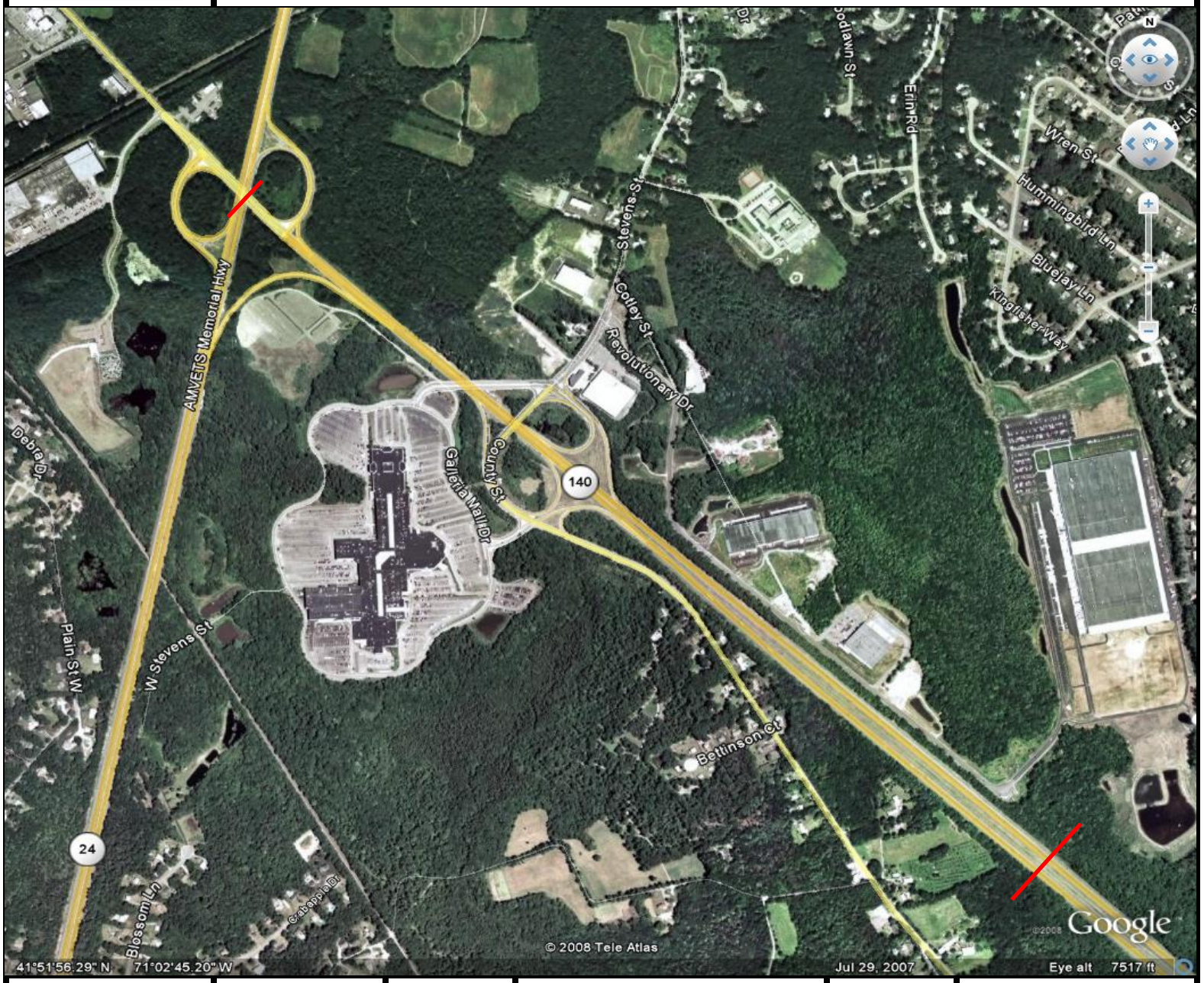
Traffic Counts with Precision



Customer:	Engineer:	Project #:	Date:	PDI File #:	City, State:
VHB	R. Raveendran	10111.31	Wed 10/15/08 thru Thur 10/16/08	81676	Taunton, MA

Route 140 EB lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 G-A volume
Site Code: 10111.31

Start	EB RL				EB LL				Combined				15-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	45		167		25		111		70		278		
12:15	40		202		18		132		58		334		
12:30	36		188		19		136		55		324		
12:45	13	134	196	753	12	74	148	527	25	208	344	1280	
01:00	25		215		12		155		37		370		
01:15	22		187		5		142		27		329		
01:30	17		176		5		133		22		309		
01:45	19	83	207	785	6	28	160	590	25	111	367	1375	
02:00	20		209		16		154		36		363		
02:15	15		205		14		180		29		385		
02:30	13		234		4		185		17		419		
02:45	5	53	218	866	9	43	201	720	14	96	419	1586	
03:00	9		241		4		186		13		427		
03:15	8		243		5		213		13		456		
03:30	10		283		5		202		15		485		
03:45	15	42	295	1062	4	18	253	854	19	60	548	1916	
04:00	17		318		7		275		24		593		
04:15	27		310		6		265		33		575		
04:30	33		290		18		289		51		579		
04:45	50	127	293	1211	27	58	254	1083	77	185	547	2294	
05:00	33		294		24		244		57		538		
05:15	49		270		42		263		91		533		
05:30	53		251		61		223		114		474		
05:45	61	196	278	1093	56	183	248	978	117	379	526	2071	
06:00	69		272		70		239		139		511		
06:15	86		240		70		194		156		434		
06:30	107		229		89		182		196		411		
06:45	121	383	215	956	119	348	158	773	240	731	373	1729	
07:00	129		199		121		121		250		320		
07:15	137		163		146		124		283		287		
07:30	163		162		154		131		317		293		
07:45	151	580	126	650	159	580	109	485	310	1160	235	1135	
08:00	130		123		140		105		270		228		
08:15	143		143		145		83		288		226		
08:30	129		103		118		84		247		187		
08:45	135	537	111	480	130	533	79	351	265	1070	190	831	
09:00	142		101		87		80		229		181		
09:15	153		89		99		58		252		147		
09:30	134		96		112		90		246		186		
09:45	151	580	56	342	101	399	43	271	252	979	99	613	
10:00	155		60		121		41		276		101		
10:15	156		53		99		49		255		102		
10:30	180		45		115		47		295		92		
10:45	164	655	50	208	104	439	45	182	268	1094	95	390	
11:00	146		38		133		20		279		58		
11:15	150		41		119		33		269		74		
11:30	167		54		121		28		288		82		
11:45	179	642	40	173	127	500	27	108	306	1142	67	281	
Total	4012		8579		3203		6922		7215		15501		
Percent	55.6%		55.3%		44.4%		44.7%						
Day Total		12591				10125				22716			
Peak	10:00		03:45		07:15		04:00		07:30		03:45		
Vol.	655		1213		599		1083		1185		2295		
P.H.F.	0.910		0.954		0.942		0.937		0.935		0.968		

Route 140 EB lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION
D A T A
INDUSTRIES, LLC
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81676 G-A volume
Site Code: 10111.31

Start	EB RL				EB LL				Combined				16-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	39		201		19		124		58		325		
12:15	42		170		25		133		67		303		
12:30	31		200		22		135		53		335		
12:45	22	134	194	765	8	74	154	546	30	208	348	1311	
01:00	20		204		19		117		39		321		
01:15	17		190		4		148		21		338		
01:30	19		181		8		135		27		316		
01:45	14	70	193	768	4	35	159	559	18	105	352	1327	
02:00	19		170		12		148		31		318		
02:15	11		212		8		189		19		401		
02:30	13		236		6		192		19		428		
02:45	12	55	236	854	5	31	214	743	17	86	450	1597	
03:00	9		257		2		209		11		466		
03:15	9		255		2		224		11		479		
03:30	11		276		7		236		18		512		
03:45	19	48	294	1082	13	24	231	900	32	72	525	1982	
04:00	10		311		9		277		19		588		
04:15	20		323		9		263		29		586		
04:30	39		314		17		257		56		571		
04:45	41	110	305	1253	18	53	287	1084	59	163	592	2337	
05:00	27		280		24		233		51		513		
05:15	41		284		43		244		84		528		
05:30	51		296		51		243		102		539		
05:45	61	180	245	1105	61	179	218	938	122	359	463	2043	
06:00	74		222		72		216		146		438		
06:15	80		252		71		201		151		453		
06:30	96		206		111		193		207		399		
06:45	109	359	215	895	120	374	151	761	229	733	366	1656	
07:00	118		191		128		128		246		319		
07:15	145		184		152		149		297		333		
07:30	165		149		156		112		321		261		
07:45	147	575	132	656	171	607	93	482	318	1182	225	1138	
08:00	149		137		143		90		292		227		
08:15	147		122		127		113		274		235		
08:30	144		108		125		79		269		187		
08:45	141	581	100	467	121	516	88	370	262	1097	188	837	
09:00	139		85		97		94		236		179		
09:15	130		87		112		74		242		161		
09:30	141		81		101		60		242		141		
09:45	158	568	67	320	108	418	53	281	266	986	120	601	
10:00	143		64		100		51		243		115		
10:15	147		55		79		55		226		110		
10:30	159		67		103		38		262		105		
10:45	156	605	46	232	129	411	32	176	285	1016	78	408	
11:00	152		62		133		31		285		93		
11:15	179		51		105		43		284		94		
11:30	171		49		112		30		283		79		
11:45	191	693	37	199	119	469	33	137	310	1162	70	336	
Total	3978		8596		3191		6977		7169		15573		
Percent	55.5%		55.2%		44.5%		44.8%						
Day Total			12574				10168				22742		
Peak	11:00		04:00		07:15		04:00		07:15		04:00		
Vol.	693		1253		622		1084		1228		2337		
P.H.F.	0.907		0.970		0.909		0.944		0.956		0.987		

PRECISION
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	2	1	14	47	49	10	7	2	1	0	**1**	0	134	40	35
01:00	0	1	3	12	33	25	4	5	0	0	0	0	0	83	39	34
02:00	0	2	6	7	17	11	10	0	0	0	0	0	0	53	40	33
03:00	0	0	3	5	11	14	4	2	3	0	0	0	0	42	42	35
04:00	0	0	8	14	34	36	21	9	4	1	0	0	0	127	43	36
05:00	0	0	11	28	60	53	26	16	1	0	**1**	0	0	196	42	35
06:00	0	8	19	47	139	106	42	17	5	0	0	0	0	383	40	34
07:00	0	1	14	81	202	**199**	54	**24**	4	1	0	0	0	580	39	34
08:00	0	8	27	76	159	165	69	24	**7**	**2**	0	0	0	537	41	34
09:00	0	0	35	69	193	188	74	16	5	0	0	0	0	580	40	34
10:00	0	2	38	95	**256**	193	50	13	6	2	0	0	0	**655**	39	33
11:00	0	**13**	**46**	**102**	207	161	**86**	24	2	0	0	0	0	641	40	33
12 PM	0	**9**	27	88	279	262	68	15	**5**	**1**	0	0	0	754	39	34
13:00	0	5	**36**	112	295	221	87	**26**	1	1	0	0	0	784	39	34
14:00	0	2	31	105	330	292	**88**	17	1	1	0	0	0	867	39	34
15:00	0	7	32	**126**	484	332	59	16	5	0	0	0	0	1061	38	33
16:00	0	0	21	111	**606**	390	69	14	1	0	0	0	0	**1212**	38	34
17:00	0	0	11	91	443	**464**	71	9	3	0	0	0	0	1092	39	34
18:00	0	5	30	102	424	312	71	10	2	0	0	0	0	956	39	34
19:00	0	0	11	56	298	201	66	17	1	0	**1**	0	0	651	39	34
20:00	0	0	7	47	217	141	51	11	5	1	0	0	0	480	39	34
21:00	0	0	3	44	125	129	32	6	1	1	1	0	0	342	39	35
22:00	0	1	2	16	83	68	25	8	5	0	0	0	0	208	41	35
23:00	0	3	4	18	75	46	22	2	2	0	1	0	0	173	40	34
Total	0	69	426	1466	5017	4058	1159	308	71	12	4	1	0	12591		
%	0.0%	0.5%	3.4%	11.6%	39.8%	32.2%	9.2%	2.4%	0.6%	0.1%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	11:00	10:00	07:00	11:00	07:00	08:00	08:00	05:00	00:00		10:00		
Vol.		13	46	102	256	199	86	24	7	2	1	1		655		
PM Peak		12:00	13:00	15:00	16:00	17:00	14:00	13:00	12:00	12:00	19:00			16:00		
Vol.		9	36	126	606	464	88	26	5	1	1			1212		

Pecent

15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	9075
Percent in Pace :	72.1%
Number of Vehicles > 35 MPH :	4801
Percent of Vehicles > 35 MPH :	38.1%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	1	18	48	45	14	3	3	1	1	0	0	134	40	35
01:00	0	1	0	12	31	14	6	4	1	1	0	0	0	70	40	34
02:00	0	0	1	3	16	24	3	6	2	0	0	0	0	55	44	37
03:00	0	0	5	8	13	9	9	3	1	0	0	0	0	48	42	34
04:00	0	0	5	8	35	39	12	6	4	1	0	0	0	110	41	36
05:00	0	1	10	17	63	45	26	12	5	1	0	0	0	180	43	35
06:00	0	4	28	45	120	97	47	15	2	1	0	0	0	359	41	34
07:00	**1**	**10**	28	81	199	174	60	18	4	0	0	0	0	575	39	34
08:00	0	7	14	60	225	191	52	**20**	**8**	1	**3**	0	0	581	39	35
09:00	0	2	25	93	213	164	49	18	4	0	0	0	0	568	39	34
10:00	0	2	31	80	188	197	**86**	16	3	1	0	0	0	604	40	34
11:00	0	0	**40**	**100**	**249**	**210**	69	17	6	**2**	0	0	0	**693**	39	34
12 PM	0	5	**51**	**164**	278	205	54	9	0	0	0	0	0	766	38	32
13:00	0	2	21	102	274	285	64	15	4	0	0	0	0	767	39	34
14:00	1	**9**	48	115	348	253	61	19	1	0	0	0	0	855	39	33
15:00	0	2	39	130	521	323	47	13	6	**1**	0	0	0	1082	38	33
16:00	0	1	19	119	**574**	**465**	63	10	1	0	0	0	0	**1252**	38	34
17:00	**2**	4	19	102	487	410	**67**	10	5	0	0	0	0	1106	38	34
18:00	0	1	21	102	405	289	57	16	3	1	0	0	0	895	38	34
19:00	0	1	4	61	276	220	58	**28**	**7**	0	**1**	0	0	656	39	35
20:00	0	0	6	47	168	166	66	9	4	0	0	0	0	466	40	35
21:00	0	0	3	43	110	108	37	17	3	0	0	0	0	321	41	35
22:00	0	0	3	18	105	68	26	8	4	0	0	0	0	232	40	35
23:00	0	2	3	21	73	64	23	7	4	1	0	**1**	0	199	41	35
Total	4	54	425	1549	5019	4065	1056	299	85	12	5	1	0	12574		
%	0.0%	0.4%	3.4%	12.3%	39.9%	32.3%	8.4%	2.4%	0.7%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	11:00	11:00	11:00	11:00	10:00	08:00	08:00	11:00	08:00			11:00		
Vol.	1	10	40	100	249	210	86	20	8	2	3			693		
PM Peak	17:00	14:00	12:00	12:00	16:00	16:00	17:00	19:00	19:00	15:00	19:00	23:00		16:00		
Vol.	2	9	51	164	574	465	67	28	7	1	1	1		1252		

Pecent

15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	9084
Percent in Pace :	72.2%
Number of Vehicles > 35 MPH :	4710
Percent of Vehicles > 35 MPH :	37.5%
Mean Speed(Average) :	34 MPH

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Route 140 EB Lanes
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City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	1	14	25	26	4	2	2	0	0	0	74	44	39
01:00	0	0	0	0	2	9	10	5	1	0	0	0	**1**	28	47	42
02:00	0	0	0	0	4	14	11	6	6	2	0	0	0	43	50	42
03:00	0	0	0	0	2	7	3	4	2	0	0	0	0	18	47	41
04:00	0	0	2	0	9	17	14	7	7	2	0	0	0	58	49	40
05:00	0	0	0	6	49	67	43	14	4	0	0	0	0	183	43	38
06:00	0	**3**	**14**	24	60	120	90	28	7	2	0	0	0	348	44	37
07:00	0	0	6	23	**136**	**210**	**158**	**39**	5	2	**1**	0	0	**580**	43	38
08:00	0	0	5	33	114	188	144	39	**8**	2	0	0	0	533	43	38
09:00	0	0	6	14	86	154	104	28	4	3	0	0	0	399	43	38
10:00	0	0	5	**34**	86	142	135	32	5	0	0	0	0	439	43	38
11:00	0	0	5	26	98	183	141	33	8	**4**	0	**1**	0	499	43	38
12 PM	0	2	14	33	97	192	146	34	9	0	**1**	0	0	528	43	37
13:00	0	1	21	38	135	209	139	37	8	0	1	0	0	589	43	37
14:00	0	2	10	22	170	274	192	41	8	2	0	0	0	721	43	37
15:00	0	1	**24**	34	130	360	242	**59**	4	0	0	0	0	854	43	38
16:00	0	0	17	**63**	**194**	**422**	319	57	11	0	0	0	0	**1083**	43	37
17:00	0	0	1	31	156	384	**342**	52	11	1	0	0	0	978	43	38
18:00	0	0	4	21	159	287	240	49	**13**	0	0	0	0	773	43	38
19:00	0	**5**	1	11	62	213	141	44	5	**3**	0	0	0	485	44	39
20:00	0	0	1	14	52	132	102	37	12	0	0	**1**	0	351	44	39
21:00	0	0	4	8	57	109	63	22	6	0	1	0	0	270	43	38
22:00	0	0	0	3	23	73	51	20	10	2	1	0	0	183	46	40
23:00	0	0	0	5	13	31	32	14	10	3	0	0	0	108	48	41
Total	0	14	140	444	1908	3822	2888	705	166	30	5	2	1	10125		
%	0.0%	0.1%	1.4%	4.4%	18.8%	37.7%	28.5%	7.0%	1.6%	0.3%	0.0%	0.0%	0.0%			
AM Peak		06:00	06:00	10:00	07:00	07:00	07:00	07:00	08:00	11:00	07:00	11:00	01:00	07:00		
Vol.		3	14	34	136	210	158	39	8	4	1	1	1	580		
PM Peak		19:00	15:00	16:00	16:00	16:00	17:00	15:00	18:00	19:00	12:00	20:00		16:00		
Vol.		5	24	63	194	422	342	59	13	3	1	1		1083		

Pecent

15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	47 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6710
Percent in Pace :	66.3%
Number of Vehicles > 35 MPH :	6854
Percent of Vehicles > 35 MPH :	67.7%
Mean Speed(Average) :	38 MPH

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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	1	10	23	24	12	1	**3**	0	0	0	74	46	40
01:00	0	0	0	1	5	9	12	7	1	0	0	0	0	35	46	40
02:00	0	2	0	1	5	7	10	3	2	1	0	0	0	31	45	39
03:00	0	0	0	0	1	8	6	6	3	0	0	0	0	24	48	42
04:00	0	0	0	2	3	15	15	10	8	0	0	0	0	53	49	42
05:00	0	1	3	10	38	64	41	16	6	0	0	0	0	179	44	38
06:00	0	0	2	28	98	125	94	15	**10**	2	0	0	0	374	43	37
07:00	0	**7**	**22**	**36**	**125**	**209**	**162**	**36**	10	0	0	0	0	**607**	43	37
08:00	0	0	11	29	106	197	131	31	7	3	**1**	0	0	516	43	37
09:00	0	0	3	25	102	151	100	29	7	1	0	0	0	418	43	37
10:00	0	0	2	26	99	150	102	25	6	0	1	0	0	411	43	37
11:00	0	0	2	24	94	195	113	32	7	2	0	0	0	469	43	38
12 PM	**2**	**10**	9	46	127	193	120	34	5	0	0	0	0	546	43	36
13:00	0	1	11	39	123	223	127	27	7	1	0	0	0	559	43	37
14:00	0	0	17	**62**	142	281	184	46	**11**	0	0	0	0	743	43	37
15:00	0	3	3	47	167	376	247	46	7	**4**	0	0	0	900	43	38
16:00	0	6	**18**	26	**183**	**435**	348	59	9	0	0	0	0	**1084**	43	38
17:00	0	0	4	20	119	352	**357**	**78**	7	1	0	0	0	938	44	39
18:00	0	0	8	46	123	310	220	50	2	2	0	0	0	761	43	38
19:00	0	0	1	17	74	174	154	54	6	1	0	**1**	0	482	44	39
20:00	0	0	0	11	58	142	121	27	5	4	**1**	1	0	370	44	39
21:00	0	0	0	3	39	100	102	30	7	0	0	0	0	281	44	39
22:00	0	2	0	1	19	56	65	26	4	3	0	0	0	176	46	40
23:00	0	0	0	3	12	47	43	18	10	1	1	0	**2**	137	47	41
Total	2	32	116	504	1872	3842	2898	717	148	29	4	2	2	10168		
%	0.0%	0.3%	1.1%	5.0%	18.4%	37.8%	28.5%	7.1%	1.5%	0.3%	0.0%	0.0%	0.0%			
AM Peak		07:00	07:00	07:00	07:00	07:00	07:00	07:00	06:00	00:00	08:00			07:00		
Vol.		7	22	36	125	209	162	36	10	3	1			607		
PM Peak	12:00	12:00	16:00	14:00	16:00	16:00	17:00	17:00	14:00	15:00	20:00	19:00	23:00	16:00		
Vol.	2	10	18	62	183	435	357	78	11	4	1	1	2	1084		

Pecent

15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	47 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6740
Percent in Pace :	66.3%
Number of Vehicles > 35 MPH :	6873
Percent of Vehicles > 35 MPH :	67.6%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB RL, EB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	2	1	15	61	74	36	11	4	3	0	**1**	0	208	43	37
01:00	0	1	3	12	35	34	14	10	1	0	0	0	**1**	111	42	36
02:00	0	2	6	7	21	25	21	6	6	2	0	0	0	96	44	37
03:00	0	0	3	5	13	21	7	6	5	0	0	0	0	60	45	37
04:00	0	0	10	14	43	53	35	16	11	3	0	0	0	185	45	37
05:00	0	0	11	34	109	120	69	30	5	0	**1**	0	0	379	43	36
06:00	0	11	33	71	199	226	132	45	12	2	0	0	0	731	43	36
07:00	0	1	20	104	338	**409**	212	**63**	9	3	1	0	0	**1160**	42	36
08:00	0	8	32	109	273	353	213	63	**15**	**4**	0	0	0	1070	43	36
09:00	0	0	41	83	279	342	178	44	9	3	0	0	0	979	42	36
10:00	0	2	43	**129**	**342**	335	185	45	11	2	0	0	0	1094	42	35
11:00	0	**13**	**51**	128	305	344	**227**	57	10	4	0	1	0	1140	42	35
12 PM	0	**11**	41	121	376	454	214	49	14	1	1	0	0	1282	42	35
13:00	0	6	**57**	150	430	430	226	63	9	1	1	0	0	1373	42	35
14:00	0	4	41	127	500	566	280	58	9	**3**	0	0	0	1588	41	36
15:00	0	8	56	160	614	692	301	**75**	9	0	0	0	0	1915	41	35
16:00	0	0	38	**174**	**800**	812	388	71	12	0	0	0	0	**2295**	41	35
17:00	0	0	12	122	599	**848**	**413**	61	14	1	0	0	0	2070	42	36
18:00	0	5	34	123	583	599	311	59	15	0	0	0	0	1729	42	36
19:00	0	5	12	67	360	414	207	61	6	3	1	0	0	1136	42	36
20:00	0	0	8	61	269	273	153	48	**17**	1	0	**1**	0	831	43	36
21:00	0	0	7	52	182	238	95	28	7	1	**2**	0	0	612	42	36
22:00	0	1	2	19	106	141	76	28	15	2	1	0	0	391	44	37
23:00	0	3	4	23	88	77	54	16	12	3	1	0	0	281	43	37
Total	0	83	566	1910	6925	7880	4047	1013	237	42	9	3	1	22716		
%	0.0%	0.4%	2.5%	8.4%	30.5%	34.7%	17.8%	4.5%	1.0%	0.2%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	10:00	10:00	07:00	11:00	07:00	08:00	08:00	05:00	00:00	01:00	07:00		
Vol.		13	51	129	342	409	227	63	15	4	1	1	1	1160		
PM Peak		12:00	13:00	16:00	16:00	17:00	17:00	15:00	20:00	14:00	21:00	20:00		16:00		
Vol.		11	57	174	800	848	413	75	17	3	2	1		2295		

Pecent

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	14805
Percent in Pace :	65.2%
Number of Vehicles > 35 MPH :	11656
Percent of Vehicles > 35 MPH :	51.3%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A speed
Site Code: 10111.31

EB RL, EB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	1	19	58	68	38	15	4	**4**	1	0	0	208	43	37
01:00	0	1	0	13	36	23	18	11	2	1	0	0	0	105	44	36
02:00	0	2	1	4	21	31	13	9	4	1	0	0	0	86	45	37
03:00	0	0	5	8	14	17	15	9	4	0	0	0	0	72	45	37
04:00	0	0	5	10	38	54	27	16	12	1	0	0	0	163	46	38
05:00	0	2	13	27	101	109	67	28	11	1	0	0	0	359	43	36
06:00	0	4	30	73	218	222	141	30	12	3	0	0	0	733	42	35
07:00	**1**	**17**	**50**	117	324	383	**222**	**54**	14	0	0	0	0	**1182**	42	35
08:00	0	7	25	89	331	388	183	51	**15**	4	**4**	0	0	1097	42	36
09:00	0	2	28	118	315	315	149	47	11	1	0	0	0	986	41	35
10:00	0	2	33	106	287	347	188	41	9	1	1	0	0	1015	42	36
11:00	0	0	42	**124**	**343**	**405**	182	49	13	4	0	0	0	1162	41	35
12 PM	**2**	**15**	60	**210**	405	398	174	43	5	0	0	0	0	1312	40	34
13:00	0	3	32	141	397	508	191	42	11	1	0	0	0	1326	41	35
14:00	1	9	**65**	177	490	534	245	65	12	0	0	0	0	1598	41	35
15:00	0	5	42	177	688	699	294	59	13	**5**	0	0	0	1982	41	35
16:00	0	7	37	145	**757**	**900**	411	69	10	0	0	0	0	**2336**	41	36
17:00	2	4	23	122	606	762	**424**	**88**	12	1	0	0	0	2044	42	36
18:00	0	1	29	148	528	599	277	66	5	3	0	0	0	1656	41	36
19:00	0	1	5	78	350	394	212	82	13	1	**1**	**1**	0	1138	43	37
20:00	0	0	6	58	226	308	187	36	9	4	1	1	0	836	42	37
21:00	0	0	3	46	149	208	139	47	10	0	0	0	0	602	43	37
22:00	0	2	3	19	124	124	91	34	8	3	0	0	0	408	44	37
23:00	0	2	3	24	85	111	66	25	**14**	2	1	1	**2**	336	44	38
Total	6	86	541	2053	6891	7907	3954	1016	233	41	9	3	2	22742		
%	0.0%	0.4%	2.4%	9.0%	30.3%	34.8%	17.4%	4.5%	1.0%	0.2%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	11:00	11:00	11:00	07:00	07:00	08:00	00:00	08:00			07:00		
Vol.	1	17	50	124	343	405	222	54	15	4	4			1182		
PM Peak	12:00	12:00	14:00	12:00	16:00	16:00	17:00	17:00	23:00	15:00	19:00	19:00	23:00	16:00		
Vol.	2	15	65	210	757	900	424	88	14	5	1	1	2	2336		

Pecent

15th Percentile : 30 MPH
50th Percentile : 36 MPH
85th Percentile : 42 MPH
95th Percentile : 45 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 14798
Percent in Pace : 65.1%
Number of Vehicles > 35 MPH : 11583
Percent of Vehicles > 35 MPH : 50.9%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	1	115	10	0	3	1	0	3	0	1	0	0	0	134
01:00	0	66	6	1	3	1	0	0	3	2	1	0	0	83
02:00	3	34	8	2	1	1	0	2	2	0	0	0	0	53
03:00	0	31	8	0	1	0	0	0	2	0	0	0	0	42
04:00	2	90	19	1	4	2	0	4	4	1	0	0	0	127
05:00	3	125	42	0	5	4	0	9	8	0	0	0	0	196
06:00	2	263	60	5	16	5	1	9	20	2	0	0	0	383
07:00	2	414	81	11	24	12	2	12	20	1	0	0	1	580
08:00	3	391	72	10	21	9	2	6	21	0	0	0	2	537
09:00	2	424	84	12	20	8	0	2	27	1	0	0	0	580
10:00	9	453	98	17	28	10	1	12	26	1	0	0	0	655
11:00	3	444	94	15	22	19	1	7	36	0	0	0	0	641
12 PM	4	568	101	15	27	8	2	7	18	2	0	0	2	754
13:00	7	575	89	24	33	13	1	19	22	0	0	1	0	784
14:00	4	639	116	20	41	16	1	12	15	2	0	0	1	867
15:00	2	771	180	12	50	14	1	14	15	1	1	0	0	1061
16:00	6	900	197	14	55	4	1	23	10	2	0	0	0	1212
17:00	4	880	143	9	30	3	0	11	11	0	0	0	1	1092
18:00	4	794	104	8	23	6	0	6	8	0	0	0	3	956
19:00	2	551	71	4	13	0	0	2	7	0	1	0	0	651
20:00	1	408	54	1	7	3	0	3	3	0	0	0	0	480
21:00	1	294	38	4	5	0	0	0	0	0	0	0	0	342
22:00	1	177	25	1	1	2	0	0	1	0	0	0	0	208
23:00	1	146	19	1	2	0	0	0	4	0	0	0	0	173
Total	67	9553	1719	187	435	141	13	163	283	16	3	1	10	12591
Percent	0.5%	75.9%	13.7%	1.5%	3.5%	1.1%	0.1%	1.3%	2.2%	0.1%	0.0%	0.0%	0.1%	
AM Peak	10:00	10:00	10:00	10:00	10:00	11:00	07:00	07:00	11:00	01:00	01:00		08:00	10:00
Vol.	9	453	98	17	28	19	2	12	36	2	1		2	655
PM Peak	13:00	16:00	16:00	13:00	16:00	14:00	12:00	16:00	13:00	12:00	15:00	13:00	18:00	16:00
Vol.	7	900	197	24	55	16	2	23	22	2	1	1	3	1212

PRECISION
D A T A
INDUSTRIES, LLC
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	110	17	3	1	1	0	2	0	0	0	0	0	134
01:00	0	57	9	0	1	0	0	1	1	0	1	0	0	70
02:00	0	41	10	1	1	1	0	0	1	0	0	0	0	55
03:00	1	30	9	0	4	1	0	1	2	0	0	0	0	48
04:00	2	77	21	1	5	1	0	0	3	0	0	0	0	110
05:00	2	122	30	4	7	1	0	5	8	1	0	0	0	180
06:00	3	227	64	6	21	8	1	9	19	1	0	0	0	359
07:00	5	400	68	17	26	9	0	21	29	0	0	0	0	575
08:00	2	418	76	15	27	12	0	8	23	0	0	0	0	581
09:00	1	411	72	13	23	5	0	4	36	2	0	0	1	568
10:00	3	429	93	6	19	10	0	10	33	1	0	0	0	604
11:00	4	489	101	21	25	11	1	15	22	2	0	2	0	693
12 PM	4	545	101	19	30	15	0	12	37	0	0	1	2	766
13:00	0	570	97	16	38	9	0	13	22	1	0	0	1	767
14:00	3	625	118	29	37	9	0	16	13	1	1	1	2	855
15:00	0	812	159	16	48	13	0	14	19	1	0	0	0	1082
16:00	2	964	197	10	50	6	1	14	8	0	0	0	0	1252
17:00	5	909	123	10	33	3	0	15	7	1	0	0	0	1106
18:00	0	752	100	11	20	1	0	6	5	0	0	0	0	895
19:00	1	550	83	4	10	3	0	2	2	0	0	0	1	656
20:00	2	416	34	0	6	1	0	3	4	0	0	0	0	466
21:00	0	285	28	1	2	0	0	1	4	0	0	0	0	321
22:00	0	199	25	1	3	1	0	1	2	0	0	0	0	232
23:00	1	166	23	2	2	0	0	0	2	3	0	0	0	199
Total	41	9604	1658	206	439	121	3	173	302	14	2	4	7	12574
Percent	0.3%	76.4%	13.2%	1.6%	3.5%	1.0%	0.0%	1.4%	2.4%	0.1%	0.0%	0.0%	0.1%	
AM Peak	07:00	11:00	11:00	11:00	08:00	08:00	06:00	07:00	09:00	09:00	01:00	11:00	09:00	11:00
Vol.	5	489	101	21	27	12	1	21	36	2	1	2	1	693
PM Peak	17:00	16:00	16:00	14:00	16:00	12:00	16:00	14:00	12:00	23:00	14:00	12:00	12:00	16:00
Vol.	5	964	197	29	50	15	1	16	37	3	1	1	2	1252

PRECISION
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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	60	13	0	1	0	0	0	0	0	0	0	0	74
01:00	0	23	2	0	3	0	0	0	0	0	0	0	0	28
02:00	0	40	3	0	0	0	0	0	0	0	0	0	0	43
03:00	0	14	2	0	1	0	0	0	1	0	0	0	0	18
04:00	1	37	16	0	2	1	0	1	0	0	0	0	0	58
05:00	1	125	40	3	11	0	0	3	0	0	0	0	0	183
06:00	1	232	79	4	16	5	0	5	6	0	0	0	0	348
07:00	0	457	91	4	19	3	1	3	2	0	0	0	0	580
08:00	2	425	74	2	17	2	1	1	9	0	0	0	0	533
09:00	2	273	90	7	14	3	1	2	7	0	0	0	0	399
10:00	2	300	85	3	28	6	1	7	7	0	0	0	0	439
11:00	2	370	86	8	20	5	0	3	5	0	0	0	0	499
12 PM	3	384	100	6	16	6	1	5	6	1	0	0	0	528
13:00	1	458	93	2	18	1	1	5	8	0	0	0	2	589
14:00	2	526	153	5	20	2	1	6	3	2	0	1	0	721
15:00	3	607	196	4	31	3	0	6	4	0	0	0	0	854
16:00	4	806	212	1	47	2	0	8	3	0	0	0	0	1083
17:00	6	806	136	3	20	1	0	6	0	0	0	0	0	978
18:00	4	641	107	1	13	1	0	4	2	0	0	0	0	773
19:00	3	392	82	2	3	1	0	1	1	0	0	0	0	485
20:00	2	294	42	1	8	0	0	1	3	0	0	0	0	351
21:00	1	227	32	3	6	0	0	0	1	0	0	0	0	270
22:00	1	150	24	1	4	0	0	1	2	0	0	0	0	183
23:00	0	97	9	0	0	0	0	0	2	0	0	0	0	108
Total	41	7744	1767	60	318	42	7	68	72	3	0	1	2	10125
Percent	0.4%	76.5%	17.5%	0.6%	3.1%	0.4%	0.1%	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	11:00	10:00	10:00	07:00	10:00	08:00					07:00
Vol.	2	457	91	8	28	6	1	7	9					580
PM Peak	17:00	16:00	16:00	12:00	16:00	12:00	12:00	16:00	13:00	14:00		14:00	13:00	16:00
Vol.	6	806	212	6	47	6	1	8	8	2		1	2	1083

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	62	11	0	0	1	0	0	0	0	0	0	0	74
01:00	1	29	3	0	2	0	0	0	0	0	0	0	0	35
02:00	1	23	5	0	1	1	0	0	0	0	0	0	0	31
03:00	1	20	2	0	1	0	0	0	0	0	0	0	0	24
04:00	0	38	13	0	1	0	0	0	1	0	0	0	0	53
05:00	0	112	52	2	10	1	0	1	1	0	0	0	0	179
06:00	0	255	87	4	18	3	0	4	3	0	0	0	0	374
07:00	2	485	90	1	18	3	0	3	5	0	0	0	0	607
08:00	1	398	74	7	20	2	0	6	8	0	0	0	0	516
09:00	1	296	86	5	17	0	0	5	8	0	0	0	0	418
10:00	0	297	83	5	11	4	0	5	6	0	0	0	0	411
11:00	1	331	98	9	14	6	0	6	4	0	0	0	0	469
12 PM	1	376	121	6	21	6	1	6	8	0	0	0	0	546
13:00	2	427	94	3	17	5	0	6	4	0	0	0	1	559
14:00	4	543	148	4	23	2	0	12	7	0	0	0	0	743
15:00	2	648	202	3	31	5	0	6	2	1	0	0	0	900
16:00	3	784	237	2	42	2	0	10	3	1	0	0	0	1084
17:00	2	763	137	0	31	1	0	4	0	0	0	0	0	938
18:00	0	624	120	0	9	1	0	5	2	0	0	0	0	761
19:00	1	400	70	2	8	0	0	1	0	0	0	0	0	482
20:00	0	295	68	0	4	0	0	0	3	0	0	0	0	370
21:00	0	243	32	1	5	0	0	0	0	0	0	0	0	281
22:00	1	149	23	1	1	0	0	0	1	0	0	0	0	176
23:00	0	126	11	0	0	0	0	0	0	0	0	0	0	137
Total	24	7724	1867	55	305	43	1	80	66	2	0	0	1	10168
Percent	0.2%	76.0%	18.4%	0.5%	3.0%	0.4%	0.0%	0.8%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	11:00	11:00	08:00	11:00		08:00	08:00					07:00
Vol.	2	485	98	9	20	6		6	8					607
PM Peak	14:00	16:00	16:00	12:00	16:00	12:00	12:00	14:00	12:00	15:00			13:00	16:00
Vol.	4	784	237	6	42	6	1	12	8	1			1	1084

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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB RL, EB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	1	175	23	0	4	1	0	3	0	1	0	0	0	208
01:00	0	89	8	1	6	1	0	0	3	2	1	0	0	111
02:00	3	74	11	2	1	1	0	2	2	0	0	0	0	96
03:00	0	45	10	0	2	0	0	0	3	0	0	0	0	60
04:00	3	127	35	1	6	3	0	5	4	1	0	0	0	185
05:00	4	250	82	3	16	4	0	12	8	0	0	0	0	379
06:00	3	495	139	9	32	10	1	14	26	2	0	0	0	731
07:00	2	871	172	15	43	15	3	15	22	1	0	0	1	1160
08:00	5	816	146	12	38	11	3	7	30	0	0	0	2	1070
09:00	4	697	174	19	34	11	1	4	34	1	0	0	0	979
10:00	11	753	183	20	56	16	2	19	33	1	0	0	0	1094
11:00	5	814	180	23	42	24	1	10	41	0	0	0	0	1140
12 PM	7	952	201	21	43	14	3	12	24	3	0	0	2	1282
13:00	8	1033	182	26	51	14	2	24	30	0	0	1	2	1373
14:00	6	1165	269	25	61	18	2	18	18	4	0	1	1	1588
15:00	5	1378	376	16	81	17	1	20	19	1	1	0	0	1915
16:00	10	1706	409	15	102	6	1	31	13	2	0	0	0	2295
17:00	10	1686	279	12	50	4	0	17	11	0	0	0	1	2070
18:00	8	1435	211	9	36	7	0	10	10	0	0	0	3	1729
19:00	5	943	153	6	16	1	0	3	8	0	1	0	0	1136
20:00	3	702	96	2	15	3	0	4	6	0	0	0	0	831
21:00	2	521	70	7	11	0	0	0	1	0	0	0	0	612
22:00	2	327	49	2	5	2	0	1	3	0	0	0	0	391
23:00	1	243	28	1	2	0	0	0	6	0	0	0	0	281
Total	108	17297	3486	247	753	183	20	231	355	19	3	2	12	22716
Percent	0.5%	76.1%	15.3%	1.1%	3.3%	0.8%	0.1%	1.0%	1.6%	0.1%	0.0%	0.0%	0.1%	
AM Peak	10:00	07:00	10:00	11:00	10:00	11:00	07:00	10:00	11:00	01:00	01:00		08:00	07:00
Vol.	11	871	183	23	56	24	3	19	41	2	1		2	1160
PM Peak	16:00	16:00	16:00	13:00	16:00	14:00	12:00	16:00	13:00	14:00	15:00	13:00	18:00	16:00
Vol.	10	1706	409	26	102	18	3	31	30	4	1	1	3	2295

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Route 140 EB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-A class
Site Code: 10111.31

EB RL, EB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	172	28	3	1	2	0	2	0	0	0	0	0	208
01:00	1	86	12	0	3	0	0	1	1	0	1	0	0	105
02:00	1	64	15	1	2	2	0	0	1	0	0	0	0	86
03:00	2	50	11	0	5	1	0	1	2	0	0	0	0	72
04:00	2	115	34	1	6	1	0	0	4	0	0	0	0	163
05:00	2	234	82	6	17	2	0	6	9	1	0	0	0	359
06:00	3	482	151	10	39	11	1	13	22	1	0	0	0	733
07:00	7	885	158	18	44	12	0	24	34	0	0	0	0	1182
08:00	3	816	150	22	47	14	0	14	31	0	0	0	0	1097
09:00	2	707	158	18	40	5	0	9	44	2	0	0	1	986
10:00	3	726	176	11	30	14	0	15	39	1	0	0	0	1015
11:00	5	820	199	30	39	17	1	21	26	2	0	2	0	1162
12 PM	5	921	222	25	51	21	1	18	45	0	0	1	2	1312
13:00	2	997	191	19	55	14	0	19	26	1	0	0	2	1326
14:00	7	1168	266	33	60	11	0	28	20	1	1	1	2	1598
15:00	2	1460	361	19	79	18	0	20	21	2	0	0	0	1982
16:00	5	1748	434	12	92	8	1	24	11	1	0	0	0	2336
17:00	7	1672	260	10	64	4	0	19	7	1	0	0	0	2044
18:00	0	1376	220	11	29	2	0	11	7	0	0	0	0	1656
19:00	2	950	153	6	18	3	0	3	2	0	0	0	1	1138
20:00	2	711	102	0	10	1	0	3	7	0	0	0	0	836
21:00	0	528	60	2	7	0	0	1	4	0	0	0	0	602
22:00	1	348	48	2	4	1	0	1	3	0	0	0	0	408
23:00	1	292	34	2	2	0	0	0	2	3	0	0	0	336
Total	65	17328	3525	261	744	164	4	253	368	16	2	4	8	22742
Percent	0.3%	76.2%	15.5%	1.1%	3.3%	0.7%	0.0%	1.1%	1.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	11:00	11:00	08:00	11:00	06:00	07:00	09:00	09:00	01:00	11:00	09:00	07:00
Vol.	7	885	199	30	47	17	1	24	44	2	1	2	1	1182
PM Peak	14:00	16:00	16:00	14:00	16:00	12:00	12:00	14:00	12:00	23:00	14:00	12:00	12:00	16:00
Vol.	7	1748	434	33	92	21	1	28	45	3	1	1	2	2336

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION
D A T A
INDUSTRIES, LLC
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81676 G-B volume
Site Code: 10111.31

Start	WB LL				WB RL				Combined				15-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	4		60		14		94		18		154		
12:15	5		73		11		120		16		193		
12:30	2		79		10		101		12		180		
12:45	6	17	81	293	6	41	112	427	12	58	193	720	
01:00	8		69		8		106		16		175		
01:15	4		77		6		110		10		187		
01:30	2		84		1		114		3		198		
01:45	3	17	68	298	5	20	119	449	8	37	187	747	
02:00	0		85		6		130		6		215		
02:15	2		103		4		112		6		215		
02:30	0		89		10		141		10		230		
02:45	3	5	91	368	8	28	120	503	11	33	211	871	
03:00	2		83		9		114		11		197		
03:15	2		98		11		128		13		226		
03:30	5		103		4		121		9		224		
03:45	1	10	97	381	12	36	126	489	13	46	223	870	
04:00	5		128		2		132		7		260		
04:15	1		101		12		138		13		239		
04:30	6		112		12		134		18		246		
04:45	14	26	104	445	23	49	144	548	37	75	248	993	
05:00	19		110		19		121		38		231		
05:15	32		106		34		126		66		232		
05:30	44		104		35		142		79		246		
05:45	54	149	102	422	49	137	110	499	103	286	212	921	
06:00	47		99		44		120		91		219		
06:15	48		97		58		117		106		214		
06:30	66		87		96		107		162		194		
06:45	93	254	76	359	80	278	105	449	173	532	181	808	
07:00	86		55		83		97		169		152		
07:15	98		70		128		92		226		162		
07:30	108		60		106		93		214		153		
07:45	106	398	56	241	118	435	74	356	224	833	130	597	
08:00	83		47		104		70		187		117		
08:15	89		54		117		56		206		110		
08:30	73		39		99		61		172		100		
08:45	96	341	45	185	122	442	58	245	218	783	103	430	
09:00	74		47		106		51		180		98		
09:15	70		44		87		65		157		109		
09:30	60		35		98		56		158		91		
09:45	50	254	43	169	102	393	45	217	152	647	88	386	
10:00	52		42		94		53		146		95		
10:15	65		20		93		31		158		51		
10:30	59		24		81		40		140		64		
10:45	60	236	22	108	104	372	30	154	164	608	52	262	
11:00	67		8		92		22		159		30		
11:15	51		7		100		26		151		33		
11:30	58		5		100		20		158		25		
11:45	60	236	5	25	92	384	14	82	152	620	19	107	
Total	1943		3294		2615		4418		4558		7712		
Percent	42.6%		42.7%		57.4%		57.3%						
Day Total		5237				7033				12270			
Peak	07:00		04:00		07:15		04:00		07:15		04:00		
Vol.	398		445		456		548		851		993		
P.H.F.	0.921		0.869		0.891		0.951		0.941		0.955		

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION
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81676 G-B volume
Site Code: 10111.31

Start	WB LL				WB RL				Combined				16-Oct-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	7		85		13		110		20		195		
12:15	6		70		17		109		23		179		
12:30	1		61		15		110		16		171		
12:45	1	15	62	278	5	50	122	451	6	65	184	729	
01:00	4		74		3		110		7		184		
01:15	1		79		7		121		8		200		
01:30	1		84		7		115		8		199		
01:45	0	6	96	333	4	21	100	446	4	27	196	779	
02:00	3		75		9		123		12		198		
02:15	2		84		5		126		7		210		
02:30	0		92		3		125		3		217		
02:45	1	6	85	336	5	22	109	483	6	28	194	819	
03:00	2		97		5		137		7		234		
03:15	3		88		9		112		12		200		
03:30	5		102		10		134		15		236		
03:45	4	14	108	395	12	36	139	522	16	50	247	917	
04:00	1		103		11		144		12		247		
04:15	7		122		6		118		13		240		
04:30	5		132		16		135		21		267		
04:45	11	24	110	467	22	55	149	546	33	79	259	1013	
05:00	14		109		15		136		29		245		
05:15	27		134		33		152		60		286		
05:30	40		114		34		119		74		233		
05:45	56	137	102	459	52	134	142	549	108	271	244	1008	
06:00	36		93		41		119		77		212		
06:15	46		97		64		117		110		214		
06:30	67		100		73		122		140		222		
06:45	85	234	87	377	100	278	106	464	185	512	193	841	
07:00	70		66		95		124		165		190		
07:15	99		54		131		81		230		135		
07:30	102		60		124		84		226		144		
07:45	109	380	55	235	133	483	69	358	242	863	124	593	
08:00	84		47		121		57		205		104		
08:15	79		50		116		69		195		119		
08:30	101		48		119		64		220		112		
08:45	68	332	35	180	108	464	55	245	176	796	90	425	
09:00	72		40		86		58		158		98		
09:15	75		40		100		47		175		87		
09:30	64		40		100		62		164		102		
09:45	56	267	51	171	94	380	61	228	150	647	112	399	
10:00	49		42		91		48		140		90		
10:15	63		31		78		37		141		68		
10:30	55		18		76		37		131		55		
10:45	59	226	11	102	95	340	29	151	154	566	40	253	
11:00	47		12		96		25		143		37		
11:15	57		14		102		27		159		41		
11:30	53		5		95		28		148		33		
11:45	69	226	9	40	108	401	15	95	177	627	24	135	
Total	1867		3373		2664		4538		4531		7911		
Percent	41.2%		42.6%		58.8%		57.4%						
Day Total			5240				7202				12442		
Peak	07:15		04:30		07:15		04:30		07:15		04:30		
Vol.	394		485		509		572		903		1057		
P.H.F.	0.904		0.905		0.957		0.941		0.933		0.924		

PRECISION
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	0	1	2	6	4	2	1	1	0	0	17	50	45
01:00	0	0	0	0	3	2	6	5	1	0	0	0	0	17	47	41
02:00	0	0	0	0	0	1	4	0	0	0	0	0	0	5	42	41
03:00	0	0	0	0	0	3	0	5	1	1	0	0	0	10	49	45
04:00	0	0	0	0	0	4	9	6	3	2	2	0	0	26	52	46
05:00	0	0	0	6	22	29	46	29	13	4	0	0	0	149	48	41
06:00	0	0	2	**20**	34	66	66	45	12	**7**	2	0	0	254	48	40
07:00	0	0	0	7	**79**	**118**	**104**	56	**30**	4	0	0	0	**398**	47	40
08:00	0	**2**	**3**	18	44	95	96	**61**	15	7	0	0	0	341	47	40
09:00	0	0	0	4	43	65	63	48	22	6	**3**	0	0	254	49	41
10:00	0	0	3	7	34	71	61	36	20	4	0	0	0	236	48	40
11:00	0	0	1	6	34	70	69	39	11	6	0	0	0	236	47	40
12 PM	0	0	1	12	39	95	74	49	17	6	0	0	0	293	47	40
13:00	0	0	5	25	52	99	57	35	**20**	5	0	0	0	298	47	39
14:00	0	0	3	26	69	129	78	42	17	3	1	0	0	368	45	38
15:00	0	0	2	21	77	122	**95**	47	13	3	0	0	0	380	45	39
16:00	0	0	4	**42**	**118**	**144**	77	39	15	5	**2**	0	0	**446**	44	37
17:00	0	0	3	15	98	134	94	**50**	19	**7**	2	0	0	422	46	39
18:00	0	0	**7**	39	97	92	67	33	19	4	1	0	0	359	45	37
19:00	0	0	0	4	35	89	71	33	8	1	0	0	0	241	45	39
20:00	0	0	0	3	16	57	48	45	14	2	0	0	0	185	48	41
21:00	0	0	0	0	15	53	60	28	13	0	0	0	0	169	47	41
22:00	0	0	0	0	6	30	33	27	9	3	0	0	0	108	49	42
23:00	0	0	0	0	1	12	5	2	4	1	0	0	0	25	50	42
Total	0	2	34	255	917	1582	1289	764	298	82	14	0	0	5237		
%	0.0%	0.0%	0.6%	4.9%	17.5%	30.2%	24.6%	14.6%	5.7%	1.6%	0.3%	0.0%	0.0%			
AM Peak		08:00	08:00	06:00	07:00	07:00	07:00	08:00	07:00	06:00	09:00			07:00		
Vol.		2	3	20	79	118	104	61	30	7	3			398		
PM Peak			18:00	16:00	16:00	16:00	15:00	17:00	13:00	17:00	16:00			16:00		
Vol.			7	42	118	144	95	50	20	7	2			446		

Pecent

15th Percentile :	32 MPH
50th Percentile :	39 MPH
85th Percentile :	47 MPH
95th Percentile :	52 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	2871
Percent in Pace :	54.8%
Number of Vehicles > 35 MPH :	3712
Percent of Vehicles > 35 MPH :	70.9%
Mean Speed(Average) :	39 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB LL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	5	1	2	4	2	1	0	0	0	15	50	42
01:00	0	0	0	0	0	1	2	3	0	0	0	0	0	6	46	44
02:00	0	0	0	0	0	3	0	1	2	0	0	0	0	6	50	43
03:00	0	0	0	0	1	4	4	2	1	1	1	0	0	14	54	44
04:00	0	0	1	1	3	2	7	7	1	2	0	0	0	24	48	42
05:00	0	0	0	7	17	27	42	28	13	2	1	0	0	137	48	41
06:00	0	0	1	14	34	63	69	39	10	3	1	0	0	234	47	40
07:00	0	**5**	**8**	**20**	**73**	**116**	79	48	24	5	**2**	0	0	**380**	47	39
08:00	0	0	3	13	41	99	**87**	**65**	16	**8**	0	0	0	332	47	40
09:00	0	1	2	9	36	92	56	34	**27**	7	1	**1**	**1**	267	49	40
10:00	0	0	1	12	21	67	63	34	22	6	0	0	0	226	48	41
11:00	0	0	1	7	24	64	68	41	17	4	0	0	0	226	48	41
12 PM	0	0	3	16	42	89	71	26	19	**11**	0	**1**	0	278	47	40
13:00	0	0	6	16	55	79	83	**60**	**28**	5	0	1	0	333	48	40
14:00	0	0	0	14	62	116	76	44	16	6	**1**	0	**1**	336	46	39
15:00	0	0	4	17	86	140	98	34	14	2	0	0	0	395	44	38
16:00	0	2	6	**43**	**143**	138	86	39	6	4	0	0	0	**467**	43	36
17:00	**1**	**3**	**11**	27	107	**154**	**101**	33	19	3	0	0	0	459	44	37
18:00	0	0	1	19	73	121	99	40	24	0	0	0	0	377	45	39
19:00	0	0	0	8	41	65	63	42	10	6	0	0	0	235	47	40
20:00	0	0	0	2	25	51	52	41	9	0	0	0	0	180	47	41
21:00	0	0	0	1	17	50	51	36	12	4	0	0	0	171	48	42
22:00	0	0	0	0	13	27	32	24	5	1	0	0	0	102	47	41
23:00	0	0	0	1	2	13	12	6	2	4	0	0	0	40	49	42
Total	1	11	48	247	921	1582	1303	731	299	85	7	3	2	5240		
%	0.0%	0.2%	0.9%	4.7%	17.6%	30.2%	24.9%	14.0%	5.7%	1.6%	0.1%	0.1%	0.0%			
AM Peak		07:00	07:00	07:00	07:00	07:00	08:00	08:00	09:00	08:00	07:00	09:00	09:00	07:00		
Vol.		5	8	20	73	116	87	65	27	8	2	1	1	380		
PM Peak	17:00	17:00	17:00	16:00	16:00	17:00	17:00	13:00	13:00	12:00	14:00	12:00	14:00	16:00		
Vol.	1	3	11	43	143	154	101	60	28	11	1	1	1	467		

Pecent

15th Percentile :	32 MPH
50th Percentile :	39 MPH
85th Percentile :	47 MPH
95th Percentile :	52 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	2885
Percent in Pace :	55.1%
Number of Vehicles > 35 MPH :	3695
Percent of Vehicles > 35 MPH :	70.5%
Mean Speed(Average) :	39 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	0	2	17	15	3	3	1	0	0	0	41	47	41
01:00	0	0	0	0	0	2	9	6	1	2	0	0	0	20	49	45
02:00	0	0	0	2	4	7	5	4	5	1	0	0	0	28	51	41
03:00	0	0	0	3	4	11	5	7	4	1	0	0	**1**	36	50	41
04:00	0	0	0	3	9	14	11	6	5	1	0	0	0	49	48	40
05:00	0	0	0	14	37	36	24	17	4	4	1	0	0	137	46	38
06:00	0	0	9	23	61	95	53	22	8	4	**2**	**1**	0	278	44	37
07:00	0	**4**	4	33	103	**152**	**97**	25	**15**	1	1	0	0	435	43	37
08:00	0	3	**12**	**45**	**108**	147	89	22	12	3	0	1	0	**442**	43	36
09:00	0	0	2	26	76	145	81	**39**	14	**8**	1	0	1	393	45	38
10:00	0	2	11	26	96	124	85	18	7	3	0	0	0	372	43	37
11:00	0	0	6	24	85	132	88	32	15	1	1	0	0	384	44	38
12 PM	0	0	6	32	110	144	81	37	13	**3**	1	0	0	427	44	37
13:00	0	6	10	33	95	146	**103**	38	13	2	**3**	0	0	449	44	37
14:00	3	6	8	38	147	**160**	98	27	**14**	2	0	0	0	503	43	36
15:00	0	4	13	50	138	151	91	25	14	1	2	0	0	489	43	36
16:00	**6**	**12**	**22**	**65**	**156**	147	84	39	13	3	1	0	0	**548**	43	35
17:00	0	5	12	63	141	156	81	28	10	3	0	0	0	499	42	36
18:00	1	4	15	60	138	114	66	37	10	2	2	0	0	449	43	35
19:00	0	1	6	24	77	131	59	**46**	8	2	2	0	0	356	45	38
20:00	0	0	0	8	46	83	56	38	11	3	0	0	0	245	46	39
21:00	0	0	2	11	49	66	56	16	14	3	0	0	0	217	44	38
22:00	0	0	1	9	25	44	42	18	14	1	0	0	0	154	47	39
23:00	0	0	0	5	13	21	25	13	1	2	2	0	0	82	46	40
Total	10	47	139	597	1720	2245	1404	563	228	57	19	2	2	7033		
%	0.1%	0.7%	2.0%	8.5%	24.5%	31.9%	20.0%	8.0%	3.2%	0.8%	0.3%	0.0%	0.0%			
AM Peak		07:00	08:00	08:00	08:00	07:00	07:00	09:00	07:00	09:00	06:00	06:00	03:00	08:00		
Vol.		4	12	45	108	152	97	39	15	8	2	1	1	442		
PM Peak	16:00	16:00	16:00	16:00	16:00	14:00	13:00	19:00	14:00	12:00	13:00			16:00		
Vol.	6	12	22	65	156	160	103	46	14	3	3			548		

Pecent

15th Percentile :	30 MPH
50th Percentile :	37 MPH
85th Percentile :	44 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	3965
Percent in Pace :	56.4%
Number of Vehicles > 35 MPH :	4071
Percent of Vehicles > 35 MPH :	57.9%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	3	2	7	14	11	5	5	3	0	0	0	50	49	40
01:00	0	0	1	0	3	8	5	2	1	0	**1**	0	0	21	45	39
02:00	0	0	1	0	7	4	3	3	3	1	0	0	0	22	50	39
03:00	0	0	0	1	10	9	6	4	1	3	1	**1**	0	36	54	41
04:00	0	0	0	1	7	20	15	6	6	0	0	0	0	55	48	40
05:00	0	0	1	8	36	38	28	11	8	4	0	0	0	134	45	38
06:00	0	0	5	20	77	96	51	22	6	1	0	0	0	278	43	37
07:00	0	0	**14**	**51**	**140**	159	75	23	**15**	**5**	1	0	0	**483**	43	36
08:00	0	**4**	7	41	105	**166**	**90**	34	13	4	0	0	0	464	43	37
09:00	0	3	3	29	94	128	85	27	9	1	1	0	0	380	43	37
10:00	0	0	1	16	74	134	69	**39**	6	1	0	0	0	340	44	38
11:00	0	2	8	37	95	143	75	29	9	3	0	0	0	401	43	37
12 PM	0	0	4	33	123	159	73	45	13	0	1	0	0	451	44	37
13:00	2	2	14	34	95	**168**	81	37	10	3	0	0	0	446	43	37
14:00	0	1	11	54	139	156	76	35	8	3	0	0	0	483	43	36
15:00	0	1	**24**	54	157	167	86	29	3	1	0	0	0	522	42	35
16:00	1	**6**	10	**85**	**195**	135	63	38	12	1	0	0	0	546	42	35
17:00	**4**	4	9	68	170	154	**88**	38	10	2	**2**	0	0	**549**	43	36
18:00	0	0	10	60	135	129	72	**48**	8	1	1	0	0	464	44	36
19:00	0	0	1	20	96	111	79	37	**14**	0	0	0	0	358	44	38
20:00	0	0	0	6	46	91	56	35	10	1	0	0	0	245	46	39
21:00	0	0	1	9	39	79	52	30	14	**4**	0	0	0	228	47	39
22:00	0	0	0	6	32	47	41	17	5	3	0	0	0	151	45	39
23:00	0	0	1	3	19	27	25	11	4	4	1	0	0	95	47	40
Total	7	23	129	638	1901	2342	1305	605	193	49	9	1	0	7202		
%	0.1%	0.3%	1.8%	8.9%	26.4%	32.5%	18.1%	8.4%	2.7%	0.7%	0.1%	0.0%	0.0%			
AM Peak		08:00	07:00	07:00	07:00	08:00	08:00	10:00	07:00	07:00	01:00	03:00		07:00		
Vol.		4	14	51	140	166	90	39	15	5	1	1		483		
PM Peak	17:00	16:00	15:00	16:00	16:00	13:00	17:00	18:00	19:00	21:00	17:00			17:00		
Vol.	4	6	24	85	195	168	88	48	14	4	2			549		

Pecent

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	44 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4243
Percent in Pace :	58.9%
Number of Vehicles > 35 MPH :	4035
Percent of Vehicles > 35 MPH :	56.0%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB LL, WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	0	3	19	21	7	5	2	1	0	0	58	48	42
01:00	0	0	0	0	3	4	15	11	2	2	0	0	0	37	48	44
02:00	0	0	0	2	4	8	9	4	5	1	0	0	0	33	50	41
03:00	0	0	0	3	4	14	5	12	5	2	0	0	**1**	46	50	42
04:00	0	0	0	3	9	18	20	12	8	3	2	0	0	75	50	42
05:00	0	0	0	20	59	65	70	46	17	8	1	0	0	286	48	40
06:00	0	0	11	43	95	161	119	67	20	11	**4**	**1**	0	532	46	39
07:00	0	4	4	40	**182**	**270**	**201**	81	**45**	5	1	0	0	**833**	45	38
08:00	0	**5**	**15**	**63**	152	242	185	83	27	10	0	1	0	783	45	38
09:00	0	0	2	30	119	210	144	**87**	36	**14**	4	0	1	647	47	39
10:00	0	2	14	33	130	195	146	54	27	7	0	0	0	608	44	38
11:00	0	0	7	30	119	202	157	71	26	7	1	0	0	620	45	39
12 PM	0	0	7	44	149	239	155	**86**	30	9	1	0	0	720	45	38
13:00	0	6	15	58	147	245	160	73	**33**	7	**3**	0	0	747	45	38
14:00	3	6	11	64	216	289	176	69	31	5	1	0	0	871	44	37
15:00	0	4	15	71	215	273	**186**	72	27	4	2	0	0	869	44	37
16:00	**6**	**12**	**26**	**107**	**274**	**291**	161	78	28	8	3	0	0	**994**	43	36
17:00	0	5	15	78	239	290	175	78	29	**10**	2	0	0	921	44	37
18:00	1	4	22	99	235	206	133	70	29	6	3	0	0	808	44	36
19:00	0	1	6	28	112	220	130	79	16	3	2	0	0	597	45	38
20:00	0	0	0	11	62	140	104	83	25	5	0	0	0	430	47	40
21:00	0	0	2	11	64	119	116	44	27	3	0	0	0	386	46	40
22:00	0	0	1	9	31	74	75	45	23	4	0	0	0	262	48	41
23:00	0	0	0	5	14	33	30	15	5	3	2	0	0	107	47	40
Total	10	49	173	852	2637	3827	2693	1327	526	139	33	2	2	12270		
%	0.1%	0.4%	1.4%	6.9%	21.5%	31.2%	21.9%	10.8%	4.3%	1.1%	0.3%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	07:00	07:00	07:00	09:00	07:00	09:00	06:00	06:00	03:00	07:00		
Vol.		5	15	63	182	270	201	87	45	14	4	1	1	833		
PM Peak	16:00	16:00	16:00	16:00	16:00	16:00	15:00	12:00	13:00	17:00	13:00			16:00		
Vol.	6	12	26	107	274	291	186	86	33	10	3			994		

Pecent

15th Percentile :	31 MPH
50th Percentile :	38 MPH
85th Percentile :	45 MPH
95th Percentile :	50 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	6520
Percent in Pace :	53.1%
Number of Vehicles > 35 MPH :	7783
Percent of Vehicles > 35 MPH :	63.4%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B speed
Site Code: 10111.31

WB LL, WB RL

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	3	2	12	15	13	9	7	4	0	0	0	65	50	40
01:00	0	0	1	0	3	9	7	5	1	0	1	0	0	27	47	40
02:00	0	0	1	0	7	7	3	4	5	1	0	0	0	28	51	41
03:00	0	0	0	1	11	13	10	6	2	4	2	**1**	0	50	53	42
04:00	0	0	1	2	10	22	22	13	7	2	0	0	0	79	48	41
05:00	0	0	1	15	53	65	70	39	21	6	1	0	0	271	48	40
06:00	0	0	6	34	111	159	120	61	16	4	1	0	0	512	45	38
07:00	0	**5**	**22**	**71**	**213**	**275**	154	71	**39**	10	**3**	0	0	**863**	44	37
08:00	0	4	10	54	146	265	**177**	**99**	29	**12**	0	0	0	796	46	38
09:00	0	4	5	38	130	220	141	61	36	8	2	1	**1**	647	45	38
10:00	0	0	2	28	95	201	132	73	28	7	0	0	0	566	46	39
11:00	0	2	9	44	119	207	143	70	26	7	0	0	0	627	45	38
12 PM	0	0	7	49	165	248	144	71	32	**11**	1	**1**	0	729	45	38
13:00	2	2	20	50	150	247	164	**97**	**38**	8	0	1	0	779	46	38
14:00	0	1	11	68	201	272	152	79	24	9	1	0	**1**	819	44	37
15:00	0	1	**28**	71	243	307	184	63	17	3	0	0	0	917	43	36
16:00	1	**8**	16	**128**	**338**	273	149	77	18	5	0	0	0	**1013**	43	36
17:00	**5**	7	20	95	277	**308**	**189**	71	29	5	**2**	0	0	1008	43	36
18:00	0	0	11	79	208	250	171	88	32	1	1	0	0	841	44	37
19:00	0	0	1	28	137	176	142	79	24	6	0	0	0	593	46	39
20:00	0	0	0	8	71	142	108	76	19	1	0	0	0	425	47	40
21:00	0	0	1	10	56	129	103	66	26	8	0	0	0	399	47	40
22:00	0	0	0	6	45	74	73	41	10	4	0	0	0	253	46	40
23:00	0	0	1	4	21	40	37	17	6	8	1	0	0	135	48	40
Total	8	34	177	885	2822	3924	2608	1336	492	134	16	4	2	12442		
%	0.1%	0.3%	1.4%	7.1%	22.7%	31.5%	21.0%	10.7%	4.0%	1.1%	0.1%	0.0%	0.0%			
AM Peak		07:00	07:00	07:00	07:00	07:00	08:00	08:00	07:00	08:00	07:00	03:00	09:00	07:00		
Vol.		5	22	71	213	275	177	99	39	12	3	1	1	863		
PM Peak	17:00	16:00	15:00	16:00	16:00	17:00	17:00	13:00	13:00	12:00	17:00	12:00	14:00	16:00		
Vol.	5	8	28	128	338	308	189	97	38	11	2	1	1	1013		

Pecent

15th Percentile : 31 MPH
50th Percentile : 37 MPH
85th Percentile : 45 MPH
95th Percentile : 50 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 6746
Percent in Pace : 54.2%
Number of Vehicles > 35 MPH : 7731
Percent of Vehicles > 35 MPH : 62.1%
Mean Speed(Average) : 38 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	14	3	0	0	0	0	0	0	0	0	0	0	17
01:00	0	13	2	0	1	0	0	0	1	0	0	0	0	17
02:00	0	1	2	0	1	0	0	1	0	0	0	0	0	5
03:00	0	8	1	0	1	0	0	0	0	0	0	0	0	10
04:00	0	19	6	0	1	0	0	0	0	0	0	0	0	26
05:00	2	81	52	1	9	0	0	2	2	0	0	0	0	149
06:00	1	163	60	4	20	0	0	3	3	0	0	0	0	254
07:00	0	310	62	1	17	2	0	4	2	0	0	0	0	398
08:00	0	250	57	5	22	1	0	1	5	0	0	0	0	341
09:00	1	162	67	3	11	4	0	1	5	0	0	0	0	254
10:00	0	172	37	6	12	1	0	3	5	0	0	0	0	236
11:00	1	171	46	3	11	0	1	0	3	0	0	0	0	236
12 PM	3	220	54	2	5	1	1	3	4	0	0	0	0	293
13:00	1	223	54	1	11	1	0	2	5	0	0	0	0	298
14:00	0	278	73	3	4	1	1	4	3	0	0	1	0	368
15:00	4	292	69	0	12	0	0	1	2	0	0	0	0	380
16:00	1	318	98	2	18	2	0	5	2	0	0	0	0	446
17:00	1	329	80	2	8	0	0	1	1	0	0	0	0	422
18:00	4	279	62	0	13	0	0	1	0	0	0	0	0	359
19:00	2	196	37	1	5	0	0	0	0	0	0	0	0	241
20:00	1	159	21	0	2	0	0	2	0	0	0	0	0	185
21:00	1	145	21	0	2	0	0	0	0	0	0	0	0	169
22:00	0	95	10	0	2	0	0	1	0	0	0	0	0	108
23:00	0	23	2	0	0	0	0	0	0	0	0	0	0	25
Total	23	3921	976	34	188	13	3	35	43	0	0	1	0	5237
Percent	0.4%	74.9%	18.6%	0.6%	3.6%	0.2%	0.1%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	09:00	10:00	08:00	09:00	11:00	07:00	08:00					07:00
Vol.	2	310	67	6	22	4	1	4	5					398
PM Peak	15:00	17:00	16:00	14:00	16:00	16:00	12:00	16:00	13:00			14:00		16:00
Vol.	4	329	98	3	18	2	1	5	5			1		446

PRECISION
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB LL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	0	12	2	0	1	0	0	0	0	0	0	0	0	15
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	4	1	0	0	0	0	0	1	0	0	0	0	6
03:00	0	11	1	0	2	0	0	0	0	0	0	0	0	14
04:00	0	13	9	0	0	1	0	1	0	0	0	0	0	24
05:00	0	80	43	2	9	1	0	2	0	0	0	0	0	137
06:00	0	149	60	2	16	3	0	1	3	0	0	0	0	234
07:00	2	276	67	2	21	2	0	2	7	1	0	0	0	380
08:00	2	248	63	2	10	1	0	2	4	0	0	0	0	332
09:00	1	190	56	4	13	0	0	0	3	0	0	0	0	267
10:00	0	172	32	2	6	2	0	2	9	0	0	0	1	226
11:00	0	149	55	3	8	1	0	5	5	0	0	0	0	226
12 PM	1	193	58	3	11	0	1	6	5	0	0	0	0	278
13:00	0	239	71	4	8	2	0	4	4	1	0	0	0	333
14:00	1	253	65	4	8	1	0	2	2	0	0	0	0	336
15:00	0	288	83	0	13	1	0	8	1	0	1	0	0	395
16:00	0	322	111	4	23	2	0	4	1	0	0	0	0	467
17:00	3	367	73	0	13	2	0	1	0	0	0	0	0	459
18:00	1	292	72	0	11	0	0	0	1	0	0	0	0	377
19:00	0	197	33	1	4	0	0	0	0	0	0	0	0	235
20:00	1	153	22	0	4	0	0	0	0	0	0	0	0	180
21:00	0	144	24	0	3	0	0	0	0	0	0	0	0	171
22:00	0	94	7	0	0	0	0	1	0	0	0	0	0	102
23:00	0	32	7	0	1	0	0	0	0	0	0	0	0	40
Total	12	3883	1016	33	185	19	1	41	46	2	1	0	1	5240
Percent	0.2%	74.1%	19.4%	0.6%	3.5%	0.4%	0.0%	0.8%	0.9%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	09:00	07:00	06:00		11:00	10:00	07:00			10:00	07:00
Vol.	2	276	67	4	21	3		5	9	1			1	380
PM Peak	17:00	17:00	16:00	13:00	16:00	13:00	12:00	15:00	12:00	13:00	15:00			16:00
Vol.	3	367	111	4	23	2	1	8	5	1	1			467

PRECISION
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	32	8	0	1	0	0	0	0	0	0	0	0	41
01:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
02:00	1	21	4	0	0	0	0	1	1	0	0	0	0	28
03:00	0	25	9	0	2	0	0	0	0	0	0	0	0	36
04:00	1	34	8	0	3	1	0	1	1	0	0	0	0	49
05:00	0	72	46	1	10	3	0	3	2	0	0	0	0	137
06:00	2	189	63	2	11	8	0	2	1	0	0	0	0	278
07:00	4	326	74	1	17	4	0	1	8	0	0	0	0	435
08:00	0	323	86	3	14	3	1	3	9	0	0	0	0	442
09:00	2	252	104	4	18	3	1	6	3	0	0	0	0	393
10:00	0	256	91	5	8	3	1	2	6	0	0	0	0	372
11:00	2	279	73	4	13	4	2	3	4	0	0	0	0	384
12 PM	1	298	89	3	21	3	1	2	9	0	0	0	0	427
13:00	2	333	77	2	18	5	2	6	4	0	0	0	0	449
14:00	1	358	102	4	21	7	0	7	3	0	0	0	0	503
15:00	1	360	96	3	18	2	1	4	4	0	0	0	0	489
16:00	2	411	103	7	17	1	0	5	2	0	0	0	0	548
17:00	3	385	96	4	9	1	0	1	0	0	0	0	0	499
18:00	2	361	68	3	13	0	0	1	1	0	0	0	0	449
19:00	1	299	51	1	4	0	0	0	0	0	0	0	0	356
20:00	0	210	32	0	3	0	0	0	0	0	0	0	0	245
21:00	0	181	32	0	3	0	0	1	0	0	0	0	0	217
22:00	0	130	23	0	1	0	0	0	0	0	0	0	0	154
23:00	0	66	15	0	1	0	0	0	0	0	0	0	0	82
Total	25	5218	1353	47	226	48	9	49	58	0	0	0	0	7033
Percent	0.4%	74.2%	19.2%	0.7%	3.2%	0.7%	0.1%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	10:00	09:00	06:00	11:00	09:00	08:00					08:00
Vol.	4	326	104	5	18	8	2	6	9					442
PM Peak	17:00	16:00	16:00	16:00	12:00	14:00	13:00	14:00	12:00					16:00
Vol.	3	411	103	7	21	7	2	7	9					548

PRECISION
D A T A
INDUSTRIES, LLC
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	36	10	0	2	1	0	0	0	0	0	0	0	50
01:00	0	11	8	1	1	0	0	0	0	0	0	0	0	21
02:00	0	16	5	0	1	0	0	0	0	0	0	0	0	22
03:00	0	24	6	0	4	2	0	0	0	0	0	0	0	36
04:00	0	44	6	0	4	1	0	0	0	0	0	0	0	55
05:00	0	77	41	0	11	2	0	2	1	0	0	0	0	134
06:00	1	194	60	1	11	6	0	2	3	0	0	0	0	278
07:00	1	357	89	2	19	5	0	4	5	1	0	0	0	483
08:00	1	332	94	3	12	6	1	4	11	0	0	0	0	464
09:00	2	246	100	5	18	1	1	1	6	0	0	0	0	380
10:00	0	244	77	0	8	3	0	3	5	0	0	0	0	340
11:00	0	278	90	4	10	3	1	2	13	0	0	0	0	401
12 PM	0	342	71	4	16	4	1	7	6	0	0	0	0	451
13:00	1	331	82	0	17	5	1	4	5	0	0	0	0	446
14:00	0	361	93	1	17	2	1	4	4	0	0	0	0	483
15:00	0	404	92	5	16	0	0	2	3	0	0	0	0	522
16:00	1	427	94	3	13	0	0	3	5	0	0	0	0	546
17:00	1	437	97	3	8	1	0	1	1	0	0	0	0	549
18:00	0	370	76	1	15	0	0	0	2	0	0	0	0	464
19:00	0	286	61	2	7	0	0	0	2	0	0	0	0	358
20:00	0	210	32	1	2	0	0	0	0	0	0	0	0	245
21:00	0	200	25	1	1	0	0	0	1	0	0	0	0	228
22:00	0	126	24	0	1	0	0	0	0	0	0	0	0	151
23:00	0	82	13	0	0	0	0	0	0	0	0	0	0	95
Total	9	5435	1346	37	214	42	6	39	73	1	0	0	0	7202
Percent	0.1%	75.5%	18.7%	0.5%	3.0%	0.6%	0.1%	0.5%	1.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	09:00	09:00	07:00	06:00	08:00	07:00	11:00	07:00				07:00
Vol.	2	357	100	5	19	6	1	4	13	1				483
PM Peak	13:00	17:00	17:00	15:00	13:00	13:00	12:00	12:00	12:00					17:00
Vol.	1	437	97	5	17	5	1	7	6					549

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB LL, WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	46	11	0	1	0	0	0	0	0	0	0	0	58
01:00	0	30	5	0	1	0	0	0	1	0	0	0	0	37
02:00	1	22	6	0	1	0	0	2	1	0	0	0	0	33
03:00	0	33	10	0	3	0	0	0	0	0	0	0	0	46
04:00	1	53	14	0	4	1	0	1	1	0	0	0	0	75
05:00	2	153	98	2	19	3	0	5	4	0	0	0	0	286
06:00	3	352	123	6	31	8	0	5	4	0	0	0	0	532
07:00	4	636	136	2	34	6	0	5	10	0	0	0	0	833
08:00	0	573	143	8	36	4	1	4	14	0	0	0	0	783
09:00	3	414	171	7	29	7	1	7	8	0	0	0	0	647
10:00	0	428	128	11	20	4	1	5	11	0	0	0	0	608
11:00	3	450	119	7	24	4	3	3	7	0	0	0	0	620
12 PM	4	518	143	5	26	4	2	5	13	0	0	0	0	720
13:00	3	556	131	3	29	6	2	8	9	0	0	0	0	747
14:00	1	636	175	7	25	8	1	11	6	0	0	1	0	871
15:00	5	652	165	3	30	2	1	5	6	0	0	0	0	869
16:00	3	729	201	9	35	3	0	10	4	0	0	0	0	994
17:00	4	714	176	6	17	1	0	2	1	0	0	0	0	921
18:00	6	640	130	3	26	0	0	2	1	0	0	0	0	808
19:00	3	495	88	2	9	0	0	0	0	0	0	0	0	597
20:00	1	369	53	0	5	0	0	2	0	0	0	0	0	430
21:00	1	326	53	0	5	0	0	1	0	0	0	0	0	386
22:00	0	225	33	0	3	0	0	1	0	0	0	0	0	262
23:00	0	89	17	0	1	0	0	0	0	0	0	0	0	107
Total	48	9139	2329	81	414	61	12	84	101	0	0	1	0	12270
Percent	0.4%	74.5%	19.0%	0.7%	3.4%	0.5%	0.1%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	10:00	08:00	06:00	11:00	09:00	08:00					07:00
Vol.	4	636	171	11	36	8	3	7	14					833
PM Peak	18:00	16:00	16:00	16:00	16:00	14:00	12:00	14:00	12:00			14:00		16:00
Vol.	6	729	201	9	35	8	2	11	13			1		994

PRECISION
D A T A
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Route 140 WB Lanes
between Rtoute 24 Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-B class
Site Code: 10111.31

WB LL, WB RL

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	48	12	0	3	1	0	0	0	0	0	0	0	65
01:00	0	16	9	1	1	0	0	0	0	0	0	0	0	27
02:00	0	20	6	0	1	0	0	0	1	0	0	0	0	28
03:00	0	35	7	0	6	2	0	0	0	0	0	0	0	50
04:00	0	57	15	0	4	2	0	1	0	0	0	0	0	79
05:00	0	157	84	2	20	3	0	4	1	0	0	0	0	271
06:00	1	343	120	3	27	9	0	3	6	0	0	0	0	512
07:00	3	633	156	4	40	7	0	6	12	2	0	0	0	863
08:00	3	580	157	5	22	7	1	6	15	0	0	0	0	796
09:00	3	436	156	9	31	1	1	1	9	0	0	0	0	647
10:00	0	416	109	2	14	5	0	5	14	0	0	0	1	566
11:00	0	427	145	7	18	4	1	7	18	0	0	0	0	627
12 PM	1	535	129	7	27	4	2	13	11	0	0	0	0	729
13:00	1	570	153	4	25	7	1	8	9	1	0	0	0	779
14:00	1	614	158	5	25	3	1	6	6	0	0	0	0	819
15:00	0	692	175	5	29	1	0	10	4	0	1	0	0	917
16:00	1	749	205	7	36	2	0	7	6	0	0	0	0	1013
17:00	4	804	170	3	21	3	0	2	1	0	0	0	0	1008
18:00	1	662	148	1	26	0	0	0	3	0	0	0	0	841
19:00	0	483	94	3	11	0	0	0	2	0	0	0	0	593
20:00	1	363	54	1	6	0	0	0	0	0	0	0	0	425
21:00	0	344	49	1	4	0	0	0	1	0	0	0	0	399
22:00	0	220	31	0	1	0	0	1	0	0	0	0	0	253
23:00	0	114	20	0	1	0	0	0	0	0	0	0	0	135
Total	21	9318	2362	70	399	61	7	80	119	3	1	0	1	12442
Percent	0.2%	74.9%	19.0%	0.6%	3.2%	0.5%	0.1%	0.6%	1.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	09:00	07:00	06:00	08:00	11:00	11:00	07:00			10:00	07:00
Vol.	3	633	157	9	40	9	1	7	18	2			1	863
PM Peak	17:00	17:00	16:00	12:00	16:00	13:00	12:00	12:00	12:00	13:00	15:00			16:00
Vol.	4	804	205	7	36	7	2	13	11	1	1			1013

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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81676 G-C volume
Site Code: 10111.31

Start Time	A.M.	EB	P.M.				Wed 15-Oct-08
12:00	59		163				
12:15	53		182				
12:30	49		199				
12:45	24	185	213	757			
01:00	30		202				
01:15	26		220				
01:30	20		200				
01:45	23	99	205	827			
02:00	16		234				
02:15	25		258				
02:30	21		284				
02:45	8	70	305	1081			
03:00	15		307				
03:15	9		325				
03:30	13		369				
03:45	12	49	412	1413			
04:00	14		420				
04:15	14		447				
04:30	20		424				
04:45	24	72	411	1702			
05:00	26		428				
05:15	43		433				
05:30	58		385				
05:45	56	183	438	1684			
06:00	81		405				
06:15	90		337				
06:30	126		299				
06:45	157	454	285	1326			
07:00	167		211				
07:15	208		215				
07:30	213		193				
07:45	226	814	173	792			
08:00	184		162				
08:15	200		161				
08:30	166		168				
08:45	148	698	142	633			
09:00	132		146				
09:15	171		131				
09:30	166		152				
09:45	137	606	101	530			
10:00	156		93				
10:15	144		91				
10:30	178		77				
10:45	174	652	80	341			
11:00	173		51				
11:15	169		59				
11:30	170		68				
11:45	195	707	62	240			
Total	4589		11326				
Percent			100.0%		0.0%	0.0%	
Day Total		15915					
Peak	07:15		04:15				
Vol.	831		1710				
P.H.F.	0.919		0.956				

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 G-C volume
Site Code: 10111.31

Start Time	A.M.	EB	P.M.				Thu 16-Oct-08
12:00	53		179				
12:15	56		198				
12:30	54		190				
12:45	32	195	228	795			
01:00	29		186				
01:15	28		200				
01:30	24		205				
01:45	19	100	219	810			
02:00	18		228				
02:15	26		288				
02:30	15		277				
02:45	14	73	307	1100			
03:00	8		336				
03:15	11		374				
03:30	14		371				
03:45	17	50	418	1499			
04:00	13		427				
04:15	14		463				
04:30	28		426				
04:45	25	80	457	1773			
05:00	20		371				
05:15	34		445				
05:30	44		400				
05:45	58	156	382	1598			
06:00	70		314				
06:15	89		326				
06:30	136		332				
06:45	141	436	271	1243			
07:00	175		190				
07:15	197		238				
07:30	212		199				
07:45	219	803	167	794			
08:00	197		153				
08:15	194		175				
08:30	188		154				
08:45	179	758	146	628			
09:00	156		139				
09:15	151		129				
09:30	147		146				
09:45	146	600	116	530			
10:00	144		95				
10:15	151		99				
10:30	151		81				
10:45	163	609	80	355			
11:00	177		60				
11:15	172		87				
11:30	178		66				
11:45	202	729	60	273			
Total	4589		11398				
Percent			100.0%		0.0%	0.0%	
Day Total		15987					
Peak	07:15		04:00				
Vol.	825		1773				
P.H.F.	0.942		0.957				

PRECISION
D A T A
INDUSTRIES, LLC
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Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C speed
Site Code: 10111.31

EB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	3	7	22	52	47	43	9	1	1	0	185	73	66
01:00	0	0	0	0	10	21	38	19	9	1	0	1	0	99	69	63
02:00	0	0	0	1	4	11	29	15	6	2	2	0	0	70	70	64
03:00	0	0	0	0	0	8	18	12	5	3	1	1	1	49	74	67
04:00	0	0	0	1	2	11	26	19	8	4	1	0	0	72	71	65
05:00	0	0	0	3	11	31	42	57	25	11	1	1	1	183	73	66
06:00	0	0	0	8	18	59	120	125	78	30	9	3	2	452	74	66
07:00	0	**2**	0	3	26	84	**199**	**231**	**160**	79	**27**	2	**3**	**816**	75	68
08:00	0	0	0	8	16	89	175	168	133	**83**	18	**7**	1	698	76	68
09:00	0	0	0	3	24	82	185	140	112	51	6	2	1	606	74	66
10:00	0	0	**3**	**10**	**41**	103	180	178	92	39	5	1	0	652	73	65
11:00	0	0	1	9	30	**117**	195	175	127	39	12	1	1	707	73	66
12 PM	1	0	1	8	46	112	230	210	99	36	8	**6**	0	757	72	65
13:00	**2**	**1**	**3**	**19**	**71**	182	215	208	93	22	8	2	0	826	71	63
14:00	0	0	0	5	48	161	342	305	157	51	8	4	**1**	1082	72	66
15:00	0	0	0	12	44	215	427	407	242	**62**	3	0	0	1412	72	66
16:00	2	0	0	4	44	228	548	**577**	**248**	46	4	2	0	**1703**	71	66
17:00	1	0	0	3	47	**246**	**549**	576	219	39	3	1	0	1684	71	65
18:00	1	0	0	1	43	234	434	393	183	34	3	0	0	1326	71	65
19:00	0	0	1	2	34	141	279	221	89	21	4	0	0	792	70	65
20:00	0	0	0	5	42	113	231	166	66	9	1	0	0	633	70	64
21:00	0	0	2	6	18	94	197	123	69	12	**9**	0	0	530	71	65
22:00	0	0	0	6	14	44	114	104	42	11	2	3	1	341	71	65
23:00	1	0	0	2	9	34	91	72	23	6	0	2	0	240	70	65
Total	8	3	11	122	649	2442	4916	4548	2328	700	136	40	12	15915		
%	0.1%	0.0%	0.1%	0.8%	4.1%	15.3%	30.9%	28.6%	14.6%	4.4%	0.9%	0.3%	0.1%			
AM Peak		07:00	10:00	10:00	10:00	11:00	07:00	07:00	07:00	08:00	07:00	08:00	07:00	07:00		
Vol.		2	3	10	41	117	199	231	160	83	27	7	3	816		
PM Peak	13:00	13:00	13:00	13:00	13:00	17:00	17:00	16:00	16:00	15:00	21:00	12:00	14:00	16:00		
Vol.	2	1	3	19	71	246	549	577	248	62	9	6	1	1703		

Pecent

15th Percentile :	59 MPH
50th Percentile :	65 MPH
85th Percentile :	72 MPH
95th Percentile :	76 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	9464
Percent in Pace :	59.5%
Number of Vehicles > 65 MPH :	7764
Percent of Vehicles > 65 MPH :	48.8%
Mean Speed(Average) :	66 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C speed
Site Code: 10111.31

EB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	6	14	20	48	59	35	10	2	0	1	195	73	66
01:00	0	0	0	4	2	16	45	18	13	2	0	0	0	100	70	64
02:00	0	0	0	1	7	9	26	20	8	1	1	0	0	73	70	64
03:00	0	0	0	0	2	14	22	11	0	0	0	0	1	50	67	63
04:00	0	0	0	2	8	17	22	15	10	5	1	0	0	80	72	64
05:00	0	0	0	2	12	36	41	41	17	3	1	**2**	1	156	71	64
06:00	1	0	0	7	28	92	141	113	39	12	2	0	0	435	70	64
07:00	1	0	2	**15**	**59**	**173**	**265**	184	**85**	17	2	1	0	**804**	70	63
08:00	1	0	0	9	46	159	250	**204**	69	**18**	2	0	0	758	70	64
09:00	1	0	1	12	56	145	204	116	46	15	2	2	0	600	69	63
10:00	**2**	0	**3**	11	48	143	205	133	39	17	**4**	2	**2**	609	69	63
11:00	0	0	0	12	50	146	246	170	85	16	3	0	1	729	70	64
12 PM	1	0	0	**17**	**74**	153	261	190	75	21	3	0	0	795	70	63
13:00	**2**	0	2	7	40	163	262	217	91	23	2	1	0	810	70	64
14:00	0	0	**4**	10	44	184	381	302	138	**32**	5	0	0	1100	71	65
15:00	2	0	1	15	67	**257**	533	452	148	22	2	0	0	1499	70	64
16:00	2	0	1	10	61	233	**626**	**630**	174	29	6	0	0	**1772**	70	65
17:00	2	0	0	9	52	255	485	548	**223**	22	3	0	0	1599	71	65
18:00	0	0	0	4	40	200	403	389	174	28	4	1	0	1243	71	65
19:00	0	0	0	2	36	148	251	232	102	20	3	0	0	794	71	65
20:00	0	0	0	3	19	115	206	185	80	15	4	1	0	628	71	65
21:00	0	0	1	2	30	96	168	144	70	12	6	1	0	530	71	65
22:00	0	0	0	1	11	66	115	98	50	9	3	1	**1**	355	72	65
23:00	0	0	0	1	8	20	76	91	52	14	**8**	**3**	0	273	74	67
Total	15	0	15	162	814	2860	5282	4562	1823	363	69	15	7	15987		
%	0.1%	0.0%	0.1%	1.0%	5.1%	17.9%	33.0%	28.5%	11.4%	2.3%	0.4%	0.1%	0.0%			
AM Peak	10:00		10:00	07:00	07:00	07:00	07:00	08:00	07:00	08:00	10:00	05:00	10:00	07:00		
Vol.	2		3	15	59	173	265	204	85	18	4	2	2	804		
PM Peak	13:00		14:00	12:00	12:00	15:00	16:00	16:00	17:00	14:00	23:00	23:00	22:00	16:00		
Vol.	2		4	17	74	257	626	630	223	32	8	3	1	1772		

Pecent

15th Percentile :	58 MPH
50th Percentile :	64 MPH
85th Percentile :	70 MPH
95th Percentile :	75 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	9844
Percent in Pace :	61.6%
Number of Vehicles > 65 MPH :	6839
Percent of Vehicles > 65 MPH :	42.8%
Mean Speed(Average) :	64 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	1	156	21	0	4	1	0	1	1	0	0	0	0	185
01:00	3	79	7	1	2	4	0	0	1	1	1	0	0	99
02:00	1	54	10	0	1	1	0	0	3	0	0	0	0	70
03:00	0	40	5	1	2	0	0	0	1	0	0	0	0	49
04:00	2	47	11	0	3	3	0	3	3	0	0	0	0	72
05:00	4	123	33	1	5	5	0	9	3	0	0	0	0	183
06:00	4	311	80	5	22	8	0	7	13	2	0	0	0	452
07:00	12	600	113	12	33	22	1	9	14	0	0	0	0	816
08:00	9	521	94	13	24	19	1	6	11	0	0	0	0	698
09:00	13	414	100	14	29	16	0	6	13	1	0	0	0	606
10:00	12	436	108	15	31	20	0	11	19	0	0	0	0	652
11:00	16	487	101	15	32	28	2	11	14	0	0	0	1	707
12 PM	14	551	113	10	33	11	0	15	9	0	0	0	1	757
13:00	19	608	115	9	20	28	1	9	16	0	1	0	0	826
14:00	16	873	113	9	20	29	1	15	6	0	0	0	0	1082
15:00	14	1144	180	4	21	27	1	12	9	0	0	0	0	1412
16:00	22	1431	173	4	29	21	2	12	8	0	0	0	1	1703
17:00	24	1490	116	5	22	16	0	7	4	0	0	0	0	1684
18:00	17	1184	84	3	17	12	1	6	1	1	0	0	0	1326
19:00	10	699	69	4	4	5	0	1	0	0	0	0	0	792
20:00	1	586	31	1	3	5	0	4	2	0	0	0	0	633
21:00	4	483	30	3	3	4	0	2	1	0	0	0	0	530
22:00	3	319	8	1	3	4	0	2	1	0	0	0	0	341
23:00	3	221	10	1	1	3	0	0	1	0	0	0	0	240
Total	224	12857	1725	131	364	292	10	148	154	5	2	0	3	15915
Percent	1.4%	80.8%	10.8%	0.8%	2.3%	1.8%	0.1%	0.9%	1.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	10:00	07:00	11:00	11:00	10:00	10:00	06:00	01:00		11:00	07:00
Vol.	16	600	113	15	33	28	2	11	19	2	1		1	816
PM Peak	17:00	17:00	15:00	12:00	12:00	14:00	16:00	12:00	13:00	18:00	13:00		12:00	16:00
Vol.	24	1490	180	10	33	29	2	15	16	1	1		1	1703

PRECISION DATA INDUSTRIES, LLC
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Route 140 EB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-C class
Site Code: 10111.31

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	173	15	1	1	3	0	1	0	0	0	0	0	195
01:00	2	86	8	0	3	1	0	0	0	0	0	0	0	100
02:00	1	63	6	0	1	2	0	0	0	0	0	0	0	73
03:00	1	40	4	0	2	1	0	0	2	0	0	0	0	50
04:00	3	60	10	0	3	3	0	0	1	0	0	0	0	80
05:00	5	121	18	0	2	5	0	1	3	1	0	0	0	156
06:00	7	338	53	2	6	14	0	6	8	1	0	0	0	435
07:00	22	657	55	1	18	27	2	10	11	1	0	0	0	804
08:00	14	633	48	5	15	31	0	7	5	0	0	0	0	758
09:00	23	466	48	3	15	30	0	2	13	0	0	0	0	600
10:00	32	458	48	3	16	40	1	4	6	0	1	0	0	609
11:00	29	554	67	4	32	29	1	7	6	0	0	0	0	729
12 PM	22	606	77	4	33	33	0	8	10	0	0	1	1	795
13:00	24	638	75	6	27	28	0	5	6	0	0	0	1	810
14:00	17	900	108	8	30	18	1	7	8	0	1	2	0	1100
15:00	17	1274	134	3	32	24	1	7	5	2	0	0	0	1499
16:00	21	1522	161	1	24	18	1	18	4	1	0	0	1	1772
17:00	16	1434	105	2	17	13	1	8	2	1	0	0	0	1599
18:00	8	1118	74	5	15	10	0	4	6	1	0	0	2	1243
19:00	1	719	61	2	4	4	1	2	0	0	0	0	0	794
20:00	6	575	37	0	2	6	0	0	2	0	0	0	0	628
21:00	6	496	20	2	1	5	0	0	0	0	0	0	0	530
22:00	2	329	19	0	1	3	0	1	0	0	0	0	0	355
23:00	2	241	25	1	1	1	0	0	2	0	0	0	0	273
Total	282	13501	1276	53	301	349	9	98	100	8	2	3	5	15987
Percent	1.8%	84.4%	8.0%	0.3%	1.9%	2.2%	0.1%	0.6%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	11:00	08:00	11:00	10:00	07:00	07:00	09:00	05:00	10:00			07:00
Vol.	32	657	67	5	32	40	2	10	13	1	1			804
PM Peak	13:00	16:00	16:00	14:00	12:00	12:00	14:00	16:00	12:00	15:00	14:00	14:00	18:00	16:00
Vol.	24	1522	161	8	33	33	1	18	10	2	1	2	2	1772

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

81676 G-D volume
Site Code: 10111.31

Start Time	A.M.	WB	P.M.				Wed 15-Oct-08
12:00	21		191				
12:15	24		211				
12:30	17		203				
12:45	10	72	199	804			
01:00	22		185				
01:15	10		199				
01:30	18		190				
01:45	7	57	243	817			
02:00	9		227				
02:15	7		258				
02:30	13		240				
02:45	14	43	227	952			
03:00	18		215				
03:15	12		232				
03:30	23		229				
03:45	39	92	255	931			
04:00	35		230				
04:15	66		225				
04:30	101		258				
04:45	132	334	284	997			
05:00	187		236				
05:15	304		251				
05:30	346		275				
05:45	357	1194	225	987			
06:00	322		191				
06:15	320		224				
06:30	365		157				
06:45	398	1405	171	743			
07:00	370		138				
07:15	434		138				
07:30	401		123				
07:45	416	1621	97	496			
08:00	369		96				
08:15	344		100				
08:30	326		94				
08:45	362	1401	88	378			
09:00	251		88				
09:15	280		74				
09:30	233		61				
09:45	223	987	69	292			
10:00	203		74				
10:15	200		57				
10:30	223		46				
10:45	190	816	41	218			
11:00	202		26				
11:15	221		37				
11:30	223		41				
11:45	201	847	23	127			
Total	8869		7742				
Percent			100.0%		0.0%	0.0%	
Day Total		16611					
Peak	07:00		04:45				
Vol.	1621		1046				
P.H.F.	0.934		0.921				

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D volume
Site Code: 10111.31

Start Time	A.M.	WB	P.M.				Thu 16-Oct-08
12:00	17		207				
12:15	16		224				
12:30	13		193				
12:45	15	61	205	829			
01:00	15		193				
01:15	10		239				
01:30	15		201				
01:45	13	53	250	883			
02:00	13		199				
02:15	11		249				
02:30	5		236				
02:45	17	46	221	905			
03:00	15		201				
03:15	17		231				
03:30	33		238				
03:45	23	88	232	902			
04:00	37		232				
04:15	52		264				
04:30	104		284				
04:45	123	316	256	1036			
05:00	187		245				
05:15	285		293				
05:30	344		265				
05:45	358	1174	259	1062			
06:00	336		220				
06:15	339		218				
06:30	348		219				
06:45	368	1391	180	837			
07:00	327		159				
07:15	406		142				
07:30	420		99				
07:45	401	1554	108	508			
08:00	344		81				
08:15	339		98				
08:30	341		101				
08:45	346	1370	87	367			
09:00	260		85				
09:15	266		65				
09:30	228		70				
09:45	229	983	58	278			
10:00	189		76				
10:15	243		66				
10:30	208		47				
10:45	191	831	37	226			
11:00	215		28				
11:15	200		39				
11:30	183		37				
11:45	214	812	30	134			
Total	8679		7967				
Percent			100.0%		0.0%	0.0%	
Day Total		16646					
Peak	07:15		04:30				
Vol.	1571		1078				
P.H.F.	0.935		0.920				

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

WB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	1	0	0	1	1	17	18	20	8	2	3	1	0	72	72	65
01:00	2	0	0	3	3	6	18	19	4	1	1	0	0	57	69	62
02:00	2	0	0	3	1	7	11	11	6	1	0	1	0	43	71	62
03:00	0	0	1	3	2	15	30	26	9	5	1	0	0	92	71	65
04:00	6	0	1	1	9	35	82	99	65	25	5	4	2	334	74	66
05:00	53	0	0	6	14	73	224	300	272	186	51	12	2	1193	77	67
06:00	63	0	0	7	25	**125**	268	320	300	207	74	14	3	1406	78	67
07:00	**79**	0	0	1	24	108	**293**	320	**407**	**266**	**103**	18	1	**1620**	78	68
08:00	70	0	0	3	**28**	99	245	**331**	272	240	90	20	4	1402	78	68
09:00	53	0	1	4	23	77	207	240	196	104	55	**21**	**6**	987	77	66
10:00	43	**1**	0	3	23	77	181	208	137	96	33	10	4	816	77	66
11:00	48	0	**2**	**8**	20	73	191	222	160	76	31	14	2	847	75	65
12 PM	47	**1**	0	**8**	24	77	195	222	137	62	23	6	2	804	74	64
13:00	46	0	0	1	20	71	188	218	146	80	31	13	3	817	76	65
14:00	**55**	0	**2**	1	**27**	88	196	239	207	96	33	6	2	952	75	65
15:00	39	0	0	4	23	**108**	**237**	198	171	96	37	14	4	931	76	66
16:00	44	0	0	3	20	75	188	259	**216**	116	**56**	**15**	5	**997**	77	67
17:00	26	0	0	4	12	43	202	**276**	207	**146**	50	15	5	986	78	69
18:00	14	0	0	2	8	53	169	222	170	71	25	3	**6**	743	75	68
19:00	2	1	0	3	16	60	145	141	82	29	16	1	1	497	74	66
20:00	3	0	0	1	11	40	92	118	74	27	12	0	0	378	74	67
21:00	2	0	2	2	12	41	85	62	49	27	6	2	2	292	75	66
22:00	2	0	0	4	9	20	65	60	43	5	7	2	1	218	73	66
23:00	0	0	0	1	9	9	40	36	22	8	2	0	0	127	73	66
Total	700	3	9	77	364	1397	3570	4167	3360	1972	745	192	55	16611		
%	4.2%	0.0%	0.1%	0.5%	2.2%	8.4%	21.5%	25.1%	20.2%	11.9%	4.5%	1.2%	0.3%			
AM Peak	07:00	10:00	11:00	11:00	08:00	06:00	07:00	08:00	07:00	07:00	07:00	09:00	09:00	07:00		
Vol.	79	1	2	8	28	125	293	331	407	266	103	21	6	1620		
PM Peak	14:00	12:00	14:00	12:00	14:00	15:00	15:00	17:00	16:00	17:00	16:00	16:00	18:00	16:00		
Vol.	55	1	2	8	27	108	237	276	216	146	56	15	6	997		

Pecent

15th Percentile :	60 MPH
50th Percentile :	68 MPH
85th Percentile :	77 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	7737
Percent in Pace :	46.6%
Number of Vehicles > 65 MPH :	10491
Percent of Vehicles > 65 MPH :	63.2%
Mean Speed(Average) :	67 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O.Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

WB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	3	9	17	16	11	4	1	0	0	61	73	66
01:00	1	0	0	2	2	3	19	19	5	2	0	0	0	53	70	64
02:00	0	0	0	0	2	5	14	18	4	2	1	0	0	46	70	66
03:00	0	0	0	3	3	10	25	25	14	5	1	2	0	88	73	66
04:00	4	0	0	1	8	28	79	87	73	23	12	0	1	316	75	67
05:00	55	0	0	0	12	81	233	283	257	183	62	6	2	1174	78	67
06:00	**63**	0	0	0	21	**125**	**272**	316	292	216	65	18	3	1391	78	67
07:00	63	0	0	2	**24**	96	272	**364**	**330**	**276**	110	12	5	**1554**	79	68
08:00	53	0	0	0	20	80	229	330	274	222	**121**	**37**	4	1370	79	69
09:00	47	0	0	3	17	77	213	243	205	117	41	14	6	983	77	67
10:00	48	0	0	**5**	21	74	151	202	177	87	46	15	5	831	77	66
11:00	49	0	0	1	11	46	191	233	128	88	35	18	**11**	811	77	66
12 PM	**51**	0	1	3	20	58	176	208	158	101	31	16	6	829	77	66
13:00	42	0	0	1	**21**	68	169	220	181	105	**59**	**17**	1	884	78	67
14:00	42	0	1	2	14	78	210	195	168	116	59	13	**7**	905	78	67
15:00	41	0	0	1	14	57	218	233	183	105	36	13	1	902	76	67
16:00	49	0	0	2	12	75	213	**288**	187	**139**	56	13	2	1036	77	67
17:00	44	0	0	0	5	87	**250**	256	**225**	137	47	7	4	**1062**	77	67
18:00	24	**1**	0	**4**	17	**101**	243	204	150	74	15	3	1	837	74	65
19:00	12	0	1	4	14	69	126	157	81	30	11	3	0	508	73	65
20:00	1	0	0	1	11	49	102	104	58	30	9	1	0	366	74	67
21:00	4	0	0	2	13	44	79	71	42	15	5	1	3	279	73	65
22:00	2	0	**2**	2	12	33	57	65	37	9	5	1	1	226	73	65
23:00	2	0	0	1	5	20	37	37	24	7	1	0	0	134	73	65
Total	697	1	5	40	302	1373	3595	4174	3264	2093	829	210	63	16646		
%	4.2%	0.0%	0.0%	0.2%	1.8%	8.2%	21.6%	25.1%	19.6%	12.6%	5.0%	1.3%	0.4%			
AM Peak	06:00			10:00	07:00	06:00	06:00	07:00	07:00	07:00	08:00	08:00	11:00	07:00		
Vol.	63			5	24	125	272	364	330	276	121	37	11	1554		
PM Peak	12:00	18:00	22:00	18:00	13:00	18:00	17:00	16:00	17:00	16:00	13:00	13:00	14:00	17:00		
Vol.	51	1	2	4	21	101	250	288	225	139	59	17	7	1062		

Pecent

15th Percentile :	61 MPH
50th Percentile :	68 MPH
85th Percentile :	77 MPH
95th Percentile :	82 MPH

Stats

10 MPH Pace Speed :	61-70 MPH
Number in Pace :	7769
Percent in Pace :	46.7%
Number of Vehicles > 65 MPH :	10633
Percent of Vehicles > 65 MPH :	63.9%
Mean Speed(Average) :	67 MPH

PRECISION DATA INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

Direction 2

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/15/0																
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:00	8	0	0	0	0	0	0	0	0	0	0	0	0	8	7	4
06:00	10	0	0	0	0	0	0	0	0	0	0	0	0	10	8	6
07:00	**17**	0	0	0	0	0	0	0	0	0	0	0	0	**17**	14	9
08:00	9	0	0	0	0	0	0	0	0	0	0	0	0	9	8	5
09:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
10:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
11:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
12 PM	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1	41	41
13:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
14:00	**7**	0	0	0	0	0	0	0	0	0	0	0	0	**7**	6	4
15:00	4	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2
16:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
17:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
18:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
19:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
20:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	81	0	1	0	0	0	0	0	0	0	0	0	0	82		
%	98.8%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00													07:00		
Vol.	17													17		
PM Peak	14:00		12:00											14:00		
Vol.	7		1											7		

Pecent

15th Percentile :	4 MPH
50th Percentile :	15 MPH
85th Percentile :	30 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	1-10 MPH
Number in Pace :	30
Percent in Pace :	36.6%
Number of Vehicles > 65 MPH :	0
Percent of Vehicles > 65 MPH :	0.0%
Mean Speed(Average) :	17 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D speed
Site Code: 10111.31

Direction 2

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 9999	Total	85th % ile	Ave Speed
10/16/0																
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:00	10	0	0	0	0	0	0	0	0	0	0	0	0	10	8	6
06:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
07:00	**13**	0	0	0	0	0	0	0	0	0	0	0	0	**13**	11	7
08:00	6	0	0	0	0	0	0	0	0	0	0	0	0	6	5	4
09:00	7	0	0	0	0	0	0	0	0	0	0	0	0	7	6	4
10:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
11:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
12 PM	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
13:00	4	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2
14:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
15:00	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3
16:00	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
17:00	**7**	0	0	0	0	0	0	0	0	0	0	0	0	**7**	6	4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	74	0	0	0	0	0	0	0	0	0	0	0	0	74		
%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00													07:00		
Vol.	13													13		
PM Peak	17:00													17:00		
Vol.	7													7		

Pecent

15th Percentile :	4 MPH
50th Percentile :	17 MPH
85th Percentile :	30 MPH
95th Percentile :	33 MPH

Stats

10 MPH Pace Speed :	1-10 MPH
Number in Pace :	24
Percent in Pace :	32.4%
Number of Vehicles > 65 MPH :	0
Percent of Vehicles > 65 MPH :	0.0%
Mean Speed(Average) :	17 MPH

PRECISION DATA INDUSTRIES, LLC
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/15/0														
8	0	58	9	0	3	0	0	0	2	0	0	0	0	72
01:00	2	42	4	0	4	1	0	0	4	0	0	0	0	57
02:00	0	26	8	0	1	0	0	3	5	0	0	0	0	43
03:00	1	64	16	1	7	0	0	0	3	0	0	0	0	92
04:00	2	208	78	7	32	2	0	3	2	0	0	0	0	334
05:00	4	660	375	10	122	3	0	12	7	0	0	0	0	1193
06:00	9	984	301	10	79	8	1	12	2	0	0	0	0	1406
07:00	11	1310	200	16	49	10	8	13	3	0	0	0	0	1620
08:00	6	1121	180	14	49	6	9	12	5	0	0	0	0	1402
09:00	7	740	154	12	37	15	3	10	9	0	0	0	0	987
10:00	3	601	137	11	44	8	1	9	2	0	0	0	0	816
11:00	18	601	137	12	40	12	3	13	10	1	0	0	0	847
12 PM	13	588	107	18	44	10	4	7	13	0	0	0	0	804
13:00	6	594	128	23	40	8	0	13	5	0	0	0	0	817
14:00	4	688	166	15	54	7	5	10	3	0	0	0	0	952
15:00	5	695	151	11	44	4	5	5	11	0	0	0	0	931
16:00	1	789	141	13	29	3	4	15	2	0	0	0	0	997
17:00	6	808	132	7	20	5	2	3	3	0	0	0	0	986
18:00	14	607	87	4	25	2	0	1	3	0	0	0	0	743
19:00	3	394	82	2	12	1	0	1	2	0	0	0	0	497
20:00	1	322	45	0	8	0	0	1	1	0	0	0	0	378
21:00	1	247	38	0	3	1	0	0	2	0	0	0	0	292
22:00	0	200	15	0	1	0	0	1	1	0	0	0	0	218
23:00	1	112	13	0	0	1	0	0	0	0	0	0	0	127
Total	118	12459	2704	186	747	107	45	144	100	1	0	0	0	16611
Percent	0.7%	75.0%	16.3%	1.1%	4.5%	0.6%	0.3%	0.9%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	05:00	07:00	05:00	09:00	08:00	07:00	11:00	11:00				07:00
Vol.	18	1310	375	16	122	15	9	13	10	1				1620
PM Peak	18:00	17:00	14:00	13:00	14:00	12:00	14:00	16:00	12:00					16:00
Vol.	14	808	166	23	54	10	5	15	13					997

PRECISION
D A T A
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Route 140 WB
east of Stevens Street Ramps
City, State: Taunton, MA
Client: VHB/R. Raveendran

81676 G-D class
Site Code: 10111.31

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/16/0														
8	1	48	8	0	1	0	0	2	1	0	0	0	0	61
01:00	0	40	5	2	1	1	0	1	3	0	0	0	0	53
02:00	1	33	10	0	0	1	0	1	0	0	0	0	0	46
03:00	0	58	16	1	9	0	0	0	4	0	0	0	0	88
04:00	0	188	82	9	30	3	0	2	2	0	0	0	0	316
05:00	5	672	349	8	118	9	0	12	1	0	0	0	0	1174
06:00	6	974	316	8	61	10	0	10	6	0	0	0	0	1391
07:00	12	1227	227	12	40	14	0	14	8	0	0	0	0	1554
08:00	4	1095	176	11	52	8	0	16	8	0	0	0	0	1370
09:00	4	743	161	14	45	9	0	3	4	0	0	0	0	983
10:00	2	619	134	11	44	6	0	8	6	1	0	0	0	831
11:00	7	573	139	14	53	7	0	13	4	1	0	0	0	811
12 PM	7	595	128	20	48	6	2	13	10	0	0	0	0	829
13:00	8	633	155	22	45	5	0	11	5	0	0	0	0	884
14:00	6	649	160	20	44	9	0	16	1	0	0	0	0	905
15:00	3	696	146	10	39	3	0	4	1	0	0	0	0	902
16:00	6	814	147	8	47	6	0	8	0	0	0	0	0	1036
17:00	2	859	154	8	30	2	0	6	1	0	0	0	0	1062
18:00	2	682	115	4	28	4	0	2	0	0	0	0	0	837
19:00	0	420	67	3	15	0	0	3	0	0	0	0	0	508
20:00	1	310	43	0	9	1	0	1	1	0	0	0	0	366
21:00	0	226	47	0	5	0	0	0	1	0	0	0	0	279
22:00	0	197	26	0	1	0	0	1	1	0	0	0	0	226
23:00	0	115	16	1	1	0	0	0	1	0	0	0	0	134
Total	77	12466	2827	186	766	104	2	147	69	2	0	0	0	16646
Percent	0.5%	74.9%	17.0%	1.1%	4.6%	0.6%	0.0%	0.9%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	05:00	09:00	05:00	07:00		08:00	07:00	10:00				07:00
Vol.	12	1227	349	14	118	14		16	8	1				1554
PM Peak	13:00	17:00	14:00	13:00	12:00	14:00	12:00	14:00	12:00					17:00
Vol.	8	859	160	22	48	9	2	16	10					1062

Appendix 4.1-F

Preliminary Traffic Signal Warrant Analysis

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Anawan / Broadway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	375	265	575	840	Yes	Yes	Yes	Yes	Yes
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	275	260	655	915	Yes	Yes	Yes	Yes	Yes
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
				Warrants Met?		**1**		**2**	**3**
						NO		**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Central / Davol

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	EIGHT-HOUR VEHICULAR VOLUME	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	224	327	560	887	Yes	Yes	Yes	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	300	348	596	944	Yes	Yes	Yes	Yes	Verify
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Verify**
				Warrants Met?		**1**		**2**	**3**
						NO		**No**	**Verify**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Davol Street NB / Station Driveway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	600	600
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	480	720
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	50	975		975	No	No	No	No	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	190	910		910	Yes	Yes	Yes	Verify	No
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?			**1**		**2**	**3**
						NO		**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: South Main St / High Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1 EIGHT-HOUR VEHICULAR VOLUME		Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 FOUR HOUR VEHICULAR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 PEAK HOUR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	63	555	1250	1805	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	14	1433	719	2152	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: South Main St / Ridge Hill Road

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	EIGHT-HOUR VEHICULAR VOLUME	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
	80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B	Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 FOUR HOUR VEHICULAR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 PEAK HOUR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	76	848	1292	2140	No	Yes	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	281	1513	700	2213	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: South Main St / Narrows

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	160	199	479	678	Yes	No	Yes	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	138	578	142	720	No	No	Yes	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: South Main St / Site Driveway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Warrant 1 EIGHT-HOUR VEHICULAR VOLUME		Required approach volumes: Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 FOUR HOUR VEHICULAR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 PEAK HOUR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road: Northbound	Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	26	240	472	712	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	54	539	336	875	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?			**1**		**2**	**3**
						NO		**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Coggeshall St at North Front Street

Major Street Direction: Eastbound-Westbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	EIGHT-HOUR VEHICULAR VOLUME	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 FOUR HOUR VEHICULAR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 PEAK HOUR VOLUME

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Eastbound	Entering Vol. on Major Road Westbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	150	495	490	985	No	Yes	Yes	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	275	550	435	985	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Coggeshall St at Purchase Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	170	272	292	564	Yes	No	No	No	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	178	427	355	782	Yes	Yes	Yes	Verify	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 5

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Purchase Street at Weld Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	205	285	280	565	Yes	No	No	No	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	240	460	275	735	Yes	No	Yes	Verify	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Purchase Street at Rt 18 SB Exit Ramp

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	298	231	279	510	Yes	No	No	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	250	468	269	737	Yes	No	Yes	Yes	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?			**1**		**2**	**3**
						NO		**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 28

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 2

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 140 SB Off Ramps at Mr. Pleasant Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**		Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)			
	Major Street :	1 Lane(s) on each approach	500	500
	Minor Street :	1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)			
	Major Street :	1 Lane(s) on each approach	750	750
	Minor Street :	1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B			Warrant 1A	Warrant 1B
	Major Street :	1 Lane(s) on each approach	400	600
	Minor Street :	1 Lane(s) on each approach	120	60

Required approach volumes

Warrant 2	**FOUR HOUR VEHICULAR VOLUME**		
	Major Street :	1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-1 or 4C-2.
	Minor Street :	1 Lane(s) on each approach	25 = accuracy of regression equations

Warrant 3	**PEAK HOUR VOLUME**		
	Major Street :	1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-3 or 4C-4.
	Minor Street :	1 Lane(s) on each approach	25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	167	638	281	919	Yes	Yes	Yes	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	257	667	567	1234	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Whales's Tooth Station Driveway / Mc Arthur Dr

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

		Required approach volumes	
			Adjusted
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	70	230	125	355	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	165	115	110	225	No	No	No	No	No
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Washington St at Fredrick Martin Parkway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	600	600
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	480	720
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	149	939	855	1794	No	Yes	No	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	156	1033	1119	2152	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?			**1**		**2**	**3**
						NO		**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Oak Street / Station Driveway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

		Required approach volumes	
			Adjusted
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 1 Lane(s) on each approach	75	75
	80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B	Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	400	720
	Minor Street : 1 Lane(s) on each approach	160	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	109	400	489	889	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	163	477	540	1017	No	Yes	Yes	Verify	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

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2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Arlington St / Station Driveway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	400	720
	Minor Street : 1 Lane(s) on each approach	160	60

Warrant 2	**FOUR HOUR VEHICULAR VOLUME**	
	Major Street : 2 Lane(s) on each approach	If "verify" indicated, see Figure 4C-1 or 4C-2.
	Minor Street : 1 Lane(s) on each approach	25 = accuracy of regression equations

Warrant 3	**PEAK HOUR VOLUME**	
	Major Street : 2 Lane(s) on each approach	If "verify" indicated, see Figure 4C-3 or 4C-4.
	Minor Street : 1 Lane(s) on each approach	25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	50	265	363	628	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	107	126	541	667	No	No	No	No	No
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
				Warrants Met?	**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 123 / N Worcester

Major Street Direction: Eastbound-Westbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Eastbound	Entering Vol. on Major Road Westbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	457	550	412	962	Yes	Yes	Yes	Yes	Yes
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM	372	565	654	1219	Yes	Yes	Yes	Yes	Yes
5:00 - 6:00 PM				0	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
				Warrants Met?		**1**		**2**	**3**
						NO		**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Station Driveway / S. Worcester Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM				0	No	No	No	No	No
8:00 - 9:00 AM	74	204	255	459	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	90	283	160	443	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 138 at Station Driveway

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 4

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	83	1431	409	1840	No	Yes	No	Verify	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	119	644	1107	1751	No	Yes	No	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 138 at ElmStreet

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	600	600
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 1 Lane(s) on each approach	75	75
	80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B	Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	480	720
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	232	1415	492	1907	Yes	Yes	Yes	Yes	Yes
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	133	803	1369	2172	No	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 138 at Union Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

Required approach volumes

Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	600	600
	Minor Street : 2 Lane(s) on each approach	200	200
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 2 Lane(s) on each approach	900	900
	Minor Street : 2 Lane(s) on each approach	100	100
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 2 Lane(s) on each approach	480	720
	Minor Street : 2 Lane(s) on each approach	160	80

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 2 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 2 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	186	1528	492	2020	No	Yes	Yes	Yes	Yes
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	317	797	1361	2158	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Main Street at Center Street

Major Street Direction: Eastbound-Westbound

Year: **Condition:** Future

Operating speed on major roadway: 30 mph

Number of approaches: 3

		Required approach volumes	
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
	80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B	Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Eastbound	Entering Vol. on Major Road Westbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	209	504	330	834	Yes	Yes	Yes	Yes	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	158	291	1014	1305	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

2003 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection: Route 138 at Wilbur Street

Major Street Direction: Northbound-Southbound

Year: **Condition:** Future

Operating speed on major roadway: 40 mph

Number of approaches: 3

		Required approach volumes	
			Adjusted
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B		Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2	**FOUR HOUR VEHICULAR VOLUME**	
	Major Street : 1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-1 or 4C-2.
	Minor Street : 1 Lane(s) on each approach	25 = accuracy of regression equations

Warrant 3	**PEAK HOUR VOLUME**	
	Major Street : 1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-3 or 4C-4.
	Minor Street : 1 Lane(s) on each approach	25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM				0	No	No	No	No	No
7:00 - 8:00 AM	12	1429	403	1832	No	No	No	No	No
8:00 - 9:00 AM				0	No	No	No	No	No
9:00 - 10:00 AM				0	No	No	No	No	No
10:00 - 11:00 AM				0	No	No	No	No	No
11:00 - 12:00 AM				0	No	No	No	No	No
12:00 - 1:00 PM				0	No	No	No	No	No
1:00 - 2:00 PM				0	No	No	No	No	No
2:00 - 3:00 PM				0	No	No	No	No	No
3:00 - 4:00 PM				0	No	No	No	No	No
4:00 - 5:00 PM				0	No	No	No	No	No
5:00 - 6:00 PM	10	648	1283	1931	No	No	No	No	No
6:00 - 7:00 PM				0	No	No	No	No	No
					No	**No**	**No**	**No**	**No**
			Warrants Met?		**1**			**2**	**3**
					NO			**No**	**No**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 0

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2003 Edition [2003]

last updated: 08/05/05 [version]

Appendix 4.1-G

Pedestrian/Bicycle Distribution Analysis

South Coast Rail

Project #: 10111.00

Pedestrian Routes based on TAZs

Station Location	TAZ	Route	Route Description	Alternate Route
Fall River Depot 30621				
	2762	N. Davol St via Brightman Br/Brightman St	All traffic will filter south on Riverside Ave/County St, east through Brightman St bridge, south on North Davol St	
	2772	N. Davol St via Brayton Ave.	Traffic filter north on Brayton Ave, east on GAR Highway and Brightman St/bridge, south on North Davol St	
	2763	N. Davol St via Brayton Point Rd	All traffic will filter north on Brayton Point Rd, east on GAR Highway and Brightman St/bridge, south on North Davol St	
	2771	N. Davol St via N. Main St - SB	All traffic will filter south on N. Main St, west on Pearce St, south on N. Davol St.	Traffic can also filter south on Robeson St, west on President Ave, south on N. Davol St
	2768/ 2774	N. Davol St via N. Main St - SB	All traffic will filter south on N. Main St, west on Pearce St, south on N. Davol St.	All traffic will filter south on N. Main St, west on President Ave, south on N. Davol St.
	2773/ 2775	N. Davol St via Robeson St	All traffic will filter south on Robeson St, west through President Ave, south through N. Main St, west on Pearce St, north on N. Davol St	All traffic will filter south on Robeson St, west through President Ave, south on N. Davol St
	2776/ 2777/ 2782	N. Davol St via N. Main St - NB	All traffic will filter north on N. Main St, west through Turner, north on N. Davol St	
	2778	N.Davol St via Prospect St	Traffic will filter north on Winter and west on Prospect St, north on N. Main St, west on Turner, north on N. Davol St	
	2785	N. Davol St via Bedford St/Central St	All traffic will filter west on Bedford St, north on Main St, west through Turner, north on N. Davol St	
Battleship Cove 30625				
	2783	Battleship Cove via Columbia St	All traffic filters west on Columbia St, north on Eagle St/Water St	
	2784	Battleship Cove via N. Main St	All traffic filters south on N. Main St, west on Pine St and Central St, south on Water St	
	2787	Battleship Cove via Bay St	Traffic filters north on Bay St, east on William St, north on Eagle St/Water St	
	2788/ 2795	Battleship Cove via Broadway St	Traffic filters north on Broadway St, and north on Eagle St	
	2789	Battleship Cove via S. Main St	Traffic filters north on S. Main St and Hunter St, west on Columbia, north on Eagle St/Water St	
	2790	Battleship Cove via Bedford St	Traffic will filter west on Bedford St, south on Water St	
	2791/ 2794	Battleship Cove via Pleasant St	Traffic filters west on Pleasant St/Pocasset St, south on Water St	
	2796/ 2797	Battleship Cove via Plymouth Ave	Traffic will filter north on Plymouth Ave, west on Middle St, north on Brodway St and Eagle St/Water St	

Barrowsville 30580				
	2455	S. Worcester St. via Maple St	All traffic will filter north or south on Maple St, east through Harvey, northwest on S. Worcester St/Dean St	All traffic will filter north on Dean St OR north on Maple St, west on S. Worcester St
	2453	S. Worcester St. via N. Worcester St	All traffic will filter south on N. Worcester St, west on S. Wocester St.	
	2451	S. Worcester St. via Barrows St.	All traffic will filter south through Taunton Ave, west on Barrows St, southeast on S. Worcester St/Dean St.	All traffic will filter west on W Main St, south through Austin St, southwest on Barrows St
	2450	S. Worcester St via Dean St	All traffic will filter west on E Hodges St, north on Dean St.	All traffic will filter west on S. Worcester St, north on Dean St.
Freetown 30606				
	2806	S. Main St via Narrows Rd	All traffic will filter southeast on Narrows Rd/Causeway Rd, south on S. Main St AND north on S. Main St	
Kings Highway 30633				
	2831	Kings Highway via Church St - SB	All traffic will filter south on Church St, west on Tarkiln Hill Rd/ Kings Highway	
	2833	Kings Highway via Phillips St	All traffic will filter, east on Samuel Barnett Blvd, south on Phillips St/Church St, west on Tarkiln Hill Rd/ Kings Highway	
	2832	Kings Highway via Ashley Blvd	All traffic will filter south on Ashley Blvd, west on Tarkiln Hill Rd/ Kings Highway	
	2834	Kings Highway via Mt Pleasant St	All traffic will filter south on Mt Pleasant St, east on Kings Highway	
	2835	Kings Highway via Church St - NB	All traffic will filter north on Church St, west on Tarkiln Hill Rd/ Kings Highway	
	2836	Kings Highway via Tarkiln Hill Rd (East)	All traffic will filter west on Tarkiln Hill Rd until Kings Highway	
Whales Tooth 30640				
	2868	Mc Arthur Dr via Purchase St	All traffic will filter north on Purchase St, east through Union St, north on Mc Arthur Dr/Acushnet Ave	
	2867	Mc Arthur Dr via S. Front St	All Traffic will filter north on S. Front Street. Some traffic will filter east on Delano St and take the ped. Bridge to S. Front St	
	2864/ 2862	Mc Arthur Dr via Union St	All traffic will filter east on Union St, north on Mc Arthur Dr	
	2863	Mc Arthur Dr via County St	All traffic will filter south/north on County St and north on Pleasant St, east through Hillman St, north on Mc Arthur Dr	
	2861	Mc Arthur Dr via Rt 6 (Mill St/Kempton St)	All traffic will filter east on either Mill Street or Kempton St, north on Purchase St, east through Hillman St, north on Mc Arthur Dr.	All traffic will filter east on Union St, north on Mc Arthur Dr.
	2859	Mc Arthur Dr via Pleasant St	All traffic will filter south on Pleasant St, east on Hillman St, north on Mc Arthur Dr	
	2858/ 2857	Mc Arthur Dr via Hillman St	All traffic will filter, east on Parker St, south on County St, east on Hillman St, north on Mc Arthur Dr	
	2855	Mc Arthur Dr via Logan St	All traffic will filter north/south on Purchase St, east through Logan St, south on Mc Arthur Dr	
	2850	Mc Arthur Dr via Coggeshall St	All traffic will filter east on Coggeshall St, south on Purchase St, east through Logan St, south on Mc Arthur Dr	Traffic will also filter west on Coggeshall St, south on N. Front St, west through Logan St, and south on Mc Arthur Dr.

East Taunton 30589				
	2607	County St via Plain St	All traffic will filter north or south on Plain St, east on Hart St, south on County St	
	2606	County St via Linden St	All traffic will filter south on Linden St, east on Hart St, south on County St	
GATRA 30585				
	2593/ 2597	Oak St via School St	All traffic will filter south on School St and Washington St, west through Taunton Gr, south on Oak St	
	2596	Oak St via Hopewell St	All traffic will filter east on West Brittania St and Danforth St, south through Hopewell St , southwest on Washington St	
	2595/ 2594	Oak St via Tremont St	All traffic will filter east on Tremont St, south on Oak St	
	2592	Oak via Summer St	Traffic will filter north on Summer St, west on Main St and Court St, south on Washington St	
	2591	Oak St via High St	Traffic will filter north on Weir St and High St, west on High Street and Martin Sr Pkwy, south on Oak St	
	2583	Oak St via Cohannett St	Traffic will filter north on Winthrop St, Cohannett St and Somerset St, then west through R Martin Pkwy, south on Oak St	
	2590/ 2585	Oak St via Winthrop St	Traffic will filter north on Winthrop St and Somerset St, west through High St and Martin Sr Pkwy, south on Oak St	
	2588/ 2587	Oak St via Kilmer/Tremont	traffic will filter west through Kilmer St and Tremont St, south or north on Oak St	
	2589	Oak St via Hodges St	All traffic will filter east on Hodges St, south on Oak St	Some traffic will filter north through Winthrop st, west on High St and R. Martin Pkwy, and south on Oak St
	2586	Oak St NB via Highland St	Traffic will filter north on Cohannet St and south on Highland St, east on Oak St	
Dean 30666				
	2590/ 2591	Arlington St via Wier St	Traffic will filter north on Rt 138 (Weir St) and Somerset St, east on Main St, north on Arlington St	
	2603/ 2606	Arlington St via Gordon Riverway	Traffic will filter north through Linden St and Gordon Riverway, west on Rt 44 (Dean St), north on Arlington	
	2592	Arlington St via Main St	Traffic will filter north through Summer St and Prospect Street, east on Main St, north on Arlington St	
	2589	Arlington St via Hodges St	Traffic will filter east on Hodges St an dnorth on Winthrop St, east through Main St, and north on Arlington St	
	2593	Arlington St via Broadway St	Traffic will filter south on Broadway St and School St, east on Main St, north on Arlington	
	2597/ 2599	Arlington St via School	Traffic will filter east on Winter St and Purchase, south through School St, east on Arlington St	
	2598	Arlington St via Longmeadow Rd	Traffic will filter south on Longmeadow Rd and S. Main St, west on Dean St, north on Arlington	
	2600	Arlington St via Bay St	Traffic will filter south on Bay St and Arlington St	

Raynham				
30653				
	2529	Turnpike St (Rt. 138)	Traffic will filter east and west through Foundry St, south on Turnpike St and Washington St	
	2556	Broadway St (Rt. 138)	Traffic will filter west on Wilbur St and Elm St, east on Bridge St and Elm St, north on Broadway St	Some traffic will filter north through Robinson St and west on Wilbur St, north on Rt 138
Easton North				
30651	1716	Roche Bros via Plain St	Traffic will filter east on Plain St, south on Wier St, east on Plain St, south on Washington St (Rt. 138)	Part of the traffic will filter south on N. Main St, east on Elm St, and north on Rt. 138 to Roche Bros. Way
Easton Village				
30652	2523	Easton Village via Center St	Traffic will filter east on Depot St (Rt. 123), north on Center St, north on Sullivan Rd	
	2519	Easton Village via Rockland St	Traffic will filter east on Rockland St, north and south on Bay Rd to Lincoln St, east on Lincoln St and north on Rt. 138 to Roche Bros. Way	
	2524	Easton Village via Main St SB	Traffic will filter south on Canton and Main St, west on Elm St, east through Oliver St	
	2525	Easton Village via Union St	Traffic will filter west on Union St/Pleasant St, south on Rt. 138, west on Elm St, south on Main St, east on Oliver St	
	2526	Easton Village via Pearl St	Traffic will filter north on Pearl St, west on Main St, north on Sullivan Rd	

Google Maps

Address **Davol St**
Fall River, MA

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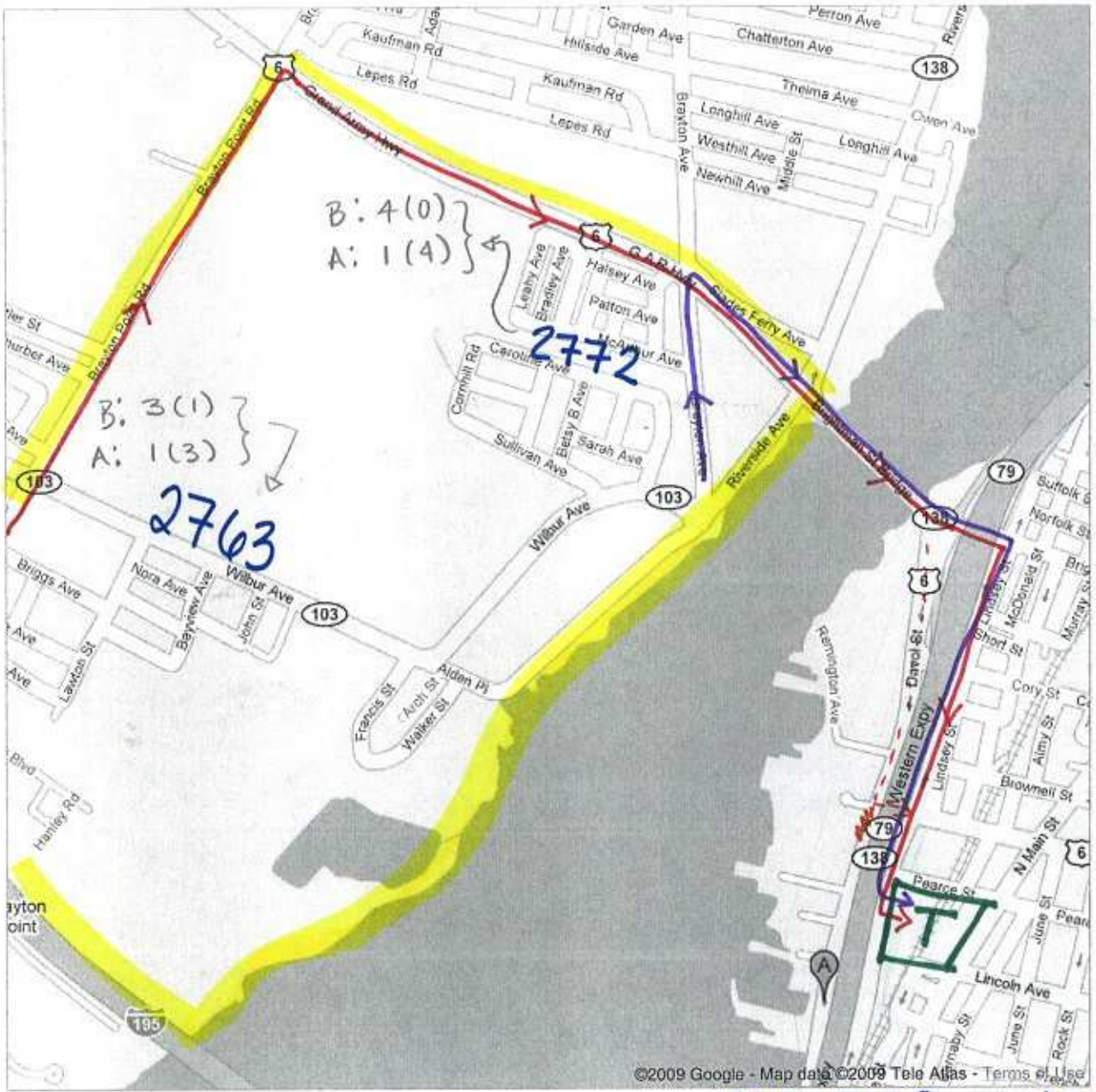

SCR - Fall River Depot

TAZ: 2772 & 2763

TAZ

Train Station Location

TAZ code

Ped Route for TAZ 2763

Ped Route for TAZ 2772

Google Maps

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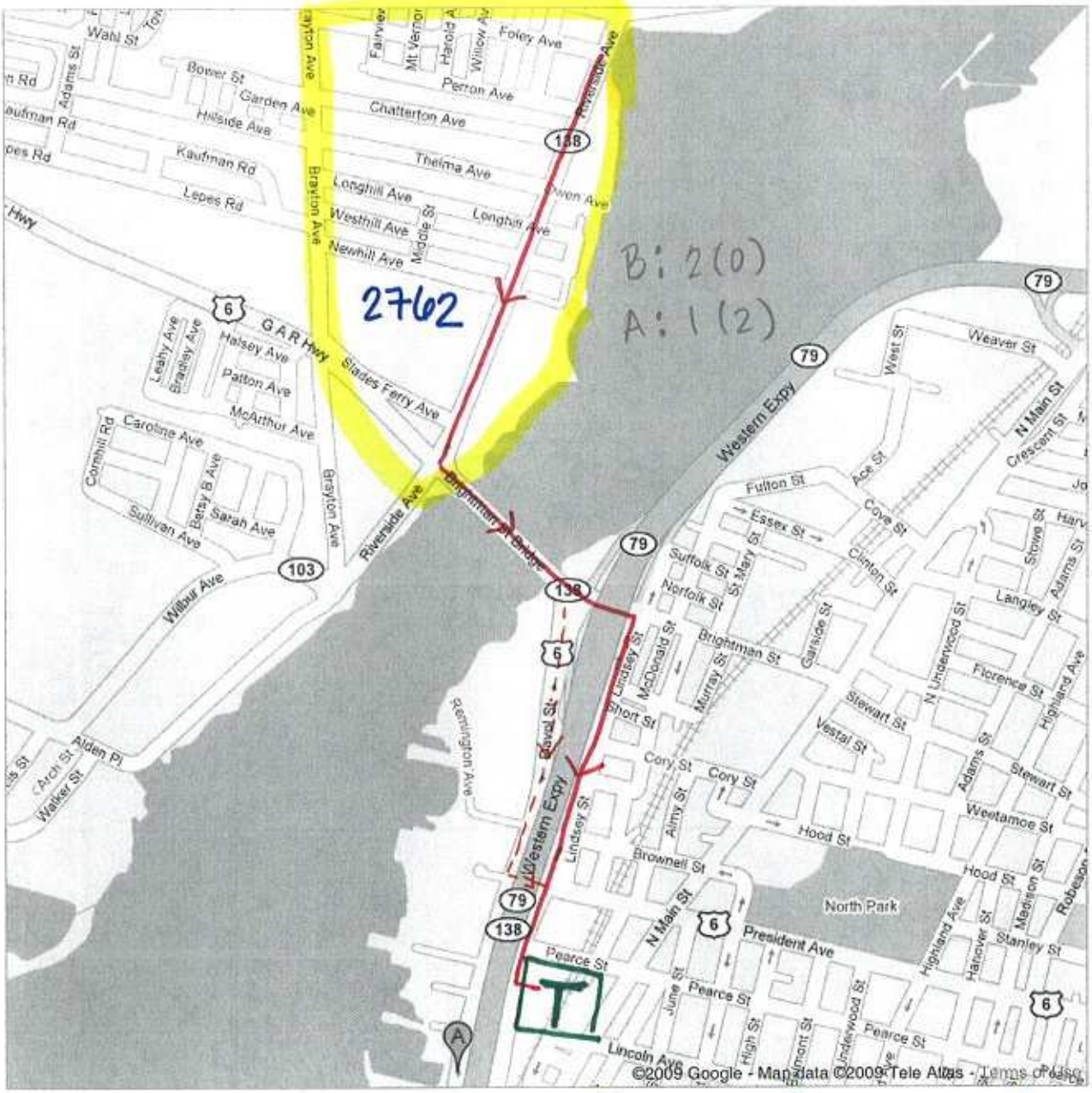

TAZ
Pedestrian Route
Train Station Location
TAZ number

GCR - Fall River Depot
TAZ: 2762

Bike

Google Maps

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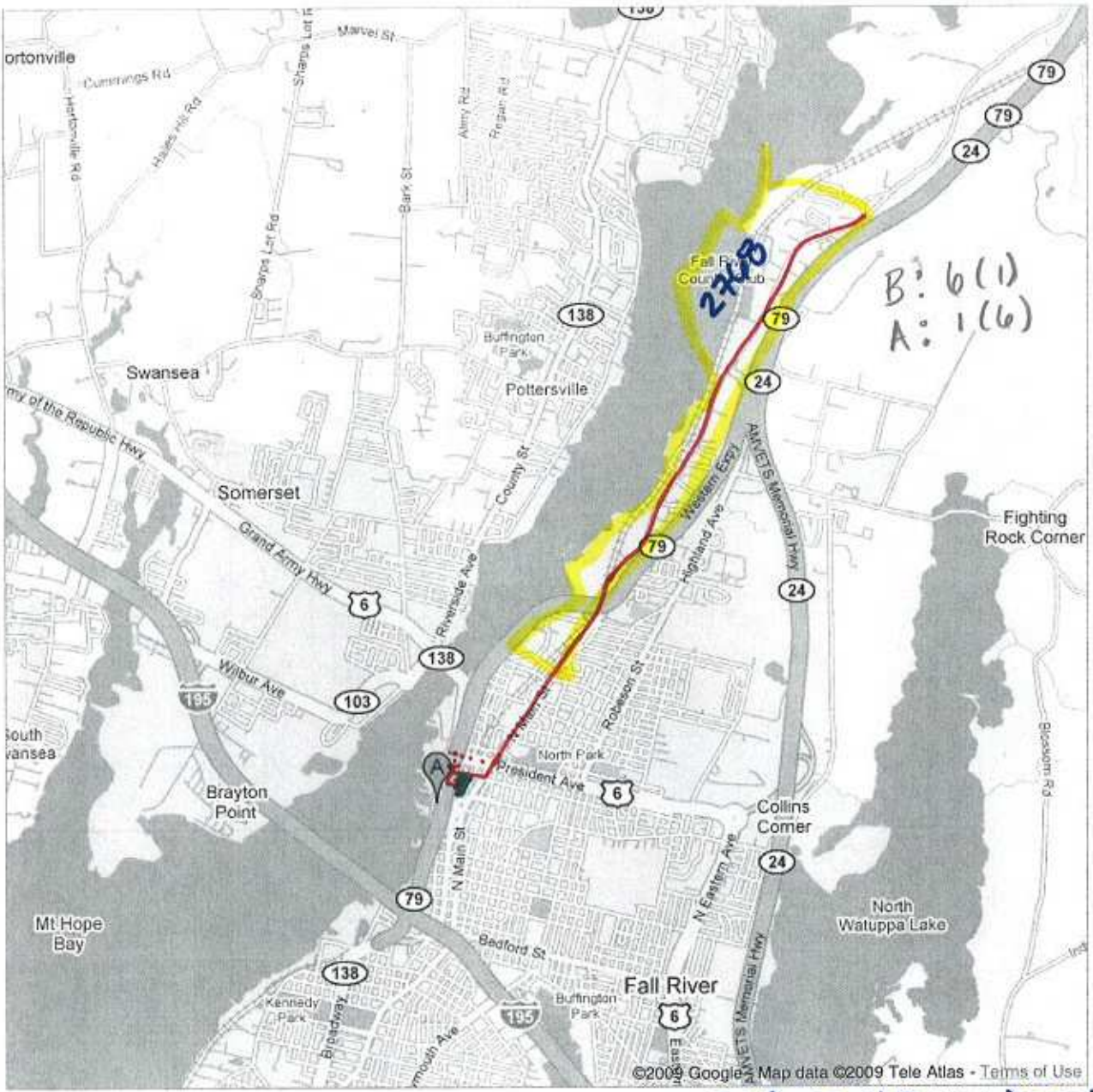

SCR - Fall River Depot
TAZ: 2768

Google Maps

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Fall River, MA

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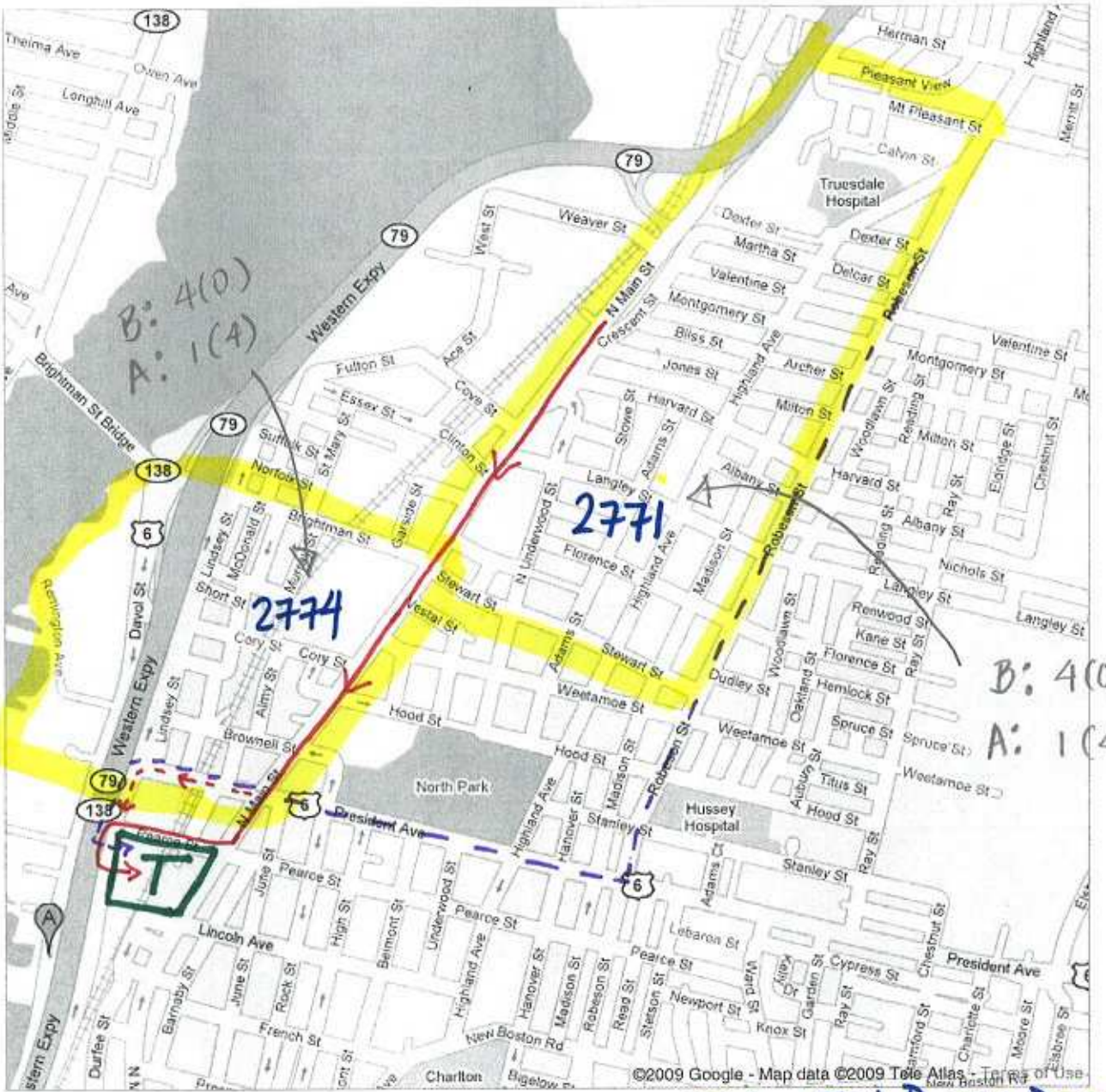

SCR - Fall River Depot

TAZ: 2771 & 2774

TAZ

Fall River Depot station

TAZ code

Ped route to train station for both TAZs

--- alternate ped route for both TAZs

--- alternate route for TAZ 2771 only

Google Maps

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Fall River, MA

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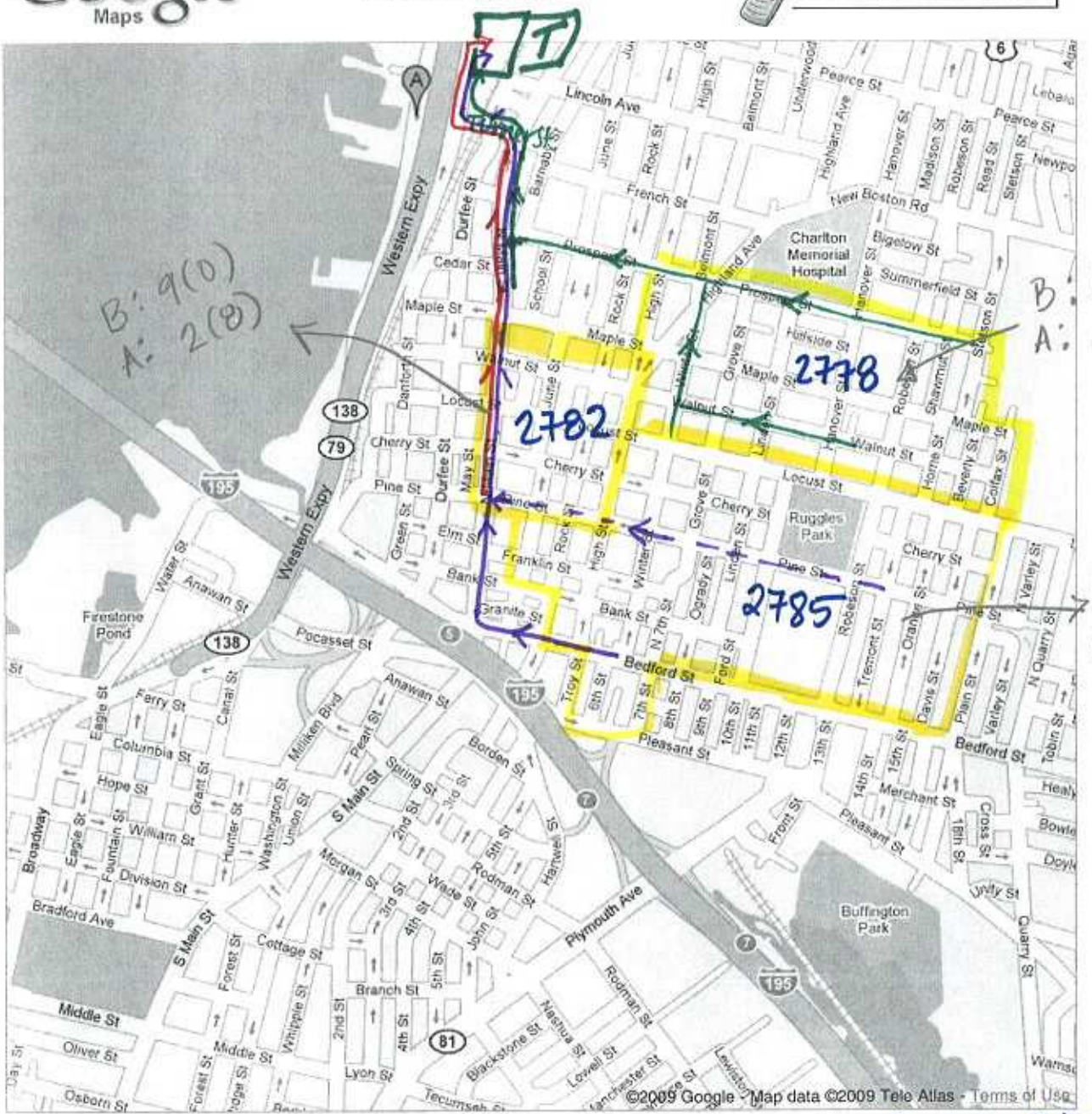

T Fall River Depot Station

Fall River Depot Station

TAZ: 2782 & 2785 & 2778

— Ped route to train station from TAZ 2782

— Ped route to train station from TAZ 2785

- - - Alternate ped route to train station from TAZ 2785

— Ped route to train station from TAZ 2778

Google Maps

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Fall River, MA

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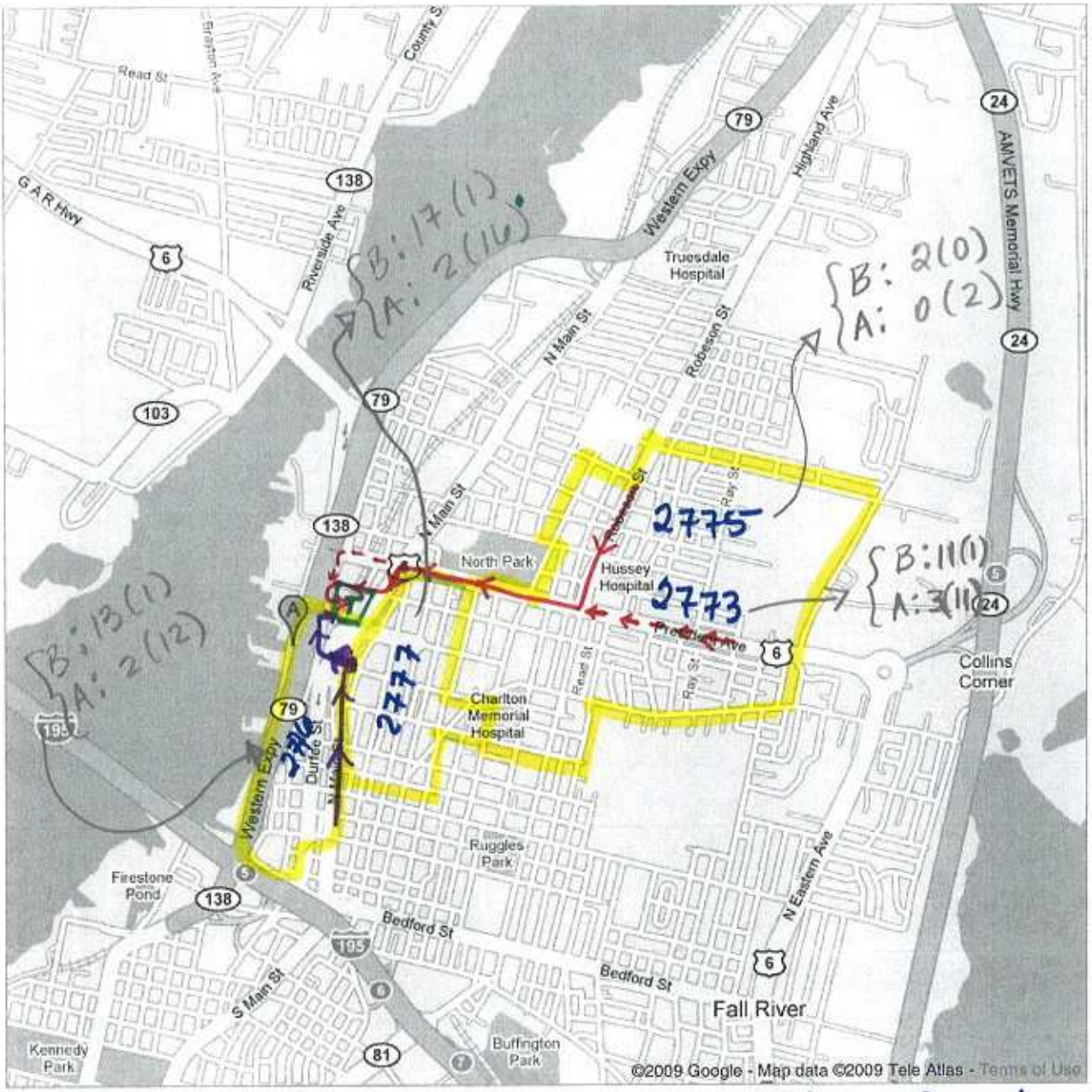

Fall River Depot

TAZ: 2775 & 2773
2777 & 2776

- TAZ
- Fall River Depot Station
- # TAZ code
- Ped Route to train station for both TAZ
- alternate ped route for both TAZ (2775 and 2773)
- Ped route to train station for taz 2777 and 2776

Google Maps

Address **President Ave & Davol St**
Fall River, MA 02720

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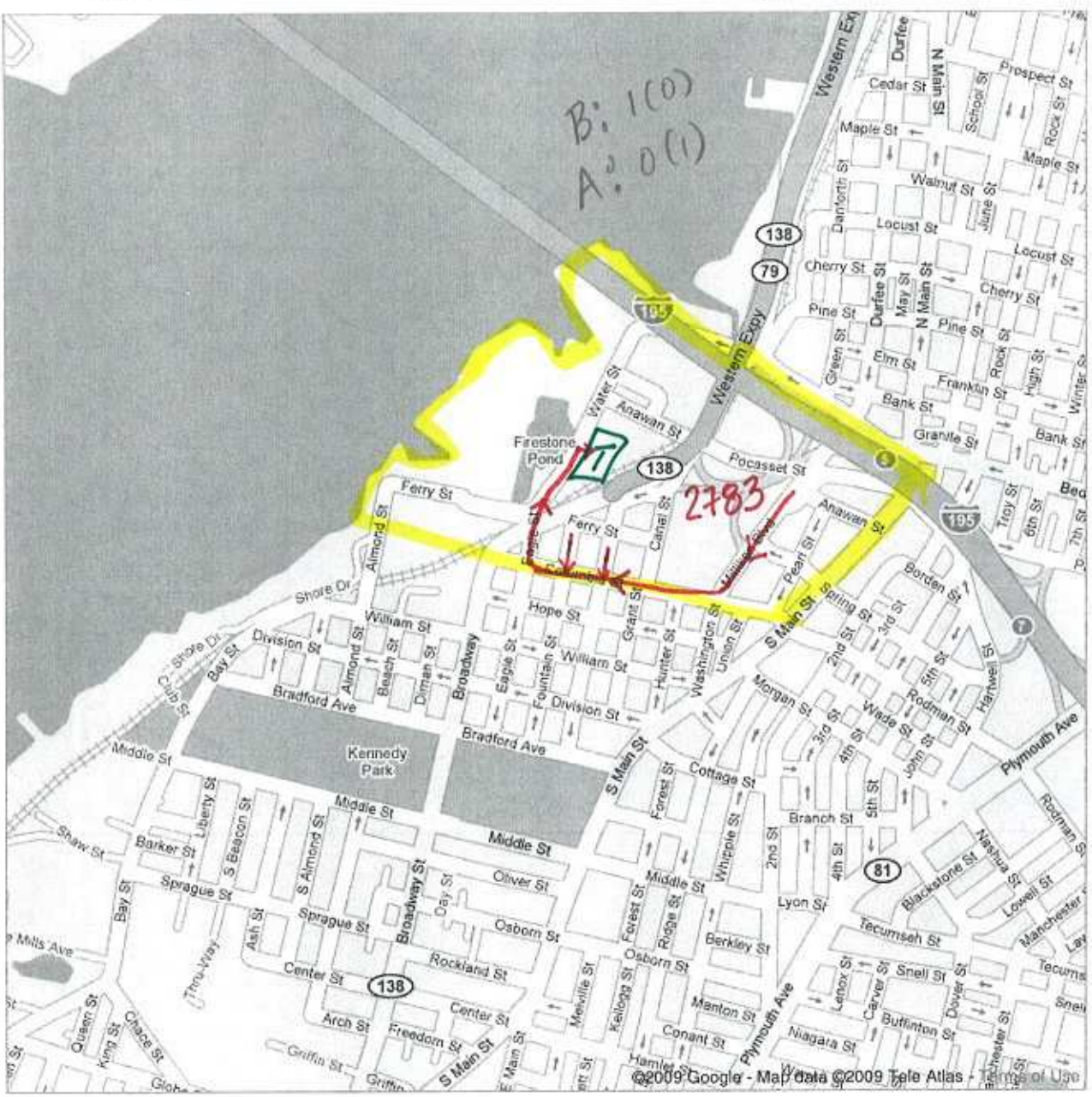

T Battleship Cove Station

– Ped route to Battleship Cove Station from TAZ 2783

Google Maps

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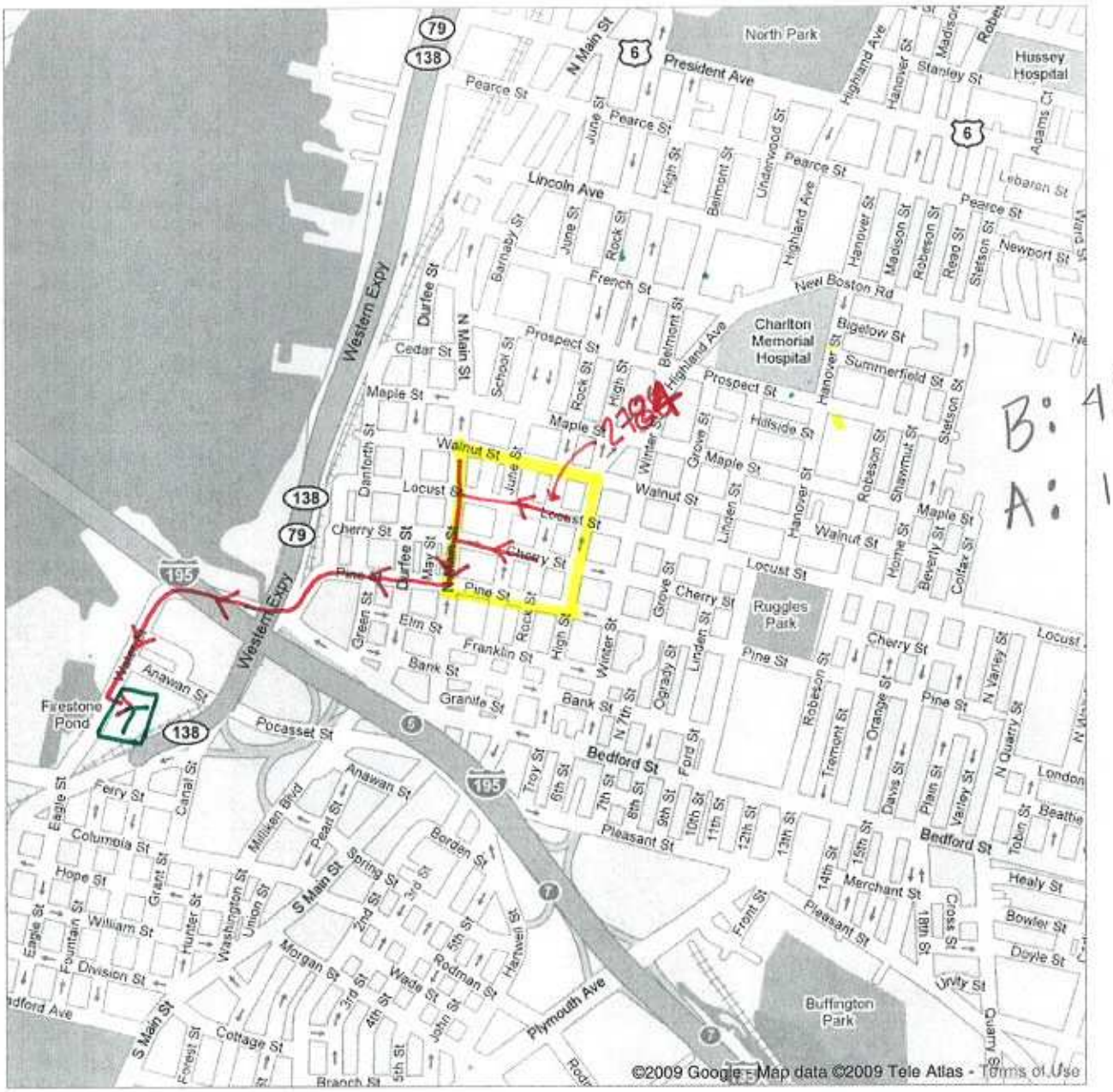

T Battleship Cove Station

— Ped route to Battleship Cove Station from TAZ 2784

Bike

Google Maps

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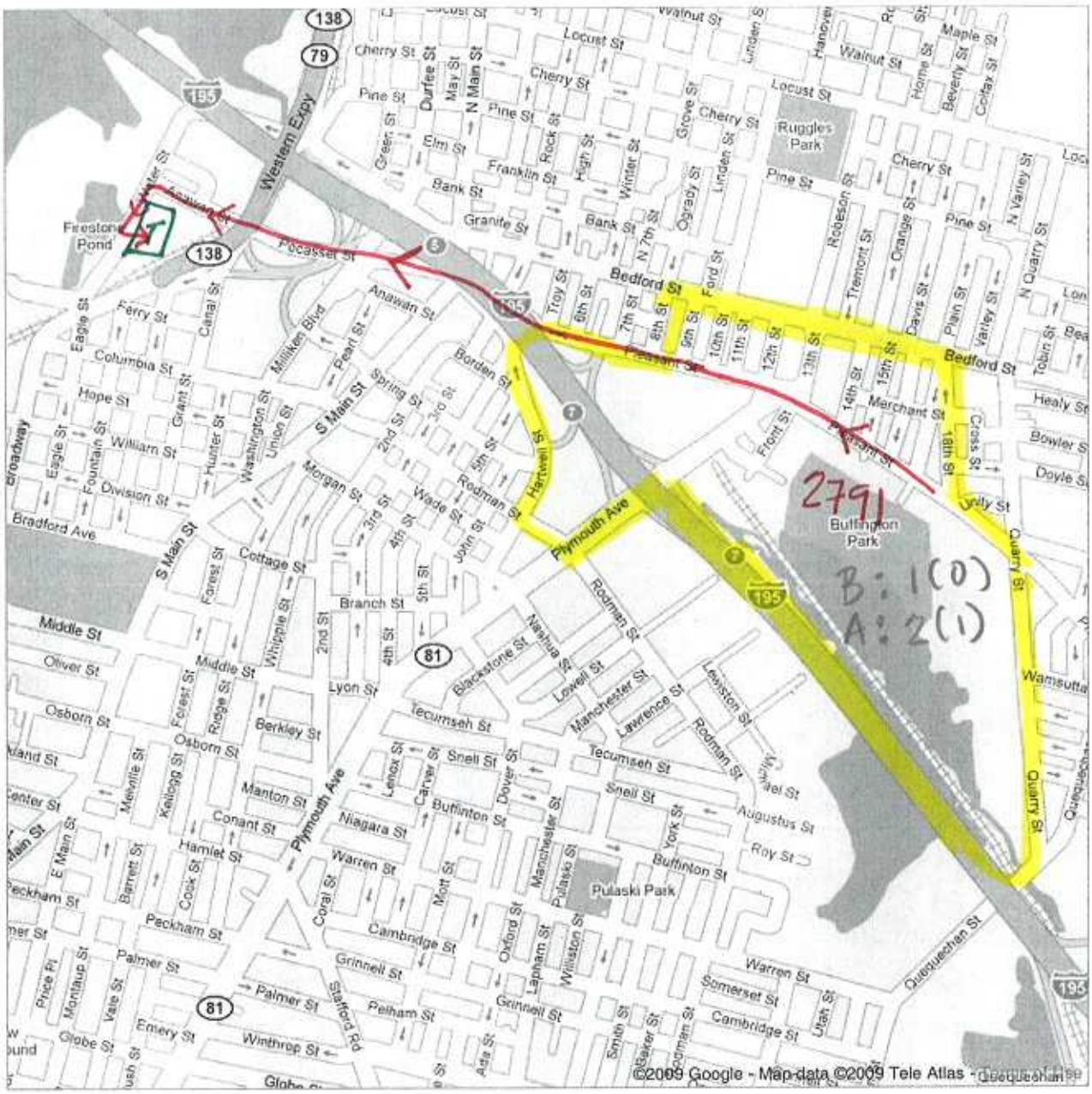

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T Battleship Cove Station

– Ped route from TAZ 2791 to Battleship Cove Station

Bike

Google Maps

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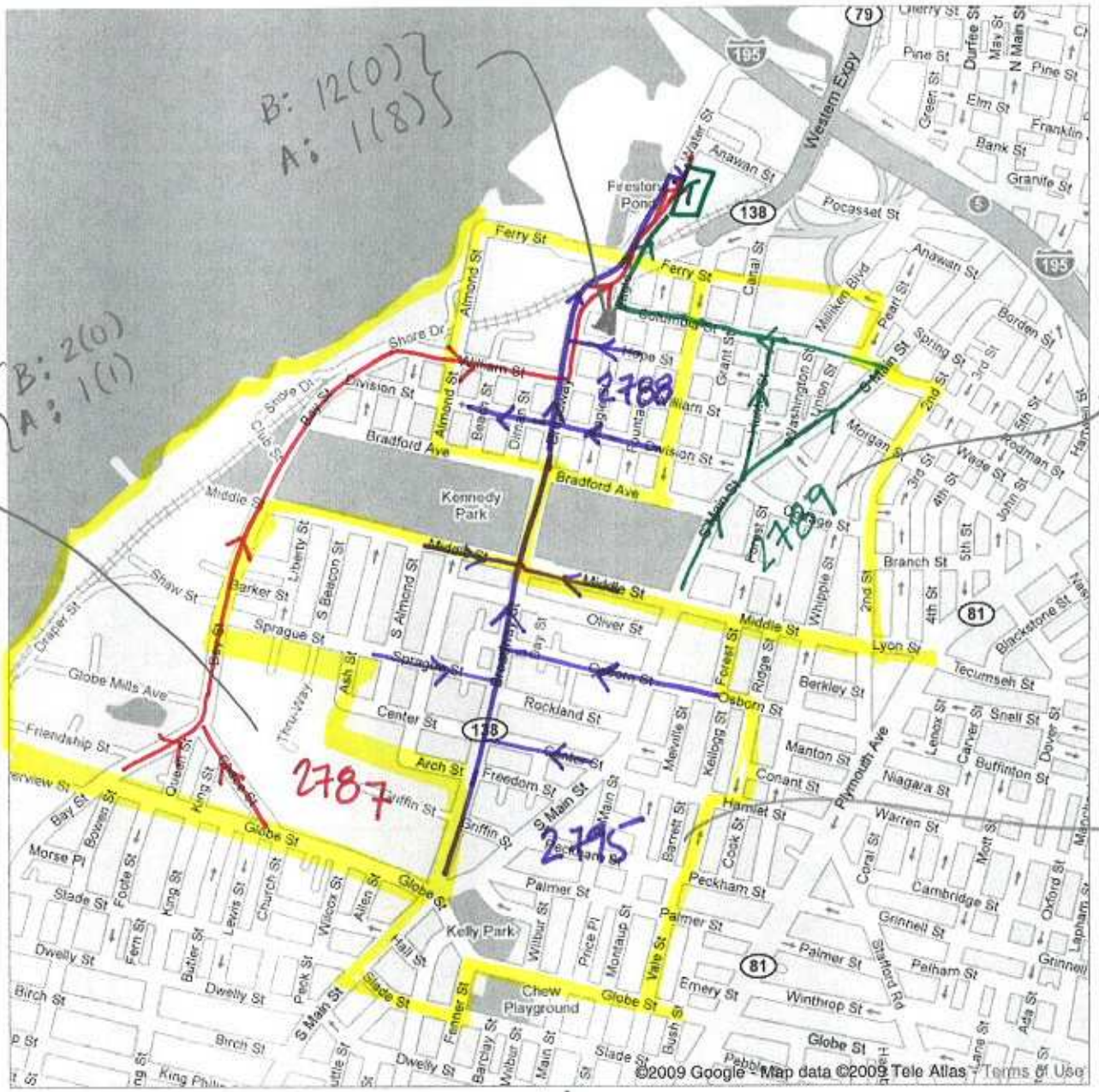
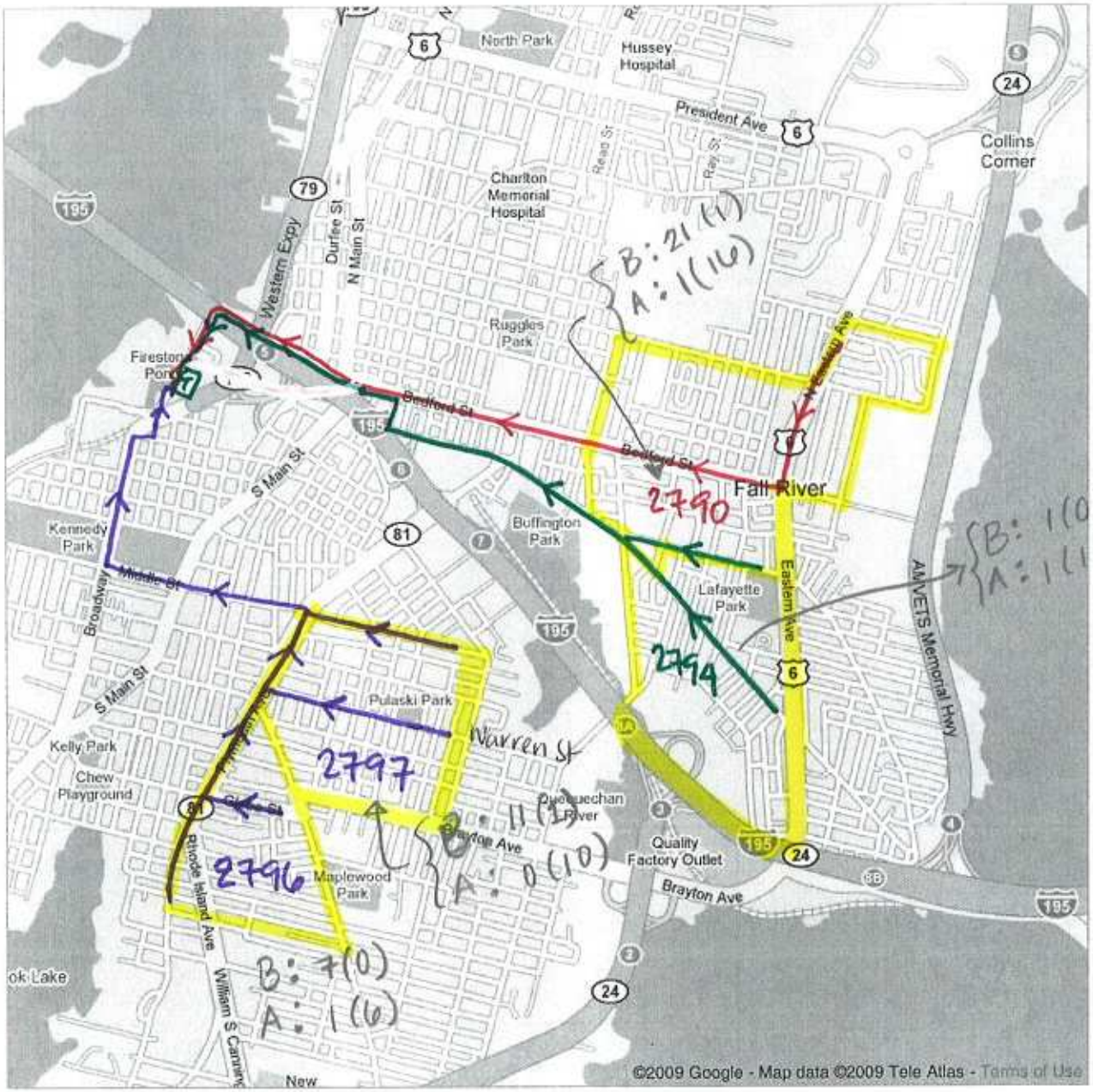

B: 12(0)
A: 1(8)
B: 2(0)
A: 1(1)
B: 19(1)
A: 1(15)
B: 10(0)
A: 1(9)
2788
2789
2787
2795
Kennedy Park
Kelly Park
Chew Playground
Bradford Ave
Middle St
Globe St
Palmer St
Peckham St
Western Expy
Pocasset St
Ferry St
Anawan St
Bank St
Granite St
Pine St
Elm St
Franklin
Shaw St
Sprague St
Rockland St
Center St
Arch St
Freedom St
Griffin St
Oliver St
Lyon St
Branch St
Berkley St
Tecumseh St
Niagara St
Warren St
Cambridge St
Grinnell St
Pelham St
Winthrop St
Emery St
Globe Mills Ave
Friendship St
Morse Pl
Stade St
Dwelly St
Birch St
Manton St
Conant St
Hamlet St
Buffinton St
Snell St
Blackstone St
Division St
Bay St
Water St
Almond St
Main St
Pleasant St
Columbia St
Hope St
Milliken Blvd
Pearl St
Spring St
Borden St
Morgan St
Wade St
Rodman St
Whipple St
Ridge St
Forest St
Osborn St
Plymouth Ave
Coral St
Cook St
Barnett St
Melville St
Kellogg St
Lenox St
Carver St
Dover St
Oxford St
Laphams St
Stafford Rd
Valle St
Wilbur St
Price Pl
Montaup St
Fenner St
Barclay St
Bush St
Hall St
Allen St
Willcox St
Peck St
Butler St
Fern St
Foote St
King St
Levis St
Church St
Bowen St
Queen St
Thurlway
Liberty St
S Beacon St
S Almond St
Ash St
Barker St
Draper St
Middle St
Shore Dr
Club St
Division St
Bradford Ave
Almond St
Bay St
Durfee St
May St
N Main St
Green St
Canal St
Clashington St
Union St
Graham St
Whipple St
2nd St
3rd St
4th St
5th St
John St
Hanover St
Water St
Columbia St
Hope St
Pleasant St
Main St
Osborn St
Rockland St
Center St
Arch St
Freedom St
Griffin St
Peckham St
Palmer St
Globe St
Slade St
Hall St
Dwelly St
Birch St
Morse Pl
Bay St
Bowen St
Queen St
King St
Levis St
Church St
Fern St
Foote St
Butler St
Peck St
Willcox St
Allen St
Wilbur St
Price Pl
Montaup St
Valle St
Barclay St
Fenner St
Bush St
Main St
Barnett St
Cook St
Coral St
Mott
Oxford St
Laphams St
Stafford Rd
Grinnell St
Pelham St
Winthrop St
Emery St
Globe St
Manton St
Conant St
Hamlet St
Buffinton St
Snell St
Blackstone St
Tecumseh St
Berkley St
Branch St
Lyon St
Middle St
Oliver St
Sprague

Google Maps

Address **President Ave & Davol St**
Fall River, MA 02720

Get Google Maps on your phone
Text the word "GMAPS" to 466453



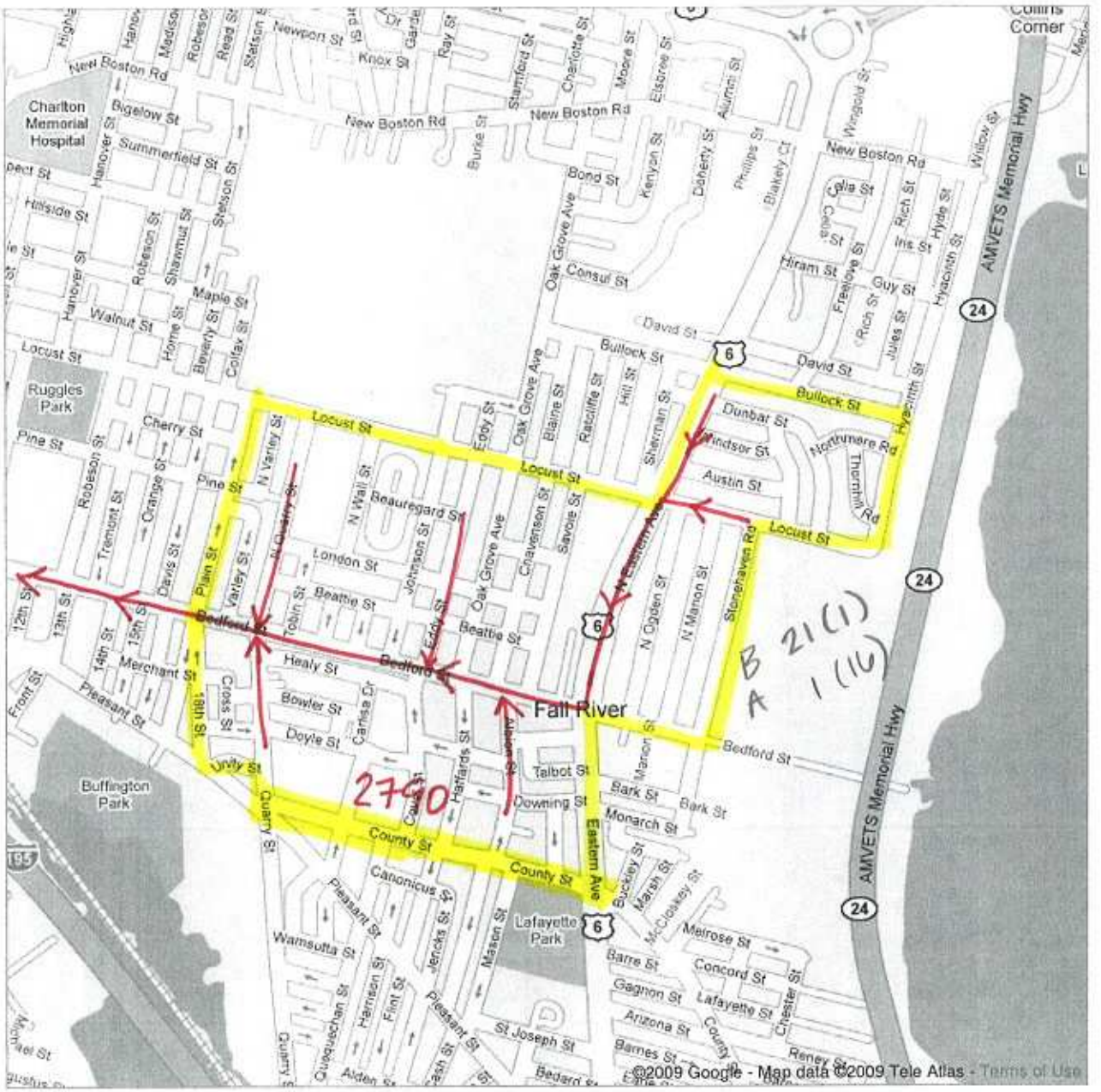
T Battleship Cove Station

- Ped route to Battleship Cove Station from TAZ 2790
- Ped route to Battleship Cove Station from TAZ 2794
- Ped routes to Battleship Cove Station from TAZs: 2796 & 2797

Google Maps

Address **President Ave & Davol St**
Fall River, MA 02720

Get Google Maps on your phone
Text the word "GMAPS" to 466453

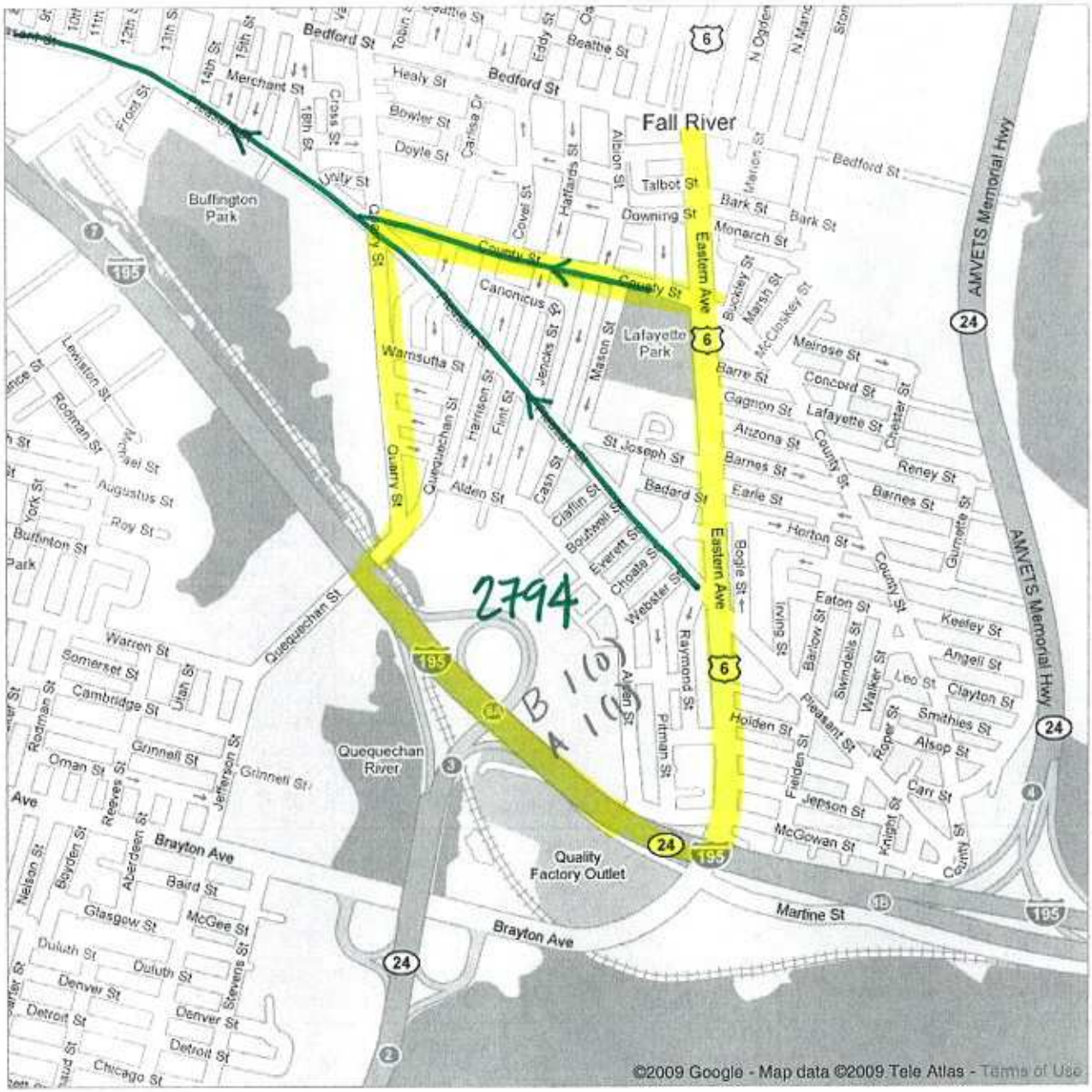


— Ped route from 2790

Google Maps

Address **President Ave & Davol St**
Fall River, MA 02720

Get Google Maps on your phone
Text the word "GMAPS" to 466453

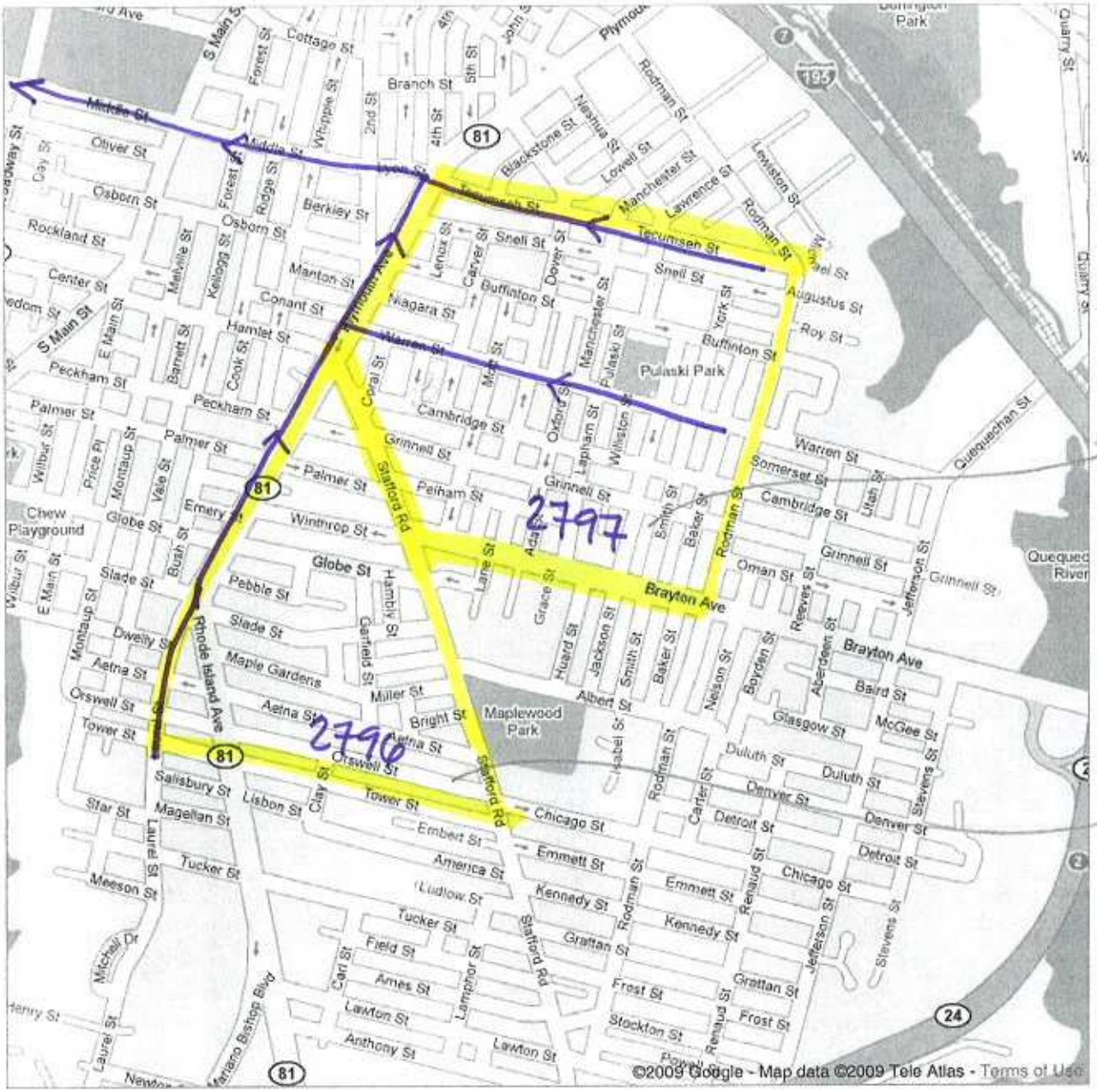


– Ped Route to Battleship Cove from TAZ 2794

Google Maps

Address **President Ave & Davol St**
Fall River, MA 02720

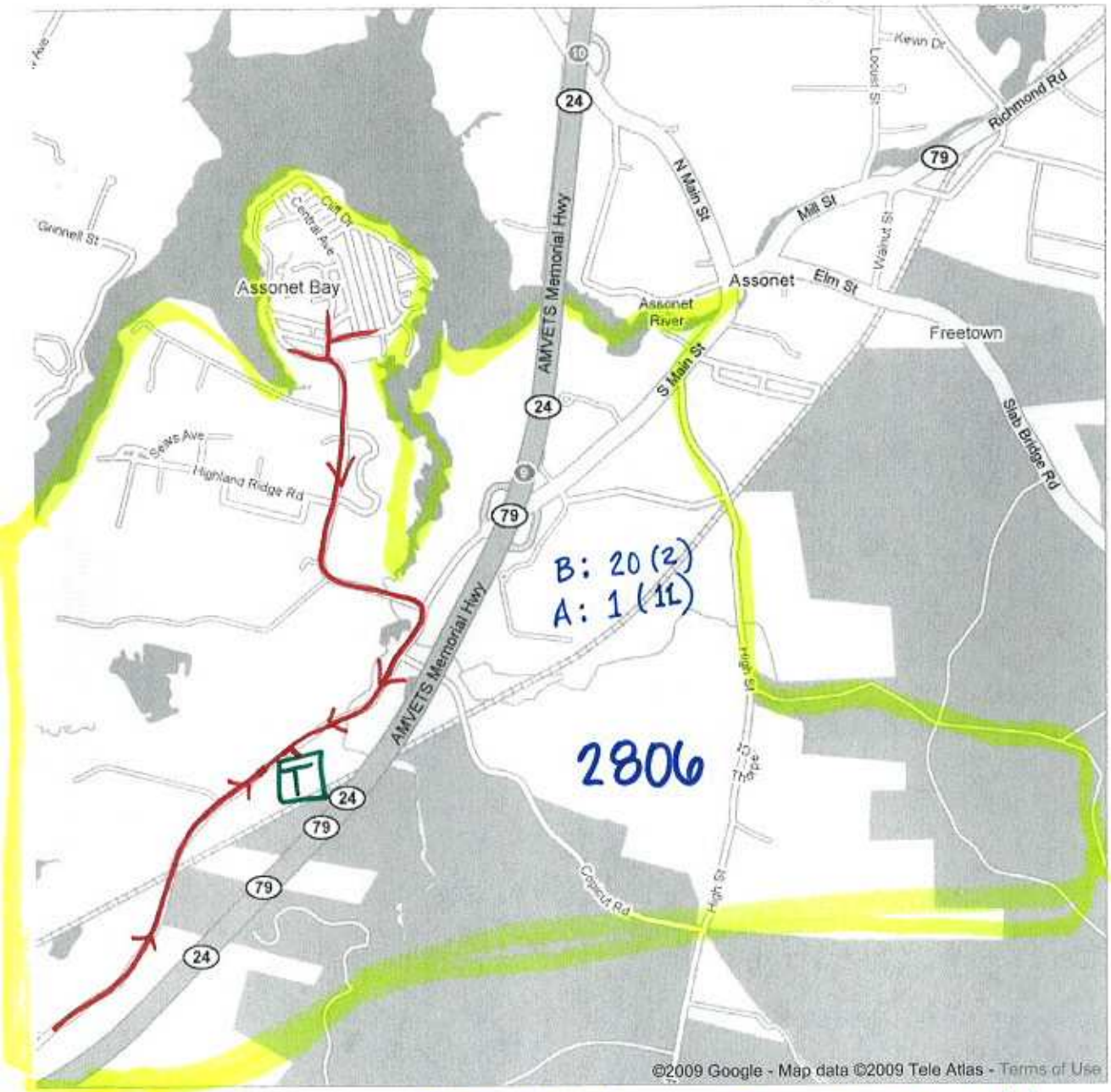
Get Google Maps on your phone
Text the word "GMAPS" to 466453



- Ped routes to Battleship Cove from TAZs: 2796 & 2797

Google maps

Get Google Maps on your phone
Text the word "GMAPS" to 466453



TAZ 2806 Freetown, MA

T Freetown Station

— Pedestrian Route to Freetown Station

B : Boardings

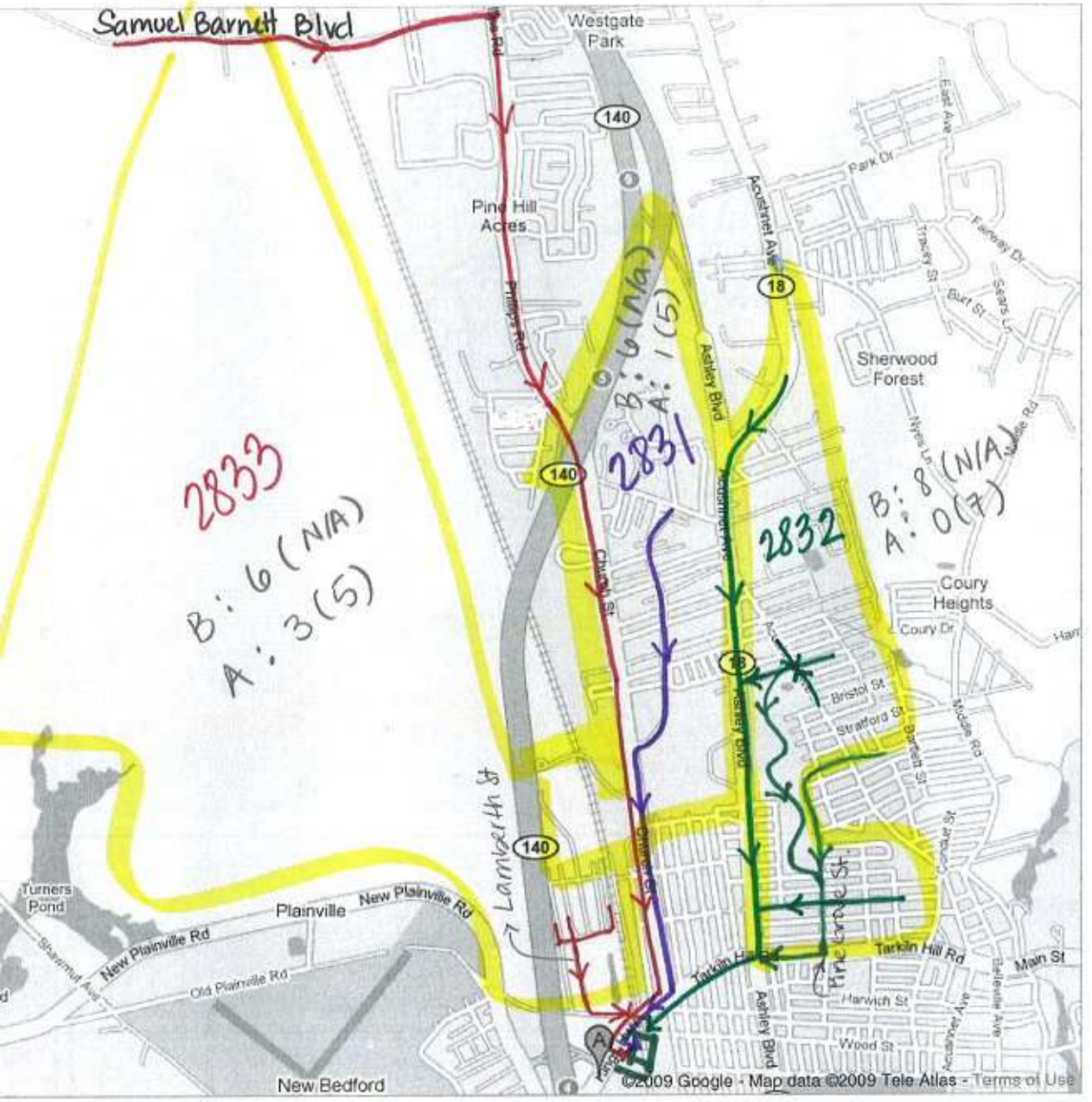
A : Alightings

xx (xx) : AM (PM)

Google Maps

Address **Kings Hwy**
New Bedford, MA 02745

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Kings Highway Station

— Pedestrian route to Kings Highway Station through Wildwood Rd (TAZ 2831)

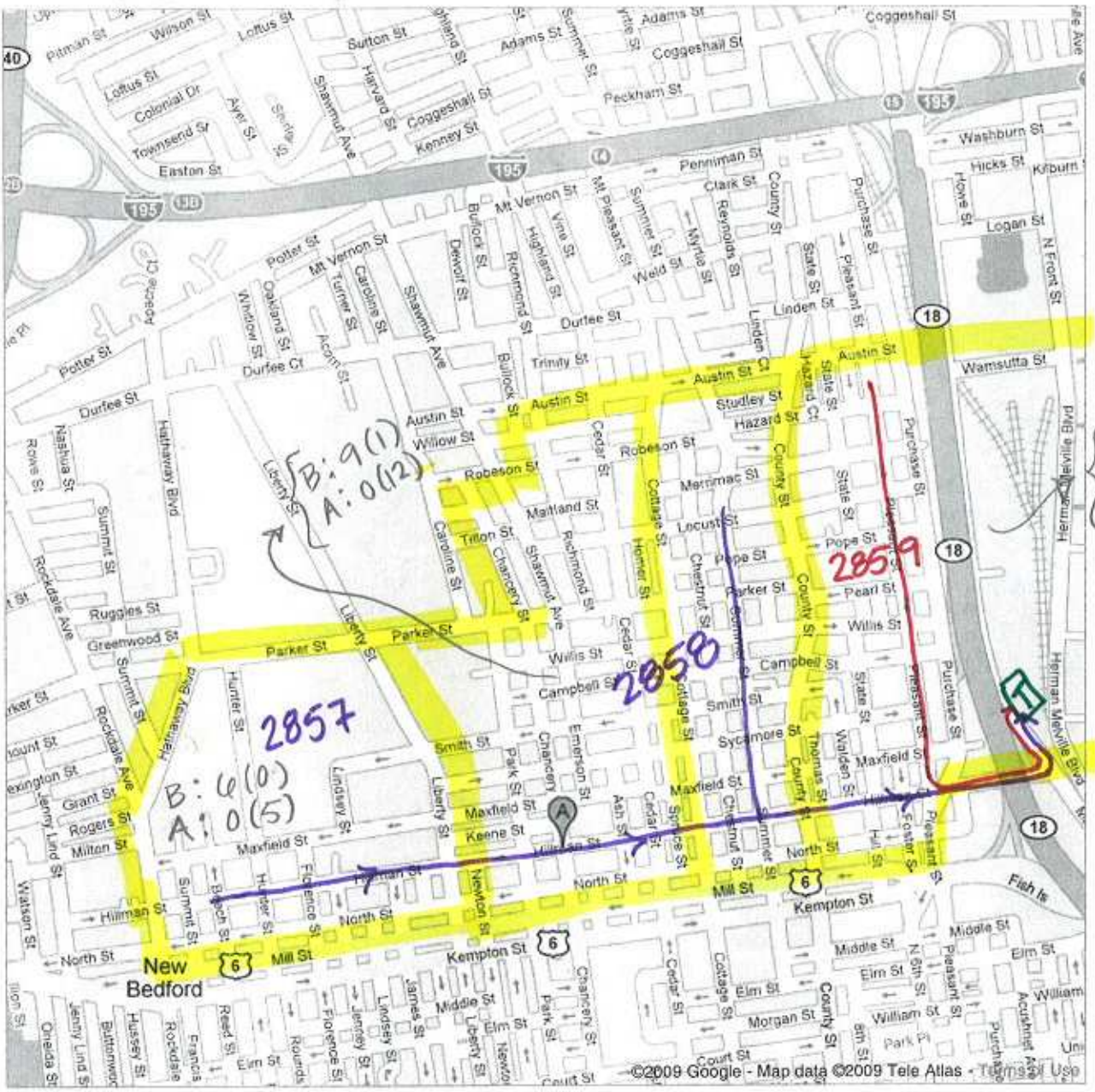
— Pedestrian route to Kings H. Station through Phillips St. (TAZ 2833)

— Pedestrian route to Kings Highway Station from TAZ 2832.

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453



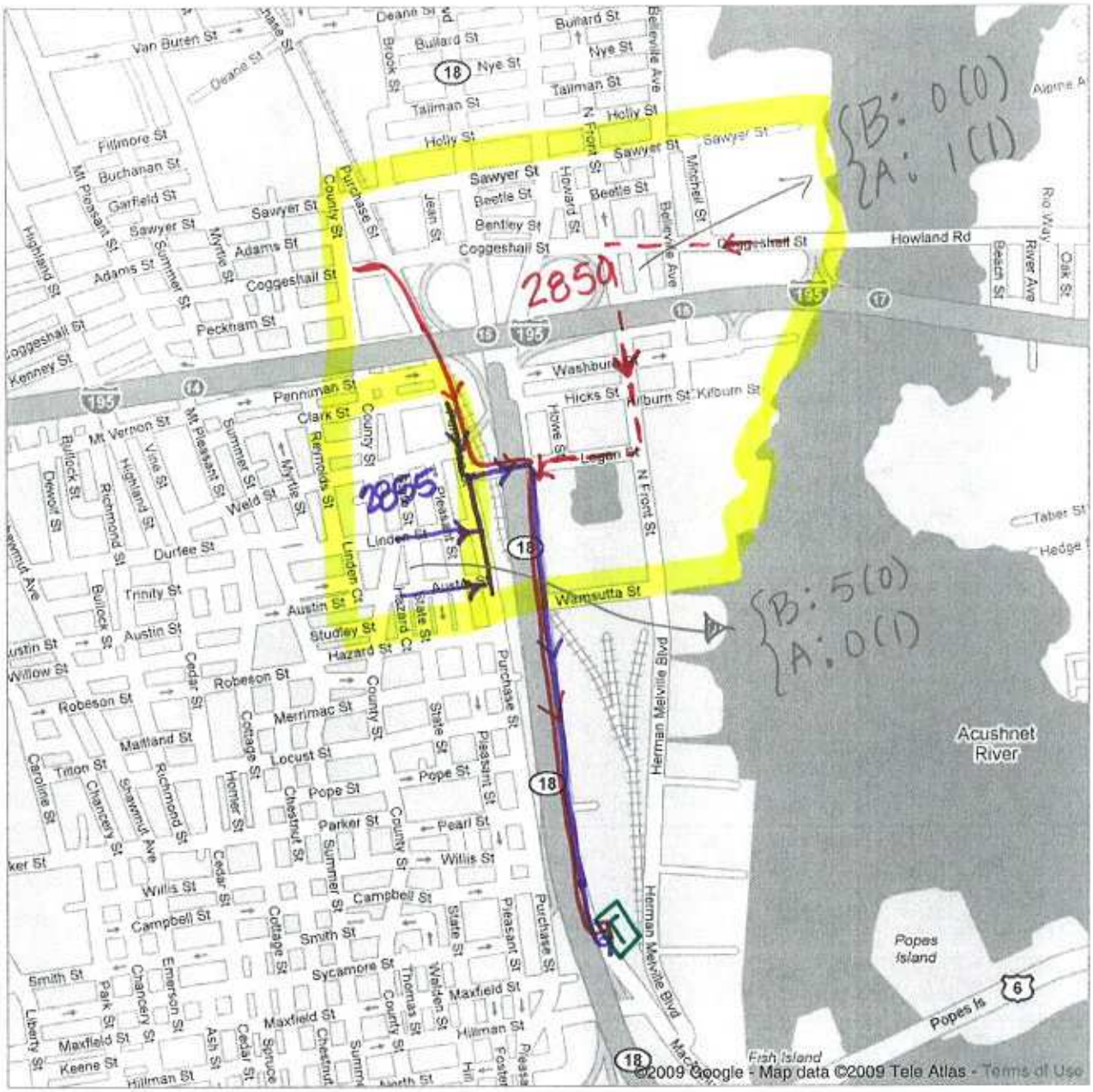
[T] Whales Tooth station

- Ped route to Whales Tooth Station from TAZs: 2857 & 2858
- Ped route to Whales Tooth Station from TAZ 2859

Google Maps

Address **Union St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Whales Tooth Station

— Ped route to Whales Tooth Station from TAZ 2850

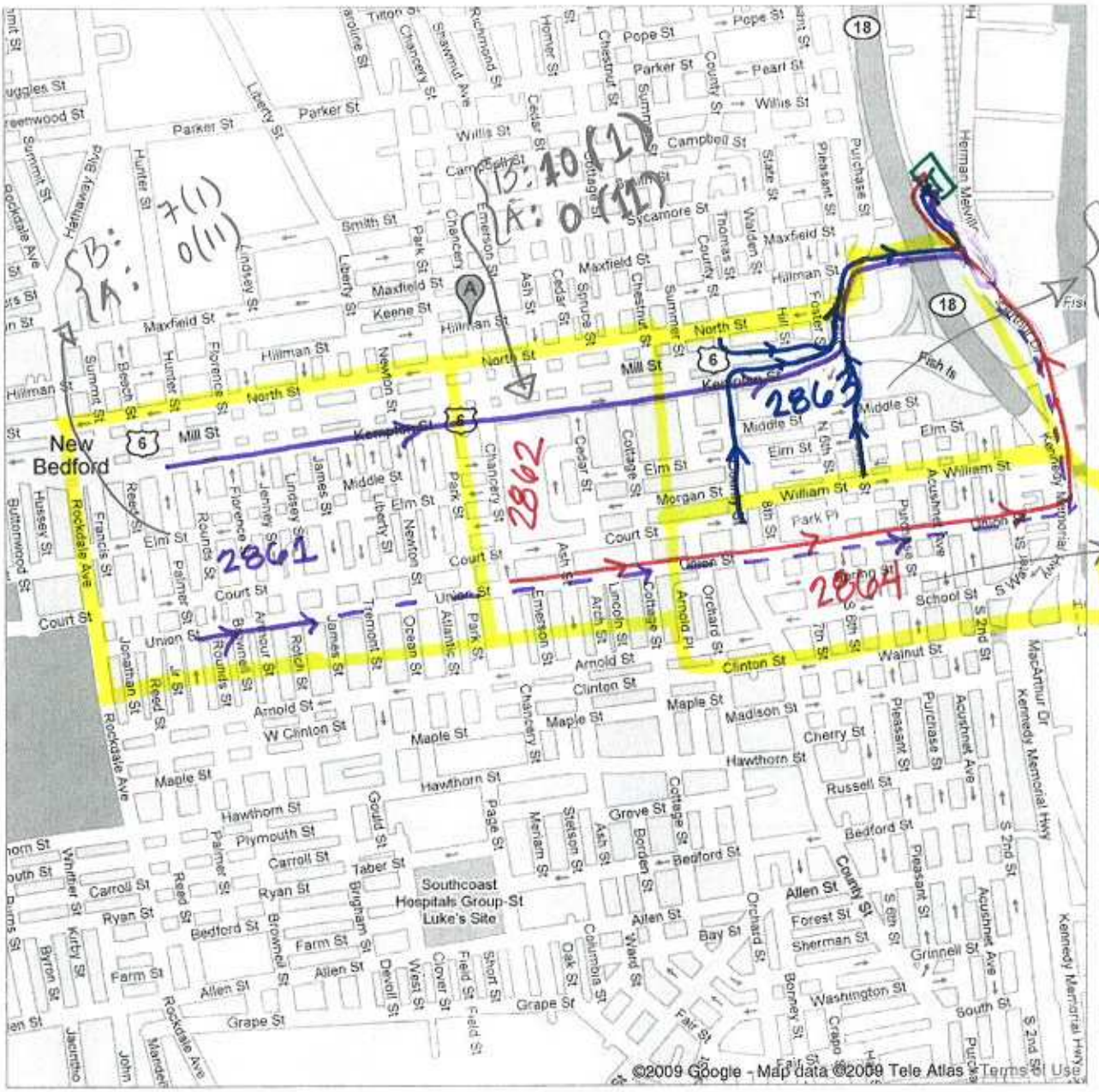
--- Alternate ped route through N. Front St.

— Ped route to Whales Tooth Station from TAZ 2855

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Whales Tooth Station

— Ped route to Whales Tooth Station from TAZ 2861

--- Alternate ped rout from TAZ 2861 (through Union St.)

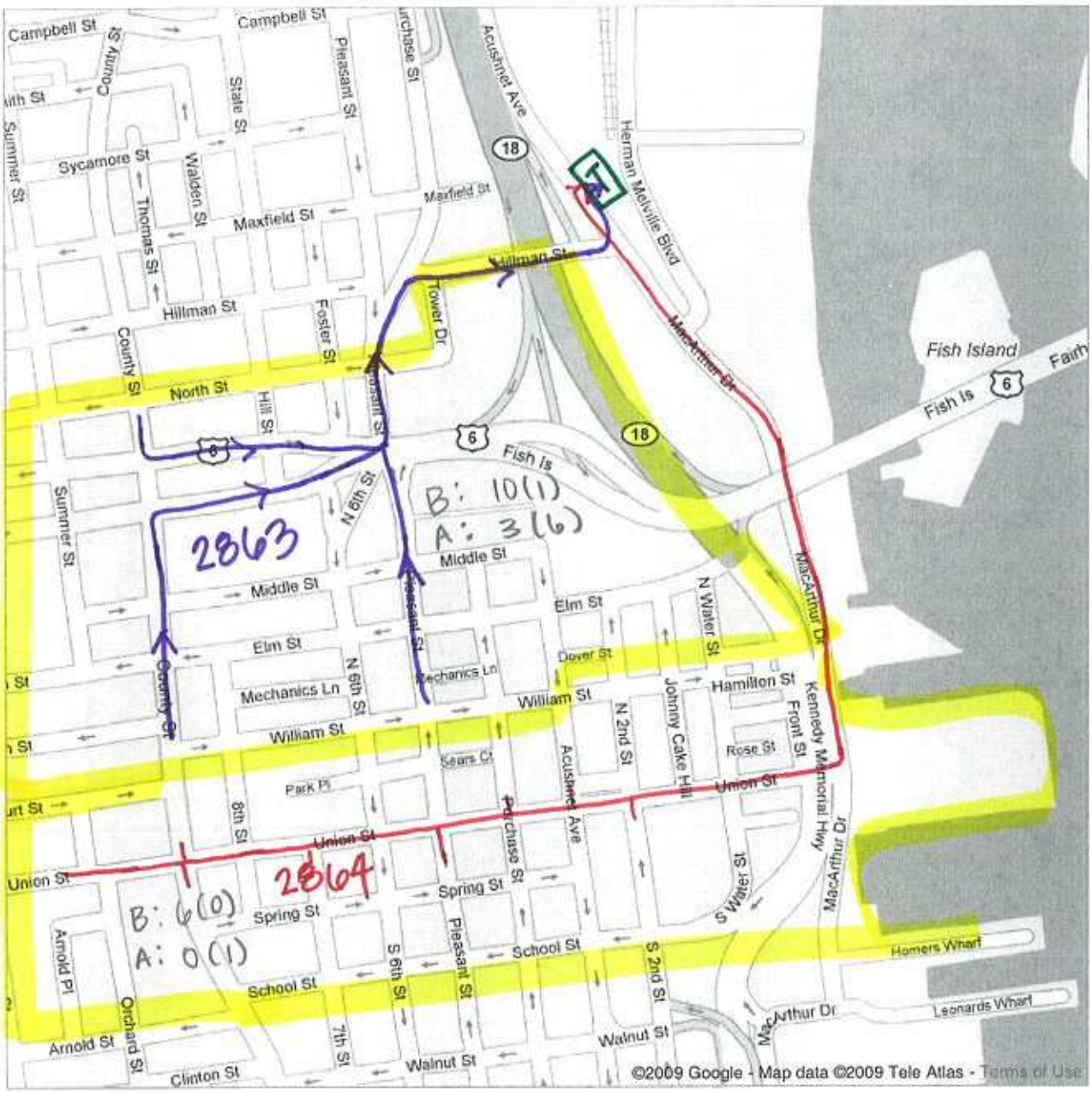
— Ped route to Whales Tooth Station from TAZs 2862 & 2864

— Ped route to Whales Tooth Station from TAZ 2863

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Whales Tooth station

— Ped route to Whales Tooth Station from TAZ 2863

— Ped Route to " " " from TAZ 2864

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453

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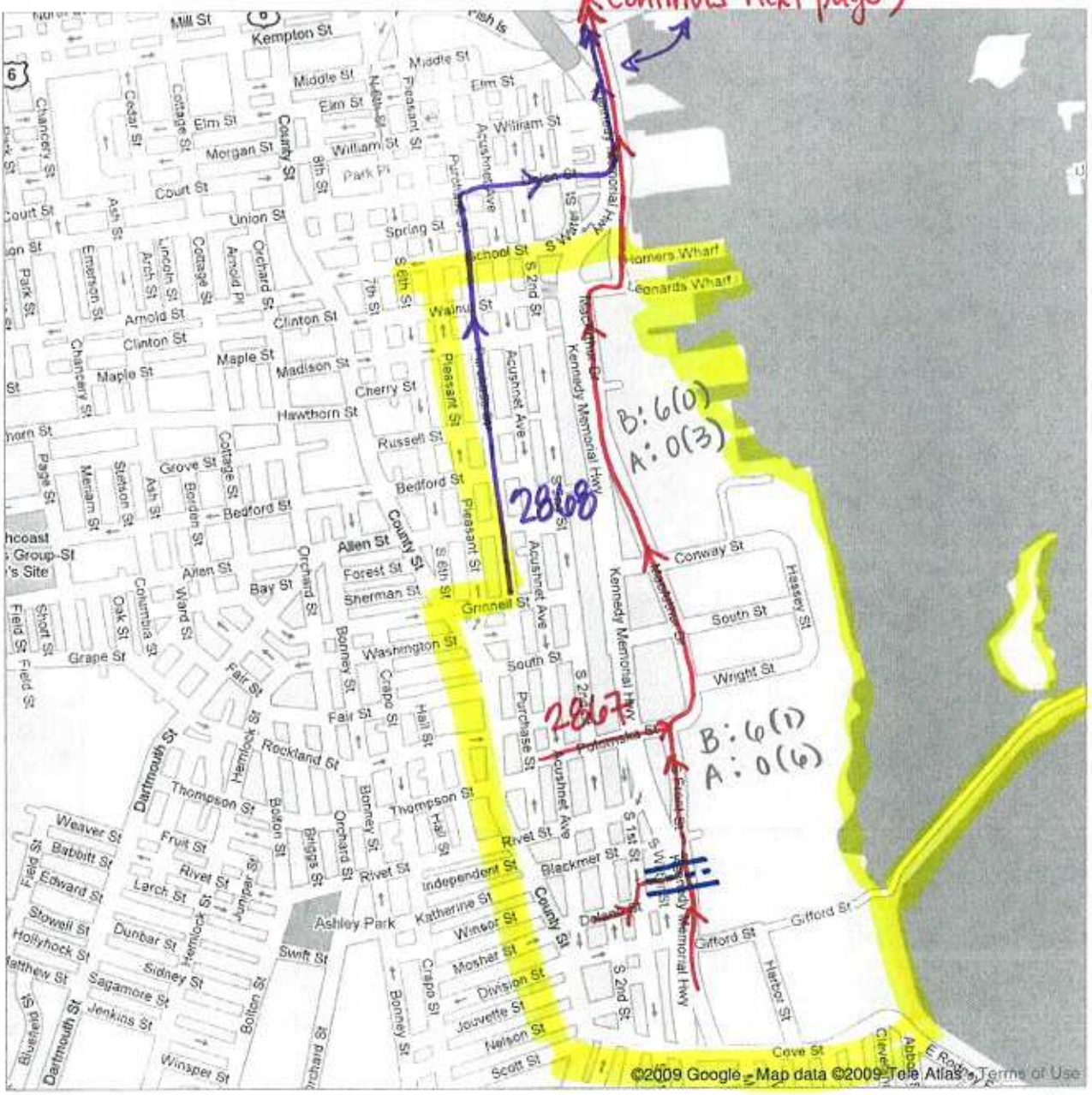

2868
2867
B: 6(0)
A: 0(3)
B: 6(1)
A: 0(6)
Kempton St
Middle St
Elm St
William St
Morgan St
Court St
Union St
Spring St
School St
Walnut St
Clinton St
Maple St
Madison St
Cherry St
Hawthorn St
Russell St
Bedford St
Allen St
Forest St
Sherman St
Grinnell St
Bay St
Washington St
South St
Wright St
Corway St
Rockland St
Thompson St
Weaver St
Fruit St
Rivet St
Blackmer St
Independent St
Katherine St
Winsor St
Mosher St
Division St
Jouvette St
Nelson St
Scott St
Cove St
Gifford St
Harbor St
Ashley Park
Swift St
Sagamore St
Sidney St
Dunbar St
Stowell St
Hollyhock St
Jenkins St
Winspear St
Kennedy Memorial Hwy
Homers Wharf
Leonards Wharf
Pleasant St
Acushnet Ave
Purchase St
Hillman St
Columbia St
Hemlock St
Dartmouth St
Bolton St
Orchard St
Bonney St
Hall St
Crapo St
County St
S 1st St
S 2nd St
S 6th St
Hazard St
Heasley St
Grape St
Oak St
Field St
Short St
Ash St
Stetson St
Merriam St
Page St
Cottage St
Arnold St
Lincoln St
Emerson St
Park St
Chancery St
Cedar St
Pleasant St
Borden St
Viard St
Babbitt St
Edward St
Larch St
Juniper St
Hemlock St
Bolton St
Orchard St
Bonney St
Crapo St
Hall St
Purchase St
Acushnet Ave
Blackmer St
Independent St
Rivet St
Thompson St
Rockland St
Fair St
Grape St
Bay St
Allen St
Forest St
Sherman St
Grinnell St
Bedford St
Russell St
Hawthorn St
Cherry St
Madison St
Maple St
Clinton St
Arnold St
Orchard St
Union St
Spring St
Court St
Morgan St
Elm St
Middle St
Kempton St
Mill St
Fish Is
Kennedy Memorial Hwy
Homers Wharf
Leonards Wharf
Corway St
South St
Wright St
Heasley St
Gifford St
Harbor St
Cove St
Ashley Park
Swift St
Sagamore St
Sidney St
Dunbar St
Stowell St
Hollyhock St
Jenkins St
Winspear St
Dartmouth St
Bolton St
Orchard St
Bonney

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453

2

↓ cont. on next page
prev.

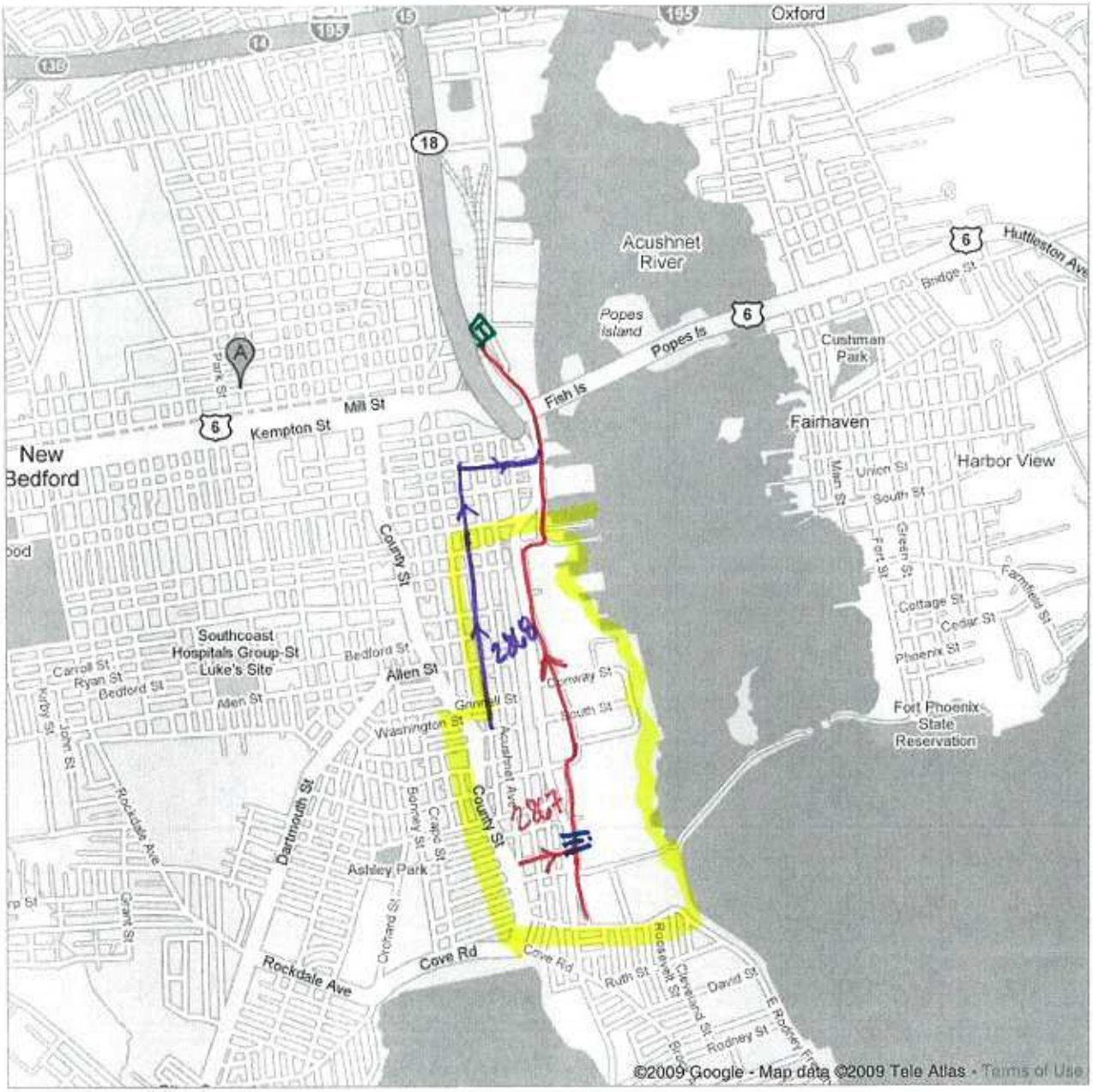
T Whales Tooth Station

Google Maps

Address **Hillman St**
New Bedford, MA 02740

Get Google Maps on your phone
Text the word "GMAPS" to 466453

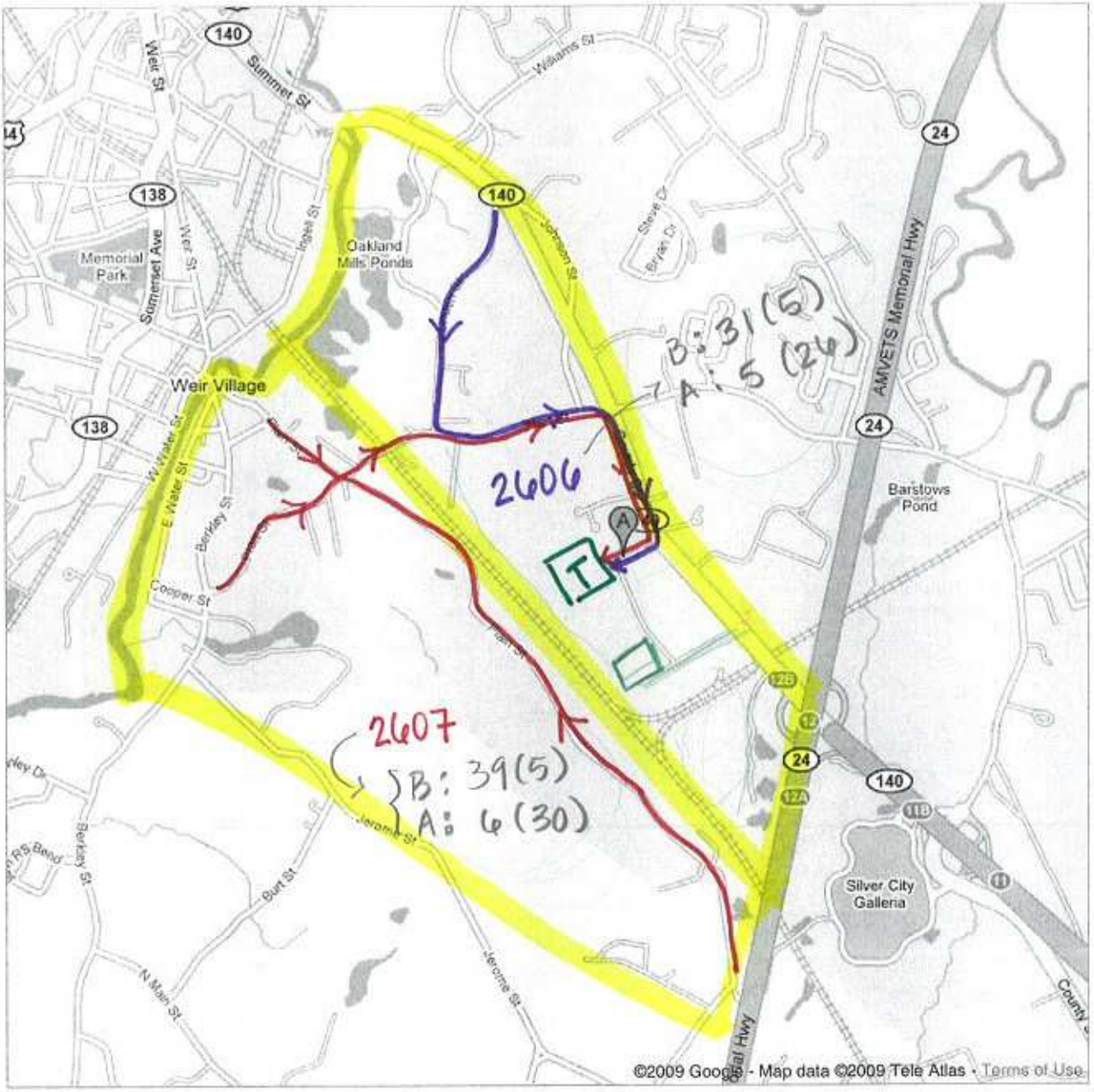
3



Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T East Taunton Station

– Ped route to E. Taunton Station from TAZ 2606

– Ped route to E. Taunton Station from TAZ 2607

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453

B 3(2)
A 2(7)
2598

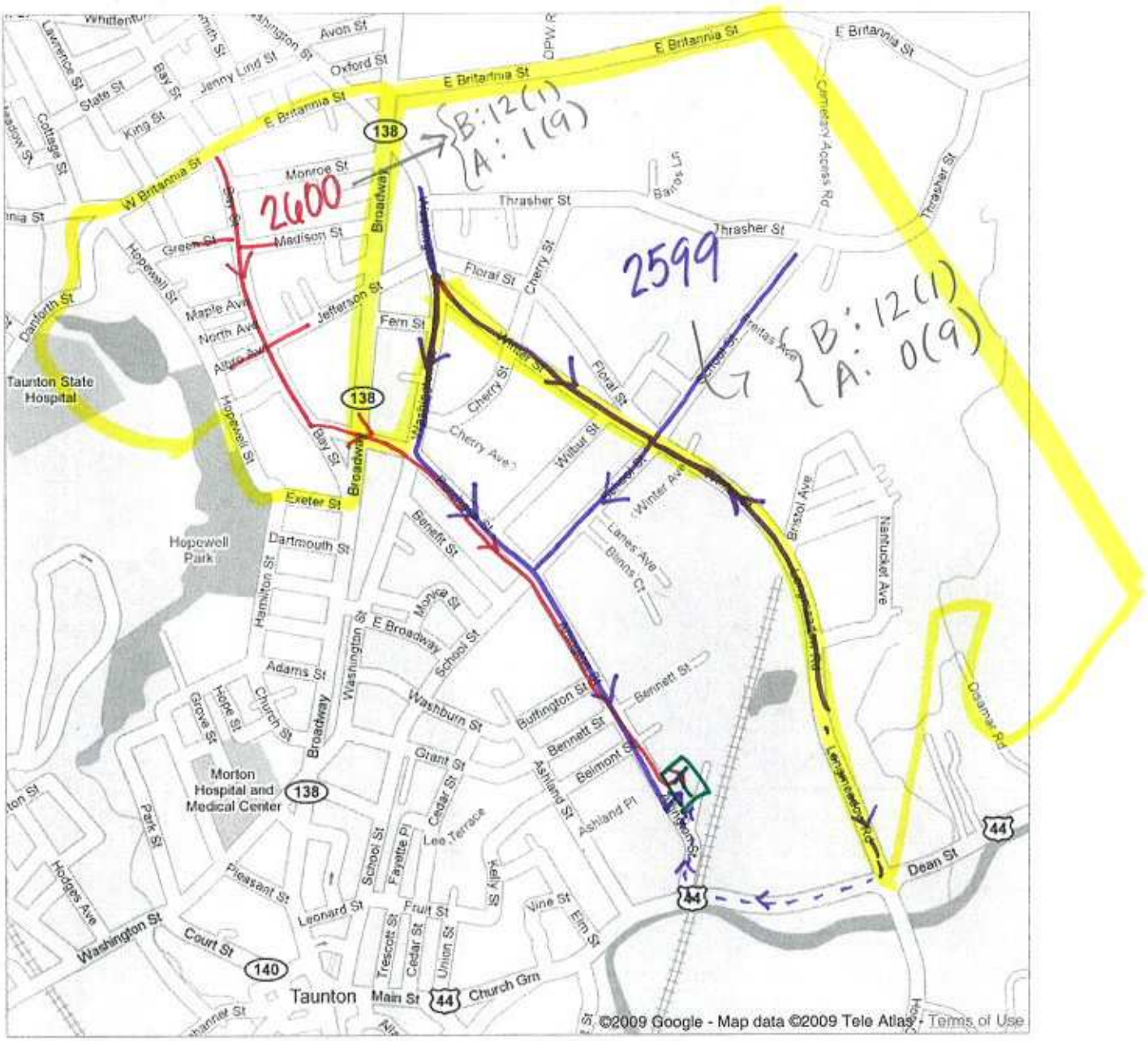
[T] Taunton Station (Dean St)

– Ped route to Taunton Station from 2598

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T (Dean St) Taunton Station

— Ped route from TAZ 2600

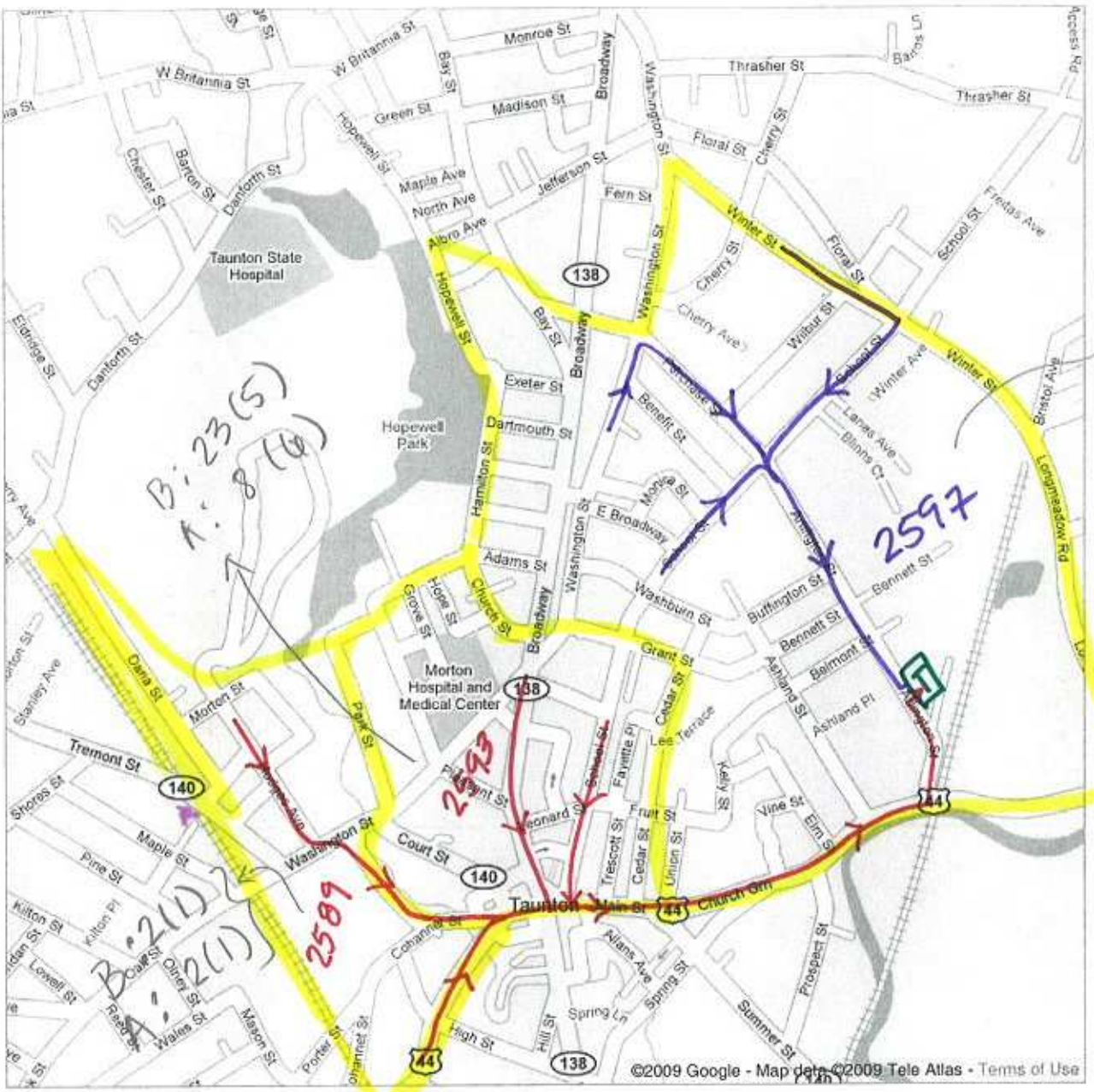
– Ped route from 2599

--- alternate route from 2599

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



B: 23 (5)
A: 8 (4)

B: 21 (2)
A: 3 (6)

B: 2 (1) 2
A: 2 (1)

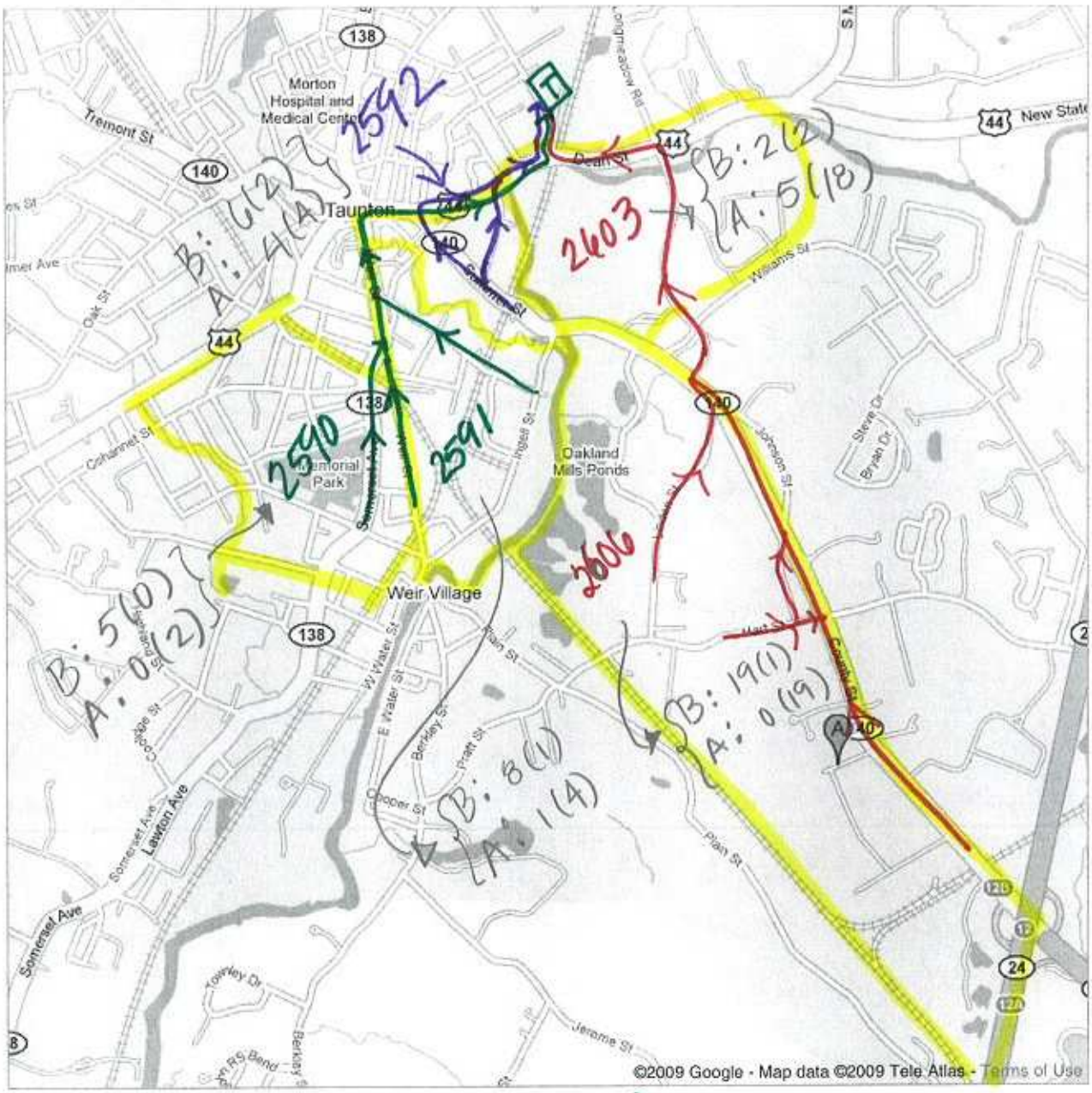
T Taunton Station (Dean St.)

- Ped route from TAZs: 2589 & 2593
- Ped route from TAZ 2597

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



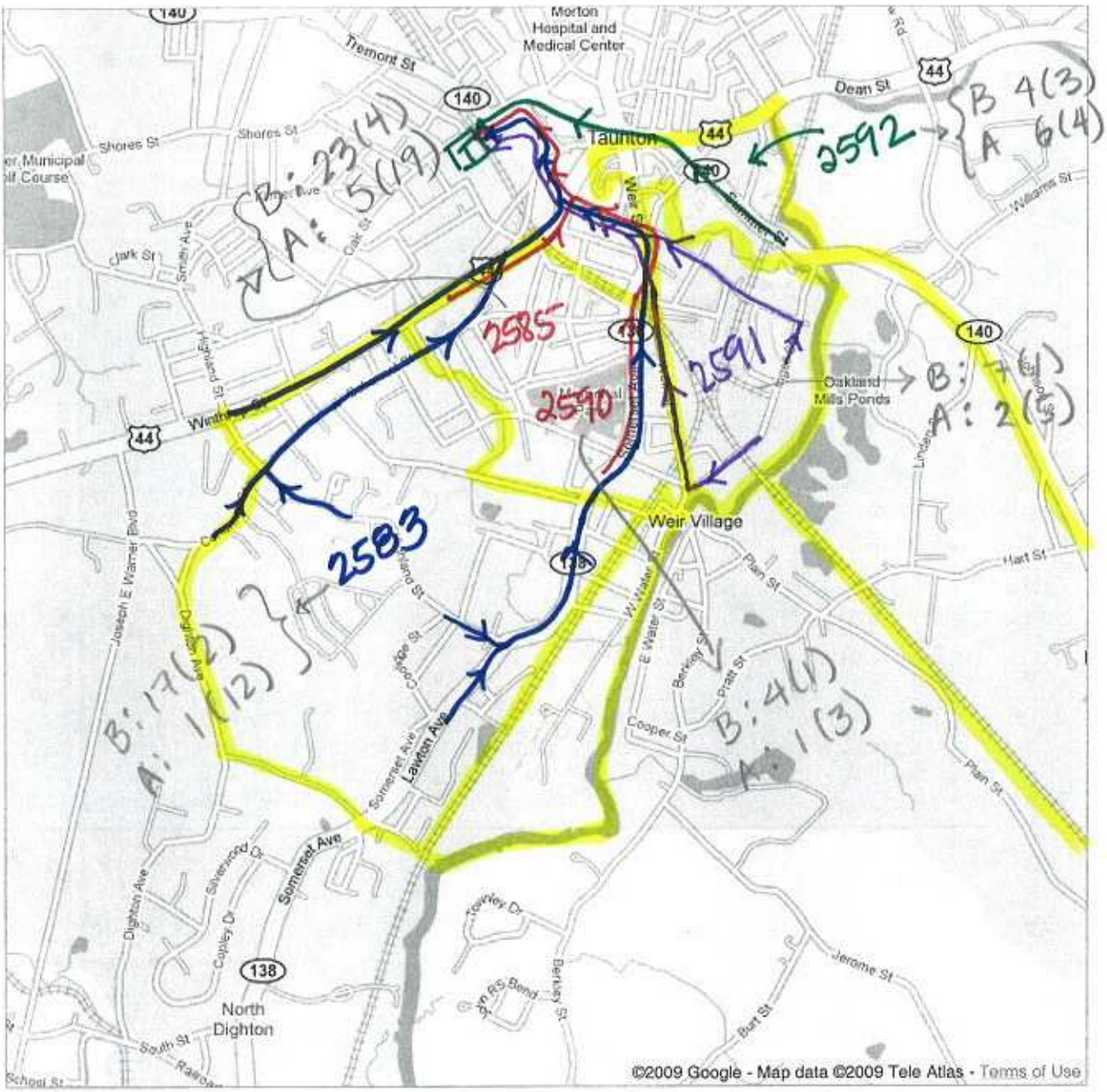
[T] Taunton Station (Dean St)

- Ped route from TAZ 2592
- Ped route from TAZs: 2603 & 2606
- Ped route from TAZs: 2590 & 2591

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



[T] Taunton Depot Station

- Ped route from TAZs 2585 & 2590
- Ped route from TAZ 2583
- Ped route from TAZ 2592
- Ped route from TAZ 2591

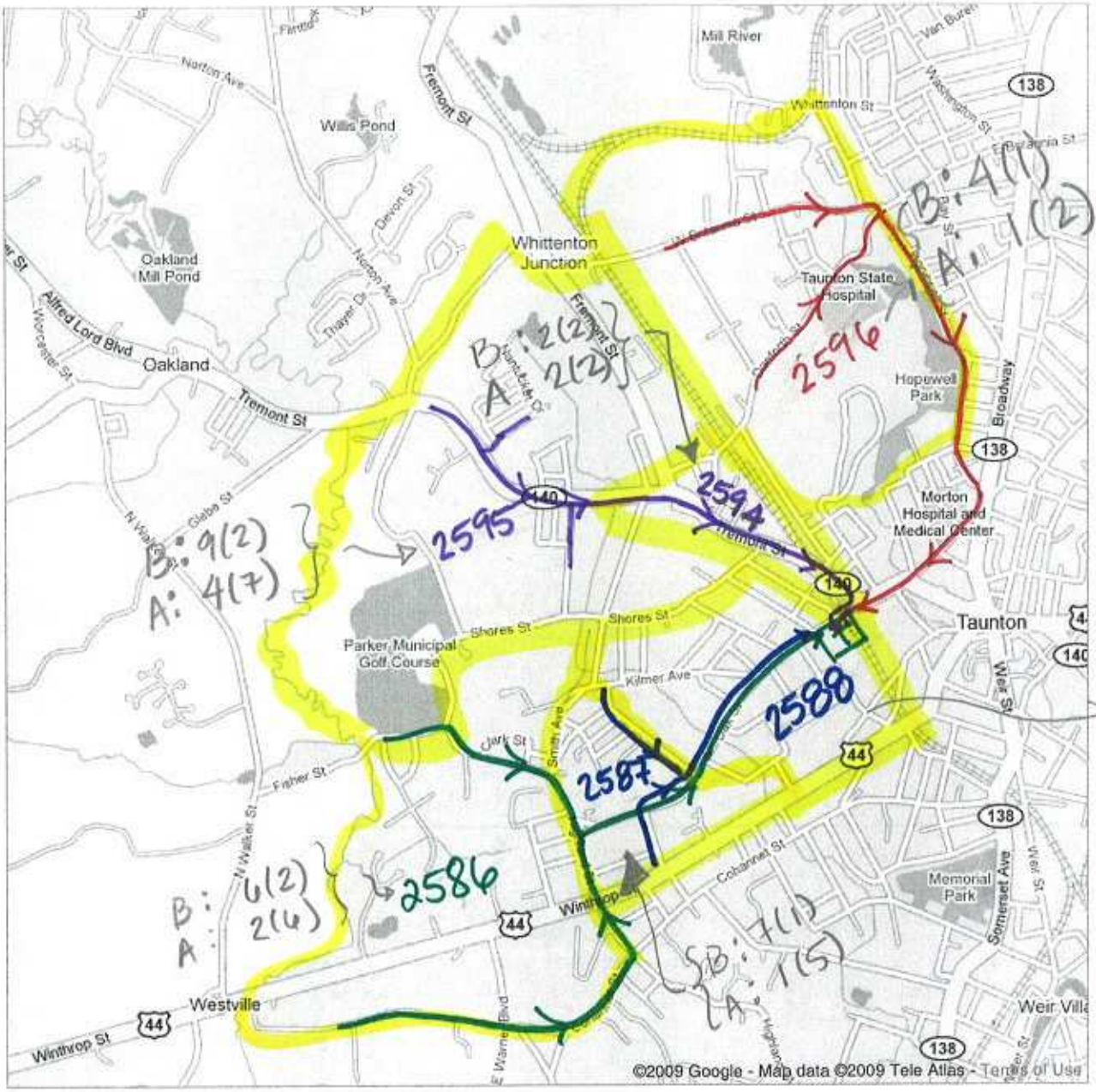
All routes are heading to Taunton Depot Station

bike

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



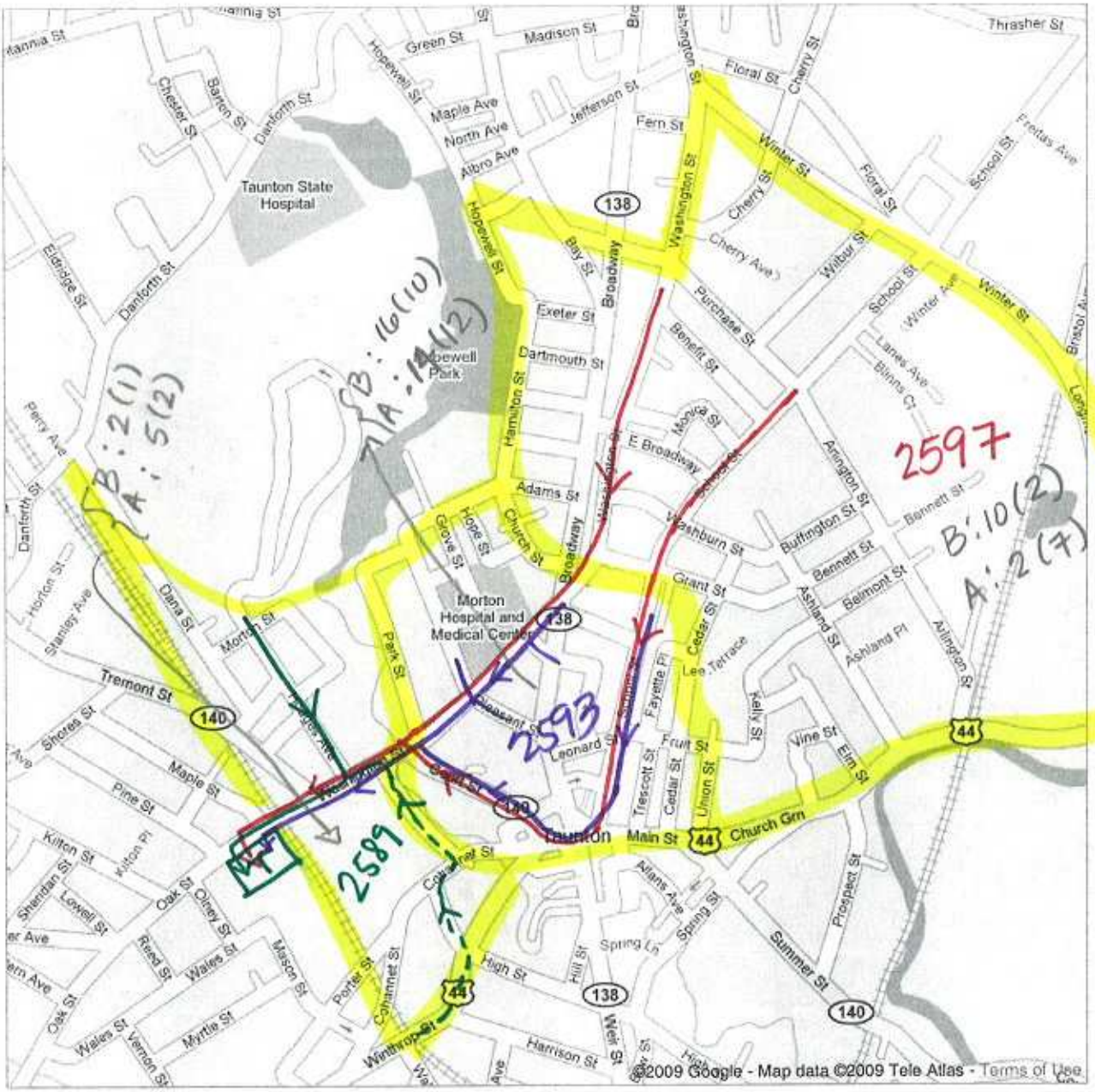
[T] Taunton Station
Depot

- Ped route to Taunton Depot Station from TAZ 2596
- Ped route to Taunton Depot Station from TAZs: 2594 & 2595
- Ped route to Taunton Depot Station from 2586
- Ped route to Taunton Depot Station from TAZs: 2587 & 2588

Google Maps

Address **Taunton Depot Dr**
Taunton, MA 02780

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Taunton Station (Gatra)
Depot

– Ped route to Taunton Depot Station from TAZ 2593

– Ped route to Taunton Depot Station from TAZ 2597

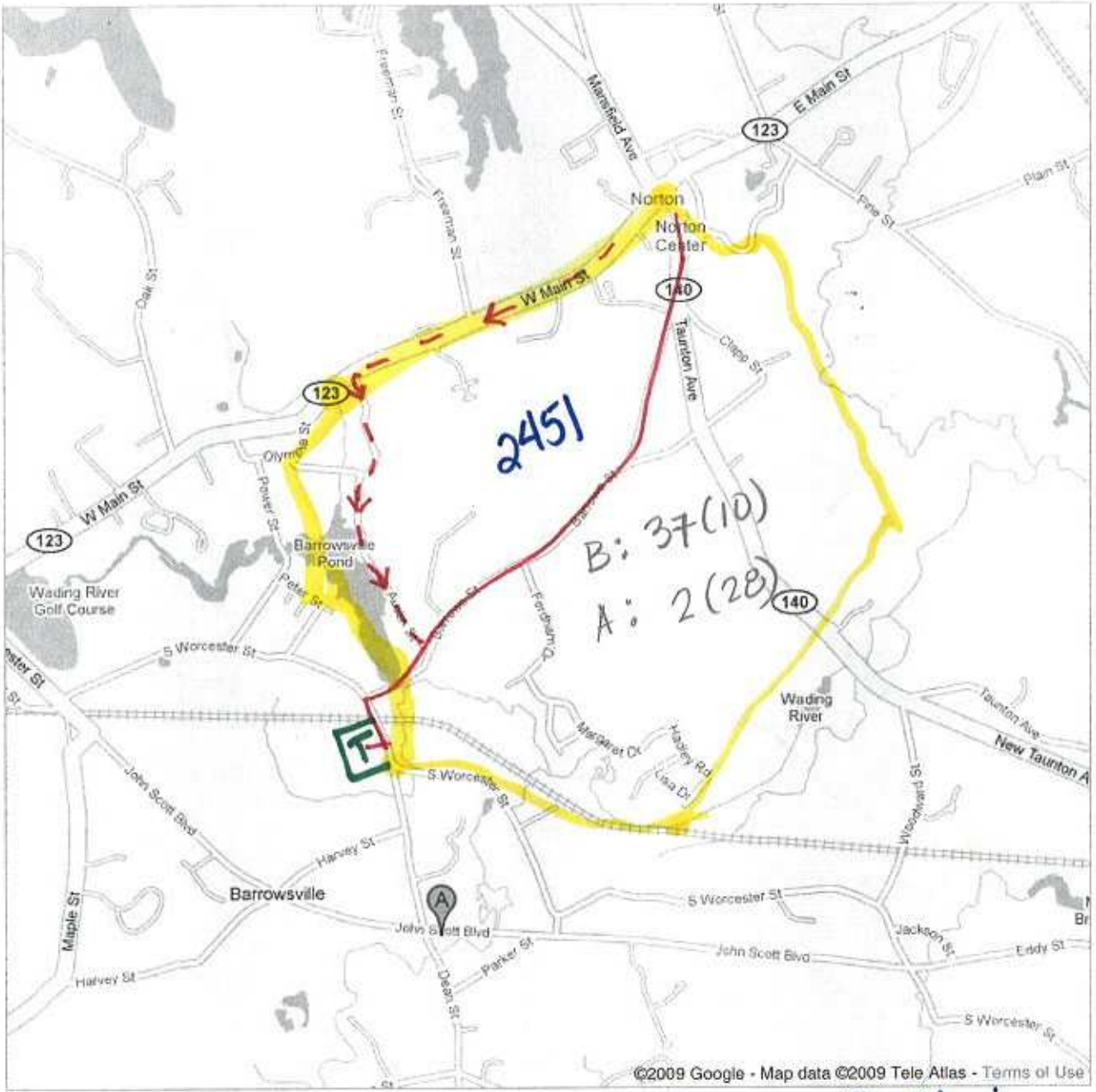
— Ped route to Taunton Depot Station from TAZ 2589

--- Alternate ped route from Winthrop St.

Google Maps

Address **John Scott Blvd**
Norton, MA 02766

Get Google Maps on your phone
Text the word "GMAPS" to 466453



TAZ: 2451 Barrowsville Station

T Barrowsville Station
——— Ped route to train station through Taunton Ave
- - - alternate ped route through W. Main St.

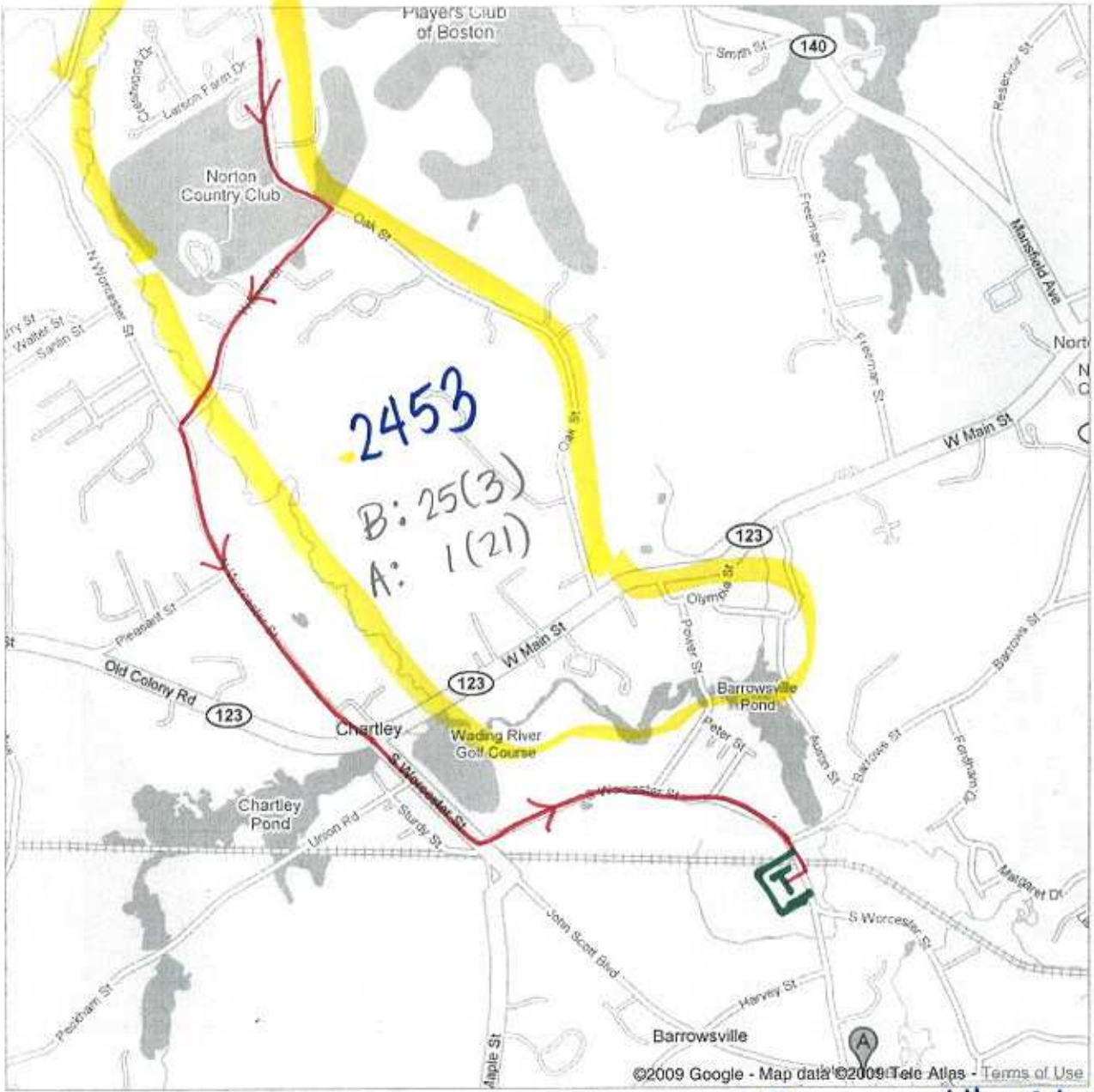
	Boardings	Alightments
AM	37	10
PM	2	28

over 2 miles

Google Maps

Address **John Scott Blvd**
Norton, MA 02766

Get Google Maps on your phone
Text the word "GMAPS" to 466453



Barrowsville Station

T Barrowsville Station

— Ped Route to Barrowsville Station

TAZ : 2453

	Boardings	Alightments
AM	25	3
PM	1	21

over 3 miles

Google Maps

Address **John Scott Blvd**
Norton, MA 02766

Get Google Maps on your phone
Text the word "GMAPS" to 466453

TAZ: 2455 Barrowsville Station

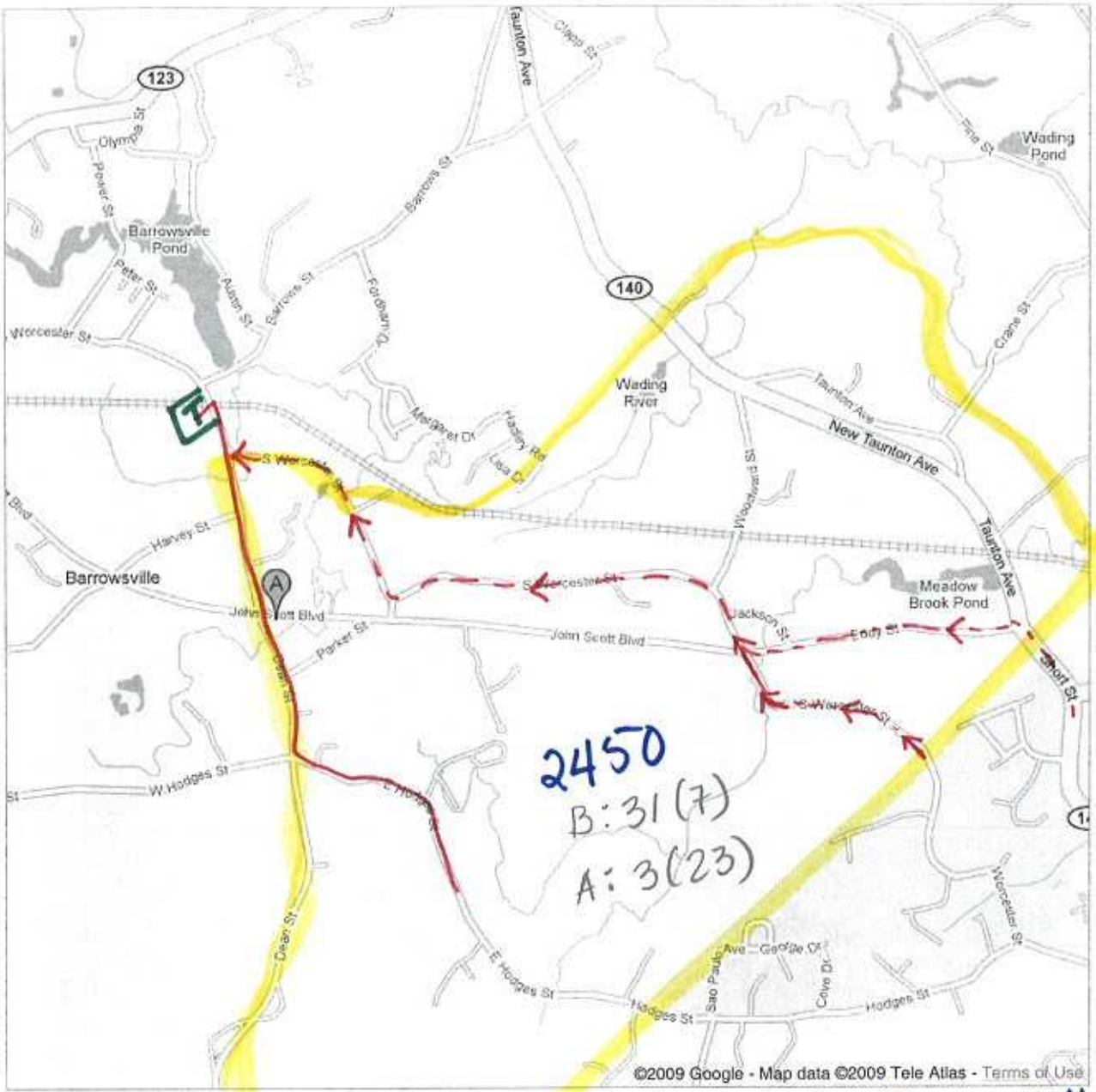
— Barrowsville Station
— Ped route to Barrowsville station
- - - } Alternate ped routes to Barrowsville station

	Boardings	Alightments
AM	43	2
PM	2	33

Google Maps

Address **John Scott Blvd**
Norton, MA 02766

Get Google Maps on your phone
Text the word "GMAPS" to 466453



TAZ 2450 Barrowsville Station

T Barrowsville station

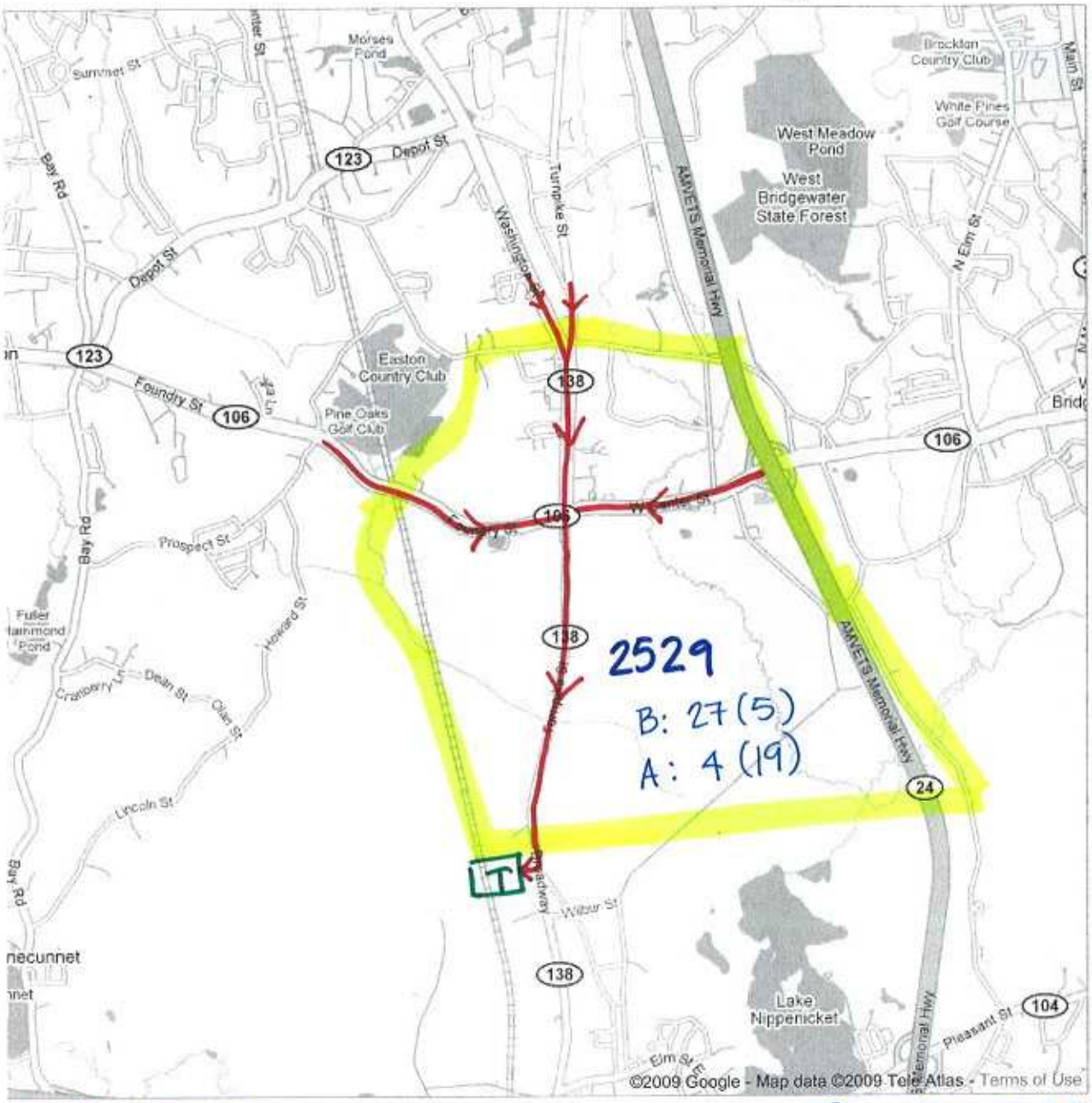
— Ped route to train station through E. Hodges St

--- Alternate ped route to train station through S. Worcester St.

	Boardings	Alightments
AM	31	7
PM	3	23

Google maps

Get Google Maps on your phone
Text the word "GMAPS" to 466453



TAZ 2529

Raynham, MA

T Raynham Park Station

— Pedestrian Route to Raynham Park Station

B: Boardings

A: Alightings

XX (XX): AM (PM)

Google maps

Get Google Maps on your phone
Text the word "GMAPS" to 466453

TAZ 2556

Raynham, MA

T Raynham Park Station

— Pedestrian Route to Raynham Park Station

B: Boardings

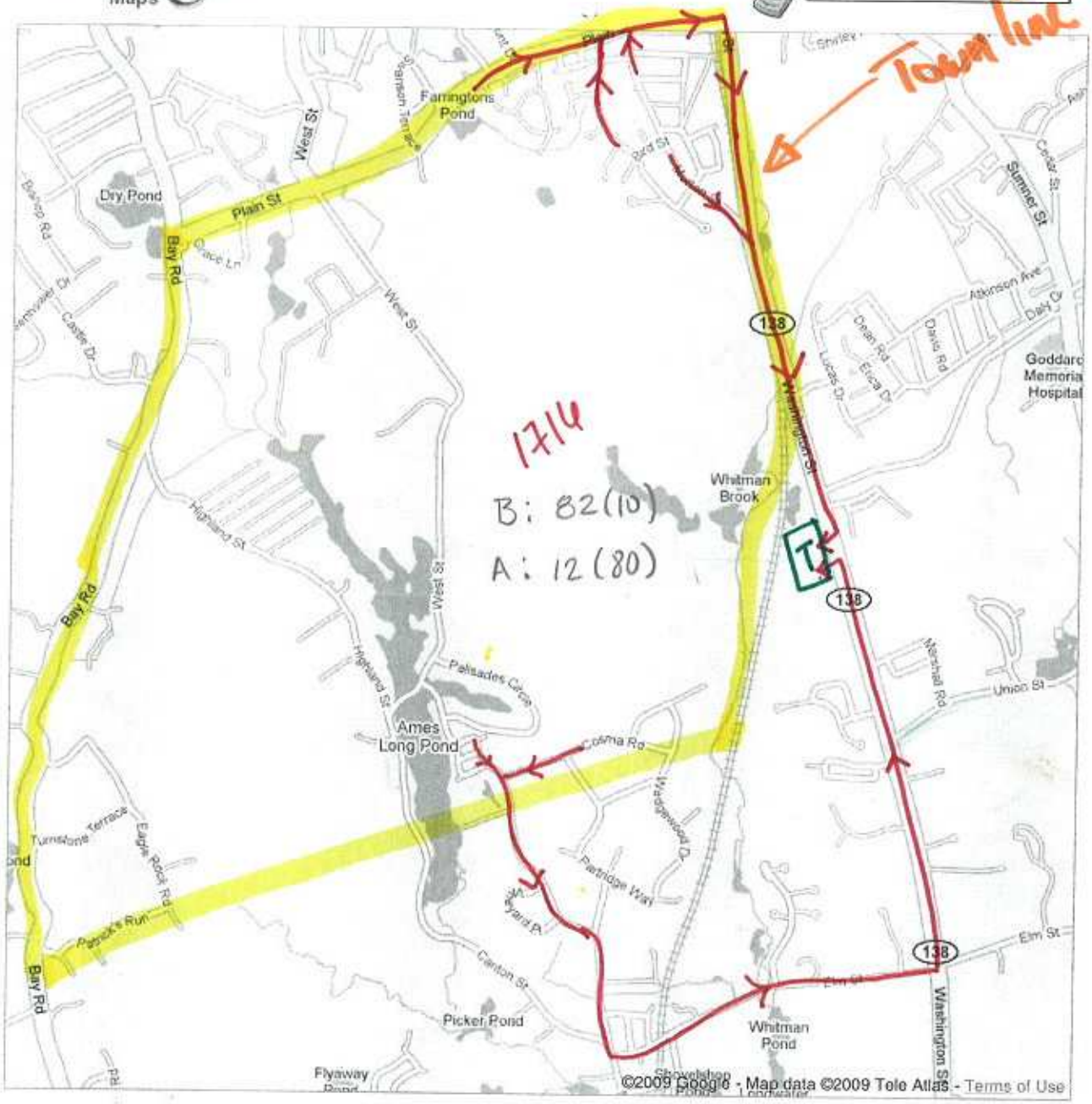
A: Alightings

XX(XX) = AM(PM)

Google Maps

Address **Barrows St MA 02356**

Get Google Maps on your phone
Text the word "GMAPS" to 466453



T Easton (North) Station

– Ped routes to North Easton Station from TAZ 1716

Boardings Alightments

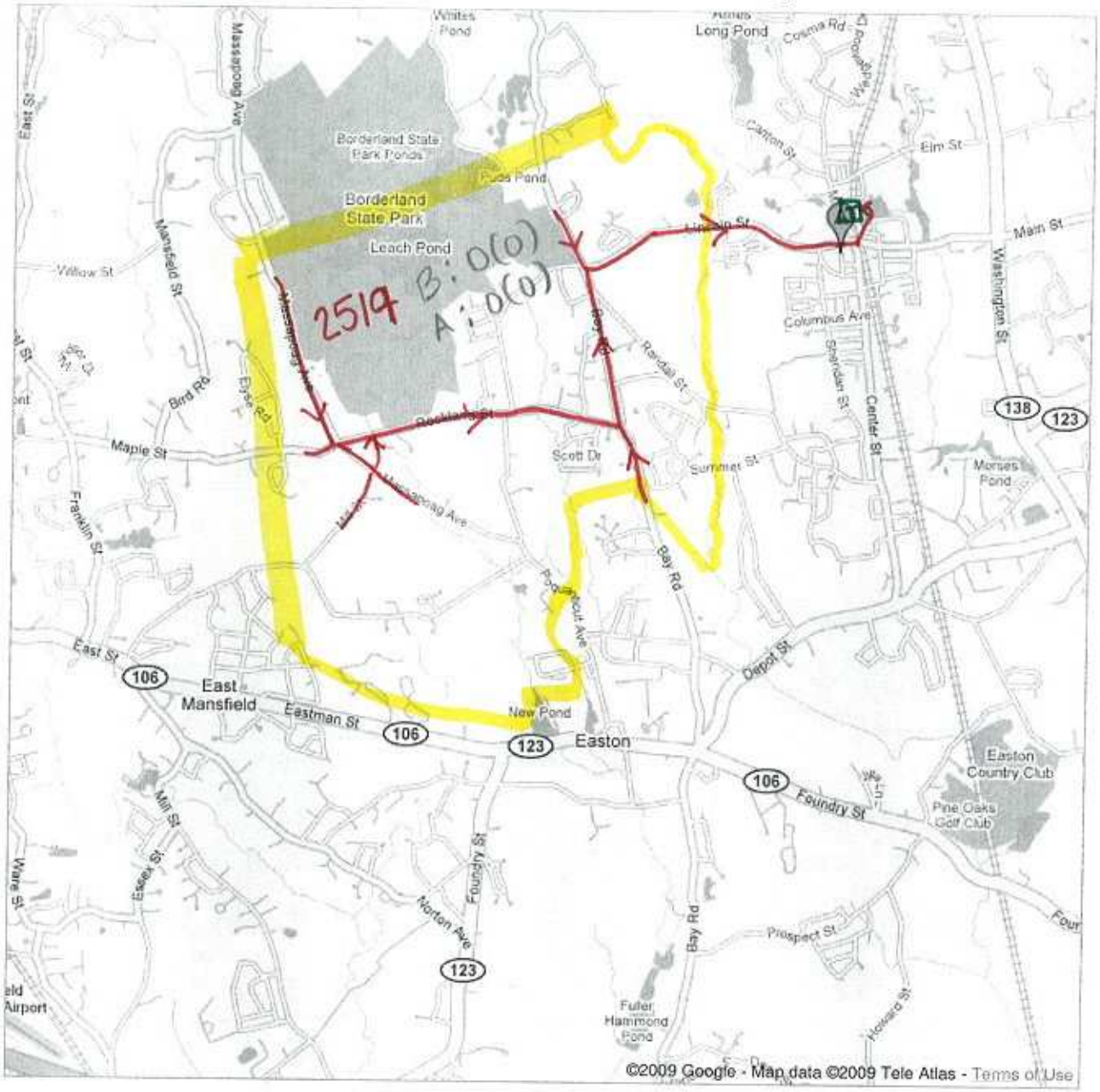
Stoughton people close to Stoughton

People along Elm would go Easton Village

Google Maps

Address **Barrows St**
MA 02356

Get Google Maps on your phone
Text the word "GMAPS" to 466453



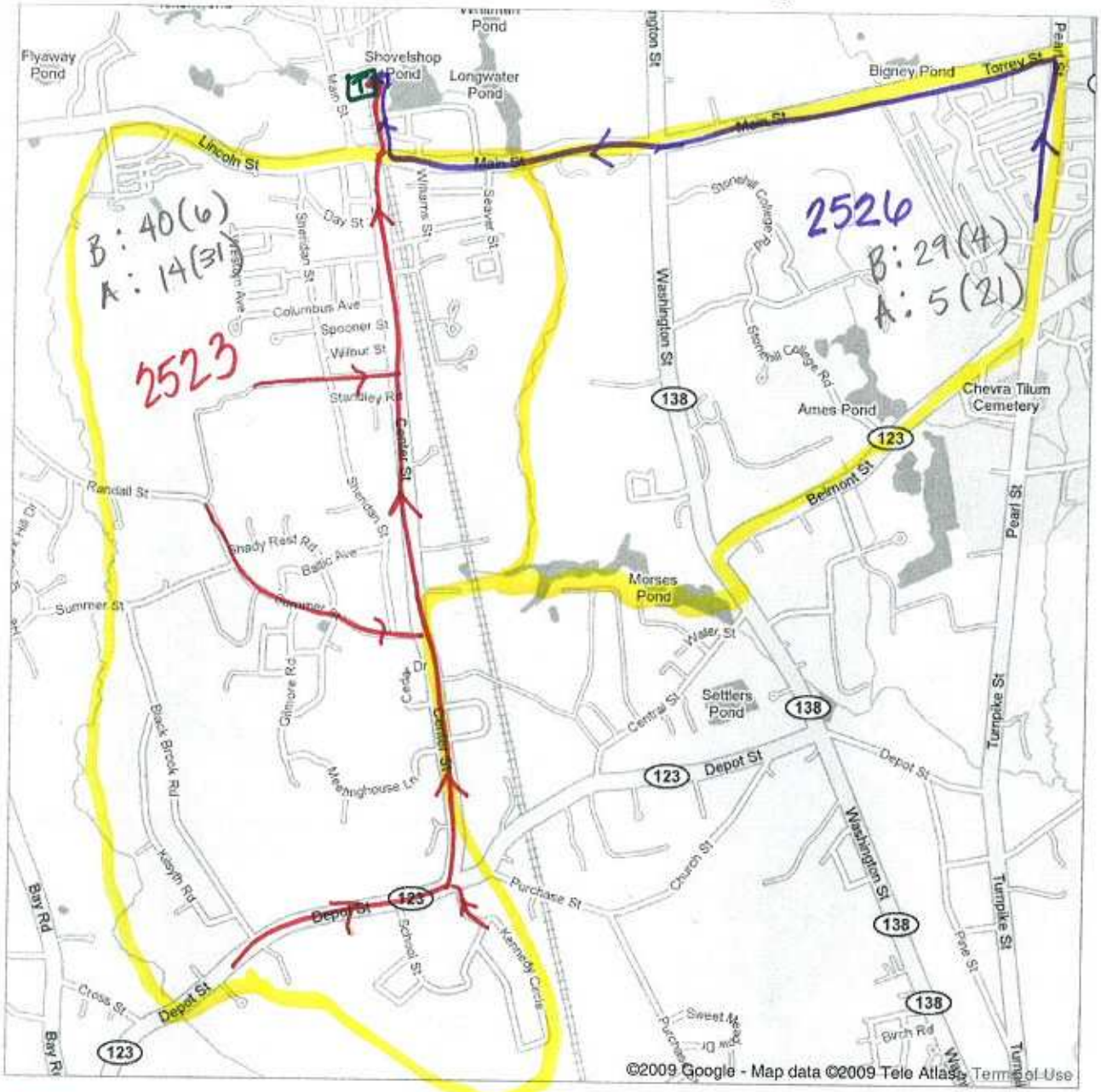
T Easton Village Station

– Ped route to Easton Village Station from TAZ 2519

Google Maps

Address **Elm St**
MA 02356

Get Google Maps on your phone
Text the word "GMAPS" to 466453



B: 40(6)
A: 14(31)

2523

2526
B: 29(4)
A: 5(21)

[T] Easton Village Station

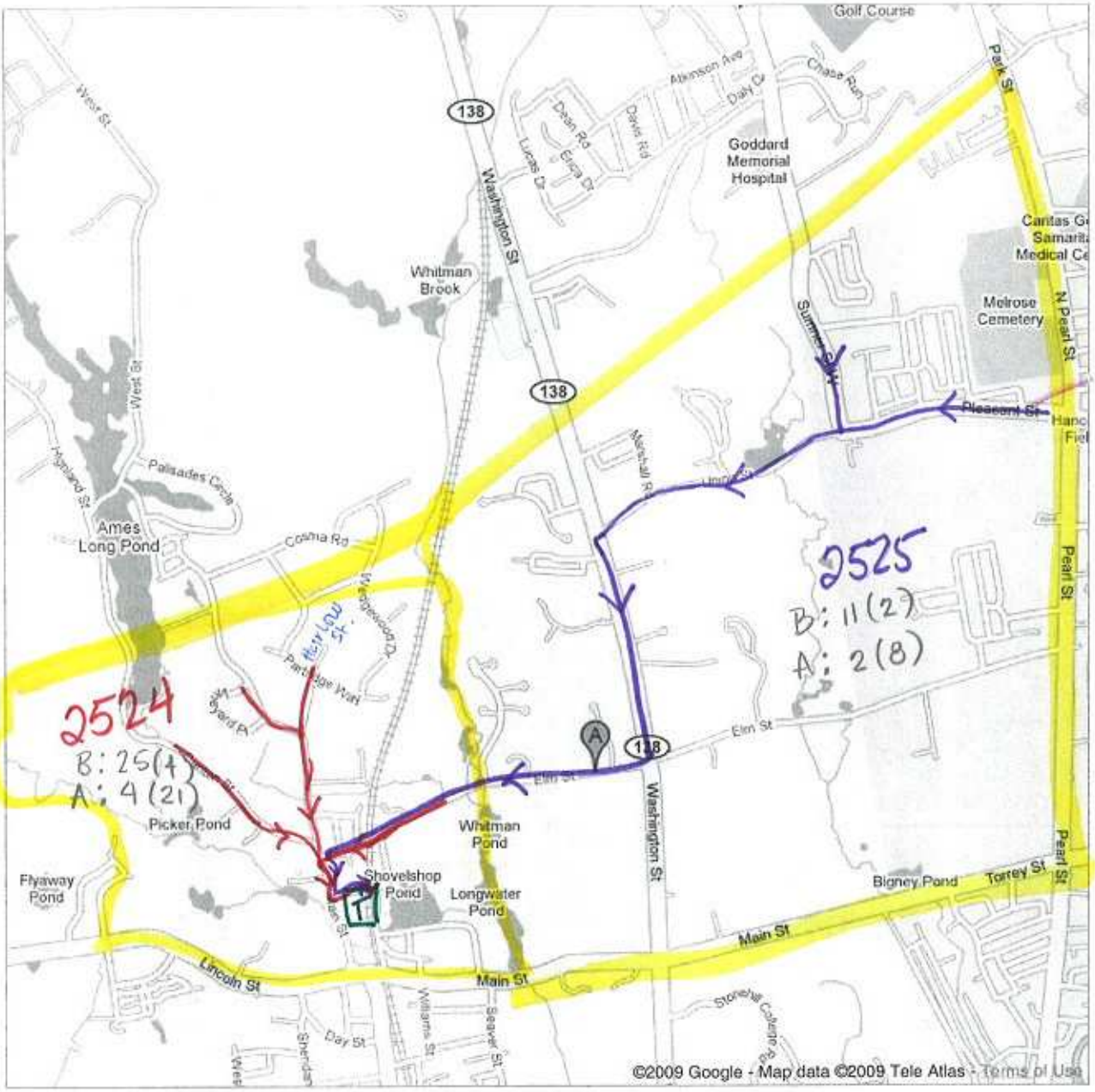
– Ped route to Easton Village Station from TAZ 2526

– Ped route to Easton Village Station from TAZ 2523

Google Maps

Address **Elm St**
MA 02356

Get Google Maps on your phone
Text the word "GMAPS" to 466453



[T] Easton Village Station

– Ped route to Easton Village Station from TAZ 2525

– Ped route to Easton Village Station from TAZ 2524

Appendix 4.1-H

Ridership and Trip Generation (2030)

Note: The first seven pages of this appendix remain unchanged from the DEIS/DEIR. The station boarding estimates presented in this appendix have been supersceded by the station-level boarding information provided in the 2035 CTPS ridership projections (FEIS/FEIR Appendix 3.2-H). However, this appendix is retained in the FEIS/FEIR because these 2030 ridership and boardings were the basis for many of the station-level transportation impact assessments presented in Chapter 4.1 of the FEIS/FEIR. Section 4.1.5.2 of the FEIS/FEIR (subsection on stations) discusses the sensitivity analyses conducted to compare the 2030 and 2035 boardings and determine necessary updates to the impact analyses. The last page of this appendix provides the backup documentation of this sensitivity analysis.

SCR Trip Generation Summary

Alternative		AM Peak Hour Trips								PM Peak Hour Trips							
	Station	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**
Stoughton Alternative																	
	North Easton	239	31	27	27	0	0	**266**	**58**	27	234	26	26	0	0	**53**	**261**
	Easton Village	0	0	44	44	0	0	**44**	**44**	0	0	32	32	0	0	**32**	**32**
	E. Taunton North	160	20	18	18	0	0	**178**	**38**	12	128	14	14	0	0	**26**	**142**
	Dean St	41	17	20	20	0	0	**61**	**37**	11	24	12	12	0	0	**24**	**37**
	Freetown	81	9	17	17	0	0	**98**	**26**	5	45	9	9	0	0	**14**	**54**

Alternative		AM Peak Hour Trips								PM Peak Hour Trips							
	Station	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**
Attleboro Alternative																	
	Barrowsville	143	32	59	59	0	0	**202**	**91**	12	93	35	35	0	0	**47**	**129**
	Taunton Depot/GATRA	237	78	62	62	10	10	**309**	**150**	59	184	47	47	9	9	**115**	**241**
	E. Taunton North																
	Fall River Depot	184	25	26	26	0	0	**210**	**51**	14	166	22	22	0	0	**36**	**188**
	Battleship Cove	0	0	34	34	0	0	**34**	**34**	0	0	25	25	0	0	**25**	**25**
	Kings Hwy	143	16	28	28	0	0	**170**	**44**	8	114	21	21	0	0	**30**	**135**
	Whales Tooth	146	16	44	44	11	11	**201**	**71**	10	120	35	35	11	11	**56**	**166**

Alternative		AM Peak Hour Trips								PM Peak Hour Trips							
	Station	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**	PNR Entry	PNR Exit	KNR Entry	KNR Exit	Transit Entry	Transit Exit	**Total Entry**	**Total Exit**
Stoughton Whittendon Alternative																	
	Rayhnam	183	21	32	32	0	0	**215**	**53**	17	166	29	29	0	0	**46**	**195**

SCR CTPS Ridership Estimates
2030 Alightings

Location		Alternative		Average Daily Person Trips															
				2030 Stoughton Local Electric															
Corridor						Mode of Access				Inbound Alightings					Outbound Alightings				
Station		Branch	Community	Daily Boardings	Parking Spaces Available	Walk/ Bike	PNR	KNR	Other	Total	AM	MD	PM	NT	Total	AM	MD	PM	NT
Stoughton																			
9	North Easton	Merge	Easton	750	999	180	520	50	0	50	30	20			700	40	90	530	40
10	Easton Village	Merge	Easton	320	0	240	0	80	0	40	30	10			280	20	50	160	50
11	Raynham	Merge	Raynham																
12	Dean St	Merge	Taunton	410	999	250	120	40	0	50	30	10	10		360	60	120	120	60
13	E. Taunton North			510		160	320	30	0	20	10	10			490	40	50	320	80
14	Freetown	FR	Freetown	240	999	40	170	30	0						240	20	60	100	60
15	Fall River Depot			740											740	80	170	440	50
16	Battleship Cove			210											210	10	50	100	50
17	Kings Hwy			460											460	40	80	280	60
18	Whales Tooth			600											600	50	100	340	110
Attleboro																			
9	Barrowsville	Merge	Norton																
10	Taunton Depot/GATRA	Merge	Taunton																
11	E. Taunton North	Merge	Taunton																
12	Freetown																		
13	Fall River Depot	FR	Fall River																
14	Battleship Cove	FR	Fall River																
14	Kings Hwy	NB	New Bedford																
15	Whales Tooth	NB	New Bedford																
Stoughton - Whittenton Alternative																			
11	Raynham	Merge	Raynham	600	999	140	400	60	0	10	10	0	0	0	590	40	90	390	70

Walk/Bike = Assumes a max of a 1 mile
KNR = Kiss-and-Ride or drop-offs
PNR = People using parking lot spaces
Other = Transit access

AM = Peak 3 hrs (6AM to 9AM)
MD = Midday 6 hrs (9AM to 3PM)
PM = Peak 3 hrs (3PM to 6PM)
NT = Night 12 hrs (6PM to 6AM)

SCR CTPS Ridership Estimates
2030 Alightings

Location		Alternative		Average Daily Person Trips																
Corridor				2030 Attleboro Local Electric																
Station		Branch	Community	Daily Boardings	Parking Spaces Available	Mode of Access				Inbound Alightings					Outbound Alightings				
						Walk/ Bike	PNR	KNR	Other	Total	AM	MD	PM	NT	Total	AM	MD	PM	NT
Stoughton																			
9	North Easton	Merge	Easton																
10	Easton Village	Merge	Easton																
11	Raynham	Merge	Raynham																
12	Dean St	Merge	Taunton																
13	E. Taunton North																		
14	Freetown	FR	Freetown																
15	Fall River Depot																		
16	Battleship Cove																		
17	Kings Hwy																		
18	Whales Tooth																		
Attleboro																			
9	Barrowsville	Merge	Norton	680		270	310	100	0	40	30	10	0	0	640	80	150	320	90
10	Taunton Depot/GATRA	Merge	Taunton	1,350		360	590	110	290	250	180	30	0	40	1,100	100	220	660	120
11	E. Taunton North	Merge	Taunton																
12	Freetown			210		30	150	30	0						210	20	40	130	20
13	Fall River Depot	FR	Fall River	760	999	280	430	50	0						760	70	150	460	80
14	Battleship Cove	FR	Fall River	240	0	180	0	60	0						240	20	50	140	30
14	Kings Hwy	NB	New Bedford	470	999	120	300	50	0						470	40	90	280	60
15	Whales Tooth	NB	New Bedford	610	999	150	310	80	70						610	50	120	370	70
Stoughton - Whittenton Alternative																			
11	Raynham	Merge	Raynham																

Walk/Bike = Assumes a max of a 1 mile
KNR = Kiss-and-Ride or drop-offs
PNR = People using parking lot spaces
Other = Transit access

AM = Peak 3 hrs (6AM to 9AM)
MD = Midday 6 hrs (9AM to 3PM)
PM = Peak 3 hrs (3PM to 6PM)
NT = Night 12 hrs (6PM to 6AM)

SCR CTPS Ridership Estimates
2030 Boardings

Location		Alternative		Average Daily Person Trips: 2030 Stoughton Local Electric															
Corridor						Mode of Access				Inbound Boardings					Outbound Boardings				
Station		Branch	Community	Daily Boardings	Parking Spaces Available	Walk/ Bike	PNR	KNR	Other	Total	AM	MD	PM	NT	Total	AM	MD	PM	NT
Stoughton																			
9	North Easton	Merge	Easton	750	xx	180	520	50	0	700	540	120	30	10	50	-	10	30	10
10	Easton Village	Merge	Easton	320	0	240	0	80	0	280	210	50	10	10	40	-	10	20	10
11	Raynham	Merge	Raynham																
12	Dean St	Merge	Taunton	410	999	250	120	40	0	360	220	100	30	10	50	-	10	30	10
13	E. Taunton North	Merge	Taunton	510	XX	160	320	30	0	490	400	60	20	10	20	-	-	10	10
14	Freetown	FR	Freetown	240	999	40	170	30	0	240	180	50	10	0	-	-	-	-	-
15	Fall River Depot																		
16	Battleship Cove																		
17	Kings Hwy																		
18	Whales Tooth																		
Attleboro																			
9	Barrowsville	Merge	Norton																
10	Taunton Depot	Merge	Taunton																
11	E. Taunton North	Merge	Taunton																
12	Freetown																		
13	Fall River Depot	FR	Fall River																
14	Battleship Cove	FR	Fall River																
14	Kings Hwy	NB	New Bedford																
15	Whales Tooth	NB	New Bedford																
Stoughton - Whittenton																			
11	Raynham	Merge	Raynham	600	999	140	400	60	0	590	430	120	30	10	10	-	-	10	-

Walk/Bike = Assumes a max of a 1 mile
KNR = Kiss-and-Ride or drop-offs
PNR = People using parking lot spaces
Other = Transit access

AM = Peak 3 hrs (6AM to 9AM)
MD = Midday 6 hrs (9AM to 3PM)
PM = Peak 3 hrs (3PM to 6PM)
NT = Night 12 hrs (6PM to 6AM)

SCR CTPS Ridership Estimates
2030 Boardings

Location		Alternative		Average Daily Person Trips: 2030 Attleboro Local Electric																
Corridor						Mode of Access				Inbound Boardings					Outbound Boardings					
Station		Branch	Community	Daily Boardings	Parking Spaces Available	Walk/ Bike	PNR	KNR	Other	Total	AM	MD	PM	NT	Total	AM	MD	PM	NT
Stoughton																				
9	North Easton	Merge	Easton																	
10	Easton Village	Merge	Easton																	
11	Raynham	Merge	Raynham																	
12	Dean St	Merge	Taunton																	
13	E. Taunton North	Merge	Taunton																	
14	Freetown	FR	Freetown																	
15	Fall River Depot																			
16	Battleship Cove																			
17	Kings Hwy																			
18	Whales Tooth																			
Attleboro																				
9	Barrowsville	Merge	Norton	680		270	310	100	0	640	460	120	40	20	40	30	10	-	-	
10	Taunton Depot	Merge	Taunton	1350		360	590	110	290	1,100	810	210	60	20	250	40	20	150	40	
11	E. Taunton North	Merge	Taunton																	
12	Freetown																			
13	Fall River Depot	FR	Fall River	760	999	280	430	50	0	760	510	140	40	70	-	-	-	-	-	
14	Battleship Cove	FR	Fall River	240	0	180	0	60	0	240	180	50	10	0	-	-	-	-	-	
14	Kings Hwy	NB	New Bedford	470	999	120	300	50	0	470	350	90	20	10	-	-	-	-	-	
15	Whales Tooth	NB	New Bedford	610	999	150	310	80	70	610	450	120	30	10	-	-	-	-	-	
Stoughton - Whittenton																				
11	Raynham	Merge	Raynham																	

Walk/Bike = Assumes a max of a 1 mile
KNR = Kiss-and-Ride or drop-offs
PNR = People using parking lot spaces
Other = Transit access

AM = Peak 3 hrs (6AM to 9AM)
MD = Midday 6 hrs (9AM to 3PM)
PM = Peak 3 hrs (3PM to 6PM)
NT = Night 12 hrs (6PM to 6AM)

SCR Trip Generation Calculations (Alightings)

SLE

Stations	Daily Boardings	Mode of Access				Inbound Alightings										Outbound Alightings									
		Walk/ Bike	PNR	KNR	Other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	PM other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	AM other
North Easton	750	24%	69%	7%	0%	20	5	13	1	0	0	0	0	0	0	27	6	18	2	-	355	85	234	24	0
Easton Village	320	75%	0%	25%	0%	20	15	0	5	0	0	0	0	0	0	13	10	-	3	-	107	80	0	27	0
E. Taunton North	510	31%	63%	6%	0%	7	2	4	0	0	0	0	0	0	0	27	8	16	2	-	214	67	128	13	0
Dean St	410	61%	29%	10%	0%	20	12	6	2	0	7	4	2	1	0	40	25	11	4	-	80	49	22	8	0
Freetown	240	17%	71%	13%	0%	0	0	0	0	0	0	0	0	0	0	13	2	9	2	-	67	11	45	8	0

ALE

Stations	Daily Boardings	Mode of Access				Inbound Alightings										Outbound Alightings									
		Walk/ Bike	PNR	KNR	Other	AM	AM W/B	AM PNR	AM KNR	AM other	PM	PM W/B	PM PNR	PM KNR	PM other	AM	AM W/B	AM PNR	AM KNR	AM other	PM	PM W/B	PM PNR	PM KNR	PM other
Barrowsville	680	40%	46%	15%	0%	20	8	9	3	0	0	0	0	0	0	54	21	23	8	0	214	85	93	32	0
Taunton Depot	1350	27%	44%	8%	21%	121	32	50	10	26	0	0	0	0	0	67	18	28	5	14	442	118	184	36	95
Fall River Depot	760	37%	57%	7%	0%	0	0	0	0	0	0	0	0	0	0	47	17	25	3	0	308	114	166	20	0
Battleship Cove	240	75%	0%	25%	0%	0	0	0	0	0	0	0	0	0	0	13	10	0	3	0	94	70	0	23	0
Kings Hwy	470	26%	64%	11%	0%	0	0	0	0	0	0	0	0	0	0	27	7	16	3	0	188	48	114	20	0
Whales Tooth	610	25%	51%	13%	11%	0	0	0	0	0	0	0	0	0	0	34	8	16	4	4	248	61	120	33	28

Whittenton LE

Stations	Daily Boardings	Mode of Access				Inbound Alightings										Outbound Alightings									
		Walk/ Bike	PNR	KNR	Other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	PM other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	AM other
Raynham	600	23%	67%	10%	0%	7	2	4	1	0	0	0	0	0	0	27	6	17	3	-	261	61	166	26	0

Notes:
1. Mode split based on CTPS ridership estimates
2. Peak hour adjustment factor of 0.67 used to reduce CTPS peak period (3-hours) ridership to peak hour ridership
3. Park and ride ridership converted to vehicles with vehicle occupancy factor of 1.05 .

SCR Trip Generation Calculations (Boardings)

SLE

Station	Daily Boardings	Mode of Access				Inbound Boardings										Outbound Boardings									
		Walk/ Bike	PNR	KNR	Other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	PM other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	AM other
North Easton	750	24%	69%	7%	0%	362	87	239	24	0	20	5	13	1	0	-	-	-	-	-	20	5	13	1	0
Easton Village	320	75%	0%	25%	0%	141	106	0	35	0	7	5	0	2	0	-	-	-	-	-	13	10	0	3	0
E. Taunton North	510	31%	63%	6%	0%	268	84	160	16	0	13	4	8	1	0	-	-	-	-	-	7	2	4	0	0
Dean St	410	61%	29%	10%	0%	147	90	41	14	0	20	12	6	2	0	-	-	-	-	-	20	12	6	2	0
Freetown	240	17%	71%	13%	0%	121	20	81	15	0	7	1	5	1	0	-	-	-	-	-	-	0	0	0	0

ALE

Stations	Daily Boardings	Mode of Access				Inbound Boardings										Outbound Boardings									
		Walk/ Bike	PNR	KNR	Other	AM	AM W/B	AM PNR	AM KNR	AM other	PM	PM W/B	PM PNR	PM KNR	PM other	AM	AM W/B	AM PNR	AM KNR	AM other	PM	PM W/B	PM PNR	PM KNR	PM other
Barrowsville	680	40%	46%	15%	0%	308	122	134	45	0	27	11	12	4	0	20	8	9	3	0	-	0	0	0	0
Taunton Depot	1350	27%	44%	8%	21%	543	145	226	44	117	40	11	17	3	9	27	7	11	2	6	101	27	42	8	22
Fall River Depot	760	37%	57%	7%	0%	342	126	184	22	0	27	10	14	2	0	-	0	0	0	0	-	0	0	0	0
Battleship Cove	240	75%	0%	25%	0%	121	90	0	30	0	7	5	0	2	0	-	0	0	0	0	-	0	0	0	0
Kings Hwy	470	26%	64%	11%	0%	235	60	143	25	0	13	3	8	1	0	-	0	0	0	0	-	0	0	0	0
Whales Tooth	610	25%	51%	13%	11%	302	74	146	40	35	20	5	10	3	2	-	0	0	0	0	-	0	0	0	0

Whittenton LE

Stations	Daily Boardings	Mode of Access				Inbound Boardings										Outbound Boardings									
		Walk/ Bike	PNR	KNR	Other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	PM other	AM-Total	AM W/B	AM PNR	AM KNR	AM other	PM-Total	PM W/B	PM PNR	PM KNR	AM other
Raynham	600	23%	67%	10%	0%	288	67	183	29	0	20	5	13	2	0	-	-	-	-	-	7	2	4	1	0

Notes:
1. Mode split based on CTPS ridership estimates
2. Peak hour adjustment factor of 0.67 used to reduce CTPS peak period (3-hours) ridership to peak hour ridership
3. Park and ride ridership converted to vehicles with vehicle occupancy factor of 1.05 .

Table 1. SCR Ridership and Trip Generation Comparison

Stations			Stoughton Electric Inbound Boardings						DEIR Peak Hour Trip Generation[3]				New Stoughton Electric Peak Hour Trip Generation[4]				Difference between 2030 and 2035	
			2030		2035		Difference between 2030 and 2035		2030				2035					
Station No.	2030 Stations	2035 Stations	Total[1]	AM Peak Period[2]	Total	AM Peak Period	Total	AM Peak Period	AM W/B[5]	AM PNR[6]	AM KNR[7]	AM other[8]	AM W/B	AM PNR	AM KNR	AM other	AM PNR Trips	AM KNR Trips
1	South Station	South Station	-	-	-	-	-	-										
2	Back Bay	Back Bay	1,930	1,350	880	610	(1,050)	(740)										
3	Ruggles	Ruggles	160	100	120	80	(40)	(20)										
4	Hyde Park	Hyde Park	700	350	460	320	(240)	(30)										
5	Rte 128 Station	Rte 128 Station	1,320	910	600	420	(720)	(490)										
6	Canton Junction	Canton Junction	1,470	960	710	470	(760)	(490)										
7	Canton Center	Canton Center	1,240	830	720	480	(520)	(350)										
8	Stoughton	Stoughton	1,430	1,030	900	680	(530)	(350)										
9	North Easton	North Easton	700	540	450	310	(250)	(230)	87	239	24	0	50	138	14	0	(101)	(11)
10	Easton Village	Easton Village	280	210	150	120	(130)	(90)	106	0	35	0	64	0	16	0	0	(19)
11	Raynham	Raynham	530	390	410	310	(120)	(80)	67	183	29	0	43	129	29	0	(54)	0
12	Taunton Depot/GATRA	Dana Street	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
13	Dean St	Taunton	360	220	620	480	260	260	90	41	14	0	110	119	58	29	78	43
14	E. Taunton North	Taunton Depot	490	400	380	290	(110)	(110)	84	160	16	0	39	102	29	19	(58)	13
15	Freetown	Freetown	240	180	180	140	(60)	(40)	20	81	15	0	16	65	10	0	(17)	(5)
16	Fall River Depot	Fall River Depot	740	550	840	600	100	50	126	184	22	0	139	210	34	10	26	11
17	Battleship Cove	Battleship Cove	210	160	240	80	30	(80)	90	0	30	0	40	0	11	2	0	(19)
18	Kings Hwy	Kings Hwy	460	340	520	390	60	50	60	143	25	0	55	163	35	0	20	10
19	Whales Tooth	Whales Tooth	600	440	680	460	80	20	74	146	40	35	86	134	41	41	(12)	1
		Total	**12,860**	**8,960**	**8,860**	**6,240**	**-**	**-**	**804**	**1,177**	**250**	**35**	**643**	**1,058**	**276**	**101**	**-**	-

[1] Total Includes: AM Peak Period = Peak 3 hrs (6AM to 9AM); Midday Peak Period= 6hrs (9AM to 3 PM); PM Peak Period = Peak 3 hrs (3PM to 6PM) and Nighttime Peak Period = 12hrs (6PM to 6AM)

[2] AM Peak Period = Morning Peak 3 hrs (6AM to 9AM)

[3] Trips from DEIR documents and reflect the highest projected ridership at individual stations from the Stoughton Electric, Attleboro Electric and the Whittenton Electric Alternative analyses

[4] Peak Hour adjustment factor of 0.67 used to reduce CTPS peak period (3-hours) ridership to peak hour ridership

[5] Walk/Bike = Assumes a max of a 1 mile

[6] PNR = People using parking lot spaces; Park and ride ridership converted to vehicles with vehicle occupancy factor of 1.05 .

[7] KNR = Kiss-and-Ride or drop-offs

[8] Other = Transit access

Stations			Whittenton Electric Inbound Boardings						DEIR Peak Hour Trip Generation[3]				New Whittenton Electric Peak Hour Trip Generation[4]				Difference between 2030 and 2035	
			2030		2035		Difference between 2030 and 2035		2030				2035					
Station No.	2030 Stations	2035 Stations	Total[1]	AM Peak Period[2]	Total	AM Peak Period	Total	AM Peak Period	AM W/B[5]	AM PNR[6]	AM KNR[7]	AM other[8]	AM W/B	AM PNR	AM KNR	AM other	AM PNR Trips	AM KNR Trips
1	South Station	South Station	-	-	-	-	-	-										
2	Back Bay	Back Bay	1,250	880	830	580	(420)	(300)										
3	Ruggles	Ruggles	160	100	110	70	(50)	(30)										
4	Hyde Park	Hyde Park	700	350	450	310	(250)	(40)										
5	Rte 128 Station	Rte 128 Station	1,320	910	630	440	(690)	(470)										
6	Canton Junction	Canton Junction	1,470	960	720	480	(750)	(480)										
7	Canton Center	Canton Center	1,240	830	740	490	(500)	(340)										
8	Stoughton	Stoughton	1,430	1,030	950	720	(480)	(310)										
9	North Easton	North Easton	700	540	480	330	(220)	(210)	87	239	24	0	50	150	14	0	(88)	(11)
10	Easton Village	Easton Village	280	210	150	120	(130)	(90)	106	0	35	0	64	0	16	0	0	(19)
11	Raynham	Raynham	590	430	500	380	(90)	(50)	67	183	29	0	44	168	34	0	(15)	5
12	Taunton Depot/GATRA	Dana Street	850	460	310	240	(540)	(220)	145	226	44	117	25	105	25	0	(121)	(19)
13	Dean St	Taunton	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
14	E. Taunton North	Taunton Depot	340	240	340	260	0	20	84	160	16	0	34	97	29	10	(63)	13
15	Freetown	Freetown	260	130	160	120	(100)	(10)	20	81	15	0	10	57	10	0	(24)	(5)
16	Fall River Depot	Fall River Depot	640	420	750	540	110	120	126	184	22	0	125	188	29	10	4	6
17	Battleship Cove	Battleship Cove	200	120	200	70	0	(50)	90	0	30	0	35	0	9	2	0	(21)
18	Kings Hwy	Kings Hwy	390	270	480	360	90	90	60	143	25	0	55	148	30	0	6	5
19	Whales Tooth	Whales Tooth	510	360	610	410	100	50	74	146	40	35	77	124	41	27	(22)	1
		Total	**12,330**	**8,240**	**8,410**	**5,920**	**-**	**-**	**859**	**1,362**	**280**	**151**	**519**	**1,039**	**237**	**49**	**-**	-

[1] Total Includes: AM Peak Period = Peak 3 hrs (6AM to 9AM); Midday Peak Period= 6hrs (9AM to 3 PM); PM Peak Period = Peak 3 hrs (3PM to 6PM) and Nighttime Peak Period = 12hrs (6PM to 6AM)

[2] AM Peak Period = Morning Peak 3 hrs (6AM to 9AM)

[3] Trips from DEIR documents and reflect the highest projected ridership at individual stations from the Stoughton Electric, Attleboro Electric and the Whittenton Electric Alternative analyses

[4] Peak Hour adjustment factor of 0.67 used to reduce CTPS peak period (3-hours) ridership to peak hour ridership

[5] Walk/Bike = Assumes a max of a 1 mile

[6] PNR = People using parking lot spaces; Park and ride ridership converted to vehicles with vehicle occupancy factor of 1.05 .

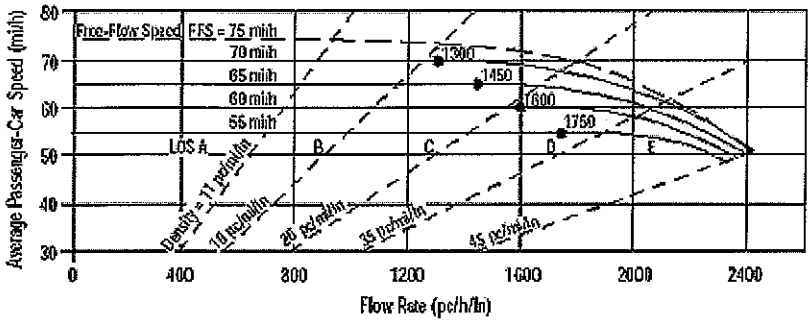
[7] KNR = Kiss-and-Ride or drop-offs

[8] Other = Transit access

Appendix 4.1-I

Capacity Analysis

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7845*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*58.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2121*	pc/h/ln
S	*54.8*	mi/h
D = v_p / S	*38.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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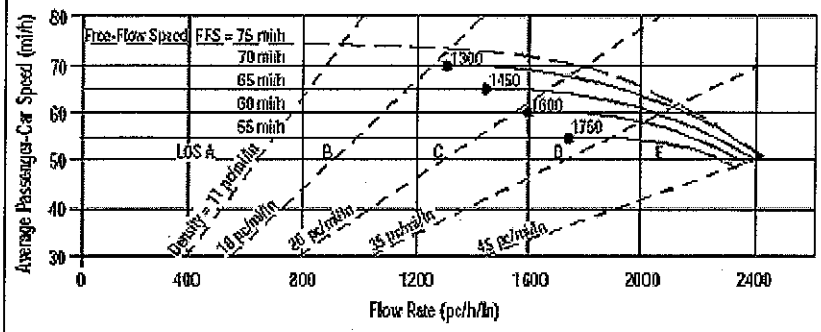
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5310*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*58.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1431*	pc/h/ln
S	*58.3*	mi/h
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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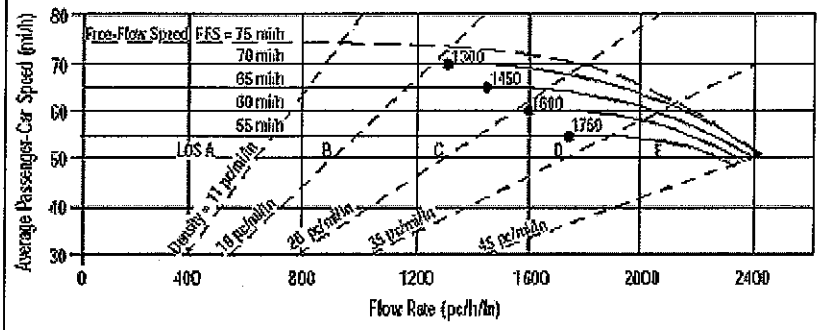
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5085*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*59.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1385*	pc/h/ln
S	*59.0*	mi/h
D = v_p / S	*23.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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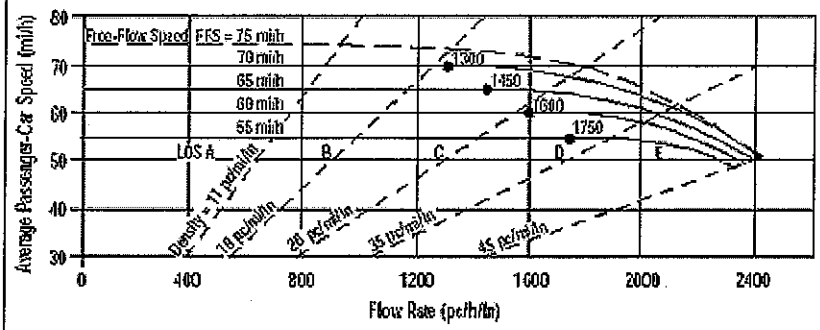

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7255*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*59.0*	mi/h	FFS	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1935*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*57.9*	mi/h	S		mi/h
D = v_p / S	*33.4*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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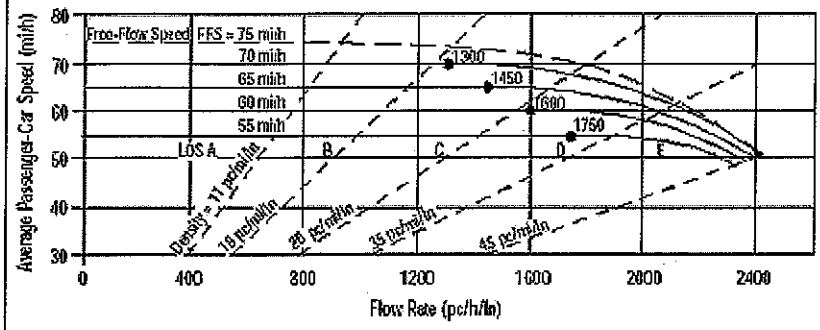

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of Route 3*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*5955*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*66.0*	mi/h	FFS	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1628*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*65.7*	mi/h	S		mi/h
D = v_p / S	*24.8*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*C*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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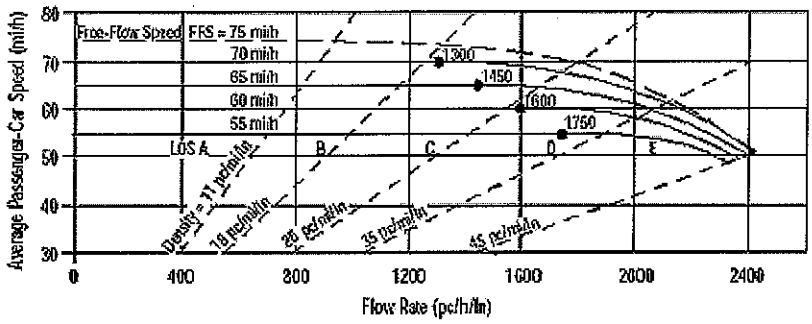

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4755*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1275*	pc/h/ln
S	*66.0*	mi/h
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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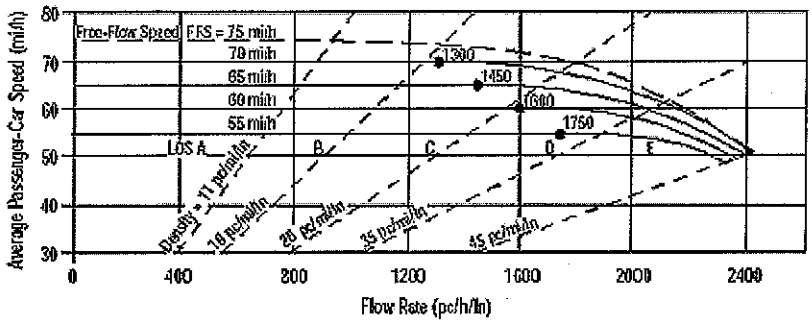
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6985*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*64.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1845*	pc/h/ln
S	*62.7*	mi/h
D = v_p / S	*29.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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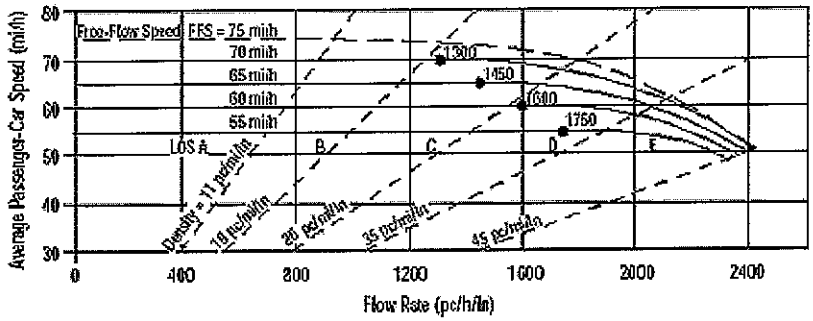
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7375*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*64.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1948*	pc/h/ln
S	*61.5*	mi/h
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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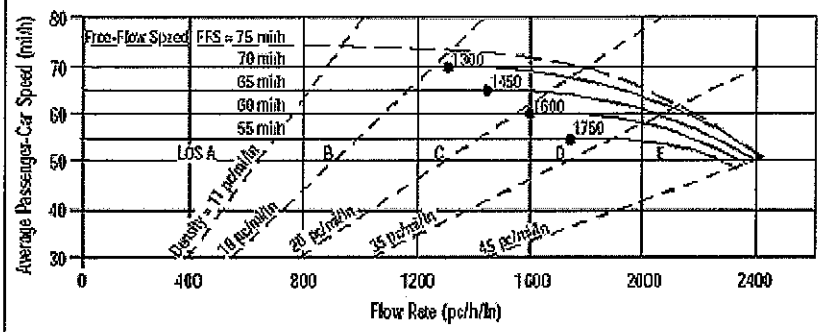

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5102*	veh/h	Peak-Hour Factor, PHF	*0.89*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.9*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2064*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*34.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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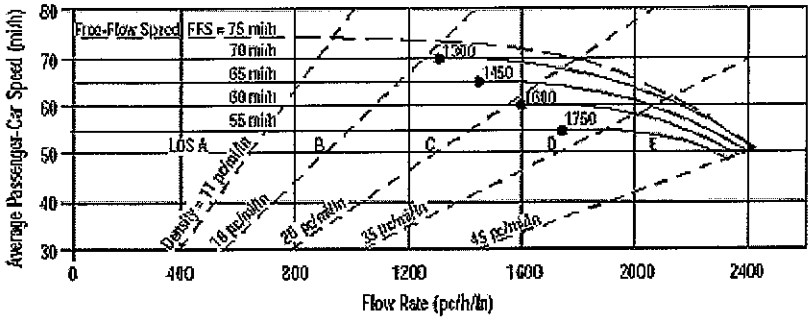

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2775*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.9*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*998*	pc/h/ln
S	*63.9*	mi/h
D = v_p / S	*15.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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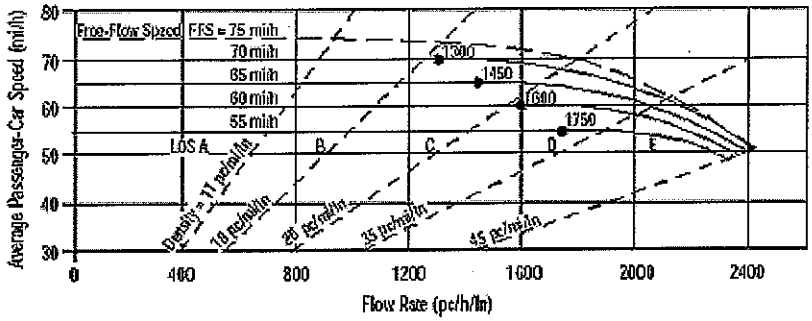

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3400*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1261*	pc/h/ln
S	*65.8*	mi/h
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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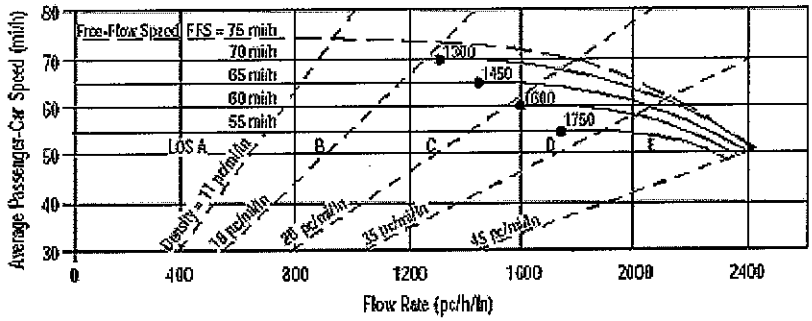

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6110*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2141*	pc/h/ln
S	*59.1*	mi/h
D = v_p / S	*36.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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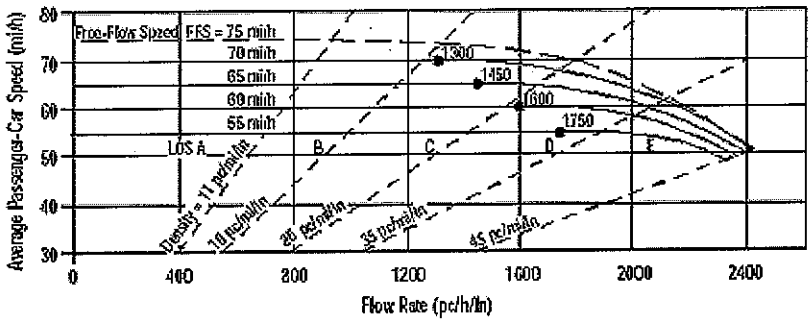

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5355*	veh/h	Peak-Hour Factor, PHF	*0.99*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.4*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.4*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1893*	pc/h/ln
S	*64.0*	mi/h
D = v_p / S	*29.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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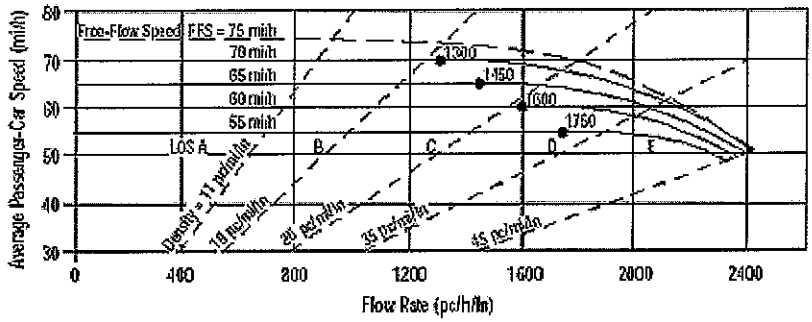
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3330*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1184*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*16.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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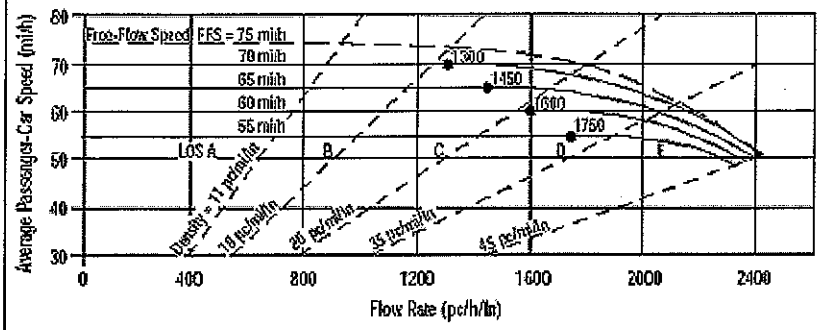
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3075*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1104*	pc/h/ln
S	*67.1*	mi/h
D = v_p / S	*16.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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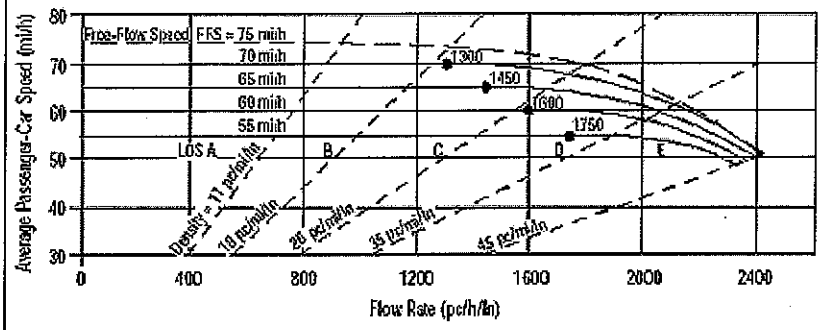

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6010*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2117*	pc/h/ln
S	*60.5*	mi/h
D = v_p / S	*35.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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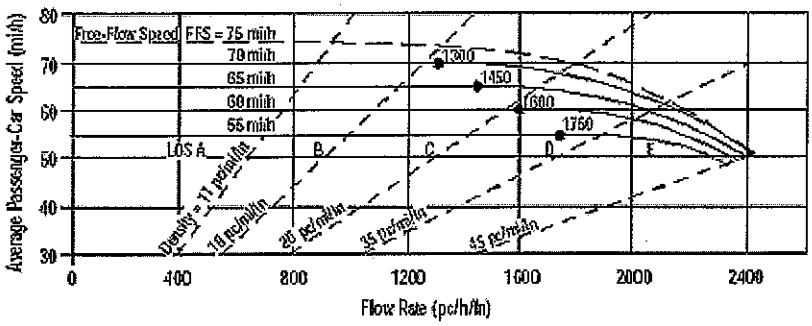

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5405*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1950*	pc/h/ln
S	*63.7*	mi/h
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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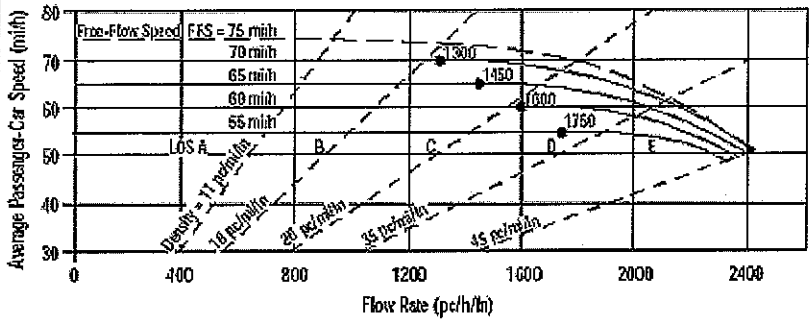
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3260*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1172*	pc/h/ln
S	*67.1*	mi/h
D = v_p / S	*17.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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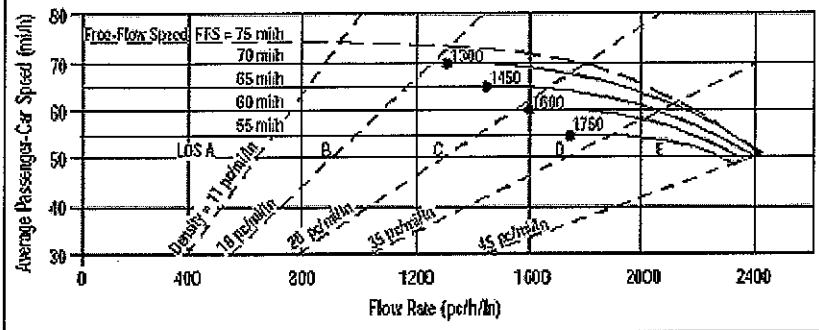

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2350*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*858*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*12.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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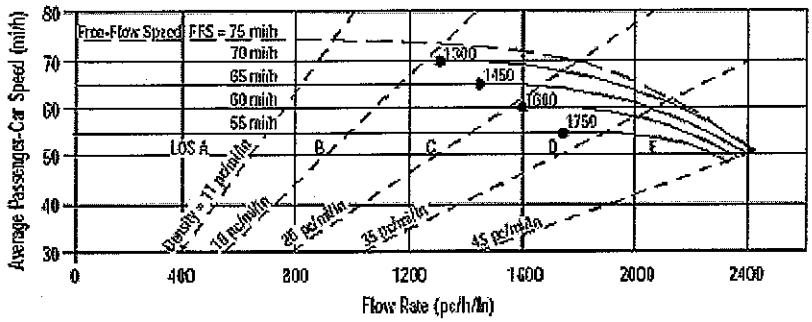

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5445*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1889*	pc/h/ln
S	*66.2*	mi/h
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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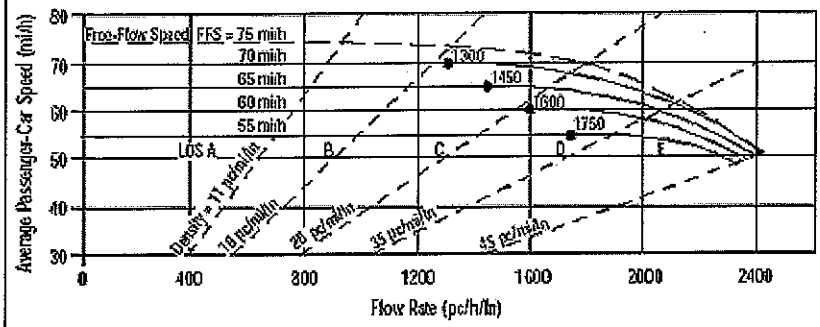
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route I-495*
Jurisdiction	*Raynham*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5260*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1881*	pc/h/ln
S	*64.5*	mi/h
D = v_p / S	*29.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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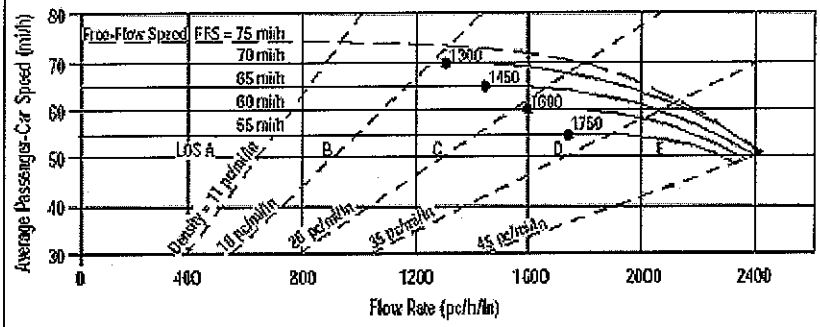

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3435*	veh/h	Peak-Hour Factor, PHF	*0.95*	
AADT		veh/day	%Trucks and Buses, P_T	*6*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1241*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*18.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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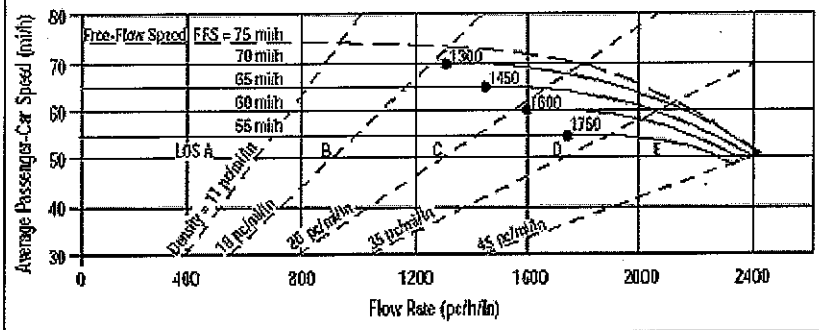

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2630*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*949*	pc/h/ln
S	*63.0*	mi/h
D = v_p / S	*15.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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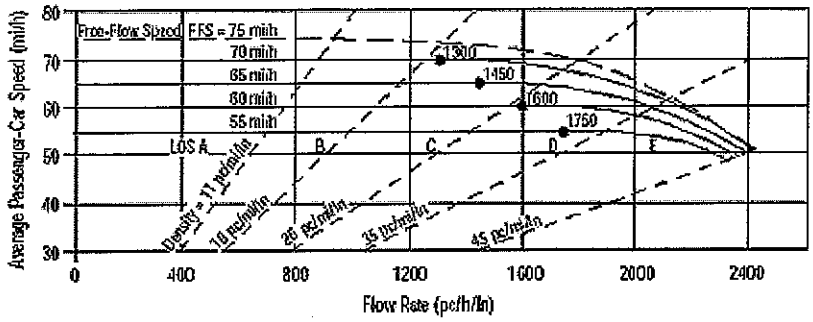

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4755*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1666*	pc/h/ln
S	*62.8*	mi/h
D = v_p / S	*26.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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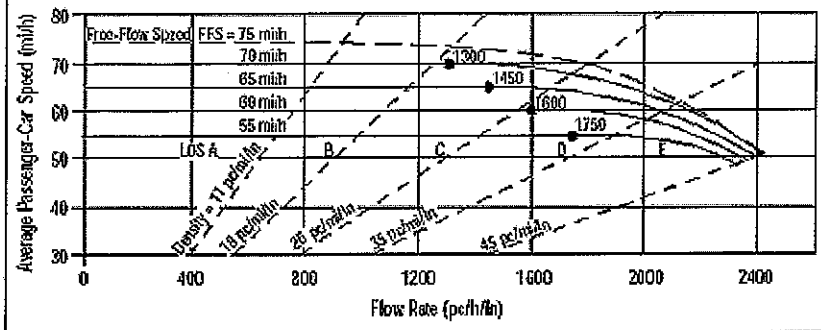

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3930*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2137*	pc/h/ln
S	*62.1*	mi/h
D = v_p / S	*34.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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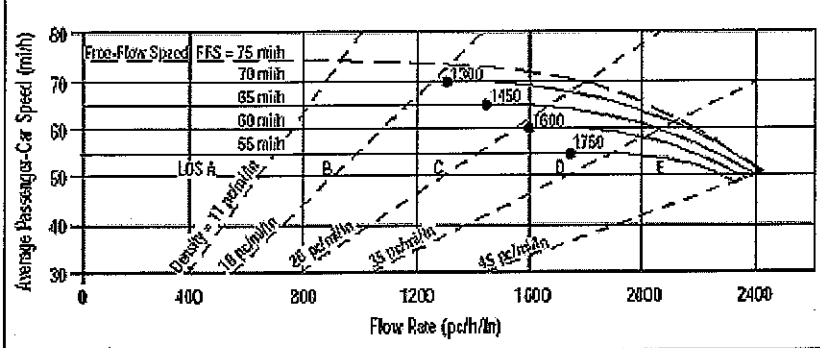

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2475*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1397*	pc/h/ln
S	*70.9*	mi/h
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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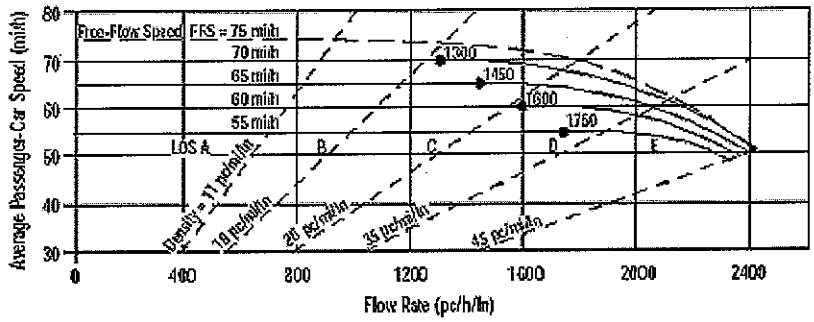

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2110*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1159*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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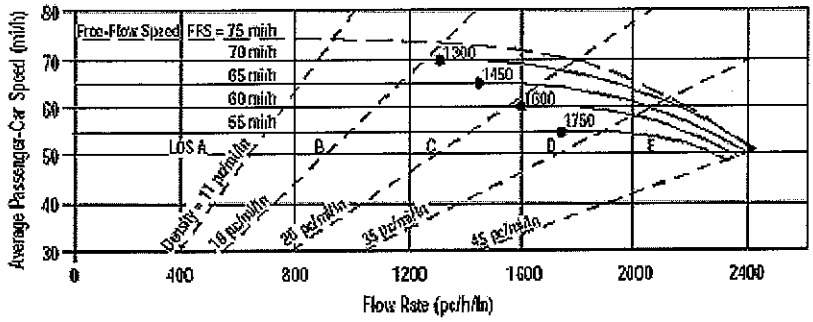
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3860*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2088*	pc/h/ln
S	*62.8*	mi/h
D = v_p / S	*33.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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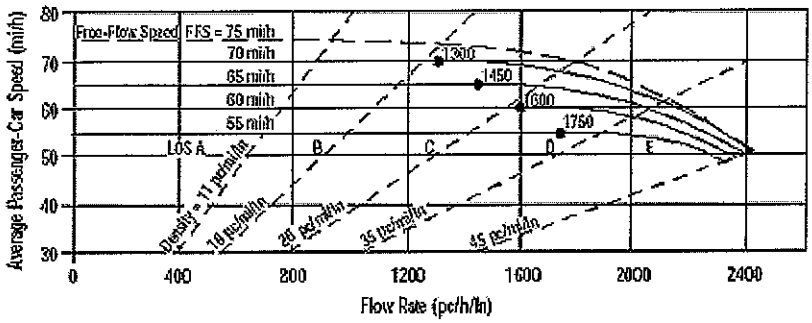

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 South of Route 140*
Date Performed	*11/18/2008*	Jurisdiction	*Taunton*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*1110*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*70.1*	mi/h	FFS	*70.1*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*611*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*70.1*	mi/h	S		mi/h
D = v_p / S	*8.7*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*A*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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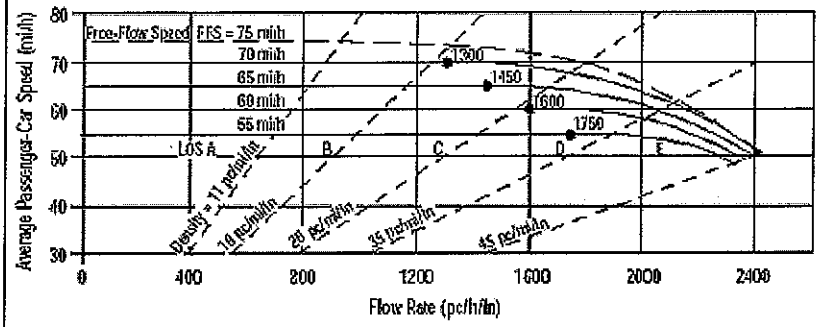

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1255*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/\{1+P_T(E_T - 1) + P_R(E_R - 1)\}$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*715*	pc/h/ln
S	*70.1*	mi/h
D = v_p / S	*10.2*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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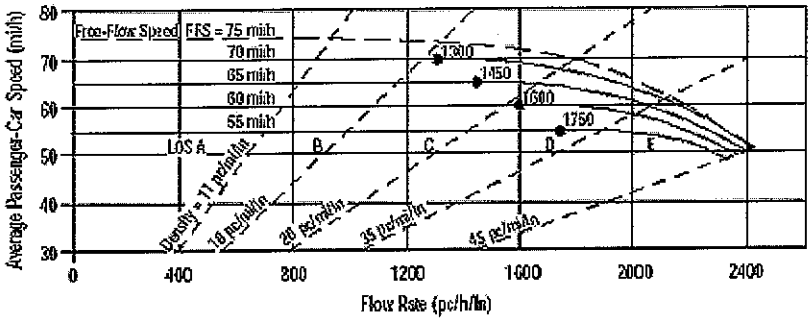

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1355*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*770*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*11.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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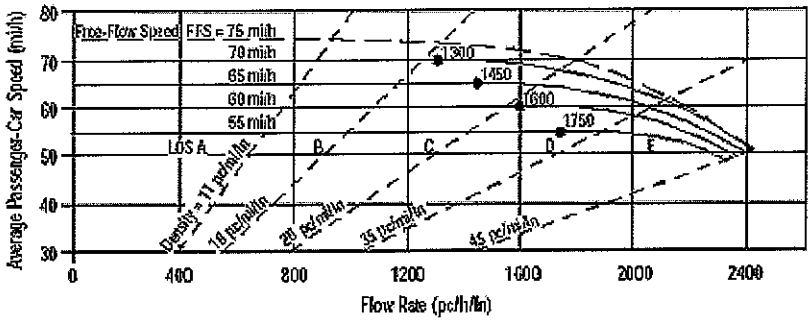

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2875*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1560*	pc/h/ln
S	*69.6*	mi/h
D = v_p / S	*22.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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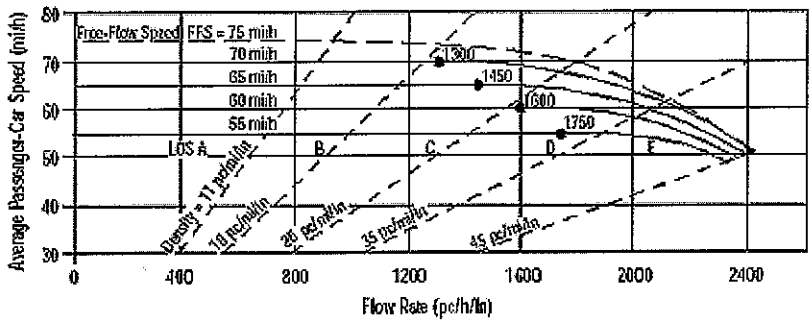

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Eastbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*830*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*469*	pc/h/ln
S	*65.0*	mi/h
D = v_p / S	*7.2*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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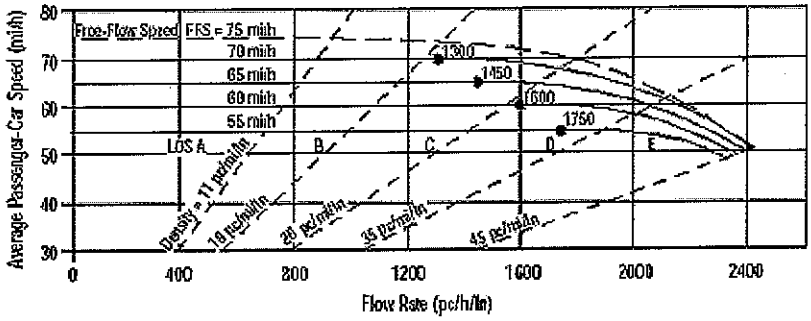

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Eastbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1740*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*924*	pc/h/ln
S	*65.0*	mi/h
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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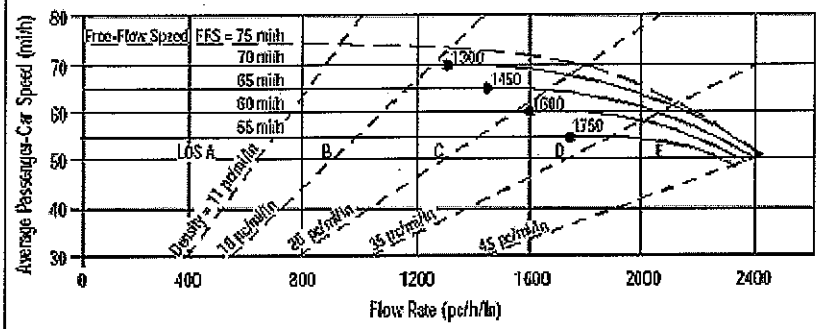

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Westbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1595*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*883*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*13.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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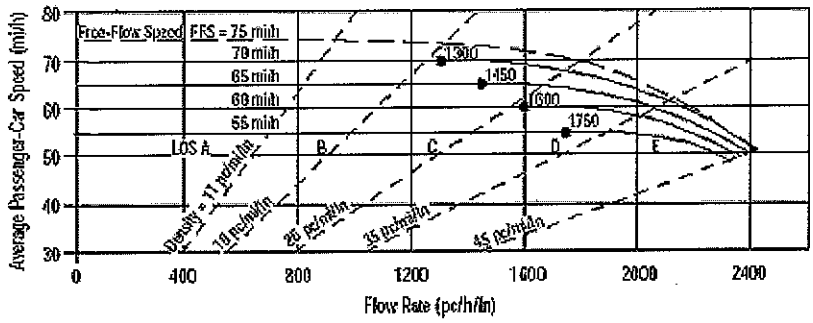

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Westbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1060*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*593*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*8.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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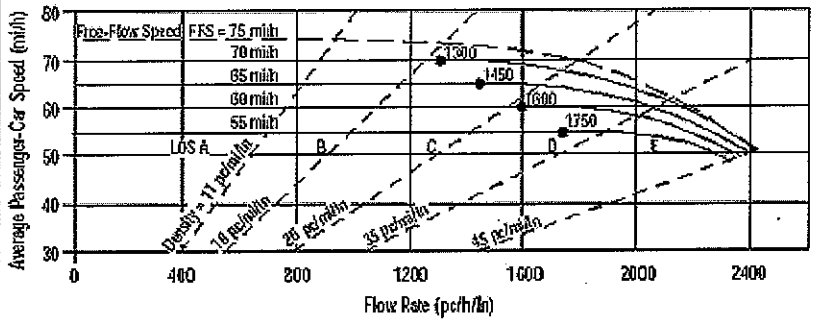

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2015*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1120*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*16.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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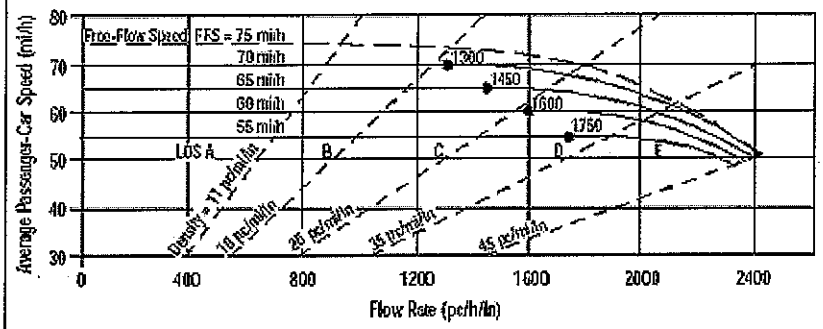

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2085*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1153*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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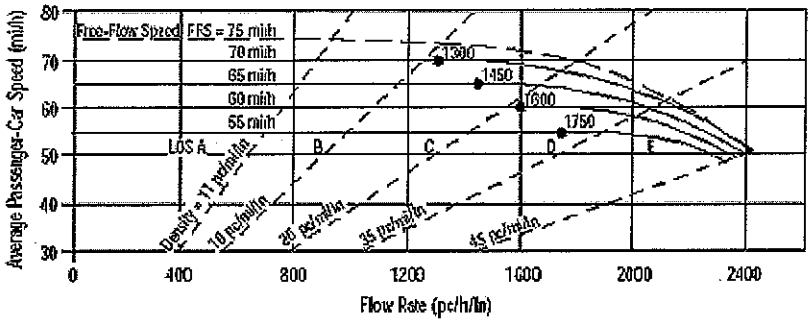

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 North of Hathaway Rd*
Date Performed	*11/18/2008*	Jurisdiction	*New Bedford*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2160*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*62.2*	mi/h	FFS	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1196*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*62.2*	mi/h	S		mi/h
D = v_p / S	*19.2*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*C*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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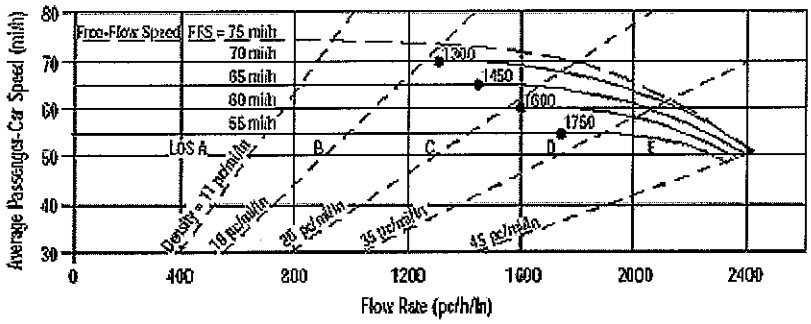

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2225*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.2*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1194*	pc/h/ln
S	*62.2*	mi/h
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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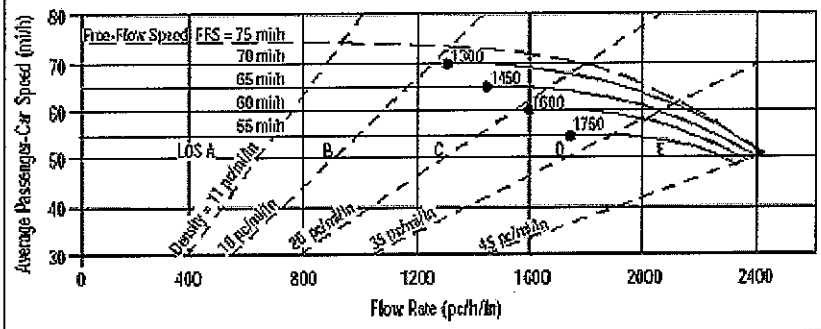

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2030*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1162*	pc/h/ln
S	*70.8*	mi/h
D = v_p / S	*16.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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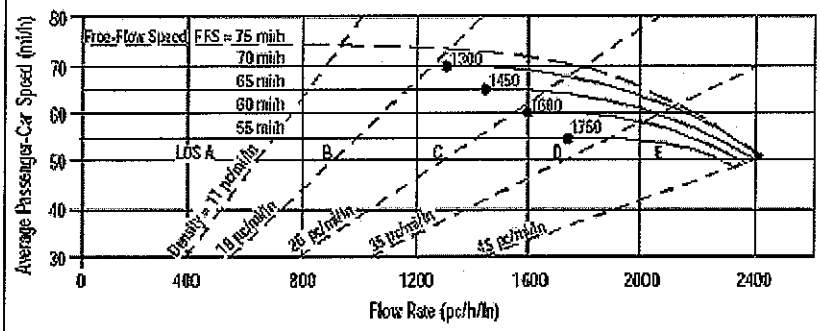
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1890*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1115*	pc/h/ln
S	*70.8*	mi/h
D = v_p / S	*15.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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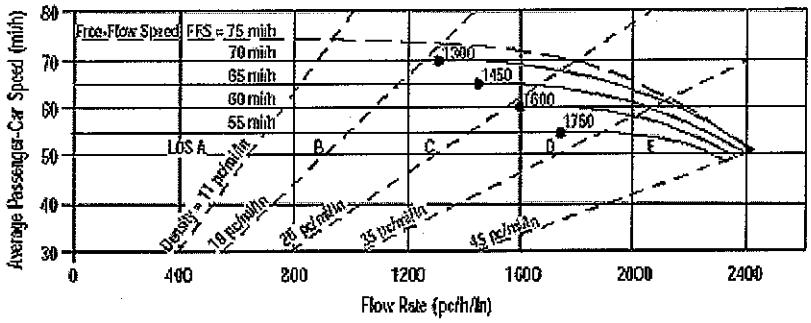
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1770*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*996*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*15.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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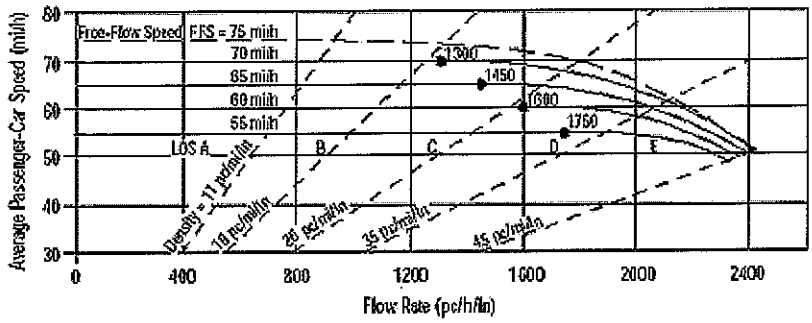

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2008*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2590*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1434*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*22.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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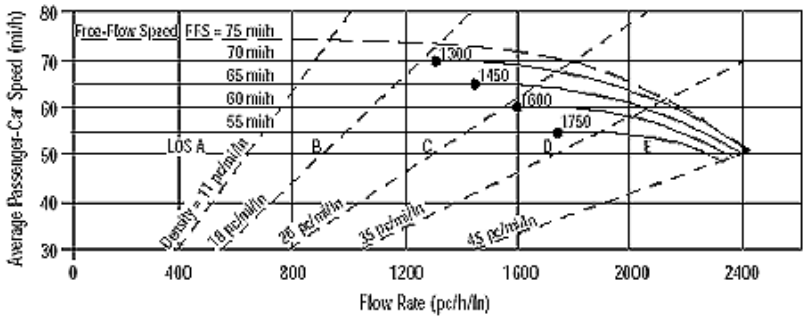

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3795*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1369*	pc/h/ln
S	*71.0*	mi/h
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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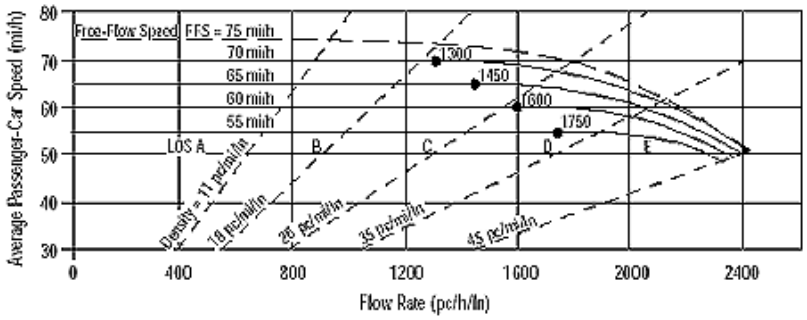

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2060*	veh/h	Peak-Hour Factor, PHF	*0.93*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*775*	pc/h/ln
S	*71.0*	mi/h
D = v_p / S	*10.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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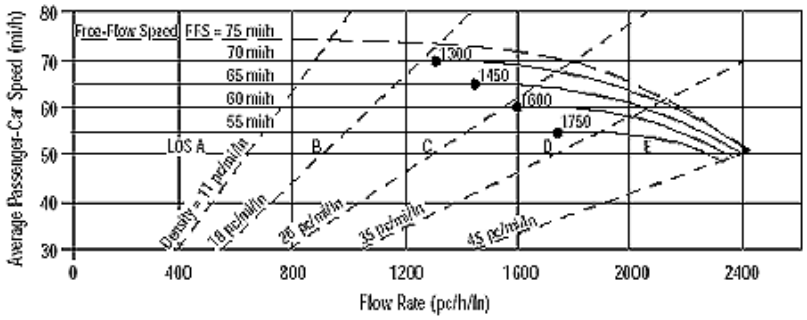

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1860*	veh/h	Peak-Hour Factor, PHF	*0.96*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*678*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*9.7*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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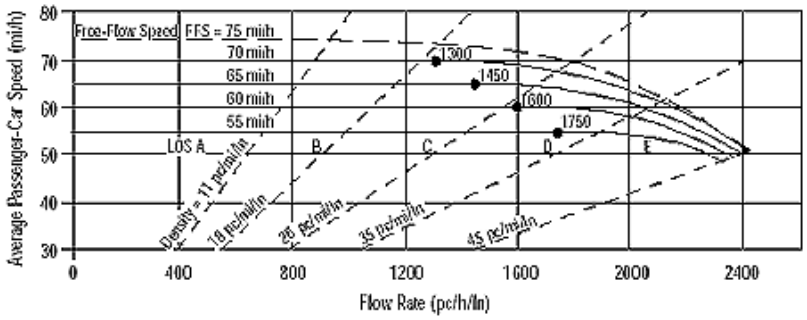

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3910*	veh/h	Peak-Hour Factor, PHF	*0.98*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1396*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*20.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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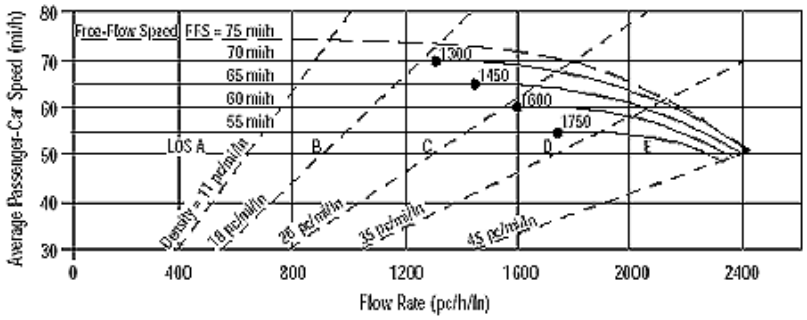

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1835*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*714*	pc/h/ln
S	*70.8*	mi/h
D = v_p / S	*10.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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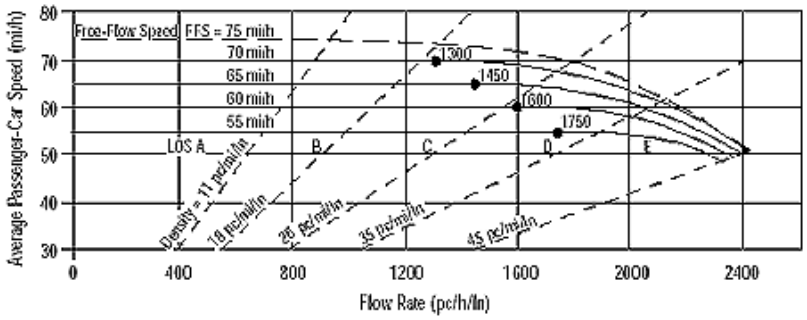

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1610*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*983*	pc/h/ln
S	*70.8*	mi/h
D = v_p / S	*13.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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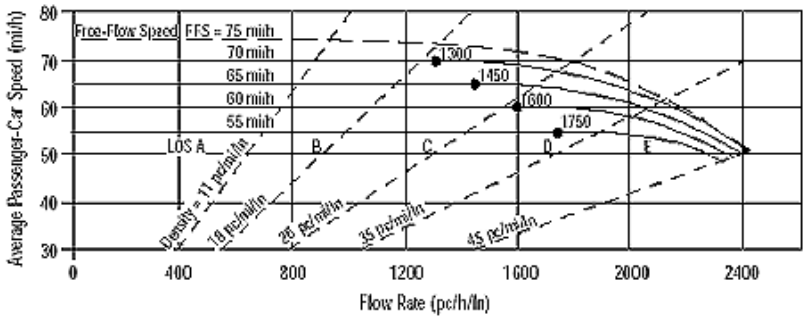

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1430*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*816*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*13.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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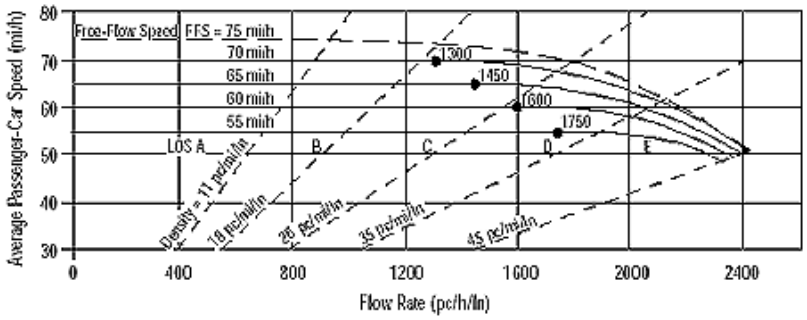

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2008 Existing*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2390*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1349*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*21.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	30	30	10	15	25	25	1145	15	0	365	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.68	0.68	0.68	0.91	0.91	0.91	0.89	0.89	0.89
Hourly flow rate (vph)	107	36	36	15	22	37	27	1258	16	0	410	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1802	1762	433	1808	1776	1266	455			1275		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1802	1762	433	1808	1776	1266	455			1275		
tC, single (s)	7.1	6.5	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	0	56	94	61	71	82	97			100		
cM capacity (veh/h)	39	82	621	38	75	204	1095			552		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	179	74	1302	455
Volume Left	107	15	27	0
Volume Right	36	37	16	45
cSH	55	85	1095	552
Volume to Capacity	3.26	0.87	0.03	0.00
Queue Length 95th (ft)	Err	115	2	0
Control Delay (s)	Err	149.1	1.0	0.0
Lane LOS	F	F	A	
Approach Delay (s)	Err	149.1	1.0	0.0
Approach LOS	F	F		

Intersection Summary				
Average Delay	894.7			
Intersection Capacity Utilization	103.0%	ICU Level of Service	G	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	430	15	135	100	55	5	55	440	80	35	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.80	0.80	0.80	0.87	0.87	0.87
Hourly flow rate (vph)	5	473	16	155	115	63	6	69	550	92	40	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	115			489			975	917	481	983	957	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			489			975	917	481	983	957	147
tC, single (s)	4.1			4.1			7.3	6.5	6.2	7.1	6.7	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			85			96	70	6	0	81	99
cM capacity (veh/h)	1487			1064			163	231	585	9	208	906

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	495	333	625	138
Volume Left	5	155	6	92
Volume Right	16	63	550	6
cSH	1487	1064	490	14
Volume to Capacity	0.00	0.15	1.28	10.04
Queue Length 95th (ft)	0	13	648	Err
Control Delay (s)	0.1	5.0	164.0	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.1	5.0	164.0	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	932.5			
Intersection Capacity Utilization	90.1%	ICU Level of Service	E	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	445	0	0	110	0	0	0	5	0	0	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.59
Hourly flow rate (vph)	141	464	0	0	125	0	0	0	6	0	0	110
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	125			464			980	870	464	875	870	125
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	125			464			980	870	464	875	870	125
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			100	100	99	100	100	88
cM capacity (veh/h)	1462			1098			187	262	599	249	262	928

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	604	125	6	110
Volume Left	141	0	0	0
Volume Right	0	0	6	110
cSH	1462	1700	599	928
Volume to Capacity	0.10	0.07	0.01	0.12
Queue Length 95th (ft)	8	0	1	10
Control Delay (s)	2.6	0.0	11.1	9.4
Lane LOS	A		B	A
Approach Delay (s)	2.6	0.0	11.1	9.4
Approach LOS			B	A

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

Existing Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	85	1010	235	70	335
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.89	0.89	0.81	0.81
Hourly flow rate (vph)	68	97	1135	264	86	414
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1853	1267			1399	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1853	1267			1399	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	52			82	
cM capacity (veh/h)	68	203			485	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	165	1399	500
Volume Left	68	0	86
Volume Right	97	264	0
cSH	111	1700	485
Volume to Capacity	1.48	0.82	0.18
Queue Length 95th (ft)	298	0	16
Control Delay (s)	329.3	0.0	5.2
Lane LOS	F		A
Approach Delay (s)	329.3	0.0	5.2
Approach LOS	F		

Intersection Summary			
Average Delay	27.5		
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	15	140	90	45	140
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.86	0.86	0.73	0.73
Hourly flow rate (vph)	45	17	163	105	62	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	530	215			267	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	530	215			267	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	90	98			95	
cM capacity (veh/h)	475	812			1296	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	62	267	253
Volume Left	45	0	62
Volume Right	17	105	0
cSH	536	1700	1296
Volume to Capacity	0.12	0.16	0.05
Queue Length 95th (ft)	10	0	4
Control Delay (s)	12.6	0.0	2.2
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	2.2
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	0	5	830	480	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	5	902	522	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				856		
pX, platoon unblocked	0.66					
vC, conflicting volume	1438	524	527			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1405	524	527			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	100	99			
cM capacity (veh/h)	101	553	1040			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	908	527
Volume Left	11	5	0
Volume Right	0	0	5
cSH	101	1040	1700
Volume to Capacity	0.11	0.01	0.31
Queue Length 95th (ft)	9	0	0
Control Delay (s)	45.1	0.1	0.0
Lane LOS	E	A	
Approach Delay (s)	45.1	0.1	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

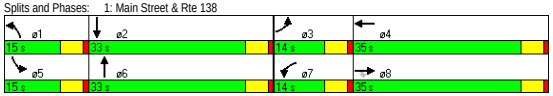
Lanes, Volumes, Timings
1: Main Street & Rte 138

Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	180	200	70	325	80	195	375	45	125	520	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	11	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4952			2928	
Travel Time (s)		26.1			62.7			84.4			49.9	
Peak Hour Factor	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	201	220	244	82	476	0	217	467	0	140	859	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	12.0	12.0	12.0	21.0		12.0	21.0		12.0	20.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	15.0	33.0	0.0	15.0	33.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	15.5%	34.0%	0.0%	15.5%	34.0%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		10.0	28.0		10.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					5.0			5.0				
Flash Dont Walk (s)					11.0			11.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	1.01	0.51	0.43	0.48	0.72		0.98	0.43		0.69	0.78	
Control Delay	107.0	33.6	6.7	45.8	35.3		95.8	22.5		54.3	28.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	107.0	33.6	6.7	45.8	35.3		95.8	22.5		54.3	28.6	
Queue Length 50th (ft)	~113	105	0	41	114		~115	93		70	184	
Queue Length 95th (ft)	#231	157	41	84	153		#275	149		#160	277	
Internal Link Dist (ft)		1645			3138			4872			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	199	682	747	195	1275		221	1159		217	1185	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.01	0.32	0.33	0.42	0.37		0.98	0.40		0.65	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 97	
Actuated Cycle Length: 80.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	180	200	70	325	80	195	375	45	125	520	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818	1583	1728	3346		1770	3287		1736	3235	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1818	1583	1728	3346		1770	3287		1736	3235	
Peak-hour factor, PHF	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	201	220	244	82	382	94	217	417	50	140	584	275
RTOR Reduction (vph)	0	0	187	0	26	0	0	9	0	0	55	0
Lane Group Flow (vph)	201	220	57	82	450	0	217	458	0	140	804	0
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.1	19.1	19.1	6.4	16.4		10.1	26.5		9.5	25.9	
Effective Green, g (s)	9.1	19.1	19.1	6.4	16.4		10.1	26.5		9.5	25.9	
Actuated g/C Ratio	0.11	0.23	0.23	0.08	0.20		0.12	0.33		0.12	0.32	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	198	426	371	136	673		219	1069		202	1028	
v/s Ratio Prot	c0.11	c0.12		0.05	c0.13		c0.12	0.14		0.08	c0.25	
v/s Ratio Perm			0.04									
v/c Ratio	1.02	0.52	0.15	0.60	0.67		0.99	0.43		0.69	0.78	
Uniform Delay, d1	36.2	27.2	24.8	36.3	30.0		35.7	21.6		34.6	25.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	67.9	0.4	0.1	5.1	2.0		58.0	0.4		8.0	4.2	
Delay (s)	104.1	27.6	24.9	41.4	32.0		93.6	21.9		42.6	29.4	
Level of Service	F	C	C	D	C		F	C		D	C	
Approach Delay (s)		49.7			33.4			44.7			31.3	
Approach LOS		D			C			D			C	

Intersection Summary					
HCM Average Control Delay	39.1	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	81.5	Sum of lost time (s)		25.0	
Intersection Capacity Utilization	70.4%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

Existing Condition - PM Peak Hour

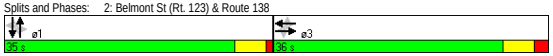
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	25	70	485	35	165	25	365	290	205	580	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	10	11	12	12	11	12	12	11	12
Storage Length (ft)	0		0	100		0	0		0	200		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		387			2550			908			853	
Travel Time (s)		5.9			38.6			13.8			12.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	0	551	228	0	0	731	0	0	895	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		13.0	13.0		13.0	13.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.7%	50.7%	0.0%	50.7%	50.7%	0.0%	49.3%	49.3%	0.0%	49.3%	49.3%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.19		1.02	0.29			0.53			1.05	
Control Delay		7.0		69.0	4.6			9.8			66.4	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		7.0		69.0	4.6			9.8			66.4	
Queue Length 50th (ft)		16		~247	10			63			~228	
Queue Length 95th (ft)		46		#427	46			110			#342	
Internal Link Dist (ft)		307			2470			828			773	
Turn Bay Length (ft)				100								
Base Capacity (vph)		754		538	777			1391			856	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.19		1.02	0.29			0.53			1.05	

Intersection Summary	
Area Type:	Other
Cycle Length: 71	
Actuated Cycle Length: 71	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	25	70	485	35	165	25	365	290	205	580	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	14	12	10	11	12	12	11	12	12	11	12
Total Lost time (s)		6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.92		1.00	0.88			0.94			0.99	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1851		1668	1583			3178			3315	
Flt Permitted		0.89		0.72	1.00			0.90			0.60	
Satd. Flow (perm)		1677		1273	1583			2867			2016	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	34	28	79	551	40	188	27	392	312	225	637	33
RTOR Reduction (vph)	0	46	0	0	109	0	0	180	0	0	4	0
Lane Group Flow (vph)	0	95	0	551	119	0	0	551	0	0	891	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		30.0		30.0	30.0			30.0			30.0	
Effective Green, g (s)		30.0		30.0	30.0			30.0			30.0	
Actuated g/C Ratio		0.42		0.42	0.42			0.42			0.42	
Clearance Time (s)		6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)		4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)		709		538	669			1211			852	
v/s Ratio Prot					0.08							
v/s Ratio Perm		0.06		c0.43				0.19			c0.44	
v/c Ratio		0.13		1.02	0.18			0.45			1.05	
Uniform Delay, d1		12.6		20.5	12.8			14.7			20.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		45.1	0.2			0.4			43.5	
Delay (s)		12.7		65.6	13.0			15.0			64.0	
Level of Service		B		E	B			B			E	
Approach Delay (s)		12.7			50.2			15.0			64.0	
Approach LOS		B			D			B			E	

Intersection Summary					
HCM Average Control Delay	42.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	1.04				
Actuated Cycle Length (s)	71.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	90.4%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

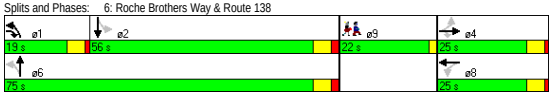
Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138

Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	85	0	270	1	0	0	175	425	5	5	720	130	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	12	12	12	11	11	11	12	12	12	
Storage Length (ft)	0		100	0		0	0		0	0		0	
Storage Lanes	0		1	0		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		635			332			1623			2417		
Travel Time (s)		14.4			7.5			36.9			54.9		
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	94	300	0	4	0	0	737	0	0	950	0	
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm			
Protected Phases		4	1		8		1	6			2		9
Permitted Phases	4		4	8			6			2			
Detector Phase	4	4	1	8	8		1	6		2	2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0		7.0
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	21.0		21.0	21.0		22.0
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0	22.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%	18%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0		20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag		
Lead-Lag Optimize?			Yes				Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.36	0.48		0.02			0.55			0.69		
Control Delay		25.2	5.0		20.0			7.2			15.8		
Queue Delay		0.0	0.0		0.0			0.0			0.0		
Total Delay		25.2	5.0		20.0			7.2			15.8		
Queue Length 50th (ft)		25	0		1			48			118		
Queue Length 95th (ft)		73	45		2			87			208		
Internal Link Dist (ft)		555			252			1543			2337		
Turn Bay Length (ft)			100										
Base Capacity (vph)		580	832		538			1969			2985		
Starvation Cap Reductn		0	0		0			0			0		
Spillback Cap Reductn		0	0		0			0			0		
Storage Cap Reductn		0	0		0			0			0		
Reduced v/c Ratio		0.16	0.36		0.01			0.37			0.32		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 51	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 6: Roche Brothers Way & Route 138



HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	0	270	1	0	0	175	425	5	5	720	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.94		1.00			1.00			0.99	
Flpb, ped/bikes		0.95	1.00		0.96			1.00			1.00	
Frt		1.00	0.85		1.00			1.00			0.98	
Flt Protected		0.95	1.00		0.95			0.99			1.00	
Satd. Flow (prot)		1714	1454		1725			3331			3434	
Flt Permitted		0.76	1.00		0.70			0.54			0.95	
Satd. Flow (perm)		1363	1454		1264			1816			3262	
Peak-hour factor, PHF	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Adj. Flow (vph)	94	0	300	4	0	0	213	518	6	6	800	144
RTOR Reduction (vph)	0	0	218	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	94	82	0	4	0	0	737	0	0	938	0
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		7.7	14.2		7.7			33.1			21.6	
Effective Green, g (s)		7.7	14.2		7.7			33.1			21.6	
Actuated g/C Ratio		0.15	0.27		0.15			0.64			0.42	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)		203	539		188			1351			1360	
v/s Ratio Prot			0.02					c0.07				
v/s Ratio Perm		c0.07	0.04		0.00			0.28			c0.29	
v/c Ratio		0.46	0.15		0.02			0.55			0.69	
Uniform Delay, d1		20.2	14.2		18.8			5.2			12.4	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.6	0.0		0.0			0.2			1.2	
Delay (s)		20.8	14.3		18.8			5.4			13.5	
Level of Service		C	B		B			A			B	
Approach Delay (s)		15.8			18.8			5.4			13.5	
Approach LOS		B			B			A			B	

Intersection Summary					
HCM Average Control Delay		11.1	HCM Level of Service		B
HCM Volume to Capacity ratio		0.65			
Actuated Cycle Length (s)		51.8	Sum of lost time (s)		17.0
Intersection Capacity Utilization		68.3%	ICU Level of Service		C
Analysis Period (min)		15			

c Critical Lane Group

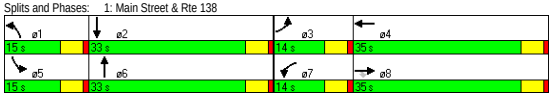
Lanes, Volumes, Timings
1: Main Street & Rte 138

Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	345	330	170	30	130	110	105	665	45	65	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	11	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4949			2928	
Travel Time (s)		26.1			62.7			84.4			49.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	388	371	191	34	273	0	114	772	0	74	392	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	23.0		12.0	23.0		12.0	21.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	15.0	33.0	0.0	15.0	33.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	15.5%	34.0%	0.0%	15.5%	34.0%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		10.0	28.0		10.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					7.0			7.0				
Flash Dont Walk (s)					8.0			8.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	1.87	0.62	0.30	0.21	0.36		0.54	0.74		0.38	0.38	
Control Delay	438.0	31.6	5.5	42.0	15.6		48.3	30.3		43.6	22.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	438.0	31.6	5.5	42.0	15.6		48.3	30.3		43.6	22.7	
Queue Length 50th (ft)	~337	185	0	17	33		58	183		38	78	
Queue Length 95th (ft)	#576	294	46	49	63		#142	302		86	134	
Internal Link Dist (ft)		1645			3138			4869			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	207	771	768	202	1371		245	1308		243	1324	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.87	0.48	0.25	0.17	0.20		0.47	0.59		0.30	0.30	

Intersection Summary	
Area Type:	Other
Cycle Length: 97	
Actuated Cycle Length: 76.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	345	330	170	30	130	110	105	665	45	65	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1818	1553	1586	3066		1736	3298		1719	3305	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1626	1818	1553	1586	3066		1736	3298		1719	3305	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	388	371	191	34	148	125	114	723	49	74	324	68
RTOR Reduction (vph)	0	0	131	0	95	0	0	5	0	0	18	0
Lane Group Flow (vph)	388	371	60	34	178	0	114	767	0	74	374	0
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.7	24.9	24.9	3.9	19.1		6.9	24.1		6.4	23.6	
Effective Green, g (s)	9.7	24.9	24.9	3.9	19.1		6.9	24.1		6.4	23.6	
Actuated g/C Ratio	0.12	0.31	0.31	0.05	0.24		0.09	0.30		0.08	0.30	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	199	571	488	78	738		151	1002		139	984	
v/s Ratio Prot	c0.24	c0.20		0.02	0.06		c0.07	c0.23		0.04	0.11	
v/s Ratio Perm			0.04									
v/c Ratio	1.95	0.65	0.12	0.44	0.24		0.75	0.77		0.53	0.38	
Uniform Delay, d1	34.8	23.4	19.4	36.6	24.3		35.4	25.0		35.0	22.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	445.2	1.9	0.0	1.4	0.1		17.2	3.8		2.0	0.3	
Delay (s)	480.0	25.4	19.4	38.0	24.3		52.5	28.8		37.0	22.4	
Level of Service	F	C	B	D	C		D	C		D	C	
Approach Delay (s)		209.9			25.8			31.9			24.7	
Approach LOS		F			C			C			C	

Intersection Summary					
HCM Average Control Delay	94.7	HCM Level of Service		F	
HCM Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	79.3	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	68.6%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

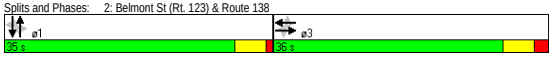
Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	15	5	235	15	180	15	645	410	175	265	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	10	11	12	12	11	12	12	11	12
Storage Length (ft)	0		0	100		0	0		0	200		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		387			2550			980			856	
Travel Time (s)		5.9			38.6			14.8			13.0	
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	287	238	0	0	1151	0	0	483	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		13.0	13.0		13.0	13.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.7%	50.7%	0.0%	50.7%	50.7%	0.0%	49.3%	49.3%	0.0%	49.3%	49.3%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.08		0.68	0.43			0.74			1.48dl	
Control Delay		11.7		26.2	10.1			14.7			15.6	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		11.7		26.2	10.1			14.7			15.6	
Queue Length 50th (ft)		9		91	30			128			60	
Queue Length 95th (ft)		20		142	64			265			132	
Internal Link Dist (ft)		307			2470			900			776	
Turn Bay Length (ft)				100								
Base Capacity (vph)		848		656	790			1691			964	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.05		0.44	0.30			0.68			0.50	

Intersection Summary	
Area Type:	Other
Cycle Length: 71	
Actuated Cycle Length: 59.4	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	15	5	235	15	180	15	645	410	175	265	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	14	12	10	11	12	12	11	12	12	11	12
Total Lost time (s)		6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.98		1.00	0.86			0.94			1.00	
Flt Protected		0.98		0.95	1.00			1.00			0.98	
Satd. Flow (prot)		1807		1636	1398			3192			3275	
Flt Permitted		0.88		0.73	1.00			0.95			0.55	
Satd. Flow (perm)		1617		1256	1398			3023			1848	
Peak-hour factor, PHF	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	14	21	7	287	18	220	16	694	441	190	288	5
RTOR Reduction (vph)	0	5	0	0	83	0	0	123	0	0	1	0
Lane Group Flow (vph)	0	37	0	287	155	0	0	1028	0	0	482	0
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		19.9		19.9	19.9			28.1			28.1	
Effective Green, g (s)		19.9		19.9	19.9			28.1			28.1	
Actuated g/C Ratio		0.34		0.34	0.34			0.48			0.48	
Clearance Time (s)		6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)		4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)		545		424	472			1440			880	
v/s Ratio Prot					0.11							
v/s Ratio Perm		0.02		c0.23				c0.34			0.26	
v/c Ratio		0.07		0.68	0.33			0.71			1.48dl	
Uniform Delay, d1		13.3		16.8	14.6			12.3			10.9	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		4.6	0.6			1.8			0.9	
Delay (s)		13.3		21.4	15.1			14.1			11.8	
Level of Service		B		C	B			B			B	
Approach Delay (s)		13.3			18.6			14.1			11.8	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	14.6	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	59.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	77.0%	ICU Level of Service		D	
Analysis Period (min)	15				

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

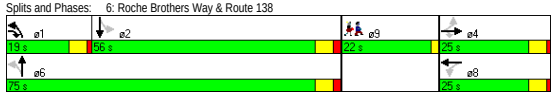
c Critical Lane Group

Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138 — Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	75	0	60	5	0	5	175	915	0	0	310	85	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	12	12	12	11	11	11	12	12	12	
Storage Length (ft)	0		100	0		0	0		0	0		0	
Storage Lanes	0		1	0		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		635			332			1623			2417		
Travel Time (s)		14.4			7.5			36.9			54.9		
Peak Hour Factor	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84	
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	91	73	0	16	0	0	1282	0	0	470	0	
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm			
Protected Phases		4	1		8		1	6			2		9
Permitted Phases	4		4	8			6			2			
Detector Phase	4	4	1	8	8		1	6		2	2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0		7.0
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	21.0		21.0	21.0		22.0
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0	22.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%	18%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0		20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag		
Lead-Lag Optimize?			Yes				Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.42	0.15		0.07			0.69			0.23		
Control Delay		34.6	7.0		22.4			8.5			8.3		
Queue Delay		0.0	0.0		0.0			0.0			0.0		
Total Delay		34.6	7.0		22.4			8.5			8.3		
Queue Length 50th (ft)		30	0		3			116			47		
Queue Length 95th (ft)		86	26		14			178			74		
Internal Link Dist (ft)		555			252			1543			2337		
Turn Bay Length (ft)			100										
Base Capacity (vph)		455	671		485			2365			2741		
Starvation Cap Reductn		0	0		0			0			0		
Spillback Cap Reductn		0	0		0			0			0		
Storage Cap Reductn		0	0		0			0			0		
Reduced v/c Ratio		0.20	0.11		0.03			0.54			0.17		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 64.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 6: Roche Brothers Way & Route 138



HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138 — Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	0	60	5	0	5	175	915	0	0	310	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.93			1.00			0.97	
Flt Protected		0.95	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1736	1473		1686			3361			3345	
Flt Permitted		0.75	1.00		0.83			0.72			1.00	
Satd. Flow (perm)		1365	1473		1440			2455			3345	
Peak-hour factor, PHF	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	91	0	73	8	0	8	206	1076	0	0	369	101
RTOR Reduction (vph)	0	0	58	0	7	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	91	15	0	9	0	0	1282	0	0	454	0
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		8.5	13.2		8.5			46.4			36.7	
Effective Green, g (s)		8.5	13.2		8.5			46.4			36.7	
Actuated g/C Ratio		0.13	0.20		0.13			0.70			0.56	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)		176	407		186			1793			1863	
v/s Ratio Prot			0.00					c0.05			0.14	
v/s Ratio Perm		c0.07	0.01		0.01			c0.45				
v/c Ratio		0.52	0.04		0.05			0.72			0.24	
Uniform Delay, d1		26.8	21.2		25.2			5.8			7.5	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.1	0.0		0.0			1.1			0.0	
Delay (s)		27.9	21.2		25.2			7.0			7.5	
Level of Service		C	C		C			A			A	
Approach Delay (s)		24.9			25.2			7.0			7.5	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM Average Control Delay	8.8	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	65.9	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	63.2%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	15	30	20	45	35	55	575	25	20	875	150
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.88	0.88	0.88	0.85	0.85	0.85
Hourly flow rate (vph)	71	18	35	23	52	41	62	653	28	24	1029	176
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2024	1972	1118	2001	2046	668	1206			682		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2024	1972	1118	2001	2046	668	1206			682		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	68	86	12	0	91	89			97		
cM capacity (veh/h)	0	55	250	26	49	457	579			920		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	124	116	744	1229
Volume Left	71	23	62	24
Volume Right	35	41	28	176
cSH	0	57	579	920
Volume to Capacity	Err	2.03	0.11	0.03
Queue Length 95th (ft)	Err	281	9	2
Control Delay (s)	Err	634.7	3.0	1.0
Lane LOS	F	F	A	A
Approach Delay (s)	Err	634.7	3.0	1.0
Approach LOS	F	F		

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	215	25	365	385	90	15	40	185	70	65	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Hourly flow rate (vph)	6	253	29	424	448	105	17	45	208	75	70	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	448			282			1674	1576	268	1651	1643	500
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448			282			1674	1576	268	1651	1643	500
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			67			0	38	73	0	0	98
cM capacity (veh/h)	1123			1286			0	73	769	22	66	575

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	288	977	270	156
Volume Left	6	424	17	75
Volume Right	29	105	208	11
cSH	1123	1286	0	35
Volume to Capacity	0.01	0.33	Err	4.51
Queue Length 95th (ft)	0	36	Err	Err
Control Delay (s)	0.2	6.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	6.5	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	94.6%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	230	0	0	405	5	10	5	15	0	0	165
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.89	0.89	0.92	0.92	0.92	0.89	0.92	0.89
Hourly flow rate (vph)	71	274	0	0	455	6	11	5	16	0	0	185
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	461			274			1060	877	274	894	875	458
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	461			274			1060	877	274	894	875	458
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			92	98	98	100	100	69
cM capacity (veh/h)	1111			1289			133	268	765	242	269	607

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	345	461	33	185
Volume Left	71	0	11	0
Volume Right	0	6	16	185
cSH	1111	1700	265	607
Volume to Capacity	0.06	0.27	0.12	0.31
Queue Length 95th (ft)	5	0	10	32
Control Delay (s)	2.3	0.0	20.5	13.5
Lane LOS	A		C	B
Approach Delay (s)	2.3	0.0	20.5	13.5
Approach LOS			C	B

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	165	115	505	145	120	895
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Hourly flow rate (vph)	206	144	601	173	130	973
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1921	688			774	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1921	688			774	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	68			85	
cM capacity (veh/h)	63	448			846	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	350	774	1103
Volume Left	206	0	130
Volume Right	144	173	0
cSH	98	1700	846
Volume to Capacity	3.59	0.46	0.15
Queue Length 95th (ft)	Err	0	14
Control Delay (s)	Err	0.0	4.4
Lane LOS	F		A
Approach Delay (s)	Err	0.0	4.4
Approach LOS	F		

Intersection Summary			
Average Delay	1573.6		
Intersection Capacity Utilization	115.3%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Elm Street & Main Street

Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	120	95	150	50	35	160
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	143	113	163	54	37	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	432	190			217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	432	190			217	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	87			97	
cM capacity (veh/h)	565	854			1364	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	256	217	205
Volume Left	143	0	37
Volume Right	113	54	0
cSH	664	1700	1364
Volume to Capacity	0.39	0.13	0.03
Queue Length 95th (ft)	45	0	2
Control Delay (s)	13.8	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	13.8	0.0	1.6
Approach LOS	B		

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
48: Roosevelt Circle & Route 138

Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	10	30	530	770	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	11	33	576	837	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				853		
pX, platoon unblocked	0.85					
vC, conflicting volume	1489	848	859			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1487	848	859			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	96			
cM capacity (veh/h)	112	361	782			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	609	859
Volume Left	5	33	0
Volume Right	11	0	22
cSH	207	782	1700
Volume to Capacity	0.08	0.04	0.51
Queue Length 95th (ft)	6	3	0
Control Delay (s)	23.9	1.1	0.0
Lane LOS	C	A	
Approach Delay (s)	23.9	1.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2008 Existing Condition - AM Peak Hour

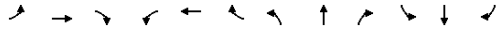
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	245	45	10	60	25	160
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.90	0.90	0.62	0.62	0.78	0.78
Hourly flow rate (vph)	272	50	16	97	32	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	264	135	237			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264	135	237			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	95	99			
cM capacity (veh/h)	719	920	1342			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	322	113	237
Volume Left	272	16	0
Volume Right	50	0	205
cSH	744	1342	1700
Volume to Capacity	0.43	0.01	0.14
Queue Length 95th (ft)	55	1	0
Control Delay (s)	13.5	1.2	0.0
Lane LOS	B	A	
Approach Delay (s)	13.5	1.2	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Ponta Delgada

2008 Existing Condition - AM Peak Hour



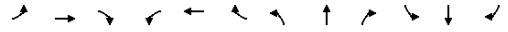
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	0	35	10	5	5	10	290	20	150	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.72	0.72	0.72	0.91	0.91	0.91	0.87	0.87	0.87
Hourly flow rate (vph)	0	31	0	49	14	7	5	11	319	23	172	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	425	571	184	427	423	170	195			330		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425	571	184	427	423	170	195			330		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	100	90	97	99	100			98		
cM capacity (veh/h)	518	404	864	501	514	879	1390			1213		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	31	69	335	218
Volume Left	0	49	5	23
Volume Right	0	7	319	23
cSH	404	526	1390	1213
Volume to Capacity	0.08	0.13	0.00	0.02
Queue Length 95th (ft)	6	11	0	1
Control Delay (s)	14.7	12.9	0.2	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	14.7	12.9	0.2	1.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2008 Existing Condition - AM Peak Hour



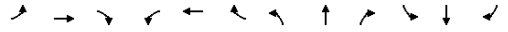
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	70	100	130	0	300	0	0	440	80
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.76	0.76	0.86	0.86	0.86	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	0	92	132	171	0	349	0	0	550	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1186	949	600	949	999	349	650			349		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1186	949	600	949	999	349	650			349		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	61	46	75	100			100		
cM capacity (veh/h)	72	263	505	238	242	690	946			1221		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	158	237	349	650
Volume Left	92	0	0	0
Volume Right	0	171	0	100
cSH	240	455	946	1700
Volume to Capacity	0.66	0.52	0.00	0.38
Queue Length 95th (ft)	103	73	0	0
Control Delay (s)	45.0	21.2	0.0	0.0
Lane LOS	E	C		
Approach Delay (s)	30.7		0.0	0.0
Approach LOS	D			

Intersection Summary				
Average Delay			8.7	
Intersection Capacity Utilization			43.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	35	130	170	25	30	20	10	140	70	220	275	30
Peak Hour Factor	0.94	0.94	0.94	0.76	0.76	0.76	0.84	0.84	0.84	0.81	0.81	0.81
Hourly flow rate (vph)	37	138	181	33	39	26	12	167	83	272	340	37

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	356	99	262	648
Volume Left (vph)	37	33	12	272
Volume Right (vph)	181	26	83	37
Hadj (s)	0.04	-0.02	-0.17	0.07
Departure Headway (s)	6.8	7.6	6.6	6.2
Degree Utilization, x	0.67	0.21	0.48	1.12
Capacity (veh/h)	513	419	515	569
Control Delay (s)	22.5	12.6	15.5	98.7
Approach Delay (s)	22.5	12.6	15.5	98.7
Approach LOS	C	B	C	F

Intersection Summary				
Delay			56.6	
HCM Level of Service			F	
Intersection Capacity Utilization			71.0%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2008 Existing Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	45	670	155	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.68	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	66	736	170	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	821	453			907	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	821	453			907	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	88			100	
cM capacity (veh/h)	316	535			759	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	66	491	416
Volume Left	0	0	0
Volume Right	66	0	170
cSH	535	1700	1700
Volume to Capacity	0.12	0.29	0.24
Queue Length 95th (ft)	11	0	0
Control Delay (s)	12.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.7	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		33.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & North Davol Street

2008 Existing Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	75	715	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	82	786	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	786	393			786	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	786	393			786	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	87			100	
cM capacity (veh/h)	333	609			842	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	82	393	393
Volume Left	0	0	0
Volume Right	82	0	0
cSH	609	1700	1700
Volume to Capacity	0.13	0.23	0.23
Queue Length 95th (ft)	12	0	0
Control Delay (s)	11.8	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.8	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		31.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
85: Davol St. SB & U-Turn to SB U-turn to SB Davol St

2008 Existing Condition - AM Peak Hour

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	720	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.75	0.75
Hourly flow rate (vph)	0	0	0	837	27	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		419	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		419	0
tC, single (s)			4.1		7.1	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		95	100
cM capacity (veh/h)			1636		533	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	419	419	27
Volume Left	0	0	27
Volume Right	0	0	0
cSH	1700	1700	533
Volume to Capacity	0.25	0.25	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	12.1
Lane LOS			B
Approach Delay (s)	0.0		12.1
Approach LOS			B

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		46.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
88: Davol St. NB & U-turn to NB Davol St

2008 Existing Condition - AM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	710	0	0	110	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.72	0.72
Hourly flow rate (vph)	0	789	0	0	153	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				394	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				394	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				74	100
cM capacity (veh/h)	1636				585	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	394	394	153
Volume Left	0	0	153
Volume Right	0	0	0
cSH	1700	1700	585
Volume to Capacity	0.23	0.23	0.26
Queue Length 95th (ft)	0	0	26
Control Delay (s)	0.0	0.0	13.3
Lane LOS			B
Approach Delay (s)	0.0		13.3
Approach LOS			B

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		51.3%	ICU Level of Service	A
Analysis Period (min)		15		

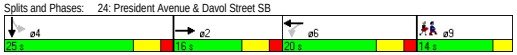
Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	330	5	0	0	0	0	510	500	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		238			272			1959			1114		
Travel Time (s)		5.4			6.2			44.5			25.3		
Peak Hour Factor	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	
Shared Lane Traffic (%)				49%									
Lane Group Flow (vph)	0	0	0	198	196	0	0	0	0	0	1123	0	
Turn Type				Perm						Perm			
Protected Phases		2			6						4		9
Permitted Phases				6						4			
Detector Phase		2		6	6					4	4		
Switch Phase													
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0		7.0
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0		14.0
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	14.0
Total Split (%)	0.0%	21.3%	0.0%	26.7%	26.7%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	19%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0		11.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0		3.0
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0		3.0
Recall Mode		None		Min	Min					C-Max	C-Max		None
Walk Time (s)													5.0
Flash Dont Walk (s)													6.0
Pedestrian Calls (#/hr)													5
v/c Ratio				0.52	0.48						0.58		
Control Delay				35.6	34.3						15.2		
Queue Delay				1.5	1.7						0.0		
Total Delay				37.2	36.1						15.2		
Queue Length 50th (ft)				96	95						148		
Queue Length 95th (ft)				152	150						#395		
Internal Link Dist (ft)		158			192			1879			1034		
Turn Bay Length (ft)													
Base Capacity (vph)				391	419						1945		
Starvation Cap Reductn				78	107						0		
Spillback Cap Reductn				0	0						0		
Storage Cap Reductn				0	0						0		
Reduced v/c Ratio				0.63	0.63						0.58		

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 5 (7%), Referenced to phase 4:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: President Avenue & Davol Street SB



HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	330	5	0	0	0	0	510	500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)				6.0	6.0						6.0	
Lane Util. Factor				0.95	0.95						0.95	
Frt				1.00	1.00						1.00	
Flt Protected				0.95	0.95						0.98	
Satd. Flow (prot)				1600	1722						3452	
Flt Permitted				0.95	0.95						0.98	
Satd. Flow (perm)				1600	1715						3452	
Peak-hour factor, PHF	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	388	6	0	0	0	0	567	556	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	198	196	0	0	0	0	0	1123	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)				17.9	17.9						39.9	
Effective Green, g (s)				17.9	17.9						39.9	
Actuated g/C Ratio				0.24	0.24						0.53	
Clearance Time (s)				6.0	6.0						6.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)				382	409						1836	
v/s Ratio Prot												
v/s Ratio Perm				c0.12	0.11						0.33	
v/c Ratio				0.52	0.48						0.61	
Uniform Delay, d1				24.8	24.5						12.2	
Progression Factor				1.28	1.29						1.00	
Incremental Delay, d2				1.2	0.9						1.5	
Delay (s)				33.0	32.5						13.7	
Level of Service				C	C						B	
Approach Delay (s)		0.0			32.7			0.0			13.7	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

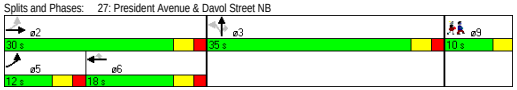
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	35	475	0	0	270	340	65	580	280	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12	
Storage Length (ft)	0		0	0		165	0		125	0		0	
Storage Lanes	0		0	0		1	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		272			959			475			333		
Travel Time (s)		6.2			21.8			10.8			7.6		
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92	
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	554	0	0	303	382	0	742	322	0	0	0	
Turn Type	pm+pt					Perm	Perm		Perm				
Protected Phases	5	2			6			3					9
Permitted Phases	2					6	3		3				
Detector Phase	5	2			6	6	3	3	3				
Switch Phase													
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0				7.0
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0				10.0
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0	10.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%	13%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0				7.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag							
Lead-Lag Optimize?	Yes				Yes	Yes							
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None				Ped
Walk Time (s)													4.0
Flash Dont Walk (s)													3.0
Pedestrian Calls (#/hr)													1
v/c Ratio		0.42			0.21	0.57		0.68	0.63				
Control Delay		15.5			15.7	22.8		25.3	27.1				
Queue Delay		0.2			0.0	0.0		0.0	0.0				
Total Delay		15.7			15.7	22.8		25.3	27.1				
Queue Length 50th (ft)		34			45	132		156	126				
Queue Length 95th (ft)		135			82	#252		177	173				
Internal Link Dist (ft)		192			879			395			253		
Turn Bay Length (ft)						165			125				
Base Capacity (vph)		1315			1442	667		1376	646				
Starvation Cap Reductn		250			0	0		0	0				
Spillback Cap Reductn		0			0	0		0	0				
Storage Cap Reductn		0			0	0		0	0				
Reduced v/c Ratio		0.52			0.21	0.57		0.54	0.50				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	475	0	0	270	340	65	580	280	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3439			3455	1599		3441	1615			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3149			3455	1599		3441	1615			
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	38	516	0	0	303	382	75	667	322	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	554	0	0	303	382	0	742	322	0	0	0
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		31.3			31.3	31.3		23.7	23.7			
Effective Green, g (s)		31.3			31.3	31.3		23.7	23.7			
Actuated g/C Ratio		0.42			0.42	0.42		0.32	0.32			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1314			1442	667		1087	510			
v/s Ratio Prot					0.09							
v/s Ratio Perm		0.18				c0.24		0.22	0.20			
v/c Ratio		0.42			0.21	0.57		0.68	0.63			
Uniform Delay, d1		15.4			14.0	16.7		22.4	21.9			
Progression Factor		0.87			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.2			0.3	3.6		1.8	2.5			
Delay (s)		13.6			14.3	20.3		24.2	24.5			
Level of Service		B			B	C		C	C			
Approach Delay (s)		13.6			17.6			24.3			0.0	
Approach LOS		B			B			C			A	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
35: President Avenue & North Main Street

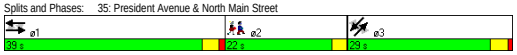
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR	ø2
Lane Configurations													
Volume (vph)	110	530	110	55	405	55	110	240	70	145	180	85	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12	
Storage Length (ft)	0		0	125		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		959			1952			265			1409		
Travel Time (s)		21.8			44.4			6.0			32.0		
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96	
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0	
Parking (#/hr)			5										
Shared Lane Traffic (%)													
Lane Group Flow (vph)	122	711	0	65	541	0	0	457	0	0	428	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		1			1			3			3		2
Permitted Phases	1			1			3			3			
Detector Phase	1	1		1	1		3	3		3	3		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		10.0
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0		22.0
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0	22.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%	24%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0		19.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lead	Lead								Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes								Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0		3.0
Recall Mode	Min	Min		Min	Min		None	None		None	None		None
Walk Time (s)													10.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													15
v/c Ratio	0.49	0.72		0.55	0.54			0.79			0.89		
Control Delay	24.1	22.0		38.1	16.8			34.2			45.7		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	24.1	22.0		38.1	16.8			34.2			45.7		
Queue Length 50th (ft)	30	203		16	134			160			157		
Queue Length 95th (ft)	#133	#581		#94	328			#462			#467		
Internal Link Dist (ft)		879			1872			185			1329		
Turn Bay Length (ft)				125									
Base Capacity (vph)	264	1046		127	1062			580			483		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.46	0.68		0.51	0.51			0.79			0.89		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 70.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: President Avenue & North Main Street



HCM Signalized Intersection Capacity Analysis
35: President Avenue & North Main Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	530	110	55	405	55	110	240	70	145	180	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1752	2070		1719	2091			2061			2027	
Flt Permitted	0.28	1.00		0.14	1.00			0.76			0.64	
Satd. Flow (perm)	523	2070		250	2091			1587			1312	
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	122	589	122	65	476	65	120	261	76	151	188	89
RTOR Reduction (vph)	0	0	0	0	5	0	0	7	0	0	10	0
Lane Group Flow (vph)	122	711	0	65	536	0	0	450	0	0	418	0
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	33.5	33.5		33.5	33.5			25.5			25.5	
Effective Green, g (s)	33.5	33.5		33.5	33.5			25.5			25.5	
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.35			0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	240	950		115	960			554			458	
v/s Ratio Prot		c0.34			0.26							
v/s Ratio Perm	0.23			0.26				0.28			c0.32	
v/c Ratio	0.51	0.75		0.57	0.56			0.81			0.91	
Uniform Delay, d1	13.9	16.3		14.4	14.4			21.6			22.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.5	3.9		10.1	1.2			10.4			24.2	
Delay (s)	17.4	20.2		24.5	15.6			32.0			46.9	
Level of Service	B	C		C	B			C			D	
Approach Delay (s)		19.8			16.5			32.0			46.9	
Approach LOS		B			B			C			D	

Intersection Summary

HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

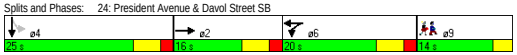
Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	10	15	375	15	0	0	0	0	405	450	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		238			272			1959			1114		
Travel Time (s)		5.4			6.2			44.5			25.3		
Peak Hour Factor	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88	
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%	
Shared Lane Traffic (%)				48%									
Lane Group Flow (vph)	0	44	0	222	221	0	0	0	0	0	977	0	
Turn Type				Split						Perm			
Protected Phases		2		6	6						4		9
Permitted Phases										4			
Detector Phase		2		6	6					4	4		
Switch Phase													
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0		7.0
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0		14.0
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	14.0
Total Split (%)	0.0%	21.3%	0.0%	26.7%	26.7%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	19%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0		11.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0		3.0
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0		3.0
Recall Mode		None		Min	Min					C-Max	C-Max		None
Walk Time (s)													5.0
Flash Dont Walk (s)													6.0
Pedestrian Calls (#/hr)													5
v/c Ratio		0.25		0.71	0.66						0.57		
Control Delay		21.4		56.5	52.5						19.6		
Queue Delay		0.0		0.1	0.9						0.0		
Total Delay		21.4		56.6	53.4						19.6		
Queue Length 50th (ft)		8		122	121						171		
Queue Length 95th (ft)		18		#203	187						#384		
Internal Link Dist (ft)		158			192			1879			1034		
Turn Bay Length (ft)													
Base Capacity (vph)		256		320	345						1729		
Starvation Cap Reductn		0		2	24						0		
Spillback Cap Reductn		0		0	0						0		
Storage Cap Reductn		0		0	0						0		
Reduced v/c Ratio		0.17		0.70	0.69						0.57		

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 5 (7%), Referenced to phase 4:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: President Avenue & Davol Street SB



HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	10	15	375	15	0	0	0	0	405	450	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0		6.0	6.0						6.0	
Lane Util. Factor		1.00		0.95	0.95						0.95	
Frt		0.92		1.00	1.00						1.00	
Flt Protected		1.00		0.95	0.96						0.98	
Satd. Flow (prot)		1748		1569	1694						3473	
Flt Permitted		1.00		0.95	0.96						0.98	
Satd. Flow (perm)		1748		1569	1694						3473	
Peak-hour factor, PHF	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	18	26	426	17	0	0	0	0	460	511	6
RTOR Reduction (vph)	0	24	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	20	0	222	221	0	0	0	0	0	976	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%
Turn Type				Split						Perm		
Protected Phases		2		6	6						4	
Permitted Phases										4		
Actuated Green, G (s)		4.4		14.9	14.9						32.5	
Effective Green, g (s)		4.4		14.9	14.9						32.5	
Actuated g/C Ratio		0.06		0.20	0.20						0.43	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		103		312	337						1505	
v/s Ratio Prot		c0.01		c0.14	0.13							
v/s Ratio Perm											0.28	
v/c Ratio		0.19		0.71	0.66						0.65	
Uniform Delay, d1		33.6		28.0	27.7						16.8	
Progression Factor		1.00		1.53	1.53						1.00	
Incremental Delay, d2		0.9		7.3	4.5						2.2	
Delay (s)		34.5		50.3	46.9						18.9	
Level of Service		C		D	D						B	
Approach Delay (s)		34.5			48.6			0.0			18.9	
Approach LOS		C			D			A			B	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

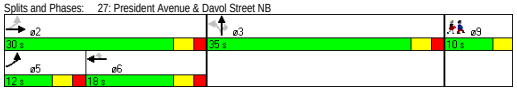
Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	30	385	0	0	310	190	80	440	270	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12	
Storage Length (ft)	0		0	0		165	0		125	0		0	
Storage Lanes	0		0	0		1	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		272			959			475			333		
Travel Time (s)		6.2			21.8			10.8			7.6		
Peak Hour Factor	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	507	0	0	352	216	0	565	293	0	0	0	
Turn Type	pm+pt					Perm	Perm		Perm				
Protected Phases	5	2			6			3					9
Permitted Phases	2					6	3		3				
Detector Phase	5	2			6	6	3	3	3				
Switch Phase													
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0				7.0
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0				10.0
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0	10.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%	13%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0				7.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag							
Lead-Lag Optimize?	Yes				Yes	Yes							
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None				Ped
Walk Time (s)													4.0
Flash Dont Walk (s)													3.0
Pedestrian Calls (#/hr)													1
v/c Ratio		0.36			0.23	0.30		0.60	0.67				
Control Delay		18.9			14.3	16.2		25.6	30.9				
Queue Delay		0.2			0.0	0.0		0.1	0.0				
Total Delay		19.2			14.3	16.2		25.7	30.9				
Queue Length 50th (ft)		36			50	61		119	120				
Queue Length 95th (ft)		154			91	128		142	170				
Internal Link Dist (ft)		192			879			395			253		
Turn Bay Length (ft)						165			125				
Base Capacity (vph)		1405			1546	715		1348	633				
Starvation Cap Reductn		346			0	0		0	0				
Spillback Cap Reductn		0			0	0		126	0				
Storage Cap Reductn		0			0	0		0	0				
Reduced v/c Ratio		0.48			0.23	0.30		0.46	0.46				

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	385	0	0	310	190	80	440	270	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3382			3388	1568		3372	1583			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3079			3388	1568		3372	1583			
Peak-hour factor, PHF	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	470	0	0	352	216	87	478	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	507	0	0	352	216	0	565	293	0	0	0
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		34.2			34.2	34.2		20.8	20.8			
Effective Green, g (s)		34.2			34.2	34.2		20.8	20.8			
Actuated g/C Ratio		0.46			0.46	0.46		0.28	0.28			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1404			1545	715		935	439			
v/s Ratio Prot					0.10							
v/s Ratio Perm		c0.16				0.14		0.17	c0.19			
v/c Ratio		0.36			0.23	0.30		0.60	0.67			
Uniform Delay, d1		13.3			12.4	12.9		23.5	24.0			
Progression Factor		1.23			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.1			0.3	1.1		1.1	3.8			
Delay (s)		16.5			12.7	14.0		24.6	27.9			
Level of Service		B			B	B		C	C			
Approach Delay (s)		16.5			13.2			25.7			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
35: President Avenue & North Main Street

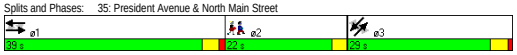
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR	ø2
Lane Configurations													
Volume (vph)	130	460	65	50	320	65	95	180	70	100	155	75	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12	
Storage Length (ft)	0		0	125		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		959			1952			265			1409		
Travel Time (s)		21.8			44.4			6.0			32.0		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75	
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0	
Parking (#/hr)			5										
Shared Lane Traffic (%)													
Lane Group Flow (vph)	149	604	0	57	443	0	0	396	0	0	440	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		1			1			3			3		2
Permitted Phases	1			1			3			3			
Detector Phase	1	1		1	1		3	3		3	3		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		10.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		22.0
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0	22.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%	24%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0		19.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lead	Lead								Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes								Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0		3.0
Recall Mode	Min	Min		Min	Min		None	None		None	None		None
Walk Time (s)													10.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													15
v/c Ratio	0.51	0.66		0.34	0.48			0.69			0.77		
Control Delay	22.8	19.9		21.2	15.9			28.4			32.2		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	22.8	19.9		21.2	15.9			28.4			32.2		
Queue Length 50th (ft)	36	160		13	102			127			147		
Queue Length 95th (ft)	129	399		58	265			#373			#335		
Internal Link Dist (ft)		879			1872			185			1329		
Turn Bay Length (ft)				125									
Base Capacity (vph)	355	1114		206	1119			577			574		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.42	0.54		0.28	0.40			0.69			0.77		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 67.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: President Avenue & North Main Street



HCM Signalized Intersection Capacity Analysis
35: President Avenue & North Main Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	460	65	50	320	65	95	180	70	100	155	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.97			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	2069		1805	2064			1923			1966	
Flt Permitted	0.35	1.00		0.20	1.00			0.76			0.74	
Satd. Flow (perm)	659	2069		382	2064			1478			1467	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Adj. Flow (vph)	149	529	75	57	368	75	109	207	80	133	207	100
RTOR Reduction (vph)	0	0	0	0	7	0	0	9	0	0	10	0
Lane Group Flow (vph)	149	604	0	57	436	0	0	387	0	0	430	0
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	29.7	29.7		29.7	29.7			25.8			25.8	
Effective Green, g (s)	29.7	29.7		29.7	29.7			25.8			25.8	
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.37			0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	282	887		164	885			550			546	
v/s Ratio Prot		c0.29			0.21							
v/s Ratio Perm	0.23			0.15				0.26			c0.29	
v/c Ratio	0.53	0.68		0.35	0.49			0.70			0.79	
Uniform Delay, d1	14.6	16.0		13.3	14.3			18.5			19.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.4	2.8		2.7	0.9			6.0			9.1	
Delay (s)	18.0	18.8		16.0	15.2			24.5			28.4	
Level of Service	B	B		B	B			C			C	
Approach Delay (s)		18.6			15.3			24.5			28.4	
Approach LOS		B			B			C			C	

Intersection Summary

HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	13.8
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2008 Existing Condition - PM Peak Hour

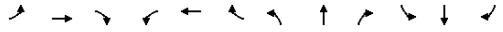
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	145	30	15	15	25	255
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.74	0.74
Hourly flow rate (vph)	163	34	16	16	34	345
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	256	206	378			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	206	378			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	96	99			
cM capacity (veh/h)	725	839	1191			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	197	33	378
Volume Left	163	16	0
Volume Right	34	0	345
cSH	742	1191	1700
Volume to Capacity	0.26	0.01	0.22
Queue Length 95th (ft)	27	1	0
Control Delay (s)	11.6	4.1	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	4.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		40.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Ponta Delgada

2008 Existing Condition - PM Peak Hour



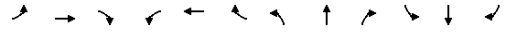
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	25	5	65	0	5	0	10	155	35	215	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.67	0.67	0.67	0.91	0.91	0.91	0.78	0.78	0.78
Hourly flow rate (vph)	0	36	7	97	0	7	0	11	170	45	276	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	475	553	282	493	474	96	288			181		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	475	553	282	493	474	96	288			181		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	91	99	78	100	99	100			97		
cM capacity (veh/h)	487	419	762	442	476	966	1285			1388		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	104	181	333
Volume Left	0	97	0	45
Volume Right	7	7	170	13
cSH	453	460	1285	1388
Volume to Capacity	0.09	0.23	0.00	0.03
Queue Length 95th (ft)	8	22	0	3
Control Delay (s)	13.8	15.1	0.0	1.3
Lane LOS	B	C		A
Approach Delay (s)	13.8	15.1	0.0	1.3
Approach LOS	B	C		

Intersection Summary				
Average Delay		3.9		
Intersection Capacity Utilization		44.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2008 Existing Condition - PM Peak Hour



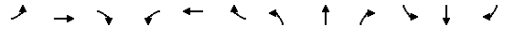
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	120	110	255	5	310	0	0	440	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.86	0.86	0.86	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	140	128	297	6	397	0	0	489	128
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1323	963	553	963	1027	397	617			397		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1323	963	553	963	1027	397	617			397		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	40	45	55	99			100		
cM capacity (veh/h)	41	256	537	234	231	657	973			1172		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	203	360	404	617
Volume Left	140	0	6	0
Volume Right	0	297	0	128
cSH	233	495	973	1700
Volume to Capacity	0.87	0.73	0.01	0.36
Queue Length 95th (ft)	177	149	0	0
Control Delay (s)	74.9	29.4	0.2	0.0
Lane LOS	F	D	A	
Approach Delay (s)	45.8		0.2	0.0
Approach LOS	E			

Intersection Summary					
Average Delay			16.4		
Intersection Capacity Utilization			51.6%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	110	85	50	95	40	55	5	150	85	170	355	35
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.94	0.94	0.94	0.85	0.85	0.85
Hourly flow rate (vph)	126	98	57	125	53	72	5	160	90	200	418	41

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	282	250	255	659
Volume Left (vph)	126	125	5	200
Volume Right (vph)	57	72	90	41
Hadj (s)	0.01	-0.06	-0.19	0.04
Departure Headway (s)	7.4	7.4	7.1	6.7
Degree Utilization, x	0.58	0.51	0.50	1.22
Capacity (veh/h)	463	450	473	534
Control Delay (s)	19.9	18.0	17.1	136.3
Approach Delay (s)	19.9	18.0	17.1	136.3
Approach LOS	C	C	C	F

Intersection Summary					
Delay			72.1		
HCM Level of Service			F		
Intersection Capacity Utilization			70.0%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	60	785	115	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	0	107	872	128	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	936	500			1000	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	936	500			1000	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	79			100	
cM capacity (veh/h)	267	516			700	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	107	581	419
Volume Left	0	0	0
Volume Right	107	0	128
cSH	516	1700	1700
Volume to Capacity	0.21	0.34	0.25
Queue Length 95th (ft)	19	0	0
Control Delay (s)	13.8	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.8	0.0	
Approach LOS	B		

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		35.7%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & North Davol Street

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	70	855	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	0	104	994	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	994	497			994	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	994	497			994	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	80			100	
cM capacity (veh/h)	245	521			704	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	104	497	497
Volume Left	0	0	0
Volume Right	104	0	0
cSH	521	1700	1700
Volume to Capacity	0.20	0.29	0.29
Queue Length 95th (ft)	19	0	0
Control Delay (s)	13.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.6	0.0	
Approach LOS	B		

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		34.6%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
85: Davol St. SB & U-Turn to SB U-turn to SB Davol St

2008 Existing Condition - PM Peak Hour

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	735	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	0	0	0	799	40	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		399	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		399	0
tC, single (s)			4.1		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1636		558	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	399	399	40
Volume Left	0	0	40
Volume Right	0	0	0
cSH	1700	1700	558
Volume to Capacity	0.23	0.23	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.0	12.0
Lane LOS			B
Approach Delay (s)	0.0		12.0
Approach LOS			B

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
88: Davol St. NB & U-turn to NB Davol St

2008 Existing Condition - PM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	825	0	0	75	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	0	927	0	0	84	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				463	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				463	0
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				84	100
cM capacity (veh/h)	1636				525	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	463	463	84
Volume Left	0	0	84
Volume Right	0	0	0
cSH	1700	1700	525
Volume to Capacity	0.27	0.27	0.16
Queue Length 95th (ft)	0	0	14
Control Delay (s)	0.0	0.0	13.2
Lane LOS			B
Approach Delay (s)	0.0		13.2
Approach LOS			B

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		54.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Narrows St & South Main St

2008 Existing Conditions - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	120	10	10	165	185	85
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.75	0.75	0.79	0.79
Hourly flow rate (vph)	146	12	13	220	234	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	535	288	342			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	535	288	342			
tC, single (s)	6.5	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.5	2.3			
p0 queue free %	70	98	99			
cM capacity (veh/h)	485	710	1174			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	159	233	342
Volume Left	146	13	0
Volume Right	12	0	108
cSH	498	1174	1700
Volume to Capacity	0.32	0.01	0.20
Queue Length 95th (ft)	34	1	0
Control Delay (s)	15.6	0.6	0.0
Lane LOS	C	A	
Approach Delay (s)	15.6	0.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		3.5	
Intersection Capacity Utilization		30.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
5: Copicut Road & South Main St

2008 Existing Conditions - AM Peak Hour

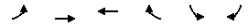
Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	5	5	170	0	5	200
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.72	0.72	0.81	0.81
Hourly flow rate (vph)	9	9	236	0	6	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	495	236			236	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	495	236			236	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	535	774			1343	

Direction, Lane #	WB 1	NE 1	SW 1
Volume Total	18	236	253
Volume Left	9	0	6
Volume Right	9	0	0
cSH	633	1700	1343
Volume to Capacity	0.03	0.14	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	10.9	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	10.9	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: South Main St & Route 24 SB Off-Ramp

2008 Existing Conditions - AM Peak Hour



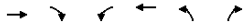
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	70	245	225	350	25	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.87	0.87	0.91	0.91
Hourly flow rate (vph)	82	288	259	402	27	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	259				913	460
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259				913	460
tC, single (s)	4.2				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.5
p0 queue free %	93				90	89
cM capacity (veh/h)	1266				269	558

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	371	661	88
Volume Left	82	0	27
Volume Right	0	402	60
cSH	1266	1700	418
Volume to Capacity	0.07	0.39	0.21
Queue Length 95th (ft)	5	0	20
Control Delay (s)	2.3	0.0	15.9
Lane LOS	A		C
Approach Delay (s)	2.3	0.0	15.9
Approach LOS			C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: South Main St & Route 24 NB Off-Ramp

2008 Existing Conditions - AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	160	75	85	500	75	280
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80
Hourly flow rate (vph)	195	91	97	568	94	350
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			195		1002	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			195		1002	241
tC, single (s)			4.2		6.5	6.5
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			93		62	53
cM capacity (veh/h)			1331		244	742

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	287	665	444
Volume Left	0	97	94
Volume Right	91	0	350
cSH	1700	1331	519
Volume to Capacity	0.17	0.07	0.86
Queue Length 95th (ft)	0	6	226
Control Delay (s)	0.0	1.9	40.5
Lane LOS		A	E
Approach Delay (s)	0.0	1.9	40.5
Approach LOS			E

Intersection Summary			
Average Delay	13.8		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2008 Existing Conditions - AM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	15	5	130	15	0	5	30	390	20	15	440	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.59	0.59	0.59	0.84	0.84	0.84	0.95	0.95	0.95
Hourly flow rate (vph)	20	7	171	25	0	8	36	464	24	16	463	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1053	1057	466	1219	1048	476	468			488		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1053	1057	466	1219	1048	476	468			488		
tC, single (s)	7.1	7.0	6.2	7.3	6.5	6.4	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.4	3.3	3.7	4.0	3.5	2.3			2.3		
p0 queue free %	90	96	71	73	100	98	97			98		
cM capacity (veh/h)	195	177	595	96	219	544	1038			1045		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	197	34	524	484
Volume Left	20	25	36	16
Volume Right	171	8	24	5
cSH	463	121	1038	1045
Volume to Capacity	0.43	0.28	0.03	0.02
Queue Length 95th (ft)	52	27	3	1
Control Delay (s)	18.4	46.1	1.0	0.4
Lane LOS	C	E	A	A
Approach Delay (s)	18.4	46.1	1.0	0.4
Approach LOS	C	E		

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	50.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High Street

2008 Existing Conditions - AM Peak Hour

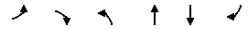
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	5	385	0	5	470	5	0	0	0	5	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.25	0.25	0.25	0.64	0.64	0.64
Hourly flow rate (vph)	5	414	0	5	485	5	0	0	0	8	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	490			414			938	922	487	922	925	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	490			414			938	922	487	922	925	414
tC, single (s)	4.1			5.1			7.1	6.5	6.2	7.3	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			3.1			3.5	4.0	3.3	3.7	4.0	3.5
p0 queue free %	100			99			100	100	100	97	100	97
cM capacity (veh/h)	1084			768			238	269	585	234	268	607

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	419	495	0	23
Volume Left	5	5	0	8
Volume Right	0	5	0	16
cSH	1084	768	1700	396
Volume to Capacity	0.00	0.01	0.00	0.06
Queue Length 95th (ft)	0	1	0	5
Control Delay (s)	0.2	0.2	0.0	14.7
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	0.2	0.0	14.7
Approach LOS			A	B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	37.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: Narrows St & South Main St

2008 Existing Conditions - PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	110	15	25	265	240	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	134	18	28	298	253	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	659	305	358			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	659	305	358			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	67	97	98			
cM capacity (veh/h)	412	712	1212			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	152	326	358
Volume Left	134	28	0
Volume Right	18	0	105
cSH	434	1212	1700
Volume to Capacity	0.35	0.02	0.21
Queue Length 95th (ft)	39	2	0
Control Delay (s)	17.7	0.9	0.0
Lane LOS	C	A	
Approach Delay (s)	17.7	0.9	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Copicut Road & South Main St

2008 Existing Conditions - PM Peak Hour

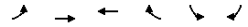
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	10	270	5	5	250
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.46	0.46	0.93	0.93	0.73	0.73
Hourly flow rate (vph)	11	22	290	5	7	342
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	649	293			296	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	649	293			296	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	435	721			1277	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	296	349
Volume Left	11	0	7
Volume Right	22	5	0
cSH	591	1700	1277
Volume to Capacity	0.06	0.17	0.01
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.4	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	11.4	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
7: South Main St & Route 24 SB Off-Ramp

2008 Existing Conditions - PM Peak Hour



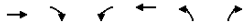
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	95	265	295	250	110	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.94	0.94	0.79	0.79
Hourly flow rate (vph)	108	301	314	266	139	44
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	314				964	447
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				964	447
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	91				45	92
cM capacity (veh/h)	1213				254	589

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	580	184
Volume Left	108	0	139
Volume Right	0	266	44
cSH	1213	1700	294
Volume to Capacity	0.09	0.34	0.62
Queue Length 95th (ft)	7	0	97
Control Delay (s)	2.8	0.0	35.6
Lane LOS	A		E
Approach Delay (s)	2.8	0.0	35.6
Approach LOS			E

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: South Main St & Route 24 NB Off-Ramp

2008 Existing Conditions - PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	280	95	50	470	85	340
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.95	0.95
Hourly flow rate (vph)	329	112	53	500	89	358
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			329		992	385
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			329		992	385
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			96		64	46
cM capacity (veh/h)			1219		246	662

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	441	553	447
Volume Left	0	53	89
Volume Right	112	0	358
cSH	1700	1219	495
Volume to Capacity	0.26	0.04	0.90
Queue Length 95th (ft)	0	3	258
Control Delay (s)	0.0	1.2	49.3
Lane LOS		A	E
Approach Delay (s)	0.0	1.2	49.3
Approach LOS			E

Intersection Summary			
Average Delay	15.8		
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2008 Existing Conditions - PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	80	35	0	15	35	530	30	5	405	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	87	41	0	17	38	576	33	6	466	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1163	1162	466	1232	1145	592	466			609		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1163	1162	466	1232	1145	592	466			609		
tC, single (s)	7.2	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	85	66	100	97	97			99		
cM capacity (veh/h)	153	189	599	120	193	510	1106			980		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	98	58	647	471
Volume Left	11	41	38	6
Volume Right	87	17	33	0
cSH	452	156	1106	980
Volume to Capacity	0.22	0.37	0.03	0.01
Queue Length 95th (ft)	20	39	3	0
Control Delay (s)	15.1	41.1	0.9	0.2
Lane LOS	C	E	A	A
Approach Delay (s)	15.1	41.1	0.9	0.2
Approach LOS	C	E		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High St.

2008 Existing Conditions - PM Peak Hour

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	535	10	15	410	5	0	0	0	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.25	0.25	0.25	0.83	0.83	0.83
Hourly flow rate (vph)	0	588	11	16	441	5	0	0	0	0	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	446			599			1081	1075	444	1069	1072	593
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	446			599			1081	1075	444	1069	1072	593
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	100	100	100	98
cM capacity (veh/h)	1125			954			190	218	618	198	219	509

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	599	462	0	12
Volume Left	0	16	0	0
Volume Right	11	5	0	12
cSH	1125	954	1700	509
Volume to Capacity	0.00	0.02	0.00	0.02
Queue Length 95th (ft)	0	1	0	2
Control Delay (s)	0.0	0.5	0.0	12.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	0.5	0.0	12.2
Approach LOS			A	B

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: Jones St & Mt Pleasant St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	5	0	170	10	530	0	70	220	175	185	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Hourly flow rate (vph)	0	6	0	207	12	646	0	74	234	211	223	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1492	956	226	839	842	191	229			309		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1492	956	226	839	842	191	229			309		
tC, single (s)	7.1	6.7	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.2	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	100	97	100	13	95	23	100			83		
cM capacity (veh/h)	20	200	818	238	229	843	1351			1235		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	6	220	646	309	211	229
Volume Left	0	207	0	0	211	0
Volume Right	0	0	646	234	0	6
cSH	200	237	843	1351	1235	1700
Volume to Capacity	0.03	0.92	0.77	0.00	0.17	0.13
Queue Length 95th (ft)	2	201	189	0	15	0
Control Delay (s)	23.6	84.4	21.8	0.0	8.5	0.0
Lane LOS	C	F	C		A	
Approach Delay (s)	23.6	37.7		0.0	4.1	
Approach LOS	C	E				

Intersection Summary				
Average Delay	21.3			
Intersection Capacity Utilization	63.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	10	540	690	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	12	24	12	651	767	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				393	611	
pX, platoon unblocked	0.82					
vC, conflicting volume	1475	800	833			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1469	800	833			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	94	99			
cM capacity (veh/h)	113	380	808			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	37	663	833
Volume Left	12	12	0
Volume Right	24	0	67
cSH	213	808	1700
Volume to Capacity	0.17	0.01	0.49
Queue Length 95th (ft)	15	1	0
Control Delay (s)	25.4	0.4	0.0
Lane LOS	D	A	
Approach Delay (s)	25.4	0.4	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Park Ave. & Church St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	65	130	20	0	45	0	400	20	10	185	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.84	0.84	0.84	0.85	0.85	0.85	0.76	0.76	0.76
Hourly flow rate (vph)	0	83	167	24	0	54	0	471	24	13	243	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	806	764	243	960	752	482	243			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	751	706	144	918	693	482	144			494		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	75	80	84	100	91	100			99		
cM capacity (veh/h)	275	330	818	150	338	588	1345			1080		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	250	77	494	257
Volume Left	0	24	0	13
Volume Right	167	54	24	0
cSH	548	310	1700	1080
Volume to Capacity	0.46	0.25	0.29	0.01
Queue Length 95th (ft)	59	24	0	1
Control Delay (s)	17.0	20.5	0.0	0.5
Lane LOS	C	C		A
Approach Delay (s)	17.0	20.5	0.0	0.5
Approach LOS	C	C		

Intersection Summary				
Average Delay		5.5		
Intersection Capacity Utilization		47.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	25	0	20	5	260	0	0	325	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85	0.77	0.77	0.77
Hourly flow rate (vph)	7	0	7	32	0	25	6	306	0	0	422	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	772	746	429	753	753	306	435			306		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	772	746	429	753	753	306	435			306		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	90	100	97	99			100		
cM capacity (veh/h)	307	342	631	314	339	739	1135			1266		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	57	312	435
Volume Left	7	32	6	0
Volume Right	7	25	0	13
cSH	413	422	1135	1700
Volume to Capacity	0.03	0.14	0.01	0.26
Queue Length 95th (ft)	2	12	0	0
Control Delay (s)	14.0	14.9	0.2	0.0
Lane LOS	B	B	A	
Approach Delay (s)	14.0	14.9	0.2	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		27.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	375	45	85	305	50	25	60	45	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	56	421	51	101	363	60	29	70	52	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.98			0.92			0.93	0.93	0.92	0.93	0.93	0.98
vC, conflicting volume	423			472			1154	1184	447	1241	1180	393
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	397			382			1073	1105	355	1167	1100	367
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	95			91			82	59	92	100	100	100
cM capacity (veh/h)	1124			1082			160	168	620	90	172	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	528	524	151
Volume Left	56	101	29
Volume Right	51	60	52
cSH	1124	1082	222
Volume to Capacity	0.05	0.09	0.68
Queue Length 95th (ft)	4	8	108
Control Delay (s)	1.4	2.5	50.0
Lane LOS	A	A	E
Approach Delay (s)	1.4	2.5	50.0
Approach LOS			E

Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	53.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
54: driveway & Purchase St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	235	5	35	0	215	0	0	250	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	255	5	38	0	234	0	0	272	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								830				
pX, platoon unblocked												
vC, conflicting volume	546	505	272	516	505	234	272			234		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	505	272	516	505	234	272			234		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	45	99	95	100			100		
cM capacity (veh/h)	423	469	767	463	469	805	1292			1334		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	299	234	272
Volume Left	0	255	0	0
Volume Right	11	38	0	0
cSH	767	489	1292	1700
Volume to Capacity	0.01	0.61	0.00	0.16
Queue Length 95th (ft)	1	101	0	0
Control Delay (s)	9.8	23.2	0.0	0.0
Lane LOS	A	C		
Approach Delay (s)	9.8	23.2	0.0	0.0
Approach LOS	A	C		

Intersection Summary				
Average Delay	8.6			
Intersection Capacity Utilization	41.9%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	150	35	35	100	90	10	185	60	90	165	15
Peak Hour Factor	0.80	0.80	0.80	0.83	0.83	0.83	0.89	0.89	0.89	0.88	0.88	0.88
Hourly flow rate (vph)	19	188	44	42	120	108	11	208	67	102	188	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	250	271	287	307
Volume Left (vph)	19	42	11	102
Volume Right (vph)	44	108	67	17
Hadj (s)	-0.04	-0.09	-0.05	0.19
Departure Headway (s)	6.4	6.3	6.3	6.4
Degree Utilization, x	0.45	0.48	0.50	0.55
Capacity (veh/h)	496	506	523	508
Control Delay (s)	14.5	15.0	15.4	17.0
Approach Delay (s)	14.5	15.0	15.4	17.0
Approach LOS	B	B	C	C

Intersection Summary				
Delay			15.5	
HCM Level of Service			C	
Intersection Capacity Utilization			60.0%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	115	55	25	55	210	0	0	225	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83
Hourly flow rate (vph)	6	0	6	129	62	28	62	236	0	0	271	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	705	646	286	652	661	236	301			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	705	646	286	652	661	236	301			236		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	98	100	99	64	83	96	95			100		
cM capacity (veh/h)	286	373	746	361	363	786	1216			1343		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	12	160	59	298	301
Volume Left	6	129	0	62	0
Volume Right	6	0	28	0	30
cSH	413	361	488	1216	1343
Volume to Capacity	0.03	0.44	0.12	0.05	0.00
Queue Length 95th (ft)	2	55	10	4	0
Control Delay (s)	14.0	22.6	13.4	2.1	0.0
Lane LOS	B	C	B	A	
Approach Delay (s)	14.0	20.1		2.1	0.0
Approach LOS	B	C			

Intersection Summary				
Average Delay			6.3	
Intersection Capacity Utilization			49.2%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	35	0	40	0	225	115	90	255	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	42	0	48	0	250	128	100	283	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	845	861	283	797	797	314	283			378		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	845	861	283	797	797	314	283			378		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.3		
p0 queue free %	100	100	100	85	100	93	100			91		
cM capacity (veh/h)	248	270	760	280	294	715	1291			1154		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	89	378	383
Volume Left	0	42	0	100
Volume Right	0	48	128	0
cSH	1700	414	1291	1154
Volume to Capacity	0.00	0.22	0.00	0.09
Queue Length 95th (ft)	0	20	0	7
Control Delay (s)	0.0	16.1	0.0	2.8
Lane LOS	A	C		A
Approach Delay (s)	0.0	16.1	0.0	2.8
Approach LOS	A	C		

Intersection Summary				
Average Delay		3.0		
Intersection Capacity Utilization		51.6%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	15	15	5	5	15	5	130	5	55	190	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.69	0.69	0.69	0.78	0.78	0.78	0.93	0.93	0.93
Hourly flow rate (vph)	159	18	18	7	7	22	6	167	6	59	204	70
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	566	543	239	567	575	170	274			173		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566	543	239	567	575	170	274			173		
tC, single (s)	7.2	6.5	6.4	7.1	6.5	6.4	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.5	3.5	4.0	3.5	2.4			2.2		
p0 queue free %	59	96	98	98	98	97	99			96		
cM capacity (veh/h)	391	428	762	399	411	827	1207			1404		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	194	36	179	333
Volume Left	159	7	6	59
Volume Right	18	22	6	70
cSH	412	584	1207	1404
Volume to Capacity	0.47	0.06	0.01	0.04
Queue Length 95th (ft)	61	5	0	3
Control Delay (s)	21.3	11.6	0.3	1.7
Lane LOS	C	B	A	A
Approach Delay (s)	21.3	11.6	0.3	1.7
Approach LOS	C	B		

Intersection Summary				
Average Delay		7.0		
Intersection Capacity Utilization		50.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
77: Rt. 140 Ramps & Mt. Pleasant Street

2008 Existing Condition - AM Peak Hour

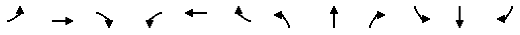
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	155	45	215	385	55	210
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.69	0.85	0.85	0.75	0.75
Hourly flow rate (vph)	225	65	253	453	73	280
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	906	479			253	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	906	479			253	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	18	89			94	
cM capacity (veh/h)	276	582			1312	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	290	706	353
Volume Left	225	0	73
Volume Right	65	453	0
cSH	313	1700	1312
Volume to Capacity	0.93	0.42	0.06
Queue Length 95th (ft)	227	0	4
Control Delay (s)	71.4	0.0	2.1
Lane LOS	F		A
Approach Delay (s)	71.4	0.0	2.1
Approach LOS	F		

Intersection Summary				
Average Delay		15.9		
Intersection Capacity Utilization		70.4%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Avenue

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	140	50	20	55	0	20	5	35	0	5	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.88	0.88	0.88	0.67	0.67	0.67
Hourly flow rate (vph)	19	175	62	22	61	0	23	6	40	0	7	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	109	98	7	228	78	26	7			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	109	98	7	228	78	26	7			45		
tC, single (s)	7.2	6.5	6.3	7.2	6.6	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.6	4.1	3.3	2.3			2.2		
p0 queue free %	98	77	94	96	92	100	99			100		
cM capacity (veh/h)	788	776	1063	545	792	1056	1526			1575		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	256	83	68	7
Volume Left	19	22	23	0
Volume Right	62	0	40	0
cSH	832	707	1526	1575
Volume to Capacity	0.31	0.12	0.01	0.00
Queue Length 95th (ft)	33	10	1	0
Control Delay (s)	11.2	10.8	2.5	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.2	10.8	2.5	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay		9.5		
Intersection Capacity Utilization		28.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2008 Existing Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	115	35	125	95	60	130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.99	0.99	0.81	0.81
Hourly flow rate (vph)	122	37	126	96	74	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	483	174			222	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	483	174			222	
tC, single (s)	6.6	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	75	96			94	
cM capacity (veh/h)	490	829			1301	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	160	222	235
Volume Left	122	0	74
Volume Right	37	96	0
cSH	542	1700	1301
Volume to Capacity	0.29	0.13	0.06
Queue Length 95th (ft)	31	0	5
Control Delay (s)	14.4	0.0	2.8
Lane LOS	B		A
Approach Delay (s)	14.4	0.0	2.8
Approach LOS	B		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & McArthur Dr

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	45	160	115	45	30	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.82	0.82
Hourly flow rate (vph)	53	188	126	49	37	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	354	52	67			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	52	67			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	91	81	91			
cM capacity (veh/h)	587	1005	1433			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	241	176	67
Volume Left	53	126	0
Volume Right	188	0	30
cSH	869	1433	1700
Volume to Capacity	0.28	0.09	0.04
Queue Length 95th (ft)	28	7	0
Control Delay (s)	10.7	5.8	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	5.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & McArthur Drive

2008 Existing Condition - AM Peak Hour

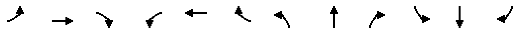
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	10	50	15	10	65
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.86	0.86	0.76	0.76
Hourly flow rate (vph)	31	15	58	17	13	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	179	67			58	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	179	67			58	
tC, single (s)	6.4	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.3	
p0 queue free %	96	98			99	
cM capacity (veh/h)	808	936			1502	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	46	76	99
Volume Left	31	0	13
Volume Right	15	17	0
cSH	847	1700	1502
Volume to Capacity	0.05	0.04	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.5	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	10	5	0	10	5	110	15	10	155	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.58	0.58	0.58	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	23	0	16	9	0	17	5	118	16	11	174	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	365	356	188	363	362	126	202			134		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	365	356	188	363	362	126	202			134		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.3	4.1			4.5		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.4	2.2			2.5		
p0 queue free %	96	100	98	98	100	98	100			99		
cM capacity (veh/h)	578	566	859	545	561	900	1382			1265		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	26	140	213
Volume Left	23	9	5	11
Volume Right	16	17	16	28
cSH	665	740	1382	1265
Volume to Capacity	0.06	0.03	0.00	0.01
Queue Length 95th (ft)	5	3	0	1
Control Delay (s)	10.8	10.0	0.3	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	10.8	10.0	0.3	0.5
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Tarkiln Hill Rd & Church Street

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	505	5	35	435	65	220	200	75	65	265	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	554	0	38	549	0	256	320	0	0	371	129
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Minimum Split (s)	35.0	35.0		35.0	35.0		21.0	21.0		21.0	21.0	21.0
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	59.3%	59.3%	0.0%	59.3%	59.3%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	40.7%
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	19.0		19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
v/c Ratio	0.40	0.60		0.13	0.61		1.13	0.58			0.79	0.25
Control Delay	14.1	13.7		9.1	14.0		124.3	21.7			33.8	16.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	14.1	13.7		9.1	14.0		124.3	21.7			33.8	16.4
Queue Length 50th (ft)	24	128		7	128		~109	93			118	33
Queue Length 95th (ft)	63	214		21	215		#217	154			#243	68
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	298	924		294	901		227	553			467	515
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.40	0.60		0.13	0.61		1.13	0.58			0.79	0.25

Intersection Summary

Area Type: Other
Cycle Length: 59
Actuated Cycle Length: 59
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 65
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Tarkiln Hill Rd & Church Street

HCM Signalized Intersection Capacity Analysis
14: Tarkiln Hill Rd & Church Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	505	5	35	435	65	220	200	75	65	265	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1636	1816		1631	1770		1728	1718			1787	1599
Flt Permitted	0.34	1.00		0.34	1.00		0.39	1.00			0.80	1.00
Satd. Flow (perm)	587	1816		578	1770		705	1718			1448	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	120	549	5	38	478	71	256	233	87	73	298	129
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	120	554	0	38	549	0	256	320	0	0	371	129
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Effective Green, g (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32			0.32	0.32
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	298	923		294	900		227	553			466	515
v/s Ratio Prot		0.31			c0.31			0.19				
v/s Ratio Perm	0.20			0.07			c0.36				0.26	0.08
v/c Ratio	0.40	0.60		0.13	0.61		1.13	0.58			0.80	0.25
Uniform Delay, d1	9.0	10.3		7.6	10.3		20.0	16.7			18.2	14.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.0	2.9		0.9	3.1		98.4	4.4			13.2	1.2
Delay (s)	13.0	13.1		8.5	13.4		118.4	21.0			31.4	15.9
Level of Service	B	B		A	B		F	C			C	B
Approach Delay (s)		13.1			13.1			64.3			27.4	
Approach LOS		B			B			E			C	

Intersection Summary

HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
19: Wood Street & Route 18

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	15	150	10	45	100	35	15	370	50	110	510	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		197			310			393			488		
Travel Time (s)		4.5			7.0			8.9			11.1		
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86	
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	190	0	0	205	0	18	506	0	128	610	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	21.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	26%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													4.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.39			0.45		0.06	0.54		0.32	0.64		
Control Delay		16.5			16.9		6.9	10.4		10.0	12.3		
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0		
Total Delay		16.5			16.9		6.9	10.4		10.0	12.3		
Queue Length 50th (ft)		42			43		2	73		16	96		
Queue Length 95th (ft)		83			85		10	150		50	207		
Internal Link Dist (ft)		117			230			313			408		
Turn Bay Length (ft)													
Base Capacity (vph)		1021			931		318	937		396	956		
Starvation Cap Reductn		0			0		0	0		0	0		
Spillback Cap Reductn		0			0		0	0		0	0		
Storage Cap Reductn		0			0		0	0		0	0		
Reduced v/c Ratio		0.19			0.22		0.06	0.54		0.32	0.64		

Intersection Summary	
Area Type:	Other
Cycle Length: 81	
Actuated Cycle Length: 47.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 19: Wood Street & Route 18

HCM Signalized Intersection Capacity Analysis
19: Wood Street & Route 18

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	150	10	45	100	35	15	370	50	110	510	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1985			1917		1745	1753		1728	1794	
Flt Permitted		0.96			0.89		0.33	1.00		0.41	1.00	
Satd. Flow (perm)		1916			1734		597	1753		744	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	16	163	11	51	114	40	18	446	60	128	593	17
RTOR Reduction (vph)	0	3	0	0	12	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	187	0	0	193	0	18	502	0	128	609	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		12.0			12.0		25.1	25.1		25.1	25.1	
Effective Green, g (s)		12.0			12.0		25.1	25.1		25.1	25.1	
Actuated g/C Ratio		0.25			0.25		0.53	0.53		0.53	0.53	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		488			442		318	934		396	956	
v/s Ratio Prot								0.29			c0.34	
v/s Ratio Perm		0.10			c0.11		0.03			0.17		
v/c Ratio		0.38			0.44		0.06	0.54		0.32	0.64	
Uniform Delay, d1		14.5			14.7		5.3	7.2		6.2	7.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.9		0.1	0.8		0.6	1.6	
Delay (s)		15.2			15.7		5.4	8.0		6.9	9.4	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		15.2			15.7			7.9			8.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
24: Nash Road & Church Street

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	400	75	40	265	55	60	160	30	70	235	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	696	0	0	395	0	0	281	0	0	523	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.87			0.47			0.60			0.87	
Control Delay		30.5			14.3			24.1			38.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.5			14.3			24.1			38.1	
Queue Length 50th (ft)		235			102			90			190	
Queue Length 95th (ft)		#388			168			161			#331	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		798			846			472			602	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.87			0.47			0.60			0.87	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	400	75	40	265	55	60	160	30	70	235	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		2048			2045			1926			1983	
Flt Permitted		0.84			0.89			0.72			0.89	
Satd. Flow (perm)		1727			1834			1396			1780	
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	131	476	89	44	291	60	67	180	34	81	273	169
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	696	0	0	395	0	0	281	0	0	523	0
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		797			846			472			602	
v/s Ratio Prot												
v/s Ratio Perm		c0.40			0.22			0.20			c0.29	
v/c Ratio		0.87			0.47			0.60			0.87	
Uniform Delay, d1		15.8			12.0			17.8			20.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		12.7			1.8			5.4			15.6	
Delay (s)		28.5			13.9			23.3			35.8	
Level of Service		C			B			C			D	
Approach Delay (s)		28.5			13.9			23.3			35.8	
Approach LOS		C			B			C			D	

Intersection Summary					
HCM Average Control Delay		26.7	HCM Level of Service		C
HCM Volume to Capacity ratio		0.87			
Actuated Cycle Length (s)		65.0	Sum of lost time (s)		13.0
Intersection Capacity Utilization		91.7%	ICU Level of Service		F
Analysis Period (min)		15			
c Critical Lane Group					

Lanes, Volumes, Timings
28: Coggeshall Street & Route 18 SB (Ashley Blvd)

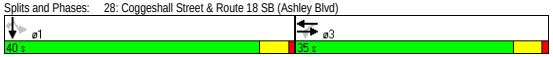
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	205	90	165	220	0	0	0	0	100	605	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	321	0	0	448	0	0	0	0	0	734	47
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.44			0.90						0.48	0.06
Control Delay		16.8			45.3						15.1	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		16.8			45.3						15.1	4.0
Queue Length 50th (ft)		93			190						117	0
Queue Length 95th (ft)		160			#339						163	16
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		727			499						1522	728
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.44			0.90						0.48	0.06

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle: 75
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Route 18 SB (Ashley Blvd)



HCM Signalized Intersection Capacity Analysis
28: Coggeshall Street & Route 18 SB (Ashley Blvd)

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	205	90	165	220	0	0	0	0	100	605	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1763			2026						3262	1507
Flt Permitted		1.00			0.60						0.99	1.00
Satd. Flow (perm)		1763			1247						3262	1507
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	0	223	98	192	256	0	0	0	0	104	630	47
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	300	0	0	448	0	0	0	0	0	734	22
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		705			499						1522	703
v/s Ratio Prot		0.17										
v/s Ratio Perm					c0.36						0.23	0.01
v/c Ratio		0.43			0.90						0.48	0.03
Uniform Delay, d1		16.3			21.1						13.8	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		1.9			21.6						1.1	0.1
Delay (s)		18.1			42.6						14.9	10.9
Level of Service		B			D						B	B
Approach Delay (s)		18.1			42.6			0.0			14.6	
Approach LOS		B			D			A			B	

Intersection Summary

HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

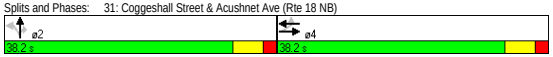
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	260	0	0	270	80	115	445	280	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	0	0	372	0	124	478	301	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.43			0.44		0.16	0.63	0.37			
Control Delay		18.0			16.7		14.6	22.2	3.4			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.0			16.7		14.6	22.2	3.4			
Queue Length 50th (ft)		107			113		36	174	0			
Queue Length 95th (ft)		174			183		69	273	43			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		763			854		756	754	816			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.43			0.44		0.16	0.63	0.37			

Intersection Summary

Area Type: Other
Cycle Length: 76.4
Actuated Cycle Length: 76.4
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rte 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	260	0	0	270	80	115	445	280	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.97		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		2012			2005		1805	1801	1531			
Flt Permitted		0.90			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1822			2005		1805	1801	1531			
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	48	280	0	0	287	85	124	478	301	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	175	0	0	0
Lane Group Flow (vph)	0	328	0	0	358	0	124	478	126	0	0	0
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		763			840		756	754	641			
v/s Ratio Prot					0.18			c0.27				
v/s Ratio Perm		c0.18					0.07		0.08			
v/c Ratio		0.43			0.43		0.16	0.63	0.20			
Uniform Delay, d1		15.7			15.7		13.9	17.6	14.1			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.8			1.6		0.5	4.0	0.7			
Delay (s)		17.5			17.3		14.3	21.6	14.7			
Level of Service		B			B		B	C	B			
Approach Delay (s)		17.5			17.3			18.3			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

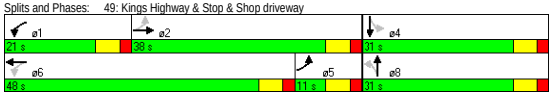
Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	700	110	160	420	50	85	45	220	155	25	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			213			360			359	
Travel Time (s)		11.7			4.8			8.2			8.2	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1048	0	0	663	0	0	412	0	0	387	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	38.0	0.0	21.0	48.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.2%	42.2%	0.0%	23.3%	53.3%	0.0%	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%
Maximum Green (s)	5.0	32.0		15.0	42.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.71			0.57			0.59			0.65	
Control Delay		12.4			10.2			11.2			15.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.4			10.2			11.2			15.7	
Queue Length 50th (ft)		102			56			22			30	
Queue Length 95th (ft)		231			135			49			65	
Internal Link Dist (ft)		435			133			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1480			1525			1289			1144	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.71			0.43			0.32			0.34	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 55.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	700	110	160	420	50	85	45	220	155	25	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.99			0.91			0.93	
Flt Protected		0.99			0.99			0.99			0.98	
Satd. Flow (prot)		3488			3490			3215			3247	
Flt Permitted		0.72			0.56			0.77			0.69	
Satd. Flow (perm)		2517			1986			2515			2288	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	177	753	118	168	442	53	100	53	259	174	28	185
RTOR Reduction (vph)	0	7	0	0	5	0	0	208	0	0	149	0
Lane Group Flow (vph)	0	1041	0	0	658	0	0	204	0	0	238	0
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		32.2			32.2			10.8			10.8	
Effective Green, g (s)		32.2			32.2			10.8			10.8	
Actuated g/C Ratio		0.59			0.59			0.20			0.20	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1474			1163			494			449	
v/s Ratio Prot												
v/s Ratio Perm		c0.41			0.33			0.08			c0.10	
v/c Ratio		0.71			0.57			0.41			0.53	
Uniform Delay, d1		8.1			7.1			19.3			19.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			0.4			0.2			0.6	
Delay (s)		9.3			7.4			19.5			20.4	
Level of Service		A			A			B			C	
Approach Delay (s)		9.3			7.4			19.5			20.4	
Approach LOS		A			A			B			C	

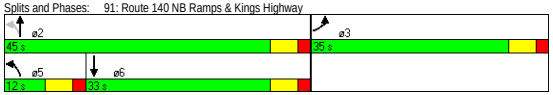
Intersection Summary					
HCM Average Control Delay		12.2	HCM Level of Service		B
HCM Volume to Capacity ratio		0.66			
Actuated Cycle Length (s)		55.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization		86.8%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	465	155	145	510	580	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.92	0.92	0.83	0.83	0.79	0.79
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	673	0	0	789	848	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	35.0	0.0	12.0	45.0	33.0	0.0
Total Split (%)	43.8%	0.0%	15.0%	56.3%	41.3%	0.0%
Maximum Green (s)	29.0		6.0	39.0	27.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Recall Mode	None		None	Min	Min	
v/c Ratio	0.91			0.83	0.54	
Control Delay	41.7			26.1	15.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	41.7			26.1	15.6	
Queue Length 50th (ft)	308			162	144	
Queue Length 95th (ft)	#533			206	161	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	808			1150	1654	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.83			0.69	0.51	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 72.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 91: Route 140 NB Ramps & Kings Highway



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	465	155	145	510	580	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1976			3520	3454	
Flt Permitted	0.96			0.59	1.00	
Satd. Flow (perm)	1976			2092	3454	
Peak-hour factor, PHF	0.92	0.92	0.83	0.83	0.79	0.79
Adj. Flow (vph)	505	168	175	614	734	114
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	673	0	0	789	848	0
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	27.3			33.1	33.1	
Effective Green, g (s)	27.3			33.1	33.1	
Actuated g/C Ratio	0.38			0.46	0.46	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	2.0			2.0	2.0	
Lane Grp Cap (vph)	745			956	1579	
v/s Ratio Prot	c0.34				0.25	
v/s Ratio Perm				c0.38		
v/c Ratio	0.90			0.83	0.54	
Uniform Delay, d1	21.3			17.1	14.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	14.0			5.6	0.2	
Delay (s)	35.3			22.7	14.3	
Level of Service	D			C	B	
Approach Delay (s)	35.3			22.7	14.3	
Approach LOS	D			C	B	

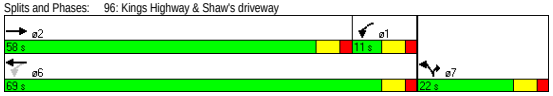
Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	565	225	140	595	150	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.91	0.91	0.96	0.96	0.89	0.89
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	868	0	0	766	169	101
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	58.0	0.0	11.0	69.0	22.0	22.0
Total Split (%)	63.7%	0.0%	12.1%	75.8%	24.2%	24.2%
Maximum Green (s)	52.0		5.0	63.0	16.0	16.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.48			0.64	0.47	0.25
Control Delay	6.9			10.6	20.6	6.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.9			10.6	20.6	6.4
Queue Length 50th (ft)	50			58	32	0
Queue Length 95th (ft)	98			121	91	29
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	3389			2320	674	666
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.26			0.33	0.25	0.15

Intersection Summary	
Area Type:	Other
Cycle Length: 91	
Actuated Cycle Length: 43.4	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 96: Kings Highway & Shaw's driveway



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	565	225	140	595	150	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3407			3541	1787	1599
Flt Permitted	1.00			0.65	0.95	1.00
Satd. Flow (perm)	3407			2321	1787	1599
Peak-hour factor, PHF	0.91	0.91	0.96	0.96	0.89	0.89
Adj. Flow (vph)	621	247	146	620	169	101
RTOR Reduction (vph)	52	0	0	0	0	81
Lane Group Flow (vph)	816	0	0	766	169	20
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	22.5			22.5	8.7	8.7
Effective Green, g (s)	22.5			22.5	8.7	8.7
Actuated g/C Ratio	0.52			0.52	0.20	0.20
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	1774			1209	360	322
v/s Ratio Prot	0.24				c0.09	0.01
v/s Ratio Perm				c0.33		
v/c Ratio	0.46			0.63	0.47	0.06
Uniform Delay, d1	6.5			7.4	15.2	14.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.8	0.4	0.0
Delay (s)	6.6			8.2	15.6	14.0
Level of Service	A			A	B	B
Approach Delay (s)	6.6			8.2	15.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

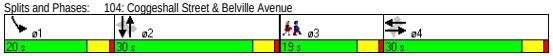
Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	110	265	70	70	225	255	30	225	315	280	175	140	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		443			1111			850			178		
Travel Time (s)		10.1			25.3			19.3			4.0		
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	484	0	0	313	271	0	283	350	0	646	0	
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt			
Protected Phases		4			4			2		1	2		3
Permitted Phases	4			4		4	2		2	2			
Detector Phase	4	4		4	4	4	2	2	2	1	2		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		6.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		19.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0	19.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%	19%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0		14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		0.2
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None		None
Walk Time (s)													6.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.44			0.52	0.35		0.43	0.39		0.68		
Control Delay		13.3			16.8	3.2		15.0	3.0		17.5		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0		
Total Delay		13.3			16.8	3.2		15.0	3.0		17.5		
Queue Length 50th (ft)		60			81	0		69	0		87		
Queue Length 95th (ft)		96			148	37		124	40		140		
Internal Link Dist (ft)		363			1031			770			98		
Turn Bay Length (ft)													
Base Capacity (vph)		1096			602	772		693	927		997		
Starvation Cap Reductn		0			0	0		0	0		0		
Spillback Cap Reductn		0			0	0		0	0		0		
Storage Cap Reductn		0			0	0		0	0		0		
Reduced v/c Ratio		0.44			0.52	0.35		0.41	0.38		0.65		

Intersection Summary	
Area Type:	Other
Cycle Length: 99	
Actuated Cycle Length: 58.8	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	265	70	70	225	255	30	225	315	280	175	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.98			1.00	0.85		1.00	0.85		0.96	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3269			1735	1449		1818	1706		3215	
Flt Permitted		0.77			0.80	1.00		0.89	1.00		0.69	
Satd. Flow (perm)		2548			1413	1449		1628	1706		2274	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	120	288	76	74	239	271	33	250	350	304	190	152
RTOR Reduction (vph)	0	12	0	0	0	156	0	0	208	0	29	0
Lane Group Flow (vph)	0	472	0	0	313	115	0	283	142	0	617	0
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.0			25.0	25.0		23.8	23.8		23.8	
Effective Green, g (s)		25.0			25.0	25.0		23.8	23.8		23.8	
Actuated g/C Ratio		0.43			0.43	0.43		0.40	0.40		0.40	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		1083			601	616		659	691		920	
v/s Ratio Prot												
v/s Ratio Perm		0.19			c0.22	0.08		0.17	0.08		c0.27	
v/c Ratio		0.44			0.52	0.19		0.43	0.21		0.67	
Uniform Delay, d1		11.9			12.5	10.6		12.6	11.4		14.3	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.3			3.2	0.7		0.6	0.2		2.1	
Delay (s)		13.2			15.7	11.2		13.2	11.6		16.4	
Level of Service		B			B	B		B	B		B	
Approach Delay (s)		13.2			13.6			12.3			16.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

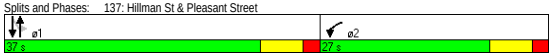
Lanes, Volumes, Timings
137: Hillman St & Pleasant Street

2008 Existing Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	95	80	355	550	105	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.77	0.77	0.94	0.94	0.73	0.73
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	227	0	963	0	0	603
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.36		0.51			0.61
Control Delay	13.5		5.3			15.9
Queue Delay	0.0		0.0			0.0
Total Delay	13.5		5.3			15.9
Queue Length 50th (ft)	46		43			86
Queue Length 95th (ft)	76		80			98
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	637		1904			992
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.36		0.51			0.61

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street



HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	95	80	355	550	105	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.91			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1884		3398			3694
Flt Permitted	0.97		1.00			0.57
Satd. Flow (perm)	1884		3398			2115
Peak-hour factor, PHF	0.77	0.77	0.94	0.94	0.73	0.73
Adj. Flow (vph)	123	104	378	585	144	459
RTOR Reduction (vph)	47	0	311	0	0	0
Lane Group Flow (vph)	180	0	652	0	0	603
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	589		1593			991
v/s Ratio Prot	c0.10		0.19			
v/s Ratio Perm						c0.29
v/c Ratio	0.30		0.41			0.61
Uniform Delay, d1	16.7		11.2			12.6
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.3		0.8			2.8
Delay (s)	18.1		12.0			15.4
Level of Service	B		B			B
Approach Delay (s)	18.1		12.0			15.4
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

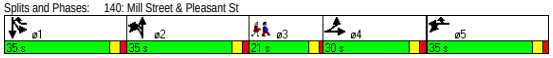
Lanes, Volumes, Timings
140: Mill Street & Pleasant St

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	250	185	345	195	230	25	130	430	100	80	310	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	16	11	12	10	16	10	12	14	16	14	16	
Storage Length (ft)	0		0		0		100		0	0		0	
Storage Lanes	1		1		1		1		0	0		0	
Taper Length (ft)	25		25		25		25		25	25		25	
Right Turn on Red					No				Yes				
Link Speed (mph)		30		30				30			30		
Link Distance (ft)		168		308				709			499		
Travel Time (s)		3.8		7.0				16.1			11.3		
Peak Hour Factor	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83	
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	260	193	371	210	247	0	178	609	0	0	529	0	
Turn Type	Split		Split		pt+ov	Split	Split			Split			
Protected Phases	4	4	5	5	1 5	2	2	2		1	1		3
Permitted Phases													
Detector Phase	4	4	5	5	1 5	2	2	2		1	1		
Switch Phase													
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0		10.0
Minimum Split (s)	12.0	12.0	12.0	12.0		12.0	12.0	12.0		12.0	12.0		21.0
Total Split (s)	30.0	30.0	35.0	35.0	70.0	35.0	35.0	35.0	0.0	35.0	35.0	0.0	21.0
Total Split (%)	19.2%	19.2%	22.4%	22.4%	44.9%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%	0.0%	13%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	30.0	30.0		30.0	30.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag				Lag	Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0		0.2
Recall Mode	Max	Max	Max	Max		Max	Max	Max		Max	Max		None
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.76	0.49	0.99	0.50	0.35		0.50	0.79			0.64		
Control Delay	67.4	54.1	97.5	50.9	23.6		51.4	56.7			51.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0		
Total Delay	67.4	54.1	97.5	50.9	23.6		51.4	56.7			51.6		
Queue Length 50th (ft)	219	153	328	163	132		138	261			223		
Queue Length 95th (ft)	#339	233	#538	246	199		206	318			259		
Internal Link Dist (ft)		88		228				629			419		
Turn Bay Length (ft)							100						
Base Capacity (vph)	342	395	373	418	704		359	770			831		
Starvation Cap Reductn	0	0	0	0	0		0	0			0		
Spillback Cap Reductn	0	0	0	0	0		0	0			0		
Storage Cap Reductn	0	0	0	0	0		0	0			0		
Reduced v/c Ratio	0.76	0.49	0.99	0.50	0.35		0.50	0.79			0.64		

Intersection Summary	
Area Type:	Other
Cycle Length: 156	
Actuated Cycle Length: 135	
Natural Cycle: 120	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 140: Mill Street & Pleasant St



HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	185	345	195	230	25	130	430	100	80	310	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95			0.95	
Frt	1.00	1.00	1.00	1.00	0.85		1.00	0.97			0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1847	2132	1678	1881	1463		1617	3406			3738	
Flt Permitted	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1847	2132	1678	1881	1463		1617	3406			3738	
Peak-hour factor, PHF	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Adj. Flow (vph)	260	193	371	210	247	29	149	494	115	96	373	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	260	193	371	210	247	0	178	597	0	0	529	0
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	5	5	1 5	2	2	2		1	1	
Permitted Phases												
Actuated Green, G (s)	25.0	25.0	30.0	30.0	65.0		30.0	30.0			30.0	
Effective Green, g (s)	25.0	25.0	30.0	30.0	65.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.19	0.19	0.22	0.22	0.48		0.22	0.22			0.22	
Clearance Time (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Lane Grp Cap (vph)	342	395	373	418	704		359	757			831	
v/s Ratio Prot	c0.14	0.09	c0.22	0.11	0.17		0.11	c0.18			c0.14	
v/s Ratio Perm												
v/c Ratio	0.76	0.49	0.99	0.50	0.35		0.50	0.79			0.64	
Uniform Delay, d1	52.2	49.3	52.4	46.0	21.8		45.9	49.5			47.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	14.7	4.3	45.3	4.3	1.4		4.8	8.1			3.7	
Delay (s)	66.8	53.5	97.7	50.2	23.2		50.7	57.6			51.3	
Level of Service	E	D	F	D	C		D	E			D	
Approach Delay (s)		61.2		63.4				56.1			51.3	
Approach LOS		E		E				E			D	

Intersection Summary					
HCM Average Control Delay	58.3	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	135.0	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

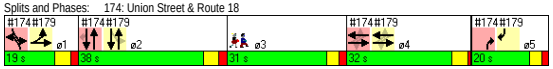
Lanes, Volumes, Timings
174: Union Street & Route 18

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	325	30	60	65	35	15	85	940	20	35	1105	140	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	16	16	11	11	11	10	11	11	
Storage Length (ft)	0		0	0		0	150		225	150		225	
Storage Lanes	0		0	0		0	1		1	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		432			82			365			2491		
Travel Time (s)		9.8			1.9			8.3			56.6		
Peak Hour Factor	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99	
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	446	0	0	135	0	93	1033	22	35	1116	141	
Turn Type	Perm			Perm			Prot		custom	Prot		Perm	
Protected Phases		4			4		1	2	5	1	2		3
Permitted Phases	4			4								2	
Detector Phase	4	4		4	4		1	2	5	1	2	2	
Switch Phase													
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0	17.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0	31.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0	31.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%	22%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0	26.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0	0.2
Recall Mode	None	None		None	None		None	None	None	None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													0
v/c Ratio		1.22			0.31		0.51	1.02	0.11	0.23	1.10	0.27	
Control Delay		156.0			66.4		55.0	70.0	42.6	47.5	94.9	15.0	
Queue Delay		0.0			0.0		0.0	85.6	0.2	0.0	0.0	0.0	
Total Delay		156.0			66.4		55.0	155.7	42.9	47.5	94.9	15.0	
Queue Length 50th (ft)		~385			90		61	~406	14	22	~470	31	
Queue Length 95th (ft)		#589			153		115	#545	37	54	#611	82	
Internal Link Dist (ft)		352			2			285			2411		
Turn Bay Length (ft)							150		225	150		225	
Base Capacity (vph)		366			433		213	1016	222	177	1016	524	
Starvation Cap Reductn		0			0		0	174	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	59	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	0	
Reduced v/c Ratio		1.22			0.31		0.44	1.23	0.13	0.20	1.10	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 105.8			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 174: Union Street & Route 18



HCM Signalized Intersection Capacity Analysis
174: Union Street & Route 18

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	325	30	60	65	35	15	85	940	20	35	1105	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2011			2034		1728	3355	1561	1440	3355	1546
Flt Permitted		0.69			0.81		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1433			1694		1728	3355	1561	1440	3355	1546
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Adj. Flow (vph)	349	32	65	76	41	18	93	1033	22	35	1116	141
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	56
Lane Group Flow (vph)	0	446	0	0	135	0	93	1033	22	35	1116	85
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)		27.0			27.0		11.3	32.0	13.4	11.3	32.0	32.0
Effective Green, g (s)		27.0			27.0		11.3	32.0	13.4	11.3	32.0	32.0
Actuated g/C Ratio		0.26			0.26		0.11	0.30	0.13	0.11	0.30	0.30
Clearance Time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)		5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		366			433		185	1016	198	154	1016	468
v/s Ratio Prot							c0.05	0.31	c0.01	0.02	c0.33	
v/s Ratio Perm		c0.31			0.08							0.06
v/c Ratio		1.22			0.31		0.50	1.02	0.11	0.23	1.10	0.18
Uniform Delay, d1		39.3			31.8		44.5	36.8	40.9	43.2	36.8	27.2
Progression Factor		1.00			1.94		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		120.7			0.8		2.9	32.5	0.3	1.0	59.1	0.3
Delay (s)		160.1			62.6		47.5	69.3	41.2	44.2	96.0	27.4
Level of Service		F			E		D	E	D	D	F	C
Approach Delay (s)		160.1			62.6			67.0			87.1	
Approach LOS		F			E			E			F	

Intersection Summary					
HCM Average Control Delay		89.1	HCM Level of Service		F
HCM Volume to Capacity ratio		0.90			
Actuated Cycle Length (s)		105.7	Sum of lost time (s)		22.0
Intersection Capacity Utilization		79.3%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

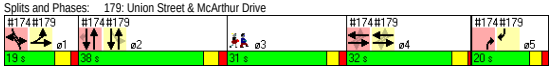
Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	45	5	35	0	15	5	0	190	5	5	235	100	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		0	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		82			609			920			687		
Travel Time (s)		1.9			13.8			20.9			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83	
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	95	0	0	27	0	0	282	0	0	289	120	
Turn Type	pm+pt			Perm						Perm		custom	
Protected Phases	1	1 4			4			2			2	5	3
Permitted Phases	1 4			4						2			
Detector Phase	1	1 4		4	4			2		2	2	5	
Switch Phase													
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0	17.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0	31.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0	31.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%	22%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0	26.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0	
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0	0.2
Recall Mode	None			None	None			None		None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.16			0.06			0.46			0.54	0.59	
Control Delay		6.5			25.6			33.4			35.8	56.6	
Queue Delay		0.0			0.0			0.0			0.0	672.4	
Total Delay		6.5			25.6			33.4			35.8	729.0	
Queue Length 50th (ft)		19			11			158			168	78	
Queue Length 95th (ft)		m29			27			176			233	129	
Internal Link Dist (ft)		2			529			840			607		
Turn Bay Length (ft)												50	
Base Capacity (vph)		626			489			612			539	227	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			8			0			0	187	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.15			0.06			0.46			0.54	3.00	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 105.8	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 179: Union Street & McArthur Drive



HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	35	0	15	5	0	190	5	5	235	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.94			0.96			1.00			1.00	0.85
Flt Protected		0.97			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1833			1894			2018			1793	1599
Flt Permitted		0.87			1.00			1.00			0.99	1.00
Satd. Flow (perm)		1628			1894			2018			1781	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Adj. Flow (vph)	50	6	39	0	20	7	0	275	7	6	283	120
RTOR Reduction (vph)	0	0	0	0	5	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	95	0	0	22	0	0	281	0	0	289	120
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		38.3			27.0			32.0			32.0	13.4
Effective Green, g (s)		38.3			27.0			32.0			32.0	13.4
Actuated g/C Ratio		0.36			0.26			0.30			0.30	0.13
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		612			484			611			539	203
v/s Ratio Prot		c0.02			0.01			0.14				c0.08
v/s Ratio Perm		c0.04									c0.16	
v/c Ratio		0.16			0.05			0.46			0.54	0.59
Uniform Delay, d1		22.8			29.6			29.9			30.7	43.6
Progression Factor		0.46			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.1			0.1			0.8			1.3	5.3
Delay (s)		10.7			29.7			30.6			32.0	48.9
Level of Service		B			C			C			C	D
Approach Delay (s)		10.7			29.7			30.6			36.9	
Approach LOS		B			C			C			D	

Intersection Summary					
HCM Average Control Delay	31.4	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	23.0		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
14: Tarkiln Hill Road & Church St

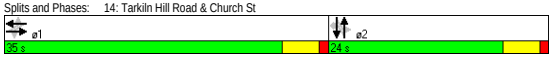
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	295	0	30	450	60	215	190	40	45	165	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	364	0	34	586	0	256	274	0	0	233	94
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Minimum Split (s)	35.0	35.0		35.0	35.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	59.3%	59.3%	0.0%	59.3%	59.3%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	40.7%
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	19.0		19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
v/c Ratio	0.28	0.40		0.08	0.65		0.75	0.48			0.47	0.18
Control Delay	11.8	10.6		8.1	15.0		35.0	19.6			19.9	15.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	11.8	10.6		8.1	15.0		35.0	19.6			19.9	15.6
Queue Length 50th (ft)	14	73		6	140		80	77			65	24
Queue Length 95th (ft)	34	109		17	223		#166	126			122	53
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	266	916		434	899		341	567			493	520
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.28	0.40		0.08	0.65		0.75	0.48			0.47	0.18

Intersection Summary

Area Type: Other
Cycle Length: 59
Actuated Cycle Length: 59
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Tarkiln Hill Road & Church St



HCM Signalized Intersection Capacity Analysis
14: Tarkiln Hill Road & Church St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	295	0	30	450	60	215	190	40	45	165	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1604	1801		1616	1769		1728	1759			1722	1615
Flt Permitted	0.31	1.00		0.50	1.00		0.58	1.00			0.88	1.00
Satd. Flow (perm)	524	1801		853	1769		1060	1759			1531	1615
Peak-hour factor, PHF	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	74	364	0	34	517	69	256	226	48	50	183	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	74	364	0	34	586	0	256	274	0	0	233	94
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Effective Green, g (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32			0.32	0.32
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	266	916		434	899		341	566			493	520
v/s Ratio Prot		0.20			c0.33			0.16				
v/s Ratio Perm	0.14			0.04			c0.24				0.15	0.06
v/c Ratio	0.28	0.40		0.08	0.65		0.75	0.48			0.47	0.18
Uniform Delay, d1	8.3	8.9		7.4	10.7		17.9	16.1			16.0	14.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.6	1.3		0.4	3.7		14.1	2.9			3.2	0.8
Delay (s)	10.9	10.2		7.8	14.3		32.0	19.0			19.2	15.2
Level of Service	B	B		A	B		C	B			B	B
Approach Delay (s)		10.3			14.0			25.3			18.1	
Approach LOS		B			B			C			B	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
19: Wood St & Rt 18

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	25	75	10	55	115	40	10	280	60	60	355	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		197			310			393			488		
Travel Time (s)		4.5			7.0			8.9			11.1		
Peak Hour Factor	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91	
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	142	0	0	305	0	11	386	0	66	406	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	21.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	26%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													4.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.20			0.43		0.03	0.53		0.20	0.55		
Control Delay		11.6			14.1		10.9	16.0		13.1	16.7		
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0		
Total Delay		11.6			14.1		10.9	16.0		13.1	16.7		
Queue Length 50th (ft)		30			71		2	96		15	105		
Queue Length 95th (ft)		51			89		10	162		38	181		
Internal Link Dist (ft)		117			230			313			408		
Turn Bay Length (ft)													
Base Capacity (vph)		703			711		318	724		334	734		
Starvation Cap Reductn		0			0		0	0		0	0		
Spillback Cap Reductn		0			0		0	0		0	0		
Storage Cap Reductn		0			0		0	0		0	0		
Reduced v/c Ratio		0.20			0.43		0.03	0.53		0.20	0.55		

Intersection Summary	
Area Type:	Other
Cycle Length: 81	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	

Splits and Phases: 19: Wood St & Rt 18

HCM Signalized Intersection Capacity Analysis
19: Wood St & Rt 18

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	75	10	55	115	40	10	280	60	60	355	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.97		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859			1878		1745	1716		1745	1758	
Flt Permitted		0.89			0.89		0.41	1.00		0.44	1.00	
Satd. Flow (perm)		1679			1684		762	1716		801	1758	
Peak-hour factor, PHF	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91
Adj. Flow (vph)	32	97	13	80	167	58	11	318	68	66	390	16
RTOR Reduction (vph)	0	4	0	0	9	0	0	8	0	0	2	0
Lane Group Flow (vph)	0	139	0	0	296	0	11	378	0	66	404	0
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.0			25.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)		25.0			25.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio		0.42			0.42		0.42	0.42		0.42	0.42	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		700			702		318	715		334	733	
v/s Ratio Prot								0.22			c0.23	
v/s Ratio Perm		0.08			c0.18		0.01			0.08		
v/c Ratio		0.20			0.42		0.03	0.53		0.20	0.55	
Uniform Delay, d1		11.1			12.4		10.4	13.1		11.1	13.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			1.9		0.2	2.8		1.3	3.0	
Delay (s)		11.8			14.2		10.6	15.9		12.4	16.2	
Level of Service		B			B		B	B		B	B	
Approach Delay (s)		11.8			14.2			15.7			15.7	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	14.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.49				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	56.7%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
24: Nash Road & Church Street

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	230	25	40	245	40	60	95	25	35	155	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	0	0	339	0	0	216	0	0	362	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.52			0.39			0.44			0.60	
Control Delay		15.4			13.1			20.4			22.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.4			13.1			20.4			22.9	
Queue Length 50th (ft)		103			83			65			117	
Queue Length 95th (ft)		172			140			110			197	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		751			875			486			602	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.52			0.39			0.44			0.60	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	230	25	40	245	40	60	95	25	35	155	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			0.94	
Flt Protected		0.99			0.99			0.98			0.99	
Satd. Flow (prot)		1935			2056			1902			1875	
Flt Permitted		0.83			0.92			0.74			0.94	
Satd. Flow (perm)		1628			1898			1436			1777	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	101	258	28	42	255	42	72	114	30	38	170	154
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	387	0	0	339	0	0	216	0	0	362	0
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		751			876			486			601	
v/s Ratio Prot												
v/s Ratio Perm		c0.24			0.18			0.15			c0.20	
v/c Ratio		0.52			0.39			0.44			0.60	
Uniform Delay, d1		12.4			11.5			16.7			17.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			1.3			2.9			4.4	
Delay (s)		14.9			12.8			19.7			22.3	
Level of Service		B			B			B			C	
Approach Delay (s)		14.9			12.8			19.7			22.3	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	17.2	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.55				
Actuated Cycle Length (s)	65.0	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	67.3%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
28: Coggeshall Street & Ashley Blvd. (Rt 18 SB)

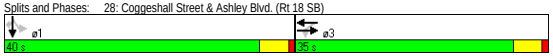
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	190	90	185	195	0	0	0	0	115	665	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	359	0	0	442	0	0	0	0	0	887	45
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.50			1.04						0.59	0.06
Control Delay		17.8			80.4						16.7	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		17.8			80.4						16.7	4.0
Queue Length 50th (ft)		107			~227						152	0
Queue Length 95th (ft)		148			#370						201	15
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		722			425						1507	694
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.50			1.04						0.59	0.06

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle: 80
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Ashley Blvd. (Rt 18 SB)



HCM Signalized Intersection Capacity Analysis
28: Coggeshall Street & Ashley Blvd. (Rt 18 SB)

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	190	90	185	195	0	0	0	0	115	665	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1747			1942						3229	1436
Flt Permitted		1.00			0.53						0.99	1.00
Satd. Flow (perm)		1747			1062						3229	1436
Peak-hour factor, PHF	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	244	115	215	227	0	0	0	0	131	756	45
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	336	0	0	442	0	0	0	0	0	887	21
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		699			425						1507	670
v/s Ratio Prot		0.19										
v/s Ratio Perm					c0.42						0.27	0.01
v/c Ratio		0.48			1.04						0.59	0.03
Uniform Delay, d1		16.7			22.5						14.7	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		2.4			54.4						1.7	0.1
Delay (s)		19.1			76.9						16.4	10.9
Level of Service		B			E						B	B
Approach Delay (s)		19.1			76.9			0.0			16.1	
Approach LOS		B			E			A			B	

Intersection Summary

HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rt 18 NB)

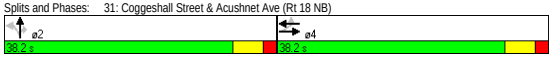
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	260	0	0	300	50	80	285	220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	321	0	0	407	0	95	339	262	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.44			0.49		0.14	0.48	0.34			
Control Delay		18.2			18.1		14.5	19.1	3.3			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.2			18.1		14.5	19.1	3.3			
Queue Length 50th (ft)		105			132		27	114	0			
Queue Length 95th (ft)		172			196		51	169	32			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		731			833		675	699	781			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.44			0.49		0.14	0.48	0.34			

Intersection Summary

Area Type: Other
Cycle Length: 76.4
Actuated Cycle Length: 76.4
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rt 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rt 18 NB)

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	260	0	0	300	50	80	285	220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.98		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		1939			1971		1612	1670	1501			
Flt Permitted		0.89			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1745			1971		1612	1670	1501			
Peak-hour factor, PHF	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	47	274	0	0	349	58	95	339	262	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	152	0	0	0
Lane Group Flow (vph)	0	321	0	0	399	0	95	339	110	0	0	0
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		731			826		675	699	629			
v/s Ratio Prot					c0.20			c0.20				
v/s Ratio Perm		0.18					0.06		0.07			
v/c Ratio		0.44			0.48		0.14	0.48	0.17			
Uniform Delay, d1		15.8			16.2		13.7	16.2	13.9			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.9			2.0		0.4	2.4	0.6			
Delay (s)		17.7			18.2		14.1	18.6	14.5			
Level of Service		B			B		B	B	B			
Approach Delay (s)		17.7			18.2			16.5			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

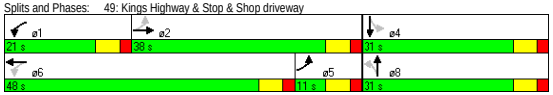
Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	445	40	100	575	35	25	5	60	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			185			360			359	
Travel Time (s)		11.7			4.2			8.2			8.2	
Peak Hour Factor	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	691	0	0	789	0	0	101	0	0	159	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	38.0	0.0	21.0	48.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.2%	42.2%	0.0%	23.3%	53.3%	0.0%	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%
Maximum Green (s)	5.0	32.0		15.0	42.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.50			0.56			0.20			0.29	
Control Delay		7.6			8.2			9.2			10.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.6			8.2			9.2			10.5	
Queue Length 50th (ft)		44			52			3			6	
Queue Length 95th (ft)		67			94			21			22	
Internal Link Dist (ft)		435			105			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1992			2508			1561			1656	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.35			0.31			0.06			0.10	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 42.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

2008 Existing Condition - AM Peak Hour

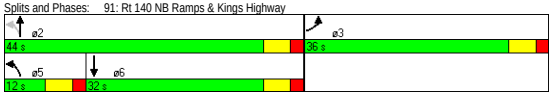
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	445	40	100	575	35	25	5	60	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.90			0.92	
Flt Protected		0.99			0.99			0.99			0.98	
Satd. Flow (prot)		3354			3442			3014			3227	
Flt Permitted		0.76			0.76			0.83			0.82	
Satd. Flow (perm)		2574			2647			2540			2685	
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Adj. Flow (vph)	93	549	49	111	639	39	28	6	67	62	14	83
RTOR Reduction (vph)	0	5	0	0	4	0	0	55	0	0	68	0
Lane Group Flow (vph)	0	686	0	0	785	0	0	46	0	0	91	0
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		22.5			22.5			7.5			7.5	
Effective Green, g (s)		22.5			22.5			7.5			7.5	
Actuated g/C Ratio		0.54			0.54			0.18			0.18	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1379			1418			454			479	
v/s Ratio Prot												
v/s Ratio Perm		0.27			c0.30			0.02			c0.03	
v/c Ratio		0.50			0.55			0.10			0.19	
Uniform Delay, d1		6.2			6.4			14.4			14.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.3			0.0			0.1	
Delay (s)		6.3			6.7			14.5			14.7	
Level of Service		A			A			B			B	
Approach Delay (s)		6.3			6.7			14.5			14.7	
Approach LOS		A			A			B			B	

Intersection Summary					
HCM Average Control Delay		7.7	HCM Level of Service		A
HCM Volume to Capacity ratio		0.46			
Actuated Cycle Length (s)		42.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization		59.8%	ICU Level of Service		B
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	305	95	85	255	615	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.83	0.83	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	481	0	0	400	777	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	36.0	0.0	12.0	44.0	32.0	0.0
Total Split (%)	45.0%	0.0%	15.0%	55.0%	40.0%	0.0%
Maximum Green (s)	30.0		6.0	38.0	26.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		None	Min	Min	
v/c Ratio	0.66			0.51	0.62	
Control Delay	18.3			15.5	15.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	18.3			15.5	15.6	
Queue Length 50th (ft)	104			43	87	
Queue Length 95th (ft)	203			91	161	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	1263			1689	1923	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.38			0.24	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 48.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 91: Rt 140 NB Ramps & Kings Highway



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	305	95	85	255	615	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.99	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1945			3380	3414	
Flt Permitted	0.96			0.62	1.00	
Satd. Flow (perm)	1945			2116	3414	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.85	0.85
Adj. Flow (vph)	367	114	100	300	724	53
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	481	0	0	400	777	0
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	18.2			17.9	17.9	
Effective Green, g (s)	18.2			17.9	17.9	
Actuated g/C Ratio	0.38			0.37	0.37	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	736			787	1270	
v/s Ratio Prot	c0.25				c0.23	
v/s Ratio Perm				0.19		
v/c Ratio	0.65			0.51	0.61	
Uniform Delay, d1	12.3			11.7	12.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.1			0.5	0.9	
Delay (s)	14.4			12.2	13.2	
Level of Service	B			B	B	
Approach Delay (s)	14.4			12.2	13.2	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

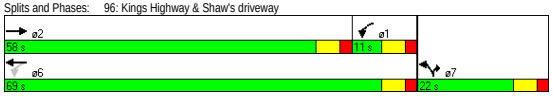
Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2008 Existing Condition - AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	300	100	85	625	85	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.85	0.85
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	431	0	0	771	100	47
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	58.0	0.0	11.0	69.0	22.0	22.0
Total Split (%)	63.7%	0.0%	12.1%	75.8%	24.2%	24.2%
Maximum Green (s)	52.0		5.0	63.0	16.0	16.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.21			0.44	0.29	0.13
Control Delay	4.7			7.2	15.8	6.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.7			7.2	15.8	6.3
Queue Length 50th (ft)	18			50	17	0
Queue Length 95th (ft)	38			91	45	16
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	3308			2930	751	711
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.13			0.26	0.13	0.07

Intersection Summary	
Area Type:	Other
Cycle Length: 91	
Actuated Cycle Length: 36.8	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 96: Kings Highway & Shaw's driveway



HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2008 Existing Condition - AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	300	100	85	625	85	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3309			3447	1687	1538
Flt Permitted	1.00			0.84	0.95	1.00
Satd. Flow (perm)	3309			2929	1687	1538
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.85	0.85
Adj. Flow (vph)	323	108	92	679	100	47
RTOR Reduction (vph)	39	0	0	0	0	40
Lane Group Flow (vph)	392	0	0	771	100	7
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	20.4			20.4	5.7	5.7
Effective Green, g (s)	20.4			20.4	5.7	5.7
Actuated g/C Ratio	0.54			0.54	0.15	0.15
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	1772			1568	252	230
v/s Ratio Prot	0.12				c0.06	0.00
v/s Ratio Perm				c0.26		
v/c Ratio	0.22			0.49	0.40	0.03
Uniform Delay, d1	4.7			5.6	14.6	13.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.0			0.1	0.4	0.0
Delay (s)	4.7			5.7	15.0	13.9
Level of Service	A			A	B	B
Approach Delay (s)	4.7			5.7	14.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	38.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

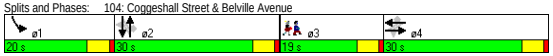
Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	85	250	85	65	210	130	35	125	160	215	205	180	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		443			1111			850			178		
Travel Time (s)		10.1			25.3			19.3			4.0		
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84	
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	466	0	0	302	143	0	195	195	0	714	0	
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt			
Protected Phases		4			4			2		1	2		3
Permitted Phases	4			4		4	2		2	2			
Detector Phase	4	4		4	4	4	2	2	2	1	2		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		6.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		19.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0	19.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%	19%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0		14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.0
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None		None
Walk Time (s)													6.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.40			0.51	0.20		0.35	0.27		0.69		
Control Delay		12.2			16.3	3.3		14.2	3.2		16.9		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0		
Total Delay		12.2			16.3	3.3		14.2	3.2		16.9		
Queue Length 50th (ft)		55			78	0		46	0		91		
Queue Length 95th (ft)		88			144	27		79	24		129		
Internal Link Dist (ft)		363			1031			770			98		
Turn Bay Length (ft)													
Base Capacity (vph)		1172			597	698		615	783		1129		
Starvation Cap Reductn		0			0	0		0	0		0		
Spillback Cap Reductn		0			0	0		0	0		0		
Storage Cap Reductn		0			0	0		0	0		0		
Reduced v/c Ratio		0.40			0.51	0.20		0.32	0.25		0.63		

Intersection Summary	
Area Type:	Other
Cycle Length: 99	
Actuated Cycle Length: 57.8	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	250	85	65	210	130	35	125	160	215	205	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.97			1.00	0.85		1.00	0.85		0.96	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3197			1672	1422		1784	1552		3166	
Flt Permitted		0.82			0.81	1.00		0.79	1.00		0.77	
Satd. Flow (perm)		2660			1377	1422		1418	1552		2497	
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84
Adj. Flow (vph)	94	278	94	71	231	143	43	152	195	256	244	214
RTOR Reduction (vph)	0	17	0	0	0	81	0	0	118	0	49	0
Lane Group Flow (vph)	0	449	0	0	302	62	0	195	77	0	665	0
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.1			25.1	25.1		22.7	22.7		22.7	
Effective Green, g (s)		25.1			25.1	25.1		22.7	22.7		22.7	
Actuated g/C Ratio		0.43			0.43	0.43		0.39	0.39		0.39	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		1155			598	618		557	610		981	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.22	0.04		0.14	0.05		c0.27	
v/c Ratio		0.39			0.51	0.10		0.35	0.13		0.68	
Uniform Delay, d1		11.1			11.8	9.7		12.4	11.2		14.5	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.0			3.0	0.3		0.5	0.1		2.0	
Delay (s)		12.1			14.9	10.0		12.9	11.3		16.6	
Level of Service		B			B	A		B	B		B	
Approach Delay (s)		12.1			13.3			12.1			16.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

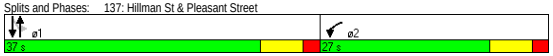
Lanes, Volumes, Timings
137: Hillman St & Pleasant Street

2008 Existing Condition - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	40	175	400	125	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.84	0.84	0.86	0.86	0.90	0.90
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	668	0	0	550
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.19		0.38			0.49
Control Delay	10.9		3.9			13.6
Queue Delay	0.0		0.0			0.0
Total Delay	10.9		3.9			13.6
Queue Length 50th (ft)	16		22			73
Queue Length 95th (ft)	43		44			113
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	581		1778			1118
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.19		0.38			0.49

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street



HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2008 Existing Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	40	175	400	125	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.90			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1751		3265			3596
Flt Permitted	0.97		1.00			0.65
Satd. Flow (perm)	1751		3265			2383
Peak-hour factor, PHF	0.84	0.84	0.86	0.86	0.90	0.90
Adj. Flow (vph)	60	48	203	465	139	411
RTOR Reduction (vph)	33	0	247	0	0	0
Lane Group Flow (vph)	75	0	421	0	0	550
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	547		1530			1117
v/s Ratio Prot	c0.04		0.13			
v/s Ratio Perm						c0.23
v/c Ratio	0.14		0.28			0.49
Uniform Delay, d1	15.8		10.4			11.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.5		0.4			1.6
Delay (s)	16.3		10.8			13.3
Level of Service	B		B			B
Approach Delay (s)	16.3		10.8			13.3
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

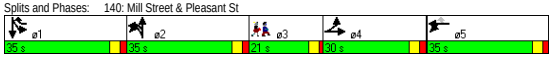
Lanes, Volumes, Timings
140: Mill Street & Pleasant St

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations														
Volume (vph)	215	135	5	395	175	140	20	55	205	30	50	270	45	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	16	16	11	12	10	16	10	12	14	16	14	16	
Storage Length (ft)	0			0		0		100		0	0		0	
Storage Lanes	1			1		1		1		0	0		0	
Taper Length (ft)	25			25		25		25		25	25		25	
Right Turn on Red			Yes			No				Yes				
Link Speed (mph)		30			30				30			30		
Link Distance (ft)		168			308				709			499		
Travel Time (s)		3.8			7.0				16.1			11.3		
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84	0.84	
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%	4%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	244	159	0	482	213	171	0	85	267	0	0	435	0	
Turn Type	Split			Split		pm+ov	Split	Split			Split			
Protected Phases	4	4		5	5	1	2	2	2		1	1		3
Permitted Phases						5								
Detector Phase	4	4		5	5	1	2	2	2		1	1		
Switch Phase														
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0		4.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	21.0	21.0	21.0		21.0	21.0		21.0
Total Split (s)	30.0	30.0	0.0	35.0	35.0	35.0	35.0	35.0	35.0	0.0	35.0	35.0	0.0	21.0
Total Split (%)	19.2%	19.2%	0.0%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%	0.0%	13%
Maximum Green (s)	25.0	25.0		30.0	30.0	30.0	30.0	30.0	30.0		30.0	30.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		3.0
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max		Max	Max		None
Walk Time (s)														10.0
Flash Dont Walk (s)														7.0
Pedestrian Calls (#/hr)														0
v/c Ratio	0.74	0.40		1.28	0.52	0.24		0.24	0.35			0.53		
Control Delay	66.6	51.7		187.9	51.5	21.8		45.4	44.3			49.0		
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0			0.0		
Total Delay	66.6	51.7		187.9	51.5	21.8		45.4	44.3			49.0		
Queue Length 50th (ft)	204	123		~535	166	86		62	101			178		
Queue Length 95th (ft)	#298	189		#655	223	122		108	140			215		
Internal Link Dist (ft)		88			228				629			419		
Turn Bay Length (ft)								100						
Base Capacity (vph)	329	393		376	410	698		351	758			825		
Starvation Cap Reductn	0	0		0	0	0		0	0			0		
Spillback Cap Reductn	0	0		0	0	0		0	0			0		
Storage Cap Reductn	0	0		0	0	0		0	0			0		
Reduced v/c Ratio	0.74	0.40		1.28	0.52	0.24		0.24	0.35			0.53		

Intersection Summary			
Area Type:	Other		
Cycle Length: 156			
Actuated Cycle Length: 135			
Natural Cycle: 115			
Control Type: Semi Act-Uncoord			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 140: Mill Street & Pleasant St



HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	215	135	5	395	175	140	20	55	205	30	50	270	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.98			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1776	2121		1694	1845	1449		1581	3381			3714	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1776	2121		1694	1845	1449		1581	3381			3714	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84	0.84
Adj. Flow (vph)	244	153	6	482	213	171	23	62	233	34	60	321	54
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	244	158	0	482	213	171	0	85	260	0	0	435	0
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%	4%
Turn Type	Split			Split		pm+ov	Split	Split			Split		
Protected Phases	4	4		5	5	1	2	2	2		1	1	
Permitted Phases						5							
Actuated Green, G (s)	25.0	25.0		30.0	30.0	60.0		30.0	30.0			30.0	
Effective Green, g (s)	25.0	25.0		30.0	30.0	60.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.19	0.19		0.22	0.22	0.44		0.22	0.22			0.22	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)	329	393		376	410	698		351	751			825	
v/s Ratio Prot	c0.14	0.07		c0.28	0.12	0.05		0.05	c0.08			c0.12	
v/s Ratio Perm						0.06							
v/c Ratio	0.74	0.40		1.28	0.52	0.24		0.24	0.35			0.53	
Uniform Delay, d1	51.9	48.4		52.5	46.2	23.4		43.2	44.2			46.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	14.0	3.1		145.8	4.6	0.8		1.6	1.3			2.4	
Delay (s)	66.0	51.5		198.3	50.8	24.2		44.8	45.5			48.7	
Level of Service	E	D		F	D	C		D	D			D	
Approach Delay (s)		60.2			127.6				45.3			48.7	
Approach LOS		E			F				D			D	

Intersection Summary			
HCM Average Control Delay	83.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

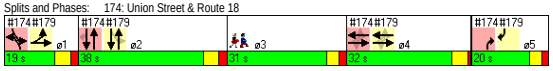
Lanes, Volumes, Timings
174: Union Street & Route 18

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	240	50	40	35	15	10	40	855	25	85	820	230	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	16	16	16	16	11	11	11	10	11	11	
Storage Length (ft)	0		0	0		0	150		225	150		225	
Storage Lanes	1		0	0		0	1		1	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		440			82			328			2491		
Travel Time (s)		10.0			1.9			7.5			56.6		
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	270	101	0	0	73	0	45	972	28	92	891	250	
Turn Type	Perm			Perm			Prot		custom	Prot		Perm	
Protected Phases		4			4		1	2	5	1	2		3
Permitted Phases	4			4								2	
Detector Phase	4	4		4	4		1	2	5	1	2	2	
Switch Phase													
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0	17.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0	31.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0	31.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%	22%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0	26.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0	3.0
Recall Mode	None	None		None	None		None	None	None	None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.79	0.23			0.17		0.24	0.93	0.18	0.51	0.84	0.41	
Control Delay	54.2	32.6			58.3		45.9	50.4	45.3	54.4	41.4	11.6	
Queue Delay	0.0	0.0			0.0		0.0	100.1	0.9	0.0	0.0	0.0	
Total Delay	54.2	32.6			58.3		45.9	150.5	46.2	54.4	41.4	11.6	
Queue Length 50th (ft)	170	53			43		27	334	17	58	294	35	
Queue Length 95th (ft)	#320	101			75		63	#481	44	114	#429	106	
Internal Link Dist (ft)		360			2			248			2411		
Turn Bay Length (ft)							150		225	150		225	
Base Capacity (vph)	342	443			432		213	1046	226	205	1066	607	
Starvation Cap Reductn	0	0			0		0	254	0	0	0	0	
Spillback Cap Reductn	0	0			0		0	0	99	1	0	0	
Storage Cap Reductn	0	0			0		0	0	0	0	0	0	
Reduced v/c Ratio	0.79	0.23			0.17		0.21	1.23	0.22	0.45	0.84	0.41	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 100.6	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 174: Union Street & Route 18



HCM Signalized Intersection Capacity Analysis
174: Union Street & Route 18

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	50	40	35	15	10	40	855	25	85	820	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1616	1638			1918		1631	3261	1501	1574	3323	1516
Flt Permitted	0.74	1.00			0.81		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1261	1638			1595		1631	3261	1501	1574	3323	1516
Peak-hour factor, PHF	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	270	56	45	43	18	12	45	972	28	92	891	250
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	121
Lane Group Flow (vph)	270	101	0	0	73	0	45	972	28	92	891	129
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)	27.2	27.2			27.2		11.4	32.3	8.7	11.4	32.3	32.3
Effective Green, g (s)	27.2	27.2			27.2		11.4	32.3	8.7	11.4	32.3	32.3
Actuated g/C Ratio	0.27	0.27			0.27		0.11	0.32	0.09	0.11	0.32	0.32
Clearance Time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	338	439			427		183	1037	129	177	1056	482
v/s Ratio Prot		0.06					0.03	c0.30	c0.02	c0.06	0.27	
v/s Ratio Perm	c0.21				0.05							0.08
v/c Ratio	0.80	0.23			0.17		0.25	0.94	0.22	0.52	0.84	0.27
Uniform Delay, d1	34.7	29.0			28.5		41.2	33.7	43.3	42.5	32.3	25.8
Progression Factor	1.00	1.00			1.84		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.1	0.6			0.4		1.0	15.2	1.2	3.4	6.5	0.4
Delay (s)	48.7	29.6			52.9		42.1	48.9	44.4	45.9	38.8	26.2
Level of Service	D	C			D		D	D	D	D	D	C
Approach Delay (s)		43.5			52.9			48.5			36.8	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay		42.6	HCM Level of Service		D
HCM Volume to Capacity ratio		0.75			
Actuated Cycle Length (s)		101.6	Sum of lost time (s)		22.0
Intersection Capacity Utilization		62.5%	ICU Level of Service		B
Analysis Period (min)		15			
c Critical Lane Group					

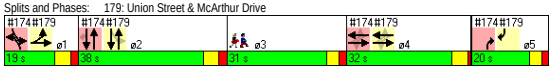
Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	50	20	90	5	10	5	0	155	20	15	170	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		0	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		82			609			920			687		
Travel Time (s)		1.9			13.8			20.9			15.6		
Peak Hour Factor	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81	
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	205	0	0	36	0	0	196	0	0	229	62	
Turn Type	pm+pt			Perm						Perm		custom	
Protected Phases	1	1 4			4			2			2	5	3
Permitted Phases	1 4			4						2			
Detector Phase	1	1 4		4	4			2		2	2	5	
Switch Phase													
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0	17.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0	31.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0	31.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%	22%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0	26.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0	
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0	3.0
Recall Mode	None			None	None			None		None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.32			0.08			0.34			0.44	0.39	
Control Delay		5.6			25.0			29.5			32.2	50.9	
Queue Delay		0.0			0.0			0.0			0.0	138.0	
Total Delay		5.6			25.0			29.5			32.2	188.9	
Queue Length 50th (ft)		25			14			99			122	39	
Queue Length 95th (ft)		34			24			168			180	73	
Internal Link Dist (ft)		2			529			840			607		
Turn Bay Length (ft)												50	
Base Capacity (vph)		668			440			572			521	234	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			11			0			0	183	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.31			0.08			0.34			0.44	1.22	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 100.6	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 179: Union Street & McArthur Drive



HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	20	90	5	10	5	0	155	20	15	170	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.92			0.97			0.98			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1809			1708			1774			1673	1553
Flt Permitted		0.90			0.93			1.00			0.97	1.00
Satd. Flow (perm)		1661			1603			1774			1623	1553
Peak-hour factor, PHF	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81
Adj. Flow (vph)	64	26	115	9	18	9	0	174	22	19	210	62
RTOR Reduction (vph)	0	0	0	0	7	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	205	0	0	29	0	0	193	0	0	229	62
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		38.6			27.2			32.3			32.3	8.7
Effective Green, g (s)		38.6			27.2			32.3			32.3	8.7
Actuated g/C Ratio		0.38			0.27			0.32			0.32	0.09
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		648			429			564			516	133
v/s Ratio Prot		c0.04						0.11				c0.04
v/s Ratio Perm		c0.08			0.02						c0.14	
v/c Ratio		0.32			0.07			0.34			0.44	0.47
Uniform Delay, d1		22.2			27.8			26.5			27.5	44.2
Progression Factor		0.32			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.4			0.1			0.5			0.8	3.5
Delay (s)		7.4			27.9			27.0			28.3	47.7
Level of Service		A			C			C			C	D
Approach Delay (s)		7.4			27.9			27.0			32.5	
Approach LOS		A			C			C			C	

Intersection Summary					
HCM Average Control Delay	23.7	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	23.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	270	5	470	5	155	385	405	315	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Hourly flow rate (vph)	9	0	9	278	5	485	5	165	410	506	394	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2274	1991	394	1796	1787	370	394			574		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2274	1991	394	1796	1787	370	394			574		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	99	0	87	28	100			50		
cM capacity (veh/h)	4	30	660	37	41	674	1176			1004		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	19	284	485	580	900
Volume Left	9	278	0	5	506
Volume Right	9	0	485	410	0
cSH	9	37	674	1176	1004
Volume to Capacity	2.10	7.67	0.72	0.00	0.50
Queue Length 95th (ft)	83	Err	153	0	73
Control Delay (s)	1330.2	Err	22.8	0.1	10.3
Lane LOS	F	F	C	A	B
Approach Delay (s)	1330.2	3705.3		0.1	10.3
Approach LOS	F	F			

Intersection Summary				
Average Delay	1270.7			
Intersection Capacity Utilization	103.0%	ICU Level of Service	G	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	15	30	1045	615	155
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	62	19	33	1148	683	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				393	611	
pX, platoon unblocked	0.73					
vC, conflicting volume	1984	769	856			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2159	769	856			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	95	96			
cM capacity (veh/h)	37	402	784			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	1181	856
Volume Left	62	33	0
Volume Right	19	0	172
cSH	47	784	1700
Volume to Capacity	1.75	0.04	0.50
Queue Length 95th (ft)	203	3	0
Control Delay (s)	548.7	1.5	0.0
Lane LOS	F	A	
Approach Delay (s)	548.7	1.5	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	21.9		
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Park Avenue & Church Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	160	310	15	0	30	0	460	20	5	300	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.85	0.85	0.85	0.79	0.79	0.79
Hourly flow rate (vph)	5	170	330	19	0	38	0	541	24	6	380	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	983	957	380	1360	945	553	380			565		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	888	858	174	1335	844	553	174			565		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	32	55	32	100	93	100			99		
cM capacity (veh/h)	208	249	734	27	254	531	1195			1017		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	505	56	565	386
Volume Left	5	19	0	6
Volume Right	330	38	24	0
cSH	437	75	1700	1017
Volume to Capacity	1.16	0.75	0.33	0.01
Queue Length 95th (ft)	468	90	0	0
Control Delay (s)	123.2	137.2	0.0	0.2
Lane LOS	F	F		A
Approach Delay (s)	123.2	137.2	0.0	0.2
Approach LOS	F	F		

Intersection Summary				
Average Delay		46.3		
Intersection Capacity Utilization		59.9%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	25	5	15	10	365	0	0	455	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.66	0.66	0.66	0.92	0.92	0.92	0.91	0.91	0.91
Hourly flow rate (vph)	7	0	7	38	8	23	11	397	0	0	500	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	948	921	503	928	924	397	505			397		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	948	921	503	928	924	397	505			397		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	97	100	99	84	97	96	99			100		
cM capacity (veh/h)	227	270	573	241	269	642	1014			1173		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	68	408	505
Volume Left	7	38	11	0
Volume Right	7	23	0	5
cSH	325	309	1014	1700
Volume to Capacity	0.04	0.22	0.01	0.30
Queue Length 95th (ft)	3	21	1	0
Control Delay (s)	16.6	19.9	0.3	0.0
Lane LOS	C	C	A	
Approach Delay (s)	16.6	19.9	0.3	0.0
Approach LOS	C	C		

Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization		37.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	390	40	50	315	45	25	130	55	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	102	419	43	54	339	48	32	165	70	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.96			0.92			0.94	0.94	0.92	0.94	0.94	0.96
vC, conflicting volume	387			462			1116	1140	441	1267	1137	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342			370			997	1022	347	1159	1020	317
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	91			95			83	14	89	100	100	100
cM capacity (veh/h)	1170			1081			189	192	627	37	194	700

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	565	441	266
Volume Left	102	54	32
Volume Right	43	48	70
cSH	1170	1081	234
Volume to Capacity	0.09	0.05	1.14
Queue Length 95th (ft)	7	4	304
Control Delay (s)	2.3	1.5	144.8
Lane LOS	A	A	F
Approach Delay (s)	2.3	1.5	144.8
Approach LOS			F

Intersection Summary				
Average Delay	31.8			
Intersection Capacity Utilization	61.4%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
54: driveway & Purchase St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	185	5	50	5	430	0	0	255	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	201	5	54	5	467	0	0	277	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								824				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	812	755	277	755	755	467	277			467		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	764	703	277	703	703	394	277			394		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	39	98	91	100			100		
cM capacity (veh/h)	269	337	762	328	337	612	1286			1087		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	261	473	277
Volume Left	0	201	5	0
Volume Right	0	54	0	0
cSH	1700	363	1286	1700
Volume to Capacity	0.00	0.72	0.00	0.16
Queue Length 95th (ft)	0	134	0	0
Control Delay (s)	0.0	36.5	0.1	0.0
Lane LOS	A	E	A	
Approach Delay (s)	0.0	36.5	0.1	0.0
Approach LOS	A	E		

Intersection Summary				
Average Delay	9.5			
Intersection Capacity Utilization	46.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	130	10	20	140	100	20	310	70	105	220	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.94	0.94	0.94
Hourly flow rate (vph)	6	148	11	23	159	114	24	373	84	112	234	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	165	295	482	356
Volume Left (vph)	6	23	24	112
Volume Right (vph)	11	114	84	11
Hadj (s)	0.01	-0.20	-0.03	0.12
Departure Headway (s)	7.7	7.0	6.5	6.9
Degree Utilization, x	0.35	0.58	0.87	0.68
Capacity (veh/h)	408	475	536	488
Control Delay (s)	14.8	19.2	38.6	23.6
Approach Delay (s)	14.8	19.2	38.6	23.6
Approach LOS	B	C	E	C

Intersection Summary				
Delay			27.1	
HCM Level of Service			D	
Intersection Capacity Utilization			72.0%	ICU Level of Service
Analysis Period (min)			15	
				C

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	0	45	85	115	30	90	340	0	0	230	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.90	0.90	0.90
Hourly flow rate (vph)	28	0	51	99	134	35	96	362	0	0	256	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	927	825	272	877	842	362	289			362		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	927	825	272	877	842	362	289			362		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	79	100	93	58	52	95	93			100		
cM capacity (veh/h)	138	287	755	236	279	663	1279			1208		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	80	166	102	457	289
Volume Left	28	99	0	96	0
Volume Right	51	0	35	0	33
cSH	291	252	348	1279	1208
Volume to Capacity	0.27	0.66	0.29	0.07	0.00
Queue Length 95th (ft)	27	104	30	6	0
Control Delay (s)	22.0	43.0	19.5	2.3	0.0
Lane LOS	C	E	C	A	
Approach Delay (s)	22.0	34.1		2.3	0.0
Approach LOS	C	D			

Intersection Summary				
Average Delay			10.9	
Intersection Capacity Utilization			60.9%	ICU Level of Service
Analysis Period (min)			15	
				B

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	0	65	0	365	110	60	300	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.85	0.85	0.85	0.96	0.96	0.96	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	71	0	76	0	380	115	64	319	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	961	942	319	884	884	438	319			495		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	961	942	319	884	884	438	319			495		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	72	100	88	100			94		
cM capacity (veh/h)	199	249	726	253	269	619	1252			1044		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	147	495	383
Volume Left	0	71	0	64
Volume Right	0	76	115	0
cSH	1700	366	1252	1044
Volume to Capacity	0.00	0.40	0.00	0.06
Queue Length 95th (ft)	0	47	0	5
Control Delay (s)	0.0	21.3	0.0	2.0
Lane LOS	A	C		A
Approach Delay (s)	0.0	21.3	0.0	2.0
Approach LOS	A	C		

Intersection Summary				
Average Delay		3.8		
Intersection Capacity Utilization		62.3%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	15	10	10	20	45	5	195	5	10	130	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.61	0.61	0.61	0.92	0.92	0.92	0.88	0.88	0.88
Hourly flow rate (vph)	155	17	11	16	33	74	5	212	5	11	148	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	512	424	173	442	447	215	199			217		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	424	173	442	447	215	199			217		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	97	99	97	93	91	100			99		
cM capacity (veh/h)	404	518	875	505	503	830	1386			1364		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	184	123	223	210
Volume Left	155	16	5	11
Volume Right	11	74	5	51
cSH	427	659	1386	1364
Volume to Capacity	0.43	0.19	0.00	0.01
Queue Length 95th (ft)	53	17	0	1
Control Delay (s)	19.6	11.7	0.2	0.5
Lane LOS	C	B	A	A
Approach Delay (s)	19.6	11.7	0.2	0.5
Approach LOS	C	B		

Intersection Summary				
Average Delay		7.0		
Intersection Capacity Utilization		36.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
77: Route 140 Ramps & Mt. Pleasant Street

2008 Existing Condition - PM Peak Hour

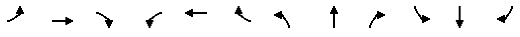
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	245	95	240	390	65	475
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.95	0.95	0.68	0.68
Hourly flow rate (vph)	278	108	253	411	96	699
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1348	458			253	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1348	458			253	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	0	82			93	
cM capacity (veh/h)	153	601			1290	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	386	663	794
Volume Left	278	0	96
Volume Right	108	411	0
cSH	194	1700	1290
Volume to Capacity	2.00	0.39	0.07
Queue Length 95th (ft)	727	0	6
Control Delay (s)	506.0	0.0	1.9
Lane LOS	F		A
Approach Delay (s)	506.0	0.0	1.9
Approach LOS	F		

Intersection Summary			
Average Delay	106.8		
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Avenue

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	130	25	25	80	0	40	15	25	0	5	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.61	0.61	0.61	0.93	0.93	0.93	0.75	0.75	0.75
Hourly flow rate (vph)	16	140	27	41	131	0	43	16	27	0	7	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	191	139	10	222	129	30	13			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	191	139	10	222	129	30	13			43		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	81	97	93	82	100	97			100		
cM capacity (veh/h)	654	732	1054	594	739	1051	1599			1579		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	183	172	86	13
Volume Left	16	41	43	0
Volume Right	27	0	27	7
cSH	758	699	1599	1579
Volume to Capacity	0.24	0.25	0.03	0.00
Queue Length 95th (ft)	24	24	2	0
Control Delay (s)	11.3	11.8	3.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.3	11.8	3.8	0.0
Approach LOS	B	B		

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	135	65	145	90	30	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.95	0.95	0.73	0.73
Hourly flow rate (vph)	178	86	153	95	41	233
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	515	200			247	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515	200			247	
tC, single (s)	6.4	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.3	
p0 queue free %	64	90			97	
cM capacity (veh/h)	500	821			1273	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	263	247	274
Volume Left	178	0	41
Volume Right	86	95	0
cSH	572	1700	1273
Volume to Capacity	0.46	0.15	0.03
Queue Length 95th (ft)	60	0	3
Control Delay (s)	16.5	0.0	1.4
Lane LOS	C		A
Approach Delay (s)	16.5	0.0	1.4
Approach LOS	C		

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & McArthur Dr

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	45	145	180	30	55	55
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.87	0.87	0.77	0.77
Hourly flow rate (vph)	54	175	207	34	71	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	555	107	143			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	555	107	143			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	87	81	85			
cM capacity (veh/h)	424	936	1422			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	229	241	143
Volume Left	54	207	0
Volume Right	175	0	71
cSH	728	1422	1700
Volume to Capacity	0.31	0.15	0.08
Queue Length 95th (ft)	34	13	0
Control Delay (s)	12.2	7.0	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	7.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & McArthur Drive

2008 Existing Condition - PM Peak Hour

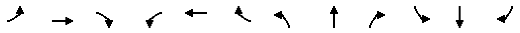
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	15	65	15	5	50
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.81	0.81	0.72	0.72	0.63	0.63
Hourly flow rate (vph)	19	19	90	21	8	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	196	101			90	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	196	101			90	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			99	
cM capacity (veh/h)	793	960			1518	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	111	87
Volume Left	19	0	8
Volume Right	19	21	0
cSH	869	1700	1518
Volume to Capacity	0.04	0.07	0.01
Queue Length 95th (ft)	3	0	0
Control Delay (s)	9.3	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	5	10	0	20	10	170	10	5	150	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.63	0.63	0.63	0.90	0.90	0.90	0.82	0.82	0.82
Hourly flow rate (vph)	22	0	7	16	0	32	11	189	11	6	183	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	456	430	195	431	436	194	207			200		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	456	430	195	431	436	194	207			200		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	96	100	99	97	100	96	99			100		
cM capacity (veh/h)	493	515	851	528	510	812	1376			1384		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	48	211	213
Volume Left	22	16	11	6
Volume Right	7	32	11	24
cSH	551	689	1376	1384
Volume to Capacity	0.05	0.07	0.01	0.00
Queue Length 95th (ft)	4	6	1	0
Control Delay (s)	11.9	10.6	0.5	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	11.9	10.6	0.5	0.3
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2008 Existing Condition - AM Pek Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	15	325	125	45	285	45	65	55	10	160	105	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.79	0.79	0.79	0.67	0.67	0.67
Hourly flow rate (vph)	16	357	137	56	352	56	82	70	13	239	157	164
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			495			1192	1018	380	997	977	426
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			495			1192	1018	380	997	977	426
tC, single (s)	4.2			4.1			7.1	6.6	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			95			0	68	98	0	31	73
cM capacity (veh/h)	1094			1080			51	219	661	150	228	614

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	511	463	165	560
Volume Left	16	56	82	239
Volume Right	137	56	13	164
cSH	1094	1080	85	220
Volume to Capacity	0.02	0.05	1.94	2.55
Queue Length 95th (ft)	1	4	357	1175
Control Delay (s)	0.4	1.5	545.6	744.6
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	1.5	545.6	744.6
Approach LOS			F	F

Intersection Summary				
Average Delay	298.8			
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2008 Existing Condition - AM Pek Hour

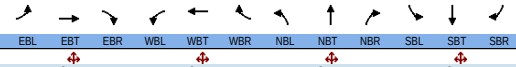
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	205	0	0	330	70	0	0	5	10	0	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.56	0.56	0.56	0.69	0.69	0.69
Hourly flow rate (vph)	33	228	0	0	367	78	0	0	9	14	0	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	444			228			765	739	228	709	700	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			228			765	739	228	709	700	406
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	97			100			100	100	99	95	100	90
cM capacity (veh/h)	1110			1352			283	337	817	313	355	645

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	261	444	9	80
Volume Left	33	0	0	14
Volume Right	0	78	9	65
cSH	1110	1352	817	541
Volume to Capacity	0.03	0.00	0.01	0.15
Queue Length 95th (ft)	2	0	1	13
Control Delay (s)	1.3	0.0	9.5	12.8
Lane LOS	A		A	B
Approach Delay (s)	1.3	0.0	9.5	12.8
Approach LOS			A	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2008 Existing Condition - AM Pek Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	170	5	5	200	0	15	0	10	5	0	5
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.75	0.75	0.75	0.69	0.69	0.69
Hourly flow rate (vph)	0	185	5	5	211	0	20	0	13	7	0	7

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	190	216	33	14
Volume Left (vph)	0	5	20	7
Volume Right (vph)	5	0	13	7
Hadj (s)	0.11	0.06	0.32	0.23
Departure Headway (s)	4.4	4.3	5.2	5.1
Degree Utilization, x	0.23	0.26	0.05	0.02
Capacity (veh/h)	807	814	643	644
Control Delay (s)	8.7	8.8	8.4	8.2
Approach Delay (s)	8.7	8.8	8.4	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
HCM Level of Service			A	
Intersection Capacity Utilization			24.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2008 Existing Condition - AM Pek Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	80	180	55	30	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.72	0.72	0.70	0.70
Hourly flow rate (vph)	49	111	250	76	43	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	431	288			326	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	431	288			326	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	91	85			97	
cM capacity (veh/h)	551	746			1245	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	160	326	100
Volume Left	49	0	43
Volume Right	111	76	0
cSH	673	1700	1245
Volume to Capacity	0.24	0.19	0.03
Queue Length 95th (ft)	23	0	3
Control Delay (s)	12.0	0.0	3.6
Lane LOS	B		A
Approach Delay (s)	12.0	0.0	3.6
Approach LOS	B		

Intersection Summary				
Average Delay			3.9	
Intersection Capacity Utilization			33.4%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
16: John B. Scott Blvd & Dean Stret

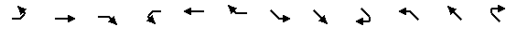
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	155	20	5	150	10	55	140	5	10	35	0
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	180	23	7	200	13	61	156	6	11	39	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	209	220	222	50
Volume Left (vph)	6	7	61	11
Volume Right (vph)	23	13	6	0
Hadj (s)	-0.03	0.11	0.16	0.25
Departure Headway (s)	4.9	5.1	5.2	5.6
Degree Utilization, x	0.29	0.31	0.32	0.08
Capacity (veh/h)	679	668	633	571
Control Delay (s)	9.9	10.3	10.7	9.1
Approach Delay (s)	9.9	10.3	10.7	9.1
Approach LOS	A	B	B	A

Intersection Summary					
Delay		10.3			
HCM Level of Service		B			
Intersection Capacity Utilization		33.7%	ICU Level of Service		A
Analysis Period (min)		15			

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	15	270	225	135	390	70	60	140	20	140	65	105
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93
Hourly flow rate (vph)	15	278	232	152	438	79	68	159	23	151	70	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	517			510			1354	1322	478	1308	1245	394
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	517			510			1354	1322	478	1308	1245	394
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			86			0	0	96	0	52	83
cM capacity (veh/h)	1059			1060			59	133	580	0	147	657

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	526	669	250	333
Volume Left	15	152	68	151
Volume Right	232	79	23	113
cSH	1059	1060	105	0
Volume to Capacity	0.01	0.14	2.39	Err
Queue Length 95th (ft)	1	12	559	Err
Control Delay (s)	0.4	3.5	717.1	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	3.5	717.1	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			100.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2008 Existing Condition - PM Peak Hour

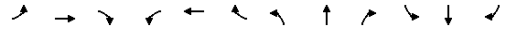
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	70	435	5	5	230	30	0	0	5	35	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.44	0.44	0.44	0.67	0.67	0.67
Hourly flow rate (vph)	77	478	5	6	261	34	0	0	11	52	0	119
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	295			484			1044	941	481	936	927	278
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	295			484			1044	941	481	936	927	278
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	98	77	100	84
cM capacity (veh/h)	1278			1090			167	248	589	228	253	763

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	560	301	11	172
Volume Left	77	6	0	52
Volume Right	5	34	11	119
cSH	1278	1090	589	445
Volume to Capacity	0.06	0.01	0.02	0.39
Queue Length 95th (ft)	5	0	1	45
Control Delay (s)	1.7	0.2	11.2	18.1
Lane LOS	A	A	B	C
Approach Delay (s)	1.7	0.2	11.2	18.1
Approach LOS			B	C

Intersection Summary				
Average Delay			4.1	
Intersection Capacity Utilization			64.8%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	285	15	10	175	0	5	5	5	0	0	5
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.75	0.75	0.75	0.42	0.42	0.42
Hourly flow rate (vph)	6	328	17	11	199	0	7	7	7	0	0	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	351	210	20	12
Volume Left (vph)	6	11	7	0
Volume Right (vph)	17	0	7	12
Hadj (s)	0.00	0.04	-0.02	-0.60
Departure Headway (s)	4.2	4.4	5.1	4.5
Degree Utilization, x	0.41	0.26	0.03	0.02
Capacity (veh/h)	845	799	629	693
Control Delay (s)	10.1	8.9	8.3	7.6
Approach Delay (s)	10.1	8.9	8.3	7.6
Approach LOS	B	A	A	A

Intersection Summary				
Delay			9.5	
HCM Level of Service			A	
Intersection Capacity Utilization			29.3%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	100	50	95	50	40	130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.86	0.86	0.79	0.79
Hourly flow rate (vph)	118	59	110	58	51	165
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	405	140			169	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405	140			169	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	93			96	
cM capacity (veh/h)	582	903			1421	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	176	169	215
Volume Left	118	0	51
Volume Right	59	58	0
cSH	660	1700	1421
Volume to Capacity	0.27	0.10	0.04
Queue Length 95th (ft)	27	0	3
Control Delay (s)	12.4	0.0	2.0
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	2.0
Approach LOS	B		

Intersection Summary				
Average Delay			4.7	
Intersection Capacity Utilization			35.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
16: John B. Scott Blvd & Dean Stret

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	185	85	15	150	15	30	60	10	10	120	5
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.86	0.86	0.86	0.96	0.96	0.96
Hourly flow rate (vph)	6	215	99	17	170	17	35	70	12	10	125	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	320	205	116	141
Volume Left (vph)	6	17	35	10
Volume Right (vph)	99	17	12	5
Hadj (s)	-0.16	-0.01	0.04	0.01
Departure Headway (s)	4.8	5.1	5.5	5.4
Degree Utilization, x	0.42	0.29	0.18	0.21
Capacity (veh/h)	716	665	579	598
Control Delay (s)	11.2	10.1	9.7	9.9
Approach Delay (s)	11.2	10.1	9.7	9.9
Approach LOS	B	B	A	A

Intersection Summary				
Delay		10.4		
HCM Level of Service		B		
Intersection Capacity Utilization		37.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
13: Dog Track driveway & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	25	40	1145	330	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	7	37	44	1258	418	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1764	418	418			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1764	418	418			
tC, single (s)	7.2	6.7	4.2			
tC, 2 stage (s)						
tF (s)	4.2	3.8	2.3			
p0 queue free %	87	93	96			
cM capacity (veh/h)	59	544	1095			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	44	1302	418
Volume Left	7	44	0
Volume Right	37	0	0
cSH	228	1095	1700
Volume to Capacity	0.19	0.04	0.25
Queue Length 95th (ft)	17	3	0
Control Delay (s)	24.5	1.5	0.0
Lane LOS	C	A	
Approach Delay (s)	24.5	1.5	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
14: I-495 SB Off-Ramp & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	235	0	45	0	0	0	0	1310	210	60	395	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.25	0.96	0.96	0.79	0.79	0.25
Hourly flow rate (vph)	305	0	58	0	0	0	0	1365	219	76	500	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1334	2016	250	1876	2126	792	500			1365		
vC1, stage 1 conf vol	652	652		1474	1474							
vC2, stage 2 conf vol	682	1365		402	652							
vCu, unblocked vol	1334	2016	250	1876	2126	792	500			1365		
tC, single (s)	7.6	6.6	7.0	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.6	5.6		6.5	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	0	100	92	100	100	100	100			84		
cM capacity (veh/h)	246	122	735	126	168	332	1075			469		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	364	910	674	76	250	250
Volume Left	305	0	0	76	0	0
Volume Right	58	0	219	0	0	0
cSH	275	1700	1700	469	1700	1700
Volume to Capacity	1.32	0.54	0.40	0.16	0.15	0.15
Queue Length 95th (ft)	461	0	0	14	0	0
Control Delay (s)	204.6	0.0	0.0	14.1	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	204.6	0.0		1.9		
Approach LOS	F					

Intersection Summary			
Average Delay	29.9		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	100	0	165	295	1240	0	0	340	245
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.80	0.80
Hourly flow rate (vph)	0	0	0	110	0	181	324	1363	0	0	425	306
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)											1195	
pX, platoon unblocked												
vC, conflicting volume	1908	2589	366	2223	2436	681	425			1363		
vC1, stage 1 conf vol	578	578		2011	2011							
vC2, stage 2 conf vol	1330	2011		212	425							
vCu, unblocked vol	1908	2589	366	2223	2436	681	425			1363		
tC, single (s)	7.5	6.5	6.9	7.6	6.6	7.0	4.2			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	53	71			100		
cM capacity (veh/h)	61	72	637	41	67	388	1124			511		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	291	324	681	681	283	448
Volume Left	110	324	0	0	0	0
Volume Right	181	0	0	0	0	306
cSH	93	1124	1700	1700	1700	1700
Volume to Capacity	3.15	0.29	0.40	0.40	0.17	0.26
Queue Length 95th (ft)	Err	30	0	0	0	0
Control Delay (s)	Err	9.5	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	Err	1.8			0.0	
Approach LOS	F					

Intersection Summary				
Average Delay	1075.9			
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
23: Center Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	15	0	130	0	1045	35	85	410	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.93	0.93	0.86	0.86	0.92
Hourly flow rate (vph)	0	0	0	17	0	144	0	1124	38	99	477	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1961	1836	477	1817	1817	1142	477			1161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1961	1836	477	1817	1817	1142	477			1161		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	68	100	40	100			83		
cM capacity (veh/h)	17	63	588	52	65	243	1085			580		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	161	1161	576
Volume Left	0	17	0	99
Volume Right	0	144	38	0
cSH	1700	176	1700	580
Volume to Capacity	0.00	0.92	0.68	0.17
Queue Length 95th (ft)	0	173	0	15
Control Delay (s)	0.0	100.4	0.0	4.6
Lane LOS	A	F		A
Approach Delay (s)	0.0	100.4	0.0	4.6
Approach LOS	A	F		

Intersection Summary				
Average Delay	9.9			
Intersection Capacity Utilization	Err%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	25	1055	15	5	415
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	44	44	1199	17	5	432
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1650	1207			1216	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1650	1207			1216	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	60	81			99	
cM capacity (veh/h)	109	225			556	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	88	1216	438
Volume Left	44	0	5
Volume Right	44	17	0
cSH	147	1700	556
Volume to Capacity	0.60	0.72	0.01
Queue Length 95th (ft)	78	0	1
Control Delay (s)	60.6	0.0	0.3
Lane LOS	F		A
Approach Delay (s)	60.6	0.0	0.3
Approach LOS	F		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	5	5	1040	425	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	0.89	0.89
Hourly flow rate (vph)	30	5	5	1040	478	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1530	480	483			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1530	480	483			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	99	100			
cM capacity (veh/h)	128	586	1069			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	1045	483
Volume Left	30	5	0
Volume Right	5	0	6
cSH	144	1069	1700
Volume to Capacity	0.24	0.00	0.28
Queue Length 95th (ft)	23	0	0
Control Delay (s)	37.8	0.1	0.0
Lane LOS	E	A	
Approach Delay (s)	37.8	0.1	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
50: Wilbur Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	1160	5	0	350
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.94	0.94	0.85	0.85
Hourly flow rate (vph)	8	8	1234	5	0	412
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1648	1237			1239	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1648	1237			1239	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	93	96			100	
cM capacity (veh/h)	110	217			529	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	1239	412
Volume Left	8	0	0
Volume Right	8	5	0
cSH	146	1700	529
Volume to Capacity	0.11	0.73	0.00
Queue Length 95th (ft)	9	0	0
Control Delay (s)	32.6	0.0	0.0
Lane LOS	D		
Approach Delay (s)	32.6	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
52: Robinson Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	1165	0	5	350
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	0	36	1280	0	6	443
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1736	1280			1280	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1736	1280			1280	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			99	
cM capacity (veh/h)	96	204			549	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	1280	449
Volume Left	0	0	6
Volume Right	36	0	0
cSH	204	1700	549
Volume to Capacity	0.17	0.75	0.01
Queue Length 95th (ft)	15	0	1
Control Delay (s)	26.3	0.0	0.3
Lane LOS	D		A
Approach Delay (s)	26.3	0.0	0.3
Approach LOS	D		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Carver Street & Route 138

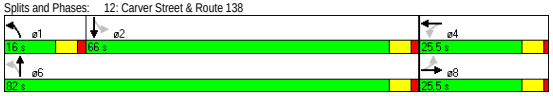
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	80	80	55	65	35	50	670	40	100	1245	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		175	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Confl. Peds. (#/hr)						5	2					
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	174	0	0	196	0	0	863	0	0	1581	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Total Split (s)	25.5	25.5	0.0	25.5	25.5	0.0	16.0	82.0	0.0	66.0	66.0	0.0
Total Split (%)	23.7%	23.7%	0.0%	23.7%	23.7%	0.0%	14.9%	76.3%	0.0%	61.4%	61.4%	0.0%
Maximum Green (s)	20.0	20.0		20.0	20.0		10.0	76.0		60.0	60.0	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.7	1.7		1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
v/c Ratio	0.75	0.45			0.70			0.55			0.88	
Control Delay	56.4	27.7			45.7			9.6			19.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	56.4	27.7			45.7			9.6			19.9	
Queue Length 50th (ft)	85	66			98			125			355	
Queue Length 95th (ft)	#177	127			146			167			#534	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	233	420			306			1992			1795	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.68	0.41			0.64			0.43			0.88	

Intersection Summary

Area Type: Other
Cycle Length: 107.5
Actuated Cycle Length: 89.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Carver Street & Route 138



HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	80	80	55	65	35	50	670	40	100	1245	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	5.5	5.5			5.5			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.92			0.97			0.99			0.98	
Flt Protected	0.95	1.00			0.98			1.00			1.00	
Satd. Flow (prot)	1787	1740			1826			3318			3343	
Flt Permitted	0.55	1.00			0.71			0.71			0.80	
Satd. Flow (perm)	1043	1740			1328			2349			2668	
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Adj. Flow (vph)	158	87	87	70	82	44	57	761	45	102	1270	209
RTOR Reduction (vph)	0	33	0	0	10	0	0	4	0	0	8	0
Lane Group Flow (vph)	158	141	0	0	186	0	0	859	0	0	1573	0
Confl. Peds. (#/hr)						5	2					
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	18.2	18.2			18.2			60.1			60.1	
Effective Green, g (s)	18.2	18.2			18.2			60.1			60.1	
Actuated g/C Ratio	0.20	0.20			0.20			0.67			0.67	
Clearance Time (s)	5.5	5.5			5.5			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	211	353			269			1572			1786	
v/s Ratio Prot		0.08										
v/s Ratio Perm	c0.15				0.14			0.37			c0.59	
v/c Ratio	0.75	0.40			0.69			0.55			0.88	
Uniform Delay, d1	33.7	31.1			33.2			7.7			12.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	12.0	0.3			6.1			0.2			5.3	
Delay (s)	45.6	31.3			39.3			8.0			17.3	
Level of Service	D	C			D			A			B	
Approach Delay (s)		38.1			39.3			8.0			17.3	
Approach LOS		D			D			A			B	

Intersection Summary

HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	11.5
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

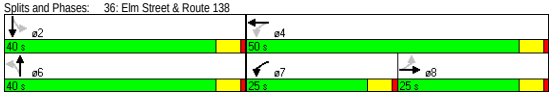
Lanes, Volumes, Timings
36: Elm Street & Route 138

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	35	320	15	25	30	550	295	40	960	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	73	0	364	45	0	0	961	0	0	1069	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		7	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		15.0	15.0		15.0	15.0	
Total Split (s)	25.0	25.0	0.0	25.0	50.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	55.6%	0.0%	44.4%	44.4%	0.0%	44.4%	44.4%	0.0%
Maximum Green (s)	20.0	20.0		20.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.37		0.62	0.07			0.72			0.74	
Control Delay		37.6		21.7	13.4			21.2			21.7	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		37.6		21.7	13.4			21.2			21.7	
Queue Length 50th (ft)		34		124	13			199			225	
Queue Length 95th (ft)		60		191	30			297			331	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		450		645	1072			1415			1526	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.16		0.56	0.04			0.68			0.70	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 73.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Elm Street & Route 138



HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	35	320	15	25	30	550	295	40	960	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.91		1.00	0.91			0.95			1.00	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1709		1770	1689			3259			3524	
Flt Permitted		0.93		0.55	1.00			0.88			0.88	
Satd. Flow (perm)		1598		1030	1689			2868			3095	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	13	13	47	364	17	28	33	604	324	42	1011	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	73	0	364	45	0	0	961	0	0	1069	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		7.1		29.9	29.9			34.3			34.3	
Effective Green, g (s)		7.1		29.9	29.9			34.3			34.3	
Actuated g/C Ratio		0.10		0.40	0.40			0.46			0.46	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		153		593	681			1326			1431	
v/s Ratio Prot				c0.15	0.03							
v/s Ratio Perm		0.05		c0.10				0.34			c0.35	
v/c Ratio		0.48		0.61	0.07			0.72			0.75	
Uniform Delay, d1		31.8		16.9	13.6			16.1			16.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.3		1.9	0.0			2.1			2.3	
Delay (s)		34.1		18.8	13.6			18.3			18.7	
Level of Service		C		B	B			B			B	
Approach Delay (s)		34.1			18.3			18.3			18.7	
Approach LOS		C			B			B			B	

Intersection Summary					
HCM Average Control Delay	18.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	74.2	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	89.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
44: Route 106 & Route 138

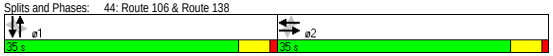
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	245	45	390	380	110	65	300	210	135	595	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4525			923	
Travel Time (s)		39.6			50.8			102.8			21.0	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	462	0	0	936	0	0	620	0	0	894	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.49			1.08dl			0.58			0.88	
Control Delay		15.6			45.9			13.4			29.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.6			45.9			13.4			29.8	
Queue Length 50th (ft)		67			197			72			171	
Queue Length 95th (ft)		90			#334			118			#289	
Internal Link Dist (ft)		1662			2156			4445			843	
Turn Bay Length (ft)												
Base Capacity (vph)		944			956			1100			1044	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.98			0.56			0.86	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 69.2
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 44: Route 106 & Route 138



HCM Signalized Intersection Capacity Analysis
44: Route 106 & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	245	45	390	380	110	65	300	210	135	595	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.95			0.98	
Flt Protected		0.99			0.98			0.99			0.99	
Satd. Flow (prot)		3438			3300			3244			3403	
Flt Permitted		0.62			0.64			0.71			0.69	
Satd. Flow (perm)		2144			2170			2325			2369	
Peak-hour factor, PHF	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Adj. Flow (vph)	95	310	57	415	404	117	73	337	210	144	633	117
RTOR Reduction (vph)	0	16	0	0	16	0	0	94	0	0	17	0
Lane Group Flow (vph)	0	446	0	0	920	0	0	526	0	0	877	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		30.0			30.0			29.2			29.2	
Effective Green, g (s)		30.0			30.0			29.2			29.2	
Actuated g/C Ratio		0.43			0.43			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		929			941			981			1000	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.42			0.23			c0.37	
v/c Ratio		0.48			1.08dl			0.54			0.88	
Uniform Delay, d1		14.0			19.3			14.9			18.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			23.8			0.7			9.0	
Delay (s)		14.6			43.1			15.7			27.4	
Level of Service		B			D			B			C	
Approach Delay (s)		14.6			43.1			15.7			27.4	
Approach LOS		B			D			B			C	

Intersection Summary

HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lanes, Volumes, Timings
12: Carver Street & Route 138

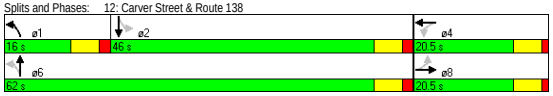
2008 Existing Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	25	30	15	40	160	35	1140	5	45	455	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		175	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	66	0	0	233	0	0	1242	0	0	619	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Total Split (s)	20.5	20.5	0.0	20.5	20.5	0.0	16.0	62.0	0.0	46.0	46.0	0.0
Total Split (%)	24.8%	24.8%	0.0%	24.8%	24.8%	0.0%	19.4%	75.2%	0.0%	55.8%	55.8%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0		10.0	56.0		40.0	40.0	
Yellow Time (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.7	1.7		1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
v/c Ratio	0.74	0.13			0.41			0.82			0.52	
Control Delay	36.2	10.6			12.5			16.3			10.4	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	36.2	10.6			12.5			16.3			10.4	
Queue Length 50th (ft)	69	7			30			154			60	
Queue Length 95th (ft)	#189	32			96			222			90	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	338	527			571			3114			1870	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.74	0.13			0.41			0.40			0.33	

Intersection Summary

Area Type: Other
Cycle Length: 82.5
Actuated Cycle Length: 52.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Carver Street & Route 138



HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	25	30	15	40	160	35	1140	5	45	455	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	5.5	5.5			5.5			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frt	1.00	0.92			0.90			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1787	1727			1742			3381			3208	
Flt Permitted	0.62	1.00			0.98			0.92			0.75	
Satd. Flow (perm)	1166	1727			1712			3116			2411	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	250	30	36	16	43	174	37	1200	5	51	517	51
RTOR Reduction (vph)	0	26	0	0	74	0	0	1	0	0	8	0
Lane Group Flow (vph)	250	40	0	0	159	0	0	1241	0	0	611	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.2	15.2			15.2			25.5			25.5	
Effective Green, g (s)	15.2	15.2			15.2			25.5			25.5	
Actuated g/C Ratio	0.29	0.29			0.29			0.49			0.49	
Clearance Time (s)	5.5	5.5			5.5			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	340	503			499			1522			1178	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.21				0.09			c0.40			0.25	
v/c Ratio	0.74	0.08			0.32			0.82			0.52	
Uniform Delay, d1	16.7	13.4			14.5			11.4			9.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	6.9	0.0			0.1			3.3			0.2	
Delay (s)	23.6	13.5			14.6			14.7			9.3	
Level of Service	C	B			B			B			A	
Approach Delay (s)		21.5			14.6			14.7			9.3	
Approach LOS		C			B			B			A	

Intersection Summary					
HCM Average Control Delay	14.2	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	52.2	Sum of lost time (s)		11.5	
Intersection Capacity Utilization	91.6%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
36: Elm Street & Route 138

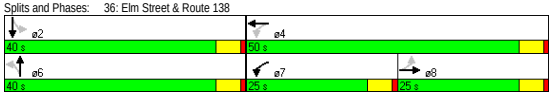
2008 Existing Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	20	25	205	5	55	5	1050	190	35	310	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	297	87	0	0	1324	0	0	451	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		7	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		15.0	15.0		15.0	15.0	
Total Split (s)	25.0	25.0	0.0	25.0	50.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	55.6%	0.0%	44.4%	44.4%	0.0%	44.4%	44.4%	0.0%
Maximum Green (s)	20.0	20.0		20.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.47		0.55	0.15			0.85			0.43	
Control Delay		39.9		20.1	14.1			26.8			16.8	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		39.9		20.1	14.1			26.8			16.8	
Queue Length 50th (ft)		45		98	25			306			77	
Queue Length 95th (ft)		84		113	38			#511			118	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		411		613	942			1564			1061	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.23		0.48	0.09			0.85			0.43	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 74.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 36: Elm Street & Route 138



HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	20	25	205	5	55	5	1050	190	35	310	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.96		1.00	0.86			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1796		1686	1531			3424			3148	
Flt Permitted		0.82		0.58	1.00			0.95			0.70	
Satd. Flow (perm)		1501		1034	1531			3266			2217	
Peak-hour factor, PHF	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	42	24	30	297	7	80	5	1117	202	43	378	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	96	0	297	87	0	0	1324	0	0	451	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		8.3		30.0	30.0			35.8			35.8	
Effective Green, g (s)		8.3		30.0	30.0			35.8			35.8	
Actuated g/C Ratio		0.11		0.40	0.40			0.47			0.47	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		164		553	606			1543			1047	
v/s Ratio Prot				c0.12	0.06							
v/s Ratio Perm		0.06		c0.09				c0.41			0.20	
v/c Ratio		0.59		0.54	0.14			0.86			0.43	
Uniform Delay, d1		32.1		17.2	14.7			17.7			13.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		5.2		1.0	0.1			5.2			0.4	
Delay (s)		37.4		18.2	14.8			22.9			13.6	
Level of Service		D		B	B			C			B	
Approach Delay (s)		37.4			17.4			22.9			13.6	
Approach LOS		D			B			C			B	

Intersection Summary

HCM Average Control Delay		20.7	HCM Level of Service		C
HCM Volume to Capacity ratio		0.70			
Actuated Cycle Length (s)		75.8	Sum of lost time (s)		10.0
Intersection Capacity Utilization		65.0%	ICU Level of Service		C
Analysis Period (min)		15			

c Critical Lane Group

Lanes, Volumes, Timings
44: Route 106 & Route 138

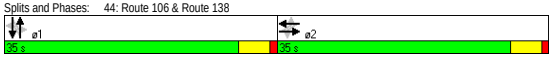
2008 Existing Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	340	25	165	330	155	55	705	350	80	160	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4568			923	
Travel Time (s)		39.6			50.8			103.8			21.0	
Confl. Peds. (#/hr)			3									
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	511	0	0	730	0	0	1206	0	0	371	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.53			0.78			0.85			0.44	
Control Delay		16.7			21.8			23.1			11.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.7			21.8			23.1			11.1	
Queue Length 50th (ft)		79			119			215			37	
Queue Length 95th (ft)		117			182			#350			72	
Internal Link Dist (ft)		1662			2156			4488			843	
Turn Bay Length (ft)												
Base Capacity (vph)		1101			1061			1485			891	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.46			0.69			0.81			0.42	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 65.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 44: Route 106 & Route 138



HCM Signalized Intersection Capacity Analysis
44: Route 106 & Route 138

2008 Existing Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	340	25	165	330	155	55	705	350	80	160	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.95			0.95	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		3439			3154			3331			3096	
Flt Permitted		0.68			0.69			0.91			0.57	
Satd. Flow (perm)		2362			2200			3045			1793	
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	97	386	28	185	371	174	60	766	380	86	172	113
RTOR Reduction (vph)	0	6	0	0	44	0	0	75	0	0	63	0
Lane Group Flow (vph)	0	505	0	0	686	0	0	1131	0	0	308	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		26.7			26.7			28.8			28.8	
Effective Green, g (s)		26.7			26.7			28.8			28.8	
Actuated g/C Ratio		0.41			0.41			0.44			0.44	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		963			897			1339			788	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.31			c0.37			0.17	
v/c Ratio		0.52			0.76			0.84			0.39	
Uniform Delay, d1		14.6			16.7			16.4			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			4.2			5.3			0.4	
Delay (s)		15.3			20.9			21.6			12.9	
Level of Service		B			C			C			B	
Approach Delay (s)		15.3			20.9			21.6			12.9	
Approach LOS		B			C			C			B	

Intersection Summary					
HCM Average Control Delay		19.1	HCM Level of Service		B
HCM Volume to Capacity ratio		0.81			
Actuated Cycle Length (s)		65.5	Sum of lost time (s)		10.0
Intersection Capacity Utilization		90.7%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
10: Dog Track driveway & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	60	30	555	1000	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	7	88	33	617	1099	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1782	1099	1099			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1782	1099	1099			
tC, single (s)	6.7	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.8	3.3	2.3			
p0 queue free %	90	66	95			
cM capacity (veh/h)	71	261	620			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	96	650	1099
Volume Left	7	33	0
Volume Right	88	0	0
cSH	216	620	1700
Volume to Capacity	0.44	0.05	0.65
Queue Length 95th (ft)	52	4	0
Control Delay (s)	34.2	1.5	0.0
Lane LOS	D	A	
Approach Delay (s)	34.2	1.5	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
14: I-495 SB Off-Ramp & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	205	0	440	0	0	0	0	740	125	95	1125	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.25	0.25	0.25	0.25	0.95	0.95	0.98	0.98	0.25
Hourly flow rate (vph)	253	0	543	0	0	0	0	779	132	97	1148	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1731	2121	574	1613	2187	455	1148			779		
vC1, stage 1 conf vol	1342	1342		845	845							
vC2, stage 2 conf vol	389	779		768	1342							
vCu, unblocked vol	1731	2121	574	1613	2187	455	1148			779		
tC, single (s)	7.6	6.6	7.0	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.6	5.6		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	100	100			88		
cM capacity (veh/h)	133	161	457	0	173	558	616			834		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	796	519	391	97	574	574
Volume Left	253	0	0	97	0	0
Volume Right	543	0	132	0	0	0
cSH	258	1700	1700	834	1700	1700
Volume to Capacity	3.09	0.31	0.23	0.12	0.34	0.34
Queue Length 95th (ft)	Err	0	0	10	0	0
Control Delay (s)	Err	0.0	0.0	9.9	0.0	0.0
Lane LOS	F			A		
Approach Delay (s)	Err	0.0		0.8		
Approach LOS	F					

Intersection Summary			
Average Delay	2697.8		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	125	0	75	100	825	0	0	1095	230
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.78	0.78	0.78	0.92	0.92	0.25	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	160	0	96	109	897	0	0	1141	240
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)											1195	
pX, platoon unblocked	0.80	0.80	0.80	0.80	0.80		0.80					
vC, conflicting volume	1926	2375	690	1684	2255	448	1141			897		
vC1, stage 1 conf vol	1260	1260		1114	1114							
vC2, stage 2 conf vol	666	1114		570	1141							
vCu, unblocked vol	1655	2217	107	1353	2067	448	672			897		
tC, single (s)	7.5	6.5	6.9	7.6	6.6	7.0	4.2			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	11	100	83	85			100		
cM capacity (veh/h)	196	186	745	180	170	555	720			753		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	256	109	448	448	760	620
Volume Left	160	109	0	0	0	0
Volume Right	96	0	0	0	0	240
cSH	241	720	1700	1700	1700	1700
Volume to Capacity	1.07	0.15	0.26	0.26	0.45	0.36
Queue Length 95th (ft)	271	13	0	0	0	0
Control Delay (s)	120.6	10.9	0.0	0.0	0.0	0.0
Lane LOS	F	B				
Approach Delay (s)	120.6	1.2			0.0	
Approach LOS	F					

Intersection Summary				
Average Delay	12.1			
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
23: Center Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	5	25	0	100	0	670	35	290	1125	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.38	0.38	0.82	0.82	0.82	0.90	0.90	0.90	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	13	30	0	122	0	744	39	296	1148	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2626	2523	1148	2517	2504	764	1148			783		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2626	2523	1148	2517	2504	764	1148			783		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	100	100	95	0	100	69	100			65		
cM capacity (veh/h)	8	18	244	13	18	396	605			835		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	152	783	1444
Volume Left	0	30	0	296
Volume Right	13	122	39	0
cSH	244	56	1700	835
Volume to Capacity	0.05	2.74	0.46	0.35
Queue Length 95th (ft)	4	394	0	40
Control Delay (s)	20.6	945.9	0.0	11.7
Lane LOS	C	F		B
Approach Delay (s)	20.6	945.9	0.0	11.7
Approach LOS	C	F		

Intersection Summary				
Average Delay	67.4			
Intersection Capacity Utilization	Err%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	20	695	25	25	1140
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.85	0.85	0.97	0.97
Hourly flow rate (vph)	40	27	818	29	26	1175
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2059	832			847	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2059	832			847	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	32	93			97	
cM capacity (veh/h)	58	369			790	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	67	847	1201
Volume Left	40	0	26
Volume Right	27	29	0
cSH	88	1700	790
Volume to Capacity	0.76	0.50	0.03
Queue Length 95th (ft)	96	0	3
Control Delay (s)	121.1	0.0	1.2
Lane LOS	F		A
Approach Delay (s)	121.1	0.0	1.2
Approach LOS	F		

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	5	5	680	1100	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	18	6	6	773	1146	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1948	1164	1182			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1948	1164	1182			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	97	99			
cM capacity (veh/h)	71	239	587			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	778	1182
Volume Left	18	6	0
Volume Right	6	0	36
cSH	86	587	1700
Volume to Capacity	0.28	0.01	0.70
Queue Length 95th (ft)	26	1	0
Control Delay (s)	62.4	0.3	0.0
Lane LOS	F	A	
Approach Delay (s)	62.4	0.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
50: Wilbur Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	565	10	10	1040
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.39	0.39	0.97	0.97	0.96	0.96
Hourly flow rate (vph)	13	13	582	10	10	1083
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1692	588			593	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1692	588			593	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	98			99	
cM capacity (veh/h)	102	513			983	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	593	1094
Volume Left	13	0	10
Volume Right	13	10	0
cSH	171	1700	983
Volume to Capacity	0.15	0.35	0.01
Queue Length 95th (ft)	13	0	1
Control Delay (s)	29.8	0.0	0.3
Lane LOS	D		A
Approach Delay (s)	29.8	0.0	0.3
Approach LOS	D		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		72.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
52: Robinson Street & Route 138

2008 Existing Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	570	0	10	1050
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	0	24	633	0	11	1154
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1809	633			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1809	633			633	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	95			99	
cM capacity (veh/h)	87	469			959	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	633	1165
Volume Left	0	0	11
Volume Right	24	0	0
cSH	469	1700	959
Volume to Capacity	0.05	0.37	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	13.1	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	13.1	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		73.2%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2008 Existing Condition - AM Peak Hour

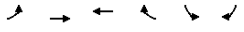
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL	NER
Lane Configurations											
Volume (veh/h)	0	130	10	0	0	0	565	220	85	0	415
Sign Control		Stop			Stop		Free			Free	
Grade		0%			0%		0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83
Hourly flow rate (vph)	0	140	11	0	0	0	608	237	91	0	500
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type							Raised			None	
Median storage veh)							1				
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1747	1997	282	1532	1543	0	500				
vC1, stage 1 conf vol	1497	1497		0	0						
vC2, stage 2 conf vol	250	500		1532	1543						
vCu, unblocked vol	1747	1997	282	1532	1543	0	500				
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.2				
tC, 2 stage (s)	6.1	5.6		6.1	5.5						
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.3				
p0 queue free %	100	0	99	0	100	100	42				
cM capacity (veh/h)	54	24	761	0	67	1091	1044				

Direction, Lane #	EB 1	EB 2	SB 1	SB 2	SB 3	NE 1
Volume Total	140	11	304	304	328	500
Volume Left	0	0	304	304	0	0
Volume Right	0	11	0	0	91	500
cSH	24	761	1044	1044	1700	1700
Volume to Capacity	5.81	0.01	0.58	0.58	0.19	0.29
Queue Length 95th (ft)	Err	1	97	97	0	0
Control Delay (s)	Err	9.8	13.1	13.1	0.0	0.0
Lane LOS	F	A	B	B		
Approach Delay (s)	9285.5		8.5			0.0
Approach LOS	F					

Intersection Summary				
Average Delay	886.4			
Intersection Capacity Utilization	39.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
67: Taunton Green & Broadway

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	670	695	0	380
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	0	0	736	764	0	396
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	1500				736	368
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1500				736	368
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	100				100	36
cM capacity (veh/h)	453				358	620

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	368	368	764	396
Volume Left	0	0	0	0
Volume Right	0	0	764	396
cSH	1700	1700	1700	620
Volume to Capacity	0.22	0.22	0.45	0.64
Queue Length 95th (ft)	0	0	0	114
Control Delay (s)	0.0	0.0	0.0	20.5
Lane LOS				C
Approach Delay (s)	0.0			20.5
Approach LOS				C

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2008 Existing Condition - AM Peak Hour

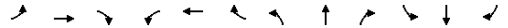
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	600	55	380	0	0	0	0	265	0
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.94	0.94	0.94	0.92	0.92	0.92	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	22	638	59	404	0	0	0	0	298	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	59			22			1484	1335	0	1346	1357	59
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			22			1484	1335	0	1346	1357	59
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			59			0	100	100	100	0	100
cM capacity (veh/h)	1558			1562			0	92	1091	88	86	1013

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	22	426	271	404	298
Volume Left	0	426	213	0	0
Volume Right	22	0	0	404	0
cSH	1700	1562	1562	1700	86
Volume to Capacity	0.01	0.41	0.41	0.24	3.44
Queue Length 95th (ft)	0	51	51	0	Err
Control Delay (s)	0.0	8.9	7.8	0.0	Err
Lane LOS		A	A		F
Approach Delay (s)	0.0	5.4			Err
Approach LOS					F

Intersection Summary					
Average Delay	2100.0				
Intersection Capacity Utilization	45.3%	ICU Level of Service	A		
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
75: Driveway & Washington Street

2008 Existing Condition - AM Peak Hour



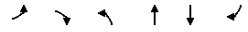
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	90	0	130	0	700	150	100	625	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.42	0.42	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	12	0	0	103	0	149	0	795	170	114	710	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.96	0.89			0.96		
vC, conflicting volume	1487	1906	713	1818	1824	483	716			966		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1331	1793	614	1696	1702	385	617			887		
tC, single (s)	7.5	6.5	6.9	7.7	6.5	7.0	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	100	0	100	75	100			84		
cM capacity (veh/h)	68	62	391	44	71	588	864			713		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	12	103	149	398	568	114	716
Volume Left	12	103	0	0	0	114	0
Volume Right	0	0	149	0	170	0	6
cSH	68	44	588	864	1700	713	1700
Volume to Capacity	0.18	2.33	0.25	0.00	0.33	0.16	0.42
Queue Length 95th (ft)	15	273	25	0	0	14	0
Control Delay (s)	68.8	801.8	13.2	0.0	0.0	11.0	0.0
Lane LOS	F	F	B			B	
Approach Delay (s)	68.8	335.8		0.0		1.5	
Approach LOS	F	F					

Intersection Summary					
Average Delay	42.2				
Intersection Capacity Utilization	72.0%	ICU Level of Service	C		
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2008 Existing Condition - AM Peak Hour



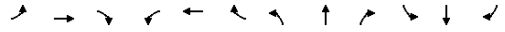
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	95	10	20	330	165	95
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.79	0.79
Hourly flow rate (vph)	119	12	25	412	209	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	731	269	329			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	731	269	329			
tC, single (s)	6.4	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.3			
p0 queue free %	69	98	98			
cM capacity (veh/h)	379	728	1197			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	131	438	329
Volume Left	119	25	0
Volume Right	12	0	120
cSH	397	1197	1700
Volume to Capacity	0.33	0.02	0.19
Queue Length 95th (ft)	35	2	0
Control Delay (s)	18.5	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	18.5	0.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	46.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	220	10	15	120	5	25	65	20	10	65	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.88	0.88	0.88	0.69	0.69	0.69	0.90	0.90	0.90
Hourly flow rate (vph)	41	259	12	17	136	6	36	94	29	11	72	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	142			271			618	523	265	596	526	139
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			271			618	523	265	596	526	139
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			89	78	96	97	83	93
cM capacity (veh/h)	1417			1305			319	438	767	325	436	914

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	312	159	159	144
Volume Left	41	17	36	11
Volume Right	12	6	29	61
cSH	1417	1305	435	542
Volume to Capacity	0.03	0.01	0.37	0.27
Queue Length 95th (ft)	2	1	41	27
Control Delay (s)	1.2	0.9	18.0	14.0
Lane LOS	A	A	C	B
Approach Delay (s)	1.2	0.9	18.0	14.0
Approach LOS			C	B

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2008 Existing Condition - AM Peak Hour

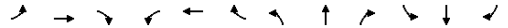
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	100	5	20	125	35	5	60	40	100	45	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.70	0.70	0.70
Hourly flow rate (vph)	0	145	7	29	184	51	7	88	59	143	64	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	235			152			463	443	149	520	421	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235			152			463	443	149	520	421	210
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	82	93	62	88	98
cM capacity (veh/h)	1344			1441			446	499	903	374	516	836

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	152	265	154	221
Volume Left	0	29	7	143
Volume Right	7	51	59	14
cSH	1344	1441	597	423
Volume to Capacity	0.00	0.02	0.26	0.52
Queue Length 95th (ft)	0	2	26	74
Control Delay (s)	0.0	1.0	13.1	22.5
Lane LOS		A	B	C
Approach Delay (s)	0.0	1.0	13.1	22.5
Approach LOS			B	C

Intersection Summary					
Average Delay			9.2		
Intersection Capacity Utilization			38.3%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2008 Existing Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	210	10	70	355	20	25	35	60	20	40	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.84	0.84	0.84	0.56	0.56	0.56
Hourly flow rate (vph)	11	226	11	111	563	32	30	42	71	36	71	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	595			237			1108	1070	231	1147	1060	579
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595			237			1108	1070	231	1147	1060	579
tC, single (s)	4.2			4.1			7.1	6.6	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.1	3.3	3.6	4.0	3.3
p0 queue free %	99			92			76	79	91	70	65	97
cM capacity (veh/h)	952			1336			122	197	801	118	205	518

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	247	706	143	125
Volume Left	11	111	30	36
Volume Right	11	32	71	18
cSH	952	1336	262	183
Volume to Capacity	0.01	0.08	0.54	0.68
Queue Length 95th (ft)	1	7	75	103
Control Delay (s)	0.5	2.1	34.0	59.1
Lane LOS	A	A	D	F
Approach Delay (s)	0.5	2.1	34.0	59.1
Approach LOS			D	F

Intersection Summary					
Average Delay			11.3		
Intersection Capacity Utilization			54.3%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

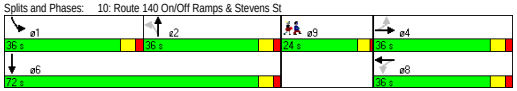
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	40	80	5	30	40	45	5	165	305	180	175	35	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	200		0	
Storage Lanes	0		0	0		0	0		0	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		819			376			787			471		
Travel Time (s)		18.6			8.5			17.9			10.7		
Peak Hour Factor	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80	
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	165	0	0	138	0	0	534	0	225	263	0	
Turn Type	Perm			Perm			Perm			Prot			
Protected Phases		4			8			2		1	6		9
Permitted Phases	4			8			2						
Detector Phase	4	4		8	8		2	2		1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		24.0
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0	24.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%	18%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag							Lag	Lag		Lead			
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.31			0.26			0.62		0.35	0.27		
Control Delay		17.4			12.2			9.9		17.3	6.0		
Queue Delay		0.0			0.0			0.0		0.0	0.0		
Total Delay		17.4			12.2			9.9		17.3	6.0		
Queue Length 50th (ft)		17			8			22		23	27		
Queue Length 95th (ft)		35			27			60		46	52		
Internal Link Dist (ft)		739			296			707			391		
Turn Bay Length (ft)										200			
Base Capacity (vph)		2328			2102			2369		2641	1828		
Starvation Cap Reductn		0			0			0		0	0		
Spillback Cap Reductn		0			0			0		0	0		
Storage Cap Reductn		0			0			0		0	0		
Reduced v/c Ratio		0.07			0.07			0.23		0.09	0.14		

Intersection Summary

Area Type: Other
Cycle Length: 132
Actuated Cycle Length: 41.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	80	5	30	40	45	5	165	305	180	175	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		0.99			0.94			0.90		1.00	0.97	
Flt Protected		0.98			0.99			1.00		0.95	1.00	
Satd. Flow (prot)		3648			3244			3172		3467	1828	
Flt Permitted		0.82			0.84			0.95		0.95	1.00	
Satd. Flow (perm)		3053			2745			3009		3467	1828	
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	53	105	7	36	48	54	6	185	343	225	219	44
RTOR Reduction (vph)	0	2	0	0	44	0	0	254	0	0	5	0
Lane Group Flow (vph)	0	163	0	0	94	0	0	280	0	225	258	0
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		7.4			7.4			8.5		7.7	22.2	
Effective Green, g (s)		7.4			7.4			8.5		7.7	22.2	
Actuated g/C Ratio		0.18			0.18			0.20		0.19	0.53	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		543			488			615		642	976	
v/s Ratio Prot										0.06	c0.14	
v/s Ratio Perm		c0.05			0.03			c0.09				
v/c Ratio		0.30			0.19			0.46		0.35	0.26	
Uniform Delay, d1		14.8			14.6			14.5		14.8	5.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.1			0.2		0.1	0.1	
Delay (s)		15.0			14.6			14.7		14.9	5.3	
Level of Service		B			B			B		B	A	
Approach Delay (s)		15.0			14.6			14.7			9.7	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

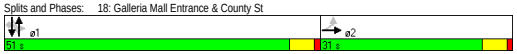
Lanes, Volumes, Timings
18: Galleria Mall Entrance & County St

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	150	45	0	0	0	25	60	0	135	135	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	527	0	0	0	0	0	112	0	0	300	483
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.45						0.11			0.33	0.53
Control Delay		9.3						6.9			8.2	3.3
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		9.3						6.9			8.2	3.3
Queue Length 50th (ft)		27						5			14	0
Queue Length 95th (ft)		60						12			33	31
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3474						2942			2764	1794
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.15						0.04			0.11	0.27

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 28.2	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Galleria Mall Entrance & County St



HCM Signalized Intersection Capacity Analysis
18: Galleria Mall Entrance & County St

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	150	45	0	0	0	25	60	0	135	135	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.99						1.00			1.00	0.85
Flt Protected		0.97						0.99			0.98	1.00
Satd. Flow (prot)		3734						3558			3453	1794
Flt Permitted		0.97						0.82			0.78	1.00
Satd. Flow (perm)		3734						2943			2763	1794
Peak-hour factor, PHF	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	319	160	48	0	0	0	33	79	0	150	150	483
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	321
Lane Group Flow (vph)	0	518	0	0	0	0	0	112	0	0	300	162
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		8.7						9.4			9.4	9.4
Effective Green, g (s)		8.7						9.4			9.4	9.4
Actuated g/C Ratio		0.31						0.33			0.33	0.33
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		1156						984			924	600
v/s Ratio Prot												
v/s Ratio Perm		0.14						0.04			c0.11	0.09
v/c Ratio		0.45						0.11			0.32	0.27
Uniform Delay, d1		7.8						6.5			7.0	6.8
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.1						0.0			0.1	0.1
Delay (s)		7.9						6.5			7.1	6.9
Level of Service		A						A			A	A
Approach Delay (s)		7.9			0.0			6.5			7.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	28.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

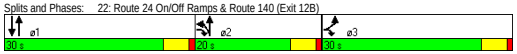
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	240	1340	205	790	1000	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	50	250			100
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	729			870	522	
Travel Time (s)	16.6			19.8	11.9	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	836	810	223	859	1435	0
Turn Type		pt+ov	Prot			
Protected Phases	3	2 3	2	1 2	1	
Permitted Phases						
Detector Phase	3	2 3	2	1 2	1	
Switch Phase						
Minimum Initial (s)	10.0		8.0		10.0	
Minimum Split (s)	15.0		13.0		15.0	
Total Split (s)	30.0	50.0	20.0	50.0	30.0	0.0
Total Split (%)	37.5%	62.5%	25.0%	62.5%	37.5%	0.0%
Maximum Green (s)	25.0		15.0		25.0	
Yellow Time (s)	4.0		4.0		4.0	
All-Red Time (s)	1.0		1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		3.0		4.0	
Recall Mode	None		None		Min	
v/c Ratio	1.50	0.98	0.66	0.44	1.30	
Control Delay	260.3	45.3	40.8	11.0	167.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	260.3	45.3	40.8	11.0	167.2	
Queue Length 50th (ft)	~589	381	104	120	~484	
Queue Length 95th (ft)	#804	#664	#190	162	#616	
Internal Link Dist (ft)	649			790	442	
Turn Bay Length (ft)		50	250			
Base Capacity (vph)	557	830	338	1972	1105	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	1.50	0.98	0.66	0.44	1.30	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



HCM Signalized Intersection Capacity Analysis
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	240	1340	205	790	1000	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	
Frt	0.89	0.85	1.00	1.00	0.96	
Flt Protected	0.99	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1782	1475	1805	3505	3410	
Flt Permitted	0.99	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1782	1475	1805	3505	3410	
Peak-hour factor, PHF	0.96	0.96	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	1396	223	859	1087	348
RTOR Reduction (vph)	0	0	0	0	39	0
Lane Group Flow (vph)	836	810	223	859	1397	0
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Turn Type		pt+ov	Prot			
Protected Phases	3	2 3	2	1 2	1	
Permitted Phases						
Actuated Green, G (s)	25.0	45.0	15.0	45.0	25.0	
Effective Green, g (s)	25.0	45.0	15.0	45.0	25.0	
Actuated g/C Ratio	0.31	0.56	0.19	0.56	0.31	
Clearance Time (s)	5.0		5.0		5.0	
Vehicle Extension (s)	4.0		3.0		4.0	
Lane Grp Cap (vph)	557	830	338	1972	1066	
v/s Ratio Prot	c0.47	c0.55	0.12	0.25	c0.41	
v/s Ratio Perm						
v/c Ratio	1.50	0.98	0.66	0.44	1.31	
Uniform Delay, d1	27.5	17.0	30.1	10.1	27.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	234.7	25.2	4.6	0.2	146.3	
Delay (s)	262.2	42.1	34.7	10.4	173.8	
Level of Service	F	D	C	B	F	
Approach Delay (s)	153.9			15.4	173.8	
Approach LOS	F			B	F	

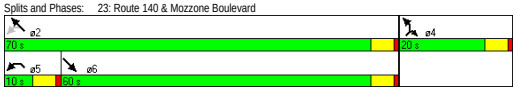
Intersection Summary			
HCM Average Control Delay	124.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1110	180	215	815	165	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	0		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1786			342	1096	
Travel Time (s)	40.6			7.8	24.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1403	0	0	1120	179	228
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	15.0		10.0	10.0	15.0	15.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.58			1.18dl	0.62	0.58
Control Delay	6.6			19.4	42.2	17.6
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.6			19.4	42.2	17.6
Queue Length 50th (ft)	145			185	84	29
Queue Length 95th (ft)	204			#337	164	104
Internal Link Dist (ft)	1706			262	1016	
Turn Bay Length (ft)						
Base Capacity (vph)	2812			1551	378	466
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.50			0.72	0.47	0.49

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 74.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 23: Route 140 & Mozzone Boulevard



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1110	180	215	815	165	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3465			3503	1770	1583
Flt Permitted	1.00			0.51	0.95	1.00
Satd. Flow (perm)	3465			1822	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1207	196	234	886	179	228
RTOR Reduction (vph)	11	0	0	0	0	136
Lane Group Flow (vph)	1392	0	0	1120	179	92
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	51.5			51.5	12.2	12.2
Effective Green, g (s)	51.5			51.5	12.2	12.2
Actuated g/C Ratio	0.70			0.70	0.17	0.17
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2421			1273	293	262
v/s Ratio Prot	0.40				c0.10	0.06
v/s Ratio Perm				c0.61		
v/c Ratio	0.57			1.18dl	0.61	0.35
Uniform Delay, d1	5.6			8.7	28.5	27.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			7.2	3.7	0.8
Delay (s)	5.9			15.9	32.3	28.1
Level of Service	A			B	C	C
Approach Delay (s)	5.9			15.9	29.9	
Approach LOS	A			B	C	

Intersection Summary

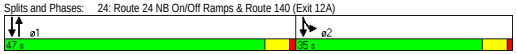
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	235	740	715	160	2215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	250	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.94	0.94	0.98	0.98	0.97	0.97
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	250	755	730	165	2284
Turn Type		Free		Free	Prot	
Protected Phases			1		2	1 2
Permitted Phases		Free		Free		
Detector Phase			1		2	1 2
Switch Phase						
Minimum Initial (s)			16.0		8.0	
Minimum Split (s)			21.0		13.0	
Total Split (s)	0.0	0.0	47.0	0.0	35.0	82.0
Total Split (%)	0.0%	0.0%	57.3%	0.0%	42.7%	100.0%
Maximum Green (s)			42.0		30.0	
Yellow Time (s)			4.0		4.0	
All-Red Time (s)			1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	
Recall Mode			Min		None	
v/c Ratio		0.14	0.44	0.48	0.27	0.65
Control Delay		0.2	12.4	1.1	17.8	1.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.2	12.4	1.1	17.8	1.0
Queue Length 50th (ft)		0	94	0	44	0
Queue Length 95th (ft)		0	161	0	105	0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	250	
Base Capacity (vph)		1772	2183	1524	758	3465
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.14	0.35	0.48	0.22	0.66

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 68.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



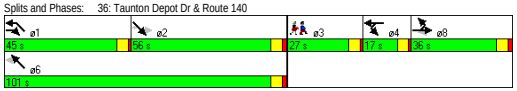
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	235	740	715	160	2215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1772	3505	1524	1703	3505
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1772	3505	1524	1703	3505
Peak-hour factor, PHF	0.94	0.94	0.98	0.98	0.97	0.97
Adj. Flow (vph)	0	250	755	730	165	2284
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	250	755	730	165	2284
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Turn Type		Free		Free	Prot	
Protected Phases			1		2	1 2
Permitted Phases		Free		Free		
Actuated Green, G (s)		68.6	33.9	68.6	24.7	68.6
Effective Green, g (s)		68.6	33.9	68.6	24.7	68.6
Actuated g/C Ratio		1.00	0.49	1.00	0.36	1.00
Clearance Time (s)			5.0		5.0	
Vehicle Extension (s)			2.0		2.0	
Lane Grp Cap (vph)		1772	1732	1524	613	3505
v/s Ratio Prot			0.22		0.10	c0.65
v/s Ratio Perm		0.14		0.48		
v/c Ratio		0.14	0.44	0.48	0.27	0.65
Uniform Delay, d1		0.0	11.2	0.0	15.6	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	1.1	0.1	0.3
Delay (s)		0.2	11.2	1.1	15.6	0.3
Level of Service		A	B	A	B	A
Approach Delay (s)	0.2		6.3			1.4
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	3.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	0.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR	ø3
Lane Configurations													
Volume (vph)	225	5	220	5	0	0	0	810	250	185	755	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12	
Storage Length (ft)	0		100	0		0	180		130	320		350	
Storage Lanes	1		1	0		0	1		1	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		846			205			2224			1786		
Travel Time (s)		19.2			4.7			50.5			40.6		
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94	
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%	
Shared Lane Traffic (%)	49%												
Lane Group Flow (vph)	123	124	237	0	8	0	0	827	255	197	803	0	
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt			
Protected Phases	8	8	1	4	4			2		1	6		3
Permitted Phases			8				2		2	6			
Detector Phase	8	8	1	4	4		2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0		4.0
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0		27.0
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0	27.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%	15%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0		22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0	
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?				Yes	Yes		Yes	Yes	Yes				Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0		3.0
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.44	0.45	0.31		0.05			0.56	0.35	0.43	0.35		
Control Delay	37.1	37.1	4.0		41.8			18.4	11.1	8.6	7.0		
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0		
Total Delay	37.1	37.1	4.0		41.8			18.4	11.1	8.6	7.0		
Queue Length 50th (ft)	46	46	0		3			123	37	25	65		
Queue Length 95th (ft)	144	145	49		15			284	130	83	167		
Internal Link Dist (ft)		766			125			2144			1706		
Turn Bay Length (ft)			100						130	320			
Base Capacity (vph)	760	765	1383		370			2652	1211	1128	3490		
Starvation Cap Reductn	0	0	0		0			0	0	0	0		
Spillback Cap Reductn	0	0	0		0			0	0	0	0		
Storage Cap Reductn	0	0	0		0			0	0	0	0		
Reduced v/c Ratio	0.16	0.16	0.17		0.02			0.31	0.21	0.17	0.23		

Intersection Summary	
Area Type:	Other
Cycle Length: 181	
Actuated Cycle Length: 71.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Taunton Depot Dr & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	225	5	220	5	0	0	0	810	250	185	755	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		1.00			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		0.95			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1690	1599		2046			3539	1583	1805	3574	
Flt Permitted	0.95	0.95	1.00		0.95			1.00	1.00	0.21	1.00	
Satd. Flow (perm)	1681	1690	1599		2046			3539	1583	405	3574	
Peak-hour factor, PHF	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	242	5	237	8	0	0	0	827	255	197	803	0
RTOR Reduction (vph)	0	0	168	0	0	0	0	0	59	0	0	0
Lane Group Flow (vph)	123	124	69	0	8	0	0	827	196	197	803	0
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	11.8	11.8	21.8		0.8			30.4	30.4	45.4	45.4	
Effective Green, g (s)	11.8	11.8	21.8		0.8			30.4	30.4	45.4	45.4	
Actuated g/C Ratio	0.16	0.16	0.29		0.01			0.41	0.41	0.61	0.61	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	264	266	465		22			1434	642	432	2163	
v/s Ratio Prot	0.07	c0.07	0.02		c0.00			c0.23		c0.06	0.22	
v/s Ratio Perm			0.02						0.12	0.22		
v/c Ratio	0.47	0.47	0.15		0.36			0.58	0.30	0.46	0.37	
Uniform Delay, d1	28.7	28.7	19.7		36.8			17.3	15.1	8.2	7.5	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.5	0.1		3.7			0.7	0.4	0.3	0.1	
Delay (s)	29.2	29.2	19.8		40.5			18.0	15.5	8.5	7.7	
Level of Service	C	C	B		D			B	B	A	A	
Approach Delay (s)		24.6			40.5			17.4			7.8	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
40: Honorable Gordon M. Owen Riverway & Route 140

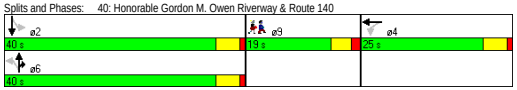
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	450	0	5	0	500	325	15	645	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12	
Storage Length (ft)	0		0	0		0	0		175	0		0	
Storage Lanes	0		0	0		0	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		220			991			547			1888		
Travel Time (s)		5.0			22.5			12.4			42.9		
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89	
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	555	0	0	521	339	0	742	0	
Turn Type				Perm			Perm		Prot	Perm			
Protected Phases					4			6	6		2		9
Permitted Phases				4			6			2			
Detector Phase				4	4		6	6	6	2	2		
Switch Phase													
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0		1.0
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0		19.0
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0	19.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%	23%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0		14.0
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		3.5
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
Recall Mode				None	None		None	None	None	None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio					0.94			0.57	0.34		0.76		
Control Delay					48.8			13.1	2.1		18.0		
Queue Delay					0.0			0.0	0.0		0.0		
Total Delay					48.8			13.1	2.1		18.0		
Queue Length 50th (ft)					215			122	0		203		
Queue Length 95th (ft)					#350			202	32		323		
Internal Link Dist (ft)		140			911			467			1808		
Turn Bay Length (ft)									175				
Base Capacity (vph)					593			1010	1053		1074		
Starvation Cap Reductn					0			0	0		0		
Spillback Cap Reductn					0			0	0		0		
Storage Cap Reductn					0			0	0		0		
Reduced v/c Ratio					0.94			0.52	0.32		0.69		

Intersection Summary

Area Type: Other
Cycle Length: 84
Actuated Cycle Length: 62.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 40: Honorable Gordon M. Owen Riverway & Route 140



HCM Signalized Intersection Capacity Analysis
40: Honorable Gordon M. Owen Riverway & Route 140

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	450	0	5	0	500	325	15	645	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1830			1783	1599		1923	
Flt Permitted					0.95			1.00	1.00		0.99	
Satd. Flow (perm)					1830			1783	1599		1898	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	549	0	6	0	521	339	17	725	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	165	0	0	0
Lane Group Flow (vph)	0	0	0	0	554	0	0	521	174	0	742	0
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%
Turn Type				Perm			Perm		Prot	Perm		
Protected Phases					4			6	6		2	
Permitted Phases				4			6			2		
Actuated Green, G (s)					20.1			31.9	31.9		31.9	
Effective Green, g (s)					20.1			31.9	31.9		31.9	
Actuated g/C Ratio					0.32			0.51	0.51		0.51	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					593			917	823		977	
v/s Ratio Prot								0.29	0.11			
v/s Ratio Perm					0.30						c0.39	
v/c Ratio					0.93			0.57	0.21		0.76	
Uniform Delay, d1					20.3			10.3	8.2		12.0	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					22.3			1.0	0.2		3.7	
Delay (s)					42.6			11.3	8.4		15.7	
Level of Service					D			B	A		B	
Approach Delay (s)		0.0			42.6			10.2			15.7	
Approach LOS		A			D			B			B	

Intersection Summary

HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

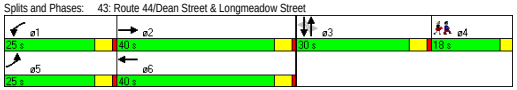
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø4
Lane Configurations													
Volume (vph)	10	780	335	385	730	210	70	315	210	145	225	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12	
Storage Length (ft)	100		70	100		70	0		50	0		100	
Storage Lanes	1		1	1		1	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1663			1440			2994			1249		
Travel Time (s)		37.8			32.7			68.0			28.4		
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1199	0	401	979	0	0	646	0	0	453	0	
Turn Type	Prot			Prot			Perm			Perm			
Protected Phases	5	2		1	6			3			3		4
Permitted Phases							3			3			
Detector Phase	5	2		1	6		3	3		3	3		
Switch Phase													
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0		8.0
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0		18.0
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	18.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%	16%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0		3.0
Recall Mode	None	Min		None	Min		None	None		None	None		None
Walk Time (s)													8.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.07	0.94		1.15	0.48			0.94			1.71dl		
Control Delay	40.4	43.2		132.3	11.9			53.8			56.9		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	40.4	43.2		132.3	11.9			53.8			56.9		
Queue Length 50th (ft)	6	347		~287	140			178			138		
Queue Length 95th (ft)	23	#493		#468	270			#293			#207		
Internal Link Dist (ft)		1583			1360			2914			1169		
Turn Bay Length (ft)	100			100									
Base Capacity (vph)	355	1272		348	2052			686			503		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.03	0.94		1.15	0.48			0.94			0.90		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 95
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	780	335	385	730	210	70	315	210	145	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.95		1.00	0.97			0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1685	3347		1652	3387			3236			3378	
Flt Permitted	0.95	1.00		0.95	1.00			0.73			0.55	
Satd. Flow (perm)	1685	3347		1652	3387			2374			1904	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	11	839	360	401	760	219	76	342	228	173	268	12
RTOR Reduction (vph)	0	37	0	0	14	0	0	62	0	0	1	0
Lane Group Flow (vph)	11	1162	0	401	965	0	0	584	0	0	452	0
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.8	39.0		20.0	57.2			25.0			25.0	
Effective Green, g (s)	1.8	39.0		20.0	57.2			25.0			25.0	
Actuated g/C Ratio	0.02	0.39		0.20	0.58			0.25			0.25	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	31	1319		334	1957			599			481	
v/s Ratio Prot	0.01	c0.35		c0.24	0.28							
v/s Ratio Perm								c0.25			0.24	
v/c Ratio	0.35	0.88		1.20	0.49			0.97			1.71dl	
Uniform Delay, d1	48.0	27.8		39.5	12.3			36.7			36.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.3	7.7		115.5	0.4			30.3			26.4	
Delay (s)	57.3	35.6		155.0	12.7			67.0			62.7	
Level of Service	E	D		F	B			E			E	
Approach Delay (s)		35.8			54.1			67.0			62.7	
Approach LOS		D			D			E			E	

Intersection Summary

HCM Average Control Delay	51.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

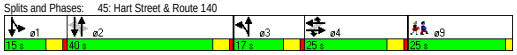
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2	ø9
Lane Configurations														
Volume (vph)	35	95	155	100	145	100	220	630	110	95	815	10		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12		
Storage Length (ft)	0		50	0		50	50		0	50		0		
Storage Lanes	0		1	0		1	1		0	1		0		
Taper Length (ft)	25		25	25		25	25		25	25		25		
Right Turn on Red			Yes			Yes			Yes			Yes		
Link Speed (mph)		30			30			35			35			
Link Distance (ft)		1373			971			2224			3692			
Travel Time (s)		31.2			22.1			43.3			71.9			
Peak Hour Factor	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96		
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	191	228	0	258	105	0	1011	0	0	958	0		
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt				
Protected Phases		4	4		4	4	3	2 3		1	1 2		2	9
Permitted Phases	4			4			2 3			1 2				
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2			
Switch Phase														
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	4.0			4.0			8.0	1.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	9.0			9.0			13.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0	40.0	25.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%	33%	20%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	12.0			10.0			35.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0			4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0			1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead			Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes			Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0			3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None			None			None	None
Walk Time (s)														7.0
Flash Dont Walk (s)														16.0
Pedestrian Calls (#/hr)														0
v/c Ratio		0.85	0.55		1.08	0.29		0.87			0.84			
Control Delay		70.0	21.1		118.2	22.4		30.4			27.5			
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0			
Total Delay		70.0	21.1		118.2	22.4		30.4			27.5			
Queue Length 50th (ft)		114	54		~178	32		203			197			
Queue Length 95th (ft)		139	72		#332	78		#279			#257			
Internal Link Dist (ft)		1293			891			2144			3612			
Turn Bay Length (ft)			50			50								
Base Capacity (vph)		225	416		240	364		1165			1135			
Starvation Cap Reductn		0	0		0	0		0			0			
Spillback Cap Reductn		0	0		0	0		0			0			
Storage Cap Reductn		0	0		0	0		0			0			
Reduced v/c Ratio		0.85	0.55		1.08	0.29		0.87			0.84			

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 97	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 45: Hart Street & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	95	155	100	145	100	220	630	110	95	815	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.98			1.00	
Flt Protected		0.99	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1799	1531		1836	1599		3357			3486	
Flt Permitted		0.60	1.00		0.62	1.00		0.61			0.61	
Satd. Flow (perm)		1092	1531		1163	1599		2059			2150	
Peak-hour factor, PHF	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	51	140	228	105	153	105	232	663	116	99	849	10
RTOR Reduction (vph)	0	0	100	0	0	34	0	7	0	0	1	0
Lane Group Flow (vph)	0	191	128	0	258	71	0	1004	0	0	957	0
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		47.0			45.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		47.0			45.0	
Actuated g/C Ratio		0.21	0.21		0.21	0.21		0.48			0.46	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		225	316		240	330		1158			1135	
v/s Ratio Prot			0.08			0.04		c0.11			c0.09	
v/s Ratio Perm		0.17			c0.22			c0.31			0.30	
v/c Ratio		0.85	0.40		1.08	0.21		0.87			0.84	
Uniform Delay, d1		37.0	33.3		38.5	32.0		22.2			22.9	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		30.9	3.8		79.4	1.5		7.0			5.9	
Delay (s)		67.9	37.2		117.9	33.5		29.3			28.8	
Level of Service		E	D		F	C		C			C	
Approach Delay (s)		51.2			93.5			29.3			28.8	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
52: Route 44/Dean Street & Arlington Street

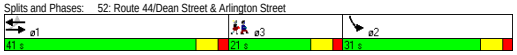
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	20	760	715	80	370	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.89	0.89	0.98	0.98	0.97	0.97	
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	22	854	812	0	448	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	9.0	9.0	9.0		4.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	35.0	35.0	35.0		25.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							0
v/c Ratio	0.18	0.91	0.77		0.75		
Control Delay	15.2	33.5	21.0		29.8		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	15.2	33.5	21.0		29.8		
Queue Length 50th (ft)	5	328	273		168		
Queue Length 95th (ft)	21	#581	#459		267		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	121	935	1052		679		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.18	0.91	0.77		0.66		

Intersection Summary

Area Type: Other
Cycle Length: 93
Actuated Cycle Length: 69.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	20	760	715	80	370	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.99		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1685	1845	2068		1875	
Flt Permitted	0.13	1.00	1.00		0.96	
Satd. Flow (perm)	237	1845	2068		1875	
Peak-hour factor, PHF	0.89	0.89	0.98	0.98	0.97	0.97
Adj. Flow (vph)	22	854	730	82	381	67
RTOR Reduction (vph)	0	0	3	0	0	0
Lane Group Flow (vph)	22	854	809	0	448	0
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	35.1	35.1	35.1		22.1	
Effective Green, g (s)	35.1	35.1	35.1		22.1	
Actuated g/C Ratio	0.51	0.51	0.51		0.32	
Clearance Time (s)	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	120	936	1049		599	
v/s Ratio Prot		c0.46	0.39		c0.24	
v/s Ratio Perm	0.09					
v/c Ratio	0.18	0.91	0.77		0.75	
Uniform Delay, d1	9.3	15.6	13.8		21.1	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.7	12.9	3.6		5.1	
Delay (s)	10.0	28.6	17.4		26.1	
Level of Service	B	C	B		C	
Approach Delay (s)		28.1	17.4		26.1	
Approach LOS		C	B		C	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

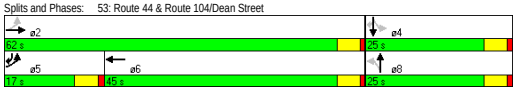
Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	965	0	0	990	15	15	10	5	60	15	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0		0	0		50
Storage Lanes	1		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		825			1426			127			959	
Travel Time (s)		18.8			32.4			2.9			21.8	
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1134	0	0	1197	0	0	40	0	0	81	290
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Detector Phase	5	2			6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	6.0	12.0			12.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0		11.0	11.0		11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	25.0	25.0	0.0	25.0	25.0	17.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	28.7%	28.7%	0.0%	28.7%	28.7%	19.5%
Maximum Green (s)	12.0	57.0			40.0		20.0	20.0		20.0	20.0	12.0
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	1.5	1.5			1.5		2.0	2.0		2.0	2.0	1.5
Recall Mode	None	Min			Min		None	None		None	None	None
v/c Ratio		0.67			0.73			0.16			0.35	0.47
Control Delay		6.6			14.9			24.3			30.7	17.4
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		6.6			14.9			24.3			30.7	17.4
Queue Length 50th (ft)		75			154			9			24	60
Queue Length 95th (ft)		135			243			34			78	166
Internal Link Dist (ft)		745			1346			47			879	
Turn Bay Length (ft)												50
Base Capacity (vph)		2125			2636			615			580	801
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.53			0.45			0.07			0.14	0.36

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 55.2	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: Route 44 & Route 104/Dean Street



HCM Signalized Intersection Capacity Analysis
53: Route 44 & Route 104/Dean Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	965	0	0	990	15	15	10	5	60	15	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	12	16
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.99			1.00			0.98			0.96	1.00
Satd. Flow (prot)		3518			3529			1810			1827	1794
Flt Permitted		0.60			1.00			0.80			0.74	1.00
Satd. Flow (perm)		2121			3529			1484			1408	1794
Peak-hour factor, PHF	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	139	995	0	0	1179	18	20	13	7	65	16	290
RTOR Reduction (vph)	0	0	0	0	1	0	0	6	0	0	0	25
Lane Group Flow (vph)	0	1134	0	0	1196	0	0	34	0	0	81	265
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Actuated Green, G (s)		39.1			26.4			6.7			6.7	14.4
Effective Green, g (s)		39.1			26.4			6.7			6.7	14.4
Actuated g/C Ratio		0.70			0.47			0.12			0.12	0.26
Clearance Time (s)		5.0			5.0			5.0			5.0	5.0
Vehicle Extension (s)		1.5			1.5			2.0			2.0	1.5
Lane Grp Cap (vph)		1679			1670			178			169	624
v/s Ratio Prot		c0.09			0.34							c0.06
v/s Ratio Perm		c0.38						0.02			0.06	0.09
v/c Ratio		0.68			0.72			0.19			0.48	0.42
Uniform Delay, d1		4.7			11.7			22.1			22.9	17.2
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.9			1.2			0.2			0.8	0.2
Delay (s)		5.6			13.0			22.3			23.7	17.4
Level of Service		A			B			C			C	B
Approach Delay (s)		5.6			13.0			22.3			18.8	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
57: Spring Street & Summer Street

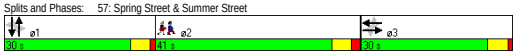
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	40	205	105	15	235	10	55	355	10	10	335	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12	
Right Turn on Red			Yes			No			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		376			382			1581			384		
Travel Time (s)		8.5			8.7			35.9			8.7		
Peak Hour Factor	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93	
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%	
Parking (#/hr)											0		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	437	0	0	342	0	0	495	0	0	403	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	41.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	41%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		35.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.62			0.40			0.70			0.52		
Control Delay		17.8			14.0			20.9			15.8		
Queue Delay		0.0			0.0			0.0			0.1		
Total Delay		17.8			14.0			20.9			16.0		
Queue Length 50th (ft)		113			83			141			102		
Queue Length 95th (ft)		164			113			218			174		
Internal Link Dist (ft)		296			302			1501			304		
Turn Bay Length (ft)													
Base Capacity (vph)		705			854			708			780		
Starvation Cap Reductn		0			0			0			44		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.62			0.40			0.70			0.55		

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 60
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 57: Spring Street & Summer Street



HCM Signalized Intersection Capacity Analysis
57: Spring Street & Summer Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	205	105	15	235	10	55	355	10	10	335	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			1.00			0.99	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		1782			2117			1850			1893	
Flt Permitted		0.93			0.97			0.91			0.98	
Satd. Flow (perm)		1662			2049			1696			1866	
Peak-hour factor, PHF	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93
Adj. Flow (vph)	50	256	131	20	309	13	65	418	12	11	360	32
RTOR Reduction (vph)	0	12	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	425	0	0	342	0	0	494	0	0	401	0
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.0			25.0			25.0			25.0	
Effective Green, g (s)		25.0			25.0			25.0			25.0	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		693			854			707			778	
v/s Ratio Prot												
v/s Ratio Perm		c0.26			0.17			c0.29			0.21	
v/c Ratio		0.61			0.40			0.70			0.51	
Uniform Delay, d1		13.7			12.3			14.4			13.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.0			1.4			5.7			2.4	
Delay (s)		17.7			13.7			20.1			15.4	
Level of Service		B			B			C			B	
Approach Delay (s)		17.7			13.7			20.1			15.4	
Approach LOS		B			B			C			B	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
58: Route 44/Main Street & Union Street

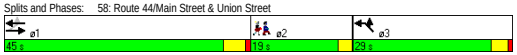
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	15	460	375	0	485	20	0	0	375	25	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91	
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	914	0	0	587	0	0	0	412	43	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												0
v/c Ratio		0.84			0.53				0.69	0.07		
Control Delay		22.9			13.0				28.3	12.4		
Queue Delay		0.0			0.0				0.1	0.0		
Total Delay		22.9			13.0				28.4	12.4		
Queue Length 50th (ft)		310			159				160	8		
Queue Length 95th (ft)		#566			226				258	28		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		1083			1117				598	614		
Starvation Cap Reductn		0			0				10	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.84			0.53				0.70	0.07		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 74	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	15	460	375	0	485	20	0	0	375	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.94			0.99				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1980			2063				1770	1785	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1958			2063				1770	1785	
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	16	495	403	0	564	23	0	0	412	27	16
RTOR Reduction (vph)	0	25	0	0	1	0	0	0	0	11	0
Lane Group Flow (vph)	0	889	0	0	586	0	0	0	412	32	0
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.0			40.0				25.0	25.0	
Effective Green, g (s)		40.0			40.0				25.0	25.0	
Actuated g/C Ratio		0.54			0.54				0.34	0.34	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		1058			1115				598	603	
v/s Ratio Prot					0.28				c0.23	0.02	
v/s Ratio Perm		c0.45									
v/c Ratio		0.84			0.53				0.69	0.05	
Uniform Delay, d1		14.3			10.9				21.1	16.5	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		8.1			1.8				6.4	0.2	
Delay (s)		22.4			12.7				27.5	16.7	
Level of Service		C			B				C	B	
Approach Delay (s)		22.4			12.7		0.0		26.5		
Approach LOS		C			B		A		C		

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
61: Taunton Green & Broadway

2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	160	855	320	0	0	1075	0	190	125	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		304			913			579			302		
Travel Time (s)		6.9			20.8			13.2			6.9		
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%	
Parking (#/hr)			0			0			0				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	172	919	344	0	0	1168	0	216	142	0	0	0	
Turn Type	Perm		Perm			Free			Perm				
Protected Phases		1						3					2
Permitted Phases	1		1			Free			3				
Detector Phase	1	1	1					3	3				
Switch Phase													
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0				1.0
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0				21.0
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	21.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%	24%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0				17.0
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0				4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead										Lag
Lead-Lag Optimize?	Yes	Yes	Yes										Yes
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0				2.0
Recall Mode	Max	Max	Max					Max	Max				Ped
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.24	0.75	0.44			0.44		0.43	0.29				
Control Delay	5.4	28.8	4.0			0.5		27.9	6.1				
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0				
Total Delay	5.4	28.8	4.0			0.5		27.9	6.1				
Queue Length 50th (ft)	6	228	0			0		94	0				
Queue Length 95th (ft)	47	298	49			0		154	39				
Internal Link Dist (ft)		224			833			499			222		
Turn Bay Length (ft)													
Base Capacity (vph)	714	1223	787			2647		506	487				
Starvation Cap Reductn	0	0	0			0		0	0				
Spillback Cap Reductn	0	0	0			0		0	0				
Storage Cap Reductn	0	0	0			0		0	0				
Reduced v/c Ratio	0.24	0.75	0.44			0.44		0.43	0.29				

Intersection Summary

Area Type: Other
Cycle Length: 86
Actuated Cycle Length: 86
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 61: Taunton Green & Broadway

HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	855	320	0	0	1075	0	190	125	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1770	3505	1615			2647		1739	1330			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1770	3505	1615			2647		1739	1330			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	172	919	344	0	0	1168	0	216	142	0	0	0
RTOR Reduction (vph)	96	0	224	0	0	0	0	0	101	0	0	0
Lane Group Flow (vph)	76	919	120	0	0	1168	0	216	41	0	0	0
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	617	1223	563			2647		506	387			
v/s Ratio Prot		c0.26						0.12				
v/s Ratio Perm	0.04		0.07			c0.44			0.03			
v/c Ratio	0.12	0.75	0.21			0.44		0.43	0.11			
Uniform Delay, d1	19.0	24.7	19.7			0.0		24.7	22.3			
Progression Factor	0.91	0.98	0.86			1.00		1.00	1.00			
Incremental Delay, d2	0.4	4.3	0.9			0.5		2.6	0.6			
Delay (s)	17.7	28.4	17.9			0.5		27.3	22.9			
Level of Service	B	C	B			A		C	C			
Approach Delay (s)		24.6			0.5			25.6			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	415	20	540	230	50	650	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.95	0.95	
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	441	21	587	250	53	684	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	17.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	17.0
Total Split (%)	25.8%	25.8%	56.7%	56.7%	56.7%	56.7%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							0
v/c Ratio	1.18	0.06	0.65	0.29	0.20	0.71	
Control Delay	142.1	24.5	21.3	2.6	15.4	22.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	142.1	24.5	21.3	2.6	15.4	22.9	
Queue Length 50th (ft)	~329	7	251	0	17	306	
Queue Length 95th (ft)	#516	27	370	36	42	443	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	373	361	905	856	259	970	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.18	0.06	0.65	0.29	0.20	0.71	

Intersection Summary	
Area Type:	Other
Cycle Length: 97	
Actuated Cycle Length: 97	
Offset: 0 (0%), Referenced to phase 2:Ped and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 71: Court Street & Washington Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	415	20	540	230	50	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1811	1723	1756	1425	1671	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.29	1.00
Satd. Flow (perm)	1811	1723	1756	1425	503	1881
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	441	21	587	250	53	684
RTOR Reduction (vph)	0	6	0	121	0	0
Lane Group Flow (vph)	441	15	587	129	53	684
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.0	20.0	50.0	50.0	50.0	50.0
Effective Green, g (s)	20.0	20.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio	0.21	0.21	0.52	0.52	0.52	0.52
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	373	355	905	735	259	970
v/s Ratio Prot	c0.24		0.33			c0.36
v/s Ratio Perm		0.01		0.09	0.11	
v/c Ratio	1.18	0.04	0.65	0.18	0.20	0.71
Uniform Delay, d1	38.5	30.8	17.1	12.5	12.7	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	106.2	0.2	3.6	0.5	1.8	4.3
Delay (s)	144.7	31.1	20.7	13.0	14.5	22.2
Level of Service	F	C	C	B	B	C
Approach Delay (s)	139.5		18.4			21.6
Approach LOS	F		B			C

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

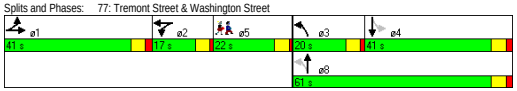
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø5
Lane Configurations													
Volume (vph)	480	165	95	25	125	35	100	300	55	35	340	490	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		698			192			1911			574		
Travel Time (s)		15.9			4.4			43.4			13.0		
Peak Hour Factor	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88	
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%	
Shared Lane Traffic (%)	23%												
Lane Group Flow (vph)	381	382	0	0	228	0	0	484	0	0	983	0	
Turn Type	Split			Split			pm+pt			Perm			
Protected Phases	1	1		2	2		3	8			4		5
Permitted Phases							8			4			
Detector Phase	1	1		2	2		3	8		4	4		
Switch Phase													
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0		3.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0		22.0
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0	22.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%	16%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0		17.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.72	0.76			0.94			0.88dl			0.79		
Control Delay	37.4	39.3			86.3			30.3			25.3		
Queue Delay	0.0	0.0			0.0			0.0			0.0		
Total Delay	37.4	39.3			86.3			30.3			25.3		
Queue Length 50th (ft)	204	202			128			117			204		
Queue Length 95th (ft)	324	326			#267			202			313		
Internal Link Dist (ft)		618			112			1831			494		
Turn Bay Length (ft)													
Base Capacity (vph)	693	651			242			1068			1241		
Starvation Cap Reductn	0	0			0			0			0		
Spillback Cap Reductn	0	0			0			0			0		
Storage Cap Reductn	0	0			0			0			0		
Reduced v/c Ratio	0.55	0.59			0.94			0.45			0.79		

Intersection Summary

Area Type: Other
Cycle Length: 141
Actuated Cycle Length: 91.9
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	480	165	95	25	125	35	100	300	55	35	340	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.96			0.97			0.98			0.92	
Flt Protected	0.95	0.99			0.99			0.99			1.00	
Satd. Flow (prot)	1811	1681			1805			3351			3103	
Flt Permitted	0.95	0.99			0.99			0.52			0.91	
Satd. Flow (perm)	1811	1681			1805			1766			2832	
Peak-hour factor, PHF	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	495	170	98	31	154	43	106	319	59	40	386	557
RTOR Reduction (vph)	0	8	0	0	5	0	0	8	0	0	136	0
Lane Group Flow (vph)	381	374	0	0	223	0	0	476	0	0	847	0
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	26.9	26.9			12.1			35.9			35.9	
Effective Green, g (s)	26.9	26.9			12.1			35.9			35.9	
Actuated g/C Ratio	0.29	0.29			0.13			0.39			0.39	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	530	492			238			690			1106	
v/s Ratio Prot	0.21	c0.22			c0.12							
v/s Ratio Perm								0.27			c0.30	
v/c Ratio	0.72	0.76			0.94			0.88dl			0.77	
Uniform Delay, d1	29.1	29.6			39.5			23.4			24.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.9	5.9			40.3			2.3			2.9	
Delay (s)	33.0	35.5			79.8			25.7			27.2	
Level of Service	C	D			E			C			C	
Approach Delay (s)		34.2			79.8			25.7			27.2	
Approach LOS		C			E			C			C	

Intersection Summary

HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	91.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lanes, Volumes, Timings
93: Washington Street & Broadway

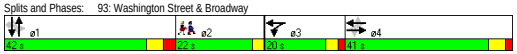
2008 Existing Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	270	140	5	35	140	5	5	480	55	20	480	375	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			No			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1068			1376			92			2042		
Travel Time (s)		24.3			31.3			2.1			46.4		
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95	
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%	
Parking (#/hr)									2				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	450	0	0	215	0	0	551	0	0	526	395	
Turn Type	Perm			pm+pt			Perm			Perm		Perm	
Protected Phases		4		3	3 4			1			1		2
Permitted Phases	4			3 4			1			1		1	
Detector Phase	4	4		3	3 4		1	1		1	1	1	
Switch Phase													
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0	1.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0	22.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0	22.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%	18%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0	19.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0	2.0
Recall Mode	None	None		None			Max	Max		Max	Max	Max	None
Walk Time (s)													7.0
Flash Dont Walk (s)													12.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.89			0.27			0.48			0.85	0.71	
Control Delay		53.1			13.8			26.5			44.4	36.6	
Queue Delay		0.0			0.0			0.0			0.0	0.0	
Total Delay		53.1			13.8			26.5			44.4	36.6	
Queue Length 50th (ft)		265			70			137			302	212	
Queue Length 95th (ft)		#477			103			198			#514	342	
Internal Link Dist (ft)		988			1296			12			1962		
Turn Bay Length (ft)												50	
Base Capacity (vph)		503			851			1142			622	555	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			0			0			0	0	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.89			0.25			0.48			0.85	0.71	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 98.9	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 93: Washington Street & Broadway



HCM Signalized Intersection Capacity Analysis
93: Washington Street & Broadway

2008 Existing Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	140	5	35	140	5	5	480	55	20	480	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.97			0.99			1.00			1.00	1.00
Satd. Flow (prot)		2029			1797			3373			1820	1568
Flt Permitted		0.68			0.89			0.95			0.96	1.00
Satd. Flow (perm)		1423			1619			3206			1756	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	293	152	5	42	167	6	5	490	56	21	505	395
RTOR Reduction (vph)	0	0	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	450	0	0	215	0	0	545	0	0	526	395
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		35.0			45.9			35.0			35.0	35.0
Effective Green, g (s)		35.0			45.9			35.0			35.0	35.0
Actuated g/C Ratio		0.35			0.46			0.35			0.35	0.35
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		504			771			1135			621	555
v/s Ratio Prot					c0.03							
v/s Ratio Perm		c0.32			0.10			0.17			c0.30	0.25
v/c Ratio		0.89			0.28			0.48			0.85	0.71
Uniform Delay, d1		30.2			16.3			24.9			29.5	27.6
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		18.3			0.1			1.5			13.4	7.6
Delay (s)		48.4			16.4			26.3			42.9	35.2
Level of Service		D			B			C			D	D
Approach Delay (s)		48.4			16.4			26.3			39.6	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

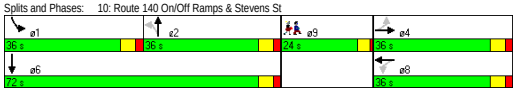
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	5	5	0	10	5	110	5	205	70	80	55	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	200		0	
Storage Lanes	0		0	0		0	0		0	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		819			376			787			471		
Travel Time (s)		18.6			8.5			17.9			10.7		
Peak Hour Factor	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	149	0	0	329	0	95	77	0	
Turn Type	Perm			Perm			Perm			Prot			
Protected Phases		4			8			2		1	6		9
Permitted Phases	4			8			2						
Detector Phase	4	4		8	8		2	2		1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		24.0
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0	24.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%	18%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag							Lag	Lag		Lead			
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		3.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.03			0.22			0.39		0.14	0.08		
Control Delay		14.9			6.2			13.1		15.2	4.2		
Queue Delay		0.0			0.0			0.0		0.0	0.0		
Total Delay		14.9			6.2			13.1		15.2	4.2		
Queue Length 50th (ft)		2			1			28		9	6		
Queue Length 95th (ft)		4			17			53		22	16		
Internal Link Dist (ft)		739			296			707			391		
Turn Bay Length (ft)										200			
Base Capacity (vph)		2652			2271			2476		2561	1796		
Starvation Cap Reductn		0			0			0		0	0		
Spillback Cap Reductn		0			0			0		0	0		
Storage Cap Reductn		0			0			0		0	0		
Reduced v/c Ratio		0.01			0.07			0.13		0.04	0.04		

Intersection Summary

Area Type: Other
Cycle Length: 132
Actuated Cycle Length: 34.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	10	5	110	5	205	70	80	55	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		1.00			0.87			0.96		1.00	0.98	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		3639			2964			3204		3155	1795	
Flt Permitted		0.88			0.93			0.95		0.95	1.00	
Satd. Flow (perm)		3269			2768			3043		3155	1795	
Peak-hour factor, PHF	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	11	11	0	12	6	131	6	241	82	95	65	12
RTOR Reduction (vph)	0	0	0	0	115	0	0	24	0	0	5	0
Lane Group Flow (vph)	0	22	0	0	34	0	0	305	0	95	72	0
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		4.3			4.3			9.2		4.4	19.6	
Effective Green, g (s)		4.3			4.3			9.2		4.4	19.6	
Actuated g/C Ratio		0.12			0.12			0.26		0.12	0.55	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		392			332			780		387	980	
v/s Ratio Prot										c0.03	0.04	
v/s Ratio Perm		0.01			c0.01			c0.10				
v/c Ratio		0.06			0.10			0.39		0.25	0.07	
Uniform Delay, d1		14.0			14.1			11.0		14.2	3.9	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0			0.1		0.1	0.0	
Delay (s)		14.0			14.1			11.2		14.4	3.9	
Level of Service		B			B			B		B	A	
Approach Delay (s)		14.0			14.1			11.2			9.7	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	35.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

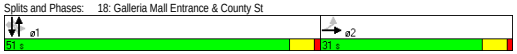
Lanes, Volumes, Timings
18: Galleria Mall Entrance & County St

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	100	0	50	50	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	0	0	0	124	0	0	114	86
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.06						0.04			0.05	0.06
Control Delay		8.2						2.0			2.0	1.2
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		8.2						2.0			2.0	1.2
Queue Length 50th (ft)		1						0			0	0
Queue Length 95th (ft)		9						12			11	10
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		2420						3239			2721	1679
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.02						0.04			0.04	0.05

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 29.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Galleria Mall Entrance & County St



HCM Signalized Intersection Capacity Analysis
18: Galleria Mall Entrance & County St

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	100	0	50	50	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.96						1.00			1.00	0.85
Flt Protected		0.98						1.00			0.98	1.00
Satd. Flow (prot)		2745						3412			3187	1679
Flt Permitted		0.98						0.95			0.83	1.00
Satd. Flow (perm)		2745						3238			2722	1679
Peak-hour factor, PHF	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	18	12	12	0	0	0	6	118	0	57	57	86
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	30	0	0	0	0	0	124	0	0	114	58
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		1.3						22.8			22.8	22.8
Effective Green, g (s)		1.3						22.8			22.8	22.8
Actuated g/C Ratio		0.04						0.67			0.67	0.67
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		105						2165			1820	1123
v/s Ratio Prot												
v/s Ratio Perm		0.01						0.04			c0.04	0.03
v/c Ratio		0.29						0.06			0.06	0.05
Uniform Delay, d1		16.0						1.9			2.0	1.9
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.6						0.0			0.0	0.0
Delay (s)		16.5						2.0			2.0	1.9
Level of Service		B						A			A	A
Approach Delay (s)		16.5			0.0			2.0			2.0	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.07		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

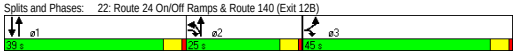
Lanes, Volumes, Timings
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	200	605	75	740	585	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	50	50			100
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	741			870	518	
Travel Time (s)	16.8			19.8	11.8	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.84	0.84
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	484	463	83	822	964	0
Turn Type		pt+ov	Prot			
Protected Phases	3	2 3	2	1 2	1	
Permitted Phases						
Detector Phase	3	2 3	2	1 2	1	
Switch Phase						
Minimum Initial (s)	12.0		8.0		10.0	
Minimum Split (s)	17.0		13.0		15.0	
Total Split (s)	45.0	70.0	25.0	64.0	39.0	0.0
Total Split (%)	41.3%	64.2%	22.9%	58.7%	35.8%	0.0%
Maximum Green (s)	40.0		20.0		34.0	
Yellow Time (s)	4.0		4.0		4.0	
All-Red Time (s)	1.0		1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	4.0		3.0		4.0	
Recall Mode	None		None		Min	
v/c Ratio	0.83	0.57	0.28	0.42	0.86	
Control Delay	44.6	17.1	40.4	14.1	40.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.6	17.1	40.4	14.1	40.9	
Queue Length 50th (ft)	292	191	49	163	311	
Queue Length 95th (ft)	386	263	97	220	370	
Internal Link Dist (ft)	661			790	438	
Turn Bay Length (ft)		50	50			
Base Capacity (vph)	687	878	304	1961	1130	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.70	0.53	0.27	0.42	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 109	
Actuated Cycle Length: 103	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



HCM Signalized Intersection Capacity Analysis
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

2008 Existing Condition - AM Peak Hour

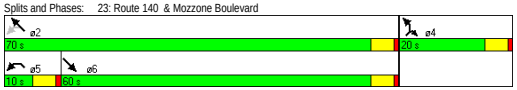
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	200	605	75	740	585	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	
Frt	0.92	0.85	1.00	1.00	0.96	
Flt Protected	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1759	1408	1556	3471	3298	
Flt Permitted	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1759	1408	1556	3471	3298	
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.84	0.84
Adj. Flow (vph)	235	712	83	822	696	268
RTOR Reduction (vph)	0	0	0	0	36	0
Lane Group Flow (vph)	484	463	83	822	928	0
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Turn Type		pt+ov	Prot			
Protected Phases	3	2 3	2	1 2	1	
Permitted Phases						
Actuated Green, G (s)	34.2	59.1	19.9	58.7	33.8	
Effective Green, g (s)	34.2	59.1	19.9	58.7	33.8	
Actuated g/C Ratio	0.33	0.57	0.19	0.57	0.33	
Clearance Time (s)	5.0		5.0		5.0	
Vehicle Extension (s)	4.0		3.0		4.0	
Lane Grp Cap (vph)	585	809	301	1980	1083	
v/s Ratio Prot	c0.28	c0.33	0.05	0.24	c0.28	
v/s Ratio Perm						
v/c Ratio	0.83	0.57	0.28	0.42	0.86	
Uniform Delay, d1	31.6	13.9	35.4	12.4	32.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	1.0	0.5	0.2	7.1	
Delay (s)	41.4	14.9	35.9	12.6	39.4	
Level of Service	D	B	D	B	D	
Approach Delay (s)	28.4			14.8	39.4	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	795	20	35	905	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	0		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1797			332	1312	
Travel Time (s)	40.8			7.5	29.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	886	0	0	1022	5	16
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	15.0		10.0	10.0	15.0	15.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.27			0.34	0.02	0.06
Control Delay	1.2			1.5	18.0	11.2
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.2			1.5	18.0	11.2
Queue Length 50th (ft)	0			0	1	0
Queue Length 95th (ft)	66			85	9	14
Internal Link Dist (ft)	1717			252	1232	
Turn Bay Length (ft)						
Base Capacity (vph)	3525			3207	752	682
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.25			0.32	0.01	0.02

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 37.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 23: Route 140 & Mozzone Boulevard



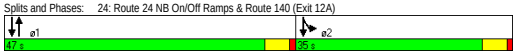
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	795	20	35	905	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3526			3533	1770	1583
Flt Permitted	1.00			0.91	0.95	1.00
Satd. Flow (perm)	3526			3206	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	864	22	38	984	5	16
RTOR Reduction (vph)	1	0	0	0	0	16
Lane Group Flow (vph)	885	0	0	1022	5	0
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	30.3			30.3	0.9	0.9
Effective Green, g (s)	30.3			30.3	0.9	0.9
Actuated g/C Ratio	0.74			0.74	0.02	0.02
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2593			2358	39	35
v/s Ratio Prot	0.25				c0.00	0.00
v/s Ratio Perm				c0.32		
v/c Ratio	0.34			0.43	0.13	0.01
Uniform Delay, d1	1.9			2.1	19.8	19.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.5	0.1
Delay (s)	2.0			2.2	21.3	19.8
Level of Service	A			A	C	B
Approach Delay (s)	2.0			2.2	20.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	2.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	41.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	270	565	1095	270	910
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	50	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.92	0.92	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	293	657	1273	293	989
Turn Type		Free		Free	Prot	
Protected Phases			1		2	1 2
Permitted Phases		Free		Free		
Detector Phase			1		2	1 2
Switch Phase						
Minimum Initial (s)			16.0		8.0	
Minimum Split (s)			21.0		13.0	
Total Split (s)	0.0	0.0	47.0	0.0	35.0	82.0
Total Split (%)	0.0%	0.0%	57.3%	0.0%	42.7%	100.0%
Maximum Green (s)			42.0		30.0	
Yellow Time (s)			4.0		4.0	
All-Red Time (s)			1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	
Recall Mode			Min		None	
v/c Ratio		0.16	0.44	0.84	0.54	0.30
Control Delay		0.2	10.2	6.6	16.2	0.2
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.2	10.2	6.6	16.2	0.2
Queue Length 50th (ft)		0	50	0	49	0
Queue Length 95th (ft)		0	107	0	130	0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	50	
Base Capacity (vph)		1790	3142	1524	1248	3343
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.16	0.21	0.84	0.23	0.30

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 42.4	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	270	565	1095	270	910
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1790	3374	1524	1703	3343
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1790	3374	1524	1703	3343
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.92	0.92
Adj. Flow (vph)	0	293	657	1273	293	989
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	293	657	1273	293	989
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Turn Type		Free		Free	Prot	
Protected Phases			1		2	1 2
Permitted Phases		Free		Free		
Actuated Green, G (s)		42.1	18.6	42.1	13.5	42.1
Effective Green, g (s)		42.1	18.6	42.1	13.5	42.1
Actuated g/C Ratio		1.00	0.44	1.00	0.32	1.00
Clearance Time (s)			5.0		5.0	
Vehicle Extension (s)			2.0		2.0	
Lane Grp Cap (vph)		1790	1491	1524	546	3343
v/s Ratio Prot			0.19		0.17	0.30
v/s Ratio Perm		0.16		c0.84		
v/c Ratio		0.16	0.44	0.84	0.54	0.30
Uniform Delay, d1		0.0	8.1	0.0	11.7	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	5.6	0.5	0.0
Delay (s)		0.2	8.2	5.6	12.2	0.0
Level of Service		A	A	A	B	A
Approach Delay (s)	0.2		6.5			2.8
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	4.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	0.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

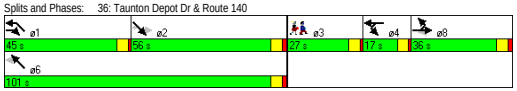
Lanes, Volumes, Timings
36: Taunton Depot Dr & Route 140

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR	ø3
Lane Configurations													
Volume (vph)	55	0	60	0	0	5	5	720	120	80	670	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12	
Storage Length (ft)	0		100	0		0	180		130	320		350	
Storage Lanes	1		1	0		0	1		1	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		846			205			2224			1797		
Travel Time (s)		19.2			4.7			50.5			40.8		
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93	
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%	
Shared Lane Traffic (%)	50%												
Lane Group Flow (vph)	32	33	71	0	10	0	0	806	133	86	720	0	
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt			
Protected Phases	8	8	1	4	4			2		1	6		3
Permitted Phases			8				2		2	6			
Detector Phase	8	8	1	4	4		2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0		7.0
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0		27.0
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0	27.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%	15%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0		22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0	
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?				Yes	Yes								Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0		3.0
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.17	0.18	0.14		0.02			0.51	0.17	0.18	0.30		
Control Delay	28.7	28.8	6.2		0.0			12.7	7.5	5.0	5.0		
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0		
Total Delay	28.7	28.8	6.2		0.0			12.7	7.5	5.0	5.0		
Queue Length 50th (ft)	9	9	0		0			90	14	7	40		
Queue Length 95th (ft)	38	40	25		0			193	53	30	110		
Internal Link Dist (ft)		766			125			2144			1717		
Turn Bay Length (ft)			100						130	320			
Base Capacity (vph)	860	860	1397		738			2938	1377	1329	3406		
Starvation Cap Reductn	0	0	0		0			0	0	0	0		
Spillback Cap Reductn	0	0	0		0			0	0	0	0		
Storage Cap Reductn	0	0	0		0			0	0	0	0		
Reduced v/c Ratio	0.04	0.04	0.05		0.01			0.27	0.10	0.06	0.21		

Intersection Summary	
Area Type:	Other
Cycle Length: 181	
Actuated Cycle Length: 56.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Taunton Depot Dr & Route 140



HCM Signalized Intersection Capacity Analysis
36: Taunton Depot Dr & Route 140

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	55	0	60	0	0	5	5	720	120	80	670	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		0.86			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1573	1573	1553		1863			3471	1538	1805	3406	
Flt Permitted	0.95	0.95	1.00		1.00			0.95	1.00	0.24	1.00	
Satd. Flow (perm)	1573	1573	1553		1863			3296	1538	465	3406	
Peak-hour factor, PHF	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	65	0	71	0	0	10	6	800	133	86	720	0
RTOR Reduction (vph)	0	0	58	0	10	0	0	0	29	0	0	0
Lane Group Flow (vph)	32	33	13	0	0	0	0	806	104	86	720	0
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	5.3	5.3	11.7		0.7			27.6	27.6	39.0	39.0	
Effective Green, g (s)	5.3	5.3	11.7		0.7			27.6	27.6	39.0	39.0	
Actuated g/C Ratio	0.09	0.09	0.19		0.01			0.45	0.45	0.63	0.63	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	134	134	293		21			1467	685	431	2142	
v/s Ratio Prot	0.02	c0.02	0.00		c0.00					0.02	c0.21	
v/s Ratio Perm			0.00					c0.24	0.07	0.10		
v/c Ratio	0.24	0.25	0.05		0.01			0.55	0.15	0.20	0.34	
Uniform Delay, d1	26.5	26.5	20.6		30.3			12.6	10.2	5.3	5.4	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.4	0.0		0.0			0.5	0.1	0.1	0.1	
Delay (s)	26.8	26.8	20.6		30.3			13.2	10.4	5.4	5.5	
Level of Service	C	C	C		C			B	B	A	A	
Approach Delay (s)		23.6			30.3			12.8			5.5	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
40: Honorable Gordon M. Owen Riverway & Route 140

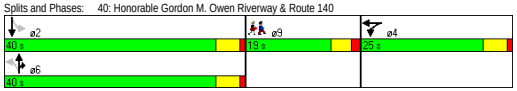
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	210	0	5	0	620	275	10	380	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12	
Storage Length (ft)	0		0	0		0	0		175	0		0	
Storage Lanes	0		0	0		0	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		220			991			547			1888		
Travel Time (s)		5.0			22.5			12.4			42.9		
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89	
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	256	0	0	667	296	0	438	0	
Turn Type				Split			Perm		Prot	Perm			
Protected Phases				4	4			6	6		2		9
Permitted Phases							6			2			
Detector Phase				4	4		6	6	6	2	2		
Switch Phase													
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0		1.0
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0		19.0
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0	19.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%	23%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0		14.0
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		3.5
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
Recall Mode				None	None		None	None	None	None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio					0.56			0.70	0.30		0.43		
Control Delay					23.9			14.4	2.5		9.4		
Queue Delay					0.0			0.0	0.0		0.0		
Total Delay					23.9			14.4	2.5		9.4		
Queue Length 50th (ft)					81			141	5		75		
Queue Length 95th (ft)					132			302	37		156		
Internal Link Dist (ft)		140			911			467			1808		
Turn Bay Length (ft)									175				
Base Capacity (vph)					643			1126	1101		1194		
Starvation Cap Reductn					0			0	0		0		
Spillback Cap Reductn					0			0	0		0		
Storage Cap Reductn					0			0	0		0		
Reduced v/c Ratio					0.40			0.59	0.27		0.37		

Intersection Summary

Area Type: Other
Cycle Length: 84
Actuated Cycle Length: 55.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 40: Honorable Gordon M. Owen Riverway & Route 140



HCM Signalized Intersection Capacity Analysis
40: Honorable Gordon M. Owen Riverway & Route 140

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	210	0	5	0	620	275	10	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1731			1733	1553		1866	
Flt Permitted					0.95			1.00	1.00		0.98	
Satd. Flow (perm)					1731			1733	1553		1837	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	250	0	6	0	667	296	11	427	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	116	0	0	0
Lane Group Flow (vph)	0	0	0	0	255	0	0	667	180	0	438	0
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Actuated Green, G (s)					14.6			30.6	30.6		30.6	
Effective Green, g (s)					14.6			30.6	30.6		30.6	
Actuated g/C Ratio					0.26			0.55	0.55		0.55	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					458			961	861		1018	
v/s Ratio Prot					c0.15			c0.38	0.12			
v/s Ratio Perm											0.24	
v/c Ratio					0.56			0.69	0.21		0.43	
Uniform Delay, d1					17.5			8.9	6.2		7.2	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					1.8			2.4	0.2		0.4	
Delay (s)					19.3			11.3	6.4		7.6	
Level of Service					B			B	A		A	
Approach Delay (s)		0.0			19.3			9.8			7.6	
Approach LOS		A			B			A			A	

Intersection Summary

HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

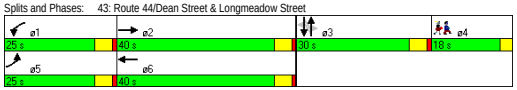
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø4
Lane Configurations													
Volume (vph)	10	775	270	175	610	90	110	335	260	120	210	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12	
Storage Length (ft)	100		70	100		70	0		50	0		100	
Storage Lanes	1		1	1		1	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1663			1440			2994			1249		
Travel Time (s)		37.8			32.7			68.0			28.4		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68	
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1111	0	186	745	0	0	820	0	0	507	0	
Turn Type	Prot			Prot			Perm			Perm			
Protected Phases	5	2		1	6			3			3		4
Permitted Phases							3			3			
Detector Phase	5	2		1	6		3	3		3	3		
Switch Phase													
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0		8.0
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0		18.0
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	18.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%	16%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0		0.2
Recall Mode	None	Min		None	Min		None	None		None	None		None
Walk Time (s)													8.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.08	0.84		0.66	0.37			1.27			2.17dl		
Control Delay	40.4	32.2		46.5	11.1			162.6			77.3		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	40.4	32.2		46.5	11.1			162.6			77.3		
Queue Length 50th (ft)	6	293		101	98			~299			~157		
Queue Length 95th (ft)	23	#436		171	194			#409			#171		
Internal Link Dist (ft)		1583			1360			2914			1169		
Turn Bay Length (ft)	100			100									
Base Capacity (vph)	314	1322		352	2007			644			503		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.04	0.84		0.53	0.37			1.27			1.01		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 91.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	775	270	175	610	90	110	335	260	120	210	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.96		1.00	0.98			0.94			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1428	3369		1604	3413			3109			3191	
Flt Permitted	0.95	1.00		0.95	1.00			0.67			0.56	
Satd. Flow (perm)	1428	3369		1604	3413			2093			1822	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Adj. Flow (vph)	11	824	287	186	649	96	128	390	302	176	309	22
RTOR Reduction (vph)	0	26	0	0	7	0	0	70	0	0	3	0
Lane Group Flow (vph)	11	1085	0	186	738	0	0	750	0	0	504	0
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.7	39.0		16.1	53.4			25.0			25.0	
Effective Green, g (s)	1.7	39.0		16.1	53.4			25.0			25.0	
Actuated g/C Ratio	0.02	0.41		0.17	0.56			0.26			0.26	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	26	1382		272	1916			550			479	
v/s Ratio Prot	0.01	c0.32		c0.12	0.22							
v/s Ratio Perm								c0.36			0.28	
v/c Ratio	0.42	0.79		0.68	0.39			1.36			2.17dl	
Uniform Delay, d1	46.2	24.4		37.1	11.7			35.0			35.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.4	3.5		7.5	0.3			175.1			55.6	
Delay (s)	60.6	27.9		44.6	11.9			210.1			90.6	
Level of Service	E	C		D	B			F			F	
Approach Delay (s)		28.2			18.5			210.1			90.6	
Approach LOS		C			B			F			F	

Intersection Summary

HCM Average Control Delay	79.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lanes, Volumes, Timings
45: Hart Street & Route 140

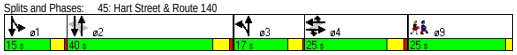
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2	ø9
Lane Configurations														
Volume (vph)	25	140	230	115	100	220	125	575	55	85	400	10		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12		
Storage Length (ft)	0		50	0		50	50		0	50		0		
Storage Lanes	0		1	0		1	1		0	1		0		
Taper Length (ft)	25		25	25		25	25		25	25		25		
Right Turn on Red			Yes			Yes			Yes			Yes		
Link Speed (mph)		30			30			35			35			
Link Distance (ft)		1373			971			2224			3692			
Travel Time (s)		31.2			22.1			43.3			71.9			
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73		
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	206	288	0	226	232	0	795	0	0	678	0		
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt				
Protected Phases		4	4		4	4	3	2 3		1	1 2		2	9
Permitted Phases	4			4			2 3			1 2				
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2			
Switch Phase														
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	4.0			4.0			8.0	1.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	8.0			8.0			13.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0	40.0	25.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%	33%	20%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	13.0			11.0			35.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5			3.5			4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5			0.5			1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead			Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes			Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0			3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None			None			None	None
Walk Time (s)														7.0
Flash Dont Walk (s)														16.0
Pedestrian Calls (#/hr)														0
v/c Ratio		0.60	0.64		0.96	0.54		0.69			0.56			
Control Delay		41.1	23.5		88.2	22.5		20.4			15.1			
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0			
Total Delay		41.1	23.5		88.2	22.5		20.4			15.1			
Queue Length 50th (ft)		110	73		134	62		147			111			
Queue Length 95th (ft)		165	132		#291	142		195			122			
Internal Link Dist (ft)		1293			891			2144			3612			
Turn Bay Length (ft)			50			50								
Base Capacity (vph)		346	450		235	431		1322			1272			
Starvation Cap Reductn		0	0		0	0		0			0			
Spillback Cap Reductn		0	0		0	0		0			0			
Storage Cap Reductn		0	0		0	0		0			0			
Reduced v/c Ratio		0.60	0.64		0.96	0.54		0.60			0.53			

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 91
Natural Cycle: 110
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 45: Hart Street & Route 140



HCM Signalized Intersection Capacity Analysis
45: Hart Street & Route 140

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	140	230	115	100	220	125	575	55	85	400	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		0.97	1.00		0.99			0.99	
Satd. Flow (prot)		1735	1516		1807	1568		3272			3340	
Flt Permitted		0.90	1.00		0.58	1.00		0.72			0.65	
Satd. Flow (perm)		1569	1516		1067	1568		2360			2179	
Peak-hour factor, PHF	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Adj. Flow (vph)	31	175	288	121	105	232	132	605	58	116	548	14
RTOR Reduction (vph)	0	0	115	0	0	85	0	4	0	0	1	0
Lane Group Flow (vph)	0	206	173	0	226	147	0	791	0	0	677	0
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.1	20.1		20.1	20.1		41.8			43.4	
Effective Green, g (s)		20.1	20.1		20.1	20.1		41.8			43.4	
Actuated g/C Ratio		0.22	0.22		0.22	0.22		0.46			0.48	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		347	335		236	347		1180			1181	
v/s Ratio Prot			0.11			0.09		c0.07			c0.07	
v/s Ratio Perm		0.13			c0.21			c0.24			0.20	
v/c Ratio		0.59	0.52		0.96	0.42		0.67			0.57	
Uniform Delay, d1		31.7	31.1		35.0	30.4		19.2			17.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		7.3	5.6		48.6	3.8		1.5			0.7	
Delay (s)		39.0	36.7		83.6	34.2		20.7			17.8	
Level of Service		D	D		F	C		C			B	
Approach Delay (s)		37.7			58.6			20.7			17.8	
Approach LOS		D			E			C			B	

Intersection Summary

HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
52: Route 44/Dean Street & Arlington Street

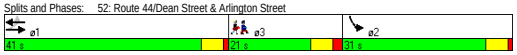
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	30	765	625	110	265	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.87	0.87	0.86	0.86	0.81	0.81	
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	34	879	855	0	389	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		5.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	36.0	36.0	36.0		26.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	1.0	1.0	1.0		1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							0
v/c Ratio	0.26	0.88	0.77		0.73		
Control Delay	15.8	27.3	18.7		29.3		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	15.8	27.3	18.7		29.3		
Queue Length 50th (ft)	6	278	237		138		
Queue Length 95th (ft)	29	#579	#448		193		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	133	999	1117		720		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.26	0.88	0.77		0.54		

Intersection Summary

Area Type: Other
Cycle Length: 93
Actuated Cycle Length: 65.5
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	765	625	110	265	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	5.0	5.0	5.0		5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1636	1810	2015		1808	
Flt Permitted	0.14	1.00	1.00		0.96	
Satd. Flow (perm)	241	1810	2015		1808	
Peak-hour factor, PHF	0.87	0.87	0.86	0.86	0.81	0.81
Adj. Flow (vph)	34	879	727	128	327	62
RTOR Reduction (vph)	0	0	5	0	0	0
Lane Group Flow (vph)	34	879	850	0	389	0
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	36.2	36.2	36.2		19.3	
Effective Green, g (s)	36.2	36.2	36.2		19.3	
Actuated g/C Ratio	0.55	0.55	0.55		0.29	
Clearance Time (s)	5.0	5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	133	1000	1114		533	
v/s Ratio Prot		c0.49	0.42		c0.22	
v/s Ratio Perm	0.14					
v/c Ratio	0.26	0.88	0.76		0.73	
Uniform Delay, d1	7.6	12.7	11.3		20.8	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.0	8.9	3.2		5.0	
Delay (s)	8.7	21.6	14.5		25.7	
Level of Service	A	C	B		C	
Approach Delay (s)		21.2	14.5		25.7	
Approach LOS		C	B		C	

Intersection Summary

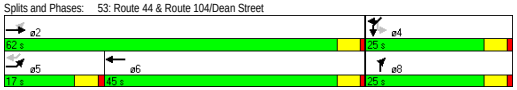
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	170	955	0	0	695	20	0	0	30	5	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0	0		0	50
Storage Lanes	1		0	0		0	0	1		1	1
Taper Length (ft)	25		25	25		25	25	25		25	25
Right Turn on Red			Yes			Yes					Yes
Link Speed (mph)		30			30		30			30	
Link Distance (ft)		825			1426		127			959	
Travel Time (s)		18.8			32.4		2.9			21.8	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	1324	0	0	777	0	0	0	0	40	191
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Detector Phase	5	2			6			8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0			12.0			6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0			11.0	11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	0.0	25.0	25.0	25.0	25.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	0.0%	28.7%	28.7%	28.7%	28.7%
Maximum Green (s)	12.0	57.0			40.0			20.0	20.0	20.0	20.0
Yellow Time (s)	4.0	4.0			4.0			4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0			1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag						
Lead-Lag Optimize?	Yes				Yes						
Vehicle Extension (s)	1.5	1.5			1.5			2.0	2.0	2.0	2.0
Recall Mode	None	Min			Min			None	None	None	None
v/c Ratio		0.78			0.32					0.18	0.56
Control Delay		10.4			4.0					28.7	18.1
Queue Delay		0.0			0.0					0.0	0.0
Total Delay		10.4			4.0					28.7	18.1
Queue Length 50th (ft)		121			41					12	20
Queue Length 95th (ft)		230			84					44	87
Internal Link Dist (ft)		745			1346		47			879	
Turn Bay Length (ft)											50
Base Capacity (vph)		2190			2608					576	677
Starvation Cap Reductn		0			0					0	0
Spillback Cap Reductn		0			0					0	0
Storage Cap Reductn		0			0					0	0
Reduced v/c Ratio		0.60			0.30					0.07	0.28

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 61.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: Route 44 & Route 104/Dean Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	170	955	0	0	695	20	0	0	30	5	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	16
Total Lost time (s)		5.0			5.0					5.0	5.0
Lane Util. Factor		0.95			0.95					1.00	1.00
Frt		1.00			1.00					1.00	0.85
Flt Protected		0.99			1.00					0.95	1.00
Satd. Flow (prot)		3479			3460					1704	1760
Flt Permitted		0.69			1.00					0.95	1.00
Satd. Flow (perm)		2432			3460					1704	1760
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	200	1124	0	0	755	22	0	0	34	6	191
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	108
Lane Group Flow (vph)	0	1324	0	0	776	0	0	0	0	40	83
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Actuated Green, G (s)		42.9			42.9					8.2	8.2
Effective Green, g (s)		42.9			42.9					8.2	8.2
Actuated g/C Ratio		0.70			0.70					0.13	0.13
Clearance Time (s)		5.0			5.0					5.0	5.0
Vehicle Extension (s)		1.5			1.5					2.0	2.0
Lane Grp Cap (vph)		1708			2429					229	236
v/s Ratio Prot					0.22						c0.05
v/s Ratio Perm		c0.54								0.02	
v/c Ratio		0.78			0.32					0.17	0.35
Uniform Delay, d1		5.9			3.5					23.4	24.0
Progression Factor		1.00			1.00					1.00	1.00
Incremental Delay, d2		2.1			0.0					0.1	0.3
Delay (s)		8.0			3.5					23.6	24.4
Level of Service		A			A					C	C
Approach Delay (s)		8.0			3.5		0.0			24.2	
Approach LOS		A			A		A			C	

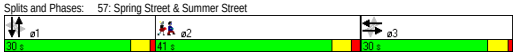
Intersection Summary			
HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	61.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	20	205	55	35	135	10	45	425	20	10	250	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12	
Right Turn on Red			Yes			No			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		376			382			1581			384		
Travel Time (s)		8.5			8.7			35.9			8.7		
Peak Hour Factor	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76	
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%	
Parking (#/hr)											0		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	322	0	0	220	0	0	527	0	0	368	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	41.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	41%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		35.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.44			0.29			0.75			0.48		
Control Delay		14.4			12.9			23.1			15.2		
Queue Delay		0.0			0.0			0.0			0.1		
Total Delay		14.4			12.9			23.1			15.3		
Queue Length 50th (ft)		76			51			153			91		
Queue Length 95th (ft)		129			83			#300			124		
Internal Link Dist (ft)		296			302			1501			304		
Turn Bay Length (ft)													
Base Capacity (vph)		727			758			707			768		
Starvation Cap Reductn		0			0			0			34		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.44			0.29			0.75			0.50		

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 60
Natural Cycle: 70
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 57: Spring Street & Summer Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	205	55	35	135	10	45	425	20	10	250	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.99			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1771			2015			1799			1876	
Flt Permitted		0.97			0.89			0.94			0.98	
Satd. Flow (perm)		1727			1816			1696			1838	
Peak-hour factor, PHF	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	23	236	63	43	165	12	48	457	22	13	329	26
RTOR Reduction (vph)	0	7	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	315	0	0	220	0	0	526	0	0	366	0
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.0			25.0			25.0			25.0	
Effective Green, g (s)		25.0			25.0			25.0			25.0	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		720			757			707			766	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.12			c0.31			0.20	
v/c Ratio		0.44			0.29			0.74			0.48	
Uniform Delay, d1		12.5			11.6			14.8			12.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			1.0			7.0			2.1	
Delay (s)		14.4			12.6			21.8			14.9	
Level of Service		B			B			C			B	
Approach Delay (s)		14.4			12.6			21.8			14.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
58: Route 44/Main Street & Union Street

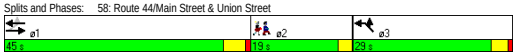
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	10	505	290	0	465	10	0	0	430	10	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	894	0	0	533	0	0	0	443	31	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												0
v/c Ratio		0.84			0.49				0.78	0.05		
Control Delay		22.9			12.5				33.5	9.7		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		22.9			12.5				33.5	9.7		
Queue Length 50th (ft)		307			141				180	3		
Queue Length 95th (ft)		#557			213				#322	20		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		1065			1093				570	632		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.84			0.49				0.78	0.05		

Intersection Summary

Area Type: Other
Cycle Length: 93
Actuated Cycle Length: 74
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	10	505	290	0	465	10	0	0	430	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.95			1.00				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1951			2023				1687	1830	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1939			2023				1687	1830	
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	11	561	322	0	522	11	0	0	443	10	21
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	877	0	0	533	0	0	0	443	17	0
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.0			40.0				25.0	25.0	
Effective Green, g (s)		40.0			40.0				25.0	25.0	
Actuated g/C Ratio		0.54			0.54				0.34	0.34	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		1048			1094				570	618	
v/s Ratio Prot					0.26				c0.26	0.01	
v/s Ratio Perm		c0.45									
v/c Ratio		0.84			0.49				0.78	0.03	
Uniform Delay, d1		14.3			10.6				22.0	16.4	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		7.9			1.6				10.0	0.1	
Delay (s)		22.2			12.2				32.0	16.5	
Level of Service		C			B				C	B	
Approach Delay (s)		22.2			12.2		0.0		31.0		
Approach LOS		C			B		A		C		

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
61: Taunton Green & Broadway

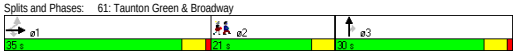
2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	170	730	180	0	0	905	0	280	85	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		304			913			579			302		
Travel Time (s)		6.9			20.8			13.2			6.9		
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%	
Parking (#/hr)			0			0			0				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	187	802	198	0	0	984	0	311	94	0	0	0	
Turn Type	Perm		Perm			Free			Perm				
Protected Phases		1						3					2
Permitted Phases	1		1			Free			3				
Detector Phase	1	1	1					3	3				
Switch Phase													
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0				1.0
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0				21.0
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	21.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%	24%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0				17.0
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0				4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead										Lag
Lead-Lag Optimize?	Yes	Yes	Yes										Yes
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0				2.0
Recall Mode	Max	Max	Max					Max	Max				Ped
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.27	0.68	0.31			0.39		0.64	0.22				
Control Delay	5.0	26.5	4.0			0.4		33.7	6.7				
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0				
Total Delay	5.0	26.5	4.0			0.4		33.7	6.7				
Queue Length 50th (ft)	5	193	0			0		146	0				
Queue Length 95th (ft)	m46	253	m38			0		234	34				
Internal Link Dist (ft)		224			833			499			222		
Turn Bay Length (ft)													
Base Capacity (vph)	702	1188	647			2547		486	432				
Starvation Cap Reductn	0	0	0			0		0	0				
Spillback Cap Reductn	0	0	0			0		0	0				
Storage Cap Reductn	0	0	0			0		0	0				
Reduced v/c Ratio	0.27	0.68	0.31			0.39		0.64	0.22				

Intersection Summary

Area Type: Other
Cycle Length: 86
Actuated Cycle Length: 86
Natural Cycle: 90
Control Type: Semi Act-Uncoord
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 61: Taunton Green & Broadway



HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	730	180	0	0	905	0	280	85	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1703	3406	1484			2547		1673	1256			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1703	3406	1484			2547		1673	1256			
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	187	802	198	0	0	984	0	311	94	0	0	0
RTOR Reduction (vph)	107	0	129	0	0	0	0	0	67	0	0	0
Lane Group Flow (vph)	80	802	69	0	0	984	0	311	27	0	0	0
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	594	1188	518			2547		486	365			
v/s Ratio Prot		c0.24						c0.19				
v/s Ratio Perm	0.05		0.05			c0.39			0.02			
v/c Ratio	0.13	0.68	0.13			0.39		0.64	0.07			
Uniform Delay, d1	19.1	23.8	19.1			0.0		26.6	22.1			
Progression Factor	0.86	0.97	0.85			1.00		1.00	1.00			
Incremental Delay, d2	0.5	3.1	0.5			0.4		6.3	0.4			
Delay (s)	16.9	26.1	16.8			0.4		32.9	22.5			
Level of Service	B	C	B			A		C	C			
Approach Delay (s)		23.1			0.4			30.5			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

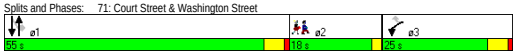
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	345	20	590	260	35	390	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.88	0.88	0.87	0.87	0.85	0.85	
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	392	23	678	299	41	459	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Detector Phase	3	3	1	1	1	1	
Switch Phase							
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	3.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	18.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	18.0
Total Split (%)	25.5%	25.5%	56.1%	56.1%	56.1%	56.1%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0	0.7
Recall Mode	Max	Max	Max	Max	Max	Max	None
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							0
v/c Ratio	0.92	0.05	0.63	0.30	0.12	0.40	
Control Delay	58.4	18.1	12.6	1.7	7.1	8.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	58.4	18.1	12.6	1.7	7.1	8.8	
Queue Length 50th (ft)	191	6	186	0	7	102	
Queue Length 95th (ft)	#341	23	273	23	19	145	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	428	437	1076	986	356	1153	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.92	0.05	0.63	0.30	0.12	0.40	

Intersection Summary

Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 80
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 71: Court Street & Washington Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	345	20	590	260	35	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	1723	1722	1398	1805	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.30	1.00
Satd. Flow (perm)	1711	1723	1722	1398	571	1845
Peak-hour factor, PHF	0.88	0.88	0.87	0.87	0.85	0.85
Adj. Flow (vph)	392	23	678	299	41	459
RTOR Reduction (vph)	0	6	0	112	0	0
Lane Group Flow (vph)	392	17	678	187	41	459
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.0	20.0	50.0	50.0	50.0	50.0
Effective Green, g (s)	20.0	20.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio	0.25	0.25	0.62	0.62	0.62	0.62
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	428	431	1076	874	357	1153
v/s Ratio Prot	c0.23		c0.39			0.25
v/s Ratio Perm		0.01		0.13	0.07	
v/c Ratio	0.92	0.04	0.63	0.21	0.11	0.40
Uniform Delay, d1	29.2	22.7	9.3	6.5	6.1	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.8	0.2	2.8	0.6	0.7	1.0
Delay (s)	56.0	22.9	12.1	7.1	6.7	8.5
Level of Service	E	C	B	A	A	A
Approach Delay (s)	54.2		10.5			8.4
Approach LOS	D		B			A

Intersection Summary

HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø5
Lane Configurations													
Volume (vph)	430	150	50	35	120	50	80	365	55	30	230	350	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		698			192			1911			574		
Travel Time (s)		15.9			4.4			43.4			13.0		
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92	
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%	
Shared Lane Traffic (%)	27%												
Lane Group Flow (vph)	323	327	0	0	221	0	0	562	0	0	663	0	
Turn Type	Split			Split			pm+pt			Perm			
Protected Phases	1	1		2	2		3	8			4		5
Permitted Phases							8			4			
Detector Phase	1	1		2	2		3	8		4	4		
Switch Phase													
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0		3.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0		22.0
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0	22.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%	16%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0		17.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													0
v/c Ratio	0.65	0.69			0.86			0.67			0.58		
Control Delay	35.2	36.9			68.6			26.7			16.0		
Queue Delay	0.0	0.0			0.0			0.0			0.0		
Total Delay	35.2	36.9			68.6			26.7			16.0		
Queue Length 50th (ft)	160	161			112			123			91		
Queue Length 95th (ft)	302	307			#333			210			170		
Internal Link Dist (ft)		618			112			1831			494		
Turn Bay Length (ft)													
Base Capacity (vph)	737	694			258			1499			1329		
Starvation Cap Reductn	0	0			0			0			0		
Spillback Cap Reductn	0	0			0			0			0		
Storage Cap Reductn	0	0			0			0			0		
Reduced v/c Ratio	0.44	0.47			0.86			0.37			0.50		

Intersection Summary

Area Type: Other

Cycle Length: 141

Actuated Cycle Length: 86.4

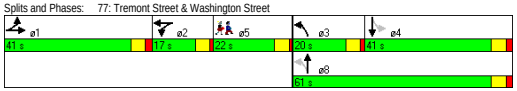
Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2008 Existing Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	430	150	50	35	120	50	80	365	55	30	230	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.98			0.97			0.98			0.91	
Flt Protected	0.95	0.98			0.99			0.99			1.00	
Satd. Flow (prot)	1759	1649			1745			3359			2974	
Flt Permitted	0.95	0.98			0.99			0.67			0.90	
Satd. Flow (perm)	1759	1649			1745			2273			2683	
Peak-hour factor, PHF	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	443	155	52	38	129	54	90	410	62	33	250	380
RTOR Reduction (vph)	0	4	0	0	8	0	0	7	0	0	145	0
Lane Group Flow (vph)	323	323	0	0	213	0	0	555	0	0	518	0
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	24.5	24.5			12.4			31.8			31.8	
Effective Green, g (s)	24.5	24.5			12.4			31.8			31.8	
Actuated g/C Ratio	0.29	0.29			0.14			0.37			0.37	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	503	471			252			843			996	
v/s Ratio Prot	0.18	c0.20			c0.12							
v/s Ratio Perm								c0.24			0.19	
v/c Ratio	0.64	0.69			0.85			0.66			0.52	
Uniform Delay, d1	26.8	27.2			35.7			22.4			21.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.1	3.3			21.4			1.4			0.2	
Delay (s)	28.9	30.5			57.1			23.9			21.2	
Level of Service	C	C			E			C			C	
Approach Delay (s)		29.7			57.1			23.9			21.2	
Approach LOS		C			E			C			C	

Intersection Summary

HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

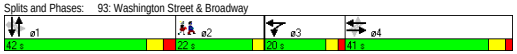
Lanes, Volumes, Timings
93: Washington Street & Broadway

2008 Existing Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	265	85	5	20	90	5	5	495	15	10	355	215	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			No			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1068			1376			92			2042		
Travel Time (s)		24.3			31.3			2.1			46.4		
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89	
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%	
Parking (#/hr)									2				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	404	0	0	160	0	0	592	0	0	410	242	
Turn Type	Perm			pm+pt			Perm			Perm		Perm	
Protected Phases		4		3	3 4			1			1		2
Permitted Phases	4			3 4			1			1		1	
Detector Phase	4	4		3	3 4		1	1		1	1	1	
Switch Phase													
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0	1.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0	22.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0	22.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%	18%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0	19.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0	2.0
Recall Mode	None	None		None			Min	Min		Min	Min	Min	None
Walk Time (s)													7.0
Flash Dont Walk (s)													12.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.75			0.19			0.54			0.74	0.49	
Control Delay		36.2			12.1			27.3			36.6	28.6	
Queue Delay		0.0			0.0			0.0			0.0	0.0	
Total Delay		36.2			12.1			27.3			36.6	28.6	
Queue Length 50th (ft)		203			45			145			208	111	
Queue Length 95th (ft)		#380			66			196			323	186	
Internal Link Dist (ft)		988			1296			12			1962		
Turn Bay Length (ft)												50	
Base Capacity (vph)		542			947			1322			670	601	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			0			0			0	0	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.75			0.17			0.45			0.61	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 91.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 93: Washington Street & Broadway



HCM Signalized Intersection Capacity Analysis
93: Washington Street & Broadway

2008 Existing Condition - AM Peak Hour

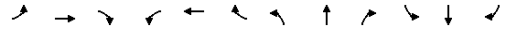
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	265	85	5	20	90	5	5	495	15	10	355	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frt		1.00			0.99			1.00			1.00	0.85
Flt Protected		0.96			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1981			1839			3590			1771	1553
Flt Permitted		0.68			0.92			0.95			0.98	1.00
Satd. Flow (perm)		1399			1701			3412			1732	1553
Peak-hour factor, PHF	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	301	97	6	28	125	7	6	569	17	11	399	242
RTOR Reduction (vph)	0	1	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	403	0	0	160	0	0	591	0	0	410	242
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		35.3			43.9			29.2			29.2	29.2
Effective Green, g (s)		35.3			43.9			29.2			29.2	29.2
Actuated g/C Ratio		0.39			0.48			0.32			0.32	0.32
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		542			833			1094			555	498
v/s Ratio Prot					c0.02							
v/s Ratio Perm		c0.29			0.07			0.17			c0.24	0.16
v/c Ratio		0.74			0.19			0.54			0.74	0.49
Uniform Delay, d1		24.0			13.5			25.4			27.6	24.9
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		5.8			0.0			0.5			5.1	0.7
Delay (s)		29.9			13.5			25.9			32.7	25.7
Level of Service		C			B			C			C	C
Approach Delay (s)		29.9			13.5			25.9			30.1	
Approach LOS		C			B			C			C	

Intersection Summary					
HCM Average Control Delay	27.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	63.7%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2008 Existing Condition - PM Peak Hour



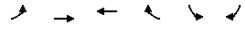
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	245	30	0	0	0	0	0	405	740	430	95
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.99	0.99	0.99	0.94	0.94	0.94
Hourly flow rate (vph)	0	263	32	0	0	0	0	0	409	787	457	101
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			Raised	
Median storage veh)											1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2287	2492	508	2196	2133	0	559			409		
vC1, stage 1 conf vol	2082	2082		0	0							
vC2, stage 2 conf vol	205	409		2196	2133							
vCu, unblocked vol	2287	2492	508	2196	2133	0	559			409		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	0	94	0	100	100	100			32		
cM capacity (veh/h)	13	9	563	0	26	1085	1022			1150		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	SB 3
Volume Total	263	32	409	394	394	559
Volume Left	0	0	0	394	394	0
Volume Right	0	32	409	0	0	101
cSH	9	563	1700	1150	1150	1700
Volume to Capacity	29.10	0.06	0.24	0.68	0.68	0.33
Queue Length 95th (ft)	Err	5	0	144	144	0
Control Delay (s)	Err	11.8	0.0	14.6	14.6	0.0
Lane LOS	F	B		B	B	
Approach Delay (s)	8909.5		0.0	8.6		
Approach LOS	F					

Intersection Summary				
Average Delay	1290.4			
Intersection Capacity Utilization	69.1%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
67: Post Office Square & Broadway

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	885	530	0	520
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	0	0	932	558	0	584
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	932				932	466
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932				932	466
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	730				269	543

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	466	466	558	584
Volume Left	0	0	0	0
Volume Right	0	0	558	584
cSH	1700	1700	1700	543
Volume to Capacity	0.27	0.27	0.33	1.08
Queue Length 95th (ft)	0	0	0	439
Control Delay (s)	0.0	0.0	0.0	87.6
Lane LOS				F
Approach Delay (s)	0.0			87.6
Approach LOS				F

Intersection Summary			
Average Delay	24.7		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2008 Existing Condition - PM Peak Hour

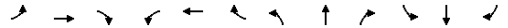
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	25	900	120	350	0	0	0	0	325	20
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	29	968	129	376	0	0	0	0	361	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	129			29			2267	2065	0	2079	2094	129
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	129			29			2267	2065	0	2079	2094	129
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			39			0	100	100	100	0	98
cM capacity (veh/h)	1469			1584			0	21	1091	20	20	926

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	29	645	452	376	383
Volume Left	0	645	323	0	0
Volume Right	29	0	0	376	22
cSH	1700	1584	1584	1700	22
Volume to Capacity	0.02	0.61	0.61	0.22	17.78
Queue Length 95th (ft)	0	111	111	0	Err
Control Delay (s)	0.0	10.8	9.7	0.0	Err
Lane LOS		B	A		F
Approach Delay (s)	0.0	7.7			Err
Approach LOS					F

Intersection Summary				
Average Delay	2038.8			
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

2008 Existing Condition - PM Peak Hour



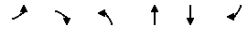
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	5	90	0	165	5	615	300	230	805	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	10	99	0	181	5	661	323	245	856	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	1868	2340	856	2189	2179	492	856			984		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2000	2640	627	2435	2421	492	627			984		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	0	100	66	99			65		
cM capacity (veh/h)	13	11	318	9	16	528	711			704		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	99	181	336	653	245	856
Volume Left	0	99	0	5	0	245	0
Volume Right	10	0	181	0	323	0	0
cSH	318	9	528	711	1700	704	1700
Volume to Capacity	0.03	11.49	0.34	0.01	0.38	0.35	0.50
Queue Length 95th (ft)	2	Err	38	1	0	39	0
Control Delay (s)	16.7	Err	15.3	0.3	0.0	12.8	0.0
Lane LOS	C	F	C	A		B	
Approach Delay (s)	16.7	3539.0		0.1		2.8	
Approach LOS	C	F					

Intersection Summary				
Average Delay	418.0			
Intersection Capacity Utilization	90.8%	ICU Level of Service	E	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2008 Existing Condition - PM Peak Hour



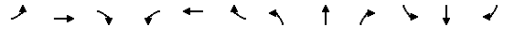
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	80	20	25	200	340	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.91	0.91
Hourly flow rate (vph)	111	28	35	278	374	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	765	418	462			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	765	418	462			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	96	97			
cM capacity (veh/h)	357	640	1110			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	139	312	462
Volume Left	111	35	0
Volume Right	28	0	88
cSH	392	1110	1700
Volume to Capacity	0.35	0.03	0.27
Queue Length 95th (ft)	39	2	0
Control Delay (s)	19.2	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	19.2	1.2	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	310	20	5	85	5	30	85	40	20	130	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	64	330	21	7	118	7	37	104	49	24	159	73
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	125			351			756	607	340	704	614	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	125			351			756	607	340	704	614	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			81	73	93	90	59	92
cM capacity (veh/h)	1462			1219			196	391	707	253	387	930

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	415	132	189	256
Volume Left	64	7	37	24
Volume Right	21	7	49	73
cSH	1462	1219	363	438
Volume to Capacity	0.04	0.01	0.52	0.58
Queue Length 95th (ft)	3	0	72	91
Control Delay (s)	1.5	0.5	25.3	24.2
Lane LOS	A	A	D	C
Approach Delay (s)	1.5	0.5	25.3	24.2
Approach LOS			D	C

Intersection Summary				
Average Delay	11.7			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2008 Existing Condition - PM Peak Hour

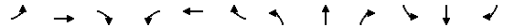
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	65	50	230	100	5	40	85	35	5	85	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.81	0.81	0.81	0.88	0.88	0.88	0.77	0.77	0.77
Hourly flow rate (vph)	11	69	53	284	123	6	45	97	40	6	110	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	130			122			873	815	96	900	838	127
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	130			122			873	815	96	900	838	127
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			81			70	61	96	96	55	99
cM capacity (veh/h)	1468			1459			150	250	958	150	244	929

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	133	414	182	123
Volume Left	11	284	45	6
Volume Right	53	6	40	6
cSH	1468	1459	249	245
Volume to Capacity	0.01	0.19	0.73	0.50
Queue Length 95th (ft)	1	18	127	65
Control Delay (s)	0.7	6.1	50.7	33.7
Lane LOS	A	A	F	D
Approach Delay (s)	0.7	6.1	50.7	33.7
Approach LOS			F	D

Intersection Summary				
Average Delay	18.7			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2008 Existing Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	240	15	170	380	25	25	45	80	25	60	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.85	0.85	0.85	0.78	0.78	0.78	0.88	0.88	0.88
Hourly flow rate (vph)	7	333	21	200	447	29	32	58	103	28	68	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	476			354			1271	1234	344	1351	1230	462
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	476			354			1271	1234	344	1351	1230	462
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			83			59	61	85	57	54	97
cM capacity (veh/h)	1096			1210			78	148	694	66	147	604

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	361	676	192	114
Volume Left	7	200	32	28
Volume Right	21	29	103	17
cSH	1096	1210	203	123
Volume to Capacity	0.01	0.17	0.95	0.92
Queue Length 95th (ft)	0	15	197	149
Control Delay (s)	0.2	3.9	98.9	128.6
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	3.9	98.9	128.6
Approach LOS			F	F

Intersection Summary				
Average Delay	27.1			
Intersection Capacity Utilization	65.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Appendix A – Capacity Analysis Results

- No-Build Condition
- Build Condition
- Build with Mitigation Condition

Capacity Analysis Results
No-Build Condition

Fall River

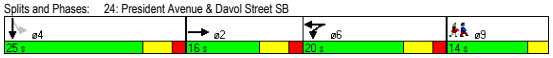
Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	10	5	400	15	0	0	0	0	435	480	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	8	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		238			272			1959			1114		
Travel Time (s)		5.4			6.2			44.5			25.3		
Peak Hour Factor	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88	
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%	
Shared Lane Traffic (%)				48%									
Lane Group Flow (vph)	0	27	0	237	235	0	0	0	0	0	1045	0	
Turn Type				Split						Perm			
Protected Phases		2		6	6						4		9
Permitted Phases										4			
Detector Phase		2		6	6					4	4		
Switch Phase													
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0		7.0
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0		14.0
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	14.0
Total Split (%)	0.0%	21.3%	0.0%	26.7%	26.7%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	19%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0		11.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0		3.0
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0		3.0
Recall Mode		None		Min	Min					C-Max	C-Max		None
Walk Time (s)													5.0
Flash Dont Walk (s)													6.0
Pedestrian Calls (#/hr)													5
v/c Ratio		0.17		0.73	0.67						0.57		
Control Delay		26.3		53.6	49.3						18.7		
Queue Delay		0.0		1.2	2.1						0.0		
Total Delay		26.3		54.7	51.4						18.7		
Queue Length 50th (ft)		8		125	121						128		
Queue Length 95th (ft)		17		#214	197						#422		
Internal Link Dist (ft)		158			192			1879			1034		
Turn Bay Length (ft)													
Base Capacity (vph)		250		333	359						1820		
Starvation Cap Reductn		0		19	45						0		
Spillback Cap Reductn		0		0	0						0		
Storage Cap Reductn		0		0	0						0		
Reduced v/c Ratio		0.11		0.75	0.75						0.57		

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 5 (7%), Referenced to phase 4:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: President Avenue & Davol Street SB



HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	10	5	400	15	0	0	0	0	435	480	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	8
Total Lost time (s)		6.0		6.0	6.0						6.0	
Lane Util. Factor		1.00		0.95	0.95						0.95	
Frt		0.96		1.00	1.00						1.00	
Flt Protected		1.00		0.95	0.96						0.98	
Satd. Flow (prot)		1814		1569	1694						3473	
Flt Permitted		1.00		0.95	0.96						0.98	
Satd. Flow (perm)		1814		1569	1694						3473	
Peak-hour factor, PHF	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	18	9	455	17	0	0	0	0	494	545	6
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	18	0	237	235	0	0	0	0	0	1044	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%
Turn Type				Split						Perm		
Protected Phases		2		6	6						4	
Permitted Phases										4		
Actuated Green, G (s)		3.0		15.5	15.5						33.3	
Effective Green, g (s)		3.0		15.5	15.5						33.3	
Actuated g/C Ratio		0.04		0.21	0.21						0.44	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		73		324	350						1542	
v/s Ratio Prot		c0.01		c0.15	0.14							
v/s Ratio Perm											0.30	
v/c Ratio		0.25		0.73	0.67						0.68	
Uniform Delay, d1		34.9		27.8	27.4						16.6	
Progression Factor		1.00		1.43	1.44						1.00	
Incremental Delay, d2		1.8		8.0	4.9						2.4	
Delay (s)		36.7		47.9	44.3						19.0	
Level of Service		D		D	D						B	
Approach Delay (s)		36.7			46.1			0.0			19.0	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

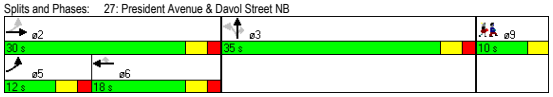
Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	30	410	0	0	330	205	85	470	290	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12	
Storage Length (ft)	0		0	0		165	0		125	0		0	
Storage Lanes	0		0	0		1	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		272			959			475			333		
Travel Time (s)		6.2			21.8			10.8			7.6		
Peak Hour Factor	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	537	0	0	375	233	0	603	315	0	0	0	
Turn Type	pm+pt					Perm	Perm		Perm				
Protected Phases	5	2			6			3					9
Permitted Phases	2					6	3		3				
Detector Phase	5	2			6	6	3	3	3				
Switch Phase													
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0				7.0
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0				10.0
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0	10.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%	13%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0				7.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag							
Lead-Lag Optimize?	Yes				Yes	Yes							
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None				Ped
Walk Time (s)													4.0
Flash Dont Walk (s)													3.0
Pedestrian Calls (#/hr)													1
v/c Ratio		0.39			0.25	0.34		0.61	0.68				
Control Delay		20.1			15.1	17.4		25.0	30.5				
Queue Delay		0.3			0.0	0.0		0.1	0.0				
Total Delay		20.4			15.1	17.4		25.1	30.5				
Queue Length 50th (ft)		38			55	68		126	129				
Queue Length 95th (ft)		162			99	141		149	179				
Internal Link Dist (ft)		192			879			395			253		
Turn Bay Length (ft)						165			125				
Base Capacity (vph)		1362			1498	693		1348	633				
Starvation Cap Reductn		315			0	0		0	0				
Spillback Cap Reductn		0			0	0		156	0				
Storage Cap Reductn		0			0	0		0	0				
Reduced v/c Ratio		0.51			0.25	0.34		0.51	0.50				

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	410	0	0	330	205	85	470	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3384			3388	1568		3372	1583			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3080			3388	1568		3372	1583			
Peak-hour factor, PHF	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	500	0	0	375	233	92	511	315	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	537	0	0	375	233	0	603	315	0	0	0
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		33.2			33.2	33.2		21.8	21.8			
Effective Green, g (s)		33.2			33.2	33.2		21.8	21.8			
Actuated g/C Ratio		0.44			0.44	0.44		0.29	0.29			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1363			1500	694		980	460			
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.17				0.15		0.18	c0.20			
v/c Ratio		0.39			0.25	0.34		0.62	0.68			
Uniform Delay, d1		14.1			13.1	13.7		23.0	23.6			
Progression Factor		1.22			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.2			0.4	1.3		1.2	4.2			
Delay (s)		17.4			13.5	15.0		24.1	27.8			
Level of Service		B			B	B		C	C			
Approach Delay (s)		17.4			14.1			25.4			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

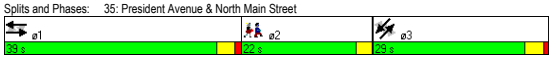
Lanes, Volumes, Timings
35: President Avenue & North Main Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR	ø2
Lane Configurations													
Volume (vph)	140	495	70	55	345	70	100	195	75	105	165	80	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12	
Storage Length (ft)	0		0	125		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		959			1952			265			1409		
Travel Time (s)		21.8			44.4			6.0			32.0		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75	
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0	
Parking (#/hr)			5										
Shared Lane Traffic (%)													
Lane Group Flow (vph)	161	649	0	63	477	0	0	425	0	0	467	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		1			1			3			3		2
Permitted Phases	1			1			3			3			
Detector Phase	1	1		1	1		3	3		3	3		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		10.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		22.0
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0	22.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%	24%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0		19.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lead	Lead								Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes								Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0		3.0
Recall Mode	Min	Min		Min	Min		None	None		None	None		None
Walk Time (s)													10.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													14
v/c Ratio	0.56	0.68		0.40	0.50			0.79			0.88		
Control Delay	25.4	20.5		24.4	15.9			34.8			43.4		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	25.4	20.5		24.4	15.9			34.8			43.4		
Queue Length 50th (ft)	41	177		15	113			149			173		
Queue Length 95th (ft)	#161	439		69	289			#418			#376		
Internal Link Dist (ft)		879			1872			185			1329		
Turn Bay Length (ft)				125									
Base Capacity (vph)	321	1073		176	1076			539			531		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.50	0.60		0.36	0.44			0.79			0.88		

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 69.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 35: President Avenue & North Main Street



HCM Signalized Intersection Capacity Analysis
35: President Avenue & North Main Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	140	495	70	55	345	70	100	195	75	105	165	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.97			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	2070		1805	2065			1924			1966	
Flt Permitted	0.33	1.00		0.18	1.00			0.73			0.70	
Satd. Flow (perm)	621	2070		341	2065			1433			1406	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Adj. Flow (vph)	161	569	80	63	397	80	115	224	86	140	220	107
RTOR Reduction (vph)	0	0	0	0	7	0	0	9	0	0	10	0
Lane Group Flow (vph)	161	649	0	63	470	0	0	416	0	0	457	0
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	32.0	32.0		32.0	32.0			25.6			25.6	
Effective Green, g (s)	32.0	32.0		32.0	32.0			25.6			25.6	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	278	926		153	924			513			503	
v/s Ratio Prot		c0.31			0.23							
v/s Ratio Perm	0.26			0.18				0.29			c0.32	
v/c Ratio	0.58	0.70		0.41	0.51			0.81			0.91	
Uniform Delay, d1	14.7	15.9		13.4	14.1			20.8			21.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	4.6	3.0		3.7	0.9			11.1			21.8	
Delay (s)	19.3	18.9		17.1	15.0			31.8			43.6	
Level of Service	B	B		B	B			C			D	
Approach Delay (s)		19.0			15.3			31.8			43.6	
Approach LOS		B			B			C			D	

Intersection Summary					
HCM Average Control Delay	25.7	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	71.5	Sum of lost time (s)		13.9	
Intersection Capacity Utilization	73.7%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2030 No-Build Conditions - AM Peak Hour

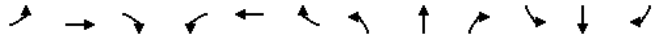
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	260	50	10	65	25	170
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.90	0.90	0.62	0.62	0.78	0.78
Hourly flow rate (vph)	289	56	16	105	32	218
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	278	141	250			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	278	141	250			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	94	99			
cM capacity (veh/h)	705	912	1327			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	344	121	250
Volume Left	289	16	0
Volume Right	56	0	218
cSH	732	1327	1700
Volume to Capacity	0.47	0.01	0.15
Queue Length 95th (ft)	63	1	0
Control Delay (s)	14.2	1.1	0.0
Lane LOS	B	A	
Approach Delay (s)	14.2	1.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization		43.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Ponta Delgada

2030 No-Build Conditions - AM Peak Hour



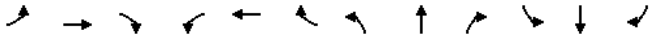
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	0	35	10	5	5	10	310	20	160	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.72	0.72	0.72	0.91	0.91	0.91	0.87	0.87	0.87
Hourly flow rate (vph)	0	31	0	49	14	7	5	11	341	23	184	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	448	604	195	449	445	181	207			352		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448	604	195	449	445	181	207			352		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	100	90	97	99	100			98		
cM capacity (veh/h)	500	386	851	482	499	866	1376			1191		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	31	69	357	230
Volume Left	0	49	5	23
Volume Right	0	7	341	23
cSH	386	508	1376	1191
Volume to Capacity	0.08	0.14	0.00	0.02
Queue Length 95th (ft)	7	12	0	1
Control Delay (s)	15.1	13.2	0.2	1.0
Lane LOS	C	B	A	A
Approach Delay (s)	15.1	13.2	0.2	1.0
Approach LOS	C	B		

Intersection Summary			
Average Delay		2.4	
Intersection Capacity Utilization		37.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2030 No-Build Conditions - AM Peak Hour



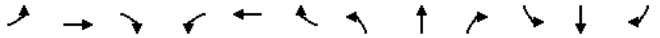
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	75	105	140	0	320	0	0	470	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.76	0.76	0.86	0.86	0.86	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	0	99	138	184	0	372	0	0	588	106
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1266	1013	641	1013	1066	372	694			372		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1266	1013	641	1013	1066	372	694			372		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	54	37	72	100			100		
cM capacity (veh/h)	53	241	479	216	220	669	911			1198		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	168	253	372	694
Volume Left	99	0	0	0
Volume Right	0	184	0	106
cSH	218	430	911	1700
Volume to Capacity	0.77	0.59	0.00	0.41
Queue Length 95th (ft)	135	92	0	0
Control Delay (s)	61.6	24.6	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	39.4		0.0	0.0
Approach LOS	E			

Intersection Summary				
Average Delay	11.2			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	35	140	180	25	30	20	10	150	75	235	295	30
Peak Hour Factor	0.94	0.94	0.94	0.76	0.76	0.76	0.84	0.84	0.84	0.81	0.81	0.81
Hourly flow rate (vph)	37	149	191	33	39	26	12	179	89	290	364	37

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	378	99	280	691
Volume Left (vph)	37	33	12	290
Volume Right (vph)	191	26	89	37
Hadj (s)	0.04	-0.02	-0.17	0.07
Departure Headway (s)	6.8	7.7	6.7	6.4
Degree Utilization, x	0.72	0.21	0.52	1.22
Capacity (veh/h)	509	407	507	557
Control Delay (s)	25.3	12.8	16.7	137.8
Approach Delay (s)	25.3	12.8	16.7	137.8
Approach LOS	D	B	C	F

Intersection Summary				
Delay	76.6			
HCM Level of Service	F			
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2030 No-Build Conditions - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	45	720	165	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.68	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	66	791	181	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	882	486			973	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	882	486			973	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	87			100	
cM capacity (veh/h)	290	509			717	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	66	527	445
Volume Left	0	0	0
Volume Right	66	0	181
cSH	509	1700	1700
Volume to Capacity	0.13	0.31	0.26
Queue Length 95th (ft)	11	0	0
Control Delay (s)	13.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.1	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		35.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & North Davol Street

2030 No-Build Conditions - AM Peak Hour

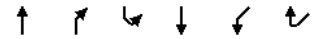
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	80	765	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	87	841	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	841	420			841	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	841	420			841	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			100	
cM capacity (veh/h)	308	585			803	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	87	420	420
Volume Left	0	0	0
Volume Right	87	0	0
cSH	585	1700	1700
Volume to Capacity	0.15	0.25	0.25
Queue Length 95th (ft)	13	0	0
Control Delay (s)	12.2	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.2	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		32.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
85: Davol St. SB & U-Turn to SB U-turn to SB Davol St

2030 No-Build Conditions - AM Peak Hour



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	770	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.75	0.75
Hourly flow rate (vph)	0	0	0	895	27	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		448	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		448	0
tC, single (s)			4.1		7.1	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		95	100
cM capacity (veh/h)			1636		510	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	448	448	27
Volume Left	0	0	27
Volume Right	0	0	0
cSH	1700	1700	510
Volume to Capacity	0.26	0.26	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	12.5
Lane LOS			B
Approach Delay (s)	0.0		12.5
Approach LOS			B

Intersection Summary			
Average Delay			0.4
Intersection Capacity Utilization			49.5%
Analysis Period (min)			15
ICU Level of Service			A

HCM Unsignalized Intersection Capacity Analysis
88: Davol St. NB & U-turn to NB Davol St

2030 No-Build Conditions - AM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	760	0	0	120	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.72	0.72
Hourly flow rate (vph)	0	844	0	0	167	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				422	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				422	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				70	100
cM capacity (veh/h)	1636				562	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	422	422	167
Volume Left	0	0	167
Volume Right	0	0	0
cSH	1700	1700	562
Volume to Capacity	0.25	0.25	0.30
Queue Length 95th (ft)	0	0	31
Control Delay (s)	0.0	0.0	14.1
Lane LOS			B
Approach Delay (s)	0.0		14.1
Approach LOS			B

Intersection Summary			
Average Delay			2.3
Intersection Capacity Utilization			52.7%
Analysis Period (min)			15
ICU Level of Service			A

Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

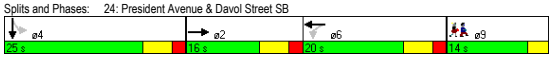
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	355	5	0	0	0	0	545	535	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		238			272			1959			1114		
Travel Time (s)		5.4			6.2			44.5			25.3		
Peak Hour Factor	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	
Shared Lane Traffic (%)				49%									
Lane Group Flow (vph)	0	0	0	213	211	0	0	0	0	0	1200	0	
Turn Type				Perm						Perm			
Protected Phases		2			6						4		9
Permitted Phases				6						4			
Detector Phase		2		6	6					4	4		
Switch Phase													
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0		7.0
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0		14.0
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	14.0
Total Split (%)	0.0%	21.3%	0.0%	26.7%	26.7%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	19%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0		11.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0		3.0
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0		3.0
Recall Mode		None		Min	Min					C-Max	C-Max		None
Walk Time (s)													5.0
Flash Dont Walk (s)													6.0
Pedestrian Calls (#/hr)													5
v/c Ratio				0.52	0.48						0.64		
Control Delay				35.1	33.8						17.2		
Queue Delay				2.3	2.5						0.0		
Total Delay				37.4	36.3						17.2		
Queue Length 50th (ft)				104	103						174		
Queue Length 95th (ft)				162	158						#446		
Internal Link Dist (ft)		158			192			1879			1034		
Turn Bay Length (ft)													
Base Capacity (vph)				414	444						1884		
Starvation Cap Reductn				102	133						0		
Spillback Cap Reductn				0	0						0		
Storage Cap Reductn				0	0						0		
Reduced v/c Ratio				0.68	0.68						0.64		

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 5 (7%), Referenced to phase 4:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 24: President Avenue & Davol Street SB



HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	355	5	0	0	0	0	545	535	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)				6.0	6.0						6.0	
Lane Util. Factor				0.95	0.95						0.95	
Frt				1.00	1.00						1.00	
Flt Protected				0.95	0.95						0.98	
Satd. Flow (prot)				1600	1721						3452	
Flt Permitted				0.95	0.95						0.98	
Satd. Flow (perm)				1600	1715						3452	
Peak-hour factor, PHF	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	418	6	0	0	0	0	606	594	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	213	211	0	0	0	0	0	1200	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)				19.3	19.3						38.5	
Effective Green, g (s)				19.3	19.3						38.5	
Actuated g/C Ratio				0.26	0.26						0.51	
Clearance Time (s)				6.0	6.0						6.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)				412	441						1772	
v/s Ratio Prot												
v/s Ratio Perm				c0.13	0.12						0.35	
v/c Ratio				0.52	0.48						0.68	
Uniform Delay, d1				23.9	23.6						13.6	
Progression Factor				1.32	1.32						1.00	
Incremental Delay, d2				1.1	0.8						2.1	
Delay (s)				32.5	31.9						15.7	
Level of Service				C	C						B	
Approach Delay (s)		0.0			32.2			0.0			15.7	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

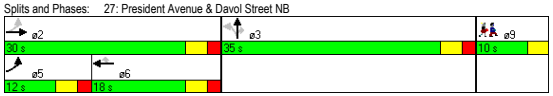
Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	35	510	0	0	290	365	70	620	300	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12	
Storage Length (ft)	0		0	0		165	0		125	0		0	
Storage Lanes	0		0	0		1	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		272			959			475			333		
Travel Time (s)		6.2			21.8			10.8			7.6		
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92	
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	592	0	0	326	410	0	793	345	0	0	0	
Turn Type	pm+pt					Perm	Perm		Perm				
Protected Phases	5	2			6			3					9
Permitted Phases	2					6	3		3				
Detector Phase	5	2			6	6	3	3	3				
Switch Phase													
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0				7.0
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0				10.0
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0	10.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%	13%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0				7.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag							
Lead-Lag Optimize?	Yes				Yes	Yes							
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0				3.0
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None				Ped
Walk Time (s)													4.0
Flash Dont Walk (s)													3.0
Pedestrian Calls (#/hr)													5
v/c Ratio		0.46			0.23	0.63		0.71	0.65				
Control Delay		16.1			16.3	25.2		25.3	27.3				
Queue Delay		0.3			0.0	0.0		0.0	0.0				
Total Delay		16.4			16.3	25.2		25.3	27.3				
Queue Length 50th (ft)		37			51	149		166	135				
Queue Length 95th (ft)		147			88	#300		192	188				
Internal Link Dist (ft)		192			879			395			253		
Turn Bay Length (ft)						165			125				
Base Capacity (vph)		1281			1405	650		1376	646				
Starvation Cap Reductn		243			0	0		0	0				
Spillback Cap Reductn		0			0	0		0	0				
Storage Cap Reductn		0			0	0		0	0				
Reduced v/c Ratio		0.57			0.23	0.63		0.58	0.53				

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	510	0	0	290	365	70	620	300	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3440			3455	1599		3441	1615			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3150			3455	1599		3441	1615			
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	38	554	0	0	326	410	80	713	345	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	592	0	0	326	410	0	793	345	0	0	0
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		30.5			30.5	30.5		24.5	24.5			
Effective Green, g (s)		30.5			30.5	30.5		24.5	24.5			
Actuated g/C Ratio		0.41			0.41	0.41		0.33	0.33			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1281			1405	650		1124	528			
v/s Ratio Prot					0.09							
v/s Ratio Perm		0.19				c0.26		0.23	0.21			
v/c Ratio		0.46			0.23	0.63		0.71	0.65			
Uniform Delay, d1		16.3			14.6	17.8		22.1	21.6			
Progression Factor		0.86			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.2			0.4	4.6		2.0	2.9			
Delay (s)		14.2			15.0	22.4		24.1	24.5			
Level of Service		B			B	C		C	C			
Approach Delay (s)		14.2			19.1			24.3			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

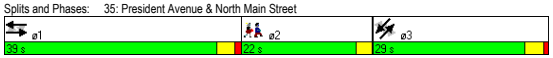
Lanes, Volumes, Timings
35: President Avenue & North Main Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR	ø2
Lane Configurations													
Volume (vph)	120	570	120	60	435	60	120	255	75	155	195	90	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12	
Storage Length (ft)	0		0	125		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		959			1952			265			1409		
Travel Time (s)		21.8			44.4			6.0			32.0		
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96	
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0	
Parking (#/hr)			5										
Shared Lane Traffic (%)													
Lane Group Flow (vph)	133	766	0	71	583	0	0	489	0	0	458	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		1			1			3			3		2
Permitted Phases	1			1			3			3			
Detector Phase	1	1		1	1		3	3		3	3		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		10.0
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0		22.0
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0	22.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%	24%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0		19.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead		Lead	Lead								Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes								Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0		3.0
Recall Mode	Min	Min		Min	Min		None	None		None	None		None
Walk Time (s)													10.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													8
v/c Ratio	0.57	0.76		0.71	0.57			0.90			1.02		
Control Delay	28.9	23.2		59.7	17.2			45.4			75.9		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	28.9	23.2		59.7	17.2			45.4			75.9		
Queue Length 50th (ft)	35	228		20	149			180			179		
Queue Length 95th (ft)	#162	#653		#114	360			#514			#519		
Internal Link Dist (ft)		879			1872			185			1329		
Turn Bay Length (ft)				125									
Base Capacity (vph)	233	1013		100	1029			545			447		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.57	0.76		0.71	0.57			0.90			1.02		

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 72.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 35: President Avenue & North Main Street



HCM Signalized Intersection Capacity Analysis
35: President Avenue & North Main Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	120	570	120	60	435	60	120	255	75	155	195	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1752	2069		1719	2091			2060			2028	
Flt Permitted	0.26	1.00		0.11	1.00			0.74			0.61	
Satd. Flow (perm)	476	2069		204	2091			1535			1253	
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	133	633	133	71	512	71	130	277	82	161	203	94
RTOR Reduction (vph)	0	0	0	0	5	0	0	7	0	0	9	0
Lane Group Flow (vph)	133	766	0	71	578	0	0	482	0	0	449	0
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	35.4	35.4		35.4	35.4			25.3			25.3	
Effective Green, g (s)	35.4	35.4		35.4	35.4			25.3			25.3	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.34			0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	225	979		97	990			519			424	
v/s Ratio Prot		c0.37			0.28							
v/s Ratio Perm	0.28			0.35				0.31			c0.36	
v/c Ratio	0.59	0.78		0.73	0.58			0.93			1.06	
Uniform Delay, d1	14.4	16.5		15.9	14.3			23.9			24.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.2	4.8		29.0	1.4			24.3			60.0	
Delay (s)	20.6	21.3		44.9	15.7			48.2			84.7	
Level of Service	C	C		D	B			D			F	
Approach Delay (s)		21.2			18.9			48.2			84.7	
Approach LOS		C			B			D			F	

Intersection Summary					
HCM Average Control Delay	37.5	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	14.1		
Intersection Capacity Utilization	90.2%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2030 No-Build Conditions - PM Peak Hour

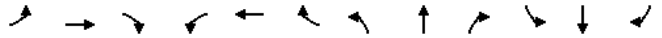
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	155	30	15	15	25	275
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.74	0.74
Hourly flow rate (vph)	174	34	16	16	34	372
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	269	220	405			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	269	220	405			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	96	99			
cM capacity (veh/h)	712	825	1164			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	208	33	405
Volume Left	174	16	0
Volume Right	34	0	372
cSH	728	1164	1700
Volume to Capacity	0.29	0.01	0.24
Queue Length 95th (ft)	29	1	0
Control Delay (s)	11.9	4.1	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	4.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay			4.0	
Intersection Capacity Utilization			42.1%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Ponta Delgada

2030 No-Build Conditions - PM Peak Hour



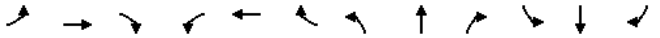
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	25	5	70	0	5	0	10	165	35	230	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.67	0.67	0.67	0.91	0.91	0.91	0.78	0.78	0.78
Hourly flow rate (vph)	0	36	7	104	0	7	0	11	181	45	295	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	500	583	301	518	499	102	308			192		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500	583	301	518	499	102	308			192		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	91	99	75	100	99	100			97		
cM capacity (veh/h)	469	402	743	425	461	959	1264			1375		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	112	192	353
Volume Left	0	104	0	45
Volume Right	7	7	181	13
cSH	436	441	1264	1375
Volume to Capacity	0.10	0.25	0.00	0.03
Queue Length 95th (ft)	8	25	0	3
Control Delay (s)	14.2	15.9	0.0	1.2
Lane LOS	B	C		A
Approach Delay (s)	14.2	15.9	0.0	1.2
Approach LOS	B	C		

Intersection Summary				
Average Delay			4.0	
Intersection Capacity Utilization			46.2%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2030 No-Build Conditions - PM Peak Hour



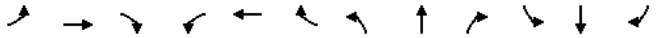
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	130	120	275	5	330	0	0	470	125
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.86	0.86	0.86	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	151	140	320	6	423	0	0	522	139
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1417	1028	592	1028	1097	423	661			423		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1417	1028	592	1028	1097	423	661			423		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	28	34	50	99			100		
cM capacity (veh/h)	27	234	510	211	210	635	937			1147		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	221	390	429	661
Volume Left	151	0	6	0
Volume Right	0	320	0	139
cSH	211	466	937	1700
Volume to Capacity	1.05	0.84	0.01	0.39
Queue Length 95th (ft)	244	205	1	0
Control Delay (s)	123.1	41.2	0.2	0.0
Lane LOS	F	E	A	
Approach Delay (s)	70.8		0.2	0.0
Approach LOS	F			

Intersection Summary				
Average Delay	25.5			
Intersection Capacity Utilization	54.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	120	90	55	100	45	60	5	160	90	180	380	35
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.94	0.94	0.94	0.85	0.85	0.85
Hourly flow rate (vph)	138	103	63	132	59	79	5	170	96	212	447	41

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	305	270	271	700
Volume Left (vph)	138	132	5	212
Volume Right (vph)	63	79	96	41
Hadj (s)	0.01	-0.07	-0.19	0.04
Departure Headway (s)	7.6	7.6	7.4	7.0
Degree Utilization, x	0.64	0.57	0.56	1.36
Capacity (veh/h)	452	438	455	505
Control Delay (s)	23.1	20.4	19.3	195.2
Approach Delay (s)	23.1	20.4	19.3	195.2
Approach LOS	C	C	C	F

Intersection Summary				
Delay	99.9			
HCM Level of Service	F			
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2030 No-Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	60	840	125	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	0	107	933	139	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1003	536			1072	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1003	536			1072	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			100	
cM capacity (veh/h)	242	489			658	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	107	622	450
Volume Left	0	0	0
Volume Right	107	0	139
cSH	489	1700	1700
Volume to Capacity	0.22	0.37	0.26
Queue Length 95th (ft)	21	0	0
Control Delay (s)	14.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.4	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & North Davol Street

2030 No-Build Conditions - PM Peak Hour

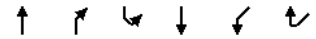
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	75	915	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	0	112	1064	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	1064	532			1064	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1064	532			1064	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	77			100	
cM capacity (veh/h)	221	495			663	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	112	532	532
Volume Left	0	0	0
Volume Right	112	0	0
cSH	495	1700	1700
Volume to Capacity	0.23	0.31	0.31
Queue Length 95th (ft)	22	0	0
Control Delay (s)	14.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.4	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
85: Davol St. SB & U-Turn to SB U-turn to SB Davol St

2030 No-Build Conditions - PM Peak Hour



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	785	20	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	0	0	0	853	40	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		427	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		427	0
tC, single (s)			4.1		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1636		536	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	427	427	40
Volume Left	0	0	40
Volume Right	0	0	0
cSH	1700	1700	536
Volume to Capacity	0.25	0.25	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.0	12.3
Lane LOS			B
Approach Delay (s)	0.0		12.3
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		53.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
88: Davol St. NB & U-turn to NB Davol St

2030 No-Build Conditions - PM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	885	0	0	80	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	0	994	0	0	90	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				497	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				497	0
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	100
cM capacity (veh/h)	1636				500	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	497	497	90
Volume Left	0	0	90
Volume Right	0	0	0
cSH	1700	1700	500
Volume to Capacity	0.29	0.29	0.18
Queue Length 95th (ft)	0	0	16
Control Delay (s)	0.0	0.0	13.8
Lane LOS			B
Approach Delay (s)	0.0		13.8
Approach LOS			B

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		56.1%	ICU Level of Service B
Analysis Period (min)		15	

Freetown

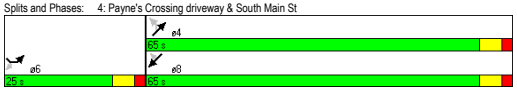
Lanes, Volumes, Timings
4: Payne's Crossing driveway & South Main St — 2030 No Build Conditions - AM Peak Hour

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	5	5	5	327	435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	381			1115	461	
Travel Time (s)	8.7			25.3	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	5	5	355	473	0
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	25.0	25.0	65.0	65.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	59.0	59.0	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.02	0.05	0.01	0.24	0.32	
Control Delay	39.4	25.4	1.8	2.6	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.1	
Total Delay	39.4	25.4	1.8	2.6	0.7	
Queue Length 50th (ft)	1	0	1	35	1	
Queue Length 95th (ft)	7	11	2	58	1	
Internal Link Dist (ft)	301			1035	381	
Turn Bay Length (ft)			200			
Base Capacity (vph)	725	338	732	1496	1496	
Starvation Cap Reductn	0	0	0	0	298	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.01	0.01	0.24	0.39	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 33 (37%), Referenced to phase 4:NETL and 8:SWT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 4: Payne's Crossing driveway & South Main St



HCM Signalized Intersection Capacity Analysis
4: Payne's Crossing driveway & South Main St — 2030 No Build Conditions - AM Peak Hour

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	5	5	5	327	435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	1863	1863	
Flt Permitted	0.95	1.00	0.49	1.00	1.00	
Satd. Flow (perm)	3433	1583	913	1863	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	5	5	355	473	0
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	5	0	5	355	473	0
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	5.8	5.8	72.2	72.2	72.2	
Effective Green, g (s)	5.8	5.8	72.2	72.2	72.2	
Actuated g/C Ratio	0.06	0.06	0.80	0.80	0.80	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	221	102	732	1495	1495	
v/s Ratio Prot	c0.00			0.19	c0.25	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.02	0.00	0.01	0.24	0.32	
Uniform Delay, d1	39.4	39.4	1.8	2.2	2.4	
Progression Factor	1.00	1.00	1.00	1.00	0.01	
Incremental Delay, d2	0.0	0.0	0.0	0.4	0.5	
Delay (s)	39.5	39.4	1.8	2.5	0.6	
Level of Service	D	D	A	A	A	
Approach Delay (s)	39.4			2.5	0.6	
Approach LOS	D			A	A	

Intersection Summary

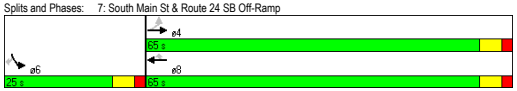
HCM Average Control Delay	1.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	275	430	875	120	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	16	12
Storage Length (ft)	0			240	0	0
Storage Lanes	1			2	1	1
Taper Length (ft)	25			25	25	25
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		461	773		388	
Travel Time (s)		10.5	17.6		8.8	
Peak Hour Factor	0.85	0.85	0.87	0.87	0.91	0.91
Heavy Vehicles (%)	9%	11%	12%	2%	15%	24%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	53	324	494	1006	132	5
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Detector Phase	4	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	65.0	65.0	65.0	65.0	25.0	25.0
Total Split (%)	72.2%	72.2%	72.2%	72.2%	27.8%	27.8%
Maximum Green (s)	59.0	59.0	59.0	59.0	19.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.09	0.26	0.21	0.67	0.56	0.03
Control Delay	4.3	4.6	0.5	1.2	45.0	19.6
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0
Total Delay	4.3	4.6	0.5	2.4	45.0	19.6
Queue Length 50th (ft)	7	49	3	0	71	0
Queue Length 95th (ft)	18	71	m4	m0	122	10
Internal Link Dist (ft)		381	693		308	
Turn Bay Length (ft)				240		
Base Capacity (vph)	602	1256	2365	1507	376	279
Starvation Cap Reductn	0	0	0	279	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.26	0.21	0.82	0.35	0.02

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 7: South Main St & Route 24 SB Off-Ramp



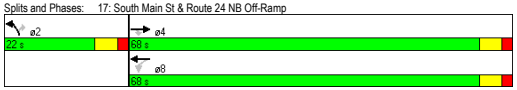
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	275	430	875	120	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	16	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	1712	3223	1689	1779	1302
Flt Permitted	0.47	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	822	1712	3223	1689	1779	1302
Peak-hour factor, PHF	0.85	0.85	0.87	0.87	0.91	0.91
Adj. Flow (vph)	53	324	494	1006	132	5
RTOR Reduction (vph)	0	0	0	268	0	4
Lane Group Flow (vph)	53	324	494	738	132	1
Heavy Vehicles (%)	9%	11%	12%	2%	15%	24%
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	66.0	66.0	66.0	66.0	12.0	12.0
Effective Green, g (s)	66.0	66.0	66.0	66.0	12.0	12.0
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	603	1255	2364	1239	237	174
v/s Ratio Prot		0.19	0.15		c0.07	
v/s Ratio Perm	0.06			c0.44		0.00
v/c Ratio	0.09	0.26	0.21	0.60	0.56	0.00
Uniform Delay, d1	3.4	3.9	3.8	5.7	36.5	33.8
Progression Factor	0.94	0.90	0.11	1.21	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.1	0.6	2.8	0.0
Delay (s)	3.5	4.1	0.5	7.4	39.3	33.8
Level of Service	A	A	A	A	D	C
Approach Delay (s)		4.0	5.1		39.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	325	60	120	1290	15	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	15	16	16
Storage Length (ft)		200	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	773			446	481	
Travel Time (s)	17.6			10.1	10.9	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80
Heavy Vehicles (%)	7%	26%	10%	3%	33%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	396	73	136	1466	19	644
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	68.0	68.0	68.0	68.0	22.0	22.0
Total Split (%)	75.6%	75.6%	75.6%	75.6%	24.4%	24.4%
Maximum Green (s)	62.0	62.0	62.0	62.0	16.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.31	0.07	0.21	1.00	0.08	0.92
Control Delay	4.0	0.5	5.7	39.9	32.1	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	0.5	5.7	39.9	32.1	27.3
Queue Length 50th (ft)	51	0	25	~917	9	62
Queue Length 95th (ft)	67	3	46	#1125	25	128
Internal Link Dist (ft)	693			366	401	
Turn Bay Length (ft)		200	100			
Base Capacity (vph)	1278	1066	645	1461	273	741
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.07	0.21	1.00	0.07	0.87

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: South Main St & Route 24 NB Off-Ramp



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	325	60	120	1290	15	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	15	16	16
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1453	1641	2029	1538	1760
Flt Permitted	1.00	1.00	0.52	1.00	0.95	1.00
Satd. Flow (perm)	1776	1453	897	2029	1538	1760
Peak-hour factor, PHF	0.82	0.82	0.88	0.88	0.80	0.80
Adj. Flow (vph)	396	73	136	1466	19	644
RTOR Reduction (vph)	0	20	0	0	0	445
Lane Group Flow (vph)	396	53	136	1466	19	199
Heavy Vehicles (%)	7%	26%	10%	3%	33%	4%
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	64.8	64.8	64.8	64.8	13.2	13.2
Effective Green, g (s)	64.8	64.8	64.8	64.8	13.2	13.2
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.15	0.15
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1279	1046	646	1461	226	258
v/s Ratio Prot	0.22			c0.72	0.01	
v/s Ratio Perm		0.04	0.15			c0.11
v/c Ratio	0.31	0.05	0.21	1.00	0.08	0.77
Uniform Delay, d1	4.5	3.7	4.2	12.6	33.2	37.0
Progression Factor	0.65	0.28	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.7	24.4	0.2	13.4
Delay (s)	3.6	1.1	4.9	37.0	33.3	50.4
Level of Service	A	A	A	D	C	D
Approach Delay (s)	3.2			34.2	49.9	
Approach LOS	A			C	D	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

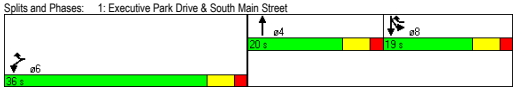
Lanes, Volumes, Timings
1: Executive Park Drive & South Main Street

2030 No-Build Condition - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	1385	220	40	190	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Storage Length (ft)	0	0		0	200	
Storage Lanes	1	2		1	1	
Taper Length (ft)	100	100		100	100	
Right Turn on Red		No		No		
Link Speed (mph)	35		35			35
Link Distance (ft)	285		553			804
Travel Time (s)	5.6		10.8			15.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	11	1458	274	0	180	194
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Detector Phase	6	6 8	4		8	8
Switch Phase						
Minimum Initial (s)	6.0		6.0		6.0	6.0
Minimum Split (s)	12.0		12.0		12.0	12.0
Total Split (s)	36.0	55.0	20.0	0.0	19.0	19.0
Total Split (%)	48.0%	73.3%	26.7%	0.0%	25.3%	25.3%
Maximum Green (s)	30.0		14.0		13.0	13.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	C-Max		None		None	None
v/c Ratio	0.01	0.82	0.77		0.68	0.65
Control Delay	5.8	14.2	45.0		43.9	40.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.8	14.2	45.0		43.9	40.8
Queue Length 50th (ft)	1	113	121		83	89
Queue Length 95th (ft)	m4	186	#229		#173	#175
Internal Link Dist (ft)	205		473			724
Turn Bay Length (ft)					200	
Base Capacity (vph)	757	1771	370		265	297
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.01	0.82	0.74		0.68	0.65

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 6:WBL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1: Executive Park Drive & South Main Street



HCM Signalized Intersection Capacity Analysis
1: Executive Park Drive & South Main Street

2030 No-Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	1385	220	40	190	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.88	1.00		0.95	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	0.99
Satd. Flow (prot)	1796	2623	1852		1528	1711
Flt Permitted	0.95	1.00	1.00		0.95	0.99
Satd. Flow (perm)	1796	2623	1852		1528	1711
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	1458	232	42	200	174
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	11	1458	274	0	180	194
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Actuated Green, G (s)	30.6	49.6	13.4		13.0	13.0
Effective Green, g (s)	31.6	50.6	14.4		13.0	13.0
Actuated g/C Ratio	0.42	0.67	0.19		0.17	0.17
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	757	1770	356		265	297
v/s Ratio Prot	0.01	c0.56	c0.15		0.12	0.11
v/s Ratio Perm						
v/c Ratio	0.01	0.82	0.77		0.68	0.65
Uniform Delay, d1	12.6	8.9	28.7		29.0	28.9
Progression Factor	0.44	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	3.0	9.6		6.8	5.1
Delay (s)	5.6	12.0	38.4		35.8	34.0
Level of Service	A	B	D		D	C
Approach Delay (s)	11.9		38.4			34.9
Approach LOS	B		D			C

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
2: Executive Park Drive & Route 24 SB Off-Ramp

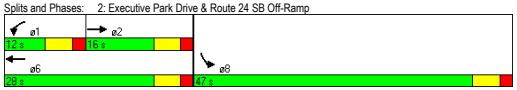
2030 No-Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	85	0	165	770	0	0	0	0	1575	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Storage Length (ft)	0		0	0		0	0		0	0		300
Storage Lanes	0		1	2		0	0		0	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		307			406			405			737	
Travel Time (s)		6.0			7.9			7.9			14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	0	174	811	0	0	0	0	1658	0	0
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Detector Phase		2		1	6					8		
Switch Phase												
Minimum Initial (s)		10.0		6.0	10.0					10.0		
Minimum Split (s)		16.0		12.0	16.0					16.0		
Total Split (s)	0.0	16.0	0.0	12.0	28.0	0.0	0.0	0.0	0.0	47.0	0.0	0.0
Total Split (%)	0.0%	21.3%	0.0%	16.0%	37.3%	0.0%	0.0%	0.0%	0.0%	62.7%	0.0%	0.0%
Maximum Green (s)		10.0		6.0	22.0					41.0		
Yellow Time (s)		4.0		4.0	4.0					4.0		
All-Red Time (s)		2.0		2.0	2.0					2.0		
Lost Time Adjust (s)	0.0	0.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Recall Mode		C-Max		None	C-Max					None		
v/c Ratio		0.19		0.54	0.77					0.92		
Control Delay		8.4		48.0	43.2					25.5		
Queue Delay		0.0		0.0	0.0					0.0		
Total Delay		8.4		48.0	43.2					25.5		
Queue Length 50th (ft)		4		45	187					329		
Queue Length 95th (ft)		m11		m58	m232					#506		
Internal Link Dist (ft)		227			326			325			657	
Turn Bay Length (ft)												
Base Capacity (vph)		458		322	1052					1830		
Starvation Cap Reductn		0		0	0					0		
Spillback Cap Reductn		0		0	0					0		
Storage Cap Reductn		0		0	0					0		
Reduced v/c Ratio		0.19		0.54	0.77					0.91		

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Executive Park Drive & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	85	0	165	770	0	0	0	0	1575	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Total Lost time (s)		6.0		5.0	5.0					6.0		
Lane Util. Factor		0.95		0.97	0.95					0.97		
Frt		1.00		1.00	1.00					1.00		
Flt Protected		1.00		0.95	1.00					0.95		
Satd. Flow (prot)		3276		3450	3359					3347		
Flt Permitted		1.00		0.95	1.00					0.95		
Satd. Flow (perm)		3276		3450	3359					3347		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	89	0	174	811	0	0	0	0	1658	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	89	0	174	811	0	0	0	0	1658	0	0
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Actuated Green, G (s)		10.5		6.0	22.5					40.5		
Effective Green, g (s)		10.5		7.0	23.5					40.5		
Actuated g/C Ratio		0.14		0.09	0.31					0.54		
Clearance Time (s)		6.0		6.0	6.0					6.0		
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Lane Grp Cap (vph)		459		322	1052					1807		
v/s Ratio Prot		0.03		0.05	c0.24					c0.50		
v/s Ratio Perm												
v/c Ratio		0.19		0.54	0.77					0.92		
Uniform Delay, d1		28.5		32.5	23.3					15.7		
Progression Factor		0.26		1.33	1.65					1.00		
Incremental Delay, d2		0.7		1.3	3.8					7.8		
Delay (s)		8.2		44.4	42.2					23.6		
Level of Service		A		D	D					C		
Approach Delay (s)		8.2			42.6			0.0			23.6	
Approach LOS		A			D			A			C	

Intersection Summary

HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

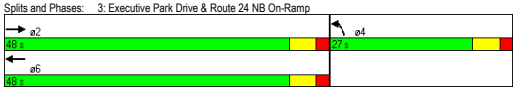
Lanes, Volumes, Timings
3: Executive Park Drive & Route 24 NB On-Ramp

2030 No-Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1575	0	0	165	0	770	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Storage Length (ft)	0		0	0		0	400		615	0		0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		352			205			1194			650	
Travel Time (s)		6.9			4.0			23.3			12.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1658	0	0	174	0	811	0	0	0	0	0
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Detector Phase		2			6		4					
Switch Phase												
Minimum Initial (s)		10.0			10.0		6.0					
Minimum Split (s)		16.0			16.0		12.0					
Total Split (s)	0.0	48.0	0.0	0.0	48.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	64.0%	0.0%	0.0%	64.0%	0.0%	36.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		42.0			42.0		21.0					
Yellow Time (s)		4.0			4.0		4.0					
All-Red Time (s)		2.0			2.0		2.0					
Lost Time Adjust (s)	0.0	-1.0	0.0	0.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0					
Recall Mode		C-Max			C-Max		None					
v/c Ratio		0.81			0.08		0.87					
Control Delay		6.8			7.3		37.0					
Queue Delay		0.0			0.0		0.0					
Total Delay		6.8			7.3		37.0					
Queue Length 50th (ft)		73			17		181					
Queue Length 95th (ft)		m126			30		#276					
Internal Link Dist (ft)		272			125			1114			570	
Turn Bay Length (ft)							400					
Base Capacity (vph)		2043			2063		956					
Starvation Cap Reductn		0			0		0					
Spillback Cap Reductn		0			0		0					
Storage Cap Reductn		0			0		0					
Reduced v/c Ratio		0.81			0.08		0.85					

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 20 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Executive Park Drive & Route 24 NB On-Ramp



HCM Signalized Intersection Capacity Analysis
3: Executive Park Drive & Route 24 NB On-Ramp

2030 No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1575	0	0	165	0	770	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Total Lost time (s)		5.0			5.0		5.0					
Lane Util. Factor		0.95			0.95		0.97					
Frt		1.00			1.00		1.00					
Flt Protected		1.00			1.00		0.95					
Satd. Flow (prot)		3522			3557		3259					
Flt Permitted		1.00			1.00		0.95					
Satd. Flow (perm)		3522			3557		3259					
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1658	0	0	174	0	811	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1658	0	0	174	0	811	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Actuated Green, G (s)		42.5			42.5		20.5					
Effective Green, g (s)		43.5			43.5		21.5					
Actuated g/C Ratio		0.58			0.58		0.29					
Clearance Time (s)		6.0			6.0		6.0					
Vehicle Extension (s)		3.0			3.0		3.0					
Lane Grp Cap (vph)		2043			2063		934					
v/s Ratio Prot		c0.47			0.05		c0.25					
v/s Ratio Perm												
v/c Ratio		0.81			0.08		0.87					
Uniform Delay, d1		12.5			7.0		25.4					
Progression Factor		0.39			1.00		1.00					
Incremental Delay, d2		1.7			0.1		8.6					
Delay (s)		6.6			7.0		34.0					
Level of Service		A			A		C					
Approach Delay (s)		6.6			7.0			34.0			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Narrows Rd & South Main St

2030 No Build Conditions - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	145	45	15	170	325	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.75	0.75	0.79	0.79
Hourly flow rate (vph)	177	55	20	227	411	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1115	
pX, platoon unblocked						
vC, conflicting volume	741	475	538			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	741	475	538			
tC, single (s)	6.5	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.5	2.3			
p0 queue free %	51	90	98			
cM capacity (veh/h)	363	555	991			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	232	247	538
Volume Left	177	20	0
Volume Right	55	0	127
cSH	396	991	1700
Volume to Capacity	0.59	0.02	0.32
Queue Length 95th (ft)	90	2	0
Control Delay (s)	26.2	0.9	0.0
Lane LOS	D	A	
Approach Delay (s)	26.2	0.9	0.0
Approach LOS	D		

Intersection Summary			
Average Delay		6.2	
Intersection Capacity Utilization		40.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
11: Copicut Rd & South Main St

2030 No Build Conditions - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	5	180	5	5	375
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	43	5	225	6	6	469
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	709	228			231	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	709	228			231	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	99			100	
cM capacity (veh/h)	399	811			1337	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	49	231	475
Volume Left	43	0	6
Volume Right	5	6	0
cSH	422	1700	1337
Volume to Capacity	0.12	0.14	0.00
Queue Length 95th (ft)	10	0	0
Control Delay (s)	14.6	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	14.6	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		33.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2030 No Build Conditions - AM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	20	5	155	70	0	20	35	540	265	75	1185	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.59	0.59	0.59	0.84	0.84	0.84	0.95	0.95	0.95
Hourly flow rate (vph)	26	7	204	119	0	34	42	643	315	79	1247	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								446				
pX, platoon unblocked	0.94	0.94		0.94	0.94	0.94				0.94		
vC, conflicting volume	2326	2450	1250	2499	2294	801	1253			958		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2382	2514	1250	2567	2349	753	1253			921		
tC, single (s)	7.1	7.0	6.2	7.3	6.5	6.4	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.4	3.3	3.7	4.0	3.5	2.3			2.3		
p0 queue free %	0	56	3	0	100	90	92			88		
cM capacity (veh/h)	17	15	210	0	28	351	519			671		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	237	153	1000	1332
Volume Left	26	119	42	79
Volume Right	204	34	315	5
cSH	81	0	519	671
Volume to Capacity	2.92	531.28	0.08	0.12
Queue Length 95th (ft)	582	Err	7	10
Control Delay (s)	976.5	Err	2.7	5.3
Lane LOS	F	F	A	A
Approach Delay (s)	976.5	Err	2.7	5.3
Approach LOS	F	F		

Intersection Summary				
Average Delay	649.2			
Intersection Capacity Utilization	117.0%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High St

2030 No Build Conditions - AM Peak Hour

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	5	540	5	5	1220	5	0	0	0	60	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.25	0.25	0.25	0.64	0.64	0.64
Hourly flow rate (vph)	5	581	5	5	1258	5	0	0	0	94	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1263			586			1880	1867	1260	1865	1867	583
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1263			586			1880	1867	1260	1865	1867	583
tC, single (s)	4.1			5.1			7.1	6.5	6.2	7.3	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			3.1			3.5	4.0	3.3	3.7	4.0	3.5
p0 queue free %	99			99			100	100	100	0	100	97
cM capacity (veh/h)	557			645			52	72	210	50	72	485

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	591	1268	0	109
Volume Left	5	5	0	94
Volume Right	5	5	0	16
cSH	557	645	1700	58
Volume to Capacity	0.01	0.01	0.00	1.90
Queue Length 95th (ft)	1	1	0	260
Control Delay (s)	0.3	0.4	0.0	578.1
Lane LOS	A	A	A	F
Approach Delay (s)	0.3	0.4	0.0	578.1
Approach LOS			A	F

Intersection Summary				
Average Delay	32.4			
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			

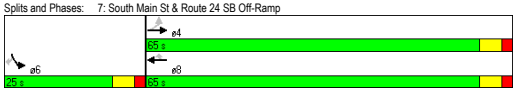
Lanes, Volumes, Timings
7: South Main St & Route 24 SB Off-Ramp

2030 No Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	210	670	600	495	155	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	12	12
Storage Length (ft)	0			240	0	0
Storage Lanes	1			2	1	1
Taper Length (ft)	25			25	25	25
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		496	772		360	
Travel Time (s)		11.3	17.5		8.2	
Peak Hour Factor	0.88	0.88	0.94	0.94	0.79	0.79
Heavy Vehicles (%)	8%	6%	6%	3%	6%	13%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	239	761	638	527	196	89
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Detector Phase	4	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	65.0	65.0	65.0	65.0	25.0	25.0
Total Split (%)	72.2%	72.2%	72.2%	72.2%	27.8%	27.8%
Maximum Green (s)	59.0	59.0	59.0	59.0	19.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.48	0.61	0.27	0.40	0.69	0.28
Control Delay	8.8	8.8	4.4	1.1	47.5	9.4
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	8.8	9.3	4.4	1.1	47.5	9.4
Queue Length 50th (ft)	30	268	43	5	105	0
Queue Length 95th (ft)	73	328	m63	m3	145	28
Internal Link Dist (ft)		416	692		280	
Turn Bay Length (ft)				240		
Base Capacity (vph)	502	1253	2382	1328	360	372
Starvation Cap Reductn	0	175	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.71	0.27	0.40	0.54	0.24

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 88 (98%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 7: South Main St & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
7: South Main St & Route 24 SB Off-Ramp

2030 No Build Conditions - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	210	670	600	495	155	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1671	1792	3406	1672	1703	1429
Flt Permitted	0.41	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	718	1792	3406	1672	1703	1429
Peak-hour factor, PHF	0.88	0.88	0.94	0.94	0.79	0.79
Adj. Flow (vph)	239	761	638	527	196	89
RTOR Reduction (vph)	0	0	0	159	0	74
Lane Group Flow (vph)	239	761	638	368	196	15
Heavy Vehicles (%)	8%	6%	6%	3%	6%	13%
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	62.9	62.9	62.9	62.9	15.1	15.1
Effective Green, g (s)	62.9	62.9	62.9	62.9	15.1	15.1
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	502	1252	2380	1169	286	240
v/s Ratio Prot		c0.42	0.19		c0.12	
v/s Ratio Perm	0.33			0.22		0.01
v/c Ratio	0.48	0.61	0.27	0.32	0.69	0.06
Uniform Delay, d1	6.1	7.1	5.0	5.2	35.2	31.5
Progression Factor	0.76	0.82	0.78	0.93	1.00	1.00
Incremental Delay, d2	3.0	2.0	0.2	0.4	6.7	0.1
Delay (s)	7.6	7.9	4.1	5.2	41.9	31.6
Level of Service	A	A	A	A	D	C
Approach Delay (s)		7.8	4.6		38.7	
Approach LOS		A	A		D	

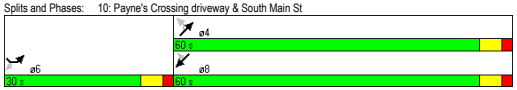
Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: Payne's Crossing driveway & South Main St — 2030 No Build Conditions - PM Peak Hour

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	385	125	120	500	305	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	75	200			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	230			1086	496	
Travel Time (s)	5.2			24.7	11.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	418	136	130	543	332	397
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Maximum Green (s)	24.0	24.0	54.0	54.0	54.0	54.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.66	0.34	0.18	0.43	0.26	0.33
Control Delay	39.1	7.9	6.7	8.2	2.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	7.9	6.7	8.2	2.4	0.9
Queue Length 50th (ft)	115	0	23	119	11	0
Queue Length 95th (ft)	153	44	54	216	29	0
Internal Link Dist (ft)	150			1006	416	
Turn Bay Length (ft)		75	200			
Base Capacity (vph)	915	522	708	1272	1272	1207
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	12	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.26	0.18	0.43	0.26	0.33

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 13 (14%), Referenced to phase 4:NETL and 8:SWT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 10: Payne's Crossing driveway & South Main St



HCM Signalized Intersection Capacity Analysis
10: Payne's Crossing driveway & South Main St — 2030 No Build Conditions - PM Peak Hour

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	385	125	120	500	305	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.56	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1036	1863	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	418	136	130	543	332	397
RTOR Reduction (vph)	0	111	0	0	0	126
Lane Group Flow (vph)	418	25	130	543	332	271
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	16.5	16.5	61.5	61.5	61.5	61.5
Effective Green, g (s)	16.5	16.5	61.5	61.5	61.5	61.5
Actuated g/C Ratio	0.18	0.18	0.68	0.68	0.68	0.68
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	629	290	708	1273	1273	1082
v/s Ratio Prot	c0.12			c0.29	0.18	
v/s Ratio Perm		0.02	0.13			0.17
v/c Ratio	0.66	0.09	0.18	0.43	0.26	0.25
Uniform Delay, d1	34.2	30.5	5.2	6.4	5.5	5.4
Progression Factor	1.00	1.00	1.00	1.00	0.30	0.28
Incremental Delay, d2	2.7	0.1	0.6	1.0	0.5	0.5
Delay (s)	36.8	30.6	5.7	7.4	2.1	2.1
Level of Service	D	C	A	A	A	A
Approach Delay (s)	35.3			7.1	2.1	
Approach LOS	D			A	A	

Intersection Summary

HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

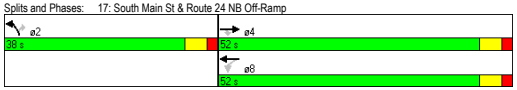
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	630	130	140	890	205	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	15	16	16
Storage Length (ft)		200	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	772			440	420	
Travel Time (s)	17.5			10.0	9.5	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.95	0.95
Heavy Vehicles (%)	4%	13%	4%	4%	16%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	741	153	149	947	216	879
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%
Maximum Green (s)	46.0	46.0	46.0	46.0	32.0	32.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.79	0.17	0.90	0.92	0.34	1.18
Control Delay	17.1	2.1	73.9	36.4	23.3	120.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	2.1	73.9	36.4	23.3	120.2
Queue Length 50th (ft)	163	3	73	473	89	~545
Queue Length 95th (ft)	287	13	#198	#749	148	#776
Internal Link Dist (ft)	692			360	340	
Turn Bay Length (ft)		200	100			
Base Capacity (vph)	934	902	165	1027	627	743
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.17	0.90	0.92	0.34	1.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 17: South Main St & Route 24 NB Off-Ramp



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	630	130	140	890	205	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	15	16	16
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1620	1736	2010	1764	1794
Flt Permitted	1.00	1.00	0.18	1.00	0.95	1.00
Satd. Flow (perm)	1827	1620	323	2010	1764	1794
Peak-hour factor, PHF	0.85	0.85	0.94	0.94	0.95	0.95
Adj. Flow (vph)	741	153	149	947	216	879
RTOR Reduction (vph)	0	74	0	0	0	105
Lane Group Flow (vph)	741	79	149	947	216	774
Heavy Vehicles (%)	4%	13%	4%	4%	16%	2%
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	46.0	46.0	46.0	46.0	32.0	32.0
Effective Green, g (s)	46.0	46.0	46.0	46.0	32.0	32.0
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.36	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	934	828	165	1027	627	638
v/s Ratio Prot	0.41			c0.47	0.12	
v/s Ratio Perm		0.05	0.46			c0.43
v/c Ratio	0.79	0.10	0.90	0.92	0.34	1.21
Uniform Delay, d1	18.1	11.3	20.0	20.3	21.3	29.0
Progression Factor	0.59	0.84	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.2	48.2	14.6	0.3	109.9
Delay (s)	16.4	9.7	68.2	35.0	21.6	138.9
Level of Service	B	A	E	C	C	F
Approach Delay (s)	15.2			39.5	115.8	
Approach LOS	B			D	F	

Intersection Summary

HCM Average Control Delay	59.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

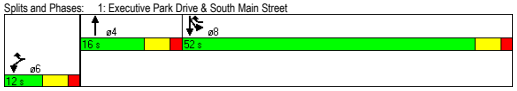
Lanes, Volumes, Timings
1: Executive Park Drive & South Main Street

2030 No-Build Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	25	245	195	20	1425	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Storage Length (ft)	0	0		0	200	
Storage Lanes	1	2		0	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		No		No		
Link Speed (mph)	35		35			35
Link Distance (ft)	282		553			804
Travel Time (s)	5.5		10.8			15.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Shared Lane Traffic (%)					41%	
Lane Group Flow (vph)	26	258	226	0	885	883
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Detector Phase	6	6 8	4		8	8
Switch Phase						
Minimum Initial (s)	6.0		6.0		6.0	6.0
Minimum Split (s)	12.0		12.0		12.0	12.0
Total Split (s)	12.0	64.0	16.0	0.0	52.0	52.0
Total Split (%)	15.0%	80.0%	20.0%	0.0%	65.0%	65.0%
Maximum Green (s)	6.0		10.0		46.0	46.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		None		C-Max	C-Max
v/c Ratio	0.17	0.13	0.88		1.01	0.97
Control Delay	33.1	3.2	68.6		51.5	41.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	33.1	3.2	68.6		51.5	41.4
Queue Length 50th (ft)	12	16	113		~438	407
Queue Length 95th (ft)	34	26	#237		#725	#704
Internal Link Dist (ft)	202		473			724
Turn Bay Length (ft)					200	
Base Capacity (vph)	157	1934	257		879	913
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.17	0.13	0.88		1.01	0.97

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 33 (41%), Referenced to phase 8:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Executive Park Drive & South Main Street



HCM Signalized Intersection Capacity Analysis
1: Executive Park Drive & South Main Street

2030 No-Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	25	245	195	20	1425	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.88	1.00		0.95	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	0.97
Satd. Flow (prot)	1796	2623	1867		1528	1589
Flt Permitted	0.95	1.00	1.00		0.95	0.97
Satd. Flow (perm)	1796	2623	1867		1528	1589
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	258	205	21	1500	268
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	26	258	226	0	885	883
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Actuated Green, G (s)	6.0	58.0	10.0		46.0	46.0
Effective Green, g (s)	7.0	59.0	11.0		46.0	46.0
Actuated g/C Ratio	0.09	0.74	0.14		0.57	0.57
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	157	1934	257		879	914
v/s Ratio Prot	0.01	c0.10	c0.12		c0.58	0.56
v/s Ratio Perm						
v/c Ratio	0.17	0.13	0.88		1.01	0.97
Uniform Delay, d1	33.8	3.1	33.8		17.0	16.3
Progression Factor	0.90	0.97	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.0	27.0		32.0	22.6
Delay (s)	30.9	3.0	60.9		49.0	38.9
Level of Service	C	A	E		D	D
Approach Delay (s)	5.6		60.9			44.0
Approach LOS	A		E			D

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

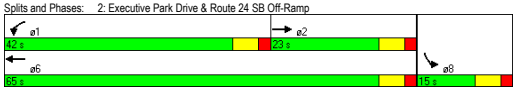
Lanes, Volumes, Timings
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	645	0	1395	135	0	0	0	0	235	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Storage Length (ft)	0		0	0		0	0		0	0		300
Storage Lanes	0		1	2		0	0		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		307			406			405			737	
Travel Time (s)		6.0			7.9			7.9			14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	679	0	1468	142	0	0	0	0	247	0	0
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Detector Phase		2		1	6					8		
Switch Phase												
Minimum Initial (s)		10.0		6.0	10.0					6.0		
Minimum Split (s)		16.0		12.0	16.0					12.0		
Total Split (s)	0.0	23.0	0.0	42.0	65.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
Total Split (%)	0.0%	28.8%	0.0%	52.5%	81.3%	0.0%	0.0%	0.0%	0.0%	18.8%	0.0%	0.0%
Maximum Green (s)		17.0		36.0	59.0					9.0		
Yellow Time (s)		4.0		4.0	4.0					4.0		
All-Red Time (s)		2.0		2.0	2.0					2.0		
Lost Time Adjust (s)	0.0	0.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Recall Mode		C-Max		None	C-Max					None		
v/c Ratio		0.95		0.93	0.06					0.67		
Control Delay		28.0		26.8	2.1					43.8		
Queue Delay		0.0		0.0	0.0					0.0		
Total Delay		28.0		26.8	2.1					43.8		
Queue Length 50th (ft)		158		198	5					61		
Queue Length 95th (ft)		m158		#494	8					#99		
Internal Link Dist (ft)		227			326			325			657	
Turn Bay Length (ft)												
Base Capacity (vph)		712		1596	2527					377		
Starvation Cap Reductn		0		0	0					0		
Spillback Cap Reductn		0		0	0					0		
Storage Cap Reductn		0		0	0					0		
Reduced v/c Ratio		0.95		0.92	0.06					0.66		

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Executive Park Drive & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	645	0	1395	135	0	0	0	0	235	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Total Lost time (s)		6.0		5.0	5.0					6.0		
Lane Util. Factor		0.95		0.97	0.95					0.97		
Frt		1.00		1.00	1.00					1.00		
Flt Protected		1.00		0.95	1.00					0.95		
Satd. Flow (prot)		3276		3450	3359					3347		
Flt Permitted		1.00		0.95	1.00					0.95		
Satd. Flow (perm)		3276		3450	3359					3347		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	679	0	1468	142	0	0	0	0	247	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	679	0	1468	142	0	0	0	0	247	0	0
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Actuated Green, G (s)		17.4		35.8	59.2					8.8		
Effective Green, g (s)		17.4		36.8	60.2					8.8		
Actuated g/C Ratio		0.22		0.46	0.75					0.11		
Clearance Time (s)		6.0		6.0	6.0					6.0		
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Lane Grp Cap (vph)		713		1587	2528					368		
v/s Ratio Prot		c0.21		c0.43	0.04					c0.07		
v/s Ratio Perm												
v/c Ratio		0.95		0.93	0.06					0.67		
Uniform Delay, d1		30.9		20.3	2.6					34.2		
Progression Factor		0.50		0.80	0.78					1.00		
Incremental Delay, d2		8.8		8.4	0.0					4.8		
Delay (s)		24.3		24.7	2.0					39.0		
Level of Service		C		C	A					D		
Approach Delay (s)		24.3			22.7			0.0			39.0	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

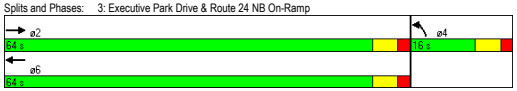
Lanes, Volumes, Timings
3: Executive Park Drive & Route 24 NB On-Ramp

2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	0	0	1395	0	135	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Storage Length (ft)	0		0	0		0	400		615	0		0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		352			205			740			316	
Travel Time (s)		6.9			4.0			14.4			6.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	247	0	0	1468	0	142	0	0	0	0	0
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Detector Phase		2			6		4					
Switch Phase												
Minimum Initial (s)		10.0			10.0		6.0					
Minimum Split (s)		16.0			16.0		12.0					
Total Split (s)	0.0	64.0	0.0	0.0	64.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	80.0%	0.0%	0.0%	80.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		58.0			58.0		10.0					
Yellow Time (s)		4.0			4.0		4.0					
All-Red Time (s)		2.0			2.0		2.0					
Lost Time Adjust (s)	0.0	-1.0	0.0	0.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0					
Recall Mode		C-Max			C-Max		None					
v/c Ratio		0.09			0.55		0.37					
Control Delay		10.1			5.1		34.8					
Queue Delay		0.0			0.0		0.0					
Total Delay		10.1			5.1		34.8					
Queue Length 50th (ft)		53			126		34					
Queue Length 95th (ft)		m62			179		59					
Internal Link Dist (ft)		272			125			660			236	
Turn Bay Length (ft)							400					
Base Capacity (vph)		2661			2687		448					
Starvation Cap Reductn		0			0		0					
Spillback Cap Reductn		0			0		0					
Storage Cap Reductn		0			0		0					
Reduced v/c Ratio		0.09			0.55		0.32					

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 35 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Executive Park Drive & Route 24 NB On-Ramp



HCM Signalized Intersection Capacity Analysis
3: Executive Park Drive & Route 24 NB On-Ramp

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	0	0	1395	0	135	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Total Lost time (s)		5.0			5.0		5.0					
Lane Util. Factor		0.95			0.95		0.97					
Frt		1.00			1.00		1.00					
Flt Protected		1.00			1.00		0.95					
Satd. Flow (prot)		3522			3557		3259					
Flt Permitted		1.00			1.00		0.95					
Satd. Flow (perm)		3522			3557		3259					
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	247	0	0	1468	0	142	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	247	0	0	1468	0	142	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Actuated Green, G (s)		59.4			59.4		8.6					
Effective Green, g (s)		60.4			60.4		9.6					
Actuated g/C Ratio		0.76			0.76		0.12					
Clearance Time (s)		6.0			6.0		6.0					
Vehicle Extension (s)		3.0			3.0		3.0					
Lane Grp Cap (vph)		2659			2686		391					
v/s Ratio Prot		0.07			c0.41		c0.04					
v/s Ratio Perm												
v/c Ratio		0.09			0.55		0.36					
Uniform Delay, d1		2.6			4.1		32.4					
Progression Factor		3.66			1.00		1.00					
Incremental Delay, d2		0.0			0.8		0.6					
Delay (s)		9.5			4.9		33.0					
Level of Service		A			A		C					
Approach Delay (s)		9.5			4.9			33.0			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Narrows Rd & South Main St

2030 No Build Conditions - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	130	25	50	500	315	120
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	159	30	56	562	332	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked						
vC, conflicting volume	1069	395	458			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1069	395	458			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	31	95	95			
cM capacity (veh/h)	229	633	1114			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	189	618	458
Volume Left	159	56	0
Volume Right	30	0	126
cSH	255	1114	1700
Volume to Capacity	0.74	0.05	0.27
Queue Length 95th (ft)	131	4	0
Control Delay (s)	50.9	1.3	0.0
Lane LOS	F	A	
Approach Delay (s)	50.9	1.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		8.3	
Intersection Capacity Utilization		71.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
11: Copicut Rd & South Main St

2030 No Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	30	505	40	30	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	33	549	43	33	337
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	973	571			592	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	973	571			592	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	94			97	
cM capacity (veh/h)	270	521			983	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	592	370
Volume Left	11	0	33
Volume Right	33	43	0
cSH	423	1700	983
Volume to Capacity	0.10	0.35	0.03
Queue Length 95th (ft)	9	0	3
Control Delay (s)	14.5	0.0	1.1
Lane LOS	B		A
Approach Delay (s)	14.5	0.0	1.1
Approach LOS	B		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		51.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2030 No Build Conditions - PM Peak Hour

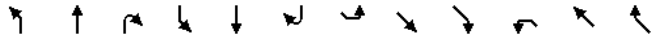
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	95	260	0	70	40	1355	105	20	675	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	103	302	0	81	43	1473	114	23	776	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								440				
pX, platoon unblocked	0.64	0.64		0.64	0.64	0.64				0.64		
vC, conflicting volume	2520	2496	776	2542	2439	1530	776			1587		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3099	3061	776	3134	2972	1547	776			1636		
tC, single (s)	7.2	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	74	0	100	10	95			91		
cM capacity (veh/h)	0	7	399	3	8	91	849			256		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	114	384	1630	799
Volume Left	11	302	43	23
Volume Right	103	81	114	0
cSH	4	3	849	256
Volume to Capacity	29.15	119.98	0.05	0.09
Queue Length 95th (ft)	Err	Err	4	7
Control Delay (s)	Err	Err	7.3	3.9
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	7.3	3.9
Approach LOS	F	F		

Intersection Summary				
Average Delay	1705.8			
Intersection Capacity Utilization	127.4%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High St

2030 No Build Conditions - PM Peak Hour



Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	1360	60	20	690	5	0	0	0	10	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.25	0.25	0.25	0.83	0.83	0.83
Hourly flow rate (vph)	0	1495	66	22	742	5	0	0	0	12	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	747			1560			2327	2348	745	2315	2318	1527
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	747			1560			2327	2348	745	2315	2318	1527
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	100	53	100	92
cM capacity (veh/h)	870			410			23	35	418	26	36	146

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	1560	769	0	24
Volume Left	0	22	0	12
Volume Right	66	5	0	12
cSH	870	410	1700	44
Volume to Capacity	0.00	0.05	0.00	0.55
Queue Length 95th (ft)	0	4	0	50
Control Delay (s)	0.0	1.7	0.0	160.3
Lane LOS		A	A	F
Approach Delay (s)	0.0	1.7	0.0	160.3
Approach LOS			A	F

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	85.2%	ICU Level of Service	E	
Analysis Period (min)	15			

New Bedford

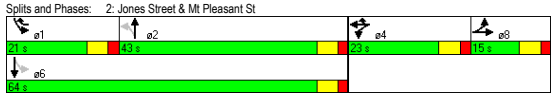
Lanes, Volumes, Timings
2: Jones Street & Mt Pleasant St

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	0	180	10	550	0	75	230	180	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	16	12	11	11	12
Storage Length (ft)	0		0	0		0	0		300	300		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1031			525			388			877	
Travel Time (s)		23.4			11.9			8.8			19.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Heavy Vehicles (%)	0%	20%	0%	7%	25%	5%	0%	9%	8%	5%	11%	60%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	232	671	0	325	0	217	241	0
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Detector Phase	8	8		4	4	4 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		27.0	27.0		19.0	22.0	
Total Split (s)	15.0	15.0	0.0	23.0	23.0	44.0	43.0	43.0	0.0	21.0	64.0	0.0
Total Split (%)	14.7%	14.7%	0.0%	22.5%	22.5%	43.1%	42.2%	42.2%	0.0%	20.6%	62.7%	0.0%
Maximum Green (s)	9.0	9.0		17.0	17.0		37.0	37.0		15.0	58.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)							5.0	5.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
v/c Ratio		0.02			0.56	0.59		0.67		0.50	0.30	
Control Delay		29.0			27.2	3.2		18.9		13.8	10.6	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		29.0			27.2	3.2		18.9		13.8	10.6	
Queue Length 50th (ft)		2			59	0		42		35	39	
Queue Length 95th (ft)		14			166	21		152		97	107	
Internal Link Dist (ft)		951			445			308			797	
Turn Bay Length (ft)										300		
Base Capacity (vph)		311			551	1195		1323		564	1535	
Starvation Cap Reductn		0			0	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.02			0.42	0.56		0.25		0.38	0.16	

Intersection Summary	
Area Type:	Other
Cycle Length: 102	
Actuated Cycle Length: 55.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 2: Jones Street & Mt Pleasant St



HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	0	180	10	550	0	75	230	180	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	11	11	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.90		1.00	1.00	
Flt Protected		1.00			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1794			1681	1538		1787		1662	1631	
Flt Permitted		1.00			0.95	1.00		1.00		0.23	1.00	
Satd. Flow (perm)		1794			1681	1538		1787		409	1631	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Adj. Flow (vph)	0	6	0	220	12	671	0	80	245	217	235	6
RTOR Reduction (vph)	0	0	0	0	0	406	0	138	0	0	1	0
Lane Group Flow (vph)	0	6	0	0	232	265	0	187	0	217	240	0
Heavy Vehicles (%)	0%	20%	0%	7%	25%	5%	0%	9%	8%	5%	11%	60%
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		0.9			13.5	23.5		11.1		27.1	27.1	
Effective Green, g (s)		0.9			13.5	23.5		11.1		27.1	27.1	
Actuated g/C Ratio		0.02			0.23	0.39		0.19		0.46	0.46	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		27			381	607		333		397	743	
v/s Ratio Prot		c0.00			c0.14	0.17		0.10		c0.09	0.15	
v/s Ratio Perm										c0.16		
v/c Ratio		0.22			0.61	0.44		0.56		0.55	0.32	
Uniform Delay, d1		29.0			20.6	13.2		22.0		11.3	10.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.5			1.9	0.2		1.3		0.8	0.1	
Delay (s)		30.5			22.5	13.3		23.3		12.2	10.4	
Level of Service		C			C	B		C		B	B	
Approach Delay (s)		30.5			15.7			23.3			11.3	
Approach LOS		C			B			C			B	

Intersection Summary					
HCM Average Control Delay	16.0	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	59.5	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
14: Tarkiln Hill Road & Church Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	305	0	30	470	60	225	200	40	45	170	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	377	0	34	609	0	268	286	0	0	239	100
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Minimum Split (s)	35.0	35.0		35.0	35.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	59.3%	59.3%	0.0%	59.3%	59.3%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	40.7%
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	19.0		19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
v/c Ratio	0.29	0.41		0.08	0.68		0.80	0.50			0.48	0.19
Control Delay	12.4	10.7		8.1	15.6		39.3	20.0			20.1	15.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	12.4	10.7		8.1	15.6		39.3	20.0			20.1	15.7
Queue Length 50th (ft)	14	76		6	149		85	81			67	25
Queue Length 95th (ft)	34	113		17	237		#179	131			125	55
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	251	916		424	900		336	567			493	520
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.29	0.41		0.08	0.68		0.80	0.50			0.48	0.19

Intersection Summary

Area Type: Other
Cycle Length: 59
Actuated Cycle Length: 59
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Tarkiln Hill Road & Church Street

HCM Signalized Intersection Capacity Analysis
14: Tarkiln Hill Road & Church Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	305	0	30	470	60	225	200	40	45	170	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1604	1801		1616	1770		1728	1761			1723	1615
Flt Permitted	0.29	1.00		0.49	1.00		0.57	1.00			0.88	1.00
Satd. Flow (perm)	493	1801		833	1770		1044	1761			1531	1615
Peak-hour factor, PHF	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	74	377	0	34	540	69	268	238	48	50	189	100
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	74	377	0	34	609	0	268	286	0	0	239	100
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Effective Green, g (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32			0.32	0.32
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	251	916		424	900		336	567			493	520
v/s Ratio Prot		0.21			c0.34			0.16				
v/s Ratio Perm	0.15			0.04			c0.26				0.16	0.06
v/c Ratio	0.29	0.41		0.08	0.68		0.80	0.50			0.48	0.19
Uniform Delay, d1	8.4	9.0		7.4	10.9		18.2	16.2			16.1	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.0	1.4		0.4	4.1		17.7	3.2			3.4	0.8
Delay (s)	11.4	10.4		7.8	14.9		35.9	19.4			19.5	15.3
Level of Service	B	B		A	B		D	B			B	B
Approach Delay (s)		10.5			14.6			27.4			18.2	
Approach LOS		B			B			C			B	

Intersection Summary

HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
19: Wood Street & Route 18

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	25	80	10	55	120	40	10	290	60	60	370	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		197			310			393			488		
Travel Time (s)		4.5			7.0			8.9			11.1		
Peak Hour Factor	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91	
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	149	0	0	312	0	11	398	0	66	423	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	21.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	26%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													4.0
Pedestrian Calls (#/hr)													8
v/c Ratio		0.22			0.46		0.04	0.58		0.24	0.61		
Control Delay		15.4			18.2		16.2	20.9		18.8	22.1		
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0		
Total Delay		15.4			18.2		16.2	20.9		18.8	22.1		
Queue Length 50th (ft)		31			73		2	100		15	111		
Queue Length 95th (ft)		84			146		15	#272		61	#333		
Internal Link Dist (ft)		117			230			313			408		
Turn Bay Length (ft)													
Base Capacity (vph)		666			672		249	686		270	696		
Starvation Cap Reductn		0			0		0	0		0	0		
Spillback Cap Reductn		0			0		0	0		0	0		
Storage Cap Reductn		0			0		0	0		0	0		
Reduced v/c Ratio		0.22			0.46		0.04	0.58		0.24	0.61		

Intersection Summary	
Area Type:	Other
Cycle Length: 81	
Actuated Cycle Length: 64.2	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 19: Wood Street & Route 18

HCM Signalized Intersection Capacity Analysis
19: Wood Street & Route 18

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	80	10	55	120	40	10	290	60	60	370	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.97		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1860			1879		1745	1718		1745	1759	
Flt Permitted		0.89			0.88		0.34	1.00		0.37	1.00	
Satd. Flow (perm)		1676			1678		632	1718		685	1759	
Peak-hour factor, PHF	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91
Adj. Flow (vph)	32	104	13	80	174	58	11	330	68	66	407	16
RTOR Reduction (vph)	0	4	0	0	9	0	0	8	0	0	2	0
Lane Group Flow (vph)	0	145	0	0	303	0	11	390	0	66	421	0
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4		25.4	25.4		25.4	25.4	
Effective Green, g (s)		25.4			25.4		25.4	25.4		25.4	25.4	
Actuated g/C Ratio		0.37			0.37		0.37	0.37		0.37	0.37	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		615			616		232	631		251	646	
v/s Ratio Prot								0.23			c0.24	
v/s Ratio Perm		0.09			c0.18		0.02			0.10		
v/c Ratio		0.24			0.49		0.05	0.62		0.26	0.65	
Uniform Delay, d1		15.2			16.9		14.1	17.9		15.3	18.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			2.8		0.4	4.5		2.5	5.1	
Delay (s)		16.1			19.7		14.5	22.4		17.9	23.3	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		16.1			19.7			22.2			22.5	
Approach LOS		B			B			C			C	

Intersection Summary					
HCM Average Control Delay	21.1	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.57				
Actuated Cycle Length (s)	69.2	Sum of lost time (s)		18.4	
Intersection Capacity Utilization	58.0%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
24: Nash Road & Church Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	240	25	40	255	40	60	100	25	35	160	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	405	0	0	350	0	0	222	0	0	373	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.54			0.40			0.46			0.62	
Control Delay		16.0			13.3			20.6			23.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.0			13.3			20.6			23.4	
Queue Length 50th (ft)		109			87			67			121	
Queue Length 95th (ft)		182			145			113			204	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		744			876			484			601	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.54			0.40			0.46			0.62	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	240	25	40	255	40	60	100	25	35	160	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			0.94	
Flt Protected		0.99			0.99			0.98			0.99	
Satd. Flow (prot)		1935			2057			1904			1875	
Flt Permitted		0.82			0.92			0.74			0.94	
Satd. Flow (perm)		1613			1898			1430			1778	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	107	270	28	42	266	42	72	120	30	38	176	159
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	405	0	0	350	0	0	222	0	0	373	0
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		744			876			484			602	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.18			0.16			c0.21	
v/c Ratio		0.54			0.40			0.46			0.62	
Uniform Delay, d1		12.6			11.6			16.8			18.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.9			1.4			3.1			4.7	
Delay (s)		15.4			12.9			19.9			22.7	
Level of Service		B			B			B			C	
Approach Delay (s)		15.4			12.9			19.9			22.7	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	17.5	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
28: Coggeshall Street & Route 18 SB

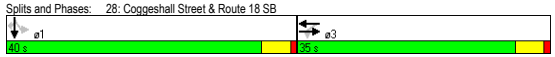
2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	95	195	205	0	0	0	0	120	690	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	378	0	0	465	0	0	0	0	0	920	45
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.52			1.15						0.61	0.06
Control Delay		18.4			116.0						17.1	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		18.4			116.0						17.1	4.0
Queue Length 50th (ft)		116			~259						160	0
Queue Length 95th (ft)		157			#403						211	15
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		721			406						1507	694
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.52			1.15						0.61	0.06

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle: 80
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Route 18 SB



HCM Signalized Intersection Capacity Analysis
28: Coggeshall Street & Route 18 SB

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	95	195	205	0	0	0	0	120	690	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1747			1942						3229	1436
Flt Permitted		1.00			0.51						0.99	1.00
Satd. Flow (perm)		1747			1014						3229	1436
Peak-hour factor, PHF	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	256	122	227	238	0	0	0	0	136	784	45
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	355	0	0	465	0	0	0	0	0	920	21
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		699			406						1507	670
v/s Ratio Prot		0.20										
v/s Ratio Perm					c0.46						0.28	0.01
v/c Ratio		0.51			1.15						0.61	0.03
Uniform Delay, d1		16.9			22.5						14.9	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		2.6			90.6						1.9	0.1
Delay (s)		19.6			113.1						16.8	10.9
Level of Service		B			F						B	B
Approach Delay (s)		19.6			113.1			0.0			16.5	
Approach LOS		B			F			A			B	

Intersection Summary

HCM Average Control Delay	42.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

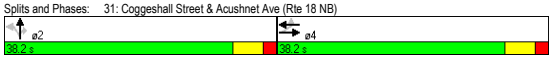
Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	270	0	0	310	50	85	295	230	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	331	0	0	418	0	101	351	274	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.45			0.50		0.15	0.50	0.35			
Control Delay		18.4			18.4		14.6	19.5	3.4			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.4			18.4		14.6	19.5	3.4			
Queue Length 50th (ft)		109			136		29	119	0			
Queue Length 95th (ft)		178			202		54	176	33			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		731			833		675	699	788			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.45			0.50		0.15	0.50	0.35			

Intersection Summary	
Area Type:	Other
Cycle Length: 76.4	
Actuated Cycle Length: 76.4	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rte 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	270	0	0	310	50	85	295	230	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.98		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		1940			1972		1612	1670	1501			
Flt Permitted		0.89			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1747			1972		1612	1670	1501			
Peak-hour factor, PHF	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	47	284	0	0	360	58	101	351	274	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	159	0	0	0
Lane Group Flow (vph)	0	331	0	0	410	0	101	351	115	0	0	0
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		732			826		675	699	629			
v/s Ratio Prot					c0.21			c0.21				
v/s Ratio Perm		0.19					0.06		0.08			
v/c Ratio		0.45			0.50		0.15	0.50	0.18			
Uniform Delay, d1		15.9			16.3		13.8	16.3	14.0			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		2.0			2.1		0.5	2.6	0.6			
Delay (s)		17.9			18.4		14.2	18.9	14.6			
Level of Service		B			B		B	B	B			
Approach Delay (s)		17.9			18.4			16.6			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

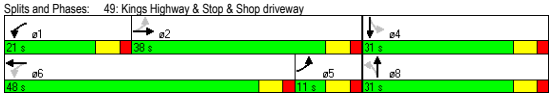
c Critical Lane Group

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway — 2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	465	40	105	600	35	25	5	60	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			228			360			359	
Travel Time (s)		11.7			5.2			8.2			8.2	
Peak Hour Factor	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	722	0	0	823	0	0	101	0	0	159	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	38.0	0.0	21.0	48.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.2%	42.2%	0.0%	23.3%	53.3%	0.0%	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%
Maximum Green (s)	5.0	32.0		15.0	42.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.51			0.56			0.21			0.31	
Control Delay		7.3			7.9			10.2			11.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.3			7.9			10.2			11.6	
Queue Length 50th (ft)		46			56			3			7	
Queue Length 95th (ft)		71			99			22			23	
Internal Link Dist (ft)		435			148			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1870			2395			1474			1565	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.39			0.34			0.07			0.10	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 44.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway — 2030 No-Build Conditions - AM Peak Hour

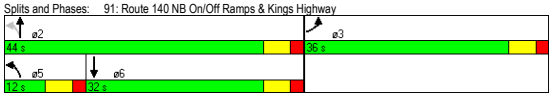
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	465	40	105	600	35	25	5	60	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.90			0.92	
Flt Protected		0.99			0.99			0.99			0.98	
Satd. Flow (prot)		3354			3443			3014			3227	
Flt Permitted		0.75			0.75			0.83			0.82	
Satd. Flow (perm)		2533			2610			2540			2685	
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Adj. Flow (vph)	99	574	49	117	667	39	28	6	67	62	14	83
RTOR Reduction (vph)	0	4	0	0	3	0	0	56	0	0	69	0
Lane Group Flow (vph)	0	718	0	0	820	0	0	45	0	0	90	0
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		25.1			25.1			7.5			7.5	
Effective Green, g (s)		25.1			25.1			7.5			7.5	
Actuated g/C Ratio		0.56			0.56			0.17			0.17	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1426			1469			427			452	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.31			0.02			c0.03	
v/c Ratio		0.50			0.56			0.11			0.20	
Uniform Delay, d1		5.9			6.2			15.7			16.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.3			0.0			0.1	
Delay (s)		6.1			6.5			15.8			16.0	
Level of Service		A			A			B			B	
Approach Delay (s)		6.1			6.5			15.8			16.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	44.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	320	100	90	265	640	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.83	0.83	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	506	0	0	418	806	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	36.0	0.0	12.0	44.0	32.0	0.0
Total Split (%)	45.0%	0.0%	15.0%	55.0%	40.0%	0.0%
Maximum Green (s)	30.0		6.0	38.0	26.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		None	Min	Min	
v/c Ratio	0.68			0.55	0.64	
Control Delay	19.0			16.6	16.5	
Queue Delay	0.0			0.0	0.0	
Total Delay	19.0			16.6	16.5	
Queue Length 50th (ft)	115			47	96	
Queue Length 95th (ft)	214			100	175	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	1219			1598	1855	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.42			0.26	0.43	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 50.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 91: Route 140 NB On/Off Ramps & Kings Highway



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	320	100	90	265	640	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.99	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1945			3379	3415	
Flt Permitted	0.96			0.60	1.00	
Satd. Flow (perm)	1945			2058	3415	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.85	0.85
Adj. Flow (vph)	386	120	106	312	753	53
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	506	0	0	418	806	0
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	19.2			18.6	18.6	
Effective Green, g (s)	19.2			18.6	18.6	
Actuated g/C Ratio	0.39			0.37	0.37	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	750			769	1275	
v/s Ratio Prot	c0.26				c0.24	
v/s Ratio Perm				0.20		
v/c Ratio	0.67			0.54	0.63	
Uniform Delay, d1	12.7			12.3	12.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.4			0.8	1.0	
Delay (s)	15.1			13.1	13.8	
Level of Service	B			B	B	
Approach Delay (s)	15.1			13.1	13.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

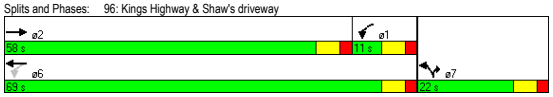
2030 No-Build Conditions - AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	310	105	90	650	90	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.85	0.85
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	446	0	0	805	106	53
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	58.0	0.0	11.0	69.0	22.0	22.0
Total Split (%)	63.7%	0.0%	12.1%	75.8%	24.2%	24.2%
Maximum Green (s)	52.0		5.0	63.0	16.0	16.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.22			0.46	0.31	0.15
Control Delay	4.7			7.4	16.3	6.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.7			7.4	16.3	6.4
Queue Length 50th (ft)	18			52	18	0
Queue Length 95th (ft)	40			98	50	18
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	3308			2905	745	709
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.13			0.28	0.14	0.07

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 37.1
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 96: Kings Highway & Shaw's driveway



HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2030 No-Build Conditions - AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	310	105	90	650	90	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3308			3446	1687	1538
Flt Permitted	1.00			0.84	0.95	1.00
Satd. Flow (perm)	3308			2904	1687	1538
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.85	0.85
Adj. Flow (vph)	333	113	98	707	106	53
RTOR Reduction (vph)	39	0	0	0	0	45
Lane Group Flow (vph)	407	0	0	805	106	8
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	20.7			20.7	5.7	5.7
Effective Green, g (s)	20.7			20.7	5.7	5.7
Actuated g/C Ratio	0.54			0.54	0.15	0.15
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	1783			1565	250	228
v/s Ratio Prot	0.12				c0.06	0.01
v/s Ratio Perm				c0.28		
v/c Ratio	0.23			0.51	0.42	0.03
Uniform Delay, d1	4.7			5.6	14.9	14.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.0			0.1	0.4	0.0
Delay (s)	4.7			5.8	15.3	14.0
Level of Service	A			A	B	B
Approach Delay (s)	4.7			5.8	14.9	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	38.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

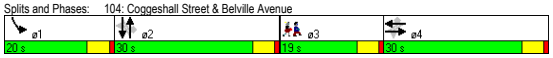
Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	90	260	90	70	220	135	35	130	165	225	215	185	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		443			1111			850			178		
Travel Time (s)		10.1			25.3			19.3			4.0		
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84	
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	489	0	0	319	148	0	202	201	0	744	0	
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt			
Protected Phases		4			4			2		1	2		3
Permitted Phases	4			4		4	2		2	2			
Detector Phase	4	4		4	4	4	2	2	2	1	2		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		6.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		19.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0	19.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%	19%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0		14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.0
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None		None
Walk Time (s)													6.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													6
v/c Ratio		0.47			0.58	0.22		0.39	0.28		0.76		
Control Delay		16.2			22.6	4.4		18.3	4.2		22.5		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0		
Total Delay		16.2			22.6	4.4		18.3	4.2		22.5		
Queue Length 50th (ft)		59			84	0		48	0		98		
Queue Length 95th (ft)		150			#264	39		126	33		#238		
Internal Link Dist (ft)		363			1031			770			98		
Turn Bay Length (ft)													
Base Capacity (vph)		1040			548	669		560	753		1055		
Starvation Cap Reductn		0			0	0		0	0		0		
Spillback Cap Reductn		0			0	0		0	0		0		
Storage Cap Reductn		0			0	0		0	0		0		
Reduced v/c Ratio		0.47			0.58	0.22		0.36	0.27		0.71		

Intersection Summary	
Area Type:	Other
Cycle Length: 99	
Actuated Cycle Length: 62.2	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	260	90	70	220	135	35	130	165	225	215	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.97			1.00	0.85		1.00	0.85		0.96	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3196			1672	1422		1784	1552		3168	
Flt Permitted		0.77			0.79	1.00		0.76	1.00		0.77	
Satd. Flow (perm)		2499			1340	1422		1371	1552		2467	
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84
Adj. Flow (vph)	100	289	100	77	242	148	43	159	201	268	256	220
RTOR Reduction (vph)	0	19	0	0	0	91	0	0	129	0	50	0
Lane Group Flow (vph)	0	470	0	0	319	57	0	202	72	0	694	0
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.4			25.4	25.4		23.6	23.6		23.6	
Effective Green, g (s)		25.4			25.4	25.4		23.6	23.6		23.6	
Actuated g/C Ratio		0.38			0.38	0.38		0.36	0.36		0.36	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		959			514	546		489	553		879	
v/s Ratio Prot												
v/s Ratio Perm		0.19			c0.24	0.04		0.15	0.05		c0.28	
v/c Ratio		0.49			0.62	0.10		0.41	0.13		0.79	
Uniform Delay, d1		15.5			16.5	13.1		16.1	14.4		19.1	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		1.8			5.5	0.4		0.8	0.1		5.0	
Delay (s)		17.3			22.1	13.5		16.8	14.5		24.1	
Level of Service		B			C	B		B	B		C	
Approach Delay (s)		17.3			19.3			15.7			24.1	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	19.8	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	17.2		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
137: Hillman St & Pleasant Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	40	180	415	130	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.84	0.84	0.86	0.86	0.90	0.90
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	692	0	0	572
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.19		0.39			0.52
Control Delay	10.9		3.9			14.0
Queue Delay	0.0		0.0			0.0
Total Delay	10.9		3.9			14.0
Queue Length 50th (ft)	16		23			77
Queue Length 95th (ft)	43		45			119
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	581		1786			1103
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.19		0.39			0.52

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street

HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2030 No-Build Conditions - AM Peak Hour

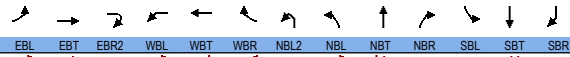
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	50	40	180	415	130	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.90			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1751		3265			3596
Flt Permitted	0.97		1.00			0.65
Satd. Flow (perm)	1751		3265			2352
Peak-hour factor, PHF	0.84	0.84	0.86	0.86	0.90	0.90
Adj. Flow (vph)	60	48	209	483	144	428
RTOR Reduction (vph)	33	0	257	0	0	0
Lane Group Flow (vph)	75	0	435	0	0	572
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	547		1530			1103
v/s Ratio Prot	c0.04		0.13			
v/s Ratio Perm						c0.24
v/c Ratio	0.14		0.28			0.52
Uniform Delay, d1	15.8		10.4			11.9
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.5		0.5			1.7
Delay (s)	16.3		10.9			13.7
Level of Service	B		B			B
Approach Delay (s)	16.3		10.9			13.7
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
140: Mill Street & Pleasant St

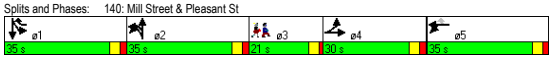
2030 No-Build Conditions - AM Peak Hour



Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations														
Volume (vph)	225	140	5	410	180	145	20	55	215	30	50	280	45	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	16	16	11	12	10	16	10	12	14	16	14	16	
Storage Length (ft)	0			0		0		100		0	0		0	
Storage Lanes	1			1		1		1		0	0		0	
Taper Length (ft)	25			25		25		25		25	25		25	
Right Turn on Red			Yes			No				Yes				
Link Speed (mph)		30			30				30			30		
Link Distance (ft)		168			308				709			499		
Travel Time (s)		3.8			7.0				16.1			11.3		
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84	0.84	
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%	4%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	256	165	0	500	220	177	0	85	278	0	0	447	0	
Turn Type	Split			Split		pm+ov	Split	Split			Split			
Protected Phases	4	4		5	5	1	2	2	2		1	1		3
Permitted Phases						5								
Detector Phase	4	4		5	5	1	2	2	2		1	1		
Switch Phase														
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0		4.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	21.0	21.0	21.0		21.0	21.0		21.0
Total Split (s)	30.0	30.0	0.0	35.0	35.0	35.0	35.0	35.0	35.0	0.0	35.0	35.0	0.0	21.0
Total Split (%)	19.2%	19.2%	0.0%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%	0.0%	13%
Maximum Green (s)	25.0	25.0		30.0	30.0	30.0	30.0	30.0	30.0		30.0	30.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		3.0
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max		Max	Max		None
Walk Time (s)														10.0
Flash Dont Walk (s)														7.0
Pedestrian Calls (#/hr)														9
v/c Ratio	0.80	0.43		1.37	0.55	0.26		0.25	0.38			0.56		
Control Delay	74.0	55.7		222.3	55.8	24.9		49.2	47.7			52.5		
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0			0.0		
Total Delay	74.0	55.7		222.3	55.8	24.9		49.2	47.7			52.5		
Queue Length 50th (ft)	216	128		~568	172	90		62	105			183		
Queue Length 95th (ft)	#409	228		#828	271	162		127	172			262		
Internal Link Dist (ft)		88			228				629			419		
Turn Bay Length (ft)								100						
Base Capacity (vph)	320	383		366	399	679		342	739			804		
Starvation Cap Reductn	0	0		0	0	0		0	0			0		
Spillback Cap Reductn	0	0		0	0	0		0	0			0		
Storage Cap Reductn	0	0		0	0	0		0	0			0		
Reduced v/c Ratio	0.80	0.43		1.37	0.55	0.26		0.25	0.38			0.56		

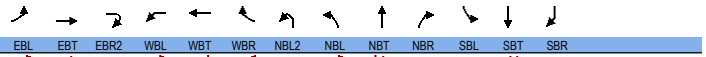
Intersection Summary	
Area Type:	Other
Cycle Length: 156	
Actuated Cycle Length: 139.2	
Natural Cycle: 125	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 140: Mill Street & Pleasant St



HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	225	140	5	410	180	145	20	55	215	30	50	280	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.95			0.95	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.98			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1776	2121		1694	1845	1449		1581	3383			3718	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1776	2121		1694	1845	1449		1581	3383			3718	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84	0.84
Adj. Flow (vph)	256	159	6	500	220	177	23	62	244	34	60	333	54
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	256	164	0	500	220	177	0	85	271	0	0	447	0
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%	4%
Turn Type	Split			Split		pm+ov	Split	Split			Split		
Protected Phases	4	4		5	5	1	2	2	2		1	1	
Permitted Phases						5							
Actuated Green, G (s)	25.1	25.1		30.1	30.1	60.2		30.1	30.1			30.1	
Effective Green, g (s)	25.1	25.1		30.1	30.1	60.2		30.1	30.1			30.1	
Actuated g/C Ratio	0.18	0.18		0.21	0.21	0.42		0.21	0.21			0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)	313	374		358	390	663		334	715			786	
v/s Ratio Prot	c0.14	0.08		c0.30	0.12	0.06		0.05	c0.08			c0.12	
v/s Ratio Perm						0.07							
v/c Ratio	0.82	0.44		1.40	0.56	0.27		0.25	0.38			0.57	
Uniform Delay, d1	56.5	52.4		56.2	50.3	26.7		46.8	48.1			50.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	20.6	3.7		194.7	5.8	1.0		1.8	1.5			3.0	
Delay (s)	77.1	56.1		250.9	56.1	27.7		48.6	49.7			53.3	
Level of Service	E	E		F	E	C		D	D			D	
Approach Delay (s)		68.8			159.1				49.4			53.3	
Approach LOS		E			F				D			D	

Intersection Summary			
HCM Average Control Delay	100.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	142.4	Sum of lost time (s)	27.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

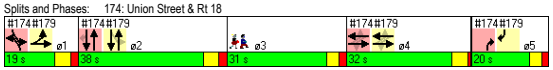
Lanes, Volumes, Timings
174: Union Street & Rt 18

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	250	50	40	35	15	10	40	890	25	90	855	240	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	16	16	16	16	11	11	11	10	11	11	
Storage Length (ft)	0		0	0		0	150		225	150		225	
Storage Lanes	1		0	0		0	1		1	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		440			82			328			2491		
Travel Time (s)		10.0			1.9			7.5			56.6		
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	281	101	0	0	73	0	45	1011	28	98	929	261	
Turn Type	Perm			Perm			Prot		custom	Prot		Perm	
Protected Phases		4			4		1	2	5	1	2		3
Permitted Phases	4			4								2	
Detector Phase	4	4		4	4		1	2	5	1	2	2	
Switch Phase													
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0	17.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0	31.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0	31.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%	22%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0	26.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0	3.0
Recall Mode	None	None		None	None		None	None	None	None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													7
v/c Ratio	0.87	0.24			0.18		0.25	1.01	0.19	0.56	0.91	0.44	
Control Delay	68.0	38.5			67.8		52.6	70.2	52.2	62.4	51.6	14.9	
Queue Delay	0.0	0.0			0.0		0.0	128.2	0.8	0.1	0.0	0.0	
Total Delay	68.0	38.5			67.8		52.6	198.3	53.1	62.5	51.6	14.9	
Queue Length 50th (ft)	180	53			43		27	~362	17	62	313	41	
Queue Length 95th (ft)	#482	136			95		79	#746	54	#170	#681	155	
Internal Link Dist (ft)		360			2			248			2411		
Turn Bay Length (ft)							150		225	150		225	
Base Capacity (vph)	322	423			410		203	999	215	196	1018	588	
Starvation Cap Reductn	0	0			0		0	233	0	0	0	0	
Spillback Cap Reductn	0	0			0		0	0	89	2	0	0	
Storage Cap Reductn	0	0			0		0	0	0	0	0	0	
Reduced v/c Ratio	0.87	0.24			0.18		0.22	1.32	0.22	0.51	0.91	0.44	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 107.3	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 174: Union Street & Rt 18



HCM Signalized Intersection Capacity Analysis
174: Union Street & Rt 18

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	50	40	35	15	10	40	890	25	90	855	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1616	1638			1918		1631	3261	1501	1574	3323	1516
Flt Permitted	0.73	1.00			0.80		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1246	1638			1586		1631	3261	1501	1574	3323	1516
Peak-hour factor, PHF	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	281	56	45	43	18	12	45	1011	28	98	929	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	126
Lane Group Flow (vph)	281	101	0	0	73	0	45	1011	28	98	929	135
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)	27.7	27.7			27.7		11.8	32.8	8.8	11.8	32.8	32.8
Effective Green, g (s)	27.7	27.7			27.7		11.8	32.8	8.8	11.8	32.8	32.8
Actuated g/C Ratio	0.25	0.25			0.25		0.11	0.29	0.08	0.11	0.29	0.29
Clearance Time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	308	405			392		172	954	118	166	972	444
v/s Ratio Prot		0.06					0.03	c0.31	c0.02	c0.06	0.28	
v/s Ratio Perm	c0.23				0.05							0.09
v/c Ratio	0.91	0.25			0.19		0.26	1.06	0.24	0.59	0.96	0.30
Uniform Delay, d1	41.0	33.9			33.3		46.1	39.6	48.5	47.8	38.9	30.8
Progression Factor	1.00	1.00			1.79		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.0	0.7			0.5		1.1	46.3	1.4	6.4	19.0	0.5
Delay (s)	72.0	34.5			60.1		47.3	86.0	49.9	54.3	58.0	31.3
Level of Service	E	C			E		D	F	D	D	E	C
Approach Delay (s)		62.1			60.1			83.4			52.3	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM Average Control Delay	65.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	112.1	Sum of lost time (s)	31.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

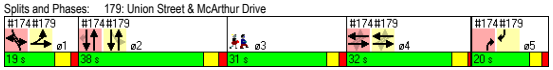
Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	50	20	95	5	10	5	0	160	20	15	175	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		0	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		82			609			920			687		
Travel Time (s)		1.9			13.8			20.9			15.6		
Peak Hour Factor	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81	
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	212	0	0	36	0	0	202	0	0	235	62	
Turn Type	pm+pt			Perm						Perm		custom	
Protected Phases	1	1 4			4			2			2	5	3
Permitted Phases	1 4			4						2			
Detector Phase	1	1 4		4	4			2		2	2	5	
Switch Phase													
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0	17.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0	31.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0	31.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%	22%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0	26.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0	
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0	3.0
Recall Mode	None			None	None			None		None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													7
v/c Ratio		0.35			0.09			0.37			0.47	0.41	
Control Delay		8.4			30.7			35.1			38.3	57.9	
Queue Delay		0.0			0.0			0.0			0.0	119.9	
Total Delay		8.4			30.7			35.1			38.3	177.7	
Queue Length 50th (ft)		25			14			103			127	40	
Queue Length 95th (ft)		41			30			238			254	92	
Internal Link Dist (ft)		2			529			840			607		
Turn Bay Length (ft)												50	
Base Capacity (vph)		637			420			546			497	223	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			11			0			0	170	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.33			0.09			0.37			0.47	1.17	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 107.3	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 179: Union Street & McArthur Drive



HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	20	95	5	10	5	0	160	20	15	175	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.92			0.97			0.99			1.00	0.85
Flt Protected		0.99			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1808			1708			1774			1673	1553
Flt Permitted		0.90			0.92			1.00			0.97	1.00
Satd. Flow (perm)		1659			1598			1774			1622	1553
Peak-hour factor, PHF	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81
Adj. Flow (vph)	64	26	122	9	18	9	0	180	22	19	216	62
RTOR Reduction (vph)	0	0	0	0	7	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	212	0	0	29	0	0	199	0	0	235	62
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		39.5			27.7			32.8			32.8	8.8
Effective Green, g (s)		39.5			27.7			32.8			32.8	8.8
Actuated g/C Ratio		0.35			0.25			0.29			0.29	0.08
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		600			395			519			475	122
v/s Ratio Prot		c0.04						0.11				c0.04
v/s Ratio Perm		c0.09			0.02						c0.14	
v/c Ratio		0.35			0.07			0.38			0.49	0.51
Uniform Delay, d1		26.9			32.4			31.6			32.8	49.6
Progression Factor		0.39			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.5			0.2			0.6			1.1	4.5
Delay (s)		11.0			32.5			32.2			33.9	54.1
Level of Service		B			C			C			C	D
Approach Delay (s)		11.0			32.5			32.2			38.1	
Approach LOS		B			C			C			D	

Intersection Summary					
HCM Average Control Delay	28.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.43				
Actuated Cycle Length (s)	112.1	Sum of lost time (s)	32.0		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2030 No-Build Conditions - AM Peak Hour

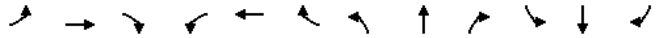
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	20	10	560	720	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	12	24	12	675	800	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				394	611	
pX, platoon unblocked	0.82					
vC, conflicting volume	1532	833	867			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1539	833	867			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	93	98			
cM capacity (veh/h)	102	364	786			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	37	687	867
Volume Left	12	12	0
Volume Right	24	0	67
cSH	197	786	1700
Volume to Capacity	0.19	0.02	0.51
Queue Length 95th (ft)	17	1	0
Control Delay (s)	27.5	0.4	0.0
Lane LOS	D	A	
Approach Delay (s)	27.5	0.4	0.0
Approach LOS	D		

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
16: Park Avenue & Church Street

2030 No-Build Conditions - AM Peak Hour



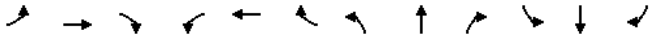
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	70	135	20	0	45	0	420	20	10	190	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.84	0.84	0.84	0.85	0.85	0.85	0.76	0.76	0.76
Hourly flow rate (vph)	0	90	173	24	0	54	0	494	24	13	250	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	836	794	250	1000	782	506	250			518		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	780	735	145	958	722	506	145			518		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	72	79	82	100	91	100			99		
cM capacity (veh/h)	261	316	813	134	324	570	1337			1059		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	263	77	518	263
Volume Left	0	24	0	13
Volume Right	173	54	24	0
cSH	529	285	1700	1059
Volume to Capacity	0.50	0.27	0.30	0.01
Queue Length 95th (ft)	68	27	0	1
Control Delay (s)	18.3	22.3	0.0	0.5
Lane LOS	C	C		A
Approach Delay (s)	18.3	22.3	0.0	0.5
Approach LOS	C	C		

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization		49.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2030 No-Build Conditions - AM Peak Hour



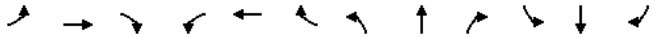
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	25	0	20	5	270	0	0	340	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85	0.77	0.77	0.77
Hourly flow rate (vph)	7	0	7	32	0	25	6	318	0	0	442	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	803	777	448	784	784	318	455			318		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	803	777	448	784	784	318	455			318		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	89	100	97	99			100		
cM capacity (veh/h)	292	328	615	299	326	728	1117			1254		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	57	324	455
Volume Left	7	32	6	0
Volume Right	7	25	0	13
cSH	396	405	1117	1700
Volume to Capacity	0.03	0.14	0.01	0.27
Queue Length 95th (ft)	3	12	0	0
Control Delay (s)	14.4	15.3	0.2	0.0
Lane LOS	B	C	A	
Approach Delay (s)	14.4	15.3	0.2	0.0
Approach LOS	B	C		

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	28.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 No-Build Conditions - AM Peak Hour



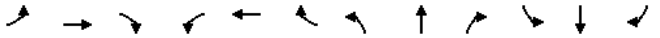
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	390	45	90	320	50	25	60	45	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	56	438	51	107	381	60	29	70	52	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.94			0.91			0.95	0.95	0.91	0.95	0.95	0.94
vC, conflicting volume	440			489			1201	1231	463	1288	1226	411
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372			394			1038	1070	367	1130	1065	340
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	95			90			83	61	91	100	100	100
cM capacity (veh/h)	1104			1065			171	178	607	98	181	664

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	545	548	151
Volume Left	56	107	29
Volume Right	51	60	52
cSH	1104	1065	233
Volume to Capacity	0.05	0.10	0.65
Queue Length 95th (ft)	4	8	100
Control Delay (s)	1.4	2.7	45.2
Lane LOS	A	A	E
Approach Delay (s)	1.4	2.7	45.2
Approach LOS			E

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	55.9%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
54: Rt 18 SB Exit Ramp & Purchase St

2030 No-Build Conditions - AM Peak Hour



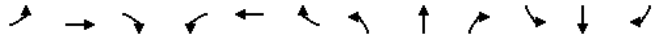
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	245	5	35	0	225	0	0	260	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	266	5	38	0	245	0	0	283	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								822				
pX, platoon unblocked												
vC, conflicting volume	568	527	283	538	527	245	283			245		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568	527	283	538	527	245	283			245		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	40	99	95	100			100		
cM capacity (veh/h)	409	456	756	447	456	794	1280			1322		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	310	245	283
Volume Left	0	266	0	0
Volume Right	11	38	0	0
cSH	756	473	1280	1700
Volume to Capacity	0.01	0.65	0.00	0.17
Queue Length 95th (ft)	1	116	0	0
Control Delay (s)	9.8	25.9	0.0	0.0
Lane LOS	A	D		
Approach Delay (s)	9.8	25.9	0.0	0.0
Approach LOS	A	D		

Intersection Summary				
Average Delay	9.6			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 No-Build Conditions - AM Peak Hour



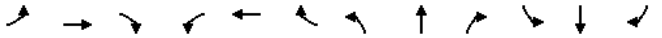
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	155	35	35	105	90	10	195	60	95	170	15
Peak Hour Factor	0.80	0.80	0.80	0.83	0.83	0.83	0.89	0.89	0.89	0.88	0.88	0.88
Hourly flow rate (vph)	19	194	44	42	127	108	11	219	67	108	193	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	256	277	298	318
Volume Left (vph)	19	42	11	108
Volume Right (vph)	44	108	67	17
Hadj (s)	-0.04	-0.09	-0.04	0.20
Departure Headway (s)	6.6	6.5	6.4	6.6
Degree Utilization, x	0.47	0.50	0.53	0.58
Capacity (veh/h)	484	494	510	499
Control Delay (s)	15.3	15.8	16.4	18.3
Approach Delay (s)	15.3	15.8	16.4	18.3
Approach LOS	C	C	C	C

Intersection Summary				
Delay	16.6			
HCM Level of Service	C			
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2030 No-Build Conditions - AM Peak Hour



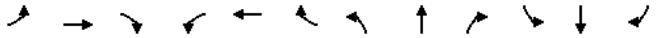
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	120	55	25	55	220	0	0	235	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83
Hourly flow rate (vph)	6	0	6	135	62	28	62	247	0	0	283	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	728	669	298	675	684	247	313			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728	669	298	675	684	247	313			247		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	98	100	99	61	82	96	95			100		
cM capacity (veh/h)	274	362	734	348	352	775	1203			1330		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	12	166	59	309	313
Volume Left	6	135	0	62	0
Volume Right	6	0	28	0	30
cSH	399	349	476	1203	1700
Volume to Capacity	0.03	0.48	0.12	0.05	0.18
Queue Length 95th (ft)	2	61	11	4	0
Control Delay (s)	14.3	24.3	13.6	2.0	0.0
Lane LOS	B	C	B	A	
Approach Delay (s)	14.3	21.5		2.0	0.0
Approach LOS	B	C			

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2030 No-Build Conditions - AM Peak Hour



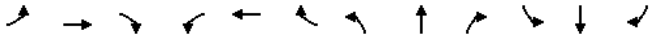
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	35	0	40	0	235	120	95	265	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	42	0	48	0	261	133	106	294	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	881	900	294	833	833	328	294			394		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	881	900	294	833	833	328	294			394		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.3		
p0 queue free %	100	100	100	84	100	93	100			91		
cM capacity (veh/h)	233	254	750	263	278	702	1279			1137		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	89	394	400
Volume Left	0	42	0	106
Volume Right	0	48	133	0
cSH	1700	395	1279	1137
Volume to Capacity	0.00	0.23	0.00	0.09
Queue Length 95th (ft)	0	21	0	8
Control Delay (s)	0.0	16.8	0.0	2.9
Lane LOS	A	C		A
Approach Delay (s)	0.0	16.8	0.0	2.9
Approach LOS	A	C		

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	15	15	5	5	15	5	135	5	55	200	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.69	0.69	0.69	0.78	0.78	0.78	0.93	0.93	0.93
Hourly flow rate (vph)	165	18	18	7	7	22	6	173	6	59	215	70
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	583	561	250	584	592	176	285			179		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	583	561	250	584	592	176	285			179		
tC, single (s)	7.2	6.5	6.4	7.1	6.5	6.4	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.5	3.5	4.0	3.5	2.4			2.2		
p0 queue free %	57	96	98	98	98	97	99			96		
cM capacity (veh/h)	380	419	751	388	402	820	1196			1396		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	200	36	186	344
Volume Left	165	7	6	59
Volume Right	18	22	6	70
cSH	401	573	1196	1396
Volume to Capacity	0.50	0.06	0.01	0.04
Queue Length 95th (ft)	67	5	0	3
Control Delay (s)	22.6	11.7	0.3	1.6
Lane LOS	C	B	A	A
Approach Delay (s)	22.6	11.7	0.3	1.6
Approach LOS	C	B		

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	51.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
77: Route 140 On/Off Ramps & Mt. Pleasant Street

2030 No-Build Conditions - AM Peak Hour

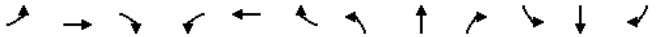
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	160	0	225	400	55	220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.69	0.85	0.85	0.75	0.75
Hourly flow rate (vph)	232	0	265	471	73	293
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			877			
pX, platoon unblocked						
vC, conflicting volume	940	500			265	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	940	500			265	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	12	100			94	
cM capacity (veh/h)	263	567			1299	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	232	735	367
Volume Left	232	0	73
Volume Right	0	471	0
cSH	263	1700	1299
Volume to Capacity	0.88	0.43	0.06
Queue Length 95th (ft)	190	0	4
Control Delay (s)	70.6	0.0	2.0
Lane LOS	F		A
Approach Delay (s)	70.6	0.0	2.0
Approach LOS	F		

Intersection Summary			
Average Delay	12.8		
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Ave.

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	145	50	20	55	0	20	5	35	0	5	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.88	0.88	0.88	0.67	0.67	0.67
Hourly flow rate (vph)	19	181	62	22	61	0	23	6	40	0	7	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	109	98	7	232	78	26	7			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	109	98	7	232	78	26	7			45		
tC, single (s)	7.2	6.5	6.3	7.2	6.6	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.6	4.1	3.3	2.3			2.2		
p0 queue free %	98	77	94	96	92	100	99			100		
cM capacity (veh/h)	788	776	1063	538	792	1056	1526			1575		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	262	83	68	7
Volume Left	19	22	23	0
Volume Right	62	0	40	0
cSH	830	704	1526	1575
Volume to Capacity	0.32	0.12	0.01	0.00
Queue Length 95th (ft)	34	10	1	0
Control Delay (s)	11.3	10.8	2.5	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.3	10.8	2.5	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	9.6			
Intersection Capacity Utilization	29.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2030 No-Build Conditions - AM Peak Hour

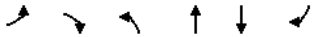
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	120	35	130	100	60	135
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.99	0.99	0.81	0.81
Hourly flow rate (vph)	128	37	131	101	74	167
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	497	182			232	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497	182			232	
tC, single (s)	6.6	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	73	95			94	
cM capacity (veh/h)	481	821			1290	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	165	232	241
Volume Left	128	0	74
Volume Right	37	101	0
cSH	531	1700	1290
Volume to Capacity	0.31	0.14	0.06
Queue Length 95th (ft)	33	0	5
Control Delay (s)	14.8	0.0	2.8
Lane LOS	B		A
Approach Delay (s)	14.8	0.0	2.8
Approach LOS	B		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & Acushnet Ave.

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	45	165	120	45	30	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.82	0.82
Hourly flow rate (vph)	53	194	132	49	37	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	365	52	67			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	365	52	67			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	91	81	91			
cM capacity (veh/h)	576	1005	1433			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	247	181	67
Volume Left	53	132	0
Volume Right	194	0	30
cSH	867	1433	1700
Volume to Capacity	0.29	0.09	0.04
Queue Length 95th (ft)	29	8	0
Control Delay (s)	10.8	5.8	0.0
Lane LOS	B	A	
Approach Delay (s)	10.8	5.8	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		7.5		
Intersection Capacity Utilization		35.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & Acushnet Ave.

2030 No-Build Conditions - AM Peak Hour

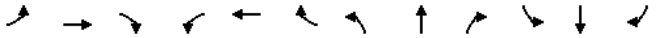
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	10	50	15	10	70
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.86	0.86	0.76	0.76
Hourly flow rate (vph)	31	15	58	17	13	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	185	67			58	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185	67			58	
tC, single (s)	6.4	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.3	
p0 queue free %	96	98			99	
cM capacity (veh/h)	801	936			1502	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	46	76	105
Volume Left	31	0	13
Volume Right	15	17	0
cSH	842	1700	1502
Volume to Capacity	0.05	0.04	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.5	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	1.0
Approach LOS	A		

Intersection Summary				
Average Delay		2.4		
Intersection Capacity Utilization		20.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2030 No-Build Conditions - AM Peak Hour



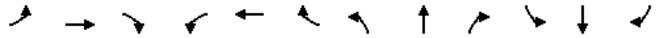
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	10	5	0	10	5	115	15	10	160	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.58	0.58	0.58	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	23	0	16	9	0	17	5	124	16	11	180	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	376	367	194	374	373	132	208			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	376	367	194	374	373	132	208			140		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.3	4.1			4.5		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.4	2.2			2.5		
p0 queue free %	96	100	98	98	100	98	100			99		
cM capacity (veh/h)	568	558	853	536	554	894	1375			1259		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	26	145	219
Volume Left	23	9	5	11
Volume Right	16	17	16	28
cSH	656	731	1375	1259
Volume to Capacity	0.06	0.04	0.00	0.01
Queue Length 95th (ft)	5	3	0	1
Control Delay (s)	10.8	10.1	0.3	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	10.8	10.1	0.3	0.5
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	24.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
182: McArthur Blvd & McArthur Dr-Leonard's Wharf

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	185	50	5	5	25	20	35	30	5	25	10	205
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.64	0.64	0.64	0.90	0.90	0.90
Hourly flow rate (vph)	210	57	6	7	35	28	55	47	8	28	11	228

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	273	69	109	267
Volume Left (vph)	210	7	55	28
Volume Right (vph)	6	28	8	228
Hadj (s)	0.31	0.18	0.38	-0.19
Departure Headway (s)	5.3	5.5	5.6	4.9
Degree Utilization, x	0.40	0.11	0.17	0.36
Capacity (veh/h)	641	589	589	697
Control Delay (s)	11.8	9.2	9.8	10.6
Approach Delay (s)	11.8	9.2	9.8	10.6
Approach LOS	B	A	A	B

Intersection Summary				
Delay	10.8			
HCM Level of Service	B			
Intersection Capacity Utilization	41.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
184: McArthur Blvd & McArthur Dr

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	230	35	0	15	0	245	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	291	44	0	17	0	278	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	195	312	0	173	173	139	0			278		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195	312	0	173	173	139	0			278		
tC, single (s)	7.1	6.5	6.2	7.2	7.1	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.5	3.3	2.5			2.2		
p0 queue free %	100	100	100	61	93	100	99			100		
cM capacity (veh/h)	720	599	1091	755	621	914	1463			1296		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	335	295	0
Volume Left	291	17	0
Volume Right	0	278	0
cSH	734	1463	1700
Volume to Capacity	0.46	0.01	0.00
Queue Length 95th (ft)	60	1	0
Control Delay (s)	14.0	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	14.0	0.5	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	37.2%	ICU Level of Service	A	
Analysis Period (min)	15			

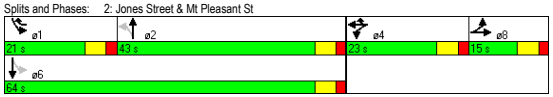
Lanes, Volumes, Timings
2: Jones Street & Mt Pleasant St

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	280	5	490	5	160	400	420	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	16	12	11	11	12
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1031			525			388			877	
Travel Time (s)		23.4			11.9			8.8			19.9	
Peak Hour Factor	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	294	505	0	601	0	525	412	0
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Detector Phase	8	8		4	4	4 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		27.0	27.0		19.0	22.0	
Total Split (s)	15.0	15.0	0.0	23.0	23.0	44.0	43.0	43.0	0.0	21.0	64.0	0.0
Total Split (%)	14.7%	14.7%	0.0%	22.5%	22.5%	43.1%	42.2%	42.2%	0.0%	20.6%	62.7%	0.0%
Maximum Green (s)	9.0	9.0		17.0	17.0		37.0	37.0		15.0	58.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)							5.0	5.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
v/c Ratio		0.10			0.76	0.51		0.88		1.21	0.41	
Control Delay		31.1			48.3	3.4		36.3		136.7	11.5	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		31.1			48.3	3.4		36.3		136.7	11.5	
Queue Length 50th (ft)		4			124	0		200		~232	86	
Queue Length 95th (ft)		14			#355	49		402		#479	170	
Internal Link Dist (ft)		951			445			308			797	
Turn Bay Length (ft)										300		
Base Capacity (vph)		233			385	995		969		434	1295	
Starvation Cap Reductn		0			0	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.08			0.76	0.51		0.62		1.21	0.32	

Intersection Summary	
Area Type:	Other
Cycle Length: 102	
Actuated Cycle Length: 80.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Jones Street & Mt Pleasant St



HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	280	5	490	5	160	400	420	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	11	11	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.93			1.00	0.85		0.90		1.00	1.00	
Flt Protected		0.98			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1959			1776	1568		1909		1728	1749	
Flt Permitted		0.98			0.95	1.00		1.00		0.15	1.00	
Satd. Flow (perm)		1959			1776	1568		1902		267	1749	
Peak-hour factor, PHF	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Adj. Flow (vph)	9	0	9	289	5	505	5	170	426	525	412	0
RTOR Reduction (vph)	0	9	0	0	0	308	0	95	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	294	197	0	506	0	525	412	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		2.3			17.5	33.0		25.2		46.7	46.7	
Effective Green, g (s)		2.3			17.5	33.0		25.2		46.7	46.7	
Actuated g/C Ratio		0.03			0.21	0.39		0.30		0.55	0.55	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		53			368	612		567		416	967	
v/s Ratio Prot		c0.00			c0.17	0.13				c0.23	0.24	
v/s Ratio Perm								0.27		c0.47		
v/c Ratio		0.17			0.80	0.32		0.89		1.26	0.43	
Uniform Delay, d1		40.2			31.8	18.0		28.4		23.0	11.1	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.6			10.8	0.1		15.9		136.0	0.1	
Delay (s)		40.7			42.6	18.1		44.3		159.0	11.2	
Level of Service		D			D	B		D		F	B	
Approach Delay (s)		40.7			27.1			44.3			94.0	
Approach LOS		D			C			D			F	

Intersection Summary					
HCM Average Control Delay	58.2	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.05				
Actuated Cycle Length (s)	84.5	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	94.0%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
14: Kings Highway & Church Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	525	5	35	455	70	230	210	80	70	275	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	576	0	38	577	0	267	337	0	0	388	135
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Minimum Split (s)	35.0	35.0		35.0	35.0		21.0	21.0		21.0	21.0	21.0
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	59.3%	59.3%	0.0%	59.3%	59.3%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	40.7%
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	19.0		19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
v/c Ratio	0.45	0.62		0.14	0.64		1.25	0.61			0.89	0.26
Control Delay	15.8	14.2		9.3	14.7		171.6	22.5			45.2	16.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	15.8	14.2		9.3	14.7		171.6	22.5			45.2	16.5
Queue Length 50th (ft)	26	135		7	137		~123	99			128	35
Queue Length 95th (ft)	69	227		21	232		#232	163			#269	71
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	278	924		279	899		213	553			437	515
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.45	0.62		0.14	0.64		1.25	0.61			0.89	0.26

Intersection Summary

Area Type: Other
Cycle Length: 59
Actuated Cycle Length: 59
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 65
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Kings Highway & Church Street

HCM Signalized Intersection Capacity Analysis
14: Kings Highway & Church Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	525	5	35	455	70	230	210	80	70	275	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1636	1816		1631	1769		1728	1717			1786	1599
Flt Permitted	0.32	1.00		0.32	1.00		0.36	1.00			0.75	1.00
Satd. Flow (perm)	547	1816		547	1769		663	1717			1357	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	125	571	5	38	500	77	267	244	93	79	309	135
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	125	576	0	38	577	0	267	337	0	0	388	135
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Effective Green, g (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32			0.32	0.32
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	278	923		278	899		214	553			437	515
v/s Ratio Prot		0.32			c0.33			0.20				
v/s Ratio Perm	0.23			0.07			c0.40				0.29	0.08
v/c Ratio	0.45	0.62		0.14	0.64		1.25	0.61			0.89	0.26
Uniform Delay, d1	9.2	10.4		7.7	10.6		20.0	16.9			19.0	14.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.2	3.2		1.0	3.5		144.2	4.9			22.5	1.2
Delay (s)	14.4	13.6		8.7	14.1		164.2	21.8			41.5	16.0
Level of Service	B	B		A	B		F	C			D	B
Approach Delay (s)		13.8			13.8			84.8			35.0	
Approach LOS		B			B			F			C	

Intersection Summary

HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
19: Wood Street & Route 18

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	15	155	10	45	105	35	15	385	50	115	530	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		197			310			393			488		
Travel Time (s)		4.5			7.0			8.9			11.1		
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86	
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	195	0	0	210	0	18	524	0	134	633	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	21.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	26%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													4.0
Pedestrian Calls (#/hr)													8
v/c Ratio		0.41			0.48		0.08	0.60		0.45	0.71		
Control Delay		20.1			20.8		13.7	17.2		20.9	20.3		
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0		
Total Delay		20.1			20.8		13.7	17.2		20.9	20.3		
Queue Length 50th (ft)		43			44		2	78		18	104		
Queue Length 95th (ft)		130			134		20	#364		#131	#506		
Internal Link Dist (ft)		117			230			313			408		
Turn Bay Length (ft)													
Base Capacity (vph)		960			860		212	878		300	895		
Starvation Cap Reductn		0			0		0	0		0	0		
Spillback Cap Reductn		0			0		0	0		0	0		
Storage Cap Reductn		0			0		0	0		0	0		
Reduced v/c Ratio		0.20			0.24		0.08	0.60		0.45	0.71		

Intersection Summary	
Area Type:	Other
Cycle Length: 81	
Actuated Cycle Length: 52.4	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 19: Wood Street & Route 18

HCM Signalized Intersection Capacity Analysis
19: Wood Street & Route 18

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	155	10	45	105	35	15	385	50	115	530	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1986			1918		1745	1754		1728	1794	
Flt Permitted		0.97			0.88		0.23	1.00		0.33	1.00	
Satd. Flow (perm)		1925			1713		427	1754		601	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	16	168	11	51	119	40	18	464	60	134	616	17
RTOR Reduction (vph)	0	3	0	0	12	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	192	0	0	198	0	18	520	0	134	632	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		13.0			13.0		26.1	26.1		26.1	26.1	
Effective Green, g (s)		13.0			13.0		26.1	26.1		26.1	26.1	
Actuated g/C Ratio		0.23			0.23		0.46	0.46		0.46	0.46	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		438			390		195	802		275	820	
v/s Ratio Prot								0.30			c0.35	
v/s Ratio Perm		0.10			c0.12		0.04			0.22		
v/c Ratio		0.44			0.51		0.09	0.65		0.49	0.77	
Uniform Delay, d1		18.9			19.3		8.8	12.0		10.8	13.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			1.4		0.3	2.0		1.9	4.8	
Delay (s)		19.9			20.7		9.1	14.0		12.7	17.8	
Level of Service		B			C		A	B		B	B	
Approach Delay (s)		19.9			20.7			13.8			16.9	
Approach LOS		B			C			B			B	

Intersection Summary					
HCM Average Control Delay	16.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	57.1	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	70.7%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
24: Nash Road & Church Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	415	80	40	275	55	60	165	30	75	245	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	726	0	0	406	0	0	286	0	0	546	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.92			0.48			0.61			0.92	
Control Delay		36.8			14.5			24.7			44.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		36.8			14.5			24.7			44.6	
Queue Length 50th (ft)		254			105			93			203	
Queue Length 95th (ft)		#418			175			166			#354	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		788			845			467			596	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.92			0.48			0.61			0.92	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	415	80	40	275	55	60	165	30	75	245	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		2047			2047			1927			1984	
Flt Permitted		0.83			0.89			0.71			0.88	
Satd. Flow (perm)		1708			1831			1380			1763	
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	137	494	95	44	302	60	67	185	34	87	285	174
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	726	0	0	406	0	0	286	0	0	546	0
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		788			845			467			597	
v/s Ratio Prot												
v/s Ratio Perm		c0.43			0.22			0.21			c0.31	
v/c Ratio		0.92			0.48			0.61			0.91	
Uniform Delay, d1		16.4			12.1			17.9			20.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		17.8			2.0			5.9			20.9	
Delay (s)		34.2			14.1			23.8			41.5	
Level of Service		C			B			C			D	
Approach Delay (s)		34.2			14.1			23.8			41.5	
Approach LOS		C			B			C			D	

Intersection Summary					
HCM Average Control Delay	30.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0		
Intersection Capacity Utilization	96.1%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
28: Coggeshall Street & Route 18 SB

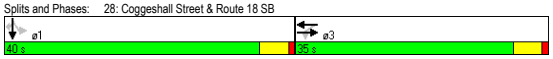
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	215	95	170	230	0	0	0	0	105	630	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	337	0	0	465	0	0	0	0	0	765	47
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.46			0.96						0.50	0.06
Control Delay		17.3			57.8						15.4	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		17.3			57.8						15.4	4.0
Queue Length 50th (ft)		99			205						124	0
Queue Length 95th (ft)		169			#365						172	16
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		727			483						1522	728
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.46			0.96						0.50	0.06

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green
Natural Cycle: 75
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Route 18 SB



HCM Signalized Intersection Capacity Analysis
28: Coggeshall Street & Route 18 SB

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	215	95	170	230	0	0	0	0	105	630	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1763			2026						3262	1507
Flt Permitted		1.00			0.58						0.99	1.00
Satd. Flow (perm)		1763			1209						3262	1507
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	0	234	103	198	267	0	0	0	0	109	656	47
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	316	0	0	465	0	0	0	0	0	765	22
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		705			484						1522	703
v/s Ratio Prot		0.18										
v/s Ratio Perm					c0.38						0.23	0.01
v/c Ratio		0.45			0.96						0.50	0.03
Uniform Delay, d1		16.4			21.9						13.9	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		2.1			32.2						1.2	0.1
Delay (s)		18.5			54.2						15.1	10.9
Level of Service		B			D						B	B
Approach Delay (s)		18.5			54.2			0.0			14.9	
Approach LOS		B			D			A			B	

Intersection Summary

HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

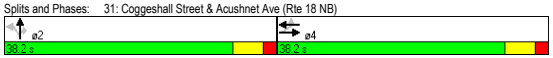
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	270	0	0	280	85	120	465	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	338	0	0	388	0	129	500	312	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.44			0.45		0.17	0.66	0.38			
Control Delay		18.2			17.0		14.7	23.1	3.4			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.2			17.0		14.7	23.1	3.4			
Queue Length 50th (ft)		111			119		37	185	0			
Queue Length 95th (ft)		179			192		71	289	44			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		763			854		756	754	823			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.44			0.45		0.17	0.66	0.38			

Intersection Summary

Area Type: Other
Cycle Length: 76.4
Actuated Cycle Length: 76.4
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rte 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	270	0	0	280	85	120	465	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.97		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		2012			2005		1805	1801	1531			
Flt Permitted		0.90			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1821			2005		1805	1801	1531			
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	48	290	0	0	298	90	129	500	312	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	181	0	0	0
Lane Group Flow (vph)	0	338	0	0	374	0	129	500	131	0	0	0
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		763			840		756	754	641			
v/s Ratio Prot					c0.19			c0.28				
v/s Ratio Perm		0.19					0.07		0.09			
v/c Ratio		0.44			0.45		0.17	0.66	0.20			
Uniform Delay, d1		15.8			15.9		13.9	17.9	14.1			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.9			1.7		0.5	4.6	0.7			
Delay (s)		17.7			17.6		14.4	22.4	14.8			
Level of Service		B			B		B	C	B			
Approach Delay (s)		17.7			17.6			18.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

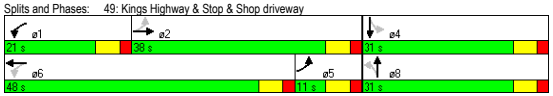
Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	730	115	165	440	50	90	45	230	160	25	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			218			360			359	
Travel Time (s)		11.7			5.0			8.2			8.2	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1092	0	0	690	0	0	430	0	0	399	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	38.0	0.0	21.0	48.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.2%	42.2%	0.0%	23.3%	53.3%	0.0%	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%
Maximum Green (s)	5.0	32.0		15.0	42.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.74			0.60			0.60			0.67	
Control Delay		13.6			10.9			11.4			16.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.6			10.9			11.4			16.3	
Queue Length 50th (ft)		113			61			23			31	
Queue Length 95th (ft)		#258			148			52			70	
Internal Link Dist (ft)		435			138			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1467			1482			1274			1114	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.74			0.47			0.34			0.36	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 55.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

2030 No-Build Conditions - PM Peak Hour

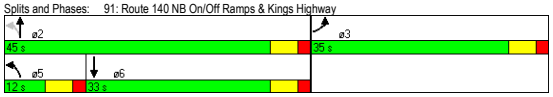
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	730	115	165	440	50	90	45	230	160	25	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.99			0.91			0.93	
Flt Protected		0.99			0.99			0.99			0.98	
Satd. Flow (prot)		3488			3492			3213			3247	
Flt Permitted		0.71			0.55			0.77			0.67	
Satd. Flow (perm)		2494			1953			2495			2238	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	183	785	124	174	463	53	106	53	271	180	28	191
RTOR Reduction (vph)	0	7	0	0	5	0	0	217	0	0	153	0
Lane Group Flow (vph)	0	1085	0	0	685	0	0	213	0	0	246	0
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		32.7			32.7			11.1			11.1	
Effective Green, g (s)		32.7			32.7			11.1			11.1	
Actuated g/C Ratio		0.59			0.59			0.20			0.20	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1462			1145			496			445	
v/s Ratio Prot												
v/s Ratio Perm		c0.44			0.35			0.09			c0.11	
v/c Ratio		0.74			0.60			0.43			0.55	
Uniform Delay, d1		8.5			7.4			19.6			20.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.8			0.6			0.2			0.8	
Delay (s)		10.3			7.9			19.8			21.0	
Level of Service		B			A			B			C	
Approach Delay (s)		10.3			7.9			19.8			21.0	
Approach LOS		B			A			B			C	

Intersection Summary					
HCM Average Control Delay		12.9	HCM Level of Service		B
HCM Volume to Capacity ratio		0.69			
Actuated Cycle Length (s)		55.8	Sum of lost time (s)		12.0
Intersection Capacity Utilization		89.4%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	485	160	150	530	605	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.92	0.92	0.83	0.83	0.79	0.79
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	701	0	0	820	886	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	35.0	0.0	12.0	45.0	33.0	0.0
Total Split (%)	43.8%	0.0%	15.0%	56.3%	41.3%	0.0%
Maximum Green (s)	29.0		6.0	39.0	27.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Recall Mode	None		None	Min	Min	
v/c Ratio	0.94			0.86	0.55	
Control Delay	47.2			29.4	16.1	
Queue Delay	0.0			0.0	0.0	
Total Delay	47.2			29.4	16.1	
Queue Length 50th (ft)	340			175	152	
Queue Length 95th (ft)	#566			223	170	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	765			1068	1622	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.92			0.77	0.55	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 75.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 91: Route 140 NB On/Off Ramps & Kings Highway



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	485	160	150	530	605	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1976			3520	3454	
Flt Permitted	0.96			0.58	1.00	
Satd. Flow (perm)	1976			2049	3454	
Peak-hour factor, PHF	0.92	0.92	0.83	0.83	0.79	0.79
Adj. Flow (vph)	527	174	181	639	766	120
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	701	0	0	820	886	0
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	28.5			34.9	34.9	
Effective Green, g (s)	28.5			34.9	34.9	
Actuated g/C Ratio	0.38			0.46	0.46	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	2.0			2.0	2.0	
Lane Grp Cap (vph)	747			948	1599	
v/s Ratio Prot	c0.35				0.26	
v/s Ratio Perm				c0.40		
v/c Ratio	0.94			0.86	0.55	
Uniform Delay, d1	22.6			18.1	14.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	19.0			8.0	0.2	
Delay (s)	41.6			26.2	14.9	
Level of Service	D			C	B	
Approach Delay (s)	41.6			26.2	14.9	
Approach LOS	D			C	B	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

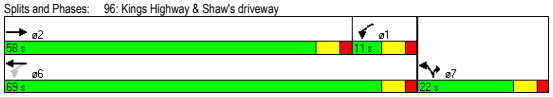
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	585	235	145	620	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.91	0.91	0.96	0.96	0.89	0.89
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	901	0	0	797	174	107
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	58.0	0.0	11.0	69.0	22.0	22.0
Total Split (%)	63.7%	0.0%	12.1%	75.8%	24.2%	24.2%
Maximum Green (s)	52.0		5.0	63.0	16.0	16.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.48			0.66	0.49	0.27
Control Delay	6.9			11.0	22.2	6.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.9			11.0	22.2	6.7
Queue Length 50th (ft)	53			64	36	0
Queue Length 95th (ft)	106			134	101	31
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	3337			2277	648	648
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.27			0.35	0.27	0.17

Intersection Summary

Area Type: Other
Cycle Length: 91
Actuated Cycle Length: 45.3
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 96: Kings Highway & Shaw's driveway



HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2030 No-Build Conditions - PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	585	235	145	620	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3406			3541	1787	1599
Flt Permitted	1.00			0.64	0.95	1.00
Satd. Flow (perm)	3406			2276	1787	1599
Peak-hour factor, PHF	0.91	0.91	0.96	0.96	0.89	0.89
Adj. Flow (vph)	643	258	151	646	174	107
RTOR Reduction (vph)	51	0	0	0	0	86
Lane Group Flow (vph)	850	0	0	797	174	21
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	24.1			24.1	8.9	8.9
Effective Green, g (s)	24.1			24.1	8.9	8.9
Actuated g/C Ratio	0.54			0.54	0.20	0.20
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	1824			1219	353	316
v/s Ratio Prot	0.25				c0.10	0.01
v/s Ratio Perm				c0.35		
v/c Ratio	0.47			0.65	0.49	0.07
Uniform Delay, d1	6.5			7.5	16.0	14.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			1.0	0.4	0.0
Delay (s)	6.5			8.4	16.4	14.7
Level of Service	A			A	B	B
Approach Delay (s)	6.5			8.4	15.8	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

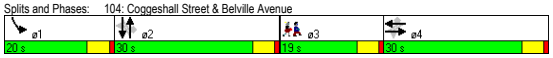
Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	115	275	75	75	235	265	30	235	330	290	180	145	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		443			1111			850			178		
Travel Time (s)		10.1			25.3			19.3			4.0		
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	506	0	0	330	282	0	294	367	0	669	0	
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt			
Protected Phases		4			4			2		1	2		3
Permitted Phases	4			4		4	2		2	2			
Detector Phase	4	4		4	4	4	2	2	2	1	2		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		6.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0		19.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0	19.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%	19%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0		14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		0.2
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None		None
Walk Time (s)													6.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													7
v/c Ratio		0.52			0.59	0.37		0.47	0.42		0.76		
Control Delay		17.6			22.9	4.2		19.0	3.8		24.4		
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0		
Total Delay		17.6			22.9	4.2		19.0	3.8		24.4		
Queue Length 50th (ft)		64			87	0		72	0		93		
Queue Length 95th (ft)		161			#272	51		199	57		#264		
Internal Link Dist (ft)		363			1031			770			98		
Turn Bay Length (ft)													
Base Capacity (vph)		966			557	753		655	908		914		
Starvation Cap Reductn		0			0	0		0	0		0		
Spillback Cap Reductn		0			0	0		0	0		0		
Storage Cap Reductn		0			0	0		0	0		0		
Reduced v/c Ratio		0.52			0.59	0.37		0.45	0.40		0.73		

Intersection Summary	
Area Type:	Other
Cycle Length: 99	
Actuated Cycle Length: 62.8	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	275	75	75	235	265	30	235	330	290	180	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.98			1.00	0.85		1.00	0.85		0.96	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3266			1735	1449		1819	1706		3215	
Flt Permitted		0.71			0.78	1.00		0.89	1.00		0.67	
Satd. Flow (perm)		2356			1376	1449		1621	1706		2189	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	125	299	82	80	250	282	33	261	367	315	196	158
RTOR Reduction (vph)	0	14	0	0	0	175	0	0	234	0	32	0
Lane Group Flow (vph)	0	492	0	0	330	107	0	294	133	0	637	0
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.4			25.4	25.4		24.2	24.2		24.2	
Effective Green, g (s)		25.4			25.4	25.4		24.2	24.2		24.2	
Actuated g/C Ratio		0.38			0.38	0.38		0.36	0.36		0.36	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		896			523	551		587	618		793	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.24	0.07		0.18	0.08		c0.29	
v/c Ratio		0.55			0.63	0.19		0.50	0.22		0.80	
Uniform Delay, d1		16.2			16.9	13.9		16.6	14.7		19.2	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		2.4			5.7	0.8		0.9	0.2		6.2	
Delay (s)		18.6			22.6	14.6		17.5	15.0		25.4	
Level of Service		B			C	B		B	B		C	
Approach Delay (s)		18.6			18.9			16.1			25.4	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	19.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	66.8	Sum of lost time (s)		17.2	
Intersection Capacity Utilization	78.6%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
137: Hillman St & Pleasant Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	85	270	575	110	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.77	0.77	0.94	0.94	0.73	0.73
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	240	0	899	0	0	630
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.38		0.47			0.62
Control Delay	14.1		4.3			16.0
Queue Delay	0.0		0.0			0.0
Total Delay	14.1		4.3			16.0
Queue Length 50th (ft)	50		32			91
Queue Length 95th (ft)	81		64			102
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	637		1899			1022
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.38		0.47			0.62

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street

HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2030 No-Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	85	270	575	110	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.90			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1884		3357			3694
Flt Permitted	0.97		1.00			0.58
Satd. Flow (perm)	1884		3357			2180
Peak-hour factor, PHF	0.77	0.77	0.94	0.94	0.73	0.73
Adj. Flow (vph)	130	110	287	612	151	479
RTOR Reduction (vph)	47	0	325	0	0	0
Lane Group Flow (vph)	193	0	574	0	0	630
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	589		1574			1022
v/s Ratio Prot	c0.10		0.17			
v/s Ratio Perm						c0.29
v/c Ratio	0.33		0.36			0.62
Uniform Delay, d1	16.8		10.9			12.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	1.5		0.7			2.8
Delay (s)	18.3		11.5			15.5
Level of Service	B		B			B
Approach Delay (s)	18.3		11.5			15.5
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

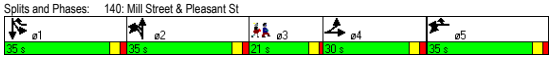
Lanes, Volumes, Timings
140: Mill Street & Pleasant St

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	260	195	360	205	240	25	135	450	105	85	325	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	16	11	12	10	16	10	12	14	16	14	16	
Storage Length (ft)	0		0		0		100		0	0		0	
Storage Lanes	1		1		1		1		0	0		0	
Taper Length (ft)	25		25		25		25		25	25		25	
Right Turn on Red					No				Yes				
Link Speed (mph)		30		30				30			30		
Link Distance (ft)		168		308				709			499		
Travel Time (s)		3.8		7.0				16.1			11.3		
Peak Hour Factor	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83	
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	271	203	387	220	258	0	184	638	0	0	554	0	
Turn Type	Split		Split		pt+ov	Split	Split			Split			
Protected Phases	4	4	5	5	1 5	2	2	2		1	1		3
Permitted Phases													
Detector Phase	4	4	5	5	1 5	2	2	2		1	1		
Switch Phase													
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0		10.0
Minimum Split (s)	12.0	12.0	12.0	12.0		12.0	12.0	12.0		12.0	12.0		21.0
Total Split (s)	30.0	30.0	35.0	35.0	70.0	35.0	35.0	35.0	0.0	35.0	35.0	0.0	21.0
Total Split (%)	19.2%	19.2%	22.4%	22.4%	44.9%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%	0.0%	13%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	30.0	30.0		30.0	30.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lag	Lag				Lag	Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0		0.2
Recall Mode	Max	Max	Max	Max		Max	Max	Max		Max	Max		None
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													16
v/c Ratio	0.84	0.54	1.10	0.56	0.39		0.54	0.88			0.70		
Control Delay	80.1	61.7	127.8	58.5	29.7		59.1	67.8			59.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0		
Total Delay	80.1	61.7	127.8	58.5	29.7		59.1	67.8			59.2		
Queue Length 50th (ft)	230	162	~365	171	139		143	276			235		
Queue Length 95th (ft)	#450	285	#690	301	269		250	#432			322		
Internal Link Dist (ft)		88		228				629			419		
Turn Bay Length (ft)							100						
Base Capacity (vph)	324	374	353	396	666		340	729			787		
Starvation Cap Reductn	0	0	0	0	0		0	0			0		
Spillback Cap Reductn	0	0	0	0	0		0	0			0		
Storage Cap Reductn	0	0	0	0	0		0	0			0		
Reduced v/c Ratio	0.84	0.54	1.10	0.56	0.39		0.54	0.88			0.70		

Intersection Summary	
Area Type:	Other
Cycle Length: 156	
Actuated Cycle Length: 143.4	
Natural Cycle: 130	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 140: Mill Street & Pleasant St



HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	195	360	205	240	25	135	450	105	85	325	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95			0.95	
Frt	1.00	1.00	1.00	1.00	0.85		1.00	0.97			0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1847	2132	1678	1881	1463		1617	3405			3741	
Flt Permitted	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1847	2132	1678	1881	1463		1617	3405			3741	
Peak-hour factor, PHF	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Adj. Flow (vph)	271	203	387	220	258	29	155	517	121	102	392	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	271	203	387	220	258	0	184	625	0	0	554	0
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	5	5	1 5	2	2	2		1	1	
Permitted Phases												
Actuated Green, G (s)	25.1	25.1	30.2	30.2	65.4		30.2	30.2			30.2	
Effective Green, g (s)	25.1	25.1	30.2	30.2	65.4		30.2	30.2			30.2	
Actuated g/C Ratio	0.17	0.17	0.21	0.21	0.45		0.21	0.21			0.21	
Clearance Time (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Lane Grp Cap (vph)	318	367	347	389	655		334	704			774	
v/s Ratio Prot	c0.15	0.10	c0.23	0.12	0.18		0.11	c0.18			c0.15	
v/s Ratio Perm												
v/c Ratio	0.85	0.55	1.12	0.57	0.39		0.55	0.89			0.72	
Uniform Delay, d1	58.7	55.3	57.9	52.0	27.0		51.8	56.3			53.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	24.0	5.9	83.2	5.8	1.8		6.4	15.5			5.6	
Delay (s)	82.6	61.2	141.1	57.9	28.8		58.2	71.8			59.5	
Level of Service	F	E	F	E	C		E	E			E	
Approach Delay (s)		73.5		86.4				68.8			59.5	
Approach LOS		E		F				E			E	

Intersection Summary					
HCM Average Control Delay	73.3	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	146.0	Sum of lost time (s)		30.3	
Intersection Capacity Utilization	75.7%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

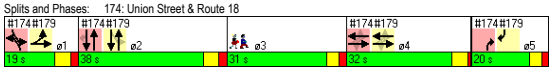
Lanes, Volumes, Timings
174: Union Street & Route 18

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	340	30	60	70	35	15	90	980	20	35	1150	145	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	16	16	11	11	11	10	11	11	
Storage Length (ft)	0		0	0		0	150		225	150		225	
Storage Lanes	0		0	0		0	1		1	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		432			82			365			2491		
Travel Time (s)		9.8			1.9			8.3			56.6		
Peak Hour Factor	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99	
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	463	0	0	141	0	99	1077	22	35	1162	146	
Turn Type	Perm			Perm			Prot		custom	Prot		Perm	
Protected Phases		4			4		1	2	5	1	2		3
Permitted Phases	4			4								2	
Detector Phase	4	4		4	4		1	2	5	1	2	2	
Switch Phase													
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0	17.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0	31.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0	31.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%	22%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0	26.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0	0.2
Recall Mode	None	None		None	None		None	None	None	None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													14
v/c Ratio		1.41			0.34		0.59	1.17	0.12	0.25	1.26	0.30	
Control Delay		237.8			82.9		69.6	125.1	54.5	59.4	161.2	20.9	
Queue Delay		0.0			0.0		0.0	107.5	0.2	0.0	0.0	0.0	
Total Delay		237.8			82.9		69.6	232.6	54.8	59.4	161.2	20.9	
Queue Length 50th (ft)		~418			95		66	~445	14	22	~510	34	
Queue Length 95th (ft)		#835			195		#158	#827	47	67	#912	114	
Internal Link Dist (ft)		352			2			285			2411		
Turn Bay Length (ft)							150		225	150		225	
Base Capacity (vph)		328			412		193	924	202	161	924	484	
Starvation Cap Reductn		0			0		0	159	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	46	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	0	
Reduced v/c Ratio		1.41			0.34		0.51	1.41	0.14	0.22	1.26	0.30	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 118.7	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 174: Union Street & Route 18



HCM Signalized Intersection Capacity Analysis
174: Union Street & Route 18

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	30	60	70	35	15	90	980	20	35	1150	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2012			2033		1728	3355	1561	1440	3355	1546
Flt Permitted		0.67			0.85		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1411			1773		1728	3355	1561	1440	3355	1546
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Adj. Flow (vph)	366	32	65	82	41	18	99	1077	22	35	1162	146
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	58
Lane Group Flow (vph)	0	463	0	0	141	0	99	1077	22	35	1162	88
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)		27.6			27.6		11.6	32.7	13.8	11.6	32.7	32.7
Effective Green, g (s)		27.6			27.6		11.6	32.7	13.8	11.6	32.7	32.7
Actuated g/C Ratio		0.23			0.23		0.10	0.27	0.11	0.10	0.27	0.27
Clearance Time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)		5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		321			403		165	903	177	137	903	416
v/s Ratio Prot							c0.06	0.32	c0.01	0.02	c0.35	
v/s Ratio Perm		c0.33			0.08							0.06
v/c Ratio		1.44			0.35		0.60	1.19	0.12	0.26	1.29	0.21
Uniform Delay, d1		46.9			39.4		52.7	44.4	48.4	50.9	44.4	34.4
Progression Factor		1.00			1.89		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		215.9			0.9		6.9	97.7	0.4	1.3	137.5	0.3
Delay (s)		262.9			75.6		59.7	142.1	48.8	52.3	181.9	34.7
Level of Service		F			E		E	F	D	D	F	C
Approach Delay (s)		262.9			75.6			133.5			162.5	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	162.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	121.5	Sum of lost time (s)	35.8
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

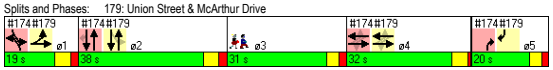
Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø3
Lane Configurations													
Volume (vph)	45	5	35	0	15	5	0	200	5	5	245	105	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		0	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			No			Yes			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		82			609			920			687		
Travel Time (s)		1.9			13.8			20.9			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83	
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	95	0	0	27	0	0	297	0	0	301	127	
Turn Type	pm+pt			Perm						Perm		custom	
Protected Phases	1	1 4			4			2			2	5	3
Permitted Phases	1 4			4						2			
Detector Phase	1	1 4		4	4			2		2	2	5	
Switch Phase													
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0	17.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0	31.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0	31.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%	22%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0	26.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0	
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0	0.2
Recall Mode	None			None	None			None		None	None	None	None
Walk Time (s)													17.0
Flash Dont Walk (s)													9.0
Pedestrian Calls (#/hr)													14
v/c Ratio		0.18			0.06			0.53			0.61	0.68	
Control Delay		7.2			34.9			44.1			47.4	72.4	
Queue Delay		0.0			0.0			0.0			0.0	670.9	
Total Delay		7.2			34.9			44.1			47.4	743.3	
Queue Length 50th (ft)		20			11			170			177	84	
Queue Length 95th (ft)		m34			35			253			331	#184	
Internal Link Dist (ft)		2			529			840			607		
Turn Bay Length (ft)												50	
Base Capacity (vph)		567			446			557			490	206	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			7			0			0	174	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.17			0.06			0.53			0.61	3.97	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 118.7	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 179: Union Street & McArthur Drive



HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	35	0	15	5	0	200	5	5	245	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.94			0.96			1.00			1.00	0.85
Flt Protected		0.97			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1833			1894			2019			1793	1599
Flt Permitted		0.86			1.00			1.00			0.99	1.00
Satd. Flow (perm)		1615			1894			2019			1781	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Adj. Flow (vph)	50	6	39	0	20	7	0	290	7	6	295	127
RTOR Reduction (vph)	0	0	0	0	5	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	95	0	0	22	0	0	296	0	0	301	127
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		39.2			27.6			32.7			32.7	13.8
Effective Green, g (s)		39.2			27.6			32.7			32.7	13.8
Actuated g/C Ratio		0.32			0.23			0.27			0.27	0.11
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		542			430			543			479	182
v/s Ratio Prot		c0.02			0.01			0.15				c0.08
v/s Ratio Perm		c0.04									c0.17	
v/c Ratio		0.18			0.05			0.55			0.63	0.70
Uniform Delay, d1		29.5			36.7			38.0			39.1	51.8
Progression Factor		0.33			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.2			0.1			1.4			2.9	11.9
Delay (s)		9.9			36.8			39.4			42.0	63.7
Level of Service		A			D			D			D	E
Approach Delay (s)		9.9			36.8			39.4			48.4	
Approach LOS		A			D			D			D	

Intersection Summary					
HCM Average Control Delay	40.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.44				
Actuated Cycle Length (s)	121.5	Sum of lost time (s)		36.8	
Intersection Capacity Utilization	38.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2030 No-Build Conditions - PM Peak Hour

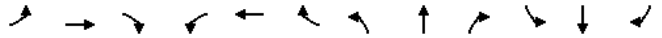
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	15	30	1090	640	160
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	62	19	33	1198	711	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				393	611	
pX, platoon unblocked	0.72					
vC, conflicting volume	2064	800	889			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2288	800	889			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	95	96			
cM capacity (veh/h)	30	387	762			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	1231	889
Volume Left	62	33	0
Volume Right	19	0	178
cSH	38	762	1700
Volume to Capacity	2.16	0.04	0.52
Queue Length 95th (ft)	222	3	0
Control Delay (s)	762.8	1.7	0.0
Lane LOS	F	A	
Approach Delay (s)	762.8	1.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	29.1		
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Park Avenue & Church Street

2030 No-Build Conditions - PM Peak Hour



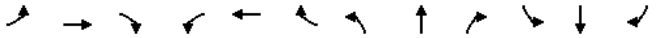
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	165	325	15	0	35	0	485	20	5	310	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.85	0.85	0.85	0.79	0.79	0.79
Hourly flow rate (vph)	5	176	346	19	0	44	0	571	24	6	392	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1031	999	392	1421	987	582	392			594		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	939	900	174	1405	886	582	174			594		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	25	52	4	100	91	100			99		
cM capacity (veh/h)	187	233	726	20	237	511	1182			992		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	527	62	594	399
Volume Left	5	19	0	6
Volume Right	346	44	24	0
cSH	418	60	1700	992
Volume to Capacity	1.26	1.04	0.35	0.01
Queue Length 95th (ft)	559	125	0	0
Control Delay (s)	163.0	242.7	0.0	0.2
Lane LOS	F	F		A
Approach Delay (s)	163.0	242.7	0.0	0.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	63.9		
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2030 No-Build Conditions - PM Peak Hour



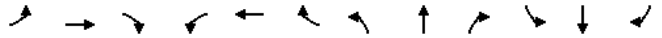
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	25	5	15	10	380	0	0	475	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.66	0.66	0.66	0.92	0.92	0.92	0.91	0.91	0.91
Hourly flow rate (vph)	7	0	0	38	8	23	11	413	0	0	522	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	986	960	525	960	962	413	527			413		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986	960	525	960	962	413	527			413		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	97	100	100	84	97	96	99			100		
cM capacity (veh/h)	214	256	557	232	255	628	995			1157		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	7	68	424	527
Volume Left	7	38	11	0
Volume Right	0	23	0	5
cSH	214	298	995	1700
Volume to Capacity	0.03	0.23	0.01	0.31
Queue Length 95th (ft)	3	22	1	0
Control Delay (s)	22.4	20.6	0.3	0.0
Lane LOS	C	C	A	
Approach Delay (s)	22.4	20.6	0.3	0.0
Approach LOS	C	C		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	38.0%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 No-Build Conditions - PM Peak Hour



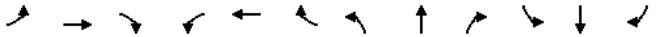
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	405	40	50	330	45	25	135	55	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	108	435	43	54	355	48	32	171	70	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.93			0.91			0.95	0.95	0.91	0.95	0.95	0.93
vC, conflicting volume	403			478			1159	1183	457	1314	1180	379
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			379			967	993	356	1131	990	291
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	91			95			84	15	89	100	100	100
cM capacity (veh/h)	1152			1065			199	200	615	39	203	698

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	586	457	272
Volume Left	108	54	32
Volume Right	43	48	70
cSH	1152	1065	242
Volume to Capacity	0.09	0.05	1.13
Queue Length 95th (ft)	8	4	304
Control Delay (s)	2.4	1.5	139.3
Lane LOS	A	A	F
Approach Delay (s)	2.4	1.5	139.3
Approach LOS			F

Intersection Summary				
Average Delay	30.4			
Intersection Capacity Utilization	64.2%	ICU Level of Service		C
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
54: Rt 18 SB Exit Ramp & Purchase St

2030 No-Build Conditions - PM Peak Hour



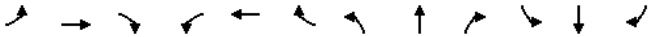
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	195	5	50	5	450	0	0	265	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	212	5	54	5	489	0	0	288	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								823				
pX, platoon unblocked												
vC, conflicting volume	845	788	288	788	788	489	288			489		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	845	788	288	788	788	489	288			489		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	31	98	91	100			100		
cM capacity (veh/h)	252	322	751	308	322	579	1274			1074		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	272	495	288
Volume Left	0	212	5	0
Volume Right	0	54	0	0
cSH	1700	340	1274	1700
Volume to Capacity	0.00	0.80	0.00	0.17
Queue Length 95th (ft)	0	167	0	0
Control Delay (s)	0.0	46.9	0.1	0.0
Lane LOS	A	E	A	
Approach Delay (s)	0.0	46.9	0.1	0.0
Approach LOS	A	E		

Intersection Summary				
Average Delay	12.2			
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 No-Build Conditions - PM Peak Hour



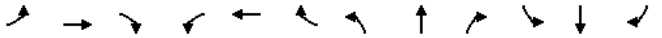
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	135	10	20	145	105	20	325	75	110	230	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.94	0.94	0.94
Hourly flow rate (vph)	6	153	11	23	165	119	24	392	90	117	245	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	170	307	506	372
Volume Left (vph)	6	23	24	117
Volume Right (vph)	11	119	90	11
Hadj (s)	0.01	-0.20	-0.03	0.12
Departure Headway (s)	8.1	7.3	6.8	7.2
Degree Utilization, x	0.38	0.63	0.95	0.75
Capacity (veh/h)	399	468	526	482
Control Delay (s)	16.1	21.9	53.4	28.5
Approach Delay (s)	16.1	21.9	53.4	28.5
Approach LOS	C	C	F	D

Intersection Summary				
Delay	34.7			
HCM Level of Service	D			
Intersection Capacity Utilization	74.6%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2030 No-Build Conditions - PM Peak Hour



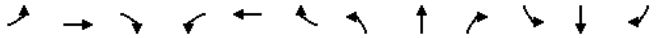
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	0	45	90	120	30	95	355	0	0	240	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.90	0.90	0.90
Hourly flow rate (vph)	28	0	51	105	140	35	101	378	0	0	267	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	968	863	283	914	880	378	300			378		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	968	863	283	914	880	378	300			378		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	76	100	93	53	47	95	92			100		
cM capacity (veh/h)	121	271	744	222	264	650	1267			1192		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	80	174	105	479	300
Volume Left	28	105	0	101	0
Volume Right	51	0	35	0	33
cSH	261	237	329	1267	1700
Volume to Capacity	0.30	0.74	0.32	0.08	0.18
Queue Length 95th (ft)	31	127	33	6	0
Control Delay (s)	24.7	53.3	21.0	2.4	0.0
Lane LOS	C	F	C	A	
Approach Delay (s)	24.7	41.2		2.4	0.0
Approach LOS	C	E			

Intersection Summary				
Average Delay	12.8			
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2030 No-Build Conditions - PM Peak Hour



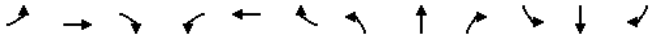
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	0	70	0	380	115	60	310	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.85	0.85	0.85	0.96	0.96	0.96	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	71	0	82	0	396	120	64	330	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	996	973	330	913	913	456	330			516		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	996	973	330	913	913	456	330			516		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	71	100	86	100			94		
cM capacity (veh/h)	185	238	716	242	258	605	1241			1025		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	153	516	394
Volume Left	0	71	0	64
Volume Right	0	82	120	0
cSH	1700	357	1241	1025
Volume to Capacity	0.00	0.43	0.00	0.06
Queue Length 95th (ft)	0	52	0	5
Control Delay (s)	0.0	22.4	0.0	2.0
Lane LOS	A	C		A
Approach Delay (s)	0.0	22.4	0.0	2.0
Approach LOS	A	C		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	15	10	10	20	45	5	205	5	10	135	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.61	0.61	0.61	0.92	0.92	0.92	0.88	0.88	0.88
Hourly flow rate (vph)	161	17	11	16	33	74	5	223	5	11	153	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	528	441	179	458	464	226	205			228		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528	441	179	458	464	226	205			228		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	97	99	97	93	91	100			99		
cM capacity (veh/h)	393	507	869	492	492	819	1379			1352		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	190	123	234	216
Volume Left	161	16	5	11
Volume Right	11	74	5	51
cSH	415	647	1379	1352
Volume to Capacity	0.46	0.19	0.00	0.01
Queue Length 95th (ft)	58	17	0	1
Control Delay (s)	20.8	11.9	0.2	0.5
Lane LOS	C	B	A	A
Approach Delay (s)	20.8	11.9	0.2	0.5
Approach LOS	C	B		

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	37.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
77: Route 140 On/Off Ramps & Mt. Pleasant Street

2030 No-Build Conditions - PM Peak Hour

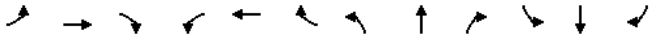
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	255	0	250	405	70	495
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.95	0.95	0.68	0.68
Hourly flow rate (vph)	290	0	263	426	103	728
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			877			
pX, platoon unblocked						
vC, conflicting volume	1410	476			263	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1410	476			263	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	0	100			92	
cM capacity (veh/h)	140	587			1278	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	290	689	831
Volume Left	290	0	103
Volume Right	0	426	0
cSH	140	1700	1278
Volume to Capacity	2.08	0.41	0.08
Queue Length 95th (ft)	586	0	7
Control Delay (s)	561.0	0.0	2.0
Lane LOS	F		A
Approach Delay (s)	561.0	0.0	2.0
Approach LOS	F		

Intersection Summary				
Average Delay	90.7			
Intersection Capacity Utilization	92.0%	ICU Level of Service		F
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Ave.

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	135	25	25	85	0	40	15	25	0	5	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.61	0.61	0.61	0.93	0.93	0.93	0.75	0.75	0.75
Hourly flow rate (vph)	16	145	27	41	139	0	43	16	27	0	7	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	195	139	10	225	129	30	13			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195	139	10	225	129	30	13			43		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	80	97	93	81	100	97			100		
cM capacity (veh/h)	644	732	1054	588	739	1051	1599			1579		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	188	180	86	13
Volume Left	16	41	43	0
Volume Right	27	0	27	7
cSH	756	698	1599	1579
Volume to Capacity	0.25	0.26	0.03	0.00
Queue Length 95th (ft)	25	26	2	0
Control Delay (s)	11.3	11.9	3.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.3	11.9	3.8	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	9.9			
Intersection Capacity Utilization	29.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2030 No-Build Conditions - PM Peak Hour

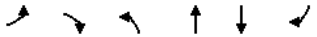
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	140	70	155	95	30	175
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.95	0.95	0.73	0.73
Hourly flow rate (vph)	184	92	163	100	41	240
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	535	213			263	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	535	213			263	
tC, single (s)	6.4	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.3	
p0 queue free %	62	89			97	
cM capacity (veh/h)	486	807			1256	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	276	263	281
Volume Left	184	0	41
Volume Right	92	100	0
cSH	560	1700	1256
Volume to Capacity	0.49	0.15	0.03
Queue Length 95th (ft)	68	0	3
Control Delay (s)	17.5	0.0	1.4
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	1.4
Approach LOS	C		

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & Acushnet Ave.

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	45	150	190	30	55	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.87	0.87	0.77	0.77
Hourly flow rate (vph)	54	181	218	34	71	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	582	110	149			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	582	110	149			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	87	81	85			
cM capacity (veh/h)	405	932	1414			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	235	253	149
Volume Left	54	218	0
Volume Right	181	0	78
cSH	717	1414	1700
Volume to Capacity	0.33	0.15	0.09
Queue Length 95th (ft)	36	14	0
Control Delay (s)	12.5	7.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.5	7.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		7.4		
Intersection Capacity Utilization		37.2%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & Acushnet Ave.

2030 No-Build Conditions - PM Peak Hour

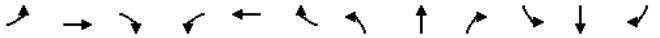
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	15	70	15	5	50
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.81	0.81	0.72	0.72	0.63	0.63
Hourly flow rate (vph)	19	19	97	21	8	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	203	108			97	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	203	108			97	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			99	
cM capacity (veh/h)	786	952			1509	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	118	87
Volume Left	19	0	8
Volume Right	19	21	0
cSH	861	1700	1509
Volume to Capacity	0.04	0.07	0.01
Queue Length 95th (ft)	3	0	0
Control Delay (s)	9.4	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.7
Approach LOS	A		

Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization		16.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2030 No-Build Conditions - PM Peak Hour



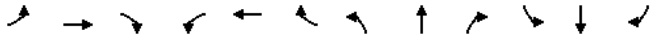
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	5	10	0	20	10	175	10	5	155	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.63	0.63	0.63	0.90	0.90	0.90	0.82	0.82	0.82
Hourly flow rate (vph)	22	0	7	16	0	32	11	194	11	6	189	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467	441	201	443	448	200	213			206		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	441	201	443	448	200	213			206		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	95	100	99	97	100	96	99			100		
cM capacity (veh/h)	484	507	845	519	503	807	1369			1378		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	48	217	220
Volume Left	22	16	11	6
Volume Right	7	32	11	24
cSH	542	681	1369	1378
Volume to Capacity	0.05	0.07	0.01	0.00
Queue Length 95th (ft)	4	6	1	0
Control Delay (s)	12.0	10.7	0.5	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	12.0	10.7	0.5	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay			2.0	
Intersection Capacity Utilization			24.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
182: McArthur Blvd & McArthur Dr-Leonard's Wharf

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	155	10	0	0	20	10	15	20	0	15	10	265
Peak Hour Factor	0.81	0.81	0.81	0.83	0.83	0.83	0.51	0.51	0.51	0.85	0.85	0.85
Hourly flow rate (vph)	191	12	0	0	24	12	29	39	0	18	12	312

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	204	36	69	341
Volume Left (vph)	191	0	29	18
Volume Right (vph)	0	12	0	312
Hadj (s)	0.30	-0.13	0.69	-0.41
Departure Headway (s)	5.2	5.0	5.6	4.2
Degree Utilization, x	0.29	0.05	0.11	0.40
Capacity (veh/h)	646	637	595	806
Control Delay (s)	10.4	8.3	9.3	10.1
Approach Delay (s)	10.4	8.3	9.3	10.1
Approach LOS	B	A	A	B

Intersection Summary				
Delay			10.0	
HCM Level of Service			A	
Intersection Capacity Utilization			40.3%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
184: McArthur Blvd & McArthur Dr

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	270	30	0	40	0	165	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.83	0.83	0.83	0.82	0.82	0.82	0.25	0.25	0.25
Hourly flow rate (vph)	0	0	0	325	36	0	49	0	201	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216	299	0	198	198	101	0			201		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216	299	0	198	198	101	0			201		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	100	56	95	100	97			100		
cM capacity (veh/h)	698	598	1091	736	680	960	1591			1383		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	361	250	0
Volume Left	325	49	0
Volume Right	0	201	0
cSH	730	1591	1700
Volume to Capacity	0.49	0.03	0.00
Queue Length 95th (ft)	69	2	0
Control Delay (s)	14.7	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	14.7	1.6	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Taunton

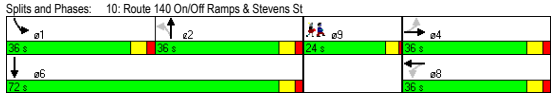
Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	5	5	0	10	5	140	5	565	75	160	65	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	200		0	
Storage Lanes	0		0	0		0	0		0	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		819			376			787			471		
Travel Time (s)		18.6			8.5			17.9			10.7		
Peak Hour Factor	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	185	0	0	759	0	190	89	0	
Turn Type	Perm			Perm			Perm			Prot			
Protected Phases		4			8			2		1	6		9
Permitted Phases	4			8			2						
Detector Phase	4	4		8	8		2	2		1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		24.0
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0	24.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%	18%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag							Lag	Lag		Lead			
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		3.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.07			0.41			0.56		0.42	0.07		
Control Delay		23.4			9.0			14.4		24.8	3.1		
Queue Delay		0.0			0.0			0.0		0.0	0.0		
Total Delay		23.4			9.0			14.4		24.8	3.1		
Queue Length 50th (ft)		3			2			93		29	7		
Queue Length 95th (ft)		6			24			144		53	17		
Internal Link Dist (ft)		739			296			707			391		
Turn Bay Length (ft)										200			
Base Capacity (vph)		1502			1544			1661		1663	1800		
Starvation Cap Reductn		0			0			0		0	0		
Spillback Cap Reductn		0			0			0		0	0		
Storage Cap Reductn		0			0			0		0	0		
Reduced v/c Ratio		0.01			0.12			0.46		0.11	0.05		

Intersection Summary	
Area Type:	Other
Cycle Length: 132	
Actuated Cycle Length: 57	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	10	5	140	5	565	75	160	65	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		1.00			0.86			0.98		1.00	0.98	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		3639			2967			3294		3155	1799	
Flt Permitted		0.76			0.93			0.95		0.95	1.00	
Satd. Flow (perm)		2851			2778			3142		3155	1799	
Peak-hour factor, PHF	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	11	11	0	12	6	167	6	665	88	190	77	12
RTOR Reduction (vph)	0	0	0	0	149	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	22	0	0	36	0	0	753	0	190	86	0
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		6.3			6.3			24.5		8.2	38.7	
Effective Green, g (s)		6.3			6.3			24.5		8.2	38.7	
Actuated g/C Ratio		0.11			0.11			0.43		0.14	0.68	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		315			307			1351		454	1221	
v/s Ratio Prot										c0.06	0.05	
v/s Ratio Perm		0.01			c0.01			c0.24				
v/c Ratio		0.07			0.12			0.56		0.42	0.07	
Uniform Delay, d1		22.7			22.8			12.2		22.2	3.1	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1			0.3		0.2	0.0	
Delay (s)		22.8			22.9			12.5		22.5	3.1	
Level of Service		C			C			B		C	A	
Approach Delay (s)		22.8			22.9			12.5			16.3	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	15.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

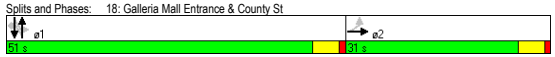
Lanes, Volumes, Timings
18: Galleria Mall Entrance & County St

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	110	0	60	55	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	0	0	0	135	0	0	132	92
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.06						0.05			0.05	0.06
Control Delay		8.2						1.9			2.0	1.2
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		8.2						1.9			2.0	1.2
Queue Length 50th (ft)		1						0			0	0
Queue Length 95th (ft)		9						13			13	11
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		2420						3243			2666	1679
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.02						0.04			0.05	0.05

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 29.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Galleria Mall Entrance & County St



HCM Signalized Intersection Capacity Analysis
18: Galleria Mall Entrance & County St

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	110	0	60	55	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.96						1.00			1.00	0.85
Flt Protected		0.98						1.00			0.97	1.00
Satd. Flow (prot)		2745						3417			3180	1679
Flt Permitted		0.98						0.95			0.82	1.00
Satd. Flow (perm)		2745						3243			2668	1679
Peak-hour factor, PHF	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	18	12	12	0	0	0	6	129	0	69	63	92
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	30
Lane Group Flow (vph)	0	30	0	0	0	0	0	135	0	0	132	62
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		1.3						22.8			22.8	22.8
Effective Green, g (s)		1.3						22.8			22.8	22.8
Actuated g/C Ratio		0.04						0.67			0.67	0.67
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		105						2168			1784	1123
v/s Ratio Prot												
v/s Ratio Perm		0.01						0.04			c0.05	0.04
v/c Ratio		0.29						0.06			0.07	0.05
Uniform Delay, d1		16.0						2.0			2.0	1.9
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.6						0.0			0.0	0.0
Delay (s)		16.5						2.0			2.0	2.0
Level of Service		B						A			A	A
Approach Delay (s)		16.5			0.0			2.0			2.0	
Approach LOS		B			A			A			A	

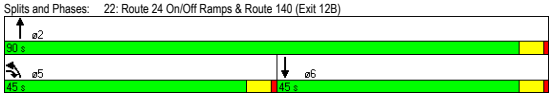
Intersection Summary					
HCM Average Control Delay	3.5	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.09				
Actuated Cycle Length (s)	34.1	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	25.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	765	95	805	750	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	0	250			0
Storage Lanes	0	2	1			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	741			870	631	
Travel Time (s)	16.8			19.8	14.3	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.84	0.84
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	900	106	894	1173	0
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Detector Phase		5	5	2	6	
Switch Phase						
Minimum Initial (s)		4.0	4.0	4.0	4.0	
Minimum Split (s)		10.0	10.0	22.0	22.0	
Total Split (s)	0.0	45.0	45.0	90.0	45.0	0.0
Total Split (%)	0.0%	50.0%	50.0%	100.0%	50.0%	0.0%
Maximum Green (s)		40.0	40.0	85.0	40.0	
Yellow Time (s)		4.0	4.0	4.0	4.0	
All-Red Time (s)		1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Recall Mode		None	None	C-Min	C-Min	
Walk Time (s)				5.0	5.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
v/c Ratio		0.85	0.17	0.26	0.72	
Control Delay		33.0	11.2	0.2	20.1	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		33.0	11.2	0.2	20.1	
Queue Length 50th (ft)		251	33	0	260	
Queue Length 95th (ft)		295	61	0	321	
Internal Link Dist (ft)	661			790	551	
Turn Bay Length (ft)			250			
Base Capacity (vph)		1159	692	3471	1636	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.78	0.15	0.26	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



HCM Signalized Intersection Capacity Analysis
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

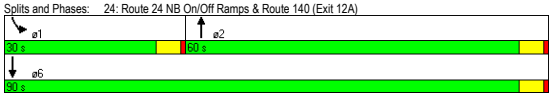
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	765	95	805	750	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		0.88	1.00	0.95	0.95	
Frt		0.85	1.00	1.00	0.96	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2608	1556	3471	3314	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2608	1556	3471	3314	
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.84	0.84
Adj. Flow (vph)	0	900	106	894	893	280
RTOR Reduction (vph)	0	0	0	0	31	0
Lane Group Flow (vph)	0	900	106	894	1142	0
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Actuated Green, G (s)		36.4	36.4	90.0	43.6	
Effective Green, g (s)		36.4	36.4	90.0	43.6	
Actuated g/C Ratio		0.40	0.40	1.00	0.48	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1055	629	3471	1605	
v/s Ratio Prot		c0.35	0.07	0.26	c0.34	
v/s Ratio Perm						
v/c Ratio		0.85	0.17	0.26	0.71	
Uniform Delay, d1		24.4	17.1	0.0	18.3	
Progression Factor		1.00	0.66	1.00	0.95	
Incremental Delay, d2		6.8	0.1	0.2	2.6	
Delay (s)		31.2	11.4	0.2	19.9	
Level of Service		C	B	A	B	
Approach Delay (s)	31.2			1.4	19.9	
Approach LOS	C			A	B	

Intersection Summary				
HCM Average Control Delay	17.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	285	640	1175	285	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	250	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.92	0.92	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	310	744	1366	310	1332
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			8.0		16.0	16.0
Minimum Split (s)			13.0		21.0	21.0
Total Split (s)	0.0	0.0	60.0	0.0	30.0	90.0
Total Split (%)	0.0%	0.0%	66.7%	0.0%	33.3%	100.0%
Maximum Green (s)			55.0		25.0	85.0
Yellow Time (s)			4.0		4.0	4.0
All-Red Time (s)			1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	2.0
Recall Mode			C-Max		None	C-Min
v/c Ratio		0.17	0.33	0.90	0.79	0.40
Control Delay		0.2	7.6	9.9	40.6	0.2
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.2	7.6	9.9	40.6	0.2
Queue Length 50th (ft)		0	86	0	172	0
Queue Length 95th (ft)		0	127	0	m217	0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	250	
Base Capacity (vph)		1790	2227	1524	473	3343
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.17	0.33	0.90	0.66	0.40

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 13 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



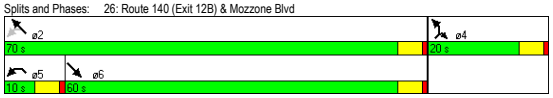
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	285	640	1175	285	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1790	3374	1524	1703	3343
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1790	3374	1524	1703	3343
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.92	0.92
Adj. Flow (vph)	0	310	744	1366	310	1332
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	310	744	1366	310	1332
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Actuated Green, G (s)		90.0	59.4	90.0	20.6	90.0
Effective Green, g (s)		90.0	59.4	90.0	20.6	90.0
Actuated g/C Ratio		1.00	0.66	1.00	0.23	1.00
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			2.0		2.0	2.0
Lane Grp Cap (vph)		1790	2227	1524	390	3343
v/s Ratio Prot			0.22		0.18	0.40
v/s Ratio Perm		0.17		c0.90		
v/c Ratio		0.17	0.33	0.90	0.79	0.40
Uniform Delay, d1		0.0	6.7	0.0	32.7	0.0
Progression Factor		1.00	1.00	1.00	0.93	1.00
Incremental Delay, d2		0.2	0.4	8.6	6.7	0.2
Delay (s)		0.2	7.1	8.6	37.1	0.2
Level of Service		A	A	A	D	A
Approach Delay (s)	0.2		8.1			7.2
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	7.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	970	20	35	980	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1723			724	1178	
Travel Time (s)	39.2			16.5	26.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1076	0	0	1103	5	16
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	15.0		10.0	10.0	15.0	15.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	C-Min		None	C-Min	None	None
v/c Ratio	0.33			0.38	0.04	0.13
Control Delay	1.4			0.9	39.6	20.5
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.4			0.9	39.6	20.5
Queue Length 50th (ft)	0			2	3	0
Queue Length 95th (ft)	81			28	14	20
Internal Link Dist (ft)	1643			644	1098	
Turn Bay Length (ft)						
Base Capacity (vph)	3267			2884	295	277
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.33			0.38	0.02	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 16 (18%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 26: Route 140 (Exit 12B) & Mozzone Blvd



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	970	20	35	980	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3528			3533	1770	1583
Flt Permitted	1.00			0.88	0.95	1.00
Satd. Flow (perm)	3528			3115	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1054	22	38	1065	5	16
RTOR Reduction (vph)	1	0	0	0	0	16
Lane Group Flow (vph)	1075	0	0	1103	5	0
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	77.3			77.3	2.7	2.7
Effective Green, g (s)	77.3			77.3	2.7	2.7
Actuated g/C Ratio	0.86			0.86	0.03	0.03
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3030			2675	53	47
v/s Ratio Prot	0.30				c0.00	0.00
v/s Ratio Perm				c0.35		
v/c Ratio	0.35			0.41	0.09	0.01
Uniform Delay, d1	1.3			1.4	42.5	42.4
Progression Factor	1.00			0.39	1.00	1.00
Incremental Delay, d2	0.3			0.1	0.8	0.1
Delay (s)	1.6			0.6	43.2	42.4
Level of Service	A			A	D	D
Approach Delay (s)	1.6			0.6	42.6	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	1.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

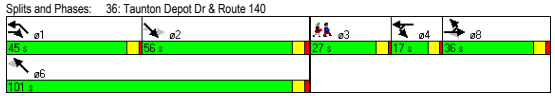
Lanes, Volumes, Timings
36: Taunton Depot Dr & Route 140

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR	ø3
Lane Configurations													
Volume (vph)	60	0	65	5	0	0	5	895	125	85	730	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12	
Storage Length (ft)	0		100	0		0	180		130	320		350	
Storage Lanes	1		1	0		0	1		1	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		846			205			2224			1723		
Travel Time (s)		19.2			4.7			50.5			39.2		
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93	
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%	
Shared Lane Traffic (%)	50%												
Lane Group Flow (vph)	35	36	76	0	10	0	0	1000	139	91	785	0	
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt			
Protected Phases	8	8	1	4	4			2		1	6		3
Permitted Phases			8				2		2	6			
Detector Phase	8	8	1	4	4		2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0		7.0
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0		27.0
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0	27.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%	15%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0		22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0	
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?				Yes	Yes								Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0		3.0
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													2
v/c Ratio	0.26	0.27	0.19		0.08			0.51	0.15	0.23	0.31		
Control Delay	45.7	45.8	9.6		45.8			15.5	9.8	8.2	7.3		
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0		
Total Delay	45.7	45.8	9.6		45.8			15.5	9.8	8.2	7.3		
Queue Length 50th (ft)	14	15	0		4			122	16	8	45		
Queue Length 95th (ft)	62	64	36		15			448	96	64	253		
Internal Link Dist (ft)		766			125			2144			1643		
Turn Bay Length (ft)			100						130	320			
Base Capacity (vph)	584	584	1000		304			2164	1023	988	3241		
Starvation Cap Reductn	0	0	0		0			0	0	0	0		
Spillback Cap Reductn	0	0	0		0			0	0	0	0		
Storage Cap Reductn	0	0	0		0			0	0	0	0		
Reduced v/c Ratio	0.06	0.06	0.08		0.03			0.46	0.14	0.09	0.24		

Intersection Summary	
Area Type:	Other
Cycle Length: 181	
Actuated Cycle Length: 84.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Taunton Depot Dr & Route 140



HCM Signalized Intersection Capacity Analysis
36: Taunton Depot Dr & Route 140

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	60	0	65	5	0	0	5	895	125	85	730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		1.00			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		0.95			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1573	1573	1553		2046			3471	1538	1805	3406	
Flt Permitted	0.95	0.95	1.00		0.95			0.95	1.00	0.20	1.00	
Satd. Flow (perm)	1573	1573	1553		2046			3300	1538	376	3406	
Peak-hour factor, PHF	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	71	0	76	10	0	0	6	994	139	91	785	0
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	35	36	11	0	10	0	0	1000	118	91	785	0
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	6.0	6.0	13.0		0.8			50.2	50.2	62.2	62.2	
Effective Green, g (s)	6.0	6.0	13.0		0.8			50.2	50.2	62.2	62.2	
Actuated g/C Ratio	0.06	0.06	0.14		0.01			0.53	0.53	0.66	0.66	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	100	100	215		17			1762	821	355	2254	
v/s Ratio Prot	0.02	c0.02	0.00		c0.00					0.02	c0.23	
v/s Ratio Perm			0.00					c0.30	0.08	0.15		
v/c Ratio	0.35	0.36	0.05		0.59			0.57	0.14	0.26	0.35	
Uniform Delay, d1	42.1	42.2	35.1		46.4			14.6	11.1	7.5	7.0	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.8	0.0		29.3			0.5	0.1	0.1	0.1	
Delay (s)	42.9	43.0	35.2		75.7			15.2	11.2	7.7	7.1	
Level of Service	D	D	D		E			B	B	A	A	
Approach Delay (s)		38.9			75.7			14.7			7.2	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

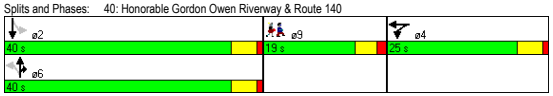
Lanes, Volumes, Timings
40: Honorable Gordon Owen Riverway & Route 140

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	220	0	5	0	650	290	10	400	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12	
Storage Length (ft)	0		0	0		0	0		175	0		0	
Storage Lanes	0		0	0		0	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		220			991			547			1888		
Travel Time (s)		5.0			22.5			12.4			42.9		
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89	
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	268	0	0	699	312	0	460	0	
Turn Type				Split			Perm		Prot	Perm			
Protected Phases				4	4			6	6		2		9
Permitted Phases							6			2			
Detector Phase				4	4		6	6	6	2	2		
Switch Phase													
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0		1.0
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0		19.0
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0	19.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%	23%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0		14.0
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		3.5
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
Recall Mode				None	None		None	None	None	None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													1
v/c Ratio					0.63			0.74	0.32		0.46		
Control Delay					30.1			20.4	3.8		12.8		
Queue Delay					0.0			0.0	0.0		0.0		
Total Delay					30.1			20.4	3.8		12.8		
Queue Length 50th (ft)					86			156	7		81		
Queue Length 95th (ft)					191			#584	65		276		
Internal Link Dist (ft)		140			911			467			1808		
Turn Bay Length (ft)									175				
Base Capacity (vph)					582			1019	1021		1080		
Starvation Cap Reductn					0			0	0		0		
Spillback Cap Reductn					0			0	0		0		
Storage Cap Reductn					0			0	0		0		
Reduced v/c Ratio					0.46			0.69	0.31		0.43		

Intersection Summary	
Area Type:	Other
Cycle Length: 84	
Actuated Cycle Length: 61.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 40: Honorable Gordon Owen Riverway & Route 140



HCM Signalized Intersection Capacity Analysis
40: Honorable Gordon Owen Riverway & Route 140

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	220	0	5	0	650	290	10	400	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1731			1733	1553		1866	
Flt Permitted					0.95			1.00	1.00		0.98	
Satd. Flow (perm)					1731			1733	1553		1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	262	0	6	0	699	312	11	449	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	128	0	0	0
Lane Group Flow (vph)	0	0	0	0	267	0	0	699	184	0	460	0
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Actuated Green, G (s)					15.1			33.5	33.5		33.5	
Effective Green, g (s)					15.1			33.5	33.5		33.5	
Actuated g/C Ratio					0.23			0.51	0.51		0.51	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					398			884	792		936	
v/s Ratio Prot					c0.15			c0.40	0.12			
v/s Ratio Perm											0.25	
v/c Ratio					0.67			0.79	0.23		0.49	
Uniform Delay, d1					23.0			13.2	8.9		10.5	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					4.8			5.2	0.2		0.6	
Delay (s)					27.9			18.4	9.2		11.1	
Level of Service					C			B	A		B	
Approach Delay (s)		0.0			27.9			15.5			11.1	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	17.1
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

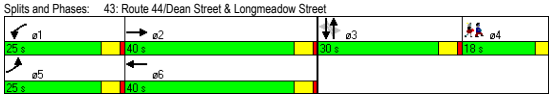
2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø4
Lane Configurations													
Volume (vph)	10	810	285	185	640	95	115	350	270	125	220	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12	
Storage Length (ft)	100		70	100		70	0		50	0		100	
Storage Lanes	1		1	1		1	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1663			1440			2994			1249		
Travel Time (s)		37.8			32.7			68.0			28.4		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68	
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1165	0	197	782	0	0	855	0	0	530	0	
Turn Type	Prot			Prot			Perm			Perm			
Protected Phases	5	2		1	6			3			3		4
Permitted Phases							3			3			
Detector Phase	5	2		1	6		3	3		3	3		
Switch Phase													
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0		8.0
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0		18.0
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	18.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%	16%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0		0.2
Recall Mode	None	Min		None	Min		None	None		None	None		None
Walk Time (s)													8.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													6
v/c Ratio	0.08	0.91		0.70	0.40			1.43			2.36dl		
Control Delay	45.3	40.8		52.0	13.8			230.3			98.4		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	45.3	40.8		52.0	13.8			230.3			98.4		
Queue Length 50th (ft)	6	321		108	105			~337			~180		
Queue Length 95th (ft)	27	#626		#230	284			#542			#238		
Internal Link Dist (ft)		1583			1360			2914			1169		
Turn Bay Length (ft)	100			100									
Base Capacity (vph)	302	1274		339	1964			598			492		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.04	0.91		0.58	0.40			1.43			1.08		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 95.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	810	285	185	640	95	115	350	270	125	220	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.96		1.00	0.98			0.94			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1428	3368		1604	3412			3110			3193	
Flt Permitted	0.95	1.00		0.95	1.00			0.64			0.57	
Satd. Flow (perm)	1428	3368		1604	3412			2001			1853	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Adj. Flow (vph)	11	862	303	197	681	101	134	407	314	184	324	22
RTOR Reduction (vph)	0	28	0	0	7	0	0	71	0	0	3	0
Lane Group Flow (vph)	11	1137	0	197	775	0	0	784	0	0	527	0
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.5	39.4		16.8	54.7			25.2			25.2	
Effective Green, g (s)	1.5	39.4		16.8	54.7			25.2			25.2	
Actuated g/C Ratio	0.01	0.39		0.16	0.54			0.25			0.25	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	21	1302		264	1832			495			458	
v/s Ratio Prot	0.01	c0.34		c0.12	0.23							
v/s Ratio Perm								c0.39			0.28	
v/c Ratio	0.52	0.87		0.75	0.42			1.58			2.36dl	
Uniform Delay, d1	49.8	28.9		40.5	14.1			38.4			38.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	27.4	7.3		11.6	0.3			272.5			90.3	
Delay (s)	77.3	36.3		52.1	14.5			310.8			128.7	
Level of Service	E	D		D	B			F			F	
Approach Delay (s)		36.6			22.0			310.8			128.7	
Approach LOS		D			C			F			F	

Intersection Summary

HCM Average Control Delay	112.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	20.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

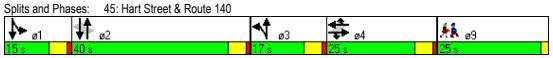
Lanes, Volumes, Timings
45: Hart Street & Route 140

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2	ø9
Lane Configurations														
Volume (vph)	25	165	270	120	110	245	135	625	60	160	530	10		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12		
Storage Length (ft)	0		50	0		50	50		0	50		0		
Storage Lanes	0		1	0		1	1		0	1		0		
Taper Length (ft)	25		25	25		25	25		25	25		25		
Right Turn on Red			Yes			Yes			Yes			Yes		
Link Speed (mph)		30			30			35			35			
Link Distance (ft)		1373			971			2224			3692			
Travel Time (s)		31.2			22.1			43.3			71.9			
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73		
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	237	338	0	242	258	0	863	0	0	959	0		
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt				
Protected Phases		4	4		4	4	3	2 3		1	1 2		2	9
Permitted Phases	4			4			2 3			1 2				
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2			
Switch Phase														
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	4.0			4.0			8.0	1.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	9.0			9.0			13.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0	40.0	25.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%	33%	20%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	12.0			10.0			35.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0			4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0			1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead			Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes			Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0			3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None			None			None	None
Walk Time (s)														7.0
Flash Dont Walk (s)														16.0
Pedestrian Calls (#/hr)														4
v/c Ratio		0.91	0.80		1.48	0.64		0.78			0.99			
Control Delay		79.3	37.9		279.8	30.3		28.4			53.2			
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0			
Total Delay		79.3	37.9		279.8	30.3		28.4			53.2			
Queue Length 50th (ft)		143	111		~203	80		165			201			
Queue Length 95th (ft)		#315	#246		#452	#226		#400			#361			
Internal Link Dist (ft)		1293			891			2144			3612			
Turn Bay Length (ft)			50			50								
Base Capacity (vph)		260	421		163	401		1108			964			
Starvation Cap Reductn		0	0		0	0		0			0			
Spillback Cap Reductn		0	0		0	0		0			0			
Storage Cap Reductn		0	0		0	0		0			0			
Reduced v/c Ratio		0.91	0.80		1.48	0.64		0.78			0.99			

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 102	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 45: Hart Street & Route 140



HCM Signalized Intersection Capacity Analysis
45: Hart Street & Route 140

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	165	270	120	110	245	135	625	60	160	530	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		0.97	1.00		0.99			0.99	
Satd. Flow (prot)		1734	1516		1808	1568		3272			3328	
Flt Permitted		0.75	1.00		0.45	1.00		0.63			0.54	
Satd. Flow (perm)		1315	1516		826	1568		2069			1830	
Peak-hour factor, PHF	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Adj. Flow (vph)	31	206	338	126	116	258	142	658	63	219	726	14
RTOR Reduction (vph)	0	0	122	0	0	91	0	4	0	0	1	0
Lane Group Flow (vph)	0	237	216	0	242	167	0	859	0	0	958	0
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.2	20.2		20.2	20.2		47.4			45.4	
Effective Green, g (s)		20.2	20.2		20.2	20.2		47.4			45.4	
Actuated g/C Ratio		0.20	0.20		0.20	0.20		0.46			0.44	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		257	296		161	306		1088			949	
v/s Ratio Prot			0.14			0.11		c0.09			c0.10	
v/s Ratio Perm		0.18			c0.29			0.27			c0.34	
v/c Ratio		0.92	0.73		1.50	0.55		0.79			1.01	
Uniform Delay, d1		40.9	39.1		41.7	37.5		23.8			29.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		39.2	14.8		255.9	6.8		3.9			31.7	
Delay (s)		80.1	53.9		297.6	44.4		27.7			60.7	
Level of Service		F	D		F	D		C			E	
Approach Delay (s)		64.7			166.9			27.7			60.7	
Approach LOS		E			F			C			E	

Intersection Summary					
HCM Average Control Delay		70.0	HCM Level of Service		E
HCM Volume to Capacity ratio		1.10			
Actuated Cycle Length (s)		103.5	Sum of lost time (s)		25.8
Intersection Capacity Utilization		81.9%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

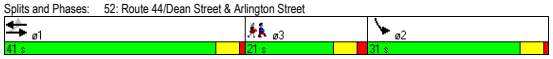
Lanes, Volumes, Timings
52: Route 44/Dean Street & Arlington Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	30	800	655	115	275	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.87	0.87	0.86	0.86	0.81	0.81	
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	34	920	896	0	402	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		5.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	36.0	36.0	36.0		26.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	1.0	1.0	1.0		1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							4
v/c Ratio	0.35	0.97	0.84		0.78		
Control Delay	29.3	43.8	26.6		36.0		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	29.3	43.8	26.6		36.0		
Queue Length 50th (ft)	7	317	268		144		
Queue Length 95th (ft)	#57	#890	#795		287		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	97	948	1061		684		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.35	0.97	0.84		0.59		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 70.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	800	655	115	275	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	5.0	5.0	5.0		5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1636	1810	2015		1809	
Flt Permitted	0.11	1.00	1.00		0.96	
Satd. Flow (perm)	187	1810	2015		1809	
Peak-hour factor, PHF	0.87	0.87	0.86	0.86	0.81	0.81
Adj. Flow (vph)	34	920	762	134	340	62
RTOR Reduction (vph)	0	0	6	0	0	0
Lane Group Flow (vph)	34	920	890	0	402	0
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	36.9	36.9	36.9		20.1	
Effective Green, g (s)	36.9	36.9	36.9		20.1	
Actuated g/C Ratio	0.49	0.49	0.49		0.27	
Clearance Time (s)	5.0	5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	92	887	987		483	
v/s Ratio Prot		c0.51	0.44		c0.22	
v/s Ratio Perm	0.18					
v/c Ratio	0.37	1.04	0.90		0.83	
Uniform Delay, d1	12.0	19.2	17.5		26.0	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.5	40.3	11.2		11.7	
Delay (s)	14.5	59.5	28.8		37.7	
Level of Service	B	E	C		D	
Approach Delay (s)		57.9	28.8		37.7	
Approach LOS		E	C		D	

Intersection Summary			
HCM Average Control Delay	42.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	18.3
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

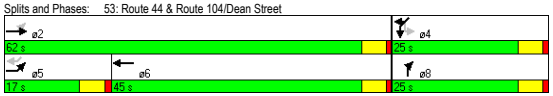
Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	180	1000	0	0	725	20	0	0	30	5	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0	0		0	50
Storage Lanes	1		0	0		0	0	1		1	1
Taper Length (ft)	25		25	25		25	25	25		25	25
Right Turn on Red			Yes			Yes					Yes
Link Speed (mph)		30			30		30			30	
Link Distance (ft)		825			1426		127			959	
Travel Time (s)		18.8			32.4		2.9			21.8	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	1388	0	0	810	0	0	0	0	40	202
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Detector Phase	5	2			6			8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0			12.0			6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0			11.0	11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	0.0	25.0	25.0	25.0	25.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	0.0%	28.7%	28.7%	28.7%	28.7%
Maximum Green (s)	12.0	57.0			40.0			20.0	20.0	20.0	20.0
Yellow Time (s)	4.0	4.0			4.0			4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0			1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag						
Lead-Lag Optimize?	Yes				Yes						
Vehicle Extension (s)	1.5	1.5			1.5			2.0	2.0	2.0	2.0
Recall Mode	None	Min			Min			None	None	None	None
v/c Ratio		0.82			0.33					0.18	0.61
Control Delay		12.4			4.1					30.2	22.6
Queue Delay		0.0			0.0					0.0	0.0
Total Delay		12.4			4.1					30.2	22.6
Queue Length 50th (ft)		152			47					16	35
Queue Length 95th (ft)		290			95					44	100
Internal Link Dist (ft)		745			1346		47			879	
Turn Bay Length (ft)											50
Base Capacity (vph)		2019			2516					521	616
Starvation Cap Reductn		0			0					0	0
Spillback Cap Reductn		0			0					0	0
Storage Cap Reductn		0			0					0	0
Reduced v/c Ratio		0.69			0.32					0.08	0.33

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 67.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: Route 44 & Route 104/Dean Street



HCM Signalized Intersection Capacity Analysis
53: Route 44 & Route 104/Dean Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	180	1000	0	0	725	20	0	0	30	5	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	16
Total Lost time (s)		5.0			5.0					5.0	5.0
Lane Util. Factor		0.95			0.95					1.00	1.00
Frt		1.00			1.00					1.00	0.85
Flt Protected		0.99			1.00					0.95	1.00
Satd. Flow (prot)		3478			3461					1704	1760
Flt Permitted		0.68			1.00					0.95	1.00
Satd. Flow (perm)		2371			3461					1704	1760
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	212	1176	0	0	788	22	0	0	34	6	202
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	98
Lane Group Flow (vph)	0	1388	0	0	809	0	0	0	0	40	104
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Actuated Green, G (s)		48.2			48.2					8.9	8.9
Effective Green, g (s)		48.2			48.2					8.9	8.9
Actuated g/C Ratio		0.72			0.72					0.13	0.13
Clearance Time (s)		5.0			5.0					5.0	5.0
Vehicle Extension (s)		1.5			1.5					2.0	2.0
Lane Grp Cap (vph)		1703			2486					226	233
v/s Ratio Prot					0.23						c0.06
v/s Ratio Perm		c0.59								0.02	
v/c Ratio		0.82			0.33					0.18	0.45
Uniform Delay, d1		6.4			3.5					25.8	26.8
Progression Factor		1.00			1.00					1.00	1.00
Incremental Delay, d2		3.0			0.0					0.1	0.5
Delay (s)		9.4			3.5					26.0	27.3
Level of Service		A			A					C	C
Approach Delay (s)		9.4			3.5		0.0			27.1	
Approach LOS		A			A		A			C	

Intersection Summary					
HCM Average Control Delay		9.2	HCM Level of Service		A
HCM Volume to Capacity ratio		0.76			
Actuated Cycle Length (s)		67.1	Sum of lost time (s)		10.0
Intersection Capacity Utilization		71.0%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

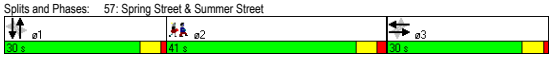
Lanes, Volumes, Timings
57: Spring Street & Summer Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	20	215	60	35	140	10	45	445	20	10	260	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12	
Right Turn on Red			Yes			No			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		376			382			1581			384		
Travel Time (s)		8.5			8.7			35.9			8.7		
Peak Hour Factor	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76	
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%	
Parking (#/hr)											0		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	339	0	0	226	0	0	548	0	0	381	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	41.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	41%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		35.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		5.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													6
v/c Ratio		0.49			0.31			0.81			0.52		
Control Delay		18.8			16.7			31.2			19.6		
Queue Delay		0.0			0.0			0.0			0.1		
Total Delay		18.8			16.7			31.2			19.7		
Queue Length 50th (ft)		81			52			162			96		
Queue Length 95th (ft)		219			135			#498			207		
Internal Link Dist (ft)		296			302			1501			304		
Turn Bay Length (ft)													
Base Capacity (vph)		689			722			675			729		
Starvation Cap Reductn		0			0			0			32		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.49			0.31			0.81			0.55		

Intersection Summary	
Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 64.2	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 57: Spring Street & Summer Street



HCM Signalized Intersection Capacity Analysis
57: Spring Street & Summer Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	215	60	35	140	10	45	445	20	10	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.99			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1770			2016			1800			1877	
Flt Permitted		0.97			0.90			0.94			0.98	
Satd. Flow (perm)		1724			1825			1704			1840	
Peak-hour factor, PHF	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	23	247	69	43	171	12	48	478	22	13	342	26
RTOR Reduction (vph)	0	8	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	331	0	0	226	0	0	547	0	0	379	0
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4			25.4			25.4	
Effective Green, g (s)		25.4			25.4			25.4			25.4	
Actuated g/C Ratio		0.37			0.37			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		633			670			625			675	
v/s Ratio Prot												
v/s Ratio Perm		c0.19			0.12			c0.32			0.21	
v/c Ratio		0.52			0.34			0.87			0.56	
Uniform Delay, d1		17.2			15.8			20.4			17.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.1			1.4			15.7			3.4	
Delay (s)		20.2			17.2			36.1			20.8	
Level of Service		C			B			D			C	
Approach Delay (s)		20.2			17.2			36.1			20.8	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
58: Route 44/Main Street & Union Street

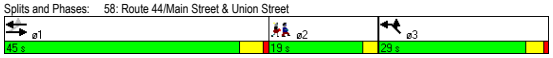
2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	10	530	305	0	485	10	0	0	450	10	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	939	0	0	556	0	0	0	464	31	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												7
v/c Ratio		0.92			0.53				0.85	0.05		
Control Delay		33.4			16.1				42.5	12.3		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		33.4			16.1				42.5	12.3		
Queue Length 50th (ft)		337			149				191	3		
Queue Length 95th (ft)		#860			356				#481	26		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		1023			1048				547	607		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.92			0.53				0.85	0.05		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 77.8	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	10	530	305	0	485	10	0	0	450	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.95			1.00				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1951			2023				1687	1830	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1938			2023				1687	1830	
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	11	589	339	0	545	11	0	0	464	10	21
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	920	0	0	556	0	0	0	464	17	0
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.3			40.3				25.2	25.2	
Effective Green, g (s)		40.3			40.3				25.2	25.2	
Actuated g/C Ratio		0.50			0.50				0.31	0.31	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		974			1017				530	575	
v/s Ratio Prot					0.27				c0.28	0.01	
v/s Ratio Perm		c0.47									
v/c Ratio		0.94			0.55				0.88	0.03	
Uniform Delay, d1		18.9			13.7				26.0	19.0	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		18.2			2.1				18.1	0.1	
Delay (s)		37.1			15.8				44.1	19.1	
Level of Service		D			B				D	B	
Approach Delay (s)		37.1			15.8		0.0		42.5		
Approach LOS		D			B		A		D		

Intersection Summary			
HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	14.7
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

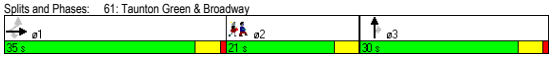
Lanes, Volumes, Timings
61: Taunton Green & Broadway

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	180	765	190	0	0	950	0	295	90	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		304			913			579			302		
Travel Time (s)		6.9			20.8			13.2			6.9		
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%	
Parking (#/hr)			0			0			0				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	198	841	209	0	0	1033	0	328	100	0	0	0	
Turn Type	Perm		Perm			Free			Perm				
Protected Phases		1						3					2
Permitted Phases	1		1			Free			3				
Detector Phase	1	1	1					3	3				
Switch Phase													
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0				1.0
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0				21.0
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	21.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%	24%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0				17.0
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0				4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead										Lag
Lead-Lag Optimize?	Yes	Yes	Yes										Yes
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0				2.0
Recall Mode	Max	Max	Max					Max	Max				Ped
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													7
v/c Ratio	0.29	0.71	0.32			0.41		0.67	0.23				
Control Delay	6.5	27.3	4.0			0.5		35.0	6.6				
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0				
Total Delay	6.5	27.3	4.0			0.5		35.0	6.6				
Queue Length 50th (ft)	13	205	0			0		156	0				
Queue Length 95th (ft)	m57	268	m39			0		249	35				
Internal Link Dist (ft)		224			833			499			222		
Turn Bay Length (ft)													
Base Capacity (vph)	692	1188	654			2547		486	436				
Starvation Cap Reductn	0	0	0			0		0	0				
Spillback Cap Reductn	0	0	0			0		0	0				
Storage Cap Reductn	0	0	0			0		0	0				
Reduced v/c Ratio	0.29	0.71	0.32			0.41		0.67	0.23				

Intersection Summary	
Area Type:	Other
Cycle Length: 86	
Actuated Cycle Length: 86	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 61: Taunton Green & Broadway



HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	765	190	0	0	950	0	295	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1703	3406	1484			2547		1673	1256			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1703	3406	1484			2547		1673	1256			
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	198	841	209	0	0	1033	0	328	100	0	0	0
RTOR Reduction (vph)	98	0	136	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	100	841	73	0	0	1033	0	328	29	0	0	0
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	594	1188	518			2547		486	365			
v/s Ratio Prot		c0.25						c0.20				
v/s Ratio Perm	0.06		0.05			c0.41			0.02			
v/c Ratio	0.17	0.71	0.14			0.41		0.67	0.08			
Uniform Delay, d1	19.4	24.2	19.2			0.0		26.9	22.1			
Progression Factor	0.89	0.97	0.86			1.00		1.00	1.00			
Incremental Delay, d2	0.6	3.6	0.6			0.5		7.3	0.4			
Delay (s)	17.9	26.9	17.0			0.5		34.2	22.6			
Level of Service	B	C	B			A		C	C			
Approach Delay (s)		23.8			0.5			31.5			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
71: Court Street & Washington Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	360	20	620	270	35	410	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.88	0.88	0.87	0.87	0.85	0.85	
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	409	23	713	310	41	482	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Detector Phase	3	3	1	1	1	1	
Switch Phase							
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	3.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	18.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	18.0
Total Split (%)	25.5%	25.5%	56.1%	56.1%	56.1%	56.1%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0	0.7
Recall Mode	Max	Max	Max	Max	Max	Max	None
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							6
v/c Ratio	0.99	0.05	0.69	0.32	0.14	0.43	
Control Delay	76.5	21.2	17.1	2.3	10.5	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.5	21.2	17.1	2.3	10.5	11.5	
Queue Length 50th (ft)	202	6	203	0	8	109	
Queue Length 95th (ft)	#469	28	482	35	31	251	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	413	422	1038	966	292	1113	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.99	0.05	0.69	0.32	0.14	0.43	

Intersection Summary	
Area Type:	Other
Cycle Length: 98	
Actuated Cycle Length: 83.4	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 71: Court Street & Washington Street

HCM Signalized Intersection Capacity Analysis
71: Court Street & Washington Street

2030 No-Build Conditions - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	360	20	620	270	35	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	1723	1722	1398	1805	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1711	1723	1722	1398	484	1845
Peak-hour factor, PHF	0.88	0.88	0.87	0.87	0.85	0.85
Adj. Flow (vph)	409	23	713	310	41	482
RTOR Reduction (vph)	0	6	0	127	0	0
Lane Group Flow (vph)	409	17	713	183	41	482
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.1	20.1	50.3	50.3	50.3	50.3
Effective Green, g (s)	20.1	20.1	50.3	50.3	50.3	50.3
Actuated g/C Ratio	0.24	0.24	0.59	0.59	0.59	0.59
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	405	407	1019	827	286	1092
v/s Ratio Prot	c0.24		c0.41			0.26
v/s Ratio Perm		0.01		0.13	0.08	
v/c Ratio	1.01	0.04	0.70	0.22	0.14	0.44
Uniform Delay, d1	32.4	25.0	12.1	8.2	7.7	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	47.2	0.2	4.0	0.6	1.1	1.3
Delay (s)	79.7	25.2	16.1	8.8	8.8	10.9
Level of Service	E	C	B	A	A	B
Approach Delay (s)	76.8		13.9			10.7
Approach LOS	E		B			B

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

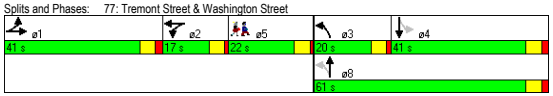
Lanes, Volumes, Timings
77: Tremont Street & Washington Street

2030 No-Build Conditions - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø5
Lane Configurations													
Volume (vph)	450	155	50	35	125	50	85	380	60	30	240	365	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		698			192			1911			574		
Travel Time (s)		15.9			4.4			43.4			13.0		
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92	
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%	
Shared Lane Traffic (%)	27%												
Lane Group Flow (vph)	339	337	0	0	226	0	0	590	0	0	691	0	
Turn Type	Split			Split			pm+pt			Perm			
Protected Phases	1	1		2	2		3	8			4		5
Permitted Phases							8			4			
Detector Phase	1	1		2	2		3	8		4	4		
Switch Phase													
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0		3.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0		22.0
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0	22.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%	16%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0		17.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													8
v/c Ratio	0.71	0.74			0.95			0.73			0.60		
Control Delay	43.7	45.3			89.8			32.4			18.4		
Queue Delay	0.0	0.0			0.0			0.0			0.0		
Total Delay	43.7	45.3			89.8			32.4			18.4		
Queue Length 50th (ft)	182	180			126			142			103		
Queue Length 95th (ft)	#441	#465			#448			303			239		
Internal Link Dist (ft)		618			112			1831			494		
Turn Bay Length (ft)													
Base Capacity (vph)	679	640			239			1291			1287		
Starvation Cap Reductn	0	0			0			0			0		
Spillback Cap Reductn	0	0			0			0			0		
Storage Cap Reductn	0	0			0			0			0		
Reduced v/c Ratio	0.50	0.53			0.95			0.46			0.54		

Intersection Summary	
Area Type:	Other
Cycle Length: 141	
Actuated Cycle Length: 96.5	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2030 No-Build Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	155	50	35	125	50	85	380	60	30	240	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.98			0.97			0.98			0.91	
Flt Protected	0.95	0.98			0.99			0.99			1.00	
Satd. Flow (prot)	1759	1650			1748			3356			2973	
Flt Permitted	0.95	0.98			0.99			0.63			0.90	
Satd. Flow (perm)	1759	1650			1748			2123			2673	
Peak-hour factor, PHF	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	464	160	52	38	134	54	96	427	67	33	261	397
RTOR Reduction (vph)	0	4	0	0	8	0	0	7	0	0	147	0
Lane Group Flow (vph)	339	333	0	0	218	0	0	583	0	0	544	0
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	26.3	26.3			12.8			36.4			36.4	
Effective Green, g (s)	26.3	26.3			12.8			36.4			36.4	
Actuated g/C Ratio	0.26	0.26			0.13			0.36			0.36	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	464	435			224			774			975	
v/s Ratio Prot	0.19	c0.20			c0.12							
v/s Ratio Perm								c0.27			0.20	
v/c Ratio	0.73	0.76			0.97			0.75			0.56	
Uniform Delay, d1	33.5	33.9			43.3			27.8			25.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	5.0	7.1			52.1			3.7			0.4	
Delay (s)	38.6	40.9			95.5			31.5			25.7	
Level of Service	D	D			F			C			C	
Approach Delay (s)		39.8			95.5			31.5			25.7	
Approach LOS		D			F			C			C	

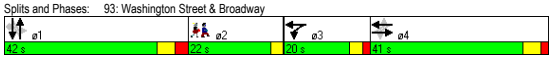
Intersection Summary					
HCM Average Control Delay	38.8	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	99.8	Sum of lost time (s)		24.3	
Intersection Capacity Utilization	83.0%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	275	90	5	20	95	5	5	520	15	10	370	225	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			No			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1068			1376			92			2042		
Travel Time (s)		24.3			31.3			2.1			46.4		
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89	
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%	
Parking (#/hr)									2				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	420	0	0	167	0	0	621	0	0	427	253	
Turn Type	Perm			pm+pt			Perm			Perm		Perm	
Protected Phases		4		3	3 4			1			1		2
Permitted Phases	4			3 4			1			1		1	
Detector Phase	4	4		3	3 4		1	1		1	1	1	
Switch Phase													
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0	1.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0	22.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0	22.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%	18%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0	19.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0	2.0
Recall Mode	None	None		None			Min	Min		Min	Min	Min	None
Walk Time (s)													7.0
Flash Dont Walk (s)													12.0
Pedestrian Calls (#/hr)													8
v/c Ratio		0.82			0.20			0.58			0.78	0.52	
Control Delay		46.0			15.4			31.5			43.1	33.4	
Queue Delay		0.0			0.0			0.0			0.0	0.0	
Total Delay		46.0			15.4			31.5			43.1	33.4	
Queue Length 50th (ft)		226			50			154			220	118	
Queue Length 95th (ft)		#565			99			285			#504	264	
Internal Link Dist (ft)		988			1296			12			1962		
Turn Bay Length (ft)												50	
Base Capacity (vph)		510			898			1250			634	568	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			0			0			0	0	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.82			0.19			0.50			0.67	0.45	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 97.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 93: Washington Street & Broadway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	90	5	20	95	5	5	520	15	10	370	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frt		1.00			0.99			1.00			1.00	0.85
Flt Protected		0.96			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1982			1840			3591			1771	1553
Flt Permitted		0.68			0.92			0.95			0.98	1.00
Satd. Flow (perm)		1392			1699			3413			1732	1553
Peak-hour factor, PHF	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	312	102	6	28	132	7	6	598	17	11	416	253
RTOR Reduction (vph)	0	1	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	419	0	0	167	0	0	620	0	0	427	253
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		35.7			45.0			30.8			30.8	30.8
Effective Green, g (s)		35.7			45.0			30.8			30.8	30.8
Actuated g/C Ratio		0.36			0.45			0.31			0.31	0.31
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		498			779			1053			535	479
v/s Ratio Prot					c0.02							
v/s Ratio Perm		c0.30			0.08			0.18			c0.25	0.16
v/c Ratio		0.84			0.21			0.59			0.80	0.53
Uniform Delay, d1		29.5			16.7			29.1			31.6	28.5
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		12.7			0.1			0.8			8.1	1.1
Delay (s)		42.1			16.7			30.0			39.8	29.6
Level of Service		D			B			C			D	C
Approach Delay (s)		42.1			16.7			30.0			36.0	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
25: Route 24 Slip Ramp & Route 140 (Exit 12A)

2030 No-Build Conditions - AM Peak Hour

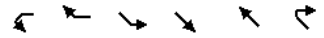
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	185	0	1830	1225	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	250	0	1968	1317	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					624	
pX, platoon unblocked						
vC, conflicting volume	2301	659	1317			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2301	659	1317			
tC, single (s)	6.8	7.1	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	100	35	100			
cM capacity (veh/h)	33	386	532			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	250	984	984	659	659
Volume Left	0	0	0	0	0
Volume Right	250	0	0	0	0
cSH	386	1700	1700	1700	1700
Volume to Capacity	0.65	0.58	0.58	0.39	0.39
Queue Length 95th (ft)	110	0	0	0	0
Control Delay (s)	30.0	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	30.0	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
37: Route 140 (Exit 12B) &

2030 No-Build Conditions - AM Peak Hour



Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	0	210	0	985	805	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	228	0	1071	875	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				724	631	
pX, platoon unblocked	0.99					
vC, conflicting volume	1410	438	875			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	438	875			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	60	100			
cM capacity (veh/h)	131	567	767			

Direction, Lane #	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	228	535	535	438	438
Volume Left	0	0	0	0	0
Volume Right	228	0	0	0	0
cSH	567	1700	1700	1700	1700
Volume to Capacity	0.40	0.31	0.31	0.26	0.26
Queue Length 95th (ft)	48	0	0	0	0
Control Delay (s)	15.6	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	15.6	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2030 No-Build Conditions - AM Peak Hour

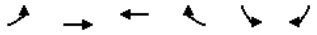
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL	NER
Lane Configurations											
Volume (veh/h)	0	135	10	0	0	0	590	230	90	0	430
Sign Control		Stop			Stop		Free			Free	
Grade		0%			0%		0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83
Hourly flow rate (vph)	0	145	11	0	0	0	634	247	97	0	518
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type							Raised			None	
Median storage veh)							1				
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1824	2083	296	1599	1613	0	518				
vC1, stage 1 conf vol	1565	1565		0	0						
vC2, stage 2 conf vol	259	518		1599	1613						
vCu, unblocked vol	1824	2083	296	1599	1613	0	518				
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.2				
tC, 2 stage (s)	6.1	5.6		6.1	5.5						
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.3				
p0 queue free %	100	0	99	0	100	100	38				
cM capacity (veh/h)	45	19	748	0	57	1091	1028				

Direction, Lane #	EB 1	EB 2	SB 1	SB 2	SB 3	NE 1
Volume Total	145	11	317	317	344	518
Volume Left	0	0	317	317	0	0
Volume Right	0	11	0	0	97	518
cSH	19	748	1028	1028	1700	1700
Volume to Capacity	7.46	0.01	0.62	0.62	0.20	0.30
Queue Length 95th (ft)	Err	1	111	111	0	0
Control Delay (s)	Err	9.9	14.0	14.0	0.0	0.0
Lane LOS	F	A	B	B		
Approach Delay (s)	9310.1		9.1			0.0
Approach LOS	F					

Intersection Summary				
Average Delay	883.8			
Intersection Capacity Utilization	40.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
67: Taunton Green & Broadway

2030 No-Build Conditions - AM Peak Hour



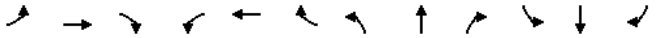
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	700	730	0	400
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	0	0	769	802	0	417
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	1571				769	385
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1571				769	385
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	100				100	31
cM capacity (veh/h)	425				342	605

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	385	385	802	417
Volume Left	0	0	0	0
Volume Right	0	0	802	417
cSH	1700	1700	1700	605
Volume to Capacity	0.23	0.23	0.47	0.69
Queue Length 95th (ft)	0	0	0	135
Control Delay (s)	0.0	0.0	0.0	23.1
Lane LOS				C
Approach Delay (s)	0.0			23.1
Approach LOS				C

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	50.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2030 No-Build Conditions - AM Peak Hour



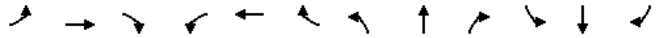
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	630	60	400	0	0	0	0	275	0
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.94	0.94	0.94	0.92	0.92	0.92	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	22	670	64	426	0	0	0	0	309	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	64			22			1559	1404	0	1415	1426	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			22			1559	1404	0	1415	1426	64
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			57			0	100	100	100	0	100
cM capacity (veh/h)	1551			1562			0	80	1091	77	76	1006

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	22	447	287	426	309
Volume Left	0	447	223	0	0
Volume Right	22	0	0	426	0
cSH	1700	1562	1562	1700	76
Volume to Capacity	0.01	0.43	0.43	0.25	4.08
Queue Length 95th (ft)	0	55	55	0	Err
Control Delay (s)	0.0	9.0	7.9	0.0	Err
Lane LOS		A	A		F
Approach Delay (s)	0.0	5.4			Err
Approach LOS					F

Intersection Summary				
Average Delay	2077.4			
Intersection Capacity Utilization	46.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Frederick Marting Parkway & Washington Street

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	95	0	135	0	735	155	105	655	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.42	0.42	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	12	0	0	109	0	155	0	835	176	119	744	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.90	0.90	0.88	0.90	0.90	0.96	0.88			0.96		
vC, conflicting volume	1559	1997	747	1906	1912	506	750			1011		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1379	1865	644	1764	1771	389	647			918		
tC, single (s)	7.5	6.5	6.9	7.7	6.5	7.0	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	80	100	100	0	100	73	100			83		
cM capacity (veh/h)	60	55	370	39	63	580	834			688		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	12	109	155	418	594	119	750
Volume Left	12	109	0	0	0	119	0
Volume Right	0	0	155	0	176	0	6
cSH	60	39	580	834	1700	688	1700
Volume to Capacity	0.20	2.83	0.27	0.00	0.35	0.17	0.44
Queue Length 95th (ft)	17	305	27	0	0	16	0
Control Delay (s)	78.6	1045.0	13.5	0.0	0.0	11.3	0.0
Lane LOS	F	F	B			B	
Approach Delay (s)	78.6	439.5		0.0		1.6	
Approach LOS	F	F					

Intersection Summary				
Average Delay	54.9			
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2030 No-Build Conditions - AM Peak Hour

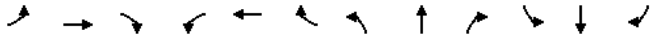
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	95	10	20	345	175	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.79	0.79
Hourly flow rate (vph)	119	12	25	431	222	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	766	285	348			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	766	285	348			
tC, single (s)	6.4	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.3			
p0 queue free %	67	98	98			
cM capacity (veh/h)	362	713	1178			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	131	456	348
Volume Left	119	25	0
Volume Right	12	0	127
cSH	379	1178	1700
Volume to Capacity	0.35	0.02	0.20
Queue Length 95th (ft)	38	2	0
Control Delay (s)	19.4	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	19.4	0.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		47.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2030 No-Build Conditions - AM Peak Hour



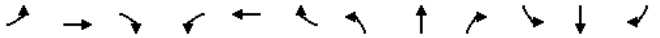
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	230	10	15	125	5	25	70	20	10	70	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.88	0.88	0.88	0.69	0.69	0.69	0.90	0.90	0.90
Hourly flow rate (vph)	41	271	12	17	142	6	36	101	29	11	78	67
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	148			282			643	541	276	618	544	145
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			282			643	541	276	618	544	145
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			88	76	96	96	82	93
cM capacity (veh/h)	1410			1292			300	428	755	308	426	908

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	324	165	167	156
Volume Left	41	17	36	11
Volume Right	12	6	29	67
cSH	1410	1292	421	533
Volume to Capacity	0.03	0.01	0.40	0.29
Queue Length 95th (ft)	2	1	46	30
Control Delay (s)	1.2	0.9	19.1	14.5
Lane LOS	A	A	C	B
Approach Delay (s)	1.2	0.9	19.1	14.5
Approach LOS			C	B

Intersection Summary			
Average Delay		7.4	
Intersection Capacity Utilization		40.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2030 No-Build Conditions - AM Peak Hour



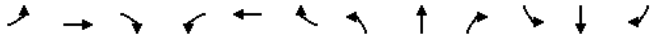
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	105	5	20	130	35	5	65	40	105	45	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.70	0.70	0.70
Hourly flow rate (vph)	0	152	7	29	191	51	7	96	59	150	64	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	243			159			478	457	156	538	435	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			159			478	457	156	538	435	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	80	93	58	87	98
cM capacity (veh/h)	1336			1432			435	489	895	357	507	828

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	159	272	162	229
Volume Left	0	29	7	150
Volume Right	7	51	59	14
cSH	1336	1432	582	405
Volume to Capacity	0.00	0.02	0.28	0.56
Queue Length 95th (ft)	0	2	28	84
Control Delay (s)	0.0	1.0	13.5	24.8
Lane LOS		A	B	C
Approach Delay (s)	0.0	1.0	13.5	24.8
Approach LOS			B	C

Intersection Summary				
Average Delay	9.9			
Intersection Capacity Utilization	38.9%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2030 No-Build Conditions - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	220	10	75	370	20	25	35	65	20	40	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.84	0.84	0.84	0.56	0.56	0.56
Hourly flow rate (vph)	11	237	11	119	587	32	30	42	77	36	71	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	619			247			1158	1121	242	1203	1110	603
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	619			247			1158	1121	242	1203	1110	603
tC, single (s)	4.2			4.1			7.1	6.6	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.1	3.3	3.6	4.0	3.3
p0 queue free %	99			91			73	77	90	66	62	96
cM capacity (veh/h)	933			1324			109	182	790	105	190	503

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	258	738	149	125
Volume Left	11	119	30	36
Volume Right	11	32	77	18
cSH	933	1324	248	166
Volume to Capacity	0.01	0.09	0.60	0.75
Queue Length 95th (ft)	1	7	88	118
Control Delay (s)	0.5	2.2	39.2	73.1
Lane LOS	A	A	E	F
Approach Delay (s)	0.5	2.2	39.2	73.1
Approach LOS			E	F

Intersection Summary				
Average Delay	13.2			
Intersection Capacity Utilization	56.2%	ICU Level of Service		B
Analysis Period (min)	15			

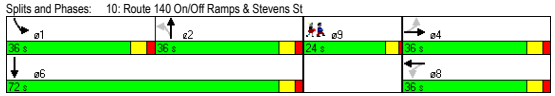
Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	40	85	5	30	40	55	5	265	320	530	210	35	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	200		0	
Storage Lanes	0		0	0		0	0		0	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		819			376			787			471		
Travel Time (s)		18.6			8.5			17.9			10.7		
Peak Hour Factor	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80	
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	172	0	0	149	0	0	664	0	662	306	0	
Turn Type	Perm			Perm			Perm			Prot			
Protected Phases		4			8			2		1	6		9
Permitted Phases	4			8			2						
Detector Phase	4	4		8	8		2	2		1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		24.0
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0	24.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%	18%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag							Lag	Lag		Lead			
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													0
v/c Ratio		0.39			0.33			0.70		0.64	0.25		
Control Delay		28.8			18.7			18.9		22.9	4.8		
Queue Delay		0.0			0.0			0.0		0.0	0.0		
Total Delay		28.8			18.7			18.9		22.9	4.8		
Queue Length 50th (ft)		30			14			76		108	37		
Queue Length 95th (ft)		58			42			153		165	62		
Internal Link Dist (ft)		739			296			707			391		
Turn Bay Length (ft)										200			
Base Capacity (vph)		1529			1406			1635		1741	1761		
Starvation Cap Reductn		0			0			0		0	0		
Spillback Cap Reductn		0			0			0		0	0		
Storage Cap Reductn		0			0			0		0	0		
Reduced v/c Ratio		0.11			0.11			0.41		0.38	0.17		

Intersection Summary	
Area Type:	Other
Cycle Length: 132	
Actuated Cycle Length: 61.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	85	5	30	40	55	5	265	320	530	210	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		0.99			0.93			0.92		1.00	0.98	
Flt Protected		0.98			0.99			1.00		0.95	1.00	
Satd. Flow (prot)		3651			3227			3200		3467	1835	
Flt Permitted		0.82			0.84			0.95		0.95	1.00	
Satd. Flow (perm)		3042			2733			3044		3467	1835	
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	53	112	7	36	48	65	6	298	360	662	262	44
RTOR Reduction (vph)	0	3	0	0	56	0	0	156	0	0	3	0
Lane Group Flow (vph)	0	169	0	0	93	0	0	508	0	662	303	0
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		8.9			8.9			16.1		18.4	40.5	
Effective Green, g (s)		8.9			8.9			16.1		18.4	40.5	
Actuated g/C Ratio		0.14			0.14			0.26		0.30	0.66	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		441			396			798		1039	1210	
v/s Ratio Prot										c0.19	0.17	
v/s Ratio Perm		c0.06			0.03			c0.17				
v/c Ratio		0.38			0.24			0.64		0.64	0.25	
Uniform Delay, d1		23.8			23.2			20.1		18.6	4.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.1			1.2		0.9	0.0	
Delay (s)		24.0			23.4			21.3		19.6	4.3	
Level of Service		C			C			C		B	A	
Approach Delay (s)		24.0			23.4			21.3			14.7	
Approach LOS		C			C			C			B	

Intersection Summary					
HCM Average Control Delay	18.4	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

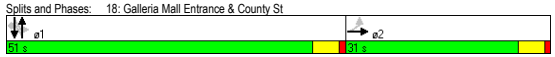
Lanes, Volumes, Timings
18: Galleria Mall Entrance & County St

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	155	45	0	0	0	25	65	0	165	145	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	548	0	0	0	0	0	119	0	0	344	506
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.47						0.12			0.36	0.53
Control Delay		10.0						6.9			8.5	3.3
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		10.0						6.9			8.5	3.3
Queue Length 50th (ft)		31						5			17	0
Queue Length 95th (ft)		71						13			41	34
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3345						2949			2720	1794
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.16						0.04			0.13	0.28

Intersection Summary	
Area Type:	Other
Cycle Length: 82	
Actuated Cycle Length: 29.5	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Galleria Mall Entrance & County St



HCM Signalized Intersection Capacity Analysis
18: Galleria Mall Entrance & County St

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	155	45	0	0	0	25	65	0	165	145	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.99						1.00			1.00	0.85
Flt Protected		0.97						0.99			0.97	1.00
Satd. Flow (prot)		3735						3561			3445	1794
Flt Permitted		0.97						0.82			0.77	1.00
Satd. Flow (perm)		3735						2950			2719	1794
Peak-hour factor, PHF	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	335	165	48	0	0	0	33	86	0	183	161	506
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	329
Lane Group Flow (vph)	0	539	0	0	0	0	0	119	0	0	344	177
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		9.1						10.3			10.3	10.3
Effective Green, g (s)		9.1						10.3			10.3	10.3
Actuated g/C Ratio		0.31						0.35			0.35	0.35
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		1156						1034			953	629
v/s Ratio Prot												
v/s Ratio Perm		0.14						0.04			c0.13	0.10
v/c Ratio		0.47						0.12			0.36	0.28
Uniform Delay, d1		8.2						6.5			7.1	6.9
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.1						0.0			0.1	0.1
Delay (s)		8.3						6.5			7.2	7.0
Level of Service		A						A			A	A
Approach Delay (s)		8.3			0.0			6.5			7.1	
Approach LOS		A			A			A			A	

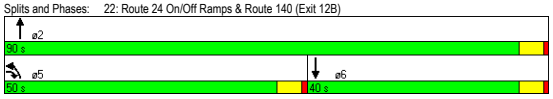
Intersection Summary					
HCM Average Control Delay	7.5	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	29.4	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	45.8%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1440	285	965	1085	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	0	250			200
Storage Lanes	0	2	1			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	729			870	625	
Travel Time (s)	16.6			19.8	14.2	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1500	310	1049	1543	0
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Detector Phase		5	5	2	6	
Switch Phase						
Minimum Initial (s)		4.0	4.0	4.0	4.0	
Minimum Split (s)		9.0	9.0	21.0	21.0	
Total Split (s)	0.0	50.0	50.0	90.0	40.0	0.0
Total Split (%)	0.0%	55.6%	55.6%	100.0%	44.4%	0.0%
Maximum Green (s)		45.0	45.0	85.0	35.0	
Yellow Time (s)		4.0	4.0	4.0	4.0	
All-Red Time (s)		1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Recall Mode		None	None	C-Min	C-Min	
Walk Time (s)				5.0	5.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
v/c Ratio		1.10	0.34	0.30	1.13	
Control Delay		79.5	18.0	0.2	94.0	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		79.5	18.0	0.2	94.0	
Queue Length 50th (ft)		~554	137	0	~535	
Queue Length 95th (ft)		#699	167	0	#674	
Internal Link Dist (ft)	649			790	545	
Turn Bay Length (ft)			250			
Base Capacity (vph)		1367	903	3505	1360	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		1.10	0.34	0.30	1.13	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1440	285	965	1085	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		0.88	1.00	0.95	0.95	
Frt		0.85	1.00	1.00	0.96	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2733	1805	3505	3414	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2733	1805	3505	3414	
Peak-hour factor, PHF	0.96	0.96	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1500	310	1049	1179	364
RTOR Reduction (vph)	0	0	0	0	32	0
Lane Group Flow (vph)	0	1500	310	1049	1511	0
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Actuated Green, G (s)		45.0	45.0	90.0	35.0	
Effective Green, g (s)		45.0	45.0	90.0	35.0	
Actuated g/C Ratio		0.50	0.50	1.00	0.39	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1367	903	3505	1328	
v/s Ratio Prot		c0.55	0.17	0.30	c0.44	
v/s Ratio Perm						
v/c Ratio		1.10	0.34	0.30	1.14	
Uniform Delay, d1		22.5	13.6	0.0	27.5	
Progression Factor		1.00	1.22	1.00	0.92	
Incremental Delay, d2		55.5	0.2	0.2	69.9	
Delay (s)		78.0	16.8	0.2	95.3	
Level of Service		E	B	A	F	
Approach Delay (s)	78.0			4.0	95.3	
Approach LOS	E			A	F	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

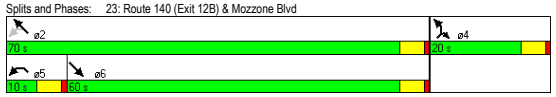
c Critical Lane Group

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1200	190	225	995	175	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1713			740	1061	
Travel Time (s)	38.9			16.8	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1511	0	0	1327	190	239
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	15.0		10.0	15.0	15.0	15.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	C-Min		None	C-Min	None	None
v/c Ratio	0.59			1.30dl	0.72	0.66
Control Delay	6.6			35.1	52.4	23.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.6			35.1	52.4	23.4
Queue Length 50th (ft)	180			~383	102	46
Queue Length 95th (ft)	232			#560	#177	123
Internal Link Dist (ft)	1633			660	981	
Turn Bay Length (ft)						
Base Capacity (vph)	2574			1331	295	388
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.59			1.00	0.64	0.62

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 2:NWTL and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 23: Route 140 (Exit 12B) & Mozzone Blvd



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1200	190	225	995	175	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3466			3507	1770	1583
Flt Permitted	1.00			0.51	0.95	1.00
Satd. Flow (perm)	3466			1798	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1304	207	245	1082	190	239
RTOR Reduction (vph)	9	0	0	0	0	127
Lane Group Flow (vph)	1502	0	0	1327	190	112
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	66.6			66.6	13.4	13.4
Effective Green, g (s)	66.6			66.6	13.4	13.4
Actuated g/C Ratio	0.74			0.74	0.15	0.15
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2565			1331	264	236
v/s Ratio Prot	0.43				c0.11	0.07
v/s Ratio Perm				c0.74		
v/c Ratio	0.59			1.30dl	0.72	0.48
Uniform Delay, d1	5.4			11.6	36.5	35.1
Progression Factor	1.00			0.71	1.00	1.00
Incremental Delay, d2	1.0			23.6	9.0	1.5
Delay (s)	6.4			31.8	45.6	36.6
Level of Service	A			C	D	D
Approach Delay (s)	6.4			31.8	40.6	
Approach LOS	A			C	D	

Intersection Summary

HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

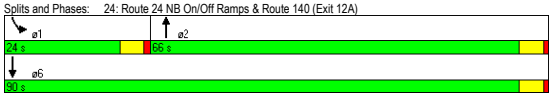
Lanes, Volumes, Timings
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

2030 No-Build Conditions - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	245	985	880	170	2390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	250	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.94	0.94	0.98	0.98	0.97	0.97
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	261	1005	898	175	2464
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			8.0		16.0	16.0
Minimum Split (s)			13.0		21.0	21.0
Total Split (s)	0.0	0.0	66.0	0.0	24.0	90.0
Total Split (%)	0.0%	0.0%	73.3%	0.0%	26.7%	100.0%
Maximum Green (s)			61.0		19.0	85.0
Yellow Time (s)			4.0		4.0	4.0
All-Red Time (s)			1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	2.0
Recall Mode			C-Min		None	C-Min
v/c Ratio		0.15	0.41	0.59	0.56	0.70
Control Delay		0.2	6.2	1.7	35.7	0.1
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.2	6.2	1.7	35.7	0.1
Queue Length 50th (ft)		0	103	0	97	0
Queue Length 95th (ft)		0	154	0	m75	m0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	250	
Base Capacity (vph)		1772	2469	1524	360	3505
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.15	0.41	0.59	0.49	0.70

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 30 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



HCM Signalized Intersection Capacity Analysis
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

2030 No-Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	245	985	880	170	2390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1772	3505	1524	1703	3505
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1772	3505	1524	1703	3505
Peak-hour factor, PHF	0.94	0.94	0.98	0.98	0.97	0.97
Adj. Flow (vph)	0	261	1005	898	175	2464
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	261	1005	898	175	2464
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Actuated Green, G (s)		90.0	63.4	90.0	16.6	90.0
Effective Green, g (s)		90.0	63.4	90.0	16.6	90.0
Actuated g/C Ratio		1.00	0.70	1.00	0.18	1.00
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			2.0		2.0	2.0
Lane Grp Cap (vph)		1772	2469	1524	314	3505
v/s Ratio Prot			0.29		0.10	c0.70
v/s Ratio Perm		0.15		0.59		
v/c Ratio		0.15	0.41	0.59	0.56	0.70
Uniform Delay, d1		0.0	5.5	0.0	33.4	0.0
Progression Factor		1.00	1.00	1.00	1.04	1.00
Incremental Delay, d2		0.2	0.5	1.7	0.1	0.1
Delay (s)		0.2	6.0	1.7	34.8	0.1
Level of Service		A	A	A	C	A
Approach Delay (s)	0.2		4.0			2.4
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	2.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
36: Taunton Depot Dr & Route 140

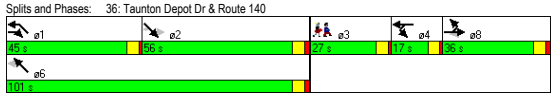
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR	ø3
Lane Configurations													
Volume (vph)	235	5	230	5	0	0	0	885	260	195	930	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12	
Storage Length (ft)	0		100	0		0	180		130	320		350	
Storage Lanes	1		1	0		0	1		1	1		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		846			205			2224			1713		
Travel Time (s)		19.2			4.7			50.5			38.9		
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94	
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%	
Shared Lane Traffic (%)	49%												
Lane Group Flow (vph)	129	129	247	0	8	0	0	903	265	207	989	0	
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt			
Protected Phases	8	8	1	4	4			2		1	6		3
Permitted Phases			8				2		2	6			
Detector Phase	8	8	1	4	4		2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0		4.0
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0		27.0
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0	27.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%	15%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0		22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0	
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?				Yes	Yes		Yes	Yes	Yes				Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0		3.0
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													6
v/c Ratio	0.50	0.50	0.33		0.06			0.60	0.36	0.48	0.43		
Control Delay	47.6	47.5	4.9		55.0			24.6	15.6	12.9	10.9		
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0		
Total Delay	47.6	47.5	4.9		55.0			24.6	15.6	12.9	10.9		
Queue Length 50th (ft)	55	55	0		3			147	44	27	88		
Queue Length 95th (ft)	203	203	61		20			507	219	157	393		
Internal Link Dist (ft)		766			125			2144			1633		
Turn Bay Length (ft)			100						130	320			
Base Capacity (vph)	669	672	1276		326			2348	1082	1005	3307		
Starvation Cap Reductn	0	0	0		0			0	0	0	0		
Spillback Cap Reductn	0	0	0		0			0	0	0	0		
Storage Cap Reductn	0	0	0		0			0	0	0	0		
Reduced v/c Ratio	0.19	0.19	0.19		0.02			0.38	0.24	0.21	0.30		

Intersection Summary

Area Type: Other
Cycle Length: 181
Actuated Cycle Length: 85.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 36: Taunton Depot Dr & Route 140



HCM Signalized Intersection Capacity Analysis
36: Taunton Depot Dr & Route 140

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	235	5	230	5	0	0	0	885	260	195	930	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		1.00			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		0.95			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1690	1599		2046			3539	1583	1805	3574	
Flt Permitted	0.95	0.95	1.00		0.95			1.00	1.00	0.17	1.00	
Satd. Flow (perm)	1681	1690	1599		2046			3539	1583	330	3574	
Peak-hour factor, PHF	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	253	5	247	8	0	0	0	903	265	207	989	0
RTOR Reduction (vph)	0	0	179	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	129	129	68	0	8	0	0	903	208	207	989	0
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	13.2	13.2	25.5		0.7			37.3	37.3	54.6	54.6	
Effective Green, g (s)	13.2	13.2	25.5		0.7			37.3	37.3	54.6	54.6	
Actuated g/C Ratio	0.14	0.14	0.27		0.01			0.40	0.40	0.59	0.59	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	239	240	438		15			1419	635	389	2098	
v/s Ratio Prot	c0.08	0.08	0.02		c0.00			c0.26		0.07	c0.28	
v/s Ratio Perm			0.02						0.13	0.24		
v/c Ratio	0.54	0.54	0.15		0.53			0.64	0.33	0.53	0.47	
Uniform Delay, d1	37.1	37.1	25.6		46.0			22.4	19.2	11.9	11.0	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.2	0.1		17.0			1.1	0.4	0.7	0.2	
Delay (s)	38.3	38.2	25.6		63.0			23.5	19.6	12.6	11.2	
Level of Service	D	D	C		E			C	B	B	B	
Approach Delay (s)		32.1			63.0			22.6			11.4	
Approach LOS		C			E			C			B	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

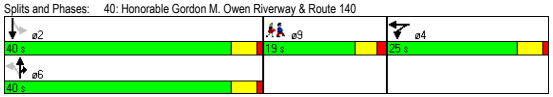
c Critical Lane Group

Lanes, Volumes, Timings
40: Honorable Gordon M. Owen Riverway & Route 140 — 2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	0	0	0	470	0	5	0	525	340	15	675	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12	
Storage Length (ft)	0		0	0		0	0		175	0		0	
Storage Lanes	0		0	0		0	0		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		220			991			547			1888		
Travel Time (s)		5.0			22.5			12.4			42.9		
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89	
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	579	0	0	547	354	0	775	0	
Turn Type				Split			Perm		Prot	Perm			
Protected Phases				4	4			6	6		2		9
Permitted Phases							6			2			
Detector Phase				4	4		6	6	6	2	2		
Switch Phase													
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0		1.0
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0		19.0
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0	19.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%	23%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0		14.0
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		3.5
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0
Recall Mode				None	None		None	None	None	None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													1
v/c Ratio					1.06			0.60	0.36		0.80		
Control Delay					83.3			16.9	2.8		24.1		
Queue Delay					0.0			0.0	0.0		0.0		
Total Delay					83.3			16.9	2.8		24.1		
Queue Length 50th (ft)					~239			132	0		219		
Queue Length 95th (ft)					#527			360	48		#625		
Internal Link Dist (ft)		140			911			467			1808		
Turn Bay Length (ft)									175				
Base Capacity (vph)					546			929	1002		988		
Starvation Cap Reductn					0			0	0		0		
Spillback Cap Reductn					0			0	0		0		
Storage Cap Reductn					0			0	0		0		
Reduced v/c Ratio					1.06			0.59	0.35		0.78		

Intersection Summary	
Area Type:	Other
Cycle Length: 84	
Actuated Cycle Length: 68	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 40: Honorable Gordon M. Owen Riverway & Route 140



HCM Signalized Intersection Capacity Analysis
40: Honorable Gordon M. Owen Riverway & Route 140 — 2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	470	0	5	0	525	340	15	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1831			1783	1599		1924	
Flt Permitted					0.95			1.00	1.00		0.99	
Satd. Flow (perm)					1831			1783	1599		1897	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	573	0	6	0	547	354	17	758	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	184	0	0	0
Lane Group Flow (vph)	0	0	0	0	578	0	0	547	170	0	775	0
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Actuated Green, G (s)					20.2			34.6	34.6		34.6	
Effective Green, g (s)					20.2			34.6	34.6		34.6	
Actuated g/C Ratio					0.28			0.48	0.48		0.48	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					513			856	767		910	
v/s Ratio Prot					c0.32			0.31	0.11			
v/s Ratio Perm											c0.41	
v/c Ratio					1.13			0.64	0.22		0.85	
Uniform Delay, d1					26.0			14.1	10.9		16.5	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					79.6			1.8	0.2		8.0	
Delay (s)					105.6			15.8	11.1		24.5	
Level of Service					F			B	B		C	
Approach Delay (s)		0.0			105.6			14.0			24.5	
Approach LOS		A			F			B			C	

Intersection Summary					
HCM Average Control Delay		41.1	HCM Level of Service		D
HCM Volume to Capacity ratio		0.95			
Actuated Cycle Length (s)		72.1	Sum of lost time (s)		17.3
Intersection Capacity Utilization		82.2%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

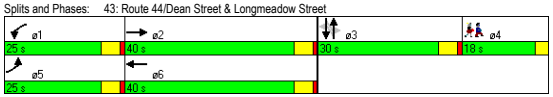
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø4
Lane Configurations													
Volume (vph)	10	815	350	405	765	220	75	330	220	150	235	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12	
Storage Length (ft)	100		70	100		70	0		50	0		100	
Storage Lanes	1		1	1		1	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1663			1440			2994			1249		
Travel Time (s)		37.8			32.7			68.0			28.4		
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1252	0	422	1026	0	0	680	0	0	471	0	
Turn Type	Prot			Prot			Perm			Perm			
Protected Phases	5	2		1	6			3			3		4
Permitted Phases							3			3			
Detector Phase	5	2		1	6		3	3		3	3		
Switch Phase													
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0		8.0
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0		18.0
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	18.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%	16%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0		15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0		3.0
Recall Mode	None	Min		None	Min		None	None		None	None		None
Walk Time (s)													8.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													4
v/c Ratio	0.07	1.02		1.25	0.51			1.08			2.36dl		
Control Delay	45.1	60.6		171.0	15.0			90.9			69.5		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	45.1	60.6		171.0	15.0			90.9			69.5		
Queue Length 50th (ft)	6	374		~314	149			~216			145		
Queue Length 95th (ft)	27	#692		#615	396			#416			#281		
Internal Link Dist (ft)		1583			1360			2914			1169		
Turn Bay Length (ft)	100			100									
Base Capacity (vph)	344	1233		337	2002			631			491		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.03	1.02		1.25	0.51			1.08			0.96		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 98.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	815	350	405	765	220	75	330	220	150	235	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.95		1.00	0.97			0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1685	3347		1652	3388			3236			3379	
Flt Permitted	0.95	1.00		0.95	1.00			0.69			0.56	
Satd. Flow (perm)	1685	3347		1652	3388			2237			1922	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	11	876	376	422	797	229	82	359	239	179	280	12
RTOR Reduction (vph)	0	38	0	0	15	0	0	62	0	0	2	0
Lane Group Flow (vph)	11	1214	0	422	1011	0	0	618	0	0	469	0
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.6	39.3		20.1	57.8			25.1			25.1	
Effective Green, g (s)	1.6	39.3		20.1	57.8			25.1			25.1	
Actuated g/C Ratio	0.02	0.37		0.19	0.55			0.24			0.24	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	26	1252		316	1863			534			459	
v/s Ratio Prot	0.01	c0.36		c0.26	0.30							
v/s Ratio Perm								c0.28			0.24	
v/c Ratio	0.42	0.97		1.34	0.54			1.16			2.36dl	
Uniform Delay, d1	51.3	32.3		42.5	15.2			40.0			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.4	18.6		171.0	0.6			89.9			47.9	
Delay (s)	65.7	50.9		213.5	15.7			129.9			87.9	
Level of Service	E	D		F	B			F			F	
Approach Delay (s)		51.1			73.4			129.9			87.9	
Approach LOS		D			E			F			F	

Intersection Summary

HCM Average Control Delay	77.8	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.11				
Actuated Cycle Length (s)	105.1	Sum of lost time (s)		20.6	
Intersection Capacity Utilization	102.4%	ICU Level of Service		G	
Analysis Period (min)	15				

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

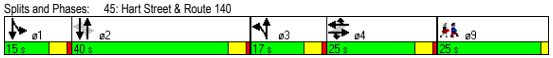
Lanes, Volumes, Timings
45: Hart Street & Route 140

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2	ø9
Lane Configurations														
Volume (vph)	35	105	170	105	170	240	260	770	115	120	880	10		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12		
Storage Length (ft)	0		50	0		50	50		0	50		0		
Storage Lanes	0		1	0		1	1		0	1		0		
Taper Length (ft)	25		25	25		25	25		25	25		25		
Right Turn on Red			Yes			Yes			Yes			Yes		
Link Speed (mph)		30			30			35			35			
Link Distance (ft)		1373			971			2224			3692			
Travel Time (s)		31.2			22.1			43.3			71.9			
Peak Hour Factor	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96		
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	205	250	0	290	253	0	1206	0	0	1052	0		
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt				
Protected Phases		4	4		4	4	3	2 3		1	1 2		2	9
Permitted Phases	4			4			2 3			1 2				
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2			
Switch Phase														
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	4.0			4.0			8.0	1.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	9.0			9.0			13.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0	40.0	25.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%	33%	20%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	12.0			10.0			35.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0			4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0			1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead			Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes			Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0			3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None			None			None	None
Walk Time (s)														7.0
Flash Dont Walk (s)														16.0
Pedestrian Calls (#/hr)														0
v/c Ratio		1.05	0.60		1.27	0.63		1.07			1.04			
Control Delay		118.3	23.2		184.3	29.8		72.8			63.5			
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0			
Total Delay		118.3	23.2		184.3	29.8		72.8			63.5			
Queue Length 50th (ft)		~139	65		~227	90		~307			~248			
Queue Length 95th (ft)		#180	83		#388	174		#398			#415			
Internal Link Dist (ft)		1293			891			2144			3612			
Turn Bay Length (ft)			50			50								
Base Capacity (vph)		195	418		229	403		1128			1007			
Starvation Cap Reductn		0	0		0	0		0			0			
Spillback Cap Reductn		0	0		0	0		0			0			
Storage Cap Reductn		0	0		0	0		0			0			
Reduced v/c Ratio		1.05	0.60		1.27	0.63		1.07			1.04			

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 97	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 45: Hart Street & Route 140



HCM Signalized Intersection Capacity Analysis
45: Hart Street & Route 140

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	105	170	105	170	240	260	770	115	120	880	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.98			1.00	
Flt Protected		0.99	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1801	1531		1839	1599		3365			3484	
Flt Permitted		0.52	1.00		0.59	1.00		0.58			0.51	
Satd. Flow (perm)		948	1531		1114	1599		1957			1795	
Peak-hour factor, PHF	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	51	154	250	111	179	253	274	811	121	125	917	10
RTOR Reduction (vph)	0	0	102	0	0	73	0	6	0	0	1	0
Lane Group Flow (vph)	0	205	148	0	290	180	0	1200	0	0	1051	0
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		47.0			45.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		47.0			45.0	
Actuated g/C Ratio		0.21	0.21		0.21	0.21		0.48			0.46	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		195	316		230	330		1122			1007	
v/s Ratio Prot			0.10			0.11		c0.13			c0.11	
v/s Ratio Perm		0.22			c0.26			c0.39			0.38	
v/c Ratio		1.05	0.47		1.26	0.55		1.07			1.04	
Uniform Delay, d1		38.5	33.8		38.5	34.4		25.0			26.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		78.6	4.9		147.5	6.3		47.6			40.6	
Delay (s)		117.1	38.7		186.0	40.8		72.6			66.6	
Level of Service		F	D		F	D		E			E	
Approach Delay (s)		74.0			118.3			72.6			66.6	
Approach LOS		E			F			E			E	

Intersection Summary					
HCM Average Control Delay	78.5	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	97.0	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	99.5%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

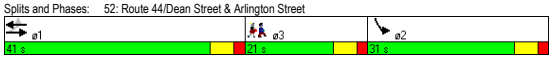
Lanes, Volumes, Timings
52: Route 44/Dean Street & Arlington Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	20	795	750	85	385	70	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.89	0.89	0.98	0.98	0.97	0.97	
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	22	893	852	0	469	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	9.0	9.0	9.0		4.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	35.0	35.0	35.0		25.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							2
v/c Ratio	0.23	1.02	0.86		0.79		
Control Delay	23.7	58.1	30.6		36.3		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	23.7	58.1	30.6		36.3		
Queue Length 50th (ft)	5	373	309		178		
Queue Length 95th (ft)	32	#890	#802		#458		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	95	877	986		636		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.23	1.02	0.86		0.74		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 74.6	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	20	795	750	85	385	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.99		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1685	1845	2068		1874	
Flt Permitted	0.11	1.00	1.00		0.96	
Satd. Flow (perm)	200	1845	2068		1874	
Peak-hour factor, PHF	0.89	0.89	0.98	0.98	0.97	0.97
Adj. Flow (vph)	22	893	765	87	397	72
RTOR Reduction (vph)	0	0	4	0	0	0
Lane Group Flow (vph)	22	893	848	0	469	0
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	35.5	35.5	35.5		23.6	
Effective Green, g (s)	35.5	35.5	35.5		23.6	
Actuated g/C Ratio	0.45	0.45	0.45		0.30	
Clearance Time (s)	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	89	824	923		556	
v/s Ratio Prot		c0.48	0.41		c0.25	
v/s Ratio Perm	0.11					
v/c Ratio	0.25	1.08	0.92		0.84	
Uniform Delay, d1	13.7	22.0	20.6		26.2	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.5	56.5	13.7		11.2	
Delay (s)	15.1	78.5	34.4		37.4	
Level of Service	B	E	C		D	
Approach Delay (s)		77.0	34.4		37.4	
Approach LOS		E	C		D	

Intersection Summary			
HCM Average Control Delay	52.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	20.4
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

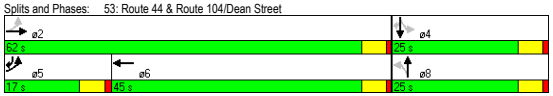
Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	1010	0	0	1035	15	15	10	5	65	15	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0		0	0		50
Storage Lanes	1		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		825			1426			127			959	
Travel Time (s)		18.8			32.4			2.9			21.8	
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1185	0	0	1250	0	0	40	0	0	86	306
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Detector Phase	5	2			6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	6.0	12.0			12.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0		11.0	11.0		11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	25.0	25.0	0.0	25.0	25.0	17.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	28.7%	28.7%	0.0%	28.7%	28.7%	19.5%
Maximum Green (s)	12.0	57.0			40.0		20.0	20.0		20.0	20.0	12.0
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	1.5	1.5			1.5		2.0	2.0		2.0	2.0	1.5
Recall Mode	None	Min			Min		None	None		None	None	None
v/c Ratio		0.70			0.73			0.17			0.39	0.51
Control Delay		6.9			15.0			26.1			33.8	20.0
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		6.9			15.0			26.1			33.8	20.0
Queue Length 50th (ft)		84			175			11			30	81
Queue Length 95th (ft)		148			270			34			81	175
Internal Link Dist (ft)		745			1346			47			879	
Turn Bay Length (ft)												50
Base Capacity (vph)		2005			2496			575			540	753
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.59			0.50			0.07			0.16	0.41

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 59.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: Route 44 & Route 104/Dean Street



HCM Signalized Intersection Capacity Analysis
53: Route 44 & Route 104/Dean Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	1010	0	0	1035	15	15	10	5	65	15	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	12	16
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.99			1.00			0.98			0.96	1.00
Satd. Flow (prot)		3518			3530			1810			1826	1794
Flt Permitted		0.58			1.00			0.80			0.74	1.00
Satd. Flow (perm)		2062			3530			1480			1403	1794
Peak-hour factor, PHF	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	144	1041	0	0	1232	18	20	13	7	70	16	306
RTOR Reduction (vph)	0	0	0	0	1	0	0	6	0	0	0	22
Lane Group Flow (vph)	0	1185	0	0	1249	0	0	34	0	0	86	284
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Actuated Green, G (s)		43.2			29.7			7.0			7.0	15.5
Effective Green, g (s)		43.2			29.7			7.0			7.0	15.5
Actuated g/C Ratio		0.72			0.49			0.12			0.12	0.26
Clearance Time (s)		5.0			5.0			5.0			5.0	5.0
Vehicle Extension (s)		1.5			1.5			2.0			2.0	1.5
Lane Grp Cap (vph)		1685			1742			172			163	611
v/s Ratio Prot		c0.10			0.35							c0.07
v/s Ratio Perm		c0.41						0.02			0.06	0.09
v/c Ratio		0.70			0.72			0.20			0.53	0.47
Uniform Delay, d1		4.8			12.0			24.1			25.0	18.9
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.1			1.2			0.2			1.4	0.2
Delay (s)		6.0			13.1			24.3			26.5	19.1
Level of Service		A			B			C			C	B
Approach Delay (s)		6.0			13.1			24.3			20.7	
Approach LOS		A			B			C			C	

Intersection Summary					
HCM Average Control Delay	11.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	60.2	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	81.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
57: Spring Street & Summer Street

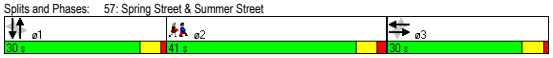
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	40	215	110	15	245	10	60	370	10	10	350	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12	
Right Turn on Red			Yes			No			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		376			382			1581			384		
Travel Time (s)		8.5			8.7			35.9			8.7		
Peak Hour Factor	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93	
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%	
Parking (#/hr)											0		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	457	0	0	355	0	0	518	0	0	419	0	
Turn Type	Perm			Perm			Perm			Perm			
Protected Phases		3			3			1			1		2
Permitted Phases	3			3			1			1			
Detector Phase	3	3		3	3		1	1		1	1		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0		15.0
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0		21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	41.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	41%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0		35.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													8.0
Pedestrian Calls (#/hr)													8
v/c Ratio		0.68			0.44			0.81			0.57		
Control Delay		24.1			18.0			31.6			20.5		
Queue Delay		0.0			0.0			0.0			0.2		
Total Delay		24.1			18.0			31.6			20.7		
Queue Length 50th (ft)		120			87			153			108		
Queue Length 95th (ft)		#301			187			#435			289		
Internal Link Dist (ft)		296			302			1501			304		
Turn Bay Length (ft)													
Base Capacity (vph)		672			809			641			740		
Starvation Cap Reductn		0			0			0			40		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.68			0.44			0.81			0.60		

Intersection Summary	
Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 64.2	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 57: Spring Street & Summer Street



HCM Signalized Intersection Capacity Analysis
57: Spring Street & Summer Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	215	110	15	245	10	60	370	10	10	350	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.96			1.00			1.00			0.99	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		1782			2117			1850			1894	
Flt Permitted		0.93			0.96			0.87			0.98	
Satd. Flow (perm)		1672			2047			1620			1866	
Peak-hour factor, PHF	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93
Adj. Flow (vph)	50	269	138	20	322	13	71	435	12	11	376	32
RTOR Reduction (vph)	0	13	0	0	0	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	444	0	0	355	0	0	517	0	0	416	0
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4			25.4			25.4	
Effective Green, g (s)		25.4			25.4			25.4			25.4	
Actuated g/C Ratio		0.37			0.37			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		614			751			595			685	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.17			c0.32			0.22	
v/c Ratio		0.72			0.47			0.87			0.61	
Uniform Delay, d1		18.9			16.8			20.4			17.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.3			2.1			15.9			4.0	
Delay (s)		26.1			18.9			36.2			21.8	
Level of Service		C			B			D			C	
Approach Delay (s)		26.1			18.9			36.2			21.8	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
58: Route 44/Main Street & Union Street

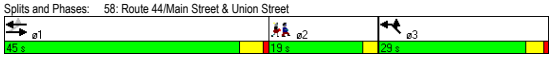
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	15	480	395	0	510	20	0	0	395	25	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91	
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	957	0	0	616	0	0	0	434	43	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												12
v/c Ratio		0.92			0.58				0.76	0.07		
Control Delay		33.1			16.8				35.3	15.4		
Queue Delay		0.0			0.0				0.2	0.0		
Total Delay		33.1			16.8				35.5	15.4		
Queue Length 50th (ft)		340			170				172	8		
Queue Length 95th (ft)		#867			381				#426	38		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		1041			1071				574	590		
Starvation Cap Reductn		0			0				9	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.92			0.58				0.77	0.07		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 77.8	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	15	480	395	0	510	20	0	0	395	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.94			0.99				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1979			2063				1770	1785	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1956			2063				1770	1785	
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	16	516	425	0	593	23	0	0	434	27	16
RTOR Reduction (vph)	0	27	0	0	1	0	0	0	0	11	0
Lane Group Flow (vph)	0	930	0	0	615	0	0	0	434	32	0
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.3			40.3				25.2	25.2	
Effective Green, g (s)		40.3			40.3				25.2	25.2	
Actuated g/C Ratio		0.50			0.50				0.31	0.31	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		983			1037				556	561	
v/s Ratio Prot					0.30				c0.25	0.02	
v/s Ratio Perm		c0.48									
v/c Ratio		0.95			0.59				0.78	0.06	
Uniform Delay, d1		18.9			14.1				25.0	19.2	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		18.3			2.5				10.4	0.2	
Delay (s)		37.3			16.6				35.4	19.4	
Level of Service		D			B				D	B	
Approach Delay (s)		37.3			16.6		0.0		34.0		
Approach LOS		D			B		A		C		

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	14.7
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

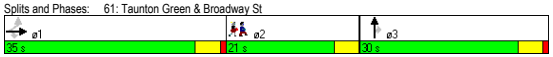
Lanes, Volumes, Timings
61: Taunton Green & Broadway St

2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	170	895	335	0	0	1125	0	200	130	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		304			913			579			302		
Travel Time (s)		6.9			20.8			13.2			6.9		
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%	
Parking (#/hr)			0			0			0				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	183	962	360	0	0	1223	0	227	148	0	0	0	
Turn Type	Perm		Perm			Free			Perm				
Protected Phases		1						3					2
Permitted Phases	1		1			Free			3				
Detector Phase	1	1	1					3	3				
Switch Phase													
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0				1.0
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0				21.0
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	21.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%	24%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0				17.0
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0				4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0				0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead										Lag
Lead-Lag Optimize?	Yes	Yes	Yes										Yes
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0				2.0
Recall Mode	Max	Max	Max					Max	Max				Ped
Walk Time (s)													10.0
Flash Dont Walk (s)													7.0
Pedestrian Calls (#/hr)													8
v/c Ratio	0.26	0.79	0.45			0.46		0.45	0.30				
Control Delay	7.0	30.1	4.0			0.6		28.3	6.0				
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0				
Total Delay	7.0	30.1	4.0			0.6		28.3	6.0				
Queue Length 50th (ft)	16	242	0			0		100	0				
Queue Length 95th (ft)	58	316	50			0		162	40				
Internal Link Dist (ft)		224			833			499			222		
Turn Bay Length (ft)													
Base Capacity (vph)	705	1223	798			2647		506	492				
Starvation Cap Reductn	0	0	0			0		0	0				
Spillback Cap Reductn	0	0	0			0		0	0				
Storage Cap Reductn	0	0	0			0		0	0				
Reduced v/c Ratio	0.26	0.79	0.45			0.46		0.45	0.30				

Intersection Summary	
Area Type:	Other
Cycle Length: 86	
Actuated Cycle Length: 86	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	

Splits and Phases: 61: Taunton Green & Broadway St



HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway St

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	895	335	0	0	1125	0	200	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1770	3505	1615			2647		1739	1330			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1770	3505	1615			2647		1739	1330			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	183	962	360	0	0	1223	0	227	148	0	0	0
RTOR Reduction (vph)	87	0	234	0	0	0	0	0	105	0	0	0
Lane Group Flow (vph)	96	962	126	0	0	1223	0	227	43	0	0	0
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	617	1223	563			2647		506	387			
v/s Ratio Prot		c0.27						0.13				
v/s Ratio Perm	0.05		0.08			c0.46			0.03			
v/c Ratio	0.16	0.79	0.22			0.46		0.45	0.11			
Uniform Delay, d1	19.3	25.1	19.8			0.0		24.9	22.4			
Progression Factor	0.92	0.98	0.86			1.00		1.00	1.00			
Incremental Delay, d2	0.5	5.1	0.9			0.6		2.9	0.6			
Delay (s)	18.3	29.7	17.9			0.6		27.7	22.9			
Level of Service	B	C	B			A		C	C			
Approach Delay (s)		25.5			0.6			25.8			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
71: Court Street & Washington Street

2030 No-Build Conditions - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	435	20	565	240	50	680	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.95	0.95	
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	463	21	614	261	53	716	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	17.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	17.0
Total Split (%)	25.8%	25.8%	56.7%	56.7%	56.7%	56.7%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							10
v/c Ratio	1.24	0.06	0.68	0.30	0.22	0.74	
Control Delay	164.1	25.3	22.3	2.6	15.9	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	164.1	25.3	22.3	2.6	15.9	24.1	
Queue Length 50th (ft)	~357	7	269	0	17	329	
Queue Length 95th (ft)	#548	28	396	37	43	477	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	373	360	905	861	240	970	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.24	0.06	0.68	0.30	0.22	0.74	

Intersection Summary

Area Type: Other
Cycle Length: 97
Actuated Cycle Length: 97
Offset: 0 (0%), Referenced to phase 2:Ped and 6:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 71: Court Street & Washington Street

HCM Signalized Intersection Capacity Analysis
71: Court Street & Washington Street

2030 No-Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	435	20	565	240	50	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1811	1723	1756	1425	1671	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.27	1.00
Satd. Flow (perm)	1811	1723	1756	1425	466	1881
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	463	21	614	261	53	716
RTOR Reduction (vph)	0	5	0	126	0	0
Lane Group Flow (vph)	463	16	614	135	53	716
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.0	20.0	50.0	50.0	50.0	50.0
Effective Green, g (s)	20.0	20.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio	0.21	0.21	0.52	0.52	0.52	0.52
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	373	355	905	735	240	970
v/s Ratio Prot	c0.26		0.35			c0.38
v/s Ratio Perm		0.01		0.09	0.11	
v/c Ratio	1.24	0.05	0.68	0.18	0.22	0.74
Uniform Delay, d1	38.5	30.9	17.5	12.6	12.8	18.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	129.4	0.2	4.1	0.5	2.1	5.0
Delay (s)	167.9	31.1	21.6	13.1	15.0	23.4
Level of Service	F	C	C	B	B	C
Approach Delay (s)	162.0		19.1			22.8
Approach LOS	F		B			C

Intersection Summary

HCM Average Control Delay	52.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

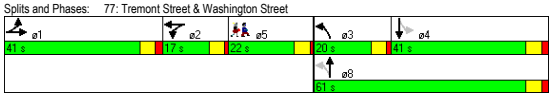
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø5
Lane Configurations													
Volume (vph)	505	175	100	25	130	35	105	315	60	35	355	515	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		698			192			1911			574		
Travel Time (s)		15.9			4.4			43.4			13.0		
Peak Hour Factor	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88	
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%	
Shared Lane Traffic (%)	22%												
Lane Group Flow (vph)	406	398	0	0	234	0	0	511	0	0	1028	0	
Turn Type	Split			Split			pm+pt			Perm			
Protected Phases	1	1		2	2		3	8			4		5
Permitted Phases							8			4			
Detector Phase	1	1		2	2		3	8		4	4		
Switch Phase													
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0		3.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0		22.0
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0	22.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%	16%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0		17.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None		None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													11
v/c Ratio	0.78	0.81			1.06			1.15dl			0.83		
Control Delay	47.0	48.6			121.6			35.9			29.6		
Queue Delay	0.0	0.0			0.0			0.0			0.0		
Total Delay	47.0	48.6			121.6			35.9			29.6		
Queue Length 50th (ft)	222	213			~140			138			240		
Queue Length 95th (ft)	#574	#574			#399			283			440		
Internal Link Dist (ft)		618			112			1831			494		
Turn Bay Length (ft)													
Base Capacity (vph)	631	594			221			952			1244		
Starvation Cap Reductn	0	0			0			0			0		
Spillback Cap Reductn	0	0			0			0			0		
Storage Cap Reductn	0	0			0			0			0		
Reduced v/c Ratio	0.64	0.67			1.06			0.54			0.83		

Intersection Summary

Area Type: Other
Cycle Length: 141
Actuated Cycle Length: 103.6
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	505	175	100	25	130	35	105	315	60	35	355	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.96			0.98			0.98			0.91	
Flt Protected	0.95	0.99			0.99			0.99			1.00	
Satd. Flow (prot)	1811	1681			1806			3350			3102	
Flt Permitted	0.95	0.99			0.99			0.51			0.91	
Satd. Flow (perm)	1811	1681			1806			1728			2822	
Peak-hour factor, PHF	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	521	180	103	31	160	43	112	335	64	40	403	585
RTOR Reduction (vph)	0	9	0	0	5	0	0	8	0	0	140	0
Lane Group Flow (vph)	406	389	0	0	229	0	0	503	0	0	888	0
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	29.8	29.8			12.4			40.6			40.6	
Effective Green, g (s)	29.8	29.8			12.4			40.6			40.6	
Actuated g/C Ratio	0.28	0.28			0.12			0.38			0.38	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	503	467			209			654			1068	
v/s Ratio Prot	0.22	c0.23			c0.13							
v/s Ratio Perm								0.29			c0.31	
v/c Ratio	0.81	0.83			1.09			1.15dl			0.83	
Uniform Delay, d1	36.1	36.4			47.4			29.2			30.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	8.7	11.6			89.7			4.9			5.4	
Delay (s)	44.8	48.0			137.1			34.1			35.6	
Level of Service	D	D			F			C			D	
Approach Delay (s)		46.4			137.1			34.1			35.6	
Approach LOS		D			F			C			D	

Intersection Summary

HCM Average Control Delay	47.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	24.5
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lanes, Volumes, Timings
93: Washington Street & Broadway

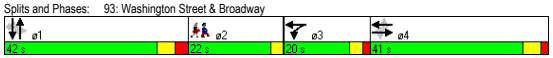
2030 No-Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø2
Lane Configurations													
Volume (vph)	285	145	5	35	145	5	5	505	60	20	480	375	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12	
Storage Length (ft)	0		0	0		0	0		0	0		50	
Storage Lanes	0		0	0		0	0		1	0		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			No			Yes			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1068			1376			92			2042		
Travel Time (s)		24.3			31.3			2.1			46.4		
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95	
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%	
Parking (#/hr)									2				
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	473	0	0	221	0	0	581	0	0	526	395	
Turn Type	Perm			pm+pt			Perm			Perm		Perm	
Protected Phases		4		3	3 4			1			1		2
Permitted Phases	4			3 4			1			1		1	
Detector Phase	4	4		3	3 4		1	1		1	1	1	
Switch Phase													
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0	1.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0	22.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0	22.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%	18%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0	19.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0	2.0
Recall Mode	None	None		None			Max	Max		Max	Max	Max	None
Walk Time (s)													7.0
Flash Dont Walk (s)													12.0
Pedestrian Calls (#/hr)													9
v/c Ratio		0.98			0.29			0.54			0.88	0.74	
Control Delay		72.1			16.9			30.7			51.1	41.5	
Queue Delay		0.0			0.0			0.0			0.0	0.0	
Total Delay		72.1			16.9			30.7			51.1	41.5	
Queue Length 50th (ft)		286			72			147			303	213	
Queue Length 95th (ft)		#674			155			279			#689	#493	
Internal Link Dist (ft)		988			1296			12			1962		
Turn Bay Length (ft)												50	
Base Capacity (vph)		483			823			1085			598	535	
Starvation Cap Reductn		0			0			0			0	0	
Spillback Cap Reductn		0			0			0			0	0	
Storage Cap Reductn		0			0			0			0	0	
Reduced v/c Ratio		0.98			0.27			0.54			0.88	0.74	

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 103.6	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 93: Washington Street & Broadway



HCM Signalized Intersection Capacity Analysis
93: Washington Street & Broadway

2030 No-Build Conditions - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	285	145	5	35	145	5	5	505	60	20	480	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.97			0.99			1.00			1.00	1.00
Satd. Flow (prot)		2029			1798			3371			1820	1568
Flt Permitted		0.67			0.89			0.94			0.96	1.00
Satd. Flow (perm)		1414			1623			3164			1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	310	158	5	42	173	6	5	515	61	21	505	395
RTOR Reduction (vph)	0	0	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	473	0	0	221	0	0	574	0	0	526	395
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		35.3			46.4			35.3			35.3	35.3
Effective Green, g (s)		35.3			46.4			35.3			35.3	35.3
Actuated g/C Ratio		0.33			0.44			0.33			0.33	0.33
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		472			730			1056			585	523
v/s Ratio Prot					c0.03							
v/s Ratio Perm		c0.33			0.10			0.18			c0.30	0.25
v/c Ratio		1.00			0.30			0.54			0.90	0.76
Uniform Delay, d1		35.2			19.2			28.7			33.6	31.4
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		41.9			0.1			2.0			19.3	9.8
Delay (s)		77.2			19.3			30.7			52.8	41.2
Level of Service		E			B			C			D	D
Approach Delay (s)		77.2			19.3			30.7			47.8	
Approach LOS		E			B			C			D	

Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	24.1
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
25: Route 24 Slip Ramp & Route 140 (Exit 12A)

2030 No-Build Conditions - PM Peak Hour

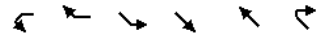
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	205	0	1850	2425	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.97	0.97	0.95	0.95
Hourly flow rate (vph)	0	244	0	1907	2553	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					624	
pX, platoon unblocked	0.05	0.05	0.05			
vC, conflicting volume	3506	1276	2553			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13593	0	0			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	0	100			
cM capacity (veh/h)	0	52	78			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	244	954	954	1276	1276
Volume Left	0	0	0	0	0
Volume Right	244	0	0	0	0
cSH	52	1700	1700	1700	1700
Volume to Capacity	4.74	0.56	0.56	0.75	0.75
Queue Length 95th (ft)	Err	0	0	0	0
Control Delay (s)	Err	0.0	0.0	0.0	0.0
Lane LOS	F				
Approach Delay (s)	Err	0.0		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay		518.8	
Intersection Capacity Utilization		86.4%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
38: Rt. 24 SB Slip Ramp & Route 140 (Exit 12B)

2030 No-Build Conditions - PM Peak Hour



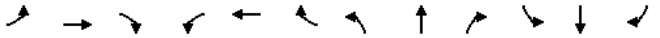
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	0	250	0	1420	965	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	272	0	1543	1049	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				740	625	
pX, platoon unblocked	0.82					
vC, conflicting volume	1821	524	1049			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1562	524	1049			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	45	100			
cM capacity (veh/h)	84	498	659			

Direction, Lane #	WB 1	SE 1	SE 2	NW 1	NW 2
Volume Total	272	772	772	524	524
Volume Left	0	0	0	0	0
Volume Right	272	0	0	0	0
cSH	498	1700	1700	1700	1700
Volume to Capacity	0.55	0.45	0.45	0.31	0.31
Queue Length 95th (ft)	81	0	0	0	0
Control Delay (s)	20.6	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	20.6	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		48.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2030 No-Build Conditions - PM Peak Hour



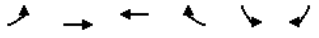
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	255	30	0	0	0	0	0	420	775	450	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.99	0.99	0.99	0.94	0.94	0.94
Hourly flow rate (vph)	0	274	32	0	0	0	0	0	424	824	479	106
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			Raised	
Median storage veh)											1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2393	2605	532	2297	2234	0	585			424		
vC1, stage 1 conf vol	2181	2181		0	0							
vC2, stage 2 conf vol	212	424		2297	2234							
vCu, unblocked vol	2393	2605	532	2297	2234	0	585			424		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	0	94	0	100	100	100			27		
cM capacity (veh/h)	10	7	546	0	20	1085	1000			1135		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	SB 3
Volume Total	274	32	424	412	412	585
Volume Left	0	0	0	412	412	0
Volume Right	0	32	424	0	0	106
cSH	7	546	1700	1135	1135	1700
Volume to Capacity	41.34	0.06	0.25	0.73	0.73	0.34
Queue Length 95th (ft)	Err	5	0	170	170	0
Control Delay (s)	Err	12.0	0.0	16.1	16.1	0.0
Lane LOS	F	B		C	C	
Approach Delay (s)	8947.7		0.0	9.4		
Approach LOS	F					

Intersection Summary				
Average Delay	1287.4			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
67: Post Office Square & Broadway

2030 No-Build Conditions - PM Peak Hour



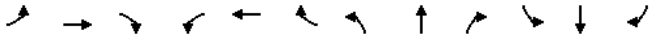
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	925	555	0	545
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	0	0	974	584	0	612
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	974				974	487
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974				974	487
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	704				253	527

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	487	487	584	612
Volume Left	0	0	0	0
Volume Right	0	0	584	612
cSH	1700	1700	1700	527
Volume to Capacity	0.29	0.29	0.34	1.16
Queue Length 95th (ft)	0	0	0	536
Control Delay (s)	0.0	0.0	0.0	118.7
Lane LOS				F
Approach Delay (s)	0.0			118.7
Approach LOS				F

Intersection Summary			
Average Delay	33.5		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2030 No-Build Conditions - PM Peak Hour



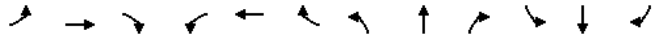
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	25	940	125	365	0	0	0	0	340	20
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	29	1011	134	392	0	0	0	0	378	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	134			29			2367	2156	0	2170	2185	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	134			29			2367	2156	0	2170	2185	134
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			36			0	100	100	100	0	98
cM capacity (veh/h)	1463			1584			0	18	1091	17	17	920

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	29	674	471	392	400
Volume Left	0	674	337	0	0
Volume Right	29	0	0	392	22
cSH	1700	1584	1584	1700	18
Volume to Capacity	0.02	0.64	0.64	0.23	22.83
Queue Length 95th (ft)	0	124	124	0	Err
Control Delay (s)	0.0	11.2	10.2	0.0	Err
Lane LOS		B	B		F
Approach Delay (s)	0.0	8.0			Err
Approach LOS					F

Intersection Summary				
Average Delay	2039.9			
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	5	95	0	175	5	645	315	240	845	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	10	104	0	192	5	694	339	255	899	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.72	0.72	0.72	0.72	0.72		0.72					
vC, conflicting volume	1959	2453	899	2293	2283	516	899			1032		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2142	2832	660	2609	2595	516	660			1032		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	0	100	62	99			62		
cM capacity (veh/h)	9	8	294	6	11	509	671			675		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	104	192	352	685	255	899
Volume Left	0	104	0	5	0	255	0
Volume Right	10	0	192	0	339	0	0
cSH	294	6	509	671	1700	675	1700
Volume to Capacity	0.03	17.70	0.38	0.01	0.40	0.38	0.53
Queue Length 95th (ft)	3	Err	44	1	0	44	0
Control Delay (s)	17.7	Err	16.3	0.3	0.0	13.5	0.0
Lane LOS	C	F	C	A		B	
Approach Delay (s)	17.7	3528.7		0.1		3.0	
Approach LOS	C	F					

Intersection Summary				
Average Delay	420.5			
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2030 No-Build Conditions - PM Peak Hour

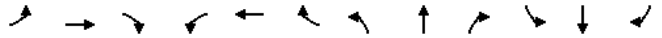
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	80	20	25	210	355	85
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.91	0.91
Hourly flow rate (vph)	111	28	35	292	390	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	798	437	484			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	798	437	484			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	96	97			
cM capacity (veh/h)	341	624	1090			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	139	326	484
Volume Left	111	35	0
Volume Right	28	0	93
cSH	375	1090	1700
Volume to Capacity	0.37	0.03	0.28
Queue Length 95th (ft)	42	2	0
Control Delay (s)	20.1	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	20.1	1.2	0.0
Approach LOS	C		

Intersection Summary				
Average Delay			3.4	
Intersection Capacity Utilization			44.3%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2030 No-Build Conditions - PM Peak Hour



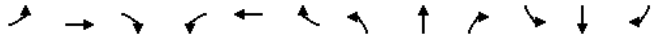
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	325	20	5	90	5	30	90	40	20	135	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	69	346	21	7	125	7	37	110	49	24	165	79
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	132			367			799	641	356	741	648	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			367			799	641	356	741	648	128
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			79	71	93	89	55	91
cM capacity (veh/h)	1453			1203			173	372	692	231	369	921

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	436	139	195	268
Volume Left	69	7	37	24
Volume Right	21	7	49	79
cSH	1453	1203	338	420
Volume to Capacity	0.05	0.01	0.58	0.64
Queue Length 95th (ft)	4	0	86	108
Control Delay (s)	1.6	0.4	29.2	27.5
Lane LOS	A	A	D	D
Approach Delay (s)	1.6	0.4	29.2	27.5
Approach LOS			D	D

Intersection Summary				
Average Delay			13.3	
Intersection Capacity Utilization			50.5%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2030 No-Build Conditions - PM Peak Hour



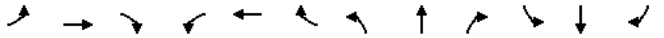
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	70	50	240	105	5	40	90	35	5	90	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.81	0.81	0.81	0.88	0.88	0.88	0.77	0.77	0.77
Hourly flow rate (vph)	11	74	53	296	130	6	45	102	40	6	117	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	136			128			913	851	101	939	874	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			128			913	851	101	939	874	133
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			80			65	57	96	95	49	99
cM capacity (veh/h)	1461			1452			130	236	952	133	229	922

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	138	432	188	130
Volume Left	11	296	45	6
Volume Right	53	6	40	6
cSH	1461	1452	227	230
Volume to Capacity	0.01	0.20	0.82	0.57
Queue Length 95th (ft)	1	19	156	78
Control Delay (s)	0.6	6.1	67.7	39.3
Lane LOS	A	A	F	E
Approach Delay (s)	0.6	6.1	67.7	39.3
Approach LOS			F	E

Intersection Summary				
Average Delay	23.1			
Intersection Capacity Utilization	48.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2030 No-Build Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	250	15	180	400	25	25	45	85	25	65	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.85	0.85	0.85	0.78	0.78	0.78	0.88	0.88	0.88
Hourly flow rate (vph)	7	347	21	212	471	29	32	58	109	28	74	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	500			368			1334	1295	358	1418	1291	485
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			368			1334	1295	358	1418	1291	485
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			82			48	57	84	48	45	97
cM capacity (veh/h)	1075			1196			62	134	682	55	134	586

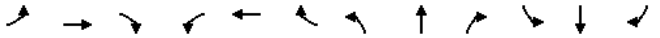
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	375	712	199	119
Volume Left	7	212	32	28
Volume Right	21	29	109	17
cSH	1075	1196	179	109
Volume to Capacity	0.01	0.18	1.11	1.10
Queue Length 95th (ft)	0	16	248	185
Control Delay (s)	0.2	4.1	152.7	190.5
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	4.1	152.7	190.5
Approach LOS			F	F

Intersection Summary				
Average Delay	39.9			
Intersection Capacity Utilization	67.6%	ICU Level of Service		C
Analysis Period (min)	15			

Norton

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2030 No-Build Condition - AM Peak Hour



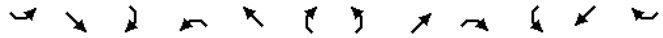
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	355	135	50	310	50	175	115	120	70	60	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.79	0.79	0.79	0.67	0.67	0.67
Hourly flow rate (vph)	16	390	148	62	383	62	222	146	152	104	90	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	444			538			1094	1065	464	1259	1108	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			538			1094	1065	464	1259	1108	414
tC, single (s)	4.2			4.1			7.1	6.6	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			94			0	28	74	0	53	98
cM capacity (veh/h)	1060			1040			112	204	592	41	189	624

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	555	506	519	209
Volume Left	16	62	222	104
Volume Right	148	62	152	15
cSH	1060	1040	176	69
Volume to Capacity	0.02	0.06	2.96	3.02
Queue Length 95th (ft)	1	5	1176	Err
Control Delay (s)	0.4	1.7	935.4	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	1.7	935.4	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	1439.8			
Intersection Capacity Utilization	77.3%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2030 No-Build Condition - AM Peak Hour



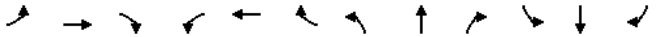
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	35	225	0	0	360	75	0	0	5	10	0	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.56	0.56	0.56	0.69	0.69	0.69
Hourly flow rate (vph)	39	250	0	0	400	83	0	0	9	14	0	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	483			250			842	811	250	778	769	442
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	483			250			842	811	250	778	769	442
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	96			100			100	100	99	95	100	88
cM capacity (veh/h)	1074			1327			246	304	794	279	322	616

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	289	483	9	87
Volume Left	39	0	0	14
Volume Right	0	83	9	72
cSH	1074	1327	794	513
Volume to Capacity	0.04	0.00	0.01	0.17
Queue Length 95th (ft)	3	0	1	15
Control Delay (s)	1.5	0.0	9.6	13.4
Lane LOS	A		A	B
Approach Delay (s)	1.5	0.0	9.6	13.4
Approach LOS			A	B

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2030 No-Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	185	5	5	220	0	15	0	10	5	0	5
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.75	0.75	0.75	0.69	0.69	0.69
Hourly flow rate (vph)	0	201	5	5	232	0	20	0	13	7	0	7

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	207	237	33	14
Volume Left (vph)	0	5	20	7
Volume Right (vph)	5	0	13	7
Hadj (s)	0.11	0.06	0.32	0.23
Departure Headway (s)	4.4	4.3	5.2	5.2
Degree Utilization, x	0.25	0.28	0.05	0.02
Capacity (veh/h)	803	811	629	628
Control Delay (s)	8.9	9.0	8.5	8.3
Approach Delay (s)	8.9	9.0	8.5	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.9	
HCM Level of Service			A	
Intersection Capacity Utilization			25.6%	ICU Level of Service
Analysis Period (min)			15	A

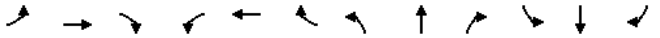
HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2030 No-Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	85	195	60	35	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.72	0.72	0.70	0.70
Hourly flow rate (vph)	56	118	271	83	50	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	477	312			354	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	477	312			354	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	89	84			96	
cM capacity (veh/h)	514	723			1216	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	174	354	114
Volume Left	56	0	50
Volume Right	118	83	0
cSH	640	1700	1216
Volume to Capacity	0.27	0.21	0.04
Queue Length 95th (ft)	27	0	3
Control Delay (s)	12.7	0.0	3.7
Lane LOS	B		A
Approach Delay (s)	12.7	0.0	3.7
Approach LOS	B		

Intersection Summary				
Average Delay			4.1	
Intersection Capacity Utilization			35.7%	ICU Level of Service
Analysis Period (min)			15	A



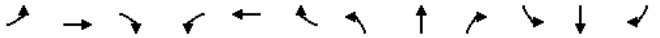
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	170	20	5	165	10	60	155	5	10	40	0
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	198	23	7	220	13	67	172	6	11	44	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	227	240	244	56
Volume Left (vph)	6	7	67	11
Volume Right (vph)	23	13	6	0
Hadj (s)	-0.03	0.11	0.16	0.23
Departure Headway (s)	5.1	5.2	5.4	5.8
Degree Utilization, x	0.32	0.35	0.37	0.09
Capacity (veh/h)	658	649	616	546
Control Delay (s)	10.5	11.0	11.5	9.4
Approach Delay (s)	10.5	11.0	11.5	9.4
Approach LOS	B	B	B	A

Intersection Summary				
Delay		10.9		
HCM Level of Service		B		
Intersection Capacity Utilization		36.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2030 No-Build Condition - PM Peak Hour



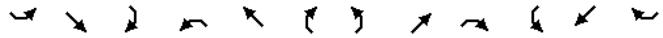
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	295	245	150	425	75	155	70	115	65	155	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.93	0.93	0.93	0.88	0.88	0.88
Hourly flow rate (vph)	15	304	253	169	478	84	167	75	124	74	176	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	562			557			1429	1360	430	1479	1444	520
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562			557			1429	1360	430	1479	1444	520
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	98			83			0	38	80	0	0	96
cM capacity (veh/h)	1020			1019			0	122	627	38	109	549

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	572	730	366	273
Volume Left	15	169	167	74
Volume Right	253	84	124	23
cSH	1020	1019	0	75
Volume to Capacity	0.02	0.17	Err	3.62
Queue Length 95th (ft)	1	15	Err	Err
Control Delay (s)	0.4	3.9	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	3.9	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			109.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2030 No-Build Condition - PM Peak Hour



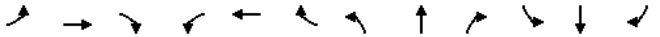
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	75	475	5	5	250	35	0	0	5	40	0	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.44	0.44	0.44	0.67	0.67	0.67
Hourly flow rate (vph)	82	522	5	6	284	40	0	0	11	60	0	127
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	324			527			1132	1025	525	1016	1008	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			527			1132	1025	525	1016	1008	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			100	100	98	70	100	83
cM capacity (veh/h)	1247			1050			143	220	557	199	225	738

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	610	330	11	187
Volume Left	82	6	0	60
Volume Right	5	40	11	127
cSH	1247	1050	557	396
Volume to Capacity	0.07	0.01	0.02	0.47
Queue Length 95th (ft)	5	0	2	61
Control Delay (s)	1.8	0.2	11.6	21.9
Lane LOS	A	A	B	C
Approach Delay (s)	1.8	0.2	11.6	21.9
Approach LOS			B	C

Intersection Summary				
Average Delay			4.7	
Intersection Capacity Utilization			69.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2030 No-Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	310	15	10	190	0	5	5	5	0	0	5
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.75	0.75	0.75	0.42	0.42	0.42
Hourly flow rate (vph)	6	356	17	11	216	0	7	7	7	0	0	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	379	227	20	12
Volume Left (vph)	6	11	7	0
Volume Right (vph)	17	0	7	12
Hadj (s)	0.00	0.04	-0.02	-0.60
Departure Headway (s)	4.2	4.4	5.2	4.6
Degree Utilization, x	0.44	0.28	0.03	0.02
Capacity (veh/h)	841	794	613	674
Control Delay (s)	10.5	9.1	8.4	7.7
Approach Delay (s)	10.5	9.1	8.4	7.7
Approach LOS	B	A	A	A

Intersection Summary				
Delay			9.9	
HCM Level of Service			A	
Intersection Capacity Utilization			30.7%	ICU Level of Service
Analysis Period (min)			15	A

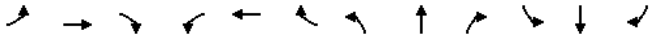
HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2030 No-Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	110	55	105	55	45	140
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.86	0.86	0.79	0.79
Hourly flow rate (vph)	129	65	122	64	57	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	445	154			186	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	445	154			186	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	93			96	
cM capacity (veh/h)	549	887			1401	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	194	186	234
Volume Left	129	0	57
Volume Right	65	64	0
cSH	629	1700	1401
Volume to Capacity	0.31	0.11	0.04
Queue Length 95th (ft)	33	0	3
Control Delay (s)	13.3	0.0	2.1
Lane LOS	B		A
Approach Delay (s)	13.3	0.0	2.1
Approach LOS	B		

Intersection Summary				
Average Delay			5.0	
Intersection Capacity Utilization			38.2%	ICU Level of Service
Analysis Period (min)			15	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	200	95	15	165	15	35	65	10	10	130	5
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.86	0.86	0.86	0.96	0.96	0.96
Hourly flow rate (vph)	6	233	110	17	188	17	41	76	12	10	135	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	349	222	128	151
Volume Left (vph)	6	17	41	10
Volume Right (vph)	110	17	12	5
Hadj (s)	-0.16	-0.01	0.05	0.01
Departure Headway (s)	4.9	5.2	5.7	5.6
Degree Utilization, x	0.47	0.32	0.20	0.24
Capacity (veh/h)	699	644	558	573
Control Delay (s)	12.2	10.6	10.1	10.3
Approach Delay (s)	12.2	10.6	10.1	10.3
Approach LOS	B	B	B	B

Intersection Summary				
Delay		11.1		
HCM Level of Service		B		
Intersection Capacity Utilization		41.1%	ICU Level of Service	A
Analysis Period (min)		15		

Raynham

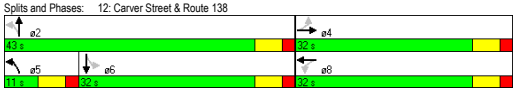
Lanes, Volumes, Timings
12: Carver Street & Route 138

2030 No-Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	25	40	15	45	175	45	1255	5	50	515	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	268	78	0	0	255	0	0	1373	0	0	699	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		16.0	16.0	
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	11.0	43.0	0.0	32.0	32.0	0.0
Total Split (%)	42.7%	42.7%	0.0%	42.7%	42.7%	0.0%	14.7%	57.3%	0.0%	42.7%	42.7%	0.0%
Maximum Green (s)	26.0	26.0		26.0	26.0		5.0	37.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	C-Min		C-Min	C-Min	
v/c Ratio	0.91	0.15			0.49			0.82			0.57	
Control Delay	61.3	9.3			21.6			21.0			14.3	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	61.3	9.3			21.6			21.0			14.3	
Queue Length 50th (ft)	114	10			81			274			109	
Queue Length 95th (ft)	#207	32			140			#448			166	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	345	623			613			1669			1231	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.78	0.13			0.42			0.82			0.57	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 12: Carver Street & Route 138



HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	25	40	15	45	175	45	1255	5	50	515	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frt	1.00	0.91			0.90			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1787	1708			1743			3380			3208	
Flt Permitted	0.53	1.00			0.98			0.90			0.70	
Satd. Flow (perm)	995	1708			1716			3057			2242	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	268	30	48	16	49	190	47	1321	5	57	585	57
RTOR Reduction (vph)	0	34	0	0	20	0	0	0	0	0	6	0
Lane Group Flow (vph)	268	44	0	0	235	0	0	1373	0	0	693	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	22.0			22.0			41.0			41.0	
Effective Green, g (s)	22.0	22.0			22.0			41.0			41.0	
Actuated g/C Ratio	0.29	0.29			0.29			0.55			0.55	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	292	501			503			1671			1226	
v/s Ratio Prot		0.03										
v/s Ratio Perm	c0.27				0.14			c0.45			0.31	
v/c Ratio	0.92	0.09			0.47			0.82			0.57	
Uniform Delay, d1	25.6	19.2			21.7			14.0			11.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	31.3	0.0			0.2			3.2			1.9	
Delay (s)	56.9	19.3			21.9			17.2			13.0	
Level of Service	E	B			C			B			B	
Approach Delay (s)		48.4			21.9			17.2			13.0	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

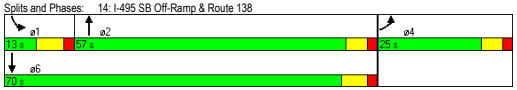
Lanes, Volumes, Timings
14: I-495 SB Off-Ramp & Route 138

2030 No-Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	255	0	175	0	0	0	0	1440	230	65	435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	14	16	16	16	12	12	16	10	12	12
Storage Length (ft)	0		500	0		0	0		0	200		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1388			1423			507			722	
Travel Time (s)		31.5			32.3			11.5			16.4	
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.25	0.96	0.96	0.79	0.79	0.25
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	3%	3%	8%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	331	0	227	0	0	0	0	1740	0	82	551	0
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Detector Phase	4							2		1	6	
Switch Phase												
Minimum Initial (s)	10.0							10.0		5.0	10.0	
Minimum Split (s)	22.0							22.0		12.0	23.0	
Total Split (s)	25.0	0.0	0.0	0.0	0.0	0.0	0.0	57.0	0.0	13.0	70.0	0.0
Total Split (%)	26.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.0%	0.0%	13.7%	73.7%	0.0%
Maximum Green (s)	19.0							51.0		6.0	63.0	
Yellow Time (s)	4.0							4.0		5.0	5.0	
All-Red Time (s)	2.0							2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	4.0	4.0	4.0	4.0	4.0	6.0	4.0	7.0	7.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Recall Mode	None							C-Max		None	C-Max	
v/c Ratio	0.93		0.14					0.94		0.80	0.25	
Control Delay	71.6		0.2					33.0		99.6	1.2	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	71.6		0.2					33.0		99.6	1.2	
Queue Length 50th (ft)	197		0					490		48	3	
Queue Length 95th (ft)	#275		0					#682		m#102	4	
Internal Link Dist (ft)		1308			1343			427			642	
Turn Bay Length (ft)			500							200		
Base Capacity (vph)	360		1610					1842		102	2223	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	0.92		0.14					0.94		0.80	0.25	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 14: I-495 SB Off-Ramp & Route 138



HCM Signalized Intersection Capacity Analysis
14: I-495 SB Off-Ramp & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	255	0	175	0	0	0	0	1440	230	65	435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	16	14	16	16	16	12	12	16	10	12	12
Total Lost time (s)	6.0		4.0					6.0		7.0	7.0	
Lane Util. Factor	1.00		1.00					0.95		1.00	0.95	
Frt	1.00		0.85					0.98		1.00	1.00	
Flt Protected	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1799		1610					3432		1560	3343	
Flt Permitted	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1799		1610					3432		1560	3343	
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.25	0.96	0.96	0.79	0.79	0.25
Adj. Flow (vph)	331	0	227	0	0	0	0	1500	240	82	551	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	331	0	227	0	0	0	0	1740	0	82	551	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	3%	3%	8%	8%	0%
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Actuated Green, G (s)	18.8		95.0					51.0		6.2	63.2	
Effective Green, g (s)	18.8		95.0					51.0		6.2	63.2	
Actuated g/C Ratio	0.20		1.00					0.54		0.07	0.67	
Clearance Time (s)	6.0							6.0		7.0	7.0	
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Lane Grp Cap (vph)	356		1610					1842		102	2224	
v/s Ratio Prot	c0.18							c0.51		c0.05	0.16	
v/s Ratio Perm			0.14									
v/c Ratio	0.93		0.14					0.94		0.80	0.25	
Uniform Delay, d1	37.5		0.0					20.7		43.8	6.4	
Progression Factor	1.00		1.00					1.00		1.29	0.15	
Incremental Delay, d2	30.0		0.2					11.4		31.1	0.2	
Delay (s)	67.4		0.2					32.1		87.6	1.2	
Level of Service	E		A					C		F	A	
Approach Delay (s)		40.1			0.0			32.1			12.4	
Approach LOS		D			A			C			B	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

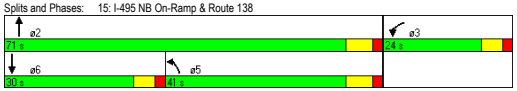
Lanes, Volumes, Timings
15: I-495 NB On-Ramp & Route 138

2030 No-Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	110	0	180	335	1345	0	0	375	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	10	12	12	12	12	16
Storage Length (ft)	0		0	0		300	225		0	0		0
Storage Lanes	0		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1299			722			1195	
Travel Time (s)		31.5			29.5			16.4			27.2	
Peak Hour Factor	0.25	0.25	0.25	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	3%	3%	0%	0%	9%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	121	0	198	368	1478	0	0	800	0
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Detector Phase				3			5	2			6	
Switch Phase												
Minimum Initial (s)				5.0			5.0	10.0			10.0	
Minimum Split (s)				22.0			12.0	23.0			22.0	
Total Split (s)	0.0	0.0	0.0	24.0	0.0	0.0	41.0	71.0	0.0	0.0	30.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	25.3%	0.0%	0.0%	43.2%	74.7%	0.0%	0.0%	31.6%	0.0%
Maximum Green (s)				18.0			34.0	64.0			24.0	
Yellow Time (s)				4.0			5.0	5.0			4.0	
All-Red Time (s)				2.0			2.0	2.0			2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.0	4.0	4.0	7.0	7.0	4.0	4.0	6.0	4.0
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Recall Mode				None			None	C-Min			C-Min	
v/c Ratio				0.53		0.11	0.81	0.56			0.64	
Control Delay				47.1		0.1	28.3	4.9			34.8	
Queue Delay				0.0		0.0	0.0	0.0			0.0	
Total Delay				47.1		0.1	28.3	4.9			34.8	
Queue Length 50th (ft)				70		0	169	141			244	
Queue Length 95th (ft)				120		0	m147	m146			288	
Internal Link Dist (ft)		1304			1219			642			1115	
Turn Bay Length (ft)						300	225					
Base Capacity (vph)				373		1760	586	2616			1257	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.32		0.11	0.63	0.56			0.64	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 93 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 15: I-495 NB On-Ramp & Route 138



HCM Signalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	110	0	180	335	1345	0	0	375	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	12	12	16
Total Lost time (s)				6.0		4.0	7.0	7.0			6.0	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.94	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1967		1760	1636	3505			3106	
Flt Permitted				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1967		1760	1636	3505			3106	
Peak-hour factor, PHF	0.25	0.25	0.25	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.80	0.80
Adj. Flow (vph)	0	0	0	121	0	198	368	1478	0	0	469	331
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	121	0	198	368	1478	0	0	800	0
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	3%	3%	0%	0%	9%	9%
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Actuated Green, G (s)				11.1		95.0	26.5	70.9			38.4	
Effective Green, g (s)				11.1		95.0	26.5	70.9			38.4	
Actuated g/C Ratio				0.12		1.00	0.28	0.75			0.40	
Clearance Time (s)				6.0			7.0	7.0			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				230		1760	456	2616			1255	
v/s Ratio Prot				c0.06			c0.22	0.42			c0.26	
v/s Ratio Perm						0.11						
v/c Ratio				0.53		0.11	0.81	0.56			0.64	
Uniform Delay, d1				39.5		0.0	31.9	5.3			22.7	
Progression Factor				1.00		1.00	0.73	0.79			1.30	
Incremental Delay, d2				2.2		0.1	3.8	0.3			2.1	
Delay (s)				41.6		0.1	27.1	4.5			31.7	
Level of Service				D		A	C	A			C	
Approach Delay (s)		0.0			15.9			9.0			31.7	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

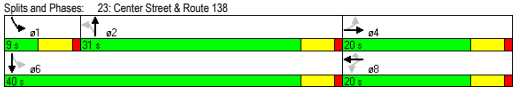
Lanes, Volumes, Timings
23: Center Street & Route 138

2030 No-Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	140	0	1160	40	90	475	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	14	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		60	0		200	200		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		129			915			1524			2001	
Travel Time (s)		2.9			20.8			34.6			45.5	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.93	0.93	0.86	0.86	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	4%	4%	8%	8%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	22	156	0	1290	0	0	657	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0	20.0	20.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	20.0	31.0	31.0	0.0	9.0	40.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	33.3%	51.7%	51.7%	0.0%	15.0%	66.7%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0	15.0	26.0	26.0		4.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
v/c Ratio					0.08	0.53		0.54			0.43	
Control Delay					18.6	26.9		7.2			6.8	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay					18.6	26.9		7.2			6.8	
Queue Length 50th (ft)					6	47		111			50	
Queue Length 95th (ft)					21	94		201			95	
Internal Link Dist (ft)		49			835			1444			1921	
Turn Bay Length (ft)						60						
Base Capacity (vph)					371	417		2395			1516	
Starvation Cap Reductn					0	0		0			0	
Spillback Cap Reductn					0	0		0			0	
Storage Cap Reductn					0	0		0			0	
Reduced v/c Ratio					0.06	0.37		0.54			0.43	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 56.5	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	

Splits and Phases: 23: Center Street & Route 138



HCM Signalized Intersection Capacity Analysis
23: Center Street & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	140	0	1160	40	90	475	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	14	12	12	12	12	12	12	12	12
Total Lost time (s)					5.0	5.0		5.0			5.0	
Lane Util. Factor					1.00	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.95	1.00		1.00			0.99	
Satd. Flow (prot)					1752	1568		3454			3316	
Flt Permitted					0.76	1.00		1.00			0.65	
Satd. Flow (perm)					1397	1568		3454			2185	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.93	0.93	0.86	0.86	0.92
Adj. Flow (vph)	0	0	0	22	0	156	0	1247	43	105	552	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	156	0	1290	0	0	657	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	4%	4%	8%	8%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)					9.3	9.3		38.1			38.1	
Effective Green, g (s)					9.3	9.3		38.1			38.1	
Actuated g/C Ratio					0.16	0.16		0.66			0.66	
Clearance Time (s)					5.0	5.0		5.0			5.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					226	254		2293			1450	
v/s Ratio Prot								c0.37				
v/s Ratio Perm					0.02	c0.10					0.30	
v/c Ratio					0.10	0.61		0.56			0.45	
Uniform Delay, d1					20.5	22.4		5.2			4.6	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.2	4.4		1.0			0.2	
Delay (s)					20.7	26.7		6.2			4.9	
Level of Service					C	C		A			A	
Approach Delay (s)		0.0			26.0			6.2			4.9	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
36: Elm Street & Route 138

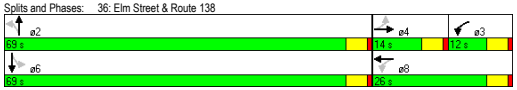
2030 No-Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	25	225	5	60	5	1140	205	40	340	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	326	94	0	0	1436	0	0	494	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		35.0	35.0		35.0	35.0	
Total Split (s)	14.0	14.0	0.0	12.0	26.0	0.0	69.0	69.0	0.0	69.0	69.0	0.0
Total Split (%)	14.7%	14.7%	0.0%	12.6%	27.4%	0.0%	72.6%	72.6%	0.0%	72.6%	72.6%	0.0%
Maximum Green (s)	9.0	9.0		7.0	21.0		64.0	64.0		64.0	64.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
v/c Ratio		0.66		0.83	0.22			0.72			0.36	
Control Delay		62.1		54.6	30.2			8.2			9.4	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		62.1		54.6	30.2			8.2			9.4	
Queue Length 50th (ft)		58		178	44			181			68	
Queue Length 95th (ft)		#125		#254	68			161			73	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		160		395	429			2201			1504	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.64		0.83	0.22			0.65			0.33	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 28 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 36: Elm Street & Route 138



HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	25	225	5	60	5	1140	205	40	340	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.96		1.00	0.86			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1798		1686	1529			3424			3150	
Flt Permitted		0.80		0.67	1.00			0.95			0.70	
Satd. Flow (perm)		1478		1194	1529			3266			2231	
Peak-hour factor, PHF	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	48	24	30	326	7	87	5	1213	218	49	415	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	102	0	326	94	0	0	1436	0	0	494	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.0		26.6	26.6			58.4			58.4	
Effective Green, g (s)		10.0		26.6	26.6			58.4			58.4	
Actuated g/C Ratio		0.11		0.28	0.28			0.61			0.61	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		156		394	428			2008			1371	
v/s Ratio Prot				c0.10	0.06							
v/s Ratio Perm		0.07		c0.13				c0.44			0.22	
v/c Ratio		0.65		0.83	0.22			0.72			0.36	
Uniform Delay, d1		40.8		33.0	26.2			12.6			9.1	
Progression Factor		1.00		1.00	1.00			0.51			1.00	
Incremental Delay, d2		9.5		13.3	0.3			1.9			0.7	
Delay (s)		50.3		46.3	26.5			8.3			9.8	
Level of Service		D		D	C			A			A	
Approach Delay (s)		50.3			41.9			8.3			9.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

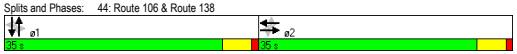
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	365	25	180	355	165	60	755	375	85	170	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4525			923	
Travel Time (s)		39.6			50.8			102.8			21.0	
Confl. Peds. (#/hr)			3									
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	545	0	0	786	0	0	1294	0	0	392	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.58			0.85			0.92			0.48	
Control Delay		17.9			26.6			29.5			12.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.9			26.6			29.5			12.0	
Queue Length 50th (ft)		87			137			246			41	
Queue Length 95th (ft)		129			#238			#397			78	
Internal Link Dist (ft)		1662			2156			4445			843	
Turn Bay Length (ft)												
Base Capacity (vph)		1000			981			1406			816	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.80			0.92			0.48	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 68.5
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 44: Route 106 & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	365	25	180	355	165	60	755	375	85	170	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.95			0.95	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		3441			3154			3331			3098	
Flt Permitted		0.65			0.67			0.91			0.55	
Satd. Flow (perm)		2266			2141			3030			1709	
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	102	415	28	202	399	185	65	821	408	91	183	118
RTOR Reduction (vph)	0	6	0	0	43	0	0	76	0	0	66	0
Lane Group Flow (vph)	0	539	0	0	743	0	0	1218	0	0	326	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		28.4			28.4			30.1			30.1	
Effective Green, g (s)		28.4			28.4			30.1			30.1	
Actuated g/C Ratio		0.41			0.41			0.44			0.44	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		939			888			1331			751	
v/s Ratio Prot												
v/s Ratio Perm		0.24			c0.35			c0.40			0.19	
v/c Ratio		0.57			0.84			0.92			0.43	
Uniform Delay, d1		15.4			18.0			18.0			13.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			7.2			10.1			0.5	
Delay (s)		16.4			25.2			28.1			13.8	
Level of Service		B			C			C			B	
Approach Delay (s)		16.4			25.2			28.1			13.8	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
10: Dog Track driveway & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	25	45	1245	360	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	7	37	49	1368	456	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1923	456	456			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1923	456	456			
tC, single (s)	7.2	6.7	4.2			
tC, 2 stage (s)						
tF (s)	4.2	3.8	2.3			
p0 queue free %	84	93	95			
cM capacity (veh/h)	45	516	1059			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	44	1418	456
Volume Left	7	49	0
Volume Right	37	0	0
cSH	188	1059	1700
Volume to Capacity	0.23	0.05	0.27
Queue Length 95th (ft)	22	4	0
Control Delay (s)	29.9	2.3	0.0
Lane LOS	D	A	
Approach Delay (s)	29.9	2.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay		2.4	
Intersection Capacity Utilization		100.3%	ICU Level of Service G
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	25	1175	20	5	485
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	53	44	1335	23	5	505
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1862	1347			1358	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1862	1347			1358	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	35	77			99	
cM capacity (veh/h)	80	187			491	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	96	1358	510
Volume Left	53	0	5
Volume Right	44	23	0
cSH	108	1700	491
Volume to Capacity	0.89	0.80	0.01
Queue Length 95th (ft)	133	0	1
Control Delay (s)	131.2	0.0	0.3
Lane LOS	F		A
Approach Delay (s)	131.2	0.0	0.3
Approach LOS	F		

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		73.1%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2030 No-Build Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	5	5	1160	495	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	0.89	0.89
Hourly flow rate (vph)	30	5	5	1160	556	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1729	559	562			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1729	559	562			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	99	99			
cM capacity (veh/h)	97	529	1000			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	1165	562
Volume Left	30	5	0
Volume Right	5	0	6
cSH	109	1000	1700
Volume to Capacity	0.32	0.01	0.33
Queue Length 95th (ft)	31	0	0
Control Delay (s)	52.7	0.2	0.0
Lane LOS	F	A	
Approach Delay (s)	52.7	0.2	0.0
Approach LOS	F		

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		75.0%	ICU Level of Service	D
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
50: Wilbur Street & Route 138

2030 No-Build Condition- AM Peak Hour

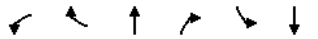
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	1260	5	0	380
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.94	0.94	0.85	0.85
Hourly flow rate (vph)	8	8	1340	5	0	447
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1790	1343			1346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1790	1343			1346	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	91	96			100	
cM capacity (veh/h)	90	188			481	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	1346	447
Volume Left	8	0	0
Volume Right	8	5	0
cSH	122	1700	481
Volume to Capacity	0.13	0.79	0.00
Queue Length 95th (ft)	11	0	0
Control Delay (s)	39.0	0.0	0.0
Lane LOS	E		
Approach Delay (s)	39.0	0.0	0.0
Approach LOS	E		

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		76.6%	ICU Level of Service	D
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
52: Robinson Street & Route 138

2030 No-Build Condition- AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	1265	0	5	385
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	0	36	1390	0	6	487
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1890	1390			1390	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1890	1390			1390	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	80			99	
cM capacity (veh/h)	77	176			499	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	1390	494
Volume Left	0	0	6
Volume Right	36	0	0
cSH	176	1700	499
Volume to Capacity	0.20	0.82	0.01
Queue Length 95th (ft)	18	0	1
Control Delay (s)	30.6	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	30.6	0.0	0.4
Approach LOS	D		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Carver Street & Route 138

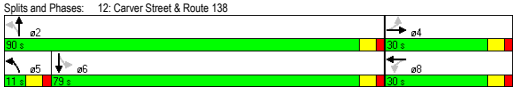
2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	85	100	60	70	40	70	775	45	110	1395	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Confl. Peds. (#/hr)						5	2					
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	201	0	0	216	0	0	1012	0	0	1759	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		16.0	16.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	11.0	90.0	0.0	79.0	79.0	0.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	9.2%	75.0%	0.0%	65.8%	65.8%	0.0%
Maximum Green (s)	24.0	24.0		24.0	24.0		5.0	84.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	C-Min		C-Min	C-Min	
v/c Ratio	0.91	0.54			0.97			0.74			1.03	
Control Delay	95.4	39.5			99.7			15.2			47.8	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	95.4	39.5			99.7			15.2			47.8	
Queue Length 50th (ft)	128	109			158			231			~769	
Queue Length 95th (ft)	#262	188			#252			304			#911	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	189	381			228			1363			1712	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.89	0.53			0.95			0.74			1.03	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Carver Street & Route 138



HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	85	100	60	70	40	70	775	45	110	1395	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.92			0.97			0.99			0.98	
Flt Protected	0.95	1.00			0.98			1.00			1.00	
Satd. Flow (prot)	1787	1728			1823			3317			3345	
Flt Permitted	0.50	1.00			0.59			0.58			0.72	
Satd. Flow (perm)	945	1728			1095			1928			2415	
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Adj. Flow (vph)	168	92	109	76	89	51	80	881	51	112	1423	224
RTOR Reduction (vph)	0	35	0	0	10	0	0	3	0	0	7	0
Lane Group Flow (vph)	168	166	0	0	206	0	0	1009	0	0	1752	0
Confl. Peds. (#/hr)						5	2					
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.3	23.3			23.3			84.7			84.7	
Effective Green, g (s)	23.3	23.3			23.3			84.7			84.7	
Actuated g/C Ratio	0.19	0.19			0.19			0.71			0.71	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	183	336			213			1361			1705	
v/s Ratio Prot		0.10										
v/s Ratio Perm	0.18				c0.19			0.52			c0.73	
v/c Ratio	0.92	0.49			0.97			0.74			1.03	
Uniform Delay, d1	47.4	43.1			48.0			10.9			17.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	42.8	0.4			51.8			1.9			29.1	
Delay (s)	90.2	43.5			99.8			12.8			46.8	
Level of Service	F	D			F			B			D	
Approach Delay (s)		64.7			99.8			12.8			46.8	
Approach LOS		E			F			B			D	

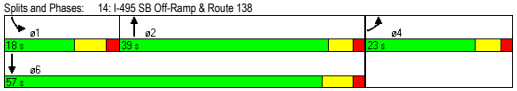
Intersection Summary			
HCM Average Control Delay	41.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	0	515	0	0	0	0	850	140	105	1230	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	12	12	16	10	12	12
Storage Length (ft)	0		500	0		0	0		0	300		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1388			1423			507			722	
Travel Time (s)		31.5			32.3			11.5			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.25	0.25	0.25	0.25	0.95	0.95	0.98	0.98	0.25
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	0%	3%	3%	2%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	0	636	0	0	0	0	1042	0	107	1255	0
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Detector Phase	4							2		1	6	
Switch Phase												
Minimum Initial (s)	10.0							10.0		5.0	10.0	
Minimum Split (s)	22.0							22.0		12.0	23.0	
Total Split (s)	23.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	18.0	57.0	0.0
Total Split (%)	28.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.8%	0.0%	22.5%	71.3%	0.0%
Maximum Green (s)	17.0							33.0		11.0	50.0	
Yellow Time (s)	4.0							4.0		5.0	5.0	
All-Red Time (s)	2.0							2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	4.0	4.0	4.0	4.0	4.0	6.0	4.0	7.0	7.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Recall Mode	None							C-Min		None	C-Min	
v/c Ratio	0.74		0.36					0.62		0.55	0.54	
Control Delay	43.3		0.6					19.0		40.2	11.9	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	43.3		0.6					19.0		40.2	11.9	
Queue Length 50th (ft)	127		0					216		59	174	
Queue Length 95th (ft)	179		0					298		m73	m204	
Internal Link Dist (ft)		1308			1343			427			642	
Turn Bay Length (ft)			500							300		
Base Capacity (vph)	418		1760					1683		227	2304	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	0.65		0.36					0.62		0.47	0.54	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 14: I-495 SB Off-Ramp & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	0	515	0	0	0	0	850	140	105	1230	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	12	12	16	10	12	12
Total Lost time (s)	6.0		4.0					6.0		7.0	7.0	
Lane Util. Factor	1.00		1.00					0.95		1.00	0.95	
Frt	1.00		0.85					0.98		1.00	1.00	
Flt Protected	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1967		1760					3431		1652	3539	
Flt Permitted	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1967		1760					3431		1652	3539	
Peak-hour factor, PHF	0.81	0.81	0.81	0.25	0.25	0.25	0.25	0.95	0.95	0.98	0.98	0.25
Adj. Flow (vph)	272	0	636	0	0	0	0	895	147	107	1255	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	272	0	636	0	0	0	0	1042	0	107	1255	0
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	0%	3%	3%	2%	2%	0%
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Actuated Green, G (s)	14.9		80.0					37.9		8.2	52.1	
Effective Green, g (s)	14.9		80.0					37.9		8.2	52.1	
Actuated g/C Ratio	0.19		1.00					0.47		0.10	0.65	
Clearance Time (s)	6.0							6.0		7.0	7.0	
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Lane Grp Cap (vph)	366		1760					1625		169	2305	
v/s Ratio Prot	c0.14							c0.30		0.06	c0.35	
v/s Ratio Perm			0.36									
v/c Ratio	0.74		0.36					0.64		0.63	0.54	
Uniform Delay, d1	30.7		0.0					15.9		34.5	7.5	
Progression Factor	1.00		1.00					1.00		1.04	1.42	
Incremental Delay, d2	7.9		0.6					2.0		4.2	0.5	
Delay (s)	38.7		0.6					17.9		39.9	11.2	
Level of Service	D		A					B		D	B	
Approach Delay (s)		12.0			0.0			17.9			13.4	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

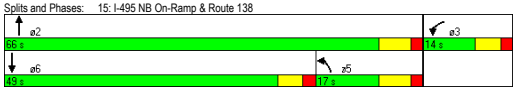
Lanes, Volumes, Timings
15: I-495 NB On-Ramp & Route 138

2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	140	0	80	145	900	0	0	1195	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	10	12	12	12	12	16
Storage Length (ft)	0		0	0		300	225		0	0		0
Storage Lanes	0		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1299			722			1195	
Travel Time (s)		31.5			29.5			16.4			27.2	
Peak Hour Factor	0.25	0.25	0.25	0.78	0.78	0.78	0.92	0.92	0.25	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	0%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	179	0	103	158	978	0	0	1505	0
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Detector Phase				3			5	2			6	
Switch Phase												
Minimum Initial (s)				5.0			5.0	10.0			10.0	
Minimum Split (s)				11.0			12.0	23.0			22.0	
Total Split (s)	0.0	0.0	0.0	14.0	0.0	0.0	17.0	66.0	0.0	0.0	49.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	17.5%	0.0%	0.0%	21.3%	82.5%	0.0%	0.0%	61.3%	0.0%
Maximum Green (s)				8.0			10.0	59.0			43.0	
Yellow Time (s)				4.0			5.0	5.0			4.0	
All-Red Time (s)				2.0			2.0	2.0			2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.0	4.0	4.0	7.0	7.0	4.0	4.0	6.0	4.0
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Recall Mode				None			None	C-Min			C-Min	
v/c Ratio				0.85		0.06	0.76	0.39			0.83	
Control Delay				71.6		0.1	50.4	3.4			20.6	
Queue Delay				0.0		0.0	0.0	0.0			0.0	
Total Delay				71.6		0.1	50.4	3.4			20.6	
Queue Length 50th (ft)				90		0	82	46			357	
Queue Length 95th (ft)				#164		0	m#169	81			481	
Internal Link Dist (ft)		1304			1219			642			1115	
Turn Bay Length (ft)						300	225					
Base Capacity (vph)				210		1777	211	2560			1853	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.85		0.06	0.75	0.38			0.81	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 15: I-495 NB On-Ramp & Route 138



HCM Signalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	140	0	80	145	900	0	0	1195	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	12	12	16
Total Lost time (s)				6.0		4.0	7.0	7.0			6.0	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.97	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1986		1777	1620	3471			3448	
Flt Permitted				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1986		1777	1620	3471			3448	
Peak-hour factor, PHF	0.25	0.25	0.25	0.78	0.78	0.78	0.92	0.92	0.25	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	179	0	103	158	978	0	0	1245	260
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	179	0	103	158	978	0	0	1505	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	0%	2%	2%	2%
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Actuated Green, G (s)				8.5		80.0	10.2	58.5			42.3	
Effective Green, g (s)				8.5		80.0	10.2	58.5			42.3	
Actuated g/C Ratio				0.11		1.00	0.13	0.73			0.53	
Clearance Time (s)				6.0			7.0	7.0			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				211		1777	207	2538			1823	
v/s Ratio Prot				c0.09			c0.10	0.28			c0.44	
v/s Ratio Perm						0.06						
v/c Ratio				0.85		0.06	0.76	0.39			0.83	
Uniform Delay, d1				35.1		0.0	33.7	4.0			15.8	
Progression Factor				1.00		1.00	0.86	0.77			1.07	
Incremental Delay, d2				25.8		0.1	12.2	0.3			3.4	
Delay (s)				60.9		0.1	41.3	3.4			20.3	
Level of Service				E		A	D	A			C	
Approach Delay (s)		0.0			38.7			8.7			20.3	
Approach LOS		A			D			A			C	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
23: Center Street & Route 138

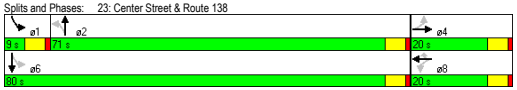
2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	0	110	0	795	40	315	1280	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	14	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		60	0		200	200		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		155			915			1524			2001	
Travel Time (s)		3.5			20.8			34.6			45.5	
Peak Hour Factor	0.38	0.38	0.38	0.82	0.82	0.82	0.90	0.90	0.90	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	37	134	0	927	0	0	1627	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0	20.0	20.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	20.0	71.0	71.0	0.0	9.0	80.0	0.0
Total Split (%)	20.0%	20.0%	0.0%	20.0%	20.0%	20.0%	71.0%	71.0%	0.0%	9.0%	80.0%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0	15.0	66.0	66.0		4.0	75.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
v/c Ratio					0.21	0.69		0.35			0.99	
Control Delay					40.8	58.9		4.2			32.5	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay					40.8	58.9		4.2			32.5	
Queue Length 50th (ft)					21	81		83			~446	
Queue Length 95th (ft)					47	129		112			#715	
Internal Link Dist (ft)		75			835			1444			1921	
Turn Bay Length (ft)						60						
Base Capacity (vph)					207	232		2673			1648	
Starvation Cap Reductn					0	0		0			0	
Spillback Cap Reductn					0	0		0			0	
Storage Cap Reductn					0	0		0			0	
Reduced v/c Ratio					0.18	0.58		0.35			0.99	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 97.7	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: Center Street & Route 138



HCM Signalized Intersection Capacity Analysis
23: Center Street & Route 138

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	0	110	0	795	40	315	1280	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	14	12	12	12	12	12	12	12	12
Total Lost time (s)					5.0	5.0		5.0			5.0	
Lane Util. Factor					1.00	1.00		0.95			0.95	
Frt					1.00	0.85		0.99			1.00	
Flt Protected					0.95	1.00		1.00			0.99	
Satd. Flow (prot)					1687	1509		3480			3505	
Flt Permitted					0.76	1.00		1.00			0.61	
Satd. Flow (perm)					1345	1509		3480			2144	
Peak-hour factor, PHF	0.38	0.38	0.38	0.82	0.82	0.82	0.90	0.90	0.90	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	37	0	134	0	883	44	321	1306	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	37	134	0	927	0	0	1627	0
Heavy Vehicles (%)	0%	0%	0%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)					12.7	12.7		75.1			75.1	
Effective Green, g (s)					12.7	12.7		75.1			75.1	
Actuated g/C Ratio					0.13	0.13		0.77			0.77	
Clearance Time (s)					5.0	5.0		5.0			5.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					175	196		2672			1646	
v/s Ratio Prot								0.27				
v/s Ratio Perm					0.03	c0.09					c0.76	
v/c Ratio					0.21	0.68		0.35			0.99	
Uniform Delay, d1					38.1	40.6		3.6			10.9	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.6	9.5		0.4			19.3	
Delay (s)					38.7	50.1		3.9			30.2	
Level of Service					D	D		A			C	
Approach Delay (s)		0.0			47.6			3.9			30.2	
Approach LOS		A			D			A			C	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

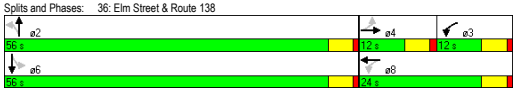
Lanes, Volumes, Timings
36: Elm Street & Route 138

2030 No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	25	30	600	325	45	1045	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	79	0	398	45	0	0	1049	0	0	1163	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		35.0	35.0		35.0	35.0	
Total Split (s)	12.0	12.0	0.0	12.0	24.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0
Total Split (%)	15.0%	15.0%	0.0%	15.0%	30.0%	0.0%	70.0%	70.0%	0.0%	70.0%	70.0%	0.0%
Maximum Green (s)	7.0	7.0		7.0	19.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
v/c Ratio		0.48		0.80	0.09			0.65			0.68	
Control Delay		43.8		42.2	22.1			8.7			14.3	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		43.8		42.2	22.1			8.7			14.3	
Queue Length 50th (ft)		37		172	16			72			204	
Queue Length 95th (ft)		67		#376	42			92			218	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		171		500	525			1837			1941	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.46		0.80	0.09			0.57			0.60	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 36 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 36: Elm Street & Route 138



HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	25	30	600	325	45	1045	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.91		1.00	0.91			0.95			1.00	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1703		1770	1689			3257			3525	
Flt Permitted		0.93		0.76	1.00			0.88			0.86	
Satd. Flow (perm)		1600		1417	1689			2882			3046	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	13	13	53	398	17	28	33	659	357	47	1100	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	79	0	398	45	0	0	1049	0	0	1163	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.1		25.8	25.8			44.2			44.2	
Effective Green, g (s)		7.1		25.8	25.8			44.2			44.2	
Actuated g/C Ratio		0.09		0.32	0.32			0.55			0.55	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		142		517	545			1592			1683	
v/s Ratio Prot				c0.13	0.03							
v/s Ratio Perm		0.05		c0.12				0.36			c0.38	
v/c Ratio		0.56		0.77	0.08			0.66			0.69	
Uniform Delay, d1		34.9		24.3	18.9			12.6			13.0	
Progression Factor		1.00		1.00	1.00			0.58			1.00	
Incremental Delay, d2		4.7		6.8	0.1			2.1			2.4	
Delay (s)		39.6		31.1	18.9			9.4			15.3	
Level of Service		D		C	B			A			B	
Approach Delay (s)		39.6			29.9			9.4			15.3	
Approach LOS		D			C			A			B	

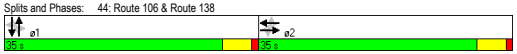
Intersection Summary					
HCM Average Control Delay	16.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	96.8%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	260	50	420	405	120	70	325	225	145	640	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4525			923	
Travel Time (s)		39.6			50.8			102.8			21.0	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	493	0	0	1006	0	0	669	0	0	963	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.56			1.23dl			0.64			0.96	
Control Delay		17.0			77.6			15.2			40.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.0			77.6			15.2			40.9	
Queue Length 50th (ft)		75			~258			85			198	
Queue Length 95th (ft)		98			#376			138			#333	
Internal Link Dist (ft)		1662			2156			4445			843	
Turn Bay Length (ft)												
Base Capacity (vph)		887			927			1040			1005	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.56			1.09			0.64			0.96	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 44: Route 106 & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	260	50	420	405	120	70	325	225	145	640	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.95			0.98	
Flt Protected		0.99			0.98			0.99			0.99	
Satd. Flow (prot)		3436			3299			3245			3402	
Flt Permitted		0.59			0.63			0.68			0.67	
Satd. Flow (perm)		2032			2124			2214			2303	
Peak-hour factor, PHF	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Adj. Flow (vph)	101	329	63	447	431	128	79	365	225	154	681	128
RTOR Reduction (vph)	0	17	0	0	17	0	0	91	0	0	17	0
Lane Group Flow (vph)	0	476	0	0	989	0	0	578	0	0	946	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		30.0			30.0			30.0			30.0	
Effective Green, g (s)		30.0			30.0			30.0			30.0	
Actuated g/C Ratio		0.43			0.43			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		871			910			949			987	
v/s Ratio Prot												
v/s Ratio Perm		0.23			c0.47			0.26			c0.41	
v/c Ratio		0.55			1.23dl			0.61			0.96	
Uniform Delay, d1		14.9			20.0			15.5			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			56.4			1.3			19.2	
Delay (s)		15.8			76.4			16.8			38.6	
Level of Service		B			E			B			D	
Approach Delay (s)		15.8			76.4			16.8			38.6	
Approach LOS		B			E			B			D	

Intersection Summary

HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
13: Dog Track driveway & Route 138

2030 No-Build Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	65	30	605	1085	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	7	96	33	672	1192	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1931	1192	1192			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1931	1192	1192			
tC, single (s)	6.7	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.8	3.3	2.3			
p0 queue free %	87	58	94			
cM capacity (veh/h)	57	230	572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	103	706	1192
Volume Left	7	33	0
Volume Right	96	0	0
cSH	189	572	1700
Volume to Capacity	0.55	0.06	0.70
Queue Length 95th (ft)	71	5	0
Control Delay (s)	44.8	1.6	0.0
Lane LOS	E	A	
Approach Delay (s)	44.8	1.6	0.0
Approach LOS	E		

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		68.1%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2030 No-Build Condition - PM Peak Hour

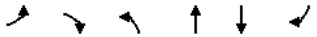
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	20	825	30	25	1300
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.85	0.85	0.97	0.97
Hourly flow rate (vph)	47	27	971	35	26	1340
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2380	988			1006	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2380	988			1006	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	91			96	
cM capacity (veh/h)	36	300			689	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	1006	1366
Volume Left	47	0	26
Volume Right	27	35	0
cSH	54	1700	689
Volume to Capacity	1.37	0.59	0.04
Queue Length 95th (ft)	166	0	3
Control Delay (s)	375.6	0.0	2.0
Lane LOS	F		A
Approach Delay (s)	375.6	0.0	2.0
Approach LOS	F		

Intersection Summary			
Average Delay		12.4	
Intersection Capacity Utilization		98.5%	ICU Level of Service F
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2030 No-Build Condition - PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	5	5	810	1260	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	18	6	6	920	1312	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2265	1333	1354			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2265	1333	1354			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	97	99			
cM capacity (veh/h)	45	190	505			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	926	1354
Volume Left	18	6	0
Volume Right	6	0	42
cSH	55	505	1700
Volume to Capacity	0.44	0.01	0.80
Queue Length 95th (ft)	41	1	0
Control Delay (s)	113.3	0.4	0.0
Lane LOS	F	A	
Approach Delay (s)	113.3	0.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		78.7%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
50: Wilbur Street & Route 138

2030 No-Build Condition - PM Peak Hour

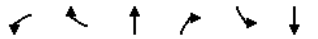
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	615	10	10	1130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.39	0.39	0.97	0.97	0.96	0.96
Hourly flow rate (vph)	13	13	634	10	10	1177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1837	639			644	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1837	639			644	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	97			99	
cM capacity (veh/h)	83	479			941	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	644	1188
Volume Left	13	0	10
Volume Right	13	10	0
cSH	142	1700	941
Volume to Capacity	0.18	0.38	0.01
Queue Length 95th (ft)	16	0	1
Control Delay (s)	35.9	0.0	0.4
Lane LOS	E		A
Approach Delay (s)	35.9	0.0	0.4
Approach LOS	E		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		77.4%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
52: Robinson Street & Route 138

2030 No-Build Condition - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	620	0	10	1140
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	0	24	689	0	11	1253
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1964	689			689	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1964	689			689	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	95			99	
cM capacity (veh/h)	69	436			915	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	689	1264
Volume Left	0	0	11
Volume Right	24	0	0
cSH	436	1700	915
Volume to Capacity	0.05	0.41	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	13.7	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	13.7	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Easton

Lanes, Volumes, Timings
1: Main Street & Route 138

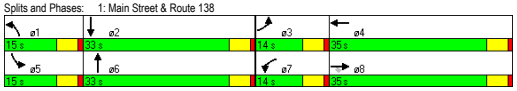
No-Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	365	220	45	140	120	120	735	50	70	330	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	11	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4953			2928	
Travel Time (s)		26.1			62.7			84.4			49.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	416	410	247	51	295	0	130	853	0	80	449	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	23.0		12.0	23.0		12.0	21.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	15.0	33.0	0.0	15.0	33.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	15.5%	34.0%	0.0%	15.5%	34.0%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		10.0	28.0		10.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					7.0			7.0				
Flash Dont Walk (s)					8.0			8.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	2.21	0.72	0.38	0.33	0.38		0.66	0.75		0.44	0.45	
Control Delay	586.8	35.5	5.3	45.7	15.1		56.1	31.7		47.1	25.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	586.8	35.5	5.3	45.7	15.1		56.1	31.7		47.1	25.1	
Queue Length 50th (ft)	~387	212	0	27	36		70	223		43	98	
Queue Length 95th (ft)	#616	330	52	66	67		#169	#374		92	155	
Internal Link Dist (ft)		1645			3138			4873			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	188	699	749	183	1263		223	1189		220	1203	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	2.21	0.59	0.33	0.28	0.23		0.58	0.72		0.36	0.37	

Intersection Summary

Area Type: Other
Cycle Length: 97
Actuated Cycle Length: 81.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Main Street & Route 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Route 138

No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	365	220	45	140	120	120	735	50	70	330	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1818	1553	1586	3064		1736	3298		1719	3310	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1626	1818	1553	1586	3064		1736	3298		1719	3310	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	416	410	247	51	159	136	130	799	54	80	375	74
RTOR Reduction (vph)	0	0	172	0	103	0	0	5	0	0	17	0
Lane Group Flow (vph)	416	410	75	51	192	0	130	848	0	80	432	0
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.4	25.5	25.5	4.3	20.4		9.3	28.1		6.6	25.4	
Effective Green, g (s)	9.4	25.5	25.5	4.3	20.4		9.3	28.1		6.6	25.4	
Actuated g/C Ratio	0.11	0.30	0.30	0.05	0.24		0.11	0.33		0.08	0.30	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	181	549	469	81	740		191	1097		134	995	
v/s Ratio Prot	c0.26	c0.23		0.03	0.06		c0.07	c0.26		0.05	0.13	
v/s Ratio Perm			0.05									
v/c Ratio	2.30	0.75	0.16	0.63	0.26		0.68	0.77		0.60	0.43	
Uniform Delay, d1	37.6	26.6	21.6	39.3	25.9		36.2	25.3		37.7	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	601.4	4.8	0.1	10.5	0.1		7.7	3.7		4.7	0.4	
Delay (s)	638.9	31.4	21.7	49.8	26.0		43.9	29.0		42.4	24.2	
Level of Service	F	C	C	D	C		D	C		D	C	
Approach Delay (s)		264.7			29.5			31.0			26.9	
Approach LOS		F			C			C			C	

Intersection Summary

HCM Average Control Delay	115.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

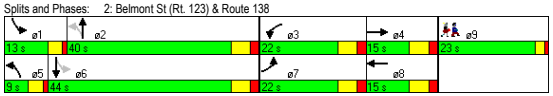
Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

No-Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	20	55	35	250	50	190	85	690	435	195	305	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	13	12	11	12	12	12	11	12	11	12	13	
Storage Length (ft)	0		0	475		0	0		0	200		300	
Storage Lanes	1		0	2		0	1		0	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		45			45			45			45		
Link Distance (ft)		387			2550			980			872		
Travel Time (s)		5.9			38.6			14.8			13.2		
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92	
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	28	125	0	305	293	0	91	1210	0	212	348	0	
Turn Type	Prot			Prot			pm+pt			pm+pt			
Protected Phases	7	4		3	8		5	2		1	6		9
Permitted Phases							2			6			
Detector Phase	7	4		3	8		5	2		1	6		
Switch Phase													
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
Minimum Split (s)	22.0	10.0		22.0	10.0		8.0	10.0		8.0	10.0		23.0
Total Split (s)	22.0	15.0	0.0	22.0	15.0	0.0	9.0	40.0	0.0	13.0	44.0	0.0	23.0
Total Split (%)	19.5%	13.3%	0.0%	19.5%	13.3%	0.0%	8.0%	35.4%	0.0%	11.5%	38.9%	0.0%	20%
Maximum Green (s)	16.0	9.0		16.0	9.0		5.0	34.0		9.0	38.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max		None
Walk Time (s)													6.0
Flash Dont Walk (s)													14.0
Pedestrian Calls (#/hr)													2
v/c Ratio	0.27	0.69		0.72	0.74		0.17	0.91		0.65	0.20		
Control Delay	55.8	61.7		57.1	37.6		14.0	40.9		39.4	21.6		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	55.8	61.7		57.1	37.6		14.0	40.9		39.4	21.6		
Queue Length 50th (ft)	20	74		109	118		23	377		100	66		
Queue Length 95th (ft)	38	#112		141	#240		72	#650		#295	157		
Internal Link Dist (ft)		307			2470			900			792		
Turn Bay Length (ft)				475						200			
Base Capacity (vph)	219	182		465	395		531	1328		324	1735		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.13	0.69		0.66	0.74		0.17	0.91		0.65	0.20		

Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 113	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	55	35	250	50	190	85	690	435	195	305	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	12	12	12	11	12	11	12	13
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.88		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1544	1772		3286	1476		1805	3191		1662	3453	
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00		0.09	1.00	
Satd. Flow (perm)	1544	1772		3286	1476		1032	3191		161	3453	
Peak-hour factor, PHF	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	28	76	49	305	61	232	91	742	468	212	332	16
RTOR Reduction (vph)	0	20	0	0	106	0	0	82	0	0	3	0
Lane Group Flow (vph)	28	105	0	305	187	0	91	1128	0	212	345	0
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.2	12.7		14.6	22.1		45.1	39.5		60.7	51.1	
Effective Green, g (s)	5.2	12.7		14.6	22.1		45.1	39.5		60.7	51.1	
Actuated g/C Ratio	0.05	0.11		0.13	0.20		0.40	0.35		0.54	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	199		425	289		450	1115		315	1561	
v/s Ratio Prot	0.02	0.06		c0.09	c0.13		0.01	c0.35		c0.10	0.10	
v/s Ratio Perm							0.07			0.26		
v/c Ratio	0.39	0.53		0.72	0.65		0.20	1.01		0.67	0.22	
Uniform Delay, d1	52.4	47.3		47.2	41.9		21.5	36.8		27.1	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.49	1.21	
Incremental Delay, d2	3.6	2.7		5.7	4.9		0.2	29.9		5.2	0.3	
Delay (s)	56.0	50.0		52.9	46.8		21.7	66.6		45.4	23.1	
Level of Service	E	D		D	D		C	E		D	C	
Approach Delay (s)		51.1			49.9			63.5			31.6	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM Average Control Delay	52.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

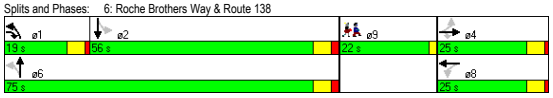
Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138

No-Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	80	0	65	5	0	5	190	990	0	0	350	90	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	10	11	11	12	11	11	
Storage Length (ft)	0		100	0		0	350		0	0		0	
Storage Lanes	0		1	0		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		635			332			1623			2417		
Travel Time (s)		14.4			7.5			36.9			54.9		
Peak Hour Factor	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84	
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	98	79	0	16	0	0	1389	0	0	524	0	
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm			
Protected Phases		4	1		8		1	6			2		9
Permitted Phases	4		4	8			6			2			
Detector Phase	4	4	1	8	8		1	6		2	2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0		7.0
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	21.0		21.0	21.0		22.0
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0	22.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%	18%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0		20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag		
Lead-Lag Optimize?			Yes				Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													2
v/c Ratio		0.58	0.18		0.07			0.78			0.26		
Control Delay		53.8	8.8		28.9			14.8			10.1		
Queue Delay		0.0	0.0		0.0			0.0			0.0		
Total Delay		53.8	8.8		28.9			14.8			10.1		
Queue Length 50th (ft)		50	0		4			136			56		
Queue Length 95th (ft)		115	31		17			#468			148		
Internal Link Dist (ft)		555			252			1543			2337		
Turn Bay Length (ft)			100										
Base Capacity (vph)		308	568		381			1924			2052		
Starvation Cap Reductn		0	0		0			0			0		
Spillback Cap Reductn		0	0		0			0			0		
Storage Cap Reductn		0	0		0			0			0		
Reduced v/c Ratio		0.32	0.14		0.04			0.72			0.26		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 91.1	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Roche Brothers Way & Route 138



HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138

No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	0	65	5	0	5	190	990	0	0	350	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	10	11	11	12	11	11
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.93			1.00			0.97	
Flt Protected		0.95	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1736	1524		1911			3361			3240	
Flt Permitted		0.75	1.00		0.85			0.71			1.00	
Satd. Flow (perm)		1365	1524		1667			2422			3240	
Peak-hour factor, PHF	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	98	0	79	8	0	8	224	1165	0	0	417	107
RTOR Reduction (vph)	0	0	65	0	7	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	98	14	0	9	0	0	1389	0	0	511	0
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		11.3	16.1		11.3			66.2			56.4	
Effective Green, g (s)		11.3	16.1		11.3			66.2			56.4	
Actuated g/C Ratio		0.12	0.17		0.12			0.71			0.60	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)		165	344		201			1763			1954	
v/s Ratio Prot			0.00					c0.04			0.16	
v/s Ratio Perm		c0.07	0.01		0.01			c0.52				
v/c Ratio		0.59	0.04		0.04			0.79			0.26	
Uniform Delay, d1		38.9	32.3		36.3			9.0			8.7	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		3.8	0.0		0.0			2.2			0.0	
Delay (s)		42.7	32.3		36.4			11.2			8.8	
Level of Service		D	C		D			B			A	
Approach Delay (s)		38.1			36.4			11.2			8.8	
Approach LOS		D			D			B			A	

Intersection Summary					
HCM Average Control Delay		13.1	HCM Level of Service		B
HCM Volume to Capacity ratio		0.75			
Actuated Cycle Length (s)		93.5	Sum of lost time (s)		16.0
Intersection Capacity Utilization		67.4%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

Lanes, Volumes, Timings
49: Roosevelt Circle & Route 138

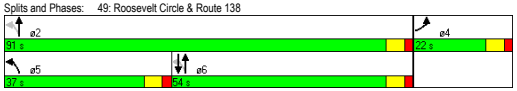
No-Build Condition - AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	40	15	5	895	540	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	50			0	
Storage Lanes	1	0	1			0	
Taper Length (ft)	25	25	25			25	
Right Turn on Red		Yes				Yes	
Link Speed (mph)	30			40	45		
Link Distance (ft)	613			872	4953		
Travel Time (s)	13.9			14.9	75.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	59	0	5	973	647	0	
Turn Type			pm+pt				
Protected Phases	4		5	2 6	6		2
Permitted Phases			2 6				
Detector Phase	4		5	2 6	6		
Switch Phase							
Minimum Initial (s)	4.0		4.0		4.0		4.0
Minimum Split (s)	22.0		22.0		22.0		22.0
Total Split (s)	22.0	0.0	37.0	145.0	54.0	0.0	91.0
Total Split (%)	19.5%	0.0%	32.7%	128.3%	47.8%	0.0%	81%
Maximum Green (s)	16.0		31.0		48.0		85.0
Yellow Time (s)	4.0		4.0		4.0		4.0
All-Red Time (s)	2.0		2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0	
Lead/Lag			Lead		Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Recall Mode	None		None		C-Max		C-Min
Walk Time (s)	5.0		5.0		5.0		5.0
Flash Dont Walk (s)	11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)	0		0		0		0
v/c Ratio	0.41		0.01	0.61	0.42		
Control Delay	47.7		0.4	3.6	5.2		
Queue Delay	0.0		0.0	0.7	0.0		
Total Delay	47.7		0.4	4.4	5.2		
Queue Length 50th (ft)	32		0	32	98		
Queue Length 95th (ft)	72		m0	m188	286		
Internal Link Dist (ft)	533			792	4873		
Turn Bay Length (ft)			50				
Base Capacity (vph)	257		856	1583	1526		
Starvation Cap Reductn	0		0	291	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.23		0.01	0.75	0.42		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 113
Offset: 41 (36%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 49: Roosevelt Circle & Route 138



HCM Signalized Intersection Capacity Analysis
49: Roosevelt Circle & Route 138

No-Build Condition - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	15	5	895	540	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1731		1770	1863	1839	
Flt Permitted	0.96		0.35	1.00	1.00	
Satd. Flow (perm)	1731		655	1863	1839	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	16	5	973	587	60
RTOR Reduction (vph)	13	0	0	0	1	0
Lane Group Flow (vph)	46	0	5	973	646	0
Turn Type			pm+pt			
Protected Phases	4		5	2 6	6	
Permitted Phases			2 6			
Actuated Green, G (s)	7.4		93.6	93.6	86.5	
Effective Green, g (s)	7.4		93.6	93.6	86.5	
Actuated g/C Ratio	0.07		0.83	0.83	0.77	
Clearance Time (s)	6.0		6.0		6.0	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	113		553	1543	1408	
v/s Ratio Prot	c0.03		0.00	c0.52	0.35	
v/s Ratio Perm			0.01			
v/c Ratio	0.41		0.01	0.63	0.46	
Uniform Delay, d1	50.7		2.7	3.5	4.8	
Progression Factor	1.00		0.18	0.66	1.00	
Incremental Delay, d2	2.4		0.0	1.0	1.1	
Delay (s)	53.1		0.5	3.3	5.9	
Level of Service	D		A	A	A	
Approach Delay (s)	53.1			3.3	5.9	
Approach LOS	D			A	A	

Intersection Summary

HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

No-Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	120	30	35	10	15	25	30	1245	15	0	415	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.68	0.68	0.68	0.91	0.91	0.91	0.89	0.89	0.89
Hourly flow rate (vph)	143	36	42	15	22	37	33	1368	16	0	466	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1982	1942	492	1993	1959	1376	517			1385		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1982	1942	492	1993	1959	1376	517			1385		
tC, single (s)	7.1	6.5	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	0	43	93	35	61	79	97			100		
cM capacity (veh/h)	25	63	575	23	57	176	1039			501		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	220	74	1418	517
Volume Left	143	15	33	0
Volume Right	42	37	16	51
cSH	35	59	1039	501
Volume to Capacity	6.33	1.25	0.03	0.00
Queue Length 95th (ft)	Err	156	2	0
Control Delay (s)	Err	313.9	1.6	0.0
Lane LOS	F	F	A	
Approach Delay (s)	9999.0	313.9	1.6	0.0
Approach LOS	F	F		

Intersection Summary				
Average Delay			999.7	
Intersection Capacity Utilization			114.3%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

No-Build Condition - AM Peak Hour

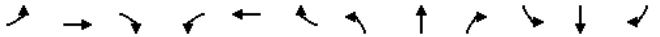
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	470	15	145	110	60	5	60	480	90	45	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.80	0.80	0.80	0.87	0.87	0.87
Hourly flow rate (vph)	5	516	16	167	126	69	6	75	600	103	52	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	126			533			1062	995	525	1067	1038	161
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			533			1062	995	525	1067	1038	161
tC, single (s)	4.1			4.1			7.3	6.5	6.2	7.1	6.7	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			84			95	63	0	0	72	99
cM capacity (veh/h)	1472			1025			129	204	553	0	182	889

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	538	362	681	161
Volume Left	5	167	6	103
Volume Right	16	69	600	6
cSH	1472	1025	454	0
Volume to Capacity	0.00	0.16	1.50	Err
Queue Length 95th (ft)	0	14	891	Err
Control Delay (s)	0.1	5.1	260.4	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.1	5.1	260.4	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			97.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

No-Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	485	0	0	120	0	0	0	5	0	0	75
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.59
Hourly flow rate (vph)	151	505	0	0	136	0	0	0	6	0	0	127
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	136			505			1071	944	505	949	944	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			505			1071	944	505	949	944	136
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			100	100	99	100	100	86
cM capacity (veh/h)	1448			1059			157	235	567	221	235	915

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	656	136	6	127
Volume Left	151	0	0	0
Volume Right	0	0	6	127
cSH	1448	1700	567	915
Volume to Capacity	0.10	0.08	0.01	0.14
Queue Length 95th (ft)	9	0	1	12
Control Delay (s)	2.7	0.0	11.4	9.6
Lane LOS	A		B	A
Approach Delay (s)	2.7	0.0	11.4	9.6
Approach LOS			B	A

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			

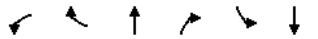
HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

No-Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	65	90	1095	255	75	380
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.89	0.89	0.81	0.81
Hourly flow rate (vph)	74	102	1230	287	93	469
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2028	1374			1517	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2028	1374			1517	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	42			79	
cM capacity (veh/h)	50	176			437	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	176	1517	562
Volume Left	74	0	93
Volume Right	102	287	0
cSH	86	1700	437
Volume to Capacity	2.05	0.89	0.21
Queue Length 95th (ft)	388	0	20
Control Delay (s)	588.6	0.0	6.3
Lane LOS	F		A
Approach Delay (s)	588.6	0.0	6.3
Approach LOS	F		

Intersection Summary			
Average Delay	47.5		
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	15	150	95	50	150
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.86	0.86	0.73	0.73
Hourly flow rate (vph)	51	17	174	110	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	572	230			285	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	572	230			285	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	89	98			95	
cM capacity (veh/h)	446	797			1277	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	285	274
Volume Left	51	0	68
Volume Right	17	110	0
cSH	502	1700	1277
Volume to Capacity	0.14	0.17	0.05
Queue Length 95th (ft)	12	0	4
Control Delay (s)	13.3	0.0	2.4
Lane LOS	B		A
Approach Delay (s)	13.3	0.0	2.4
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
1: Main Street & Rte 138

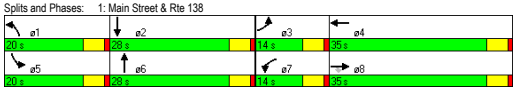
No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	195	270	105	360	85	290	480	85	135	625	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	12	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4944			2928	
Travel Time (s)		26.1			62.7			84.3			49.9	
Peak Hour Factor	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	213	238	329	124	524	0	322	627	0	152	994	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	12.0	12.0	12.0	21.0		12.0	21.0		12.0	20.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	20.0	28.0	0.0	20.0	28.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	20.6%	28.9%	0.0%	20.6%	28.9%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		15.0	23.0		15.0	23.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					5.0			5.0				
Flash Dont Walk (s)					11.0			11.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	1.12	0.64	0.56	0.70	0.76		1.02	0.57		0.66	1.06	
Control Delay	139.3	38.9	7.4	59.6	37.0		92.0	26.9		48.5	77.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	139.3	38.9	7.4	59.6	37.0		92.0	26.9		48.5	77.2	
Queue Length 50th (ft)	~130	116	0	64	129		~174	138		77	~293	
Queue Length 95th (ft)	#252	168	43	#141	170		#372	226		139	#455	
Internal Link Dist (ft)		1645			3138			4864			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	190	651	778	186	1220		317	1097		311	936	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.12	0.37	0.42	0.67	0.43		1.02	0.57		0.49	1.06	

Intersection Summary

Area Type: Other
Cycle Length: 97
Actuated Cycle Length: 83.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	195	270	105	360	85	290	480	85	135	625	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	12	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818	1583	1728	3350		1770	3385		1736	3248	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1818	1583	1728	3350		1770	3385		1736	3248	
Peak-hour factor, PHF	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	213	238	329	124	424	100	322	533	94	152	702	292
RTOR Reduction (vph)	0	0	262	0	25	0	0	13	0	0	44	0
Lane Group Flow (vph)	213	238	67	124	499	0	322	614	0	152	950	0
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.0	17.2	17.2	8.6	16.8		15.0	26.9		11.2	23.1	
Effective Green, g (s)	9.0	17.2	17.2	8.6	16.8		15.0	26.9		11.2	23.1	
Actuated g/C Ratio	0.11	0.21	0.21	0.10	0.20		0.18	0.32		0.13	0.28	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	190	373	325	177	671		316	1085		232	894	
v/s Ratio Prot	c0.12	0.13		0.07	c0.15		c0.18	c0.18		0.09	c0.29	
v/s Ratio Perm			0.04									
v/c Ratio	1.12	0.64	0.21	0.70	0.74		1.02	0.57		0.66	1.06	
Uniform Delay, d1	37.5	30.5	27.7	36.4	31.5		34.4	23.7		34.5	30.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	101.5	2.6	0.1	9.8	3.9		55.6	0.8		5.0	48.1	
Delay (s)	139.0	33.1	27.8	46.2	35.4		90.0	24.5		39.5	78.5	
Level of Service	F	C	C	D	D		F	C		D	E	
Approach Delay (s)		59.8			37.5			46.7			73.3	
Approach LOS		E			D			D			E	

Intersection Summary

HCM Average Control Delay		56.6	HCM Level of Service		E	
HCM Volume to Capacity ratio		1.05				
Actuated Cycle Length (s)		83.9	Sum of lost time (s)		25.0	
Intersection Capacity Utilization		80.7%	ICU Level of Service		D	
Analysis Period (min)		15				

c Critical Lane Group

Lanes, Volumes, Timings
2: Belmont St & Route 138

No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	70	125	275	500	150	170	230	395	300	220	650	60	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	13	12	11	13	12	11	12	12	11	12	13	
Storage Length (ft)	0		0	475		0	0		0	200		300	
Storage Lanes	1		0	2		0	1		0	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		45			45			45			45		
Link Distance (ft)		387			2550			908			876		
Travel Time (s)		5.9			38.6			13.8			13.3		
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	79	449	0	568	363	0	247	748	0	242	780	0	
Turn Type	Prot			Prot			pm+pt			pm+pt			
Protected Phases	7	4		3	8		5	2		1	6		9
Permitted Phases							2			6			
Detector Phase	7	4		3	8		5	2		1	6		
Switch Phase													
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
Minimum Split (s)	22.0	10.0		22.0	10.0		10.0	10.0		10.0	10.0		23.0
Total Split (s)	22.0	26.0	0.0	22.0	26.0	0.0	14.0	27.0	0.0	15.0	28.0	0.0	23.0
Total Split (%)	19.5%	23.0%	0.0%	19.5%	23.0%	0.0%	12.4%	23.9%	0.0%	13.3%	24.8%	0.0%	20%
Maximum Green (s)	16.0	20.0		16.0	20.0		8.0	21.0		9.0	22.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max		None
Walk Time (s)													6.0
Flash Dont Walk (s)													14.0
Pedestrian Calls (#/hr)													5
v/c Ratio	0.49	1.18		1.20	0.76		0.62	0.85		0.61	0.92		
Control Delay	58.2	137.1		150.3	48.0		32.5	43.4		29.9	47.4		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	58.2	137.1		150.3	48.0		32.5	43.4		29.9	47.4		
Queue Length 50th (ft)	56	~338		~258	224		96	213		65	275		
Queue Length 95th (ft)	101	#532		#356	#410		#355	#379		m#272	#467		
Internal Link Dist (ft)		307			2470			828			796		
Turn Bay Length (ft)				475						200			
Base Capacity (vph)	247	382		474	477		400	880		396	847		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.32	1.18		1.20	0.76		0.62	0.85		0.61	0.92		

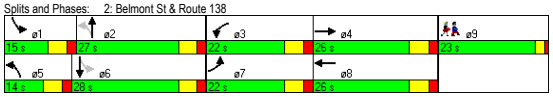
Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 113	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Belmont St & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St & Route 138

No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	125	275	500	150	170	230	395	300	220	650	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	13	12	11	12	12	11	12	13
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.92		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1761		3351	1788		1745	3287		1662	3469	
Flt Permitted	0.95	1.00		0.95	1.00		0.18	1.00		0.17	1.00	
Satd. Flow (perm)	1745	1761		3351	1788		324	3287		294	3469	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	79	140	309	568	170	193	247	425	323	242	714	66
RTOR Reduction (vph)	0	69	0	0	33	0	0	119	0	0	6	0
Lane Group Flow (vph)	79	380	0	568	330	0	247	629	0	242	774	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.2	21.2		16.0	28.0		43.7	22.7		45.9	23.8	
Effective Green, g (s)	9.2	21.2		16.0	28.0		43.7	22.7		45.9	23.8	
Actuated g/C Ratio	0.08	0.19		0.14	0.25		0.39	0.20		0.41	0.21	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	330		474	443		389	660		387	731	
v/s Ratio Prot	0.05	c0.22		c0.17	0.18		0.12	0.19		c0.12	c0.22	
v/s Ratio Perm							0.13			0.13		
v/c Ratio	0.56	1.15		1.20	0.74		0.63	0.95		0.63	1.06	
Uniform Delay, d1	49.9	45.9		48.5	39.2		26.5	44.6		25.3	44.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.05	0.83	
Incremental Delay, d2	4.7	97.2		108.2	6.7		3.4	25.2		2.1	43.7	
Delay (s)	54.6	143.1		156.7	45.9		29.9	69.8		28.7	80.9	
Level of Service	D	F		F	D		C	E		C	F	
Approach Delay (s)		129.8			113.5			59.9			68.5	
Approach LOS		F			F			E			E	

Intersection Summary					
HCM Average Control Delay	87.4	HCM Level of Service		F	
HCM Volume to Capacity ratio	0.94				
Actuated Cycle Length (s)	113.0	Sum of lost time (s)		25.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

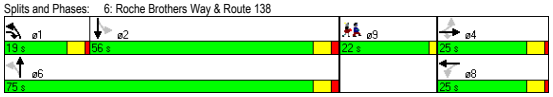
Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138

No-Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	90	0	305	1	0	0	200	490	5	5	835	140	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	12	12	12	11	11	11	12	12	12	
Storage Length (ft)	0		100	0		0	0		0	0		0	
Storage Lanes	0		1	0		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		635			332			1623			2417		
Travel Time (s)		14.4			7.5			36.9			54.9		
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30	
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	100	339	0	4	0	0	848	0	0	1090	0	
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm			
Protected Phases		4	1		8		1	6			2		9
Permitted Phases	4		4	8			6			2			
Detector Phase	4	4	1	8	8		1	6		2	2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		10.0	10.0		7.0
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	22.0		22.0	22.0		22.0
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0	22.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%	18%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0		20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag		
Lead-Lag Optimize?			Yes				Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	None	None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													2
v/c Ratio		0.40	0.55		0.02			0.66			0.71		
Control Delay		36.6	7.3		33.0			12.7			18.7		
Queue Delay		0.0	0.0		0.0			0.0			0.0		
Total Delay		36.6	7.3		33.0			12.7			18.7		
Queue Length 50th (ft)		32	0		1			68			160		
Queue Length 95th (ft)		130	76		4			214			420		
Internal Link Dist (ft)		555			252			1543			2337		
Turn Bay Length (ft)			100										
Base Capacity (vph)		471	780		435			1740			2596		
Starvation Cap Reductn		0	0		0			0			0		
Spillback Cap Reductn		0	0		0			0			0		
Storage Cap Reductn		0	0		0			0			0		
Reduced v/c Ratio		0.21	0.43		0.01			0.49			0.42		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 68.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 6: Roche Brothers Way & Route 138



HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138

No-Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	0	305	1	0	0	200	490	5	5	835	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.93		1.00			1.00			0.99	
Flpb, ped/bikes		0.95	1.00		0.95			1.00			1.00	
Frt		1.00	0.85		1.00			1.00			0.98	
Flt Protected		0.95	1.00		0.95			0.99			1.00	
Satd. Flow (prot)		1710	1436		1722			3331			3442	
Flt Permitted		0.76	1.00		0.69			0.52			0.95	
Satd. Flow (perm)		1359	1436		1255			1758			3271	
Peak-hour factor, PHF	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Adj. Flow (vph)	100	0	339	4	0	0	244	598	6	6	928	156
RTOR Reduction (vph)	0	0	257	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	100	82	0	4	0	0	848	0	0	1080	0
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		9.9	16.9		9.9			44.8			32.8	
Effective Green, g (s)		9.9	16.9		9.9			44.8			32.8	
Actuated g/C Ratio		0.14	0.24		0.14			0.64			0.47	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		192	450		178			1284			1535	
v/s Ratio Prot			0.02					c0.07				
v/s Ratio Perm		c0.07	0.04		0.00			c0.36			0.33	
v/c Ratio		0.52	0.18		0.02			0.66			0.70	
Uniform Delay, d1		27.8	21.0		25.8			7.8			14.7	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		2.5	0.2		0.1			1.3			1.5	
Delay (s)		30.3	21.2		25.9			9.1			16.2	
Level of Service		C	C		C			A			B	
Approach Delay (s)		23.3			25.9			9.1			16.2	
Approach LOS		C			C			A			B	

Intersection Summary					
HCM Average Control Delay	15.0	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	15.2		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D		
Analysis Period (min)	15				

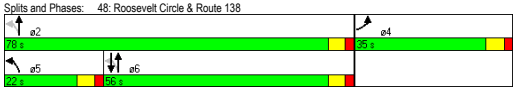
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	160	50	0	605	830	155	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	50			0	
Storage Lanes	1	0	1			0	
Taper Length (ft)	25	25	25			25	
Right Turn on Red		Yes				Yes	
Link Speed (mph)	30			40	45		
Link Distance (ft)	1067			876	4944		
Travel Time (s)	24.3			14.9	74.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	228	0	0	658	1070	0	
Turn Type			pm+pt				
Protected Phases	4		5	2 6	6		2
Permitted Phases			2 6				
Detector Phase	4		5	2 6	6		
Switch Phase							
Minimum Initial (s)	4.0		4.0		4.0		4.0
Minimum Split (s)	22.0		22.0		22.0		22.0
Total Split (s)	35.0	0.0	22.0	134.0	56.0	0.0	78.0
Total Split (%)	31.0%	0.0%	19.5%	118.6%	49.6%	0.0%	69%
Maximum Green (s)	29.0		16.0		50.0		72.0
Yellow Time (s)	4.0		4.0		4.0		4.0
All-Red Time (s)	2.0		2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0	
Lead/Lag			Lead		Lag		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Recall Mode	None		None		C-Min		C-Max
Walk Time (s)	5.0		5.0		5.0		5.0
Flash Dont Walk (s)	11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)	0		0		0		0
v/c Ratio	0.74			0.49	0.81		
Control Delay	55.7			10.3	18.1		
Queue Delay	0.0			0.0	0.0		
Total Delay	55.7			10.3	18.1		
Queue Length 50th (ft)	150			152	452		
Queue Length 95th (ft)	220			m391	#955		
Internal Link Dist (ft)	987			796	4864		
Turn Bay Length (ft)							
Base Capacity (vph)	455			1346	1321		
Starvation Cap Reductn	0			0	0		
Spillback Cap Reductn	0			0	0		
Storage Cap Reductn	0			0	0		
Reduced v/c Ratio	0.50			0.49	0.81		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 113
Offset: 93 (82%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 48: Roosevelt Circle & Route 138

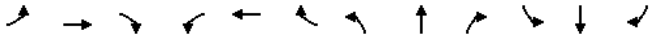


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	160	50	0	605	830	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			1.00	1.00	
Satd. Flow (prot)	1737			1863	1823	
Flt Permitted	0.96			1.00	1.00	
Satd. Flow (perm)	1737			1863	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	54	0	658	902	168
RTOR Reduction (vph)	11	0	0	0	3	0
Lane Group Flow (vph)	217	0	0	658	1067	0
Turn Type			pm+pt			
Protected Phases	4		5	2 6	6	
Permitted Phases			2 6			
Actuated Green, G (s)	19.4			81.6	81.6	
Effective Green, g (s)	19.4			81.6	81.6	
Actuated g/C Ratio	0.17			0.72	0.72	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	298			1345	1316	
v/s Ratio Prot	c0.13			0.35	c0.59	
v/s Ratio Perm						
v/c Ratio	0.73			0.49	0.81	
Uniform Delay, d1	44.3			6.7	10.5	
Progression Factor	1.00			1.23	1.00	
Incremental Delay, d2	8.6			0.8	5.5	
Delay (s)	52.9			9.1	16.0	
Level of Service	D			A	B	
Approach Delay (s)	52.9			9.1	16.0	
Approach LOS	D			A	B	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

No-Build Condition - PM Peak Hour



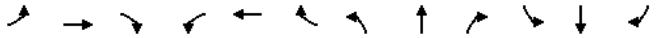
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	15	35	25	50	35	65	685	30	20	1000	185
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.88	0.88	0.88	0.85	0.85	0.85
Hourly flow rate (vph)	88	18	41	29	58	41	74	778	34	24	1176	218
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2345	2293	1285	2326	2384	795	1394			812		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2345	2293	1285	2326	2384	795	1394			812		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	46	79	0	0	89	85			97		
cM capacity (veh/h)	0	33	199	11	29	386	491			823		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	147	128	886	1418
Volume Left	88	29	74	24
Volume Right	41	41	34	218
cSH	0	26	491	823
Volume to Capacity	Err	4.89	0.15	0.03
Queue Length 95th (ft)	Err	Err	13	2
Control Delay (s)	Err	Err	4.7	1.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	4.7	1.6
Approach LOS	F	F		

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			95.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

No-Build Condition - PM Peak Hour



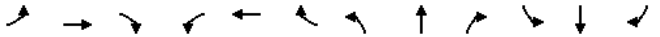
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	255	25	420	440	105	15	50	220	85	70	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Hourly flow rate (vph)	6	300	29	488	512	122	17	56	247	91	75	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	512			329			1924	1815	315	1904	1891	573
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512			329			1924	1815	315	1904	1891	573
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			60			0	0	66	0	0	98
cM capacity (veh/h)	1064			1236			0	47	723	0	42	523

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	335	1122	320	177
Volume Left	6	488	17	91
Volume Right	29	122	247	11
cSH	1064	1236	0	0
Volume to Capacity	0.01	0.40	Err	Err
Queue Length 95th (ft)	0	48	Err	Err
Control Delay (s)	0.2	7.8	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	7.8	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			107.3%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

No-Build Condition - PM Peak Hour



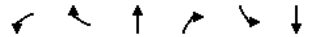
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	270	0	0	465	5	10	5	15	0	0	180
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.89	0.89	0.92	0.92	0.92	0.89	0.92	0.89
Hourly flow rate (vph)	83	321	0	0	522	6	11	5	16	0	0	202
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	528			321			1216	1016	321	1032	1013	525
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528			321			1216	1016	321	1032	1013	525
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			88	98	98	100	100	64
cM capacity (veh/h)	1049			1238			94	219	719	192	220	556

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	405	528	33	202
Volume Left	83	0	11	0
Volume Right	0	6	16	202
cSH	1049	1700	201	556
Volume to Capacity	0.08	0.31	0.16	0.36
Queue Length 95th (ft)	6	0	14	41
Control Delay (s)	2.5	0.0	26.4	15.1
Lane LOS	A		D	C
Approach Delay (s)	2.5	0.0	26.4	15.1
Approach LOS			D	C

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

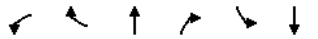
No-Build Condition - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	185	125	595	170	130	1040
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Hourly flow rate (vph)	231	156	708	202	141	1130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2223	810			911	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2223	810			911	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	59			81	
cM capacity (veh/h)	39	382			752	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	388	911	1272
Volume Left	231	0	141
Volume Right	156	202	0
cSH	61	1700	752
Volume to Capacity	6.30	0.54	0.19
Queue Length 95th (ft)	Err	0	17
Control Delay (s)	Err	0.0	6.6
Lane LOS	F		A
Approach Delay (s)	Err	0.0	6.6
Approach LOS	F		

Intersection Summary			
Average Delay	1510.9		
Intersection Capacity Utilization	131.5%	ICU Level of Service	H
Analysis Period (min)	15		

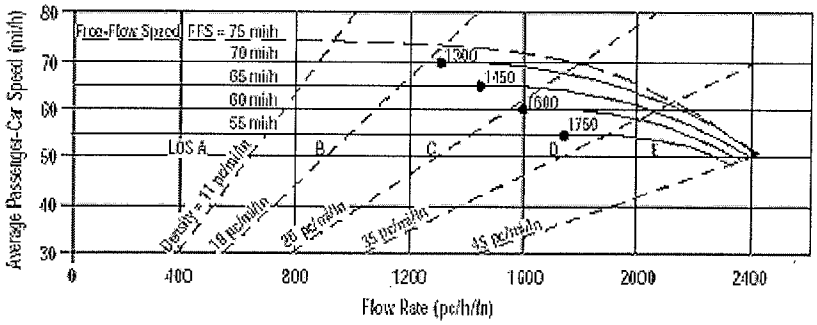


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	130	100	165	55	35	180
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	155	119	179	60	37	189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	472	209			239	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	472	209			239	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	86			97	
cM capacity (veh/h)	535	834			1340	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	274	239	226
Volume Left	155	0	37
Volume Right	119	60	0
cSH	634	1700	1340
Volume to Capacity	0.43	0.14	0.03
Queue Length 95th (ft)	54	0	2
Control Delay (s)	14.9	0.0	1.5
Lane LOS	B		A
Approach Delay (s)	14.9	0.0	1.5
Approach LOS	B		

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8760*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*58.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2369*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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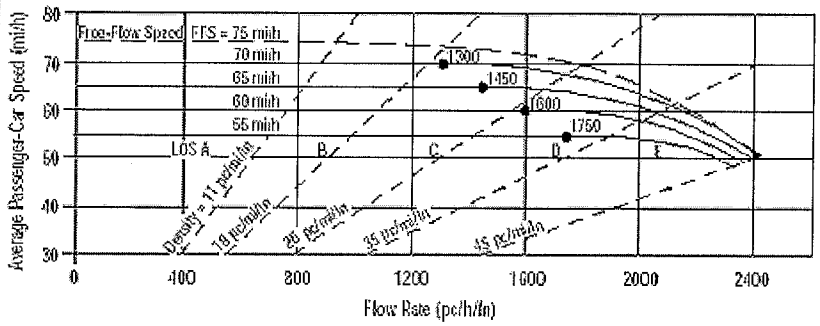
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5450*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*58.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1469*	pc/h/ln
S	*58.3*	mi/h
D = v_p / S	*25.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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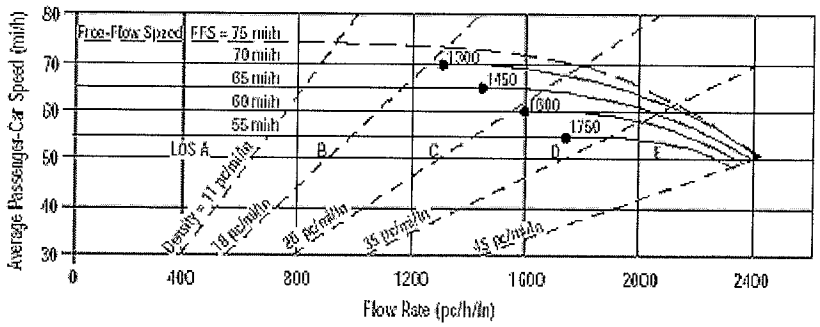
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5220*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*59.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1422*	pc/h/ln
S	*59.0*	mi/h
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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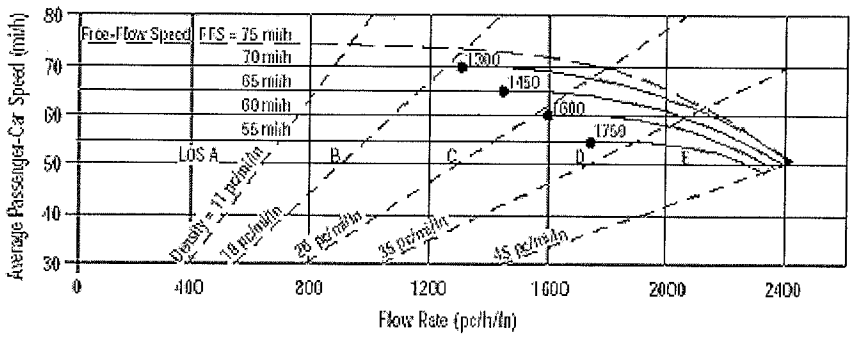

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/5/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of F.B.P.*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8100*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*59.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2161*	pc/h/ln
S	*54.4*	mi/h
D = v_p / S	*39.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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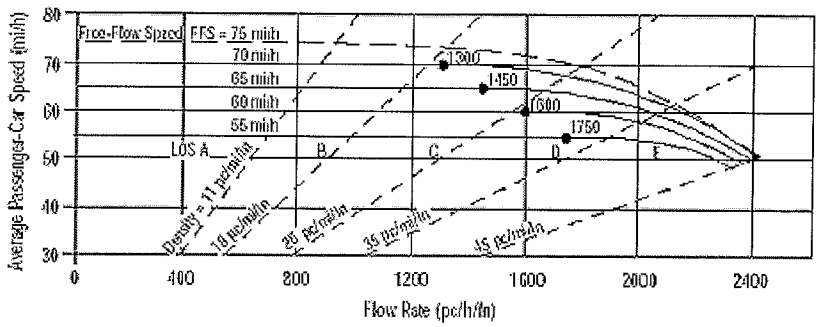

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6645*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1817*	pc/h/ln
S	*64.6*	mi/h
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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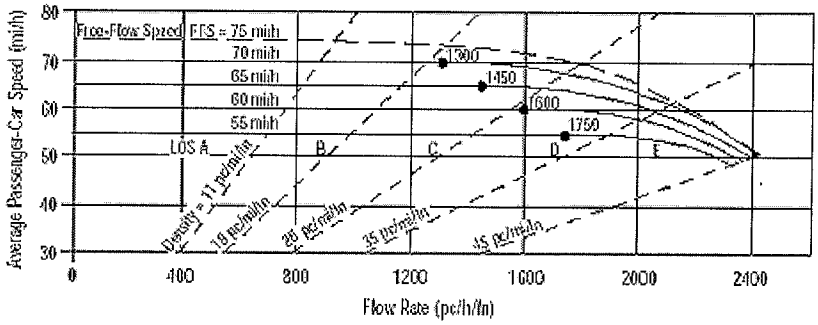

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4880*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1309*	pc/h/ln
S	*66.0*	mi/h
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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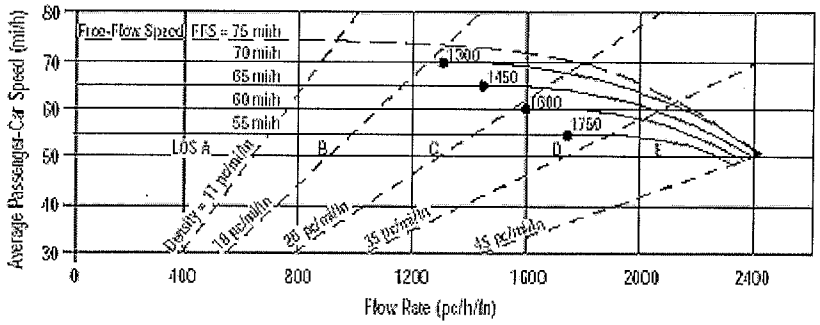

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7160*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*4*	
FFS (measured)	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*64.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1891*	pc/h/ln
S	*62.2*	mi/h
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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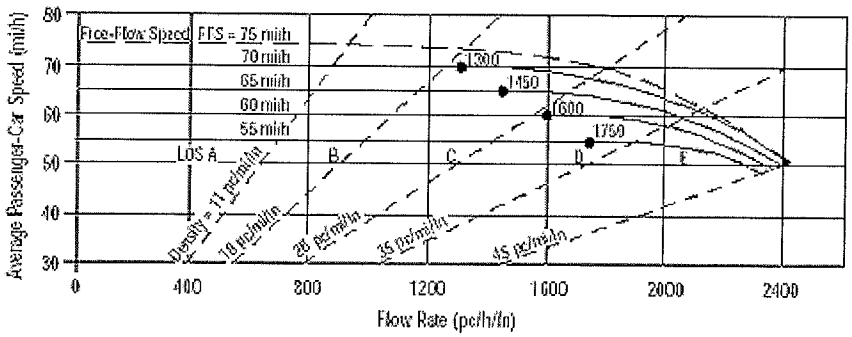

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route I-93 South of Route 3*
Jurisdiction	*Braintree*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8235*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*4*	
FFS (measured)	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*64.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2175*	pc/h/ln
S	*57.1*	mi/h
D = v_p / S	*38.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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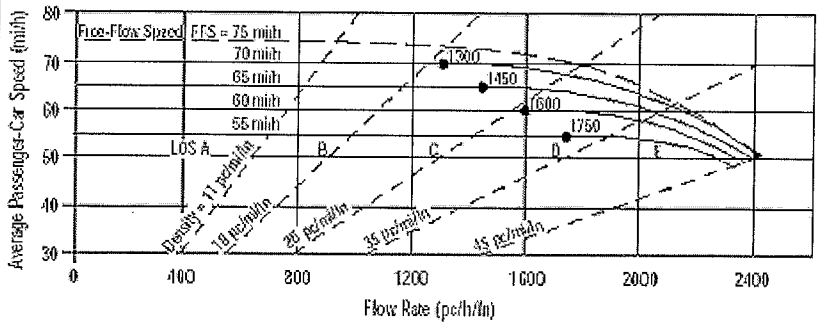

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5700*	veh/h	Peak-Hour Factor, PHF	*0.89*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.9*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2306*	pc/h/ln
S	*53.1*	mi/h
D = v_p / S	*43.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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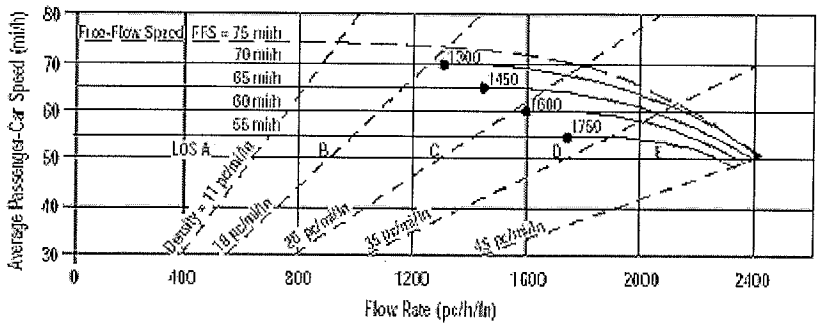
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2875*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.9*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1034*	pc/h/ln
S	*63.9*	mi/h
D = v_p / S	*16.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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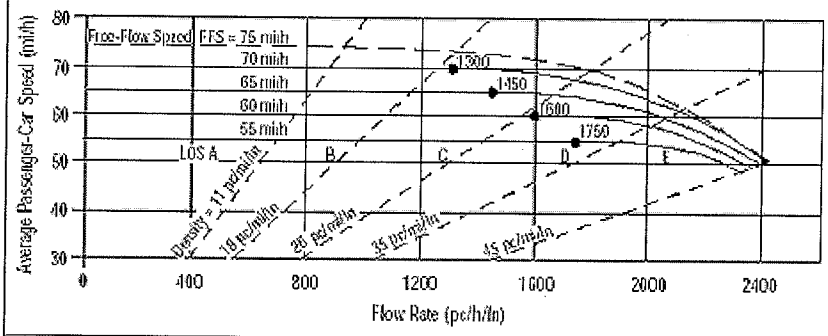

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3520*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1306*	pc/h/ln
S	*65.8*	mi/h
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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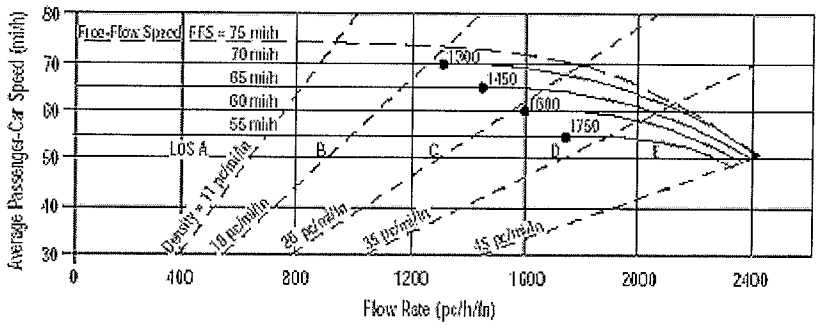

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6830*	veh/h	Peak-Hour Factor, PHF	*0.98*	
AADT		veh/day	%Trucks and Buses, P_T	*6*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2393*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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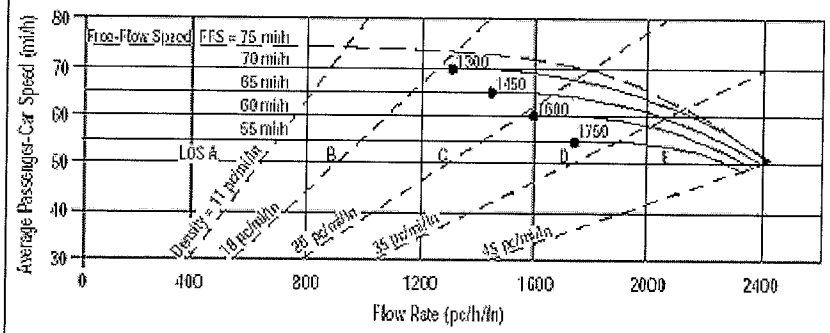

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5985*	veh/h	Peak-Hour Factor, PHF	*0.99*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.4*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.4*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2116*	pc/h/ln
S	*60.0*	mi/h
D = v_p / S	*35.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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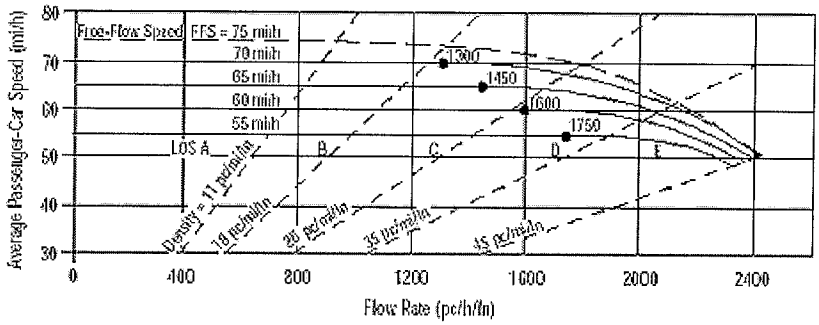

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3445*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1225*	pc/h/ln
S	*70.0*	mi/h
D = v_p / S	*17.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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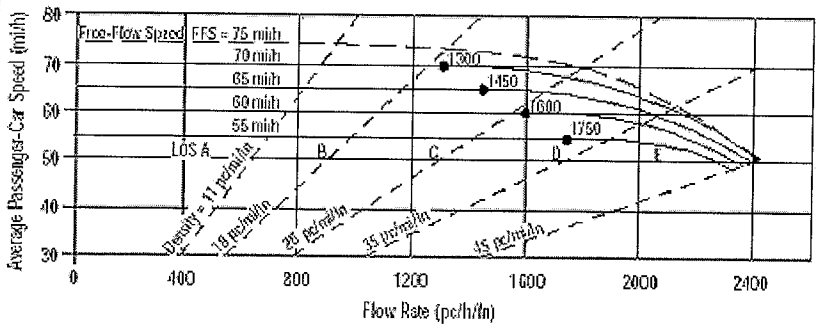

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3180*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1142*	pc/h/ln
S	*67.1*	mi/h
D = v_p / S	*17.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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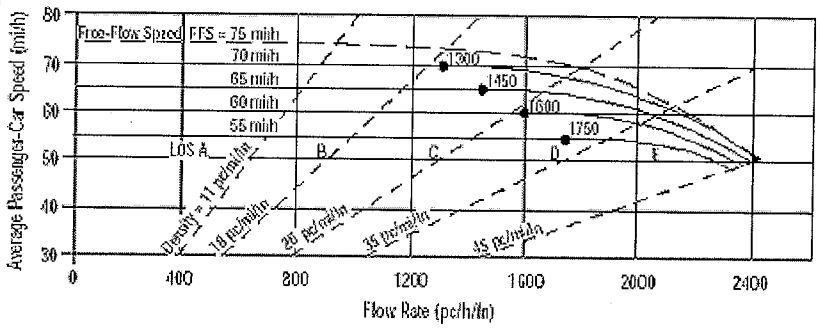
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24, South of Pond St.*
Jurisdiction	*Avon*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6715*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2365*	pc/h/ln
S	*52.9*	mi/h
D = v_p / S	*44.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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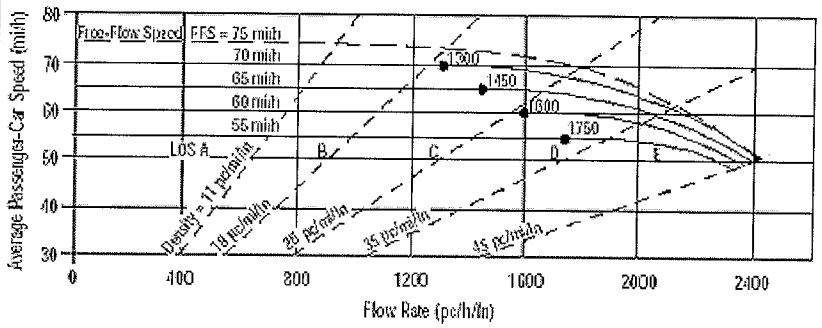
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6050*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2183*	pc/h/ln
S	*58.8*	mi/h
D = v_p / S	*37.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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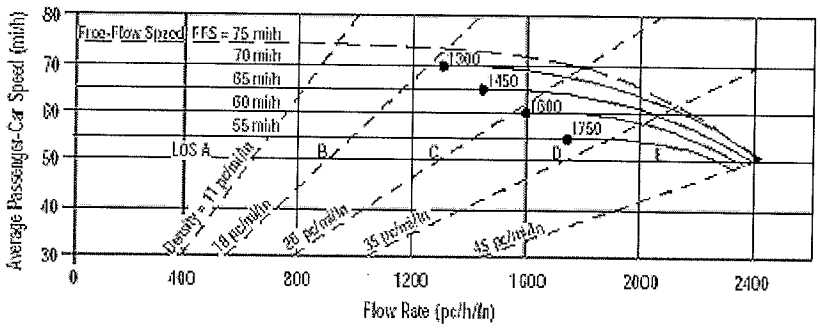

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3435*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*67.1*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1235*	pc/h/ln
S	*67.1*	mi/h
D = v_p / S	*18.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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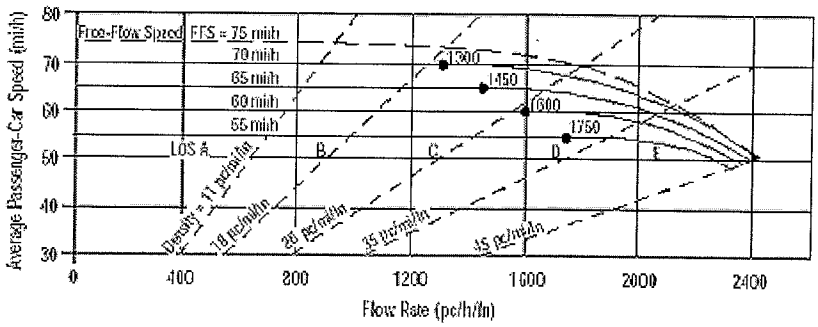

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2510*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*916*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*13.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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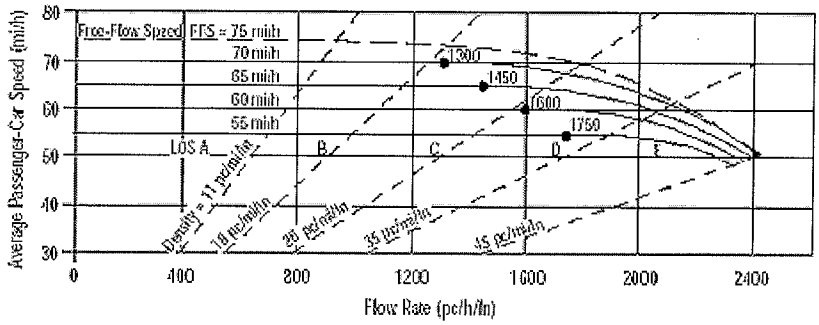
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6100*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2116*	pc/h/ln
S	*61.9*	mi/h
D = v_p / S	*34.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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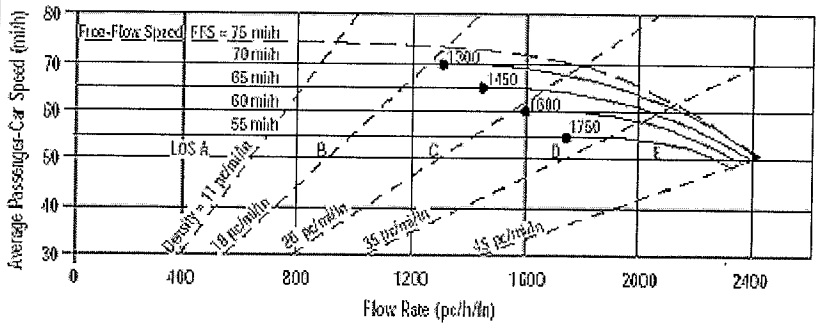

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route I-495*
Jurisdiction	*Raynham*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5910*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2114*	pc/h/ln
S	*60.3*	mi/h
D = v_p / S	*35.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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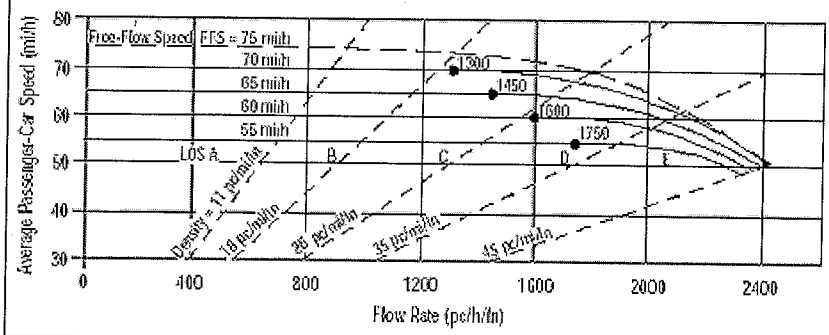

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3720*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1344*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*20.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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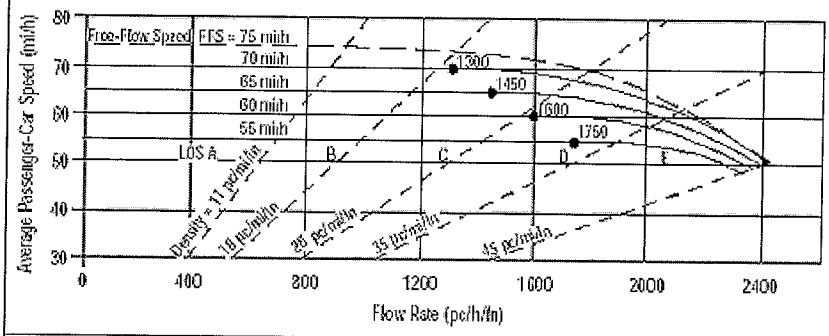
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2900*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1046*	pc/h/ln
S	*63.0*	mi/h
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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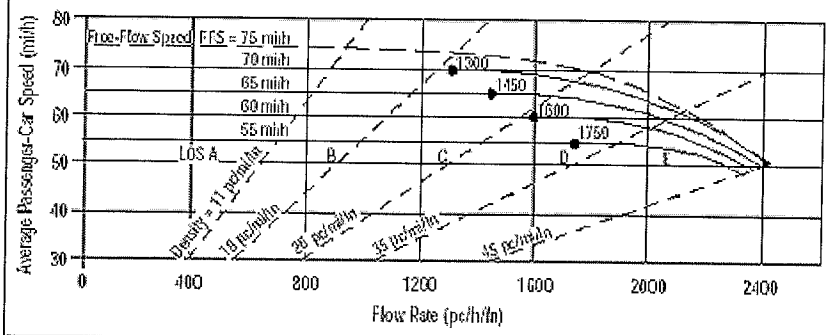

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of I-495*
Jurisdiction	*Raynham*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5355*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1876*	pc/h/ln
S	*61.6*	mi/h
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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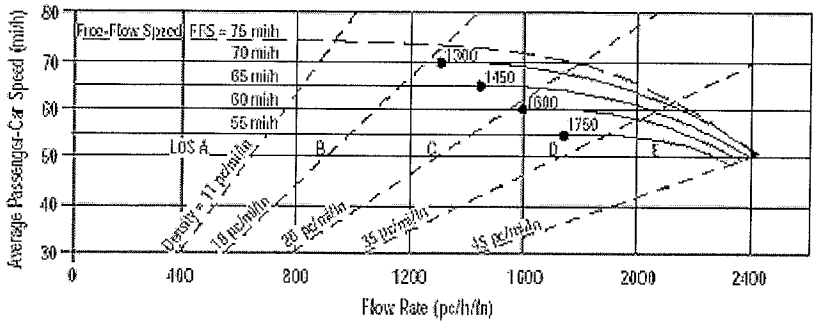

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/7/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5105*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1851*	pc/h/ln
S	*67.9*	mi/h
D = v_p / S	*27.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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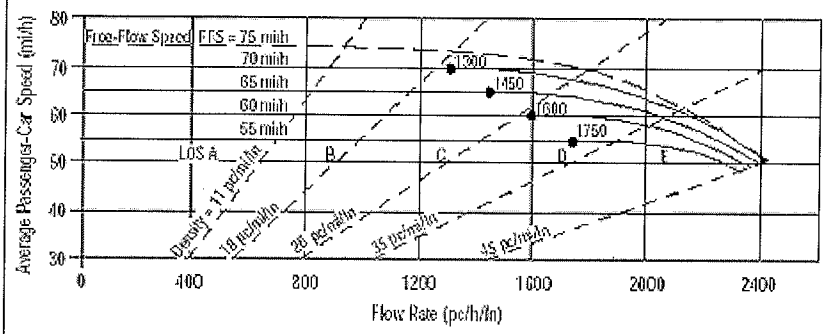

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/7/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3705*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1394*	pc/h/ln
S	*70.9*	mi/h
D = v_p / S	*19.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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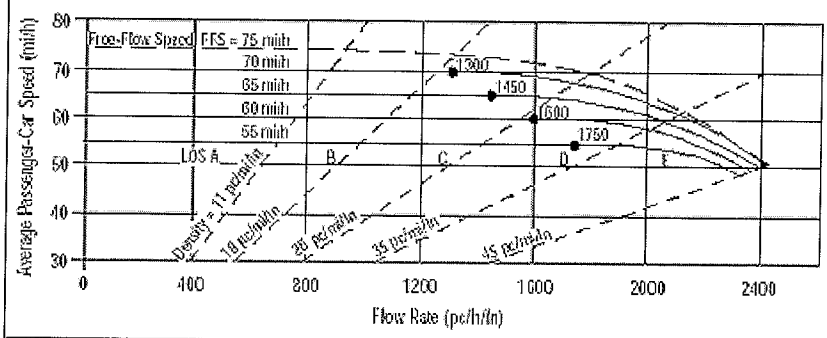

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/7/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3320*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1216*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*17.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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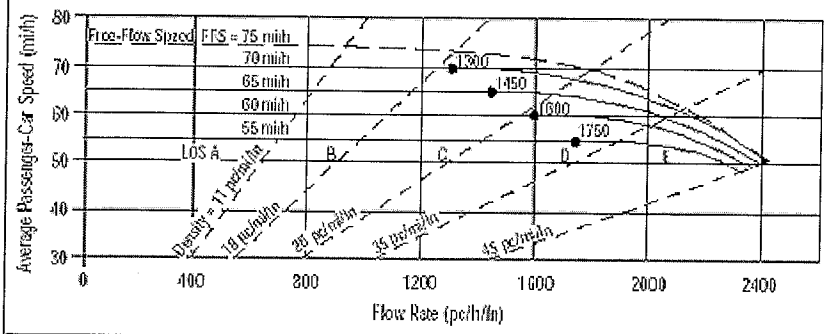

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/7/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5070*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1828*	pc/h/ln
S	*67.3*	mi/h
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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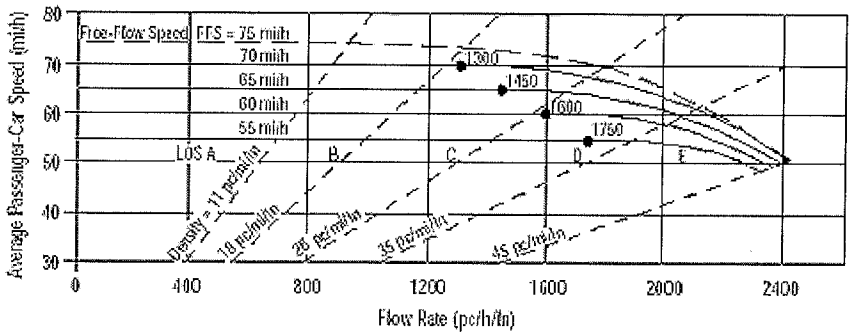

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/5/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3535*	veh/h	Peak-Hour Factor, PHF	*0.91*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.2*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.2*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1981*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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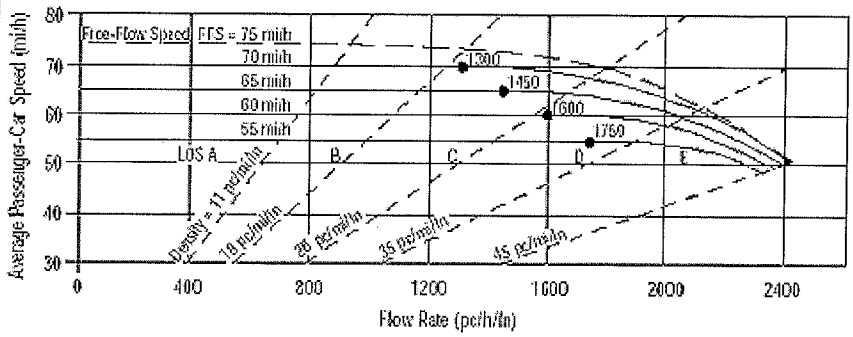

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/5/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3560*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.2*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.2*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1952*	pc/h/ln
S	*65.2*	mi/h
D = v_p / S	*30.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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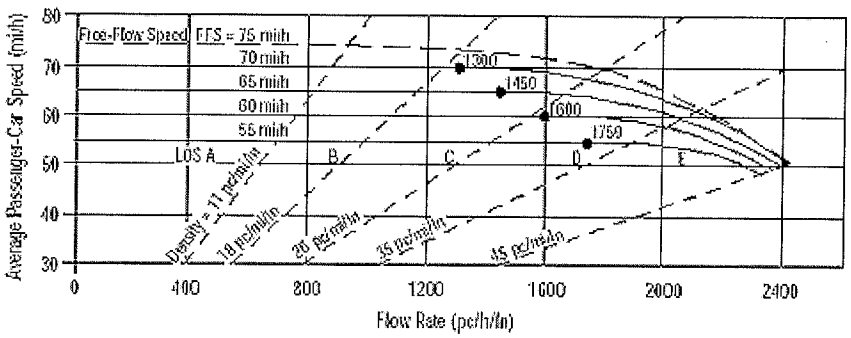

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/5/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3285*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1866*	pc/h/ln
S	*67.0*	mi/h
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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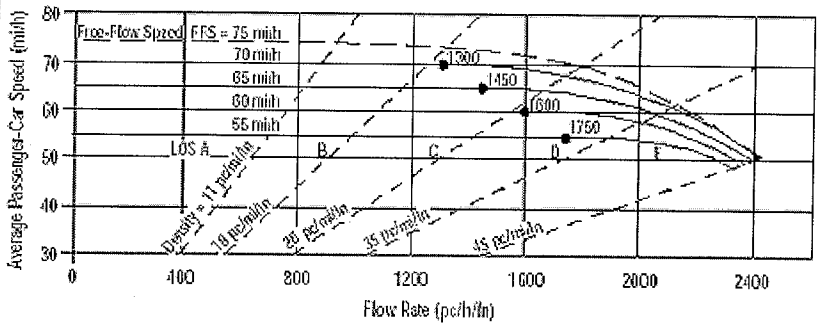

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3705*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2010*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*31.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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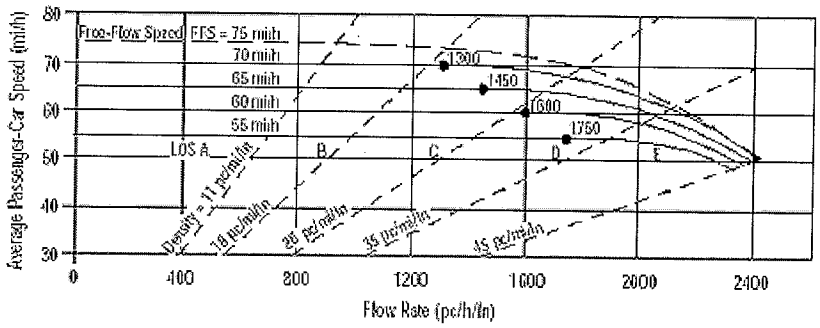

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Eastbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 South of Route 24*
Date Performed	*6/3/09*	Jurisdiction	*Taunton*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1320*	veh/h	Peak-Hour Factor, PHF	*0.93*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*745*	pc/h/ln
S	*65.0*	mi/h
D = v_p / S	*11.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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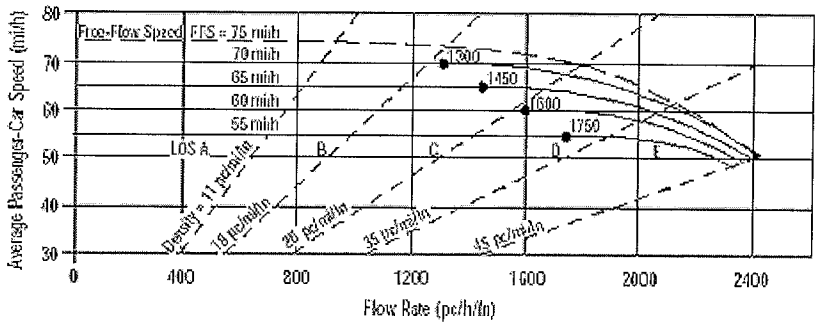

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Eastbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2150*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1142*	pc/h/ln
S	*65.0*	mi/h
D = v_p / S	*17.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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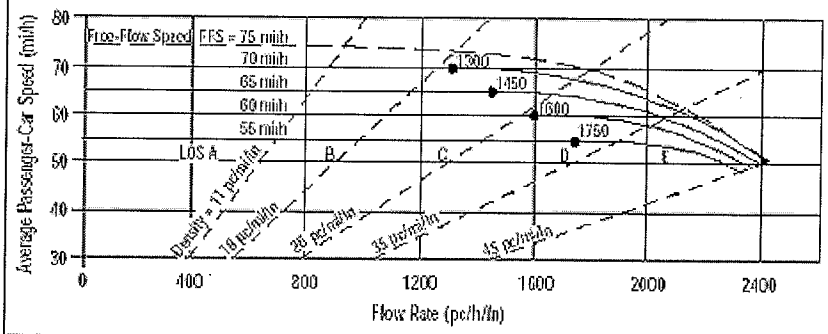

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Westbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1985*	veh/h	Peak-Hour Factor, PHF	*0.93*	
AADT		veh/day	%Trucks and Buses, P_T	*6*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1099*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*16.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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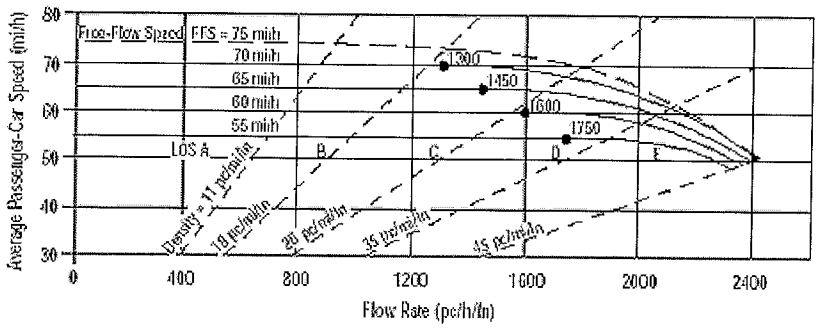

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Westbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1590*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*890*	pc/h/ln
S	*66.8*	mi/h
D = v_p / S	*13.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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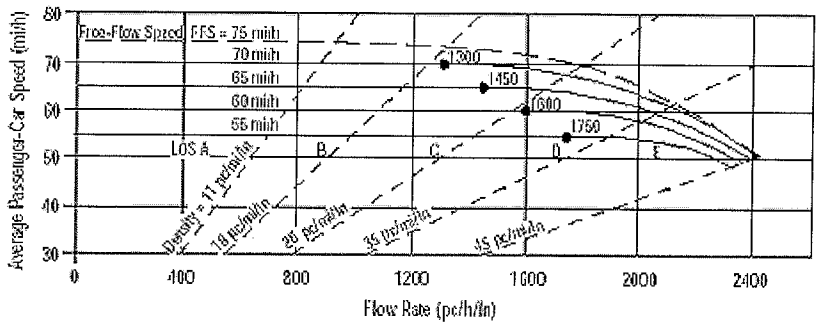
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2300*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1278*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*18.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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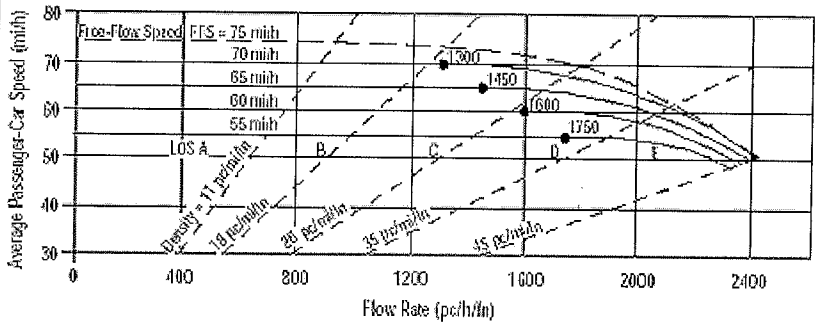

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2390*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1322*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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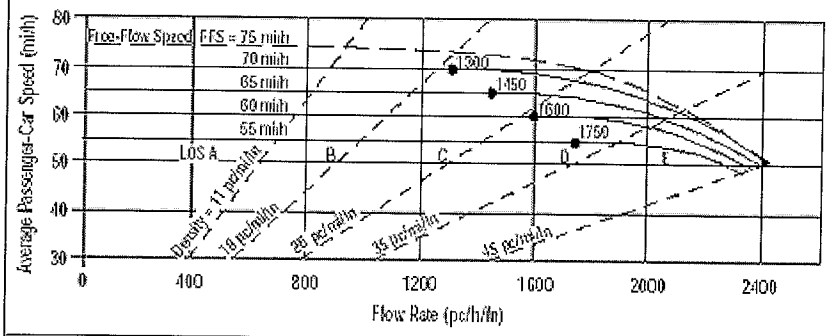

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2465*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.2*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1365*	pc/h/ln
S	*62.2*	mi/h
D = v_p / S	*21.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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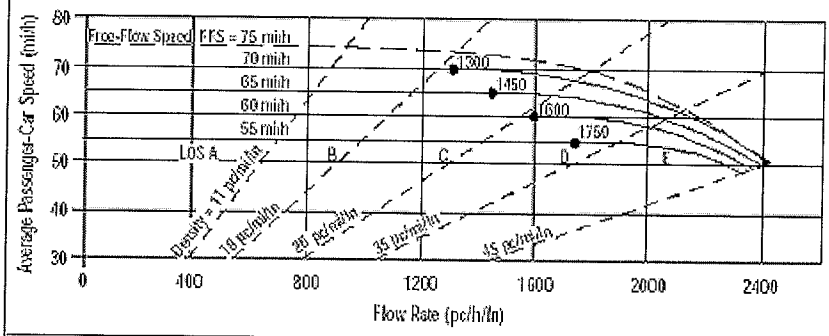

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 140 North of Hathaway Rd*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2545*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.2*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1366*	pc/h/ln
S	*62.2*	mi/h
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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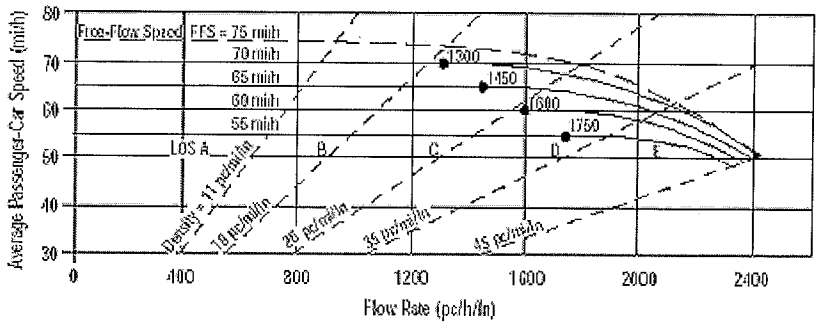

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4840*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2770*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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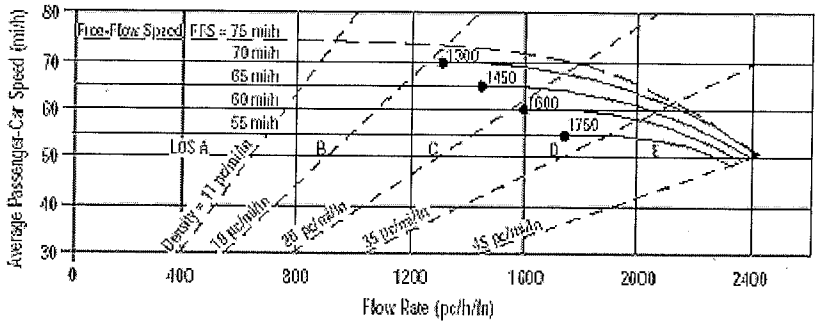

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2585*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1525*	pc/h/ln
S	*70.5*	mi/h
D = v_p / S	*21.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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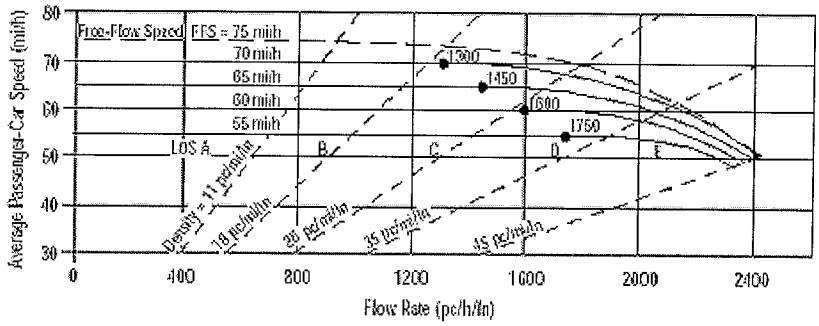
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2030*

Project Description South Coast Rail

☐ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2740*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1541*	pc/h/ln
S	*62.5*	mi/h
D = v_p / S	*24.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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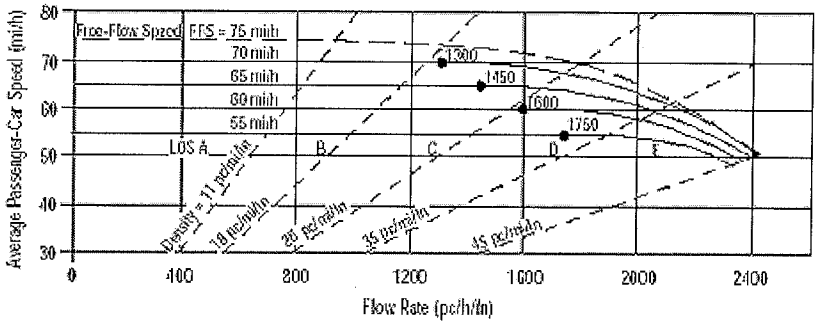

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*6/3/09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5490*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3040*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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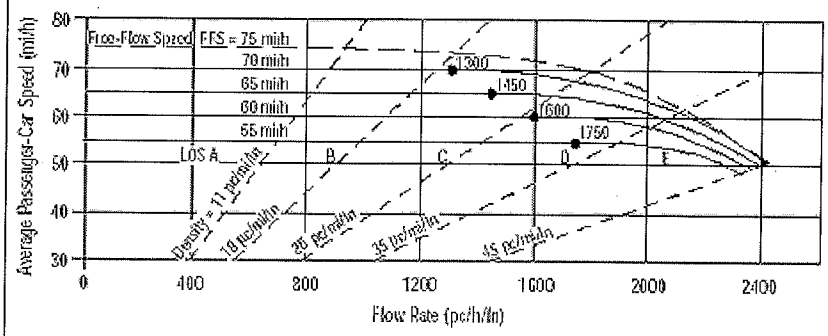

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/28/2009*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5020*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2717*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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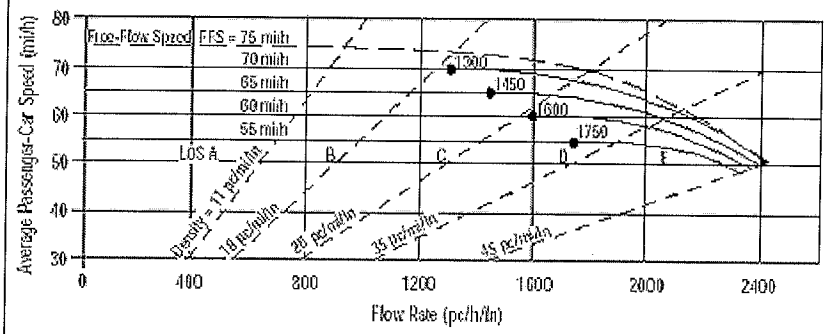

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/28/2009*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3740*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2111*	pc/h/ln
S	*62.8*	mi/h
D = v_p / S	*33.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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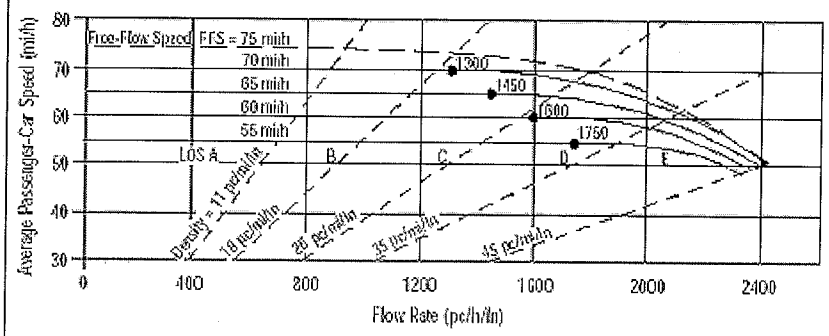

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/28/2009*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3520*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1925*	pc/h/ln
S	*66.0*	mi/h
D = v_p / S	*29.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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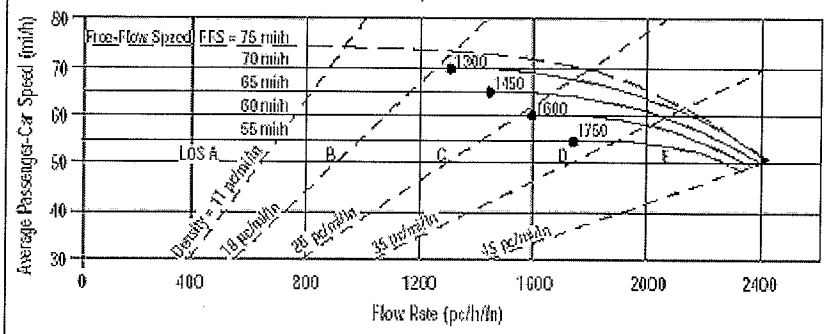

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*7/28/2009*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5240*	veh/h	Peak-Hour Factor, PHF	*0.98*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*	
Driver type adjustment	*1.00*		Up/Down %		

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2807*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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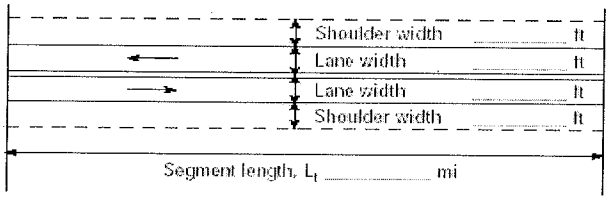
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JBB*	Highway	*Route 138*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Foundry Street/Robinson Street*
Date Performed	*5/14/08*	Jurisdiction	*Easton*
Analysis Time Period	*AM Peak*	Analysis Year	*2008*

Project Description: *South Coast Rail - EIR/EIS*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1570* veh/h
Directional split	*77 / 23*
Peak-hour factor, PHF	*0.94*
No-passing zone	*0*
% Trucks and Buses , P_T	*7%*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*0*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1682*
v_p * highest directional split proportion[2] (pc/h)	*1295*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*42 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*487 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*45.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.7*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*31.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1682*
v_p * highest directional split proportion[2] (pc/h)	*1295*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*77.2*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*0.0*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*77.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3,200$	*0.53*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*835*
Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*3140*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*26.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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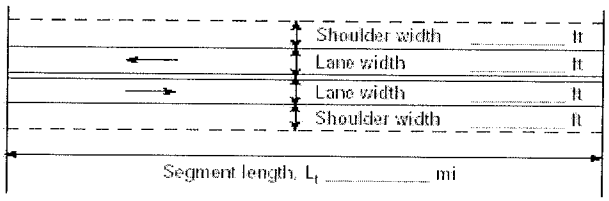
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JBB*	Highway	*Route 138*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Foundry Street/Robinson Street*
Date Performed	*5/14/08*	Jurisdiction	*Easton*
Analysis Time Period	*PM Peak*	Analysis Year	*2008*

Project Description: *South Coast Rail - EIR/EIS*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1750* veh/h
Directional split	*64 / 36*
Peak-hour factor, PHF	*0.92*
No-passing zone	*0*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*0*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1915*
v_p * highest directional split proportion[2] (pc/h)	*1226*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*42 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*296 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*44.3 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.7*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*27.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1915*
v_p * highest directional split proportion[2] (pc/h)	*1226*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*81.4*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*0.0*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*81.4*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.60*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*951*
Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*3500*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*34.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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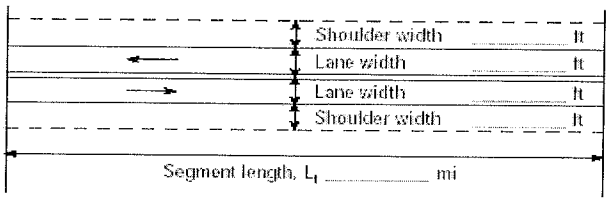
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JBB	Highway	Route 138
Agency or Company	Coler & Colantonio, Inc.	From/To	Washington Street / Bay Street
Date Performed	5/14/09	Jurisdiction	Taunton
Analysis Time Period	AM Peak	Analysis Year	2030

Project Description: South Coast Rail - EIR/EIS

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	1510 veh/h
Directional split	50 / 50
Peak-hour factor, PHF	0.96
No-passing zone	0
% Trucks and Buses , P_T	4 %
% Recreational vehicles, P_R	0%
Access points/ mi	5

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	1579
v_p * highest directional split proportion[2] (pc/h)	790

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	37 mi/h	Base free-flow speed, $BFFS_{FM}$	mi/h
Observed volume, V_f	495 veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	mi/h
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	mi/h	Adj. for access points, f_A (Exhibit 20-6)	mi/h
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	40.9 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	1.7
Average travel speed, ATS (mi/h) $ATS=FFS-0.00776v_p-f_{np}$	26.9

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	1579
v_p * highest directional split proportion[2] (pc/h)	790
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	75.0
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	0.0
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	75.0

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	D
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	0.49
Peak 15-min veh-miles of travel, VMT_{15} (veh- mi) $VMT_{15}=0.25L_t(V/PHF)$	157
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	604
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	5.8

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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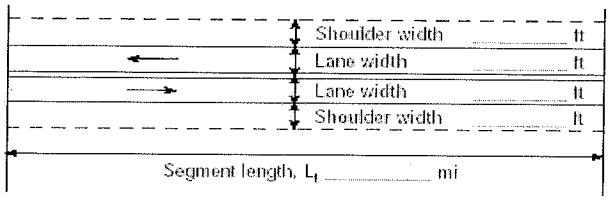
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JBB*	Highway	*Route 138*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Washington Street / Bay Street*
Date Performed	*5/14/09*	Jurisdiction	*Taunton*
Analysis Time Period	*PM Peak*	Analysis Year	*2008*

Project Description: *South Coast Rail - EIR/EIS*

Input Data



☐ Class I highway ☐ Class II highway

Terrain ☐ Level ☐ Rolling

Two-way hourly volume	*1760* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.97*
No-passing zone	*0*
% Trucks and Buses , P_T	*4 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*5*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1822*
v_p * highest directional split proportion[2] (pc/h)	*1020*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*37 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*408 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*40.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.7*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*24.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1822*
v_p * highest directional split proportion[2] (pc/h)	*1020*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*79.8*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*0.0*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*79.8*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.57*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*181*
Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*704*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*7.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	918	42	79	1132	43	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.993				0.946	
Flt Protected				0.997	0.971	
Satd. Flow (prot)	3485	0	0	3501	1978	0
Flt Permitted				0.997	0.971	
Satd. Flow (perm)	3485	0	0	3501	1978	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	600			600	423	
Travel Time (s)	9.1			9.1	9.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%
Adj. Flow (vph)	956	44	82	1179	45	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1000	0	0	1261	75	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			10	16	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	0.85
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 74.5% ICU Level of Service D
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	918	42	79	1132	43	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	956	44	82	1179	45	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1000		1732	500
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1000		1732	500
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		37	94
cM capacity (veh/h)			700		71	522

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	638	362	475	786	75
Volume Left	0	0	82	0	45
Volume Right	0	44	0	0	30
cSH	1700	1700	700	1700	109
Volume to Capacity	0.38	0.21	0.12	0.46	0.69
Queue Length 95th (ft)	0	0	10	0	90
Control Delay (s)	0.0	0.0	3.2	0.0	90.7
Lane LOS			A		F
Approach Delay (s)	0.0		1.2		90.7
Approach LOS					F

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1147	79	72	1022	36	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.990				0.904	
Flt Protected				0.997	0.986	
Satd. Flow (prot)	3476	0	0	3501	1919	0
Flt Permitted				0.997	0.986	
Satd. Flow (perm)	3476	0	0	3501	1919	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	600			600	423	
Travel Time (s)	9.1			9.1	9.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%
Adj. Flow (vph)	1207	83	76	1076	38	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1290	0	0	1152	133	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			10	16	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	0.85
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 82.1% ICU Level of Service E
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1147	79	72	1022	36	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1207	83	76	1076	38	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1291		1938	645
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1291		1938	645
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		25	77
cM capacity (veh/h)			544		51	420

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	805	486	434	717	133
Volume Left	0	0	76	0	38
Volume Right	0	83	0	0	95
cSH	1700	1700	544	1700	136
Volume to Capacity	0.47	0.29	0.14	0.42	0.98
Queue Length 95th (ft)	0	0	12	0	171
Control Delay (s)	0.0	0.0	4.1	0.0	133.9
Lane LOS			A		F
Approach Delay (s)	0.0		1.5		133.9
Approach LOS					F

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	4	0	249	18	0	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991			
Flt Protected	0.950					
Satd. Flow (prot)	2046	0	1883	0	0	1900
Flt Permitted	0.950					
Satd. Flow (perm)	2046	0	1883	0	0	1900
Link Speed (mph)	30		30			30
Link Distance (ft)	100		540			313
Travel Time (s)	2.3		12.3			7.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	4	0	277	20	0	330
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	297	0	0	330
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	16		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.85	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 25.6% ICU Level of Service A
Analysis Period (min) 15

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	0	249	18	0	297
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	0	277	20	0	330
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	617	287			297	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	617	287			297	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	457	757			1276	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	297	330
Volume Left	4	0	0
Volume Right	0	20	0
cSH	457	1700	1276
Volume to Capacity	0.01	0.17	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.0	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.0	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	63	4	388	20	2	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.992		0.993			
Flt Protected	0.955					
Satd. Flow (prot)	2040	0	1887	0	0	1900
Flt Permitted	0.955					
Satd. Flow (perm)	2040	0	1887	0	0	1900
Link Speed (mph)	30		30			30
Link Distance (ft)	100		540			313
Travel Time (s)	2.3		12.3			7.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	68	4	422	22	2	470
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	444	0	0	472
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	16		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.85	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.7% ICU Level of Service A
Analysis Period (min) 15

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	63	4	388	20	2	432
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	4	422	22	2	470
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	907	433			443	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	907	433			443	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	99			100	
cM capacity (veh/h)	308	627			1127	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	443	472
Volume Left	68	0	2
Volume Right	4	22	0
cSH	318	1700	1127
Volume to Capacity	0.23	0.26	0.00
Queue Length 95th (ft)	22	0	0
Control Delay (s)	19.7	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	19.7	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*JGM*
Agency/Co.	*Coler & Colantonio*
Date Performed	*6/26/2009*
Analysis Time Period	*AM Peak*

Site Information

Intersection	*Whale's Tooth Access*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description *South Coast Rail*

East/West Street: *Site Drive* | North/South Street: *Acushnet Avenue*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		*99*	*125*	*76*	*61*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*99*	*125*	*76*	*61*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				*9*		*18*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*9*	*0*	*18*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*67*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*76*		*27*				
C (m) (vph)		*1357*		*683*				
v/c		*0.06*		*0.04*				
95% queue length		*0.18*		*0.12*				
Control Delay		*7.8*		*10.5*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.5*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*JGM*
Agency/Co.	*Coler & Colantonio*
Date Performed	*6/26/2009*
Analysis Time Period	*PM Peak*

Site Information

Intersection	*Whale's Tooth Access*
Jurisdiction	*New Bedford*
Analysis Year	*2030*

Project Description *South Coast Rail*

East/West Street: *Site Drive* | North/South Street: *Acushnet Avenue*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		*83*	*6*	*21*	*127*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*83*	*6*	*21*	*127*	*0*
Percent Heavy Vehicles	*0*	--	--	*57*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				*122*		*79*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*122*	*0*	*79*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*10*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*21*		*201*				
C (m) (vph)		*1222*		*800*				
v/c		*0.02*		*0.25*				
95% queue length		*0.05*		*0.99*				
Control Delay		*8.0*		*11.0*				
LOS		*A*		*B*				
Approach Delay	--	--	*11.0*					
Approach LOS	--	--	*B*					

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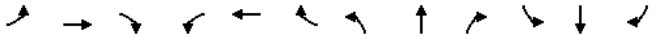
Capacity Analysis Results Build Condition

Fall River



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	11	5	436	16	0	0	0	0	434	522	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		238			272			1959			1114	
Travel Time (s)		5.4			6.2			44.5			25.3	
Peak Hour Factor	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	28	0	257	256	0	0	0	0	0	1092	0
Turn Type				Split						Perm		
Protected Phases		2		6	6						4	
Permitted Phases										4		
Detector Phase		2		6	6					4	4	
Switch Phase												
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0	
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0	
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0
Total Split (%)	0.0%	20.5%	0.0%	25.6%	25.6%	0.0%	0.0%	0.0%	0.0%	32.1%	32.1%	0.0%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0	
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		Min	Min					C-Max	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.18		0.74	0.69						0.60	
Control Delay		27.8		44.0	39.4						19.0	
Queue Delay		0.0		6.6	7.1						0.0	
Total Delay		27.8		50.6	46.5						19.0	
Queue Length 50th (ft)		9		115	112						155	
Queue Length 95th (ft)		19		#242	#227						#434	
Internal Link Dist (ft)		158			192			1879			1034	
Turn Bay Length (ft)												
Base Capacity (vph)		241		345	372						1812	
Starvation Cap Reductn		0		52	77						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.12		0.88	0.87						0.60	

Intersection Summary	
Area Type:	Other

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	22%
Maximum Green (s)	14.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	4.0
Pedestrian Calls (#/hr)	5
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

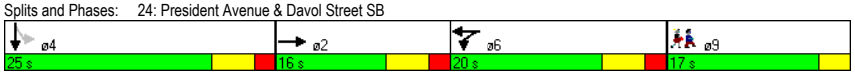
Intersection Summary

Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

2030 Build Condition - AM Peak Hour

Cycle Length: 78
Actuated Cycle Length: 78
Offset: 5 (6%), Referenced to phase 4:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 24: President Avenue & Davol Street SB

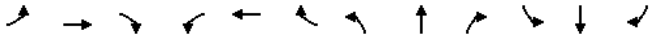


HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	11	5	436	16	0	0	0	0	434	522	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0		6.0	6.0						6.0	
Lane Util. Factor		1.00		0.95	0.95						0.95	
Frt		0.96		1.00	1.00						1.00	
Flt Protected		1.00		0.95	0.96						0.98	
Satd. Flow (prot)		1818		1569	1693						3477	
Flt Permitted		1.00		0.95	0.96						0.98	
Satd. Flow (perm)		1818		1569	1693						3477	
Peak-hour factor, PHF	0.57	0.57	0.57	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	19	9	495	18	0	0	0	0	493	593	6
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	19	0	257	256	0	0	0	0	0	1091	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	1%	0%
Turn Type				Split						Perm		
Protected Phases		2		6	6						4	
Permitted Phases										4		
Actuated Green, G (s)		3.0		17.1	17.1						34.7	
Effective Green, g (s)		3.0		17.1	17.1						34.7	
Actuated g/C Ratio		0.04		0.22	0.22						0.44	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		70		344	371						1547	
v/s Ratio Prot		c0.01		c0.16	0.15							
v/s Ratio Perm											0.31	
v/c Ratio		0.28		0.75	0.69						0.71	
Uniform Delay, d1		36.4		28.4	28.0						17.5	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		2.1		8.6	5.4						2.7	
Delay (s)		38.6		37.0	33.5						20.2	
Level of Service		D		D	C						C	
Approach Delay (s)		38.6			35.2			0.0			20.2	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	412	0	0	352	203	100	492	308	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12
Storage Length (ft)	0		0	0		165	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		272			959			475			333	
Travel Time (s)		6.2			21.8			10.8			7.6	
Peak Hour Factor	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	541	0	0	400	231	0	644	335	0	0	0
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Detector Phase	5	2			6	6	3	3	3			
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0			
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0			
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.42			0.28	0.35		0.60	0.67			
Control Delay		18.2			16.5	18.8		23.4	28.2			
Queue Delay		0.7			0.0	0.0		0.0	0.0			
Total Delay		18.9			16.5	18.8		23.4	28.2			
Queue Length 50th (ft)		92			63	72		130	132			
Queue Length 95th (ft)		135			106	141		159	192			
Internal Link Dist (ft)		192			879			395			253	
Turn Bay Length (ft)						165			125			
Base Capacity (vph)		1273			1410	653		1349	633			
Starvation Cap Reductn		405			0	0		0	0			
Spillback Cap Reductn		0			0	0		0	0			
Storage Cap Reductn		0			0	0		0	0			
Reduced v/c Ratio		0.62			0.28	0.35		0.48	0.53			

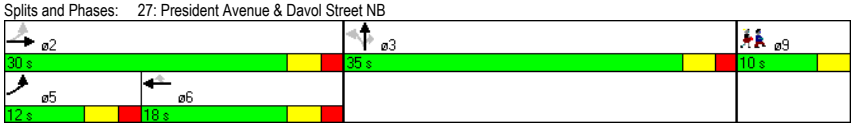
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	10.0
Total Split (s)	10.0
Total Split (%)	13%
Maximum Green (s)	7.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	4.0
Flash Dont Walk (s)	3.0
Pedestrian Calls (#/hr)	7
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 Build Condition - AM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	412	0	0	352	203	100	492	308	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3383			3388	1568		3371	1583			
Flt Permitted		0.90			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3057			3388	1568		3371	1583			
Peak-hour factor, PHF	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	502	0	0	400	231	109	535	335	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	541	0	0	400	231	0	644	335	0	0	0
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		31.2			31.2	31.2		23.8	23.8			
Effective Green, g (s)		31.2			31.2	31.2		23.8	23.8			
Actuated g/C Ratio		0.42			0.42	0.42		0.32	0.32			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1272			1409	652		1070	502			
v/s Ratio Prot					0.12							
v/s Ratio Perm		c0.18				0.15		0.19	c0.21			
v/c Ratio		0.43			0.28	0.35		0.60	0.67			
Uniform Delay, d1		15.5			14.5	15.0		21.6	22.2			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.2			0.5	1.5		1.0	3.3			
Delay (s)		15.8			15.0	16.5		22.6	25.5			
Level of Service		B			B	B		C	C			
Approach Delay (s)		15.8			15.6			23.6			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	143	507	71	54	355	70	102	193	75	107	166	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12
Storage Length (ft)	0		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		959			1952			265			1409	
Travel Time (s)		21.8			44.4			6.0			32.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	665	0	62	488	0	0	425	0	0	481	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Detector Phase	1	1		1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.62	0.71		0.47	0.52			0.89			1.01	
Control Delay	32.5	24.4		33.7	18.8			49.7			73.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	32.5	24.4		33.7	18.8			49.7			73.4	
Queue Length 50th (ft)	43	184		15	116			152			183	
Queue Length 95th (ft)	#172	#461		#81	298			#429			#398	
Internal Link Dist (ft)		879			1872			185			1329	
Turn Bay Length (ft)				125								
Base Capacity (vph)	280	989		140	993			478			476	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	

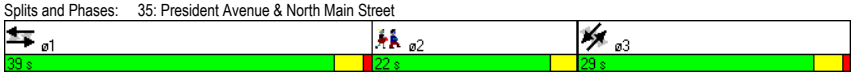
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	24%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	20
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.59	0.67		0.44	0.49			0.89			1.01	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 75.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: President Avenue & North Main Street



Lane Group	ø2
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	143	507	71	54	355	70	102	193	75	107	166	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	2070		1805	2066			1923			1961	
Flt Permitted	0.31	1.00		0.15	1.00			0.70			0.68	
Satd. Flow (perm)	584	2070		294	2066			1373			1360	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Adj. Flow (vph)	164	583	82	62	408	80	117	222	86	143	221	117
RTOR Reduction (vph)	0	0	0	0	7	0	0	9	0	0	12	0
Lane Group Flow (vph)	164	665	0	62	481	0	0	416	0	0	469	0
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	34.0	34.0		34.0	34.0			25.7			25.7	
Effective Green, g (s)	34.0	34.0		34.0	34.0			25.7			25.7	
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.33			0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	258	913		130	911			458			453	
v/s Ratio Prot		c0.32			0.23							
v/s Ratio Perm	0.28			0.21				0.30			c0.34	
v/c Ratio	0.64	0.73		0.48	0.53			0.91			1.04	
Uniform Delay, d1	16.7	17.7		15.3	15.7			24.6			25.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.0	3.6		5.7	1.1			23.3			51.7	
Delay (s)	23.7	21.3		20.9	16.8			47.8			77.4	
Level of Service	C	C		C	B			D			E	
Approach Delay (s)		21.8			17.2			47.8			77.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	37.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	17.4
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Fall River Depot Station & Davol Street NB

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	51	765	210	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	55	841	231	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						1021
pX, platoon unblocked						
vC, conflicting volume	956	536			1071	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	956	536			1071	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	256	489			646	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	55	560	511
Volume Left	0	0	0
Volume Right	55	0	231
cSH	489	1700	1700
Volume to Capacity	0.11	0.33	0.30
Queue Length 95th (ft)	10	0	0
Control Delay (s)	13.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.3	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		37.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2030 Build Condition - AM Peak Hour

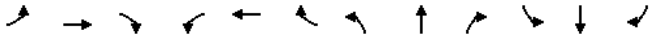
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	280	48	11	68	30	193
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.90	0.90	0.62	0.62	0.78	0.78
Hourly flow rate (vph)	311	53	18	110	38	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	307	162	286			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307	162	286			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	54	94	99			
cM capacity (veh/h)	677	888	1288			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	364	127	286
Volume Left	311	18	0
Volume Right	53	0	247
cSH	702	1288	1700
Volume to Capacity	0.52	0.01	0.17
Queue Length 95th (ft)	76	1	0
Control Delay (s)	15.5	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.5	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		7.5	
Intersection Capacity Utilization		46.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Water Street

2030 Build Condition - AM Peak Hour



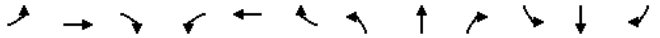
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	21	0	39	11	5	5	12	332	21	171	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.72	0.72	0.72	0.91	0.91	0.91	0.87	0.87	0.87
Hourly flow rate (vph)	0	33	0	54	15	7	5	13	365	24	197	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	478	646	209	480	476	196	221			378		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	646	209	480	476	196	221			378		
tC, single (s)	7.1	6.7	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	91	100	88	97	99	100			98		
cM capacity (veh/h)	476	365	837	457	479	851	1360			1164		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	33	76	384	245
Volume Left	0	54	5	24
Volume Right	0	7	365	24
cSH	365	481	1360	1164
Volume to Capacity	0.09	0.16	0.00	0.02
Queue Length 95th (ft)	7	14	0	2
Control Delay (s)	15.8	13.9	0.1	1.0
Lane LOS	C	B	A	A
Approach Delay (s)	15.8	13.9	0.1	1.0
Approach LOS	C	B		

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	39.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2030 Build Condition - AM Peak Hour



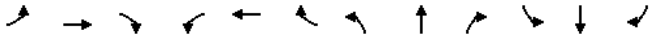
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	75	107	140	0	327	0	0	474	86
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.76	0.76	0.86	0.86	0.86	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	0	99	141	184	0	380	0	0	592	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1281	1026	646	1026	1080	380	700			380		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1281	1026	646	1026	1080	380	700			380		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	53	35	72	100			100		
cM capacity (veh/h)	49	236	475	211	216	662	906			1189		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	169	255	380	700
Volume Left	99	0	0	0
Volume Right	0	184	0	108
cSH	213	422	906	1700
Volume to Capacity	0.79	0.60	0.00	0.41
Queue Length 95th (ft)	142	96	0	0
Control Delay (s)	65.9	25.7	0.0	0.0
Lane LOS	F	D		
Approach Delay (s)	41.7		0.0	0.0
Approach LOS	E			

Intersection Summary				
Average Delay	11.8			
Intersection Capacity Utilization	46.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	40	147	192	27	33	21	11	153	75	237	296	33
Peak Hour Factor	0.94	0.94	0.94	0.76	0.76	0.76	0.84	0.84	0.84	0.81	0.81	0.81
Hourly flow rate (vph)	43	156	204	36	43	28	13	182	89	293	365	41

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	403	107	285	699
Volume Left (vph)	43	36	13	293
Volume Right (vph)	204	28	89	41
Hadj (s)	0.04	-0.02	-0.16	0.07
Departure Headway (s)	6.9	7.9	6.9	6.6
Degree Utilization, x	0.78	0.23	0.54	1.28
Capacity (veh/h)	507	399	494	534
Control Delay (s)	29.9	13.3	17.8	159.1
Approach Delay (s)	29.9	13.3	17.8	159.1
Approach LOS	D	B	C	F

Intersection Summary				
Delay			86.9	
HCM Level of Service			F	
Intersection Capacity Utilization			76.9%	ICU Level of Service
Analysis Period (min)			15	D

HCM Unsignalized Intersection Capacity Analysis
20: Battleship Cove Station driveway & Ponta Delgada

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	13	21	329	21	13	198
Sign Control	Stop		Free			Free
Grade	0%		0%			1%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	23	358	23	14	215
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	612	369			380	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	612	369			380	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	97			99	
cM capacity (veh/h)	451	677			1178	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	37	380	229
Volume Left	14	0	14
Volume Right	23	23	0
cSH	568	1700	1178
Volume to Capacity	0.07	0.22	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	11.8	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	11.8	0.0	0.6
Approach LOS	B		

Intersection Summary				
Average Delay			0.9	
Intersection Capacity Utilization			31.1%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	69	906	166	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.68	0.68	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	101	996	182	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1087	589			1178	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1087	589			1178	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	77			100	
cM capacity (veh/h)	214	434			600	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	101	664	514
Volume Left	0	0	0
Volume Right	101	0	182
cSH	434	1700	1700
Volume to Capacity	0.23	0.39	0.30
Queue Length 95th (ft)	22	0	0
Control Delay (s)	15.8	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.8	0.0	
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & Davol Street NB

2030 Build Condition - AM Peak Hour

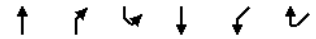
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	80	819	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	0	87	900	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	900	450			900	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	900	450			900	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			100	
cM capacity (veh/h)	282	559			763	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	87	450	450
Volume Left	0	0	0
Volume Right	87	0	0
cSH	559	1700	1700
Volume to Capacity	0.16	0.26	0.26
Queue Length 95th (ft)	14	0	0
Control Delay (s)	12.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.6	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
85: Davol St. SB & U-turn to SB Davol St

2030 Build Condition - AM Peak Hour



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	786	21	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.75	0.75
Hourly flow rate (vph)	0	0	0	914	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		457	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		457	0
tC, single (s)			4.1		7.1	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1636		503	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	457	457	28
Volume Left	0	0	28
Volume Right	0	0	0
cSH	1700	1700	503
Volume to Capacity	0.27	0.27	0.06
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	12.6
Lane LOS			B
Approach Delay (s)	0.0		12.6
Approach LOS			B

Intersection Summary				
Average Delay			0.4	
Intersection Capacity Utilization			53.6%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
88: Davol St. NB & U-turn to NB Davol St

2030 Build Condition - AM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	890	0	0	177	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.72	0.72
Hourly flow rate (vph)	0	989	0	0	246	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				494	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				494	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				51	100
cM capacity (veh/h)	1636				507	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	494	494	246
Volume Left	0	0	246
Volume Right	0	0	0
cSH	1700	1700	507
Volume to Capacity	0.29	0.29	0.49
Queue Length 95th (ft)	0	0	65
Control Delay (s)	0.0	0.0	18.6
Lane LOS			C
Approach Delay (s)	0.0		18.6
Approach LOS			C

Intersection Summary				
Average Delay			3.7	
Intersection Capacity Utilization			58.1%	ICU Level of Service B
Analysis Period (min)			15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	431	5	0	0	0	0	546	541	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		238			272			1959			1114	
Travel Time (s)		5.4			6.2			44.5			25.3	
Peak Hour Factor	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	0	0	259	254	0	0	0	0	0	1208	0
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Detector Phase		2		6	6					4	4	
Switch Phase												
Minimum Initial (s)		4.0		12.0	12.0					12.0	12.0	
Minimum Split (s)		10.0		18.0	18.0					18.0	18.0	
Total Split (s)	0.0	16.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0
Total Split (%)	0.0%	21.3%	0.0%	26.7%	26.7%	0.0%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)		10.0		14.0	14.0					19.0	19.0	
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	
All-Red Time (s)		2.0		2.0	2.0					2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	6.0	6.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		Min	Min					C-Max	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio				0.47	0.43						0.77	
Control Delay				27.6	26.6						24.3	
Queue Delay				2.8	2.6						0.0	
Total Delay				30.4	29.2						24.4	
Queue Length 50th (ft)				116	111						210	
Queue Length 95th (ft)				174	168						#523	
Internal Link Dist (ft)		158			192			1879			1034	
Turn Bay Length (ft)												
Base Capacity (vph)				553	593						1576	
Starvation Cap Reductn				191	228						0	
Spillback Cap Reductn				0	0						11	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.72	0.70						0.77	

Intersection Summary	
Area Type:	Other

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	19%
Maximum Green (s)	11.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	5
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
24: President Avenue & Davol Street SB

2030 Build Condition - PM Peak Hour

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 5 (7%), Referenced to phase 4:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

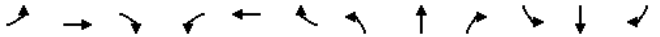
Splits and Phases: 24: President Avenue & Davol Street SB

HCM Signalized Intersection Capacity Analysis
24: President Avenue & Davol Street SB

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	431	5	0	0	0	0	546	541	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)				6.0	6.0						6.0	
Lane Util. Factor				0.95	0.95						0.95	
Frt				1.00	1.00						1.00	
Flt Protected				0.95	0.95						0.98	
Satd. Flow (prot)				1600	1721						3453	
Flt Permitted				0.95	0.95						0.98	
Satd. Flow (perm)				1600	1715						3453	
Peak-hour factor, PHF	0.38	0.38	0.38	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	507	6	0	0	0	0	607	601	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	259	254	0	0	0	0	0	1208	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)				25.9	25.9						31.9	
Effective Green, g (s)				25.9	25.9						31.9	
Actuated g/C Ratio				0.35	0.35						0.43	
Clearance Time (s)				6.0	6.0						6.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)				553	592						1469	
v/s Ratio Prot												
v/s Ratio Perm				c0.16	0.15						0.35	
v/c Ratio				0.47	0.43						0.82	
Uniform Delay, d1				19.2	18.9						19.0	
Progression Factor				1.30	1.30						1.00	
Incremental Delay, d2				0.6	0.5						5.3	
Delay (s)				25.5	24.9						24.4	
Level of Service				C	C						C	
Approach Delay (s)		0.0			25.2			0.0			24.4	
Approach LOS		A			C			A			C	

Intersection Summary				
HCM Average Control Delay	24.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	17.2	
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	509	0	0	291	364	146	666	371	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12
Storage Length (ft)	0		0	0		165	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		272			959			475			333	
Travel Time (s)		6.2			21.8			10.8			7.6	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	593	0	0	327	409	0	934	426	0	0	0
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Detector Phase	5	2			6	6	3	3	3			
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0			
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	16.0%	40.0%	0.0%	0.0%	24.0%	24.0%	46.7%	46.7%	46.7%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0			
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.53			0.27	0.72		0.72	0.70			
Control Delay		21.2			18.5	30.7		23.5	26.5			
Queue Delay		0.6			0.0	0.0		0.2	0.0			
Total Delay		21.9			18.5	30.7		23.6	26.5			
Queue Length 50th (ft)		37			57	168		183	157			
Queue Length 95th (ft)		m192			88	#299		235	242			
Internal Link Dist (ft)		192			879			395			253	
Turn Bay Length (ft)						165			125			
Base Capacity (vph)		1119			1232	570		1372	646			
Starvation Cap Reductn		223			0	0		0	0			
Spillback Cap Reductn		0			0	0		57	0			
Storage Cap Reductn		0			0	0		0	0			
Reduced v/c Ratio		0.66			0.27	0.72		0.71	0.66			

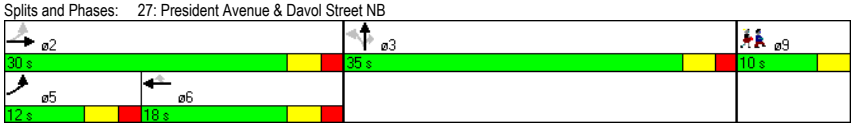
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	10.0
Total Split (s)	10.0
Total Split (%)	13%
Maximum Green (s)	7.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	4.0
Flash Dont Walk (s)	3.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 Build Condition - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	509	0	0	291	364	146	666	371	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3439			3455	1599		3430	1615			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3135			3455	1599		3430	1615			
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	40	553	0	0	327	409	168	766	426	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	593	0	0	327	409	0	934	426	0	0	0
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		26.7			26.7	26.7		28.3	28.3			
Effective Green, g (s)		26.7			26.7	26.7		28.3	28.3			
Actuated g/C Ratio		0.36			0.36	0.36		0.38	0.38			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1116			1230	569		1294	609			
v/s Ratio Prot					0.09							
v/s Ratio Perm		0.19				c0.26		0.27	0.26			
v/c Ratio		0.53			0.27	0.72		0.72	0.70			
Uniform Delay, d1		19.2			17.2	20.9		20.0	19.8			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.3			0.5	7.6		2.0	3.5			
Delay (s)		19.5			17.7	28.5		22.0	23.3			
Level of Service		B			B	C		C	C			
Approach Delay (s)		19.5			23.7			22.4			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

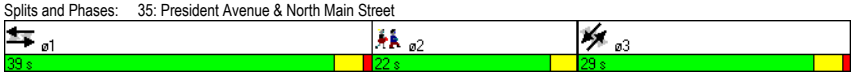
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	134	622	119	59	435	59	116	257	75	155	193	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12
Storage Length (ft)	0		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		959			1952			265			1409	
Travel Time (s)		21.8			44.4			6.0			32.0	
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	823	0	69	581	0	0	487	0	0	458	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Detector Phase	1	1		1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	43.3%	43.3%	0.0%	43.3%	43.3%	0.0%	32.2%	32.2%	0.0%	32.2%	32.2%	0.0%
Maximum Green (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.63	0.81		0.69	0.56			0.89			1.03	
Control Delay	32.2	25.7		57.1	17.1			43.8			76.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	32.2	25.7		57.1	17.1			43.8			76.5	
Queue Length 50th (ft)	41	256		20	148			178			179	
Queue Length 95th (ft)	#185	#724		#110	359			#510			#520	
Internal Link Dist (ft)		879			1872			185			1329	
Turn Bay Length (ft)				125								
Base Capacity (vph)	235	1016		100	1029			549			446	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	24%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	13
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.63	0.81		0.69	0.56			0.89			1.03	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 72.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 35: President Avenue & North Main Street



Lane Group	ø2
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	134	622	119	59	435	59	116	257	75	155	193	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1752	2074		1719	2092			2060			2027	
Flt Permitted	0.26	1.00		0.11	1.00			0.74			0.60	
Satd. Flow (perm)	479	2074		204	2092			1551			1246	
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	149	691	132	69	512	69	126	279	82	161	201	96
RTOR Reduction (vph)	0	0	0	0	5	0	0	7	0	0	10	0
Lane Group Flow (vph)	149	823	0	69	576	0	0	480	0	0	448	0
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)	35.4	35.4		35.4	35.4			25.3			25.3	
Effective Green, g (s)	35.4	35.4		35.4	35.4			25.3			25.3	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.34			0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)	227	982		97	990			525			421	
v/s Ratio Prot		c0.40			0.28							
v/s Ratio Perm	0.31			0.34				0.31			c0.36	
v/c Ratio	0.66	0.84		0.71	0.58			0.91			1.06	
Uniform Delay, d1	15.1	17.2		15.6	14.3			23.7			24.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.9	7.1		26.2	1.4			21.9			62.0	
Delay (s)	23.9	24.3		41.9	15.7			45.7			86.7	
Level of Service	C	C		D	B			D			F	
Approach Delay (s)		24.2			18.5			45.7			86.7	
Approach LOS		C			B			D			F	

Intersection Summary			
HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	14.1
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Fall River Depot Station driveway & North Davol Street

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	188	905	36	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	0	204	1006	40	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						980
pX, platoon unblocked						
vC, conflicting volume	1026	523			1046	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1026	523			1046	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	59			100	
cM capacity (veh/h)	231	499			661	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	204	670	375
Volume Left	0	0	0
Volume Right	204	0	40
cSH	499	1700	1700
Volume to Capacity	0.41	0.39	0.22
Queue Length 95th (ft)	49	0	0
Control Delay (s)	17.1	0.0	0.0
Lane LOS	C		
Approach Delay (s)	17.1	0.0	
Approach LOS	C		

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		44.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
4: Ferry Street & Ponta Delgada

2030 Build Condition - PM Peak Hour

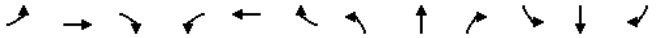
Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	165	32	16	17	29	303
Sign Control	Stop		Free		Free	
Grade	1%		1%		1%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.74	0.74
Hourly flow rate (vph)	185	36	18	19	39	409
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	298	244	449			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298	244	449			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	96	98			
cM capacity (veh/h)	685	800	1122			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	221	36	449
Volume Left	185	18	0
Volume Right	36	0	409
cSH	701	1122	1700
Volume to Capacity	0.32	0.02	0.26
Queue Length 95th (ft)	34	1	0
Control Delay (s)	12.5	4.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.5	4.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		4.1	
Intersection Capacity Utilization		44.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Anawan Street & Water Street

2030 Build Condition - PM Peak Hour



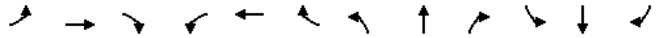
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	27	5	74	0	5	0	11	177	37	242	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.67	0.67	0.67	0.91	0.91	0.91	0.78	0.78	0.78
Hourly flow rate (vph)	0	39	7	110	0	7	0	12	195	47	310	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	529	619	317	548	529	109	324			207		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	529	619	317	548	529	109	324			207		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	90	99	72	100	99	100			97		
cM capacity (veh/h)	448	383	728	401	442	950	1247			1359		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	46	118	207	372
Volume Left	0	110	0	47
Volume Right	7	7	195	14
cSH	413	416	1247	1359
Volume to Capacity	0.11	0.28	0.00	0.03
Queue Length 95th (ft)	9	29	0	3
Control Delay (s)	14.8	17.0	0.0	1.3
Lane LOS	B	C		A
Approach Delay (s)	14.8	17.0	0.0	1.3
Approach LOS	B	C		

Intersection Summary					
Average Delay			4.3		
Intersection Capacity Utilization			48.0%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
9: Central Street & Davol Street

2030 Build Condition - PM Peak Hour



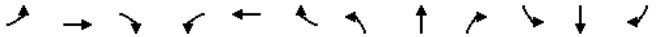
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	129	118	279	5	343	0	0	473	123
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.86	0.86	0.86	0.78	0.78	0.78	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	150	137	324	6	440	0	0	526	137
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1439	1046	594	1046	1115	440	662			440		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1439	1046	594	1046	1115	440	662			440		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	27	33	48	99			100		
cM capacity (veh/h)	24	229	509	205	205	622	936			1131		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	219	393	446	662
Volume Left	150	0	6	0
Volume Right	0	324	0	137
cSH	205	459	936	1700
Volume to Capacity	1.07	0.86	0.01	0.39
Queue Length 95th (ft)	248	218	1	0
Control Delay (s)	130.4	44.4	0.2	0.0
Lane LOS	F	E	A	
Approach Delay (s)	75.1		0.2	0.0
Approach LOS	F			

Intersection Summary					
Average Delay			26.8		
Intersection Capacity Utilization			55.0%	ICU Level of Service	B
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
10: Anawan Street & Davol Street

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	125	94	56	102	45	60	5	164	91	182	380	39
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.94	0.94	0.94	0.85	0.85	0.85
Hourly flow rate (vph)	144	108	64	134	59	79	5	174	97	214	447	46

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	316	272	277	707
Volume Left (vph)	144	134	5	214
Volume Right (vph)	64	79	97	46
Hadj (s)	0.01	-0.06	-0.18	0.04
Departure Headway (s)	7.6	7.7	7.5	7.1
Degree Utilization, x	0.67	0.59	0.58	1.40
Capacity (veh/h)	449	433	449	502
Control Delay (s)	24.9	21.1	20.2	211.1
Approach Delay (s)	24.9	21.1	20.2	211.1
Approach LOS	C	C	C	F

Intersection Summary				
Delay			107.1	
HCM Level of Service			F	
Intersection Capacity Utilization			75.5%	ICU Level of Service
Analysis Period (min)			15	D

HCM Unsignalized Intersection Capacity Analysis
20: Battleship Cove Station driveway & Ponta Delgada

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	9	173	9	16	305
Sign Control	Stop		Free			Free
Grade	0%		0%			1%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	10	188	10	17	332
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	559	193			198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	559	193			198	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			99	
cM capacity (veh/h)	484	849			1375	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	198	349
Volume Left	17	0	17
Volume Right	10	10	0
cSH	572	1700	1375
Volume to Capacity	0.05	0.12	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	11.6	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	11.6	0.0	0.5
Approach LOS	B		

Intersection Summary				
Average Delay			0.9	
Intersection Capacity Utilization			39.1%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
29: Turner Street & Davol Street NB

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	63	878	123	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	0	112	976	137	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1044	556			1112	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1044	556			1112	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	76			100	
cM capacity (veh/h)	228	474			635	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	112	650	462
Volume Left	0	0	0
Volume Right	112	0	137
cSH	474	1700	1700
Volume to Capacity	0.24	0.38	0.27
Queue Length 95th (ft)	23	0	0
Control Delay (s)	14.9	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.9	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Pearce Street & North Davol Street

2030 Build Condition - PM Peak Hour

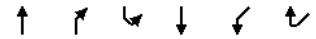
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	75	1108	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.67	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	0	112	1288	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						475
pX, platoon unblocked						
vC, conflicting volume	1288	644			1288	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1288	644			1288	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	73			100	
cM capacity (veh/h)	158	418			545	

Direction, Lane #	WB 1	NB 1	NB 2
Volume Total	112	644	644
Volume Left	0	0	0
Volume Right	112	0	0
cSH	418	1700	1700
Volume to Capacity	0.27	0.38	0.38
Queue Length 95th (ft)	27	0	0
Control Delay (s)	16.7	0.0	0.0
Lane LOS	C		
Approach Delay (s)	16.7	0.0	
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
85: Davol St SB & U-Turn to SB U-turn to SB Davol St

2030 Build Condition - PM Peak Hour



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	0	865	21	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	0	0	0	940	42	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		470	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		470	0
tC, single (s)			4.1		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		92	100
cM capacity (veh/h)			1636		502	1091

Direction, Lane #	SB 1	SB 2	SW 1
Volume Total	470	470	42
Volume Left	0	0	42
Volume Right	0	0	0
cSH	1700	1700	502
Volume to Capacity	0.28	0.28	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.0	12.8
Lane LOS			B
Approach Delay (s)	0.0		12.8
Approach LOS			B

Intersection Summary				
Average Delay			0.5	
Intersection Capacity Utilization			56.5%	ICU Level of Service B
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
88: Davol St NB & U-turn to NB Davol St

2030 Build Condition - PM Peak Hour

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Volume (veh/h)	0	915	0	0	86	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	0	1028	0	0	97	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				514	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				514	0
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				80	100
cM capacity (veh/h)	1636				488	1091

Direction, Lane #	NB 1	NB 2	NE 1
Volume Total	514	514	97
Volume Left	0	0	97
Volume Right	0	0	0
cSH	1700	1700	488
Volume to Capacity	0.30	0.30	0.20
Queue Length 95th (ft)	0	0	18
Control Delay (s)	0.0	0.0	14.2
Lane LOS			B
Approach Delay (s)	0.0		14.2
Approach LOS			B

Intersection Summary				
Average Delay			1.2	
Intersection Capacity Utilization			58.4%	ICU Level of Service B
Analysis Period (min)			15	

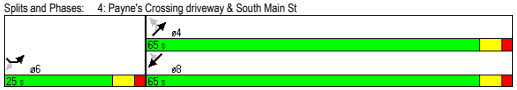
Freetown

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	5	5	5	327	489	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	381			1115	461	
Travel Time (s)	8.7			25.3	10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	5	5	355	532	0
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	25.0	25.0	65.0	65.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	59.0	59.0	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.02	0.05	0.01	0.24	0.36	
Control Delay	39.4	25.4	1.8	2.6	0.9	
Queue Delay	0.0	0.0	0.0	0.0	0.1	
Total Delay	39.4	25.4	1.8	2.6	1.0	
Queue Length 50th (ft)	1	0	0	35	2	
Queue Length 95th (ft)	7	11	2	58	12	
Internal Link Dist (ft)	301			1035	381	
Turn Bay Length (ft)			200			
Base Capacity (vph)	725	338	683	1496	1496	
Starvation Cap Reductn	0	0	0	0	249	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.01	0.01	0.24	0.43	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 33 (37%), Referenced to phase 4:NETL and 8:SWT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 4: Payne's Crossing driveway & South Main St



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	5	5	5	327	489	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1583	1770	1863	1863	
Flt Permitted	0.95	1.00	0.46	1.00	1.00	
Satd. Flow (perm)	3433	1583	851	1863	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	5	5	355	532	0
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	5	0	5	355	532	0
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	5.8	5.8	72.2	72.2	72.2	
Effective Green, g (s)	5.8	5.8	72.2	72.2	72.2	
Actuated g/C Ratio	0.06	0.06	0.80	0.80	0.80	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	221	102	683	1495	1495	
v/s Ratio Prot	c0.00			0.19	c0.29	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.02	0.00	0.01	0.24	0.36	
Uniform Delay, d1	39.4	39.4	1.8	2.2	2.5	
Progression Factor	1.00	1.00	1.00	1.00	0.08	
Incremental Delay, d2	0.0	0.0	0.0	0.4	0.7	
Delay (s)	39.5	39.4	1.8	2.5	0.9	
Level of Service	D	D	A	A	A	
Approach Delay (s)	39.4			2.5	0.9	
Approach LOS	D			A	A	

Intersection Summary

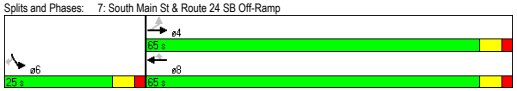
HCM Average Control Delay	2.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	46	286	466	875	120	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	16	12
Storage Length (ft)	0			240	0	0
Storage Lanes	1			2	1	1
Taper Length (ft)	25			25	25	25
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		461	773		388	
Travel Time (s)		10.5	17.6		8.8	
Peak Hour Factor	0.85	0.85	0.87	0.87	0.91	0.91
Heavy Vehicles (%)	9%	11%	12%	2%	15%	24%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	54	336	536	1006	132	25
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Detector Phase	4	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	65.0	65.0	65.0	65.0	25.0	25.0
Total Split (%)	72.2%	72.2%	72.2%	72.2%	27.8%	27.8%
Maximum Green (s)	59.0	59.0	59.0	59.0	19.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.09	0.27	0.23	0.67	0.56	0.13
Control Delay	4.4	4.6	0.6	0.7	45.0	14.3
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0
Total Delay	4.4	4.6	0.6	1.9	45.0	14.3
Queue Length 50th (ft)	7	52	5	0	71	0
Queue Length 95th (ft)	18	74	m5	m0	122	21
Internal Link Dist (ft)		381	693		308	
Turn Bay Length (ft)				240		
Base Capacity (vph)	580	1256	2365	1507	376	295
Starvation Cap Reductn	0	0	0	271	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.27	0.23	0.81	0.35	0.08

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 20 (22%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 7: South Main St & Route 24 SB Off-Ramp



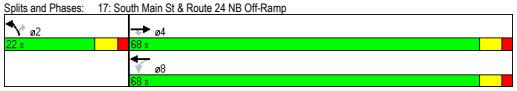
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	46	286	466	875	120	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	16	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	1712	3223	1689	1779	1302
Flt Permitted	0.45	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	789	1712	3223	1689	1779	1302
Peak-hour factor, PHF	0.85	0.85	0.87	0.87	0.91	0.91
Adj. Flow (vph)	54	336	536	1006	132	25
RTOR Reduction (vph)	0	0	0	268	0	22
Lane Group Flow (vph)	54	336	536	738	132	3
Heavy Vehicles (%)	9%	11%	12%	2%	15%	24%
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	66.0	66.0	66.0	66.0	12.0	12.0
Effective Green, g (s)	66.0	66.0	66.0	66.0	12.0	12.0
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	579	1255	2364	1239	237	174
v/s Ratio Prot		0.20	0.17		c0.07	
v/s Ratio Perm	0.07			c0.44		0.00
v/c Ratio	0.09	0.27	0.23	0.60	0.56	0.02
Uniform Delay, d1	3.4	4.0	3.8	5.7	36.5	33.9
Progression Factor	0.94	0.90	0.13	1.08	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.0	0.2	2.8	0.0
Delay (s)	3.6	4.1	0.5	6.3	39.3	33.9
Level of Service	A	A	A	A	D	C
Approach Delay (s)		4.0	4.3		38.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	333	63	120	1317	23	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	15	16	16
Storage Length (ft)		200	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	773			446	481	
Travel Time (s)	17.6			10.1	10.9	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80
Heavy Vehicles (%)	7%	26%	10%	3%	33%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	406	77	136	1497	29	644
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	68.0	68.0	68.0	68.0	22.0	22.0
Total Split (%)	75.6%	75.6%	75.6%	75.6%	24.4%	24.4%
Maximum Green (s)	62.0	62.0	62.0	62.0	16.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.32	0.07	0.21	1.03	0.13	0.92
Control Delay	4.1	0.5	5.8	47.4	32.9	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	0.5	5.8	47.4	32.9	28.7
Queue Length 50th (ft)	54	0	25	~954	14	68
Queue Length 95th (ft)	70	3	47	#1163	34	137
Internal Link Dist (ft)	693			366	401	
Turn Bay Length (ft)		200	100			
Base Capacity (vph)	1272	1063	633	1454	273	733
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.07	0.21	1.03	0.11	0.88

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: South Main St & Route 24 NB Off-Ramp



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	333	63	120	1317	23	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	15	16	16
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1453	1641	2029	1538	1760
Flt Permitted	1.00	1.00	0.51	1.00	0.95	1.00
Satd. Flow (perm)	1776	1453	884	2029	1538	1760
Peak-hour factor, PHF	0.82	0.82	0.88	0.88	0.80	0.80
Adj. Flow (vph)	406	77	136	1497	29	644
RTOR Reduction (vph)	0	22	0	0	0	434
Lane Group Flow (vph)	406	55	136	1497	29	210
Heavy Vehicles (%)	7%	26%	10%	3%	33%	4%
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	64.5	64.5	64.5	64.5	13.5	13.5
Effective Green, g (s)	64.5	64.5	64.5	64.5	13.5	13.5
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.15	0.15
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1273	1041	634	1454	231	264
v/s Ratio Prot	0.23			c0.74	0.02	
v/s Ratio Perm		0.04	0.15			c0.12
v/c Ratio	0.32	0.05	0.21	1.03	0.13	0.79
Uniform Delay, d1	4.7	3.8	4.3	12.8	33.1	36.9
Progression Factor	0.66	0.29	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.8	31.5	0.2	15.1
Delay (s)	3.7	1.2	5.0	44.3	33.4	52.0
Level of Service	A	A	A	D	C	D
Approach Delay (s)	3.3			41.0	51.2	
Approach LOS	A			D	D	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

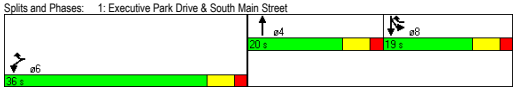
Lanes, Volumes, Timings
1: Executive Park Drive & South Main Street

2030 Build Condition - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	1404	242	40	197	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Storage Length (ft)	0	0		0	200	
Storage Lanes	1	2		1	1	
Taper Length (ft)	100	100		100	100	
Right Turn on Red		No		No		
Link Speed (mph)	35		35			35
Link Distance (ft)	285		553			804
Travel Time (s)	5.6		10.8			15.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	11	1478	297	0	186	201
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Detector Phase	6	6 8	4		8	8
Switch Phase						
Minimum Initial (s)	6.0		6.0		6.0	6.0
Minimum Split (s)	12.0		12.0		12.0	12.0
Total Split (s)	36.0	55.0	20.0	0.0	19.0	19.0
Total Split (%)	48.0%	73.3%	26.7%	0.0%	25.3%	25.3%
Maximum Green (s)	30.0		14.0		13.0	13.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	C-Max		None		None	None
v/c Ratio	0.01	0.84	0.82		0.70	0.68
Control Delay	5.8	14.9	49.3		45.5	42.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.8	14.9	49.3		45.5	42.2
Queue Length 50th (ft)	1	118	133		86	93
Queue Length 95th (ft)	m4	192	#255		#181	#185
Internal Link Dist (ft)	205		473			724
Turn Bay Length (ft)					200	
Base Capacity (vph)	752	1763	371		265	297
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.01	0.84	0.80		0.70	0.68

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 6:WBL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1: Executive Park Drive & South Main Street



HCM Signalized Intersection Capacity Analysis
1: Executive Park Drive & South Main Street

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	10	1404	242	40	197	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.88	1.00		0.95	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	0.99
Satd. Flow (prot)	1796	2623	1855		1528	1711
Flt Permitted	0.95	1.00	1.00		0.95	0.99
Satd. Flow (perm)	1796	2623	1855		1528	1711
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	1478	255	42	207	180
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	11	1478	297	0	186	201
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Actuated Green, G (s)	30.4	49.4	13.6		13.0	13.0
Effective Green, g (s)	31.4	50.4	14.6		13.0	13.0
Actuated g/C Ratio	0.42	0.67	0.19		0.17	0.17
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	752	1763	361		265	297
v/s Ratio Prot	0.01	c0.56	c0.16		0.12	0.12
v/s Ratio Perm						
v/c Ratio	0.01	0.84	0.82		0.70	0.68
Uniform Delay, d1	12.8	9.2	29.0		29.2	29.0
Progression Factor	0.44	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	3.4	14.0		8.1	6.0
Delay (s)	5.7	12.6	43.0		37.3	35.0
Level of Service	A	B	D		D	D
Approach Delay (s)	12.6		43.0			36.1
Approach LOS	B		D			D

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

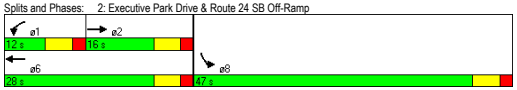
Lanes, Volumes, Timings
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	87	0	181	770	0	0	0	0	1575	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Storage Length (ft)	0		0	0		0	0		0	0		300
Storage Lanes	0		1	2		0	0		0	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		307			406			405			737	
Travel Time (s)		6.0			7.9			7.9			14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	0	191	811	0	0	0	0	1658	0	0
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Detector Phase		2		1	6					8		
Switch Phase												
Minimum Initial (s)		10.0		6.0	10.0					10.0		
Minimum Split (s)		16.0		12.0	16.0					16.0		
Total Split (s)	0.0	16.0	0.0	12.0	28.0	0.0	0.0	0.0	0.0	47.0	0.0	0.0
Total Split (%)	0.0%	21.3%	0.0%	16.0%	37.3%	0.0%	0.0%	0.0%	0.0%	62.7%	0.0%	0.0%
Maximum Green (s)		10.0		6.0	22.0					41.0		
Yellow Time (s)		4.0		4.0	4.0					4.0		
All-Red Time (s)		2.0		2.0	2.0					2.0		
Lost Time Adjust (s)	0.0	0.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Recall Mode		C-Max		None	C-Max					None		
v/c Ratio		0.20		0.59	0.77					0.92		
Control Delay		8.7		49.0	43.2					25.5		
Queue Delay		0.0		0.0	0.0					0.0		
Total Delay		8.7		49.0	43.2					25.5		
Queue Length 50th (ft)		4		50	188					329		
Queue Length 95th (ft)		m11		m62	m228					#506		
Internal Link Dist (ft)		227			326			325			657	
Turn Bay Length (ft)												
Base Capacity (vph)		458		322	1052					1830		
Starvation Cap Reductn		0		0	0					0		
Spillback Cap Reductn		0		0	0					0		
Storage Cap Reductn		0		0	0					0		
Reduced v/c Ratio		0.20		0.59	0.77					0.91		

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Executive Park Drive & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	87	0	181	770	0	0	0	0	1575	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Total Lost time (s)		6.0		5.0	5.0					6.0		
Lane Util. Factor		0.95		0.97	0.95					0.97		
Frt		1.00		1.00	1.00					1.00		
Flt Protected		1.00		0.95	1.00					0.95		
Satd. Flow (prot)		3276		3450	3359					3347		
Flt Permitted		1.00		0.95	1.00					0.95		
Satd. Flow (perm)		3276		3450	3359					3347		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	92	0	191	811	0	0	0	0	1658	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	92	0	191	811	0	0	0	0	1658	0	0
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Actuated Green, G (s)		10.5		6.0	22.5					40.5		
Effective Green, g (s)		10.5		7.0	23.5					40.5		
Actuated g/C Ratio		0.14		0.09	0.31					0.54		
Clearance Time (s)		6.0		6.0	6.0					6.0		
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Lane Grp Cap (vph)		459		322	1052					1807		
v/s Ratio Prot		0.03		0.06	c0.24					c0.50		
v/s Ratio Perm												
v/c Ratio		0.20		0.59	0.77					0.92		
Uniform Delay, d1		28.5		32.6	23.3					15.7		
Progression Factor		0.27		1.32	1.65					1.00		
Incremental Delay, d2		0.7		2.0	3.7					7.8		
Delay (s)		8.5		45.1	42.2					23.6		
Level of Service		A		D	D					C		
Approach Delay (s)		8.5			42.7			0.0			23.6	
Approach LOS		A			D			A			C	

Intersection Summary			
HCM Average Control Delay	30.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

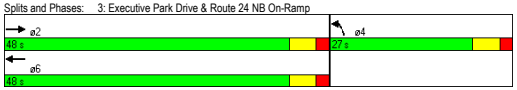
Lanes, Volumes, Timings
3: Executive Park Drive & Route 24 NB On-Ramp

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1575	0	0	170	0	785	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Storage Length (ft)	0		0	0		0	400		615	0		0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		352			205			1194			650	
Travel Time (s)		6.9			4.0			23.3			12.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1658	0	0	179	0	826	0	0	0	0	0
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Detector Phase		2			6		4					
Switch Phase												
Minimum Initial (s)		10.0			10.0		6.0					
Minimum Split (s)		16.0			16.0		12.0					
Total Split (s)	0.0	48.0	0.0	0.0	48.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	64.0%	0.0%	0.0%	64.0%	0.0%	36.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		42.0			42.0		21.0					
Yellow Time (s)		4.0			4.0		4.0					
All-Red Time (s)		2.0			2.0		2.0					
Lost Time Adjust (s)	0.0	-1.0	0.0	0.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0					
Recall Mode		C-Max			C-Max		None					
v/c Ratio		0.81			0.09		0.88					
Control Delay		6.9			7.3		38.1					
Queue Delay		0.0			0.0		0.0					
Total Delay		6.9			7.3		38.1					
Queue Length 50th (ft)		73			17		186					
Queue Length 95th (ft)		m126			31		#285					
Internal Link Dist (ft)		272			125			1114			570	
Turn Bay Length (ft)							400					
Base Capacity (vph)		2039			2059		956					
Starvation Cap Reductn		0			0		0					
Spillback Cap Reductn		0			0		0					
Storage Cap Reductn		0			0		0					
Reduced v/c Ratio		0.81			0.09		0.86					

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 20 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Executive Park Drive & Route 24 NB On-Ramp



HCM Signalized Intersection Capacity Analysis
3: Executive Park Drive & Route 24 NB On-Ramp

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1575	0	0	170	0	785	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Total Lost time (s)		5.0			5.0		5.0					
Lane Util. Factor		0.95			0.95		0.97					
Frt		1.00			1.00		1.00					
Flt Protected		1.00			1.00		0.95					
Satd. Flow (prot)		3522			3557		3259					
Flt Permitted		1.00			1.00		0.95					
Satd. Flow (perm)		3522			3557		3259					
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1658	0	0	179	0	826	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1658	0	0	179	0	826	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Actuated Green, G (s)		42.4			42.4		20.6					
Effective Green, g (s)		43.4			43.4		21.6					
Actuated g/C Ratio		0.58			0.58		0.29					
Clearance Time (s)		6.0			6.0		6.0					
Vehicle Extension (s)		3.0			3.0		3.0					
Lane Grp Cap (vph)		2038			2058		939					
v/s Ratio Prot		c0.47			0.05		c0.25					
v/s Ratio Perm												
v/c Ratio		0.81			0.09		0.88					
Uniform Delay, d1		12.6			7.0		25.5					
Progression Factor		0.39			1.00		1.00					
Incremental Delay, d2		1.8			0.1		9.4					
Delay (s)		6.6			7.1		34.9					
Level of Service		A			A		C					
Approach Delay (s)		6.6			7.1			34.9			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Narrows Rd & South Main St

2030 Build Conditions - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	145	48	17	182	379	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.75	0.75	0.79	0.79
Hourly flow rate (vph)	177	59	23	243	480	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1115	
pX, platoon unblocked						
vC, conflicting volume	831	543	606			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	831	543	606			
tC, single (s)	6.5	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.5	2.3			
p0 queue free %	45	88	98			
cM capacity (veh/h)	320	506	934			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	235	265	606
Volume Left	177	23	0
Volume Right	59	0	127
cSH	352	934	1700
Volume to Capacity	0.67	0.02	0.36
Queue Length 95th (ft)	115	2	0
Control Delay (s)	33.6	1.0	0.0
Lane LOS	D	A	
Approach Delay (s)	33.6	1.0	0.0
Approach LOS	D		

Intersection Summary				
Average Delay			7.4	
Intersection Capacity Utilization			43.7%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
5: Freetown Station driveway & S. Main St.

2030 Build Conditions - AM Peak Hour

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	12	14	199	41	57	415
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	13	15	249	51	71	519
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	936	274			300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	936	274			300	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			94	
cM capacity (veh/h)	278	764			1273	

Direction, Lane #	NW 1	NW 2	NE 1	SW 1
Volume Total	13	15	300	590
Volume Left	13	0	0	71
Volume Right	0	15	51	0
cSH	278	764	1700	1273
Volume to Capacity	0.05	0.02	0.18	0.06
Queue Length 95th (ft)	4	2	0	4
Control Delay (s)	18.6	9.8	0.0	1.5
Lane LOS	C	A		A
Approach Delay (s)	13.9		0.0	1.5
Approach LOS	B			

Intersection Summary				
Average Delay			1.4	
Intersection Capacity Utilization			51.3%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
11: Copicut Rd & South Main St

2030 Build Conditions - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	5	194	5	5	432
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	43	5	242	6	6	540
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	798	246			249	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	798	246			249	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	99			100	
cM capacity (veh/h)	353	793			1317	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	49	249	546
Volume Left	43	0	6
Volume Right	5	6	0
cSH	377	1700	1317
Volume to Capacity	0.13	0.15	0.00
Queue Length 95th (ft)	11	0	0
Control Delay (s)	16.0	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	16.0	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		36.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2030 Build Conditions - AM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	20	5	155	70	0	20	35	546	267	75	1212	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.59	0.59	0.59	0.84	0.84	0.84	0.95	0.95	0.95
Hourly flow rate (vph)	26	7	204	119	0	34	42	650	318	79	1276	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								446				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	2362	2488	1278	2536	2331	809	1281			968		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2426	2561	1278	2612	2393	758	1281			928		
tC, single (s)	7.1	7.0	6.2	7.3	6.5	6.4	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.4	3.3	3.7	4.0	3.5	2.3			2.3		
p0 queue free %	0	53	0	0	100	90	92			88		
cM capacity (veh/h)	16	14	202	0	26	346	506			663		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	237	153	1010	1360
Volume Left	26	119	42	79
Volume Right	204	34	318	5
cSH	76	0	506	663
Volume to Capacity	3.13	Err	0.08	0.12
Queue Length 95th (ft)	Err	Err	7	10
Control Delay (s)	Err	Err	2.9	5.7
Lane LOS	F	F	A	A
Approach Delay (s)	9999.0	Err	2.9	5.7
Approach LOS	F	F		

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		118.5%	ICU Level of Service H
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High St

2030 Build Conditions - AM Peak Hour

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	5	545	5	5	1247	5	0	0	0	60	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.25	0.25	0.25	0.64	0.64	0.64
Hourly flow rate (vph)	5	586	5	5	1286	5	0	0	0	94	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1291			591			1914	1901	1288	1898	1900	589
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1291			591			1914	1901	1288	1898	1900	589
tC, single (s)	4.1			5.1			7.1	6.5	6.2	7.3	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			3.1			3.5	4.0	3.3	3.7	4.0	3.5
p0 queue free %	99			99			100	100	100	0	100	97
cM capacity (veh/h)	544			641			50	69	202	47	69	481

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	597	1296	0	109
Volume Left	5	5	0	94
Volume Right	5	5	0	16
cSH	544	641	1700	54
Volume to Capacity	0.01	0.01	0.00	2.01
Queue Length 95th (ft)	1	1	0	267
Control Delay (s)	0.3	0.4	0.0	631.5
Lane LOS	A	A	A	F
Approach Delay (s)	0.3	0.4	0.0	631.5
Approach LOS			A	F

Intersection Summary					
Average Delay			34.8		
Intersection Capacity Utilization			79.7%	ICU Level of Service	D
Analysis Period (min)			15		

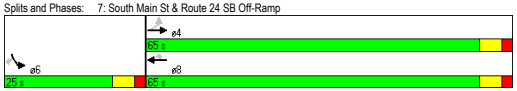
Lanes, Volumes, Timings
7: South Main St & Route 24 SB Off-Ramp

2030 Build Conditions - PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	214	694	606	485	155	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	12	12
Storage Length (ft)	0			240	0	0
Storage Lanes	1			2	1	1
Taper Length (ft)	25			25	25	25
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		496	772		360	
Travel Time (s)		11.3	17.5		8.2	
Peak Hour Factor	0.88	0.88	0.94	0.94	0.79	0.79
Heavy Vehicles (%)	8%	6%	6%	3%	6%	13%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	243	789	645	516	196	90
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Detector Phase	4	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	65.0	65.0	65.0	65.0	25.0	25.0
Total Split (%)	72.2%	72.2%	72.2%	72.2%	27.8%	27.8%
Maximum Green (s)	59.0	59.0	59.0	59.0	19.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.49	0.63	0.27	0.39	0.69	0.29
Control Delay	9.0	9.1	4.4	1.0	47.5	9.4
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	9.0	9.6	4.4	1.0	47.5	9.4
Queue Length 50th (ft)	31	275	43	5	105	0
Queue Length 95th (ft)	73	333	m64	m3	145	28
Internal Link Dist (ft)		416	692		280	
Turn Bay Length (ft)				240		
Base Capacity (vph)	498	1253	2382	1324	360	373
Starvation Cap Reductn	0	153	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.72	0.27	0.39	0.54	0.24

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 88 (98%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 7: South Main St & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
7: South Main St & Route 24 SB Off-Ramp

2030 Build Conditions - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	214	694	606	485	155	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1671	1792	3406	1672	1703	1429
Flt Permitted	0.40	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	712	1792	3406	1672	1703	1429
Peak-hour factor, PHF	0.88	0.88	0.94	0.94	0.79	0.79
Adj. Flow (vph)	243	789	645	516	196	90
RTOR Reduction (vph)	0	0	0	155	0	75
Lane Group Flow (vph)	243	789	645	361	196	15
Heavy Vehicles (%)	8%	6%	6%	3%	6%	13%
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	62.9	62.9	62.9	62.9	15.1	15.1
Effective Green, g (s)	62.9	62.9	62.9	62.9	15.1	15.1
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	498	1252	2380	1169	286	240
v/s Ratio Prot		c0.44	0.19		c0.12	
v/s Ratio Perm	0.34			0.22		0.01
v/c Ratio	0.49	0.63	0.27	0.31	0.69	0.06
Uniform Delay, d1	6.2	7.3	5.0	5.2	35.2	31.5
Progression Factor	0.76	0.82	0.78	0.92	1.00	1.00
Incremental Delay, d2	3.1	2.2	0.2	0.4	6.7	0.1
Delay (s)	7.8	8.2	4.1	5.2	41.9	31.6
Level of Service	A	A	A	A	D	C
Approach Delay (s)		8.1	4.6		38.6	
Approach LOS		A	A		D	

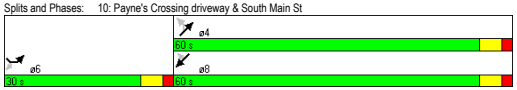
Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: Payne's Crossing driveway & South Main St — 2030 Build Conditions - PM Peak Hour

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	385	125	120	523	312	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	75	200			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	230			1086	496	
Travel Time (s)	5.2			24.7	11.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	418	136	130	568	339	397
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Maximum Green (s)	24.0	24.0	54.0	54.0	54.0	54.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.66	0.34	0.19	0.45	0.27	0.33
Control Delay	39.1	7.9	6.7	8.4	2.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	7.9	6.7	8.5	2.4	0.9
Queue Length 50th (ft)	115	0	23	126	11	0
Queue Length 95th (ft)	153	44	54	229	29	0
Internal Link Dist (ft)	150			1006	416	
Turn Bay Length (ft)		75	200			
Base Capacity (vph)	915	522	701	1272	1272	1207
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.26	0.19	0.45	0.27	0.33

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 13 (14%), Referenced to phase 4:NETL and 8:SWT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 10: Payne's Crossing driveway & South Main St



HCM Signalized Intersection Capacity Analysis
10: Payne's Crossing driveway & South Main St — 2030 Build Conditions - PM Peak Hour

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	385	125	120	523	312	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	1863	1863	1583
Flt Permitted	0.95	1.00	0.55	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1027	1863	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	418	136	130	568	339	397
RTOR Reduction (vph)	0	111	0	0	0	126
Lane Group Flow (vph)	418	25	130	568	339	271
Turn Type		Perm	Perm			Perm
Protected Phases	6			4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	16.5	16.5	61.5	61.5	61.5	61.5
Effective Green, g (s)	16.5	16.5	61.5	61.5	61.5	61.5
Actuated g/C Ratio	0.18	0.18	0.68	0.68	0.68	0.68
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	629	290	702	1273	1273	1082
v/s Ratio Prot	c0.12			c0.30	0.18	
v/s Ratio Perm		0.02	0.13			0.17
v/c Ratio	0.66	0.09	0.19	0.45	0.27	0.25
Uniform Delay, d1	34.2	30.5	5.2	6.5	5.5	5.4
Progression Factor	1.00	1.00	1.00	1.00	0.30	0.27
Incremental Delay, d2	2.7	0.1	0.6	1.1	0.5	0.5
Delay (s)	36.8	30.6	5.7	7.6	2.2	2.0
Level of Service	D	C	A	A	A	A
Approach Delay (s)	35.3			7.3	2.1	
Approach LOS	D			A	A	

Intersection Summary

HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

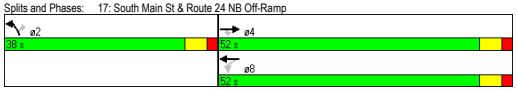
Lanes, Volumes, Timings
17: South Main St & Route 24 NB Off-Ramp

2030 Build Conditions - PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	708	140	140	895	206	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	15	16	16
Storage Length (ft)		200	100		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	772			440	420	
Travel Time (s)	17.5			10.0	9.5	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.95	0.95
Heavy Vehicles (%)	4%	13%	4%	4%	16%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	833	165	149	952	217	879
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%
Maximum Green (s)	46.0	46.0	46.0	46.0	32.0	32.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min
v/c Ratio	0.89	0.18	1.48	0.93	0.35	1.22
Control Delay	24.2	2.7	284.1	37.1	23.3	136.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	2.7	284.1	37.1	23.3	136.9
Queue Length 50th (ft)	185	4	~118	477	89	~574
Queue Length 95th (ft)	#511	18	#183	#756	148	#805
Internal Link Dist (ft)	692			360	340	
Turn Bay Length (ft)		200	100			
Base Capacity (vph)	934	899	101	1027	627	720
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.18	1.48	0.93	0.35	1.22

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green, Master Intersection	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 17: South Main St & Route 24 NB Off-Ramp



HCM Signalized Intersection Capacity Analysis
17: South Main St & Route 24 NB Off-Ramp

2030 Build Conditions - PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	708	140	140	895	206	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	15	16	16
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1620	1736	2010	1764	1794
Flt Permitted	1.00	1.00	0.11	1.00	0.95	1.00
Satd. Flow (perm)	1827	1620	197	2010	1764	1794
Peak-hour factor, PHF	0.85	0.85	0.94	0.94	0.95	0.95
Adj. Flow (vph)	833	165	149	952	217	879
RTOR Reduction (vph)	0	71	0	0	0	82
Lane Group Flow (vph)	833	94	149	952	217	797
Heavy Vehicles (%)	4%	13%	4%	4%	16%	2%
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	46.0	46.0	46.0	46.0	32.0	32.0
Effective Green, g (s)	46.0	46.0	46.0	46.0	32.0	32.0
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.36	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	934	828	101	1027	627	638
v/s Ratio Prot	0.46			0.47	0.12	
v/s Ratio Perm		0.06	c0.76			c0.44
v/c Ratio	0.89	0.11	1.48	0.93	0.35	1.25
Uniform Delay, d1	19.8	11.4	22.0	20.4	21.3	29.0
Progression Factor	0.62	0.82	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.4	0.2	259.5	15.2	0.3	125.0
Delay (s)	22.6	9.6	281.5	35.6	21.6	154.0
Level of Service	C	A	F	D	C	F
Approach Delay (s)	20.5			68.9	127.8	
Approach LOS	C			E	F	

Intersection Summary			
HCM Average Control Delay	74.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

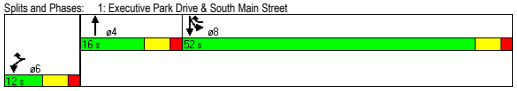
Lanes, Volumes, Timings
1: Executive Park Drive & South Main Street

2030 Build Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	25	248	198	20	1440	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Storage Length (ft)	0	0		0	200	
Storage Lanes	1	2		0	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		No		No		
Link Speed (mph)	35		35			35
Link Distance (ft)	282		553			804
Travel Time (s)	5.5		10.8			15.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Shared Lane Traffic (%)					41%	
Lane Group Flow (vph)	26	261	229	0	894	902
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Detector Phase	6	6 8	4		8	8
Switch Phase						
Minimum Initial (s)	6.0		6.0		6.0	6.0
Minimum Split (s)	12.0		12.0		12.0	12.0
Total Split (s)	12.0	64.0	16.0	0.0	52.0	52.0
Total Split (%)	15.0%	80.0%	20.0%	0.0%	65.0%	65.0%
Maximum Green (s)	6.0		10.0		46.0	46.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		None		C-Max	C-Max
v/c Ratio	0.17	0.13	0.89		1.02	0.99
Control Delay	32.9	3.1	70.6		54.3	45.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	32.9	3.1	70.6		54.3	45.5
Queue Length 50th (ft)	12	16	114		~461	427
Queue Length 95th (ft)	34	26	#240		#736	#725
Internal Link Dist (ft)	202		473			724
Turn Bay Length (ft)					200	
Base Capacity (vph)	157	1934	257		879	915
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.17	0.13	0.89		1.02	0.99

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 33 (41%), Referenced to phase 8:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Executive Park Drive & South Main Street



HCM Signalized Intersection Capacity Analysis
1: Executive Park Drive & South Main Street

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	25	248	198	20	1440	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%		-3%			4%
Total Lost time (s)	5.0	5.0	5.0		6.0	6.0
Lane Util. Factor	1.00	0.88	1.00		0.95	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	0.97
Satd. Flow (prot)	1796	2623	1867		1528	1590
Flt Permitted	0.95	1.00	1.00		0.95	0.97
Satd. Flow (perm)	1796	2623	1867		1528	1590
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	261	208	21	1516	280
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	26	261	229	0	894	902
Heavy Vehicles (%)	2%	10%	2%	2%	10%	2%
Turn Type		pt+ov			Split	
Protected Phases	6	6 8	4		8	8
Permitted Phases						
Actuated Green, G (s)	6.0	58.0	10.0		46.0	46.0
Effective Green, g (s)	7.0	59.0	11.0		46.0	46.0
Actuated g/C Ratio	0.09	0.74	0.14		0.57	0.57
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	157	1934	257		879	914
v/s Ratio Prot	0.01	c0.10	c0.12		c0.59	0.57
v/s Ratio Perm						
v/c Ratio	0.17	0.13	0.89		1.02	0.99
Uniform Delay, d1	33.8	3.1	33.9		17.0	16.7
Progression Factor	0.89	0.97	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.0	29.5		34.7	26.8
Delay (s)	30.7	3.0	63.4		51.7	43.5
Level of Service	C	A	E		D	D
Approach Delay (s)	5.5		63.4			47.6
Approach LOS	A		E			D

Intersection Summary			
HCM Average Control Delay	43.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

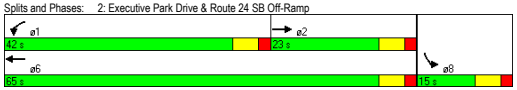
Lanes, Volumes, Timings
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	648	0	1398	135	0	0	0	0	235	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Storage Length (ft)	0		0	0		0	0		0	0		300
Storage Lanes	0		1	2		0	0		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		307			406			405			737	
Travel Time (s)		6.0			7.9			7.9			14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	682	0	1472	142	0	0	0	0	247	0	0
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Detector Phase		2		1	6					8		
Switch Phase												
Minimum Initial (s)		10.0		6.0	10.0					6.0		
Minimum Split (s)		16.0		12.0	16.0					12.0		
Total Split (s)	0.0	23.0	0.0	42.0	65.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
Total Split (%)	0.0%	28.8%	0.0%	52.5%	81.3%	0.0%	0.0%	0.0%	0.0%	18.8%	0.0%	0.0%
Maximum Green (s)		17.0		36.0	59.0					9.0		
Yellow Time (s)		4.0		4.0	4.0					4.0		
All-Red Time (s)		2.0		2.0	2.0					2.0		
Lost Time Adjust (s)	0.0	0.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Recall Mode		C-Max		None	C-Max					None		
v/c Ratio		0.96		0.93	0.06					0.67		
Control Delay		23.3		27.0	2.1					43.8		
Queue Delay		0.0		0.0	0.0					0.0		
Total Delay		23.3		27.0	2.1					43.8		
Queue Length 50th (ft)		158		200	5					61		
Queue Length 95th (ft)		m156		#496	8					#99		
Internal Link Dist (ft)		227			326			325			657	
Turn Bay Length (ft)												
Base Capacity (vph)		712		1596	2527					377		
Starvation Cap Reductn		0		0	0					0		
Spillback Cap Reductn		0		0	0					0		
Storage Cap Reductn		0		0	0					0		
Reduced v/c Ratio		0.96		0.92	0.06					0.66		

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Executive Park Drive & Route 24 SB Off-Ramp



HCM Signalized Intersection Capacity Analysis
2: Executive Park Drive & Route 24 SB Off-Ramp

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	648	0	1398	135	0	0	0	0	235	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		4%			-1%			0%			5%	
Total Lost time (s)		6.0		5.0	5.0					6.0		
Lane Util. Factor		0.95		0.97	0.95					0.97		
Frt		1.00		1.00	1.00					1.00		
Flt Protected		1.00		0.95	1.00					0.95		
Satd. Flow (prot)		3276		3450	3359					3347		
Flt Permitted		1.00		0.95	1.00					0.95		
Satd. Flow (perm)		3276		3450	3359					3347		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	682	0	1472	142	0	0	0	0	247	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	682	0	1472	142	0	0	0	0	247	0	0
Heavy Vehicles (%)	2%	8%	8%	2%	8%	2%	2%	2%	2%	2%	2%	8%
Turn Type			Free	Prot						Prot		Free
Protected Phases		2		1	6					8		
Permitted Phases			Free									Free
Actuated Green, G (s)		17.4		35.8	59.2					8.8		
Effective Green, g (s)		17.4		36.8	60.2					8.8		
Actuated g/C Ratio		0.22		0.46	0.75					0.11		
Clearance Time (s)		6.0		6.0	6.0					6.0		
Vehicle Extension (s)		3.0		3.0	3.0					3.0		
Lane Grp Cap (vph)		713		1587	2528					368		
v/s Ratio Prot		c0.21		c0.43	0.04					c0.07		
v/s Ratio Perm												
v/c Ratio		0.96		0.93	0.06					0.67		
Uniform Delay, d1		30.9		20.3	2.6					34.2		
Progression Factor		0.50		0.80	0.78					1.00		
Incremental Delay, d2		4.1		8.6	0.0					4.8		
Delay (s)		19.6		24.9	2.0					39.0		
Level of Service		B		C	A					D		
Approach Delay (s)		19.6			22.9			0.0			39.0	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

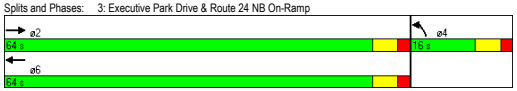
Lanes, Volumes, Timings
3: Executive Park Drive & Route 24 NB On-Ramp

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	0	0	1396	0	137	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Storage Length (ft)	0		0	0		0	400		615	0		0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		352			205			740			316	
Travel Time (s)		6.9			4.0			14.4			6.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	247	0	0	1469	0	144	0	0	0	0	0
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Detector Phase		2			6		4					
Switch Phase												
Minimum Initial (s)		10.0			10.0		6.0					
Minimum Split (s)		16.0			16.0		12.0					
Total Split (s)	0.0	64.0	0.0	0.0	64.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	80.0%	0.0%	0.0%	80.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		58.0			58.0		10.0					
Yellow Time (s)		4.0			4.0		4.0					
All-Red Time (s)		2.0			2.0		2.0					
Lost Time Adjust (s)	0.0	-1.0	0.0	0.0	-1.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0					
Recall Mode		C-Max			C-Max		None					
v/c Ratio		0.09			0.55		0.37					
Control Delay		10.1			5.2		34.8					
Queue Delay		0.0			0.0		0.0					
Total Delay		10.1			5.2		34.8					
Queue Length 50th (ft)		53			127		34					
Queue Length 95th (ft)		m62			179		60					
Internal Link Dist (ft)		272			125			660			236	
Turn Bay Length (ft)							400					
Base Capacity (vph)		2658			2685		448					
Starvation Cap Reductn		0			0		0					
Spillback Cap Reductn		0			0		0					
Storage Cap Reductn		0			0		0					
Reduced v/c Ratio		0.09			0.55		0.32					

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 35 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Executive Park Drive & Route 24 NB On-Ramp



HCM Signalized Intersection Capacity Analysis
3: Executive Park Drive & Route 24 NB On-Ramp

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	235	0	0	1396	0	137	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			-1%			0%	
Total Lost time (s)		5.0			5.0		5.0					
Lane Util. Factor		0.95			0.95		0.97					
Frt		1.00			1.00		1.00					
Flt Protected		1.00			1.00		0.95					
Satd. Flow (prot)		3522			3557		3259					
Flt Permitted		1.00			1.00		0.95					
Satd. Flow (perm)		3522			3557		3259					
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	247	0	0	1469	0	144	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	247	0	0	1469	0	144	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%	2%
Turn Type						Free	Prot		Free			
Protected Phases		2			6		4					
Permitted Phases						Free			Free			
Actuated Green, G (s)		59.4			59.4		8.6					
Effective Green, g (s)		60.4			60.4		9.6					
Actuated g/C Ratio		0.76			0.76		0.12					
Clearance Time (s)		6.0			6.0		6.0					
Vehicle Extension (s)		3.0			3.0		3.0					
Lane Grp Cap (vph)		2659			2686		391					
v/s Ratio Prot		0.07			c0.41		c0.04					
v/s Ratio Perm												
v/c Ratio		0.09			0.55		0.37					
Uniform Delay, d1		2.6			4.1		32.4					
Progression Factor		3.66			1.00		1.00					
Incremental Delay, d2		0.0			0.8		0.6					
Delay (s)		9.5			4.9		33.0					
Level of Service		A			A		C					
Approach Delay (s)		9.5			4.9			33.0			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Narrows Rd & South Main St

2030 Build Conditions - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	130	26	50	528	322	120
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	159	32	56	593	339	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked						
vC, conflicting volume	1108	402	465			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1108	402	465			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	27	95	95			
cM capacity (veh/h)	217	627	1107			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	190	649	465
Volume Left	159	56	0
Volume Right	32	0	126
cSH	243	1107	1700
Volume to Capacity	0.78	0.05	0.27
Queue Length 95th (ft)	144	4	0
Control Delay (s)	58.1	1.3	0.0
Lane LOS	F	A	
Approach Delay (s)	58.1	1.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		9.1	
Intersection Capacity Utilization		73.6%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
11: Copicut Rd & South Main St

2030 Build Conditions - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	30	533	40	30	318
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	33	579	43	33	346
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1012	601			623	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1012	601			623	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			97	
cM capacity (veh/h)	256	500			958	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	623	378
Volume Left	11	0	33
Volume Right	33	43	0
cSH	404	1700	958
Volume to Capacity	0.11	0.37	0.03
Queue Length 95th (ft)	9	0	3
Control Delay (s)	15.0	0.0	1.1
Lane LOS	B		A
Approach Delay (s)	15.0	0.0	1.1
Approach LOS	B		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		51.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
21: Ridge Hill Rd & South Main St

2030 Build Conditions - PM Peak Hour

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	95	260	0	70	40	1368	105	20	680	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	103	302	0	81	43	1487	114	23	782	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								440				
pX, platoon unblocked	0.56	0.56		0.56	0.56	0.56				0.56		
vC, conflicting volume	2540	2516	782	2562	2459	1544	782			1601		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3363	3320	782	3402	3217	1579	782			1681		
tC, single (s)	7.2	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	74	0	100	0	95			89		
cM capacity (veh/h)	0	4	396	1	5	76	845			215		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	114	384	1645	805
Volume Left	11	302	43	23
Volume Right	103	81	114	0
cSH	0	2	845	215
Volume to Capacity	Err	222.22	0.05	0.11
Queue Length 95th (ft)	Err	Err	4	9
Control Delay (s)	Err	Err	8.4	5.2
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	8.4	5.2
Approach LOS	F	F		

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			128.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
30: South Main St & High St

2030 Build Conditions - PM Peak Hour

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	0	1372	61	20	694	5	0	0	0	11	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.25	0.25	0.25	0.83	0.83	0.83
Hourly flow rate (vph)	0	1508	67	22	746	5	0	0	0	13	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	752			1575			2345	2367	749	2333	2336	1541
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752			1575			2345	2367	749	2333	2336	1541
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	100	47	100	92
cM capacity (veh/h)	867			404			22	34	415	25	35	143

Direction, Lane #	NB 1	SB 1	SE 1	NW 1
Volume Total	1575	773	0	25
Volume Left	0	22	0	13
Volume Right	67	5	0	12
cSH	867	404	1700	41
Volume to Capacity	0.00	0.05	0.00	0.61
Queue Length 95th (ft)	0	4	0	56
Control Delay (s)	0.0	1.7	0.0	183.0
Lane LOS		A	A	F
Approach Delay (s)	0.0	1.7	0.0	183.0
Approach LOS			A	F

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			85.9%	ICU Level of Service
Analysis Period (min)			15	

New Bedford

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	0	189	10	563	0	75	294	193	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	16	12	12	16	12
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1031			525			388			877	
Travel Time (s)		23.4			11.9			8.8			19.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Heavy Vehicles (%)	0%	20%	0%	7%	25%	5%	0%	9%	8%	5%	11%	60%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	242	687	0	393	0	233	241	0
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		8			4	4 1		2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4	4 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		27.0	27.0		19.0	22.0	
Total Split (s)	15.0	15.0	0.0	15.0	15.0	38.0	62.0	62.0	0.0	23.0	85.0	0.0
Total Split (%)	15.0%	15.0%	0.0%	15.0%	15.0%	38.0%	62.0%	62.0%	0.0%	23.0%	85.0%	0.0%
Maximum Green (s)	9.0	9.0		9.0	9.0		56.0	56.0		17.0	79.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Min	Min		None	Min	
Walk Time (s)							5.0	5.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
v/c Ratio		0.01			0.34	0.51		0.81		0.70	0.38	
Control Delay		14.2			17.8	3.4		22.7		36.4	25.5	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		14.2			17.8	3.4		22.7		36.4	25.5	
Queue Length 50th (ft)		2			44	35		49		115	115	
Queue Length 95th (ft)		9			179	26		138		135	134	
Internal Link Dist (ft)		951			445			308			797	
Turn Bay Length (ft)										300		
Base Capacity (vph)		987			710	1351		1132		357	1511	
Starvation Cap Reductn		0			0	23		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.01			0.34	0.52		0.35		0.65	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 12 (12%), Referenced to phase 4:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 2: Jones Street & Mt Pleasant St

HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	0	189	10	563	0	75	294	193	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.89		1.00	1.00	
Flt Protected		1.00			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1794			1681	1538		1776		1719	1912	
Flt Permitted		1.00			0.73	1.00		1.00		0.22	1.00	
Satd. Flow (perm)		1794			1290	1538		1776		402	1912	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Adj. Flow (vph)	0	6	0	230	12	687	0	80	313	233	235	6
RTOR Reduction (vph)	0	0	0	0	0	165	0	275	0	0	3	0
Lane Group Flow (vph)	0	6	0	0	242	522	0	118	0	233	238	0
Heavy Vehicles (%)	0%	20%	0%	7%	25%	5%	0%	9%	8%	5%	11%	60%
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		8			4	4 1		2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		55.0			55.0	76.0		12.0		33.0	33.0	
Effective Green, g (s)		55.0			55.0	76.0		12.0		33.0	33.0	
Actuated g/C Ratio		0.55			0.55	0.76		0.12		0.33	0.33	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		987			710	1169		213		330	631	
v/s Ratio Prot		0.00				c0.34		0.07		c0.11	0.12	
v/s Ratio Perm					0.19					c0.13		
v/c Ratio		0.01			0.34	0.45		0.55		0.71	0.38	
Uniform Delay, d1		10.2			12.5	4.4		41.5		27.1	25.6	
Progression Factor		1.00			1.11	3.84		1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.3	0.1		1.8		5.5	0.1	
Delay (s)		10.2			15.0	16.8		43.2		32.6	25.8	
Level of Service		B			B	B		D		C	C	
Approach Delay (s)		10.2			16.4			43.2			29.1	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
14: Tarkiln Hill Road & Church Street

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	315	0	30	504	60	241	200	40	45	170	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	389	0	34	648	0	287	286	0	0	239	102
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Detector Phase	1	1		1	1		2	2		2	2	2
Switch Phase												
Minimum Initial (s)	30.0	30.0		30.0	30.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	35.0	35.0		35.0	35.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	54.0	54.0	0.0	54.0	54.0	0.0	46.0	46.0	0.0	46.0	46.0	46.0
Total Split (%)	54.0%	54.0%	0.0%	54.0%	54.0%	0.0%	46.0%	46.0%	0.0%	46.0%	46.0%	46.0%
Maximum Green (s)	49.0	49.0		49.0	49.0		41.0	41.0		41.0	41.0	41.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		5.0	5.0		5.0	5.0	5.0
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	C-Min
v/c Ratio	0.82	0.53		0.13	0.89		0.56	0.33			0.32	0.13
Control Delay	82.1	23.9		16.9	42.1		25.6	18.7			18.8	16.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	82.1	23.9		16.9	42.1		25.6	18.7			18.8	16.8
Queue Length 50th (ft)	40	176		13	363		129	111			92	36
Queue Length 95th (ft)	#101	201		28	437		221	179			169	76
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	109	882		321	868		512	862			754	791
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.69	0.44		0.11	0.75		0.56	0.33			0.32	0.13

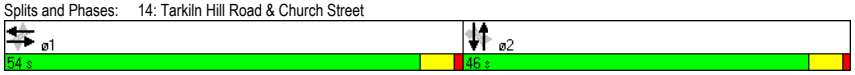
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
14: Tarkiln Hill Road & Church Street

2030 Build Condition - AM Peak Hour

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Tarkiln Hill Road & Church Street

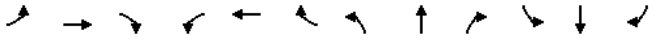


HCM Signalized Intersection Capacity Analysis
14: Tarkiln Hill Road & Church Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	315	0	30	504	60	241	200	40	45	170	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1604	1801		1616	1772		1728	1761			1723	1615
Flt Permitted	0.13	1.00		0.39	1.00		0.57	1.00			0.89	1.00
Satd. Flow (perm)	223	1801		657	1772		1045	1761			1542	1615
Peak-hour factor, PHF	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	75	389	0	34	579	69	287	238	48	50	189	102
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	75	389	0	34	648	0	287	286	0	0	239	102
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	41.1	41.1		41.1	41.1		48.9	48.9			48.9	48.9
Effective Green, g (s)	41.1	41.1		41.1	41.1		48.9	48.9			48.9	48.9
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.49	0.49			0.49	0.49
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	92	740		270	728		511	861			754	790
v/s Ratio Prot		0.22			c0.37			0.16				
v/s Ratio Perm	0.34			0.05			c0.27				0.15	0.06
v/c Ratio	0.82	0.53		0.13	0.89		0.56	0.33			0.32	0.13
Uniform Delay, d1	26.1	22.1		18.3	27.4		18.0	15.6			15.5	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	38.7	0.3		0.1	12.8		4.4	1.0			1.1	0.3
Delay (s)	64.8	22.4		18.4	40.1		22.4	16.6			16.6	14.3
Level of Service	E	C		B	D		C	B			B	B
Approach Delay (s)		29.3			39.0			19.5			15.9	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	27.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	81	10	55	120	47	10	290	60	61	370	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		197			310			393			488	
Travel Time (s)		4.5			7.0			8.9			11.1	
Peak Hour Factor	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	322	0	11	398	0	67	423	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lead	Lead		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.23			0.48		0.04	0.58		0.25	0.61	
Control Delay		15.5			18.3		16.2	20.9		18.8	22.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		15.5			18.3		16.2	20.9		18.8	22.1	
Queue Length 50th (ft)		32			75		2	100		15	111	
Queue Length 95th (ft)		85			150		15	#272		62	#333	
Internal Link Dist (ft)		117			230			313			408	
Turn Bay Length (ft)												
Base Capacity (vph)		664			673		249	686		270	696	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.23			0.48		0.04	0.58		0.25	0.61	

Intersection Summary	
Area Type:	Other

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	26%
Maximum Green (s)	15.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	4.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
19: Wood Street & Route 18

2030 Build Condition - AM Peak Hour

Cycle Length: 81
Actuated Cycle Length: 64.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: Wood Street & Route 18

HCM Signalized Intersection Capacity Analysis
19: Wood Street & Route 18

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	81	10	55	120	47	10	290	60	61	370	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.97		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1860			1874		1745	1718		1745	1759	
Flt Permitted		0.89			0.88		0.34	1.00		0.37	1.00	
Satd. Flow (perm)		1674			1678		632	1718		685	1759	
Peak-hour factor, PHF	0.77	0.77	0.77	0.69	0.69	0.69	0.88	0.88	0.88	0.91	0.91	0.91
Adj. Flow (vph)	32	105	13	80	174	68	11	330	68	67	407	16
RTOR Reduction (vph)	0	4	0	0	11	0	0	8	0	0	2	0
Lane Group Flow (vph)	0	146	0	0	311	0	11	390	0	67	421	0
Heavy Vehicles (%)	0%	8%	11%	4%	4%	3%	0%	4%	5%	0%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4		25.4	25.4		25.4	25.4	
Effective Green, g (s)		25.4			25.4		25.4	25.4		25.4	25.4	
Actuated g/C Ratio		0.37			0.37		0.37	0.37		0.37	0.37	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		614			616		232	631		251	646	
v/s Ratio Prot								0.23			c0.24	
v/s Ratio Perm		0.09			c0.19		0.02			0.10		
v/c Ratio		0.24			0.51		0.05	0.62		0.27	0.65	
Uniform Delay, d1		15.2			17.0		14.1	17.9		15.4	18.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			2.9		0.4	4.5		2.6	5.1	
Delay (s)		16.1			20.0		14.5	22.4		18.0	23.3	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		16.1			20.0			22.2			22.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	240	25	40	255	42	60	102	25	35	161	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	407	0	0	352	0	0	225	0	0	375	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.55			0.40			0.46			0.62	
Control Delay		16.2			13.3			20.7			23.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.2			13.3			20.7			23.5	
Queue Length 50th (ft)		110			87			69			122	
Queue Length 95th (ft)		184			146			114			205	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		740			876			485			601	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.40			0.46			0.62	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Lanes, Volumes, Timings
24: Nash Road & Church Street
2030 Build Condition - AM Peak Hour

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	240	25	40	255	42	60	102	25	35	161	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			0.94	
Flt Protected		0.99			0.99			0.98			0.99	
Satd. Flow (prot)		1934			2056			1905			1875	
Flt Permitted		0.82			0.92			0.74			0.94	
Satd. Flow (perm)		1604			1898			1432			1778	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.83	0.83	0.83	0.91	0.91	0.91
Adj. Flow (vph)	109	270	28	42	266	44	72	123	30	38	177	160
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	407	0	0	352	0	0	225	0	0	375	0
Heavy Vehicles (%)	15%	6%	12%	7%	2%	0%	2%	2%	8%	8%	10%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		740			876			485			602	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.19			0.16			c0.21	
v/c Ratio		0.55			0.40			0.46			0.62	
Uniform Delay, d1		12.6			11.6			16.9			18.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.9			1.4			3.2			4.8	
Delay (s)		15.6			12.9			20.0			22.8	
Level of Service		B			B			C			C	
Approach Delay (s)		15.6			12.9			20.0			22.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
28: Coggeshall Street & Route 18 SB

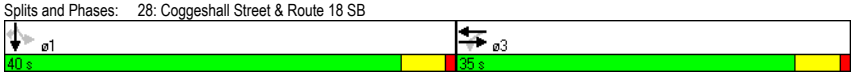
2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	95	196	212	0	0	0	0	126	690	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	378	0	0	475	0	0	0	0	0	927	45
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.52			1.16						0.62	0.06
Control Delay		18.4			122.9						17.2	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		18.4			122.9						17.2	4.0
Queue Length 50th (ft)		116			~267						161	0
Queue Length 95th (ft)		157			#412						213	15
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		721			408						1505	694
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.52			1.16						0.62	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Route 18 SB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	200	95	196	212	0	0	0	0	126	690	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1747			1942						3227	1436
Flt Permitted		1.00			0.51						0.99	1.00
Satd. Flow (perm)		1747			1020						3227	1436
Peak-hour factor, PHF	0.78	0.78	0.78	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	0	256	122	228	247	0	0	0	0	143	784	45
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	355	0	0	475	0	0	0	0	0	927	21
Heavy Vehicles (%)	0%	5%	2%	2%	8%	0%	0%	0%	0%	7%	3%	5%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		699			408						1506	670
v/s Ratio Prot		0.20										
v/s Ratio Perm					c0.47						0.29	0.01
v/c Ratio		0.51			1.16						0.62	0.03
Uniform Delay, d1		16.9			22.5						15.0	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		2.6			97.6						1.9	0.1
Delay (s)		19.6			120.1						16.9	10.9
Level of Service		B			F						B	B
Approach Delay (s)		19.6			120.1			0.0			16.6	
Approach LOS		B			F			A			B	

Intersection Summary				
HCM Average Control Delay	44.1	HCM Level of Service		D
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service		F
Analysis Period (min)	15			

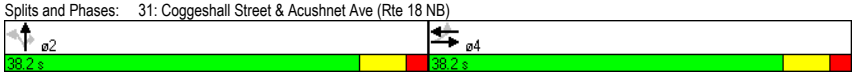
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	278	0	0	318	54	85	295	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	340	0	0	433	0	101	351	275	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.47			0.52		0.15	0.50	0.35			
Control Delay		18.8			18.7		14.6	19.5	3.4			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.8			18.7		14.6	19.5	3.4			
Queue Length 50th (ft)		113			143		29	119	0			
Queue Length 95th (ft)		184			210		54	176	33			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		721			833		675	699	789			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.47			0.52		0.15	0.50	0.35			

Intersection Summary	
Area Type:	Other
Cycle Length: 76.4	
Actuated Cycle Length: 76.4	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	

Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rte 18 NB) 2030 Build Condition - AM Peak Hour

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rte 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	278	0	0	318	54	85	295	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.98		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		1940			1970		1612	1670	1501			
Flt Permitted		0.88			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1720			1970		1612	1670	1501			
Peak-hour factor, PHF	0.95	0.95	0.95	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	47	293	0	0	370	63	101	351	275	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	160	0	0	0
Lane Group Flow (vph)	0	340	0	0	425	0	101	351	115	0	0	0
Heavy Vehicles (%)	7%	7%	0%	0%	4%	4%	12%	10%	4%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		720			825		675	699	629			
v/s Ratio Prot					c0.22			c0.21				
v/s Ratio Perm		0.20					0.06		0.08			
v/c Ratio		0.47			0.51		0.15	0.50	0.18			
Uniform Delay, d1		16.1			16.4		13.8	16.3	14.0			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		2.2			2.3		0.5	2.6	0.6			
Delay (s)		18.3			18.7		14.2	18.9	14.6			
Level of Service		B			B		B	B	B			
Approach Delay (s)		18.3			18.7			16.6			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	465	159	157	600	35	52	5	78	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			208			360			359	
Travel Time (s)		11.7			4.7			8.2			8.2	
Peak Hour Factor	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	869	0	0	880	0	0	151	0	0	159	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	70.0	0.0	11.0	70.0	0.0	19.0	19.0	0.0	19.0	19.0	0.0
Total Split (%)	11.0%	70.0%	0.0%	11.0%	70.0%	0.0%	19.0%	19.0%	0.0%	19.0%	19.0%	0.0%
Maximum Green (s)	5.0	64.0		5.0	64.0		13.0	13.0		13.0	13.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.45			0.51			0.53			0.54	
Control Delay		1.5			4.8			26.9			28.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		1.5			4.8			26.9			28.7	
Queue Length 50th (ft)		10			71			21			24	
Queue Length 95th (ft)		36			127			51			38	
Internal Link Dist (ft)		435			128			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1935			1734			395			413	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.45			0.51			0.38			0.38	

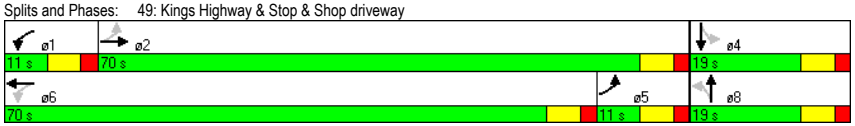
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 Build Condition - AM Peak Hour

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	465	159	157	600	35	52	5	78	45	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.97			0.99			0.91			0.92	
Flt Protected		0.99			0.99			0.98			0.98	
Satd. Flow (prot)		3293			3440			3027			3227	
Flt Permitted		0.73			0.63			0.80			0.80	
Satd. Flow (perm)		2412			2173			2455			2622	
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Adj. Flow (vph)	99	574	196	174	667	39	58	6	87	62	14	83
RTOR Reduction (vph)	0	15	0	0	2	0	0	80	0	0	76	0
Lane Group Flow (vph)	0	854	0	0	878	0	0	71	0	0	83	0
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		79.7			79.7			8.3			8.3	
Effective Green, g (s)		79.7			79.7			8.3			8.3	
Actuated g/C Ratio		0.80			0.80			0.08			0.08	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1922			1732			204			218	
v/s Ratio Prot												
v/s Ratio Perm		0.35			c0.40			0.03			c0.03	
v/c Ratio		0.44			0.51			0.35			0.38	
Uniform Delay, d1		3.2			3.5			43.3			43.4	
Progression Factor		0.29			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.1			0.4			0.4	
Delay (s)		1.0			3.5			43.7			43.8	
Level of Service		A			A			D			D	
Approach Delay (s)		1.0			3.5			43.7			43.8	
Approach LOS		A			A			D			D	

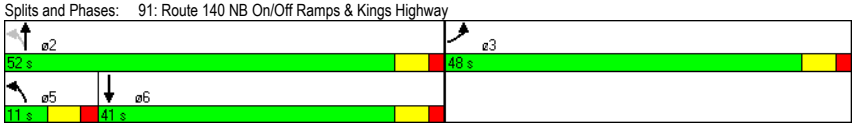
Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	361	100	90	342	664	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.83	0.83	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	555	0	0	508	837	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	48.0	0.0	11.0	52.0	41.0	0.0
Total Split (%)	48.0%	0.0%	11.0%	52.0%	41.0%	0.0%
Maximum Green (s)	42.0		5.0	46.0	35.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		None	C-Min	C-Min	
v/c Ratio	0.84			0.44	0.45	
Control Delay	41.8			16.6	15.5	
Queue Delay	0.0			0.0	0.0	
Total Delay	41.8			16.6	15.5	
Queue Length 50th (ft)	320			102	177	
Queue Length 95th (ft)	355			203	249	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	819			1149	1843	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.68			0.44	0.45	

Intersection Summary	
Area Type:	Other

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 91: Route 140 NB On/Off Ramps & Kings Highway



HCM Signalized Intersection Capacity Analysis
91: Route 140 NB On/Off Ramps & Kings Highway

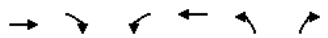
2030 Build Condition - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	361	100	90	342	664	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.99	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1949			3389	3414	
Flt Permitted	0.96			0.62	1.00	
Satd. Flow (perm)	1949			2128	3414	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.85	0.85
Adj. Flow (vph)	435	120	106	402	781	56
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	555	0	0	508	837	0
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	34.0			54.0	54.0	
Effective Green, g (s)	34.0			54.0	54.0	
Actuated g/C Ratio	0.34			0.54	0.54	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	663			1149	1844	
v/s Ratio Prot	c0.28				c0.25	
v/s Ratio Perm				0.24		
v/c Ratio	0.84			0.44	0.45	
Uniform Delay, d1	30.4			13.9	14.0	
Progression Factor	1.00			0.99	0.97	
Incremental Delay, d2	9.0			0.3	0.7	
Delay (s)	39.5			14.1	14.3	
Level of Service	D			B	B	
Approach Delay (s)	39.5			14.1	14.3	
Approach LOS	D			B	B	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2030 Build Condition - AM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	388	105	91	673	90	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.85	0.85
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	530	0	0	831	106	53
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	60.0	0.0	11.0	71.0	29.0	29.0
Total Split (%)	60.0%	0.0%	11.0%	71.0%	29.0%	29.0%
Maximum Green (s)	54.0		5.0	65.0	23.0	23.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	C-Min		None	C-Min	None	None
v/c Ratio	0.21			0.39	0.58	0.25
Control Delay	5.2			2.0	54.2	13.8
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	5.2			2.0	54.2	13.8
Queue Length 50th (ft)	50			23	65	0
Queue Length 95th (ft)	97			31	108	30
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	2575			2145	388	395
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.21			0.39	0.27	0.13

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 38 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2030 Build Condition - AM Peak Hour

Natural Cycle: 40
Control Type: Actuated-Coordinated

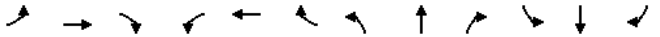
Splits and Phases: 96: Kings Highway & Shaw's driveway

HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2030 Build Condition - AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	388	105	91	673	90	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.97			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3323			3447	1687	1538
Flt Permitted	1.00			0.80	0.95	1.00
Satd. Flow (perm)	3323			2780	1687	1538
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.85	0.85
Adj. Flow (vph)	417	113	99	732	106	53
RTOR Reduction (vph)	12	0	0	0	0	47
Lane Group Flow (vph)	518	0	0	831	106	6
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	77.1			77.1	10.9	10.9
Effective Green, g (s)	77.1			77.1	10.9	10.9
Actuated g/C Ratio	0.77			0.77	0.11	0.11
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	2562			2143	184	168
v/s Ratio Prot	0.16				c0.06	0.00
v/s Ratio Perm				c0.30		
v/c Ratio	0.20			0.39	0.58	0.03
Uniform Delay, d1	3.1			3.7	42.4	39.8
Progression Factor	1.66			0.38	1.00	1.00
Incremental Delay, d2	0.2			0.0	2.7	0.0
Delay (s)	5.3			1.5	45.1	39.9
Level of Service	A			A	D	D
Approach Delay (s)	5.3			1.5	43.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	266	90	70	231	135	35	130	165	225	215	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		443			1111			850			178	
Travel Time (s)		10.1			25.3			19.3			4.0	
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	497	0	0	331	148	0	202	201	0	764	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Detector Phase	4	4		4	4	4	2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.49			0.61	0.22		0.39	0.28		0.76	
Control Delay		16.7			23.5	4.4		18.3	4.1		22.4	
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	
Total Delay		16.7			23.5	4.4		18.3	4.1		22.4	
Queue Length 50th (ft)		61			89	0		48	0		100	
Queue Length 95th (ft)		153			#279	39		126	33		#245	
Internal Link Dist (ft)		363			1031			770			98	
Turn Bay Length (ft)												
Base Capacity (vph)		1014			545	664		548	749		1055	
Starvation Cap Reductn		0			0	0		0	0		0	
Spillback Cap Reductn		0			0	0		0	0		0	
Storage Cap Reductn		0			0	0		0	0		0	
Reduced v/c Ratio		0.49			0.61	0.22		0.37	0.27		0.72	

Intersection Summary	
Area Type:	Other

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	6.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	19%
Maximum Green (s)	14.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	8
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

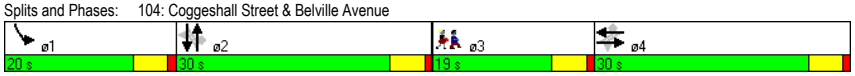
Intersection Summary

Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2030 Build Condition - AM Peak Hour

Cycle Length: 99
Actuated Cycle Length: 62.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	266	90	70	231	135	35	130	165	225	215	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.97			1.00	0.85		1.00	0.85		0.95	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3197			1672	1422		1784	1552		3161	
Flt Permitted		0.76			0.80	1.00		0.75	1.00		0.77	
Satd. Flow (perm)		2459			1345	1422		1354	1552		2470	
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.91	0.91	0.82	0.82	0.82	0.84	0.84	0.84
Adj. Flow (vph)	101	296	100	77	254	148	43	159	201	268	256	240
RTOR Reduction (vph)	0	19	0	0	0	92	0	0	128	0	57	0
Lane Group Flow (vph)	0	478	0	0	331	56	0	202	73	0	707	0
Heavy Vehicles (%)	1%	6%	5%	1%	6%	6%	3%	6%	11%	4%	4%	2%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.4			25.4	25.4		24.1	24.1		24.1	
Effective Green, g (s)		25.4			25.4	25.4		24.1	24.1		24.1	
Actuated g/C Ratio		0.38			0.38	0.38		0.36	0.36		0.36	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		936			512	542		489	561		892	
v/s Ratio Prot												
v/s Ratio Perm		0.19			c0.25	0.04		0.15	0.05		c0.29	
v/c Ratio		0.51			0.65	0.10		0.41	0.13		0.79	
Uniform Delay, d1		15.9			17.0	13.3		16.0	14.3		19.1	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		2.0			6.2	0.4		0.8	0.1		5.1	
Delay (s)		17.9			23.2	13.7		16.8	14.4		24.2	
Level of Service		B			C	B		B	B		C	
Approach Delay (s)		17.9			20.2			15.6			24.2	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	17.2
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	67	46	180	505	151	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.84	0.84	0.86	0.86	0.90	0.90
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	135	0	796	0	0	596
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.23		0.43			0.58
Control Delay	11.5		3.6			15.3
Queue Delay	0.0		0.0			0.0
Total Delay	11.5		3.6			15.3
Queue Length 50th (ft)	22		23			84
Queue Length 95th (ft)	53		46			131
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	589		1832			1021
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.23		0.43			0.58

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street

HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2030 Build Condition - AM Peak Hour

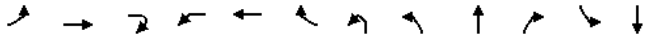
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	67	46	180	505	151	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.89			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1763		3245			3587
Flt Permitted	0.97		1.00			0.60
Satd. Flow (perm)	1763		3245			2178
Peak-hour factor, PHF	0.84	0.84	0.86	0.86	0.90	0.90
Adj. Flow (vph)	80	55	209	587	168	428
RTOR Reduction (vph)	38	0	312	0	0	0
Lane Group Flow (vph)	97	0	484	0	0	596
Heavy Vehicles (%)	8%	18%	7%	5%	8%	5%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	551		1521			1021
v/s Ratio Prot	c0.06		0.15			
v/s Ratio Perm						c0.27
v/c Ratio	0.18		0.32			0.58
Uniform Delay, d1	16.0		10.6			12.4
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.7		0.6			2.4
Delay (s)	16.7		11.2			14.9
Level of Service	B		B			B
Approach Delay (s)	16.7		11.2			14.9
Approach LOS	B		B			B

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
140: Mill Street & Pleasant St

2030 Build Condition - AM Peak Hour

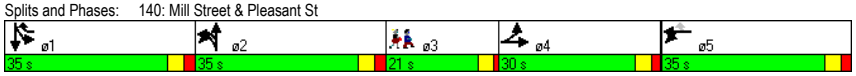


Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	225	185	5	410	180	187	20	55	219	30	57	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	16	16	11	12	10	16	10	12	14	16	14
Storage Length (ft)	0			0		0		100		0	0	
Storage Lanes	1			1		1		1		0	0	
Taper Length (ft)	25			25		25		25		25	25	
Right Turn on Red			Yes			No				Yes		
Link Speed (mph)		30			30				30			30
Link Distance (ft)		168			308				709			499
Travel Time (s)		3.8			7.0				16.1			11.3
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	256	216	0	500	220	228	0	85	283	0	0	466
Turn Type	Split			Split		pm+ov	Split	Split			Split	
Protected Phases	4	4		5	5	1	2	2	2		1	1
Permitted Phases						5						
Detector Phase	4	4		5	5	1	2	2	2		1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	21.0	21.0	21.0		21.0	21.0
Total Split (s)	30.0	30.0	0.0	35.0	35.0	35.0	35.0	35.0	35.0	0.0	35.0	35.0
Total Split (%)	19.2%	19.2%	0.0%	22.4%	22.4%	22.4%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%
Maximum Green (s)	25.0	25.0		30.0	30.0	30.0	30.0	30.0	30.0		30.0	30.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max		Max	Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.82	0.58		1.40	0.57	0.35		0.26	0.39			0.60
Control Delay	79.2	62.7		239.0	59.0	28.8		52.1	50.6			56.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0			0.0
Total Delay	79.2	62.7		239.0	59.0	28.8		52.1	50.6			56.0
Queue Length 50th (ft)	216	173		~568	172	120		62	108			193
Queue Length 95th (ft)	#409	293		#828	271	210		127	175			274
Internal Link Dist (ft)		88			228				629			419
Turn Bay Length (ft)								100				
Base Capacity (vph)	311	373		356	388	660		332	718			781
Starvation Cap Reductn	0	0		0	0	0		0	0			0
Spillback Cap Reductn	0	0		0	0	0		0	0			0
Storage Cap Reductn	0	0		0	0	0		0	0			0
Reduced v/c Ratio	0.82	0.58		1.40	0.57	0.35		0.26	0.39			0.60

Lane Group	SBR	ø3
Lane Configurations		
Volume (vph)	47	
Ideal Flow (vphpl)	1900	
Lane Width (ft)	16	
Storage Length (ft)	0	
Storage Lanes	0	
Taper Length (ft)	25	
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor	0.84	
Heavy Vehicles (%)	4%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	
Turn Type		
Protected Phases		3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		4.0
Minimum Split (s)		21.0
Total Split (s)	0.0	21.0
Total Split (%)	0.0%	13%
Maximum Green (s)		17.0
Yellow Time (s)		3.0
All-Red Time (s)		1.0
Lost Time Adjust (s)	0.0	
Total Lost Time (s)	4.0	
Lead/Lag		Lead
Lead-Lag Optimize?		Yes
Vehicle Extension (s)		3.0
Recall Mode		None
Walk Time (s)		10.0
Flash Dont Walk (s)		7.0
Pedestrian Calls (#/hr)		11
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
Area Type:	Other
Cycle Length: 156	
Actuated Cycle Length: 143.4	
Natural Cycle: 125	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 140: Mill Street & Pleasant St

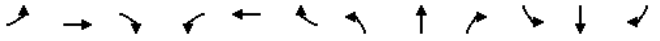


Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	225	185	5	410	180	187	20	55	219	30	57	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	16	11	12	10	16	10	12	14	16	14
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.95			0.95
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.98			0.98
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99
Satd. Flow (prot)	1776	2124		1694	1845	1449		1581	3384			3714
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00			0.99
Satd. Flow (perm)	1776	2124		1694	1845	1449		1581	3384			3714
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84
Adj. Flow (vph)	256	210	6	500	220	228	23	62	249	34	68	342
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	6	0	0	0
Lane Group Flow (vph)	256	215	0	500	220	228	0	85	277	0	0	466
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%
Turn Type	Split			Split		pm+ov	Split	Split			Split	
Protected Phases	4	4		5	5	1	2	2	2		1	1
Permitted Phases						5						
Actuated Green, G (s)	25.1	25.1		30.2	30.2	60.4		30.2	30.2			30.2
Effective Green, g (s)	25.1	25.1		30.2	30.2	60.4		30.2	30.2			30.2
Actuated g/C Ratio	0.17	0.17		0.21	0.21	0.41		0.21	0.21			0.21
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0
Lane Grp Cap (vph)	305	365		350	382	649		327	700			768
v/s Ratio Prot	c0.14	0.10		c0.30	0.12	0.07		0.05	c0.08			c0.13
v/s Ratio Perm						0.08						
v/c Ratio	0.84	0.59		1.43	0.58	0.35		0.26	0.40			0.61
Uniform Delay, d1	58.5	55.7		57.9	52.1	29.4		48.5	50.0			52.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2	23.3	6.8		208.7	6.2	1.5		1.9	1.7			3.5
Delay (s)	81.8	62.5		266.6	58.3	30.9		50.5	51.7			56.1
Level of Service	F	E		F	E	C		D	D			E
Approach Delay (s)		73.0			161.6				51.4			56.1
Approach LOS		E			F				D			E

Intersection Summary			
HCM Average Control Delay	103.2	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	30.3
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	47
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	56
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	54	40	39	16	10	40	890	51	91	855	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	16	16	16	11	11	11	10	11	11
Storage Length (ft)	0		0	0		0	150		225	150		225
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		440			82			328			2491	
Travel Time (s)		10.0			1.9			7.5			56.6	
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	281	106	0	0	80	0	45	1011	58	99	929	261
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Detector Phase	4	4		4	4		1	2	5	1	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	None		None	None		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.94	0.26			0.21		0.26	1.07	0.39	0.60	0.96	0.46
Control Delay	84.3	43.4			76.9		58.0	88.6	61.8	69.5	62.9	16.8
Queue Delay	0.0	0.0			0.0		0.0	149.8	289.8	0.4	0.0	0.0
Total Delay	84.3	43.4			76.9		58.0	238.4	351.6	69.9	62.9	16.8
Queue Length 50th (ft)	182	57			49		28	~366	37	63	315	41
Queue Length 95th (ft)	#486	142			110		79	#746	95	#172	#681	155
Internal Link Dist (ft)		360			2			248			2411	
Turn Bay Length (ft)							150		225	150		225
Base Capacity (vph)	299	403			384		193	948	205	186	967	567
Starvation Cap Reductn	0	0			0		0	231	0	0	0	0
Spillback Cap Reductn	0	0			0		0	0	168	6	0	0
Storage Cap Reductn	0	0			0		0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.26			0.21		0.23	1.41	1.57	0.55	0.96	0.46

Lanes, Volumes, Timings
174: Union Street & Route 18
2030 Build Condition - AM Peak Hour

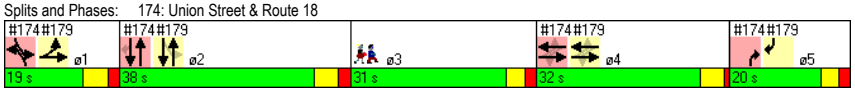
Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	22%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	13
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 114.2	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 174: Union Street & Route 18



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	54	40	39	16	10	40	890	51	91	855	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.94			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1616	1642			1921		1631	3261	1501	1574	3323	1516
Flt Permitted	0.72	1.00			0.79		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1221	1642			1563		1631	3261	1501	1574	3323	1516
Peak-hour factor, PHF	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	281	61	45	48	20	12	45	1011	58	99	929	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	128
Lane Group Flow (vph)	281	106	0	0	80	0	45	1011	58	99	929	133
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)	28.0	28.0			28.0		12.0	33.2	9.3	12.0	33.2	33.2
Effective Green, g (s)	28.0	28.0			28.0		12.0	33.2	9.3	12.0	33.2	33.2
Actuated g/C Ratio	0.24	0.24			0.24		0.10	0.28	0.08	0.10	0.28	0.28
Clearance Time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	290	390			371		166	918	118	160	935	427
v/s Ratio Prot		0.06					0.03	c0.31	c0.04	c0.06	0.28	
v/s Ratio Perm	c0.23				0.05							0.09
v/c Ratio	0.97	0.27			0.22		0.27	1.10	0.49	0.62	0.99	0.31
Uniform Delay, d1	44.6	36.7			36.2		49.0	42.4	52.1	50.8	42.3	33.4
Progression Factor	1.00	1.00			1.80		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.5	0.8			0.6		1.2	61.4	4.3	7.9	27.7	0.6
Delay (s)	89.0	37.5			65.6		50.2	103.8	56.4	58.7	70.0	34.0
Level of Service	F	D			E		D	F	E	E	E	C
Approach Delay (s)		74.9			65.6			99.2			61.9	
Approach LOS		E			E			F			E	

Intersection Summary					
HCM Average Control Delay		78.2	HCM Level of Service		E
HCM Volume to Capacity ratio		0.92			
Actuated Cycle Length (s)		118.0	Sum of lost time (s)		35.5
Intersection Capacity Utilization		64.3%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	20	95	5	10	5	0	168	20	15	183	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12
Storage Length (ft)	0		0	0		0	0		0	0		50
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		82			609			920			687	
Travel Time (s)		1.9			13.8			20.9			15.6	
Peak Hour Factor	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	36	0	0	211	0	0	245	69
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Detector Phase	1	1 4		4	4			2		2	2	5
Switch Phase												
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes	
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0
Recall Mode	None			None	None			None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.45			0.09			0.41			0.52	0.45
Control Delay		16.0			34.7			40.1			43.9	63.7
Queue Delay		0.0			0.0			0.0			0.0	335.7
Total Delay		16.0			34.7			40.1			43.9	399.4
Queue Length 50th (ft)		48			14			109			134	44
Queue Length 95th (ft)		76			30			247			266	100
Internal Link Dist (ft)		2			529			840			607	
Turn Bay Length (ft)												50
Base Capacity (vph)		586			395			519			472	212
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			11			0			0	171
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.43			0.09			0.41			0.52	1.68

Lanes, Volumes, Timings
179: Union Street & McArthur Drive
2030 Build Condition - AM Peak Hour

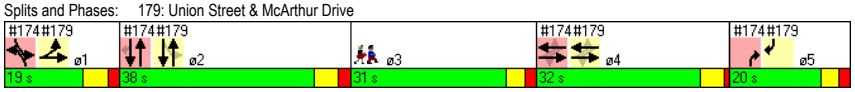
Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	22%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	13
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2030 Build Condition - AM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 114.2	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 179: Union Street & McArthur Drive



HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	20	95	5	10	5	0	168	20	15	183	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.93			0.97			0.99			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1812			1708			1774			1674	1553
Flt Permitted		0.85			0.92			1.00			0.97	1.00
Satd. Flow (perm)		1573			1585			1774			1622	1553
Peak-hour factor, PHF	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81
Adj. Flow (vph)	104	26	122	9	18	9	0	189	22	19	226	69
RTOR Reduction (vph)	0	0	0	0	7	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	252	0	0	29	0	0	208	0	0	245	69
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		40.0			28.0			33.2			33.2	9.3
Effective Green, g (s)		40.0			28.0			33.2			33.2	9.3
Actuated g/C Ratio		0.34			0.24			0.28			0.28	0.08
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		558			376			499			456	122
v/s Ratio Prot		c0.05						0.12				c0.04
v/s Ratio Perm		c0.11			0.02						c0.15	
v/c Ratio		0.45			0.08			0.42			0.54	0.57
Uniform Delay, d1		30.4			35.0			34.5			35.9	52.4
Progression Factor		0.64			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.8			0.2			0.8			1.6	7.1
Delay (s)		20.2			35.1			35.3			37.5	59.5
Level of Service		C			D			D			D	E
Approach Delay (s)		20.2			35.1			35.3			42.3	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM Average Control Delay		33.3	HCM Level of Service		C
HCM Volume to Capacity ratio		0.50			
Actuated Cycle Length (s)		118.0	Sum of lost time (s)		36.5
Intersection Capacity Utilization		50.0%	ICU Level of Service		A
Analysis Period (min)		15			
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2030 Build Condition - AM Peak Hour

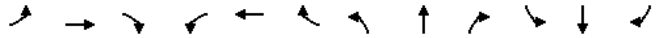
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	21	10	578	771	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.83	0.83	0.90	0.90
Hourly flow rate (vph)	12	26	12	696	857	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				393	611	
pX, platoon unblocked	0.91					
vC, conflicting volume	1610	890	923			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1621	890	923			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	92	98			
cM capacity (veh/h)	101	337	748			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	38	708	923
Volume Left	12	12	0
Volume Right	26	0	67
cSH	192	748	1700
Volume to Capacity	0.20	0.02	0.54
Queue Length 95th (ft)	18	1	0
Control Delay (s)	28.3	0.4	0.0
Lane LOS	D	A	
Approach Delay (s)	28.3	0.4	0.0
Approach LOS	D		

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			54.2%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
16: Park Avenue & Church Street

2030 Build Condition - AM Peak Hour



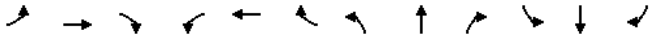
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	73	140	20	0	52	0	428	20	10	190	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.84	0.84	0.84	0.85	0.85	0.85	0.76	0.76	0.76
Hourly flow rate (vph)	0	94	179	24	0	62	0	504	24	13	250	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	854	803	250	1018	792	515	250			527		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809	756	165	985	743	515	165			527		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	70	78	81	100	89	100			99		
cM capacity (veh/h)	248	312	804	127	319	564	1335			1050		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	273	86	527	263
Volume Left	0	24	0	13
Volume Right	179	62	24	0
cSH	522	288	1700	1050
Volume to Capacity	0.52	0.30	0.31	0.01
Queue Length 95th (ft)	75	30	0	1
Control Delay (s)	19.2	22.7	0.0	0.5
Lane LOS	C	C		A
Approach Delay (s)	19.2	22.7	0.0	0.5
Approach LOS	C	C		

Intersection Summary				
Average Delay			6.4	
Intersection Capacity Utilization			50.5%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2030 Build Condition - AM Peak Hour



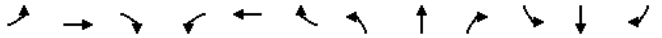
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	25	0	20	5	274	0	0	343	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.85	0.85	0.85	0.77	0.77	0.77
Hourly flow rate (vph)	7	0	7	32	0	25	6	322	0	0	445	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	811	786	452	793	793	322	458			322		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	811	786	452	793	793	322	458			322		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	89	100	96	99			100		
cM capacity (veh/h)	288	325	612	295	322	723	1113			1249		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	57	328	458
Volume Left	7	32	6	0
Volume Right	7	25	0	13
cSH	392	400	1113	1700
Volume to Capacity	0.03	0.14	0.01	0.27
Queue Length 95th (ft)	3	12	0	0
Control Delay (s)	14.5	15.5	0.2	0.0
Lane LOS	B	C	A	
Approach Delay (s)	14.5	15.5	0.2	0.0
Approach LOS	B	C		

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	28.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 Build Condition - AM Peak Hour



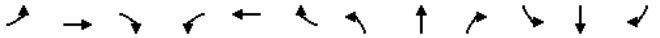
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	390	54	119	320	50	37	67	52	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	56	438	61	142	381	60	43	78	60	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.93			0.91			0.95	0.95	0.91	0.95	0.95	0.93
vC, conflicting volume	440			499			1275	1305	469	1374	1305	411
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	357			398			1089	1120	365	1194	1121	325
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	95			87			72	51	90	100	100	100
cM capacity (veh/h)	1104			1054			153	160	604	76	161	668

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	555	582	181
Volume Left	56	142	43
Volume Right	61	60	60
cSH	1104	1054	209
Volume to Capacity	0.05	0.13	0.87
Queue Length 95th (ft)	4	12	168
Control Delay (s)	1.4	3.4	80.0
Lane LOS	A	A	F
Approach Delay (s)	1.4	3.4	80.0
Approach LOS			F

Intersection Summary				
Average Delay	13.1			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
55: Rt 18 SB Exit Ramp & Purchase St

2030 Build Condition - AM Peak Hour



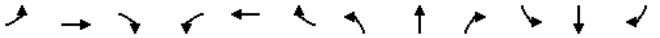
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	248	5	35	0	231	0	0	279	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	270	5	38	0	251	0	0	303	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								823				
pX, platoon unblocked												
vC, conflicting volume	595	554	303	565	554	251	303			251		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595	554	303	565	554	251	303			251		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	37	99	95	100			100		
cM capacity (veh/h)	392	440	736	429	440	788	1258			1314		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	313	251	303
Volume Left	0	270	0	0
Volume Right	11	38	0	0
cSH	736	454	1258	1700
Volume to Capacity	0.01	0.69	0.00	0.18
Queue Length 95th (ft)	1	129	0	0
Control Delay (s)	10.0	28.7	0.0	0.0
Lane LOS	A	D		
Approach Delay (s)	10.0	28.7	0.0	0.0
Approach LOS	A	D		

Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	44.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	155	36	35	109	98	10	202	60	97	177	15
Peak Hour Factor	0.80	0.80	0.80	0.83	0.83	0.83	0.89	0.89	0.89	0.88	0.88	0.88
Hourly flow rate (vph)	19	194	45	42	131	118	11	227	67	110	201	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	258	292	306	328
Volume Left (vph)	19	42	11	110
Volume Right (vph)	45	118	67	17
Hadj (s)	-0.04	-0.10	-0.04	0.20
Departure Headway (s)	6.8	6.6	6.6	6.7
Degree Utilization, x	0.48	0.54	0.56	0.61
Capacity (veh/h)	469	487	498	491
Control Delay (s)	15.9	17.0	17.5	19.8
Approach Delay (s)	15.9	17.0	17.5	19.8
Approach LOS	C	C	C	C

Intersection Summary				
Delay	17.7			
HCM Level of Service	C			
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	121	55	25	57	229	0	0	256	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83
Hourly flow rate (vph)	6	0	6	136	62	28	64	257	0	0	308	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	768	709	323	715	724	257	339			257		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	768	709	323	715	724	257	339			257		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	98	100	99	58	81	96	95			100		
cM capacity (veh/h)	254	342	711	326	333	765	1177			1319		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	12	167	59	321	339
Volume Left	6	136	0	64	0
Volume Right	6	0	28	0	30
cSH	375	328	455	1177	1700
Volume to Capacity	0.03	0.51	0.13	0.05	0.20
Queue Length 95th (ft)	2	69	11	4	0
Control Delay (s)	14.9	26.9	14.1	2.1	0.0
Lane LOS	B	D	B	A	
Approach Delay (s)	14.9	23.5		2.1	0.0
Approach LOS	B	C			

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2030 Build Condition - AM Peak Hour

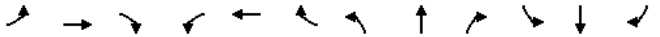
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	35	0	46	0	240	120	106	279	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	42	0	55	0	267	133	118	310	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934	946	310	879	879	333	310			400		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934	946	310	879	879	333	310			400		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.3		
p0 queue free %	100	100	100	83	100	92	100			90		
cM capacity (veh/h)	211	236	735	243	258	697	1262			1132		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	96	400	428
Volume Left	0	42	0	118
Volume Right	0	55	133	0
cSH	1700	385	1262	1132
Volume to Capacity	0.00	0.25	0.00	0.10
Queue Length 95th (ft)	0	24	0	9
Control Delay (s)	0.0	17.4	0.0	3.1
Lane LOS	A	C		A
Approach Delay (s)	0.0	17.4	0.0	3.1
Approach LOS	A	C		

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	156	15	15	5	5	15	5	146	5	55	219	89
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.69	0.69	0.69	0.78	0.78	0.78	0.93	0.93	0.93
Hourly flow rate (vph)	184	18	18	7	7	22	6	187	6	59	235	96
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	630	608	283	631	653	190	331			194		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630	608	283	631	653	190	331			194		
tC, single (s)	7.2	6.5	6.4	7.1	6.5	6.4	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.5	3.5	4.0	3.5	2.4			2.2		
p0 queue free %	48	96	98	98	98	97	99			96		
cM capacity (veh/h)	352	393	719	360	371	805	1149			1380		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	219	36	200	390
Volume Left	184	7	6	59
Volume Right	18	22	6	96
cSH	371	543	1149	1380
Volume to Capacity	0.59	0.07	0.01	0.04
Queue Length 95th (ft)	91	5	0	3
Control Delay (s)	27.8	12.1	0.3	1.5
Lane LOS	D	B	A	A
Approach Delay (s)	27.8	12.1	0.3	1.5
Approach LOS	D	B		

Intersection Summary				
Average Delay	8.5			
Intersection Capacity Utilization	55.3%	ICU Level of Service		B
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
77: Route 140 On/Off Ramps & Mt. Pleasant Street

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	167	0	230	408	55	226
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.69	0.69	0.85	0.85	0.75	0.75
Hourly flow rate (vph)	242	0	271	480	73	301
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			877			
pX, platoon unblocked						
vC, conflicting volume	959	511			271	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	959	511			271	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	5	100			94	
cM capacity (veh/h)	256	559			1293	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	242	751	375
Volume Left	242	0	73
Volume Right	0	480	0
cSH	256	1700	1293
Volume to Capacity	0.95	0.44	0.06
Queue Length 95th (ft)	217	0	5
Control Delay (s)	85.2	0.0	2.0
Lane LOS	F		A
Approach Delay (s)	85.2	0.0	2.0
Approach LOS	F		

Intersection Summary				
Average Delay	15.6			
Intersection Capacity Utilization	71.3%	ICU Level of Service		C
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Ave.

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	145	61	39	55	0	26	7	51	0	6	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.88	0.88	0.88	0.67	0.67	0.67
Hourly flow rate (vph)	19	181	76	43	61	0	30	8	58	0	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	136	134	9	272	105	37	9			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136	134	9	272	105	37	9			66		
tC, single (s)	7.2	6.5	6.3	7.2	6.6	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.6	4.1	3.3	2.3			2.2		
p0 queue free %	98	75	93	91	92	100	98			100		
cM capacity (veh/h)	752	739	1061	492	763	1041	1524			1549		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	276	104	95	9
Volume Left	19	43	30	0
Volume Right	76	0	58	0
cSH	807	621	1524	1549
Volume to Capacity	0.34	0.17	0.02	0.00
Queue Length 95th (ft)	38	15	1	0
Control Delay (s)	11.8	12.0	2.4	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.8	12.0	2.4	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
129: Whale's Tooth Station driveway & Acushnet Ave.

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	35	80	151	50	75
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.76	0.76
Hourly flow rate (vph)	39	38	93	176	66	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	411	181			269	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411	181			269	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	96			95	
cM capacity (veh/h)	567	862			1295	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	77	269	164
Volume Left	39	0	66
Volume Right	38	176	0
cSH	682	1700	1295
Volume to Capacity	0.11	0.16	0.05
Queue Length 95th (ft)	10	0	4
Control Delay (s)	11.0	0.0	3.4
Lane LOS	B		A
Approach Delay (s)	11.0	0.0	3.4
Approach LOS	B		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2030 Build Condition - AM Peak Hour

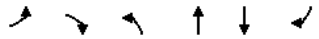
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	120	35	169	100	60	149
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.99	0.99	0.81	0.81
Hourly flow rate (vph)	128	37	171	101	74	184
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	553	221			272	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	553	221			272	
tC, single (s)	6.6	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.3	
p0 queue free %	71	95			94	
cM capacity (veh/h)	444	780			1247	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	165	272	258
Volume Left	128	0	74
Volume Right	37	101	0
cSH	492	1700	1247
Volume to Capacity	0.34	0.16	0.06
Queue Length 95th (ft)	36	0	5
Control Delay (s)	16.0	0.0	2.7
Lane LOS	C		A
Approach Delay (s)	16.0	0.0	2.7
Approach LOS	C		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & Acushnet Ave.

2030 Build Condition - AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	156	165	120	84	44	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.82	0.82
Hourly flow rate (vph)	184	194	132	92	54	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438	82	111			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438	82	111			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	65	80	90			
cM capacity (veh/h)	521	966	1379			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	378	224	111
Volume Left	184	132	0
Volume Right	194	0	57
cSH	682	1379	1700
Volume to Capacity	0.55	0.10	0.07
Queue Length 95th (ft)	85	8	0
Control Delay (s)	16.6	5.0	0.0
Lane LOS	C	A	
Approach Delay (s)	16.6	5.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	10.4		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & Acushnet Ave.

2030 Build Condition - AM Peak Hour

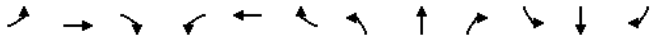
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	39	10	74	26	10	101
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.65	0.86	0.86	0.76	0.76
Hourly flow rate (vph)	60	15	86	30	13	133
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260	101			86	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	101			86	
tC, single (s)	6.4	6.4			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.3	
p0 queue free %	92	98			99	
cM capacity (veh/h)	726	895			1467	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	75	116	146
Volume Left	60	0	13
Volume Right	15	30	0
cSH	755	1700	1467
Volume to Capacity	0.10	0.07	0.01
Queue Length 95th (ft)	8	0	1
Control Delay (s)	10.3	0.0	0.7
Lane LOS	B		A
Approach Delay (s)	10.3	0.0	0.7
Approach LOS	B		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	0	10	5	0	10	5	115	15	10	160	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.64	0.64	0.64	0.58	0.58	0.58	0.93	0.93	0.93	0.89	0.89	0.89
Hourly flow rate (vph)	41	0	16	9	0	17	5	124	16	11	180	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	387	378	204	385	394	132	229			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	387	378	204	385	394	132	229			140		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.3	4.1			4.5		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.4	2.2			2.5		
p0 queue free %	93	100	98	98	100	98	100			99		
cM capacity (veh/h)	559	550	841	527	538	894	1351			1259		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	56	26	145	240
Volume Left	41	9	5	11
Volume Right	16	17	16	49
cSH	616	725	1351	1259
Volume to Capacity	0.09	0.04	0.00	0.01
Queue Length 95th (ft)	7	3	0	1
Control Delay (s)	11.4	10.1	0.3	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.4	10.1	0.3	0.4
Approach LOS	B	B		

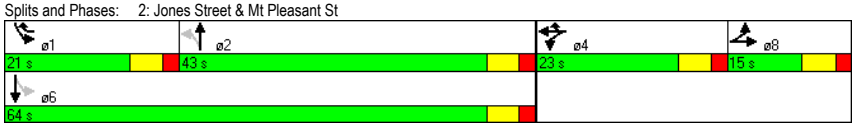
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	328	5	502	5	160	407	424	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	16	12	11	11	12
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1031			525			388			877	
Travel Time (s)		23.4			11.9			8.8			19.9	
Peak Hour Factor	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	343	518	0	608	0	530	412	0
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Detector Phase	8	8		4	4	4 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		27.0	27.0		19.0	22.0	
Total Split (s)	15.0	15.0	0.0	23.0	23.0	44.0	43.0	43.0	0.0	21.0	64.0	0.0
Total Split (%)	14.7%	14.7%	0.0%	22.5%	22.5%	43.1%	42.2%	42.2%	0.0%	20.6%	62.7%	0.0%
Maximum Green (s)	9.0	9.0		17.0	17.0		37.0	37.0		15.0	58.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)							5.0	5.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
v/c Ratio		0.10			0.90	0.52		0.88		1.22	0.41	
Control Delay		31.2			62.8	3.5		35.5		139.4	11.4	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		31.2			62.8	3.5		35.5		139.4	11.4	
Queue Length 50th (ft)		4			153	0		204		~239	86	
Queue Length 95th (ft)		14			#430	50		408		#481	170	
Internal Link Dist (ft)		951			445			308			797	
Turn Bay Length (ft)										300		
Base Capacity (vph)		231			382	998		963		435	1283	
Starvation Cap Reductn		0			0	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.08			0.90	0.52		0.63		1.22	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 81.6
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Jones Street & Mt Pleasant St



HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	328	5	502	5	160	407	424	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	11	11	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.93			1.00	0.85		0.90		1.00	1.00	
Flt Protected		0.98			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1959			1776	1568		1908		1728	1749	
Flt Permitted		0.98			0.95	1.00		1.00		0.15	1.00	
Satd. Flow (perm)		1959			1776	1568		1901		274	1749	
Peak-hour factor, PHF	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Adj. Flow (vph)	9	0	9	338	5	518	5	170	433	530	412	0
RTOR Reduction (vph)	0	9	0	0	0	317	0	95	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	343	201	0	513	0	530	412	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Turn Type	Split			Split		pt+ov	Perm			pm+pt		
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		2.3			17.5	33.0		25.9		47.4	47.4	
Effective Green, g (s)		2.3			17.5	33.0		25.9		47.4	47.4	
Actuated g/C Ratio		0.03			0.21	0.39		0.30		0.56	0.56	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		53			365	607		578		417	973	
v/s Ratio Prot		c0.00			c0.19	0.13				c0.23	0.24	
v/s Ratio Perm								0.27		c0.48		
v/c Ratio		0.17			0.94	0.33		0.89		1.27	0.42	
Uniform Delay, d1		40.5			33.3	18.3		28.3		22.9	11.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.6			31.2	0.1		14.8		139.6	0.1	
Delay (s)		41.1			64.6	18.5		43.1		162.5	11.1	
Level of Service		D			E	B		D		F	B	
Approach Delay (s)		41.1			36.8			43.1			96.3	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM Average Control Delay	61.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
14: Kings Highway & Church Street

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	554	5	35	461	70	233	210	80	70	275	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	607	0	38	584	0	271	337	0	0	388	136
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Minimum Split (s)	35.0	35.0		35.0	35.0		21.0	21.0		21.0	21.0	21.0
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	59.3%	59.3%	0.0%	59.3%	59.3%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	40.7%
Maximum Green (s)	30.0	30.0		30.0	30.0		19.0	19.0		19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
v/c Ratio	0.46	0.66		0.15	0.65		1.27	0.61			0.89	0.26
Control Delay	16.3	15.0		9.6	14.9		178.8	22.5			45.2	16.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	16.3	15.0		9.6	14.9		178.8	22.5			45.2	16.6
Queue Length 50th (ft)	26	146		7	139		~126	99			128	35
Queue Length 95th (ft)	71	245		21	237		#236	163			#269	72
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	273	924		256	899		213	553			437	515
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.46	0.66		0.15	0.65		1.27	0.61			0.89	0.26

Intersection Summary	
Area Type:	Other
Cycle Length: 59	
Actuated Cycle Length: 59	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Kings Highway & Church Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	554	5	35	461	70	233	210	80	70	275	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1636	1816		1631	1770		1728	1717			1786	1599
Flt Permitted	0.31	1.00		0.29	1.00		0.36	1.00			0.75	1.00
Satd. Flow (perm)	537	1816		504	1770		663	1717			1357	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	126	602	5	38	507	77	271	244	93	79	309	136
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	126	607	0	38	584	0	271	337	0	0	388	136
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Effective Green, g (s)	30.0	30.0		30.0	30.0		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32			0.32	0.32
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	273	923		256	900		214	553			437	515
v/s Ratio Prot		c0.33			0.33			0.20				
v/s Ratio Perm	0.23			0.08			c0.41				0.29	0.09
v/c Ratio	0.46	0.66		0.15	0.65		1.27	0.61			0.89	0.26
Uniform Delay, d1	9.3	10.7		7.7	10.6		20.0	16.9			19.0	14.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.5	3.7		1.2	3.6		151.5	4.9			22.5	1.2
Delay (s)	14.8	14.4		8.9	14.3		171.5	21.8			41.5	16.1
Level of Service	B	B		A	B		F	C			D	B
Approach Delay (s)		14.4			13.9			88.5			34.9	
Approach LOS		B			B			F			C	

Intersection Summary				
HCM Average Control Delay	36.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	105.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	161	10	45	105	35	15	385	50	125	530	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	16	14	16	11	11	16	11	11	16
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		197			310			393			488	
Travel Time (s)		4.5			7.0			8.9			11.1	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	202	0	0	210	0	18	524	0	145	633	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%	37.0%	37.0%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lead	Lead		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.41			0.47		0.09	0.60		0.49	0.71	
Control Delay		19.8			20.2		14.4	17.8		23.1	20.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		19.8			20.2		14.4	17.8		23.1	20.9	
Queue Length 50th (ft)		44			44		2	83		22	111	
Queue Length 95th (ft)		134			133		21	#380		#151	#525	
Internal Link Dist (ft)		117			230			313			408	
Turn Bay Length (ft)												
Base Capacity (vph)		952			853		208	871		294	888	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.21			0.25		0.09	0.60		0.49	0.71	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
19: Wood Street & Route 18
2030 Build Condition - PM Peak Hour

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	26%
Maximum Green (s)	15.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	4.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
19: Wood Street & Route 18

2030 Build Condition - PM Peak Hour

Cycle Length: 81
Actuated Cycle Length: 53
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: Wood Street & Route 18

HCM Signalized Intersection Capacity Analysis
19: Wood Street & Route 18

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	161	10	45	105	35	15	385	50	125	530	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	14	16	16	14	16	11	11	16	11	11	16
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1987			1918		1745	1754		1728	1794	
Flt Permitted		0.96			0.88		0.23	1.00		0.33	1.00	
Satd. Flow (perm)		1923			1712		420	1754		595	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	16	175	11	51	119	40	18	464	60	145	616	17
RTOR Reduction (vph)	0	3	0	0	11	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	199	0	0	199	0	18	520	0	145	632	0
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	3%	2%	1%	2%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		13.5			13.5		26.2	26.2		26.2	26.2	
Effective Green, g (s)		13.5			13.5		26.2	26.2		26.2	26.2	
Actuated g/C Ratio		0.23			0.23		0.45	0.45		0.45	0.45	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		450			401		191	796		270	815	
v/s Ratio Prot								0.30			c0.35	
v/s Ratio Perm		0.10			c0.12		0.04			0.24		
v/c Ratio		0.44			0.50		0.09	0.65		0.54	0.78	
Uniform Delay, d1		18.9			19.1		9.0	12.2		11.4	13.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			1.3		0.3	2.1		2.6	4.9	
Delay (s)		19.8			20.5		9.3	14.4		14.0	18.2	
Level of Service		B			C		A	B		B	B	
Approach Delay (s)		19.8			20.5			14.2			17.4	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	17.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	71.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	415	80	40	275	55	60	166	30	76	247	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	16	14	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1761			1229			1754			2421	
Travel Time (s)		40.0			27.9			39.9			55.0	
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	727	0	0	406	0	0	288	0	0	551	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	36.0	36.0		36.0	36.0		29.0	29.0		29.0	29.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	29.0	29.0	0.0	29.0	29.0	0.0
Total Split (%)	55.4%	55.4%	0.0%	55.4%	55.4%	0.0%	44.6%	44.6%	0.0%	44.6%	44.6%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.92			0.48			0.62			0.92	
Control Delay		37.4			14.5			24.9			46.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		37.4			14.5			24.9			46.0	
Queue Length 50th (ft)		256			105			94			206	
Queue Length 95th (ft)		#420			175			167			#359	
Internal Link Dist (ft)		1681			1149			1674			2341	
Turn Bay Length (ft)												
Base Capacity (vph)		786			845			466			596	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.92			0.48			0.62			0.92	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 24: Nash Road & Church Street

HCM Signalized Intersection Capacity Analysis
24: Nash Road & Church Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	415	80	40	275	55	60	166	30	76	247	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	16	14	16	16	16	16
Total Lost time (s)		6.0			6.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		2047			2047			1927			1984	
Flt Permitted		0.83			0.89			0.71			0.88	
Satd. Flow (perm)		1705			1830			1378			1760	
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	138	494	95	44	302	60	67	187	34	88	287	176
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	727	0	0	406	0	0	288	0	0	551	0
Heavy Vehicles (%)	1%	3%	1%	3%	3%	0%	0%	3%	3%	0%	4%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		30.0			30.0			22.0			22.0	
Effective Green, g (s)		30.0			30.0			22.0			22.0	
Actuated g/C Ratio		0.46			0.46			0.34			0.34	
Clearance Time (s)		6.0			6.0			7.0			7.0	
Lane Grp Cap (vph)		787			845			466			596	
v/s Ratio Prot												
v/s Ratio Perm		c0.43			0.22			0.21			c0.31	
v/c Ratio		0.92			0.48			0.62			0.92	
Uniform Delay, d1		16.4			12.1			18.0			20.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		18.1			2.0			6.0			22.3	
Delay (s)		34.6			14.1			24.0			43.0	
Level of Service		C			B			C			D	
Approach Delay (s)		34.6			14.1			24.0			43.0	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
28: Coggeshall Street & Route 18 SB

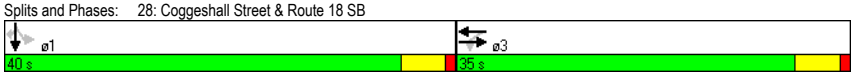
2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	217	95	170	257	0	0	0	0	106	630	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	12	12	12	12	12	10	10
Storage Length (ft)	0		0	0		0	0		0	0		130
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		686			474			1008			501	
Travel Time (s)		15.6			10.8			22.9			11.4	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	339	0	0	497	0	0	0	0	0	766	47
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Minimum Split (s)		35.0		35.0	35.0					40.0	40.0	40.0
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	0.0	0.0	0.0	40.0	40.0	40.0
Total Split (%)	0.0%	46.7%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	53.3%	53.3%	53.3%
Maximum Green (s)		30.0		30.0	30.0					35.0	35.0	35.0
Yellow Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.47			1.01						0.50	0.06
Control Delay		17.3			69.5						15.4	4.0
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		17.3			69.5						15.4	4.0
Queue Length 50th (ft)		100			~231						124	0
Queue Length 95th (ft)		171			#395						172	16
Internal Link Dist (ft)		606			394			928			421	
Turn Bay Length (ft)												130
Base Capacity (vph)		727			491						1522	728
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.47			1.01						0.50	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Coggeshall Street & Route 18 SB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	217	95	170	257	0	0	0	0	106	630	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	10	10
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.96			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.99	1.00
Satd. Flow (prot)		1764			2029						3261	1507
Flt Permitted		1.00			0.59						0.99	1.00
Satd. Flow (perm)		1764			1226						3261	1507
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	0	236	103	198	299	0	0	0	0	110	656	47
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	318	0	0	497	0	0	0	0	0	766	22
Heavy Vehicles (%)	0%	3%	4%	1%	1%	0%	0%	0%	0%	6%	2%	0%
Turn Type				Perm						Perm		Perm
Protected Phases		3			3						1	
Permitted Phases				3						1		1
Actuated Green, G (s)		30.0			30.0						35.0	35.0
Effective Green, g (s)		30.0			30.0						35.0	35.0
Actuated g/C Ratio		0.40			0.40						0.47	0.47
Clearance Time (s)		5.0			5.0						5.0	5.0
Lane Grp Cap (vph)		706			490						1522	703
v/s Ratio Prot		0.18										
v/s Ratio Perm					c0.41						0.23	0.01
v/c Ratio		0.45			1.01						0.50	0.03
Uniform Delay, d1		16.5			22.5						13.9	10.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		2.1			44.3						1.2	0.1
Delay (s)		18.5			66.8						15.1	10.9
Level of Service		B			E						B	B
Approach Delay (s)		18.5			66.8			0.0			14.9	
Approach LOS		B			E			A			B	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

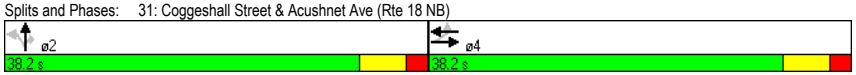
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	273	0	0	307	103	120	465	292	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	15	12	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	0		160	0		0
Storage Lanes	0		0	0		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		474			546			1002			363	
Travel Time (s)		10.8			12.4			22.8			8.3	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	342	0	0	437	0	129	500	314	0	0	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Minimum Split (s)	38.2	38.2			38.2		38.2	38.2	38.2			
Total Split (s)	38.2	38.2	0.0	0.0	38.2	0.0	38.2	38.2	38.2	0.0	0.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	0.0%	50.0%	0.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%
Maximum Green (s)	32.0	32.0			32.0		32.0	32.0	32.0			
Yellow Time (s)	4.2	4.2			4.2		4.2	4.2	4.2			
All-Red Time (s)	2.0	2.0			2.0		2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	4.0	6.2	4.0	6.2	6.2	6.2	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.46			0.51		0.17	0.66	0.38			
Control Delay		18.6			17.9		14.7	23.1	3.4			
Queue Delay		0.0			0.0		0.0	0.0	0.0			
Total Delay		18.6			17.9		14.7	23.1	3.4			
Queue Length 50th (ft)		113			139		37	185	0			
Queue Length 95th (ft)		184			220		71	289	44			
Internal Link Dist (ft)		394			466			922			283	
Turn Bay Length (ft)									160			
Base Capacity (vph)		738			853		756	754	824			
Starvation Cap Reductn		0			0		0	0	0			
Spillback Cap Reductn		0			0		0	0	0			
Storage Cap Reductn		0			0		0	0	0			
Reduced v/c Ratio		0.46			0.51		0.17	0.66	0.38			

Intersection Summary	
Area Type:	Other
Cycle Length: 76.4	
Actuated Cycle Length: 76.4	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	

Lanes, Volumes, Timings
31: Coggeshall Street & Acushnet Ave (Rte 18 NB) 2030 Build Condition - PM Peak Hour

Splits and Phases: 31: Coggeshall Street & Acushnet Ave (Rte 18 NB)



HCM Signalized Intersection Capacity Analysis
31: Coggeshall Street & Acushnet Ave (Rte 18 NB)

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	273	0	0	307	103	120	465	292	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	15	12	12	11	11	12	12	12
Total Lost time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00			
Frt		1.00			0.97		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		2012			1999		1805	1801	1531			
Flt Permitted		0.87			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1761			1999		1805	1801	1531			
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	48	294	0	0	327	110	129	500	314	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	182	0	0	0
Lane Group Flow (vph)	0	342	0	0	421	0	129	500	132	0	0	0
Heavy Vehicles (%)	4%	3%	0%	0%	1%	1%	0%	2%	2%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		32.0			32.0		32.0	32.0	32.0			
Effective Green, g (s)		32.0			32.0		32.0	32.0	32.0			
Actuated g/C Ratio		0.42			0.42		0.42	0.42	0.42			
Clearance Time (s)		6.2			6.2		6.2	6.2	6.2			
Lane Grp Cap (vph)		738			837		756	754	641			
v/s Ratio Prot					c0.21			c0.28				
v/s Ratio Perm		0.19					0.07		0.09			
v/c Ratio		0.46			0.50		0.17	0.66	0.21			
Uniform Delay, d1		16.0			16.3		13.9	17.9	14.1			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		2.1			2.2		0.5	4.6	0.7			
Delay (s)		18.1			18.5		14.4	22.4	14.8			
Level of Service		B			B		B	C	B			
Approach Delay (s)		18.1			18.5			18.8			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 Build Condition - PM Peak Hour

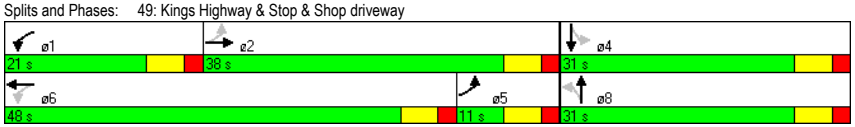
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	730	134	175	440	50	166	45	289	160	25	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			196			360			359	
Travel Time (s)		11.7			4.5			8.2			8.2	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1112	0	0	700	0	0	588	0	0	399	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	11.0	38.0	0.0	21.0	48.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.2%	42.2%	0.0%	23.3%	53.3%	0.0%	34.4%	34.4%	0.0%	34.4%	34.4%	0.0%
Maximum Green (s)	5.0	32.0		15.0	42.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.78			0.64			0.74			0.66	
Control Delay		16.2			12.9			14.9			16.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.2			12.9			14.9			16.0	
Queue Length 50th (ft)		133			73			38			32	
Queue Length 95th (ft)		#321			177			84			77	
Internal Link Dist (ft)		435			116			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1421			1389			1218			998	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.78			0.50			0.48			0.40	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

Cycle Length: 90
Actuated Cycle Length: 59.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 49: Kings Highway & Stop & Shop driveway



HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	730	134	175	440	50	166	45	289	160	25	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.99			0.91			0.93	
Flt Protected		0.99			0.99			0.98			0.98	
Satd. Flow (prot)		3481			3490			3222			3247	
Flt Permitted		0.70			0.54			0.73			0.62	
Satd. Flow (perm)		2470			1915			2377			2067	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	183	785	144	184	463	53	195	53	340	180	28	191
RTOR Reduction (vph)	0	9	0	0	6	0	0	264	0	0	148	0
Lane Group Flow (vph)	0	1103	0	0	694	0	0	324	0	0	251	0
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		33.7			33.7			13.1			13.1	
Effective Green, g (s)		33.7			33.7			13.1			13.1	
Actuated g/C Ratio		0.57			0.57			0.22			0.22	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1416			1098			530			461	
v/s Ratio Prot												
v/s Ratio Perm		c0.45			0.36			c0.14			0.12	
v/c Ratio		0.78			0.63			0.61			0.54	
Uniform Delay, d1		9.7			8.4			20.6			20.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			0.9			1.5			0.7	
Delay (s)		12.2			9.3			22.0			20.9	
Level of Service		B			A			C			C	
Approach Delay (s)		12.2			9.3			22.0			20.9	
Approach LOS		B			A			C			C	

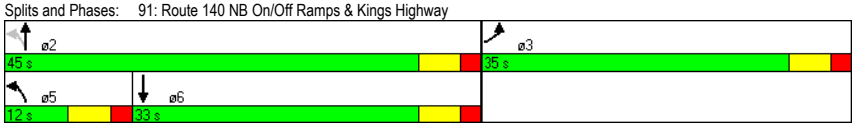
Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	493	160	150	541	666	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.92	0.92	0.83	0.83	0.79	0.79
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	710	0	0	833	984	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	35.0	0.0	12.0	45.0	33.0	0.0
Total Split (%)	43.8%	0.0%	15.0%	56.3%	41.3%	0.0%
Maximum Green (s)	29.0		6.0	39.0	27.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Recall Mode	None		None	Min	Min	
v/c Ratio	0.95			1.04dl	0.62	
Control Delay	48.4			36.0	17.2	
Queue Delay	0.0			0.0	0.0	
Total Delay	48.4			36.0	17.2	
Queue Length 50th (ft)	346			185	176	
Queue Length 95th (ft)	#576			#239	193	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	754			1004	1605	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.94			0.83	0.61	

Intersection Summary	
Area Type:	Other

Cycle Length: 80
Actuated Cycle Length: 76.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 91: Route 140 NB On/Off Ramps & Kings Highway



HCM Signalized Intersection Capacity Analysis
91: Route 140 NB On/Off Ramps & Kings Highway

2030 Build Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	493	160	150	541	666	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1977			3521	3449	
Flt Permitted	0.96			0.55	1.00	
Satd. Flow (perm)	1977			1958	3449	
Peak-hour factor, PHF	0.92	0.92	0.83	0.83	0.79	0.79
Adj. Flow (vph)	536	174	181	652	843	141
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	710	0	0	833	984	0
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	29.0			35.4	35.4	
Effective Green, g (s)	29.0			35.4	35.4	
Actuated g/C Ratio	0.38			0.46	0.46	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	2.0			2.0	2.0	
Lane Grp Cap (vph)	750			907	1598	
v/s Ratio Prot	c0.36				0.29	
v/s Ratio Perm				c0.43		
v/c Ratio	0.95			1.04dl	0.62	
Uniform Delay, d1	23.0			19.2	15.4	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	20.5			13.6	0.5	
Delay (s)	43.4			32.8	15.9	
Level of Service	D			C	B	
Approach Delay (s)	43.4			32.8	15.9	
Approach LOS	D			C	B	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2030 Build Condition - PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	596	235	145	681	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.91	0.91	0.96	0.96	0.89	0.89
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	913	0	0	860	174	107
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	13.0		11.0	13.0	13.0	13.0
Total Split (s)	58.0	0.0	11.0	69.0	22.0	22.0
Total Split (%)	63.7%	0.0%	12.1%	75.8%	24.2%	24.2%
Maximum Green (s)	52.0		5.0	63.0	16.0	16.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
v/c Ratio	0.47			0.66	0.51	0.28
Control Delay	6.5			10.7	25.0	7.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.5			10.7	25.0	7.3
Queue Length 50th (ft)	56			73	41	0
Queue Length 95th (ft)	112			152	111	34
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	3275			2298	596	605
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.28			0.37	0.29	0.18

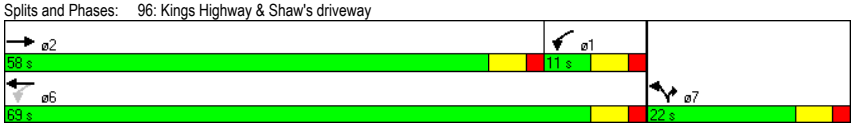
Intersection Summary	
Area Type:	Other
Cycle Length: 91	
Actuated Cycle Length: 49.4	
Natural Cycle: 50	

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2030 Build Condition - PM Peak Hour

Control Type: Actuated-Uncoordinated

Splits and Phases: 96: Kings Highway & Shaw's driveway

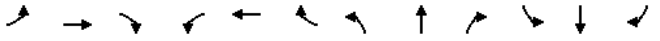


HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2030 Build Condition - PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	596	235	145	681	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3408			3543	1787	1599
Flt Permitted	1.00			0.65	0.95	1.00
Satd. Flow (perm)	3408			2309	1787	1599
Peak-hour factor, PHF	0.91	0.91	0.96	0.96	0.89	0.89
Adj. Flow (vph)	655	258	151	709	174	107
RTOR Reduction (vph)	47	0	0	0	0	87
Lane Group Flow (vph)	866	0	0	860	174	20
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	27.7			27.7	9.3	9.3
Effective Green, g (s)	27.7			27.7	9.3	9.3
Actuated g/C Ratio	0.57			0.57	0.19	0.19
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	1927			1305	339	303
v/s Ratio Prot	0.25				c0.10	0.01
v/s Ratio Perm				c0.37		
v/c Ratio	0.45			0.66	0.51	0.07
Uniform Delay, d1	6.2			7.4	17.8	16.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.9	0.5	0.0
Delay (s)	6.3			8.3	18.4	16.3
Level of Service	A			A	B	B
Approach Delay (s)	6.3			8.3	17.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	284	75	75	239	265	30	235	330	290	180	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	11	16	16	10	10	16	12	14	16	11	16
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		443			1111			850			178	
Travel Time (s)		10.1			25.3			19.3			4.0	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	516	0	0	334	282	0	294	367	0	673	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Detector Phase	4	4		4	4	4	2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0	30.0	0.0
Total Split (%)	30.3%	30.3%	0.0%	30.3%	30.3%	30.3%	30.3%	30.3%	30.3%	20.2%	30.3%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0	25.0	25.0	25.0	25.0	15.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.54			0.61	0.38		0.46	0.41		0.76	
Control Delay		18.0			23.4	4.2		18.9	3.8		24.1	
Queue Delay		0.0			0.0	0.0		0.0	0.0		0.0	
Total Delay		18.0			23.4	4.2		18.9	3.8		24.1	
Queue Length 50th (ft)		66			89	0		72	0		93	
Queue Length 95th (ft)		165			#277	51		199	57		#266	
Internal Link Dist (ft)		363			1031			770			98	
Turn Bay Length (ft)												
Base Capacity (vph)		952			550	750		649	904		909	
Starvation Cap Reductn		0			0	0		0	0		0	
Spillback Cap Reductn		0			0	0		0	0		0	
Storage Cap Reductn		0			0	0		0	0		0	
Reduced v/c Ratio		0.54			0.61	0.38		0.45	0.41		0.74	

Intersection Summary	
Area Type:	Other

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	6.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	19%
Maximum Green (s)	14.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

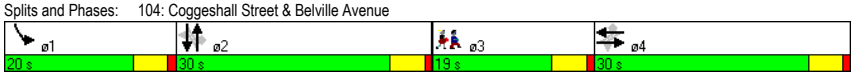
Intersection Summary

Lanes, Volumes, Timings
104: Coggeshall Street & Belville Avenue

2030 Build Condition - PM Peak Hour

Cycle Length: 99
Actuated Cycle Length: 63.2
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 104: Coggeshall Street & Belville Avenue



HCM Signalized Intersection Capacity Analysis
104: Coggeshall Street & Belville Avenue

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	284	75	75	239	265	30	235	330	290	180	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	11	16	16	10	10	16	12	14	16	11	16
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		0.95	
Frt		0.98			1.00	0.85		1.00	0.85		0.96	
Flt Protected		0.99			0.99	1.00		0.99	1.00		0.98	
Satd. Flow (prot)		3268			1735	1449		1819	1706		3214	
Flt Permitted		0.71			0.78	1.00		0.89	1.00		0.67	
Satd. Flow (perm)		2343			1374	1449		1620	1706		2192	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	125	309	82	80	254	282	33	261	367	315	196	162
RTOR Reduction (vph)	0	13	0	0	0	176	0	0	232	0	32	0
Lane Group Flow (vph)	0	503	0	0	334	106	0	294	135	0	641	0
Heavy Vehicles (%)	1%	3%	6%	1%	1%	4%	3%	4%	1%	3%	3%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4		4	2		2	2		
Actuated Green, G (s)		25.3			25.3	25.3		24.7	24.7		24.7	
Effective Green, g (s)		25.3			25.3	25.3		24.7	24.7		24.7	
Actuated g/C Ratio		0.38			0.38	0.38		0.37	0.37		0.37	
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		882			517	546		595	627		806	
v/s Ratio Prot												
v/s Ratio Perm		0.21			c0.24	0.07		0.18	0.08		c0.29	
v/c Ratio		0.57			0.65	0.19		0.49	0.22		0.79	
Uniform Delay, d1		16.6			17.3	14.1		16.4	14.6		19.0	
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		2.7			6.1	0.8		0.9	0.2		5.8	
Delay (s)		19.3			23.4	14.9		17.3	14.8		24.7	
Level of Service		B			C	B		B	B		C	
Approach Delay (s)		19.3			19.5			15.9			24.7	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	17.2
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	161	98	370	595	114	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	14	16	16	14
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	693		149			313
Travel Time (s)	15.8		3.4			7.1
Peak Hour Factor	0.77	0.77	0.94	0.94	0.73	0.73
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	336	0	1027	0	0	635
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Minimum Split (s)	27.0		37.0		37.0	37.0
Total Split (s)	27.0	0.0	37.0	0.0	37.0	37.0
Total Split (%)	42.2%	0.0%	57.8%	0.0%	57.8%	57.8%
Maximum Green (s)	20.0		30.0		30.0	30.0
Yellow Time (s)	5.0		5.0		5.0	5.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag		Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes		Yes	Yes
v/c Ratio	0.53		0.53			0.66
Control Delay	19.0		5.3			17.2
Queue Delay	0.0		0.0			0.0
Total Delay	19.0		5.3			17.2
Queue Length 50th (ft)	89		45			94
Queue Length 95th (ft)	128		84			106
Internal Link Dist (ft)	613		69			233
Turn Bay Length (ft)						
Base Capacity (vph)	629		1928			960
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.53		0.53			0.66

Intersection Summary	
Area Type:	Other
Cycle Length: 64	
Actuated Cycle Length: 64	
Offset: 35 (55%), Referenced to phase 2:WBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	

Splits and Phases: 137: Hillman St & Pleasant Street

HCM Signalized Intersection Capacity Analysis
137: Hillman St & Pleasant Street

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	161	98	370	595	114	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	14	16	16	14
Total Lost time (s)	7.0		7.0			7.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.95		0.91			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1903		3393			3693
Flt Permitted	0.97		1.00			0.55
Satd. Flow (perm)	1903		3393			2048
Peak-hour factor, PHF	0.77	0.77	0.94	0.94	0.73	0.73
Adj. Flow (vph)	209	127	394	633	156	479
RTOR Reduction (vph)	34	0	336	0	0	0
Lane Group Flow (vph)	302	0	691	0	0	635
Heavy Vehicles (%)	3%	6%	3%	3%	3%	3%
Turn Type					Perm	
Protected Phases	2		1			1
Permitted Phases					1	
Actuated Green, G (s)	20.0		30.0			30.0
Effective Green, g (s)	20.0		30.0			30.0
Actuated g/C Ratio	0.31		0.47			0.47
Clearance Time (s)	7.0		7.0			7.0
Lane Grp Cap (vph)	595		1590			960
v/s Ratio Prot	c0.16		0.20			
v/s Ratio Perm						c0.31
v/c Ratio	0.51		0.43			0.66
Uniform Delay, d1	18.0		11.3			13.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	3.1		0.9			3.6
Delay (s)	21.0		12.2			16.7
Level of Service	C		B			B
Approach Delay (s)	21.0		12.2			16.7
Approach LOS	C		B			B

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
140: Mill Street & Pleasant St

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	203	360	205	248	25	135	455	105	117	345	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	16	11	12	10	16	10	12	14	16	14	16
Storage Length (ft)	0		0		0		100		0	0		0
Storage Lanes	1		1		1		1		0	0		0
Taper Length (ft)	25		25		25		25		25	25		25
Right Turn on Red					No				Yes			
Link Speed (mph)		30		30				30			30	
Link Distance (ft)		168		308				709			499	
Travel Time (s)		3.8		7.0				16.1			11.3	
Peak Hour Factor	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	271	211	387	220	267	0	184	644	0	0	628	0
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	5	5	1 5	2	2	2		1	1	
Permitted Phases												
Detector Phase	4	4	5	5	1 5	2	2	2		1	1	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	12.0	12.0	12.0	12.0		12.0	12.0	12.0		12.0	12.0	
Total Split (s)	30.0	30.0	35.0	35.0	70.0	35.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	19.2%	19.2%	22.4%	22.4%	44.9%	22.4%	22.4%	22.4%	0.0%	22.4%	22.4%	0.0%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag				Lag	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Recall Mode	Max	Max	Max	Max		Max	Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.86	0.58	1.13	0.57	0.41		0.56	0.91			0.82	
Control Delay	85.9	65.3	139.7	61.3	32.2		62.0	74.1			67.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	85.9	65.3	139.7	61.3	32.2		62.0	74.1			67.2	
Queue Length 50th (ft)	276	203	~477	208	193		173	339			331	
Queue Length 95th (ft)	#450	295	#690	301	278		250	#439			368	
Internal Link Dist (ft)		88		228				629			419	
Turn Bay Length (ft)							100					
Base Capacity (vph)	314	363	343	384	648		330	709			762	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.86	0.58	1.13	0.57	0.41		0.56	0.91			0.82	

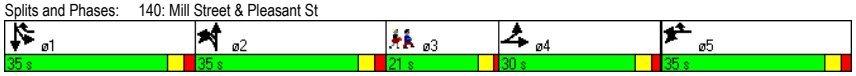
Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	13%
Maximum Green (s)	17.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	10.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	18
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 156	
Actuated Cycle Length: 147.6	
Natural Cycle: 140	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 140: Mill Street & Pleasant St



HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	203	360	205	248	25	135	455	105	117	345	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95			0.95	
Frt	1.00	1.00	1.00	1.00	0.85		1.00	0.97			0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1847	2132	1678	1881	1463		1617	3406			3731	
Flt Permitted	0.95	1.00	0.95	1.00	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1847	2132	1678	1881	1463		1617	3406			3731	
Peak-hour factor, PHF	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Adj. Flow (vph)	271	211	387	220	267	29	155	523	121	141	416	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	271	211	387	220	267	0	184	631	0	0	628	0
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	5	5	1 5	2	2	2		1	1	
Permitted Phases												
Actuated Green, G (s)	25.1	25.1	30.2	30.2	65.4		30.2	30.2			30.2	
Effective Green, g (s)	25.1	25.1	30.2	30.2	65.4		30.2	30.2			30.2	
Actuated g/C Ratio	0.17	0.17	0.20	0.20	0.44		0.20	0.20			0.20	
Clearance Time (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Lane Grp Cap (vph)	310	358	339	380	640		327	688			754	
v/s Ratio Prot	c0.15	0.10	c0.23	0.12	0.18		0.11	c0.19			c0.17	
v/s Ratio Perm												
v/c Ratio	0.87	0.59	1.14	0.58	0.42		0.56	0.92			0.83	
Uniform Delay, d1	60.6	57.4	59.6	53.9	28.9		53.7	58.4			57.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	27.2	7.0	93.0	6.3	2.0		6.8	19.2			10.4	
Delay (s)	87.9	64.3	152.6	60.2	30.9		60.5	77.6			67.6	
Level of Service	F	E	F	E	C		E	E			E	
Approach Delay (s)		77.6		92.2				73.8			67.6	
Approach LOS		E		F				E			E	

Intersection Summary				
HCM Average Control Delay	78.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	149.4	Sum of lost time (s)	33.7	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
174: Union Street & Route 18

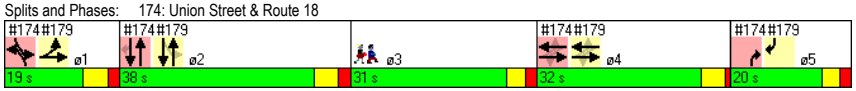
2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	31	60	85	38	15	90	980	24	36	1150	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	10	11	11
Storage Length (ft)	0		0	0		0	150		225	150		225
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		432			82			365			2491	
Travel Time (s)		9.8			1.9			8.3			56.6	
Peak Hour Factor	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	464	0	0	163	0	99	1077	26	36	1162	146
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Detector Phase	4	4		4	4		1	2	5	1	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	19.0	38.0	20.0	19.0	38.0	38.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	13.6%	27.1%	14.3%	13.6%	27.1%	27.1%
Maximum Green (s)	27.0	27.0		27.0	27.0		13.0	32.0	15.0	13.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	None		None	None		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.44			0.40		0.59	1.18	0.13	0.26	1.27	0.30
Control Delay		248.8			85.3		70.0	129.7	54.6	59.7	166.5	20.9
Queue Delay		0.0			0.0		0.0	110.0	0.3	0.0	0.0	0.0
Total Delay		248.8			85.3		70.0	239.7	54.9	59.7	166.5	20.9
Queue Length 50th (ft)		~421			119		66	~445	16	23	~510	34
Queue Length 95th (ft)		#841			m212		#158	#827	53	68	#912	114
Internal Link Dist (ft)		352			2			285			2411	
Turn Bay Length (ft)							150		225	150		225
Base Capacity (vph)		323			406		191	915	200	160	915	480
Starvation Cap Reductn		0			0		0	159	0	0	0	0
Spillback Cap Reductn		0			0		0	0	46	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		1.44			0.40		0.52	1.42	0.17	0.23	1.27	0.30

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	22%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	19
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 119.5	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 174: Union Street & Route 18



HCM Signalized Intersection Capacity Analysis
174: Union Street & Route 18

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	31	60	85	38	15	90	980	24	36	1150	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2012			2033		1728	3355	1561	1440	3355	1546
Flt Permitted		0.67			0.84		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1401			1764		1728	3355	1561	1440	3355	1546
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Adj. Flow (vph)	366	33	65	100	45	18	99	1077	26	36	1162	146
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	59
Lane Group Flow (vph)	0	464	0	0	163	0	99	1077	26	36	1162	87
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)		27.5			27.5		11.6	32.6	14.8	11.6	32.6	32.6
Effective Green, g (s)		27.5			27.5		11.6	32.6	14.8	11.6	32.6	32.6
Actuated g/C Ratio		0.22			0.22		0.09	0.27	0.12	0.09	0.27	0.27
Clearance Time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)		5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		315			396		164	894	189	136	894	412
v/s Ratio Prot							c0.06	0.32	c0.02	0.03	c0.35	
v/s Ratio Perm		c0.33			0.09							0.06
v/c Ratio		1.47			0.41		0.60	1.20	0.14	0.26	1.30	0.21
Uniform Delay, d1		47.5			40.5		53.2	44.9	48.1	51.4	44.9	34.9
Progression Factor		1.00			1.92		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		229.4			1.1		7.1	102.7	0.5	1.4	143.1	0.4
Delay (s)		276.8			78.7		60.3	147.6	48.5	52.9	188.0	35.3
Level of Service		F			E		E	F	D	D	F	D
Approach Delay (s)		276.8			78.7			138.3			167.8	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	168.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	35.9
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
179: Union Street & McArthur Drive

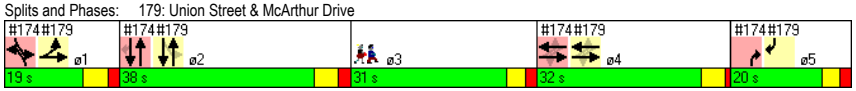
2030 Build Condition - PM Peak Hour

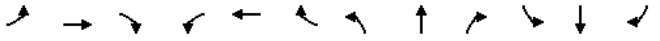
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	5	35	0	15	5	0	206	5	5	252	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12
Storage Length (ft)	0		0	0		0	0		0	0		50
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		82			609			920			687	
Travel Time (s)		1.9			13.8			20.9			15.6	
Peak Hour Factor	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	101	0	0	27	0	0	306	0	0	310	149
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Detector Phase	1	1 4		4	4			2		2	2	5
Switch Phase												
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0
Total Split (s)	19.0	51.0	0.0	32.0	32.0	0.0	0.0	38.0	0.0	38.0	38.0	20.0
Total Split (%)	13.6%	36.4%	0.0%	22.9%	22.9%	0.0%	0.0%	27.1%	0.0%	27.1%	27.1%	14.3%
Maximum Green (s)	13.0			27.0	27.0			32.0		32.0	32.0	15.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes	
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0
Recall Mode	None			None	None			None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.19			0.06			0.55			0.64	0.76
Control Delay		7.6			34.9			44.9			48.5	77.0
Queue Delay		0.0			0.0			0.0			0.0	668.2
Total Delay		7.6			34.9			44.9			48.5	745.2
Queue Length 50th (ft)		23			11			176			184	100
Queue Length 95th (ft)		m40			35			261			341	#231
Internal Link Dist (ft)		2			529			840			607	
Turn Bay Length (ft)												50
Base Capacity (vph)		560			442			552			486	204
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			7			0			0	175
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.18			0.06			0.55			0.64	5.14

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	22%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	19
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 119.5	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 179: Union Street & McArthur Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	5	35	0	15	5	0	206	5	5	252	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.95			0.96			1.00			1.00	0.85
Flt Protected		0.97			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1845			1894			2019			1793	1599
Flt Permitted		0.85			1.00			1.00			0.99	1.00
Satd. Flow (perm)		1602			1894			2019			1781	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Adj. Flow (vph)	56	6	39	0	20	7	0	299	7	6	304	149
RTOR Reduction (vph)	0	0	0	0	5	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	101	0	0	22	0	0	305	0	0	310	149
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		39.1			27.5			32.6			32.6	14.8
Effective Green, g (s)		39.1			27.5			32.6			32.6	14.8
Actuated g/C Ratio		0.32			0.22			0.27			0.27	0.12
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		535			426			538			474	193
v/s Ratio Prot		c0.02			0.01			0.15				c0.09
v/s Ratio Perm		c0.04									c0.17	
v/c Ratio		0.19			0.05			0.57			0.65	0.77
Uniform Delay, d1		30.2			37.2			38.8			39.9	52.2
Progression Factor		0.35			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.2			0.1			1.7			3.6	18.2
Delay (s)		10.7			37.3			40.5			43.5	70.4
Level of Service		B			D			D			D	E
Approach Delay (s)		10.7			37.3			40.5			52.2	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	122.4	Sum of lost time (s)		36.9	
Intersection Capacity Utilization	39.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
9: Tarkiln Hill Rd & Kings Highway

2030 Build Condition - PM Peak Hour

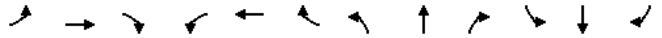
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	15	30	1149	650	160
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	62	19	33	1263	722	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				393	611	
pX, platoon unblocked	0.71					
vC, conflicting volume	2140	811	900			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2401	811	900			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	95	96			
cM capacity (veh/h)	25	381	755			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	1296	900
Volume Left	62	33	0
Volume Right	19	0	178
cSH	32	755	1700
Volume to Capacity	2.56	0.04	0.53
Queue Length 95th (ft)	236	3	0
Control Delay (s)	972.6	1.9	0.0
Lane LOS	F	A	
Approach Delay (s)	972.6	1.9	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	35.8		
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Park Avenue & Church Street

2030 Build Condition - PM Peak Hour



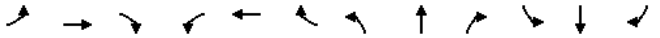
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	177	341	15	0	31	0	488	20	5	310	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.85	0.85	0.85	0.79	0.79	0.79
Hourly flow rate (vph)	5	188	363	19	0	39	0	574	24	6	392	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											176	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1030	1003	392	1448	991	586	392			598		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	937	905	174	1438	891	586	174			598		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	19	50	0	100	92	100			99		
cM capacity (veh/h)	190	231	726	15	236	508	1182			989		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	556	58	598	399
Volume Left	5	19	0	6
Volume Right	363	39	24	0
cSH	415	43	1700	989
Volume to Capacity	1.34	1.33	0.35	0.01
Queue Length 95th (ft)	645	140	0	0
Control Delay (s)	196.3	396.5	0.0	0.2
Lane LOS	F	F		A
Approach Delay (s)	196.3	396.5	0.0	0.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	82.0		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Irvington Street & Church Street

2030 Build Condition - PM Peak Hour



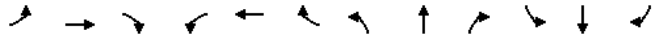
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	25	5	15	10	382	0	0	479	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.66	0.66	0.66	0.92	0.92	0.92	0.91	0.91	0.91
Hourly flow rate (vph)	7	0	0	38	8	23	11	415	0	0	526	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	993	966	529	966	969	415	532			415		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	993	966	529	966	969	415	532			415		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3			2.2		
p0 queue free %	97	100	100	84	97	96	99			100		
cM capacity (veh/h)	211	254	553	230	253	627	992			1155		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	7	68	426	532
Volume Left	7	38	11	0
Volume Right	0	23	0	5
cSH	211	295	992	1700
Volume to Capacity	0.03	0.23	0.01	0.31
Queue Length 95th (ft)	3	22	1	0
Control Delay (s)	22.6	20.8	0.3	0.0
Lane LOS	C	C	A	
Approach Delay (s)	22.6	20.8	0.3	0.0
Approach LOS	C	C		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	38.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 Build Condition - PM Peak Hour



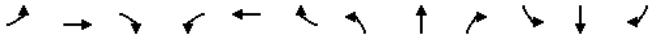
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	405	45	58	330	45	70	139	65	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	108	435	48	62	355	48	89	176	82	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		546			443							
pX, platoon unblocked	0.92			0.91			0.95	0.95	0.91	0.95	0.95	0.92
vC, conflicting volume	403			484			1178	1203	460	1349	1203	379
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313			382			979	1005	356	1159	1005	286
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	91			94			54	10	87	100	100	100
cM capacity (veh/h)	1153			1059			194	195	614	29	197	700

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	591	466	347
Volume Left	108	62	89
Volume Right	48	48	82
cSH	1153	1059	233
Volume to Capacity	0.09	0.06	1.49
Queue Length 95th (ft)	8	5	515
Control Delay (s)	2.4	1.7	281.3
Lane LOS	A	A	F
Approach Delay (s)	2.4	1.7	281.3
Approach LOS			F

Intersection Summary				
Average Delay	71.1			
Intersection Capacity Utilization	65.7%	ICU Level of Service		C
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
55: Rt 18 SB Exit Ramp & Purchase St

2030 Build Condition - PM Peak Hour



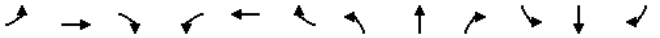
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	195	5	50	5	463	0	0	269	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	212	5	54	5	503	0	0	292	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								828				
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	864	807	292	807	807	503	292			503		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	812	750	292	750	750	422	292			422		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	30	98	91	100			100		
cM capacity (veh/h)	246	313	747	302	313	584	1269			1051		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	272	509	292
Volume Left	0	212	5	0
Volume Right	0	54	0	0
cSH	1700	334	1269	1700
Volume to Capacity	0.00	0.81	0.00	0.17
Queue Length 95th (ft)	0	173	0	0
Control Delay (s)	0.0	49.2	0.1	0.0
Lane LOS	A	E	A	
Approach Delay (s)	0.0	49.2	0.1	0.0
Approach LOS	A	E		

Intersection Summary				
Average Delay	12.5			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 Build Condition - PM Peak Hour



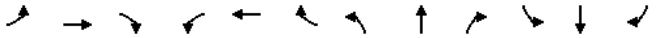
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	136	10	20	158	118	20	333	75	111	234	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.94	0.94	0.94
Hourly flow rate (vph)	6	155	11	23	180	134	24	401	90	118	249	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	172	336	516	378
Volume Left (vph)	6	23	24	118
Volume Right (vph)	11	134	90	11
Hadj (s)	0.01	-0.21	-0.03	0.12
Departure Headway (s)	8.3	7.4	7.1	7.4
Degree Utilization, x	0.40	0.69	1.01	0.78
Capacity (veh/h)	388	468	516	473
Control Delay (s)	16.7	25.6	69.2	31.9
Approach Delay (s)	16.7	25.6	69.2	31.9
Approach LOS	C	D	F	D

Intersection Summary				
Delay	42.3			
HCM Level of Service	E			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
72: Weld St & Purchase St

2030 Build Condition - PM Peak Hour



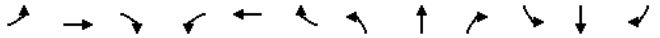
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	0	46	92	120	30	97	367	0	0	246	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.94	0.94	0.94	0.90	0.90	0.90
Hourly flow rate (vph)	28	0	52	107	140	35	103	390	0	0	273	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	991	887	290	939	903	390	307			390		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	991	887	290	939	903	390	307			390		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	75	100	93	50	45	95	92			100		
cM capacity (veh/h)	113	262	737	213	255	639	1260			1179		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	81	177	105	494	307
Volume Left	28	107	0	103	0
Volume Right	52	0	35	0	33
cSH	250	228	319	1260	1700
Volume to Capacity	0.32	0.78	0.33	0.08	0.18
Queue Length 95th (ft)	34	139	35	7	0
Control Delay (s)	26.1	60.3	21.7	2.4	0.0
Lane LOS	D	F	C	A	
Approach Delay (s)	26.1	45.9		2.4	0.0
Approach LOS	D	E			

Intersection Summary				
Average Delay	13.9			
Intersection Capacity Utilization	63.9%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
74: Logan St & Purchase St

2030 Build Condition - PM Peak Hour



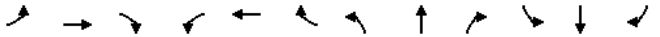
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	0	76	0	389	115	66	314	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.85	0.85	0.85	0.96	0.96	0.96	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	71	0	89	0	405	120	70	334	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1029	999	334	940	940	465	334			525		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1029	999	334	940	940	465	334			525		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	69	100	85	100			93		
cM capacity (veh/h)	172	228	712	231	247	597	1237			1017		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	160	525	404
Volume Left	0	71	0	70
Volume Right	0	89	120	0
cSH	1700	351	1237	1017
Volume to Capacity	0.00	0.46	0.00	0.07
Queue Length 95th (ft)	0	57	0	6
Control Delay (s)	0.0	23.5	0.0	2.2
Lane LOS	A	C		A
Approach Delay (s)	0.0	23.5	0.0	2.2
Approach LOS	A	C		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
75: Logan St & North Front Street

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	170	15	10	10	20	45	5	234	5	10	141	52
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.61	0.61	0.61	0.92	0.92	0.92	0.88	0.88	0.88
Hourly flow rate (vph)	195	17	11	16	33	74	5	254	5	11	160	59
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											720	
pX, platoon unblocked												
vC, conflicting volume	571	483	190	501	510	257	219			260		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	571	483	190	501	510	257	219			260		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	47	96	99	96	93	91	100			99		
cM capacity (veh/h)	365	480	857	460	464	786	1362			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	224	123	265	231
Volume Left	195	16	5	11
Volume Right	11	74	5	59
cSH	384	614	1362	1316
Volume to Capacity	0.58	0.20	0.00	0.01
Queue Length 95th (ft)	89	19	0	1
Control Delay (s)	26.7	12.3	0.2	0.5
Lane LOS	D	B	A	A
Approach Delay (s)	26.7	12.3	0.2	0.5
Approach LOS	D	B		

Intersection Summary				
Average Delay	9.1			
Intersection Capacity Utilization	40.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
77: Route 140 On/Off Ramps & Mt. Pleasant Street

2030 Build Condition - PM Peak Hour

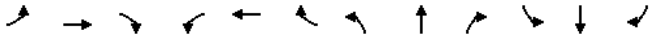
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	257	0	255	412	70	497
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.95	0.95	0.68	0.68
Hourly flow rate (vph)	292	0	268	434	103	731
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			877			
pX, platoon unblocked						
vC, conflicting volume	1422	485			268	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1422	485			268	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	0	100			92	
cM capacity (veh/h)	137	580			1272	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	292	702	834
Volume Left	292	0	103
Volume Right	0	434	0
cSH	137	1700	1272
Volume to Capacity	2.13	0.41	0.08
Queue Length 95th (ft)	598	0	7
Control Delay (s)	585.0	0.0	2.0
Lane LOS	F		A
Approach Delay (s)	585.0	0.0	2.0
Approach LOS	F		

Intersection Summary				
Average Delay	94.4			
Intersection Capacity Utilization	93.0%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
126: Logan St & Acushnet Ave.

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	135	31	32	85	0	46	17	55	0	6	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.61	0.61	0.61	0.93	0.93	0.93	0.75	0.75	0.75
Hourly flow rate (vph)	16	145	33	52	139	0	49	18	59	0	8	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	228	188	11	264	161	48	15			77		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228	188	11	264	161	48	15			77		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	79	97	90	80	100	97			100		
cM capacity (veh/h)	607	685	1052	542	706	1027	1597			1534		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	195	192	127	15
Volume Left	16	52	49	0
Volume Right	33	0	59	7
cSH	720	652	1597	1534
Volume to Capacity	0.27	0.29	0.03	0.00
Queue Length 95th (ft)	27	31	2	0
Control Delay (s)	11.8	12.8	3.0	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.8	12.8	3.0	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	34.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
129: Whale's Tooth Station driveway & Acushnet Ave.

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	99	67	80	36	20	90
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.72	0.72	0.63	0.63
Hourly flow rate (vph)	108	73	111	50	32	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	342	136			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	342	136			161	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	92			98	
cM capacity (veh/h)	639	913			1418	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	180	161	175
Volume Left	108	0	32
Volume Right	73	50	0
cSH	727	1700	1418
Volume to Capacity	0.25	0.09	0.02
Queue Length 95th (ft)	24	0	2
Control Delay (s)	11.6	0.0	1.5
Lane LOS	B		A
Approach Delay (s)	11.6	0.0	1.5
Approach LOS	B		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
130: Herman Melville Boulevard & McArthur Drive

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	140	70	166	95	30	201
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.95	0.95	0.73	0.73
Hourly flow rate (vph)	184	92	175	100	41	275
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	582	225			275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	582	225			275	
tC, single (s)	6.4	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.3	
p0 queue free %	60	88			97	
cM capacity (veh/h)	456	795			1244	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	276	275	316
Volume Left	184	0	41
Volume Right	92	100	0
cSH	532	1700	1244
Volume to Capacity	0.52	0.16	0.03
Queue Length 95th (ft)	74	0	3
Control Delay (s)	18.9	0.0	1.3
Lane LOS	C		A
Approach Delay (s)	18.9	0.0	1.3
Approach LOS	C		

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		48.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
136: Hillman St & Acushnet Ave.

2030 Build Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	70	150	190	41	81	133
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.87	0.87	0.77	0.77
Hourly flow rate (vph)	84	181	218	47	105	173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	675	192	278			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	192	278			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	76	78	83			
cM capacity (veh/h)	349	840	1268			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	265	266	278
Volume Left	84	218	0
Volume Right	181	0	173
cSH	581	1268	1700
Volume to Capacity	0.46	0.17	0.16
Queue Length 95th (ft)	59	16	0
Control Delay (s)	16.3	7.2	0.0
Lane LOS	C	A	
Approach Delay (s)	16.3	7.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		7.7	
Intersection Capacity Utilization		48.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
147: Wamsutta St & Acushnet Ave.

2030 Build Condition - PM Peak Hour

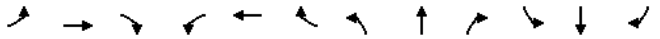
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	15	108	44	5	64
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.81	0.81	0.72	0.72	0.63	0.63
Hourly flow rate (vph)	26	19	150	61	8	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	298	181			150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298	181			150	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	694	867			1444	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	44	211	110
Volume Left	26	0	8
Volume Right	19	61	0
cSH	757	1700	1444
Volume to Capacity	0.06	0.12	0.01
Queue Length 95th (ft)	5	0	0
Control Delay (s)	10.1	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	0.6
Approach LOS	B		

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	18.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
148: Wamsutta St & North Front St

2030 Build Condition - PM Peak Hour



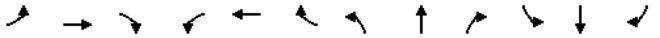
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	0	5	10	0	20	10	175	10	5	155	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.63	0.63	0.63	0.90	0.90	0.90	0.82	0.82	0.82
Hourly flow rate (vph)	65	0	7	16	0	32	11	194	11	6	189	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	471	445	205	447	455	200	221			206		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471	445	205	447	455	200	221			206		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	87	100	99	97	100	96	99			100		
cM capacity (veh/h)	482	504	841	516	498	807	1360			1378		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	72	48	217	227
Volume Left	65	16	11	6
Volume Right	7	32	11	32
cSH	504	679	1360	1378
Volume to Capacity	0.14	0.07	0.01	0.00
Queue Length 95th (ft)	12	6	1	0
Control Delay (s)	13.3	10.7	0.5	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	13.3	10.7	0.5	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	27.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
182: McArthur Blvd & McArthur Dr-Leonard's Wharf

2030 Build Condition - PM Peak Hour



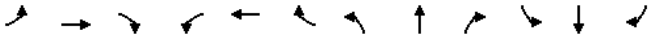
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	155	10	0	0	20	10	15	20	0	15	10	265
Peak Hour Factor	0.81	0.81	0.81	0.83	0.83	0.83	0.51	0.51	0.51	0.85	0.85	0.85
Hourly flow rate (vph)	191	12	0	0	24	12	29	39	0	18	12	312

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	204	36	69	341
Volume Left (vph)	191	0	29	18
Volume Right (vph)	0	12	0	312
Hadj (s)	0.30	-0.13	0.69	-0.41
Departure Headway (s)	5.2	5.0	5.6	4.2
Degree Utilization, x	0.29	0.05	0.11	0.40
Capacity (veh/h)	646	637	595	806
Control Delay (s)	10.4	8.3	9.3	10.1
Approach Delay (s)	10.4	8.3	9.3	10.1
Approach LOS	B	A	A	B

Intersection Summary				
Delay			10.0	
HCM Level of Service			A	
Intersection Capacity Utilization			40.3%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
184: McArthur Blvd & McArthur Dr

2030 Build Condition - PM Peak Hour

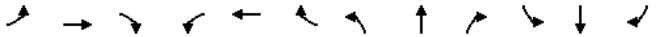


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	270	30	0	40	0	165	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.83	0.83	0.83	0.82	0.82	0.82	0.25	0.25	0.25
Hourly flow rate (vph)	0	0	0	325	36	0	49	0	201	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216	299	0	198	198	101	0			201		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216	299	0	198	198	101	0			201		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	100	56	95	100	97			100		
cM capacity (veh/h)	698	598	1091	736	680	960	1591			1383		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	361	250	0
Volume Left	325	49	0
Volume Right	0	201	0
cSH	730	1591	1700
Volume to Capacity	0.49	0.03	0.00
Queue Length 95th (ft)	69	2	0
Control Delay (s)	14.7	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	14.7	1.6	0.0
Approach LOS	B		

Intersection Summary				
Average Delay			9.3	
Intersection Capacity Utilization			35.6%	ICU Level of Service
Analysis Period (min)			15	A

Taunton



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	10	5	140	5	565	81	165	65	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		819			376			787			471	
Travel Time (s)		18.6			8.5			17.9			10.7	
Peak Hour Factor	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	0	0	185	0	0	766	0	196	89	0
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.07			0.41			0.55		0.44	0.07	
Control Delay		24.2			9.3			14.0		26.0	3.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		24.2			9.3			14.0		26.0	3.0	
Queue Length 50th (ft)		3			3			95		31	7	
Queue Length 95th (ft)		6			24			145		55	17	
Internal Link Dist (ft)		739			296			707			391	
Turn Bay Length (ft)										200		
Base Capacity (vph)		1461			1506			1612		1617	1800	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.02			0.12			0.48		0.12	0.05	

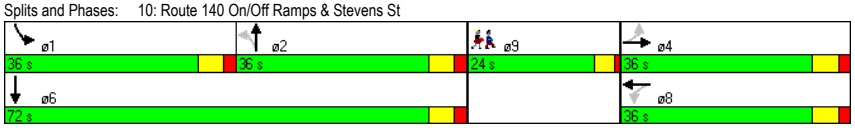
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

2030 Build Condition - AM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 132	
Actuated Cycle Length: 58.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	10	5	140	5	565	81	165	65	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		1.00			0.86			0.98		1.00	0.98	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		3639			2967			3289		3155	1799	
Flt Permitted		0.76			0.93			0.95		0.95	1.00	
Satd. Flow (perm)		2851			2778			3137		3155	1799	
Peak-hour factor, PHF	0.45	0.45	0.45	0.84	0.84	0.84	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	11	11	0	12	6	167	6	665	95	196	77	12
RTOR Reduction (vph)	0	0	0	0	149	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	22	0	0	36	0	0	760	0	196	86	0
Heavy Vehicles (%)	0%	0%	0%	33%	0%	3%	0%	7%	13%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		6.3			6.3			26.0		8.3	40.3	
Effective Green, g (s)		6.3			6.3			26.0		8.3	40.3	
Actuated g/C Ratio		0.11			0.11			0.44		0.14	0.69	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		307			299			1392		447	1237	
v/s Ratio Prot										c0.06	0.05	
v/s Ratio Perm		0.01			c0.01			c0.24				
v/c Ratio		0.07			0.12			0.55		0.44	0.07	
Uniform Delay, d1		23.5			23.6			12.0		23.0	3.0	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1			0.2		0.3	0.0	
Delay (s)		23.6			23.7			12.2		23.3	3.0	
Level of Service		C			C			B		C	A	
Approach Delay (s)		23.6			23.7			12.2			16.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	116	0	60	56	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	0	0	0	142	0	0	133	92
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.06						0.05			0.06	0.06
Control Delay		7.9						2.0			2.1	1.2
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		7.9						2.0			2.1	1.2
Queue Length 50th (ft)		1						0			0	0
Queue Length 95th (ft)		8						13			13	11
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		2433						3245			2664	1679
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.02						0.04			0.05	0.05

Intersection Summary	
Area Type:	Other

Cycle Length: 82
Actuated Cycle Length: 29.7
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 18: Galleria Mall Entrance & County St

HCM Signalized Intersection Capacity Analysis
18: Galleria Mall Entrance & County St

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	10	0	0	0	5	116	0	60	56	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.96						1.00			1.00	0.85
Flt Protected		0.98						1.00			0.97	1.00
Satd. Flow (prot)		2745						3419			3182	1679
Flt Permitted		0.98						0.95			0.82	1.00
Satd. Flow (perm)		2745						3246			2664	1679
Peak-hour factor, PHF	0.83	0.83	0.83	0.77	0.77	0.77	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	18	12	12	0	0	0	6	136	0	69	64	92
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	31
Lane Group Flow (vph)	0	30	0	0	0	0	0	142	0	0	133	61
Heavy Vehicles (%)	41%	25%	38%	0%	0%	0%	36%	4%	0%	13%	8%	9%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		1.3						22.5			22.5	22.5
Effective Green, g (s)		1.3						22.5			22.5	22.5
Actuated g/C Ratio		0.04						0.67			0.67	0.67
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		106						2161			1773	1118
v/s Ratio Prot												
v/s Ratio Perm		0.01						0.04			c0.05	0.04
v/c Ratio		0.29						0.07			0.08	0.05
Uniform Delay, d1		15.8						2.0			2.0	2.0
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.5						0.0			0.0	0.0
Delay (s)		16.3						2.0			2.0	2.0
Level of Service		B						A			A	A
Approach Delay (s)		16.3			0.0			2.0			2.0	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	3.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.09			
Actuated Cycle Length (s)	33.8	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	25.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

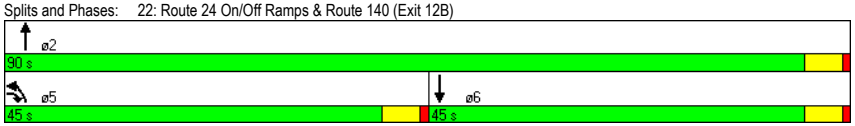
Lanes, Volumes, Timings
22: Route 24 On/Off Ramps & Route 140 (Exit 12B)

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	765	95	891	764	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	0	250			0
Storage Lanes	0	2	1			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	741			870	631	
Travel Time (s)	16.8			19.8	14.3	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.84	0.84
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	900	106	990	1198	0
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Detector Phase		5	5	2	6	
Switch Phase						
Minimum Initial (s)		4.0	4.0	4.0	4.0	
Minimum Split (s)		10.0	10.0	22.0	22.0	
Total Split (s)	0.0	45.0	45.0	90.0	45.0	0.0
Total Split (%)	0.0%	50.0%	50.0%	100.0%	50.0%	0.0%
Maximum Green (s)		40.0	40.0	85.0	40.0	
Yellow Time (s)		4.0	4.0	4.0	4.0	
All-Red Time (s)		1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Recall Mode		None	None	C-Min	C-Min	
Walk Time (s)				5.0	5.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
v/c Ratio		0.86	0.17	0.29	0.73	
Control Delay		33.6	24.6	0.2	20.3	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		33.6	24.6	0.2	20.3	
Queue Length 50th (ft)		251	52	0	269	
Queue Length 95th (ft)		295	92	0	331	
Internal Link Dist (ft)	661			790	551	
Turn Bay Length (ft)			250			
Base Capacity (vph)		1159	692	3471	1645	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.78	0.15	0.29	0.73	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	765	95	891	764	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		0.88	1.00	0.95	0.95	
Frt		0.85	1.00	1.00	0.96	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2608	1556	3471	3313	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2608	1556	3471	3313	
Peak-hour factor, PHF	0.85	0.85	0.90	0.90	0.84	0.84
Adj. Flow (vph)	0	900	106	990	910	288
RTOR Reduction (vph)	0	0	0	0	31	0
Lane Group Flow (vph)	0	900	106	990	1167	0
Heavy Vehicles (%)	5%	9%	16%	4%	6%	2%
Turn Type		Over	Prot			
Protected Phases		5	5	2	6	
Permitted Phases						
Actuated Green, G (s)		36.1	36.1	90.0	43.9	
Effective Green, g (s)		36.1	36.1	90.0	43.9	
Actuated g/C Ratio		0.40	0.40	1.00	0.49	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1046	624	3471	1616	
v/s Ratio Prot		c0.35	0.07	0.29	c0.35	
v/s Ratio Perm						
v/c Ratio		0.86	0.17	0.29	0.72	
Uniform Delay, d1		24.6	17.3	0.0	18.2	
Progression Factor		1.00	1.47	1.00	0.95	
Incremental Delay, d2		7.4	0.1	0.2	2.7	
Delay (s)		32.0	25.7	0.2	20.0	
Level of Service		C	C	A	C	
Approach Delay (s)	32.0			2.7	20.0	
Approach LOS	C			A	C	

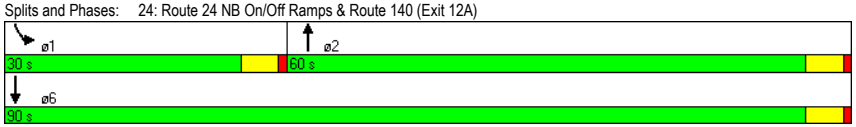
Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	330	681	1175	286	1237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	250	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		No		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.92	0.92	0.86	0.86	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	359	792	1366	311	1345
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			8.0		8.0	8.0
Minimum Split (s)			13.0		13.0	13.0
Total Split (s)	0.0	0.0	60.0	0.0	30.0	90.0
Total Split (%)	0.0%	0.0%	66.7%	0.0%	33.3%	100.0%
Maximum Green (s)			55.0		25.0	85.0
Yellow Time (s)			4.0		4.0	4.0
All-Red Time (s)			1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	2.0
Recall Mode			C-Min		None	C-Min
v/c Ratio		0.20	0.36	0.90	0.80	0.40
Control Delay		0.3	8.1	9.9	46.8	0.2
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.3	8.1	9.9	46.8	0.2
Queue Length 50th (ft)		0	94	0	182	0
Queue Length 95th (ft)		0	148	0	m228	0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	250	
Base Capacity (vph)		1790	2246	1524	482	3343
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.20	0.35	0.90	0.65	0.40

Intersection Summary	
Area Type:	Other

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 16 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



HCM Signalized Intersection Capacity Analysis
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

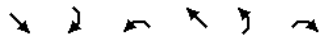
2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	330	681	1175	286	1237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1790	3374	1524	1703	3343
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1790	3374	1524	1703	3343
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.92	0.92
Adj. Flow (vph)	0	359	792	1366	311	1345
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	359	792	1366	311	1345
Heavy Vehicles (%)	0%	1%	7%	6%	6%	8%
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Actuated Green, G (s)		90.0	59.4	90.0	20.6	90.0
Effective Green, g (s)		90.0	59.4	90.0	20.6	90.0
Actuated g/C Ratio		1.00	0.66	1.00	0.23	1.00
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			2.0		2.0	2.0
Lane Grp Cap (vph)		1790	2227	1524	390	3343
v/s Ratio Prot			0.23		0.18	0.40
v/s Ratio Perm		0.20		c0.90		
v/c Ratio		0.20	0.36	0.90	0.80	0.40
Uniform Delay, d1		0.0	6.8	0.0	32.7	0.0
Progression Factor		1.00	1.00	1.00	1.14	1.00
Incremental Delay, d2		0.3	0.4	8.6	6.7	0.2
Delay (s)		0.3	7.2	8.6	43.9	0.2
Level of Service		A	A	A	D	A
Approach Delay (s)	0.3		8.1			8.4
Approach LOS	A		A			A

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
26: Route 140 (Exit 12B) & Mozzone Blvd

2030 Build Condition - AM Peak Hour

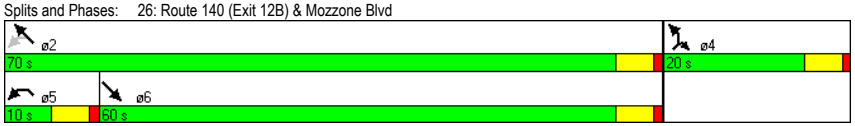


Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	990	20	35	1079	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1723			724	1178	
Travel Time (s)	39.2			16.5	26.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1098	0	0	1211	5	16
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	15.0		10.0	15.0	15.0	15.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	C-Min		None	C-Min	None	None
v/c Ratio	0.34			0.42	0.04	0.13
Control Delay	1.4			3.9	39.6	20.5
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.4			3.9	39.6	20.5
Queue Length 50th (ft)	0			1	3	0
Queue Length 95th (ft)	84			263	14	20
Internal Link Dist (ft)	1643			644	1098	
Turn Bay Length (ft)						
Base Capacity (vph)	3267			2897	295	277
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.34			0.42	0.02	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	

Offset: 16 (18%), Referenced to phase 2:NWTL and 6:SET, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 26: Route 140 (Exit 12B) & Mozzone Blvd



Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	990	20	35	1079	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3529			3534	1770	1583
Flt Permitted	1.00			0.88	0.95	1.00
Satd. Flow (perm)	3529			3127	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1076	22	38	1173	5	16
RTOR Reduction (vph)	1	0	0	0	0	16
Lane Group Flow (vph)	1097	0	0	1211	5	0
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	77.3			77.3	2.7	2.7
Effective Green, g (s)	77.3			77.3	2.7	2.7
Actuated g/C Ratio	0.86			0.86	0.03	0.03
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3031			2686	53	47
v/s Ratio Prot	0.31				c0.00	0.00
v/s Ratio Perm				c0.39		
v/c Ratio	0.36			0.45	0.09	0.01
Uniform Delay, d1	1.3			1.5	42.5	42.4
Progression Factor	1.00			2.62	1.00	1.00
Incremental Delay, d2	0.3			0.1	0.8	0.1
Delay (s)	1.6			3.9	43.2	42.4
Level of Service	A			A	D	D
Approach Delay (s)	1.6			3.9	42.6	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	3.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

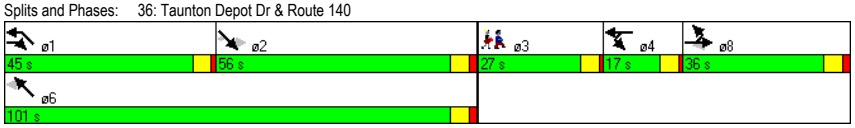
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	78	0	85	5	0	0	5	895	204	184	730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	0		100	0		0	180		130	320		350
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		846			205			2224			1723	
Travel Time (s)		19.2			4.7			50.5			39.2	
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	46	46	100	0	10	0	0	1000	227	198	785	0
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Detector Phase	8	8	1	4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0	
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0	
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?				Yes	Yes							
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.34	0.34	0.22		0.08			0.52	0.25	0.44	0.30	
Control Delay	52.8	52.8	7.9		52.8			18.6	12.0	9.5	7.0	
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0	
Total Delay	52.8	52.8	7.9		52.8			18.6	12.0	9.5	7.0	
Queue Length 50th (ft)	24	24	0		5			142	32	19	48	
Queue Length 95th (ft)	82	82	38		17			525	173	130	259	
Internal Link Dist (ft)		766			125			2144			1643	
Turn Bay Length (ft)			100						130	320		
Base Capacity (vph)	547	547	949		285			1912	923	949	3191	
Starvation Cap Reductn	0	0	0		0			0	0	0	0	
Spillback Cap Reductn	0	0	0		0			0	0	0	0	
Storage Cap Reductn	0	0	0		0			0	0	0	0	
Reduced v/c Ratio	0.08	0.08	0.11		0.04			0.52	0.25	0.21	0.25	

Lanes, Volumes, Timings
36: Taunton Depot Dr & Route 140 2030 Build Condition - AM Peak Hour

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 181	
Actuated Cycle Length: 91.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Taunton Depot Dr & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	78	0	85	5	0	0	5	895	204	184	730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		1.00			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		0.95			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1573	1573	1553		2046			3471	1538	1805	3406	
Flt Permitted	0.95	0.95	1.00		0.95			0.95	1.00	0.19	1.00	
Satd. Flow (perm)	1573	1573	1553		2046			3300	1538	370	3406	
Peak-hour factor, PHF	0.85	0.85	0.85	0.50	0.50	0.50	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	92	0	100	10	0	0	6	994	227	198	785	0
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	35	0	0	0
Lane Group Flow (vph)	46	46	17	0	10	0	0	1000	192	198	785	0
Heavy Vehicles (%)	9%	0%	4%	0%	0%	0%	0%	4%	5%	0%	6%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	6.3	6.3	17.0		0.8			53.3	53.3	69.0	69.0	
Effective Green, g (s)	6.3	6.3	17.0		0.8			53.3	53.3	69.0	69.0	
Actuated g/C Ratio	0.06	0.06	0.17		0.01			0.53	0.53	0.68	0.68	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	98	98	261		16			1741	812	405	2327	
v/s Ratio Prot	c0.03	0.03	0.01		c0.00					c0.05	0.23	
v/s Ratio Perm			0.00					c0.30	0.12	0.28		
v/c Ratio	0.47	0.47	0.06		0.62			0.57	0.24	0.49	0.34	
Uniform Delay, d1	45.7	45.7	35.3		50.0			16.2	12.9	8.4	6.6	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.3	0.0		44.0			0.6	0.2	0.3	0.1	
Delay (s)	47.0	47.0	35.4		94.0			16.7	13.1	8.8	6.7	
Level of Service	D	D	D		F			B	B	A	A	
Approach Delay (s)		40.9			94.0			16.0			7.1	
Approach LOS		D			F			B			A	

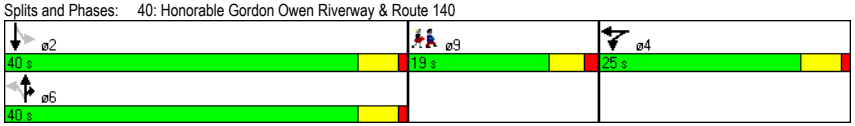
Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	29.9
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	231	0	5	0	650	302	10	400	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12
Storage Length (ft)	0		0	0		0	0		175	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		220			991			547			1888	
Travel Time (s)		5.0			22.5			12.4			42.9	
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	281	0	0	699	325	0	460	0
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Detector Phase				4	4		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0	
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Recall Mode				None	None		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio					0.66			0.74	0.34		0.46	
Control Delay					31.0			20.5	3.9		12.9	
Queue Delay					0.0			0.0	0.0		0.0	
Total Delay					31.0			20.5	3.9		12.9	
Queue Length 50th (ft)					91			161	7		85	
Queue Length 95th (ft)					201			#584	67		276	
Internal Link Dist (ft)		140			911			467			1808	
Turn Bay Length (ft)									175			
Base Capacity (vph)					568			994	1008		1054	
Starvation Cap Reductn					0			0	0		0	
Spillback Cap Reductn					0			0	0		0	
Storage Cap Reductn					0			0	0		0	
Reduced v/c Ratio					0.49			0.70	0.32		0.44	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	23%
Maximum Green (s)	14.0
Yellow Time (s)	3.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	4.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	3
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 84	
Actuated Cycle Length: 63	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 40: Honorable Gordon Owen Riverway & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	231	0	5	0	650	302	10	400	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1731			1733	1553		1866	
Flt Permitted					0.95			1.00	1.00		0.98	
Satd. Flow (perm)					1731			1733	1553		1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.93	0.93	0.93	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	275	0	6	0	699	325	11	449	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	133	0	0	0
Lane Group Flow (vph)	0	0	0	0	280	0	0	699	192	0	460	0
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	6%	4%	8%	5%	0%
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Actuated Green, G (s)					15.6			34.2	34.2		34.2	
Effective Green, g (s)					15.6			34.2	34.2		34.2	
Actuated g/C Ratio					0.23			0.51	0.51		0.51	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					404			886	794		939	
v/s Ratio Prot					c0.16			c0.40	0.12			
v/s Ratio Perm											0.25	
v/c Ratio					0.69			0.79	0.24		0.49	
Uniform Delay, d1					23.5			13.4	9.1		10.7	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					5.5			5.0	0.2		0.6	
Delay (s)					29.0			18.4	9.3		11.2	
Level of Service					C			B	A		B	
Approach Delay (s)		0.0			29.0			15.5			11.2	
Approach LOS		A			C			B			B	

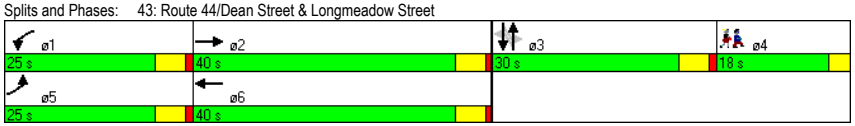
Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	17.1
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	819	296	185	655	95	127	350	270	125	220	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12
Storage Length (ft)	100		70	100		70	0		50	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1663			1440			2994			1249	
Travel Time (s)		37.8			32.7			68.0			28.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1186	0	197	798	0	0	869	0	0	530	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Detector Phase	5	2		1	6		3	3		3	3	
Switch Phase												
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0	
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.08	0.93		0.70	0.41			1.47			2.36dl	
Control Delay	45.3	42.8		52.0	13.9			248.5			97.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	45.3	42.8		52.0	13.9			248.5			97.1	
Queue Length 50th (ft)	6	330		108	107			~350			~179	
Queue Length 95th (ft)	27	#642		#230	290			#558			#238	
Internal Link Dist (ft)		1583			1360			2914			1169	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	302	1274		339	1964			590			494	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.93		0.58	0.41			1.47			1.07	

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	16%
Maximum Green (s)	15.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	12
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

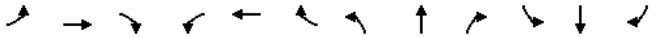
Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 95.4	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	819	296	185	655	95	127	350	270	125	220	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.96		1.00	0.98			0.95			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1428	3365		1604	3414			3109			3193	
Flt Permitted	0.95	1.00		0.95	1.00			0.63			0.57	
Satd. Flow (perm)	1428	3365		1604	3414			1981			1860	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Adj. Flow (vph)	11	871	315	197	697	101	148	407	314	184	324	22
RTOR Reduction (vph)	0	29	0	0	7	0	0	68	0	0	3	0
Lane Group Flow (vph)	11	1157	0	197	791	0	0	801	0	0	527	0
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.5	39.4		16.8	54.7			25.2			25.2	
Effective Green, g (s)	1.5	39.4		16.8	54.7			25.2			25.2	
Actuated g/C Ratio	0.01	0.39		0.16	0.54			0.25			0.25	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	21	1301		264	1833			490			460	
v/s Ratio Prot	0.01	c0.34		c0.12	0.23							
v/s Ratio Perm								c0.40			0.28	
v/c Ratio	0.52	0.89		0.75	0.43			1.64			2.36dl	
Uniform Delay, d1	49.8	29.2		40.5	14.2			38.4			38.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	27.4	8.3		11.6	0.3			295.0			88.4	
Delay (s)	77.3	37.6		52.1	14.6			333.4			126.7	
Level of Service	E	D		D	B			F			F	
Approach Delay (s)		37.9			22.0			333.4			126.7	
Approach LOS		D			C			F			F	

Intersection Summary					
HCM Average Control Delay	118.1	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.09				
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	20.5		
Intersection Capacity Utilization	91.2%	ICU Level of Service	F		
Analysis Period (min)	15				
dl Defacto Left Lane. Recode with 1 though lane as a left lane.					
c Critical Lane Group					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	165	307	134	110	245	141	636	62	160	558	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		50	0		50	50		0	50		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		1373			971			2224			3692	
Travel Time (s)		31.2			22.1			43.3			71.9	
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	237	384	0	257	258	0	882	0	0	997	0
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	6.0			6.0		
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	11.0			11.0		
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	12.0			10.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0		
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0		
Recall Mode	Max	Max	Max	Max	Max	Max	None			None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.97	0.88		1.60	0.65		0.81			1.04	
Control Delay		92.9	44.5		325.6	31.8		30.3			64.8	
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0	
Total Delay		92.9	44.5		325.6	31.8		30.3			64.8	
Queue Length 50th (ft)		145	131		~224	84		170			213	
Queue Length 95th (ft)		#326	#291		#481	#236		#433			#398	
Internal Link Dist (ft)		1293			891			2144			3612	
Turn Bay Length (ft)			50			50						
Base Capacity (vph)		245	438		161	395		1088			960	
Starvation Cap Reductn		0	0		0	0		0			0	
Spillback Cap Reductn		0	0		0	0		0			0	
Storage Cap Reductn		0	0		0	0		0			0	
Reduced v/c Ratio		0.97	0.88		1.60	0.65		0.81			1.04	

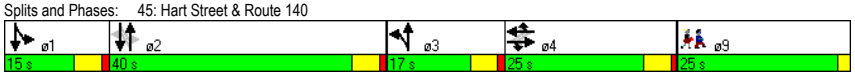
Lane Group	ø2	ø9
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	2	9
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	8.0	1.0
Minimum Split (s)	13.0	25.0
Total Split (s)	40.0	25.0
Total Split (%)	33%	20%
Maximum Green (s)	35.0	23.0
Yellow Time (s)	4.0	2.0
All-Red Time (s)	1.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		16.0
Pedestrian Calls (#/hr)		4
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 102	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 45: Hart Street & Route 140



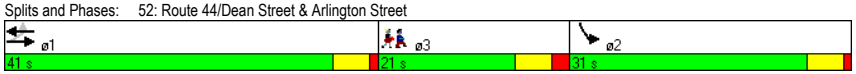
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	165	307	134	110	245	141	636	62	160	558	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		0.97	1.00		0.99			0.99	
Satd. Flow (prot)		1734	1516		1807	1568		3272			3331	
Flt Permitted		0.71	1.00		0.44	1.00		0.61			0.54	
Satd. Flow (perm)		1238	1516		814	1568		2010			1821	
Peak-hour factor, PHF	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Adj. Flow (vph)	31	206	384	141	116	258	148	669	65	219	764	14
RTOR Reduction (vph)	0	0	138	0	0	85	0	4	0	0	1	0
Lane Group Flow (vph)	0	237	246	0	257	173	0	878	0	0	996	0
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.2	20.2		20.2	20.2		47.4			45.4	
Effective Green, g (s)		20.2	20.2		20.2	20.2		47.4			45.4	
Actuated g/C Ratio		0.20	0.20		0.20	0.20		0.46			0.44	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		242	296		159	306		1068			946	
v/s Ratio Prot			0.16			0.11		c0.10			c0.10	
v/s Ratio Perm		0.19			c0.32			0.28			c0.36	
v/c Ratio		0.98	0.83		1.62	0.56		0.82			1.05	
Uniform Delay, d1		41.4	40.0		41.6	37.7		24.4			29.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		52.8	22.8		304.4	7.3		5.2			44.3	
Delay (s)		94.2	62.8		346.1	45.0		29.6			73.4	
Level of Service		F	E		F	D		C			E	
Approach Delay (s)		74.8			195.2			29.6			73.4	
Approach LOS		E			F			C			E	

Intersection Summary			
HCM Average Control Delay	81.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	103.5	Sum of lost time (s)	25.8
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	48	800	655	142	296	57	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.87	0.87	0.86	0.86	0.81	0.81	
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	55	920	927	0	435	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		5.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	36.0	36.0	36.0		26.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	1.0	1.0	1.0		1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							8
v/c Ratio	0.57	1.00	0.90		0.79		
Control Delay	46.9	52.2	32.7		35.9		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	46.9	52.2	32.7		35.9		
Queue Length 50th (ft)	15	352	317		159		
Queue Length 95th (ft)	#96	#890	#835		#337		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	96	919	1027		663		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.57	1.00	0.90		0.66		

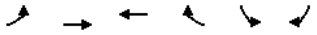
Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 72.3	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	48	800	655	142	296	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	5.0	5.0	5.0		5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1636	1810	2008		1807	
Flt Permitted	0.11	1.00	1.00		0.96	
Satd. Flow (perm)	188	1810	2008		1807	
Peak-hour factor, PHF	0.87	0.87	0.86	0.86	0.81	0.81
Adj. Flow (vph)	55	920	762	165	365	70
RTOR Reduction (vph)	0	0	7	0	0	0
Lane Group Flow (vph)	55	920	920	0	435	0
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	36.7	36.7	36.7		22.1	
Effective Green, g (s)	36.7	36.7	36.7		22.1	
Actuated g/C Ratio	0.48	0.48	0.48		0.29	
Clearance Time (s)	5.0	5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	89	862	956		518	
v/s Ratio Prot		c0.51	0.46		c0.24	
v/s Ratio Perm	0.29					
v/c Ratio	0.62	1.07	0.96		0.84	
Uniform Delay, d1	15.0	20.2	19.5		25.8	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	12.1	50.2	20.4		11.4	
Delay (s)	27.1	70.4	39.9		37.3	
Level of Service	C	E	D		D	
Approach Delay (s)		68.0	39.9		37.3	
Approach LOS		E	D		D	

Intersection Summary				
HCM Average Control Delay	51.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	18.3	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	182	1008	0	0	736	20	0	0	30	5	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0	0		0	50
Storage Lanes	1		0	0		0	0	1		1	1
Taper Length (ft)	25		25	25		25	25	25		25	25
Right Turn on Red			Yes			Yes					Yes
Link Speed (mph)		30			30		30			30	
Link Distance (ft)		825			1426		127			959	
Travel Time (s)		18.8			32.4		2.9			21.8	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	1400	0	0	822	0	0	0	0	40	207
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Detector Phase	5	2			6			8	4	4	4
Switch Phase											
Minimum Initial (s)	6.0	12.0			12.0			6.0	6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0			11.0	11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	0.0	25.0	25.0	25.0	25.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	0.0%	28.7%	28.7%	28.7%	28.7%
Maximum Green (s)	12.0	57.0			40.0			20.0	20.0	20.0	20.0
Yellow Time (s)	4.0	4.0			4.0			4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0			1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag						
Lead-Lag Optimize?	Yes				Yes						
Vehicle Extension (s)	1.5	1.5			1.5			2.0	2.0	2.0	2.0
Recall Mode	None	Min			Min			None	None	None	None
v/c Ratio		0.82			0.33					0.18	0.63
Control Delay		12.8			4.1					30.8	24.7
Queue Delay		0.0			0.0					0.0	0.0
Total Delay		12.8			4.1					30.8	24.7
Queue Length 50th (ft)		162			50					17	44
Queue Length 95th (ft)		308			100					44	106
Internal Link Dist (ft)		745			1346		47			879	
Turn Bay Length (ft)											50
Base Capacity (vph)		1945			2504					495	588
Starvation Cap Reductn		0			0					0	0
Spillback Cap Reductn		0			0					0	0
Storage Cap Reductn		0			0					0	0
Reduced v/c Ratio		0.72			0.33					0.08	0.35

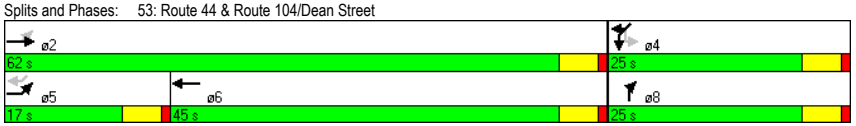
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 Build Condition - AM Peak Hour

Cycle Length: 87
Actuated Cycle Length: 70.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 53: Route 44 & Route 104/Dean Street

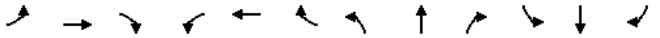


HCM Signalized Intersection Capacity Analysis
53: Route 44 & Route 104/Dean Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	182	1008	0	0	736	20	0	0	30	5	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	16
Total Lost time (s)		5.0			5.0					5.0	5.0
Lane Util. Factor		0.95			0.95					1.00	1.00
Frt		1.00			1.00					1.00	0.85
Flt Protected		0.99			1.00					0.95	1.00
Satd. Flow (prot)		3478			3461					1704	1760
Flt Permitted		0.67			1.00					0.95	1.00
Satd. Flow (perm)		2352			3461					1704	1760
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	214	1186	0	0	800	22	0	0	34	6	207
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	95
Lane Group Flow (vph)	0	1400	0	0	821	0	0	0	0	40	112
Heavy Vehicles (%)	3%	3%	0%	0%	4%	0%	0%	0%	7%	0%	4%
Turn Type	pm+pt							custom	Perm		custom
Protected Phases	5	2			6			8		4	4
Permitted Phases	2								4		5
Actuated Green, G (s)		51.0			51.0					9.3	9.3
Effective Green, g (s)		51.0			51.0					9.3	9.3
Actuated g/C Ratio		0.73			0.73					0.13	0.13
Clearance Time (s)		5.0			5.0					5.0	5.0
Vehicle Extension (s)		1.5			1.5					2.0	2.0
Lane Grp Cap (vph)		1706			2511					225	233
v/s Ratio Prot					0.24						c0.06
v/s Ratio Perm		c0.60								0.02	
v/c Ratio		0.82			0.33					0.18	0.48
Uniform Delay, d1		6.5			3.5					27.1	28.3
Progression Factor		1.00			1.00					1.00	1.00
Incremental Delay, d2		3.1			0.0					0.1	0.6
Delay (s)		9.7			3.5					27.2	28.8
Level of Service		A			A					C	C
Approach Delay (s)		9.7			3.5		0.0			28.6	
Approach LOS		A			A		A			C	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	228	60	35	144	10	45	445	20	10	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		376			382			1581			384	
Travel Time (s)		8.5			8.7			35.9			8.7	
Peak Hour Factor	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%
Parking (#/hr)											0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	354	0	0	231	0	0	548	0	0	381	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lead	Lead		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.51			0.32			0.81			0.52	
Control Delay		19.2			16.8			31.2			19.6	
Queue Delay		0.0			0.0			0.0			0.1	
Total Delay		19.2			16.8			31.2			19.7	
Queue Length 50th (ft)		86			53			162			96	
Queue Length 95th (ft)		230			138			#498			207	
Internal Link Dist (ft)		296			302			1501			304	
Turn Bay Length (ft)												
Base Capacity (vph)		690			722			675			729	
Starvation Cap Reductn		0			0			0			32	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.51			0.32			0.81			0.55	

Intersection Summary

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.0
Total Split (s)	41.0
Total Split (%)	41%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	11
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
57: Spring Street & Summer Street

2030 Build Condition - AM Peak Hour

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 64.2
Natural Cycle: 75
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 57: Spring Street & Summer Street

HCM Signalized Intersection Capacity Analysis
57: Spring Street & Summer Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	20	228	60	35	144	10	45	445	20	10	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.99			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1772			2017			1800			1877	
Flt Permitted		0.97			0.90			0.94			0.98	
Satd. Flow (perm)		1728			1828			1704			1840	
Peak-hour factor, PHF	0.87	0.87	0.87	0.82	0.82	0.82	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	23	262	69	43	176	12	48	478	22	13	342	26
RTOR Reduction (vph)	0	7	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	347	0	0	231	0	0	547	0	0	379	0
Heavy Vehicles (%)	5%	4%	4%	3%	5%	13%	2%	5%	0%	0%	2%	5%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4			25.4			25.4	
Effective Green, g (s)		25.4			25.4			25.4			25.4	
Actuated g/C Ratio		0.37			0.37			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		634			671			625			675	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.13			c0.32			0.21	
v/c Ratio		0.55			0.34			0.87			0.56	
Uniform Delay, d1		17.3			15.9			20.4			17.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.4			1.4			15.7			3.4	
Delay (s)		20.7			17.3			36.1			20.8	
Level of Service		C			B			D			C	
Approach Delay (s)		20.7			17.3			36.1			20.8	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

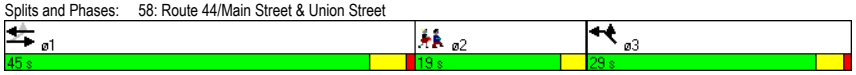
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	10	535	305	0	488	10	0	0	450	10	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	944	0	0	559	0	0	0	464	31	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												18
v/c Ratio		0.96			0.56				0.89	0.05		
Control Delay		43.4			18.8				50.2	13.7		
Queue Delay		0.0			0.0				0.0	0.0		
Total Delay		43.4			18.8				50.2	13.7		
Queue Length 50th (ft)		341			150				191	3		
Queue Length 95th (ft)		#864			359				#481	26		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		982			1004				523	582		
Starvation Cap Reductn		0			0				0	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.96			0.56				0.89	0.05		

Intersection Summary

Area Type: Other
Cycle Length: 93
Actuated Cycle Length: 81.6
Natural Cycle: 110
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	10	535	305	0	488	10	0	0	450	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.95			1.00				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1951			2023				1687	1830	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1939			2023				1687	1830	
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	11	594	339	0	548	11	0	0	464	10	21
RTOR Reduction (vph)	0	20	0	0	1	0	0	0	0	15	0
Lane Group Flow (vph)	0	924	0	0	558	0	0	0	464	16	0
Heavy Vehicles (%)	0%	5%	5%	0%	6%	14%	0%	0%	7%	0%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.5			40.5				25.3	25.3	
Effective Green, g (s)		40.5			40.5				25.3	25.3	
Actuated g/C Ratio		0.49			0.49				0.30	0.30	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		942			982				512	555	
v/s Ratio Prot					0.28				c0.28	0.01	
v/s Ratio Perm		c0.48									
v/c Ratio		0.98			0.57				0.91	0.03	
Uniform Delay, d1		21.1			15.2				27.9	20.4	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		25.2			2.4				22.2	0.1	
Delay (s)		46.2			17.6				50.2	20.5	
Level of Service		D			B				D	C	
Approach Delay (s)		46.2			17.6		0.0		48.3		
Approach LOS		D			B		A		D		

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	17.6
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
61: Taunton Green & Broadway

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	794	193	0	0	1051	0	306	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		304			913			579			302	
Travel Time (s)		6.9			20.8			13.2			6.9	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	873	212	0	0	1142	0	340	99	0	0	0
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Detector Phase	1	1	1					3	3			
Switch Phase												
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0			
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0			
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0			
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Recall Mode	Max	Max	Max					Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.29	0.73	0.32			0.45		0.70	0.23			
Control Delay	8.2	28.1	4.0			0.6		36.2	6.7			
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0			
Total Delay	8.2	28.1	4.0			0.6		36.2	6.7			
Queue Length 50th (ft)	21	215	0			0		163	0			
Queue Length 95th (ft)	m66	283	m39			0		259	35			
Internal Link Dist (ft)		224			833			499			222	
Turn Bay Length (ft)												
Base Capacity (vph)	678	1188	656			2547		486	435			
Starvation Cap Reductn	0	0	0			0		0	0			
Spillback Cap Reductn	0	0	0			0		0	0			
Storage Cap Reductn	0	0	0			0		0	0			
Reduced v/c Ratio	0.29	0.73	0.32			0.45		0.70	0.23			

Intersection Summary

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	24%
Maximum Green (s)	17.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	26
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Area Type: Other
Cycle Length: 86
Actuated Cycle Length: 86
Natural Cycle: 90
Control Type: Semi Act-Uncoord
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 61: Taunton Green & Broadway

HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	794	193	0	0	1051	0	306	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1703	3406	1484			2547		1673	1256			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1703	3406	1484			2547		1673	1256			
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	197	873	212	0	0	1142	0	340	99	0	0	0
RTOR Reduction (vph)	84	0	138	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	113	873	74	0	0	1142	0	340	29	0	0	0
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	594	1188	518			2547		486	365			
v/s Ratio Prot		c0.26						c0.20				
v/s Ratio Perm	0.07		0.05			c0.45			0.02			
v/c Ratio	0.19	0.73	0.14			0.45		0.70	0.08			
Uniform Delay, d1	19.5	24.5	19.2			0.0		27.2	22.1			
Progression Factor	0.90	0.96	0.85			1.00		1.00	1.00			
Incremental Delay, d2	0.7	4.1	0.6			0.6		8.1	0.4			
Delay (s)	18.3	27.7	16.8			0.6		35.3	22.6			
Level of Service	B	C	B			A		D	C			
Approach Delay (s)		24.5			0.6			32.4			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
71: Court Street & Washington Street

2030 Build Condition - AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	438	21	638	295	37	421	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.88	0.88	0.87	0.87	0.85	0.85	
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	498	24	733	339	44	495	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Detector Phase	3	3	1	1	1	1	
Switch Phase							
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0	3.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	18.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	18.0
Total Split (%)	25.5%	25.5%	56.1%	56.1%	56.1%	56.1%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0	0.7
Recall Mode	Max	Max	Max	Max	Max	Max	None
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							19
v/c Ratio	1.25	0.06	0.73	0.35	0.18	0.46	
Control Delay	163.8	24.0	20.9	2.6	13.4	13.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	163.8	24.0	20.9	2.6	13.4	13.7	
Queue Length 50th (ft)	~300	6	213	0	8	113	
Queue Length 95th (ft)	#593	29	504	36	34	260	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	398	406	1001	955	250	1072	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.25	0.06	0.73	0.35	0.18	0.46	

Intersection Summary	
Area Type:	Other
Cycle Length: 98	
Actuated Cycle Length: 86.8	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 71: Court Street & Washington Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	438	21	638	295	37	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	1723	1722	1398	1805	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.23	1.00
Satd. Flow (perm)	1711	1723	1722	1398	431	1845
Peak-hour factor, PHF	0.88	0.88	0.87	0.87	0.85	0.85
Adj. Flow (vph)	498	24	733	339	44	495
RTOR Reduction (vph)	0	5	0	145	0	0
Lane Group Flow (vph)	498	19	733	194	44	495
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.2	20.2	50.4	50.4	50.4	50.4
Effective Green, g (s)	20.2	20.2	50.4	50.4	50.4	50.4
Actuated g/C Ratio	0.23	0.23	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	393	396	986	801	247	1057
v/s Ratio Prot	c0.29		c0.43			0.27
v/s Ratio Perm		0.01		0.14	0.10	
v/c Ratio	1.27	0.05	0.74	0.24	0.18	0.47
Uniform Delay, d1	33.9	26.4	14.0	9.3	8.9	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	139.0	0.2	5.1	0.7	1.6	1.5
Delay (s)	172.9	26.6	19.1	10.0	10.5	12.5
Level of Service	F	C	B	B	B	B
Approach Delay (s)	166.2		16.2			12.3
Approach LOS	F		B			B

Intersection Summary			
HCM Average Control Delay	51.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	157	108	39	126	52	112	431	63	31	341	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		698			192			448			574	
Travel Time (s)		15.9			4.4			10.2			13.0	
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Shared Lane Traffic (%)	20%											
Lane Group Flow (vph)	371	366	0	0	233	0	0	681	0	0	803	0
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Detector Phase	1	1		2	2		3	8		4	4	
Switch Phase												
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0	
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.83	0.87			1.23			0.87			0.68	
Control Delay	62.1	66.0			182.6			48.4			28.2	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	62.1	66.0			182.6			48.4			28.2	
Queue Length 50th (ft)	344	331			~288			302			260	
Queue Length 95th (ft)	#520	#526			#464			#417			338	
Internal Link Dist (ft)		618			112			368			494	
Turn Bay Length (ft)												
Base Capacity (vph)	536	500			190			930			1178	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.69	0.73			1.23			0.73			0.68	

Intersection Summary	
Area Type:	Other

Lane Group	ø5
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	16%
Maximum Green (s)	17.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	21
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

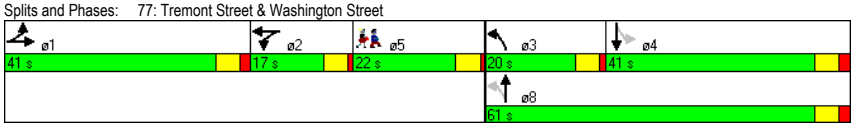
Intersection Summary

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

2030 Build Condition - AM Peak Hour

Cycle Length: 141
Actuated Cycle Length: 120.9
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	157	108	39	126	52	112	431	63	31	341	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.95			0.97			0.98			0.93	
Flt Protected	0.95	0.99			0.99			0.99			1.00	
Satd. Flow (prot)	1759	1608			1745			3355			3016	
Flt Permitted	0.95	0.99			0.99			0.57			0.89	
Satd. Flow (perm)	1759	1608			1745			1934			2688	
Peak-hour factor, PHF	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	464	162	111	42	135	56	126	484	71	34	371	398
RTOR Reduction (vph)	0	11	0	0	8	0	0	6	0	0	101	0
Lane Group Flow (vph)	371	355	0	0	225	0	0	675	0	0	702	0
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	30.6	30.6			12.6			48.4			48.4	
Effective Green, g (s)	30.6	30.6			12.6			48.4			48.4	
Actuated g/C Ratio	0.25	0.25			0.10			0.40			0.40	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	440	402			180			765			1064	
v/s Ratio Prot	0.21	c0.22			c0.13							
v/s Ratio Perm								c0.35			0.26	
v/c Ratio	0.84	0.88			1.25			0.88			0.66	
Uniform Delay, d1	43.6	44.1			54.9			34.3			30.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	13.2	19.3			149.8			11.4			1.1	
Delay (s)	56.8	63.4			204.7			45.7			31.4	
Level of Service	E	E			F			D			C	
Approach Delay (s)		60.1			204.7			45.7			31.4	
Approach LOS		E			F			D			C	

Intersection Summary				
HCM Average Control Delay	60.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	122.3	Sum of lost time (s)	30.7	
Intersection Capacity Utilization	90.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	92	5	20	96	5	5	520	15	10	370	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	0		0	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1068			1376			92			2042	
Travel Time (s)		24.3			31.3			2.1			46.4	
Peak Hour Factor	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%
Parking (#/hr)									2			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	423	0	0	168	0	0	621	0	0	427	253
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Detector Phase	4	4		3	3 4		1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None			Min	Min		Min	Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.88			0.22			0.59			0.80	0.53
Control Delay		55.6			18.0			34.5			47.4	36.8
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		55.6			18.0			34.5			47.4	36.8
Queue Length 50th (ft)		237			53			155			221	118
Queue Length 95th (ft)		#569			100			285			#504	264
Internal Link Dist (ft)		988			1296			12			1962	
Turn Bay Length (ft)												50
Base Capacity (vph)		483			849			1183			599	538
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0

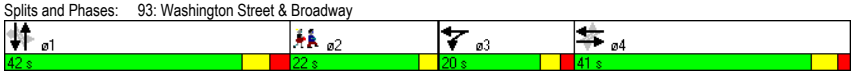
Lanes, Volumes, Timings
93: Washington Street & Broadway
2030 Build Condition - AM Peak Hour

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	19
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.88			0.20			0.52			0.71	0.47

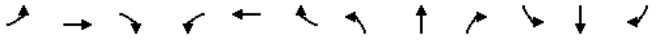
Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 103.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 93: Washington Street & Broadway



Lane Group	ø2
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	92	5	20	96	5	5	520	15	10	370	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frt		1.00			0.99			1.00			1.00	0.85
Flt Protected		0.96			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1983			1841			3591			1771	1553
Flt Permitted		0.68			0.91			0.95			0.98	1.00
Satd. Flow (perm)		1395			1697			3413			1732	1553
Peak-hour factor, PHF	0.88	0.88	0.88	0.72	0.72	0.72	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	312	105	6	28	133	7	6	598	17	11	416	253
RTOR Reduction (vph)	0	1	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	422	0	0	168	0	0	620	0	0	427	253
Heavy Vehicles (%)	5%	2%	25%	6%	1%	0%	6%	0%	0%	13%	7%	4%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		36.0			46.0			32.1			32.1	32.1
Effective Green, g (s)		36.0			46.0			32.1			32.1	32.1
Actuated g/C Ratio		0.34			0.44			0.30			0.30	0.30
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		476			754			1038			527	473
v/s Ratio Prot					c0.02							
v/s Ratio Perm		c0.30			0.08			0.18			c0.25	0.16
v/c Ratio		0.89			0.22			0.60			0.81	0.53
Uniform Delay, d1		32.8			18.6			31.2			33.9	30.5
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		18.2			0.1			0.9			9.2	1.2
Delay (s)		51.1			18.6			32.1			43.1	31.7
Level of Service		D			B			C			D	C
Approach Delay (s)		51.1			18.6			32.1			38.8	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	105.5	Sum of lost time (s)	27.4
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
46: Taunton Station driveway & Arlington Street

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	26	11	144	46	15	327
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	12	157	50	16	355
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			729			
pX, platoon unblocked						
vC, conflicting volume	570	182			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570	182			207	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			99	
cM capacity (veh/h)	477	861			1365	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	28	12	207	372
Volume Left	28	0	0	16
Volume Right	0	12	50	0
cSH	477	861	1700	1365
Volume to Capacity	0.06	0.01	0.12	0.01
Queue Length 95th (ft)	5	1	0	1
Control Delay (s)	13.0	9.2	0.0	0.4
Lane LOS	B	A		A
Approach Delay (s)	11.9		0.0	0.4
Approach LOS	B			

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		39.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2030 Build Condition - AM Peak Hour

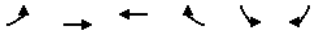
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL	NER
Lane Configurations											
Volume (veh/h)	0	151	10	0	0	0	613	232	131	0	429
Sign Control		Stop			Stop		Free			Free	
Grade		0%			0%		0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83
Hourly flow rate (vph)	0	162	11	0	0	0	659	249	141	0	517
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type							Raised			None	
Median storage veh)							1				
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1897	2155	320	1660	1709	0	517				
vC1, stage 1 conf vol	1638	1638		0	0						
vC2, stage 2 conf vol	258	517		1660	1709						
vCu, unblocked vol	1897	2155	320	1660	1709	0	517				
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.2				
tC, 2 stage (s)	6.1	5.6		6.1	5.5						
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.3				
p0 queue free %	100	0	99	0	100	100	36				
cM capacity (veh/h)	38	16	726	0	48	1091	1029				

Direction, Lane #	EB 1	EB 2	SB 1	SB 2	SB 3	NE 1
Volume Total	162	11	330	330	390	517
Volume Left	0	0	330	330	0	0
Volume Right	0	11	0	0	141	517
cSH	16	726	1029	1029	1700	1700
Volume to Capacity	9.89	0.01	0.64	0.64	0.23	0.30
Queue Length 95th (ft)	Err	1	121	121	0	0
Control Delay (s)	Err	10.0	14.5	14.5	0.0	0.0
Lane LOS	F	B	B	B		
Approach Delay (s)	9378.6		9.1			0.0
Approach LOS	F					

Intersection Summary			
Average Delay		938.9	
Intersection Capacity Utilization		41.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
67: Post Office Square & Broadway

2030 Build Condition - AM Peak Hour



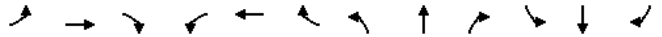
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	817	729	0	400
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	0	0	898	801	0	417
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	1699				898	449
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1699				898	449
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	24
cM capacity (veh/h)	380				283	549

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	449	449	801	417
Volume Left	0	0	0	0
Volume Right	0	0	801	417
cSH	1700	1700	1700	549
Volume to Capacity	0.26	0.26	0.47	0.76
Queue Length 95th (ft)	0	0	0	168
Control Delay (s)	0.0	0.0	0.0	29.3
Lane LOS				D
Approach Delay (s)	0.0			29.3
Approach LOS				D

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2030 Build Condition - AM Peak Hour



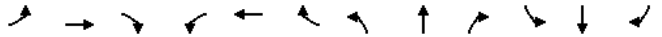
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	10	670	58	475	0	0	0	0	300	0
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.94	0.94	0.94	0.92	0.92	0.92	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	22	713	62	505	0	0	0	0	337	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	62			22			1656	1487	0	1498	1509	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			22			1656	1487	0	1498	1509	62
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			54			0	100	100	100	0	100
cM capacity (veh/h)	1554			1562			0	68	1091	65	64	1009

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	22	475	299	505	337
Volume Left	0	475	238	0	0
Volume Right	22	0	0	505	0
cSH	1700	1562	1562	1700	64
Volume to Capacity	0.01	0.46	0.46	0.30	5.25
Queue Length 95th (ft)	0	62	62	0	Err
Control Delay (s)	0.0	9.2	8.2	0.0	Err
Lane LOS		A	A		F
Approach Delay (s)	0.0	5.3			Err
Approach LOS					F

Intersection Summary			
Average Delay	2061.1		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

2030 Build Condition - AM Peak Hour



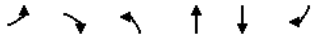
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	104	0	136	0	776	164	105	745	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.42	0.42	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	12	0	0	120	0	156	0	882	186	119	847	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.90	0.90	0.85	0.90	0.90	0.91	0.85			0.91		
vC, conflicting volume	1685	2156	849	2060	2066	534	852			1068		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1331	1856	736	1749	1755	290	739			877		
tC, single (s)	7.5	6.5	6.9	7.7	6.5	7.0	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	100	0	100	76	100			82		
cM capacity (veh/h)	67	55	312	39	64	640	746			680		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	12	120	156	441	627	119	852
Volume Left	12	120	0	0	0	119	0
Volume Right	0	0	156	0	186	0	6
cSH	67	39	640	746	1700	680	1700
Volume to Capacity	0.18	3.03	0.24	0.00	0.37	0.18	0.50
Queue Length 95th (ft)	15	Err	24	0	0	16	0
Control Delay (s)	69.8	Err	12.4	0.0	0.0	11.4	0.0
Lane LOS	F	F	B			B	
Approach Delay (s)	69.8	4339.9		0.0		1.4	
Approach LOS	F	F					

Intersection Summary				
Average Delay	515.3			
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2030 Build Condition - AM Peak Hour



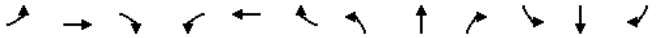
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	109	10	21	387	193	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.80	0.80	0.79	0.79
Hourly flow rate (vph)	130	12	26	484	244	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	848	312	380			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	848	312	380			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	59	98	98			
cM capacity (veh/h)	319	719	1184			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	142	510	380
Volume Left	130	26	0
Volume Right	12	0	135
cSH	335	1184	1700
Volume to Capacity	0.42	0.02	0.22
Queue Length 95th (ft)	51	2	0
Control Delay (s)	23.4	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	23.4	0.7	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2030 Build Condition - AM Peak Hour



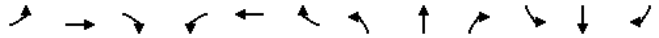
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	243	10	16	133	5	25	70	21	11	70	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.88	0.88	0.88	0.69	0.69	0.69	0.90	0.90	0.90
Hourly flow rate (vph)	41	286	12	18	151	6	36	101	30	12	78	67
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	157			298			670	567	292	646	570	154
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	157			298			670	567	292	646	570	154
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			87	75	96	96	81	93
cM capacity (veh/h)	1399			1275			286	413	740	292	411	897

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	339	175	168	157
Volume Left	41	18	36	12
Volume Right	12	6	30	67
cSH	1399	1275	406	513
Volume to Capacity	0.03	0.01	0.41	0.31
Queue Length 95th (ft)	2	1	50	32
Control Delay (s)	1.2	0.9	20.0	15.1
Lane LOS	A	A	C	C
Approach Delay (s)	1.2	0.9	20.0	15.1
Approach LOS			C	C

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	40.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2030 Build Condition - AM Peak Hour



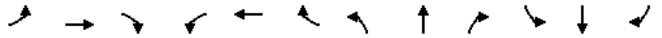
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	112	5	21	137	36	5	65	42	109	45	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.70	0.70	0.70
Hourly flow rate (vph)	0	162	7	31	201	53	7	96	62	156	64	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	254			170			502	482	166	565	459	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	254			170			502	482	166	565	459	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	80	93	54	87	98
cM capacity (veh/h)	1322			1420			417	473	884	339	491	816

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	170	285	165	234
Volume Left	0	31	7	156
Volume Right	7	53	62	14
cSH	1322	1420	569	385
Volume to Capacity	0.00	0.02	0.29	0.61
Queue Length 95th (ft)	0	2	30	97
Control Delay (s)	0.0	1.0	13.9	27.8
Lane LOS		A	B	D
Approach Delay (s)	0.0	1.0	13.9	27.8
Approach LOS			B	D

Intersection Summary				
Average Delay	10.6			
Intersection Capacity Utilization	39.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	220	10	75	370	20	25	35	65	20	41	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.84	0.84	0.84	0.56	0.56	0.56
Hourly flow rate (vph)	11	237	11	119	587	32	30	42	77	36	73	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	619			247			1159	1121	242	1203	1110	603
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	619			247			1159	1121	242	1203	1110	603
tC, single (s)	4.2			4.1			7.1	6.6	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.1	3.3	3.6	4.0	3.3
p0 queue free %	99			91			72	77	90	66	61	96
cM capacity (veh/h)	933			1324			107	182	790	105	190	503

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	258	738	149	127
Volume Left	11	119	30	36
Volume Right	11	32	77	18
cSH	933	1324	246	167
Volume to Capacity	0.01	0.09	0.60	0.76
Queue Length 95th (ft)	1	7	89	121
Control Delay (s)	0.5	2.2	39.6	74.4
Lane LOS	A	A	E	F
Approach Delay (s)	0.5	2.2	39.6	74.4
Approach LOS			E	F

Intersection Summary				
Average Delay	13.4			
Intersection Capacity Utilization	56.2%	ICU Level of Service		B
Analysis Period (min)	15			

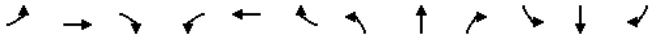
HCM Unsignalized Intersection Capacity Analysis
100: Downtown Taunton Station driveway & Oak Street

2030 Build Condition - AM Peak Hour

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	27	82	524	54	159	330
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	89	570	59	173	359
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						807
pX, platoon unblocked	0.83					
vC, conflicting volume	1303	599			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1262	599			628	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	82			82	
cM capacity (veh/h)	127	502			954	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	118	628	532
Volume Left	29	0	173
Volume Right	89	59	0
cSH	290	1700	954
Volume to Capacity	0.41	0.37	0.18
Queue Length 95th (ft)	48	0	16
Control Delay (s)	25.7	0.0	4.6
Lane LOS	D		A
Approach Delay (s)	25.7	0.0	4.6
Approach LOS	D		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	73.6%	ICU Level of Service		D
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	85	5	30	40	55	5	265	320	530	210	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	13	16	12	12	16	12	12	16	12	12	12
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		819			376			787			471	
Travel Time (s)		18.6			8.5			17.9			10.7	
Peak Hour Factor	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	172	0	0	149	0	0	664	0	662	306	0
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	36.0	72.0	0.0
Total Split (%)	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	27.3%	0.0%	27.3%	54.5%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	66.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.39			0.33			0.69		0.65	0.25	
Control Delay		29.2			18.9			18.2		23.6	4.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		29.2			18.9			18.2		23.6	4.7	
Queue Length 50th (ft)		31			15			77		111	37	
Queue Length 95th (ft)		58			42			150		169	62	
Internal Link Dist (ft)		739			296			707			391	
Turn Bay Length (ft)										200		
Base Capacity (vph)		1510			1390			1618		1720	1754	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.11			0.11			0.41		0.38	0.17	

Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St
2030 Build Condition - PM Peak Hour

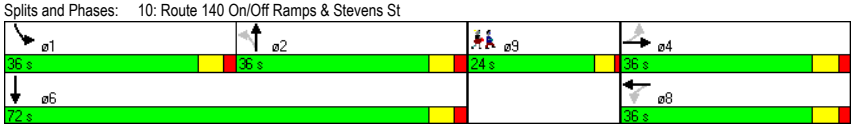
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
10: Route 140 On/Off Ramps & Stevens St

2030 Build Condition - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 132	
Actuated Cycle Length: 62.6	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Route 140 On/Off Ramps & Stevens St



HCM Signalized Intersection Capacity Analysis
10: Route 140 On/Off Ramps & Stevens St

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	85	5	30	40	55	5	265	320	530	210	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	13	16	12	12	16	12	12	16	12	12	12
Total Lost time (s)		6.0			6.0			6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95			0.95		0.97	1.00	
Frt		0.99			0.93			0.92		1.00	0.98	
Flt Protected		0.98			0.99			1.00		0.95	1.00	
Satd. Flow (prot)		3651			3227			3200		3467	1835	
Flt Permitted		0.82			0.84			0.95		0.95	1.00	
Satd. Flow (perm)		3042			2733			3044		3467	1835	
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.89	0.89	0.89	0.80	0.80	0.80
Adj. Flow (vph)	53	112	7	36	48	65	6	298	360	662	262	44
RTOR Reduction (vph)	0	3	0	0	56	0	0	154	0	0	3	0
Lane Group Flow (vph)	0	169	0	0	93	0	0	510	0	662	303	0
Heavy Vehicles (%)	0%	0%	0%	10%	0%	2%	0%	8%	0%	1%	1%	3%
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)		8.9			8.9			17.0		18.3	41.3	
Effective Green, g (s)		8.9			8.9			17.0		18.3	41.3	
Actuated g/C Ratio		0.14			0.14			0.27		0.29	0.66	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		435			391			832		1020	1218	
v/s Ratio Prot										c0.19	0.17	
v/s Ratio Perm		c0.06			0.03			c0.17				
v/c Ratio		0.39			0.24			0.61		0.65	0.25	
Uniform Delay, d1		24.2			23.6			19.7		19.1	4.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.1			0.9		1.1	0.0	
Delay (s)		24.4			23.8			20.7		20.2	4.2	
Level of Service		C			C			C		C	A	
Approach Delay (s)		24.4			23.8			20.7			15.2	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	155	45	0	0	0	25	65	0	165	153	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	14	12	12	12	12	12	16	12	12	16
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		396			269			674			311	
Travel Time (s)		9.0			6.1			15.3			7.1	
Peak Hour Factor	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	548	0	0	0	0	0	119	0	0	353	506
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Detector Phase	2	2					1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0					8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	13.0	13.0					13.0	13.0		13.0	13.0	13.0
Total Split (s)	31.0	31.0	0.0	0.0	0.0	0.0	51.0	51.0	0.0	51.0	51.0	51.0
Total Split (%)	37.8%	37.8%	0.0%	0.0%	0.0%	0.0%	62.2%	62.2%	0.0%	62.2%	62.2%	62.2%
Maximum Green (s)	26.0	26.0					46.0	46.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0					4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0					1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag					Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None					Min	Min		Min	Min	Min
v/c Ratio		0.48						0.11			0.35	0.51
Control Delay		11.0						6.9			8.3	3.1
Queue Delay		0.0						0.0			0.0	0.0
Total Delay		11.0						6.9			8.3	3.1
Queue Length 50th (ft)		35						5			18	0
Queue Length 95th (ft)		82						14			46	37
Internal Link Dist (ft)		316			189			594			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3115						2975			2717	1794
Starvation Cap Reductn		0						0			0	0
Spillback Cap Reductn		0						0			0	0
Storage Cap Reductn		0						0			0	0
Reduced v/c Ratio		0.18						0.04			0.13	0.28

Intersection Summary	
Area Type:	Other

Cycle Length: 82
Actuated Cycle Length: 32.1
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 18: Galleria Mall Entrance & County St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	155	45	0	0	0	25	65	0	165	153	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	14	12	12	12	12	12	16	12	12	16
Total Lost time (s)		5.0						5.0			5.0	5.0
Lane Util. Factor		0.95						0.95			0.95	1.00
Frt		0.99						1.00			1.00	0.85
Flt Protected		0.97						0.99			0.97	1.00
Satd. Flow (prot)		3735						3561			3449	1794
Flt Permitted		0.97						0.82			0.77	1.00
Satd. Flow (perm)		3735						2974			2719	1794
Peak-hour factor, PHF	0.94	0.94	0.94	0.79	0.79	0.79	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	335	165	48	0	0	0	33	86	0	183	170	506
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	315
Lane Group Flow (vph)	0	539	0	0	0	0	0	119	0	0	353	191
Heavy Vehicles (%)	1%	4%	0%	0%	0%	11%	0%	0%	0%	3%	1%	2%
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		2						1			1	
Permitted Phases	2						1			1		1
Actuated Green, G (s)		9.8						12.0			12.0	12.0
Effective Green, g (s)		9.8						12.0			12.0	12.0
Actuated g/C Ratio		0.31						0.38			0.38	0.38
Clearance Time (s)		5.0						5.0			5.0	5.0
Vehicle Extension (s)		2.0						2.0			2.0	2.0
Lane Grp Cap (vph)		1151						1122			1026	677
v/s Ratio Prot												
v/s Ratio Perm		0.14						0.04			c0.13	0.11
v/c Ratio		0.47						0.11			0.34	0.28
Uniform Delay, d1		8.9						6.4			7.1	6.9
Progression Factor		1.00						1.00			1.00	1.00
Incremental Delay, d2		0.1						0.0			0.1	0.1
Delay (s)		9.0						6.4			7.2	7.0
Level of Service		A						A			A	A
Approach Delay (s)		9.0			0.0			6.4			7.1	
Approach LOS		A			A			A			A	

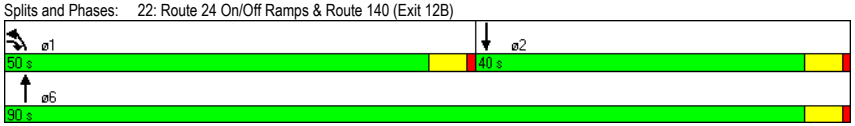
Intersection Summary				
HCM Average Control Delay	7.7	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	31.8	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1440	285	976	1129	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	12	12	12
Storage Length (ft)	0	0	250			200
Storage Lanes	0	2	1			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	729			870	625	
Travel Time (s)	16.6			19.8	14.2	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1500	310	1061	1620	0
Turn Type		Over	Prot			
Protected Phases		1	1	6	2	
Permitted Phases						
Detector Phase		1	1	6	2	
Switch Phase						
Minimum Initial (s)		4.0	4.0	4.0	4.0	
Minimum Split (s)		9.0	9.0	9.0	21.0	
Total Split (s)	0.0	50.0	50.0	90.0	40.0	0.0
Total Split (%)	0.0%	55.6%	55.6%	100.0%	44.4%	0.0%
Maximum Green (s)		45.0	45.0	85.0	35.0	
Yellow Time (s)		4.0	4.0	4.0	4.0	
All-Red Time (s)		1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Recall Mode		None	None	C-Min	C-Min	
Walk Time (s)					5.0	
Flash Dont Walk (s)					11.0	
Pedestrian Calls (#/hr)					0	
v/c Ratio		1.10	0.34	0.30	1.19	
Control Delay		79.5	14.4	0.2	116.4	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		79.5	14.4	0.2	116.4	
Queue Length 50th (ft)		~554	134	0	~584	
Queue Length 95th (ft)		#699	91	0	#724	
Internal Link Dist (ft)	649			790	545	
Turn Bay Length (ft)			250			
Base Capacity (vph)		1367	903	3505	1361	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		1.10	0.34	0.30	1.19	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Route 24 On/Off Ramps & Route 140 (Exit 12B)



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1440	285	976	1129	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	15	12	12	12	12	12
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		0.88	1.00	0.95	0.95	
Frt		0.85	1.00	1.00	0.96	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2733	1805	3505	3410	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2733	1805	3505	3410	
Peak-hour factor, PHF	0.96	0.96	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1500	310	1061	1227	393
RTOR Reduction (vph)	0	0	0	0	34	0
Lane Group Flow (vph)	0	1500	310	1061	1586	0
Heavy Vehicles (%)	2%	4%	0%	3%	2%	2%
Turn Type		Over	Prot			
Protected Phases		1	1	6	2	
Permitted Phases						
Actuated Green, G (s)		45.0	45.0	90.0	35.0	
Effective Green, g (s)		45.0	45.0	90.0	35.0	
Actuated g/C Ratio		0.50	0.50	1.00	0.39	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1367	903	3505	1326	
v/s Ratio Prot		c0.55	0.17	0.30	c0.46	
v/s Ratio Perm						
v/c Ratio		1.10	0.34	0.30	1.20	
Uniform Delay, d1		22.5	13.6	0.0	27.5	
Progression Factor		1.00	0.96	1.00	0.89	
Incremental Delay, d2		55.5	0.2	0.2	94.2	
Delay (s)		78.0	13.3	0.2	118.6	
Level of Service		E	B	A	F	
Approach Delay (s)	78.0			3.2	118.6	
Approach LOS	E			A	F	

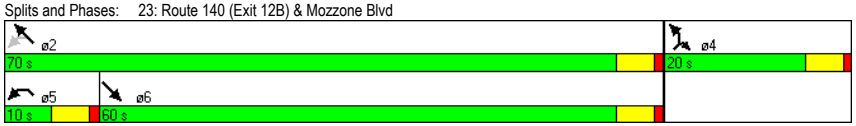
Intersection Summary			
HCM Average Control Delay	69.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1271	191	225	1008	176	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150	0		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)		25	25		25	25
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1713			740	1061	
Travel Time (s)	38.9			16.8	24.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1590	0	0	1341	191	239
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Detector Phase	6		5	2	4	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	10.0		10.0	10.0	10.0	10.0
Total Split (s)	60.0	0.0	10.0	70.0	20.0	20.0
Total Split (%)	66.7%	0.0%	11.1%	77.8%	22.2%	22.2%
Maximum Green (s)	55.0		5.0	65.0	15.0	15.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	C-Min		None	C-Min	None	None
v/c Ratio	0.62			1.46dl	0.72	0.67
Control Delay	7.0			46.1	52.5	25.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	7.0			46.1	52.5	25.4
Queue Length 50th (ft)	198			~442	103	51
Queue Length 95th (ft)	255			#576	#180	130
Internal Link Dist (ft)	1633			660	981	
Turn Bay Length (ft)						
Base Capacity (vph)	2574			1309	295	380
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.62			1.02	0.65	0.63

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	

Offset: 40 (44%), Referenced to phase 2:NWTL and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 23: Route 140 (Exit 12B) & Mozzone Blvd



HCM Signalized Intersection Capacity Analysis
23: Route 140 (Exit 12B) & Mozzone Blvd

2030 Build Condition - PM Peak Hour

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	1271	191	225	1008	176	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3470			3507	1770	1583
Flt Permitted	1.00			0.50	0.95	1.00
Satd. Flow (perm)	3470			1770	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1382	208	245	1096	191	239
RTOR Reduction (vph)	9	0	0	0	0	118
Lane Group Flow (vph)	1581	0	0	1341	191	121
Turn Type			pm+pt			Prot
Protected Phases	6		5	2	4	4
Permitted Phases			2			
Actuated Green, G (s)	66.6			66.6	13.4	13.4
Effective Green, g (s)	66.6			66.6	13.4	13.4
Actuated g/C Ratio	0.74			0.74	0.15	0.15
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2568			1310	264	236
v/s Ratio Prot	0.46				c0.11	0.08
v/s Ratio Perm				c0.76		
v/c Ratio	0.62			1.46dl	0.72	0.51
Uniform Delay, d1	5.6			11.7	36.5	35.3
Progression Factor	1.00			1.04	1.00	1.00
Incremental Delay, d2	1.1			30.8	9.4	1.9
Delay (s)	6.7			43.0	46.0	37.2
Level of Service	A			D	D	D
Approach Delay (s)	6.7			43.0	41.1	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	25.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	97.9%	ICU Level of Service		F
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lanes, Volumes, Timings
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

2030 Build Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	249	991	880	170	2434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12
Storage Length (ft)	0	0		300	250	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	736		624			870
Travel Time (s)	16.7		14.2			19.8
Peak Hour Factor	0.94	0.94	0.98	0.98	0.97	0.97
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	265	1011	898	175	2509
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			8.0		8.0	8.0
Minimum Split (s)			13.0		13.0	13.0
Total Split (s)	0.0	0.0	66.0	0.0	24.0	90.0
Total Split (%)	0.0%	0.0%	73.3%	0.0%	26.7%	100.0%
Maximum Green (s)			61.0		19.0	85.0
Yellow Time (s)			4.0		4.0	4.0
All-Red Time (s)			1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)			2.0		2.0	2.0
Recall Mode			C-Min		None	C-Min
v/c Ratio		0.15	0.39	0.59	0.68	0.72
Control Delay		0.2	5.3	1.7	36.0	0.1
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.2	5.3	1.7	36.0	0.1
Queue Length 50th (ft)		0	91	0	100	0
Queue Length 95th (ft)		0	155	0	m74	m0
Internal Link Dist (ft)	656		544			790
Turn Bay Length (ft)				300	250	
Base Capacity (vph)		1772	2588	1524	360	3505
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.15	0.39	0.59	0.49	0.72

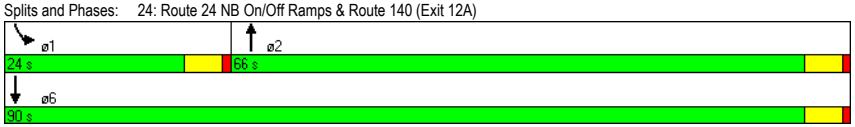
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

2030 Build Condition - PM Peak Hour

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 18 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)



HCM Signalized Intersection Capacity Analysis
24: Route 24 NB On/Off Ramps & Route 140 (Exit 12A)

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	249	991	880	170	2434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12
Total Lost time (s)		4.0	5.0	4.0	5.0	5.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95
Frt		0.86	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1772	3505	1524	1703	3505
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1772	3505	1524	1703	3505
Peak-hour factor, PHF	0.94	0.94	0.98	0.98	0.97	0.97
Adj. Flow (vph)	0	265	1011	898	175	2509
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	265	1011	898	175	2509
Heavy Vehicles (%)	0%	2%	3%	6%	6%	3%
Turn Type		Free		Free	Prot	
Protected Phases			2		1	6
Permitted Phases		Free		Free		
Actuated Green, G (s)		90.0	66.5	90.0	13.5	90.0
Effective Green, g (s)		90.0	66.5	90.0	13.5	90.0
Actuated g/C Ratio		1.00	0.74	1.00	0.15	1.00
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			2.0		2.0	2.0
Lane Grp Cap (vph)		1772	2590	1524	255	3505
v/s Ratio Prot			0.29		0.10	c0.72
v/s Ratio Perm		0.15		0.59		
v/c Ratio		0.15	0.39	0.59	0.69	0.72
Uniform Delay, d1		0.0	4.3	0.0	36.2	0.0
Progression Factor		1.00	1.00	1.00	0.98	1.00
Incremental Delay, d2		0.2	0.4	1.7	0.6	0.1
Delay (s)		0.2	4.8	1.7	36.1	0.1
Level of Service		A	A	A	D	A
Approach Delay (s)	0.2		3.3			2.5
Approach LOS	A		A			A

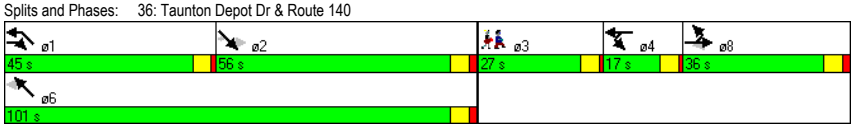
Intersection Summary				
HCM Average Control Delay	2.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	305	5	302	5	0	0	0	885	272	209	930	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	0		100	0		0	180		130	320		350
Storage Lanes	1		1	0		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		846			205			2224			1713	
Travel Time (s)		19.2			4.7			50.5			38.9	
Peak Hour Factor	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	167	166	325	0	8	0	0	903	278	222	989	0
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Detector Phase	8	8	1	4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	4.0	4.0		6.0	6.0	6.0	6.0	20.0	
Minimum Split (s)	12.0	12.0	11.0	9.0	9.0		12.0	12.0	12.0	11.0	26.0	
Total Split (s)	36.0	36.0	45.0	17.0	17.0	0.0	56.0	56.0	56.0	45.0	101.0	0.0
Total Split (%)	19.9%	19.9%	24.9%	9.4%	9.4%	0.0%	30.9%	30.9%	30.9%	24.9%	55.8%	0.0%
Maximum Green (s)	30.0	30.0	40.0	12.0	12.0		50.0	50.0	50.0	40.0	95.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0	4.0	6.0	6.0	6.0	5.0	6.0	4.0
Lead/Lag			Lead	Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?				Yes	Yes		Yes	Yes	Yes			
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		4.0	4.0	4.0	2.0	4.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.59	0.58	0.40		0.07			0.58	0.37	0.51	0.43	
Control Delay	51.4	51.0	4.6		60.0			26.4	16.8	14.0	11.8	
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0	0.0	0.0	
Total Delay	51.4	51.0	4.6		60.0			26.4	16.8	14.0	11.8	
Queue Length 50th (ft)	84	84	0		4			165	52	34	101	
Queue Length 95th (ft)	260	258	65		20			547	245	179	422	
Internal Link Dist (ft)		766			125			2144			1633	
Turn Bay Length (ft)			100						130	320		
Base Capacity (vph)	598	600	1235		291			2097	979	918	3237	
Starvation Cap Reductn	0	0	0		0			0	0	0	0	
Spillback Cap Reductn	0	0	0		0			0	0	0	0	
Storage Cap Reductn	0	0	0		0			0	0	0	0	
Reduced v/c Ratio	0.28	0.28	0.26		0.03			0.43	0.28	0.24	0.31	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	6
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 181	
Actuated Cycle Length: 94.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Taunton Depot Dr & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	305	5	302	5	0	0	0	885	272	209	930	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85		1.00			1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00		0.95			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1689	1599		2046			3539	1583	1805	3574	
Flt Permitted	0.95	0.95	1.00		0.95			1.00	1.00	0.18	1.00	
Satd. Flow (perm)	1681	1689	1599		2046			3539	1583	338	3574	
Peak-hour factor, PHF	0.93	0.93	0.93	0.63	0.63	0.63	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	328	5	325	8	0	0	0	903	278	222	989	0
RTOR Reduction (vph)	0	0	230	0	0	0	0	0	59	0	0	0
Lane Group Flow (vph)	167	166	95	0	8	0	0	903	219	222	989	0
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Turn Type	Split		pm+ov	Split			Perm		Perm	pm+pt		
Protected Phases	8	8	1	4	4			2		1	6	
Permitted Phases			8				2		2	6		
Actuated Green, G (s)	16.0	16.0	29.7		0.7			42.1	42.1	60.8	60.8	
Effective Green, g (s)	16.0	16.0	29.7		0.7			42.1	42.1	60.8	60.8	
Actuated g/C Ratio	0.16	0.16	0.29		0.01			0.41	0.41	0.60	0.60	
Clearance Time (s)	6.0	6.0	5.0		5.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0			4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	263	265	465		14			1459	653	398	2128	
v/s Ratio Prot	c0.10	0.10	0.03		c0.00			c0.26		c0.07	0.28	
v/s Ratio Perm			0.03						0.14	0.26		
v/c Ratio	0.63	0.63	0.20		0.57			0.62	0.34	0.56	0.46	
Uniform Delay, d1	40.3	40.3	27.3		50.6			23.7	20.5	12.8	11.5	
Progression Factor	1.00	1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	3.3	0.1		30.5			0.9	0.4	1.0	0.2	
Delay (s)	44.0	43.6	27.4		81.0			24.6	20.9	13.8	11.8	
Level of Service	D	D	C		F			C	C	B	B	
Approach Delay (s)		35.7			81.0			23.7			12.1	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	29.6
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	476	0	0	0	525	343	15	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	13	12
Storage Length (ft)	0		0	0		0	0		175	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		220			991			547			1888	
Travel Time (s)		5.0			22.5			12.4			42.9	
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	580	0	0	547	357	0	775	0
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Detector Phase				4	4		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)				6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)				11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	0.0	0.0	0.0	25.0	25.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	29.8%	29.8%	0.0%	47.6%	47.6%	47.6%	47.6%	47.6%	0.0%
Maximum Green (s)				20.0	20.0		35.0	35.0	35.0	35.0	35.0	
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Recall Mode				None	None		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio					1.06			0.60	0.36		0.80	
Control Delay					82.6			16.8	2.8		23.9	
Queue Delay					0.0			0.0	0.0		0.0	
Total Delay					82.6			16.8	2.8		23.9	
Queue Length 50th (ft)					~236			132	0		219	
Queue Length 95th (ft)					#521			360	48		#625	
Internal Link Dist (ft)		140			911			467			1808	
Turn Bay Length (ft)									175			
Base Capacity (vph)					548			925	1002		984	
Starvation Cap Reductn					0			0	0		0	
Spillback Cap Reductn					0			0	0		0	
Storage Cap Reductn					0			0	0		0	
Reduced v/c Ratio					1.06			0.59	0.36		0.79	

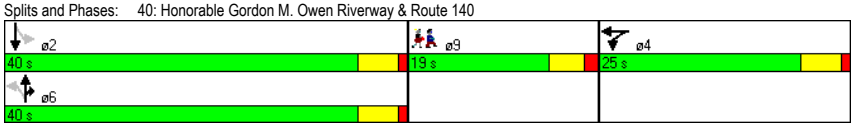
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	23%
Maximum Green (s)	14.0
Yellow Time (s)	3.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	4.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	3
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 84	
Actuated Cycle Length: 68.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 40: Honorable Gordon M. Owen Riverway & Route 140



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	476	0	0	0	525	343	15	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	13	12
Total Lost time (s)					5.0			5.0	5.0		5.0	
Lane Util. Factor					1.00			1.00	1.00		1.00	
Frt					1.00			1.00	0.85		1.00	
Flt Protected					0.95			1.00	1.00		1.00	
Satd. Flow (prot)					1847			1783	1599		1924	
Flt Permitted					0.95			1.00	1.00		0.99	
Satd. Flow (perm)					1847			1783	1599		1897	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.96	0.96	0.96	0.89	0.89	0.89
Adj. Flow (vph)	0	0	0	580	0	0	0	547	357	17	758	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	185	0	0	0
Lane Group Flow (vph)	0	0	0	0	580	0	0	547	172	0	775	0
Heavy Vehicles (%)	2%	2%	2%	1%	0%	100%	0%	3%	1%	0%	2%	0%
Turn Type				Split			Perm		Prot	Perm		
Protected Phases				4	4			6	6		2	
Permitted Phases							6			2		
Actuated Green, G (s)					20.2			34.8	34.8		34.8	
Effective Green, g (s)					20.2			34.8	34.8		34.8	
Actuated g/C Ratio					0.28			0.48	0.48		0.48	
Clearance Time (s)					5.0			5.0	5.0		5.0	
Vehicle Extension (s)					4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)					516			858	770		913	
v/s Ratio Prot					c0.31			0.31	0.11			
v/s Ratio Perm											c0.41	
v/c Ratio					1.12			0.64	0.22		0.85	
Uniform Delay, d1					26.0			14.0	10.9		16.4	
Progression Factor					1.00			1.00	1.00		1.00	
Incremental Delay, d2					78.3			1.8	0.2		7.7	
Delay (s)					104.4			15.8	11.1		24.2	
Level of Service					F			B	B		C	
Approach Delay (s)		0.0			104.4			13.9			24.2	
Approach LOS		A			F			B			C	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

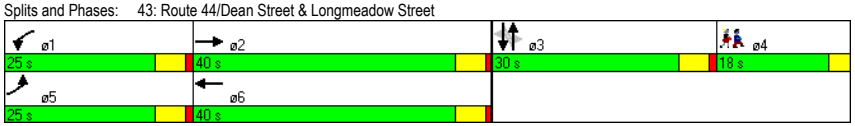
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	829	356	405	769	220	78	330	220	150	235	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12
Storage Length (ft)	100		70	100		70	0		50	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1663			1440			2994			1249	
Travel Time (s)		37.8			32.7			68.0			28.4	
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1274	0	422	1030	0	0	683	0	0	471	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Detector Phase	5	2		1	6		3	3		3	3	
Switch Phase												
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0	
Total Split (s)	25.0	40.0	0.0	25.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	22.1%	35.4%	0.0%	22.1%	35.4%	0.0%	26.5%	26.5%	0.0%	26.5%	26.5%	0.0%
Maximum Green (s)	20.0	35.0		20.0	35.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.07	1.03		1.25	0.51			1.09			2.39dl	
Control Delay	45.1	65.4		171.0	15.0			93.6			69.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	45.1	65.4		171.0	15.0			93.6			69.1	
Queue Length 50th (ft)	6	~385		~314	150			~218			145	
Queue Length 95th (ft)	27	#710		#615	398			#420			#281	
Internal Link Dist (ft)		1583			1360			2914			1169	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	344	1233		337	2002			629			492	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	1.03		1.25	0.51			1.09			0.96	

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	16%
Maximum Green (s)	15.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	7
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 98.6	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	829	356	405	769	220	78	330	220	150	235	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.95		1.00	0.97			0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1685	3347		1652	3388			3237			3379	
Flt Permitted	0.95	1.00		0.95	1.00			0.68			0.56	
Satd. Flow (perm)	1685	3347		1652	3388			2230			1924	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	11	891	383	422	801	229	85	359	239	179	280	12
RTOR Reduction (vph)	0	38	0	0	15	0	0	62	0	0	2	0
Lane Group Flow (vph)	11	1236	0	422	1015	0	0	621	0	0	469	0
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.6	39.3		20.1	57.8			25.1			25.1	
Effective Green, g (s)	1.6	39.3		20.1	57.8			25.1			25.1	
Actuated g/C Ratio	0.02	0.37		0.19	0.55			0.24			0.24	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	26	1252		316	1863			533			459	
v/s Ratio Prot	0.01	c0.37		c0.26	0.30							
v/s Ratio Perm								c0.28			0.24	
v/c Ratio	0.42	0.99		1.34	0.54			1.17			2.39dl	
Uniform Delay, d1	51.3	32.6		42.5	15.2			40.0			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.4	22.3		171.0	0.6			93.5			47.9	
Delay (s)	65.7	54.9		213.5	15.8			133.5			87.9	
Level of Service	E	D		F	B			F			F	
Approach Delay (s)		55.0			73.2			133.5			87.9	
Approach LOS		E			E			F			F	

Intersection Summary					
HCM Average Control Delay	79.6	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	105.1	Sum of lost time (s)		20.6	
Intersection Capacity Utilization	103.0%	ICU Level of Service		G	
Analysis Period (min)	15				
dl Defacto Left Lane. Recode with 1 though lane as a left lane.					
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	105	173	106	170	240	290	803	122	120	882	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		50	0		50	50		0	50		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		1373			971			2224			3692	
Travel Time (s)		31.2			22.1			43.3			71.9	
Peak Hour Factor	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	254	0	291	253	0	1278	0	0	1054	0
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Detector Phase	4	4	4	4	4	4	3	2 3		1	1 2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	4.0			4.0		
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0	9.0			9.0		
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	17.0	57.0	0.0	15.0	55.0	0.0
Total Split (%)	20.5%	20.5%	20.5%	20.5%	20.5%	20.5%	13.9%	46.7%	0.0%	12.3%	45.1%	0.0%
Maximum Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	12.0			10.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0		
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead			Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0		
Recall Mode	Max	Max	Max	Max	Max	Max	None			None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.05	0.60		1.27	0.63		1.08			1.06	
Control Delay		118.3	23.4		186.0	29.8		77.4			68.0	
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0	
Total Delay		118.3	23.4		186.0	29.8		77.4			68.0	
Queue Length 50th (ft)		~139	66		~228	90		~340			~255	
Queue Length 95th (ft)		#181	85		#389	174		#423			#423	
Internal Link Dist (ft)		1293			891			2144			3612	
Turn Bay Length (ft)			50			50						
Base Capacity (vph)		195	420		229	403		1179			996	
Starvation Cap Reductn		0	0		0	0		0			0	
Spillback Cap Reductn		0	0		0	0		0			0	
Storage Cap Reductn		0	0		0	0		0			0	
Reduced v/c Ratio		1.05	0.60		1.27	0.63		1.08			1.06	

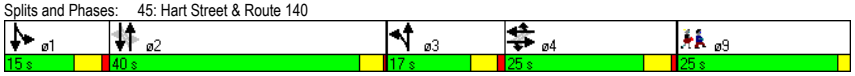
Lane Group	ø2	ø9
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	2	9
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	1.0
Minimum Split (s)	20.0	25.0
Total Split (s)	40.0	25.0
Total Split (%)	33%	20%
Maximum Green (s)	36.0	23.0
Yellow Time (s)	3.5	2.0
All-Red Time (s)	0.5	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		16.0
Pedestrian Calls (#/hr)		0
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 97	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 45: Hart Street & Route 140



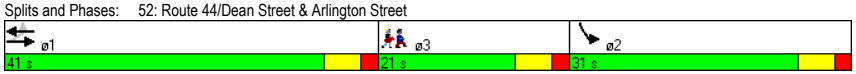
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	105	173	106	170	240	290	803	122	120	882	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		4.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.98			1.00	
Flt Protected		0.99	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1801	1531		1839	1599		3363			3484	
Flt Permitted		0.52	1.00		0.59	1.00		0.57			0.50	
Satd. Flow (perm)		943	1531		1112	1599		1947			1764	
Peak-hour factor, PHF	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	51	154	254	112	179	253	305	845	128	125	919	10
RTOR Reduction (vph)	0	0	104	0	0	73	0	6	0	0	1	0
Lane Group Flow (vph)	0	205	150	0	291	180	0	1272	0	0	1053	0
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Turn Type	Perm		Prot	Perm		Prot	pm+pt			pm+pt		
Protected Phases		4	4		4	4	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		48.0			46.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		48.0			46.0	
Actuated g/C Ratio		0.21	0.21		0.21	0.21		0.49			0.47	
Clearance Time (s)		5.0	5.0		5.0	5.0						
Vehicle Extension (s)		3.0	3.0		3.0	3.0						
Lane Grp Cap (vph)		194	316		229	330		1139			1014	
v/s Ratio Prot			0.10			0.11		c0.14			c0.11	
v/s Ratio Perm		0.22			c0.26			c0.41			0.39	
v/c Ratio		1.06	0.47		1.27	0.55		1.12			1.04	
Uniform Delay, d1		38.5	33.9		38.5	34.4		24.5			25.5	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		80.4	5.0		151.5	6.3		64.8			38.9	
Delay (s)		118.9	38.9		190.0	40.8		89.3			64.4	
Level of Service		F	D		F	D		F			E	
Approach Delay (s)		74.6			120.6			89.3			64.4	
Approach LOS		E			F			F			E	

Intersection Summary					
HCM Average Control Delay	84.5	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	97.0	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	100.8%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	25	795	750	93	406	79	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.89	0.89	0.98	0.98	0.97	0.97	
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	28	893	860	0	500	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	9.0	9.0	9.0		4.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	35.0	35.0	35.0		25.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							4
v/c Ratio	0.30	1.04	0.89		0.81		
Control Delay	27.3	65.7	33.7		36.8		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	27.3	65.7	33.7		36.8		
Queue Length 50th (ft)	7	373	314		194		
Queue Length 95th (ft)	42	#890	#811		#500		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	93	856	963		621		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.30	1.04	0.89		0.81		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 76.2	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	795	750	93	406	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.99		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1685	1845	2066		1872	
Flt Permitted	0.11	1.00	1.00		0.96	
Satd. Flow (perm)	200	1845	2066		1872	
Peak-hour factor, PHF	0.89	0.89	0.98	0.98	0.97	0.97
Adj. Flow (vph)	28	893	765	95	419	81
RTOR Reduction (vph)	0	0	5	0	0	0
Lane Group Flow (vph)	28	893	855	0	500	0
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	35.4	35.4	35.4		25.3	
Effective Green, g (s)	35.4	35.4	35.4		25.3	
Actuated g/C Ratio	0.44	0.44	0.44		0.31	
Clearance Time (s)	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	87	804	901		583	
v/s Ratio Prot		c0.48	0.41		c0.27	
v/s Ratio Perm	0.14					
v/c Ratio	0.32	1.11	0.95		0.86	
Uniform Delay, d1	15.0	22.9	22.0		26.3	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.1	66.6	18.6		11.9	
Delay (s)	17.2	89.5	40.7		38.2	
Level of Service	B	F	D		D	
Approach Delay (s)		87.3	40.7		38.2	
Approach LOS		F	D		D	

Intersection Summary			
HCM Average Control Delay	59.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	20.5
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	1022	0	0	1038	15	15	10	5	65	15	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	16	12	12	12	12	12	16
Storage Length (ft)	50		0	0		50	0		0	0		50
Storage Lanes	1		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		825			1426			127			959	
Travel Time (s)		18.8			32.4			2.9			21.8	
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1200	0	0	1254	0	0	40	0	0	86	308
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Detector Phase	5	2			6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	6.0	12.0			12.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	17.0			17.0		11.0	11.0		11.0	11.0	11.0
Total Split (s)	17.0	62.0	0.0	0.0	45.0	0.0	25.0	25.0	0.0	25.0	25.0	17.0
Total Split (%)	19.5%	71.3%	0.0%	0.0%	51.7%	0.0%	28.7%	28.7%	0.0%	28.7%	28.7%	19.5%
Maximum Green (s)	12.0	57.0			40.0		20.0	20.0		20.0	20.0	12.0
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead				Lag							Lead
Lead-Lag Optimize?	Yes				Yes							Yes
Vehicle Extension (s)	1.5	1.5			1.5		2.0	2.0		2.0	2.0	1.5
Recall Mode	None	Min			Min		None	None		None	None	None
v/c Ratio		0.70			0.71			0.18			0.40	0.53
Control Delay		6.9			14.6			26.7			34.8	20.9
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		6.9			14.6			26.7			34.8	20.9
Queue Length 50th (ft)		86			176			12			33	93
Queue Length 95th (ft)		151			273			34			81	176
Internal Link Dist (ft)		745			1346			47			879	
Turn Bay Length (ft)												50
Base Capacity (vph)		1971			2427			552			518	727
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.61			0.52			0.07			0.17	0.42

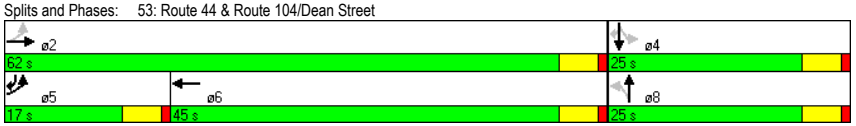
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
53: Route 44 & Route 104/Dean Street

2030 Build Condition - PM Peak Hour

Cycle Length: 87
Actuated Cycle Length: 61.5
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 53: Route 44 & Route 104/Dean Street

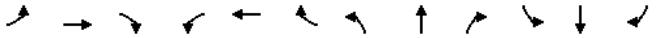


HCM Signalized Intersection Capacity Analysis
53: Route 44 & Route 104/Dean Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	1022	0	0	1038	15	15	10	5	65	15	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	12	12	12	16
Total Lost time (s)		5.0			5.0			5.0			5.0	5.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.99			1.00			0.98			0.96	1.00
Satd. Flow (prot)		3518			3530			1810			1826	1794
Flt Permitted		0.58			1.00			0.80			0.74	1.00
Satd. Flow (perm)		2056			3530			1480			1403	1794
Peak-hour factor, PHF	0.97	0.97	0.97	0.84	0.84	0.84	0.75	0.75	0.75	0.93	0.93	0.93
Adj. Flow (vph)	146	1054	0	0	1236	18	20	13	7	70	16	308
RTOR Reduction (vph)	0	0	0	0	1	0	0	6	0	0	0	22
Lane Group Flow (vph)	0	1200	0	0	1253	0	0	34	0	0	86	286
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt						Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2						8			4		4
Actuated Green, G (s)		45.1			31.5			7.0			7.0	15.6
Effective Green, g (s)		45.1			31.5			7.0			7.0	15.6
Actuated g/C Ratio		0.73			0.51			0.11			0.11	0.25
Clearance Time (s)		5.0			5.0			5.0			5.0	5.0
Vehicle Extension (s)		1.5			1.5			2.0			2.0	1.5
Lane Grp Cap (vph)		1696			1791			167			158	595
v/s Ratio Prot		c0.10			0.36							c0.07
v/s Ratio Perm		c0.42						0.02			0.06	0.09
v/c Ratio		0.71			0.70			0.20			0.54	0.48
Uniform Delay, d1		4.8			11.7			25.0			26.0	19.8
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.1			1.0			0.2			2.0	0.2
Delay (s)		5.9			12.7			25.2			28.1	20.0
Level of Service		A			B			C			C	C
Approach Delay (s)		5.9			12.7			25.2			21.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	219	110	15	251	10	60	370	10	10	350	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	16	12
Right Turn on Red			Yes			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		376			382			1581			384	
Travel Time (s)		8.5			8.7			35.9			8.7	
Peak Hour Factor	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%
Parking (#/hr)											0	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	462	0	0	363	0	0	518	0	0	419	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Detector Phase	3	3		3	3		1	1		1	1	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%	29.7%	29.7%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lead	Lead		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.69			0.45			0.81			0.57	
Control Delay		24.3			18.1			31.6			20.5	
Queue Delay		0.0			0.0			0.0			0.2	
Total Delay		24.3			18.1			31.6			20.7	
Queue Length 50th (ft)		122			89			153			108	
Queue Length 95th (ft)		#307			192			#435			289	
Internal Link Dist (ft)		296			302			1501			304	
Turn Bay Length (ft)												
Base Capacity (vph)		672			810			641			740	
Starvation Cap Reductn		0			0			0			40	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.69			0.45			0.81			0.60	

Intersection Summary

Lanes, Volumes, Timings
57: Spring Street & Summer Street
2030 Build Condition - PM Peak Hour

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.0
Total Split (s)	41.0
Total Split (%)	41%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	12
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
57: Spring Street & Summer Street

2030 Build Condition - PM Peak Hour

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 64.2
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 57: Spring Street & Summer Street

HCM Signalized Intersection Capacity Analysis
57: Spring Street & Summer Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	219	110	15	251	10	60	370	10	10	350	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	12	12	12	16	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.96			1.00			1.00			0.99	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		1783			2118			1850			1894	
Flt Permitted		0.93			0.97			0.87			0.98	
Satd. Flow (perm)		1672			2049			1620			1866	
Peak-hour factor, PHF	0.80	0.80	0.80	0.76	0.76	0.76	0.85	0.85	0.85	0.93	0.93	0.93
Adj. Flow (vph)	50	274	138	20	330	13	71	435	12	11	376	32
RTOR Reduction (vph)	0	13	0	0	0	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	449	0	0	363	0	0	517	0	0	416	0
Heavy Vehicles (%)	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	1%	3%
Parking (#/hr)											0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		3			3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		25.4			25.4			25.4			25.4	
Effective Green, g (s)		25.4			25.4			25.4			25.4	
Actuated g/C Ratio		0.37			0.37			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		614			752			595			685	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.18			c0.32			0.22	
v/c Ratio		0.73			0.48			0.87			0.61	
Uniform Delay, d1		19.0			16.8			20.4			17.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.5			2.2			15.9			4.0	
Delay (s)		26.5			19.1			36.2			21.8	
Level of Service		C			B			D			C	
Approach Delay (s)		26.5			19.1			36.2			21.8	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

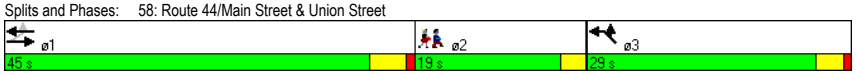
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2	ø2
Lane Configurations												
Volume (vph)	15	482	395	0	512	20	0	0	395	25	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	16	12	16	12	12	12	12	16	15	
Right Turn on Red			Yes			Yes		Yes			Yes	
Link Speed (mph)		30			30		30		30			
Link Distance (ft)		913			784		606		384			
Travel Time (s)		20.8			17.8		13.8		8.7			
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91	
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%	
Parking (#/hr)			0			0						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	959	0	0	618	0	0	0	434	43	0	
Turn Type	Perm									Prot		
Protected Phases		1			1				3	3		2
Permitted Phases	1											
Detector Phase	1	1			1				3	3		
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0				5.0	5.0		1.0
Minimum Split (s)	20.0	20.0			20.0				9.0	9.0		19.0
Total Split (s)	45.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0	29.0	29.0	0.0	19.0
Total Split (%)	48.4%	48.4%	0.0%	0.0%	48.4%	0.0%	0.0%	0.0%	31.2%	31.2%	0.0%	20%
Maximum Green (s)	40.0	40.0			40.0				25.0	25.0		16.0
Yellow Time (s)	4.0	4.0			4.0				3.0	3.0		3.0
All-Red Time (s)	1.0	1.0			1.0				1.0	1.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead			Lead							Lag
Lead-Lag Optimize?	Yes	Yes			Yes							Yes
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Recall Mode	Max	Max			Max				Max	Max		None
Walk Time (s)												7.0
Flash Dont Walk (s)												9.0
Pedestrian Calls (#/hr)												19
v/c Ratio		0.96			0.60				0.79	0.08		
Control Delay		42.8			19.7				40.3	17.3		
Queue Delay		0.0			0.0				0.3	0.0		
Total Delay		42.8			19.7				40.6	17.3		
Queue Length 50th (ft)		341			171				172	8		
Queue Length 95th (ft)		#869			383				#426	38		
Internal Link Dist (ft)		833			704		526		304			
Turn Bay Length (ft)												
Base Capacity (vph)		998			1026				549	565		
Starvation Cap Reductn		0			0				9	0		
Spillback Cap Reductn		0			0				0	0		
Storage Cap Reductn		0			0				0	0		
Reduced v/c Ratio		0.96			0.60				0.80	0.08		

Intersection Summary

Area Type: Other
Cycle Length: 93
Actuated Cycle Length: 81.6
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Route 44/Main Street & Union Street



HCM Signalized Intersection Capacity Analysis
58: Route 44/Main Street & Union Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR	NWR2
Lane Configurations											
Volume (vph)	15	482	395	0	512	20	0	0	395	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	12	12	12	12	16	15
Total Lost time (s)		5.0			5.0				4.0	4.0	
Lane Util. Factor		1.00			1.00				1.00	1.00	
Frt		0.94			0.99				1.00	0.85	
Flt Protected		1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1980			2063				1770	1785	
Flt Permitted		0.99			1.00				0.95	1.00	
Satd. Flow (perm)		1956			2063				1770	1785	
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	16	518	425	0	595	23	0	0	434	27	16
RTOR Reduction (vph)	0	28	0	0	2	0	0	0	0	11	0
Lane Group Flow (vph)	0	931	0	0	616	0	0	0	434	32	0
Heavy Vehicles (%)	7%	3%	1%	0%	4%	0%	0%	0%	2%	4%	0%
Parking (#/hr)			0			0					
Turn Type	Perm									Prot	
Protected Phases		1			1				3	3	
Permitted Phases	1										
Actuated Green, G (s)		40.5			40.5				25.3	25.3	
Effective Green, g (s)		40.5			40.5				25.3	25.3	
Actuated g/C Ratio		0.49			0.49				0.30	0.30	
Clearance Time (s)		5.0			5.0				4.0	4.0	
Vehicle Extension (s)		3.0			3.0				3.0	3.0	
Lane Grp Cap (vph)		950			1002				537	541	
v/s Ratio Prot					0.30				c0.25	0.02	
v/s Ratio Perm		c0.48									
v/c Ratio		0.98			0.62				0.81	0.06	
Uniform Delay, d1		21.1			15.7				26.8	20.6	
Progression Factor		1.00			1.00				1.00	1.00	
Incremental Delay, d2		24.8			2.8				12.4	0.2	
Delay (s)		45.9			18.6				39.2	20.8	
Level of Service		D			B				D	C	
Approach Delay (s)		45.9			18.6		0.0		37.5		
Approach LOS		D			B		A		D		

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	17.6
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
61: Taunton Green & Broadway

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	961	347	0	0	1155	0	202	131	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		304			913			579			302	
Travel Time (s)		6.9			20.8			13.2			6.9	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	1033	373	0	0	1255	0	230	149	0	0	0
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Detector Phase	1	1	1					3	3			
Switch Phase												
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0			
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0			
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0
Total Split (%)	40.7%	40.7%	40.7%	0.0%	0.0%	0.0%	0.0%	34.9%	34.9%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0			
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Recall Mode	Max	Max	Max					Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.26	0.84	0.46			0.47		0.45	0.30			
Control Delay	7.4	33.2	4.1			0.6		28.5	6.0			
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0			
Total Delay	7.4	33.2	4.1			0.6		28.5	6.0			
Queue Length 50th (ft)	17	267	0			0		101	0			
Queue Length 95th (ft)	59	#354	51			0		164	40			
Internal Link Dist (ft)		224			833			499			222	
Turn Bay Length (ft)												
Base Capacity (vph)	701	1223	806			2647		506	492			
Starvation Cap Reductn	0	0	0			0		0	0			
Spillback Cap Reductn	0	0	0			0		0	0			
Storage Cap Reductn	0	0	0			0		0	0			
Reduced v/c Ratio	0.26	0.84	0.46			0.47		0.45	0.30			

Intersection Summary

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	24%
Maximum Green (s)	17.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	7.0
Pedestrian Calls (#/hr)	22
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Area Type: Other
Cycle Length: 86
Actuated Cycle Length: 86
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 61: Taunton Green & Broadway

HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	961	347	0	0	1155	0	202	131	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1770	3505	1615			2647		1739	1330			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1770	3505	1615			2647		1739	1330			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	181	1033	373	0	0	1255	0	230	149	0	0	0
RTOR Reduction (vph)	83	0	243	0	0	0	0	0	106	0	0	0
Lane Group Flow (vph)	98	1033	130	0	0	1255	0	230	43	0	0	0
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			86.0		25.0	25.0			
Actuated g/C Ratio	0.35	0.35	0.35			1.00		0.29	0.29			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	617	1223	563			2647		506	387			
v/s Ratio Prot		c0.29						0.13				
v/s Ratio Perm	0.06		0.08			c0.47			0.03			
v/c Ratio	0.16	0.84	0.23			0.47		0.45	0.11			
Uniform Delay, d1	19.3	25.8	19.8			0.0		24.9	22.4			
Progression Factor	0.92	0.98	0.87			1.00		1.00	1.00			
Incremental Delay, d2	0.5	7.2	1.0			0.6		2.9	0.6			
Delay (s)	18.3	32.5	18.3			0.6		27.9	22.9			
Level of Service	B	C	B			A		C	C			
Approach Delay (s)		27.5			0.6			25.9			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
71: Court Street & Washington Street

2030 Build Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø2
Lane Configurations							
Volume (vph)	457	21	578	289	52	694	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.95	0.95	
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	486	22	628	314	55	731	
Turn Type		Perm		Perm	Perm		
Protected Phases	3		1			1	2
Permitted Phases		3		1	1		
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	17.0
Total Split (s)	25.0	25.0	55.0	55.0	55.0	55.0	17.0
Total Split (%)	25.8%	25.8%	56.7%	56.7%	56.7%	56.7%	18%
Maximum Green (s)	20.0	20.0	50.0	50.0	50.0	50.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Walk Time (s)							7.0
Flash Dont Walk (s)							8.0
Pedestrian Calls (#/hr)							21
v/c Ratio	1.30	0.06	0.69	0.35	0.24	0.75	
Control Delay	188.2	25.6	22.8	2.7	16.5	24.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	188.2	25.6	22.8	2.7	16.5	24.8	
Queue Length 50th (ft)	~387	8	279	0	18	340	
Queue Length 95th (ft)	#581	29	410	40	45	495	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	373	360	905	887	230	970	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.30	0.06	0.69	0.35	0.24	0.75	

Intersection Summary	
Area Type:	Other
Cycle Length: 97	
Actuated Cycle Length: 97	

Offset: 0 (0%), Referenced to phase 2:Ped and 6:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 71: Court Street & Washington Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	457	21	578	289	52	694
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1811	1723	1756	1425	1671	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1811	1723	1756	1425	447	1881
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	486	22	628	314	55	731
RTOR Reduction (vph)	0	5	0	152	0	0
Lane Group Flow (vph)	486	17	628	162	55	731
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%
Turn Type		Perm		Perm	Perm	
Protected Phases	3		1			1
Permitted Phases		3		1	1	
Actuated Green, G (s)	20.0	20.0	50.0	50.0	50.0	50.0
Effective Green, g (s)	20.0	20.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio	0.21	0.21	0.52	0.52	0.52	0.52
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	373	355	905	735	230	970
v/s Ratio Prot	c0.27		0.36			c0.39
v/s Ratio Perm		0.01		0.11	0.12	
v/c Ratio	1.30	0.05	0.69	0.22	0.24	0.75
Uniform Delay, d1	38.5	30.9	17.7	12.8	13.0	18.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	154.6	0.3	4.4	0.7	2.4	5.4
Delay (s)	193.1	31.1	22.1	13.5	15.4	24.0
Level of Service	F	C	C	B	B	C
Approach Delay (s)	186.1		19.2			23.4
Approach LOS	F		B			C

Intersection Summary				
HCM Average Control Delay	58.6	HCM Level of Service		E
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	97.0	Sum of lost time (s)		27.0
Intersection Capacity Utilization	76.6%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		698			192			454			574	
Travel Time (s)		15.9			4.4			10.3			13.0	
Peak Hour Factor	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Shared Lane Traffic (%)	20%											
Lane Group Flow (vph)	415	404	0	0	241	0	0	644	0	0	1074	0
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Detector Phase	1	1		2	2		3	8		4	4	
Switch Phase												
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0	
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	0.0	17.0	17.0	0.0	20.0	61.0	0.0	41.0	41.0	0.0
Total Split (%)	29.1%	29.1%	0.0%	12.1%	12.1%	0.0%	14.2%	43.3%	0.0%	29.1%	29.1%	0.0%
Maximum Green (s)	35.0	35.0		12.0	12.0		15.0	55.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.86	0.88			1.24			2.15dl			0.92	
Control Delay	62.5	64.7			186.2			61.0			42.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	62.5	64.7			186.2			61.0			42.9	
Queue Length 50th (ft)	378	361			~291			293			415	
Queue Length 95th (ft)	#603	#593			#417			#425			#507	
Internal Link Dist (ft)		618			112			374			494	
Turn Bay Length (ft)												
Base Capacity (vph)	552	520			195			842			1167	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.75	0.78			1.24			0.76			0.92	

Intersection Summary	
Area Type:	Other

Lane Group	ø5
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	16%
Maximum Green (s)	17.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	22
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

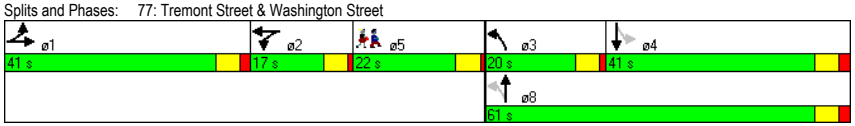
Intersection Summary

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

2030 Build Condition - PM Peak Hour

Cycle Length: 141
Actuated Cycle Length: 120.2
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 77: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	
Lane Util. Factor	0.95	0.95			1.00			0.95			0.95	
Frt	1.00	0.95			0.97			0.98			0.92	
Flt Protected	0.95	0.99			0.99			0.99			1.00	
Satd. Flow (prot)	1811	1672			1804			3355			3113	
Flt Permitted	0.95	0.99			0.99			0.51			0.87	
Satd. Flow (perm)	1811	1672			1804			1746			2704	
Peak-hour factor, PHF	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	519	178	122	33	162	46	170	409	65	42	449	583
RTOR Reduction (vph)	0	11	0	0	6	0	0	6	0	0	125	0
Lane Group Flow (vph)	415	393	0	0	235	0	0	638	0	0	949	0
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Turn Type	Split			Split			pm+pt			Perm		
Protected Phases	1	1		2	2		3	8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	32.1	32.1			12.6			46.3			46.3	
Effective Green, g (s)	32.1	32.1			12.6			46.3			46.3	
Actuated g/C Ratio	0.26	0.26			0.10			0.38			0.38	
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	477	441			187			664			1028	
v/s Ratio Prot	0.23	c0.23			c0.13							
v/s Ratio Perm								c0.37			0.35	
v/c Ratio	0.87	0.89			1.26			2.15dl			0.92	
Uniform Delay, d1	42.9	43.2			54.6			36.9			36.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	15.3	19.2			150.9			25.3			13.0	
Delay (s)	58.2	62.4			205.5			62.1			49.1	
Level of Service	E	E			F			E			D	
Approach Delay (s)		60.3			205.5			62.1			49.1	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM Average Control Delay	69.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	30.8
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	285	147	5	35	146	5	5	505	61	20	505	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	0		0	0		50
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1068			1376			92			2042	
Travel Time (s)		24.3			31.3			2.1			46.4	
Confl. Peds. (#/hr)										5		
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%
Parking (#/hr)									2			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	475	0	0	222	0	0	582	0	0	553	416
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Detector Phase	4	4		3	3 4		1	1		1	1	1
Switch Phase												
Minimum Initial (s)	8.0	8.0		4.0			18.0	18.0		18.0	18.0	18.0
Minimum Split (s)	14.0	14.0		9.0			25.0	25.0		25.0	25.0	25.0
Total Split (s)	41.0	41.0	0.0	20.0	61.0	0.0	42.0	42.0	0.0	42.0	42.0	42.0
Total Split (%)	32.8%	32.8%	0.0%	16.0%	48.8%	0.0%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%
Maximum Green (s)	35.0	35.0		15.0			35.0	35.0		35.0	35.0	35.0
Yellow Time (s)	4.0	4.0		3.0			4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0			3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	7.0	7.0	4.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag		Lead			Lead	Lead		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.0			3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None			Max	Max		Max	Max	Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.03			0.30			0.59			0.96	0.81
Control Delay		86.5			19.3			35.1			67.7	49.7
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		86.5			19.3			35.1			67.7	49.7
Queue Length 50th (ft)		288			72			151			326	229
Queue Length 95th (ft)		#676			156			285			#739	#532
Internal Link Dist (ft)		988			1296			12			1962	
Turn Bay Length (ft)												50
Base Capacity (vph)		463			791			980			574	513
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0

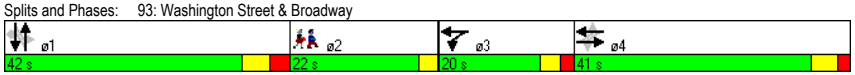
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	17
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		1.03			0.28			0.59			0.96	0.81

Intersection Summary

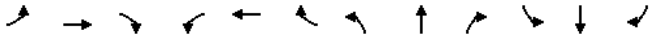
Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 108.5
Natural Cycle: 110
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 93: Washington Street & Broadway



Lane Group	ø2
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	285	147	5	35	146	5	5	505	61	20	505	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			5.0			7.0			7.0	7.0
Lane Util. Factor		1.00			1.00			0.95			1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		1.00			1.00			0.98			1.00	0.85
Flt Protected		0.97			0.99			1.00			1.00	1.00
Satd. Flow (prot)		2029			1799			3369			1820	1568
Flt Permitted		0.68			0.90			0.88			0.96	1.00
Satd. Flow (perm)		1415			1626			2974			1754	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	310	160	5	42	174	6	5	515	62	21	532	416
RTOR Reduction (vph)	0	0	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	475	0	0	222	0	0	575	0	0	553	416
Confl. Peds. (#/hr)										5		
Heavy Vehicles (%)	3%	2%	0%	3%	3%	50%	29%	4%	15%	9%	4%	3%
Parking (#/hr)									2			
Turn Type	Perm			pm+pt			Perm			Perm		Perm
Protected Phases		4		3	3 4			1			1	
Permitted Phases	4			3 4			1			1		1
Actuated Green, G (s)		35.5			47.1			35.5			35.5	35.5
Effective Green, g (s)		35.5			47.1			35.5			35.5	35.5
Actuated g/C Ratio		0.32			0.43			0.32			0.32	0.32
Clearance Time (s)		6.0						7.0			7.0	7.0
Vehicle Extension (s)		4.0						3.0			3.0	3.0
Lane Grp Cap (vph)		456			713			958			565	505
v/s Ratio Prot					c0.03							
v/s Ratio Perm		c0.34			0.10			0.19			c0.32	0.27
v/c Ratio		1.04			0.31			0.60			0.98	0.82
Uniform Delay, d1		37.4			20.8			31.4			37.0	34.5
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		53.4			0.1			2.8			33.0	14.1
Delay (s)		90.8			20.9			34.2			70.0	48.6
Level of Service		F			C			C			E	D
Approach Delay (s)		90.8			20.9			34.2			60.8	
Approach LOS		F			C			C			E	

Intersection Summary			
HCM Average Control Delay	56.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	27.6
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
65: Taunton Station driveway & Arlington Street

2030 Build Condition - PM Peak Hour

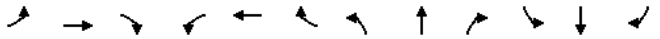
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	7	105	13	10	456
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	8	114	14	11	496
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			728			
pX, platoon unblocked						
vC, conflicting volume	639	121			128	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	639	121			128	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			99	
cM capacity (veh/h)	437	930			1458	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	32	8	128	507
Volume Left	32	0	0	11
Volume Right	0	8	14	0
cSH	437	930	1700	1458
Volume to Capacity	0.07	0.01	0.08	0.01
Queue Length 95th (ft)	6	1	0	1
Control Delay (s)	13.9	8.9	0.0	0.2
Lane LOS	B	A		A
Approach Delay (s)	12.9		0.0	0.2
Approach LOS	B			

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		41.2%	ICU Level of Service
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
66: Cohannet Street & Taunton Green

2030 Build Condition - PM Peak Hour



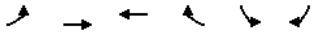
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	288	31	0	0	0	0	0	420	822	451	112
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.99	0.99	0.99	0.94	0.94	0.94
Hourly flow rate (vph)	0	310	33	0	0	0	0	0	424	874	480	119
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			Raised	
Median storage veh)											1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2500	2713	539	2417	2348	0	599			424		
vC1, stage 1 conf vol	2288	2288		0	0							
vC2, stage 2 conf vol	212	424		2417	2348							
vCu, unblocked vol	2500	2713	539	2417	2348	0	599			424		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	0	94	0	100	100	100			23		
cM capacity (veh/h)	7	5	540	0	14	1085	988			1135		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	SB 3
Volume Total	310	33	424	437	437	599
Volume Left	0	0	0	437	437	0
Volume Right	0	33	424	0	0	119
cSH	5	540	1700	1135	1135	1700
Volume to Capacity	65.39	0.06	0.25	0.77	0.77	0.35
Queue Length 95th (ft)	Err	5	0	202	202	0
Control Delay (s)	Err	12.1	0.0	17.9	17.9	0.0
Lane LOS	F	B		C	C	
Approach Delay (s)	9028.5		0.0	10.6		
Approach LOS	F					

Intersection Summary			
Average Delay		1389.1	
Intersection Capacity Utilization		74.6%	ICU Level of Service
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
67: Post Office Square & Broadway

2030 Build Condition - PM Peak Hour



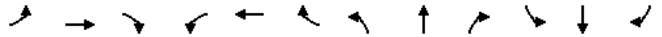
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	959	555	0	547
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	0	0	1009	584	0	615
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			302			
pX, platoon unblocked						
vC, conflicting volume	1009				1009	505
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1009				1009	505
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	682				240	513

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	505	505	584	615
Volume Left	0	0	0	0
Volume Right	0	0	584	615
cSH	1700	1700	1700	513
Volume to Capacity	0.30	0.30	0.34	1.20
Queue Length 95th (ft)	0	0	0	571
Control Delay (s)	0.0	0.0	0.0	132.9
Lane LOS				F
Approach Delay (s)	0.0			132.9
Approach LOS				F

Intersection Summary			
Average Delay		37.0	
Intersection Capacity Utilization		67.0%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
70: Post Office Square & Court Street

2030 Build Condition - PM Peak Hour



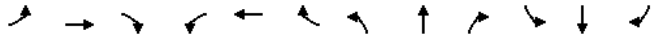
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	26	955	126	388	0	0	0	0	388	21
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	30	1027	135	417	0	0	0	0	431	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					565							
pX, platoon unblocked												
vC, conflicting volume	135			30			2428	2189	0	2204	2219	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135			30			2428	2189	0	2204	2219	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			35			0	100	100	100	0	97
cM capacity (veh/h)	1461			1583			0	16	1091	15	15	919

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	30	685	478	417	454
Volume Left	0	685	342	0	0
Volume Right	30	0	0	417	23
cSH	1700	1583	1583	1700	16
Volume to Capacity	0.02	0.65	0.65	0.25	28.24
Queue Length 95th (ft)	0	129	129	0	Err
Control Delay (s)	0.0	11.4	10.4	0.0	Err
Lane LOS		B	B		F
Approach Delay (s)	0.0	8.1			9999.0
Approach LOS					F

Intersection Summary			
Average Delay		2207.5	
Intersection Capacity Utilization		64.8%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

2030 Build Condition - PM Peak Hour



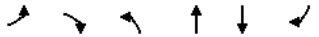
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	5	98	0	173	5	705	323	241	878	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	10	108	0	190	5	758	347	256	934	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								574			260	
pX, platoon unblocked	0.71	0.71	0.70	0.71	0.71	0.99	0.70			0.99		
vC, conflicting volume	2027	2563	934	2399	2389	553	934			1105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2191	2947	696	2716	2702	528	696			1087		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	0	100	62	99			60		
cM capacity (veh/h)	8	6	274	5	9	495	640			637		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	108	190	384	726	256	934
Volume Left	0	108	0	5	0	256	0
Volume Right	10	0	190	0	347	0	0
cSH	274	5	495	640	1700	637	1700
Volume to Capacity	0.04	23.02	0.38	0.01	0.43	0.40	0.55
Queue Length 95th (ft)	3	Err	45	1	0	48	0
Control Delay (s)	18.7	Err	16.7	0.3	0.0	14.4	0.0
Lane LOS	C	F	C	A		B	
Approach Delay (s)	18.7	3626.6		0.1		3.1	
Approach LOS	C	F					

Intersection Summary				
Average Delay	415.5			
Intersection Capacity Utilization	98.3%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
78: Kilmer Street & Oak Street

2030 Build Condition - PM Peak Hour



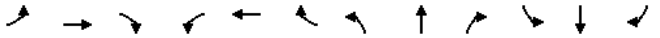
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	90	21	26	225	387	89
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.72	0.72	0.91	0.91
Hourly flow rate (vph)	114	27	36	312	425	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	859	474	523			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	859	474	523			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	95	97			
cM capacity (veh/h)	314	588	1043			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	141	349	523
Volume Left	114	36	0
Volume Right	27	0	98
cSH	345	1043	1700
Volume to Capacity	0.41	0.03	0.31
Queue Length 95th (ft)	48	3	0
Control Delay (s)	22.4	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	22.4	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
87: Purchase Street & School Street

2030 Build Condition - PM Peak Hour



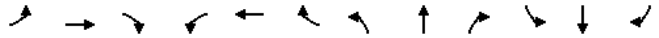
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	333	20	5	97	5	30	90	41	21	135	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.72	0.72	0.72	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	69	354	21	7	135	7	37	110	50	26	165	79
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	142			376			817	659	365	760	666	138
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			376			817	659	365	760	666	138
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			78	70	93	88	54	91
cM capacity (veh/h)	1441			1194			166	363	685	222	360	910

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	445	149	196	270
Volume Left	69	7	37	26
Volume Right	21	7	50	79
cSH	1441	1194	330	408
Volume to Capacity	0.05	0.01	0.60	0.66
Queue Length 95th (ft)	4	0	91	115
Control Delay (s)	1.6	0.4	30.8	29.4
Lane LOS	A	A	D	D
Approach Delay (s)	1.6	0.4	30.8	29.4
Approach LOS			D	D

Intersection Summary					
Average Delay			13.9		
Intersection Capacity Utilization			50.8%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
88: Purchase Street & Washington Street

2030 Build Condition - PM Peak Hour



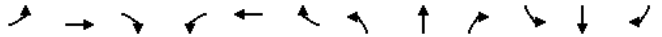
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	76	50	241	110	5	40	90	37	5	90	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.81	0.81	0.81	0.88	0.88	0.88	0.77	0.77	0.77
Hourly flow rate (vph)	11	81	53	298	136	6	45	102	42	6	117	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	142			134			928	866	107	956	889	139
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			134			928	866	107	956	889	139
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			79			64	56	96	95	48	99
cM capacity (veh/h)	1453			1444			125	230	944	127	224	915

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	145	440	190	130
Volume Left	11	298	45	6
Volume Right	53	6	42	6
cSH	1453	1444	223	224
Volume to Capacity	0.01	0.21	0.85	0.58
Queue Length 95th (ft)	1	19	166	81
Control Delay (s)	0.6	6.1	73.4	41.1
Lane LOS	A	A	F	E
Approach Delay (s)	0.6	6.1	73.4	41.1
Approach LOS			F	E

Intersection Summary					
Average Delay			24.4		
Intersection Capacity Utilization			52.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
89: Winter Street & School Street

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	250	15	180	400	25	25	45	85	25	66	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.85	0.85	0.85	0.78	0.78	0.78	0.88	0.88	0.88
Hourly flow rate (vph)	7	347	21	212	471	29	32	58	109	28	75	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	500			368			1335	1295	358	1418	1291	485
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			368			1335	1295	358	1418	1291	485
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			82			47	57	84	48	44	97
cM capacity (veh/h)	1075			1196			61	134	682	55	134	586

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	375	712	199	120
Volume Left	7	212	32	28
Volume Right	21	29	109	17
cSH	1075	1196	178	109
Volume to Capacity	0.01	0.18	1.12	1.11
Queue Length 95th (ft)	0	16	250	187
Control Delay (s)	0.2	4.1	155.4	193.0
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	4.1	155.4	193.0
Approach LOS			F	F

Intersection Summary				
Average Delay	40.6			
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
100: Downtown Taunton Station driveway & Oak Street

2030 Build Condition - PM Peak Hour

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	35	127	478	22	60	481
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	138	520	24	65	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						801
pX, platoon unblocked	0.77					
vC, conflicting volume	1185	532			543	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	532			543	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	75			94	
cM capacity (veh/h)	171	548			1025	

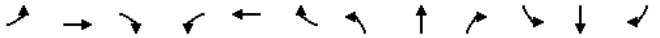
Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	176	543	588
Volume Left	38	0	65
Volume Right	138	24	0
cSH	372	1700	1025
Volume to Capacity	0.47	0.32	0.06
Queue Length 95th (ft)	61	0	5
Control Delay (s)	23.1	0.0	1.7
Lane LOS	C		A
Approach Delay (s)	23.1	0.0	1.7
Approach LOS	C		

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	74.9%	ICU Level of Service	D	
Analysis Period (min)	15			

Norton

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2030 Build Condition - AM Peak Hour



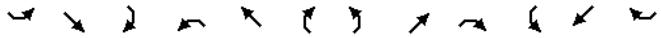
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	355	180	52	310	50	198	128	132	70	65	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.79	0.79	0.79	0.67	0.67	0.67
Hourly flow rate (vph)	16	390	198	64	383	62	251	162	167	104	97	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	444			588			1127	1095	489	1312	1163	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			588			1127	1095	489	1312	1163	414
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			94			0	17	71	0	44	98
cM capacity (veh/h)	1060			997			94	194	573	26	174	624

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	604	509	580	216
Volume Left	16	64	251	104
Volume Right	198	62	167	15
cSH	1060	997	153	47
Volume to Capacity	0.02	0.06	3.79	4.60
Queue Length 95th (ft)	1	5	Err	Err
Control Delay (s)	0.4	1.8	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	1.8	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	4170.3			
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2030 Build Condition - AM Peak Hour



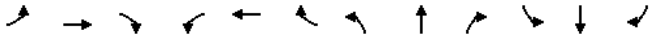
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	130	225	0	0	360	75	0	0	5	10	0	109
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.56	0.56	0.56	0.69	0.69	0.69
Hourly flow rate (vph)	144	250	0	0	400	83	0	0	9	14	0	158
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	483			250			1139	1022	250	989	981	442
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	483			250			1139	1022	250	989	981	442
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	87			100			100	100	99	92	100	74
cM capacity (veh/h)	1074			1327			120	206	794	184	218	616

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	394	483	9	172
Volume Left	144	0	0	14
Volume Right	0	83	9	158
cSH	1074	1327	794	514
Volume to Capacity	0.13	0.00	0.01	0.34
Queue Length 95th (ft)	12	0	1	37
Control Delay (s)	4.1	0.0	9.6	15.5
Lane LOS	A		A	C
Approach Delay (s)	4.1	0.0	9.6	15.5
Approach LOS			A	C

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	66.5%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	185	5	5	220	0	15	0	10	5	0	5
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.75	0.75	0.75	0.69	0.69	0.69
Hourly flow rate (vph)	0	201	5	5	232	0	20	0	13	7	0	7

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	207	237	33	14
Volume Left (vph)	0	5	20	7
Volume Right (vph)	5	0	13	7
Hadj (s)	0.11	0.06	0.32	0.23
Departure Headway (s)	4.4	4.3	5.2	5.2
Degree Utilization, x	0.25	0.28	0.05	0.02
Capacity (veh/h)	803	811	629	628
Control Delay (s)	8.9	9.0	8.5	8.3
Approach Delay (s)	8.9	9.0	8.5	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.9	
HCM Level of Service			A	
Intersection Capacity Utilization			25.6%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	65	85	254	76	35	140
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.72	0.72	0.70	0.70
Hourly flow rate (vph)	90	118	353	106	50	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	706	406			458	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	706	406			458	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	76	82			96	
cM capacity (veh/h)	376	641			1113	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	208	458	250
Volume Left	90	0	50
Volume Right	118	106	0
cSH	491	1700	1113
Volume to Capacity	0.42	0.27	0.04
Queue Length 95th (ft)	52	0	4
Control Delay (s)	17.6	0.0	2.0
Lane LOS	C		A
Approach Delay (s)	17.6	0.0	2.0
Approach LOS	C		

Intersection Summary				
Average Delay			4.6	
Intersection Capacity Utilization			46.1%	ICU Level of Service A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
15: Barrowsville Station driveway & S. Worcester St

2030 Build Condition - AM Peak Hour

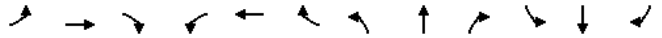
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	17	83	172	86	119
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	18	90	187	93	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	526	158	223			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	526	158	223			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	98	93			
cM capacity (veh/h)	478	887	1346			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	99	277	223
Volume Left	80	90	0
Volume Right	18	0	129
cSH	523	1346	1700
Volume to Capacity	0.19	0.07	0.13
Queue Length 95th (ft)	17	5	0
Control Delay (s)	13.5	3.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.5	3.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: John B. Scott Blvd & Dean Stret

2030 Build Condition - AM Peak Hour



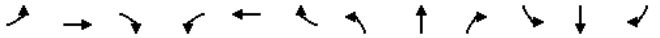
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	170	20	5	165	36	60	212	5	17	50	0
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	198	23	7	220	48	67	236	6	19	56	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	227	275	308	74
Volume Left (vph)	6	7	67	19
Volume Right (vph)	23	48	6	0
Hadj (s)	-0.03	0.13	0.13	0.27
Departure Headway (s)	5.5	5.6	5.6	6.2
Degree Utilization, x	0.35	0.42	0.48	0.13
Capacity (veh/h)	605	607	600	505
Control Delay (s)	11.4	12.6	13.6	10.1
Approach Delay (s)	11.4	12.6	13.6	10.1
Approach LOS	B	B	B	B

Intersection Summary			
Delay	12.4		
HCM Level of Service	B		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2030 Build Condition - PM Peak Hour



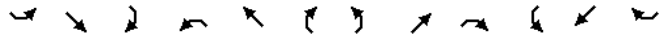
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	295	255	154	425	75	179	74	119	65	159	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.93	0.93	0.93	0.88	0.88	0.88
Hourly flow rate (vph)	15	304	263	173	478	84	192	80	128	74	181	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	562			567			1445	1374	436	1500	1464	520
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562			567			1445	1374	436	1500	1464	520
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	98			83			0	33	79	0	0	96
cM capacity (veh/h)	1020			1010			0	119	623	33	106	549

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	582	735	400	277
Volume Left	15	173	192	74
Volume Right	263	84	128	23
cSH	1020	1010	0	69
Volume to Capacity	0.02	0.17	Err	4.02
Queue Length 95th (ft)	1	15	Err	Err
Control Delay (s)	0.4	4.0	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	4.0	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			114.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
2: S Worcester St & S. Worcerster Street

2030 Build Condition - PM Peak Hour



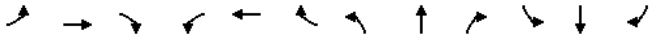
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	96	475	5	5	250	35	0	0	5	40	0	152
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.88	0.88	0.88	0.44	0.44	0.44	0.80	0.80	0.80
Hourly flow rate (vph)	105	522	5	6	284	40	0	0	11	50	0	190
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	324			527			1241	1071	525	1062	1054	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			527			1241	1071	525	1062	1054	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			100	100	98	73	100	74
cM capacity (veh/h)	1247			1050			106	203	557	183	207	738

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	633	330	11	240
Volume Left	105	6	0	50
Volume Right	5	40	11	190
cSH	1247	1050	557	452
Volume to Capacity	0.08	0.01	0.02	0.53
Queue Length 95th (ft)	7	0	2	76
Control Delay (s)	2.2	0.2	11.6	21.6
Lane LOS	A	A	B	C
Approach Delay (s)	2.2	0.2	11.6	21.6
Approach LOS			B	C

Intersection Summary				
Average Delay			5.6	
Intersection Capacity Utilization			74.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
9: John B. Scott Blvd & Harvey Street

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	310	15	10	190	0	5	5	5	0	0	5
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.75	0.75	0.75	0.42	0.42	0.42
Hourly flow rate (vph)	6	356	17	11	216	0	7	7	7	0	0	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	379	227	20	12
Volume Left (vph)	6	11	7	0
Volume Right (vph)	17	0	7	12
Hadj (s)	0.00	0.04	-0.02	-0.60
Departure Headway (s)	4.2	4.4	5.2	4.6
Degree Utilization, x	0.44	0.28	0.03	0.02
Capacity (veh/h)	841	794	613	674
Control Delay (s)	10.5	9.1	8.4	7.7
Approach Delay (s)	10.5	9.1	8.4	7.7
Approach LOS	B	A	A	A

Intersection Summary				
Delay			9.9	
HCM Level of Service			A	
Intersection Capacity Utilization			30.7%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
14: Barrows St & S. Worcester St

2030 Build Condition - PM Peak Hour

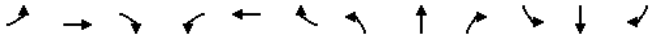
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	121	55	172	78	45	161
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.86	0.86	0.79	0.79
Hourly flow rate (vph)	142	65	200	91	57	204
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	563	245			291	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563	245			291	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	92			96	
cM capacity (veh/h)	467	789			1283	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	207	291	261
Volume Left	142	0	57
Volume Right	65	91	0
cSH	536	1700	1283
Volume to Capacity	0.39	0.17	0.04
Queue Length 95th (ft)	45	0	3
Control Delay (s)	15.9	0.0	2.0
Lane LOS	C		A
Approach Delay (s)	15.9	0.0	2.0
Approach LOS	C		

Intersection Summary				
Average Delay			5.0	
Intersection Capacity Utilization			44.8%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
16: John B. Scott Blvd & Dean Stret

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	200	95	15	165	19	35	75	10	23	155	5
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.86	0.86	0.86	0.96	0.96	0.96
Hourly flow rate (vph)	6	233	110	17	188	22	41	87	12	24	161	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	349	226	140	191
Volume Left (vph)	6	17	41	24
Volume Right (vph)	110	22	12	5
Hadj (s)	-0.16	-0.02	0.04	0.02
Departure Headway (s)	5.1	5.4	5.8	5.7
Degree Utilization, x	0.49	0.34	0.23	0.30
Capacity (veh/h)	667	616	539	565
Control Delay (s)	12.9	11.2	10.5	11.2
Approach Delay (s)	12.9	11.2	10.5	11.2
Approach LOS	B	B	B	B

Intersection Summary				
Delay			11.7	
HCM Level of Service			B	
Intersection Capacity Utilization			37.6%	ICU Level of Service
Analysis Period (min)			15	A

HCM Unsignalized Intersection Capacity Analysis
24: Barrowsville Station driveway & S. Worcester St

2030 Build Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	90	38	14	146	250	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	41	15	159	272	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	479	290	308			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	479	290	308			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	94	99			
cM capacity (veh/h)	539	749	1253			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	139	174	308
Volume Left	98	15	0
Volume Right	41	0	36
cSH	588	1253	1700
Volume to Capacity	0.24	0.01	0.18
Queue Length 95th (ft)	23	1	0
Control Delay (s)	13.0	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	0.8	0.0
Approach LOS	B		

Intersection Summary				
Average Delay			3.1	
Intersection Capacity Utilization			33.3%	ICU Level of Service
Analysis Period (min)			15	A

Raynham

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	25	40	15	45	177	45	1328	5	50	521	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	282	78	0	0	257	0	0	1450	0	0	707	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		16.0	16.0	
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	11.0	43.0	0.0	32.0	32.0	0.0
Total Split (%)	42.7%	42.7%	0.0%	42.7%	42.7%	0.0%	14.7%	57.3%	0.0%	42.7%	42.7%	0.0%
Maximum Green (s)	26.0	26.0		26.0	26.0		5.0	37.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	C-Min		C-Min	C-Min	
v/c Ratio	0.93	0.14			0.48			0.88			0.61	
Control Delay	62.4	9.2			21.7			25.1			15.4	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	62.4	9.2			21.7			25.1			15.4	
Queue Length 50th (ft)	119	9			82			314			117	
Queue Length 95th (ft)	#220	32			144			#491			173	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	348	623			610			1643			1167	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.81	0.13			0.42			0.88			0.61	

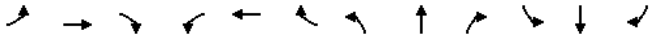
Intersection Summary	
Area Type:	Other

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Carver Street & Route 138

HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2030 Build Condition- AM Peak Hour

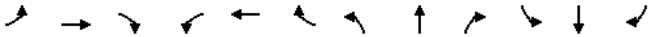


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	25	40	15	45	177	45	1328	5	50	521	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frt	1.00	0.91			0.90			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1787	1708			1742			3381			3208	
Flt Permitted	0.53	1.00			0.98			0.90			0.67	
Satd. Flow (perm)	1002	1708			1716			3062			2161	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	282	30	48	16	49	192	47	1398	5	57	592	58
RTOR Reduction (vph)	0	33	0	0	16	0	0	0	0	0	6	0
Lane Group Flow (vph)	282	45	0	0	241	0	0	1450	0	0	701	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.7	22.7			22.7			40.3			40.3	
Effective Green, g (s)	22.7	22.7			22.7			40.3			40.3	
Actuated g/C Ratio	0.30	0.30			0.30			0.54			0.54	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	303	517			519			1645			1161	
v/s Ratio Prot		0.03										
v/s Ratio Perm	c0.28				0.14			c0.47			0.32	
v/c Ratio	0.93	0.09			0.46			0.88			0.60	
Uniform Delay, d1	25.4	18.7			21.2			15.2			11.9	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	33.6	0.0			0.2			5.7			2.3	
Delay (s)	59.0	18.7			21.5			21.0			14.2	
Level of Service	E	B			C			C			B	
Approach Delay (s)		50.2			21.5			21.0			14.2	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition- AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	0	175	0	0	0	0	1526	230	70	442	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	14	16	16	16	12	12	16	10	12	12
Storage Length (ft)	0		500	0		0	0		0	200		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1388			1423			507			722	
Travel Time (s)		31.5			32.3			11.5			16.4	
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.25	0.96	0.96	0.79	0.79	0.25
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	3%	3%	8%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	355	0	227	0	0	0	0	1830	0	89	559	0
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Detector Phase	4							2		1	6	
Switch Phase												
Minimum Initial (s)	10.0							10.0		5.0	10.0	
Minimum Split (s)	22.0							22.0		12.0	23.0	
Total Split (s)	25.0	0.0	0.0	0.0	0.0	0.0	0.0	57.0	0.0	13.0	70.0	0.0
Total Split (%)	26.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.0%	0.0%	13.7%	73.7%	0.0%
Maximum Green (s)	19.0							51.0		6.0	63.0	
Yellow Time (s)	4.0							4.0		5.0	5.0	
All-Red Time (s)	2.0							2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	4.0	4.0	4.0	4.0	4.0	6.0	4.0	7.0	7.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Recall Mode	None							C-Max		None	C-Max	
v/c Ratio	0.99		0.14					0.99		0.90	0.25	
Control Delay	83.8		0.2					42.0		117.1	1.2	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	83.8		0.2					42.0		117.1	1.2	
Queue Length 50th (ft)	215		0					544		53	3	
Queue Length 95th (ft)	#304		0					#742		m#113	4	
Internal Link Dist (ft)		1308			1343			427			642	
Turn Bay Length (ft)			500							200		
Base Capacity (vph)	360		1610					1844		99	2217	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	0.99		0.14					0.99		0.90	0.25	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition- AM Peak Hour

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: I-495 SB Off-Ramp & Route 138

HCM Signalized Intersection Capacity Analysis
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	0	175	0	0	0	0	1526	230	70	442	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	16	14	16	16	16	12	12	16	10	12	12
Total Lost time (s)	6.0		4.0					6.0		7.0	7.0	
Lane Util. Factor	1.00		1.00					0.95		1.00	0.95	
Frt	1.00		0.85					0.98		1.00	1.00	
Flt Protected	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1799		1610					3436		1560	3343	
Flt Permitted	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1799		1610					3436		1560	3343	
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.25	0.96	0.96	0.79	0.79	0.25
Adj. Flow (vph)	355	0	227	0	0	0	0	1590	240	89	559	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	355	0	227	0	0	0	0	1830	0	89	559	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	3%	3%	8%	8%	0%
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Actuated Green, G (s)	19.0		95.0					51.0		6.0	63.0	
Effective Green, g (s)	19.0		95.0					51.0		6.0	63.0	
Actuated g/C Ratio	0.20		1.00					0.54		0.06	0.66	
Clearance Time (s)	6.0							6.0		7.0	7.0	
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Lane Grp Cap (vph)	360		1610					1845		99	2217	
v/s Ratio Prot	c0.20							c0.53		c0.06	0.17	
v/s Ratio Perm			0.14									
v/c Ratio	0.99		0.14					0.99		0.90	0.25	
Uniform Delay, d1	37.9		0.0					21.8		44.2	6.5	
Progression Factor	1.00		1.00					1.00		1.30	0.16	
Incremental Delay, d2	43.3		0.2					19.1		52.3	0.2	
Delay (s)	81.2		0.2					40.9		109.7	1.2	
Level of Service	F		A					D		F	A	
Approach Delay (s)		49.6			0.0			40.9			16.1	
Approach LOS		D			A			D			B	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	110	0	212	335	1449	0	0	387	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	10	12	12	12	12	16
Storage Length (ft)	0		0	0		300	225		0	0		0
Storage Lanes	0		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1299			722			1195	
Travel Time (s)		31.5			29.5			16.4			27.2	
Peak Hour Factor	0.25	0.25	0.25	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	3%	3%	0%	0%	9%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	121	0	233	368	1592	0	0	823	0
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Detector Phase				3			5	2			6	
Switch Phase												
Minimum Initial (s)				5.0			5.0	10.0			10.0	
Minimum Split (s)				22.0			12.0	23.0			22.0	
Total Split (s)	0.0	0.0	0.0	24.0	0.0	0.0	41.0	71.0	0.0	0.0	30.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	25.3%	0.0%	0.0%	43.2%	74.7%	0.0%	0.0%	31.6%	0.0%
Maximum Green (s)				18.0			34.0	64.0			24.0	
Yellow Time (s)				4.0			5.0	5.0			4.0	
All-Red Time (s)				2.0			2.0	2.0			2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.0	4.0	4.0	7.0	7.0	4.0	4.0	6.0	4.0
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Recall Mode				None			None	C-Min			C-Min	
v/c Ratio				0.53		0.13	0.81	0.61			0.65	
Control Delay				47.1		0.2	27.9	5.5			35.9	
Queue Delay				0.0		0.0	0.0	0.1			0.0	
Total Delay				47.1		0.2	27.9	5.6			35.9	
Queue Length 50th (ft)				70		0	175	183			247	
Queue Length 95th (ft)				120		0	m136	m150			m#296	
Internal Link Dist (ft)		1304			1219			642			1115	
Turn Bay Length (ft)						300	225					
Base Capacity (vph)				373		1760	586	2616			1257	
Starvation Cap Reductn				0		0	0	202			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.32		0.13	0.63	0.66			0.65	

Intersection Summary	
Area Type:	Other

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 93 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: I-495 NB On-Ramp & Route 138

HCM Signalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	110	0	212	335	1449	0	0	387	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	12	12	16
Total Lost time (s)				6.0		4.0	7.0	7.0			6.0	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.94	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1967		1760	1636	3505			3107	
Flt Permitted				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1967		1760	1636	3505			3107	
Peak-hour factor, PHF	0.25	0.25	0.25	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.80	0.80
Adj. Flow (vph)	0	0	0	121	0	233	368	1592	0	0	484	339
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	121	0	233	368	1592	0	0	823	0
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	3%	3%	0%	0%	9%	9%
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Actuated Green, G (s)				11.1		95.0	26.5	70.9			38.4	
Effective Green, g (s)				11.1		95.0	26.5	70.9			38.4	
Actuated g/C Ratio				0.12		1.00	0.28	0.75			0.40	
Clearance Time (s)				6.0			7.0	7.0			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				230		1760	456	2616			1256	
v/s Ratio Prot				c0.06			c0.22	c0.45			0.26	
v/s Ratio Perm						0.13						
v/c Ratio				0.53		0.13	0.81	0.61			0.66	
Uniform Delay, d1				39.5		0.0	31.9	5.6			22.9	
Progression Factor				1.00		1.00	0.77	0.84			1.34	
Incremental Delay, d2				2.2		0.2	2.8	0.3			2.2	
Delay (s)				41.6		0.2	27.2	5.0			32.8	
Level of Service				D		A	C	A			C	
Approach Delay (s)		0.0			14.3			9.2			32.8	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
23: Center Street & Route 138

2030 Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	171	0	1203	40	90	481	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	14	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		60	0		200	200		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		129			915			1524			2001	
Travel Time (s)		2.9			20.8			34.6			45.5	
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.93	0.93	0.86	0.86	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	4%	4%	8%	8%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	22	190	0	1337	0	0	664	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0	20.0	20.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	20.0	31.0	31.0	0.0	9.0	40.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	33.3%	51.7%	51.7%	0.0%	15.0%	66.7%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0	15.0	26.0	26.0		4.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
v/c Ratio					0.08	0.60		0.62			0.50	
Control Delay					18.3	29.0		8.8			8.2	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay					18.3	29.0		8.8			8.2	
Queue Length 50th (ft)					6	59		127			56	
Queue Length 95th (ft)					21	113		212			99	
Internal Link Dist (ft)		49			835			1444			1921	
Turn Bay Length (ft)						60						
Base Capacity (vph)					361	406		2162			1323	
Starvation Cap Reductn					0	0		0			0	
Spillback Cap Reductn					0	0		0			0	
Storage Cap Reductn					0	0		0			0	
Reduced v/c Ratio					0.06	0.47		0.62			0.50	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
23: Center Street & Route 138

2030 Build Condition- AM Peak Hour

Cycle Length: 60
Actuated Cycle Length: 58
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 23: Center Street & Route 138

HCM Signalized Intersection Capacity Analysis
23: Center Street & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	171	0	1203	40	90	481	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	14	12	12	12	12	12	12	12	12
Total Lost time (s)					5.0	5.0		5.0			5.0	
Lane Util. Factor					1.00	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.95	1.00		1.00			0.99	
Satd. Flow (prot)					1752	1568		3454			3316	
Flt Permitted					0.76	1.00		1.00			0.63	
Satd. Flow (perm)					1397	1568		3454			2111	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.93	0.93	0.86	0.86	0.92
Adj. Flow (vph)	0	0	0	22	0	190	0	1294	43	105	559	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	190	0	1337	0	0	664	0
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	4%	4%	8%	8%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)					11.7	11.7		36.3			36.3	
Effective Green, g (s)					11.7	11.7		36.3			36.3	
Actuated g/C Ratio					0.20	0.20		0.63			0.63	
Clearance Time (s)					5.0	5.0		5.0			5.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					282	316		2162			1321	
v/s Ratio Prot								c0.39				
v/s Ratio Perm					0.02	c0.12					0.31	
v/c Ratio					0.08	0.60		0.62			0.50	
Uniform Delay, d1					18.8	21.0		6.6			5.9	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	3.2		1.3			0.3	
Delay (s)					18.9	24.2		8.0			6.2	
Level of Service					B	C		A			A	
Approach Delay (s)		0.0			23.7			8.0			6.2	
Approach LOS		A			C			A			A	

Intersection Summary					
HCM Average Control Delay	8.9	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	58.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	20	25	225	5	87	5	1276	205	44	358	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	103	0	326	133	0	0	1580	0	0	521	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		35.0	35.0		35.0	35.0	
Total Split (s)	14.0	14.0	0.0	12.0	26.0	0.0	69.0	69.0	0.0	69.0	69.0	0.0
Total Split (%)	14.7%	14.7%	0.0%	12.6%	27.4%	0.0%	72.6%	72.6%	0.0%	72.6%	72.6%	0.0%
Maximum Green (s)	9.0	9.0		7.0	21.0		64.0	64.0		64.0	64.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
v/c Ratio		0.76		0.95	0.35			0.75			0.38	
Control Delay		77.4		76.8	34.0			8.8			8.5	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		77.4		76.8	34.0			8.8			8.5	
Queue Length 50th (ft)		62		~209	69			213			63	
Queue Length 95th (ft)		#136		#255	92			178			79	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		135		344	380			2205			1429	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.76		0.95	0.35			0.72			0.36	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 28 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 36: Elm Street & Route 138

HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	20	25	225	5	87	5	1276	205	44	358	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.96		1.00	0.86			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1798		1686	1523			3432			3151	
Flt Permitted		0.73		0.67	1.00			0.95			0.67	
Satd. Flow (perm)		1338		1189	1523			3274			2122	
Peak-hour factor, PHF	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	49	24	30	326	7	126	5	1357	218	54	437	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	103	0	326	133	0	0	1580	0	0	521	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.6		23.7	23.7			61.3			61.3	
Effective Green, g (s)		9.6		23.7	23.7			61.3			61.3	
Actuated g/C Ratio		0.10		0.25	0.25			0.65			0.65	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		135		344	380			2113			1369	
v/s Ratio Prot				c0.09	0.09							
v/s Ratio Perm		0.08		c0.15				c0.48			0.25	
v/c Ratio		0.76		0.95	0.35			0.75			0.38	
Uniform Delay, d1		41.6		35.6	29.3			11.6			7.9	
Progression Factor		1.00		1.00	1.00			0.59			1.00	
Incremental Delay, d2		22.2		34.7	0.6			2.1			0.8	
Delay (s)		63.8		70.3	29.9			8.9			8.7	
Level of Service		E		E	C			A			A	
Approach Delay (s)		63.8			58.6			8.9			8.7	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
44: Route 106 & Route 138

2030 Build Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	365	40	202	355	165	64	772	384	85	182	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4525			923	
Travel Time (s)		39.6			50.8			102.8			21.0	
Confl. Peds. (#/hr)			3									
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	562	0	0	811	0	0	1326	0	0	405	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.59			0.88			0.96			0.51	
Control Delay		17.9			29.8			35.6			13.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.9			29.8			35.6			13.0	
Queue Length 50th (ft)		90			148			260			44	
Queue Length 95th (ft)		134			#257			#416			84	
Internal Link Dist (ft)		1662			2156			4445			843	
Turn Bay Length (ft)												
Base Capacity (vph)		982			945			1381			793	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.57			0.86			0.96			0.51	

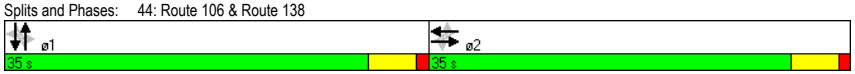
Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 69.3	
Natural Cycle: 55	

Lanes, Volumes, Timings
44: Route 106 & Route 138

Control Type: Actuated-Uncoordinated

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 44: Route 106 & Route 138



HCM Signalized Intersection Capacity Analysis
44: Route 106 & Route 138

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	365	40	202	355	165	64	772	384	85	182	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.95			0.96	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		3425			3154			3331			3104	
Flt Permitted		0.65			0.65			0.90			0.54	
Satd. Flow (perm)		2245			2092			3013			1687	
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	102	415	45	227	399	185	70	839	417	91	196	118
RTOR Reduction (vph)	0	9	0	0	40	0	0	76	0	0	64	0
Lane Group Flow (vph)	0	553	0	0	771	0	0	1250	0	0	341	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	10%	10%	10%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		29.3			29.3			30.0			30.0	
Effective Green, g (s)		29.3			29.3			30.0			30.0	
Actuated g/C Ratio		0.42			0.42			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		949			884			1304			730	
v/s Ratio Prot												
v/s Ratio Perm		0.25			c0.37			c0.41			0.20	
v/c Ratio		0.58			0.87			0.96			0.47	
Uniform Delay, d1		15.3			18.3			19.0			14.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.1			9.7			16.0			0.6	
Delay (s)		16.4			28.0			35.0			14.6	
Level of Service		B			C			D			B	
Approach Delay (s)		16.4			28.0			35.0			14.6	
Approach LOS		B			C			D			B	

Intersection Summary				
HCM Average Control Delay	27.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	98.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
11: Robinson St & Route 138

2030 Build Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	1431	0	5	355
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	0	36	1573	0	6	449
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2035	1573			1573	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2035	1573			1573	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	74			99	
cM capacity (veh/h)	62	137			425	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	1573	456
Volume Left	0	0	6
Volume Right	36	0	0
cSH	137	1700	425
Volume to Capacity	0.26	0.93	0.01
Queue Length 95th (ft)	24	0	1
Control Delay (s)	40.2	0.0	0.5
Lane LOS	E		A
Approach Delay (s)	40.2	0.0	0.5
Approach LOS	E		

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		85.3%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
17: Dog Track driveway & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	35	40	211	1240	360	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.91	0.91	0.79	0.79
Hourly flow rate (vph)	51	59	232	1363	456	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2313	487	518			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2313	487	518			
tC, single (s)	7.1	6.7	4.2			
tC, 2 stage (s)						
tF (s)	4.2	3.8	2.3			
p0 queue free %	0	88	77			
cM capacity (veh/h)	19	495	1004			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	110	1595	518
Volume Left	51	232	0
Volume Right	59	0	62
cSH	40	1004	1700
Volume to Capacity	2.78	0.23	0.30
Queue Length 95th (ft)	306	22	0
Control Delay (s)	1022.0	9.7	0.0
Lane LOS	F	A	
Approach Delay (s)	1022.0	9.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		57.6	
Intersection Capacity Utilization		113.2%	ICU Level of Service H
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2030 Build Condition- AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	25	1218	20	5	491
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.57	0.57	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	53	44	1384	23	5	511
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1917	1395			1407	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1917	1395			1407	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	29	75			99	
cM capacity (veh/h)	74	175			470	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	96	1407	517
Volume Left	53	0	5
Volume Right	44	23	0
cSH	101	1700	470
Volume to Capacity	0.96	0.83	0.01
Queue Length 95th (ft)	144	0	1
Control Delay (s)	156.4	0.0	0.3
Lane LOS	F		A
Approach Delay (s)	156.4	0.0	0.3
Approach LOS	F		

Intersection Summary			
Average Delay		7.6	
Intersection Capacity Utilization		75.3%	ICU Level of Service D
Analysis Period (min)		15	

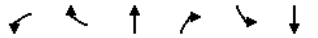
HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2030 Build Condition- AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	5	5	1197	500	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	0.89	0.89
Hourly flow rate (vph)	34	5	5	1197	562	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1772	565	569			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1772	565	569			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	63	99	99			
cM capacity (veh/h)	91	524	994			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	39	1202	569
Volume Left	34	5	0
Volume Right	5	0	7
cSH	102	994	1700
Volume to Capacity	0.38	0.01	0.33
Queue Length 95th (ft)	39	0	0
Control Delay (s)	61.0	0.2	0.0
Lane LOS	F	A	
Approach Delay (s)	61.0	0.2	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		77.0%	ICU Level of Service D
Analysis Period (min)		15	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	7	1424	5	1	402
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.94	0.94	0.85	0.85
Hourly flow rate (vph)	8	11	1515	5	1	473
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1993	1518			1520	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1993	1518			1520	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	88	92			100	
cM capacity (veh/h)	67	148			411	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	19	1520	474
Volume Left	8	0	1
Volume Right	11	5	0
cSH	99	1700	411
Volume to Capacity	0.19	0.89	0.00
Queue Length 95th (ft)	17	0	0
Control Delay (s)	50.1	0.0	0.1
Lane LOS	F		A
Approach Delay (s)	50.1	0.0	0.1
Approach LOS	F		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	85	100	60	70	40	70	787	45	111	1431	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	12	12	11	12	12	11	12
Storage Length (ft)	250		70	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			737			2001			1020	
Travel Time (s)		5.7			16.8			45.5			23.2	
Confl. Peds. (#/hr)						5	2					
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	201	0	0	216	0	0	1025	0	0	1803	0
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		16.0	16.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	11.0	90.0	0.0	79.0	79.0	0.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	9.2%	75.0%	0.0%	65.8%	65.8%	0.0%
Maximum Green (s)	24.0	24.0		24.0	24.0		5.0	84.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
v/c Ratio	0.83	0.51			0.85			0.90dl			1.09	
Control Delay	74.8	35.4			69.9			17.3			70.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	74.8	35.4			69.9			17.3			70.5	
Queue Length 50th (ft)	114	95			137			239			~760	
Queue Length 95th (ft)	#261	188			#240			315			#949	
Internal Link Dist (ft)		171			657			1921			940	
Turn Bay Length (ft)	250											
Base Capacity (vph)	214	412			264			1466			1654	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.80	0.49			0.82			0.70			1.09	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 110.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 12: Carver Street & Route 138

HCM Signalized Intersection Capacity Analysis
12: Carver Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	85	100	60	70	40	70	787	45	111	1431	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	13	12	12	11	12	12	11	12
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.92			0.97			0.99			0.98	
Flt Protected	0.95	1.00			0.98			1.00			1.00	
Satd. Flow (prot)	1787	1728			1823			3317			3345	
Flt Permitted	0.52	1.00			0.63			0.57			0.72	
Satd. Flow (perm)	980	1728			1167			1914			2412	
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.88	0.88	0.88	0.98	0.98	0.98
Adj. Flow (vph)	171	92	109	76	89	51	80	894	51	113	1460	230
RTOR Reduction (vph)	0	35	0	0	9	0	0	3	0	0	8	0
Lane Group Flow (vph)	171	166	0	0	207	0	0	1022	0	0	1795	0
Confl. Peds. (#/hr)						5	2					
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.0	23.0			23.0			75.2			75.2	
Effective Green, g (s)	23.0	23.0			23.0			75.2			75.2	
Actuated g/C Ratio	0.21	0.21			0.21			0.68			0.68	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)	205	361			244			1306			1646	
v/s Ratio Prot		0.10										
v/s Ratio Perm	0.17				c0.18			0.53			c0.74	
v/c Ratio	0.83	0.46			0.85			0.90dl			1.09	
Uniform Delay, d1	41.8	38.2			41.9			11.9			17.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	23.3	0.3			22.0			2.9			51.2	
Delay (s)	65.1	38.5			63.9			14.8			68.7	
Level of Service	E	D			E			B			E	
Approach Delay (s)		50.7			63.9			14.8			68.7	
Approach LOS		D			E			B			E	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	0	515	0	0	0	0	864	140	139	1272	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	12	12	16	10	12	12
Storage Length (ft)	0		500	0		0	0		0	300		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1388			1423			507			722	
Travel Time (s)		31.5			32.3			11.5			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.25	0.25	0.25	0.25	0.95	0.95	0.98	0.98	0.25
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	0%	3%	3%	2%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	0	636	0	0	0	0	1056	0	142	1298	0
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Detector Phase	4							2		1	6	
Switch Phase												
Minimum Initial (s)	10.0							10.0		5.0	10.0	
Minimum Split (s)	22.0							22.0		12.0	23.0	
Total Split (s)	23.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	18.0	57.0	0.0
Total Split (%)	28.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.8%	0.0%	22.5%	71.3%	0.0%
Maximum Green (s)	17.0							33.0		11.0	50.0	
Yellow Time (s)	4.0							4.0		5.0	5.0	
All-Red Time (s)	2.0							2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	4.0	4.0	4.0	4.0	4.0	6.0	4.0	7.0	7.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Recall Mode	None							C-Min		None	C-Min	
v/c Ratio	0.75		0.36					0.69		0.66	0.56	
Control Delay	43.6		0.6					21.5		42.9	12.3	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	43.6		0.6					21.5		42.9	12.3	
Queue Length 50th (ft)	128		0					230		79	162	
Queue Length 95th (ft)	181		0					303		m91	m208	
Internal Link Dist (ft)		1308			1343			427			642	
Turn Bay Length (ft)			500							300		
Base Capacity (vph)	418		1760					1531		232	2301	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	
Reduced v/c Ratio	0.66		0.36					0.69		0.61	0.56	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition - PM Peak Hour

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: I-495 SB Off-Ramp & Route 138

HCM Signalized Intersection Capacity Analysis
14: I-495 SB Off-Ramp & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	0	515	0	0	0	0	864	140	139	1272	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	12	12	16	10	12	12
Total Lost time (s)	6.0		4.0					6.0		7.0	7.0	
Lane Util. Factor	1.00		1.00					0.95		1.00	0.95	
Frt	1.00		0.85					0.98		1.00	1.00	
Flt Protected	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1967		1760					3432		1652	3539	
Flt Permitted	0.95		1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1967		1760					3432		1652	3539	
Peak-hour factor, PHF	0.81	0.81	0.81	0.25	0.25	0.25	0.25	0.95	0.95	0.98	0.98	0.25
Adj. Flow (vph)	275	0	636	0	0	0	0	909	147	142	1298	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	275	0	636	0	0	0	0	1056	0	142	1298	0
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	0%	3%	3%	2%	2%	0%
Turn Type	Prot		Free							Prot		
Protected Phases	4							2		1	6	
Permitted Phases			Free									
Actuated Green, G (s)	15.0		80.0					35.6		10.4	52.0	
Effective Green, g (s)	15.0		80.0					35.6		10.4	52.0	
Actuated g/C Ratio	0.19		1.00					0.45		0.13	0.65	
Clearance Time (s)	6.0							6.0		7.0	7.0	
Vehicle Extension (s)	3.0							3.0		3.0	3.0	
Lane Grp Cap (vph)	369		1760					1527		215	2300	
v/s Ratio Prot	c0.14							c0.31		0.09	c0.37	
v/s Ratio Perm			0.36									
v/c Ratio	0.75		0.36					0.69		0.66	0.56	
Uniform Delay, d1	30.7		0.0					17.8		33.1	7.7	
Progression Factor	1.00		1.00					1.00		1.05	1.43	
Incremental Delay, d2	8.0		0.6					2.6		3.5	0.5	
Delay (s)	38.6		0.6					20.4		38.4	11.5	
Level of Service	D		A					C		D	B	
Approach Delay (s)		12.1			0.0			20.4			14.2	
Approach LOS		B			A			C			B	

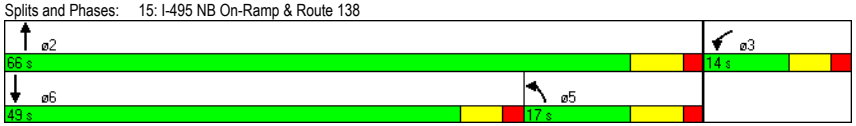
Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	140	0	84	145	917	0	0	1271	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	10	12	12	12	12	16
Storage Length (ft)	0		0	0		300	225		0	0		0
Storage Lanes	0		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1384			1299			722			1195	
Travel Time (s)		31.5			29.5			16.4			27.2	
Peak Hour Factor	0.25	0.25	0.25	0.78	0.78	0.78	0.92	0.92	0.25	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	0%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	179	0	108	158	997	0	0	1614	0
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Detector Phase				3			5	2			6	
Switch Phase												
Minimum Initial (s)				5.0			5.0	10.0			10.0	
Minimum Split (s)				11.0			12.0	23.0			22.0	
Total Split (s)	0.0	0.0	0.0	14.0	0.0	0.0	17.0	66.0	0.0	0.0	49.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	17.5%	0.0%	0.0%	21.3%	82.5%	0.0%	0.0%	61.3%	0.0%
Maximum Green (s)				8.0			10.0	59.0			43.0	
Yellow Time (s)				4.0			5.0	5.0			4.0	
All-Red Time (s)				2.0			2.0	2.0			2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.0	4.0	4.0	7.0	7.0	4.0	4.0	6.0	4.0
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Recall Mode				None			None	C-Min			C-Min	
v/c Ratio				0.86		0.06	0.80	0.39			0.88	
Control Delay				72.6		0.1	52.7	3.2			22.9	
Queue Delay				0.0		0.0	0.0	0.0			0.0	
Total Delay				72.6		0.1	52.7	3.2			22.9	
Queue Length 50th (ft)				90		0	86	67			426	
Queue Length 95th (ft)				#164		0	m#145	82			m514	
Internal Link Dist (ft)		1304			1219			642			1115	
Turn Bay Length (ft)						300	225					
Base Capacity (vph)				209		1777	203	2560			1851	
Starvation Cap Reductn				0		0	0	0			0	
Spillback Cap Reductn				0		0	0	0			0	
Storage Cap Reductn				0		0	0	0			0	
Reduced v/c Ratio				0.86		0.06	0.78	0.39			0.87	

Intersection Summary	
Area Type:	Other

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 76 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: I-495 NB On-Ramp & Route 138



HCM Signalized Intersection Capacity Analysis
15: I-495 NB On-Ramp & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	140	0	84	145	917	0	0	1271	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	12	12	16
Total Lost time (s)				6.0		4.0	7.0	7.0			6.0	
Lane Util. Factor				1.00		1.00	1.00	0.95			0.95	
Frt				1.00		0.85	1.00	1.00			0.97	
Flt Protected				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1986		1777	1620	3471			3444	
Flt Permitted				0.95		1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1986		1777	1620	3471			3444	
Peak-hour factor, PHF	0.25	0.25	0.25	0.78	0.78	0.78	0.92	0.92	0.25	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	179	0	108	158	997	0	0	1324	290
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	179	0	108	158	997	0	0	1614	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	0%	2%	2%	2%
Turn Type				Prot		Free	Prot					
Protected Phases				3			5	2			6	
Permitted Phases						Free						
Actuated Green, G (s)				8.4		80.0	9.8	58.6			42.8	
Effective Green, g (s)				8.4		80.0	9.8	58.6			42.8	
Actuated g/C Ratio				0.11		1.00	0.12	0.73			0.53	
Clearance Time (s)				6.0			7.0	7.0			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				209		1777	198	2543			1843	
v/s Ratio Prot				c0.09			c0.10	0.29			c0.47	
v/s Ratio Perm						0.06						
v/c Ratio				0.86		0.06	0.80	0.39			0.88	
Uniform Delay, d1				35.2		0.0	34.1	4.0			16.3	
Progression Factor				1.00		1.00	0.86	0.72			1.13	
Incremental Delay, d2				27.4		0.1	14.8	0.3			3.9	
Delay (s)				62.6		0.1	44.2	3.2			22.2	
Level of Service				E		A	D	A			C	
Approach Delay (s)		0.0			39.1			8.8			22.2	
Approach LOS		A			D			A			C	

Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service		B
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		19.0
Intersection Capacity Utilization	75.6%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
23: Center Street & Route 138

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	0	113	0	803	40	321	1311	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	14	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		60	0		200	200		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		155			915			1524			2001	
Travel Time (s)		3.5			20.8			34.6			45.5	
Peak Hour Factor	0.38	0.38	0.38	0.82	0.82	0.82	0.90	0.90	0.90	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	37	138	0	936	0	0	1666	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0	20.0	20.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	20.0	81.0	81.0	0.0	9.0	90.0	0.0
Total Split (%)	18.2%	18.2%	0.0%	18.2%	18.2%	18.2%	73.6%	73.6%	0.0%	8.2%	81.8%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0	15.0	76.0	76.0		4.0	85.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		None	Max	
v/c Ratio					0.22	0.74		0.34			1.00	
Control Delay					46.1	69.4		4.0			34.2	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay					46.1	69.4		4.0			34.2	
Queue Length 50th (ft)					24	94		88			~554	
Queue Length 95th (ft)					51	146		112			#791	
Internal Link Dist (ft)		75			835			1444			1921	
Turn Bay Length (ft)						60						
Base Capacity (vph)					186	209		2729			1673	
Starvation Cap Reductn					0	0		0			0	
Spillback Cap Reductn					0	0		0			0	
Storage Cap Reductn					0	0		0			0	
Reduced v/c Ratio					0.20	0.66		0.34			1.00	

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
23: Center Street & Route 138

2030 Build Condition - PM Peak Hour

Cycle Length: 110
Actuated Cycle Length: 108.4
Natural Cycle: 110
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: Center Street & Route 138

HCM Signalized Intersection Capacity Analysis
23: Center Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	0	113	0	803	40	321	1311	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	14	12	12	12	12	12	12	12	12
Total Lost time (s)					5.0	5.0		5.0			5.0	
Lane Util. Factor					1.00	1.00		0.95			0.95	
Frt					1.00	0.85		0.99			1.00	
Flt Protected					0.95	1.00		1.00			0.99	
Satd. Flow (prot)					1687	1509		3480			3505	
Flt Permitted					0.76	1.00		1.00			0.60	
Satd. Flow (perm)					1345	1509		3480			2133	
Peak-hour factor, PHF	0.38	0.38	0.38	0.82	0.82	0.82	0.90	0.90	0.90	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	37	0	138	0	892	44	328	1338	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	37	138	0	936	0	0	1666	0
Heavy Vehicles (%)	0%	0%	0%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)					13.4	13.4		85.0			85.0	
Effective Green, g (s)					13.4	13.4		85.0			85.0	
Actuated g/C Ratio					0.12	0.12		0.78			0.78	
Clearance Time (s)					5.0	5.0		5.0			5.0	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					166	187		2729			1673	
v/s Ratio Prot								0.27				
v/s Ratio Perm					0.03	c0.09					c0.78	
v/c Ratio					0.22	0.74		0.34			1.00	
Uniform Delay, d1					42.8	45.8		3.5			11.5	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.7	14.1		0.3			20.9	
Delay (s)					43.5	59.9		3.8			32.4	
Level of Service					D	E		A			C	
Approach Delay (s)		0.0			56.4			3.8			32.4	
Approach LOS		A			E			A			C	

Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	84.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	28	30	620	325	74	1149	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	79	0	398	49	0	0	1071	0	0	1303	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		35.0	35.0		35.0	35.0	
Total Split (s)	12.0	12.0	0.0	12.0	24.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0
Total Split (%)	15.0%	15.0%	0.0%	15.0%	30.0%	0.0%	70.0%	70.0%	0.0%	70.0%	70.0%	0.0%
Maximum Green (s)	7.0	7.0		7.0	19.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
v/c Ratio		0.56		0.95	0.11			0.61			0.77	
Control Delay		51.3		66.2	24.6			6.3			14.8	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		51.3		66.2	24.6			6.3			14.8	
Queue Length 50th (ft)		38		~207	19			77			212	
Queue Length 95th (ft)		68		#381	45			92			287	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		146		421	441			1822			1765	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.54		0.95	0.11			0.59			0.74	

Intersection Summary	
Area Type:	Other

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 36 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 36: Elm Street & Route 138

HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	28	30	620	325	74	1149	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.91		1.00	0.90			0.95			1.00	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1703		1770	1680			3261			3522	
Flt Permitted		0.93		0.76	1.00			0.87			0.78	
Satd. Flow (perm)		1599		1415	1680			2857			2771	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	13	13	53	398	17	32	33	681	357	78	1209	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	79	0	398	49	0	0	1071	0	0	1303	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.9		22.0	22.0			48.0			48.0	
Effective Green, g (s)		5.9		22.0	22.0			48.0			48.0	
Actuated g/C Ratio		0.07		0.28	0.28			0.60			0.60	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		118		438	462			1714			1663	
v/s Ratio Prot				c0.13	0.03							
v/s Ratio Perm		0.05		c0.12				0.37			c0.47	
v/c Ratio		0.67		0.91	0.11			0.62			0.78	
Uniform Delay, d1		36.1		27.5	21.7			10.2			12.1	
Progression Factor		1.00		1.00	1.00			0.50			1.00	
Incremental Delay, d2		13.5		22.3	0.1			1.6			3.8	
Delay (s)		49.6		49.8	21.8			6.7			15.8	
Level of Service		D		D	C			A			B	
Approach Delay (s)		49.6			46.7			6.7			15.8	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
44: Route 106 & Route 138

2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	260	52	429	405	120	89	345	237	145	652	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1742			2236			4525			923	
Travel Time (s)		39.6			50.8			102.8			21.0	
Confl. Peds. (#/hr)												1
Peak Hour Factor	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	496	0	0	1015	0	0	725	0	0	976	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Detector Phase	2	2		2	2		1	1		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
v/c Ratio		0.56			1.27dl			0.76			1.00	
Control Delay		17.1			83.4			19.5			51.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.1			83.4			19.5			51.3	
Queue Length 50th (ft)		75			~264			106			~208	
Queue Length 95th (ft)		99			#382			172			#348	
Internal Link Dist (ft)		1662			2156			4445			843	
Turn Bay Length (ft)												
Base Capacity (vph)		885			922			958			974	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.56			1.10			0.76			1.00	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Natural Cycle: 75	

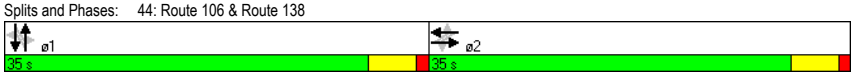
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 44: Route 106 & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	260	52	429	405	120	89	345	237	145	652	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.95			0.98	
Flt Protected		0.99			0.98			0.99			0.99	
Satd. Flow (prot)		3434			3299			3247			3403	
Flt Permitted		0.58			0.63			0.62			0.65	
Satd. Flow (perm)		2024			2116			2040			2232	
Peak-hour factor, PHF	0.79	0.79	0.79	0.94	0.94	0.94	0.89	0.89	1.00	0.94	0.94	0.94
Adj. Flow (vph)	101	329	66	456	431	128	100	388	237	154	694	128
RTOR Reduction (vph)	0	17	0	0	16	0	0	84	0	0	17	0
Lane Group Flow (vph)	0	479	0	0	999	0	0	641	0	0	959	0
Confl. Peds. (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		30.0			30.0			30.0			30.0	
Effective Green, g (s)		30.0			30.0			30.0			30.0	
Actuated g/C Ratio		0.43			0.43			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		867			907			874			957	
v/s Ratio Prot												
v/s Ratio Perm		0.24			c0.47			0.31			c0.43	
v/c Ratio		0.55			1.27dl			0.73			1.00	
Uniform Delay, d1		15.0			20.0			16.7			20.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			61.6			3.4			29.6	
Delay (s)		15.9			81.6			20.1			49.6	
Level of Service		B			F			C			D	
Approach Delay (s)		15.9			81.6			20.1			49.6	
Approach LOS		B			F			C			D	

Intersection Summary					
HCM Average Control Delay	47.8	HCM Level of Service		D	
HCM Volume to Capacity ratio	1.05				
Actuated Cycle Length (s)	70.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	101.1%	ICU Level of Service		G	
Analysis Period (min)	15				

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
10: Robinson Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	544	0	10	1283
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.63	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	0	24	604	0	11	1410
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2036	604			604	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2036	604			604	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	95			99	
cM capacity (veh/h)	63	487			983	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	604	1421
Volume Left	0	0	11
Volume Right	24	0	0
cSH	487	1700	983
Volume to Capacity	0.05	0.36	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	12.8	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.8	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		85.5%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
11: Station driveway & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	57	208	54	605	1085	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.68	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	84	306	60	672	1192	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1997	1204	1216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1997	1204	1216			
tC, single (s)	6.7	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.8	3.3	2.3			
p0 queue free %	0	0	89			
cM capacity (veh/h)	49	226	559			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	390	732	1216
Volume Left	84	60	0
Volume Right	306	0	24
cSH	127	559	1700
Volume to Capacity	3.08	0.11	0.72
Queue Length 95th (ft)	Err	9	0
Control Delay (s)	Err	3.0	0.0
Lane LOS	F	A	
Approach Delay (s)	Err	3.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay		1667.3	
Intersection Capacity Utilization		99.2%	ICU Level of Service F
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
24: Britton Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	20	833	30	25	1331
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.85	0.85	0.97	0.97
Hourly flow rate (vph)	47	27	980	35	26	1372
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2421	998			1015	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2421	998			1015	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	91			96	
cM capacity (veh/h)	34	296			683	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	1015	1398
Volume Left	47	0	26
Volume Right	27	35	0
cSH	51	1700	683
Volume to Capacity	1.45	0.60	0.04
Queue Length 95th (ft)	172	0	3
Control Delay (s)	416.6	0.0	2.2
Lane LOS	F		A
Approach Delay (s)	416.6	0.0	2.2
Approach LOS	F		

Intersection Summary			
Average Delay	13.5		
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
27: Britton Street & Route 138

2030 Build Condition - PM Peak Hour

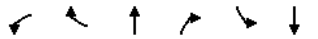
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	5	5	818	1282	48
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.88	0.88	0.96	0.96
Hourly flow rate (vph)	18	6	6	930	1335	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2301	1360	1385			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2301	1360	1385			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	97	99			
cM capacity (veh/h)	43	183	491			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	935	1385
Volume Left	18	6	0
Volume Right	6	0	50
cSH	53	491	1700
Volume to Capacity	0.46	0.01	0.81
Queue Length 95th (ft)	43	1	0
Control Delay (s)	122.3	0.4	0.0
Lane LOS	F	A	
Approach Delay (s)	122.3	0.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
50: Wilbur Street & Route 138

2030 Build Condition - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	638	10	20	1263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.39	0.39	0.97	0.97	0.96	0.96
Hourly flow rate (vph)	13	13	658	10	21	1316
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2020	663			668	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2020	663			668	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	97			98	
cM capacity (veh/h)	63	465			922	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	668	1336
Volume Left	13	0	21
Volume Right	13	10	0
cSH	111	1700	922
Volume to Capacity	0.23	0.39	0.02
Queue Length 95th (ft)	21	0	2
Control Delay (s)	46.7	0.0	1.0
Lane LOS	E		A
Approach Delay (s)	46.7	0.0	1.0
Approach LOS	E		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

Easton

Lanes, Volumes, Timings
1: Main Street & Rte 138

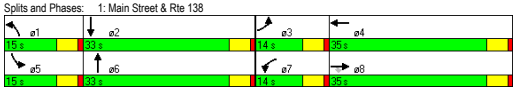
2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	374	225	45	144	135	123	801	50	73	342	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	11	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4962			2928	
Travel Time (s)		26.1			62.7			84.6			49.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	466	420	253	51	317	0	134	925	0	83	471	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	21.0	21.0	12.0	23.0		12.0	23.0		12.0	21.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	15.0	33.0	0.0	15.0	33.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	15.5%	34.0%	0.0%	15.5%	34.0%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		10.0	28.0		10.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					7.0			7.0				
Flash Dont Walk (s)					8.0			8.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	2.52	0.74	0.38	0.33	0.40		0.68	0.80		0.46	0.47	
Control Delay	719.1	37.0	5.3	46.1	14.9		58.2	34.0		48.2	25.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	719.1	37.0	5.3	46.1	14.9		58.2	34.0		48.2	25.2	
Queue Length 50th (ft)	~453	220	0	28	37		73	255		45	105	
Queue Length 95th (ft)	#687	340	52	66	69		#175	#427		95	162	
Internal Link Dist (ft)		1645			3138			4882			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	185	689	746	180	1253		219	1172		217	1187	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	2.52	0.61	0.34	0.28	0.25		0.61	0.79		0.38	0.40	

Intersection Summary

Area Type: Other
Cycle Length: 97
Actuated Cycle Length: 82.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	374	225	45	144	135	123	801	50	73	342	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1818	1553	1586	3054		1736	3300		1719	3305	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1626	1818	1553	1586	3054		1736	3300		1719	3305	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	466	420	253	51	164	153	134	871	54	83	389	82
RTOR Reduction (vph)	0	0	177	0	116	0	0	5	0	0	18	0
Lane Group Flow (vph)	466	420	76	51	201	0	134	920	0	83	453	0
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.4	25.6	25.6	4.4	20.6		9.3	28.9		6.6	26.2	
Effective Green, g (s)	9.4	25.6	25.6	4.4	20.6		9.3	28.9		6.6	26.2	
Actuated g/C Ratio	0.11	0.30	0.30	0.05	0.24		0.11	0.34		0.08	0.31	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	179	544	465	82	736		189	1115		133	1013	
v/s Ratio Prot	c0.29	c0.23		0.03	0.07		c0.08	c0.28		0.05	0.14	
v/s Ratio Perm			0.05									
v/c Ratio	2.60	0.77	0.16	0.62	0.27		0.71	0.83		0.62	0.45	
Uniform Delay, d1	38.1	27.3	22.1	39.7	26.4		36.8	26.0		38.2	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	737.5	6.1	0.1	10.1	0.1		9.5	5.3		6.4	0.4	
Delay (s)	775.5	33.4	22.1	49.8	26.4		46.3	31.3		44.7	24.3	
Level of Service	F	C	C	D	C		D	C		D	C	
Approach Delay (s)		334.5			29.7			33.2			27.3	
Approach LOS		F			C			C			C	

Intersection Summary

HCM Average Control Delay	141.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

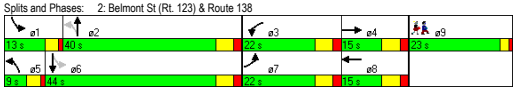
2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	22	55	35	250	50	204	85	743	435	202	315	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	13	12	11	12	12	12	11	12	11	12	13	
Storage Length (ft)	0		0	475		0	0		0	200		300	
Storage Lanes	1		0	2		0	1		0	1		1	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		45			45			45			45		
Link Distance (ft)		387			2550			980			851		
Travel Time (s)		5.9			38.6			14.8			12.9		
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92	
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	31	125	0	305	310	0	91	1267	0	220	358	0	
Turn Type	Prot			Prot			pm+pt			pm+pt			
Protected Phases	7	4		3	8		5	2		1	6		9
Permitted Phases							2			6			
Detector Phase	7	4		3	8		5	2		1	6		
Switch Phase													
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
Minimum Split (s)	22.0	10.0		22.0	10.0		8.0	10.0		8.0	10.0		23.0
Total Split (s)	22.0	15.0	0.0	22.0	15.0	0.0	9.0	40.0	0.0	13.0	44.0	0.0	23.0
Total Split (%)	19.5%	13.3%	0.0%	19.5%	13.3%	0.0%	8.0%	35.4%	0.0%	11.5%	38.9%	0.0%	20%
Maximum Green (s)	16.0	9.0		16.0	9.0		5.0	34.0		9.0	38.0		20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max		None
Walk Time (s)													6.0
Flash Dont Walk (s)													14.0
Pedestrian Calls (#/hr)													4
v/c Ratio	0.29	0.69		0.72	0.78		0.18	0.98		0.65	0.21		
Control Delay	56.2	61.7		57.1	39.4		14.2	53.7		38.8	21.7		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	56.2	61.7		57.1	39.4		14.2	53.7		38.8	21.7		
Queue Length 50th (ft)	22	74		109	126		23	422		105	68		
Queue Length 95th (ft)	42	#112		141	#257		72	#706		#309	162		
Internal Link Dist (ft)		307			2470			900			771		
Turn Bay Length (ft)				475						200			
Base Capacity (vph)	219	182		465	400		516	1288		341	1735		
Starvation Cap Reductn	0	0		0	0		0	0		0	0		
Spillback Cap Reductn	0	0		0	0		0	0		0	0		
Storage Cap Reductn	0	0		0	0		0	0		0	0		
Reduced v/c Ratio	0.14	0.69		0.66	0.78		0.18	0.98		0.65	0.21		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 113
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	55	35	250	50	204	85	743	435	202	315	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	12	12	12	11	12	11	12	13
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.88		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1544	1772		3286	1474		1805	3200		1662	3454	
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00		0.09	1.00	
Satd. Flow (perm)	1544	1772		3286	1474		1022	3200		165	3454	
Peak-hour factor, PHF	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	31	76	49	305	61	249	91	799	468	220	342	16
RTOR Reduction (vph)	0	20	0	0	114	0	0	71	0	0	2	0
Lane Group Flow (vph)	31	105	0	305	196	0	91	1196	0	220	356	0
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.4	12.7		14.6	21.9		44.0	38.4		60.7	51.1	
Effective Green, g (s)	5.4	12.7		14.6	21.9		44.0	38.4		60.7	51.1	
Actuated g/C Ratio	0.05	0.11		0.13	0.19		0.39	0.34		0.54	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	74	199		425	286		437	1087		331	1562	
v/s Ratio Prot	0.02	0.06		c0.09	c0.13		0.01	c0.37		c0.11	0.10	
v/s Ratio Perm							0.07			0.25		
v/c Ratio	0.42	0.53		0.72	0.69		0.21	1.10		0.66	0.23	
Uniform Delay, d1	52.3	47.3		47.2	42.4		22.2	37.3		27.1	18.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.48	1.21	
Incremental Delay, d2	3.8	2.7		5.7	6.7		0.2	59.1		4.6	0.3	
Delay (s)	56.1	50.0		52.9	49.0		22.4	96.4		44.6	23.2	
Level of Service	E	D		D	D		C	F		D	C	
Approach Delay (s)		51.2			51.0			91.5			31.3	
Approach LOS		D			D			F			C	

Intersection Summary

HCM Average Control Delay	67.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

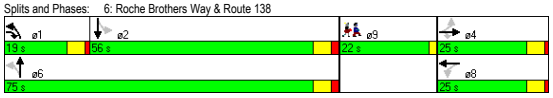
Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138

2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	ø9
Lane Configurations													
Volume (vph)	103	0	99	5	0	5	389	999	0	0	353	158	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	16	12	10	11	11	12	11	11	
Storage Length (ft)	0		100	0		0	350		0	0		0	
Storage Lanes	0		1	0		0	0		0	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Right Turn on Red			Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		635			332			1623			2417		
Travel Time (s)		14.4			7.5			36.9			54.9		
Peak Hour Factor	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84	
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	126	121	0	16	0	0	1633	0	0	608	0	
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm			
Protected Phases		4	1		8		1	6			2		9
Permitted Phases	4		4	8			6			2			
Detector Phase	4	4	1	8	8		1	6		2	2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0		7.0
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	21.0		21.0	21.0		22.0
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0	22.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%	18%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0		20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	
Lead/Lag			Lead				Lead			Lag	Lag		
Lead-Lag Optimize?			Yes				Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None	None		None	Min		Min	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													13.0
Pedestrian Calls (#/hr)													11
v/c Ratio		0.70	0.26		0.07			1.03			0.31		
Control Delay		62.2	7.6		28.4			47.0			10.4		
Queue Delay		0.0	0.0		0.0			0.0			0.0		
Total Delay		62.2	7.6		28.4			47.0			10.4		
Queue Length 50th (ft)		71	0		4			207			67		
Queue Length 95th (ft)		143	36		17			#925			167		
Internal Link Dist (ft)		555			252			1543			2337		
Turn Bay Length (ft)			100										
Base Capacity (vph)		280	580		348			1583			1957		
Starvation Cap Reductn		0	0		0			0			0		
Spillback Cap Reductn		0	0		0			0			0		
Storage Cap Reductn		0	0		0			0			0		
Reduced v/c Ratio		0.45	0.21		0.05			1.03			0.31		

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 98.7	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Roche Brothers Way & Route 138



HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138

2030 Build Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	0	99	5	0	5	389	999	0	0	353	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	10	11	11	12	11	11
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.93			1.00			0.95	
Flt Protected		0.95	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1736	1524		1911			3341			3181	
Flt Permitted		0.75	1.00		0.85			0.62			1.00	
Satd. Flow (perm)		1365	1524		1668			2113			3181	
Peak-hour factor, PHF	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	126	0	121	8	0	8	458	1175	0	0	420	188
RTOR Reduction (vph)	0	0	98	0	7	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	126	23	0	9	0	0	1633	0	0	579	0
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		13.0	19.1		13.0			70.9			59.8	
Effective Green, g (s)		13.0	19.1		13.0			70.9			59.8	
Actuated g/C Ratio		0.13	0.19		0.13			0.71			0.60	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)		177	367		217			1571			1900	
v/s Ratio Prot			0.00					c0.06			0.18	
v/s Ratio Perm		c0.09	0.01		0.01			c0.67				
v/c Ratio		0.71	0.06		0.04			1.04			0.30	
Uniform Delay, d1		41.8	33.2		38.1			14.6			9.9	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		10.7	0.0		0.0			33.7			0.0	
Delay (s)		52.4	33.2		38.1			48.3			10.0	
Level of Service		D	C		D			D			A	
Approach Delay (s)		43.0			38.1			48.3			10.0	
Approach LOS		D			D			D			A	

Intersection Summary					
HCM Average Control Delay	38.4	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.98				
Actuated Cycle Length (s)	100.1	Sum of lost time (s)		16.2	
Intersection Capacity Utilization	78.0%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
47: Roosevelt Circle & Route 138

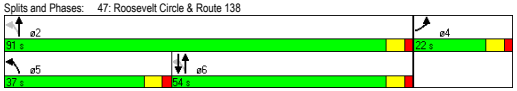
2030 Build Condition - AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	40	15	5	964	557	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	50			0	
Storage Lanes	1	0	1			0	
Taper Length (ft)	25	25	25			25	
Right Turn on Red		Yes				Yes	
Link Speed (mph)	30			40	45		
Link Distance (ft)	901			851	4962		
Travel Time (s)	20.5			14.5	75.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	59	0	5	1048	665	0	
Turn Type			pm+pt				
Protected Phases	4		5	2 6	6		2
Permitted Phases			2 6				
Detector Phase	4		5	2 6	6		
Switch Phase							
Minimum Initial (s)	4.0		4.0		4.0		4.0
Minimum Split (s)	22.0		22.0		22.0		22.0
Total Split (s)	22.0	0.0	37.0	145.0	54.0	0.0	91.0
Total Split (%)	19.5%	0.0%	32.7%	128.3%	47.8%	0.0%	81%
Maximum Green (s)	16.0		31.0		48.0		85.0
Yellow Time (s)	4.0		4.0		4.0		4.0
All-Red Time (s)	2.0		2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0	
Lead/Lag			Lead		Lag		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Recall Mode	None		None		C-Max		C-Max
Walk Time (s)	5.0		5.0		5.0		5.0
Flash Dont Walk (s)	11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)	0		0		0		0
v/c Ratio	0.41		0.01	0.66	0.44		
Control Delay	47.7		0.4	4.7	5.3		
Queue Delay	0.0		0.0	1.3	0.0		
Total Delay	47.7		0.4	6.0	5.3		
Queue Length 50th (ft)	32		0	56	103		
Queue Length 95th (ft)	72		m0	m224	298		
Internal Link Dist (ft)	821			771	4882		
Turn Bay Length (ft)			50				
Base Capacity (vph)	257		846	1583	1526		
Starvation Cap Reductn	0		0	309	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.23		0.01	0.82	0.44		

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 113
Offset: 41 (36%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 47: Roosevelt Circle & Route 138



HCM Signalized Intersection Capacity Analysis
47: Roosevelt Circle & Route 138

2030 Build Condition - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	15	5	964	557	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1731		1770	1863	1840	
Flt Permitted	0.96		0.34	1.00	1.00	
Satd. Flow (perm)	1731		639	1863	1840	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	16	5	1048	605	60
RTOR Reduction (vph)	13	0	0	0	1	0
Lane Group Flow (vph)	46	0	5	1048	664	0
Turn Type			pm+pt			
Protected Phases	4		5	2 6	6	
Permitted Phases			2 6			
Actuated Green, G (s)	7.4		93.6	93.6	86.5	
Effective Green, g (s)	7.4		93.6	93.6	86.5	
Actuated g/C Ratio	0.07		0.83	0.83	0.77	
Clearance Time (s)	6.0		6.0		6.0	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	113		540	1543	1408	
v/s Ratio Prot	c0.03		0.00	c0.56	0.36	
v/s Ratio Perm			0.01			
v/c Ratio	0.41		0.01	0.68	0.47	
Uniform Delay, d1	50.7		2.7	3.8	4.9	
Progression Factor	1.00		0.18	0.84	1.00	
Incremental Delay, d2	2.4		0.0	1.0	1.1	
Delay (s)	53.1		0.5	4.2	6.0	
Level of Service	D		A	A	A	
Approach Delay (s)	53.1			4.2	6.0	
Approach LOS	D			A	A	

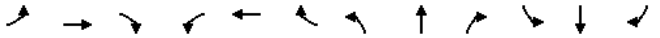
Intersection Summary

HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

2030 Build Condition - AM Peak Hour



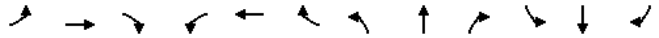
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	167	31	35	10	15	31	30	1370	15	0	438	54
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.68	0.68	0.68	0.91	0.91	0.91	0.89	0.89	0.89
Hourly flow rate (vph)	199	37	42	15	22	46	33	1505	16	0	492	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2159	2110	522	2162	2132	1514	553			1522		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2159	2110	522	2162	2132	1514	553			1522		
tC, single (s)	7.1	6.5	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	0	25	92	0	50	69	97			100		
cM capacity (veh/h)	14	49	552	12	44	146	1007			444		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	277	82	1555	553
Volume Left	199	15	33	0
Volume Right	42	46	16	61
cSH	19	40	1007	444
Volume to Capacity	14.88	2.04	0.03	0.00
Queue Length 95th (ft)	Err	219	3	0
Control Delay (s)	Err	697.5	2.8	0.0
Lane LOS	F	F	A	
Approach Delay (s)	Err	697.5	2.8	0.0
Approach LOS	F	F		

Intersection Summary				
Average Delay	1149.1			
Intersection Capacity Utilization	123.5%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

2030 Build Condition - AM Peak Hour



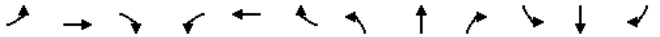
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	484	15	154	114	62	5	61	525	90	48	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.80	0.80	0.80	0.87	0.87	0.87
Hourly flow rate (vph)	5	532	16	177	131	71	6	76	656	103	55	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	131			548			1105	1036	540	1110	1080	167
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	131			548			1105	1036	540	1110	1080	167
tC, single (s)	4.1			4.1			7.3	6.5	6.2	7.1	6.7	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.0	3.3	3.5	4.1	3.3
p0 queue free %	100			82			95	60	0	0	67	99
cM capacity (veh/h)	1467			1011			114	190	542	0	169	883

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	554	379	739	164
Volume Left	5	177	6	103
Volume Right	16	71	656	6
cSH	1467	1011	443	0
Volume to Capacity	0.00	0.18	1.67	Err
Queue Length 95th (ft)	0	16	1084	Err
Control Delay (s)	0.1	5.3	332.5	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.1	5.3	332.5	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	102.0%	ICU Level of Service	G	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

2030 Build Condition - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	187	499	0	0	124	0	0	0	5	0	0	84
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.59
Hourly flow rate (vph)	195	520	0	0	141	0	0	0	6	0	0	142
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	141			520			1193	1050	520	1056	1050	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	141			520			1193	1050	520	1056	1050	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			100			100	100	99	100	100	84
cM capacity (veh/h)	1442			1046			124	196	556	182	196	910

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	715	141	6	142
Volume Left	195	0	0	0
Volume Right	0	0	6	142
cSH	1442	1700	556	910
Volume to Capacity	0.14	0.08	0.01	0.16
Queue Length 95th (ft)	12	0	1	14
Control Delay (s)	3.3	0.0	11.5	9.7
Lane LOS	A		B	A
Approach Delay (s)	3.3	0.0	11.5	9.7
Approach LOS			B	A

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	58.3%	ICU Level of Service		B
Analysis Period (min)	15			

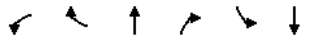
HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

2030 Build Condition - AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	65	121	1271	257	80	412
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.89	0.89	0.81	0.81
Hourly flow rate (vph)	74	138	1428	289	99	509
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2279	1572			1717	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2279	1572			1717	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			73	
cM capacity (veh/h)	33	134			366	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	211	1717	607
Volume Left	74	0	99
Volume Right	138	289	0
cSH	64	1700	366
Volume to Capacity	3.30	1.01	0.27
Queue Length 95th (ft)	Err	0	27
Control Delay (s)	Err	0.0	8.9
Lane LOS	F		A
Approach Delay (s)	Err	0.0	8.9
Approach LOS	F		

Intersection Summary			
Average Delay	835.6		
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	53	15	160	134	50	158
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.86	0.86	0.73	0.73
Hourly flow rate (vph)	60	17	186	156	68	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	617	264			342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	617	264			342	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	86	98			94	
cM capacity (veh/h)	419	763			1217	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	77	342	285
Volume Left	60	0	68
Volume Right	17	156	0
cSH	465	1700	1217
Volume to Capacity	0.17	0.20	0.06
Queue Length 95th (ft)	15	0	4
Control Delay (s)	14.3	0.0	2.4
Lane LOS	B		A
Approach Delay (s)	14.3	0.0	2.4
Approach LOS	B		

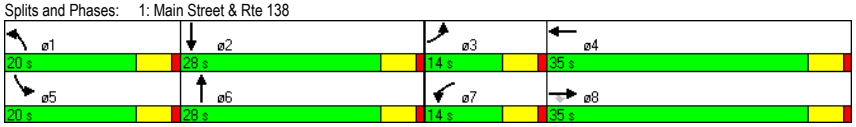
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	198	279	105	366	88	295	493	85	150	684	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	12	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4974			2928	
Travel Time (s)		26.1			62.7			84.8			49.9	
Peak Hour Factor	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	241	340	124	535	0	328	642	0	169	1105	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	8	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	12.0	12.0	12.0	21.0		12.0	21.0		12.0	20.0	
Total Split (s)	14.0	35.0	35.0	14.0	35.0	0.0	20.0	28.0	0.0	20.0	28.0	0.0
Total Split (%)	14.4%	36.1%	36.1%	14.4%	36.1%	0.0%	20.6%	28.9%	0.0%	20.6%	28.9%	0.0%
Maximum Green (s)	9.0	30.0	30.0	9.0	30.0		15.0	23.0		15.0	23.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)					5.0			5.0				
Flash Dont Walk (s)					11.0			11.0				
Pedestrian Calls (#/hr)					0			0				
v/c Ratio	1.17	0.64	0.57	0.70	0.76		1.04	0.60		0.69	1.18	
Control Delay	157.7	38.7	7.4	60.1	37.2		98.1	28.1		49.9	121.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	157.7	38.7	7.4	60.1	37.2		98.1	28.1		49.9	121.5	
Queue Length 50th (ft)	~142	118	0	64	133		~189	146		85	~360	
Queue Length 95th (ft)	#267	171	43	#142	173		#381	234		155	#530	
Internal Link Dist (ft)		1645			3138			4894			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	190	649	784	185	1215		316	1068		310	935	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.17	0.37	0.43	0.67	0.44		1.04	0.60		0.55	1.18	

Intersection Summary

Area Type: Other
Cycle Length: 97
Actuated Cycle Length: 84.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	198	279	105	366	88	295	493	85	150	684	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	12	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818	1583	1728	3348		1770	3386		1736	3243	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1818	1583	1728	3348		1770	3386		1736	3243	
Peak-hour factor, PHF	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	223	241	340	124	431	104	328	548	94	169	769	336
RTOR Reduction (vph)	0	0	269	0	25	0	0	13	0	0	48	0
Lane Group Flow (vph)	223	241	71	124	510	0	328	629	0	169	1057	0
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)	9.0	17.5	17.5	8.6	17.1		15.0	26.2		11.8	23.0	
Effective Green, g (s)	9.0	17.5	17.5	8.6	17.1		15.0	26.2		11.8	23.0	
Actuated g/C Ratio	0.11	0.21	0.21	0.10	0.20		0.18	0.31		0.14	0.27	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	189	378	329	177	681		316	1055		244	887	
v/s Ratio Prot	c0.13	0.13		0.07	c0.15		c0.19	c0.19		0.10	c0.33	
v/s Ratio Perm			0.04									
v/c Ratio	1.18	0.64	0.22	0.70	0.75		1.04	0.60		0.69	1.19	
Uniform Delay, d1	37.5	30.4	27.6	36.5	31.5		34.5	24.5		34.4	30.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	122.3	2.6	0.1	9.8	4.0		60.8	1.1		6.7	97.4	
Delay (s)	159.8	33.0	27.7	46.3	35.5		95.4	25.5		41.1	128.0	
Level of Service	F	C	C	D	D		F	C		D	F	
Approach Delay (s)		66.0			37.5			49.2			116.5	
Approach LOS		E			D			D			F	

Intersection Summary				
HCM Average Control Delay	73.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	25.0	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

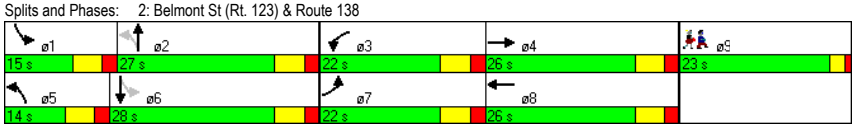
2030 Build Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	125	275	500	150	174	230	407	300	243	687	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	13	12	11	13	12	11	12	12	11	12	13
Storage Length (ft)	0		0	475		0	0		0	200		300
Storage Lanes	1		0	2		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		387			2550			908			849	
Travel Time (s)		5.9			38.6			13.8			12.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	449	0	568	368	0	247	761	0	267	824	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	22.0	10.0		22.0	22.0		10.0	10.0		10.0	10.0	
Total Split (s)	22.0	26.0	0.0	22.0	26.0	0.0	14.0	27.0	0.0	15.0	28.0	0.0
Total Split (%)	19.5%	23.0%	0.0%	19.5%	23.0%	0.0%	12.4%	23.9%	0.0%	13.3%	24.8%	0.0%
Maximum Green (s)	16.0	20.0		16.0	20.0		8.0	21.0		9.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.49	1.18		1.20	0.77		0.61	0.92		0.63	0.98	
Control Delay	58.3	137.1		150.3	48.8		32.4	52.3		29.5	55.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.3	137.1		150.3	48.8		32.4	52.3		29.5	55.0	
Queue Length 50th (ft)	56	~338		~258	228		96	228		76	282	
Queue Length 95th (ft)	102	#532		#356	#418		#347	#392		m#292	m#488	
Internal Link Dist (ft)		307			2470			828			769	
Turn Bay Length (ft)				475						200		
Base Capacity (vph)	247	382		474	476		402	827		423	844	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.32	1.18		1.20	0.77		0.61	0.92		0.63	0.98	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	23.0
Total Split (s)	23.0
Total Split (%)	20%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 113	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

2030 Build Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	125	275	500	150	174	230	407	300	243	687	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	13	12	11	12	12	11	12	13
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.92		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1745	1761		3351	1786		1745	3290		1662	3469	
Flt Permitted	0.95	1.00		0.95	1.00		0.19	1.00		0.17	1.00	
Satd. Flow (perm)	1745	1761		3351	1786		352	3290		295	3469	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	80	140	309	568	170	198	247	438	323	267	755	69
RTOR Reduction (vph)	0	69	0	0	34	0	0	118	0	0	6	0
Lane Group Flow (vph)	80	380	0	568	334	0	247	643	0	267	818	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.2	21.2		16.0	28.0		42.0	20.9		47.6	23.7	
Effective Green, g (s)	9.2	21.2		16.0	28.0		42.0	20.9		47.6	23.7	
Actuated g/C Ratio	0.08	0.19		0.14	0.25		0.37	0.18		0.42	0.21	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	330		474	443		391	609		413	728	
v/s Ratio Prot	0.05	c0.22		c0.17	0.19		0.12	0.20		c0.14	c0.24	
v/s Ratio Perm							0.12			0.14		
v/c Ratio	0.56	1.15		1.20	0.75		0.63	1.06		0.65	1.12	
Uniform Delay, d1	50.0	45.9		48.5	39.3		27.4	46.0		24.6	44.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.03	0.84	
Incremental Delay, d2	5.0	97.2		108.2	7.1		3.3	52.0		2.0	66.8	
Delay (s)	55.0	143.1		156.7	46.5		30.8	98.0		27.4	104.3	
Level of Service	E	F		F	D		C	F		C	F	
Approach Delay (s)		129.8			113.3			81.6			85.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	98.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
6: Roche Brothers Way & Route 138

2030 Build Condition - PM Peak Hour

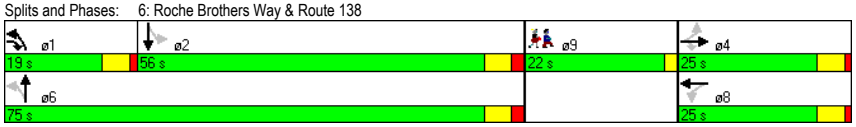
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	0	492	0	0	0	235	492	5	5	839	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			332			1623			2417	
Travel Time (s)		14.4			7.5			36.9			54.9	
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	547	0	0	0	0	893	0	0	1114	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		10.0	10.0	
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	22.0		22.0	22.0	
Total Split (s)	25.0	25.0	19.0	25.0	25.0	0.0	19.0	75.0	0.0	56.0	56.0	0.0
Total Split (%)	20.5%	20.5%	15.6%	20.5%	20.5%	0.0%	15.6%	61.5%	0.0%	45.9%	45.9%	0.0%
Maximum Green (s)	20.0	20.0	14.0	20.0	20.0		14.0	69.0		50.0	50.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.64	0.78					0.99dl			0.78	
Control Delay		46.0	19.2					14.1			25.6	
Queue Delay		0.0	0.0					0.0			0.0	
Total Delay		46.0	19.2					14.1			25.6	
Queue Length 50th (ft)		79	68					109			228	
Queue Length 95th (ft)		#265	#343					228			493	
Internal Link Dist (ft)		555			252			1543			2337	
Turn Bay Length (ft)			100									
Base Capacity (vph)		349	773					1644			2081	
Starvation Cap Reductn		0	0					0			0	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	11
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.52	0.71					0.54			0.54	

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 83.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 6: Roche Brothers Way & Route 138



Lane Group	ø9
Reduced v/c Ratio	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	0	492	0	0	0	235	492	5	5	839	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		1.00	1.00					0.95			0.95	
Frpb, ped/bikes		1.00	0.94					1.00			0.99	
Flpb, ped/bikes		0.96	1.00					1.00			1.00	
Frt		1.00	0.85					1.00			0.98	
Flt Protected		0.95	1.00					0.98			1.00	
Satd. Flow (prot)		1739	1450					3329			3430	
Flt Permitted		0.76	1.00					0.52			0.95	
Satd. Flow (perm)		1386	1450					1771			3259	
Peak-hour factor, PHF	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Adj. Flow (vph)	183	0	547	0	0	0	287	600	6	6	932	176
RTOR Reduction (vph)	0	0	232	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	183	315	0	0	0	0	893	0	0	1102	0
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		17.5	27.2					51.5			36.8	
Effective Green, g (s)		17.5	27.2					51.5			36.8	
Actuated g/C Ratio		0.21	0.32					0.61			0.43	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)		286	551					1255			1416	
v/s Ratio Prot			c0.07					c0.08				
v/s Ratio Perm		0.13	0.15					0.35			c0.34	
v/c Ratio		0.64	0.57					0.99dl			0.78	
Uniform Delay, d1		30.7	23.9					11.5			20.5	
Progression Factor		1.00	1.00					1.00			1.00	
Incremental Delay, d2		4.7	1.4					1.9			2.8	
Delay (s)		35.4	25.3					13.4			23.2	
Level of Service		D	C					B			C	
Approach Delay (s)		27.9			0.0			13.4			23.2	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	84.7	Sum of lost time (s)	21.7
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	160	50	0	623	893	155	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	0	50			0	
Storage Lanes	1	0	1			0	
Taper Length (ft)	25	25	25			25	
Right Turn on Red		Yes				Yes	
Link Speed (mph)	30			40	45		
Link Distance (ft)	1333			849	4974		
Travel Time (s)	30.3			14.5	75.4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	228	0	0	677	1139	0	
Turn Type			pm+pt				
Protected Phases	4		5	2 6	6		2
Permitted Phases			2 6				
Detector Phase	4		5	2 6	6		
Switch Phase							
Minimum Initial (s)	4.0		4.0		4.0		4.0
Minimum Split (s)	22.0		22.0		22.0		22.0
Total Split (s)	35.0	0.0	22.0	134.0	56.0	0.0	78.0
Total Split (%)	31.0%	0.0%	19.5%	118.6%	49.6%	0.0%	69%
Maximum Green (s)	29.0		16.0		50.0		72.0
Yellow Time (s)	4.0		4.0		4.0		4.0
All-Red Time (s)	2.0		2.0		2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0	
Lead/Lag			Lead		Lag		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Recall Mode	None		None		C-Min		C-Min
v/c Ratio	0.74			0.50	0.86		
Control Delay	55.7			10.6	21.5		
Queue Delay	0.0			0.0	0.0		
Total Delay	55.7			10.6	21.5		
Queue Length 50th (ft)	150			158	529		
Queue Length 95th (ft)	220			m374	#1063		
Internal Link Dist (ft)	1253			769	4894		
Turn Bay Length (ft)							
Base Capacity (vph)	455			1346	1321		
Starvation Cap Reductn	0			0	0		
Spillback Cap Reductn	0			0	0		
Storage Cap Reductn	0			0	0		
Reduced v/c Ratio	0.50			0.50	0.86		

Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 113	

Lanes, Volumes, Timings
47: Roosevelt Circle & Route 138 2030 Build Condition - PM Peak Hour

Offset: 93 (82%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

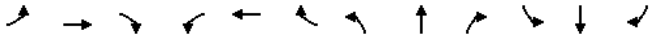
Splits and Phases: 47: Roosevelt Circle & Route 138

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	160	50	0	623	893	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			1.00	1.00	
Satd. Flow (prot)	1737			1863	1826	
Flt Permitted	0.96			1.00	1.00	
Satd. Flow (perm)	1737			1863	1826	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	54	0	677	971	168
RTOR Reduction (vph)	11	0	0	0	3	0
Lane Group Flow (vph)	217	0	0	677	1136	0
Turn Type			pm+pt			
Protected Phases	4		5	2 6	6	
Permitted Phases			2 6			
Actuated Green, G (s)	19.4			81.6	81.6	
Effective Green, g (s)	19.4			81.6	81.6	
Actuated g/C Ratio	0.17			0.72	0.72	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	298			1345	1319	
v/s Ratio Prot	c0.13			0.36	c0.62	
v/s Ratio Perm						
v/c Ratio	0.73			0.50	0.86	
Uniform Delay, d1	44.3			6.9	11.5	
Progression Factor	1.00			1.26	1.00	
Incremental Delay, d2	8.6			0.7	7.6	
Delay (s)	52.9			9.4	19.1	
Level of Service	D			A	B	
Approach Delay (s)	52.9			9.4	19.1	
Approach LOS	D			A	B	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: Elm St & Route 138

2030 Build Condition - PM Peak Hour



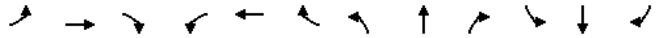
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	83	15	35	25	50	36	65	708	30	22	1113	235
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.88	0.88	0.88	0.85	0.85	0.85
Hourly flow rate (vph)	98	18	41	29	58	42	74	805	34	26	1309	276
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2540	2486	1448	2519	2607	822	1586			839		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2540	2486	1448	2519	2607	822	1586			839		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	26	74	0	0	89	82			97		
cM capacity (veh/h)	0	24	159	5	20	373	414			805		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	156	129	912	1612
Volume Left	98	29	74	26
Volume Right	41	42	34	276
cSH	0	14	414	805
Volume to Capacity	Err	9.06	0.18	0.03
Queue Length 95th (ft)	Err	Err	16	2
Control Delay (s)	Err	Err	6.3	4.7
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	6.3	4.7
Approach LOS	F	F		

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			99.0%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
10: Lincoln Street & Main Street

2030 Build Condition - PM Peak Hour



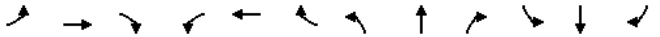
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	261	25	459	449	106	15	50	229	85	73	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Hourly flow rate (vph)	6	307	29	534	522	123	17	56	257	91	78	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	522			336			2035	1923	322	2013	1999	584
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522			336			2035	1923	322	2013	1999	584
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			57			0	0	64	0	0	98
cM capacity (veh/h)	1055			1228			0	37	717	0	33	515

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	342	1179	330	181
Volume Left	6	534	17	91
Volume Right	29	123	257	11
cSH	1055	1228	0	0
Volume to Capacity	0.01	0.43	Err	Err
Queue Length 95th (ft)	0	56	Err	Err
Control Delay (s)	0.2	8.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.5	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			111.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
11: Lincoln Street & Barrows Street

2030 Build Condition - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	78	276	0	0	474	5	10	5	15	0	0	399
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.89	0.89	0.92	0.92	0.92	0.89	0.92	0.89
Hourly flow rate (vph)	93	329	0	0	533	6	11	5	16	0	0	448
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	538			329			1498	1052	329	1069	1050	535
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	538			329			1498	1052	329	1069	1050	535
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			37	97	98	100	100	18
cM capacity (veh/h)	1040			1231			17	206	713	179	207	549

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	421	538	33	448
Volume Left	93	0	11	0
Volume Right	0	6	16	448
cSH	1040	1700	48	549
Volume to Capacity	0.09	0.32	0.68	0.82
Queue Length 95th (ft)	7	0	67	203
Control Delay (s)	2.7	0.0	176.3	34.4
Lane LOS	A		F	D
Approach Delay (s)	2.7	0.0	176.3	34.4
Approach LOS			F	D

Intersection Summary				
Average Delay	15.5			
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			

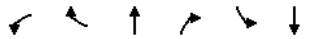
HCM Unsignalized Intersection Capacity Analysis
12: Union Street & Route 138

2030 Build Condition - PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	186	131	627	171	158	1203
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Hourly flow rate (vph)	232	164	746	204	172	1308
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2499	848			950	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2499	848			950	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	55			76	
cM capacity (veh/h)	25	363			727	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	396	950	1479
Volume Left	232	0	172
Volume Right	164	204	0
cSH	40	1700	727
Volume to Capacity	9.90	0.56	0.24
Queue Length 95th (ft)	Err	0	23
Control Delay (s)	Err	0.0	11.5
Lane LOS	F		B
Approach Delay (s)	Err	0.0	11.5
Approach LOS	F		

Intersection Summary			
Average Delay	1408.2		
Intersection Capacity Utilization	143.8%	ICU Level of Service	H
Analysis Period (min)	15		

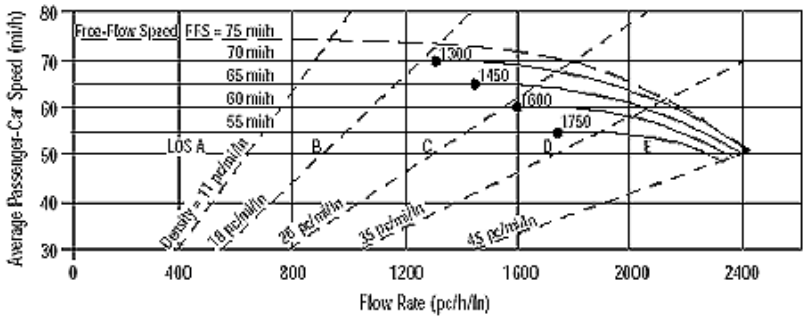


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	173	101	168	61	35	183
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	206	120	183	66	37	193
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	482	216			249	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	482	216			249	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	61	85			97	
cM capacity (veh/h)	528	827			1329	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	326	249	229
Volume Left	206	0	37
Volume Right	120	66	0
cSH	609	1700	1329
Volume to Capacity	0.54	0.15	0.03
Queue Length 95th (ft)	79	0	2
Control Delay (s)	17.5	0.0	1.5
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	1.5
Approach LOS	C		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7816*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*58.3*	mi/h	FFS	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2114*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*54.9*	mi/h	S	mi/h
D = v_p / S	*38.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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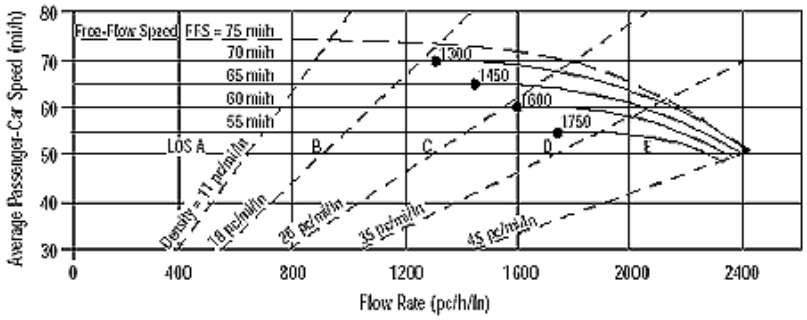

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5361*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*58.3*	mi/h	FFS	*58.3*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1445*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*58.3*	mi/h	S	mi/h
D = v_p / S	*24.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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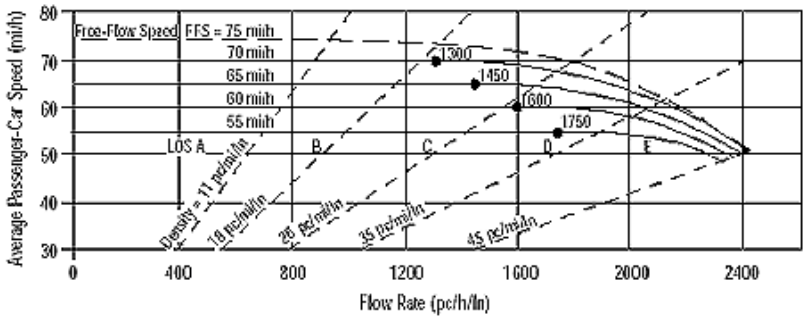

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5156*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*59.0*	mi/h	FFS	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1404*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*59.0*	mi/h	S	mi/h
D = v_p / S	*23.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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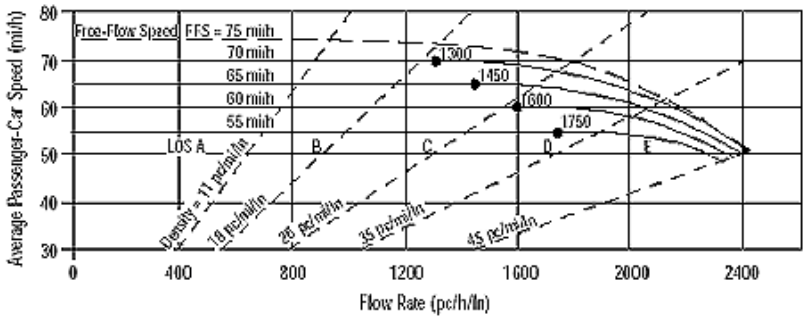

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of F.B.P.*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7207*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*59.0*	mi/h	FFS	*59.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1922*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*58.0*	mi/h	S	mi/h
D = v_p / S	*33.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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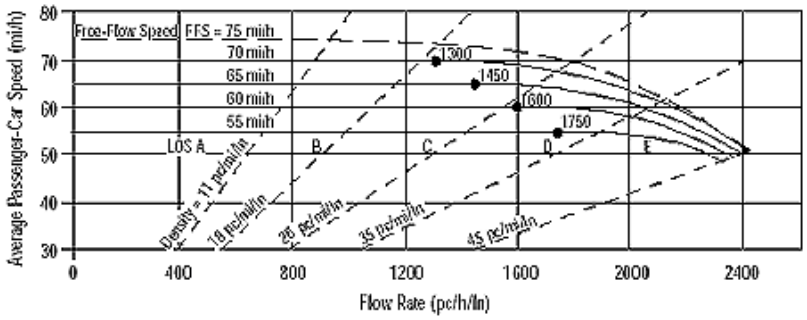

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of Route 3*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5701*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*66.0*	mi/h	FFS	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1559*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.9*	mi/h	S	mi/h
D = v_p / S	*23.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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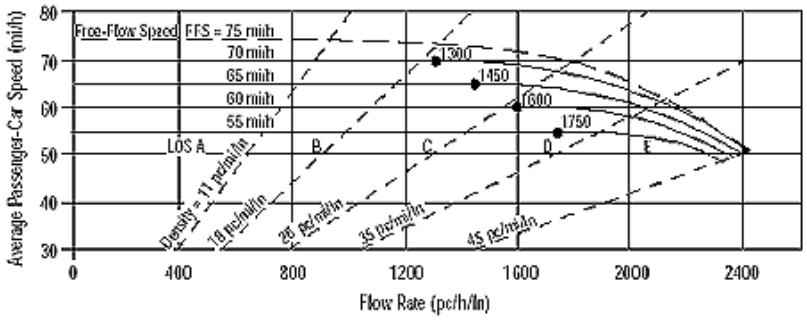

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of Route 3*
Date Performed	*11/18/2008*	Jurisdiction	*Braintree*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4791*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*66.0*	mi/h	FFS	*66.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1285*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.0*	mi/h	S	mi/h
D = v_p / S	*19.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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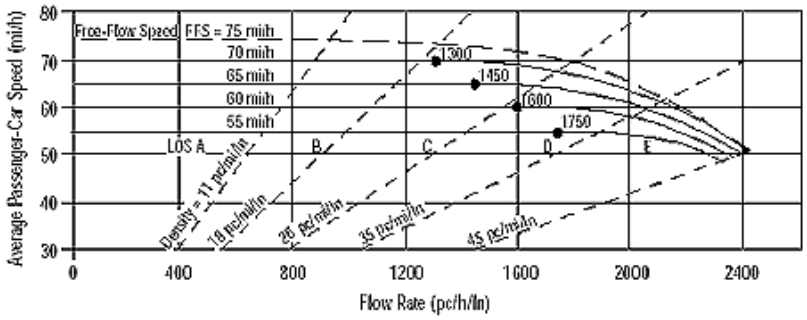

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of Route 3*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7096*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*64.0*	mi/h	FFS	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1875*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*62.4*	mi/h	S	mi/h
D = v_p / S	*30.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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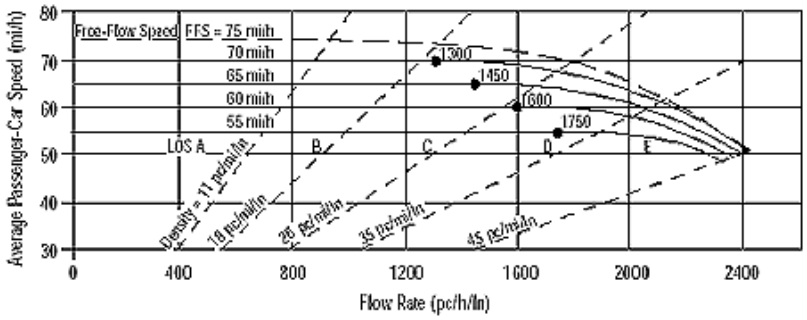

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route I-93 South of Route 3*
Date Performed	*11/21/08*	Jurisdiction	*Braintree*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 Build*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*7342*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*4*		f_N		mi/h
FFS (measured)	*64.0*	mi/h	FFS	*64.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1940*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*61.6*	mi/h	S	mi/h
D = v_p / S	*31.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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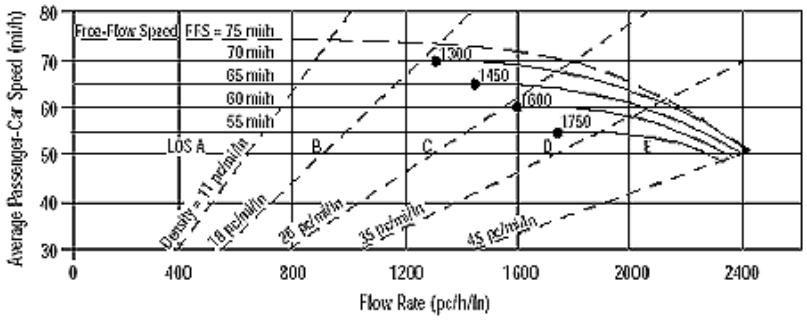

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 at Freetown Line*
Date Performed	*11/19/08*	Jurisdiction	*Fall River*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4846*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2773*	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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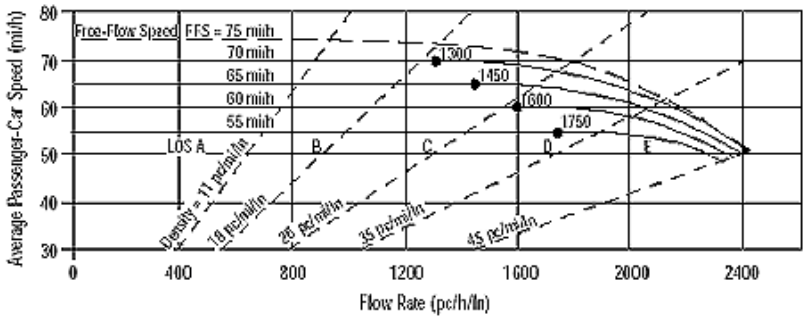

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 at Freetown Line*
Jurisdiction	*Fall River*
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2573*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1518*	pc/h/ln
S	*70.5*	mi/h
D = v_p / S	*21.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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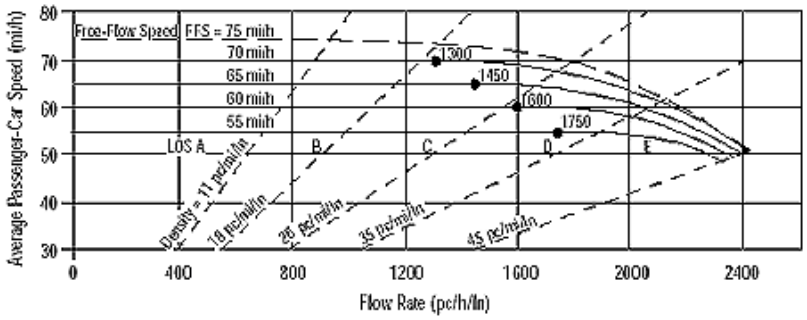

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 at Freetown Line*
Date Performed	*11/19/08*	Jurisdiction	*Fall River*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2728*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*62.5*	mi/h	FFS	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1534*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*62.5*	mi/h	S	mi/h
D = v_p / S	*24.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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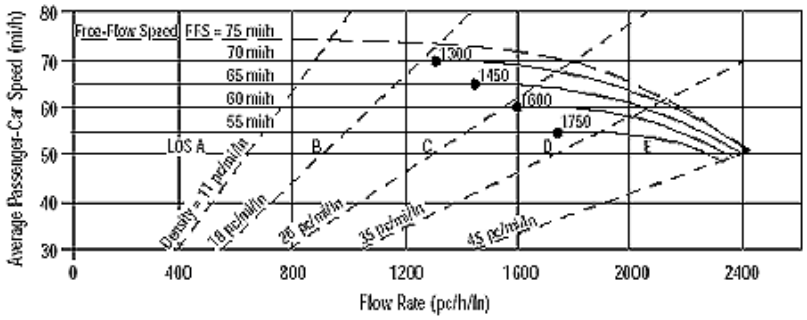

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 at Freetown Line*
Date Performed	*11/19/08*	Jurisdiction	*Fall River*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*5496*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*62.5*	mi/h	FFS	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3043*	pc/h/ln	Design LOS		
S		mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S		pc/mi/ln	S		mi/h
LOS	*F*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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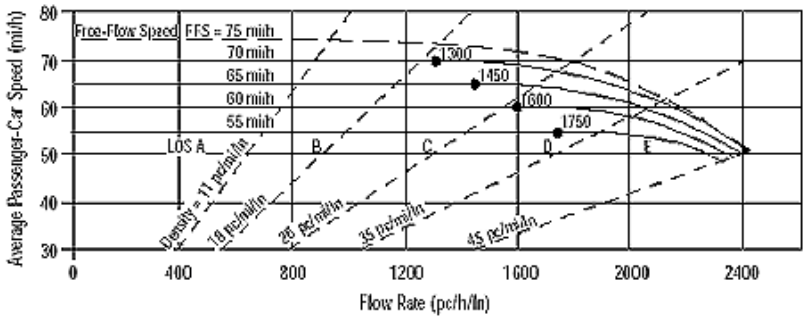

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 South of Route I-93*
Date Performed	*11/18/08*	Jurisdiction	*Randolph*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*4756*	veh/h	Peak-Hour Factor, PHF	*0.89*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*63.9*	mi/h	FFS	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1924*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*61.8*	mi/h	S	mi/h
D = v_p / S	*31.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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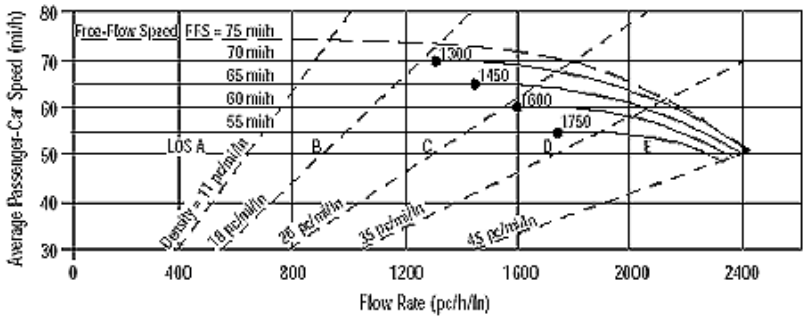

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route I-93*
Jurisdiction	*Randolph*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2786*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*63.9*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*63.9*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1503*	pc/h/ln
S	*63.9*	mi/h
D = v_p / S	*23.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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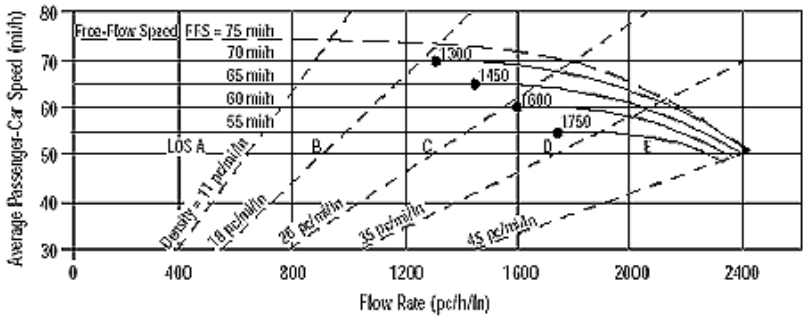

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 South of Route I-93*
Date Performed	*11/18/08*	Jurisdiction	*Randolph*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*3456*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*65.8*	mi/h	FFS	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1923*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.2*	mi/h	S	mi/h
D = v_p / S	*30.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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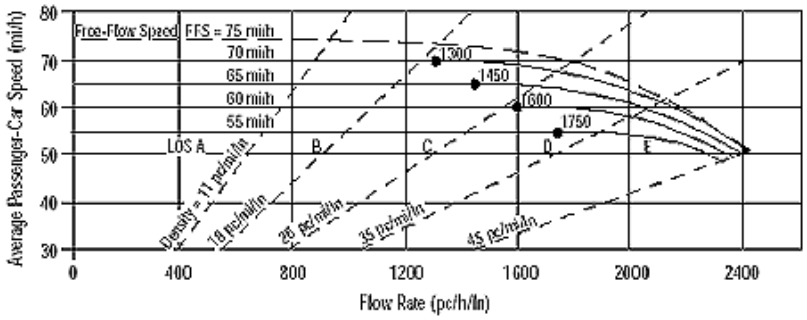

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 South of Route I-93*
Date Performed	*11/18/08*	Jurisdiction	*Randolph*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*5937*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*65.8*	mi/h	FFS	*65.8*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2080*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*60.5*	mi/h	S	mi/h
D = v_p / S	*34.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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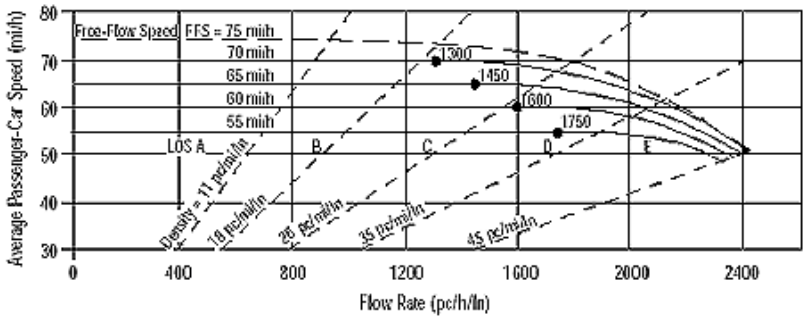

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		**Site Information**	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24, South of Pond St.*
Date Performed	*11/21/08*	Jurisdiction	*Avon*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5041*	veh/h	Peak-Hour Factor, PHF	*0.99*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*66.4*	mi/h	FFS	*66.4*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1782*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.2*	mi/h	S	mi/h
D = v_p / S	*27.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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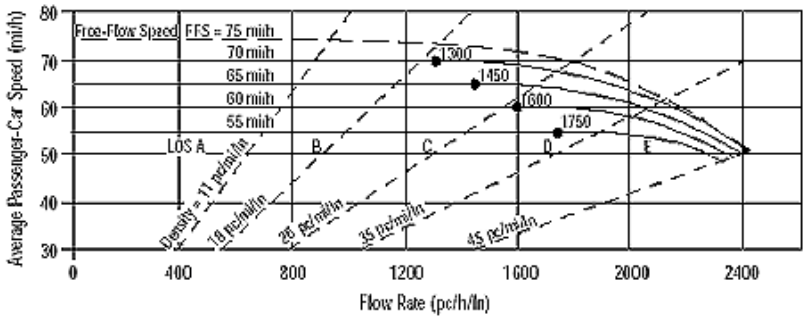

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24, South of Pond St.*
Date Performed	*11/21/08*	Jurisdiction	*Avon*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3356*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*70.0*	mi/h	FFS	*70.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1790*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	*68.0*	mi/h	S		mi/h
D = v_p / S	*26.3*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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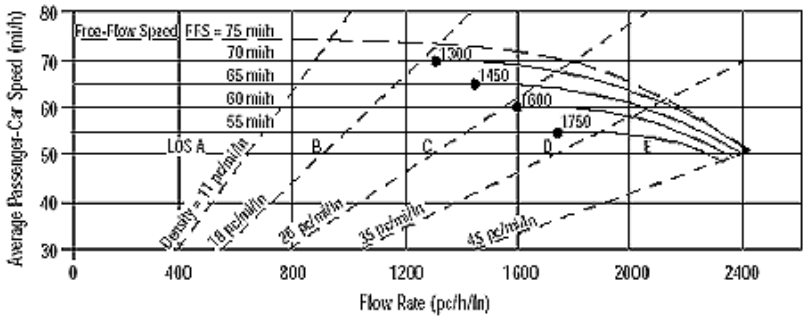

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24, South of Pond St.*
Date Performed	*11/21/08*	Jurisdiction	*Avon*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*3116*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*67.1*	mi/h	FFS	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1678*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.5*	mi/h	S	mi/h
D = v_p / S	*25.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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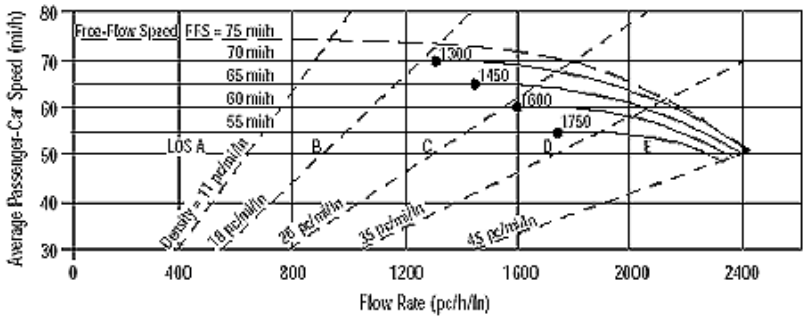

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24, South of Pond St.*
Date Performed	*11/21/08*	Jurisdiction	*Avon*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*5822*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*67.1*	mi/h	FFS	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2051*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*61.9*	mi/h	S	mi/h
D = v_p / S	*33.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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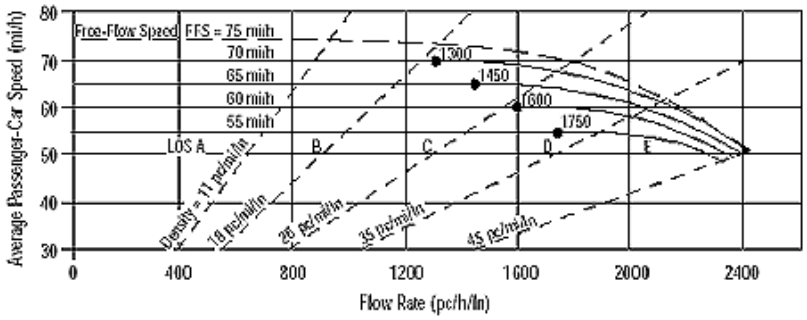

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of Route 123*
Date Performed	*11/21/08*	Jurisdiction	*Brockton*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*5106*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*67.1*	mi/h	FFS	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1842*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.2*	mi/h	S	mi/h
D = v_p / S	*28.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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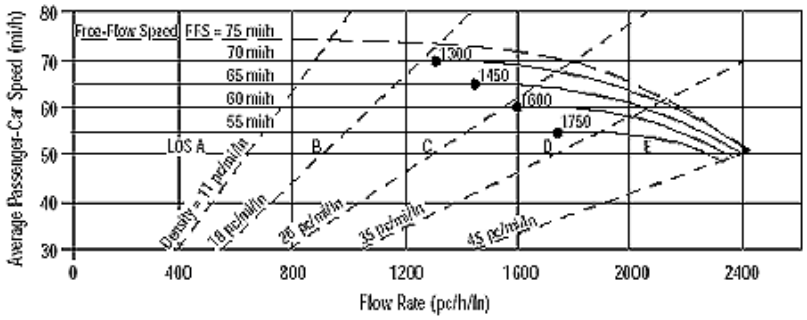

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of Route 123*
Date Performed	*11/21/08*	Jurisdiction	*Brockton*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3346*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*67.1*	mi/h	FFS	*67.1*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1805*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.5*	mi/h	S	mi/h
D = v_p / S	*27.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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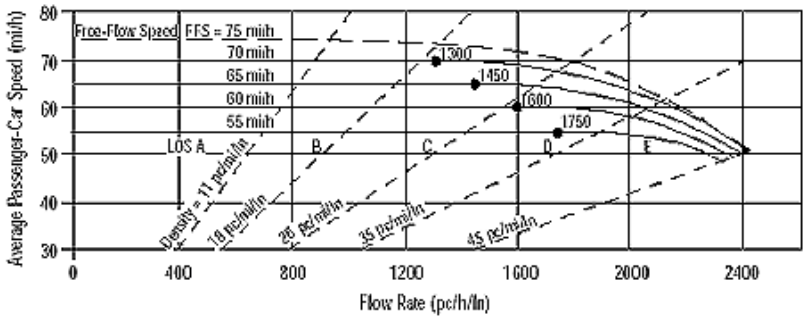

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 123*
Jurisdiction	*Brockton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2446*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.3*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1339*	pc/h/ln
S	*69.3*	mi/h
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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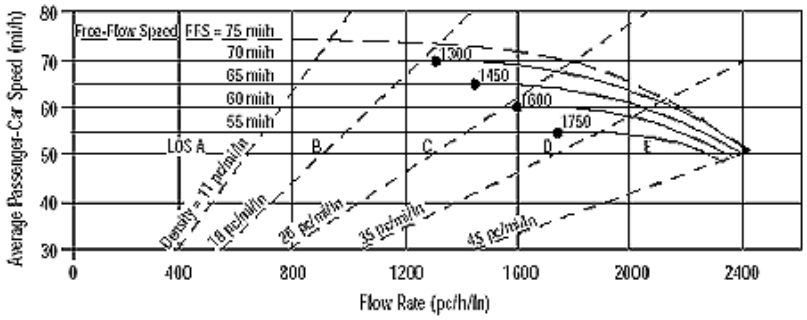

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of Route 123*
Date Performed	*11/21/08*	Jurisdiction	*Brockton*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5207*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*69.3*	mi/h	FFS	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1807*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*67.2*	mi/h	S	mi/h
D = v_p / S	*26.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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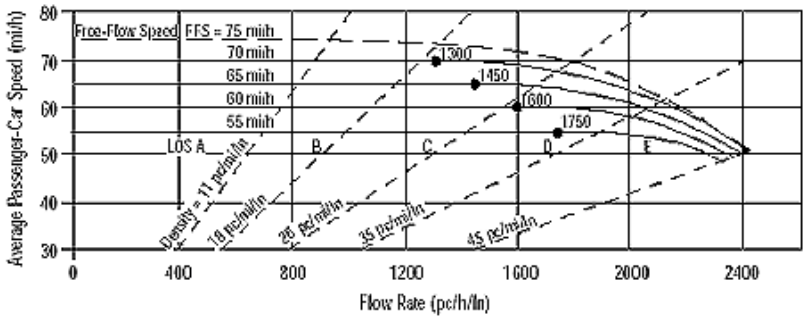

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4387*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1583*	pc/h/ln
S	*70.4*	mi/h
D = v_p / S	*22.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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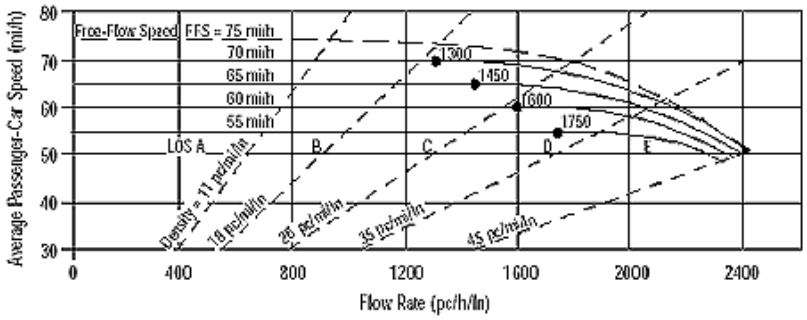

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bas*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3692*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1389*	pc/h/ln
S	*70.9*	mi/h
D = v_p / S	*19.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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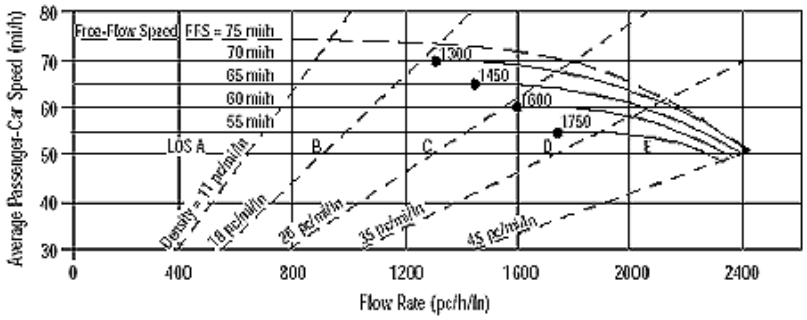

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3485*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1271*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*18.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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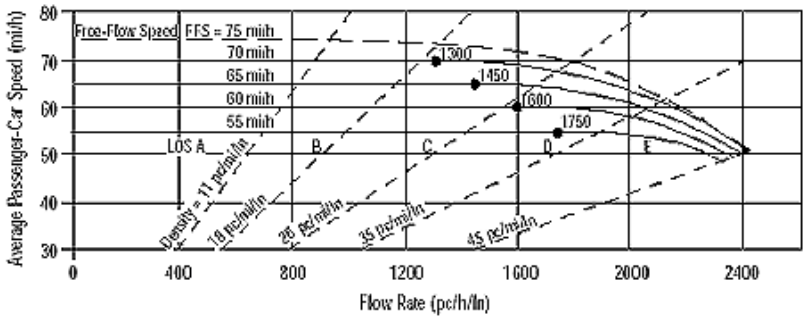

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4639*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1657*	pc/h/ln
S	*68.9*	mi/h
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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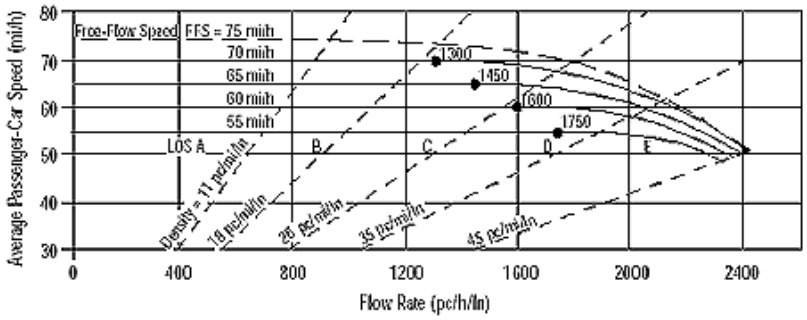

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/18/2008*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4183*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1517*	pc/h/ln
S	*70.7*	mi/h
D = v_p / S	*21.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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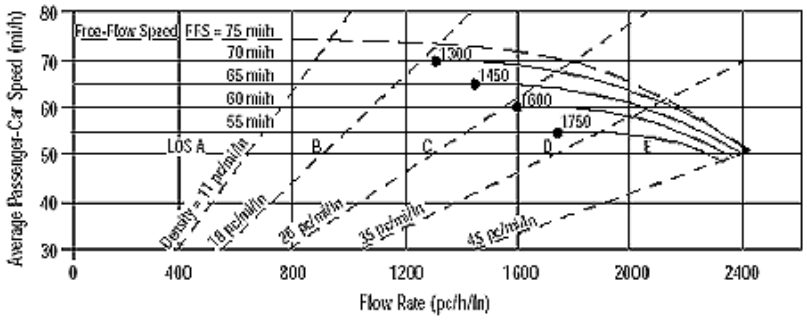
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3620*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*71.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*71.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1362*	pc/h/ln
S	*71.0*	mi/h
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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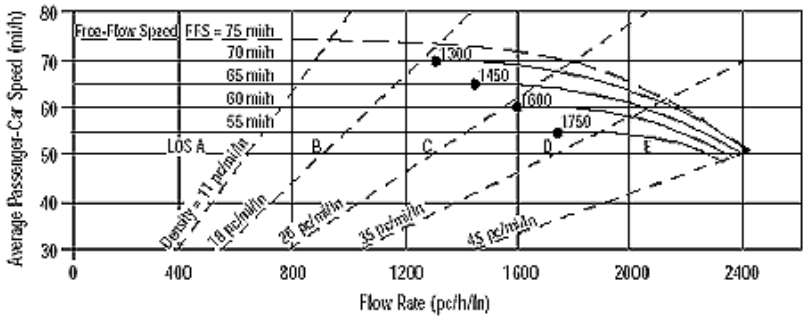

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3267*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1197*	pc/h/ln
S	*69.7*	mi/h
D = v_p / S	*17.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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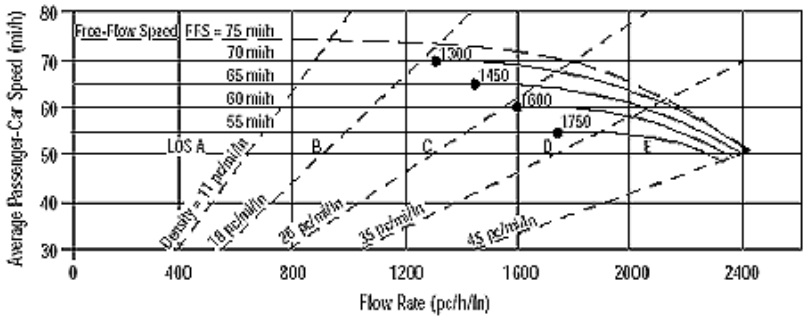

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 44*
Jurisdiction	*Taunton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4199*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*69.7*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*69.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1514*	pc/h/ln
S	*69.5*	mi/h
D = v_p / S	*21.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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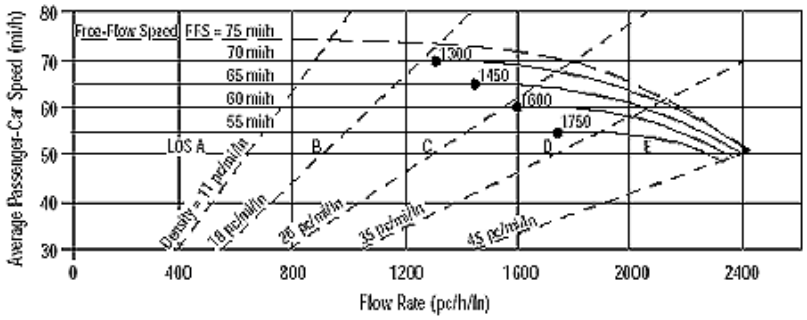

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBB*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route I-495*
Jurisdiction	*Raynham*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4988*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*3*	
FFS (measured)	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*66.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1784*	pc/h/ln
S	*65.5*	mi/h
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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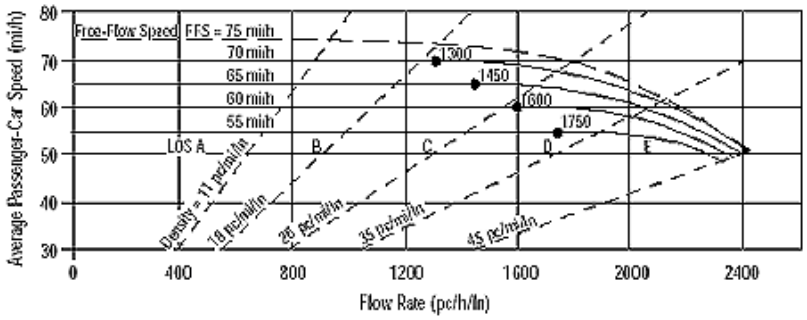

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of I-495*
Date Performed	*11/21/08*	Jurisdiction	*Raynham*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*3635*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*66.8*	mi/h	FFS	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1314*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.8*	mi/h	S	mi/h
D = v_p / S	*19.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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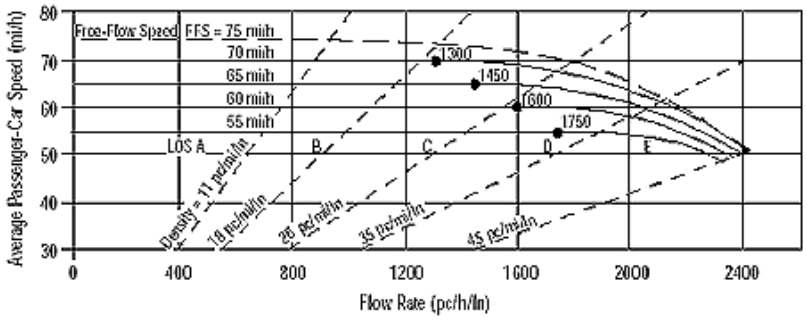

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of I-495*
Date Performed	*11/21/08*	Jurisdiction	*Raynham*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2847*	veh/h	Peak-Hour Factor, PHF	*0.97*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*63.0*	mi/h	FFS	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1027*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.0*	mi/h	S	mi/h
D = v_p / S	*16.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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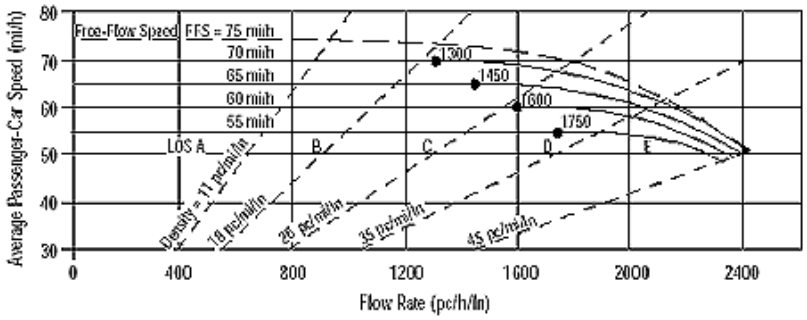

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBB*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 24 North of I-495*
Date Performed	*11/21/08*	Jurisdiction	*Raynham*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*4484*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*3*		f_N		mi/h
FFS (measured)	*63.0*	mi/h	FFS	*63.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1571*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.0*	mi/h	S	mi/h
D = v_p / S	*24.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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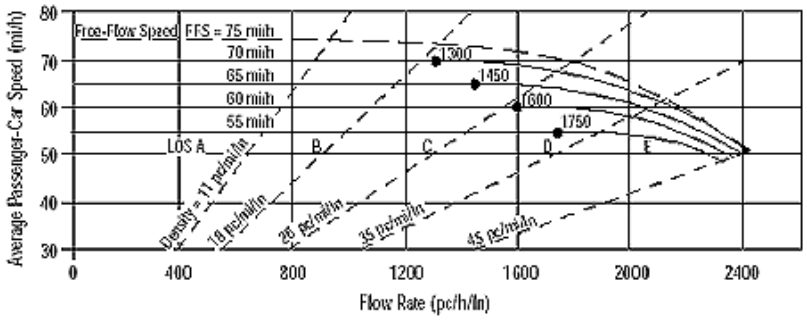

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2449*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*3*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*952*	pc/h/ln
S	*70.8*	mi/h
D = v_p / S	*13.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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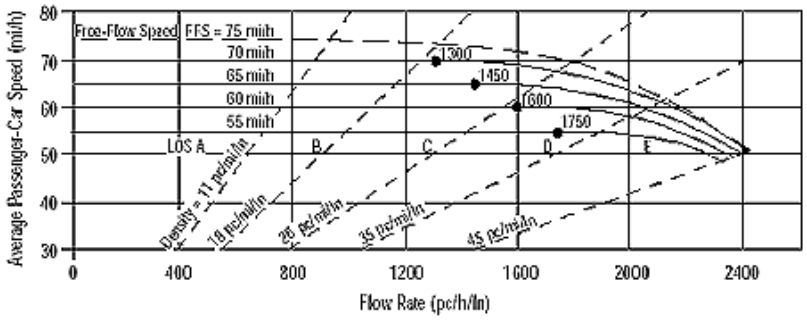

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3645*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2225*	pc/h/ln
S	*59.6*	mi/h
D = v_p / S	*37.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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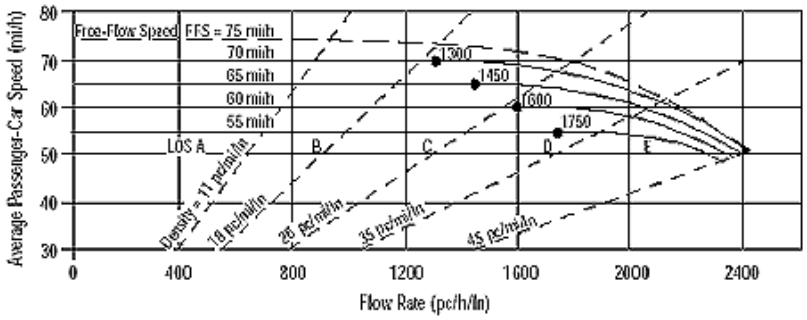

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*11/21/08*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3442*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1964*	pc/h/ln
S	*60.2*	mi/h
D = v_p / S	*32.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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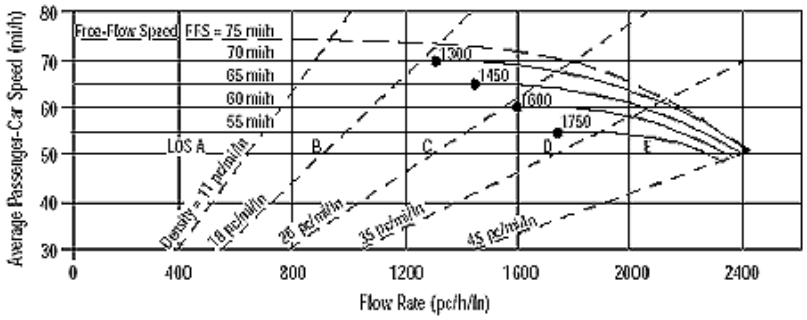

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 North of Route 79*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3140*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1773*	pc/h/ln
S	*62.0*	mi/h
D = v_p / S	*28.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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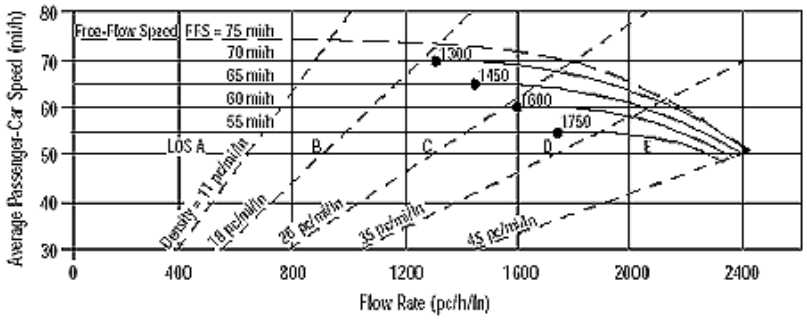

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*4-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3509*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2047*	pc/h/ln
S	*64.2*	mi/h
D = v_p / S	*31.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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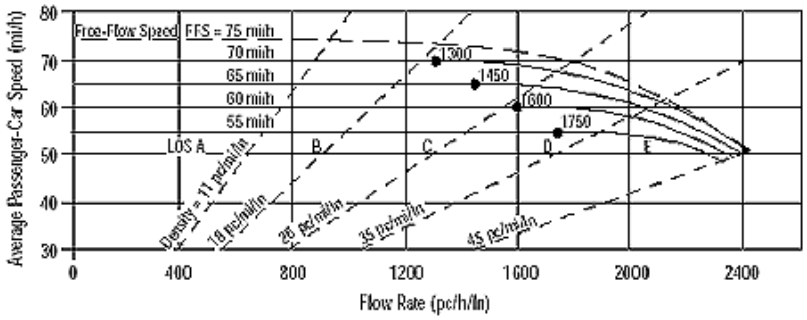

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Northbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3535*	veh/h	Peak-Hour Factor, PHF	*0.86*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*70.8*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*70.8*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2158*	pc/h/ln
S	*61.5*	mi/h
D = v_p / S	*35.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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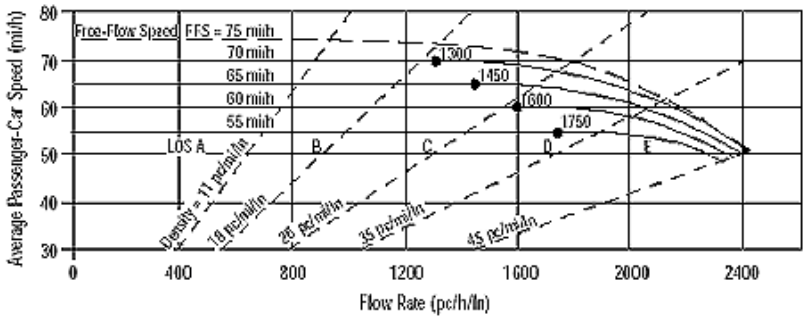

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3267*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1864*	pc/h/ln
S	*61.3*	mi/h
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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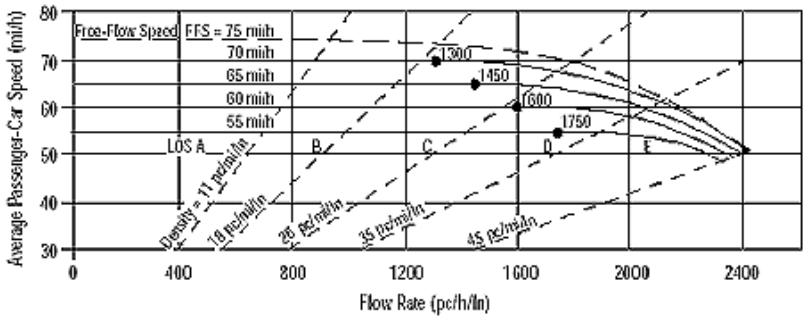

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*RMA*
Agency or Company	
Date Performed	*04-30-09*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Southbound*
From/To	*Route 24 South of Route 140*
Jurisdiction	
Analysis Year	*2030 Rapid Bus*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3660*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	I/mi
Number of Lanes, N	*2*	
FFS (measured)	*62.5*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*62.5*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2066*	pc/h/ln
S	*58.6*	mi/h
D = v_p / S	*35.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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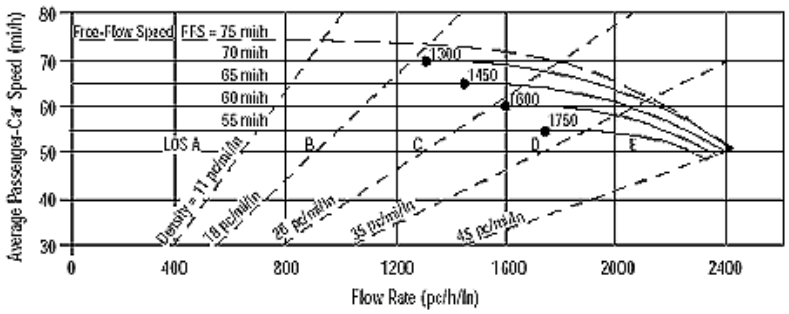

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 North of Hathaway Rd*
Date Performed	*11/18/2008*	Jurisdiction	*New Bedford*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*1715*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*69.3*	mi/h	FFS	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*953*	pc/h/ln	Design LOS		
S	*69.3*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*13.8*	pc/mi/ln	S		mi/h
LOS	*B*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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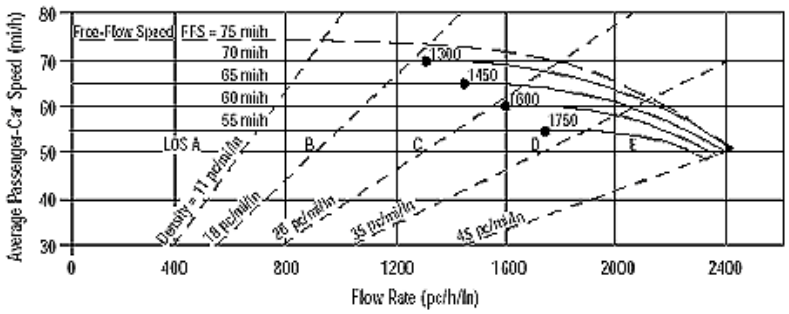

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Northbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 North of Hathaway Rd*
Date Performed	*11/18/2008*	Jurisdiction	*New Bedford*
Analysis Time Period	*PM Peak Hour*	Analysis Year	

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2340*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*69.3*	mi/h	FFS	*69.3*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1294*	pc/h/ln	Design LOS		
S	*69.3*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*18.7*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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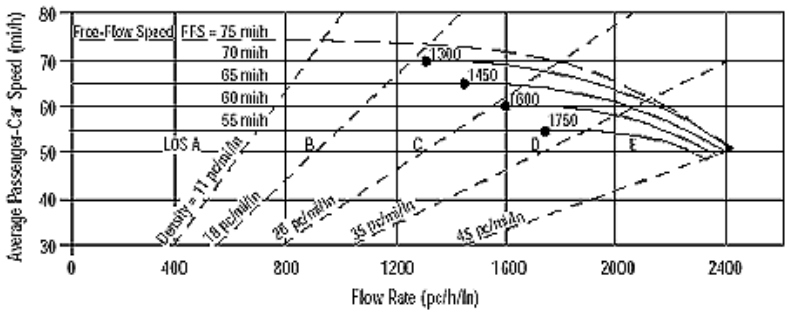

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 North of Hathaway Rd*
Date Performed	*11/18/2008*	Jurisdiction	*New Bedford*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2434*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*62.2*	mi/h	FFS	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1348*	pc/h/ln	Design LOS		
S	*62.2*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*21.7*	pc/mi/ln	S		mi/h
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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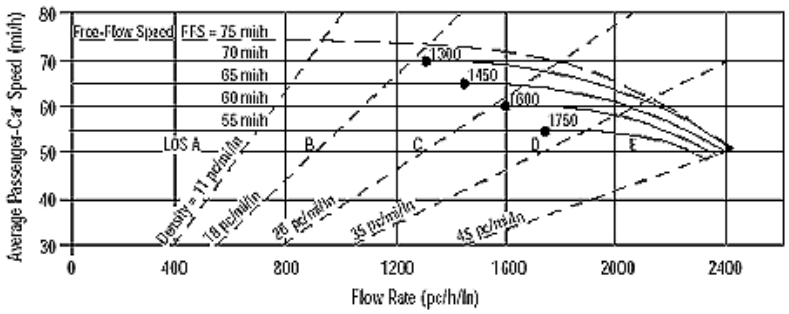
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Southbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 North of Hathaway Rd*
Date Performed	*11/18/2008*	Jurisdiction	*New Bedford*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2011*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	I/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*62.2*	mi/h	FFS	*62.2*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1080*	pc/h/ln	Design LOS		
S	*62.2*	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	*17.4*	pc/mi/ln	S		mi/h
LOS	*B*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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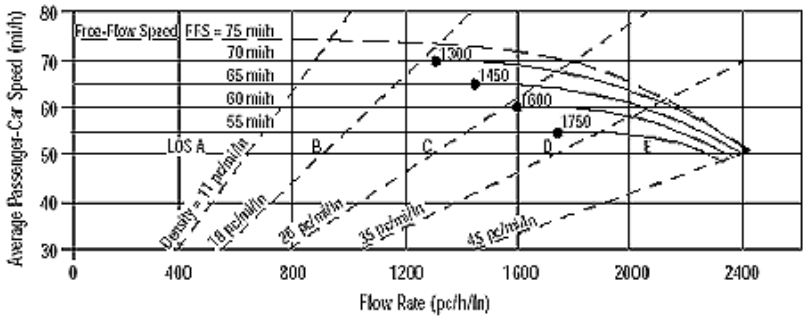

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*JBC*	Highway/Direction of Travel	*Eastbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 South of Route 24*
Date Performed	*11/19/08*	Jurisdiction	*Taunton*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1289*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*65.0*	mi/h	FFS	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*728*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*65.0*	mi/h	S	mi/h
D = v_p / S	*11.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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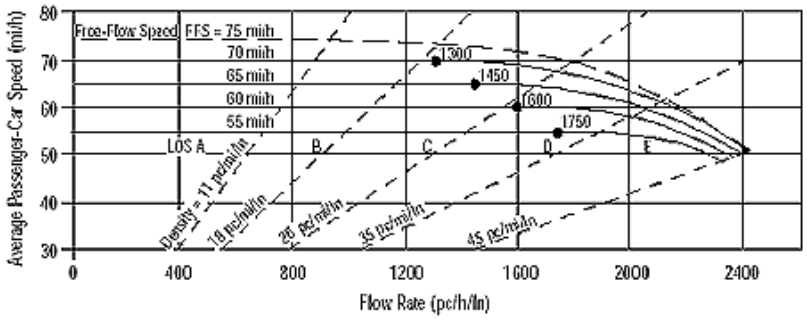

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*JBC*
Agency or Company	*Coler & Colantonio, Inc.*
Date Performed	*11/19/08*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*Eastbound*
From/To	*Route 140 South of Route 24*
Jurisdiction	*Taunton*
Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1616*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.50*	l/mi
Number of Lanes, N	*2*	
FFS (measured)	*65.0*	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}		mi/h
f_{LC}		mi/h
f_{ID}		mi/h
f_N		mi/h
FFS	*65.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*859*	pc/h/ln
S	*65.0*	mi/h
D = v_p / S	*13.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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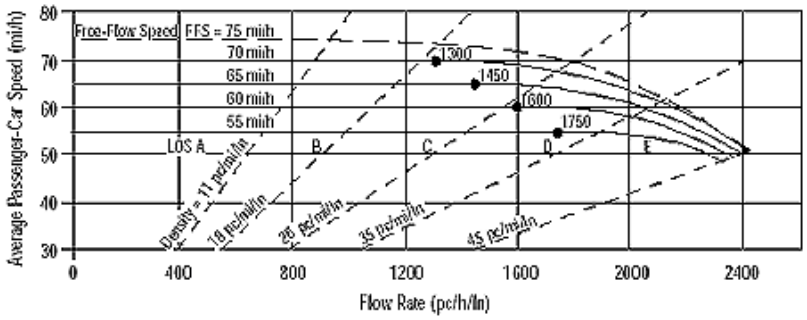

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Westbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 South of Route 24*
Date Performed	*11/18/2008*	Jurisdiction	*Taunton*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*1400*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*66.8*	mi/h	FFS	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*775*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.8*	mi/h	S	mi/h
D = v_p / S	*11.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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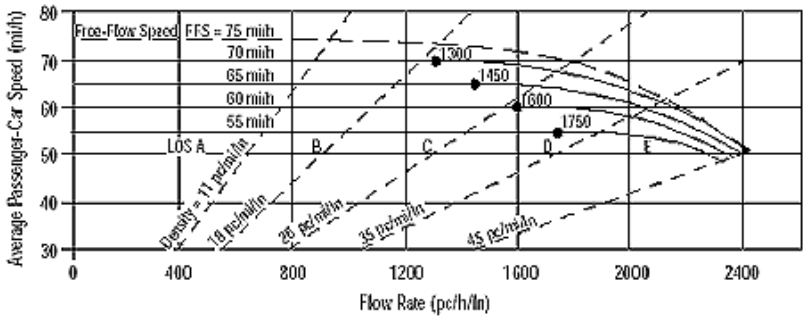

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*JBC*	Highway/Direction of Travel	*Westbound*
Agency or Company	*Coler & Colantonio, Inc.*	From/To	*Route 140 South of Route 24*
Date Performed	*11/18/2008*	Jurisdiction	*Taunton*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2030 RBA*

Project Description South Coast Rail

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*1540*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}		mi/h
Interchange Density	*0.50*	l/mi	f_{ID}		mi/h
Number of Lanes, N	*2*		f_N		mi/h
FFS (measured)	*66.8*	mi/h	FFS	*66.8*	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*862*	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*66.8*	mi/h	S	mi/h
D = v_p / S	*12.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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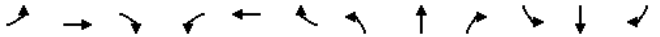
Capacity Analysis Results
Build with Mitigation Condition

Fall River



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	412	0	0	352	203	100	492	308	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12
Storage Length (ft)	0		0	0		165	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		272			959			475			333	
Travel Time (s)		6.2			21.8			10.8			7.6	
Peak Hour Factor	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	541	0	0	400	231	0	644	335	0	0	0
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Detector Phase	5	2			6	6	3	3	3			
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0			
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	13.8%	34.5%	0.0%	0.0%	20.7%	20.7%	40.2%	40.2%	40.2%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0			
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.52			0.35	0.43		0.65	0.73			
Control Delay		26.4			23.7	27.0		29.8	36.7			
Queue Delay		1.4			0.0	0.0		0.0	0.0			
Total Delay		27.9			23.7	27.0		29.8	36.7			
Queue Length 50th (ft)		126			87	99		157	160			
Queue Length 95th (ft)		167			131	172		202	241			
Internal Link Dist (ft)		192			879			395			253	
Turn Bay Length (ft)						165			125			
Base Capacity (vph)		1036			1154	534		1163	546			
Starvation Cap Reductn		298			0	0		0	0			
Spillback Cap Reductn		0			0	0		0	0			
Storage Cap Reductn		0			0	0		0	0			
Reduced v/c Ratio		0.73			0.35	0.43		0.55	0.61			

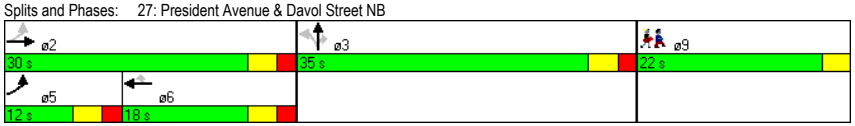
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	7
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 Build With Mitigation Condition - AM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 87	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 Build With Mitigation Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	412	0	0	352	203	100	492	308	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3383			3388	1568		3371	1583			
Flt Permitted		0.90			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3042			3388	1568		3371	1583			
Peak-hour factor, PHF	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	502	0	0	400	231	109	535	335	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	541	0	0	400	231	0	644	335	0	0	0
Heavy Vehicles (%)	13%	2%	0%	0%	3%	3%	1%	3%	2%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		29.6			29.6	29.6		25.4	25.4			
Effective Green, g (s)		29.6			29.6	29.6		25.4	25.4			
Actuated g/C Ratio		0.34			0.34	0.34		0.29	0.29			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1035			1153	533		984	462			
v/s Ratio Prot					0.12							
v/s Ratio Perm		c0.18				0.15		0.19	c0.21			
v/c Ratio		0.52			0.35	0.43		0.65	0.73			
Uniform Delay, d1		23.0			21.5	22.2		27.0	27.7			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.5			0.8	2.6		1.6	5.6			
Delay (s)		23.5			22.3	24.8		28.5	33.2			
Level of Service		C			C	C		C	C			
Approach Delay (s)		23.5			23.2			30.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	143	507	71	54	355	70	102	193	75	107	166	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	16	12	12	16	12	12	16	12
Storage Length (ft)	100		0	125		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		959			1952			265			1409	
Travel Time (s)		21.8			44.4			6.0			32.0	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	665	0	62	488	0	117	308	0	143	338	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	9.0		8.0	9.0		9.0	9.0		9.0	9.0	
Total Split (s)	30.0	30.0	0.0	9.0	39.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	31.6%	31.6%	0.0%	9.5%	41.1%	0.0%	36.8%	36.8%	0.0%	36.8%	36.8%	0.0%
Maximum Green (s)	25.0	25.0		5.0	34.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.49	0.79		0.26	0.50		0.70	0.56		0.73	0.60	
Control Delay	31.8	34.5		18.3	19.1		48.3	25.5		47.6	25.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.8	34.5		18.3	19.1		48.3	25.5		47.6	25.8	
Queue Length 50th (ft)	44	210		9	94		38	89		47	97	
Queue Length 95th (ft)	#186	#675		50	331		#128	210		112	185	
Internal Link Dist (ft)		879			1872			185			1329	
Turn Bay Length (ft)	100			125			150			150		
Base Capacity (vph)	336	838		243	1141		295	948		346	967	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	

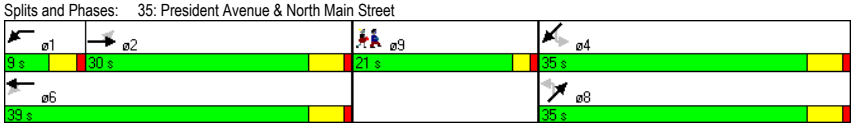
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	22%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	20
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.49	0.79		0.26	0.43		0.40	0.32		0.41	0.35	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 68.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: President Avenue & North Main Street

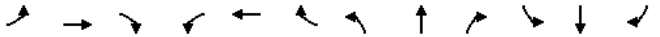


Lane Group	ø9
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	143	507	71	54	355	70	102	193	75	107	166	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	16	12	12	16	12
Total Lost time (s)	5.0	5.0		4.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	2070		1805	2066		1656	1931		1703	1962	
Flt Permitted	0.45	1.00		0.13	1.00		0.35	1.00		0.40	1.00	
Satd. Flow (perm)	831	2070		240	2066		607	1931		711	1962	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.75	0.75	0.75
Adj. Flow (vph)	164	583	82	62	408	80	117	222	86	143	221	117
RTOR Reduction (vph)	0	0	0	0	6	0	0	15	0	0	21	0
Lane Group Flow (vph)	164	665	0	62	482	0	117	293	0	143	317	0
Heavy Vehicles (%)	2%	2%	3%	0%	2%	0%	9%	6%	9%	6%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	27.7	27.7		34.3	34.3		19.0	19.0		19.0	19.0	
Effective Green, g (s)	27.7	27.7		34.3	34.3		19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.39	0.39		0.48	0.48		0.27	0.27		0.27	0.27	
Clearance Time (s)	5.0	5.0		4.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	802		172	991		161	513		189	521	
v/s Ratio Prot		c0.32		0.01	c0.23			0.15			0.16	
v/s Ratio Perm	0.20			0.16			0.19			c0.20		
v/c Ratio	0.51	0.83		0.36	0.49		0.73	0.57		0.76	0.61	
Uniform Delay, d1	16.7	19.8		14.5	12.6		23.9	22.7		24.1	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	7.1		1.3	0.4		15.0	1.5		15.8	2.0	
Delay (s)	18.0	26.9		15.8	13.0		38.9	24.3		39.9	25.0	
Level of Service	B	C		B	B		D	C		D	C	
Approach Delay (s)		25.1			13.3			28.3			29.4	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	71.5	Sum of lost time (s)	23.2	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	509	0	0	291	364	146	666	371	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	12	12
Storage Length (ft)	0		0	0		165	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		272			959			475			333	
Travel Time (s)		6.2			21.8			10.8			7.6	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	593	0	0	327	409	0	934	426	0	0	0
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Detector Phase	5	2			6	6	3	3	3			
Switch Phase												
Minimum Initial (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Minimum Split (s)	11.0	11.0			11.0	11.0	11.0	11.0	11.0			
Total Split (s)	12.0	30.0	0.0	0.0	18.0	18.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	13.8%	34.5%	0.0%	0.0%	20.7%	20.7%	40.2%	40.2%	40.2%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0	25.0			13.0	13.0	30.0	30.0	30.0			
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.64			0.32	0.86		0.81	0.79			
Control Delay		30.6			25.1	49.3		33.0	38.0			
Queue Delay		4.1			0.0	0.0		0.0	0.0			
Total Delay		34.7			25.1	49.3		33.0	38.0			
Queue Length 50th (ft)		150			73	214		239	205			
Queue Length 95th (ft)		207			108	#374		299	#306			
Internal Link Dist (ft)		192			879			395			253	
Turn Bay Length (ft)						165			125			
Base Capacity (vph)		928			1027	475		1183	557			
Starvation Cap Reductn		251			0	0		0	0			
Spillback Cap Reductn		0			0	0		0	0			
Storage Cap Reductn		0			0	0		0	0			
Reduced v/c Ratio		0.88			0.32	0.86		0.79	0.76			

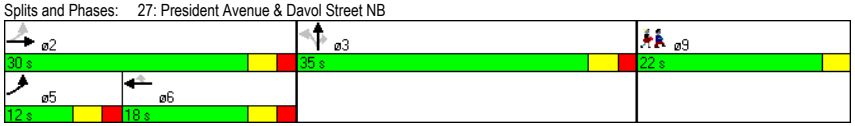
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
27: President Avenue & Davol Street NB

2030 Build With Mitigation Condition - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 87	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 27: President Avenue & Davol Street NB



HCM Signalized Intersection Capacity Analysis
27: President Avenue & Davol Street NB

2030 Build With Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	509	0	0	291	364	146	666	371	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0	5.0			
Lane Util. Factor		0.95			0.95	1.00		0.95	1.00			
Frt		1.00			1.00	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		3439			3455	1599		3430	1615			
Flt Permitted		0.91			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		3123			3455	1599		3430	1615			
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	40	553	0	0	327	409	168	766	426	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	593	0	0	327	409	0	934	426	0	0	0
Heavy Vehicles (%)	3%	1%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			3				
Permitted Phases	2					6	3		3			
Actuated Green, G (s)		25.9			25.9	25.9		29.1	29.1			
Effective Green, g (s)		25.9			25.9	25.9		29.1	29.1			
Actuated g/C Ratio		0.30			0.30	0.30		0.33	0.33			
Clearance Time (s)		5.0			5.0	5.0		5.0	5.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		930			1029	476		1147	540			
v/s Ratio Prot					0.09							
v/s Ratio Perm		0.19				c0.26		0.27	0.26			
v/c Ratio		0.64			0.32	0.86		0.81	0.79			
Uniform Delay, d1		26.5			23.7	28.8		26.5	26.2			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		1.4			0.8	18.0		4.5	7.5			
Delay (s)		27.9			24.5	46.8		31.0	33.7			
Level of Service		C			C	D		C	C			
Approach Delay (s)		27.9			36.9			31.9			0.0	
Approach LOS		C			D			C			A	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	134	622	119	59	435	59	118	257	75	155	193	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	11	12	11	12	12	11	12	12
Storage Length (ft)	100		0	125		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		959			1952			265			1409	
Travel Time (s)		21.8			44.4			6.0			32.0	
Peak Hour Factor	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	823	0	69	581	0	128	361	0	161	297	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Total Split (s)	40.0	40.0	0.0	9.0	49.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	38.1%	38.1%	0.0%	8.6%	46.7%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	35.0	35.0		5.0	44.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.60	0.97		0.39	0.66		0.44	0.56		0.69	0.46	
Control Delay	35.5	51.8		19.6	22.1		30.6	27.7		44.3	24.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.5	51.8		19.6	22.1		30.6	27.7		44.3	24.8	
Queue Length 50th (ft)	59	408		17	200		51	144		71	108	
Queue Length 95th (ft)	#194	#903		52	425		138	311		#224	245	
Internal Link Dist (ft)		879			1872			185			1329	
Turn Bay Length (ft)	100			125			150			150		
Base Capacity (vph)	250	850		177	923		288	649		235	640	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	

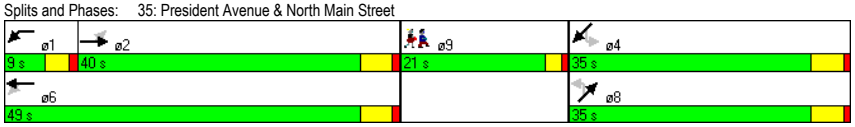
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	20%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	13
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.60	0.97		0.39	0.63		0.44	0.56		0.69	0.46	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 86.4
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: President Avenue & North Main Street



Lane Group	ø9
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	134	622	119	59	435	59	118	257	75	155	193	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	11	12	11	12	12	11	12	12
Total Lost time (s)	5.0	5.0		4.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	2074		1662	1784		1728	1821		1728	1778	
Flt Permitted	0.33	1.00		0.10	1.00		0.45	1.00		0.37	1.00	
Satd. Flow (perm)	608	2074		178	1784		820	1821		670	1778	
Peak-hour factor, PHF	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	149	691	132	69	512	69	128	279	82	161	201	96
RTOR Reduction (vph)	0	0	0	0	4	0	0	9	0	0	15	0
Lane Group Flow (vph)	149	823	0	69	577	0	128	352	0	161	282	0
Heavy Vehicles (%)	3%	1%	3%	5%	1%	2%	1%	1%	0%	1%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	2	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.4	35.4		43.3	43.3		30.4	30.4		30.4	30.4	
Effective Green, g (s)	35.4	35.4		43.3	43.3		30.4	30.4		30.4	30.4	
Actuated g/C Ratio	0.39	0.39		0.48	0.48		0.34	0.34		0.34	0.34	
Clearance Time (s)	5.0	5.0		4.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	240	819		150	861		278	617		227	603	
v/s Ratio Prot		c0.40		0.02	c0.32			0.19			0.16	
v/s Ratio Perm	0.25			0.20			0.16			c0.24		
v/c Ratio	0.62	1.00		0.46	0.67		0.46	0.57		0.71	0.47	
Uniform Delay, d1	21.8	27.2		19.8	17.7		23.2	24.3		25.8	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	32.6		0.8	1.5		0.4	0.8		8.0	0.2	
Delay (s)	25.3	59.8		20.6	19.3		23.7	25.1		33.8	23.5	
Level of Service	C	E		C	B		C	C		C	C	
Approach Delay (s)		54.5			19.4			24.7			27.1	
Approach LOS		D			B			C			C	

Intersection Summary				
HCM Average Control Delay	35.1	HCM Level of Service		D
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	89.7	Sum of lost time (s)		21.0
Intersection Capacity Utilization	85.8%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

New Bedford

HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	0	189	10	563	0	75	294	193	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.89		1.00	1.00	
Flt Protected		1.00			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1794			1681	1538		1776		1719	1912	
Flt Permitted		1.00			0.73	1.00		1.00		0.22	1.00	
Satd. Flow (perm)		1794			1290	1538		1776		402	1912	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.94	0.94	0.94	0.83	0.83	0.83
Adj. Flow (vph)	0	6	0	230	12	687	0	80	313	233	235	6
RTOR Reduction (vph)	0	0	0	0	0	165	0	275	0	0	3	0
Lane Group Flow (vph)	0	6	0	0	242	522	0	118	0	233	238	0
Heavy Vehicles (%)	0%	20%	0%	7%	25%	5%	0%	9%	8%	5%	11%	60%
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		8			4	4 1		2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		55.0			55.0	76.0		12.0		33.0	33.0	
Effective Green, g (s)		55.0			55.0	76.0		12.0		33.0	33.0	
Actuated g/C Ratio		0.55			0.55	0.76		0.12		0.33	0.33	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		987			710	1169		213		330	631	
v/s Ratio Prot		0.00				c0.34		0.07		c0.11	0.12	
v/s Ratio Perm					0.19					c0.13		
v/c Ratio		0.01			0.34	0.45		0.55		0.71	0.38	
Uniform Delay, d1		10.2			12.5	4.4		41.5		27.1	25.6	
Progression Factor		1.00			0.62	3.41		1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.3	0.1		1.8		5.5	0.1	
Delay (s)		10.2			8.9	15.0		43.2		32.6	25.8	
Level of Service		B			A	B		D		C	C	
Approach Delay (s)		10.2			13.4			43.2			29.1	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Tarkiln Hill Road & Church Street

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	315	0	30	504	60	241	200	40	45	170	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1604	1801		1616	1772		1728	1761			1723	1615
Flt Permitted	0.25	1.00		0.45	1.00		0.53	1.00			0.88	1.00
Satd. Flow (perm)	429	1801		773	1772		965	1761			1533	1615
Peak-hour factor, PHF	0.81	0.81	0.81	0.87	0.87	0.87	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	75	389	0	34	579	69	287	238	48	50	189	102
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	75	389	0	34	648	0	287	286	0	0	239	102
Heavy Vehicles (%)	5%	2%	0%	8%	2%	2%	1%	2%	0%	11%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	53.6	53.6		53.6	53.6		36.4	36.4			36.4	36.4
Effective Green, g (s)	53.6	53.6		53.6	53.6		36.4	36.4			36.4	36.4
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.36	0.36			0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	230	965		414	950		351	641			558	588
v/s Ratio Prot		0.22			c0.37			0.16				
v/s Ratio Perm	0.17			0.04			c0.30				0.16	0.06
v/c Ratio	0.33	0.40		0.08	0.68		0.82	0.45			0.43	0.17
Uniform Delay, d1	13.0	13.7		11.3	17.0		28.8	24.1			24.0	21.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.7	1.3		0.4	4.0		15.3	1.0			1.1	0.3
Delay (s)	16.8	15.0		11.6	20.9		44.1	25.2			25.1	21.9
Level of Service	B	B		B	C		D	C			C	C
Approach Delay (s)		15.3			20.5			34.7			24.1	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	390	54	119	320	50	37	67	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	15	16	16	15	16	16	15	16	16	16	16
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frt		0.99			0.99			0.96				
Flt Protected		0.99			0.99			0.99				
Satd. Flow (prot)		1945			1968			1858				
Flt Permitted		0.90			0.77			0.99				
Satd. Flow (perm)		1759			1524			1858				
Peak-hour factor, PHF	0.89	0.89	0.89	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	56	438	61	142	381	60	43	78	60	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	555	0	0	583	0	0	181	0	0	0	0
Heavy Vehicles (%)	4%	5%	9%	2%	3%	10%	8%	3%	9%	0%	0%	0%
Turn Type	Perm			Perm			Perm					
Protected Phases		4			8			2				
Permitted Phases	4			8			2					
Actuated Green, G (s)		22.2			22.2			10.1				
Effective Green, g (s)		22.2			22.2			10.1				
Actuated g/C Ratio		0.50			0.50			0.23				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		881			764			424				
v/s Ratio Prot												
v/s Ratio Perm		0.32			c0.38			0.10				
v/c Ratio		0.63			0.76			0.43				
Uniform Delay, d1		8.1			8.9			14.6				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.4			4.5			0.7				
Delay (s)		9.5			13.5			15.3				
Level of Service		A			B			B				
Approach Delay (s)		9.5			13.5			15.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

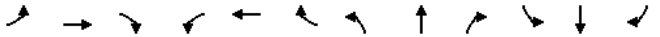
2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	455	159	157	579	95	52	5	78	55	10	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.97			0.98			0.91			0.92	
Flt Protected		0.99			0.99			0.98			0.98	
Satd. Flow (prot)		3291			3413			3027			3220	
Flt Permitted		0.70			0.63			0.78			0.80	
Satd. Flow (perm)		2305			2172			2406			2622	
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.90	0.90	0.90	0.72	0.72	0.72
Adj. Flow (vph)	111	562	196	174	643	106	58	6	87	76	14	112
RTOR Reduction (vph)	0	11	0	0	4	0	0	79	0	0	102	0
Lane Group Flow (vph)	0	858	0	0	919	0	0	72	0	0	100	0
Heavy Vehicles (%)	6%	6%	3%	1%	4%	0%	12%	29%	2%	0%	13%	0%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		79.1			79.1			8.9			8.9	
Effective Green, g (s)		79.1			79.1			8.9			8.9	
Actuated g/C Ratio		0.79			0.79			0.09			0.09	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1823			1718			214			233	
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.42			0.03			c0.04	
v/c Ratio		0.47			0.53			0.34			0.43	
Uniform Delay, d1		3.5			3.8			42.8			43.1	
Progression Factor		0.23			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.2			0.3			0.5	
Delay (s)		0.9			3.9			43.1			43.6	
Level of Service		A			A			D			D	
Approach Delay (s)		0.9			3.9			43.1			43.6	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM Average Control Delay	9.2	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 Build Condition w/ Mitigation - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	155	36	35	109	98	10	202	60	97	177	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	15	16	16	12	16	16	16	16	16	16	16
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.95			0.97			0.99	
Flt Protected		1.00			0.99			1.00			0.98	
Satd. Flow (prot)		1974			1672			1988			1922	
Flt Permitted		0.97			0.93			0.98			0.81	
Satd. Flow (perm)		1915			1562			1961			1585	
Peak-hour factor, PHF	0.80	0.80	0.80	0.83	0.83	0.83	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	19	194	45	42	131	118	11	227	67	110	201	17
RTOR Reduction (vph)	0	11	0	0	36	0	0	10	0	0	2	0
Lane Group Flow (vph)	0	247	0	0	255	0	0	295	0	0	326	0
Heavy Vehicles (%)	0%	4%	0%	11%	5%	7%	36%	4%	3%	6%	11%	13%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.6			12.6			20.9			20.9	
Effective Green, g (s)		12.6			12.6			20.9			20.9	
Actuated g/C Ratio		0.26			0.26			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		502			409			852			689	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.16			0.15			c0.21	
v/c Ratio		0.49			0.62			0.35			0.47	
Uniform Delay, d1		15.0			15.7			9.1			9.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			2.9			0.2			0.5	
Delay (s)		15.8			18.6			9.3			10.2	
Level of Service		B			B			A			B	
Approach Delay (s)		15.8			18.6			9.3			10.2	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
91: Route 140 NB On/Off Ramps & Kings Highway

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	361	100	90	342	664	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.99	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1949			3389	3414	
Flt Permitted	0.96			0.62	1.00	
Satd. Flow (perm)	1949			2128	3414	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.85	0.85
Adj. Flow (vph)	435	120	106	402	781	56
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	555	0	0	508	837	0
Heavy Vehicles (%)	3%	4%	7%	5%	5%	0%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	34.0			54.0	54.0	
Effective Green, g (s)	34.0			54.0	54.0	
Actuated g/C Ratio	0.34			0.54	0.54	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	663			1149	1844	
v/s Ratio Prot	c0.28				c0.25	
v/s Ratio Perm				0.24		
v/c Ratio	0.84			0.44	0.45	
Uniform Delay, d1	30.4			13.9	14.0	
Progression Factor	1.00			0.52	0.96	
Incremental Delay, d2	9.0			0.3	0.7	
Delay (s)	39.5			7.5	14.2	
Level of Service	D			A	B	
Approach Delay (s)	39.5			7.5	14.2	
Approach LOS	D			A	B	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
96: Kings Highway & Shaw's driveway

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	388	105	91	673	90	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.97			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3323			3447	1687	1538
Flt Permitted	1.00			0.80	0.95	1.00
Satd. Flow (perm)	3323			2780	1687	1538
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.85	0.85
Adj. Flow (vph)	417	113	99	732	106	53
RTOR Reduction (vph)	12	0	0	0	0	47
Lane Group Flow (vph)	518	0	0	831	106	6
Heavy Vehicles (%)	6%	2%	5%	4%	7%	5%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	77.1			77.1	10.9	10.9
Effective Green, g (s)	77.1			77.1	10.9	10.9
Actuated g/C Ratio	0.77			0.77	0.11	0.11
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	2562			2143	184	168
v/s Ratio Prot	0.16				c0.06	0.00
v/s Ratio Perm				c0.30		
v/c Ratio	0.20			0.39	0.58	0.03
Uniform Delay, d1	3.1			3.7	42.4	39.8
Progression Factor	0.52			0.32	1.00	1.00
Incremental Delay, d2	0.2			0.0	2.7	0.0
Delay (s)	1.8			1.3	45.1	39.9
Level of Service	A			A	D	D
Approach Delay (s)	1.8			1.3	43.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	5.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	225	185	5	410	180	187	20	55	219	30	57	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	16	11	12	10	16	10	12	14	16	14
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0			5.0
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00		1.00	0.95			0.95
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.98			0.98
Flt Protected	0.95	1.00		0.95	0.98	1.00		0.95	1.00			0.99
Satd. Flow (prot)	1776	2124		1609	1718	1449		1581	3384			3714
Flt Permitted	0.95	1.00		0.95	0.98	1.00		0.95	1.00			0.99
Satd. Flow (perm)	1776	2124		1609	1718	1449		1581	3384			3714
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.84	0.84
Adj. Flow (vph)	256	210	6	500	220	228	23	62	249	34	68	342
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	256	215	0	355	365	228	0	85	274	0	0	466
Heavy Vehicles (%)	5%	1%	0%	3%	3%	4%	0%	9%	5%	3%	4%	0%
Turn Type	Split			Split		pt+ov	Split	Split			Split	
Protected Phases	4	4		8	8	8 6	2	2	2		6	6
Permitted Phases												
Actuated Green, G (s)	20.4	20.4		30.4	30.4	47.6		15.7	15.7			17.2
Effective Green, g (s)	20.4	20.4		30.4	30.4	47.6		15.7	15.7			17.2
Actuated g/C Ratio	0.18	0.18		0.27	0.27	0.43		0.14	0.14			0.16
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0			5.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0	5.0			5.0
Lane Grp Cap (vph)	327	391		441	471	622		224	479			576
v/s Ratio Prot	c0.14	0.10		c0.22	0.21	0.16		0.05	c0.08			c0.13
v/s Ratio Perm												
v/c Ratio	0.78	0.55		0.80	0.77	0.37		0.38	0.57			0.81
Uniform Delay, d1	43.1	41.1		37.5	37.1	21.4		43.2	44.5			45.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2	13.3	2.8		11.6	9.1	0.8		2.2	2.6			9.3
Delay (s)	56.4	43.9		49.1	46.2	22.2		45.4	47.1			54.6
Level of Service	E	D		D	D	C		D	D			D
Approach Delay (s)		50.7			41.5				46.7			54.6
Approach LOS		D			D				D			D

Intersection Summary			
HCM Average Control Delay	47.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	27.2
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
140: Mill Street & Pleasant St

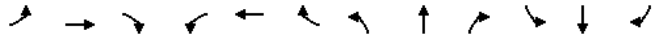
2030 Build Condition w/ Mitigation - AM Peak Hour

Movement	SBR
Lane Configurations	
Volume (vph)	47
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	56
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

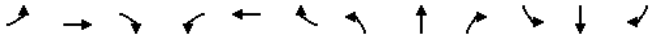
HCM Signalized Intersection Capacity Analysis
174: Union Street & Route 18

2030 Build Condition w/ Mitigation - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	54	40	39	16	10	40	890	51	91	855	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.94			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1616	1642			1921		1631	3261	1501	1574	3323	1516
Flt Permitted	0.72	1.00			0.79		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1221	1642			1563		1631	3261	1501	1574	3323	1516
Peak-hour factor, PHF	0.89	0.89	0.89	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	281	61	45	48	20	12	45	1011	58	99	929	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	128
Lane Group Flow (vph)	281	106	0	0	80	0	45	1011	58	99	929	133
Heavy Vehicles (%)	8%	6%	3%	6%	6%	10%	7%	7%	4%	7%	5%	3%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)	28.0	28.0			28.0		12.0	33.2	9.3	12.0	33.2	33.2
Effective Green, g (s)	28.0	28.0			28.0		12.0	33.2	9.3	12.0	33.2	33.2
Actuated g/C Ratio	0.24	0.24			0.24		0.10	0.28	0.08	0.10	0.28	0.28
Clearance Time (s)	5.0	5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	290	390			371		166	918	118	160	935	427
v/s Ratio Prot		0.06					0.03	c0.31	c0.04	c0.06	0.28	
v/s Ratio Perm	c0.23				0.05							0.09
v/c Ratio	0.97	0.27			0.22		0.27	1.10	0.49	0.62	0.99	0.31
Uniform Delay, d1	44.6	36.7			36.2		49.0	42.4	52.1	50.8	42.3	33.4
Progression Factor	1.00	1.00			1.80		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.5	0.8			0.6		1.2	61.4	4.3	7.9	27.7	0.6
Delay (s)	89.0	37.5			65.6		50.2	103.8	56.4	58.7	70.0	34.0
Level of Service	F	D			E		D	F	E	E	E	C
Approach Delay (s)		74.9			65.6			99.2			61.9	
Approach LOS		E			E			F			E	

Intersection Summary					
HCM Average Control Delay	78.2	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	118.0	Sum of lost time (s)		35.5	
Intersection Capacity Utilization	64.3%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	20	95	5	10	5	0	168	20	15	183	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.93			0.97			0.99			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1812			1708			1774			1674	1553
Flt Permitted		0.85			0.92			1.00			0.97	1.00
Satd. Flow (perm)		1573			1585			1774			1622	1553
Peak-hour factor, PHF	0.78	0.78	0.78	0.57	0.57	0.57	0.89	0.89	0.89	0.81	0.81	0.81
Adj. Flow (vph)	104	26	122	9	18	9	0	189	22	19	226	69
RTOR Reduction (vph)	0	0	0	0	7	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	252	0	0	29	0	0	208	0	0	245	69
Heavy Vehicles (%)	12%	14%	5%	0%	17%	33%	0%	22%	0%	14%	13%	4%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		40.0			28.0			33.2			33.2	9.3
Effective Green, g (s)		40.0			28.0			33.2			33.2	9.3
Actuated g/C Ratio		0.34			0.24			0.28			0.28	0.08
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		558			376			499			456	122
v/s Ratio Prot		c0.05						0.12				c0.04
v/s Ratio Perm		c0.11			0.02						c0.15	
v/c Ratio		0.45			0.08			0.42			0.54	0.57
Uniform Delay, d1		30.4			35.0			34.5			35.9	52.4
Progression Factor		0.64			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.8			0.2			0.8			1.6	7.1
Delay (s)		20.2			35.1			35.3			37.5	59.5
Level of Service		C			D			D			D	E
Approach Delay (s)		20.2			35.1			35.3			42.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	36.5
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	328	5	502	5	160	407	424	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12	12	16	12	11	11	12
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1031			525			388			877	
Travel Time (s)		23.4			11.9			8.8			19.9	
Peak Hour Factor	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	343	518	0	608	0	530	412	0
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		8			4	4 1		2		1	6	
Permitted Phases	8			4			2			6		
Detector Phase	8	8		4	4	4 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		27.0	27.0		19.0	22.0	
Total Split (s)	23.0	23.0	0.0	23.0	23.0	59.0	51.0	51.0	0.0	36.0	87.0	0.0
Total Split (%)	20.9%	20.9%	0.0%	20.9%	20.9%	53.6%	46.4%	46.4%	0.0%	32.7%	79.1%	0.0%
Maximum Green (s)	17.0	17.0		17.0	17.0		45.0	45.0		30.0	81.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		C-Max	C-Max		Min	Min		None	Min	
Walk Time (s)							5.0	5.0				
Flash Dont Walk (s)							16.0	16.0				
Pedestrian Calls (#/hr)							0	0				
v/c Ratio		0.04			0.98	0.46		0.88		0.95	0.37	
Control Delay		26.2			80.0	4.7		41.1		54.0	10.1	
Queue Delay		0.0			0.0	0.1		0.0		0.0	0.0	
Total Delay		26.2			80.0	4.8		41.1		54.0	10.1	
Queue Length 50th (ft)		5			~260	52		321		273	122	
Queue Length 95th (ft)		13			#542	167		412		314	106	
Internal Link Dist (ft)		951			445			308			797	
Turn Bay Length (ft)										300		
Base Capacity (vph)		442			349	1136		859		574	1288	
Starvation Cap Reductn		0			0	114		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.04			0.98	0.51		0.71		0.92	0.32	

Lanes, Volumes, Timings
2: Jones Street & Mt Pleasant St
2030 Build Condition w/ Mitigation - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 90 (82%), Referenced to phase 4:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Jones Street & Mt Pleasant St

HCM Signalized Intersection Capacity Analysis
2: Jones Street & Mt Pleasant St

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	328	5	502	5	160	407	424	330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	16	12	11	11	12
Total Lost time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.93			1.00	0.85		0.90		1.00	1.00	
Flt Protected		0.98			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1959			1776	1568		1908		1728	1749	
Flt Permitted		0.83			0.72	1.00		1.00		0.16	1.00	
Satd. Flow (perm)		1664			1335	1568		1901		290	1749	
Peak-hour factor, PHF	0.54	0.54	0.54	0.97	0.97	0.97	0.94	0.94	0.94	0.80	0.80	0.80
Adj. Flow (vph)	9	0	9	338	5	518	5	170	433	530	412	0
RTOR Reduction (vph)	0	7	0	0	0	220	0	94	0	0	0	0
Lane Group Flow (vph)	0	11	0	0	343	298	0	514	0	530	412	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	3%	0%	2%	2%	1%	5%	0%
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		8			4	4 1		2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		28.8			28.8	63.3		34.7		69.2	69.2	
Effective Green, g (s)		28.8			28.8	63.3		34.7		69.2	69.2	
Actuated g/C Ratio		0.26			0.26	0.58		0.32		0.63	0.63	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		436			350	902		600		555	1100	
v/s Ratio Prot						0.19				c0.25	0.24	
v/s Ratio Perm		0.01			c0.26			0.27		c0.35		
v/c Ratio		0.03			0.98	0.33		0.86		0.95	0.37	
Uniform Delay, d1		30.2			40.3	12.2		35.3		28.0	9.9	
Progression Factor		1.00			0.83	2.37		1.00		1.00	1.00	
Incremental Delay, d2		0.0			40.3	0.1		11.2		26.9	0.1	
Delay (s)		30.2			73.9	29.1		46.5		54.9	10.0	
Level of Service		C			E	C		D		D	A	
Approach Delay (s)		30.2			46.9			46.5			35.2	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	42.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
14: Kings Highway & Church Street

2030 Build Condition w/ Mitigation - PM Peak Hour

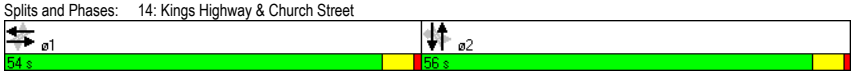
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	554	5	35	461	70	233	210	80	70	275	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	11	11	12	11	11	11	11	11	12
Storage Length (ft)	50		0	0		0	0		0	0		145
Storage Lanes	1		0	1		0	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		305			1116			176			552	
Travel Time (s)		6.9			25.4			4.0			12.5	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	607	0	38	584	0	271	337	0	0	388	136
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Detector Phase	1	1		1	1		2	2		2	2	2
Switch Phase												
Minimum Initial (s)	30.0	30.0		30.0	30.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	35.0	35.0		35.0	35.0		23.0	23.0		23.0	23.0	23.0
Total Split (s)	54.0	54.0	0.0	54.0	54.0	0.0	56.0	56.0	0.0	56.0	56.0	56.0
Total Split (%)	49.1%	49.1%	0.0%	49.1%	49.1%	0.0%	50.9%	50.9%	0.0%	50.9%	50.9%	50.9%
Maximum Green (s)	49.0	49.0		49.0	49.0		51.0	51.0		51.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lead	Lead		Lag	Lag		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		5.0	5.0		5.0	5.0	5.0
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
v/c Ratio	0.59	0.69		0.19	0.68		0.89	0.46			0.64	0.20
Control Delay	36.9	28.7		21.8	28.5		59.8	24.0			29.8	19.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	36.9	28.7		21.8	28.5		59.8	24.0			29.8	19.4
Queue Length 50th (ft)	67	348		16	333		161	154			197	55
Queue Length 95th (ft)	#163	494		42	475		#296	217			293	93
Internal Link Dist (ft)		225			1036			96			472	
Turn Bay Length (ft)	50											145
Base Capacity (vph)	214	878		198	855		331	797			656	741
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.59	0.69		0.19	0.68		0.82	0.42			0.59	0.18

Lanes, Volumes, Timings
14: Kings Highway & Church Street

2030 Build Condition w/ Mitigation - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 14: Kings Highway & Church Street



HCM Signalized Intersection Capacity Analysis
14: Kings Highway & Church Street

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	554	5	35	461	70	233	210	80	70	275	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	11	11	12	11	11	11	11	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1636	1816		1631	1770		1728	1717			1786	1599
Flt Permitted	0.26	1.00		0.24	1.00		0.39	1.00			0.78	1.00
Satd. Flow (perm)	443	1816		410	1770		713	1717			1415	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	126	602	5	38	507	77	271	244	93	79	309	136
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	126	607	0	38	584	0	271	337	0	0	388	136
Heavy Vehicles (%)	3%	1%	0%	7%	2%	0%	1%	2%	4%	1%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		2
Actuated Green, G (s)	53.1	53.1		53.1	53.1		46.9	46.9			46.9	46.9
Effective Green, g (s)	53.1	53.1		53.1	53.1		46.9	46.9			46.9	46.9
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.43	0.43			0.43	0.43
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	214	877		198	854		304	732			603	682
v/s Ratio Prot		c0.33			0.33			0.20				
v/s Ratio Perm	0.28			0.09			c0.38				0.27	0.09
v/c Ratio	0.59	0.69		0.19	0.68		0.89	0.46			0.64	0.20
Uniform Delay, d1	20.6	22.1		16.2	22.0		29.2	22.5			24.9	19.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	11.3	4.5		2.1	4.4		27.6	1.0			3.2	0.3
Delay (s)	31.9	26.6		18.4	26.4		56.8	23.5			28.2	20.1
Level of Service	C	C		B	C		E	C			C	C
Approach Delay (s)		27.5			25.9			38.3			26.1	
Approach LOS		C			C			D			C	

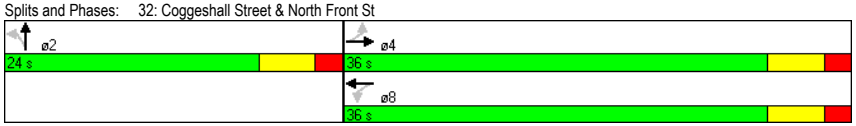
Intersection Summary					
HCM Average Control Delay	29.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	105.4%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	405	45	58	330	45	70	139	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	15	16	16	15	16	16	15	16	16	16	16
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		546			443			880			185	
Travel Time (s)		12.4			10.1			20.0			4.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.79	0.79	0.79	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	3%	4%	1%	0%	0%	2%	8%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	591	0	0	465	0	0	347	0	0	0	0
Turn Type	Perm			Perm			Perm					
Protected Phases		4			8			2				
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0				
Minimum Split (s)	22.0	22.0		22.0	22.0		22.0	22.0				
Total Split (s)	36.0	36.0	0.0	36.0	36.0	0.0	24.0	24.0	0.0	0.0	0.0	0.0
Total Split (%)	60.0%	60.0%	0.0%	60.0%	60.0%	0.0%	40.0%	40.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		18.0	18.0				
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0				
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Recall Mode	None	None		None	None		Min	Min				
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0				
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
v/c Ratio		0.77			0.57			0.63				
Control Delay		19.0			13.1			22.2				
Queue Delay		0.0			0.0			0.0				
Total Delay		19.0			13.1			22.2				
Queue Length 50th (ft)		125			86			83				
Queue Length 95th (ft)		259			177			151				
Internal Link Dist (ft)		466			363			800			105	
Turn Bay Length (ft)												
Base Capacity (vph)		1127			1188			772				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.52			0.39			0.45				

Intersection Summary	
Area Type:	Other

Cycle Length: 60
Actuated Cycle Length: 47.9
Natural Cycle: 55
Control Type: Semi Act-Uncoord

Splits and Phases: 32: Coggeshall Street & North Front St



HCM Signalized Intersection Capacity Analysis
32: Coggeshall Street & North Front St

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	405	45	58	330	45	70	139	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	15	16	16	15	16	16	15	16	16	16	16
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frt		0.99			0.99			0.97				
Flt Protected		0.99			0.99			0.99				
Satd. Flow (prot)		1992			2021			1941				
Flt Permitted		0.85			0.88			0.99				
Satd. Flow (perm)		1700			1790			1941				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	108	435	48	62	355	48	89	176	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	591	0	0	465	0	0	347	0	0	0	0
Heavy Vehicles (%)	2%	3%	3%	4%	1%	0%	0%	2%	8%	0%	0%	0%
Turn Type	Perm			Perm			Perm					
Protected Phases		4			8			2				
Permitted Phases	4			8			2					
Actuated Green, G (s)		21.7			21.7			13.5				
Effective Green, g (s)		21.7			21.7			13.5				
Actuated g/C Ratio		0.46			0.46			0.29				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		782			823			555				
v/s Ratio Prot												
v/s Ratio Perm		c0.35			0.26			0.18				
v/c Ratio		0.76			0.57			0.63				
Uniform Delay, d1		10.6			9.3			14.7				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		4.2			0.9			2.2				
Delay (s)		14.7			10.2			16.9				
Level of Service		B			B			B				
Approach Delay (s)		14.7			10.2			16.9			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 Build Condition w/ Mitigation - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	700	134	175	420	210	166	45	289	210	25	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		515			191			360			359	
Travel Time (s)		11.7			4.3			8.2			8.2	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1112	0	0	847	0	0	588	0	0	472	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	13.0		11.0	13.0		13.0	13.0		19.0	19.0	
Total Split (s)	12.0	52.0	0.0	10.0	50.0	0.0	48.0	48.0	0.0	48.0	48.0	0.0
Total Split (%)	10.9%	47.3%	0.0%	9.1%	45.5%	0.0%	43.6%	43.6%	0.0%	43.6%	43.6%	0.0%
Maximum Green (s)	6.0	46.0		4.0	44.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										8.0	8.0	
Pedestrian Calls (#/hr)										0	0	
v/c Ratio		0.81			0.70			0.90			0.76	
Control Delay		18.9			17.9			42.9			27.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.9			17.9			42.9			27.9	
Queue Length 50th (ft)		243			180			147			92	
Queue Length 95th (ft)		m#516			333			176			133	
Internal Link Dist (ft)		435			111			280			279	
Turn Bay Length (ft)												
Base Capacity (vph)		1380			1208			889			838	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.81			0.70			0.66			0.56	

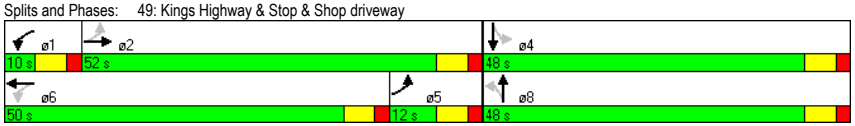
Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
49: Kings Highway & Stop & Shop driveway

2030 Build Condition w/ Mitigation - PM Peak Hour

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 49: Kings Highway & Stop & Shop driveway

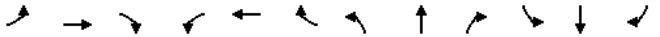


HCM Signalized Intersection Capacity Analysis
49: Kings Highway & Stop & Shop driveway

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	700	134	175	420	210	166	45	289	210	25	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.98			0.96			0.91			0.93	
Flt Protected		0.99			0.99			0.98			0.98	
Satd. Flow (prot)		3476			3406			3222			3258	
Flt Permitted		0.61			0.54			0.61			0.56	
Satd. Flow (perm)		2150			1862			2012			1856	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	215	753	144	184	442	221	195	53	340	236	28	208
RTOR Reduction (vph)	0	7	0	0	20	0	0	146	0	0	155	0
Lane Group Flow (vph)	0	1105	0	0	827	0	0	442	0	0	317	0
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	2%	0%	0%	1%	0%	1%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		70.2			70.2			27.8			27.8	
Effective Green, g (s)		70.2			70.2			27.8			27.8	
Actuated g/C Ratio		0.64			0.64			0.25			0.25	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1372			1188			508			469	
v/s Ratio Prot												
v/s Ratio Perm		c0.51			0.44			c0.22			0.17	
v/c Ratio		0.81			0.70			0.87			0.67	
Uniform Delay, d1		14.8			13.0			39.4			37.0	
Progression Factor		0.94			1.00			1.00			1.00	
Incremental Delay, d2		1.6			1.5			14.2			3.0	
Delay (s)		15.5			14.4			53.5			40.0	
Level of Service		B			B			D			D	
Approach Delay (s)		15.5			14.4			53.5			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	26.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	136	10	20	158	118	20	333	75	111	234	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	15	16	16	12	16	16	16	16	16	16	16
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1098			686			1488			550	
Travel Time (s)		25.0			15.6			33.8			12.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	8%	0%	0%	3%	0%	4%	4%	5%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	172	0	0	337	0	0	515	0	0	378	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.30			0.64			0.58			0.57	
Control Delay		14.6			18.9			17.1			18.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.6			18.9			17.1			18.9	
Queue Length 50th (ft)		30			58			76			57	
Queue Length 95th (ft)		90			164			#323			#303	
Internal Link Dist (ft)		1018			606			1408			470	
Turn Bay Length (ft)												
Base Capacity (vph)		1115			985			889			662	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.15			0.34			0.58			0.57	

Intersection Summary	
Area Type:	Other

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	15.0
Total Split (s)	20.0
Total Split (%)	27%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
58: Coggeshall St & Purchase Street

2030 Build Condition w/ Mitigation - PM Peak Hour

Cycle Length: 75
Actuated Cycle Length: 46.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 58: Coggeshall St & Purchase Street

HCM Signalized Intersection Capacity Analysis
58: Coggeshall St & Purchase Street

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	136	10	20	158	118	20	333	75	111	234	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	15	16	16	12	16	16	16	16	16	16	16
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.95			0.98			1.00	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		2022			1771			2021			2027	
Flt Permitted		0.98			0.97			0.97			0.72	
Satd. Flow (perm)		1991			1723			1971			1478	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.94	0.94	0.94
Adj. Flow (vph)	6	155	11	23	180	134	24	401	90	118	249	11
RTOR Reduction (vph)	0	4	0	0	35	0	0	8	0	0	1	0
Lane Group Flow (vph)	0	168	0	0	302	0	0	507	0	0	377	0
Heavy Vehicles (%)	0%	2%	8%	0%	0%	3%	0%	4%	4%	5%	4%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.3			13.3			20.9			20.9	
Effective Green, g (s)		13.3			13.3			20.9			20.9	
Actuated g/C Ratio		0.27			0.27			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		543			470			844			633	
v/s Ratio Prot												
v/s Ratio Perm		0.08			c0.18			c0.26			0.26	
v/c Ratio		0.31			0.64			0.60			0.60	
Uniform Delay, d1		14.1			15.7			10.7			10.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			3.0			1.2			1.5	
Delay (s)		14.4			18.7			11.9			12.2	
Level of Service		B			B			B			B	
Approach Delay (s)		14.4			18.7			11.9			12.2	
Approach LOS		B			B			B			B	

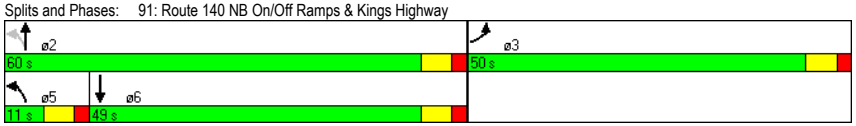
Intersection Summary				
HCM Average Control Delay	13.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	493	160	150	541	666	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	12	12	16
Storage Length (ft)	0	100	0			100
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Right Turn on Red		No				No
Link Speed (mph)	30			30	30	
Link Distance (ft)	268			574	515	
Travel Time (s)	6.1			13.0	11.7	
Peak Hour Factor	0.92	0.92	0.83	0.83	0.79	0.79
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	710	0	0	833	984	0
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Detector Phase	3		5	2	6	
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	
Minimum Split (s)	13.0		11.0	13.0	13.0	
Total Split (s)	50.0	0.0	11.0	60.0	49.0	0.0
Total Split (%)	45.5%	0.0%	10.0%	54.5%	44.5%	0.0%
Maximum Green (s)	44.0		5.0	54.0	43.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	4.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0		2.0	2.0	2.0	
Recall Mode	None		None	C-Min	C-Min	
v/c Ratio	0.94			0.92dl	0.56	
Control Delay	54.7			23.4	19.7	
Queue Delay	0.0			0.0	0.4	
Total Delay	54.7			23.4	20.1	
Queue Length 50th (ft)	462			200	243	
Queue Length 95th (ft)	#692			291	246	
Internal Link Dist (ft)	188			494	435	
Turn Bay Length (ft)						
Base Capacity (vph)	791			989	1760	
Starvation Cap Reductn	0			0	329	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.90			0.84	0.69	

Intersection Summary	
Area Type:	Other

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 52 (47%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 91: Route 140 NB On/Off Ramps & Kings Highway



HCM Signalized Intersection Capacity Analysis
91: Route 140 NB On/Off Ramps & Kings Highway

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	493	160	150	541	666	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	11	12	12	16
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.97			1.00	0.98	
Flt Protected	0.96			0.99	1.00	
Satd. Flow (prot)	1977			3521	3449	
Flt Permitted	0.96			0.54	1.00	
Satd. Flow (perm)	1977			1939	3449	
Peak-hour factor, PHF	0.92	0.92	0.83	0.83	0.79	0.79
Adj. Flow (vph)	536	174	181	652	843	141
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	710	0	0	833	984	0
Heavy Vehicles (%)	2%	0%	3%	1%	2%	5%
Turn Type			pm+pt			
Protected Phases	3		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	41.9			56.1	56.1	
Effective Green, g (s)	41.9			56.1	56.1	
Actuated g/C Ratio	0.38			0.51	0.51	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	2.0			2.0	2.0	
Lane Grp Cap (vph)	753			989	1759	
v/s Ratio Prot	c0.36				0.29	
v/s Ratio Perm				c0.43		
v/c Ratio	0.94			0.92dl	0.56	
Uniform Delay, d1	32.9			23.1	18.5	
Progression Factor	1.00			0.58	0.97	
Incremental Delay, d2	19.9			6.2	1.1	
Delay (s)	52.8			19.7	19.0	
Level of Service	D			B	B	
Approach Delay (s)	52.8			19.7	19.0	
Approach LOS	D			B	B	

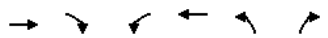
Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
96: Kings Highway & Shaw's driveway

2030 Build Condition w/ Mitigation - PM Peak Hour

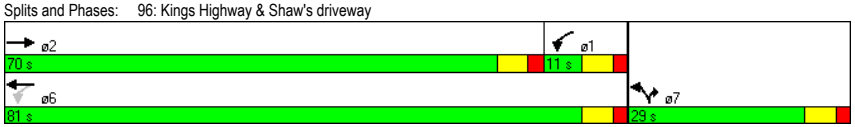


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	596	235	145	681	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			574	347	
Travel Time (s)	11.9			13.0	7.9	
Peak Hour Factor	0.91	0.91	0.96	0.96	0.89	0.89
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	913	0	0	860	174	107
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Detector Phase	2		1	6	7	7
Switch Phase						
Minimum Initial (s)	7.0		5.0	7.0	7.0	7.0
Minimum Split (s)	24.0		11.0	13.0	13.0	13.0
Total Split (s)	70.0	0.0	11.0	81.0	29.0	29.0
Total Split (%)	63.6%	0.0%	10.0%	73.6%	26.4%	26.4%
Maximum Green (s)	64.0		5.0	75.0	23.0	23.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0
Recall Mode	C-Min		None	C-Min	None	None
Walk Time (s)	7.0					
Flash Dont Walk (s)	11.0					
Pedestrian Calls (#/hr)	0					
v/c Ratio	0.35			0.51	0.71	0.34
Control Delay	0.8			6.1	60.8	10.7
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	1.0			6.1	60.8	10.7
Queue Length 50th (ft)	16			89	119	0
Queue Length 95th (ft)	m0			m67	180	45
Internal Link Dist (ft)	445			494	267	
Turn Bay Length (ft)						
Base Capacity (vph)	2594			1671	374	419
Starvation Cap Reductn	798			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.51			0.51	0.47	0.26

Intersection Summary	
Area Type:	Other

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 53 (48%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Kings Highway & Shaw's driveway



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	596	235	145	681	155	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3408			3543	1787	1599
Flt Permitted	1.00			0.62	0.95	1.00
Satd. Flow (perm)	3408			2215	1787	1599
Peak-hour factor, PHF	0.91	0.91	0.96	0.96	0.89	0.89
Adj. Flow (vph)	655	258	151	709	174	107
RTOR Reduction (vph)	22	0	0	0	0	92
Lane Group Flow (vph)	891	0	0	860	174	15
Heavy Vehicles (%)	2%	0%	1%	1%	1%	1%
Turn Type			pm+pt			Prot
Protected Phases	2		1	6	7	7
Permitted Phases			6			
Actuated Green, G (s)	83.0			83.0	15.0	15.0
Effective Green, g (s)	83.0			83.0	15.0	15.0
Actuated g/C Ratio	0.75			0.75	0.14	0.14
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	2571			1671	244	218
v/s Ratio Prot	0.26				c0.10	0.01
v/s Ratio Perm				c0.39		
v/c Ratio	0.35			0.51	0.71	0.07
Uniform Delay, d1	4.5			5.4	45.4	41.4
Progression Factor	0.15			0.85	1.00	1.00
Incremental Delay, d2	0.2			0.1	7.9	0.0
Delay (s)	0.9			4.7	53.4	41.4
Level of Service	A			A	D	D
Approach Delay (s)	0.9			4.7	48.8	
Approach LOS	A			A	D	

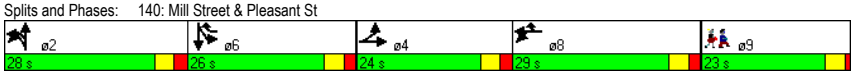
Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	203	360	205	248	25	135	455	105	117	345	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	16	11	12	10	16	10	12	14	16	14	16
Storage Length (ft)	0		0		0		100		0	0		0
Storage Lanes	1		1		1		1		0	0		0
Taper Length (ft)	25		25		25		25		25	25		25
Right Turn on Red					No				Yes			
Link Speed (mph)		30		30				30			30	
Link Distance (ft)		168		308				709			499	
Travel Time (s)		3.8		7.0				16.1			11.3	
Peak Hour Factor	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Shared Lane Traffic (%)			23%									
Lane Group Flow (vph)	271	211	298	309	267	0	184	644	0	0	628	0
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	8	8	8 6	2	2	2		6	6	
Permitted Phases												
Detector Phase	4	4	8	8	8 6	2	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	12.0	12.0	12.0	12.0		12.0	12.0	12.0		12.0	12.0	
Total Split (s)	24.0	24.0	29.0	29.0	55.0	28.0	28.0	28.0	0.0	26.0	26.0	0.0
Total Split (%)	18.5%	18.5%	22.3%	22.3%	42.3%	21.5%	21.5%	21.5%	0.0%	20.0%	20.0%	0.0%
Maximum Green (s)	19.0	19.0	24.0	24.0		23.0	23.0	23.0		21.0	21.0	
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	5.0	
Recall Mode	None	None	None	None		None	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.89	0.60	0.90	0.85	0.47		0.57	0.93			0.92	
Control Delay	78.9	54.9	75.6	67.3	18.3		52.1	65.5			67.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay	78.9	54.9	75.6	67.3	18.3		52.1	65.5			67.8	
Queue Length 50th (ft)	181	133	206	211	61		112	219			221	
Queue Length 95th (ft)	#417	257	#469	#467	170		219	#402			#368	
Internal Link Dist (ft)		88		228				629			419	
Turn Bay Length (ft)							100					
Base Capacity (vph)	305	352	332	364	571		323	695			680	
Starvation Cap Reductn	0	0	0	0	0		0	0			0	
Spillback Cap Reductn	0	0	0	0	0		0	0			0	
Storage Cap Reductn	0	0	0	0	0		0	0			0	
Reduced v/c Ratio	0.89	0.60	0.90	0.85	0.47		0.57	0.93			0.92	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	23.0
Total Split (s)	23.0
Total Split (%)	18%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	18
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

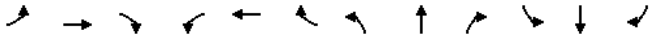
Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 116.2	
Natural Cycle: 130	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 140: Mill Street & Pleasant St



Movement	EBL	EBT	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	203	360	205	248	25	135	455	105	117	345	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	16	11	12	10	16	10	12	14	16	14	16
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00		1.00	0.95			0.95	
Frt	1.00	1.00	1.00	1.00	0.85		1.00	0.97			0.98	
Flt Protected	0.95	1.00	0.95	0.99	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1847	2132	1594	1747	1463		1617	3406			3731	
Flt Permitted	0.95	1.00	0.95	0.99	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1847	2132	1594	1747	1463		1617	3406			3731	
Peak-hour factor, PHF	0.96	0.96	0.93	0.93	0.93	0.87	0.87	0.87	0.87	0.83	0.83	0.83
Adj. Flow (vph)	271	211	387	220	267	29	155	523	121	141	416	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	271	211	298	309	267	0	184	629	0	0	628	0
Heavy Vehicles (%)	1%	1%	4%	1%	3%	0%	5%	3%	3%	0%	0%	3%
Turn Type	Split		Split		pt+ov	Split	Split			Split		
Protected Phases	4	4	8	8	8 6	2	2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	19.2	19.2	24.2	24.2	45.4		23.2	23.2			21.2	
Effective Green, g (s)	19.2	19.2	24.2	24.2	45.4		23.2	23.2			21.2	
Actuated g/C Ratio	0.16	0.16	0.20	0.20	0.38		0.20	0.20			0.18	
Clearance Time (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Vehicle Extension (s)	5.0	5.0	5.0	5.0			5.0	5.0			5.0	
Lane Grp Cap (vph)	299	345	325	356	560		316	666			667	
v/s Ratio Prot	c0.15	0.10	c0.19	0.18	0.18		0.11	c0.18			c0.17	
v/s Ratio Perm												
v/c Ratio	0.91	0.61	0.92	0.87	0.48		0.58	0.94			0.94	
Uniform Delay, d1	48.8	46.2	46.2	45.7	27.6		43.3	47.1			48.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	30.4	4.6	30.6	20.9	1.3		4.2	22.6			22.2	
Delay (s)	79.3	50.8	76.8	66.6	29.0		47.5	69.6			70.3	
Level of Service	E	D	E	E	C		D	E			E	
Approach Delay (s)		66.8		58.6				64.7			70.3	
Approach LOS		E		E				E			E	

Intersection Summary					
HCM Average Control Delay	64.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.93				
Actuated Cycle Length (s)	118.6	Sum of lost time (s)		30.8	
Intersection Capacity Utilization	77.2%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

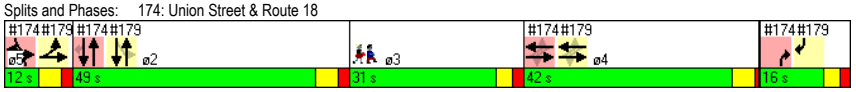


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	31	60	85	38	15	90	980	24	36	1150	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	10	11	11
Storage Length (ft)	0		0	0		0	150		225	150		225
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		432			82			365			2491	
Travel Time (s)		9.8			1.9			8.3			56.6	
Peak Hour Factor	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	464	0	0	163	0	99	1077	26	36	1162	146
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Detector Phase	4	4		4	4		1	2	5	1	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	13.0	9.0	10.0	13.0	13.0
Total Split (s)	42.0	42.0	0.0	42.0	42.0	0.0	12.0	49.0	16.0	12.0	49.0	49.0
Total Split (%)	28.0%	28.0%	0.0%	28.0%	28.0%	0.0%	8.0%	32.7%	10.7%	8.0%	32.7%	32.7%
Maximum Green (s)	37.0	37.0		37.0	37.0		6.0	43.0	11.0	6.0	43.0	43.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.0	6.0	5.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	None		None	None		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.16			0.35		1.24	0.97	0.20	0.54	1.04	0.26
Control Delay		139.3			86.0		228.6	64.1	65.2	93.1	82.1	18.4
Queue Delay		0.0			0.0		0.0	167.9	0.8	0.9	0.0	0.0
Total Delay		139.3			86.0		228.6	232.0	66.0	94.0	82.1	18.4
Queue Length 50th (ft)		~394			130		~89	406	19	27	454	34
Queue Length 95th (ft)		#814			m159		#257	#775	58	#96	#866	110
Internal Link Dist (ft)		352			2			285			2411	
Turn Bay Length (ft)							150		225	150		225
Base Capacity (vph)		399			460		80	1112	132	67	1112	566
Starvation Cap Reductn		0			0		0	336	0	0	0	0
Spillback Cap Reductn		0			0		0	0	29	2	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		1.16			0.35		1.24	1.39	0.25	0.55	1.04	0.26

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	19
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

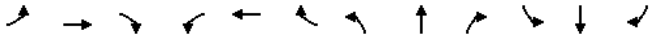
Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 131.4	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 174: Union Street & Route 18



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	31	60	85	38	15	90	980	24	36	1150	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	11	11	11	10	11	11
Total Lost time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2012			2033		1728	3355	1561	1440	3355	1546
Flt Permitted		0.67			0.77		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1399			1613		1728	3355	1561	1440	3355	1546
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.85	0.85	0.91	0.91	0.91	0.99	0.99	0.99
Adj. Flow (vph)	366	33	65	100	45	18	99	1077	26	36	1162	146
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	54
Lane Group Flow (vph)	0	464	0	0	163	0	99	1077	26	36	1162	92
Heavy Vehicles (%)	1%	3%	0%	2%	0%	0%	1%	4%	0%	17%	4%	1%
Turn Type	Perm			Perm			Prot		custom	Prot		Perm
Protected Phases		4			4		1	2	5	1	2	
Permitted Phases	4			4								2
Actuated Green, G (s)		37.5			37.5		6.1	43.6	11.1	6.1	43.6	43.6
Effective Green, g (s)		37.5			37.5		6.1	43.6	11.1	6.1	43.6	43.6
Actuated g/C Ratio		0.28			0.28		0.05	0.32	0.08	0.05	0.32	0.32
Clearance Time (s)		5.0			5.0		6.0	6.0	5.0	6.0	6.0	6.0
Vehicle Extension (s)		5.0			5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		390			450		78	1088	129	65	1088	502
v/s Ratio Prot							c0.06	0.32	c0.02	0.03	c0.35	
v/s Ratio Perm		c0.33			0.10							0.06
v/c Ratio		1.19			0.36		1.27	0.99	0.20	0.55	1.07	0.18
Uniform Delay, d1		48.5			38.9		64.2	45.2	57.5	62.8	45.4	32.6
Progression Factor		1.00			2.09		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		108.2			0.3		190.4	24.6	1.1	12.0	47.4	0.2
Delay (s)		156.7			81.3		254.5	69.8	58.6	74.8	92.8	32.9
Level of Service		F			F		F	E	E	E	F	C
Approach Delay (s)		156.7			81.3			84.7			85.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	95.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	134.4	Sum of lost time (s)	36.1
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	5	35	0	15	5	0	206	5	5	252	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	15	16	16	16	16	16	12	12
Storage Length (ft)	0		0	0		0	0		0	0		50
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			Yes			Yes			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		82			609			920			687	
Travel Time (s)		1.9			13.8			20.9			15.6	
Peak Hour Factor	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	101	0	0	27	0	0	306	0	0	310	149
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Detector Phase	1	1 4		4	4			2		2	2	5
Switch Phase												
Minimum Initial (s)	4.0			7.0	7.0			7.0		7.0	7.0	4.0
Minimum Split (s)	10.0			12.0	12.0			13.0		13.0	13.0	9.0
Total Split (s)	12.0	54.0	0.0	42.0	42.0	0.0	0.0	49.0	0.0	49.0	49.0	16.0
Total Split (%)	8.0%	36.0%	0.0%	28.0%	28.0%	0.0%	0.0%	32.7%	0.0%	32.7%	32.7%	10.7%
Maximum Green (s)	6.0			37.0	37.0			43.0		43.0	43.0	11.0
Yellow Time (s)	4.0			4.0	4.0			4.0		4.0	4.0	3.0
All-Red Time (s)	2.0			1.0	1.0			2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	4.0	6.0	4.0	6.0	6.0	5.0
Lead/Lag	Lead			Lag	Lag			Lag		Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes			Yes		Yes	Yes	
Vehicle Extension (s)	4.0			5.0	5.0			4.0		4.0	4.0	4.0
Recall Mode	None			None	None			None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.19			0.05			0.46			0.52	1.10
Control Delay		14.0			32.2			39.8			42.1	160.8
Queue Delay		0.0			0.0			0.0			0.0	604.3
Total Delay		14.0			32.2			39.8			42.1	765.1
Queue Length 50th (ft)		24			11			175			183	~118
Queue Length 95th (ft)		m42			34			254			333	#297
Internal Link Dist (ft)		2			529			840			607	
Turn Bay Length (ft)												50
Base Capacity (vph)		526			545			670			591	136
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			9			0			0	112
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.19			0.05			0.46			0.52	6.21

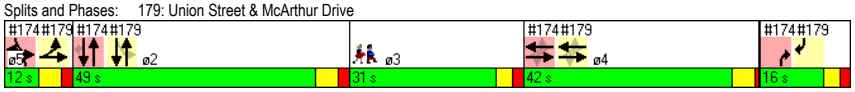
Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	17.0
Minimum Split (s)	31.0
Total Split (s)	31.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	17.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	19
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
179: Union Street & McArthur Drive

2030 Build Condition w/ Mitigation - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 131.4	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 179: Union Street & McArthur Drive



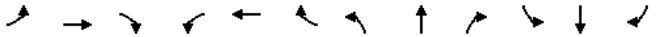
HCM Signalized Intersection Capacity Analysis
179: Union Street & McArthur Drive

2030 Build Condition w/ Mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	5	35	0	15	5	0	206	5	5	252	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	15	16	16	16	16	16	12	12
Total Lost time (s)		6.0			5.0			6.0			6.0	5.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		0.95			0.96			1.00			1.00	0.85
Flt Protected		0.97			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1845			1894			2019			1793	1599
Flt Permitted		0.84			1.00			1.00			0.99	1.00
Satd. Flow (perm)		1589			1894			2019			1782	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.75	0.75	0.75	0.69	0.69	0.69	0.83	0.83	0.83
Adj. Flow (vph)	56	6	39	0	20	7	0	299	7	6	304	149
RTOR Reduction (vph)	0	0	0	0	5	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	101	0	0	22	0	0	305	0	0	310	149
Heavy Vehicles (%)	0%	25%	16%	0%	0%	25%	0%	6%	20%	0%	6%	1%
Turn Type	pm+pt			Perm						Perm		custom
Protected Phases	1	1 4			4			2			2	5
Permitted Phases	1 4			4						2		
Actuated Green, G (s)		43.6			37.5			43.6			43.6	11.1
Effective Green, g (s)		43.6			37.5			43.6			43.6	11.1
Actuated g/C Ratio		0.32			0.28			0.32			0.32	0.08
Clearance Time (s)					5.0			6.0			6.0	5.0
Vehicle Extension (s)					5.0			4.0			4.0	4.0
Lane Grp Cap (vph)		527			528			655			578	132
v/s Ratio Prot		c0.01			0.01			0.15				c0.09
v/s Ratio Perm		c0.05									c0.17	
v/c Ratio		0.19			0.04			0.47			0.54	1.13
Uniform Delay, d1		32.7			35.3			36.1			37.1	61.7
Progression Factor		0.57			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.2			0.1			0.7			1.2	117.1
Delay (s)		18.9			35.4			36.9			38.4	178.8
Level of Service		B			D			D			D	F
Approach Delay (s)		18.9			35.4			36.9			83.9	
Approach LOS		B			D			D			F	

Intersection Summary			
HCM Average Control Delay	59.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	134.4	Sum of lost time (s)	37.1
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Taunton



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	157	108	39	126	52	112	431	63	31	341	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		698			192			448			574	
Travel Time (s)		15.9			4.4			10.2			13.0	
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Shared Lane Traffic (%)	20%											
Lane Group Flow (vph)	371	366	0	0	233	0	0	681	0	0	405	398
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Detector Phase	1	1		2	2		3	8		4	4	1
Switch Phase												
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0	18.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0	24.0
Total Split (s)	35.0	35.0	0.0	22.0	22.0	0.0	11.0	56.0	0.0	45.0	45.0	35.0
Total Split (%)	25.5%	25.5%	0.0%	16.1%	16.1%	0.0%	8.0%	40.9%	0.0%	32.8%	32.8%	25.5%
Maximum Green (s)	29.0	29.0		17.0	17.0		6.0	50.0		39.0	39.0	29.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	Min		Min	Min	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.91			0.91			0.86			0.75	0.35
Control Delay	68.0	73.0			89.1			48.5			45.0	1.9
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.4
Total Delay	68.0	73.0			89.1			48.5			45.0	2.3
Queue Length 50th (ft)	350	~357			~216			290			314	0
Queue Length 95th (ft)	#571	#571			#390			#382			448	38
Internal Link Dist (ft)		618			112			368			494	
Turn Bay Length (ft)												
Base Capacity (vph)	428	403			256			908			563	1122
Starvation Cap Reductn	0	0			0			0			0	301
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.87	0.91			0.91			0.75			0.72	0.48

Intersection Summary	
Area Type:	Other

Lane Group	ø5
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	18%
Maximum Green (s)	19.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	21
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

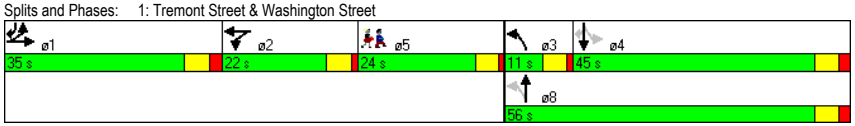
Intersection Summary

Lanes, Volumes, Timings
1: Tremont Street & Washington Street

9/17/2009

Cycle Length: 137
Actuated Cycle Length: 122.1
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Tremont Street & Washington Street



HCM Signalized Intersection Capacity Analysis
1: Tremont Street & Washington Street

9/17/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	157	108	39	126	52	112	431	63	31	341	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Lane Util. Factor	0.95	0.95			1.00			0.95			1.00	1.00
Frt	1.00	0.95			0.97			0.98			1.00	0.85
Flt Protected	0.95	0.99			0.99			0.99			1.00	1.00
Satd. Flow (prot)	1759	1608			1745			3355			1730	1495
Flt Permitted	0.95	0.99			0.99			0.64			0.85	1.00
Satd. Flow (perm)	1759	1608			1745			2150			1481	1495
Peak-hour factor, PHF	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	464	162	111	42	135	56	126	484	71	34	371	398
RTOR Reduction (vph)	0	11	0	0	8	0	0	6	0	0	0	159
Lane Group Flow (vph)	371	355	0	0	225	0	0	675	0	0	405	239
Heavy Vehicles (%)	4%	4%	10%	8%	1%	10%	8%	4%	6%	3%	6%	8%
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Actuated Green, G (s)	29.7	29.7			17.4			44.7			44.7	74.4
Effective Green, g (s)	29.7	29.7			17.4			44.7			44.7	74.4
Actuated g/C Ratio	0.24	0.24			0.14			0.36			0.36	0.60
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	421	385			245			775			534	969
v/s Ratio Prot	0.21	c0.22			c0.13							0.06
v/s Ratio Perm								c0.31			0.27	0.10
v/c Ratio	0.88	0.92			0.92			0.87			0.76	0.25
Uniform Delay, d1	45.4	46.0			52.6			37.0			34.9	11.6
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	18.5	26.7			35.5			10.2			5.4	0.0
Delay (s)	63.9	72.7			88.1			47.1			40.3	11.7
Level of Service	E	E			F			D			D	B
Approach Delay (s)		68.3			88.1			47.1			26.1	
Approach LOS		E			F			D			C	

Intersection Summary					
HCM Average Control Delay	50.5	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	124.0	Sum of lost time (s)		32.2	
Intersection Capacity Utilization	87.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	819	296	185	655	95	127	350	270	125	220	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12
Storage Length (ft)	100		70	100		70	0		50	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1663			1440			2994			1249	
Travel Time (s)		37.8			32.7			68.0			28.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1186	0	197	798	0	0	869	0	0	530	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Detector Phase	5	2		1	6		3	3		3	3	
Switch Phase												
Minimum Initial (s)	9.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0	
Total Split (s)	14.0	37.0	0.0	17.0	40.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	11.7%	30.8%	0.0%	14.2%	33.3%	0.0%	31.7%	31.7%	0.0%	31.7%	31.7%	0.0%
Maximum Green (s)	9.0	32.0		12.0	35.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.08	1.04		0.99	0.48			1.12			2.09dl	
Control Delay	46.6	68.7		106.2	21.0			100.1			49.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	46.6	68.7		106.2	21.0			100.1			49.5	
Queue Length 50th (ft)	6	347		116	138			~280			146	
Queue Length 95th (ft)	28	#740		#340	373			#532			#219	
Internal Link Dist (ft)		1583			1360			2914			1169	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	133	1144		199	1660			774			599	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	1.04		0.99	0.48			1.12			0.88	

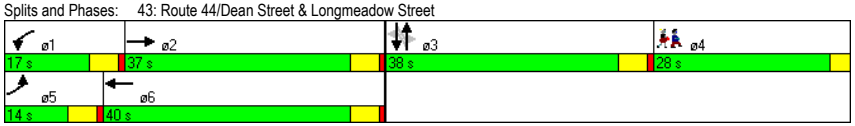
Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	23%
Maximum Green (s)	25.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	0.2
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	18.0
Pedestrian Calls (#/hr)	12
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

9/17/2009

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 97.6	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street

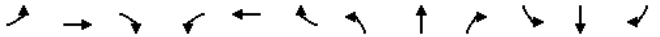


HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

9/17/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	819	296	185	655	95	127	350	270	125	220	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.96		1.00	0.98			0.95			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1428	3365		1604	3414			3109			3193	
Flt Permitted	0.95	1.00		0.95	1.00			0.67			0.54	
Satd. Flow (perm)	1428	3365		1604	3414			2089			1744	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.68	0.68	0.68
Adj. Flow (vph)	11	871	315	197	697	101	148	407	314	184	324	22
RTOR Reduction (vph)	0	27	0	0	7	0	0	62	0	0	3	0
Lane Group Flow (vph)	11	1159	0	197	791	0	0	807	0	0	527	0
Heavy Vehicles (%)	18%	3%	3%	5%	4%	2%	8%	6%	3%	3%	8%	20%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			3			3	
Permitted Phases							3			3		
Actuated Green, G (s)	1.5	36.7		12.1	47.3			33.4			33.4	
Effective Green, g (s)	1.5	36.7		12.1	47.3			33.4			33.4	
Actuated g/C Ratio	0.01	0.35		0.12	0.45			0.32			0.32	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	21	1184		186	1548			669			558	
v/s Ratio Prot	0.01	c0.34		c0.12	0.23							
v/s Ratio Perm								c0.39			0.30	
v/c Ratio	0.52	0.98		1.06	0.51			1.21			2.09dl	
Uniform Delay, d1	51.0	33.4		46.1	20.3			35.5			34.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	27.4	21.1		82.5	0.6			106.6			25.2	
Delay (s)	78.5	54.6		128.6	20.8			142.1			59.7	
Level of Service	E	D		F	C			F			E	
Approach Delay (s)		54.8			42.2			142.1			59.7	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM Average Control Delay	73.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	104.3	Sum of lost time (s)	22.1
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	165	307	134	110	245	141	636	62	160	558	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		50	0		50	50		0	50		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		1373			971			2224			3692	
Travel Time (s)		31.2			22.1			43.3			71.9	
Peak Hour Factor	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	237	384	0	257	258	0	882	0	0	997	0
Turn Type	Perm		pt+ov	Perm		pt+ov	pm+pt			pm+pt		
Protected Phases		4	4 3		4	4 1	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Detector Phase	4	4	4 3	4	4	4 1	3	2 3		1	1 2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0			6.0		
Minimum Split (s)	13.0	13.0		13.0	13.0		11.0			11.0		
Total Split (s)	32.0	32.0	43.0	32.0	32.0	45.0	11.0	52.0	0.0	13.0	54.0	0.0
Total Split (%)	26.2%	26.2%	35.2%	26.2%	26.2%	36.9%	9.0%	42.6%	0.0%	10.7%	44.3%	0.0%
Maximum Green (s)	27.0	27.0		27.0	27.0		6.0			8.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0			4.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0			1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead			Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0			3.0		
Recall Mode	None	None		None	None		None			None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.56	0.55		0.97	0.38		0.98			1.10	
Control Delay		39.8	15.4		87.9	11.4		54.9			88.9	
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0	
Total Delay		39.8	15.4		87.9	11.4		54.9			88.9	
Queue Length 50th (ft)		124	75		154	52		192			~246	
Queue Length 95th (ft)		228	171		#411	103		#500			#432	
Internal Link Dist (ft)		1293			891			2144			3612	
Turn Bay Length (ft)			50			50						
Base Capacity (vph)		426	699		265	684		896			903	
Starvation Cap Reductn		0	0		0	0		0			0	
Spillback Cap Reductn		0	0		0	0		0			0	
Storage Cap Reductn		0	0		0	0		0			0	
Reduced v/c Ratio		0.56	0.55		0.97	0.38		0.98			1.10	

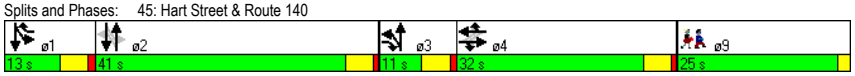
Lane Group	ø2	ø9
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	2	9
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	8.0	1.0
Minimum Split (s)	13.0	25.0
Total Split (s)	41.0	25.0
Total Split (%)	34%	20%
Maximum Green (s)	36.0	23.0
Yellow Time (s)	4.0	2.0
All-Red Time (s)	1.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		16.0
Pedestrian Calls (#/hr)		4
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Lanes, Volumes, Timings
45: Hart Street & Route 140

9/17/2009

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 102	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 45: Hart Street & Route 140



HCM Signalized Intersection Capacity Analysis
45: Hart Street & Route 140

9/17/2009

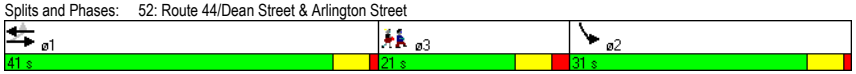
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	165	307	134	110	245	141	636	62	160	558	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		0.97	1.00		0.99			0.99	
Satd. Flow (prot)		1734	1516		1807	1568		3272			3331	
Flt Permitted		0.91	1.00		0.53	1.00		0.59			0.53	
Satd. Flow (perm)		1596	1516		992	1568		1960			1796	
Peak-hour factor, PHF	0.80	0.80	0.80	0.95	0.95	0.95	0.95	0.95	0.95	0.73	0.73	0.73
Adj. Flow (vph)	31	206	384	141	116	258	148	669	65	219	764	14
RTOR Reduction (vph)	0	0	131	0	0	82	0	4	0	0	1	0
Lane Group Flow (vph)	0	237	253	0	257	176	0	878	0	0	996	0
Heavy Vehicles (%)	0%	6%	3%	1%	4%	3%	4%	5%	2%	10%	6%	13%
Turn Type	Perm		pt+ov	Perm		pt+ov	pm+pt			pm+pt		
Protected Phases		4	4 3		4	4 1	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		27.2	38.3		27.2	35.3		42.4			44.4	
Effective Green, g (s)		27.2	38.3		27.2	35.3		42.4			44.4	
Actuated g/C Ratio		0.26	0.37		0.26	0.34		0.41			0.43	
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		419	561		261	535		880			891	
v/s Ratio Prot			0.17			0.11		c0.06			c0.09	
v/s Ratio Perm		0.15			c0.26			0.35			c0.39	
v/c Ratio		0.57	0.45		0.98	0.33		1.00			1.12	
Uniform Delay, d1		33.0	24.6		37.9	25.3		30.5			29.6	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.8	0.6		51.0	0.4		29.5			68.2	
Delay (s)		34.8	25.2		89.0	25.7		60.0			97.7	
Level of Service		C	C		F	C		E			F	
Approach Delay (s)		28.9			57.3			60.0			97.7	
Approach LOS		C			E			E			F	

Intersection Summary			
HCM Average Control Delay	65.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	103.5	Sum of lost time (s)	25.8
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	48	800	655	142	296	57	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.87	0.87	0.86	0.86	0.81	0.81	
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	55	920	927	0	435	0	
Turn Type	Perm						
Protected Phases		1	1		2		3
Permitted Phases	1						
Detector Phase	1	1	1		2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0		5.0		5.0
Minimum Split (s)	15.0	15.0	15.0		10.0		21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	0.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	0.0%	23%
Maximum Green (s)	36.0	36.0	36.0		26.0		15.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0
All-Red Time (s)	1.0	1.0	1.0		1.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0		1.0
Recall Mode	None	None	None		None		None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							0
v/c Ratio	0.54	0.96	0.86		0.75		
Control Delay	38.2	39.7	25.8		29.3		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	38.2	39.7	25.8		29.3		
Queue Length 50th (ft)	15	352	317		159		
Queue Length 95th (ft)	#71	#620	#563		219		
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	101	960	1072		692		
Starvation Cap Reductn	0	0	0		0		
Spillback Cap Reductn	0	0	0		0		
Storage Cap Reductn	0	0	0		0		
Reduced v/c Ratio	0.54	0.96	0.86		0.63		

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 68.1	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

9/17/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	48	800	655	142	296	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	5.0	5.0	5.0		5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.98	
Flt Protected	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1636	1810	2008		1807	
Flt Permitted	0.11	1.00	1.00		0.96	
Satd. Flow (perm)	191	1810	2008		1807	
Peak-hour factor, PHF	0.87	0.87	0.86	0.86	0.81	0.81
Adj. Flow (vph)	55	920	762	165	365	70
RTOR Reduction (vph)	0	0	7	0	0	0
Lane Group Flow (vph)	55	920	920	0	435	0
Heavy Vehicles (%)	3%	5%	5%	3%	4%	12%
Turn Type	Perm					
Protected Phases		1	1		2	
Permitted Phases	1					
Actuated Green, G (s)	36.1	36.1	36.1		21.9	
Effective Green, g (s)	36.1	36.1	36.1		21.9	
Actuated g/C Ratio	0.53	0.53	0.53		0.32	
Clearance Time (s)	5.0	5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	101	961	1066		582	
v/s Ratio Prot		c0.51	0.46		c0.24	
v/s Ratio Perm	0.29					
v/c Ratio	0.54	0.96	0.86		0.75	
Uniform Delay, d1	10.5	15.2	13.8		20.6	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.9	19.3	7.4		5.2	
Delay (s)	16.4	34.5	21.2		25.8	
Level of Service	B	C	C		C	
Approach Delay (s)		33.5	21.2		25.8	
Approach LOS		C	C		C	

Intersection Summary				
HCM Average Control Delay	27.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
61: Taunton Green & Broadway

9/17/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	794	193	0	0	1051	0	306	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		304			913			579			302	
Travel Time (s)		6.9			20.8			13.2			6.9	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	873	212	0	0	1142	0	340	99	0	0	0
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Detector Phase	1	1	1					3	3			
Switch Phase												
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0			
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0			
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0
Total Split (%)	39.3%	39.3%	39.3%	0.0%	0.0%	0.0%	0.0%	33.7%	33.7%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0			
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Recall Mode	Max	Max	Max					Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.30	0.76	0.33			0.45		0.72	0.23			
Control Delay	8.1	30.5	4.2			0.6		39.2	6.9			
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0			
Total Delay	8.1	30.5	4.2			0.6		39.2	6.9			
Queue Length 50th (ft)	20	227	0			0		172	0			
Queue Length 95th (ft)	m66	298	m40			0		#279	36			
Internal Link Dist (ft)		224			833			499			222	
Turn Bay Length (ft)												
Base Capacity (vph)	664	1148	641			2547		470	424			
Starvation Cap Reductn	0	0	0			0		0	0			
Spillback Cap Reductn	0	0	0			0		0	0			
Storage Cap Reductn	0	0	0			0		0	0			
Reduced v/c Ratio	0.30	0.76	0.33			0.45		0.72	0.23			

Intersection Summary

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	27%
Maximum Green (s)	20.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 61: Taunton Green & Broadway

HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

9/17/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	794	193	0	0	1051	0	306	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1703	3406	1484			2547		1673	1256			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1703	3406	1484			2547		1673	1256			
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	197	873	212	0	0	1142	0	340	99	0	0	0
RTOR Reduction (vph)	89	0	141	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	108	873	71	0	0	1142	0	340	28	0	0	0
Heavy Vehicles (%)	6%	6%	11%	0%	0%	6%	2%	6%	8%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			89.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			89.0		25.0	25.0			
Actuated g/C Ratio	0.34	0.34	0.34			1.00		0.28	0.28			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	574	1148	500			2547		470	353			
v/s Ratio Prot		c0.26						c0.20				
v/s Ratio Perm	0.06		0.05			c0.45			0.02			
v/c Ratio	0.19	0.76	0.14			0.45		0.72	0.08			
Uniform Delay, d1	20.9	26.3	20.5			0.0		28.9	23.5			
Progression Factor	0.89	0.96	0.85			1.00		1.00	1.00			
Incremental Delay, d2	0.7	4.8	0.6			0.6		9.3	0.4			
Delay (s)	19.4	30.1	18.0			0.6		38.2	24.0			
Level of Service	B	C	B			A		D	C			
Approach Delay (s)		26.5			0.6			35.0			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
71: Court Street & Washington Street

9/17/2009

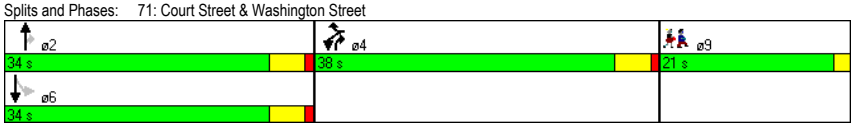
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø9
Lane Configurations							
Volume (vph)	438	21	638	295	37	421	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.88	0.88	0.87	0.87	0.85	0.85	
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	498	24	733	339	44	495	
Turn Type		Prot		pm+ov	Perm		
Protected Phases	4	4	2	4		6	9
Permitted Phases				2	6		
Detector Phase	4	4	2	4	6	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	10.0	5.0	10.0	10.0	3.0
Minimum Split (s)	10.0	10.0	15.0	10.0	15.0	15.0	21.0
Total Split (s)	38.0	38.0	34.0	38.0	34.0	34.0	21.0
Total Split (%)	40.9%	40.9%	36.6%	40.9%	36.6%	36.6%	23%
Maximum Green (s)	33.0	33.0	29.0	33.0	29.0	29.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	4.0	3.0	4.0	4.0	0.7
Recall Mode	None	None	C-Min	None	C-Min	C-Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							19
v/c Ratio	0.89	0.04	0.90	0.26	0.40	0.57	
Control Delay	48.5	14.8	42.6	1.0	39.3	25.3	
Queue Delay	0.0	0.0	175.4	0.1	0.0	0.0	
Total Delay	48.5	14.8	218.0	1.1	39.3	25.3	
Queue Length 50th (ft)	263	6	328	0	14	174	
Queue Length 95th (ft)	#415	22	#755	18	#73	#405	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	607	617	816	1275	110	874	
Starvation Cap Reductn	0	0	290	160	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.82	0.04	1.39	0.30	0.40	0.57	

Lanes, Volumes, Timings
71: Court Street & Washington Street

9/17/2009

Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 93	
Offset: 8 (9%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 71: Court Street & Washington Street

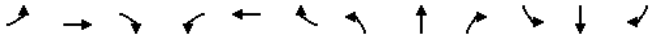


HCM Signalized Intersection Capacity Analysis
71: Court Street & Washington Street

9/17/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	438	21	638	295	37	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1711	1723	1722	1398	1805	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.12	1.00
Satd. Flow (perm)	1711	1723	1722	1398	231	1845
Peak-hour factor, PHF	0.88	0.88	0.87	0.87	0.85	0.85
Adj. Flow (vph)	498	24	733	339	44	495
RTOR Reduction (vph)	0	6	0	71	0	0
Lane Group Flow (vph)	498	18	733	268	44	495
Heavy Vehicles (%)	9%	0%	3%	4%	0%	3%
Turn Type		Prot		pm+ov	Perm	
Protected Phases	4	4	2	4		6
Permitted Phases				2	6	
Actuated Green, G (s)	30.5	30.5	42.9	73.4	42.9	42.9
Effective Green, g (s)	30.5	30.5	42.9	73.4	42.9	42.9
Actuated g/C Ratio	0.33	0.33	0.46	0.79	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	561	565	794	1179	107	851
v/s Ratio Prot	c0.29	0.01	c0.43	0.07		0.27
v/s Ratio Perm				0.12	0.19	
v/c Ratio	0.89	0.03	0.92	0.23	0.41	0.58
Uniform Delay, d1	29.6	21.2	23.5	2.5	16.7	18.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	0.0	17.9	0.1	11.3	2.9
Delay (s)	45.3	21.2	41.4	2.6	27.9	21.3
Level of Service	D	C	D	A	C	C
Approach Delay (s)	44.2		29.2			21.9
Approach LOS	D		C			C

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	0	104	0	136	0	776	164	105	745	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	16	16	12	9	12	12	12	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		216			709			574			260	
Travel Time (s)		4.9			16.1			13.0			5.9	
Peak Hour Factor	0.42	0.42	0.42	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	9%	0%	3%	0%	3%	15%	5%	6%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	120	156	0	1068	0	0	972	0
Turn Type	Perm			Perm		pm+ov	Perm			pm+pt		
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	15.0	15.0		15.0	15.0	9.0	15.0	15.0		9.0	9.0	
Total Split (s)	15.0	15.0	0.0	15.0	15.0	9.0	42.0	42.0	0.0	9.0	51.0	0.0
Total Split (%)	16.5%	16.5%	0.0%	16.5%	16.5%	9.9%	46.2%	46.2%	0.0%	9.9%	56.0%	0.0%
Maximum Green (s)	10.0	10.0		10.0	10.0	4.0	37.0	37.0		4.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.08			0.67	0.30		0.59			0.61	
Control Delay		36.8			57.9	5.2		14.7			10.7	
Queue Delay		0.0			0.0	0.0		0.0			5.3	
Total Delay		36.8			57.9	5.2		14.7			16.0	
Queue Length 50th (ft)		6			65	0		164			88	
Queue Length 95th (ft)		11			#147	28		357			#250	
Internal Link Dist (ft)		136			629			494			180	
Turn Bay Length (ft)												
Base Capacity (vph)		156			186	516		1825			1589	
Starvation Cap Reductn		0			0	0		0			544	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.08			0.65	0.30		0.59			0.93	

Intersection Summary	
Area Type:	Other

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	27%
Maximum Green (s)	23.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	12
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

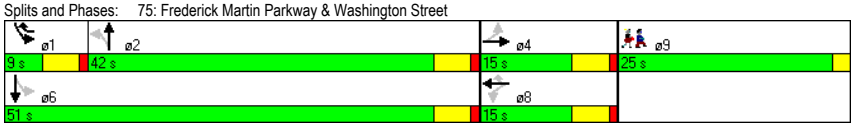
Intersection Summary

Lanes, Volumes, Timings
75: Frederick Martin Parkway & Washington Street

9/17/2009

Cycle Length: 91
Actuated Cycle Length: 91
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 75: Frederick Martin Parkway & Washington Street

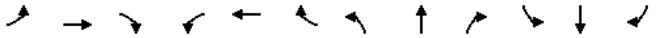


HCM Signalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

9/17/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	0	104	0	136	0	776	164	105	745	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	16	16	12	9	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00			1.00	1.00		0.95			0.95	
Frt		1.00			1.00	0.85		0.97			1.00	
Flt Protected		0.95			0.95	1.00		1.00			0.99	
Satd. Flow (prot)		1865			1877	1777		3011			3387	
Flt Permitted		0.64			0.75	1.00		1.00			0.62	
Satd. Flow (perm)		1248			1481	1777		3011			2123	
Peak-hour factor, PHF	0.42	0.42	0.42	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	0	0	120	0	156	0	882	186	119	847	6
RTOR Reduction (vph)	0	0	0	0	0	128	0	14	0	0	0	0
Lane Group Flow (vph)	0	12	0	0	120	28	0	1054	0	0	972	0
Heavy Vehicles (%)	0%	0%	0%	9%	0%	3%	0%	3%	15%	5%	6%	0%
Turn Type	Perm			Perm		pm+ov	Perm			pm+pt		
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		11.0			11.0	16.2		53.2			63.4	
Effective Green, g (s)		11.0			11.0	16.2		53.2			63.4	
Actuated g/C Ratio		0.12			0.12	0.18		0.58			0.70	
Clearance Time (s)		5.0			5.0	5.0		5.0			5.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		151			179	316		1760			1551	
v/s Ratio Prot						0.01		0.35			c0.04	
v/s Ratio Perm		0.01			c0.08	0.01					c0.40	
v/c Ratio		0.08			0.67	0.09		0.60			0.63	
Uniform Delay, d1		35.5			38.3	31.2		12.1			7.4	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.2			9.5	0.1		1.5			0.8	
Delay (s)		35.7			47.7	31.4		13.6			8.2	
Level of Service		D			D	C		B			A	
Approach Delay (s)		35.7			38.5			13.6			8.2	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	112	5	21	137	36	5	65	42	109	45	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	11	12	12	11	12
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		367			1375			1388			879	
Travel Time (s)		8.3			31.3			31.5			20.0	
Peak Hour Factor	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.70	0.70	0.70
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	285	0	0	165	0	0	234	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	829	356	405	769	220	78	330	220	150	235	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	10	12	13	12	11	16	12	11	12
Storage Length (ft)	100		70	100		70	0		50	0		100
Storage Lanes	1		1	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1663			1440			2994			1249	
Travel Time (s)		37.8			32.7			68.0			28.4	
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1274	0	422	1030	0	0	683	0	0	471	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	12.0		9.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		13.0	13.0		13.0	13.0	
Total Split (s)	14.0	39.0	0.0	26.0	51.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	11.4%	31.7%	0.0%	21.1%	41.5%	0.0%	24.4%	24.4%	0.0%	24.4%	24.4%	0.0%
Maximum Green (s)	9.0	34.0		21.0	46.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.08	1.08		1.21	0.52			1.12			2.42dl	
Control Delay	48.4	82.3		154.7	16.5			105.1			73.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	48.4	82.3		154.7	16.5			105.1			73.1	
Queue Length 50th (ft)	6	~426		~303	150			~224			145	
Queue Length 95th (ft)	28	#816		#668	457			#473			#316	
Internal Link Dist (ft)		1583			1360			2914			1169	
Turn Bay Length (ft)	100			100								
Base Capacity (vph)	153	1179		348	1981			612			485	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.07	1.08		1.21	0.52			1.12			0.97	

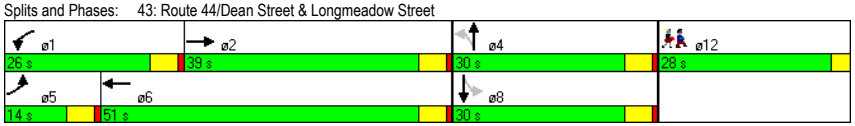
Lane Group	ø12
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	12
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	8.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	23%
Maximum Green (s)	25.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	18.0
Pedestrian Calls (#/hr)	7
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Lanes, Volumes, Timings
43: Route 44/Dean Street & Longmeadow Street

2030 Build Condition w/ mitigation - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 123	
Actuated Cycle Length: 100.6	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 43: Route 44/Dean Street & Longmeadow Street



HCM Signalized Intersection Capacity Analysis
43: Route 44/Dean Street & Longmeadow Street

2030 Build Condition w/ mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	829	356	405	769	220	78	330	220	150	235	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	10	12	13	12	11	16	12	11	12
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.95		1.00	0.97			0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1685	3347		1652	3388			3237			3379	
Flt Permitted	0.95	1.00		0.95	1.00			0.68			0.56	
Satd. Flow (perm)	1685	3347		1652	3388			2217			1924	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	11	891	383	422	801	229	85	359	239	179	280	12
RTOR Reduction (vph)	0	35	0	0	15	0	0	56	0	0	2	0
Lane Group Flow (vph)	11	1239	0	422	1015	0	0	627	0	0	469	0
Heavy Vehicles (%)	0%	3%	3%	2%	3%	3%	1%	2%	1%	1%	1%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.5	38.7		21.2	58.4			25.3			25.3	
Effective Green, g (s)	1.5	38.7		21.2	58.4			25.3			25.3	
Actuated g/C Ratio	0.01	0.36		0.20	0.54			0.24			0.24	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	4.0	5.0		4.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	24	1207		326	1844			523			454	
v/s Ratio Prot	0.01	c0.37		c0.26	0.30							
v/s Ratio Perm								c0.28			0.24	
v/c Ratio	0.46	1.03		1.29	0.55			1.20			2.42dl	
Uniform Delay, d1	52.5	34.3		43.0	15.9			41.0			41.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	17.7	33.0		153.5	0.6			107.0			51.3	
Delay (s)	70.2	67.3		196.5	16.5			148.0			92.3	
Level of Service	E	E		F	B			F			F	
Approach Delay (s)		67.3			68.8			148.0			92.3	
Approach LOS		E			E			F			F	

Intersection Summary					
HCM Average Control Delay	85.1	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.14				
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	22.1		
Intersection Capacity Utilization	103.0%	ICU Level of Service	G		
Analysis Period (min)	15				
dl Defacto Left Lane. Recode with 1 though lane as a left lane.					
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	105	173	106	170	240	290	803	122	120	882	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		50	0		50	50		0	50		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		1373			971			2224			3692	
Travel Time (s)		31.2			22.1			43.3			71.9	
Peak Hour Factor	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	254	0	291	253	0	1278	0	0	1054	0
Turn Type	Perm		pt+ov	Perm		pt+ov	pm+pt			pm+pt		
Protected Phases		4	4 3		4	4 1	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Detector Phase	4	4	4 3	4	4	4 1	3	2 3		1	1 2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0			4.0		
Minimum Split (s)	13.0	13.0		13.0	13.0		9.0			9.0		
Total Split (s)	36.0	36.0	45.0	36.0	36.0	46.0	9.0	79.0	0.0	10.0	80.0	0.0
Total Split (%)	24.0%	24.0%	30.0%	24.0%	24.0%	30.7%	6.0%	52.7%	0.0%	6.7%	53.3%	0.0%
Maximum Green (s)	31.0	31.0		31.0	31.0		4.0			5.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0			4.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0			1.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag		Lag	Lag		Lead			Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0			3.0		
Recall Mode	None	None		None	None		None			None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.75	0.44		1.03	0.44		1.13			0.96	
Control Delay		61.6	19.7		108.3	24.5		96.6			42.9	
Queue Delay		0.0	0.0		0.0	0.0		0.0			0.0	
Total Delay		61.6	19.7		108.3	24.5		96.6			42.9	
Queue Length 50th (ft)		154	81		~252	106		~406			242	
Queue Length 95th (ft)		173	92		#432	185		#617			#371	
Internal Link Dist (ft)		1293			891			2144			3612	
Turn Bay Length (ft)			50			50						
Base Capacity (vph)		274	573		282	580		1129			1101	
Starvation Cap Reductn		0	0		0	0		0			0	
Spillback Cap Reductn		0	0		0	0		0			0	
Storage Cap Reductn		0	0		0	0		0			0	
Reduced v/c Ratio		0.75	0.44		1.03	0.44		1.13			0.96	

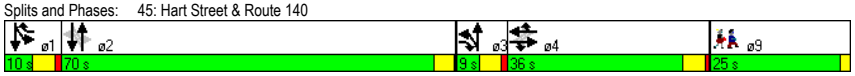
Lane Group	ø2	ø9
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Right Turn on Red		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	2	9
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	1.0
Minimum Split (s)	20.0	25.0
Total Split (s)	70.0	25.0
Total Split (%)	47%	17%
Maximum Green (s)	66.0	23.0
Yellow Time (s)	3.5	2.0
All-Red Time (s)	0.5	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		16.0
Pedestrian Calls (#/hr)		0
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 125	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 45: Hart Street & Route 140



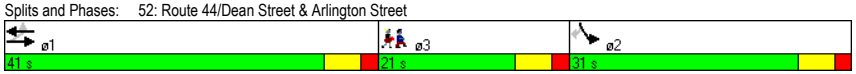
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	105	173	106	170	240	290	803	122	120	882	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0		4.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.98			1.00	
Flt Protected		0.99	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1801	1531		1839	1599		3363			3484	
Flt Permitted		0.60	1.00		0.61	1.00		0.55			0.53	
Satd. Flow (perm)		1103	1531		1137	1599		1875			1848	
Peak-hour factor, PHF	0.68	0.68	0.68	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	51	154	254	112	179	253	305	845	128	125	919	10
RTOR Reduction (vph)	0	0	83	0	0	55	0	5	0	0	0	0
Lane Group Flow (vph)	0	205	171	0	291	198	0	1273	0	0	1054	0
Heavy Vehicles (%)	0%	1%	2%	2%	1%	1%	1%	1%	1%	2%	3%	0%
Turn Type	Perm		pt+ov	Perm		pt+ov	pm+pt			pm+pt		
Protected Phases		4	4 3		4	4 1	3	2 3		1	1 2	
Permitted Phases	4			4			2 3			1 2		
Actuated Green, G (s)		31.0	40.0		31.0	41.0		70.0			71.0	
Effective Green, g (s)		31.0	40.0		31.0	41.0		70.0			71.0	
Actuated g/C Ratio		0.25	0.32		0.25	0.33		0.56			0.57	
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		274	490		282	524		1098			1115	
v/s Ratio Prot			0.11			0.12		c0.04			c0.04	
v/s Ratio Perm		0.19			c0.26			c0.61			0.50	
v/c Ratio		0.75	0.35		1.03	0.38		1.16			0.94	
Uniform Delay, d1		43.4	32.5		47.0	32.2		27.5			25.2	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		10.6	0.4		62.1	0.5		82.2			15.4	
Delay (s)		54.0	33.0		109.1	32.7		109.7			40.6	
Level of Service		D	C		F	C		F			D	
Approach Delay (s)		42.4			73.6			109.7			40.6	
Approach LOS		D			E			F			D	

Intersection Summary					
HCM Average Control Delay	72.7	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.10				
Actuated Cycle Length (s)	125.0	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	100.8%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø3
Lane Configurations							
Volume (vph)	25	795	750	93	406	79	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	10	12	16	12	14	12	
Storage Length (ft)	150			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25			25	25	25	
Right Turn on Red				Yes		No	
Link Speed (mph)		30	30		30		
Link Distance (ft)		1036	1663		418		
Travel Time (s)		23.5	37.8		9.5		
Peak Hour Factor	0.89	0.89	0.98	0.98	0.97	0.97	
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	28	893	860	0	419	81	
Turn Type	Perm					Perm	
Protected Phases		1	1		2		3
Permitted Phases	1					2	
Detector Phase	1	1	1		2	2	
Switch Phase							
Minimum Initial (s)	9.0	9.0	9.0		4.0	4.0	5.0
Minimum Split (s)	15.0	15.0	15.0		10.0	10.0	21.0
Total Split (s)	41.0	41.0	41.0	0.0	31.0	31.0	21.0
Total Split (%)	44.1%	44.1%	44.1%	0.0%	33.3%	33.3%	23%
Maximum Green (s)	35.0	35.0	35.0		25.0	25.0	15.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	1.0
Recall Mode	None	None	None		None	None	None
Walk Time (s)							5.0
Flash Dont Walk (s)							10.0
Pedestrian Calls (#/hr)							0
v/c Ratio	0.26	0.93	0.79		0.74	0.18	
Control Delay	18.4	34.2	21.2		29.7	18.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	18.4	34.2	21.2		29.7	18.0	
Queue Length 50th (ft)	6	319	268		153	24	
Queue Length 95th (ft)	28	#620	#545		244	53	
Internal Link Dist (ft)		956	1583		338		
Turn Bay Length (ft)	150						
Base Capacity (vph)	108	965	1084		712	574	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.26	0.93	0.79		0.59	0.14	

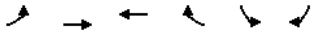
Intersection Summary	
Area Type:	Other
Cycle Length: 93	
Actuated Cycle Length: 67.2	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 52: Route 44/Dean Street & Arlington Street



HCM Signalized Intersection Capacity Analysis
52: Route 44/Dean Street & Arlington Street

2030 Build Condition w/ mitigation - PM Peak Hour

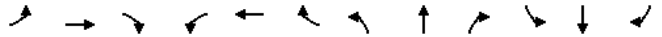


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	795	750	93	406	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	16	12	14	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1685	1845	2066		1906	1538
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	205	1845	2066		1906	1538
Peak-hour factor, PHF	0.89	0.89	0.98	0.98	0.97	0.97
Adj. Flow (vph)	28	893	765	95	419	81
RTOR Reduction (vph)	0	0	4	0	0	0
Lane Group Flow (vph)	28	893	856	0	419	81
Heavy Vehicles (%)	0%	3%	3%	0%	1%	5%
Turn Type	Perm					Perm
Protected Phases		1	1		2	
Permitted Phases	1					2
Actuated Green, G (s)	35.1	35.1	35.1		20.0	20.0
Effective Green, g (s)	35.1	35.1	35.1		20.0	20.0
Actuated g/C Ratio	0.52	0.52	0.52		0.30	0.30
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	107	965	1081		568	458
v/s Ratio Prot		c0.48	0.41		c0.22	
v/s Ratio Perm	0.14					0.05
v/c Ratio	0.26	0.93	0.79		0.74	0.18
Uniform Delay, d1	8.8	14.8	13.0		21.2	17.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	14.2	4.0		5.0	0.2
Delay (s)	10.1	29.0	17.1		26.2	17.6
Level of Service	B	C	B		C	B
Approach Delay (s)		28.4	17.1		24.8	
Approach LOS		C	B		C	

Intersection Summary				
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
61: Taunton Green & Broadway

2030 Build Condition w/ mitigation - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	961	347	0	0	1155	0	202	131	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	10	10	12	12	12
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		304			913			579			302	
Travel Time (s)		6.9			20.8			13.2			6.9	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	1033	373	0	0	1255	0	230	149	0	0	0
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Detector Phase	1	1	1					3	3			
Switch Phase												
Minimum Initial (s)	30.0	30.0	30.0					25.0	25.0			
Minimum Split (s)	35.0	35.0	35.0					30.0	30.0			
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0
Total Split (%)	39.3%	39.3%	39.3%	0.0%	0.0%	0.0%	0.0%	33.7%	33.7%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0	30.0					25.0	25.0			
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Recall Mode	Max	Max	Max					Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.26	0.87	0.47			0.47		0.47	0.31			
Control Delay	7.5	37.0	4.2			0.6		30.4	6.4			
Queue Delay	0.0	0.0	0.0			0.0		0.0	0.0			
Total Delay	7.5	37.0	4.2			0.6		30.4	6.4			
Queue Length 50th (ft)	16	283	0			0		107	0			
Queue Length 95th (ft)	60	#397	53			0		172	41			
Internal Link Dist (ft)		224			833			499			222	
Turn Bay Length (ft)												
Base Capacity (vph)	684	1181	792			2647		488	481			
Starvation Cap Reductn	0	0	0			0		0	0			
Spillback Cap Reductn	0	0	0			0		0	0			
Storage Cap Reductn	0	0	0			0		0	0			
Reduced v/c Ratio	0.26	0.87	0.47			0.47		0.47	0.31			

Intersection Summary

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	27%
Maximum Green (s)	20.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	0
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 61: Taunton Green & Broadway

HCM Signalized Intersection Capacity Analysis
61: Taunton Green & Broadway

2030 Build Condition w/ mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	961	347	0	0	1155	0	202	131	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	10	10	12	12	12
Total Lost time (s)	5.0	5.0	5.0			4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95	1.00			0.88		1.00	1.00			
Frt	1.00	1.00	0.85			0.85		1.00	0.85			
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (prot)	1770	3505	1615			2647		1739	1330			
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00			
Satd. Flow (perm)	1770	3505	1615			2647		1739	1330			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	181	1033	373	0	0	1255	0	230	149	0	0	0
RTOR Reduction (vph)	88	0	247	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	93	1033	126	0	0	1255	0	230	42	0	0	0
Heavy Vehicles (%)	2%	3%	2%	0%	0%	2%	0%	2%	2%	0%	0%	0%
Parking (#/hr)			0			0			0			
Turn Type	Perm		Perm			Free			Perm			
Protected Phases		1						3				
Permitted Phases	1		1			Free			3			
Actuated Green, G (s)	30.0	30.0	30.0			89.0		25.0	25.0			
Effective Green, g (s)	30.0	30.0	30.0			89.0		25.0	25.0			
Actuated g/C Ratio	0.34	0.34	0.34			1.00		0.28	0.28			
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0			
Vehicle Extension (s)	2.0	2.0	2.0					2.0	2.0			
Lane Grp Cap (vph)	597	1181	544			2647		488	374			
v/s Ratio Prot		c0.29						0.13				
v/s Ratio Perm	0.05		0.08			c0.47			0.03			
v/c Ratio	0.16	0.87	0.23			0.47		0.47	0.11			
Uniform Delay, d1	20.6	27.7	21.2			0.0		26.5	23.8			
Progression Factor	0.92	0.98	0.86			1.00		1.00	1.00			
Incremental Delay, d2	0.6	9.1	1.0			0.6		3.2	0.6			
Delay (s)	19.5	36.2	19.3			0.6		29.8	24.4			
Level of Service	B	D	B			A		C	C			
Approach Delay (s)		30.3			0.6			27.6			0.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

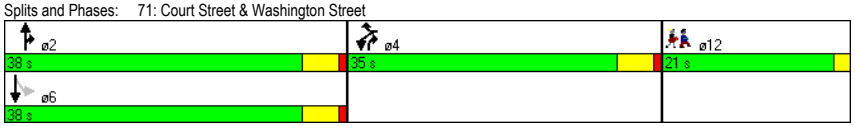
Lanes, Volumes, Timings
71: Court Street & Washington Street

2030 Build Condition w/ mitigation - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø12
Lane Configurations							
Volume (vph)	457	21	578	289	52	694	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	14	10	9	12	12	
Storage Length (ft)	0	50		0	0		
Storage Lanes	1	1		1	1		
Taper Length (ft)	25	25		25	25		
Right Turn on Red		Yes		Yes			
Link Speed (mph)	30		30			30	
Link Distance (ft)	1051		260			584	
Travel Time (s)	23.9		5.9			13.3	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.95	0.95	
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	486	22	628	314	55	731	
Turn Type		Prot		pt+ov	Perm		
Protected Phases	4	4	2	2 4		6	12
Permitted Phases					6		
Detector Phase	4	4	2	2 4	6	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0	3.0
Minimum Split (s)	10.0	10.0	15.0		15.0	15.0	21.0
Total Split (s)	35.0	35.0	38.0	73.0	38.0	38.0	21.0
Total Split (%)	37.2%	37.2%	40.4%	77.7%	40.4%	40.4%	22%
Maximum Green (s)	30.0	30.0	33.0		33.0	33.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	4.0		4.0	4.0	0.7
Recall Mode	None	None	C-Min		C-Min	C-Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							21
v/c Ratio	0.90	0.04	0.71	0.24	0.26	0.77	
Control Delay	52.8	16.9	28.0	0.9	23.8	30.1	
Queue Delay	0.0	0.0	105.9	0.1	0.0	0.0	
Total Delay	52.8	16.9	134.0	1.0	23.8	30.1	
Queue Length 50th (ft)	267	6	231	0	15	283	
Queue Length 95th (ft)	#438	23	#609	20	62	#719	
Internal Link Dist (ft)	971		180			504	
Turn Bay Length (ft)		50					
Base Capacity (vph)	578	555	889	1296	212	952	
Starvation Cap Reductn	0	0	377	173	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.04	1.23	0.28	0.26	0.77	

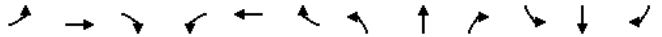
Intersection Summary	
Area Type:	Other
Cycle Length: 94	
Actuated Cycle Length: 94	
Offset: 4 (4%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 71: Court Street & Washington Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	457	21	578	289	52	694
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	14	10	9	12	12
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1811	1723	1756	1425	1671	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.24	1.00
Satd. Flow (perm)	1811	1723	1756	1425	419	1881
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.95	0.95
Adj. Flow (vph)	486	22	628	314	55	731
RTOR Reduction (vph)	0	6	0	49	0	0
Lane Group Flow (vph)	486	16	628	265	55	731
Heavy Vehicles (%)	3%	0%	1%	2%	8%	1%
Turn Type		Prot		pt+ov	Perm	
Protected Phases	4	4	2	2 4		6
Permitted Phases					6	
Actuated Green, G (s)	28.0	28.0	46.4	79.4	46.4	46.4
Effective Green, g (s)	28.0	28.0	46.4	79.4	46.4	46.4
Actuated g/C Ratio	0.30	0.30	0.49	0.84	0.49	0.49
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	4.0		4.0	4.0
Lane Grp Cap (vph)	539	513	867	1204	207	928
v/s Ratio Prot	c0.27	0.01	0.36	0.19		c0.39
v/s Ratio Perm					0.13	
v/c Ratio	0.90	0.03	0.72	0.22	0.27	0.79
Uniform Delay, d1	31.7	23.4	18.8	1.4	13.9	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.2	0.0	5.2	0.1	3.1	6.7
Delay (s)	49.9	23.4	24.0	1.5	17.0	26.4
Level of Service	D	C	C	A	B	C
Approach Delay (s)	48.8		16.5			25.8
Approach LOS	D		B			C

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	5	98	0	173	5	705	323	241	878	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	16	16	12	9	12	12	12	12
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		216			530			574			260	
Travel Time (s)		4.9			12.0			13.0			5.9	
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	2%	3%	1%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	108	190	0	1110	0	0	1190	0
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		4			8	8 1		2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8	8 1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	10.0		15.0	15.0		15.0	15.0		10.0	10.0	
Total Split (s)	15.0	15.0	0.0	15.0	15.0	25.0	41.0	41.0	0.0	10.0	51.0	0.0
Total Split (%)	16.5%	16.5%	0.0%	16.5%	16.5%	27.5%	45.1%	45.1%	0.0%	11.0%	56.0%	0.0%
Maximum Green (s)	10.0	10.0		10.0	10.0		36.0	36.0		5.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.05			0.63	0.48		0.63			0.81	
Control Delay		37.2			56.2	31.7		16.3			15.7	
Queue Delay		0.0			0.0	0.0		0.0			26.5	
Total Delay		37.2			56.2	31.7		16.3			42.2	
Queue Length 50th (ft)		5			60	94		165			92	
Queue Length 95th (ft)		12			#128	110		#471			#501	
Internal Link Dist (ft)		136			450			494			180	
Turn Bay Length (ft)												
Base Capacity (vph)		187			176	380		1750			1465	
Starvation Cap Reductn		0			0	0		0			326	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.05			0.61	0.50		0.63			1.04	

Intersection Summary	
Area Type:	Other

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	27%
Maximum Green (s)	23.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

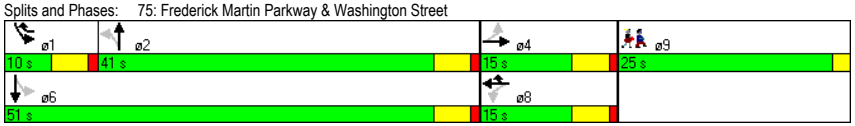
Intersection Summary

Lanes, Volumes, Timings
75: Frederick Martin Parkway & Washington Street

2030 Build Condition w/ mitigation - PM Peak Hour

Cycle Length: 91
Actuated Cycle Length: 91
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 75: Frederick Martin Parkway & Washington Street



HCM Signalized Intersection Capacity Analysis
75: Frederick Martin Parkway & Washington Street

2030 Build Condition w/ mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	5	98	0	173	5	705	323	241	878	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	16	16	12	9	12	12	12	12
Total Lost time (s)		5.0			5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00			1.00	1.00		0.95			0.95	
Frt		0.86			1.00	0.85		0.95			1.00	
Flt Protected		1.00			0.95	1.00		1.00			0.99	
Satd. Flow (prot)		1698			2025	1830		3026			3509	
Flt Permitted		1.00			0.75	1.00		0.95			0.53	
Satd. Flow (perm)		1698			1601	1830		2876			1867	
Peak-hour factor, PHF	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Adj. Flow (vph)	0	0	10	108	0	190	5	758	347	256	934	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	10	0	0	108	190	0	1110	0	0	1190	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	2%	3%	1%	2%	0%
Turn Type	Perm			Perm		pt+ov	Perm			pm+pt		
Protected Phases		4			8	8 1		2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.7			9.7	15.6		53.8			64.7	
Effective Green, g (s)		9.7			9.7	15.6		53.8			64.7	
Actuated g/C Ratio		0.11			0.11	0.17		0.59			0.71	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		181			171	314		1700			1434	
v/s Ratio Prot		0.01				0.10					c0.05	
v/s Ratio Perm					c0.07			0.39			c0.54	
v/c Ratio		0.06			0.63	0.61		0.65			0.83	
Uniform Delay, d1		36.5			38.9	34.9		12.4			9.3	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.1			7.4	3.3		2.0			4.1	
Delay (s)		36.7			46.3	38.1		14.4			13.4	
Level of Service		D			D	D		B			B	
Approach Delay (s)		36.7			41.1			14.4			13.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		698			192			454			574	
Travel Time (s)		15.9			4.4			10.3			13.0	
Peak Hour Factor	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Shared Lane Traffic (%)	20%											
Lane Group Flow (vph)	415	404	0	0	241	0	0	644	0	0	491	583
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Detector Phase	1	1		2	2		3	8		4	4	1
Switch Phase												
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0	18.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0	24.0
Total Split (s)	38.0	38.0	0.0	22.0	22.0	0.0	11.0	63.0	0.0	52.0	52.0	38.0
Total Split (%)	25.9%	25.9%	0.0%	15.0%	15.0%	0.0%	7.5%	42.9%	0.0%	35.4%	35.4%	25.9%
Maximum Green (s)	32.0	32.0		17.0	17.0		6.0	57.0		46.0	46.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	Max		Max	Max	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.98	1.00			1.04			0.78			0.75	0.46
Control Delay	91.0	96.4			126.9			44.1			44.8	2.0
Queue Delay	0.0	0.0			0.0			0.0			3.6	0.6
Total Delay	91.0	96.4			126.9			44.1			48.4	2.5
Queue Length 50th (ft)	~455	~442			~260			291			418	0
Queue Length 95th (ft)	#682	#668			#373			#385			554	35
Internal Link Dist (ft)		618			112			374			494	
Turn Bay Length (ft)												
Base Capacity (vph)	425	403			231			821			652	1279
Starvation Cap Reductn	0	0			0			0			91	334
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.98	1.00			1.04			0.78			0.88	0.62

Intersection Summary	
Area Type:	Other

Lane Group	ø5
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	19.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	22
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

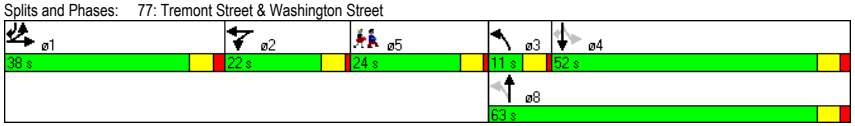
Intersection Summary

Lanes, Volumes, Timings
77: Tremont Street & Washington Street

2030 Build Condition w/ mitigation - PM Peak Hour

Cycle Length: 147
Actuated Cycle Length: 137.4
Natural Cycle: 145
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 77: Tremont Street & Washington Street

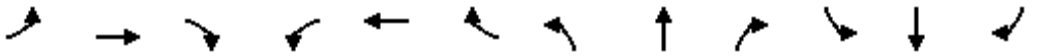


HCM Signalized Intersection Capacity Analysis
77: Tremont Street & Washington Street

2030 Build Condition w/ mitigation - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Lane Util. Factor	0.95	0.95			1.00			0.95			1.00	1.00
Frt	1.00	0.95			0.97			0.98			1.00	0.85
Flt Protected	0.95	0.99			0.99			0.99			1.00	1.00
Satd. Flow (prot)	1811	1672			1804			3355			1764	1583
Flt Permitted	0.95	0.99			0.99			0.57			0.88	1.00
Satd. Flow (perm)	1811	1672			1804			1952			1559	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	519	178	122	33	162	46	170	409	65	42	449	583
RTOR Reduction (vph)	0	11	0	0	6	0	0	5	0	0	0	208
Lane Group Flow (vph)	415	393	0	0	235	0	0	639	0	0	491	375
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Actuated Green, G (s)	32.2	32.2			17.1			57.4			57.4	89.6
Effective Green, g (s)	32.2	32.2			17.1			57.4			57.4	89.6
Actuated g/C Ratio	0.23	0.23			0.12			0.41			0.41	0.64
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	418	386			221			804			642	1086
v/s Ratio Prot	0.23	c0.24			c0.13							0.08
v/s Ratio Perm								c0.33			0.32	0.16
v/c Ratio	0.99	1.02			1.06			0.79			0.76	0.35
Uniform Delay, d1	53.5	53.6			61.2			35.8			35.2	11.4
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	41.9	50.6			78.1			5.1			8.4	0.1
Delay (s)	95.4	104.2			139.2			40.9			43.6	11.5
Level of Service	F	F			F			D			D	B
Approach Delay (s)		99.7			139.2			40.9			26.2	
Approach LOS		F			F			D			C	

Intersection Summary					
HCM Average Control Delay	61.1	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	139.4	Sum of lost time (s)		32.7	
Intersection Capacity Utilization	91.9%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	12	16	12	12	12	13	12	12	12	11	12
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		698			192			454			574	
Travel Time (s)		15.9			4.4			10.3			13.0	
Peak Hour Factor	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Shared Lane Traffic (%)	20%											
Lane Group Flow (vph)	415	404	0	0	241	0	0	644	0	0	491	583
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Detector Phase	1	1		2	2		3	8		4	4	1
Switch Phase												
Minimum Initial (s)	18.0	18.0		7.0	7.0		6.0	18.0		18.0	18.0	18.0
Minimum Split (s)	24.0	24.0		12.0	12.0		11.0	24.0		24.0	24.0	24.0
Total Split (s)	38.0	38.0	0.0	22.0	22.0	0.0	11.0	63.0	0.0	52.0	52.0	38.0
Total Split (%)	25.9%	25.9%	0.0%	15.0%	15.0%	0.0%	7.5%	42.9%	0.0%	35.4%	35.4%	25.9%
Maximum Green (s)	32.0	32.0		17.0	17.0		6.0	57.0		46.0	46.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		1.0	1.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead			Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	Max		Max	Max	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.98	1.00			1.04			0.78			0.75	0.46
Control Delay	91.0	96.4			126.9			44.1			44.8	2.0
Queue Delay	0.0	0.0			0.0			0.0			3.6	0.6
Total Delay	91.0	96.4			126.9			44.1			48.4	2.5
Queue Length 50th (ft)	~455	~442			~260			291			418	0
Queue Length 95th (ft)	#682	#668			#373			#385			554	35
Internal Link Dist (ft)		618			112			374			494	
Turn Bay Length (ft)												
Base Capacity (vph)	425	403			231			821			652	1279
Starvation Cap Reductn	0	0			0			0			91	334
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.98	1.00			1.04			0.78			0.88	0.62

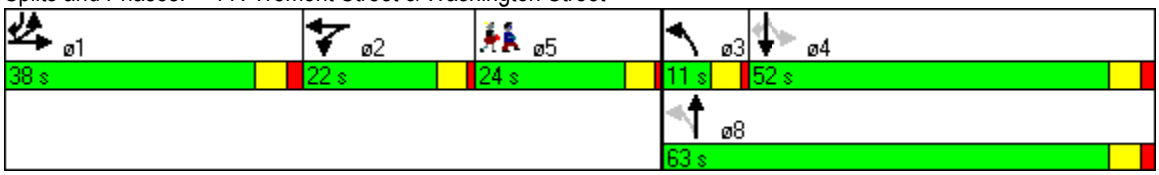
Intersection Summary	
Area Type:	Other

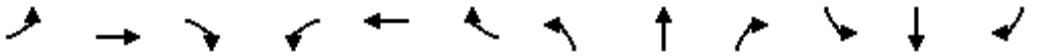
Lane Group	ø5
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	16%
Maximum Green (s)	19.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	22
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Cycle Length: 147
Actuated Cycle Length: 137.4
Natural Cycle: 145
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 77: Tremont Street & Washington Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	173	118	27	131	37	160	384	61	37	395	513
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	12	16	12	12	12	13	12	12	12	11	12
Total Lost time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Lane Util. Factor	0.95	0.95			1.00			0.95			1.00	1.00
Frt	1.00	0.95			0.97			0.98			1.00	0.85
Flt Protected	0.95	0.99			0.99			0.99			1.00	1.00
Satd. Flow (prot)	1811	1672			1804			3355			1764	1583
Flt Permitted	0.95	0.99			0.99			0.57			0.88	1.00
Satd. Flow (perm)	1811	1672			1804			1952			1559	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.81	0.81	0.81	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	519	178	122	33	162	46	170	409	65	42	449	583
RTOR Reduction (vph)	0	11	0	0	6	0	0	5	0	0	0	208
Lane Group Flow (vph)	415	393	0	0	235	0	0	639	0	0	491	375
Heavy Vehicles (%)	1%	2%	2%	0%	2%	3%	3%	6%	0%	0%	4%	2%
Turn Type	Split			Split			pm+pt			Perm		pm+ov
Protected Phases	1	1		2	2		3	8			4	1
Permitted Phases							8			4		4
Actuated Green, G (s)	32.2	32.2			17.1			57.4			57.4	89.6
Effective Green, g (s)	32.2	32.2			17.1			57.4			57.4	89.6
Actuated g/C Ratio	0.23	0.23			0.12			0.41			0.41	0.64
Clearance Time (s)	6.0	6.0			5.0			6.0			6.0	6.0
Vehicle Extension (s)	2.0	2.0			2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	418	386			221			804			642	1086
v/s Ratio Prot	0.23	c0.24			c0.13							0.08
v/s Ratio Perm								c0.33			0.32	0.16
v/c Ratio	0.99	1.02			1.06			0.79			0.76	0.35
Uniform Delay, d1	53.5	53.6			61.2			35.8			35.2	11.4
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	41.9	50.6			78.1			5.1			8.4	0.1
Delay (s)	95.4	104.2			139.2			40.9			43.6	11.5
Level of Service	F	F			F			D			D	B
Approach Delay (s)		99.7			139.2			40.9			26.2	
Approach LOS		F			F			D			C	

Intersection Summary			
HCM Average Control Delay	61.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	139.4	Sum of lost time (s)	32.7
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Norton

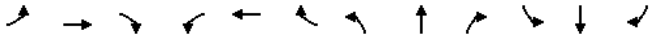
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	355	180	52	310	50	198	128	132	70	65	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	16	12
Storage Length (ft)	0		0	0		0	200		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		221			255			2304			335	
Travel Time (s)		5.0			5.8			44.9			6.5	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.79	0.79	0.79	0.67	0.67	0.67
Heavy Vehicles (%)	13%	4%	7%	0%	3%	2%	1%	5%	5%	13%	9%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	604	0	0	447	62	0	580	0	0	216	0
Turn Type	Perm			Perm		Perm	pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	24.0	24.0		24.0	24.0	24.0	8.0	24.0		24.0	24.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	60.0	8.0	32.0	0.0	24.0	24.0	0.0
Total Split (%)	65.2%	65.2%	0.0%	65.2%	65.2%	65.2%	8.7%	34.8%	0.0%	26.1%	26.1%	0.0%
Maximum Green (s)	54.0	54.0		54.0	54.0	54.0	4.0	26.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0		5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0		0	0	
v/c Ratio		0.82			0.66	0.09		0.96			0.47	
Control Delay		26.7			19.9	10.6		53.7			22.6	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		26.7			19.9	10.6		53.7			22.6	
Queue Length 50th (ft)		208			139	14		224			64	
Queue Length 95th (ft)		324			188	29		#458			112	
Internal Link Dist (ft)		141			175			2224			255	
Turn Bay Length (ft)												
Base Capacity (vph)		1369			1259	1276		604			464	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.44			0.36	0.05		0.96			0.47	

Lanes, Volumes, Timings
1: Route 123 & N. Worcester Street
2030 Build with Mitigation Condition - AM Peak Hour

Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 68.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 123 & N. Worcester Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	355	180	52	310	50	198	128	132	70	65	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frt		0.96			1.00	0.85		0.96			0.99	
Flt Protected		1.00			0.99	1.00		0.98			0.98	
Satd. Flow (prot)		1724			1839	1583		1962			1878	
Flt Permitted		0.98			0.84	1.00		0.78			0.62	
Satd. Flow (perm)		1698			1562	1583		1557			1193	
Peak-hour factor, PHF	0.91	0.91	0.91	0.81	0.81	0.81	0.79	0.79	0.79	0.67	0.67	0.67
Adj. Flow (vph)	16	390	198	64	383	62	251	162	167	104	97	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	604	0	0	447	62	0	580	0	0	216	0
Heavy Vehicles (%)	13%	4%	7%	0%	3%	2%	1%	5%	5%	13%	9%	9%
Turn Type	Perm			Perm		Perm	pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		29.5			29.5	29.5		26.4			26.4	
Effective Green, g (s)		29.5			29.5	29.5		26.4			26.4	
Actuated g/C Ratio		0.43			0.43	0.43		0.39			0.39	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		738			679	688		605			464	
v/s Ratio Prot												
v/s Ratio Perm		c0.36			0.29	0.04		c0.37			0.18	
v/c Ratio		0.82			0.66	0.09		0.96			0.47	
Uniform Delay, d1		16.8			15.2	11.3		20.2			15.5	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		7.0			2.3	0.1		26.3			0.7	
Delay (s)		23.9			17.5	11.4		46.5			16.2	
Level of Service		C			B	B		D			B	
Approach Delay (s)		23.9			16.8			46.5			16.2	
Approach LOS		C			B			D			B	

Intersection Summary				
HCM Average Control Delay	28.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
1: Route 123 & N. Worcester Street

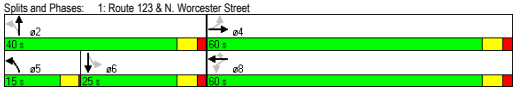
2030 Build with Mitigation Condition - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	295	255	154	425	75	179	74	119	65	159	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	16	12
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		221			255			2304			335	
Travel Time (s)		5.0			5.8			44.9			6.5	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.93	0.93	0.93	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	1%	2%	1%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	582	0	0	651	84	0	400	0	0	278	0
Turn Type	Perm			Perm		Perm	pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	24.0	24.0		24.0	24.0	24.0	8.0	24.0		24.0	24.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	60.0	15.0	40.0	0.0	25.0	25.0	0.0
Total Split (%)	60.0%	60.0%	0.0%	60.0%	60.0%	60.0%	15.0%	40.0%	0.0%	25.0%	25.0%	0.0%
Maximum Green (s)	54.0	54.0		54.0	54.0	54.0	11.0	34.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0	7.0		5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0		0	0	
v/c Ratio		0.62			0.98	0.10		1.02			0.48	
Control Delay		19.7			55.7	11.6		85.1			29.5	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		19.7			55.7	11.6		85.1			29.5	
Queue Length 50th (ft)		244			386	25		~263			139	
Queue Length 95th (ft)		358			#631	48		#455			211	
Internal Link Dist (ft)		141			175			2224			255	
Turn Bay Length (ft)												
Base Capacity (vph)		934			662	872		392			575	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.62			0.98	0.10		1.02			0.48	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Route 123 & N. Worcester Street



HCM Signalized Intersection Capacity Analysis
1: Route 123 & N. Worcester Street

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	295	255	154	425	75	179	74	119	65	159	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	12	16	12
Total Lost time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frt		0.94			1.00	0.85		0.96			0.99	
Flt Protected		1.00			0.99	1.00		0.98			0.99	
Satd. Flow (prot)		1763			1843	1615		1696			2091	
Flt Permitted		0.98			0.66	1.00		0.66			0.80	
Satd. Flow (perm)		1729			1225	1615		1153			1690	
Peak-hour factor, PHF	0.97	0.97	0.97	0.89	0.89	0.89	0.93	0.93	0.93	0.88	0.88	0.88
Adj. Flow (vph)	15	304	263	173	478	84	192	80	128	74	181	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	582	0	0	651	84	0	400	0	0	278	0
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	1%	2%	1%	0%	0%	6%
Turn Type	Perm			Perm		Perm	pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		54.0			54.0	54.0		34.0			34.0	
Effective Green, g (s)		54.0			54.0	54.0		34.0			34.0	
Actuated g/C Ratio		0.54			0.54	0.54		0.34			0.34	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		934			662	872		392			575	
v/s Ratio Prot												
v/s Ratio Perm		0.34			c0.53	0.05		c0.35			0.16	
v/c Ratio		0.62			0.98	0.10		1.02			0.48	
Uniform Delay, d1		15.9			22.6	11.2		33.0			26.1	
Progression Factor		1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.3			30.6	0.0		50.7			0.6	
Delay (s)		17.2			53.2	11.2		83.7			26.7	
Level of Service		B			D	B		F			C	
Approach Delay (s)		17.2			48.4			83.7			26.7	
Approach LOS		B			D			F			C	

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

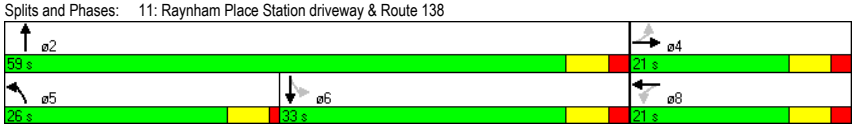
Raynham

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	0	48	0	0	20	211	1220	0	5	355	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	200		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		897			574			510			2071	
Travel Time (s)		20.4			13.0			11.6			47.1	
Peak Hour Factor	0.68	0.68	0.68	0.56	0.56	0.56	0.91	0.91	0.91	0.79	0.79	0.79
Heavy Vehicles (%)	75%	0%	50%	0%	0%	0%	11%	3%	0%	0%	12%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	71	0	0	36	0	232	1341	0	0	517	0
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	21.0	21.0	0.0	21.0	21.0	0.0	26.0	59.0	0.0	33.0	33.0	0.0
Total Split (%)	26.3%	26.3%	0.0%	26.3%	26.3%	0.0%	32.5%	73.8%	0.0%	41.3%	41.3%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0		21.0	53.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	7.0	7.0										
Pedestrian Calls (#/hr)	5	5										
v/c Ratio	0.39	0.11			0.11		0.60	0.55			0.50	
Control Delay	33.4	0.3			2.6		27.8	7.2			19.2	
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	
Total Delay	33.4	0.3			2.6		27.8	7.2			19.2	
Queue Length 50th (ft)	15	0			0		67	120			73	
Queue Length 95th (ft)	39	0			0		163	220			126	
Internal Link Dist (ft)		817			494			430			1991	
Turn Bay Length (ft)							175					
Base Capacity (vph)	220	716			507		629	3143			1496	
Starvation Cap Reductn	0	0			0		0	0			0	
Spillback Cap Reductn	0	0			0		0	0			0	
Storage Cap Reductn	0	0			0		0	0			0	
Reduced v/c Ratio	0.23	0.10			0.07		0.37	0.43			0.35	

Intersection Summary

Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 56.9	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	

Splits and Phases: 11: Raynham Place Station driveway & Route 138



HCM Signalized Intersection Capacity Analysis
11: Raynham Place Station driveway & Route 138

2030 Build with Mitigation Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	0	48	0	0	20	211	1220	0	5	355	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		5.0	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	
Frt	1.00	0.85			0.86		1.00	1.00			0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1031	1077			1644		1626	3505			3209	
Flt Permitted	0.73	1.00			1.00		0.95	1.00			0.93	
Satd. Flow (perm)	797	1077			1644		1626	3505			2990	
Peak-hour factor, PHF	0.68	0.68	0.68	0.56	0.56	0.56	0.91	0.91	0.91	0.79	0.79	0.79
Adj. Flow (vph)	51	0	71	0	0	36	232	1341	0	6	449	62
RTOR Reduction (vph)	0	61	0	0	31	0	0	0	0	0	13	0
Lane Group Flow (vph)	51	10	0	0	5	0	232	1341	0	0	504	0
Heavy Vehicles (%)	75%	0%	50%	0%	0%	0%	11%	3%	0%	0%	12%	0%
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	7.9	7.9			7.9		13.6	38.1			19.5	
Effective Green, g (s)	7.9	7.9			7.9		13.6	38.1			19.5	
Actuated g/C Ratio	0.14	0.14			0.14		0.23	0.66			0.34	
Clearance Time (s)	6.0	6.0			6.0		5.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	109	147			224		381	2302			1005	
v/s Ratio Prot		0.01			0.00		0.14	c0.38				
v/s Ratio Perm	c0.06										0.17	
v/c Ratio	0.47	0.07			0.02		0.61	0.58			0.50	
Uniform Delay, d1	23.1	21.8			21.7		19.8	5.5			15.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.2	0.2			0.0		2.8	0.4			0.4	
Delay (s)	26.3	22.0			21.7		22.6	5.9			15.8	
Level of Service	C	C			C		C	A			B	
Approach Delay (s)		23.8			21.7			8.4			15.8	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM Average Control Delay	11.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
36: Elm Street & Route 138

2030 Build with Mitigation Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	20	25	225	5	87	5	1276	205	44	358	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	103	0	326	133	0	0	1580	0	0	521	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0		12.0	23.0		35.0	35.0		35.0	35.0	
Total Split (s)	23.0	23.0	0.0	13.0	35.0	0.0	60.0	60.0	0.0	60.0	60.0	0.0
Total Split (%)	24.0%	24.0%	0.0%	13.5%	36.5%	0.0%	62.5%	62.5%	0.0%	62.5%	62.5%	0.0%
Maximum Green (s)	18.0	18.0		8.0	30.0		55.0	55.0		55.0	55.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0			10.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
v/c Ratio		0.60		0.85	0.32			0.78			0.40	
Control Delay		53.4		53.9	28.4			17.9			11.3	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		53.4		53.9	28.4			17.9			11.3	
Queue Length 50th (ft)		60		173	62			360			82	
Queue Length 95th (ft)		98		181	80			501			112	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		258		385	492			2038			1291	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	

Lanes, Volumes, Timings
36: Elm Street & Route 138

2030 Build with Mitigation Condition- AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.40		0.85	0.27			0.78			0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 96	
Actuated Cycle Length: 96	
Offset: 28 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	

Splits and Phases: 36: Elm Street & Route 138

HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 Build with Mitigation Condition- AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	20	25	225	5	87	5	1276	205	44	358	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.96		1.00	0.86			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		1799		1686	1523			3432			3151	
Flt Permitted		0.75		0.67	1.00			0.95			0.66	
Satd. Flow (perm)		1375		1192	1523			3274			2074	
Peak-hour factor, PHF	0.83	0.83	0.83	0.69	0.69	0.69	0.94	0.94	0.94	0.82	0.82	0.82
Adj. Flow (vph)	49	24	30	326	7	126	5	1357	218	54	437	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	103	0	326	133	0	0	1580	0	0	521	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	13%	13%	13%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.6		27.2	27.2			58.8			58.8	
Effective Green, g (s)		10.6		27.2	27.2			58.8			58.8	
Actuated g/C Ratio		0.11		0.28	0.28			0.61			0.61	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		152		397	432			2005			1270	
v/s Ratio Prot				c0.10	0.09							
v/s Ratio Perm		0.07		c0.13				c0.48			0.25	
v/c Ratio		0.68		0.82	0.31			0.79			0.41	
Uniform Delay, d1		41.1		33.2	27.0			13.9			9.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		11.4		12.8	0.4			3.2			1.0	
Delay (s)		52.4		46.0	27.4			17.2			10.6	
Level of Service		D		D	C			B			B	
Approach Delay (s)		52.4			40.6			17.2			10.6	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	21.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	96.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	72.8%	ICU Level of Service		C	
Analysis Period (min)	15				

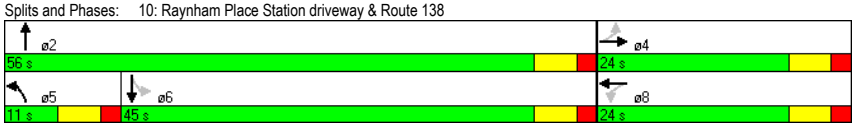
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	0	208	0	0	15	54	590	0	10	1075	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	200		0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		758			664			485			2063	
Travel Time (s)		17.2			15.1			11.0			46.9	
Peak Hour Factor	0.92	0.92	0.92	0.63	0.63	0.63	0.90	0.90	0.90	0.91	0.91	0.91
Heavy Vehicles (%)	33%	0%	0%	0%	0%	8%	6%	5%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	226	0	0	24	0	60	656	0	0	1216	0
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		10.0	10.0		10.0	20.0		20.0	20.0	
Total Split (s)	24.0	24.0	0.0	24.0	24.0	0.0	11.0	56.0	0.0	45.0	45.0	0.0
Total Split (%)	30.0%	30.0%	0.0%	30.0%	30.0%	0.0%	13.8%	70.0%	0.0%	56.3%	56.3%	0.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		5.0	50.0		39.0	39.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		Min	Min	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	7.0	7.0										
Pedestrian Calls (#/hr)	0	0										
v/c Ratio	0.37	0.58			0.05		0.42	0.30			0.66	
Control Delay	33.0	16.1			0.2		42.9	5.5			13.7	
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	
Total Delay	33.0	16.1			0.2		42.9	5.5			13.7	
Queue Length 50th (ft)	23	23			0		23	45			183	
Queue Length 95th (ft)	60	88			0		#79	92			310	
Internal Link Dist (ft)		678			584			405			1983	
Turn Bay Length (ft)							175					
Base Capacity (vph)	321	601			655		143	2814			2196	
Starvation Cap Reductn	0	0			0		0	0			0	
Spillback Cap Reductn	0	0			0		0	0			0	
Storage Cap Reductn	0	0			0		0	0			0	
Reduced v/c Ratio	0.19	0.38			0.04		0.42	0.23			0.55	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 62.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Raynham Place Station driveway & Route 138



HCM Signalized Intersection Capacity Analysis
10: Raynham Place Station driveway & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	0	208	0	0	15	54	590	0	10	1075	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	
Frt	1.00	0.85			0.86		1.00	1.00			1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1357	1615			1522		1703	3438			3529	
Flt Permitted	0.74	1.00			1.00		0.95	1.00			0.95	
Satd. Flow (perm)	1059	1615			1522		1703	3438			3347	
Peak-hour factor, PHF	0.92	0.92	0.92	0.63	0.63	0.63	0.90	0.90	0.90	0.91	0.91	0.91
Adj. Flow (vph)	62	0	226	0	0	24	60	656	0	11	1181	24
RTOR Reduction (vph)	0	137	0	0	20	0	0	0	0	0	1	0
Lane Group Flow (vph)	62	89	0	0	4	0	60	656	0	0	1215	0
Heavy Vehicles (%)	33%	0%	0%	0%	0%	8%	6%	5%	0%	0%	2%	0%
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	9.7	9.7			9.7		2.6	42.8			34.2	
Effective Green, g (s)	9.7	9.7			9.7		2.6	42.8			34.2	
Actuated g/C Ratio	0.15	0.15			0.15		0.04	0.66			0.53	
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	159	243			229		69	2281			1775	
v/s Ratio Prot		0.06			0.00		c0.04	0.19				
v/s Ratio Perm	c0.06										c0.36	
v/c Ratio	0.39	0.37			0.02		0.87	0.29			0.68	
Uniform Delay, d1	24.7	24.6			23.3		30.8	4.5			11.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.6	0.9			0.0		64.4	0.1			1.1	
Delay (s)	26.3	25.6			23.4		95.1	4.6			12.3	
Level of Service	C	C			C		F	A			B	
Approach Delay (s)		25.7			23.4			12.2			12.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	67.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
36: Elm Street & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

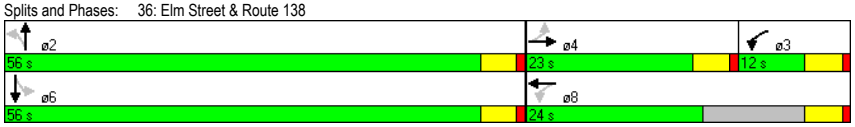
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	28	30	620	325	74	1149	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	160		0	0		0	0		205
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		820			1216			1195			808	
Travel Time (s)		18.6			27.6			27.2			18.4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	79	0	398	49	0	0	1071	0	0	1303	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	23.0	23.0		12.0	23.0		35.0	35.0		35.0	35.0	
Total Split (s)	23.0	23.0	0.0	12.0	24.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0
Total Split (%)	25.3%	25.3%	0.0%	13.2%	26.4%	0.0%	61.5%	61.5%	0.0%	61.5%	61.5%	0.0%
Maximum Green (s)	18.0	18.0		7.0	19.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0			10.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
v/c Ratio		0.46		0.87	0.10			0.63			0.81	
Control Delay		46.1		51.2	22.2			14.8			20.8	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		46.1		51.2	22.2			14.8			20.8	
Queue Length 50th (ft)		43		200	20			207			305	
Queue Length 95th (ft)		69		#319	43			285			#431	
Internal Link Dist (ft)		740			1136			1115			728	
Turn Bay Length (ft)				160								
Base Capacity (vph)		318		459	554			1700			1606	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.25		0.87	0.09			0.63			0.81	

Lanes, Volumes, Timings
36: Elm Street & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 91	
Actuated Cycle Length: 91	
Offset: 36 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 36: Elm Street & Route 138



HCM Signalized Intersection Capacity Analysis
36: Elm Street & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	350	15	28	30	620	325	74	1149	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.91		1.00	0.90			0.95			1.00	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1703		1770	1680			3261			3522	
Flt Permitted		0.94		0.72	1.00			0.87			0.76	
Satd. Flow (perm)		1606		1349	1680			2842			2684	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	13	13	53	398	17	32	33	681	357	78	1209	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	79	0	398	49	0	0	1071	0	0	1303	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	2%	2%	2%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.5		27.5	27.5			53.5			53.5	
Effective Green, g (s)		8.5		27.5	27.5			53.5			53.5	
Actuated g/C Ratio		0.09		0.30	0.30			0.59			0.59	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)		150		472	508			1671			1578	
v/s Ratio Prot				c0.13	0.03							
v/s Ratio Perm		0.05		c0.12				0.38			c0.49	
v/c Ratio		0.53		0.84	0.10			0.64			0.83	
Uniform Delay, d1		39.3		29.6	22.8			12.4			15.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.3		12.9	0.1			1.9			5.1	
Delay (s)		42.6		42.5	22.9			14.3			20.1	
Level of Service		D		D	C			B			C	
Approach Delay (s)		42.6			40.3			14.3			20.1	
Approach LOS		D			D			B			C	

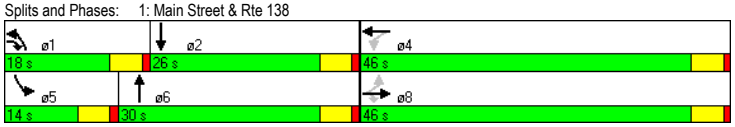
Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Easton

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	374	225	45	144	135	123	801	50	73	342	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	11	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4948			2928	
Travel Time (s)		26.1			62.7			84.3			49.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	466	420	253	51	317	0	134	925	0	83	471	0
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Detector Phase	8	8	1	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	21.0	21.0	12.0	23.0	23.0		12.0	23.0		12.0	21.0	
Total Split (s)	46.0	46.0	18.0	46.0	46.0	0.0	18.0	30.0	0.0	14.0	26.0	0.0
Total Split (%)	51.1%	51.1%	20.0%	51.1%	51.1%	0.0%	20.0%	33.3%	0.0%	15.6%	28.9%	0.0%
Maximum Green (s)	41.0	41.0	13.0	41.0	41.0		13.0	25.0		9.0	21.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)				7.0	7.0			7.0				
Flash Dont Walk (s)				8.0	8.0			8.0				
Pedestrian Calls (#/hr)				0	0			0				
v/c Ratio	1.03	0.49	0.24	0.16	0.21		0.64	0.95		0.52	0.59	
Control Delay	77.0	19.0	3.9	16.2	7.6		50.7	51.7		50.5	31.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	77.0	19.0	3.9	16.2	7.6		50.7	51.7		50.5	31.7	
Queue Length 50th (ft)	~294	162	27	16	26		73	~273		46	115	
Queue Length 95th (ft)	#474	243	52	39	50		130	#414		90	165	
Internal Link Dist (ft)		1645			3138			4868			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	452	858	1093	314	1522		260	971		178	844	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.03	0.49	0.23	0.16	0.21		0.52	0.95		0.47	0.56	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 87.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

2030 Build with Mitigation Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	374	225	45	144	135	123	801	50	73	342	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	11	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1818	1553	1586	3054		1736	3300		1719	3305	
Flt Permitted	0.56	1.00	1.00	0.40	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	958	1818	1553	667	3054		1736	3300		1719	3305	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	466	420	253	51	164	153	134	871	54	83	389	82
RTOR Reduction (vph)	0	0	50	0	82	0	0	5	0	0	20	0
Lane Group Flow (vph)	466	420	203	51	235	0	134	920	0	83	451	0
Heavy Vehicles (%)	11%	1%	4%	10%	6%	6%	4%	5%	2%	5%	3%	2%
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)	41.1	41.1	51.7	41.1	41.1		10.6	25.5		6.6	21.5	
Effective Green, g (s)	41.1	41.1	51.7	41.1	41.1		10.6	25.5		6.6	21.5	
Actuated g/C Ratio	0.47	0.47	0.59	0.47	0.47		0.12	0.29		0.07	0.24	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	446	847	998	311	1423		209	954		129	806	
v/s Ratio Prot		0.23	0.02		0.08		c0.08	c0.28		0.05	0.14	
v/s Ratio Perm	c0.49		0.11	0.08								
v/c Ratio	1.04	0.50	0.20	0.16	0.17		0.64	0.96		0.64	0.56	
Uniform Delay, d1	23.6	16.4	8.6	13.6	13.6		37.0	30.9		39.7	29.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.8	0.2	0.0	0.1	0.0		5.0	20.9		8.0	1.0	
Delay (s)	78.4	16.5	8.6	13.7	13.6		41.9	51.8		47.6	30.3	
Level of Service	E	B	A	B	B		D	D		D	C	
Approach Delay (s)		40.1			13.7			50.6			32.9	
Approach LOS		D			B			D			C	

Intersection Summary				
HCM Average Control Delay	39.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	77.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

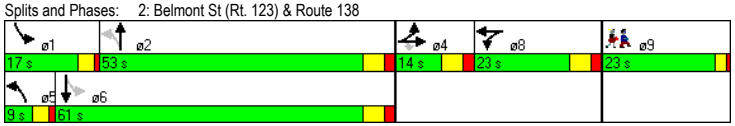
2030 Build with Mitigation Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	55	35	250	50	204	85	743	435	202	315	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	13	12	11	12	12	12	11	12	11	12	13
Storage Length (ft)	0		0	475		0	0		0	200		300
Storage Lanes	0		1	2		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		387			2550			980			853	
Travel Time (s)		5.9			38.6			14.8			12.9	
Peak Hour Factor	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	49	305	310	0	91	1267	0	220	358	0
Turn Type	Split		Perm	Split			pm+pt			pm+pt		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		
Detector Phase	4	4	4	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0		8.0	10.0		8.0	10.0	
Total Split (s)	14.0	14.0	14.0	23.0	23.0	0.0	9.0	53.0	0.0	17.0	61.0	0.0
Total Split (%)	10.8%	10.8%	10.8%	17.7%	17.7%	0.0%	6.9%	40.8%	0.0%	13.1%	46.9%	0.0%
Maximum Green (s)	8.0	8.0	8.0	17.0	17.0		5.0	47.0		13.0	55.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.97	0.34	0.71	1.01		0.16	0.83		0.73	0.19	
Control Delay		139.2	22.0	64.1	87.2		12.4	34.5		46.4	14.4	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		139.2	22.0	64.1	87.2		12.4	34.5		46.4	14.4	
Queue Length 50th (ft)		92	0	128	~167		23	433		83	60	
Queue Length 95th (ft)		#153	25	161	#296		69	#715		#319	107	
Internal Link Dist (ft)		307			2470			900			773	
Turn Bay Length (ft)				475						200		
Base Capacity (vph)		110	145	430	306		580	1528		303	1903	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		0.97	0.34	0.71	1.01		0.16	0.83		0.73	0.19	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	23.0
Total Split (s)	23.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

2030 Build with Mitigation Condition - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	55	35	250	50	204	85	743	435	202	315	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	12	12	12	11	12	11	12	13
Total Lost time (s)		6.0	6.0	6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.88		1.00	0.94		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1780	1615	3286	1474		1805	3200		1662	3454	
Flt Permitted		0.99	1.00	0.95	1.00		0.54	1.00		0.07	1.00	
Satd. Flow (perm)		1780	1615	3286	1474		1022	3200		129	3454	
Peak-hour factor, PHF	0.72	0.72	0.72	0.82	0.82	0.82	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	31	76	49	305	61	249	91	799	468	220	342	16
RTOR Reduction (vph)	0	0	46	0	113	0	0	57	0	0	2	0
Lane Group Flow (vph)	0	107	3	305	197	0	91	1210	0	220	356	0
Heavy Vehicles (%)	13%	7%	0%	3%	15%	13%	0%	3%	3%	5%	4%	0%
Turn Type	Split		Perm	Split			pm+pt			pm+pt		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		8.0	8.0	17.0	17.0		64.2	57.4		80.0	69.2	
Effective Green, g (s)		8.0	8.0	17.0	17.0		64.2	57.4		80.0	69.2	
Actuated g/C Ratio		0.06	0.06	0.13	0.13		0.49	0.44		0.62	0.53	
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		110	99	430	193		546	1413		299	1839	
v/s Ratio Prot		c0.06		0.09	c0.13		0.01	c0.38		c0.11	0.10	
v/s Ratio Perm			0.00				0.07			0.35		
v/c Ratio		0.97	0.03	0.71	1.02		0.17	0.86		0.74	0.19	
Uniform Delay, d1		60.9	57.4	54.1	56.5		17.5	32.6		34.3	15.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.20	0.89	
Incremental Delay, d2		76.7	0.1	5.3	70.3		0.1	6.9		8.5	0.2	
Delay (s)		137.6	57.5	59.4	126.8		17.7	39.5		49.6	14.4	
Level of Service		F	E	E	F		B	D		D	B	
Approach Delay (s)		112.4			93.4			38.0			27.8	
Approach LOS		F			F			D			C	

Intersection Summary				
HCM Average Control Delay	52.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.0	
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

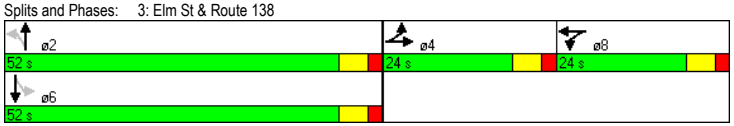
Lanes, Volumes, Timings
3: Elm St & Route 138

2030 Build with Mitigation Condition - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	31	35	10	15	31	30	1370	15	0	438	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	0		300	0		300
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2352			2953			2928			3218	
Travel Time (s)		53.5			67.1			66.5			73.1	
Peak Hour Factor	0.84	0.84	0.84	0.68	0.68	0.68	0.91	0.91	0.91	0.89	0.89	0.89
Heavy Vehicles (%)	0%	3%	3%	0%	15%	4%	4%	3%	0%	0%	3%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	278	0	0	83	0	0	1554	0	0	553	0
Turn Type	Split			Split			Perm			Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	24.0	24.0	0.0	24.0	24.0	0.0	52.0	52.0	0.0	52.0	52.0	0.0
Total Split (%)	24.0%	24.0%	0.0%	24.0%	24.0%	0.0%	52.0%	52.0%	0.0%	52.0%	52.0%	0.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		0.77			0.46			0.90			0.30	
Control Delay		51.3			46.6			29.7			13.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		51.3			46.6			29.7			13.3	
Queue Length 50th (ft)		153			46			435			93	
Queue Length 95th (ft)		#247			68			#664			139	
Internal Link Dist (ft)		2272			2873			2848			3138	
Turn Bay Length (ft)												
Base Capacity (vph)		406			329			1729			1829	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.68			0.25			0.90			0.30	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 88.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Elm St & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	31	35	10	15	31	30	1370	15	0	438	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.98			0.93			1.00			0.98	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1960			1586			3496			3432	
Flt Permitted		0.97			0.99			0.93			1.00	
Satd. Flow (perm)		1960			1586			3259			3432	
Peak-hour factor, PHF	0.84	0.84	0.84	0.68	0.68	0.68	0.91	0.91	0.91	0.89	0.89	0.89
Adj. Flow (vph)	199	37	42	15	22	46	33	1505	16	0	492	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	278	0	0	83	0	0	1554	0	0	544	0
Heavy Vehicles (%)	0%	3%	3%	0%	15%	4%	4%	3%	0%	0%	3%	7%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		16.1			8.5			46.7			46.7	
Effective Green, g (s)		16.1			8.5			46.7			46.7	
Actuated g/C Ratio		0.18			0.10			0.52			0.52	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		353			151			1704			1795	
v/s Ratio Prot		c0.14			c0.05						0.16	
v/s Ratio Perm								c0.48				
v/c Ratio		0.79			0.55			0.91			0.30	
Uniform Delay, d1		35.0			38.6			19.4			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.0			4.1			8.9			0.1	
Delay (s)		46.0			42.6			28.3			12.2	
Level of Service		D			D			C			B	
Approach Delay (s)		46.0			42.6			28.3			12.2	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	0	99	5	0	5	389	999	0	0	353	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	10	11	11	12	11	11
Storage Length (ft)	0		100	0		0	350		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			332			1623			2417	
Travel Time (s)		14.4			7.5			36.9			54.9	
Peak Hour Factor	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	121	0	16	0	0	1633	0	0	608	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	21.0		21.0	21.0	
Total Split (s)	26.0	26.0	19.0	26.0	26.0	0.0	19.0	74.0	0.0	55.0	55.0	0.0
Total Split (%)	21.3%	21.3%	15.6%	21.3%	21.3%	0.0%	15.6%	60.7%	0.0%	45.1%	45.1%	0.0%
Maximum Green (s)	21.0	21.0	14.0	21.0	21.0		14.0	68.0		49.0	49.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.69	0.26		0.07			1.04			0.31	
Control Delay		60.4	7.4		27.9			48.9			10.6	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		60.4	7.4		27.9			48.9			10.6	
Queue Length 50th (ft)		70	0		4			~206			67	
Queue Length 95th (ft)		141	36		17			#933			170	
Internal Link Dist (ft)		555			252			1543			2337	
Turn Bay Length (ft)			100									
Base Capacity (vph)		297	586		369			1574			1942	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.42	0.21		0.04			1.04			0.31	

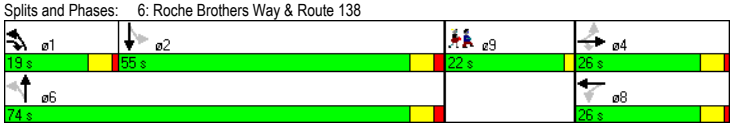
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	11
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 122	
Actuated Cycle Length: 97.7	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Roche Brothers Way & Route 138



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	0	99	5	0	5	389	999	0	0	353	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	10	11	11	12	11	11
Total Lost time (s)		5.0	5.0		5.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.93			1.00			0.95	
Flt Protected		0.95	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1736	1524		1911			3341			3181	
Flt Permitted		0.75	1.00		0.85			0.62			1.00	
Satd. Flow (perm)		1365	1524		1669			2112			3181	
Peak-hour factor, PHF	0.82	0.82	0.82	0.63	0.63	0.63	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	126	0	121	8	0	8	458	1175	0	0	420	188
RTOR Reduction (vph)	0	0	98	0	7	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	126	23	0	9	0	0	1633	0	0	579	0
Heavy Vehicles (%)	4%	0%	6%	2%	0%	3%	3%	3%	0%	0%	4%	6%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		13.1	19.2		13.1			69.9			58.8	
Effective Green, g (s)		13.1	19.2		13.1			69.9			58.8	
Actuated g/C Ratio		0.13	0.19		0.13			0.70			0.59	
Clearance Time (s)		5.0	5.0		5.0			6.0			6.0	
Vehicle Extension (s)		2.0	2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)		180	372		220			1564			1886	
v/s Ratio Prot			0.00					c0.06			0.18	
v/s Ratio Perm		c0.09	0.01		0.01			c0.67				
v/c Ratio		0.70	0.06		0.04			1.04			0.31	
Uniform Delay, d1		41.2	32.7		37.6			14.6			10.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		9.2	0.0		0.0			35.2			0.0	
Delay (s)		50.4	32.7		37.6			49.9			10.1	
Level of Service		D	C		D			D			B	
Approach Delay (s)		41.7			37.6			49.9			10.1	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	16.2
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

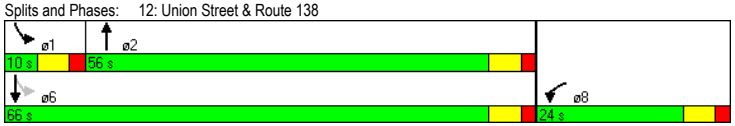
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	65	121	1271	257	80	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red		Yes		No		
Link Speed (mph)	30		30			30
Link Distance (ft)	1092		3218			1623
Travel Time (s)	24.8		73.1			36.9
Peak Hour Factor	0.88	0.88	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	5%	3%	2%	3%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	0	1717	0	0	608
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	24.0		20.0		10.0	20.0
Total Split (s)	24.0	0.0	56.0	0.0	10.0	66.0
Total Split (%)	26.7%	0.0%	62.2%	0.0%	11.1%	73.3%
Maximum Green (s)	18.0		50.0		4.0	60.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		None	Min
Walk Time (s)	7.0					
Flash Dont Walk (s)	8.0					
Pedestrian Calls (#/hr)	0					
v/c Ratio	0.64		0.74			0.88dl
Control Delay	25.8		10.6			7.3
Queue Delay	0.0		0.0			0.0
Total Delay	25.8		10.6			7.3
Queue Length 50th (ft)	51		213			54
Queue Length 95th (ft)	110		375			94
Internal Link Dist (ft)	1012		3138			1543
Turn Bay Length (ft)						
Base Capacity (vph)	487		2416			1646
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.44		0.71			0.37

Intersection Summary	
Area Type:	Other
Cycle Length: 90	

Actuated Cycle Length: 71.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 12: Union Street & Route 138



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	65	121	1271	257	80	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.91		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1650		3422			3421
Flt Permitted	0.98		1.00			0.57
Satd. Flow (perm)	1650		3422			1951
Peak-hour factor, PHF	0.88	0.88	0.89	0.89	0.81	0.81
Adj. Flow (vph)	74	138	1428	289	99	509
RTOR Reduction (vph)	79	0	0	0	0	0
Lane Group Flow (vph)	133	0	1717	0	0	608
Heavy Vehicles (%)	0%	5%	3%	2%	3%	5%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	10.8		48.7			48.7
Effective Green, g (s)	10.8		48.7			48.7
Actuated g/C Ratio	0.15		0.68			0.68
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	249		2331			1329
v/s Ratio Prot	c0.08		c0.50			
v/s Ratio Perm						0.31
v/c Ratio	0.53		0.74			0.88dl
Uniform Delay, d1	28.0		7.3			5.3
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	2.2		1.2			0.3
Delay (s)	30.2		8.5			5.5
Level of Service	C		A			A
Approach Delay (s)	30.2		8.5			5.5
Approach LOS	C		A			A

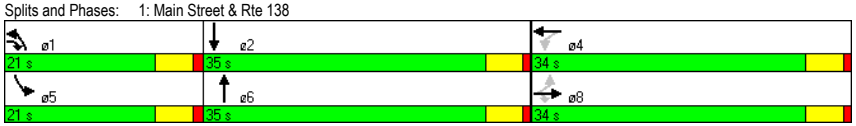
Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	71.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	198	274	105	366	88	295	493	85	150	684	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	11	11	12	12	11	12	11	11
Storage Length (ft)	150		230	90		140	140		140	115		150
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			35			40			40	
Link Distance (ft)		1725			3218			4950			2928	
Travel Time (s)		26.1			62.7			84.4			49.9	
Peak Hour Factor	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	241	334	124	535	0	328	642	0	169	1105	0
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Detector Phase	8	8	1	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	15.0		7.0	15.0	
Minimum Split (s)	12.0	12.0	12.0	21.0	21.0		12.0	21.0		12.0	20.0	
Total Split (s)	34.0	34.0	21.0	34.0	34.0	0.0	21.0	35.0	0.0	21.0	35.0	0.0
Total Split (%)	37.8%	37.8%	23.3%	37.8%	37.8%	0.0%	23.3%	38.9%	0.0%	23.3%	38.9%	0.0%
Maximum Green (s)	29.0	29.0	16.0	29.0	29.0		16.0	30.0		16.0	30.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)				5.0	5.0			5.0				
Flash Dont Walk (s)				11.0	11.0			11.0				
Pedestrian Calls (#/hr)				0	0			0				
v/c Ratio	1.05	0.41	0.37	0.41	0.49		1.04	0.50		0.70	0.97	
Control Delay	109.4	26.5	10.8	28.9	24.6		100.2	23.4		51.7	49.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	109.4	26.5	10.8	28.9	24.6		100.2	23.4		51.7	49.7	
Queue Length 50th (ft)	~140	106	83	55	118		~204	142		92	303	
Queue Length 95th (ft)	#244	154	121	100	155		#367	205		152	#439	
Internal Link Dist (ft)		1645			3138			4870			2848	
Turn Bay Length (ft)	150		230	90			140			115		
Base Capacity (vph)	212	586	901	302	1102		315	1272		309	1135	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.05	0.41	0.37	0.41	0.49		1.04	0.50		0.55	0.97	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & Rte 138



HCM Signalized Intersection Capacity Analysis
1: Main Street & Rte 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	198	274	105	366	88	295	493	85	150	684	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	11	11	11	12	12	11	12	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818	1583	1728	3348		1770	3386		1736	3243	
Flt Permitted	0.35	1.00	1.00	0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	660	1818	1583	938	3348		1770	3386		1736	3243	
Peak-hour factor, PHF	0.82	0.82	0.82	0.85	0.85	0.85	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	223	241	334	124	431	104	328	548	94	169	769	336
RTOR Reduction (vph)	0	0	25	0	23	0	0	14	0	0	55	0
Lane Group Flow (vph)	223	241	310	124	512	0	328	628	0	169	1050	0
Heavy Vehicles (%)	2%	1%	2%	1%	1%	2%	2%	5%	0%	4%	3%	2%
Turn Type	Perm		pm+ov	Perm			Prot			Prot		
Protected Phases		8	1		4		1	6		5	2	
Permitted Phases	8		8	4								
Actuated Green, G (s)	29.0	29.0	45.0	29.0	29.0		16.0	33.4		12.6	30.0	
Effective Green, g (s)	29.0	29.0	45.0	29.0	29.0		16.0	33.4		12.6	30.0	
Actuated g/C Ratio	0.32	0.32	0.50	0.32	0.32		0.18	0.37		0.14	0.33	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	213	586	879	302	1079		315	1257		243	1081	
v/s Ratio Prot		0.13	0.06		0.15		c0.19	c0.19		0.10	c0.32	
v/s Ratio Perm	c0.34		0.13	0.13								
v/c Ratio	1.05	0.41	0.35	0.41	0.47		1.04	0.50		0.70	0.97	
Uniform Delay, d1	30.5	23.8	13.7	23.8	24.4		37.0	21.8		36.9	29.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	74.5	0.2	0.1	0.3	0.1		61.9	0.4		6.8	20.8	
Delay (s)	105.0	24.0	13.7	24.2	24.5		98.9	22.3		43.7	50.4	
Level of Service	F	C	B	C	C		F	C		D	D	
Approach Delay (s)		42.4			24.5			48.2			49.5	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	43.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
2: Belmont St (Rt. 123) & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

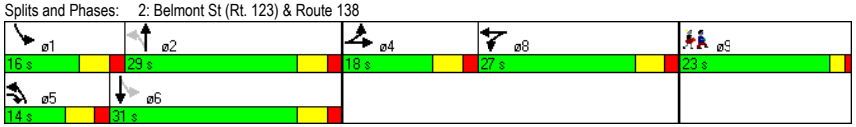
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	125	275	500	150	174	230	407	300	243	687	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	13	12	11	13	12	11	12	12	11	12	13
Storage Length (ft)	0		0	475		0	0		0	200		300
Storage Lanes	0		1	2		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		387			2550			908			849	
Travel Time (s)		5.9			38.6			13.8			12.9	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	220	309	568	368	0	247	761	0	267	824	0
Turn Type	Split		Over	Split			pm+pt			pm+pt		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases							2			6		
Detector Phase	4	4	5	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	18.0	18.0	14.0	27.0	27.0	0.0	14.0	29.0	0.0	16.0	31.0	0.0
Total Split (%)	15.9%	15.9%	12.4%	23.9%	23.9%	0.0%	12.4%	25.7%	0.0%	14.2%	27.4%	0.0%
Maximum Green (s)	12.0	12.0	8.0	21.0	21.0		8.0	23.0		10.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.07	0.56	0.91	1.00		0.63	0.83		0.64	0.87	
Control Delay		131.9	9.9	65.5	87.2		33.2	41.4		31.1	39.2	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		131.9	9.9	65.5	87.2		33.2	41.4		31.1	39.2	
Queue Length 50th (ft)		~178	0	210	240		98	216		85	256	
Queue Length 95th (ft)		#328	#107	#298	#421		#356	#367		m#276	m#437	
Internal Link Dist (ft)		307			2470			828			769	
Turn Bay Length (ft)				475						200		
Base Capacity (vph)		205	549	623	369		393	916		417	944	
Starvation Cap Reductn		0	0	0	0		0	0		0	0	
Spillback Cap Reductn		0	0	0	0		0	0		0	0	
Storage Cap Reductn		0	0	0	0		0	0		0	0	
Reduced v/c Ratio		1.07	0.56	0.91	1.00		0.63	0.83		0.64	0.87	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	23.0
Total Split (s)	23.0
Total Split (%)	20%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary	
Area Type:	Other
Cycle Length: 113	
Actuated Cycle Length: 113	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Belmont St (Rt. 123) & Route 138



HCM Signalized Intersection Capacity Analysis
2: Belmont St (Rt. 123) & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	125	275	500	150	174	230	407	300	243	687	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	13	12	11	13	12	11	12	12	11	12	13
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.92		1.00	0.94		1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1928	1615	3351	1786		1745	3290		1662	3469	
Flt Permitted		0.98	1.00	0.95	1.00		0.16	1.00		0.14	1.00	
Satd. Flow (perm)		1928	1615	3351	1786		292	3290		248	3469	
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	80	140	309	568	170	198	247	438	323	267	755	69
RTOR Reduction (vph)	0	0	252	0	37	0	0	116	0	0	6	0
Lane Group Flow (vph)	0	220	57	568	331	0	247	645	0	267	818	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	2%	0%	4%	1%	5%	3%	0%
Turn Type	Split		Over	Split			pm+pt			pm+pt		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		12.0	20.8	21.0	21.0		46.0	25.2		52.0	28.2	
Effective Green, g (s)		12.0	20.8	21.0	21.0		46.0	25.2		52.0	28.2	
Actuated g/C Ratio		0.11	0.18	0.19	0.19		0.41	0.22		0.46	0.25	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		205	297	623	332		386	734		412	866	
v/s Ratio Prot		c0.11	0.04	0.17	c0.19		0.12	0.20		c0.14	c0.24	
v/s Ratio Perm							0.14			0.16		
v/c Ratio		1.07	0.19	0.91	1.00		0.64	0.88		0.65	0.94	
Uniform Delay, d1		50.5	39.0	45.1	46.0		25.0	42.4		23.7	41.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.15	0.82	
Incremental Delay, d2		83.6	0.3	17.7	47.9		3.5	14.1		1.9	12.7	
Delay (s)		134.1	39.3	62.8	93.9		28.5	56.6		29.1	46.7	
Level of Service		F	D	E	F		C	E		C	D	
Approach Delay (s)		78.7			75.0			49.7			42.4	
Approach LOS		E			E			D			D	

Intersection Summary				
HCM Average Control Delay	58.4	HCM Level of Service		E
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	113.0	Sum of lost time (s)		31.0
Intersection Capacity Utilization	83.4%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings
3: Elm St & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

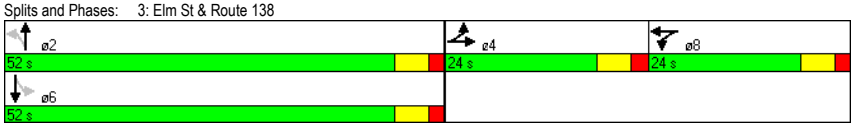
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	15	35	25	50	36	65	708	30	22	1113	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	11	12	12	12	12	12	11	12
Storage Length (ft)	0		0	0		0	0		300	0		300
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			No			No			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2352			2953			2928			3218	
Travel Time (s)		53.5			67.1			66.5			73.1	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	2%	0%	4%	0%	0%	3%	2%	3%	4%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	157	0	0	129	0	0	913	0	0	1611	0
Turn Type	Split			Split			Perm			Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	24.0	24.0	0.0	24.0	24.0	0.0	52.0	52.0	0.0	52.0	52.0	0.0
Total Split (%)	24.0%	24.0%	0.0%	24.0%	24.0%	0.0%	52.0%	52.0%	0.0%	52.0%	52.0%	0.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		0.59			0.56			0.88			0.98	
Control Delay		45.6			46.4			32.6			41.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		45.6			46.4			32.6			41.8	
Queue Length 50th (ft)		83			68			225			437	
Queue Length 95th (ft)		144			124			#428			#685	
Internal Link Dist (ft)		2272			2873			2848			3138	
Turn Bay Length (ft)												
Base Capacity (vph)		386			347			1035			1636	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.37			0.88			0.98	

Lanes, Volumes, Timings
3: Elm St & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 89.7	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 3: Elm St & Route 138

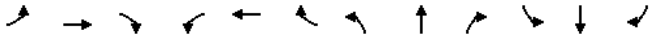


HCM Signalized Intersection Capacity Analysis
3: Elm St & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	15	35	25	50	36	65	708	30	22	1113	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	11	12	12	12	12	12	11	12
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.96			0.96			0.99			0.97	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1911			1720			3473			3337	
Flt Permitted		0.97			0.99			0.57			0.93	
Satd. Flow (perm)		1911			1720			1972			3093	
Peak-hour factor, PHF	0.85	0.85	0.85	0.86	0.86	0.86	0.88	0.88	0.88	0.85	0.85	0.85
Adj. Flow (vph)	98	18	41	29	58	42	74	805	34	26	1309	276
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	157	0	0	129	0	0	911	0	0	1596	0
Heavy Vehicles (%)	2%	0%	4%	0%	0%	3%	2%	3%	4%	0%	2%	1%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		12.6			12.0			47.0			47.0	
Effective Green, g (s)		12.6			12.0			47.0			47.0	
Actuated g/C Ratio		0.14			0.13			0.52			0.52	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		269			230			1034			1622	
v/s Ratio Prot		c0.08			c0.08							
v/s Ratio Perm								0.46			c0.52	
v/c Ratio		0.58			0.56			0.88			0.98	
Uniform Delay, d1		36.0			36.3			18.8			20.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.2			3.1			8.9			18.5	
Delay (s)		39.3			39.4			27.7			39.4	
Level of Service		D			D			C			D	
Approach Delay (s)		39.3			39.4			27.7			39.4	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



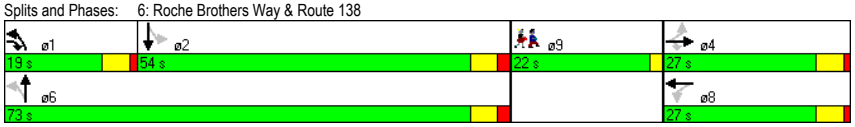
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	0	492	0	0	0	235	492	5	5	839	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	12	12	11	11	11	12	12	12
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			332			1623			2417	
Travel Time (s)		14.4			7.5			36.9			54.9	
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Peak Hour Factor	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	547	0	0	0	0	893	0	0	1114	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		10.0	10.0	
Minimum Split (s)	21.0	21.0	11.0	21.0	21.0		11.0	22.0		22.0	22.0	
Total Split (s)	27.0	27.0	19.0	27.0	27.0	0.0	19.0	73.0	0.0	54.0	54.0	0.0
Total Split (%)	22.1%	22.1%	15.6%	22.1%	22.1%	0.0%	15.6%	59.8%	0.0%	44.3%	44.3%	0.0%
Maximum Green (s)	22.0	22.0	14.0	22.0	22.0		14.0	67.0		48.0	48.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.63	0.78					1.06dl			0.77	
Control Delay		44.3	18.4					15.4			24.9	
Queue Delay		0.0	0.0					0.0			0.0	
Total Delay		44.3	18.4					15.4			24.9	
Queue Length 50th (ft)		79	67					104			216	
Queue Length 95th (ft)		#246	284					238			508	
Internal Link Dist (ft)		555			252			1543			2337	
Turn Bay Length (ft)			100									
Base Capacity (vph)		393	799					1605			2038	
Starvation Cap Reductn		0	0					0			0	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	11
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.47	0.68					0.56			0.55	

Intersection Summary
Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 82.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Roche Brothers Way & Route 138



Lane Group	ø9
Reduced v/c Ratio	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Roche Brothers Way & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	0	492	0	0	0	235	492	5	5	839	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	12	12	12	11	11	11	12	12	12
Total Lost time (s)		5.0	5.0					6.0			6.0	
Lane Util. Factor		1.00	1.00					0.95			0.95	
Frpb, ped/bikes		1.00	0.96					1.00			0.99	
Flpb, ped/bikes		0.96	1.00					1.00			1.00	
Frt		1.00	0.85					1.00			0.98	
Flt Protected		0.95	1.00					0.98			1.00	
Satd. Flow (prot)		1740	1484					3329			3431	
Flt Permitted		0.76	1.00					0.52			0.95	
Satd. Flow (perm)		1387	1484					1768			3260	
Peak-hour factor, PHF	0.90	0.90	0.90	0.25	0.25	0.25	0.82	0.82	0.82	0.90	0.90	0.90
Adj. Flow (vph)	183	0	547	0	0	0	287	600	6	6	932	176
RTOR Reduction (vph)	0	0	239	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	183	308	0	0	0	0	893	0	0	1102	0
Confl. Peds. (#/hr)	25		50	15		25	10		25	40		30
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	2%	1%
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Actuated Green, G (s)		17.5	25.9					50.3			36.9	
Effective Green, g (s)		17.5	25.9					50.3			36.9	
Actuated g/C Ratio		0.21	0.31					0.60			0.44	
Clearance Time (s)		5.0	5.0					6.0			6.0	
Vehicle Extension (s)		3.0	3.0					3.0			3.0	
Lane Grp Cap (vph)		291	549					1222			1441	
v/s Ratio Prot			c0.06					c0.07				
v/s Ratio Perm		0.13	0.15					c0.37			0.34	
v/c Ratio		0.63	0.56					1.06dl			0.76	
Uniform Delay, d1		30.0	24.0					11.8			19.6	
Progression Factor		1.00	1.00					1.00			1.00	
Incremental Delay, d2		4.2	1.3					2.3			2.5	
Delay (s)		34.3	25.4					14.1			22.1	
Level of Service		C	C					B			C	
Approach Delay (s)		27.6			0.0			14.1			22.1	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	21.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	15.7	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Lanes, Volumes, Timings
12: Union Street & Route 138

2030 Build with Mitigation Condition - PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	186	131	627	171	158	1203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	10	11
Storage Length (ft)	0	0		0	120	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Right Turn on Red		No		No		
Link Speed (mph)	30		30			30
Link Distance (ft)	1092		3218			1623
Travel Time (s)	24.8		73.1			36.9
Peak Hour Factor	0.80	0.80	0.84	0.84	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	3%	1%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	396	0	950	0	0	1480
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	24.0		20.0		10.0	20.0
Total Split (s)	33.0	0.0	51.0	0.0	26.0	77.0
Total Split (%)	30.0%	0.0%	46.4%	0.0%	23.6%	70.0%
Maximum Green (s)	28.0		46.0		21.0	72.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	5.0	4.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	Min		Min		Min	Min
Walk Time (s)	7.0					
Flash Dont Walk (s)	8.0					
Pedestrian Calls (#/hr)	0					
v/c Ratio	0.95		0.49			1.05
Control Delay	73.3		15.6			58.9
Queue Delay	0.0		0.0			0.0
Total Delay	73.3		15.6			58.9
Queue Length 50th (ft)	274		203			~360
Queue Length 95th (ft)	#372		231			#557
Internal Link Dist (ft)	1012		3138			1543
Turn Bay Length (ft)						
Base Capacity (vph)	430		1953			1403
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.92		0.49			1.05

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 109.3	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Union Street & Route 138

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	186	131	627	171	158	1203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	10	11
Total Lost time (s)	5.0		5.0			5.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.94		0.97			1.00
Flt Protected	0.97		1.00			0.99
Satd. Flow (prot)	1678		3471			3376
Flt Permitted	0.97		1.00			0.60
Satd. Flow (perm)	1678		3471			2027
Peak-hour factor, PHF	0.80	0.80	0.84	0.84	0.92	0.92
Adj. Flow (vph)	232	164	746	204	172	1308
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	396	0	950	0	0	1480
Heavy Vehicles (%)	0%	1%	0%	3%	1%	3%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	27.3		61.5			72.0
Effective Green, g (s)	27.3		61.5			72.0
Actuated g/C Ratio	0.25		0.56			0.66
Clearance Time (s)	5.0		5.0			5.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	419		1953			1403
v/s Ratio Prot	c0.24		0.27			c0.05
v/s Ratio Perm						c0.64
v/c Ratio	0.95		0.49			1.05
Uniform Delay, d1	40.3		14.4			18.6
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	30.1		0.2			39.9
Delay (s)	70.4		14.6			58.6
Level of Service	E		B			E
Approach Delay (s)	70.4		14.6			58.6
Approach LOS	E		B			E

Intersection Summary			
HCM Average Control Delay	45.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	109.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Appendix 4.1-J

Grade Crossing Analysis

Vanasse Hangen Brustlin, Inc.

Project	SCR	10111	
Calculated by	A. Soupharath	April 14, 2009	Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure
Checked by	MPR		
Location	Various		

				Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
Stoughton																
Brock Street	**NB**	Daily	1875	1.09	2,045											
MP 4.30		AM	212	1.09	231	3600	0.06	35	51	765	15	150	4	5.6	80.6	150
		PM	218	1.09	238	3600	0.07	35	51	765	15	150	4	5.9	80.9	150
													-	-		
	SB	Daily	1418	1.09	1,547								-	-		
		AM	92	1.09	101	3600	0.03	35	51	765	15	150	4	0.2	75.2	25
		PM	160	1.09	174	3600	0.05	35	51	765	15	150	4	3.3	78.3	100
													-	-		
Plain Street	**EB**	Daily	3457	1.10	3,804								-	-		
MP 4.60		AM	337	1.10	371	3600	0.10	45	66	765	12	60	-	6.2	36.2	175
		PM	314	1.10	345	3600	0.10	45	66	765	12	60	-	5.8	35.8	150
													-	-		
	WB	Daily	3815	1.10	4,199								-	-		
		AM	228	1.10	251	3600	0.07	45	66	765	12	60	-	4.2	34.2	125
		PM	463	1.10	509	3600	0.14	45	66	765	12	60	-	8.5	38.5	225
													-	-		
Morton Street		Daily	1522	1.06	1,616								-	-		
MP 5.20		AM	120	1.06	127	3600	0.04	60	88	765	9	60	-	2.1	32.1	75
		PM	170	1.06	181	3600	0.05	60	88	765	9	60	-	3.0	33.0	100
													-	-		
Easton													-	-		
													-	-		
Elm Street	**nb**	Daily	2092	1.07	2,248								-	-		
MP 7.60		AM	174	1.07	174	3600	0.05	45	66	765	12	60	-	2.9	32.9	75
		PM	154	1.07	122	3600	0.03	45	66	765	12	60	-	2.0	32.0	75
													-	-		
	sb	Daily	2484	1.07	2,669								-	-		
		AM	168	1.07	98	3600	0.03	45	66	765	12	60	-	1.6	31.6	50
		PM	239	1.07	293	3600	0.08	45	66	765	12	60	-	4.9	34.9	125
													-	-		

VHB *Vanasse Hangen Brustlin, Inc.*

Project	SCR	10111
Calculated by	A. Soupharath	April 14, 2009
Checked by	MPR	
Location	Various	

Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

			Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
Oliver Street		Daily	978	1.06	1,039							-	-		
MP 7.80		AM	76	1.06	81	3600	0.02	45	66	765	12	150	4	(0.6)	74.4	(25)
		PM	96	1.06	102	3600	0.03	45	66	765	12	150	4	0.2	75.2	25
													-	-		
Easton DPW	**No volumes available, crossing closed/gated…address qualitative**												-	-		
MP 8.65		AM	0	1.04	-	3600	0.00	45	66	765	12	60	-	-	30.0	-
		PM	0	1.04	-	3600	0.00	45	66	765	12	60	-	-	30.0	-
													-	-		
Gary Lane	**No volumes available, crossing closed/gated…address qualitative**												-	-		
MP 9.15		AM	0	1.04	-	3600	0.00	45	66	765	12	60	-	-	30.0	-
		PM	0	1.04	-	3600	0.00	45	66	765	12	60	-	-	30.0	-
													-	-		
Short Street	**NB**	Daily	2152	1.09	2,347								-	-		
MP 9.55		AM	136	1.09	148	3600	0.04	45	66	765	12	60	-	2.5	32.5	75
		PM	218	1.09	238	3600	0.07	45	66	765	12	60	-	4.0	34.0	100
													-	-		
	SB	Daily	2179	1.09	2,377								-	-		
		AM	201	1.09	219	3600	0.06	45	66	765	12	60	-	3.7	33.7	100
		PM	165	1.09	180	3600	0.05	45	66	765	12	60	-	3.0	33.0	75
													-	-		
Depot Street/123	**EB**	Daily	9603	1.07	10,319								-	-		
MP 10.00		AM	1011	1.07	1,086	3600	0.30	45	66	765	12	60	-	18.1	48.1	475
		PM	617	1.07	663	3600	0.18	45	66	765	12	60	-	11.1	41.1	300
													-	-		
	WB	Daily	8723	1.07	9,373								-	-		
		AM	446	1.07	479	3600	0.13	45	66	765	12	60	-	8.0	38.0	200
		PM	824	1.07	886	3600	0.25	45	66	765	12	60	-	14.8	44.8	375
													-	-		
Purchase Street	**NB**	Daily	1103	1.08	1,193								-	-		
MP 10.20		AM	92	1.08	100	3600	0.03	45	66	765	12	60	-	1.7	31.7	50
		PM	101	1.08	109	3600	0.03	45	66	765	12	60	-	1.8	31.8	50
													-	-		
	SB	Daily	1158	1.08	1,251								-	-		
		AM	98	1.08	106	3600	0.03	45	66	765	12	60	-	1.8	31.8	50
		PM	128	1.08	138	3600	0.04	45	66	765	12	60	-	2.3	32.3	75

VHB *Vanasse Hangen Brustlin, Inc.*

Project SCR 10111
Calculated by A. Soupharath April 14, 2009
Checked by MPR
Location Various

Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

				Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
													-	-		
Prospect Street	**NB**	Daily	951	1.08	1,031								-	-		
MP 10.90		AM	82	1.08	88	3600	0.02	45	66	765	12	60	-	1.5	31.5	50
		PM	74	1.08	81	3600	0.02	45	66	765	12	60	-	1.3	31.3	50
													-	-		
	SB	Daily	1049	1.08	1,137								-	-		
		AM	65	1.08	71	3600	0.02	45	66	765	12	60	-	1.2	31.2	50
		PM	112	1.08	121	3600	0.03	45	66	765	12	60	-	2.0	32.0	75
													-	-		
Foundry Street (R	**EB**	Daily	5984	1.08	6,468								-	-		
MP 11.80		AM	489	1.08	522	3600	0.14	45	66	765	12	60	-	8.7	38.7	225
		PM	543	1.08	415	3600	0.12	45	66	765	12	60	-	6.9	36.9	175
													-	-		
	WB	Daily	5859	1.08	6,333								-	-		
		AM	359	1.08	571	3600	0.16	45	66	765	12	60	-	9.5	39.5	250
		PM	580	1.08	633	3600	0.18	45	66	765	12	60	-	10.5	40.5	275
													-	-		
Raynham													-	-		
													-	-		
Elm Street	**EB**	Daily			1,343								-	-		
MP 15.40		AM	0	1.04	98	3600	0.03	45	66	765	12	60	-	1.6	31.6	50
		PM	0	1.04	65	3600	0.02	45	66	765	12	60	-	1.1	31.1	50
													-	-		
	WB	Daily			553								-	-		
		AM	0	1.04	40	3600	0.01	45	66	765	12	60	-	0.7	30.7	25
		PM	0	1.04	65	3600	0.02	45	66	765	12	60	-	1.1	31.1	50
													-	-		
Carver Street	**EB**	Daily			4,583								-	-		
MP 15.80		AM	0	1.04	333	3600	0.09	45	66	765	12	60	-	5.6	35.6	150
		PM	0	1.04	366	3600	0.10	45	66	765	12	60	-	6.1	36.1	175
													-	-		
	WB	Daily			2,213								-	-		
		AM	0	1.04	161	3600	0.04	45	66	765	12	60	-	2.7	32.7	75
		PM	0	1.04	387	3600	0.11	45	66	765	12	60	-	6.5	36.5	175

Vanasse Hangen Brustlin, Inc.

Project	SCR	10111
Calculated by	A. Soupharath	April 14, 2009
Checked by	MPR	
Location	Various	

Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

				Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
													-	-		
Route 138	**NB**	Daily			19,440								-	-		
MP xxxx		AM	0	1.04	1,414	3600	0.39	50	73	765	10	70	-	27.5	62.5	700
		PM	0	1.04	930	3600	0.26	50	73	765	10	70	-	18.1	53.1	475
													-	-		
	SB	Daily			7,981								-	-		
		AM	0	1.04	580	3600	0.16	50	73	765	10	70	-	11.3	46.3	300
		PM	0	1.04	1,425	3600	0.40	50	73	765	10	70	-	27.7	62.7	700
													-	-		
Britton Street	**EB**	Daily			395								-	-		
MP 16.50		AM	0	1.04	29	3600	0.01	50	73	765	10	60	-	0.5	30.5	25
		PM	0	1.04	59	3600	0.02	50	73	765	10	60	-	1.0	31.0	25
													-	-		
	WB	Daily			869								-	-		
		AM	0	1.04	63	3600	0.02	50	73	765	10	60	-	1.1	31.1	50
		PM	0	1.04	65	3600	0.02	50	73	765	10	60	-	1.1	31.1	50
													-	-		
King Phillip Street		**Daily**	3793	1.07	4,068								-	-		
MP 17.10		AM	276	1.07	296	3600	0.08	70	103	765	7	60	-	4.9	34.9	125
		PM	328	1.07	352	3600	0.10	70	103	765	7	60	-	5.9	35.9	150
													-	-		
East Brittannia		**Daily**	4368	1.07	4,684								-	-		
MP		AM	310	1.07	333	3600	0.09	60	88	765	9	60	-	5.5	35.5	150
		PM	387	1.07	415	3600	0.12	60	88	765	9	60	-	6.9	36.9	175
													-	-		
Taunton													-	-		
													-	-		
Hart Street	**EB**	Daily	5885	1.06	6,267								-	-		
MP 12.5		AM	555	1.06	462	3600	0.13	25	37	765	21	60	-	7.7	37.7	200
		PM	474	1.06	326	3600	0.09	25	37	765	21	60	-	5.4	35.4	150
													-	-		
	WB	Daily	6236	1.06	6,641								-	-		
		AM	440	1.06	275	3600	0.08	25	37	765	21	60	-	4.6	34.6	125
		PM	579	1.06	432	3600	0.12	25	37	765	21	60	-	7.2	37.2	200

Vanasse Hangen Brustlin, Inc.

Project SCR 10111
Calculated by A. Soupharath April 14, 2009
Checked by MPR
Location Various

Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

				Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
													-	-		
Winter Street /																
Longmeadow	**NB**	Daily	6648	1.05	6,992								-	-		
MP 18.90		AM	456	1.05	511	3600	0.14	25	37	765	21	60	-	8.5	38.5	225
		PM	568	1.05	637	3600	0.18	25	37	765	21	60	-	10.6	40.6	275
													-	-		
	SB	Daily	6016	1.05	6,327								-	-		
		AM	467	1.05	396	3600	0.11	25	37	765	21	60	-	6.6	36.6	175
		PM	537	1.05	411	3600	0.11	25	37	765	21	60	-	6.8	36.8	175
													-	-		
Dean Street	**EB**	Daily	14951	1.06	15,855								-	-		
MP 19.40		AM	1236	1.06	912	3600	0.25	25	37	765	21	150	4	34.0	109.0	875
		PM	1100	1.06	858	3600	0.24	25	37	765	21	150	4	31.7	106.7	800
													-	-		
	WB	Daily	16626	1.06	17,632								-	-		
		AM	1033	1.06	846	3600	0.24	25	37	765	21	150	4	31.3	106.3	800
		PM	1405	1.06	879	3600	0.24	25	37	765	21	150	4	32.6	107.6	825
													-	-		
Whittenton Street	**EB**	Daily			1,946								-	-		
MP xxxx		AM	0	1.03	121	3600	0.03	25	37	765	21	60	-	2.0	32.0	75
		PM	0	1.03	179	3600	0.05	25	37	765	21	60	-	3.0	33.0	75
													-	-		
	WB	Daily			1,327								-	-		
		AM	0	1.03	82	3600	0.02	25	37	765	21	60	-	1.4	31.4	50
		PM	0	1.03	226	3600	0.06	25	37	765	21	60	-	3.8	33.8	100
													-	-		
Ingell Street	**NB**	Daily	3385	1.06	3,604								-	-		
MP xxxx		AM	407	1.06	433	3600	0.12	25	37	765	21	60	-	7.2	37.2	200
		PM	432	1.06	460	3600	0.13	25	37	765	21	60	-	7.7	37.7	200
													-	-		
	SB	Daily	3714	1.06	3,956								-	-		
		AM	407	1.06	433	3600	0.12	25	37	765	21	60	-	7.2	37.2	200
		PM	432	1.06	460	3600	0.13	25	37	765	21	60	-	7.7	37.7	200

Vanasse Hangen Brustlin, Inc.

Project SCR 10111
Calculated by A. Soupharath April 14, 2009
Checked by MPR
Location Various

Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

			Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
Warren Street	**No volumes available, crossing closed/gated…address qualitative**											-	-		
MP xxxx	AM	0	1.03	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
	PM	0	1.03	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
												-	-		
Berkley												-	-		
												-	-		
Mill Street	**No volumes available, crossing closed/gated…address qualitative**											-	-		
MP 0.20	AM	0	1.13	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
	PM	0	1.13	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
												-	-		
Adams Lane	**No volumes available, crossing closed/gated…address qualitative**											-	-		
MP 0.60	AM	0	1.13	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
	PM	0	1.13	-	3600	0.00	25	37	765	21	60	-	-	30.0	-
												-	-		
Freetown												-	-		
												-	-		
Forge Road-North EB	Daily	426	1.25	532								-	-		
MP 2.4	AM	16	1.25	20	3600	0.01	25	37	765	21	60	-	0.3	30.3	25
	PM	57	1.25	72	3600	0.02	25	37	765	21	60	-	1.2	31.2	50
												-	-		
WB	Daily	500	1.25	625								-	-		
	AM	64	1.25	80	3600	0.02	25	37	765	21	60	-	1.3	31.3	50
	PM	63	1.25	78	3600	0.02	25	37	765	21	60	-	1.3	31.3	50
												-	-		
Richmond Road-S NB	Daily	1894	1.25	2,365								-	-		
MP 2.4	AM	170	1.25	213	3600	0.06	25	37	765	21	60	-	3.5	33.5	100
	PM	161	1.25	202	3600	0.06	25	37	765	21	60	-	3.4	33.4	100
												-	-		
SB	Daily	1910	1.25	2,385								-	-		
	AM	170	1.25	213	3600	0.06	25	37	765	21	60	-	3.5	33.5	100
	PM	146	1.25	182	3600	0.05	25	37	765	21	60	-	3.0	33.0	100
												-	-		
Forge Road-South NB	Daily	1250	1.25	1,561								-	-		
MP 2.7	AM	69	1.25	86	3600	0.02	25	37	765	21	60	-	1.4	31.4	50
	PM	141	1.25	176	3600	0.05	25	37	765	21	60	-	2.9	32.9	75
				3,335								-	-		
SB	Daily	1420	1.25	1,774								-	-		
	AM	165	1.25	206	3600	0.06	25	37	765	21	60	-	3.4	33.4	100
	PM	94	1.25	117	3600	0.03	25	37	765	21	60	-	2.0	32.0	50

Vanasse Hangen Brustlin, Inc.

Project	SCR	10111	
Calculated by	A. Soupharath	April 14, 2009	Based on XX% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure
Checked by	MPR		
Location	Various		

				Growth Factor	Design 2030 Volume	Seconds /Hour	Veh /Sec	Train Speed (MPH)	Train Speed (FPS)	Train Length	seconds to cross	Gate Closed (seconds)	clearing Vehicles	Vehicles Queued	Average Delay	Queue Length (ft)
New Bedford													-	-		
													-	-		
													-	-		
Tarkiln Hill Road	**EB**	Daily	17094	1.05	18,010								-	-		
MP 28.5		AM	1272	1.05	611	3600	0.17	25	37	765	21	60	-	10.2	40.2	275
		PM	1359	1.05	1,283	3600	0.36	25	37	765	21	60	-	21.4	51.4	550
					4,850								-	-		
	WB	Daily	15150	1.05	15,961								-	-		
		AM	972	1.05	817	3600	0.23	25	37	765	21	60	-	13.6	43.6	350
		PM	1179	1.05	848	3600	0.24	25	37	765	21	60	-	14.1	44.1	375
													-	-		
Nash Road	**EB**	Daily	7094	1.06	7,488								-	-		
MP 29.5		AM	433	1.06	400	3600	0.11	25	37	765	21	60	-	6.7	36.7	175
		PM	625	1.06	663	3600	0.18	25	37	765	21	60	-	11.1	41.1	300
													-	-		
	WB	Daily	7006	1.06	7,394								-	-		
		AM	506	1.06	511	3600	0.14	25	37	765	21	60	-	8.5	38.5	225
		PM	620	1.06	745	3600	0.21	25	37	765	21	60	-	12.4	42.4	325
													-	-		

Grade Crossing Delay Calculations

Project: South Coast Rail
Project#:
Calculated by:
Checked by:
Date: May 1, 2009
Location: Attleboro Alignment

Based on 1% growth rate, 765' train (1 engine, 8 coaches) & 30 second advanced gate closure

		EB or NB Volume	WB or SB Volume	Largest Volume	PHF		Base Year	Future Year	Years	growth rate	Growth Factor	2030 Volume	Veh /Sec	Gate Closed (seconds)	Vehicles Queued	Average Delay	Queue Length (ft)
Richardson Ave.																	
	AM	96	307	307	0.92	334	2006	2030	24	1.0041	1.103	368	0.10	60	6.1	36.1	175
	PM	262	120	262	0.92	285	2006	2030	24	1.0041	1.103	314	0.09	60	5.2	35.2	150
Pleasant St.																	
	AM	556	504	556	0.92	604	2005	2030	25	1.0041	1.108	669	0.19	60	11.2	41.2	300
	PM	595	582	595	0.92	647	2005	2030	25	1.0041	1.108	716	0.20	60	11.9	41.9	300
Union St.																	
MP 26.31	AM	63	63	63	0.92	68	2001	2030	29	1.0041	1.126	77	0.02	60	1.3	31.3	50
	PM	82	103	103	0.92	112	2001	2030	29	1.0041	1.126	126	0.04	60	2.1	32.1	75
John Scott Blvd.																	
MP 26.87	AM	396	199	396	0.92	430	2001	2030	29	1.0041	1.126	485	0.13	60	8.1	38.1	225
	PM	205	389	389	0.92	423	2001	2030	29	1.0041	1.126	476	0.13	60	7.9	37.9	200
S. Worcester Street																	
MP 27.75	AM	86	213	213	0.92	232	2001	2030	29	1.0041	1.126	261	0.07	60	4.3	34.3	125
	PM	209	127	209	0.92	227	2001	2030	29	1.0041	1.126	256	0.07	60	4.3	34.3	125
Woodward St.																	
MP 29.34	AM	50	53	53	0.92	58	2001	2030	29	1.0041	1.126	65	0.02	60	1.1	31.1	50
	PM	47	48	48	0.92	52	2001	2030	29	1.0041	1.126	59	0.02	60	1.0	31.0	25
Harvey St.																	
MP 30.62	AM	242	662	662	0.91	727	2004	2030	26	1.0021	1.056	768	0.21	60	12.8	42.8	325
	PM	663	278	663	0.95	698	2004	2030	26	1.0021	1.056	737	0.20	60	12.3	42.3	325
Crane St.																	
MP 31.28	AM	184	87	184	0.91	202	2000	2030	30	1.0021	1.065	215	0.06	60	3.6	33.6	100
	PM	97	185	185	0.95	195	2000	2030	30	1.0021	1.065	207	0.06	60	3.5	33.5	100
Fremont St.																	
MP 32.19	AM	112	68	112	0.91	123	2000	2030	30	1.0021	1.065	131	0.04	60	2.2	32.2	75
	PM	72	96	96	0.95	101	2000	2030	30	1.0021	1.065	108	0.03	60	1.8	31.8	50
West Brittannia St.																	
MP 33.00	AM	149	246	246	0.91	270	2000	2030	30	1.0021	1.065	288	0.08	60	4.8	34.8	125
	PM	276	211	276	0.95	291	2000	2030	30	1.0021	1.065	309	0.09	60	5.2	35.2	150
Danforth St.																	
MP 33.64	AM	182	123	182	0.91	200	2000	2030	30	1.0021	1.065	213	0.06	60	3.5	33.5	100
	PM	156	243	243	0.95	256	2000	2030	30	1.0021	1.065	272	0.08	60	4.5	34.5	125
Tremont St.																	
MP 34.06	AM	569	520	569	0.91	625	2000	2030	30	1.0021	1.065	666	0.18	60	11.1	41.1	300
	PM	712	710	712	0.95	749	2000	2030	30	1.0021	1.065	798	0.22	60	13.3	43.3	350
Oak St.[1]																	
MP 34.23	AM	652	343	652	0.91	716	2000	2030	30	1.0021	1.065	763	0.21	150	31.8	106.8	800
	PM	489	546	489	0.95	515	2000	2030	30	1.0021	1.065	548	0.15	150	22.8	97.8	575
Porter St.																	
MP 34.47	AM	127	89	127	0.91	140	2000	2030	30	1.0021	1.065	149	0.04	60	2.5	32.5	75
	PM	176	123	176	0.95	185	2000	2030	30	1.0021	1.065	197	0.05	60	3.3	33.3	100
Cohannet St.																	
MP 34.54	AM	118		118	0.91	130	2000	2030	30	1.0021	1.065	138	0.04	60	2.3	32.3	75
	PM	200		200	0.95	211	2000	2030	30	1.0021	1.065	224	0.06	60	3.7	33.7	100
Winthrop St.																	
MP 34.60	AM	539	684	684	0.91	752	2000	2030	30	1.0021	1.065	800	0.22	60	13.3	43.3	350
	PM	724	648	724	0.95	762	2000	2030	30	1.0021	1.065	812	0.23	60	13.5	43.5	350
Harrison Ave.																	
MP 34.74	AM	139	72	139	0.91	153	2000	2030	30	1.0021	1.065	163	0.05	60	2.7	32.7	75
	PM	111	79	111	0.95	117	2000	2030	30	1.0021	1.065	124	0.03	60	2.1	32.1	75
Somerset Ave.																	
MP 34.92	AM	371	207	371	0.91	408	2000	2030	30	1.0021	1.065	434	0.12	60	7.2	37.2	200
	PM	327	431	431	0.95	454	2000	2030	30	1.0021	1.065	483	0.13	60	8.1	38.1	225
Weir St.																	
MP 35.00	AM	525	465	525	0.91	577	2001	2030	29	1.0021	1.063	613	0.17	70	11.9	46.9	300
	PM	426	613	613	0.95	645	2001	2030	29	1.0021	1.063	686	0.19	70	13.3	48.3	350

1 The existing pre-signals at Oak Street do not allow for vehicles to cross the tracks while the train dwells in the station. Therefore, no 4 vehicle queue reduction credit has been taken.

Appendix 4.1-K

Relocated Stoughton Station Analyses

Traffic Appendix

- Traffic Counts
- Parking Lot Counts
- Intersection Inventory
- Crash Data
- Crash Rate Analysis
- Capacity Analysis
- Signal Warrant Analysis

Traffic Counts

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision

Client:	Engineer:	Site Code:	Date:	PDI Job Number:	City, State:
VHB	E. Chan	10111.34	Wed 4/11 thru Thurs 4/12/12	122868	Stoughton, MA

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/10/1														
2	0	24	3	0	0	0	0	0	0	0	0	0	0	27
01:00	0	12	5	0	0	0	0	0	0	0	0	0	0	17
02:00	0	7	2	0	1	1	0	0	0	0	0	0	0	11
03:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
04:00	0	21	6	0	3	0	0	0	0	0	0	0	0	30
05:00	0	121	37	1	3	3	0	0	1	0	0	0	0	166
06:00	1	406	61	0	9	1	0	9	1	0	0	0	0	488
07:00	3	490	71	4	12	2	0	1	1	0	0	0	0	584
08:00	1	415	76	2	11	6	2	3	2	0	0	0	0	518
09:00	1	350	64	1	14	5	1	1	1	0	0	0	0	438
10:00	4	278	64	1	9	2	1	5	1	0	0	0	0	365
11:00	4	292	54	3	4	7	2	2	3	1	0	0	0	372
12 PM	4	303	61	3	13	2	0	2	7	0	0	0	0	395
13:00	4	322	47	1	11	3	0	0	0	0	0	0	0	388
14:00	6	303	60	2	7	2	1	1	1	0	0	0	0	383
15:00	2	324	51	1	16	2	0	2	0	0	0	0	0	398
16:00	5	312	49	3	3	1	0	0	0	0	0	0	0	373
17:00	3	323	40	0	5	1	0	0	1	0	0	0	0	373
18:00	1	300	34	1	3	3	0	3	0	0	0	0	0	345
19:00	4	264	32	1	4	2	0	0	0	0	0	0	0	307
20:00	1	186	21	0	2	2	0	0	0	0	0	0	0	212
21:00	1	126	14	0	0	0	0	1	1	0	0	0	0	143
22:00	0	81	3	0	0	0	0	0	0	0	0	0	0	84
23:00	0	38	6	0	1	0	0	0	0	0	0	0	0	45
Total	45	5306	864	24	131	45	7	30	20	1	0	0	0	6473
Percent	0.7%	82.0%	13.3%	0.4%	2.0%	0.7%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	08:00	07:00	09:00	11:00	08:00	06:00	11:00	11:00				07:00
Vol.	4	490	76	4	14	7	2	9	3	1				584
PM Peak	14:00	15:00	12:00	12:00	15:00	13:00	14:00	18:00	12:00					15:00
Vol.	6	324	61	3	16	3	1	3	7					398

PRECISION
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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/11/1														
2	0	25	5	0	0	1	0	0	0	0	0	0	0	31
01:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
02:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
03:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
04:00	0	27	5	1	1	1	0	0	1	0	0	0	0	36
05:00	0	115	34	0	2	2	0	0	2	0	0	0	0	155
06:00	0	412	70	0	17	2	0	8	3	0	0	0	0	512
07:00	1	477	55	3	11	1	1	1	3	0	0	0	0	553
08:00	0	440	63	2	13	6	0	4	1	0	0	0	0	529
09:00	2	321	60	1	12	8	2	1	3	0	0	0	0	410
10:00	5	305	61	3	14	2	1	2	2	0	0	0	0	395
11:00	0	262	73	2	9	5	0	5	2	0	0	0	0	358
12 PM	2	325	54	4	8	1	0	0	2	0	0	0	0	396
13:00	4	299	62	2	7	6	0	1	6	0	0	0	0	387
14:00	1	322	54	1	6	5	0	1	4	0	0	0	0	394
15:00	5	305	48	1	6	2	0	1	0	0	0	0	0	368
16:00	2	333	52	1	7	0	0	0	0	0	0	0	0	395
17:00	4	343	37	1	5	3	0	3	1	0	0	0	0	397
18:00	2	304	32	0	3	0	0	0	0	0	0	0	0	341
19:00	4	264	22	0	5	2	0	0	0	0	0	0	0	297
20:00	0	201	28	0	2	0	0	0	0	0	0	0	0	231
21:00	0	146	9	0	0	0	0	1	1	0	0	0	0	157
22:00	2	99	7	0	1	0	0	0	0	0	0	0	0	109
23:00	0	51	4	0	0	0	0	0	0	0	0	0	0	55
Total	34	5406	838	22	129	47	4	28	31	0	0	0	0	6539
Percent	0.5%	82.7%	12.8%	0.3%	2.0%	0.7%	0.1%	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	11:00	07:00	06:00	09:00	09:00	06:00	06:00					07:00
Vol.	5	477	73	3	17	8	2	8	3					553
PM Peak	15:00	17:00	13:00	12:00	12:00	13:00		17:00	13:00					17:00
Vol.	5	343	62	4	8	6		3	6					397

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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/12/1														
2	0	15	10	0	0	0	0	0	0	0	0	0	0	25
01:00	0	11	5	0	0	0	0	0	0	0	0	0	0	16
02:00	0	8	1	0	0	1	0	0	1	0	0	0	0	11
03:00	0	10	1	0	0	0	0	0	1	0	0	0	0	12
04:00	0	27	6	0	2	2	0	0	0	0	0	0	0	37
05:00	0	100	32	2	7	0	0	0	0	0	0	0	0	141
06:00	1	398	63	2	7	4	0	7	4	0	0	0	0	486
07:00	0	489	63	2	8	1	0	2	1	0	0	0	0	566
08:00	2	435	64	0	9	5	0	1	3	0	0	0	0	519
09:00	0	302	59	0	7	6	1	2	3	1	0	0	0	381
10:00	1	278	43	2	14	4	0	1	2	0	0	0	0	345
11:00	2	310	58	3	11	6	0	3	2	0	0	0	0	395
12 PM	2	302	50	1	13	2	0	2	4	0	0	0	0	376
13:00	1	302	68	3	8	3	0	3	3	0	0	0	0	391
14:00	5	329	53	1	11	6	0	0	0	0	0	0	0	405
15:00	1	332	50	1	11	7	0	1	1	0	0	0	0	404
16:00	5	301	44	0	9	6	0	3	0	0	0	1	0	369
17:00	1	334	47	1	3	2	0	0	0	0	0	0	0	388
18:00	7	339	50	1	5	1	0	0	1	0	0	0	0	404
19:00	0	258	38	0	3	1	0	0	0	0	0	0	0	300
20:00	2	216	16	0	2	0	0	0	0	0	0	0	0	236
21:00	0	136	14	0	0	0	0	1	1	0	0	0	0	152
22:00	0	83	12	0	0	1	0	0	0	0	0	0	0	96
23:00	0	59	4	0	0	0	0	0	0	0	0	0	0	63
Total	30	5374	851	19	130	58	1	26	27	1	0	1	0	6518
Percent	0.5%	82.4%	13.1%	0.3%	2.0%	0.9%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	11:00	10:00	09:00	09:00	06:00	06:00	09:00				07:00
Vol.	2	489	64	3	14	6	1	7	4	1				566
PM Peak	18:00	18:00	13:00	13:00	12:00	15:00		13:00	12:00			16:00		14:00
Vol.	7	339	68	3	13	7		3	4			1		405
Total		16086	2553	65	390	150	12	84	78	2	0	1	0	19530

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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/10/1														
2	1	40	6	0	0	0	0	0	0	0	0	0	0	47
01:00	0	23	2	0	1	0	0	0	0	0	0	0	0	26
02:00	0	10	1	0	0	1	0	0	0	0	0	0	0	12
03:00	1	3	2	0	0	1	0	0	0	0	0	0	0	7
04:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
05:00	0	36	11	1	2	0	0	0	0	0	0	0	0	50
06:00	1	114	26	1	3	0	0	3	0	0	0	0	0	148
07:00	0	258	54	6	8	4	1	1	0	0	0	0	0	332
08:00	3	287	50	2	7	4	0	1	0	0	0	0	0	354
09:00	0	235	40	2	17	2	0	4	1	0	0	0	0	301
10:00	1	276	48	1	15	2	0	1	1	0	0	0	0	345
11:00	1	327	63	1	13	6	0	0	0	1	0	0	0	412
12 PM	1	297	45	1	18	3	0	2	0	2	0	0	0	369
13:00	3	338	55	1	17	3	0	2	0	0	0	0	0	419
14:00	2	394	63	2	16	3	0	0	1	0	0	0	0	481
15:00	2	407	57	5	16	2	0	3	1	0	0	0	0	493
16:00	0	501	97	0	12	1	0	5	0	0	0	0	0	616
17:00	7	626	85	0	10	1	0	2	0	0	0	0	0	731
18:00	1	501	46	3	6	1	1	1	0	0	0	0	0	560
19:00	1	357	38	0	8	0	0	1	0	0	0	0	0	405
20:00	0	247	29	1	2	1	0	0	0	0	0	0	0	280
21:00	0	202	18	0	3	0	0	0	0	0	0	0	0	223
22:00	0	93	9	0	4	0	0	1	0	0	0	0	0	107
23:00	0	66	4	0	1	0	0	0	0	0	0	0	0	71
Total	25	5649	851	27	180	35	2	27	4	3	0	0	0	6803
Percent	0.4%	83.0%	12.5%	0.4%	2.6%	0.5%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	07:00	09:00	11:00	07:00	09:00	09:00	11:00				11:00
Vol.	3	327	63	6	17	6	1	4	1	1				412
PM Peak	17:00	17:00	16:00	15:00	12:00	12:00	18:00	16:00	14:00	12:00				17:00
Vol.	7	626	97	5	18	3	1	5	1	2				731

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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/11/1														
2	1	34	2	0	1	0	0	0	0	0	0	0	0	38
01:00	0	22	3	0	1	0	0	0	0	0	0	0	0	26
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
04:00	0	16	7	0	1	1	1	0	1	0	0	0	0	27
05:00	0	35	15	0	3	1	0	0	0	0	0	0	0	54
06:00	0	122	23	1	4	2	0	0	3	0	0	0	0	155
07:00	1	254	50	0	12	5	0	2	1	0	0	0	0	325
08:00	3	256	56	6	10	4	0	3	2	0	0	0	0	340
09:00	2	263	48	2	16	5	0	0	1	0	0	0	0	337
10:00	2	298	49	1	16	3	0	3	2	0	0	0	0	374
11:00	1	351	69	4	14	2	0	3	3	0	0	0	0	447
12 PM	3	358	64	4	13	2	0	2	2	0	0	0	0	448
13:00	4	316	60	1	9	3	0	0	5	0	0	0	0	398
14:00	3	362	61	2	10	2	0	1	1	0	0	0	0	442
15:00	4	408	86	6	10	4	0	4	2	0	0	0	0	524
16:00	2	522	99	1	17	3	0	4	0	0	0	0	0	648
17:00	3	617	60	1	8	5	0	3	1	0	0	0	0	698
18:00	3	536	62	1	7	0	0	0	0	0	0	0	0	609
19:00	4	357	38	1	5	1	0	0	0	1	0	0	0	407
20:00	0	266	42	0	3	1	0	0	0	0	0	0	0	312
21:00	0	212	18	0	1	0	0	0	0	0	0	0	0	231
22:00	0	114	10	0	0	0	0	0	0	0	0	0	0	124
23:00	1	66	8	0	1	0	0	0	0	0	0	0	0	76
Total	37	5801	932	31	162	44	1	25	24	1	0	0	0	7058
Percent	0.5%	82.2%	13.2%	0.4%	2.3%	0.6%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	08:00	09:00	07:00	04:00	08:00	06:00					11:00
Vol.	3	351	69	6	16	5	1	3	3					447
PM Peak	13:00	17:00	16:00	15:00	16:00	17:00		15:00	13:00	19:00				17:00
Vol.	4	617	99	6	17	5		4	5	1				698

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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Class
Site Code: 10111.34

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/12/1														
2	1	37	5	0	1	0	0	0	0	0	0	0	0	44
01:00	0	19	6	0	0	0	0	0	0	0	0	0	0	25
02:00	0	9	2	0	0	0	0	0	1	0	0	0	0	12
03:00	0	8	4	0	0	0	0	0	0	0	0	0	0	12
04:00	0	13	2	0	1	1	0	0	0	0	0	0	0	17
05:00	0	44	11	2	2	1	0	0	1	0	0	0	0	61
06:00	0	125	20	2	3	1	0	1	1	0	0	0	0	153
07:00	1	240	51	3	7	4	0	0	3	0	0	0	0	309
08:00	1	263	54	4	11	4	0	2	4	0	0	0	0	343
09:00	0	237	51	2	14	3	0	2	1	0	0	0	0	310
10:00	2	277	52	2	14	6	0	1	3	0	0	0	0	357
11:00	2	307	59	3	12	5	0	1	1	0	0	0	0	390
12 PM	3	302	60	1	11	5	0	4	4	0	0	0	0	390
13:00	1	319	67	2	13	5	0	0	4	0	0	0	0	411
14:00	6	364	64	3	18	8	0	4	1	0	1	0	0	469
15:00	1	433	86	7	11	2	0	2	0	0	0	0	0	542
16:00	1	493	72	1	14	1	0	5	2	0	0	0	0	589
17:00	1	665	96	1	13	1	0	2	0	0	0	0	0	779
18:00	0	529	66	1	6	0	0	2	0	0	0	0	0	604
19:00	2	377	58	0	4	1	0	0	0	0	0	0	0	442
20:00	2	270	29	0	4	0	0	0	0	0	0	0	0	305
21:00	1	200	25	0	1	0	0	0	0	0	0	0	0	227
22:00	0	119	18	0	2	0	0	0	0	0	0	0	0	139
23:00	0	85	10	0	2	0	0	0	1	0	0	0	0	98
Total	25	5735	968	34	164	48	0	26	27	0	1	0	0	7028
Percent	0.4%	81.6%	13.8%	0.5%	2.3%	0.7%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	08:00	09:00	10:00		08:00	08:00					11:00
Vol.	2	307	59	4	14	6		2	4					390
PM Peak	14:00	17:00	17:00	15:00	14:00	14:00		16:00	12:00		14:00			17:00
Vol.	6	665	96	7	18	8		5	4		1			779
Total		17185	2751	92	506	127	3	78	55	4	1	0	0	20889

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Washington Street (Route 138)
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City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/10/1																
2	0	0	0	0	8	14	3	1	1	0	0	0	0	27	39	37
01:00	0	0	0	0	3	6	7	0	1	0	0	0	0	17	42	39
02:00	0	0	1	0	3	3	2	1	1	0	0	0	0	11	37	37
03:00	0	0	0	0	0	7	3	1	0	0	0	0	0	11	41	39
04:00	0	0	0	1	1	10	14	4	0	0	0	0	0	30	44	40
05:00	1	0	1	2	15	73	63	8	**3**	0	0	0	0	166	43	39
06:00	0	3	8	39	126	225	**78**	**9**	0	0	0	0	0	488	40	35
07:00	2	7	19	**102**	204	**227**	23	0	0	0	0	0	0	**584**	37	33
08:00	**19**	**18**	**29**	85	**209**	132	26	0	0	0	0	0	0	518	36	30
09:00	0	2	14	55	162	156	46	3	0	0	0	0	0	438	38	34
10:00	0	4	12	47	110	146	42	4	0	0	0	0	0	365	39	34
11:00	1	3	3	47	138	148	31	1	0	0	0	0	0	372	38	34
12 PM	**1**	**4**	8	43	140	**161**	**34**	3	0	0	0	0	**1**	395	38	34
13:00	1	1	9	53	147	148	24	5	0	0	0	0	0	388	38	34
14:00	0	1	6	37	170	143	25	1	0	0	0	0	0	383	38	34
15:00	0	2	**17**	56	157	147	19	0	0	0	0	0	0	**398**	37	33
16:00	1	4	6	65	**173**	102	19	3	0	0	0	0	0	373	37	33
17:00	0	4	15	**70**	157	109	18	0	0	0	0	0	0	373	37	32
18:00	1	0	6	39	111	154	33	1	0	0	0	0	0	345	38	34
19:00	0	0	7	22	107	134	33	4	0	0	0	0	0	307	39	35
20:00	1	1	3	14	59	98	34	2	0	0	0	0	0	212	39	35
21:00	0	0	4	7	48	55	20	**8**	**1**	0	0	0	0	143	40	36
22:00	0	0	1	5	23	26	25	4	0	0	0	0	0	84	42	37
23:00	0	0	0	3	5	19	14	4	0	0	0	0	0	45	43	38
%	0.4%	0.8%	2.6%	12.2%	35.2%	37.7%	9.8%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	08:00	07:00	06:00	06:00	05:00					07:00		
Vol.	19	18	29	102	209	227	78	9	3					584		
PM Peak	12:00	12:00	15:00	17:00	16:00	12:00	12:00	21:00	21:00				12:00	15:00		
Vol.	1	4	17	70	173	161	34	8	1				1	398		
Total	28	54	169	792	2276	2443	636	67	7	0	0	0	1	6473	940	
Pecent			15th Percentile :			27 MPH										
			50th Percentile :			33 MPH										
			85th Percentile :			38 MPH										
			95th Percentile :			42 MPH										

Stats		
	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	4293
	Percent in Pace :	66.3%
	Number of Vehicles > 35 MPH :	2639
	Percent of Vehicles > 35 MPH :	40.8%
	Mean Speed(Average) :	34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/11/1																
2	0	0	0	2	7	15	7	0	0	0	0	0	0	31	40	36
01:00	0	0	0	0	2	7	2	1	0	0	0	0	0	12	39	38
02:00	0	0	0	0	2	5	2	1	0	**1**	0	0	0	11	39	40
03:00	0	0	0	1	1	3	5	0	0	0	0	0	0	10	42	38
04:00	0	0	1	3	5	10	14	3	0	0	0	0	0	36	42	38
05:00	**2**	0	0	3	21	68	**52**	**8**	**1**	0	0	0	0	155	42	38
06:00	0	0	6	46	179	**234**	42	5	0	0	0	0	0	512	38	35
07:00	1	0	**24**	**117**	236	156	19	0	0	0	0	0	0	**553**	36	32
08:00	1	**4**	17	69	**260**	154	23	1	0	0	0	0	0	529	37	33
09:00	1	0	9	75	142	153	30	0	0	0	0	0	0	410	38	33
10:00	0	0	7	34	155	168	27	4	0	0	0	0	0	395	38	34
11:00	0	1	9	48	154	129	17	0	0	0	0	0	0	358	37	33
12 PM	**1**	0	8	23	147	**178**	37	1	**1**	0	0	0	0	396	38	35
13:00	0	0	9	47	149	131	**50**	1	0	0	0	0	0	387	39	34
14:00	1	1	9	57	155	141	29	1	0	0	0	0	0	394	38	33
15:00	1	1	7	66	131	128	31	3	0	0	0	0	0	368	38	33
16:00	0	2	7	83	170	111	20	2	0	0	0	0	0	395	37	33
17:00	0	**4**	**14**	**84**	**174**	103	17	1	0	0	0	0	0	**397**	36	32
18:00	0	1	10	40	131	123	31	4	1	0	0	0	0	341	38	34
19:00	0	0	9	31	102	121	33	1	0	0	0	0	0	297	38	34
20:00	0	3	2	19	68	105	32	2	0	0	0	0	0	231	39	35
21:00	0	0	0	10	45	74	22	**6**	0	0	0	0	0	157	40	36
22:00	1	0	4	12	34	34	21	3	0	0	0	0	0	109	40	35
23:00	0	0	0	2	17	24	9	2	1	0	0	0	0	55	40	37
%	0.1%	0.3%	2.3%	13.3%	38.0%	36.3%	8.7%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	08:00	07:00	07:00	08:00	06:00	05:00	05:00	05:00	02:00				07:00		
Vol.	2	4	24	117	260	234	52	8	1	1				553		
PM Peak	12:00	17:00	17:00	17:00	17:00	12:00	13:00	21:00	12:00					17:00		
Vol.	1	4	14	84	174	178	50	6	1					397		
Total	9	17	152	872	2487	2375	572	50	4	1	0	0	0	6539	929	
Pecent			15th Percentile :		28 MPH											
			50th Percentile :		33 MPH											
			85th Percentile :		38 MPH											
			95th Percentile :		41 MPH											

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	4442
Percent in Pace :	67.9%
Number of Vehicles > 35 MPH :	2526
Percent of Vehicles > 35 MPH :	38.6%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/12/1																
2	0	0	0	3	7	11	1	3	0	0	0	0	0	25	39	36
01:00	0	1	0	1	5	8	1	0	0	0	0	0	0	16	38	33
02:00	0	0	1	1	2	4	2	1	0	0	0	0	0	11	38	36
03:00	0	0	0	1	3	2	6	0	0	0	0	0	0	12	42	37
04:00	0	0	0	1	4	15	14	3	0	0	0	0	0	37	42	39
05:00	**1**	0	1	1	12	57	52	**14**	**3**	0	0	0	0	141	43	39
06:00	0	1	13	65	148	**189**	**67**	3	0	0	0	0	0	486	39	34
07:00	1	**4**	**18**	**106**	**249**	158	30	0	0	0	0	0	0	**566**	37	32
08:00	0	0	15	97	245	138	22	2	0	0	0	0	0	519	37	33
09:00	0	0	10	43	132	162	34	0	0	0	0	0	0	381	38	34
10:00	0	1	13	46	121	120	38	5	1	0	0	0	0	345	39	34
11:00	0	2	8	57	163	138	26	1	0	0	0	0	0	395	37	33
12 PM	0	0	1	**71**	163	123	17	1	0	0	0	0	0	376	37	33
13:00	1	0	10	58	167	**131**	22	2	0	0	0	0	0	391	37	33
14:00	0	0	14	61	**191**	126	12	1	0	0	0	0	0	**405**	37	33
15:00	0	0	**21**	70	170	121	21	1	0	0	0	0	0	404	37	33
16:00	2	**9**	9	59	158	110	21	1	0	0	0	0	0	369	37	32
17:00	0	0	9	68	187	96	25	3	0	0	0	0	0	388	37	33
18:00	**3**	1	6	68	185	128	13	0	0	0	0	0	0	404	37	33
19:00	0	0	5	33	120	110	**30**	2	0	0	0	0	0	300	38	34
20:00	0	3	8	20	83	108	10	**4**	0	0	0	0	0	236	38	34
21:00	0	0	3	10	45	77	17	0	0	0	0	0	0	152	39	35
22:00	0	0	4	9	26	38	15	4	0	0	0	0	0	96	40	35
23:00	0	0	0	2	17	28	12	4	0	0	0	0	0	63	41	37
%	0.1%	0.3%	2.6%	14.6%	39.9%	33.7%	7.8%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	07:00	07:00	07:00	07:00	06:00	06:00	05:00	05:00					07:00		
Vol.	1	4	18	106	249	189	67	14	3					566		
PM Peak	18:00	16:00	15:00	12:00	14:00	13:00	19:00	20:00						14:00		
Vol.	3	9	21	71	191	131	30	4						405		
Total	8	22	169	951	2603	2198	508	55	4	0	0	0	0	6518	924	
Pecent			15th Percentile :		27 MPH											
			50th Percentile :		33 MPH											
			85th Percentile :		38 MPH											
			95th Percentile :		41 MPH											

Stats		
	10 MPH Pace Speed :	29-38 MPH
	Number in Pace :	4407
	Percent in Pace :	67.6%
	Number of Vehicles > 35 MPH :	2336
	Percent of Vehicles > 35 MPH :	35.8%
	Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/10/1																
2	0	0	0	5	9	14	16	3	0	0	0	0	0	47	42	37
01:00	0	0	0	2	5	12	4	2	**1**	0	0	0	0	26	41	37
02:00	0	0	0	0	1	3	8	0	0	0	0	0	0	12	43	40
03:00	0	2	0	0	2	3	0	0	0	0	0	0	0	7	36	28
04:00	0	0	0	0	2	5	5	2	0	0	0	0	0	14	43	40
05:00	0	0	0	4	10	21	12	3	0	0	0	0	0	50	41	37
06:00	0	0	3	26	37	54	23	5	0	0	0	0	0	148	40	35
07:00	**3**	4	**23**	74	119	81	23	4	0	0	0	**1**	0	332	37	32
08:00	0	**7**	22	65	120	116	21	3	0	0	0	0	0	354	37	32
09:00	0	0	12	57	110	96	22	4	0	0	0	0	0	301	38	33
10:00	0	1	7	48	136	127	23	3	0	0	0	0	0	345	38	34
11:00	2	7	16	**75**	**154**	**128**	**24**	**6**	0	0	0	0	0	**412**	37	32
12 PM	0	3	16	76	140	112	18	4	0	0	0	0	0	369	37	32
13:00	0	**19**	17	68	162	121	27	4	1	0	0	0	0	419	37	32
14:00	3	2	16	92	190	146	26	4	**2**	0	0	0	0	481	37	33
15:00	0	11	21	81	198	149	27	6	0	0	0	0	0	493	37	32
16:00	0	1	18	97	280	**191**	24	5	0	0	0	0	0	616	37	33
17:00	**10**	17	**49**	**191**	**281**	160	21	2	0	0	0	0	0	**731**	36	30
18:00	1	2	17	80	241	177	39	3	0	0	0	0	0	560	37	33
19:00	0	0	5	48	159	150	39	4	0	0	0	0	0	405	38	34
20:00	1	4	13	37	86	97	**41**	1	0	0	0	0	0	280	39	34
21:00	0	0	4	24	81	78	29	**7**	0	0	0	0	0	223	39	35
22:00	0	0	2	9	21	44	22	7	2	0	0	0	0	107	42	37
23:00	0	0	0	4	12	22	27	6	0	0	0	0	0	71	43	38
%	0.3%	1.2%	3.8%	17.1%	37.6%	31.0%	7.7%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	07:00	11:00	11:00	11:00	11:00	11:00	01:00			07:00		11:00		
Vol.	3	7	23	75	154	128	24	6	1			1		412		
PM Peak	17:00	13:00	17:00	17:00	17:00	16:00	20:00	21:00	14:00					17:00		
Vol.	10	19	49	191	281	191	41	7	2					731		
Total	20	80	261	1163	2556	2107	521	88	6	0	0	1	0	6803	932	
Pecent			15th Percentile :		26 MPH											
			50th Percentile :		32 MPH											
			85th Percentile :		38 MPH											
			95th Percentile :		41 MPH											

Stats		
	10 MPH Pace Speed :	29-38 MPH
	Number in Pace :	4321
	Percent in Pace :	63.5%
	Number of Vehicles > 35 MPH :	2301
	Percent of Vehicles > 35 MPH :	33.8%
	Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/11/1																
2	0	0	1	4	7	14	10	2	0	0	0	0	0	38	41	36
01:00	0	0	0	1	5	8	9	3	0	0	0	0	0	26	43	39
02:00	0	0	1	0	3	1	4	1	0	0	0	0	0	10	42	37
03:00	0	0	0	0	1	3	1	3	0	0	0	0	0	8	46	41
04:00	0	0	1	1	7	11	6	1	0	0	0	0	0	27	41	36
05:00	0	0	1	3	6	27	14	3	0	0	0	0	0	54	41	37
06:00	0	0	5	24	48	53	21	2	**1**	**1**	0	0	0	155	39	34
07:00	**1**	2	**33**	63	98	91	33	**4**	0	0	0	0	0	325	38	32
08:00	0	1	24	57	143	101	10	4	0	0	0	0	0	340	37	32
09:00	1	**3**	13	43	120	113	**40**	4	0	0	0	0	0	337	39	34
10:00	0	2	15	37	144	**147**	28	1	0	0	0	0	0	374	38	34
11:00	0	2	20	**65**	**191**	147	19	3	0	0	0	0	0	**447**	37	33
12 PM	0	1	11	55	169	167	41	3	0	**1**	0	0	0	448	38	34
13:00	1	6	27	57	139	133	32	2	1	0	0	0	0	398	38	33
14:00	0	13	8	64	180	143	29	5	0	0	0	0	0	442	38	33
15:00	4	5	22	83	193	177	37	3	0	0	0	0	0	524	38	33
16:00	**6**	10	48	142	242	161	37	2	0	0	0	0	0	648	37	31
17:00	3	**14**	**58**	**147**	**283**	165	25	3	0	0	0	0	0	**698**	36	31
18:00	3	4	14	117	207	**199**	**62**	3	0	0	0	0	0	609	38	33
19:00	1	1	11	49	142	166	33	4	0	0	0	0	0	407	38	34
20:00	0	1	7	30	93	135	40	5	1	0	0	0	0	312	39	35
21:00	0	0	3	16	63	98	43	**7**	1	0	0	0	0	231	40	36
22:00	0	2	8	13	37	40	18	4	**2**	0	0	0	0	124	40	34
23:00	1	0	1	6	17	24	24	3	0	0	0	0	0	76	42	36
%	0.3%	0.9%	4.7%	15.3%	36.0%	32.9%	8.7%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	07:00	11:00	11:00	10:00	09:00	07:00	06:00	06:00				11:00		
Vol.	1	3	33	65	191	147	40	4	1	1				447		
PM Peak	16:00	17:00	17:00	17:00	17:00	18:00	18:00	21:00	22:00	12:00				17:00		
Vol.	6	14	58	147	283	199	62	7	2	1				698		
Total	21	67	332	1077	2538	2324	616	75	6	2	0	0	0	7058	944	
Pecent			15th Percentile :		26 MPH											
			50th Percentile :		32 MPH											
			85th Percentile :		38 MPH											
			95th Percentile :		41 MPH											

Stats		
	10 MPH Pace Speed :	29-38 MPH
	Number in Pace :	4455
	Percent in Pace :	63.1%
	Number of Vehicles > 35 MPH :	2549
	Percent of Vehicles > 35 MPH :	36.1%
	Mean Speed(Average) :	33 MPH

PRECISION
D A T A
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Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughotn, MA
Client: VHB/ E. Chan

122868 A Speed
Site Code: 10111.34

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/12/1																
2	0	0	0	2	6	17	14	**5**	0	0	0	0	0	44	43	39
01:00	0	0	0	1	5	12	4	3	0	0	0	0	0	25	43	38
02:00	0	0	0	0	1	6	4	1	0	0	0	0	0	12	42	39
03:00	0	0	0	0	3	3	4	2	0	0	0	0	0	12	42	39
04:00	0	0	0	0	4	10	2	1	0	0	0	0	0	17	38	37
05:00	0	0	0	2	7	29	19	3	**1**	0	0	0	0	61	42	38
06:00	0	0	7	30	44	47	24	1	0	0	0	0	0	153	39	34
07:00	**3**	3	19	69	102	86	25	2	0	0	0	0	0	309	37	32
08:00	1	**7**	19	**80**	126	87	22	1	0	0	0	0	0	343	37	32
09:00	0	2	8	45	102	114	**36**	3	0	0	0	0	0	310	39	34
10:00	0	0	**20**	51	133	115	34	4	0	0	0	0	0	357	38	33
11:00	0	1	16	59	**146**	**129**	34	5	0	0	0	0	0	**390**	38	33
12 PM	1	3	17	65	135	136	29	3	1	0	0	0	0	390	38	33
13:00	0	7	31	61	151	128	32	1	0	0	0	0	0	411	37	32
14:00	3	6	17	105	188	119	28	3	0	0	0	0	0	469	37	32
15:00	0	6	25	93	227	151	37	3	0	0	0	0	0	542	37	33
16:00	1	**16**	19	82	219	**202**	48	2	0	0	0	0	0	589	38	33
17:00	1	6	**36**	**179**	**335**	176	44	2	0	0	0	0	0	**779**	36	32
18:00	**6**	6	25	113	242	168	36	5	**3**	0	0	0	0	604	37	32
19:00	1	0	24	80	153	149	33	2	0	0	0	0	0	442	38	33
20:00	1	2	10	44	105	100	37	4	2	0	0	0	0	305	39	34
21:00	0	0	3	21	55	92	**51**	4	1	0	0	0	0	227	41	36
22:00	0	0	3	20	30	46	36	3	1	0	0	0	0	139	41	36
23:00	0	0	3	8	15	44	17	**8**	2	**1**	0	0	0	98	42	37
%	0.3%	0.9%	4.3%	17.2%	36.1%	30.8%	9.2%	1.0%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	10:00	08:00	11:00	11:00	09:00	00:00	05:00					11:00		
Vol.	3	7	20	80	146	129	36	5	1					390		
PM Peak	18:00	16:00	17:00	17:00	17:00	16:00	21:00	23:00	18:00	23:00				17:00		
Vol.	6	16	36	179	335	202	51	8	3	1				779		
Total	18	65	302	1210	2534	2166	650	71	11	1	0	0	0	7028	939	
Pecent			15th Percentile :		26 MPH											
			50th Percentile :		32 MPH											
			85th Percentile :		38 MPH											
			95th Percentile :		41 MPH											

Stats		
	10 MPH Pace Speed :	29-38 MPH
	Number in Pace :	4367
	Percent in Pace :	62.1%
	Number of Vehicles > 35 MPH :	2465
	Percent of Vehicles > 35 MPH :	35.1%
	Mean Speed(Average) :	33 MPH

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

122868 A Volume
Site Code: 10111.34

Start	NB				SB				Combined				10-Apr-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	9		98		21		91		30		189		
12:15	7		113		9		92		16		205		
12:30	5		87		6		96		11		183		
12:45	6	27	97	395	11	47	90	369	17	74	187	764	
01:00	5		80		10		131		15		211		
01:15	7		92		5		103		12		195		
01:30	1		123		6		90		7		213		
01:45	4	17	93	388	5	26	95	419	9	43	188	807	
02:00	2		107		3		113		5		220		
02:15	1		77		5		125		6		202		
02:30	6		89		2		126		8		215		
02:45	2	11	110	383	2	12	117	481	4	23	227	864	
03:00	4		99		0		118		4		217		
03:15	2		93		4		129		6		222		
03:30	2		94		2		115		4		209		
03:45	3	11	112	398	1	7	131	493	4	18	243	891	
04:00	5		76		4		158		9		234		
04:15	10		90		2		164		12		254		
04:30	5		118		1		124		6		242		
04:45	10	30	89	373	7	14	170	616	17	44	259	989	
05:00	25		101		10		196		35		297		
05:15	29		99		6		162		35		261		
05:30	52		79		9		197		61		276		
05:45	60	166	94	373	25	50	176	731	85	216	270	1104	
06:00	81		90		10		144		91		234		
06:15	129		86		25		157		154		243		
06:30	137		85		42		148		179		233		
06:45	141	488	84	345	71	148	111	560	212	636	195	905	
07:00	131		94		65		116		196		210		
07:15	140		80		79		125		219		205		
07:30	166		74		91		85		257		159		
07:45	147	584	59	307	97	332	79	405	244	916	138	712	
08:00	140		57		98		89		238		146		
08:15	138		55		89		68		227		123		
08:30	113		59		93		66		206		125		
08:45	127	518	41	212	74	354	57	280	201	872	98	492	
09:00	124		40		81		73		205		113		
09:15	98		40		75		55		173		95		
09:30	125		39		78		46		203		85		
09:45	91	438	24	143	67	301	49	223	158	739	73	366	
10:00	96		28		67		36		163		64		
10:15	86		24		103		23		189		47		
10:30	98		17		94		30		192		47		
10:45	85	365	15	84	81	345	18	107	166	710	33	191	
11:00	84		10		100		13		184		23		
11:15	107		8		111		28		218		36		
11:30	86		15		95		20		181		35		
11:45	95	372	12	45	106	412	10	71	201	784	22	116	
Total	3027		3446		2048		4755		5075		8201		
Percent	59.6%		42.0%		40.4%		58.0%						
Day Total		6473				6803				13276			
Peak	07:15		01:15		11:00		05:00		07:30		05:00		
Vol.	593		415		412		731		966		1104		
P.H.F.	0.893		0.843		0.928		0.928		0.940		0.929		

Washington Street (Route 138)
north of Kinsley Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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122868 A Volume
Site Code: 10111.34

Start Time	NB A.M.		NB P.M.		SB A.M.		SB P.M.		Combined A.M.		Combined P.M.		11-Apr-12 Wed
12:00	6		85		11		109		17		194		
12:15	9		102		12		120		21		222		
12:30	10		97		6		108		16		205		
12:45	6	31	112	396	9	38	111	448	15	69	223	844	
01:00	3		89		11		93		14		182		
01:15	3		102		7		103		10		205		
01:30	4		98		5		100		9		198		
01:45	2	12	98	387	3	26	102	398	5	38	200	785	
02:00	2		90		2		105		4		195		
02:15	2		98		2		101		4		199		
02:30	4		100		4		117		8		217		
02:45	3	11	106	394	2	10	119	442	5	21	225	836	
03:00	3		97		0		120		3		217		
03:15	1		72		2		138		3		210		
03:30	3		86		5		117		8		203		
03:45	3	10	113	368	1	8	149	524	4	18	262	892	
04:00	4		102		7		153		11		255		
04:15	5		91		6		158		11		249		
04:30	14		93		5		143		19		236		
04:45	13	36	109	395	9	27	194	648	22	63	303	1043	
05:00	23		100		7		152		30		252		
05:15	27		97		10		178		37		275		
05:30	50		98		11		185		61		283		
05:45	55	155	102	397	26	54	183	698	81	209	285	1095	
06:00	90		95		15		176		105		271		
06:15	135		87		36		138		171		225		
06:30	126		87		33		166		159		253		
06:45	161	512	72	341	71	155	129	609	232	667	201	950	
07:00	112		82		64		119		176		201		
07:15	137		83		79		108		216		191		
07:30	145		58		82		98		227		156		
07:45	159	553	74	297	100	325	82	407	259	878	156	704	
08:00	143		58		89		72		232		130		
08:15	142		58		71		82		213		140		
08:30	122		70		90		87		212		157		
08:45	122	529	45	231	90	340	71	312	212	869	116	543	
09:00	125		39		79		61		204		100		
09:15	101		44		83		58		184		102		
09:30	92		36		94		62		186		98		
09:45	92	410	38	157	81	337	50	231	173	747	88	388	
10:00	89		32		80		37		169		69		
10:15	102		32		98		32		200		64		
10:30	101		24		107		27		208		51		
10:45	103	395	21	109	89	374	28	124	192	769	49	233	
11:00	106		22		117		20		223		42		
11:15	90		9		114		20		204		29		
11:30	81		12		112		19		193		31		
11:45	81	358	12	55	104	447	17	76	185	805	29	131	
Total	3012		3527		2141		4917		5153		8444		
Percent	58.5%		41.8%		41.5%		58.2%						
Day Total		6539				7058				13597			
Peak	07:30		04:45		11:00		05:15		07:15		05:15		
Vol.	589		404		447		722		934		1114		
P.H.F.	0.926		0.894		0.955		0.976		0.902		0.977		

Washington Street (Route 138)
north of Kinsley Street
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Client: VHB/ E. Chan

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122868 A Volume
Site Code: 10111.34

Start	NB				SB				Combined				12-Apr-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	7		88		14		90		21		178		
12:15	8		94		15		96		23		190		
12:30	5		88		9		111		14		199		
12:45	5	25	106	376	6	44	93	390	11	69	199	766	
01:00	6		97		6		96		12		193		
01:15	4		99		8		103		12		202		
01:30	5		100		5		105		10		205		
01:45	1	16	95	391	6	25	107	411	7	41	202	802	
02:00	3		99		5		105		8		204		
02:15	3		98		5		112		8		210		
02:30	2		97		1		127		3		224		
02:45	3	11	111	405	1	12	125	469	4	23	236	874	
03:00	0		93		3		132		3		225		
03:15	6		105		2		142		8		247		
03:30	2		108		4		125		6		233		
03:45	4	12	98	404	3	12	143	542	7	24	241	946	
04:00	4		99		6		136		10		235		
04:15	12		91		3		141		15		232		
04:30	7		74		5		148		12		222		
04:45	14	37	105	369	3	17	164	589	17	54	269	958	
05:00	14		101		13		197		27		298		
05:15	29		98		10		178		39		276		
05:30	42		94		16		226		58		320		
05:45	56	141	95	388	22	61	178	779	78	202	273	1167	
06:00	78		117		20		153		98		270		
06:15	139		115		35		157		174		272		
06:30	127		75		39		161		166		236		
06:45	142	486	97	404	59	153	133	604	201	639	230	1008	
07:00	120		96		63		110		183		206		
07:15	156		62		65		143		221		205		
07:30	156		81		81		95		237		176		
07:45	134	566	61	300	100	309	94	442	234	875	155	742	
08:00	129		58		76		95		205		153		
08:15	139		63		91		72		230		135		
08:30	124		55		96		85		220		140		
08:45	127	519	60	236	80	343	53	305	207	862	113	541	
09:00	97		50		87		67		184		117		
09:15	102		39		69		59		171		98		
09:30	105		36		76		56		181		92		
09:45	77	381	27	152	78	310	45	227	155	691	72	379	
10:00	87		26		88		40		175		66		
10:15	76		22		81		29		157		51		
10:30	99		24		106		37		205		61		
10:45	83	345	24	96	82	357	33	139	165	702	57	235	
11:00	82		24		100		34		182		58		
11:15	111		12		105		24		216		36		
11:30	97		16		87		20		184		36		
11:45	105	395	11	63	98	390	20	98	203	785	31	161	
Total	2934		3584		2033		4995		4967		8579		
Percent	59.1%		41.8%		40.9%		58.2%						
Day Total		6518				7028				13546			
Peak	07:15		05:30		10:30		05:00		07:30		05:00		
Vol.	575		421		393		779		906		1167		
P.H.F.	0.921		0.900		0.927		0.862		0.956		0.912		

PRECISION
D A T A
INDUSTRIES, LLC
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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/10/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	7	9	0	1	0	0	0	0	0	0	0	0	17
06:00	0	33	6	3	1	0	0	0	0	0	0	0	0	43
07:00	0	87	37	0	5	0	0	0	0	0	0	0	0	129
08:00	0	110	22	1	5	0	0	0	0	0	0	0	0	138
09:00	1	62	15	0	5	0	0	0	0	0	0	0	0	83
10:00	1	51	13	0	6	0	0	0	0	0	0	0	0	71
11:00	0	44	17	0	6	0	0	0	0	0	0	0	0	67
12 PM	0	49	14	0	2	0	0	0	0	0	0	0	0	65
13:00	2	49	19	0	4	0	0	1	0	0	0	0	0	75
14:00	0	81	19	2	2	0	0	0	0	0	0	0	0	104
15:00	0	83	28	1	7	0	0	0	0	0	0	0	0	119
16:00	0	93	31	0	4	0	0	1	0	0	0	0	0	129
17:00	2	109	40	0	8	0	0	0	0	0	0	0	0	159
18:00	0	94	23	0	4	0	0	0	0	0	0	0	0	121
19:00	2	54	28	0	4	0	0	0	0	0	0	0	0	88
20:00	0	39	10	0	1	0	0	0	0	0	0	0	0	50
21:00	0	20	4	0	1	0	0	0	0	0	0	0	0	25
22:00	0	9	4	0	0	0	0	0	0	0	0	0	0	13
23:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
Total	8	1086	339	7	67	0	0	2	0	0	0	0	0	1509
Percent	0.5%	72.0%	22.5%	0.5%	4.4%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	07:00	06:00	10:00									08:00
Vol.	1	110	37	3	6									138
PM Peak	13:00	17:00	17:00	14:00	17:00			13:00						17:00
Vol.	2	109	40	2	8			1						159

PRECISION
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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/11/1														
2	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	1	0	0	0	0	0	0	0	2
05:00	0	6	9	0	0	0	0	0	0	0	0	0	0	15
06:00	0	34	4	3	3	0	0	0	0	0	0	0	0	44
07:00	0	73	26	0	7	0	0	0	0	0	0	0	0	106
08:00	0	96	26	1	6	0	0	1	0	0	0	0	0	130
09:00	0	48	13	0	4	0	0	0	0	0	0	0	0	65
10:00	1	45	13	0	2	0	0	0	0	0	0	0	0	61
11:00	0	47	17	0	6	0	0	0	0	0	0	0	0	70
12 PM	0	52	12	1	4	0	0	1	0	0	0	0	0	70
13:00	2	52	16	0	5	0	0	0	0	0	0	0	0	75
14:00	0	64	39	3	4	0	0	0	0	0	0	0	0	110
15:00	0	84	29	1	6	1	0	1	0	0	0	0	0	122
16:00	1	113	36	0	10	0	0	1	0	0	0	0	0	161
17:00	2	122	41	0	10	0	0	0	0	0	0	0	0	175
18:00	0	81	24	0	4	0	0	0	0	0	0	0	0	109
19:00	0	57	18	0	2	0	0	0	0	0	0	0	0	77
20:00	0	26	7	0	2	0	0	0	0	0	0	0	0	35
21:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
22:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
23:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
Total	6	1042	336	9	75	2	0	4	0	0	0	0	0	1474
Percent	0.4%	70.7%	22.8%	0.6%	5.1%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	07:00	06:00	07:00	04:00		08:00						08:00
Vol.	1	96	26	3	7	1		1						130
PM Peak	13:00	17:00	17:00	14:00	16:00	15:00		12:00						17:00
Vol.	2	122	41	3	10	1		1						175

PRECISION
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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/12/1														
2	0	1	1	0	0	0	0	0	0	0	0	0	0	2
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	4	1	0	0	1	0	0	0	0	0	0	0	6
05:00	0	6	6	0	1	0	0	0	0	0	0	0	0	13
06:00	0	31	9	2	4	0	0	0	0	0	0	0	0	46
07:00	0	71	17	1	3	0	0	0	0	0	0	0	0	92
08:00	1	94	25	0	5	0	0	1	0	0	0	0	0	126
09:00	3	61	19	0	2	0	0	0	0	0	0	0	0	85
10:00	0	46	17	0	3	0	0	1	0	0	0	0	0	67
11:00	0	56	20	0	2	0	0	0	0	0	0	0	0	78
12 PM	0	46	16	0	3	0	0	0	0	0	0	0	0	65
13:00	1	49	10	0	2	0	0	0	0	0	0	0	0	62
14:00	0	76	34	3	4	0	0	0	0	0	0	0	0	117
15:00	1	82	29	1	9	1	0	0	0	0	0	0	0	123
16:00	1	88	26	0	7	0	0	2	0	0	0	0	0	124
17:00	0	103	28	0	5	0	0	0	0	0	0	0	0	136
18:00	0	93	19	0	5	0	0	0	0	0	0	0	0	117
19:00	0	53	17	0	3	0	0	0	0	0	0	0	0	73
20:00	0	38	9	0	2	0	0	0	0	0	0	0	0	49
21:00	0	12	5	0	1	0	0	0	0	0	0	0	0	18
22:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
23:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
Total	7	1035	310	7	61	2	0	4	0	0	0	0	0	1426
Percent	0.5%	72.6%	21.7%	0.5%	4.3%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	06:00	08:00	04:00		08:00						08:00
Vol.	3	94	25	2	5	1		1						126
PM Peak	13:00	17:00	14:00	14:00	15:00	15:00		16:00						17:00
Vol.	1	103	34	3	9	1		2						136
Total		3163	985	23	203	4	0	10	0	0	0	0	0	4409

PRECISION
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INDUSTRIES, LLC
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Email: datarequests@pdillc.com

Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/10/1														
2	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
06:00	0	71	13	0	3	0	0	0	0	0	0	0	0	87
07:00	0	169	22	2	2	0	0	0	0	0	0	0	0	195
08:00	0	128	22	0	3	0	0	0	0	0	0	0	0	153
09:00	0	48	16	0	6	0	0	0	0	0	0	0	0	70
10:00	2	46	19	0	4	1	0	0	0	0	0	0	0	72
11:00	1	76	21	0	2	0	0	0	0	0	0	0	0	100
12 PM	0	61	11	0	2	0	1	0	0	0	0	0	0	75
13:00	1	62	17	0	2	1	0	0	1	0	0	0	0	84
14:00	2	89	24	0	5	0	0	0	0	0	0	0	0	120
15:00	2	90	20	3	5	0	0	1	0	0	0	0	0	121
16:00	0	123	37	0	3	0	0	0	0	0	0	0	0	163
17:00	1	142	37	0	8	1	0	0	0	0	0	0	0	189
18:00	0	97	18	0	0	0	0	0	0	0	0	0	0	115
19:00	1	59	12	0	1	0	0	0	0	0	0	0	0	73
20:00	0	37	8	1	0	0	0	0	0	0	0	0	0	46
21:00	0	42	4	0	0	0	0	0	0	0	0	0	0	46
22:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
23:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
Total	10	1374	307	6	46	3	1	1	1	0	0	0	0	1749
Percent	0.6%	78.6%	17.6%	0.3%	2.6%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	07:00	09:00	10:00								07:00
Vol.	2	169	22	2	6	1								195
PM Peak	14:00	17:00	16:00	15:00	17:00	13:00	12:00	15:00	13:00					17:00
Vol.	2	142	37	3	8	1	1	1	1					189

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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/11/1														
2	0	6	1	0	0	0	0	0	0	0	0	0	0	7
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
03:00	0	1	0	0	0	1	0	0	0	0	0	0	0	2
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	6	1	0	1	0	0	0	0	0	0	0	0	8
06:00	0	65	12	1	0	0	0	0	0	0	0	0	0	78
07:00	0	164	22	2	3	0	0	0	0	0	0	0	0	191
08:00	0	120	19	2	5	0	0	0	0	0	0	0	0	146
09:00	0	48	21	0	6	0	0	0	0	0	0	0	0	75
10:00	1	44	10	0	2	0	0	1	0	0	0	0	0	58
11:00	0	57	15	0	3	1	0	0	0	0	0	0	0	76
12 PM	0	54	10	0	0	0	0	0	0	0	0	0	0	64
13:00	0	68	13	0	3	0	0	0	0	0	0	0	0	84
14:00	0	81	19	0	4	0	0	0	0	0	0	0	0	104
15:00	0	80	23	3	3	0	0	0	0	0	0	0	0	109
16:00	3	127	46	0	5	2	0	1	0	0	0	0	0	184
17:00	0	147	39	0	3	1	0	0	0	0	0	0	0	190
18:00	1	89	12	0	2	0	0	0	0	0	0	0	0	104
19:00	0	48	12	0	2	0	0	0	0	0	0	0	0	62
20:00	0	42	7	0	0	0	0	0	0	0	0	0	0	49
21:00	0	27	2	0	0	0	0	0	0	0	0	0	0	29
22:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Total	5	1302	287	8	42	5	0	2	0	0	0	0	0	1651
Percent	0.3%	78.9%	17.4%	0.5%	2.5%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	07:00	09:00	03:00		10:00						07:00
Vol.	1	164	22	2	6	1		1						191
PM Peak	16:00	17:00	16:00	15:00	16:00	16:00		16:00						17:00
Vol.	3	147	46	3	5	2		1						190

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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Class
Site Code: 10111.34

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/12/1														
2	0	5	1	0	0	0	0	0	0	0	0	0	0	6
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
06:00	0	70	14	0	2	0	0	0	0	0	0	0	0	86
07:00	0	178	25	1	2	0	0	0	0	0	0	0	0	206
08:00	0	131	25	1	6	1	0	1	0	0	0	0	0	165
09:00	0	46	15	0	2	1	0	1	0	0	0	0	0	65
10:00	0	48	9	0	3	0	0	0	0	0	0	0	0	60
11:00	0	63	24	1	2	1	0	0	0	0	0	0	0	91
12 PM	0	57	11	0	1	0	0	0	0	0	0	0	0	69
13:00	0	64	12	0	5	0	0	0	0	0	0	0	0	81
14:00	0	99	20	0	6	0	0	0	0	0	0	0	0	125
15:00	1	99	29	6	3	0	0	0	0	0	0	0	0	138
16:00	1	112	26	0	2	1	0	0	1	0	0	0	0	143
17:00	1	129	25	0	3	1	0	0	0	0	0	0	0	159
18:00	0	92	12	0	1	0	0	0	0	0	0	0	0	105
19:00	0	74	18	0	2	0	0	0	0	0	0	0	0	94
20:00	0	42	9	0	0	0	0	0	0	0	0	0	0	51
21:00	0	27	7	0	0	0	0	0	0	0	0	0	0	34
22:00	0	18	7	0	0	0	0	0	0	0	0	0	0	25
23:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
Total	3	1371	290	9	41	5	0	2	1	0	0	0	0	1722
Percent	0.2%	79.6%	16.8%	0.5%	2.4%	0.3%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	07:00	08:00	08:00		08:00						07:00
Vol.		178	25	1	6	1		1						206
PM Peak	15:00	17:00	15:00	15:00	14:00	16:00			16:00					17:00
Vol.	1	129	29	6	6	1			1					159
Total		4047	884	23	129	13	1	5	2	0	0	0	0	5122

PRECISION
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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Speed
Site Code: 10111.34

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/10/1																
2	0	0	0	1	2	0	0	0	0	0	0	0	0	3	*	30
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
05:00	1	0	2	7	7	0	0	0	0	0	0	0	0	17	33	27
06:00	1	2	13	16	6	**5**	0	0	0	0	0	0	0	43	32	26
07:00	1	**6**	**31**	54	34	3	0	0	0	0	0	0	0	129	31	26
08:00	2	0	26	**63**	**40**	5	**2**	0	0	0	0	0	0	**138**	32	28
09:00	**5**	1	20	36	17	2	2	0	0	0	0	0	0	83	30	25
10:00	5	4	17	25	17	3	0	0	0	0	0	0	0	71	31	24
11:00	3	1	10	38	13	1	1	0	0	0	0	0	0	67	30	26
12 PM	3	4	14	23	21	0	0	0	0	0	0	0	0	65	31	25
13:00	2	1	12	33	20	7	0	0	0	0	0	0	0	75	33	27
14:00	3	5	22	42	28	3	**1**	0	0	0	0	0	0	104	31	26
15:00	2	0	20	53	35	**9**	0	0	0	0	0	0	0	119	32	28
16:00	5	6	**32**	52	31	3	0	0	0	0	0	0	0	129	31	25
17:00	**10**	**13**	32	**69**	32	2	1	0	0	0	0	0	0	**159**	30	24
18:00	3	4	8	62	**40**	4	0	0	0	0	0	0	0	121	32	27
19:00	2	2	18	54	8	4	0	0	0	0	0	0	0	88	29	26
20:00	1	2	8	25	14	0	0	0	0	0	0	0	0	50	31	26
21:00	0	0	7	9	6	3	0	0	0	0	0	0	0	25	33	28
22:00	0	1	2	5	4	1	0	0	0	0	0	0	0	13	32	27
23:00	0	0	1	2	3	0	0	0	0	0	0	0	0	6	31	29
%	3.2%	3.4%	19.5%	44.5%	25.1%	3.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	07:00	08:00	08:00	06:00	08:00							08:00		
Vol.	5	6	31	63	40	5	2							138		
PM Peak	17:00	17:00	16:00	17:00	18:00	15:00	14:00							17:00		
Vol.	10	13	32	69	40	9	1							159		
Total	49	52	295	671	379	56	7	0	0	0	0	0	0	1509	595	
Pecent			15th Percentile :		20 MPH											
			50th Percentile :		26 MPH											
			85th Percentile :		31 MPH											
			95th Percentile :		34 MPH											

Stats		
	10 MPH Pace Speed :	23-32 MPH
	Number in Pace :	977
	Percent in Pace :	64.7%
	Number of Vehicles > 30 MPH :	363
	Percent of Vehicles > 30 MPH :	24.1%
	Mean Speed(Average) :	26 MPH

PRECISION
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Brock Street
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122868 B Speed
Site Code: 10111.34

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/11/1																
2	0	0	1	2	1	0	0	0	0	0	0	0	0	4	*	27
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
04:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
05:00	1	0	1	9	4	0	0	0	0	0	0	0	0	15	31	26
06:00	2	4	6	18	10	3	**1**	0	0	0	0	0	0	44	31	26
07:00	2	**5**	**22**	41	30	6	0	0	0	0	0	0	0	106	32	27
08:00	**11**	5	20	**54**	**36**	4	0	0	0	0	0	0	0	**130**	31	25
09:00	0	3	14	29	15	3	1	0	0	0	0	0	0	65	31	27
10:00	3	0	9	24	17	**7**	1	0	0	0	0	0	0	61	33	27
11:00	0	5	9	34	20	2	0	0	0	0	0	0	0	70	31	27
12 PM	1	0	10	29	27	3	0	0	0	0	0	0	0	70	32	28
13:00	2	4	13	36	17	3	0	0	0	0	0	0	0	75	31	26
14:00	2	1	23	42	37	5	0	0	0	0	0	0	0	110	32	27
15:00	4	4	21	50	34	**9**	0	0	0	0	0	0	0	122	32	27
16:00	4	3	21	71	**53**	7	**2**	0	0	0	0	0	0	161	32	27
17:00	**7**	**10**	**33**	**78**	40	7	0	0	0	0	0	0	0	**175**	31	25
18:00	1	1	25	44	37	1	0	0	0	0	0	0	0	109	31	27
19:00	1	6	15	32	22	1	0	0	0	0	0	0	0	77	31	26
20:00	2	2	8	17	4	2	0	0	0	0	0	0	0	35	30	24
21:00	0	1	2	9	11	0	0	0	0	0	0	0	0	23	32	28
22:00	1	0	1	7	1	0	0	0	0	0	0	0	0	10	28	24
23:00	0	0	0	4	1	2	0	0	0	0	0	0	0	7	28	31
%	3.0%	3.7%	17.2%	42.9%	28.5%	4.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	07:00	08:00	08:00	10:00	06:00							08:00		
Vol.	11	5	22	54	36	7	1							130		
PM Peak	17:00	17:00	17:00	17:00	16:00	15:00	16:00							17:00		
Vol.	7	10	33	78	53	9	2							175		
Total	44	54	254	632	420	65	5	0	0	0	0	0	0	1474	590	
Pecent			15th Percentile :		20 MPH											
			50th Percentile :		26 MPH											
			85th Percentile :		32 MPH											
			95th Percentile :		34 MPH											

Stats		
	10 MPH Pace Speed :	24-33 MPH
	Number in Pace :	952
	Percent in Pace :	64.6%
	Number of Vehicles > 30 MPH :	399
	Percent of Vehicles > 30 MPH :	27.1%
	Mean Speed(Average) :	26 MPH

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EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/12/1																
2	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
02:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	1	1	1	2	1	0	0	0	0	0	0	0	6	*	27
05:00	1	0	2	4	5	1	0	0	0	0	0	0	0	13	32	26
06:00	1	4	5	19	15	2	0	0	0	0	0	0	0	46	31	26
07:00	1	3	16	33	**33**	**6**	0	0	0	0	0	0	0	92	32	28
08:00	1	**5**	**21**	**73**	23	3	0	0	0	0	0	0	0	**126**	30	26
09:00	3	4	14	38	24	2	0	0	0	0	0	0	0	85	31	26
10:00	**4**	3	17	27	16	0	0	0	0	0	0	0	0	67	30	24
11:00	0	3	14	34	23	4	0	0	0	0	0	0	0	78	32	27
12 PM	4	1	5	34	18	3	0	0	0	0	0	0	0	65	31	26
13:00	2	3	10	31	14	2	0	0	0	0	0	0	0	62	31	26
14:00	1	**6**	24	53	29	4	0	0	0	0	0	0	0	117	31	26
15:00	5	4	**28**	52	30	4	0	0	0	0	0	0	0	123	31	26
16:00	**7**	3	15	53	37	**9**	0	0	0	0	0	0	0	124	32	26
17:00	4	3	14	60	**45**	7	**3**	0	0	0	0	0	0	**136**	32	28
18:00	1	3	8	**65**	35	5	0	0	0	0	0	0	0	117	32	28
19:00	0	1	13	41	16	2	0	0	0	0	0	0	0	73	31	27
20:00	3	2	8	21	13	2	0	0	0	0	0	0	0	49	31	25
21:00	0	1	2	4	10	0	1	0	0	0	0	0	0	18	32	29
22:00	0	0	3	7	3	0	0	0	0	0	0	0	0	13	30	27
23:00	1	0	2	5	1	1	0	0	0	0	0	0	0	10	28	24
%	2.7%	3.5%	15.6%	46.1%	27.7%	4.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	08:00	08:00	07:00	07:00								08:00		
Vol.	4	5	21	73	33	6								126		
PM Peak	16:00	14:00	15:00	18:00	17:00	16:00	17:00							17:00		
Vol.	7	6	28	65	45	9	3							136		
Total	39	50	222	658	395	58	4	0	0	0	0	0	0	1426	590	
Pecent			15th Percentile :		20 MPH											
			50th Percentile :		26 MPH											
			85th Percentile :		31 MPH											
			95th Percentile :		34 MPH											

Stats		
	10 MPH Pace Speed :	24-33 MPH
	Number in Pace :	953
	Percent in Pace :	66.8%
	Number of Vehicles > 30 MPH :	375
	Percent of Vehicles > 30 MPH :	26.3%
	Mean Speed(Average) :	27 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Speed
Site Code: 10111.34

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/10/1																
2	0	0	1	2	1	0	0	0	0	0	0	0	0	4	*	27
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	*	22
05:00	0	0	0	3	3	0	0	0	0	0	0	0	0	6	31	30
06:00	2	0	12	44	27	2	0	0	0	0	0	0	0	87	31	27
07:00	2	3	19	**109**	**58**	**4**	0	0	0	0	0	0	0	**195**	31	28
08:00	0	2	21	87	39	3	**1**	0	0	0	0	0	0	153	31	28
09:00	2	**4**	22	32	8	2	0	0	0	0	0	0	0	70	29	24
10:00	**4**	2	21	32	13	0	0	0	0	0	0	0	0	72	29	24
11:00	4	2	**25**	57	11	0	1	0	0	0	0	0	0	100	29	25
12 PM	5	4	18	37	9	2	0	0	0	0	0	0	0	75	29	24
13:00	2	5	28	37	12	0	0	0	0	0	0	0	0	84	29	24
14:00	2	1	33	56	28	0	0	0	0	0	0	0	0	120	30	26
15:00	0	5	28	70	16	2	0	0	0	0	0	0	0	121	29	26
16:00	2	**12**	44	78	25	2	0	0	0	0	0	0	0	163	29	25
17:00	**8**	8	**50**	**95**	27	1	0	0	0	0	0	0	0	**189**	29	24
18:00	0	2	20	59	**32**	2	0	0	0	0	0	0	0	115	31	27
19:00	1	0	26	32	14	0	0	0	0	0	0	0	0	73	30	26
20:00	0	3	18	21	4	0	0	0	0	0	0	0	0	46	28	24
21:00	1	0	5	32	4	**4**	0	0	0	0	0	0	0	46	31	27
22:00	0	3	6	7	3	0	0	0	0	0	0	0	0	19	29	24
23:00	0	0	1	5	1	0	0	0	0	0	0	0	0	7	28	27
%	2.0%	3.2%	22.8%	51.2%	19.3%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	11:00	07:00	07:00	07:00	08:00							07:00		
Vol.	4	4	25	109	58	4	1							195		
PM Peak	17:00	16:00	17:00	17:00	18:00	21:00								17:00		
Vol.	8	12	50	95	32	4								189		
Total	35	56	399	895	337	25	2	0	0	0	0	0	0	1749	563	
Pecent			15th Percentile :		20 MPH											
			50th Percentile :		25 MPH											
			85th Percentile :		30 MPH											
			95th Percentile :		33 MPH											

Stats		
	10 MPH Pace Speed :	22-31 MPH
	Number in Pace :	1232
	Percent in Pace :	70.4%
	Number of Vehicles > 30 MPH :	310
	Percent of Vehicles > 30 MPH :	17.7%
	Mean Speed(Average) :	26 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Speed
Site Code: 10111.34

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/11/1																
2	0	0	1	5	0	1	0	0	0	0	0	0	0	7	28	28
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	*	22
02:00	0	0	0	3	0	0	0	0	0	0	0	0	0	3	26	27
03:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2	*	24
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	*	27
05:00	0	0	1	6	1	0	0	0	0	0	0	0	0	8	28	27
06:00	**3**	1	16	32	23	3	0	0	0	0	0	0	0	78	31	26
07:00	2	**4**	**32**	**97**	**53**	2	**1**	0	0	0	0	0	0	**191**	31	27
08:00	0	3	29	81	28	**5**	0	0	0	0	0	0	0	146	31	27
09:00	0	4	23	33	14	1	0	0	0	0	0	0	0	75	30	26
10:00	2	2	14	35	3	2	0	0	0	0	0	0	0	58	28	25
11:00	0	1	19	42	11	3	0	0	0	0	0	0	0	76	30	27
12 PM	0	3	12	32	16	1	0	0	0	0	0	0	0	64	31	27
13:00	2	2	13	49	15	3	0	0	0	0	0	0	0	84	30	26
14:00	1	4	28	47	20	**4**	0	0	0	0	0	0	0	104	30	26
15:00	0	3	24	56	26	0	0	0	0	0	0	0	0	109	30	27
16:00	**6**	**8**	40	93	**33**	4	0	0	0	0	0	0	0	184	30	25
17:00	2	4	**45**	**102**	33	4	0	0	0	0	0	0	0	**190**	30	26
18:00	1	0	22	59	21	1	0	0	0	0	0	0	0	104	30	27
19:00	4	2	19	32	5	0	0	0	0	0	0	0	0	62	28	23
20:00	2	0	13	24	9	1	0	0	0	0	0	0	0	49	30	26
21:00	0	0	8	12	9	0	0	0	0	0	0	0	0	29	31	27
22:00	2	1	4	8	4	0	0	**1**	0	0	0	0	0	20	30	24
23:00	0	0	1	2	2	0	0	0	0	0	0	0	0	5	*	28
%	1.6%	2.5%	22.2%	51.5%	19.8%	2.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	07:00	07:00	07:00	07:00	08:00	07:00							07:00		
Vol.	3	4	32	97	53	5	1							191		
PM Peak	16:00	16:00	17:00	17:00	16:00	14:00		22:00						17:00		
Vol.	6	8	45	102	33	4		1						190		
Total	27	42	367	851	327	35	1	1	0	0	0	0	0	1651	593	
Pecent																

15th Percentile : 20 MPH
50th Percentile : 26 MPH
85th Percentile : 30 MPH
95th Percentile : 33 MPH

Stats

10 MPH Pace Speed : 22-31 MPH
Number in Pace : 1174
Percent in Pace : 71.1%
Number of Vehicles > 30 MPH : 312
Percent of Vehicles > 30 MPH : 18.9%
Mean Speed(Average) : 26 MPH

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Brock Street
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City, State: Stoughton, MA
Client: VHB/ E. Chan

122868 B Speed
Site Code: 10111.34

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
04/12/1																
2	0	1	1	3	1	0	0	0	0	0	0	0	0	6	26	24
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	*	27
05:00	0	0	0	3	1	0	0	0	0	0	0	0	0	4	27	28
06:00	1	2	16	44	19	4	0	0	0	0	0	0	0	86	31	27
07:00	0	**7**	**36**	**110**	**46**	**6**	**1**	0	0	0	0	0	0	**206**	31	27
08:00	1	1	30	91	39	2	1	0	0	0	0	0	0	165	30	27
09:00	**2**	2	22	25	12	2	0	0	0	0	0	0	0	65	30	25
10:00	0	2	18	31	8	1	0	0	0	0	0	0	0	60	29	26
11:00	2	1	29	46	12	1	0	0	0	0	0	0	0	91	29	25
12 PM	1	1	23	35	9	0	0	0	0	0	0	0	0	69	29	25
13:00	2	3	25	40	9	2	0	0	0	0	0	0	0	81	29	25
14:00	0	4	30	64	26	0	**1**	0	0	0	0	0	0	125	30	26
15:00	**6**	3	**46**	67	14	2	0	0	0	0	0	0	0	138	29	24
16:00	6	**6**	27	**74**	27	3	0	0	0	0	0	0	0	143	30	25
17:00	2	0	33	74	**48**	2	0	0	0	0	0	0	0	**159**	31	27
18:00	3	1	14	65	18	**4**	0	0	0	0	0	0	0	105	30	26
19:00	1	4	29	46	14	0	0	0	0	0	0	0	0	94	29	25
20:00	1	3	11	27	8	1	0	0	0	0	0	0	0	51	29	25
21:00	0	0	9	16	8	1	0	0	0	0	0	0	0	34	31	27
22:00	0	2	10	8	5	0	0	0	0	0	0	0	0	25	30	25
23:00	0	1	4	5	2	0	0	0	0	0	0	0	0	12	28	25
%	1.6%	2.6%	24.0%	50.8%	19.0%	1.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	07:00	07:00	07:00	07:00	07:00							07:00		
Vol.	2	7	36	110	46	6	1							206		
PM Peak	15:00	16:00	15:00	16:00	17:00	18:00	14:00							17:00		
Vol.	6	6	46	74	48	4	1							159		
Total	28	44	414	875	327	31	3	0	0	0	0	0	0	1722	588	
Pecent			15th Percentile :		20 MPH											
			50th Percentile :		26 MPH											
			85th Percentile :		30 MPH											
			95th Percentile :		33 MPH											

Stats

10 MPH Pace Speed :	22-31 MPH
Number in Pace :	1225
Percent in Pace :	71.1%
Number of Vehicles > 30 MPH :	310
Percent of Vehicles > 30 MPH :	18.0%
Mean Speed(Average) :	26 MPH

Brock Street
west of Washington Street (Route 138)
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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122868 B Volume
Site Code: 10111.34

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		10-Apr-12 Tue
12:00	0		16		0		20		0		36		
12:15	1		15		0		17		1		32		
12:30	1		14		0		26		1		40		
12:45	1	3	20	65	4	4	12	75	5	7	32	140	
01:00	0		22		0		20		0		42		
01:15	1		20		1		25		2		45		
01:30	0		18		0		17		0		35		
01:45	0	1	15	75	0	1	22	84	0	2	37	159	
02:00	0		17		0		24		0		41		
02:15	0		23		1		33		1		56		
02:30	1		21		0		36		1		57		
02:45	0	1	43	104	0	1	27	120	0	2	70	224	
03:00	1		32		0		22		1		54		
03:15	0		21		0		29		0		50		
03:30	0		31		1		40		1		71		
03:45	0	1	35	119	0	1	30	121	0	2	65	240	
04:00	0		32		0		29		0		61		
04:15	0		27		1		49		1		76		
04:30	0		45		0		39		0		84		
04:45	1	1	25	129	0	1	46	163	1	2	71	292	
05:00	1		37		1		43		2		80		
05:15	5		28		1		49		6		77		
05:30	7		49		2		54		9		103		
05:45	4	17	45	159	2	6	43	189	6	23	88	348	
06:00	14		35		4		41		18		76		
06:15	8		35		14		27		22		62		
06:30	8		25		29		26		37		51		
06:45	13	43	26	121	40	87	21	115	53	130	47	236	
07:00	21		17		38		18		59		35		
07:15	46		30		54		24		100		54		
07:30	34		30		62		17		96		47		
07:45	28	129	11	88	41	195	14	73	69	324	25	161	
08:00	33		12		51		12		84		24		
08:15	47		11		60		12		107		23		
08:30	30		17		26		12		56		29		
08:45	28	138	10	50	16	153	10	46	44	291	20	96	
09:00	14		10		18		23		32		33		
09:15	27		4		16		7		43		11		
09:30	21		7		19		9		40		16		
09:45	21	83	4	25	17	70	7	46	38	153	11	71	
10:00	18		4		16		6		34		10		
10:15	19		5		23		6		42		11		
10:30	13		2		18		4		31		6		
10:45	21	71	2	13	15	72	3	19	36	143	5	32	
11:00	22		1		25		2		47		3		
11:15	14		1		28		0		42		1		
11:30	15		2		21		1		36		3		
11:45	16	67	2	6	26	100	4	7	42	167	6	13	
Total	555		954		691		1058		1246		2012		
Percent	44.5%		47.4%		55.5%		52.6%						
Day Total			1509				1749				3258		
Peak	07:30		05:30		07:30		04:45		07:30		05:00		
Vol.	142		164		214		192		356		348		
P.H.F.	0.755		0.837		0.863		0.889		0.832		0.845		

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122868 B Volume
Site Code: 10111.34

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		11-Apr-12 Wed
12:00	2		19		3		23		5		42		
12:15	2		9		0		10		2		19		
12:30	0		19		3		16		3		35		
12:45	0	4	23	70	1	7	15	64	1	11	38	134	
01:00	0		22		1		19		1		41		
01:15	0		25		0		22		0		47		
01:30	0		19		0		20		0		39		
01:45	1	1	9	75	0	1	23	84	1	2	32	159	
02:00	0		17		2		25		2		42		
02:15	1		25		0		19		1		44		
02:30	0		32		1		30		1		62		
02:45	0	1	36	110	0	3	30	104	0	4	66	214	
03:00	0		31		0		21		0		52		
03:15	1		27		1		27		2		54		
03:30	0		40		0		21		0		61		
03:45	0	1	24	122	1	2	40	109	1	3	64	231	
04:00	1		51		0		34		1		85		
04:15	0		29		1		44		1		73		
04:30	0		44		0		49		0		93		
04:45	1	2	37	161	1	2	57	184	2	4	94	345	
05:00	2		52		0		56		2		108		
05:15	2		36		0		40		2		76		
05:30	4		54		4		51		8		105		
05:45	7	15	33	175	4	8	43	190	11	23	76	365	
06:00	9		42		2		36		11		78		
06:15	7		21		17		26		24		47		
06:30	8		24		17		30		25		54		
06:45	20	44	22	109	42	78	12	104	62	122	34	213	
07:00	16		18		33		16		49		34		
07:15	32		29		61		13		93		42		
07:30	27		21		55		16		82		37		
07:45	31	106	9	77	42	191	17	62	73	297	26	139	
08:00	35		7		41		18		76		25		
08:15	52		7		52		10		104		17		
08:30	29		12		27		13		56		25		
08:45	14	130	9	35	26	146	8	49	40	276	17	84	
09:00	20		7		26		11		46		18		
09:15	21		8		13		6		34		14		
09:30	13		5		18		5		31		10		
09:45	11	65	3	23	18	75	7	29	29	140	10	52	
10:00	11		2		13		5		24		7		
10:15	18		3		19		8		37		11		
10:30	18		4		13		4		31		8		
10:45	14	61	1	10	13	58	3	20	27	119	4	30	
11:00	16		1		19		0		35		1		
11:15	16		2		25		2		41		4		
11:30	15		1		14		1		29		2		
11:45	23	70	3	7	18	76	2	5	41	146	5	12	
Total	500		974		647		1004		1147		1978		
Percent	43.6%		49.2%		56.4%		50.8%						
Day Total		1474				1651				3125			
Peak	07:45		04:45		07:15		04:15		07:30		04:45		
Vol.	147		179		199		206		335		383		
P.H.F.	0.707		0.829		0.816		0.904		0.805		0.887		

Brock Street
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122868 B Volume
Site Code: 10111.34

Start	EB				WB				Combined				12-Apr-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	1		13		2		19		3		32		
12:15	0		13		1		19		1		32		
12:30	1		18		2		15		3		33		
12:45	0	2	21	65	1	6	16	69	1	8	37	134	
01:00	0		16		1		24		1		40		
01:15	1		10		0		16		1		26		
01:30	0		16		0		21		0		37		
01:45	1	2	20	62	0	1	20	81	1	3	40	143	
02:00	0		15		0		19		0		34		
02:15	1		20		0		31		1		51		
02:30	0		30		0		38		0		68		
02:45	1	2	52	117	0	0	37	125	1	2	89	242	
03:00	0		31		0		37		0		68		
03:15	0		40		0		30		0		70		
03:30	0		23		0		40		0		63		
03:45	0	0	29	123	0	0	31	138	0	0	60	261	
04:00	1		24		0		33		1		57		
04:15	0		38		0		37		0		75		
04:30	2		30		2		34		4		64		
04:45	3	6	32	124	0	2	39	143	3	8	71	267	
05:00	2		32		0		43		2		75		
05:15	2		38		0		34		2		72		
05:30	5		35		3		44		8		79		
05:45	4	13	31	136	1	4	38	159	5	17	69	295	
06:00	10		40		6		30		16		70		
06:15	10		27		16		31		26		58		
06:30	7		30		24		22		31		52		
06:45	19	46	20	117	40	86	22	105	59	132	42	222	
07:00	14		17		47		35		61		52		
07:15	26		14		56		29		82		43		
07:30	33		27		61		16		94		43		
07:45	19	92	15	73	42	206	14	94	61	298	29	167	
08:00	38		9		44		14		82		23		
08:15	38		8		56		14		94		22		
08:30	28		18		39		10		67		28		
08:45	22	126	14	49	26	165	13	51	48	291	27	100	
09:00	17		6		19		10		36		16		
09:15	26		3		15		9		41		12		
09:30	24		6		14		8		38		14		
09:45	18	85	3	18	17	65	7	34	35	150	10	52	
10:00	17		7		19		10		36		17		
10:15	20		5		8		4		28		9		
10:30	12		1		20		7		32		8		
10:45	18	67	0	13	13	60	4	25	31	127	4	38	
11:00	17		3		25		6		42		9		
11:15	22		3		24		2		46		5		
11:30	21		2		22		2		43		4		
11:45	18	78	2	10	20	91	2	12	38	169	4	22	
Total	519		907		686		1036		1205		1943		
Percent	43.1%		46.7%		56.9%		53.3%						
Day Total		1426				1722				3148			
Peak	07:30		02:30		07:00		04:45		07:30		04:45		
Vol.	128		153		206		160		331		297		
P.H.F.	0.842		0.736		0.844		0.909		0.880		0.834		

PRECISION DATA INDUSTRIES, LLC
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N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 A
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	28	1	0	4	0	0	0	0	2	195	21	55	0	62	0	0	0	0	1	28	0	0	0	397
06:45 AM	0	0	33	1	0	2	0	0	0	0	0	171	35	68	0	59	0	0	0	0	0	22	0	0	0	391
Total	0	0	61	2	0	6	0	0	0	0	2	366	56	123	0	121	0	0	0	0	1	50	0	0	0	788
07:00 AM	0	0	39	2	0	3	0	0	0	0	2	180	48	50	0	96	0	0	0	0	0	35	0	0	0	455
07:15 AM	0	0	44	1	0	2	0	0	0	0	2	172	62	73	0	149	0	0	0	0	1	50	0	0	0	556
07:30 AM	0	0	63	4	0	3	0	0	0	0	3	185	29	72	0	125	0	0	0	0	0	55	0	0	0	539
07:45 AM	0	0	58	2	0	3	0	0	0	0	3	189	41	73	0	93	0	0	0	0	0	39	0	0	0	501
Total	0	0	204	9	0	11	0	0	0	0	10	726	180	268	0	463	0	0	0	0	1	179	0	0	0	2051
08:00 AM	0	0	65	3	0	7	0	0	0	0	0	156	34	71	0	98	0	0	0	0	1	35	0	0	0	470
08:15 AM	0	0	73	3	0	6	0	0	0	0	2	184	29	84	0	123	0	0	0	0	0	38	0	0	0	542
Grand Total	0	0	403	17	0	30	0	0	0	0	14	1432	299	546	0	805	0	0	0	0	3	302	0	0	0	3851
Apprch %	0	0	96	4	0	100	0	0	0	0	0.6	62.5	13.1	23.8	0	100	0	0	0	0	1	99	0	0	0	
Total %	0	0	10.5	0.4	0	0.8	0	0	0	0	0.4	37.2	7.8	14.2	0	20.9	0	0	0	0	0.1	7.8	0	0	0	
Cars	0	0	373	16	0	30	0	0	0	0	14	1398	283	511	0	784	0	0	0	0	3	297	0	0	0	3709
% Cars	0	0	92.6	94.1	0	100	0	0	0	0	100	97.6	94.6	93.6	0	97.4	0	0	0	0	100	98.3	0	0	0	96.3
Heavy Vehicles	0	0	30	1	0	0	0	0	0	0	0	34	16	35	0	21	0	0	0	0	0	5	0	0	0	142
% Heavy Vehicles	0	0	7.4	5.9	0	0	0	0	0	0	0	2.4	5.4	6.4	0	2.6	0	0	0	0	0	1.7	0	0	0	3.7

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 7:15:00 AM																															
7:15:00 AM	0	0	44	1	0	45	2	0	0	0	0	2	2	172	**62**	**73**	0	**309**	**149**	0	0	0	0	**149**	**1**	50	0	0	0	51	**556**
7:30:00 AM	0	0	63	**4**	0	67	3	0	0	0	0	3	**3**	185	29	72	0	289	125	0	0	0	0	125	0	**55**	0	0	0	**55**	539
7:45:00 AM	0	0	58	2	0	60	3	0	0	0	0	3	3	**189**	41	73	0	306	93	0	0	0	0	93	0	39	0	0	0	39	501
8:00:00 AM	0	0	**65**	3	0	**68**	**7**	0	0	0	0	**7**	0	156	34	71	0	261	98	0	0	0	0	98	1	35	0	0	0	36	470
Total Volume	0	0	230	10	0	240	15	0	0	0	0	15	8	702	166	289	0	1165	465	0	0	0	0	465	2	179	0	0	0	181	2066
% App. Total	0	0	95.8	4.2	0		100	0	0	0	0		0.7	60.3	14.2	24.8	0		100	0	0	0	0		1.1	98.9	0	0	0		
PHF	.000	.000	.885	.625	.000	.882	.536	.000	.000	.000	.000	.536	.667	.929	.669	.990	.000	.943	.780	.000	.000	.000	.000	.780	.500	.814	.000	.000	.000	.823	.929
Cars	0	0	217	10	0	227	15	0	0	0	0	15	8	685	158	268	0	1119	452	0	0	0	0	452	2	175	0	0	0	177	1990
% Cars	0	0	94.3	100	0	94.6	100	0	0	0	0	100	100	97.6	95.2	92.7	0	96.1	97.2	0	0	0	0	97.2	100	97.8	0	0	0	97.8	96.3
Heavy Vehicles	0	0	13	0	0	13	0	0	0	0	0	0	0	17	8	21	0	46	13	0	0	0	0	13	0	4	0	0	0	4	76
% Heavy Vehicles	0	0	5.7	0	0	5.4	0	0	0	0	0	0	0	2.4	4.8	7.3	0	3.9	2.8	0	0	0	0	2.8	0	2.2	0	0	0	2.2	3.7

N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 A
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	26	1	0	4	0	0	0	0	2	193	21	53	0	61	0	0	0	0	1	28	0	0	0	390
06:45 AM	0	0	30	1	0	2	0	0	0	0	0	162	33	65	0	58	0	0	0	0	0	22	0	0	0	373
Total	0	0	56	2	0	6	0	0	0	0	2	355	54	118	0	119	0	0	0	0	1	50	0	0	0	763
07:00 AM	0	0	32	1	0	3	0	0	0	0	2	178	44	49	0	94	0	0	0	0	0	34	0	0	0	437
07:15 AM	0	0	39	1	0	2	0	0	0	0	2	169	59	66	0	143	0	0	0	0	1	49	0	0	0	531
07:30 AM	0	0	62	4	0	3	0	0	0	0	3	181	29	66	0	123	0	0	0	0	0	55	0	0	0	526
07:45 AM	0	0	57	2	0	3	0	0	0	0	3	181	38	69	0	91	0	0	0	0	0	37	0	0	0	481
Total	0	0	190	8	0	11	0	0	0	0	10	709	170	250	0	451	0	0	0	0	1	175	0	0	0	1975
08:00 AM	0	0	59	3	0	7	0	0	0	0	0	154	32	67	0	95	0	0	0	0	1	34	0	0	0	452
08:15 AM	0	0	68	3	0	6	0	0	0	0	2	180	27	76	0	119	0	0	0	0	0	38	0	0	0	519
Grand Total	0	0	373	16	0	30	0	0	0	0	14	1398	283	511	0	784	0	0	0	0	3	297	0	0	0	3709
Apprch %	0	0	95.9	4.1	0	100	0	0	0	0	0.6	63.4	12.8	23.2	0	100	0	0	0	0	1	99	0	0	0	
Total %	0	0	10.1	0.4	0	0.8	0	0	0	0	0.4	37.7	7.6	13.8	0	21.1	0	0	0	0	0.1	8	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 7:15:00 AM																															
7:15:00 AM	0	0	39	1	0	40	2	0	0	0	0	2	2	169	**59**	66	0	**296**	**143**	0	0	0	0	**143**	**1**	49	0	0	0	50	**531**
7:30:00 AM	0	0	**62**	**4**	0	**66**	3	0	0	0	0	3	**3**	**181**	29	66	0	279	123	0	0	0	0	123	0	**55**	0	0	0	**55**	526
7:45:00 AM	0	0	57	2	0	59	3	0	0	0	0	3	3	181	38	**69**	0	291	91	0	0	0	0	91	0	37	0	0	0	37	481
8:00:00 AM	0	0	59	3	0	62	**7**	0	0	0	0	**7**	0	154	32	67	0	253	95	0	0	0	0	95	1	34	0	0	0	35	452
Total Volume	0	0	217	10	0	227	15	0	0	0	0	15	8	685	158	268	0	1119	452	0	0	0	0	452	2	175	0	0	0	177	1990
% App. Total	0	0	95.6	4.4	0		100	0	0	0	0		0.7	61.2	14.1	23.9	0		100	0	0	0	0		1.1	98.9	0	0	0		
PHF	.000	.000	.875	.625	.000	.860	.536	.000	.000	.000	.000	.536	.667	.946	.669	.971	.000	.945	.790	.000	.000	.000	.000	.790	.500	.795	.000	.000	.000	.805	.937

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N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 A
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	2	0	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	7
06:45 AM	0	0	3	0	0	0	0	0	0	0	0	9	2	3	0	1	0	0	0	0	0	0	0	0	0	18
Total	0	0	5	0	0	0	0	0	0	0	0	11	2	5	0	2	0	0	0	0	0	0	0	0	0	25
07:00 AM	0	0	7	1	0	0	0	0	0	0	0	2	4	1	0	2	0	0	0	0	0	1	0	0	0	18
07:15 AM	0	0	5	0	0	0	0	0	0	0	0	3	3	7	0	6	0	0	0	0	0	1	0	0	0	25
07:30 AM	0	0	1	0	0	0	0	0	0	0	0	4	0	6	0	2	0	0	0	0	0	0	0	0	0	13
07:45 AM	0	0	1	0	0	0	0	0	0	0	0	8	3	4	0	2	0	0	0	0	0	2	0	0	0	20
Total	0	0	14	1	0	0	0	0	0	0	0	17	10	18	0	12	0	0	0	0	0	4	0	0	0	76
08:00 AM	0	0	6	0	0	0	0	0	0	0	0	2	2	4	0	3	0	0	0	0	0	1	0	0	0	18
08:15 AM	0	0	5	0	0	0	0	0	0	0	0	4	2	8	0	4	0	0	0	0	0	0	0	0	0	23
Grand Total	0	0	30	1	0	0	0	0	0	0	0	34	16	35	0	21	0	0	0	0	0	5	0	0	0	142
Apprch %	0	0	96.8	3.2	0	0	0	0	0	0	0	40	18.8	41.2	0	100	0	0	0	0	0	100	0	0	0	
Total %	0	0	21.1	0.7	0	0	0	0	0	0	0	23.9	11.3	24.6	0	14.8	0	0	0	0	0	3.5	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 7:00:00 AM																															
7:00:00 AM	0	0	**7**	**1**	0	**8**	0	0	0	0	0	0	0	2	**4**	1	0	7	2	0	0	0	0	2	0	1	0	0	0	1	18
7:15:00 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	3	3	**7**	0	13	**6**	0	0	0	0	**6**	0	1	0	0	0	1	**25**
7:30:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	4	0	6	0	10	2	0	0	0	0	2	0	0	0	0	0	0	13
7:45:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	**8**	3	4	0	**15**								**2**	0	0	0	**2**	20
Total Volume	0	0	14	1	0	15	0	0	0	0	0	0	0	17	10	18	0	45	12	0	0	0	0	12	0	4	0	0	0	4	76
% App. Total	0	0	93.3	6.7	0		0	0	0	0	0		0	37.8	22.2	40	0		100	0	0	0	0		0	100	0	0	0		
PHF	.000	.000	.500	.250	.000	.469	.000	.000	.000	.000	.000	.000	.000	.531	.625	.643	.000	.750	.500	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.500	.760

N/S: Washington Street (Route 138)
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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	5
06:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	8
07:00 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	9
07:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	13
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	5
Total	0	0	0	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	29
08:00 AM	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	4
Grand Total	0	0	0	0	2	0	0	0	0	17	0	1	0	1	0	0	0	0	0	25	0	0	0	0	0	46
Apprch %	0	0	0	0	100	0	0	0	0	100	0	50	0	50	0	0	0	0	0	100	0	0	0	0	0	
Total %	0	0	0	0	4.3	0	0	0	0	37	0	2.2	0	2.2	0	0	0	0	0	54.3	0	0	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 6:30:00 AM																															
6:30:00 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	5
6:45:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	3
7:00:00 AM	0	0	0	0	**1**	**1**	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	9
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	0	0	0	0	0	0	0	**10**	**10**	0	0	0	0	0	0	**13**
Total Volume	0	0	0	0	1	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	22	22	0	0	0	0	0	0	30
% App. Total	0	0	0	0	100		0	0	0	0	100		0	0	0	0	0		0	0	0	0	100		0	0	0	0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.583	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.550	.550	.000	.000	.000	.000	.000	.000	.577

N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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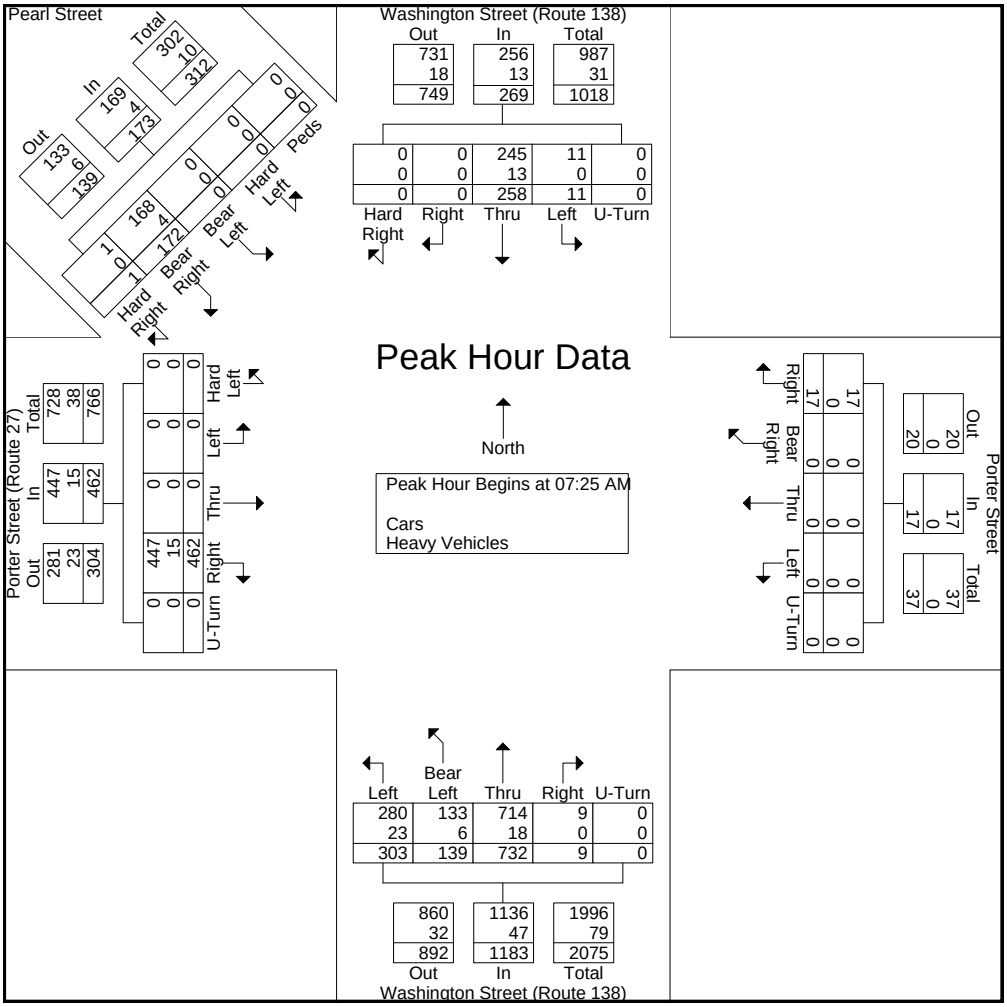
File Name : 122868 A
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 07:25 AM																															
07:25 AM	0	0	21	0	0	21	0	0	0	0	0	0	1	**72**	**16**	**34**	0	**123**	**57**	0	0	0	0	**57**	0	14	0	0	0	14	**215**
07:30 AM	0	0	20	**2**	0	22	1	0	0	0	0	1	0	63	11	19	0	93	43	0	0	0	0	43	0	20	0	0	0	20	179
07:35 AM	0	0	24	1	0	25	1	0	0	0	0	1	**2**	51	10	32	0	95	41	0	0	0	0	41	0	11	0	0	0	11	173
07:40 AM	0	0	19	1	0	20	1	0	0	0	0	1	1	71	8	21	0	101	41	0	0	0	0	41	0	**24**	0	0	0	**24**	187
07:45 AM	0	0	**31**	1	0	**32**	1	0	0	0	0	1	2	70	12	32	0	116	32	0	0	0	0	32	0	9	0	0	0	9	190
07:50 AM	0	0	10	1	0	11	1	0	0	0	0	1	1	63	14	13	0	91	29	0	0	0	0	29	0	19	0	0	0	19	151
07:55 AM	0	0	17	0	0	17	1	0	0	0	0	1	0	56	15	28	0	99	32	0	0	0	0	32	0	11	0	0	0	11	160
08:00 AM	0	0	25	1	0	26	1	0	0	0	0	1	0	60	13	24	0	97	33	0	0	0	0	33	0	12	0	0	0	12	169
08:05 AM	0	0	17	1	0	18	**6**	0	0	0	0	**6**	0	50	13	26	0	89	38	0	0	0	0	38	0	11	0	0	0	11	162
08:10 AM	0	0	23	1	0	24	0	0	0	0	0	0	0	46	8	21	0	75	27	0	0	0	0	27	**1**	12	0	0	0	13	139
08:15 AM	0	0	23	0	0	23	3	0	0	0	0	3	2	59	12	34	0	107	41	0	0	0	0	41	0	11	0	0	0	11	185
08:20 AM	0	0	28	2	0	30	1	0	0	0	0	1	0	71	7	19	0	97	48	0	0	0	0	48	0	18	0	0	0	18	194
Total Volume	0	0	258	11	0	269	17	0	0	0	0	17	9	732	139	303	0	1183	462	0	0	0	0	462	1	172	0	0	0	173	2104
% App. Total	0	0	95.9	4.1	0		100	0	0	0	0		0.8	61.9	11.7	25.6	0		100	0	0	0	0		0.6	99.4	0	0	0		
PHF	.000	.000	.694	.458	.000	.701	.236	.000	.000	.000	.000	.236	.375	.847	.724	.743	.000	.801	.675	.000	.000	.000	.000	.675	.083	.597	.000	.000	.000	.601	.816
Cars	0	0	245	11	0	256	17	0	0	0	0	17	9	714	133	280	0	1136	447	0	0	0	0	447	1	168	0	0	0	169	2025
% Cars	0	0	95.0	100	0	95.2	100	0	0	0	0	100	100	97.5	95.7	92.4	0	96.0	96.8	0	0	0	0	96.8	100	97.7	0	0	0	97.7	96.2
Heavy Vehicles	0	0	13	0	0	13	0	0	0	0	0	0	0	18	6	23	0	47	15	0	0	0	0	15	0	4	0	0	0	4	79
% Heavy Vehicles	0	0	5.0	0	0	4.8	0	0	0	0	0	0	0	2.5	4.3	7.6	0	4.0	3.2	0	0	0	0	3.2	0	2.3	0	0	0	2.3	3.8



N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 AA
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	1	123	1	0	6	0	0	0	0	3	110	42	79	0	119	0	0	0	0	3	45	0	0	0	532
04:55 PM	0	0	123	5	0	7	0	0	0	0	5	112	35	82	0	126	0	0	0	0	1	46	0	0	0	542
05:10 PM	0	1	142	3	0	4	0	0	0	0	3	100	45	82	0	147	0	0	0	0	1	41	0	0	0	569
05:25 PM	1	0	126	1	0	3	0	0	0	0	5	120	42	91	0	125	0	0	0	0	1	45	0	0	0	560
05:40 PM	0	1	137	4	0	10	0	0	0	0	3	134	36	83	0	127	0	0	0	0	3	44	0	0	0	582
05:55 PM	0	2	114	3	0	7	0	0	0	0	4	97	35	75	0	112	0	0	0	0	1	49	0	0	0	499
06:10 PM	0	0	115	2	0	4	0	0	0	0	3	103	44	68	0	137	0	0	0	0	5	46	0	0	0	527
06:25 PM	0	0	134	3	0	4	0	0	0	0	3	91	33	46	0	83	0	0	0	0	2	55	0	0	0	454
Grand Total	1	5	1014	22	0	45	0	0	0	0	29	867	312	606	0	976	0	0	0	0	17	371	0	0	0	4265
Apprch %	0.1	0.5	97.3	2.1	0	100	0	0	0	0	1.6	47.8	17.2	33.4	0	100	0	0	0	0	4.4	95.6	0	0	0	
Total %	0	0.1	23.8	0.5	0	1.1	0	0	0	0	0.7	20.3	7.3	14.2	0	22.9	0	0	0	0	0.4	8.7	0	0	0	
Cars	1	5	1001	21	0	44	0	0	0	0	29	850	304	590	0	954	0	0	0	0	17	362	0	0	0	4178
% Cars	100	100	98.7	95.5	0	97.8	0	0	0	0	100	98	97.4	97.4	0	97.7	0	0	0	0	100	97.6	0	0	0	98
Heavy Vehicles	0	0	13	1	0	1	0	0	0	0	0	17	8	16	0	22	0	0	0	0	0	9	0	0	0	87
% Heavy Vehicles	0	0	1.3	4.5	0	2.2	0	0	0	0	0	2	2.6	2.6	0	2.3	0	0	0	0	0	2.4	0	0	0	2

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 4:55:00 PM																															
4:55:00 PM	0	0	123	**5**	0	128	7	0	0	0	0	7	**5**	112	35	82	0	234	126	0	0	0	0	126	1	**46**	0	0	0	**47**	542
5:10:00 PM	0	**1**	**142**	3	0	**146**	4	0	0	0	0	4	3	100	**45**	82	0	230	**147**	0	0	0	0	**147**	1	41	0	0	0	42	569
5:25:00 PM	**1**	0	126	1	0	128	3	0	0	0	0	3	5	120	42	**91**	0	**258**	125	0	0	0	0	125	1	45	0	0	0	46	560
5:40:00 PM	0	1	137	4	0	142	**10**	0	0	0	0	**10**	3	**134**	36	83	0	256	127	0	0	0	0	127	**3**	44	0	0	0	47	**582**
Total Volume	1	2	528	13	0	544	24	0	0	0	0	24	16	466	158	338	0	978	525	0	0	0	0	525	6	176	0	0	0	182	2253
% App. Total	0.2	0.4	97.1	2.4	0		100	0	0	0	0		1.6	47.6	16.2	34.6	0		100	0	0	0	0		3.3	96.7	0	0	0		
PHF	.250	.500	.930	.650	.000	.932	.600	.000	.000	.000	.000	.600	.800	.869	.878	.929	.000	.948	.893	.000	.000	.000	.000	.893	.500	.957	.000	.000	.000	.968	.968
Cars	1	2	521	12	0	536	24	0	0	0	0	24	16	456	156	331	0	959	518	0	0	0	0	518	6	171	0	0	0	177	2214
% Cars	100	100	98.7	92.3	0	98.5	100	0	0	0	0	100	100	97.9	98.7	97.9	0	98.1	98.7	0	0	0	0	98.7	100	97.2	0	0	0	97.3	98.3
Heavy Vehicles	0	0	7	1	0	8	0	0	0	0	0	0	0	10	2	7	0	19	7	0	0	0	0	7	0	5	0	0	0	5	39
% Heavy Vehicles	0	0	1.3	7.7	0	1.5	0	0	0	0	0	0	0	2.1	1.3	2.1	0	1.9	1.3	0	0	0	0	1.3	0	2.8	0	0	0	2.7	1.7

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N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 AA
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	1	121	1	0	6	0	0	0	0	3	108	41	77	0	113	0	0	0	0	3	44	0	0	0	518
04:55 PM	0	0	121	4	0	7	0	0	0	0	5	110	35	80	0	125	0	0	0	0	1	46	0	0	0	534
05:10 PM	0	1	140	3	0	4	0	0	0	0	3	97	43	80	0	141	0	0	0	0	1	38	0	0	0	551
05:25 PM	1	0	125	1	0	3	0	0	0	0	5	117	42	89	0	125	0	0	0	0	1	44	0	0	0	553
05:40 PM	0	1	135	4	0	10	0	0	0	0	3	132	36	82	0	127	0	0	0	0	3	43	0	0	0	576
05:55 PM	0	2	110	3	0	6	0	0	0	0	4	95	32	72	0	109	0	0	0	0	1	47	0	0	0	481
06:10 PM	0	0	115	2	0	4	0	0	0	0	3	100	43	66	0	134	0	0	0	0	5	46	0	0	0	518
06:25 PM	0	0	134	3	0	4	0	0	0	0	3	91	32	44	0	80	0	0	0	0	2	54	0	0	0	447
Grand Total	1	5	1001	21	0	44	0	0	0	0	29	850	304	590	0	954	0	0	0	0	17	362	0	0	0	4178
Apprch %	0.1	0.5	97.4	2	0	100	0	0	0	0	1.6	47.9	17.1	33.3	0	100	0	0	0	0	4.5	95.5	0	0	0	
Total %	0	0.1	24	0.5	0	1.1	0	0	0	0	0.7	20.3	7.3	14.1	0	22.8	0	0	0	0	0.4	8.7	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 4:55:00 PM																															
4:55:00 PM	0	0	121	**4**	0	125	7	0	0	0	0	7	**5**	110	35	80	0	230	125	0	0	0	0	125	1	**46**	0	0	0	**47**	534
5:10:00 PM	0	**1**	**140**	3	0	**144**	4	0	0	0	0	4	3	97	**43**	80	0	223	**141**	0	0	0	0	**141**	1	38	0	0	0	39	551
5:25:00 PM	**1**	0	125	1	0	127	3	0	0	0	0	3	5	117	42	**89**	0	**253**	125	0	0	0	0	125	1	44	0	0	0	45	553
5:40:00 PM	0	1	135	4	0	140	**10**	0	0	0	0	**10**	3	**132**	36	82	0	253	127	0	0	0	0	127	**3**	43	0	0	0	46	**576**
Total Volume	1	2	521	12	0	536	24	0	0	0	0	24	16	456	156	331	0	959	518	0	0	0	0	518	6	171	0	0	0	177	2214
% App. Total	0.2	0.4	97.2	2.2	0		100	0	0	0	0		1.7	47.5	16.3	34.5	0		100	0	0	0	0		3.4	96.6	0	0	0		
PHF	.250	.500	.930	.750	.000	.931	.600	.000	.000	.000	.000	.600	.800	.864	.907	.930	.000	.948	.918	.000	.000	.000	.000	.918	.500	.929	.000	.000	.000	.941	.961

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Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	0	2	0	0	0	0	0	0	0	0	2	1	2	0	6	0	0	0	0	0	1	0	0	0	14
04:55 PM	0	0	2	1	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0	8
05:10 PM	0	0	2	0	0	0	0	0	0	0	0	3	2	2	0	6	0	0	0	0	0	3	0	0	0	18
05:25 PM	0	0	1	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	1	0	0	0	7
05:40 PM	0	0	2	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	6
05:55 PM	0	0	4	0	0	1	0	0	0	0	0	2	3	3	0	3	0	0	0	0	0	2	0	0	0	18
06:10 PM	0	0	0	0	0	0	0	0	0	0	0	3	1	2	0	3	0	0	0	0	0	0	0	0	0	9
06:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	1	0	0	0	7
Grand Total	0	0	13	1	0	1	0	0	0	0	0	17	8	16	0	22	0	0	0	0	0	9	0	0	0	87
Apprch %	0	0	92.9	7.1	0	100	0	0	0	0	0	41.5	19.5	39	0	100	0	0	0	0	0	100	0	0	0	
Total %	0	0	14.9	1.1	0	1.1	0	0	0	0	0	19.5	9.2	18.4	0	25.3	0	0	0	0	0	10.3	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:10:00 PM																															
5:10:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	**3**	2	2	0	7	**6**	0	0	0	0	**6**	0	**3**	0	0	0	**3**	**18**
5:25:00 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	2	0	5	0	0	0	0	0	0	0	1	0	0	0	1	7
5:40:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	2	0	1	0	3	0	0	0	0	0	0	0	1	0	0	0	1	6
5:55:00 PM	0	0	**4**	0	0	**4**	**1**	0	0	0	0	**1**	0	2	**3**	**3**	0	**8**													
Total Volume	0	0	9	0	0	9	1	0	0	0	0	1	0	10	5	8	0	23	9	0	0	0	0	9	0	7	0	0	0	7	49
% App. Total	0	0	100	0	0		100	0	0	0	0		0	43.5	21.7	34.8	0		100	0	0	0	0		0	100	0	0	0		
PHF	.000	.000	.563	.000	.000	.563	.250	.000	.000	.000	.000	.250	.000	.833	.417	.667	.000	.719	.375	.000	.000	.000	.000	.375	.000	.583	.000	.000	.000	.583	.681

N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 AA
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North					Porter Street From East					Washington Street (Route 138) From South					Porter Street (Route 27) From West					Pearl Street From Northwest					
Start Time	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:55 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
05:10 PM	0	0	0	0	2	0	0	0	0	5	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	10
05:25 PM	0	0	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	13
05:40 PM	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	9
05:55 PM	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	8
06:10 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	11
06:25 PM	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5
Grand Total	0	0	0	0	8	0	0	0	0	38	0	0	0	0	0	0	0	0	0	17	0	1	0	0	0	64
Apprch %	0	0	0	0	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	
Total %	0	0	0	0	12.5	0	0	0	0	59.4	0	0	0	0	0	0	0	0	0	26.6	0	1.6	0	0	0	

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:25:00 PM																															
5:25:00 PM	0	0	0	0	**2**	**2**	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	**7**	**7**	0	0	0	0	0	0	**13**
5:40:00 PM	0	0	0	0	1	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	9
5:55:00 PM	0	0	0	0	1	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	8
6:10:00 PM	0	0	0	0	0	0	0	0	0	0	**9**	**9**	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	11
Total Volume	0	0	0	0	4	4	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0	14	14	0	0	0	0	0	0	41
% App. Total	0	0	0	0	100		0	0	0	0	100		0	0	0	0	0		0	0	0	0	100		0	0	0	0	0		
PHF	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.639	.639	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.788

N/S: Washington Street (Route 138)
E/W/NW: Porter Street/Pearl Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Site Code : 10111.34
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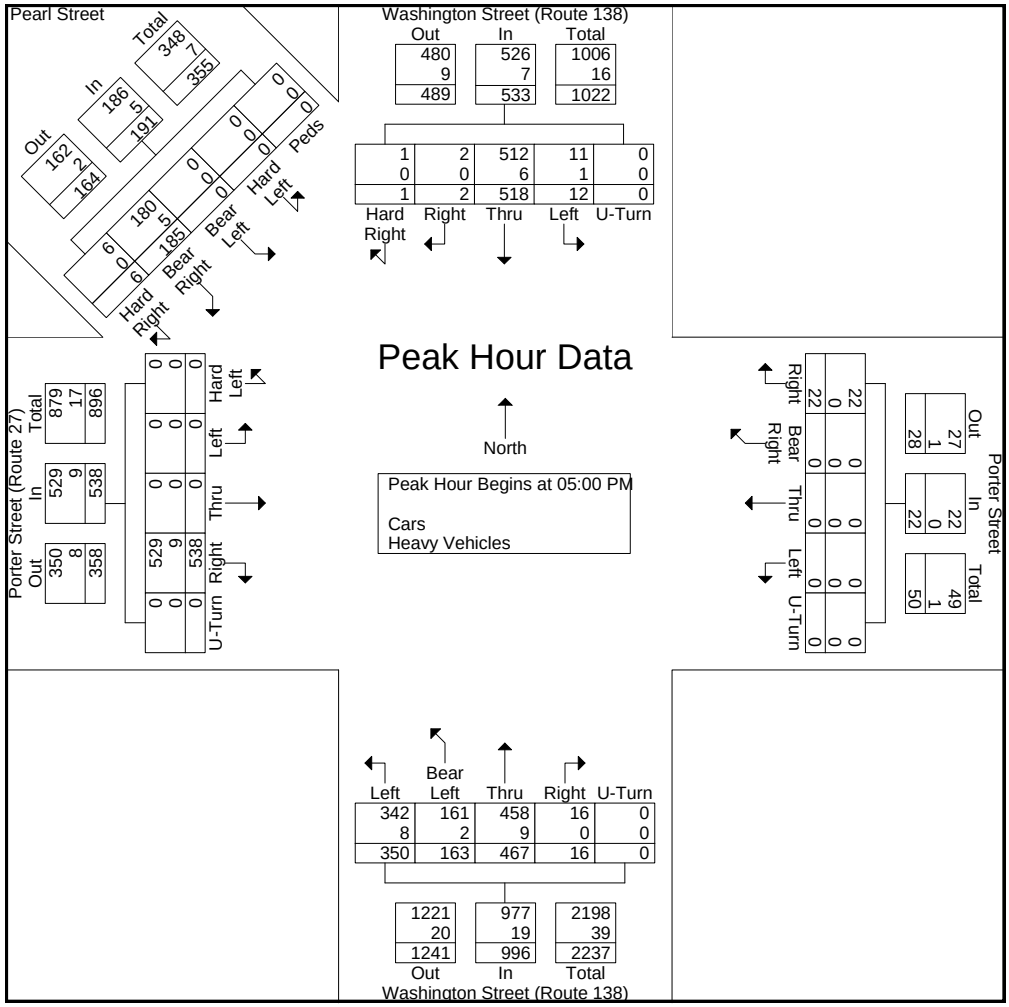
Page No : 1

	Washington Street (Route 138) From North						Porter Street From East						Washington Street (Route 138) From South						Porter Street (Route 27) From West						Pearl Street From Northwest						
Start Time	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 05:00 PM																															
05:00 PM	0	0	49	1	0	50	2	0	0	0	0	2	2	38	14	30	0	84	46	0	0	0	0	46	0	15	0	0	0	15	197
05:05 PM	0	0	35	**2**	0	37	2	0	0	0	0	2	1	39	14	27	0	81	44	0	0	0	0	44	1	18	0	0	0	19	183
05:10 PM	0	0	48	1	0	49	3	0	0	0	0	3	2	37	**19**	31	0	**89**													202
05:15 PM	0	**1**	41	0	0	42	1	0	0	0	0	1	0	30	9	32	0	71	48	0	0	0	0	48	0	18	0	0	0	18	180
05:20 PM	0	0	**53**	2	0	**55**	0	0	0	0	0	0	1	33	17	19	0	70	50	0	0	0	0	50	1	11	0	0	0	12	187
05:25 PM	0	0	43	1	0	44	1	0	0	0	0	1	1	**47**	13	26	0	87	39	0	0	0	0	39	0	16	0	0	0	16	187
05:30 PM	**1**	0	44	0	0	45	0	0	0	0	0	0	0	35	12	**38**	0	85	35	0	0	0	0	35	0	13	0	0	0	13	178
05:35 PM	0	0	39	0	0	39	2	0	0	0	0	2	**4**	38	17	27	0	86	51	0	0	0	0	51	1	16	0	0	0	17	195
05:40 PM	0	0	50	2	0	52	1	0	0	0	0	1	1	45	9	29	0	84	**54**	0	0	0	0	**54**	1	15	0	0	0	16	**207**
05:45 PM	0	0	41	1	0	42	**6**	0	0	0	0	**6**	1	45	11	32	0	89	29	0	0	0	0	29	**2**	17	0	0	0	19	185
05:50 PM	0	1	46	1	0	48	3	0	0	0	0	3	1	44	16	22	0	83	44	0	0	0	0	44	0	12	0	0	0	12	190
05:55 PM	0	0	29	1	0	30	1	0	0	0	0	1	2	36	12	37	0	87	49	0	0	0	0	49	0	**22**	0	0	0	**22**	189
Total Volume	1	2	518	12	0	533	22	0	0	0	0	22	16	467	163	350	0	996	538	0	0	0	0	538	6	185	0	0	0	191	2280
% App. Total	0.2	0.4	97.2	2.3	0		100	0	0	0	0		1.6	46.9	16.4	35.1	0		100	0	0	0	0		3.1	96.9	0	0	0		
PHF	.083	.167	.814	.500	.000	.808	.306	.000	.000	.000	.000	.306	.333	.828	.715	.768	.000	.933	.830	.000	.000	.000	.000	.830	.250	.701	.000	.000	.000	.723	.918
Cars	1	2	512	11	0	526	22	0	0	0	0	22	16	458	161	342	0	977	529	0	0	0	0	529	6	180	0	0	0	186	2240
% Cars	100	100	98.8	91.7	0	98.7	100	0	0	0	0	100	100	98.1	98.8	97.7	0	98.1	98.3	0	0	0	0	98.3	100	97.3	0	0	0	97.4	98.2
Heavy Vehicles	0	0	6	1	0	7	0	0	0	0	0	0	0	9	2	8	0	19	9	0	0	0	0	9	0	5	0	0	0	5	40
% Heavy Vehicles	0	0	1.2	8.3	0	1.3	0	0	0	0	0	0	0	1.9	1.2	2.3	0	1.9	1.7	0	0	0	0	1.7	0	2.7	0	0	0	2.6	1.8



PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 B
Site Code : 10111.34
Start Date :

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	10	105	2	0	2	0	0	0	1	262	28	0	19	0	10	0	439
06:45 AM	6	106	0	0	0	0	0	0	0	271	28	0	29	0	5	0	445
Total	16	211	2	0	2	0	0	0	1	533	56	0	48	0	15	0	884
07:00 AM	5	163	0	0	1	0	0	0	0	275	2	0	19	0	0	0	465
07:15 AM	11	232	2	0	2	0	0	0	1	298	1	0	23	0	0	0	570
07:30 AM	15	223	2	0	0	0	0	0	1	268	6	0	24	0	0	0	539
07:45 AM	10	182	1	0	3	0	0	0	1	296	5	0	34	0	0	0	532
Total	41	800	5	0	6	0	0	0	3	1137	14	0	100	0	0	0	2106
08:00 AM	23	172	1	0	2	0	0	0	1	258	2	0	30	0	0	0	489
08:15 AM	14	212	0	0	1	0	0	0	2	293	0	0	31	0	0	0	553
Grand Total	94	1395	8	0	11	0	0	0	7	2221	72	0	209	0	15	0	4032
Apprch %	6.3	93.2	0.5	0	100	0	0	0	0.3	96.6	3.1	0	93.3	0	6.7	0	
Total %	2.3	34.6	0.2	0	0.3	0	0	0	0.2	55.1	1.8	0	5.2	0	0.4	0	
Cars	89	1335	8	0	10	0	0	0	5	2142	72	0	195	0	15	0	3871
% Cars	94.7	95.7	100	0	90.9	0	0	0	71.4	96.4	100	0	93.3	0	100	0	96
Heavy Vehicles	5	60	0	0	1	0	0	0	2	79	0	0	14	0	0	0	161
% Heavy Vehicles	5.3	4.3	0	0	9.1	0	0	0	28.6	3.6	0	0	6.7	0	0	0	4

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:15:00 AM																					
7:15:00 AM	11	**232**	**2**	0	**245**	2	0	0	0	2	**1**	**298**	**1**	**0**	**300**	**23**	**0**	**0**	**0**	**23**	**570**
7:30:00 AM	15	223	2	0	240	0	0	0	0	0	1	268	**6**	0	275	24	0	0	0	24	539
7:45:00 AM	10	182	1	0	193	**3**	0	0	0	**3**	1	296	5	0	**302**	**34**	0	0	0	**34**	532
8:00:00 AM	**23**	172	1	0	196	2	0	0	0	2	1	258	2	0	261	30	0	0	0	30	489
Total Volume	59	809	6	0	874	7	0	0	0	7	4	1120	14	0	1138	111	0	0	0	111	2130
% App. Total																					
PHF	.641	.872	.750	.000	.892	.583	.000	.000	.000	.583	1.00	.940	.583	.000	.942	.816	.000	.000	.000	.816	.934
Cars	55	775	6	0	836	7	0	0	0	7	3	1078	14	0	1095	104	0	0	0	104	2042
% Cars	93.2	95.8	100	0	95.7	100	0	0	0	100	75.0	96.3	100	0	96.2	93.7	0	0	0	93.7	95.9
Heavy Vehicles																					
% Heavy Vehicles	6.8	4.2	0	0	4.3	0	0	0	0	0	25.0	3.8	0	0	3.8	6.3	0	0	0	6.3	4.1

PRECISION
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N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
File Name : 122868 B
Site Code : 10111.34
Start Date :

Groups Printed- Cars

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	10	102	2	0	2	0	0	0	0	260	28	0	17	0	10	0	431
06:45 AM	6	102	0	0	0	0	0	0	0	259	28	0	27	0	5	0	427
Total	16	204	2	0	2	0	0	0	0	519	56	0	44	0	15	0	858
07:00 AM	5	154	0	0	1	0	0	0	0	265	2	0	18	0	0	0	445
07:15 AM	11	216	2	0	2	0	0	0	1	288	1	0	21	0	0	0	542
07:30 AM	14	220	2	0	0	0	0	0	1	259	6	0	22	0	0	0	524
07:45 AM	10	175	1	0	3	0	0	0	1	281	5	0	31	0	0	0	507
Total	40	765	5	0	6	0	0	0	3	1093	14	0	92	0	0	0	2018
08:00 AM	20	164	1	0	2	0	0	0	0	250	2	0	30	0	0	0	469
08:15 AM	13	202	0	0	0	0	0	0	2	280	0	0	29	0	0	0	526
Grand Total	89	1335	8	0	10	0	0	0	5	2142	72	0	195	0	15	0	3871
Apprch %	6.2	93.2	0.6	0	100	0	0	0	0.2	96.5	3.2	0	92.9	0	7.1	0	
Total %	2.3	34.5	0.2	0	0.3	0	0	0	0.1	55.3	1.9	0	5	0	0.4	0	

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:15:00 AM																					
7:15:00 AM	11	216	**2**	0	229	2	0	0	0	2	**1**	**288**	**1**	**0**	**290**	21	0	0	0	21	**542**
7:30:00 AM	14	**220**	**2**	**0**	**236**	0	0	0	0	0	1	259	**6**	0	266	22	0	0	0	22	524
7:45:00 AM	10	175	1	0	186	**3**	0	0	0	**3**	1	281	5	0	287	**31**	0	0	0	**31**	507
8:00:00 AM	**20**	164	1	0	185	2	0	0	0	2	0	250	2	0	252	30	0	0	0	30	469
Total Volume	55	775	6	0	836	7	0	0	0	7	3	1078	14	0	1095	104	0	0	0	104	2042
% App. Total																					
PHF	.688	.881	.750	.000	.886	.583	.000	.000	.000	.583	.750	.936	.583	.000	.944	.839	.000	.000	.000	.839	.942

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City, State: Stoughton, MA
File Name: 122868 B
Site Code: 10111.34
Start Date:

Groups Printed- Heavy Vehicles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	0	3	0	0	0	0	0	0	1	2	0	0	2	0	0	0	8
06:45 AM	0	4	0	0	0	0	0	0	0	12	0	0	2	0	0	0	18
Total	0	7	0	0	0	0	0	0	1	14	0	0	4	0	0	0	26
07:00 AM	0	9	0	0	0	0	0	0	0	10	0	0	1	0	0	0	20
07:15 AM	0	16	0	0	0	0	0	0	0	10	0	0	2	0	0	0	28
07:30 AM	1	3	0	0	0	0	0	0	0	9	0	0	2	0	0	0	15
07:45 AM	0	7	0	0	0	0	0	0	0	15	0	0	3	0	0	0	25
Total	1	35	0	0	0	0	0	0	0	44	0	0	8	0	0	0	88
08:00 AM	3	8	0	0	0	0	0	0	1	8	0	0	0	0	0	0	20
08:15 AM	1	10	0	0	1	0	0	0	0	13	0	0	2	0	0	0	27
Grand Total	5	60	0	0	1	0	0	0	2	79	0	0	14	0	0	0	161
Apprch %	7.7	92.3	0	0	100	0	0	0	2.5	97.5	0	0	100	0	0	0	
Total %	3.1	37.3	0	0	0.6	0	0	0	1.2	49.1	0	0	8.7	0	0	0	

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	0	9	0	0	9	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	20
7:15:00 AM	0	**16**			**16**	0	0	0	0	0	0	10	0	0	10	2	0	0	0	2	**28**
7:30:00 AM	**1**	3	0	0	4	0	0	0	0	0	0	9	0	0	9	2	0	0	0	2	15
7:45:00 AM	0	7	0	0	7	0	0	0	0	0	0	**15**			**15**	**3**	0	0	0	**3**	25
Total Volume	1	35	0	0	36	0	0	0	0	0	0	44	0	0	44	8	0	0	0	8	88
% App. Total	2.8	97.2	0	0		0	0	0	0		0	100	0	0		100	0	0	0		
PHF	.250	.547	.000	.000	.563	.000	.000	.000	.000	.000	.000	.733	.000	.000	.733	.667	.000	.000	.000	.667	.786

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
File #: 122868 B/ E. Chan

File Name : 122868 B
Site Code : 10111.34
Start Date :

Groups Printed- Peds and Bicycles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	6
06:45 AM	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	7	21
Total	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	11	27
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
07:15 AM	0	0	0	4	0	0	0	2	0	0	0	0	0	0	0	12	18
07:30 AM	0	0	0	20	0	0	0	1	0	0	0	0	0	0	0	1	22
07:45 AM	0	0	0	2	0	0	0	3	0	0	0	1	1	0	0	2	9
Total	0	0	0	26	0	0	0	6	0	0	0	1	1	0	0	23	57
08:00 AM	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	1	8
08:15 AM	0	0	0	13	0	0	0	2	0	2	0	0	0	0	0	4	21
Grand Total	0	0	0	61	0	0	0	9	0	2	0	1	1	0	0	39	113
Apprch %	0	0	0	100	0	0	0	100	0	66.7	0	33.3	2.5	0	0	97.5	
Total %	0	0	0	54	0	0	0	8	0	1.8	0	0.9	0.9	0	0	34.5	

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	21
7:00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8	8
7:15:00 AM	0	0	0	4	4	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	**12**	**12**	18
7:30:00 AM	0	0	0	**20**	**20**	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	**22**
Total Volume	0	0	0	38	38	0	0	0	3	3	0	0	0	0	0	0	0	0	28	28	69
% App. Total	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.475	.475	.000	.000	.000	.375	.375	.000	.000	.000	.000	.000	.000	.000	.000	.583	.583	.784

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: 122B/ E. Chan

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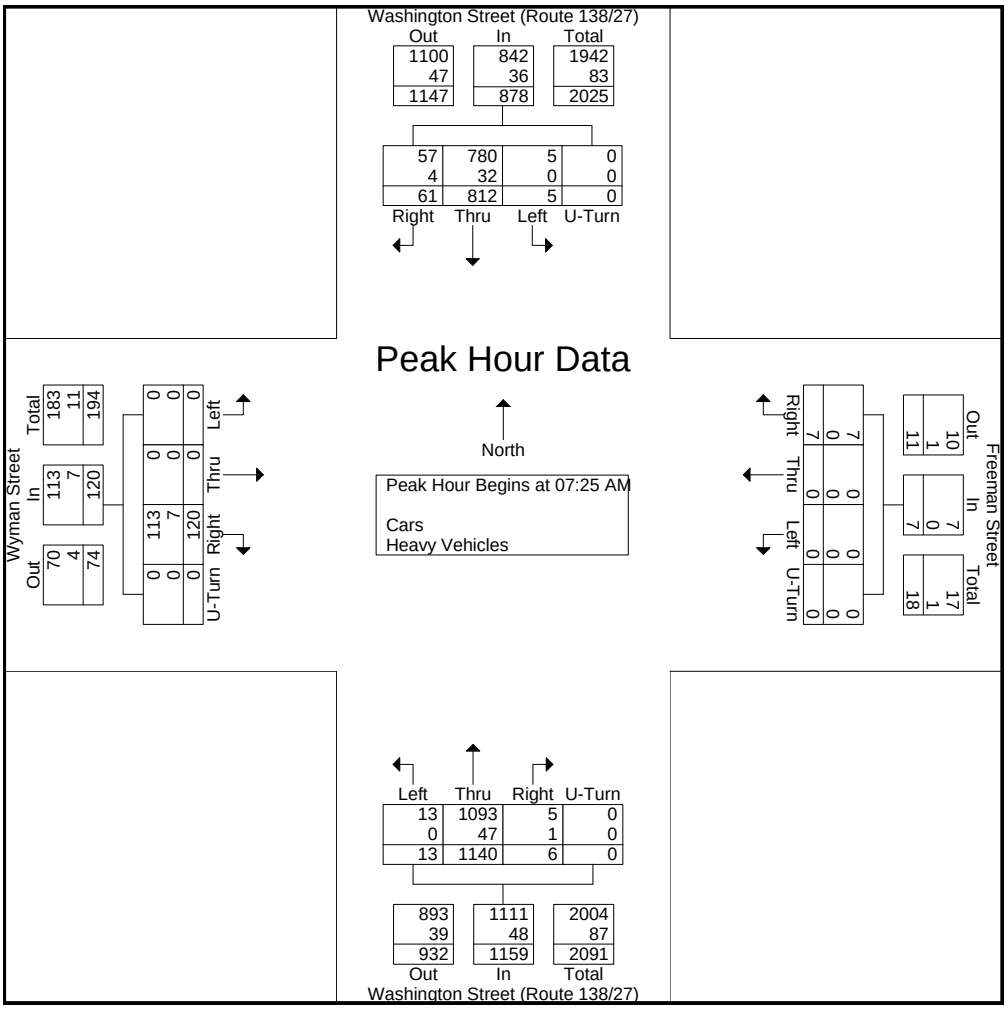
File Name : 122868 B
Site Code : 10111.34
Start Date :

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:25 AM																					
07:25 AM	4	**89**	**1**	0	**94**	**2**	0	0	0	**2**	1	**116**	**0**	**0**	**117**	10	0	0	0	10	**223**
07:30 AM	**7**	**74**	**0**	**0**	**81**	**0**	**0**	**0**	**0**	**0**	**0**	**92**	**2**	**0**	**94**	**6**	**0**	**0**	**0**	**6**	**181**
07:35 AM	**4**	**72**	**1**	**0**	**77**	**0**	**0**	**0**	**0**	**0**	**1**	**83**	**0**	**0**	**84**	**7**	**0**	**0**	**0**	**7**	**168**
07:40 AM	**4**	**77**	**1**	**0**	**82**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**4**	0	97	11	0	0	0	11	190
07:45 AM	6	69	0	0	75	1	0	0	0	1	0	104	2	0	106	**16**	0	0	0	**16**	198
07:50 AM	2	55	1	0	58	1	0	0	0	1	0	99	1	0	100	11	0	0	0	11	170
07:55 AM	2	58	0	0	60	1	0	0	0	1	1	93	2	0	96	7	0	0	0	7	164
08:00 AM	**11**	59	0	0	70	1	0	0	0	1	0	96	1	0	97	13	0	0	0	13	181
08:05 AM	7	57	0	0	64	1	0	0	0	1	0	87	1	0	88	11	0	0	0	11	164
08:10 AM	5	56	1	0	62	0	0	0	0	0	1	75	0	0	76	6	0	0	0	6	144
08:15 AM	4	70	0	0	74	0	0	0	0	0	0	111	0	0	111	9	0	0	0	9	194
08:20 AM	5	76	0	0	81	0	0	0	0	0	**2**	91	0	0	93	13	0	0	0	13	187
Total Volume	61	812	5	0	878	7	0	0	0	7	6	1140	13	0	1159	120	0	0	0	120	2164
% App. Total																					
PHF	.462	.760	.417	.000	.778	.292	.000	.000	.000	.292	.250	.819	.271	.000	.825	.625	.000	.000	.000	.625	.809
Cars	57	780	5	0	842	7	0	0	0	7	5	1093	13	0	1111	113	0	0	0	113	2073
% Cars	93.4	96.1	100	0	95.9	100	0	0	0	100	83.3	95.9	100	0	95.9	94.2	0	0	0	94.2	95.8
Heavy Vehicles																					
% Heavy Vehicles	6.6	3.9	0	0	4.1	0	0	0	0	0	16.7	4.1	0	0	4.1	5.8	0	0	0	5.8	4.2



N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 BB
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	20	267	0	0	1	0	0	0	4	233	4	0	29	0	1	0	559
04:55 PM	15	283	2	0	3	0	0	0	4	237	2	0	32	0	0	0	578
05:10 PM	20	306	2	0	2	0	0	0	0	224	3	0	27	0	0	0	584
05:25 PM	19	281	0	0	4	0	0	0	5	247	0	0	40	0	0	0	596
05:40 PM	14	293	3	0	5	0	0	0	1	224	10	0	28	0	2	0	580
05:55 PM	16	245	3	0	4	0	0	0	2	183	21	0	32	0	2	0	508
06:10 PM	13	296	1	0	1	0	0	0	2	203	22	0	35	0	0	0	573
06:25 PM	21	251	0	0	1	0	1	0	0	158	17	0	22	0	0	0	471
Grand Total	138	2222	11	0	21	0	1	0	18	1709	79	0	245	0	5	0	4449
Apprch %	5.8	93.7	0.5	0	95.5	0	4.5	0	1	94.6	4.4	0	98	0	2	0	
Total %	3.1	49.9	0.2	0	0.5	0	0	0	0.4	38.4	1.8	0	5.5	0	0.1	0	
Cars	136	2184	9	0	18	0	1	0	18	1675	78	0	241	0	4	0	4364
% Cars	98.6	98.3	81.8	0	85.7	0	100	0	100	98	98.7	0	98.4	0	80	0	98.1
Heavy Vehicles	2	38	2	0	3	0	0	0	0	34	1	0	4	0	1	0	85
% Heavy Vehicles	1.4	1.7	18.2	0	14.3	0	0	0	0	2	1.3	0	1.6	0	20	0	1.9

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	15	283	2	0	300	3	0	0	0	3	4	237	2	0	243	32	0	0	0	32	578
5:10:00 PM	**20**	**306**			**328**	2	0	0	0	2	0	224	3	0	227	27	0	0	0	27	584
5:25:00 PM	19	281	0	0	300	4	0	0	0	4	**5**	**247**			**252**	**40**	0	0	0	**40**	**596**
5:40:00 PM	14	293	**3**	0	310	**5**	0	0	0	**5**	1	224	**10**	0	235	28	0	**2**	0	30	580
Total Volume	68	1163	7	0	1238	14	0	0	0	14	10	932	15	0	957	127	0	2	0	129	2338
% App. Total																					
PHF	.850	.950	.583	.000	.944	.700	.000	.000	.000	.700	.500	.943	.375	.000	.949	.794	.000	.250	.000	.806	.981
Cars	67	1145	6	0	1218	12	0	0	0	12	10	917	14	0	941	125	0	2	0	127	2298
% Cars	98.5	98.5	85.7	0	98.4	85.7	0	0	0	85.7	100	98.4	93.3	0	98.3	98.4	0	100	0	98.4	98.3
Heavy Vehicles																					
% Heavy Vehicles	1.5	1.5	14.3	0	1.6	14.3	0	0	0	14.3	0	1.6	6.7	0	1.7	1.6	0	0	0	1.6	1.7

N/S: Washington Street (Route 138/27)
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File Name : 122868 BB
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Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	20	259	0	0	1	0	0	0	4	227	4	0	28	0	1	0	544
04:55 PM	15	279	2	0	3	0	0	0	4	233	2	0	32	0	0	0	570
05:10 PM	20	296	1	0	2	0	0	0	0	219	2	0	27	0	0	0	567
05:25 PM	18	280	0	0	2	0	0	0	5	244	0	0	39	0	0	0	588
05:40 PM	14	290	3	0	5	0	0	0	1	221	10	0	27	0	2	0	573
05:55 PM	15	241	2	0	3	0	0	0	2	178	21	0	31	0	1	0	494
06:10 PM	13	292	1	0	1	0	0	0	2	198	22	0	35	0	0	0	564
06:25 PM	21	247	0	0	1	0	1	0	0	155	17	0	22	0	0	0	464
Grand Total	136	2184	9	0	18	0	1	0	18	1675	78	0	241	0	4	0	4364
Apprch %	5.8	93.8	0.4	0	94.7	0	5.3	0	1	94.6	4.4	0	98.4	0	1.6	0	
Total %	3.1	50	0.2	0	0.4	0	0	0	0.4	38.4	1.8	0	5.5	0	0.1	0	

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	15	279	2	0	296	3	0	0	0	3	4	233	2	0	239	32	0	0	0	32	570
5:10:00 PM	**20**	**296**			**317**	2	0	0	0	2	0	219	2	0	221	27	0	0	0	27	567
5:25:00 PM	18	280	0	0	298	2	0	0	0	2	**5**	**244**			**249**	**39**	0	0	0	**39**	**588**
5:40:00 PM	14	290	**3**	0	307	**5**	0	0	0	**5**	1	221	**10**	0	232	27	0	**2**	0	29	573
Total Volume	67	1145	6	0	1218	12	0	0	0	12	10	917	14	0	941	125	0	2	0	127	2298
% App. Total																					
PHF	.838	.967	.500	.000	.961	.600	.000	.000	.000	.600	.500	.940	.350	.000	.945	.801	.000	.250	.000	.814	.977

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Groups Printed- Heavy Vehicles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	0	8	0	0	0	0	0	0	0	6	0	0	1	0	0	0	15
04:55 PM	0	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	8
05:10 PM	0	10	1	0	0	0	0	0	0	5	1	0	0	0	0	0	17
05:25 PM	1	1	0	0	2	0	0	0	0	3	0	0	1	0	0	0	8
05:40 PM	0	3	0	0	0	0	0	0	0	3	0	0	1	0	0	0	7
05:55 PM	1	4	1	0	1	0	0	0	0	5	0	0	1	0	1	0	14
06:10 PM	0	4	0	0	0	0	0	0	0	5	0	0	0	0	0	0	9
06:25 PM	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	7
Grand Total	2	38	2	0	3	0	0	0	0	34	1	0	4	0	1	0	85
Apprch %	4.8	90.5	4.8	0	100	0	0	0	0	97.1	2.9	0	80	0	20	0	
Total %	2.4	44.7	2.4	0	3.5	0	0	0	0	40	1.2	0	4.7	0	1.2	0	

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	0	8	0	0	8	0	0	0	0	0	0	**6**	**0**	**0**	**6**	**1**	0	0	0	**1**	15
4:55:00 PM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
5:10:00 PM	0	**10**	**1**	0	**11**	0	0	0	0	0	0	5	**1**	0	6	0	0	0	0	0	**17**
5:25:00 PM	**1**	1	0	0	2	**2**	0	0	0	**2**	0	3	0	0	3	1	0	0	0	1	8
Total Volume	1	23	1	0	25	2	0	0	0	2	0	18	1	0	19	2	0	0	0	2	48
% App. Total	4	92	4	0		100	0	0	0		0	94.7	5.3	0		100	0	0	0		
PHF	.250	.575	.250	.000	.568	.250	.000	.000	.000	.250	.000	.750	.250	.000	.792	.500	.000	.000	.000	.500	.706

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Groups Printed- Peds and Bicycles

	Washington Street (Route 138/27) From North				Freeman Street From East				Washington Street (Route 138/27) From South				Wyman Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:40 PM	0	0	0	8	0	0	0	2	0	0	0	0	0	0	0	3	13
04:55 PM	0	1	0	6	0	0	0	2	0	0	0	0	0	0	0	8	17
05:10 PM	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	8	15
05:25 PM	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	3	18
05:40 PM	0	0	0	1	0	0	0	6	0	0	0	2	0	0	0	3	12
05:55 PM	0	0	0	17	0	0	0	2	0	0	0	0	0	0	0	3	22
06:10 PM	0	0	0	10	0	0	0	3	0	0	0	1	0	0	0	4	18
06:25 PM	0	0	0	7	0	0	0	4	0	0	0	3	0	0	0	2	16
Grand Total	0	1	0	71	0	0	0	19	0	0	0	6	0	0	0	34	131
Apprch %	0	1.4	0	98.6	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0.8	0	54.2	0	0	0	14.5	0	0	0	4.6	0	0	0	26	

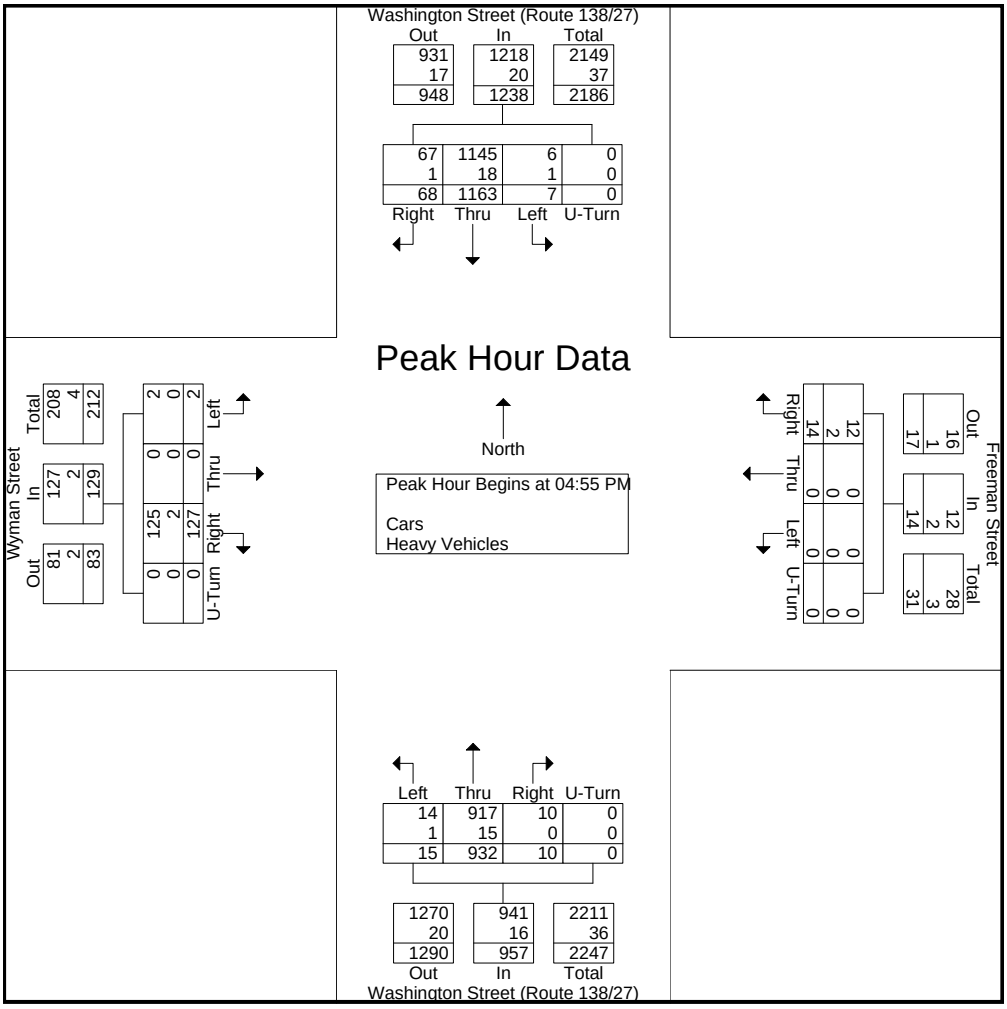
	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 5:25:00 PM																					
5:25:00 PM	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	18
5:40:00 PM	0	0	0	1	1	0	0	0	**6**	**6**	0	0	0	**2**	**2**	0	0	0	3	3	12
5:55:00 PM	0	0	0	**17**	**17**	0	0	0	2	2	0	0	0	0	0	0	0	0	3	3	**22**
6:10:00 PM	0	0	0	10	10	0	0	0	3	3	0	0	0	1	1	0	0	0	**4**	**4**	18
Total Volume	0	0	0	43	43	0	0	0	11	11	0	0	0	3	3	0	0	0	13	13	70
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.632	.632	.000	.000	.000	.458	.458	.000	.000	.000	.375	.375	.000	.000	.000	.813	.813	.795

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 BB
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

	Washington Street (Route 138/27) From North					Freeman Street From East					Washington Street (Route 138/27) From South					Wyman Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:55 PM																					
04:55 PM	7	87	0	0	94	2	0	0	0	2	2	69	2	0	73	14	0	0	0	14	183
05:00 PM	4	97	1	0	102	0	0	0	0	0	1	82	0	0	83	9	0	0	0	9	194
05:05 PM	4	99	1	0	104	1	0	0	0	1	1	**86**	**0**	**0**	**87**	9	0	0	0	9	201
05:10 PM	6	98	1	0	105	2	0	0	0	2	0	80	1	0	81	5	0	0	0	5	193
05:15 PM	**9**	99	1	0	109	0	0	0	0	0	0	74	0	0	74	11	0	0	0	11	194
05:20 PM	5	109	0	0	114	0	0	0	0	0	0	70	2	0	72	11	0	0	0	11	197
05:25 PM	6	93	0	0	99	2	0	0	0	2	0	85	0	0	85	8	0	0	0	8	194
05:30 PM	6	85	0	0	91	0	0	0	0	0	**3**	81	0	0	84	**18**	0	0	0	**18**	193
05:35 PM	7	103	0	0	110	2	0	0	0	2	2	81	0	0	83	14	0	0	0	14	209
05:40 PM	6	**113**			**119**	1	0	0	0	1	1	77	4	0	82	6	0	**2**	0	8	**210**
05:45 PM	**5**	**80**	**1**	**0**	**86**	**3**	0	0	0	**3**	0	77	**5**	0	82	14	0	0	0	14	185
05:50 PM	3	100	**2**	0	105	1	0	0	0	1	0	70	1	0	71	8	0	0	0	8	185
Total Volume	68	1163	7	0	1238	14	0	0	0	14	10	932	15	0	957	127	0	2	0	129	2338
% App. Total																					
PHF	.630	.858	.292	.000	.867	.389	.000	.000	.000	.389	.278	.903	.250	.000	.917	.588	.000	.083	.000	.597	.928
Cars	67	1145	6	0	1218	12	0	0	0	12	10	917	14	0	941	125	0	2	0	127	2298
% Cars	98.5	98.5	85.7	0	98.4	85.7	0	0	0	85.7	100	98.4	93.3	0	98.3	98.4	0	100	0	98.4	98.3
Heavy Vehicles																					
% Heavy Vehicles	1.5	1.5	14.3	0	1.6	14.3	0	0	0	14.3	0	1.6	6.7	0	1.7	1.6	0	0	0	1.6	1.7



PRECISION
D A T A
INDUSTRIES, LLC
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N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 C
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
06:30 AM	33	68	24	0	17	0	0	0	11	185	0	0	0	15	89	0	442
06:45 AM	37	78	22	0	18	0	0	0	5	201	0	0	0	17	80	0	458
Total	70	146	46	0	35	0	0	0	16	386	0	0	0	32	169	0	900
07:00 AM	48	92	40	0	20	0	0	0	10	182	0	0	0	28	81	0	501
07:15 AM	54	153	46	0	25	0	0	0	5	173	0	0	0	18	95	0	569
07:30 AM	75	144	47	0	25	0	0	0	4	182	0	0	0	29	91	0	597
07:45 AM	54	121	48	0	30	0	0	0	10	178	0	0	0	20	95	0	556
Total	231	510	181	0	100	0	0	0	29	715	0	0	0	95	362	0	2223
08:00 AM	51	110	36	0	18	0	0	0	10	176	0	0	0	19	67	0	487
08:15 AM	64	152	36	0	26	0	0	0	6	170	0	0	0	22	98	0	574
Grand Total	416	918	299	0	179	0	0	0	61	1447	0	0	0	168	696	0	4184
Apprch %	25.5	56.2	18.3	0	100	0	0	0	4	96	0	0	0	19.4	80.6	0	
Total %	9.9	21.9	7.1	0	4.3	0	0	0	1.5	34.6	0	0	0	4	16.6	0	
Cars	393	887	288	0	167	0	0	0	59	1400	0	0	0	158	678	0	4030
% Cars	94.5	96.6	96.3	0	93.3	0	0	0	96.7	96.8	0	0	0	94	97.4	0	96.3
Heavy Vehicles	23	31	11	0	12	0	0	0	2	47	0	0	0	10	18	0	154
% Heavy Vehicles	5.5	3.4	3.7	0	6.7	0	0	0	3.3	3.2	0	0	0	6	2.6	0	3.7

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	48	92	40	0	180	20	0	0	0	20	**10**	**182**	0	0	**192**	0	28	81	0	109	501
7:15:00 AM	54	**153**																**95**			
7:30:00 AM	**75**	144	47	0	**266**	**25**	**0**	**0**	**0**	**25**	**4**	**182**	**0**	**0**	**186**	**0**	**29**	91	0	**120**	**597**
7:45:00 AM	54	121	**48**	0	223	**30**	0	0	0	**30**	10	178	0	0	188	0	20	95	0	115	556
Total Volume	231	510	181	0	922	100	0	0	0	100	29	715	0	0	744	0	95	362	0	457	2223
% App. Total	25.1	55.3	19.6	0		100	0	0	0		3.9	96.1	0	0		0	20.8	79.2	0		
PHF	.770	.833	.943	.000	.867	.833	.000	.000	.000	.833	.725	.982	.000	.000	.969	.000	.819	.953	.000	.952	.931
Cars	220	489	176	0	885	92	0	0	0	92	28	690	0	0	718	0	91	357	0	448	2143
% Cars	95.2	95.9	97.2	0	96.0	92.0	0	0	0	92.0	96.6	96.5	0	0	96.5	0	95.8	98.6	0	98.0	96.4
Heavy Vehicles	11	21	5	0	37	8	0	0	0	8	1	25	0	0	26	0	4	5	0	9	80
% Heavy Vehicles	4.8	4.1	2.8	0	4.0	8.0	0	0	0	8.0	3.4	3.5	0	0	3.5	0	4.2	1.4	0	2.0	3.6

N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 C
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
06:30 AM	32	65	22	0	17	0	0	0	11	182	0	0	0	15	87	0	431
06:45 AM	36	75	20	0	18	0	0	0	5	194	0	0	0	17	74	0	439
Total	68	140	42	0	35	0	0	0	16	376	0	0	0	32	161	0	870
07:00 AM	46	86	39	0	19	0	0	0	10	177	0	0	0	24	79	0	480
07:15 AM	50	144	45	0	25	0	0	0	4	166	0	0	0	18	93	0	545
07:30 AM	73	140	46	0	22	0	0	0	4	177	0	0	0	29	91	0	582
07:45 AM	51	119	46	0	26	0	0	0	10	170	0	0	0	20	94	0	536
Total	220	489	176	0	92	0	0	0	28	690	0	0	0	91	357	0	2143
08:00 AM	46	109	36	0	16	0	0	0	9	172	0	0	0	16	64	0	468
08:15 AM	59	149	34	0	24	0	0	0	6	162	0	0	0	19	96	0	549
Grand Total	393	887	288	0	167	0	0	0	59	1400	0	0	0	158	678	0	4030
Apprch %	25.1	56.6	18.4	0	100	0	0	0	4	96	0	0	0	18.9	81.1	0	
Total %	9.8	22	7.1	0	4.1	0	0	0	1.5	34.7	0	0	0	3.9	16.8	0	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	46	86	39	0	171	19	0	0	0	19	**10**	**177**	0	0	**187**	0	24	79	0	103	480
7:15:00 AM	50	**144**																			
7:30:00 AM	**73**	140	**46**	0	**259**	**22**	**0**	**0**	**0**	**22**	**4**	**177**	**0**	**0**	**181**	**0**	**29**	91	0	**120**	**582**
7:45:00 AM	51	119	46	0	216	**26**	0	0	0	**26**	10	170	0	0	180	0	20	**94**			
Total Volume	220	489	176	0	885	92	0	0	0	92	28	690	0	0	718	0	91	357	0	448	2143
% App. Total	24.9	55.3	19.9	0		100	0	0	0		3.9	96.1	0	0		0	20.3	79.7	0		
PHF	.753	.849	.957	.000	.854	.885	.000	.000	.000	.885	.700	.975	.000	.000	.960	.000	.784	.949	.000	.933	.921

N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 C
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
06:30 AM	1	3	2	0	0	0	0	0	0	3	0	0	0	0	2	0	11
06:45 AM	1	3	2	0	0	0	0	0	0	7	0	0	0	0	6	0	19
Total	2	6	4	0	0	0	0	0	0	10	0	0	0	0	8	0	30
07:00 AM	2	6	1	0	1	0	0	0	0	5	0	0	0	4	2	0	21
07:15 AM	4	9	1	0	0	0	0	0	1	7	0	0	0	0	2	0	24
07:30 AM	2	4	1	0	3	0	0	0	0	5	0	0	0	0	0	0	15
07:45 AM	3	2	2	0	4	0	0	0	0	8	0	0	0	0	1	0	20
Total	11	21	5	0	8	0	0	0	1	25	0	0	0	4	5	0	80
08:00 AM	5	1	0	0	2	0	0	0	1	4	0	0	0	3	3	0	19
08:15 AM	5	3	2	0	2	0	0	0	0	8	0	0	0	3	2	0	25
Grand Total	23	31	11	0	12	0	0	0	2	47	0	0	0	10	18	0	154
Apprch %	35.4	47.7	16.9	0	100	0	0	0	4.1	95.9	0	0	0	35.7	64.3	0	
Total %	14.9	20.1	7.1	0	7.8	0	0	0	1.3	30.5	0	0	0	6.5	11.7	0	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:00:00 AM																					
7:00:00 AM	2	6	1	0	9	1	0	0	0	1	0	5	0	0	5	0	**4**	**2**	**0**	**6**	21
7:15:00 AM	**4**	**9**			**14**						**1**	7	0	0	**8**	0	0	2	0	2	**24**
7:30:00 AM	2	4	1	0	7	3	0	0	0	3	0	5	0	0	5	0	0	0	0	0	15
7:45:00 AM	3	2	**2**	0	7	**4**	0	0	0	**4**	0	**8**	0	0	8	0	0	1	0	1	20
Total Volume	11	21	5	0	37	8	0	0	0	8	1	25	0	0	26	0	4	5	0	9	80
% App. Total	29.7	56.8	13.5	0		100	0	0	0		3.8	96.2	0	0		0	44.4	55.6	0		
PHF	.688	.583	.625	.000	.661	.500	.000	.000	.000	.500	.250	.781	.000	.000	.813	.000	.250	.625	.000	.375	.833

PRECISION
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N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 C
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	Peds	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	6
06:45 AM	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0	6	12
Total	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	10	18
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7	8
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9
07:30 AM	0	0	0	0	0	0	0	2	0	0	0	5	0	0	0	11	18
07:45 AM	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	1	4
Total	0	0	1	0	0	0	0	5	0	0	0	5	0	0	0	28	39
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	4
Grand Total	0	0	1	0	0	0	0	9	0	1	0	10	0	0	0	40	61
Apprch %	0	0	100	0	0	0	0	100	0	9.1	0	90.9	0	0	0	100	
Total %	0	0	1.6	0	0	0	0	14.8	0	1.6	0	16.4	0	0	0	65.6	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	Peds	App. Total	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	4	4	0	0	0	6	6	12
7:00:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	7	7	8
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	9
7:30:00 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	**5**	**5**	0	0	0	**11**	**11**	**18**
Total Volume	0	0	0	0	0	0	0	0	5	5	0	0	0	9	9	0	0	0	33	33	47
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.625	.625	.000	.000	.000	.450	.450	.000	.000	.000	.750	.750	.653

N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

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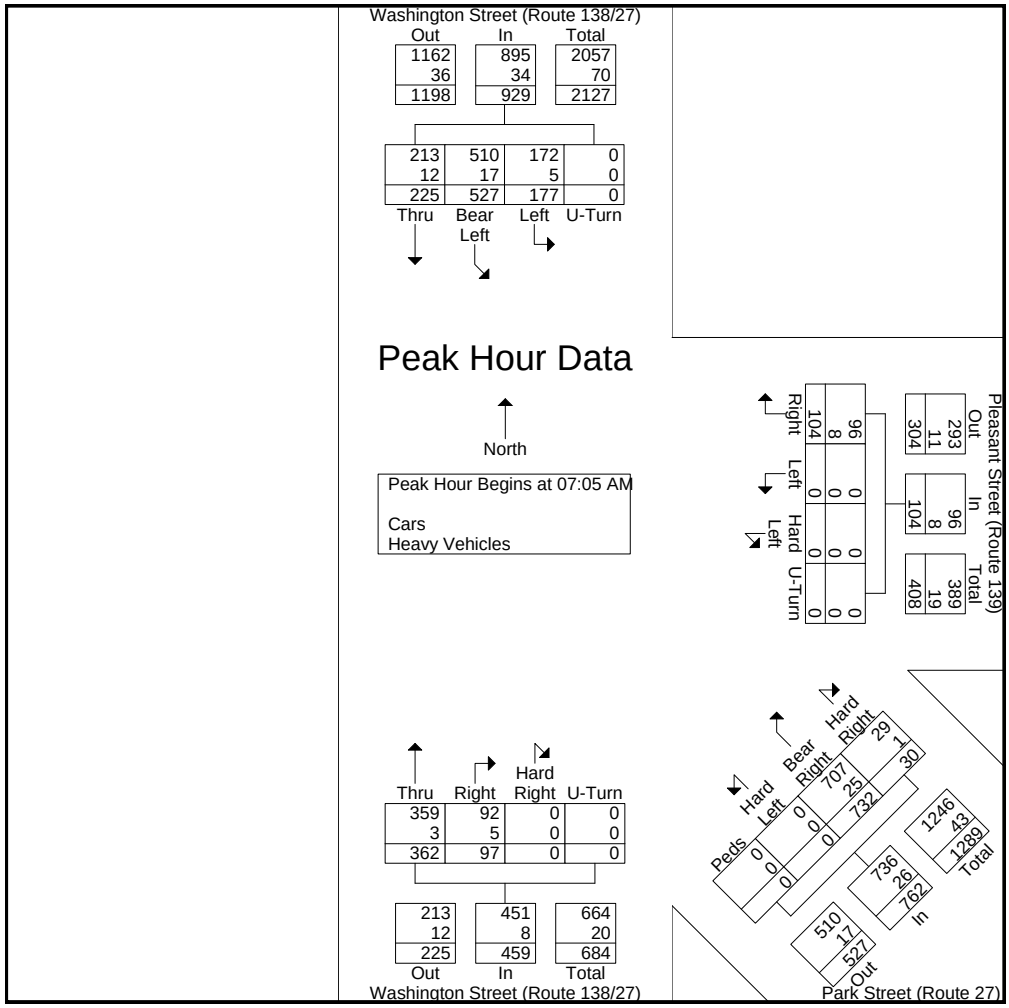
	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:05 AM																					
07:05 AM	16	32	13	0	61	7	0	0	0	7	2	**70**	0	0	72	0	7	32	0	39	179
07:10 AM	14	34	11	0	59	9	0	0	0	9	**6**	61	0	0	67	0	**17**	29	0	**46**	181
07:15 AM	18	46	12	0	76	8	0	0	0	8	2	54	0	0	56	0	5	**40**			
07:20 AM	**17**	**48**	**14**	**0**	**79**	**9**	**0**	**0**	**0**	**9**	**1**	**54**	**0**	**0**	**55**	**0**	**7**	**20**	**0**	**27**	**170**
07:25 AM	**19**	**59**	**20**	**0**	**98**	**8**	**0**	**0**	**0**	**8**	**2**	**65**	**0**	**0**	**67**	**0**	**6**	**35**	**0**	**41**	**214**
07:30 AM	22	53	12	0	87	6	0	0	0	6	0	57	0	0	57	0	10	33	0	43	193
07:35 AM	22	49	13	0	84	13	0	0	0	13	1	55	0	0	56	0	14	26	0	40	193
07:40 AM	**31**	42	**22**	0	95	6	0	0	0	6	3	70	0	0	**73**	0	5	32	0	37	211
07:45 AM	26	49	10	0	85	6	0	0	0	6	3	64	0	0	67	0	5	32	0	37	195
07:50 AM	12	33	21	0	66	7	0	0	0	7	3	63	0	0	66	0	7	30	0	37	176
07:55 AM	16	39	17	0	72	**17**	0	0	0	**17**	4	51	0	0	55	0	8	33	0	41	185
08:00 AM	12	43	12	0	67	8	0	0	0	8	3	68	0	0	71	0	6	20	0	26	172
Total Volume	225	527	177	0	929	104	0	0	0	104	30	732	0	0	762	0	97	362	0	459	2254
% App. Total	24.2	56.7	19.1	0		100	0	0	0		3.9	96.1	0	0		0	21.1	78.9	0		
PHF	.605	.744	.670	.000	.790	.510	.000	.000	.000	.510	.417	.871	.000	.000	.870	.000	.475	.754	.000	.832	.878
Cars	213	510	172	0	895	96	0	0	0	96	29	707	0	0	736	0	92	359	0	451	2178
% Cars	94.7	96.8	97.2	0	96.3	92.3	0	0	0	92.3	96.7	96.6	0	0	96.6	0	94.8	99.2	0	98.3	96.6
Heavy Vehicles	12	17	5	0	34	8	0	0	0	8	1	25	0	0	26	0	5	3	0	8	76
% Heavy Vehicles	5.3	3.2	2.8	0	3.7	7.7	0	0	0	7.7	3.3	3.4	0	0	3.4	0	5.2	0.8	0	1.7	3.4



N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 CC
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
04:40 PM	112	121	32	0	41	0	0	0	6	141	0	0	0	15	59	0	527
04:55 PM	122	163	30	0	44	0	0	0	5	132	0	0	0	23	56	0	575
05:10 PM	137	155	40	0	36	0	0	0	12	126	0	0	0	25	54	0	585
05:25 PM	139	148	33	0	54	0	0	0	7	125	0	0	1	21	78	0	606
05:40 PM	126	156	34	0	44	0	0	0	9	157	0	0	0	22	61	0	609
05:55 PM	112	155	23	0	38	0	0	0	9	123	0	0	0	20	67	0	547
06:10 PM	102	182	40	0	31	0	0	0	5	125	0	0	0	17	75	0	577
06:25 PM	126	139	18	0	36	0	0	0	5	94	0	0	0	20	52	0	490
Grand Total	976	1219	250	0	324	0	0	0	58	1023	0	0	1	163	502	0	4516
Apprch %	39.9	49.9	10.2	0	100	0	0	0	5.4	94.6	0	0	0.2	24.5	75.4	0	
Total %	21.6	27	5.5	0	7.2	0	0	0	1.3	22.7	0	0	0	3.6	11.1	0	
Cars	961	1194	246	0	320	0	0	0	56	1003	0	0	1	159	489	0	4429
% Cars	98.5	97.9	98.4	0	98.8	0	0	0	96.6	98	0	0	100	97.5	97.4	0	98.1
Heavy Vehicles	15	25	4	0	4	0	0	0	2	20	0	0	0	4	13	0	87
% Heavy Vehicles	1.5	2.1	1.6	0	1.2	0	0	0	3.4	2	0	0	0	2.5	2.6	0	1.9

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	122	**163**	**30**	**0**	**315**	**44**	**0**	**0**	**0**	**44**	**5**	**132**	**0**	**0**	**137**	**0**	**23**	**56**	**0**	**79**	**575**
5:10:00 PM	137	155	**40**	0	**332**	**36**	**0**	**0**	**0**	**36**	**12**	126	0	0	138	0	**25**	54	0	79	585
5:25:00 PM	**139**	148	33	0	320	**54**	0	0	0	**54**	7	125	0	0	132	**1**		**78**		**100**	606
5:40:00 PM	126	156	34	0	316	44	0	0	0	44	9	**157**	0	0	**166**	0	22	61	0	83	**609**
Total Volume	524	622	137	0	1283	178	0	0	0	178	33	540	0	0	573	1	91	249	0	341	2375
% App. Total	40.8	48.5	10.7	0		100	0	0	0		5.8	94.2	0	0		0.3	26.7	73	0		
PHF	.942	.954	.856	.000	.966	.824	.000	.000	.000	.824	.688	.860	.000	.000	.863	.250	.910	.798	.000	.853	.975
Cars	515	610	135	0	1260	175	0	0	0	175	32	530	0	0	562	1	89	243	0	333	2330
% Cars	98.3	98.1	98.5	0	98.2	98.3	0	0	0	98.3	97.0	98.1	0	0	98.1	100	97.8	97.6	0	97.7	98.1
Heavy Vehicles	9	12	2	0	23	3	0	0	0	3	1	10	0	0	11	0	2	6	0	8	45
% Heavy Vehicles	1.7	1.9	1.5	0	1.8	1.7	0	0	0	1.7	3.0	1.9	0	0	1.9	0	2.2	2.4	0	2.3	1.9

N/S: Washington Street (Route 138/27)
E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Page No : 1

Groups Printed- Cars

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
04:40 PM	109	116	31	0	40	0	0	0	6	140	0	0	0	13	58	0	513
04:55 PM	120	160	29	0	44	0	0	0	5	128	0	0	0	23	55	0	564
05:10 PM	134	147	39	0	34	0	0	0	12	122	0	0	0	24	53	0	565
05:25 PM	139	147	33	0	54	0	0	0	6	123	0	0	1	20	75	0	598
05:40 PM	122	156	34	0	43	0	0	0	9	157	0	0	0	22	60	0	603
05:55 PM	111	153	22	0	38	0	0	0	8	122	0	0	0	20	63	0	537
06:10 PM	102	177	40	0	31	0	0	0	5	118	0	0	0	17	74	0	564
06:25 PM	124	138	18	0	36	0	0	0	5	93	0	0	0	20	51	0	485
Grand Total	961	1194	246	0	320	0	0	0	56	1003	0	0	1	159	489	0	4429
Apprch %	40	49.7	10.2	0	100	0	0	0	5.3	94.7	0	0	0.2	24.5	75.3	0	
Total %	21.7	27	5.6	0	7.2	0	0	0	1.3	22.6	0	0	0	3.6	11	0	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	120	**160**	**29**	**0**	**309**	**44**	**0**	**0**	**0**	**44**	**5**	**128**	**0**	**0**	**133**	**0**	**23**	**55**	**0**	**78**	**564**
5:10:00 PM	134	147	**39**	0	**320**	**34**	**0**	**0**	**0**	**34**	**12**	122	0	0	134	0	**24**	53	0	77	565
5:25:00 PM	**139**	147	33	0	319	**54**	0	0	0	**54**	6	123	0	0	129	**1**		**75**		**96**	598
5:40:00 PM	122	156	34	0	312	43	0	0	0	43	9	**157**	0	0	**166**	0	22	60	0	82	**603**
Total Volume	515	610	135	0	1260	175	0	0	0	175	32	530	0	0	562	1	89	243	0	333	2330
% App. Total	40.9	48.4	10.7	0		100	0	0	0		5.7	94.3	0	0		0.3	26.7	73	0		
PHF	.926	.953	.865	.000	.984	.810	.000	.000	.000	.810	.667	.844	.000	.000	.846	.250	.927	.810	.000	.867	.966

N/S: Washington Street (Route 138/27)
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City, State: Stoughton, MA
Client: VHB/ E. Chan

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Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	U-Turn	Int. Total
04:40 PM	3	5	1	0	1	0	0	0	0	1	0	0	0	2	1	0	14
04:55 PM	2	3	1	0	0	0	0	0	0	4	0	0	0	0	1	0	11
05:10 PM	3	8	1	0	2	0	0	0	0	4	0	0	0	1	1	0	20
05:25 PM	0	1	0	0	0	0	0	0	1	2	0	0	0	1	3	0	8
05:40 PM	4	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	6
05:55 PM	1	2	1	0	0	0	0	0	1	1	0	0	0	0	4	0	10
06:10 PM	0	5	0	0	0	0	0	0	0	7	0	0	0	0	1	0	13
06:25 PM	2	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	5
Grand Total	15	25	4	0	4	0	0	0	2	20	0	0	0	4	13	0	87
Apprch %	34.1	56.8	9.1	0	100	0	0	0	9.1	90.9	0	0	0	23.5	76.5	0	
Total %	17.2	28.7	4.6	0	4.6	0	0	0	2.3	23	0	0	0	4.6	14.9	0	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	**3**	5	**1**	0	9	1	0	0	0	1	0	1	0	0	1	0	**2**	1	0	3	14
4:55:00 PM	2	3	1	0	6	0	0	0	0	0	0	**4**	0	0	**4**	0	0	1	0	1	11
5:10:00 PM	3	**8**			**12**	**2**	0	0	0	**2**	0	4	0	0	4	0	1	1	0	2	**20**
5:25:00 PM	0	1	0	0	1	0	0	0	0	0	**1**	2	0	0	3	0	1	**3**		**4**	8
Total Volume	8	17	3	0	28	3	0	0	0	3	1	11	0	0	12	0	4	6	0	10	53
% App. Total	28.6	60.7	10.7	0		100	0	0	0		8.3	91.7	0	0		0	40	60	0		
PHF	.667	.531	.750	.000	.583	.375	.000	.000	.000	.375	.250	.688	.000	.000	.750	.000	.500	.500	.000	.625	.663

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E/SE:Pleasant St (Rt 139/Park St (Rt 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 CC
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138/27) From North				Pleasant Street (Route 139) From East				Park Street (Route 27) From Southeast				Washington Street (Route 138/27) From South				
Start Time	Thru	Bear Left	Left	Peds	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	Int. Total
04:40 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4
04:55 PM	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	4	7
05:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:25 PM	0	0	0	0	0	0	0	2	0	0	0	7	0	0	0	8	17
05:40 PM	0	0	0	0	0	0	0	6	0	0	0	1	0	0	0	1	8
05:55 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	4	10
06:10 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
06:25 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	4	7
Grand Total	0	0	1	0	0	0	0	14	0	0	0	15	0	0	0	27	57
Apprch %	0	0	100	0	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	1.8	0	0	0	0	24.6	0	0	0	26.3	0	0	0	47.4	

	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	Peds	App. Total	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 5:10:00 PM																					
5:10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
5:25:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	**7**	**7**	0	0	0	**8**	**8**	**17**
5:40:00 PM	0	0	0	0	0	0	0	0	**6**	**6**	0	0	0	1	1	0	0	0	1	1	8
5:55:00 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	3	3	0	0	0	4	4	10
Total Volume	0	0	0	0	0	0	0	0	11	11	0	0	0	11	11	0	0	0	15	15	37
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.458	.458	.000	.000	.000	.393	.393	.000	.000	.000	.469	.469	.544

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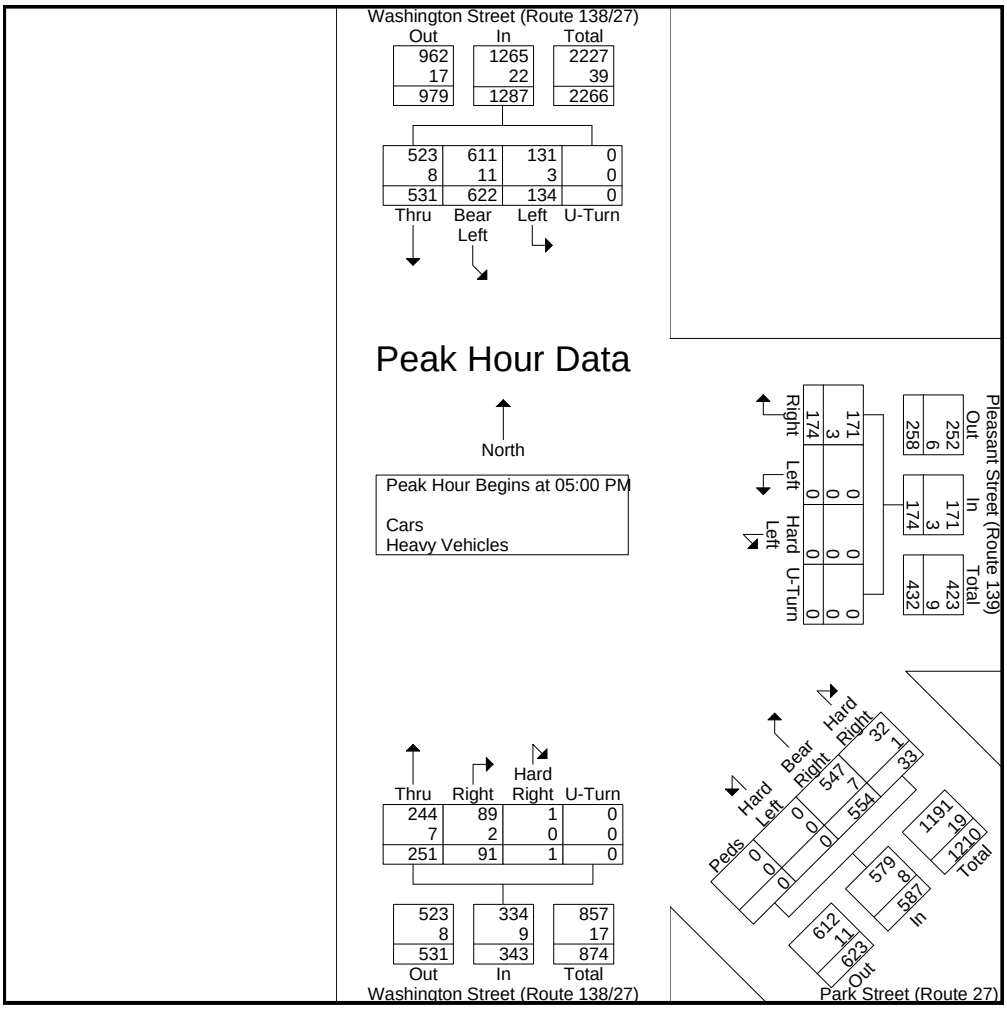
	Washington Street (Route 138/27) From North					Pleasant Street (Route 139) From East					Park Street (Route 27) From Southeast					Washington Street (Route 138/27) From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	45	54	9	0	108	11	0	0	0	11	1	52	0	0	53	0	9	21	0	30	202
05:05 PM	35	58	9	0	102	19	0	0	0	19	2	42	0	0	44	0	6	19	0	25	190
05:10 PM	44	49	13	0	106	11	0	0	0	11	5	42	0	0	47	0	**14**	25	0	39	203
05:15 PM	46	45	**15**	0	106	14	0	0	0	14	1	52	0	0	53	0	7	9	0	16	189
05:20 PM	47	**61**			**120**						**6**	32	0	0	38	0	4	20	0	24	193
05:25 PM	43	47	13	0	103	12	0	0	0	12	3	44	0	0	47	**1**		**32**		**44**	206
05:30 PM	41	50	6	0	97	20	0	0	0	20	1	45	0	0	46	0	5	24	0	29	192
05:35 PM	**55**	51	14	0	120	**22**	0	0	0	**22**	3	36	0	0	39	0	5	22	0	27	208
05:40 PM	55	53	12	0	120	14	0	0	0	14	4	**57**	0	0	**61**	0	5	15	0	20	**215**
05:45 PM	37	48	10	0	95	19	0	0	0	19	3	54	0	0	57	0	9	19	0	28	199
05:50 PM	34	55	12	0	101	11	0	0	0	11	2	46	0	0	48	0	8	27	0	35	195
05:55 PM	49	51	9	0	109	10	0	0	0	10	2	52	0	0	54	0	8	18	0	26	199
Total Volume	531	622	134	0	1287	174	0	0	0	174	33	554	0	0	587	1	91	251	0	343	2391
% App. Total	41.3	48.3	10.4	0		100	0	0	0		5.6	94.4	0	0		0.3	26.5	73.2	0		
PHF	.805	.850	.744	.000	.894	.659	.000	.000	.000	.659	.458	.810	.000	.000	.802	.083	.542	.654	.000	.650	.927
Cars	523	611	131	0	1265	171	0	0	0	171	32	547	0	0	579	1	89	244	0	334	2349
% Cars	98.5	98.2	97.8	0	98.3	98.3	0	0	0	98.3	97.0	98.7	0	0	98.6	100	97.8	97.2	0	97.4	98.2
Heavy Vehicles	8	11	3	0	22	3	0	0	0	3	1	7	0	0	8	0	2	7	0	9	42
% Heavy Vehicles	1.5	1.8	2.2	0	1.7	1.7	0	0	0	1.7	3.0	1.3	0	0	1.4	0	2.2	2.8	0	2.6	1.8



N/S: Washington Street (Route 138/27)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	7	39	0	0	1	4	0	0	2	129	15	0	1	1	7	0	206
06:45 AM	9	45	1	0	1	7	1	0	5	122	25	0	7	8	2	0	233
Total	16	84	1	0	2	11	1	0	7	251	40	0	8	9	9	0	439
07:00 AM	10	56	1	0	1	9	3	0	6	145	30	0	6	7	3	0	277
07:15 AM	11	64	0	0	2	11	3	0	7	132	30	0	13	9	3	0	285
07:30 AM	12	78	3	0	3	6	0	0	9	162	49	0	11	15	8	0	356
07:45 AM	15	76	2	0	0	7	1	0	14	113	22	0	6	7	9	0	272
Total	48	274	6	0	6	33	7	0	36	552	131	0	36	38	23	0	1190
08:00 AM	11	71	1	0	4	10	0	0	10	135	26	0	18	15	7	0	308
08:15 AM	17	77	1	0	1	12	1	0	7	122	34	0	9	18	12	0	311
Grand Total	92	506	9	0	13	66	9	0	60	1060	231	0	71	80	51	0	2248
Apprch %	15.2	83.4	1.5	0	14.8	75	10.2	0	4.4	78.5	17.1	0	35.1	39.6	25.2	0	
Total %	4.1	22.5	0.4	0	0.6	2.9	0.4	0	2.7	47.2	10.3	0	3.2	3.6	2.3	0	
Cars	89	474	9	0	13	65	9	0	59	1027	225	0	69	78	51	0	2168
% Cars	96.7	93.7	100	0	100	98.5	100	0	98.3	96.9	97.4	0	97.2	97.5	100	0	96.4
Heavy Vehicles	3	32	0	0	0	1	0	0	1	33	6	0	2	2	0	0	80
% Heavy Vehicles	3.3	6.3	0	0	0	1.5	0	0	1.7	3.1	2.6	0	2.8	2.5	0	0	3.6

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:30:00 AM																					
7:30:00 AM	12	**78**	**3**	0	93	3	6	0	0	9	9	**162**	**49**	0	**220**	11	15	8	0	34	**356**
7:45:00 AM	15	76	2	0	93	0	7	**1**	0	8	**14**	113	22	0	149	6	7	9	0	22	272
8:00:00 AM	11	71	1	0	83	**4**	10	0	0	**14**	10	135	26	0	171	**18**				**40**	308
8:15:00 AM	**17**	77	1	0	**95**		**12**										**18**	**12**			
Total Volume	55	302	7	0	364	8	35	2	0	45	40	532	131	0	703	44	55	36	0	135	1247
% App. Total	15.1	83	1.9	0		17.8	77.8	4.4	0		5.7	75.7	18.6	0		32.6	40.7	26.7	0		
PHF	.809	.968	.583	.000	.958	.500	.729	.500	.000	.804	.714	.821	.668	.000	.799	.611	.764	.750	.000	.844	.876
Cars	53	281	7	0	341	8	34	2	0	44	40	517	128	0	685	43	55	36	0	134	1204
% Cars	96.4	93.0	100	0	93.7	100	97.1	100	0	97.8	100	97.2	97.7	0	97.4	97.7	100	100	0	99.3	96.6
Heavy Vehicles	2	21	0	0	23	0	1	0	0	1	0	15	3	0	18	1	0	0	0	1	43
% Heavy Vehicles	3.6	7.0	0	0	6.3	0	2.9	0	0	2.2	0	2.8	2.3	0	2.6	2.3	0	0	0	0.7	3.4

N/S: Washington Street (Route 138/27)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	7	38	0	0	1	4	0	0	2	128	15	0	1	1	7	0	204
06:45 AM	9	42	1	0	1	7	1	0	5	117	24	0	6	8	2	0	223
Total	16	80	1	0	2	11	1	0	7	245	39	0	7	9	9	0	427
07:00 AM	10	55	1	0	1	9	3	0	5	136	30	0	6	7	3	0	266
07:15 AM	10	58	0	0	2	11	3	0	7	129	28	0	13	7	3	0	271
07:30 AM	12	74	3	0	3	6	0	0	9	161	48	0	10	15	8	0	349
07:45 AM	15	72	2	0	0	6	1	0	14	113	22	0	6	7	9	0	267
Total	47	259	6	0	6	32	7	0	35	539	128	0	35	36	23	0	1153
08:00 AM	9	65	1	0	4	10	0	0	10	126	25	0	18	15	7	0	290
08:15 AM	17	70	1	0	1	12	1	0	7	117	33	0	9	18	12	0	298
Grand Total	89	474	9	0	13	65	9	0	59	1027	225	0	69	78	51	0	2168
Apprch %	15.6	82.9	1.6	0	14.9	74.7	10.3	0	4.5	78.3	17.2	0	34.8	39.4	25.8	0	
Total %	4.1	21.9	0.4	0	0.6	3	0.4	0	2.7	47.4	10.4	0	3.2	3.6	2.4	0	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:30:00 AM																					
7:30:00 AM	12	**74**	**3**	0	**89**	**3**	**6**	**0**	**0**	**9**	**9**	**161**	**48**	0	**218**	10	15	8	0	33	**349**
7:45:00 AM	15	72	2	0	89	0	6	**1**	0	7	**14**	113	22	0	149	6	7	9	0	22	267
8:00:00 AM	9	65	1	0	75	**4**	10	0	0	**14**	10	126	25	0	161	**18**				**40**	290
8:15:00 AM	**17**	70	1	0	88	1	**12**										**18**	**12**			
Total Volume	53	281	7	0	341	8	34	2	0	44	40	517	128	0	685	43	55	36	0	134	1204
% App. Total	15.5	82.4	2.1	0		18.2	77.3	4.5	0		5.8	75.5	18.7	0		32.1	41	26.9	0		
PHF	.779	.949	.583	.000	.958	.500	.708	.500	.000	.786	.714	.803	.667	.000	.786	.597	.764	.750	.000	.838	.862

N/S: Washington Street (Route 138/27)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 D
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
06:45 AM	0	3	0	0	0	0	0	0	0	5	1	0	1	0	0	0	10
Total	0	4	0	0	0	0	0	0	0	6	1	0	1	0	0	0	12
07:00 AM	0	1	0	0	0	0	0	0	1	9	0	0	0	0	0	0	11
07:15 AM	1	6	0	0	0	0	0	0	0	3	2	0	0	2	0	0	14
07:30 AM	0	4	0	0	0	0	0	0	0	1	1	0	1	0	0	0	7
07:45 AM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5
Total	1	15	0	0	0	1	0	0	1	13	3	0	1	2	0	0	37
08:00 AM	2	6	0	0	0	0	0	0	0	9	1	0	0	0	0	0	18
08:15 AM	0	7	0	0	0	0	0	0	0	5	1	0	0	0	0	0	13
Grand Total	3	32	0	0	0	1	0	0	1	33	6	0	2	2	0	0	80
Apprch %	8.6	91.4	0	0	0	100	0	0	2.5	82.5	15	0	50	50	0	0	
Total %	3.8	40	0	0	0	1.2	0	0	1.2	41.2	7.5	0	2.5	2.5	0	0	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:15:00 AM																					
7:15:00 AM	1	**6**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	0	5	0	**2**	0	0	**2**	14
7:30:00 AM	0	4	0	0	4	0	0	0	0	0	0	1	1	0	2	**1**					
7:45:00 AM	0	4	0	0	4	0	**1**	**0**	**0**	**1**	0	0	0	0	0	0	0	0	0	0	5
8:00:00 AM	**2**	6	0	0	**8**							**9**	1	0	**10**	0	0	0	0	0	**18**
Total Volume	3	20	0	0	23	0	1	0	0	1	0	13	4	0	17	1	2	0	0	3	44
% App. Total	13	87	0	0		0	100	0	0		0	76.5	23.5	0		33.3	66.7	0	0		
PHF	.375	.833	.000	.000	.719	.000	.250	.000	.000	.250	.000	.361	.500	.000	.425	.250	.250	.000	.000	.375	.611

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Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:30 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	4
07:45 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
Total	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	1	9
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3
Grand Total	0	0	0	4	0	1	0	5	0	0	0	0	0	0	0	4	14
Apprch %	0	0	0	100	0	16.7	0	83.3	0	0	0	0	0	0	0	100	
Total %	0	0	0	28.6	0	7.1	0	35.7	0	0	0	0	0	0	0	28.6	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:30:00 AM																					
7:30:00 AM	0	0	0	**3**	**3**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
7:45:00 AM	0	0	0	1	1	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	3
8:00:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
8:15:00 AM	0	0	0	0	0	0	**1**												**2**	**2**	3
Total Volume	0	0	0	4	4	0	1	0	4	5	0	0	0	0	0	0	0	0	3	3	12
% App. Total	0	0	0	100		0	20	0	80		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.333	.333	.000	.250	.000	.500	.625	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.750

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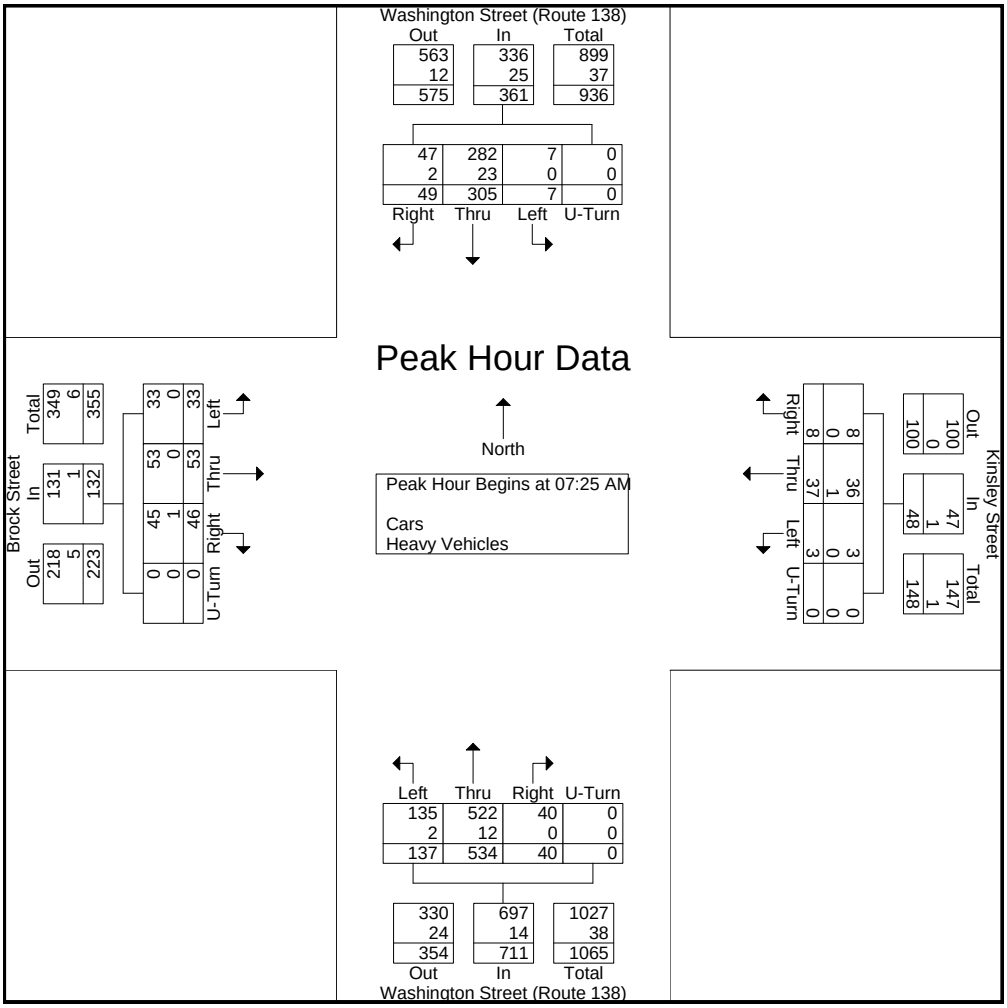
Page No : 1

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:25 AM																					
07:25 AM	2	27	0	0	29	1	6	**1**	0	**8**	1	47	15	0	63	4	4	1	0	9	109
07:30 AM	3	23	0	0	26	0	2	0	0	2	5	46	17	0	68	6	4	3	0	13	109
07:35 AM	6	21	1	0	28	1	2	0	0	3	0	57	11	0	68	4	5	3	0	12	111
07:40 AM	3	**34**	**2**	0	39	**2**	2	0	0	4	4	**59**	**21**	0	**84**	1	6	2	0	9	**136**
07:45 AM	4	34	2	0	**40**																
07:50 AM	**7**	18	0	0	25	0	1	0	0	1	4	38	8	0	50	1	4	**5**	**0**	**10**	**86**
07:55 AM	**4**	**24**	**0**	**0**	**28**	**0**	**2**	**0**	**0**	**2**	**5**	**38**	**8**	**0**	**51**	**3**	**1**	**2**	**0**	**6**	**87**
08:00 AM	**2**	**13**	**0**	**0**	**15**	**1**	**2**	**0**	**0**	**3**	**1**	**43**	**8**	**0**	**52**	**4**	**5**	**3**	**0**	**12**	**82**
08:05 AM	**3**	**26**	**0**	**0**	**29**	**2**	**1**	**0**	**0**	**3**	**2**	**40**	**9**	**0**	**51**	**10**	**5**	**3**	**0**	**18**	101
08:10 AM	6	32	1	0	39	1	**7**				**7**	52	9	0	68	4	5	1	0	10	125
08:15 AM	2	22	1	0	25	0	5	0	0	5	1	39	14	0	54	5	**7**	4	0	16	100
08:20 AM	7	31	0	0	38	0	3	1	0	4	5	38	11	0	54	2	5	4	0	11	107
Total Volume	49	305	7	0	361	8	37	3	0	48	40	534	137	0	711	46	53	33	0	132	1252
% App. Total	13.6	84.5	1.9	0		16.7	77.1	6.2	0		5.6	75.1	19.3	0		34.8	40.2	25	0		
PHF	.583	.748	.292	.000	.752	.333	.440	.250	.000	.500	.476	.754	.544	.000	.705	.383	.631	.550	.000	.611	.767
Cars	47	282	7	0	336	8	36	3	0	47	40	522	135	0	697	45	53	33	0	131	1211
% Cars	95.9	92.5	100	0	93.1	100	97.3	100	0	97.9	100	97.8	98.5	0	98.0	97.8	100	100	0	99.2	96.7
Heavy Vehicles	2	23	0	0	25	0	1	0	0	1	0	12	2	0	14	1	0	0	0	1	41
% Heavy Vehicles	4.1	7.5	0	0	6.9	0	2.7	0	0	2.1	0	2.2	1.5	0	2.0	2.2	0	0	0	0.8	3.3



N/S: Washington Street (Route 138)
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Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	12	162	3	0	1	11	3	0	6	95	19	0	13	8	7	0	340
04:55 PM	11	179	4	0	1	13	6	0	7	94	16	0	16	14	8	0	369
05:10 PM	6	168	2	0	2	16	0	0	2	100	11	0	15	21	5	0	348
05:25 PM	17	204	6	0	1	8	4	0	6	99	17	0	22	9	3	0	396
05:40 PM	13	166	0	0	2	9	7	0	4	85	22	0	15	13	4	0	340
05:55 PM	13	153	0	0	0	5	3	0	8	109	9	0	17	9	7	0	333
06:10 PM	4	136	1	0	1	9	7	0	2	114	9	0	21	8	7	0	319
06:25 PM	8	159	2	0	2	6	2	0	6	77	13	0	12	10	5	0	302
Grand Total	84	1327	18	0	10	77	32	0	41	773	116	0	131	92	46	0	2747
Apprch %	5.9	92.9	1.3	0	8.4	64.7	26.9	0	4.4	83.1	12.5	0	48.7	34.2	17.1	0	
Total %	3.1	48.3	0.7	0	0.4	2.8	1.2	0	1.5	28.1	4.2	0	4.8	3.3	1.7	0	
Cars	84	1309	17	0	10	77	32	0	41	756	114	0	128	91	42	0	2701
% Cars	100	98.6	94.4	0	100	100	100	0	100	97.8	98.3	0	97.7	98.9	91.3	0	98.3
Heavy Vehicles	0	18	1	0	0	0	0	0	0	17	2	0	3	1	4	0	46
% Heavy Vehicles	0	1.4	5.6	0	0	0	0	0	0	2.2	1.7	0	2.3	1.1	8.7	0	1.7

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	12	162	3	0	177	1	11	3	0	15	6	95	**19**	0	120	13	8	7	0	28	340
4:55:00 PM	11	179	4	0	194	1	13	**6**		**20**	**7**							**8**			
5:10:00 PM	6	168	2	0	176	**2**	**16**	**0**	**0**	**18**	**2**	**100**	**11**	**0**	**113**	**15**	**21**	5	0	**41**	348
5:25:00 PM	**17**	**204**	**6**		**227**	1	8	4	0	13	6	99	17	0	**122**	**22**					**396**
Total Volume	46	713	15	0	774	5	48	13	0	66	21	388	63	0	472	66	52	23	0	141	1453
% App. Total	5.9	92.1	1.9	0		7.6	72.7	19.7	0		4.4	82.2	13.3	0		46.8	36.9	16.3	0		
PHF	.676	.874	.625	.000	.852	.625	.750	.542	.000	.825	.750	.970	.829	.000	.967	.750	.619	.719	.000	.860	.917
Cars	46	702	14	0	762	5	48	13	0	66	21	378	61	0	460	66	52	21	0	139	1427
% Cars	100	98.5	93.3	0	98.4	100	100	100	0	100	100	97.4	96.8	0	97.5	100	100	91.3	0	98.6	98.2
Heavy Vehicles	0	11	1	0	12	0	0	0	0	0	0	10	2	0	12	0	0	2	0	2	26
% Heavy Vehicles	0	1.5	6.7	0	1.6	0	0	0	0	0	0	2.6	3.2	0	2.5	0	0	8.7	0	1.4	1.8

N/S: Washington Street (Route 138)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 DD
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	12	161	3	0	1	11	3	0	6	92	19	0	13	8	6	0	335
04:55 PM	11	172	4	0	1	13	6	0	7	92	15	0	16	14	7	0	358
05:10 PM	6	165	2	0	2	16	0	0	2	97	11	0	15	21	5	0	342
05:25 PM	17	204	5	0	1	8	4	0	6	97	16	0	22	9	3	0	392
05:40 PM	13	162	0	0	2	9	7	0	4	84	22	0	15	13	2	0	333
05:55 PM	13	152	0	0	0	5	3	0	8	105	9	0	16	9	7	0	327
06:10 PM	4	136	1	0	1	9	7	0	2	112	9	0	20	7	7	0	315
06:25 PM	8	157	2	0	2	6	2	0	6	77	13	0	11	10	5	0	299
Grand Total	84	1309	17	0	10	77	32	0	41	756	114	0	128	91	42	0	2701
Apprch %	6	92.8	1.2	0	8.4	64.7	26.9	0	4.5	83	12.5	0	49	34.9	16.1	0	
Total %	3.1	48.5	0.6	0	0.4	2.9	1.2	0	1.5	28	4.2	0	4.7	3.4	1.6	0	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	12	161	3	0	176	1	11	3	0	15	6	92	**19**	0	117	13	8	6	0	27	335
4:55:00 PM	11	172	4	0	187	1	13	**6**		**20**	**7**							**7**			
5:10:00 PM	6	165	2	0	173	**2**	**16**	**0**	**0**	**18**	**2**	**97**	**11**	**0**	**110**	**15**	**21**	5	0	**41**	342
5:25:00 PM	**17**	**204**	**5**		**226**	1	8	4	0	13	6	97	16	0	**119**	**22**					**392**
Total Volume	46	702	14	0	762	5	48	13	0	66	21	378	61	0	460	66	52	21	0	139	1427
% App. Total	6	92.1	1.8	0		7.6	72.7	19.7	0		4.6	82.2	13.3	0		47.5	37.4	15.1	0		
PHF	.676	.860	.700	.000	.843	.625	.750	.542	.000	.825	.750	.974	.803	.000	.966	.750	.619	.750	.000	.848	.910

N/S: Washington Street (Route 138)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	0	1	0	0	0	0	0	0	0	3	0	0	0	0	1	0	5
04:55 PM	0	7	0	0	0	0	0	0	0	2	1	0	0	0	1	0	11
05:10 PM	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
05:25 PM	0	0	1	0	0	0	0	0	0	2	1	0	0	0	0	0	4
05:40 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	2	0	7
05:55 PM	0	1	0	0	0	0	0	0	0	4	0	0	1	0	0	0	6
06:10 PM	0	0	0	0	0	0	0	0	0	2	0	0	1	1	0	0	4
06:25 PM	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3
Grand Total	0	18	1	0	0	0	0	0	0	17	2	0	3	1	4	0	46
Apprch %	0	94.7	5.3	0	0	0	0	0	0	89.5	10.5	0	37.5	12.5	50	0	
Total %	0	39.1	2.2	0	0	0	0	0	0	37	4.3	0	6.5	2.2	8.7	0	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	0	**7**	0	0	**7**	0	0	0	0	0	0	2	**1**	0	**3**	0	0	1	0	1	**11**
5:10:00 PM	0	3	0	0	3	0	0	0	0	0	0	**3**									
5:25:00 PM	0	0	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**4**
5:40:00 PM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	**2**	**0**	**2**	7
Total Volume	0	14	1	0	15	0	0	0	0	0	0	8	2	0	10	0	0	3	0	3	28
% App. Total	0	93.3	6.7	0		0	0	0	0		0	80	20	0		0	0	100	0		
PHF	.000	.500	.250	.000	.536	.000	.000	.000	.000	.000	.000	.667	.500	.000	.833	.000	.000	.375	.000	.375	.636

N/S: Washington Street (Route 138)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North				Kinsley Street From East				Washington Street (Route 138) From South				Brock Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:40 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:55 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
06:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
06:25 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3
Grand Total	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	8
Apprch %	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	100	
Total %	0	0	0	25	0	0	0	12.5	0	0	0	0	0	0	0	62.5	

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 5:40:00 PM																					
5:40:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55:00 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
6:10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
6:25:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	**3**
Total Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	6
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.500

N/S: Washington Street (Route 138)
E/W: Kinsley Street/ Brock Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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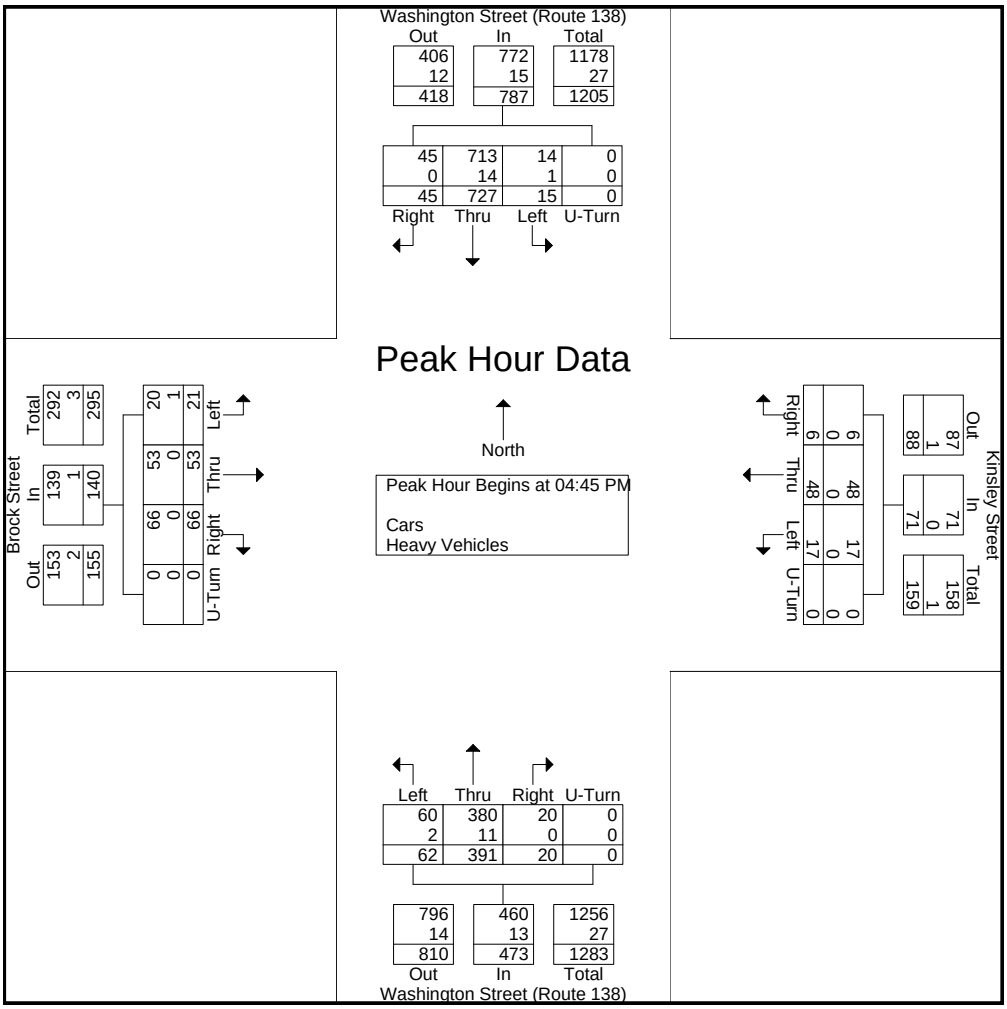
Page No : 1

	Washington Street (Route 138) From North					Kinsley Street From East					Washington Street (Route 138) From South					Brock Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	5	48	0	0	53	**1**	5	1	0	7	2	38	**9**	0	49	5	1	**4**	**0**	**10**	**119**
04:50 PM	**3**	**69**	**3**	**0**	**75**	**0**	**4**	**2**	**0**	**6**	**2**	**32**	**3**	**0**	**37**	**3**	**4**	**0**	**0**	**7**	**125**
04:55 PM	**2**	**58**	**3**	**0**	**63**	**0**	**3**	**1**	**0**	**4**	**2**	**32**	**7**	**0**	**41**	**7**	**5**	**4**	**0**	**16**	**124**
05:00 PM	**5**	**70**	**0**	**0**	**75**	**1**	**5**	**4**	**0**	**10**	**3**	**28**	**3**	**0**	**34**	**5**	**6**	**2**	**0**	**13**	**132**
05:05 PM	**4**	**51**	**1**	**0**	**56**	**0**	**5**	**1**	**0**	**6**	**2**	**34**	**6**	**0**	**42**	**4**	**3**	**2**	**0**	**9**	**113**
05:10 PM	**2**	**49**	**0**	**0**	**51**	**1**	**3**	**0**	**0**	**4**	**1**	**37**	**4**	**0**	**42**	**5**	**6**	**1**	**0**	**12**	**109**
05:15 PM	**3**	**58**	**0**	**0**	**61**	**1**	**6**	**0**	**0**	**7**	**1**	**29**	**2**	**0**	**32**	**5**	**9**	2	0	16	116
05:20 PM	1	61	2	0	64	0	**7**														
05:25 PM	**5**	**61**	**0**	**0**	**66**	**1**	**5**	**1**	**0**	**7**	**2**	**42**	**6**	**0**	**50**	6	3	0	0	9	132
05:30 PM	3	70	3	0	76	0	1	0	0	1	3	34	2	0	39	3	4	1	0	8	124
05:35 PM	**9**	**73**	3	0	**85**	0	2	3	0	5	1	23	9	0	33	**13**				**17**	**140**
05:40 PM	3	59	0	0	62	1	2	4	0	7	1	28	6	0	35	5	4	1	0	10	114
Total Volume	45	727	15	0	787	6	48	17	0	71	20	391	62	0	473	66	53	21	0	140	1471
% App. Total	5.7	92.4	1.9	0		8.5	67.6	23.9	0		4.2	82.7	13.1	0		47.1	37.9	15	0		
PHF	.417	.830	.417	.000	.772	.500	.571	.354	.000	.592	.556	.776	.574	.000	.788	.423	.491	.438	.000	.686	.876
Cars	45	713	14	0	772	6	48	17	0	71	20	380	60	0	460	66	53	20	0	139	1442
% Cars	100	98.1	93.3	0	98.1	100	100	100	0	100	100	97.2	96.8	0	97.3	100	100	95.2	0	99.3	98.0
Heavy Vehicles	0	14	1	0	15	0	0	0	0	0	0	11	2	0	13	0	0	1	0	1	29
% Heavy Vehicles	0	1.9	6.7	0	1.9	0	0	0	0	0	0	2.8	3.2	0	2.7	0	0	4.8	0	0.7	2.0



N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 E
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry street From West						Summer Street From Northwest						
	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	2	3	7	1	0	2	0	0	0	0	0	2	25	3	2	0	0	0	3	4	0	0	0	0	1	0	4	0	0	59
06:45 AM																																					
Total	0	0	1	0	0	0	0	7	4	13	1	0	2	0	0	0	0	0	4	53	16	6	1	0	0	3	12	0	1	0	3	3	0	5	0	0	135
07:00 AM	0	0	1	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	30	34	4	0	0	0	0	6	0	1	0	0	5	0	2	0	0	88
07:15 AM																																					
07:30 AM	0	0	7	0	0	0	1	2	3	8	3	0	0	0	0	0	1	0	14	34	35	4	2	0	0	0	11	1	0	0	1	9	0	0	0	0	136
07:45 AM	1	0	0	1	1	0	0	2	0	7	1	0	0	0	0	0	0	0	1	19	13	6	1	0	0	0	15	1	1	0	0	4	0	1	0	0	75
Total	1	0	9	1	1	0	1	5	6	30	4	0	0	0	0	0	1	0	16	129	123	16	3	0	0	1	39	2	3	0	1	26	0	7	0	0	425
08:00 AM	0	1	2	0	1	0	1	0	7	8	0	0	1	0	0	0	0	0	0	30	5	3	2	0	0	0	7	0	2	0	0	3	0	1	0	0	74
08:15 AM																																					
Grand Total	1	1	12	1	2	0	4	13	18	56	5	0	3	0	0	0	2	0	27	236	156	30	6	0	0	4	67	4	6	0	4	36	1	15	0	0	710
Apprch %	5.9	5.9	70.6	5.9	11.8	0	4.2	13.5	18.8	58.3	5.2	0	60	0	0	0	40	0	5.9	51.9	34.3	6.6	1.3	0	0	4.9	82.7	4.9	7.4	0	7.1	64.3	1.8	26.8	0	0	
Total %	0.1	0.1	1.7	0.1	0.3	0	0.6	1.8	2.5	7.9	0.7	0	0.4	0	0	0	0.3	0	3.8	33.2	22	4.2	0.8	0	0	0.6	9.4	0.6	0.8	0	0.6	5.1	0.1	2.1	0	0	
Cars	1	1	12	1	2	0	4	13	18	53	4	0	3	0	0	0	2	0	27	230	156	30	5	0	0	3	65	4	6	0	4	35	1	13	0	0	693
% Cars	100	100	100	100	100	0	100	100	100	94.6	80	0	100	0	0	0	100	0	100	97.5	100	100	83.3	0	0	75	97	100	100	0	100	97.2	100	86.7	0	0	97.6
Heavy Vehicles	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	6	0	0	1	0	0	1	2	0	0	0	0	1	0	2	0	0	17
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	5.4	20	0	0	0	0	0	0	0	0	2.5	0	0	16.7	0	0	25	3	0	0	0	0	2.8	0	13.3	0	0	2.4

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry street From West							Summer Street From Northwest							
	Har	Rig	Bear Right	Thru	Left	U-T	App. Total	Rig	Bear Right	Thru	Bear Left	Left	U-T	App. Total	Right	Thru	Bear Left	Left	Har	U-T	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	U-Turn	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
6:45:00 AM	0	0	1	0	0	0	1	0	**5**	**1**	**6**	**0**	**0**	12	0	0	0	0	0	0	0	2	28	13	**4**	1	0	48	0	0	8	0	**1**	**0**	**9**	**3**	2	0	1	0	0	6	76
7:00:00 AM	0	0	1	0	0	0	1	0	1	2	2	0	0	5	0	0	0	0	0	0	0	0	30	34	4	0	0	68	0	0	6	0	1	0	7	0	5	0	2	0	0	7	88
7:15:00 AM	0	0	1	0	0	0	1	0	0	1	**13**	0	0	14	0	0	0	0	0	0	0	1	**46**	**41**	2	0	0	**90**	0	**1**	7	0	1	0	9	0	8	0	**4**	**0**	**0**	**12**	126
7:30:00 AM	0	0	**7**	**0**	**0**	**0**	**7**	**1**	**2**	**3**	8	**3**	0	**17**	**0**	**0**	**0**	**0**	**1**	0	**1**	**14**	34	35	4	**2**	**0**	89	0	0	**11**	**1**	**0**	**0**	**12**	1	**9**	0	0	0	0	10	**136**
Total Volume	0	0	10	0	0	0	10	1	8	7	29	3	0	48	0	0	0	0	1	0	1	17	138	123	14	3	0	295	0	1	32	1	3	0	37	4	24	0	7	0	0	35	426
% App. Total	0	0	100	0	0	0		2.1	16.7	14.6	60.4	6.2	0		0	0	0	0	100	0		5.8	46.8	41.7	4.7	1	0		0	2.7	86.5	2.7	8.1	0		11.4	68.6	0	20	0	0		
PHF	.000	.000	.357	.000	.000	.000	.357	.250	.400	.583	.558	.250	.000	.706	.000	.000	.000	.000	.250	.000	.250	.304	.750	.750	.875	.375	.000	.819	.000	.250	.727	.250	.750	.000	.771	.333	.667	.000	.438	.000	.000	.729	.783
Cars	0	0	10	0	0	0	10	1	8	7	29	2	0	47	0	0	0	0	1	0	1	17	135	123	14	3	0	292	0	0	30	1	3	0	34	4	23	0	6	0	0	33	417
% Cars	0	0	100	0	0	0	100	100	100	100	100	66.7	0	97.9	0	0	0	0	100	0	100	100	97.8	100	100	100	0	99.0	0	0	93.8	100	100	0	91.9	100	95.8	0	85.7	0	0	94.3	97.9
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	1	2	0	0	0	3	0	1	0	1	0	0	2	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	33.3	0	2.1	0	0	0	0	0	0	0	0	0	2.2	0	0	0	0	1.0	0	100	6.3	0	0	0	8.1	0	4.2	0	14.3	0	0	5.7	2.1

Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 6:45:00 AM

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 122868 E
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry street From West						Summer Street From Northwest						
	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	2	3	7	1	0	2	0	0	0	0	0	2	24	3	2	0	0	0	3	4	0	0	0	0	1	0	4	0	0	58
06:45 AM																																					
Total	0	0	1	0	0	0	0	7	4	13	1	0	2	0	0	0	0	0	4	50	16	6	1	0	0	3	12	0	1	0	3	2	0	5	0	0	131
07:00 AM	0	0	1	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	29	34	4	0	0	0	0	6	0	1	0	0	5	0	2	0	0	87
07:15 AM																																					
07:30 AM	0	0	7	0	0	0	1	2	3	8	2	0	0	0	0	0	1	0	14	34	35	4	2	0	0	0	9	1	0	0	1	9	0	0	0	0	133
07:45 AM	1	0	0	1	1	0	0	2	0	7	1	0	0	0	0	0	0	0	1	18	13	6	1	0	0	0	15	1	1	0	0	4	0	0	0	0	73
Total	1	0	9	1	1	0	1	5	6	30	3	0	0	0	0	0	1	0	16	127	123	16	3	0	0	0	37	2	3	0	1	26	0	5	0	0	417
08:00 AM	0	1	2	0	1	0	1	0	7	6	0	0	1	0	0	0	0	0	0	30	5	3	1	0	0	0	7	0	2	0	0	3	0	1	0	0	71
08:15 AM																																					
Grand Total	1	1	12	1	2	0	4	13	18	53	4	0	3	0	0	0	2	0	27	230	156	30	5	0	0	3	65	4	6	0	4	35	1	13	0	0	693
Apprch %	5.9	5.9	70.6	5.9	11.8	0	4.3	14.1	19.6	57.6	4.3	0	60	0	0	0	40	0	6	51.3	34.8	6.7	1.1	0	0	3.8	83.3	5.1	7.7	0	7.5	66	1.9	24.5	0	0	
Total %	0.1	0.1	1.7	0.1	0.3	0	0.6	1.9	2.6	7.6	0.6	0	0.4	0	0	0	0.3	0	3.9	33.2	22.5	4.3	0.7	0	0	0.4	9.4	0.6	0.9	0	0.6	5.1	0.1	1.9	0	0	

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry street From West							Summer Street From Northwest							
	Har	Rig	Bear Right	Thru	Left	U-T	App. Total	Rig	Bear Right	Thru	Bear Left	Left	U-T	App. Total	Right	Thru	Bear Left	Left	Har	U-T	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	Hard Left	U-Turn	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 6:45:00 AM																																										
6:45:00 AM	0	0	1	0	0	0	1	0	**5**	**1**	**6**	**0**	**0**	12	0	0	0	0	0	0	0	2	26	13	**4**	1	0	46	0	0	8	0	**1**	**0**	**9**	**3**	1	0	1	0	0	5	73
7:00:00 AM	0	0	1	0	0	0	1	0	1	2	2	0	0	5	0	0	0	0	0	0	0	0	29	34	4	0	0	67	0	0	6	0	1	0	7	0	5	0	2	0	0	7	87
7:15:00 AM	0	0	1	0	0	0	1	0	0	1	**13**	0	0	14	0	0	0	0	0	0	0	1	**46**	**41**	2	0	0	**90**	0	0	7	0	1	0	8	0	8	0	**3**	**0**	**0**	**11**	124
7:30:00 AM	0	0	**7**	**0**	**0**	**0**	**7**	**1**	**2**	**3**	8	**2**	0	**16**	**0**	**0**	**0**	**0**	**1**	0	**1**	**14**	34	35	4	**2**	**0**	89	0	0	**9**	**1**	**0**	**0**	**10**	1	**9**	0	0	0	0	10	**133**
Total Volume	0	0	10	0	0	0	10	1	8	7	29	2	0	47	0	0	0	0	1	0	1	17	135	123	14	3	0	292	0	0	30	1	3	0	34	4	23	0	6	0	0	33	417
% App. Total	0	0	100	0	0	0		2.1	17	14.9	61.7	4.3	0		0	0	0	0	100	0		5.8	46.2	42.1	4.8	1	0		0	0	88.2	2.9	8.8	0		12.1	69.7	0	18.2	0	0		
PHF	.000	.000	.357	.000	.000	.000	.357	.250	.400	.583	.558	.250	.000	.734	.000	.000	.000	.000	.250	.000	.250	.304	.734	.750	.875	.375	.000	.811	.000	.000	.833	.250	.750	.000	.850	.333	.639	.000	.500	.000	.000	.750	.784

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 E
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry street From West						Summer Street From Northwest						
	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	2	0	0	0	0	0	0	2	0	0	8
08:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	6	0	0	1	0	0	1	2	0	0	0	0	1	0	2	0	0	17
Apprch %	0	0	0	0	0	0	0	0	0	75	25	0	0	0	0	0	0	0	0	85.7	0	0	14.3	0	0	33.3	66.7	0	0	0	0	33.3	0	66.7	0	0	
Total %	0	0	0	0	0	0	0	0	0	17.6	5.9	0	0	0	0	0	0	0	0	35.3	0	0	5.9	0	0	5.9	11.8	0	0	0	0	5.9	0	11.8	0	0	

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry street From West							Summer Street From Northwest							
	Har	Rig	Bear Right	Thru	Left	U-T	App. Total	Rig	Bear Right	Thru	Bear Left	Left	U-T	App. Total	Right	Thru	Bear Left	Left	Har	U-T	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	Hard Left	U-Turn	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 7:15:00 AM																																										
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	1	0	0	0	**1**	**0**	**0**	**1**	2
7:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	0	0	0	0	**3**
7:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1	0	0	1	2
8:00:00 AM	0	0	0	0	0	0	0	0	0	**2**	0	0	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
Total Volume	0	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	1	2	0	0	0	3	0	0	0	2	0	0	2	10
% App. Total	0	0	0	0	0	0		0	0	0	66.7	33.3	0		0	0	0	0	0	0		0	50	0	0	50	0		0	33.3	66.7	0	0	0		0	0	0	10	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.500	.000	.250	.000	.000	.000	.000	.375	.000	.000	.000	.500	.000	.000	.500	.833

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry street From West						Summer Street From Northwest						
	Hard Right	Right	Bear Right	Thru	Left	Peds	Right	Bear Right	Thru	Bear Left	Left	Peds	Right	Thru	Bear Left	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	Peds	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	7
06:45 AM	0	0	0	0	0	5	0	0	0	0	0	28	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	40
Total	0	0	0	0	0	6	0	0	0	0	0	33	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	47
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	13	0	0	0	0	0	21	0	0	0	0	0	10	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	52
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	8
Total	0	0	0	0	0	14	0	0	0	0	0	27	0	0	0	0	0	11	0	2	0	0	0	1	0	0	1	0	0	2	0	0	0	0	0	5	63
08:00 AM	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
08:15 AM	0	0	0	0	0	8	0	0	0	0	0	20	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	3	37
Grand Total	0	0	0	0	0	30	0	0	0	0	0	82	0	0	0	0	0	17	0	2	0	0	0	2	0	0	1	0	0	4	0	0	0	0	0	14	152
Apprch %	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	50	0	0	0	50	0	0	20	0	0	80	0	0	0	0	0	100	
Total %	0	0	0	0	0	19.7	0	0	0	0	0	53.9	0	0	0	0	0	11.2	0	1.3	0	0	0	1.3	0	0	0.7	0	0	2.6	0	0	0	0	0	9.2	

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry street From West							Summer Street From Northwest							
	Har	Rig	Bear Right	Thru	Left	Peds	App. Total	Rig	Bear Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Har	Peds	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	Hard Left	Peds	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 7:30:00 AM																																										
7:30:00 AM	0	0	0	0	0	13	13	0	0	0	0	0	21	21	0	0	0	0	0	10	10	0	2	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	5	5	52
7:45:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	1	2	0	0	0	0	0	0	0	8
8:00:00 AM	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5
8:15:00 AM	0	0	0	0	0	8	8	0	0	0	0	0	20	20	0	0	0	0	0	3	3	0	0	0	0	0	1	1	0	0	0	0	0	2	2	0	0	0	0	0	3	3	37
Total Volume	0	0	0	0	0	24	24	0	0	0	0	0	47	47	0	0	0	0	0	13	13	0	2	0	0	0	2	4	0	0	1	0	0	4	5	0	0	0	0	0	9	9	102
% App. Total	0	0	0	0	0	100		0	0	0	0	0	100		0	0	0	0	0	100		0	50	0	0	0	50		0	0	20	0	0	80		0	0	0	0	0	100		
PHF	.000	.000	.000	.000	.000	.462	.462	.000	.000	.000	.000	.000	.563	.560	.000	.000	.000	.000	.000	.325	.325	.000	.250	.000	.000	.000	.500	.500	.000	.000	.250	.000	.000	.500	.625	.000	.000	.000	.000	.000	.450	.450	.490

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
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Start Date : 4/12/2012
Page No : 1

	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry street From West							Summer Street From Northwest							
Start Time	Har	Rig	Bear Right	Thru	Left	U-T	App. Total	Rig	Bear Right	Thru	Bear Left	Left	U-T	App. Total	Right	Thru	Bear Left	Left	Har	U-T	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	Hard Left	U-Turn	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 07:05 AM																																										
07:05 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	6	12	**3**	0	0	21	0	0	1	0	**1**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**0**	**3**	28
07:10 AM	0	0	1	0	0	0	1	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	15	13	1	0	0	29	0	0	1	0	0	0	1	0	2	0	1	0	0	3	36
07:15 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	8	12	1	0	0	21	0	**1**	2	0	1	0	4	0	2	0	0	0	0	2	31
07:20 AM	0	0	1	0	0	0	1	0	0	1	3	0	0	4	0	0	0	0	0	0	0	0	**20**	14	0	0	0	34	0	0	3	0	0	0	3	0	4	0	**2**			**6**	48
07:25 AM	0	0	0	0	0	0	0	0	0	0	**6**	0	0	6	0	0	0	0	0	0	0	1	18	15	1	0	0	35	0	0	2	0	0	0	2	0	2	0	2	0	0	4	47
07:30 AM	0	0	2	0	0	0	2	0	0	0	3	**1**	0	4	0	0	0	0	0	0	0	1	10	5	1	**2**		19	0	0	4	**1**											32
07:35 AM	0	0	**4**				**4**	**1**	**2**										**1**	0	**1**	**9**	8	13	1	0	0	31	0	0	4	0	0	0	4	0	**5**	0	0	0	0	5	51
07:40 AM	0	0	1	0	0	0	1	0	0	**3**	3	1	0	7	0	0	0	0	0	0	0	4	16	**17**	2	0	0	**39**	0	0	3	0	0	0	3	**1**	2	0	0	0	0	3	**53**
07:45 AM	0	0	0	**1**	0	0	1	0	0	0	3	0	0	3	0	0	0	0	0	0	0	1	6	8	3	1	0	19	0	0	3	1	1	0	5	0	3	0	1	0	0	4	32
07:50 AM	**1**	0	0	0	**1**	0	2	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	7	1	1	0	0	9	0	0	**6**	0	0	0	**6**	0	1	0	0	0	0	1	21
07:55 AM	0	0	0	0	0	0	0	0	2	0	2	0	0	4	0	0	0	0	0	0	0	0	6	4	2	0	0	12	0	0	6	0	0	0	6	0	0	0	0	0	0	0	22
08:00 AM	0	0	1	0	1	0	2	1	0	3	4	0	0	**8**									10	0	1	0	0	11	0	0	5	0	1	0	6	0	1	0	0	0	0	1	28
Total Volume	1	0	10	1	2	0	14	2	5	9	33	4	0	53	0	0	0	0	1	0	1	16	130	114	17	3	0	280	0	1	40	2	4	0	47	1	26	0	7	0	0	34	429
% App. Total	7.1	0	71.4	7.1	14.3	0		3.8	9.4	17	62.3	7.5	0		0	0	0	0	100	0		5.7	46.4	40.7	6.1	1.1	0		0	2.1	85.1	4.3	8.5	0		2.9	76.5	0	20.6	0	0		
PHF	.083	.000	.208	.083	.167	.000	.292	.167	.208	.250	.458	.333	.000	.552	.000	.000	.000	.000	.083	.000	.083	.148	.542	.559	.472	.125	.000	.598	.000	.083	.556	.167	.333	.000	.653	.083	.433	.000	.292	.000	.000	.472	.675
Cars	1	0	10	1	2	0	14	2	5	9	33	3	0	52	0	0	0	0	1	0	1	16	128	114	17	3	0	278	0	0	38	2	4	0	44	1	26	0	5	0	0	32	421
% Cars	100	0	100	100	100	0	100	100	100	100	100	75.0	0	98.1	0	0	0	0	100	0	100	100	98.5	100	100	100	0	99.3	0	0	95.0	100	100	0	93.6	100	100	0	71.4	0	0	94.1	98.1
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	1	2	0	0	0	3	0	0	0	2	0	0	2	8
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	25.0	0	1.9	0	0	0	0	0	0	0	0	1.5	0	0	0	0	0.7	0	100	5.0	0	0	0	6.4	0	0	0	28.6	0	0	5.9	1.9

PRECISION
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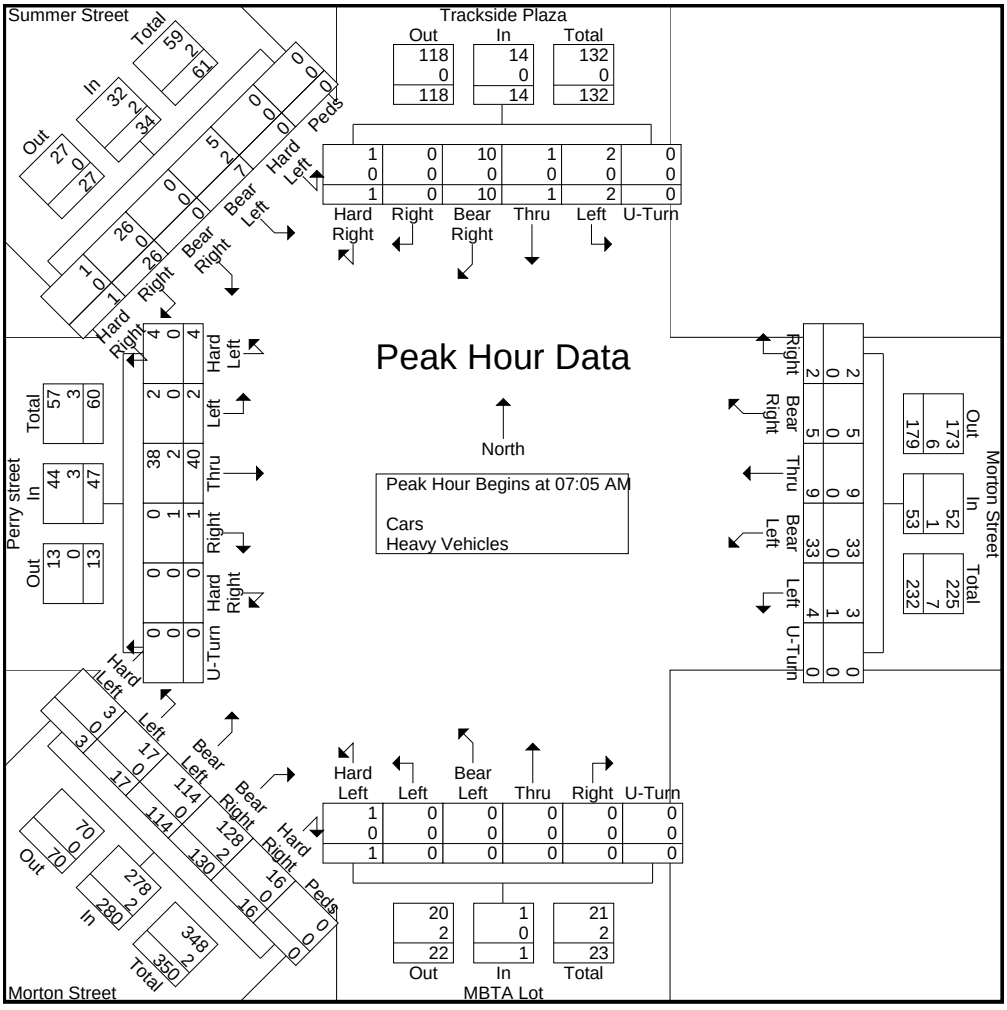
N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 E
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 2



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City, State: Stoughton, MA
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Groups Printed- Cars - Heavy Vehicles

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry Street From West						Summer Street From Northwest						
	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	0	8	0	1	0	0	3	10	24	0	0	0	0	0	0	1	0	0	16	1	5	0	0	0	0	5	0	0	0	4	11	0	3	0	0	92
04:55 PM	0	1	2	0	1	0	0	3	5	20	1	0	0	0	0	0	0	0	0	16	4	2	0	0	0	0	7	0	0	0	4	9	1	6	0	0	82
05:10 PM	0	0	6	0	2	0	1	5	3	26	2	0	0	0	0	1	0	0	0	23	4	2	0	0	1	0	4	0	0	0	2	8	0	10	0	0	100
05:25 PM	0	1	10	0	2	0	0	6	6	27	0	0	0	0	0	0	6	0	1	15	4	5	0	0	0	0	5	1	0	0	1	6	0	2	0	0	98
05:40 PM	0	0	5	0	1	0	2	3	7	20	0	0	0	0	0	0	0	0	0	11	4	4	0	0	2	0	8	0	0	0	3	9	0	3	0	0	82
05:55 PM	0	1	7	0	0	0	1	2	10	28	0	0	1	0	0	0	2	0	0	18	1	3	3	0	0	0	5	0	0	0	1	5	0	1	0	0	89
06:10 PM	0	0	10	0	0	0	0	1	8	30	1	0	0	0	0	0	2	0	0	13	2	1	0	0	0	0	4	0	0	0	0	8	0	5	0	0	85
06:25 PM	1	2	8	0	0	0	0	2	11	25	1	0	2	0	0	0	8	0	1	7	4	4	1	0	0	0	7	0	0	0	1	3	0	4	0	0	92
Grand Total	1	5	56	0	7	0	4	25	60	200	5	0	3	0	0	1	19	0	2	119	24	26	4	0	3	0	45	1	0	0	16	59	1	34	0	0	720
Apprch %	1.4	7.2	81.2	0	10.1	0	1.4	8.5	20.4	68	1.7	0	13	0	0	4.3	82.6	0	1.1	68	13.7	14.9	2.3	0	6.1	0	91.8	2	0	0	14.5	53.6	0.9	30.9	0	0	
Total %	0.1	0.7	7.8	0	1	0	0.6	3.5	8.3	27.8	0.7	0	0.4	0	0	0.1	2.6	0	0.3	16.5	3.3	3.6	0.6	0	0.4	0	6.2	0.1	0	0	2.2	8.2	0.1	4.7	0	0	
Cars	1	5	56	0	7	0	4	25	60	194	5	0	3	0	0	1	19	0	2	116	24	24	4	0	3	0	44	1	0	0	16	56	0	34	0	0	704
% Cars	100	100	100	0	100	0	100	100	100	97	100	0	100	0	0	100	100	0	100	97.5	100	92.3	100	0	100	0	97.8	100	0	0	100	94.9	0	100	0	0	97.8
Heavy Vehicles	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	1	0	0	0	0	3	1	0	0	0	16
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2.5	0	7.7	0	0	0	0	2.2	0	0	0	0	5.1	100	0	0	0	2.2

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry Street From West							Summer Street From Northwest							
	Hard Right	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 4:40:00 PM																																										
4:40:00 PM	0	0	8	0	1	0	9	0	3	10	24	0	0	37	0	0	0	0	1	0	1	0	16	1	5	0	0	22	0	0	5	0	0	0	5	4	11	0	3	0	0	18	92
4:55:00 PM	0	1	2	0	1	0	4	0	3	5	20	1	0	29	0	0	0	0	0	0	0	0	16	4	2	0	0	22	0	0	7	0	0	0	7	4	9	1	6	0	0	20	82
5:10:00 PM	0	0	6	0	2	0	8	1	5	3	26	2	0	37	0	0	0	1	0	0	1	0	23	4	2	0	0	29	1	0	4	0	0	0	5	2	8	0	10	0	0	20	100
5:25:00 PM	0	1	10	0	2	0	13	0	6	6	27	0	0	39	0	0	0	0	6	0	6	1	15	4	5	0	0	25	0	0	5	1	0	0	6	1	6	0	2	0	0	9	98
Total Volume	0	2	26	0	6	0	34	1	17	24	97	3	0	142	0	0	0	1	7	0	8	1	70	13	14	0	0	98	1	0	21	1	0	0	23	11	34	1	21	0	0	67	372
% App. Total	0	5.9	76.5	0	17.6	0		0.7	12	16.9	68.3	2.1	0		0	0	0	12.5	87.5	0		1	71.4	13.3	14.3	0	0		4.3	0	91.3	4.3	0	0		16.4	50.7	1.5	31.3	0	0		
PHF	.000	.500	.650	.000	.750	.000	.654	.250	.708	.600	.898	.375	.000	.910	.000	.000	.000	.250	.292	.000	.333	.250	.761	.813	.700	.000	.000	.845	.250	.000	.750	.250	.000	.000	.821	.688	.773	.250	.525	.000	.000	.838	.930
Cars	0	2	26	0	6	0	34	1	17	24	93	3	0	138	0	0	0	1	7	0	8	1	70	13	13	0	0	97	1	0	20	1	0	0	22	11	32	0	21	0	0	64	363
% Cars	0	100	100	0	100	0	100	100	100	100	95.9	100	0	97.2	0	0	0	100	100	0	100	100	100	100	92.9	0	0	99.0	100	0	95.2	100	0	0	95.7	100	94.1	0	100	0	0	95.5	97.6
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	2	1	0	0	0	3	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	4.1	0	0	2.8	0	0	0	0	0	0	0	0	0	0	7.1	0	0	1.0	0	0	4.8	0	0	0	4.3	0	5.9	100	0	0	0	4.5	2.4

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File Name : 122868 EE
Site Code : 10111.34
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Groups Printed- Cars

	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry Street From West						Summer Street From Northwest						
Start Time	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	0	8	0	1	0	0	3	10	23	0	0	0	0	0	0	1	0	0	16	1	5	0	0	0	0	5	0	0	0	4	9	0	3	0	0	89
04:55 PM	0	1	2	0	1	0	0	3	5	20	1	0	0	0	0	0	0	0	0	16	4	1	0	0	0	0	7	0	0	0	4	9	0	6	0	0	80
05:10 PM	0	0	6	0	2	0	1	5	3	25	2	0	0	0	0	1	0	0	0	23	4	2	0	0	1	0	3	0	0	0	2	8	0	10	0	0	98
05:25 PM	0	1	10	0	2	0	0	6	6	25	0	0	0	0	0	0	6	0	1	15	4	5	0	0	0	0	5	1	0	0	1	6	0	2	0	0	96
05:40 PM	0	0	5	0	1	0	2	3	7	20	0	0	0	0	0	0	0	0	0	10	4	3	0	0	2	0	8	0	0	0	3	9	0	3	0	0	80
05:55 PM	0	1	7	0	0	0	1	2	10	26	0	0	1	0	0	0	2	0	0	16	1	3	3	0	0	0	5	0	0	0	1	5	0	1	0	0	85
06:10 PM	0	0	10	0	0	0	0	1	8	30	1	0	0	0	0	0	2	0	0	13	2	1	0	0	0	0	4	0	0	0	0	7	0	5	0	0	84
06:25 PM	1	2	8	0	0	0	0	2	11	25	1	0	2	0	0	0	8	0	1	7	4	4	1	0	0	0	7	0	0	0	1	3	0	4	0	0	92
Grand Total	1	5	56	0	7	0	4	25	60	194	5	0	3	0	0	1	19	0	2	116	24	24	4	0	3	0	44	1	0	0	16	56	0	34	0	0	704
Apprch %	1.4	7.2	81.2	0	10.1	0	1.4	8.7	20.8	67.4	1.7	0	13	0	0	4.3	82.6	0	1.2	68.2	14.1	14.1	2.4	0	6.2	0	91.7	2.1	0	0	15.1	52.8	0	32.1	0	0	
Total %	0.1	0.7	8	0	1	0	0.6	3.6	8.5	27.6	0.7	0	0.4	0	0	0.1	2.7	0	0.3	16.5	3.4	3.4	0.6	0	0.4	0	6.2	0.1	0	0	2.3	8	0	4.8	0	0	

	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry Street From West							Summer Street From Northwest							
Start Time	Hard Right	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 4:40:00 PM																																										
4:40:00 PM	0	0	8	0	1	0	9	0	3	10	23	0	0	36	0	0	0	0	1	0	1	0	16	1	5	0	0	22	0	0	5	0	0	0	5	4	9	0	3	0	0	16	89
4:55:00 PM	0	1	2	0	1	0	4	0	3	5	20	1	0	29	0	0	0	0	0	0	0	0	16	4	1	0	0	21	0	0	7	0	0	0	7	4	9	0	6	0	0	19	80
5:10:00 PM	0	0	6	0	2	0	8	1	5	3	25	2	0	36	0	0	0	1	0	0	1	0	23	4	2	0	0	29	1	0	3	0	0	0	4	2	8	0	10	0	0	20	98
5:25:00 PM	0	1	10	0	2	0	13	0	6	6	25	0	0	37	0	0	0	0	6	0	6	1	15	4	5	0	0	25	0	0	5	1	0	0	6	1	6	0	2	0	0	9	96
Total Volume	0	2	26	0	6	0	34	1	17	24	93	3	0	138	0	0	0	1	7	0	8	1	70	13	13	0	0	97	1	0	20	1	0	0	22	11	32	0	21	0	0	64	363
% App. Total	0	5.9	76.5	0	17.6	0		0.7	12.3	17.4	67.4	2.2	0		0	0	0	12.5	87.5	0		1	72.2	13.4	13.4	0	0		4.5	0	90.9	4.5	0	0		17.2	50	0	32.8	0	0		
PHF	.000	.500	.650	.000	.750	.000	.654	.250	.708	.600	.930	.375	.000	.932	.000	.000	.000	.250	.292	.000	.333	.250	.761	.813	.650	.000	.000	.836	.250	.000	.714	.250	.000	.000	.786	.688	.889	.000	.525	.000	.000	.800	.926

N/S: Washington Street (Route 138/27)
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Start Time	Hard Right	Right	Bear Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Bear Left	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	Int. Total
04:40 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3
04:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
05:10 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
05:25 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:55 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
06:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
06:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	1	0	0	0	0	3	1	0	0	0	16
Apprch %	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	60	0	40	0	0	0	0	100	0	0	0	0	75	25	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	37.5	0	0	0	0	0	0	0	0	0	18.8	0	12.5	0	0	0	0	6.2	0	0	0	0	18.8	6.2	0	0	0	

	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry Street From West							Summer Street From Northwest							
Start Time	Hard Right	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 5:10:00 PM																																										
5:10:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:25:00 PM	0	0	0	0	0	0	0	0	0	0	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:40:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:55:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
Total Volume	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	3	0	1	0	0	4	0	0	1	0	0	0	1	0	0	0	0	0	0	0	10
% App. Total	0	0	0	0	0	0		0	0	0	100	0	0		0	0	0	0	0	0		0	75	0	25	0	0		0	0	100	0	0	0		0	0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.625	.000	.000	.625	.000	.000	.000	.000	.000	.000	.000	.000	.375	.000	.250	.000	.000	.500	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.625

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 EE
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Trackside Plaza From North						Morton Street From East						MBTA Lot From South						Morton Street From Southwest						Perry Street From West						Summer Street From Northwest						Int. Total
	Hard Right	Right	Bear Right	Thru	Left	Peds	Right	Bear Right	Thru	Bear Left	Left	Peds	Right	Thru	Bear Left	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Hard Left	Peds	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	
04:40 PM	0	0	1	0	0	8	0	0	0	0	0	27	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	38
04:55 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	6
05:10 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	4
05:25 PM	0	0	0	0	0	5	0	0	0	0	0	24	0	0	0	0	0	6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	39
05:40 PM	0	0	0	0	0	2	0	0	0	0	0	5	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	12
05:55 PM	0	0	0	0	0	7	0	0	0	0	0	12	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	28
06:10 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6
06:25 PM	0	0	0	0	0	3	0	0	0	0	0	28	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	41
Grand Total	0	0	1	0	0	27	0	0	0	0	0	99	0	0	0	0	0	29	0	0	0	0	0	6	0	0	0	0	0	1	0	0	0	1	0	10	174
Apprch %	0	0	3.6	0	0	96.4	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	9.1	0	90.9	
Total %	0	0	0.6	0	0	15.5	0	0	0	0	0	56.9	0	0	0	0	0	16.7	0	0	0	0	0	3.4	0	0	0	0	0	0.6	0	0	0	0.6	0	5.7	

Start Time	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry Street From West							Summer Street From Northwest							Int. Total
	Hard Right	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 4:40:00 PM																																										
4:40:00 PM	0	0	**1**	0	0	**8**	**9**	0	0	0	0	0	27	**27**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	38
4:55:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	1	1	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**
5:10:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	4
5:25:00 PM	0	0	0	0	0	5	5	0	0	0	0	0	24	24	0	0	0	0	0	**6**	**6**	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	**39**
Total Volume	0	0	1	0	0	14	15	0	0	0	0	0	54	54	0	0	0	0	0	9	9	0	0	0	0	0	3	3	0	0	0	0	0	1	1	0	0	0	1	0	4	5	87
% App. Total	0	0	6.7	0	0	93.3		0	0	0	0	0	100		0	0	0	0	0	100		0	0	0	0	0	100		0	0	0	0	0	100		0	0	0	20	0	80		
PHF	.000	.000	.250	.000	.000	.438	.417	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.375	.375	.000	.000	.000	.000	.000	.750	.750	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.000	.333	.417	.558

N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
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File Name : 122868 EE
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

	Trackside Plaza From North							Morton Street From East							MBTA Lot From South							Morton Street From Southwest							Perry Street From West							Summer Street From Northwest							
Start Time	Har	Rig	Bear Right	Thru	Left	U-T	App. Total	Rig	Bear Right	Thru	Bear Left	Left	U-T	App. Total	Right	Thru	Bear Left	Left	Har	U-T	App. Total	Hard Right	Bear Right	Bear Left	Left	Har	Peds	App. Total	Har	Rig	Thru	Left	Hard Left	U-Turn	App. Total	Har	Rig	Bear Right	Bear Left	Hard Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																																										
Peak Hour for Entire Intersection Begins at 04:50 PM																																										
04:50 PM	0	0	**5**	**0**	**0**	**0**	**5**	**0**	**1**	**2**	**9**	**0**	**0**	12	0	0	0	0	1	0	1	0	8	0	**3**	0	0	11	0	0	2	0	0	0	2	**2**	1	0	1	0	0	4	35
04:55 PM	0	**1**												10	0	0	0	0	0	0	0	0	5	1	0	0	0	6	0	0	2	0	0	0	2	2	4	0	2	0	0	8	30
05:00 PM	0	0	0	0	0	0	0	0	2	2	8	0	0	12	0	0	0	0	0	0	0	0	4	2	1	0	0	7	0	0	1	0	0	0	1	1	2	**1**					25
05:05 PM	0	0	0	0	0	0	0	0	0	1	5	**1**	0	7	0	0	0	0	0	0	0	0	7	1	1	0	0	9	0	0	**4**	0	0	0	4	1	3	0	3	0	0	7	27
05:10 PM	0	0	3	0	1	0	4	**1**						10	0	0	0	0	0	0	0	0	6	1	0	0	0	7	1	0	1	0	0	0	2	0	3	0	1	0	0	4	27
05:15 PM	0	0	0	0	1	0	1	0	**3**		13	0	0	17	0	0	0	**1**	0	0	1	0	7	1	1	0	0	9	0	0	1	0	0	0	1	1	1	0	3	0	0	5	34
05:20 PM	0	0	3	0	0	0	3	0	1	1	7	1	0	10	0	0	0	0	0	0	0	0	10	2	1	0	0	**13**	0	0	2	0	0	0	2	1	4	0	**6**			**11**	39
05:25 PM	0	0	1	0	0	0	1	0	2	0	5	0	0	7	0	0	0	0	0	0	0	**1**	6	0	0	0	0	7	0	0	1	0	0	0	1	0	2	0	0	0	0	2	18
05:30 PM	0	0	5	0	0	0	5	0	1	2	11	0	0	14	0	0	0	0	2	0	2	0	3	**3**	2	0	0	8	0	0	3	**1**											36
05:35 PM	0	1	4	0	**2**	0	**7**	0	3	**4**	11	0	0	**18**	**0**	**0**	**0**	**0**	**4**	0	**4**							10	0	0	1	0	0	0	1	1	2	0	1	0	0	4	**44**
05:40 PM	0	0	2	0	1	0	3	0	1	3	6	0	0	10	0	0	0	0	0	0	0	0	2	3	2	0	0	7	0	0	1	0	0	0	1	0	**5**	0	2	0	0	7	28
05:45 PM	0	0	1	0	0	0	1	1	1	2	12	0	0	16	0	0	0	0	0	0	0	0	6	0	2	0	0	8	**2**	0	3	0	0	0	**5**	1	3	0	1	0	0	5	35
Total Volume	0	2	26	0	6	0	34	2	17	21	100	3	0	143	0	0	0	1	7	0	8	1	70	15	16	0	0	102	3	0	22	1	0	0	26	10	32	1	22	0	0	65	378
% App. Total	0	5.9	76.5	0	17.6	0		1.4	11.9	14.7	69.9	2.1	0		0	0	0	12.5	87.5	0		1	68.6	14.7	15.7	0	0		11.5	0	84.6	3.8	0	0		15.4	49.2	1.5	33.8	0	0		
PHF	.000	.167	.433	.000	.250	.000	.405	.167	.472	.438	.641	.250	.000	.662	.000	.000	.000	.083	.146	.000	.167	.083	.583	.417	.444	.000	.000	.654	.125	.000	.458	.083	.000	.000	.433	.417	.533	.083	.306	.000	.000	.492	.716
Cars	0	2	26	0	6	0	34	2	17	21	97	3	0	140	0	0	0	1	7	0	8	1	69	15	14	0	0	99	3	0	21	1	0	0	25	10	32	0	22	0	0	64	370
% Cars	0	100	100	0	100	0	100	100	100	100	97.0	100	0	97.9	0	0	0	100	100	0	100	100	98.6	100	87.5	0	0	97.1	100	0	95.5	100	0	0	96.2	100	100	0	100	0	0	98.5	97.9
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	0	2	0	0	3	0	0	1	0	0	0	1	0	0	1	0	0	0	1	8
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	3.0	0	0	2.1	0	0	0	0	0	0	0	0	1.4	0	12.5	0	0	2.9	0	0	4.5	0	0	0	3.8	0	0	100	0	0	0	1.5	2.1

PRECISION
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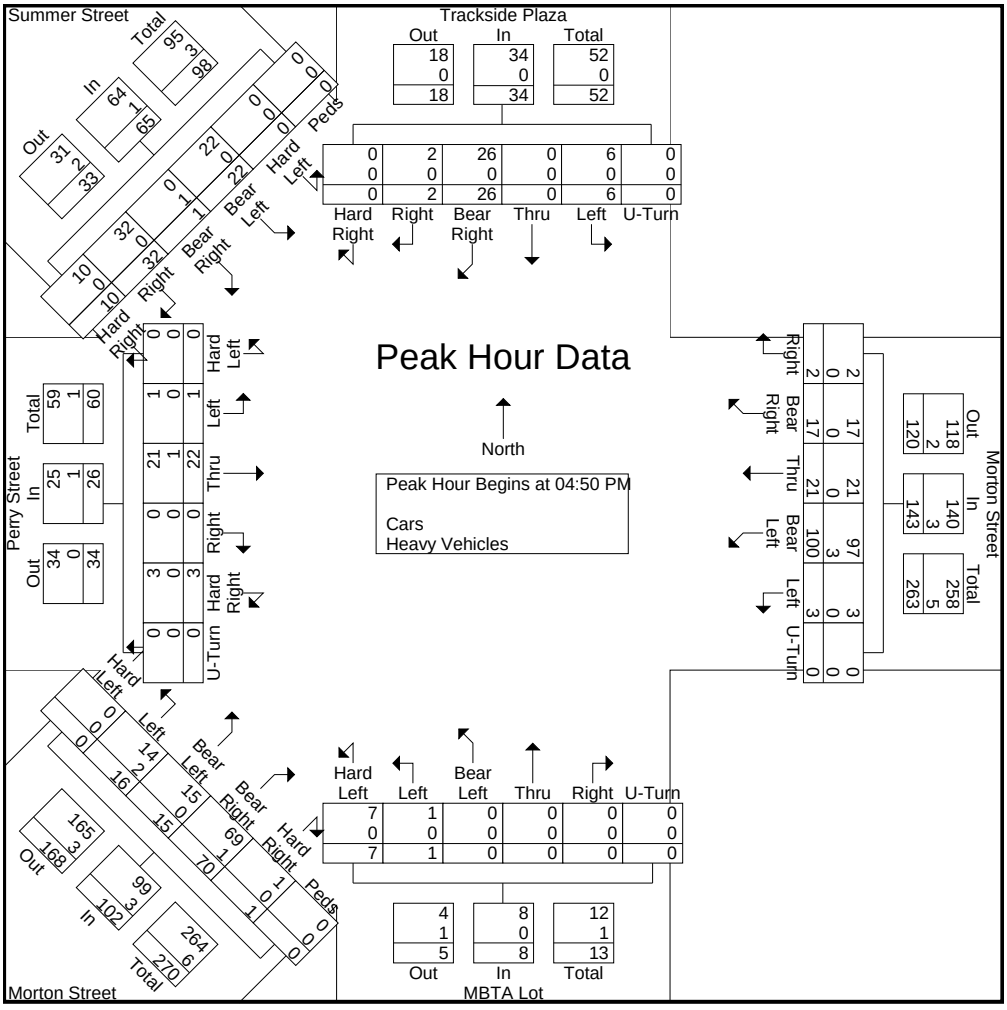
N/S: Washington Street (Route 138/27)
E/W: Freeman Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 EE
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 2



N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 F
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	1	0	6	0	0	7	18	0	1	0	0	26	0	0	0	0	0	0	6	0	2	0	7	0	0	74
06:45 AM	0	0	8	2	0	19	15	0	3	0	8	30	0	0	0	0	0	0	5	0	2	0	8	0	0	100
Total	1	0	14	2	0	26	33	0	4	0	8	56	0	0	0	0	0	0	11	0	4	0	15	0	0	174
07:00 AM	0	0	4	6	0	25	25	0	1	0	2	42	0	0	0	0	0	0	11	0	8	0	7	0	0	131
07:15 AM	0	0	17	1	0	27	16	0	7	0	9	61	1	1	0	0	0	0	22	0	11	0	15	0	0	188
07:30 AM	1	0	15	8	0	39	23	0	6	0	8	58	0	0	0	0	0	0	12	0	7	0	16	0	0	193
07:45 AM	1	0	8	2	0	9	24	2	5	0	9	23	0	0	0	0	1	0	11	0	5	0	9	0	0	109
Total	2	0	44	17	0	100	88	2	19	0	28	184	1	1	0	0	1	0	56	0	31	0	47	0	0	621
08:00 AM	0	0	12	2	0	9	23	0	12	0	16	29	0	0	0	0	0	0	25	0	7	0	19	0	0	154
08:15 AM	1	0	8	3	0	23	24	0	13	0	21	27	0	0	0	0	0	0	30	0	13	0	12	0	0	175
Grand Total	4	0	78	24	0	158	168	2	48	0	73	296	1	1	0	0	1	0	122	0	55	0	93	0	0	1124
Apprch %	3.8	0	73.6	22.6	0	42	44.7	0.5	12.8	0	19.7	79.8	0.3	0.3	0	0	0.8	0	99.2	0	37.2	0	62.8	0	0	
Total %	0.4	0	6.9	2.1	0	14.1	14.9	0.2	4.3	0	6.5	26.3	0.1	0.1	0	0	0.1	0	10.9	0	4.9	0	8.3	0	0	
Cars	4	0	75	23	0	158	163	2	45	0	69	292	1	1	0	0	1	0	118	0	50	0	93	0	0	1095
% Cars	100	0	96.2	95.8	0	100	97	100	93.8	0	94.5	98.6	100	100	0	0	100	0	96.7	0	90.9	0	100	0	0	97.4
Heavy Vehicles	0	0	3	1	0	0	5	0	3	0	4	4	0	0	0	0	0	0	4	0	5	0	0	0	0	29
% Heavy Vehicles	0	0	3.8	4.2	0	0	3	0	6.2	0	5.5	1.4	0	0	0	0	0	0	3.3	0	9.1	0	0	0	0	2.6

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 7:15:00 AM																															
7:15:00 AM	0	0	**17**	1	0	18	27	16	0	7	0	50	9	**61**	**1**	**1**	0	**72**	**0**	**0**	**0**	**22**	**0**	**22**	**11**	0	15	0	0	**26**	188
7:30:00 AM	**1**	0	15	**8**	0	**24**	**39**	23	0	6	0	**68**	8	58	0	0	0	66	0	0	0	12	0	12	7	0	16	0	0	23	**193**
7:45:00 AM	1	0	8	2	0	11	9	**24**	**2**	5	0	40	9	23	0	0	0	32	0	**1**	0	11	0	12	5	0	9	0	0	14	109
8:00:00 AM	0	0	12	2	0	14	9	23	0	**12**	0	44	**16**	29	0	0	0	45	0	0	0	**25**	0	**25**	7	0	**19**	0	0	26	154
Total Volume	2	0	52	13	0	67	84	86	2	30	0	202	42	171	1	1	0	215	0	1	0	70	0	71	30	0	59	0	0	89	644
% App. Total	3	0	77.6	19.4	0		41.6	42.6	1	14.9	0		19.5	79.5	0.5	0.5	0		0	1.4	0	98.6	0		33.7	0	66.3	0	0		
PHF	.500	.000	.765	.406	.000	.698	.538	.896	.250	.625	.000	.743	.656	.701	.250	.250	.000	.747	.000	.250	.000	.700	.000	.710	.682	.000	.776	.000	.000	.856	.834
Cars	2	0	50	13	0	65	84	83	2	27	0	196	41	171	1	1	0	214	0	1	0	70	0	71	29	0	59	0	0	88	634
% Cars	100	0	96.2	100	0	97.0	100	96.5	100	90.0	0	97.0	97.6	100	100	100	0	99.5	0	100	0	100	0	100	96.7	0	100	0	0	98.9	98.4
Heavy Vehicles	0	0	2	0	0	2	0	3	0	3	0	6	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	10
% Heavy Vehicles	0	0	3.8	0	0	3.0	0	3.5	0	10.0	0	3.0	2.4	0	0	0	0	0.5	0	0	0	0	0	0	3.3	0	0	0	0	1.1	1.6

N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 F
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	1	0	6	0	0	7	18	0	1	0	0	25	0	0	0	0	0	0	5	0	1	0	7	0	0	71
06:45 AM	0	0	8	1	0	19	15	0	3	0	6	28	0	0	0	0	0	0	4	0	2	0	8	0	0	94
Total	1	0	14	1	0	26	33	0	4	0	6	53	0	0	0	0	0	0	9	0	3	0	15	0	0	165
07:00 AM	0	0	4	6	0	25	24	0	1	0	1	41	0	0	0	0	0	0	10	0	6	0	7	0	0	125
07:15 AM	0	0	17	1	0	27	14	0	6	0	8	61	1	1	0	0	0	0	22	0	10	0	15	0	0	183
07:30 AM	1	0	15	8	0	39	22	0	6	0	8	58	0	0	0	0	0	0	12	0	7	0	16	0	0	192
07:45 AM	1	0	8	2	0	9	24	2	4	0	9	23	0	0	0	0	1	0	11	0	5	0	9	0	0	108
Total	2	0	44	17	0	100	84	2	17	0	26	183	1	1	0	0	1	0	55	0	28	0	47	0	0	608
08:00 AM	0	0	10	2	0	9	23	0	11	0	16	29	0	0	0	0	0	0	25	0	7	0	19	0	0	151
08:15 AM	1	0	7	3	0	23	23	0	13	0	21	27	0	0	0	0	0	0	29	0	12	0	12	0	0	171
Grand Total	4	0	75	23	0	158	163	2	45	0	69	292	1	1	0	0	1	0	118	0	50	0	93	0	0	1095
Apprch %	3.9	0	73.5	22.5	0	42.9	44.3	0.5	12.2	0	19	80.4	0.3	0.3	0	0	0.8	0	99.2	0	35	0	65	0	0	
Total %	0.4	0	6.8	2.1	0	14.4	14.9	0.2	4.1	0	6.3	26.7	0.1	0.1	0	0	0.1	0	10.8	0	4.6	0	8.5	0	0	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 7:15:00 AM																															
7:15:00 AM	0	0	**17**	1	0	18	27	14	0	6	0	47	8	**61**	**1**	**1**	0	**71**	**0**	**0**	**0**	**22**	**0**	**22**	**10**	0	15	0	0	25	183
7:30:00 AM	**1**	0	15	**8**	0	**24**	**39**	22	0	6	0	**67**	8	58	0	0	0	66	0	0	0	12	0	12	7	0	16	0	0	23	**192**
7:45:00 AM	1	0	8	2	0	11	9	**24**	**2**	4	0	39	9	23	0	0	0	32	0	**1**	0	11	0	12	5	0	9	0	0	14	108
8:00:00 AM	0	0	10	2	0	12	9	23	0	**11**	0	43	**16**	29	0	0	0	45	0	0	0	**25**	0	**25**	7	0	**19**	0	0	**26**	151
Total Volume	2	0	50	13	0	65	84	83	2	27	0	196	41	171	1	1	0	214	0	1	0	70	0	71	29	0	59	0	0	88	634
% App. Total	3.1	0	76.9	20	0		42.9	42.3	1	13.8	0		19.2	79.9	0.5	0.5	0		0	1.4	0	98.6	0		33	0	67	0	0		
PHF	.500	.000	.735	.406	.000	.677	.538	.865	.250	.614	.000	.731	.641	.701	.250	.250	.000	.754	.000	.250	.000	.700	.000	.710	.725	.000	.776	.000	.000	.846	.826

N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 F
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	3
06:45 AM	0	0	0	1	0	0	0	0	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	0	0	6
Total	0	0	0	1	0	0	0	0	0	0	2	3	0	0	0	0	0	0	2	0	1	0	0	0	0	9
07:00 AM	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	2	0	0	0	0	6
07:15 AM	0	0	0	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5
07:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	4	0	2	0	2	1	0	0	0	0	0	0	1	0	3	0	0	0	0	13
08:00 AM	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	4
Grand Total	0	0	3	1	0	0	5	0	3	0	4	4	0	0	0	0	0	0	4	0	5	0	0	0	0	29
Apprch %	0	0	75	25	0	0	62.5	0	37.5	0	50	50	0	0	0	0	0	0	100	0	100	0	0	0	0	
Total %	0	0	10.3	3.4	0	0	17.2	0	10.3	0	13.8	13.8	0	0	0	0	0	0	13.8	0	17.2	0	0	0	0	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 6:30:00 AM																															
6:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	**1**	0	**1**	1	0	0	0	0	1	3
6:45:00 AM	0	0	0	**1**	0	**1**	0	0	0	0	0	0	**2**	**2**	0	0	0	**4**													**6**
7:00:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	2	0	0	0	1	0	1	**2**	0	0	0	0	**2**	6
7:15:00 AM	0	0	0	0	0	0	0	**2**	0	**1**	0	**3**	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	5
Total Volume	0	0	0	1	0	1	0	3	0	1	0	4	4	4	0	0	0	8	0	0	0	3	0	3	4	0	0	0	0	4	20
% App. Total	0	0	0	100	0		0	75	0	25	0		50	50	0	0	0		0	0	0	100	0		100	0	0	0	0		
PHF	.000	.000	.000	.250	.000	.250	.000	.375	.000	.250	.000	.333	.500	.500	.000	.000	.000	.500	.000	.000	.000	.750	.000	.750	.500	.000	.000	.000	.000	.500	.833

N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 F
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Total	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Grand Total	0	0	0	0	1	0	1	0	0	7	0	2	0	0	2	0	0	0	0	0	0	0	0	0	1	14
Apprch %	0	0	0	0	100	0	12.5	0	0	87.5	0	50	0	0	50	0	0	0	0	0	0	0	0	0	100	
Total %	0	0	0	0	7.1	0	7.1	0	0	50	0	14.3	0	0	14.3	0	0	0	0	0	0	0	0	0	7.1	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 6:45:00 AM																															
6:45:00 AM	0	0	0	0	**1**	**1**	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**3**
7:00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**													
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	**2**	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	1	1	0	0	0	0	2	2	0	2	0	0	2	4	0	0	0	0	0	0	0	0	0	0	1	1	8
% App. Total	0	0	0	0	100		0	0	0	0	100		0	50	0	0	50		0	0	0	0	0		0	0	0	0	0	100		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.500	.500	.000	.250	.000	.000	.250	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.667

N/S/SW: Morton Street
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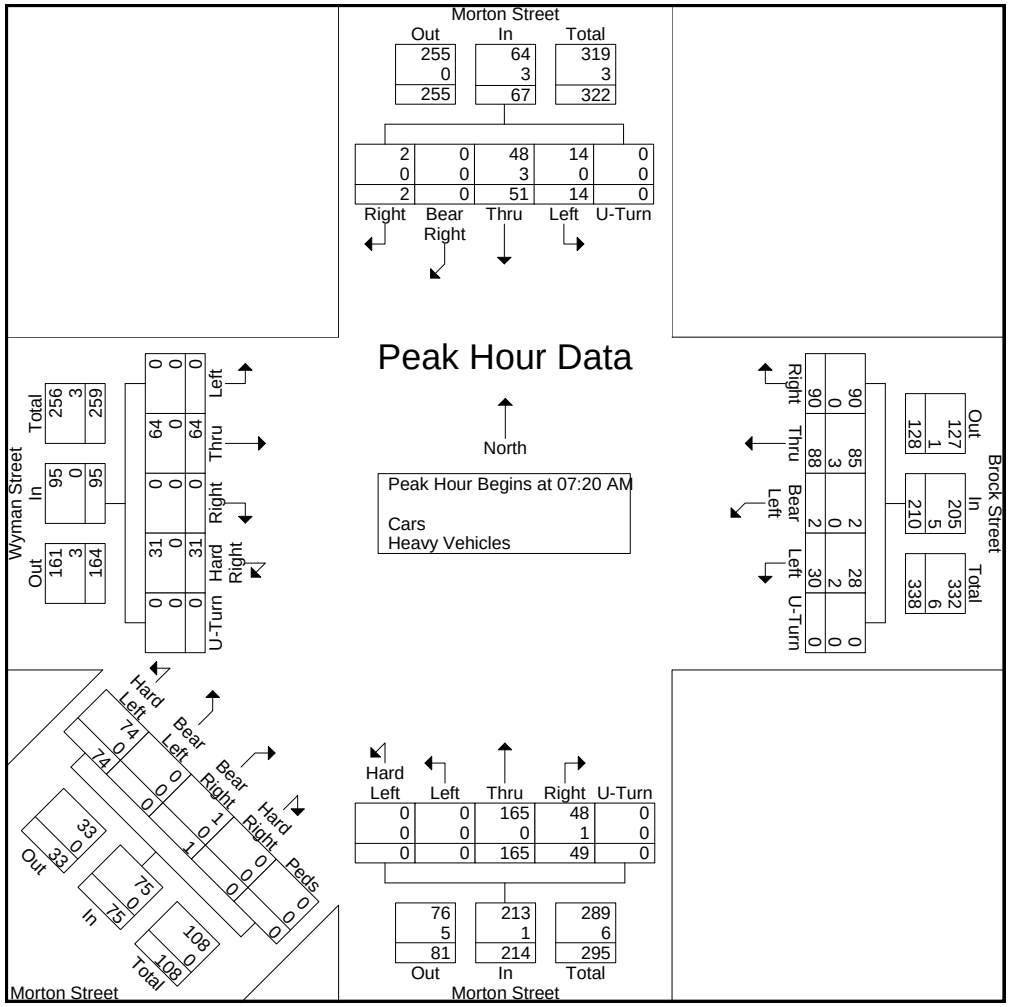
	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 07:20 AM																															
07:20 AM	0	0	4	1	0	5	12	5	0	2	0	19	4	**23**	0	0	0	**27**	**0**	**0**	**0**	**10**	0	**10**	**5**	0	**9**	0	0	**14**	**75**
07:25 AM	0	0	7	0	0	7	11	8	0	2	0	21	4	23	0	0	0	27	0	0	0	6	0	6	3	0	3	0	0	6	67
07:30 AM	0	0	5	**4**	0	9	11	8	0	3	0	22	2	13	0	0	0	15	0	0	0	3	0	3	1	0	9	0	0	10	59
07:35 AM	0	0	**8**	2	0	**10**	10	10	0	1	0	21	5	22	0	0	0	27	0	0	0	5	0	5	4	0	6	0	0	10	73
07:40 AM	**1**	0	2	2	0	5	**18**	5	0	2	0	**25**	1	23	0	0	0	24	0	0	0	4	0	4	2	0	1	0	0	3	61
07:45 AM	1	0	4	2	0	7	5	8	0	2	0	15	2	9	0	0	0	11	0	0	0	4	0	4	3	0	5	0	0	8	45
07:50 AM	0	0	3	0	0	3	2	8	0	1	0	11	3	5	0	0	0	8	0	**1**	0	6	0	7	2	0	2	0	0	4	33
07:55 AM	0	0	1	0	0	1	2	8	**2**	2	0	14	4	9	0	0	0	13	0	0	0	1	0	1	0	0	2	0	0	2	31
08:00 AM	0	0	3	2	0	5	2	6	0	3	0	11	5	10	0	0	0	15	0	0	0	10	0	10	2	0	6	0	0	8	49
08:05 AM	0	0	6	0	0	6	3	6	0	1	0	10	7	8	0	0	0	15	0	0	0	7	0	7	2	0	7	0	0	9	47
08:10 AM	0	0	3	0	0	3	4	**11**	0	**8**	0	23	4	11	0	0	0	15	0	0	0	8	0	8	3	0	6	0	0	9	58
08:15 AM	0	0	5	1	0	6	10	5	0	3	0	18	**8**	9	0	0	0	17	0	0	0	10	0	10	4	0	8	0	0	12	63
Total Volume	2	0	51	14	0	67	90	88	2	30	0	210	49	165	0	0	0	214	0	1	0	74	0	75	31	0	64	0	0	95	661
% App. Total	3	0	76.1	20.9	0		42.9	41.9	1	14.3	0		22.9	77.1	0	0	0		0	1.3	0	98.7	0		32.6	0	67.4	0	0		
PHF	.167	.000	.531	.292	.000	.558	.417	.667	.083	.313	.000	.700	.510	.598	.000	.000	.000	.660	.000	.083	.000	.617	.000	.625	.517	.000	.593	.000	.000	.565	.734
Cars	2	0	48	14	0	64	90	85	2	28	0	205	48	165	0	0	0	213	0	1	0	74	0	75	31	0	64	0	0	95	652
% Cars	100	0	94.1	100	0	95.5	100	96.6	100	93.3	0	97.6	98.0	100	0	0	0	99.5	0	100	0	100	0	100	100	0	100	0	0	100	98.6
Heavy Vehicles	0	0	3	0	0	3	0	3	0	2	0	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9
% Heavy Vehicles	0	0	5.9	0	0	4.5	0	3.4	0	6.7	0	2.4	2.0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	1.4



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File Name : 122868 FF
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	1	0	36	9	0	9	25	0	3	0	5	14	0	0	0	0	0	0	10	0	13	0	15	0	0	140
04:55 PM	0	0	23	8	0	5	30	0	0	0	3	12	0	0	0	0	0	0	10	0	10	0	16	2	0	119
05:10 PM	0	0	30	7	0	7	22	0	4	0	8	20	0	0	0	0	0	0	12	0	11	0	24	1	0	146
05:25 PM	0	0	33	16	0	4	31	0	9	0	5	19	2	0	0	0	0	0	10	0	12	0	16	2	0	159
05:40 PM	0	0	28	10	0	5	32	0	11	0	5	11	0	0	0	0	0	0	13	0	10	0	14	0	0	139
05:55 PM	0	0	28	9	0	4	15	0	6	0	3	18	0	0	0	0	0	0	16	0	21	0	21	0	0	141
06:10 PM	0	0	38	14	0	2	14	0	8	0	5	10	0	1	0	0	0	0	6	0	13	0	16	1	0	128
06:25 PM	0	0	36	11	0	3	13	1	8	0	2	14	0	0	0	0	0	0	6	0	12	0	14	0	0	120
Grand Total	1	0	252	84	0	39	182	1	49	0	36	118	2	1	0	0	0	0	83	0	102	0	136	6	0	1092
Apprch %	0.3	0	74.8	24.9	0	14.4	67.2	0.4	18.1	0	22.9	75.2	1.3	0.6	0	0	0	0	100	0	41.8	0	55.7	2.5	0	
Total %	0.1	0	23.1	7.7	0	3.6	16.7	0.1	4.5	0	3.3	10.8	0.2	0.1	0	0	0	0	7.6	0	9.3	0	12.5	0.5	0	
Cars	1	0	250	82	0	38	182	1	48	0	34	118	2	1	0	0	0	0	83	0	102	0	135	6	0	1083
% Cars	100	0	99.2	97.6	0	97.4	100	100	98	0	94.4	100	100	100	0	0	0	0	100	0	100	0	99.3	100	0	99.2
Heavy Vehicles	0	0	2	2	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	9
% Heavy Vehicles	0	0	0.8	2.4	0	2.6	0	0	2	0	5.6	0	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0.8

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:10:00 PM																															
5:10:00 PM	0	0	30	7	0	37	**7**	22	0	4	0	33	**8**	**20**	0	0	0	**28**	**0**	**0**	**0**	**12**	**0**	**12**	**11**	**0**	**24**	1	0	36	146
5:25:00 PM	0	0	**33**	**16**	0	**49**	4	31	0	9	0	44	5	19	**2**	0	0	26	0	0	0	10	0	10	12	0	16	**2**	0	30	**159**
5:40:00 PM	0	0	28	10	0	38	5	**32**	0	**11**	0	**48**	5	11	0	0	0	16	0	0	0	13	0	13	10	0	14	0	0	24	139
5:55:00 PM	0	0	28	9	0	37	4	15	0	6	0	25	3	18	0	0	0	21	0	0	0	**16**	0	**16**	**21**	0	21	0	0	**42**	141
Total Volume	0	0	119	42	0	161	20	100	0	30	0	150	21	68	2	0	0	91	0	0	0	51	0	51	54	0	75	3	0	132	585
% App. Total	0	0	73.9	26.1	0		13.3	66.7	0	20	0		23.1	74.7	2.2	0	0		0	0	0	100	0		40.9	0	56.8	2.3	0		
PHF	.000	.000	.902	.656	.000	.821	.714	.781	.000	.682	.000	.781	.656	.850	.250	.000	.000	.813	.000	.000	.000	.797	.000	.797	.643	.000	.781	.375	.000	.786	.920
Cars	0	0	118	42	0	160	19	100	0	29	0	148	20	68	2	0	0	90	0	0	0	51	0	51	54	0	74	3	0	131	580
% Cars	0	0	99.2	100	0	99.4	95.0	100	0	96.7	0	98.7	95.2	100	100	0	0	98.9	0	0	0	100	0	100	100	0	98.7	100	0	99.2	99.1
Heavy Vehicles	0	0	1	0	0	1	1	0	0	1	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	5
% Heavy Vehicles	0	0	0.8	0	0	0.6	5.0	0	0	3.3	0	1.3	4.8	0	0	0	0	1.1	0	0	0	0	0	0	0	0	1.3	0	0	0.8	0.9

N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 FF
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	1	0	35	8	0	9	25	0	3	0	5	14	0	0	0	0	0	0	10	0	13	0	15	0	0	138
04:55 PM	0	0	23	8	0	5	30	0	0	0	3	12	0	0	0	0	0	0	10	0	10	0	16	2	0	119
05:10 PM	0	0	30	7	0	7	22	0	4	0	8	20	0	0	0	0	0	0	12	0	11	0	24	1	0	146
05:25 PM	0	0	33	16	0	4	31	0	8	0	5	19	2	0	0	0	0	0	10	0	12	0	16	2	0	158
05:40 PM	0	0	28	10	0	4	32	0	11	0	4	11	0	0	0	0	0	0	13	0	10	0	14	0	0	137
05:55 PM	0	0	27	9	0	4	15	0	6	0	3	18	0	0	0	0	0	0	16	0	21	0	20	0	0	139
06:10 PM	0	0	38	13	0	2	14	0	8	0	4	10	0	1	0	0	0	0	6	0	13	0	16	1	0	126
06:25 PM	0	0	36	11	0	3	13	1	8	0	2	14	0	0	0	0	0	0	6	0	12	0	14	0	0	120
Grand Total	1	0	250	82	0	38	182	1	48	0	34	118	2	1	0	0	0	0	83	0	102	0	135	6	0	1083
Apprch %	0.3	0	75.1	24.6	0	14.1	67.7	0.4	17.8	0	21.9	76.1	1.3	0.6	0	0	0	0	100	0	42	0	55.6	2.5	0	
Total %	0.1	0	23.1	7.6	0	3.5	16.8	0.1	4.4	0	3.1	10.9	0.2	0.1	0	0	0	0	7.7	0	9.4	0	12.5	0.6	0	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:10:00 PM																															
5:10:00 PM	0	0	30	7	0	37	**7**	22	0	4	0	33	**8**	**20**	0	0	0	**28**	**0**	**0**	**0**	**12**	**0**	**12**	**11**	**0**	**24**	1	0	36	146
5:25:00 PM	0	0	**33**	**16**	0	**49**	4	31	0	8	0	43	5	19	**2**	0	0	26	0	0	0	10	0	10	12	0	16	**2**	0	30	**158**
5:40:00 PM	0	0	28	10	0	38	4	**32**	0	**11**	0	**47**	4	11	0	0	0	15	0	0	0	13	0	13	10	0	14	0	0	24	137
5:55:00 PM	0	0	27	9	0	36	4	15	0	6	0	25	3	18	0	0	0	21	0	0	0	**16**	0	**16**	**21**	0	20	0	0	**41**	139
Total Volume	0	0	118	42	0	160	19	100	0	29	0	148	20	68	2	0	0	90	0	0	0	51	0	51	54	0	74	3	0	131	580
% App. Total	0	0	73.8	26.2	0		12.8	67.6	0	19.6	0		22.2	75.6	2.2	0	0		0	0	0	100	0		41.2	0	56.5	2.3	0		
PHF	.000	.000	.894	.656	.000	.816	.679	.781	.000	.659	.000	.787	.625	.850	.250	.000	.000	.804	.000	.000	.000	.797	.000	.797	.643	.000	.771	.375	.000	.799	.918

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N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 FF
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:25 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:40 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:55 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
06:10 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
06:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	2	2	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	9
Apprch %	0	0	50	50	0	50	0	0	50	0	100	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	22.2	22.2	0	11.1	0	0	11.1	0	22.2	0	0	0	0	0	0	0	0	0	0	0	11.1	0	0	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:25:00 PM																															
5:25:00 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40:00 PM	0	0	0	0	0	0	**1**	0	0	0	0	1	**1**	0	0	0	**1**														**2**
5:55:00 PM	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	2
6:10:00 PM	0	0	0	**1**	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	1	1	0	2	1	0	0	1	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	7
% App. Total	0	0	50	50	0		50	0	0	50	0		100	0	0	0	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.000	.250	.250	.000	.500	.250	.000	.000	.250	.000	.500	.500	.000	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.875

N/S/SW: Morton Street
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Page No : 1

Groups Printed- Peds and Bicycles

	Morton Street From North					Brock Street From East					Morton Street From South					Morton Street From Southwest					Wyman Street From West					
Start Time	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Int. Total
04:40 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:55 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:10 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	5
05:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:40 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:55 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
06:10 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
06:25 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	0	1	0	1	0	0	0	0	12	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	19
Apprch %	0	0	50	0	50	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	100	0	0	
Total %	0	0	5.3	0	5.3	0	0	0	0	63.2	0	0	0	0	0	0	0	0	0	21.1	0	0	5.3	0	0	

	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 5:40:00 PM																															
5:40:00 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:55:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	2
6:10:00 PM	0	0	0	0	0	0	0	0	0	0	**4**	**4**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
6:25:00 PM	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	12
% App. Total	0	0	0	0	0		0	0	0	0	100		0	0	0	0	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.688	.688	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.750

N/S/SW: Morton Street
E/W: Brock Street/ Wyman Street
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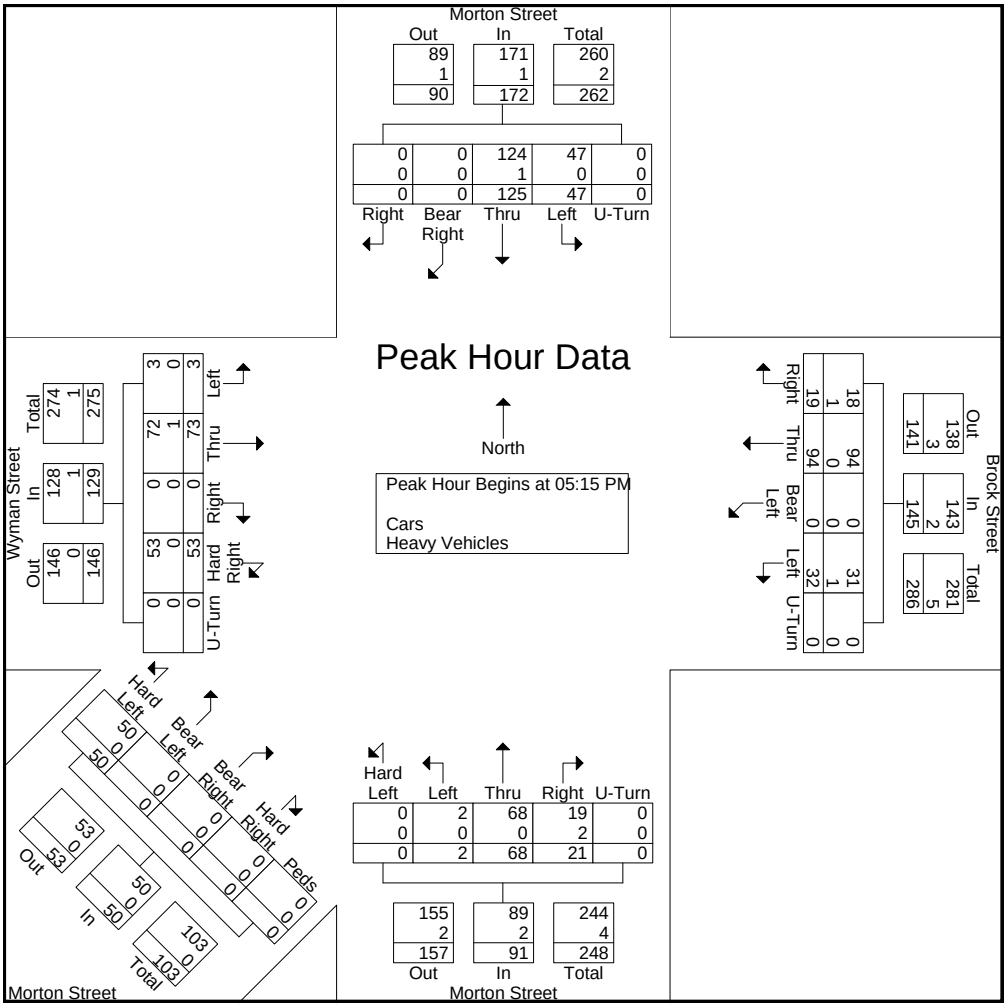
	Morton Street From North						Brock Street From East						Morton Street From South						Morton Street From Southwest						Wyman Street From West						
Start Time	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	App. Total	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 05:15 PM																															
05:15 PM	0	0	11	3	0	14	1	5	0	4	0	10	3	7	0	0	0	10	0	0	0	5	0	5	4	0	6	0	0	10	49
05:20 PM	0	0	11	1	0	12	**4**	8	0	0	0	12	**4**	**9**	0	0	0	**13**										**1**	0	15	54
05:25 PM	0	0	8	2	0	10	0	12	0	4	0	16	2	8	0	0	0	10	0	0	0	4	0	4	2	0	7	1	0	10	50
05:30 PM	0	0	8	4	0	12	1	5	0	2	0	8	2	4	**2**	0	0	8	0	0	0	4	0	4	2	0	3	1	0	6	38
05:35 PM	0	0	**17**	**10**	0	**27**	3	14	0	3	0	20	1	7	0	0	0	8	0	0	0	2	0	2	8	0	6	0	0	14	**71**
05:40 PM	0	0	11	3	0	14	3	7	0	4	0	14	1	2	0	0	0	3	0	0	0	**6**	0	**6**	2	0	2	0	0	4	41
05:45 PM	0	0	12	4	0	16	2	7	0	2	0	11	2	4	0	0	0	6	0	0	0	4	0	4	4	0	6	0	0	10	47
05:50 PM	0	0	5	3	0	8	0	**18**	0	**5**	0	**23**	2	5	0	0	0	7	0	0	0	3	0	3	4	0	6	0	0	10	51
05:55 PM	0	0	4	0	0	4	0	5	0	0	0	5	2	9	0	0	0	11	0	0	0	6	0	6	6	0	5	0	0	11	37
06:00 PM	0	0	11	6	0	17	1	5	0	2	0	8	0	4	0	0	0	4	0	0	0	6	0	6	5	0	**11**	0	0	**16**	51
06:05 PM	0	0	13	3	0	16	3	5	0	4	0	12	1	5	0	0	0	6	0	0	0	4	0	4	**10**	0	5	0	0	15	53
06:10 PM	0	0	14	8	0	22	1	3	0	2	0	6	1	4	0	0	0	5	0	0	0	4	0	4	1	0	7	0	0	8	45
Total Volume	0	0	125	47	0	172	19	94	0	32	0	145	21	68	2	0	0	91	0	0	0	50	0	50	53	0	73	3	0	129	587
% App. Total	0	0	72.7	27.3	0		13.1	64.8	0	22.1	0		23.1	74.7	2.2	0	0		0	0	0	100	0		41.1	0	56.6	2.3	0		
PHF	.000	.000	.613	.392	.000	.531	.396	.435	.000	.533	.000	.525	.438	.630	.083	.000	.000	.583	.000	.000	.000	.694	.000	.694	.442	.000	.553	.250	.000	.672	.689
Cars	0	0	124	47	0	171	18	94	0	31	0	143	19	68	2	0	0	89	0	0	0	50	0	50	53	0	72	3	0	128	581
% Cars	0	0	99.2	100	0	99.4	94.7	100	0	96.9	0	98.6	90.5	100	100	0	0	97.8	0	0	0	100	0	100	100	0	98.6	100	0	99.2	99.0
Heavy Vehicles	0	0	1	0	0	1	1	0	0	1	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	6
% Heavy Vehicles	0	0	0.8	0	0	0.6	5.3	0	0	3.1	0	1.4	9.5	0	0	0	0	2.2	0	0	0	0	0	0	0	0	1.4	0	0	0.8	1.0



N/S: Park Avenue/Summer Street
E/W: Park Street (Route 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 G
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	1	0	0	0	1	148	1	0	3	0	54	0	9	62	0	0	279
06:45 AM	0	0	0	0	1	158	6	0	4	0	49	0	20	74	0	0	312
Total	1	0	0	0	2	306	7	0	7	0	103	0	29	136	0	0	591
07:00 AM	2	0	0	0	2	123	1	0	1	0	49	0	28	82	1	0	289
07:15 AM	1	0	2	0	1	133	0	0	3	0	51	0	27	108	1	0	327
07:30 AM	3	0	1	0	5	157	0	0	0	2	50	0	19	133	3	0	373
07:45 AM	4	1	0	0	2	136	4	0	3	3	45	0	24	104	0	0	326
Total	10	1	3	0	10	549	5	0	7	5	195	0	98	427	5	0	1315
08:00 AM	3	2	0	0	0	129	6	0	4	1	59	0	25	96	1	0	326
08:15 AM	2	0	1	0	0	145	1	0	3	3	46	0	18	114	1	0	334
Grand Total	16	3	4	0	12	1129	19	0	21	9	403	0	170	773	7	0	2566
Apprch %	69.6	13	17.4	0	1	97.3	1.6	0	4.8	2.1	93.1	0	17.9	81.4	0.7	0	
Total %	0.6	0.1	0.2	0	0.5	44	0.7	0	0.8	0.4	15.7	0	6.6	30.1	0.3	0	
Cars	16	3	4	0	12	1082	16	0	21	9	383	0	162	730	7	0	2445
% Cars	100	100	100	0	100	95.8	84.2	0	100	100	95	0	95.3	94.4	100	0	95.3
Heavy Vehicles	0	0	0	0	0	47	3	0	0	0	20	0	8	43	0	0	121
% Heavy Vehicles	0	0	0	0	0	4.2	15.8	0	0	0	5	0	4.7	5.6	0	0	4.7

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:30:00 AM																					
7:30:00 AM	3	0	**1**	**0**	**4**	**5**	**157**	**0**	**0**	**162**	0	2	50	0	52	19	**133**	**3**	**0**	**155**	**373**
7:45:00 AM	**4**				**5**	2	136	4	0	142	3	**3**									
8:00:00 AM	3	**2**	0	0	5	0	129	**6**	**0**	**135**	**4**	**1**	**59**	0	**64**	**25**	**96**	**1**	**0**	**122**	**326**
8:15:00 AM	2	0	1	0	3	0	145	1	0	146	3	3	46	0	52	18	114	1	0	133	334
Total Volume	12	3	2	0	17	7	567	11	0	585	10	9	200	0	219	86	447	5	0	538	1359
% App. Total	70.6	17.6	11.8	0		1.2	96.9	1.9	0		4.6	4.1	91.3	0		16	83.1	0.9	0		
PHF	.750	.375	.500	.000	.850	.350	.903	.458	.000	.903	.625	.750	.847	.000	.855	.860	.840	.417	.000	.868	.911
Cars	12	3	2	0	17	7	544	9	0	560	10	9	188	0	207	83	433	5	0	521	1305
% Cars	100	100	100	0	100	100	95.9	81.8	0	95.7	100	100	94.0	0	94.5	96.5	96.9	100	0	96.8	96.0
Heavy Vehicles	0	0	0	0	0	0	23	2	0	25	0	0	12	0	12	3	14	0	0	17	54
% Heavy Vehicles	0	0	0	0	0	0	4.1	18.2	0	4.3	0	0	6.0	0	5.5	3.5	3.1	0	0	3.2	4.0

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Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	1	0	0	0	1	145	1	0	3	0	54	0	9	58	0	0	272
06:45 AM	0	0	0	0	1	153	6	0	4	0	46	0	19	70	0	0	299
Total	1	0	0	0	2	298	7	0	7	0	100	0	28	128	0	0	571
07:00 AM	2	0	0	0	2	114	0	0	1	0	46	0	26	73	1	0	265
07:15 AM	1	0	2	0	1	126	0	0	3	0	49	0	25	96	1	0	304
07:30 AM	3	0	1	0	5	152	0	0	0	2	48	0	19	127	3	0	360
07:45 AM	4	1	0	0	2	130	3	0	3	3	42	0	24	102	0	0	314
Total	10	1	3	0	10	522	3	0	7	5	185	0	94	398	5	0	1243
08:00 AM	3	2	0	0	0	124	5	0	4	1	54	0	23	94	1	0	311
08:15 AM	2	0	1	0	0	138	1	0	3	3	44	0	17	110	1	0	320
Grand Total	16	3	4	0	12	1082	16	0	21	9	383	0	162	730	7	0	2445
Apprch %	69.6	13	17.4	0	1.1	97.5	1.4	0	5.1	2.2	92.7	0	18	81.2	0.8	0	
Total %	0.7	0.1	0.2	0	0.5	44.3	0.7	0	0.9	0.4	15.7	0	6.6	29.9	0.3	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 7:30:00 AM																					
7:30:00 AM	3	0	**1**	**0**	**4**	**5**	**152**	**0**	**0**	**157**	0	2	48	0	50	19	**127**	**3**	**0**	**149**	**360**
7:45:00 AM	**4**				**5**	2	130	3	0	135	3	**3**				**24**					
8:00:00 AM	3	**2**	0	0	5	0	124	**5**	**0**	**129**	**4**	**1**	**54**	0	**59**	23	94	1	0	118	311
8:15:00 AM	2	0	1	0	3	0	138	1	0	139	3	3	44	0	50	17	110	1	0	128	320
Total Volume	12	3	2	0	17	7	544	9	0	560	10	9	188	0	207	83	433	5	0	521	1305
% App. Total	70.6	17.6	11.8	0		1.2	97.1	1.6	0		4.8	4.3	90.8	0		15.9	83.1	1	0		
PHF	.750	.375	.500	.000	.850	.350	.895	.450	.000	.892	.625	.750	.870	.000	.877	.865	.852	.417	.000	.874	.906

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Page No : 1

Groups Printed- Heavy Vehicles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	7
06:45 AM	0	0	0	0	0	5	0	0	0	0	3	0	1	4	0	0	13
Total	0	0	0	0	0	8	0	0	0	0	3	0	1	8	0	0	20
07:00 AM	0	0	0	0	0	9	1	0	0	0	3	0	2	9	0	0	24
07:15 AM	0	0	0	0	0	7	0	0	0	0	2	0	2	12	0	0	23
07:30 AM	0	0	0	0	0	5	0	0	0	0	2	0	0	6	0	0	13
07:45 AM	0	0	0	0	0	6	1	0	0	0	3	0	0	2	0	0	12
Total	0	0	0	0	0	27	2	0	0	0	10	0	4	29	0	0	72
08:00 AM	0	0	0	0	0	5	1	0	0	0	5	0	2	2	0	0	15
08:15 AM	0	0	0	0	0	7	0	0	0	0	2	0	1	4	0	0	14
Grand Total	0	0	0	0	0	47	3	0	0	0	20	0	8	43	0	0	121
Apprch %	0	0	0	0	0	94	6	0	0	0	100	0	15.7	84.3	0	0	
Total %	0	0	0	0	0	38.8	2.5	0	0	0	16.5	0	6.6	35.5	0	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	**3**	0	**3**	1	4	0	0	5	13
7:00:00 AM	0	0	0	0	0	0	**9**	**1**		**10**	0	0	3	0	3	**2**					**24**
7:15:00 AM	0	0	0	0	0	0	7	0	0	7	0	0	2	0	2	2	**12**	0	0	**14**	23
7:30:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	2	0	2	0	6	0	0	6	13
Total Volume	0	0	0	0	0	0	26	1	0	27	0	0	10	0	10	5	31	0	0	36	73
% App. Total	0	0	0	0		0	96.3	3.7	0		0	0	100	0		13.9	86.1	0	0		
PHF	.000	.000	.000	.000	.000	.000	.722	.250	.000	.675	.000	.000	.833	.000	.833	.625	.646	.000	.000	.643	.760

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Page No : 1

Groups Printed- Peds and Bicycles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:30 AM	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	5
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	6
07:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	6	0	2	0	1	0	0	0	4	0	0	0	0	13
Apprch %	0	0	0	100	0	66.7	0	33.3	0	0	0	100	0	0	0	0	
Total %	0	0	0	46.2	0	15.4	0	7.7	0	0	0	30.8	0	0	0	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:30:00 AM																					
6:30:00 AM	0	0	0	**3**	**3**	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**5**
6:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
7:00:00 AM	0	0	0	1	1	0	**1**			**1**	0	0	0	0	0	0	0	0	0	0	2
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	4	4	0	1	0	0	1	0	0	0	3	3	0	0	0	0	0	8
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.333	.333	.000	.250	.000	.000	.250	.000	.000	.000	.375	.375	.000	.000	.000	.000	.000	.400

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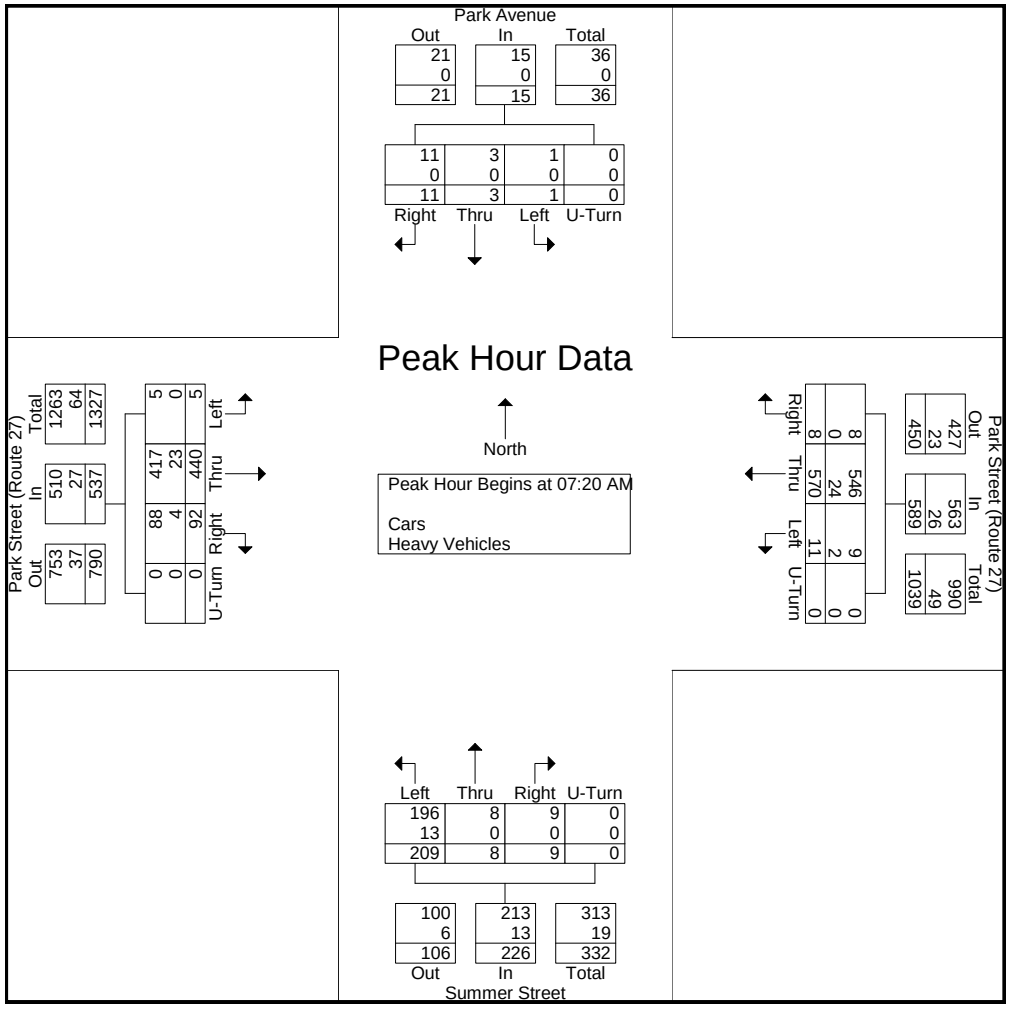
	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:20 AM																					
07:20 AM	0	0	0	0	0	1	53	0	0	54	1	0	19	0	20	9	40	1	0	50	124
07:25 AM	1	0	0	0	1	0	42	0	0	42	1	0	20	0	21	10	39	0	0	49	113
07:30 AM	1	0	0	0	1	2	35	0	0	37	0	1	21	0	22	9	**58**	**2**	**0**	**69**	**129**
07:35 AM	1	0	0	0	1	**3**	**62**			**65**	0	0	15	0	15	2	34	0	0	36	117
07:40 AM	1	0	**1**																		
07:45 AM	**2**	**0**	**0**	**0**	**2**	**0**	**44**	**0**	**0**	**44**	**0**	**0**	**11**	**0**	**11**	**12**	**31**	**0**	**0**	**43**	**100**
07:50 AM	**0**	**1**	0	0	1	0	47	3	0	50	1	1	15	0	17	8	41	0	0	49	117
07:55 AM	2	0	0	0	2	2	45	1	0	48	**2**	**2**									
08:00 AM	**2**	**1**	**0**	**0**	**3**	0	43	**4**	**0**	**47**	**2**	**1**	**20**	**0**	**23**	**14**	**37**	**1**	**0**	**52**	**125**
08:05 AM	**1**	**0**	**0**	**0**	**1**	**0**	**34**	**2**	**0**	**36**	**0**	**0**	**17**	**0**	**17**	**5**	**22**	**0**	**0**	**27**	**81**
08:10 AM	**0**	**1**	**0**	**0**	**1**	**0**	**52**	**0**	**0**	**52**	**2**	**0**	**22**	0	**24**	6	37	0	0	43	120
08:15 AM	0	0	0	0	0	0	53	1	0	54	0	2	16	0	18	5	28	0	0	33	105
Total Volume	11	3	1	0	15	8	570	11	0	589	9	8	209	0	226	92	440	5	0	537	1367
% App. Total	73.3	20	6.7	0		1.4	96.8	1.9	0		4	3.5	92.5	0		17.1	81.9	0.9	0		
PHF	.458	.250	.083	.000	.417	.222	.766	.229	.000	.755	.375	.333	.792	.000	.785	.548	.632	.208	.000	.649	.883
Cars	11	3	1	0	15	8	546	9	0	563	9	8	196	0	213	88	417	5	0	510	1301
% Cars	100	100	100	0	100	100	95.8	81.8	0	95.6	100	100	93.8	0	94.2	95.7	94.8	100	0	95.0	95.2
Heavy Vehicles	0	0	0	0	0	0	24	2	0	26	0	0	13	0	13	4	23	0	0	27	66
% Heavy Vehicles	0	0	0	0	0	0	4.2	18.2	0	4.4	0	0	6.2	0	5.8	4.3	5.2	0	0	5.0	4.8



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City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 122868 GG
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	13	6	3	0	5	110	4	0	4	0	40	0	31	134	9	0	359
04:55 PM	3	4	1	0	2	120	5	0	6	1	23	0	50	135	7	0	357
05:10 PM	10	3	2	0	2	117	6	0	3	2	31	0	49	130	3	0	358
05:25 PM	4	2	1	0	6	106	5	0	3	3	27	0	32	135	5	0	329
05:40 PM	8	4	4	0	3	115	4	0	3	3	37	0	37	125	5	0	348
05:55 PM	15	3	2	0	2	91	3	0	0	2	28	0	39	132	2	0	319
06:10 PM	1	0	0	0	2	101	4	0	1	1	34	0	44	144	0	0	332
06:25 PM	1	1	0	0	1	92	3	0	2	0	29	0	29	116	0	0	274
Grand Total	55	23	13	0	23	852	34	0	22	12	249	0	311	1051	31	0	2676
Apprch %	60.4	25.3	14.3	0	2.5	93.7	3.7	0	7.8	4.2	88	0	22.3	75.4	2.2	0	
Total %	2.1	0.9	0.5	0	0.9	31.8	1.3	0	0.8	0.4	9.3	0	11.6	39.3	1.2	0	
Cars	53	23	13	0	23	840	34	0	22	12	243	0	306	1028	31	0	2628
% Cars	96.4	100	100	0	100	98.6	100	0	100	100	97.6	0	98.4	97.8	100	0	98.2
Heavy Vehicles	2	0	0	0	0	12	0	0	0	0	6	0	5	23	0	0	48
% Heavy Vehicles	3.6	0	0	0	0	1.4	0	0	0	0	2.4	0	1.6	2.2	0	0	1.8

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	**13**	**6**	**3**	**0**	**22**	5	110	4	0	119	4	0	**40**	0	**44**	31	134	**9**	**0**	**174**	**359**
4:55:00 PM	3	4	1	0	8	2	**120**			**127**	**6**					**50**	**135**	7	0	**192**	357
5:10:00 PM	10	3	2	0	15	2	117	**6**													
5:25:00 PM	4	2	1	0	7	**6**	106	5	0	117	3	**3**	**27**	**0**	**33**	**32**	**135**	**5**	**0**	**172**	**329**
Total Volume	30	15	7	0	52	15	453	20	0	488	16	6	121	0	143	162	534	24	0	720	1403
% App. Total	57.7	28.8	13.5	0		3.1	92.8	4.1	0		11.2	4.2	84.6	0		22.5	74.2	3.3	0		
PHF	.577	.625	.583	.000	.591	.625	.944	.833	.000	.961	.667	.500	.756	.000	.813	.810	.989	.667	.000	.938	.977
Cars	29	15	7	0	51	15	446	20	0	481	16	6	118	0	140	159	518	24	0	701	1373
% Cars	96.7	100	100	0	98.1	100	98.5	100	0	98.6	100	100	97.5	0	97.9	98.1	97.0	100	0	97.4	97.9
Heavy Vehicles	1	0	0	0	1	0	7	0	0	7	0	0	3	0	3	3	16	0	0	19	30
% Heavy Vehicles	3.3	0	0	0	1.9	0	1.5	0	0	1.4	0	0	2.5	0	2.1	1.9	3.0	0	0	2.6	2.1

N/S: Park Avenue/Summer Street
E/W: Park Street (Route 27)
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 GG
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	13	6	3	0	5	108	4	0	4	0	38	0	30	130	9	0	350
04:55 PM	3	4	1	0	2	118	5	0	6	1	23	0	49	131	7	0	350
05:10 PM	9	3	2	0	2	115	6	0	3	2	30	0	48	123	3	0	346
05:25 PM	4	2	1	0	6	105	5	0	3	3	27	0	32	134	5	0	327
05:40 PM	8	4	4	0	3	115	4	0	3	3	37	0	37	125	5	0	348
05:55 PM	14	3	2	0	2	89	3	0	0	2	28	0	39	129	2	0	313
06:10 PM	1	0	0	0	2	100	4	0	1	1	32	0	42	140	0	0	323
06:25 PM	1	1	0	0	1	90	3	0	2	0	28	0	29	116	0	0	271
Grand Total	53	23	13	0	23	840	34	0	22	12	243	0	306	1028	31	0	2628
Apprch %	59.6	25.8	14.6	0	2.6	93.6	3.8	0	7.9	4.3	87.7	0	22.4	75.3	2.3	0	
Total %	2	0.9	0.5	0	0.9	32	1.3	0	0.8	0.5	9.2	0	11.6	39.1	1.2	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	**13**	**6**	**3**	**0**	**22**	5	108	4	0	117	4	0	**38**	0	**42**	30	130	**9**	**0**	**169**	**350**
4:55:00 PM	3	4	1	0	8	2	**118**			**125**	**6**					**49**				**187**	350
5:10:00 PM	9	3	2	0	14	2	115	**6**													
5:25:00 PM	4	2	1	0	7	**6**	105	5	0	116	3	**3**	**27**	**0**	**33**	**32**	**134**	5	0	171	327
Total Volume	29	15	7	0	51	15	446	20	0	481	16	6	118	0	140	159	518	24	0	701	1373
% App. Total	56.9	29.4	13.7	0		3.1	92.7	4.2	0		11.4	4.3	84.3	0		22.7	73.9	3.4	0		
PHF	.558	.625	.583	.000	.580	.625	.945	.833	.000	.962	.667	.500	.776	.000	.833	.811	.966	.667	.000	.937	.981

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Groups Printed- Heavy Vehicles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:40 PM	0	0	0	0	0	2	0	0	0	0	2	0	1	4	0	0	9
04:55 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	4	0	0	7
05:10 PM	1	0	0	0	0	2	0	0	0	0	1	0	1	7	0	0	12
05:25 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:55 PM	1	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	6
06:10 PM	0	0	0	0	0	1	0	0	0	0	2	0	2	4	0	0	9
06:25 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	3
Grand Total	2	0	0	0	0	12	0	0	0	0	6	0	5	23	0	0	48
Apprch %	100	0	0	0	0	100	0	0	0	0	100	0	17.9	82.1	0	0	
Total %	4.2	0	0	0	0	25	0	0	0	0	12.5	0	10.4	47.9	0	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:40:00 PM																					
4:40:00 PM	0	0	0	0	0	0	**2**	**0**	**0**	**2**	0	0	**2**	0	**2**	**1**	**4**	**0**	**0**	**5**	**9**
4:55:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	4	0	0	5	7
5:10:00 PM	**1**				**1**	0	2	0	0	2	0	0	1	0	1	1	**7**	0	0	**8**	**12**
5:25:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	1	0	0	0	1	0	7	0	0	7	0	0	3	0	3	3	16	0	0	19	30
% App. Total	100	0	0	0		0	100	0	0		0	0	100	0		15.8	84.2	0	0		
PHF	.250	.000	.000	.000	.250	.000	.875	.000	.000	.875	.000	.000	.375	.000	.375	.750	.571	.000	.000	.594	.625

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Groups Printed- Peds and Bicycles

	Park Avenue From North				Park Street (Route 27) From East				Summer Street From South				Park Street (Route 27) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:55 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
05:10 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3
05:25 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:40 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
05:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:10 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
06:25 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	2	0	0	0	0	0	0	0	9	0	0	0	0	11
Apprch %	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	18.2	0	0	0	0	0	0	0	81.8	0	0	0	0	

	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:55:00 PM																					
4:55:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	2
5:10:00 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	**3**
5:25:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
5:40:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Total Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	8
% App. Total	0	0	0	100		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.000	.000	.000	.000	.000	.667

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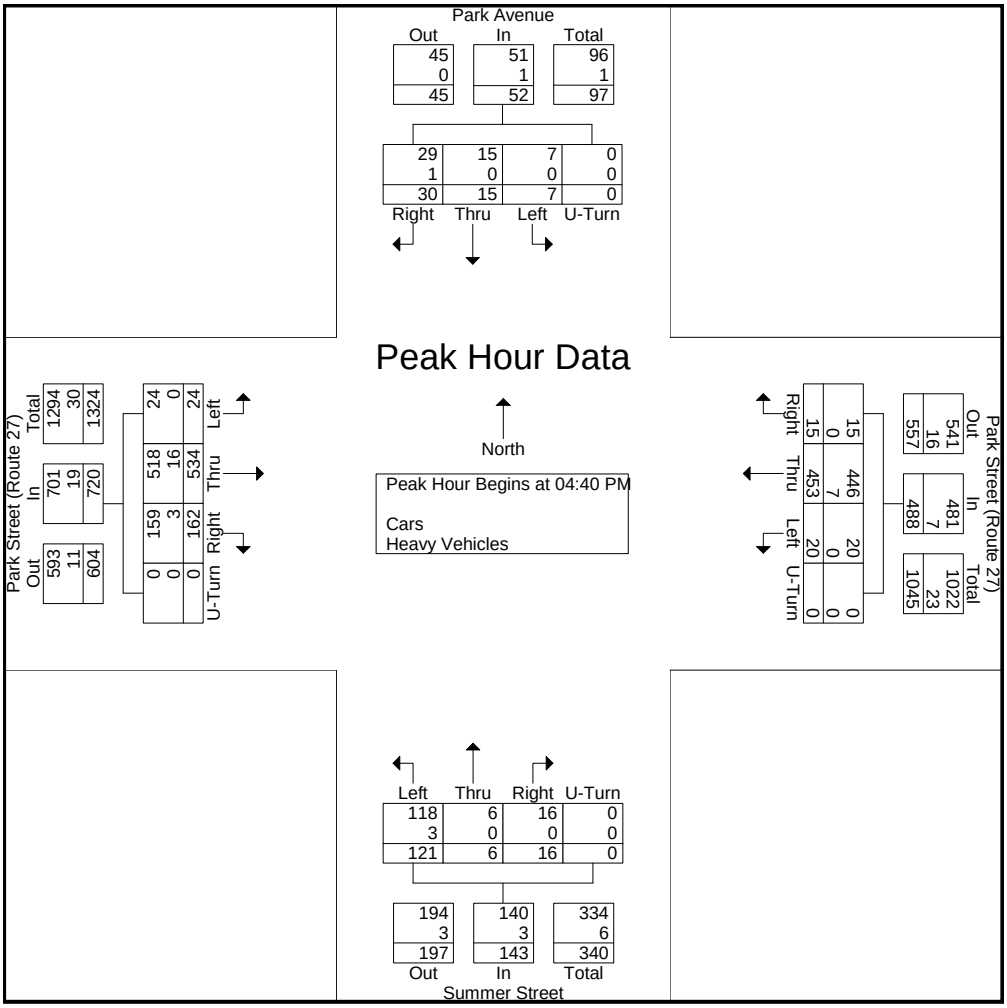
	Park Avenue From North					Park Street (Route 27) From East					Summer Street From South					Park Street (Route 27) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:40 PM																					
04:40 PM	**5**	**3**	**2**	**0**	**10**	**3**	43	2	0	48	1	0	5	0	6	13	**57**	**4**	**0**	**74**	**138**
04:45 PM	3	1	0	0	4	1	35	2	0	38	2	0	**18**	0	**20**	10	37	3	0	50	112
04:50 PM	5	2	1	0	8	1	32	0	0	33	1	0	17	0	18	8	40	2	0	50	109
04:55 PM	2	0	0	0	2	0	35	3	0	38	0	0	6	0	6	17	40	2	0	59	105
05:00 PM	0	2	1	0	3	1	46	2	0	49	2	0	8	0	10	**21**					
05:05 PM	**1**	**2**	**0**	**0**	**3**	**1**	**39**	**0**	**0**	**40**	**4**	**1**	**9**	**0**	**14**	**12**	**49**	**2**	**0**	**63**	**120**
05:10 PM	**2**	**0**	**2**	**0**	**4**	**0**	**40**	**0**	**0**	**40**	**0**	**1**	**11**	**0**	**12**	**15**	**47**	**0**	**0**	**62**	**118**
05:15 PM	**3**	**3**	**0**	**0**	**6**	**1**	**35**	**4**	**0**	**40**	**2**	**0**	**9**	**0**	**11**	**20**	**32**	**2**	**0**	**54**	**111**
05:20 PM	**5**	**0**	**0**	**0**	**5**	**1**	**42**	**2**	**0**	**45**	**1**	**1**	**11**	**0**	**13**	**14**	**51**	**1**	**0**	**66**	**129**
05:25 PM	**0**	**0**	**1**	**0**	**1**	**2**	**47**	**2**	**0**	**51**	1	1	10	0	12	9	36	2	0	47	111
05:30 PM	4	1	0	0	5	2	30	3	0	35	1	1	5	0	7	14	54	3	0	71	118
05:35 PM	0	1	0	0	1	2	29	0	0	31	1	1	12	0	14	9	45	0	0	54	100
Total Volume	30	15	7	0	52	15	453	20	0	488	16	6	121	0	143	162	534	24	0	720	1403
% App. Total	57.7	28.8	13.5	0		3.1	92.8	4.1	0		11.2	4.2	84.6	0		22.5	74.2	3.3	0		
PHF	.500	.417	.292	.000	.433	.417	.803	.417	.000	.797	.333	.500	.560	.000	.596	.643	.781	.500	.000	.811	.847
Cars	29	15	7	0	51	15	446	20	0	481	16	6	118	0	140	159	518	24	0	701	1373
% Cars	96.7	100	100	0	98.1	100	98.5	100	0	98.6	100	100	97.5	0	97.9	98.1	97.0	100	0	97.4	97.9
Heavy Vehicles	1	0	0	0	1	0	7	0	0	7	0	0	3	0	3	3	16	0	0	19	30
% Heavy Vehicles	3.3	0	0	0	1.9	0	1.5	0	0	1.4	0	0	2.5	0	2.1	1.9	3.0	0	0	2.6	2.1



Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Groups Printed- Cars - Heavy Vehicles

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
06:30 AM	2	2	0	0	0	0	0	0	0	4
06:45 AM	12	1	0	0	0	0	0	2	1	16
Total	14	3	0	0	0	0	0	2	1	20
07:00 AM	33	2	0	0	0	0	0	1	2	38
07:15 AM	42	3	0	0	0	0	0	1	1	47
07:30 AM	15	8	0	0	0	0	0	1	1	25
07:45 AM	14	3	0	0	0	0	0	1	4	22
Total	104	16	0	0	0	0	0	4	8	132
08:00 AM	7	3	0	0	0	0	0	0	2	12
08:15 AM	7	3	0	0	0	0	0	4	1	15
Grand Total	132	25	0	0	0	0	0	10	12	179
Apprch %	84.1	15.9	0	0	0	0	0	45.5	54.5	
Total %	73.7	14	0	0	0	0	0	5.6	6.7	
Cars	131	25	0	0	0	0	0	10	12	178
% Cars	99.2	100	0	0	0	0	0	100	100	99.4
Heavy Vehicles	1	0	0	0	0	0	0	0	0	1
% Heavy Vehicles	0.8	0	0	0	0	0	0	0	0	0.6

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	33	2	0	35	0	0	0	0	0	**1**	**2**	**3**	**38**
7:15:00 AM	**42**	3	0	**45**	0	0	0	0	0	1	1	2	**47**
7:30:00 AM	15	**8**											
7:45:00 AM	**14**	**3**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**5**	22
Total Volume	104	16	0	120	0	0	0	0	0	4	8	12	132
% App. Total	86.7	13.3	0		0	0	0		0	33.3	66.7		
PHF	.619	.500	.000	.667	.000	.000	.000	.000	.000	1.00	.500	.600	.702
Cars	104	16	0	120	0	0	0	0	0	4	8	12	132
% Cars	100	100	0	100	0	0	0	0	0	100	100	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
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Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
06:30 AM	2	2	0	0	0	0	0	0	0	4
06:45 AM	12	1	0	0	0	0	0	2	1	16
Total	14	3	0	0	0	0	0	2	1	20
07:00 AM	33	2	0	0	0	0	0	1	2	38
07:15 AM	42	3	0	0	0	0	0	1	1	47
07:30 AM	15	8	0	0	0	0	0	1	1	25
07:45 AM	14	3	0	0	0	0	0	1	4	22
Total	104	16	0	0	0	0	0	4	8	132
08:00 AM	6	3	0	0	0	0	0	0	2	11
08:15 AM	7	3	0	0	0	0	0	4	1	15
Grand Total	131	25	0	0	0	0	0	10	12	178
Apprch %	84	16	0	0	0	0	0	45.5	54.5	
Total %	73.6	14	0	0	0	0	0	5.6	6.7	

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	33	2	0	35	0	0	0	0	0	**1**	**2**	**3**	**38**
7:15:00 AM	**42**	3	0	**45**	0	0	0	0	0	1	1	2	**47**
7:30:00 AM	15	**8**											
7:45:00 AM	**14**	**3**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**5**	22
Total Volume	104	16	0	120	0	0	0	0	0	4	8	12	132
% App. Total	86.7	13.3	0		0	0	0		0	33.3	66.7		
PHF	.619	.500	.000	.667	.000	.000	.000	.000	.000	1.00	.500	.600	.702

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
Client: VHB/ E. Chan

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 122868 H
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	0	0	0	0	0	1
Apprch %	100	0	0	0	0	0	0	0	0	
Total %	100	0	0	0	0	0	0	0	0	

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:15:00 AM													
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00 AM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	**1**
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1
% App. Total	100	0	0		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
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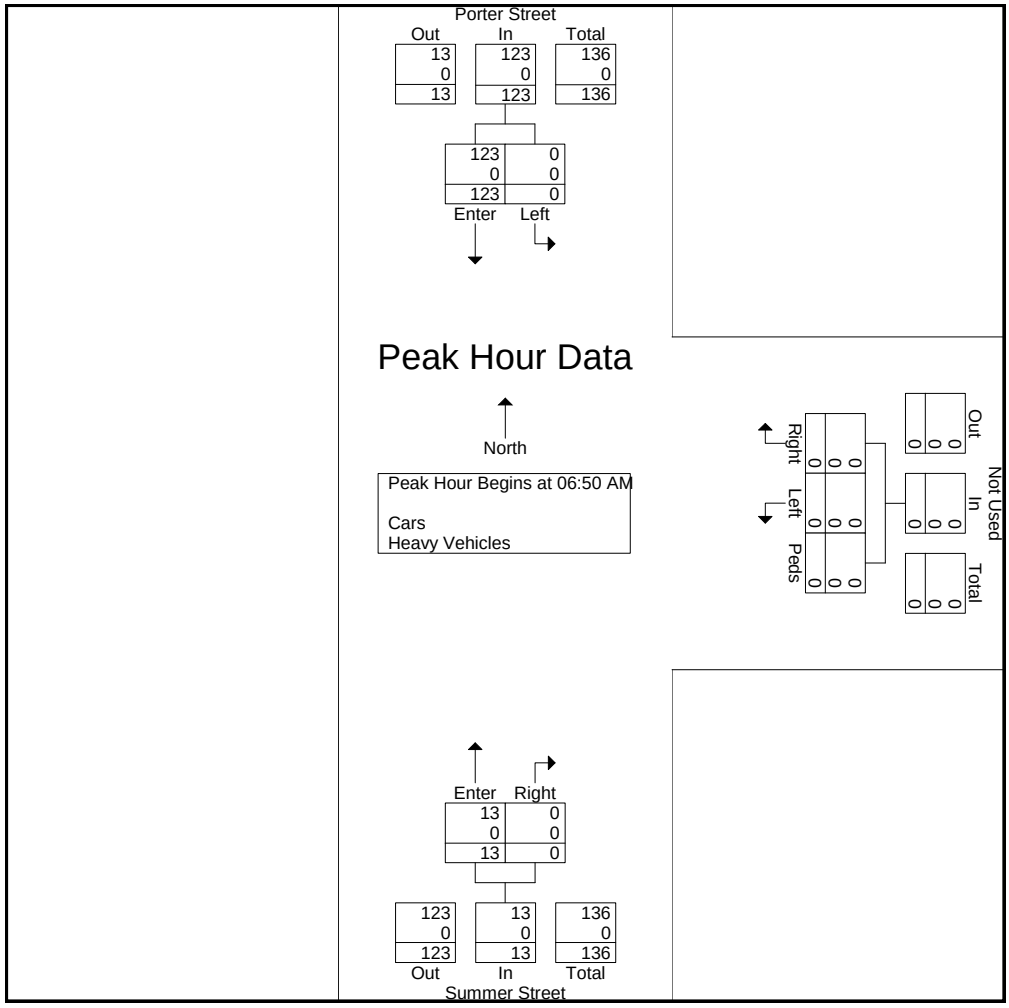
Start Date : 4/12/2012
Page No : 1

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 06:50 AM													
06:50 AM	5	0	0	5	0	0	0	0	0	**2**	**0**	**2**	**7**
06:55 AM	**4**	**1**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**6**
07:00 AM	**7**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**8**
07:05 AM	**15**	0	0	15	0	0	0	0	0	0	**2**	**2**	**17**
07:10 AM	11	2	0	13	0	0	0	0	0	0	0	0	13
07:15 AM	14	0	0	14	0	0	0	0	0	0	1	1	15
07:20 AM	14	1	0	15	0	0	0	0	0	0	0	0	15
07:25 AM	14	2	0	**16**	0	0	0	0	0	1	0	1	17
07:30 AM	3	**4**											
07:35 AM	**4**	**3**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
07:40 AM	**8**	**1**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**11**
07:45 AM	**8**	**2**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**3**	13
Total Volume	107	16	0	123	0	0	0	0	0	6	7	13	136
% App. Total	87	13	0		0	0	0		0	46.2	53.8		
PHF	.594	.333	.000	.641	.000	.000	.000	.000	.000	.250	.292	.361	.667
Cars	107	16	0	123	0	0	0	0	0	6	7	13	136
% Cars	100	100	0	100	0	0	0	0	0	100	100	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0



Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 HH
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
04:40 PM	7	7	0	0	0	0	0	3	3	20
04:55 PM	6	6	0	0	0	0	0	4	2	18
05:10 PM	6	9	0	0	0	0	0	3	1	19
05:25 PM	8	12	0	0	0	0	0	4	2	26
05:40 PM	6	12	0	0	0	0	0	7	3	28
05:55 PM	4	7	0	0	0	0	0	4	5	20
06:10 PM	11	16	0	0	0	0	0	6	0	33
06:25 PM	8	3	0	0	0	0	0	3	3	17
Grand Total	56	72	0	0	0	0	0	34	19	181
Apprch %	43.8	56.2	0	0	0	0	0	64.2	35.8	
Total %	30.9	39.8	0	0	0	0	0	18.8	10.5	
Cars	56	72	0	0	0	0	0	34	19	181
% Cars	100	100	0	0	0	0	0	100	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 5:25:00 PM													
5:25:00 PM	8	12	0	20	0	0	0	0	0	4	2	6	26
5:40:00 PM	6	12	0	18	0	0	0	0	0	**7**	**3**	**10**	28
5:55:00 PM	4	7	0	11	0	0	0	0	0	4	**5**		
6:10:00 PM	**11**	**16**	**0**	**27**	0	0	0	0	0	6	0	6	**33**
Total Volume	29	47	0	76	0	0	0	0	0	21	10	31	107
% App. Total	38.2	61.8	0		0	0	0		0	67.7	32.3		
PHF	.659	.734	.000	.704	.000	.000	.000	.000	.000	.750	.500	.775	.811
Cars	29	47	0	76	0	0	0	0	0	21	10	31	107
% Cars	100	100	0	100	0	0	0	0	0	100	100	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 HH
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
04:40 PM	7	7	0	0	0	0	0	3	3	20
04:55 PM	6	6	0	0	0	0	0	4	2	18
05:10 PM	6	9	0	0	0	0	0	3	1	19
05:25 PM	8	12	0	0	0	0	0	4	2	26
05:40 PM	6	12	0	0	0	0	0	7	3	28
05:55 PM	4	7	0	0	0	0	0	4	5	20
06:10 PM	11	16	0	0	0	0	0	6	0	33
06:25 PM	8	3	0	0	0	0	0	3	3	17
Grand Total	56	72	0	0	0	0	0	34	19	181
Apprch %	43.8	56.2	0	0	0	0	0	64.2	35.8	
Total %	30.9	39.8	0	0	0	0	0	18.8	10.5	

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 5:25:00 PM													
5:25:00 PM	8	12	0	20	0	0	0	0	0	4	2	6	26
5:40:00 PM	6	12	0	18	0	0	0	0	0	**7**	**3**	**10**	28
5:55:00 PM	4	7	0	11	0	0	0	0	0	4	**5**		
6:10:00 PM	**11**	**16**	**0**	**27**	0	0	0	0	0	6	0	6	**33**
Total Volume	29	47	0	76	0	0	0	0	0	21	10	31	107
% App. Total	38.2	61.8	0		0	0	0		0	67.7	32.3		
PHF	.659	.734	.000	.704	.000	.000	.000	.000	.000	.750	.500	.775	.811

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
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Page No : 1

Groups Printed- Heavy Vehicles

	Porter Street From North			Not Used From East			Summer Street From South			
Start Time	Exit	Enter	Left	Right	Left	Peds	Right	Exit	Enter	Int. Total
04:40 PM	0	0	0	0	0	0	0	0	0	0
04:55 PM	0	0	0	0	0	0	0	0	0	0
05:10 PM	0	0	0	0	0	0	0	0	0	0
05:25 PM	0	0	0	0	0	0	0	0	0	0
05:40 PM	0	0	0	0	0	0	0	0	0	0
05:55 PM	0	0	0	0	0	0	0	0	0	0
06:10 PM	0	0	0	0	0	0	0	0	0	0
06:25 PM	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:40:00 PM													
4:40:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Entering & Exiting Traffic to Trackside Plaza from Porter & Summer Streets
City, State: Stoughton, MA
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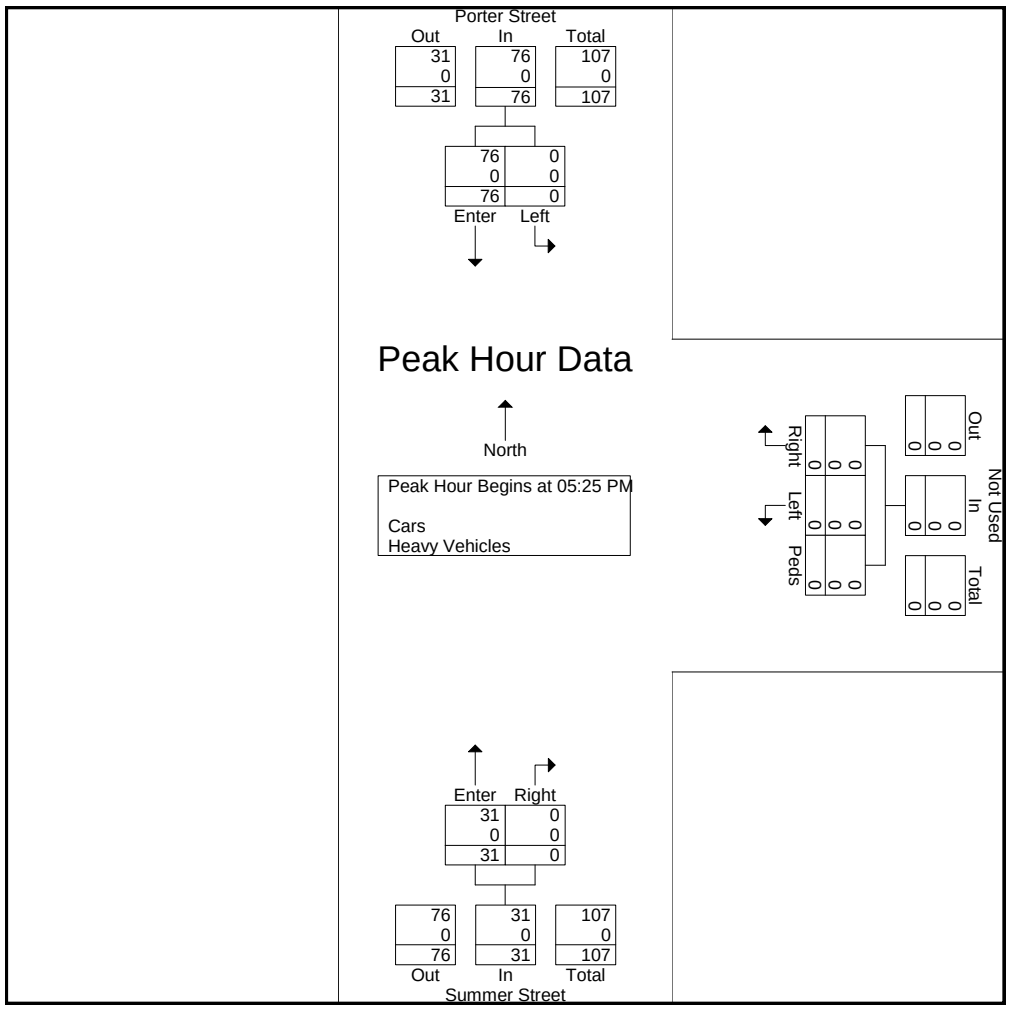
Page No : 1

	Porter Street From North				Not Used From East				Summer Street From South				
Start Time	Exit	Enter	Left	App. Total	Right	Left	Peds	App. Total	Right	Exit	Enter	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:25 PM													
05:25 PM	0	2	0	2	0	0	0	0	0	2	1	3	5
05:30 PM	4	4	0	8	0	0	0	0	0	2	0	2	10
05:35 PM	4	6	0	**10**	0	0	0	0	0	0	1	1	11
05:40 PM	3	4	0	7	0	0	0	0	0	**3**			
05:45 PM	**1**	**6**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**9**
05:50 PM	**2**	**2**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**4**	**8**
05:55 PM	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
06:00 PM	**1**	**4**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**4**	**9**
06:05 PM	**2**	**2**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**5**	9
06:10 PM	2	**7**											
06:15 PM	**3**	**6**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**12**
06:20 PM	**6**	3	0	9	0	0	0	0	0	2	0	2	11
Total Volume	29	47	0	76	0	0	0	0	0	21	10	31	107
% App. Total	38.2	61.8	0		0	0	0		0	67.7	32.3		
PHF	.403	.560	.000	.633	.000	.000	.000	.000	.000	.583	.278	.517	.743
Cars	29	47	0	76	0	0	0	0	0	21	10	31	107
% Cars	100	100	0	100	0	0	0	0	0	100	100	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0



N/S: Washington Street (Route 138)
W: Railroad Avenue
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 I
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	2	30	0	117	1	0	1	0	0	151
06:45 AM	1	36	0	91	0	0	3	0	0	131
Total	3	66	0	208	1	0	4	0	0	282
07:00 AM	0	49	0	115	0	0	0	0	0	164
07:15 AM	0	56	0	108	0	0	1	0	0	165
07:30 AM	2	69	0	130	0	0	2	1	0	204
07:45 AM	0	54	0	110	0	0	2	0	0	166
Total	2	228	0	463	0	0	5	1	0	699
08:00 AM	0	54	0	90	0	0	1	0	0	145
08:15 AM	1	60	0	114	0	0	2	0	0	177
Grand Total	6	408	0	875	1	0	12	1	0	1303
Apprch %	1.4	98.6	0	99.9	0.1	0	92.3	7.7	0	
Total %	0.5	31.3	0	67.2	0.1	0	0.9	0.1	0	
Cars	6	384	0	841	1	0	12	1	0	1245
% Cars	100	94.1	0	96.1	100	0	100	100	0	95.5
Heavy Vehicles	0	24	0	34	0	0	0	0	0	58
% Heavy Vehicles	0	5.9	0	3.9	0	0	0	0	0	4.5

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	0	49	0	49	115	0	0	115	0	0	0	0	164
7:15:00 AM	0	56	0	56	108	0	0	108	1	0	0	1	165
7:30:00 AM	**2**	**69**	**0**	**71**	**130**	0	0	**130**	**2**	**1**	**0**	**3**	**204**
7:45:00 AM	0	54	0	54	110	0	0	110	2	0	0	2	166
Total Volume	2	228	0	230	463	0	0	463	5	1	0	6	699
% App. Total	0.9	99.1	0		100	0	0		83.3	16.7	0		
PHF	.250	.826	.000	.810	.890	.000	.000	.890	.625	.250	.000	.500	.857
Cars	2	216	0	218	447	0	0	447	5	1	0	6	671
% Cars	100	94.7	0	94.8	96.5	0	0	96.5	100	100	0	100	96.0
Heavy Vehicles	0	12	0	12	16	0	0	16	0	0	0	0	28
% Heavy Vehicles	0	5.3	0	5.2	3.5	0	0	3.5	0	0	0	0	4.0

N/S: Washington Street (Route 138)
W: Railroad Avenue
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	2	29	0	116	1	0	1	0	0	149
06:45 AM	1	35	0	86	0	0	3	0	0	125
Total	3	64	0	202	1	0	4	0	0	274
07:00 AM	0	47	0	106	0	0	0	0	0	153
07:15 AM	0	51	0	105	0	0	1	0	0	157
07:30 AM	2	67	0	130	0	0	2	1	0	202
07:45 AM	0	51	0	106	0	0	2	0	0	159
Total	2	216	0	447	0	0	5	1	0	671
08:00 AM	0	49	0	84	0	0	1	0	0	134
08:15 AM	1	55	0	108	0	0	2	0	0	166
Grand Total	6	384	0	841	1	0	12	1	0	1245
Apprch %	1.5	98.5	0	99.9	0.1	0	92.3	7.7	0	
Total %	0.5	30.8	0	67.6	0.1	0	1	0.1	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	0	47	0	47	106	0	0	106	0	0	0	0	153
7:15:00 AM	0	51	0	51	105	0	0	105	1	0	0	1	157
7:30:00 AM	**2**	**67**	**0**	**69**	**130**	0	0	**130**	**2**	**1**	**0**	**3**	**202**
7:45:00 AM	0	51	0	51	106	0	0	106	2	0	0	2	159
Total Volume	2	216	0	218	447	0	0	447	5	1	0	6	671
% App. Total	0.9	99.1	0		100	0	0		83.3	16.7	0		
PHF	.250	.806	.000	.790	.860	.000	.000	.860	.625	.250	.000	.500	.830

N/S: Washington Street (Route 138)
W: Railroad Avenue
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 I
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	0	1	0	1	0	0	0	0	0	2
06:45 AM	0	1	0	5	0	0	0	0	0	6
Total	0	2	0	6	0	0	0	0	0	8
07:00 AM	0	2	0	9	0	0	0	0	0	11
07:15 AM	0	5	0	3	0	0	0	0	0	8
07:30 AM	0	2	0	0	0	0	0	0	0	2
07:45 AM	0	3	0	4	0	0	0	0	0	7
Total	0	12	0	16	0	0	0	0	0	28
08:00 AM	0	5	0	6	0	0	0	0	0	11
08:15 AM	0	5	0	6	0	0	0	0	0	11
Grand Total	0	24	0	34	0	0	0	0	0	58
Apprch %	0	100	0	100	0	0	0	0	0	
Total %	0	41.4	0	58.6	0	0	0	0	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:30:00 AM													
7:30:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	2
7:45:00 AM	0	3	0	3	4	0	0	4	0	0	0	0	7
8:00:00 AM	0	**5**	**0**	**5**	**6**	0	0	**6**	0	0	0	0	**11**
8:15:00 AM	0	5	0	5	6	0	0	6	0	0	0	0	11
Total Volume	0	15	0	15	16	0	0	16	0	0	0	0	31
% App. Total	0	100	0		100	0	0		0	0	0		
PHF	.000	.750	.000	.750	.667	.000	.000	.667	.000	.000	.000	.000	.705

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Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
06:30 AM	0	0	5	0	0	0	0	0	3	8
06:45 AM	0	0	11	0	0	1	0	0	3	15
Total	0	0	16	0	0	1	0	0	6	23
07:00 AM	0	0	7	0	0	0	0	0	1	8
07:15 AM	0	0	9	0	0	0	0	0	4	13
07:30 AM	0	0	13	0	0	0	0	0	0	13
07:45 AM	0	0	5	0	0	0	0	0	1	6
Total	0	0	34	0	0	0	0	0	6	40
08:00 AM	0	0	1	0	0	0	0	0	0	1
08:15 AM	0	0	3	0	0	0	0	0	2	5
Grand Total	0	0	54	0	0	1	0	0	14	69
Apprch %	0	0	100	0	0	100	0	0	100	
Total %	0	0	78.3	0	0	1.4	0	0	20.3	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 6:45:00 AM													
6:45:00 AM	0	0	11	11	0	0	**1**	**1**	0	0	3	3	**15**
7:00:00 AM	0	0	7	7	0	0	0	0	0	0	1	1	8
7:15:00 AM	0	0	9	9	0	0	0	0	0	0	**4**	**4**	13
7:30:00 AM	0	0	**13**	**13**	0	0	0	0	0	0	0	0	13
Total Volume	0	0	40	40	0	0	1	1	0	0	8	8	49
% App. Total	0	0	100		0	0	100		0	0	100		
PHF	.000	.000	.769	.769	.000	.000	.250	.250	.000	.000	.500	.500	.817

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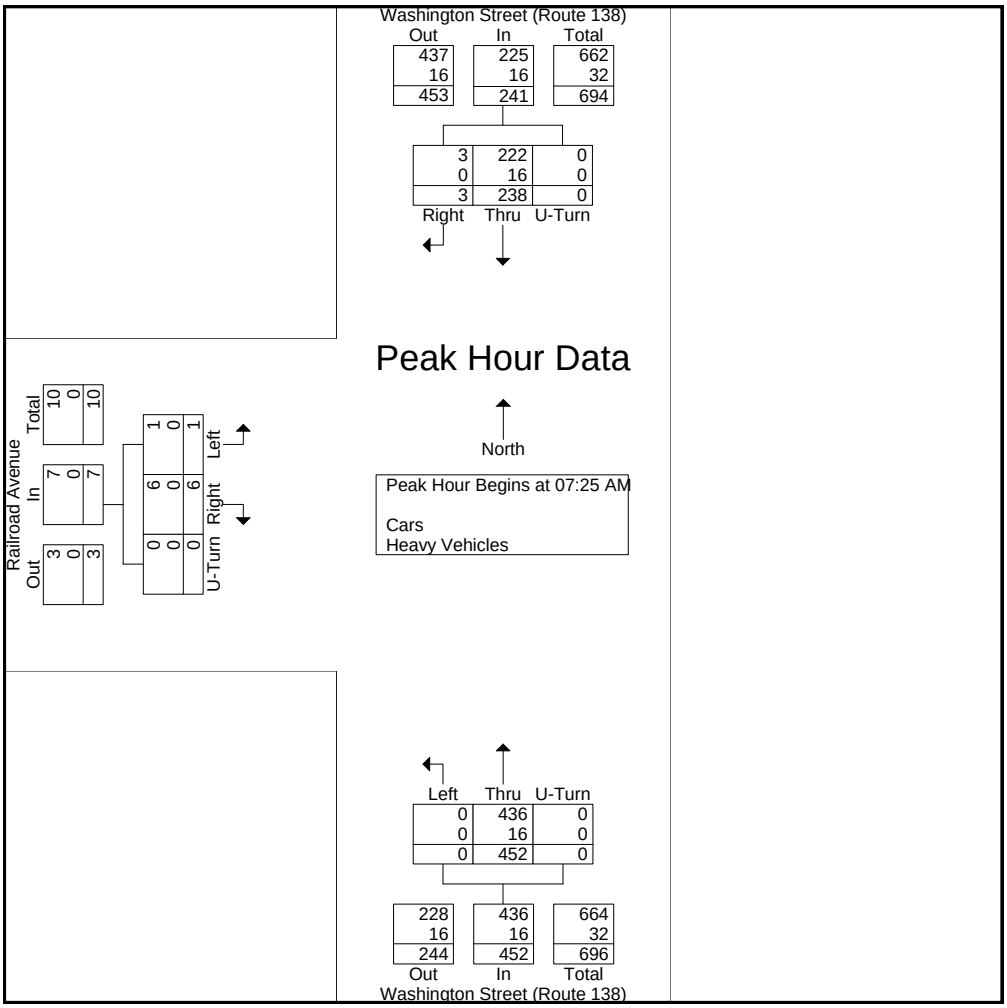
Start Date : 4/12/2012
Page No : 1

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:25 AM													
07:25 AM	0	21	0	21	37	0	0	37	1	0	0	1	59
07:30 AM	**1**	18	0	19	**48**	0	0	**48**	1	0	0	1	68
07:35 AM	1	24	0	25	40	0	0	40	0	0	0	0	65
07:40 AM	0	**27**		**27**	42	0	0	42	1	**1**		**2**	**71**
07:45 AM	0	27	0	27	31	0	0	31	**2**	0	0	2	60
07:50 AM	0	13	0	13	45	0	0	45	0	0	0	0	58
07:55 AM	0	14	0	14	34	0	0	34	0	0	0	0	48
08:00 AM	0	12	0	12	32	0	0	32	0	0	0	0	44
08:05 AM	0	19	0	19	32	0	0	32	1	0	0	1	52
08:10 AM	0	23	0	23	26	0	0	26	0	0	0	0	49
08:15 AM	0	18	0	18	37	0	0	37	0	0	0	0	55
08:20 AM	1	22	0	23	48	0	0	48	0	0	0	0	71
Total Volume	3	238	0	241	452	0	0	452	6	1	0	7	700
% App. Total	1.2	98.8	0		100	0	0		85.7	14.3	0		
PHF	.250	.735	.000	.744	.785	.000	.000	.785	.250	.083	.000	.292	.822
Cars	3	222	0	225	436	0	0	436	6	1	0	7	668
% Cars	100	93.3	0	93.4	96.5	0	0	96.5	100	100	0	100	95.4
Heavy Vehicles	0	16	0	16	16	0	0	16	0	0	0	0	32
% Heavy Vehicles	0	6.7	0	6.6	3.5	0	0	3.5	0	0	0	0	4.6



N/S: Washington Street (Route 138)
W: Railroad Avenue
City, State: Stoughton, MA
Client: VHB/ E. Chan

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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	3	107	0	77	1	0	7	0	0	195
04:55 PM	3	121	0	86	1	0	1	0	0	212
05:10 PM	4	129	0	94	0	0	0	0	0	227
05:25 PM	1	141	0	92	1	0	8	0	0	243
05:40 PM	4	123	0	82	2	0	0	0	0	211
05:55 PM	2	107	0	86	0	0	5	0	0	200
06:10 PM	2	102	0	99	0	0	1	0	0	204
06:25 PM	4	120	0	65	5	0	2	2	0	198
Grand Total	23	950	0	681	10	0	24	2	0	1690
Apprch %	2.4	97.6	0	98.6	1.4	0	92.3	7.7	0	
Total %	1.4	56.2	0	40.3	0.6	0	1.4	0.1	0	
Cars	7	950	0	664	10	0	24	2	0	1657
% Cars	30.4	100	0	97.5	100	0	100	100	0	98
Heavy Vehicles	16	0	0	17	0	0	0	0	0	33
% Heavy Vehicles	69.6	0	0	2.5	0	0	0	0	0	2

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:55:00 PM													
4:55:00 PM	3	121	0	124	86	1	0	87	1	0	0	1	212
5:10:00 PM	**4**	129	0	133	**94**	0	0	**94**	0	0	0	0	227
5:25:00 PM	1	**141**		**142**	92	1	0	93	**8**	0	0	**8**	**243**
5:40:00 PM	4	123	0	127	82	**2**	0	84	0	0	0	0	211
Total Volume	12	514	0	526	354	4	0	358	9	0	0	9	893
% App. Total	2.3	97.7	0		98.9	1.1	0		100	0	0		
PHF	.750	.911	.000	.926	.941	.500	.000	.952	.281	.000	.000	.281	.919
Cars	2	514	0	516	345	4	0	349	9	0	0	9	874
% Cars	16.7	100	0	98.1	97.5	100	0	97.5	100	0	0	100	97.9
Heavy Vehicles	10	0	0	10	9	0	0	9	0	0	0	0	19
% Heavy Vehicles	83.3	0	0	1.9	2.5	0	0	2.5	0	0	0	0	2.1

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N/S: Washington Street (Route 138)
W: Railroad Avenue
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File Name : 122868 II
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Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	0	107	0	74	1	0	7	0	0	189
04:55 PM	0	121	0	83	1	0	1	0	0	206
05:10 PM	1	129	0	91	0	0	0	0	0	221
05:25 PM	0	141	0	91	1	0	8	0	0	241
05:40 PM	1	123	0	80	2	0	0	0	0	206
05:55 PM	1	107	0	83	0	0	5	0	0	196
06:10 PM	2	102	0	97	0	0	1	0	0	202
06:25 PM	2	120	0	65	5	0	2	2	0	196
Grand Total	7	950	0	664	10	0	24	2	0	1657
Apprch %	0.7	99.3	0	98.5	1.5	0	92.3	7.7	0	
Total %	0.4	57.3	0	40.1	0.6	0	1.4	0.1	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:55:00 PM													
4:55:00 PM	0	121	0	121	83	1	0	84	1	0	0	1	206
5:10:00 PM	**1**	129	0	130	**91**	0	0	91	0	0	0	0	221
5:25:00 PM	0	**141**		**141**	91	1	0	**92**	**8**	0	0	**8**	**241**
5:40:00 PM	1	123	0	124	80	**2**	0	82	0	0	0	0	206
Total Volume	2	514	0	516	345	4	0	349	9	0	0	9	874
% App. Total	0.4	99.6	0		98.9	1.1	0		100	0	0		
PHF	.500	.911	.000	.915	.948	.500	.000	.948	.281	.000	.000	.281	.907

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Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	3	0	0	3	0	0	0	0	0	6
04:55 PM	3	0	0	3	0	0	0	0	0	6
05:10 PM	3	0	0	3	0	0	0	0	0	6
05:25 PM	1	0	0	1	0	0	0	0	0	2
05:40 PM	3	0	0	2	0	0	0	0	0	5
05:55 PM	1	0	0	3	0	0	0	0	0	4
06:10 PM	0	0	0	2	0	0	0	0	0	2
06:25 PM	2	0	0	0	0	0	0	0	0	2
Grand Total	16	0	0	17	0	0	0	0	0	33
Apprch %	100	0	0	100	0	0	0	0	0	
Total %	48.5	0	0	51.5	0	0	0	0	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:40:00 PM													
4:40:00 PM	**3**	0	0	**3**	**3**	0	0	**3**	0	0	0	0	**6**
4:55:00 PM	3	0	0	3	3	0	0	3	0	0	0	0	6
5:10:00 PM	3	0	0	3	3	0	0	3	0	0	0	0	6
5:25:00 PM	1	0	0	1	1	0	0	1	0	0	0	0	2
Total Volume	10	0	0	10	10	0	0	10	0	0	0	0	20
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.833	.000	.000	.833	.833	.000	.000	.833	.000	.000	.000	.000	.833

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Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Railroad Avenue From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:40 PM	0	0	4	0	0	0	0	0	3	7
04:55 PM	0	0	4	0	0	0	0	0	3	7
05:10 PM	0	0	4	0	0	0	0	0	9	13
05:25 PM	0	0	12	0	0	1	0	0	2	15
05:40 PM	0	0	4	0	0	0	0	0	0	4
05:55 PM	0	0	9	0	0	0	0	0	4	13
06:10 PM	0	0	1	0	0	2	0	0	1	4
06:25 PM	0	0	5	0	0	1	0	0	3	9
Grand Total	0	0	43	0	0	4	0	0	25	72
Apprch %	0	0	100	0	0	100	0	0	100	
Total %	0	0	59.7	0	0	5.6	0	0	34.7	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 5:10:00 PM													
5:10:00 PM	0	0	4	4	0	0	0	0	0	0	**9**	**9**	13
5:25:00 PM	0	0	**12**	**12**	0	0	**1**	**1**	0	0	2	2	**15**
5:40:00 PM	0	0	4	4	0	0	0	0	0	0	0	0	4
5:55:00 PM	0	0	9	9	0	0	0	0	0	0	4	4	13
Total Volume	0	0	29	29	0	0	1	1	0	0	15	15	45
% App. Total	0	0	100		0	0	100		0	0	100		
PHF	.000	.000	.604	.604	.000	.000	.250	.250	.000	.000	.417	.417	.750

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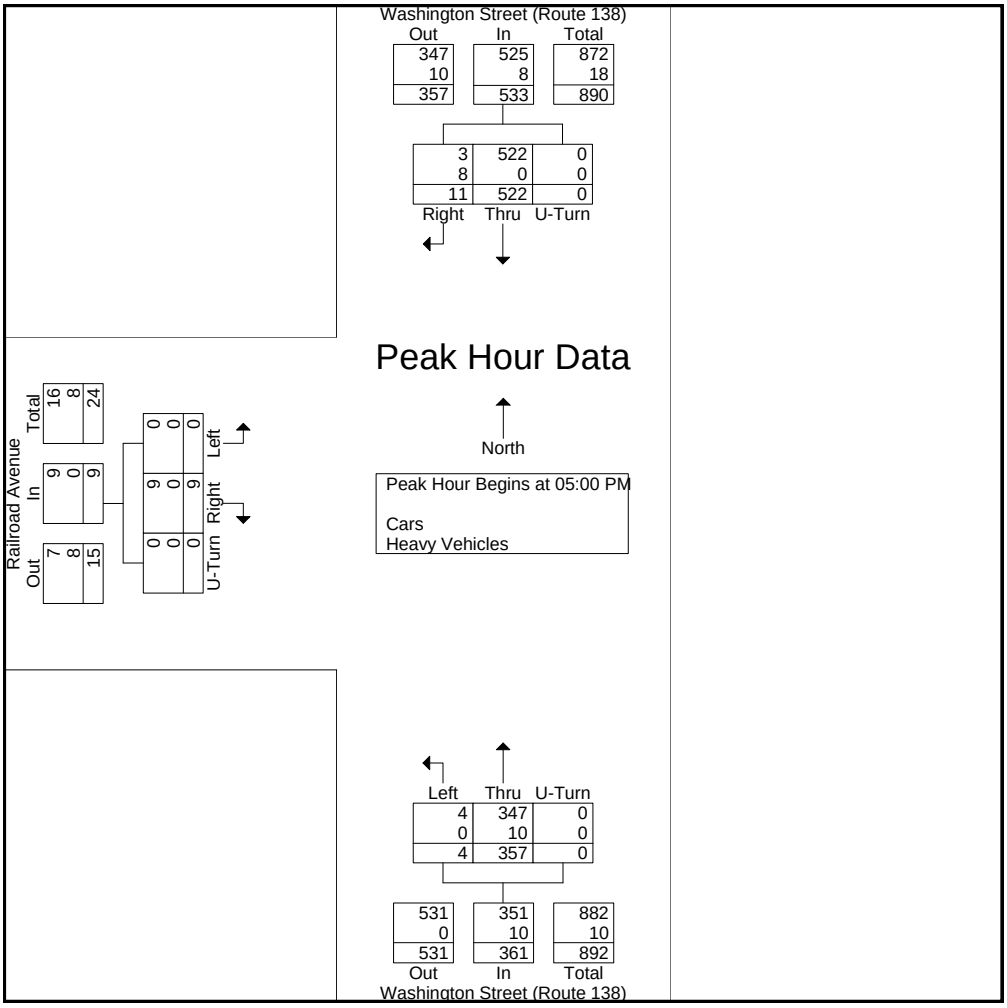
Page No : 1

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Railroad Avenue From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	42	0	42	36	**1**	0	37	0	0	0	0	79
05:05 PM	1	39	0	40	23	0	0	23	1	0	0	1	64
05:10 PM	1	41	0	42	**41**	0	0	**41**	0	0	0	0	83
05:15 PM	1	45	0	46	17	0	0	17	0	0	0	0	63
05:20 PM	2	43	0	45	36	0	0	36	0	0	0	0	81
05:25 PM	0	48	0	48	35	0	0	35	1	0	0	1	**84**
05:30 PM	0	38	0	38	33	1	0	34	**7**	0	0	**7**	79
05:35 PM	1	**55**		**56**	24	0	0	24	0	0	0	0	80
05:40 PM	**4**	50	0	54	21	1	0	22	0	0	0	0	76
05:45 PM	0	36	0	36	27	0	0	27	0	0	0	0	63
05:50 PM	0	37	0	37	34	1	0	35	0	0	0	0	72
05:55 PM	1	48	0	49	30	0	0	30	0	0	0	0	79
Total Volume	11	522	0	533	357	4	0	361	9	0	0	9	903
% App. Total	2.1	97.9	0		98.9	1.1	0		100	0	0		
PHF	.229	.791	.000	.793	.726	.333	.000	.734	.107	.000	.000	.107	.896
Cars	3	522	0	525	347	4	0	351	9	0	0	9	885
% Cars	27.3	100	0	98.5	97.2	100	0	97.2	100	0	0	100	98.0
Heavy Vehicles	8	0	0	8	10	0	0	10	0	0	0	0	18
% Heavy Vehicles	72.7	0	0	1.5	2.8	0	0	2.8	0	0	0	0	2.0



N/S: Washington Street (Route 138)
W: Lot Access
City, State: Stoughton, MA
Client: VHB/ E. Chan

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File Name : 122868 J
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	1	32	0	107	13	0	0	3	0	156
06:45 AM	0	38	0	92	22	0	5	0	0	157
Total	1	70	0	199	35	0	5	3	0	313
07:00 AM	1	48	0	118	1	0	0	0	0	168
07:15 AM	0	54	1	121	6	0	1	0	0	183
07:30 AM	0	73	0	119	16	0	6	1	0	215
07:45 AM	0	53	0	105	1	0	3	0	0	162
Total	1	228	1	463	24	0	10	1	0	728
08:00 AM	0	54	0	104	2	0	0	0	0	160
08:15 AM	0	63	0	109	4	0	2	1	0	179
Grand Total	2	415	1	875	65	0	17	5	0	1380
Apprch %	0.5	99.3	0.2	93.1	6.9	0	77.3	22.7	0	
Total %	0.1	30.1	0.1	63.4	4.7	0	1.2	0.4	0	
Cars	2	388	1	841	65	0	17	5	0	1319
% Cars	100	93.5	100	96.1	100	0	100	100	0	95.6
Heavy Vehicles	0	27	0	34	0	0	0	0	0	61
% Heavy Vehicles	0	6.5	0	3.9	0	0	0	0	0	4.4

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	**1**	48	0	49	118	1	0	119	0	0	0	0	168
7:15:00 AM	0	54	**1**		**121**	6	0	127	1	0	0	1	183
7:30:00 AM	0	**73**		**73**	119	**16**	0	**135**	**6**	**1**		**7**	**215**
7:45:00 AM	0	53	0	53	105	1	0	106	3	0	0	3	162
Total Volume	1	228	1	230	463	24	0	487	10	1	0	11	728
% App. Total	0.4	99.1	0.4		95.1	4.9	0		90.9	9.1	0		
PHF	.250	.781	.250	.788	.957	.375	.000	.902	.417	.250	.000	.393	.847
Cars	1	213	1	215	449	24	0	473	10	1	0	11	699
% Cars	100	93.4	100	93.5	97.0	100	0	97.1	100	100	0	100	96.0
Heavy Vehicles	0	15	0	15	14	0	0	14	0	0	0	0	29
% Heavy Vehicles	0	6.6	0	6.5	3.0	0	0	2.9	0	0	0	0	4.0

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Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	1	31	0	106	13	0	0	3	0	154
06:45 AM	0	37	0	85	22	0	5	0	0	149
Total	1	68	0	191	35	0	5	3	0	303
07:00 AM	1	45	0	110	1	0	0	0	0	157
07:15 AM	0	48	1	118	6	0	1	0	0	174
07:30 AM	0	70	0	118	16	0	6	1	0	211
07:45 AM	0	50	0	103	1	0	3	0	0	157
Total	1	213	1	449	24	0	10	1	0	699
08:00 AM	0	49	0	98	2	0	0	0	0	149
08:15 AM	0	58	0	103	4	0	2	1	0	168
Grand Total	2	388	1	841	65	0	17	5	0	1319
Apprch %	0.5	99.2	0.3	92.8	7.2	0	77.3	22.7	0	
Total %	0.2	29.4	0.1	63.8	4.9	0	1.3	0.4	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 7:00:00 AM													
7:00:00 AM	**1**	45	0	46	110	1	0	111	0	0	0	0	157
7:15:00 AM	0	48	**1**		**118**	6	0	124	1	0	0	1	174
7:30:00 AM	0	**70**		**70**	118	**16**	0	**134**	**6**	**1**		**7**	**211**
7:45:00 AM	0	50	0	50	103	1	0	104	3	0	0	3	157
Total Volume	1	213	1	215	449	24	0	473	10	1	0	11	699
% App. Total	0.5	99.1	0.5		94.9	5.1	0		90.9	9.1	0		
PHF	.250	.761	.250	.768	.951	.375	.000	.882	.417	.250	.000	.393	.828

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W: Lot Access
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 J
Site Code : 10111.34
Start Date : 4/12/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:30 AM	0	1	0	1	0	0	0	0	0	2
06:45 AM	0	1	0	7	0	0	0	0	0	8
Total	0	2	0	8	0	0	0	0	0	10
07:00 AM	0	3	0	8	0	0	0	0	0	11
07:15 AM	0	6	0	3	0	0	0	0	0	9
07:30 AM	0	3	0	1	0	0	0	0	0	4
07:45 AM	0	3	0	2	0	0	0	0	0	5
Total	0	15	0	14	0	0	0	0	0	29
08:00 AM	0	5	0	6	0	0	0	0	0	11
08:15 AM	0	5	0	6	0	0	0	0	0	11
Grand Total	0	27	0	34	0	0	0	0	0	61
Apprch %	0	100	0	100	0	0	0	0	0	
Total %	0	44.3	0	55.7	0	0	0	0	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 6:45:00 AM													
6:45:00 AM	0	1	0	1	7	0	0	7	0	0	0	0	8
7:00:00 AM	0	3	0	3	**8**	0	0	**8**	0	0	0	0	**11**
7:15:00 AM	0	**6**		**6**	3	0	0	3	0	0	0	0	9
7:30:00 AM	0	3	0	3	1	0	0	1	0	0	0	0	4
Total Volume	0	13	0	13	19	0	0	19	0	0	0	0	32
% App. Total	0	100	0		100	0	0		0	0	0		
PHF	.000	.542	.000	.542	.594	.000	.000	.594	.000	.000	.000	.000	.727

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File Name : 122868 J
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Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
06:30 AM	0	0	0	0	0	0	0	0	2	2
06:45 AM	0	0	1	0	0	1	0	0	2	4
Total	0	0	1	0	0	1	0	0	4	6
07:00 AM	0	0	0	0	0	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	3	3
07:30 AM	0	0	0	0	0	3	0	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	0	0	5	8
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	4	0	0	2	6
Grand Total	0	0	1	0	0	8	0	0	11	20
Apprch %	0	0	100	0	0	100	0	0	100	
Total %	0	0	5	0	0	40	0	0	55	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 6:45:00 AM													
6:45:00 AM	0	0	**1**	**1**	0	0	1	1	0	0	2	2	**4**
7:00:00 AM	0	0	0	0	0	0	0	0	0	0	2	2	2
7:15:00 AM	0	0	0	0	0	0	0	0	0	0	**3**	**3**	3
7:30:00 AM	0	0	0	0	0	0	**3**	**3**	0	0	0	0	3
Total Volume	0	0	1	1	0	0	4	4	0	0	7	7	12
% App. Total	0	0	100		0	0	100		0	0	100		
PHF	.000	.000	.250	.250	.000	.000	.333	.333	.000	.000	.583	.583	.750

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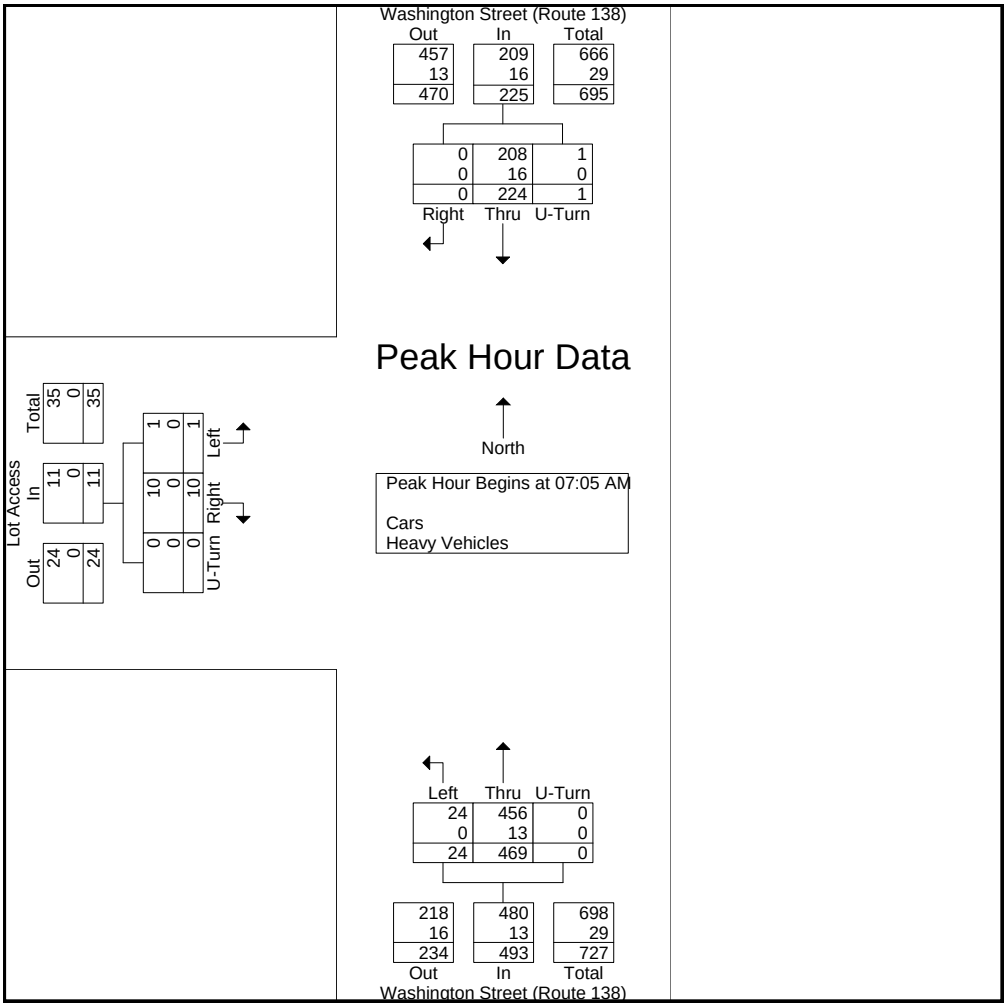
Page No : 1

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:05 AM													
07:05 AM	0	17	0	17	40	0	0	40	0	0	0	0	57
07:10 AM	0	14	0	14	**50**	0	0	50	0	0	0	0	64
07:15 AM	0	18	0	18	42	2	0	44	0	0	0	0	62
07:20 AM	0	16	**1**										
07:25 AM	**0**	**20**	**0**	**20**	**48**	**3**	**0**	**51**	0	0	0	0	71
07:30 AM	0	21	0	21	35	3	0	38	0	0	0	0	59
07:35 AM	0	21	0	21	43	5	0	48	0	0	0	0	69
07:40 AM	0	**31**		**31**	41	**8**	0	49	**6**	**1**		**7**	**87**
07:45 AM	0	26	0	26	34	1	0	35	3	0	0	3	64
07:50 AM	0	12	0	12	36	0	0	36	0	0	0	0	48
07:55 AM	0	15	0	15	35	0	0	35	0	0	0	0	50
08:00 AM	0	13	0	13	34	1	0	35	0	0	0	0	48
Total Volume	0	224	1	225	469	24	0	493	10	1	0	11	729
% App. Total	0	99.6	0.4		95.1	4.9	0		90.9	9.1	0		
PHF	.000	.602	.083	.605	.782	.250	.000	.806	.139	.083	.000	.131	.698
Cars	0	208	1	209	456	24	0	480	10	1	0	11	700
% Cars	0	92.9	100	92.9	97.2	100	0	97.4	100	100	0	100	96.0
Heavy Vehicles	0	16	0	16	13	0	0	13	0	0	0	0	29
% Heavy Vehicles	0	7.1	0	7.1	2.8	0	0	2.6	0	0	0	0	4.0



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File Name : 122868 JJ
Site Code : 10111..4
Start Date : 4/12/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	1	116	0	86	3	0	20	1	0	227
04:55 PM	0	112	0	83	1	0	1	0	0	197
05:10 PM	1	116	1	75	5	0	0	1	0	199
05:25 PM	0	129	0	83	10	0	22	7	0	251
05:40 PM	0	130	0	83	5	0	3	1	0	222
05:55 PM	0	120	0	94	3	1	12	0	0	230
06:10 PM	0	100	0	102	5	0	3	0	0	210
06:25 PM	2	116	1	64	6	0	17	1	0	207
Grand Total	4	939	2	670	38	1	78	11	0	1743
Apprch %	0.4	99.4	0.2	94.5	5.4	0.1	87.6	12.4	0	
Total %	0.2	53.9	0.1	38.4	2.2	0.1	4.5	0.6	0	
Cars	4	921	2	651	37	1	78	11	0	1705
% Cars	100	98.1	100	97.2	97.4	100	100	100	0	97.8
Heavy Vehicles	0	18	0	19	1	0	0	0	0	38
% Heavy Vehicles	0	1.9	0	2.8	2.6	0	0	0	0	2.2

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 5:25:00 PM													
5:25:00 PM	0	129	0	129	83	**10**	0	93	**22**	**7**	**0**	**29**	**251**
5:40:00 PM	0	**130**		**130**	83	5	0	88	3	1	0	4	222
5:55:00 PM	0	120	0	120	94	3	**1**	98	12	0	0	12	230
6:10:00 PM	0	100	0	100	**102**	5	0	**107**	3	0	0	3	210
Total Volume	0	479	0	479	362	23	1	386	40	8	0	48	913
% App. Total	0	100	0		93.8	6	0.3		83.3	16.7	0		
PHF	.000	.921	.000	.921	.887	.575	.250	.902	.455	.286	.000	.414	.909
Cars	0	472	0	472	352	23	1	376	40	8	0	48	896
% Cars	0	98.5	0	98.5	97.2	100	100	97.4	100	100	0	100	98.1
Heavy Vehicles	0	7	0	7	10	0	0	10	0	0	0	0	17
% Heavy Vehicles	0	1.5	0	1.5	2.8	0	0	2.6	0	0	0	0	1.9

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Page No : 1

Groups Printed- Cars

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	1	114	0	82	2	0	20	1	0	220
04:55 PM	0	108	0	80	1	0	1	0	0	190
05:10 PM	1	113	1	73	5	0	0	1	0	194
05:25 PM	0	129	0	81	10	0	22	7	0	249
05:40 PM	0	126	0	81	5	0	3	1	0	216
05:55 PM	0	118	0	91	3	1	12	0	0	225
06:10 PM	0	99	0	99	5	0	3	0	0	206
06:25 PM	2	114	1	64	6	0	17	1	0	205
Grand Total	4	921	2	651	37	1	78	11	0	1705
Apprch %	0.4	99.4	0.2	94.5	5.4	0.1	87.6	12.4	0	
Total %	0.2	54	0.1	38.2	2.2	0.1	4.6	0.6	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 5:25:00 PM													
5:25:00 PM	0	**129**	**0**	**129**	81	**10**	0	91	**22**	**7**	**0**	**29**	**249**
5:40:00 PM	0	126	0	126	81	5	0	86	3	1	0	4	216
5:55:00 PM	0	118	0	118	91	3	**1**	95	12	0	0	12	225
6:10:00 PM	0	99	0	99	**99**	5	0	**104**	3	0	0	3	206
Total Volume	0	472	0	472	352	23	1	376	40	8	0	48	896
% App. Total	0	100	0		93.6	6.1	0.3		83.3	16.7	0		
PHF	.000	.915	.000	.915	.889	.575	.250	.904	.455	.286	.000	.414	.900

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Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:40 PM	0	2	0	4	1	0	0	0	0	7
04:55 PM	0	4	0	3	0	0	0	0	0	7
05:10 PM	0	3	0	2	0	0	0	0	0	5
05:25 PM	0	0	0	2	0	0	0	0	0	2
05:40 PM	0	4	0	2	0	0	0	0	0	6
05:55 PM	0	2	0	3	0	0	0	0	0	5
06:10 PM	0	1	0	3	0	0	0	0	0	4
06:25 PM	0	2	0	0	0	0	0	0	0	2
Grand Total	0	18	0	19	1	0	0	0	0	38
Apprch %	0	100	0	95	5	0	0	0	0	
Total %	0	47.4	0	50	2.6	0	0	0	0	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:40:00 PM													
4:40:00 PM	0	2	0	2	**4**	**1**	0	**5**	0	0	0	0	**7**
4:55:00 PM	0	**4**		**4**	3	0	0	3	0	0	0	0	7
5:10:00 PM	0	3	0	3	2	0	0	2	0	0	0	0	5
5:25:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
Total Volume	0	9	0	9	11	1	0	12	0	0	0	0	21
% App. Total	0	100	0		91.7	8.3	0		0	0	0		
PHF	.000	.563	.000	.563	.688	.250	.000	.600	.000	.000	.000	.000	.750

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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Washington Street (Route 138)
W: Lot Access
City, State: Stoughton, MA
Client: VHB/ E. Chan

File Name : 122868 JJ
Site Code : 10111..4
Start Date : 4/12/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street (Route 138) From North			Washington Street (Route 138) From South			Lot Access From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:40 PM	0	0	2	0	0	0	0	0	5	7
04:55 PM	0	0	0	0	0	0	0	0	0	0
05:10 PM	0	0	0	0	0	0	0	0	2	2
05:25 PM	0	0	1	0	0	0	0	0	0	1
05:40 PM	0	0	0	0	0	0	0	0	0	0
05:55 PM	0	0	0	0	0	0	0	0	1	1
06:10 PM	0	0	0	0	0	0	0	0	1	1
06:25 PM	0	0	1	0	0	0	0	0	2	3
Grand Total	0	0	4	0	0	0	0	0	11	15
Apprch %	0	0	100	0	0	0	0	0	100	
Total %	0	0	26.7	0	0	0	0	0	73.3	

	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:40:00 PM to 6:25:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:40:00 PM													
4:40:00 PM	0	0	**2**	**2**	0	0	0	0	0	0	**5**	**5**	**7**
4:55:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10:00 PM	0	0	0	0	0	0	0	0	0	0	2	2	2
5:25:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	3	3	0	0	0	0	0	0	7	7	10
% App. Total	0	0	100		0	0	0		0	0	100		
PHF	.000	.000	.375	.375	.000	.000	.000	.000	.000	.000	.350	.350	.357

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Washington Street (Route 138)
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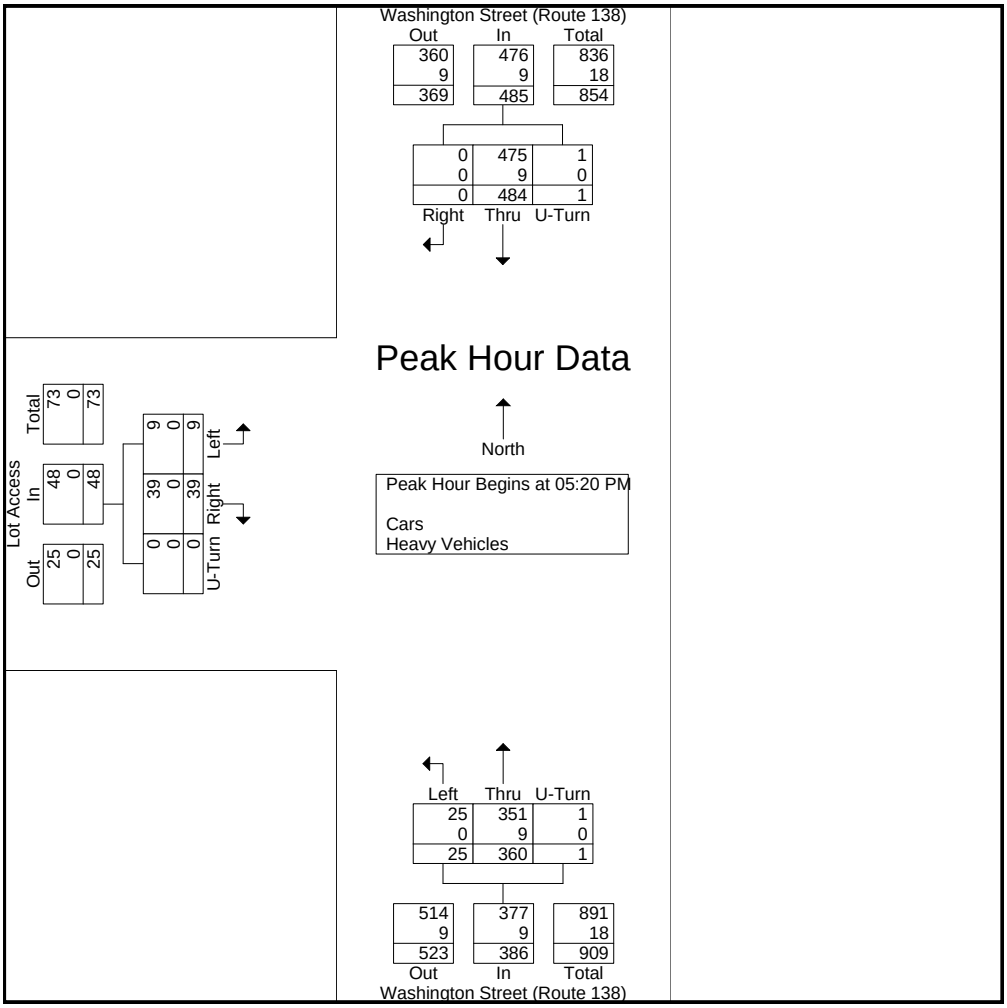
	Washington Street (Route 138) From North				Washington Street (Route 138) From South				Lot Access From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:40 PM to 06:35 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:20 PM													
05:20 PM	0	42	**1**	**43**	**26**	**3**	**0**	**29**	**0**	**1**	**0**	**1**	**73**
05:25 PM	**0**	**35**	**0**	**35**	**27**	**7**	0	34	0	0	0	0	69
05:30 PM	0	46	0	46	33	2	0	35	**18**	**7**		**25**	**106**
05:35 PM	0	48	0	48	23	1	0	24	4	0	0	4	76
05:40 PM	0	**53**		**53**	26	3	0	29	3	1	0	4	86
05:45 PM	0	40	0	40	26	0	0	26	0	0	0	0	66
05:50 PM	0	37	0	37	31	2	0	33	0	0	0	0	70
05:55 PM	0	46	0	46	36	1	**1**	38	0	0	0	0	84
06:00 PM	0	29	0	29	28	1	0	29	1	0	0	1	59
06:05 PM	0	45	0	45	30	1	0	31	11	0	0	11	87
06:10 PM	0	32	0	32	**39**	1	0	**40**	2	0	0	2	74
06:15 PM	0	31	0	31	35	3	0	38	0	0	0	0	69
Total Volume	0	484	1	485	360	25	1	386	39	9	0	48	919
% App. Total	0	99.8	0.2		93.3	6.5	0.3		81.2	18.8	0		
PHF	.000	.761	.083	.763	.769	.298	.083	.804	.181	.107	.000	.160	.722
Cars	0	475	1	476	351	25	1	377	39	9	0	48	901
% Cars	0	98.1	100	98.1	97.5	100	100	97.7	100	100	0	100	98.0
Heavy Vehicles	0	9	0	9	9	0	0	9	0	0	0	0	18
% Heavy Vehicles	0	1.9	0	1.9	2.5	0	0	2.3	0	0	0	0	2.0



Parking Lot Counts

MBTA Parking Lot counts
04.12.2012

	Total Spaces			
Parking Lot	**Monthly**	**Daily**	**Non-MBTA**	**Total**
A	**-**	**80**	**-**	**80**
B	**-**	**99**	**-**	**99**
C	**49**	**25**	**-**	**74**
D	**-**	**67**	**-**	**67**
E	**-**	**86**	**-**	**86**
Total	**49**	**357**	**0**	**406**

	6:30 AM				8:30 AM			
Parking Lot	**Monthly**	**Daily**	**Non-MBTA**	**Total**	**Monthly**	**Daily**	**Non-MBTA**	**Total**
A	-	0	0	**0**	-	31	6	**37**
B	-	0	-	**0**	-	Full	-	**0**
C	1	0		**1**	28	20		**48**
D	-	5		**5**		60		**60**
E	0	0	0	**0**		30		**30**
Total	**1**	**5**	**0**	**6**	**28**	**141**	**6**	**175**

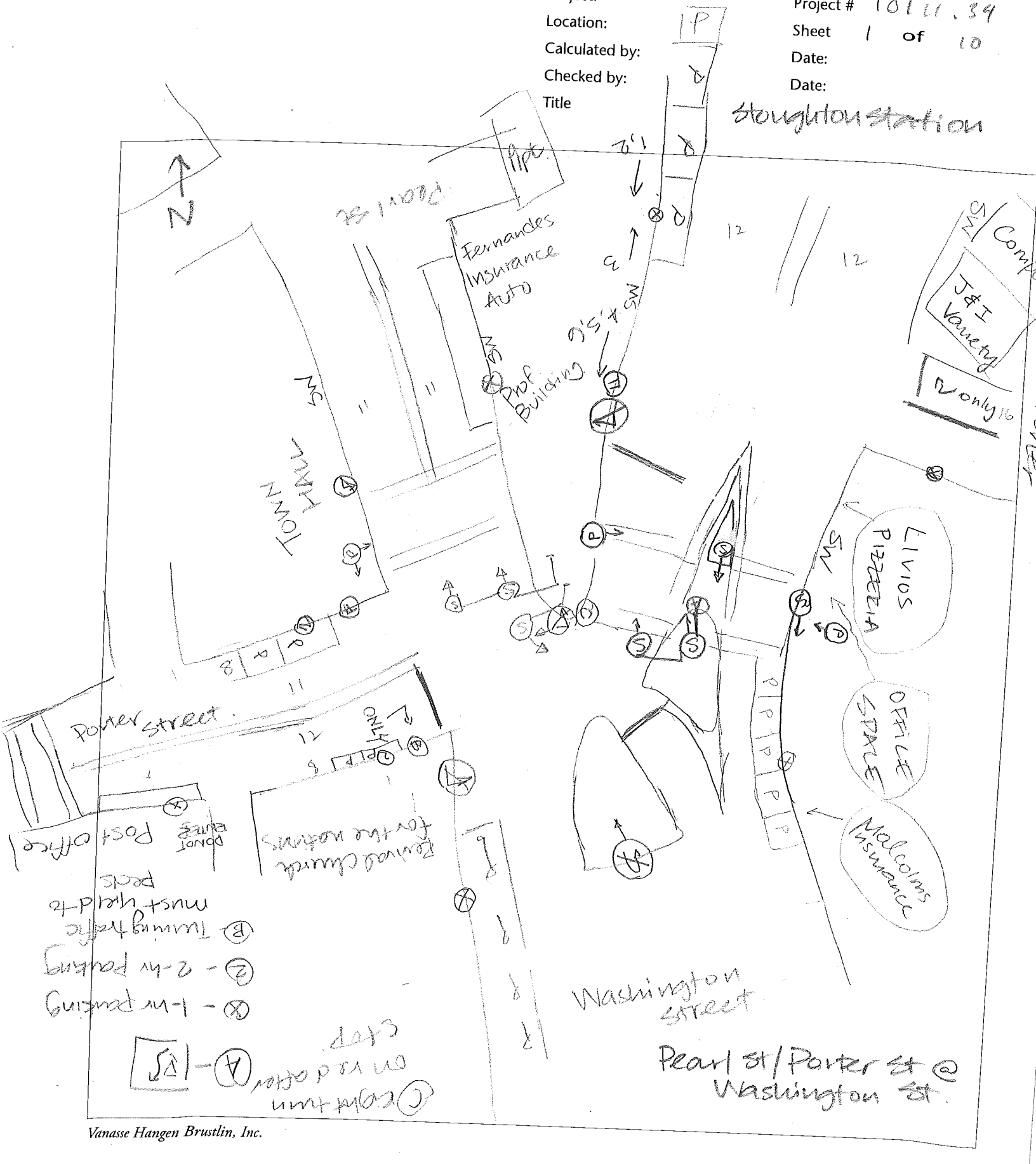
	4:40 PM				6:40 PM			
Parking Lot	**Monthly**	**Daily**	**Non-MBTA**	**Total**	**Monthly**	**Daily**	**Non-MBTA**	**Total**
A		33		**33**		10		**10**
B		94		**94**		23		**23**
C	23	21		**44**	8	1		**9**
D		61		**61**		11		**11**
E		34		**34**		12		**12**
Total	**23**	**243**	**0**	**266**	**8**	**57**	**0**	**65**

Intersection Inventory

Project:
Location:
Calculated by:
Checked by:
Title

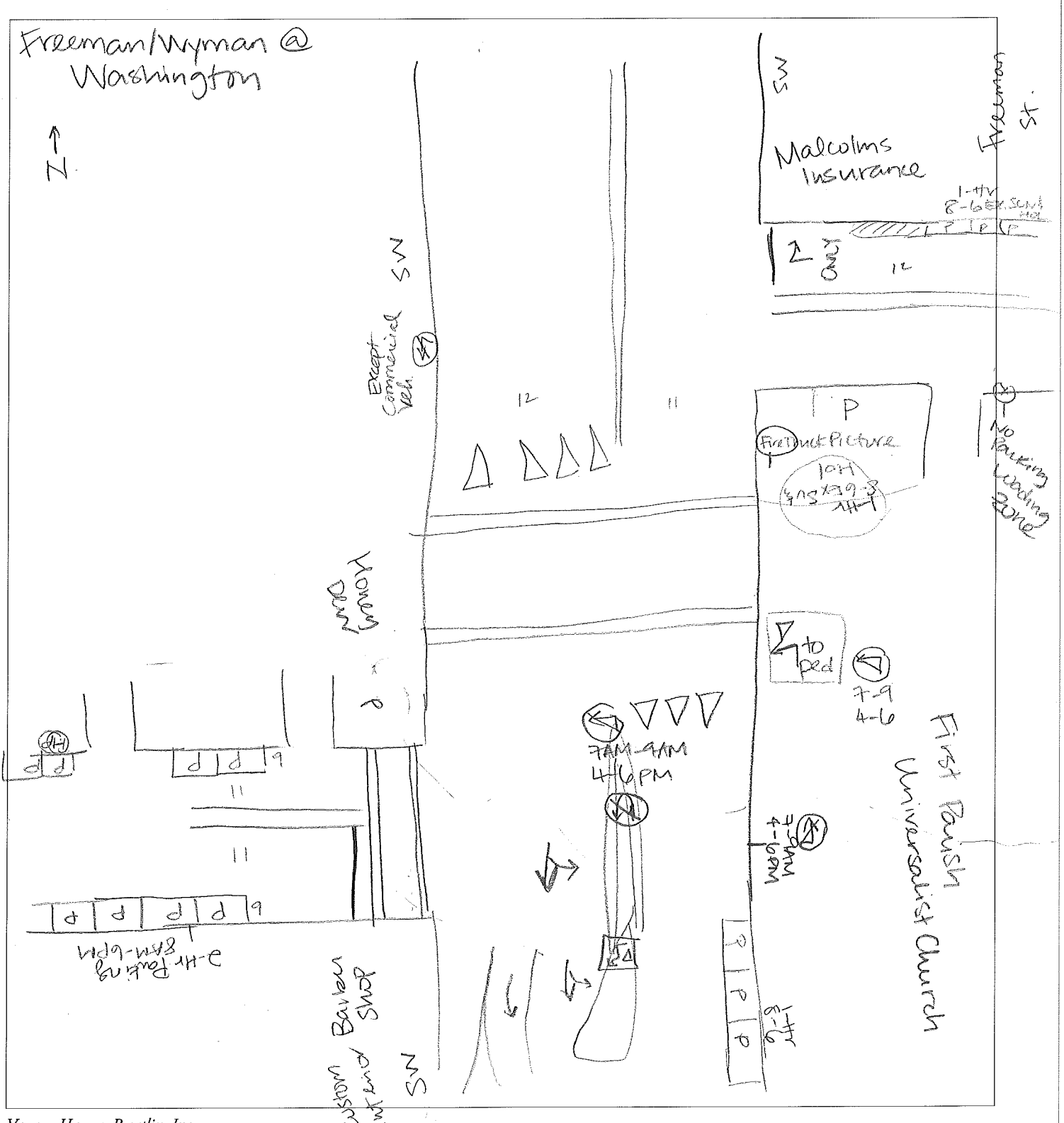
Project # 10111.34
Sheet 1 of 10
Date:
Date:

Stoughton Station



VHB *Computations*

Project: | Project # 10111.34
Location: | Sheet 2 of 10
Calculated by: | Date:
Checked by: | Date:
Title Stoughton Station



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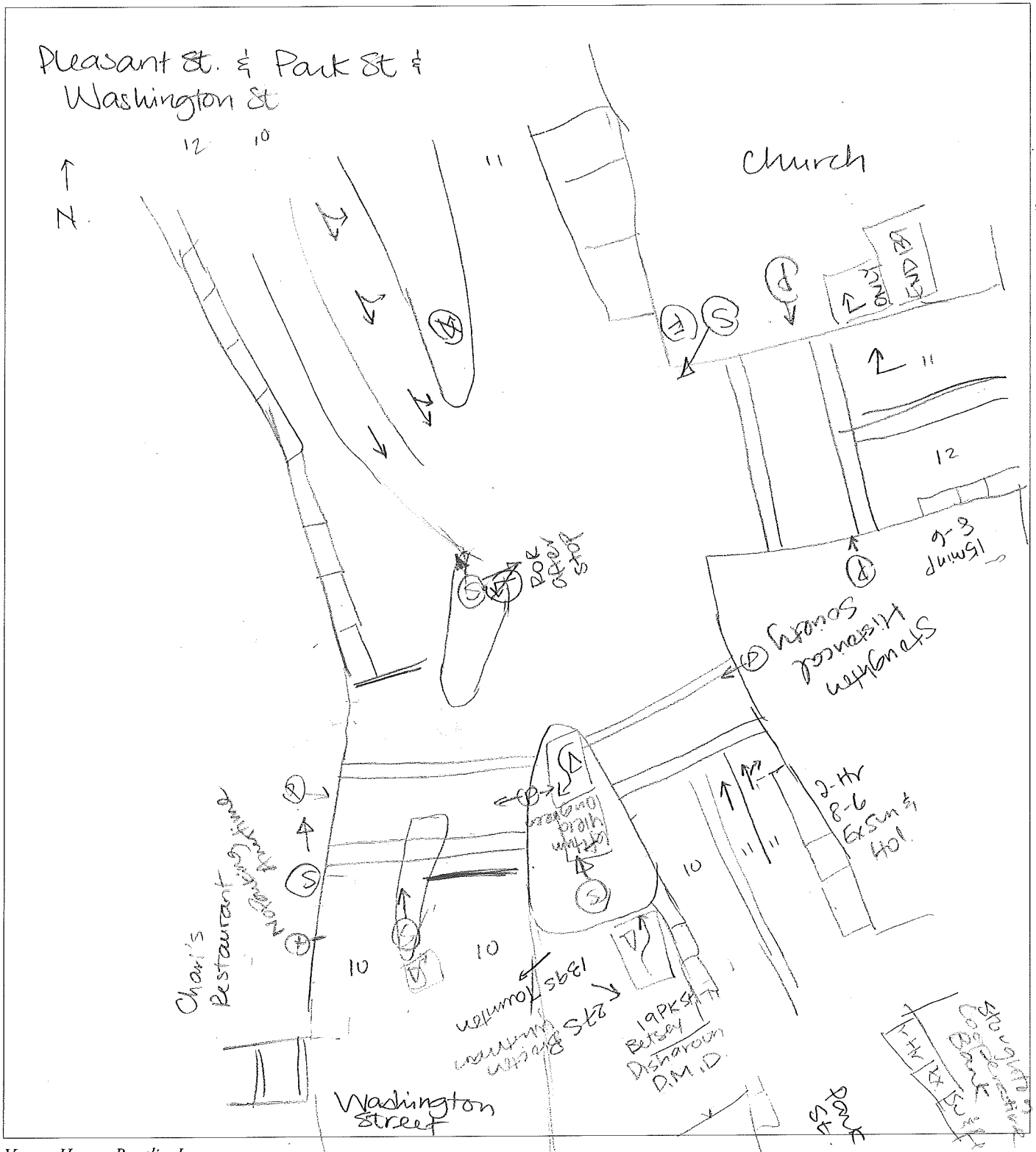
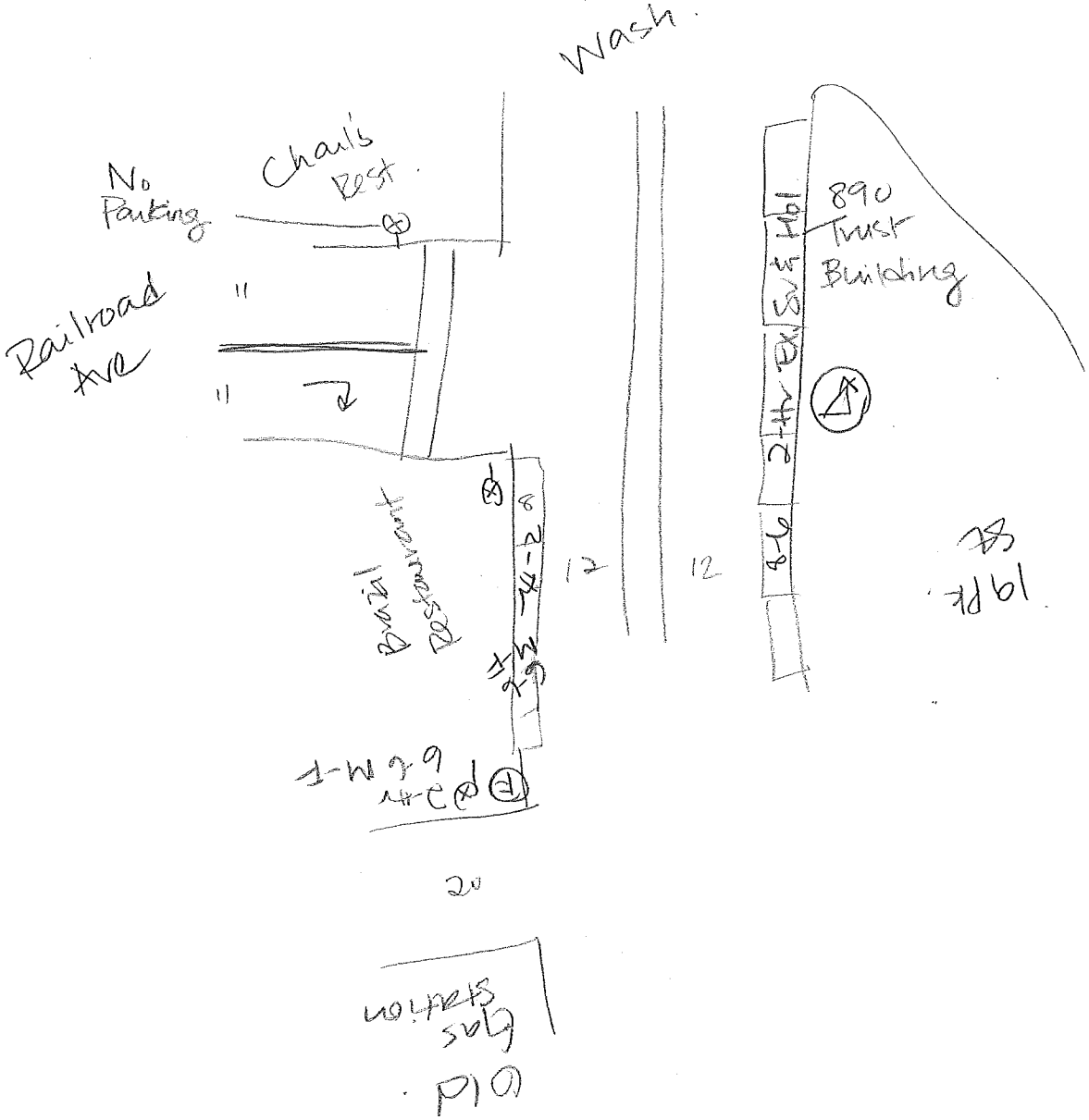
Location: | Sheet 3 of 10
Calculated by: | Date:
Checked by: | Date:
Title Stoughton Station

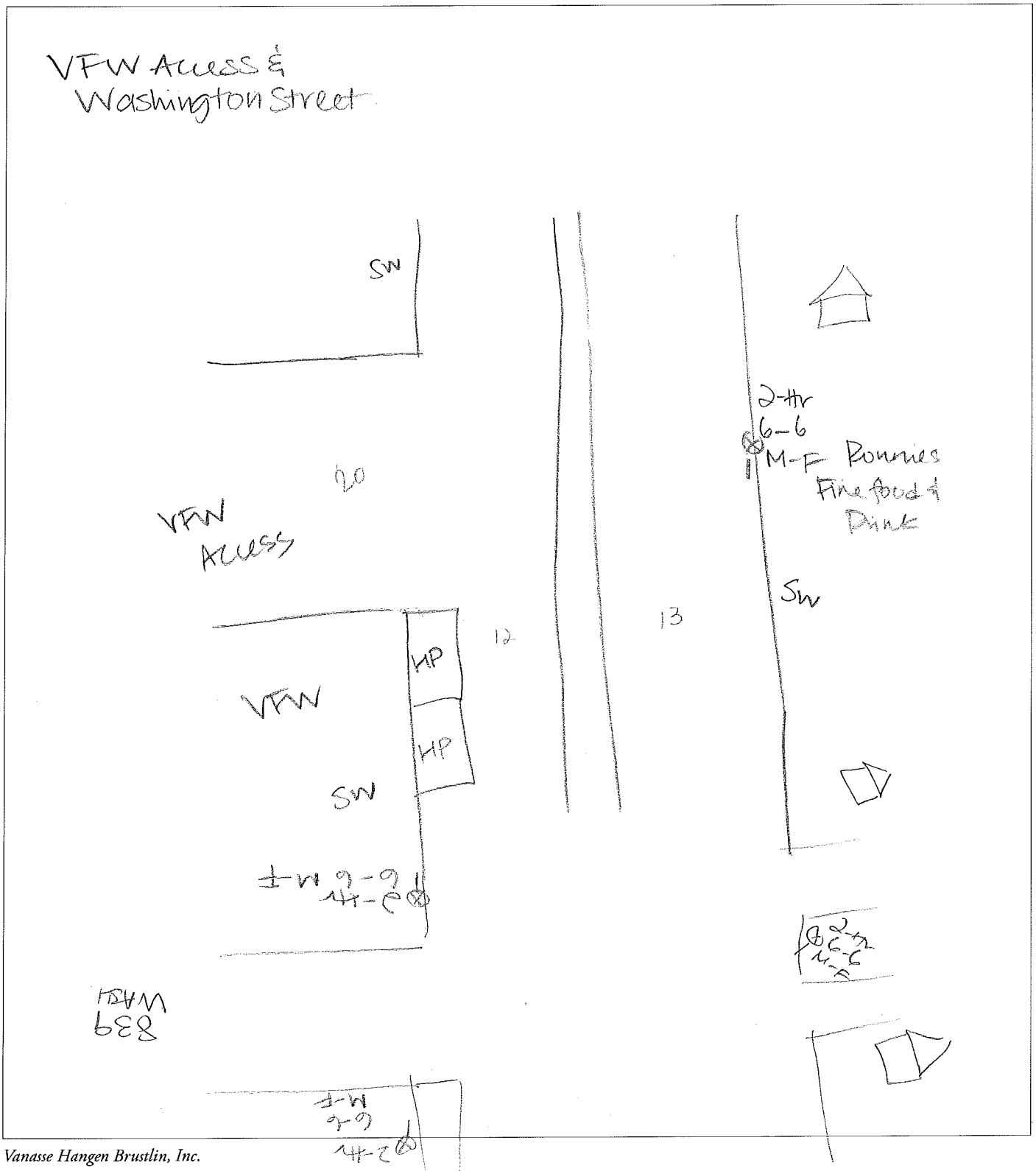


Project:	Project # 10111.34
Location:	Sheet 4 of 10
Calculated by:	Date:
Checked by:	Date:
Title Stoughton Station	

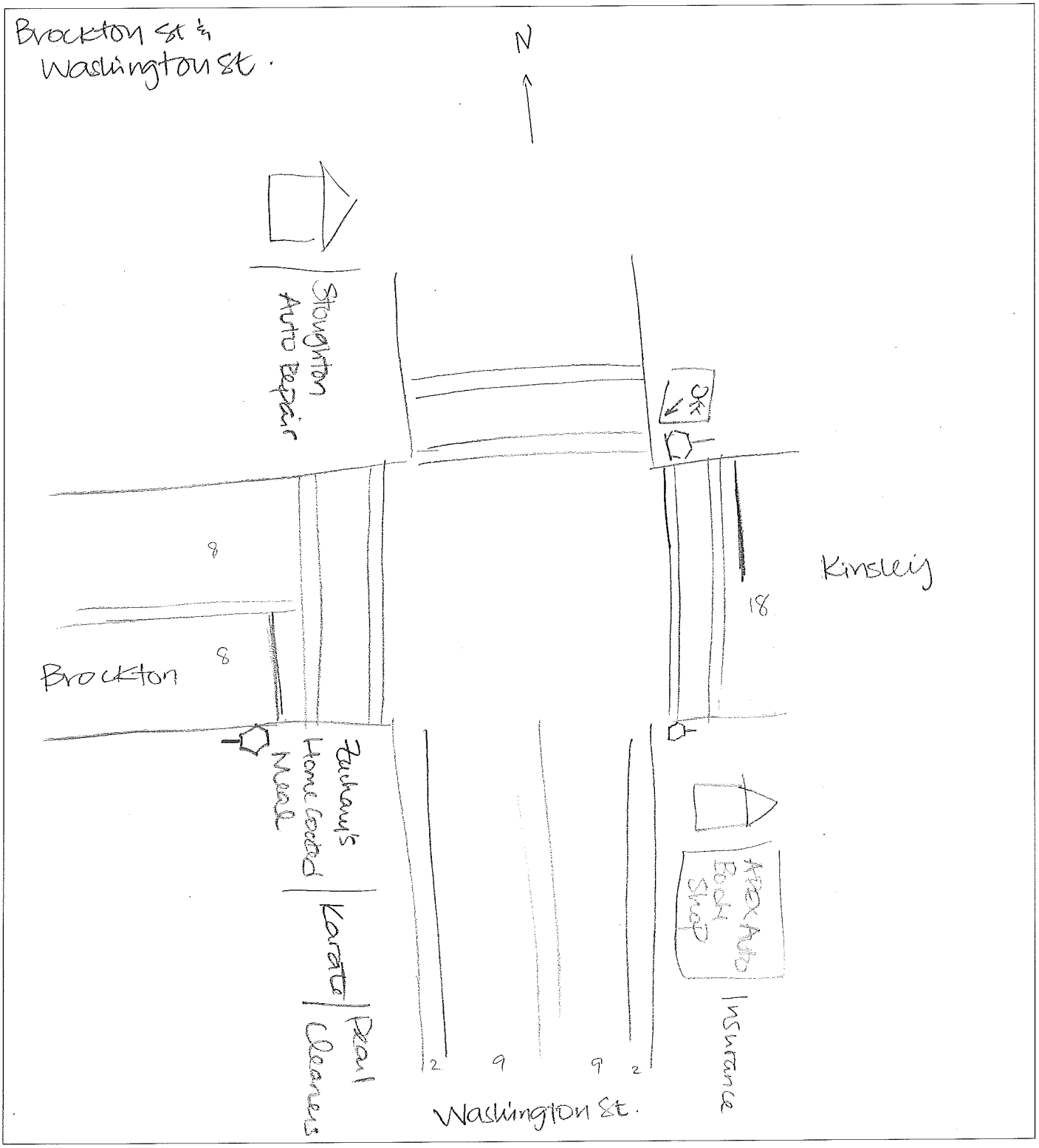
Washington St & Railroad Ave



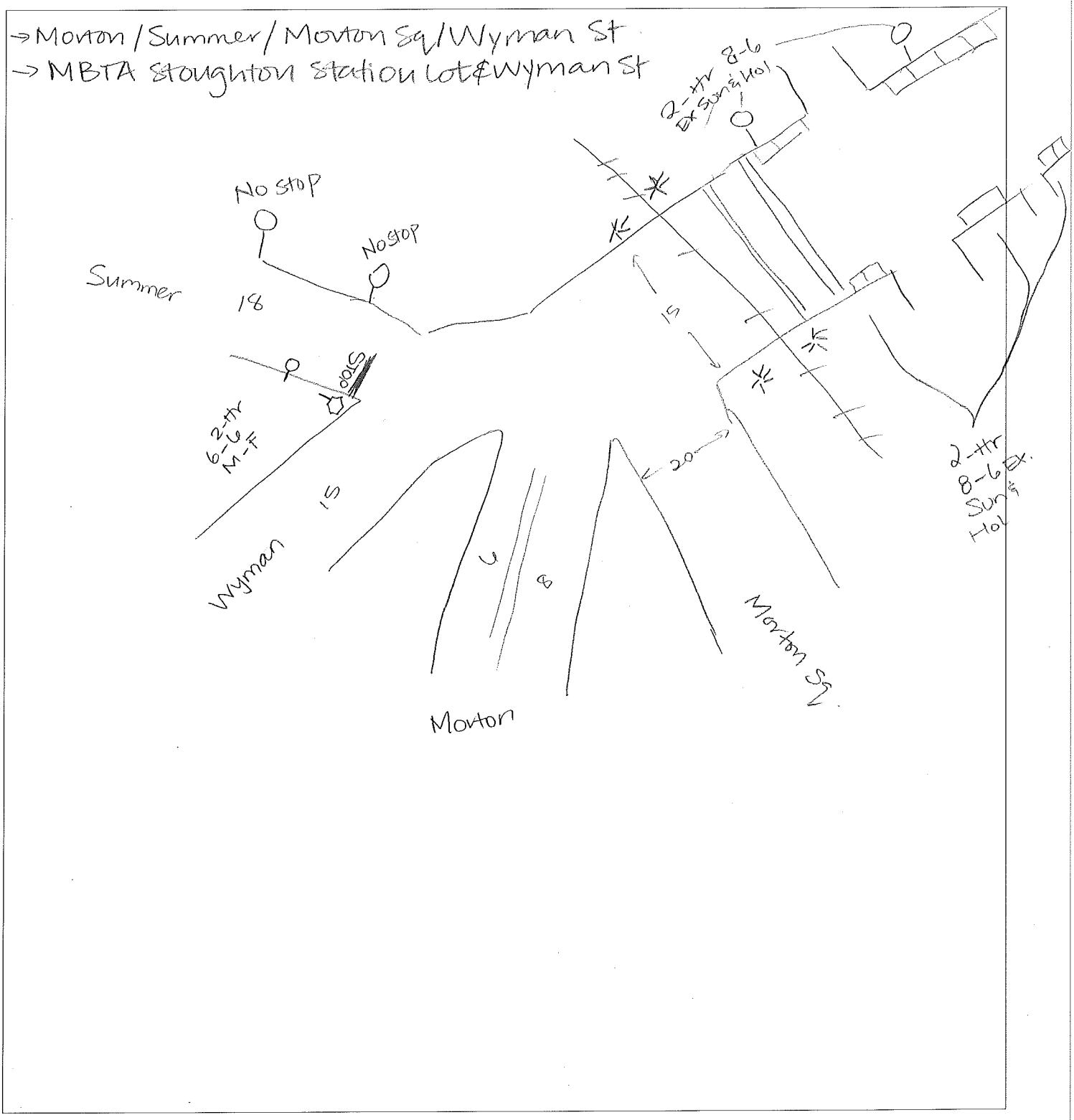
Project: Project # 10111.34
Location: Sheet 5 of 10
Calculated by: Date:
Checked by: Date:
Title Stoughton Station



Project: | Project # 10111.34
Location: | Sheet 6 of 10
Calculated by: | Date:
Checked by: | Date:
Title Stoughton Station

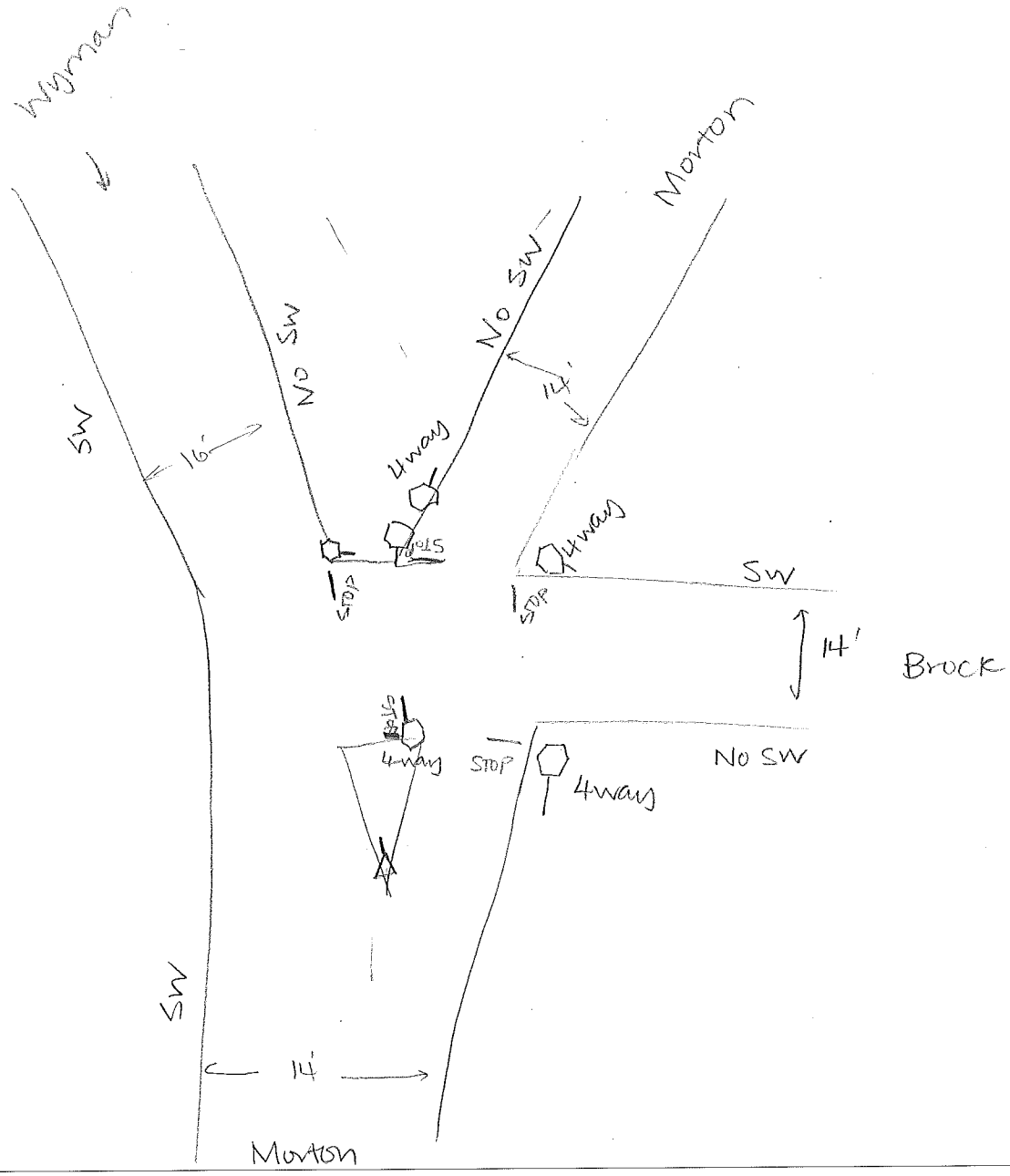


Project: | Project # 10111.34
Location: | Sheet 7 of 10
Calculated by: | Date:
Checked by: | Date:
Title Stoughton Station



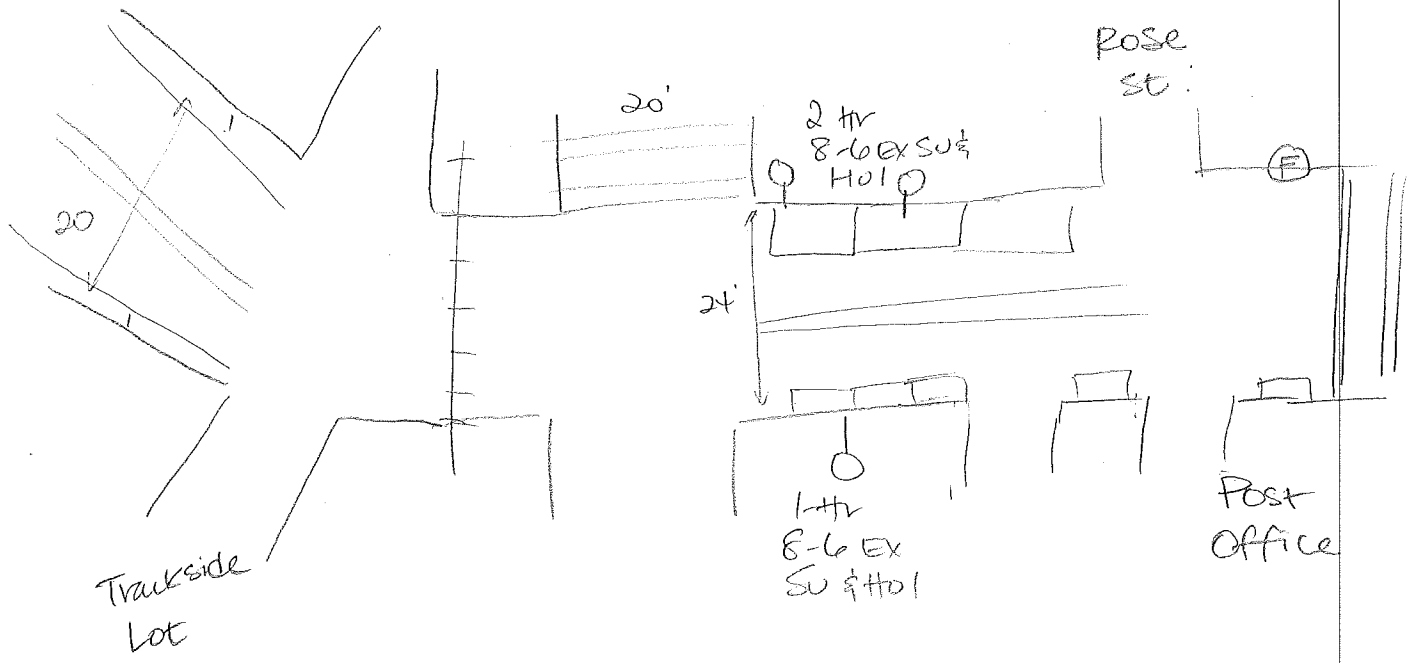
Project: Project # 10111.34
Location: Sheet 8 of 10
Calculated by: Date:
Checked by: Date:
Title Stoughton Station

Morton St / Wyman St / Brock St

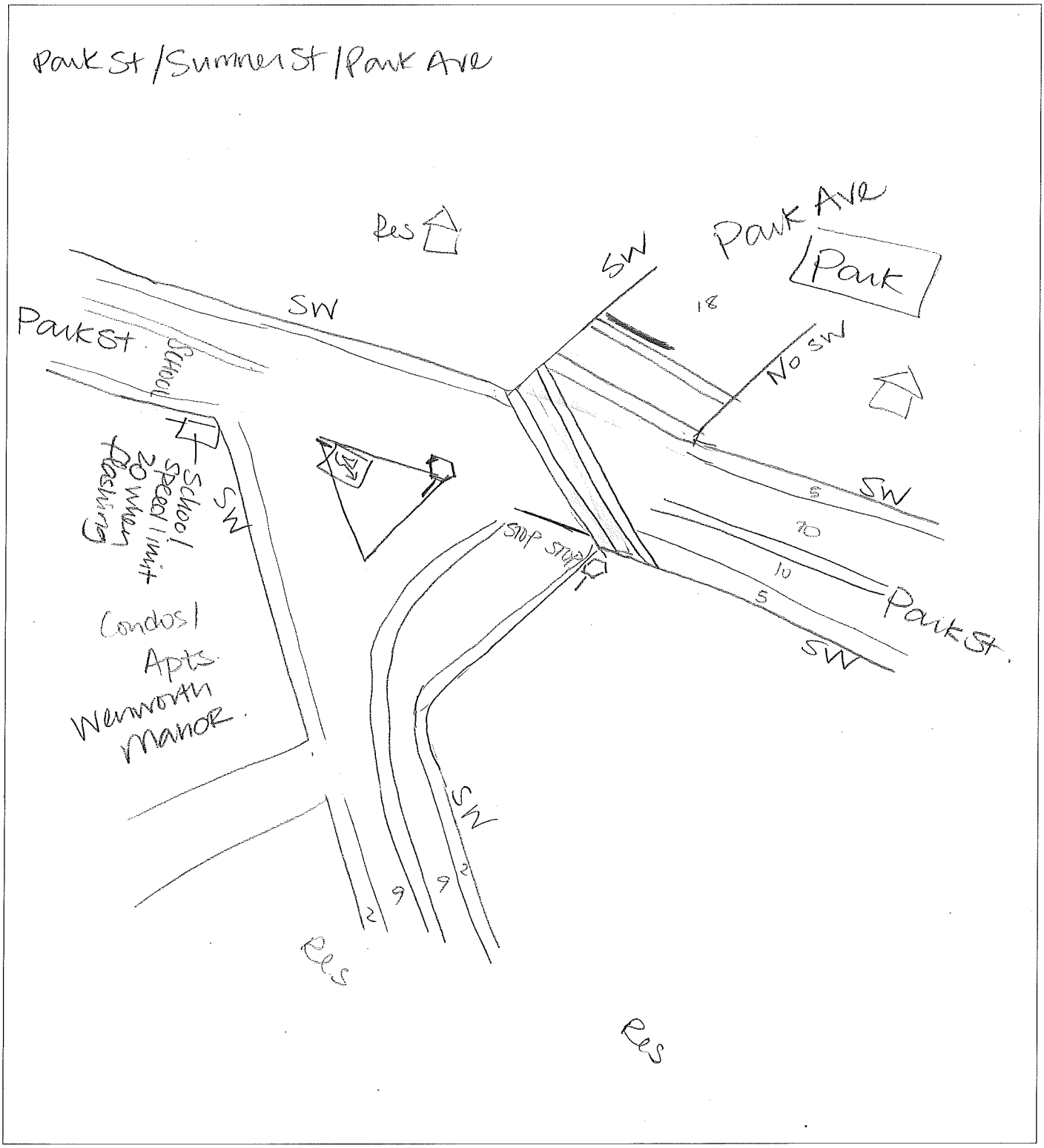


Project: | Project # 10111.34
Location: | Sheet 9 of 10
Calculated by: | Date:
Checked by: | Date:
Title Stoughton Station

Porter St & MBTA Lots / Trackside Lot



Project: Project # 10114.34
Location: Sheet 10 of 10
Calculated by: Date:
Checked by: Date:
Title Stoughton Station



Crash Data

Brock at Kinsley/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/17/2007	5:15 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	BROCK STREET / WASHINGTON STREET	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/15/2007	6:50 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Ice	Daylight	Snow	KINSLEY STREET / WASHINGTON STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/15/2007	8:20 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not Reported	MORTON STREET / BROCK STREET	V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/17/2007	2:03 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/24/2007	10:40 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / KINSLEY STREET	V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/24/2007	11:38 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET / KINSLEY STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/19/2007	5:02 PM	Non-fatal injury	3	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Northbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	9/14/2007	6:55 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dusk	Clear	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/1/2007	8:47 AM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N / KINSLEY STREET	V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/12/2007	5:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	BROCK STREET / MORTON STREET	V1:Eastbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2007	12/7/2007	3:56 PM	Non-fatal injury	2	4	0	Angle	Snow	Dusk	Snow	WASHINGTON STREET Rte 138 / KINSLEY STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/17/2007	7:31 AM	Non-fatal injury	1	2	0	Single vehicle crash	Ice	Daylight	Clear		V1:Westbound	V1: Collision with light pole or other post/support
STOUGHTON	2008	2/27/2008	2:48 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Northbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2008	4/28/2008	9:36 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy/Rain	WASHINGTON STREET / KINSLEY STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	5/6/2008	4:52 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / BROCK STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/18/2008	1:25 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/4/2008	3:09 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/22/2008	5:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / KINSLEY STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	10/24/2008	4:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear/Unknown	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	10/30/2008	7:48 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Other	KINSLEY STREET / PARK STREET	V1:Northbound / V2:Southbound	V1: Collision with other movable object / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/14/2008	12:22 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain	PARK STREET / KINSLEY STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/20/2008	5:15 AM	Not Reported	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 / BROCK STREET / KINSLEY STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	2/13/2009	3:14 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Westbound / V2:Eastbound	V1: Collision with parked motor vehicle / V2: Other
STOUGHTON	2009	4/27/2009	10:04 AM	Non-fatal injury	3	2	0	Rear-to-rear	Dry	Daylight	Clear	PARK STREET / KINSLEY STREET	V1:Northbound / V2:Northbound / V3:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2009	5/6/2009	8:49 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy	BROCK STREET / Rte 138 / WASHINGTON STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/11/2009	9:47 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WYMAN STREET / BROCK STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/15/2009	9:02 PM	Non-fatal injury	2	3	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/25/2009	2:45 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	KINSLEY STREET / WASHINGTON STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/15/2009	9:02 AM	Non-fatal injury	2	3	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/5/2009	10:27 AM	Non-fatal injury	2	2	0	Rear-end	Wet	Daylight	Cloudy/Rain	KINSLEY STREET / PARK STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/25/2009	10:03 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain	PARK STREET / KINSLEY STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/14/2008	9:20 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Daylight	Snow		V1:Southbound	V1: Collision with utility pole
STOUGHTON	2009	2/7/2009	10:49 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/16/2009	8:13 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Brock at Wyman/Morton

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/11/2007	5:26 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / MORTON STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/17/2007	5:15 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	BROCK STREET / WASHINGTON STREET	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/5/2007	8:33 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	MORTON STREET / ROGERS DRIVE	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/9/2007	11:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/15/2007	8:20 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not Reported	MORTON STREET / BROCK STREET	V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/17/2007	2:03 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/23/2007	1:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/23/2007	8:18 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Cloudy		V1:Westbound / V2:Westbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/25/2007	3:59 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear	MORTON STREET / PLAIN STREET	V1:Westbound	V1: Collision with fence
STOUGHTON	2007	3/8/2007	9:44 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2007	4/17/2007	4:21 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dusk	Rain/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/12/2007	3:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	ROGERS DRIVE / MORTON STREET	V1:Westbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	5/29/2007	9:58 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/3/2007	4:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Cloudy		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	6/19/2007	5:02 PM	Non-fatal injury	3	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Northbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	7/2/2007	7:20 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	8/30/2007	5:21 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / MORTON STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/12/2007	7:35 AM	Unknown	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/14/2007	6:55 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dusk	Clear	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/12/2007	5:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	BROCK STREET / MORTON STREET	V1:Eastbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2007	10/16/2007	10:40 AM	Property damage only (none injured)	2	0	0	Not reported	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / MORTON STREET	V1:Not reported / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/20/2007	2:16 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/25/2007	9:31 AM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Cloudy	MORTON STREET / PERRY STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/17/2007	10:25 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/21/2007	6:54 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dark - roadway not lighted	Rain	WASHINGTON STREET Rte 138 N / MORTON STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/13/2007	8:54 AM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear/Cloudy	WYMAN STREET / WASHINGTON STREET	V1:Eastbound	V1: Collision with light pole or other
STOUGHTON	2007	12/16/2007	12:14 PM	Non-fatal injury	1	1	0	Sideswipe, same direction	Ice	Daylight	Sleet, hail (freezing rain or drizzle)		V1:Southbound	V1: Collision with pedestrian
STOUGHTON	2007	12/16/2007	7:33 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Ice	Dark - lighted roadway	Rain/Snow		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/21/2007	3:36 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Daylight	Snow		V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2008	1/8/2008	1:55 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with motor vehicle in traffic
STOUGHTON	2008	2/1/2008	10:37 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Rain	MORTON STREET / PLAIN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/3/2008	6:19 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle
STOUGHTON	2008	3/4/2008	12:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/27/2008	11:46 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with light pole or other
STOUGHTON	2008	4/3/2008	2:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/16/2008	8:07 PM	Non-fatal injury	2	2	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/30/2008	1:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	5/6/2008	4:52 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / BROCK STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/11/2008	6:15 AM	Non-fatal injury	2	1	0	Not reported	Dry	Daylight	Clear	WASHINGTON STREET / MORTON STREET	V1:Northbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	6/18/2008	1:25 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/31/2008	9:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/4/2008	11:34 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	MORTON STREET / PLAIN STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/4/2008	3:09 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/7/2008	3:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported

Brock at Wyman/Morton

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2008	10/24/2008	4:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear/Unknown	WASHINGTON STREET Rte 138 / KINSLEY STREET / BROCK STREET	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	11/3/2008	3:21 PM	Non-fatal injury	1	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PARK STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	11/20/2008	5:15 AM	Not Reported	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 / BROCK STREET / KINSLEY STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/8/2008	11:00 AM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/19/2008	3:10 PM	Property damage only (none injured)	2	0	0	Rear-end	Ice	Daylight	Snow/Severe crosswinds	WASHINGTON STREET / MORTON STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/22/2008	9:18 AM	Property damage only (none injured)	2	0	0	Angle	Ice	Daylight	Clear	PLAIN STREET / MORTON STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/14/2009	8:35 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Dark - lighted roadway	Clear	WYMAN STREET / WATER STREET	V1:Northbound	V1: Collision with tree
STOUGHTON	2009	1/15/2009	5:46 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/21/2009	3:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound	V1: Collision with light pole or other
STOUGHTON	2009	2/24/2009	5:27 PM	Non-fatal injury	2	2	0	Head-on	Dry	Dusk	Clear	WASHINGTON STREET Rte 27 S / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/26/2009	2:23 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Unknown		V1:Eastbound	V1: Collision with utility pole
STOUGHTON	2009	5/6/2009	8:49 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy	BROCK STREET / Rte 138 / WASHINGTON STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/11/2009	9:47 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WYMAN STREET / BROCK STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/12/2009	12:44 PM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/8/2009	8:53 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/20/2009	8:17 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/13/2009	1:30 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLAIN STREET / MORTON STREET	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	9/15/2009	9:02 PM	Non-fatal injury	2	3	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/21/2009	11:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	MORTON STREET / GREG ROAD	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/15/2009	9:02 AM	Non-fatal injury	2	3	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / BROCK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/23/2009	8:30 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/24/2009	7:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/25/2009	9:44 PM	Non-fatal injury	1	1	0	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Fog, smog, smoke		V1:Southbound	V1: Collision with tree
STOUGHTON	2009	12/30/2009	3:32 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Freeman at Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/2/2007	8:10 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Clear		V1:Not reported / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle
STOUGHTON	2007	1/10/2007	7:14 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/22/2007	9:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/25/2007	5:16 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain	WASHINGTON STREET / FREEMAN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/18/2007	11:39 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Unknown		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/5/2007	7:06 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / FREEMAN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/3/2007	5:07 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET / FREEMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/23/2007	3:39 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/7/2008	12:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Snow	WASHINGTON STREET / FREEMAN STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/19/2008	3:11 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/26/2008	3:39 PM	Not Reported	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Collision with parked motor vehicle / V2:
STOUGHTON	2008	6/27/2008	9:05 AM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	10/23/2008	5:34 AM	Property damage only (none injured)	4	0	0	Angle	Dry	Daylight	Cloudy/Clear		V1:Northbound / V2:Eastbound / V3:Northbound / V4:Northbound	V1: Not reported / V2: Not reported / V3: Collision with motor vehicle in traffic / V4: Not reported
STOUGHTON	2009	1/17/2009	4:09 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dusk	Clear	FREEMAN STREET / WASHINGTON STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/12/2009	12:44 PM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/18/2009	4:29 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy/Clear	WASHINGTON STREET / FREEMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/17/2009	12:57 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/22/2009	8:03 AM	Property damage only (none injured)	2	0	0	Angle	Snow	Daylight	Clear		V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/28/2009	9:04 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported

Morton at Summer/Wyman/Porter

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/11/2007	5:26 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / MORTON STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/5/2007	8:33 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	MORTON STREET / ROGERS DRIVE	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/9/2007	11:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/15/2007	8:20 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Not Reported	MORTON STREET / BROCK STREET	V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/23/2007	1:00 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	2/23/2007	8:18 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Cloudy		V1:Westbound / V2:Westbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/25/2007	3:59 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear	MORTON STREET / PLAIN STREET	V1:Westbound	V1: Collision with fence
STOUGHTON	2007	3/8/2007	9:44 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2007	4/17/2007	4:21 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dusk	Rain/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/12/2007	3:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	ROGERS DRIVE / MORTON STREET	V1:Westbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	5/29/2007	9:58 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/3/2007	4:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Cloudy		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	7/2/2007	7:20 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	8/30/2007	5:21 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / MORTON STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/12/2007	7:35 AM	Unknown	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/12/2007	5:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	BROCK STREET / MORTON STREET	V1:Eastbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2007	10/16/2007	10:40 AM	Property damage only (none injured)	2	0	0	Not reported	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / MORTON STREET	V1:Not reported / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/20/2007	2:16 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/25/2007	9:31 AM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Cloudy	MORTON STREET / PERRY STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/17/2007	10:25 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/21/2007	6:54 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dark - roadway not lighted	Rain	WASHINGTON STREET Rte 138 N / MORTON STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/13/2007	8:54 AM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear/Cloudy	WYMAN STREET / WASHINGTON STREET	V1:Eastbound	V1: Collision with light pole or other
STOUGHTON	2007	12/16/2007	12:14 PM	Non-fatal injury	1	1	0	Sideswipe, same direction	Ice	Daylight	Sleet, hail (freezing rain or drizzle)		V1:Southbound	V1: Collision with pedestrian
STOUGHTON	2007	12/16/2007	7:33 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Ice	Dark - lighted roadway	Rain/Snow		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/21/2007	3:36 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Daylight	Snow		V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2008	1/8/2008	1:55 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with motor vehicle in traffic
STOUGHTON	2008	2/1/2008	10:37 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Rain	MORTON STREET / PLAIN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/3/2008	6:19 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle
STOUGHTON	2008	3/4/2008	12:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/27/2008	11:46 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with light pole or other
STOUGHTON	2008	4/3/2008	2:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/16/2008	8:07 PM	Non-fatal injury	2	2	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/19/2008	7:07 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle
STOUGHTON	2008	4/30/2008	1:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/11/2008	6:15 AM	Non-fatal injury	2	1	0	Not reported	Dry	Daylight	Clear	WASHINGTON STREET / MORTON STREET	V1:Northbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	8/31/2008	9:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/4/2008	11:34 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	MORTON STREET / PLAIN STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/7/2008	3:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	11/3/2008	3:21 PM	Non-fatal injury	1	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PARK STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	12/8/2008	11:00 AM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / WYMAN	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/19/2008	3:10 PM	Property damage only (none injured)	2	0	0	Rear-end	Ice	Daylight	Snow/Severe crosswinds	WASHINGTON STREET / MORTON STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/22/2008	9:18 AM	Property damage only (none injured)	2	0	0	Angle	Ice	Daylight	Clear	PLAIN STREET / MORTON STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Morton at Summer/Wyman/Porter

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2009	1/14/2009	8:35 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Dark - lighted roadway	Clear	WYMAN STREET / WATER STREET	V1:Northbound	V1: Collision with tree
STOUGHTON	2009	1/15/2009	5:46 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/21/2009	3:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound	V1: Collision with light pole or other
STOUGHTON	2009	2/24/2009	5:27 PM	Non-fatal injury	2	2	0	Head-on	Dry	Dusk	Clear	WASHINGTON STREET Rte 27 S / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/26/2009	2:23 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Unknown		V1:Eastbound	V1: Collision with utility pole
STOUGHTON	2009	5/11/2009	9:47 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WYMAN STREET / BROCK STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/12/2009	12:44 PM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/8/2009	8:53 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/20/2009	8:17 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/13/2009	1:30 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLAIN STREET / MORTON STREET	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	9/21/2009	11:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	MORTON STREET / GREG ROAD	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/23/2009	8:30 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/24/2009	7:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/25/2009	9:44 PM	Non-fatal injury	1	1	0	Single vehicle crash	Wet	Dark - lighted roadway	Rain/Fog, smog, smoke		V1:Southbound	V1: Collision with tree
STOUGHTON	2009	12/30/2009	3:32 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Pleasant at Park/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/3/2007	2:40 AM	Not Reported	2	0	0	Rear-end	Dry	Daylight	Clear	Rte 139 / PLEASANT STREET	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	1/9/2007	8:17 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with other movable object
STOUGHTON	2007	1/13/2007	5:20 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dark - lighted roadway	Cloudy/Other	PLEASANT STREET Rte 139 / TURNPIKE STREET	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	1/18/2007	00:00 AM	Non-fatal injury	2	3	0	Head-on	Snow	Dark - lighted roadway	Snow/Cloudy		V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/21/2007	4:20 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET / PLEASANT STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/22/2007	2:58 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PINE STREET / PLEASANT STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/24/2007	2:55 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear/Cloudy	PLEASANT STREET / LOWE AVENUE	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/30/2007	3:09 PM	Property damage only (none injured)	3	0	0	Angle	Dry	Daylight	Clear/Cloudy	PLEASANT STREET / LINCOLN STREET	V1:Southbound / V2:Westbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	2/9/2007	3:42 PM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Dry	Daylight	Clear	PLEASANT STREET / PINE STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/16/2007	8:25 PM	Property damage only (none injured)	2	0	0	Head-on	Ice	Dark - lighted roadway	Clear/Other	CENTRAL STREET / PLEASANT STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/23/2007	4:24 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Dark - lighted roadway	Snow	PLEASANT STREET / PINE STREET	V1:Eastbound	V1: Collision with tree
STOUGHTON	2007	2/24/2007	7:38 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/25/2007	7:05 AM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear/Other	PLEASANT STREET Rte 139 N / CENTRAL STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/26/2007	11:52 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Dark - lighted roadway	Snow/Sleet, hail (freezing rain or drizzle)		V1:Eastbound	V1: Collision with highway traffic sign post
STOUGHTON	2007	3/1/2007	2:20 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	LINCOLN STREET / PLEASANT STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/2/2007	6:31 PM	Property damage only (none injured)	2	0	0	Angle	Sand, mud, dirt, oil, gravel	Dark - lighted roadway	Clear	PLEASANT STREET / LINCOLN STREET	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/5/2007	3:24 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/6/2007	8:25 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / LINCOLN STREET	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/13/2007	3:33 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/15/2007	12:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Not reported / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/18/2007	2:00 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PLEASANT STREET / PARK STREET	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	3/26/2007	3:30 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Cloudy/Rain	PLEASANT STREET / TURNPIKE STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/2/2007	10:30 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain	PLEASANT STREET Rte 139 / PINE STREET	V1:Eastbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	4/4/2007	3:25 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain/Sleet, hail (freezing rain or drizzle)		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/7/2007	3:11 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / LINCOLN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/17/2007	4:58 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET Rte 139 E / PARK STREET Rte 27 N	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/19/2007	1:39 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET Rte 139 / CHESTNUT STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/22/2007	3:04 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / TURNPIKE STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/23/2007	4:16 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dawn	Clear	PARK STREET Rte 27 / PLEASANT STREET Rte 139	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/16/2007	9:41 AM	Property damage only (none injured)	3	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / OAKLAND STREET	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	6/20/2007	9:41 AM	Property damage only (none injured)	3	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / OAKLAND STREET	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	6/25/2007	1:37 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Dry	Dark - unknown roadway lighting	Clear	CENTRAL STREET / PLEASANT STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	7/6/2007	3:40 AM	Not Reported	3	0	0	Rear-end	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Not reported /	V1: Not reported / V2: Not reported / V3: Not
STOUGHTON	2007	7/19/2007	12:30 PM	Not Reported	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	7/27/2007	7:30 AM	Property damage only (none injured)	1	0	0	Rear-end	Dry	Daylight	Cloudy	TURNPIKE STREET Rte 139 / PLEASANT STREET	V1:Southbound	V1: Not reported
STOUGHTON	2007	8/5/2007	3:20 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	8/14/2007	00:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear		V1:Westbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2007	8/20/2007	8:45 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	8/31/2007	2:50 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Other		V1:Westbound	V1: Collision with guardrail
STOUGHTON	2007	8/31/2007	1:02 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/2/2007	5:32 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/6/2007	8:10 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/10/2007	8:37 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy	WASHINGTON STREET Rte 138 S / PLEASANT STREET Rte 139 N	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Pleasant at Park/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	9/18/2007	8:11 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	CAPEN STREET / PLEASANT STREET Rte 139 E	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/19/2007	9:50 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET Rte 139 W / WASHINGTON STREET Rte 138	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/20/2007	10:54 AM	Property damage only (none injured)	3	0	0	Not reported	Not reported	Not reported	Not Reported	PLEASANT STREET / TURNPIKE STREET	V1:Southbound / V2:Southbound / V3:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2007	9/25/2007	7:00 PM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / OAKLAND STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2007	10/11/2007	8:42 AM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Rain	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/22/2007	3:45 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/29/2007	3:50 AM	Non-fatal injury	2	1	0	Not reported	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Northbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	11/3/2007	10:14 AM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Rain		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/11/2007	1:10 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET Rte 139 / LINCOLN STREET	V1:Westbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	11/20/2007	3:43 PM	Not Reported	2	0	0	Angle	Wet	Dusk	Rain	PLEASANT STREET / PINE STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/2/2007	8:30 PM	Property damage only (none injured)	2	0	0	Rear-end	Snow	Dark - lighted roadway	Snow	PLEASANT STREET / CENTRAL STREET	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	12/2/2007	8:38 PM	Property damage only (none injured)	2	0	0	Angle	Snow	Dark - lighted roadway	Snow/Sleet, hail (freezing rain or drizzle)	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/4/2007	2:59 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/5/2007	8:46 AM	Non-fatal injury	4	1	0	Rear-end	Dry	Daylight	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Westbound / V2:Westbound / V3:Westbound / V4:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic / V4: Collision with motor vehicle in traffic
STOUGHTON	2007	12/11/2007	11:03 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear		V1:Southbound	V1: Collision with utility pole
STOUGHTON	2007	12/12/2007	7:34 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dark - lighted roadway	Clear	PLEASANT STREET / TURNPIKE STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/13/2007	1:00 AM	Property damage only (none injured)	2	0	0	Rear-end	Snow	Daylight	Snow	PLEASANT STREET Rte 139 / PROSPECT STREET	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	12/18/2007	6:59 AM	Property damage only (none injured)	2	0	0	Head-on	Dry	Dawn	Sleet, hail (freezing rain or drizzle)	CENTRAL STREET / PLEASANT STREET Rte 139 N	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/18/2007	5:24 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	PLEASANT STREET Rte 139 E / CENTRAL STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/22/2007	11:00 AM	Not Reported	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	PLEASANT STREET / Rte 139	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	12/24/2007	5:50 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	PLEASANT STREET / TURNPIKE STREET	V1:Westbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2007	12/28/2007	8:52 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Cloudy/Rain	PLEASANT STREET / CENTRAL STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/30/2007	6:17 PM	Non-fatal injury	2	2	0	Sideswipe, same direction	Dry	Dark - lighted roadway	Clear	LINCOLN STREET / PLEASANT STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/31/2007	12:03 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / PAGE STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/18/2008	8:47 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Wet	Daylight	Cloudy/Rain	PINE STREET / PLEASANT STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/18/2008	12:48 PM	Non-fatal injury	2	3	0	Head-on	Snow	Dark - lighted roadway	Snow/Cloudy		V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/2/2008	4:04 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Wet	Dark - lighted roadway	Rain		V1:Northbound	V1: Collision with utility pole
STOUGHTON	2008	2/8/2008	5:36 PM	Property damage only (none injured)	3	0	0	Rear-end	Wet	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	TURNPIKE STREET / PLEASANT STREET	V1:Westbound / V2:Westbound / V3:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2008	2/10/2008	1:10 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Clear/Cloudy	PLEASANT STREET / PINE STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/18/2008	5:36 PM	Property damage only (none injured)	3	0	0	Sideswipe, same direction	Wet	Dark - lighted roadway	Rain		V1:Northbound / V2:Northbound / V3:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2008	2/24/2008	00:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	CENTRAL STREET / PLEASANT STREET Rte 139	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/21/2008	12:30 PM	Not Reported	2	0	0	Single vehicle crash	Dry	Daylight	Clear	PLEASANT STREET Rte 139 / CHESTNUT STREET	V1:Southbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	3/22/2008	4:00 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/7/2008	7:09 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/7/2008	7:47 AM	Non-fatal injury	2	1	0	Unknown	Dry	Daylight	Clear/Other	LINCOLN STREET / PLEASANT STREET Rte 139	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/29/2008	2:51 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain		V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	5/2/2008	6:42 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain	PROSPECT STREET / PLEASANT STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	5/12/2008	3:27 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear		V1:Westbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	5/16/2008	5:00 AM	Non-fatal injury	1	1	0	Sideswipe, same direction	Wet	Dusk	Cloudy	CENTRAL STREET / PLEASANT STREET	V1:Northbound	V1: Not reported
STOUGHTON	2008	5/22/2008	2:33 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / GROVE STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	5/26/2008	10:51 AM	Not Reported	2	0	0	Sideswipe, same direction	Unknown	Unknown	Unknown		V1:Not reported / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2008	5/29/2008	7:09 PM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with motor vehicle in traffic

Pleasant at Park/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2008	5/29/2008	7:09 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PLEASANT STREET	V1:Eastbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2008	5/30/2008	10:53 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear/Cloudy	TURNPIKE STREET / PLEASANT STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/4/2008	6:58 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Cloudy/Rain	PLEASANT STREET / CENTRAL STREET	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/5/2008	4:06 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Cloudy/Rain	PROSPECT STREET / PLEASANT STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/11/2008	6:42 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/13/2008	3:03 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear		V1:Northbound	V1: Overturn/rollover
STOUGHTON	2008	6/26/2008	9:17 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	PLEASANT STREET / GLEN ECHO BOULEVARD	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	7/6/2008	3:45 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	7/14/2008	6:42 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / LINCOLN STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	7/21/2008	4:00 AM	Not Reported	2	0	0	Not reported	Not reported	Not reported	Rain		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	7/23/2008	9:57 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy/Clear	TURNPIKE STREET / PLEASANT STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	7/31/2008	8:45 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Cloudy/Rain	CENTRAL STREET / PLEASANT STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/2/2008	11:29 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear		V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/24/2008	6:01 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with guardrail
STOUGHTON	2008	8/28/2008	7:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Unknown	PLEASANT STREET / CENTRAL STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/28/2008	5:57 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	PLEASANT STREET Rte 139 / CENTRAL STREET	V1:Eastbound	V1: Collision with light pole or other
STOUGHTON	2008	9/14/2008	11:25 AM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Cloudy/Rain	PLEASANT STREET / CENTRAL STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/14/2008	4:08 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy	PLEASANT STREET / LINCOLN STREET	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	9/15/2008	4:15 PM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / LINCOLN STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2008	9/21/2008	5:10 AM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Clear/Clear		V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2008	10/21/2008	7:41 AM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Cloudy/Other		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	10/22/2008	3:19 PM	Non-fatal injury	2	1	0	Angle	Wet	Daylight	Rain		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/3/2008	3:21 PM	Non-fatal injury	1	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PARK STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	11/7/2008	10:07 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Clear		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/8/2008	5:02 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	PLEASANT STREET / GROVE STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/22/2008	8:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/27/2008	6:40 AM	Non-fatal injury	2	3	0	Head-on	Dry	Dawn	Clear		V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/1/2008	12:00 PM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / WASHINGTON STREET / PARK STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/4/2008	12:42 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / GROVE STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/9/2008	3:52 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Rain	PLEASANT STREET / GLEN ECHO BOULEVARD	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/17/2008	10:06 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/21/2008	11:53 PM	Property damage only (none injured)	2	0	0	Angle	Snow	Dark - lighted roadway	Snow		V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/3/2009	00:00 AM	Property damage only (none injured)	1	0	0	Head-on	Ice	Dark - lighted roadway	Cloudy/Snow		V1:Southbound	V1: Collision with light pole or other
STOUGHTON	2009	1/12/2009	6:00 AM	Unknown	2	0	0	Rear-end	Wet	Dark - unknown roadway lighting	Clear		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2009	1/14/2009	1:55 PM	Property damage only (none injured)	3	0	0	Angle	Dry	Daylight	Clear	LINCOLN STREET / PLEASANT STREET	V1:Eastbound / V2:Northbound / V3:Southbound	V1: Collision with motor vehicle in traffic / V2: Not reported / V3: Collision with motor vehicle
STOUGHTON	2009	1/16/2009	5:32 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Dark - lighted roadway	Clear	PLEASANT STREET / PINE STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/17/2009	8:04 AM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/19/2009	3:05 PM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear	LINCOLN STREET / PLEASANT STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/26/2009	4:00 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	2/3/2009	2:25 PM	Property damage only (none injured)	2	0	0	Rear-end	Ice	Daylight	Snow/Sleet, hail (freezing rain or drizzle)		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	2/12/2009	10:43 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	CHESTNUT STREET / PLEASANT STREET	V1:Southbound	V1: Collision with utility pole

Pleasant at Park/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2009	2/17/2009	9:11 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	3/8/2009	1:34 AM	Non-fatal injury	2	2	0	Angle	Dry	Dark - lighted roadway	Cloudy/Other	PLEASANT STREET / LOWE AVENUE	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	3/18/2009	1:50 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S / PLEASANT STREET Rte 139 E / PARK STREET Rte 27 N	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	3/25/2009	5:10 PM	Property damage only (none injured)	4	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / OAKLAND STREET	V1:Eastbound / V2:Eastbound / V3:Eastbound / V4:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic / V4: Collision with motor vehicle in traffic
STOUGHTON	2009	3/26/2009	1:10 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear	CENTRAL STREET / PLEASANT STREET	V1:Northbound	V1: Collision with light pole or other
STOUGHTON	2009	4/5/2009	12:54 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/15/2009	4:53 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/20/2009	1:06 PM	Non-fatal injury	3	1	0	Angle	Dry	Daylight	Clear	PLEASANT STREET Rte 139 W / LINCOLN STREET	V1:Eastbound / V2:Southbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2009	4/20/2009	3:26 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N / PARK STREET Rte 27 S / PLEASANT STREET Rte 139 W	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/20/2009	5:16 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / LINCOLN STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/8/2009	9:00 AM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/13/2009	2:36 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Other		V1:Westbound	V1: Overturn/rollover
STOUGHTON	2009	5/16/2009	9:47 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/24/2009	5:02 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Wet	Daylight	Rain/Cloudy	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/21/2009	4:29 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Wet	Daylight	Rain	LINCOLN STREET / PLEASANT STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/23/2009	8:18 AM	Non-fatal injury	2	1	0	Rear-end	Wet	Daylight	Cloudy/Rain		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/28/2009	3:30 PM	Property damage only (none injured)	2	0	0	Head-on	Wet	Dark - lighted roadway	Rain/Cloudy	CENTRAL STREET / PLEASANT STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	7/10/2009	4:51 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	PLEASANT STREET Rte 139 / LINCOLN STREET	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	7/19/2009	4:10 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	7/25/2009	3:06 PM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / PARK STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/5/2009	11:48 AM	Non-fatal injury	2	2	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / CHESTNUT STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/12/2009	8:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/12/2009	2:39 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 N / PARK STREET Rte 27 S / PLEASANT STREET Rte 139 W	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/11/2009	5:04 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Rain	TURNPIKE STREET / PLEASANT STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/19/2009	10:05 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/30/2009	6:23 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dawn	Clear	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/9/2009	4:55 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy	PLEASANT STREET / CENTRAL STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/20/2009	8:40 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/21/2009	8:10 AM	Property damage only (none injured)	2	0	0	Single vehicle crash	Dry	Daylight	Clear	PAGE STREET / OLD MAPLE STREET / PLEASANT STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	10/29/2009	9:20 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/6/2009	4:42 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dusk	Clear	TURNPIKE STREET / PLEASANT STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/7/2009	11:36 AM	Non-fatal injury	3	3	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound / V3:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic
STOUGHTON	2009	11/7/2009	4:23 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	CENTRAL STREET / PLEASANT STREET	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/9/2009	6:15 PM	Not Reported	2	0	0	Not reported	Dry	Dark - lighted roadway	Clear	PLEASANT AVENUE Rte 139 / LINCOLN STREET / Rte 139	V1:Southbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2009	11/12/2009	4:51 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Dark - lighted roadway	Clear	PINE STREET / PLEASANT STREET	V1:Not reported / V2:Westbound	V1: Not reported / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/19/2009	7:09 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/25/2009	4:10 PM	Non-fatal injury	2	1	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/29/2009	6:53 AM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dawn	Clear		V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)

Pleasant at Park/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2009	11/30/2009	3:44 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain/Cloudy	LINCOLN STREET / PLEASANT STREET	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/4/2009	6:24 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Other	Clear		V1:Northbound	V1: Collision with unknown movable object
STOUGHTON	2009	12/8/2009	11:54 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/10/2009	9:04 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/22/2009	8:24 AM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Clear	PLEASANT STREET / LOWE AVENUE	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/29/2009	1:52 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PLEASANT STREET / CENTRAL STREET	V1:Westbound / V2:Eastbound	V1: Not reported / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/1/2007	11:31 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain	PARK STREET / WASHINGTON STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/29/2007	4:02 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/9/2007	5:09 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/22/2007	7:37 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	7/2/2007	6:20 PM	Not Reported	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	7/28/2007	3:04 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/6/2007	7:32 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/14/2008	6:10 AM	Non-fatal injury	2	1	0	Rear-end	Snow	Dawn	Snow		V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	3/8/2008	5:43 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Wet	Dusk	Rain/Severe crosswinds	PARK STREET / WASHINGTON STREET	V1:Southbound	V1: Collision with highway traffic sign post
STOUGHTON	2008	7/28/2008	5:30 AM	Property damage only (none injured)	2	0	0	Not reported	Wet	Not reported	Rain		V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/12/2008	4:21 AM	Non-fatal injury	2	1	0	Angle	Wet	Dark - lighted roadway	Rain	WASHINGTON STREET Rte 138 / Rte 139	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	12/26/2008	3:30 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	7/15/2009	11:30 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / PARK STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/18/2009	7:26 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / PARK STREET Rte 27	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Porter at Pearl/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/3/2007	7:54 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear	PORTER STREET / WASHINGTON STREET / PEARL STREET	V1:Northbound	V1: Collision with utility pole
STOUGHTON	2007	1/4/2007	4:35 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	PORTER STREET / WASHINGTON STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	1/28/2007	4:44 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET / PORTER STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/1/2007	10:17 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Not reported / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle
STOUGHTON	2007	3/8/2007	7:05 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear		V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	5/31/2007	11:21 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/31/2007	7:57 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Westbound	V1: Collision with parked motor vehicle / V2:
STOUGHTON	2007	6/13/2007	10:45 AM	Unknown	2	0	0	Angle	Dry	Daylight	Cloudy	PORTER STREET / Rte 27 N	V1:Westbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	6/13/2007	10:46 AM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Cloudy	PEARL STREET / PORTER STREET	V1:Southbound	V1: Collision with motor vehicle in traffic
STOUGHTON	2007	6/25/2007	11:10 AM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	PORTER STREET / ROSE STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	8/6/2007	11:48 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Not reported / V2:Eastbound	V1: Not reported / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/17/2007	5:27 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	PORTER STREET / HAYDEN STREET	V1:Westbound	V1: Not reported
STOUGHTON	2007	10/17/2007	11:09 AM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Dry	Daylight	Clear	WASHINGTON STREET / PORTER STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/13/2007	9:00 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	PORTER STREET / ROSE STREET	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/1/2007	8:29 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Unknown		V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2007	12/17/2007	3:10 PM	Property damage only (none injured)	2	0	0	Angle	Ice	Daylight	Clear/Cloudy	PORTER STREET / ROSE STREET	V1:Southbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/4/2008	2:10 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PORTER STREET / ROSE STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	1/27/2008	3:18 PM	Property damage only (none injured)	2	0	0	Rear-end	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	PORTER STREET / CANTON STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/7/2008	4:36 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dusk	Cloudy		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/28/2008	7:49 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / PORTER STREET / PEARL STREET	V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)
STOUGHTON	2008	2/29/2008	2:10 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear/Unknown	PORTER STREET / CANTON STREET	V1:Eastbound	V1: Collision with curb
STOUGHTON	2008	3/8/2008	11:24 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Wet	Daylight	Rain		V1:Westbound	V1: Collision with utility pole
STOUGHTON	2008	4/3/2008	8:04 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle
STOUGHTON	2008	4/3/2008	9:07 PM	Unknown	1	0	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear	CANTON STREET / PORTER STREET	V1:Eastbound	V1: Collision with curb
STOUGHTON	2008	4/5/2008	9:00 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Wet	Daylight	Cloudy		V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2008	4/30/2008	6:15 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	ROSE STREET / PORTER STREET	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	5/1/2008	12:20 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/8/2008	2:03 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / PORTER STREET	V1:Southbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2008	7/19/2008	3:53 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Daylight	Clear	PORTER STREET / CANTON STREET	V1:Westbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	7/25/2008	8:00 PM	Non-fatal injury	2	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	7/31/2008	12:41 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PORTER STREET / HAYDEN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	2/20/2009	00:00 AM	Property damage only (none injured)	2	0	0	Angle	Ice	Dark - lighted roadway	Cloudy/Snow		V1:Westbound / V2:Eastbound	V1: Other / V2: Collision with parked motor
STOUGHTON	2009	5/21/2009	11:08 AM	Property damage only (none injured)	2	0	0	Angle	Not reported	Daylight	Clear	PORTER STREET / ROSE STREET	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/14/2009	5:47 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/15/2009	10:17 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	PEARL STREET / PORTER STREET / WASHINGTON STREET Rte 27 N	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	8/20/2009	1:01 PM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear	PORTER STREET / WASHINGTON STREET	V1:Southbound	V1: Collision with light pole or other post/support
STOUGHTON	2009	8/23/2009	10:16 AM	Property damage only (none injured)	3	0	0	Angle	Dry	Daylight	Cloudy	CANTON STREET Rte 27 / PORTER STREET Rte 27	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle / V3: Collision with motor vehicle in traffic
STOUGHTON	2009	9/24/2009	3:23 PM	Property damage only (none injured)	4	0	0	Rear-end	Dry	Daylight	Clear		V1:Southbound / V2:Southbound / V3:Southbound / V4:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic / V4: Collision with motor vehicle in traffic
STOUGHTON	2009	10/12/2009	3:45 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PORTER STREET / PEARL STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Sumner at Park Avenue/Park

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/14/2007	10:39 PM	Non-fatal injury	1	3	0	Single vehicle crash	Wet	Dark - lighted roadway	Rain	RYAN ROAD / SUMNER STREET	V1:Southbound	V1: Collision with tree
STOUGHTON	2007	2/21/2007	3:40 PM	Property damage only (none injured)	2	0	0	Not reported	Dry	Daylight	Clear	SUMNER STREET / MANOR DRIVE	V1:Southbound / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2007	3/9/2007	6:53 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear	SUMNER STREET / PARK STREET	V1:Westbound	V1: Other
STOUGHTON	2007	4/5/2007	7:41 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/6/2007	7:04 AM	Non-fatal injury	1	1	0	Single vehicle crash	Ice	Daylight	Clear		V1:Northbound	V1: Collision with tree
STOUGHTON	2007	4/10/2007	3:39 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/12/2007	1:35 AM	Not Reported	2	0	0	Rear-end	Wet	Daylight	Rain		V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	8/14/2007	10:45 PM	Non-fatal injury	1	1	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear		V1:Southbound	V1: Collision with utility pole
STOUGHTON	2007	9/4/2007	4:38 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	PARK STREET / SUMNER STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/7/2007	8:35 PM	Non-fatal injury	2	2	0	Angle	Dry	Dark - lighted roadway	Clear	PARK STREET Rte 27 S / SUMNER STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/12/2007	7:10 AM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	SUMNER STREET / SUMNER STREET / PARK STREET	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported
STOUGHTON	2007	10/8/2007	4:50 PM	Non-fatal injury	2	1	0	Sideswipe, opposite direction	Dry	Daylight	Cloudy		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/26/2007	5:43 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Wet	Dark - lighted roadway	Clear	GAY STREET / SUMNER STREET	V1:Eastbound	V1: Collision with tree
STOUGHTON	2008	1/28/2008	7:46 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Dark - lighted roadway	Clear	PARK AVENUE / PARK STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/28/2008	6:23 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	SUMNER STREET / PARK STREET	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/13/2008	8:46 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - roadway not lighted	Clear		V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/10/2008	2:49 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	PARK STREET / SUMNER STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	10/10/2008	3:01 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	PARK AVENUE / Rte 27 S	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/18/2008	1:10 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/18/2008	1:30 AM	Non-fatal injury	1	1	0	Single vehicle crash	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)		V1:Northbound	V1: Not reported
STOUGHTON	2008	12/24/2008	10:45 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	12/26/2008	7:12 PM	Non-fatal injury	1	1	0	Head-on	Ice	Dawn	Clear		V1:Northbound	V1: Collision with tree
STOUGHTON	2008	12/31/2008	6:36 PM	Property damage only (none injured)	2	0	0	Angle	Snow	Dark - lighted roadway	Snow/Blowing sand, snow		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/30/2009	7:15 AM	Property damage only (none injured)	2	0	0	Unknown	Snow	Daylight	Clear	SUMNER STREET / ATKINSON AVENUE	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported
STOUGHTON	2009	3/24/2009	3:59 PM	Non-fatal injury	2	1	0	Rear-end	Dry	Daylight	Clear	PARK STREET / SUMNER STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/11/2009	1:22 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Wet	Dark - lighted roadway	Rain/Cloudy		V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	4/20/2009	12:55 PM	Property damage only (none injured)	2	0	0	Angle	Snow	Daylight	Clear/Clear	SUMNER STREET / VAUGHN COURT	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/12/2009	10:13 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/23/2009	7:26 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Dawn	Rain/Cloudy	SUMNER STREET / BANCROFT ROAD / DUNCAN ROAD	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/24/2009	8:41 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Dawn	Clear/Other		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle
STOUGHTON	2009	9/27/2009	1:19 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain	SUMNER STREET / MELENDY AVENUE	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	9/28/2009	4:10 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/2/2009	4:56 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - roadway not lighted	Cloudy		V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/24/2009	2:05 PM	Property damage only (none injured)	2	0	0	Rear-end	Wet	Daylight	Cloudy		V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Wyman at Freeman/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	1/2/2007	8:10 AM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Clear		V1:Not reported / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle
STOUGHTON	2007	1/10/2007	7:14 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/9/2007	11:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/22/2007	9:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/23/2007	8:18 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Cloudy		V1:Westbound / V2:Westbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/8/2007	9:44 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2007	4/17/2007	4:21 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dusk	Rain/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	4/25/2007	5:16 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain	WASHINGTON STREET / FREEMAN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/29/2007	9:58 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	6/18/2007	11:39 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Unknown		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	7/2/2007	7:20 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	9/5/2007	7:06 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / FREEMAN STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/3/2007	5:07 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear	WASHINGTON STREET / FREEMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/20/2007	2:16 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	11/23/2007	3:39 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/13/2007	8:54 AM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear/Cloudy	WYMAN STREET / WASHINGTON STREET	V1:Eastbound	V1: Collision with light pole or other post/support
STOUGHTON	2007	12/16/2007	7:33 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Ice	Dark - lighted roadway	Rain/Snow		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/7/2008	12:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Snow	WASHINGTON STREET / FREEMAN STREET	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	2/19/2008	3:11 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear		V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/3/2008	6:19 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle
STOUGHTON	2008	3/4/2008	12:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/27/2008	11:46 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with light pole or other post/support
STOUGHTON	2008	4/3/2008	2:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/16/2008	8:07 PM	Non-fatal injury	2	2	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/30/2008	1:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	6/26/2008	3:39 PM	Not Reported	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Not reported / V2:Not reported	V1: Collision with parked motor vehicle / V2: Not reported
STOUGHTON	2008	6/27/2008	9:05 AM	Non-fatal injury	2	2	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/31/2008	9:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	10/23/2008	5:34 AM	Property damage only (none injured)	4	0	0	Angle	Dry	Daylight	Cloudy/Clear		V1:Northbound / V2:Eastbound / V3:Northbound / V4:Northbound	V1: Not reported / V2: Not reported / V3: Collision with motor vehicle in traffic / V4: Not reported

Wyman at Freeman/Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2008	11/3/2008	3:21 PM	Non-fatal injury	1	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PARK STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	12/8/2008	11:00 AM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	1/14/2009	8:35 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Dark - lighted roadway	Clear	WYMAN STREET / WATER STREET	V1:Northbound	V1: Collision with tree
STOUGHTON	2009	1/15/2009	5:46 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/17/2009	4:09 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dusk	Clear	FREEMAN STREET / WASHINGTON STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/21/2009	3:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound	V1: Collision with light pole or other post/support
STOUGHTON	2009	2/24/2009	5:27 PM	Non-fatal injury	2	2	0	Head-on	Dry	Dusk	Clear	WASHINGTON STREET Rte 27 S / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/11/2009	9:47 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WYMAN STREET / BROCK STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/12/2009	12:44 PM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/18/2009	4:29 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Cloudy/Clear	WASHINGTON STREET / FREEMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/8/2009	8:53 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/20/2009	8:17 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/17/2009	12:57 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/24/2009	7:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/22/2009	8:03 AM	Property damage only (none injured)	2	0	0	Angle	Snow	Daylight	Clear		V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/30/2009	3:32 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/3/2007	1:26 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Daylight	Rain/Cloudy			V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/14/2007	3:55 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Daylight	Clear			V1: Not reported / V2: Not reported
STOUGHTON	2008	10/30/2008	6:46 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Dawn	Clear/Other			V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	2/21/2009	12:33 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear			V1: Not reported / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/28/2009	9:04 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear			V1: Collision with motor vehicle in traffic / V2: Not reported

Wyman at Washington

Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Intersection	Vehicles Travel Directions	Most Harmful Events
STOUGHTON	2007	2/9/2007	11:57 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	2/23/2007	8:18 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Cloudy		V1:Westbound / V2:Westbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	3/8/2007	9:44 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Dark - lighted roadway	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported
STOUGHTON	2007	4/17/2007	4:21 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dusk	Rain/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	5/29/2007	9:58 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	7/2/2007	7:20 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	10/20/2007	2:16 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2007	12/13/2007	8:54 AM	Property damage only (none injured)	1	0	0	Angle	Dry	Daylight	Clear/Cloudy	WYMAN STREET / WASHINGTON STREET	V1:Eastbound	V1: Collision with light pole or other
STOUGHTON	2007	12/16/2007	7:33 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	Ice	Dark - lighted roadway	Rain/Snow		V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/3/2008	6:19 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear		V1:Eastbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle
STOUGHTON	2008	3/4/2008	12:56 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Cloudy		V1:Northbound / V2:Not reported	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	3/27/2008	11:46 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	Dry	Daylight	Clear		V1:Westbound	V1: Collision with light pole or other
STOUGHTON	2008	4/3/2008	2:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	Dry	Daylight	Clear		V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/16/2008	8:07 PM	Non-fatal injury	2	2	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	4/30/2008	1:36 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	8/31/2008	9:00 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear/Cloudy	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2008	11/3/2008	3:21 PM	Non-fatal injury	1	1	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET / PARK STREET / PLEASANT STREET	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)
STOUGHTON	2008	12/8/2008	11:00 AM	Not Reported	2	0	0	Angle	Dry	Daylight	Clear	WASHINGTON STREET Rte 138 / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported
STOUGHTON	2009	1/14/2009	8:35 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Ice	Dark - lighted roadway	Clear	WYMAN STREET / WATER STREET	V1:Northbound	V1: Collision with tree
STOUGHTON	2009	1/15/2009	5:46 PM	Property damage only (none injured)	2	0	0	Rear-end	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET Rte 138 S / WYMAN STREET	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	1/21/2009	3:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	Snow	Daylight	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound	V1: Collision with light pole or other
STOUGHTON	2009	2/24/2009	5:27 PM	Non-fatal injury	2	2	0	Head-on	Dry	Dusk	Clear	WASHINGTON STREET Rte 27 S / WYMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/11/2009	9:47 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	WYMAN STREET / BROCK STREET	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	5/12/2009	12:44 PM	Non-fatal injury	2	2	0	Head-on	Dry	Daylight	Clear	WASHINGTON STREET / WYMAN STREET / FREEMAN STREET	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/8/2009	8:53 PM	Property damage only (none injured)	2	0	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	6/20/2009	8:17 PM	Non-fatal injury	2	1	0	Angle	Dry	Dark - lighted roadway	Clear	WASHINGTON STREET / WYMAN STREET	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	11/24/2009	7:04 PM	Property damage only (none injured)	2	0	0	Angle	Wet	Dark - lighted roadway	Rain		V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic
STOUGHTON	2009	12/30/2009	3:32 PM	Property damage only (none injured)	2	0	0	Head-on	Dry	Daylight	Clear		V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic

Crash Rate Analysis

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

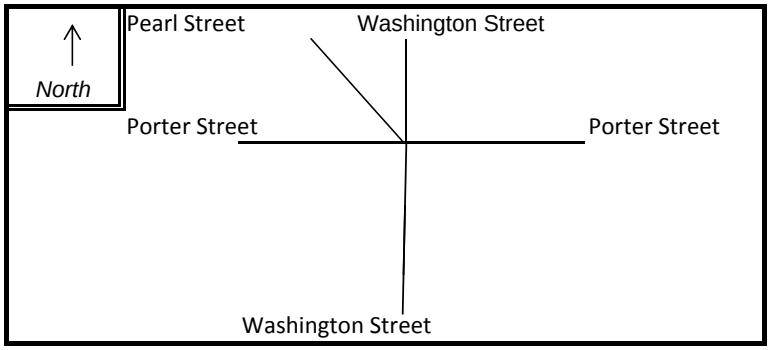
DISTRICT : 5 UNSIGNALIZED : [ ] 0.6 SIGNALIZED : [X] 0.77

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street, Pearl Street

MINOR STREET(S) : Porter Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SEB	SWB	
PEAK HOURLY VOLUMES (PM) :	530	25	960	185	545	**2,245**

" K " FACTOR : **0.086** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **26,105**

TOTAL # OF CRASHES : 14 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **4.67**

CRASH RATE CALCULATION : **0.49** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

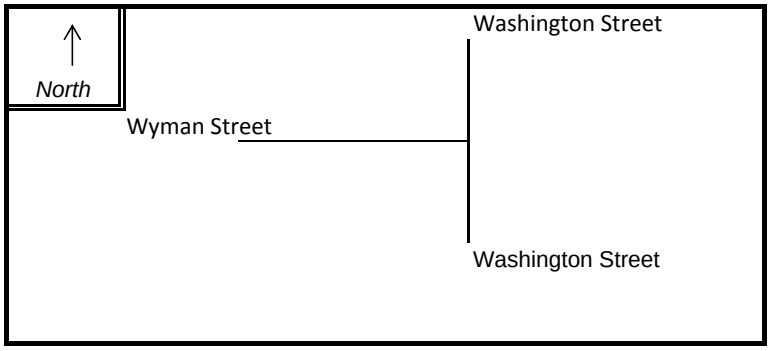
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street

MINOR STREET(S) : Wyman Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	WB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	15	955	1,240			**2,210**

" K " FACTOR : **0.107**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **20,654**

TOTAL # OF CRASHES : 17

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **5.67**

CRASH RATE CALCULATION : **0.75**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

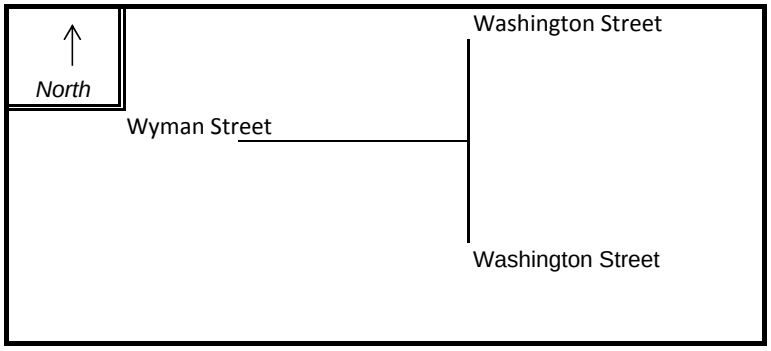
0.6 0.77

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street

MINOR STREET(S) : Wyman Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	125	970	1,235			**2,330**

" K " FACTOR : **0.107** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **21,776**

TOTAL # OF CRASHES : 23 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **7.67**

CRASH RATE CALCULATION : **0.96** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

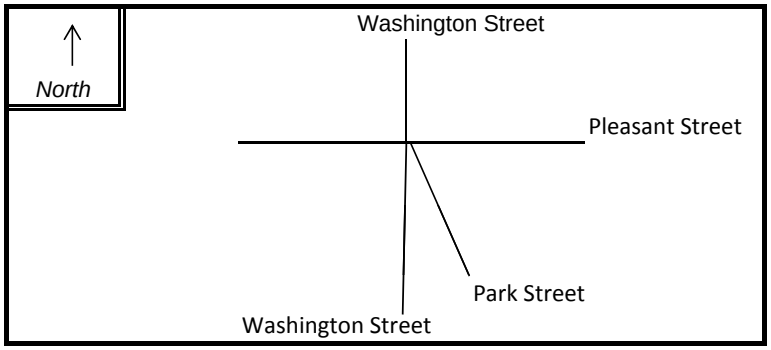
DISTRICT : 5 UNSIGNALIZED : [ ] 0.6 SIGNALIZED : [X] 0.77

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street, Park Street

MINOR STREET(S) : Pleasant Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	WB	NWB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	180	580	340	1,290		**2,390**

" K " FACTOR : **0.086**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **27,791**

TOTAL # OF CRASHES : 35

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **11.67**

CRASH RATE CALCULATION : **1.15**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

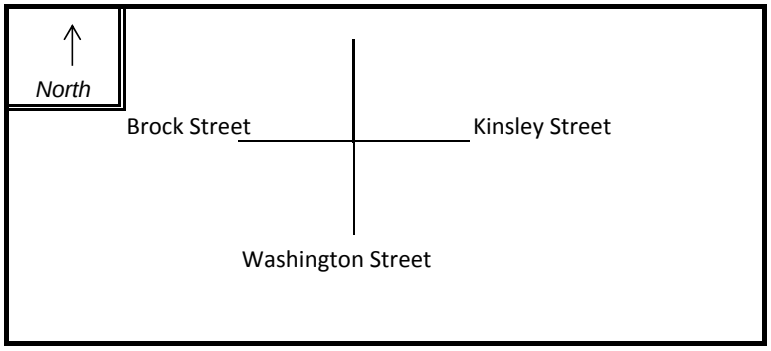
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Massachusetts Avenue

MINOR STREET(S) : North University Drive

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	145	70	465	775		1,455

" K " FACTOR : **0.086** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **16,919**

TOTAL # OF CRASHES : 22 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **7.33**

CRASH RATE CALCULATION : **1.19** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

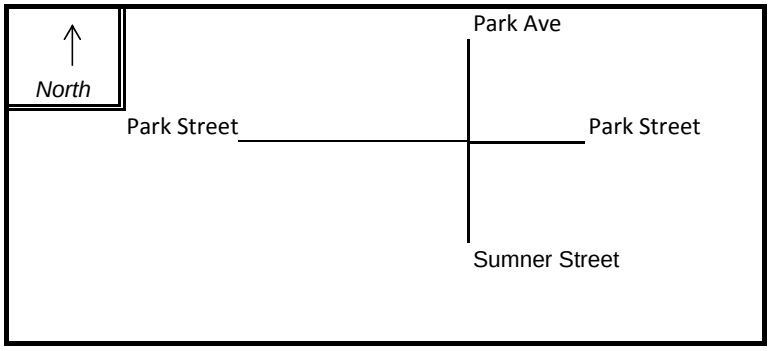
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Massachusetts Avenue

MINOR STREET(S) : North University Drive

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	705	495	145	50		1,395

" K " FACTOR : **0.107**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **13,037**

TOTAL # OF CRASHES : 10

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **3.33**

CRASH RATE CALCULATION : **0.70**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

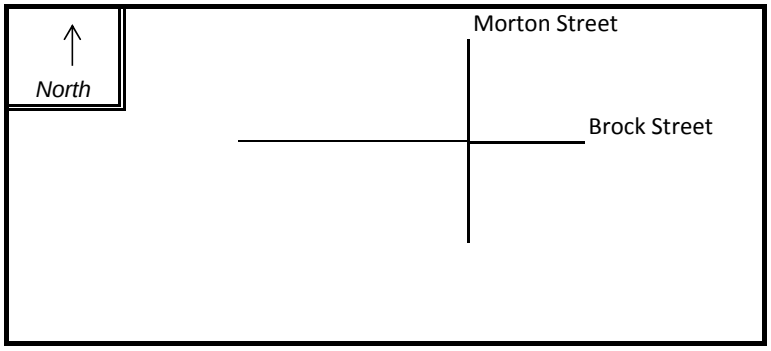
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Massachusetts Avenue

MINOR STREET(S) : North University Drive

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	80	160	82	155		477

" K " FACTOR : **0.107**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **4,458**

TOTAL # OF CRASHES : 2

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.67**

CRASH RATE CALCULATION : **0.41**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

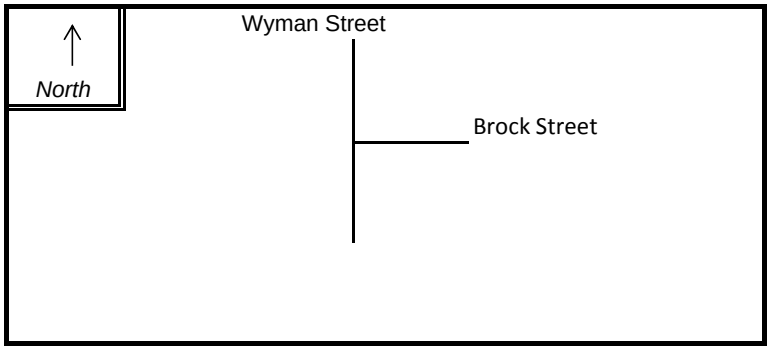
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Morton Street/ Wyman Street

MINOR STREET(S) : Brock Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	WB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	115	45	120			**280**

" K " FACTOR : **0.107**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **2,617**

TOTAL # OF CRASHES : 1

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : **0.35**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoughton, MA COUNT DATE : 4/12/2012

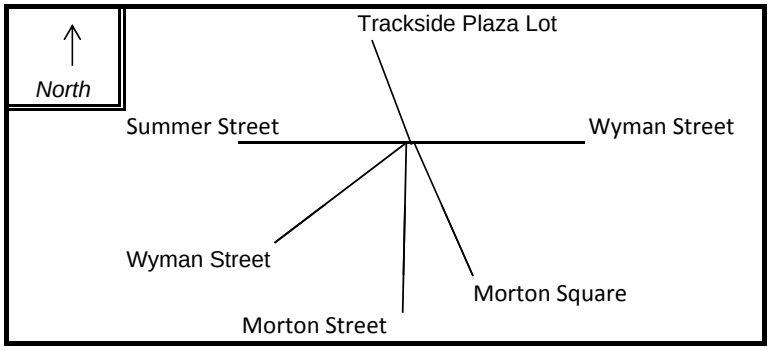
DISTRICT : 5 UNSIGNALIZED : X (0.6) SIGNALIZED : (0.77)

~ INTERSECTION DATA ~

MAJOR STREET : Summer/Wyman Street

MINOR STREET(S) : Wyman/Morton Street/Morton Square/ Trackside Plaza Lot

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	6	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	NEB	SEB	NWB	
PEAK HOURLY VOLUMES (PM) :	65	140	100	25	30	5	**365**

" K " FACTOR : **0.086**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **4,244**

TOTAL # OF CRASHES : 4

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **1.33**

CRASH RATE CALCULATION : **0.86**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : 2007 - 2009 MassDOT Crash Data

Project Title & Date:

Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	695	10	10	230
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.98	0.98	0.93	0.93
Hourly flow rate (vph)	0	28	709	10	11	247
Pedestrians	13					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	996	740			732	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	937	652			643	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			99	
cM capacity (veh/h)	257	410			822	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	719	258
Volume Left	0	0	11
Volume Right	28	10	0
cSH	410	1700	822
Volume to Capacity	0.07	0.42	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	14.4	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	14.4	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		50.7%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBR	NBL	NBT	SBT	SER	ø9
Lane Configurations						
Volume (vph)	470	165	705	230	180	
Turn Type	Over	Prot			custom	
Protected Phases	1	1	1 2 4	2		9
Permitted Phases					4	
Detector Phase	1	1	1 2 4	2	4	
Switch Phase						
Minimum Initial (s)	7.0	7.0		7.0	7.0	1.0
Minimum Split (s)	12.0	12.0		12.0	12.0	20.0
Total Split (s)	51.0	51.0	105.0	29.0	25.0	20.0
Total Split (%)	40.8%	40.8%	84.0%	23.2%	20.0%	16%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes		
Recall Mode	None	None		Min	None	None
Act Effct Green (s)	35.6	35.6	86.9	18.8	17.5	
Actuated g/C Ratio	0.38	0.38	0.92	0.20	0.19	
v/c Ratio	0.68	0.70	0.45	0.67	0.66	
Control Delay	12.4	33.5	3.0	49.0	51.9	
Queue Delay	0.0	0.5	0.1	0.0	0.0	
Total Delay	12.4	34.0	3.1	49.0	51.9	
LOS	B	C	A	D	D	
Approach Delay			15.2	49.0		
Approach LOS			B	D		

Intersection Summary			
Cycle Length: 125			
Actuated Cycle Length: 94.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Porter Street & Washington Street (Rt138)

Lane Group	EBR	NBL	NBT	SBT	SER
Lane Group Flow (vph)	588	494	766	250	216
v/c Ratio	0.68	0.70	0.45	0.67	0.66
Control Delay	12.4	33.5	3.0	49.0	51.9
Queue Delay	0.0	0.5	0.1	0.0	0.0
Total Delay	12.4	34.0	3.1	49.0	51.9
Queue Length 50th (ft)	63	230	0	133	114
Queue Length 95th (ft)	155	467	223	282	#249
Internal Link Dist (ft)			89	1	
Turn Bay Length (ft)					
Base Capacity (vph)	1052	1000	1712	522	410
Starvation Cap Reductn	0	190	182	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.61	0.50	0.48	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2
Lane Configurations										
Volume (vph)	0	470	290	165	705	230	0	0	180	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00			0.95	
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00	
Frt		0.86		1.00	1.00	1.00			1.00	
Flt Protected		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (prot)		1596		1863	1863	1863			1766	
Flt Permitted		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (perm)		1596		1863	1863	1863			1766	
Peak-hour factor, PHF	0.80	0.80	0.92	0.92	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	0	588	315	179	766	250	0	0	214	2
RTOR Reduction (vph)	0	265	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	323	0	494	766	250	0	0	216	0
Confl. Peds. (#/hr)		12	12							12
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				
Permitted Phases									4	
Actuated Green, G (s)		35.6		35.6	81.9	18.8			17.5	
Effective Green, g (s)		35.6		35.6	81.9	18.8			17.5	
Actuated g/C Ratio		0.37		0.37	0.86	0.20			0.18	
Clearance Time (s)		5.0		5.0		5.0			5.0	
Vehicle Extension (s)		2.0		2.0		2.0			2.0	
Lane Grp Cap (vph)		595		694	1598	367			324	
v/s Ratio Prot		0.20		c0.27	0.41	c0.13				
v/s Ratio Perm									c0.12	
v/c Ratio		0.54		0.71	0.48	0.68			0.67	
Uniform Delay, d1		23.6		25.6	1.6	35.6			36.3	
Progression Factor		1.00		1.00	1.00	1.00			1.00	
Incremental Delay, d2		0.5		2.9	0.1	4.1			4.0	
Delay (s)		24.1		28.5	1.7	39.7			40.3	
Level of Service		C		C	A	D			D	
Approach Delay (s)	24.1				12.2	39.7		40.3		
Approach LOS	C				B	D		D		

Intersection Summary

HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	23.6
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	10	1150	5	5	875
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.58	0.58	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	17	1337	6	6	983
Pedestrians	39					39
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.75	0.75			0.75	
vC, conflicting volume	1882	1418			1382	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2007	1391			1343	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	81			98	
cM capacity (veh/h)	37	93			363	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	1343	333	655
Volume Left	0	0	6	0
Volume Right	17	6	0	0
cSH	93	1700	363	1700
Volume to Capacity	0.19	0.79	0.02	0.39
Queue Length 95th (ft)	16	0	1	0
Control Delay (s)	52.4	0.0	0.5	0.0
Lane LOS	F		A	
Approach Delay (s)	52.4	0.0	0.2	
Approach LOS	F			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	125	15	1155	815	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	152	17	1343	916	67
Pedestrians	17			17		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.76					
vC, conflicting volume	2344	526	1000			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2613	526	1000			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	100	68	97			
cM capacity (veh/h)	14	473	666			

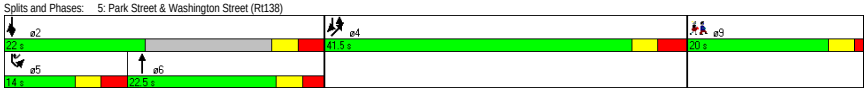
Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	152	1360	610	373
Volume Left	0	17	0	0
Volume Right	152	0	0	67
cSH	473	666	1700	1700
Volume to Capacity	0.32	0.03	0.36	0.22
Queue Length 95th (ft)	35	2	0	0
Control Delay (s)	16.2	1.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.2	1.4	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SBR	NET	SWR	ø9
Lane Configurations							
Volume (vph)	710	175	530	235	90	100	
Turn Type		Prot		pt+ov		Over	
Protected Phases	6	5	2	2 4	4	5	9
Permitted Phases							
Detector Phase	6	5	2	2 4	4	5	
Switch Phase							
Minimum Initial (s)	7.0	5.0	7.0		10.0	5.0	1.0
Minimum Split (s)	21.5	11.0	22.0		22.5	11.0	19.0
Total Split (s)	22.5	14.0	22.0	63.5	41.5	14.0	20.0
Total Split (%)	23.0%	14.3%	22.4%	64.8%	42.3%	14.3%	20%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	3.0	3.0		3.5	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.5	6.0	
Lead/Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Recall Mode	Min	None	Min		None	None	None
Act Effct Green (s)	17.5	8.2	31.4	67.5	24.2	8.2	
Actuated g/C Ratio	0.25	0.12	0.44	0.95	0.34	0.12	
v/c Ratio	0.89	0.99	0.75	0.15	0.82	0.23	
Control Delay	42.5	98.9	27.4	1.4	34.3	1.1	
Queue Delay	0.0	0.0	1.4	0.0	0.0	0.0	
Total Delay	42.5	98.9	28.8	1.4	34.3	1.1	
LOS	D	F	C	A	C	A	
Approach Delay	42.5		35.0		34.3		
Approach LOS	D		D		C		

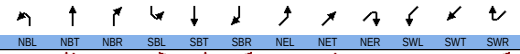
Intersection Summary			
Cycle Length: 98			
Actuated Cycle Length: 71.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 35.5		Intersection LOS: D	
Intersection Capacity Utilization 76.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: Park Street & Washington Street (Rt138)



Lane Group	NBT	SBL	SBT	SBR	NET	SWR
Lane Group Flow (vph)	755	199	602	267	500	122
v/c Ratio	0.89	0.99	0.75	0.15	0.82	0.23
Control Delay	42.5	98.9	27.4	1.4	34.3	1.1
Queue Delay	0.0	0.0	1.4	0.0	0.0	0.0
Total Delay	42.5	98.9	28.8	1.4	34.3	1.1
Queue Length 50th (ft)	154	82	188	0	178	0
Queue Length 95th (ft)	#418	#291	#584	60	393	0
Internal Link Dist (ft)	171		18		24	
Turn Bay Length (ft)						
Base Capacity (vph)	853	201	807	1736	908	520
Starvation Cap Reductn	0	0	77	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.99	0.82	0.15	0.55	0.23

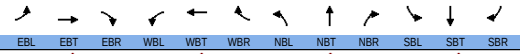
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	710	30	175	530	235	360	90	0	0	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (prot)		3465		1736	1827	1827		1791				1508
Flt Permitted		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (perm)		3465		1736	1827	1827		1791				1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	0	724	31	199	602	267	400	100	0	0	0	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	109
Lane Group Flow (vph)	0	755	0	199	602	267	0	500	0	0	0	13
Confl. Peds. (#/hr)			9									4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	9%	9%	9%
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		17.7		8.2	31.4	61.6		24.2				8.2
Effective Green, g (s)		17.7		8.2	31.4	61.6		24.2				8.2
Actuated g/C Ratio		0.24		0.11	0.42	0.83		0.33				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		827		192	773	1517		584				167
v/s Ratio Prot		c0.22		0.11	c0.33	0.15		c0.28				0.01
v/s Ratio Perm												
v/c Ratio		0.91		1.04	0.78	0.18		0.86				0.08
Uniform Delay, d1		27.5		33.0	18.4	1.3		23.4				29.6
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		14.1		74.8	4.5	0.0		11.4				0.1
Delay (s)		41.6		107.8	23.0	1.3		34.8				29.7
Level of Service		D		F	C	A		C				C
Approach Delay (s)		41.6			33.4			34.8			29.7	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	36.0	HCM Level of Service		D
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	74.2	Sum of lost time (s)		24.1
Intersection Capacity Utilization	76.7%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	180	15	5	60	2	1	0	1	2	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.50	0.50	0.50	0.54	0.54	0.54
Hourly flow rate (vph)	128	243	20	6	68	2	2	0	2	4	2	19
Pedestrians		16			43			37			43	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			3			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	113			301			663	672	333	679	681	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	113			301			663	672	333	679	681	128
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			99	100	100	99	99	98
cM capacity (veh/h)	1399			1205			307	319	662	298	315	877

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	392	76	4	24
Volume Left	128	6	2	4
Volume Right	20	2	2	19
cSH	1399	1205	420	611
Volume to Capacity	0.09	0.00	0.01	0.04
Queue Length 95th (ft)	8	0	1	3
Control Delay (s)	3.1	0.6	13.7	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	3.1	0.6	13.7	11.1
Approach LOS			B	B

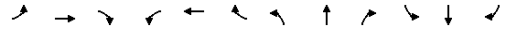
Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	39.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	45	50	5	35	10	130	240	40	5	290	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.73	0.73	0.73	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	33	59	66	7	48	14	160	296	49	5	315	54
Pedestrians		6			8			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1047	1034	352	1103	1036	337	376			354		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1047	1034	352	1103	1036	337	376			354		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	77	70	90	94	76	98	86			100		
cM capacity (veh/h)	144	197	685	116	197	696	1177			1170		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	158	68	506	375
Volume Left	33	7	160	5
Volume Right	66	14	49	54
cSH	253	212	1177	1170
Volume to Capacity	0.62	0.32	0.14	0.00
Queue Length 95th (ft)	95	33	12	0
Control Delay (s)	40.3	29.9	3.7	0.2
Lane LOS	E	D	A	A
Approach Delay (s)	40.3	29.9	3.7	0.2
Approach LOS	E	D		

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	60	0	30	90	85	2	175	45	15	60	2
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	0	69	0	39	118	112	3	246	63	21	83	3

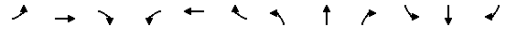
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	69	270	313	107
Volume Left (vph)	0	39	3	21
Volume Right (vph)	0	112	63	3
Hadj (s)	0.03	-0.17	-0.09	0.07
Departure Headway (s)	5.4	4.9	4.9	5.3
Degree Utilization, x	0.10	0.37	0.42	0.16
Capacity (veh/h)	590	681	703	617
Control Delay (s)	9.1	10.8	11.4	9.3
Approach Delay (s)	9.1	10.8	11.4	9.3
Approach LOS	A	B	B	A

Intersection Summary				
Delay			10.7	
HCM Level of Service			B	
Intersection Capacity Utilization			38.8%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	90	70	1	60	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	7	118	93	1	69	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266	94			95	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266	94			95	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	88			95	
cM capacity (veh/h)	687	960			1499	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	125	95	103
Volume Left	7	0	69
Volume Right	118	1	0
cSH	940	1700	1499
Volume to Capacity	0.13	0.06	0.05
Queue Length 95th (ft)	11	0	4
Control Delay (s)	9.4	0.0	5.1
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	5.1
Approach LOS	A		

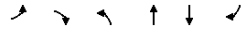
Intersection Summary				
Average Delay			5.3	
Intersection Capacity Utilization			24.1%	ICU Level of Service
Analysis Period (min)			15	
				A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	435	0	10	555	10	205	5	10	5	5	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.85	0.85
Hourly flow rate (vph)	6	500	0	11	631	11	238	6	12	6	6	12
Pedestrians		1			1			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	643			501			1187	1178	502	1187	1173	638
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	643			501			1187	1178	502	1187	1173	638
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			0	97	98	96	97	98
cM capacity (veh/h)	927			1052			153	185	562	155	189	476

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	506	653	238	17	24
Volume Left	6	11	238	0	6
Volume Right	0	11	0	12	12
cSH	927	1052	153	334	251
Volume to Capacity	0.01	0.01	1.56	0.05	0.09
Queue Length 95th (ft)	0	1	406	4	8
Control Delay (s)	0.2	0.3	335.2	16.4	20.8
Lane LOS	A	A	F	C	C
Approach Delay (s)	0.2	0.3	313.5		20.8
Approach LOS			F		C

Intersection Summary				
Average Delay	56.3			
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	1	5	45	20	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	1	5	49	22	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	92	33	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92	33	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	904	1041	1565			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	54	43
Volume Left	33	5	0
Volume Right	1	0	22
cSH	908	1565	1700
Volume to Capacity	0.04	0.00	0.03
Queue Length 95th (ft)	3	0	0
Control Delay (s)	9.1	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	0.8	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	16.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	25	460	15	15	530
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.97	0.97	0.95	0.95
Hourly flow rate (vph)	0	42	474	15	16	558
Pedestrians	26		21			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	1118	534			516	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1098	482			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			98	
cM capacity (veh/h)	211	531			1020	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	42	490	574
Volume Left	0	0	16
Volume Right	42	15	0
cSH	531	1700	1020
Volume to Capacity	0.08	0.29	0.02
Queue Length 95th (ft)	6	0	1
Control Delay (s)	12.4	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		55.8%	ICU Level of Service B
Analysis Period (min)		15	

Lane Group	EBR	NBL	NBT	SBT	SER	ø9
Lane Configurations						
Volume (vph)	530	155	475	530	180	
Turn Type	Over	Prot			custom	
Protected Phases	1	1	1 2 4	2		9
Permitted Phases					4	
Detector Phase	1	1	1 2 4	2	4	
Switch Phase						
Minimum Initial (s)	7.0	7.0		7.0	7.0	1.0
Minimum Split (s)	12.0	12.0		12.0	12.0	20.0
Total Split (s)	51.0	51.0	105.0	29.0	25.0	20.0
Total Split (%)	40.8%	40.8%	84.0%	23.2%	20.0%	16%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes		
Recall Mode	None	None		Min	None	None
Act Effct Green (s)	34.6	34.6	90.8	25.3	16.7	
Actuated g/C Ratio	0.35	0.35	0.92	0.26	0.17	
v/c Ratio	0.74	0.76	0.29	1.13	0.74	
Control Delay	17.7	38.0	2.1	118.3	58.1	
Queue Delay	0.0	0.7	0.1	0.0	0.0	
Total Delay	17.7	38.7	2.2	118.3	58.1	
LOS	B	D	A	F	E	
Approach Delay			20.6	118.3		
Approach LOS			C	F		

Intersection Summary		
Cycle Length: 125		
Actuated Cycle Length: 98.4		
Natural Cycle: 100		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.13		
Intersection Signal Delay: 45.8	Intersection LOS: D	
Intersection Capacity Utilization 86.5%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Porter Street & Washington Street (Rt138)

Lane Group	EBR	NBL	NBT	SBT	SER
Lane Group Flow (vph)	589	500	490	535	220
v/c Ratio	0.74	0.76	0.29	1.13	0.74
Control Delay	17.7	38.0	2.1	118.3	58.1
Queue Delay	0.0	0.7	0.1	0.0	0.0
Total Delay	17.7	38.7	2.2	118.3	58.1
Queue Length 50th (ft)	110	244	0	~362	119
Queue Length 95th (ft)	312	474	115	#813	#256
Internal Link Dist (ft)			89	1	
Turn Bay Length (ft)					
Base Capacity (vph)	972	918	1705	474	376
Starvation Cap Reductn	0	165	245	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.66	0.34	1.13	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2
Lane Configurations										
Volume (vph)	0	530	330	155	475	530	0	0	180	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00			0.94	
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00	
Frt		0.86		1.00	1.00	1.00			1.00	
Flt Protected		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (prot)		1611		1863	1863	1845			1760	
Flt Permitted		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (perm)		1611		1863	1863	1845			1760	
Peak-hour factor, PHF	0.90	0.90	0.97	0.97	0.97	0.99	0.99	0.84	0.84	0.84
Adj. Flow (vph)	0	589	340	160	490	535	0	0	214	6
RTOR Reduction (vph)	0	231	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	358	0	500	490	535	0	0	220	0
Confl. Peds. (#/hr)		12								12
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				
Permitted Phases									4	
Actuated Green, G (s)		34.6		34.6	86.6	25.3			16.7	
Effective Green, g (s)		34.6		34.6	86.6	25.3			16.7	
Actuated g/C Ratio		0.34		0.34	0.86	0.25			0.17	
Clearance Time (s)		5.0		5.0		5.0			5.0	
Vehicle Extension (s)		2.0		2.0		2.0			2.0	
Lane Grp Cap (vph)		555		642	1607	465			293	
v/s Ratio Prot		0.22		c0.27	0.26	c0.29				
v/s Ratio Perm									c0.13	
v/c Ratio		0.65		0.78	0.30	1.15			0.75	
Uniform Delay, d1		27.7		29.5	1.3	37.6			39.9	
Progression Factor		1.00		1.00	1.00	1.00			1.00	
Incremental Delay, d2		1.9		5.4	0.0	90.0			9.2	
Delay (s)		29.7		34.9	1.3	127.6			49.1	
Level of Service		C		C	A	F			D	
Approach Delay (s)	29.7				18.3	127.6		49.1		
Approach LOS	C				B	F		D		

Intersection Summary

HCM Average Control Delay	49.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	23.8
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	945	10	5	1235
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	21	995	11	5	1314
Pedestrians	37					37
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.78	0.78			0.78	
vC, conflicting volume	1705	1074			1042	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1762	954			914	
tC, single (s)	7.1	7.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	100	88			99	
cM capacity (veh/h)	50	174			561	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	1005	443	876
Volume Left	0	0	5	0
Volume Right	21	11	0	0
cSH	174	1700	561	1700
Volume to Capacity	0.12	0.59	0.01	0.52
Queue Length 95th (ft)	10	0	1	0
Control Delay (s)	28.5	0.0	0.3	0.0
Lane LOS	D		A	
Approach Delay (s)	28.5	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	125	15	955	1165	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	154	16	1005	1239	74
Pedestrians	24			24		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.79					
vC, conflicting volume	2337	705	1338			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2561	705	1338			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	58	97			
cM capacity (veh/h)	16	364	501			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	154	1021	826	488
Volume Left	0	16	0	0
Volume Right	154	0	0	74
cSH	364	501	1700	1700
Volume to Capacity	0.42	0.03	0.49	0.29
Queue Length 95th (ft)	51	2	0	0
Control Delay (s)	22.0	1.1	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	22.0	1.1	0.0	
Approach LOS	C			

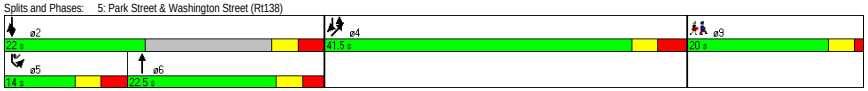
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SBR	NET	SWR	ø9
Lane Configurations							
Volume (vph)	545	140	625	525	95	180	
Turn Type		Prot		pt+ov		Over	
Protected Phases	6	5	2	2 4	4	5	9
Permitted Phases							
Detector Phase	6	5	2	2 4	4	5	
Switch Phase							
Minimum Initial (s)	7.0	5.0	7.0		10.0	5.0	1.0
Minimum Split (s)	21.5	11.0	22.0		22.5	11.0	19.0
Total Split (s)	22.5	14.0	22.0	63.5	41.5	14.0	20.0
Total Split (%)	23.0%	14.3%	22.4%	64.8%	42.3%	14.3%	20%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	3.0	3.0		3.5	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.5	6.0	
Lead/Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Recall Mode	Min	None	Min		None	None	None
Act Effct Green (s)	17.9	8.4	32.1	65.4	22.0	8.4	
Actuated g/C Ratio	0.25	0.12	0.44	0.90	0.30	0.12	
v/c Ratio	0.78	0.71	0.79	0.32	0.74	0.37	
Control Delay	37.5	57.2	31.5	3.0	32.2	1.8	
Queue Delay	0.0	0.0	2.6	0.0	0.0	0.0	
Total Delay	37.5	57.2	34.2	3.0	32.2	1.8	
LOS	D	E	C	A	C	A	
Approach Delay	37.5		24.0		32.2		
Approach LOS	D		C		C		

Intersection Summary

Cycle Length: 98
Actuated Cycle Length: 72.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 26.9 — Intersection LOS: C
Intersection Capacity Utilization 68.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Park Street & Washington Street (Rt138)



Lane Group	NBT	SBL	SBT	SBR	NET	SWR
Lane Group Flow (vph)	675	144	644	541	400	220
v/c Ratio	0.78	0.71	0.79	0.32	0.74	0.37
Control Delay	37.5	57.2	31.5	3.0	32.2	1.8
Queue Delay	0.0	0.0	2.6	0.0	0.0	0.0
Total Delay	37.5	57.2	34.2	3.0	32.2	1.8
Queue Length 50th (ft)	120	53	178	0	132	0
Queue Length 95th (ft)	#332	#211	#657	140	273	0
Internal Link Dist (ft)	171		18		24	
Turn Bay Length (ft)						
Base Capacity (vph)	864	204	820	1694	908	592
Starvation Cap Reductn	0	0	89	185	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.71	0.88	0.36	0.44	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	545	35	140	625	525	245	95	0	0	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (prot)		3527		1770	1863	1863		1798				1611
Flt Permitted		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (perm)		3527		1770	1863	1863		1798				1611
Peak-hour factor, PHF	0.86	0.86	0.86	0.97	0.97	0.97	0.85	0.85	0.85	0.82	0.82	0.82
Adj. Flow (vph)	0	634	41	144	644	541	288	112	0	0	0	220
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	195
Lane Group Flow (vph)	0	675	0	144	644	541	0	400	0	0	0	25
Confl. Peds. (#/hr)			18	8					23			8
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		18.2		8.4	32.1	60.1		22.0				8.4
Effective Green, g (s)		18.2		8.4	32.1	60.1		22.0				8.4
Actuated g/C Ratio		0.24		0.11	0.43	0.80		0.29				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		856		198	797	1493		527				180
v/s Ratio Prot		0.19		0.08	c0.35	0.29		c0.22				0.02
v/s Ratio Perm												
v/c Ratio		0.79		0.73	0.81	0.36		0.76				0.14
Uniform Delay, d1		26.6		32.2	18.8	2.1		24.1				30.0
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		4.5		10.7	5.7	0.1		5.5				0.1
Delay (s)		31.1		42.9	24.5	2.1		29.6				30.2
Level of Service		C		D	C	A		C				C
Approach Delay (s)		31.1			17.4			29.6			30.2	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)		20.9
Intersection Capacity Utilization	68.5%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	110	2	5	130	5	5	0	0	5	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.90	0.90	0.90	0.29	0.29	0.29	0.60	0.60	0.60
Hourly flow rate (vph)	26	141	3	6	144	6	17	0	0	8	0	42
Pedestrians		11			43			43			40	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			4			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	190			187			448	438	228	435	436	198
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190			187			448	438	228	435	436	198
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	100	98	100	95
cM capacity (veh/h)	1293			1338			440	466	754	461	467	807

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	169	156	17	50
Volume Left	26	6	17	8
Volume Right	3	6	0	42
cSH	1293	1338	440	718
Volume to Capacity	0.02	0.00	0.04	0.07
Queue Length 95th (ft)	2	0	3	6
Control Delay (s)	1.3	0.3	13.5	10.4
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	0.3	13.5	10.4
Approach LOS			B	B

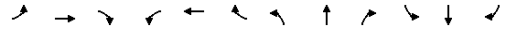
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	32.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	55	70	20	45	5	65	380	20	10	715	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.95	0.95	0.95	0.85	0.85	0.85
Hourly flow rate (vph)	23	62	80	23	52	6	68	400	21	12	841	59
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1474	1453	873	1553	1472	411	901			421		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1474	1453	873	1553	1472	411	901			421		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	47	77	39	54	99	91			99		
cM capacity (veh/h)	62	117	349	38	114	641	754			1138		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	165	81	489	912
Volume Left	23	23	68	12
Volume Right	80	6	21	59
cSH	146	76	754	1138
Volume to Capacity	1.13	1.08	0.09	0.01
Queue Length 95th (ft)	228	147	7	1
Control Delay (s)	174.7	222.0	2.5	0.3
Lane LOS	F	F	A	A
Approach Delay (s)	174.7	222.0	2.5	0.3
Approach LOS	F	F		

Intersection Summary				
Average Delay	29.3			
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	70	0	25	115	25	2	70	20	40	115	0
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	6	80	0	33	151	33	3	99	28	56	160	0

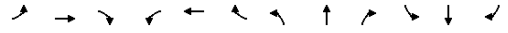
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	86	217	130	215
Volume Left (vph)	6	33	3	56
Volume Right (vph)	0	33	28	0
Hadj (s)	0.05	-0.01	-0.09	0.10
Departure Headway (s)	5.1	4.9	4.9	5.0
Degree Utilization, x	0.12	0.30	0.18	0.30
Capacity (veh/h)	635	686	680	680
Control Delay (s)	8.9	9.9	8.9	10.0
Approach Delay (s)	8.9	9.9	8.9	10.0
Approach LOS	A	A	A	B

Intersection Summary				
Delay	9.6			
HCM Level of Service	A			
Intersection Capacity Utilization	37.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	115	45	0	75	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	0	151	60	0	86	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	284	60			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284	60			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			94	
cM capacity (veh/h)	665	1003			1544	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	60	138
Volume Left	0	0	86
Volume Right	151	0	0
cSH	1003	1700	1544
Volume to Capacity	0.15	0.04	0.06
Queue Length 95th (ft)	13	0	4
Control Delay (s)	9.2	0.0	4.8
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	4.8
Approach LOS	A		

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	525	0	20	460	15	120	10	15	10	15	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.83	0.83	0.83	0.72	0.72	0.72
Hourly flow rate (vph)	22	565	0	21	474	15	145	12	18	14	21	35
Pedestrians		2			6			6			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	492			571			1184	1146	577	1163	1139	486
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	492			571			1184	1146	577	1163	1139	486
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			0	94	96	91	89	94
cM capacity (veh/h)	1070			997			137	190	511	151	192	579

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	586	510	145	30	69
Volume Left	22	21	145	0	14
Volume Right	0	15	0	18	35
cSH	1070	997	137	305	267
Volume to Capacity	0.02	0.02	1.05	0.10	0.26
Queue Length 95th (ft)	2	2	196	8	25
Control Delay (s)	0.6	0.6	155.4	18.1	23.2
Lane LOS	A	A	F	C	C
Approach Delay (s)	0.6	0.6	131.8		23.2
Approach LOS			F		C

Intersection Summary				
Average Delay	18.8			
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	55	10	0	25	25	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	11	0	27	27	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	71	43	60			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	43	60			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	934	1027	1544			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	71	27	60
Volume Left	60	0	0
Volume Right	11	0	33
cSH	947	1544	1700
Volume to Capacity	0.07	0.00	0.04
Queue Length 95th (ft)	6	0	0
Control Delay (s)	9.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.1	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	730	10	10	245
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.98	0.98	0.93	0.93
Hourly flow rate (vph)	0	28	745	10	11	263
Pedestrians	13					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.89	0.89			0.89	
vC, conflicting volume	1048	776			768	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	992	686			677	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			99	
cM capacity (veh/h)	237	389			792	

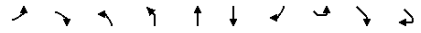
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	755	274
Volume Left	0	0	11
Volume Right	28	10	0
cSH	389	1700	792
Volume to Capacity	0.07	0.44	0.01
Queue Length 95th (ft)	6	0	1
Control Delay (s)	15.0	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	15.0	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		52.6%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2	ø9
Lane Configurations											
Volume (vph)	0	495	310	175	740	245	0	0	190	2	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Right Turn on Red		Yes								No	
Link Speed (mph)	30				30	30		30			
Link Distance (ft)	255				169	77		193			
Travel Time (s)	5.8				3.8	1.8		4.4			
Confl. Peds. (#/hr)		12	12							12	
Peak Hour Factor	0.80	0.80	0.92	0.92	0.92	0.92	0.92	0.84	0.84	0.84	
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	619	0	527	804	266	0	0	228	0	
Turn Type		Over	Prot	Prot					custom		
Protected Phases		1	1	1	1 2 4	2					9
Permitted Phases									4		
Detector Phase		1	1	1	1 2 4	2			4		
Switch Phase											
Minimum Initial (s)		7.0	7.0	7.0		7.0			7.0		1.0
Minimum Split (s)		12.0	12.0	12.0		12.0			12.0		20.0
Total Split (s)	0.0	51.0	51.0	51.0	105.0	29.0	0.0	0.0	25.0	0.0	20.0
Total Split (%)	0.0%	40.8%	40.8%	40.8%	84.0%	23.2%	0.0%	0.0%	20.0%	0.0%	16%
Yellow Time (s)		3.0	3.0	3.0		3.0			3.0		3.0
All-Red Time (s)		2.0	2.0	2.0		2.0			2.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	4.0	
Lead/Lag		Lead	Lead	Lead		Lag					
Lead-Lag Optimize?		Yes	Yes	Yes		Yes					
Recall Mode		None	None	None		Min			None		None
v/c Ratio		0.71		0.73	0.47	0.71			0.71		
Control Delay		14.6		34.9	3.2	51.4			55.2		
Queue Delay		0.0		1.2	0.1	0.0			0.0		
Total Delay		14.6		36.1	3.3	51.4			55.2		
Queue Length 50th (ft)		94		259	0	152			132		
Queue Length 95th (ft)		199		508	243	#316			#271		
Internal Link Dist (ft)	175				89	1		113			
Turn Bay Length (ft)											
Base Capacity (vph)		1010		944	1697	492			387		
Starvation Cap Reductn		0		216	173	0			0		
Spillback Cap Reductn		0		0	0	0			0		
Storage Cap Reductn		0		0	0	0			0		
Reduced v/c Ratio		0.61		0.72	0.53	0.54			0.59		

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 97.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Porter Street & Washington Street (Rt138)



Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2
Lane Configurations										
Volume (vph)	0	495	310	175	740	245	0	0	190	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00			0.95	
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00	
Frt		0.86		1.00	1.00	1.00			1.00	
Flt Protected		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (prot)		1596		1863	1863	1863			1765	
Flt Permitted		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (perm)		1596		1863	1863	1863			1765	
Peak-hour factor, PHF	0.80	0.80	0.92	0.92	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	0	619	337	190	804	266	0	0	226	2
RTOR Reduction (vph)	0	252	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	367	0	527	804	266	0	0	228	0
Confl. Peds. (#/hr)		12	12							12
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				
Permitted Phases									4	
Actuated Green, G (s)		38.0		38.0	85.8	19.8			18.0	
Effective Green, g (s)		38.0		38.0	85.8	19.8			18.0	
Actuated g/C Ratio		0.38		0.38	0.86	0.20			0.18	
Clearance Time (s)		5.0		5.0		5.0			5.0	
Vehicle Extension (s)		2.0		2.0		2.0			2.0	
Lane Grp Cap (vph)		610		711	1606	371			319	
v/s Ratio Prot		0.23		c0.28	0.43	c0.14				
v/s Ratio Perm									c0.13	
v/c Ratio		0.60		0.74	0.50	0.72			0.71	
Uniform Delay, d1		24.7		26.5	1.7	37.2			38.3	
Progression Factor		1.00		1.00	1.00	1.00			1.00	
Incremental Delay, d2		1.1		3.7	0.1	5.4			6.2	
Delay (s)		25.8		30.2	1.7	42.7			44.5	
Level of Service		C		C	A	D			D	
Approach Delay (s)	25.8				13.0	42.7		44.5		
Approach LOS	C				B	D		D		

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	23.7
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	10	1215	5	5	925
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.58	0.58	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	17	1413	6	6	1039
Pedestrians	39					39
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.74	0.74			0.74	
vC, conflicting volume	1986	1494			1458	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2153	1492			1443	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			98	
cM capacity (veh/h)	29	78			328	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	1419	352	693
Volume Left	0	0	6	0
Volume Right	17	6	0	0
cSH	78	1700	328	1700
Volume to Capacity	0.22	0.83	0.02	0.41
Queue Length 95th (ft)	19	0	1	0
Control Delay (s)	63.4	0.0	0.6	0.0
Lane LOS	F		A	
Approach Delay (s)	63.4	0.0	0.2	
Approach LOS	F			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	130	15	1220	860	65
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	159	17	1419	966	73
Pedestrians	17			17		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.75					
vC, conflicting volume	2473	554	1056			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2798	554	1056			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	100	65	97			
cM capacity (veh/h)	10	453	634			

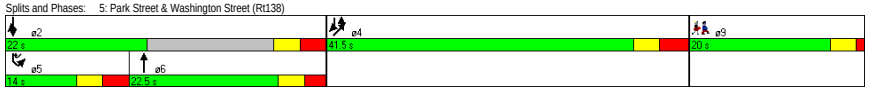
Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	159	1436	644	395
Volume Left	0	17	0	0
Volume Right	159	0	0	73
cSH	453	634	1700	1700
Volume to Capacity	0.35	0.03	0.38	0.23
Queue Length 95th (ft)	39	2	0	0
Control Delay (s)	17.2	1.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.2	1.9	0.0	
Approach LOS	C			

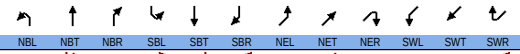
Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		90.5%	ICU Level of Service E
Analysis Period (min)		15	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR	ø9
Lane Configurations													
Volume (vph)	0	750	30	185	560	245	380	95	0	0	0	105	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		251			98			104			233		
Travel Time (s)		5.7			2.2			2.4			5.3		
Confl. Peds. (#/hr)			9									4	
Confl. Bikes (#/hr)			1										
Peak Hour Factor	0.98	0.98	0.98	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	9%	9%	9%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	796	0	210	636	278	0	528	0	0	0	128	
Turn Type				Prot		pt+ov	custom					Over	
Protected Phases		6		5	2	2 4	4	4				5	9
Permitted Phases							4						
Detector Phase		6		5	2	2 4	4	4				5	
Switch Phase													
Minimum Initial (s)		7.0		5.0	7.0		10.0	10.0				5.0	1.0
Minimum Split (s)		21.5		11.0	22.0		22.5	22.5				11.0	19.0
Total Split (s)	0.0	22.5	0.0	14.0	22.0	63.5	41.5	41.5	0.0	0.0	0.0	14.0	20.0
Total Split (%)	0.0%	23.0%	0.0%	14.3%	22.4%	64.8%	42.3%	42.3%	0.0%	0.0%	0.0%	14.3%	20%
Yellow Time (s)		3.0		3.0	3.0		3.0	3.0				3.0	3.0
All-Red Time (s)		2.5		3.0	3.0		3.5	3.5				3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.5	4.0	6.0	6.0	6.0	6.5	6.5	4.0	4.0	4.0	6.0	
Lead/Lag		Lag		Lead								Lead	
Lead-Lag Optimize?		Yes		Yes								Yes	
Recall Mode		Min		None	Min		None	None				None	None
v/c Ratio		0.96		1.07	0.81	0.16		0.82				0.25	
Control Delay		54.1		122.3	31.6	1.4		34.2				1.2	
Queue Delay		0.0		0.0	2.8	0.0		0.0				0.0	
Total Delay		54.1		122.3	34.4	1.4		34.2				1.2	
Queue Length 50th (ft)		176		~101	226	0		192				0	
Queue Length 95th (ft)		#447		#308	#630	63		#456				0	
Internal Link Dist (ft)		171			18			24			153		
Turn Bay Length (ft)													
Base Capacity (vph)		829		196	785	1727		883				507	
Starvation Cap Reductn		0		0	72	0		0				0	
Spillback Cap Reductn		0		0	0	0		0				0	
Storage Cap Reductn		0		0	0	0		0				0	
Reduced v/c Ratio		0.96		1.07	0.89	0.16		0.60				0.25	

Intersection Summary
Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 72.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Park Street & Washington Street (Rt138)

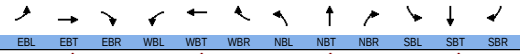




Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	750	30	185	560	245	380	95	0	0	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (prot)		3466		1736	1827	1827		1791				1508
Flt Permitted		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (perm)		3466		1736	1827	1827		1791				1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	0	765	31	210	636	278	422	106	0	0	0	128
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	114
Lane Group Flow (vph)	0	796	0	210	636	278	0	528	0	0	0	14
Confl. Peds. (#/hr)			9									4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	9%	9%	9%
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		17.6		8.2	31.3	63.3		26.0				8.2
Effective Green, g (s)		17.6		8.2	31.3	63.3		26.0				8.2
Actuated g/C Ratio		0.23		0.11	0.41	0.83		0.34				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		804		188	753	1524		614				163
v/s Ratio Prot		c0.23		0.12	c0.35	0.15		c0.29				0.01
v/s Ratio Perm												
v/c Ratio		0.99		1.12	0.84	0.18		0.86				0.08
Uniform Delay, d1		29.1		33.9	20.1	1.2		23.3				30.5
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		29.1		100.5	8.3	0.0		11.2				0.1
Delay (s)		58.2		134.4	28.4	1.3		34.4				30.6
Level of Service		E		F	C	A		C				C
Approach Delay (s)		58.2			41.5			34.4			30.6	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM Average Control Delay	44.7	HCM Level of Service		D
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	75.9	Sum of lost time (s)		24.1
Intersection Capacity Utilization	79.7%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	195	17	5	62	2	1	0	1	2	1	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.50	0.50	0.50	0.54	0.54	0.54
Hourly flow rate (vph)	142	264	23	6	70	2	2	0	2	4	2	20
Pedestrians		16			43			37			43	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			3			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	116			323			716	723	355	730	733	131
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			323			716	723	355	730	733	131
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			99	100	100	99	99	98
cM capacity (veh/h)	1397			1182			280	295	644	274	291	874

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	428	78	4	26
Volume Left	142	6	2	4
Volume Right	23	2	2	20
cSH	1397	1182	391	600
Volume to Capacity	0.10	0.00	0.01	0.04
Queue Length 95th (ft)	8	0	1	3
Control Delay (s)	3.2	0.6	14.3	11.3
Lane LOS	A	A	B	B
Approach Delay (s)	3.2	0.6	14.3	11.3
Approach LOS			B	B

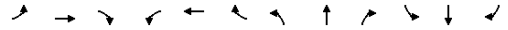
Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	40.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	45	55	5	35	10	140	255	40	5	305	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.73	0.73	0.73	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	33	59	72	7	48	14	173	315	49	5	332	60
Pedestrians		6			8			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1109	1096	371	1171	1101	356	397			372		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1109	1096	371	1171	1101	356	397			372		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	74	67	89	93	73	98	85			100		
cM capacity (veh/h)	126	178	669	98	177	679	1155			1152		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	164	68	537	397
Volume Left	33	7	173	5
Volume Right	72	14	49	60
cSH	235	190	1155	1152
Volume to Capacity	0.70	0.36	0.15	0.00
Queue Length 95th (ft)	115	38	13	0
Control Delay (s)	49.8	34.3	3.9	0.2
Lane LOS	E	D	A	A
Approach Delay (s)	49.8	34.3	3.9	0.2
Approach LOS	E	D		

Intersection Summary				
Average Delay	10.9			
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	65	0	30	95	90	2	190	45	15	65	2
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	0	75	0	39	125	118	3	268	63	21	90	3

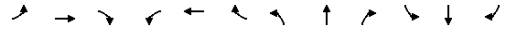
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	75	283	334	114
Volume Left (vph)	0	39	3	21
Volume Right (vph)	0	118	63	3
Hadj (s)	0.03	-0.17	-0.08	0.07
Departure Headway (s)	5.6	5.0	5.0	5.4
Degree Utilization, x	0.12	0.40	0.46	0.17
Capacity (veh/h)	571	666	681	602
Control Delay (s)	9.3	11.3	12.1	9.6
Approach Delay (s)	9.3	11.3	12.1	9.6
Approach LOS	A	B	B	A

Intersection Summary				
Delay			11.2	
HCM Level of Service			B	
Intersection Capacity Utilization			39.7%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	95	75	1	65	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	7	125	100	1	75	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	285	101			101	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	285	101			101	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	87			95	
cM capacity (veh/h)	668	952			1491	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	132	101	109
Volume Left	7	0	75
Volume Right	125	1	0
cSH	932	1700	1491
Volume to Capacity	0.14	0.06	0.05
Queue Length 95th (ft)	12	0	4
Control Delay (s)	9.5	0.0	5.3
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	5.3
Approach LOS	A		

Intersection Summary				
Average Delay			5.3	
Intersection Capacity Utilization			24.7%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	460	0	10	585	10	215	5	10	5	5	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.85	0.85
Hourly flow rate (vph)	6	529	0	11	665	11	250	6	12	6	6	12
Pedestrians		1			1			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	677			530			1250	1241	531	1250	1235	672
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	677			530			1250	1241	531	1250	1235	672
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			0	97	98	96	97	97
cM capacity (veh/h)	900			1027			138	169	542	140	173	455

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	534	688	250	17	24
Volume Left	6	11	250	0	6
Volume Right	0	11	0	12	12
cSH	900	1027	138	312	231
Volume to Capacity	0.01	0.01	1.82	0.06	0.10
Queue Length 95th (ft)	0	1	475	4	8
Control Delay (s)	0.2	0.3	449.6	17.2	22.3
Lane LOS	A	A	F	C	C
Approach Delay (s)	0.2	0.3	421.4		22.3
Approach LOS			F		C

Intersection Summary				
Average Delay	75.0			
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	35	1	5	50	20	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	1	5	54	22	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98	33	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	33	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	898	1041	1565			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	39	60	43
Volume Left	38	5	0
Volume Right	1	0	22
cSH	902	1565	1700
Volume to Capacity	0.04	0.00	0.03
Queue Length 95th (ft)	3	0	0
Control Delay (s)	9.2	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.7	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	16.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	25	485	15	15	555
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.97	0.97	0.95	0.95
Hourly flow rate (vph)	0	42	500	15	16	584
Pedestrians	26		21			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	1171	560			541	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1152	506			487	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			98	
cM capacity (veh/h)	196	513			996	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	42	515	600
Volume Left	0	0	16
Volume Right	42	15	0
cSH	513	1700	996
Volume to Capacity	0.08	0.30	0.02
Queue Length 95th (ft)	7	0	1
Control Delay (s)	12.6	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		57.1%	ICU Level of Service B
Analysis Period (min)		15	

Lane Group	EBR	NBL	NBT	SBT	SER	ø9
Lane Configurations						
Volume (vph)	565	165	500	555	190	
Turn Type	Over	Prot			custom	
Protected Phases	1	1	1 2 4	2		9
Permitted Phases					4	
Detector Phase	1	1	1 2 4	2	4	
Switch Phase						
Minimum Initial (s)	7.0	7.0		7.0	7.0	1.0
Minimum Split (s)	12.0	12.0		12.0	12.0	20.0
Total Split (s)	51.0	51.0	105.0	29.0	25.0	20.0
Total Split (%)	40.8%	40.8%	84.0%	23.2%	20.0%	16%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes		
Recall Mode	None	None		Min	None	None
Act Effct Green (s)	36.5	36.5	93.2	25.0	17.6	
Actuated g/C Ratio	0.36	0.36	0.92	0.25	0.17	
v/c Ratio	0.78	0.79	0.30	1.23	0.76	
Control Delay	20.9	39.5	2.2	155.4	59.7	
Queue Delay	0.0	1.4	0.1	0.0	0.0	
Total Delay	20.9	40.9	2.3	155.4	59.7	
LOS	C	D	A	F	E	
Approach Delay			21.9	155.4		
Approach LOS			C	F		

Intersection Summary		
Cycle Length: 125		
Actuated Cycle Length: 101		
Natural Cycle: 120		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.23		
Intersection Signal Delay: 55.5	Intersection LOS: E	
Intersection Capacity Utilization 90.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Porter Street & Washington Street (Rt138)

Lane Group	EBR	NBL	NBT	SBT	SER
Lane Group Flow (vph)	628	531	515	561	232
v/c Ratio	0.78	0.79	0.30	1.23	0.76
Control Delay	20.9	39.5	2.2	155.4	59.7
Queue Delay	0.0	1.4	0.1	0.0	0.0
Total Delay	20.9	40.9	2.3	155.4	59.7
Queue Length 50th (ft)	147	273	0	~431	132
Queue Length 95th (ft)	373	513	123	#859	#277
Internal Link Dist (ft)			89	1	
Turn Bay Length (ft)					
Base Capacity (vph)	947	885	1713	457	363
Starvation Cap Reductn	0	184	239	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.76	0.35	1.23	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2
Lane Configurations										
Volume (vph)	0	565	350	165	500	555	0	0	190	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00			0.95	
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00	
Frt		0.86		1.00	1.00	1.00			1.00	
Flt Protected		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (prot)		1611		1863	1863	1845			1761	
Flt Permitted		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (perm)		1611		1863	1863	1845			1761	
Peak-hour factor, PHF	0.90	0.90	0.97	0.97	0.97	0.99	0.99	0.84	0.84	0.84
Adj. Flow (vph)	0	628	361	170	515	561	0	0	226	6
RTOR Reduction (vph)	0	223	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	405	0	531	515	561	0	0	232	0
Confl. Peds. (#/hr)		12								12
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				
Permitted Phases									4	
Actuated Green, G (s)		36.5		36.5	89.1	25.0			17.6	
Effective Green, g (s)		36.5		36.5	89.1	25.0			17.6	
Actuated g/C Ratio		0.35		0.35	0.87	0.24			0.17	
Clearance Time (s)		5.0		5.0		5.0			5.0	
Vehicle Extension (s)		2.0		2.0		2.0			2.0	
Lane Grp Cap (vph)		571		660	1612	448			301	
v/s Ratio Prot		0.25		c0.29	0.28	c0.30				
v/s Ratio Perm									c0.13	
v/c Ratio		0.71		0.80	0.32	1.25			0.77	
Uniform Delay, d1		28.7		30.0	1.3	39.0			40.8	
Progression Factor		1.00		1.00	1.00	1.00			1.00	
Incremental Delay, d2		3.3		6.7	0.0	130.8			10.6	
Delay (s)		32.0		36.7	1.3	169.8			51.4	
Level of Service		C		D	A	F			D	
Approach Delay (s)	32.0				19.3	169.8		51.4		
Approach LOS	C				B	F		D		

Intersection Summary

HCM Average Control Delay	59.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	23.9
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	995	10	5	1305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	21	1047	11	5	1388
Pedestrians	37					37
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.77	0.77			0.77	
vC, conflicting volume	1794	1127			1095	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1882	1016			974	
tC, single (s)	7.1	7.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	100	86			99	
cM capacity (veh/h)	40	156			526	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	1058	468	926
Volume Left	0	0	5	0
Volume Right	21	11	0	0
cSH	156	1700	526	1700
Volume to Capacity	0.14	0.62	0.01	0.54
Queue Length 95th (ft)	12	0	1	0
Control Delay (s)	31.7	0.0	0.3	0.0
Lane LOS	D		A	
Approach Delay (s)	31.7	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	140	15	1005	1230	75
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	173	16	1058	1309	80
Pedestrians	24			24		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.78					
vC, conflicting volume	2462	742	1412			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2740	742	1412			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	50	97			
cM capacity (veh/h)	12	344	469			

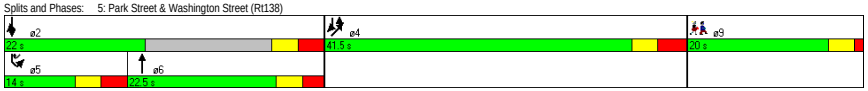
Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	173	1074	872	516
Volume Left	0	16	0	0
Volume Right	173	0	0	80
cSH	344	469	1700	1700
Volume to Capacity	0.50	0.03	0.51	0.30
Queue Length 95th (ft)	67	3	0	0
Control Delay (s)	25.6	1.3	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	25.6	1.3	0.0	
Approach LOS	D			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SBR	NET	SWR	ø9
Lane Configurations							
Volume (vph)	575	150	665	555	100	190	
Turn Type		Prot		pt+ov		Over	
Protected Phases	6	5	2	2 4	4	5	9
Permitted Phases							
Detector Phase	6	5	2	2 4	4	5	
Switch Phase							
Minimum Initial (s)	7.0	5.0	7.0		10.0	5.0	1.0
Minimum Split (s)	21.5	11.0	22.0		22.5	11.0	19.0
Total Split (s)	22.5	14.0	22.0	63.5	41.5	14.0	20.0
Total Split (%)	23.0%	14.3%	22.4%	64.8%	42.3%	14.3%	20%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	3.0	3.0		3.5	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.5	6.0	
Lead/Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Recall Mode	Min	None	Min		None	None	None
Act Effct Green (s)	17.9	8.4	32.0	66.4	23.1	8.4	
Actuated g/C Ratio	0.24	0.11	0.43	0.90	0.31	0.11	
v/c Ratio	0.83	0.77	0.85	0.34	0.74	0.40	
Control Delay	41.0	63.7	36.2	3.1	32.3	2.0	
Queue Delay	0.0	0.0	6.0	0.1	0.0	0.0	
Total Delay	41.0	63.7	42.2	3.1	32.3	2.0	
LOS	D	E	D	A	C	A	
Approach Delay	41.0		28.8		32.3		
Approach LOS	D		C		C		

Intersection Summary			
Cycle Length: 98			
Actuated Cycle Length: 73.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 30.2		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Park Street & Washington Street (Rt138)



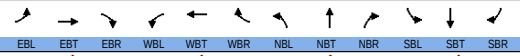
Lane Group	NBT	SBL	SBT	SBR	NET	SWR
Lane Group Flow (vph)	710	155	686	572	418	232
v/c Ratio	0.83	0.77	0.85	0.34	0.74	0.40
Control Delay	41.0	63.7	36.2	3.1	32.3	2.0
Queue Delay	0.0	0.0	6.0	0.1	0.0	0.0
Total Delay	41.0	63.7	42.2	3.1	32.3	2.0
Queue Length 50th (ft)	134	59	209	0	140	0
Queue Length 95th (ft)	#355	#228	#715	151	287	0
Internal Link Dist (ft)	171		18		24	
Turn Bay Length (ft)						
Base Capacity (vph)	852	202	808	1686	895	582
Starvation Cap Reductn	0	0	84	179	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.77	0.95	0.38	0.47	0.40

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	575	35	150	665	555	255	100	0	0	0	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (prot)		3528		1770	1863	1863		1798				1611
Flt Permitted		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (perm)		3528		1770	1863	1863		1798				1611
Peak-hour factor, PHF	0.86	0.86	0.86	0.97	0.97	0.97	0.85	0.85	0.85	0.82	0.82	0.82
Adj. Flow (vph)	0	669	41	155	686	572	300	118	0	0	0	232
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	206
Lane Group Flow (vph)	0	710	0	155	686	572	0	418	0	0	0	26
Confl. Peds. (#/hr)			18	8					23			8
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		18.2		8.4	32.1	61.2		23.1				8.4
Effective Green, g (s)		18.2		8.4	32.1	61.2		23.1				8.4
Actuated g/C Ratio		0.24		0.11	0.42	0.80		0.30				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		844		195	786	1498		546				178
v/s Ratio Prot		0.20		0.09	c0.37	0.31		c0.23				0.02
v/s Ratio Perm												
v/c Ratio		0.84		0.79	0.87	0.38		0.77				0.14
Uniform Delay, d1		27.6		33.0	20.1	2.1		24.0				30.6
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		7.3		18.5	10.2	0.1		5.7				0.1
Delay (s)		34.9		51.5	30.3	2.2		29.8				30.7
Level of Service		C		D	C	A		C				C
Approach Delay (s)		34.9			21.3			29.8			30.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	26.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

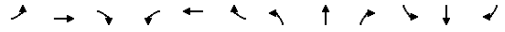


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	120	2	5	140	5	5	0	0	5	0	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.90	0.90	0.90	0.29	0.29	0.29	0.60	0.60	0.60
Hourly flow rate (vph)	27	154	3	6	156	6	17	0	0	8	0	47
Pedestrians		11			43			43			40	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			4			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	201			199			479	464	241	461	463	209
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	201			199			479	464	241	461	463	209
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	100	98	100	94
cM capacity (veh/h)	1280			1324			416	450	742	442	451	796

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	183	167	17	55
Volume Left	27	6	17	8
Volume Right	3	6	0	47
cSH	1280	1324	416	710
Volume to Capacity	0.02	0.00	0.04	0.08
Queue Length 95th (ft)	2	0	3	6
Control Delay (s)	1.3	0.3	14.0	10.5
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	0.3	14.0	10.5
Approach LOS			B	B

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.6%	ICU Level of Service	A	
Analysis Period (min)	15			

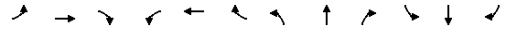
Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	60	75	20	45	5	70	400	20	10	755	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.95	0.95	0.95	0.85	0.85	0.85
Hourly flow rate (vph)	23	68	85	23	52	6	74	421	21	12	888	65
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1556	1535	923	1643	1556	432	954			442		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1556	1535	923	1643	1556	432	954			442		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	54	34	74	9	48	99	90			99		
cM capacity (veh/h)	49	103	327	26	100	624	720			1118		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	81	516	965
Volume Left	23	23	74	12
Volume Right	85	6	21	65
cSH	127	56	720	1118
Volume to Capacity	1.38	1.44	0.10	0.01
Queue Length 95th (ft)	293	183	9	1
Control Delay (s)	278.0	395.6	2.8	0.3
Lane LOS	F	F	A	A
Approach Delay (s)	278.0	395.6	2.8	0.3
Approach LOS	F	F		

Intersection Summary				
Average Delay	47.7			
Intersection Capacity Utilization	84.2%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	75	0	25	120	25	2	75	20	40	125	0
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	6	86	0	33	158	33	3	106	28	56	174	0

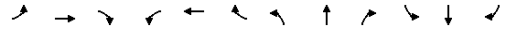
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	92	224	137	229
Volume Left (vph)	6	33	3	56
Volume Right (vph)	0	33	28	0
Hadj (s)	0.05	-0.01	-0.09	0.10
Departure Headway (s)	5.2	5.0	5.0	5.0
Degree Utilization, x	0.13	0.31	0.19	0.32
Capacity (veh/h)	623	674	667	672
Control Delay (s)	9.0	10.2	9.1	10.3
Approach Delay (s)	9.0	10.2	9.1	10.3
Approach LOS	A	B	A	B

Intersection Summary				
Delay			9.9	
HCM Level of Service			A	
Intersection Capacity Utilization			38.0%	ICU Level of Service
Analysis Period (min)			15	
				A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	120	45	0	80	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	0	158	60	0	92	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	296	60			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296	60			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			94	
cM capacity (veh/h)	652	1003			1544	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	158	60	144
Volume Left	0	0	92
Volume Right	158	0	0
cSH	1003	1700	1544
Volume to Capacity	0.16	0.04	0.06
Queue Length 95th (ft)	14	0	5
Control Delay (s)	9.3	0.0	5.0
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	5.0
Approach LOS	A		

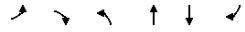
Intersection Summary				
Average Delay			6.0	
Intersection Capacity Utilization			27.6%	ICU Level of Service
Analysis Period (min)			15	
				A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	560	0	20	485	15	125	10	15	10	15	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.83	0.83	0.83	0.72	0.72	0.72
Hourly flow rate (vph)	22	602	0	21	500	15	151	12	18	14	21	35
Pedestrians		2			6			6			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	517			608			1247	1210	614	1226	1202	512
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	517			608			1247	1210	614	1226	1202	512
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			0	93	96	90	88	94
cM capacity (veh/h)	1047			965			123	174	487	136	176	560

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	624	536	151	30	69
Volume Left	22	21	151	0	14
Volume Right	0	15	0	18	35
cSH	1047	965	123	283	245
Volume to Capacity	0.02	0.02	1.23	0.11	0.28
Queue Length 95th (ft)	2	2	236	9	28
Control Delay (s)	0.6	0.6	222.6	19.2	25.4
Lane LOS	A	A	F	C	D
Approach Delay (s)	0.6	0.6	188.7		25.4
Approach LOS			F		D

Intersection Summary				
Average Delay	25.9			
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	60	10	0	25	25	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	11	0	27	27	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	73	46	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73	46	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	100			
cM capacity (veh/h)	930	1023	1537			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	27	65
Volume Left	65	0	0
Volume Right	11	0	38
cSH	943	1537	1700
Volume to Capacity	0.08	0.00	0.04
Queue Length 95th (ft)	7	0	0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	730	10	10	255
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.98	0.98	0.93	0.93
Hourly flow rate (vph)	0	28	745	10	11	274
Pedestrians	13					13
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.89	0.89			0.89	
vC, conflicting volume	1059	776			768	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1002	683			674	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			99	
cM capacity (veh/h)	232	390			791	

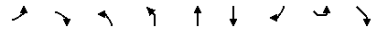
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	755	285
Volume Left	0	0	11
Volume Right	28	10	0
cSH	390	1700	791
Volume to Capacity	0.07	0.44	0.01
Queue Length 95th (ft)	6	0	1
Control Delay (s)	15.0	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	15.0	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		52.6%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	ø9
Lane Configurations										
Volume (vph)	0	390	245	175	740	255	0	0	190	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Right Turn on Red		Yes								
Link Speed (mph)	30				30	30		30		
Link Distance (ft)	255				169	77		193		
Travel Time (s)	5.8				3.8	1.8		4.4		
Confl. Peds. (#/hr)		12	12							
Peak Hour Factor	0.80	0.80	0.92	0.92	0.92	0.92	0.92	0.84	0.84	
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	2%	
Shared Lane Traffic (%)										
Lane Group Flow (vph)	0	488	0	456	804	277	0	0	226	
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				9
Permitted Phases									4	
Detector Phase		1	1	1	1 2 4	2			4	
Switch Phase										
Minimum Initial (s)		7.0	7.0	7.0		7.0			7.0	1.0
Minimum Split (s)		12.0	12.0	12.0		12.0			12.0	20.0
Total Split (s)	0.0	51.0	51.0	51.0	105.0	29.0	0.0	0.0	25.0	20.0
Total Split (%)	0.0%	40.8%	40.8%	40.8%	84.0%	23.2%	0.0%	0.0%	20.0%	16%
Yellow Time (s)		3.0	3.0	3.0		3.0			3.0	3.0
All-Red Time (s)		2.0	2.0	2.0		2.0			2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	5.0	
Lead/Lag		Lead	Lead	Lead		Lag				
Lead-Lag Optimize?		Yes	Yes	Yes		Yes				
Recall Mode		None	None	None		Min			None	None
v/c Ratio		0.58		0.67	0.47	0.70			0.66	
Control Delay		8.5		32.7	3.2	49.1			50.8	
Queue Delay		0.0		0.3	0.1	0.0			0.0	
Total Delay		8.5		33.0	3.3	49.1			50.8	
Queue Length 50th (ft)		31		211	0	142			117	
Queue Length 95th (ft)		84		422	243	#338			#247	
Internal Link Dist (ft)	175				89	1		113		
Turn Bay Length (ft)										
Base Capacity (vph)		1048		1006	1689	525			437	
Starvation Cap Reductn		0		166	173	0			0	
Spillback Cap Reductn		0		0	0	0			0	
Storage Cap Reductn		0		0	0	0			0	
Reduced v/c Ratio		0.47		0.54	0.53	0.53			0.52	

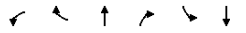
Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 93.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Porter Street & Washington Street (Rt138)



Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations									
Volume (vph)	0	390	245	175	740	255	0	0	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00			1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00
Frt		0.86		1.00	1.00	1.00			1.00
Flt Protected		1.00		1.00	1.00	1.00			1.00
Satd. Flow (prot)		1596		1863	1863	1863			1863
Flt Permitted		1.00		1.00	1.00	1.00			1.00
Satd. Flow (perm)		1596		1863	1863	1863			1863
Peak-hour factor, PHF	0.80	0.80	0.92	0.92	0.92	0.92	0.92	0.84	0.84
Adj. Flow (vph)	0	488	266	190	804	277	0	0	226
RTOR Reduction (vph)	0	258	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	230	0	456	804	277	0	0	226
Confl. Peds. (#/hr)		12	12						
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom
Protected Phases		1	1	1	1 2 4	2			
Permitted Phases									4
Actuated Green, G (s)		34.2		34.2	81.4	19.9			17.3
Effective Green, g (s)		34.2		34.2	81.4	19.9			17.3
Actuated g/C Ratio		0.36		0.36	0.86	0.21			0.18
Clearance Time (s)		5.0		5.0		5.0			5.0
Vehicle Extension (s)		2.0		2.0		2.0			2.0
Lane Grp Cap (vph)		575		671	1598	391			340
v/s Ratio Prot		0.14		c0.24	0.43	c0.15			
v/s Ratio Perm									c0.12
v/c Ratio		0.40		0.68	0.50	0.71			0.66
Uniform Delay, d1		22.7		25.7	1.7	34.8			36.1
Progression Factor		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2		0.2		2.2	0.1	4.7			3.8
Delay (s)		22.9		27.9	1.8	39.6			39.9
Level of Service		C		C	A	D			D
Approach Delay (s)	22.9				11.2	39.6		39.9	
Approach LOS	C				B	D		D	

Intersection Summary				
HCM Average Control Delay	20.1	HCM Level of Service		C
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	94.9	Sum of lost time (s)		23.5
Intersection Capacity Utilization	65.0%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	10	1150	5	5	830
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.58	0.58	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	17	1337	6	6	933
Pedestrians	39					39
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.76	0.76			0.76	
vC, conflicting volume	1857	1418			1382	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1972	1392			1344	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	81			98	
cM capacity (veh/h)	39	93			364	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	1343	316	622
Volume Left	0	0	6	0
Volume Right	17	6	0	0
cSH	93	1700	364	1700
Volume to Capacity	0.19	0.79	0.02	0.37
Queue Length 95th (ft)	16	0	1	0
Control Delay (s)	52.3	0.0	0.5	0.0
Lane LOS	F		A	
Approach Delay (s)	52.3	0.0	0.2	
Approach LOS	F			

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	78.3%	ICU Level of Service		D
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	115	15	1155	760	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.86	0.86	0.89	0.89
Hourly flow rate (vph)	0	140	17	1343	854	79
Pedestrians	17			17		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.76					
vC, conflicting volume	2288	500	950			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2536	500	950			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	100	71	97			
cM capacity (veh/h)	15	491	697			

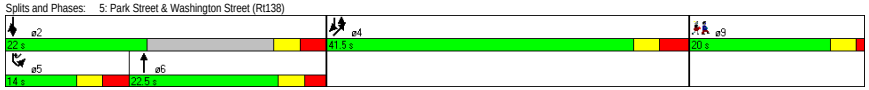
Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	140	1360	569	363
Volume Left	0	17	0	0
Volume Right	140	0	0	79
cSH	491	697	1700	1700
Volume to Capacity	0.29	0.03	0.33	0.21
Queue Length 95th (ft)	29	2	0	0
Control Delay (s)	15.2	1.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.2	1.3	0.0	
Approach LOS	C			

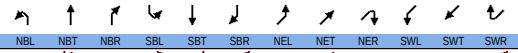
Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		87.1%	ICU Level of Service E
Analysis Period (min)		15	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR	ø9
Lane Configurations													
Volume (vph)	0	710	30	160	475	240	360	120	0	0	0	100	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Right Turn on Red			No			No			No			Yes	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		251			98			104			233		
Travel Time (s)		5.7			2.2			2.4			5.3		
Confl. Peds. (#/hr)			9									4	
Confl. Bikes (#/hr)			1										
Peak Hour Factor	0.98	0.98	0.98	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	9%	9%	9%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	755	0	182	540	273	0	533	0	0	0	122	
Turn Type				Prot		pt+ov	custom					Over	
Protected Phases		6		5	2	2 4	4	4				5	9
Permitted Phases							4						
Detector Phase		6		5	2	2 4	4	4				5	
Switch Phase													
Minimum Initial (s)		7.0		5.0	7.0		10.0	10.0				5.0	1.0
Minimum Split (s)		21.5		11.0	22.0		22.5	22.5				11.0	19.0
Total Split (s)	0.0	22.5	0.0	14.0	22.0	63.5	41.5	41.5	0.0	0.0	0.0	14.0	20.0
Total Split (%)	0.0%	23.0%	0.0%	14.3%	22.4%	64.8%	42.3%	42.3%	0.0%	0.0%	0.0%	14.3%	20%
Yellow Time (s)		3.0		3.0	3.0		3.0	3.0				3.0	3.0
All-Red Time (s)		2.5		3.0	3.0		3.5	3.5				3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	5.5	4.0	6.0	6.0	6.0	6.5	6.5	4.0	4.0	4.0	6.0	
Lead/Lag		Lag		Lead								Lead	
Lead-Lag Optimize?		Yes		Yes								Yes	
Recall Mode		Min		None	Min		None	None				None	None
v/c Ratio		0.91		0.93	0.69	0.16		0.83				0.24	
Control Delay		47.0		88.0	26.3	1.4		34.3				1.1	
Queue Delay		0.0		0.0	0.9	0.0		0.0				0.0	
Total Delay		47.0		88.0	27.2	1.4		34.3				1.1	
Queue Length 50th (ft)		165		79	178	0		195				0	
Queue Length 95th (ft)		#418		#266	#500	61		#462				0	
Internal Link Dist (ft)		171			18			24			153		
Turn Bay Length (ft)													
Base Capacity (vph)		827		195	782	1725		883				517	
Starvation Cap Reductn		0		0	78	0		0				0	
Spillback Cap Reductn		0		0	0	0		0				0	
Storage Cap Reductn		0		0	0	0		0				0	
Reduced v/c Ratio		0.91		0.93	0.77	0.16		0.60				0.24	

Intersection Summary
Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 73.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Park Street & Washington Street (Rt138)

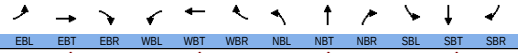




Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	710	30	160	475	240	360	120	0	0	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (prot)		3465		1736	1827	1827		1795				1508
Flt Permitted		1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (perm)		3465		1736	1827	1827		1795				1508
Peak-hour factor, PHF	0.98	0.98	0.98	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	0	724	31	182	540	273	400	133	0	0	0	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	109
Lane Group Flow (vph)	0	755	0	182	540	273	0	533	0	0	0	13
Confl. Peds. (#/hr)			9									4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	9%	9%	9%
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		17.6		8.2	31.3	63.5		26.2				8.2
Effective Green, g (s)		17.6		8.2	31.3	63.5		26.2				8.2
Actuated g/C Ratio		0.23		0.11	0.41	0.83		0.34				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		801		187	751	1525		618				162
v/s Ratio Prot		c0.22		0.10	c0.30	0.15		c0.30				0.01
v/s Ratio Perm												
v/c Ratio		0.94		0.97	0.72	0.18		0.86				0.08
Uniform Delay, d1		28.8		33.8	18.7	1.2		23.3				30.6
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		19.0		57.4	2.8	0.0		11.5				0.1
Delay (s)		47.7		91.3	21.5	1.2		34.8				30.6
Level of Service		D		F	C	A		C				C
Approach Delay (s)		47.7			28.7			34.8			30.6	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	36.1	HCM Level of Service		D
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	76.1	Sum of lost time (s)		24.1
Intersection Capacity Utilization	77.4%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	115	0	0	80	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.50	0.50	0.50	0.54	0.54	0.54
Hourly flow rate (vph)	0	155	0	0	91	0	0	0	0	0	0	0
Pedestrians		16			43			37			43	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			3			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	134			192			299	326	235	332	326	150
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	134			192			299	326	235	332	326	150
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1375			1321			593	553	751	548	553	853

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	155	91	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1375	1321	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

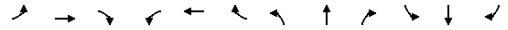
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	28.2%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	135	95	5	85	10	165	235	40	5	305	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.73	0.73	0.73	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	72	178	125	7	116	14	204	290	49	5	332	49
Pedestrians		6			8			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1175	1128	366	1315	1128	331	386			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1175	1128	366	1315	1128	331	386			348		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	0	0	81	0	30	98	83			100		
cM capacity (veh/h)	62	166	674	0	166	701	1166			1176		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	375	137	543	386
Volume Left	72	7	204	5
Volume Right	125	14	49	49
cSH	154	0	1166	1176
Volume to Capacity	2.43	Err	0.17	0.00
Queue Length 95th (ft)	799	Err	16	0
Control Delay (s)	708.9	Err	4.5	0.2
Lane LOS	F	F	A	A
Approach Delay (s)	708.9	Err	4.5	0.2
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		75.8%	ICU Level of Service	D
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	70	0	35	95	60	5	210	45	15	60	0
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	0	80	0	46	125	79	7	296	63	21	83	0

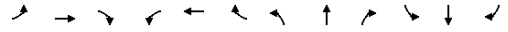
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	80	250	366	104
Volume Left (vph)	0	46	7	21
Volume Right (vph)	0	79	63	0
Hadj (s)	0.03	-0.10	-0.07	0.09
Departure Headway (s)	5.6	5.2	4.9	5.4
Degree Utilization, x	0.12	0.36	0.50	0.16
Capacity (veh/h)	571	646	694	603
Control Delay (s)	9.4	11.0	12.7	9.4
Approach Delay (s)	9.4	11.0	12.7	9.4
Approach LOS	A	B	B	A

Intersection Summary				
Delay			11.4	
HCM Level of Service			B	
Intersection Capacity Utilization			38.4%	ICU Level of Service
Analysis Period (min)			15	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	95	75	5	65	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	7	125	100	7	75	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	287	103			107	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	287	103			107	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	87			95	
cM capacity (veh/h)	666	949			1484	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	132	107	109
Volume Left	7	0	75
Volume Right	125	7	0
cSH	929	1700	1484
Volume to Capacity	0.14	0.06	0.05
Queue Length 95th (ft)	12	0	4
Control Delay (s)	9.5	0.0	5.3
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	5.3
Approach LOS	A		

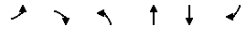
Intersection Summary				
Average Delay			5.3	
Intersection Capacity Utilization			24.7%	ICU Level of Service
Analysis Period (min)			15	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	460	0	10	590	10	215	5	10	5	5	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.85	0.85
Hourly flow rate (vph)	6	529	0	11	670	11	250	6	12	6	6	12
Pedestrians		1			1			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	683			530			1256	1247	531	1256	1241	678
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	683			530			1256	1247	531	1256	1241	678
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			0	97	98	96	97	97
cM capacity (veh/h)	895			1027			136	168	542	139	172	451

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	534	693	250	17	24
Volume Left	6	11	250	0	6
Volume Right	0	11	0	12	12
cSH	895	1027	136	311	229
Volume to Capacity	0.01	0.01	1.83	0.06	0.10
Queue Length 95th (ft)	0	1	478	4	8
Control Delay (s)	0.2	0.3	457.6	17.3	22.5
Lane LOS	A	A	F	C	C
Approach Delay (s)	0.2	0.3	428.9		22.5
Approach LOS			F		C

Intersection Summary				
Average Delay	76.1			
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	50	5	65	45	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	5	71	49	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	155	73	98			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	155	73	98			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	95	100			
cM capacity (veh/h)	834	988	1495			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	54	76	98
Volume Left	0	5	0
Volume Right	54	0	49
cSH	988	1495	1700
Volume to Capacity	0.05	0.00	0.06
Queue Length 95th (ft)	4	0	0
Control Delay (s)	8.9	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	0.6	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	17.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	65	110	160	110	55
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	71	120	174	120	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	505	207			293	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505	207			293	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	92			91	
cM capacity (veh/h)	477	834			1268	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	92	293	179
Volume Left	22	0	120
Volume Right	71	174	0
cSH	709	1700	1268
Volume to Capacity	0.13	0.17	0.09
Queue Length 95th (ft)	11	0	8
Control Delay (s)	10.8	0.0	5.7
Lane LOS	B		A
Approach Delay (s)	10.8	0.0	5.7
Approach LOS	B		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	125	200	125	155	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	136	217	136	168	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	353				432	285
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	353				432	285
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				71	99
cM capacity (veh/h)	1205				578	754

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	141	353	174
Volume Left	5	0	168
Volume Right	0	136	5
cSH	1205	1700	582
Volume to Capacity	0.00	0.21	0.30
Queue Length 95th (ft)	0	0	31
Control Delay (s)	0.3	0.0	13.8
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.8
Approach LOS			B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	25	485	15	15	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.97	0.97	0.95	0.95
Hourly flow rate (vph)	0	42	500	15	16	600
Pedestrians	26		21			26
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			77			
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	1186	560			541	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1171	513			494	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			98	
cM capacity (veh/h)	192	512			997	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	42	515	616
Volume Left	0	0	16
Volume Right	42	15	0
cSH	512	1700	997
Volume to Capacity	0.08	0.30	0.02
Queue Length 95th (ft)	7	0	1
Control Delay (s)	12.7	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.7	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		57.9%	ICU Level of Service B
Analysis Period (min)		15	

Lane Group	EBR	NBL	NBT	SBT	SER	ø9
Lane Configurations						
Volume (vph)	525	165	500	570	190	
Turn Type	Over	Prot			custom	
Protected Phases	1	1	1 2 4	2		9
Permitted Phases					4	
Detector Phase	1	1	1 2 4	2	4	
Switch Phase						
Minimum Initial (s)	7.0	7.0		7.0	7.0	1.0
Minimum Split (s)	12.0	12.0		12.0	12.0	20.0
Total Split (s)	51.0	51.0	105.0	29.0	25.0	20.0
Total Split (%)	40.8%	40.8%	84.0%	23.2%	20.0%	16%
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes		
Recall Mode	None	None		Min	None	None
Act Effct Green (s)	32.6	32.6	89.6	25.0	17.1	
Actuated g/C Ratio	0.35	0.35	0.96	0.27	0.18	
v/c Ratio	0.74	0.70	0.29	1.16	0.72	
Control Delay	16.9	32.9	1.4	127.8	52.5	
Queue Delay	0.0	0.3	0.1	0.0	0.0	
Total Delay	16.9	33.2	1.4	127.8	52.5	
LOS	B	C	A	F	D	
Approach Delay			16.3	127.8		
Approach LOS			B	F		

Intersection Summary		
Cycle Length: 125		
Actuated Cycle Length: 93.2		
Natural Cycle: 100		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.16		
Intersection Signal Delay: 47.2	Intersection LOS: D	
Intersection Capacity Utilization 88.7%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Porter Street & Washington Street (Rt138)

Lane Group	EBR	NBL	NBT	SBT	SER
Lane Group Flow (vph)	583	454	515	576	232
v/c Ratio	0.74	0.70	0.29	1.16	0.72
Control Delay	16.9	32.9	1.4	127.8	52.5
Queue Delay	0.0	0.3	0.1	0.0	0.0
Total Delay	16.9	33.2	1.4	127.8	52.5
Queue Length 50th (ft)	112	216	0	~388	119
Queue Length 95th (ft)	310	420	123	#886	#277
Internal Link Dist (ft)			89	1	
Turn Bay Length (ft)					
Base Capacity (vph)	997	959	1757	495	393
Starvation Cap Reductn	0	135	239	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.55	0.34	1.16	0.59

Intersection Summary

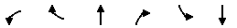
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL2	NBL	NBT	SBT	SBR	SEL	SER	SER2
Lane Configurations										
Volume (vph)	0	525	275	165	500	570	0	0	190	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00	1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00			0.95	
Flpb, ped/bikes		1.00		1.00	1.00	1.00			1.00	
Frt		0.86		1.00	1.00	1.00			1.00	
Flt Protected		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (prot)		1611		1863	1863	1845			1764	
Flt Permitted		1.00		1.00	1.00	1.00			1.00	
Satd. Flow (perm)		1611		1863	1863	1845			1764	
Peak-hour factor, PHF	0.90	0.90	0.97	0.97	0.97	0.99	0.99	0.84	0.84	0.84
Adj. Flow (vph)	0	583	284	170	515	576	0	0	226	6
RTOR Reduction (vph)	0	228	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	355	0	454	515	576	0	0	232	0
Confl. Peds. (#/hr)		12								12
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Turn Type		Over	Prot	Prot					custom	
Protected Phases		1	1	1	1 2 4	2				
Permitted Phases									4	
Actuated Green, G (s)		32.6		32.6	84.7	25.0			17.1	
Effective Green, g (s)		32.6		32.6	84.7	25.0			17.1	
Actuated g/C Ratio		0.34		0.34	0.88	0.26			0.18	
Clearance Time (s)		5.0		5.0		5.0			5.0	
Vehicle Extension (s)		2.0		2.0		2.0			2.0	
Lane Grp Cap (vph)		547		633	1644	480			314	
v/s Ratio Prot		0.22		c0.24	0.28	c0.31				
v/s Ratio Perm									c0.13	
v/c Ratio		0.65		0.72	0.31	1.20			0.74	
Uniform Delay, d1		26.9		27.7	0.9	35.5			37.3	
Progression Factor		1.00		1.00	1.00	1.00			1.00	
Incremental Delay, d2		2.0		3.2	0.0	108.6			7.6	
Delay (s)		28.9		30.9	1.0	144.1			45.0	
Level of Service		C		C	A	F			D	
Approach Delay (s)	28.9				15.0	144.1		45.0		
Approach LOS	C				B	F		D		

Intersection Summary

HCM Average Control Delay	52.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	15	925	10	5	1280
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	21	974	11	5	1362
Pedestrians	37					37
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	3					3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			256			169
pX, platoon unblocked	0.78	0.78			0.78	
vC, conflicting volume	1707	1053			1021	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1764	930			890	
tC, single (s)	7.1	7.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	100	88			99	
cM capacity (veh/h)	50	182			576	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	21	984	459	908
Volume Left	0	0	5	0
Volume Right	21	11	0	0
cSH	182	1700	576	1700
Volume to Capacity	0.12	0.58	0.01	0.53
Queue Length 95th (ft)	10	0	1	0
Control Delay (s)	27.4	0.0	0.3	0.0
Lane LOS	D		A	
Approach Delay (s)	27.4	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	90	15	935	1205	75
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.95	0.95	0.94	0.94
Hourly flow rate (vph)	0	111	16	984	1282	80
Pedestrians	24			24		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				183	242	
pX, platoon unblocked	0.79					
vC, conflicting volume	2362	729	1386			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2586	729	1386			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	68	97			
cM capacity (veh/h)	16	351	480			

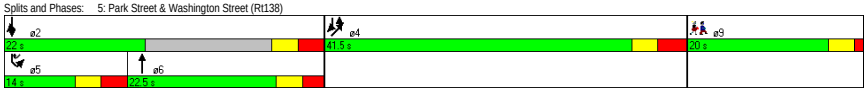
Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	111	1000	855	507
Volume Left	0	16	0	0
Volume Right	111	0	0	80
cSH	351	480	1700	1700
Volume to Capacity	0.32	0.03	0.50	0.30
Queue Length 95th (ft)	33	3	0	0
Control Delay (s)	19.9	1.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.9	1.2	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SBR	NET	SWR	ø9
Lane Configurations							
Volume (vph)	535	135	610	550	115	175	
Turn Type		Prot		pt+ov		Over	
Protected Phases	6	5	2	2 4	4	5	9
Permitted Phases							
Detector Phase	6	5	2	2 4	4	5	
Switch Phase							
Minimum Initial (s)	7.0	5.0	7.0		10.0	5.0	1.0
Minimum Split (s)	21.5	11.0	22.0		22.5	11.0	19.0
Total Split (s)	22.5	14.0	22.0	63.5	41.5	14.0	20.0
Total Split (%)	23.0%	14.3%	22.4%	64.8%	42.3%	14.3%	20%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.5	3.0	3.0		3.5	3.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0	6.0	6.5	6.0	
Lead/Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Recall Mode	Min	None	Min		None	None	None
Act Effct Green (s)	17.9	8.4	32.1	66.4	23.0	8.4	
Actuated g/C Ratio	0.24	0.11	0.43	0.90	0.31	0.11	
v/c Ratio	0.78	0.69	0.78	0.34	0.74	0.36	
Control Delay	37.9	56.8	31.7	3.0	32.2	1.7	
Queue Delay	0.0	0.0	2.5	0.1	0.0	0.0	
Total Delay	37.9	56.8	34.3	3.1	32.2	1.7	
LOS	D	E	C	A	C	A	
Approach Delay	37.9		23.4		32.2		
Approach LOS	D		C		C		

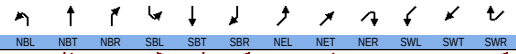
Intersection Summary			
Cycle Length: 98			
Actuated Cycle Length: 73.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 26.7		Intersection LOS: C	
Intersection Capacity Utilization 68.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Park Street & Washington Street (Rt138)



Lane Group	NBT	SBL	SBT	SBR	NET	SWR
Lane Group Flow (vph)	663	139	629	567	417	213
v/c Ratio	0.78	0.69	0.78	0.34	0.74	0.36
Control Delay	37.9	56.8	31.7	3.0	32.2	1.7
Queue Delay	0.0	0.0	2.5	0.1	0.0	0.0
Total Delay	37.9	56.8	34.3	3.1	32.2	1.7
Queue Length 50th (ft)	123	53	183	0	139	0
Queue Length 95th (ft)	#323	#202	#637	149	287	0
Internal Link Dist (ft)	171		18		24	
Turn Bay Length (ft)						
Base Capacity (vph)	852	202	808	1687	897	595
Starvation Cap Reductn	0	0	89	180	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.69	0.87	0.38	0.46	0.36

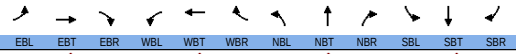
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	535	35	135	610	550	240	115	0	0	0	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		6.0	6.0	6.0		6.5				6.0
Lane Util. Factor		0.95		1.00	1.00	1.00		1.00				1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00				1.00
Frt		1.00		1.00	1.00	1.00		1.00				0.86
Flt Protected		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (prot)		3527		1770	1863	1863		1802				1611
Flt Permitted		1.00		0.95	1.00	1.00		0.97				1.00
Satd. Flow (perm)		3527		1770	1863	1863		1802				1611
Peak-hour factor, PHF	0.86	0.86	0.86	0.97	0.97	0.97	0.85	0.85	0.85	0.82	0.82	0.82
Adj. Flow (vph)	0	622	41	139	629	567	282	135	0	0	0	213
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	189
Lane Group Flow (vph)	0	663	0	139	629	567	0	417	0	0	0	24
Confl. Peds. (#/hr)			18	8					23			8
Turn Type				Prot		pt+ov	custom					Over
Protected Phases		6		5	2	2 4	4	4				5
Permitted Phases							4					
Actuated Green, G (s)		18.2		8.4	32.1	61.1		23.0				8.4
Effective Green, g (s)		18.2		8.4	32.1	61.1		23.0				8.4
Actuated g/C Ratio		0.24		0.11	0.42	0.80		0.30				0.11
Clearance Time (s)		5.5		6.0	6.0			6.5				6.0
Vehicle Extension (s)		2.0		2.0	2.0			2.0				2.0
Lane Grp Cap (vph)		845		196	787	1498		545				178
v/s Ratio Prot		0.19		0.08	c0.34	0.30		c0.23				0.01
v/s Ratio Perm												
v/c Ratio		0.78		0.71	0.80	0.38		0.77				0.13
Uniform Delay, d1		27.1		32.6	19.1	2.1		24.0				30.5
Progression Factor		1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2		4.5		9.2	5.3	0.1		5.7				0.1
Delay (s)		31.5		41.8	24.5	2.2		29.8				30.6
Level of Service		C		D	C	A		C				C
Approach Delay (s)		31.5			16.8			29.8			30.6	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	23.7	HCM Level of Service		C
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	76.0	Sum of lost time (s)		20.9
Intersection Capacity Utilization	68.5%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

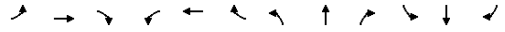


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	85	0	0	100	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.90	0.90	0.90	0.29	0.29	0.29	0.60	0.60	0.60
Hourly flow rate (vph)	0	109	0	0	111	0	0	0	0	0	0	0
Pedestrians		11			43			43			40	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			4			4			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	151			152			274	303	195	303	303	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151			152			274	303	195	303	303	162
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1336			1378			614	568	787	574	568	845

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	109	111	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1336	1378	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	28.8%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	125	135	20	90	5	90	380	20	10	705	95
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.95	0.95	0.95	0.85	0.85	0.85
Hourly flow rate (vph)	40	142	153	23	105	6	95	400	21	12	829	112
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1568	1520	887	1734	1566	411	942			421		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1568	1520	887	1734	1566	411	942			421		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	55	0	0	99	87			99		
cM capacity (veh/h)	0	102	342	0	96	641	727			1138		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	335	134	516	953
Volume Left	40	23	95	12
Volume Right	153	6	21	112
cSH	0	0	727	1138
Volume to Capacity	Err	Err	0.13	0.01
Queue Length 95th (ft)	Err	Err	11	1
Control Delay (s)	Err	Err	3.5	0.3
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	3.5	0.3
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	75	0	35	120	15	5	80	20	40	140	0
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.71	0.71	0.71	0.72	0.72	0.72
Hourly flow rate (vph)	6	86	0	46	158	20	7	113	28	56	194	0

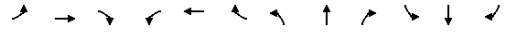
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	92	224	148	250
Volume Left (vph)	6	46	7	56
Volume Right (vph)	0	20	28	0
Hadj (s)	0.05	0.04	-0.07	0.10
Departure Headway (s)	5.3	5.1	5.0	5.0
Degree Utilization, x	0.14	0.32	0.21	0.35
Capacity (veh/h)	607	652	658	669
Control Delay (s)	9.2	10.5	9.3	10.8
Approach Delay (s)	9.2	10.5	9.3	10.8
Approach LOS	A	B	A	B

Intersection Summary				
Delay		10.2		
HCM Level of Service		B		
Intersection Capacity Utilization		38.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	125	45	0	80	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.76	0.76	0.75	0.75	0.87	0.87
Hourly flow rate (vph)	0	164	60	0	92	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	296	60			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296	60			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	84			94	
cM capacity (veh/h)	652	1003			1544	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	164	60	144
Volume Left	0	0	92
Volume Right	164	0	0
cSH	1003	1700	1544
Volume to Capacity	0.16	0.04	0.06
Queue Length 95th (ft)	15	0	5
Control Delay (s)	9.3	0.0	5.0
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	5.0
Approach LOS	A		

Intersection Summary				
Average Delay		6.1		
Intersection Capacity Utilization		27.9%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	565	0	20	490	15	125	10	15	10	15	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.83	0.83	0.83	0.72	0.72	0.72
Hourly flow rate (vph)	22	608	0	21	505	15	151	12	18	14	21	35
Pedestrians		2			6			6			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	523			614			1258	1220	620	1237	1213	517
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	523			614			1258	1220	620	1237	1213	517
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			0	93	96	90	88	94
cM capacity (veh/h)	1042			961			120	171	483	133	173	557

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	629	541	151	30	69
Volume Left	22	21	151	0	14
Volume Right	0	15	0	18	35
cSH	1042	961	120	280	242
Volume to Capacity	0.02	0.02	1.25	0.11	0.29
Queue Length 95th (ft)	2	2	241	9	29
Control Delay (s)	0.6	0.6	232.7	19.4	25.8
Lane LOS	A	A	F	C	D
Approach Delay (s)	0.6	0.6	197.1		25.8
Approach LOS			F		D

Intersection Summary				
Average Delay	26.8			
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	75	10	0	35	40	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	11	0	38	43	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	114	76	109			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114	76	109			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	99	100			
cM capacity (veh/h)	882	985	1482			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	92	38	109
Volume Left	82	0	0
Volume Right	11	0	65
cSH	893	1482	1700
Volume to Capacity	0.10	0.00	0.06
Queue Length 95th (ft)	9	0	0
Control Delay (s)	9.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	75	70	30	70	100
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	82	76	33	76	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	353	92			109	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	353	92			109	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	92			95	
cM capacity (veh/h)	611	965			1482	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	168	109	185
Volume Left	87	0	76
Volume Right	82	33	0
cSH	743	1700	1482
Volume to Capacity	0.23	0.06	0.05
Queue Length 95th (ft)	22	0	4
Control Delay (s)	11.3	0.0	3.4
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	3.4
Approach LOS	B		

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	135	160	115	140	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	147	174	125	152	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	299				383	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	299				383	236
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				75	99
cM capacity (veh/h)	1262				619	803

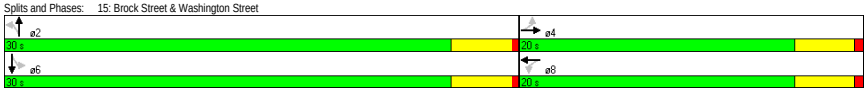
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	147	299	163
Volume Left	0	0	152
Volume Right	0	125	11
cSH	1262	1700	629
Volume to Capacity	0.00	0.18	0.26
Queue Length 95th (ft)	0	0	26
Control Delay (s)	0.0	0.0	12.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	135	95	5	85	10	165	235	40	5	305	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		328			131			380			991	
Travel Time (s)		7.5			3.0			8.6			22.5	
Confl. Peds. (#/hr)	6		2	4		8	2		4	8		6
Peak Hour Factor	0.76	0.76	0.76	0.73	0.73	0.73	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	375	0	0	137	0	0	543	0	0	386	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%	60.0%	60.0%	0.0%	60.0%	60.0%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
v/c Ratio		0.68			0.24			0.76			0.42	
Control Delay		20.5			12.8			18.9			8.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		20.5			12.8			18.9			8.7	
Queue Length 50th (ft)		79			26			109			58	
Queue Length 95th (ft)		119			46			177			108	
Internal Link Dist (ft)		248			51			300			911	
Turn Bay Length (ft)												
Base Capacity (vph)		553			582			713			910	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.68			0.24			0.76			0.42	

Intersection Summary	
Area Type:	Other
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	

Splits and Phases: 15: Brock Street & Washington Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	135	95	5	85	10	165	235	40	5	305	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.99			0.98	
Flt Protected		0.99			1.00			0.98			1.00	
Satd. Flow (prot)		1746			1826			1801			1738	
Flt Permitted		0.92			0.98			0.74			0.99	
Satd. Flow (perm)		1614			1791			1357			1729	
Peak-hour factor, PHF	0.76	0.76	0.76	0.73	0.73	0.73	0.81	0.81	0.81	0.92	0.92	0.92
Adj. Flow (vph)	72	178	125	7	116	14	204	290	49	5	332	49
RTOR Reduction (vph)	0	36	0	0	8	0	0	7	0	0	11	0
Lane Group Flow (vph)	0	339	0	0	129	0	0	536	0	0	375	0
Confl. Peds. (#/hr)	6		2	4		8	2		4	8		6
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.0			16.0			26.0			26.0	
Effective Green, g (s)		16.0			16.0			26.0			26.0	
Actuated g/C Ratio		0.32			0.32			0.52			0.52	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		516			573			706			899	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.07			c0.39			0.22	
v/c Ratio		0.66			0.22			0.76			0.42	
Uniform Delay, d1		14.6			12.5			9.5			7.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		6.4			0.9			7.5			1.4	
Delay (s)		21.0			13.4			17.0			8.8	
Level of Service		C			B			B			A	
Approach Delay (s)		21.0			13.4			17.0			8.8	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	35	125	20	90	90	380	10	705
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	40.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		16.0		16.0		36.0		36.0
Actuated g/C Ratio		0.27		0.27		0.60		0.60
v/c Ratio		0.68		0.29		0.61		0.87
Control Delay		24.2		19.1		11.3		21.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		24.2		19.1		11.3		21.1
LOS		C		B		B		C
Approach Delay		24.2		19.1		11.3		21.1
Approach LOS		C		B		B		C

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.9 — Intersection LOS: B
Intersection Capacity Utilization 100.0% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 15: Brock Street & Washington Street

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	335	134	516	953
v/c Ratio	0.68	0.29	0.61	0.87
Control Delay	24.2	19.1	11.3	21.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.2	19.1	11.3	21.1
Queue Length 50th (ft)	85	37	100	245
Queue Length 95th (ft)	#166	73	184	#461
Internal Link Dist (ft)	247	51	300	911
Turn Bay Length (ft)				
Base Capacity (vph)	490	459	852	1098
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.29	0.61	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	35	125	135	20	90	5	90	380	20	10	705	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.99			0.99			0.98	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1720			1836			1836			1827	
Flt Permitted		0.95			0.92			0.76			0.99	
Satd. Flow (perm)		1647			1710			1415			1817	
Peak-hour factor, PHF	0.88	0.88	0.88	0.86	0.86	0.86	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	40	142	153	23	105	6	95	400	21	12	829	112
RTOR Reduction (vph)	0	51	0	0	3	0	0	2	0	0	8	0
Lane Group Flow (vph)	0	284	0	0	131	0	0	514	0	0	945	0
Confl. Peds. (#/hr)			1				1					1
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.0			16.0			36.0			36.0	
Effective Green, g (s)		16.0			16.0			36.0			36.0	
Actuated g/C Ratio		0.27			0.27			0.60			0.60	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		439			456			849			1090	
v/s Ratio Prot												
v/s Ratio Perm		c0.17			0.08			0.36			c0.52	
v/c Ratio		0.65			0.29			0.60			0.87	
Uniform Delay, d1		19.5			17.5			7.5			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.2			1.6			3.2			9.3	
Delay (s)		26.7			19.1			10.7			19.3	
Level of Service		C			B			B			B	
Approach Delay (s)		26.7			19.1			10.7			19.3	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Signal Warrant Analysis

2009 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection:

Major Street Direction: Northbound-Southbound

Year: 2012 **Condition:** Existing

Operating speed on major roadway: 40 mph

Number of approaches: 4

			Required approach volumes	
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**		Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)			
	Major Street :	1 Lane(s) on each approach	500	500
	Minor Street :	1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)			
	Major Street :	1 Lane(s) on each approach	750	750
	Minor Street :	1 Lane(s) on each approach	75	75
80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B			Warrant 1A	Warrant 1B
	Major Street :	1 Lane(s) on each approach	400	600
	Minor Street :	1 Lane(s) on each approach	120	60

Warrant 2	**FOUR HOUR VEHICULAR VOLUME**		
	Major Street :	1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-1 or 4C-2.
	Minor Street :	1 Lane(s) on each approach	25 = accuracy of regression equations

Warrant 3	**PEAK HOUR VOLUME**		
	Major Street :	1 Lane(s) on each approach	If "verify" indicated, see Figure 4C-3 or 4C-4.
	Minor Street :	1 Lane(s) on each approach	25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM	43	488	148	636	No	No	No	No	No
7:00 - 8:00 AM	129	584	332	916	No	Yes	Yes	Verify	No
8:00 - 9:00 AM	138	518	354	872	No	Yes	Yes	Verify	No
9:00 - 10:00 AM	83	438	301	739	No	No	No	No	No
10:00 - 11:00 AM	71	365	345	710	No	No	No	No	No
11:00 - 12:00 AM	67	372	412	784	No	No	No	No	No
12:00 - 1:00 PM	65	395	369	764	No	No	No	No	No
1:00 - 2:00 PM	75	388	419	807	No	No	No	No	No
2:00 - 3:00 PM	104	383	481	864	No	Yes	No	No	No
3:00 - 4:00 PM	119	398	493	891	No	Yes	No	Verify	No
4:00 - 5:00 PM	129	373	616	989	No	Yes	Yes	Yes	No
5:00 - 6:00 PM	159	373	731	1104	Yes	Yes	Yes	Yes	Verify
6:00 - 7:00 PM	121	345	560	905	No	Yes	Yes	Verify	No
					No	**No**	**No**	**Verify**	**Verify**
			Warrants Met?		**1**			**2**	**3**
					NO			**Verify**	**Verify**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 22

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2009 Edition [2009]

2009 MUTCD

TRAFFIC SIGNAL WARRANT ANALYSIS (VOLUME BASED)

Intersection:

Major Street Direction: Northbound-Southbound

Year: 2030 **Condition:** Build

Operating speed on major roadway: 40 mph

Number of approaches: 4

		Required approach volumes	
Warrant 1	**EIGHT-HOUR VEHICULAR VOLUME**	Minimum*	Adjusted Minimum**
Warrant 1A	MINIMUM VEHICULAR VOLUME (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	500	500
	Minor Street : 1 Lane(s) on each approach	150	150
Warrant 1B	INTERRUPTION OF CONTINUOUS TRAFFIC (8 hours of day)		
	Major Street : 1 Lane(s) on each approach	750	750
	Minor Street : 1 Lane(s) on each approach	75	75
	80 PERCENT SATISFACTION OF WARRANT 1A **AND** WARRANT 1B	Warrant 1A	Warrant 1B
	Major Street : 1 Lane(s) on each approach	400	600
	Minor Street : 1 Lane(s) on each approach	120	60

Warrant 2 **FOUR HOUR VEHICULAR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-1 or 4C-2.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Warrant 3 **PEAK HOUR VOLUME**

Major Street : 1 Lane(s) on each approach — If "verify" indicated, see Figure 4C-3 or 4C-4.

Minor Street : 1 Lane(s) on each approach — 25 = accuracy of regression equations

Hour	Entering Vol. Minor Road+	Entering Vol. on Major Road Northbound	Entering Vol. on Major Road Southbound	Tot. Ent. Vol. On Major Rd	Meets the following volume-based warrants? 1A	1B	80%(1A&1B)	2	3
6:00 - 7:00 AM	43	488	148	636	No	No	No	No	No
7:00 - 8:00 AM	285	584	332	916	Yes	Yes	Yes	Yes	Yes
8:00 - 9:00 AM	150	518	354	872	No	Yes	Yes	Verify	No
9:00 - 10:00 AM	83	438	301	739	No	No	No	No	No
10:00 - 11:00 AM	71	365	345	710	No	No	No	No	No
11:00 - 12:00 AM	67	372	412	784	No	No	No	No	No
12:00 - 1:00 PM	65	395	369	764	No	No	No	No	No
1:00 - 2:00 PM	75	388	419	807	No	No	No	No	No
2:00 - 3:00 PM	104	383	481	864	No	Yes	No	No	No
3:00 - 4:00 PM	119	398	493	891	No	Yes	No	Verify	No
4:00 - 5:00 PM	129	373	616	989	No	Yes	Yes	Yes	No
5:00 - 6:00 PM	295	373	731	1104	Yes	Yes	Yes	Yes	Yes
6:00 - 7:00 PM	121	345	560	905	No	Yes	Yes	Verify	No
					No	**No**	**No**	**Verify**	**Yes**
			Warrants Met?		**1**			**2**	**3**
					NO			**Verify**	**Yes**

*From the criteria described for the warrant in the MUTCD.

**If the operating speed is higher than 40mph then the volumes can be adjusted to 70%. (If no adjusted minimum, the minimum from the previous column is shown)

+If more than one approach, report the approach that has the higher volume.

NON-VOLUME-BASED WARRANTS

Warrant 4, Minimum Pedestrian Volume: No

Peak Four Hour Pedestrian Volumes: 22

(non-concurrent) 0

0

0

Warrant 5, School Crossing:

See MUTCD for details.

Warrant 6, Coordinated Signal System:

See MUTCD for details.

Warrant 7, Crash Experience: No

# of accidents "correctable by signalization" occuring in the last 12 months: 0

Warrant 8, Roadway Network:

See MUTCD for details.

Source: *Manual on Uniform Traffic Control Devices* (MUTCD); 2009 Edition [2009]

Appendix 4.1-L

No-Build Project Descriptions

No-Build Projects

New Bedford

A new traffic signal system was installed and activated in early 2009 at the intersection of King's Highway and Mount Pleasant Street. The No-Build analysis of this location reflects the four phase operation of this traffic signal system. The initial phase provides for a protected southbound left-turn movement from Mount Pleasant Street. The second phase controls movements for both the northbound and southbound Mount Pleasant Street approaches. The third and fourth phases provide protected movements for the Jones Road and King's Highway approaches. Pedestrians would cross the northbound approach concurrently with the fourth phase.

The Enhanced Bus No-Build Alternative includes expanding the existing park-and-ride lot on Mt. Pleasant Street at the Route 140 interchange. An expanded facility with a maximum of 447 spaces could be developed using adjacent vacant wooded land within the Route 140 state highway layout next to the existing lot. Access to the lot would be through the existing curb cut on Mt. Pleasant Street. The lot design would allow for bus access and circulation through the parking aisles with adequate turning radii for entering and exiting movements.

Freetown

On the west side of South Main Street just south of Route 24 Exit 9, the Payne's Crossing development is proposed to include:

- A 167,000 square foot home-improvement warehouse store;
- A 195,000 square foot discount superstore;
- 15,000 square feet of other retail space; and
- 1,530 parking spaces.

Proposed traffic mitigation for the Payne's Crossing project includes proposed improvements at Route 24 Exit 9:

- Widening a portion of South Main Street between the Payne's Crossing driveway and the northbound ramps intersection at Exit 9; and
- Installing traffic signals at the South Main Street intersections with the Route 24 northbound and southbound ramps.

The Riverfront Business Park is a proposed 1.7-million square foot commercial development on the west side of South Main Street south of the Stop & Shop Distribution Center.

The Campanelli Warehouse project currently includes a 70,000 square foot facility along Ridge Hill Road east of South Main Street just north of Route 24 Exit 9. Approximately 730,000 additional square feet of warehouse development are planned to be developed on the site.

In conjunction with the proposed Fall River Executive Park (FREP) development in Fall River and Freetown, a new interchange is under construction on Route 24 between Exits 8 and 9. The purpose of new interchange is to serve the proposed FREP development, provide improved access to Route 24 for the Stop & Shop Distribution Center and other development along South Main Street in Freetown, and divert traffic away from South Main Street in Freetown and from Route 24 Exits 8 and 9.

Fall River

The proposed FREP development will contain three million square feet of office and light industrial space. It is proposed for a site located on the Fall River/Freetown municipal boundary east of and adjacent to Route 24. The bulk of the development will be located in the City of Fall River. A new interchange is under construction on Route 24 between Exits 8 and 9 in Freetown that will provide the primary access to the FREP. Additional access will provided to Route 24 Exit 8 via a connection to Rigginbach Road in Fall River.

The Fall River Commerce Park is an existing commercial development with room for approximately 258,000 square feet of additional industrial and warehousing space. The Park is located off Airport Road east of Route 24 (Exit 8) and north of the Fall River Industrial Park.

Taunton

East Taunton Industrial Park is an industrial development located along Stevens Street. Phase I is located on the south side of Stevens Street and contains 1,783,360 square feet of warehouse/distribution facilities, including 183,440 square feet of associated office space, 63,000 square feet of retail space, and 53,000 feet of amenities. Phase II is located on the north side of Stevens Street and contains approximately 663,000 square feet of warehouse/ distribution facilities, including approximately 69,900 square feet of office space.

The proposed Taunton Crossing is a retail development which will be located on Mozzone Boulevard off Route 140 (County Street). The project consists of constructing 83,000 square feet of retail space on a 7.85-acre parcel of land with parking for 297 vehicles. Access to the site will be provided via two full access driveways on Mozzone Boulevard, one of which will be shared with an adjacent restaurant development.

Several roadway improvements along Route 140 are part of the mitigation commitments for the proposed Taunton Crossing and East Taunton Industrial Park developments. These improvements were included in the No-Build traffic analysis. The Taunton Crossing improvements include:

- Widening the Route 140 approaches to Mozzone Boulevard to provide turn lanes; and

The East Taunton Industrial Park improvements include:

- Constructing a new Route 24 southbound off-ramp to Route 140 westbound;
- Eliminating the left turn from the existing southbound off-ramp to Route 140 northbound; and
- Providing a channelized right-turn onto Route 140 southbound.

The existing 211-space park-and-ride lot at the Silver City Galleria in Taunton was found to be operating at capacity during both summer and fall 2008 utilization surveys. An excess older paved parking area located along an access road within the mall property appears to have the potential for an expanded park-and-ride facility that could provide up to 486 spaces. The expanded facility would include a new bus turnaround to expedite bus entry and exit, a bus shelter with amenities such as benches and lighting, and convenient access from Galleria Mall Drive at Exit 11 off Route 140.

Easton

A new apartment building of 182 units is proposed to be constructed in the existing Shovel Shop complex in Easton, Massachusetts. The site is located southeast of the Main Street/Oliver Street intersection and adjacent to the proposed Easton Village Station. The project includes the revitalization of older industrial buildings with new construction of 182 apartment units and 8,400 square feet of light industrial space. The site will be served by four driveways, two located on Main Street and two located on Oliver Street.

The Shovel Shop Square project identified a safety issue on the segment of Main Street, between Barrows Street and Center Street. Vehicles were observed to park perpendicular to the roadway on both sides of the street, encroaching on the traveled way. The Shovel Shop Square project has recommended eliminating parking from the northerly side and restriping the parking spaces on the southerly side with angle parking.

Queset Commons is a Smart Growth project proposed for a location west of Route 138 and north of Morse's Pond. It is planned to include:

- 60 condominium units;
- 83 assisted living units;
- 137 apartments;
- 60,000 square feet of retail and commercial space;
- A 16,000 square foot conference center;
- A 15,000 square foot food market; and
- 25,000 square feet of office space.

Signalization of the intersection of Route 138 (Washington Street) and Roosevelt Circle is also part of the mitigation for the proposed Queset Commons development. The improvements include:

- Widening the northbound approach to provide a through lane and an exclusive left-turn turn lane; and
- Installing a traffic signal at this intersection to be coordinated with the traffic signal at the intersection of Route 138 and Belmont Street. The signal is proposed to provide an actuated three phase cycle, which includes a northbound protected phase, a permissive northbound/southbound phase, and an exclusive eastbound phase.

Reconstruction of the intersection of Route 138 (Washington Street) and Route 123 (Belmont Street) is also part of the mitigation for the proposed Queset Commons development. The improvements include:

- Widening the approaches to provide turn lanes;
- Updating the signal timings and phasing; and
- Restriping the westbound approach to provide a shared through/left-turn lane with an exclusive right-turn lane.

Raynham

A new 210,000 square foot Wal-Mart store is proposed to be constructed on the west side of Route 138, south of First Street. The project will include 64,000 square feet of grocery sales space and approximately 1,075 parking spaces. Access to the site will be provided via a new driveway on Route 138.

As part of the Wal-Mart project, several roadway improvements will be made along Route 138. These improvements were included in the No-Build traffic analysis and include:

- Widening Route 138 between Center Street and Carver Street;
- Signalizing the two intersections with the I-495 ramps;
- Signalizing the Center Street intersection and widening the northbound and southbound approaches;
- Modifying signal timings at the intersection with Carver Street; and
- Coordinating the signal at Elm Street with the new signals at the I-495 ramps.

Appendix 4.2-A

MassGIS Generalized Land Use Data

The MassGIS dataset used to identify developable land is available at http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/lus2005.html. MassDOT considered land currently identified as agricultural, forest, mining, recreation, or undeveloped as potentially developable land area. For uncluttered presentation in the accompanying figures, MassDOT generalized MassGIS's land use categories as indicated in the following table.

Generalized Land Use Category	***MassGIS Land Use Categories***
Agriculture	*Orchard (part of #21), Pasture, Nursery (part of #21), Cropland*
Cemetery	*Cemetery*
Commercial	*Commercial*
Forest	*Forest*
Industrial	*Industrial, junkyards*
Institutional	*Urban public/institutional*
Mining	*Mining*
Open Water	*Water*
Recreation	*Participation Recreation, Spectator Recreation, Water Based Recreation, Marina (part of #9)*
Residential	*Low Density Residential, Very low density > 1 acre lots, Medium Density Residential, Multi-Unit Residential*
Transportation/Utilities	*Waste Disposal, Powerlines (part of #6)*
Undeveloped	*Coastal Shore/Saltwater sandy beach (part of #9; no longer used) (from DEP), Forested wetland (part of #3; no longer used) (from DEP), Salt Wetland, Urban Open, Non-forested Wetland (from DEP), Open Land*

Appendix 4.4-A

CTPS South Coast Rail Environmental Justice Study

MEMORANDUM

To: South Coast Rail Project Interested Parties **September 4, 2009**

From: Ben Dowling, Esq.

Re: South Coast Rail Environmental Justice Study

SUMMARY

This memo summarizes the results of the environmental justice analysis—an examination of the geographic distribution of benefits and burdens—conducted for the South Coast Rail project. The analysis was conducted using the regional travel demand model and readily available geographic and spatial information. The analysis examines how South Coast Rail proposed build alternatives affect the travel accessibility and mobility of environmental justice communities in Taunton, Fall River and New Bedford. The analysis was based on the future year (2030) travel forecasting done in connection with the South Coast Rail project. This analysis did not examine the effects of improved interconnectivity between the South Coast Rail study area and Providence, although there may be some environmental justice benefits associated with such improved connectivity.

Definition of Environmental Justice Communities

The State Executive Office of Environmental Affairs' (EOEA) definition of environmental justice populations was used in this study. The EOEA considers a population to be an environmental justice population if a Census block group's median annual household income is at or below 65 percent of the statewide median income for Massachusetts, or if twenty-five percent of its residents are members of minorities; or if twenty-five percent of its residents are foreign born, or if twenty-five percent of its residents lack English proficiency.

The regional travel demand forecasting model's transportation analysis zones (TAZ) in the South Coast area, the geographic base for the environmental justice analysis, do not split block groups. In the Boston area there are some misalignments between TAZs and Census block groups, however this did not significantly affect the environmental justice analysis results. For a detailed discussion of the regional travel demand forecasting model please refer to the August 2009 CTPS memorandum titled "Methodology and Assumptions of Central Transportation Planning Staff Regional Travel Demand Modeling."

Modeling Assumptions

It is important to note that the results presented in this memo—like the results of alternatives analyses in many different contexts—are relative. In the case of this environmental justice analysis, the results are relative to a future year no-build/Transportation Systems Management scenario in which the headways of the private bus lines that currently service the South Coast region were improved over their current year counterparts. In transportation planning, it is standard practice to assume that in the absence of future build project implementation, existing transit services, in a future year no-build, should be incrementally improved, to meet the increased demand due to "background" population growth. Such a future year transit network is called a Transportation System Management (TSM) scenario. In this analysis, the private bus headway improvements were included in the future year no-build/TSM because, in the absence of a build alternative implementation, such improvements are expected in order to accommodate regional population growth and concomitant increases in transit demand, over the project study horizon.

In this environmental justice analysis, if a no-build/TSM scenario was not used as the future year no-build, and a true no-build was used in its place, the environmental justice results would tend to improve because, again, the analysis results are relative to a no-build. Using a true no-build instead of a no-build/TSM would create more distance between the build alternatives and the scenario to which they are compared.

It is also important to note that environmental justice analysis results are, of course, influenced by specific aspects of the build alternatives. For a complete description of the build alternatives please refer to the Draft Environmental Impact Report.

ANALYSIS

Accessibility to Jobs

This statistic measures the degree to which a build alternative provides greater access to employment as compared to the no-build/TSM alternative. It measures the change, for environmental and non-environmental justice zones, in the number of basic, retail and service jobs that are within ninety minutes transit time of environmental justice and non-environmental justice zones in Taunton, New Bedford and Fall River. For this analysis the number of jobs available remain constant as between the no-build/TSM and the build alternatives. The analysis accounts for in-vehicle as well as out of vehicle transit travel times. The transit access percentages in Table 1 (below) represent the change between the no-build/TSM and listed build alternatives.

Table 1: Accessibility to Basic, Retail and Service Jobs—Change From No-Build/TSM to Build

	TAUNTON BASIC EMPLOYMENT		TAUNTON RETAIL EMPLOYMENT		TAUNTON SERVICE EMPLOYMENT	
	TRANSIT ACCESS		TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	61%	41%	69%	48%	223%	84%
Stoughton Local Diesel	46%	35%	51%	39%	135%	63%
Attleboro Local Electric	70%	37%	80%	43%	280%	82%
Attleboro Local Diesel	53%	32%	59%	35%	169%	61%
Stoughton Local Electric--Whittenton	39%	26%	39%	25%	122%	27%
Stoughton Local Diesel--Whittenton	29%	22%	29%	20%	74%	20%
Rapid Bus	-3%	0%	-2%	0%	0%	0%

	FALL RIVER BASIC EMPLOYMENT		FALL RIVER RETAIL EMPLOYMENT		FALL RIVER SERVICE EMPLOYMENT	
	TRANSIT ACCESS		TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	147%	84%	137%	82%	278%	117%
Stoughton Local Diesel	125%	75%	112%	75%	216%	108%
Attleboro Local Electric	127%	69%	116%	70%	257%	108%
Attleboro Local Diesel	108%	62%	94%	63%	200%	99%
Stoughton Local Electric--Whittenton	117%	69%	103%	68%	199%	104%
Stoughton Local Diesel--Whittenton	99%	62%	84%	62%	155%	96%
Rapid Bus	14%	-1%	27%	7%	100%	50%

	NEW BEDFORD BASIC EMPLOYMENT		NEW BEDFORD RETAIL EMPLOYMENT		NEW BEDFORD SERVICE EMPLOYMENT	
	TRANSIT ACCESS		TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	11%	4%	13%	6%	39%	5%
Stoughton Local Diesel	1%	0%	0%	3%	11%	1%
Attleboro Local Electric	9%	3%	8%	1%	34%	2%
Attleboro Local Diesel	1%	0%	0%	0%	9%	0%
Stoughton Local Electric--Whittenton	-2%	0%	-4%	1%	4%	-1%
Stoughton Local Diesel--Whittenton	-3%	0%	-5%	0%	1%	-1%
Rapid Bus	0%	-3%	2%	-1%	7%	3%

As TABLE 1 (above) shows, the build alternatives generally provide greater accessibility to jobs than the no-build/TSM alternative. Also, as TABLE 1 shows, environmental justice zones in these three communities generally experience greater accessibility increases as compared with non-environmental justice zones.

The small decreases in employment accessibility in New Bedford are likely due to the differences between the build alternatives and the no-build/TSM alternative in terms of connectivity with the Southeastern Regional Transit Authority (SRTA) local bus network. Unlike existing and proposed improved private bus service to New Bedford and Fall River, build alternative station locations do not terminate at or directly provide for transfers with the SRTA central bus terminals in New Bedford and Fall River. In the case of New Bedford, this factor, in conjunction with the location of TAZs containing EJ populations, results in some slight accessibility decreases.

Accessibility to Universities and Colleges

This statistic in Table 2 (below) measures the degree to which a given build alternative provides greater access to colleges and hospitals as compared to the no-build/TSM alternative. Transit access measures the change in the number of college enrollment slots and hospital beds between the no-build/TSM and the build alternatives within ninety minutes of environmental and non-environmental justice zones in Fall River, New Bedford, and Taunton. For this analysis the number of enrollment slots and hospital beds available remain constant as between the no-build/TSM and the build alternatives. The analysis accounts for in-vehicle as well as out-of-vehicle transit travel times.

Table 2: Accessibility to Colleges, Universities and Hospitals—Change From No-Build/TSM to Build

	TAUNTON COLLEGE ENROLLMENT		TAUNTON HOSPITAL BEDS	
	TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	156%	80%	132%	83%
Stoughton Local Diesel	84%	55%	65%	53%
Attleboro Local Electric	248%	92%	178%	77%
Attleboro Local Diesel	134%	62%	88%	49%
Stoughton Local Electric--Whittenton	104%	33%	58%	32%
Stoughton Local Diesel--Whittenton	56%	22%	28%	20%
Rapid Bus	-1%	0%	-2%	-1%

	FALL RIVER COLLEGE ENROLLMENT		FALL RIVER HOSPITAL BEDS	
	TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	70%	82%	414%	159%
Stoughton Local Diesel	56%	67%	340%	139%
Attleboro Local Electric	69%	72%	402%	152%
Attleboro Local Diesel	55%	59%	320%	132%
Stoughton Local Electric--Whittenton	53%	62%	338%	139%
Stoughton Local Diesel--Whittenton	42%	50%	277%	120%
Rapid Bus	15%	3%	167%	35%

	NEW BEDFORD COLLEGE ENROLLMENT		NEW BEDFORD HOSPITAL BEDS	
	TRANSIT ACCESS		TRANSIT ACCESS	
	EJ	NonEJ	EJ	NonEJ
Stoughton Local Electric	8%	11%	19%	6%
Stoughton Local Diesel	-2%	1%	1%	0%
Attleboro Local Electric	6%	8%	8%	3%
Attleboro Local Diesel	-1%	1%	1%	0%
Stoughton Local Electric--Whittenton	0%	0%	0%	1%
Stoughton Local Diesel--Whittenton	0%	0%	0%	0%
Rapid Bus	2%	0%	6%	4%

A pattern similar to the employment accessibility results emerges with college enrollment and hospital beds. Transit accessibility to colleges and hospitals for these three cities generally increases from the no-build/TSM to build alternatives. Decreases in college enrollment associated with the rapid bus build alternative are due to run time differences with the no-build/TSM. Once again, the slight decreases in college enrollment accessibility in New Bedford are likely due to the differences in local bus service connectivity provided with the no-build/TSM.

Mobility

This statistic is simply un-weighted in-vehicle travel time from the three South Coast communities to a selected TAZ in Boston (the TAZ in which South Station is located). A positive value represents a travel time savings as compared to the no-build/TSM. The statistic is further broken out between environmental justice zones and non-environmental justice zones.

Table 3: Mobility: In-Vehicle Travel Times to Boston—Change From No-Build/TSM to Build

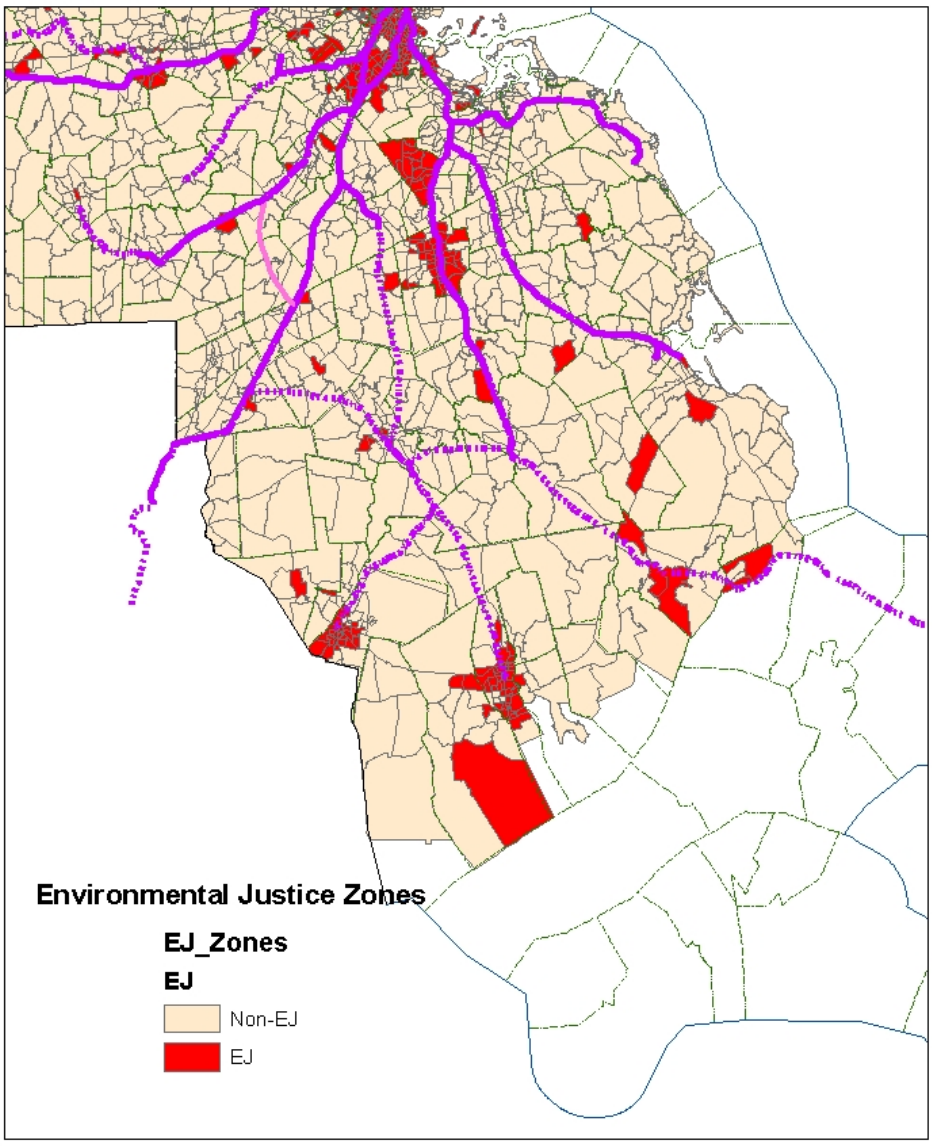
TAUNTON IN-VEHICLE TRAVEL TIME TO BOSTON	EJ	NonEJ
Stoughton Local Electric	81%	62%
Stoughton Local Diesel	59%	44%
Attleboro Local Electric	98%	69%
Attleboro Local Diesel	76%	50%
Stoughton Local Electric--Whittenton	63%	43%
Stoughton Local Diesel--Whittenton	44%	30%
Rapid Bus	14%	11%

FALL RIVER IN-VEHICLE TRAVEL TIME TO BOSTON	EJ	NonEJ
Stoughton Local Electric	16%	20%
Stoughton Local Diesel	10%	13%
Attleboro Local Electric	17%	21%
Attleboro Local Diesel	11%	14%
Stoughton Local Electric--Whittenton	10%	13%
Stoughton Local Diesel--Whittenton	6%	9%
Rapid Bus	0%	2%

NEW BEDFORD IN-VEHICLE TRAVEL TIME TO BOSTON	EJ	NonEJ
Stoughton Local Electric	43%	51%
Stoughton Local Diesel	27%	34%
Attleboro Local Electric	45%	53%
Attleboro Local Diesel	31%	42%
Stoughton Local Electric--Whittenton	26%	32%
Stoughton Local Diesel--Whittenton	20%	22%
Rapid Bus	24%	28%

Table 3 (above) shows that each build alternative, with one exception, offers travel time savings over the no-build/TSM alternative. In some instances, non-environmental justice communities experience slightly greater travel time savings than environmental justice communities. This results from the relative locations of the build stations/stops as compared to the environmental justice and non-environmental justice communities.

South Coast Rail Environmental Justice Zones



Appendix 4.6-A

Noise Monitoring Field Notes

Attleboro Line

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Day/Night #		Location	Land Use Category	Existing Leq (daytime)	Existing Leq (night time)	
		Taunton				
13 / 14	1	Webster Street • (12/14 Monitor #1)	2	415 - 435 56.7	705-735 53.4	EOP/SIDEWALK
12 / 15	2	Hoton Street	2	335-355 48.4	740-800 41.4	EoP
11 / 16	3	Powder Horn Drive •	2	3-320 48.3	815-835 40.7	EoP
9 (10) / 17 (18)	4	Jeffrery Lane • ⊗ 1 School Bus @ 220, 1 UPS TRUCK @ 215 / ⊙ CARS #17 (18)	2	205-225 / 220-240 56.0 / (45.6)	845-905 / 905-925 51.8 ⊙ / (39.7)	@ EoP
						EV +3
		Norton				
8 / 19	5	Garrett Drive •	2	1135-1155 39.8	935-955 42.7	@ EoP
7 / 20	6	Sturdy Street •	2	105-125 46.5	1005-1025 41.1	30' off EoP
						NIGHT +8
		Attleboro				
6 / 21	7	*Pike Avenue* •	2	1235-1255 55.8	1035-1055 50.2	25' off EoP
5 / 22	8	*Frontier Drive* •	2	1205-1225 46.8	1105-1135 39.9	@ EoP
		Mansfield				
1, 23 (9) 23 (24)	9	Gilbert Street ⊗ Active Rail + CARS on GILBERT	2	1130-1150 T-64.3 / (53.9)	1135-1200 T-63.3 / (47.0)	30' EoP

(9) GILBERT DAY

#2 - 1 TRAIN <5 MIN 74.7

#3 - 1 TRAIN 20 MIN 64.0

#4 0 TRAINS 5 min 53.9

Night

#23 - 1 TRAIN 10 MIN 63.3

#24 - 0 TRAINS 11 MIN 47.0

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Tile 1

Tile 2

Bristol Law Library

Taunton State Hospital

TAUNTON STATE HOSPITAL

Salamon School

Pride Inc.

Taunton Depot

Caleb Barnum

MEMORIAL PARK

Stoughton Line

Attleboro Secondary

Taunton River

Whittenton Branch

Three Mile River Watershed ACEC

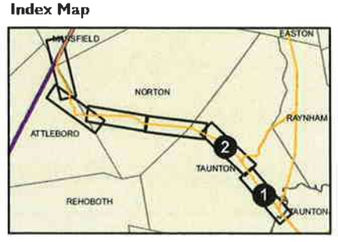
0 200 400 800 Feet

11/13/2008
File: \\Mahon\projects\10111.00\GIS\project\Phase2\Wetlands\Attleboro\CJtoAT_Out09pg1.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commuter Rail
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Environmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-5a

Attleboro Secondary from Cotley Junction to Attleboro Bypass

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

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Tile 1

Tile 2

Attleboro Secondary

Three Mile River Watershed ACEC

NORTON

TAUNTON

Barrowsville

Chartley Pond

CHARTLEY POND CONSERVATION AREA

WOODWARD SPRINGS

LIONS PARK BALLFIELD

0 200 400 800 Feet

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
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- Schools
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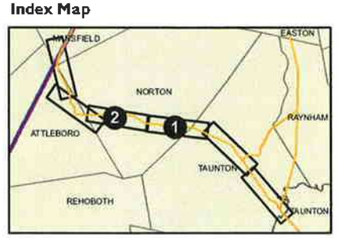
Index Map



EOT

SOUTH COAST RAIL

Figure 5-5b

Attleboro Secondary from Cotley Junction to Attleboro Bypass

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

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Tile 1

Tile 2

ATTLEBORO

NORTON

MANSFIELD

Attleboro Bypass

Attleboro Secondary

Northeast Corridor

Chartley Pond

CHARTLEY BROOK

EISENHOWER SWAMP

0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\Attleboro\CJbsAT_Ord8bpg3.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
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- Grade Crossings
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- Existing Layover Facilities
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- MBTA Commuter Rail
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- NHESP Potential Vernal Pools
- Field Verified Vernal Pools
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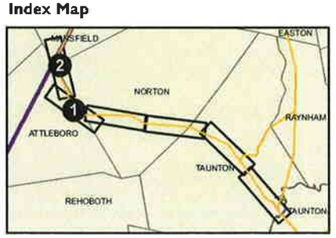
- DEP Wetlands
- DEP Open Water

Index Map



Frontier Dr.
EOT

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

SOUTH COAST RAIL

Figure 5-5c

Attleboro Secondary from Cotley Junction to Attleboro Bypass

WORK SHEET

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SOUTH COAST RAIL

Technical Report
Noise and Vibration
Draft

Northeast Corridor

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Run #	#	Location	Land Use Category	Existing Leq (daytime)	Existing Leq (night time)	
		Dedham		1140 - 1155	945 - 1003	
1 21	21	**Hooper Road**	2	44	47.3	50' from BARRIER @ EOP
		Westwood				
		University Ave (Funeral Institute of				
		Canton				
DAY 2,3,4,5 22	20	I-95 - Industrail		1145 - 1155	915 - 930	Background Noise Analysis
		Cedarcreast Road		48.8	50.2	@ Cul-de-Sac EOP
		Chapman Street		1101 20	850 - 905	
6/18 19	19	**Norfolk Street** # 123		60.6	56.0	on SW @ 123 N/o Paul
		High Street				
		Sharon				
	18	Rhodes Avenue				
		Upland Road (Route 27)		135 - 150	815 - 830	
7 17	17	**Flintlock Road - Deborah Sampson**		45.7	44.3	@ Cul de Sac EOP
		Chase Drive - Islamic Academy of		210 - 225		
8,9	16	Old Wolomolopoag Street		44.2	DOG BARK	@ Cul de Sac EOP
		Burnt Bridge Rd				
		Foxborough				
		East Street		240 - 255	750 - 803	
10 16	15	~~**Keryns Way**~~ EAST ST (#140)		60.7	53.1	25' OFF EOP (Kids @ Play)
		Summer Street				
		Mansfield				
	14	Angell Street				
		Chauncy Street		310 325	725 - 740	
11, 14, 15	13	**Central Street**		52.0	48.9	EOP 25' FROM END OF Cul De Sac
12, 13	12	**Old School Street**		59.6	57.0	@ Gravel turn around = 100' from R.1
		Otis Street		335 - 350	710 715	
	10	**Gilbert Street (without Trains)**	**2**	**53.9**	**47.0**	

14 - DOG BARK - JUNK

15, ON HIGH ST.

#18 W/TRAIN 3 MIN = 64.9 dBA (850 - 853)

#2 W/ TRAIN 5 min 70.5dBA (1225 - 1230)
#3 W/ TRAIN 4 min 60.1 (1230 - 1235)
#4 W/TRAIN 5 min 67.3 (1235 - 1240)
#8 W/Train 1 min 62.7 (202 - 203)

Location	Land Use Category	Existing Leq (daytime)	Existing Leq (night time)	Existing Ldn
Dedham				
Hooper Road		44	47.3	50.3
Westwood				
University Ave (Funeral Institute of the North East)				
Canton				
I-95 - Industrial				
Cedarcreast Road		48.8	50.2	53.2
Chapman Street				
Norfolk Street		60.6	56.0	59.0
High Street				
Sharon				
Rhodes Avenue				
Upland Road (Route 27)				
Flintlock Road - Deborah Sampson Park)		45.7	44.3	47.3
Chase Drive - Islamic Academy of N.E.				
Burnt Bridge Road		44.2	-	42.2
Foxborough				
East Street		60.7	53.1	56.1
Summer Street				
Mansfield				
Angell Street				
Chauncy Street (Route 106)				
Central Street / High Street		52.0	48.9	51.9
Old School Street		59.6	57.0	60.0
Otis Street				
Gilbert Street (without Trains)	2	53.9	47.0	55.0
Gilbert Street (with Trains)	2	64.0	63.3	71.3

Tile 1

Tile 2

Attleboro Bypass

Northeast Corridor

NORTON

MANSFIELD

10

11

12

13

SWEET-KALING CONS. AREA

ZECHER LOT

GREAT WOODS CONSERVATION AREA

Amego Inc

Roland Green School

FULTON POND

Al-Noor Academy

Mansfield Junction

NORTH COMMON

0 200 400 800 Feet

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
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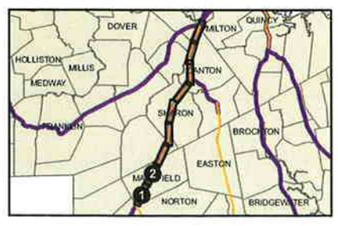
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Figure 5-6a

Northeast Corridor

15 - Kerynn WM

Tile 1

Tile 2

Framingham Secondary

Northeast Corridor

MANSFIELD

FOXBOROUGH

SHARON

14

15

16

Canoe River Aquifer ACEC

RUMFORD RIVER GREENBELT

COUNTY STREET AREA

MAPLE PARK CONSERVATION AREA

Mabelle M Burrell

CANOE RIVER WILDERNESS AREA

FULLER

INDEL TRUST PROPERTY BAREFOOT HILL

CEDAR SWAMP WETLANDS

CEDAR SWAMP LAND

NAUSET RD WETLANDS

NORFOLK COUNTY CANOE RIVER WILDERNESS

CANOE RIVER WATER CONSERVATION PROJECT

CANOE RIVER WETLANDS

EAST FOXBORO STATE HILL SITE

MOHAWK ST WETLANDS

Islamic Academy of N.E.

0 200 400 800 Feet

10/31/2008
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Legend

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Index Map

EOT

SOUTH COAST RAIL

Figure 5-6b

Northeast Corridor

Source: MassGIS
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17 - Flintlock Road

Tile 1

Tile 2

Fowl Meadow And Ponkapoag Bog ACEC

11/13/2008
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Legend

- Community Health Centers
- Hospitals
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Index Map

EOT

SOUTH COAST RAIL

Figure 5-6c

Northeast Corridor

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

19. Hartwell Pl X 123 Norfolk

Tile 1

CANTON

Fowl Meadow And Ponkapoag Bog ACEC

NEPONSET RIVER RESERVATION

CANTON JUNCTION

Northeast Corridor

Stoughton Line

20

19

0 200 400 800 Feet

Tile 2

NORWOOD

WESTWOOD

Northeast Corridor

Fowl Meadow And Ponkapoag Bog ACEC

CANTON ALONG PECUNIT BROOK

ROUTE 128

DEDHAM

Funeral Institute Of The Northeast

BLUE HILL VISTA

NEPONSET RIVER RESERVATION

0 200 400 800 Feet

11/12/2009
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
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Index Map

EOT

SOUTH COAST RAIL

Figure 5-6d

Northeast Corridor

Source: MassGIS
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Hooper Rd

NB.

@ EOP

Resident suggested extending Berm. Said it was cut short 1 round.

11/12/2008
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Legend

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- Hospitals
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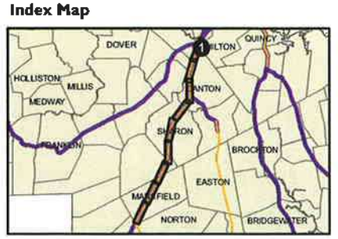
Index Map



EOT

SOUTH COAST RAIL

Figure 5-6e

Northeast Corridor

Source: MassGIS
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Southern Triangle

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[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12/30/2008

Project No.:

Site: # 1

Weather: 40° WIND

Noise Monitor: Larsen Davis 824

Time Start: 1040 AM - 11°° AM
8°° PM - 8 20

Duration: 20 Minutes

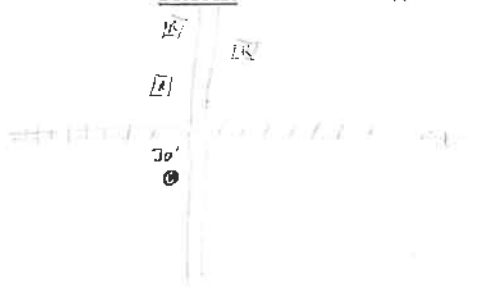
What was the name of the data run? COTLEY ST DAY / #10 Night

Results

Leq 51.6 / 45.6

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch → N



Notes:

What was the angle of exposure to the highway? 0

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

NO TRAFFIC ON COTLEY ST @ RR X ING

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources? WIND

Ldn = 49.6 / 48.6

[redacted]

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Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-05

Project No.:

Site: #2

Weather: 40' WIND

Noise Monitor: Larsen Davis 824

Time Start: 11:15 AM - 11:35 830-850 pm

Duration: 20 Minutes

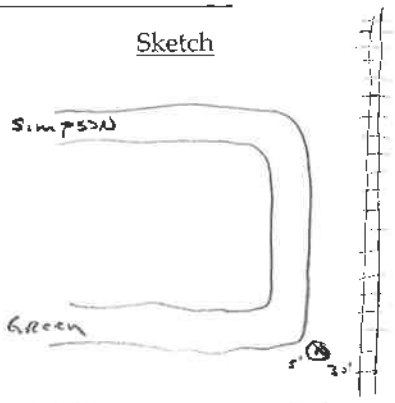
What was the name of the data run? #2 GREEN #11

Results

Leq 55.3 / 41.2

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby? GREEN SIMPSON

LITTLE TO NO TRAFFIC

Were there significant other non-highway noise sources?

Ldn = 53.3 / 44.2

[redacted]

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Environmental Services

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101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-09

Project No.:

Site: #3

Weather: 40° WIND

Noise Monitor: Larsen Davis 824

Time Start: 1150 - 1210 900 - 920

Duration: 20 Minutes

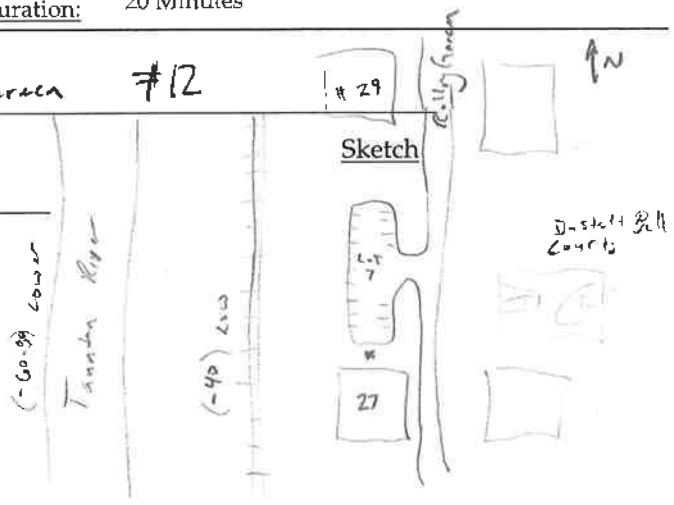
What was the name of the data run? #3 Rolling Green #12

Results

Leq 55.5 / 43.8

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources? WIND Neighborhood Noise Kids @ play.

Ldn = 53.5 / 46.8

[redacted]

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Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-08

Project No.:

Site: #4

Weather: 40° WIND

Noise Monitor: Larsen Davis 824

Time Start: 1225-1245 930-950

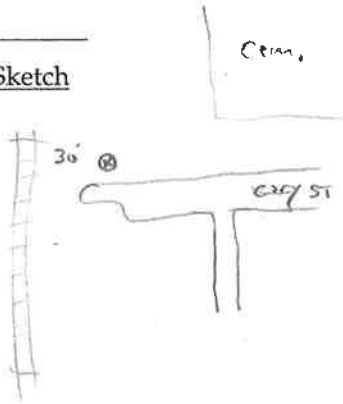
Duration: 20 Minutes

What was the name of the data run? #4 Cory St #B

Results

Leq 57.2 / 52.1

Sketch



Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby? CARS URBAN NOISE

Were there significant other non-highway noise sources? WIND Dogs Barking (NOT TOO close/Loud)

Ldn = (55.2) / (55.1)

[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12/30/08

Project No.:

Site: #5

Weather: 40° WIND

Noise Monitor: Larsen Davis 824

Time Start: 1:20 - 1:30 10:15 - 10:35

Duration: 20 Minutes

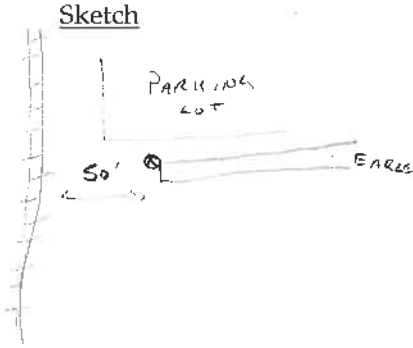
What was the name of the data run? #5 EARLE ST #14

Results

Leq 55.6 / 47.6

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources? WIND

Ldn = (53.6) / (55.6)

[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-08

Project No.:

Site: #6

Weather: 40° Wind

Noise Monitor: Larsen Davis 824

Time Start: 2^40 - 3^00 1045 - 1105

Duration: 20 Minutes

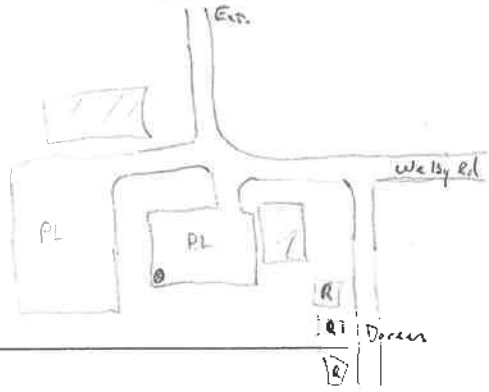
What was the name of the data run? #6 Welby Rd #5

Results

Leq 51.8 44.1

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources?

Ldn = 49.8 / 52.1

[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-08

Project No.:

Site: #7

Weather: 40 WIND

Noise Monitor: Larsen Davis 824

Time Start: 3:15 - 3:35 11:20 11:40

Duration: 20 Minutes

What was the name of the data run? #7 GUNDER'S WAY #16

Results

Leq 48.7 35.6

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch

Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources?

Ldn = 46.7 / 43.6

[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-03

Project No.:

Site: # 8

Weather: 40° WIND

Noise Monitor: Larsen Davis 824

Time Start: 4⁰⁰ - 4²⁰ 12⁰⁰ - 12²⁰

Duration: 20 Minutes

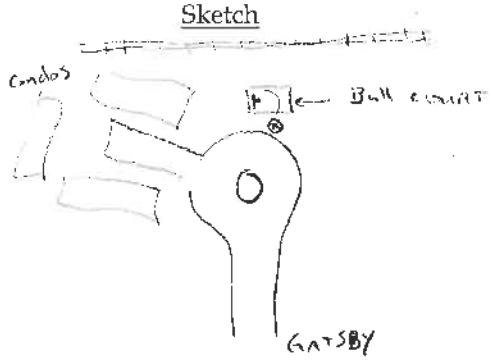
What was the name of the data run? # 8 GATSBY #17

Results

Leq 43.2 36.0

Traffic Data	Volumes	Speeds
Automobiles		
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway?

Were there any objects blocking the highway noise sources? (Such as buildings or hills)

Were there other roadway or highway noise sources nearby?

Were there significant other non-highway noise sources?

Ldn = 41.2 / 44

[redacted]

Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

VHB

101 Walnut Street
Post Office Box 9151
Watertown
Massachusetts 02272
617 924 1770
FAX 617 924 2286

Noise Monitoring Data

Notes Taken By: NBS

Date: 12-30-09

Project No.:

Site: #9

Weather: 40° WIND (slight)

Noise Monitor: Larsen Davis 824

Time Start: 430 - 450 1230 - 1250

Duration: 20 Minutes

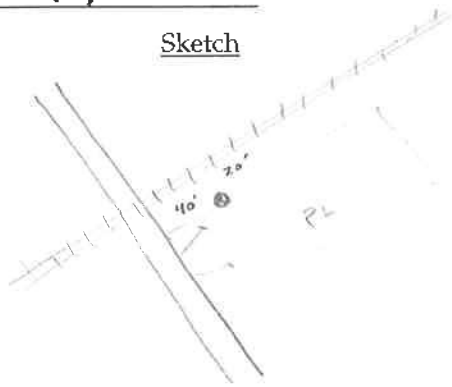
What was the name of the data run? #9 Middleboro Ave #18

Results

Leq 65.1 54.6

Traffic Data	Volumes	Speeds
Automobiles		± 35
Medium Trucks		
Heavy Trucks		

Sketch



Notes:

What was the angle of exposure to the highway? 180°

Were there any objects blocking the highway noise sources? (Such as buildings or hills) NO

Were there other roadway or highway noise sources nearby? NO

Were there significant other non-highway noise sources? NO

Ldn - (63.1) / (62.6)

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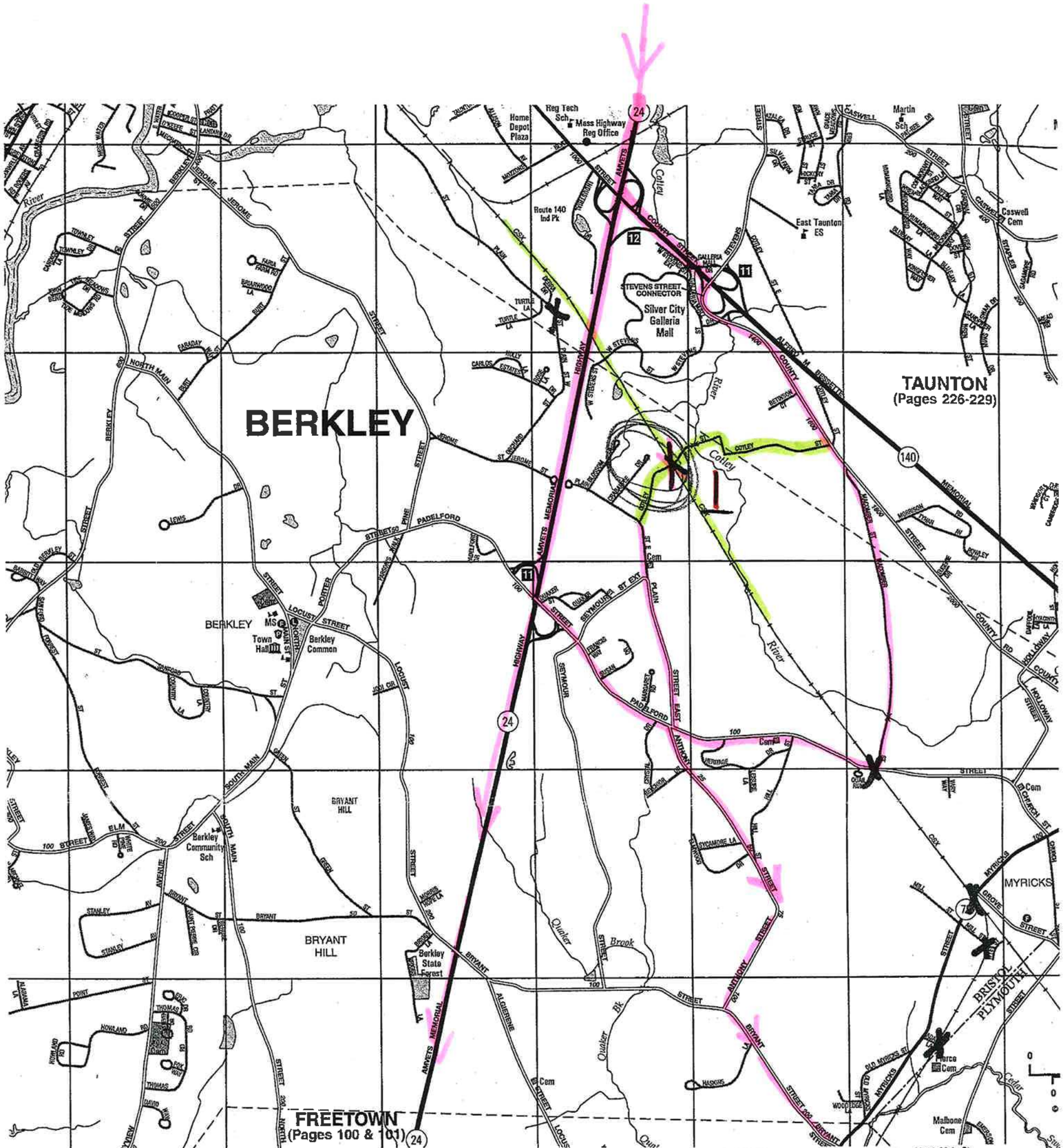


MAP INDEX

DIGHTON

Localities

Chestnut Tree Corner E5
Dighton F6
Dighton Rock Park H6
North Dighton C6
Segreganset D7

Bow St B6
Bradley Rd E5
Briarwood Dr D3
Briggs St D5
Brook St E4
Bruce La E5
Buck Plain Rd F5
Carriage Park La C3
Cedar St F1-F2
Cedarwood Cir D2
Center St D4-E6
Chase Av F7
Chase St C6
Cherry St H7
Cheryl Rd E6
Chestnut St A1
Cobbs La F7
Collard St B6
Council Oak Way F5
Country Hill Dr D7
County St H6-G7
Data Vault Rd H3
Debra Jane Ct F3
Elm St H5-F6
Estherbrook Av G6
Fairway Dr B2
Fieldstone Dr E2
Forest St C5
Gray Ter C7
Green Acres Rd C8
Gulliver St A2
Hart St G3-G6
Marion Av G6
Massasoit Rd F5
Middle St C5
Milk St F5
Millers La H4
Milliken Av C6
Mt Hope St B6
Muddy Cove La G7
North St A1
Oak Grove Dr D3
Oak St D1
Old Proprietors Rd H3
Old Somerset Av G7
Old Wellington St E1
Old Williams St G3
Palmer St F5
Park Av H7
Park St B5
Pearl St B6
Pine Hill Rd D3
Pine St E5
Pleasant St H7-G7
Prospect St B5
Purchase St F1
Putters Way B2
Rebecca Rd E6
Regional Rd C1
Riverside Av C7
Rose Ter B6
Rowland Dr E5
Sandpiper Dr D7
Susan Rd E6
Swanee Dr C5
Tanglewood Rd D2
Tremont St C4-C5
U S Hwy 44 ..... B1
Walker St A2
Walnut St G7
Washington St H7
Water St G7
Wellington St D1-E2
Wheeler St C2
Whitmarsh La F5
Williams St B3-G3
Winfield La C1
Winter St B6
Winthrop St B1-B2
Wisconsin La H5

Points of Interest

American Auto Auction B3
Berkley Bridge E8
Boat Ramp H7
Bristol County Agricultural School E7
Dighton Elementary School/Middle School E7
Dighton Cemetery F6
Dighton Conservation Area D3
Dighton Rock Park H7
Dighton-Rehoboth Regional High School C1

Fire Stations

Chase Street B6
Main Street F6
Hathaway Cemetery D5
Hospital D7
Library F6
Old Town Landing G7
Police Station E7

Post Offices

Main F7
North Dighton B7
Riverside Cemetery C7
Segreganset Country Club A2

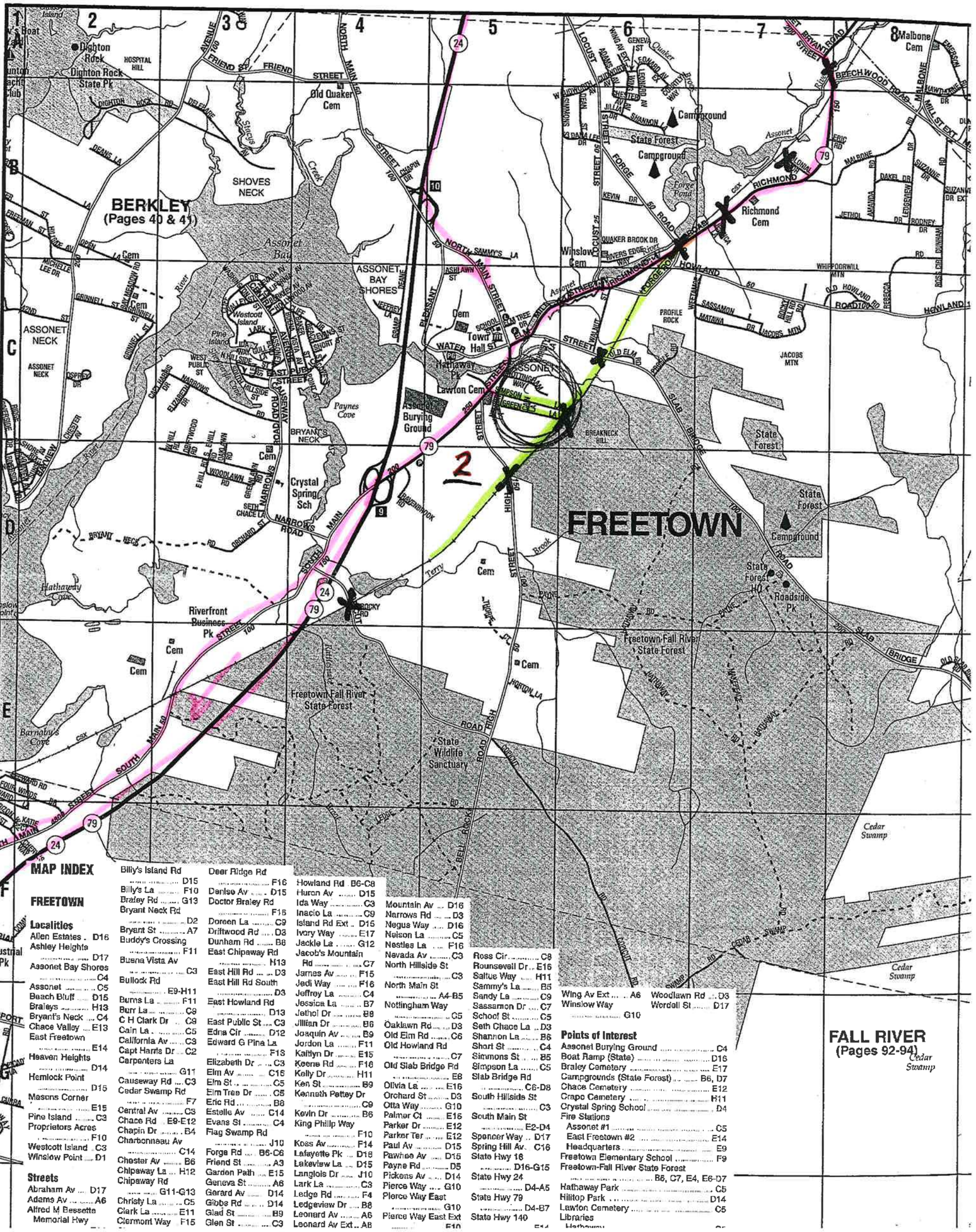
BERKLEY

Localities

Assonet Neck H3
Berkley D9
Bryant Hill E10
Conspiracy Island J7
Grassy Island F9
Myricks E15
Shoves Neck G9

Streets

Adams La F14
Alabama La F8
Algerine St F11
Amvets Memorial Hwy F11-C12
Anthony St D12-F13
Babbitt Way D8
Bay Meadow Rd H8
Bayview Av J8-F9
Beach St G7
Belchior Dr E12
Berkley St E8-C9
Berube Dr E8
Blossom La C12
Bonnie Dr B9
Briarwood La B10
Briggs La E11
Broadview Av J7
Bryant St E9-E11
Burt St C9
Desautels Ct D8
Dighton Rock Rd G8
Dillingham Av H7
Elm St E8-E9
Elmwood Dr E13
Eric Dr F9
Faraday Way B9
Faria Farm Rd B10
Ferry La G7
Forrest St D8
Forty Second St H7
Fox Way F9
Francis Way D12
Freeman St G7
Friend St F9
Green St D10
Grinnell St H8
Grove St E14
Haskins La F13
Heritage Dr D13
Hill St E13
Hillside Av G8
Holloway St D15
Holly La C11
Howland Rd F8
James Way E9
Jerome St B10-C11
Jessie La G7
Jodi Cir D10
John Bend B8
Juniper Tr J7
Karens Way D6
North Main St C9-D10
Old Berkley St D8
Old Myricks Rd F14
Opaa La G8
Orchard St C11
Osprey Dr H8
Padelford Dr C11
Padelford St C11-D12
Parson's Walk D11
Pine St C11
Plain St East C12-D12
Plain St West B12
Point St F8
Porter St D10
Quail Run E14
Quaker St D12
Ridge St H7
Riverside Dr H7
Rose La C12
Saints Way D8
Sanford St D8
Seymour St D12
Seymour St Ext D12
Shore Rd J8
South Main St E10
St Pierre Cir E9
Stanley Av E9
State Hwy 24 ..... F11-C12
State Hwy 79 ..... E14



MAP INDEX

FREETOWN

Localities

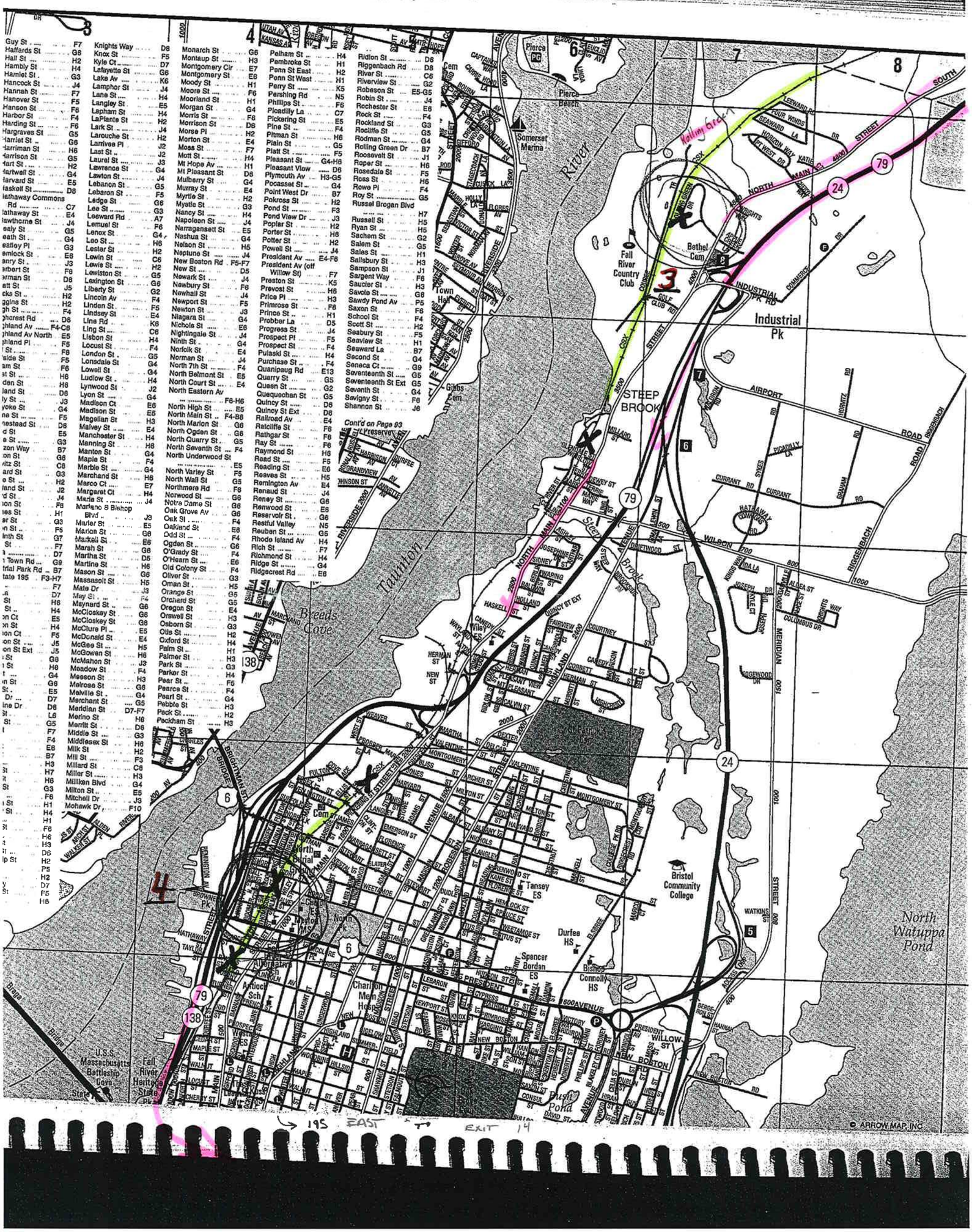
Allen Estates ... D16
Ashley Heights ... D17
Assonet Bay Shores ... C4
Assonet ... C5
Beach Bluff ... D15
Braleys ... H13
Bryant's Neck ... C4
Chace Valley ... E13
East Freetown ... E14
Heaven Heights ... D14
Hemlock Point ... D15
Masons Corner ... E15
Pine Island ... C3
Proprietors Acres ... F10
Westcott Island ... C3
Winslow Point ... D1

Streets

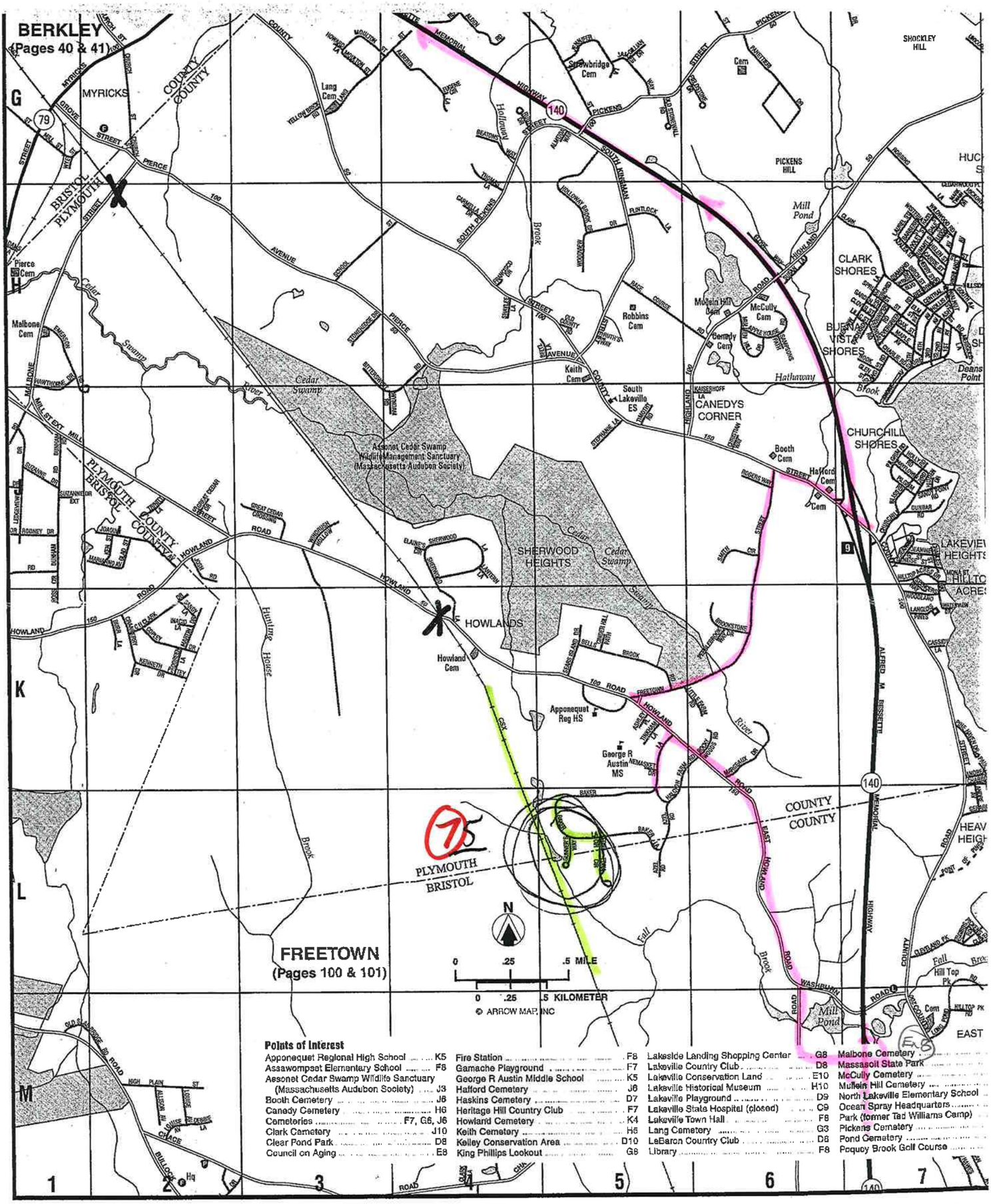
Abraham Av ... D17
Adams Av ... A6
Alfred M Bessette Memorial Hwy ... F15
Billy's Island Rd ... D15
Billy's La ... F10
Braley Rd ... G13
Bryant Neck Rd ... D2
Bryant St ... A7
Buddy's Crossing ... F11
Buena Vista Av ... C3
Bullock Rd ... E9-H11
Burns La ... F11
Burr La ... C9
C H Clark Dr ... C9
Cain La ... C5
California Av ... C3
Capt Harris Dr ... C2
Carpenters La ... G11
Causeway Rd ... C3
Cedar Swamp Rd ... F7
Central Av ... C3
Chace Rd ... E9-E12
Chapin Dr ... B4
Charbonneau Av ... C14
Chester Av ... B6
Chipaway La ... H12
Chipaway Rd ... G11-G13
Christy La ... C5
Clark La ... E11
Clermont Way ... F15
Deer Ridge Rd ... F16
Denise Av ... D15
Doctor Braley Rd ... F15
Doreen La ... C9
Driftwood Rd ... D3
Dunham Rd ... B8
East Chipaway Rd ... H13
East Hill Rd ... D3
East Hill Rd South ... D3
East Howland Rd ... D13
East Public St ... C3
Edna Cir ... D12
Edward G Pina La ... F13
Elizabeth Dr ... C3
Elm Av ... C15
Elm St ... C5
Elm Tree Dr ... C5
Eric Rd ... B8
Estelle Av ... C14
Evans St ... C4
Flag Swamp Rd ... J10
Forge Rd ... B6-C6
Friend St ... A3
Garden Path ... E15
Geneva St ... A6
Gerard Av ... D14
Gibbs Rd ... D14
Glad St ... B9
Glen St ... C3
Howland Rd ... B6-C8
Huron Av ... D15
Ida Way ... C3
Inacio La ... C9
Island Rd Ext ... D15
Ivory Way ... E17
Jackie La ... G12
Jacob's Mountain Rd ... C7
James Av ... F15
Jedi Way ... F16
Jeffrey La ... C4
Jessica La ... B7
Jethoe Dr ... B8
Jillian Dr ... B6
Joaquin Av ... B9
Jordon La ... F11
Kaitlyn Dr ... E15
Keene Rd ... F16
Kelly Dr ... H11
Ken St ... B9
Kenneth Pettey Dr ... C9
Kevin Dr ... B6
King Philip Way ... F10
Koss Av ... F14
Lafayette Pk ... D18
Lakeview La ... D15
Langlois Dr ... J10
Lark La ... C3
Ledge Rd ... F4
Ledgeview Dr ... B8
Leonard Av ... A6
Leonard Av Ext ... A8
Mountain Av ... D16
Narrows Rd ... D3
Negus Way ... D16
Nelson La ... C5
Nestles La ... F16
Nevada Av ... C3
North Hillside St ... C3
North Main St ... A4-B5
Nottingham Way ... C5
Oaklawn Rd ... D3
Old Elm Rd ... C6
Old Howland Rd ... C7
Old Slab Bridge Rd ... E8
Olivia La ... E16
Orchard St ... D3
Otta Way ... G10
Palmer Ct ... E16
Parker Dr ... E12
Parker Ter ... E12
Paul Av ... D15
Pawhee Av ... D15
Payne Rd ... D5
Pickens Av ... D14
Pierce Way ... G10
Pierce Way East ... G10
Pierce Way East Ext ... F10
Ross Cir ... C8
Rounsevell Dr ... E16
Saltus Way ... H11
Sammy's La ... B5
Sandy La ... C9
Sassamon Dr ... C7
School St ... C5
Seth Chace La ... D3
Shannon La ... B6
Short St ... C4
Simmons St ... B5
Simpson La ... C5
Slab Bridge Rd ... C6-D8
South Hillside St ... C3
South Main St ... E2-D4
Spencer Way ... D17
Spring Hill Av ... C16
State Hwy 18 ... D16-G15
State Hwy 24 ... D4-A5
State Hwy 79 ... D4-B7
State Hwy 140 ... F11
Wing Av Ext ... A6
Winslow Way ... G10
Woodlawn Rd ... D3
Wordell St ... D17

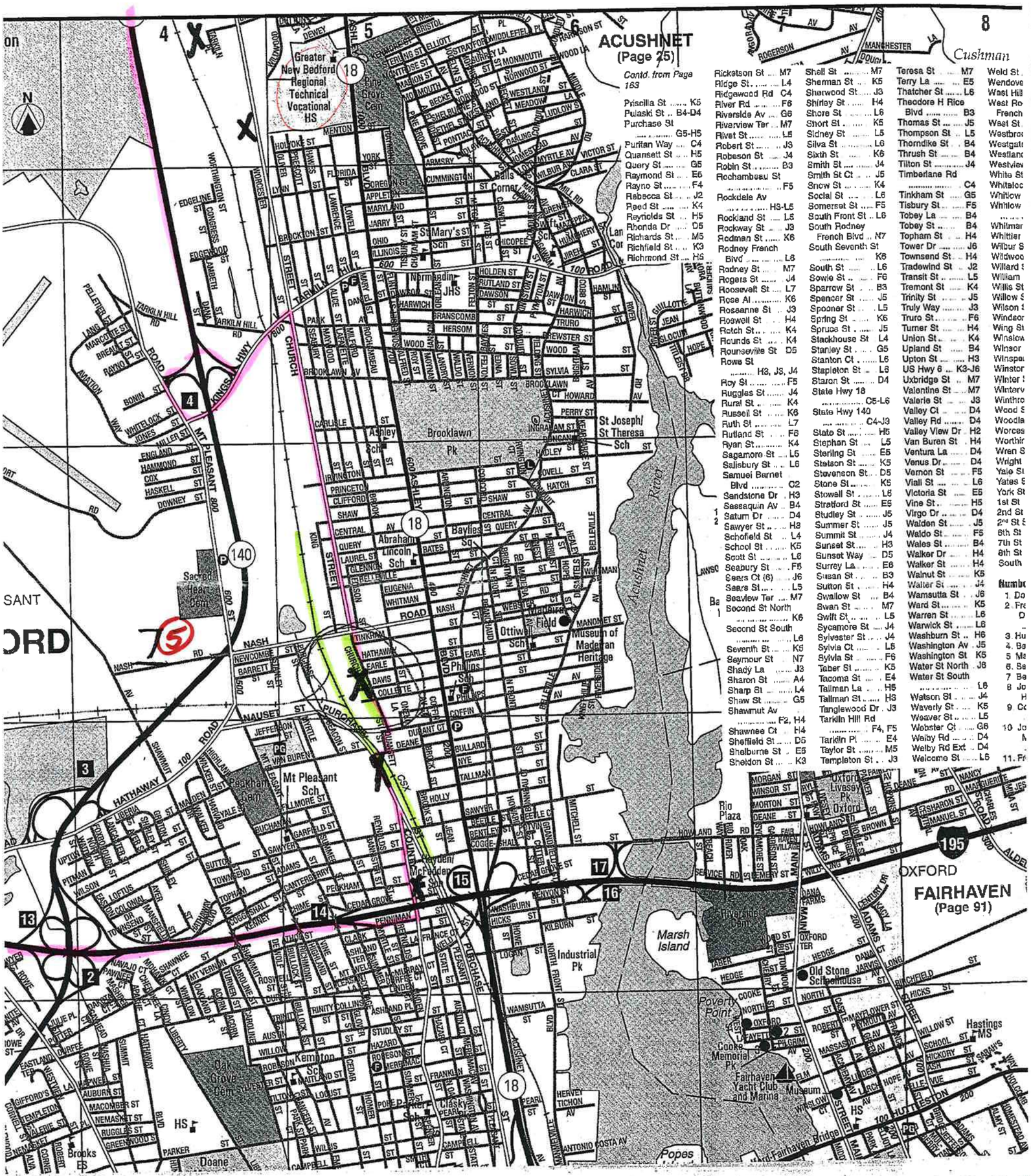
Points of Interest

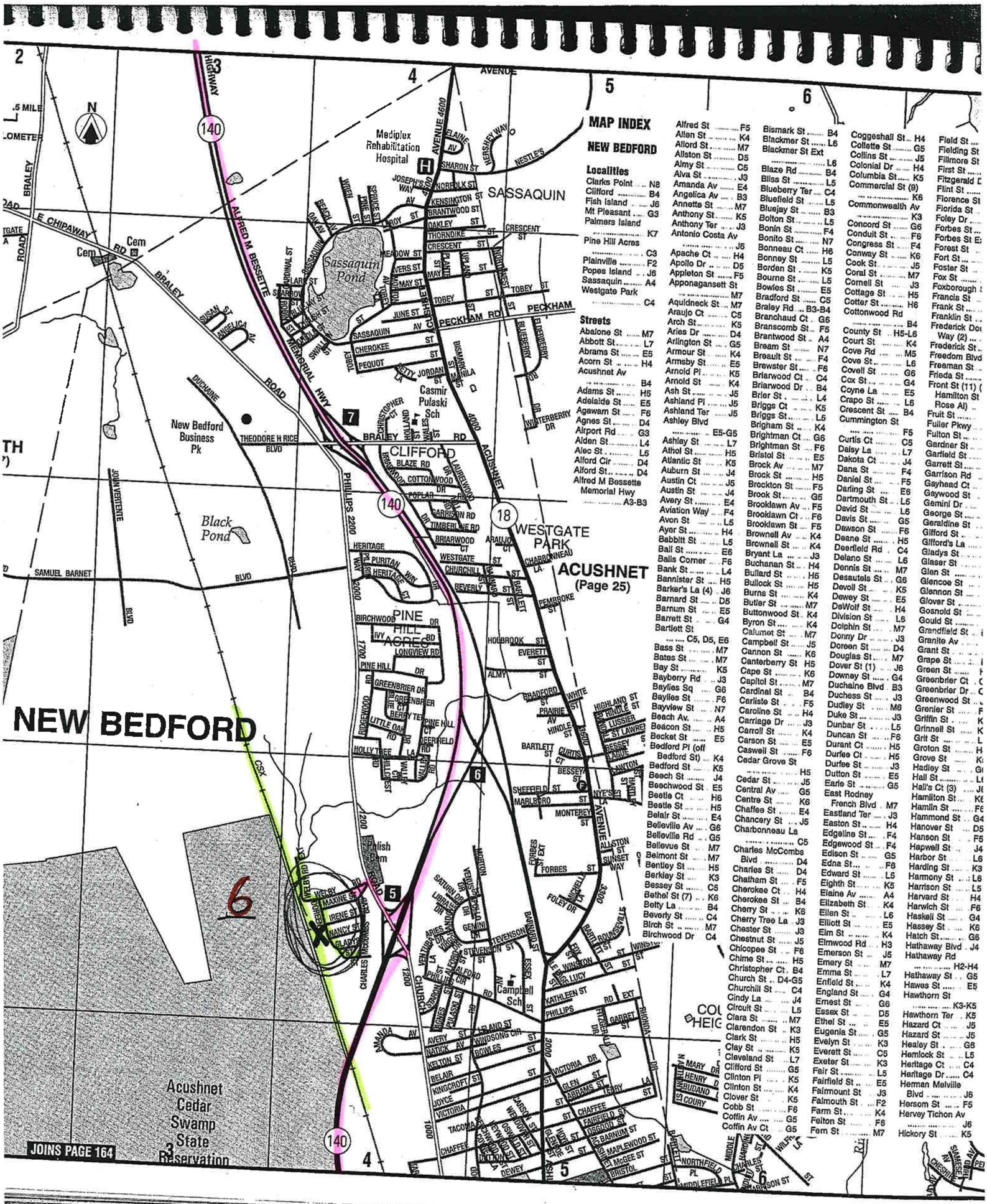
Assonet Burying Ground ... C4
Boat Ramp (State) ... D16
Braley Cemetery ... E17
Campgrounds (State Forest) ... B6, D7
Chace Cemetery ... E12
Crapo Cemetery ... H11
Crystal Spring School ... D4
Fire Stations
Assonet #1 ... C5
East Freetown #2 ... E14
Headquarters ... E9
Freetown Elementary School ... F9
Freetown-Fall River State Forest ... B6, C7, E4, E6-D7
Hathaway Park ... C5
Hilltop Park ... D14
Lawton Cemetery ... C5
Libraries

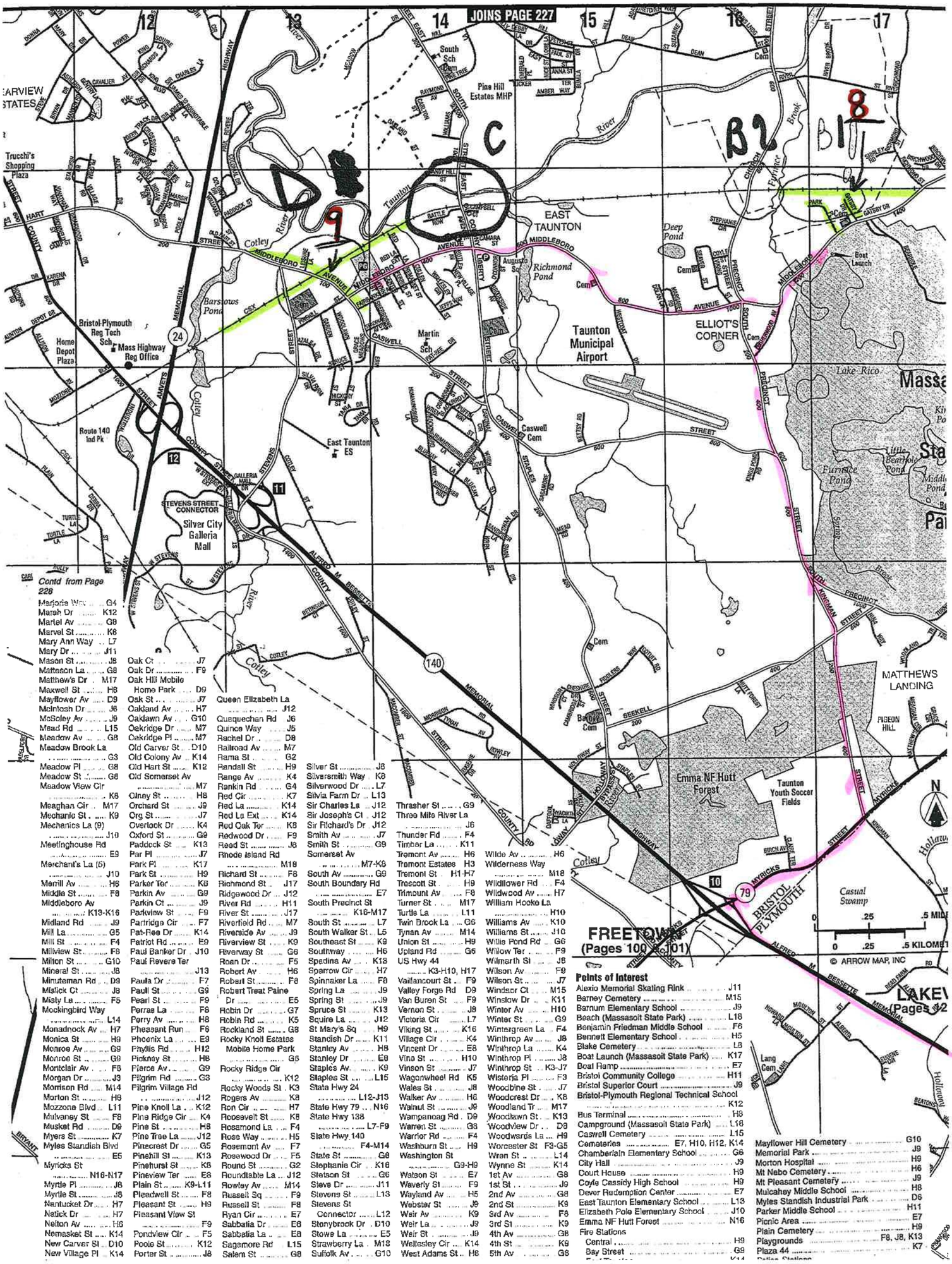


(4) Between Cory St and Brownell St


BERKLEY
(Pages 40 & 41)
FREETOWN
(Pages 100 & 101)
MYRICKS
BRISTOL
PLYMOUTH
COUNTY
Pierce Cem
Malbone Cem
Lang Cem
Shawbridge Cem
Hollowell
Cedar Swamp
Assonet Cedar Swamp Wildlife Management Sanctuary (Massachusetts Audubon Society)
SHERWOOD HEIGHTS
HOWLANDS
Howland Cem
Huttire House
Apponequet Reg HS
George R Austin MS
South Lakeville ES
Keith Cem
Robbins Cem
Mulein Hill Cem
McCully Cem
Bennett Cem
Booth Cem
Halford Cem
Cem
PICKENS HILL
SHOCKLEY HILL
CLARK SHORES
BUENA VISTA SHORES
CANEDYS CORNER
CHURCHILL SHORES
LAKEVIEW HEIGHTS
Mill Pond
Hathaway Brook
Deans Point
Cedar Swamp River
Brook
Fall Brook
Hill Top Pk
Mill Pond
EAST
HIGHWAY 140
HIGHWAY 79
HIGHWAY 9
ALFRED M. BESSETTE
PLYMOUTH BRISTOL
COUNTY COUNTY
N
0 .25 .5 MILE
0 .25 .5 KILOMETER
© ARROW MAP, INC
Points of Interest
Apponequet Regional High School K5
Assawompset Elementary School F8
Assonet Cedar Swamp Wildlife Sanctuary (Massachusetts Audubon Society) J3
Booth Cemetery J8
Canedy Cemetery H6
Cemeteries F7, G6, J6
Clark Cemetery J10
Clear Pond Park D8
Council on Aging E8
Fire Station F8
Gamache Playground F7
George R Austin Middle School K5
Hafford Cemetery J6
Haskins Cemetery D7
Heritage Hill Country Club F7
Howland Cemetery K4
Keith Cemetery H6
Kelley Conservation Area D10
King Phillips Lookout G8
Lakeside Landing Shopping Center G8
Lakeville Country Club D8
Lakeville Conservation Land E10
Lakeville Historical Museum H10
Lakeville Playground D9
Lakeville State Hospital (closed) C9
Lakeville Town Hall F8
Lang Cemetery G3
LeBaron Country Club D8
Library F8
Malbone Cemetery
Massasoit State Park
McCully Cemetery
Mullein Hill Cemetery
North Lakeville Elementary School
Ocean Spray Headquarters
Park (former Tad Williams Camp)
Pickens Cemetery
Pond Cemetery
Poquoy Brook Golf Course


ACUSHNET
(Page 75)
Contd. from Page 163
FAIRHAVEN
(Page 91)
Greater New Bedford Regional Technical Vocational HS
Fine Grove Cem
Normandin JHS
St Mary's Sch
Ashley Sch
Brooklawn Pk
St Joseph/ St Theresa Sch
Abraham Lincoln Sch
Baylies Sq
Sacred Heart Cem
Ottiwell Field
Museum of Maderan Heritage
Phillips Sch
Mt Pleasant Sch
Peakham Cem
Hayden/ McFadden Sch
Kempton Sch
Oak Grove Cem
Brooks EB
Doane
Acushnet River
Marsh Island
Industrial Pk
Poverty Point
Cooke Memorial Pk
Fairhaven Yacht Club and Marina
Old Stone Schoolhouse
Riverside Cem
Oxford Livesey Pk
Rio Plaza
Hastings MS
Popes
Cushman
Priscilla St K5
Pulaski St B4-D4
Purchase St G5-H5
Puritan Way C4
Quansett St H5
Query St G5
Raymond St E6
Rayno St F4
Rebecca St J2
Reed St K4
Reynolds St H5
Rhonda Dr D5
Richards St M5
Richfield St K3
Richmond St H5
Ricketson St M7
Ridge St L4
Ridgewood Rd C4
River Rd F6
Riverside Av G6
Riverview Ter M7
Rivet St L5
Robert St J3
Robeson St J4
Robin St B3
Rochambeau St F5
Rockdale Av H3-L5
Rockland St L5
Rockway St J3
Redman St K6
Rodney French Blvd L6
Radney St M7
Rogers St J4
Roosevelt St L7
Rose Al K6
Roseanne St J3
Roswell St H4
Rotch St K4
Rounds St K4
Rounsevville St D5
Rowe St H3, J3, J4
Roy St F5
Ruggles St J4
Rural St K4
Russell St K6
Ruth St L7
Rutland St F6
Ryan St K4
Sagamore St L5
Salisbury St L6
Samuel Barnet Blvd C2
Sandstone Dr H3
Sassaquin Av B4
Saturn Dr D4
Sawyer St H3
Schofield St L4
School St K5
Scott St L6
Seabury St F6
Sears Ct (6) J6
Sears St L5
Seaview Ter M7
Second St North K6
Second St South L6
Seventh St K5
Seymour St N7
Shady La J3
Sharon St A4
Sharp St L4
Shaw St G5
Shawmut Av F2, H4
Shawnee Ct H4
Sheffield St D5
Shelburne St E5
Sheldon St K3
Shell St M7
Sherman St K5
Sherwood St J3
Shirley St H4
Shore St L6
Short St K5
Sidney St L5
Silva St L6
Sixth St K6
Smith St J4
Smith St Ct J5
Snow St K4
Social St L6
Somerset St F5
South Front St L6
South Rodney French Blvd N7
South Seventh St K6
South St L6
Sowle St F6
Sparrow St B3
Spencer St J5
Spooner St L5
Spring St K6
Spruce St J5
Stackhouse St L4
Stanley St G5
Stanton Ct L6
Stapleton St L8
Staron St D4
State Hwy 18 C5-L6
State Hwy 140 C4-J3
State St H5
Stephan St L5
Sterling St E5
Stetson St K5
Stevenson St D5
Stone St K5
Stowell St L8
Stratford St E5
Studley St J5
Summer St J5
Summit St J4
Sunset St H3
Sunset Way D5
Surrey La E8
Susan St B3
Sutton St H4
Swallow St B4
Swan St M7
Swift St L5
Sycamore St J4
Sylvester St J4
Sylvia Ct L5
Sylvia St F6
Taber St K5
Tacoma St E4
Tallman La H5
Tallman St H3
Tanglewood Dr J3
Tarklin Hill Rd F4, F5
Tarklin Pl E4
Taylor St M5
Templeton St J3
Teresa St M7
Terry La E5
Thatcher St L6
Theodore H Rice Blvd B3
Thomas St J5
Thompson St L5
Thorndike St B4
Thrush St B4
Tilton St J4
Timberlane Rd C4
Tinkham St G5
Tisbury St F5
Tobey La B4
Tobey St B4
Topham St H4
Tower Dr J6
Townsend St H4
Tradewind St J2
Transit St L5
Tremont St K4
Trinity St J5
Truly Way J3
Truro St F6
Turner St H4
Union St K4
Upland St B4
Upton St H3
US Hwy 6 K3-J6
Uxbridge St M7
Valentine St M7
Valerie St J3
Valley Ct D4
Valley Rd D4
Valley View Dr H2
Van Buren St H4
Ventura La D4
Venus Dr D4
Vernon St F5
Viall St L6
Victoria St E5
Vine St H5
Virgo Dr D4
Walden St J5
Waldo St F5
Wales St B4
Walker Dr H4
Walker St H4
Walnut St K5
Walter St J4
Wamsutta St J6
Ward St K5
Warren St L6
Warwick St L8
Washburn St H6
Washington Av J5
Washington St K5
Water St North J6
Water St South L6
Watson St J4
Waverly St K5
Weaver St L5
Webster Ct G6
Welby Rd D4
Welby Rd Ext D4
Welcome St L5
Weld St
Wendove
West Hill
West Ro
French
West St
Westbro
Westgate
Westlanc
Westview
White St
Whitelec
Whitlow
Whitlow
Whitmar
Whittier
Wilbur S
Wildwoo
Willard S
William
Willis St
Willow S
Wilson S
Windeor
Wing St
Winslow
Winsor
Winspea
Winstor
Winter S
Wintery
Winthro
Wood S
Woodla
Worces
Worthir
Wren S
Wright
Yale St
Yates S
York St
1st St
2nd St
2nd St E
8th St
7th St
8th St
South
1. Do
2. Fre
D
3. Hu
4. Ba
5. Ma
6. Ba
7. Ba
8. Jo
H
9. Co
10. Jo
N
11. Fa
Rogerson Av
Manchester La
Bridge
Fairhaven Bridge
Oxford
Fairhaven
Nash Rd
Mt Pleasant
Church
Kings Hwy
Hathaway
Shawmut
Purchase
Union
Main
Pleasant
Bellville
Middle
Hamlin
Dawson
Harwich
Brownell
Hillman
Brookside
Hathaway
Earle
Davis
Collette
Whitman
Nash
Webster
Tinkham
Coffin
Durant Ct
Deane
Bullard
Nye
Tallman
Sawyer
Beetle
Bent
Cogges Hall
Cedar Grove
Penniman
Clark
Shuland
Richmond
Howe
Mt Vernon
Carolina
Rosweir
Durfee
Bullock
Trinity
Collins
Austin
Ashland
Studley
Hazard
Robeson
Merrimac
Cedar
Franklin
Summer
Maxfield
Weber
Pope
Parker
Loudon
Tilton
Hoosac
Pearl
Campbell
Willis
Parker
Auburn
Macomber
Nemasket
Ruggles
Greenwood
Templeton
Gifford
Valerie
Robert
Corne
Maya
Eastland
Westview
Dawnell
Dawnell Ter
Dawnell Cir
Dawnell Ln
Dawnell Pl
Dawnell Ct
Dawnell Rd
Dawnell Dr
Dawnell Ave
Dawnell St
Dawnell Blvd
Dawnell Way
Dawnell Park
Dawnell Square
Dawnell Circle
Dawnell Terrace
Dawnell Lane
Dawnell Place
Dawnell Court
Dawnell Road
Dawnell Drive
Dawnell Avenue
Dawnell Street
Dawnell Boulevard
Dawnell Parkway


NEW BEDFORD
ACUSHNET
(Page 25)
SASSAQUIN
CLIFFORD
WESTGATE PARK
PINE HILL ACRES
Sassaquin Pond
Black Pond
Mediplex Rehabilitation Hospital
New Bedford Business Pk
Casmir Pulaski Sch
Campbell Sch
Acushnet Cedar Swamp State Reservation
JOINS PAGE 164
ALFRED M BESSETTE MEMORIAL HWY
PHILLIPS 2200
ACUSHNET 4000
AVENUE 4600
PECKHAM RD
BRALEY RD
E CHIPAWAY RD
SAMUEL BARNET BLVD
THEODORE H RICE BLVD
PINE HILL DR
LONGVIEW RD
CHURCH 1200
PLEASANT 3000
COUCH HEIGHTS
MAP INDEX
NEW BEDFORD
Localities
Clarks Point N8
Clifford B4
Fish Island J6
Mt Pleasant G3
Palmers Island K7
Pine Hill Acres C3
Plainville F2
Popes Island J6
Sassaquin A4
Westgate Park C4
Streets
Abalone St M7
Abbott St L7
Abrams St E5
Acorn St H4
Acushnet Av B4
Adams St H5
Adelaide St E5
Agawam St F6
Agnes St D4
Airport Rd G3
Alden St L4
Alec St L5
Alford Cir D4
Alford St D4
Alfred M Bessette Memorial Hwy A3-B3
Alfred St F5
Allen St K4
Allord St M7
Allston St D5
Almy St C5
Alva St J3
Amanda Av E4
Angelica Av B3
Annette St M7
Anthony St K5
Anthony Ter J3
Antonio Costa Av J6
Apache Ct H4
Apollo Dr D5
Appleton St F5
Apponagansett St M7
Aquidneck St M7
Araujo Ct C5
Arch St K5
Aries Dr D4
Arlington St G5
Armour St K4
Armsby St E5
Arnold Pl K5
Arnold St K4
Ash St J5
Ashland Pl J5
Ashland Ter J5
Ashley Blvd E5-G5
Ashley St L7
Athol St H5
Atlantic St K5
Auburn St J4
Austin Ct J5
Austin St J4
Avery St E4
Aviation Way F4
Avon St L5
Ayer St H4
Babbitt St L5
Bail St E6
Balls Corner F6
Bank St L4
Bannister St H5
Barker's La (4) J6
Barnard St D5
Barnum St E5
Barrett St G4
Bartlett St C5, D5, E6
Bass St M7
Bates St M7
Bay St K5
Bayberry Rd J3
Baylies Sq G6
Baylies St F6
Bayview St N7
Beach Av. A4
Beacon St H5
Becket St E5
Bedford Pl (off Bedford St) K4
Bedford St K5
Beech St J4
Beechwood St E5
Beetle Ct H6
Beetle St H5
Belair St E4
Belleville Av G6
Belleville Rd G5
Bellevue St M7
Belmont St M7
Bentley St H5
Berkley St K3
Bessey St C5
Bethel St (7) K6
Betty La B4
Beverly St C4
Birch St M7
Birchwood Dr C4
Bismark St B4
Blackmer St L6
Blackmer St Ext L6
Blaze Rd B4
Bliss St L5
Blueberry Ter C4
Bluefield St L5
Bluejay St B3
Bolton St L5
Bonin St F4
Bonito St N7
Bonneau Ct H6
Bonney St L5
Borden St K5
Bourne St L5
Bowles St E5
Bradford St C5
Braley Rd B3-B4
Branchaud Ct G6
Branscomb St F5
Brantwood St A4
Bream St N7
Breault St F4
Brewster St F6
Briarwood Ct C4
Briarwood Dr B4
Brier St L4
Briggs Ct K5
Briggs St L5
Brigham St K4
Brightman Ct G6
Brightman St F6
Bristol St E5
Brock Av M7
Brock St H5
Brockton St F5
Brook St G5
Brooklawn Av F5
Brooklawn Ct F6
Brooklawn St F5
Brownell Av K4
Brownell St K4
Bryant La J3
Buchanan St H4
Bullard St H5
Bullock St H5
Burns St K4
Butler St M7
Buttonwood St K4
Byron St K4
Calumet St M7
Campbell St J5
Cannon St K6
Canterberry St H5
Cape St K6
Capitol St M7
Cardinal St B4
Carlisle St F5
Caroline St H4
Carriage Dr J3
Carroll St K4
Carson St E5
Caswell St F6
Cedar Grove St H5
Cedar St J5
Central Av G5
Centre St K6
Chaffee St E4
Chancery St J5
Charbonneau La C5
Charles McCombs Blvd D4
Charles St D4
Chatham St F5
Cherokee Ct H4
Cherokee St B4
Cherry St K6
Cherry Tree La J3
Chester St J3
Chestnut St J5
Chicopee St F6
Chime St H5
Christopher Ct B4
Church St D4-G5
Churchill St C4
Cindy La J4
Circuit St L5
Clara St M7
Clarendon St K3
Clark St H5
Clay St K5
Cleveland St L7
Clifford St G5
Clinton Pl K5
Clinton St K4
Clover St K5
Cobb St F6
Coffin Av G5
Coffin Av Ct G5
Coggeshall St H4
Collette St G5
Collins St J5
Colonial Dr H4
Columbia St K5
Commercial St (9) K6
Commonwealth Av K3
Concord St G6
Conduit St F6
Congress St F4
Conway St K6
Cook St J5
Coral St M7
Cornell St J3
Cottage St H5
Cotter St H6
Cottonwood Rd B4
County St H5-L6
Court St K4
Cove Rd M5
Cove St L6
Covell St G6
Cox St G4
Coyne La E5
Crapo St L6
Crescent St B4
Cummington St F5
Curtis Ct C5
Daisy La L7
Dakota Ct J4
Dana St F4
Daniel St F5
Darling St E6
Dartmouth St L5
David St L6
Davis St G5
Dawson St F6
Deane St H5
Deerfield Rd C4
Delano St L6
Dennis St M7
Desautels St G6
Devoll St K5
Dewey St E5
DeWolf St H4
Division St L6
Dolphin St M7
Donny Dr J3
Doreen St D4
Douglas St M7
Dover St (1) J6
Downey St G4
Duchaine Blvd B3
Duchess St J3
Dudley St M6
Duke St J3
Dunbar St L5
Duncan St F6
Durant Ct H5
Durfee Ct H5
Durfee St J3
Dutton St E5
Earle St G5
East Rodney French Blvd M7
Eastland Ter J3
Easton St H4
Edgelino St F4
Edgewood St F4
Edison St G5
Edna St F6
Edward St L5
Eighth St K5
Elaine Av A4
Elizabeth St K4
Ellen St L6
Elliott St E5
Elm St K4
Elmwood Rd H3
Emerson St J5
Emery St M7
Emma St L7
Enfield St K4
England St G4
Ernest St G6
Essex St D5
Ethel St E5
Eugenia St G5
Evelyn St K3
Everett St C5
Exeter St K3
Fair St L5
Fairfield St E5
Fairmount St J3
Falmouth St F2
Farm St K4
Felton St F6
Fern St M7
Field St
Fielding St
Fillmore St
First St
Fitzgerald D
Flint St
Florence St
Florida St
Foley Dr
Forbes St
Forbes St E
Forest St
Fort St
Foster St
Fox St
Foxborough
Francis St
Frank St
Franklin St
Frederick Dou Way (2)
Frederick St
Freedom Blvd
Freeman St
Frieda St
Front St (11) (Hamilton St Rose Al)
Fruit St
Fuller Pkwy
Fulton St
Gardner St
Garfield St
Garrett St
Garrison Rd
Gayhead Ct
Gaywood St
Gemini Dr
George St
Geraldine St
Gifford St
Gifford's La
Gladys St
Glaser St
Glen St
Glencoe St
Glennon St
Glover St
Gosnold St
Gould St
Grandfield St
Granite Av
Grant St
Grape St
Green St
Greenbrier Ct
Greenbrier Dr
Greenwood St
Grenier St
Griffin St
Grinnell St
Grit St
Groton St
Grove St
Hadley St
Hall St
Hall's Ct (3)
Hamilton St
Hamlin St
Hammond St
Hanover St
Hanson St
Hapwell St
Harbor St
Harding St
Harmony St
Harrison St
Harvard St
Harwich St
Haskell St
Hassey St
Hatch St
Hathaway Blvd
Hathaway Rd H2-H4
Hathaway St
Hawes St
Hawthorn St K3-K5
Hawthorn Ter
Hazard Ct
Hazard St
Healey St
Hemlock St
Heritage Ct
Heritage Dr
Herman Melville Blvd
Hersom St
Hervey Tichon Av J6
Hickory St



Contd from Page 228

Marjorie Way ... G4
Marsh Dr ... K12
Martel Av ... G8
Marvel St ... K8
Mary Ann Way ... L7
Mary Dr ... J11
Mason St ... J8
Matteson La ... G8
Matthew's Dr ... M17
Maxwell St ... H8
Mayflower Av ... D9
McIntosh Dr ... J6
McSoley Av ... J9
Mead Rd ... L15
Meadow Av ... G8
Meadow Brook La ... G3
Meadow Pl ... G8
Meadow St ... G8
Meadow View Cir ... K8
Meaghan Cir ... M17
Mechanic St ... K9
Mechanics La (9) ... J10
Meetinghouse Rd ... E9
Merchant's La (5) ... J10
Merrill Av ... H8
Middle St ... F8
Middleboro Av ... K13-K16
Midland Rd ... J9
Mill La ... G5
Mill St ... F4
Millview St ... F8
Milton St ... G10
Mineral St ... J8
Minuteman Rd ... D9
Mistick Ct ... J8
Misty La ... F5
Mockingbird Way ... L14
Monadnock Av ... H7
Monica St ... H9
Monroe Av ... G9
Monroe St ... G9
Montclair Av ... F5
Morgan Dr ... J3
Morrison Rd ... M14
Morton St ... H9
Mozzone Blvd ... L11
Mulvaney St ... F8
Musket Rd ... D9
Myers St ... K7
Myles Standish Blvd ... E5
Myricks St ... N16-N17
Myrtle Pl ... J8
Myrtle St ... J8
Nantucket Dr ... H7
Natick Dr ... H7
Nelton Av ... H6
Nemasket St ... K14
New Carver St ... D10
New Village Pl ... K14
Oak Ct ... J7
Oak Dr ... F9
Oak Hill Mobile Home Park ... D9
Oak St ... J7
Oakland Av ... H7
Oaklawn Av ... G10
Oakridge Dr ... M7
Oakridge Pl ... M7
Old Carver St ... D10
Old Colony Av ... K14
Old Hart St ... K12
Old Somerset Av ... M7
Olney St ... H8
Orchard St ... J9
Org St ... J7
Overlook Dr ... K4
Oxford St ... G9
Paddock St ... K13
Par Pl ... J7
Park Pl ... K17
Park St ... H9
Parker Ter ... K8
Parkin Av ... G9
Parkin Ct ... J9
Parkview St ... F9
Partridge Cir ... F7
Pat-Ree Dr ... K14
Patriot Rd ... E9
Paul Banker Dr ... J10
Paul Revere Ter ... J13
Paula Dr ... F7
Paull St ... G9
Pearl St ... F9
Perras La ... F8
Perry Av ... H8
Pheasant Run ... F6
Phoenix La ... E9
Phyllis Rd ... H12
Pickney St ... H8
Pierce Av ... G9
Pilgrim Rd ... G3
Pilgrim Village Rd ... J12
Pine Knoll La ... K12
Pine Ridge Cir ... K4
Pine St ... H8
Pine Tree La ... J12
Pinecrest Dr ... G5
Pinehill St ... K13
Pinehurst St ... K8
Pineview Ter ... E8
Plain St ... K9-L11
Pleadwell St ... F8
Pleasant St ... H9
Pleasant View St ... F9
Pondview Cir ... F5
Poole St ... K12
Porter St ... J8
Queen Elizabeth La ... J12
Quequechan Rd ... J6
Quince Way ... J5
Rachel Dr ... D8
Railroad Av ... M7
Rama St ... G2
Randall St ... H9
Range Av ... K4
Rankin Rd ... G4
Red Cir ... K7
Red La ... K14
Red La Ext ... K14
Red Oak Ter ... K8
Redwood Dr ... F9
Reed St ... J8
Rhode Island Rd ... M18
Richard St ... F8
Richmond St ... J17
Ridgewood Dr ... J12
River Rd ... H11
River St ... J17
Riverfield Rd ... M7
Riverside Av ... J9
Riverview St ... K9
Riverway St ... G6
Roan Dr ... F5
Robert Av ... H6
Robert St ... F8
Robert Treat Paine Dr ... E5
Robin Dr ... G7
Robin Rd ... K5
Rockland St ... G8
Rocky Knoll Estates Mobile Home Park ... G5
Rocky Ridge Cir ... K12
Rocky Woods St ... K3
Rogers Av ... K8
Ron Cir ... H7
Roosevelt St ... K8
Rosamond La ... F4
Rose Way ... H5
Rosemont Av ... F7
Rosewood Dr ... F5
Round St ... G2
Roundtable La ... J12
Rowley Av ... M14
Russell Sq ... F9
Russell St ... F8
Ryan Cir ... E7
Sabbatia Dr ... E8
Sabbatia La ... E8
Sagamore Rd ... L15
Salem St ... G8
Silver St ... J8
Silversmith Way ... K8
Silverwood Dr ... L7
Silvia Farm Dr ... L13
Sir Charles La ... J12
Sir Joseph's Ct ... J12
Sir Richard's Dr ... J12
Smith Av ... J7
Smith St ... G9
Somerset Av ... M7-K9
South Av ... G9
South Boundary Rd ... E7
South Precinct St ... K16-M17
South St ... L7
South Walker St ... L5
Southeast St ... K9
Southway ... H6
Spadina Av ... K18
Sparrow Cir ... H7
Spinnaker La ... F8
Spring La ... J9
Spring St ... J9
Spruce St ... K13
Squire La ... J12
St Mary's Sq ... H9
Standish Dr ... K11
Stanley Av ... H8
Stanley Dr ... E9
Staples Av ... K9
Staples St ... L15
State Hwy 24 ... L12-J13
State Hwy 79 ... N16
State Hwy 138 ... L7-F9
State Hwy 140 ... F4-M14
State St ... G8
Stephanie Cir ... K16
Stetson St ... G6
Steve Dr ... J11
Stevens St ... L13
Stevens St Connector ... L12
Stonybrook Dr ... D10
Stowe La ... E5
Strawberry La ... M18
Suffolk Av ... G10
Thrasher St ... G9
Three Mile River La ... J6
Thunder Rd ... F4
Timber La ... K11
Tremont Av ... H6
Tremont Estates ... H3
Tremont St ... H1-H7
Trescott St ... H9
Trimount Av ... F8
Turner St ... M17
Turtle La ... L11
Twin Brook La ... G6
Tynan Av ... M14
Union St ... H9
Upland Rd ... G6
US Hwy 44 ... K3-H10, H17
Vaillancourt St ... F9
Valley Forge Rd ... D9
Van Buren St ... F9
Vernon St ... J8
Victoria Cir ... L7
Viking St ... K16
Village Cir ... K4
Vincent Dr ... E8
Vine St ... H10
Vinson St ... J7
Wagonwheel Rd ... K5
Wales St ... J8
Walker Av ... H6
Walnut St ... J9
Wampanoag Rd ... D9
Warren St ... G8
Warrior Rd ... F4
Washburn St ... H9
Washington St ... G9-H9
Watson St ... E7
Waverly St ... F9
Wayland Av ... H5
Webster St ... J9
Weir Av ... K9
Weir La ... J9
Weir St ... J9
Wellesley Cir ... K14
West Adams St ... H8
Wilde Av ... H6
Wilderness Way ... M18
Wildflower Rd ... F4
Wildwood Av ... H7
William Hooke La ... H10
Williams Av ... K10
Williams St ... J10
Willis Pond Rd ... G6
Willow Ter ... F9
Wilmarth St ... J8
Wilson Av ... F9
Wilson St ... J7
Windsor Ct ... M15
Winslow Dr ... K11
Winter Av ... H10
Winter St ... G9
Wintergreen La ... F4
Winthrop Av ... J8
Winthrop La ... K4
Winthrop Pl ... J8
Winthrop St ... K3-J7
Wisteria Pl ... F3
Woodbine St ... J7
Woodcrest Dr ... K8
Woodland Tr ... M17
Woodlawn St ... K13
Woodview Dr ... D9
Woodwards La ... H9
Worcester St ... F3-G5
Wren St ... L14
Wynne St ... K14
1st Av ... G8
1st St ... J9
2nd Av ... G8
2nd St ... K9
3rd Av ... F8
3rd St ... K9
4th Av ... G8
4th St ... K9
5th Av ... G8

Points of Interest

Alexio Memorial Skating Rink ... J11
Barney Cemetery ... M15
Barnum Elementary School ... J9
Beach (Massasoit State Park) ... L18
Benjamin Friedman Middle School ... F6
Bennett Elementary School ... H5
Blake Cemetery ... L8
Boat Launch (Massasoit State Park) ... K17
Boat Ramp ... E7
Bristol Community College ... H11
Bristol Superior Court ... J9
Bristol-Plymouth Regional Technical School ... K12
Bus Terminal ... H3
Campground (Massasoit State Park) ... L18
Caswell Cemetery ... L15
Cemeteries ... E7, H10, H12, K14
Chamberlain Elementary School ... G6
City Hall ... J9
Court House ... H9
Coyle Cassidy High School ... H9
Dever Redemption Center ... E7
East Taunton Elementary School ... L13
Elizabeth Pole Elementary School ... J10
Emma NF Hutt Forest ... N16
Fire Stations
Central ... H9
Bay Street ... G9
Mayflower Hill Cemetery ... G10
Memorial Park ... J9
Morton Hospital ... H9
Mt Nebo Cemetery ... H6
Mt Pleasant Cemetery ... J9
Mulcahey Middle School ... H8
Myles Standish Industrial Park ... D8
Parker Middle School ... H11
Picnic Area ... E7
Plain Cemetery ... H9
Playgrounds ... F8, J8, K13
Plaza 44 ... K7

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Stoughton Line

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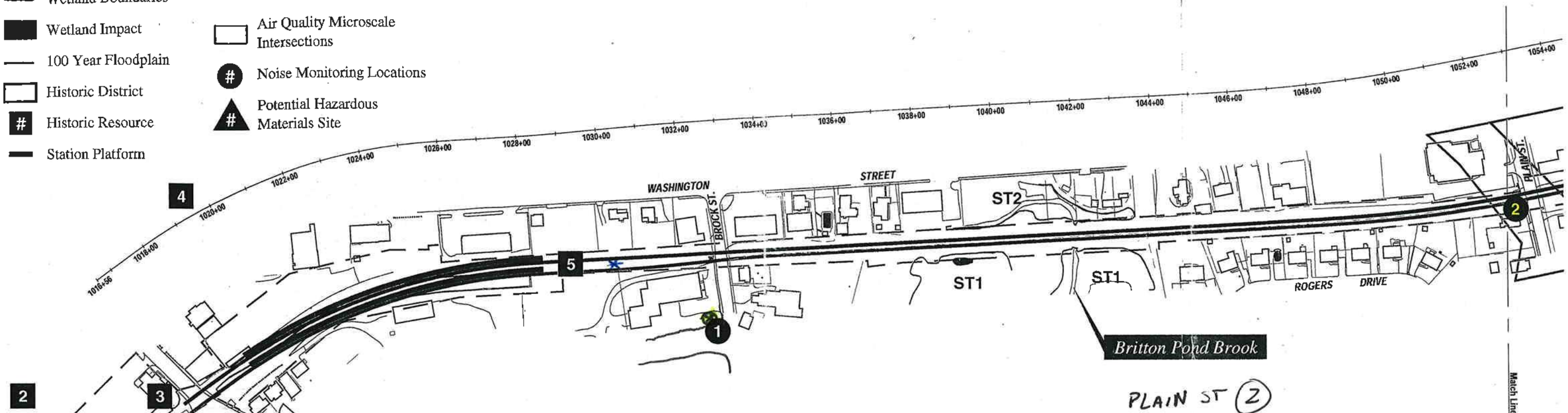
ALL DAY DATA 12/13/08
Night DATA 12/13/08 – 12/14/08

- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
- Historic District
- # Historic Resource
- Station Platform
- Rare Species Habitat and Significant Natural Communities
- Estimated Habitat of Rare Wildlife
- DEP Approved Zone II Well Head Protection Area
- Air Quality Microscale Intersections
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site



STOUGHTON

Match Line

PLAIN ST (2)

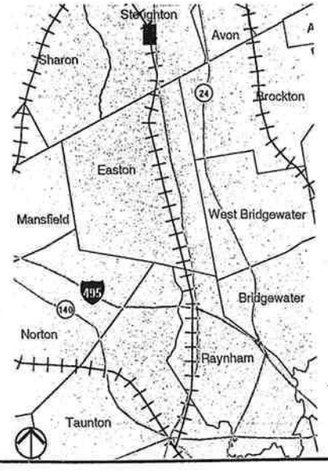
DAY #3 1015 - 1030 62.6
High V. TRUCK TRAFFIC ON PLAIN ST.

Ldn = 60.6

BROCK (1) #1

DAY #1 *9:30 - 9:45 56.7
#2 9:45 - 10:00 59.4
#22 2:45 - 2:55 AM 45.3 } 42.4
Low Memory (12-31-08)
#23 2:55 - 3:05 AM 37.6
AS CHECK

Ldn = ~~50.4~~ (57.4) /50.4



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2
Stoughton Branch
Sheet 1 of 23

#1 * TRAIN IDELING BEHIND BUILDING

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- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
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- # Historic Resource
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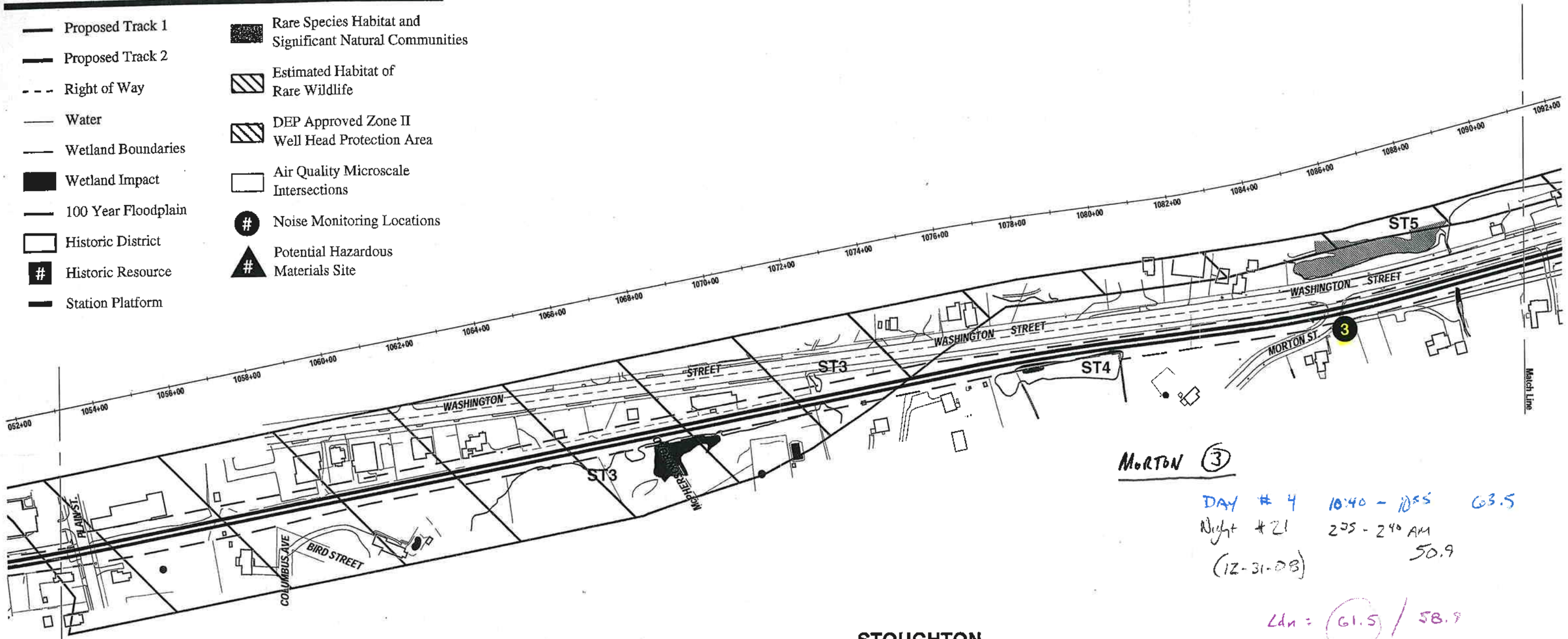
- Estimated Habitat of Rare Wildlife
- DEP Approved Zone II Well Head Protection Area
- Air Quality Microscale Intersections
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

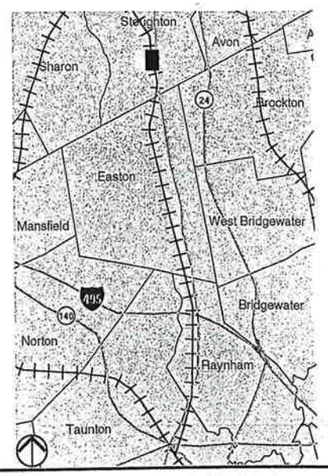


MORTON (3)

DAY # 4 10:40 - 10:55 63.5
Night #21 2:25 - 2:40 AM 50.9
(12-31-08)

Ldn = (61.5) / 58.9

STOUGHTON



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch
Sheet 2 of 23

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- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
- Historic District
- # Historic Resource
- Station Platform
- Rare Species Habitat and Significant Natural Communities
- Estimated Habitat of Rare Wildlife
- DEP Approved Zone II Well Head Protection Area
- Air Quality Microscale Intersections
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

SNEL/POND (6)

DAY #6 1130 - 1145 55.8

Night #19 150 - 205 AM 38.8
(12-31-08)

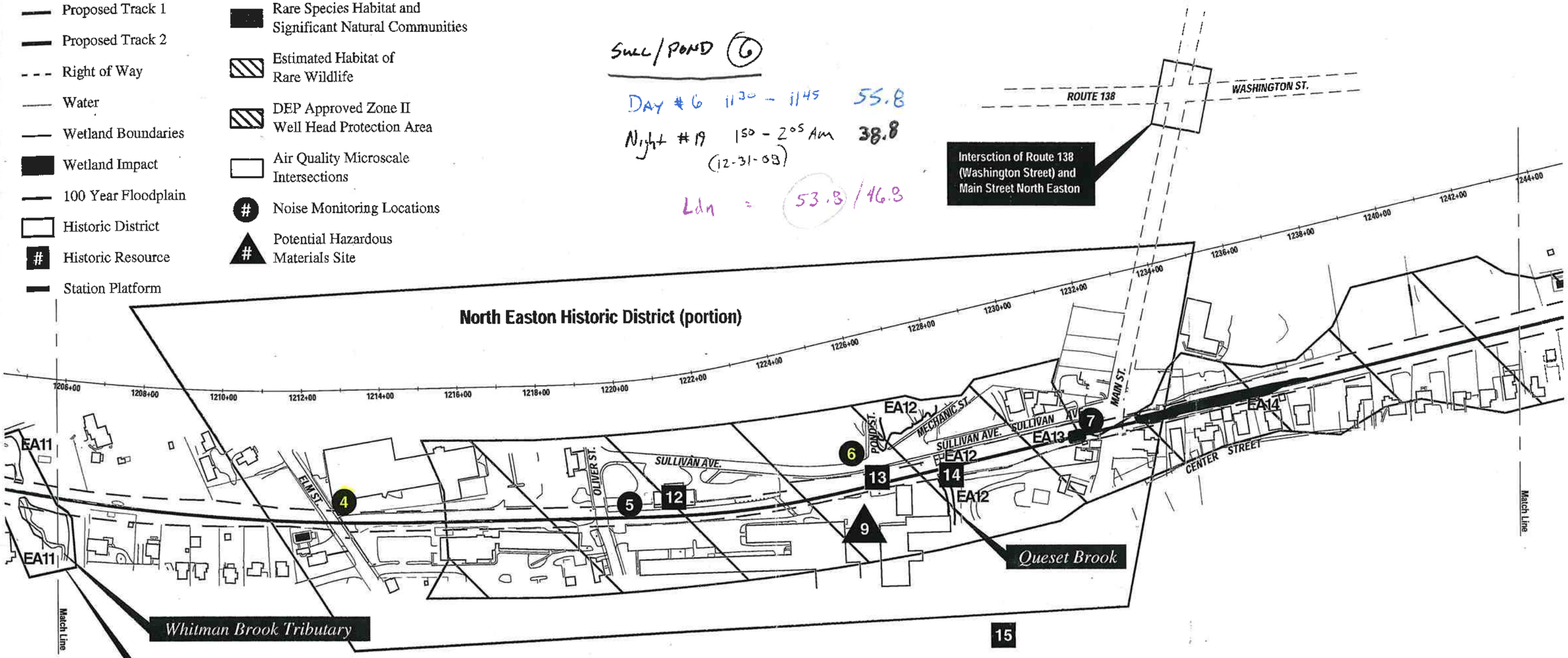
Ldn = 53.8 / 46.8

ELM (4)

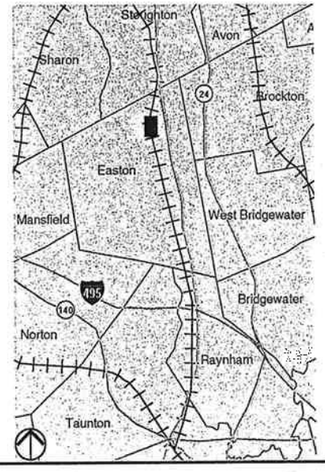
DAY #5 1105 - 1120 64.8

Night #20 210 - 225 AM 48.8
(12-31-08)

Ldn = 59.8 / 56.8



EASTON



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 6 of 23

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- Proposed Track 1
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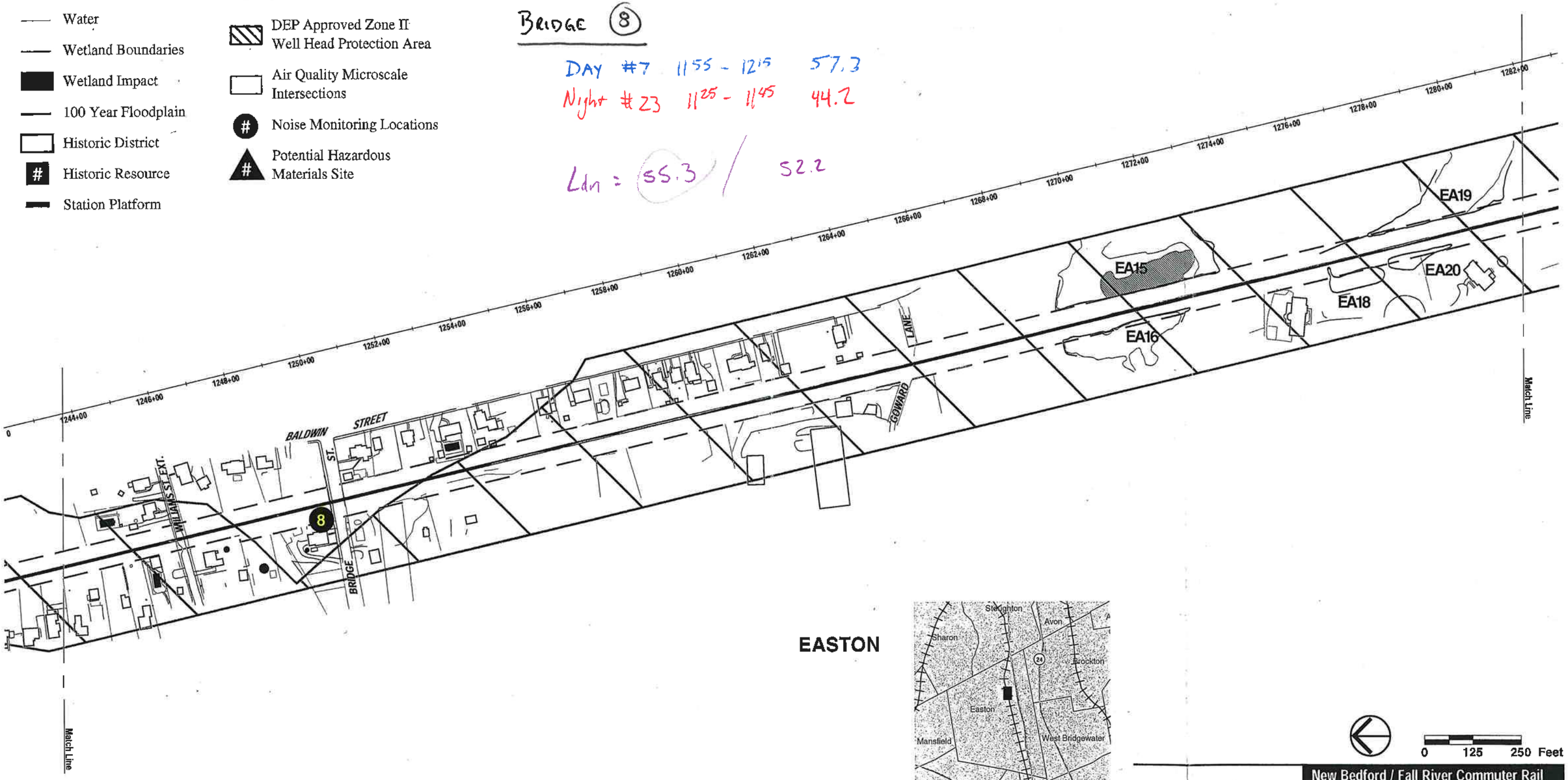
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

Bridge (8)

Day #7 11:55 - 12:15 57.3

Night #23 11:25 - 11:45 44.2

Ldn = 55.3 / 52.2



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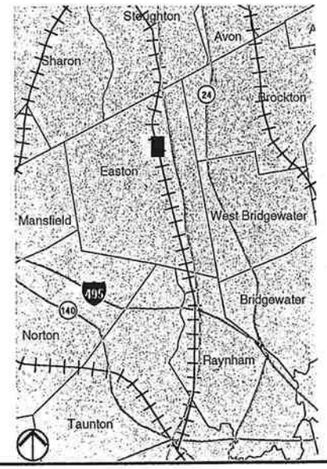

0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch
Sheet 7 of 23

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- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
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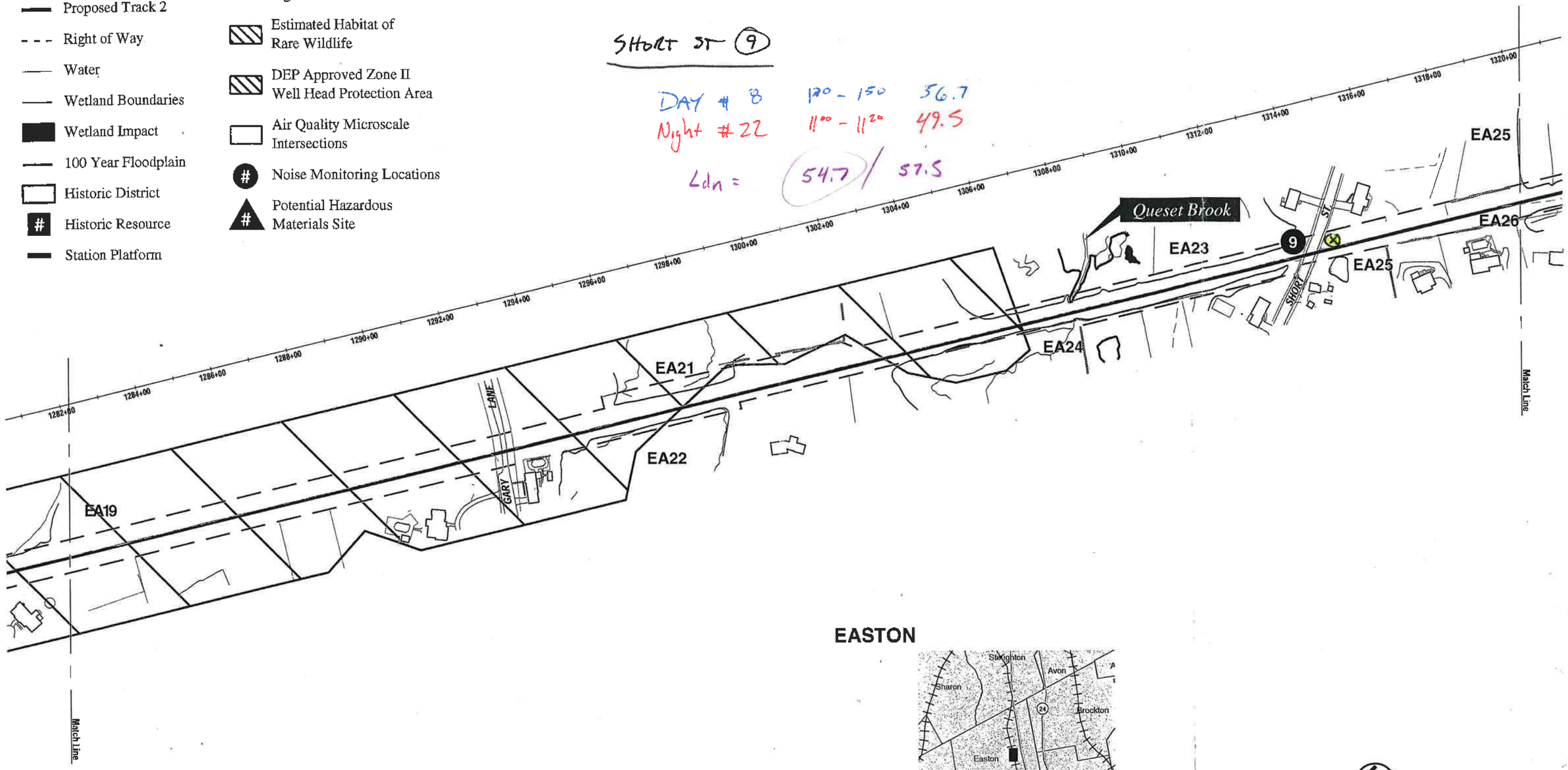
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

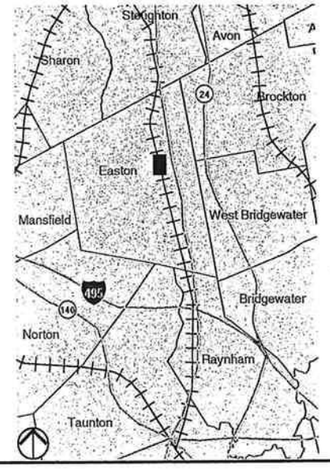
SHORT ST (9)

DAY # 8 120 - 150 56.7
Night #22 11⁰⁰ - 11²⁰ 49.5

Ldn = (54.7) / 57.5



EASTON



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 8 of 23

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- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
- Historic District
- # Historic Resource
- Station Platform

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- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

PURCHASE (11)
DAY #9 2:00 - 2:20 55.9
Night #21 10:30 - 10:50 49.7
Ldn = (53.9) / 57.7

Limit of ACEC

Match Line

1320+00 1322+00 1324+00 1326+00 1328+00 1330+00 1332+00 1334+00 1336+00 1338+00 1340+00 1342+00 1344+00 1346+00 1348+00 1350+00 1352+00 1354+00 1356+00 1358+00

EA25 EA26 EA27 EA28 EA29 EA30

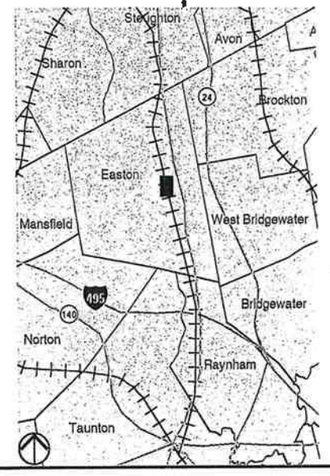
8 10 11

DEPOT ST. RTE. 123 ST. PURCHASE ~30' From PURCHASE

Hockomock Swamp

EASTON

Match Line



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2
Stoughton Branch
Sheet 9 of 23

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PROSPECT (12)

DAY # 10 235 - 255 60.9

Night # 20 1005 1025 54.8

Ldn = (58.9) / 62.8 - 57.8

Limit of ACEC

Hockomock Swamp

1358+00 1360+00 1362+00 1364+00 1366+00 1368+00 1370+00 1372+00 1374+00 1376+00 1378+00 1380+00 1382+00 1384+00 1386+00 1388+00 1390+00 1392+00 1394+00 1396+00 1398

Match Line

EA32

EA31

EA31

12

PROSPECT ST

Black Brook

Match Line

EASTON

Hockomock Swamp

- Proposed Track 1
- Proposed Track 2
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- Water
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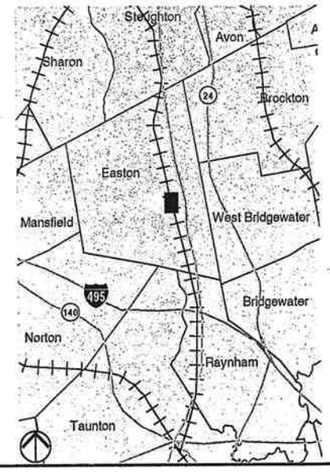
- Air Quality Microscale Intersections
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 10 of 23

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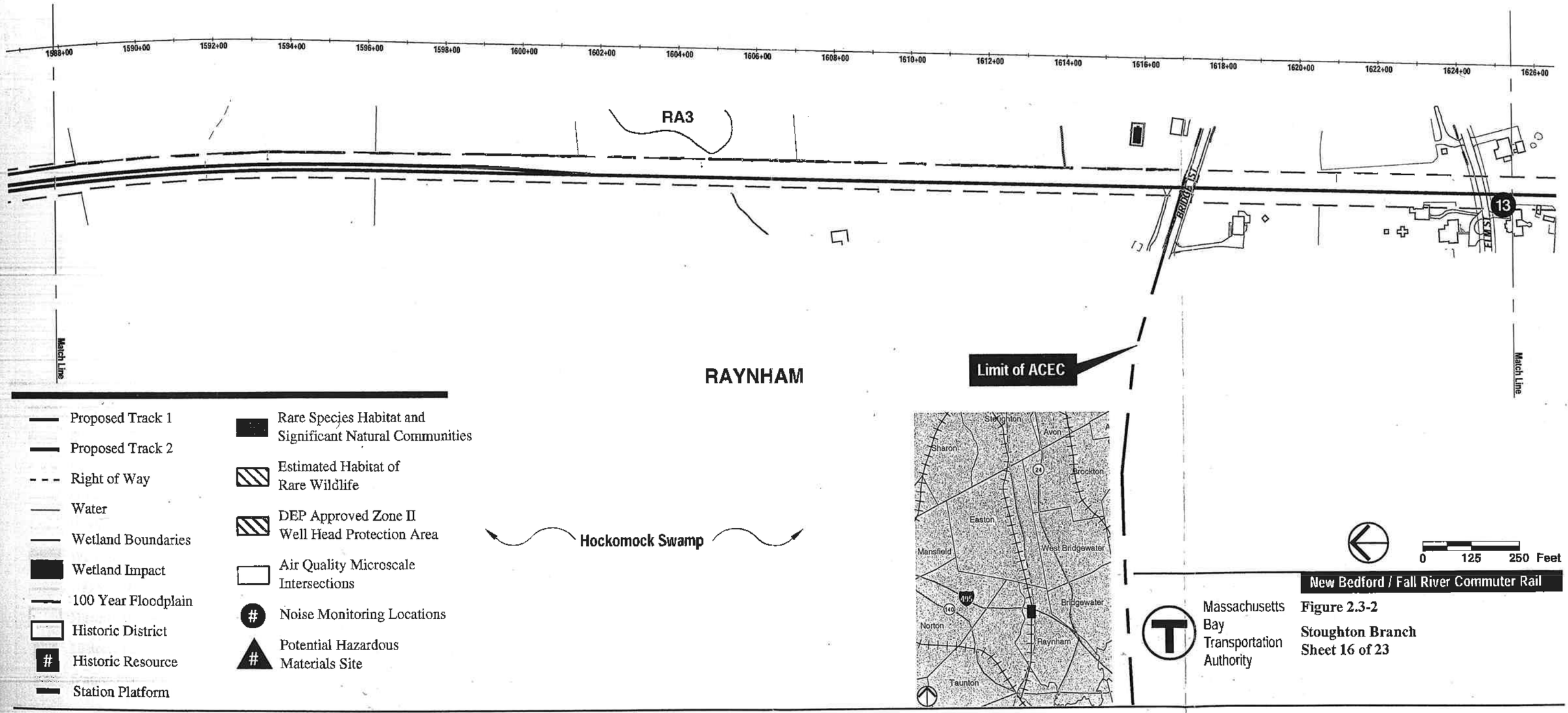

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch
Sheet 16 of 23

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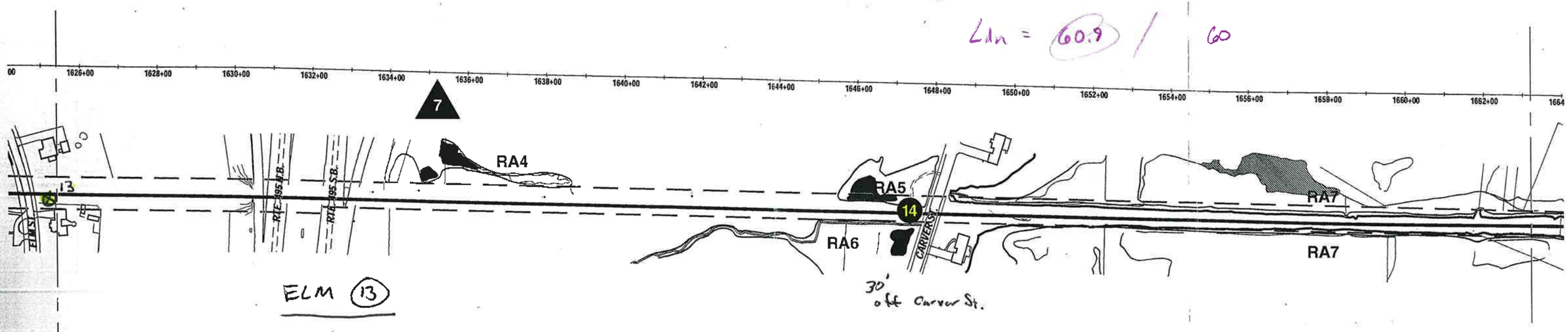
CARVER (14)

DAY #12 340 - 400 62.9
Night #18 855 - 915 57.0

Ldn = 60.9 / 60



ELM (13)

DAY #11 310 - 330 55.5
Night #19 925 - 945 52.0

Ldn = 53.5 / 55

Match Line

Match Line

RAYNHAM

- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
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- Wetland Impact
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- Air Quality Microscale Intersections
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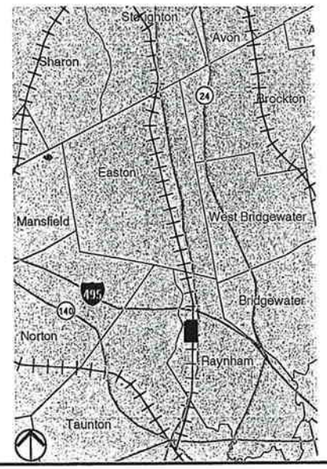

0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2
Stoughton Branch
Sheet 17 of 23

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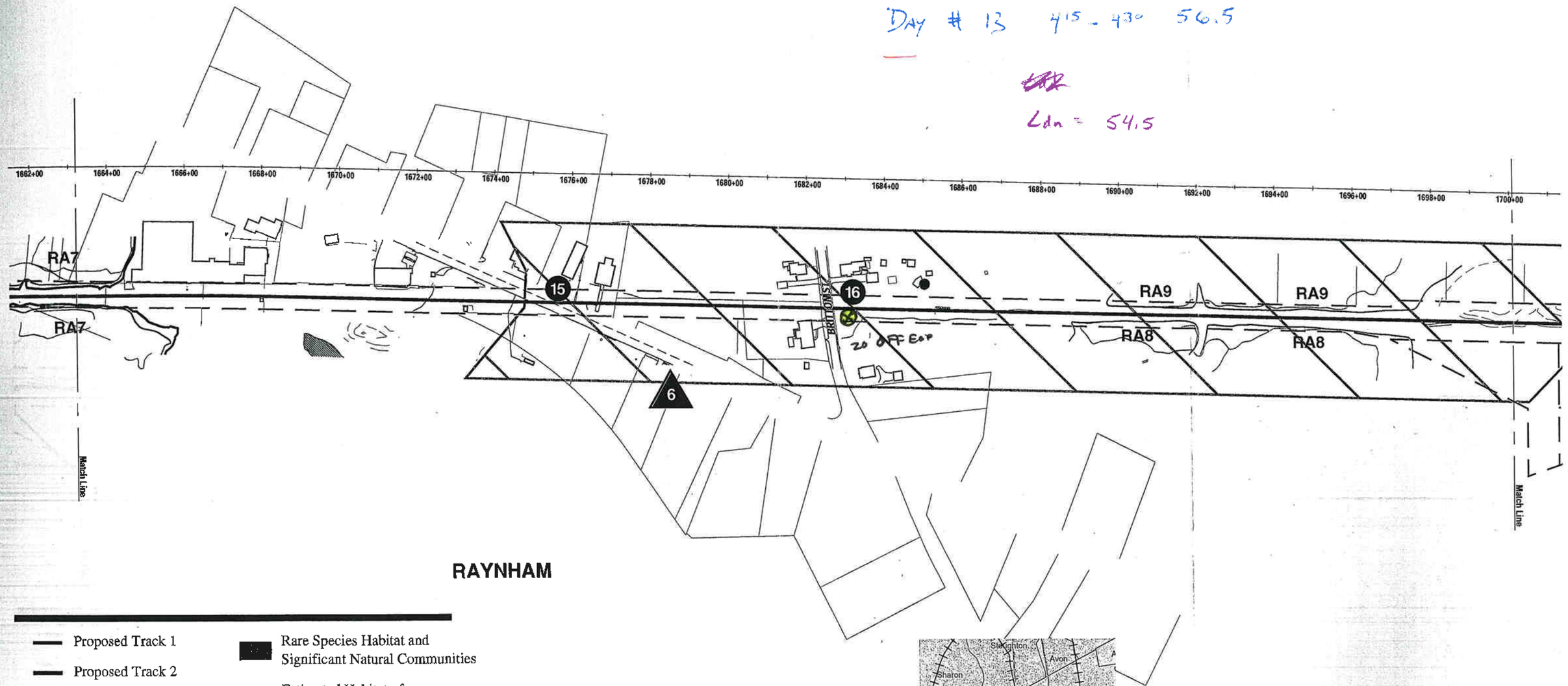
BRITTON ST (16)

DAY # 13 4:15 - 4:30 56.5

~~XXX~~

Ldn = 54.5



RAYNHAM

- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
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- Historic Resource
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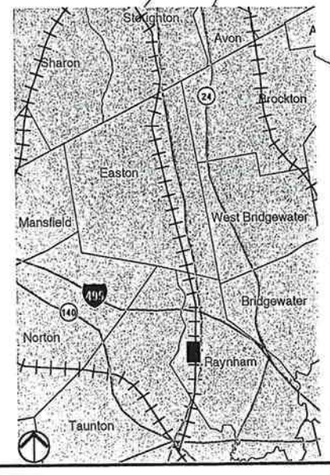

0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2
Stoughton Branch
Sheet 18 of 23

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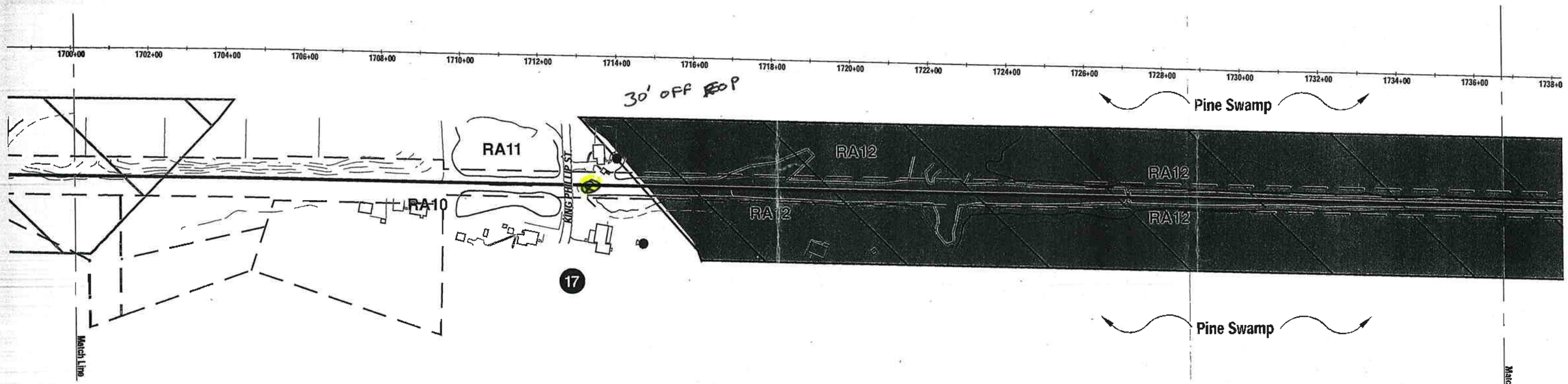
KING PHILLIP (17)

DAY # 14 5:00 - 5:15 59.3

Night # 17 8:30 - 8:50 53.4

Ldn = 57.3 / 56.4



- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
- Historic District
- # Historic Resource
- Station Platform
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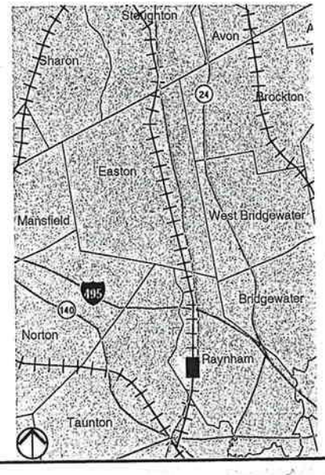
- Estimated Habitat of Rare Wildlife
- DEP Approved Zone II Well Head Protection Area
- Air Quality Microscale Intersections
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site

RAYNHAM



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 19 of 23

te\05921\graphics\figures\design\5921b21-23.p65

RAYNHAM

RA13

RA15

RA16

RA17

THRASHER ST.

Match Line

TA1

TA2

WINTER ST.

18 4

Match Line

TAUNTON

- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
- 100 Year Floodplain
- Historic District
- # Historic Resource
- Station Platform
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- Estimated Habitat of Rare Wildlife
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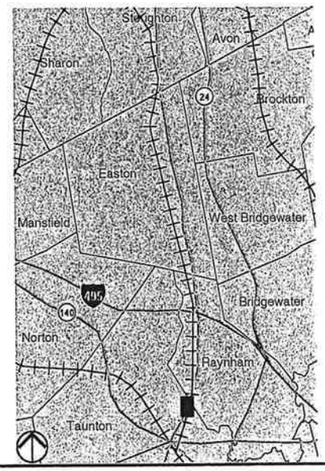
- # Noise Monitoring Locations
- # Potential Hazardous Materials Site



0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 21 of 23

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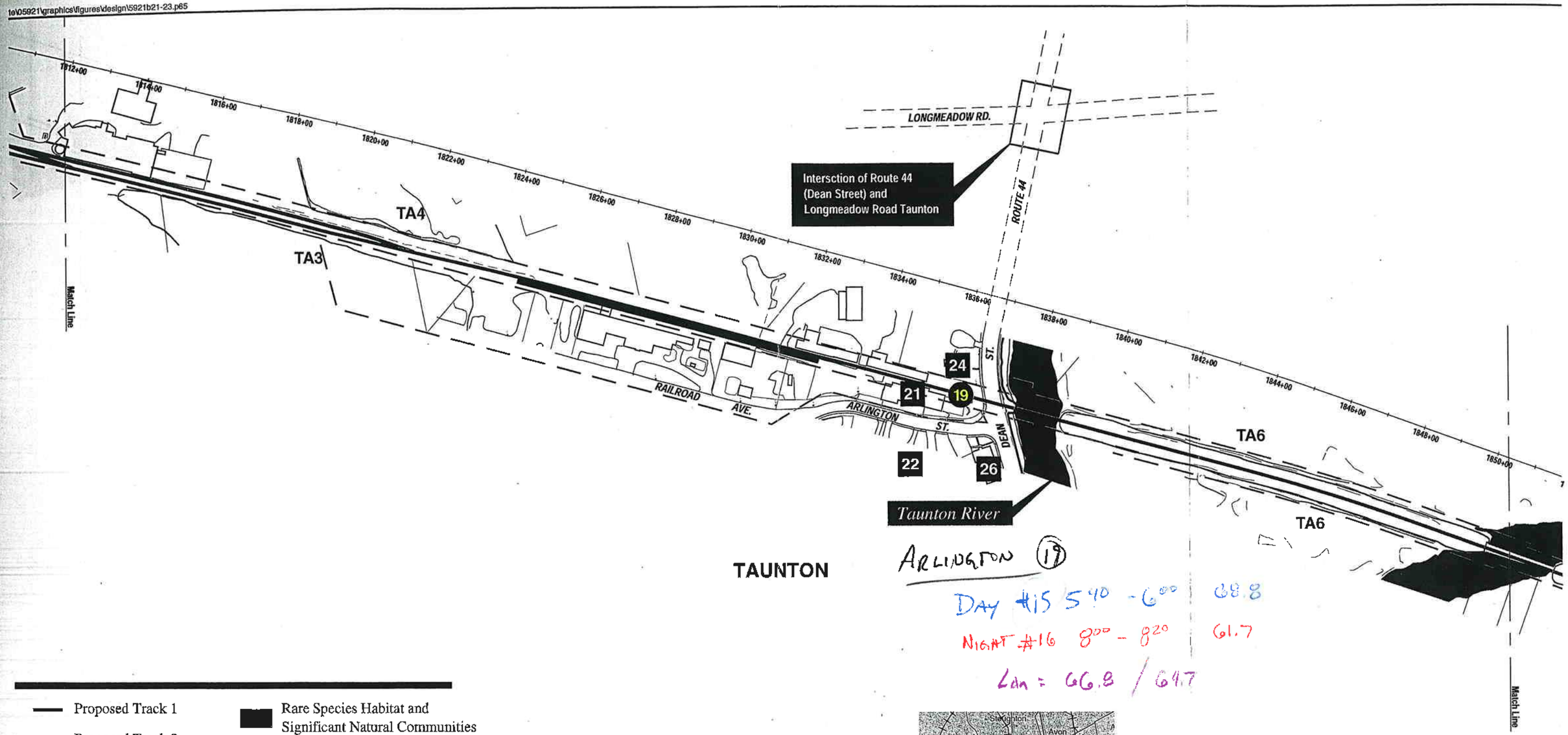

TAUNTON

ARLINGTON (19)

DAY #15 5:40 - 6:00 68.8

NIGHT #16 8:00 - 8:20 61.7

Ldn = 66.8 / 64.7

- Proposed Track 1
- Proposed Track 2
- Right of Way
- Water
- Wetland Boundaries
- Wetland Impact
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- Historic District
- # Historic Resource
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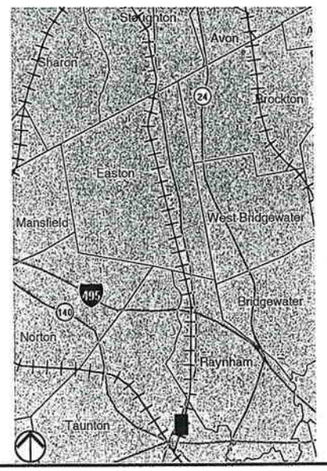

0 125 250 Feet

New Bedford / Fall River Commuter Rail

Massachusetts Bay Transportation Authority

Figure 2.3-2

Stoughton Branch

Sheet 22 of 23

Appendix 4.6-B

Noise Impacts for the Stoughton Diesel Alternative and Whittenton Electric Alternative

FTA Train Calculations

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Stoughton Diesel

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New Bedford/Fall River Modeled Noise Levels
Impact Ranges based upon various Existing Noise Levels

When	Severe		Moderate		No Impact	
Existing dba	greater than dBA	closer than feet	between dBA	between feet	less than dBA	farther than feet
60	63	115	58-63	115-225	58	225
61	64	100	59-64	100-200	59	200
62	64	100	59-64	100-200	59	200
63	65	75	60-65	75-175	60	175
64	65	75	60-65	75-175	60	175
65	66	65	61-66	65-150	61	150
66	67	55	62-67	55-135	62	135
67	67	55	62-67	55-135	62	135
68	68	50	63-68	50-115	63	115
69	69	45	64-69	45-100	64	100
70	69	45	64-69	45-100	64	100
71	70	40	66-70	40-65	66	65
72	71	30	66-71	30-65	66	65

Segment	MP	No-build	Build	Severe - closer than (feet)	Quantity Severe	Moderate - closer than (feet)	Quantity Moderate
Brock Street	4.30	63	65	65	3	150	8
Plain Street	4.60	59	65	100	8	200	14
Morton Street	5.20	69	70	30	0	65	0
North Easton Station	**6.40**	62	62	75	0	175	0
Elm Street (MP 7.60)	7.60	67	68	45	0	100	10
Oliver Street	7.80	58	62	75	0	175	2
Pond Street	7.90	58	61	75	0	175	8
Main Street	8.05	63	67	55	6	135	15
Bridge Street	8.40	58	62	100	2	200	15
Short Street	9.55	64	66	55	0	135	5
Depot Street/123	10.00	65	69	45	0	100	1
Purchase Street	10.20	61	64	75	0	175	2
Prospect Street	10.90	60	66	100	0	200	2
Raynham Station	**14.10**	63	63	65	0	150	0
Elm Street (MP 15.40)	15.40	57	63	100	4	200	3
Carver Street	15.80	60	65	100	1	200	1
Route 138	16.40	67	69	45	0	100	4
Britton Street	16.50	57	63	115	4	225	4
King Phillip Street	17.10	63	65	55	4	135	3
Longmeadow Road	18.90	67	70	45	0	100	2
Dean Street Station	**19.20**	52	55	150	0	300	0
Dean Street	19.40	65	68	50	0	115	2
Ingell Street	61.92	63	#REF!	55	0	135	0
Hart Street	62.43	65	#REF!	50	0	115	6
Total					**32**		**107**

School	Distance to Track (feet)	Existing Background Noise	Leq (dBA) No-Build	Project	Build	Impact
Jones School	1,400					
Kimball School	1,400					
Unionville School	3,200					
Stonehill College	5,500					
Parkview School	2,300					
Easton Jr. High School	3,100					
Ames Highschoo	3,100					
Holy Cross Seminary	4,000					
School building near Easton Center	1,700					
Southeastern Regional Vocational High School	**750**	**61**	**62**	**50**	**62**	**No Impact**
High School	3,200					
Pole School	2,000					
Summer Street School	**600**	**65**	**66**	**51**	**66**	**No Impact**

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New Bedford/Fall River
Noise Modeling

Site #	Location	Milepost	M.A.S.	At-Grade Crossing?	Horn/Bell	locomotive	cars	trains/hr day	trains/hr night	Building Offset (ft.)	Quantity	Existing Leq (day)	trains per hour	Leq (night)	trains per hour	Existing Ldn[1]
1	Brock Street	4.30	70	Yes	Horn	1	8	2.47	0.33	75	20	58	2.47	59	0.33	65
2	Plain Street	4.60	70	Yes	Horn	1	8	2.47	0.33	75	10	60	2.47	55	0.33	62
3	Morton Street	5.20	70	Yes	Horn	1	8	2.47	0.33	100	5	67	2.47	65	0.33	72
North Easton Station		6.40	70	**Station**	Horn	1	8	2.47	0.33	1300	5					
4	Elm Street (MP 7.60)	7.60	70	Yes	Horn	1	8	2.47	0.33	75	10	65	2.47	63	0.33	70
5	Oliver Street	7.80	70	Yes	Horn	1	8	2.47	0.33	75	5	63	2.47	54	0.33	63
6	Pond Street	7.90	70	No	n/a	1	8	2.47	0.33	75	0	62	2.47	54	0.33	63
7	Main Street	8.05	70	No	n/a	1	8	2.47	0.33	75	5	64	2.47	59	0.33	66
8	Bridge Street	8.40	70	No	n/a	1	8	2.47	0.33	75	25	58	2.47	54	0.33	61
9	Short Street	9.55	70	Yes	Horn	1	8	2.47	0.33	100	20	63	2.47	60	0.33	67
10	Depot Street/123	10.00	70	Yes	Horn	1	8	2.47	0.33	75	5	67	2.47	61	0.33	69
11	Purchase Street	10.20	70	Yes	Horn	1	8	2.47	0.33	300	10	60	2.47	57	0.33	64
12	Prospect Street	10.90	70	Yes	Horn	1	8	2.47	0.33	100	2	55	2.47	56	0.33	62
Raynham Station		14.10	70	**Station**	Horn	1	8	2.47	0.33	1800	5					
13	Elm Street (MP 15.40)	15.40	70	Yes	Horn	1	8	2.47	0.33	75	5	58	2.47	53	0.33	61
14	Carver Street	15.80	70	Yes	Horn	1	8	2.47	0.33	75	3	56	2.47	56	0.33	62
15	Route 138	16.40	70	Yes	Horn	1	8	2.47	0.33	100	5	65	2.47	63	0.33	70
16	Britton Street	16.50	70	Yes	Horn	1	8	2.47	0.33	75	3	58	2.47	53	0.33	60
17	King Phillip Street	17.10	70	Yes	Horn	1	8	2.47	0.33	75	10	64	2.47	59	0.33	66
18	Longmeadow Road	18.90	70	Yes	Horn	1	8	2.47	0.33	75	5	61	2.47	63	0.33	69
Dean Street Station		19.20	40	**Station**	Bell	1	8	2.40	0.44	600	5					
19	Dean Street	19.40	40	Yes	Bell	1	8	2.40	0.44	n/a	2	65	2.40	61	0.44	68
20	Ingell Street	61.92	40	Yes	Bell	1	8	2.40	0.44	200	15	59	2.40	59	0.44	66
21	Hart Street	62.43	40	Yes	Bell	1	8	2.40	0.44	75	10	65	2.40	61	0.44	68

1: L_{dn} computed using: 10*LOG((15*10^(L_{eq}day/10))+(9*10^((L_{eq}nite+10)/10)))-13.8

Federal Transit Adminstration
General Transit Noise Assessment
Case:

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	63	63	54
Source 1	62	61	52
Source 2	58	58	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		
Dist. to receiver	distance (ft)	50	distance (ft)	50		
Daytime Hours	speed (mph)	30	speed (mph)	30		
(7 AM - 10 PM)	trains/hour	2.47	trains/hour	2.47		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	30	speed (mph)	30		
(10 PM - 7 AM)	trains/hour	0.33	trains/hour	0.33		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	Y	Y/N	Y		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

New Bedford/Fall River Modeled Noise Levels	Milepost	Crossing Type - Grade, Overhead, Underground, Station	Horn Noise	Speed Used	Building Offset (ft.)	Leq					Ldn				
						Rail Project	Existing Road (Monitored)	Future No-Build	Build Condition	difference (Build - Existing) dbA	Rail Project	Existing (Monitored)	Future No-Build	Build Condition	difference (Build - Existing) dbA
1 Brock Street	4.30	G	Yes	30	75	57	58	59	61	3	60	62	63	65	3
2 Plain Street	4.60	G	Yes	30	75	61	60	61	64	4	64	58	59	65	7
3 Morton Street	5.20	G	Yes	30	100	60	67	68	69	2	63	68	69	70	2
North Easton Station	**6.40**	Sta.	No		1,200	47	64	65	65	1	47	61	62	62	1
4 Elm Street (MP 7.60)	7.60	G	Yes	30	75	59	65	66	67	2	62	66	67	68	2
5 Oliver Street	7.80	G	Yes	30	100	57	63	64	65	2	60	57	58	62	5
6 Pond Street	7.90	UG	No	30	100	56	62	63	63	2	59	57	58	61	4
7 Main Street	8.05	OH	No	40	75	61	64	65	66	3	64	62	63	67	5
8 Bridge Street	8.40	OH	No	50	75	57	58	59	61	3	60	57	58	62	5
9 Short Street	9.55	G	Yes	70	100	59	63	64	65	2	62	63	64	66	3
10 Depot Street/123	10.00	G	Yes	70	75	63	67	68	69	2	66	64	65	69	5
11 Purchase Street	10.20	G	Yes	70	300	59	60	61	63	3	62	60	61	64	4
12 Prospect Street	10.90	G	Yes	70	100	62	55	56	63	8	65	59	60	66	7
Raynham Station	**14.10**	Sta.	No		1,600	46	65	66	66	1	46	62	63	63	1
13 Elm Street (MP 15.40)	15.40	G	Yes	70	100	59	58	59	62	4	61	56	57	63	7
14 Carver Street	15.80	G	Yes	70	75	60	56	57	62	6	63	59	60	65	6
15 Route 138	16.40	G	Yes	70	75	63	65	66	68	3	65	66	67	69	3
16 Britton Street	16.50	G	Yes	70	75	59	58	59	62	4	61	56	57	63	7
17 King Phillip Street	17.10	G	Yes	70	100	59	64	65	66	2	62	62	63	65	3
18 Longmeadow Road	18.90	G	Yes	30	300	63	61	62	66	5	66	66	67	70	4
Dean Street Station	**19.20**	Sta.	No		600	52	54	55	57	3	52	51	52	55	4
19 Dean Street	19.40	G	Yes	30	75	61	65	66	67	2	64	64	65	68	4
20 Ingell Street	61.92	G	Yes	30	100	#REF!	59	60	#REF!	#REF!	#REF!	62	63	#REF!	#REF!
21 Hart Street	62.43	G	Yes	30	75	#REF!	65	66	#REF!	#REF!	#REF!	64	65	#REF!	#REF!
22 High Street Freetown		G	Yes	30	250	#REF!	-	1	#REF!	#REF!	#REF!	57	58	#REF!	#REF!

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Federal Transit Adminstration
General Transit Noise Assessment
Case: Brock Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	60	57	52
Source 1	57	55	50
Source 2	56	53	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	125	distance (ft)	125		
Daytime Hours	speed (mph)	45	speed (mph)	45		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	45	speed (mph)	45		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Plain Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	64	61	57
Source 1	61	58	53
Source 2	61	59	54
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	100	distance (ft)	100		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Morton Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	63	60	55
Source 1	59	57	52
Source 2	60	57	52
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	125	distance (ft)	125		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Elm Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	62	59	54
Source 1	58	56	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	145	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Oliver Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	60	57	52
Source 1	56	54	49
Source 2	57	54	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	200	distance (ft)	200		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Pond Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	59	56	51
Source 1	56	53	48
Source 2	56	53	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	225	distance (ft)	225		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Main Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	64	61	57
Source 1	61	58	53
Source 2	61	59	54
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	100	distance (ft)	100		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Bridge Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	60	57	52
Source 1	56	54	49
Source 2	57	54	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	200	distance (ft)	200		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Short Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	62	59	54
Source 1	58	56	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	145	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Depot Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	63	58
Source 1	63	60	55
Source 2	63	60	56
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	75	distance (ft)	75		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Purchase Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	62	59	54
Source 1	58	56	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	145	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Prospect Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	65	62	57
Source 1	61	58	54
Source 2	62	59	55
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	95	distance (ft)	90		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Elm Street - Raynham

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	59	54
Source 1	58	55	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	150	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Carver Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	63	60	55
Source 1	59	57	52
Source 2	60	57	52
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	125	distance (ft)	125		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Route 138

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	65	63	58
Source 1	62	59	55
Source 2	63	60	55
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	81	distance (ft)	81		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Britton Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	59	54
Source 1	58	55	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	150	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: King Phillip Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	62	59	54
Source 1	58	55	51
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	150	distance (ft)	145		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Longmeadow Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	63	58
Source 1	63	60	55
Source 2	63	60	56
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	75	distance (ft)	75		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Dean Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	64	61	57
Source 1	61	58	53
Source 2	61	59	54
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	100	distance (ft)	100		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

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SOUTH COAST RAIL

Technical Report
Noise and Vibration
Draft

Whittenton Electric

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New Bedford/Fall River Modeled Noise Levels
Impact Ranges based upon various Existing Noise Levels

When	Severe		Moderate		No Impact	
Existing dba	greater than dBA	closer than feet	between dBA	between feet	less than dBA	farther than feet
60	63	115	58-63	115-225	58	225
61	64	100	59-64	100-200	59	200
62	64	100	59-64	100-200	59	200
63	65	75	60-65	75-175	60	175
64	65	75	60-65	75-175	60	175
65	66	65	61-66	65-150	61	150
66	67	55	62-67	55-135	62	135
67	67	55	62-67	55-135	62	135
68	68	50	63-68	50-115	63	115
69	69	45	64-69	45-100	64	100
70	69	45	64-69	45-100	64	100
71	70	40	66-70	40-65	66	65
72	71	30	66-71	30-65	66	65

Segment	MP	No-build	Build	Severe - closer than (feet)	Quantity Severe	Moderate - closer than (feet)	Quantity Moderate
Brock Street	4.30	63	#REF!	65	3	150	8
Plain Street	4.60	59	#REF!	100	8	200	14
Morton Street	5.20	69	#REF!	30	0	65	0
North Easton Station	**6.40**	62	62	75	0	175	0
Elm Street (MP 7.60)	7.60	67	#REF!	45	0	100	10
Oliver Street	7.80	58	#REF!	75	0	175	2
Pond Street	7.90	58	#REF!	75	0	175	8
Main Street	8.05	63	#REF!	55	6	135	15
Bridge Street	8.40	58	#REF!	100	2	200	15
Short Street	9.55	64	#REF!	55	0	135	5
Depot Street/123	10.00	65	#REF!	45	0	100	1
Purchase Street	10.20	61	#REF!	75	0	175	2
Prospect Street	10.90	60	#REF!	100	0	200	2
Raynham Station	**14.10**	63	63	65	0	150	0
Elm Street (MP 15.40)	15.40	57	#REF!	100	4	200	3
Carver Street	15.80	60	#REF!	100	1	200	1
Route 138	16.40	67	#REF!	45	0	100	4
Britton Street	16.50	57	#REF!	115	4	225	4
King Phillip Street	17.10	63	#REF!	55	4	135	3
Longmeadow Road	18.90	67	#REF!	45	0	100	2
Dean Street Station	**19.20**	52	55	150	0	300	0
Dean Street	19.40	65	#REF!	50	0	115	2
Ingell Street	61.92	63	#REF!	55	0	135	0
Hart Street	62.43	65	#REF!	50	0	115	6
Total					**32**		**107**

School	Distance to Track (feet)	Existing Background Noise	Leq (dBA) No-Build	Project	Build	Impact
Jones School	1,400					
Kimball School	1,400					
Unionville School	3,200					
Stonehill College	5,500					
Parkview School	2,300					
Easton Jr. High School	3,100					
Ames Highschoo	3,100					
Holy Cross Seminary	4,000					
School building near Easton Center	1,700					
Southeastern Regional Vocational High School	**750**	**61**	**62**	**50**	**62**	**No Impact**
High School	3,200					
Pole School	2,000					
Summer Street School	**600**	**65**	**66**	**51**	**66**	**No Impact**

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New Bedford/Fall River
Noise Modeling

Site #	Location	Milepost	M.A.S.	At-Grade Crossing?	Horn/Bell	locomotive	cars	trains/hr day	trains/hr night	Building Offset (ft.)	Quantity	Existing Leq (day)	trains per hour	Leq (night)	trains per hour	Existing Ldn[1]
1	Brock Street	4.30	70	Yes	Horn	1	8	2.47	0.33	75	20	58	2.47	59	0.33	65
2	Plain Street	4.60	70	Yes	Horn	1	8	2.47	0.33	75	10	60	2.47	55	0.33	62
3	Morton Street	5.20	70	Yes	Horn	1	8	2.47	0.33	100	5	67	2.47	65	0.33	72
North Easton Station		6.40	70	**Station**	Horn	1	8	2.47	0.33	1300	5					
4	Elm Street (MP 7.60)	7.60	70	Yes	Horn	1	8	2.47	0.33	75	10	65	2.47	63	0.33	70
5	Oliver Street	7.80	70	Yes	Horn	1	8	2.47	0.33	75	5	63	2.47	54	0.33	63
6	Pond Street	7.90	70	No	n/a	1	8	2.47	0.33	75	0	62	2.47	54	0.33	63
7	Main Street	8.05	70	No	n/a	1	8	2.47	0.33	75	5	64	2.47	59	0.33	66
8	Bridge Street	8.40	70	No	n/a	1	8	2.47	0.33	75	25	58	2.47	54	0.33	61
9	Short Street	9.55	70	Yes	Horn	1	8	2.47	0.33	100	20	63	2.47	60	0.33	67
10	Depot Street/123	10.00	70	Yes	Horn	1	8	2.47	0.33	75	5	67	2.47	61	0.33	69
11	Purchase Street	10.20	70	Yes	Horn	1	8	2.47	0.33	300	10	60	2.47	57	0.33	64
12	Prospect Street	10.90	70	Yes	Horn	1	8	2.47	0.33	100	2	55	2.47	56	0.33	62
Raynham Station		14.10	70	**Station**	Horn	1	8	2.47	0.33	1800	5					
13	Elm Street (MP 15.40)	15.40	70	Yes	Horn	1	8	2.47	0.33	75	5	58	2.47	53	0.33	61
14	Carver Street	15.80	70	Yes	Horn	1	8	2.47	0.33	75	3	56	2.47	56	0.33	62
15	Route 138	16.40	70	Yes	Horn	1	8	2.47	0.33	100	5	65	2.47	63	0.33	70
16	Britton Street	16.50	70	Yes	Horn	1	8	2.47	0.33	75	3	58	2.47	53	0.33	60
17	King Phillip Street	17.10	70	Yes	Horn	1	8	2.47	0.33	75	10	64	2.47	59	0.33	66
18	Longmeadow Road	18.90	70	Yes	Horn	1	8	2.47	0.33	75	5	61	2.47	63	0.33	69
Dean Street Station		19.20	40	**Station**	Bell	1	8	2.40	0.44	600	5					
19	Dean Street	19.40	40	Yes	Bell	1	8	2.40	0.44	n/a	2	65	2.40	61	0.44	68
20	Ingell Street	61.92	40	Yes	Bell	1	8	2.40	0.44	200	15	59	2.40	59	0.44	66
21	Hart Street	62.43	40	Yes	Bell	1	8	2.40	0.44	75	10	65	2.40	61	0.44	68

1: L_{dn} computed using: 10*LOG((15*10^(L_{eq}day/10))+(9*10^((L_{eq}nite+10)/10)))-13.8

Federal Transit Adminstration
General Transit Noise Assessment
Case:

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	63	63	54
Source 1	62	61	52
Source 2	58	58	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Diesel Loco.	2	Comm. Rail Cars	3		
Dist. to receiver	distance (ft)	50	distance (ft)	50		
Daytime Hours	speed (mph)	30	speed (mph)	30		
(7 AM - 10 PM)	trains/hour	2.47	trains/hour	2.47		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	30	speed (mph)	30		
(10 PM - 7 AM)	trains/hour	0.33	trains/hour	0.33		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	Y	Y/N	Y		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

New Bedford/Fall River Modeled Noise Levels	Milepost	Crossing Type - Grade, Overhead, Underground, Station	Horn Noise	Speed Used	Building Offset (ft.)	Leq					Ldn				
						Rail Project	Existing Road (Monitored)	Future No-Build	Build Condition	difference (Build - Existing) dbA	Rail Project	Existing (Monitored)	Future No-Build	Build Condition	difference (Build - Existing) dbA
1 Brock Street	4.30	G	Yes	30	75	#REF!	58	59	#REF!	#REF!	#REF!	62	63	#REF!	#REF!
2 Plain Street	4.60	G	Yes	30	75	#REF!	60	61	#REF!	#REF!	#REF!	58	59	#REF!	#REF!
3 Morton Street	5.20	G	Yes	30	100	#REF!	67	68	#REF!	#REF!	#REF!	68	69	#REF!	#REF!
North Easton Station	**6.40**	Sta.	No		1,200	47	64	65	65	1	47	61	62	62	1
4 Elm Street (MP 7.60)	7.60	G	Yes	30	75	#REF!	65	66	#REF!	#REF!	#REF!	66	67	#REF!	#REF!
5 Oliver Street	7.80	G	Yes	30	100	#REF!	63	64	#REF!	#REF!	#REF!	57	58	#REF!	#REF!
6 Pond Street	7.90	UG	No	30	100	#REF!	62	63	#REF!	#REF!	#REF!	57	58	#REF!	#REF!
7 Main Street	8.05	OH	No	40	75	#REF!	64	65	#REF!	#REF!	#REF!	62	63	#REF!	#REF!
8 Bridge Street	8.40	OH	No	50	75	#REF!	58	59	#REF!	#REF!	#REF!	57	58	#REF!	#REF!
9 Short Street	9.55	G	Yes	70	100	#REF!	63	64	#REF!	#REF!	#REF!	63	64	#REF!	#REF!
10 Depot Street/123	10.00	G	Yes	70	75	#REF!	67	68	#REF!	#REF!	#REF!	64	65	#REF!	#REF!
11 Purchase Street	10.20	G	Yes	70	300	#REF!	60	61	#REF!	#REF!	#REF!	60	61	#REF!	#REF!
12 Prospect Street	10.90	G	Yes	70	100	#REF!	55	56	#REF!	#REF!	#REF!	59	60	#REF!	#REF!
Raynham Station	**14.10**	Sta.	No		1,600	46	65	66	66	1	46	62	63	63	1
13 Elm Street (MP 15.40)	15.40	G	Yes	70	100	#REF!	58	59	#REF!	#REF!	#REF!	56	57	#REF!	#REF!
14 Carver Street	15.80	G	Yes	70	75	#REF!	56	57	#REF!	#REF!	#REF!	59	60	#REF!	#REF!
15 Route 138	16.40	G	Yes	70	75	#REF!	65	66	#REF!	#REF!	#REF!	66	67	#REF!	#REF!
16 Britton Street	16.50	G	Yes	70	75	#REF!	58	59	#REF!	#REF!	#REF!	56	57	#REF!	#REF!
17 King Phillip Street	17.10	G	Yes	70	100	#REF!	64	65	#REF!	#REF!	#REF!	62	63	#REF!	#REF!
18 Longmeadow Road	18.90	G	Yes	30	300	#REF!	61	62	#REF!	#REF!	#REF!	66	67	#REF!	#REF!
Dean Street Station	**19.20**	Sta.	No		600	52	54	55	57	3	52	51	52	55	4
19 Dean Street	19.40	G	Yes	30	75	#REF!	65	66	#REF!	#REF!	#REF!	64	65	#REF!	#REF!
20 Ingell Street	61.92	G	Yes	30	100	#REF!	59	60	#REF!	#REF!	#REF!	62	63	#REF!	#REF!
21 Hart Street	62.43	G	Yes	30	75	#REF!	65	66	#REF!	#REF!	#REF!	64	65	#REF!	#REF!
22 High Street Freetown		G	Yes	30	250	#REF!	-	1	#REF!	#REF!	#REF!	57	58	#REF!	#REF!

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Federal Transit Adminstration
General Transit Noise Assessment
Case: Britton St / King Philip St

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	58	53
Source 1	57	54	49
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	125	distance (ft)	125		
Daytime Hours	speed (mph)	60	speed (mph)	60		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	60	speed (mph)	60		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Redwood Drive

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	58	53
Source 1	57	54	49
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	125	distance (ft)	125		
Daytime Hours	speed (mph)	60	speed (mph)	60		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	60	speed (mph)	60		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Third Avenue

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	64	59
Source 1	64	61	56
Source 2	63	60	56
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	30	distance (ft)	30		
Daytime Hours	speed (mph)	35	speed (mph)	35		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	35	speed (mph)	35		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Warren Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	59	54
Source 1	59	56	52
Source 2	57	55	50
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	55	distance (ft)	60		
Daytime Hours	speed (mph)	30	speed (mph)	30		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	30	speed (mph)	30		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: West Britanna Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	59	54
Source 1	59	56	52
Source 2	58	55	50
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	55	distance (ft)	56		
Daytime Hours	speed (mph)	30	speed (mph)	30		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	30	speed (mph)	30		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Edwards Avenue

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	59	56	51
Source 1	54	52	47
Source 2	57	54	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	200	distance (ft)	200		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Danforth Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	61	58	53
Source 1	56	53	49
Source 2	59	56	51
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	150	distance (ft)	150		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Horton Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	59	56	51
Source 1	54	52	47
Source 2	57	54	49
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	200	distance (ft)	200		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Tremont Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	63	58
Source 1	61	58	53
Source 2	64	61	56
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	72	distance (ft)	70		
Daytime Hours	speed (mph)	70	speed (mph)	70		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	70	speed (mph)	70		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Winthrop Street

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RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	63	58
Source 1	62	59	54
Source 2	64	61	56
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	50	distance (ft)	45		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	50	speed (mph)	50		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Webster Street

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Sponsored by FTA contract #DTUM60-92-C-41008
Government users have unrestricted rights to this program

RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	62	60	55
Source 1	59	56	51
Source 2	60	57	52
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	80	distance (ft)	80		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	50	speed (mph)	50		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Federal Transit Adminstration
General Transit Noise Assessment
Case: Weir Street

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Sponsored by FTA contract #DTUM60-92-C-41008
Government users have unrestricted rights to this program

RESULTS

Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	66	63	58
Source 1	62	59	55
Source 2	63	60	55
Source 3			

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for each noise source below - see reference list for source numbers.

NOISE SOURCE PARAMETERS						
Parameter	**Source 1**		**Source 2**		**Source 3**	
Source Num.	Electric Loco.	1	Comm. Rail Cars	3		0
Dist. to receiver	distance (ft)	48	distance (ft)	50		
Daytime Hours	speed (mph)	50	speed (mph)	50		
(7 AM - 10 PM)	trains/hour	3	trains/hour	3		
	locos/train	1	cars/train	8		
Nighttime Hours	speed (mph)	50	speed (mph)	50		
(10 PM - 7 AM)	trains/hour	1	trains/hour	1		
	locos/train	1	cars/train	8		
Jointed Track?	Y/N	N	Y/N	N		
Embedded Track?	Y/N	N	Y/N	N		
Aerial Structure?	Y/N	N	Y/N	N		
Barrier Present?	Y/N	N	Y/N	N		
Intervening Rows of Buildings	number	0	number	0		

SOURCE REFERENCE LIST	
Source	**Number**
Electric Loco.	1
Diesel Loco.	2
Comm. Rail Cars	3
RRT/LRT	4
AGT, Steel Wheel	5
AGT, Rubber Tire	6
Monorail	7
Maglev	8
Automobiles	9
City Buses	10
Commuter Buses	11
Rail Yard or Shop	12
Layover Tracks	13
Bus Storage Yard	14
Bus Op. Facility	15
Bus Transit Center	16
Parking Garage	17
Park & Ride Lot	18

Appendix 4.6-C

Updated Noise Impacts and Mitigation for the Stoughton Electric Alternative

Appendix A
Noise and Vibration Tables

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Sound Level Results and Mitigation Table

Residence ID	Street	Town	Station #	Side of Track	Land Use	Noise Exposure (dBA) Existing	Noise Exposure (dBA) Project plus existing	FTA Criteria, L_{dn} (dBA) Severe Impact	FTA Criteria, L_{dn} (dBA) Cost Justified
	Brock Street								
1411			1011+69.99	E	residential	50	69	60	$30,000
	Plain Street								
1370			1039+22.08	E	residential	61	66	64	$10,000
1375			1035+49.67	E	residential	61	68	64	$20,000
1378			1032+32.91	E	residential	61	69	64	$25,000
1381			1030+85.95	E	residential	61	71	64	$30,000
1385			1028+81.08	E	residential	61	66	64	$10,000
1388			1027+96.37	E	residential	61	69	64	$25,000
1390			1027+04.03	E	residential	61	68	64	$20,000
1391			1026+33.91	E	residential	61	69	64	$25,000
1393			1025+54.07	E	residential	61	69	64	$25,000
1396			1024+67.80	E	residential	61	69	64	$25,000
1398			1023+80.72	E	residential	61	68	64	$20,000
1400			1022+75.46	E	residential	61	67	64	$15,000
	Morton								
1342			1111+38.89	E	residential	59	69	63	$30,000
1348			1074+93.11	E	residential	59	65	63	$10,000
1350			1068+17.56	E	residential	59	66	63	$15,000
1352			1063+52.41	E	residential	59	67	63	$20,000
1355			1060+19.23	E	residential	59	65	63	$10,000
1358			1054+00.29	E	residential	59	64	63	$5,000
1359			1053+81.93	E	residential	59	70	63	$30,000
1361			1052+16.85	E	residential	59	69	63	$30,000
	Rolling Green								
615			2522+72.88	W	residential	47	61	59	$10,000
617			2520+14.94	W	residential	47	61	59	$10,000
621			2515+68.58	W	residential	47	62	59	$15,000
638			2498+25.43	W	residential	47	60	59	$5,000
644			2497+36.24	E	residential	47	63	59	$20,000
649			2496+26.41	E	residential	47	63	59	$20,000
653			2495+14.66	W	residential	47	64	59	$25,000
657			2494+10.41	E	residential	47	64	59	$25,000
662			2493+03.55	W	residential	47	64	59	$25,000
663			2492+01.86	W	residential	47	64	59	$25,000
667			2491+03.55	E	residential	47	65	59	$30,000
669			2488+95.68	E	residential	47	60	59	$5,000
670			2489+93.19	E	residential	47	64	59	$25,000
	North Main								
539			2626+20.83	E	residential	60	65	63	$10,000
542			2622+67.48	E	residential	60	66	63	$15,000
572			2581+91.45	E	residential	60	68	63	$25,000
576			2580+39.63	W	residential	60	67	63	$20,000
580			2579+23.88	E	residential	60	66	63	$15,000
585			2575+47.67	E	residential	60	65	63	$10,000
	Cory								
337			2696+85.10	E	residential	55	66	61	Noise Barrier
338			2696+52.71	E	residential	55	64	61	Noise Barrier
342			2695+82.80	E	residential	55	65	61	Noise Barrier
349			2694+40.05	E	residential	55	64	61	Noise Barrier
351			2694+49.08	W	residential	55	66	61	Noise Barrier
353			2694+88.28	W	residential	55	69	61	$30,000
354			2694+99.78	E	residential	55	65	61	$20,000
357			2694+56.03	E	residential	55	65	61	$20,000
361			2694+18.21	W	residential	55	64	61	$15,000
362			2693+11.69	W	residential	55	64	61	Noise Barrier
364			2693+73.66	W	residential	55	64	61	$15,000
366			2692+35.38	W	residential	55	65	61	Noise Barrier
369			2692+93.10	W	residential	55	67	61	$30,000
375			2691+10.57	W	residential	55	64	61	Noise Barrier
380			2690+51.95	W	residential	55	64	61	Noise Barrier
387			2689+93.69	W	residential	55	65	61	Noise Barrier
392			2689+47.81	E	residential	55	65	61	Noise Barrier
394			2688+99.83	W	residential	55	65	61	Noise Barrier
401			2688+51.40	W	residential	55	65	61	Noise Barrier
406			2687+99.43	W	residential	55	65	61	Noise Barrier
410			2687+45.15	W	residential	55	67	61	Noise Barrier
411			2687+71.81	W	residential	55	64	61	Noise Barrier
414			2686+77.01	W	residential	55	70	61	Noise Barrier
415			2686+83.02	W	residential	55	65	61	Noise Barrier
417			2686+42.76	W	residential	55	65	61	Noise Barrier
419			2685+76.51	W	residential	55	68	61	Noise Barrier
422			2685+17.54	W	residential	55	66	61	Noise Barrier
425			2684+36.31	E	residential	55	68	61	Noise Barrier
427			2684+50.57	W	residential	55	64	61	Noise Barrier
431			2683+66.53	W	residential	55	64	61	Noise Barrier
434			2683+17.23	W	residential	55	63	61	Noise Barrier
437			2681+96.84	W	residential	55	68	61	Noise Barrier
441			2681+14.24	W	residential	55	67	61	Noise Barrier
447			2679+82.06	W	residential	55	65	61	Noise Barrier
450			2679+36.85	W	residential	55	63	61	Noise Barrier
453			2678+94.31	W	residential	55	63	61	Noise Barrier
472			2671+88.12	W	residential	55	65	61	$20,000
477			2670+19.00	E	residential	55	65	61	$20,000
479			2668+82.31	E	residential	55	65	61	$20,000
482			2668+06.69	E	residential	55	65	61	$20,000

STOUGHTON

FALL RIVER

Residence ID	Street	Town	Station #	Side of Track	Land Use	Noise Exposure (dBA) Existing	Noise Exposure (dBA) Project plus existing	FTA Criteria, L_{dn} (dBA) Severe Impact	FTA Criteria, L_{dn} (dBA) Cost Justified
485			2667+13.50	E	residential	55	65	61	$20,000
492			2666+11.62	W	residential	55	66	61	$25,000
493			2665+36.30	E	residential	55	65	61	$20,000
495			2666+26.29	W	residential	55	64	61	$15,000
498			2664+04.97	W	residential	55	65	61	$20,000
513			2654+82.92	W	residential	55	70	61	$30,000
516			2653+51.76	E	residential	55	64	61	$15,000
524			2651+03.61	W	residential	55	63	61	$10,000
525			2649+65.96	W	residential	55	65	61	$20,000
526			2649+13.41	W	residential	55	64	61	$15,000
529			2648+64.25	W	residential	55	64	61	$15,000
530			2648+09.82	W	residential	55	64	61	$15,000
531			2647+58.16	W	residential	55	64	61	$15,000
533			2646+73.80	E	residential	55	66	61	$25,000
535			2646+19.75	W	residential	55	65	61	$20,000
	Durfee								
129			2796+92.97	W	residential	55	66	61	$25,000
133			2795+12.69	W	residential	55	62	61	$5,000
135			2794+66.09	W	residential	55	63	61	$10,000
136			2796+64.26	E	residential	55	66	61	$25,000
137			2794+07.49	E	residential	55	62	61	$5,000
143			2793+33.46	W	residential	55	64	61	$15,000
144			2794+99.03	W	residential	55	67	61	$30,000
151			2792+02.13	W	residential	55	64	61	$15,000
156			2791+23.91	W	residential	55	64	61	$15,000
157			2790+89.04	W	residential	55	64	61	$15,000
159			2790+49.38	E	residential	55	63	61	$10,000
163			2790+00.32	W	residential	55	64	61	$15,000
166			2789+60.37	W	residential	55	63	61	$10,000
169			2793+17.52	W	residential	55	63	61	$10,000
170			2788+50.25	W	residential	55	63	61	$10,000
172			2787+40.94	W	residential	55	63	61	$10,000
176			2792+07.58	W	residential	55	63	61	$10,000
179			2791+16.09	W	residential	55	64	61	$15,000
184			2790+12.93	W	residential	55	64	61	$15,000
186			2782+91.68	W	residential	55	64	61	$15,000
188			2789+20.14	W	residential	55	64	61	$15,000
190			2787+59.74	E	residential	55	65	61	$20,000
191			2780+60.53	E	residential	55	65	61	$20,000
192			2779+68.90	E	residential	55	64	61	$15,000
193			2778+99.23	E	residential	55	63	61	$10,000
196			2778+22.37	E	residential	55	64	61	$15,000
197			2777+39.18	E	residential	55	63	61	$10,000
199			2785+62.30	E	residential	55	63	61	$10,000
200			2784+61.91	E	residential	55	65	61	$20,000
264			2740+73.91	E	residential	55	67	61	$30,000
284			2724+80.05	W	residential	55	63	61	$10,000
285			2724+88.89	E	residential	55	69	61	$30,000
296			2721+20.92	W	residential	55	63	61	$10,000
299			2720+74.83	W	residential	55	63	61	$10,000
301			2720+37.05	W	residential	55	63	61	$10,000
316			2711+33.88	E	residential	55	63	61	$10,000
323			2705+69.17	E	residential	55	66	61	$25,000
327			2704+81.36	E	residential	55	65	61	$20,000
330			2703+57.22	E	residential	55	65	61	$20,000
	Worcester								
41			2739+89.47	E	residential	55	62	61	$5,000
44			2738+87.11	E	residential	55	63	61	$10,000
45			2737+86.94	W	residential	55	62	61	$5,000
49			2736+81.02	W	residential	55	62	61	$5,000
51			2736+30.99	W	residential	55	62	61	$5,000
54			2735+61.75	W	residential	55	62	61	$5,000
98			2722+56.24	W	residential	55	65	61	$20,000
100			2722+58.73	E	residential	55	63	61	$10,000
104			2721+25.94	W	residential	55	65	61	$20,000
105			2721+30.16	E	residential	55	62	61	$5,000
	Earle & Davis								
15			2803+37.43	E	residential	56	63	61	$10,000
	Bridge								
1083			1246+26.55	E	residential	52	63	60	$15,000
1096			1242+08.25	E	residential	52	66	60	Noise Barrier
1099			1241+77.99	E	residential	52	61	60	Noise Barrier
1102			1241+12.00	W	residential	52	61	60	Noise Barrier
1107			1240+04.07	E	residential	52	66	60	Noise Barrier
1108			1240+13.01	E	residential	52	61	60	Noise Barrier
1110			1239+37.40	E	residential	52	67	60	Noise Barrier
1113			1239+21.89	E	residential	52	61	60	Noise Barrier
1117			1238+55.88	E	residential	52	61	60	Noise Barrier
1118			1238+15.17	E	residential	52	66	60	Noise Barrier
1120			1237+71.27	E	residential	52	66	60	Noise Barrier
1122			1237+87.31	E	residential	52	61	60	Noise Barrier
1124			1237+22.83	E	residential	52	66	60	Noise Barrier
1129			1236+53.19	E	residential	52	66	60	Noise Barrier
1132			1236+44.39	E	residential	52	61	60	Noise Barrier
1134			1235+47.14	E	residential	52	61	60	Noise Barrier
1135			1235+13.15	E	residential	52	65	60	Noise Barrier

Residence ID	Street	Town	Station #	Side of Track	Land Use	Noise Exposure (dBA) Existing	Noise Exposure (dBA) Project plus existing	FTA Criteria, L_{dn} (dBA) Severe Impact	FTA Criteria, L_{dn} (dBA) Cost Justified
1140			1234+21.46	E	residential	52	65	60	Noise Barrier
1143			1233+72.46	E	residential	52	61	60	Noise Barrier
1145			1232+89.39	E	residential	52	66	60	Noise Barrier
1147			1232+56.16	E	residential	52	61	60	Noise Barrier
1148			1231+76.18	E	residential	52	66	60	Noise Barrier
1149			1230+91.06	E	residential	52	62	60	$10,000
1152			1230+29.14	E	residential	52	62	60	$10,000
1153			1230+76.25	E	residential	52	65	60	Noise Barrier
1155			1229+61.34	E	residential	52	62	60	$10,000
1156			1230+42.36	E	residential	52	61	60	Noise Barrier
1157			1228+89.02	E	residential	52	62	60	$10,000
1158			1229+54.86	E	residential	52	66	60	Noise Barrier
1161			1227+72.34	E	residential	52	62	60	Noise Barrier
1163			1227+79.29	E	residential	52	67	60	Noise Barrier
1164			1227+86.53	E	residential	52	65	60	$25,000
1166			1226+97.84	E	residential	52	62	60	Noise Barrier
1171			1227+00.54	E	residential	52	64	60	$20,000
1172			1226+20.85	E	residential	52	62	60	Noise Barrier
1173			1225+62.66	E	residential	52	62	60	Noise Barrier
1177			1226+07.89	E	residential	52	63	60	$15,000
1178			1224+95.69	E	residential	52	62	60	Noise Barrier
1179			1225+24.13	E	residential	52	68	60	Noise Barrier
1182			1223+98.34	E	residential	52	62	60	Noise Barrier
1183			1224+79.98	E	residential	52	63	60	$15,000
1187			1223+45.00	E	residential	52	62	60	Noise Barrier
1189			1223+82.90	E	residential	52	67	60	$30,000
1190			1222+93.40	E	residential	52	62	60	Noise Barrier
1191			1223+75.90	E	residential	52	63	60	$15,000
1192			1223+79.45	E	residential	52	62	60	$10,000
1197			1222+34.82	E	residential	52	62	60	Noise Barrier
1200			1222+65.00	E	residential	52	62	60	$10,000
1203			1221+41.00	E	residential	52	63	60	Noise Barrier
1208			1220+78.71	E	residential	52	65	60	Noise Barrier
1211			1220+06.04	E	residential	52	63	60	Noise Barrier
1217			1219+39.72	E	residential	52	64	60	Noise Barrier
	Depot/Route 123								
1046			1315+51.08	W	residential	65	69	66	$15,000
	Elm								
1272			1192+34.33	E	residential	57	64	62	$10,000
1279			1190+12.74	E	residential	57	67	62	$25,000
1281		E	1189+16.79	E	residential	57	66	62	$20,000
1284		A	1188+57.55	E	residential	57	65	62	$15,000
1286		S	1188+16.24	E	residential	57	64	62	$10,000
1289		T	1188+01.66	E	residential	57	64	62	$10,000
1293		O	1187+15.89	E	residential	57	66	62	$20,000
1294		N	1187+36.10	E	residential	57	64	62	$10,000
1298			1186+69.40	E	residential	57	64	62	$10,000
1305			1185+87.38	E	residential	57	67	62	$25,000
1307			1184+67.02	E	residential	57	66	62	$20,000
1310			1182+31.72	E	residential	57	64	62	$10,000
1316			1180+67.57	E	residential	57	65	62	$15,000
1317			1179+98.38	E	residential	57	67	62	$25,000
1318			1179+22.47	E	residential	57	64	62	$10,000
1319			1179+12.79	E	residential	57	64	62	$10,000
1326			1168+15.52	E	residential	57	67	62	$25,000
	Main								
1220			1217+75.89	E	residential	62	67	64	Noise Barrier
1223			1218+71.82	E	residential	62	67	64	Noise Barrier
1225			1216+72.39	E	residential	62	68	64	Noise Barrier
1228			1215+45.44	E	residential	62	69	64	Noise Barrier
1229			1214+75.86	E	residential	62	69	64	Noise Barrier
1231			1213+88.37	E	residential	62	69	64	Noise Barrier
1233			1212+90.09	E	residential	62	69	64	Noise Barrier
1236			1211+25.46	W	residential	62	71	64	$30,000
1238			1210+41.01	E	residential	62	67	64	$15,000
1239			1209+64.15	W	residential	62	71	64	$30,000
1240			1209+12.91	W	residential	62	67	64	$15,000
	Oliver								
1259			1197+12.74	E	residential	52	62	60	$10,000
1260			1197+07.39	E	residential	52	64	60	$20,000
1263			1196+66.08	E	residential	52	64	60	$20,000
1265			1196+56.11	E	residential	52	61	60	$5,000
	Pond								
1243			1207+21.36	E	residential	47	60	59	$5,000
1245			1206+67.29	W	residential	47	62	59	$15,000
1250			1205+45.89	E	residential	47	60	59	$5,000
	Purchase								
1025			1353+50.72	W	residential	58	65	62	$15,000
1026			1350+89.64	W	residential	58	65	62	$15,000
1029			1347+12.40	W	residential	58	65	62	$15,000
1041			1327+52.01	W	residential	58	64	62	$10,000
	Short								
1049			1298+66.67	E	residential	58	64	62	$10,000
1051			1296+84.36	E	residential	58	65	62	$15,000
1052			1295+06.98	E	residential	58	64	62	$10,000
1055			1293+98.00	E	residential	58	67	62	$25,000

Residence ID	Street	Town	Station #	Side of Track	Land Use	Noise Exposure (dBA) Existing	Noise Exposure (dBA) Project plus existing	FTA Criteria, L_{dn} (dBA) Severe Impact	FTA Criteria, L_{dn} (dBA) Cost Justified
1059			1292+38.22	W	residential	58	68	62	$30,000
1060			1292+30.41	W	residential	58	65	62	$15,000
1061			1290+84.52	E	residential	58	66	62	$20,000
1065			1278+20.37	E	residential	58	64	62	$10,000
1067			1272+43.55	W	residential	58	63	62	$5,000
1068			1269+08.23	W	residential	58	64	62	$10,000
1070			1258+30.61	E	residential	58	65	62	$15,000
1073			1253+57.04	E	residential	58	67	62	$25,000
	Britton								
973			1661+17.85	E	residential	55	64	61	$15,000
974			1660+76.45	E	residential	55	65	61	$20,000
976			1660+48.35	E	residential	55	63	61	$10,000
978			1659+94.36	E	residential	55	62	61	$5,000
979			1659+51.74	E	residential	55	68	61	$30,000
980			1659+20.05	E	residential	55	66	61	$25,000
	Carver								
992			1626+14.42	W	residential	60	66	63	$15,000
	Elm								
995			1605+68.60	W	residential	55	65	61	$20,000
999			1603+08.32	W	residential	55	68	61	$30,000
1001			1602+74.68	W	residential	55	65	61	$20,000
1007			1601+55.78	W	residential	55	63	61	$10,000
1008			1601+46.03	W	residential	55	67	61	$30,000
1009			1595+92.16	W	residential	55	66	61	$25,000
1013			1594+32.86	W	residential	55	64	61	$15,000
1018			1585+92.34	W	residential	55	64	61	$15,000
	King Phillip								
938			1696+78.76	E	residential	56	64	62	$10,000
946			1691+16.91	W	residential	56	66	62	$20,000
947			1691+16.05	E	residential	56	65	62	$15,000
951			1689+33.92	E	residential	56	65	62	$15,000
954			1686+52.89	E	residential	56	69	62	$30,000
958			1684+31.23	E	residential	56	65	62	$15,000
961			1682+67.13	E	residential	56	66	62	$20,000
963			1679+60.91	E	residential	56	66	62	$20,000
	Dean								
896			1845+71.10	E	residential	65	69	66	$15,000
898			1839+78.92	E	residential	65	69	66	$15,000
899			1839+17.11	W	residential	65	70	66	$20,000
902			1838+28.55	W	residential	65	70	66	$20,000
904			1836+67.41	E	residential	65	69	66	$15,000
906			1812+81.62	E	residential	65	70	66	$20,000
	Hart								
864			1903+77.64	W	residential	63	68	65	$15,000
870			1901+36.10	W	residential	63	69	65	$20,000
871			1899+96.58	E	residential	63	68	65	$15,000
873			1900+17.92	E	residential	63	69	65	$20,000
	Ingell								
878			1872+05.34	W	residential	57	64	62	$10,000
883			1870+37.80	W	residential	57	65	62	$15,000
	Longmeadow								
914			1783+99.15	E	residential	59	70	63	$30,000
927			1760+65.31	E	residential	59	69	63	$30,000
928			1761+07.78	E	residential	59	64	63	$5,000
929			1760+25.76	E	residential	59	64	63	$5,000
930			1760+60.66	E	residential	59	69	63	$30,000
	Plain								
843			1977+90.83	E	residential	55	62	61	$5,000
845			1975+95.18	E	residential	55	63	61	$10,000
850			1923+51.93	E	residential	55	62	61	$5,000
851			1919+83.93	E	residential	55	63	61	$10,000
853			1918+36.84	E	residential	55	63	61	$10,000
854			1917+61.13	W	residential	55	62	61	$5,000
	Chipaway								
545			2525+99.41	E	residential	60	65	63	$10,000
567			2503+80.40	W	residential	60	68	63	$25,000
575			2501+69.44	E	residential	60	66	63	$15,000
581			2500+57.59	E	residential	60	68	63	$25,000
591			2492+51.20	W	residential	60	67	63	$20,000
594			2491+54.26	W	residential	60	65	63	$10,000
	Elm & Walnut								
717			2307+07.39	E	residential	55	65	61	$20,000
718			2305+43.07	E	residential	55	65	61	$20,000
723			2298+61.29	E	residential	55	65	61	$20,000
	Forge								
738			2284+76.79	W	residential	55	63	61	$10,000
739			2283+05.58	W	residential	55	64	61	$15,000
742			2282+04.81	W	residential	55	65	61	$20,000
744			2280+43.12	W	residential	55	64	61	$15,000
763			2269+83.06	W	residential	55	63	61	$10,000
	High								
681			2345+04.44	E	residential	55	63	61	$10,000
683			2341+86.85	E	residential	55	63	61	$10,000
686			2342+66.62	E	residential	55	64	61	$15,000
Richmond (Colonial to Forge)									
768			2259+67.89	E	residential	60	68	63	$25,000

EASTON

RAYNHAM

TAUNTON

FREETOWN

Residence ID	Street	Town	Station #	Side of Track	Land Use	Noise Exposure (dBA) Existing	Noise Exposure (dBA) Project plus existing	FTA Criteria, L_{dn} (dBA) Severe Impact	FTA Criteria, L_{dn} (dBA) Cost Justified
Richmond (Bryant to Beechwood)		FREETOWN							
781			2210+19.22	E	residential	60	66	63	$15,000
	Simpson & Green								
699			2322+52.20	W	residential	44	60	59	$5,000
700			2321+39.95	W	residential	44	66	59	$30,000
702			2318+58.64	W	residential	44	64	59	$25,000
703			2319+02.63	W	residential	44	62	59	$15,000
707			2316+60.46	W	residential	44	69	59	$30,000
709			2317+16.25	E	residential	44	63	59	$20,000
	Gunner's	LAKEVILLE							
674			2345+75.38	E	residential	44	59	58	$5,000
	Howland								
728			2297+96.29	E	residential	55	62	61	$5,000
733			2293+71.55	W	residential	55	63	61	$10,000
735			2291+87.09	W	residential	55	65	61	$20,000
741			2284+07.29	W	residential	55	63	61	$10,000
745			2280+25.86	W	residential	55	65	61	$20,000
746			2278+32.37	W	residential	55	63	61	$10,000
	Malbone								
793			2162+70.78	E	residential	55	64	61	$15,000
	Adams								
788			2175+00.54	E	residential	45	66	59	$30,000
	Cotley								
819			2036+55.39	E	residential	49	60	59	$5,000
827			2025+97.32	E	residential	49	60	59	$5,000
830			2024+24.47	E	residential	49	63	59	$20,000
835			2020+57.21	E	residential	49	60	59	$5,000
837		BERKLEY	2020+59.89	E	residential	49	64	59	$25,000
839			2018+05.65	E	residential	49	62	59	$15,000
	Mill								
794			2153+13.68	E	residential	45	60	59	$5,000
796			2151+23.66	E	residential	45	60	59	$5,000
798			2149+63.63	E	residential	45	60	59	$5,000
	Myricks								
797			2149+97.42	E	residential	60	67	63	$20,000
799			2147+15.13	E	residential	60	67	63	$20,000
800			2147+39.19	E	residential	60	66	63	$15,000
	Padelford								
811			2105+67.47	E	residential	55	63	61	$10,000
812			2104+80.36	E	residential	55	65	61	$20,000
813			2102+81.12	E	residential	55	66	61	$25,000

Vibration Results and Mitigation Table

Milepost	Municipality	Street	Impacted Receptors	Length of Ballast Mat	Cost at $180/ft.	Cost per Receptor	Cost Effective
Stoughton Station to Myricks Junction							
19.2	Stoughton	Brock Street	1	400 feet	$72,000	$24,000	Yes
	Stoughton	Washington Street	2				
19.5	Stoughton	Rogers Drive/	8	1200 feet	$216,000	$21,600	Yes
	Stoughton	Plain Street	2				
19.6	Stoughton	Columbus Avenue	2	600 feet	$108,000	$54,000	No
19.9	Stoughton	Smyth Street/	2	400 feet	$72,000	$24,000	Yes
20.2	Stoughton	Washington Street	1				
20.3	Stoughton	Morton Street/	1	800 feet	$144,000	$48,000	No
	Stoughton	Washington Street	2				
20.4	Stoughton	Washington Street	1	200 feet	$36,000	$36,000	No
22.2	Easton	Partridge Way	1	200 feet	$36,000	$36,000	No
22.4	Easton	Mullen Lane	1	200 feet	$36,000	$36,000	No
22.5	Easton	Linden Street/	1	700 feet	$126,000	$42,000	No
	Easton	Elm Street	2				
22.8	Easton	Main Street	1	200 feet	$36,000	$36,000	No
23.0	Easton	Center Street/	10	3000 feet	$540,000	$20,770	Yes
	Easton	Williams Street/	2				
	Easton	Avis Circle/	1				
23.3	Easton	Baldwin Street/	13				
23.5	Easton	off Center Street	1	200 feet	$36,000	$36,000	No
23.7	Easton	Tait Avenue	4	800 feet	$144,000	$36,000	No
24.1	Easton	Gary Lane	2	500 feet	$90,000	$45,000	No
24.2	Easton	Laurel Drive	3	400 feet	$72,000	$24,000	Yes
24.5	Easton	Short Street/	6	1300 feet	$234,000	$23,400	Yes
	Easton	Lantern Lane	4				
24.9	Easton	Depot Street	1	200 feet	$36,000	$36,000	No
25.1	Easton	Purchase Street/	4	1100 feet	$198,000	$33,000	No
	Easton	Granite Lane	2				
25.5	Easton	Kennedy Circle	11	1800 feet	$324,000	$29,455	Yes
25.8	Easton	Prospect Street	3	400 feet	$72,000	$24,000	Yes
26.0	Easton	Justin Drive	1	200 feet	$36,000	$36,000	No
26.7	Easton	Foundry Street	2	400 feet	$72,000	$36,000	No
30.0	Raynham	off Bridge Street	1	200 feet	$36,000	$36,000	No
30.2	Raynham	Bridge Street	3	400 feet	$72,000	$24,000	Yes
30.4	Raynham	Elm Street West	6	600 feet	$108,000	$18,000	Yes
30.8	Raynham	Carver Street	2	250 feet	$45,000	$22,500	Yes
31.5	Raynham	Britton Street	9	500 feet	$90,000	$10,000	Yes
31.9	Raynham	Wampanoag Road/	5	2100 feet	$378,000	$29,075	Yes
	Raynham	King Philips Street/	5				
32.2	Raynham	Chickering Road	3				
33.5	Taunton	Thrasher Street/	4	600 feet	$108,000	$15,430	Yes
	Taunton	Malcolm Circle	3				
33.8	Taunton	Longmeadow Road	1	200 feet	$36,000	$36,000	No
34.3	Taunton	Dean Street	1	200 feet	$36,000	$36,000	No
34.8	Taunton	Summer Street	5	500 feet	$90,000	$18,000	Yes
35.0	Taunton	High Street/	5*	1200 feet	$216,000	$27,000	Yes
	Taunton	Paul Bunker Drive	3*				
35.4	Taunton	Ingell Street	2	400 feet	$72,000	$36,000	No

36.0	Taunton	Hart Street/	6	900 feet	$162,000	$14,730	Yes
	Taunton	Alegi Avenue	5				
36.4	Taunton	Williams Avenue/	1	1150 feet	$207,000	$29,570	Yes
	Taunton	Plain Street	6				
37.5	Taunton	Debra Drive/	3	1200 feet	$216,000	$54,000	No
	Taunton	Plain Street West	1				
38.3	Berkley	Crabapple Drive/	2	550 feet	$99,000	$49,500	No
38.4	Berkley	Cotley Street	1	200 feet	$36,000	$36,000	No
39.8	Berkley	Padelford Street	3	500 feet	$90,000	$30,000	Yes
40.5	Berkley	Mill Village Road	1	200 feet	$36,000	$36,000	No
40.6	Berkley	Myricks Street/	2	1300 feet	$234,000	$46,800	No
	Berkley	Grove Street	3				
Myricks Junction to New Bedford							
40.9	Lakeville	Malbone Street	1	200 feet	$36,000	$36,000	No
43.2	Lakeville	Howland Street	3	900 feet	$162,000	$54,000	No
43.5	Lakeville	Howland Street	3	900 feet	$162,000	$54,000	No
47.2	Freetown	Braley Road	5	700 feet	$126,000	$25,200	Yes
47.4	Freetown	Braley Road	3	600 feet	$108,000	$36,000	No
47.8	Freetown	Chipaway Drive	1	200 feet	$36,000	$36,000	No
51.5	New Bedford	Lynn Street	2	300 feet	$54,000	$27,000	Yes
53.5	New Bedford	Purchase Street	6	700 feet	$126,000	$21,000	Yes
53.8	New Bedford	Purchase Street	2	250 feet	$45,000	$22,500	Yes
Myricks Junction to Fall River							
40.6	Berkley	Mill Street	6	900 feet	$162,000	$27,000	Yes
41.2	Berkley	Adams Lane	2	250 feet	$45,000	$22,500	Yes
41.8	Freetown	Richmond Road	3	500 feet	$90,000	$30,000	Yes
42.0	Freetown	Richmond Road	2	400 feet	$72,000	$36,000	No
42.3	Freetown	Colonial Drive	1	200 feet	$36,000	$36,000	No
42.6	Freetown	Richmond Road	1	200 feet	$36,000	$36,000	No
42.8	Freetown	Richmond Road	1	200 feet	$36,000	$36,000	No
43.0	Freetown	Richmond Road	1	200 feet	$36,000	$36,000	No
43.3	Freetown	Forge Road	4	600 feet	$108,000	$27,000	Yes
43.6	Freetown	Elm Street	1	200 feet	$36,000	$36,000	No
43.7	Freetown	Elm Street	2	450 feet	$81,000	$40,500	No
43.9	Freetown	Green Lane/	3	1000 feet	$180,000	$45,000	No
	Freetown	Sampson Lane	1				
44.4	Freetown	High Street/	1	300 feet	$54,000	$27,000	Yes
	Freetown	Alexander Drive	1				
47.2	Fall River	Leeward Road	9	1200 feet	$216,000	$24,000	Yes
47.7	Fall River	Rolling Green Drive	3*	1100 feet	$198,000	<$30,000	Yes
48.7	Fall River	North Main Street	19	2600 feet	$468,000	$24,630	Yes
49.3	Fall River	North Main Street	1	200 feet	$36,000	$36,000	No
49.7	Fall River	Wayland Street	2	250 feet	$45,000	$22,500	Yes
49.8	Fall River	Alton Street	1	200 feet	$36,000	$36,000	No
50.2	Fall River	North Main Street	13	1000 feet	$180,000	$13,850	Yes
50.5	Fall River	Pickering Street/	3*	1000 feet	$180,000	$25,715	Yes
	Fall River	Clinton Street/	2				
	Fall River	St. James Street	2				
50.8	Fall River	Murry Street/	17	2000 feet	$360,000	$7,350	Yes
	Fall River	Cory Street/	6				
	Fall River	Ballard Street/	3				

	Fall River	Almy Street/	9				
	Fall River	Railroad Avenue/	1				
	Fall River	North Court Street/	7				
	Fall River	Brownell Street/	4				
	Fall River	Thompson Street	2				
51.2	Fall River	Dyer Street	3	400 feet	$72,000	$24,000	Yes
51.6	Fall River	Durfee Street/	4	700 feet	$126,000	$18,000	Yes
	Fall River	Cedar Street	3				
51.7	Fall River	MapleStreet	2*	400 feet	$72,000	$18,000	Yes
51.9	Fall River	Meadow Street	7	600 feet	$108,000	$15,430	Yes
Totals			**369**				

* Impacted receptors are multi-unit apartment buildings.

Appendix 4.8-A

Draft Programmatic Agreement

DRAFT V6

PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION FOR THE SOUTH COAST RAIL PROJECT, FALL RIVER/NEW BEDFORD TO BOSTON, MASSACHUSETTS

WHEREAS, the Massachusetts Department of Transportation (MassDOT) proposes to construct the South Coast Rail Project (Project) to establish electric passenger rail service between Fall River/New Bedford and Boston, extending the existing active Stoughton commuter rail line from its current terminus in Stoughton southward along a presently abandoned rail right-of-way through Easton and Raynham to Taunton, and from this point extending further south through upgrading of existing active freight rail tracks to accommodate passenger service via the Attleboro Secondary, which subsequently splits into the New Bedford Main Line to New Bedford and the Fall River Secondary to Fall River; the Project also includes new passenger rail stations, layover facilities and ancillary facilities, including power substations and catenary; and,

WHEREAS, the Project requires a Department of the Army (DA) Permit under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) for work in navigable waters of the United States, and Section 404 of the Clean Water Act (33 USC 1344) for the discharge of dredged or fill material into waters of the United States, including adjacent wetlands; and,

WHEREAS, MassDOT, in consultation with the United States Army Corps of Engineers (USACE) and the Massachusetts State Historic Preservation Officer (SHPO), conducted cultural resource studies for the Project in order to identify and evaluate historic properties located within the Area of Potential Effects (APE; defined in 36 CFR Part 800.16(d)), and listed or eligible for listing in the National Register of Historic Places (NRHP); and,

WHEREAS, the USACE has determined the Project will have effects to historic properties and that said effects are not yet fully determined since the specifics of the final design are not yet known, and has consulted with the SHPO and the Advisory Council on Historic Preservation (ACHP) pursuant to 36 CFR Part 800.6 and 800.14, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f); and,

WHEREAS the USACE has determined the Project will have an adverse effect on the H.H Richardson Historic District of North Easton National Historic Landmark and has consulted with the SHPO, ACHP and the National Park Service (NPS) pursuant to 36 CFR Part 800.6, 800.10(c) and 800.14, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f); and,

WHEREAS, the USACE has determined, in consultation with the SHPO, that the APE is defined by work types, operations and resource class as follows: (1) for below-ground resources: the rail corridors, stations (including boarding platforms, parking lots, access roads, and associated features), layover and maintenance facilities, electric substations, construction and staging areas, permanent access/maintenance road (new lane within existing right-of-way), and roads (new lane outside existing right-of-way, temporary and permanent access to proposed facilities, and intersections) within the area of direct impact resulting from proposed construction activities (the Permit Area, defined in 33 CFR Part 325, Appendix

Revised Draft

C, Section 1(g); (2) for above-ground resources the rail corridor within 800 feet (400 feet to either side of centerline), the stations within 250 feet from perimeter of proposed facility boundary, those locations associated with layover and maintenance facilities within 250 feet from perimeter of proposed facility boundary, those locations associated with construction laydown and staging areas within 250 feet from perimeter of proposed facility boundary, those locations associated with roads outside existing right-of-way as well as temporary and permanent access roads and intersections within 400 feet from proposed centerline; and, (3) Historic Properties of Religious and Cultural Significance to Indian Tribes to be determined in consultation with federally-recognized Indian Tribes known by the USACE to have an interest in the geographic region that includes the APE; and,

WHEREAS, the Tribal Historic Preservation Officers (THPOs) of the Wampanoag Tribe of Gay Head (Aquinnah), the Mashpee Wampanoag Tribe, and the Narragansett Indian Tribe, have been consulted and invited to sign the PA as concurring parties; and,

WHEREAS, the Berkley Historical Commission, Canton Historical Commission, City of New Bedford, Easton Historical Commission Fall River Historical Commission, Freetown Historical Commission, Lakeville Historical Commission, New Bedford Historical Commission, Stoughton Historical Commission, and the Taunton Historic District Commission were invited to participate in the consultation process but did not choose to do so and have therefore not been invited to concur in the PA; and,

WHEREAS, the USACE has issued a Final Environmental Impact Statement (FEIS) dated [month, day, year] to document efforts to identify and then avoid, minimize and mitigate adverse impacts to resources including historic properties; and,

WHEREAS, the USACE, in accordance with Section 800.2(d)(3), used the agency's procedures for public involvement under the National Environmental Policy Act (NEPA) to inform the public of the undertaking and solicit their views on the Project, and has distributed the FEIS to appropriate federal agencies, federally recognized Indian Tribes, state agencies and the public; and,

WHEREAS, pursuant to 36 CFR Section 800.13, the USACE and MassDOT, with concurrence from the SHPO and the ACHP have developed procedures in this PA to ensure that the identification and evaluation of historic properties, assessment of effects, consideration of avoidance alternatives, and development of treatment and mitigation plans for unforeseen effects to previously identified historic properties and/or historic properties discovered during implementation of the undertaking are properly coordinated with all phases of the design and construction of the undertaking; and,

NOW, THEREFORE, the USACE, the SHPO, MassDOT, NPS, and the ACHP agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account foreseen and unforeseen future effects to historic properties.

STIPULATIONS

USACE, in coordination with MassDOT, will ensure that the following measures are carried out.

I. PROJECT MONITORING

A. USACE affirms, and MassDOT concurs, that avoidance of adverse effects to historic properties remains the preferred course of action and that design activities may include the shifting of the project

Revised Draft

limits if necessary to avoid, minimize or mitigate adverse effects to historic properties, so long as same remains in compliance with the DA permit conditions or USACE-authorized modification thereto.

B. USACE and MassDOT will ensure that contractors involved in the implementation of all phases of the undertaking are aware of and comply with the requirements of the PA. Compliance with this the PA is required as a condition of the DA permit and a part of the project contract, and will be written into the project contract.

C. To ensure that avoidance or minimization of adverse effects to historic properties is the preferred option during design and construction, MassDOT will develop a Cultural Resource Monitoring Program specific to this project that will require a Cultural Resource Monitor (CRM) with specific responsibilities to coordinate the requirements of this agreement for the Project as the liaison for MassDOT and the USACE.

1. The CRM will meet the professional qualifications outlined in Stipulation XI.

2. Oversight for the Cultural Resource Monitoring Program will be provided by USACE and MassDOT to whom the CRM reports.

3. The CRM will act as the liaison and work cooperatively with USACE and MassDOT and its contractors throughout the design/bid/build program.

a. The design/bid/build program will require the contractor(s) to design individual sections of the Project, which have not yet been defined.

b. The CRM will provide the design and construction contractors with the list and locations of the above-ground and below-ground historic properties presented in Appendices A and B and undetermined historic properties listed in Appendix C. USACE and MassDOT will ensure that avoidance of adverse effects to historic properties is the preferred treatment during the design phase and will utilize all measures to avoid adverse effects. The design/bid/build program will take into account measures presented in Stipulation III.

c. During the design phase, the CRM will be available to assist the contractor regarding the status of the design as it relates to those historic properties identified in Appendices A and B. In addition, the availability of geotechnical data and access to previously inaccessible areas may result in information associated with undetermined historic properties listed in Appendix C. If known or undetermined historic properties may be affected, the CRM will notify USACE and MassDOT of the situation through submission of a report via electronic mail describing how the proposed design affects the known or undetermined historic property. USACE and MassDOT will review the report, consult with the SHPO, and take into account measures presented in Stipulation III.

d. When the design reaches 30 percent for a given section, the CRM will review all available plans and specifications and determine if the design might affect historic properties listed in Appendices A, B and C. If historic properties may be affected, the CRM will notify USACE and MassDOT of the situation through submission of a report via electronic mail describing the historic property, the location of the property and how the proposed design affects the property. USACE and MassDOT will review the report, consult with the SHPO, and take into account measures presented in Stipulation III.

Revised Draft

e. When the design reaches 60 percent for a given section, the CRM will review all available plans and specifications and determine whether the design might affect historic properties. If historic properties may be affected, the CRM will notify USACE and MassDOT of the situation through submission of a report via electronic mail describing the historic property, the location of the property and how the proposed design affects the property. USACE and MassDOT will review the report, consult with the SHPO, and take into account measures presented in Stipulation III.

f. When the design reaches 90 percent for a given section, the CRM will complete a review of all available plans and specifications. If historic properties may be affected, the CRM will notify USACE and MassDOT of the situation through submission of a report via electronic mail describing the historic property, the location of the property and how the proposed design affects the property. USACE and MassDOT will review the report, consult with the SHPO, and take into account measures presented in Stipulation III.

g. Prior to construction, the contractor will hold a field review meeting once the access, staging and temporary construction zones that may be required have been determined and detailed on construction plans. The design plans will be provided to the CRM, USACE, MassDOT and SHPO a minimum of 21 days before the field review meeting. It is expected that by the field review meeting the construction limits will be flagged and will define the maximum extent of ground disturbance. Comments of the field review meeting attendees will be addressed and take into account measures presented in Stipulation III before proceeding with initial ground disturbance.

d. The MassDOT and/or their contractor will also hold preconstruction field review meetings to review specific information related to individual property owners of historic properties and their concerns, including visual impacts, construction-related activities and scheduling. These meetings will be in the same format as the field review meetings, and will allow the CRM, USACE, and MassDOT and any other attendees to comment. USACE and MassDOT will review and consult with the SHPO before allowing construction to proceed if any new issues arise.

e. The preconstruction field meetings will provide an opportunity for the CRM, USACE, MassDOT, SHPO, other members of the public and the project team to comment on the plans prior to the initiation of ground-disturbing activities. Any unforeseen effects to historic properties listed in Appendices A and B will be resolved in accordance with Stipulation V below.

f. All design enhancements and/or aesthetic treatments that may affect historic properties will be subject to review and concurrence by the SHPO.

g. The contractor will hold weekly and as-needed construction field review meetings with the CRM to review ongoing construction. If theretofore unknown effects to historic properties may occur, or if there is an alteration to the construction plan, the CRM will notify USACE and MassDOT of the situation and provide them with a report via electronic mail describing the situation, the historic property, the location of the property and how the proposed design affects the property. USACE and MassDOT will review the report and consult with the SHPO before authorizing any work in that location.

h. The CRM shall provide the consulting parties with a schedule for the undertaking that includes opportunities for on-site reviews by the consulting parties. Should MassDOT modify the schedule, the consulting parties will typically be given 20 working days' notice.

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II. PUBLIC PARTICIPATION

A. USACE will utilize MassDOT to ensure that an active public participation program regarding effects on historic properties is carried out. MassDOT will develop and maintain a proactive communication program that will be led by MassDOT's Community Relations Liaison (CRL) for the Project. During final design, MassDOT will conduct periodic public briefing sessions, continue to maintain the project website, and provide information on potential construction impacts and mitigation plans to impacted communities and/or abutters. MassDOT and/or its Contractors will maintain a log of community concerns and responses, with action items and resolutions. During construction, MassDOT and its Contractors will maintain a database for communication with abutters, elected officials and interested members of the public. This database will be used to communicate construction plans, schedule information and updates. MassDOT will provide regular updates on construction progress via the website, media notices and social media, maintain a construction field office (or offices), and will provide a telephone hotline for resolving urgent issues or questions.

B. Should any member of the public raise an objection pertaining to the manner in which the terms of this Agreement are carried out, at any time during its implementation, the USACE shall take the objection into account by consulting with the objector to resolve the objection. When USACE responds to an objection, it shall notify MassDOT and the CRM of the objection and the manner in which it was resolved. USACE may request assistance of MassDOT and the CRM to resolve objections.

C. Consistent with Section 304 of the National Historic Preservation Act of 1966, as amended, the signatories and participating concurring parties to this Agreement will withhold from disclosure to the public, information about the location, character, or ownership of a historic property if it is determined that disclosure may (1) cause a significant invasion of privacy, or (2) risk harm to a historic property.

III. TREATMENT OF HISTORIC PROPERTIES

A. USACE will ensure that avoidance of adverse effects to any previously identified historic properties is the preferred alternative and will utilize all practicable measures to avoid adverse effects. If avoidance is not possible and an adverse effect will result, MassDOT will develop a Mitigation Plan, in consultation with USACE, the CRM and any other consulting parties, and submit the mitigation plan to the SHPO for review and concurrence. USACE shall direct MassDOT to implement the mitigation plan once it is approved by the SHPO. If, after consultation, USACE and the SHPO cannot agree on appropriate terms for the mitigation plan, USACE will refer the matter to the ACHP pursuant to Stipulation IX. The USACE and MassDOT will ensure that the following measures will be carried out and considered in the design and construction process.

B. Historic Buildings, Districts, National Historic Landmarks, Cemeteries

1. USACE and MassDOT shall avoid adverse effects to the above-ground historic properties listed in Appendix A. Known or expected impacts are provided in Appendix D.

2. As presently conceived (i.e., on the effective date of this Agreement), the Project has the potential to directly impact the Canton Junction Railroad Station, Meade Rubber Company, the Dighton and Somerset Line, and the North Main Street Area of Fall River Historic District.

Revised Draft

3. The Project may require reconstruction or widening of the Forge Pond Bridge, Weaver Street Railroad Bridge, and Central Street Road Bridge.

4. The Project may cause indirect effects associated with an alteration in setting, increased noise or vibration resulting from construction or operation to the remaining historic properties listed in Appendix D.

5. If avoidance is not possible through design change, minimization of any indirect effects should be designed to reduce ground disturbance, visual, noise and vibration levels as may be appropriate to the historic property.

6. If mitigation is required, the focus should be on maintaining the historic character, integrity and setting of the historic property through the use of vibration reduction techniques, noise barriers, and screening.

7. To the extent practicable, MassDOT will use compatible materials to minimize adverse visual impacts to historic structures and districts. All repair, rehabilitation, or modification of historic properties will be performed in accordance with the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties to the maximum extent practicable.

8. Construction staging and storage areas shall be located in protected areas outside historic districts and properties wherever possible, and in unobtrusive locations within historic districts or properties if alternative locations are not possible.

9. Clear-cutting of trees and vegetation along the railroad ROW that would result in an adverse visual impact on historic properties will be avoided to the maximum extent practicable. As documented in existing conditions pre-construction vegetation documentation, existing trees and vegetative screening will be retained to buffer historic properties from the rail line to the maximum extent practicable and with consideration for public safety, operational requirements, cost, and maintenance considerations.

10. USACE and MassDOT, in consultation with the SHPO, will develop a construction avoidance and protection plan for potential impacts to the historic Braley Cemetery in Freetown.

11. USACE and MassDOT, in consultation with the SHPO will conduct additional documentary research and field surveys, as necessary, to create historic property boundaries and conduct additional survey, if needed, for the Elisha Harvey Gravesite in relation to the Project, to complete the effects analysis, and develop a written avoidance and protection plan for the property prior to project construction activities.

C. Archaeological Resources

1. Where possible, USACE and MassDOT shall avoid affecting the NRHP-eligible archaeological sites listed in Appendix B.

2. USACE and MassDOT will complete any required subsurface survey (intensive [locational] and site examination) to make NRHP eligibility determinations and assess effects for those locations identified as archaeologically sensitive (Appendix C). If no archaeological sites are identified or sites are identified in disturbed stratigraphic contexts, then no further work will be required. If the survey and site examination identify NRHP-eligible site(s), then avoidance will be the preferred option. If avoidance is not possible and an adverse effect will result, MassDOT will develop a mitigation plan and once it is acceptable to the

Revised Draft

CRM provide it to USACE for review and consultation with other consulting parties who will have 20 working days for review and comment or concurrence. This mitigation plan will include a section evaluating design modifications for minimizing effects to historic properties. USACE shall direct MassDOT to implement the mitigation plan once the SHPO concurs with the plan. If, after consultation, USACE and the SHPO cannot agree on appropriate terms for the mitigation plan, USACE will refer the matter to the ACHP pursuant to Stipulation IX.

3. USACE and MassDOT will complete any required subsurface survey (intense [locational] and site examination) to make NRHP eligibility determinations and assess effects for those Project locations not currently identified or for which geotechnical information was not previously available, including catenary structures and work or construction equipment storage or staging areas. If no archaeological sites are identified or sites are identified in disturbed stratigraphic contexts, then no further work will be required. If the survey and site examination identify NRHP eligible site(s)),) then avoidance will be the preferred option. If avoidance is not possible and an adverse effect will result, MassDOT will develop a mitigation plan and once it is acceptable to the CRM provide it to USACE for review and consultation with other consulting parties who will have 20 working days for review and comment or concurrence. This mitigation plan will include a section evaluating design modifications for minimizing effects to historic properties. USACE shall approve and direct MassDOT to implement the mitigation plan once the SHPO concurs with the plan. If, after consultation, USACE and the SHPO cannot agree on appropriate terms for the mitigation plan, USACE will refer the matter to the ACHP pursuant to Stipulation IX.

D. Historic Properties of Religious and Cultural Significance to Indian Tribes

1. The USACE will continue consultation with federally-recognized Indian Tribes regarding historic properties of religious and cultural significance within the Project APE.

IV. UNANTICIPATED DISCOVERIES

A. If previously unidentified historic properties are identified during construction, then construction will cease in tan area sufficient to ensure there will be no inadvertent impacts, and the CRM will notify the USACE and MassDOT with information about the historic properties. USACE, in consultation with the CRM and other consulting parties, shall evaluate the historic properties to determine if they meet the NRHP criteria and request SHPO concurrence.

1. If the USACE and the SHPO agree that a property is eligible for listing on the NRHP, USACE, in cooperation with the CRM and any other consulting parties, will evaluate the potential effects to that historic property according to Stipulation III above.

2. If the USACE and the SHPO disagree regarding the NRHP eligibility of a property, or should the ACHP so request, the USACE will request a formal determination of eligibility from the Keeper of the NRHP. The historic property will be treated as eligible until the Keeper’s decision is rendered, and potential effects to the property will be evaluated according to Stipulation III above.

B. USACE will ensure that avoidance of adverse effects to any newly discovered eligible historic properties is the preferred alternative and will utilize all practicable measures to avoid adverse effects. If avoidance is not practicable and an adverse effect will result, MassDOT will develop a mitigation plan, and once it is acceptable to the CRM provide it to USACE for review and consultation with other consulting parties who will have 20 working days for review and comment or concurrence. This

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mitigation plan will include a section evaluating design modifications for minimizing effects to historic properties and take into account feasibility of engineering, cost, time and other appropriate factors. USACE shall approve and direct MassDOT to implement the mitigation plan once the SHPO concurs with the plan. If, after consultation, USACE and the SHPO cannot agree on appropriate terms for the mitigation plan, USACE will refer the matter to the ACHP pursuant to Stipulation IX.

V. UNFORESEEN EFFECTS

A. Based on Stipulation IV above, the USACE may identify unforeseen effects to historic properties. USACE, in consultation with the SHPO and MassDOT, along with input from the CRM and other consulting parties, shall evaluate the effects to the property according to 36 CFR Section 800.5.

1. If the USACE and the SHPO agree that a historic property will be adversely affected, then USACE will develop a suitable mitigation plan in consultation with the CRM and any other consulting parties and submit the mitigation plan to the SHPO for review and concurrence. USACE shall direct MassDOT to implement the mitigation plan once the Massachusetts SHPO concurs with the plan. If, after consultation, USACE and the Massachusetts SHPO cannot agree on appropriate terms for the mitigation plan, USACE will refer the matter to the ACHP pursuant to Stipulation IX of this PA.

2. If the USACE and the SHPO disagree regarding the effects to the property, the USACE will request the ACHP's opinion. The ACHP will advise the USACE of its opinion regarding the effects to the property. USACE will take into account the ACHP's opinion before making a final determination. If an adverse effect is found by USACE, MassDOT will develop a mitigation plan, which will be reviewed by the CRM before submittal to the USACE for approval and implementation by MassDOT in accordance with Stipulation III.

VI. CHANGE IN ELIGIBILITY OF HISTORIC PROPERTIES

A. Future refinements to the project design may result in the need for evaluation of NRHP eligibility for previously undetermined historic properties (which may include, but are not limited to, those properties listed in Appendices A and B). USACE, in consultation with MassDOT, the CRM and other consulting parties, shall evaluate the historic properties to determine if they meet the NRHP criteria and shall request SHPO concurrence according to Stipulation III above.

B. If any properties previously considered not eligible are determined eligible as a result of the provisions in this stipulation, then effects to those properties will be considered according to Stipulation III above.

1. If substantive new information is provided in writing to the USACE about a particular property that was previously determined not eligible, USACE will consider the information, apply NRHP criteria, and forward its determination of eligibility to the SHPO with a request for review and concurrence. The SHPO will inform the USACE within 20 working days whether or not it concurs with USACE's determination of eligibility for the property in question. If the USACE and the SHPO agree the criteria are met, the property shall be considered eligible. If the USACE and the SHPO agree the criteria are not met, the property will be considered not eligible. If the USACE and the SHPO do not agree on whether the criteria are met, the eligibility of the property will be resolved in accordance with Stipulation IX, below. Any such property will be treated as eligible while it is under review by USACE and the SHPO, and potential effects to the property will be evaluated according to Stipulation III above.

Revised Draft

2. Consistent with 36 CFR Part 800.4(c)(2), if the SHPO and the USACE disagree on NRHP eligibility for a particular property, or if the ACHP or the Secretary of Interior so requests, the USACE shall write to the Keeper of the NRHP and request a determination of eligibility in accordance with 36 CFR Part 63. Such properties will be treated as an eligible property while under review by the Keeper, and potential effects to the property will be evaluated according to Stipulation III above. The Keeper's determination of eligibility is binding.

VII. COORDINATION OF REVIEWS

A. The SHPO, ACHP, and the concurring parties will have a review period of 20 working days to comment on all documents, plans and specifications provided by the USACE under the terms of this PA. Alteration of the review time frame will require unanimous agreement among the USACE, MassDOT, SHPO and ACHP. If multiple historic properties are involved, the review time may be extended, as appropriate and based on unanimous agreement among the signatories.

B. The ACHP, at its discretion, may delegate its review of documents, plans and specifications required under the terms of this PA to the SHPO.

C. The CRM will provide any comments and recommendations directly to the USACE. If the SHPO, ACHP, and the concurring parties fail to provide comments within the designated review period, the USACE will assume their concurrence and proceed with the proposed action or activity.

VIII. PUBLIC OUTREACH AND EDUCATION

A. MassDOT will organize several opportunities for the public to learn about the results of the archaeological investigations and historical studies conducted for the Project. These opportunities may include: (1) public open houses; (2) a website that features information about the ongoing investigations; (3) public presentations for local communities, and avocational and professional audiences; (4) historic interpretive signs; at stations.; and (5) preparation of a public brochure/popular report and professional articles describing the investigations.

IX. DISPUTE RESOLUTION

A. Should any signatory object in writing within 10 working days to documents submitted for review pursuant to the terms of the PA, the USACE shall work with the disputing party to resolve the dispute. If USACE is unable to resolve the dispute, they will consult with the SHPO and ACHP to resolve the objection. If the USACE determines that the objection cannot be resolved, the USACE shall forward all documentation relevant to the dispute to the ACHP and request that the ACHP comment.

B. Within 10 working days after receipt of the pertinent documentation, the ACHP shall either:

1. Provide the USACE with recommendations to take into account in reaching a final decision regarding the dispute; or

2. Notify the USACE that the ACHP will comment in accordance with 36 CFR Section 800.7(c) and proceed to comment.

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C. Any ACHP comment provided in response to such request shall be taken into account by the USACE in accordance with 36 CFR Section 800.6(c)(4) with reference only to the subject of the dispute. The USACE responsibility to carry out all other actions and activities under this PA that are not the subject of the dispute remain unchanged.

X. EMERGENCY SITUATIONS

Should an emergency situation occur, which represents an imminent threat to public health or safety, or creates a hazardous condition, MassDOT shall immediately notify the USACE and SHPO of the condition that has initiated the situation and the measures taken to respond to the emergency or hazardous condition. Should the USACE or SHPO not concur, they will notify MassDOT within three (3) business days if the nature of the emergency or hazardous condition allows for such coordination.

XI. PROFESSIONAL QUALIFICATIONS

All cultural resource work carried out pursuant to this PA shall be performed by or under the direct supervision of qualified individuals in the appropriate historic preservation discipline meeting, at a minimum, the appropriate Federal qualifications set forth in 62 FR 3333707 (June 20, 1997). The professional disciplines include: Archaeology, History and Architectural History, and/or Architecture.

XII. AMENDMENTS

If USACE, ACHP, MassDOT, or the SHPO determines that the terms of this PA will not or cannot be carried out or that an amendment to its terms must be made, that party shall provide a written explanation for such a determination to all signatories and immediately consult with the other signatories to develop an amendment to this PA. The amendment will be effective on the date a copy is signed by USACE, ACHP, the SHPO, and MassDOT. If USACE, ACHP, and the SHPO cannot agree to appropriate terms to amend the PA, any one of these parties unilaterally may terminate the agreement in accordance with Stipulation XIII below.

XIII. TERMINATION

A. If the USACE determines that it cannot implement the terms of this PA, or if the SHPO or ACHP determine that the PA is not being properly implemented the USACE, SHPO or ACHP may propose to the other parties that the PA be terminated.

B. The party proposing to terminate this PA shall notify all parties to this PA accordingly in writing, explaining the reasons for termination and affording them at least 30 days to consult and seek alternatives to termination.

C. Should such consultation fail and the PA is terminated, the USACE shall either:

1. Consult in accordance with 36 CFR Section 800.6 to develop a new PA; or

2. Request the comments of the ACHP pursuant to 36 CFR Section 800.7 and take into account such comments in accordance with such section prior to continuing the undertaking.

XIV. SUNSET CLAUSE

Revised Draft

The terms of this PA are valid through completion of all phases of compensatory wetland mitigation, unless otherwise agreed to by the signatories to the PA.

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PROGRAMMATIC AGREEMENT IMPROVEMENTS TO SOUTH COAST RAIL PROJECT, FALL RIVER/NEW BEDFORD TO BOSTON, MASSACHUSETTS

Execution of this PA by USACE, and implementation of its terms evidence that USACE has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____
Chairman

U.S.ARMY CORPS OF ENGINEERS

By: _____ Date: _____
District Engineer, New England District, U.S. Army Corps of Engineers

MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: _____
State Historic Preservation Officer

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

By: _____ Date: _____
Secretary of Transportation

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PROGRAMMATIC AGREEMENT IMPROVEMENTS TO SOUTH COAST RAIL PROJECT, FALL RIVER/NEW BEDFORD TO BOSTON, MASSACHUSETTS

CONCUR:

MASHPEE WAMPANOAG TRIBE

By: _____ Date: _____

NARRAGANSETT INDIAN TRIBE

By: _____ Date: _____

WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH)

By: _____ Date: _____

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APPENDIX A

NATIONAL REGISTER-ELIGIBLE ABOVE-GROUND
HISTORIC PROPERTIES, STOUGHTON ALTERNATIVES

PROPERTY ID	TOWN	PROPERTY NAME/ LOCATION	ADDRESS	NRHP STATUS*; CRITERIA
Ca.C	Canton	Washington Street	Washington St	NRE;A, C
Ca.H	Canton	Washington Street/Canton Center	Washington Street/Canton Center	MHC-DOE
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman St	NRE;A, B, C
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere St	NRE;C
Ca.006	Canton	Canton Public Library	786 Washington St	MHC-DOE;A, C
Ca.007	Canton	Forge Pond Railroad Bridge	Between Washington and Bolivar Sts	MHC-DOE;C
Ca.024	Canton	Canton Water Works	44 Pine St	NRE;A, C
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Sts	NRE;A, C
St.022	Stoughton	Pearl Street Cemetery	Pearl St	NRE; A, C
St.023, St.B	Stoughton	Stoughton Town Hall	10 Pearl St	NRIND
St.024	Stoughton	Mystic Rubber Company	2 Canton St	NRE;A, C
St.025	Stoughton	Stoughton Old Colony Railroad Station	45-47 Wyman St	NRIND;A, C
St.026	Stoughton	Lucius Clapp Memorial Library	6 Park St	NRIND
St.046	Stoughton	Meade Rubber Company	25 Brock St	NRE;A, C
Ea.008, Ea.A, Ea.B (contributing)	Easton	Dighton & Somerset Line	Parallel to Mechanic Street from Elm Street to Main Street	Contributing in NRDIS, North Easton Historic District
Ea.B	Easton	North Easton Historic District	Elm, Lincoln, and Main Sts	NRDIS;A, C
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden Sts	NRE;A, C
Ea.D	Easton	H.H. Richardson Historic District	Elm and Main Sts	NHL, NRDIS;A, C
Ea.E	Easton	Center Street Area	Center St	NRE;A, C
Ea.F	Easton	Easton Center Area	Center, Depot, and Short Sts	NRE;A, C
Ea.G	Easton	Hayward - Pool Area	Foundry St	NRE;A, C

Revised Draft

PROPERTY ID	TOWN	PROPERTY NAME/ LOCATION	ADDRESS	NRHP STATUS*; CRITERIA
Ea.003	Easton	Old Colony Railroad Station	Off Oliver St on Railroad Right of Way	NRIND, in NHL District; A, C
Ra.001	Raynham	Residence and Barn	521 Prospect Hill	NRE
Ra.B	Raynham	Carver Street Area	Carver St, Broadway (Route 138)	NRE;A, C
Ra.011	Raynham	Dog Kennel and Track Property	385 Thrasher St	NRE;A
Ta.B	Taunton	Taunton Center Area	Dean, Park, and Summer Sts	NRE;A, C
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout city of Taunton	NRMPS; A, B, C, D
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Sts	NRE; A, C
Ta.18, Ta.C	Taunton	Dean-Hartshorn House	68 Dean St	NRIND, NRMPS, LHD
Ta.019, Ta.B, Ta.C	Taunton	Old Colony Railroad Station	40 Dean St	NRIND, NRMPS, LHD;A, C
Ta.020, Ta.B, Ta.C	Taunton	William Woodward House	117 Arlington St	NRIND, NRMPS, LHD; A, C
Ta.021, Ta.B, Ta.C	Taunton	Charles r. Atwood House	30 Dean St	NRIND, NRMPS, LHD; A, C
Ta.022, Ta.B, Ta.C	Taunton	Theodore Dean House	26 Dean St	NRIND, NRMPS, LHD;A, C
Ta.23, Ta.B, Ta.C	Taunton	C.J.H. Bassett House	20 Chestnut St	NRIND, NRMPS, LHD
Ta.28, Ta.B, Ta.C	Taunton	Abiezar Dean House	57 Summer St	NRIND, NRMPS, LHD
Ta.029, Ta.B, Ta.C	Taunton	Neck of Land Cemetery	Summer St	NRIND, NRMPS, LHD;A, C
Ta.89	Taunton	Cohannet Mills #3	120 Ingell St	NRIND
Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Sts	NRE;A, C
Be.006	Berkley	Residence	1 Macomber St	NRE;A, C
La.C	Lakeville	Assonet Cedar Swamp Area	Pierce Ave; County and Howland Rds; Freetown, Mill, and Malbone Sts	NRE;A, C, D
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	NRE; A, C
Ft.C	Freetown	Slab Bridge road area	Slab Bridge, Forge, Richmond, and Howland Rds	NRE; A, C
Ft.D	Freetown	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Sts	NRDIS;A, C

Revised Draft

PROPERTY ID	TOWN	PROPERTY NAME/ LOCATION	ADDRESS	NRHP STATUS*; CRITERIA
Ft.009	Freetown	Richmond Road / Maple Tree Crossing Bridge	Richmond Rd	MHC-DOE;C
NB.C	New Bedford	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Sts	NRDIS;A, C
NB.D	New Bedford	Wamsutta Mills Historic District	Acushnet Ave; Logan, North Point, and Wamsutta Sts	NRDIS;A, C
FR.N, FR.C	Fall River	American Printing Company-Metacomet Mill	Anawan St	NRMPS, NRDIS; A, C
FR.005, FR.C	Fall River	William Collins House	3775 North Main St	NRMPS, NRIND; A, C
FR.006, FR.C	Fall River	North Christian Congregational Church	3538 North Main St	NRMPS, NRIND; A, C
FR.010, FR.C	Fall River	Borden-Winslow House	3063 North Main St	NRMPS, NRIND; A, C
FR.012, FR.C	Fall River	Canedy, Squire William B. House	2634 North Main St	NRMPS, NRIND; A, C
FR.013	Fall River	William H. Wiley Middle School	2585 North Main St	NRE
FR.015.FR.C	Fall River	Border City Mills-Mill #2	1 Weaver St	NRMPS, NRIND; A, C
FR.016	Fall River	Weaver Street Railroad Bridge	Weaver St	MHC-DOE; A, C
FR.017	Fall River	Residence	311 Crescent St	NRE;A, C
FR.026, FR.C	Fall River	Brightman, Hathaway House	205 Crescent St	NRIND;A, C
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex St	NRE; A, C
FR.066, FR.C	Fall River	St. Joseph's Roman Catholic Church	1355 North Main St	NRIND, NRMPS A, C
FR.067	Fall River	Cotton Warehouse	7 Oregon St	NRE;A, C
FR.070, FR.M	Fall River	Al Mac's Diner	135 President Ave	NRMPS, NRIND;A, C
FR.081	Fall River	Residence	524 Durfee St	NRE; A C
FR.082	Fall River	Lafayette-Durfee House	94 Cherry St	NRIND;A, C
FR.084	Fall River	Central Street Bridge over Quequechan River	Central St	MHC-DOE;C
FR.089	Fall River	Borden and Remington Company	85-115 Anawan St	NRE;A, C

Revised Draft

PROPERTY ID	TOWN	PROPERTY NAME/ LOCATION	ADDRESS	NRHP STATUS*; CRITERIA
FR.003	Fall River	Jael Hathaway House	4042 North Main St	NRE;A, C
FR.052	Fall River	St Matthew's Convent	189 Wellington Street	NRE;A, C
FR.053	Fall River	St Matthew's School	231 Wellington Street	NRE;A, C
FR.110	Fall River	St. John's Cemetery	Brightman and St. Mary Streets	NRE;A, C
NB.G	New Bedford	National Spun Silk Co. – Oneko Mills	Brook St	NRE; A, C
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King St	NRE;A, C
NB.012	New Bedford	Belleville Warehouse Company Cotton Storage Building	51 King St	NRDOE;A, C
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County St	NRE;A, C
NB.029	New Bedford	Christ Presbyterian Church	1097 County St	NRE;C
NB.053	New Bedford	Purchase Street Fire Station	2071 Purchase St	NRE;A, C
NB.063	New Bedford	Union Street Railway Carbarn	1959 Purchase St	NRIND, NRDIS-C;A
NB.065	New Bedford	Dawson Building	1843-1855 Purchase St	NRIND, NRDIS-C;A, C
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co., North Stores	19 Jean St	NRE;A, C
FR.C	Fall River	Fall River Multiple Resource Area	Multiple	NRMPS;A, B, C
FR.D	Fall River	North Main Street Area	North Main St	NRE;A, C
FR.E, FR.C	Fall River	Border City Mills	Weaver and West Sts	NRDOE, NRMPS;A, C
FR.F, FR.C	Fall River	Sagamore Mill Nos. 1 and 3	Ace St	NRMPS, NRDIS;A, C
FR.G, FR.C	Fall River	Sagamore Mill No. 2	North Main St	NRMPS, NRDIS;A, C
FR.H, FR.C	Fall River	Foster Spinning Company	Cove St	NRMPS, NRDIS;A, C
FR.J, FR.C	Fall River	Narragansett Mills	North Main St	NRMPS, NRDIS; A, C
FR.K. FR.C	Fall River	North Burial Ground	North Main St	NRMPS, NRDIS; A, B, C
FR.L	Fall River	Durfee Street Area	North Main and Durfee Sts	NRE; A, C

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PROPERTY ID	TOWN	PROPERTY NAME/ LOCATION	ADDRESS	NRHP STATUS*; CRITERIA
FR.M	Fall River	Diners of Massachusetts	multiple	NRMPS; A, C

*NRHP Status	
NHL	National Historic Landmark
NRDIS	National Register Historic District
NRIND	Property individually listed in the National Register
NRMPS	District or Property individually listed in the National Register as part of a NRMPS
NRDOE	Property formally determined eligible by Keeper of the National Register
MHC-DOE	Property evaluated as eligible by MHC
NRE	Property National Register eligible, MHC Concurrence on 2/21/2013, 4/3/2013
NRDIS-C	Property contributing to an NRHP-listed district
LL	Property individually listed in the State Register
LHD	Property located in a State Register-listed historic district

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APPENDIX B

NATIONAL REGISTER-ELIGIBLE ARCHAEOLOGICAL SITES, STOUGHTON ALTERNATIVES

SITE NAME	PROJECT ELEMENT/RAIL SEGMENT	NRHP** CRITERIA	MHC CONCURRENCE, DATE
King Philip Street	Stoughton Line	NRE; D	4/3/2013
Chickering Road Site	Stoughton Line	NRE; D	4/3/2013
East Britannia Street Site	Stoughton Line	NRE; D	4/3/2013
Skunk Trapper Site	Stoughton Line	NRE; D	4/3/2013
Saws Wood Site	Stoughton Line	NRE; D	4/3/2013
Quartz Vein Site	Fall River Secondary	NRE; D	4/3/2013
Circling Hawk Site	Fall River Secondary	NRE; D	4/3/2013
Cold Toad Site	Fall River Secondary	NRE; D	4/3/2013
Overlook Site North	Fall River Secondary	NRE; D	4/3/2013
Overlook Site South	Fall River Secondary	NRE; D	4/3/2013
Braley Cemetery* (MHC #FRE.823)	Fall River Secondary	N/A	4/3/2013
Elisha Harvey Gravesite/Harvey Cemetery*	Stoughton Line	Undetermined, within an existing NRHP District	Pending (Avoidance)

* Not recommended eligible, but measures are required to protect marked/unmarked graves from project disturbance

**NRE National Register eligible

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APPENDIX C

KNOWN LOCATIONS WHERE INTENSIVE (LOCATIONAL) SURVEY MAY BE REQUIRED

PROJECT LOCATION	RAIL SEGMENT	SENSITIVITY ASSESSMENT	SURVEY RECOMMENDATION
Route 138 Grade Separation	Stoughton Line	Conditional Low/No Sensitivity	Intensive Survey may be required; pending soil boring review for catenary structures
Canton to New Bedford-Fall River active and inactive ROWs*	Stoughton Line, Fall River Secondary, New Bedford Main Line	Conditional Low/No Sensitivity	Intensive Survey may be required; pending soil boring review for catenary structures
Stoughton Station and realigned tracks	Stoughton Line	Moderate sensitivity for pre-contact , nineteenth/twentieth-century resources	Sensitivity may be refined with additional soil boring data; Intensive Survey required if sensitive areas cannot be avoided

* Excludes sensitive ROW areas subjected to 2012 Intensive Survey: Stoughton Line, Southern Triangle (Fall River Secondary and New Bedford Main Line)

In addition to the locations listed above, it is expected that unknown locations including access roads, staging or temporary construction areas, and catenary locations will be identified as the Project proceeds.

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APPENDIX D
EXPECTED IMPACTS TO HISTORIC PROPERTIES

PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
Ca.C	Washington Street	Washington St		X	X	V
Ca.H	Washington Street/Canton Center	Washington Street/Canton Center		X	X	V
Ca.001	Canton Junction Railroad Station	666 Sherman St	X		X	P,V
Ca.002	Revere Copper Company Railroad Embankment	Revere St			X	
Ca.006	Canton Public Library	786 Washington St			X	V
Ca.007	Forge Pond Railroad Bridge	Between Washington and Bolivar Sts	X			P
Ca.024	Canton Water Works	44 Pine St		X	X	V
St.B	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Sts		X	X	N,V
St.022	Pearl Street Cemetery	Pearl St		X	X	V
St.023, St.B	Stoughton Town Hall	10 Pearl St		X	X	V
St.024	Mystic Rubber Company	2 Canton St			X	
St.025	Stoughton Old Colony Railroad Station	45-47 Wyman St			X	V
St.026	Lucius Clapp Memorial Library	6 Park St		X		

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
St.046	Meade Rubber Company	25 Brock St	X			P
Ea.008, Ea.A, Ea.B (contributing)	Dighton & Somerset Line	Parallel to Mechanic Street from Elm Street to Main Street	X		X	P,V
Ea.B	North Easton Historic District	Elm, Lincoln, and Main Sts		X	X	N,V
Ea.C	Holmes-Linden Street Area	Holmes and Linden Sts		X	X	N,V
Ea.D	H.H. Richardson Historic District	Elm and Main Sts		X	X	N,V
Ea.E	Center Street Area	Center St		X	X	N,V
Ea.F	Easton Center Area	Center, Depot, and Short Sts		X	X	N,V
Ea.G	Hayward - Pool Area	Foundry St		X	X	N,V
Ea.003	Old Colony Railroad Station	Off Oliver St on Railroad Right of Way			X	V
Ra.001	Residence and Barn	521 Prospect Hill				
Ra.B	Carver Street Area	Carver St, Broadway (Route 138)		X	X	N,V
Ra.011	Dog Kennel and Track Property	385 Thrasher St		X	X	V
Ta.B	Taunton Center Area	Dean, Park, and Summer Sts		X	X	N,V
Ta.C	Taunton Multiple Resource Area	Multiple Throughout city of Taunton				

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
Ta.D	High Street Area	High, Weir, and Somerset Sts		X	X	N,V
Ta.L	Hart Street Area	Hart St		X	X	N,V
Ta.18, Ta.C	Dean-Hartshorn House	68 Dean St		X	X	N,V
Ta.019, Ta.B, Ta.C	Old Colony Railroad Station	40 Dean St			X	
Ta.020, Ta.B, Ta.C	William Woodward House	117 Arlington St		X	X	N,V
Ta.021, Ta.B, Ta.C	Charles R. Atwood House	30 Dean St		X	X	N,V
Ta.022, Ta.B, Ta.C	Theodore Dean House	26 Dean St		X	X	N,V
Ta.029, Ta.B, Ta.C	Neck of Land Cemetery	Summer St		X	X	N,V
Ta.89	Cohannet Mills #3	120 Ingell St			X	
Be.C	Myricks Street Area	Myricks, Grove, and Mill Sts		X	X	N,V
Be.006	Residence	1 Macomber St		X	X	N,V
La.C	Assonet Cedar Swamp Area	Pierce Ave; County and Howland Rds; Freetown, Mill, and Malbone Sts		X	X	N,V
La.024	Peirce and Haskins Cemetery	Off Adams Lane		X	X	N,V
Ft.C	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Rds		X	X	N,V

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
Ft.D	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Sts		X	X	N,V
Ft.009	Richmond Road / Maple Tree Crossing Bridge	Richmond Rd			X	V
NB.C	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Sts		X	X	N,V
NB.D	Wamsutta Mills Historic District	Acushnet Ave; Logan, North Point, and Wamsutta Sts		X	X	N,V
FR.N, FR.C	American Printing Company-Metacomet Mill	Anawan St			X	V
FR.005, FR.C	William Collins House	3775 North Main St		X	X	V
FR.006, FR.C	North Christian Congregational Church	3538 North Main St		X	X	V
FR.010, FR.C	Borden-Winslow House	3063 North Main St			X	N,V
FR.012, FR.C	Canedy, Squire William B. House	2634 North Main St			X	V
FR.017	Residence	311 Crescent St		X	X	V
FR.026, FR.C	Brightman, Hathaway House	205 Crescent St		X	X	V

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
FR.050	St. Michael's Roman Catholic Church	207 Essex St		X	X	N,V
FR.066, FR.C	St. Joseph's Roman Catholic Church	1355 North Main St		X		
FR.067	Cotton Warehouse	7 Oregon St			X	V
FR.070, FR.M	Al Mac's Diner	135 President Ave		X	X	V
FR.081	Residence	524 Durfee St		X	X	V
FR.082	Lafayette-Durfee House	94 Cherry St		X	X	V
FR.084	Central Street Bridge over Quequechan River	Central St			X	V
FR.089	Borden and Remington Company	85-115 Anawan St			X	
FR.003	Jael Hathaway House	4042 North Main St		X		
FR.052	St Matthew's Convent	189 Wellington Street		X	X	N,V
FR.053	St Matthew's School	231 Wellington Street		X	X	N,V
FR.110	St. John's Cemetery	Brightman and St. Mary Streets		X		
NB.G	National Spun Silk Co. – Oneko Mills	Brook St			X	
NB.011	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King St			X	

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
NB.012	Belleville Warehouse Company Cotton Storage Building	51 King St			X	
NB.026	Pierce Brothers Textile Mill Complex	1125-1129 County St			X	
NB.029	Christ Presbyterian Church	1097 County St			X	V
NB.053	Purchase Street Fire Station	2071 Purchase St			X	V
NB.063	Union Street Railway Carbarn	1959 Purchase St			X	
NB.065	Dawson Building	1843-1855 Purchase St			X	V
NB.081	New Bedford Cotton Storage Warehouse Co., North Stores	19 Jean St			X	
FR.C	Fall River Multiple Resource Area	Multiple				
FR.D	North Main Street Area	North Main St	X	X	X	P,N,V
FR.E, FR.C	Border City Mills	Weaver and West Sts			X	
FR.F, FR.C	Sagamore Mill Nos. 1 and 3	Ace St			X	
FR.G, FR.C	Sagamore Mill No. 2	North Main St			X	
FR.H, FR.C	Foster Spinning Company	Cove St			X	
FR.J, FR.C	Narragansett Mills	North Main St			X	
FR.K. FR.C	North Burial Ground	North Main St		X	X	N,V

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PROPERTY ID	PROPERTY NAME/ LOCATION	ADDRESS	Physical (Direct)	Noise (Indirect)	Visual (Indirect)	Adverse Effect (P, N, V)
FR.L	Durfee Street Area	North Main and Durfee Sts		X	X	N,V
FR.M	Diners of Massachusetts	multiple		X	X	V

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Appendix 4.8-B

Historic Resources Intensive Survey, Evaluation and Effects (1/16/2013) and Addendum (5/17/2013)

Technical Report

HISTORIC RESOURCES INTENSIVE SURVEY, EVALUATION, AND EFFECTS, SOUTH COAST RAIL PROJECT

Canton, Stoughton, Easton, Raynham, Taunton, Berkley, Lakeville, Freetown, New Bedford, Fall River

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January 2013

MANAGEMENT ABSTRACT

The Massachusetts Department of Transportation (MassDOT) is planning for the South Coast Rail Project in Canton, Stoughton, Easton, Raynham, Taunton, Berkley, Lakeville, Freetown, New Bedford, and Fall River within Southeastern Massachusetts. PAL prepared this report in support of the Final Environmental Impact Statement (FEIS) / Final Environmental Impact Report (FEIR) for the U.S. Army Corps of Engineers (USACE) and the MassDOT. The report presents the results of the historic resources intensive survey, National Register of Historic Places (National Register) and State Register of Historic Places (State Register) eligibility evaluation completed by PAL for the Stoughton Electric Alternative and the Whittenton Electric Alternative. The Area of Potential Effect (APE) for historic properties encompasses direct (construction) and indirect (atmospheric, noise, vibration, visual (setting), and traffic) effects, including a corridor that measures at least 400 feet from either side of the right-of-way center line with proposed 22-foot tall catenary, and up to 400 feet from the boundary of a proposed grade crossing, station, traction power, or other facility parcel. The report encompasses historic properties that are National Historic Landmarks (NHL), or that are listed or determined eligible for listing in the State and National Registers, and updates information about these historic properties in the cultural resources reports for the Draft Environmental Impact Statement (DEIS) / Draft Environmental Impact Report (DEIR). It also includes an intensive survey and eligibility evaluation of historic resources identified for further study in the cultural resources reports for the DEIS/DEIR. The intensive historic resources survey identifies all historic properties (those properties listed in or eligible for inclusion in the State and National Registers) within the APE of the South Coast Rail project Preferred Alternative. The survey methodology consists of background research, field survey, eligibility evaluation, and completion of Massachusetts State Historic Preservation Office (MA SHPO)/ Massachusetts Historical Commission (MHC) inventory forms for the selected historic resources.

The intensive survey resulted in the identification of 19 historic areas/districts and 43 individual properties that are listed in or previously determined eligible for listing in the National Register, including 1 NHL. An additional 20 historic areas/districts and 23 individual properties are recommended as eligible for State and National Register listing. The USACE and the MA SHPO will review this information to reach a Consensus Determination of Eligibility for the National Register for these historic properties. Twenty properties were found ineligible for the National Register, one property has been demolished, and one property is now outside the APE. The report also presents the results of an update and assessment of the effects of the South Coast Rail Project on all district and individual historic properties from the DEIS/DEIR. Project effects are assessed for a combined total of 39 historic areas/districts and 66 individual properties. The USACE and MassDOT will use the information on the historic properties in the report to finalize a Determination of Effect, undertake consultation, and develop mitigation under Section 106 of the National Historic Preservation Act and related state laws.

Table of Contents

Management Abstract ..... **i**

INTRODUCTION **1**

1.1 Report Scope 1
1.2 Project Description 1
1.3 Project Authority 3
1.4 Integration of Previous Reports 3
1.5 Project Personnel 4
1.6 Disposition of Project Materials 4

METHODOLOGY **5**

2.1 Project Goals 5
2.2 Area of Potential Effect 6
2.3 Archival Research 6
2.4 Field Survey 7
2.5 Inventory Forms 7
2.6 National Register Criteria for Evaluation 7
2.7 State Register of Historic Places 8
2.8 Information Presentation 8

NATIONAL REGISTER AND/OR STATE REGISTER LISTED **9**

3.1 Canton Summary of Historic Properties 10
3.1.1 Historic Districts 10
3.1.2 Individual Properties 10
3.2 Stoughton Summary of Historic Properties 11
3.2.1 Individual Properties 11
3.3 Easton Summary of Historic Properties 12
3.3.1 National Historic Landmarks (Districts and Individual Properties) 13
3.3.2 Historic Districts 13
3.3.3 Individual Properties 14
3.4 Raynham Summary of Historic Properties 15
3.5 Taunton Summary of Historic Properties 15
3.5.1 Historic Districts 15
3.5.2 Individual Properties 18
3.5.3 Local Historic Districts (State Register Only) 25
3.6 Berkley Summary of Historic Resources 26
3.7 Lakeville Summary of Historic Properties 26
3.8 Freetown Summary of Historic Properties 26

3.8.1 Historic Districts 26
3.8.2 Individual Properties 27
3.9 New Bedford Summary of Historic Resources 27
3.9.1 Historic Districts 27
3.10 Fall River Summary of Historic Resources 29
3.10.1 Historic Districts 29
3.10.2 Individual Properties 33

INTENSIVE SURVEY AND NATIONAL REGISTER EVALUATION RESULTS 37

4.1 Canton Historic Resources Intensive Survey 37
4.1.1 Areas/Districts Recommended National Register Eligible 37
4.1.2 Individual Properties Recommended National Register Eligible 39
4.2 Stoughton Historic Resources Intensive Survey 41
4.2.1 Areas/Districts Recommended National Register Eligible 41
4.2.2 Individual Properties Recommended National Register Eligible 42
4.3 Easton Historic Resources in Intensive Survey 43
4.3.1 Areas/Districts Recommended National Register Eligible 43
4.4 Raynham Historic Resources Intensive Survey 45
4.4.1 Areas/Districts Recommended National Register Eligible 45
4.4.2 Individual Properties Recommended National Register Eligible 46
4.4.3 Historic Resources Not Eligible for National Register 46
4.5 Taunton Historic Resources Intensive Survey 47
4.5.1 Areas/Districts Recommended National Register Eligible 47
4.5.2 Individual Properties Recommended National Register Eligible 51
4.5.3 Historic Resources Not Eligible for National Register 52
4.6 Berkley Historic Resources Intensive Survey 54
4.6.1 Areas/Districts Recommended National Register Eligible 55
4.6.2 Individual Properties Recommended National Register Eligible 55
4.7 Lakeville Historic Resources Intensive Survey 56
4.7.1 Areas/Districts Recommended National Register Eligible 56
4.7.2 Individual Properties Recommended National Register Eligible 56
4.7.3 Historic Resource Not Eligible for National Register 57
4.8 Freetown Historic Resources Intensive Survey 57
4.8.1 Areas/Districts Recommended National Register Eligible 57
4.8.2 Individual Properties Recommended National Register Eligible 58
4.8.3 Historic Resource Not Eligible for National Register 58
4.9 New Bedford Historic Resources Intensive Survey 58
4.9.1 Areas/Districts Recommended National Register Eligible 59
4.9.2 Individual Properties Recommended National Register Eligible 59
4.9.3 Historic Resources Not Eligible for National Register 62
4.10 Fall River Summary of Historic Resources 63
4.10.1 Areas/Districts Recommended National Register Eligible 63
4.10.2 Individual Properties Recommended National Register Eligible 64
4.10.3 Historic Resources Not Eligible for National Register 67

4.11 Historic Resources Demolished or Outside of APE 70
4.11.1 Demolished 70
4.11.2 Outside of Project APE 71
4.12 Summary of Historic Resources by Community 72
4.12.1 Canton 72
4.12.2 Stoughton 72
4.12.3 Easton 72
4.12.4 Raynham 73
4.12.5 Taunton - Summary of Project Effects 73
4.12.6 Berkley 73
4.12.7 Lakeville 73
4.12.8 Freetown 74
4.12.9 New Bedford 74
4.12.10 Fall River 74

PROJECT EFFECTS AND MITIGATION 75

5.1 Stoughton Alternative and Whittenton Alternative 76
5.1.1 Stoughton Alternative 76
5.1.2 Whittenton Alternative 77
5.2 Effects to Historic Properties 78
5.2.1 Direct Impacts 78
5.2.2 Indirect Impacts 79
5.3 Stations 82
5.3.1 Canton Center 82
5.3.2 Stoughton 82
5.3.3 North Easton 83
5.3.4 Easton Village 83
5.3.5 Raynham Place 84
5.3.6 Taunton 84
5.3.7 Dana Street 84
5.3.8 Taunton Depot 85
5.3.9 King's Highway 85
5.3.10 Whale's Tooth 85
5.3.11 Freetown 85
5.3.12 Fall River Depot 86
5.3.13 Battleship Cove 86
5.4 Layover Facilities 86
5.4.1 Wamsutta 87
5.4.2 Weaver's Cove East 87
5.5 Summary of Project Effects 88
5.5.1 Stoughton Alternative 88
5.5.2 Whittenton Alternative 89
5.6 Mitigation 89
5.6.1 Process and Regulations 89
5.6.2 Avoidance 90

5.6.3 Minimization 90
5.6.4 Mitigation 90

References 93

APPENDICES

A. Lists of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties, and Project Effects

B. USGS Quadrangle Maps Showing Location of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties

C. Project Aerial Maps Showing Location of All Properties Surveyed, including National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties

D. Photographs of National Register Listed and Determined Eligible Properties

E. Historic Properties Surveyed and Eligible, Forms and Evaluation Sheets

E-1 AREAS *(alphabetical by community)*

E-2 Individual Properties *(alphabetical by community)*

F. Historic Resources Surveyed and Not Eligible, Forms Out of APE or Demolished

G. List of Terms and Acronyms

H. Correspondence

List of Figures

Figure No.	Description	Page
Figure 1-1.	Stoughton Alternative and Whittenton Alternative Project Alignment	2

List of Tables

Table No.	Description	Page
Table 3-1.	Summary of National Register Listed and Determined Eligible Historic Properties	9
Table 4-1.	Summary of Historic Resources Intensive Survey and National Register Eligibility Evaluations	38
Table 5-4	Stoughton Alternative – Summary of Effects	90
Table 5-5.	Whittenton Electric Option – Summary of Effects	91

1

Introduction

1.1 Report Scope

This *Technical Report, Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, Southeast Massachusetts* addresses historic properties within the Stoughton Electric Alternative and the Whittenton Electric Alternative of the Massachusetts Department of Transportation's (MassDOT) South Coast Rail Project (Figure 1-1). PAL prepared this report in support of the Final Environmental Impact Statement (FEIS) / Final Environmental Impact Report (FEIR) for the U.S. Army Corps of Engineers (USACE) and the MassDOT. The report presents the results of the historic resources intensive survey, including National Register of Historic Places (National Register) and State Register of Historic Places (State Register) eligibility evaluations and assessment of project effects under Federal and State laws and regulations. The survey encompasses Stoughton Line, Fall River Secondary, New Bedford Main Line, Whittenton Branch, and Attleboro Secondary railroad right-of-way segments in the communities of Canton, Stoughton, Easton, Raynham, Taunton, Berkley, Freetown, Lakeville, New Bedford and Fall River. It present results for the entire Stoughton Electric Alternative, as well as for the Whittenton Electric Alternative.

1.2 Project Description

The South Coast Rail Project FEIS/FEIR evaluates two alternatives: Stoughton Electric Alternative and the Whittenton Electric Alternative. The Stoughton Alternative would provide commuter rail service using electric powered locomotives from South Station through Stoughton to New Bedford and Fall River using the Stoughton Line, New Bedford Main Line and Fall River Secondary. The Whittenton Alternative would use the Whittenton Branch and a segment of the Attleboro Secondary. Train service would be provided from South Station to Fall River and to New Bedford by extending the existing Stoughton Line service. Out-of-service track would be restored from Stoughton Station to Dean Street in Taunton. Trains would use the New Bedford and Fall River lines to reach the terminal stations. For the Stoughton Alternative, track infrastructure improvements would be required along the Stoughton Line, the New Bedford Main Line, and the Fall River Secondary Line. The Whittenton Alternative would also require improvements along the Whittenton Branch, and a portion of the Attleboro Secondary. Overhead catenary and supporting electrical system infrastructure would be required. A frontage road would be constructed in Stoughton to eliminate grade crossings and a new grade separation would be built at Route 138 in Raynham. An 1.6 mile-long trestle would be constructed in Raynham and Easton within the Hockomock Swamp (from approximately Foundry Street south to the Raynham Dog Track). The project plans include rail right-of-way,

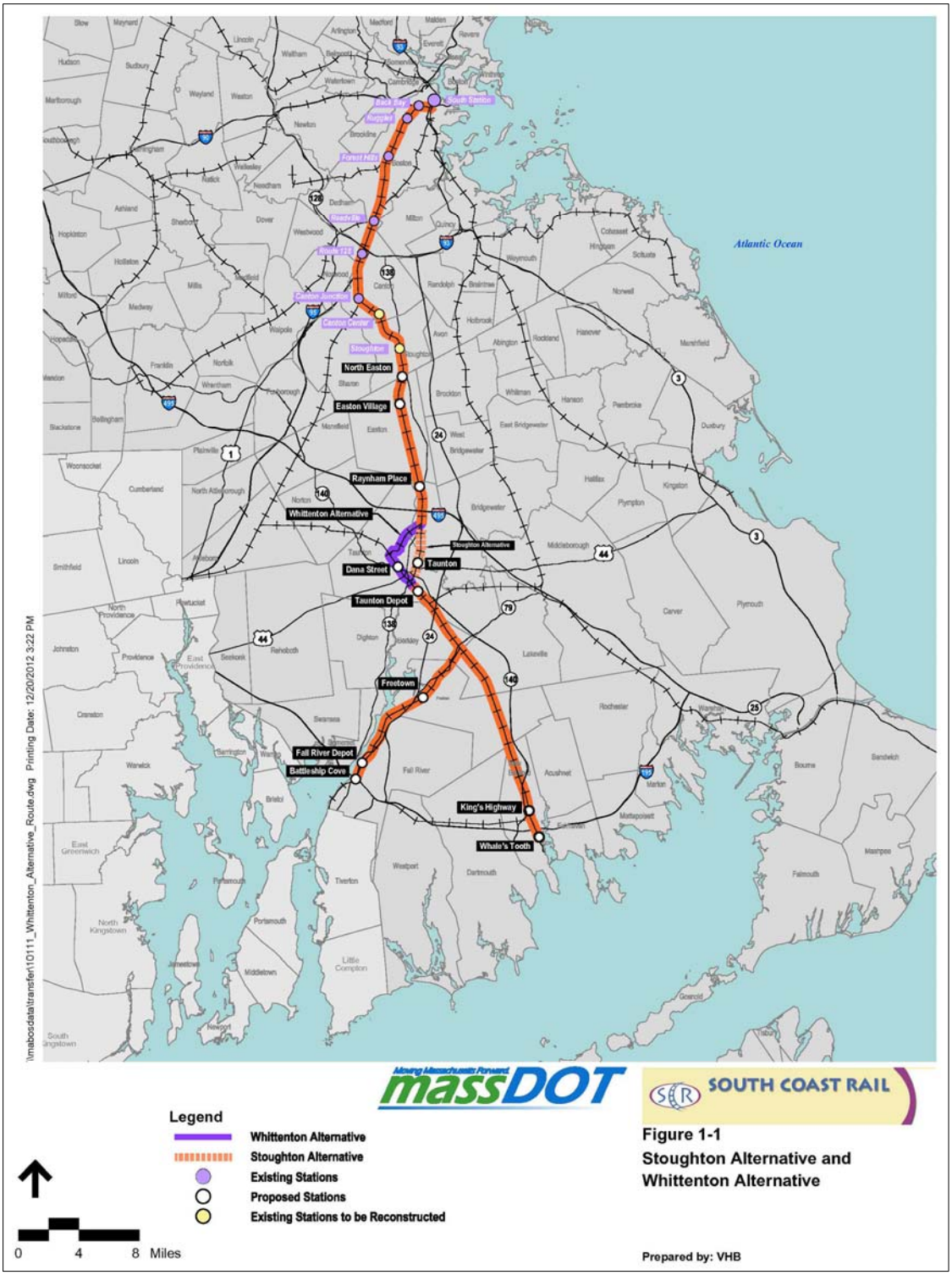

Figure 1-1. Stoughton Alternative and Whittenton Alternative Project Alignment.

existing and new stations, catenary and traction power facilities, layover and maintenance facilities, and utilities and construction staging areas.

New stations for the Stoughton Alternative include: North Easton at the Stoughton/Easton town line; Easton Village in Easton; Raynham Place in Raynham; Taunton and Taunton Depot in Taunton; Freetown in Freetown; Fall River Depot and Battleship Cove in Fall River; and King's Highway and Whale's Tooth in New Bedford. The Whittenton Alternative would not use the Taunton Station, but would substitute the Dana Street Station in Taunton. Additional project information is in Chapter 5.

1.3 Project Authority

The USACE, as the lead federal agency for the South Coast Rail Project, has compliance responsibilities regarding cultural resources under Section 106 of the National Historic Preservation Act (NHPA) as amended, the regulations of the Advisory Council on Historic Preservation (ACHP) at 36 CFR 800, the USACE's Appendix C (Historic Properties), 33 CFR 325; the National Environmental Policy Act (NEPA); and Section 4(f) of the Department of Transportation Act. MassDOT serves as the lead state agency and is responsible for identifying and evaluating properties, and determining project effects in accordance with MGL Ch. 9 Sections 26-27C, as amended; 950 CMR 71.00, 950 CMR 70.00 and the Massachusetts Environmental Policy Act (MEPA).

The historic resources intensive survey, evaluation, and effects assessment for the South Coast Rail Project was undertaken in accordance with the Secretary of the Interior's *Standards and Guidelines for Identification* (48 FR 44720-23) and the MHC historic resources survey standards. The survey complies with the standards of the Secretary of the Interior's *Standards and Guidelines for Identification* (48 FR 44720-23), The Standards of the Massachusetts State Register of Historic Places (State Register), and the National Park Service (NPS) guidelines for assessing eligibility for listing in the National Register, specifically *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*.

1.4 Integration of Previous Reports

This report updates relevant information on historic properties previously listed in or determined eligible for listing in the National and State Registers, as well as those recommended for listing, that were discussed in the cultural resources reports prepared for the Draft Environmental Impact Statement (DEIS) / Draft Environmental Impact Report (DEIR) (USACE 2011), *Cultural Resources Reconnaissance Survey South Coast Rail Project, Volumes I andVI* (Cherau et al. 2009a and 2009b) and *Volumes III, IV, and V* (Adams et al. 2009b, 2000c, and 2009d), *Supplemental Cultural Resource Reconnaissance Survey, South Coast Rail Project, Volumes I and III* (Adams et al. 2009a and 2009e). For the purposes of the eligibility evaluations, it incorporates by reference and the Historic Contexts included in Volume I of those reports. The

effects assessment updates and refines the analysis presented in the *Environmental Consequences Report, Cultural Resources* for the DEIS/DEIR (PAL and VHB 2009).

1.5 Project Personnel

The historic resources intensive survey for the South Coast Rail Project Preferred Alternative was conducted from November 2012 to January 2013. PAL staff involved in the survey included Deborah Cox (project manager); Virginia H. Adams (senior architectural historian); John J. Daly (industrial historian); and Jenny Fields Scofield, Kathleen M. Miller, and Quinn R. Stuart (architectural historians). The staff was assisted by Allison Cahoon (assistant architectural historian). All project supervisory personnel meet the professional qualification standards as outlined in the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716).

1.6 Disposition of Project Materials

All project information (field recording forms, maps, photographs) is currently on file at PAL, 26 Main Street, Pawtucket, Rhode Island.

2

Methodology

2.1 Project Goals

The purpose of the historic resources intensive survey is to identify all historic properties (those properties listed in or eligible for inclusion in the State and National Registers) within the APE of the South Coast Rail Project Stoughton Alternative and Whittenton Alternative. The USACE and MassDOT will use this information to determine the effects of the South Coast Rail Project Preferred Alternative on historic properties.

The specific tasks involved in the intensive survey were to:

- update information about historic properties that are National Historic Landmarks (NHL), or that are listed or determined eligible for listing in the State and National Registers that was in the cultural resources reports for the DEIS/DEIR (Adams et al. 2009a, 2009b, 200c, 2009d; Cherau et al. 2009a, 2009b);

- conduct an intensive survey and evaluation of historic resources identified for further study in the cultural resources reports for the DEIS/DEIR (Adams et al. 2009a, 2009b, 200c, 2009d; Cherau et al. 2009a, 2009b); and

- update and assess the effects of the project on all district and individual historic properties from the environmental consequences discussion for the DEIS/DEIR (PAL and VHB 2009; USACE 2011).

To achieve these goals, the strategies employed consisted of archival research, field survey, eligibility evaluation, and effects assessment. The intensive survey methodology included additional background research, field survey, and analysis to establish the integrity, historical context, and National Register significance criteria met for each resource. Intensive survey efforts included careful assessment and evaluation of area boundaries in defining eligible historic districts. The intensive survey is intended provide sufficient information for a Consensus Determination of Eligibility for listing in the National Register for areas/districts and individual properties.

2.2 Area of Potential Effect

As defined in the ACHP's regulations, the Area of Potential Effect (APE) for a project is the geographic area or areas within which an undertaking may directly, indirectly or cumulatively cause changes in the character of historic properties that make them eligible for listing in the National Register, if any such properties exist [36 CFR 800.2(c)]. A direct impact APE is established to include the geographic area in which historic properties would be altered or otherwise used by construction activities or impacts related to project operations. An indirect impact APE typically consists of a larger area where visual, auditory, pollution, vibration, and/or other types of environmental impacts resulting from an undertaking might affect the qualities for which a historic property is eligible or listed in the National Register.

The APE for the South Coast Rail Project was discussed in the cultural resources reconnaissance survey report for the DEIS/DEIR (Cherau et al. 2009a) and further defined by the USACE in the DEIS/DEIR Volume I, Chapter 4 – Affected Environment and Environmental Consequences (Section 4.8.1.2.) (USACE 2011). The historic resources intensive survey for the Preferred Alternative was conducted for properties within an APE defined as at least 400 feet from either side of the rail corridor center line, 250 feet from the perimeter of a proposed facility boundary, and 400 feet from a proposed grade crossing, road, or intersection centerline. The APE extends around the perimeter of historic districts. This APE addresses the potential for atmospheric, noise, physical modification or demolition, traffic, vibration, or visual (setting) impacts, which are factors with potential to cause effects to historic above-ground properties. Refer to previous project reports for further discussion on the APE. The South Coast Rail Project Preferred Alternative APE is shown on maps in Appendices B and C in this report.

2.3 Archival Research

Archival research built on the existing information collected, and the historic contexts written, for the South Coast Rail Project cultural resources reconnaissance survey (Adams et al. 2009e and Cherau et al. 2009a). Information on previously State and/or National Register listed or determined eligible properties was updated through review of the National Register Information System (NRIS) of the National Park Service (NPS) as well as the Inventory of the Historic and Archaeological Assets of the Commonwealth, the Massachusetts Cultural Resource Information System (MACRIS), and the National Register and State Register files maintained by the MHC. Other archival materials were collected and reviewed as appropriate to understand the history, construction dates, and specific historical context for areas/districts and individual properties. This information included local histories, historical maps and photographs, census data, town records, property histories, cultural resources management reports, and interviews. Sources consulted are referenced in the MHC Inventory forms prepared for the intensive survey.

Copies of the great majority of the National Register nominations and Inventory forms are available online through the NRIS (http://www.nps.gov/nr/research/) and MACRIS (http://mhc-macris.net/) websites, and are, therefore, not included as appendices to the report.

2.4 Field Survey

A walkover/drive-over field visit was conducted for each area/district and individual property in the intensive survey for the South Coast Rail Project Preferred Alternative APE. These resources included properties accessible from public ways, those not readily visible from public ways, and those accessed via rail corridors (CSX, MassCoastal and MBCR). A team of architectural historians visited most of the properties, and a team including an industrial historian visited properties with railroad, transportation, or industrial history and function. Visual information recorded about individual resources during the reconnaissance survey or on pre-existing MHC forms was updated and expanded upon. Notes were taken including massing, materials, scale, alterations, landscape features, and setting. Digital photographs were taken of all resources, their setting, and of streetscapes and key and representative buildings within areas/districts. Viewshed photographs toward the right-of-way were taken. All historic resources and area/district boundaries were recorded on aerial maps of the project area.

The 800 foot APE (400 feet from either side of the rail right-of-way centerline) was expanded in select locations to encompass the extent of identified areas. In these instances, individually significant historic properties located more than 400 feet from the right-of-way were included in the survey if they were within the identified areas. Historic railroad corridors within the proposed alternatives were also treated as survey areas and are listed in the respective area/district tables. Within those areas, noteworthy individual railroad-related structures (those that based on size, resource type, and age would be contributing to any potential district) are listed in the individual property tables for their respective alternatives.

2.5 Inventory Forms

Massachusetts inventory forms were completed for all properties in the historic resources intensive survey incorporating field and research information. Most properties were recorded in new forms. A few properties have recent, well documented forms that were updated with new photographs on continuation sheets.

2.6 National Register Criteria for Evaluation

The State and National Register eligibility evaluation of properties in the intensive survey used the National Register Criteria for Evaluation in order to evaluate the significance of historic resources and make a recommendation for State and National Register eligibility or ineligibility. Eligibility recommendations for the historic resources report were based on visual data collected during fieldwork, property specific research, the town historical context, and the

relevant property specific historic context. A National Register Eligibility Sheet was completed for each property found to be eligible.

The National Register criteria (36 CFR 60) are the standards for evaluating the significance of resources as established by the National Park Service (NPS), Department of the Interior. The criteria are designed to guide the evaluation of potential entries for the National Register. The NHL eligibility criteria (36 CFR Part 65.4) are similar to the National Register criteria, but apply to properties of national significance.

The National Register criteria state that, "the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose component may lack individual distinction; or

D. that have yielded, or may be likely to yield information important in prehistory or history.

2.7 State Register of Historic Places

The State Register is maintained by the MHC as a comprehensive listing of the buildings, structures, objects, and sites that have received local, state, or national designations based on their historical or archaeological significance. It includes all properties that are NHLs, listed in the National Register, formally determined eligible by the NPS for inclusion in the National Register, local historic districts, local historic landmarks, and properties for which the MHC holds a preservation restriction.

2.8 Information Presentation

The survey results in Chapters 3 and 4 are presented north to south by rail corridor and community. In order to maintain consistency with the DEIS/DEIR studies, map identification numbers have not been changed. One new district/area and one new individual property, both in New Bedford, have been added. These are resources located within a larger area that was found during the intensive survey to be ineligible for the State and National Registers.

3

National Register and/or State Register Listed and Determined Eligible Properties

Chapter 3 presents information on the historic properties within the APE for the Preferred Alternative that were previously listed in or determined eligible for listing in the State and National Registers. One property, the Quechechan River Bridge in Fall River (Map ID FR.084) has been determined eligible through consensus by the MHC and MassDOT since the DEIS/DEIR survey, and has therefore been added to this group. A summary of the number of identified historic properties in each category — NHL, National Register listed, or National Register determined eligible— is presented in Table 3-1. All properties discussed in this chapter are listed in Appendix A, Table 3-2 and are shown on project maps in Appendices B and C. Photographs of these properties are included in Appendix D.

Table 3-1. Summary of National Register Listed and Determined Eligible Historic Properties.

City/Town	Historic Property Type	National Register Listed or Determined Eligible	Total For City/Town
Canton	Areas/Districts	1	3
	Individual Properties	2	
Stoughton	Areas/Districts	0	3
	Individual Properties	3	
Easton	Areas/Districts	2*	3*
	Individual Properties	1	
Raynham	Areas/Districts	0	0
	Individual Properties	0	
Taunton	Areas/Districts	4	26
	Individual Properties	22	
Berkley	Areas/Districts	0	0
	Individual Properties	0	
Lakeville	Areas/Districts	0	0
	Individual Properties	0	
Freetown	Areas/Districts	1	2
	Individual Properties	1	

New Bedford	Areas/Districts	2	5
	Individual Properties	3	
Fall River	Areas/Districts	9	20
	Individual Properties	11	
Totals	**Areas/Districts**	**19***	**62***
	Individual Properties	**43**	

* Includes one district designated as a National Historic Landmark.

3.1 Canton Summary of Historic Properties

The following are descriptions of the districts and individual properties identified during the survey in Canton as either listed in or determined eligible for listing in the National Register. No properties within the APE in Canton have been designated as National Historic Landmarks (NHLs).

A review of NRIS and MHC records conducted during the archival research phase of the survey indicated that two individual properties and one historic district within the APE have been previously determined eligible for National Register listing by the MHC. No districts or individual properties have been listed in the National Register.

3.1.1 Historic Districts

3.1.1.1 Canton Center Area (Map No. Ca.H)

The Canton Center Area (MHC No. CAN.L) is located adjacent to the Stoughton Line right-of-way at Canton Center Station. The area was determined eligible for National Register listing as a historic district in 1991 by the MHC, which indicated that more information was needed to complete a nomination and determine boundaries (MHC 1991; Viens 1993). Canton Center is encompassed in the Washington Street Commercial and Institutional Area (Map No. Ca.C), which is eligible for National Register listing and is discussed in Chapter 4 – Intensive Survey and National Register Eligibility Results.

3.1.2 Individual Properties

3.1.2.1 Canton Public Library (Map No. Ca.006)

The Canton Public Library (MHC No. CAN.078) is located at 786 Washington Street, approximately 600 feet north of the Stoughton Line right-of-way, within the Canton Center and Washington Street Commercial and Institutional areas. It is a one-story, cruciform-plan building constructed in 1901, with later additions within three arms of the cross. It has a hipped copper roof with shallow dome, limestone and brick walls, and a projecting entryway, all with elaborate Classical details. The library was designed by the noted Boston architectural firm

Winslow and Bigelow, and is unique in Canton for its architectural style and quality of design and materials. In 2001, the MHC determined that the building is eligible for individual listing in the National Register at the local level under Criteria A and C for its associations with the development of the Canton municipal library system and as a well-preserved example of a Classical Revival-style library.

3.1.2.2 Forge Pond Railroad Bridge (Map No. Ca.007)

The Forge Pond Railroad Bridge (ca. 1845, 1887, 1890) (MHC No. CAN.906) carries the Stoughton Line right-of-way over a short waterway connecting Forge Pond and Kinsley Pond. The single span stone arch and reinforced concrete bridge measures 32 feet long overall with a 17 foot wide barrel arch. It is divided into two sections. The 28 foot-long rubble stone arch west section was constructed by the Stoughton Branch Railroad in 1845. In 1887, the Boston & Providence Railroad, which had by then acquired the line, strengthened the arch with a lining of unreinforced concrete using what was known as the "Beton Process." This specialized concrete and application had been developed in France in 1856 and used in the United States for after ca. 1870. When the Stoughton Line was double tracked in 1809 the bridge was extended east 13 feet using conventional granite block masonry construction. The Forge Pond Railroad Bridge was surveyed in 1988 and recommended eligible for listing in the National Register as one of the earliest examples of the use of concrete to strengthen a stone arch (Stott 1988). It has since been added to MassDOT's Historic Bridge Inventory and has been determined eligible through consensus of the MHC and MassDOT (MassDOT 2012). It meets National Register Criterion C at the local level as an unusual example of the Beton process and an early use of concrete for structural purposes (MassDOT 2012).

3.2 Stoughton Summary of Historic Properties

The following are descriptions of the areas/districts and individual properties identified during the survey in Stoughton as either listed in or determined eligible for listing in the National Register. No properties within the APE in Stoughton have been designated as NHLs.

A review of NRIS and MHC records conducted during the archival research phase of the survey indicated that no districts and three individual properties within the APE have been listed in the National Register or previously determined eligible.

3.2.1 Individual Properties

3.2.1.1 Stoughton Town Hall (Map No. St.023)

The Stoughton Town Hall (MHC No. STG.12) is located at 10 Pearl Street, approximately 400 feet northeast of the Stoughton Line right-of-way and 600 feet from Stoughton Station. The town hall is a two-story, five-bay-wide, brick, Romanesque Revival style building designed by Samuel J.F. Thayer of Boston and constructed in 1881. The building is in good condition and

retains its original mass, architectural ornamentation, and materials. Known alterations are limited to the removal of a porte cochère. The Stoughton Town Hall was determined eligible for National Register listing by the MHC in 1988 (MHC 1988). It meets Criteria A and C at the local level for its association with the late-nineteenth-century development of Stoughton and as a high style example of Victorian period public architecture, designed by notable Boston architect Samuel J.F. Thayer (Holmes 1968; Petruzzo 1988). The town hall is also located within the National Register eligible Downtown Stoughton Area (Map No. St.B).

3.2.1.2 Stoughton Old Colony Railroad Station (Map No. St.025)

The Stoughton Old Colony Railroad Station (MHC STG.44) is located at 45-47 Wyman Street at the Wyman Street railroad crossing, and serves the Stoughton Line. The station is a Romanesque Revival style granite building with a slate shingled roof, clock tower, and front portico. It was designed by Charles Brigham, architect of the Classical Revival style addition to the Massachusetts State Capitol, and constructed in 1888. The station is in good condition and is essentially unaltered. The Stoughton Old Colony Railroad Station was listed in the National Register in 1973, under Criteria A and C at the local level. It meets Criterion A for its association with the nineteenth century expansion of the railroad network in Southeastern Massachusetts and as a prominent historic public building in Stoughton. Under Criterion C, the building is significant as the only surviving example of a historic railroad station with a tower in Massachusetts, as an important example of the work of Charles Brigham, and as a well-preserved example of the Romanesque Revival style (Lebovich 1973; Petruzzo 1987b).

3.2.1.3 Lucius Clapp Memorial Library (Map No. St.026)

The Lucius Clapp Memorial Library (MHC No. STG.11) is located at 6 Park Street, approximately 600 feet northeast of the Stoughton Line right-of-way at Stoughton Station and the Wyman Street crossing. The library is a one-story, three-bay-wide, Classical Revival style brick building designed by Walter Atherton and constructed in 1903. It retains its original slate roof, granite foundation, and Indiana limestone trim as well as its characteristic Classical details, including arched windows with keystones, and a pedimented entrance portico with paired columns. A plaque on the building (MHC No. STG.900) commemorates the property as the site of the first public schoolhouse in Stoughton. The Lucius Clapp Memorial Library was listed in the National Register in 1992 at the local level under Criteria A and C for its associations with the development of Stoughton and as a well-preserved example of the Classical Revival style as applied to civic structures (Petruzzo 1992). It is also located within the National Register eligible Downtown Stoughton Area (Petruzzo 1987a; Map No. St.B).

3.3 Easton Summary of Historic Properties

The following are descriptions of the areas/districts and individual properties identified during the survey in Easton as either listed in or determined eligible for listing in the National Register.

The H.H. Richardson Historic District of North Easton, which is an NHL, is also discussed below.

A review of NRIS and MHC records conducted during the archival research phase of the survey indicated that two districts and one individual property within the APE have been listed in the National Register or previously determined eligible. Of these, one district has been designated as an NHL.

3.3.1 National Historic Landmarks (Districts and Individual Properties)

3.3.1.1 H.H. Richardson Historic District of North Easton NHL (Map No. Ea.D)

The H.H. Richardson Historic District of North Easton is a discontiguous NHL district of five properties containing Richardson Romanesque style buildings designed by Henry Hobson Richardson: the Oliver Ames Free Library (1877), Oakes Ames Memorial Hall (1879), Ames Gate Lodge (1880) and Ames Gardener's Cottage (1884) at Langwater, and the Old Colony Railroad Station (1881). The library and memorial hall are located on Main Street, approximately 400 feet west of the proposed Easton Village Station on the Stoughton Line, and the Old Colony Railroad Station is located immediately north of the proposed station abutting the rail right-of-way. The gate lodge and cottage on the Langwater property are located off Elm Street, 0.3 miles east of the Stoughton Line right-of-way. H.H. Richardson designed all five buildings under commission from the grandchildren of Oliver Ames, founder of the Ames Shovel Company, and they are all within the North Easton Historic District (described below). Frederick Law Olmsted designed the landscape of the Ames Gate Lodge and Gardener's Cottage property, and the Oakes Ames Memorial Hall, which includes a park across Main Street known as The Rockery/Olmsted Memorial Cairn.

The H.H. Richardson Historic District of North Easton was designated as an NHL in 1987 and possesses national significance under Criterion C as an important collection of Richardson's work, and for the integration of Richardson's buildings within landscape settings designed by Frederick Law Olmsted. The properties within the H.H. Richardson Historic District also meet National Register Criterion A at the local level as part of the North Easton Historic District (Pitts 1991). The Old Colony Railroad Station is additionally listed in the National Register as an individual property (Wardwell 1973; see description below).

3.3.2 Historic Districts

3.3.2.1 North Easton Historic District (Map No. Ea.B)

The North Easton Historic District (MHC No. EST.E and EST.B) is a 500-acre area that encompasses the Stoughton Line right-of-way between Main and Elm streets, and the proposed Easton Village Station. The district includes approximately 160 buildings and six landscapes that date from the late eighteenth to the early twentieth century. The Ames Company Shovel

Shop complex located adjacent to the proposed Easton Village Station contributes to the physical core of the district and generated the economic and land use stimulus that caused the majority of the historic development of the area. The district consists primarily of former Ames Company mill buildings that were originally connected to the extant millponds and the railroad; streets of worker housing; peripheral estates of Ames family members; and high style civic buildings, of which many were commissioned by the Ames family. The North Easton Historic District was listed in the National Register under Criteria A and C in 1972 for its associations with the Ames family, development of North Easton, and local rail-served industry; and for its excellent collection of eighteenth- and nineteenth-century architecture and landscape design, which includes the work of Henry Hobson Richardson and Frederick Law Olmsted (Brown 1972).

The documentation for the North Easton Historic District does not contain a comprehensive inventory of contributing and non-contributing resources within it or a description of the character-defining features of the setting, and does not elaborate upon the district's multiple themes of significance. For these reasons, other evaluations of the district or specific features within it have been completed as needed and all historic properties and landscape settings within the district should be considered as potentially contributing resources. An MHC area form was completed for the Queset-Main Street Area (MHC No. EST.R) in 2003 as a proposed amendment to the district that identifies the significance of the cultural landscape comprised by the properties along the west side of Main Street. There are additionally five properties within the district that have state preservation restrictions. The Stoughton Line right-of-way (is not identified as a contributing element of the North Easton Historic District. However, the track structure – including bridges, cuts and fills, retaining walls, and signal infrastructure – is important to the setting of the district, particularly the Ames Company Shovel Shop complex, and to the setting of the Old Colony Railroad Station (Map No. Ea.003), which is part of the H.H. Richardson Historic District of North Easton NHL (Pitts 1991; see above).

3.3.3 Individual Properties

3.3.3.1 Old Colony Railroad Station (Map No. Ea.003)

The Old Colony Railroad Station is located on the east side of the Stoughton Line right-of-way between the Oliver Street grade crossing to the north and the proposed Easton Village Station to the south. The station was constructed in 1881 and exhibits a number of hallmarks of H.H. Richardson's Richardsonian Romanesque architectural style, including a flared hip roof with large wooden support brackets, granite construction with brownstone trim, and large, segmental arch windows on the center bays of each side elevation. The wood framing members of the windows and support timbers under the porte cochère are decorated with carvings of snarling wolves' heads. The ticket window on the west side of the building projects out in a semicircular bay, and is glazed with fixed curved panes and multiple "bull's-eye" panes. The building is currently owned by the Town of Easton and houses the collections and offices of the Easton Historical Society. The North Easton Railroad Station was individually listed in the

National Register in 1972, and is a contributing property in the H.H. Richardson Historic District NHL and the North Easton Historic District. The building individually meets National Register Criteria A and C at the national level for its associations with the historic transportation system and development of North Easton and the Ames family, and as a prominent example of H.H. Richardson's architectural design (Wardwell 1971).

3.4 Raynham Summary of Historic Properties

A review of NRIS and MHC records conducted during the archival research phase of the survey indicated that no districts or individual properties within the APE in Raynham have been designated as NHLs, listed in the National Register, or previously determined eligible.

3.5 Taunton Summary of Historic Properties

The following are descriptions of the areas/districts and individual properties identified during the survey in Taunton as either listed in or determined eligible for listing in the National Register. A discussion of one Local Historic District (LHD) is also included below.

A review of NRIS and MHC records conducted during the background research phase of the survey indicated that 4 districts and 22 individual properties within the APE have been listed in the National Register or previously determined eligible. No districts or individual properties have been designated as NHLs.

3.5.1 Historic Districts

3.5.1.1 Taunton Multiple Resource Area (MRA) (Map No. Ta.C)

The Taunton MRA (MHC No. TAU.P) includes 5 National Register Historic Districts and 87 properties individually listed in the National Register. The boundaries of this National Register MRA are the city limits of Taunton. The South Coast Rail project APE for the preferred alternative encompasses 1 historic district and 19 individual properties included in the Taunton MRA. These resources are the Whittenton Mill Complex (Map No. Ta.G), Dean-Hartshorn House (Map No.Ta.018), Old Colony Railroad Station (Map No. Ta.019), William Woodward House (Map No. Ta.020), Charles R. Atwood House (Map No. Ta.021), Theodore Dean House (Map No. Ta.022), C.J. H. Bassett House (Map No. Ta.023), Abiezar Dean House (Map No. Ta.028), Neck of Land Cemetery (Map No. Ta.029), N.S. Mason House (Map No. Ta.181), St. Thomas Episcopal Church (Map No. Ta.208), McKinstrey House (Map No. Ta.209), Henry G. Brownell House (Map No. Ta.211), Lord-Baylies-Bennet House (Map No.Ta.245), Samuel Washburn House (Map No. Ta.246), Samuel Colby House (Map No. Ta.254), Sarah A. Haskins House (Map No. Ta.259), J.C. Bartlett House (Map No. Ta.266), Albert Field Tack Works (Map No. Ta.293) and the William Lawrence House (Map No. Ta.309) described below. The Taunton MRA includes residential, civic, commercial, and industrial resources constructed throughout Taunton from the mid-eighteenth through mid-twentieth centuries that are associated with the

city's historical development, significant local historical figures, and major industries. The MRA also encompasses known archaeological sites in Taunton, associated with prehistoric, PaleoIndian use of the Taunton River drainage basin. The Taunton MRA was listed in the National Register in 1983 and meets Criteria A, B, C, and D. All of the historic resources within the South Coast Rail project APE that were included in the Taunton MRA meet National Register Criteria A and C at the local level for associations with local development or industry, and as important examples of their respective architectural types and styles, or cemetery design (Fitch 1984).

3.5.1.2 Whittenton Mill Complex (Map No. Ta.G, Ta.C)

The Whittenton Mill Complex (MHC No. TAU.T) is located in the village of Whittenton in a rectangular area bounded by the Whittenton Branch right-of-way on the Whittenton Alternative to the east, Whittenton Street to the south, and the Mill River to the west. The property is an approximately 20-acre industrial complex containing 10 major attached and freestanding brick and wood-frame industrial buildings dating from ca. 1858 to 1895. The buildings are grouped around a mill yard facing the Mill River. Most of them are variations on the industrial "loft," with flat roofs, brick walls with segmental arch windows, and fire-resistive interior post and beam construction. A number of lesser, later, noncontributing buildings are located at the north end of the property. Industrial activity began here with establishment of an iron forge, and nail and cotton spinning factories (not extant) in the seventeenth and early nineteenth century. The extant Whittenton Mills complex was Taunton's largest and longest-lived textile operation. The Whittenton Mill buildings and select residences in the mill village were surveyed in 1979 and the mill complex was surveyed again in 1980. The Whittenton Mill Complex was listed in the National Register as a Historic District in 1984 as part of the Taunton MRA. The National Register historic district does not include any of the worker housing adjacent to the mill (Fitch 1984; see Map No. Ta.F described below).

3.5.1.3 Massachusetts State Hospitals and State Schools Multiple Property Submission (MPS) (Map No. Ta.R)

The Massachusetts State Hospitals and State Schools Multiple Property Submission (MHC No. TAU.AD) includes 14 state hospital and school campuses listed in the National Register and one historic district determined eligible for National Register listing. The boundaries of this MPS are the limits of the Commonwealth of Massachusetts and the 15 historic districts in the MPS are located in 19 municipalities throughout the state. The South Coast Rail project APE encompasses one of these resources, the Taunton State Hospital Historic District (Map No. Ta.S) along the Attleboro Secondary portion of the Whittenton Alternative. The Commonwealth of Massachusetts created an extensive institutional system between 1830 and 1940 in an effort to assume responsibility for the disadvantaged. During this timeframe, the state constructed approximately 31 facilities used to operate programs for the poor, sick, mentally ill or handicapped, and criminally inclined. These facilities included 13 psychiatric hospitals, three schools and one farm for the mentally handicapped, four juvenile reform schools, three

almshouses, four tuberculosis sanatoriums, and institutions of crippled children, alcoholics, and laboratory research. The Massachusetts State Hospitals and State Schools MPS was listed in the National Register in 1993. All of the historic districts included in the MPS and meet National Register Criteria A and C at the state level for their associations with the development of the state public health system and as examples of historic institutional campuses. Some of the districts additionally meet Criterion B for associations with notable historic figures in the health profession, Criterion C as an example of a notable architect or landscape architect, or Criterion D for the potential to yield information about the pre-contact or historic periods (Friedberg 1993).

3.5.1.4 Taunton State Hospital Historic District (Map No. Ta.S)

The edge of the Taunton State Hospital Historic District (MHC No. TAU.AE) is located approximately 300 feet northeast of the Attleboro Secondary right-of-way near the Danforth Street grade crossing and across from the proposed new Dana Street station on the Whittenton Alternative. The district consists of a 125-acre insane asylum campus established in 1851 and developed between 1851 and 1960 with approximately 40 Renaissance Revival, Classical Revival, Colonial Revival, Stick, and vernacular style buildings. The complex retains a portion of its original plan designed by Elbridge Boyden of Boyden and Ball, conceptualized from Dr. Thomas Kirkbride's 1847 textbook. Kirkbride recommended that hospitals be designed with a massive, central building surrounded by landscaped pastoral grounds with support buildings located behind the main building. This facility was continually expanded as the patient population increased, and includes buildings designed by the firms of Hartwell and Swasey; Swasey and Stephenson; Kendall, Taylor, and Company; Cram and Ferguson; and Hollis, French, Allen, and Hubbard. The Taunton State Hospital was listed in the National Register as part of the Massachusetts State Hospitals and State Schools MPS in 1993. It meets National Register Criteria A and C at the state level for its associations with the development of the state public health system, and as an example of an institutional campus designed by notable local and national architects to accommodate functional requirements recommended by leaders in the health professions. The potential significance of the district under Criterion D is described in the National Register nomination and is associated with a pre-contact village site and an eighteenth- and nineteenth-century farm located in the area prior to the construction of the hospital (Friedberg 1993). Recent demolition of buildings, including the main Kirkbride-designed hospital, and other changes have occurred at the Taunton State Hospital that may have affected the property's integrity. A comprehensive reevaluation of the Taunton State Hospital National Register eligibility may be warranted, but is outside of the scope of the effort for the South Coast Rail Project.

3.5.2 Individual Properties

3.5.2.1 Dean-Hartshorn House (Map No. Ta.018, Ta.C)

The Dean-Hartshorn House (MHC No. TAU.51) is located at 68 Dean Street, approximately 600 feet east of the Stoughton Line right-of-way. The building is a rectangular, three-bay by five-bay, two-and-one-half story Georgian style house constructed ca. 1798. It retains historic clapboard siding, brick end walls with four chimneys, and a Classical entrance surround with a pediment, fanlight, and pilasters. Alterations include an early-twentieth-century rear addition and installation of Georgian Revival dormers on the roof. This was the first house owned by Abiezar Dean, on property originally owned by the Dean family who were early settlers of Taunton and founders of the Taunton Iron Works in 1657. The Dean family owned the house until 1883 and it was purchased by George Hartshorn in 1905. The Dean-Hartshorn House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the settlement and development of Taunton and as an example of the Georgian architectural style. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.2 Old Colony Railroad Station (Map No. Ta.019, Ta.C)

The Old Colony Railroad Station (MHC No. TAU.45) is located on the west side of the Stoughton Line right-of-way between the Dean Street railroad crossing and the proposed Taunton Station. The building is a one-and-one-half-story brick structure with a cross-gabled roof with paired eave brackets, and corbelled walls with granite trim. It retains the majority of its historic design and materials, with the exception of two contemporary additions on its west elevation. The station was constructed in 1876 adjacent to the former Old Colony Iron Works as a result of lobbying on the part of the company's owner, Samuel Crocker, and is the last remaining passenger railroad station standing in Taunton. The Old Colony Railroad Station was listed in the National Register in 1984 as part of the Taunton MRA. The station is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.G).

3.5.2.3 William Woodward House (Map No. Ta.020, Ta.C)

The William Woodward House (MHC No. TAU.44) is located at 117 Arlington Street, approximately 200 feet west of the Stoughton Line right-of-way, near the Dean Street crossing and the proposed Taunton Station. The building is a five-bay-wide Federal style house constructed ca. 1830 with a hip roof, brick end walls with chimneys, clapboard siding, and wood quoin trim. The house was originally located on Dean Street, where it was used as a depot by the Old Colony and Newport Railroad from 1866–1881. The William Woodward House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the residential development of Taunton and as a well-preserved example of the Italianate architectural style. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.4 Charles R. Atwood House (Map No. Ta.021, Ta.C)

The Charles R. Atwood House (MHC No. TAU.41) is located at 30 Dean Street, approximately 400 feet west of the Stoughton Line right-of-way, near the Dean Street railroad crossing. It is an L-plan, two-and-one-half story, Italianate style, wood-frame house constructed ca. 1850. Owner Charles Atwood was a treasurer for the Phoenix Manufacturing Company, and author of *Reminiscences of Taunton.* The Charles Atwood House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the residential development of Taunton and as a well-preserved example of the Italianate architectural style. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.5 Theodore Dean House (Map No. Ta.022, Ta.C)

The Theodore Dean House (MHC No. TAU.40) is located at 26 Dean Street, approximately 500 feet west of the Stoughton Line right-of-way. The building is a two-and-one-half story, wood-frame house constructed in 1866 for Theodore Dean, who was a president of the Bristol County Bank and the Taunton Crucible Company, and a director of the Eagle Cotton Mill. The house retains the majority of its historic design and materials, including a hip roof with multiple dormers, a central gabled pavilion, clapboard siding, and a full width front porch with bracketed posts. The Theodore Dean House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the development of Taunton and as a well-preserved example of mid-nineteenth-century residential architecture. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.6 C.J. H. Bassett House (Map No. Ta.023, Ta.C)

The C.J. H. Bassett House (MHC No. TAU.27) is located at 20 Chestnut Street, approximately 950 feet west of the Stoughton Line right-of-way. The building is an irregular-plan, two-and-one-half story, Gothic Revival style wood-frame house constructed in 1851 for C.J. H. Bassett, who was a prominent local attorney and a president of the Taunton Bank. The house retains the majority of its original design and materials, including a deeply overhanging belcast gable roof with deep eaves and prominent vergeboards, hooded gables, and wide roofed porches with bracketed posts. The C.J. H. Bassett House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the residential development of Taunton and as a rare example of the Gothic Revival architectural style. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.7 Abiezar Dean House (Map No. Ta.028, Ta.C)

The Abiezar Dean House (MHC No. TAU.63) is located at 57 Summer Street, approximately 800 feet west of the Stoughton Line right-of-way. The building is a five-bay-wide, two-story, Federal style wood-frame house constructed ca. 1835. It was the second home of Abiezar Dean, who purchased the land from Simeon Doggett in 1833. The building is relatively unaltered and retains its original central hall plan, shallow ridge hip roof, brick end chimneys, prominent dentil molding, clapboard siding, and a Classical entrance with an elliptical fanlight, pilasters and sidelights. The Abiezar Dean House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the settlement and development of Taunton and as a well-preserved example of the Federal architectural style. The house is also located within the National Register eligible Taunton Center Area (Fitch 1984; Map No. Ta.B).

3.5.2.8 Neck of Land Cemetery (Map No. Ta.029, Ta.C)

The Neck of Land Cemetery (MHC No. TAU.804) is located on Summer Street, approximately 100 feet west of the Stoughton Line right-of-way. The property is Taunton's oldest burial ground and contains graves of many of Taunton's early prominent figures. Its oldest stones are those of Elizabeth Smith (d.1687) and Demares Smith (d.1689). It contains two other seventeenth-century stones, 83 from the eighteenth century, and 36 from the nineteenth century, with the most recent dating from 1889. The Neck of Land Cemetery was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the settlement and development of Taunton and for its collection of late-seventeenth to late-nineteenth-century gravestones (Fitch 1984). The cemetery is also located within the National Register eligible Taunton Center Area (Map No. Ta.B).

3.5.2.9 Cohannet Mills No. 3 (Map No. Ta.089)

The Cohannet Mills No. 3 (MHC Nos. TAU.297, 609, 735, 736) is located at 120 Ingell Street, approximately 400 feet southwest of the Attleboro Secondary right-of-way on the Stoughton Alternative near the Ingell Street railroad crossing. The building is a rectangular, 426-foot by 107-foot, multi-bay, brick loft constructed in 1890 with a flat roof, segmental arch windows, a granite block foundation, and slow-burning interior construction. A boiler/engine house with a round brick chimney is attached to the west side of the building. Mill No. 3 is the only survivor of three cotton spinning plants built in Taunton by Cohannet Mills. The mill was recently rehabilitated into 64 loft apartments. The Cohannet Mills No. 3 was individually listed in the National Register in 2006 at the local level under Criteria A and C for its associations with Taunton's textile industry and as an intact example of late-nineteenth-century industrial architecture (Siergiej 2006).

3.5.2.10 N.S. Mason House (Map No. Ta.181, Ta.C)

The N.S. Mason House (MHC No. TAU.494, TAU.P) is located in the Taunton MRA (Map No. Ta.C) approximately 600 feet southwest of the Attleboro Secondary right-of-way at 58 Tremont Street. The building is a two-and-one-half-story, wood-frame, front gabled, Italianate style house constructed circa 1865. It retains its historic overhanging eaves with brackets and gable returns, clapboard siding, paired round arched gable windows, protruding lintels, and a wrap-around porch. The N.S. Mason House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century development of Taunton and as an example of the Italianate style. The house is also located within the National Register eligible Tremont Street Area (Winters 1979c; Map No. Ta.T).

3.5.2.11 St. Thomas Episcopal Church (Map No. Ta.208, Ta.C)

The St. Thomas Episcopal Church property (MHC No.TAU.213, TAU.P) is located at 111-115 High Street, approximately 400 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative near the Porter Street grade crossing. The building is a Gothic Revival style stone church with a basilica plan designed by Richard Upjohn and constructed between 1857 and 1859. The church retains coursed granite walls, limestone trim, buttresses, pointed arch windows, and round stained glass clerestory windows. The St. Thomas Episcopal Church was listed in the National Register at the local level under Criteria A and C, as part of the 1984 Taunton MRA, for its associations with the nineteenth-century development of Taunton and as a well-preserved institutional example of the Gothic Revival style and the work of Richard Upjohn. The church also meets Criteria Consideration A, as a religious property that derives its significance from architectural distinction or historical importance. The property's potential state or national-level significance as an example of Richard Upjohn's work has not been assessed (Winters 1979d).

3.5.2.12 3McKinstrey House (Map No. Ta.209, Ta.C)

The McKinstrey House property (MHC No. TAU.214, TAU.P) is located approximately 400 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative near the Porter and Cohannet Street grade crossings, at 115 High Street. The building is a two-story, five-bay by two-bay, Georgian style brick house constructed circa 1760. It retains its original symmetrical design, historic hip roof with four interior end chimneys, clapboard siding on the facade, and central entrance with a broken pediment and fanlight. The house is currently used as the St. Thomas Episcopal Church rectory. The McKinstrey House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the eighteenth-century development of Taunton and as a well-preserved domestic example of the Georgian style (Winters 1979e).

3.5.2.13 Henry G. Brownell House (Map No. Ta.211, Ta.C)

The Henry G. Brownell House property (MHC No. TAU.216, TAU.P) is located approximately 400 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative, near the Porter, Cohannet and Winthrop street grade crossings, at 119 High Street. The house is a two-and-one-half story, three-bay-wide, Classical Revival style, wood-frame building constructed by local builder L.M. Witherell for Henry G. Brownell in 1893. The house retains its historic gambrel roof, central entrance and pedimented bay, ionic corner pilasters, and flat-roofed entrance porch supported by ionic columns. The building is currently used as the Taunton Lodge of Elks No. 150. The Henry G. Brownell House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the late-nineteenth-century development of Taunton and as a well-preserved domestic example of the Classical Revival style (Winters 1979f).

3.5.2.14 Lord-Baylies-Bennett House (Map No. 245, Ta.C)

The Lord-Baylies-Bennett House (MHC No. TAU.360, TAU.P) is located approximately 150 feet northeast of the Attleboro Secondary right-of-way on the Whittenon Alternative near the Winthrop Street grade crossing, at 66 Winthrop Street. The house is a one-and-one-half story, five-bay-wide, stone, Greek Revival style building constructed in 1831 with a portico. It retains its historic, low-pitched front gable roof with four interior brick chimneys, floor length rectangular window openings, stone lintels, and a central entrance with a transom and side lights. The portico has recessed panels on the cornice and is supported by 12 Doric columns. The house was built for Taunton's postmaster, Joseph L. Lord and is currently used as a Masonic lodge. The Lord-Baylies-Bennett-House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the early-nineteenth-century development of Taunton and as a well-preserved, high style example of the Greek Revival style (Winters 1979g).

3.5.2.15 Samuel Washburn House (Map No. 246, Ta.C)

The Samuel Washburn House (MHC No. TAU.361, TAU.P) is located at 68 Winthrop Street and abuts the northeast side of the Attleboro Secondary right-of-way on the Whittenton Alternative, near the Winthrop and Cohannet street grade crossings. The house is a two-story, three-bay by two-bay, Italianate style stone villa constructed circa 1860 for Samuel Washburn, a local houseware and hardware businessman. The house retains its original near-flat hipped roof with deep overhanging eaves, stuccoed walls, and a cornice line belt course. Oversized rectangular window openings with bracketed hoods and a recessed round-arched central entrance define the facade. The Samuel Washburn House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century development of Taunton and as a well-preserved, high style, domestic example of an Italianate villa as expressed in an urban neighborhood of Taunton (Winters 1979h).

3.5.2.16 Samuel Colby House (Map No. 254, Ta.C)

The Samuel Colby House (MHC No. TAU.362, TAU.P) is located approximately 150 feet southwest of the Attleboro Secondary right-of-way on the Whittenton Alternative near the Winthrop Street grade crossing, at 74 Winthrop Street. The house is a two-story, three-bay by four-bay Italianate style, stone and stucco mansion constructed circa 1869 for local clothing manufacturer, Samuel Colby. The building retains its original flat roof with a rectangular belfry, overhanging bracketed eaves, rectangular window hoods; and a full-width, one-story Stick style porch. The Samuel Colby House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century development of Taunton and as a well-preserved, high-style example of the Italianate style (Winters 1979i).

3.5.2.17 Sarah A. Haskins House (Map No. Ta.259, Ta.C, Ta. D, Ta.V)

The Sarah A. Haskins House (MHC No. TAU.231, TAU.P, TAU.I) is located approximately 400 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative, at 18 Harrison Street. The house is a two-and-one-half story, three-bay-wide, Italianate style, wood-frame house was constructed circa 1852 with a front gable roof and stone foundation. The Sarah A. Haskins House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century residential development of Taunton and as a well-preserved example of domestic architecture transitioning between the Greek Revival and Italianate styles. The building has since been altered through the installation of vinyl siding, construction of continuous shed dormers, conversion of the round arched gable window opening into a rectangular opening, and removal of the gable returns. The property is also located within the National Register eligible High Street area which incorporates the surveyed Harrison Street area (Winters 1979j; Map Nos. Ta.D and Ta.V).

3.5.2.18 Mount Pleasant Cemetery (Map No. Ta.262)

The Mount Pleasant Cemetery (MHC No. TAU.822) is located approximately 350 feet southwest of the Attleboro Secondary right-of-way on the Whittenton Alternative, at 19 Crocker Street. The cemetery encompasses an approximately 10-acre polygonal lot and contains more than 500 burials dating from 1710 through the mid-twentieth century. The oldest burials were originally part of the John King family cemetery, which was acquired when the Mount Pleasant Cemetery was created in 1836. Taunton leaders pursued the establishment of a garden-style cemetery in the city following the establishment of the Mount Auburn Cemetery in Boston in 1831 and the Forest Grove Cemetery in Augusta, Maine in 1835. Joseph Wilbar, who served as a land surveyor and Registrar of Deeds, designed the garden style plan of the cemetery, which involved the integration of burial plots and meandering footpaths with the natural hilly topography and existing vegetation. The cemetery contains a variety of slate, granite, and

marble headstone types and the burial sites of numerous local historical figures, including industrial entrepreneurs. At least one-quarter of the plots in the cemetery are the burial sites of soldiers from the American Revolution, War of 1812, Civil War, Spanish-American War, World War I, World War II, and the Korean War. The Mount Pleasant Cemetery was listed in the National Register at the local level in 2002, under Criteria A and C for its associations with the development of Taunton, local industrialists, and American war soldiers; as an intact example of a garden style cemetery and possibly the third oldest garden cemetery in the country; and for its collection of early-eighteenth- through mid-twentieth-century funerary art (Crowley 1996).

3.5.2.19 J. C. Bartlett House (Map No. Ta.266, Ta.C)

The J. C. Bartlett House (MHC No. TAU.244, TAU.P) is located immediately southwest of the Attleboro Secondary right-of-way on the Whittenton Alternative near the Winthrop Street grade crossing, at 12 Walnut Street. The house is a two-and-one-half-story, three-bay-wide, Second Empire style, wood-frame building constructed circa 1880. The house retains its original massing, mansard roof with pedimented dormers and brackets, clapboard siding, protruding rectangular lintels and a central entrance with a flat-roofed entrance porch supported by ionic columns. The J. C. Bartlett House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century residential development of Taunton and as a well-preserved, high style example of the Second Empire style (Winters 1979k).

3.5.2.20 Albert Field Tack Works (Map No. Ta.293, Ta.C, Ta.Y, Ta.D)

The Albert Field Tack Works (MHC No. TAU.163) is located approximately one-quarter mile northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative, at 19 Spring Street. It is included in the survey because it is within the National Register eligible High Street area (Map No. Ta.D). The Albert Field Tack Works consists of a two-and-one-half story, three-bay-wide, Italianate style brick office constructed in 1868, attached to a two-story brick loft with an exterior stair tower. The office has a central, pedimented bay with a round arched entrance set within an entrance porch. The tower has a steeply pitched hip roof with pedimented dormers. Sharon industrialist, Albert Field purchased an extant carding mill on the site for use as a tack, brad, and nail factory, and subsequently erected the high-style office building. The Tack Works went out of business in 1902, after which the building was used as a church, by tenant industries, and as offices. The Albert Field Tack Works was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the local iron industries, the nineteenth-century industrial development of Taunton, and as an intact example of mid-nineteenth-century industrial architecture (Winters 1979l).

3.5.2.21 H. B. Lothrup Store (Map No. Ta.294, Ta.C, Ta.D)

The H. B. Lothrup Store (MHC No. TAU.284) is located approximately 500 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative, at 210 Weir Street. The house is a two-and-one-half story, three-bay-wide Italianate style, wood frame building constructed circa 1855 with a front gable roof and clapboard siding. The store retains historic gable returns, protruding lintels, and spindled balustrade. The H. B. Lothrup Store was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the nineteenth-century commercial development of Taunton and as an intact example of an Italianate style commercial building. The property is also located within the National Register eligible High Street area (Winters 1979m; Map No. Ta.D).

3.5.2.22 William Lawrence House (Map No. Ta.309, Ta.C)

The William Lawrence House (MHC No. TAU.334) is located approximately 400 feet southwest of the Attleboro Secondary right-of-way on the Whittenton Alternative, at 101 Somerset Avenue. The house is a two-and-one-half story, three-bay-wide, Second Empire style wood-frame mansion constructed circa 1870 by local carpenter Abel Burt for William Lawrence, who was employed as a salesman. The house retains its original mansard roof with a rectangular belfry, shallow brackets and dentils, and arched dormers; clapboard siding, rectangular windows with protruding lintels, and granite foundation. A one-story full-width porch extends across the facade and defines a central entrance with a round-arched opening. The William Lawrence House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the late nineteenth-century residential development of Taunton and as a well-preserved, high style example of a Second Empire style residence (Winters 1979n).

3.5.3 Local Historic Districts (State Register Only)

3.5.3.1 Church Green Local Historic District (See Map No. Ta.B)

The Church Green LHD (TAU.AC) intersects the Stoughton Line right-of-way at the Dean Street railroad crossing. It encompasses approximately 87 properties located on Church Green, and Dean, Summer, Chestnut, Elm, and Arlington streets. The properties were developed for civic, religious, commercial, and residential uses during the mid-seventeenth through mid-twentieth century. The area was surveyed in 1976 and only the portion of the area surrounding Church Green was listed in the National Register as the Church Green Historic District in 1978 (MHC 1978). The entire area that was surveyed in 1976 was designated as an LHD in 1979 (White 1976; MHC 1978). The Church Green LHD is encompassed within the National Register eligible Taunton Center Area, which is discussed below (Map No. Ta.B).

3.6 Berkley Summary of Historic Resources

A review of the National Register Information System (NRIS) and MHC records conducted during the background research phase of the survey indicated that no properties within the APE in Berkley have been listed in or previously determined eligible for listing in the National Register, or have been designated as NHLs.

3.7 Lakeville Summary of Historic Properties

A review of the National Register Information System (NRIS) and MHC records conducted during the background research phase of the survey indicated that no properties within the APE in Lakeville have been listed in or previously determined eligible for listing in the National Register, or have been designated as NHLs.

3.8 Freetown Summary of Historic Properties

The following are descriptions of the areas/districts and individual properties identified during the survey in Freetown as either listed in or determined eligible for listing in the National Register, as well as NHLs, if any exist.
A review of NRIS and MHC records conducted during the background research phase of the survey indicated that one district and one individual property within the APE in Freetown have been listed in the National Register or previously determined eligible. No properties have been designated as NHLs.

3.8.1 Historic Districts

3.8.1.1 Assonet Historic District (Map No. Ft.D)

One property in the southeast corner of the Assonet Historic District extends to the project right-of-way along the Fall River Secondary Line. This property was historically occupied by a cattle pound, sited on a high, rocky bluff. The district is a compact village center that developed at the crossroads of North and South Main, Water, and Elm streets. It includes 229 residential, commercial, and civic buildings constructed between approximately 1720 and the mid-twentieth century, in addition to historical stone arch bridges, a cemetery, and the remains of nineteenth-century industrial complexes associated with the local boat building and iron processing trades. The Assonet Historic District meets National Register Criterion A and C at the local level for its associations with the development of Freetown and as a well-preserved historic village center that exemplifies a range of architectural styles. The district was listed in the National Register in 1999 (Meltsner 1999a).

3.8.2 Individual Properties

3.8.2.1 Richmond Road/Maple Tree Crossing Bridge (Map No. Ft.009)

The Richmond Road/Maple Tree Crossing Bridge spans the Assonet River approximately 100 feet north of the Fall River Secondary Line right-of-way near the grade crossings at Richmond and Beechwood roads. The bridge is a 45-foot long, 20-foot wide, dry-laid stone structure with three segmental arch spans. It is one of two extant bridges constructed in Freetown between 1820 and 1824 and is adjacent to the ruins of the Assonet Saw Mill, constructed in 1870. The MHC determined the Richmond Road Bridge eligible for National Register listing in 1980 under Criterion C, as an early example of a dry-laid stone arched bridge (MHC 1980).

3.9 New Bedford Summary of Historic Resources

The following are descriptions of the areas/districts and individual properties identified during the survey in New Bedford as either listed in or determined eligible for listing in the National Register, as well as NHLs, if any exist.

A review of NRIS and MHC records conducted during the background research phase of the survey indicated that two districts and three individual properties within the APE have been listed in the National Register or previously determined eligible. No properties have been designated as NHLs.

3.9.1 Historic Districts

3.9.1.1 Acushnet Heights Historic District (Map No. NB.C)

The Acushnet Heights Historic District (MHC No. NBE.AB) is located west of the New Bedford Main Line right-of-way, where it crosses Acushnet Avenue. The district encompasses approximately 40 city blocks and is bounded by Summer, Weld, Purchase, Pope, County, and Robeson streets. The district is primarily residential, but includes Clasky Common Park and a cluster of commercial and industrial buildings along Purchase Street. The district first developed with estate properties and dispersed settlement in the first half of the nineteenth century and was later built up with dense blocks of worker housing, including a cohesive group of residences on Hazard and Austin courts and State and Pleasant streets built by the Wamsutta Company in 1868. The Acushnet Heights Historic District was listed in the National Register in 1989 under Criteria A and C at the local level, as an intact nineteenth-century neighborhood associated with the development of New Bedford (Kelly 1989).

3.9.1.2 Wamsutta Mills Historic District (Map No. NB.D, Photo Nos. 028 and 029)

The Wamsutta Mills Historic District (MHC No. NBE.L) encompasses approximately 60 properties located east and west of the New Bedford Main Line right-of-way where it crosses

Acushnet Avenue. The portion of the district east of Acushnet Avenue is comprised of the Wamsutta Mill complex, including the mill office building, weave shed, and Mill Numbers 4, 5, 6, and 7. The west portion of the district consists of associated worker housing located between Hazard, County, Austin, and Purchase streets. The Wamsutta Mills were established in 1847 as manufacturers of cotton cloth. The textile industry was a notable deviation from New Bedford's traditional maritime industrial base and later provided for New Bedford's growth into a regional manufacturing center after the decline of the whaling trade. The Wamsutta Mills Historic District was determined eligible for National Register listing in 1986. The district was listed in the National Register in 2008 under Criteria A and C at the local level for the architectural quality of its intact mill complex and worker housing and because of its significance as New Bedford's first textile mill (Dixon 2008).

3.9.1.3 Individual Properties

3.9.1.3.1 Belleville Warehouse Company Cotton Storage Building (Map No. NB.012)

The Belleville Warehouse is located on the east side of the New Bedford Main Line near the Nash Road railroad crossing. The massive 950-foot-long by 100-foot-wide, seven-story, reinforced concrete storage facility is minimally ornamented with parapets on the narrow elevations and pilasters between the window bays. Noted mill engineers C.R. Makepeace and Co. of Providence, Rhode Island designed the cotton storage warehouse to serve the New Bedford mills of William Whitman in 1916. The building has lost the majority of its original steel sash and a series of eight roof monitors, but otherwise retains a high degree of architectural and material integrity. The Belleville Warehouse was determined eligible for National Register listing by the Keeper of the National Register in 1987, under Criteria A and C at the local level. Under Criterion A, the Belleville Warehouse possesses important associations with the Whitman mills infrastructure and the early-twentieth-century New Bedford cotton industry. The building possesses significance under Criterion C as an intact example of a Makepeace and Co. concrete mill loft (MHC 1987).

3.9.1.3.2 Union Street Railway Carbarn (Map No. NB.063)

The Union Street Railway Carbarn is located west of the New Bedford Main Line right-of-way at 1959 Purchase Street in Weld Square. The Carbarn is a Classical Revival style, two-story, brick structure designed by architect Louis Destremps and constructed in 1910. The building housed trolley cars historically used to transport manufactured goods along a street railway network. The Union Street Railway Carbarn with its formerly attached 1897 Repair Shop (not extant) was individually listed in the National Register in 1978 under Criterion A at the local level. The building possesses important historical associations with railroad-related commercial and industrial development in New Bedford during the late nineteenth and early twentieth centuries. The Union Street Railway Carbarn is also a contributing property to the Acushnet Heights Historic District, listed in the National Register in 1989 (Kelly 1989).

3.9.1.3.3 Dawson Building (Map No. NB.065, Photo No. 098)

The Dawson Building is located west of the New Bedford Main Line right-of-way at 1851 Purchase Street. The Dawson is a three-and-one-half-story, Classical Revival style, brick office building with cast-iron storefronts on the first floor. Local architect Samuel C. Hunt designed the structure in 1896 for Benjamin Dawson, a New Bedford mill employee, politician, businessman, and brewer. The Dawson Building possesses a high degree of architectural and material integrity and was individually listed in the National Register in 1982 under Criteria A and C at the local level. Under Criterion A, the building possesses important historical associations with local commercial and community activities at the turn of the twentieth century. Under Criterion C, the building is an intact local example of Samuel Hunt's work and retains one of few original cast-iron storefronts in the city. The Dawson Building is also a contributing property to the Acushnet Heights Historic District, listed in the National Register in 1989 (Frontiero 1983).

3.10 Fall River Summary of Historic Resources

The following are descriptions of the districts and individual properties identified during the survey in Fall River as either listed in or determined eligible for listing in the National Register, as well as NHLs, if any exist.

A review of NRIS and MHC records conducted during the background research phase of the survey indicated that 9 districts and 11 individual properties within the APE in Fall River have been listed in the National Register or previously determined eligible. Two of these districts are Multiple Property Submissions and one of the individual properties was determined eligible by MHC. No NHLs are located within the project APE.

3.10.1 Historic Districts

3.10.1.1 Fall River Multiple Resource Area (Map No. FR.C)

The Fall River Multiple Resource Area (MRA) includes five National Register Historic Districts, 90 properties individually listed in the National Register, and four districts and one individual property determined eligible for National Register listing (Frontiero 1983). The boundaries of this National Register Multiple Property Submission are the city limits of Fall River. The South Coast Rail project APE encompasses seven historic districts and six individual properties included in the Fall River MRA. These resources are the Border City Mills DOE (Map No. FR.E), Sagamore Mills No. 1 and 3 (Map No. FR.F), Sagamore Mill No. 2 (Map FR. G), Foster Spinning Company (Map No. FR.H), Narragansett Mills (Map No. FR. J), North Burial Ground (Map No. FR.K), American Printing Company – Metacomet Mill (FR.N), William Collins House (Map No. FR.005), North Christian Congregational Church (Map No. FR.006), Borden-Winslow House (Map No. FR.010), Squire William B. Canedy House (Map No. FR.012), Hathaway Brightman House (FR.026), and St. Joseph's Roman Catholic Church (Map No. FR.063), described below.

The Border City Mill No. 2 is individually listed in the National Register and is within the Fall River MRA as part of the Border City Mills DOE, but it was individually designated separately. The Fall River MRA includes residential, civic, commercial, and industrial resources constructed throughout Fall River from the mid-eighteenth through mid-twentieth centuries that are associated with the city's historical development, significant local historical figures, and major industries. The Fall River MRA was listed in the National Register in 1983 and meets Criteria A, B, and C. All of the mill complexes within the South Coast Rail project APE that were included in the Fall River MRA meet National Register Criteria A and C at the local level as physical expressions of the booming, late-nineteenth and early-twentieth-century local industries and as important examples of industrial architecture.

3.10.1.2 Border City Mills (Map No. FR.E, FR.C)

The Border City Mills complex is located on both sides of Weaver Street, between 100 and 700 feet west of the Fall River Secondary right-of-way. The complex was designed by local architect Josiah Brown and constructed between 1872 and 1889 adjacent to a railroad spur connecting the Fall River Branch Railroad to a wharf on the Taunton River. George T. Hathaway, S. Angier Chace, Chester W. Green, James A. Hathaway organized the Border City Mills for textile manufacturing. The extant district includes three brick mill lofts with attached boiler houses, and two one-story, storehouses. The Border City Mills complex was determined eligible for National Register listing at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the complex was recorded in the MHC Inventory as a district (MHC No. FLR.AL; Frontiero 1983). Mill No. 2, was separately listed in the National Register in 1990 and is counted as an individual property below.

3.10.1.3 Sagamore Mill Nos. 1 and 3 Complex (Map No. FR.F, FR.C)

The Sagamore Mill Nos. 1 and 3 Complex is located on both sides of Ace Street immediately west of the Fall River Secondary right-of-way. The district is comprised of two mill lofts with attached engine/boiler houses and several detached ancillary structures. The Sagamore Mills Company incorporated in 1872 to manufacture cotton print cloth. Mill No. 1 is a four-story, Romanesque Revival style, brick building constructed in 1888. Mill No. 3 is a three-story granite building constructed in 1907 with exterior stair towers at the corners. The Sagamore Mill Nos. 1 and 3 Complex was listed in the National Register at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the property was recorded in the MHC Inventory as a district (MHC No. FLR.AF). Sagamore Mill No. 2 was listed separately in the Fall River MRA (Frontiero 1983).

3.10.1.4 Sagamore Mill No. 2 (Map No. FR.G, FR.C)

The Sagamore Mill No. 2 is located at 1822 North Main Street across the Fall River Secondary right-of-way from the rest of the Sagamore Mills complex. Mill No. 2 is a five-story granite

ashlar loft constructed in 1881. Sagamore Mill No. 2 was listed in the National Register at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the complex was recorded in the MHC Inventory as a district (Frontiero 1983; MHC No. FLR.AE).

3.10.1.5 Foster Spinning Company (Map No. FR.H, FR.C)

The Foster Spinning Company is located at 119 Cove Street, approximately 150 feet west of the Fall River Secondary right-of-way. The property includes a two-story brick mill loft constructed in 1916, an attached boiler house, and a one-story wood storehouse. Francis A. Foster incorporated the Foster Spinning Company in 1916 to manufacture fine yarn. The Foster Spinning Company complex was the last new textile manufacturing facility established in Fall River. The Foster Spinning Company mill complex was listed in the National Register at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the property was recorded in the MHC Inventory as a district (Frontiero 1983; MHC No. FLR.W).

3.10.1.6 Narragansett Mills (Map No. FR.J, FR.C)

The Narragansett Mills complex is located at the corner of North Main Street and Narragansett Street, approximately 400 feet east of the Fall River Secondary right-of-way. The complex is comprised of nine brick buildings constructed between 1872 and 1895. Eight of the buildings are connected and include a five-story loft with a two-story, saw-tooth monitor weave shed to the north; a one-story cloth room and two-story machine shop to the west; and a five-story picker house, one-story boiler house, one-story engine house, and a five-story ell to the east. The detached building is an office constructed in 1879. The Narragansett Mills complex was listed in the National Register at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the property was recorded in the MHC Inventory as a district (Frontiero 1983; MHC No. FLR.AC).

3.10.1.7 North Burial Ground (Map No. FR.K, FR.C)

The North Burial Ground is a rectangular property bounded by the Fall River Secondary right-of-way to the west, Brightman Street to the north, North Main Street to the east, and Cory Street to the south. The North Burial Ground (MHC No. FLR.AT) was established in approximately 1810 and was purchased by the City of Fall River in 1825, making it the city's oldest municipal cemetery. The cemetery occupies a flat landscape surrounded by granite periphery walls and contains straight rows of primarily nineteenth-century slate, marble, and granite headstones. A fieldstone gatehouse constructed in approximately 1890 faces North Main Street. The North Burial Ground was listed in the National Register at the local level under Criteria A, B, and C, as a district within the 1983 Fall River MRA (Frontiero 1983). The cemetery derives its significance from its associations with the early-nineteenth-century development of Fall River, the inclusion

of graves of notable local Revolutionary War soldiers, and as an intact modest example of a Victorian era cemetery with a range of nineteenth-century stone designs.

3.10.1.8 Diners of Massachusetts Multiple Property Submission (Map No. FR.M)

The Diners of Massachusetts Multiple Property Submission (MPS) includes individual diners throughout Massachusetts that were factory-built and moved to the state or constructed on-site between the late-nineteenth century and mid-1960s. Approximately 23 of the diners inventoried during the preparation of this MPS have been individually listed in the National Register, including Al Mac's diner, which is located in the South Coast Rail project APE and is described below. The Diners of Massachusetts Multiple Property Submission was listed in the National Register in 1999 (Broomer 1999a).

3.10.1.9 American Printing Company - Metacomet Mill (Map No. FR.N, FR.C)

The American Printing Company – Metacomet Mill complex is located between Anawan Street and I-195 on both sides of the Fall River Secondary right-of-way near Battleship Cove Station. The complex encompasses several masonry buildings constructed between 1847 and the early twentieth century, combined as the American Printing Company in 1880. The portion of the complex to the east of the Fall River Secondary right-of-way encompasses the earlier Metacomet Mill Complex. This complex includes an 1847 stone loft with connected stone engine room, picker house, and storage room; and an early twentieth-century brick loft with attached engine room. The portion of the complex west of the right-of-way encompasses four brick packing and storage buildings. The American Printing Company complex was historically served by a roundhouse located north of the Metacomet Mill and a railroad spur extending from the Fall River Branch railroad past the north side of the complex to waterfront freight houses and wharfs near the present-day Fall River Heritage State Park. A portion of the railroad spur right-of-way remains between Mill Street and I-195, but the freight houses are not extant. The Borden family, who founded the American Printing Company, also owned the Fall River Line steamboat company, which operated from a pier adjacent to the Fall River Heritage State Park. The family additionally operated the Fall River Iron Works complex (Map No. FR.P) west of Water Street as part of the American Printing Company complex, but the Iron Works has lost architectural integrity and is not recommended eligible for National Register listing. The American Printing Company - Metacomet Mill complex was listed in the National Register at the local level under Criteria A and C, as an individual property within the 1983 Fall River MRA. Following the designation of the MRA, the property was recorded in the MHC Inventory as a district (Frontiero 1983; MHC No. FLR.J).

3.10.2 Individual Properties

3.10.2.1 William Collins House (Map No. FR.005, FR.C)

The William Collins House (MHC No. FLR.283) is located approximately 300 feet east of the Fall River Secondary right-of-way, at 3775 North Main Street. The house is a one-and-one-half-story, five-bay wide, Federal style Cape Cod Cottage constructed in approximately 1800. It is one of six examples of eighteenth- to early-nineteenth-century rural residential architecture in the Steep Brook village settlement of Fall River. The William Collins House was listed in the National Register at the local level under Criteria A and C, as an individual property within the Fall River MRA, which was designated in 1983 (Frontiero 1983). The property derives its significance from its historical associations with the development of Steep Brook Village, and as an intact example of a Federal style Cape Cod Cottage.

3.10.2.2 North Christian Congregational Church (Map No. FR.006, FR.C)

The North Christian Congregational Church (MHC No. FLR.241) is located 100 feet west of the Fall River Secondary right-of-way at 3538 North Main Street. The church is a two-story, Gothic Revival style wood-frame building constructed in approximately 1842. The church was the first Protestant church in the village of Steep Brook, a nineteenth-century settlement on North Main Street, and has been continually used for religious purposes. The building is currently occupied by the Fall River Portuguese Seventh-day Adventist Church. The North Christian Congregational Church was listed in the National Register at the local level under Criteria A and C, as an individual property within the Fall River MRA, which was designated in 1983. The property is also located within the National Register eligible North Main Street Area (Frontiero 1983; Map No. FR.D).

3.10.2.3 Borden-Winslow House (Map No. FR.010, FR.C)

The Borden-Winslow House (MHC No. FLR.275) is located approximately 400 feet east of the Fall River Secondary right-of-way at 3063 North Main Street. The building is a two-and-one-half-story, four-bay-wide, wood-frame, Georgian style house constructed circa 1740. It is one of six examples of eighteenth- to early-nineteenth-century rural residential architecture in the Steep Brook village settlement of Fall River. The Borden-Winslow House was listed in the National Register at the local level under Criteria A and C, as an individual property within the Fall River MRA, which was designated in 1983. The property derives its significance from its historical associations with the development of Steep Brook Village, and as an intact example of an eighteenth-century Georgian house. The property is also located within the National Register eligible North Main Street Area (Frontiero 1983; Map No. FR.D).

3.10.2.4 Squire William B. Canedy House (Map No. FR.012, FR.C)

The Squire William B. Canedy House (MHC No. FLR.274) is located approximately 100 feet east of the Fall River Secondary right-of-way at 2634 North Main Street. The building is a two-and-one-half-story, five-bay-wide, wood-frame, Federal style house constructed circa 1806. It is one of six examples of eighteenth- to early-nineteenth-century rural residential architecture in the Steep Brook village settlement of Fall River. The Squire William B. Canedy House was listed in the National Register at the local level under Criteria A and C, as an individual property within the Fall River MRA, which was designated in 1983 (Frontiero 1983). The property derives its significance from its historical associations with the development of Steep Brook Village, and as an intact example of an early-nineteenth-century Federal style house.

3.10.2.5 Border City Mill No. 2 (Map No. FR.015, FR.C)

Border City Mill No. 2 (MHC No. FLR.485) is located approximately 300 feet west of the Fall River Secondary right-of-way at 1 Weaver Street. The mill is a five-story, Italianate style brick mill loft with an exterior stair tower. The structure was designed by Josiah Brown, Fall River's first professional architect, and constructed in 1873 for the manufacture of worsted woolens, print cloth, sheeting, and shirting. The property was listed in the National Register as an individual property in 1990 and was previously determined eligible for National Register listing in the Fall River MRA in 1983 and 1989 as part of the Border City Mills complex (Frontiero 1983; Lyman 1989).

3.10.2.6 Weaver Street Bridge (Map No. FR.016)

The Weaver Street Bridge over the Fall River Secondary right-of-way (Bridge No. F-2-19, MHC No. FLR.902) is a single-span, built-up, riveted steel plate, deck girder structure. It was constructed in 1910 and rebuilt in 1960. The bridge is a notable surviving example of the riveted plate girder type because of its highly decorative cast-iron railings and battered stone abutments, both of which are typically found on bridges predating the listed construction date of 1910. In 1981, the MHC determined that the bridge was eligible for listing in the National Register as a possible contributing element to the Border City Mills Historic District. The Border City Mills Historic District (FLR.AL) was determined eligible as part of the Fall River MRA in 1983 (Frontiero 1983).

3.10.2.7 Hathaway Brightman House (Map No. FR.026, FR.C)

The Hathaway Brightman House (MHC No. FLR.73) is located approximately 400 feet east of the Fall River Secondary right-of-way at 205 Crescent Street. The building is a one-and-one-half-story, wood-frame, Gothic Revival style house constructed circa 1858 with a central gable ornamented with a pointed Palladian window. The Hathaway Brightman House was listed in the National Register at the local level under Criteria A and C, as an individual property within

the Fall River MRA, which was designated in 1983 (Frontiero 1983). The property derives its significance from its historical associations with the nineteenth-century residential development of Fall River, and as a rare, intact example of a Gothic Revival cottage.

3.10.2.8 St. Joseph's Roman Catholic Church Complex (Map No. FR.066, FR.C)

St. Joseph's Roman Catholic Church (MHC No. FLR.240) is located approximately 800 feet east of the Fall River Secondary right-of-way at 1355 North Main Street. The property is a compact complex with a church, rectory, and school, located across North Main Street from the North Burial Ground. The church is a one-and-one-half-story, High Victorian Gothic style, brick building with a three-story buttressed tower. The rectory is a two-and-one-half-story, Second Empire style, wood-frame building. The church and rectory face North Main Street and were constructed circa 1880. By 1905, a one-story social hall was added to the complex behind the rectory. This building was likely demolished when the parochial school was constructed in approximately 1930. The parochial school is a two-story, Classical Revival style brick building with a flat roof that faces North High Street and the rest of the church complex. St. Joseph's Roman Catholic Church was listed in the National Register at the local level under Criteria A and C, as an individual property within the Fall River MRA, which was designated in 1983 (Frontiero 1983). It is unclear whether this designation included the other two structures on the property. The St. Joseph's Roman Catholic Church Complex property derives its significance from its historical associations with the late-nineteenth- and early-twentieth-century residential development of Fall River and as an intact, turn-of-the-twentieth-century religious complex. The property is also located within the National Register eligible Wellington-Brownell Street Area (FR.I).

3.10.2.9 Al Mac's Diner (Map No. FR.070, FR.M)

Al Mac's Diner (MHC No. FLR.1973) is located approximately 300 feet west of the Fall River Secondary right-of-way at 135 President's Avenue. Al Mac's is a stainless steel diner with vertical and horizontal bands of porcelain enamel, curved corners, and a square entry vestibule. The diner was constructed by the DeRaffele Manufacturing Company of New Rochelle, New York in 1953 and opened by Fall River's McDermott Lunch Company in 1954. The diner was moved one block from its original location at the corner of President Avenue and Davol Street to its current location in the mid-1970s. Al Mac's Diner was listed in the National Register as part of the Diners of Massachusetts Multiple Property Submission in 1999 (Broomer 1999a). The diner retains a high degree of design and material integrity and meets National Register Criteria A and C and Criteria Considerations B and G at the local and state levels. Under Criterion A, the diner is associated with a local lunch car business run by Allen J. McDermott and is representative of trends in mid-twentieth-century restaurant development. Under Criterion C, the diner is characteristic of mid-1950s stainless steel diner design and is the oldest of four diners in Massachusetts designed by the DeRaffele Company (Broomer 1999b).

3.10.2.10 Lafayette-Durfee House, 94 Cherry Street (Map No. FR.082)

The Lafayette-Durfee House (MHC No. FLR.73) is located approximately 400 feet east of the Fall River Secondary right-of-way at 94 Cherry Street. The building is a two-story, five-bay by two-bay, wood-frame, Georgian style house constructed circa 1747. The house was originally constructed on North Main Street, probably by Thomas Durfee III, and moved to its current location in 1874 by David M. Anthony. The Lafayette-Durfee House was listed in the National Register at the local level under Criteria A and C in 1982, for its associations with the eighteenth-century development of Fall River, potential minor associations with Revolutionary War figures, and as an intact example of Georgian architecture in Fall River (Holmes 1982). The property is also located within the National Register eligible Durfee Street Area (Map No. FR.L).

3.10.2.11 Central Street Bridge over Quequechan River (Map No. FR.084)

The Central Street Bridge over the Quequechan River (Bridge No. F-2-93) is located west of the Fall River Secondary right-of-way, below the I-195 Braga Bridge. This structure is a single-span stone arch bridge with split-faced, irregular tabular block spandrel walls and parapets, regular quarry-faced voussoirs, and dressed stones in the arch barrel. The structure was constructed in 1903 in the course of a Fall River railroad grade elimination project. In 2003, the MHC and MassDOT found through a Consensus Determination of Eligibility that the Central Street Bridge was eligible for listing in the National Register (MHC 2003). The bridge is listed in the Massachusetts Highway Department's *Historic Bridge Inventory*.

4

Intensive Survey and National Register Evaluation Results

Chapter 4 presents the results of the intensive survey for historic resources and the evaluation of eligibility for listing in the State and National Registers of historic properties within the APE for the South Coast Rail Project Preferred Alternative. Within each community, north to south along the project corridor, historic properties recommended eligible for inclusion in the National Register are discussed first, followed by historic resources that are recommended not National Register eligible. The last section of the report discusses properties that were found during the survey to have been demolished or to be outside of the APE. A summary of the number of identified historic resources in each category is presented in Table 4-1. All properties discussed in this chapter are listed in Appendix A, Table 4-2 and shown on project maps in Appendix C. New or updated MHC Inventory forms for surveyed properties are included in Appendices E and F.

4.1 Canton Historic Resources Intensive Survey

The following areas/districts and individual properties in Canton identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One of two areas/districts is eligible for listing in the National Register. The other area, Revere Copper Company Works Area (Map No. Ca.B, MHC No. CAN.B), was found to be outside the project APE after closer inspection of its boundaries and is discussed at the end of this chapter. Three individual properties identified in the reconnaissance survey are eligible for National Register listing. All of these individual properties are located outside of any district boundaries.

4.1.1 Areas/Districts Recommended National Register Eligible

4.1.1.1 Washington Street Commercial and Institutional Area (Map No. Ca.C)

The Washington Street Commercial and Institutional Area is a neighborhood of approximately 20 contributing commercial, civic, and residential buildings located on a 2,000 foot long axis

Table 4-1: Summary of Historic Resources Intensive Survey and National Register Eligibility Evaluations.

City/Town	Historic Property Type	Potentially National Register Eligible DEIS/DEIR[a]	National Register Eligible Intensive Survey	Not Eligible, Demolished, or Out of APE
Canton	Areas/Districts	2	1[b]	1 (out of APE)
	Individual Properties	4[c]	3	0
Stoughton	Areas/Districts	1	1	0
	Individual Properties	4	3	1 (demolished 2006)
Easton	Areas/Districts	4	4	0
	Individual Properties	0	0	0
Raynham	Areas/Districts	2	1	1
	Individual Properties	2	1	1 (Not Eligible)
Taunton	Areas/Districts	9	7	2 (Not Eligible)
	Individual Properties	6	2	4 (Not Eligible)[d]
Berkley	Areas/Districts	1	1	0
	Individual Properties	1	1	0
Lakeville	Areas/Districts	1	1	0
	Individual Properties	2	1	1 (Not Eligible)
Freetown	Areas/Districts	1	1	0
	Individual Properties	1	0	1 (Not Eligible)
New Bedford	Areas/Districts	1[e]	1	1 (Not Eligible)
	Individual Properties	7	6	1 (Not Eligible)
Fall River	Areas/Districts	4	2	2 (Not Eligible)
	Individual Properties	13[f]	6	6 (Not Eligible)
Totals		**66**	**43**	**22**

a. Cherau et al. 2009a and 2009b and Adams et al. 2009b, 2000c, and 2009d.
b. This area encompasses a smaller area determined eligible for National Register listing by MHC.
c. One property in Canton recommended National Register eligible in the DEIS/DEIR survey has since been determined eligible by MHC and MassDOT and is accounted for in Chapter 3.
d. This number excludes two National Register listed properties in Taunton that were in a broadened APE, but are now out of the APE for the Preferred Alternative since the area has been found ineligible for the National Register.
e. One National Register eligible area was added since the DEIS/DEIR survey, within a larger area evaluated as not eligible.
f. One property in Fall River recommended National Register eligible in the DEIS/DEIR survey has since been determined eligible by MHC and is accounted for in Chapter 3.

centered on Washington Street, straddling the Stoughton Line right-of-way between Revere Street to the south and Chapel Street to the north. As noted in Chapter 3, this area encompasses the Canton Center Area (Map ID Ca.H, MHC No. CAN.L) that was determined eligible for National Register listing as a historic district in 1991 (MHC 1991). The Washington Street Commercial and Institutional Area includes resources dating from the late nineteenth to the mid-twentieth century, and constructed in a variety of styles including Italianate, Romanesque and Greek, Medieval, Gothic and Colonial Revival. Notable civic and institutional buildings include the Canton Public Library at 786 Washington Street (1901) and the Canton Town Hall. Properties are generally in good condition with some alterations. The Washington Street Commercial and Institutional Area is eligible for listing in the National Register at the local level under Criteria A and C for its associations with the development of the community and as an intact collection of commercial, institutional, and residential buildings representing a variety of architectural styles.

4.1.2 Individual Properties Recommended National Register Eligible

4.1.2.1 Canton Junction Railroad Station (Map No. Ca.001)

The Canton Junction Railroad Station (MHC No. CAN.104) is located at 666 Sherman Street, immediately east of the Stoughton Line right-of-way at the point where it diverges from the Amtrak Northeast Corridor. It is a Richardsonian Romanesque-style, one-story, rectangular-plan building constructed between 1892 and 1893 with a slate-clad hipped roof and attached platform canopies, rough-faced coursed ashlar granite masonry walls with red sandstone trim, and bay windows on its long elevations. The Old Colony Railroad Corporation commissioned architect Bradford Lee Gilbert to design the station. Gilbert, (1853-1911), a nationally-practiced architect based out of New York City, is best known for constructing perhaps the first skyscraper in New York, the Tower Building (1889). Starting out at the New York, Lake Eerie, & Western Railroad company, Gilbert became "one of the country's most prolific railroad architects" (Munn & Co. 1905:222). He went on to design two other railroad depots in Massachusetts, including the North Abington Depot in 1893 (MHC No. ABI.68) and the Beverly Depot in 1896 (MHC No. BEV.119). The Canton Junction Railroad Station was previously surveyed in 1993 for listing in the state inventory, when it was recommended individually eligible for National Register listing at the local level under Criteria A and C (Viens 1993b). The property is eligible at the local level under Criteria A and C for its associations with transportation and community development and as an intact example of a late-nineteenth-century Richardsonian Romanesque-style railroad station design by noted architect, Bradford Lee Gilbert. Restored and then moved across the Stoughton Line tracks circa 2000, the property also meets National Register Criteria Consideration B as it retains its relationship between the property and the rail right-of-way, its historical associations, and its historic features that convey its architectural values as a railroad station.

4.1.2.2 Revere Copper Company Railroad Embankment (Map No. Ca.002)

The Revere Copper Company Railroad Embankment (1835) (MHC No. CAN.935) is located in a wooded area south of Canton Junction, west of Revere Street, between the rights-of-way of the Stoughton Line and Amtrak's Northeast Corridor. It is an approximately 1,000 foot long, linear earth mound feature approximately 4 feet high with a level upper surface approximately 5 feet wide, and includes a single stone culvert, which appears contemporaneous with the remainder of the structure. The northern half of the structure lies between 200 feet and 400 feet southwest of the Stoughton Line right-of-way, with the remainder passing outside of the project APE. This former railroad roadbed, was a captive right-of-way for the Revere Copper Company (see discussion of this resource below) and carried horse-drawn freight until 1890. As constructed, it was connected to Amtrak's Northeast Corridor (originally the Boston & Providence Railroad). In 1890, the route was shifted east onto a new alignment that connected with the Stoughton Line right-of-way, leaving the 1835 structure abandoned. The Revere Copper Company Railroad Embankment was surveyed in 2006 and recommended eligible for the National Register under Criterion C (Krim 2006). The current survey finds that the structure retains its integrity and affirms and expands the earlier recommendation. The Revere Copper Company Railroad Embankment is eligible for listing in the National Register under Criteria C at the local level in the area of engineering. The structure is significant as rare surviving example of relatively unaltered railroad construction from the first generation of New England rail lines.

The Revere Copper Company Railroad Embankment is associated with the development of the Revere Copper Company and also may contribute to the significance of the Revere Copper Company Area (Map No. Ca.B, MHC No. CAN.B). However, as noted above, that area is excluded from the present survey because it was found to be outside the South Coast Rail Project APE, and so its potential significance for these associations was not evaluated (see below for a discussion of the Revere Copper Company Area).

4.1.2.3 Canton Water Works (Map No. Ca.024)

The Canton Water Works building (1885) (CAN.366) is located at 44 Pine Street, approximately 100 feet northeast of the Stoughton Line right-of-way. It is a Romanesque Revival style, one-story, rectangular-plan, industrial building. The building has a slate-clad cross-hipped roof with large gabled dormers, brick walls with corbelled cornices and large triple Roman arch windows, and a raised granite block foundation. Decorative polychrome terracotta tiling and wood fretwork is used in the dormers, window arches, and in the entry, which is set within a pedimented surround. A cylindrical brick reservoir tank with a shallow domed metal roof is located immediately behind the building. The interior of the building retains its historical pumping equipment and architectural finishes. The Canton Water Works is eligible for listing in the National Register at the local level under Criteria A and C. Under Criterion A, the building is associated with the establishment of Canton's municipal water supply, which was an important step in the community development of Canton during the late nineteenth century. Under Criterion C, the building is significant for its engineering as an intact surviving example

of a late-nineteenth-century municipal water pumping station and is significant architecturally as an excellent example of the Romanesque Revival style in the town of Canton.

4.2 Stoughton Historic Resources Intensive Survey

The following areas/districts and individual properties in Stoughton identified in the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One area/district is eligible for listing in the National Register. Three properties are individually eligible for National Register listing. These individual properties are also located within a National Register eligible historic district (Map No. St.B). One historic property, the Benjamin Marshall House (MHC STG.72) located at 1823 Washington Street was demolished in 2006. It is discussed at the end of the chapter.

4.2.1 Areas/Districts Recommended National Register Eligible

4.2.1.1 Downtown Stoughton Area (Map No. St.B)

The Downtown Stoughton Area is a large, irregularly shaped area that radiates out from the Stoughton Station on the Stoughton Line. The area consists of approximately 475 properties developed with civic, commercial, industrial, and residential buildings between the early-nineteenth through the mid-twentieth century. The civic and commercial portion of this area, centered at the intersection of Washington, Wyman, Porter and Pearl streets was previously surveyed as the Stoughton Square Area (STG.A) in 1987. This survey did not define the boundaries of the area. Stoughton Square, the area currently near the intersection of Pleasant and Washington streets, is the location of the first settlement in Stoughton. Stoughton Square, which is the current location of the historic Stoughton Station, later became a civic and commercial node in the mid-nineteenth century and contained a fire station, meeting halls, church, theatre, an auto dealer, and a shoe factory. Residential neighborhoods extend out from this civic, commercial, and industrial center, along Perry, School, Pearl, Seaver, Pleasant and Canton streets. Examples of typical building types and architectural styles in the area include multi-family worker housing, Cape Cod Cottages, Bungalows, and Greek Revival, Italianate, Queen Anne, Craftsman, Colonial Revival, and Classical Revival style buildings. Many of the buildings have been altered by the installation of synthetic siding and replacement of original doors and windows, but they retain their original form, architectural ornamentation, and setting within the streetscape. The area also encompasses the sites of the first public school and meetinghouse in Stoughton, which are commemorated by Stoughton Historical Society markers (MHC Nos. STG.900 and STG.901) near the town green. The Pearl Street Cemetery (MHC No. STG.800) and the Mystic Rubber Company (MHC No. STG.2), which are individually eligible for the National Register, are also located in the area and are discussed below. The Downtown Stoughton Area is eligible for National Register listing at the local level under Criteria A and C, for its associations with the industrialization and development of Stoughton from the early-nineteenth through the mid-twentieth century, and for its broad range of intact historic architectural types and styles.

4.2.2 Individual Properties Recommended National Register Eligible

4.2.2.1 Pearl Street Cemetery (Map No.St.022)

The Pearl Street Cemetery (MHC No. STG.800) is located approximately 1,100 feet northeast of the Stoughton Line right-of-way, near the town center. The cemetery consists of a 1.6-acre lot with approximately 400 burial markers, arranged in informal rows that identify more than 700 graves. The oldest burial ground in Stoughton and contains burial markers dating from 1737 to 1965, the cemetery includes examples of slate, marble, and granite headstones, footstones, and monuments, as well as earth-covered tombs and family plots. The Pearl Street Cemetery was surveyed by PAL in 2002 for listing in the state inventory and recommended eligible for listing in the National Register at the local level under Criteria A and C (Berg 2002). The property is eligible its associations with the settlement and development of Stoughton and under Criterion C, as it exemplifies a range of eighteenth- through twentieth-century burial art. The cemetery is also located within the National Register eligible Downtown Stoughton Area (Map No. St.B).

4.2.2.2 Mystic Rubber Company Building (Map No. St.024)

The Mystic Rubber Company (MHC No. STG.2) is located at 2 Canton Street, on the southwest side of the Stoughton Line right-of-way near Stoughton Station and the Wyman and Porter street railroad crossings. This multi-building complex includes five attached wood, brick, and concrete mill lofts as well as a boiler house and engine house. Mystic Rubber Company was established in 1877 for manufacture of rubberized clothing, and the existing complex in Stoughton was constructed in phases between 1877 and ca. 1920. The cloth was manufactured in Stoughton and then shipped to Boston for cutting and assembly of finished goods. Succeeding owners utilized the mill for the manufacture of footwear, which persisted until the 1980s. The property has since been converted into tenant-occupied mixed commercial and office spaces. The Mystic Rubber Company is eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the complex is significant for its associations with the rubber industry in Stoughton, an important economic activity in the town. Under Criterion C, the Stoughton Rubber Company complex is a significant and distinguishable grouping of late-nineteenth and early-twentieth century mill lofts erected to create an integrated manufacturing plant. It is also located within the National Register eligible Downtown Stoughton Area (Map No. St.B).

4.2.2.3 Meade Rubber Company Building (Map No. St.046)

The Meade Rubber Company Building (MHC No. STG.1) is located at 25 Brock Street on the west side of the Stoughton Line right-of-way and an existing layover facility. It is within the site of the proposed Stoughton Station and adjacent to the Brock Street railroad crossing. The building is a two-story brick mill loft with constructed with typical fire resistive engineering of the period. It has a shallow-pitched "flat" roof with a rectangular box monitor, brick walls with

evenly-spaced windows between projecting piers, and a concrete foundation. Founded in 1916, Meade Rubber Company manufactured shoe heels and soles as well as rubberized fabrics for use in hospital sheets. The company was one of several companies engaged in the rubber fabric industry in Stoughton in the late nineteenth and early twentieth century. The Meade Rubber Company Building is religible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the building is associated with the rubber clothing industry in Stoughton, which was an important economic activity for the town. Under Criterion C, the building is a good example in Stoughton of early twentieth century mill loft architecture. It is also located within the National Register eligible Downtown Stoughton Area (Map No. St.B).

4.3 Easton Historic Resources in Intensive Survey

The following areas/districts and individual properties in Easton identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey in Easton and evaluated as to their eligibility for listing in the National Register. Four areas/districts are eligible for listing in the National Register. There are no additional individual properties within the project APE in Easton that are eligible for National Register listing.

4.3.1 Areas/Districts Recommended National Register Eligible

4.3.1.1 Holmes-Linden Street Area (Map No. Ea.C)

The Holmes-Linden Street Area encompasses approximately 400 feet of the Stoughton Line right-of-way and is bounded by Holmes Street to the north, Mullen Lane to the east, the National Register-listed North Easton Historic District to the south, and Brookside Avenue to the west. The majority of the area consists of simple, one-and-one-half to two-story wood-frame residences constructed in the mid- to late nineteenth century to house laborers employed at the Ames Shovel Works and the shoe factories historically located in North Easton. The area includes approximately 78 properties, of which 72 contribute to its historic and architectural significance. Prevalent architectural styles and building forms include single-family, Italianate, Greek Revival, or Cape Cod houses. Many of the buildings have been altered by the installation of synthetic siding and replacement of original doors and windows, but they retain their original form, architectural ornamentation, and setting within the streetscape, forming a cohesive neighborhood of historic worker housing. The Holmes-Linden Street Area is eligible for National Register listing at the local level under Criteria A and C for its associations with the historical development of North Easton and as an intact neighborhood of nineteenth-century worker housing.

4.3.1.2 Center Street Area (Map No. Ea.E)

The Center Street Area encompasses approximately 0.5 miles of the Stoughton Line right-of-way and is bounded by the National Register-listed North Easton Historic District to the north, Seaver Street to the east, Wilbur Street to the south, and Sheridan Street to the west. The area includes approximately 295 properties. The one-and-one-half to two-and-one-half-story, wood-frame, single family houses demonstrate the expansion of the North Easton community out from its center at the Ames Company Shovel Shop complex. Development in the area began along Center Street in the early nineteenth century and continued between Seaver Street and the railroad during the latter half of the nineteenth century. Rows of nineteenth-century worker housing are located on Day Street, and early-twentieth-century buildings are located along Spooner Street, Sheridan Avenue, and infilled vacant lots throughout the area. Architectural styles and building types represented include Gothic Revival, Greek Revival, Italianate, Cape Cod, Second Empire, Queen Anne, Colonial Revival, and Dutch Colonial Revival. Many of the buildings have been altered by the installation of synthetic siding and replacement of original doors and windows, but they retain their original form, architectural ornamentation, and setting within the streetscape. The Center Street Area is eligible for National Register listing at the local level under Criteria A and C for its associations with the historical development of North Easton and as an intact neighborhood representing a range of nineteenth- and early-twentieth-century architectural styles. The Center Street Area encompasses two compact areas of late-nineteenth-century housing that were previously surveyed by the Easton Historical Commission and recommended as contributing resources within a potentially eligible district. These two areas are the Williams Street Area (MHC No. EST.O) and the Howland Court Area (Map No. MHC No. EST.L). Since these areas are within the larger, Center Street Area, they are not described separately in these survey results.

4.3.1.3 Easton Center Area (Map No. Ea.F)

The Easton Center Area (MHC No. EST.I) is a 250-acre area located between Center, Short, and Depot streets that encompasses approximately 0.5 miles of the Stoughton Line right-of-way. The area includes approximately120 properties developed with civic and residential buildings from the late eighteenth through the twentieth-century. Architectural styles and building types represented include Federal, Greek Revival, Italianate, Cape Cod, Colonial Revival, and Bungalow structures. The historic buildings are spread out throughout the area and retain a high degree of architectural integrity. There are approximately 62 non-contributing properties interspersed throughout the area, however, they do not detract from the cohesiveness of the historic area. The Easton Center Area was originally recommended eligible for National Register listing in 1998 at the local level under Criteria A and C for its association with the historical development of Easton and for its collection of civic and residential architecture from the eighteenth to early-twentieth century (Johnson 1998a). The current survey affirms that the area is eligible for listing in the National Register.

4.3.1.4 Hayward-Pool Area (Map No. Ea.G)

The Hayward-Pool Area (MHC No. EST.K) is located along the north side of Foundry Street and abuts approximately 1,000 feet of the Stoughton Line right-of-way at its west edge. The area encompasses 60 acres and contains 13 properties, including 11 residences, a cranberry bog with associated agricultural buildings, and a burial ground. The 13 properties were developed between 1778 and 1928 and are associated with the Hayward and Pool families who settled the area, establishing agricultural and light industrial concerns in the early eighteenth-century. Members of both the Hayward and Pool families are buried in the Pine Grove Cemetery, which is a contributing resource in the area. The site of the cranberry bog was historically used by settlers for its cedar trees and marsh hay. The Meadow Lea Cranberry Company opened the cranberry bog in 1910 and it operated under multiple owners until at least 1960. The houses include examples of the Federal, Queen Anne, and Colonial Revival architectural styles. The Hayward-Pool Area was surveyed in 1998 (Johnson 1998b) and is eligible for National Register listing at the local level under Criteria A and C for its associations with the historical development of a rural section of Easton and as an intact collection of historic buildings within an agricultural setting.

4.4 Raynham Historic Resources Intensive Survey

The following areas/districts and individual properties in Raynham identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One area/district is eligible for listing in the National Register. One individual property is also eligible for National Register listing and is located outside of any areas/districts. One area and one individual property are ineligible for National Register listing due to a lack of significant historic associations and/or architectural integrity.

4.4.1 Areas/Districts Recommended National Register Eligible

4.4.1.1 Carver Street Area (Map No. Ra.B)

The Carver Street Area is located on the east side of the Stoughton Line right-of-way at the Carver Street railroad crossing. It consists of a collection of five civic, religious, and residential properties near the intersection of Broadway and Carver Street in the central part of Raynham. One property at the north end of the district was demolished since 2008. The remaining buildings were constructed between 1850 and 1905 and include a Congregational Church (1876) and rectory (ca. 1905), the G.H. Lincoln House (ca. 1850) and the H.P. Crocker House (ca. 1870), and Gilmore Hall (ca. 1850). Some of the buildings have synthetic siding and replacement doors and windows, but generally retain a high degree of architectural integrity and are in good condition. The area is eligible for National Register listing at the local level under Criteria A and C for its associations with mid-nineteenth- and early-twentieth century development and architecture.

4.4.2 Individual Properties Recommended National Register Eligible

4.4.2.1 Dog Kennel and Track Property (Map No. Ra.011)

The Raynham Dog Kennel and Track Property located at 385 Thrasher Street, is situated along the east side of the Stoughton Line right-of-way, just southeast of the Britannia Street railroad crossing and east of the Taunton city boundary. In the early twentieth-century, likely during the 1930s, a farmstead at this site (circa 1870) was developed as a dog kennel and track. Although the history of this property is not known and the site is heavily deteriorated, the remaining historic fabric, including remnants of a fenced kennel, dog run complex, and a large, oval, dirt track with an announcer's podium, is evidence of a significant era in New England dog racing history that lasted 75 years. With state legislation in 1935, Massachusetts became the first state in New England to conduct greyhound racing. Local dog tracks likely to be contemporaries of the Raynham Dog Kennel and Track Property included Revere's Wonderland Greyhound Park (1934), Taunton Dog Track (1935) and Raynham Park (1940). Although these tracks had long histories, remaining active in the state until about 2009 when Massachusetts voters approved a dog racing ban, they no longer retain any historic fabric. As the singular remaining historic dog track site in the Raynham/Taunton area, the Dog Kennel and Track Property is eligible for National Register listing at the local level under Criteria A and D for its associations with the Massachusetts dog track industry and for its potential to yield information related to early dog track racing in the northeast region.

4.4.3 Historic Resources Not Eligible for National Register

4.4.3.1 Broadway-Center Street Area (Map No. Ra.C)

The Broadway-Center Street Area is an irregularly shaped area that encompasses portions of the Stoughton Line right-of-way and abuts the west side of the Whittenton Branch right-of-way. The area is centered on Broadway (State Route 138) in the areas previously known as Gilmoretown, which developed around a shoe-manufacturing firm established by C. and H.T. Gilmore in 1857, and Prattville. The area includes 150 properties. It consists primarily of residences, but also contains 12 commercial properties, two schools, and a modern post office. Construction dates range from approximately 1860 to 1960 and architectural styles represented range from the Greek Revival to the Colonial Revival, along with numerous Bungalow and Cape Cod residences and the Milk Bottle Restaurant – a notable example of commercial roadside architecture located outside the 400 foot APE. The majority of them have been altered by window replacement, the installation of synthetic siding, and modern additions, especially along Broadway. The Broadway-Center Street Area is not eligible for National Register listing due to overall loss of integrity.

4.4.3.2 Prospect Hill Street (Map No. Ra.001)

The 521 Prospect Hill Street individual property (a/k/a 87 Prospect Hill Street in 2009 reconnaissance survey) extends between Prospect Hill Street and the west side of the Stoughton Line right-of-way. The farmstead sits on a slightly sloping, narrow, rectangular lot predominantly wooded with a small portion dedicated to open space for farming. This property contains a farmhouse, barn, and chicken coop, with a gravel driveway leading to the main entry-ways of the south-facing farmhouse and the west-facing barn. The mid- to late-eighteenth-century farmhouse, which has lost significant architectural integrity, is a rectangular, two-bay by three-bay, one-story, wood-framed, side-gabled vernacular style building with two increasingly smaller connected work sheds extending from the east elevation that are similarly designed and oriented. A detached New England style barn constructed around the same time as the farmhouse stands just southeast of the farmstead. The barn has an asphalt shingle roof, wood shingle siding, a hay door, and large, hinged, wood paneled barn doors on the west-facing facade, and an attached rear shed. A chicken coop sits alongside Prospect Hill Street in the northwestern corner of the property. Constructed in the early-twentieth century, the chicken coop is constructed of mortared granite blocks with a tin shed roof and a wood post-and-beam standing seam tin shed-roofed addition, extending from the northern elevation. Although the property at 87 Prospect Hill Street is an early existing farmstead in the town of Raynham, it has lost architectural integrity and does not have strong historical associations with the town's agricultural development that would make it eligible for National Register listing.

4.5 Taunton Historic Resources Intensive Survey

The following areas/districts and individual properties in Taunton identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. Seven areas/districts and two individual properties within the project APE in Taunton are eligible for listing in the National Register. One of these areas (High Street Area, Map No. Ta.D) encompasses a smaller area (Harrison Street Area, Map No. Ta. V) that was included in the DEIS/DEIR, but is only eligible as part of the larger High Street Area. Therefore, the smaller Harrison Street Area (Map No. Ta. V) is not included in this survey. Two areas and four individual properties included in the survey are not eligible for National Register listing.

4.5.1 Areas/Districts Recommended National Register Eligible

4.5.1.1 Taunton Center Area (Map No. Ta.B)

The Taunton Center Area is a large, irregularly shaped area located along the north and west sides of the Taunton River east and west of the Stoughton Line right-of-way. The area encompasses three previously documented districts/areas: the Church Green National Register Historic District (TAU.A), the larger Church Green LHD (TAU.AC), and the Ashland Street Area (TAU.H); and abuts the Taunton Green National Register Historic District (TAU.C) to the

west, and the potentially National Register eligible High Street Area (Map No. Ta.D) described below. The Church Green and Taunton Green National Register Historic Districts are located more than 1,000 feet west of the Stoughton Line right-of-way, and are therefore not described separately. The Church Green LHD encompasses the smaller Church Green National Register Historic District and is described above. The Ashland Street Area includes a group of mid-nineteenth- to early-twentieth-century residences located on Ashland Street between Dean and Washburn streets. This area spans between 400 to 1,600 feet west and north of the Stoughton Line right-of-way.

The Taunton Center Area encompasses approximately 114 contributing and 11 non-contributing properties, primarily developed with residential, civic, and commercial buildings constructed between the early nineteenth century through the twentieth century. Prevalent architectural styles include examples of the Federal, Greek Revival, Gothic Revival, Italianate, Second Empire, Stick, Shingle, Classical Revival, Colonial Revival, Shingle, Dutch Colonial Revival, Craftsman, and Spanish Colonial Revival styles. Examples of the Cape Cod Cottage building type are also present. The Taunton Center Area includes many high style residential buildings and the boundaries of the area terminate on Arlington and Summer streets east of the rail right-of-way to exclude altered, lower integrity architectural examples. The Taunton Green area was the location of the first settlers' meeting-house and school in the mid-seventeenth century (not extant) and developed into the civic center for the city as early as 1848. The Taunton Center Area is recommended eligible for National Register listing at the local level under Criteria A and C for its associations with development of the city from its settlement to the mid-twentieth century and for its broad range of high style historic architecture.

4.5.1.2 High Street Area (Map No. Ta.D)

The High Street Area is a residential neighborhood bounded by the Mill River to the north, the Stoughton Line right-of-way on the Stoughton Alternative to the east, the Attleboro Secondary right-of-way on the Whittenton Alternative to the south, and Winthrop Street to the west. The area encompasses 75 properties. The majority of the historic buildings in the area are Victorian period residences constructed between 1870 and 1910, although several examples of earlier Federal, Greek Revival, and Italianate residences are also present, primarily along Spring Street. Most buildings retain a high degree of architectural integrity and minor alterations include window replacement and the installation of synthetic siding. The High Street Area encompasses the previously surveyed Harrison Street Area (Map No. Ta.V, MHC No. TAU.I), of 28 properties that comprise an intact streetscape of Greek Revival, Italianate, and Second Empire style wood-frame dwellings, constructed between 1850 and 1900. The High Street Area is recommended eligible for National Register listing at the local level under Criteria A and C for its associations with the development and expansion of Taunton due to industrialization and collection of nineteenth- and early-twentieth-century architecture.

4.5.1.3 Whittenton Mill Area (Map No. Ta.F)

The Whittenton Mill Area is centered on Whittenton Street, east of the Mill River, and is located east and west of the Whittenton Branch right-of-way on the Whittenton Alternative. The area encompasses the proposed Whittenton Station along with approximately 80 residential and industrial properties associated with the Whittenton Mills Complex (Map No. Ta.G), which was constructed between 1858 and 1895. The purpose of identifying this area was to address the significance of the worker housing and other structures associated with the Whittenton complex that were not listed in the National Register in 1984 as part of the Whittenton Mill Complex Historic District (see Map No. Ta.G). The area consists primarily of modest, nineteenth-century, one-and-one-half-story, wood-frame, identical worker housing that forms distinct streetscapes along First, Second, Third, Fourth, and Fifth avenues. Examples of worker housing include Greek Revival style duplexes with side gable roofs, shed dormers, and interior chimneys; and similar Greek Revival style single-family residences with front or side gable roofs. Although the majority of the houses in the area have been altered by window and door replacement and the installation of synthetic siding, the buildings retain their original form and arrangement, and the area retains its setting of compact housing with direct views of the mill. The Whittenton Mill Area is eligible for National Register listing at the local level under Criteria A and C for its associations with the nineteenth-century industrial development of Taunton and as an intact example of nineteenth-century mill village.

4.5.1.4 Reed and Barton Mill Village (Map No. Ta.H)

The Reed and Barton Mill Village is a compact neighborhood of worker housing located along Meadow, Cottage, and Lawrence streets, to the southeast of Whittenton Branch right-of-way on the Whittenton Alternative. The northwest end of the district is approximately 200 feet from the Whittenton Street railroad crossing and proposed Whittenton Station. The area encompasses approximately 87 properties developed with one-and-one-half to two-and-one-half-story, wood-frame residences; a common type of worker housing constructed in Taunton between the mid- to late-nineteenth century. The majority of the buildings exhibit the Greek Revival or Italianate style, and there are a few examples of the Two-Decker building type. Each streetscape has examples of identical housing with dramatic views of the brick Reed and Barton Mill complex (1830–1890) to the southeast (out of the project APE). The Reed and Barton Mill Complex (MHC No. TAU.Q) was listed in the National Register in 1984 as part of the Taunton MRA and a separate area of associated worker housing located on Cottage and West Brittania streets has been previously surveyed. The Reed and Barton Mill Village is eligible for National Register listing at the local level under Criteria A and C for its associations with the industrial and residential development of the city, and as a good, intact example of a nineteenth-century mill village in Taunton.

4.5.1.5 Ancient Whittenton Area (Map No. Ta.I)

The Ancient Whittenton Area (MHC No. TAU.R) is a linear area located on Whittenton and Warren streets that intersects the Whittenton Branch right-of-way on the Whittenton Alternative at the Warren Street railroad crossing. The area encompasses approximately 40 properties, including four eighteenth-century houses possibly associated with settlers who initiated the use of the Taunton River for iron forges near this location. The area includes several nineteenth-century Cape Cod Cottages, worker housing duplexes, and Stick and Queen Anne style residences. Many of the houses have been altered by the replacement of original windows and doors and the installation of synthetic siding, but they retain their overall design characteristics and setting. The Ancient Whittenton Area was surveyed in 1979, but no National Register evaluation was completed. It is eligible for National Register listing at the local level under Criteria A and C for its associations with the early residential settlement and industrial development of Taunton, and for its collection of intact, historic residential architecture.

4.5.1.6 Hart Street Area (Map No. Ta.L)

The Hart Street Area is located in East Taunton, on both sides of the Attleboro Secondary right-of-way on the Stoughton Alternative, equidistant from Weir Junction and Cotley Junction. It is an irregularly shaped residential area oriented on Hart Street, demarcated by the intersection of America and Linden streets to the north and Williams Street to the south. The area was originally farmland, primarily owned by the Hart and Williams families. By 1870, John W. Hart had established a brickyard, later known as the Stiles and Hart Brick Company, on the north side of Hart Street. A residential neighborhood built up around the complex throughout the late-nineteenth and early twentieth centuries. The Hart Street Area includes approximately 56 contributing and 19 non-contributing properties. The majority of the contributing buildings are residences constructed between the mid-nineteenth and early twentieth century. Prevalent architectural types and styles include Greek Revival, Italianate, Queen Anne, Cape Cod Cottage, Colonial Revival, and Bungalow. The area also includes an Italian Social Club and a former store and poultry farm. The majority of the buildings retain their original setting, design, and materials, with the exception of window replacement, the installation of synthetic siding, and small additions. The Hart Street Area is eligible for National Register listing at the local level under Criteria A and C for its associations with the economic growth and development of Taunton neighborhoods and as a well preserved collection of domestic architecture in Taunton during the second half of the nineteenth century.

4.5.1.7 Tremont Street Area (Map No. Ta.T)

The Tremont Street Area extends from approximately Horton Street to the Attleboro Secondary grade crossing at Tremont Street on the Whittenton Alternative. The area is a linear corridor encompassing 28 properties developed primarily with early- to late-nineteenth-century Greek Revival, Italianate, and Second Empire style dwellings. The houses are one-and-one-half to two-and-one-half story wood-frame structures with full-width or entrance porches, set back

approximately 50 feet from the street. All of the buildings in the area retain their original siting, massing, and some of their ornamental features, but some have been altered through window replacement and the installation of vinyl siding. One property within the area, the N.S. Mason House is individually listed in the National Register, as part of the 1984 Taunton MRA. The Tremont Street Area is eligible for National Register listing under Criteria A and C for its associations with the nineteenth-century residential development of Taunton and for its intact collection of nineteenth-century domestic architecture.

4.5.2 Individual Properties Recommended National Register Eligible

Two individual properties in Taunton were found to be eligible for listing in the National Register.

4.5.2.1 Staples Coal Company Coke Silos and Warehouse (Map No. Ta.160)

The Staples Coal Company property is located off White Avenue and abuts the northeast side of the Attleboro Secondary right-of-way on the Whittenton Alternative. The company functioned as a railroad served fuel supplier that provided anthracite coal for domestic use, and bituminous coal and coke for foundries, blacksmithing, and other commercial uses. The property contains a two-and-one-half-story, gable-roofed, wood-frame warehouse constructed circa 1870 and a collection of 12 concrete block silos set atop a one-story, rectangular concrete base, constructed circa 1920. The Staples Coal Company Coke Silos and Warehouse property is eligible for National Register listing at the local level under Criteria A and C. Under Criterion A, the property possesses important historical associations with the local metals industries in Taunton, and provided Coke used to melt metals in iron foundries and for the production of jewelry, household metals, nails, and locomotive components. The property meets Criterion C as a regionally unusual and rare surviving example of a coke storage and distribution facility, which is more typical in areas with higher consumption of coke.

4.5.2.2 Rhodes Button Company (Map No. Ta.225)

The Rhodes Button Company (MHC No. TAU.258, TAU.625) is located at 12 Porter Street, approximately 50 feet southwest of the Attleboro Secondary right-of-way on the Whittenton Alternative, near the Porter, Cohannet, and Winthrop street grade crossings. The property consists of a compact lot with two connected one-and-one-half story wood-frame machine shops constructed circa 1860 and a three-story brick loft constructed in 1879. The machine shops are rectangular buildings with gable roofs, box monitors, brick chimneys, and historic clapboard siding. One-story brick and wood-frame and additional chimney stacks are attached to the side and rear elevations of the machine shops. The brick loft is a three-bay wide, 13-bay long rectangular building with a slightly pitched gable roof, stone foundation, and segmental arched window openings with flush brick lintels. Stephen Rhodes moved to Taunton in 1830 and produced buttons, and coffin and upholstery tacks on the property during the mid-nineteenth century. As the company expanded, Stephen and his son Marcus Rhodes began

manufacturing wiring nails and fasteners for utilities companies. The property was originally located adjacent to the Mason Machine Works, manufacturer of locomotive components. The Rhodes Button Company is eligible for listing in the National Register at the local level under Criteria A and C. Under Criterion A, the property possesses significant historical associations with the nineteenth-century industrial development of Taunton, and was part of a large local network of railroad served or iron related industries. Under Criterion C, the property retains two well-preserved examples of mid-nineteenth century industrial architecture on their original site, which are rare surviving remnants of a historical concentration of railroad served industries in the area (Winters 1979b).

4.5.3 Historic Resources Not Eligible for National Register

4.5.3.1 Weir Village Area (Map No. Ta.K)

The Weir Village Area (MHC No. TAU.K) extends on either side of the Attleboro Secondary right-of-way on the Stoughton Alternative at the Ingell Street rail crossing. Weir Village, consisting of approximately 71 buildings, is an irregularly shaped area centered at the intersection of Ingell, Plain, Weir, West Water, and First streets. Located on the Taunton River, Weir Village developed during the nineteenth century as a major local shipping center and the production center for the iron, copper, brick, and stove industries. This area includes a variety of residential, commercial, and industrial properties associated with the growth of Taunton's nineteenth- and early-twentieth-century industries. Due to a loss of integrity through the demolition of two of the three most prominent related mill complexes within the APE (the Taunton Cotton Manufacturing Company and half of the Weir Stove Company), this area is not eligible for National Register listing. One individually listed National Register property, Cohannet Mills No. 3 (Map No. Ta.089), remains within the APE and is discussed in Chapter 3. Two individually listed National Register properties identified in the 2009 survey for the DEIS/DEIR are outside of the project baseline APE and are discussed at the end of this chapter.

4.5.3.2 Hodges Avenue Area (Map No. Ta.U)

The Hodges Avenue Area is an irregularly shaped neighborhood located on the northeast side of the Attleboro Secondary right-of-way on the Whittenton Alternative, near the Tremont Street grade crossing, along Chandler, Hodges, and White avenues. The area is comprised of approximately 72 properties with modest mid to late-nineteenth century worker housing, a mill overseer's house, along with two former industrial buildings, the Diamond Textile Mill complex and an ice house. Housing types in the area include one-and-one-half to two-and-one-half-story, Greek Revival Italianate, Second Empire, and vernacular style buildings, two-deckers, and gable-roofed multi-family dwellings. The Hodges Avenue Area likely housed workers of several area industries, including the Taunton Cotton and Machine Company, formerly located on the Mill River between Hodges Avenue and Park Street. Due to numerous alternatives resulting n a loss of integrity. The Hodges Avenue Area is not eligible for National Register listing.

4.5.3.3 Bridge No. 12.00 over Brickyard Road (Map No. Ta.091)

Bridge No. 12.00 carries the Attleboro Secondary right-of-way on the Stoughton Alternative over an abandoned private lane that forms an extension of Akron Lane in Taunton. The bridge is a two-track, single-span, metal, stringer structure with an open timber deck. Separate superstructures for each track cross the 14 foot span. The east deck, now without rails, consists of a pair of stringers (one under each rail) and lateral and diagonal L-channel cross-bracing. Each stringer is assembled from pair of rolled iron I-beams joined with riveted diaphragms. The west deck consists of a pair of rolled steel I-beam stringers (one under each rail). The stringers are reinforced with welded lateral and diagonal crossbracing. The bridge abutments, which appear to predate the superstructure, are assembled of massive split granite ashlar bound with heavy iron cramps. Each abutment has about 3 inches of unreinforced concrete cast onto its face. The first establishment of a bridge at this location is unknown, although historical maps show brickyard activity in the vicinity beginning in the 1870s. The east superstructure was erected in 1906 by the Boston Bridge Works for the New York, New Haven & Hartford Railroad. The west superstructure date is unknown, but its welded assembly indicates that it was erected sometime after World War II. Bridge No. 12.00 is not eligible for listing in the National Register. Both halves of the structure are typical examples of one of the most common types of railroad bridge design. The structure is not associated with any significant developments in Taunton's transportation network.

4.5.3.4 New York, New Haven, and Hartford Railroad Bridge over the Mill River (Map No. Ta.149)

The New Haven Railroad Bridge over the Mill River (Bridge No. 20.66) is located on the Whittenton Branch on the Whittenton Alternative between Warren and Whittenton streets in Taunton. This ca. 1930 structure is a seven-span, continuous, reinforced concrete deck bridge with an asphalt deck surface and pipe railings. It is approximately 80 feet long between the abutments, 27 feet wide (out-to-out), and has typical spans of 16 feet. The solid concrete cutwater piers have a small open section consisting of concrete posts, presumably to allow increased river flowage rates at flood stage. The structure is in poor condition. No plans are available for the structure, but historic maps indicated that the structure was constructed between 1915 and 1937 by the New Haven as a replacement for an earlier wood pile trestle on the same alignment. The New Haven Railroad Bridge over the Mill River is not eligible for National Register listing. The structure is a relatively late example of the commonly-used continuous concrete deck type and has no associations with important transportation improvements in Taunton. The bridge is located within the Whittenton Mills Area (Map No. Ta.F).

4.5.3.5 Taunton Car Manufacturing Company Building (Map No. Ta.206)

The Taunton Car Manufacturing Company (MHC No. TAU.257) is located at 3 Myrtle Street, approximately 400 feet south of the formerly proposed Taunton Depot station. The property contains a two-story, four-bay by one-bay, Italianate style, brick building constructed circa 1870. The building retains its original siting, massing, slightly-pitched gable roof with overhanging eaves, and segmental arched window openings. The building is the only remaining structure from the Taunton Car Manufacturing Company complex, which produced train and trolley cars. The company was strategically located close to the railroad and adjacent to two of the city's largest train component manufacturers, the Mason Machine Works and Taunton Locomotive Company. John H. Moore and James Booth purchased the property in 1881 and converted it into a molding and planning mill (Winters 1980a). The demolition of all of the other buildings that historically comprised the Taunton Car Manufacturing Company complex have resulted in a loss of integrity to the setting of this building. This building was not the primary facility in the complex and as a modest, common example of industrial architecture it does not possess architectural significance on its own to merit listing in the National Register.

4.5.3.6 Joseph E. Wilbar House (Map No. Ta.213)

The Joseph E. Wilbar House is located at 150 Cohannet Street, approximately 300 feet northeast of the Attleboro Secondary right-of-way on the Whittenton Alternative, near the Porter and Cohannet street grade crossings. The house is a two-and-one-half story, three-bay-wide, L-shaped Italianate style wood-frame building constructed circa 1860. It has been altered through the installation of vinyl siding, but retains its original siting, massing, overhanging eaves, an arched eave window, two-over-two wood sash, bracketed window hoods, and a pedimented entrance porch leading to a pair of paneled doors. A one-and-one-half-story, vinyl sided barn is located behind the house. Joseph E. Wilbar resided at the house from at least 1871 to 1895 and is the son of Joseph Wilbar, who designed the National Register-listed Mount Pleasant Cemetery (Map No. Ta.262) described above. The cemetery, established in 1834, is located approximately 1,000 feet south of the house. The Joseph E. Wilbar House has been altered by changes to siding and windows, and a large one-and one-half story gable-roof addition has been attached to the building. Its setting has also been altered, and the garage converted to a commercial building. The property is therefore not eligible for listing in the National Register.

4.6 Berkley Historic Resources Intensive Survey

The following areas/districts and individual properties in Berkley identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One area/district and one individual property located outside of any area/district boundaries are eligible for listing in the National Register.

4.6.1 Areas/Districts Recommended National Register Eligible

4.6.1.1 Myricks Street Area (Map No. Be.C)

The Myricks Street Area is located on the New Bedford Main Line and Fall River Secondary right-of-ways in southeast part of Berkley, and includes a segment of Myricks Street and all of Grove and Mill streets. The area encompasses approximately 49 properties, of which 38 contribute to its historic and architectural significance. The center of the area is within the 800 foot APE, but the boundaries of this area extend to encompass additional properties to the east and west. The area is comprised of primarily one-and-one-half-story, modest residences constructed between the mid-nineteenth century and early twentieth century in the Greek Revival, Italianate, and Colonial Revival styles that are currently in fair condition and for generally retain architectural integrity. Originally part of Taunton, Myricksville developed as an important railroad transshipment center for the agricultural goods produced in the region. During the late nineteenth century, a small textile mill (no longer extant) was constructed between what is now 6 and 12 Mill Street. The Myricks Street Area is eligible for listing in the National Register under Criterion C at the local level for its representation of mid-nineteenth to early-twentieth century residential architecture within the town of Berkley.

4.6.2 Individual Properties Recommended National Register Eligible

4.6.2.1 Residence, 1 Macomber Street (Map No. Be.006)

The property at 1 Macomber Street is located approximately 50 feet east of the New Bedford Main Line railroad crossing at Padelford Street. The building is an asymmetrical, generally rectangular, two-story, three-bay by five-bay, wood-framed Italianate-style farmhouse with a wrap-around built-in classical-style porch, an attached rear Italianate-style addition, and connected barn. The building was constructed in 1860 directly across Macomber Street from the New Bedford and Taunton Railroad line in the village Myricksville, just west of the village center. The property was located within the boundary of Taunton until 1879, when Myricksville was annexed to the town of Berkley. Early residents of the farmhouse included members of the Padelford and Macomber families, who were prominent in Taunton's history (Beers 1871; Everts & Richards 1895). Italianate cottage style residences were common in Berkley throughout the town's early industrial period, spanning from 1830 to 1870. These properties were typically constructed with either side hall or center hall plans and gable-end chimneys. The application of rounded-arch windows within the gable ends was also common. The most elaborately-designed Italianate style residence in Berkley is a circa 1865 with a two gable-end chimneys on South Main Street. At this time, the town was identified as "almost exclusively an agricultural town and as such reported 125 farms in 1865, producing Indian corn, potatoes, and various fruits" (Massachusetts Historical Commission 1981e:6-7). The property retains integrity of location, design, workmanship, materials and feeling as a Italianate style farmhouse. It is eligible for National Register listing under Criterion C at the local level for its representation of the Italianate style as applied to a rural residence.

4.7 Lakeville Historic Resources Intensive Survey

The following areas/districts and individual properties were included in the intensive survey in Lakeville and evaluated as to their eligibility for listing in the National Register. One area/district in Lakeville was defined during the course of the reconnaissance survey for the DEIS/DEIR as eligible for listing in the National Register. Two individual properties were evaluated as not eligible for the National Register.

4.7.1 Areas/Districts Recommended National Register Eligible

4.7.1.1 Assonet Cedar Swamp Area (Map No. La.C)

The Assonet Cedar Swamp Area (MHC No. LAK.D) is a cultural landscape encompassing the majority of the New Bedford Main Line right-of-way that extends through Lakeville. The area is comprised of approximately 2,670 acres of natural and cultural resources roughly bounded by Malbone, Mill, and Freetown streets, Pierce Avenue, and County and Howland roads. The center of the area is the Assonet Cedar Swamp, which is currently preserved as a wildlife refuge. The Swamp historically supported residential and agricultural development on its periphery, and served as an important source of cedar managed and harvested by local residents. The remainder of the area encompasses approximately 38 early-eighteenth to early-twentieth-century residences, mill sites, quarry sites, and cemeteries. The area boundaries include the Beechwoods/Pierce Avenue Area (MHC No. LAK.G) that was surveyed prior to the Assonet Cedar Swamp Area. Since the Beechwoods/Pierce Avenue Area is within the Assonet Cedar Swamp Area, it is not separately identified in this report. The Assonet Cedar Swamp Area was previously surveyed and evaluated as eligible for the National Register at the local level under Criteria A, C, and D for its association with the historic settlement and development of Lakeville, its intact collection of eighteenth- and nineteenth-century residences, and its retention of several mill, quarry, and domestic sites (Berg and Longiaru 2002). This survey confirms the area's eligibility for National Register listing.

4.7.2 Individual Properties Recommended National Register Eligible

4.7.2.1 Pierce and Haskins Cemetery (Map No. La.024)

The Peirce and Haskins Cemetery is a small, informal, eighteenth- to late-nineteenth-century burial ground divided into seven family plots with 45 slate and granite headstones that date from 1785 to 1892, slate footstones, and unmarked plots. Set within a rural, residential neighborhood on private property, 500 feet southeast of the end of Adams Lane, the cemetery is located 200 feet east of the Fall River Secondary right-of-way and situated at the southern edge of a field and bound on all remaining sides by a wooded swamp area. Originally part of the Holloway farm, the property was settled in 1699. The cemetery has burials for members of the Peirce family, a family that, throughout the nineteenth century and into the early-twentieth century, resided within the immediate vicinity of the cemetery. Previous research has suggested

that the unmarked graves may date to the early- to mid-eighteenth century, with associations to Quaker communities in Lakewood (the Beechwoods and the Myrics), since Quakers during this period commonly left burials unmarked; however, these burials may have simply lost their gravestones over time, due to theft, erosion, and/or deterioration. A circa 1970 plot plan indicates that the cemetery is divided into seven plots. A site visit was not possible due to lack of access to determine integrity and photograph the cemetery. Therefore, for the purposes of the South Coast Rail Project review the Pierce and Haskins Cemetery is considered to be eligible for the National Register at the local level under Criterion A for its associations with the historical development of Lakeville, and possibly under Criterion C for containing examples of eighteenth- and nineteenth-century funerary art.

4.7.3 Historic Resource Not Eligible for National Register

4.7.3.1 Railroad Bridge No. 0.92 over Assonet River (Map No. La.025)

Railroad Bridge No. 0.92 over the Assonet River (Cedar Swamp) (no MHC no., Map No. La.025) carries the Fall River Secondary Line over the Assonet River in the forested southwest corner of Lakeville. The three-span, riveted plate girder deck bridge with an open timber deck rises about 5 feet above the river on split granite abutments and piers. It measures approximately 60 feet long between the abutments and 10 feet wide. Span length varies from 19.5 to 23 feet. The New York, New Haven & Hartford Railroad erected Railroad Bridge No. 0.92 in 1908 using girders from a railroad-owned bridge in New York State. The granite piers appear to predate the structure, although their exact date of construction could not be determined. This structure is not recommended eligible for listing in the National Register. The bridge is a relatively small example of a common railroad bridge type and is not associated with any important transportation improvements in Lakeville.

4.8 Freetown Historic Resources Intensive Survey

The following areas/districts and individual properties in Freetown identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One area/district is eligible for listing in the National Register, and one individual property is not eligible.

4.8.1 Areas/Districts Recommended National Register Eligible

4.8.1.1 Slab Bridge Road Area (Map No. Ft.C)

The Slab Bridge Road Area is located immediately east of the Assonet Historic District and encompasses portions of Walnut and Elm streets, and Richmond, Slab Bridge, and Howland roads. The area overlaps with the APE along the Fall River Secondary Line and is adjacent to or overlaps three grade crossings. The area is comprised of modest, Georgian, Federal, Greek Revival, Cape Cod, and Bungalow residences constructed between the late eighteenth and early

twentieth century near the Assonet railroad depot (not extant). The depot was located near the railroad crossing of Slab Bridge Road (Beers 1871). The majority of the buildings in the area are in good condition, but have been altered by front porch additions, window replacement, and the installation of synthetic siding. Three houses in the area were previously included in the MHC Inventory: 21 Forge Road, the Rufus Macomber House at 26 Forge Road, and 28 Forge Road. The Slab Bridge Road Area is eligible for National Register listing at the local level under Criteria A and C as an intact early development of late-eighteenth to early-twentieth-century residential architecture with associations to early settlement patterns of Freetown.

4.8.2 Individual Properties Recommended National Register Eligible

No individual properties in Freetown were recommended as eligible for listing in the National Register.

4.8.3 Historic Resource Not Eligible for National Register

4.8.3.1 George Cummings House (Map No. Ft.002)

The George Cummings House is located approximately 400 feet west of the New Bedford Main Line right-of-way. The house is a rectangular, five-bay by three-bay, one-story, wood framed Cape Cod cottage constructed in 1806, with a late-nineteenth-century, one-story, side-gabled, rear addition that extends east and a secondary Queen Anne-style inset porch. The original owner of the property, George Cummings, was involved in town as a selectman, served as town assessor, and served in the war of 1812. In 1978, the George Cummings House was surveyed for listing in the state register (Thomas 1978). There are other better examples of late eighteenth- to early nineteenth-century Cape Cod style properties throughout Freetown; including the Charles A. Morton House (MHC No. FRE.133), the Hathaway House (MHC No. FRE.163), Dr. James Ashley House (MHC No. FRE.100), the Hopkins-Briggs House (MHC No. FRE.9), the Dr. Bradford Braley House (MHC No. FRE.150), and residences at 26 Forge Road (MHC No. FRE.67), and 21 Forge Road (MHC No. FRE.66). Therefore, this property is not individually eligible for listing in the National Register.

4.9 New Bedford Historic Resources Intensive Survey

The following areas/districts and individual properties in New Bedford identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. One area is eligible for National Register listing. This area is located within a larger area, which is not eligible. Six of the individual properties are eligible for inclusion in the National Register. These individual properties are located outside of any area/district boundaries.

4.9.1 Areas/Districts Recommended National Register Eligible

4.9.1.1 National Spun Silk Company Oneko Mills (Map No. NB.G)

National Spun Silk Company Oneko Mills (NBE.U) abuts the east side of the New Bedford Main Line. This complex of two free-standing brick and concrete mill lofts and a power house takes up the majority of a city block on three parcels. Three of five original buildings survive. Mill No. 2 (1918) is a typical early–twentieth century mill loft of fire-resistive brick and timber construction. Mill No. 3 (1920) is a Neo-Classical Style mill loft with a reinforced concrete, Turner-type, mushroom column frame. This five-story, 132-by-354-foot building has a pier-and-spandrel decorative scheme that makes extensive use of cast stone ornament. The Power House (1920) is Neo-Classical Style brick and cast concrete building that presents a simplified version of Mill No. 3's decorative scheme. National Spun Silk Company was organized in 1916 to manufacture spun silk cloth, a specialty product derived from waste left over from higher-quality silks. Demand for the cloth, which was used in defense-related products including gunpowder bags, rose dramatically due to World War I. Oneko Mills was one of a handful of facilities nationally that manufactured the product, and one of the larger silk companies in New Bedford. An expansion was planned for Mill No. 3 but never completed, leaving it with an asymmetrical appearance. A Weave Shed and combined Blacksmith Shop/Boiling and Drying House/Sorting House are now demolished. The National Spun Silk Company Oneko Mills is eligible for listing in the National Register under Criterion A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex has important associations with the development of New Bedford's silk industry, a significant component of the city's larger textile economy. Under Criterion C, the complex is significant for its architecturally-distinguished Neo-Classical architecture and for its examples of early twentieth century brick and concrete mill loft construction.

4.9.2 Individual Properties Recommended National Register Eligible

4.9.2.1 Lambeth Rope Corporation Complex (Map No. NB.010)

The Lambeth Rope Corporation Complex is located at 627 to 637 Tarkiln Hill Road and abuts the west side of the New Bedford Main Line right-of-way, near the Tarkiln Hill Road railroad crossing. The Lambeth Rope Corporation Complex (MHC No. NBE.641), constructed 1894-1918 consists of a brick office building, a connected brick loft and ropewalk, and a small wood frame freight house. Lambeth Rope Corporation was founded in 1894 and held rights to manufacture cotton transmission rope patented by the Lambeth Company of Blackburn, England. The product was used in rope drive systems in textile and other mills. The Lambeth Rope Corporation complex is eligible for National Register listing under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex, as a manufacturer of a specialized mill product, is associated with New Bedford's economically-significant textile industry. Under Criterion C, the complex represents an unusual example of a specialized rope manufacturing facility, including a rare surviving ropewalk building.

4.9.2.2 Manomet Mills Cotton Mill No. 4 (Map No. NB.011)

The Manomet Mills Cotton Mill No. 4 (MHC No. NBE.633) is located at 91 King Street on the east side of the New Bedford Main Line right-of-way, adjacent to Belleville Warehouse Co. Cotton Storage Building (NB.012). The integrated textile manufacturing complex includes a massive (approximately 900-foot long) three-story brick Spinning Mill, a smaller attached Picker Mill and Boiler House, and an Office. A Butler-type addition has been added across the north half of the Spinning Mill. Together, the buildings are a typical, but large-scale, example of early twentieth-century fire-resistive mill loft construction. Manomet Mills Cotton Mill No. 4 was designed by noted industrial architect C.R. Makepeace as a tire cord manufacturing facility for the William Whitman Company. This company also owned three other Manoment Mills, which are located on Belleville Avenue outside the project APE. The Firestone Tire and Rubber Company owned Mill No. 4 from 1927 to 1967 and used it for textile manufacturing and later weapons manufacturing. Manomet Mills Cotton Mill No. 4 is eligible for the National Register under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the building is associated with one of New Bedford's leading early twentieth-century textile companies – William Whitman Company, and also gains additional significance for its association with the Firestone Tire and Rubber Company, another important company in the twentieth-century economy of southeastern Massachusetts. Under Criterion C, the loft complex is significant as a major work of C.R. Makepeace and as an outsized example of integrated textile mill construction in the city during the early twentieth century.

4.9.2.3 Pierce Brothers Textile Mill Complex (Map No. NB.026)

The Pierce Brothers Textile Mill Complex is located approximately 100 feet west of the New Bedford Main Line right-of-way at 1125-1129 County Street. This property encompasses five early-twentieth-century connected brick buildings constructed by Andrew G. and Edward T. Pierce, including a Store House, Card Room, Main Mill, Boiler House, and Office (MHC No. NBE.612). A Weave Shed in the complex is now demolished. The buildings all employ typical early-twentieth century, fire-resistive mill loft construction. The Pierce Brothers founded the Pierce Brothers Limited in 1909 to the manufacture of fine cotton products, such as umbrella cloth and architectural tracing cloth. They had previously founded in 1892 the Pierce Manufacturing Corporation for cotton and silk goods and aircraft fabrics. Brothers Textile Mill Complex is eligible for National Register listing under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex is associated with New Bedford's significant early-twentieth-century textile industry. Under Criterion C, the complex presents a nearly-intact example of an early twentieth century integrated textile manufacturing facility incorporating well-preserved examples of fire-resistive brick mill loft architecture.

4.9.2.4 Christ Presbyterian Church (Map No. NB.029)

The Christ Presbyterian Church is located approximately 250 feet west of the New Bedford Main Line right-of-way at 1097 County Street. The church is a rectangular, wood-framed, one-

and-one-half-story, gable-front, Gothic Revival style wood-framed building either constructed or moved to its present location between 1924 and 1950, during a time when New Bedford's population peaked. It continues to operate as a church used by the Iglesia Adventista Del Septimo Dia. In the town of New Bedford, the Gothic Revival style was most prevalent in residences of the 1840s. The best-preserved and widely identified example in the area is the Gothic Cottage-style William J. Rotch House (MHC No. NBE.210), constructed by renowned architect, A.J. Davis. Few Gothic Revival style churches were constructed in New Bedford during the Early Industrial Period (1830-1870), including the granite-block, First Congregational Church (1838), also constructed by Davis, and the wood-framed, high-style Lund's Corner Congregational Church (MHC No. NBE.2733). This tradition fell into the Late Industrial Period (1870-1915) with the Grace Episcopal Church (MHC No. 2720) constructed by Boston Architects Van Bunt and Howe. By New Bedford's Early Modern Period (1915-1940) when the Christ Presbyterian Church was built, churches were usually Catholic in denomination and typically constructed in the Eclectic style, specifically Colonial Revival, Neoclassical, and even Tuscan. The church is eligible for National Register listing under Criterion C as a relatively rare and intact local example of a wood frame Gothic Revival ecclesiastical building.

4.9.2.5 Engine House No. 10 (Map No. NB.053)

Engine House No. 10 (a/k/a Purchase Street Fire Station) is located approximately 75 feet west of the New Bedford Main Line right-of-way at 2071 Purchase Street. The station is a rectangular, two-story, three-bay by seven-bay, hipped-roof, brick Renaissance Revival building constructed circa 1910 with a single story flat-roofed addition, and a six story drill tower constructed in 1941. There are few fire stations in New Bedford similar in design to the Engine House No. 10. One of the earliest existing fire stations is New Bedford Fire Station No. 3 (MHC No. NBE.2788), constructed in 1867. Likely an inspiration to the construction of the Purchase Street station, the Romanesque Revival style Engine House No. 7 was constructed in 1890 on the southeast corner of Durfee Street and Mount Pleasant Street, with a rectangular form, hipped-roof, single-story attached entrance, drill tower, and rounded-arch openings. Other stations that preceded the Engine House No. 10 included Engine No. 8 House (MHC No. NBE.2855), Station No. 3 (MHC No. NBE2788), Old Central Engine House, Howland Station No. 4, Pairpoint's Engine House, and the Lund's Corner Station No. 9. Constructed in 1910, the property at 2071 Purchase Street is the latest of these identified existing fire stations. Engine House No. 10 is eligible for National Register listing under Criteria A and C at the local level for its historical association with the development of city-sponsored public services and as an intact example of early-twentieth-century fire station design.

4.9.2.6 New Bedford Cotton Storage Company North Stores Warehouse and Annex (Map No. NB.081)

New Bedford Cotton Storage Warehouse Company North Stores (NBE.613) lies on the east side of the New Bedford Main Line and includes a Warehouse and detached Annex. The Warehouse is an outsized example of a typical early twentieth-century storehouse executed in fire-resistive mill loft-type construction. The six-story structure is 108 feet wide and 373 feet long. It has a

prominent four-story tower, brick walls with shallow projecting piers, and small segmental arch widows with wood sash. Loading bays with wood freight doors extend the full height of the building on the north elevation. A covered railroad loading dock has been demolished on the west end of the building. The Annex is a one-story rusticated concrete block storehouse. The New Bedford Cotton Storage Warehouse Company constructed its facility for cotton storage ca. 1910 and, by 1924, had expanded it with the Annex Building for paper and twine storage. The company was established in 1910 with leadership from textile firms in the city and its mission was to provide public warehousing space to textile and other manufacturing concerns. The firm pioneered the business in New Bedford and was a recognized leader in the field. Its North Stores Warehouse was one of three built by the company in New Bedford; the other two being the Terminal Stores near the city center, and the Union Stores, at the north end of the city. The warehouse was used particularly for cotton products, although it also housed some household and paper goods. Such facilities provided an essential service for the textile industry by supplying ancillary storage space for mills and facilitating trade between the mills, their suppliers, and their clients. New Bedford Cotton Storage Warehouse Company North Stores is eligible for listing in the National Register under Criterion A and C at the local level in the areas of industry and architecture. Under Criterion A, the building is associated with the warehousing trade in New Bedford – a critical supporting industry for the city's significant textile businesses. Under Criterion C, the building is an outstanding example of early twentieth-century, fire-resistive mill loft construction as applied to a storage warehouse. It is an especially large example of the building form that viscerally demonstrates the huge scale of textile manufacturing in the city.

4.9.3 Historic Resources Not Eligible for National Register

4.9.3.1 Brook Street Industrial and Commercial Area (Map No. NB.B)

The Brook Street Industrial and Commercial Area is a linear area located along the east side of the New Bedford Main Line right-of-way between Coggeshall, Collette, and Brook streets. The area combines five late-nineteenth- and early-twentieth-century brick and concrete mill complexes historically used for textile manufacturing, food production, and warehousing. These include (north-south) the New Bedford Cotton Mills Corporation (NBE.J), the Taber Mill complex (NBE.I), the National Spun Silk Company's Oneko Mills (NBE.U), Dawson's Brewery (NBE.D), and the New Bedford Cotton Storage Company – North Stores (NBE.613). The intensive survey found that demolition of critical historical components of several complexes (New Bedford Cotton Mills, Taber Mills, and Dawson's Brewery) had created large vacant lots within the area that made it ineligible for listing in the National Register. Two properties, National Spun Silk Company's Oneko Mills (NBE.U) and the New Bedford Cotton Storage Company – North Stores (NBE.613) were found to have significance and integrity sufficient to render them eligible for listing in the National Register individually, as discussed above.

4.9.3.2 Guardian Angel Parochial Schoolhouse (Map No. NB.064, Photo No. 097)

The Guardian Angel Parochial Schoolhouse is located approximately 300 feet east of the New Bedford Main Line right-of-way at 844 Acushnet Avenue. The building (MHC No. NBE.494) is a two-and-one-half-story, wood-frame building sheathed in vinyl siding, with a hip roof and front gabled entrance, constructed in 1896 to serve as a school managed by the Sisters of the Holy Cross. Opening in 1897, the school operated for twelve years as the Guardian Angel Parochial School until it transitioned into the church of Our Lady of the Holy Rosary, formed by two, small, local churches, St. Anthony's and Sacred Heart. While the first floor remained in use as a school, the second story was used for church services. This church continued to be active until 1966, when attendance declined after the removal of several residences to accommodate highway development. In 1978, the property was surveyed for listing in the state register (Mendes 1978). Lacking architectural integrity with extensive non-historic additions and modifications, the Guardian Angel Parochial Schoolhouse is not eligible for National Register listing.

4.10 Fall River Summary of Historic Resources

The following areas/districts and individual properties in Fall River identified during the reconnaissance survey for the DEIS/DEIR were included in the intensive survey and evaluated as to their eligibility for listing in the National Register. Two out of four areas/districts are eligible for listing in the National Register. Six of the individual properties identified in the survey are eligible for inclusion in the National Register. These individual properties are located outside of any area/district boundaries. Two area/districts and six individual resources are not eligible for National Register listing.

4.10.1 Areas/Districts Recommended National Register Eligible

4.10.1.1 North Main Street Area (Map No. FR.D)

The North Main Street Area is an approximately one-mile-long residential corridor roughly bounded by the Fall River Secondary right-of-way to the west, Millard Street to the north, Route 79 to the east, and Herman Street to the south. It encompasses 111 contributing and 25 non-contributing properties dating from the early nineteenth to the early twentieth centuries. Building styles and forms represented include Federal, Italianate, Second Empire, Classical Revival, Craftsman, Colonial Revival, Dutch Colonial Revival, Bungalow, and Cape Cod. Some buildings have been altered with synthetic siding and replacement windows, but the overall area retains its architectural integrity and setting. Three of the properties within the area are individually listed in the National Register as part of the Fall River MRA and one additional property is potentially eligible for individual National Register listing. The North Main Street Area is eligible for listing in the National Register under Criteria A and C at the local level for its association with the residential development of Fall River during the nineteenth and early twentieth centuries and as an intact neighborhood of period residential architecture.

4.10.1.2 Durfee Street Area (Map No. FR.L)

The Durfee Street Area is a large, one-mile-long residential area roughly bounded by the Fall River Secondary right-of-way to the west, Presidents Avenue to the north, the Highland Historic District (part of the Fall River MRA, 1983) to the east, and Pine Street to the south. It encompasses approximately 177 properties constructed from the early nineteenth century through the twentieth century in a wide range of architectural styles. Further study of the pattern of development in the area resulted in removing the section north of Prospect Street from this area (FR.L) and including it in the area the Wellington-Brownell Street Area (FR.I) (recommended not eligible). The street grid within the area was laid out by 1850 and became denser after the development of several neighboring textile mills in the late nineteenth and early twentieth century. The contributing buildings in the area generally possess a high degree of architectural integrity and are in good to excellent condition. One property within the area is eligible for individual National Register listing, 524 Durfee Street (Map No. FR.081). The Durfee Street Area is eligible for National Register listing under Criteria A and C at the local level for its association with the residential development of Fall River during the nineteenth through mid-twentieth century and as an intact neighborhood of historic residential architecture.

4.10.2 Individual Properties Recommended National Register Eligible

4.10.2.1 William J. Wiley Middle School (Map No. FR.013)

The William J. Wiley Middle School is located approximately 500 feet east of the Fall River Secondary right-of-way at 2585 North Main Street, and is within potentially National Register eligible North Main Street Area. The school is a rectangular, two-story, five-bay by two-bay, flat-roofed, steel and concrete structure building sheathed in red brick and brownstone trim constructed in the Classical Revival style. Constructed between 1911 and 1912, The William J. Wiley was one of the first new wave of schools to be constructed during a period of educational expansion. It was built during a period when the majority of institutional properties constructed were ecclesiastical. During the Late Industrial Period (1870-1915), Fall River experienced extensive residential development, with a high style residential district extending northward from Highland Street. School system administrators began to identify a need for updated educational buildings within the city to address an issue of overcrowded classrooms. School buildings that shortly followed suit included the Hamlet Street School and later, the Ferry Lane School. A string of new school buildings were built following the William J. Wiley School, such as the Fall River School Administration Building circa 1915, Doran School in 1926 (MHC No. FLR.99), the Fall River Technical High School in 1929 (MHC No. FLR.3049), and several others. Like the William J. Wiley School, these properties were predominantly masonry buildings constructed in the Colonial Revival and Renaissance Revival styles with flat roofs. The William J. Wiley Middle School is eligible for National Register listing at the local level under Criteria A and C for it associations with the early-twentieth-century development of Fall River and as an intact, local example of a Classical Revival style schoolhouse.

4.10.2.2 311 Crescent Street House (Map No. FR.017)

The residence at 311 Crescent Street (MHC No. FLR.74) is located approximately 400 feet east of the Fall River Secondary right-of-way. The property at 311 Crescent Street in Fall River, MA, constructed circa 1880, is a French Second Empire duplex constructed in circa 1880 within a neighborhood developed to accommodate the booming textile industry of the period. Constructed just 600 feet east of the Border City Mills, the property was likely erected to provide upper-management housing that was close in proximity to the mills. The building is a two-and-one-half-story, seven-bay by three-bay, wood framed building with a simple wood trimmed mansard roof, sinuous molded lintels over the bracketed windows, and a deep bracketed molded cornice. Set on a raised topography with a mortared stone retaining wall, the house prominently stands on its small, cleared lot. Identical entrances are located at each end of the facade to accommodate this multi-family residence. In 1977, the property was surveyed for listing in the state register (Rosebrock 1977b). The 311 Crescent Street House is eligible for National Register listing at the local level under Criteria A and C as an example of a high-style Second Empire house constructed in association with Fall River's thriving late-nineteenth-century textile industry.

4.10.2.3 St. Michael's Roman Catholic Church (Map No. FR.050)

St. Michael's Roman Catholic Church is located approximately 250 feet west of the Fall River Secondary right-of-way at 207 Essex Street. The church is a Neo-Gothic Revival style brick building with a one and one-half-story nave, flanking one-story aisles, and a square tower. Walls are lit by stained glass windows with cast stone tracery. The property was constructed in 1896 as a basement church to serve a large community of immigrants from the Azorean Islands of Portugal, who settled in Fall River in the late nineteenth-century. In 1902, the church expanded to include a French Second Empire style rectory adjacent to St. Michael's Church on Essex Street, which has since lost architectural integrity. Between 1921 and 1922, major alterations were made to the basement church by the Charles Hodgate Company of Boston, MA, when a Gothic Revival building and concrete facade were completed. The center of a large Portuguese community, the church provided house calls while the church was temporarily closed while under construction. St. Michael's Roman Catholic Church is individually eligible at the local level under Criteria A and C for its associations with the growing Portuguese community of Fall River in the early twentieth century and as a good example of the Neo-Gothic Revival style.

4.10.2.4 Westport Manufacturing Co. Waste Department (Map No. FR.67)

The Westport Manufacturing Co. Waste Department building is located at 7 Oregon Street and abuts the west side of the Fall River Secondary right-of-way. The building is a two-story, three-bay-wide by eight-bay-long warehouse constructed of brick pier and spandrel walls with iron interior posts. Westport Manufacturing Co. were producers of coarse cotton yarns used in

carpet warp, mops, and wicking. Headquartered in Westport, Massachusetts since 1812, in 1916 the company determined to construct a Fall River facility for the collection of cotton waste from larger mills – the chief raw material for their goods. The Waste Department building, designed by architect E.I. Marvell, was the result. The building used for baling and storage of cotton for shipment to Westport. Its design is a small, but architecturally distinguished example of standard early-twentieth-century fireproof industrial design, as demonstrated by its materials and a firebreak wall that vertically slices the building between its fifth and sixth bays. The Westport Manufacturing Company Waste Department building is recommended eligible for listing in the National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the property is associated with Fall River's important textile industry and is demonstrative of the geographic and economic connections fostered by that industry within the Southeast Region of Massachusetts. Under Criterion C, the building is a well-preserved example of early twentieth century industrial architecture that demonstrates the principles of fire-resistive design.

4.10.2.5 524 Durfee Street House (Map No. FR.081)

The residence at 524 Durfee Street is located approximately 200 feet east of the Fall River Secondary right-of-way. The building is a two-and-one-half-story, three-bay by six-bay, wood-frame, multi-family Italianate style tenement constructed circa 1880 with a crossed-gable-front roof and a large, three-story, flat-roofed rear addition circa 1900. Located in a dense, residential development laid out by 1850, the property was built simultaneously with the construction of neighboring textile mills and coal yards in the late nineteenth century. The building was erected two properties east of coal industry development along the Old Colony Railroad Line, including the (no longer extant) William F. Thomas Coal Yard and the Globe Coal Company (established 1881). The 524 Durfee Street House is eligible for National Register listing at the local level under Criteria A and C. Under Criterion A, the building has important historical associations with the nineteenth-century residential and industrial development of Fall River and under Criterion C, the building is an excellent, intact, high-style local example of an Italianate house. The house is also a contributing property within the National Register eligible Pearce-Durfee Street Area (Map No. FR.L).

4.10.2.6 Borden and Remington Company (Map No. 089)

The Borden and Remington Company complex (MHC No FLR.2002) is located at 104 Anawan Street and abuts the west side of the Fall River Secondary right-of-way, approximately 200 feet east of the proposed Battleship Cove Station. The complex consists of a three-story brick loft with four connected brick and wood structures, and a one-story storage shed along the railroad. The Borden and Remington Company, makers of paint and dye and also manufacturers of cloth printers and dyers, were established at their current location ca. 1892 after a move from elsewhere in Fall River. As a dealer of chemicals and supplies to Fall River's huge cloth printing businesses, the company played an important role in the city's textile industry. The firm persists today at a new location as Fall River chemical manufacturer Boremco and has world-wide

distribution. The Borden and Remington Company complex is eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the building is significant for its associations with Fall River's economically-significant textile industry. Under Criterion C, the Borden and Remington Company Complex is a well-preserved industrial loft and warehouse complex that exemplifies late-nineteenth century mill loft construction techniques.

4.10.3 Historic Resources Not Eligible for National Register

4.10.3.1 Fall River Country Club Golf Course Area (Map No. FR.B)

The Fall River Country Club Golf Course, designed by A.H. Fenn in 1899, is an 18-hole course located on both sides of the Fall River Secondary right-of way at Country Club Road. It was originally designed as a 9-hole course to emphasize views of the waterfront and to be easily accessible from the railroad and local streetcar lines. An advertisement of this course in a golf directory from 1900 describes it as located at Somerset Junction, four miles from the Fall River railroad station. Since its inception, the course has seen modifications in order to interest long-time members. From 1900 until 1922, the 9-hole layout was rearranged twice. In 1975, the property was expanded into an 18-hole course. In its current state, the country club property includes portions of a nine-hole golf course that date to 1922. As the layout of the course has changed, several different clubhouses have been constructed over the course of the property's history. The original 1899 clubhouse burned in a fire in 1909, which was replaced by another clubhouse in 1910 that was remodeled by 1975. In 1989, the clubhouse was demolished for the construction of a new building, completed in 1990. The property no longer retains integrity as a late nineteenth-century golf course. Due to the loss of historic buildings and structures, Fall River Country Club Golf Course is not eligible for listing in the National Register.

4.10.3.2 Wellington-Brownell Street Area (Map No. FR.I)

The Wellington-Brownell Street Area is an approximately half-mile-long neighborhood bounded by North Main Street to the east, Weetamoe and Essex streets to the north, Lindsey Street to the west, and President Avenue to the south, straddling the Fall River Secondary right-of-way. It contains approximately 335 properties dating to the late nineteenth and early twentieth centuries. Further study of the pattern of development in the area resulted in the addition of the portion of the Pearce-Durfee Street Area (FR.L) north of Presidents Avenue to the area. Development of the neighborhood, formerly known as Mechanicsville, began in the 1870s and was associated with the opening of nearby textile mills such as the Mechanics Mills, Sagamore Mills, Border City Mill, and the Foster Spinning Company. Multi-family dwellings are a common building form in the area and architectural styles include the Italianate, Second Empire, Bungalow, Colonial Revival and Shingle. Some buildings have been altered with synthetic siding and replacement windows, but the overall area retains its architectural integrity and setting. One property within the area, St. Joseph's Roman Catholic Church (Map No. FR.066), is listed in the National Register and two properties, St. Michaeol's Roman Catholic

Church (Map No. FR050) and Westport Manufacturing Company Waste Department (Map No. FR.067), is eligible National Register listing. The Wellington-Brownell Street Area is eligible for listing in the National Register under Criteria A and C at the local level for its association with the residential development of Fall River during the nineteenth and early twentieth century industrial boom and as an intact collection of period residential architecture.

4.10.3.3 Jael Hathaway House (Map No. FR.003)

The Jael Hathway House (MHC No. FLR.285) is located approximately 400 feet east of the Fall River Secondary right-of-way at 4042 North Main Street. The building is a rectangular, two-and-one-half-story, five-bay by three-bay, side-gabled, wood-framed, Federal style house with early 19th century and similarly styled one-story rear hipped-roof ell additions sheathed in clapboard and vinyl siding. The property is speculated to have been commissioned by Jael Hathaway, captain of a Freetown battalion of Loyalists during the American Revolution in 1785. The house shares a slightly sloping lot with a circa 1820 English barn, a non-historic outbuilding, and pool. Originally prominently situated on a raised topography, the building is now level with North Main Street, likely due to re-grading associated with highway maintenance. In 1977, the Jael Hathaway House was surveyed for listing in the state register (Rosebrock 1977a). Despite being an early local example of a Federal style house associated with a Loyalist captain, the property is not eligible for National Register listing, as the integrity has been compromised in the introduction of non-historic, synthetic materials and alterations.

4.10.3.4 Railroad Bridge near Ashley Street (Map No. FR.011)

Railroad Bridge (No. 8.58) near Ashley Street carries the Fall River Secondary Line over a closed, unnamed dirt road leading to a vacant wharf on the Taunton River. The structure is a single-track, single-span, timber stringer deck bridge. The bridge is supported near its midpoint with a timber pier and rests on split granite abutments. The open bridge deck extends 16 feet, 6 inches between the abutment faces and is 10 feet, 6 inches wide between its outer edges. There is approximately 6 feet of clearance between the underside of the deck and the lane. The deck is assembled from two bolted timber stringers that directly support the creosoted wood railroad ties and track. No plans are available for the structure are available for this structure, which appears on the 1915 railroad valuation map as Ashley's Underpass. Based on a comparison of existing conditions with previous bridge inspection reports, the structure appears to have been replaced or extensively reconstructed within the last 15 years. The Railroad Bridge near Ashley Street is not recommended eligible for listing in the National Register. This small example of timber stringer bridge was recently reconstructed and contains no noteworthy engineering features.

4.10.3.5 St. Matthew's Convent (Map No. FR.052)

St. Matthew's Convent is located approximately 300 feet west of the Fall River Secondary right-of-way at 189 Wellington Street. The convent is a rectangular, three-story, nine-bay by three-

bay, brick building constructed in the Colonial Revival style in 1920 with a full-height octagonal staircase addition, a two story full-width porch and an attached single car garage, and a rear elevation facing St. John's Cemetery. The building was built to the east of St. Matthew's Roman Catholic Church (no longer extant), to the west of St. Matthews Parochial School; to the north of St. John's Cemetery; and to the south of St. Michael's Roman Catholic Church Sunday School, apartments, and St. Michael's Roman Catholic Church. The building was constructed as part of the St. Matthews Roman Catholic Church complex, consisting of the circa 1910 St. Matthew's Roman Catholic Church (demolished between 1971 and 1996) and the circa 1920 St. Mathew's Parochial School. Although this property is not individually eligible for listing on its own merit, the convent is a contributing property within the National Register eligible Wellington-Brownell Street Area (Map No. FR.I).

4.10.3.6 St. Matthew's School (Map No. FR.053)

St. Matthew's School is located at 231 Wellington Street and abuts the west side of the Fall River Secondary right-of-way. The school is a two-story, Colonial Revival style brick and concrete building with a raised basement and a rear elevation facing St. John's Cemetery. The school was constructed circa 1920 as part of the St. Matthew's Roman Catholic Church complex and is associated with the St. Matthew's Convent (see description above). The building was built to the east of St. Matthew's Convent; to the north of St. John's Cemetery; and to the south of St. Michael's Roman Catholic Church Sunday School, apartments, and St. Michael's Roman Catholic Church. The building was constructed as part of the St. Matthews Roman Catholic Church complex, consisting of the circa 1910 St. Matthew's Roman Catholic Church (demolished between 1971 and 1996) and the circa 1920 St. Mathew's Convent. Over time, this property has lost integrity of design, with significant non-historic alterations of the original west-facing entrance and addition of a non-historic, modern main entrance on the northern elevation. Although this property is not individually eligible for listing on its own merit, the convent is a contributing property within the National Register eligible Wellington-Brownell Street Area (Map No. FR.I).

4.10.3.7 800 Davol Street Inn (Map No. FR.073)

The Davol Street Inn is a two-and-one-half-story, five-bay by three-bay, wood-frame, French Second Empire style building constructed circa 1910 and located approximately 400 feet from the proposed Fall River Depot Station on the Fall River Secondary right-of-way. It has a central, three-story tower extending from the south-facing facade and mansard roof with pedimented dormers. The main entrance features a broken scroll pediment and plain pilasters with a non-historic vinyl paneled door. The building was updated in the early twentieth century with a Colonial Revival style enclosed rear porch and entrance surrounds. Between 2003 and 2004, the property was extensively rehabilitated with non-historic alterations such as window replacement and a Colonial Revival style wrap-around porch with a dentilated cornice and simple balustrade. All historic fabric has been replaced with non-historic vinyl and faux slate.

The modifications to the building have resulted in a loss of integrity necessary to convey any architectural significance and building is not eligible for listing in the National Register.

4.10.3.8 American Printing Company Machine Shop (Map No. FR.088)

The American Printing Company Machine Shop (a/k/a American Print Works Machine Shop) is located approximately 400 feet west of the Fall River Secondary right-of-way near Battleship Cove Station, at the corner of Anawan and Water streets. The Machine Shop is an eight-bay-by-eleven-bay, two-story, brick mill loft with a subtly pitched gable roof. It was constructed circa 1900 as the American Print Works Machine Shop. In 1880, American Print Works was reorganized into the American Printing Company following a bankruptcy. The neighboring American Printing Company complex (see above), was listed in the National Register as part of the Fall River MRA in 1983, but the Machine Shop was not part of this nomination, possibly because it was primarily associated with a second company complex formerly located to the west of Water Street and now demolished. The Machine Shop currently houses the Marine Museum at Fall River and has been modified with new facade and flanking entrance towers and by the replacement of all the windows with panels. The American Printing Company Machine Shop is recommended to be not eligible for listing in the National Register. The building's associations with the existing American Printing Company complex appear to be marginal, and the modifications to the building have resulted in a loss of integrity necessary to convey any architectural significance.

4.11 Historic Resources Demolished or Outside of APE

4.11.1 Demolished

4.11.1.1 Benjamin Marshall House, Stoughton (Map No. St.075, St.D)

The Benjamin Marshall House (MHC STG.72) was located at 1823 Washington Street, approximately 300 feet east of the Stoughton Line right-of-way in Stoughton. Demolished in 2006, the remaining property is free of any buildings or structures, except for a wooden, molded post bearing the address, "1823," in vertical iron numbers. A recently erected, large wood post sign reads, "Future Home of St. James Lutheran Church, currently at 214 York Street, Canton." The house faced the street, but the rear of the property extended west to the railroad. The house was a five-bay-wide, Federal style, wood-frame building constructed ca. 1780 with a hip roof. Before it was demolished, it retained its original mass, wood clapboard, brick end chimneys, and central entrance with a Federal style fanlight and sidelights. The house was surveyed in 1988 as part of the South Stoughton Farm Area (MHC No. STG.E), a discontiguous area of five rural properties that are representative of Stoughton's nineteenth-century rural, agricultural character (Petruzzo 1988). This small group of properties are geographically dispersed and are more appropriately evaluated for the National Register individually. In the 2009 survey for the DEIS/DEIR, the Benjamin Marshall House was identified as potentially eligible for National

Register listing at the local level under Criteria A and C for its associations with the settlement of Stoughton and as a well-preserved rural example of a Federal style residence.

4.11.2 Outside of Project APE

4.11.2.1 Revere Copper Company Works Area, Canton (Map No. Ca.B)

The Revere Copper Company Works Area (MHC No. CAN.B) is located at 104 Revere Street, west of Canton Center in Canton, within a westward bend in the East Branch of the Neponset River southwest of the Stoughton Line right-of-way. The majority of this 33-acre, multiple-building, active industrial complex is 800 feet southwest of the Stoughton Line right-of-way, but the extant parking lot lies within the original Revere Copper Company lot line and extends into the APE. Intensive-level study of the Revere Copper Company Works Area (Map No. Ca.B, MHC No. CAN.B) has resulted in its removal from the project APE and it was not resurveyed and evaluated for National Register eligibility during the current survey. At the reconnaissance level, the fieldwork found that a small portion of this area intersected with the 400-foot project APE and the APE was, in accordance with survey methodologies, therefore expanded to encompass the area. However, intensive-level research using historical maps and aerial photographs shows that only an extremity of the area, an employee parking lot constructed between 1957 and 1969 on previously undeveloped land, actually falls within the 400-foot APE. This element is not included within surveyed bounds for the area as defined on previously-completed MHC inventory forms and is physically separated from the remainder of the area by Revere Street. Because of its minimal historical and limited physical associations with the Revere Copper Company and other historic-period occupants of the area, the parking lot is not a contributing resource within the area. The remaining, potentially significant portions of the area fall outside of the original 400-foot APE and additional survey and evaluation efforts for the property are no necessary.

4.11.2.2 Alfred Paul House, Taunton (Map No. Ta.087, Ta.C)

The Alfred Paul House (MHC No. TAU.294) is one of two individual National Register-listed properties that are outside the baseline APE but were included in the broadened APE for the potentially eligible Weir Village Area (Map No. Ta.K). Weir Village was evaluated as not National Register eligible (see above); therefore the Alfred Paul House is now outside the APE. The Alfred Paul House is located at 467 Weir Street in Taunton, approximately 700 feet southwest of the Attleboro Secondary right-of-way on the Stoughton Alternative near Weir Junction. The building is a square-plan, two-story, Second Empire style wood-frame house constructed circa 1860 for Alfred Paul, an important Weir Village industrialist and land owner. The house retains the majority of its design and material integrity, including a high mansard roof with elaborate dormers, and a porch with bracketed posts that wraps around the front of the building. The Alfred Paul House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the residential

development of Taunton and as a well-preserved example of the Second Empire architectural style.

4.11.2.3 Weir Engine House (Map No. Ta.088, Ta.C)

The Weir Engine House (MHC No. TAU.296) is one of two individual National Register-listed properties that are outside the baseline APE but were included in the broadened APE for the potentially eligible Weir Village Area (Map No. Ta.K). Weir Village was evaluated as not National Register eligible (see above); therefore the Weir Engine House is now outside the APE. The Weir Engine House is located at 530 Weir Street in Taunton, approximately 800 feet southwest of the Attleboro Secondary right-of-way on the Stoughton Alternative near Weir Junction. The building is a two-and one-half story, Queen Anne style, brick firehouse constructed in 1889 with a hip roof, gabled front dormer, and three prominent granite-trimmed fire engine doorways. It is one of three firehouses designed by Taunton's second Fire Chief, Abner Coleman, and one of only two that survive. The Weir Engine House was listed in the National Register at the local level under Criteria A and C as part of the 1984 Taunton MRA, for its associations with the development of Taunton and as a well-preserved example of a Queen Anne style firehouse.

4.12 Summary of Historic Resources by Community

4.12.1 Canton

The South Coast Rail Project in the Town of Canton extends approximately 2.3 miles along the Stoughton Line rail right-of-way and includes two existing stations, Canton Junction Station and Canton Center Station. Two areas/districts and five individual historic properties were identified within the Stoughton Alternative APE.

4.12.2 Stoughton

The South Coast Rail Project in the Town of Stoughton extends approximately 4.1 miles along the Stoughton Line rail right-of-way and includes one existing and one proposed station. The existing Stoughton Station is located at Wyman Street. The proposed new Stoughton Station site is located at Brock Street and the North Easton Station site is located on the town boundary between Stoughton and Easton. A total of one area/district and six individual historic resources were identified within the Stoughton Alternative APE.

4.12.3 Easton

The South Coast Rail Project in the Town of Easton extends approximately 6.6 miles along the Stoughton Line rail right-of-way and includes one station, the Easton Village Station. The proposed North Easton Station is located in Stoughton at the town boundary of Easton. Six

areas/districts, including one NHL consisting of discontiguous individual properties, and one individual historic property were identified within the Stoughton Alternative APE.

4.12.4 Raynham

The South Coast Rail Project in the Town of Raynham extends approximately 4.9 miles along the Stoughton Line and 1.2 miles along the Whittenton Branch rail rights-of-way. It includes one proposed station, Raynham Place, located on the Stoughton Line near the Easton town boundary. One area/district and one individual historic property was identified within the Stoughton Alternative APE.

4.12.5 Taunton - Summary of Project Effects

The South Coast Rail Project in the City of Taunton encompasses portions of four rail lines: Stoughton Line, Whittenton Branch, Attleboro Secondary, and New Bedford Main Line. The project area in Taunton extends approximately 2.0 miles along the Stoughton Line and 0.7 miles of the New Bedford Main Line rail right-of-way. It also extends approximately 2.1 miles along the Whittenton Branch and 1.6 miles of the Attleboro Secondary rail right-of-ways. A total of three stations are proposed in Taunton. The Stoughton Electric Alternative includes the Taunton Station on the Stoughton Line and the Taunton Depot Station on the New Bedford Main Line. The Whittenton Alternative proposes to construct the Dana Street Station on the Attleboro Secondary. A different station to serve this location, referred to as the Downtown Taunton Station, was also included in the intensive survey, before it was replaced by the Dana Street Station. Four areas/districts and nine individual historic properties were identified on the Stoughton Alternative. Nine areas/districts and fifteen historic properties were identified on the Whittenton Alternative. Two of these areas/districts (Map Nos. Ta.C and Ta.D) are on both the Stoughton and Whittenton Alternatives.

4.12.6 Berkley

The South Coast Rail Project area in the town of Berkley extends approximately 2.8 miles along the New Bedford Main Line and 0.7 miles along the Fall River Secondary rail rights-of-way. One area/district and one individual historic property were identified within the Stoughton Alternative APE.

4.12.7 Lakeville

The South Coast Rail Project in the Town of Lakeville extends approximately 2.8 miles along the New Bedford Main Line and 0.7 miles along the Fall River Secondary rail rights-of-way. One area/district and one individual historic property were identified within the Stoughton Alternative APE.

4.12.8 Freetown

The South Coast Rail Project in the Town of Freetown extends approximately 3.5 miles along the New Bedford Main Line and 5 miles along the Fall River Secondary rail rights-of-way. The project area also includes the proposed Freetown station, located on the Fall River Secondary line off South Main Street. Two areas/districts and one individual historic property were identified within the Stoughton Alternative APE.

4.12.9 New Bedford

The South Coast Rail Project in the City of New Bedford extends approximately 7.4 miles along the New Bedford Main Line rail right-of-way and includes two stations and one layover facility. The proposed stations are King's Highway and Whale's Tooth, located near the south terminus of the New Bedford Main Line. Three areas/districts and nine individual historic resources were identified within the Stoughton Line APE.

4.12.10 Fall River

The South Coast Rail project area in the City of Fall River extends approximately 6.5 miles along the Fall River Secondary line rail right-of-way and includes two stations and one layover facility. The two proposed stations are Fall River Depot and Battleship Cove, located near the south terminus of the Fall River Secondary. Eleven areas/districts and seventeen individual historic properties were identified within the Stoughton Alternative APE.

5

Project Effects and Mitigation

Chapter 5 presents information on the assessment of the effects of the South Coast Rail Project Stoughton Electric Alternative and Whittenton Electric Alternative on historic properties within the APE. These historic properties consist of properties that are previously listed in the State and National Registers, including designated NHLs, determined eligible for listing by the MA SHPO or the Keeper of the National Register, or that are recommended eligible in this survey, and confirmed by a Consensus Determination of Eligibility by the USACE and the MA SHPO. The chapter identifies the potential direct and indirect, as well as the permanent and temporary construction, impacts to historic above-ground buildings, structures, landscapes or area/district properties identified in Chapters 3 and 4 of this report. The potential impacts along the railroad alignment, grade crossings, including catenary, stations, and traction power facilities for rail electrification, are described. A review of steps that may be taken to avoid, minimize, or mitigate any adverse impacts to these historic properties is included. Project effects to historic properties are listed in Appendix A, Tables 5-1 and 5-2 and are summarized Tables 5-3 and 5-4. Historic properties within the South Coast Rail Project APE are located on USGS maps in Appendix B. All the properties in the intensive survey, including National Register listed, eligible, and not eligible historic resources, are shown on annotated project aerial maps in Appendix C.

The USACE has provided a detailed discussion of the methodology and determination of project effects of the South Coast Rail Project under Appendix C and 36 CFR 800 in the *Environmental Consequences Technical Report – Cultural Resources* (PAL and VHB 2009) and in the DEIS/DEIR Volume I, Chapter 4 – Affected Environment and Environmental Consequences (USACE 2011). The discussions in those reports are included in this intensive survey report by reference. For the FEIS/FEIR updated project information has also been prepared for noise and vibration (VHB 2012b) and the Stoughton Station (VHB 2012a). Direct impacts to historic properties from the South Coast Rail Project would result during the construction phase from the physical alteration of buildings, structures, and landscape or setting components within areas/districts, including demolition. Indirect impacts on historic properties would result during construction and/or operations from elevated noise or vibration levels, changes to the visual setting, increased traffic, or other environmental conditions affecting historic buildings, structures, and areas/districts.

5.1 Stoughton Alternative and Whittenton Alternative

5.1.1 Stoughton Alternative

The Stoughton Electric Alternative would provide commuter rail service to South Station using the Northeast Corridor (NEC), Stoughton Line, New Bedford Main Line, and Fall River Secondary. The New Bedford route would be 55.0 miles long and the Fall River route would be 52.7 miles long. Figure 2-2 shows the route of the Stoughton Alternative.

The Stoughton Alternative would:

- Utilize 15.5 miles of existing NEC track infrastructure between Boston and Canton Junction;
- Require improvements to track infrastructure along the Stoughton Line including:
- Reconstructing existing tracks from Canton Junction to Stoughton, as double track, a distance of 3.8 miles; and
- Constructing new tracks on existing right-of-way from Stoughton Station to Weir Junction in Taunton, as one to two tracks, a distance of 16.4 miles;
- Require reconstructing track on the Southern Triangle (common to both the Stoughton and Whittenton Alternatives), including:
- Reconstructing the existing New Bedford Main Line tracks from Weir Junction to New Bedford, as two to three tracks from Weir Junction to Myricks Junction, a distance of 4.9 miles; and single track with three sidings from Myricks Junction to New Bedford, a distance of 14.5 miles; and
- Reconstructing the existing Fall River Secondary tracks from Myricks Junction to Fall River, as single track with four sidings, a distance of 12.3 miles.

Infrastructure improvements for the Stoughton Alternative also include constructing, reconstructing, or widening 40 bridges and constructing or reconstructing 46 railroad at-grade crossings.

New, approximately 22-feet-tall catenary supports, wires, and a new system of traction power stations would be constructed along the length of the line with 10 traction power facilities would be constructed to operate that system:

TP-02 – Switching Station (SWS-1), Canton, Stoughton Line
TP-03 – Paralleling Station (PS-1), Easton, Stoughton Line
TP-04 - 115 KV Substation (TPSS-1), Easton, Stoughton Line
TP-05 – Paralleling Station (PS-2), Taunton, Stoughton Line
TP-06 – Switching Station (SWS-2), Berkley, Fall River Secondary (at Myricks Junction with New Bedford Main Line)
TP-07 – 115 KV Substation (TPSS-2), New Bedford, New Bedford Main Line

TP-08 – Paralleling Station (PS-3), Freetown, New Bedford Main Line
TP-09 – Paralleling Station (PS-6), New Bedford, New Bedford Main Line
TP-10 – Paralleling Station (PS-4), Freetown, Fall River Secondary
TP-11 – Paralleling Station (PS-05), Fall River, Fall River Secondary

Two existing train stations would be reconstructed at new locations (Canton Center and Stoughton) along the active Stoughton line segment, and a total of ten new train stations would be constructed throughout the rest of the Stoughton Preferred Alternative corridor. Four new stations would be built along the inactive Stoughton Line segment in Easton (North Easton, Easton Village), Raynham (Raynham Place), and Taunton (Taunton). On the New Bedford Main Line, one new station would be constructed in Taunton (Taunton Depot), one new station would be constructed in Freetown (Freetown), and two new stations would be constructed in New Bedford (King's Highway and Whale's Tooth). Two new stations would be constructed in Fall River (Battleship Cove and Fall River Depot) on the Fall River Secondary.

Two new layover facilities would be constructed at the Wamsutta location in New Bedford and at Weaver's Cove East in Fall River.

5.1.2 Whittenton Alternative

The Whittenton Alternative would provide commuter rail service to South Station through Stoughton, connecting to the existing Stoughton Line using the Whittenton Branch and a short segment of the Attleboro Secondary through the City of Taunton. Figure 2-3 shows the Whittenton Alternative. The New Bedford route would be 56.6 miles long and the Fall River route would be 54.3 miles long.

The Whittenton Alternative would:

- Utilize 15.5 miles of existing NEC track infrastructure between Boston and Canton Junction;
- Require improvements to track infrastructure along the Stoughton Line, including:
  - Reconstructing existing tracks from Canton Junction to Stoughton, as double track, a distance of 3.8 miles; and
  - Constructing new tracks on existing right-of-way from Stoughton to Raynham Junction, as one to two track sections a distance of 11.9 miles;
- Require constructing new singe track on existing Whittenton Branch right-of-way from Raynham Junction in Raynham to Whittenton Junction;
- Require reconstructing existing Attleboro Secondary tracks from Whittenton Junction to Weir Junction, as a single track with one siding, a distance of 6.0 miles);

- Require reconstructing track on the Southern Triangle (common to both rail alternatives) including:
  - Reconstructing the existing New Bedford Main Line tracks from Weir Junction to New Bedford, as two to three tracks from Weir Junction to Myricks Junction, a distance of 4.9 miles; and single track with three sidings from Myricks Junction to New Bedford, a distance of 14.5 miles; and
  - Reconstructing the existing Fall River Secondary tracks from Myricks Junction to Fall River, as single track with four sidings, a distance of 12.3 miles.

Infrastructure improvements for the Whittenton Alternative also include constructing, reconstructing, or widening 38 bridges and constructing or reconstructing 53 railroad at-grade crossings.

5.2 Effects to Historic Properties

The effects to the total of 105 historic properties along the Stoughton Electric Alternative and the Whittenton Electric Alternative may be permanent or temporary, direct, or indirect. This section discusses project elements along the rights of way, including rail right-of-way, catenary, grade crossings and traction power system facilities. Stations and layover facilities are discussed in the subsequent sections 5.3 and 5.4.

A total of 83 historic properties (33 historic districts and 50 individual) located along the Stoughton Alternative APE (Stoughton Line, portion of Attleboro Secondary, New Bedford Main Line, and Fall River Secondary) will be affected by the project. Additional information on the potential effects to historic properties is presented in Appendix A, Tables 5-1. USGS maps in Appendix B and annotated project aerial maps in Appendix C show the location of historic properties.

A total of 24 historic properties (9 historic districts and 15 individual) located along the Whittenton Alternative APE (Whittenton Branch and Attleboro Secondary) may be affected by the project. Two of the nine historic districts are also on the Stoughton Alternative (Ta.C and Ta.D). Additional information on the potential effects to historic properties is presented in Appendix A, Table 5-2. USGS maps in Appendix B and annotated project aerial maps in Appendix C show the location of historic properties.

5.2.1 Direct Impacts

Direct impacts for the Stoughton Electric Alternative and the Whittenton Alternative will include railroad upgrade (track, railroad bed, bridges and culverts, fencing in populated areas), at-grade crossing improvements (equipment, signage, traffic control), and electrical infrastructure (catenary and traction power facilities). Direct permanent impacts from work

within the existing right-of-way rail corridor are not likely to affect significant historic resources, with the exception of bridges and grade crossings.
One historic property along the right-of-way itself will be affected by rebuilding of the rail bed, track, and equipment. This location is the 2,000 ft of the Stoughton Line referred to as the Dighton and Somerset/Old Colony Railroad, Fall River Line Railroad Corridor (Map No. Ea.A) right-of-way that extends through the existing North Easton National Register Historic District (Map No. EA B) and is recommended as contributing to setting of the district.

Most at-grade crossings have no National Register listed, determined eligible, or recommended eligible historic properties in the direct impact APEs; therefore there will be no direct effects to historic properties. Direct impacts from improvements to existing at-grade crossings within historic districts and immediately adjacent to individual historic resources are expected to be minor, assuming that no roadway changes are proposed. There will be no direct impacts to historic properties from work at the traction power facilities listed above as there are no historic properties on the sites. Station and layover facility impacts are discussed below in Section 5.3. Noise mitigation insulating treatments on historic buildings, such as new windows and doors, will have an effect on the subject properties and will require design considerations for compatibility with historic properties.

Direct impacts for the Whittenton Alternative will be similar to the Stoughton Alternative. It will include clearing and grading and construction of new track and grade crossings along the abandoned line. There will be no direct impacts to historic properties for new grade crossings work within the right-of-way, and no traction power facilities are proposed. One new station is proposed and is discussed below in Section 5.3.

5.2.2 Indirect Impacts

Indirect impacts from the Stoughton Alternative and the Whittenton Alternative may include visual, auditory, vibration, or other environmental effects on the setting or other character-defining features of individual historic individual properties and districts. Indirect impacts from the addition of upgraded existing track and existing grade crossing rail infrastructure elements in the active right-of-way are generally anticipated to be low.

Clearing of a 40 to 75 feet vegetation corridor along the right-of-way and grading along the abandoned section of the Stoughton Line south of Stoughton Station will increase right-of-way visibility and may affect the setting of historic properties in the vicinity.

There are several historic properties of special note adjacent to the right-of-way in Easton that may have indirect effects from the project. The H.H. Richardson Historic District in North Easton (Map No. Ea.D) is a discontiguous NHL district of five properties including the Oliver Ames Free Library and Oakes Ames Memorial Hall on Main Street, approximately 400 feet west of the proposed Easton Village Station, and the historic Old Colony Railroad Station (Map No. Ea.003), located immediately north of the proposed station abutting the rail right-of-way. The

North Easton Historic District (Map No. Ea.B) encompasses the Stoughton Line between Main and Elm streets, and the proposed Easton Village Station and includes the Ames Company Shovel Shop complex located adjacent to the proposed Easton Village Station. The Stoughton Line right-of-way (Map No. Ea.A) track structure – including bridges, cuts and fills, retaining walls, and signal infrastructure – is recommended as important to the setting of this district. Changes will include upgrading the rail right-of-way, which will alter the Stoughton Line, including rebuilding the Main Street Bridge which will have an adverse effect on the physical properties of these resources and the appearance of the district. Construction of a new station platform, access and drop off area for the proposed Easton Village Station will occur adjacent to the historic Old Colony Railroad Station and Ames Company Shovel Shop. The design of these changes will introduce new modern rail elements that will have a visual adverse effect. Adverse effects to NHLs require special considerations to avoid, minimize, or mitigate adverse effects.

No historic properties are affected at levels that could cause damage or require vibration dampening mats. The project will result in increased noise during operations from train noise and horn blowing at grade crossings that will cause moderate to severe noise, or severe noise at residential, contemplative, and quiet setting historic properties that may require sound insulation or barrier mitigation. Noise walls are proposed as mitigation in two locations along the right-of way corridor: in Easton extending from Main Street south about 3200 feet and in Fall River between Presidents Avenue and Brightman Street. Refer to the *Noise and Vibration Mitigation Plan* for the proposed plans (VHB 2012b) and additional information will be in the FEIS/FEIR. Affected properties include:

- North Easton Historic District, Easton (Map No. Ea.B) (Oliver Street and Elm Street grade crossings)
- Holmes-Linden Street Area, Easton (Map No. Ea.C) (Elm Street grade crossing);
- Center Street Area, Easton (Map No. Ea.E) (Reynolds Street grade crossing);
- Easton Center Area, Easton (Map No. Ea.F) (Short Street and Depot Street grade crossings)
- Hayward-Pool Area, Easton (Map No. Ea.G) (Foundry Street grade crossing)
- Carver Street, Broadway, Raynham (Route 138) (Map No. Ra.B) (Carver Street grade crossing)
- High Street Area, Taunton (Ta.D) (Weir Street and Bow Street grade crossings)
- Hart Street Area, Taunton (Map No. Ta.L) (Hart Street grade crossing)
- Myricks Street Area, Berkley (Map No. Be.C) (Myricks Street and Mill Street grade crossings)
- 1 Macomber Street, Berkley (Map No. Be.006) (Padelford Street grade crossing)
- Slab Bridge Road Area, Freetown (Map No. Ft.C) (Elm Street, Forge Road, and Richmond Road grade crossings)
- Assonet Historic District, Freetown (Map No. Ft.D)
- North Main Street Area, Fall River (Map No. FR.D)
- Residence, 524 Durfee Street, Fall River (Map No. FR.081)

Four traction power facilities may have a visual effect on historic properties through the introduction of modern power structures that alter the historic setting:

- TP-05, Paralleling Station (PS-2) in will have an adverse visual impact on the High Street Area (Map No. Ta.D), Taunton
- TP-26, 115k Substation (TPSS-1) on the Hart Street Area (Map No. Ta.L), Taunton
- TP-09, Paralleling Station (PS-6) on historic properties in New Bedford:
  Acushnet Heights Historic District (Map No. NB.C)
  Wamsutta Mills Historic District (Map No. NB.D)
  Union Street Railway Carbarn (Map No. NB.063)
  Dawson Building (Map No. NB.065)
- TP-11, Paralleling Station (PS-05) will have a moderate to severe visual effect on the Pearce-Durfee Street Area (Map No. FR.L), Fall River

New construction including stations (see Section 5.3 below), traction power facilities, catenary systems, bridge modifications and replacements, right-of-way fencing, and noise mitigation barriers changes may have indirect visual impacts on adjacent historic architectural properties and their settings. The new catenary system along the right of way will have a moderate to severe visual effects on all the residential, commercial, and landscape (but not on industrial or transportation) historic properties throughout the rail corridor. The right-of-way fencing and noise mitigation barriers in and adjacent to historic districts and individual properties will have an effect on the setting of those historic resources by introducing new chainlink fence and solid walls that alter the historic character of the area.

Temporary construction period impacts may include noise and vibration from jackhammering and pile driving, atmospheric from dust and exhaust. Vibration impacts to historic resources could be caused by pile driving during construction adjacent to resources in close proximity to the right-of-way, if any pile driving occurs.

There are no anticipated permanent atmospheric or cumulative impacts to historic resources. Traffic impacts to historic resources are expected to be minor.

Indirect impacts from the Whittenton Alternative will be similar to the Stoughton Alternative, and will also involve clearing that will increase the visibility of the newly reactivated right-of-way from nearby historic properties. The abandoned Whittenton Branch crosses or is adjacent to five historic districts.

Train operations and horn blowing will result in moderate to severe, to severe noise that may require noise barrier or sound insulation at the following historic resources along the Whittenton Branch:

- Broadway-Center Street Area, Raynham (Map No. Ra.C) (Britton Street grade crossing);
- Taunton MRA (Map No. Ta.C); (Dean Street and Whittenton Street grade crossing)
- Whittenton Mill Area (Map No. Ta.F) (Whittenton Street grade crossing);
- Reed and Barton Worker Housing (Map No. Ta.H) (Whittenton Street grade crossing); and
- Ancient Whittenton Area (Map No. Ta.I) (Warren Street grade crossing).

5.3 Stations

There are 12 stations proposed for new construction (eleven stations) or improvements (one station) along the Stoughton Alternative and one new station on the Whittenton Alternative. Station plans remain at the conceptual level as they were in the DEIS/DEIR, consisting of general layouts and footprints within specified larger parcels. Stations will typically consist of a raised 800-foot long platform, canopy, parking lot, signage and lighting. The discussions below detail the results of investigations to date at the stations. The impacts to the historic structures, areas, and districts are summarized in Appendix A, Tables 5-2 and 5-3 and shown on maps in Appendices B and C. Stations in this section are listed north to south.

5.3.1 Canton Center

The Canton Center Station is an existing commuter rail station located off of Washington Street in Canton Center on the active portion of the Stoughton Line (Appendix C-1). The existing station would be modified to accommodate a second track (two new platforms adjacent to each track and minor changes to the parking layout in the existing lots near the station).

Canton Center Station is not a historic resource but is adjacent to the Canton Center Area (Map No. Ca.C). There are no historic resources on the site; therefore, there will be no direct impacts to historic resources. Improvements to the existing station may have indirect visual effects on Canton Center Area through the introduction of modern station structures and parking that alter the historic setting. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.2 Stoughton

The Stoughton Station would be relocated with new construction at a site on an active portion of the Stoughton Line (Appendix C-2). The site is within the Downtown Stoughton Center Area (Map No. St.B), which is recommended eligible for listing in the National Register. The site itself contains one property which has been recommended eligible for individual listing in the National Register: the Meade Rubber Company Building (Map No.

St.046) at 25 Brock Street (refer to Chapter 4 of this report). The property consists of a two-story brick mill loft constructed in 1916 and two stone and wood outbuildings constructed to the west of the loft after 1923. The company manufactured shoe heels and soles as well as rubberized fabrics for use in hospital sheets. Meade Rubber Company was one of several companies engaged in the rubber fabric industry in Stoughton in the early 20th century. The Meade Rubber Company Building is recommended eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. The proposed relocated station would require that the buildings on the property be demolished, resulting in a direct adverse effect to the Meade Rubber Company and to the Stoughton Center Area. Temporary noise, vibration, traffic, atmospheric, and cumulative effects may occur to the Stoughton Center Area during construction, but permanent effects are anticipated to be minimal.

5.3.3 North Easton

The North Easton Station would be constructed on an approximately 10-acre parcel (Appendix C-3). The parcel lies behind an existing retail plaza anchored by Roche Brothers shopping plaza along the Stoughton line. New medical buildings have been recently constructed and two additional buildings are planned.

North Easton Station does not have any historic properties on the proposed site or within the APE. There would be no direct or indirect impacts to historic properties.

5.3.4 Easton Village

The Easton Village Station would consist of platform, canopy, and dropoff parking lot only constructed on an approximately 1-acre parcel adjacent to Sullivan Avenue in North Easton Village along the Stoughton Line (Appendix C-3).

The proposed Easton Village Station on the Stoughton Line in Easton is located immediately adjacent to the Easton Old Colony Railroad Station (Map No. Ea.003), which is part of the H.H. Richardson Historic District NHL (Map No. Ea.D) and is within the National Register listed North Easton Historic District (Map No. Ea.B).

The proposed station site abuts important contributing properties of this district that are associated with the Ames Shovel Works, a significant historic property that has been recently rehabilitated as housing. The introduction of a new station will have a direct effect on the Stoughton Line through construction of new platform and related features on the railroad embankment. The new station will have indirect visual effects on the surrounding National Register and NHL properties through the introduction of modern station structures and parking that alter the historic setting. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.5 Raynham Place

The Raynham Place Station would be constructed at the Raynham-Taunton Greyhound Park off of Route 138 (Appendix C-4). The new station would be constructed on a less than 5-acre parcel along the Stoughton line.

No historic properties are located on the Raynham Place Station parcel nor do any exist within the station APE. There will be no impacts to historic properties.

5.3.6 Taunton

The Taunton Station would be constructed on an 8- acre parcel (Appendix C-5). The parcel is located off of Railroad Avenue near the intersection of Route 44 (Dean Street) and Arlington Street in Taunton along the Stoughton line.

There are no historic properties on the Taunton Station parcel. Therefore, there will be no direct impacts to historic properties. The station parcel is adjacent to the Taunton Center Area (Ta.B) and the Old Colony Railroad Station (Map No. Ta.019). The introduction of a new station may have indirect visual effects on these two historic properties through the introduction of modern station structures and parking that alter the historic setting. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.7 Dana Street

The Dana Street Station is proposed on a parcel between Dana Street and the Attleboro Secondary in Taunton (Appendix C-7). Dana Street replaces the Downtown Taunton Station that was previously under consideration at a different location.
The Taunton State Hospital property (Map No. Ta.S), which is listed in the National Register, is located on the opposite side of Dana Street to the east. The new station may have an indirect effect on the historic architectural and setting qualities of the Taunton State Hospital; however, these are not anticipated to be substantially different from existing conditions so the effect would not be adverse. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

The Staples Coal Company (Map No. Ta.160) is located at 28 Dana Street south of the station APE. The introduction of a new station could have indirect visual effects on this historic property through the introduction of modern station structures and parking that alter the historic setting. However, the effect will not be adverse because of the existing dense urban character of the surrounding area and the original industrial/transportation related function of the historic building. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.8 Taunton Depot

The Taunton Depot train station would be constructed on an approximately 14-acre parcel (Appendix C-8). The parcel is located off of Route 140 at the rear of an existing Target and Home Depot shopping plaza on the New Bedford Main Line.

The Taunton Depot Station does not have any historic properties on the proposed site or within the APE. There will be no direct or indirect impacts to historic properties.

5.3.9 King's Highway

The King's Highway Station would be constructed on a 55-acre parcel within a dense commercial strip off of King's Highway in New Bedford east of Route 140 along the New Bedford Main Line (Appendix C-12). The new station would occupy part of a site that is an existing shopping plaza.

The King's Highway Station does not have any historic properties on the proposed site or within the APE. There will be no direct or indirect impacts to historic properties.

5.3.10 Whale's Tooth

The Whale's Tooth Station would be constructed on an 8.7-acre parcel off of Acushnet Avenue, east of Route 18 along the New Bedford Main Line (Appendix C-12). The parcel is a paved parking lot constructed by the City of New Bedford in anticipation of the commuter rail project. The parking lot caps a closed superfund site.

The parcel that will be used for the Whale's Tooth Station does not have any historic properties on it. There will be no direct impacts to historic properties. The proposed Whale's Tooth Station is across John F. Kennedy Highway from the New Bedford Textile School (Map No. NB.069). The introduction of a new station may have indirect visual effects on the New Bedford Textile School; however, due to the intervening highway, the effect will not be adverse. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.11 Freetown

The Freetown Station would be constructed on an 18-acre parcel situated on South Main Street and west of the Fall River Secondary right-of- way (Appendix C-14). The parcel currently contains a self-storage business, and is near the Fall River Executive Park and the proposed River Front Park.

The Freetown Station does not have any historic properties on the proposed site or within the APE. Therefore, there would be no direct or indirect impacts to historic properties.

5.3.12 Fall River Depot

The Fall River Depot would be constructed on an approximately 8-acre parcel one mile north of downtown Fall River at Route 79 and Davol Street along the Fall River Secondary (Appendix C-15).

There are no historic properties on the site of the proposed Fall River Depot Station on the Fall River Secondary. Therefore, there will be no direct impacts to historic properties. The proposed Station is located across the rail right-of-way from the Pearce-Durfee Street Area (Map No. FR.L) which is recommended eligible for the National Register. The introduction of a new station will have indirect visual effects on the historic property through the introduction of modern station structures and parking that could alter the historic setting. However, the effect would not be adverse due to the industrial character of the adjacent part of the Pearce-Durfee Street Area and the presence of the highway. Noise, vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.3.13 Battleship Cove

The Battleship Cove Station would be constructed behind the Ponte Delgada monument along Water Street on an approximately 2.2-acre parcel near the southern terminus of the Fall River Secondary (Appendix C-15). It would serve all of the rail alternatives. The station would be geared to serve walk-in customers and pick up- drop off customers with no parking. The City of Fall River constructed a pickup- drop off loop road for the future commuter rail station as part of the Ponte Delgada monument.

The proposed Battleship Cove Station at the terminus of the Fall River Secondary is adjacent to the American Printing Company–Metacomet Mill (Map Nos. FR.N, FR.C), the American Printing Company Machine Shop (Map No. FR.088), and the Borden and Remington Company (Map No. FR.089) as shown in Appendix B-8. There are no historic resources on the site; therefore, there will be no direct impacts to historic resources. The introduction of a new station may have indirect visual effects on these three historic properties through the introduction of modern station structures and parking that alter the historic setting. However die to the industrial character of the properties and the highway transportation elements in the surrounding area, visual, noise, vibration, traffic, atmospheric, and cumulative effects are also anticipated to be minimal.

5.4 Layover Facilities

Two train layover facilities are planned; one each at or near the end of the Fall River Secondary and the New Bedford Main Line.

5.4.1 Wamsutta

The Wamsutta site overnight layover facility would be constructed on an approximately 8-acre parcel between Route 18 and Herman Melville Boulevard along the New Bedford Main Line (Appendix C-12). It is located on the east side of the right-of-way, opposite the proposed Whale's Tooth Station and adjacent to an existing CSX freight yard.

The Wamsutta Street Layover Facility does not have any historic properties on the proposed site; therefore, there will be no direct impacts to historic properties. The Wamsutta Layover Facility is located on the east side of the New Bedford Main Line rail between Wamsutta Street and the proposed Whale's Tooth Station. The Wamsutta Mill Historic District (Map No. NB.D) and the Revere Copper Products mill (Map No. NB.080) are both located within the APE. The introduction of a layover facility could have indirect visual and noise effects on the two nearby historic properties. Because the site is adjacent to the existing freight yard and will constitute an expansion of similar rail use, the visual impacts to the historic setting is likely to not be adverse. There will be no noise impacts to the adjacent historic industrial buildings, which are not a category of noise sensitive receptors under the FTA criteria. Vibration, traffic, atmospheric, and cumulative effects are anticipated to be minimal.

5.4.2 Weaver's Cove East

The Weaver's Cove East layover facility would be constructed on the east side of the railroad right-of-way, opposite the proposed Weaver's Cove LNG Site, approximately 2.5 miles from the southern terminus of the Fall River Secondary (Appendix C-15). A parcel on the west side of the railroad right-of-way within the proposed Weaver's Cove LNG Site is also being considered.

Historic survey completed for the Weaver's Cove layover facility parcel on the west side of the railroad right-of-way encompasses the historic resources in the APE of the current site on the east side of the right-of-way (see Appendix B-8). Based on the survey completed for the west site, the Weaver's Cove East site overlaps into a portion of the North Main Street Area (Map No. FR.D) that has been recommended eligible for the National Register. This part of the Area has no buildings. The construction of the layover facility would be an adverse effect as it would change the visual scene and the character of the area.

Two historic properties are located in the layover facility APE. There will be no adverse effect to the nearby National Register-listed Squire William B. Canedy House (Map No. FR.012) and the National Register-eligible William J. Wiley Middle School (Map No. FR.013).

5.5 Summary of Project Effects

5.5.1 Stoughton Alternative

The Stoughton Electric Alternative would result in potential direct impacts at two existing stations (Canton Station and Stoughton Station) that would need to be reconstructed. The new Stoughton Station would require demolition of Meade Rubber Co. (Map No. 046). One historic railroad bridge in Canton (Forge Pond Bridge, Map No. Ca.007, one railroad bridge in Fall River, Weaver Street (Map No. FR.016) and one historic road bridge in Fall River (Central Street Bridge. Map No. FR.084) may require reconstruction or widening. In addition, this alternative would have indirect effects to additional 56 properties as a result of changes in setting and/or increased noise that could affect the setting directly or require noise mitigation that could affect the appearance or setting of a district or building. These effects are listed in Appendix A, Table 5-1 and summarized in Table 5-4.

Table 5-4. Stoughton Alternative – Summary of Effects

Element	Direct	Indirect – Visual	Indirect – Noise (Noise + Visual)
Railroad Alignments			
Stoughton Line	2	8	0 (16)
Fall River Secondary	2	13	0 (10)
New Bedford Main	0	3	0 (4)
Stations			
Canton Center	0	0	0
Stoughton	1	0	0
North Easton	0	0	0
Easton Village	0	1	0
Raynham Place	0	0	0
Taunton	0	0	0
Taunton Depot	0	0	0
Freetown	0	0	0
Fall River Depot	0	0	0
Battleship Cove	0	0	0
King's Highway	0	0	0
Whale's Tooth	0	0	0
Wamsutta Layover	0	2	0
Weavers Cove East	1	0	0
Totals	6	26	0 (30)

5.5.2 Whittenton Alternative

The Whittenton Electric Alternative, as a variation of the Stoughton Electric Alternative, would have similar effects to historic properties. Under this alternative, three areas/districts in the Stoughton Alternative along the Stoughton Line between Raynham Junction in Raynham and Weir Junction in Taunton would not be affected. Instead this alternative would have indirect effects to an additional 21 areas/districts and 15 individual historic properties along the Whittenton Branch in Raynham and Taunton, and the Attleboro Secondary in Taunton as a result of changes in setting and/or increased noise that could affect the setting directly or require noise mitigation that could affect the appearance or setting of a district or building. These additional effects are listed in Appendix A, Table 5-2 and summarized in Table 5-5.

Table 5-5. Whittenton Electric Option – Summary of Additional Effects

Element	Direct	Indirect – Visual	Indirect – Noise (Noise+Visual)
Railroad Corridor			
Whittenton Branch	0	0	0 (3)
Attleboro Secondary	0	9	0 (7)
Station			
Dana Street	0	2	0(0)
Totals	0	11	0 (10)

5.6 Mitigation

5.6.1 Process and Regulations

This section summarizes the mitigation measures that may be taken to avoid, minimize, or mitigate the potential impacts on above-ground historic properties resulting from the implementation of the South Coast Rail Project Stoughton Alternative and Whittenton Alternative. The discussion below considers the regulatory requirements of the National Environmental Policy Act (NEPA), §106 of the National Historic Preservation Act (NHPA), and regulatory guidance detailed in the ACHP's regulations implementing §106 of the NHPA (36 CFR Part 800, Protection of Historic Properties). Impacts to cultural resources are identified and evaluated by:

(1) determining the area of potential effects (APE);
(2) identifying historic properties present in the APE that are either listed in or eligible to be listed in the National Register of Historic Places;

(3) applying the criteria of adverse effect to affected eligible historic properties; and
(4) identifying ways to avoid, minimize or mitigate adverse effects as outlined in 36 CFR 800.6 (Resolution of Adverse Effects).

Mitigation measures include avoidance, minimization, and data recovery and these measures are discussed below. The documentation for any of these mitigation measures must provide evidence that consultation has been completed with Native American Tribes and individuals with knowledge of affected resources. Further, mitigation measures must consider the comments of these persons on the measure(s) under consideration. Actions that the parties agree upon to resolve adverse effects will then be detailed in a Memorandum of Agreement (MOA), which is a legally binding agreement among the federal agency, the SHPO and/or THPO, and the ACHP. The other consulting parties may also be invited to sign the document. Once the agreement is signed by all appropriate parties and the agreement is filed with the ACHP, the Section 106 process is completed. The agency's Section 106 responsibilities are fulfilled when the MOA's stipulations are implemented.

5.6.2 Avoidance

Avoidance is the preferred response when adverse effect is determined. The Stoughton Alternative and Whittenton Alternative are expected to avoid almost all direct impacts to above-ground historic properties. Avoiding indirect impacts resulting from noise and visual intrusions may be addressed for historic properties through design modification in some locations.

5.6.3 Minimization

Minimization of impact to above-ground historic properties resources would be focused on reducing the extent of ground disturbance, establishing vegetated buffers, as well as designing noise barriers and sound insulation to be compatible with the historic setting.

This intensive survey report documents the boundaries, National Register status and criteria, and levels of significance for all district and individual above-ground historic properties within the APE in order to support consideration of minimization approaches. The report provides a discussion about the direct/indirect effects of the Stoughton Alternative and the Whittenton Alternative on districts, and individual historic properties in the APE.

5.6.4 Mitigation

The South Coast Rail Project Stoughton Alternative and Whittenton Alternative likely would result in unavoidable impacts to certain significant above-ground historic properties that cannot be addressed through avoidance or minimization. This section of

the report discusses categories of mitigation activities, which are indicated for the historic properties, including one NHL district, in Appendix A, Tables 5-1 and 5-2.

Mitigation responses for historic properties are often impact specific, especially if the resource in question was previously determined significant. Table 5.5 lists the mitigation approaches that might be used to mitigate adverse effects resulting from specific project actions. As will be noted, these various mitigation options are directed to maintaining the historic character of both buildings and settings and maintaining the integrity of existing buildings. Impacts to above-ground resources may be successfully reduced or eliminated by incorporating specific engineering methods that reduce noise generation or vibration, and through use of visual barriers that help to minimize aesthetic impacts.

There are several approaches to minimizing and mitigating potential impacts to above-ground historic properties within active rail corridors. The primary mitigation measure to avoid impacts to cultural resources is to utilize the existing rail corridor to the greatest extent feasible. This goal will be achieved by minimizing land takings for station and rail construction, avoiding unnecessary impacts to historic structures and districts. The following text provides an overview of potential mitigation measures that may be used to achieve these goals on a project-wide basis. Specific mitigation measures will be identified following the impact assessment and after consultation with the USACE, MA SHPO and the ACHP. The following sections describe mitigation measures designed to avoid impacts to aboveground historic properties.

5.6.4.1 Vibration Dampening

Vibration dampening can be an effective means or reducing or eliminating potential impacts to structures adjacent to active rail lines. Vibration dampening may be achieved by use of subgrade and ballast materials selected for reduced transmissions of vibration. Existing rail beds will be replaced with materials meeting the MassDOT standards for vibration transmission. In additional ballast treatment is necessary to avoid adverse impacts, ballast mats may be used. Ballast mats are a layer of rubber placed between the track and ballast to further reduce vibration.

the rail corridor will be reconstructed to include the use of ballasted decks containing a layer of crushed stone to absorb vibration and reduce noise generation. Specific mitigation measures used along the project corridor will be selected based on final design and the results of the historic properties impact assessment.

5.6.4.2 Noise Barriers

Noise barriers are an effective means of reducing the potential impacts created by new and expanded transportation corridors. In cases where trains may be idling at stations for the pickup and discharge of passengers or passing close to historic structures or districts,

this engineering solution may provide a means to reduce potential impacts from increased noise.

5.6.4.3 Visual Screening

The project has the potential to alter the aesthetics of certain historic properties and historic districts where new stations, parking or at-grade crossings are proposed. While the original construction of the Old Colony Railroad in the 1840s may have "fit in" with the aesthetic nature of the communities, the reactivation of the rail line using modern materials and safety standards may result in undesirable changes in the visual environment. Screening certain structures and safety and signal equipment may mitigate these impacts. Potential screening techniques include the combination of wooden and opaque chain link fencing with landscape planting.

Unnecessary clear-cutting of trees and vegetation along the railroad right of way that could have an adverse visual impact on historic properties will be avoided and existing trees and vegetative screening will be retained to buffer visually historic properties from the rail line to the extent feasible and with due regard for public safety, operational requirements, cost, and maintenance considerations.

The MassDOT will include internal landscaped areas at station parking lots which are located within or which are visible from historic properties. In and adjacent to historic districts or properties, equipment including traffic signals and controller cabinets, street lights, street furniture, and railroad signal equipment housings will be dark colored to reduce the visual impact of this equipment. Traffic signals and street lights will be ornamental type in accordance with the towns' preferences to the extent reasonably possible.

These methods, when used in combination with other mitigation measures such and noise barriers could successfully reduce and mitigate some potential visual impacts to historic properties associated with the South Coast Rail project.

5.6.4.4 Use of Compatible Materials within Historic Districts.

To the extent practicable, the MassDOT will use materials compatible in color, texture and form to minimize adverse visual impacts to historic structures and districts. A review of current conditions and materials will be undertaken by MassDOT in order to assure the use of compatible materials in the vicinity of Historic Properties. All repair, rehabilitation, or modification of historic properties, including sound insulation treatments for mitigation of noise impacts, will be performed in accordance with the U.S. Secretary of the Interior's "Standards for the Treatment of Historic Properties, including Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings".

5.6.4.5 Construction Staging and Methods

Construction staging and storage areas shall be located in protected areas outside historic districts and properties wherever possible, and in as unobtrusive a location as possible within historic districts or properties if alternative locations are infeasible. Where historic properties used as residences are within 50 feet of a staging area, a temporary solid wood fence, 6 feet high, will be used a visual screen between the residence(s) and the staging area.

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APPENDIX A

Lists of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties, and Project Effects

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ca.H	Canton	Canton Center Area	Washington Street/Canton Center	CAN.L	late-19th to mid-20th c.	MHC-DOE	Stoughton Line
Ca.006	Canton	Canton Public Library	786 Washington Street	CAN.078, CAN.L	1901	MHC-DOE	Stoughton Line
Ca.007	Canton	Forge Pond Railroad Bridge	Between Washington and Bolivar Streets	CAN.906	1845/1887/1890	MHC-DOE	Stoughton Line
St.023	Stoughton	Stoughton Town Hall	10 Pearl Street	STG.012, STG.A	1881	NRIND	Stoughton Line
St.025	Stoughton	Stoughton Old Colony Railroad Station	45-47 Wyman Street	STG.044, STG.A	1888	NRIND	Stoughton Line
St.026	Stoughton	Lucius Clapp Memorial Library	6 Park Street	STG.11	1903	NRIND	Stoughton Line
Ea.B	Easton	North Easton Historic District	Elm, Lincoln, and Main streets	EST.B, EST.E	late-18th to early-20th c.	NRDIS	Stoughton Line
Ea.D	Easton	H.H. Richardson Historic District	Elm and Main streets	EST.F	1877 - 1884	NHL, NRDIS	Stoughton Line
Ea.003, Ea.B, Ea.D	Easton	Old Colony Railroad Station	Off Oliver Street on Railroad Right-of-Way	EST.008, NBE.B, NBE.E, NBE.F	1884	NRIND	Stoughton Line
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout City of Taunton	TAU.P	mid-18th to mid-20th c.	NRMPS	Stoughton Line, Whittenton Branch, Attleboro Secondary

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ta.G	Taunton	Whittenton Mill Complex	Whittenton Street	TAU.T, TAU.P	1858 - 1895	NRDIS, NRMPS	Whittenton Branch
Ta.R	Taunton	Massachusetts State Hospitals and State Schools MPS	Multiple	TAU.AD	1830 - 1940	NRMPS	Attleboro Secondary
Ta.S	Taunton	Taunton State Hospital Historic District	Danforth Street, Dana Street	TAU.AE	Mid-19th to Early-20th century	NRDIS, NRMPS	Attleboro Secondary
Ta.018, Ta.C, Ta.B	Taunton	Dean-Hartshorn House	68 Dean Street	TAU.051, TAU.AC, TAU.P	1798	NRIND, NRMPS, LHD	Stoughton Line
Ta.019, Ta.C, Ta.B	Taunton	Old Colony Railroad Station	40 Dean Street	TAU.045, TAU.AC, TAU.P	1876	NRIND, NRMPS, LHD	Stoughton Line
Ta.020, Ta.C, Ta.B	Taunton	Woodward, William House	117 Arlington Street	TAU.044, TAU.AC, TAU.P	1810	NRIND, NRMPS, LHD	Stoughton Line
Ta.021, Ta.C, Ta.B	Taunton	Atwood, Charles R. House	30 Dean Street	TAU.041, TAU.AC, TAU.P	1850	NRIND, NRMPS, LHD	Stoughton Line
Ta.022, Ta.C, Ta.B	Taunton	Dean, Theodore House	26 Dean Street	TAU.040, TAU.AC, TAU.P	1866	NRIND, NRMPS, LHD	Stoughton Line
Ta.023, Ta.C, Ta.B	Taunton	C.J.H. Bassett House	20 Chestnut Street	TAU.027, TAU.AC, TAU.P	1851	NRIND, NRMPS, LHD	Stoughton Line

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ta.028, Ta.C, Ta.B	Taunton	Dean, Abiezar House	57 Summer Street	TAU.063, TAU.AC, TAU.P	1810	NRIND, NRMPS, LHD	Stoughton Line
Ta.029, Ta.C, Ta.B	Taunton	Neck of Land Cemetery	Summer Street	TAU.804, TAU.AC, TAU.P	1687	NRIND, NRMPS, LHD	Stoughton Line
Ta.089	Taunton	Cohannet Mills #3	120 Ingell Street	TAU.297, TAU.690, TAU.735, TAU.736, TAU.AG, TAU.K	1890	NRIND	Attleboro Secondary
Ta.181, Ta.C, Ta.T	Taunton	N.S. Mason House	58 Tremont Street	TAU.494, TAU.P	1865	NRIND, NRMPS	Attleboro Secondary
Ta.208, Ta.C	Taunton	Saint Thomas Episcopal Church	111-115 High Street	TAU.213, TAU.P	1857-1859	NRIND, NRMPS	Attleboro Secondary
Ta.209, Ta.C	Taunton	McKinstrey House	115 High Street	TAU.214, TAU.P	1759	NRIND, NRMPS	Attleboro Secondary
Ta.211, Ta.C	Taunton	Henry G. Brownell House (Elk's Lodge No. 150)	119 High Street	TAU.216, TAU.P	1893	NRIND, NRMPS	Attleboro Secondary
Ta.245, Ta.C	Taunton	Lord-Baylies-Bennett House (Taunton Masonic Lodge)	66 Winthrop Street	TAU.360, TAU.P	1831	NRIND, NRMPS	Attleboro Secondary
Ta.246, Ta.C	Taunton	Samuel Washburn House	68 Winthrop Street	TAU.361, TAU.P	1860	NRIND, NRMPS	Attleboro Secondary
Ta.254, Ta.C	Taunton	Samuel Colby House	74 Winthrop Street	TAU.362, TAU.P	1869	NRIND, NRMPS	Attleboro Secondary

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ta.259, Ta.C, Ta.V	Taunton	Sarah A. Haskins House	18 Harrison Avenue	TAU.231, TAU.I	1852	NRIND, NRMPS	Attleboro Secondary
Ta.262	Taunton	Mount Pleasant Cemetery	19 Crocker Street	TAU.822	1710 - late 20th c.	NRIND	Attleboro Secondary
Ta.266, Ta. C	Taunton	J.C. Bartlett House	12 Walnut Street	TAU.244, TAU.P	1880	NRIND, NRMPS	Attleboro Secondary
Ta.293, Ta.C	Taunton	Albert Field Tack Works	19 Spring Street	TAU.163, TAU.D, TAU.P	1868	NRIND, NRMPS	Attleboro Secondary
Ta.294, Ta.C, Ta.D	Taunton	H.B. Lothrop Store	210 Weir Street	TAU.284, TAU.P	1855	NRIND, NRMPS	Attleboro Secondary
Ta.309, Ta.C	Taunton	William Lawrence House	101 Somerset Avenue	TAU.334	1870	NRIND, NRMPS	Attleboro Secondary
Ft.D	Freetown	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Streets	FRE.A	early-18th to mid-20th c.	NRDIS	Fall River Secondary
Ft.009	Freetown	Richmond Road / Maple Tree Crossing Bridge	Richmond Road	FRE.903	1820-24	MHC-DOE	Fall River Secondary
NB.C	New Bedford	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Streets	NBE.AB	mid-19th to mid-20th c.	NRDIS	New Bedford Main Line
NB.D	New Bedford	Wamsutta Mills Historic District	Acushnet Avenue; Logan, North Point, and Wamsutta Streets	NBE.L	1847 - 1900	NRDIS	New Bedford Main Line

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
NB.012	New Bedford	Belleville Warehouse Company Cotton Storage Building	51 King Street	NBE.0627	1916	NRDOE	New Bedford Main Line
NB.063	New Bedford	Union Street Railway Carbarn	1959 Purchase Street	NBE.0198, NBE.0199, NBE.AB	1910	NRIND, NRDIS-C	New Bedford Main Line
NB.065	New Bedford	Dawson Building	1843-1855 Purchase Street	NBE.0480, NBE.AB	1896	NRIND, NRDIS-C	New Bedford Main Line
FR.C	Fall River	Fall River Multiple Resource Area	multiple	FLR.AS	late-19th to early-20th c.	NRMPS	Fall River Secondary
FR.E, FR.C	Fall River	Border City Mills	Weaver and West Streets	FLR.AL	1872-1889	NRDOE, NRMPS	Fall River Secondary
FR.F, FR.C	Fall River	Sagamore Mill Nos. 1 and 3	Ace Street	FLR.AF	1881-1907	NRMPS, NRDIS	Fall River Secondary
FR.G, FR.C	Fall River	Sagamore Mill No. 2	North Main Street	FLR.AE	1881-1907	NRMPS, NRDIS	Fall River Secondary
FR.H, FR.C	Fall River	Foster Spinning Company	Cove Street	FLR.W	1916–1919	NRMPS, NRDIS	Fall River Secondary
FR.J, FR.C	Fall River	Narragansett Mills	North Main Street	FLR.AC	1872-1895	NRMPS, NRDIS	Fall River Secondary
FR.K, FR.C	Fall River	North Burial Ground	North Main Street	FLR.AT	1810, 1849, 1890	NRMPS, NRDIS	Fall River Secondary
FR.M	Fall River	Diners of Massachusetts	multiple	FLR.F	late-19th c. to mid-1960s	NRMPS	Fall River Secondary

Table 3-2. List of National Register Listed and Determined Eligible Properties

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
FR.N, FR.C	Fall River	American Printing Company - Metacomet Mill	Anawan Street	FLR.J	1847 to early-20th c.	NRMPS, NRDIS	Fall River Secondary
FR.005, FR.C	Fall River	William Collins House	3775 North Main Street	FLR.0283, FLR.AS	1800	NRMPS, NRIND	Fall River Secondary
FR.006, FR.C	Fall River	North Christian Congregational Church	3538 North Main Street	FLR.0241, FLR.AS	1842	NRMPS, NRIND	Fall River Secondary
FR.010, FR.C	Fall River	Borden-Winslow House	3063 North Main Street	FLR.0275	1740	NRMPS, NRIND	Fall River Secondary
FR.012, FR.C	Fall River	Canedy, Squire William B. House	2634 North Main Street	FLR.0274	1806	NRMPS, NRIND	Fall River Secondary
FR.015, FR.C	Fall River	Border City Mills - Mill #2	1 Weaver Street	FLR.0485, FLR.AL, FLR.AS	1873	NRMPS, NRIND	Fall River Secondary
FR.016	Fall River	Weaver Street Bridge	Weaver Street	FLR.0902	1910	MHC-DOE	Fall River Secondary
FR.026, FR.C	Fall River	Brightman, Hathaway House	205 Crescent Street	FLR.0073, FLR.AS	1858	NRIND	Fall River Secondary
FR.066, FR.C	Fall River	St. Joseph's Roman Catholic Church	1355 North Main Street	FLR.0240	1880	NRIND, NRMPS	Fall River Secondary
FR.070, FR.M	Fall River	Al Mac's Diner	135 President Avenue	FLR.1973, FLR.F	1953	NRMPS, NRIND	Fall River Secondary
FR.082	Fall River	Lafayette-Durfee House	94 Cherry Street	FLR.0056	1747	NRIND	Fall River Secondary
FR.084	Fall River	Central Street Bridge over Quequechan River	Central Street	n/a	1903	MHC-DOE	Fall River Secondary

Table 3-2. List of National Register Listed and Determined Eligible Properties

*Resources are sequenced north to south along the project corridor and by town.

**National Register Status Key

NHL	National Historic Landmark
NRDIS	National Register District
NRMPS	National Register Multiple Property Submission or District listed in the National Register as part of an NRMPS
NRIND	Individual Property listed in the National Register
NRDOE	Property Determined Eligible for National Register listing by the Keeper of the National Register
MHC-DOE	Property Determined Eligible for National Register listing through Consensus by the Massachusetts Historical Commission and other agencies

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ca.B	Canton	Revere Copper Works Company	Revere Street	CAN.B	1835 to mid-20th c.	Out of APE	Stoughton Line
Ca.C	Canton	Washington Street District	Washington Street	n/a	late-19th to mid-20th c.	RNRE	Stoughton Line
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman Street	CAN.104	1892	RNRE	Stoughton Line
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere Street	CAN.935	1835	RNRE	Stoughton Line
Ca.024	Canton	Canton Water Works	40 Pine Street	CAN.366	1888	RNRE	Stoughton Line
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Streets	STG.A	early-19th to mid-20th c.	RNRE	Stoughton Line
St.022	Stoughton	Pearl Street Cemetery	Pearl Street	STG.800	1737 - 1965	RNRE	Stoughton Line
St.024	Stoughton	Mystic Rubber Company	2 Canton Street	STG.002, STG.A	1877-ca. 1920	RNRE	Stoughton Line
St.046	Stoughton	Meade Rubber Company	25 Brock Street	STG.001	1916	RNRE	Stoughton Line
St.075, St.D	Stoughton	Benjamin Marshall House	1823 Washington Street	STG.072, STG.E	1780	Demolished	Stoughton Line
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden streets	n/a	mid- to late-19th c.	RNRE	Stoughton Line
Ea.E	Easton	Center Street Area	Center Street	n/a	early-19th to early-20th c.	RNRE	Stoughton Line
Ea.F	Easton	Easton Center Area	Center, Depot, and Short streets	EST.I	1786 to early-20th c.	RNRE	Stoughton Line
Ea.G	Easton	Hayward - Pool Area	Foundry Street	EST.K	1770-1928	RNRE	Stoughton Line

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ra.B	Raynham	Carver Street Area	Carver Street, Broadway (Route 138)	n/a	1850 c. - 1905	RNRE	Stoughton Line
Ra.C	Raynham	Broadway-Center Street Area	Center Street, Broadway (Route 138)	n/a	mid-19th to mid-20th c.	RNRE	Stoughton Line
Ra.001	Raynham	Residence and Barn	521 Prospect Hill	n/a	1890	NE	Stoughton Line
Ra.011	Raynham	Dog Kennel and Track Property	385 Thrasher Street	n/a	1870 to mid-20th c.	RNRE	Stoughton Line
Ta.B	Taunton	Taunton Center Area	Dean, Park, and Summer Streets	(includes TAU.A, TAU.AC)	18th to mid-20th c.	RNRE	Stoughton Line
Ta.D	Taunton	High Street Area	High, Bryant, and Sumner Streets	n/a	early-19th to early-20th c.	RNRE	Stoughton Line, Attleboro Secondary
Ta.F	Taunton	Whittenton Mill Area	Whittenton Street	(includes TAU.T)	mid- to late-19th c.	RNRE	Whittenton Branch
Ta.H	Taunton	Reed and Barton Worker Housing	Cottage and Meadow Street	n/a	mid- to late-19th c.	RNRE	Whittenton Branch
Ta.I	Taunton	Ancient Whittenton Area	Warren Street	TAU.R	1730 to late-19th c.	RNRE	Whittenton Branch
Ta.K	Taunton	Weir Village Area	Plain, First, West Water, and Ingell Street	TAU.K	early-19th to mid-20th c.	NE	Attleboro Secondary
Ta.L	Taunton	Hart Street Area	Hart Street	n/a	mid-19th to early-20th c.	RNRE	Attleboro Secondary
Ta.T	Taunton	Tremont Street Area	Tremont Street	n/a	1870	RNRE	Attleboro Secondary

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ta.U	Taunton	Hodges Avenue Area	Morton, Granite, and Tremont Streets; Hodges, Chandler and Columbus Avenues	n/a	1860 - 1930	RNRE	Attleboro Secondary
Ta.087	Taunton	Alfred Paul House	467 Weir Street	TAU.294, TAU.K, TAU.P	1860	Out of APE	Attleboro Secondary
Ta.088	Taunton	Weir Engine House	530 Weir Street	TAU.296, TAU.K, TAU.P	1889	Out of APE	Attleboro Secondary
Ta.091	Taunton	Bridge over Brickyard Road (abandoned)	n/a	n/a	1906	NE	Attleboro Secondary
Ta.149	Taunton	Railroad Bridge over Mill River	Whittenton and Warren Streets	n/a	ca. 1930	NE	Whittenton Branch
Ta.160	Taunton	Staples Coal Company	28 Dana Street	n/a	1870, 1920	RNRE	Attleboro Secondary
Ta.206	Taunton	Taunton Car Manufacturing Company	3 Myrtle Street	TAU.257	ca. 1870	NE	Attleboro Secondary
Ta.213	Taunton	Joseph E. Wilbar House	150 Cohannet Street	n/a	1860	NE	Attleboro Secondary
Ta.225	Taunton	Rhodes Button Company	12 Porter Street	TAU.258, TAU.625	1860, 1879	RNRE	Attleboro Secondary
Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Streets	n/a	mid-19th to early-20th c.	RNRE	Fall River Secondary, New Bedford Main Line
Be.006	Berkley	Residence	1 Macomber Street	n/a	1860	RNRE	New Bedford Main Line

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
La.C	Lakeville	Assonet Cedar Swamp	Pierce Avenue; County and Howland Roads; Freetown, Mill, and Malbone Streets	LAK.D	late-18th c.	RNRE	New Bedford Main Line
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	n/a	1785 - 1892	RNRE	Fall River Secondary
La.025	Lakeville	Railroad Bridge over Assonet River	n/a	n/a	1908	NE	Fall River Secondary
Ft.C	Freetown	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Roads	n/a	late-18th to early-20th c.	RNRE	Fall River Secondary
Ft.002	Freetown	Cummings, George House	76 Chace Road	FRE.166	1806	NE	New Bedford Main Line
NB.B	New Bedford	Brook Street Industrial and Commercial Area	Brook, Church, and Deane Streets	n/a	1900-50	NE	New Bedford Main Line
NB.G	New Bedford	National Spun Silk Co. - Oneko Mills	Brook Street	NBE.U	early 20th century	RNRE	New Bedford Main Line
NB.010	New Bedford	Lambeth Rope Complex	627-637 Tarkiln Hill Road	NBE.0641	1893, 1918	RNRE	New Bedford Main Line
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King Street	NBE.0633	1919	RNRE	New Bedford Main Line
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County Street	NBE.0612	1909	RNRE	New Bedford Main Line
NB.029	New Bedford	Christ Presbyterian Church	1097 County Street	n/a	Aug. 1924-1950	RNRE	New Bedford Main Line
NB.053	New Bedford	Engine House No. 10	2071 Purchase Street	n/a	1910	RNRE	New Bedford Main Line

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
NB.064	New Bedford	Guardian Angel Parochial Schoolhouse	844 Acushnet Ave	NBE.0494	1896	NE	New Bedford Main Line
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co. - North Stores	19 Jean Street	NBE.613	1910-1924	RNRE	New Bedford Main Line
FR.B	Fall River	Fall River Country Club Golf Course	4232 North Main Street and Country Club Road	n/a	1895 / 1975	NE	Fall River Secondary
FR.D	Fall River	North Main Street Area	North Main Street	n/a	19th and early-20th c.	RNRE	Fall River Secondary
FR.I	Fall River	Wellington-Brownell Street Area	Brightman, Brownell, George, Morton, Oregon, Saint Mary's Streets and Wellington Streets	n/a	1870	RNRE	Fall River Secondary
FR.L	Fall River	Pearce-Durfee Street Area	North Main, Pearce and Durfee Streets; President Avenue	n/a	1870-1920	RNRE	Fall River Secondary
FR.003	Fall River	Hathaway, Jael House	4042 North Main Street	FLR.0284	1785	NE	Fall River Secondary
FR.011	Fall River	Railroad Bridge near Ashley Street	n/a	n/a	ca. 2000	NE	Fall River Secondary
FR.013	Fall River	William J. Wiley Middle School	2585 North Main Street	n/a	1912	RNRE	Fall River Secondary
FR.017	Fall River	Residence	311 Crescent Street	FLR.0074	1880	RNRE	Fall River Secondary
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex Street	n/a	1896	RNRE	Fall River Secondary

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
FR.052	Fall River	St. Matthew's Convent	189 Wellington Street	n/a	1920	NE	Fall River Secondary
FR.053	Fall River	St. Matthew's School	231 Wellington Street	n/a	1920	NE	Fall River Secondary
FR.067	Fall River	Westport Manufacturing Company Waste Department	7 Oregon Street	n/a	1918	RNRE	Fall River Secondary
FR.073	Fall River	Residence / Inn	800 Davol Street	n/a	1870	NE	Fall River Secondary
FR.081	Fall River	Residence	524 Durfee Street	n/a	1870	RNRE	Fall River Secondary
FR.088	Fall River	American Printing Company Machine Shop	28 Anawan Street	n/a	1900	NE	Fall River Secondary
FR.089	Fall River	Borden and Remington Company	104 Anawan Street	FLR.2002	1892	RNRE	Fall River Secondary

*Resources are sequenced north to south along the project corridor and by town.

**National Register Status Key

RNRE	Property Recommended Eligible for National Register Listing
NE	Property Recommended Not Eligible for National Register Listing
Out of APE	Property determined to be Out of the Area of Potential Effect for the South Coast Rail Project on Historic Properties since the DEIS/DEIR
Demolished	Property that was included in the DEIS/DEIR, but has since been demolished

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ca.C	Canton	Washington Street	Washington St	RNRE; A, C	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.H	Canton	Washington Street/Canton Center	Washington Street/Canton Center	MHC-DOE	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman St	RNRE; A, B, C	Stoughton Line, Northeast Corridor	Canton Junction Station	Possible	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Adverse: Physical (possible) Visual (possible)	Yes (possible)
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere St	RNRE; C	Stoughton Line, Northeast Corridor	n/a	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
Ca.006	Canton	Canton Public Library	786 Washington St	MHC-DOE; A, C	Stoughton Line	n/a	No	No	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ca.007	Canton	Forge Pond Railroad Bridge	Between Washington and Bolivar Sts	MHC-DOE; C	Stoughton Line	TP-02 Switching Station (SWS-1)	Possible	n/a	No Change	Yes: Severe, in close proximity to new catenary, and in vicinity of traction power facility	Adverse: Physical	Yes
Ca.024	Canton	Canton Water Works	44 Pine St	RNRE; A, C	Stoughton Line	Pine St Grade Crossing	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Sts	RNRE; A, C	Stoughton Line	Stoughton Station; School, Porter, Wyman Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
St.022	Stoughton	Pearl Street Cemetery	Pearl St	RNRE; A, C	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
St.023, St.B	Stoughton	Stoughton Town Hall	10 Pearl St	NRIND	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse; Visual	Yes
St.024	Stoughton	Mystic Rubber Company	2 Canton St	RNRE; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
St.025	Stoughton	Stoughton Old Colony Railroad Station	45-47 Wyman St	NRIND; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Visual	Yes
St.026	Stoughton	Lucius Clapp Memorial Library	6 Park St	NRIND	Stoughton Line	n/a	No	Yes, Moderate train and horn noise	No Change	No	No Adverse Effect	Yes
St.046	Stoughton	Meade Rubber Company	25 Brock St	RNRE; A, C	Stoughton Line	Stoughton Station; Brock St Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary and grade crossing systems	Adverse Effect Demolition	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ea.B	Easton	North Easton Historic District	Elm, Lincoln, and Main Sts	NRDIS; A, C	Stoughton Line	Easton Village Station; Oliver St, Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden Sts	RNRE; A, C	Stoughton Line	Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ea.D	Easton	H.H. Richardson Historic District	Elm and Main Sts	NHL, NRDIS; A, C	Stoughton Line	Easton Village Station	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in one location	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes
Ea.E	Easton	Center Street Area	Center St	RNRE; A, C	Stoughton Line	Reynolds St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ea.F	Easton	Easton Center Area	Center, Depot, and Short Sts	RNRE; A, C	Stoughton Line	Short St, Depot St Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.G	Easton	Hayward - Pool Area	Foundry St	RNRE; A, C	Stoughton Line	Foundry St Grade Crossing	No	Yes: Moderate train and moderate to severe horn noise (at edge of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.003	Easton	Old Colony Railroad Station	Off Oliver St on Railroad Right of Way	NRIND, in NHL District; A, C	Stoughton Line	Easton Village Station; Oliver St Grade Crossing	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Severe, adjacent to new catenary, Moderate station and site modifications, and grade crossing	Adverse: Visual (possible)	Yes (possible)
Ra.B	Raynham	Carver Street Area	Carver St, Broadway (Route 138)	RNRE; A, C	Stoughton Line	Carver St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ra.011	Raynham	Dog Kennel and Track Property	385 Thrasher St	RNRE; A	Stoughton Line	West Brittania St; Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB (portion of property)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing (at edge of property)	Adverse: Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.B	Taunton	Taunton Center Area	Dean, Park, and Summer Sts	RNRE; A, C	Stoughton Line	Taunton Station; Dean St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing	Adverse: Noise Visual	Yes
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout City of Taunton	NRMPS; A, B, C, D	Stoughton Line	multiple	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Sts	RNRE; A, C	Stoughton Line and Attleboro Secondary	TP - 05 Paralleling Station (Stoughton); Weir Street, Bow Street Grade Crossing (Attleboro Secondary)	No	Yes: Moderate to severe train and horn noise	Yes: 50 ft, >80 VdB (only small portion of area)	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.L	Taunton	Hart Street Area	Hart St	RNRE; A, C	Attleboro Secondary	Taunton Depot Station; Hart St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, >80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.18, Ta.C	Taunton	Dean-Hartshorn House	68 Dean St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	Yes: Moderate to severe train and horn noise	No: 100 ft, < 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.019, Ta.B, Ta.C	Taunton	Old Colony Railroad Station	40 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Taunton Station; Dean St Grade Crossing	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Severe, adjacent to new catenary and grade crossing, in vicinity of new station	No Adverse Effect	No

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.020, Ta.B, Ta.C	Taunton	William Woodward House	117 Arlington St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Dean St Grade Crossing	No	Yes: Severe train and horn noise	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.021, Ta.B, Ta.C	Taunton	Charles R. Atwood House	30 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Dean St Grade Crossing	No	Yes: Moderate train and severe horn noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.022, Ta..B, Ta.C	Taunton	Theodore Dean House	26 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	n/a	No	Yes: Severe horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.23, Ta.B, Ta.C	Taunton	C.J.H. Bassett House	20 Chestnut St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	No	No: >800 ft, < 50 VdB	No	No Adverse Effect	No
Ta.28, Ta.B, Ta.C	Taunton	Abiezar Dean House	57 Summer St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	No	No: >500 ft, < 50 VdB	No	No Adverse Effect	No
Ta.029, Ta.B, Ta.C	Taunton	Neck of Land Cemetery	Summer St	NRIND, NRMPS, LHD; A, C	Stoughton Line	n/a	No	Yes: Moderate to severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.89	Taunton	Cohannet Mills #3	120 Ingell St	NRIND	Attleboro Secondary	Grade Crossing	No	No: 100 ft <80 VdB	n/a	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Sts	RNRE; A, C	Fall River Secondary, New Bedford Main Line	TP-06 Switching Station (SWS-2); Myricks and Mill Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, and traction power facility	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Be.006	Berkley	Residence	1 Macomber St	RNRE; A, C	New Bedford Main Line	Padelford St Grade Crossing	No	Yes: Severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
La.C	Lakeville	Assonet Cedar Swamp Area	Pierce Ave; County and Howland Rds; Freetown, Mill, and Malbone Sts	RNRE; A, C, D	New Bedford Main Line	Malbone St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	RNRE; A, C NE	Fall River Secondary	Adams Lane Grade Crossing	No	Yes: Severe train and horn noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.C	Freetown	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Rds	RNRE; A, C	Fall River Secondary	Elm St, Forge Rd, Richmond Rd Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.D	Freetown	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Sts	NRDIS; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, portion of edge of area is in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.009	Freetown	Richmond Road / Maple Tree Crossing Bridge	Richmond Rd	MHC-DOE; C	Fall River Secondary	Richmond Rd, Beechwood Rd Grade Crossing	No	n/a	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.C	New Bedford	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); TP-30 Paralleling Station (PS-4)	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise Visual	Yes
NB.D	New Bedford	Wamsutta Mills Historic District	Acushnet Ave; Logan, North Point, and Wamsutta Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); Wamsutta Layover Facility	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise (to residential area) Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
NB.G	New Bedford	National Spun Silk Co. – Oneko Mills	Brook St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
NB.010	New Bedford	Lambeth Rope Complex	627-637 Tarkiln Hill Rd	RNRE; A, C	New Bedford Main Line	King's Highway Station; King's Highway / Tarkiln Hill Rd Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Possible: Moderate, in vicinity of new catenary and station	No Adverse Effect	No
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.012	New Bedford	Belleville Warehouse Company Cotton Storage Building	51 King St	NRDOE; A, C	New Bedford Main Line	Nash Rd Grade Crossing	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.029	New Bedford	Christ Presbyterian Church	1097 County St	RNRE; C	New Bedford Main Line	n/a	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.053	New Bedford	Purchase Street Fire Station	2071 Purchase St	RNRE; A, C	New Bedford Main Line	n/a	No	Yes: Moderate train noise	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.063	New Bedford	Union Street Railway Carbarn	1959 Purchase St	NRIND, NRDIS-C; A	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	No Adverse Effect	No
NB.065	New Bedford	Dawson Building	1843-1855 Purchase St	NRIND, NRDIS-C; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co., North Stores	19 Jean St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
FR.C	Fall River	Fall River Multiple Resource Area	multiple	NRMPS; A, B, C	Fall River Secondary	Battleship Cove Station	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS
FR.D	Fall River	North Main Street Area	North Main St	RNRE; A, C	Fall River Secondary	Weaver's Cove Layover(east)	Yes: Layover construction	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and layover	Adverse: Physical Noise Visual	Yes
FR.E, FR.C	Fall River	Border City Mills	Weaver and West Sts	NRDOE, NRMPS; A, C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.F, FR.C	Fall River	Sagamore Mill Nos. 1 and 3	Ace St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.G, FR.C	Fall River	Sagamore Mill No. 2	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.H, FR.C	Fall River	Foster Spinning Company	Cove St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.J, FR.C	Fall River	Narragansett Mills	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.K, FR.C	Fall River	North Burial Ground	North Main St	NRMPS, NRDIS; A, B, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.L	Fall River	Durfee Street Area	North Main and Durfee Sts	RNRE; A, C	Fall River Secondary	Fall River Depot Station; TP-11 Paralleling Station (PS-05)	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, station, and traction power facility	Adverse: Noise Visual	Yes
FR.M	Fall River	Diners of Massachusetts	multiple	NRMPS; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.N, FR.C	Fall River	American Printing Company - Metacomet Mill	Anawan St	NRMPS, NRDIS; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and station	Adverse: Visual	Yes
FR.005, FR.C	Fall River	William Collins House	3775 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.006, FR.C	Fall River	North Christian Congregational Church	3538 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.010, FR.C	Fall River	Borden-Winslow House	3063 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	No	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.012, FR.C	Fall River	Canedy, Squire William B. House	2634 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	Adverse: Visual (catenary)	Yes
FR.013	Fall River	William J. Wiley Middle School	2585 North Main Street	RNRE	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 500 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	No Adverse Effect	No
FR.015, FR.C	Fall River	Border City Mills - Mill #2	1 Weaver St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	n/a	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.016	Fall River	Weaver Street Railroad Bridge	Weaver St	MHC-DOE; A, C	Fall River Secondary	n/a	Possible	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate, in close proximity to new catenary	No Adverse Effect	No
FR.017	Fall River	Residence	311 Crescent St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.026, FR.C	Fall River	Brightman, Hathaway House	205 Crescent St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.066, FR.C	Fall River	St. Joseph's Roman Catholic Church	1355 North Main St	NRIND, NRMPS A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 700 ft, < 50 VdB	No	No Adverse Effect	No
FR.067	Fall River	Cotton Warehouse	7 Oregon St	RNRE; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Visual	Yes (possible)
FR.070, FR.M	Fall River	Al Mac's Diner	135 President Ave	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, <70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.081	Fall River	Residence	524 Durfee St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.082	Fall River	Lafayette-Durfee House	94 Cherry St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.084	Fall River	Central Street Bridge over Quequechan River	Central St	MHC-DOE; C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.089	Fall River	Borden and Remington Company	85-115 Anawan St	RNRE; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and station	No Adverse Effect	No

[1] Resources are sequenced north to south along the project corridor by community.

[2] National Register Status

NHL	National Historic Landmark
NRDIS	National Register Historic District
NRIND	Property individually listed in the National Register
NRMPS	District or Property individually listed in the National Register as part of a NRMPS
NRDOE	Property formally determined eligible by Keeper of the National Register
MHC-DOE	Property evaluated as eligible by MHC
RNRE	Property recommended as eligible
NRDIS-C	Property contributing to an NR-listed district
LL	Property individually listed in the State Register
LHD	Property located within a State Register listed historic district

[3] Within 250 feet of a proposed station, layover, or traction power facility, or an existing station where work is proposed or within 400 feet of a grade crossing.

[4] Direct/Physical Impacts

Level of impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011).
No	Historic property will not be impacted during or because of project construction activities; this *typically* applies to properties located in the vicinity of the project, but not within or immediately adjacent to construction areas.
Yes	Historic property that could be impacted during or because of project construction activities; *typical* impacts are physical in nature and may affect properties within or immediately adjacent to construction areas.

[5] Indirect Noise Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Noise* (VHB June 2009) and DEIS/DEIR (USACE 2011).
Train Noise	Noise generated by the operation of trains traveling along the rails.
Horn Noise	Noise generated by warning horn blowing, typically at grade crossings.
Moderate	Potential for the project to cause noticeable increase in cumulative noise levels, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009).
Severe	Potential for the project to cause significant increase in cumulative noise levels, causing high annoyance, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009). Under FTA criteria severe impacts are subject to mitigation (refer to VHB 2012a).

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.

n/a	Not applicable- Noise impacts were not evaluated for historic properties where noise is unlikely to impact the characteristics for which the property is historically significant, including bridges, railroad stations, and industrial complexes.

[6] Indirect Vibration Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Vibration* (VHB June 2009) and DEIS/DEIR (USACE 2011). The vibration data shown present the approximate distance of the property from the right-of-way centerline, followed by projected vibration level from train operations.
No	Low level of vibration anticipated from construction and/or operations per VHB June 2009, which determined that, based on the *FTA Generalized Ground-Surface Vibration Curves Table*, properties within approximately 90 feet of the center line of a locomotive powered passenger or freight rail line could be impacted by vibration levels of 80VdB, the threshold for human annoyance, or higher. All projected vibration levels are well below the 100 VdB threshold for potential structural damage to fragile buildings or structures (VHB June 2009) that would result in a level of moderate or high impact.
Possible	Potential for damage from vibration generated by pile driving is noted as "Vibration (possible)" under the Effects column, where individual properties or buildings within an historic district are within 25 ft of the right-of-way (per VHB June 2009). The location of any pile driving has not been determined and is expected to be limited, if any occurs.
Ft	Distance (in feet) of the property from the railroad right-of-way centerline.
VdB	RMS (root mean square) Vibration Velocity Level.

[7] Indirect Visual Impacts

Level of Impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011). The categories of level of impact were defined for the purposes of this analysis. Moderate and severe visual impacts considered to be potential adverse effects.
No	No potential for the project to change the existing visual environment (ex. increased use of existing railroad infrastructure).
Minimal	Low level of change in the visual environment of a historic property, based on the location of the property near existing railroad elements that will be slightly modified with a new feature as part of the project (ex. replacement of existing catenary with new catenary or upgrading an existing grade crossing).
Moderate	Potential for change in the visual environment of a historic property, based on the location of the property in the broad vicinity of new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).
Severe	High potential for change in the visual environment of a historic property, based on the location of the property adjacent or in close proximity to new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).

[8] Effects

The level of effect (adverse or no adverse effect) is assessed based on the impact information presented for direct and indirect physical, noise, vibration, and visual impacts and the resource type (ex. new catenary is not considered an adverse effect for industrial and railroad historic properties). New station construction and modifications to existing stations and their sites will have no adverse effect on historic stations and adjacent historic properties as long as changes are designed in a manner sensitive to the historic architectural character of the building and/or area. Noise mitigation including linear barriers and insulating treatments on historic buildings will have an effect on adjacent or subject properties and will require design considerations for compatibility with historic resources. Vibration impacts from pile driving could affect buildings adjacent to the right-of way, if pile driving or other similar construction occurs; however the location of this type of construction has not been identified. There are no anticipated atmospheric and cumulative impacts to historic resources. Traffic impacts to historic resources will be assessed when traffic analyses are available, but are expected to be minor. The level of effect presented in the table reflects the worst case and will be refined after the preferred alternative is selected, intensive historic resources survey is completed, and more detail about the project elements and work types is available.

[9] Mitigation

It is assumed that all adverse effects will require mitigation. Mitigation may include vibration dampening, noise barriers, visual screening, and the use of compatible materials within historic districts or adjacent to historic properties.

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout City of Taunton	NRMPS; A, B, C, D	Whittenton Branch	Dean St, Whittenton St Grade Crossings	See below	See below	See below	See below	See below	See below
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Sts	RNRE; A, C	Attleboro Secondary and Stoughton Line	TP-05 Paralleling Station (PS-2); Weir St, Bow St Grade Crossings	No	Yes: Moderate train noise (at edge of area)	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary, grade crossing, and traction power facility	Adverse: Noise Visual	Yes
Ta.F	Taunton	Whittenton Mill Area	Whittenton St	RNRE; A, C	Whittenton Branch	Whittenton St Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some locations)	Yes: 0 ft, > 80 VdB (only in some locations)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes
Ta.G, Ta.C	Taunton	Whittenton Mill Complex	Whittenton St	NRDIS, NRMPS; A, C	Whittenton Branch	Whittenton St Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB (only at edge of area)	Yes: Moderate, in vicinity of new catenary and grade crossing systems (in some locations)	No Adverse Effect	No
Ta.H	Taunton	Reed and Barton Worker Housing	Cottage and Meadow St	RNRE; A, C	Whittenton Branch	Whittenton St Grade Crossing	No	Yes: Moderate to severe horn noise (in some locations)	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes
Ta.I	Taunton	Ancient Whittenton Area	Warren St	RNRE; A, C	Whittenton Branch	Warren St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some locations)	Yes: 0 ft, > 80 VdB (only in some locations)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.R	Taunton	Multiple	MA State Hospitals and State Schools MPS	NRMPS; A, C, D	Attleboro Secondary	Danforth St Grade Crossing	No	Yes: Moderate train and horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Visual	Yes
Ta.S	Taunton	Danforth St, Dana St	Taunton State Hospital Historic District	NRDIS, NRMPS; A, C, D	Attleboro Secondary	Danforth St Grade Crossing	No	Yes: Moderate train and horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Visual	Yes
Ta.T	Taunton	Tremont St	Tremont St Area	RNRE; A, C	Attleboro Secondary	Tremont St Grade Crossing	No	Yes: Moderate train and severe horn noise	Yes: 50 ft, > 80 VdB (only small portion of area)	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.160	Taunton	Staples Coal Company	28 Dana St	RNRE; A, C	Attleboro Secondary	n/a	No	n/a	No: 100 ft < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
Ta.181	Taunton	N.S. Mason House	58 Tremont St	NRIND, NRMPS	Attleboro Secondary	n/a	No	Yes, Moderate train and horn noise	No	No	No Adverse Effect	No
Ta.208, Ta.C	Taunton	St. Thomas Episcopal Church	111-115 High St	NRIND, NRMPS; A, C	Attleboro Secondary	Porter St, Cohannet St Grade Crossing	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
Ta.209, Ta.C	Taunton	McKinstrey House	115 High St	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
Ta.211, Ta.C	Taunton	Henry G. Brownell House (Elk's Lodge No. 150)	119 High St	NRIND, NRMPS; A, C	Attleboro Secondary	Porter St, Cohannet St Grade Crossing	No	Yes: Moderate to severe horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.225	Taunton	Rhodes Button Company	12 Porter St	RNRE; A, C	Attleboro Secondary	Winthrop St, Porter St, Cohannet St Grade Crossings	No	n/a	Yes: 90 ft > 80 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	No Adverse Effect	No
Ta.245, Ta.C	Taunton	Lord-Baylies-Bennett House (Taunton Masonic Lodge)	66 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate train and severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.246, Ta.C	Taunton	Samuel Washburn House	68 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate to severe train and severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.254, Ta.C	Taunton	Samuel Colby House	74 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate train and severe horn noise	No: 100 ft < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.259, Ta.C, Ta.V	Taunton	Sarah A. Haskins House	18 Harrison Ave	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.262	Taunton	Mount Pleasant Cemetery	19 Crocker St	NRIND; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.266, Ta. C	Taunton	J.C. Bartlett House	12 Walnut St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St Grade Crossing	No	Yes: Moderate train and severe horn noise	No: 400 ft < 50 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.293	Taunton	Albert Field Tack Works	19 Spring St	NRIND, NRMPS	Attleboro Secondary	n/a	No	No	No: 1600 ft	No	No Effect	No
Ta.294, Ta.C, Ta.D	Taunton	H.B. Lothrop Store	210 Weir St	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.309, Ta.C	Taunton	William Lawrence House	101 Somerset Ave	NRIND, NRMPS; A, C	Attleboro Secondary	Barnum St, Weir St Grade Crossings	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative.

[1] Resources are sequenced north to south along the project corridor for each rail segment.

[2] National Register Status

NHL	National Historic Landmark
NRDIS	National Register Historic District
NRIND	Property individually listed in the National Register
NRMPS	District or Property individually listed in the National Register as part of a NRMPS
NRDOE	Property formally determined eligible by Keeper of the National Register
MHC-DOE	Property evaluated as eligible by MHC
RNRE	Property recommended as eligible
NRDIS-C	Property contributing to an NR-listed district
LL	Property individually listed in the State Register
LHD	Property located within a State Register listed historic district

[3] Within 250 feet of a proposed station, layover, or traction power facility, or an existing station where work is proposed or within 400 feet of a grade crossing.

[4] Direct/Physical Impacts

Level of impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011).
No	Historic property will not be impacted during or because of project construction activities; this *typically* applies to properties located in the vicinity of the project, but not within or immediately adjacent to construction areas.
Yes	Historic property that could be impacted during or because of project construction activities; *typical* impacts are physical in nature and may affect properties within or immediately adjacent to construction areas.

[5] Indirect Noise Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Noise* (VHB June 2009) and DEIS/DEIR (USACE 2011).
Train Noise	Noise generated by the operation of trains traveling along the rails.
Horn Noise	Noise generated by warning horn blowing, typically at grade crossings.
Moderate	Potential for the project to cause noticeable increase in cumulative noise levels, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009).
Severe	Potential for the project to cause significant increase in cumulative noise levels, causing high annoyance, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009). Under FTA criteria severe impacts are subject to mitigation (refer to VHB 2102a).
n/a	Not applicable- Noise impacts were not evaluated for historic properties where noise is unlikely to impact the characteristics for which the property is historically significant, including bridges, railroad stations, and industrial complexes.

[6] Indirect Vibration Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Vibration* (VHB June 2009) and DEIS/DEIR (USACE 2011). The vibration data shown present the approximate distance of the property from the right-of-way centerline, followed by projected vibration level from train operations.
No	Low level of vibration anticipated from construction and/or operations per VHB June 2009, which determined that, based on the *FTA Generalized Ground-Surface Vibration Curves Table*, properties within approximately 90 feet of the center line of a locomotive powered passenger or freight rail line could be impacted by vibration levels of 80VdB, the

	threshold for human annoyance, or higher. All projected vibration levels are well below the 100 VdB threshold for potential structural damage to fragile buildings or structures (VHB June 2009) that would result in a level of moderate or high impact.
Possible	Potential for damage from vibration generated by pile driving is noted as "Vibration (possible)" under the Effects column, where individual properties or buildings within an historic district are within 25 ft of the right-of-way (per VHB June 2009). The location of any pile driving has not been determined and is expected to be limited, if any occurs.
Ft	Distance (in feet) of the property from the railroad right-of-way centerline.
VdB	RMS (root mean square) Vibration Velocity Level.

[7] Indirect Visual Impacts

Level of Impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011). The categories of level of impact were defined for the purposes of this analysis. Moderate and severe visual impacts considered to be potential adverse effects.
No	No potential for the project to change the existing visual environment (ex. increased use of existing railroad infrastructure).
Minimal	Low level of change in the visual environment of a historic property, based on the location of the property near existing railroad elements that will be slightly modified with a new feature as part of the project (ex. replacement of existing catenary with new catenary or upgrading an existing grade crossing).
Moderate	Potential for change in the visual environment of a historic property, based on the location of the property in the broad vicinity of new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).
Severe	High potential for change in the visual environment of a historic property, based on the location of the property adjacent or in close proximity to new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).

[8] Effects

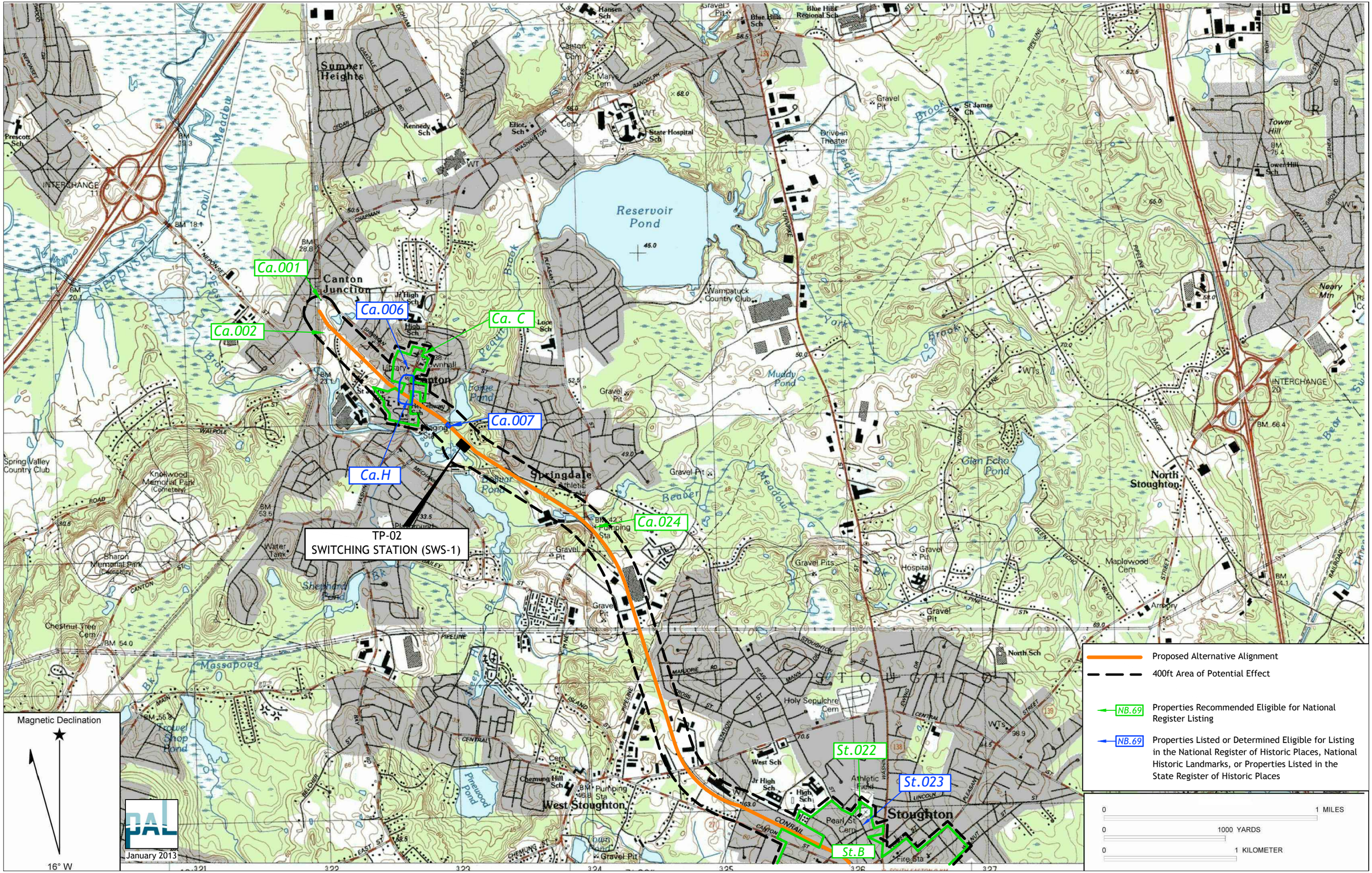
The level of effect (adverse or no adverse effect) is assessed based on the impact information presented for direct and indirect physical, noise, vibration, and visual impacts and the resource type (ex. new catenary is not considered an adverse effect for industrial and railroad historic properties). New station construction and modifications to existing stations and their sites will have no adverse effect on historic stations and adjacent historic properties as long as changes are designed in a manner sensitive to the historic architectural character of the building and/or area. Noise mitigation including linear barriers and insulating treatments on historic buildings will have an effect on adjacent or subject properties and will require design considerations for compatibility with historic resources. Vibration impacts from pile driving could affect buildings adjacent to the right-of way, if pile driving or other similar construction occurs; however the location of this type of construction has not been identified. There are no anticipated atmospheric and cumulative impacts to historic resources. Traffic impacts to historic resources will be assessed when traffic analyses are available, but are expected to be minor. The level of effect presented in the table reflects the worst case and will be refined after the preferred alternative is selected, intensive historic resources survey is completed, and more detail about the project elements and work types is available.

[9] Mitigation

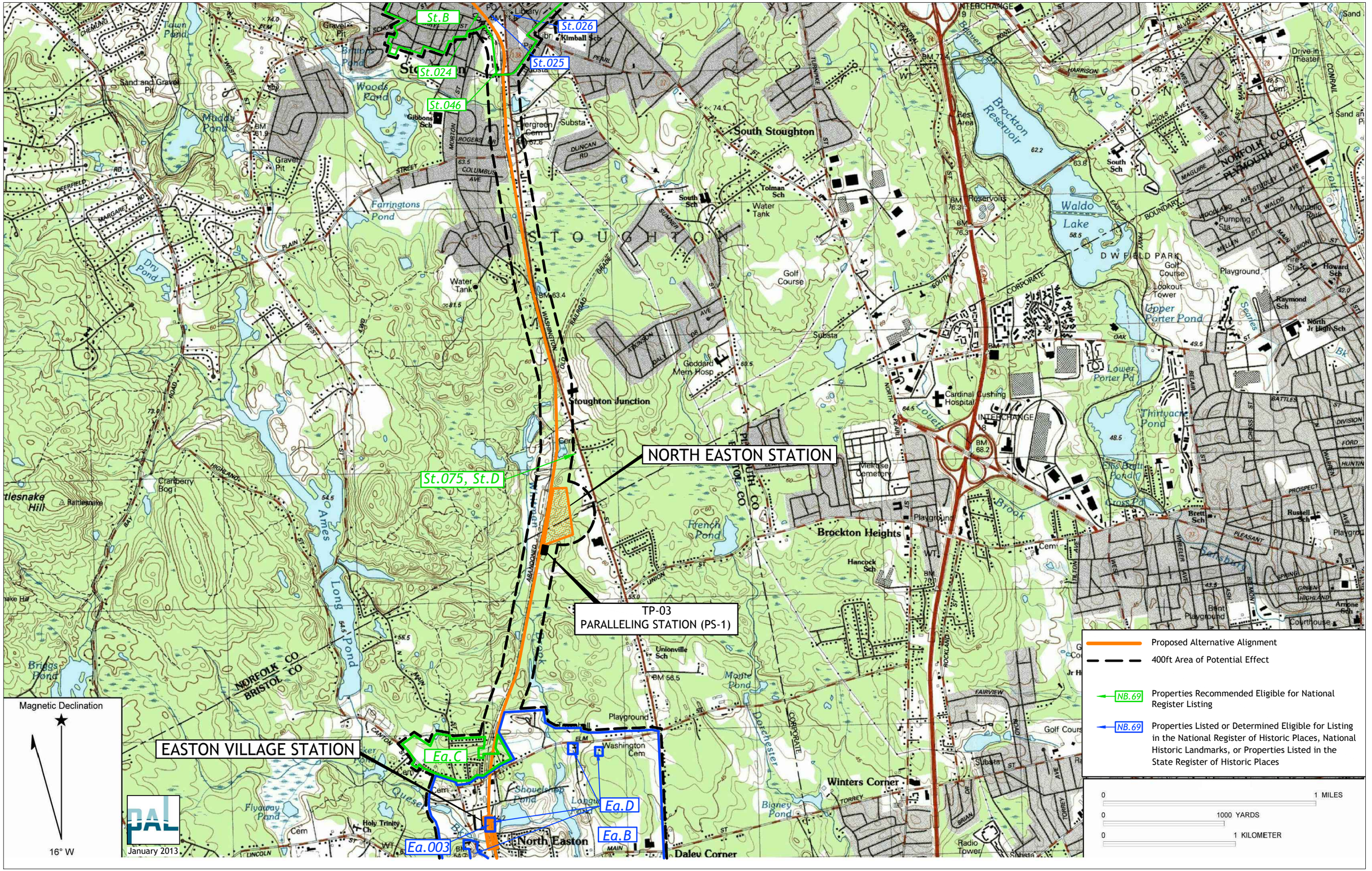
It is assumed that all adverse effects will require mitigation. Mitigation may include vibration dampening, noise barriers, visual screening, and the use of compatible materials within historic districts or adjacent to historic properties.

APPENDIX B

USGS Quadrangle Maps Showing Location of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties



Appendix B-1. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-2. National/State Register listed, determined eligible, and recommended eligible historic properties.

EASTON VILLAGE STATION

Ea.C

Ea.D

Ea.003

Ea.B

Ea.E

Ea.F

Brockton Heights

North Easton

Daley Corner

Winters Corner

Marshall Corner

Stonehouse Hill

Stonehill College

Unionville Sch

Playground

Washington Cem

Holy Trinity Ch

Militia Park

Manley Cem

Easton Jr High Sch

Parkview Sch

Ames High Sch

Easton Ch

Easton Cem

Holy Cross Seminary

Morse Corner

Morse Pond

South Easton

Easton Green

Morris Corner

Cynthia Park Cem

Easton Center

Eastondale

Manleys Corner

Coweesett Cem

Golf Course

West Jr High Sch

Fire Sta High Sch

Marciano Stadium

Radio Towers (WBET)

Radio Towers (WOKW)

Kennedy Sch

Clifton Height

Brant Playground

Fairgrounds

V A HOSPITAL

Armory

Rest Area

Gravel Pit

Water Tank

Tisdale Cem

Rattlesnake Hill

Briggs Pond

Long Pond

Upper Pond

Puds Pond

Flyaway Pond

Picker Pond

Shovelshop Pond

Langwater Pond

Monte Pond

Bigney Pond

Ames Pond

Dear Pond

Queset Brook

Shepard Brook

Black Brook

West Meadow Brook

Daley Brook

NORFOLK CO

BRISTOL CO

STATE PARK

EASTON

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

0 1000 YARDS

0 1 KILOMETER

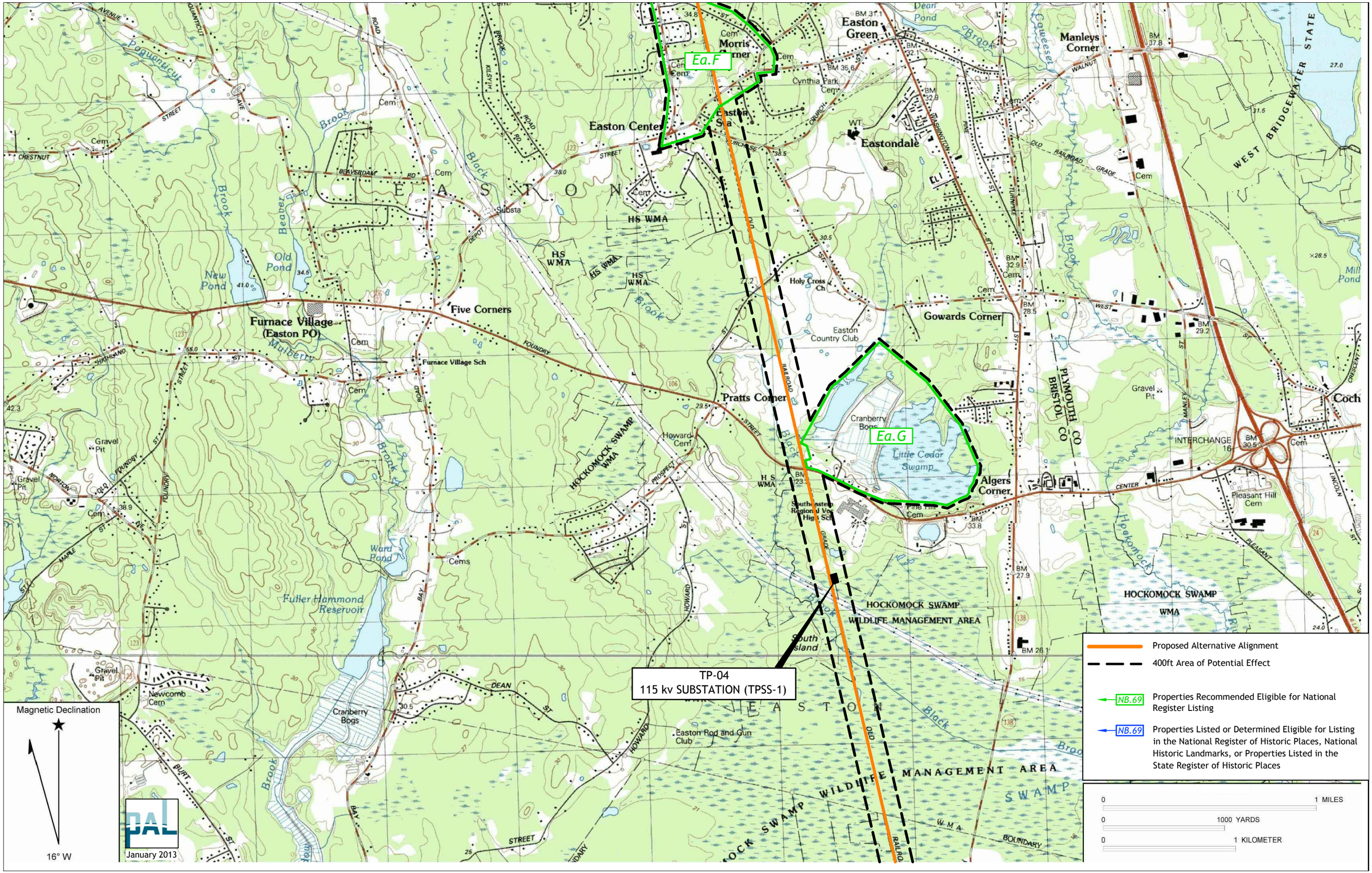
Magnetic Declination

16° W

PAL

January 2013

Appendix B-3. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-4. National/State Register listed, determined eligible, and recommended eligible historic properties.

RAYNHAM PLACE STATION

Ra.B

Magnetic Declination

16° W

January 2013

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

0 1000 YARDS

0 1 KILOMETER

Appendix B-5. National/State Register listed, determined eligible, and recommended eligible historic properties.

STOUGHTON LINE

RAYNHAM JUNCTION

Ra.B

WHITTENTON BRANCH

WHITTENTON JUNCTION

Ta.G, Ta.C

Ta.I

Ta.F

Ta.H

Ra.011

ATTLEBORO SECONDARY

Magnetic Declination

16° W

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

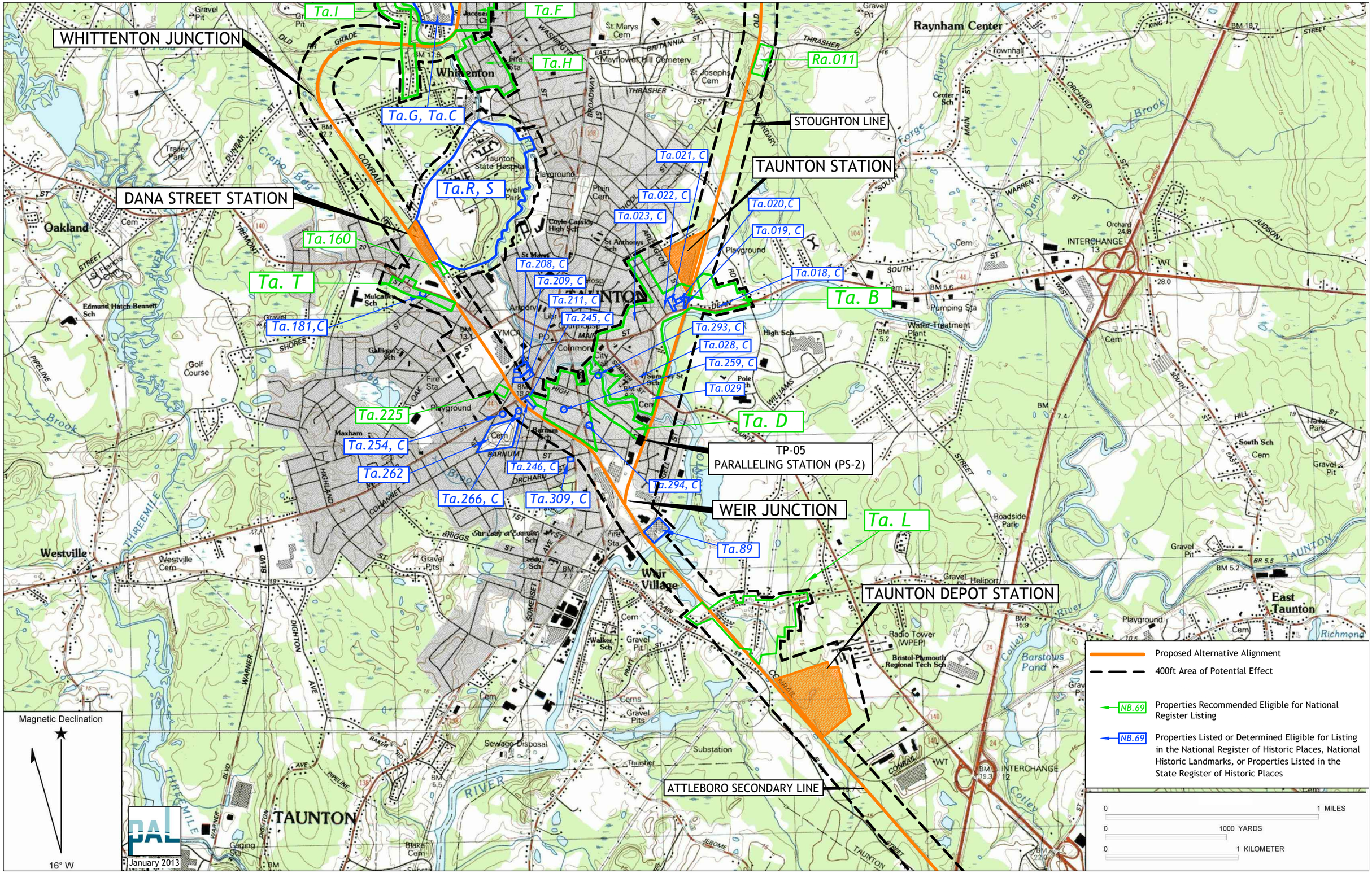
0 1000 YARDS

0 1 KILOMETER

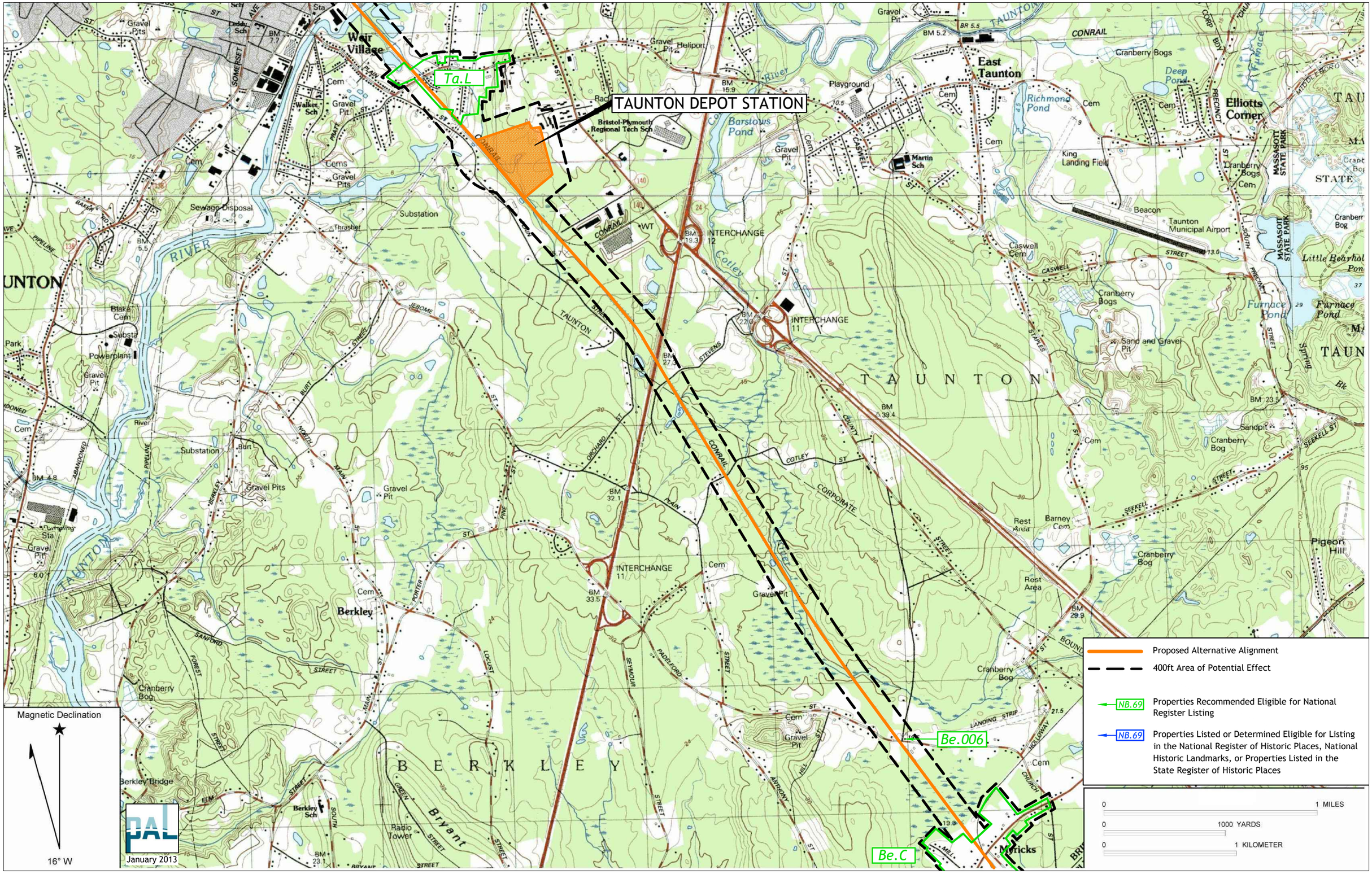
PAL

January 2013

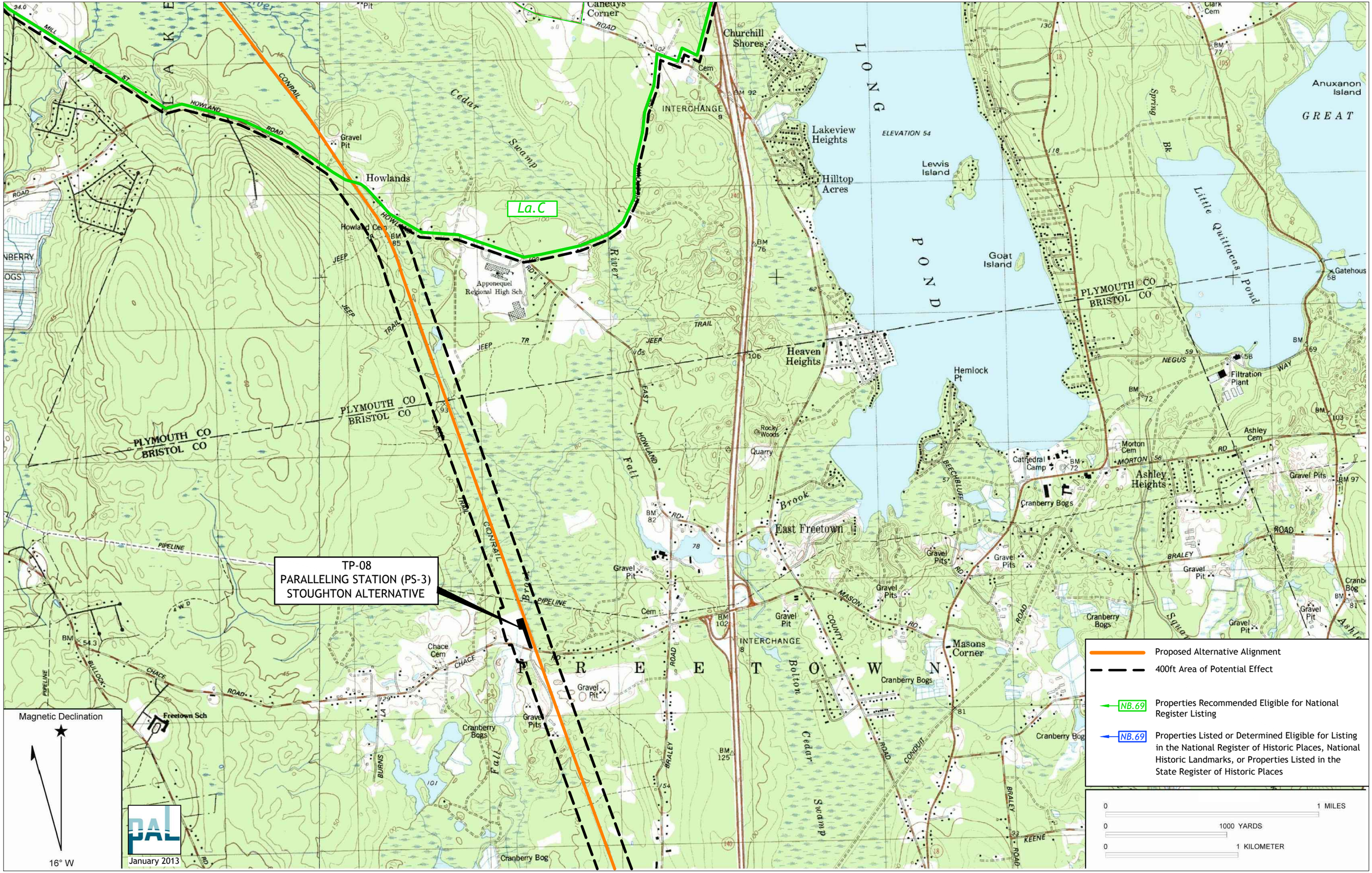
Appendix B-6. National/State Register listed, determined eligible, and recommended eligible historic properties.



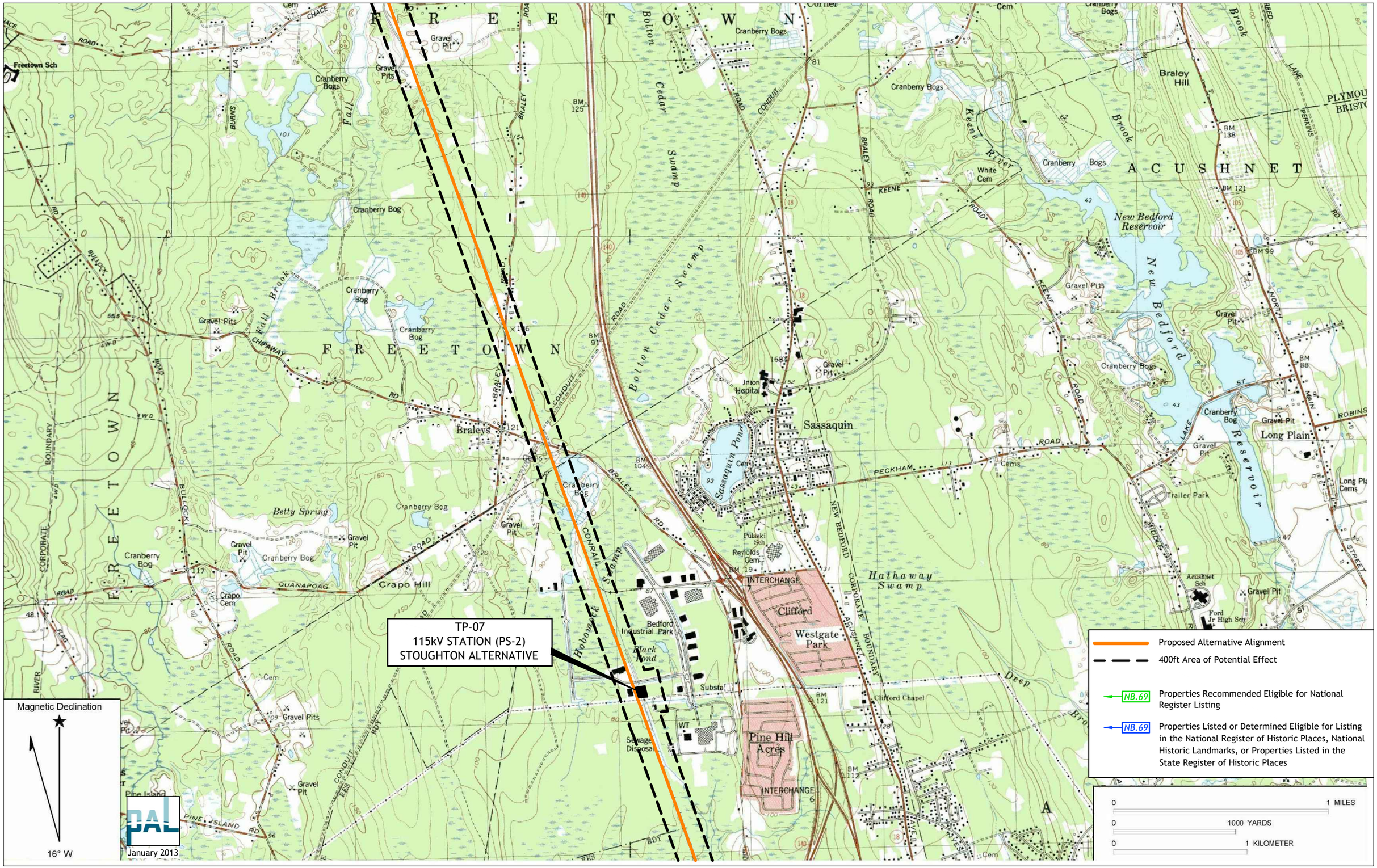
Appendix B-7. National/State Register listed, determined eligible, and recommended eligible historic properties.



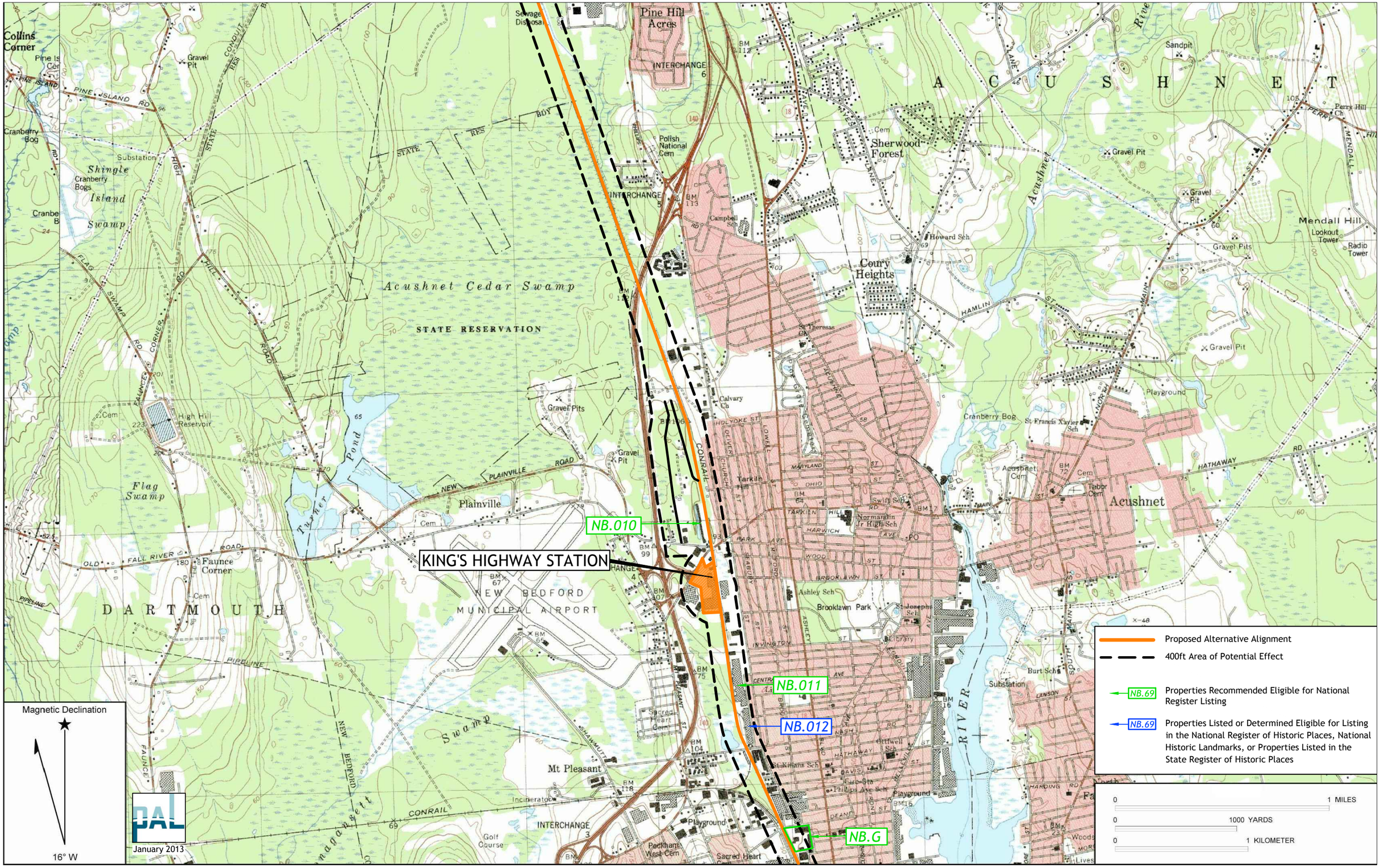
Appendix B-8. National/State Register listed, determined eligible, and recommended eligible historic properties.



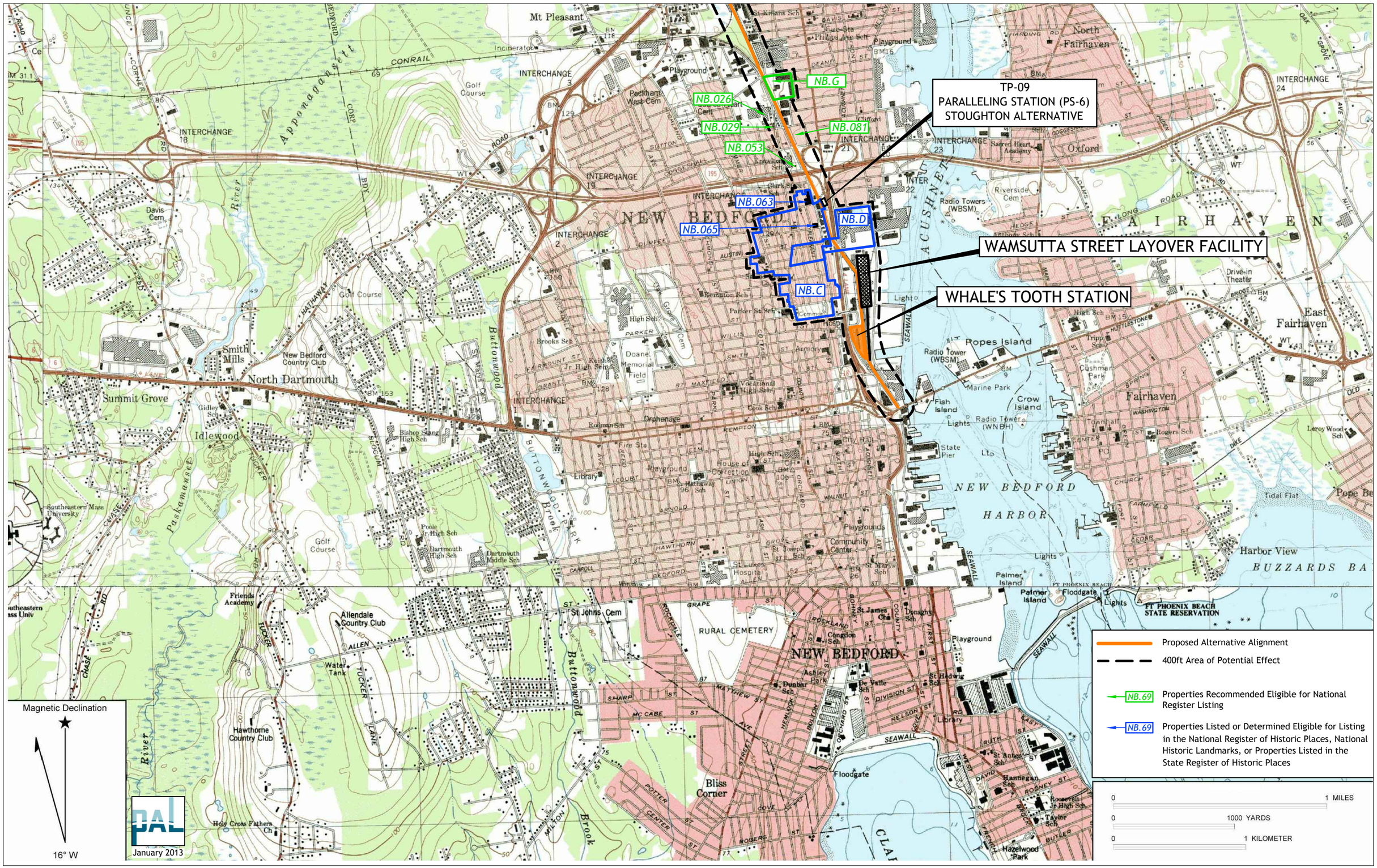
Appendix B-9. National/State Register listed, determined eligible, and recommended eligible historic properties.



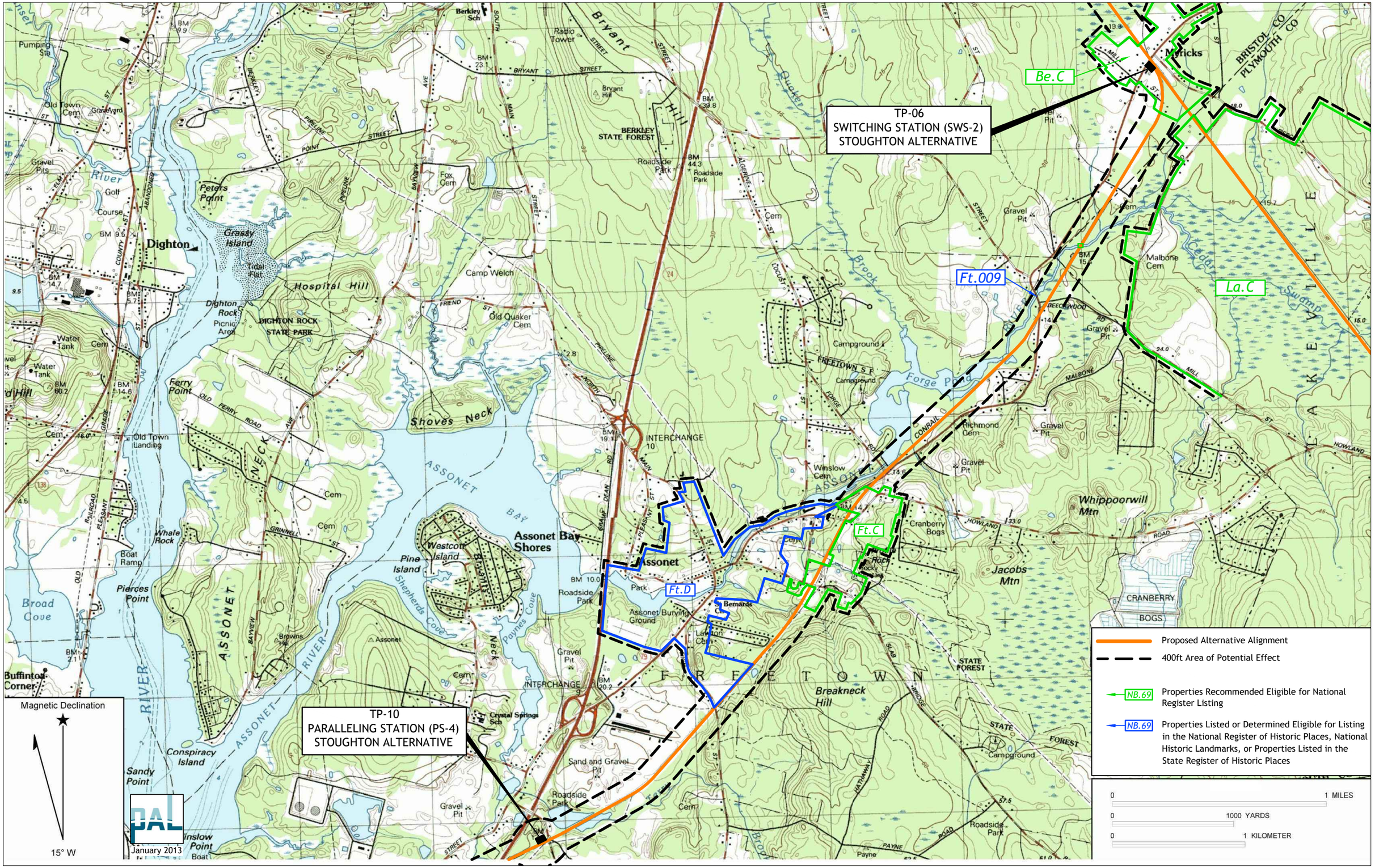
Appendix B-10. National/State Register listed, determined eligible, and recommended eligible historic properties.



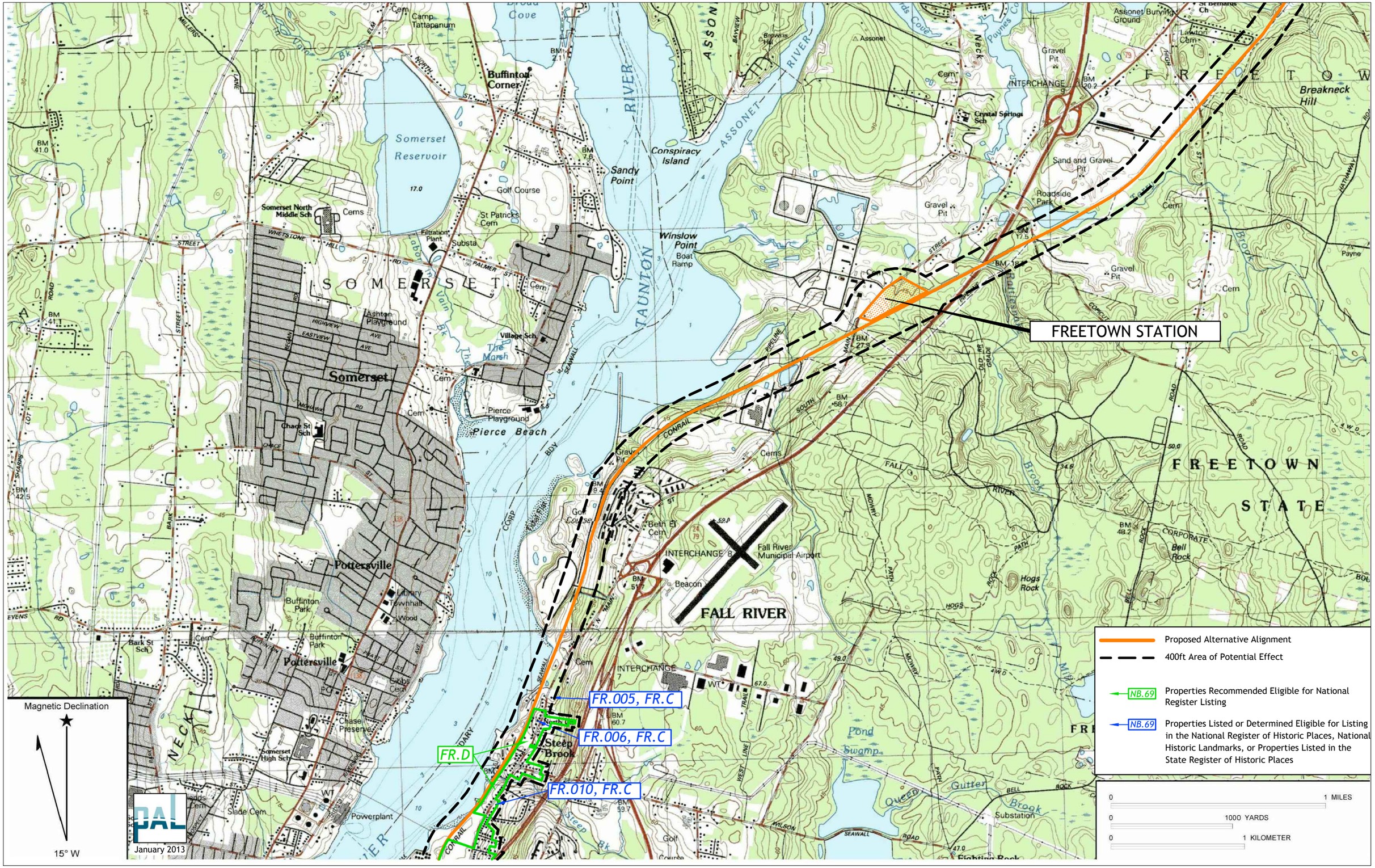
Appendix B-11. National/State Register listed, determined eligible, and recommended eligible historic properties.



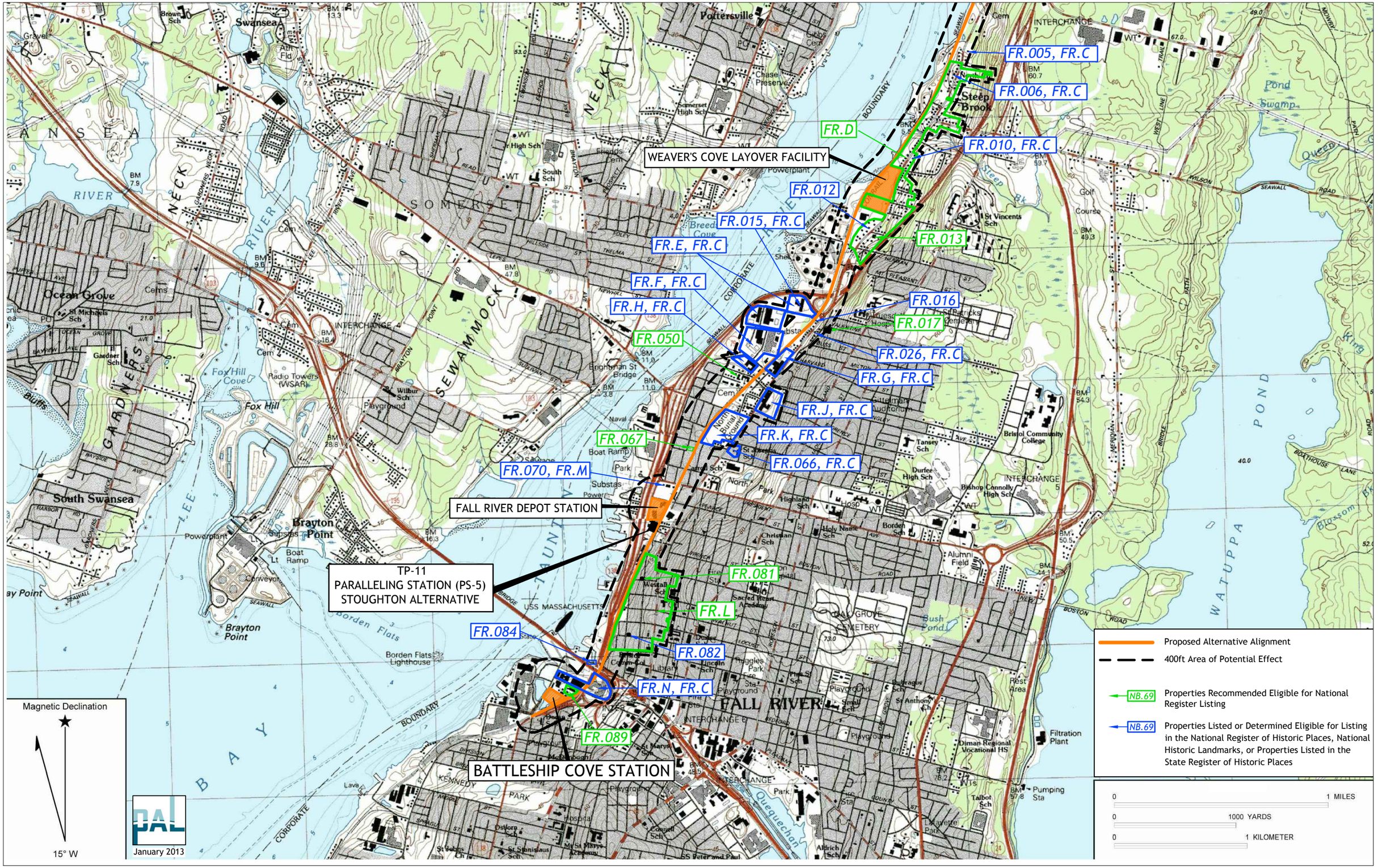
Appendix B-12. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-13. National/State Register listed, determined eligible, and recommended eligible historic properties.



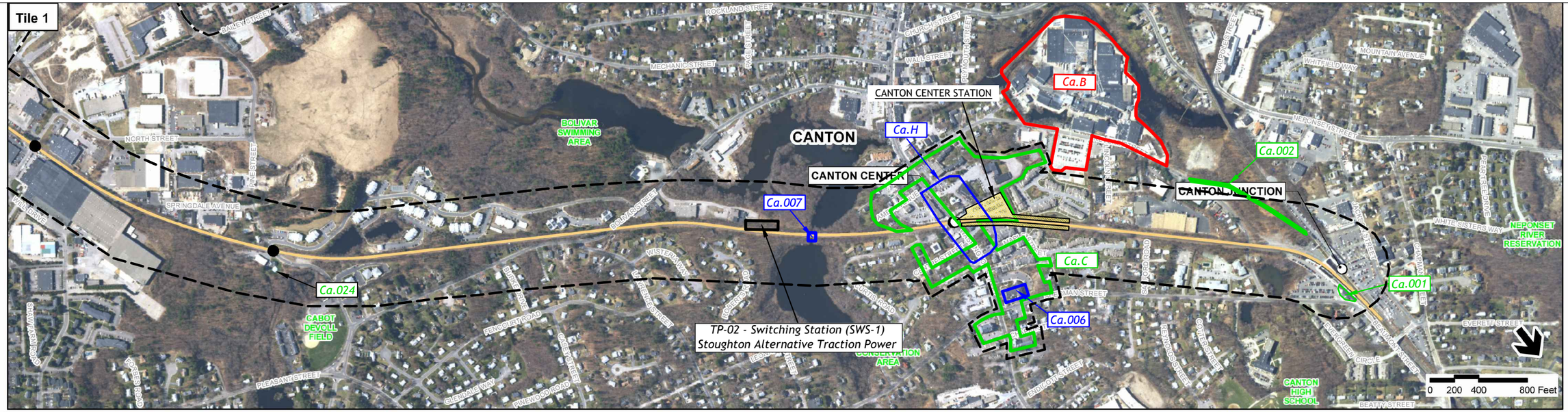
Appendix B-14. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-15. National/State Register listed, determined eligible, and recommended eligible historic properties.

APPENDIX C

Project Aerial Maps Showing Location of All Properties Surveyed,
including National Register Listed, Determined Eligible,
and Recommended Eligible Historic Properties

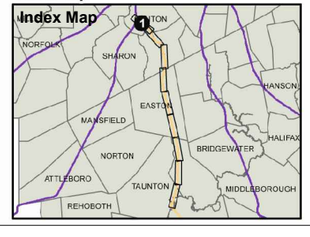


3/2/2012
\\natboxdata\projects\10111.00\GIS\project\FEIS\Base_for_PALUBase_Stoughton_sheet5.mxd

Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- Town Boundaries
- Area of Potential Effect for Above Ground Properties
- NB.052 — Properties Recommended Eligible for National Register Listing
- NB.052 — Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places
- NB.052 — Properties Recommended Not Eligible for National Register Listing (demolished or outside the APE)

Index Map



Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Appendix C-1. Historic Intensive Survey.

Tile 1

Tile 2

Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- Town Boundaries
- Area of Potential Effect for Above Ground Properties
- NB.052 — Properties Recommended Eligible for National Register Listing
- NB.052 — Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places
- NB.052 — Properties Recommended Not Eligible for National Register Listing (demolished or outside the APE)

Index Map

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

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Appendix C-2. Historic Intensive Survey.

Tile 1

Tile 2

Hockomock Swamp ACEC

Stoughton Line

EASTON

STOUGHTON

Easton Village

EASTON VILLAGE STATION

NORTH EASTON STATION

Ea.B

Ea.C

Ea.D

Ea.E

Ea.F

Ea.003, Ea.B, Ea.D

TP-03 - Paralleling Station (PS-1)
Stoughton Alternative

0 200 400 800 Feet

3/2/2012
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Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
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- Town Boundaries
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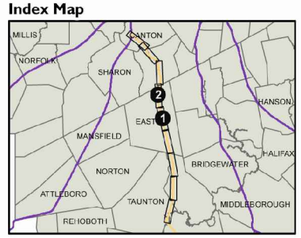
- NB.052 — Properties Recommended Not Eligible for National Register Listing (demolished or outside the APE)

Index Map



Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Tile 1

Tile 2

RAYNHAM

Hockomock Swamp ACEC

Stoughton Line

EASTON

Ra.001

Ea.G

TP-04 - 115 KV Substation (TPSS-1)
Stoughton Alternative

RAYNHAM PLACE STATION

HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA

TOWN LAND

CONSERVATION LAND

SE REG VOC TECH HS

0 200 400 800 Feet

3/2/2012
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Legend

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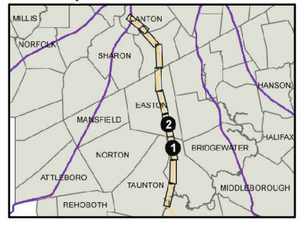
Index Map



Moving Massachusetts Forward massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Appendix C-4. Historic Intensive Survey.

Legend

- Proposed Rail Alternative
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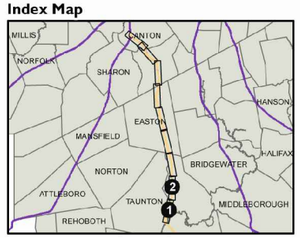


Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

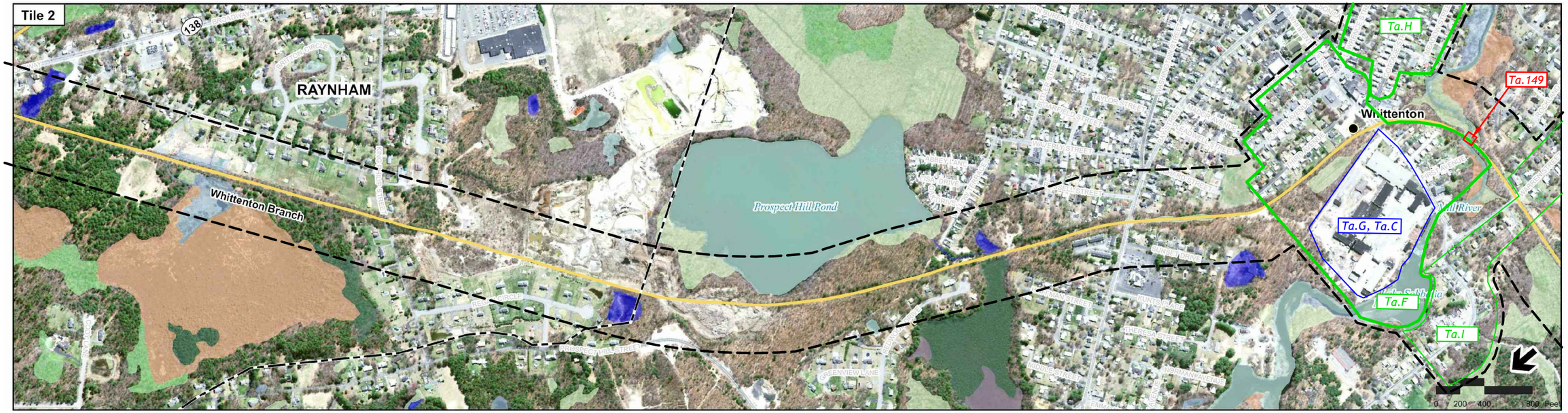
Weir Junction to Canton Junction
Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Appendix C-5. Historic Intensive Survey.

Tile 1

Tile 2



Legend

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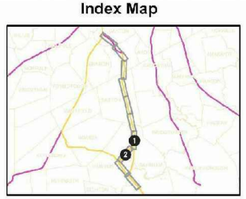


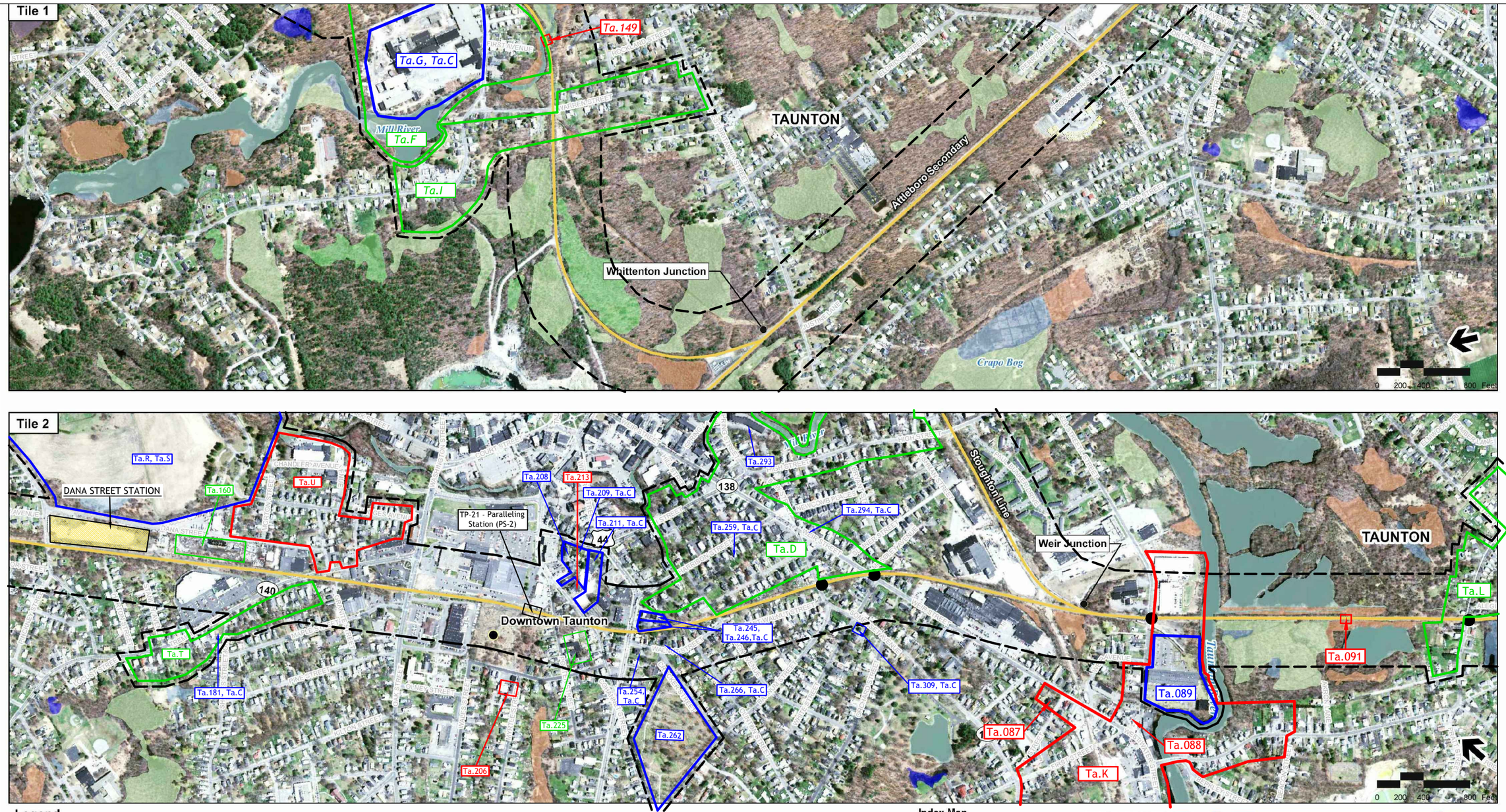
MassDOT — Moving Massachusetts Forward

SOUTH COAST RAIL

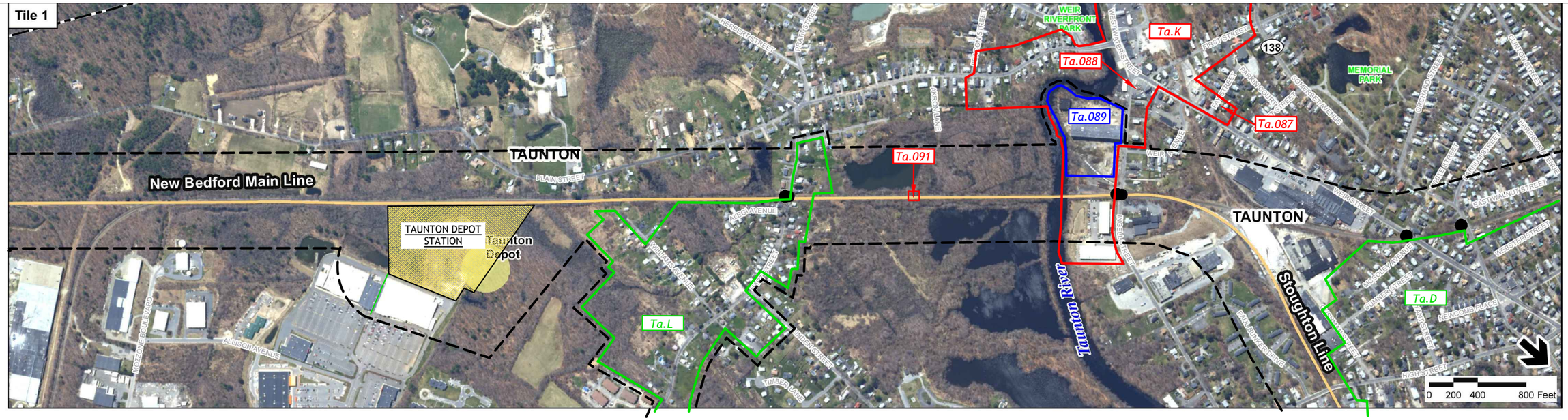
Whittenton Branch

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013



Appendix C-7. Historic Intensive Survey.



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Legend

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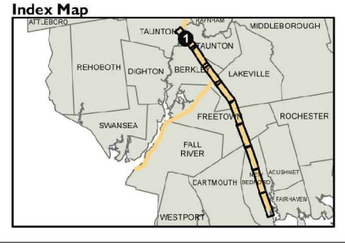

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

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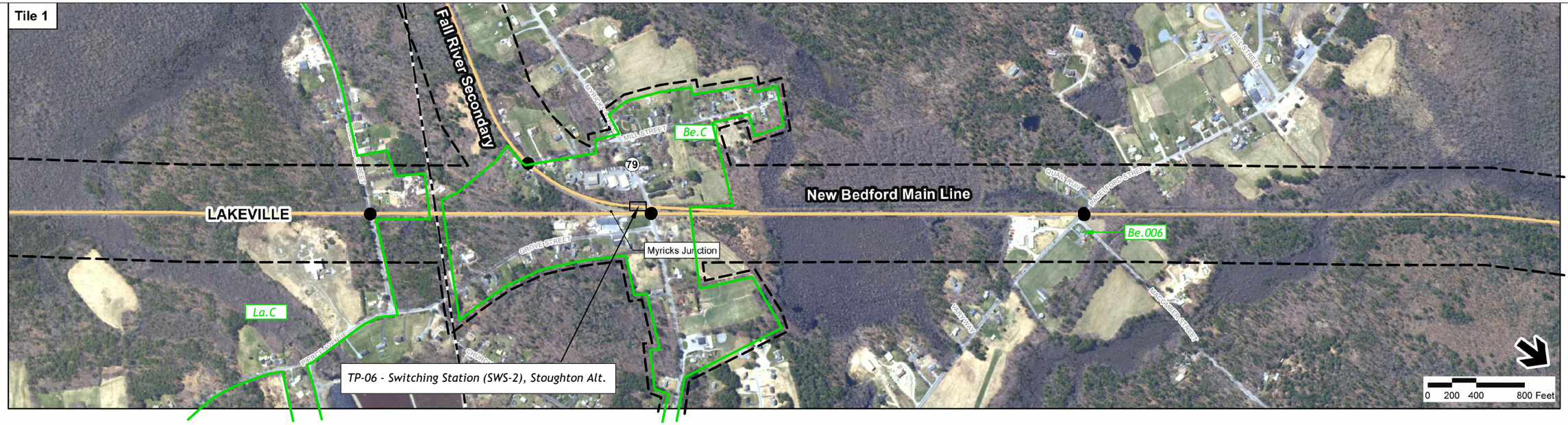

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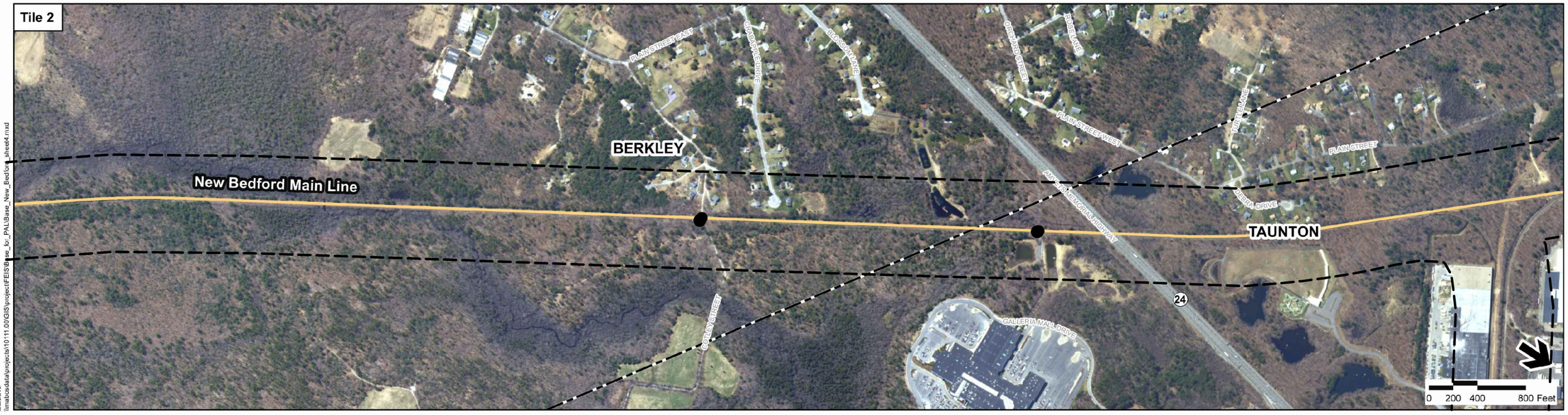

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Legend

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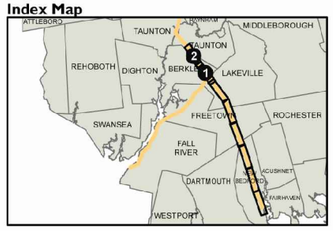

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Tile 1

Ft.002

MARIE'S WAY

MARK'S LANE

BREWSTER DRIVE

FREETOWN

New Bedford Main Line

LAKEVILLE

TP-08 - Paralleling Station (PS-3), Stoughton Alt.

CLEVELAND

PARKER DRIVE

NEFF PROPERTY

GUNNERS WAY

EDNA CIRCLE

BAKER LANE EXTENSION

APPONQUET REGIONAL HIGH SCHOOL

0 200 400 800 Feet

Tile 2

GREAT CEDAR CROSSING

La.C

LAKEVILLE

Cedar Swamp River

New Bedford Main Line

SHERWOOD LANE

0 200 400 800 Feet

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Index Map

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Appendix C-10. Historic Intensive Survey.

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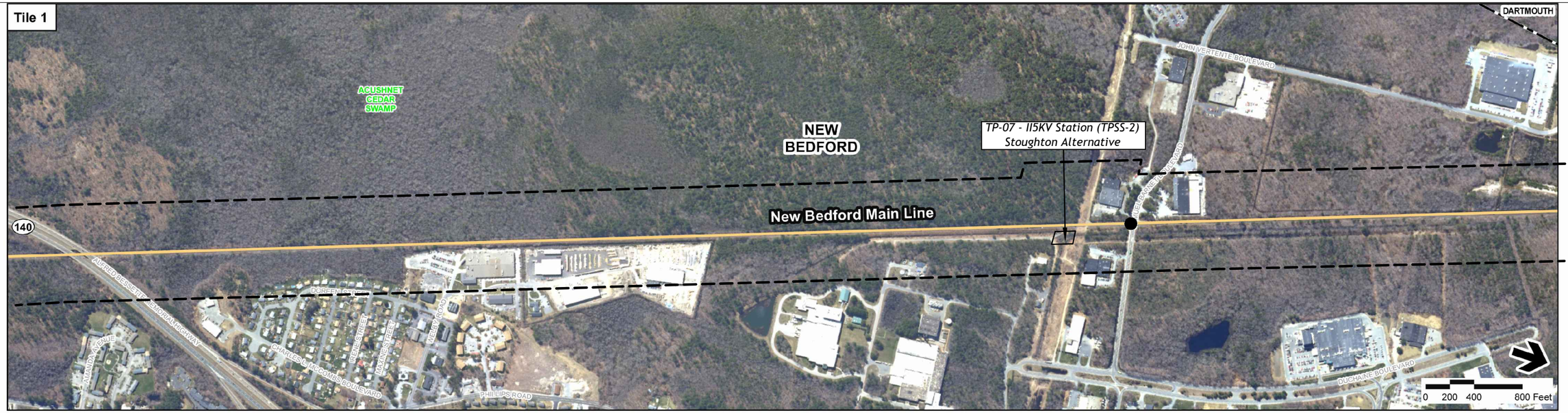

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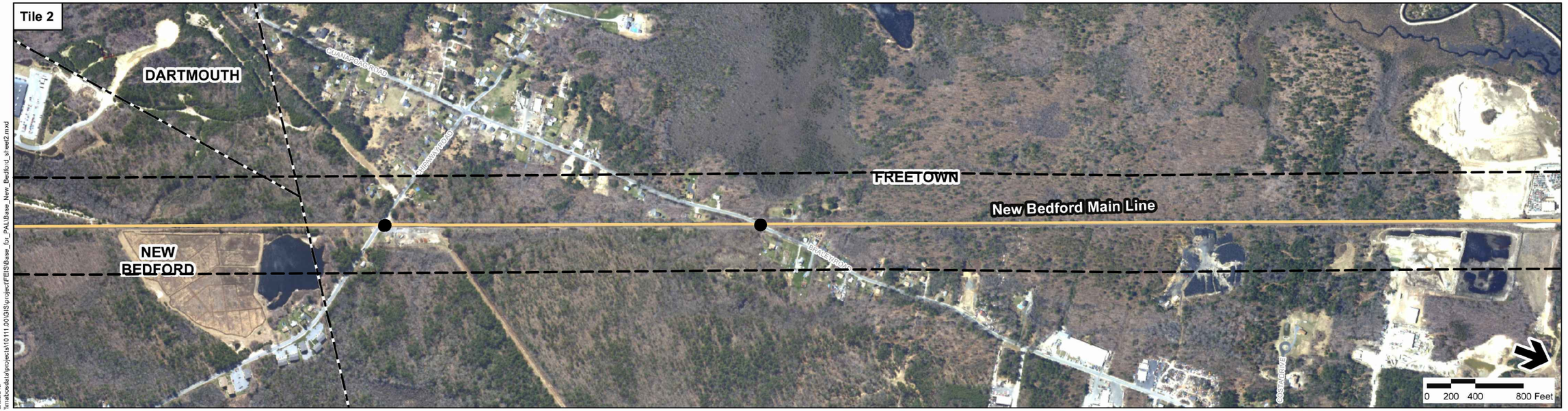

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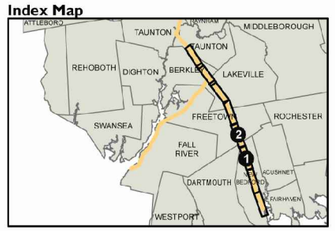


Moving Massachusetts Forward. massDOT

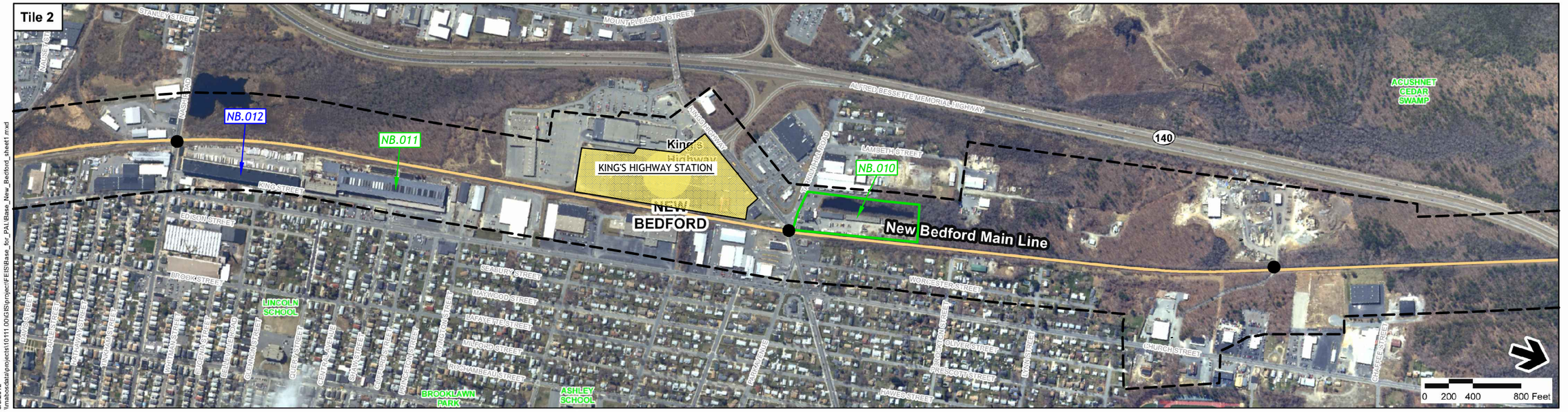
SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Appendix C-11. Historic Intensive Survey.



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Legend

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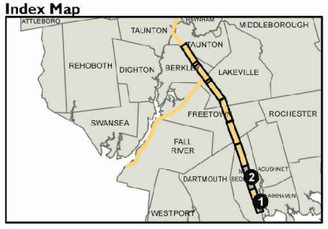

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SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

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Legend

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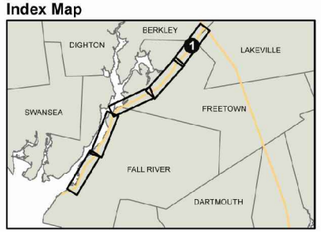

Moving Massachusetts Forward massDOT
SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

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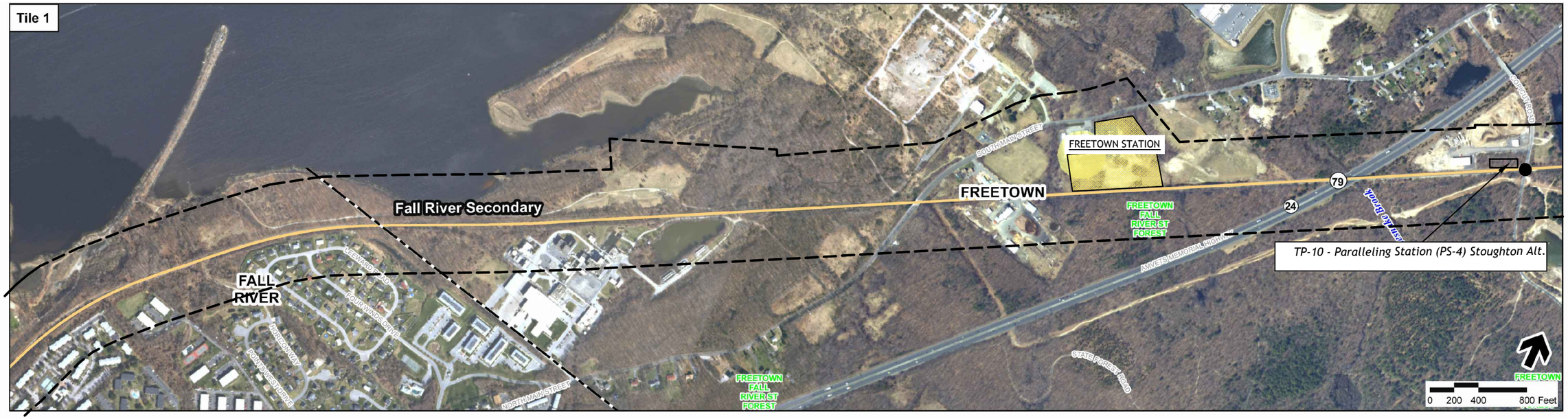

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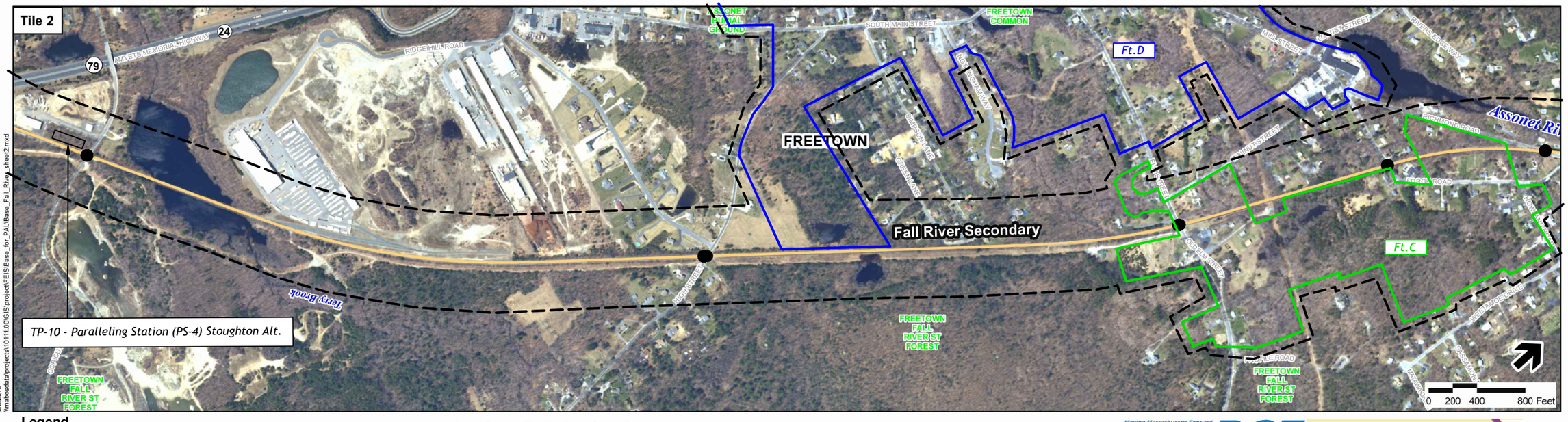

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Legend

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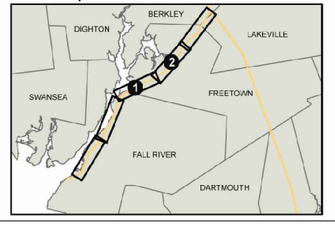


Moving Massachusetts Forward. massDOT

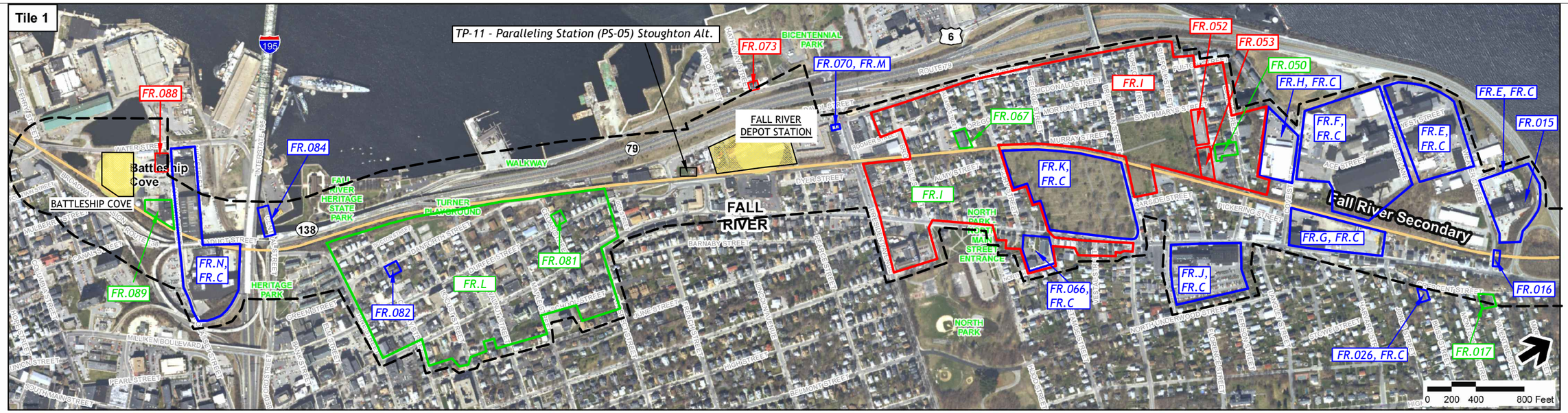
SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

Tile 1



Tile 2

Legend

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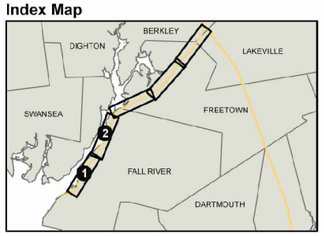

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL January 2013

3/5/2012
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APPENDIX D

Photographs of National Register Listed and Determined Eligible Properties

*Photo source = www.bing.com December 2012

Photo 1.* Map No. Ca.H Canton Center Area, Canton

Photo 2 . Map No. Ca.006 Canton Public Library, Canton

Photo 3. Map No. Ca.007 Forge Pond Railroad Bridge, Canton

Photo 4. Map No. St.023 Stoughton Town Hall, Stoughton

Photo 5. Map No. St.025 Stoughton Old Colony Railroad Station, Stoughton

Photo 6. Map No. St.026 Lucius Clapp Memorial Library, Stoughton

Photo 7. Map No. Ea.B North Easton Historic District, Easton

Photo 10. Map No. Ta.G Whittenton Mill Complex, Taunton

Photo 8. Map No. Ea.D H.H. Richardson Historic District, Easton

Photo 11. Map No. Ta.S, Ta.R Taunton State Hospital Historic District, Taunton (Massachusetts State Hospitals and State Schools MPS)

Photo 9. Map No. Ea.003, Ea.B, Ea.D Old Colony Railroad Station, Easton

Photo 12.* Map No. Ta.018, Ta.C, Ta.B Dean-Hartshorn House, Taunton

Photo 13. Map No. Ta.019, Ta.C, Ta.B Old Colony Railroad Station, Taunton

Photo 16.* Map No. Ta.022, Ta.C, Ta.B Theodore Dean House, Taunton

Photo 14. Map No. Ta.020, Ta.C, Ta.B William Woodward House, Taunton

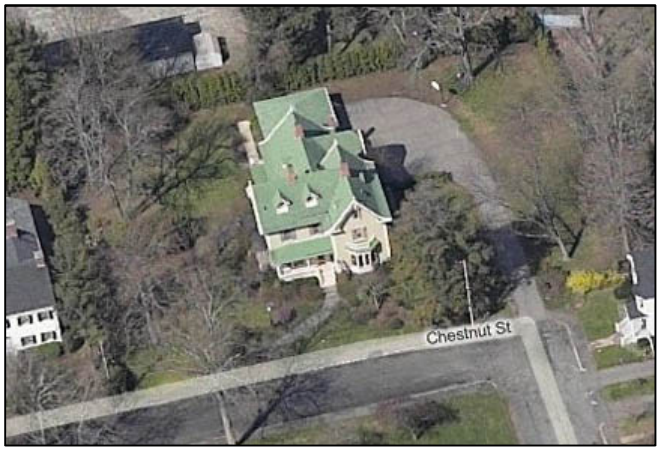


Photo 17.* Map No. Ta.023, Ta.C, Ta.B C.J.H. Bassett House, Taunton

Photo 15. Map No. Ta.021, Ta.C, Ta.B Charles R. Atwood House, Taunton

Photo 18.* Map No. Ta.028, Ta.C, Ta.B Abiezar Dean House, Taunton

Photo 19. Map No. Ta.029, Ta.C, Ta.B Neck of Land Cemetery, Taunton

Photo 22. Map No. Ta.208, Ta.C Saint Thomas Episcopal Church, Taunton

Photo 20. Map No. Ta.089 Cohannet Mills #3, Taunton

Photo 23. Map No. Ta.209, Ta.C McKinstrey House, Taunton

Photo 21. Map No. Ta.181, Ta.C, Ta.T N.S. Mason House, Taunton

Photo 24. Map No. Ta.211, Ta.C Henry G. Brownell House (Elk's Lodge No. 150), Taunton

Photo 25. Map No. Ta.245, Ta.C Lord-Baylies-Bennett House (Taunton Masonic Lodge), Taunton

Photo 26. Map No. Ta.246, Ta.C Samuel Washburn House, Taunton

Photo 27. Map No. Ta.254, Ta.C Samuel Colby House, Taunton

Photo 28. Map No. Ta.259, Ta.C, Ta.V Sarah A. Haskins House, Taunton

Photo 29. Map No. Ta.262 Mount Pleasant Cemetery, Taunton

Photo 30. Map No. Ta.266, Ta.C J.C. Bartlett House, Taunton

Photo 31.* Map No. Ta.293, Ta.C Albert Field Tack Works, Taunton

Photo 32. Map No. Ta.294, Ta.C, Ta.D H.B. Lothrop Store, Taunton

Photo 33. Map No. Ta.309, Ta.C William Lawrence House, Taunton

Photo 34.* Map No. Ft.D Assonet Historic District, Freetown

Photo 35. Map No. Ft.009 Richmond Road / Maple Tree Crossing Bridge, Freetown

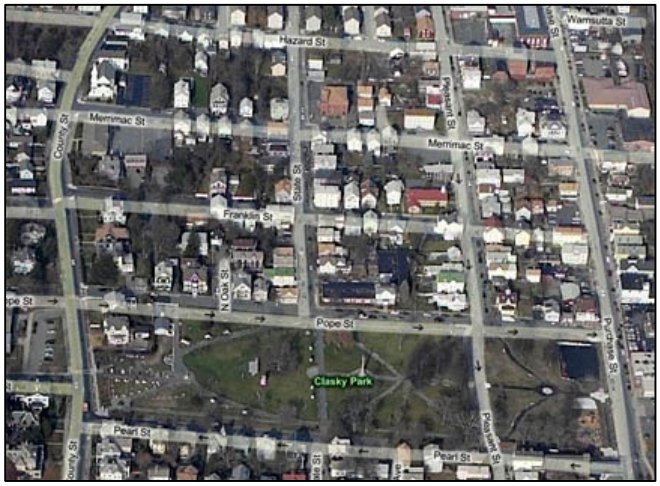


Photo 36.* Map No. NB.C Acushnet Heights Historic District, New Bedford

Photo 37. Map No. NB.D Wamsutta Mills Historic District, New Bedford

Photo 38. Map No. NB.012 Belleville Warehouse Company Cotton Storage Building, New Bedford

Photo 39. Map No. NB.063 Union Street Railway Carbarn, New Bedford

Photo 40. Map No. NB.065 Dawson Building, New Bedford

Photo 41. Map No. FR.E, FR.C Border City Mills, Fall River

Photo 42. Map No. FR.F, FR.C Sagamore Mill Nos. 1 and 3

Photo 43. Map No. FR.G, FR.C Sagamore Mill No. 2, Fall River

Photo 44.* Map No. FR.H, FR.C Foster Spinning Company, Fall River

Photo 45.* Map No. FR.J, FR.C Narragansett Mills, Fall River

Photo 46. Map No. FR.K, FR.C North Burial Ground, Fall River

Photo 47. Map No. Map No. FR.M Diners of Massachusetts, Fall River

Photo 48. Map No. FR.N, FR.C American Printing Company - Metacomet Mill, Fall River

Photo 49. Map No. FR.005, FR.C William Collins House, Fall River

Photo 50. Map No. FR.006, FR.C North Christian Congregational Church, Fall River

Photo 51. Map No. FR.010, FR.C Borden-Winslow House, Fall River

Photo 52. Map No. FR.012, FR.C Squire William B. Canedy House, Fall River

Photo 53. Map No. FR.015, FR.C Border City Mills - Mill #2, Fall River

Photo 54. Map No. FR.016 Weaver Street Bridge, Fall River

Photo 55. Map No. FR.026, FR.C Hathaway Brightman House, Fall River

Photo 58. Map No. FR.082 Lafayette-Durfee House, Fall River

Photo 56. Map No. FR.066, FR.C St. Joseph's Roman Catholic Church, Fall River

Photo 59. Map No. FR.084 Central Street Bridge over Quequechan River, Fall River

Photo 57. Map No. R.070, FR.M Al Mac's Diner, Fall River

APPENDIX E

Historic Properties Surveyed and Eligible, Forms and Evaluation Sheets

APPENDIX E-1

Areas
(alphabetical by community)

Forms in Preparation - To Be Inserted

APPENDIX E-2

Individual Properties
(alphabetical by community)

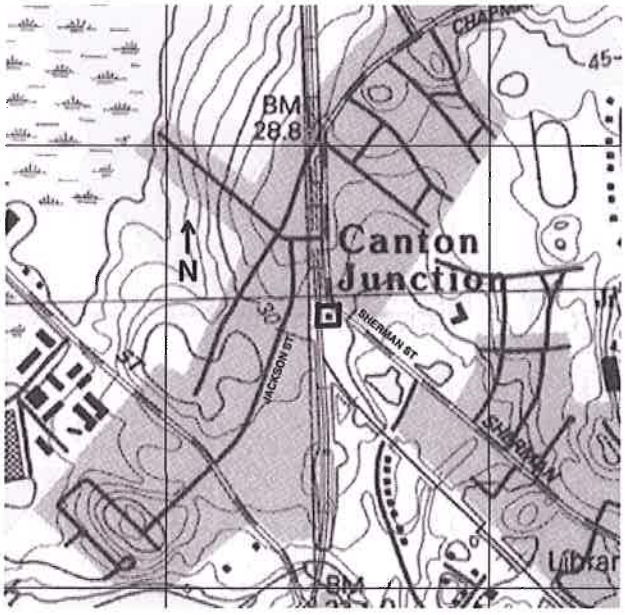
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
	Norwood		CAN.104

Photograph

Locus Map



Town/City: Canton

Place: *(neighborhood or village)*: Canton Junction

Address: 666 Sherman Street

Historic Name: Canton Junction Railroad Station

Uses: Present: Transportation

Original: Transportation

Date of Construction: 1892-1893

Source: Gilbert 1893

Style/Form: Richardsonian Romanesque

Architect/Builder: Bradford Lee Gilbert

Exterior Material:

Foundation: Granite Block

Wall/Trim: Granite Block/Red Sandstone Trim

Roof: Slate Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* None

Condition: Good

Moved: no ☐ yes ☒ **Date:** Circa 2000

Acreage: Approx. 6 acres

Setting: The property is located at the southwest corner of Beaumont Street and Sherman Street within a primarily urban, commercial area. It stands immediately east of the Stoughton Line right-of-way at the point where it diverges from the Amtrak Northeast Corridor.

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year*): December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Canton Junction Railroad Station is a generally rectangular yet asymmetrical, one-story, six-bay by two-bay, stone Richardsonian Romanesque-style building constructed between 1892 and 1893. The building has a slate-clad hipped roof and rough-faced coursed granite ashlar walls with red sandstone trim around the windows and along the water table. The railroad station faces a large parking lot to the east and sits on a raised topography on a triangular-shaped, slightly sloping lot that is predominantly paved with a small area of grass, shrubbery, mulch immediately surrounding the building. The rail line, which runs north to south, passes beneath the building's canopy, which is attached to the western elevation. The hipped-roof canopy is of post and beam construction with diagonal and heavy knee bracing is attached to the western elevation of the building and extends to the north and south. Two rough-faced coursed granite ashlar chimneys pierce the roof at the northern and southern ends of the building. A large, hipped, three-bay dormer extends from the ridgeline on the facade with wood casement windows. Heavy wood knee bracing with granite pendants supports the wide overhanging roofline. The fenestration varies, with original window and door openings, including a prominent three-bay window on the facade. While select historic casement windows and lights with tracery are retained, the majority are non-historic single-pane windows. The building was restored in-kind in the late 21st century. Circa 2000, the building's location was modified to accommodate the Amtrak high-speed rail system. Originally located on the site of the present-day easternmost tracks, the building was moved slightly southeast and rotated 3 degrees clockwise.

HISTORICAL NARRATIVE

The Old Colony Railroad Corporation commissioned architect Bradford Lee Gilbert to design the Canton Junction Railroad Station. Built between 1892 and 1893, the building was constructed with pink granite quarried in Milford, Massachusetts, with brown stone trim and a yellow pine finish. The interior was finished with oak and white spruce. Total cost of the project, excluding heating, plumbing, and exterior concrete platforms, was just under $89,000 (Gilbert 1893:12).

Bradford Lee Gilbert (1853-1911), a nationally-practiced architect based out of New York City, is best known for constructing perhaps the first skyscraper in New York, the Tower Building (1889). Starting out at the New York, Lake Eerie, & Western Railroad company, Gilbert became "one of the country's most prolific railroad architects" (Munn & Company 1905:222; Withey 1970; Gray 2007). Shortly after construction of the Canton Junction Railroad Station, Gilbert's renderings of railroad stations were on display at the World's 1893 Colombian Exposition in a pavilion attached to Louis Sullivan's Transportation Building. A few historians suggest that these renderings may have inspired architect Frank Lloyd Wright in such buildings as the Winslow House (1893) located in River Forest, Illinois: "These small station renderings were proto-Prairie in their emphasis upon long low dominating hip roofs and their pronounced articulation" (Brooks 1972:234). Gilbert had designed two other railroad depots in Massachusetts, including the North Abington Depot in 1893 (MHC No. ABI.68) and the Beverly Depot in 1896 (MHC No. BEV.119).

The original railroad line was developed by Boston & Providence Railroad (B&P). Chartered in 1831, the B&P was New England's first viable common carrier railroad. The line was surveyed by prominent early American engineer Captain William Gibbs McNeill. Eleven different routes were laid-out between Boston and Providence, including one route that would run past Canton's Stone Factory. One of the two shortest in the Old Colony system, this route would cost $40,000 more than its one-mile longer counterpart, which would run through Sharon. Though costly, this route was selected for construction, allegedly under the influence of Canton's Revere Copper Company (MHC No. CAN.B) owner Joseph Warren, who was Paul Revere's son. Construction began in Boston in 1832 and the first trains were operated to Dedham in June 1834. The line was extended to

Canton the following September, and to Providence in 1835 after the completion of the massive granite Canton Viaduct (Karr 1995:146–152).

By 1856, Canton station was the busiest office outside of Boston and Providence. In 1888, the B&P was taken over by the Old Colony Railroad. The B&P line became part of the New Haven's "Shoreline" passenger main line through Rhode Island and along the Connecticut Coast to New York City. The Penn Central took over the New Haven in 1969. In 1971, Amtrak took over intercity operations on the Shoreline, which became part of the Boston to Washington, DC, Northeast Corridor. In 1973, the MBTA purchased the Massachusetts portion of the Northeast Corridor. Today the MBTA operates commuter rail service between Boston and Providence on this section (Viens 1993; Karr 1995:146–152).

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Viens, Katheryn P.
1993 *MHC Area Form: Canton Junction Railroad Station*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

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1970 *Biographical Dictionary of American Architects (Deceased).* Hennessey & Ingalls, Inc., Los Angeles, CA.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Canton Junction Railroad Station is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C for its associations with transportation and community development and as an excellent and intact example of a late-nineteenth-century Romanesque-style railroad station design by a prominent, United States railroad station architect, Bradford Lee Gilbert. Restored and then moved across the Stoughton Line tracks circa 2000, the property also meets National Register Criteria Consideration B as it retains its relationship between the property and the rail right-of-way, its historical associations, and its historic features that convey its architectural values as a railroad station.

Prepared by PAL, December 2012

This continuation sheet was prepared by PAL, December 2012, as a supplement to the existing inventory form.

ARCHITECTURAL DESCRIPTION

The Revere Copper Company Railroad Embankment (CAN.935) has had no changes to its condition or integrity since the previous survey. The earth and stone structure is located in a wooded area south of Canton Junction, west of Revere Street, between the rights-of-way of the Massachusetts Bay Transportation Authority (MBTA) Stoughton Line and the combined MBTA Amtrak's Northeast Corridor. It is an approximately 1,000 foot long, linear earth railroad roadbed constructed in cuts and fills. A split granite box culvert bisects the roadbed. The railroad track and sleepers have been removed.

HISTORICAL NARRATIVE

The Revere Copper Company Railroad was a captive right-of-way for its namesake company and carried horse-drawn freight until about 1890. As constructed, it was connected to Amtrak's Northeast Corridor (originally the Boston & Providence Railroad). In 1890, the route was shifted east onto a new alignment that connected with the Stoughton Line right-of-way, leaving the 1835 structure abandoned. The Revere Copper Company Railroad is one of the earliest such structures to be completed in New England and may have only been the second captive railroad in the Commonwealth of Massachusetts. With its density of population and industrial activity, the state was an early adopter of the new transportation mode. The first example was the horse-drawn Quincy Granite Railway, completed 1826 in Quincy to support construction of the Bunker Hill Monument. Steam-powered railroads followed soon after, including the Boston & Lowell Railroad, and the Boston & Providence Railroad, and the Boston & Worcester Railroad, all completed in 1835. These corporations spurred a railroad construction boom that had spread across most of southern New England after the Civil War. Industry-owned, captive railroads such as the Revere Copper Company's were less common than intercity carriers that served the general public. Excepting the Quincy Granite Railway, which was a precedent-setting endeavor that proved the viability of rail transport to a broad audience; such captive rail lines played a minor role in the promulgation of railroad transportation in the state and would not generally be significant under Criterion A in the area of transportation. The Revere Copper Company Railroad is unusual because of its exceptionally early age relative to the general period of railroad construction in the state. It demonstrates structural and design features that represent one of the earliest attempts at railroad engineering in the state. Because it was a captive line not subject to frequent modifications, the survival of these qualities is enhanced. The removal of the track and ties has impacted the structure's integrity, but this is offset by the scarcity of unaltered railroad rights-of-way from this period of construction (Karr 1995:14-16, 146-152; 229-235; Krim 2006; Matherly 1973).

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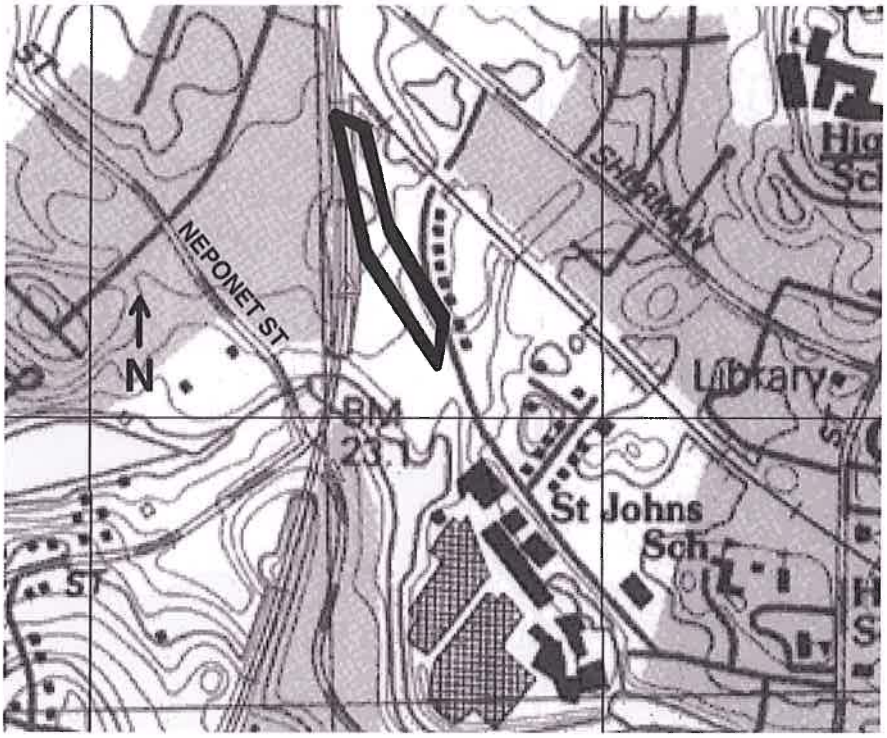
Matherly, Polly A.
1973 Quincy Granite Railway. National Register of Historic Places Inventory – Nomination Form. On file, Massachusetts Historical Commission, Boston, MA.

LOCUS MAP



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[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December 2012
The criteria that are checked in the above sections must be justified here.

The Revere Copper Company Railroad Embankment is recommended eligible for listing in the National Register under Criteria C at the local level in the area of engineering. The structure is significant as a rare surviving example of relatively unaltered railroad construction from the first generation of New England rail lines and demonstrates early approaches to the design of these transportation systems.

FORM F - STRUCTURE

Assessor's number	USGS Quad	Area(s)	Form Number
26-94	Norwood		935

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Town Canton

Place *(neighborhood or village)*

Canton Junction

ess or Location Revere St.

e Revere Company Railroad

ership ☐ *Public* ☒ *Private*

of Structure *(check one)*:

anal	☐ powderhouse
am	☐ carousel
ort	☐ boat or ship
ate	☐ street
iln	☐ tower
ghthouse	☐ wall
ound	☐ windmill
	☐ tunnel

☒ Other *(specify)* railroad embankment

Draw a map showing the structure's location in relation to the nearest cross streets and/or major natural features. Show all buildings between structure and nearest intersection or natural feature. Label streets including route numbers, if any. Circle and number the inventoried structure. Indicate north.

see attached map

Date of Construction 1835

Source deeds and maps

Architect, Engineer or Designer unknown

Material(s) earth and cut granite

Alterations *(with dates)* abandoned 1890

Condition fair

Moved ☒ no ☐ yes Date

Acreage 33.7 acres

Setting abandoned railroad in overgrown woodland

Recorded by Arthur Krim

Organization Canton Hist. Commission

Date *(month/year)* July 2006

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JUL 19 2006
MASS. HIST. COMM

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

STRUCTURE FORM

DESIGN ASSESSMENT ☒ *see continuation sheet*
Describe important design features and evaluate in terms of other structures within the community.

HISTORICAL NARRATIVE ☒ *see continuation sheet*
Explain the history of the structure, and how it relates to the development of the community.

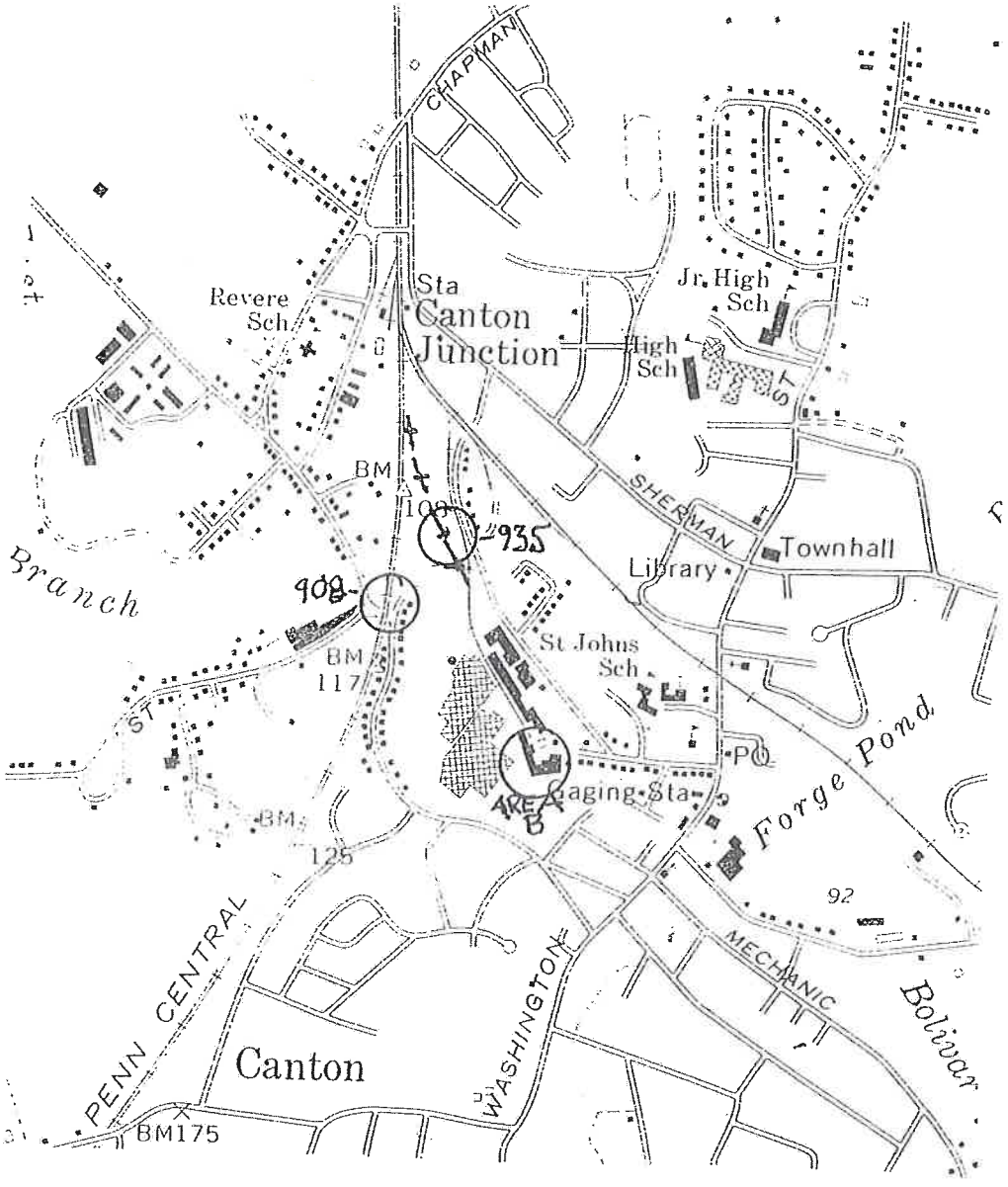
BIBLIOGRAPHY and/or REFERENCES ☒ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

ASSACHUSETTS HISTORICAL COMMISSION
ASSACHUSETTS ARCHIVES BUILDING
20 MORRISSEY BOULEVARD
OSTON, MASSACHUSETTS 02125

Area(s)	Form No.
	935

LOCATION MAP



USGS. Norwood. 1970.
(Enlarged)

INVENTORY FORM CONTINUATION SHEET

Town

Property Address

Canton Revere St.

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Area(s)	Form No.
	935

DESIGN ASSESSMENT

The former roadbed of the Revere Copper Company railroad on the west side of Revere Street was constructed in 1835 by the Revere Copper Company (RCC) to connect the Revere Copper Company (CAN.AREA B) with the Boston & Providence (AMTRACK) Railroad at Canton Junction. The former roadbed follows an alignment of approximately 1000 feet north/south as an earthen embankment on the west side of Revere Street, parallel to the present railroad track. The embankment is raised about four feet above grade and is canted on both sides with a level roadway about five feet wide for a single track railroad, now removed. A simple granite stone culvert remains intact, opposite 295 Revere Street, as the single surviving feature of the roadbed from the original 1835 construction. The RCC railroad was operated as a horse drawn freight spur from 1835-1890, when the northern section of the route was replaced by the present railroad track. After 1890 the raised embankment to Canton Junction was abandoned, with the track relocated by a new alignment along Revere Street (Canton Journal 1890). The southern section of the original 1835 roadbed at grade level remained in service to the RCC factory site (now Plymouth Rubber Company) along the level right of way, still intact with railroad track. The northern section of the original 1835 embankment at Canton Junction was eliminated in 2000 with rebuilding of the parking area at Canton Junction for high speed service over the Canton Viaduct (CAN.908). The RCC railroad remained active until 2002 when freight service was discontinued. The former railroad roadbed of the Revere Copper Company is of great interest as a rare surviving structure from the first generation of Boston area railroads opened in 1835, intact with a granite culvert along Revere Street.

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Area(s)	Form No.
	935

HISTORICAL NARRATIVE

The former roadbed of the Revere Copper Company (RCC) railroad on the west side of Revere Street is dated 1835 by deed research, local histories and maps. The original route of the RCC railroad extended south from the Boston & Providence (AMTRACK) Railroad at the Canton Viaduct (CAN.908) and Canton Junction approximately 2000 feet south to the RCC at 104 Revere Street (CAN.AREA B), now Plymouth Rubber Company. Of this length, approximately 1000 feet was built on a raised embankment as the subject of this survey, the remaining 1000 feet at grade level to the RCC site along Revere Street. The RCC railroad is dated to August 1835 by a deed (Norfolk 107-211) from Catherine Hartwell to RCC for the right of way for a "Branch Rail Road" of the Revere Copper Company to the Boston & Providence Railroad (B&P). The B&P had opened service from Boston to the unfinished Canton Viaduct (CAN.908) in September 1834, and through service over the completed Viaduct on 28 July 1835 (Harlow 1946:110-12). Thus, the Hartwell deed of August 1835 confirms the RCC railroad was built by August 1835, after the opening of the B&P in July 1835. It was likely constructed during the spring of 1835 with the work force from the Canton Viaduct, although no specific reference to the RCC railroad spur is cited by Harlow (1946) or Galvin (1987). The RCC railroad is first shown on the 1855 Map and depicted with a horsecar on the 1878 View. In 1890 the alignment of the RCC railroad was relocated east for a junction with the Stoughton Branch Railroad at Canton Depot (CAN.108), as steam engines replaced the original horsecars (Canton Journal 1890). The 1890 realignment thus abandoned the original 1835 embankment, except for the grade level portion along Revere Street to the RCC site, now Plymouth Rubber Company (PRC). The sale of the RCC to PRC in 1909 maintained the RCC railroad as an active freight spur. The original Revere Coach of ca.1835 survived after 1909 (Galvin 1987:30) and was shown in a photo by Burke (1947:19). It was reportedly donated to the Town of Canton (DiGiovani 2006), although no record of its location is known. The RCC railroad remained active until 2002 when freight service was transferred to motor trucks by PRC (DiGiovani 2006). The Revere Copper Company railroad is of great historic value as an original surviving railroad embankment from the first period of Boston area railroad construction in 1835, among the oldest intact railroad trackways from the early New England railroad era.

NVENTORY FORM CONTINUATION SHEET

Town: Canton

Property Address: Revere St.

Area(s): | Form No.: 935

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
.20 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

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Map of Canton. Boston: H.F. Walling, 1855.
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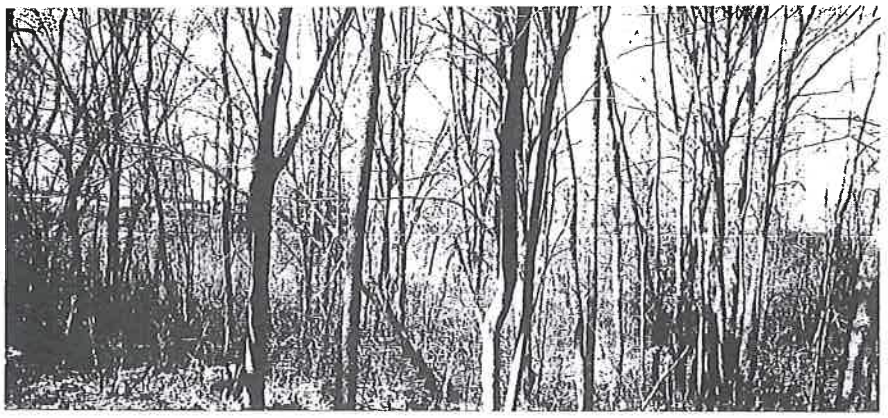
View of Canton, Mass. Boston: Bailey & Hazen, 1878.

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Revere Railroad
Looking North
1835 RR Bed-Lft.
1890 RR Track-Rt.



Revere Railroad
Looking West
1835 Embankment
Culvert-Center
Canton Viaduct)
(Mid-Horizon)

Revere Railroad
Looking North
1835 Embankment

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JUL 19 2006
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NVENTORY FORM CONTINUATION SHEET

Town: Canton

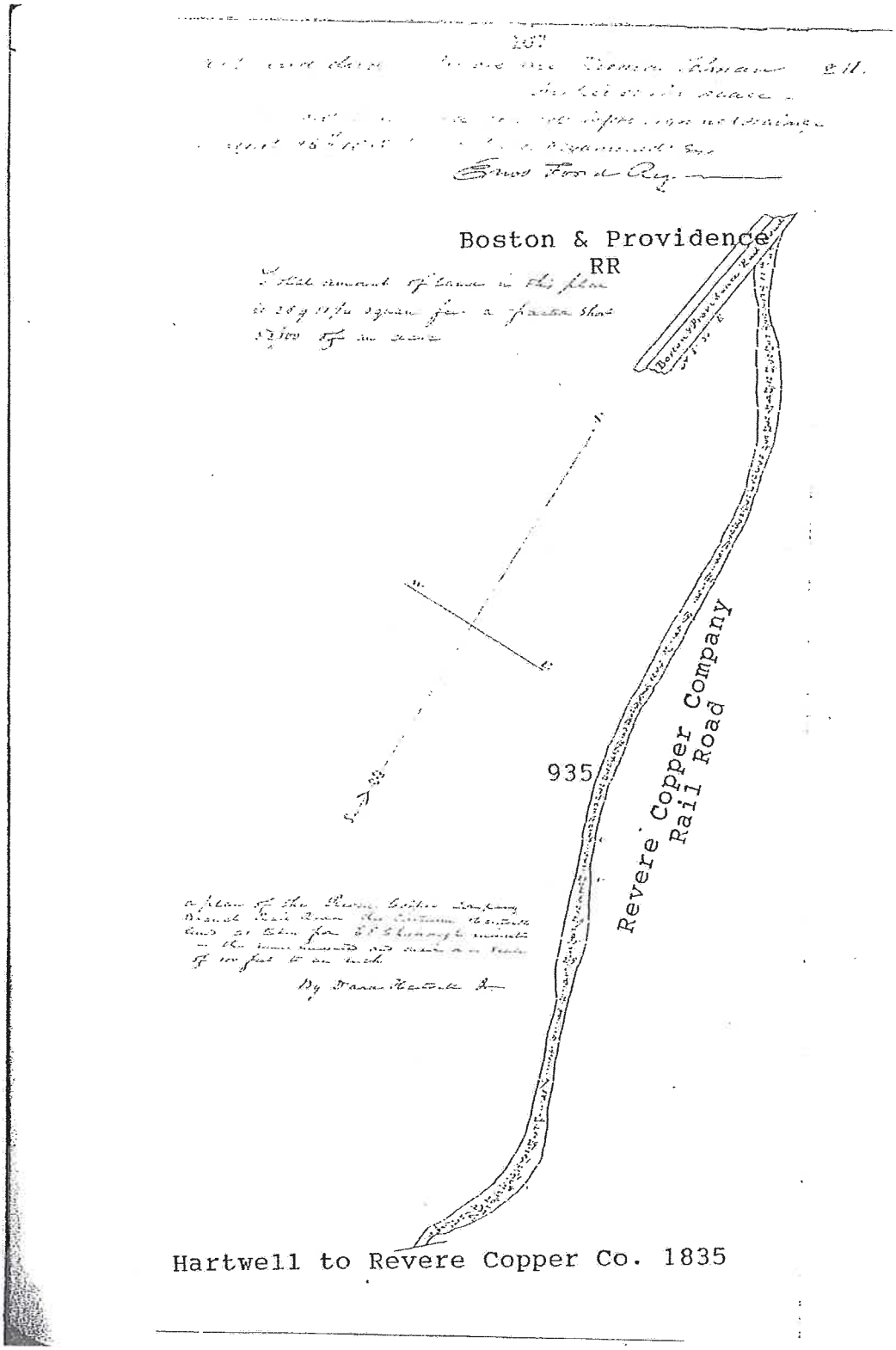
Property Address: Revere St.

Area(s):

Form No.: 935

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

ARCHIVE DEED PLAN



Hartwell to Revere Copper Co. 1835

Norfolk County Deed 107-211 (1835)

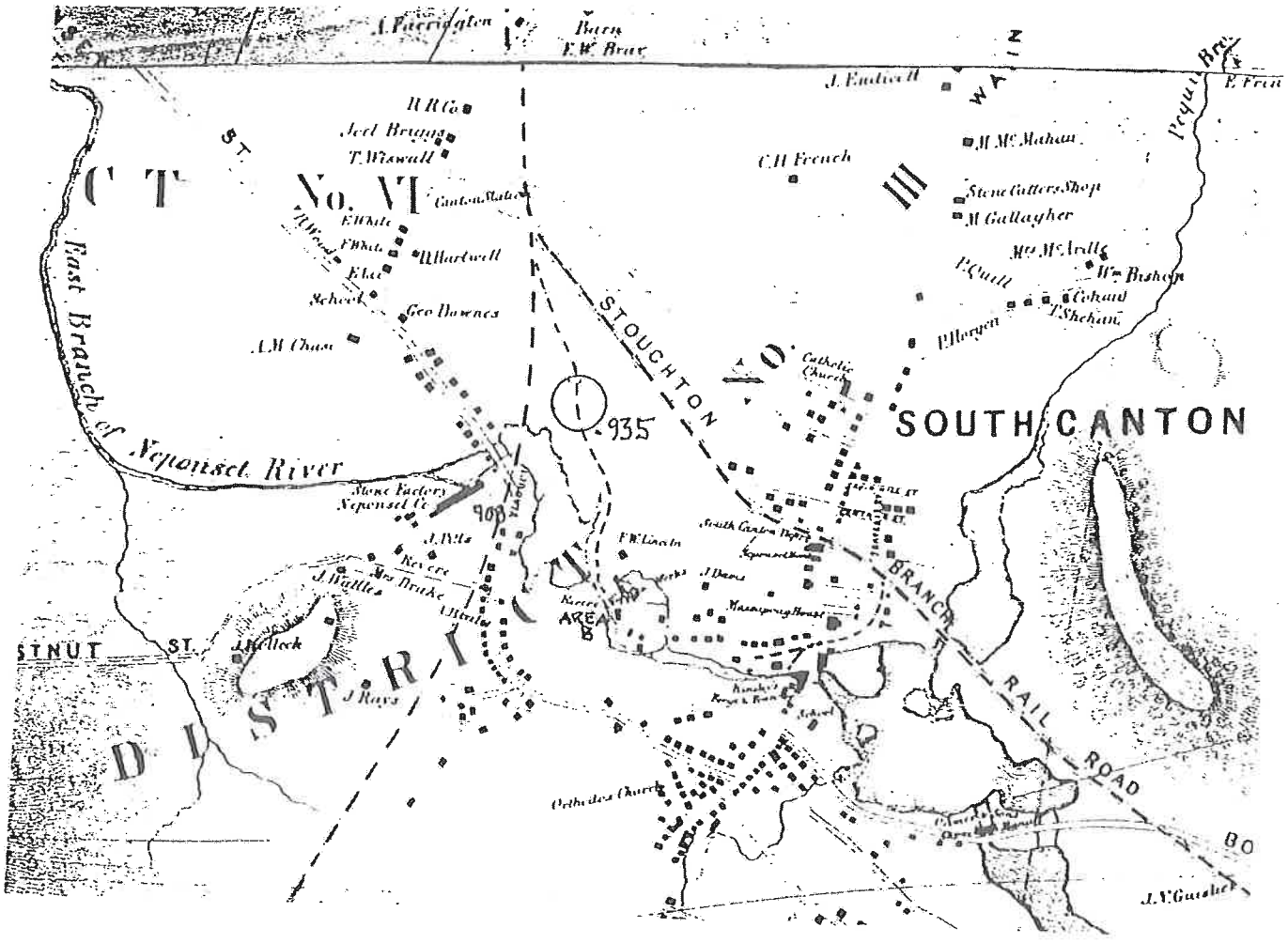
MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Town: Canton

Property Address: Revere St.

Area(s)	Form No.
	935

ARCHIVE MAP A



Map of Canton
H.F. Walling
1855

INVENTORY FORM CONTINUATION SHEET

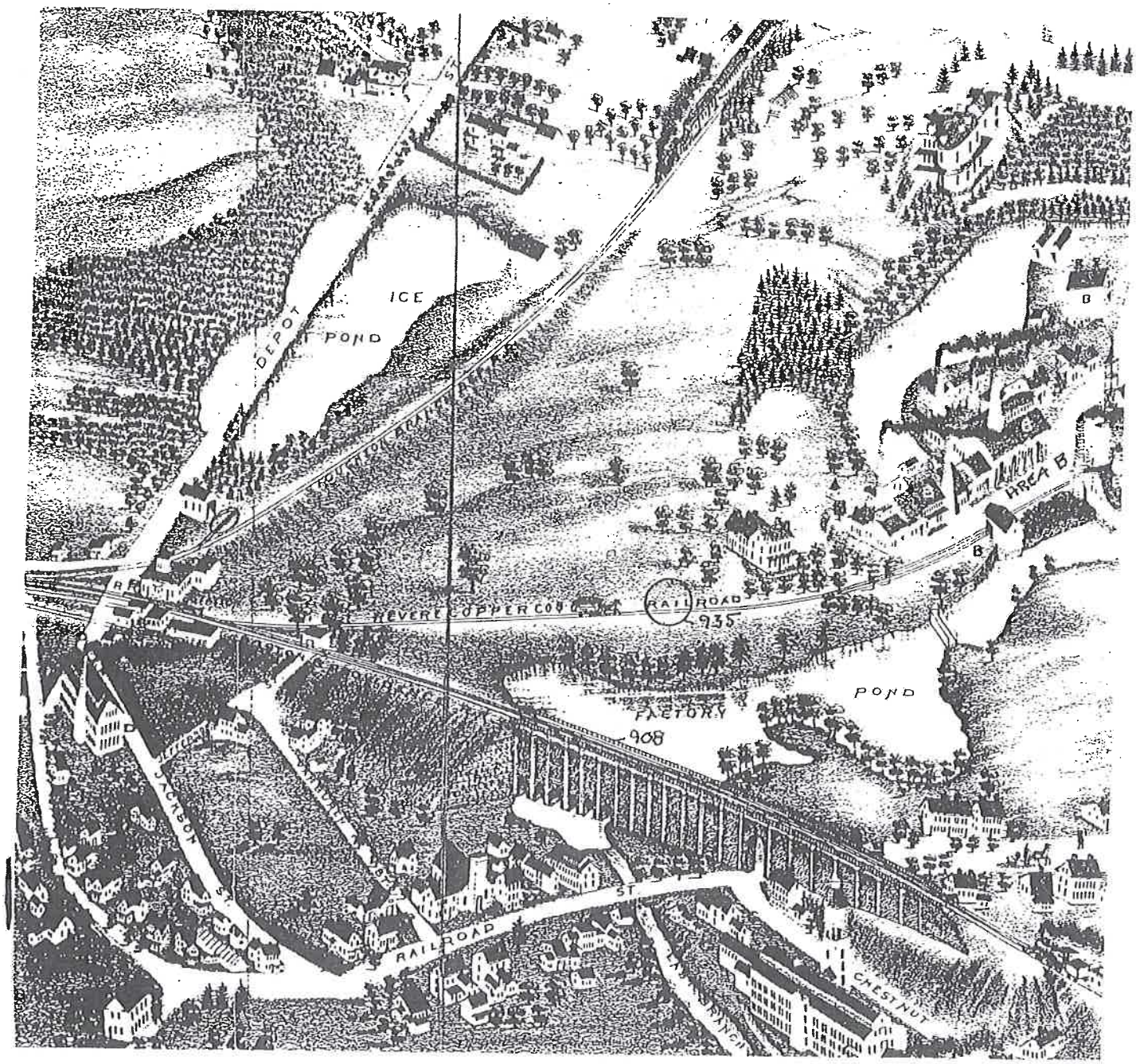
Town: Canton

Property Address: Revere St.

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Area(s)	Form No.
	935

ARCHIVE MAP B



Revere RR Horsecar
View of Canton
Bailey & Hazen
1878

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Community: Canton

Property Address: Revere St.

Area(s)	FormNo.
	935

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible only in a historic district
☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ A ☐ B ☒ C ☐ D

Criteria Considerations: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Statement of Significance by Arthur Krim
The criteria that are checked in the above sections must be justified here.

The former roadbed of the Revere Copper Company (RCC) railroad was constructed in 1835 as a freight spur from Canton Depot (now Canton Junction MBTA) to the RCC works in Canton Center. The roadbed follows a north/south alignment approximately 2000 feet from the main line of the Boston & Providence (AMTRACK) Railroad at the Canton Viaduct (CAN.908). The north section of 1000 feet is constructed as a raised embankment for a single track railroad with a surviving stone culvert. The south section is located at grade level with railroad track intact. Documentation of the roadbed is confirmed by an 1835 deed from Catherine Hartwell to the RCC for the right of way. The RCC railroad was operated as a horse drawn railroad with a private coach for the Revere family. In 1890 a new alignment was located east of the embankment, leaving the grade level section intact. The RCC spur was sold in 1909 to the Plymouth Rubber Company and remained in active service until 2002. The former roadbed of the Revere Copper Company railroad is recommended for National Register Consideration under Criterion C as a rare surviving railroad right of way from the first generation of New England railroad construction in 1835.

Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form.

ARCHITECTURAL DESCRIPTION (Continued)

The Canton Water Works (CAN.366) has had no changes to its condition or integrity since the previous survey. The building is a Romanesque Revival style brick structure with a cross-hipped slate roof, brick walls, and a granite foundation. It exhibits the characteristic elements of the Romanesque Revival style its form, Roman arch doors and windows, and ornamentation that relies on mixtures of polychrome cast terra cotta, brick, and granite masonry for decorative effect.

HISTORICAL NARRATIVE (Continued)

Completed in 1888 as a steam-powered pumping station, the facility supplied water for consumption and fire suppression throughout central Canton and thus supported the city's urbanization and industrialization in the late nineteenth and early twentieth centuries. Although converted to electric pumps in the twentieth century, the structure retains features associated with its role as a water supply facility, including the newer electric pumps and associated piping, operational water meters, and an external brick water tank. It retains its original fenestration and entries behind plywood panels. A prefabricated, Butler-type, steel garage that serves as the Town of Canton Water Division Storage Facility has been recently added to the parcel about 30 feet southeast of the Water Works. The property is in fair condition (Canton Historical Society n.d.; Commonwealth of Massachusetts 1890; State Board of Health 1890:93.

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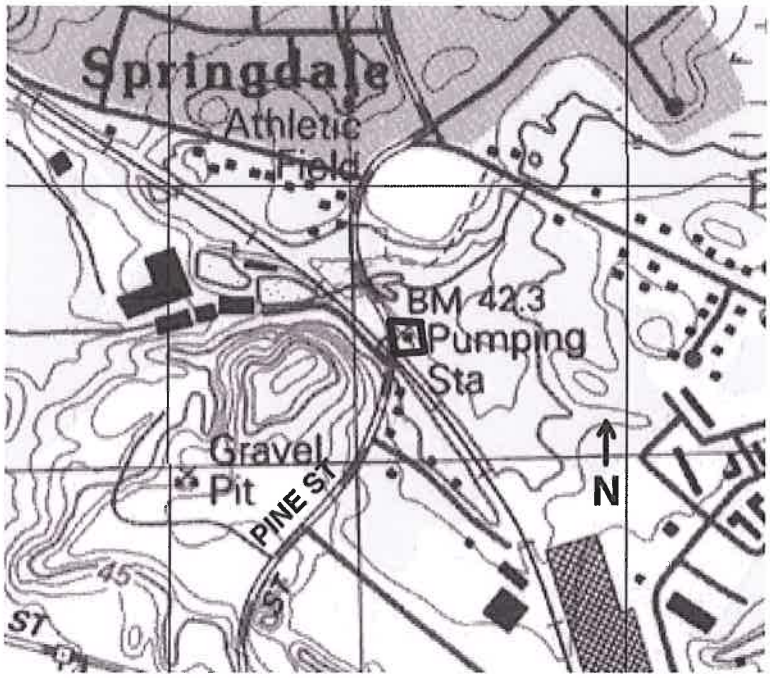
State Board of Health
1890 *Examinations by the State Board of Health of the Water Supplies and Inland Waters of Massachusett, 1887-1890.* Wright & Potter Printing Co., Boston, MA.

LOCUS MAP


Springdale
Athletic Field
BM 42.3
Pumping Sta
Gravel Pit
PINE ST
N
45
ST
ST

Canton Water Works looking southeast from Pine Street.

Canton Water Works looking east from Pine Street.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

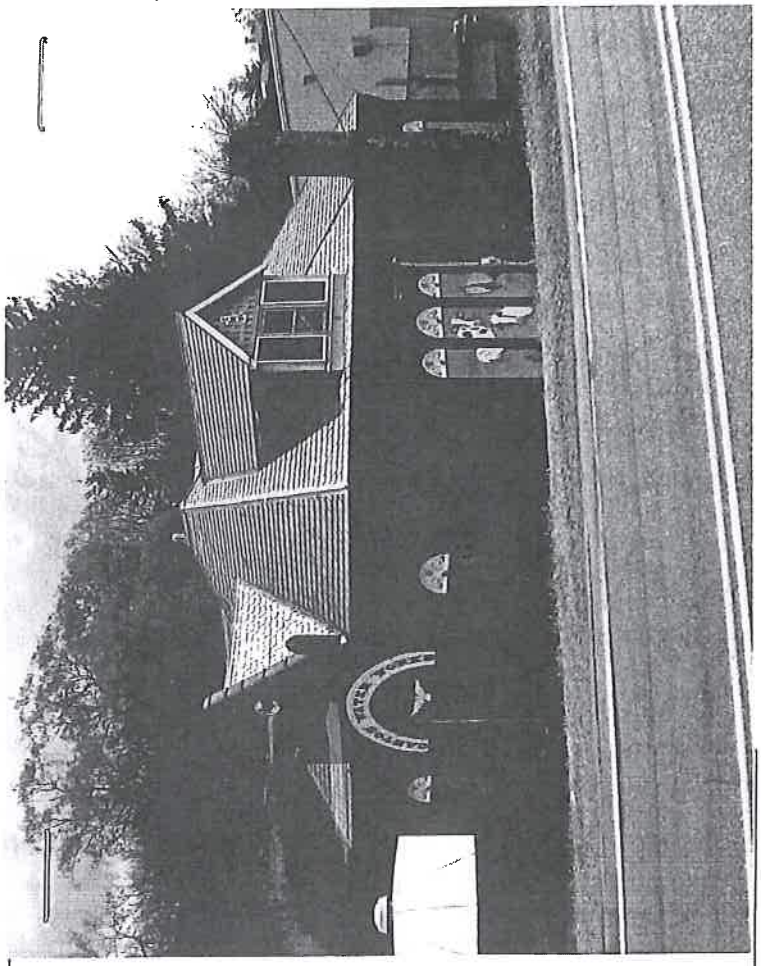
Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December 2012
The criteria that are checked in the above sections must be justified here.

The Canton Water Works is recommended eligible for listing in the National Register at the local level under Criteria A and C in the areas of Community Planning and Development, Architecture, and Engineering. Under Criterion A, the building is associated with the establishment of Canton's municipal water supply, which contributed significantly to the community development of Canton during the late nineteenth century. Under Criterion C, the building is significant for its engineering as an intact surviving example of a late-nineteenth-century municipal water pumping station and is significant architecturally as an excellent example of the Romanesque Revival style in the town of Canton.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125



Assessor's Number	USGS Quad	Area(s)	Form Number
58-92	Norwood		344

Town/City: Canton

Place: *(neighborhood or village)*: Springdale

Address: 40 Pine Street

Historic Name: Canton Water Works

Uses: Present: Springdale Pumping Station offices

Original: steam pumping station

Date of Construction: 1888

Source: water reports, date stone

Style/Form: Richardson Romanesque/ pumping station

Architect/Builder: Whittker & Wright

Exterior Material:

Foundation: granite

Wall/Trim: brick/ copper-wood

Roof: slate

Outbuildings/Secondary Structures: water reservoir

Major Alterations *(with dates):*
Steam pumps removed ca. 1965

Condition: fair

Moved: no ☒ yes ☐ **Date:**

Acreage: 15 acres

Setting: suburban district- adjacent to commuter railroad

Recorded by: Arthur Krim

Organization: Canton Historical Commission

Date (*month / year*): June 2010

RECEIVED
JUN 25 2010
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INVENTORY FORM B CONTINUATION SHEET

CANTON 40 PINE STREET

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

~~344~~ 3VV

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:

Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

The Canton Water Works at 40 Pine Street in Springdale was built in 1888 as the primary pumping station for the Canton Water Board by Whittker & Wright, engineers of Boston. The building is set directly on the ground with a granite stone sill and follows a central entrance plan of three bays, one story of brick, with a high hip slate roof and copper cornice, and dormer windows. The design is Richardson Romanesque Style, as seen in the arched entry door embossed "CANTON WATER WORKS," and the crested parapet with the date "1888," capped by carved finials. Other features include a splayed corbled cornice and segmental arched windows. Originally a large chimney stack stood near the west façade, now replaced by a smaller stack. The original steam pumps and water works have been removed (ca. 1965) and the interior space is now used as offices. A large brick water tank (now in deteriorated condition) is built to the rear, with shallow base and domed roof that has replaced the original wood frame. A cast iron door is embossed "Canton Water Works 1888," More recently (ca. 1995) a storage garage for the Department of Public Works was built on the adjacent site at 44 Pine Street and now serves as the main office of the Water Department. The Canton Water Works is a notable late 19th century municipal building in Canton, with original exterior period features and renovated interior office space.

HISTORICAL NARRATIVE

Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

The Canton Water Works at 40 Pine Street in Springdale is dated 1888 by the embossed date on the building and Canton Water Board reports. The planning for a town-wide water system was first proposed in 1882 through the Canton Board of Health with the creation of the Canton Water Act in 1885 for funding the project. The key individuals involved were Frederick Endicott, Frank Ames and Charles Galligan with the formation of the Canton Water Commission in August 1887. The original site for the main pumping station was first proposed on the Stoughton Turnpike (Route 138) in October 1887, but reconsidered for a site in Springdale along the Stoughton Ranch Railroad and Beaver Meadow Brook in late October 1887. In December 1887, the steam pumping equipment was ordered and arrived on site through Whittker & Wright of Boston, the designing engineers. Evidently, the Springdale Pumping Station was designed by a staff member at Whittker & Wright, without direct mention in the Water Board reports. The building was completed during 1888, with the date embossed above the entrance as "CANTON WATER WORKS 1888," although the site is not shown on the 1888 Atlas. The first water pipes were laid in May 1888 and evidently the first system was in operation by the end of the year, although no specific date is cited in the town reports. The Springdale Pumping Station continued to function as the primary water facility in Canton through the mid-20th century, with the original steam equipment replaced by electricity ca. 1965 and the building converted to offices ca. 1995 (Renquist 2010). The original water tank remains in place behind the main building with feeder pipes from the adjacent artesian springs to the south of the site. The Canton Water Works is notable as an important late 19th century municipal building in Canton, originally the Springdale Pumping Station, now converted offices for the Canton Water Department.

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Canton Water Board. Canton: by the town, 1885-1891.
Renquist, R. Site visit with A. Krim, 27 May 2010.
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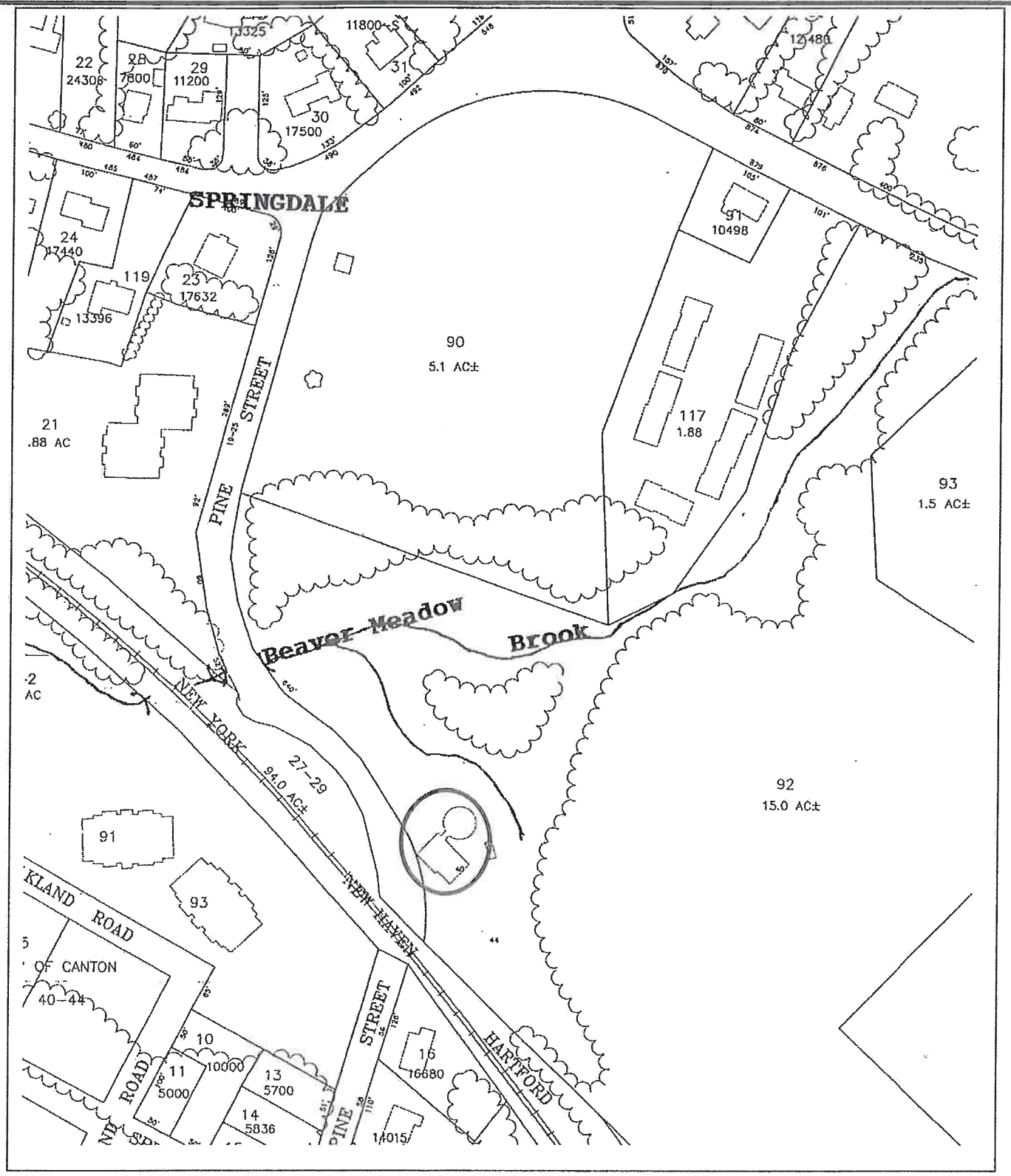
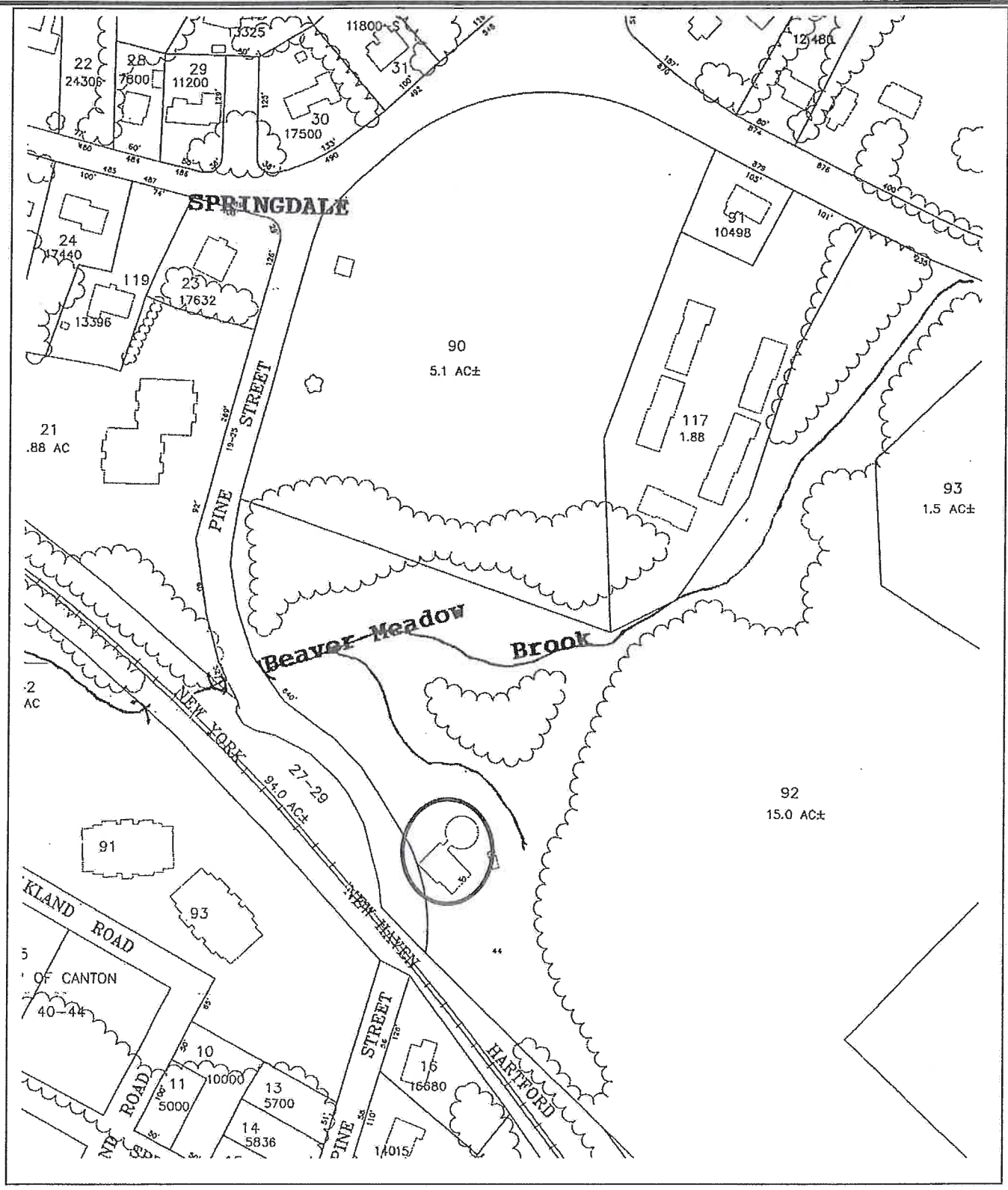


Canton Assessors' Map Sheet 58, provided by the City of Canton. Image cropped and resized (proportions constrained), with red circle added to indicate building.

Continuation sheet 2



Canton Assessors' Map Sheet 58, provided by the City of Canton. Image cropped and resized (proportions constrained), with red circle added to indicate building.

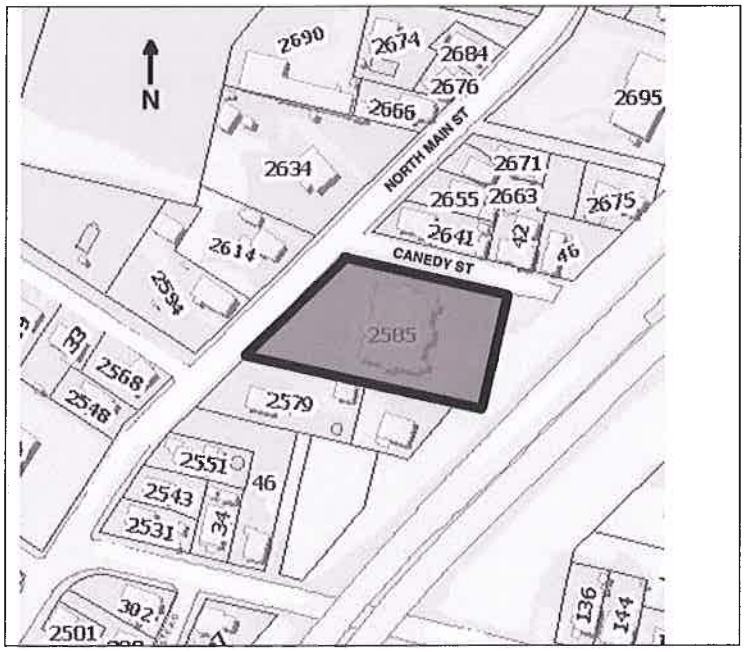
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
	Fall River		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year*): December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 2585 North Main Street

Historic Name: William J. Wiley Middle School

Uses: Present: Vacant

Original: Institutional

Date of Construction: 1910-1911

Source: Fall River Public Schools 1911

Style/Form: Classical Revival

Architect/Builder: Unknown

Exterior Material:

Foundation: Brick

Wall/Trim: Brick/Brownstone Trim

Roof: Unknown – Not Visible

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* None

Condition:

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.997

Setting: The property is located along a major thoroughfare in a mixed residential and commercial community within the North Main Street Area. The building is approximately 500 feet east of the Fall River Secondary right-of-way.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The William J. Wiley Middle School is a rectangular, two-story, five-bay by two-bay, flat-roofed, steel and concrete structure building sheathed in red brick and brownstone trim constructed in the Classical Revival style between 1910 and 1911. The building sits on a slightly sloping landscape with a concrete retaining wall and chain-link fence. The property is dotted with plantings and mixed coniferous trees. An entablature extends around the entire building, with a molded copper cornice, brick frieze, and a brownstone taenia. The building is characterized by one-story and full-height bays on all elevations, including a prominent full-height recessed bay on the west-facing facade, full height bays on the north and south elevations, and a single-story bay window on the east elevation. The centered main entrance, set within the recessed bay, is a character-defining feature with a full brownstone entablature, including a brownstone nameplate set in brick with "WILLIAM J. WILEY SCHOOL" in raised lettering and large carved flaking scrolls, and Doric pilasters. A brownstone staircase leads up to a rounded arched brick doorway with a brownstone keystone. Flanking recessed rounded-arch brick bays with brownstone sills mimic the door surround. Fenestration is regular, with rectangular-shaped, one-over-one sash, non-historic, brownstone-trimmed, ribboned windows. Historic basement windows are intact, with six-pane casements. All doors consist of non-historic aluminum double doors. Two small concrete masonry wall sheds extend from the east elevation with non-historic aluminum pedestrian doors.

HISTORICAL NARRATIVE

The William J. Wiley Public School was constructed between 1910 and 1911 as a nine-room Classical Revival style school in a lightly residentially developed area. Named after a long-time president and member of the Fall River Board of Aldermen, the school officially opened on September 23, 1911. Students came from the Steep Brook, Border City and Borden Schools. It accommodated approximately 260 students in levels Kindergarten through Eighth Grade, with a staff of ten (Beers 1871; Everts & Richards 1895; Sanborn Map Company 1933; Fall River Public Schools 1911:22).

The William J. Wiley School was one of the first new wave of schools to be constructed during a period of educational expansion in Fall River. It was built at a time when the majority of institutional properties constructed were ecclesiastical. During the Late Industrial Period (1870-1915), Fall River experienced extensive residential development, with a high style residential district extending northward from Highland Street. School system administrators began to identify a need for updated educational buildings within the city to address an issue of overcrowded classrooms. School buildings that shortly followed suit included the Hamlet Street School and later, the Ferry Lane School. A string of new school buildings were built following the William J. Wiley School such as the Fall River School Administration Building circa 1915, Doran School in 1926 (MHC No. FLR.99), the Fall River Technical High School in 1929 (MHC No. FLR.3049), and several others. Like the William J. Wiley School, these properties were predominantly masonry buildings constructed in the Colonial Revival and Renaissance Revival styles with flat roofs (MHC 1982:18-19).

Shortly after the building was constructed, school administrators identified a few issues in the property's construction and design. A 1912 Fall River public school system report documented that the building had severely leaking windows, no water access on the second floor, a poorly maintained yard, and no walkway from the street to the front door. Lastly, the school provided only two drinking fountains (located in each of the building's two basements) for approximately 260 students, who shared a single recess period (Fall River Public Schools 1911:35-36).

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1871 *Atlas of Bristol County, Massachusetts.* F.W. Beers and Company, New York, NY.

Everts & Richards Co.
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Fall River Public Schools
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Sanborn Map Company
1933 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

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National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The William J. Wiley Middle School, a two-story, brick and brownstone building at 2585 North Main Street, is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C. Under Criterion A, the school has important historical associations with the early-twentieth-century development of Fall River, while under Criterion C, the building is an excellent and intact, local example of an early twentieth-century, Classical Revival style schoolhouse. Constructed between 1910 and 1911, the William J. Wiley School was one of the first new wave of properties to be erected during a period of educational expansion in Fall River to address the issue of overcrowded schools in the city.

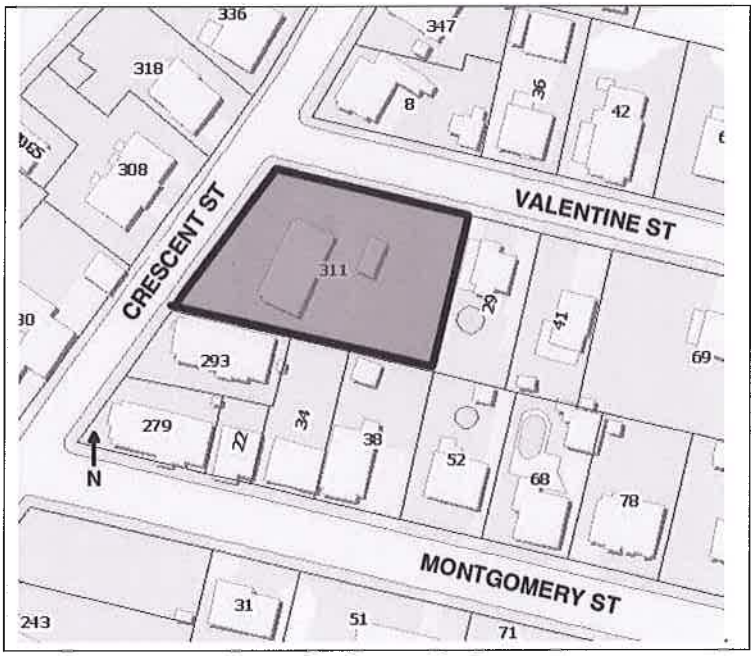
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
T-17-0001	Fall River		FLR.0074

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 311 Crescent Street

Historic Name: Residence

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1900

Sources: Style/Visual Inspection; Sanborn Map Company 1905;

Style/Form: Italianate

Architect/Builder: Unknown

Exterior Material:
Foundation: Parged Stone
Wall/Trim: Wood Clapboard
Roof: Slate Shingle

Outbuildings/Secondary Structures: One detached, side-gable shed (circa 1900).

Major Alterations *(with dates):* None

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.4

Setting: The property is set on the southeast corner of Crescent Street and Valentine Street within a suburban, residential neighborhood, approximately 400 feet east of the Fall River Secondary right-of-way with views of the Border City Mill.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The residence at 311 Crescent Street is a two-and-one-half-story, seven-bay by three-bay, multi-family, wood framed, French Second Empire style residence constructed circa 1900. The character-defining feature to this house is its simple wood trimmed mansard roof with sinuous molded lintels over the bracketed windows, and a deep bracketed molded cornice. Set on a steeply-sloping topography with a mortared stone retaining wall, the house prominently stands on its small, cleared lot. Three parallel granite stairs with simple iron railings ascend the raised topography, leading to two main entrances. The building has a central brick chimney, a slate roof, clapboard siding, and a parged stone foundation. A large central bay extends from the western façade. Identical entrances are located at each end of the façade to accommodate this multi-family residence. The entrances have paneled wood segmental arched double doors within a molded door-surround and are each set within a one-story wood inset Italianate-style entry porch with a molded cornice, large ornate brackets and spandrels, and squared paneled columns.

HISTORICAL NARRATIVE

The residence at 311 Crescent Street in Fall River, MA is a French Second Empire multi-family house constructed circa 1900 within a neighborhood developed to accommodate workers in the city's booming textile industry of the period. Constructed just 600 feet east of the Border City Mills, the property was likely erected to provide middle- to upper-management with housing that was close in proximity to the mills (Bailey 1877; Rosebrock 1977). Although this property was not likely constructed by the Border City Manufacturing Company (Border City Mills), neighboring properties have been identified as Border City Mills worker housing, including the property at 85 Valentine Street (MHC No. FLR.454), located only a few lots north (Sanborn Map Company 1895; 1905; Fall River Tax Assessor Records). Developed between 1872 and 1889, the Border City Mills initially produced print cloth, expanding in 1901 in the manufacturing of high grade cloth sheeting and skirting. Within the surrounding 20 blocks, the Border City Manufacturing Company constructed approximately 152 tenements to house its work staff (Pereira 1981).

The period between 1870 and 1915 represented Fall River's greatest industrial prosperity. The city reached its peak in new mill construction and extensive development occurred, including a high style residential district extending northward along Highland Street. The city's population grew 366 percent during the period, most of this growth between 1870 and 1900. By 1875, 14,000 of the city's 16,000 wage earners were employed in the cotton mills, most of which were involved in print cloth production. (MHC 1982).

In the 1880s, two-and-one-half-story, Italianate style, multi-family houses with mansard roofs rose in popularity in Fall River. While the majority of the surviving examples have center entrances and flanking two-story polygonal bays, the high style residence at 311 Crescent Street is unique as its entrances flank a centered bay, with delicate, Italianate style inset porches.

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1877 City of Fall River, Massachusetts. O.H. Bailey and J.C. Hazen, Fall River, MA.

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Pereira, J. and P. Vielmetti
1981 *MHC Area Form: Border City Mills, Fall River, MA.* On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Rosebrock, Ellen
1977 *MHC Building Form: 311 Crescent* Street, Fall River, MA. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Sanborn Map Company
1895 *Bristol County, Fall River, Massachusetts*. Sanborn Map Company, New York, NY.

1905 *Bristol County, Fall River, Massachusetts*. Sanborn Map Company, New York, NY.

View looking southeast at the shed.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The residence at 311 Crescent Street is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C, as an excellent example of a high style, French Second Empire multi-family house constructed in association with Fall River's booming late-nineteenth-century textile industry. Constructed around 1900 in a neighborhood with Border City Mills (1872-1889) worker housing tenements, the property likely provided mid- to upper-management employees with housing. As a well-preserved, high style, Italianate, multi-family home, the property stands out from other similarly-styled properties in Fall River that are more uniformly designed, with centered entrances and flanking two-story polygonal bays.

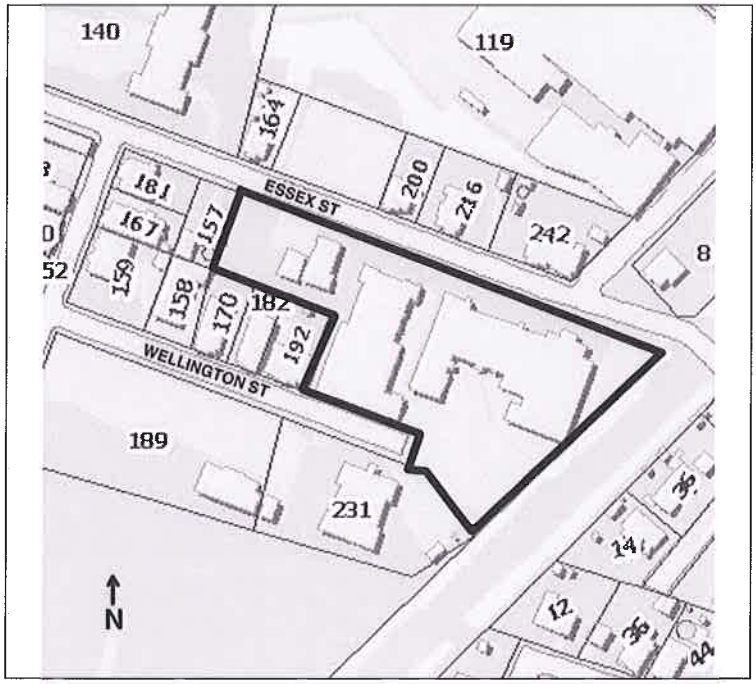
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
	Fall River		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A.Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 207 Essex Street

Historic Name: St. Michael's Roman Catholic Church

Uses: Present: Ecclesiastical

Original: Ecclesiastical

Date of Construction: 1896; 1921-1922 Additions

Source: St. Michael's Parish 2012

Style/Form: Neo-Gothic Revival

Architect/Builder: Charles Hodgate Company (Boston)

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick/Concrete

Roof: Unknown – Not Visible

Outbuildings/Secondary Structures: St. Michael's Rectory (1902); St. Michael's School (1957).

Major Alterations *(with dates):* Initially constructed as a basement church in 1896, major additions to the building were made between 1921 and 1922, including the brick upper stories and the concrete facade.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage:

Setting: The property is set within a predominantly residential, urban, Wellington-Brownell Street Area and located approximately 250 feet west of the Fall River Secondary right-of-way.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

Constructed in 1896 with 1921-1922 additions, St. Michael's Roman Catholic Church is a rectangular-shaped, three-bay by six-bay, gabled Neo-Gothic Revival style brick building with a two-story central nave, flanking one-story aisles, and a contrasting high-style facade of wood-frame construction sheathed in concrete. St. Michael's Roman Catholic Church sits on a property with the former St. Michael's Rectory (1902) to the west and the St. Michael's School (1957) to the east. The topography is raised and retained by a concrete wall. Paved walkways and two sets of concrete stairs with iron railings fill in the remaining open land on the lot.

The north-facing facade was reconstructed between 1921 and 1922 in concrete as it presently appears. The three-bay by one-bay, facade is divided into three sections, from west to east--the nave, an aisle, and an aisle with a rectangular tower. This elevation has shaped parapet roofs with copper flashing, concrete panel sheathing distressed to resemble stucco, full-height corbelled concrete pilasters, a concrete sill sheathed in marble, and a concrete foundation. The prominent, central nave features a large, elaborate stained glass Tudor arch window with cast stone tracery and a concrete frame. Both aisle facades have small rounded-arch stained glass windows with cast stone tracery. All wood paneled doors are surrounded by thick concrete frames sheathed in marble, with flanking pointed marble pilasters and carved terracotta panels.

The remainder of the building consists of a gable-front nave and flanking flat-roofed additions with a copper cornice, stretcher bond brick walls with a soldier trim, and a concrete foundation. Thick brick pilasters capped with concrete decorate the walls of the aisles. The fenestration is regular with stained glass cast-stone tracery windows, concrete lintels, and concrete sills. The nave has Tudor arch windows, the aisles have paired trefoil arched windows with a concrete frame, and the additions have singular trefoil arched windows.

Constructed in 1902, St. Michael's Rectory is a rectangular, two-story, three-bay by four-bay, wood-framed, French Second Empire building with a hipped roof. St. Michael's School was constructed in 1957 as an irregular, two-story, brick building with a tall, narrow, brick chimney piercing the center of the flat roof.

HISTORICAL NARRATIVE

The St. Michael's Roman Catholic Church was constructed in 1896 as a basement church to serve a large community of immigrants from the Azorean Islands of Portugal, who settled in Fall River in the late-nineteenth century. In 1902, the church expanded to include a French Second Empire style rectory adjacent to St. Michael's Church on Essex Street, which has since lost architectural integrity. By 1915, there was a significant influx of Portuguese to the city. In the early 20th century, a few churches associated with the Portuguese community were constructed, but these are no longer extant. Between 1921 and 1922, major alterations were made to the basement church by the Charles Hodgate Company of Boston, MA, who constructed a Neo-Gothic Revival concrete building and facade. The center of a large Portuguese community, the church provided house calls while the church was temporarily closed while under construction. These house calls were carried out by Father John de Fontes Ferraz (Pastor from 1917 until 1944), who conducted baptisms and other religious ceremonies. After the church renovations were completed, the parish began looking for sites to house their school. In 1930, the parish purchased the Fulton Street School from the City of Fall River and four years later the parish received the Lindsey Street School (no longer extant) as a donation. It was not until 1957, when the parish purchased land to the east of the church to construct a new school (MHC 1982; St. Michael's Parish 2012).

St. Michael's Roman Catholic Church was built in an area with several religious buildings and structures, including St. Michael's Rectory, St. Matthew's Convent, St. Matthew's School, St. John's Cemetery, and St. Joseph's Church complex to the south (Sanborn Map Company 1933; 1933-1950). The building's construction occurred during a transitional period in Fall River history when construction in Fall River was moving from ecclesiastical buildings to educational buildings. Several massive ecclesiastical buildings were constructed in the late nineteenth century. Catholic properties built during this era included Saint Joseph's Roman Catholic Church (MHC No. FLR.240) and several properties constructed by Louis G. Destremps, a local architect of Catholic properties, including Saint Anne's Roman Catholic Church (MHC No. FLR.1534), Saint Anne's Rectory (MHC No. FLR.1535), Saint Anne's Convent (MHC No. FLR.1521), St. Joseph's Orphanage (MHC No. FLR. 1536), Notre Dame School (MHC No. FLR.1529), and the Jesus Marie Convent (FLR.1528) (MHC 1982).

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2012 "History." *St. Michael's Parish, Fall River, MA.* Available On-line at: http://smpfr.org/parish/history.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

St. Michael's Roman Catholic Church at 199 Essex Street is individually eligible at the local level under Criteria A and C for its associations with the growing Portuguese community of Fall River in the early twentieth century and as an excellent example of the rare Neo-Gothic Revival style. The period of significance for the church extends from 1896, when the property was first developed, until 1922, when major additions to the church in order to accommodate the growing Portuguese community, was completed. The property was developed in 1896 as a basement church to serve a large community of immigrants from the Azorean Islands of Portugal. The building is a well-preserved example the Neo-Gothic Revival style, which was uncommon in late-nineteenth- to early twentieth-century Fall River. The 1921-1922 Neo-Gothic Revival style building and façade was constructed by Charles Hodgate Company of Boston, MA. The church has two, non-contributing outbuildings, including St. Michael's Rectory and St. Michael's School. The rectory, constructed in 1902, has lost significant architectural integrity and the school, built in 1957, was constructed outside of the period of significance.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
S-13-0008	Fall River		

Photograph

Locus Map

Recorded by: J. Daly, A.Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 7 Oregon Street

Historic Name: Westport Manufacturing Company Waste Department

Uses: Present: Commercial

Original: Manufacturing

Date of Construction: 1918

Source: Plan Record B.9.14.16945 at the Massachusetts State Archive

Style/Form: Vernacular industrial

Architect/Builder: E. I. Marvell

Exterior Material:
Foundation: Concrete

Wall/Trim: Brick

Roof: Rubber membrane

Outbuildings/Secondary Structures:
None

Major Alterations *(with dates):*
None

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.398

Setting: The Westport Manufacturing Co. Waste Department building is located in a residential and commercial neighborhood on a constricted, L-shaped parcel between the Fall River Secondary to the east and Oregon Street to the west. The building faces west towards Oregon Street with its facade forming a street wall. A paved driveway passes along the north side of the building and leads to a parking lot at the rear of the parcel. A narrow alley separates the building from a neighboring commercial structure to the south. The east end of the lot behind the building, where there was formerly a railroad siding and loading dock, is now overgrown gravel.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Westport Manufacturing Co. Waste Department building is a typical early twentieth-century, vernacular industrial mill loft. The brick building is two-stories in height with a partially exposed basement level and has a three-bay-by-nine-bay trapezoidal plan with a slightly angled east elevation designed to accommodate the adjoining railroad right-of-way and railroad siding for the building. The loft has a shallow-pitched "flat" gable roof with a rubber membrane surface, aluminum-clad cornice molding, and open soffits with exposed beveled rafter tails. An elevator tower and a brick firebreak wall project above the roof line. The load-bearing walls are laid in common bond and are divided into regular bays by shallow projecting piers. The primary entrance is deeply recessed within the west end of the north elevation and has an aluminum and glass replacement door. Loading bays with projecting hoist beams and two-leaf wood paneled freight doors are located on the east and south elevations. The lower doors in each bay have been replaced. Two freight doors on the west elevation (for the now-missing railroad platform) are fitted with a two-leaf wood panel door and a steel roll door. The side elevations have two window openings in each bay, and the end elevations have three window openings in each bay. Rectangular cast concrete sills and lintels are continuous across the window openings within each bay and the rectangular openings are fitted with multi-light steel sash. About 25 percent of the sash has been replaced with glass block. An iron fire escape is bolted to the southeast corner of the building. Signs that read "Westport Manufacturing Co. Waste Department" are painted on the east and west elevations.

The building interior is organized into open work floors that are subdivided into two workrooms by the brick firebreak wall. Interior finishes are of typical fire-resistive construction and include beaded, splined plank ceilings; brick walls; and wood strip floors. The exposed frame consists of cast iron posts supporting longitudinal rolled steel stringers, and transverse floor wood beams. Wood stairs enclosed in wood beadboard stairwells with gas pipe railings provide circulation between floors.

HISTORICAL NARRATIVE

Westport Manufacturing Company were producers of coarse cotton yarns used in carpet warp, mops, and wicking. Headquartered in Westport, Massachusetts since 1812, in 1916 the company determined to construct a Fall River facility for the collection of cotton waste from larger textile mills – the chief raw material for their goods. Fall River, whose sizable cotton textile industry was reaching its peak during this period, was an ideal source for such waste. The resulting building was designed by architect E.I. Marvell (not included in standard twentieth-century biographical dictionaries) and was used for baling and storage of cotton prior to its shipment to Westport for recycling into yarn. In the context of existing Fall River textile factories, the loft is a small, but architecturally distinguished example of standard early-twentieth-century fireproof industrial design, as demonstrated by its timber and brick engineering and the firebreak wall that divides the building between its fifth and sixth bays. Westport Manufacturing Company occupied the premises until after 1950. The building is currently used for office and warehouse space and is in good condition (*American Wool and Cotton Reporter* 1912; Anonymous 1918; Foster 1916:351-354; MHC 1982; Sanborn Map Company 1933, 1950).

BIBLIOGRAPHY and/or REFERENCE

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Anonymous
1918 Plan Record Card: Westport Mfg. Co. Warehouse. Building Inspection Department – District Police. On file, Massachusetts State Archives, Boston, MA.

Foster, E. Everton, Ed.
1916 *Lamb's Textile Industries of the United States.* Volume II. James H. Lamb, Boston, MA.

Massachusetts Historical Commission
1982 *MHC Reconnaissance Report: City of Fall River.* On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Sanborn Map Company
1933 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

1950 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

Rear and north elevations of Westport Manufacturing Company Waste Department

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December, 2012.
The criteria that are checked in the above sections must be justified here.

The Westport Manufacturing Company Waste Department building is recommended eligible for listing in the National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the property is significant within Fall River's substantial textile industry as it is demonstrative of the geographic and economic connections fostered by the industry within the Southeast Region of Massachusetts. Under Criterion C, the building is a well-preserved example of early twentieth century industrial architecture that demonstrates the principles of fire-resistive design.

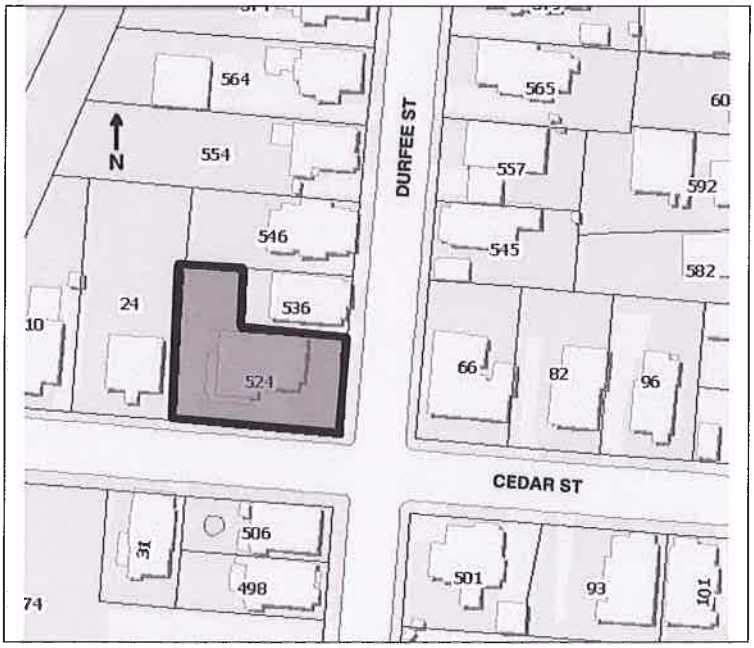
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
O-14-0037	Fall River		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 524 Durfee Street

Historic Name: Residence

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1880

Source: Sanborn Map Company 1888; Style/Visual Inspection

Style/Form: Italianate

Architect/Builder: Unknown

Exterior Material:
Foundation: Field Stone

Wall/Trim: Wood Clapboard

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* None

Condition: Fair

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: Less than 1 acre

Setting: The property is located on the edge of an urban residential neighborhood on the corner of Durfee Street and Cedar Street. Within the Pearce-Durfee Street Area, the building is just east of Mount Hope Bay and Route 79. It is located approximately 200 feet east of the Fall River Secondary right-of-way.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The residence at 524 Durfee Street is a two-and-one-half-story, three-bay by six-bay, wood-frame Italianate style house constructed circa 1880 with a crossed-gable-front roof and a large, three-story, flat-roofed rear addition circa 1900. The building sits on a steeply sloping lot with a high wooden fence extending across the eastern boundary line. The residence has two brick chimneys piercing the asphalt cross-gable roof and one small brick chimney extending from the flat-roofed addition; clapboard, asphalt, and wood shingle siding; and a brick and stone foundation. Retaining much of its original fabric and design, the house has deeply overhanging bracketed eaves, an inset Italianate-style open side-entry porch with a bracketed flat roof, decorative spandrels, and paneled square supports. A non-historic two-story porch wraps around the south and western elevations of the flat-roofed addition, with a third story porch extending the length of the western elevation. The fenestration is regular, with rounded arch, four-over-four wood sash double hung windows in the gable ends, and six-over-six double hung wood sash windows throughout the remainder of the house with wood frames and molded lintels. Non-historic modifications include the replacement of historic windows with one-over-one vinyl casement windows and a dormer sheathed in vinyl protruding from the north elevation of the cross-gable roof.

HISTORICAL NARRATIVE

Circa 1880, the property at 524 Durfee Street was developed with a multi-family, Italianate style residence and a detached shed. By 1893, the rear addition was built along the western elevation of the residence. At this time, a second multi-family residence, similar in footprint and massing, was constructed on the northeast corner of the property, replacing the shed. Between 1950 and 1994, the northern half of the property, which included the circa 1893 multi-family residence, was divided and sold. By 1933, a garage was constructed in the very southwestern corner of the property. At some point during the mid- to late-twentieth century, this garage was removed. Early property owners included lawyer and member of the Irish-American Historical Society, Henry F. Nickerson, who occupied the property in 1910 (Lee 1910:33, 572).

Located in a dense, residential development laid out by 1850, the residence at 524 Durfee Street was built simultaneously with the construction of neighboring textile mills and coal yards in the late-nineteenth century. The building was erected two properties east of coal industry development along the Old Colony Railroad Line, including the (no longer extant) William F. Thomas Coal Yard and the Globe Coal Company (established in 1881).

In the 1880s, two-and-one-half-story, Italianate style, multi-family houses rose in popularity in Fall River. While the majority of the surviving examples have mansard roofs, centered entrances, and flanking two-story polygonal bays, the high-style 524 Durfee Street House is likely unique as a gable-front building with a delicate, Italianate style, inset, side-entry porch (GoogleEarth 1995; Sanborn Map Company 1888; 1893; 1905; 1933 1933-1950; MHC 1982).

BIBLIOGRAPHY and/or REFERENCES

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1893 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1905 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1933 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1933-1950 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The 524 Durfee Street House is individually eligible for listing in the National Register of Historic Places at the local level under Criteria A and C. Under Criterion A, the building has important historical associations with the nineteenth-century residential and industrial development of Fall River and under Criterion C, the building is an excellent, intact, high-style, local example of an Italianate house. Constructed circa 1880, the property was built simultaneously with the construction of neighboring textile mills and coal yards. As a well-preserved, high style, Italianate, multi-family house, the property stands out from other similarly-styled properties in Fall River that are more uniformly designed, with centered entrances and flanking two-story polygonal bays. The house is also a contributing property within the National Register eligible Durfee Street Area.

Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form.

HISTORICAL NARRATIVE

Borden & Remington Corporation (now Boremco) is one of Fall River's oldest continually-operating firms, has important associations with the city's textile industry and was an early chemical company in the city. The concern began in 1837 when Hale Remington & Company purchased a drug and medicine business on Central Street. About 1850, Hale's son Robert K. Remington took over the business, which was moved to a building on Anawan Street opposite its present location. Robert, serving as a director for multiple textile companies, was intimately connected with Fall River's textile industry and expanded his business to supply chemicals and other raw materials to that rapidly-expanding customer base. Following Robert's death in 1886, the business passed to his son Edward B. Remington and son-in-law Charles F. Borden (previously a bookkeeper and salesmen at the firm) who formed a co-partnership as Borden & Remington. Soon thereafter, the company moved to its present location at 105-115 Anawan Street and expanded its line again to include building supplies, with distribution across southern New England. Period advertisements for the firm show that chemicals and supplies for the textile trade remained a significant proportion of the business, and industrial customers were presumably a major portion of the company building supply sales as well. Following Borden's death in 1909, company control was consolidated back into the Remington family, with the Bordens retaining a minority stake. In 1921, the firm passed out of Borden and Remington hands to Albert A. Harrison, president. During this period, the company employed approximately 100 hands. Sometime after 1950, the company vacated its Anawan Street premises and moved a short distance away to waterfront property on Water Street. Here, the company maintains a large chemical storage and processing plant. With the textile trade significantly diminished in New England, the company focuses on manufacturing products for treatment of municipal and industrial water and wastewater, as well as chemical storage and distribution for customers throughout southern New England (Beers 1871; Borden & Remington Corporation 2011; Earl 1877:113, 128; Elstner Publishing Company 1891:178; *The Fall River News* and *Taunton Gazette* 1899:27; Phillips 1945:163-164; Stone 1930:186; *The Textile Worker* 1914:32).

Insurance maps and current assessor data show that the historical Borden & Remington complex includes five of the six attached buildings, plus one detached building, all currently occupying Parcel N-16-4 at 85-115 Anawan Street. Attached buildings include the main block fronting Anawan Street (1893-1905, originally occupied by Borden & Remington), a three-story brick ell across the back of that structure (1893-1905, originally occupied by Borden & Remington), a two-story wood loft to the west of the main block (1893-1905, originally a machine shop), a brick warehouse on the southwest corner of the main block (1905-1933, woodworking), a one-story storage building on the west end of the complex (1905-1933, now heavily altered as the United Bar and Lounge at 85 Anawan Street), and a shed at the rear of the complex (post-1950, not contributing). These were unified physically into a complex by 1933, and by 1950 all of these structures were occupied by Borden & Remington. The buildings were constructed with multiple fire doors that allowed circulation throughout the complex. Although some of these properties were occupied at earlier times by tenants, their physical configuration under Borden & Remington indicates that most of these structures (excepting the wood machine shop) were all constructed by the firm and some portions thereof let on a temporary basis to other concerns. Also included on the current parcel is a detached one-story brick out-building, whose function is not indicated on historical maps. The property has had no changes to its condition or integrity since the previous survey (Sanborn Map Company 1888, 1893, 1905, 1933, 1950; Patriot Properties 2012).

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Phillips, Arthur Sherman
1945 *The Phillips History of Fall River, Fascicle II.* Dover Press, Fall River, MA.

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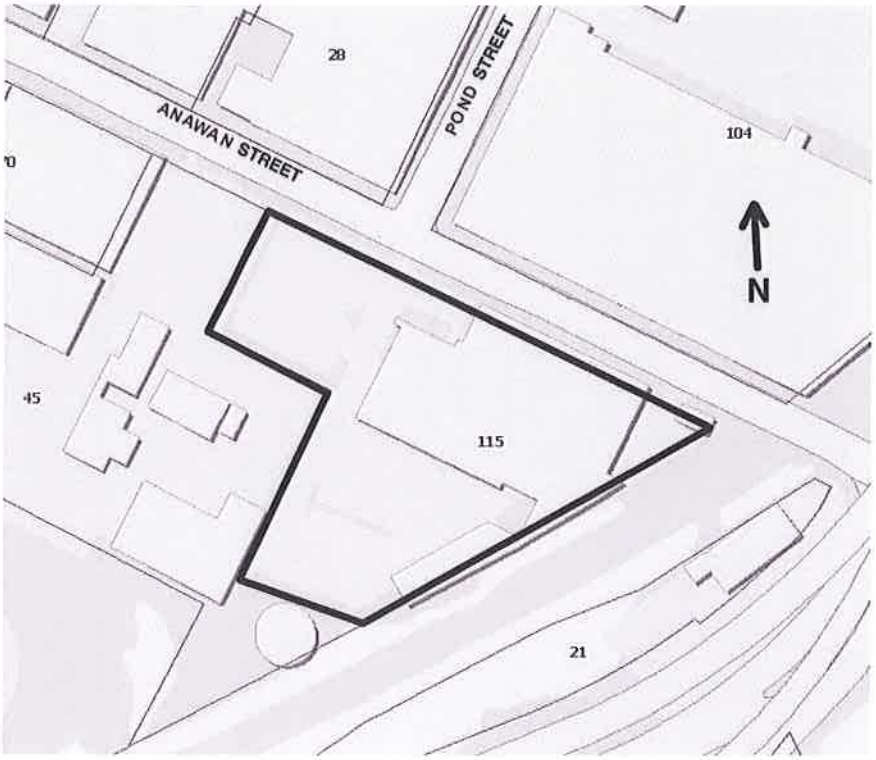
The Textile Worker
1914 "BORDEN & REMINGTON CO Advertisement, *The Textile Worker* Volulme II, No. 9 (February):32

LOCUS MAP



Borden & Remington main block (left), loft (left center) warehouse (right rear), and storage (right front).

Borden & Remington main block with ell at right.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December 2012
The criteria that are checked in the above sections must be justified here.

The Borden and Remington Company complex is recommended eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the building is significant for its associations with Fall River's economically-significant textile industry and with what may be one of the longest continually-operating chemical concerns in the city. Under Criterion C, the Borden and Remington Company Complex is a well-preserved industrial loft and warehouse complex that exemplifies late-nineteenth century mill loft construction techniques and is a unique surviving example of an early twentieth-century chemical supply facility. The property retains its integrity and is in good condition.

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	FLR.2002
Historic Name:	Borden and Remington Chemical and Dye Company
Common Name:	
Address:	105-115 Anawan St
City/Town:	Fall River
Village/Neighborhood:	
Local No:	N-16-4
Year Constructed:	C 1892
Architect(s):	
Architectural Style(s):	No style
Use(s):	Abandoned or Vacant; Other Industrial
Significance:	Architecture; Commerce; Industry
Area(s):	
Designation(s):	

The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (http://mhc-macris.net/macrisdisclaimer.htm)

Data available via the MACRIS web interface, and associated scanned files are for information purposes only. THE ACT OF CHECKING THIS DATABASE AND ASSOCIATED SCANNED FILES DOES NOT SUBSTITUTE FOR COMPLIANCE WITH APPLICABLE LOCAL, STATE OR FEDERAL LAWS AND REGULATIONS. IF YOU ARE REPRESENTING A DEVELOPER AND/OR A PROPOSED PROJECT THAT WILL REQUIRE A PERMIT, LICENSE OR FUNDING FROM ANY STATE OR FEDERAL AGENCY YOU MUST SUBMIT A PROJECT NOTIFICATION FORM TO MHC FOR MHC'S REVIEW AND COMMENT. You can obtain a copy of a PNF through the MHC web site (www.sec.state.ma.us/mhc) under the subject heading "MHC Forms."

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

This file was accessed on:

Thursday, November 08, 2012 at 3:32: PM

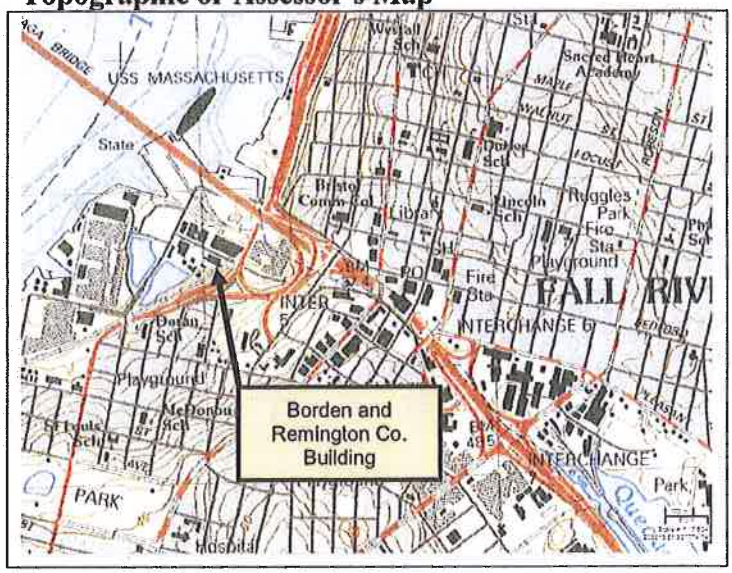
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
N-16-0004	Fall River		2002

Photograph

Topographic or Assessor's Map



Town: Fall River

Place: *(neighborhood or village)*
n/a

Address: 105-115 Anawan Street

Historic Name: Borden and Remington Co. Building

Uses: Present: light industry/vacant

Original: chemical company

Date of Construction: c. 1892

Source: City Directory

Style/Form: Three story industrial building with modest Classical Revival characteristics.

Architect/Builder: unknown

Exterior Material:

Foundation: granite

Wall/Trim: brick

Roof: flat

Outbuildings/Secondary Structures:
Small brick store (?) along Anawan Street.

Major Alterations *(with dates):* Replacement windows; infilled arched window openings.

Condition: good

Moved: no | X | yes | | **Date** _____

Acreage: 1.2 acre

Setting: The property is located on the southerly side of Anawan Street in a heavily industrialized neighborhood.

Recorded by: Jeffrey Shrimpton
Organization: MassDOT
Date (*month / year*): August/2011

RECEIVED
SEP 30 2011
MASS. HIST. COMM

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

INVENTORY FORM B CONTINUATION SHEET

[FALL RIVER] [110-115 Anawan STREET]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

___ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:

Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

The Borden and Remington Co. Building is a large three-story flat-roofed brick industrial block that is eight bays wide and eight bays deep. The building is unadorned except for arched window and door openings, and two rudimentary entablatures across the main façade (the upper one including a brick dentil course and developed as the building's cornice), and simple granite detailing. The building's foundation is constructed of granite blocks. All window openings have granite sills. A single course of narrow granite blocks forms the "cornice" of the simple entablature/belt course across the front facade between the first and second stories. The arched window openings have been altered with wooden inserts that create rectangular rather than arched openings. Replacement wooden window sash have been installed throughout the building in a variety of unmatched configurations (1/1, 2/2, 6/6). The most distinctive feature of the building is a vertical tier of wide arched loading bays that extends up the three stories of the front elevation. The projecting metal support for a (now missing) pulley remains attached to the building directly above the loading bays.

A small one-story rectangular brick out-building is located at the northeast corner of the property along Anawan Street. The building is labeled as a store on the 1933 Sanborn map. A building of similar size is shown at this location on the 1905 Sanborn map, but the 1905 map indicates that the earlier building was constructed of wood. The existing brick building is characterized by a hip roof, a wide front display window (now boarded up), and deep eaves exposing jig-sawn rafter ends, giving a Craftsman-style flavor to the building's otherwise utilitarian design.

HISTORICAL NARRATIVE

Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

The Borden and Remington Co. Building is located in a neighborhood that was highly industrialized in the 19th and early 20th centuries. The building is adjacent to the Fall River Gas Works to the south on Anawan Street, and is across Anawan Street from the National Register-listed American Printing Co.-Metacomet Mill Historic District. The Borden and Remington Co. was established in Fall River in the 1880s. An 1888 Sanborn Fire Insurance Co. map shows that the company was located at that time in a building on the north side of Anawan Street at the intersection of Water Street, in a building that is now within the previously noted National Register-listed historic district. The city directory first lists the company at 105-115 Anawan Street in 1892 and the building is first shown on the 1893 Sanborn map. The entry in the 1892 directory describes the company as "dealers in Calico Printers, Dyers, and Woolen Manufacturers." The company also dealt in paints, varnishes, and starches, according to the directory. The company was no longer listed at its Anawan Street address by the 1950s. By that time the company had relocated to a larger facility on the riverfront. Today, the company is known as Boremco and remains headquartered in Fall River. Boremco is a major chemical manufacturer with worldwide distribution. The building on Anawan Street is under other ownership and is presently used for a variety of light industrial purposes.

BIBLIOGRAPHY and/or REFERENCES

Sanborn Fire Insurance Co. maps, 1888, 1893, 1905, 1933
Fall River City Directories, 1880s-1950s

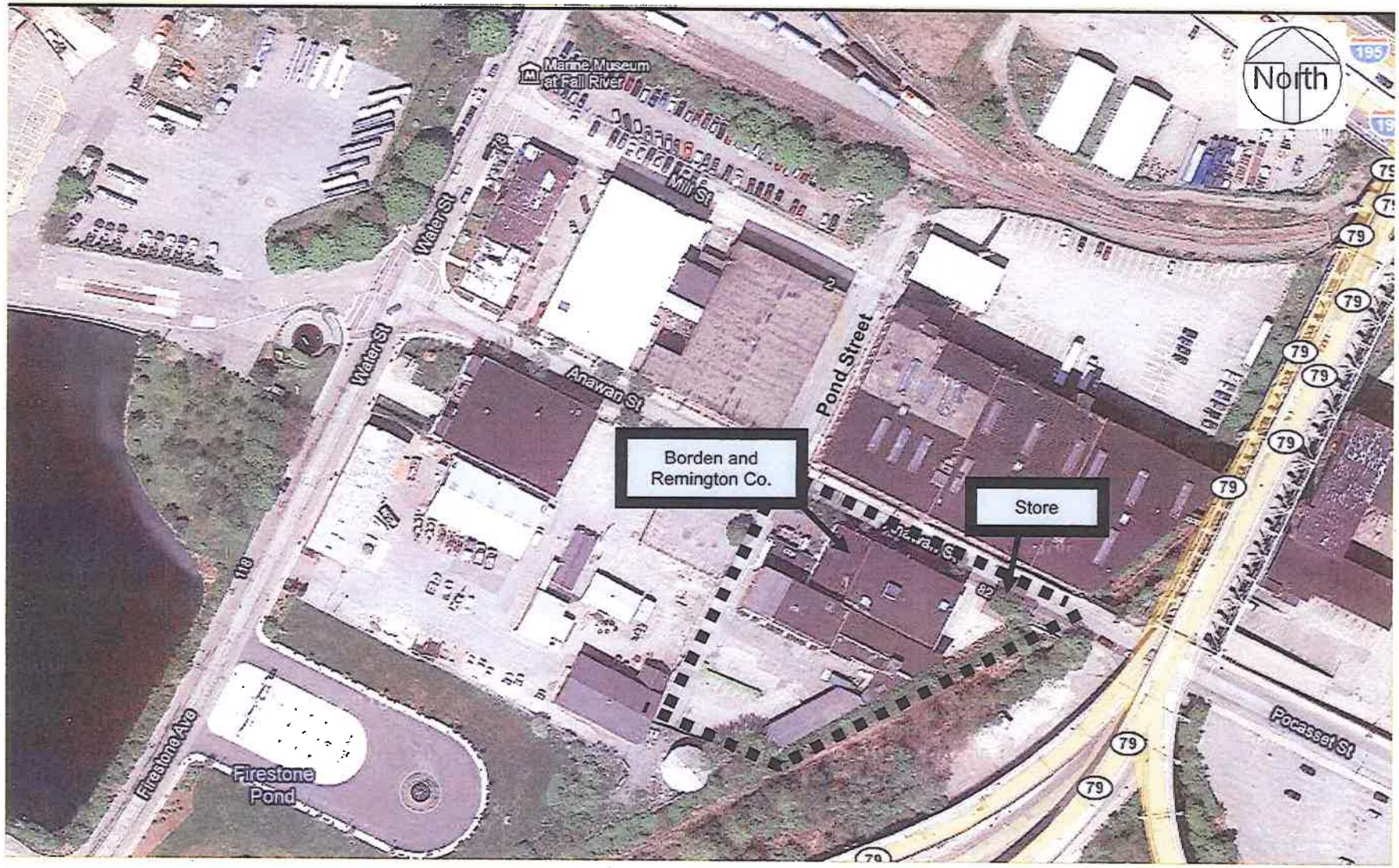
Photos (February 2011)

1. Borden and Remington Co. Building. View facing east along Anawan Street.
2. Borden and Remington Co. Building. View facing southwest.
3. Out-building. View facing southeast.

1. Borden and Remington Co. Building. View facing E along Anawan St.

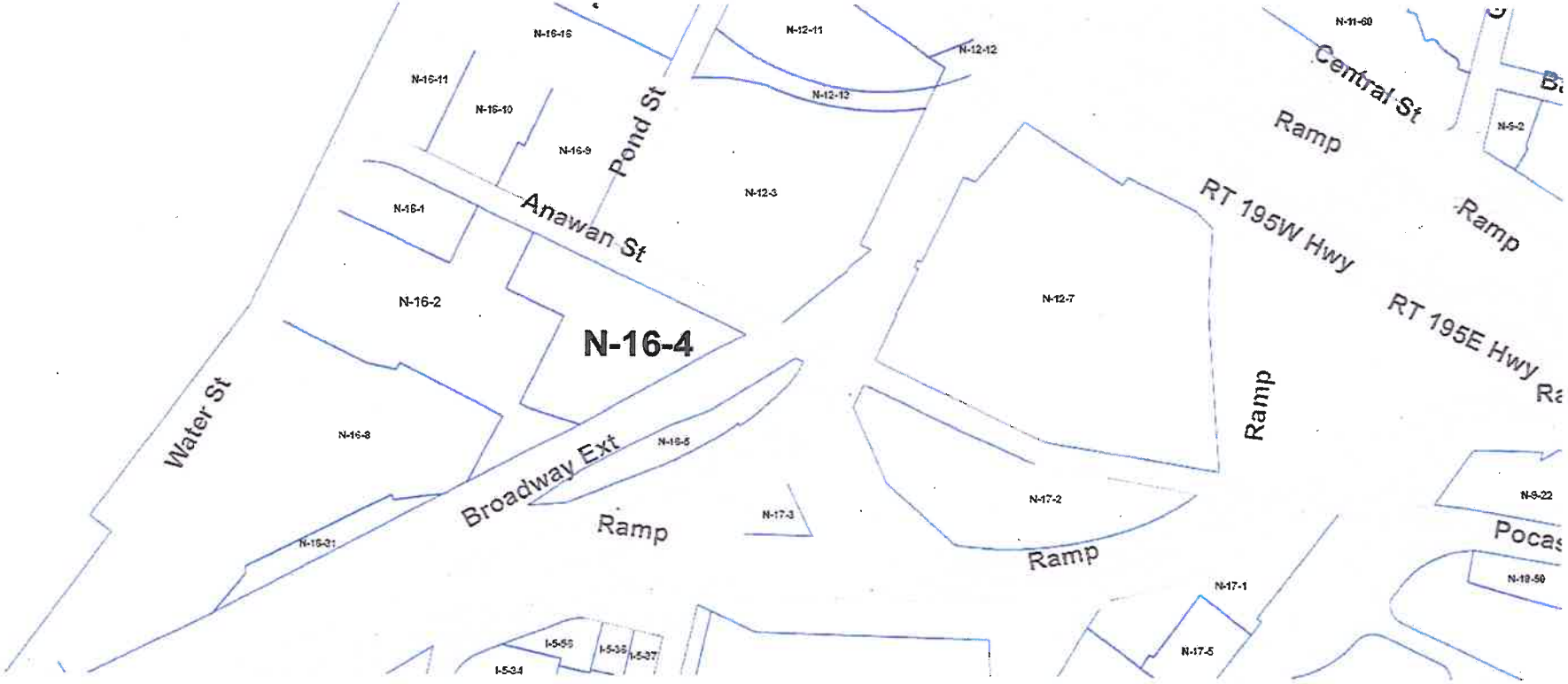
2. Borden and Remington Co. Building. View facing SW

3. Out-building. View facing SE.



Borden and Remington Co.
105-115 Anawan Street, Fall River, Massachusetts
Parcel N-16-0004

Scale: 1 inch = 150 feet



Borden and Remington Co.
105-115 Anawan Street, Fall River, Massachusetts
Parcel N-16-0004

FORM E – BURIAL GROUND

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
	Somerset		

Town: Lakeville

Place *(neighborhood or village)*:

Address or Location: Off Adams Lane

Name: Pierce and Haskins Cemetery

Ownership: ☐ *Public* ☒ *Private*

Approximate Number of Stones:

Earliest Death Date: 1785

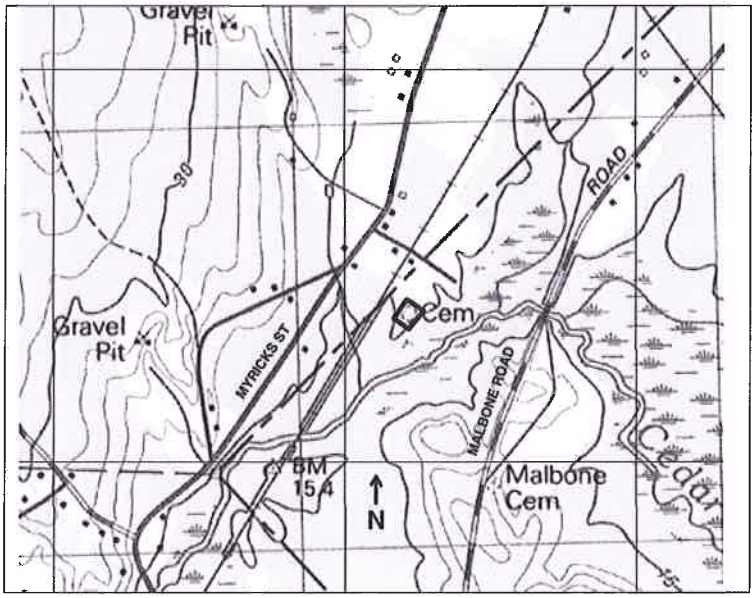
Latest Death Date: 1892

Landscape Architect: Unknown

Condition: Unknown –No Access

Photograph

Locus Map



Acreage:

Setting: Set within a rural, residential neighborhood on private property 500 feet southeast of the end of Adams Lane, the cemetery is located 200 feet east of the Fall River Secondary right-of-way. It is situated at the southern edge of a field and bound on all remaining sides by a wooded swamp area.

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month / year)*: December 2012

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

VISUAL/DESIGN ASSESSMENT

A draft MHC Burial Ground Form was completed in 2002 by Linda Grubb, Lakeville Historical Commission. Building on Grubb's documentation, this MHC Inventory Form was submitted for the purposes of the South Coast Rail project review by PAL of Pawtucket, Rhode Island. No access was possible via private road to the property.

The Peirce and Haskins Cemetery is a small, informal burial ground divided into seven family plots with 45 slate and granite headstones that date from 1785 to 1892, slate footstones, and unmarked plots. The property sits on a slightly raised topography and is enclosed by an iron rail fence with granite posts. The entrance is marked by a 6-foot high, 5-foot-by-nine-inch by four-foot-by-two-inch monument for Abraham Peirce and his two wives, Lucy and Margaret. In addition, Abraham, Lucy, and Margaret have their own individual headstones that pierce the nearby ground. The cemetery contains several distinctive mortuary monuments, including a headstone for Joseph and Esther Allen that bears carved, clasped hands. Engraved on the rear are the names of the Allens' six children, all under the age of thirteen, who have their own individual granite headstones within the Allen family lot. Three stones within the cemetery were carved by D.A. Burt, of Taunton, MA (Grubb 2002).

HISTORICAL NARRATIVE

The Peirce and Haskins Cemetery was originally part of the Holloway farm, settled in 1699, with its earliest gravestone dating to 1785. The cemetery has burials for members of the Peirce family, a family that, throughout the nineteenth century and into the early-twentieth century, resided within the immediate vicinity of the cemetery. Previous research has suggested that the unmarked graves may date to the early- to mid-eighteenth century, with associations to Quaker communities in Lakewood (the Beechwoods and the Myrics), since Quakers during this period commonly left burials unmarked; however, these burials may have simply lost their gravestones over time, due to theft, erosion, and/or deterioration. Although a circa 1970 plot plan indicates that the cemetery is divided into seven plots, no further information about this layout is evident (Grubb 2002; Lakeville Town Clerk's Office Walker 1879; Everts & Richards 1895; Richards 1903).

Likely, the majority of the late-nineteenth-century granite gravestones were locally quarried from a location just southwest of the cemetery. Three granite stones in the cemetery were carved by D.A. Burt, a stone carver from Taunton, MA. Burt started as an apprentice in 1846 to a stone-carving shop established by Samuel Warren at 84 Weir Street in Taunton, only 8 miles away from the Peirce and Haskins Cemetery (no longer extant). After six years of experience at Boston studio run by internationally-renown monument specialist, Alpheus Cary, Burt took over the Taunton shop in 1853. After significant expansion, in 1869, Burt hired a partner, artist R.L. King, who helped to produce mortuary monuments until 1877. In 1881, when Burt established the D. Arthur Burt & Co with E.W. Ellis as partner, the organization was referred to as "a firm of art memorial fabricators of wide celebrity, ranking first in quality and second to few in the volume of production. Their trade is local, suburban, [and] country-wide," (International Publishing Company 1887:128; Grubb 2002; Walker 1879; Everts & Richards 1895; Richards 1903).

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2002 *Draft MHC Inventory Form B Peirce and Haskins Cemetery*. Lakeville Historical Commission, Lakeville, MA. On file, PAL, Pawtucket, RI.

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1887 *Leading Manufacturers and Merchants of Eastern Massachusetts: Historical and Descriptive Review of the Industrial Enterprises of Bristol, Plymouth, Norfolk, and Middlesex Counties*. International Publishing Company, New York, NY

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[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

Due to access restrictions, a site visit was not possible to complete photography and documentation and to determine integrity. For the purposes of the South Coast Rail Project review, the Pierce and Haskins Cemetery is considered to be eligible for the National Register of Historic Places.

The Pierce and Haskins Cemetery is eligible for listing in the National Register at the local level under Criterion A for its associations with the historical development of Lakeville and under Criterion C for containing examples of eighteenth- and nineteenth-century funerary art. With headstones that date from 1785 to 1892, the property is one of the earliest burial grounds in the town of Lakeville and serves as a burial site for over 45 community residents. The cemetery also contains a few examples of the work of Taunton stone carver D.A. Burt, who has been identified as a well-known carver who manufactured gravestones for individuals throughout the United States.

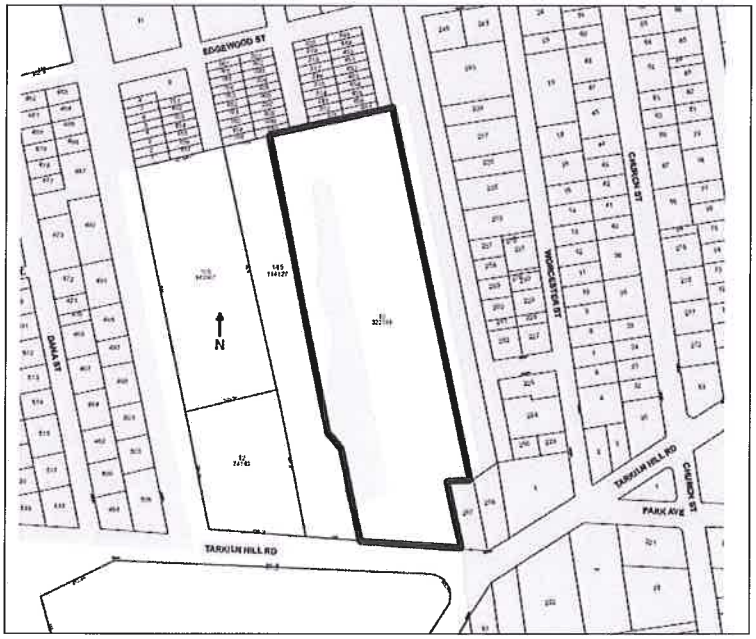
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
125-13	New Bedford North		NBE.641

Photograph

Locus Map



Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 627-637 Tarkiln Hill Road

Historic Name: Lambeth Rope Company

Uses: Present: Commercial

Original: Manufacturing

Date of Construction: 1893, 1918

Source: **Daigle** 1977

Style/Form: Vernacular industrial

Architect/Builder: Frank A. Walker

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick

Roof: Rubber membrane

Outbuildings/Secondary Structures: Office, Winding and Braiding Loft, Ropewalk

Major Alterations *(with dates):* Ropewalk was divided into 3 free-standing structures (2000s)

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 7.4

Setting: The Lambeth Rope Company complex occupies a long, narrow, level lot in a light industrial and commercial neighborhood. The lot fronts Tarklin Hill Road, and is flanked by the New Bedford Main Line railroad right-of-way to the east and by a small fire pond to the west. The north edge of the parcel is wooded.

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date (*month / year*): December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:

The Lambeth Rope Company Complex (MHC No. NBE.641) is made up of three vernacular industrial buildings: the Office, the Winding and Braiding Loft, and the Ropewalk. These last two buildings are connected in a headhouse and shed configuration. A fourth building on the land parcel, the Freight House, is a railroad-related structure that was is not historically associated with the rope company. Open areas within the parcel are paved with asphalt.

The Office is a one-story, five-bay-by-five-bay, brick building constructed in a typical early twentieth century industrial vernacular style. Its irregular rectangular plan faces south toward Tarklin Hill Road and is organized into a main block to the east and a wing to the west. A shed roof ell has been added to the north (rear) elevation and the wing expanded on its south side with a flat-roofed addition. The cross-hipped roof is sheathed with slate shingles and capped on the main block with a painted iron vent and flanking skylights. A hip roof dormer is located on the rear roof slope. The primary entry is located within a small projecting brick vestibule that extends from the center of the south elevation. A modern aluminum and glass door is set within a plain metal channel surround. The walls are laid in common bond with occasional Flemish bond courses and have a corbelled cornice. The rectangular window openings have quarry-faced granite window sills and lintels and are now filled with modern, one-over-one replacement aluminum units. Some window openings on the south elevation are now combined to form larger commercial-type openings. A modern awning runs across the front of the building. The foundation is poured concrete.

The Winding and Braiding Loft is a typical early-twentieth century industrial vernacular building with load-bearing brick exterior walls and an iron and wood timber internal frame of fire-resistive construction. The two-story, six-bay-by-eight-bay, mill loft has an irregular rectangular plan with a three-story stair tower on the west elevation and a one-story ell and high square chimney on the north elevation. The chimney has a flared top accented with drip corbelling. The subtly-pitched "flat" gable roof has open soffits, with wood ogee-profile cornice molding and exposed beveled rafter tails. The brick walls are laid in common bond and feature regularly spaced, tall window openings with segmental arch window openings. The walls extend to grade, with no visible foundation. Original windows are fifteen-over-fifteen, double-hung, wood sash in the main block of the mill, and various configurations of multi-light wood sash in the stair tower and ell. The windows have narrow wood brickmolds and wood sills. Approximately 50 percent of the window sash has been replaced with aluminum units with multi-light fixed or awning configurations.

The Ropewalk is a long, narrow, one-story building measuring about 800 feet long and 35 feet wide. The building was formerly attached to the rear (north) elevation of the Winding and Braiding Loft, but has been detached from that building and also subdivided into three free-standing structures by means of demolition of roughly 20 to 25-foot segments of the Ropewalk. The building has a shed roof with rubber membrane sheathing, open soffits with replacement plank cornice molding, and beveled rafter tails. Walls are brick laid in common bond with regularly-spaced windows set high on the east and west elevations. The windows have brick segmental arch lintels, wood sills, and ten-light fixed wood sash. As constructed, multiple wood and iron queen post trusses were used to support the ceiling and create clear-span interior spaces. Some of these trusses have now been replaced with wood posts. Numerous windows have been replaced with modern, vertical-lift garage doors on the Ropewalk's east elevation.

HISTORICAL NARRATIVE:

Lambeth Rope Company of New Bedford was established in 1893 for the manufacture of Lambeth Cotton Transmission Rope and Lambeth Mill Bandings, specialized products used for mechanical power transmission systems in textile mills and factories. The patent(s) for this product were held by the English firm of Thomas Hart, Ltd., which was founded in 1789 for the manufacture of rope drive products. There does not appear to have been any association of personnel between the two companies. Between 1893 and 1918, the company constructed the three extant buildings historically associated with rope manufacture. The mill architect was Frank A. Walker, who is not included in standard twentieth-century biographical dictionaries. The Lambeth Rope Company was a sister corporation to the Bennett Manufacturing Company and Columbia Spinning Companies of New Bedford. Following the death of Frank R. Hadley, the president of all three firms, in 1907, financial irregularities were found in the sister company that resulted in the reorganization of the Lambeth Rope Company. In 1905, the New England Cotton Yarn Corporation acquired most of the stock in the firm. Demand for rope drive products experienced a steady decline after World War I due to the demise of regional manufacturing and the widespread adoption of electric power for industrial machines. Subsequently, Lambeth Rope Company diversified into synthetic rope products for commercial fishing and other specialty applications. The company ceased operation about 1988 and, after a ten-year vacancy, was acquired by the current occupant, who also acquired the neighboring Freight House (Allen 1999; *American Wool And Cotton Reporter* 1919:633; Anonymous 1934; Boston Evening Transcript 1897:2; *The Gazette* 1939:17; Massachusetts Bureau of Statistics of Labor 1897:231; Sanborn Map Company 1924; *Textile World Record* 1905:170; Wadlin 1900:31).

The Lambeth Rope Company was a relatively late surviving example of New Bedford's rope and cordage trade, which was primarily fueled by the city's nautical economy. New Bedford Cordage Company, established 1842 between Court, Park, Ash, and Kempton streets (no longer extant), was a primary example of this business, although there were multiple small ropewalks documented in the city during the nineteenth century. Lambeth Rope Company supplied the city's textile and manufacturing economy, not maritime pursuits, which explains its late success relative to the cordage industry at large. Prior to the advent of compact, powerful electric motors that could power manufacturing equipment; the predominant mode of power transmission within mills and factories was through mechanical drive trains. English precedent for these systems was iron gears and shafting. In the Unites States, such systems were largely supplanted by leather belts and pulleys, which proved more adaptable to American limitations on materials and technology, and structural engineering. The use of rope for power transmission was uncommon in both countries throughout mid-nineteenth century but began to receive serious study in the latter part of the century, particularly after 1890. Such systems were found to have advantages over leather belting in their lower first cost, higher efficiency, their relative elasticity that provided smoothness and evenness of power, facility for distributing power to multiple drives within a factory, quiet working, and the ease of repair. These advantages were especially noteworthy in situations where there were irregular floor plans, or where high drive speeds or large amounts of power were necessary. Lambeth Rope had a high reputation in its field for flexibility and long-wearing properties. The rope was constructed of four strands of cotton, each strand being formed of a bundle of hundreds of lightly-twisted, fine yarns that were protected with outer spiral wrapping of yarns to shield the interior core bundles (Flather 1900:1-5; 83; Hunter and Bryant 1991:130-133; Pease and Hough 1889:169-170).

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Lambeth Rope Company Office

Lambeth Rope Company Winding and Braiding Loft

Lambeth Rope Company Ropewalk

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI December 2012
The criteria that are checked in the above sections must be justified here.

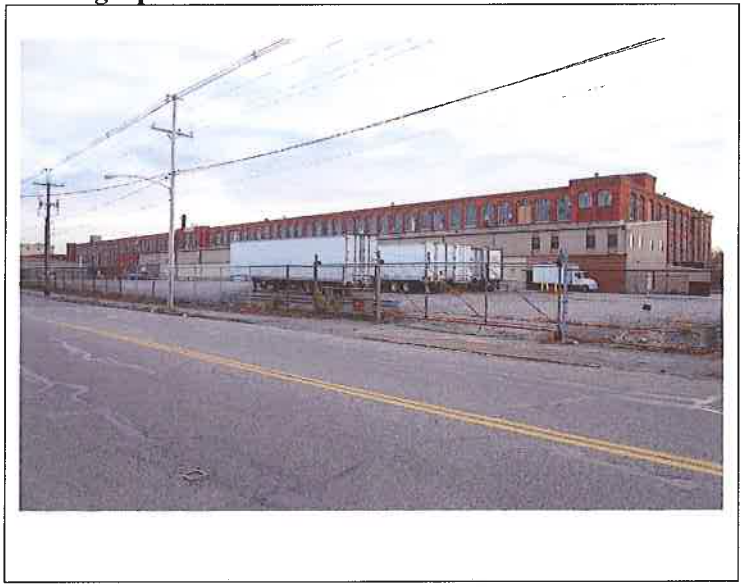
The Lambeth Rope Company complex is recommended eligible for National Register listing under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex, as a manufacturer of a specialized mill product, is significant for its associations with New Bedford's economically-significant textile industry. Under Criterion C, the complex represents an unusual example of a specialized rope manufacturing facility, including a rare surviving ropewalk building in the city. No other ropewalks are documented for New Bedford in the MHC's Inventory.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
113 -99	New Bedford North		NBE.633

Photograph



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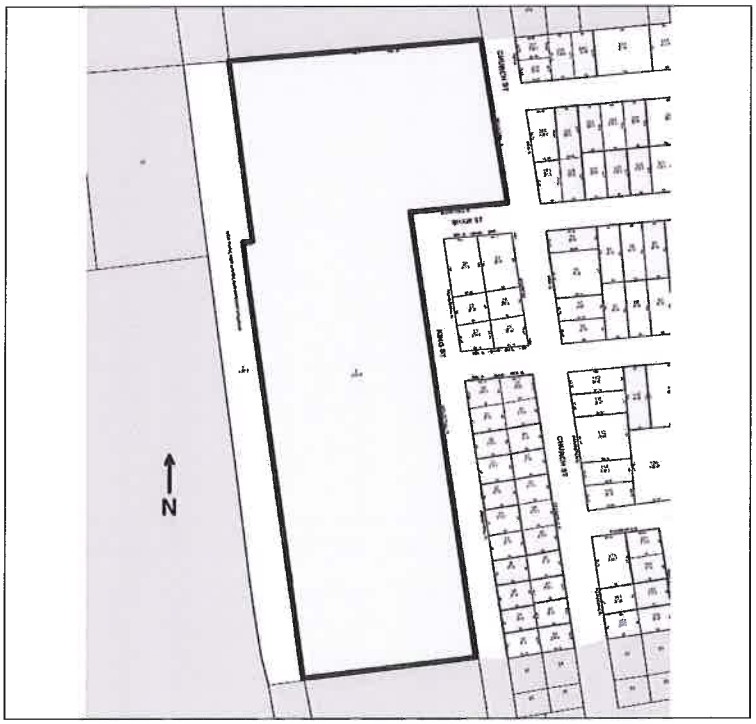

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date (*month / year*): December 2012

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 117 King Street

Historic Name: Manomet Mill #4 - Manomet Tire Cord Fabric Mill

Uses: Present: Industrial

Original: Manufacturing

Date of Construction: 1919

Source: Mendes 1977, Dixon 2012

Style/Form: Vernacular industrial

Architect/Builder: Charles R. Makepeace

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick

Roof: Built-up tar and grave/rubber membrane

Outbuildings/Secondary Structures: Spinning Mill Office, Boiler House, Picker Mill

Major Alterations *(with dates):*
Addition of Butler-type prefabricated structure on Spinning Mill, date unknown.

Condition: Fair

Moved: no ☒ yes ☐ **Date:**

Acreage: 10.67

Setting: Manomet Mill # 4 is a large, four-block-long textile manufacturing complex situated between the New Bedford Main Line railroad right-of-way to the west and King and Church Streets to the East. Additional industrial properties and warehouses flank the complex to the north and south. The mill parcel is paved with asphalt along the north, east, and south sides and surfaced with gravel at the rear of the property. A large parking lot occupies the area between the mill and Church Street. Chain link fence surrounds the parcel.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

Manomet Mill #4 (MHC No. NBE.633) consists of four buildings organized and connected north to south as follows: the Spinning Mill, Office, Boiler House, and Picker Mill. The Spinning Mill, Boiler House, and Picker Mill are typical, early twentieth-century, brick, vernacular industrial lofts executed with fire-resistive construction techniques. They are noteworthy for their massive scale and imposing presence. All of the buildings have subtly-pitched "flat" roofs with shallow brick and granite parapets and corbelled brick cornices. The walls are laid in common bond with occasional Flemish bond courses and divided into ranks of closely-spaced window bays with shallow brick piers. The tops of the piers are corbelled outwards to form hoods over the windows on the top floor of each building. Windows on the top floors have brick segmental arch lintels and granite sills. Windows on intermediate floors and the ground floor have rectangular openings with no lintels and granite or concrete sills. The window openings extend the full width of the bays and are filled with wood multi-light sash with arched windows above the transom on the top floor. Foundations are poured concrete and raised above grade level to form a water table.

The three-story, 72 bay-long by 12 bay-wide (168 foot-wide, 892 foot-long) Spinning Mill is the largest of the buildings in the complex. The upper floor of this loft is lit with a narrow row of sawtooth monitors along the center of the roof. A shallow-projecting entry surround extends across four bays and all three floors at the center of the mill's facade. The entry is topped with a raised parapet with inset brick crosses and flanked with blind brick arches. The doorways are now covered by a large Butler-type prefabricated addition that extends across the north half of the east facade. An entry at the southeast corner of the mill is capped with a heavy bracketed wood canopy and consists of a two segmental arched openings filled with replacement aluminum doors and surrounds. A one-story brick machine shop and transformer house with attached railroad loading docks extend across the west elevation.

The Picker Mill extends south from the southeast corner of the Spinning Mill. This is a two-story, 10-bay-by 26 bay (87 foot-wide, 108 foot-long) industrial loft. Two dust collectors on metal towers are mounted to the west elevation of the building and metal ductwork from the collectors extends to outlets on the roof of the Picker Mill. A majority of the windows have been replaced or the openings filled with concrete block.

The Boiler House is a two-story, 8-bay-by-13-bay (31-foot by 43-foot) building attached to the rear (west) elevation of the Picker Mill. A round brick chimney is attached to the north elevation and three cylindrical sheet metal stacks are set in the roof where it intersects with that of the Picker Mill. A Butler-type prefabricated steel and poured concrete truck loading dock extends across the south elevation of the Boiler House.

The Office is attached to the south end of the east elevation of the Spinning Mill. This 4-bay by 5-bay (55-foot by 68-foot) brick building has a flat roof, a paneled brick parapet with granite coping, and brick dentil moldings. The walls are laid in common bond with splayed flat brick arches above the door and window openings. Window sills are hammered granite. The foundation is poured concrete and serves as a water table. Matched doorways are set in the north and south elevations of the Office and utilize unpainted aluminum doors and surrounds.

HISTORICAL NARRATIVE

Manomet Mill No. 4 was constructed in 1920 with design services provided noted industrial architect C.R. Makepeace. The mill is the last of several large textile manufacturing plants developed by William Whitman, who was deeply involved with the New Bedford cotton industry. Whitman (1842-1928) was a Canadian native who emigrated to Boston and subsequently became involved at a managerial level with mills in Lawrence. In 1889, he became managing partner of Harding, Whitman & Company, which, by 1909, he reorganized as the William Whitman Company. Other manufacturing concerns operated by the William Whitman Company in New Bedford included the Nonquitt Mills, Whitman Mills, and Nashawena Mills. Harding, Whitman & Company incorporated Manomet Mills in 1903 with a substantial capital of $3,000,000. The firm constructed Manomet Mill No. 1 in 1903, Manomet Mill No. 2 in 1907, and Manomet Mill No. 3 in 1916. In 1917, he erected the massive Belleville Warehouse adjacent to the Manomet Mill No. 4. The warehouse, which supplied all of Whitman's New Bedford mills, has previously been determined eligible for listing in the National Register due to its associations with Whitman. None of the Manomet plants produced a finished cloth from raw cotton. Rather, they produced spun yarns that were sold wholesale by Harding, Whitman & Company and later by the William Whitman Company to other textile manufacturers in the Northeast region. Products from Whitman's mills upheld New Bedford's reputation as a producer of high-quality and specialty textiles and the Manomet Mills prospered during the first two decades of the twentieth century. Automobile manufacturing provided new niche markets for the firm, which dedicated Mill No. 4 to tire yarn production. In the 1920s, The Manomet Mills, along with the rest of New Bedford's textile industry, began to suffer from increased market saturation as competing companies opened production facilities in the South and overproduction began to drive down market prices. The firm sold Mill No. 3 to Nashawena Mills in 1925, Mill No. 4 to Firestone in 1927, and Mill Nos. 1 and 2 to the Delaware Rayon Company in 1928. The Firestone Tire and Rubber Company owned Mill No. 4 from 1927 to 1967 and used it for textile manufacturing and, after 1953, for weapons manufacturing. The Chamberlain Manufacturing Company purchased the plant in 1967 for defense production and sold the facility in 1999 to CMC New Bedford, LLC. The mill is currently inactive (Dixon 2012, Healey 1977a, 1977b; Mendes 1977; MHC 1987; Sanborn Map Co. 1906, 1924, 1950).

Charles R. Makepeace was a renowned industrial architect in North America. He attended, but did not graduate, at Trinity College (now Duke University) and gained experience of textile operations through his experience at his father's factory in North Carolina. In 1885, he joined the engineering firm of D.M. Thompson in Providence, Rhode Island, which he would later reorganize as C.R. Makepeace & Company. The firm specialized in the design, engineering, and equipping of textile mills and powerhouses and constructed over 250 such facilities in the United States and abroad. Manomet Mill No. 4 exemplifies early twentieth-century, large-scale mill loft design through its use of fire-resistive construction techniques, layout of buildings to maximize production efficiency, articulation of facades to maximize fenestration, massive scale, and use of materials (Dixon 2012).

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Manomet Mill No. 4 Spinning Mill (right) and Office and Picker Mill (left).

Manomet Mill No. 4 Picker Mill.

Manomet Mill No. 4 Office.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December 2012
The criteria that are checked in the above sections must be justified here.

Manomet Mills Cotton Mill No. 4 is recommended eligible for the National Register under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the building is associated with one of New Bedford's leading early twentieth-century textile companies – William Whitman Company, and also gains additional significance for its association with the Firestone Tire and Rubber Company, another important company in the twentieth-century economy of southeastern Massachusetts. Under Criterion C, the loft complex is significant as a work of industrial architect Charles Makepeace and as an outsized example of textile mill construction in the city during the early twentieth century.

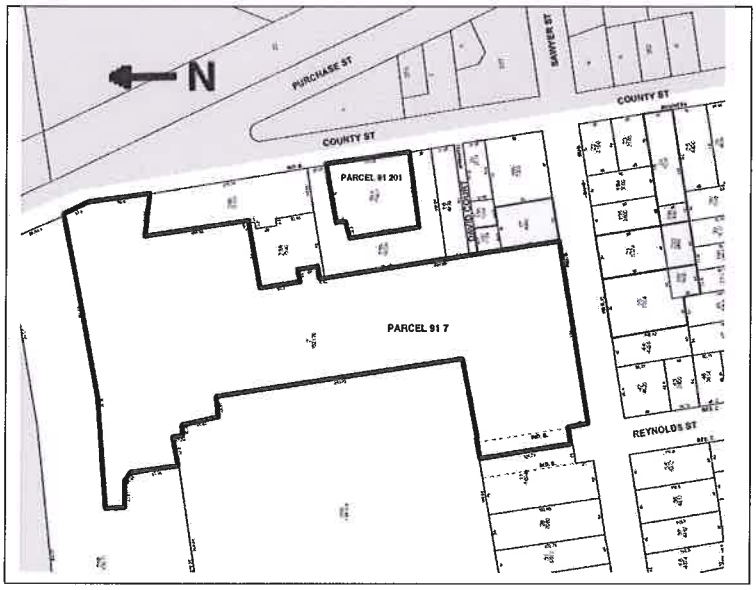
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
91-7,201,205,206, 238, 239	New Bedford North		NBE.612

Photograph

Locus Map



Recorded by: J. Daly, A.Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 1125-1129 County Street

Historic Name: Pierce Brothers Textile Mill Complex

Uses: Present: Commercial/manufacturing

Original: Industrial

Date of Construction: 1909

Source: Butts 1977, Stone 1930

Style/Form: Vernacular industrial

Architect/Builder: Unknown

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick

Roof: Built-up tar and gravel/rubber membrane

Outbuildings/Secondary Structures: Connected: Store House, Card Room, Main Mill, Boiler House with Engine Room. Free-standing: office

Major Alterations *(with dates):*

Demolition of Weave Shed –unknown date

Condition:

Moved: no ☒ yes ☐ **Date:**

Acreage:

Setting: The Pierce Brothers Textile Mill complex occupies a sloping lot on the west side of the New Bedford Main Line at the intersection of Purchase and County Streets. Light industrial properties adjoin the complex parcel to the north, east, and west. A dense neighborhood of late-nineteenth and early-twentieth century multi-unit residential properties is located to the south of the complex. The interconnected buildings are accessed via asphalt-paved driveways and parking areas. At the rear (west) side of the property, a large historic-period weave shed has been demolished and replaced with a paved parking lot.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Pierce Brothers Textile Mill complex (MHC No. NBE.612) is a grouping of four connected buildings (east to west: the Store House, Card Room, Main Mill, and Boiler House and Engine Room) and a free-standing Office located in the southeast corner of the property. The early twentieth-century, vernacular industrial textile buildings are all executed in typical brick and wood timber fire-resistive construction with varied massing and design details to accommodate buildings' differing functions. Each rectangular-plan building has a subtly-pitched "flat" gable roof with open soffits, wood plank cornice moldings (typically clad in aluminum or vinyl), and exposed beveled rafter tails. The load-bearing walls are brick laid in common bond with occasional Flemish bond courses. The brickwork extends to grade on all buildings, which are presumably supported on concrete foundations. Walls of manufacturing buildings within the complex have shallow projecting piers between window bays, while the Store House and Boiler House/Engine Room have flat brick walls. The regularly-spaced window openings have brick segmental arched lintels and quarry-faced granite sills. The window sash in the majority of the buildings, excepting the Store House, has been replaced with a variety of aluminum replacement sash units that do not replicate the appearance of the original windows.

The Office is a four-bay-by-seven-bay, two-story, loft-type structure. The soffit has been enclosed with vinyl. An aluminum and glass entry door and surround are centered on the south elevation below a wood canopy. A second entry is enclosed within a plywood vestibule at the northeast corner of the building.

The Store House is a five-story, fifteen-bay-by-three-bay, storage warehouse with an attached four-bay by four-bay Picker House at the north end. The two portions of the building are divided by a brick firebreak wall that extends above the roof line. The warehouse portion of the building has arched window openings of a small size typical for the building type that retain a majority of their four-light awning or hopper windows. Circular masonry washers are prevalent across the building's elevations. The primary entry is on the east elevation and consists of a single wood panel door recessed within a brick segmental-arched opening with a granite step. The door of a loading bay adjacent to the entry has been replaced with an aluminum and glass door and surround. The Picker House is of typical loft construction and has a large brick ventilation stack at its northwest corner.

The Card Room is a one-story, eight-bay-wide building that connects the Store House and Main Mill. It has a single sawtooth monitor extending across the west side of the roof. The large window openings are now filled, and one opening has been converted to a truck loading dock. A shed-roofed, enclosed truck loading dock covers half of the north elevation of the building. The building rests on a raised poured concrete foundation

The Main Mill is a massive, three-story, 35 bay-by-9-bay loft at the center of the complex. Solar panels have been added atop the roof. The window openings extend the full distance between the piers. A truck loading dock and elevator or stair tower has been added to the north elevation of the building. A small, three-bay, truck loading dock under a shed roof extends off the southwest corner of the building.

The Boiler House/Engine Room extends from the northwest corner of the Main Mill. This six-bay by three-bay loft has irregular rectangular plan with a cylindrical brick stack rising from the northeast corner of the building. A loading bay with a vertical lift roll door is set in the north elevation. Machinery access bays are set at grade on the west elevation. Windows openings are set high on the west and east elevations.

HISTORICAL NARRATIVE

The Pierce Brothers Ltd. was one of two companies held by New Bedford's Pierce family. First to be established was the Pierce Manufacturing Corporation in 1892. Founder Albert Granville Pierce was formerly the agent of the Wamsutta Mills, a pioneering New Bedford cotton mill, and a former city mayor. His sons Andrew G. Pierce, Jr. and Albert R. Pierce were also officials in the company, which manufactured fine cotton and silk goods. At the peak of its prosperity, Pierce Manufacturing Corporation was one of the largest textile companies in the city. Brothers Andrew Pierce, Jr. (president), Albert (agent), and Edward T. Pierce (treasurer) founded the Pierce Brothers Limited in 1909 to manufacture of fine cotton products such as umbrella cloth and architectural tracing cloth. Although smaller in capital and production than the parent company (and several other of the city's textile corporations), the firm continued New Bedford's tradition of focusing on high-quality, specialty cotton fabrics manufactured in an integrated plant that converted raw materials to finished goods. In this instance, the company produced umbrella cloth and architect's tracing cloth. The firm was founded at the apex of the city's textile boom, and prospered through the 1920s, employing 400 employees by 1930. Thereafter, Pierce Brothers, along with the rest of New Bedford's textile industry, began to suffer from increased market saturation as competing companies opened production facilities in the South and overproduction began to drive down market prices. The mill closed during the Depression, but reopened in 1937 under the direction of Fred W. Steele, former treasurer and agent of the Booth Mill, another New Bedford textile concern. In 1947, production machinery in the company was dismantled and in 1949, Pierce Bothers Ltd. was liquidated. The building was sold at auction to the Crescent Corporation, which subsequently divested portions of the real estate. Sunray Weavers, a subsidiary of Pierce Terminal, LTD took over the weave shed for rayon cloth production for a brief period before it passed to a furniture company and was later demolished. Other portions of the complex ultimately passed to the Cliftex Corporation and ownership of the complex is now divided between 69 Main Street, LLC and the Suburban Realty Corporation. The space is used by business and light industrial tenants. (Butts 1977; Crapo and Taber 1937:n.p.; Lamb 1916:35; New Bedford Whaling Museum 2011; Sanborn Map Co. 1924, 1950; Stone 1930:208).

BIBLIOGRAPHY and/or REFERENCE

Butts, George.
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Crapo, Henry H. and Edgar F. Taber.
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Foster, E. Everton, Ed.
1916 *Lamb's Textile Industries of the United States.* Volume II. James H. Lamb, Boston, MA.

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2011 Inventory of the Pierce Manufacturing Corporation Records in the New Bedford Whaling Museum Research Library. Electronic document, http://www.whalingmuseum.org/explore/library/finding-aids/mss3, accessed January 3, 2012. New Bedford Whaling Museum.

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1924 *Insurance Maps of New Bedford.* Sanborn Map Company, New York, NY.

1950 *Insurance Maps of New Bedford.* 1906 updated through 1950. Sanborn Map Company, New York, NY.

Stone, Orra L.
1930 *History of Massachusetts Industries, Volume I.* The S.J. Clarke Publishing Co., Boston, MA.

Pierce Brothers Textile Mill Store House, Card Room, Main Mill, and Boiler House/Engine Room (left-right).

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

Pierce Brothers Textile Mill Complex is recommended eligible for National Register listing under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex is significant for its associations with New Bedford's significant early-twentieth-century textile industry, having been founded by one of the leading textile families, the Pierce Brothers, in the city. Under Criterion C, the complex presents a nearly-intact example of an early twentieth century integrated textile manufacturing facility incorporating well-preserved examples of fire-resistive brick mill loft architecture.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
91 199	New Bedford North		

Photograph

Locus Map

Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 1097 County Street

Historic Name: Christ Presbyterian Church

Uses: Present: Ecclesiastical

Original: Ecclesiastical

Date of Construction: 1924-1950 (Moved or Constructed)

Source: Sanborn Map Company 1924; 1924-1950

Style/Form: Gothic Revival

Architect/Builder:

Exterior Material:

Foundation: Concrete Block

Wall/Trim: Vinyl

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* None

Condition: Good

Moved: no ☐ yes ☒ **Date:** 1924-1950 (May Have Moved)

Acreage: 0.17

Setting: Set on the corner of Sawyer Street and County Street in a predominantly residential, urban neighborhood, the building faces the New Bedford Main Line right-of-way, which is located 250 feet east.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Christ Presbyterian Church is a rectangular, wood-framed, one-and-one-half-story, gable-front Gothic Revival style building with a one-room rear addition either constructed or moved to its present location between 1924 and 1950. The church has a small, steeply-pitched, hipped-roof, enclosed belfry that sits on the ridgeline of the asphalt roof, vinyl siding, and a raised rusticated concrete block foundation. Large brackets line the overhanging eaves. A prominent, full-width concrete staircase leads from County Street to two main entrances with gabled roofs, rounded arch lights, Gothic arch verge boards, pendants, and large brackets. The facade bears a central paired Gothic arch window with a carved wood lintel adorned with a fleur-de-lis. A tall and narrow brick chimney pierces the roof of the rear addition. Fenestration is regular, with simple rectangular openings, replacement doors, and 1/1 replacement windows. The original small rear addition is detailed similarly to the main block and contains a secondary front-gabled entrance.

HISTORICAL NARRATIVE

On the corner of Sawyer Street and County Street, the simple, wood-framed, Gothic Revival style Christ Presbyterian Church with a small, rear addition was either constructed or moved to its present location between 1924 and 1950, during a time when New Bedford's population peaked. As the Gothic Revival style was popular in the United States from 1840 to 1880, this property is a late example of its type (provided, it was constructed rather than moved from a previous location).

In New Bedford, the Gothic Revival style was most prevalent in residences of the 1840s. The best-preserved and widely identified example in the area is the Gothic Cottage-style William J. Rotch House (MHC No. NBE.210), constructed by renowned architect, A.J. Davis. Gothic Revival style churches were constructed in New Bedford in the mid-nineteenth century, including the granite-block, First Congregational Church (MHC No. NBE.2733, 1838), also by Davis, and the wood-framed, high-style First Congregational Church at Lund's Corner (MHC No. NBE.561, 1867), and into the late nineteenth century. with the Grace Episcopal Church (MHC No. NBE.2720, 1880) constructed by Boston Architects Van Bunt and Howe. By the twentieth century when the Christ Presbyterian Church was established, New Bedford's churches were usually Catholic in denomination and typically constructed in the Eclectic style, specifically Colonial Revival, Neoclassical, and even Tuscan (MHC 1981, Sanborn Map Company 1924; 1924-1950; Walker 1911). Little is known about the social history of the Christ Presbyterian Church. Today, the property operates as a Spanish Seventh Day Adventist Church.

BIBLIOGRAPHY and/or REFERENCES

Massachusetts Historical Commission (MHC)
1981 *MHC Reconnaissance Report: City of New Bedford.* On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Sanborn Map Company
1924 *Bristol County, New Bedford, Massachusetts Insurance Map.* Sanborn Map Company, New York, NY.

1924-1950 *Bristol County, New Bedford, Massachusetts Insurance Map.* Sanborn Map Company, New York, NY.

Walker Lithograph & Publishing Company
1911 *Map of New Bedford, Massachusetts*. Walker Lithograph & Publishing Company, Boston, MA.

Continuation sheet 1

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Christ Presbyterian Church is eligible for listing in the National Register of Historic Places under Criterion C as an excellent, intact, local example of a wood frame, Gothic Revival style building. Although it is unclear whether or not the property was constructed or moved from another location between 1924 and 1950, the Christ Presbyterian Church is a unique early to mid-twentieth century, Gothic Revival building in the town of New Bedford. Character-defining features include Gothic-arch vergeboards, pendants, and large brackets with a central paired Gothic arch window and a carved wood lintel adorned with a fleur-de-lis.

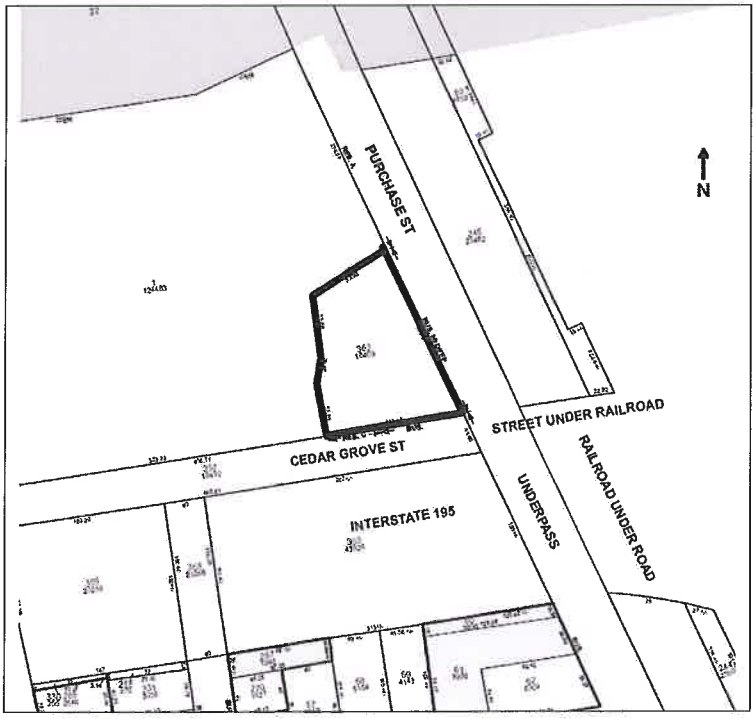
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
84 362	New Bedford North		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 2071 Purchase Street

Historic Name: Engine House No. 10

Uses: Present: Unknown

Original: Institutional

Date of Construction: Circa 1910

Source: Style/Visual Inspection; Sanborn Map Company 1906; 1924; Walker 1911

Style/Form: Renaissance Revival

Architect/Builder: Louis G. Destremps

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick/Concrete

Roof: Asphalt

Outbuildings/Secondary Structures: Detached 60-foot brick tower constructed in 1941.

Major Alterations *(with dates):* None

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.38

Setting: The building is located at the northwestern corner of Purchase Street and Cedar Grove Street, along the major thoroughfare, Route 195, within a mixed residential and commercial urban area. It is approximately 75 feet west of the New Bedford Main Line right-of-way.

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

Engine House No. 10 is a rectangular, two-story, three-bay by seven-bay, hipped-roof, brick Renaissance Revival style building constructed circa 1910 with a single story flat-roofed smoking room addition, and a six story drill tower constructed in 1941. The station sits on a sloping lot with a single deciduous tree in the southeastern corner. The building has an asphalt roof with copper flashing; deep, overhanging bracketed eaves; common bond brick walls, and a concrete foundation. The east-facing facade has a hipped dormer sitting on the roof, concrete quoins, two character-defining bay doors, wide flanking concrete pilasters, and first story concrete block sheathing. The segmental arched bay doorways have concrete lintels and wood paneled double doors with large glass panes. The second story features two flanking bay double-hung wood sash windows flanking a singular double hung six-over-six wood sash window, all framed with concrete quoined concrete blocks. The fenestration on the remainder of the building is regular, with six-over-six double hung wood sash windows with brick lintels and concrete sills. The one-story flat-roofed addition has a recessed segmental arch entry and a concrete water table. The squared drill tower has wide, segmental arch window openings. The topmost portion of the tower features wide, rectangular window openings with concrete sills.

HISTORICAL NARRATIVE

In 1908, locally prominent architect Louis Destremps was commissioned by the City of New Bedford to design the city's Engine House No. 10 at 2071 Purchase Street on the corner of Cedar Grove Street. Destremps' plans for a rectangular, two-story, three-bay by seven-bay, hipped-roof, brick Renaissance Revival style building with a single story flat-roofed smoking room addition. The plans materialized around 1910, when Engine House No. 10 was erected on the very southeast corner of land owned by the New Bedford Water Works with a double hydrant installed just north of the building. By 1924, the city laid out plans for a drill tower 60 feet in height. The tower was not built until 1941 (Sanborn Map Company 1906; 1924; Walker 1911).

A few years earlier, Destremps also provided the plans for City of New Bedford Engine No. 3 (MGC No. NBE.2788) at 834 Kempton Street. This property was constructed by 1904 with a rectangular form, hipped-roof, single-story attached entrance, drill tower, and rounded-arch openings. There are other fire stations in New Bedford similar in design to the Engine House No. 10, including the engine house on the southeast corner of Durfee Street and Mount Pleasant Street, Engine No. 8 House (MHC No. NBE.2855) and Fire Station No. 4-Howland, Cornelius Engine Co. (MHC No. NBE.1111), designed by architect Frank Avrelio in 1867. Constructed in 1910, Engine House No. 10 is the latest of these identified existing fire stations (Swetland Publishing Company 1908:161; Ellis 1890:214; Sammarco 1997:17-19; Sanborn Map Company 1888; 1895; 1906; 1924; Walker 1911).

Destremps designed institutional buildings in Fall River, New Bedford, Swansea, and North Attleboro, ranging from Catholic Church complexes to armories. Within New Bedford, he provided the city with plans for at least five other buildings, including the New Bedford Central Police Station (MHC No. NBE.13), New Bedford Gas and Edison Light Company (MHC No. NBE.1075), Union Street Railway Car Barn (MHC No. NBE.198), Bristol County Third District Court (MHC No. NBE.34), and the Jireh Swift Elementary Schoolhouse (MHC No. NBE.560). In these properties, Destremps dealt primarily in the revival styles—Classical, Colonial, and Renaissance.

BIBLIOGRAPHY and/or REFERENCES

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1908 *Plans for New Engine House Number 10: To be built at corner of Cedar Grove & Purchase Streets, City of New Bedford.* On file, Massachusetts State Archives, Boston, MA.

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Swetland Publishing Company
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Walker, George H.
1911 *Map of City of New Bedford, Massachusetts*. George H. Walker and Company, Boston, MA.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Engine House No. 10 at 2071 Purchase Street is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level. Under Criterion A, the building, constructed around 1910, has important historical associations with the development of city-sponsored public services in New Bedford, while under Criterion C, the station is an excellent and intact example of early-twentieth-century fire station design. The property is a well-preserved example of the work of locally prominent architect, Louis Destremps, who was commissioned by the City of New Bedford to design the building in 1908.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
92-45	New Bedford North		NBE.613

Photograph

Locus Map

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 19 Jean Street

Historic Name: New Bedford Cotton Storage Company North Stores Warehouse and Annex

Uses: Present: Industrial

Original: Industrial

Date of Construction: 1910 - 1924

Source: Stone 1930

Style/Form: Vernacular industrial

Architect/Builder: Unknown

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick

Roof: Built-up tar and gravel/rubber membrane

Outbuildings/Secondary Structures: Annex

Major Alterations *(with dates):*

Removal of covered railroad freight platform (date unknown)

Condition: Fair

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 1.507

Setting: The New Bedford Cotton Storage Warehouse Company occupies a 1.5-acre urban lot south of Sawyer Street. The warehouse directly abuts the New Bedford Main Line railroad right-of-way.

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date (*month / year*): December, 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The New Bedford Cotton Storage Warehouse Company – North Stores and Annex Building (NBE.613) consists of two warehouses separated by a paved parking lot. The North Stores is an outsized example of a typical early twentieth-century storehouse executed in fire-resistive mill loft-type construction. The six-story structure towers over neighboring buildings and is 10 bays wide (108 feet) and 30 bays (373 feet) long. Its shallow-pitched "flat" roof has a low brick parapet and a prominent four-story stair tower. The brick walls are divided into bays on the north and west elevations with shallow projecting piers. A majority of the small, segmental arch widow openings retain their wood six-light sash. There are no windows on the west and south elevations. The east elevation has a row of segmental arch windows in the ground floor for the office, where the primary personnel entry is set into a deep, unornamented brick surround. Loading bays extending the full height of the building on the north elevation and retain most of their two-leaf wood panel doors divided by cast concrete sills and lintels. A covered freight platform adjoining the tracks has been removed. The Warehouse is divided transversely via brick firewalls into seven different storage areas. The Annex, located to the north of the Warehouse, is a one-story structure with a rectangular plan measuring 82 by 164 feet. It has a shallow-pitched shed roof with plank fascia boards and a projecting shingled tower at the southwest corner (the former connection point of a pedestrian bridge to the North Stores). The rusticated concrete block walls are blank on the west and east elevations, excepting a newly-cut garage bay on the west. The north elevation has two vehicle doors and a grouping of two windows and a personnel door at its east end. These openings have concrete surrounds and are now filled with panels. The Annex is divided into two storage areas by a firebreak wall.

HISTORICAL NARRATIVE

The New Bedford Cotton Storage Warehouse Company constructed its North Stores Warehouse (NBE.613, see related form) facility ca. 1910 alongside the tracks of the New York, New Haven & Hartford Railroad and, by 1924, had expanded it with the Annex Building for paper and twine storage. The company was established in 1910 and its leadership included textile industrialists within the city. It pioneered the public warehousing business in New Bedford and led the city in cotton warehousing. The North Stores Warehouse was one of three built by the company in New Bedford that provided a combined floor space area of 660,000 square feet; the other two being the Terminal Stores near the city center, and the Union Stores, at the north end of the city. The warehouse was used particularly for cotton products, although it also housed some household and paper goods. Such facilities provided an essential service for the textile trade by supplying ancillary storage space for mills. They also leant fluidity and increased profitability to the cotton goods market by allowing producers and traders to hold raw materials and/or finished goods and exchange them at optimum market conditions (Sanborn Map Co. 1906, 1924, 1950; Shields 1977; Stone 1930:197-199; 217-218).

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Sanborn Map Company
1906 *Insurance Maps of New Bedford, Including Fairhaven.* Sanborn Map Company, New York, NY.

1924 *Insurance Maps of New Bedford.* Sanborn Map Company, New York, NY.

1950 *Insurance Maps of New Bedford.* 1906 updated through 1950. Sanborn Map Company, New York, NY.

Shields, Robin
1977 New Bedford Storage Warehouse North Stores. MHC Form B – Building Form. On file, Massachusetts Historical Commission, Boston, MA.

Stone, Orra L.
1930 *History of Massachusetts Industries, Volume I.* The S.J. Clarke Publishing Co., Boston, MA.

New Bedford Cotton Storage Warehouse Company, North Stores Annex Building.

Rear elevation of New Bedford Cotton Storage Warehouse Company, North Stores.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December, 2012.
The criteria that are checked in the above sections must be justified here.

New Bedford Cotton Storage Warehouse Company North Stores is recommended eligible for listing in the National Register under Criterion A and C at the local level in the areas of industry and architecture. Under Criterion A, the building is associated with the warehousing trade in New Bedford – a critical supporting industry for the city's significant textile businesses. Under Criterion C, the building is an outstanding example of early twentieth-century, fire-resistive mill loft construction as applied to a storage warehouse. It is an especially large example of the building form that viscerally demonstrates the huge scale of textile manufacturing in the city.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
10A-7	Taunton		

Photograph

Locus Map

Town/City: Raynham

Place: *(neighborhood or village)*:

Address: 385 Thrasher Street

Historic Name: Dog Kennel and Track Property

Uses: Present: Vacant

Original: Residential/Commercial/Recreational

Date of Construction: 1870 (House); late 1930s (Dog Kennel and Track Property)

Source: Style/Visual Inspection

Style/Form: Vernacular/Greek Revival (House)

Architect/Builder: Unknown

Exterior Material:

Foundation: Parged Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
One detached shed; remnants of one detached dog kennel

Major Alterations *(with dates):* None

Condition: Poor

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 8.48

Setting: The property is located on the southwest corner of Thrasher Street and East Britannia Street, along the east side of the Stoughton Line right-of-way, 700 feet southeast of the Britannia Street railroad crossing and 850 feet west of the Taunton city boundary.

Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year*): December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The approximately eight-acre Dog Kennel and Track Property is the site of a former dog racing complex that includes a house, small shed, and remnants of a fenced kennel and dog run, an announcer's podium, and a large, oval, dirt track that abuts the railroad line. The construction dates of the kennel, track, and run are unknown but likely date to the late 1930s. The property sits on a slightly sloping lot within a landscape of cleared land, swamp, and a mixed coniferous forest.

Constructed circa 1870, in the southeastern corner of the lot along Thrasher Street, the house is a one-and-a-half-story, five-bay by two-bay, side-gabled, wood-frame vernacular Greek Revival style building with a full-length porch, a centered brick chimney, a similarly styled rear ell gambrel roof addition and an enclosed rear entrance. The house has a side-gabled asphalt roof, wood shingle siding, and a parged masonry foundation. The south-facing facade features a prominent centered flush dormer, a molded cornice that wraps around the entire roofline with returns at the gable ends, and a full-length simple porch with wood square posts. The rear ell gambrel roof addition features a centered brick chimney and four dormers.

Approximately 70 feet northeast of the house sits small, wood-framed, gable-front shed with a low-pitched, asphalt roof and wide, wood plank siding. At a distance of 25 feet, northwest of this shed are the remnants of the moderately-sized, wood-framed Acadian style barn used as a dog kennel. Formerly a one-story, side-gabled, wood-frame building with character-defining shed-roofed stables along either side, the property completely collapsed between 2011 and 2012. A 1.4-acre dog run with 11 remaining runs lined with chained link fences is located just to the north of the dog kennel remnants. A chain-link fence surrounds the dog kennel ruin and dog run area, while a second divided chain-link fence surrounds the area between the small shed and the dog kennel ruin. Running alongside the western boundary of the property, is a ¼-mile dog racing track with a small, rectangular, wood-framed, enclosed announcer's podium oriented west and located just east of the track.

Currently, the entire site is vacant and the house has been mothballed.

HISTORICAL NARRATIVE

In the early twentieth-century, likely in the late 1930s, a farmstead at this site (circa 1870) was developed as a dog kennel and track. Although the history of this property is not known and the site is heavily deteriorated, the remaining historic fabric, including remnants of a fenced kennel, dog run complex, and a large, oval, dirt track with an announcer's podium, is evidence of a significant era in New England dog racing history that lasted 75 years.

With state legislation in 1935, Massachusetts became the first state in New England to conduct greyhound racing. Local dog tracks, likely to be contemporaries of the Dog Kennel and Track Property, included Revere's Wonderland Greyhound Park (1934), Taunton Dog Track (1935) and Raynham Park/Taunton-Raynham Greyhound Park (1940). Both the Raynham Park and the Dog and Kennel Track at 385 Thrasher Street were constructed on farmland. Tracks typically consisted of a kennel building to house the dogs, a racing track, and dog runs. By the 1960s, tracks were required to abide by the following provisions under state law: "a track must be located at least two miles from churches, schools and housing developments" (Telegraphy 1964:2).

Dog racing reached its height in popularity in the 1980s, when Wonderland Greyhound Park and the Raynham Park "outdrew more than twice the combined attendance of the Bruins, Celtics, and Patriots" (Temple 2011:10). But as the sport rose in popularity, public awareness brought much opposition. Although the tracks at Raynham and Wonderland had long histories, remaining active in the state until about 2009 when Massachusetts voters approved a dog racing ban, they no longer retain any historic fabric (Ebbert 2008).

BIBLIOGRAPHY and/or REFERENCES

Ebbert, Stephanie
2008 "Massachusetts Voters Approve Dog Racing Ban." *The Boston Globe*. Boston, MA.

Temple, Robert
2011 *The History of Greyhound Racing in New England*. Robert Temple: United States.

The Telegraph
1964 "Tyngsboro Dog Track is Studied," *The Telegraph*. January 22. Nashua, NH.

Aerial view of the Dog Kennel and Track Property oriented east (Bing 2012).

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☐ **C** ☒ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Dog Kennel and Track Property is eligible for listing in the National Register of Historic Places under Criteria A and D, for its associations with the Massachusetts dog track industry and for its potential to yield information related to early dog track racing in the northeast region. Although its construction date and history are not known, it likely dates to the late 1930s. This property is the singular remaining historic dog track site in the Raynham/Taunton area to have retained integrity, as other tracks had been significantly updated with non-historic alterations while active. The property is evidence of Raynham's dog racing industry around the 1930s through its remaining historic fabric, which includes a small shed, and remnants of a fenced kennel and dog run, an announcer's podium, and a large, oval, dirt track.

Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form.

ARCHITECTURAL DESCRIPTION (Continued)

HISTORICAL NARRATIVE (Continued)

The Pearl Street Cemetery appears to be unchanged since the previous survey in 2002. The town-owned Pearl Street Cemetery is one of Stoughton's oldest burial grounds, with burial markers from 1737 to 1965. The earliest gravestone in Dry Pond Cemetery (STG.801), a contemporary of Pearl Street Cemetery, dates to 1747. Dry Pond Cemetery is distinguished from Pearl Street Cemetery in that it is privately-owned and 75% smaller, with approximately 175 gravestones (Berg 2002b).

In addition to confirming that the Pearl Cemetery is individually eligible for listing in the National Register of Historic Places under Criteria A, C, and Criterion Consideration D for its historical associations with the settlement and development of Stoughton, as an example of a range of eighteenth- to twentieth-century funerary art, and with potential to yield information about Stoughton's early history, Pearl Street Cemetery is also a contributing resource within the potentially National Register eligible Downtown Stoughton Area.

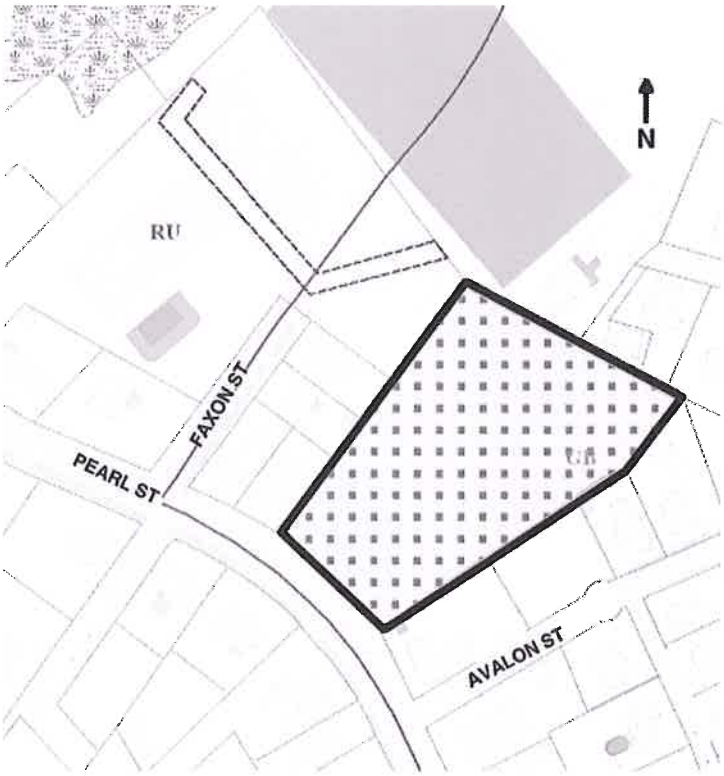
BIBLIOGRAPHY and/or REFERENCES (Continued)

Berg, Shary Page

2002a *MHC Burial Ground Form: Pearl Street Cemetery*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

2002b *MHC Burial Ground Form: Dry Pond Cemetery*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

LOCUS MAP



View looking north towards Pearl Street Cemetery.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ **A** ☐ **B** ☐ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by_____

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	STG.800
Historic Name:	Pearl Street Cemetery
Common Name:	
Address:	
City/Town:	Stoughton
Village/Neighborhood:	Stoughton
Local No:	50-68
Year Constructed:	
Architect(s):	
Architectural Style(s):	
Use(s):	Burial Ground
Significance:	Art; Community Planning; Religion
Area(s):	STG.A: Stoughton Center
Designation(s):	

The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (http://mhc-macris.net/macrisdisclaimer.htm)

Data available via the MACRIS web interface, and associated scanned files are for information purposes only. THE ACT OF CHECKING THIS DATABASE AND ASSOCIATED SCANNED FILES DOES NOT SUBSTITUTE FOR COMPLIANCE WITH APPLICABLE LOCAL, STATE OR FEDERAL LAWS AND REGULATIONS. IF YOU ARE REPRESENTING A DEVELOPER AND/OR A PROPOSED PROJECT THAT WILL REQUIRE A PERMIT, LICENSE OR FUNDING FROM ANY STATE OR FEDERAL AGENCY YOU MUST SUBMIT A PROJECT NOTIFICATION FORM TO MHC FOR MHC'S REVIEW AND COMMENT. You can obtain a copy of a PNF through the MHC web site (www.sec.state.ma.us/mhc) under the subject heading "MHC Forms."

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

This file was accessed on:

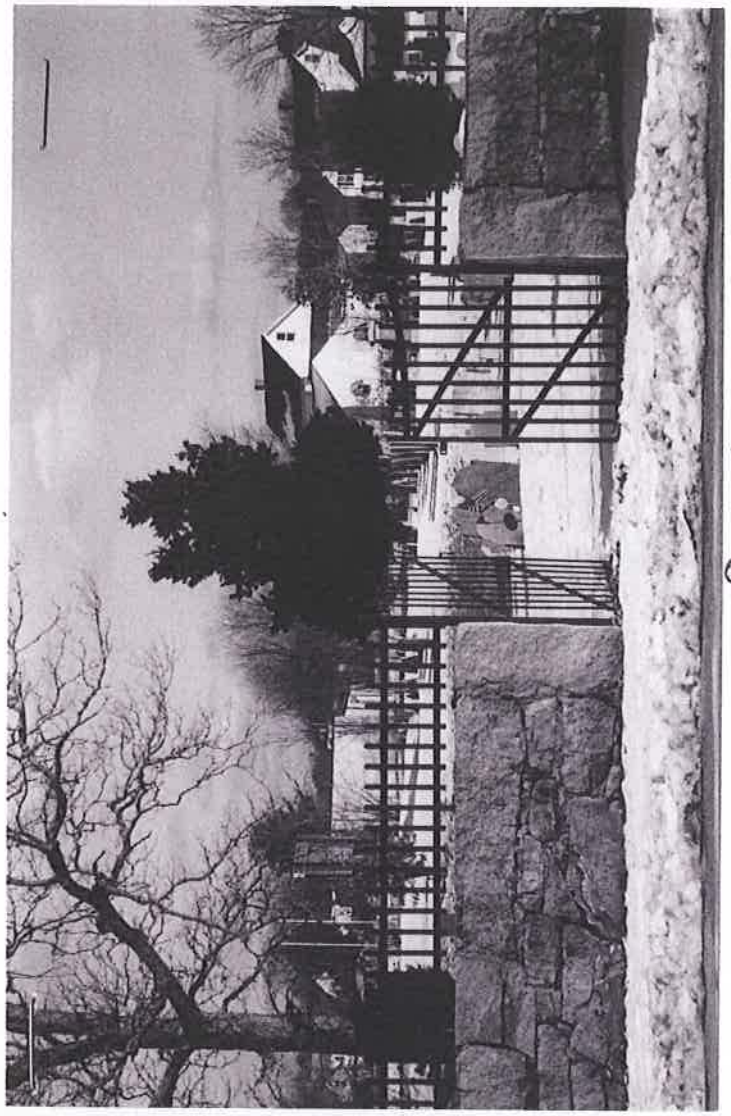
Friday, November 02, 2012 at 1:05: PM

SECTION A

FORM E - BURIAL GROUND

Assessor's number	USGS Quad	Area(s)	Form Number
50-68	Norwood	A	800

Massachusetts Historical Commission
Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125



View from Street. 2001.

Town Stoughton

Place *(neighborhood or village)* PEARL STREET

Address or Location Pearl Street

Name: Pearl Street Cemetery

Ownership ☑ *Public* ☐ *Private*

Approximate Number of Stones 400

Earliest Death Date 1737

Latest Death Date ca. 1965

Landscape Architect None

Condition Good, some biological growth on stones

Acreage 1.6 acres

Setting Residential neighborhood north of town center

Recorded by Shary Page Berg for PAL Inc.

Organization DEM - Heritage Landscape Inventory

Date *(month/day/year)* December 2002

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JUL 9 2003
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Follow Massachusetts Historical Commission Survey Manual for instructions for completing this form.

VISUAL/DESIGN ASSESSMENT

Pearl Street Cemetery (MHC 800) is the oldest burial ground in Stoughton. It was active from the mid-18th century through the mid-20th century and contains the graves of approximately 700 residents of the town, including members of the Capen, Gay, Guild, Holmes, Southworth and Talbot families.

The municipally owned cemetery is located on Pearl Street about 1/4 mile north of the center of Stoughton. The immediate area is largely a late 20th century residential neighborhood with houses surrounding the cemetery except on the northeast, where there is an athletic field. The busy commercial area of Washington Street lies a few blocks to the east.

The cemetery is a roughly rectangular parcel of 1.6 acres that lies on the east side of Pearl Street. Across the front is a rough-cut granite block and fieldstone wall approximately 4' tall surmounted by an iron fence about 1' tall that was installed in the 1990s. There is a pedestrian entrance near the center of the wall and a vehicular entrance at the southern end. Both entrances have tall iron picket gates that were installed in the 1990s. The north and south sides of the cemetery are enclosed by low fieldstone walls supplemented by 6' chain link fencing, which also extends around the east side of the property. The cemetery is kept locked to reduce vandalism and is opened by request.

The spatial organization of the cemetery is simple, with the burial markers laid out in irregular rows that run north/south at the front of the cemetery and east/west at the back. The headstones generally face southwest in the western part of the cemetery and southeast in the eastern part. There is an unpaved service road along the southern edge of the cemetery but otherwise there is no formal circulation system. The central area is grass with a few scattered trees, including one large oak and a large cedar near the center. There are also volunteer trees around the perimeter that screen the cemetery from adjacent properties.

There are approximately 700 recorded burials that are represented by roughly 400 burial markers. Well over half of the burials occurred in the 19th century, with a smaller number in the 18th century and only a few in the 20th. Of the nearly 400 headstones, approximately 80% are upright slates, about 15% are marble; the remainder are monuments and tombs. Roughly 1/4 of the slate headstones also have associated footstones, all of which have been relocated to immediately behind the headstones to facilitate maintenance. The headstones are relatively uniform in size and the vast majority have a shouldered main block headed by a round-arched tympanum. Some of the later stones, including nearly all of the marbles, are rectangular in shape.

The inscriptions and motifs displayed on the stones are typical for a cemetery of this period (1737-ca. 1965). Eighteenth century motifs include winged deaths heads, cherubs, and rising suns, while most of the 19th century slates display a willow and urn design. The majority of the marbles have a simple inscription with no picture or design. Footstones usually have only the initials of the deceased and perhaps a death date.

Upright headstones are the predominant type of burial marker but there are also tombs, large monuments and curbed lots, which add visual interest to the cemetery. There are seven tombs located near the northwest corner of the cemetery, all earth covered with granite fronts. There are also five earth-covered tombs located near the southwest corner. There are seven obelisks scattered throughout the cemetery and approximately the same number of large polished granite monuments. While the earlier burials occurred in individual lots, there are also family plots in the newer sections of the cemetery, three of which are enclosed with granite curbing. One of these is the Southworth/Wyman lot at the rear of the cemetery, which also has an iron fence. Several additional lots elevated about the ground plain indicate that at one time there were probably additional curbed lots.

The cemetery receives routine maintenance from the town of Stoughton. However, the town lacks the funds and technical expertise to undertake more substantial preservation treatments. The most pressing problem is the fairly extensive biological growth that has obscured many of the inscriptions and poses an imminent threat to the historical and artistic record of the headstones. There are also roughly a dozen stones that are toppled or broken.

HISTORICAL NARRATIVE

Although no stone exists to confirm the fact, local records indicate that the first burial in the area of the Pearl Street Cemetery occurred in 1737, with the interment of five children from the Estey family. The first adult burial was Anna Morgan who died in 1745. Her damaged stone has been relocated to the basement of the Stoughton Historical Society for safekeeping.

The cemetery was formally established on September 8, 1748 when Captain George Talbot gave roughly 1/2 acre of land to create a burial place. A 35' strip of land along the northern edge of the burial ground was given by Ebenezer Talbot on December 24, 1762. This was supplemented by a 20' strip of land along the southern and eastern edge that was purchased from Lt. Jonathan Capen in 1810. A small additional piece was added on the western end of the cemetery when the town straightened Pearl Street in 1835. Unlike earlier portions of the cemetery where burials had occurred in individual lots, this area was divided into ten large lots where family members could be buried together. The land to the south of the cemetery, comprising about .6 acre, was annexed in 1842 and 1846 by Rev. M.B. Ballow who sold lots of varied sizes and shapes to individual proprietors. The final addition, a narrow wedge of land at the far eastern edge of the cemetery, was given by Stephen Blake about 1846. This brought the size of the cemetery to its current 1.6 acres.

In the early part of the 20th century, the Pearl Street Cemetery gained a formidable advocate in the person of Luella D. Southworth. She was appointed superintendent of the cemetery in 1906 and continued for over 40 years, carrying on until she was into her nineties. She inventoried the graves; raised funds from local residents and descendants of those buried at the cemetery; and oversaw improvements to the once neglected site.

In 1955 the cemetery, which had previously been administered as a semi-public organization, was officially turned over to the town, which continues to maintain it. Partially in response to vandalism, improvements were made in the 1990s with the addition of an iron picket fence on top of the existing stone wall and two new gates. Most recently the Stoughton Historical Society has transferred Luella Drake Southworth's handwritten inventory to a computer database and continues to research the history of the cemetery and its inhabitants. Local researchers have identified 70 veterans of the Revolutionary War, War of 1812, and Civil War who are buried there.

BIBLIOGRAPHY and/or REFERENCES

Hansen, Howard, town historian. Personal communication, January 2002.

Lambert, David Allen. *Images of America, Stoughton.* Arcadia Publishing, Charleston, S.C., 2001.

Massachusetts Historical Commission. *MHC Reconnaissance Survey Report, Stoughton, Massachusetts.* Boston, MA, 1981.

RECEIVED

JUL 9 2003

MASS. HIST. COMM

Plan of The Burial Ground, Pearl Street, Stoughton (unsigned, undated map in Stoughton Historical Society files).

Stoughton Historical Society files.

Maps

1830 *A Plan of the Town of Stoughton.* Joseph Hodges.
1858 *Stoughton, Mass.* Nathaniel Pr. Fisher.
1858 *Stoughton, Mass.* Henry F. Walling.
1892 *A Plan of the Town of Stoughton.* Frederic Endicott

NATIONAL REGISTER OF HISTORIC PLACES CRITERIA STATEMENT

Pearl Street Cemetery is the oldest burial ground in Stoughton, formally established in 1748 although there are markers and records of burials as early as 1737. It is the burial place of approximately 700 residents of the community, whose graves are marked by roughly 400 headstones, monuments and tombs. It is a historically significant property that possesses integrity of location, design, materials, workmanship, feeling and association, and meets National Register Criteria A and C on the local level with a period of significance extending from the mid 18th century to the mid 20th century. The site may also have archaeological significance associated with unmarked graves that previously occupied the site.

The property meets Criterion A due to its strong associations with the 18th, 19h and 20th century history of Stoughton. It meets Criterion C as a well-documented and well-preserved municipal burial ground with a representative collection of burial markers that reflect evolving New England funerary styles and trends over more than two centuries. It meets Criterion Exception D because it contains the graves of many people with strong associations to the early history of Stoughton.

INVENTORY FORM CONTINUATION SHEET

Community: Stoughton

Property Address: Pearl Street

Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

Area(s) A

Form No. 800

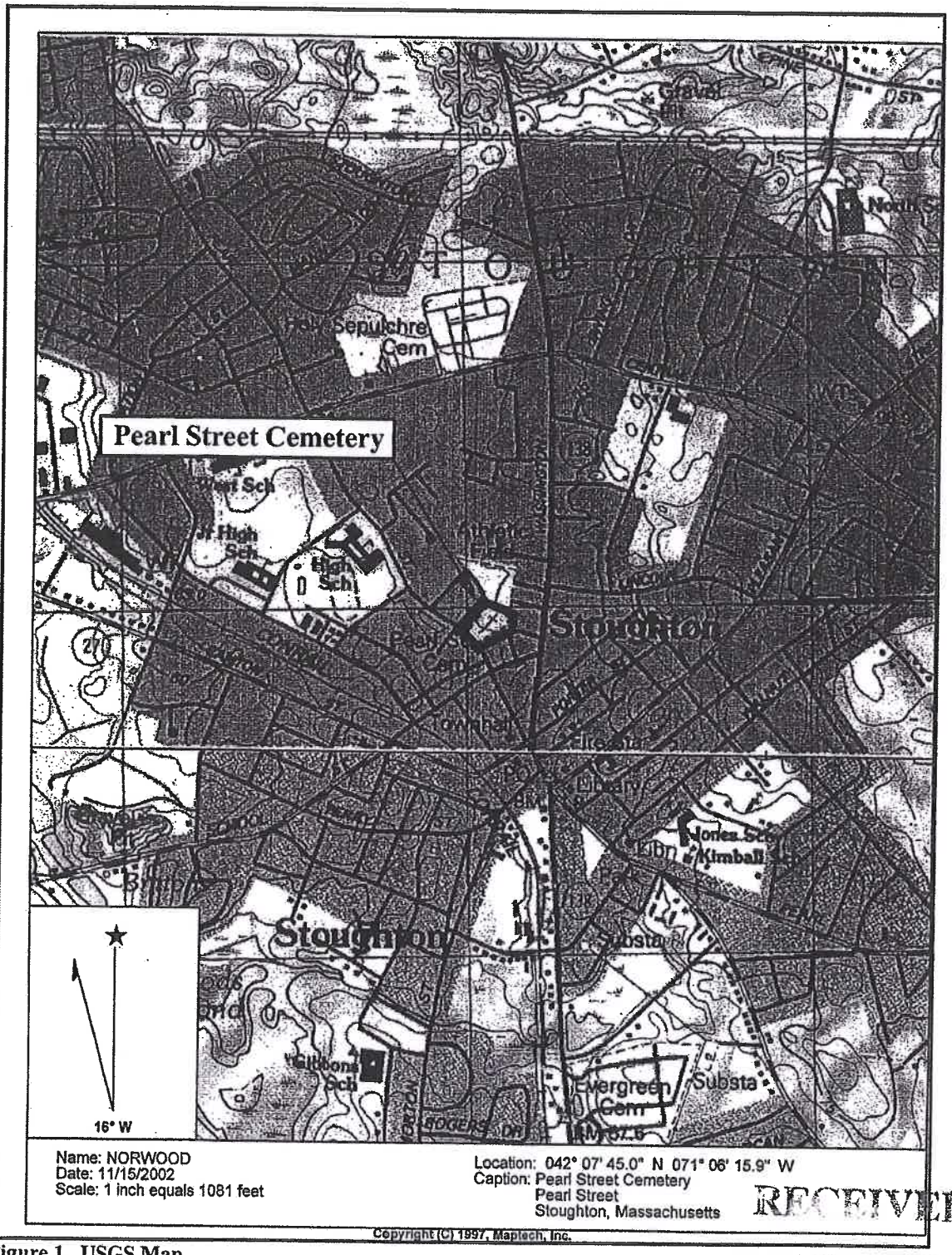

Figure 1. USGS Map

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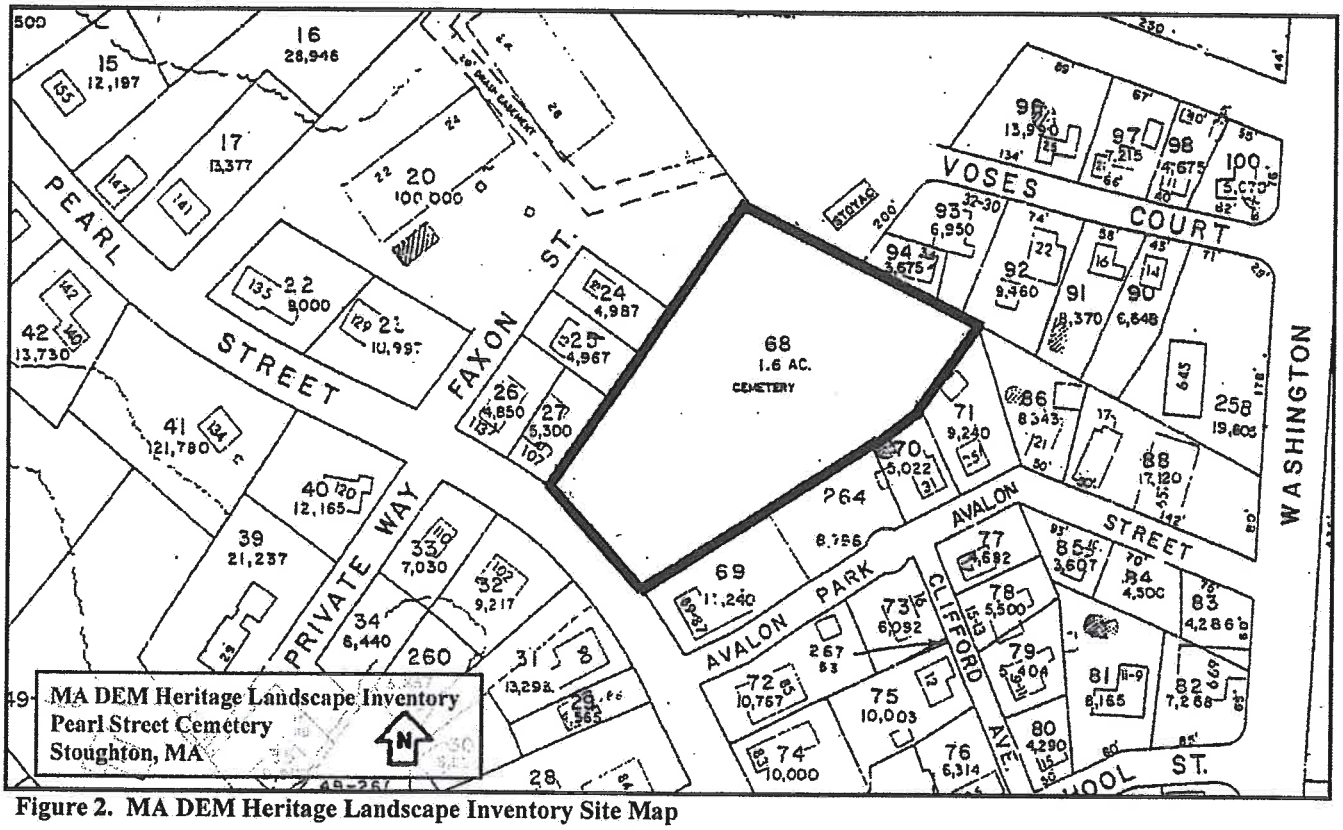

Figure 2. MA DEM Heritage Landscape Inventory Site Map

INVENTORY FORM CONTINUATION SHEET

Community: Stoughton

Property Address: Pearl Street

Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

Area(s) A

Form No. 800

List of Photographs

1. Pearl Street Cemetery, view from street – Form Front
2. Pearl Street Cemetery, view from west
3. Pearl Street Cemetery, overview
4. Pearl Street Cemetery, gravestones
5. Pearl Street Cemetery, gravestones with tombs in background

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JUL 9 2003
MASS. HIST. COMM

INVENTORY FORM CONTINUATION SHEET

Community: Stoughton

Property Address: Pearl Street

Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

Area(s) A

Form No. 800

PHOTOGRAPHS

View to west. 2001.

2.

Overview. 2001.

3.

INVENTORY FORM CONTINUATION SHEET

Community: Stoughton

Property Address: Pearl Street

Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

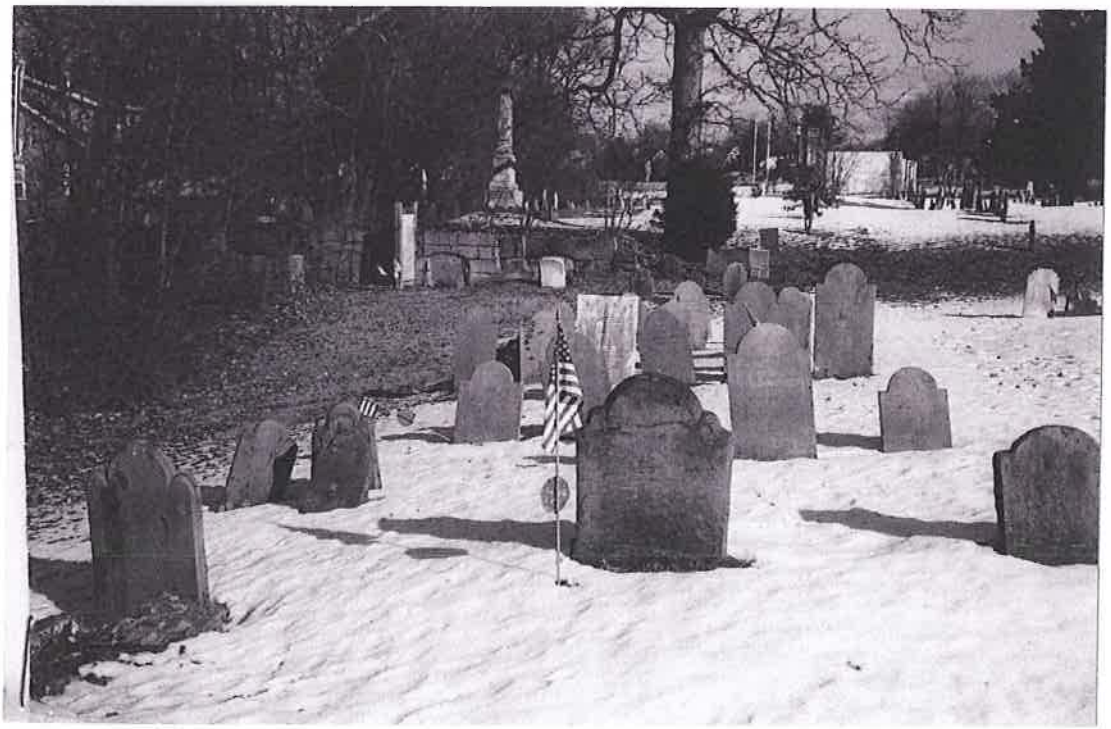
Area(s) A

Form No. 800

PHOTOGRAPHS

Gravestones
2001

4.



Gravestones with tombs in the background.
2001.

5.

FORM E - BURIAL GROUND

AREA	FORM NO.
A	800

MASSACHUSETTS HISTORICAL COMMISSION
80 BOYLSTON STREET
BOSTON, MA 02116

STOUGHTON

ss Pearl Street

Pearl Street Cemetery

ship: x Public

Private

IPTION

ximate number of stones 500+

Earliest death date 2.18.1743

Latest death date 7.1.1965

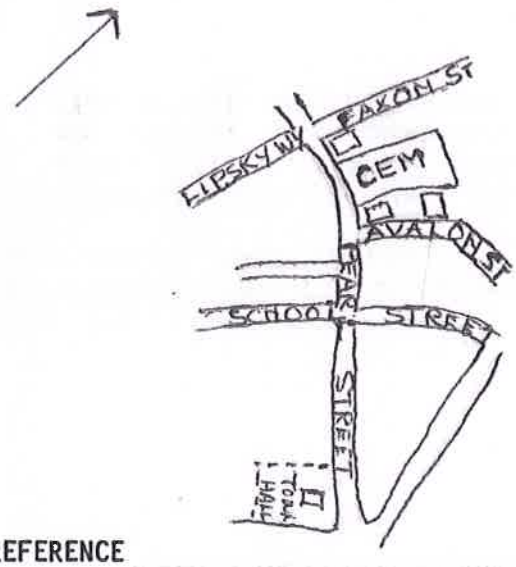
Landscape Architect (if known)

Condition Some gravestones have suffered from age, but general condition of cemetery is good

Acreage 3+ acres

Setting Residential

Sketch Map: Draw map showing property's location in relation to nearest cross streets and other buildings and/or geographical features. Indicate all buildings between inventoried property and nearest intersection.
Indicate north.



UTM REFERENCE

USGS QUADRANGLE

SCALE

Recorded by Dorothy M. Woodward
Alice M. Petruzzo

Organization Stoughton Historical Commission

Date June 11, 1987

STG.800

NATIONAL REGISTER CRITERIA STATEMENT (if applicable)

GENERAL ASSESSMENT OF ART WORK Describe materials used, designs, motifs, symbols that are either common or unusual, known carvers.

Gravestones are both slate and granite, typical of 18th century slate carved headstones (willows, cherubs, Death's head and urn) prior to 1830 and tombs, obelisks and reliefs. Some stones have survived the test of time better than others depending on their composition and exposure to the northeast.

HISTORICAL SIGNIFICANCE Explain religious affiliations, major period of use and evaluate historical importance of burial ground within the community.

Pearl Street Cemetery is Stoughton's first burial ground, has no religious affiliation and had its major period of use from 1743 to the mid-1800's. The early settlers of Stoughton and builders of the community are buried here and so recorded in Town records of Births, Deaths and Marriages. Prominent names are Capen, Southworth, Monk, Talbot, Gay, Swan, Holmes, Guild, Paul, Richmond and Adams.

BIBLIOGRAPHY and/or REFERENCES

Survey of Recorders; Stoughton Historical Society Files

Prominent Citizen

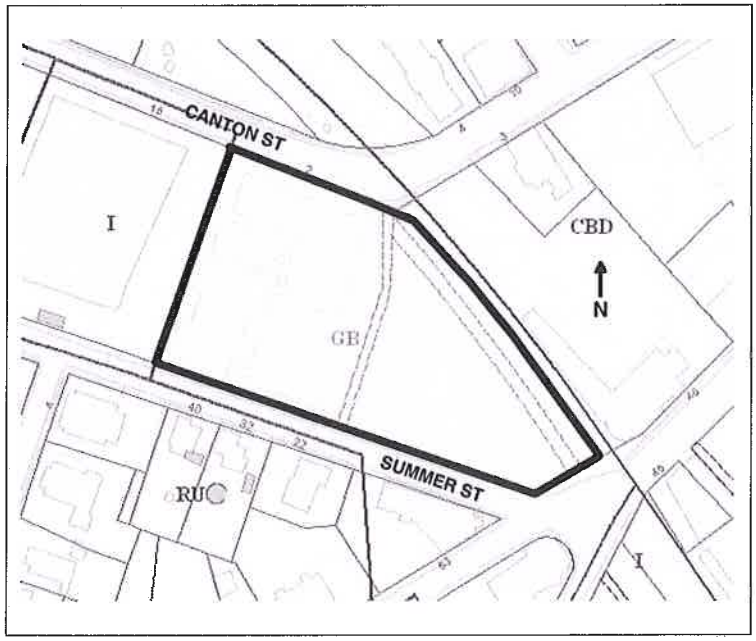
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
054 -110-0	Brockton	STG.A	STG.002

Photograph

Locus Map



Recorded by: J. Daly, A.Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Stoughton

Place: *(neighborhood or village)*:
Stoughton Center

Address: 2 Canton Street

Historic Name: Mystic Rubber Company, Stoughton Rubber Company

Uses: Present: Commercial

Original: Manufacturing

Date of Construction: ca. 1890-ca.1920

Source: Sanborn Map Company

Style/Form: Vernacular industrial

Architect/Builder:

Exterior Material:

Foundation: Concrete

Wall/Trim: Brick, concrete, vinyl, wood clapboard

Roof: Built-up tar and gravel, rubber membrane

Outbuildings/Secondary Structures: Building No. 9, Building No. 3, Building No. 6, Building No. 2, Building No. 1, Building No. 10, Building No. 11, Building No. 8

Major Alterations *(with dates):*
Demolition of Buildings No. 4 and 5 (date unknown).
Updates of buildings for commercial use (after 1990).

Condition: Good

Moved: no ☒ **yes** ☐ **Date:**

Acreage: 2.16

Setting: The Mystic Rubber Company complex is a closely-packed industrial complex set between Canton Street to the north, Summer Street to the south, and parking lots to the east and west. The Stoughton Line cuts past the northeast corner of the complex on a northwest-southeast course and is about 50 feet away from the property at its closest point. Commercial and residential properties of Stoughton Center surround the property.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Mystic Rubber Company complex (MHC No. STG.002) consists of five loft-type vernacular industrial buildings and a power house erected ca. 1890 - 1923. Beginning on the north side of the complex and moving clockwise, these include: Building No. 9 (manufacturing and stock storage, constructed ca. 1910); Building No. 3 (making, stitching and finishing; ca. 1905) and its addition, Building No. 6 (Heater Building, 1912-1923); Building No. 2 (making, spreading, and cutting; ca. 1905); Building No. 1 (calender, drying, and cement rooms; ca. 1890, second floor added 1901-1912); Buildings 10 and 11 (engine room, boiler house, and chimney; 1912-1923); and Building No. 8 (heater room, 1912-1923). Elevated pedestrian bridges connect Building Nos. 1, 2, 8, and 9. Parking lots, yards, and alley ways around and between the buildings are paved with asphalt. Two connected buildings, Nos. 4 and 5, have been demolished on the west side of the complex. The remainder of the complex has been updated for mixed commercial and office uses through the addition of new entries, vinyl siding, and replacement windows.

Building No. 9 is a three-story, three-bay-by-ten-bay, concrete pier-and-spandrel mill loft with a rectangular plan. It has a flat, rubber membrane-clad roof with a raised brick and concrete parapet and a hip-roofed elevator tower. The walls have exposed poured concrete framing with brick panel infill. Windows sash are ganged together on the north elevation to form near-continuous bands, and are set as single and quadruple units on the other elevations. Original double-hung, wood, six-over-six sash is retained in about 25 percent of the openings. Elsewhere, the sash has been replaced with aluminum or vinyl one-over-one units. There is no primary entry, although the north bay on the east elevation is now filled with an aluminum commercial entry. The building is subdivided into tenant spaces for commercial and office use.

Buildings 2 and 3 are almost identical timber-framed mill lofts attached to each other on their long (north-south) elevation by a projecting brick firewall. Each is a two-story, eight-bay-by-twenty-one-bay (dimensions) building with a shallow-pitched "flat" gable roof and a rectangular plan. Centered on each roof is a three-bay-by-sixteen-bay box monitor with asbestos tile sheathing and double-hung wood windows. The walls are clad in vinyl and the regularly spaced window openings are filled with replacement one-over-one, double-hung, vinyl sash, except on the west side of Building No. 2, where original six-over-six, double-hung wood sash is retained. Both buildings are subdivided into office and commercial tenant units. Building 3 has been enlarged on its north end with Building No. 6, a six-bay-wide, eleven-bay-long ell. Multiple entries have been cut into the east elevation of this building to serve tenant spaces.

Building No. 1 is a two-story, four-bay-by-five bay, brick mill loft on an irregular rectangular plan that fronts Summer Street. The building has a shallow-pitched "flat" roof that is clad in rubber roll roofing, ornamented with a stepped brick parapet on the south end, and has shallow eaves with integral gutters on the east and west sides. The walls, which are laid in common bond, are divided horizontally via a raised and corbelled brick cornice and belt course and vertically with piers. The primary entry is placed off-center on the south elevation and has been replaced with a wood door and flanking panels set under a rubberized awning. Windows are paired within each bay and consist of replacement one-over one vinyl or aluminum sash with simulated divided lights. The window openings have segmental arch brick lintels and concrete sills. A loading bay opening on the west elevation is now filled with windows.

Buildings 10 and 11 form a connected power plant for the complex. Both one-story structures are constructed of brick. Building 10, the Engine Room, fronts an alley on the west side of the complex. This three-bay wide structure is built on a square plan. Its shallow-pitched shed roof has a wood plank box monitor with wood sash windows, is sheathed in rubber roll roofing, and has shallow overhanging eaves with a wood plank cornice. The brick walls are laid in common bond and reinforced with deep piers or buttresses. The segmental arched window and door openings are filled with plywood and concrete block. Building 11, the

Boiler House, is east of and behind the Engine Room and largely hidden from public view. This four-bay-by-three-bay structure has an asphalt shingle-clad gable roof, and brick walls with deep piers or buttresses. A cylindrical stack constructed of glazed buff specialty brick is situated at the intersection of the Boiler House and Engine Room.

Building No. 8 is a two-story, wood-frame mill loft with a three-bay-by-five bay rectangular plan. It has a shallow-pitched "flat" gable roof, shallow wood plank eaves, and is clad in a combination of asbestos shingle, stucco, and clapboard siding. Windows are both grouped as pairs and set single within the bays and consist of replacement vinyl sash in wood plank surrounds.

HISTORICAL NARRATIVE

The Mystic Rubber Company was established in 1877 for manufacture of rubberized clothing and was perhaps the pioneer of Stoughton's rubber clothing and shoe industry, which was an important component of the city's economy until World War II. The company's Stoughton complex was initially used for production of rubberized cloth, which was then shipped to a second site in Boston for the cutting and assembly of finished goods. In 1889, Mystic Rubber Company merged with the Hall Rubber Company of Boston to form the Stoughton Rubber Company. Stoughton Rubber Company continued production of rubberized textile goods such as clothing, coats, and sheets at the Stoughton plant and, circa 1915, became part of the Rubber Goods Manufacturing Company trust. Historic maps indicate that the majority of the current physical plant was developed ca. 1890-1923 and was retooled to allow for the manufacture of completed rubber goods, rather than just cloth. After 1932, the Joseph F. Corcoran Shoe Company purchased the plant and converted it to manufacture footwear. This company, and its successor, the Acme Boot Company, continued footwear manufacture until the 1980s. The property has since been converted into tenant-occupied mixed commercial and office spaces. The Mystic and Stoughton rubber companies were two of several rubber textile and footwear industries that made an important contribution to Stoughton's manufacturing economy between circa 1880 and World War II. These also included the Plymouth Rubber Company; the Meade Rubber Company (rubber heels and sheeting, 75 employees); American Rubber Company; and Panther Rubber Manufacturing Company (rubber soles and heels, 300 employees) (*The Boston Herald* 1906; Cook 1918:354; India Rubber World 1936; Lambert 2009; MHC 1979; Petruzzo and Woodward 1987; Poor's Manual Company 1916; Sanborn Map Company 1885, 1891, 1896, 1901, 1912, 1923, 1949; Stone 1930: 1124-1125).

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Continuation sheet 2

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1916 Poor's Manual of Industrials, 1916. Poor's Manual Company, New York, NY.

Sanborn Map Company
1885 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

1891 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

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1923 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

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The southern side of the Mystic Rubber Co. complex, abutting Summer Street.

West side of the Mystic Rubber Co. complex, looking northeast from Summer Street

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Dalyand Virginia H. Adams, Pawtucket, RI. December 2012
The criteria that are checked in the above sections must be justified here.

The Mystic Rubber Company complex is recommended eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the complex is significant for its associations with the rubber industry in Stoughton, an important economic activity in the town. Under Criterion C, the Stoughton Rubber Company complex is a significant and distinguishable grouping of late-nineteenth and early-twentieth century mill lofts erected to create an integrated manufacturing plant for rubberized clothing.

The Mystic Rubber Company complex is located within and contributes to the significance of the Downtown Stoughton Area. This area, which is recommended eligible for listing in the National Register as an historic district, is an expanded version of the previously-inventoried Stoughton Square Area (STG.A) (see related Inventory and Criteria Statement forms).

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
053 -101, 102	Brockton	STG.A	STG.1

Photograph

Locus Map

Recorded by: J. Daly, A.Cahoon
Organization: PAL
Date (*month / year*): December 2012

Town/City: Stoughton

Place: *(neighborhood or village)*:

Address: 25 Brock Street

Historic Name: Meade Rubber Company

Uses: Present: Office

Original: Manufacturing

Date of Construction: 1916

Source: Cook 1918

Style/Form: Vernacular industrial

Architect/Builder: Unknown

Exterior Material:
Foundation: Concrete

Wall/Trim: Brick

Roof: Rolled rubber, tar and gravel

Outbuildings/Secondary Structures: Two warehouse buildings

Major Alterations *(with dates):*
Demolition of Building Nos. 2 and 3 (after 1949)

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 1.048

Setting: The Meade Rubber Company property abuts the west side of the MBTA Stoughton Line right-of-way and is situated on the north side of Brock Street. It is flanked by early twentieth century residential properties to the southwest and by commercial and light industrial properties to the east, across the railroad tracks. Asphalt and gravel driveways flank both sides of the building and provide access to a truck loading area at the rear of the property.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Meade Rubber Company (MHC No. STG.001) is a complex consisting of a single brick vernacular industrial loft and two detached warehouse buildings on a separate parcel west of the loft. The loft, designated Building No. 1 on historical maps, utilizes typical early twentieth-century fire-resistive industrial construction. This two-story, six-bay-by-fourteen-bay, factory has a rectangular plan with an elevator or stair tower projecting from the north end of the west elevation and a one-story shed-roofed brick ell (formerly the Engine Room) on the rear elevation. The building has a shallow-pitched "flat" gable roof clad in a combination of rubber roll roofing and built-up tar and gravel, a rectangular box monitor, and open soffits with exposed, beveled rafter tails. Wood cornice molding on the soffit cornice is now covered with aluminum flashing. The walls are laid in common bond with occasional Flemish bond courses and are organized into bays with projecting piers. The brick at the south end of west elevation is parged with stucco. Two entries are placed asymmetrically in the south elevation, facing Brock Street. The west entry is a Colonial Revival Style entry with a wood door and surround and flanking sidelights. The east entry is an aluminum commercial-type entry from the late twentieth century. A two-story loading bay is located on the north end of east elevation and has a projecting hoist rail and replacement freight doors. Window openings have brick segmental arch lintels and sills, and are fitted with six-over-six, double-hung, wood sash, of which approximately 30 percent remains. The remainder of the openings have one-over-one vinyl replacement windows. The foundation is concrete.

A pair of storage buildings form an extension of Building No. 1 on its northwest corner, and are connected to it via a sloping, enclosed freight ramp. These one-story, gable-roofed brick buildings are set on raised poured concrete foundations and have concrete truck loading docks at both ends.

There are two detached storage buildings associated with the Meade Rubber Company located on a separate lot to the west of Building No. 1. To the south is a one-bay by seven-bay, one story building with a hipped roof, mortared cobblestone walls, and a slab foundations, Several altered vehicle, entry and window bays face east towards Building No. 1. The building appears to be in poor condition. North of this storage building is a second 32 by 70-foot windowless storage building. This wood frame structure has a gable roof, panel-and-batten walls, and is elevated on footings of an unknown material.

HISTORICAL NARRATIVE

Stoughton native James Meade (1868-1929) constructed the Meade Rubber Company building in 1916. Formerly a vice president and superintendent of Plymouth Rubber Company in Canton, Meade retired to found his own company for the manufacture of rubber-coated cloth fabrics, sheets, and molded rubber shoe heels. The success of his rubberized cloth lines necessitated a discontinuance of the shoe line and a gradual expansion of the company's physical plant on Brock Street. Meade's original 100-by 40-foot factory forms the west half of the extant structure, which was expanded to its present size by 1923. Meade also added two attached loft structures (Building Nos. 2 and 3, demolished) on the west side of the present factory during this period. By 1929, he added the two extant detached outbuildings for storage. The company employed at least 200 operatives. Following Meade's death in 1929, his son J. Myles Meade took over as president of the company. By 1949, the Meade Rubber Company was apparently defunct, the complex having been taken over by L. Albert & Son, sellers of used rubber machinery. Meade Rubber Company was one of several rubber textile and footwear concerns that made an important contribution to Stoughton's manufacturing economy between circa 1880 and World War II. These also included the Plymouth Rubber Company; Mystic Rubber Company (later the Stoughton Rubber Company); American Rubber Company; and Panther Rubber Manufacturing Company (rubber soles and heels, 300 employees) (Cook 1918; Lambert 2009; MHC 1979; Petruzzo and Woodward 1987; Sanborn Map Company 1906, 1923, 1949; Stone 1930:678-684).

Continuation sheet 1

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1912 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

1923 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

1949 *Insurance Map of Stoughton, Norfolk County, Massachusetts*. Sanborn Map Company, New York, NY.

Stone, Orra L.
1930 *History of Massachusetts Industries, Volume III.* The S.J. Clarke Publishing Co., Boston, MA.

West elevation of the Meade Rubber Company loft with attached and detached storage buildings.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly and Virginia H. Adams, PAL, Pawtucket, RI. December 2012

The criteria that are checked in the above sections must be justified here.

The Meade Rubber Company Building and associated outbuildings are recommended eligible for National Register listing at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the buildings are associated with the rubber clothing industry in Stoughton, which was an important economic activity for the town. Under Criterion C, the building is a good representative example in Stoughton of early twentieth century mill loft architecture.

The Mystic Rubber Company complex is located within and contributes to the significance of the Downtown Stoughton Area. This area, which is recommended eligible for listing in the National Register as an historic district, is an expanded version of the previously-inventoried Stoughton Square Area (STG.A) (see related Inventory and Criteria Statement forms).

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
54//172/0/	Taunton		

Town/City: Taunton

Place: *(neighborhood or village)*:

Address: 28 Dana Street

Historic Name: Staples Coal Company Coke Silos and Warehouse

Uses: Present: Steel scrapyard

Original: Industrial

Date of Construction: ca. 1890 - 1920

Source: Historic maps

Style/Form: No style

Architect/Builder: Unknown

Exterior Material:

Foundation: Concrete

Wall/Trim: Concrete/wood

Roof: Asphalt shingle

Outbuildings/Secondary Structures:
None

Major Alterations *(with dates):* Silos roof removed ca. 1960

Condition: Fair

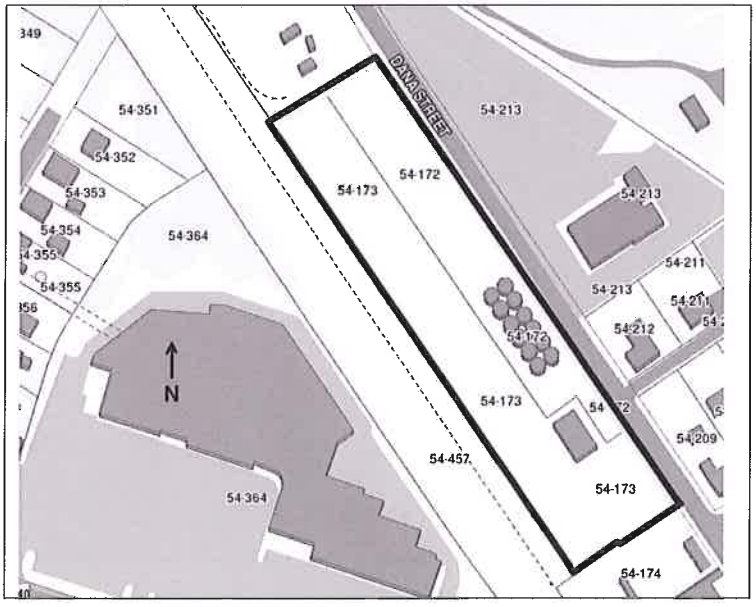
Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 4.08

Setting: Property is on the southwest side of Dana Street off White Avenue and abuts the northeast side of the Attleboro Secondary ROW. The open, level lot contains two structures, a vernacular style warehouse and 12 concrete block silos, surrounded by a high, chain link fence.

Photograph

Locus Map



Recorded by: J. Daly, Q. Stuart, A.Cahoon

Organization: PAL

Date (*month / year*): December, 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:
Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

The most prominent structure on the Staple Coal Company property is a cluster of twelve coke silos. The reinforced concrete silos are set atop a one-story, rectangular reinforced concrete base constructed between ca. 1920 (between 1893 and 1937 per historic maps). The structure originally had a wood roof, which was removed in the 1960s. The concrete base has two garage bays on the northwest elevation and one on the southeast elevation. An additional garage bay on the southeast elevation was filled with concrete block. A single, solid metal, modern door is located in the southeast end of the southwest elevation. Six window openings, evenly spaced along the southwest elevation, were filled with concrete block as well. A conveyor system was previously attached to the southwest elevation and led to a rail line (not extant) for loading coke from rail cars into the silos, but was removed after 1937.

Southeast of the coke silos is a two-story, two-bay-by-four-bay, gable-roof, wood-frame warehouse that was originally built ca. 1870 and enlarged ca, 1890, according to historic maps. The main block of the building has an asphalt shingle-clad roof with shallow gable returns and vinyl and clapboard siding with wood trim. It has a one-story block on the northwest (facade) elevation and a two-story, addition on the southwest elevation that originally served as a loading platform. The one-story block has an asphalt shingle-clad shed roof and wood shingle siding. The two-story addition has an asphalt shingle-clad, shallow shed roof and clapboard and asphalt shingle siding. A parapet extends from the addition across southwest edge of the northwest block. The current primary entrance is a single, solid door in the southwest bay of facade of the northwest block; however it appears as though the pair of non-functioning, double-doors in the southwest elevation of the main block was originally the main entry to the warehouse. Additional entrances include a single garage bay with modern overhead door in the center of the facade and a pair of non-functioning double-doors in the southeast bay of the two-story addition. Most of the original window openings have been covered with modern plywood, except for a single rectangular opening in the gable on the facade containing a two-over-one, double-hung, wood sash window. Additionally, two openings on the southeast elevation contain the remains of two-over-one double-hung wood sash windows. A four-light, clerestory window on the main block of the building is located directly above the shed-roof of the northwest block. This window does not appear to be original.

HISTORICAL NARRATIVE
Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

Taunton native Sylvanus N. Staples (1811-1894) founded the Staples Coal Company in 1888. Staples had begun his career as a sailor and risen to become a prominent Taunton ship owner, merchant, and officer in Taunton financial institutions. Immediately before founding the Staples Coal Company, he was partner in the firm of Staples & Phillips, shippers and sellers of coal, iron, and other bulk commodities. In 1888, this firm was dissolved. Phillips went on to become owner of the Taunton Iron Works and Staples founded the Staples Coal Company. This firm tapped into the strong New England market for industrial and commercial fuels and gradually expanded to become one of the largest coal sellers in Taunton and southeastern New England. In the early twentieth century, the company was one of four dealers listed in the city directory and advertised a variety of coal types and brands as well as "auto-trucks for quick delivery" (Samson & Murdock Company 1920:349). In addition to the Dana Street facility, the company had a coal dock on the Taunton River and locations on Taunton Green and West Water Street in Taunton, as well as a second dock in Fall River. The company owned a fleet of six tugs and twenty-two barges that it used to transport

coal and coke from mid-Atlantic coal ports to New England. Staples' son Herbert (1848-?) joined the business in 1868 and became selling agent in 1888. In 1894, Staples died and Joseph Stickney of New York became president (Emery 1893:24-26, 55; *Fall River News* and *Taunton Gazette* 1899; Quinn 1892:478; Samson & Murdock Company 1920:349, 355, 356).

Historical maps show that Staples Coal Company established its facility on Dana Street between 1888 and 1893. Prior to 1893, the location was the site of the S.E. White Company Coal Pockets and a small, unnamed storage facility for dressed beef. The beef facility survives in altered form currently, its rail siding now enclosed in a clapboard addition. Between 1893 and 1897, the Staples Coal Company enlarged and then modified the site for its business, modifying the beef building for a store house and coal bagging facility, adding a second storehouse (now demolished) and replacing the S.E. White coal shed with a new coal trestle and pockets (now demolished). The coke silos were constructed between 1898 and 1937 (Sanborn Map Company 1888, 1893, 1898, 1937, 1950). At an unknown date, the Staples Coal Company left the Dana Street site, which is now used as a metal scrap yard.

Coal and coke were the primary fuels of Taunton's mid- and late-twentieth century industrial expansion when the Taunton Locomotive Works, William Mason's machine works, Taunton Copper Manufacturing Company (smelter and rolling mill), Reed & Barton, and numerous textile mills, stove shops, and other industries powered the city's economy. Coal was the primary fuel for steam engines that powered machinery in these works. Coke, a processed form of bituminous coal where volatile gasses and sulfur have been removed to create a more pure form of combustible carbon, was an important alternative to charcoal for metal-working industries such as those in Taunton. This fuel was generally available after ca. 1850 and was necessary to avoid contamination in applications where metals would be smelted or forged. It was also valued in certain applications for its "smoke-free" properties (Gordon and Malone 1994 131-132; 159; 265-266; MHC 1981:11, 15). Coke was loaded into the Staple Coal Company silos from rail cars and then sold and distributed via carts and trucks to local industries.

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1937 *Insurance Map of Taunton, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.
1950 *Insurance Map of Taunton, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

View looking west toward the southeast and northeast elevations of the warehouse at 28 Dana Street.

View looking west toward the northwest and northeast elevations of the warehouse at 28 Dana Street.

View looking west toward the southeast and northeast elevations of the coke silos at 28 Dana Street.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John Daly and Virginia H. Adams, PAL, December 2012
The criteria that are checked in the above sections must be justified here.

The Staples Coal Company Coke Silos and Warehouse is recommended eligible for listing in the national Register at the local level under Criteria A and C in the areas of industry and architecture. Under Criterion A, the property is significant for its associations with the Taunton coal and coke merchant trade and with the local metals industries in Taunton, for which coke was the primary fuel. Under Criterion C, the property is significant as an intact example of the coke silo, an industrial structure that is not represented elsewhere in Taunton and is unusual in the region. Although components of the silos and warehouse are now removed or altered, the structures retain the integrity necessary to convey their significance, and the alterations to the silos are mitigated by the relative scarcity of the structure.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
65//220/0/	Taunton		TAU.258

Town/City: Taunton

Place: *(neighborhood or village)*:

Address: 12 Porter Street

Historic Name: M.M. Rhodes & Son Company

Uses: Present: Industrial

Original: Industrial

Date of Construction: ca. 1870

Source: Historic maps

Style/Form: No style

Architect/Builder: Unknown

Exterior Material:

Foundation: Brick, Stone

Wall/Trim: Wood shingle, clapboard, brick

Roof: Asphalt shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* Concrete block connector addition, ca. 1950

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 1.15

Setting: The property is located in an urban area at 12 Porter Street, approximately 50 feet southwest of the Attleboro Secondary rail ROW.

Photograph

Locus Map

Recorded by: Q. Stuart, J. Daly, A. Cahoon

Organization: PAL

Date (*month / year)*: December, 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:
Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

The M.M Rhodes & Son Company complex consists of two major connected structures constructed between ca. 1870 and 1888, with later modifications. The paint shop is a one-and-one-half-story, six bay-long, wood-frame structure with two side ells. The main block has two asphalt shingle-clad gables topped by pairs of gable-roof cupolas and four, tall brick chimneys. An additional hip-roof cupola sits at the ridge of the cross gable. The structure is clad in clapboards with wide wood trim and rests on a brick foundation. A shed-roof ell, or drying room, attached to the north elevation also has wood clapboard siding. Windows in the main block and ell of the building consist primarily of six-over-six, wood, double-hung sash in rectangular openings with wood sills and trim. A brick, shed-roof lean-to is attached to the south elevation of the structure. The lean-to has six-over-six, wood, double-hung sash in segmental arch openings with wood sills and trim. Windows in the cupola consist of six-light wood awning sash. No entrances are visible from the public way. The interior of the paint shop has a brick floor and exposed structural framing and houses large, brick, japanning ovens, or annealing ovens. It appears as though all the original equipment is intact.

The three-story, three-bay-by-thirteen-bay, industrial loft is located immediately north of the paint shop. The brick structure has a shallow, gable roof with a plank soffit and four, narrow brick chimneys and a rubble stone foundation. Two, solid granite block steps lead to the primary entrance in the center of the west (facade), which consists of a pair of solid carved panel wood doors in a segmental arch opening with a two-light wood transom. Secondary entrances are located on the south elevation in segmental arch openings and include a single, wood door covered by a shed roof and a series of loading bays near the center of the elevation on the first, second, and third stories. Each of the loading bays has a wood panel door and solid granite lintel. The fenestration consists of evenly spaced, segmental arch openings containing single six-over-six, wood, double-hung sash windows with wood sills and splayed brick lintels. Flanking the primary entrance on the facade are pairs of one-over-one, wood, double-hung replacement windows. Additional replacement windows are located on the first story in the west bays of the north and south elevations. Some original equipment survives, including a hoist with chain and pulley in the center of the south elevation. The loft is connected to the paint shops via a combination one- and two-story, L-shaped concrete and brick structure. The north end of the connector, connected to the loft's east elevation, is one-story and has concrete block walls, a shallow shed roof, and large eight-light aluminum windows and a loading bay on the north elevation. The concrete block portion leads to a two-story, brick section of earlier construction, with a shallow gable roof and segmental arch window openings. A one-story, shed-roof brick ell with two large chimneys connects the two-story portion of the building to the east elevation of the paint shop.

HISTORICAL NARRATIVE
Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

Marcus M. Rhodes established the M.M. Rhodes & Son Company in 1861 for the manufacturing of hoop-skirt trimmings. The company later produced papier-mâché shoe buttons, reported to be the first in the country to use this material for such a product. The company later concentrated on the manufacturing of upholstery buttons and shoe laces. The factory on Porter Street was originally constructed in the 1870s and consisted of a main factory building set back from the road and a smaller secondary building. By 1888, the original ca. 1870 building contained the cutting machines and machine shops and an addition housing the blacksmith shop and varnishing furnaces was constructed on the west elevation. Also constructed at this time was the three-story brick loft that served as office space, storage and machine rooms and the only two-story, wood-frame building on the property

that housed the japanning ovens, also known as the Japan house, and drying room in the ell. Japanning is the process of applying lacquer to a product meant to imitate the lacquer traditionally produced in Japan and other Asian countries popular in the seventeenth and eighteenth century. Traditionally the technique is applied to wood, but the Rhodes Company applied the coating to paper-mâché shoe buttons, providing them with a hard-coat surface. The process was typically a three-step process requiring the application, drying and polishing to occur at least three times to produce a high polish finish.

The company had grown to include eight buildings by 1893. The expansion included multiple detached buildings at the south end of the property, primarily used for storage, and an addition to the varnishing furnace room connecting it to the Japan house. By 1937, the Rhodes company turned to the manufacturing of upholstery and wire nails, which was supplied to regional utility companies. The original machine shop and cutting room was gone, but additional storage was added to the Japan house, which had been converted into a paint shop. An addition on the east elevation of the office building was constructed in the 1950s. M.M. Rhodes & Sons Co. is still owned by members of the Rhodes family and still operates a factory producing insulated staples on the property (Stone 1930:235; Sanborn 1888, 1893, 1898, 1937, 1950).

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1979 *MHC Form B – Rhode Button Factory, Taunton*. On file at MHC, Boston MA.

Photo 2. View east of the west elevation of the paint shop.

Photo 3. View northeast of the paint shop cupolas.

Photo 4. View east of the paint shop and drying room ell.

Photo 5. View east of the west (facade) and north elevations of the office building.

Photo 6. View northeast of the south elevation of the office building, with some original equipment and loading bays intact.

Photo 7. View east toward the west elevation of the concrete block and brick connector.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John Daly, Quinn Stuart, Virginia Adams, PAL, December 2012
The criteria that are checked in the above sections must be justified here.

The M.M. Rhodes & Son Company is eligible for listing in the National Register at the local level under Criteria A and C. Under Criterion A, the property possesses significant historical associations with the nineteenth-century industrial development of Taunton, specifically in metal fasteners and as an early producer of papier-mâché shoe buttons. It was part of a large local network of railroad served or iron-related industries, and is still in continuous use by the original company. Under Criterion C, the complex is an excellently preserved example of mid-nineteenth century industrial architecture, and a rare surviving concentration of historical small-scale railroad-served industries in Taunton.

APPENDIX F

Historic Resources Surveyed and Not Eligible, Out of APE, or Demolished Forms

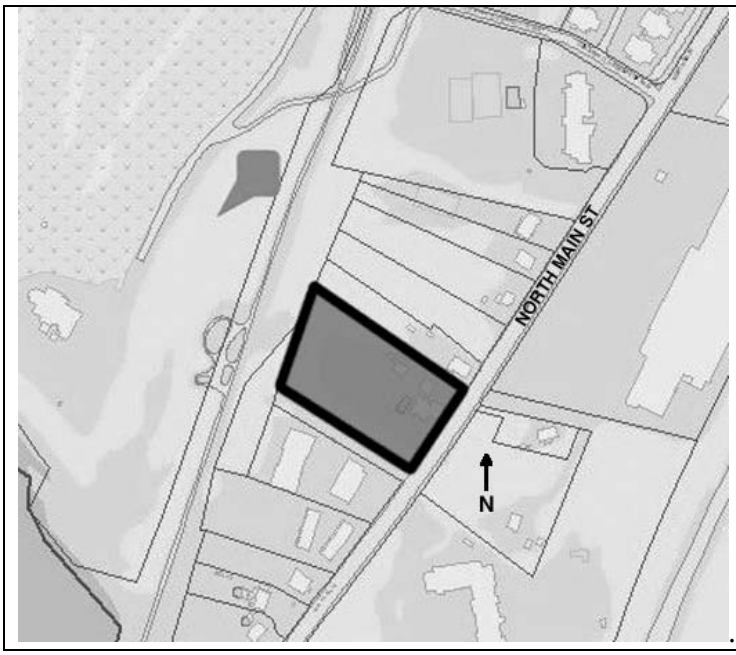
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
X-03-0005	Somerset		FLR.0284

Photograph

Locus Map



Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 4042 North Main Street

Historic Name: Hathaway, Jael House

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1785

Sources: Rosebrock 1977, Earl 1877, Hurd 1883

Style/Form: Federal

Architect/Builder: Unknown

Exterior Material:

Foundation: Parged Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
One detached, English style barn

Major Alterations *(with dates):*
Early-20th-century front porch addition, Mid- to late-20th-century modifications in materials.

Condition: Fair

Moved: no ☒ **yes** ☐ **Date:**

Acreage: 2.5

Setting: The property is located along a thoroughfare in a mixed residential and commercial area, approximately 400 feet east of the Fall River Secondary right-of-way.

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Jael Hathway House at 4042 North Main Street, built circa 1785, is a rectangular, two-and-one-half-story, five-bay by three-bay, side-gabled, wood-framed, Federal style house with early 19th century and similarly styled one-story rear hipped-roof ell additions sheathed in clapboard and vinyl siding. The house shares a relatively flat, slightly sloping lot with a circa 1820 English barn, a non-historic outbuilding, and pool. A non-historic wooden fence extends across the eastern boundary line, interrupted by two sets of granite stairs, a walkway, and a paved driveway. Plantings immediately surround the footprint of the house. The building has an asphalt roof pierced by a large central brick chimney, wood-shingle siding, and a parged stone foundation. A molded cornice wraps around the roofline of the building, with returns at the gable end. Across the east-facing facade, the cornice is dentilated. The main entrance is simple, with Doric columns and pilasters with a beveled door surround and dentilated cornice. The fenestration is regular, with original openings and similarly styled six-over-one mixed historic double-hung wood sash and non-historic vinyl windows that have decorative exterior shutters. The detached English barn is a rectangular, side-gabled building oriented east, with an asphalt roof, clapboard siding, and a foundation not visible from the public way. The barn features prominent iron-strap hinged wooden doors built of diagonal boards with a simple door surround and a molded cornice. A similarly designed hay door and two-over-two double hung wood sash window, along with an iron hay fork, sit within a dominant centered gable. The façade also features two non-historic, single-pane, fixed windows with decorative exterior shutters.

HISTORICAL NARRATIVE

The property is speculated to have been commissioned by Jael Hathaway, captain of a Freetown battalion of Loyalists during the American Revolution around 1785. The Jael Hathaway House was prominently situated on a raised landscape along a thoroughfare. The portion of Freetown that included this property was annexed to Fall River in 1858. A written description of the property from 1894 described the building as having a wood divided door, secured with a horizontal wood beam at the main entrance (French 1894:122). The first owner, for whom the house is named, was a former American Revolutionary War Loyalist captain named Jael Hathaway (1719-1811). Following his marriage in 1785, Hathaway allegedly bought the property for his new wife, Elizabeth. Between two wives, Hathaway bore nine children. The property subsequently remained in the Hathaway family for over a century, falling under the ownership of his son Russell, and his grandson David (State of Massachusetts 1739; Earl 1877; Hurd 1883; Winslow n.d.; Rosenbrock 1977). Presently, the property is no longer prominent within its surroundings, as it sits on a relatively flat topography. Despite being an early local example of a Federal style house associated with a Loyalist captain, the Jael Hathaway House is not eligible for listing in the National Register of Historic Places and the integrity has been compromised with a change in topography and the introduction of non-historic, synthetic materials to the building.

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Rosebrock, Ellen
1977 *MHC Building Form: Jael Hathaway House*. On file, Massachusetts Historical Commission, Boston, MA.

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n.d. "Old Houses," Typescript. On file, Fall River Historical Society, Fall River, MA.

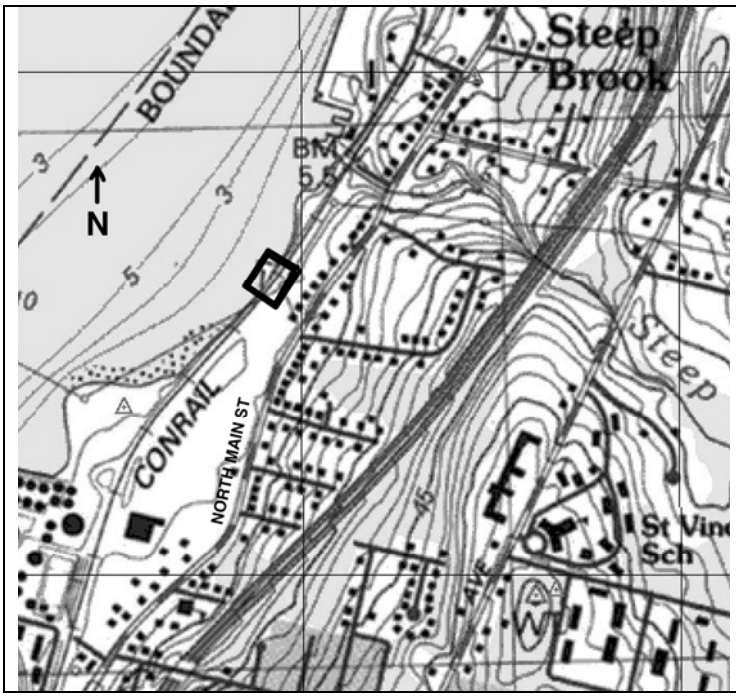
FORM F – STRUCTURE (BRIDGE)

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
Unassigned	Fall River		

Photograph

Locus Map



UTM Reference: 0322593 E; 4622939 N
Recorded by: J. Daly, A. Cahoon
Organization: PAL
Date (*month / year):* December 2012

Town/City: Fall River

Place *(neighborhood or village):*
Steep Brook

Street/Route: Fall River Secondary Line Railroad ROW

Carried over: Unnamed gravel lane
(Railroad, river, brook, canal or road)
Historic/Common name: Bridge No. 8.58
(previously Bridge No. 34.83 over Ashley's Underpass)

Ownership: MassDOT
(Name of state agency or municipality)
Mass. Highway bridge no.:

Bridge type: Stringer/Girder

Bridge typology code 1:1 2:9 3:1 4:10

Date of Construction: Ca. 1950

Source: Visual analysis

Engineer/Designer: Unknown

Bridge company/Contractor: Unknown

Material (s): Wood, granite

Alterations *(with dates):* Extensively repaired or reconstructed after 1995

Posted load limit *(if any):* None

Condition: Good

Moved ☒ **no** ☐ **yes** **Date:**

Acreage: <1.00

Setting: The Railroad Bridge No 8.58 near Ashley Street carries the Fall River Secondary railroad track across an unnamed gravel lane in the Steep Brook neighborhood. The railroad right-of-way runs on a north-south alignment between a neighborhood of late-nineteenth and early-twentieth-century residential properties along North Main Street to the east and the Taunton River immediately to the west. The lane extends from the street approximately 300 feet down a slope to a stone pier on the river.

Superstructure:

Overall length: 23.0 ft Deck width: 10.5 ft Skew: 0
Main unit: No. of spans: 1 Span length: 16.5 feet
Approaches: No. of spans: Span length:

Substructure *(structure below deck)*

Height above feature spanned: 6 ft Material of abutments or piers: Granite abutments, wood pier

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ENGINEERING/DESIGN ASSESSMENT

The Railroad Bridge No. 8.58 near Ashley Street is a single-track, single-span, timber stringer deck bridge. The bridge is supported near its midpoint with a timber pier and rests on stone abutments. The open bridge deck extends 16 feet, 6 inches between the abutment faces and is 10 feet, 6 inches wide between its outer edges. There is approximately 6 feet of clearance between the underside of the deck and the lane. The deck is assembled from two timber stringers that directly support the creosoted wood railroad ties and track. Each stringer is composed from five 8 inch-wide by 16 inch-deep creosoted timbers bolted together. The timber pier is spaced off-center below the bridge deck, 9 feet from the north abutment. It consists of a bent assembled from 12-inch-square wood posts and a cap braced with 2 inch-thick planks. The pier is supported on a timber mattress or footing that resting directly on the gravel lane surface. The mortared granite abutments are wide enough to accommodate two tracks and have stepped angled wingwalls. Each abutment is about 35 feet long and 6 feet high. The abutments are composed of massive, tabular and irregular split granite blocks with ¾-inch drill marks. The stringers rest on wood planks set on the abutment seats. There is no identification or date information attached to the structure.

HISTORICAL NARRATIVE

The railroad right-of way at the Railroad Bridge near Ashley Street was established 1838-1839 by the New Bedford & Taunton Railroad, which was merged into the New Bedford Railroad in 1874. In 1879, the route was incorporated into the Old Colony's sprawling network of southeastern Massachusetts railroads, which were in turn incorporated into the New York, New Haven & Hartford Railroad in 1893. The New Haven operated the line until 1969, after which it was under the ownership of the Penn Central Railroad (1969-1976); Conrail (1977-1999) and CSX (2000-present). No plans or annual reports documenting the construction of this bridge could be obtained. The wharf associated with this bridge, but not the bridge itself, first appears on the 1895 map of Fall River. The structure appears on the 1915 New Haven railroad valuation map as Bridge No. 34.83 over Ashley's Underpass and is identified as a wood stringer structure. Based on a comparison of existing conditions with previous bridge inspection reports, the span appears to have been replaced or extensively reconstructed within the last 15 years (Everts & Richards 1895; Karr 1995:327–330; New Haven 1915; VHB 1995).

The Railroad Bridge near Ashley Street is not recommended eligible for listing in the National Register. This small example of timber stringer bridge was recently reconstructed and contains no noteworthy engineering features.

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View of pier and underside of deck of Railroad Bridge No. 8.58, looking south.

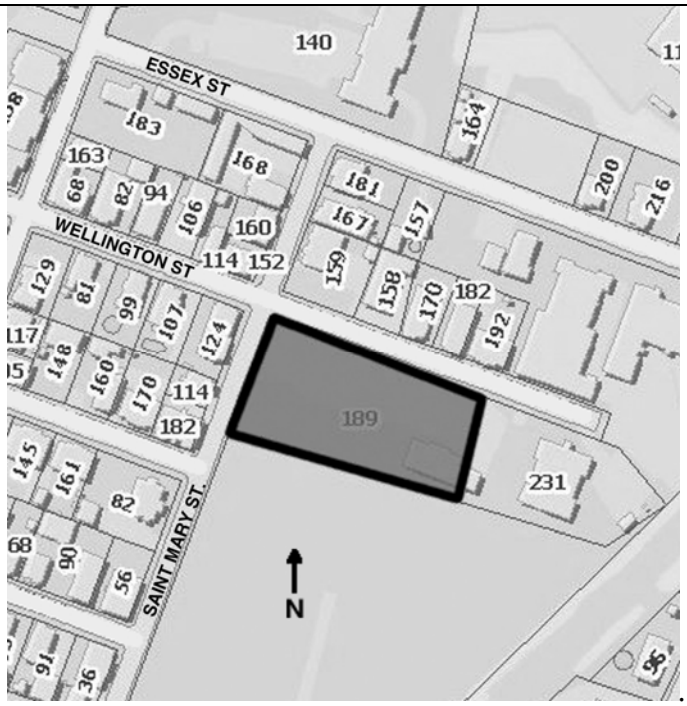
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
S-17-0045	Fall River		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year)*: December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 189 Wellington Street

Historic Name: St. Matthew's Convent

Uses: Present: Residential

Original: Ecclesiastical

Date of Construction: Circa 1920

Source: Style/Visual Assessment; Sanborn Map Company 1905; 1933.

Style/Form: Colonial Revival

Architect/Builder: Unknown

Exterior Material:

Foundation: Granite Block

Wall/Trim: Brick/Concrete Trim

Roof: Unknown – Not Visible

Outbuildings/Secondary Structures: Attached single-car garage.

Major Alterations *(with dates):* 20th-century window replacements.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 1.19

Setting: The property is located in a predominantly residential, urban community within the Wellington-Brownell Street Area. The building is approximately 300 feet west of the Fall River Secondary right-of-way at 189 Wellington Street.

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

St. Matthew's Convent is a rectangular, three-story, nine-bay by three-bay, brick building constructed in the Colonial Revival style around 1920 with a full-height octagonal staircase addition, a two story full-width porch and an attached single car garage. The building is set along the south boundary of a relatively flat lot lined with a chain-link fence. The lot consists largely of a paved parking lot just north of the building. The building has a flat roof, brick walls of common bond, a concrete water table, and a rough-cut granite foundation. The north-facing facade has a stepped-up parapet roof with a carved concrete keystone above a molded wood cornice that wraps around the remainder of the building at the roofline. This elevation has a two-story centered bay with a molded wood cornice and a pedimented entryway featuring ionic pilasters, a three-light transom, and a non-historic wood paneled door. Fenestration is regular, with simple rectangular openings and non-historic, one-over-one, vinyl windows featuring brick lintels and concrete sills. A brick corbelled chimney pierces the southwest corner of the roof. The full-width two-story porch extends from the western elevation. While the second story is enclosed and sheathed in vertical wood boards and paired non-historic windows, the first story remains open with a lattice balustrade and simple, squared supports.

HISTORICAL NARRATIVE

St. Matthew's Convent was constructed circa 1920 with St. Matthew's Roman Catholic Church to the west; St. Matthew's Parochial School to the east; St. John's Cemetery to the south; and St. Michael's Roman Catholic Church Sunday School, apartments, and St. Michael's Roman Catholic Church to the north (from west to east). The building was constructed as part of the St. Matthew's Roman Catholic Church complex, consisting of the circa 1910 St. Matthew's Roman Catholic Church (demolished between 1971 and 1996) and the circa 1920 St. Mathew's Parochial School (Sanborn Map Company 1905; 1933; 1933-1950).

The building's construction occurred during a transitional period in Fall River history when construction in Fall River was moving from ecclesiastical buildings to educational buildings. Several massive ecclesiastical buildings were constructed in the late nineteenth century. Catholic properties built during this era included Saint Joseph's Roman Catholic Church (MHC No. FLR.240) and several properties constructed by Louis G. Destremps, a local architect of Catholic properties, including Saint Anne's Roman Catholic Church (MHC No. FLR.1534), Saint Anne's Rectory (MHC No. FLR.1535), Saint Anne's Convent (MHC No. FLR.1521), St. Joseph's Orphanage (MHC No. FLR. 1536), Notre Dame School (MHC No. FLR.1529), and the Jesus Marie Convent (FLR.1528) (MHC 1982).

St. Matthew's Convent was associated with St. Matthew's Roman Catholic Church, which was likely established around 1910. The church building faced west with 130-foot flanking towers, a central nave, and 60-foot-high, pilastered interior walls. The property that served St. Matthew's Church previously operated as ecclesiastical organizations, including St. John Baptist Church in 1836, St. Matier's Roman Catholic Church by 1893, St. Mary's Roman Catholic Church from 1905 at the latest until about 1910. St. Mary's Roman Catholic Church was established at a different location in 1855, when it was founded by Reverends Edward Murphy, Richard Hardy, and John Corry. Assistant St. Mary's pastors (from 1855 until 1901) included Reverends John O'Connel, Cornelieus McSweeney, Reverends Louis Dady and James A. Gleason (Sanborn Map Company 1933; 1933-1950; Hurd 1883:361; Jewett 1901:305-306).

The St. Matthew's Convent is not individually eligible for listing in the National Register on its own merit, as it has lost integrity of association to the St. Matthews Roman Catholic Church complex, with the loss of the Church in the late-twenty-first century.

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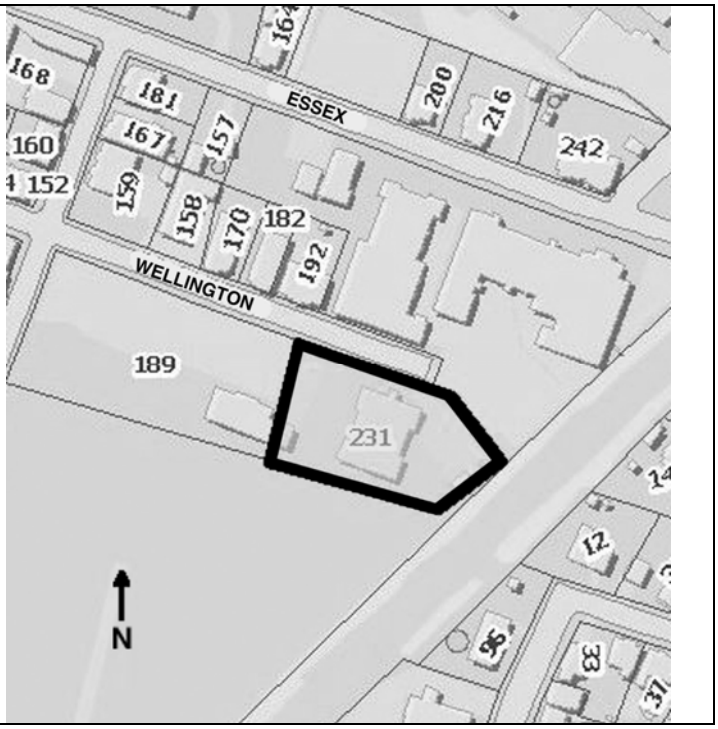
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
S-17-0044	Fall River		

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year)*: December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 231 Wellington Street

Historic Name: St. Matthew's School

Uses: Present: Residential

Original: Ecclesiastical

Date of Construction: Circa 1915

Source: Style/Visual Inspection; City of Fall River 1917; Sanborn Map Company 1905

Style/Form: Colonial Revival

Architect/Builder: Unknown

Exterior Material:

Foundation: Concrete Block

Wall/Trim: Brick/Concrete Trim

Roof: Unknown – Not Visible

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* Significant late 20th-century modifications of the side and main entrances, including the removal of the main staircase and the addition of an enclosed entry on the north elevation.

Condition: Good

Moved: no ☒ **yes** ☐ **Date:**

Acreage: Less than 1 acre

Setting: The property is located in a predominantly residential, urban community in the Wellington-Brownell Street Area. The building stands along the eastern boundary of the Fall River Secondary right-of-way.

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

Constructed circa 1915, St. Matthew's School is a rectangular, two-story, nine-bay by seven-bay, Colonial Revival style brick building with a raised basement. The building sits on a slightly sloping lot bordered by a concrete wall and chain-link fence. A paved walkway with an iron railing leads from Wellington Street to the north-facing facade. The building has a flat roof with a parapet and copper flashing, a concrete entablature that wraps around the building, brick common bond walls, a concrete water table, and a concrete block foundation. Fenestration is regular, with rectangular window openings and concrete lintels and sills. The main entrance, which historically faced west, consists of a paneled concrete door surround with a broken scroll pediment. A secondary entrance, which is now the main entrance to the building, is similarly styled with a pedimented concrete opening.

During late-twentieth century, the main entrance to the building, which once faced west, was altered to face north. Modifications include the removal of a large staircase that lead up to the west elevation, the replacement of the original entrance with a paired window, and the construction of a segmental arched brick entryway with a glass door. All historic windows were replaced with infill and aluminum sliding windows. Aluminum sliding windows were also installed along the cornice.

HISTORICAL NARRATIVE

St. Matthew's School was constructed circa 1915 with St. St. Matthew's Covenant and St. Matthew's Roman Catholic Church to the west; the New York, New Haven, and Boston Railroad right-of-way to the east, St. John's Cemetery to the south; and St. Michael's Roman Catholic Church Sunday School, apartments, and St. Michael's Roman Catholic Church to the north (from west to east). The building was constructed as part of the St. Matthew's Roman Catholic Church complex, consisting of the St. Matthew's Roman Catholic Church (established circa 1910 and demolished between 1971 and 1996) and the circa 1920 St. Mathew's Convent. By 1917, 430 students were enrolled in the school (City of Fall River 1918:641; Sanborn Map Company 1905; 1933; 1933-1950).

The building's construction occurred during a transitional period in Fall River history when construction in Fall River was moving from ecclesiastical buildings to educational buildings. Several massive ecclesiastical buildings were constructed in the late nineteenth century. Catholic properties built during this era included Saint Joseph's Roman Catholic Church (MHC No. FLR.240) and several properties constructed by Louis G. Destremps, a local architect of Catholic properties, including Saint Anne's Roman Catholic Church (MHC No. FLR.1534), Saint Anne's Rectory (MHC No. FLR.1535), Saint Anne's Convent (MHC No. FLR.1521), St. Joseph's Orphanage (MHC No. FLR. 1536), Notre Dame School (MHC No. FLR.1529), and the Jesus Marie Convent (FLR.1528) (MHC 1982).

St. Matthew's School was associated with St. Matthew's Roman Catholic Church, which was likely established around 1910. The church building faced west with 130-foot flanking towers, a central nave, and 60-foot-high, pilastered interior walls. The property that served St. Matthew's Church previously operated as ecclesiastical organizations, including St. John Baptist Church in 1836, St. Matier's Roman Catholic Church by 1893, St. Mary's Roman Catholic Church from 1905 at the latest until about 1910. St. Mary's Roman Catholic Church was established at a different location in 1855, when it was founded by Reverends Edward Murphy, Richard Hardy, and John Corry. Assistant St. Mary's pastors (from 1855 until 1901) included Reverends John O'Connel, Cornelieus McSweeney, Reverends Louis Dady and James A. Gleason (Sanborn Map Company 1933; 1933-1950; Hurd 1883:361; Jewett 1901:305-306).

Over time, this property has lost integrity of design, with significant non-historic alterations of the original west-facing entrance and addition of a non-historic, modern main entrance on the northern elevation and as a result, the St. Matthew's School is not individually eligible for listing in the National Register of Historic Places.

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1917 "Report of the Board of Health for the Year Ending December 31, 1917." Fall River City Documents. Fall River, MA.

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1883 History of Bristol County, Massachusetts. J.W. Lewis & Co., Philadelphia, PA.

Jewett, Sarah Orne
1901 New England Magazine: An Illustrated Monthly, Vol. 24. Warren F. Kellogg, Boston, MA.

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1982 MHC Reconnaissance Report: City of Fall River. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

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1933 Bristol County, Fall River, Massachusetts Insurance Maps. Sanborn Map Company, New York, NY.

1933-1950 Bristol County, Fall River, Massachusetts Insurance Maps. Sanborn Map Company,New York, NY.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
O-21-0006	Fall River		

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 800 Davol Street

Historic Name: Residence / Inn

Uses: Present: Commercial

Original: Residential/Commercial

Date of Construction: Circa 1910

Source: Sanborn Map Company 1905; 1933; Style/Visual Inspection

Style/Form: French Second Empire

Architect/Builder: Unknown

Exterior Material:

Foundation: Unknown – Not Visible

Wall/Trim: Vinyl

Roof: Faux Slate

Outbuildings/Secondary Structures: One late-20th-century, three-bay garage.

Major Alterations *(with dates):* Between 2003 and 2004, the building was extensively renovated with the addition of a Neocolonial style, wrap-around porch and the replacement of historic fabric with synthetic materials.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.245

Setting: Situated in an isolated urban residential neighborhood between Mount Hope Bay and Route 79, the building is located approximately 400 feet from the proposed Fall River Depot Station on the Fall River Secondary right-of-way.

Photograph

Locus Map

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Davol Street Inn is an ell-shaped, two-and-one-half-story, five-bay by three-bay, wood-frame, French Second Empire style building constructed circa 1910 with a central, three-story tower extending from the south-facing facade. The building sits on a relatively flat lot with concrete curbing and a large paved parking lot to the north, bound by a wood fence. The building has mansard roof with pedimented dormers. The main entrance features a broken scroll pediment and plain pilasters with a non-historic vinyl paneled door. The building was updated in the early twentieth century with a Colonial Revival style enclosed rear porch and entrance surrounds. Non-historic vinyl windows, other vinyl building materials, faux slate roof material, and a Neocolonial style wrap-around porch with a dentilated cornice and simple balustrade were added to the property between 2003 and 2004.

HISTORICAL NARRATIVE

Circa 1910, the Davol Street Inn, located at 800 Davol Street, was constructed in the French Second Empire style just two blocks west of the Fall River railroad station and several blocks south of the Fall River Yacht Club pier. Three wood-framed outbuildings formerly existed to the north of the building, beginning on a portion of the property now occupied by a parking lot (Sanborn Map Company 1905; 1933; 1933-1950). Between 2003 and 2004, the property was extensively renovated with vinyl windows and a Neocolonial style wrap-around porch. All historic fabric has been replaced with non-historic vinyl and faux slate. The modifications to the building have resulted in a loss of integrity necessary to convey any architectural significance and building is not eligible for listing in the National Register of Historic Places.

BIBLIOGRAPHY and/or REFERENCES

Sanborn Map Company
1905 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1933 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1933-1950 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

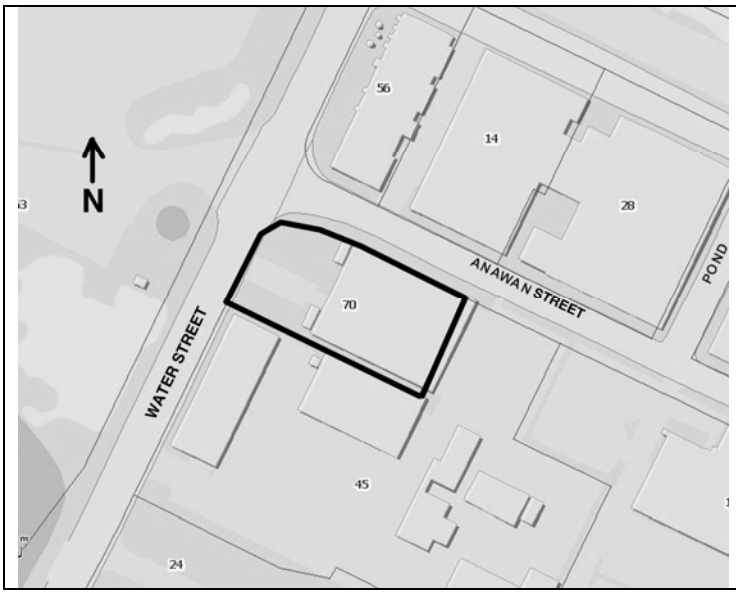
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
N.16.0001	Fall River		

Photograph

Locus Map



Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date (*month / year)*: December 2012

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 70 Water Street

Historic Name: American Printing Company Machine Shop

Uses: Present: Marine Museum at Fall River

Original: Machine Shop

Date of Construction: 1900

Source: Foster 1916, Sanborn Map Co. 1905

Style/Form: Vernacular industrial

Architect/Builder: Unknown

Exterior Material:

Foundation: Granite

Wall/Trim: Brick

Roof: Rubber membrane

Outbuildings/Secondary Structures:

Major Alterations *(with dates):* Museum addition to west facade and interior alterations (date unknown).

Condition: Good

Moved: no ☒ **yes** ☐ **Date:**

Acreage: 0.438

Setting: The American Printing Company Machine Shop, now the Marine Museum at Fall River, is a set on a low-lying terrace adjacent to the Taunton River that is occupied by densely built-up industrial lofts, warehouses, and railroad and port infrastructure. It occupies a corner lot at the intersection of Anawan and Water streets with a deep, landscaped setback from Water Street and a shallower paved setback from Anawan Street. The Water Street frontage is landscaped with grass, shrubs, and museum exhibit pieces. A gas pipe railing anchored in hammered granite blocks divides the Anawan Street sidewalk from the north elevation of the building. Parking and alleyways flank the east and south sides of the building, respectively.

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The American Printing Company Machine Shop is a typical early twentieth-century, vernacular industrial mill loft. The eleven-bay-by-eight-bay, brick industrial building is constructed on a rectangular plan and has two full stories as well as a partially-exposed basement. The subtly-pitched "flat" gable roof is clad in rubber roll roofing and has open soffits with exposed, beveled rafter tails and plank cornice molding. Two low brick chimneys pierce the northeast corner of the roof. The brick walls are laid in common bond with regularly-spaced window openings having brick segmental arch lintels and quarry-faced granite sills. Composite panels have replaced the entirety of the window sash. A low granite water table runs around the building. The altered entry is placed on the west end of the building and set within a modern brick vestibule with an arched roof and aluminum and glass door and surround. A large steel channel and composite panel sign and flanking towers, which is intended to evoke the appearance of a wood steamship's superstructure, has been constructed across the west elevation. A hoist and pulley block projects from the second floor above the entry, but the associated loading bay is now filled with a composite panel.

The loft interior is occupied by the public exhibit and museum storage areas of the Marine Museum at Fall River. Where still present, historical architecture finishes are typical of period fire-resistive mill construction and include heavy timber and cast iron framing, plank ceilings, and painted brick walls. Flooring utilized a combination of brick and concrete surfaces, with large wood and granite blocks for machine pads remaining from the building's earlier use. A mezzanine level has been inserted into the center of the building and stairwells have been updated with new materials.

HISTORICAL NARRATIVE

American Printing Company, which was one of Fall River's earliest and largest textile concerns, was founded in 1834 by Holder Borden, whose holdings also included the Fall River Iron Works Company (see area form FLR.J). Borden and his sons steadily expanded the firm over the next 30 years despite occasional market setbacks and a major fire. In the 1870s, these losses necessitated new capital, and the company reorganized as the American Print Works with brothers Thomas J. and Matthew C.D. Borden as chief officers. M.C.D. Borden consolidated ownership of the company over the next decade, and then embarked on a massive construction campaign located west and north of Anawan Street to expand printing capacity and add cloth manufacturing to his enterprise. The Machine Shop was constructed in 1900 as part of this program. Following the collapse of the New England textile industry in the 1920s and the demise of the American Printing Company, the Machine Shop was occupied by a series of manufacturing and light industrial tenants, including a manufacturer of mops. It is now owned and occupied by the Marine Museum at Fall River, who have substantially renovated the structure for use as display galleries and meeting spaces (Foster 1916:5-8, 341-343; Stone 1930:165-168).

The neighboring American Printing Company complex (FLR.J), located north of Anawan Street, was listed in the National Register as part of the Fall River MRA in 1983, but the Machine Shop was excluded from the Area Form and National Register nomination (Fox 1982; Frontiero et al. 1982). The Machine Shop is not recommended individually eligible for listing in the National Register. The property has marginal associations with the American Printing Company and it has suffered a loss of integrity because of recent alterations associated with its conversion to an exhibit hall.

BIBLIOGRAPHY and/or REFERENCE

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1916 *Lamb's Textile Industries of the United States.* Volume I. James H. Lamb, Boston, MA**.**

Fox, Pamela
1982 American Printing Co. (Including Metacomet Mill). Form A – Area Form. On file Massachusetts Historical Commission, Boston, MA.

Frontiero, Wendy, Vivienne Lasky, Peter Stott and Sarah Zimmerman
1982 Fall River Multiple Resource Area, National Register of Historic Places Inventory – Nomination Form. On file, Massachusetts Historical Commission, Boston, MA.

Sanborn Map Company
1905 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

1933 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

1950 *Insurance Map of Fall River, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

Stone, Orra L.
1930 *History of Massachusetts Industries, Volume I.* The S.J. Clarke Publishing Co., Boston, MA.

Rear elevation of American Printing Company Machine Shop.

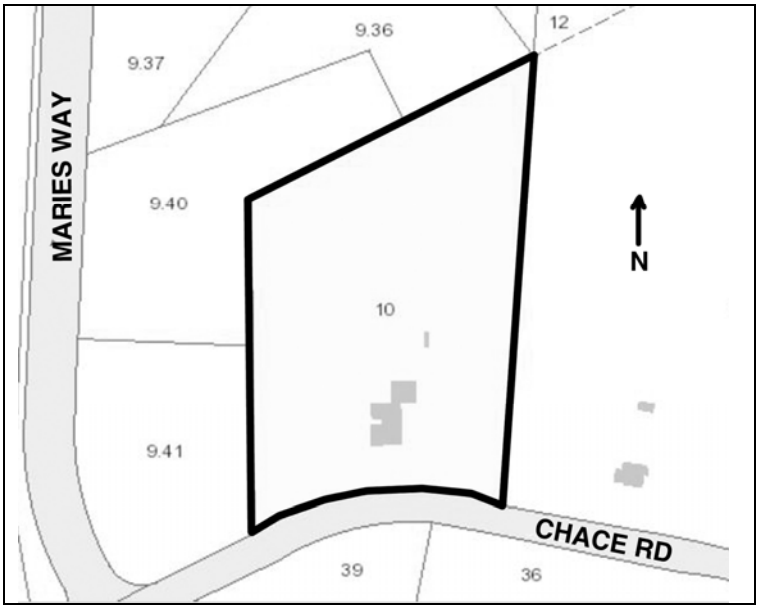
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
228-10-0-R	Assawompset Pond		FRE.166

Photograph

Locus Map



Town/City: Freetown

Place: *(neighborhood or village)*:

Address: 76 Chace Road

Historic Name: Cummings, George House

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1806

Source: Thomas 1978; Style/Visual Inspection

Style/Form: Cape

Architect/Builder: Unknown

Exterior Material:

Foundation: Granite

Wall/Trim: Wood Clapboard

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: One detached 19th-century barn.

Major Alterations *(with dates):* Mid-19th-century rear addition and inset entry porch.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 2.593

Setting: Within a predominantly rural, residential area, the building is oriented south toward a commercial cranberry bog across Chace Road and north of a heavily forested landscape. The property is located approximately 400 feet west of the New Bedford Main Line right-of-way

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The George Cummings House is a rectangular, five-bay by three-bay, one-story, wood framed Cape Cod cottage constructed circa 1806, with a late-nineteenth-century, one-story, side-gabled, rear addition that extends east and a secondary Queen Anne-style inset porch. The building has a side gable asphalt roof, wood clapboard siding, a mortared granite foundation, and a central brick chimney. The south-facing building sits on a slightly sloping, moderately wooded lot with plantings dotting the property. A short wood picket fence extends along the road, breaking for an unpaved driveway loop that surrounds the building. A molded wooden cornice wraps around the building at the roof line. Fenestration on the building consists of rectangular openings with wood molded lintels and sills and twelve-over-twelve double-hung windows. The main entrance piercing the center of the facade has a plain surround and a replacement wood paneled door with four lights. The secondary two-bay by two-bay Queen Anne-style inset porch is supported by three turned posts and a free classic balustrade. A detached barn constructed circa 1820 stands in the northeast corner of the property, with vertical wood sheathing board siding, an asphalt roof, and a central cupola piercing the ridgeline.

HISTORICAL NARRATIVE

The George Cummings House at Chace Road was constructed circa 1806 in the Cape Cod style, most likely for the man whom the house is named. George Cummings was involved in town as a selectman and town assessor, and served in the war of 1812. George Cummings belonged to the second Freetown company (of two) for the War of 1812. In 1834, and between 1836 and 1837, George Cummings became a town assessor, and collectively raised a total of $4,500 for the town. Between 1837 and 1839, and again in 1841, Cummings was elected as one of the town selectmen (J.H. Franklin & Co. 1902:75, 140, 146). By the mid- to late-nineteenth century, the property was transferred into the Chace family, and in 1871, is listed under the ownership of A.H. Chace. By the 1880s, O. Chace owned the property and his heirs took over by 1895 (Beers 1871; Everts & Richards 1895; Thomas 1978).

There are other, better-preserved examples of late eighteenth- to early nineteenth-century Cape Cod style properties throughout Freetown; including the Charles A. Morton House (MHC No. FRE.133), the Hathaway House (MHC No. FRE.163), Dr. James Ashley House (MHC No. FRE.100), the Hopkins-Briggs House (MHC No. FRE.9), the Dr. Bradford Braley House (MHC No. FRE.150), and residences at 26 Forge Road (MHC No. FRE.67), and 21 Forge Road (MHC No. FRE.66). Therefore, this property is not individually eligible for listing in the National Register of Historic Places (MHC 1981).

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Beers, Frederic W.
1871 *Atlas of Bristol County, Massachusetts.* F.W. Beers and Company, New York, NY.

Everts & Richards Co.
1895 Atlas of Bristol County, Massachusetts. On file, Freetown Historical Society, Freetown, MA.

J.H. Franklin & Co.
1902 *A History of the Town of Freetown, Massachusetts*. J.H. Franklin & Co., Fall River, MA.

Massachusetts Historical Commission (MHC)
1981 *MHC Reconnaissance Survey Report: Town of Freetown*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Thomas, Helen
1978 *MHC Building Form: George Cummings House (FRE.166)*. Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

View looking northwest towards the barn.

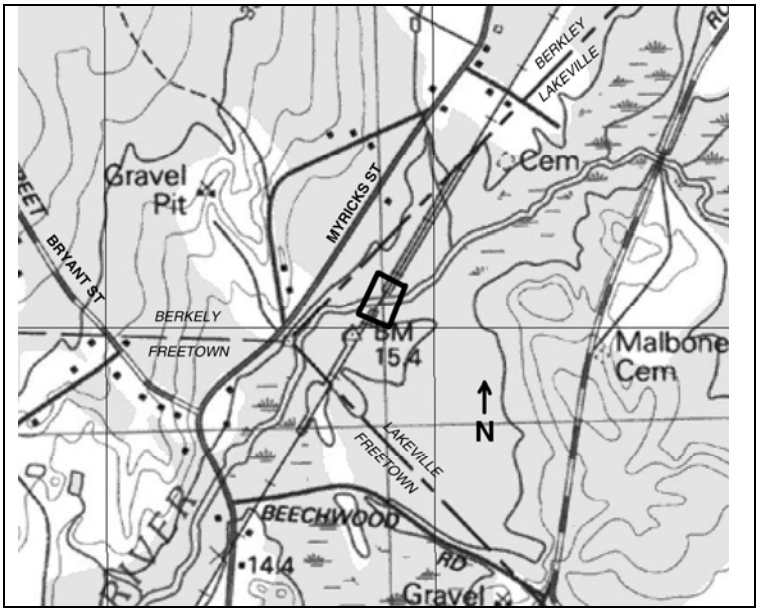
FORM F – STRUCTURE (BRIDGE)

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
Unassigned	Somerset		

Photograph

Locus Map



UTM Reference: 0331055 E; 4631495 N
Recorded by: J. Daly, A.Cahoon
Organization: PAL
Date (*month / year):* December 2012

Town/City: Lakeville

Place *(neighborhood or village):*
Myricks

Street/Route: Fall River Secondary Line

Carried over: Assonet River (a/k/a Cedar Swamp)

Historic/Common name: Railroad Bridge No.0.92 (previously No. 8.24 over Assonet River)

Ownership: MassDOT
(Name of state agency or municipality)

Mass. Highway bridge no.:

Bridge type: Plate girder

Bridge typology code 1:1 2:2 3:1 4:18

Date of Construction: 1908

Source: New Haven 1908

Engineer/Designer: Unknown

Bridge company/Contractor: Unknown

Material (s): steel, granite, wood

Alterations *(with dates):*
None

Posted load limit *(if any):* None

Condition: Fair

Moved ☐ **no** ☒ **yes** **Date:** 1908

Acreage: <1.00

Setting: Railroad Bridge No. 0.92 over the Assonet River carries the Fall River Secondary Line over the Assonet River in the forested southwest corner of Lakeville. The structure is located 0.92 miles south of Myricks Junction, where the Fall River Secondary intersects with the New Bedford Main Line.

Superstructure:

Overall length: 60 ft	Deck width: 10 ft	Skew:	0
Main unit: No. of spans:	3	Span length:	19.5 ft – 23 ft
Approaches: No. of spans:		Span length:	

Substructure *(structure below deck)*

Height above feature spanned: 5 ft Material of abutments or piers: Granite

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ENGINEERING/DESIGN ASSESSMENT

Railroad Bridge No. 0.92 over the Assonet River (a/k/a Cedar Swamp) is a three-span, single-track, riveted plate girder deck bridge. It measures approximately 60 feet long between the abutments and 10 feet wide out-to-out. The span length varies from 19.5 to 23 feet. Each span is assembled from four built-up, riveted steel plate girders (2 girders spaced 2 feet on-center under each rail). Girders on the center span are 2 feet deep and those on the approach spans are 2.5 feet deep. All girders are joined with riveted diaphragms. The girders are topped with an open timber deck of sleepers bolted directly to the girders. The bridge rises about 5 feet above the water and rests on granite piers and abutments. The squat piers are approximately 15 feet long, 5 feet wide, and are composed of mortared split rubble masonry topped with massive rectangular slabs. The 14 foot-wide abutments are of similar construction with granite slab backwalls and stepped flared wingwalls. There are no plaques or other identification markings on the structure. The bridge is in fair condition.

HISTORICAL NARRATIVE

Railroad Bridge No. 0.92 over the Assonet River (a/k/a Cedar Swamp) lies on a section of railroad right-of-way chartered in 1844 as the Fall River Branch Railroad. This company merged with the Fall River Railroad system in 1845 and subsequently was acquired by the Old Colony Railroad in 1872. The New York, New Haven & Harford Railroad (the New Haven) purchased the route in 1893 and operated it until 1969. Bridge plans drafted by the railroad show that the New Haven erected the current span in 1908 with girders reused from three different bridges on its New York Division. At that time the bridge was designated No. 8.24 over the Assonet River. The piers and abutments are from a predecessor span of an unknown date. There is no record of the work in the railroad's annual reports (Karr 1995:332–334; New Haven 1908; VHB 1995).

Railroad Bridge No. 0.92 over the Assonet River is not recommended eligible for listing in the National Register. The bridge is a relatively small example of a common railroad bridge type and is not associated with any important transportation improvements in Lakeville.

BIBLIOGRAPHY and/or REFERENCE

Karr, Ronald Dale
1995 *The Rail Lines of Southern New England: A Handbook of Railroad History.* Branch Line Press, Pepperell, MA.

New York, New Haven & Hartford Railroad (The New Haven)
1908 *N.Y.N.H. & H. R.R. Taunton Div. Bridge #8.24 (Old #301) over Assonet River, Myricks, Mass.* New York, New Haven & Hartford Railroad. On file, MBTA Plan Room, Boston, MA.

Vanasse Hangen Brustlin, Inc. (VHB)
1995 *Undergrade Bridge Inspection and Rating Report, MBTA New Bedford/Fall River Commuter Rail Project, Boston Massachusetts to New Bedford and Fall River, Massachusetts*. Prepared for MBTA, Boston, MA by VHB, Boston, MA in association with Lamson Engineering Corporation, Reid H. Potter Associates Inc., and Sverdrup Civil, Inc.

Deck view of Bridge No. 0.92, looking south.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
85 192	New Bedford North		NBE.0494

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 844 Acushnet Ave

Historic Name: Guardian Angel Parochial Schoolhouse

Uses: Present: Unknown

Original: Ecclesiastical

Date of Construction: Circa 1896

Source: Mendes 1978; Sanborn Map Company 1893; 1906; City Directory 1896

Style/Form: Vernacular

Architect/Builder: Unknown

Exterior Material:

Foundation: Granite Block

Wall/Trim: Vinyl

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* Late-20th- to early-21st-century alterations in the fenestration and replacement of historic fabric with non-historic, synthetic materials.

Condition: Fair

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.243

Setting: The building is located approximately 300 feet east of the New Bedford Main Line right-of-way in a predominantly industrial, urban area.

Photograph

Locus Map

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

Constricted circa 1896, the Guardian Angel Parochial Schoolhouse is a two-story, five-bay by two-bay wood-frame building with a hipped roof and a front-gabled entrance addition. It is situated in the southeast corner of a relatively flat lot bordered by a chain-link and barbed-wire fence. The remainder of the lot consists of a large paved parking area. The building has a centered gable end and a brick chimney piercing the asphalt roof, vinyl siding, and a rough-cut granite block foundation. The inset main entrance has a simple shed roof and vinyl supportive column with a historic wood paneled set of doors. Fenestration consists of non-historic, small, simple, rectangular, vinyl, one-over-one windows.

HISTORICAL NARRATIVE

Constructed one block north of the Wamsutta Mills around 1896, the Guardian Angel Parochial Schoolhouse at 844 Acushnet Avenue was built to serve as a school managed by the Sisters of the Holy Cross. Opening in 1897, the school operated for twelve years as the Guardian Angel Parochial School until it transitioned into the church of Our Lady of the Holy Rosary, formed by two, small, local churches, St. Anthony's and Sacred Heart. While the first floor remained in use as a school, the second story was used for church services. This church continued to be active until 1966, when attendance declined after the removal of several residences to accommodate highway development. Lacking architectural integrity with extensive non-historic additions and modifications, the Guardian Angel Parochial Schoolhouse is not eligible for listing in the National Register of Historic Places (Bristol County Registry of Deeds; City of Fall River 1897; Mendes 1978; New Bedford Public Library; New Bedford Town Assessor Office; New Building Records; Everts & Richards 1895; Sanborn Map Company 1893; 1906).

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City of Fall River
1897 *City Directory*. City of Fall River, Fall River, MA

Everts & Richards
1895 *Atlas of Bristol County, Massachusetts.* On file, Freetown Historical Society, Freetown, MA.

Mendes, Jeff
1978 *MHC Building Form: Our Lady of the Holy Rosary (NBE.0494)*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

New Bedford Public Library
New Bedford Town Assessor Office
New Building Records

Sanborn Map Company
1893 *Bristol County, New Bedford, Massachusetts*. Sanborn Map Company, New York, NY.
1906 *Bristol County, New Bedford, Massachusetts*. Sanborn Map Company, New York, NY.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
1 - 13	Taunton		

Photograph

Locus Map

Town/City: Raynham

Place: *(neighborhood or village)*:

Address: 521 Prospect Hill

Historic Name:

Uses: Present: Agricultural/Residential

Original: Agricultural/Residential

Date of Construction: Circa Late-18th C.

Source: Style, Annin Smith & Co 1830

Style/Form: Vernacular

Architect/Builder: Unknown

Exterior Material:

Foundation: Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
One detached, early-20th-century, chicken coop;
One detached, late-18th-century, New England style barn.

Major Alterations *(with dates):*
Late-19th-century modifications to the fenestration and the addition of synthetic windows in the late-20th-century.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 19.3

Setting: The property extends between Prospect Hill Street and the west side of the Stoughton Line right-of-way in a rural, predominantly residential community.

Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year)*: December 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The house at 521 Prospect Hill Street sits on a slightly sloping, narrow, rectangular lot predominantly wooded with a small portion dedicated to open space for farming. This property contains a house, barn, and chicken coop, with a gravel driveway leading to the main entrances of the south-facing house and the west-facing barn. Shrubbery and small trees surround the sill of the house. The house, which is oriented south, is a rectangular, two-bay by three-bay, one-story, wood-framed, side-gabled vernacular style building with two increasingly smaller connected work sheds extending from the east elevation that are similarly designed and oriented. The building has side-gable asphalt roofs, wood shingle siding, mortared granite foundations, a central brick chimney on the main block, and an off-centered tall corbelled brick chimney on the easternmost addition.

A detached New England style barn constructed around the same time as the farmhouse stands just southeast of the farmstead. The barn has an asphalt shingle roof, wood shingle siding, a hay door, and large, hinged, wood paneled barn doors on the west-facing facade, and an attached rear shed.

A chicken coop sits alongside Prospect Hill Street in the northwestern corner of the property. Constructed in the early 20th century, the chicken coop is constructed of mortared granite blocks with a tin shed roof and a wood post-and-beam standing seam tin shed-roofed addition, extending from the northern elevation. The west-facing facade has a hay door and a hinged wooden board-and-batten door. The addition walls are loosely sheathed with paneled plywood. A large wood-paneled sliding door connects the western elevation of the addition to the chicken coop. A single-room non-historic addition extends from the eastern elevation of the shed-roof addition.

HISTORICAL NARRATIVE

The house at 521 Prospect Hill Street was constructed at an unknown date, likely in the late-eighteenth century. Little is known about the early history of this property. The earliest identified owner is farmer Rufus Lincoln, who occupied the house from at least 1830 until his death in 1868. In 1860, U.S. Census records indicate that this 25-acre farmstead was worth $900.

Upon Lincoln's death, the farmstead was then transferred into the hands of 23-year-old Thomas T. Wilbur, who owned the property at least until 1890. At this time, farming and cattle raising was a popular industry in Raynham. An Elbridge S.P. Wilbur, likely a relative, owned a neighboring property. Thomas Wilbur owned the property until at least 1910, when he married Susan C. (Smith 1830; State of Massachusetts 1869; U.S. Census 1860; Beers 1871; Everts & Richards 1895; U.S. Census 1910).

Although the property at 87 Prospect Hill Street is an early existing farmstead in the town of Raynham, it has lost architectural integrity with significant, non-historic modifications of the fenestration, and introduction of non-historic, synthetic materials. Furthermore, the no strong historical associations with the town's agricultural development were identified that would make it eligible for listing in the National Register of Historic Places.

BIBLIOGRAPHY and/or REFERENCES

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1895 *Atlas of Bristol County, Massachusetts.* On file, Freetown Historical Society, Freetown, MA.

Smith, Annin & Company Lithographers
1830 *Map of Raynham, Massachusetts*. Boston, MA.

State of Massachusetts
1869 *Raynham, MA,* Massachusetts, Town and Vital Records, 1620-1988.

United States (US) Census
1860 Raynham, Massachusetts

1910 Raynham, Massachusetts

View looking northeast towards the property at 521 Prospect Hill Road, including the residence and barn.

View looking southeast at the chicken coop.

View looking east at the barn.

FORM F – STRUCTURE (BRIDGE)

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
92-459	Taunton		

Photograph

Locus Map

UTM Reference: 0327282 E; 4639138 W

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date (*month / year):* December 2012

Town/City: Taunton

Place *(neighborhood or village):*
Weir Village

Street/Route: New Bedford Main Line Railroad

Carried over: Brickyard Road (private lane, abandoned)
(Railroad, river, brook, canal or road)

Historic/Common name: Bridge No. 12.00 Over Brickyard Road (formerly No. 62.25 over Private Crossing)

Ownership: MassDOT
(Name of state agency or municipality)

Mass. Highway bridge no.:

Bridge type: Stringer

Bridge typology code 1:1 2:2 3:1 4:12

Date of Construction: 1906

Source: Boston Bridge Works 1906

Engineer/Designer: Boston Bridge Works

Bridge company/Contractor: Boston Bridge Works

Material (s): steel, concrete, granite

Alterations *(with dates):* Replacement of west span with current welded structure (after ca. 1950)

Posted load limit *(if any):* None

Condition: Fair - Poor

Moved ☒ **no** ☐ **yes** **Date:**

Acreage: <1.00

Setting: Bridge No. 12.00 Over Brickyard Road in Taunton is located in a wooded, marshy, and uninhabited section of Taunton on the New Bedford Main Line. It is 0.2 miles southeast of the Taunton River and about the same distance northeast of Hart Street.

Superstructure:

Overall length: 14 ft Deck width: 22 ft Skew: 0
Main unit: No. of spans: 1 Span length: 14
Approaches: No. of spans: Span length:

Substructure *(structure below deck)*

Height above feature spanned: 7.5 ft Material of abutments or piers: Granite and concrete

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ENGINEERING/DESIGN ASSESSMENT

Bridge No. 12.00 Over Brickyard Road carries the New Bedford Main Line right-of-way over an abandoned private lane that forms an extension of Akron Lane in Taunton. The bridge is a two-track, single-span, steel, stringer structure with an open timber deck 22 feet wide. Separate superstructures for each track cross the 14-foot span. The older east deck, now without rails, consists of a pair of stringers under each rail stiffened with lateral and diagonal L-channel cross-bracing. Each stringer is assembled from pair of 2 foot-deep, rolled steel I-beams spaced one foot on-center and joined with riveted diaphragms. The newer west deck consists of a pair of 2 foot-deep, rolled steel I-beams (one under each rail). The stringers are reinforced with welded lateral and diagonal cross-bracing. The bridge abutments, which appear to predate the superstructure, are 57 feet wide, including their stepped wingwalls. These are assembled from massive split granite ashlar masonry bound with heavy iron cramps. Cast onto the face of each abutment is about 3 inches of unreinforced concrete, which is now crumbling and spalling. The abutments are topped with concrete bridge seats and backwalls. The bridge is in fair to poor condition.

HISTORICAL NARRATIVE

The railroad right-of-way at the Bridge over Brickyard Road location was established in 1838 by the New Bedford & Taunton Railroad, which was later acquired by the Old Colony Railroad and subsequently by the New York, New Haven & Hartford Railroad (the New Haven). The earliest construction of a bridge at this crossing is unknown, although historical maps show brickyard activity in the vicinity beginning in the 1870s. According to plans and annual reports, the present east superstructure was designed by the Boston Bridge Works and erected in 1906-1907 by the New Haven as one of two replacements for timber stringer spans at the crossing. Valuation maps show that during the New Haven's tenure, the bridge was designated private crossing No. 62.25. The abutments from the timber bridge were retained and strengthened with concrete. This construction appears to have been part of a larger program of bridge replacement that the railroad completed in 1907. The railroad's annual reports for the period do not make specific mention of this relatively minor structure, but state that "bridges have been strengthened for heavier engines between Taunton and New Bedford" (NY,NH&H 1907:7). The west superstructure date is unknown, but its welded method of assembly indicates that it was erected sometime after World War II to replace the second 1906 girder span (Beers 1871; The Boston Bridge Works 1906; Karr 1995:327–330; The New Haven 1907, 1915; VHB 1995).

Bridge No. 12.00 is not recommended eligible for the National Register. Both halves of the structure are typical examples of one of the most common types of railroad bridge design. The structure is not associated with any significant developments in Taunton's transportation network.

BIBLIOGRAPHY and/or REFERENCE

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The Boston Bridge Works
1906 *N.Y.,N.H.&H. R.R. Bridge #221, Taunton Division*. The Boston Bridge Works, Boston, MA. On file, MBTA Plan Room, Boston, MA.

Karr, Ronald Dale
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New York, New Haven & Hartford Railroad (The New Haven)
1907 *Thirty-Sixth Year: General Statement of the Affairs of the New York, New Haven and Hartford Railroad Company for the Year Ending June 30, 1907.* The Price, Lee & Adkins Co., New Haven, CT.

1915 *Right of Way and Track Map, Old Colony R.R. Co. operated by the New York, New Haven and Hartford R.R. Co. From Mansfield to New Bedford, Station 630+80 to Station 683+60.* June 30. Office of Valuation Engineer, Boston, MA.

Vanasse Hangen Brustlin, Inc. (VHB)
1995 *Undergrade Bridge Inspection and Rating Report, MBTA New Bedford/Fall River Commuter Rail Project, Boston Massachusetts to New Bedford and Fall River, Massachusetts*. Prepared for MBTA, Boston, MA by VHB, Boston, MA in association with Lamson Engineering Corporation, Reid H. Potter Associates Inc., and Sverdrup Civil, Inc.

Bridge No. 12.00 east span, looking west.

Bridge No. 12.00 west span, looking east.

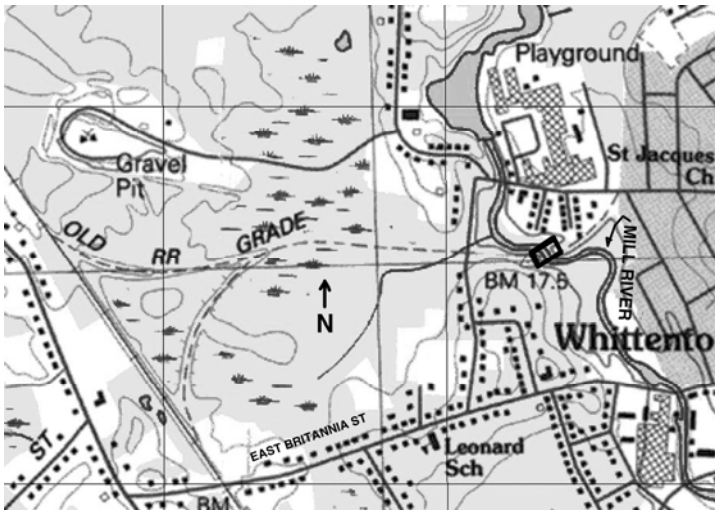
FORM F – STRUCTURE (BRIDGE)

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
38-553,554	Taunton		

Photograph

Locus Map



UTM Reference: 0325470 E; 4643242 W

Recorded by: J. Daly, A. Cahoon

Organization: PAL

Date (*month / year):* December 2012

Town/City: Taunton

Place *(neighborhood or village):*
Whittenton Village

Street/Route: Whittenton Branch Railroad

Carried over: Mill River
(Railroad, river, brook, canal or road)

Historic/Common name: Railroad Bridge over Mill River (formerly Bridge No. 20.66 over Mill River)

Ownership: MassDOT
(Name of state agency or municipality)

Mass. Highway bridge no.:

Bridge type: Slab - concrete

Bridge typology code 1:2 2:5 3:1 4:1

Date of Construction: ca. 1930

Source: New Haven 1915; Sanborn Map Co. 1937

Engineer/Designer: Unknown

Bridge company/Contractor: Unknown

Material (s): Reinforced concrete, split granite

Alterations *(with dates):* Tracks removed and deck paved with asphalt (date unknown)

Posted load limit *(if any):* None

Condition: Poor

Moved ☒ **no** ☐ **yes** **Date:**

Acreage: <1.00

Setting: The Railroad Bridge over the Mill River is located on the Whittenton Branch between Warren and Whittenton streets in Taunton. It is located on a wooded reach of the Mill River, where it passes behind a residential neighborhood in Whittenton Village.

Superstructure:

Overall length: 80 ft Deck width: 27 ft Skew: 0
Main unit: No. of spans: 7 Span length: 16 (typ.)
Approaches: No. of spans: Span length:

Substructure *(structure below deck)*

Height above feature spanned: Approx. 8 ft Material of abutments or piers: granite, reinforced concrete

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ENGINEERING/DESIGN ASSESSMENT

The Railroad Bridge over the Mill River is a seven-span, continuous, reinforced concrete deck bridge/trestle. It is approximately 80 feet long between the abutments, 27 feet wide (out-to-out), and has typical spans of 16 feet. The outside thickness of the bridge deck (measured from the top of the curb to the underside of the deck) varies from 3 feet, 9 inches on the north side to 5 feet on the south side, presumably to accommodate a superelevation of the railroad tracks on their curving alignment. The edges of the deck are decorated with cast concrete panels and topped with pipe railings. The railroad tracks have been replaced with an asphalt surface. The solid concrete cutwater piers are 2.5 feet thick, rise about 8 feet above the water, and have a small, 2 foot-high open section consisting of 30 inch diameter concrete piles. The east abutment is split granite. The west abutment, which is skewed, is reinforced concrete. There is no bridge plaque or other identification marking on the structure. The bridge is in poor condition.

HISTORICAL NARRATIVE

The Whittenton Branch right-of-way on which the Railroad Bridge over the Mill River is located was constructed in 1882 by the Dighton & Somerset Railroad, acquired by the Old Colony Railroad in 1865, and purchased by the New York, New Haven & Hartford Railroad (the New Haven) in 1893. The New Haven operated the Whittenton Branch until it obtained permission to abandon the line in 1958. The line served as a minor, connecting segment within the complicated and extensive rail network of southeastern Massachusetts. Historical maps of the Whittenton Branch show that the Mill River crossing was spanned by a wood pile structure, designated No. 20.66, until at least 1915. At an unknown date between 1915 and 1937, the present span was constructed by the New Haven, utilizing one of the abutments of the earlier structure. No record of the bridge replacement could be found in New Haven annual reports and plans are not available for the structure (Karr 1995:323-326; The New Haven 1915; Sanborn Map Company 1937).

The Railroad Bridge over the Mill River is an example of a multi-span concrete deck bridge – a relatively common solution for low-level, medium span railroad crossings where falsework is easily constructed and the obstruction of a navigation channel or other feature does not present a problem. Such structures, whether designed as a continuous structure or series of simple spans, were broadly used after circa 1910 and represent the transference of the wood timber trestle design into the newer medium of reinforced concrete. Multi-span trestles often utilize open piers or bents to economize on materials. In the case of the Mill River Span, the piers utilize a more unusual combination of solid construction with a short section of open work. The design was presumably a compromise intended to protect the structure against ice flows or water-borne debris while also allowing an increased volume of water to pass through the piers during flood stage (Howson et al. 1921:217, 220, 281).

The Railroad Bridge over the Mill River is not recommended eligible for the National Register . The structure is a relatively late example of multi-span continuous concrete deck bridge or trestle type and has no associations with important transportation improvements in Taunton. The bridge is located within the Whittenton Mills Area (see related form).

BIBLIOGRAPHY and/or REFERENCE

Howson, E.T., E.R. Lewis, and K.E. Kellenberger, Eds.
1921 *Maintenance of Way Cyclopedia.* Simmons-Boardman Publishing Company, New York, NY.

Karr, Ronald Dale
1995 *The Rail Lines of Southern New England: A Handbook of Railroad History.* Branch Line Press, Pepperell, MA.

New York, New Haven & Hartford Railroad (The New Haven)
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Sanborn Map Company
1937 *Insurance Map of Taunton, Bristol County, Massachusetts*. Sanborn Map Company, New York, NY.

South elevation of Railroad Bridge over Mill River, looking northeast.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
65//345/0/	Taunton		TAU.257

Town/City: Taunton

Place: *(neighborhood or village)*:

Address: 3 Myrtle Street

Historic Name: Taunton Car Manufacturing Company Building

Uses: Present: Residential

Original: Industrial

Date of Construction: ca. 1870

Source: Historic maps

Style/Form: No style

Architect/Builder: Unknown

Exterior Material:
Foundation: Concrete

Wall/Trim: Brick/Wood

Roof: Asphalt shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* Three porch additions; fenestration changes and replacement, mid/late20th-century. Demolition of attached mill, ca. 2010.

Condition: Good

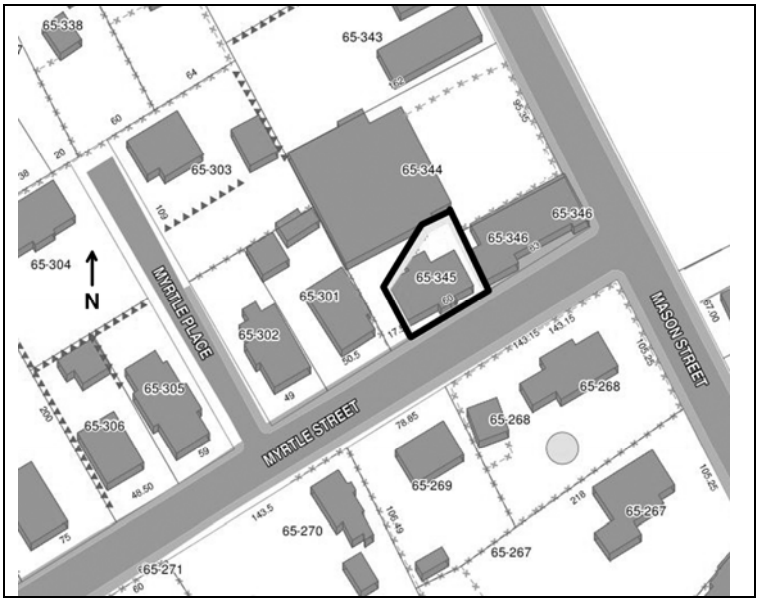
Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.07

Setting: The property is located approximately 400 feet south of the Attleboro Secondary rail ROW in an urban, mixed industrial and residential area.

Photograph

Locus Map



Recorded by: K. Miller, J. Daly, A.Cahoon

Organization: PAL

Date (*month / year)*: December, 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:
Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

The Taunton Car Manufacturing Company Building is a rectangular, four-bay by one-bay, two-story, brick, front-gabled, Italianate style building constructed circa 1870. The building has two, slender, corbelled brick chimneys piercing an extremely low-pitched roof, which is likely sheathed in rolled asphalt. A dentilated cornice sits below the overhanging eaves and above the building's common-bond brick walls and concrete foundation. The south-facing building sits on a small, relatively flat lot bound by a chain-link fence and a wood picket fence along the northern boundary. A narrow, paved driveway runs along the eastern elevation, hugs the northeast corner of the building, and abruptly stops at a small parking space along the northern elevation. The building has three twentieth-century porch additions. The main entrance at the southern facade includes a narrow, enclosed, vinyl-sided porch with three 1/1 vinyl windows, an aluminum awning, a six-step, brick staircase, and aluminum railing. Two secondary porches are located on the northern elevation, including a single-entry, vinyl porch and a two-story, vinyl porch supported by vinyl, Doric columns. Fenestration is regular, with segmental, rounded-arch window openings with brick lintels. The majority of openings are filled in with non-historic 1/1 vinyl windows, with one remaining historic, wood, 2/2, double-hung sash window centrally located on the second story of the facade. All basement window openings have been replaced with either brick or unknown infill covered with plywood and all door openings have been filled with late-twentieth-century, vinyl doors.

HISTORICAL NARRATIVE
Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

Established on June 2, 1869, the Taunton Car Manufacturing Company produced train and trolley cars. The company originally encompassed five buildings, including foundries and machine shops that extended along the north side of Myrtle Street from its intersection with Mason Street to near the present-day Myrtle Place. Strategically located close to the railroad, the complex was also adjacent to two of the city's largest train component manufacturers, the Mason Machine Works and the Taunton Locomotive Company (Sanborn Map Company 1888; 1898; Old Colony Historical Society 1980; Adams 1872:56).

In the late nineteenth century, railroad companies attached plows to their engines to facilitate transportation during the winter months. At the time, a few manufacturing companies in the east sold plows and each company produced their own type. The Portland Company (of Portland Maine) produced the "wedge" type, which included a trap door in the ram, the Ensign Manufacturing Company (of Huntingdon, West Virginia) produced Russel style plows, that "curled back upon itself", and the Taunton Car Manufacturing Company constructed plows using an 1866 patent created by C.L. Heywood, who designed a "bucker" plow with a self-adjusting scraper and movable wings (Bianculli 2002:167).

On November 23, 1873, one of the buildings associated with the Taunton Car Manufacturing Company, the paint shop, was lost during a fire. In 1881, James Booth and James H. Moore purchased the property and converted the Taunton Car Manufacturing Company complex into the Booth & Moore Planning and Moldering Mill. The company produced brackets, turned moldings, window and door frames, and cabinets. The engine house (Taunton Car Manufacturing Company Building) housed dryers and kilns for wood processing. By 1888, three out of the five buildings on the property were demolished; leaving the large mill on the corner of Myrtle and Mason Street and the connected engine house. Between 1898 and 1937, Booth & Moore ceased

operations, the large mill building was demolished, and the engine house was converted to a residence. A steam laundry was also constructed on a site to the rear of the engine house during this period. This building was standing in 2009, but was demolished by 2012. The Taunton Car Manufacturing Company Building remains as fragment of the Taunton Car Manufacturing Company complex and the Booth & Moore Planning and Moldering Mill. The integrity of the building has been compromised by three twentieth-century porches, synthetic materials, non-historic windows, and fenestration infill. As a remnant of a late-nineteenth-century industrial complex that has been converted for use as a residence with non-historic, non-sympathetic modifications, the Taunton Car Manufacturing Company Building is not eligible for individual listing in the National Register of Historic Places (Old Colony Historical Society 1980; Emery 1893:714; Sanborn Map Company 1937; 1937-1950).

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1893 *History of Taunton, Massachusetts; from its Settlement to the Present Time.* D. Mason & Co. Publishers, Syracuse, NY.

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1937 *Bristol County, Fall River, Massachusetts Fire Insurance Map*. Sanborn Map Company, New York, NY.

1937-1950 *Bristol County, Fall River, Massachusetts Fire Insurance Map*. Sanborn Map Company, New York, NY.

Old Colony Historical Society
1980 *MHC Form B: 3 Myrtle Street*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

PHOTOGRAPHS

View looking southwest towards the rear of Taunton Car Manufacturing Co.

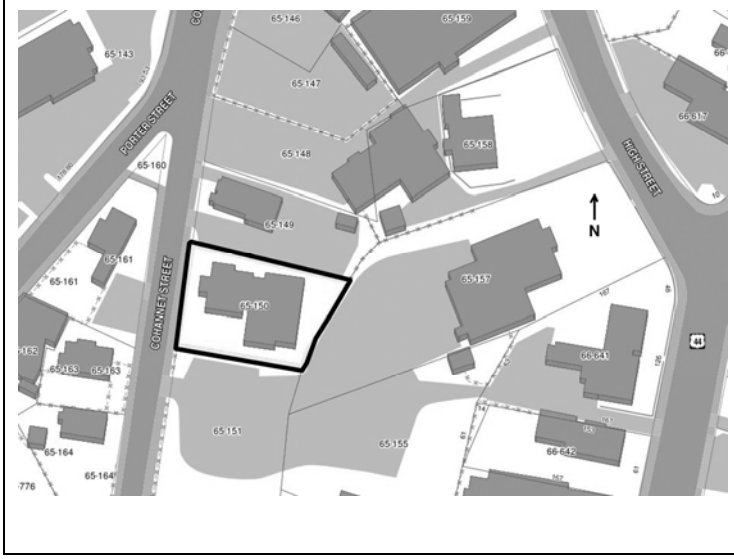
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
65//150//0/	Taunton		

Photograph

Locus Map



Town/City: Taunton

Place: *(neighborhood or village)*:

Address: 150 Cohasset Street

Historic Name: Joseph E. Wilbar House

Uses: Present: Ecclesiastical

Original: Residential

Date of Construction: Circa 1860

Source: Historic Maps

Style/Form: Italianate

Architect/Builder: Unknown

Exterior Material:

Foundation: Stone

Wall/Trim: Vinyl

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* Additions include a two-story, rear addition (before 1937) and a large rear addition (late 20th century). Vinyl siding and the replacement of historic windows (late 20th century).

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 0.30

Setting: Property is in an urban, predominantly residential area, located approximately 300 feet northeast of the Attleboro Secondary right-of-way.

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December, 2012

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION:
Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

Constructed circa 1860, the Joseph E. Wilbar House at 150 Cohannet Street is a two-story, four-bay by two-bay, wood-framed, cross-gabled, Italianate style building with a two-story, rectangular, wood-framed, gabled, pre-1937 rear addition and a large, late twentieth century salt-box addition. The building has an asphalt-shingle roof with two corbelled brick chimneys piercing the ridgeline, vinyl siding, and a stone foundation. The west-facing building sits on a flat, rectangular lot with a wide, paved driveway running the length of the southern boundary line and a paved walkway leading from the sidewalk to the main entrance staircase. A few plantings, including coniferous trees and shrubbery, line the building's facade. Leading to a pair of wood, paneled doors, the pedimented main entrance has a simple balustrade and squared, bracketed supporting posts and pilasters. Wide, overhanging eaves wrap around the building with vinyl, boxed-in returns at the gable ends, which feature 1/1, rounded-arch windows. The eastern facade has a single-story, squared, bracketed, molded, bay window with light ornamentation and a lattice-sheathed sill. The southern elevation bears a centered gable and a single-story bay window. Fenestration is regular with rectangular window openings that have molded and bracketed lintels. While half of the window openings retain their original 2/2 double hung wood sash windows, the remainder are filled with non-historic windows of synthetic material.

HISTORICAL NARRATIVE
Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the building, and the role(s) the owners/occupants played within the community.

Constructed circa 1860, the first identified owner of the property was Joseph E. Wilbar, who resided at the house from at least 1871 until 1895. Joseph E. Wilbar was the son of Joseph Wilbar, who designed Mount Pleasant Cemetery (MHC No. TAU.822; NR listed) located approximately 1,000 feet south of the house. Between 1971 and 1996, a large, salt-box form addition was built off of the rear of the building. Since at least 2006, the property has been a church and is now the Taunton Portuguese Seventh-Day Advent Church. Along with the replacement of historic fabric with non-historic, vinyl materials, the Joseph E. Wilbar House has lost integrity through the introduction of a large, late-twentieth-century, rear addition, likely in the conversion of the residential property into a church. As a result, the property is not eligible for listing in the National Register of Historic Places (Beers 1971; Everts & Richards 1895; Sanborn Map Company 1898; 1937; 1937-1950).

BIBLIOGRAPHY and/or REFERENCES

Beers, Frederic W.
1871 Atlas of Bristol County, Massachusetts. F.W. Beers and Company, New York, NY.

Everts & Richards Co.
1895 Atlas of Bristol County, Massachusetts. On file, Freetown Historical Society, Freetown, MA.

Sanborn Map Company
1898 *Bristol County, Fall River Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.
1937 *Bristol County, Fall River Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.
1937-1950 *Bristol County, Fall River Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

PHOTOGRAPHS

View looking southeast at the Joseph E. Wilbar House.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ **A** ☐ **B** ☐ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by_____
The criteria that are checked in the above sections must be justified here.

APPENDIX G

List of Terms and Acronyms

List of Acronyms

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
CSX	CSX Corporation
DEIS	Draft Environmental Impact Statement
DEIR	Draft Environmental Impact Report
FEIS	Final Environmental Impact Statement
FEIR	Final Environmental Impact Report
MassCoastal	Massachusetts Coastal Railroad
MassDOT	Massachusetts Department of Transportation
MA SHPO	Massachusetts State Historic Preservation Office
MACRIS	Massachusetts Cultural Resource Information System
MBCR	Massachusetts Bay Commuter Railroad Company
MGL	Massachusetts General Laws
MEPA	Massachusetts Environmental Policy Act
MHC	Massachusetts Historical Commission
MRA	Multiple Resource Area
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
NRIS	National Register of Historic Places Information System
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

APPENDIX H

Correspondence

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

July 2, 2009

Jennifer McCarthy
Chief, Regulatory Division
Department of the Army
New England District
Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. McCarthy:

The Massachusetts Historical Commission, office of the State Historic Preservation Officer, have received the US Army Corps of Engineers' (Corps) initial notification to commence consultation for the project referenced above in compliance with Section 106 of the National Historic Preservation Act of 106, as amended (36 CFR 800), received June 5, 2009.

Your letter indicates that the Corps is preparing environmental review documents to assist in NEPA and state MEPA requirements. Please be sure that no sensitive archaeological site data are included in any document prepared for public review in order to protect the sites.

The undertaking includes new above-ground construction, and other actions that have the potential to cause adverse effects to historic properties located in proximity, such as but not limited to visual, vibration, and atmospheric effects. The "South Coast Rail Area of Potential Effect for Cultural Resources" prepared by VHB, Inc. attached to your letter outlines a suitable approach to defining an appropriate area of potential effect and takes into account proposed direct and indirect effects to historic properties. MHC concurs with the Corps' overall approach for the identification and documentation of effects to historic properties, and determination of the area of potential effect, as proposed in VHB, Inc.'s suggested approach.

MHC has received on June 29, 2009, from VHB, Inc., the PAL's draft technical report, *Cultural Resources Reconnaissance Survey South Coast Rail Project Southeast Massachusetts*. The report should also be provided to the Corps for review and comment. MHC will review and comment, and looks forward to the Corps' comments and recommendations on the draft report.

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MHC looks forward to continued consultation. These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions please contact Jonathan K. Patton, Archaeologist/ Preservation Planner, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Charlene Dwin Vaughn, ACHP
Kate Atwood, COE-NED
Bettina Washington, THPO, Wampanoag Tribe of Gay Head (Aquinnah)
George Green Jr., THPO, Mashpee Wampanoag Tribe
James A. Peters, Jr. Massachusetts Commission on Indian Affairs
A. Kenneth Alves, Assonet Band, Wampanoag Nation
Kristina Egan, EOT
Andrew Brennan, MBTA
Holly Palmgren, MBTA
Secretary Ian A. Bowles, EEA, Attn: Aisling Eglington, MEPA Unit
Stephen C. Smith, SRPEDD
Boston Landmarks Commission
Historical Commissions, Towns of: Quincy, Milton, Canton, Randolph, Braintree, Holbrook, Avon, Stoughton, Norwood, Canton, Sharon, Easton, Foxborough, Mansfield, Bridgewater, Brockton, West Bridgewater, Taunton, Berkley, Lakeville, Middleborough, Norton, Attleborough, Fall River, Freetown, New Bedford
Deborah C. Cox, PAL
Lisa A. Standley, VHB, Inc.

July 24, 2009

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Jennifer McCarthy
Chief, Regulatory Division
Department of the Army
New England District
Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346. **CE-NAE-2007-00698.**

Dear Ms. McCarthy:

The Massachusetts Historical Commission, office of the Massachusetts State Historic Preservation Officer, has received the PAL's draft technical report, *Cultural Resources Reconnaissance Survey South Coast Rail Project Southeast Massachusetts,* received June 29, 2009.

MHC also received from VHB, Inc., on June 30, 2009, two compact discs of "draft Environmental Consequences Technical Reports" for visual and aesthetic resources and for vibration. MHC does not accept information submitted in digital format for environmental review. VHB, Inc. should provide the MHC paper copies of their filings for MHC review.

The PAL report only includes the results of the preliminary, reconnaissance-level identification and evaluation effort for historic and archaeological resources for a portion of two of the project Alternatives 2B and 4 (A, B, C). The results of the survey and assessment for historic and archaeological resources are not included for the Middleborough Secondary, Attleboro Secondary and Whittenton Branch right-of-ways within the Alternative 2B and Alternative 4 (A, B, C) (PAL report Volume VI, Section 1.1.2, 1.1.3, page 4). The PAL report also does not include layover and maintenance facilities and utilities and construction staging areas, access roads and road intersection improvements for the two alternatives, because these aspects of the project have not yet been identified sufficiently to undertake survey.

MHC anticipated receiving a draft technical report of the reconnaissance-level cultural resource survey that included complete survey data for six project alternatives (PAL Technical Proposal, 10/29/2008, page 1). It may be the case that project planners are now focusing their study and planning efforts on Alternative 2B and Alternative 4 (A, B, C) (see PAL report Volume I, Section 1.1, page 2). In the interest of efficiency and cost-effectiveness, however, the Corps also may wish to await the report of the complete reconnaissance survey results for the corridors of at least these two proposed alternatives.

Alternatively, the PAL report could allow the Corps to begin to evaluate some historic resources for National Register eligibility (36 CFR 60), and to begin to make determinations of effect for some historic resources in the portions of the two alternatives discussed in the PAL report.

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However, recommendations for intensive (locational) archaeological survey (950 CMR 70) to begin to identify archaeological resources require the complete reconnaissance archaeological survey results for the corridors.

MHC looks forward to continued consultation and to review and comment on the Corps' findings and recommendations. These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions, please contact Jonathan K. Patton, Archaeologist/ Preservation Planner, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Kate Atwood, COE-NED
Bettina Washington, THPO, Wampanoag Tribe of Gay Head (Aquinnah)
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Boston Landmarks Commission
Historical Commissions, Towns of: Quincy, Milton, Canton, Randolph, Braintree, Holbrook, Avon, Stoughton, Norwood, Sharon, Easton, Foxborough, Mansfield, Bridgewater, Brockton, West Bridgewater, Taunton, Berkley, Lakeville, Middleborough, Norton, Attleborough, Fall River, Freetown, New Bedford
Deborah C. Cox, PAL
Lisa A. Standley, VHB, Inc.

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

September 29, 2009

Jennifer McCarthy
Chief, Regulatory Division
Department of the Army
New England District
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696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. McCarthy:

The Massachusetts Historical Commission, office of the Massachusetts State Historic Preservation Officer, has reviewed the PAL's draft technical report, *Supplemental Cultural Resources Reconnaissance Survey South Coast Rail Project Southeast Massachusetts,* received August 31, 2009. MHC also received from VHB, Inc., on September 17, 2009, draft "Environmental Consequences Technical Reports" for visual and aesthetic resources and for vibration.

MHC understands that Alternatives 2 (A and B) and 3 have been eliminated from consideration as of March 2009. Alternatives now under consideration include 1, 4 and 5.

The supplemental PAL report includes summaries of historic and archaeological resources within most areas of Alternatives 1, 4 and 5 not previously addressed in the March 2009 technical report. The PAL report indicates that archaeological assessments for elements of these alternatives, including traction, parallel, switching and electrification facilities, bridges, utilities, construction staging areas, and access roads, have not yet been completed because these aspects of the project have not yet been identified sufficiently to undertake reconnaissance -level archaeological survey.

The PAL reports for the alternatives under consideration could allow the Corps to begin to evaluate some historic resources for National Register eligibility (36 CFR 60), and to begin to make determinations of effect for some historic resources within Alternatives 1, 4 and 5. Recommendations for intensive (locational) archaeological survey (950 CMR 70) to begin to identify archaeological resources require the complete reconnaissance archaeological survey results for the alternatives under consideration.

MHC looks forward to continued consultation and to review and comment on the Corps' findings and recommendations. These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions, please contact Jonathan K. Patton, Archaeologist/ Preservation Planner, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

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Deborah C. Cox, PAL
Lisa A. Standley, VHB, Inc.

November 19, 2009

Jennifer McCarthy
Chief, Regulatory Division
Department of the Army
New England District
Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. McCarthy:

The Massachusetts Historical Commission, office of the Massachusetts State Historic Preservation Officer, has reviewed the Cultural Resources Environmental Consequences Technical Report, prepared by VHB, Inc., received October 21, 2009 and have the following comments.

The technical report for the alternatives under consideration includes summaries of the project engineering consultant's opinions of preliminary considerations of effects and potential avoidance, minimization and mitigation measures for historic and archaeological resources, which could allow the Corps to begin to evaluate some historic resources for National Register eligibility (36 CFR 60), and allow the Corps to begin to make determinations of effect for some historic resources within Alternatives 1, 4 and 5.

The technical report includes recommendations for intensive (locational) archaeological survey (950 CMR 70) to begin to identify archaeological resources for the alternatives under consideration. A State Archaeologist's Permit (950 CMR 70) should be submitted to the MHC by the archaeological consultant.

MHC looks forward to continued consultation and to review and comment on the Corps' findings and recommendations. These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions, please contact Jonathan K. Patton, Archaeologist/ Preservation Planner, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: see attached

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Deborah C. Cox, PAL
Lisa A. Standley, VHB, Inc.

The Commonwealth of Massachusetts

May 2, 2011 William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Jennifer McCarthy
Chief, Regulatory Division
New England District
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. McCarthy:

Staff of the Massachusetts Historical Commission (MHC), office of the State Historic Preservation Officer, have reviewed your letter of April 4, 2011, and the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR), for the project referenced above.

Project alternatives described in the DEIS/DEIR include the Attleboro, Stoughton and Whittenton Diesel and Electric rail alternatives and the Rapid Bus alternative. The Middleborough Alternative is no longer under consideration. The DEIS/DEIR, Preface Section P.4 indicates that the Massachusetts Department of Transportation (MADOT) has recommended the Stoughton alternatives, including diesel or electric rail service on the reactivated Stoughton line through the towns of Stoughton, Easton, Raynham and Taunton, as its preferred project alternative. The Corps proposes to evaluate multiple project alternatives to identify the Least Environmentally Damaging Practical Alternative.

The Corps has requested the MHC's concurrence with the completeness of identification efforts for known but not for as-yet-unidentified historic properties, and with the Corps' preliminary determinations of eligibility and effect. Preliminary determinations of National Register eligibility and effects to previously identified historic properties are presented in DEIS/DEIR Sections 1.5.8 and 4.8. Recommendations for additional cultural resources identification and evaluation efforts for the project alternatives are also included in Section 4.8, and are noted in your letter.

The Corps proposes to complete historic properties identification and evaluation efforts once a preferred alternative has been selected as a single corridor. The draft research design and methodology for intensive-level cultural resources survey for the preferred project alternative should be submitted to the MHC for review and comment.

The MHC prefers to comment on the results of the identification and evaluation efforts and the Corps's effect determinations after the cultural resource surveys have been completed for the preferred alternative.

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Section 4.8.5 of the DEIS/DEIR generally summarizes proposed mitigation of impacts to cultural resources. Mitigation measures for specific project adverse effects, including noise, vibration, alteration of setting and demolition are discussed in Sections 4.8.5.3. Although avoidance and minimization are considered in Section 4.8.5.1 and .2, an adverse effect to significant historic properties is presumed for the project as a whole, and recommendations for the development of a Memorandum of Agreement (MOA) are described on page 4.8-95.

The presumption of adverse effect and mitigation is premature at this stage of project planning when several project alternatives are still in consideration, and with the identification and evaluation efforts, and the consultation process, not yet completed. The Final EIS/EIR should describe the relationship of consultation under 36 CFR 800.6 to the development of appropriate measures to avoid, minimize or mitigate adverse effects to significant historic properties, to more closely track the regulatory process of 36 CFR 800.

MHC also notes that mapping of historical architectural resources identified in DEIS/DEIR Volume II figures 4.8-1 to 4.8-29 are derived from 2009 cultural resources identification efforts. Plans for track alignments, stations, layover facilities, track and electrical transmission infrastructure have been refined from the alternatives presented in the 2009 ENF (pg. 1-7). The currently proposed 2011 project alternatives are described in Section 1, and are shown in Section 4.5, 4.12 and 3.2 figures, including conceptual station and layover facilities impact areas and locations of traction power electrical transmission infrastructure. Project figures in the Final EIS/EIR should accurately present the preferred project alternative impact areas and their relationship to identified historical architectural resources.

These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions or require more information at this time, please write to Jonathan K. Patton at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
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xc: Kathleen Atwood, USACOE-NED
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Stephen C. Smith, SRPEDD
Historical Commissions, Towns of: Quincy, Milton, Canton, Randolph, Braintree,
Holbrook, Avon, Stoughton, Norwood, [illegible], Sharon, Easton, Foxborough, Mansfield, Bridgewater, Brockton, West Bridgewater, Taunton, Berkley, Lakeville, Middleborough, Norton, Attleborough, Fall River, Freetown, New Bedford
Deborah C. Cox, PAL
Lisa A. Standley, VHB, Inc.

October 10, 2012

Karen Kirk Adams
Chief, Regulatory Division
New England District
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. McCarthy:

Staff of the Massachusetts Historical Commission (MHC), office of the State Historic Preservation Officer, have reviewed the draft technical archaeological report, *Supplemental Archaeological Reconnaissance Survey, Whittenton Alternative Right-of-Way*, and Historic Resources Reconnaissance Survey, Completion of Whittenton Alternative Right-of-Way, prepared by the PAL, Inc, and scopes of work for historic and archaeological resources survey for the Stoughton and Whittenton Alternatives, received September 28, and October 1 and 5, 2012, for the project referenced above.

The research designs and methodologies for historic and archaeological resources surveys for the Stoughton and Whittenton Alternatives are adequate to identify historic properties within the project impact areas. State Archaeologist's permits have been issued to the PAL for archaeological survey within archaeologically sensitive portions of the project impact areas in Easton, Raynham, Taunton, Freetown and Fall River. The MHC notes that the PAL indicates that the Whittenton Branch rail corridor is not considered to meet the criteria of eligibility (36 CFR 60) as it lacks integrity.

The MHC looks to reviewing the results of the historic and archaeological surveys as they are completed and the Corps's effect determinations after the cultural resource surveys have been completed for the preferred alternative.

These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions or require more information at this time, please write to Jonathan K. Patton at this office.

Sincerely,

Brona Simon
State Historic Preservation Officer
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Historical Commissions, Towns of: Easton, Taunton, Raynham, Fall River, Freetown
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Technical Report Addendum

HISTORIC RESOURCES INTENSIVE SURVEY, EVALUATION, AND EFFECTS, SOUTH COAST RAIL PROJECT

Canton, Stoughton, Easton, Raynham, Taunton, Berkley, Lakeville, Freetown, New Bedford, Fall River

Southeast Massachusetts

Virginia H. Adams
Kathleen M. Miller
Quinn R. Stuart

Prepared for: Vanasse Hangen Brustlin, Inc.
99 High Street, 10th Floor
Boston, Massachusetts 02110

Prepared by: PAL
26 Main Street
Pawtucket, Rhode Island 02860

May 16, 2013

Historic Resources Intensive Survey Report Addendum

1.1 Introduction

The Massachusetts Department of Transportation (MassDOT) is planning for the South Coast Rail Project in southeast Massachusetts. The U.S. Army Corps of Engineers (Army Corps) is the lead federal agency for the project. In the *Draft Environmental Impact Report/Draft Environmental Impact Statement* (DEIR/S) of February 2011 filed under the Massachusetts Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA), MassDOT identified the Stoughton Electric rail as its Preferred Alternative to provide commuter service to South Station using the Northeast Corridor, Stoughton Line, New Bedford Main Line, and Fall River Secondary Line. The Secretary's Certificate on the DEIR/S directed MassDOT to study only the Stoughton Electric Rail Alternative in the FEIR. The Army Corps requested that MassDOT also study the Whittenton Alternative for the South Coast Rail Project. The Whittenton Alternative runs primarily along the same course as the Stoughton Alternative, and differs only along an approximate 5.8-mile portion of right-of-way (ROW) between Raynham Junction and Weir Junction in Raynham and Taunton. This portion of ROW is comprised of the 3.4-mile segment of inactive track known as the Whittenton Branch; and a 2.4-mile section of active CSX track on the Attleboro Secondary between Whittenton Junction and Weir Junction at the beginning of the New Bedford Main Line. All of the proposed stations are the same for both alternatives, with the exception of the Dana Street Station. The Dana Street Station replaces the Downtown Taunton Station, and is located on a vacant parcel situated on the east side of the Attleboro Secondary just south of Danforth Street.

An intensive level survey of historic resources for the Stoughton and Whittenton Electric alternatives was conducted and the results were presented in the report prepared by The Public Archaeology Laboratory, Inc. (PAL), as part of the Vanasse Hangen Brustlin, Inc. (VHB) team, entitled *Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, Canton, Stoughton, Easton, Raynham, Taunton, Berkley, Lakeville, Freetown, New Bedford, Fall River in Southeast Massachusetts* dated January 2013 (Adams et al. January 2013). Appendix E-1, Inventory Area Forms, of the report was completed and submitted separately in February 2013. The Massachusetts Historical Commission (MHC)/ Massachusetts State Historic Preservation Office (SHPO) reviewed the January 2013 report and Appendix E-1 and issued comments in letters to the Army Corps.

This Technical Report Addendum prepared by PAL presents a compilation of the Appendix E-1, Inventory Area Forms, of the January 2013 report completed and submitted separately in February 2013, along with the revised and updated supplemental submittals in response to the MHC and Army Corps comments that were completed and submitted in March through May 2013.

1.2 Addendum Revisions and Updates

The supplemental revisions and updates to the January 2013 historic intensive survey report presented in this addendum are listed below.

- Appendix A: Tables, Revised and Updated
    - Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results.
    - Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative.
    - Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative.
- Appendix B: USGS Maps, Revised and Updated
- Appendix C: Project Aerial Maps, Revised and Updated
- Appendix E: Historic Properties Survey (MHC Inventory Forms):
    - Appendix E-1: Original Submittal, February 25, 2013
    - Appendix E-1: Areas, 3 Forms Revised and Updated
    - Appendix E-2: Addendum: B Form for ID Be.006, 1 Macomber Street, Berkley
    - Appendix E-2: Individual Properties, 12 Forms Revised and Updated
- Appendix H: Correspondence, Updated
    - Karen K. Adams, Department of the Army, New England District, Corps of Engineers to Brona Simon, Massachusetts Historical Commission, dated January 18, 2013.
    - Brona Simon, Massachusetts Historical Commission to Karen K. Adams, Department of the Army, New England District, Corps of Engineers, dated February 21, 2013.
    - Brona Simon, Massachusetts Historical Commission to Karen K. Adams, Department of the Army, New England District, Corps of Engineers, dated April 3, 2013.
    - Karen K. Adams, Department of the Army, New England District, Corps of Engineers to Jean Fox, Massachusetts Department of Transportation, dated April 10, 2013.

Based on agency review comments, additional information including research and photographs was prepared and submitted for certain historic properties. In some cases, forms were revised to reflect National Register eligibility evaluation changes. A list of these changes grouped by type of action follows, and a summary of changes by Map ID is in Table 1.

Three properties that were recommended as not National Register eligible in the January 2013 report were found to be eligible in the opinion of the MHC.

- Ra.001, Residence and Barn, 521 Prospect Hill Street, Raynham
- Ft.002/MHC FRE.116 George Cummings House, Freetown (Outside of APE – see below)
- FR.003/MHC FLR.0284, Jael Hathaway House, 4042 North Main Street, Fall River

Table 1. South Coast Rail, Summary of Updates and Revisions to January 2013 Historic Resources Intensive Survey Report, May 2013.

MAP ID/ MHC No.	COMMUNITY	PROPERTY NAME/LOCATION	MHC COMMENTS	RESPONSE
Ea.A, Ea.B	Easton	Dighton & Somerset Line, Parallel to Mechanic Street between Elm Street and Main Street	4/3/13: The MHC requested additional information on the proposed treatment and finding of effect for the Dighton & Somerset Line which is a contributing in the North Easton Historic District, listed in the National Register.	Tables 4-2, 5-1 and 5-2 updated to include this property and potential project effects.
Ra.001	Raynham	Residence and Barn, 521 Prospect Hill	2/21/13: The MHC requested additional information and photographs of the residence and barn. 4/3/13: The MHC found the property National Register eligible.	Revised B form with additional information and photographs prepared. Status changed from not National Register eligible to National Register eligible.
Ra.011	Raynham	Dog Kennel and Track, 385 Thrasher St	2/21/13: The MHC requested additional historical and contextual information for the dog kennel and track property. 4/3/13: The MHC found the property National Register eligible.	Revised B form with additional information and photographs prepared. No change to National Register status.
Ta.K	Taunton	Hodges Avenue Area, Plain, First, West Water, and Ingell Street	4/3/13: The MHC requested additional photographs.	Additional photographs prepared on inventory continuation sheets.
Ta.U	Taunton	Weir Village Area, Morton, Granite, and Tremont Streets; Hodges, Chandler and Columbus Avenues	4/3/13: The MHC requested additional photographs.	Additional photographs prepared on inventory continuation sheets. Upon further review, the area was found to be outside the APE.

MAP ID/ MHC No.	COMMUNITY	PROPERTY NAME/LOCATION	MHC COMMENTS	RESPONSE
Ft.002/MHC FRE.116	Freetown	George Cummings House, 76 Chace Road	2/21/13: The MHC found the property National Register eligible.	B form revised, and new National Register criteria sheet prepared to reflect status change to National Register eligible. Upon further review, the property was found to be outside the APE.
NB.029	New Bedford	Christ Presbyterian Church, 1097 County Street	2/21/13: The MHC found the property to be not National Register eligible.	B form revised, and National Register criteria sheet removed to reflect status change to not National Register eligible.
NB.010, NBE.0641	New Bedford	Lambeth Rope Complex, 627-637 Tarkiln Hill Road	2/21/13: The MHC requested additional information and that an MHC Form A (Area Form) be completed.	Area A form prepared with data sheet, parcel map, and photos of each structure. No National Register status change.
FR.I	Fall River	Wellington-Brownell Area, Brightman, Brownell, George, Morton, Oregon, Saint Mary's Streets and Wellington Streets	4/3/13: The MHC requested additional photographs.	Additional photographs prepared on inventory form continuation sheets.
FR.011	Fall River	Railroad bridge near Ashley St, MP 8.58 Fall River Secondary	2/21/13: The MHC requested additional information regarding the railroad bridge near Ashley Street (Map ID# FR.011), including additional information regarding the lane passing under bridge and the wharf that leads to along the Taunton River.	Research conducted in historic maps, census records, town histories, city directories, and MHC Inventory FLR.276. Continuation Sheets prepared. No National Register status change.

MAP ID/ MHC No.	COMMUNITY	PROPERTY NAME/LOCATION	MHC COMMENTS	RESPONSE
FR.003/MHC FLR.0284	Fall River	Jael Hathaway House, 4042 North Main St	2/21/13: The MHC found the property eligible for the National Register.	B form revised, and new National Register criteria sheet prepared to reflect status change to National Register eligible.
FR.050	Fall River	St. Michael's Roman Catholic Church, School, Rectory, 207 Essex Street	2/21/13: The MHC requested an MHC Form A (Area Form) be submitted for the school and-rectory associated with the St. Michael's Roman Catholic Church.	Area A form prepared for FR.Q with data sheet, parcel map, and photos of each structure.
FR.052	Fall River	St. Matthews Convent, 189 Wellington Street	2/21/13: The MHC requested additional information regarding the St. Matthew's School and St. Matthew's Convent and whether there is a potential district in this area.	Continuation Sheets and National Register Criteria Statement for potential North End Roman Catholic Historic District, recommended as National Register Eligible.
FR.053	Fall River	St. Matthews School, 231 Wellington Street	2/21/13: The MHC requested additional information regarding the St. Matthew's School and St. Matthew's Convent and whether there is a potential district in this area.	Continuation Sheets and National Register Criteria Statement for a new North End Roman Catholic Historic District, recommended as National Register Eligible.
FR.067	Fall River	Westport Manufacturing Waste Dept, 7 Oregon Street	2/21/13: The MHC requested additional information regarding the types of properties immediately adjacent to the structure.	Continuation Sheets prepared with narrative, aerial photograph, and historic map indicating no historically associated or surviving adjacent buildings in the residential neighborhood. No National Register status change.

MAP ID/ MHC No.	COMMUNITY	PROPERTY NAME/LOCATION	MHC COMMENTS	RESPONSE
FR.110 (new Map ID)	Fall River	St. John's Cemetery, Brightman and St. Mary Streets	2/21/13: The MHC requested additional information regarding St. John's Cemetery in Fall River including an inventory form and an evaluation of the property's potential eligibility for listing in the National Register.	Research and fieldwork completed for preparation of new Cemetery Form and National Register Criteria statement for cemetery recommended National Register eligible individually and as a part of a new North End Roman Catholic Historic District, recommended as National Register Eligible.

One Form B (Building Form) was completed for a newly surveyed additional property, recommended as individually National Register eligible.

- FR.110, St. John's Cemetery, Fall River

One property that was recommended as National Register eligible in the January 2013 report was found to be ineligible in the opinion of the MHC, and therefore belongs in the Appendix F.

- NB.029, Christ Presbyterian Church, New Bedford

Additional information was provided for three areas and five individual properties. Except for the Ta.K, Hodges Avenue Area, Taunton; Ta.U, Weir Village Area, Taunton; and FR.011, Railroad Bridge near Ashley Street, Fall River; all were recommended as National Register eligible in the January 2013 report. A small portion of the Ta.U Weir Village Area was considered to be within the South Coast Rail Area of Potential Effect (APE) in the January 2013 report. However, upon closer review, all historic resources are located outside the APE. The northern boundary of the Cohannet Mill property listed in the National Register runs along the north side of the building and defines a property that is outside the APE. The only historic resource within the South Coast Rail APE was the Taunton Pearl Works at 98 Ingell Street (MHC TAU.298) on the north side of the rail right-of-way. This complex was demolished within the last few years. The George Cummings House, Ft.002 (MHC FRE.116) was also determined to be outside the APE upon further review. Ta.U Weir Village and Ft.002 George Cummings House are located outside the South Coast Rail APE, and therefore belongs in Appendix F.

- Ra.011, Dog Kennel and Track, 385 Thrasher Street, Raynham (additional research on property)
- Ta.K, Hodges Avenue Area, Taunton (additional photographs)
- Ta.U, Weir Village Area, Taunton (additional photographs, boundary review, outside APE)
- FR.I, Wellington-Brownell Area, Fall River (additional photographs)
- FR.011, Railroad Bridge near Ashley Street, Fall River (additional research on bridge and lane)
- FR.052 and FR.053, St. Matthews Convent and St. Matthews School, Fall River (additional research and National Register evaluation of potential new North End Roman Catholic Historic District, FR.R, recommended as National Register eligible, along with FR.050, St. Michael's Church, School, and Rectory, and FR.010, St. John's Cemetery)
- FR.067, Westport Manufacturing Waste Department, Fall River (additional photographs of setting)

MHC Form A (Area Forms) were prepared for two individual properties that were recorded on Form Bs (Building Forms) in the January 2013 report.

- NB.010, MHC NBE.0641, Lambeth Rope, New Bedford
- FR.Q (FR.050), St. Michael's Roman Catholic Church, School, and Rectory, Fall River

Information on one contributing property within a historic district was added to Tables 4-2, 5-1 and 5-2.

- Ea.A, Somerset & Dighton Line, contributing in Ea.B, North Easton Historic District, Easton, listed in the National Register

Three properties referenced above are also revisions to Appendix F, but are included in their original Appendix location.

- Ta.U, Weir Village Area, Taunton (additional photographs, boundary review, outside APE; see Appendix E-1 Addendum)
- NB.029, Christ Presbyterian Church, New Bedford (not National Register eligible; see Appendix E-2 Addendum)
- Ft.002/MHC FRE.116 George Cummings House, Freetown (outside APE; see Appendix E-2 Addendum)

There are no changes to Appendix D, Photographs or Appendix G, Glossary of Terms.

Following Army Corps and SHPO review of the January 2013 historic resources intensive survey report and supplemental information provided, the results of the intensive survey are updated and revised. The survey resulted in the identification of 19 historic areas/districts and 43 individual properties that are listed in or previously determined eligible for listing in the National Register, including 1 NHL. An additional 21 historic areas/districts and 27 individual properties are recommended as eligible for State and National Register listing. One additional area is recommended as contributing to an existing National Register-listed district. The Army Corps and the SHPO will review this information to reach a Consensus Determination of Eligibility for the National Register for these historic properties. Fifteen properties (5 areas and 10 individual) were found ineligible for the National Register, one property has been demolished, and five (2 areas, 3 individual) are now outside the APE. The Army Corps and the SHPO have reached a Consensus Determination of Eligibility for the National Register for these historic properties. The report addendum also presents revised and updated Tables 5-1 and 5-2 assessment of the effects of the South Coast Rail Project on all district and individual historic properties for the Stoughton Electric Alternative and the Whittenton Electric Alternative. Project effects are assessed for a combined total of 41 historic areas/districts and 71 individual properties within the APE; and two of the five properties outside of the APE. The Army Corps and MassDOT will use the information on the historic properties in the report to finalize a Determination of Effect, undertake consultation, and develop mitigation under Section 106 of the National Historic Preservation Act and related state laws.

APPENDIX A
Addendum

Lists of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties, and Project Effects

Tables 4-2, 5-1, and 5-2, Revised and Updated

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ca.B	*Canton*	*Revere Copper Works Company*	*Revere Street*	*CAN.B*	*1835 to mid-20th c.*	*Out of APE*	*Stoughton Line*
Ca.C	Canton	Washington Street District	Washington Street	n/a	late-19th to mid-20th c.	RNRE	Stoughton Line
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman Street	CAN.104	1892	RNRE	Stoughton Line
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere Street	CAN.935	1835	RNRE	Stoughton Line
Ca.024	Canton	Canton Water Works	40 Pine Street	CAN.366	1888	RNRE	Stoughton Line
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Streets	STG.A	early-19th to mid-20th c.	RNRE	Stoughton Line
St.022	Stoughton	Pearl Street Cemetery	Pearl Street	STG.800	1737 - 1965	RNRE	Stoughton Line
St.024	Stoughton	Mystic Rubber Company	2 Canton Street	STG.002, STG.A	ca. 1890-ca. 1920	RNRE	Stoughton Line
St.046	Stoughton	Meade Rubber Company	25 Brock Street	STG.001	1916	RNRE	Stoughton Line
St.075, St.D	*Stoughton*	*Benjamin Marshall House*	*1823 Washington Street*	*STG.072, STG.E*	*1780*	*Demolished*	*Stoughton Line*
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden streets	n/a	mid- to late-19th c.	RNRE	Stoughton Line
Ea.E	Easton	Center Street Area	Center Street	n/a	early-19th to early-20th c.	RNRE	Stoughton Line
Ea.F	Easton	Easton Center Area	Center, Depot, and Short streets	EST.I	1786 to early-20th c.	RNRE	Stoughton Line
Ea.G	Easton	Hayward - Pool Area	Foundry Street	EST.K	1770-1928	RNRE	Stoughton Line

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ea.008, Ea.A, Ea.B	Easton	Dighton & Somerset Line	Parallel to Mechanic Street between Elm Street and Main Street	n/a	1854, 1863	NRDIS -C North Easton Historic District	Stoughton Line
Ra.B	Raynham	Carver Street Area	Carver Street, Broadway (Route 138)	n/a	1850 c. - 1905	RNRE	Stoughton Line
Ra.C	*Raynham*	*Broadway-Center Street Area*	*Center Street, Broadway (Route 138)*	*n/a*	*mid-19th to mid-20th c.*	*NE*	*Stoughton Line*
Ra.001	Raynham	Residence and Barn	521 Prospect Hill	n/a	1890	RNRE	Stoughton Line
Ra.011	Raynham	Dog Kennel and Track Property	385 Thrasher Street	n/a	1870 to mid-20th c.	RNRE	Stoughton Line
Ta.B	Taunton	Taunton Center Area	Dean, Park, and Summer Streets	(includes TAU.A, TAU.AC)	18th to mid-20th c.	RNRE	Stoughton Line
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Streets	n/a	early-19th to early-20th c.	RNRE	Stoughton Line, Attleboro Secondary
Ta.F	Taunton	Whittenton Mill Area	Whittenton Street	(includes TAU.T)	mid- to late-19th c.	RNRE	Whittenton Branch
Ta.H	Taunton	Reed and Barton Worker Housing	Cottage and Meadow Street	n/a	mid- to late-19th c.	RNRE	Whittenton Branch
Ta.I	Taunton	Ancient Whittenton Area	Warren Street	TAU.R	1730 to late-19th c.	RNRE	Whittenton Branch
Ta.K	*Taunton*	*Weir Village Area*	*Plain, First, West Water, and Ingell Street*	*TAU.K*	*early-19th to mid-20th c.*	*NE (Out of APE)*	*Attleboro Secondary*
Ta.L	Taunton	Hart Street Area	Hart Street	n/a	mid-19th to early-20th c.	RNRE	Attleboro Secondary

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Ta.T	Taunton	Tremont Street Area	Tremont Street	n/a	1870	RNRE	Attleboro Secondary
Ta.U	*Taunton*	*Hodges Avenue Area*	*Morton, Granite, and Tremont Streets; Hodges, Chandler and Columbus Avenues*	*n/a*	*1860 - 1930*	*NE*	*Attleboro Secondary*
Ta.087	*Taunton*	*Alfred Paul House*	*467 Weir Street*	*TAU.294, TAU.K, TAU.P*	*1860*	*Out of APE*	*Attleboro Secondary*
Ta.088	*Taunton*	*Weir Engine House*	*530 Weir Street*	*TAU.296, TAU.K, TAU.P*	*1889*	*Out of APE*	*Attleboro Secondary*
Ta.091	*Taunton*	*Bridge over Brickyard Road (abandoned)*	*MP 12.00, New Bedford Main Line*	*n/a*	*1906, ca. 1950*	*NE*	*Attleboro Secondary/New Bedford Main Line*
Ta.149	*Taunton*	*Railroad Bridge over Mill River*	*MP 20.66 Whittenton Branch*	*n/a*	*ca. 1930*	*NE*	*Whittenton Branch*
Ta.160	Taunton	Staples Coal Company	28 Dana Street	n/a	1870, 1920	RNRE	Attleboro Secondary
Ta.206	*Taunton*	*Taunton Car Manufacturing Company*	*3 Myrtle Street*	*TAU.257*	*1860*	*NE*	*Attleboro Secondary*
Ta.213	*Taunton*	*Joseph E. Wilbar House*	*150 Cohannet Street*	*n/a*	*1860*	*NE*	*Attleboro Secondary*
Ta.225	Taunton	Rhodes Button Company	12 Porter Street	TAU.258, TAU.625	1860, 1879	RNRE	Attleboro Secondary
Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Streets	n/a	mid-19th to early-20th c.	RNRE	Fall River Secondary, New Bedford Main Line

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
Be.006	Berkley	Residence	1 Macomber Street	n/a	1860	RNRE	New Bedford Main Line
La.C	Lakeville	Assonet Cedar Swamp	Pierce Avenue; County and Howland Roads; Freetown, Mill, and Malbone Streets	LAK.D	late-18th c.	RNRE	New Bedford Main Line
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	n/a	1785 - 1892	RNRE	Fall River Secondary
La.025	*Lakeville*	*Railroad Bridge over Assonet River*	*MP0.92 Fall River Secondary*	*n/a*	*1908*	*NE*	*Fall River Secondary*
Ft.C	Freetown	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Roads	n/a	late-18th to early-20th c.	RNRE	Fall River Secondary
Ft.002	*Freetown*	*Cummings, George House*	*76 Chace Road*	*FRE.166*	*1806*	*RNRE (Out of APE)*	*New Bedford Main Line*
NB.B	*New Bedford*	*Brook Street Industrial and Commercial Area*	*Brook, Church, and Deane Streets*	*n/a*	*1900-50*	*NE*	*New Bedford Main Line*
NB.G	New Bedford	National Spun Silk Co. - Oneko Mills	Brook Street	NBE.U	1918-1920	RNRE	New Bedford Main Line
NB.010	New Bedford	Lambeth Rope Complex	627-637 Tarkiln Hill Road	NBE.0641	1893, 1918	RNRE	New Bedford Main Line
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King Street	NBE.0633	1919	RNRE	New Bedford Main Line
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County Street	NBE.0612	1909	RNRE	New Bedford Main Line
NB.029	*New Bedford*	*Christ Presbyterian Church*	*1097 County Street*	*n/a*	*Aug. 1924-1950*	*NE*	*New Bedford Main Line*

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
NB.053	New Bedford	Engine House No. 10	2071 Purchase Street	n/a	1910	RNRE	New Bedford Main Line
NB.064	*New Bedford*	*Guardian Angel Parochial Schoolhouse*	*844 Acushnet Ave*	*NBE.0494*	*1896*	*NE*	*New Bedford Main Line*
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co. - North Stores	19 Jean Street	NBE.613	1910-1924	RNRE	New Bedford Main Line
FR.B	*Fall River*	*Fall River Country Club Golf Course*	*4232 North Main Street and Country Club Road*	*n/a*	*1895 / 1975*	*NE*	*Fall River Secondary*
FR.D	Fall River	North Main Street Area	North Main Street	n/a	19th and early-20th c.	RNRE	Fall River Secondary
FR.I	*Fall River*	*Wellington-Brownell Street Area*	*Brightman, Brownell, George, Morton, Oregon, Saint Mary's Streets and Wellington Streets*	*n/a*	*1870*	*NE*	*Fall River Secondary*
FR.L	Fall River	Durfee Street Area	North Main and Durfee Streets	n/a	1870-1920	RNRE	Fall River Secondary
FR.Q	Fall River	St. Michael's Roman Catholic Church Area	207 Essex Street	n/a	1896	RNRE	Fall River Secondary
FR.003	Fall River	Hathaway, Jael House	4042 North Main Street	FLR.0284	1785	RNRE	Fall River Secondary
FR.011	*Fall River*	*Railroad Bridge near Ashley Street*	*MP 8.58 Fall River Secondary*	*n/a*	*ca. 2000*	*NE*	*Fall River Secondary*
FR.013	Fall River	William J. Wiley Middle School	2585 North Main Street	n/a	1912	RNRE	Fall River Secondary

Table 4-2. List of Historic Resources Intensive Survey and National Register Eligibility Evaluation Results. Updated May 2013.

Map ID*	Town	Property Name	Location	MHC ID	Est. Date	NR Status**	Corridor Segment
FR.017	Fall River	Residence	311 Crescent Street	FLR.0074	1880	RNRE	Fall River Secondary
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex Street	n/a	1896	RNRE	Fall River Secondary
FR.052	Fall River	St. Matthew's Convent	189 Wellington Street	n/a	1920	RNRE	Fall River Secondary
FR.053	Fall River	St. Matthew's School	231 Wellington Street	n/a	1920	RNRE	Fall River Secondary
FR.067	Fall River	Westport Manufacturing Company Waste Department	7 Oregon Street	n/a	1918	RNRE	Fall River Secondary
FR.073	*Fall River*	*Residence / Inn*	*800 Davol Street*	*n/a*	*1870*	*NE*	*Fall River Secondary*
FR.081	Fall River	Residence	524 Durfee Street	n/a	1870	RNRE	Fall River Secondary
FR.088	*Fall River*	*American Printing Company Machine Shop*	*70 Water Street*	*n/a*	*1900*	*NE*	*Fall River Secondary*
FR.089	Fall River	Borden and Remington Company	85-115 Anawan Street	FLR.2002	1892	RNRE	Fall River Secondary
FR.110	Fall River	St. John's Cemetery	Brightman and St. Mary Streets	n/a	1858	RNRE	Fall River Secondary

*Resources are sequenced north to south along the project corridor and by town.

**National Register Status Key
RNRE Property Recommended Eligible for National Register Listing
NE *Property Recommended Not Eligible for National Register Listing*
Out of APE *Property determined to be outside of the Area of Potential Effect for the South Coast Rail Project since the DEIS/DEIR*
Demolished *Property was included in the DEIS/DEIR, but has since been demolished*

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ca.C	Canton	Washington Street	Washington St	RNRE; A, C	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.H	Canton	Washington Street/Canton Center	Washington Street/Canton Center	MHC-DOE	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman St	RNRE; A, B, C	Stoughton Line, Northeast Corridor	Canton Junction Station	Possible	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Adverse: Physical (possible) Visual (possible)	Yes (possible)
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere St	RNRE; C	Stoughton Line, Northeast Corridor	n/a	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
Ca.006	Canton	Canton Public Library	786 Washington St	MHC-DOE; A, C	Stoughton Line	n/a	No	No	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ca.007	Canton	Forge Pond Railroad Bridge	Between Washington and Bolivar Sts	MHC-DOE; C	Stoughton Line	TP-02 Switching Station (SWS-1)	Possible	n/a	No Change	Yes: Severe, in close proximity to new catenary, and in vicinity of traction power facility	Adverse: Physical	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ca.024	Canton	Canton Water Works	44 Pine St	RNRE; A, C	Stoughton Line	Pine St Grade Crossing	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Sts	RNRE; A, C	Stoughton Line	Stoughton Station; School, Porter, Wyman Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
St.022	Stoughton	Pearl Street Cemetery	Pearl St	RNRE; A, C	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
St.023, St.B	Stoughton	Stoughton Town Hall	10 Pearl St	NRIND	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse; Visual	Yes
St.024	Stoughton	Mystic Rubber Company	2 Canton St	RNRE; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
St.025	Stoughton	Stoughton Old Colony Railroad Station	45-47 Wyman St	NRIND; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Visual	Yes
St.026	Stoughton	Lucius Clapp Memorial Library	6 Park St	NRIND	Stoughton Line	n/a	No	Yes, Moderate train and horn noise	No Change	No	No Adverse Effect	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
St.046	Stoughton	Meade Rubber Company	25 Brock St	RNRE; A, C	Stoughton Line	Stoughton Station; Brock St Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary and grade crossing systems	Adverse Effect Demolition	Yes
Ea.B	Easton	North Easton Historic District	Elm, Lincoln, and Main Sts	NRDIS; A, C	Stoughton Line	Easton Village Station; Oliver St, Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden Sts	RNRE; A, C	Stoughton Line	Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ea.D	Easton	H.H. Richardson Historic District	Elm and Main Sts	NHL, NRDIS; A, C	Stoughton Line	Easton Village Station	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in one location	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ea.E	Easton	Center Street Area	Center St	RNRE; A, C	Stoughton Line	Reynolds St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.F	Easton	Easton Center Area	Center, Depot, and Short Sts	RNRE; A, C	Stoughton Line	Short St, Depot St Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.G	Easton	Hayward - Pool Area	Foundry St	RNRE; A, C	Stoughton Line	Foundry St Grade Crossing	No	Yes: Moderate train and moderate to severe horn noise (at edge of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.003	Easton	Old Colony Railroad Station	Off Oliver St on Railroad Right of Way	NRIND, in NHL District; A, C	Stoughton Line	Easton Village Station; Oliver St Grade Crossing	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Severe, adjacent to new catenary, Moderate station and site modifications, and grade crossing	Adverse: Visual (possible)	Yes (possible)
Ea.008, Ea.A, Ea.B (contributing)	Easton	Dighton & Somerset Line	Parallel to Mechanic Street from Elm Street to Main Street	Contributing in NRDIS, North Easton Historic District	Stoughton Line	Easton Village Station; Oliver St Grade Crossing	Yes: Construction and alteration	n/a	Yes: 0 ft, > 80 VdB	Yes: new catenary, and grade crossing	Adverse: Direct Visual (possible)	Yes (possible)

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ra.B	Raynham	Carver Street Area	Carver St, Broadway (Route 138)	RNRE; A, C	Stoughton Line	Carver St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ra.011	Raynham	Dog Kennel and Track Property	385 Thrasher St	RNRE; A	Stoughton Line	West Brittania St; Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB (portion of property)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing (at edge of property)	Adverse: Visual	Yes
Ta.B	Taunton	Taunton Center Area	Dean, Park, and Summer Sts	RNRE; A, C	Stoughton Line	Taunton Station; Dean St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing	Adverse: Noise Visual	Yes
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout City of Taunton	NRMPS; A, B, C, D	Stoughton Line	multiple	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS	Refer to individual properties In MPS
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Sts	RNRE; A, C	Stoughton Line and Attleboro Secondary	TP - 05 Paralleling Station (Stoughton); Weir Street, Bow Street Grade Crossing (Attleboro Secondary)	No	Yes: Moderate to severe train and horn noise	Yes: 50 ft, >80 VdB (only small portion of area)	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.L	Taunton	Hart Street Area	Hart St	RNRE; A, C	Attleboro Secondary	Taunton Depot Station; Hart St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, >80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.18, Ta.C	Taunton	Dean-Hartshorn House	68 Dean St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	Yes: Moderate to severe train and horn noise	No: 100 ft, < 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.019, Ta.B, Ta.C	Taunton	Old Colony Railroad Station	40 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Taunton Station; Dean St Grade Crossing	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Severe, adjacent to new catenary and grade crossing, in vicinity of new station	No Adverse Effect	No
Ta.020, Ta.B, Ta.C	Taunton	William Woodward House	117 Arlington St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Dean St Grade Crossing	No	Yes: Severe train and horn noise	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.021, Ta.B, Ta.C	Taunton	Charles R. Atwood House	30 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	Dean St Grade Crossing	No	Yes: Moderate train and severe horn noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.022, Ta..B, Ta.C	Taunton	Theodore Dean House	26 Dean St	NRIND, NRMPS, LHD; A, C	Stoughton Line	n/a	No	Yes: Severe horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ta.23, Ta.B, Ta.C	Taunton	C.J.H. Bassett House	20 Chestnut St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	No	No: >800 ft, < 50 VdB	No	No Adverse Effect	No

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ta.28, Ta.B, Ta.C	Taunton	Abiezar Dean House	57 Summer St	NRIND, NRMPS, LHD	Stoughton Line	n/a	No	No	No: >500 ft, < 50 VdB	No	No Adverse Effect	No
Ta.029, Ta.B, Ta.C	Taunton	Neck of Land Cemetery	Summer St	NRIND, NRMPS, LHD; A, C	Stoughton Line	n/a	No	Yes: Moderate to severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.89	Taunton	Cohannet Mills #3	120 Ingell St	NRIND	Attleboro Secondary	Grade Crossing	No	No: 100 ft <80 VdB	n/a	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Sts	RNRE; A, C	Fall River Secondary, New Bedford Main Line	TP-06 Switching Station (SWS-2); Myricks and Mill Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, and traction power facility	Adverse: Noise Visual	Yes
Be.006	Berkley	Residence	1 Macomber St	RNRE; A, C	New Bedford Main Line	Padelford St Grade Crossing	No	Yes: Severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
La.C	Lakeville	Assonet Cedar Swamp Area	Pierce Ave; County and Howland Rds; Freetown, Mill, and Malbone Sts	RNRE; A, C, D	New Bedford Main Line	Malbone St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	RNRE; A, C NE	Fall River Secondary	Adams Lane Grade Crossing	No	Yes: Severe train and horn noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.C	Freetown	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Rds	RNRE; A, C	Fall River Secondary	Elm St, Forge Rd, Richmond Rd Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ft.D	Freetown	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Sts	NRDIS; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, portion of edge of area is in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.002	Freetown	George Cummings House	76 Chace Road	RNRE: A, C	New Bedford Main Line	n/a	No	No: Outside APE 800 ft from ROW	No: Outside APE 800 ft from ROW	None. Outside APE 800 ft from ROW	No Effect	No
Ft.009	Freetown	Richmond Road / Maple Tree Crossing Bridge	Richmond Rd	MHC-DOE; C	Fall River Secondary	Richmond Rd, Beechwood Rd Grade Crossing	No	n/a	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.C	New Bedford	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); TP-30 Paralleling Station (PS-4)	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise Visual	Yes
NB.D	New Bedford	Wamsutta Mills Historic District	Acushnet Ave; Logan, North Point, and Wamsutta Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); Wamsutta Layover Facility	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise (to residential area) Visual	Yes
NB.G	New Bedford	National Spun Silk Co. – Oneko Mills	Brook St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
NB.010	New Bedford	Lambeth Rope Complex	627-637 Tarkiln Hill Rd	RNRE; A, C	New Bedford Main Line	King's Highway Station; King's Highway / Tarkiln Hill Rd Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Possible: Moderate, in vicinity of new catenary and station	No Adverse Effect	No
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
NB.012	New Bedford	Belleville Warehouse Company Cotton Storage Building	51 King St	NRDOE; A, C	New Bedford Main Line	Nash Rd Grade Crossing	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.029	New Bedford	Christ Presbyterian Church	1097 County St	RNRE; C	New Bedford Main Line	n/a	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.053	New Bedford	Purchase Street Fire Station	2071 Purchase St	RNRE; A, C	New Bedford Main Line	n/a	No	Yes: Moderate train noise	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.063	New Bedford	Union Street Railway Carbarn	1959 Purchase St	NRIND, NRDIS-C; A	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	No Adverse Effect	No
NB.065	New Bedford	Dawson Building	1843-1855 Purchase St	NRIND, NRDIS-C; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co., North Stores	19 Jean St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
FR.C	Fall River	Fall River Multiple Resource Area	multiple	NRMPS; A, B, C	Fall River Secondary	Battleship Cove Station	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.D	Fall River	North Main Street Area	North Main St	RNRE; A, C	Fall River Secondary	Weaver's Cove Layover(east)	Yes: Layover construction	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and layover	Adverse: Physical Noise Visual	Yes
FR.E, FR.C	Fall River	Border City Mills	Weaver and West Sts	NRDOE, NRMPS; A, C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.F, FR.C	Fall River	Sagamore Mill Nos. 1 and 3	Ace St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.G, FR.C	Fall River	Sagamore Mill No. 2	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.H, FR.C	Fall River	Foster Spinning Company	Cove St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.J, FR.C	Fall River	Narragansett Mills	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.K, FR.C	Fall River	North Burial Ground	North Main St	NRMPS, NRDIS; A, B, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.L	Fall River	Durfee Street Area	North Main and Durfee Sts	RNRE; A, C	Fall River Secondary	Fall River Depot Station; TP-11 Paralleling Station (PS-05)	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, station, and traction power facility	Adverse: Noise Visual	Yes
FR.M	Fall River	Diners of Massachusetts	multiple	NRMPS; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.N, FR.C	Fall River	American Printing Company - Metacomet Mill	Anawan St	NRMPS, NRDIS; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and station	Adverse: Visual	Yes
FR.Q	Fall River	St. Michael's Roman Catholic Church Complex	207 Essex Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	Yes: 100 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.003	Fall River	Joel Hathaway House	4042 North Main Street	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 100 ft, < 75 VdB	No: RR in deep cut section	No Adverse Effect	No
FR.005, FR.C	Fall River	William Collins House	3775 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.006, FR.C	Fall River	North Christian Congregational Church	3538 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.010, FR.C	Fall River	Borden-Winslow House	3063 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	No	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.012, FR.C	Fall River	Canedy, Squire William B. House	2634 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	Adverse: Visual (catenary)	Yes
FR.013	Fall River	William J. Wiley Middle School	2585 North Main Street	RNRE	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 500 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	No Adverse Effect	No
FR.015, FR.C	Fall River	Border City Mills - Mill #2	1 Weaver St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	n/a	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.016	Fall River	Weaver Street Railroad Bridge	Weaver St	MHC-DOE; A, C	Fall River Secondary	n/a	Possible	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate, in close proximity to new catenary	No Adverse Effect	No
FR.017	Fall River	Residence	311 Crescent St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.026, FR.C	Fall River	Brightman, Hathaway House	205 Crescent St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.052	Fall River	St. Matthews Convent	211 Wellington Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.053	Fall River	St. Matthews School	211 Wellington Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 100 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.066, FR.C	Fall River	St. Joseph's Roman Catholic Church	1355 North Main St	NRIND, NRMPS A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 700 ft, < 50 VdB	No	No Adverse Effect	No
FR.067	Fall River	Cotton Warehouse	7 Oregon St	RNRE; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Visual	Yes (possible)
FR.070, FR.M	Fall River	Al Mac's Diner	135 President Ave	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, <70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.081	Fall River	Residence	524 Durfee St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.082	Fall River	Lafayette-Durfee House	94 Cherry St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.084	Fall River	Central Street Bridge over Quequechan River	Central St	MHC-DOE; C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.089	Fall River	Borden and Remington Company	85-115 Anawan St	RNRE; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and station	No Adverse Effect	No

Table 5-1. Historic Properties Affected along the Stoughton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.110	Fall River	St John's Cemetery	Brightman and St. Mary's Streets	RNRE; A, C	Fall River Scondary	n/a	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

[1] Resources are sequenced north to south along the project corridor by community.

[2] National Register Status

NHL	National Historic Landmark
NRDIS	National Register Historic District
NRIND	Property individually listed in the National Register
NRMPS	District or Property individually listed in the National Register as part of a NRMPS
NRDOE	Property formally determined eligible by Keeper of the National Register
MHC-DOE	Property evaluated as eligible by MHC
RNRE	Property recommended as eligible
NRDIS-C	Property contributing to an NR-listed district
LL	Property individually listed in the State Register
LHD	Property located within a State Register listed historic district

[3] Within 250 feet of a proposed station, layover, or traction power facility, or an existing station where work is proposed or within 400 feet of a grade crossing.

[4] Direct/Physical Impacts

Level of impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011).
No	Historic property will not be impacted during or because of project construction activities; this *typically* applies to properties located in the vicinity of the project, but not within or immediately adjacent to construction areas.
Yes	Historic property that could be impacted during or because of project construction activities; *typical* impacts are physical in nature and may affect properties within or immediately adjacent to construction areas.

[5] Indirect Noise Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Noise* (VHB June 2009) and DEIS/DEIR (USACE 2011).
Train Noise	Noise generated by the operation of trains traveling along the rails.
Horn Noise	Noise generated by warning horn blowing, typically at grade crossings.
Moderate	Potential for the project to cause noticeable increase in cumulative noise levels, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009).
Severe	Potential for the project to cause significant increase in cumulative noise levels, causing high annoyance, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009). Under FTA criteria severe impacts are subject to mitigation (refer to VHB 2012a).

n/a	Not applicable- Noise impacts were not evaluated for historic properties where noise is unlikely to impact the characteristics for which the property is historically significant, including bridges, railroad stations, and industrial complexes.

[6] Indirect Vibration Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Vibration* (VHB June 2009) and DEIS/DEIR (USACE 2011). The vibration data shown present the approximate distance of the property from the right-of-way centerline, followed by projected vibration level from train operations.
No	Low level of vibration anticipated from construction and/or operations per VHB June 2009, which determined that, based on the *FTA Generalized Ground-Surface Vibration Curves Table*, properties within approximately 90 feet of the center line of a locomotive powered passenger or freight rail line could be impacted by vibration levels of 80VdB, the threshold for human annoyance, or higher. All projected vibration levels are well below the 100 VdB threshold for potential structural damage to fragile buildings or structures (VHB June 2009) that would result in a level of moderate or high impact.
Possible	Potential for damage from vibration generated by pile driving is noted as "Vibration (possible)" under the Effects column, where individual properties or buildings within an historic district are within 25 ft of the right-of-way (per VHB June 2009). The location of any pile driving has not been determined and is expected to be limited, if any occurs.
Ft	Distance (in feet) of the property from the railroad right-of-way centerline.
VdB	RMS (root mean square) Vibration Velocity Level.

[7] Indirect Visual Impacts

Level of Impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011). The categories of level of impact were defined for the purposes of this analysis. Moderate and severe visual impacts considered to be potential adverse effects.
No	No potential for the project to change the existing visual environment (ex. increased use of existing railroad infrastructure).
Minimal	Low level of change in the visual environment of a historic property, based on the location of the property near existing railroad elements that will be slightly modified with a new feature as part of the project (ex. replacement of existing catenary with new catenary or upgrading an existing grade crossing).
Moderate	Potential for change in the visual environment of a historic property, based on the location of the property in the broad vicinity of new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).
Severe	High potential for change in the visual environment of a historic property, based on the location of the property adjacent or in close proximity to new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).

[8] Effects

The level of effect (adverse or no adverse effect) is assessed based on the impact information presented for direct and indirect physical, noise, vibration, and visual impacts and the resource type (ex. new catenary is not considered an adverse effect for industrial and railroad historic properties). New station construction and modifications to existing stations and their sites will have no adverse effect on historic stations and adjacent historic properties as long as changes are designed in a manner sensitive to the historic architectural character of the building and/or area. Noise mitigation including linear barriers and insulating treatments on historic buildings will have an effect on adjacent or subject properties and will require design considerations for compatibility with historic resources. Vibration impacts from pile driving could affect buildings adjacent to the right-of way, if pile driving or other similar construction occurs; however the location of this type of construction has not been identified. There are no anticipated atmospheric and cumulative impacts to historic resources. Traffic impacts to historic resources will be assessed when traffic analyses are available, but are expected to be minor. The level of effect presented in the table reflects the worst case and will be refined after the preferred alternative is selected, intensive historic resources survey is completed, and more detail about the project elements and work types is available.

[9] Mitigation

It is assumed that all adverse effects will require mitigation. Mitigation may include vibration dampening, noise barriers, visual screening, and the use of compatible materials within historic districts or adjacent to historic properties.

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ca.C	Canton	Washington Street	Washington St	RNRE; A, C	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.H	Canton	Washington Street/Canton Center	Washington Street/Canton Center	MHC-DOE	Stoughton Line	Washington St Grade Crossing, Canton Center Station	No	Yes: Moderate to severe train noise (in some locations)	No Change	Yes: Moderate, in vicinity of new catenary and station	Adverse: Visual	Yes
Ca.001	Canton	Canton Junction Railroad Station	666 Sherman St	RNRE; A, B, C	Stoughton Line, Northeast Corridor	Canton Junction Station	Possible	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Adverse: Physical (possible) Visual (possible)	Yes (possible)
Ca.002	Canton	Revere Copper Company Railroad Embankment	Revere St	RNRE; C	Stoughton Line, Northeast Corridor	n/a	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
Ca.006	Canton	Canton Public Library	786 Washington St	MHC-DOE; A, C	Stoughton Line	n/a	No	No	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ca.007	Canton	Forge Pond Railroad Bridge	Between Washington and Bolivar Sts	MHC-DOE; C	Stoughton Line	TP-02 Switching Station (SWS-1)	Possible	n/a	No Change	Yes: Severe, in close proximity to new catenary, and in vicinity of traction power facility	Adverse: Physical	Yes

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Ca.024	Canton	Canton Water Works	44 Pine St	RNRE; A, C	Stoughton Line	Pine St Grade Crossing	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
St.B	Stoughton	Downtown Stoughton Area	Pearl, Perry, School, Washington, Pleasant, and Wyman Sts	RNRE; A, C	Stoughton Line	Stoughton Station; School, Porter, Wyman Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
St.022	Stoughton	Pearl Street Cemetery	Pearl St	RNRE; A, C	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
St.023, St.B	Stoughton	Stoughton Town Hall	10 Pearl St	NRIND	Stoughton Line	n/a	No	Yes: Moderate train noise	No Change	Yes: Moderate, in vicinity of new catenary	Adverse; Visual	Yes
St.024	Stoughton	Mystic Rubber Company	2 Canton St	RNRE; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
St.025	Stoughton	Stoughton Old Colony Railroad Station	45-47 Wyman St	NRIND; A, C	Stoughton Line	Porter St, Wyman St Grade Crossings	No	n/a	No Change	Yes: Severe, adjacent to new catenary; Moderate, modifications to site	Visual	Yes
St.026	Stoughton	Lucius Clapp Memorial Library	6 Park St	NRIND	Stoughton Line	n/a	No	Yes, Moderate train and horn noise	No Change	No	No Adverse Effect	Yes

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Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
St.046	Stoughton	Meade Rubber Company	25 Brock St	RNRE; A, C	Stoughton Line	Stoughton Station; Brock St Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary and grade crossing systems	Adverse Effect Demolition	Yes
Ea.B	Easton	North Easton Historic District	Elm, Lincoln, and Main Sts	NRDIS; A, C	Stoughton Line	Easton Village Station; Oliver St, Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes
Ea.C	Easton	Holmes-Linden Street Area	Holmes and Linden Sts	RNRE; A, C	Stoughton Line	Elm St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ea.D	Easton	H.H. Richardson Historic District	Elm and Main Sts	NHL, NRDIS; A, C	Stoughton Line	Easton Village Station	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in one location	Yes: Moderate to severe, in vicinity of new catenary, station, and grade crossing systems	Adverse: Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
Ea.E	Easton	Center Street Area	Center St	RNRE; A, C	Stoughton Line	Reynolds St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some portions of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.F	Easton	Easton Center Area	Center, Depot, and Short Sts	RNRE; A, C	Stoughton Line	Short St, Depot St Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some portions of district)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.G	Easton	Hayward - Pool Area	Foundry St	RNRE; A, C	Stoughton Line	Foundry St Grade Crossing	No	Yes: Moderate train and moderate to severe horn noise (at edge of area)	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing	Adverse: Noise Visual	Yes
Ea.003	Easton	Old Colony Railroad Station	Off Oliver St on Railroad Right of Way	NRIND, in NHL District; A, C	Stoughton Line	Easton Village Station; Oliver St Grade Crossing	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Severe, adjacent to new catenary, Moderate station and site modifications, and grade crossing	Adverse: Visual (possible)	Yes (possible)
Ea.008, Ea.A, Ea.B (contributing)	Easton	Dighton & Somerset Line	Parallel to Mechanic Street from Elm Street to Main Street	Contributing in NRDIS, North Easton Historic District	Stoughton Line	Easton Village Station; Oliver St Grade Crossing	Yes: Construction and alteration	n/a	Yes: 0 ft, > 80 VdB	Yes: new catenary, and grade crossing	Adverse: Direct Visual (possible)	Yes (possible)

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Ra.B	Raynham	Carver Street Area	Carver St, Broadway (Route 138)	RNRE; A, C	Stoughton Line	Carver St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB in some locations	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems	Adverse: Noise Visual	Yes
Ta.C	Taunton	Taunton Multiple Resource Area	Multiple Throughout City of Taunton	NRMPS; A, B, C, D	Whittenton Branch	Dean St, Whittenton St Grade Crossings	See below	See below	See below	See below	See below	See below
Ta.D	Taunton	High Street Area	High, Weir, and Somerset Sts	RNRE; A, C	Attleboro Secondary and Stoughton Line	TP-05 Paralleling Station (PS-2); Weir St, Bow St Grade Crossings	No	Yes: Moderate train noise (at edge of area)	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary, grade crossing, and traction power facility	Adverse: Noise Visual	Yes
Ta.F	Taunton	Whittenton Mill Area	Whittenton St	RNRE; A, C	Whittenton Branch	Whittenton St Grade Crossings	No	Yes: Moderate to severe train and horn noise (in some locations)	Yes: 0 ft, > 80 VdB (only in some locations)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes
Ta.G, Ta.C	Taunton	Whittenton Mill Complex	Whittenton St	NRDIS, NRMPS; A, C	Whittenton Branch	Whittenton St Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB (only at edge of area)	Yes: Moderate, in vicinity of new catenary and grade crossing systems (in some locations)	No Adverse Effect	No

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Ta.H	Taunton	Reed and Barton Worker Housing	Cottage and Meadow St	RNRE; A, C	Whittenton Branch	Whittenton St Grade Crossing	No	Yes: Moderate to severe horn noise (in some locations)	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes
Ta.I	Taunton	Ancient Whittenton Area	Warren St	RNRE; A, C	Whittenton Branch	Warren St Grade Crossing	No	Yes: Moderate to severe train and horn noise (in some locations)	Yes: 0 ft, > 80 VdB (only in some locations)	Yes: Moderate to severe, in vicinity of new catenary and grade crossing systems (in some locations)	Adverse: Noise Visual	Yes
Ta.R	Taunton	Multiple	MA State Hospitals and State Schools MPS	NRMPS; A, C, D	Attleboro Secondary	Danforth St Grade Crossing	No	Yes: Moderate train and horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Visual	Yes
Ta.S	Taunton	Danforth St, Dana St	Taunton State Hospital Historic District	NRDIS, NRMPS; A, C, D	Attleboro Secondary	Danforth St Grade Crossing	No	Yes: Moderate train and horn noise	No: 400 ft, < 50 VdB	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Visual	Yes
Ta.T	Taunton	Tremont St	Tremont St Area	RNRE; A, C	Attleboro Secondary	Tremont St Grade Crossing	No	Yes: Moderate train and severe horn noise	Yes: 50 ft, > 80 VdB (only small portion of area)	Yes: Moderate, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.160	Taunton	Staples Coal Company	28 Dana St	RNRE; A, C	Attleboro Secondary	n/a	No	n/a	No: 100 ft < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

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Ta.181	Taunton	N.S. Mason House	58 Tremont St	NRIND, NRMPS	Attleboro Secondary	n/a	No	Yes, Moderate train and horn noise	No	No	No Adverse Effect	No
Ta.208, Ta.C	Taunton	St. Thomas Episcopal Church	111-115 High St	NRIND, NRMPS; A, C	Attleboro Secondary	Porter St, Cohannet St Grade Crossing	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
Ta.209, Ta.C	Taunton	McKinstrey House	115 High St	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
Ta.211, Ta.C	Taunton	Henry G. Brownell House (Elk's Lodge No. 150)	119 High St	NRIND, NRMPS; A, C	Attleboro Secondary	Porter St, Cohannet St Grade Crossing	No	Yes: Moderate to severe horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Noise Visual	Yes
Ta.225	Taunton	Rhodes Button Company	12 Porter St	RNRE; A, C	Attleboro Secondary	Winthrop St, Porter St, Cohannet St Grade Crossings	No	n/a	Yes: 90 ft > 80 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	No Adverse Effect	No
Ta.245, Ta.C	Taunton	Lord-Baylies-Bennett House (Taunton Masonic Lodge)	66 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate train and severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes

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Ta.246, Ta.C	Taunton	Samuel Washburn House	68 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate to severe train and severe horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.254, Ta.C	Taunton	Samuel Colby House	74 Winthrop St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St, Cohannet St Grade Crossings	No	Yes: Moderate train and severe horn noise	No: 100 ft < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ta.259, Ta.C, Ta.V	Taunton	Sarah A. Haskins House	18 Harrison Ave	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.262	Taunton	Mount Pleasant Cemetery	19 Crocker St	NRIND; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.266, Ta. C	Taunton	J.C. Bartlett House	12 Walnut St	NRIND, NRMPS; A, C	Attleboro Secondary	Winthrop St Grade Crossing	No	Yes: Moderate train and severe horn noise	No: 400 ft < 50 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
Ta.293	Taunton	Albert Field Tack Works	19 Spring St	NRIND, NRMPS	Attleboro Secondary	n/a	No	No	No: 1600 ft	No	No Effect	No
Ta.294, Ta.C, Ta.D	Taunton	H.B. Lothrop Store	210 Weir St	NRIND, NRMPS; A, C	Attleboro Secondary	n/a	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
Ta.309, Ta.C	Taunton	William Lawrence House	101 Somerset Ave	NRIND, NRMPS; A, C	Attleboro Secondary	Barnum St, Weir St Grade Crossings	No	Yes: Moderate horn noise	No: 400 ft < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes

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Be.C	Berkley	Myricks Street Area	Myricks, Grove, and Mill Sts	RNRE; A, C	Fall River Secondary, New Bedford Main Line	TP-06 Switching Station (SWS-2); Myricks and Mill Sts Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, and traction power facility	Adverse: Noise Visual	Yes
Be.006	Berkley	Residence	1 Macomber St	RNRE; A, C	New Bedford Main Line	Padelford St Grade Crossing	No	Yes: Severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
La.C	Lakeville	Assonet Cedar Swamp Area	Pierce Ave; County and Howland Rds; Freetown, Mill, and Malbone Sts	RNRE; A, C, D	New Bedford Main Line	Malbone St Grade Crossing	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
La.024	Lakeville	Peirce and Haskins Cemetery	Off Adams Lane	RNRE; A, C NE	Fall River Secondary	Adams Lane Grade Crossing	No	Yes: Severe train and horn noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.C	Freetown	Slab Bridge Road Area	Slab Bridge, Forge, Richmond, and Howland Rds	RNRE; A, C	Fall River Secondary	Elm St, Forge Rd, Richmond Rd Grade Crossings	No	Yes: Moderate to severe train and horn noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.D	Freetown	Assonet Historic District	Mill, Water, Main, Pleasant, Elm, Forge Sts	NRDIS; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train and horn noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, portion of edge of area is in vicinity of new catenary	Adverse: Noise Visual	Yes
Ft.002	Freetown	George Cummings House	76 Chace Road	RNRE: A, C	New Bedford Main Line	n/a	No	No: Outside APE 800 ft from ROW	No: Outside APE 800 ft from ROW	None. Outside APE 800 ft from ROW	No Effect	No

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Ft.009	Freetown	Richmond Road / Maple Tree Crossing Bridge	Richmond Rd	MHC-DOE; C	Fall River Secondary	Richmond Rd, Beechwood Rd Grade Crossing	No	n/a	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.C	New Bedford	Acushnet Heights Historic District	State, Pleasant, Linden, Austin, Hazard, and Country Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); TP-30 Paralleling Station (PS-4)	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise Visual	Yes
NB.D	New Bedford	Wamsutta Mills Historic District	Acushnet Ave; Logan, North Point, and Wamsutta Sts	NRDIS; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6); Wamsutta Layover Facility	No	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and layover facility	Adverse: Noise (to residential area) Visual	Yes
NB.G	New Bedford	National Spun Silk Co. – Oneko Mills	Brook St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
NB.010	New Bedford	Lambeth Rope Complex	627-637 Tarkiln Hill Rd	RNRE; A, C	New Bedford Main Line	King's Highway Station; King's Highway / Tarkiln Hill Rd Grade Crossing	No	n/a	Yes: 50 ft, > 80 VdB	Possible: Moderate, in vicinity of new catenary and station	No Adverse Effect	No
NB.011	New Bedford	Manomet Mill #4 - Manomet Tire Cord Fabric Mill	117 King St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.012	New Bedford	Belleville Warehouse Company Cotton Storage Building	51 King St	NRDOE; A, C	New Bedford Main Line	Nash Rd Grade Crossing	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
NB.026	New Bedford	Pierce Brothers Textile Mill Complex	1125-1129 County St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

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NB.029	New Bedford	Christ Presbyterian Church	1097 County St	RNRE; C	New Bedford Main Line	n/a	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.053	New Bedford	Purchase Street Fire Station	2071 Purchase St	RNRE; A, C	New Bedford Main Line	n/a	No	Yes: Moderate train noise	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
NB.063	New Bedford	Union Street Railway Carbarn	1959 Purchase St	NRIND, NRDIS-C; A	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	No Adverse Effect	No
NB.065	New Bedford	Dawson Building	1843-1855 Purchase St	NRIND, NRDIS-C; A, C	New Bedford Main Line	TP-09 Paralleling Station (PS-6)	No	No	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary and traction power facility	Adverse: Visual	Yes
NB.081	New Bedford	New Bedford Cotton Storage Warehouse Co., North Stores	19 Jean St	RNRE; A, C	New Bedford Main Line	n/a	No	n/a	Yes: 50 ft, >80 VdB	Yes: Moderate in vicinity of new catenary	No Adverse Effect	No
FR.C	Fall River	Fall River Multiple Resource Area	multiple	NRMPS; A, B, C	Fall River Secondary	Battleship Cove Station	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS	Refer to individual properties in MPS
FR.D	Fall River	North Main Street Area	North Main St	RNRE; A, C	Fall River Secondary	Weaver's Cove Layover(east)	Yes: Layover construction	Yes: Moderate to severe train noise	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and layover	Adverse: Physical Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

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FR.E, FR.C	Fall River	Border City Mills	Weaver and West Sts	NRDOE, NRMPS; A, C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.F, FR.C	Fall River	Sagamore Mill Nos. 1 and 3	Ace St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.G, FR.C	Fall River	Sagamore Mill No. 2	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.H, FR.C	Fall River	Foster Spinning Company	Cove St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	n/a	Yes: 75 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.J, FR.C	Fall River	Narragansett Mills	North Main St	NRMPS, NRDIS; A, C	Fall River Secondary	n/a	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.K, FR.C	Fall River	North Burial Ground	North Main St	NRMPS, NRDIS; A, B, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Noise Visual	Yes
FR.L	Fall River	Durfee Street Area	North Main and Durfee Sts	RNRE; A, C	Fall River Secondary	Fall River Depot Station; TP-11 Paralleling Station (PS-05)	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary, station, and traction power facility	Adverse: Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.M	Fall River	Diners of Massachusetts	multiple	NRMPS; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.N, FR.C	Fall River	American Printing Company - Metacomet Mill	Anawan St	NRMPS, NRDIS; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate to severe, portions of area are in vicinity of new catenary and station	Adverse: Visual	Yes
FR.Q	Fall River	St. Michael's Roman Catholic Church Complex	207 Essex Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	Yes: 100 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.003	Fall River	Joel Hathaway House	4042 North Main Street	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 100 ft, < 75 VdB	No: RR in deep cut section	No Adverse Effect	No
FR.005, FR.C	Fall River	William Collins House	3775 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.006, FR.C	Fall River	North Christian Congregational Church	3538 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.010, FR.C	Fall River	Borden-Winslow House	3063 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	No	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.012, FR.C	Fall River	Canedy, Squire William B. House	2634 North Main St	NRMPS, NRIND; A, C	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	Adverse: Visual (catenary)	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.013	Fall River	William J. Wiley Middle School	2585 North Main Street	RNRE	Fall River Secondary	Weaver's Cove Layover (east)	No	No	No: 500 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary, layover facility	No Adverse Effect	No
FR.015, FR.C	Fall River	Border City Mills - Mill #2	1 Weaver St	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	n/a	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No
FR.016	Fall River	Weaver Street Railroad Bridge	Weaver St	MHC-DOE; A, C	Fall River Secondary	n/a	Possible	n/a	Yes: 0 ft, > 80 VdB	Yes: Moderate, in close proximity to new catenary	No Adverse Effect	No
FR.017	Fall River	Residence	311 Crescent St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.026, FR.C	Fall River	Brightman, Hathaway House	205 Crescent St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 400 ft, < 50 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.050	Fall River	St. Michael's Roman Catholic Church	207 Essex St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.052	Fall River	St. Matthews Convent	211 Wellington Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 200 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes
FR.053	Fall River	St. Matthews School	211 Wellington Street	RNRE	Fall River Secondary	n/a	No	Yes: Moderate to severe train noise	No: 100 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Noise Visual	Yes

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Map ID[1]	Town	Property Name	Location	NR Status; Criteria[2]	Rail Segment	Station, Layover, Traction Power, Grade Crossing[3]	Direct/ Physical Impacts[4]	Indirect Noise Impacts[5]	Indirect Vibration Impacts[6]	Indirect Visual Impacts[7]	Effects[8]	Mitigation (Y/N)[9]
FR.066, FR.C	Fall River	St. Joseph's Roman Catholic Church	1355 North Main St	NRIND, NRMPS A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 700 ft, < 50 VdB	No	No Adverse Effect	No
FR.067	Fall River	Cotton Warehouse	7 Oregon St	RNRE; A, C	Fall River Secondary	n/a	No	n/a	Yes: 50ft, > 80 VdB	Yes: Severe, adjacent to new catenary	Adverse: Visual	Yes (possible)
FR.070, FR.M	Fall River	Al Mac's Diner	135 President Ave	NRMPS, NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 250 ft, <70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.081	Fall River	Residence	524 Durfee St	RNRE; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 150 ft, < 75 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.082	Fall River	Lafayette-Durfee House	94 Cherry St	NRIND; A, C	Fall River Secondary	n/a	No	Yes: Moderate train noise	No: 300 ft, < 70 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.084	Fall River	Central Street Bridge over Quequechan River	Central St	MHC-DOE; C	Fall River Secondary	n/a	No	n/a	No: 100 ft, < 80 VdB	Yes: Moderate, in vicinity of new catenary	Adverse: Visual	Yes
FR.089	Fall River	Borden and Remington Company	85-115 Anawan St	RNRE; A, C	Fall River Secondary	Battleship Cove Station	No	n/a	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary and station	No Adverse Effect	No
FR.110	Fall River	St John's Cemetery	Brightman and St. Mary's Streets	RNRE; A, C	Fall River Scondary	n/a	No	Yes: Moderate to severe train noise	Yes: 50 ft, > 80 VdB	Yes: Moderate, in vicinity of new catenary	No Adverse Effect	No

[1] Resources are sequenced north to south along the project corridor for each rail segment.

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

[2] National Register Status

NHL	National Historic Landmark
NRDIS	National Register Historic District
NRIND	Property individually listed in the National Register
NRMPS	District or Property individually listed in the National Register as part of a NRMPS
NRDOE	Property formally determined eligible by Keeper of the National Register
MHC-DOE	Property evaluated as eligible by MHC
RNRE	Property recommended as eligible
NRDIS-C	Property contributing to an NR-listed district
LL	Property individually listed in the State Register
LHD	Property located within a State Register listed historic district

[3] Within 250 feet of a proposed station, layover, or traction power facility, or an existing station where work is proposed or within 400 feet of a grade crossing.

[4] Direct/Physical Impacts

Level of impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011).
No	Historic property will not be impacted during or because of project construction activities; this *typically* applies to properties located in the vicinity of the project, but not within or immediately adjacent to construction areas.
Yes	Historic property that could be impacted during or because of project construction activities; *typical* impacts are physical in nature and may affect properties within or immediately adjacent to construction areas.

[5] Indirect Noise Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Noise* (VHB June 2009) and DEIS/DEIR (USACE 2011).
Train Noise	Noise generated by the operation of trains traveling along the rails.
Horn Noise	Noise generated by warning horn blowing, typically at grade crossings.
Moderate	Potential for the project to cause noticeable increase in cumulative noise levels, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009).
Severe	Potential for the project to cause significant increase in cumulative noise levels, causing high annoyance, based on the FTA's noise impact criteria, as defined in the *Environmental Consequences Technical Report: Noise* (VHB June 2009). Under FTA criteria severe impacts are subject to mitigation (refer to VHB 2102a).
n/a	Not applicable- Noise impacts were not evaluated for historic properties where noise is unlikely to impact the characteristics for which the property is historically significant, including bridges, railroad stations, and industrial complexes.

[6] Indirect Vibration Impacts

Level of impact	Data per *Environmental Consequences Technical Report: Vibration* (VHB June 2009) and DEIS/DEIR (USACE 2011). The vibration data shown present the approximate distance of the property from the right-of-way centerline, followed by projected vibration level from train operations.
No	Low level of vibration anticipated from construction and/or operations per VHB June 2009, which determined that, based on the *FTA Generalized Ground-Surface Vibration Curves Table*, properties within approximately 90 feet of the center line of a locomotive powered passenger or freight rail line could be impacted by vibration levels of 80VdB, the threshold for human annoyance, or higher. All projected vibration levels are well below the 100 VdB threshold for potential structural damage to fragile buildings or structures (VHB June 2009) that would result in a level of moderate or high impact.

Table 5-2. Historic Properties Affected along the Whittenton Electric Alternative. Updated May 2013.

Possible	Potential for damage from vibration generated by pile driving is noted as "Vibration (possible)" under the Effects column, where individual properties or buildings within an historic district are within 25 ft of the right-of-way (per VHB June 2009). The location of any pile driving has not been determined and is expected to be limited, if any occurs.
Ft	Distance (in feet) of the property from the railroad right-of-way centerline.
VdB	RMS (root mean square) Vibration Velocity Level.

[7] **Indirect Visual Impacts**

Level of Impact	Based on review of project plans and analyses for DEIS/DEIR (USACE 2011). The categories of level of impact were defined for the purposes of this analysis. Moderate and severe visual impacts considered to be potential adverse effects.
No	No potential for the project to change the existing visual environment (ex. increased use of existing railroad infrastructure).
Minimal	Low level of change in the visual environment of a historic property, based on the location of the property near existing railroad elements that will be slightly modified with a new feature as part of the project (ex. replacement of existing catenary with new catenary or upgrading an existing grade crossing).
Moderate	Potential for change in the visual environment of a historic property, based on the location of the property in the broad vicinity of new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).
Severe	High potential for change in the visual environment of a historic property, based on the location of the property adjacent or in close proximity to new railroad elements that will be constructed as part of the project (ex. construction of a new railroad line, catenary, grade crossing systems, or traction power or layover facility).

[8] **Effects**

The level of effect (adverse or no adverse effect) is assessed based on the impact information presented for direct and indirect physical, noise, vibration, and visual impacts and the resource type (ex. new catenary is not considered an adverse effect for industrial and railroad historic properties). New station construction and modifications to existing stations and their sites will have no adverse effect on historic stations and adjacent historic properties as long as changes are designed in a manner sensitive to the historic architectural character of the building and/or area. Noise mitigation including linear barriers and insulating treatments on historic buildings will have an effect on adjacent or subject properties and will require design considerations for compatibility with historic resources. Vibration impacts from pile driving could affect buildings adjacent to the right-of way, if pile driving or other similar construction occurs; however the location of this type of construction has not been identified. There are no anticipated atmospheric and cumulative impacts to historic resources. Traffic impacts to historic resources will be assessed when traffic analyses are available, but are expected to be minor. The level of effect presented in the table reflects the worst case and will be refined after the preferred alternative is selected, intensive historic resources survey is completed, and more detail about the project elements and work types is available.

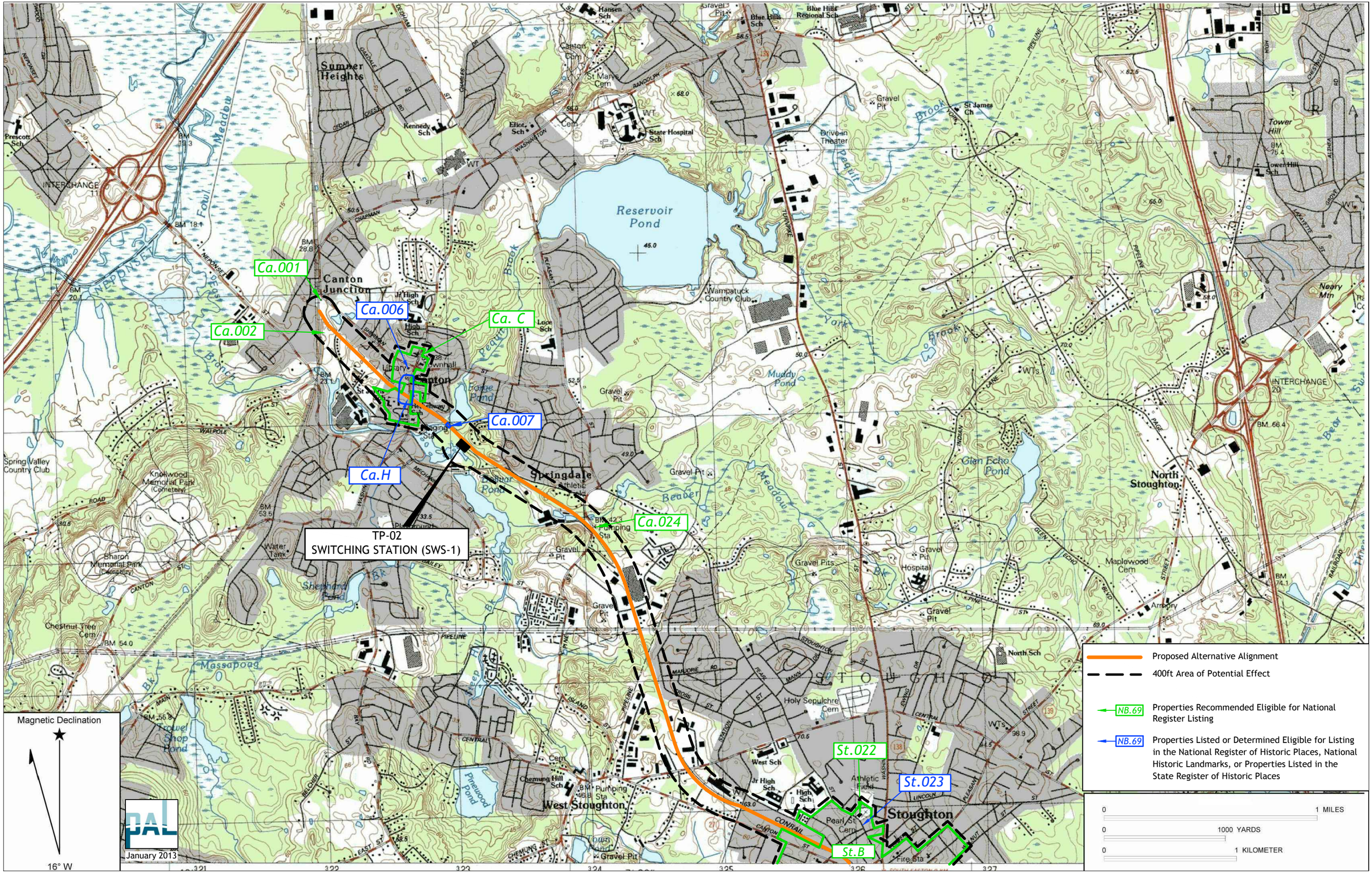
[9] **Mitigation**

It is assumed that all adverse effects will require mitigation. Mitigation may include vibration dampening, noise barriers, visual screening, and the use of compatible materials within historic districts or adjacent to historic properties.

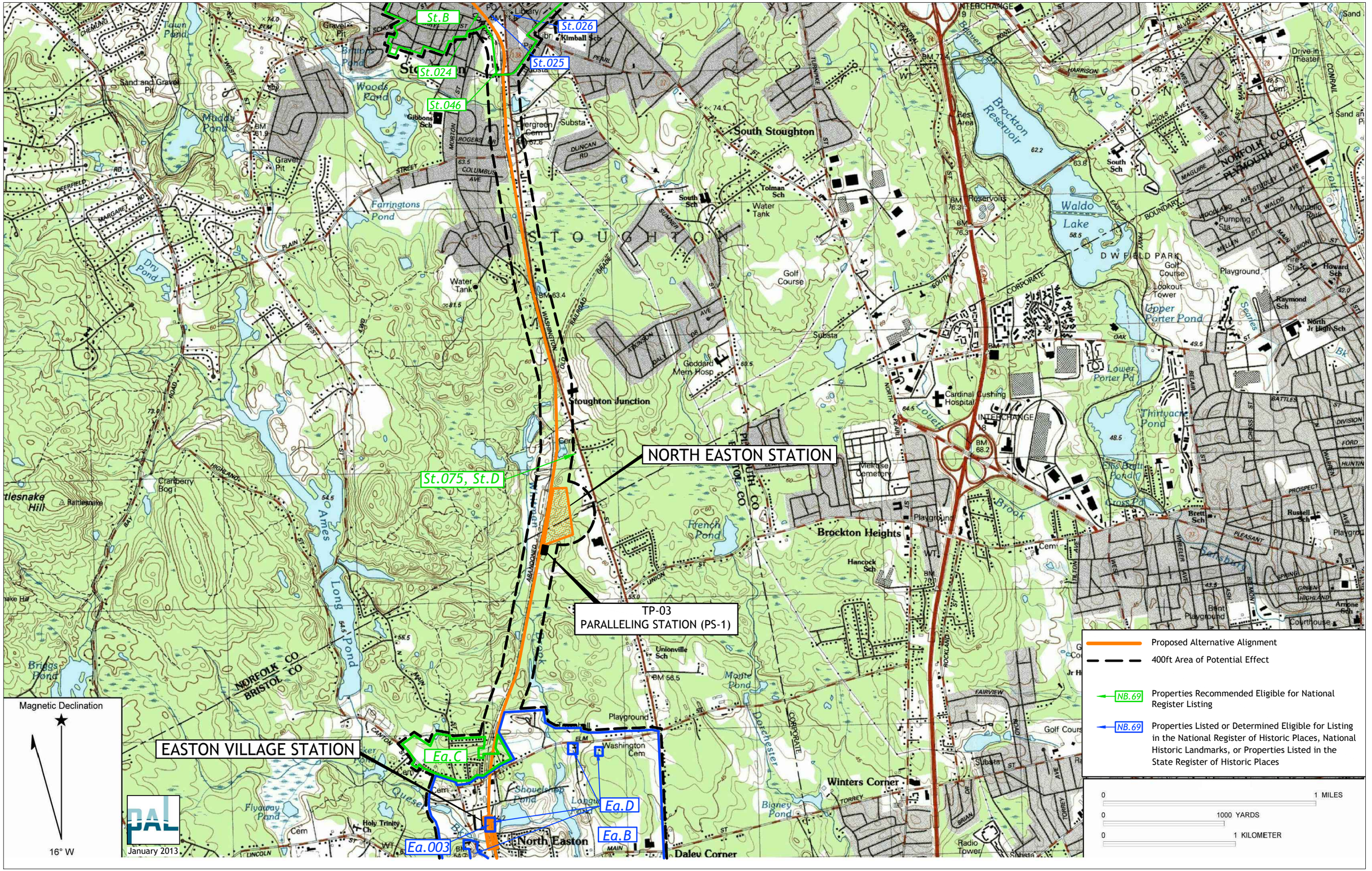
APPENDIX B
Addendum

USGS Quadrangle Maps Showing Location of National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties

Revised and Updated, May 2013



Appendix B-1. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-2. National/State Register listed, determined eligible, and recommended eligible historic properties.

EASTON VILLAGE STATION

Ea.C

Ea.D

Ea.003

Ea.B

Ea.E

Ea.F

Brockton Heights

North Easton

Daley Corner

Winters Corner

Marshall Corner

Stonehouse Hill

Stonehill College

Unionville Sch

Playground

Washington Cem

Holy Trinity Ch

Militia Park

Manley Cem

Easton Jr High Sch

Parkview Sch

Ames High Sch

Easton Ch

Easton Cem

Holy Cross Seminary

Morse Corner

Morse Pond

South Easton

Easton Green

Morris Corner

Cynthia Park Cem

Easton Center

Eastondale

Manleys Corner

Coweesett Cem

Golf Course

West Jr High Sch

Fire Sta High Sch

Marciano Stadium

Radio Towers (WBET)

Radio Towers (WOKW)

Kennedy Sch

Clifton Height

Brant Playground

Fairgrounds

V A HOSPITAL

Armory

Rest Area

Gravel Pit

Water Tank

Tisdale Cem

Rattlesnake Hill

Briggs Pond

Long Pond

Upper Pond

Puds Pond

Flyaway Pond

Picker Pond

Shovelshop Pond

Langwater Pond

Monte Pond

Bigney Pond

Ames Pond

Dear Pond

Queset Brook

Shepard Brook

Black Brook

West Meadow Brook

Daley Brook

NORFOLK CO

BRISTOL CO

STATE PARK

EASTON

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

0 1000 YARDS

0 1 KILOMETER

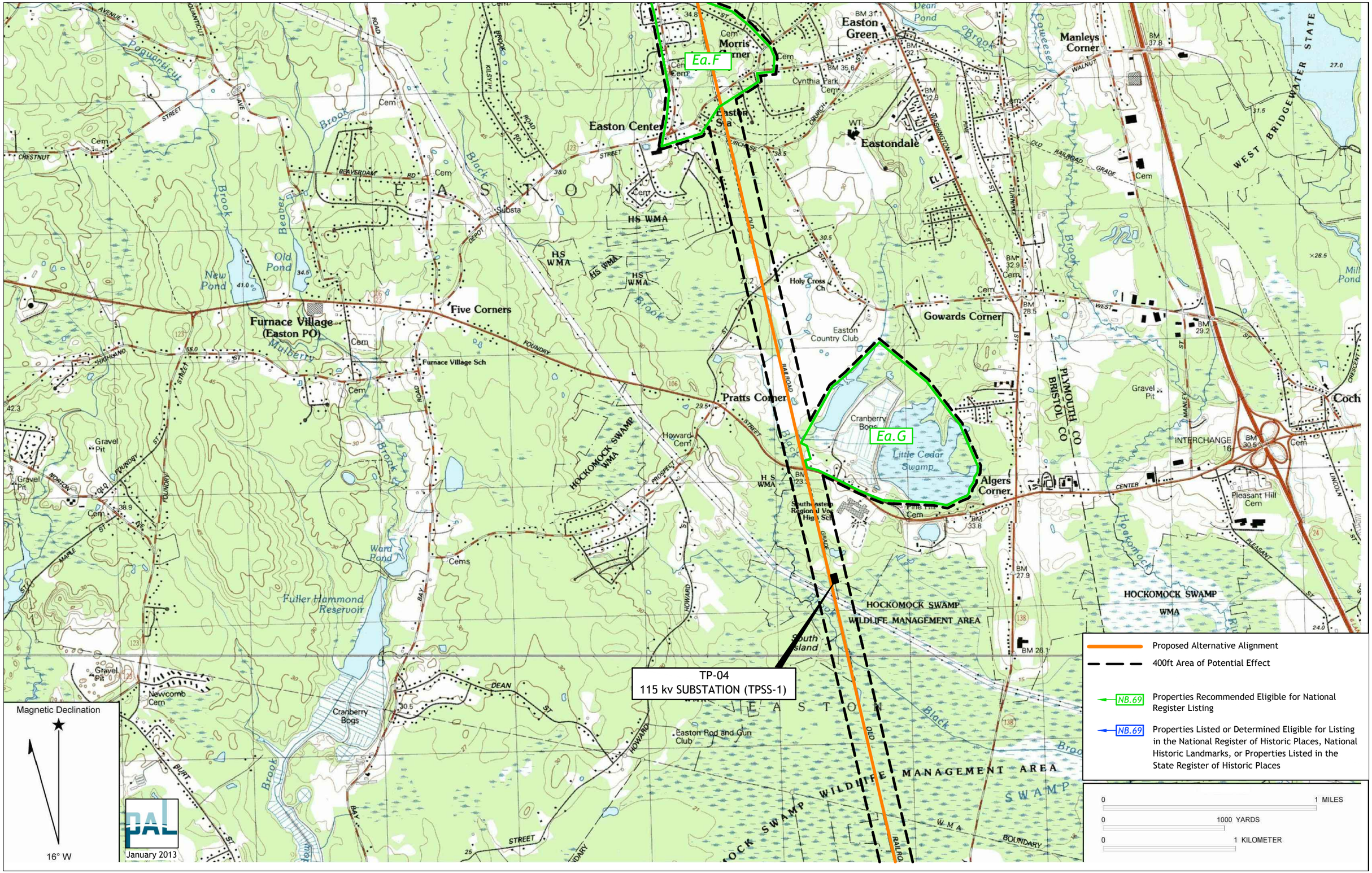
Magnetic Declination

16° W

PAL

January 2013

Appendix B-3. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-4. National/State Register listed, determined eligible, and recommended eligible historic properties.

RAYNHAM PLACE STATION

Ra.001

Ra.B

Magnetic Declination

16° W

May 2013

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

0 1000 YARDS

0 1 KILOMETER

Appendix B-5. National/State Register listed, determined eligible, and recommended eligible historic properties.

STOUGHTON LINE

RAYNHAM JUNCTION

Ra.B

WHITTENTON BRANCH

WHITTENTON JUNCTION

Ta.G, Ta.C

Ta.I

Ta.F

Ta.H

Ra.011

ATTLEBORO SECONDARY

Magnetic Declination

16° W

Proposed Alternative Alignment

400ft Area of Potential Effect

NB.69 Properties Recommended Eligible for National Register Listing

NB.69 Properties Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places

0 1 MILES

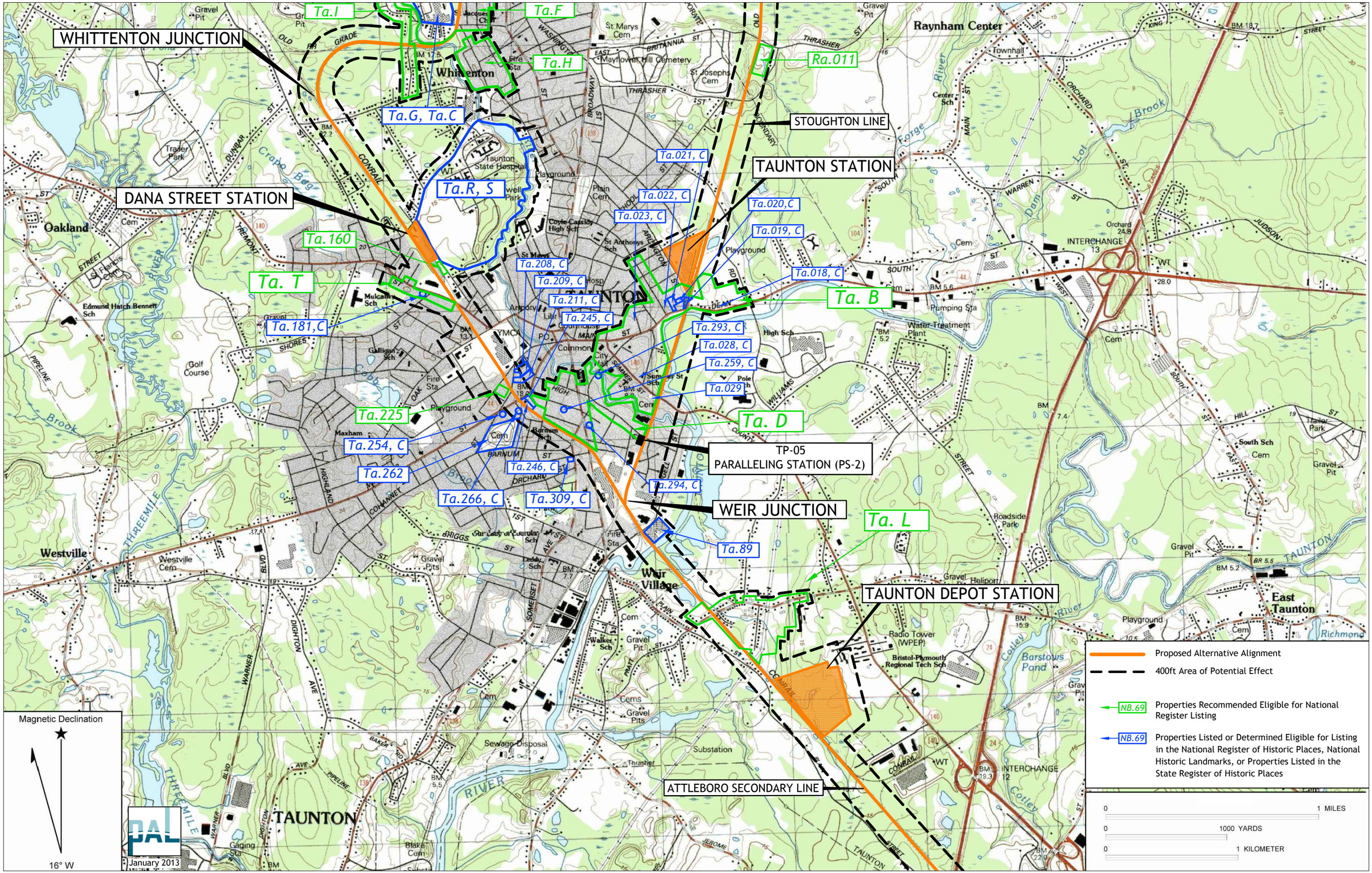
0 1000 YARDS

0 1 KILOMETER

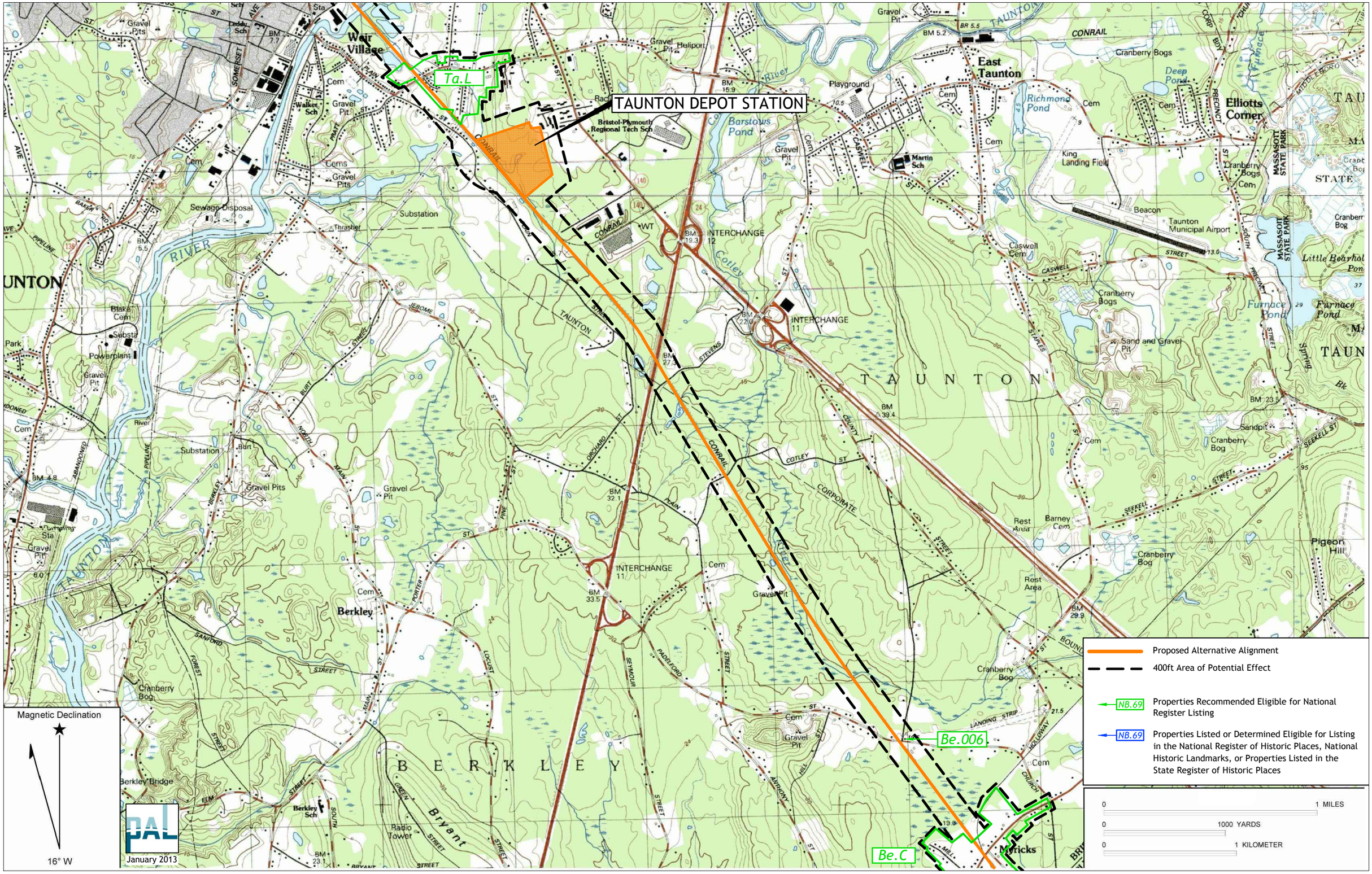
PAL

January 2013

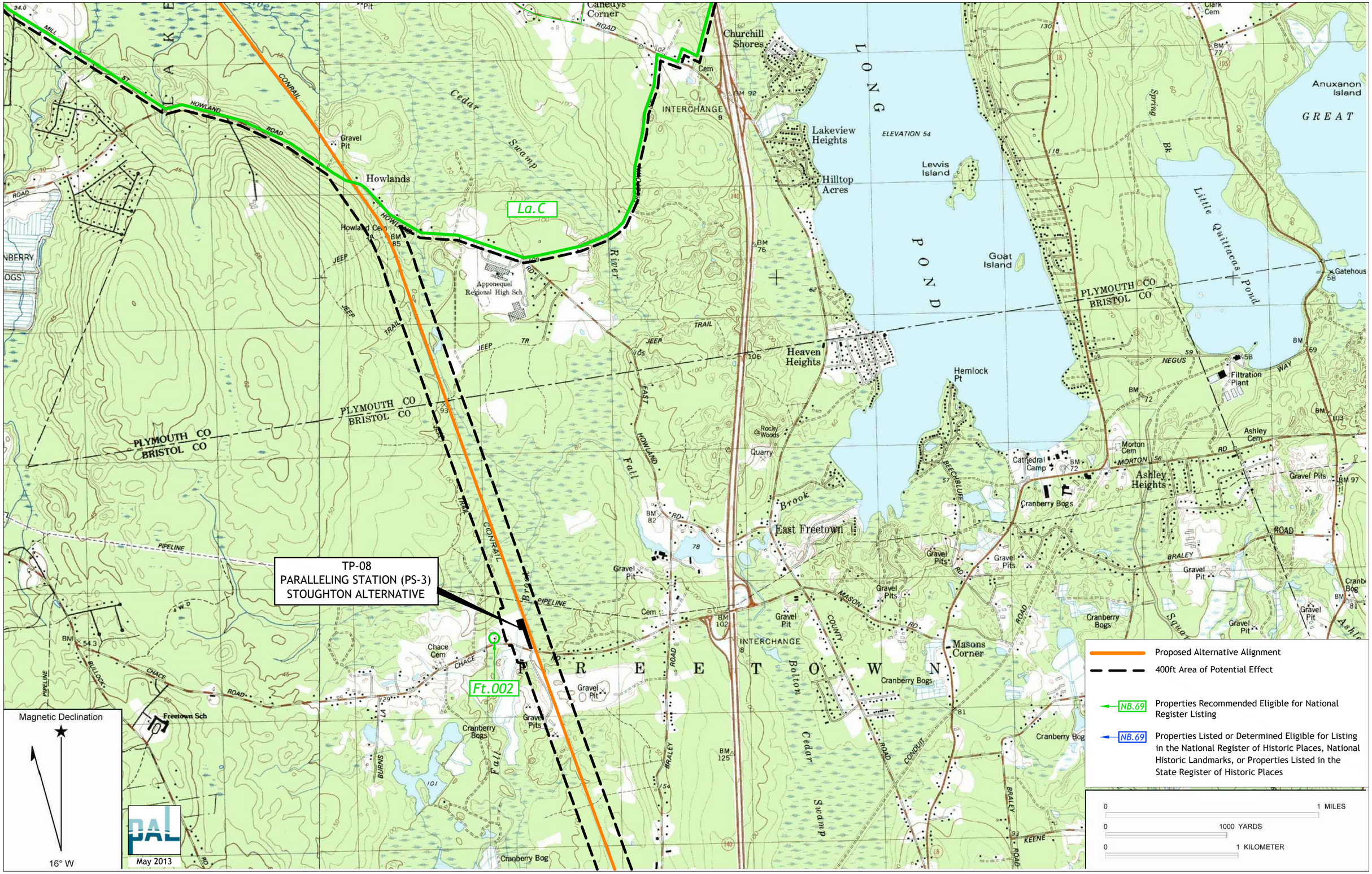
Appendix B-6. National/State Register listed, determined eligible, and recommended eligible historic properties.



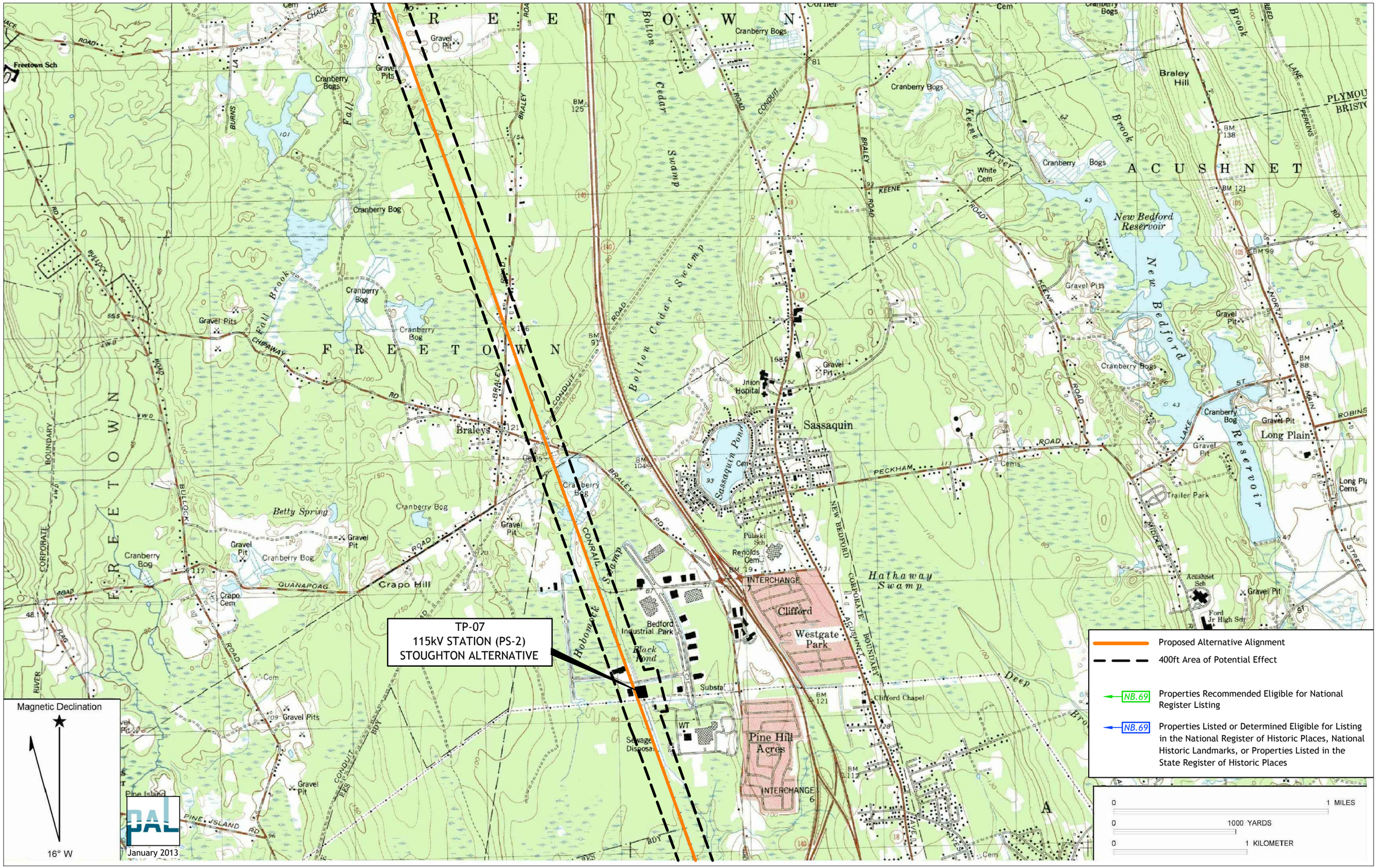
Appendix B-7. National/State Register listed, determined eligible, and recommended eligible historic properties.



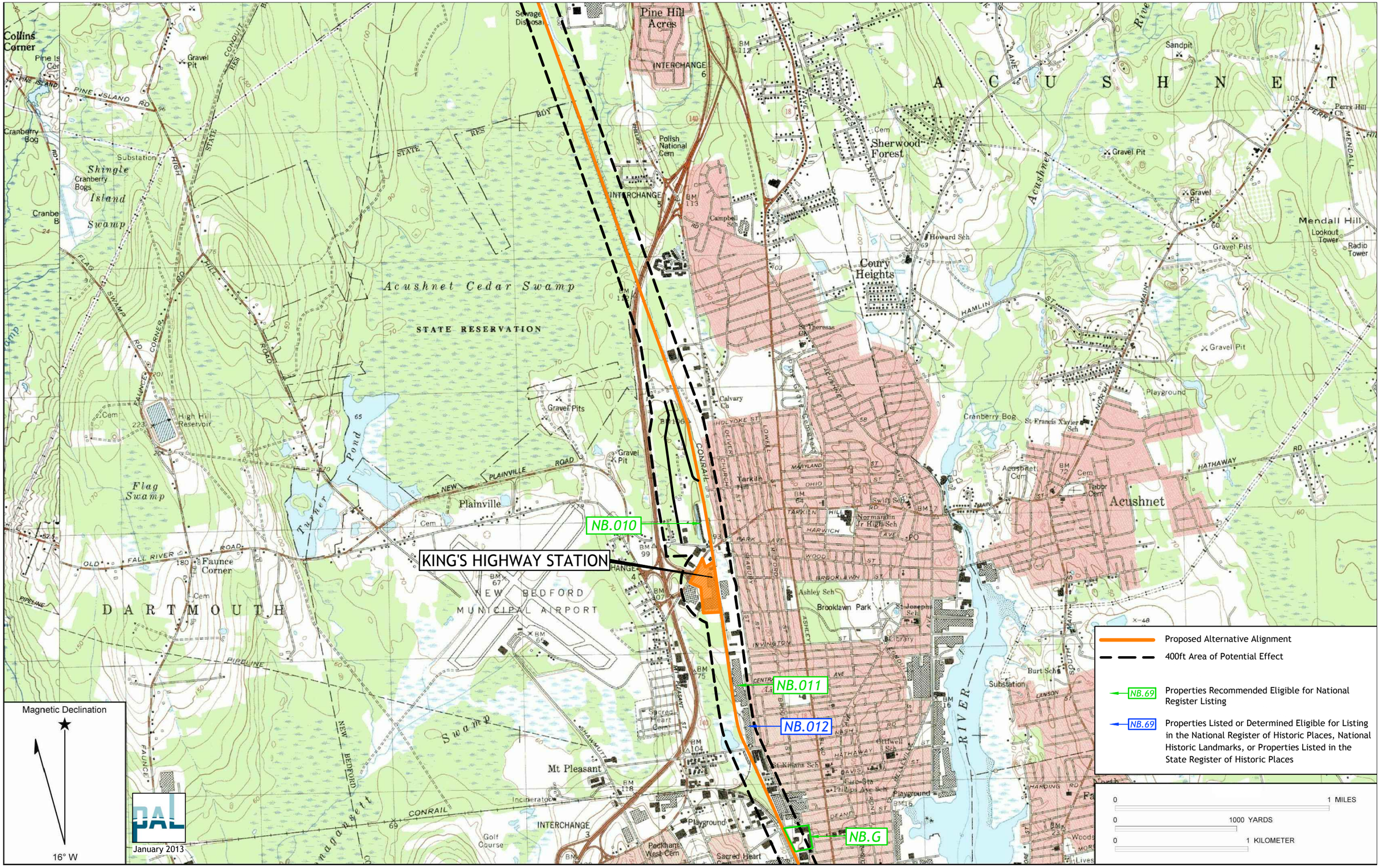
Appendix B-8. National/State Register listed, determined eligible, and recommended eligible historic properties.



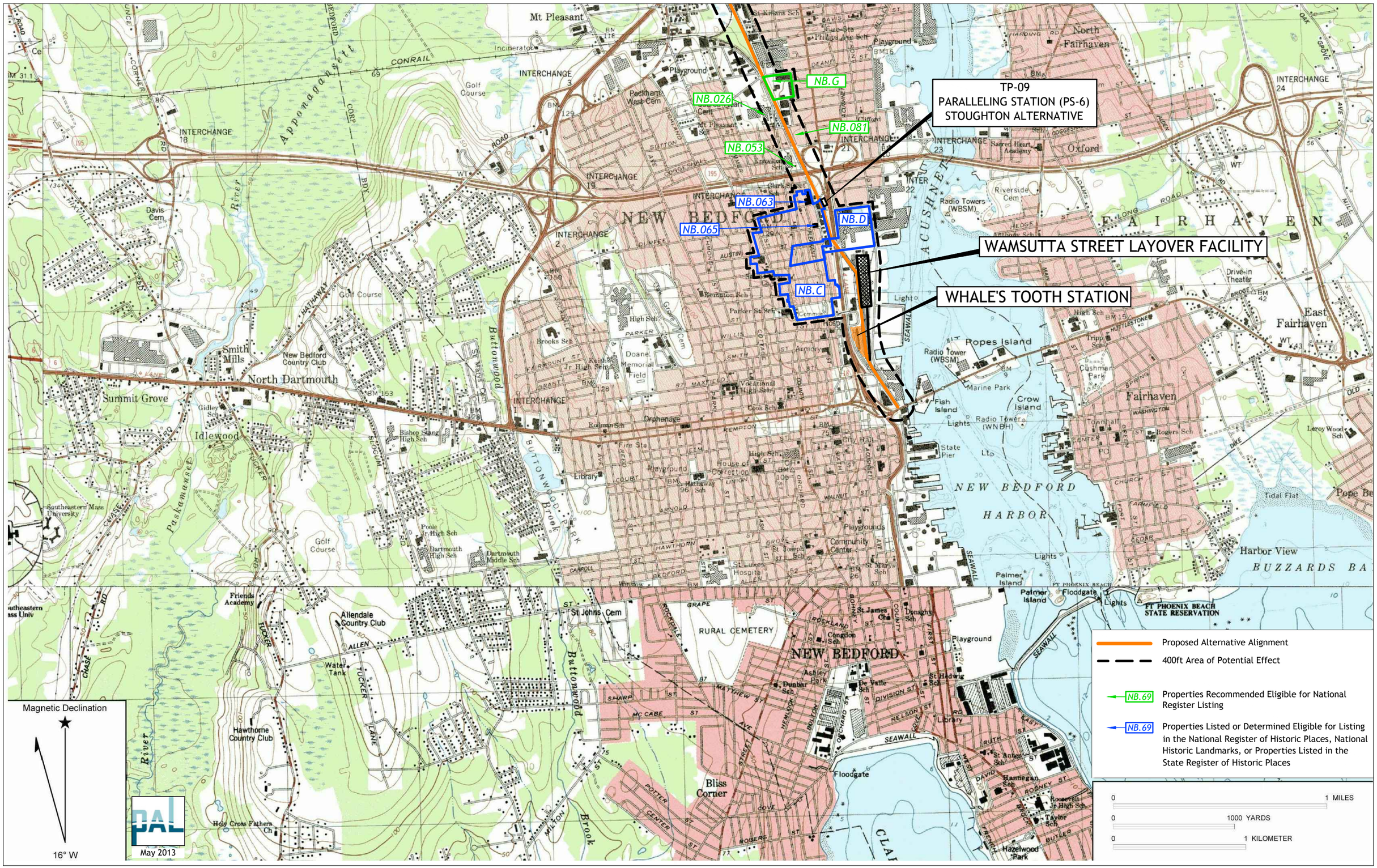
Appendix B-9. National/State Register listed, determined eligible, and recommended eligible historic properties.



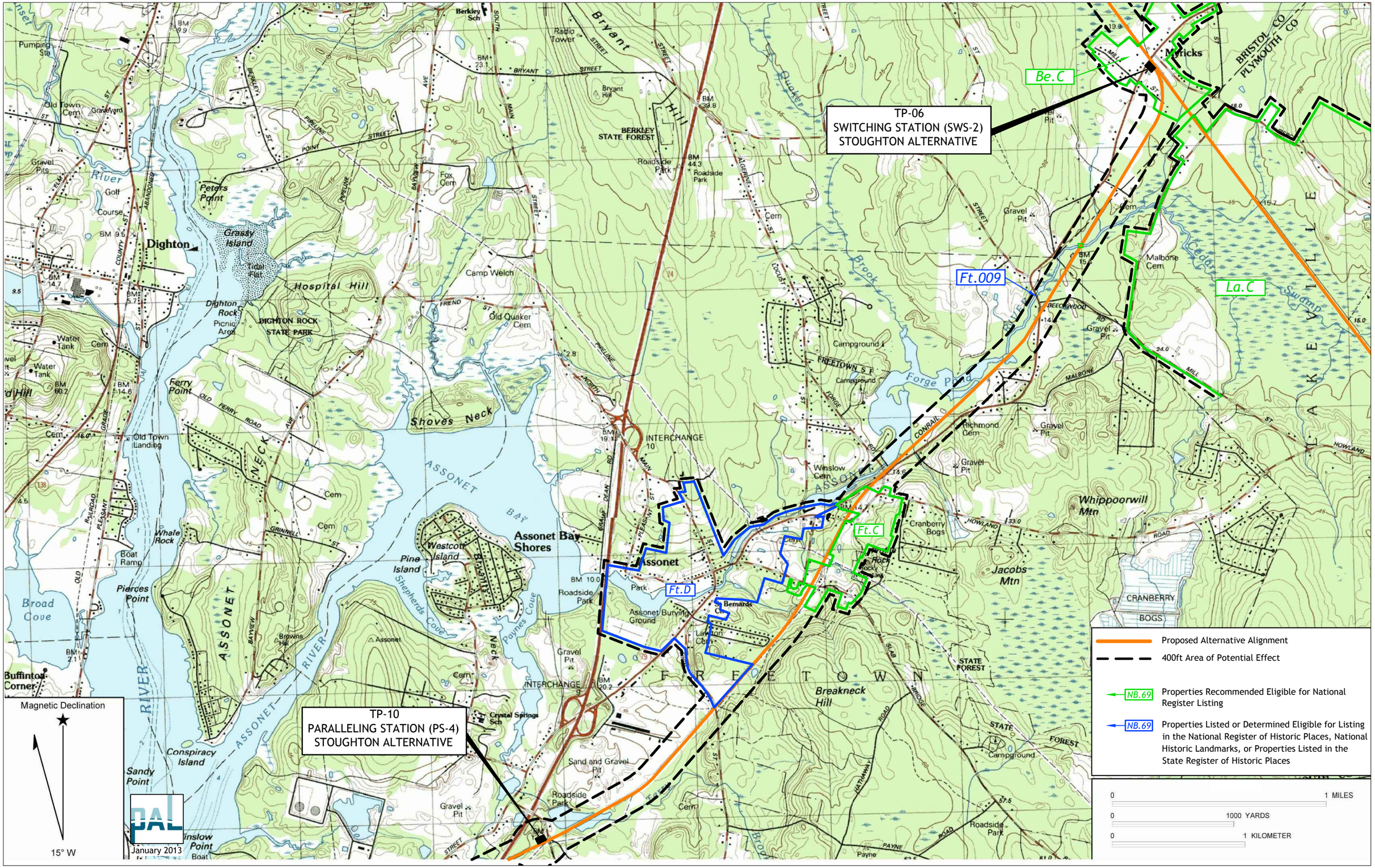
Appendix B-10. National/State Register listed, determined eligible, and recommended eligible historic properties.



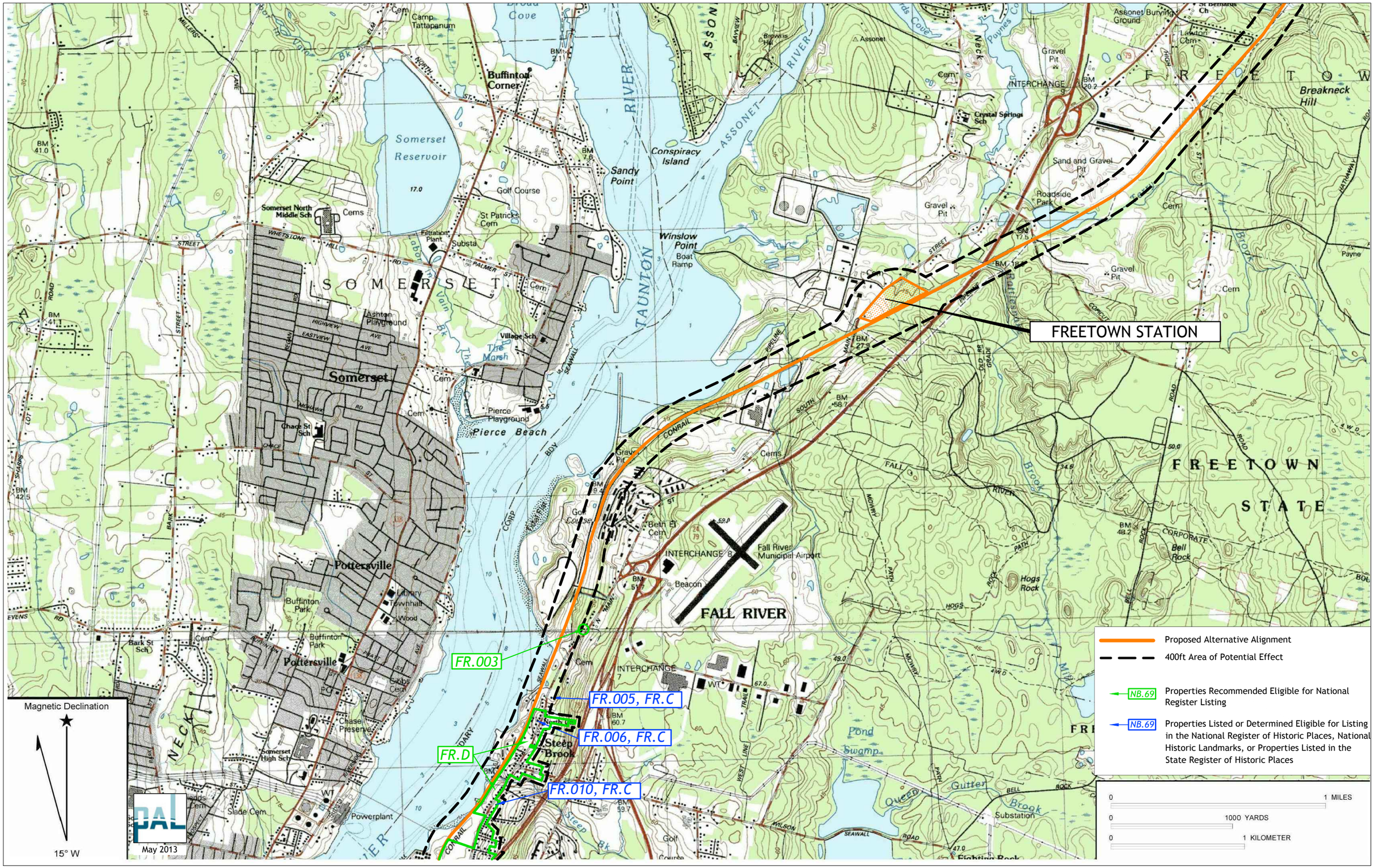
Appendix B-11. National/State Register listed, determined eligible, and recommended eligible historic properties.



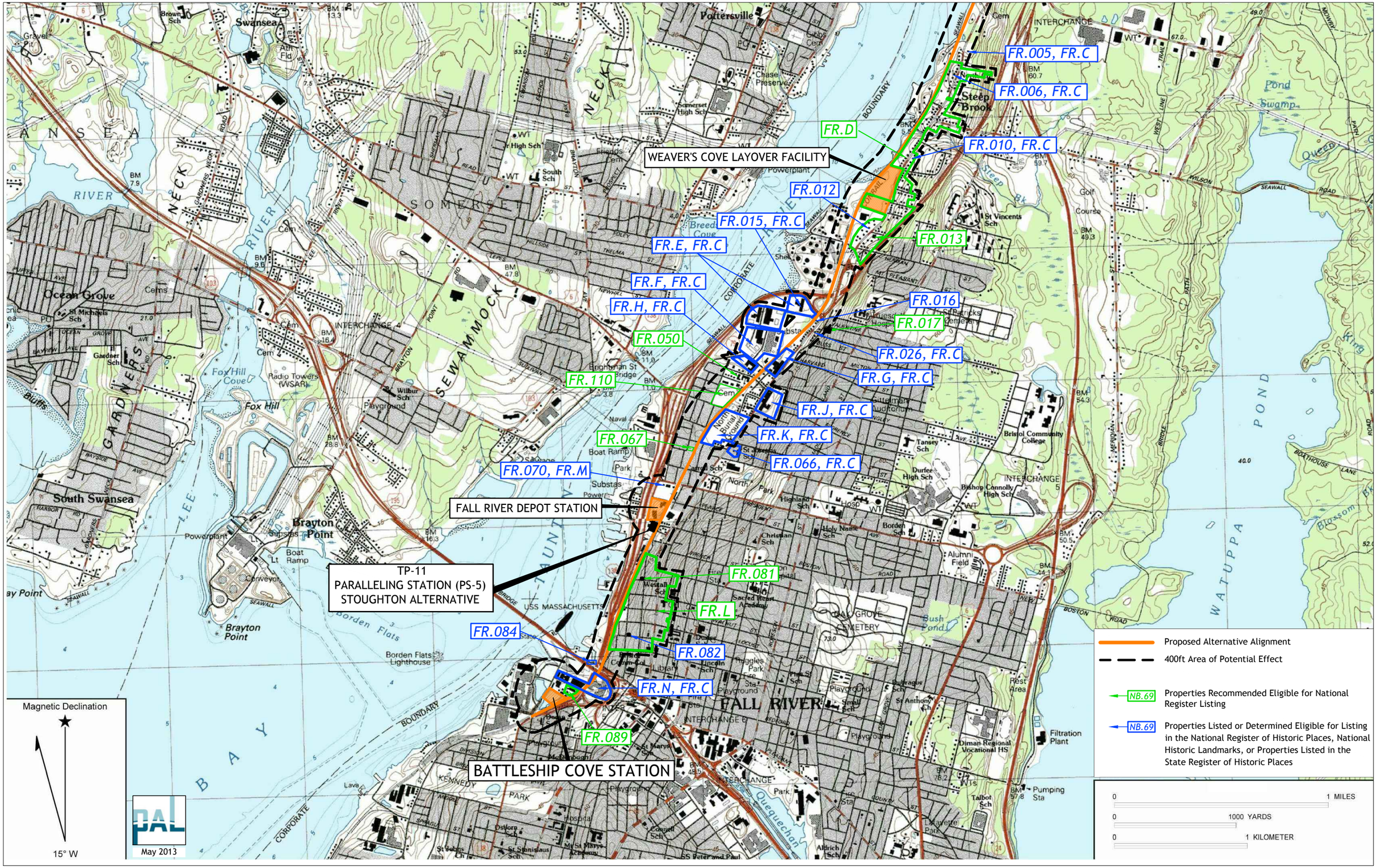
Appendix B-12. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-13. National/State Register listed, determined eligible, and recommended eligible historic properties.



Appendix B-14. National/State Register listed, determined eligible, and recommended eligible historic properties.

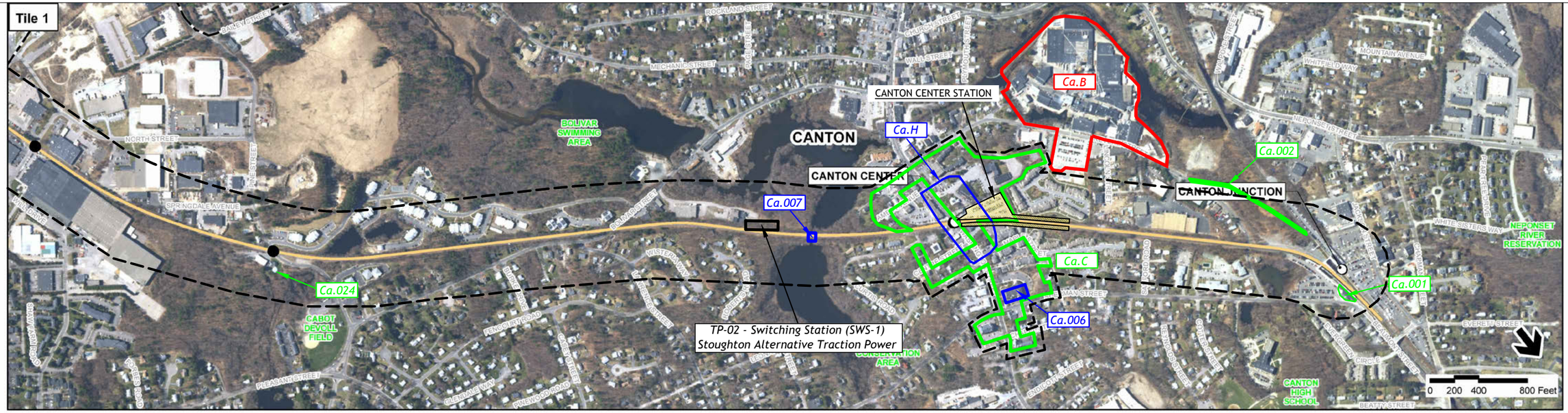


Appendix B-15. National/State Register listed, determined eligible, and recommended eligible historic properties.

APPENDIX C
Addendum

Project Aerial Maps Showing Location of All Properties Surveyed, including National Register Listed, Determined Eligible, and Recommended Eligible Historic Properties

Revised and Updated, May 2013



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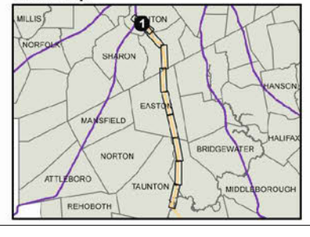
Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- Town Boundaries

- Area of Potential Effect for Above Ground Properties
- NB.052 — Properties Determined Eligible for Listing in the National Register of Historic Places as part of the South Coast Rail Project
- NB.052 — Properties Previously Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places
- NB.052 — Properties Recommended Not Eligible for National Register Listing (including properties demolished or outside the APE)

Index Map



Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-1. Historic Intensive Survey.

Tile 1

Tile 2

Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- Town Boundaries

- Area of Potential Effect for Above Ground Properties
- NB.052 — Properties Determined Eligible for Listing in the National Register of Historic Places as part of the South Coast Rail Project
- NB.052 — Properties Previously Listed or Determined Eligible for Listing in the National Register of Historic Places, National Historic Landmarks, or Properties Listed in the State Register of Historic Places
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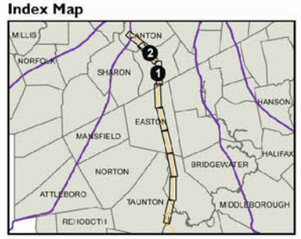
Index Map



Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

3/2/2012
\\mabcsatat\projects\10111.00\GIS\oriocrt\FEISBase_for_PALBase_Stoughton_sheet4.mxd

Appendix C-2. Historic Intensive Survey.

Tile 1

Tile 2

HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA
CONSERVATION LAND
CAROLINE ROAD
PORTER STREET
JACOB DRIVE
KENNEDY CIRCLE
Hockomock Swamp ACEC
DEPOT STREET
Ea.F
EASTON
Stoughton Line
123
CAMPEN LANE
CENTER STREET
SHERIDAN STREET
JUETT ROAD
SCHOOL ROAD
LABELLE DRIVE
CARYLANE
BALDWIN STREET
SHORT STREET
KINGSBURY ROAD
PRISCILLA ROAD
PURCHASE STREET
CHURCH STREET
DEPOT PLACE
CANTON STREET
BARRY ROAD
LITTLE WHEELOCK ROAD
0 200 400 800 Feet

Ea.D
RICKER FIELD
NORTH MAIN STREET
HARLOW STREET
ALEXANDER HEIGHTS DRIVE
SHERIDAN STREET
OAK STREET
FROTHINGHAM PARK
Ea.E
B STREET
EASTON VILLAGE STATION
Easton Village
Ea.C
ELM COURT
MAIN STREET
ARTHUR ROAD
EASTON
CAMPEN LANE
CENTER STREET
Stoughton Line
Ea.003, Ea.B, Ea.D
Ea.008, Ea.A, contributing to Ea.B
Ea.B
Ea.D
BALDWIN STREET
PARK STREET
FOREST STREET
ELMWOOD STREET
BEAVER STREET
OLD BALDWIN STREET DUMP
SHEEP PASTURE
CHAPMAN STREET
LINDENWOOD DRIVE
WINTERGREEN DRIVE
OLDE ROAD
STOUGHTON MEMORIAL CONSERVATION LAND
STOUGHTON
NORTH EASTON STATION
CONSERVATION LAND
CHAPMAN'S BROOK DRIVE
North Easton
0 200 400 800 Feet

TP-03 - Paralleling Station (PS-1)
Stoughton Alternative

3/2/2012
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Legend

- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- Town Boundaries

- Area of Potential Effect for Above Ground Properties
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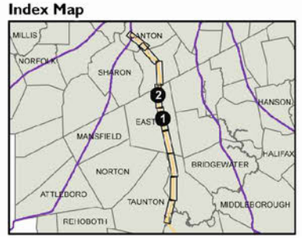
Index Map



Moving Massachusetts Forward. massDOT
SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-3. Historic Intensive Survey.

Tile 1

Tile 2

RAYNHAM

Hockomock Swamp ACEC

Stoughton Line

Ra.001

Raynham
RAYNHAM PLACE
STATION

HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA

EASTON

TOWN LAND

CONSERVATION LAND

TP-04 - 115 KV Substation (TPSS-1)
Stoughton Alternative

SE REG VOCTECH HS

Ea.G

0 200 400 800 Feet

3/2/2012
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Legend

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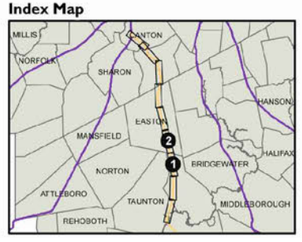


Moving Massachusetts Forward massDOT

SOUTH COAST RAIL

Weir Junction to Canton Junction
Stoughton Line

PAL

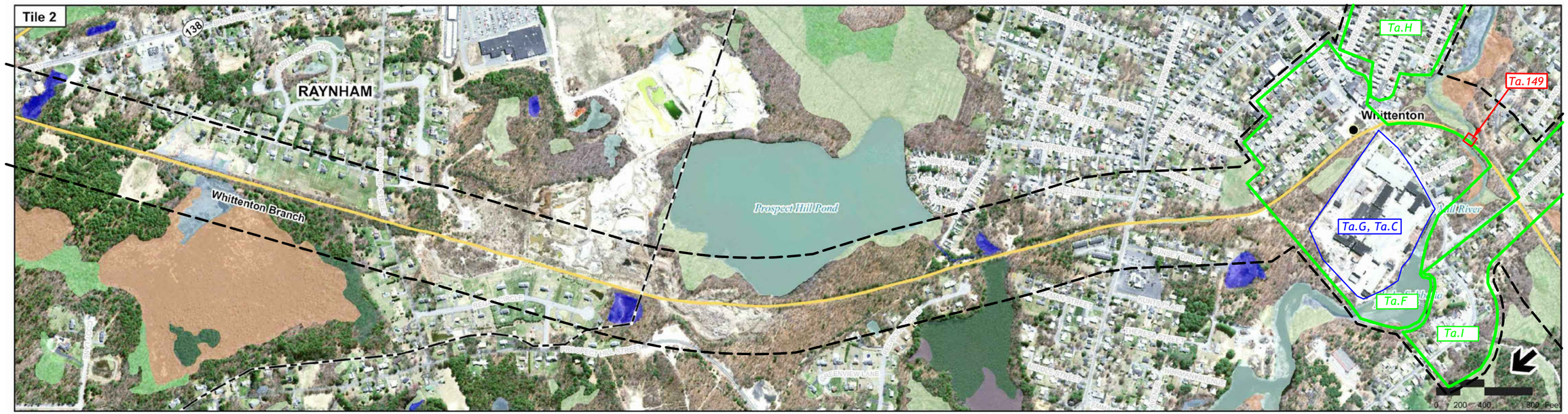
Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-4. Historic Intensive Survey.

Appendix C-5. Historic Intensive Survey.

Tile 1

Tile 2



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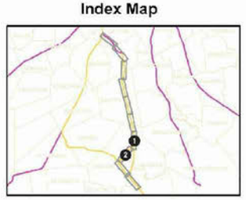
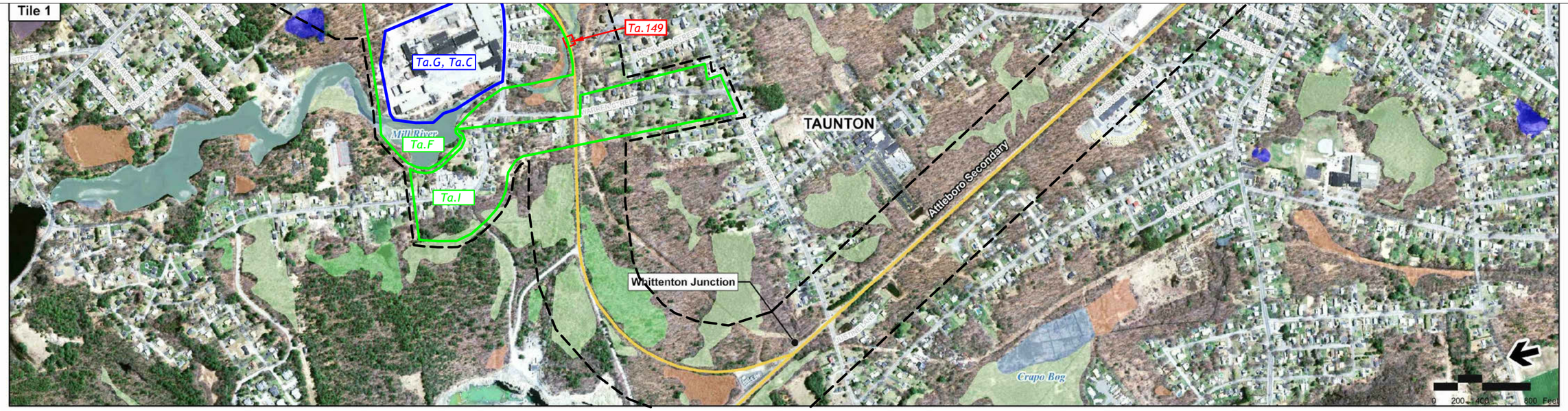


massDOT — SOUTH COAST RAIL

Whittenton Branch

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Tile 1



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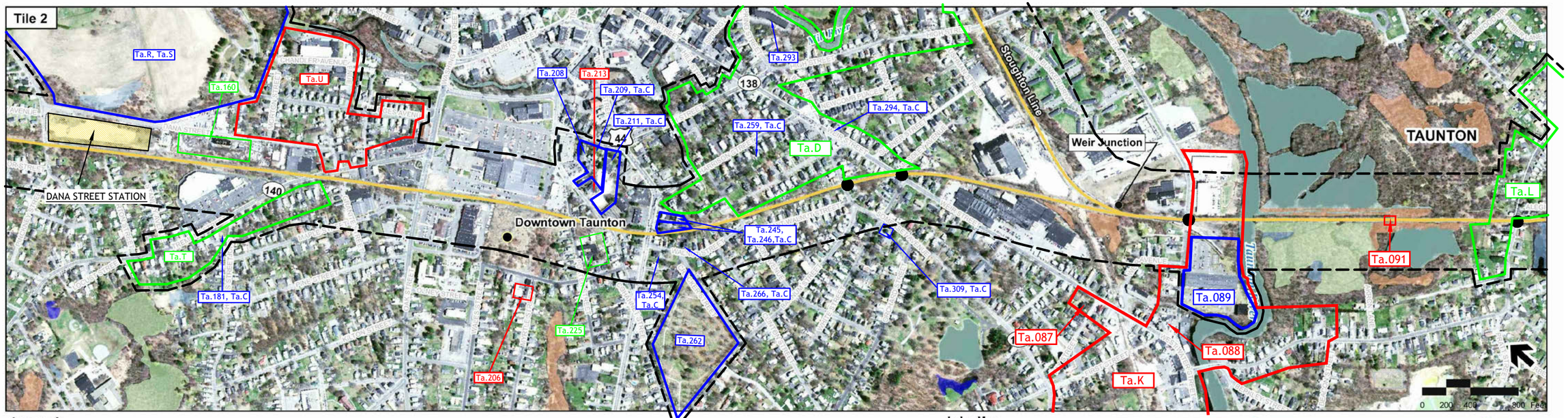

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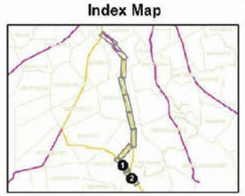
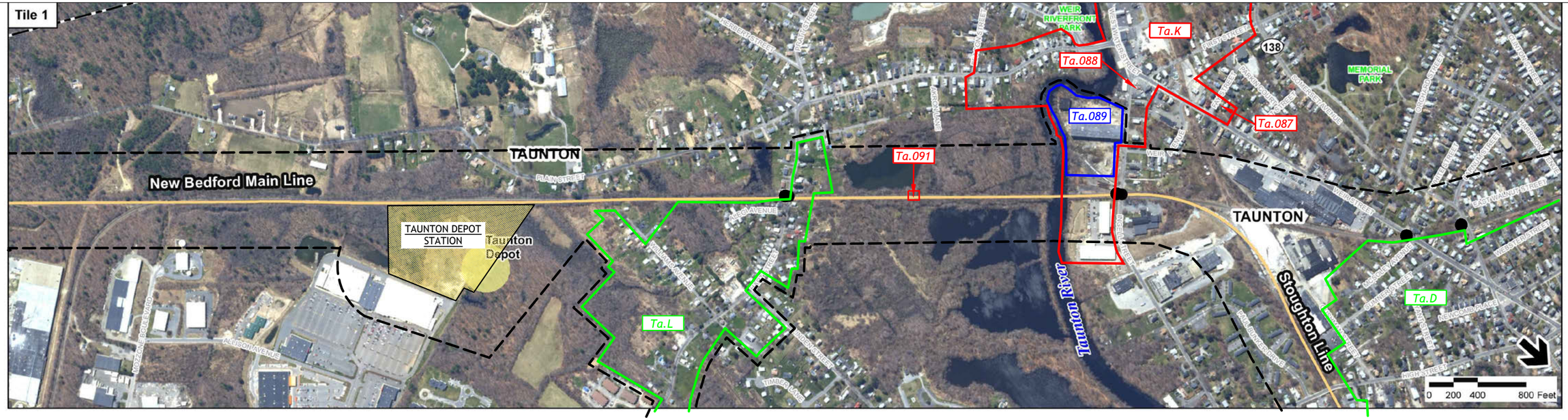


massDOT — Moving Massachusetts Forward

SOUTH COAST RAIL

Whittenton Branch

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013



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Legend

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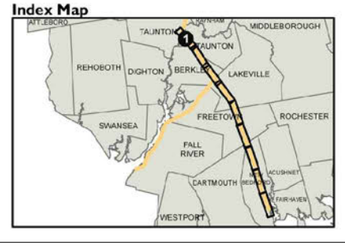

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-8. Historic Intensive Survey.

Tile 1

Tile 2

Fall River Secondary

New Bedford Main Line

LAKEVILLE

BERKLEY

TAUNTON

Myricks Junction

Be.C

La.C

Be.006

TP-06 - Switching Station (SWS-2), Stoughton Alt.

0 200 400 800 Feet

Legend

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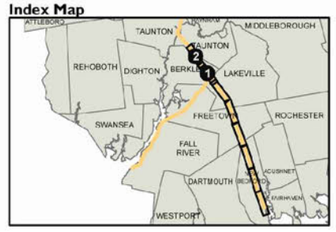

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

3/5/2012
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Tile 1

Ft.002

FREETOWN

New Bedford Main Line

LAKEVILLE

TP-08 - Paralleling Station (PS-3), Stoughton Alt.

NEFF PROPERTY

APPONQUET REGIONAL HIGH SCHOOL

0 200 400 800 Feet

Tile 2

La.C

LAKEVILLE

New Bedford Main Line

Cedar Swamp River

SHERWOOD LANE

0 200 400 800 Feet

3/19/2012
\\mabos\projects\10111.00\GIS\project\FEIS\Base_for_PAL\Base_New_Bedford_sheet3.mxd

Legend

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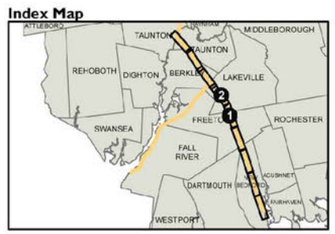


Moving Massachusetts Forward. massDOT

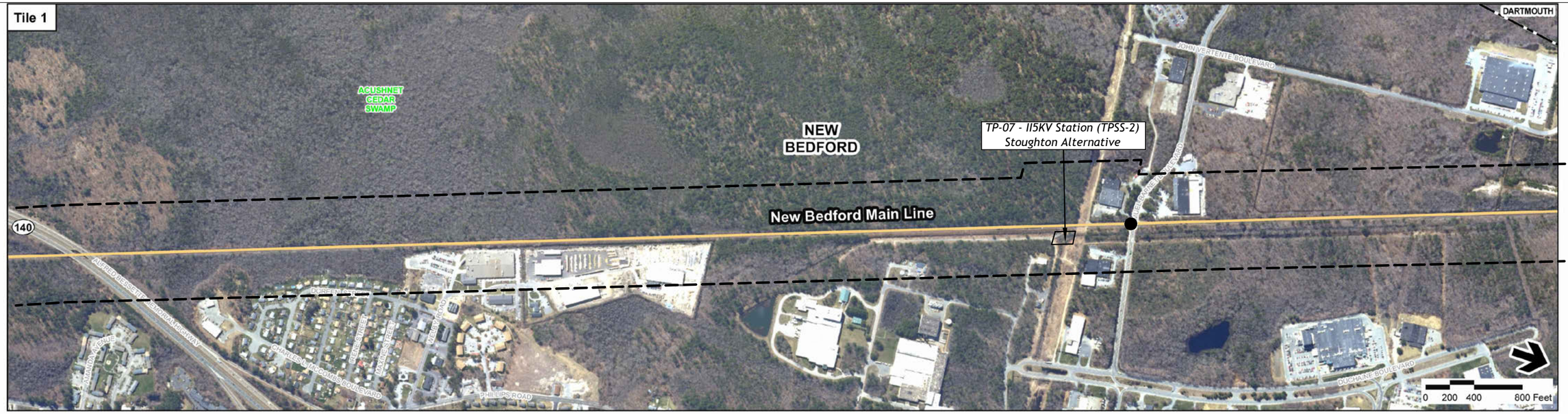
SOUTH COAST RAIL

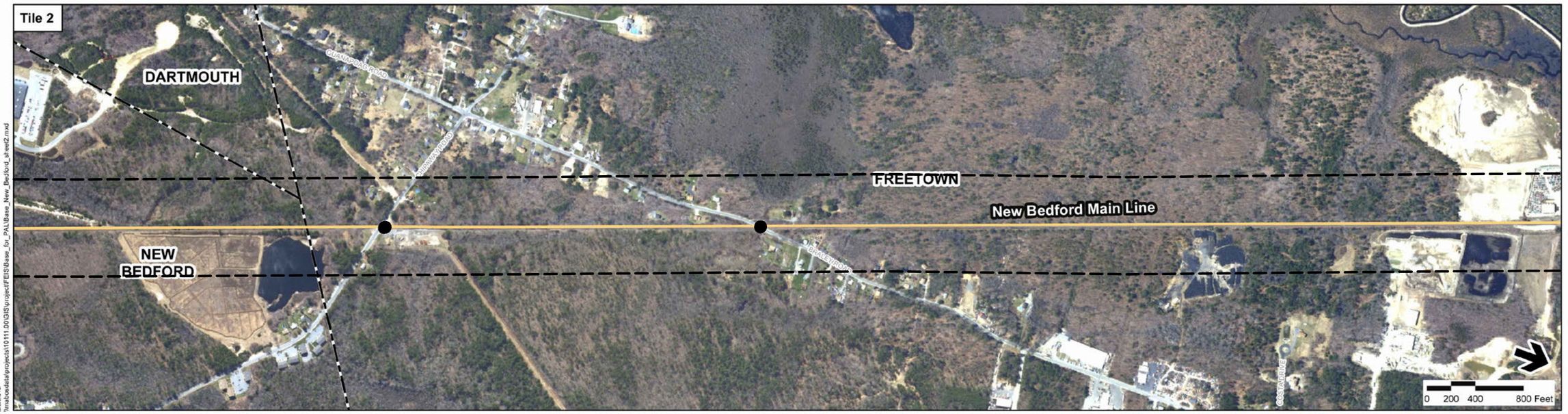
New Bedford Main Line to Weir Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-10. Historic Intensive Survey.





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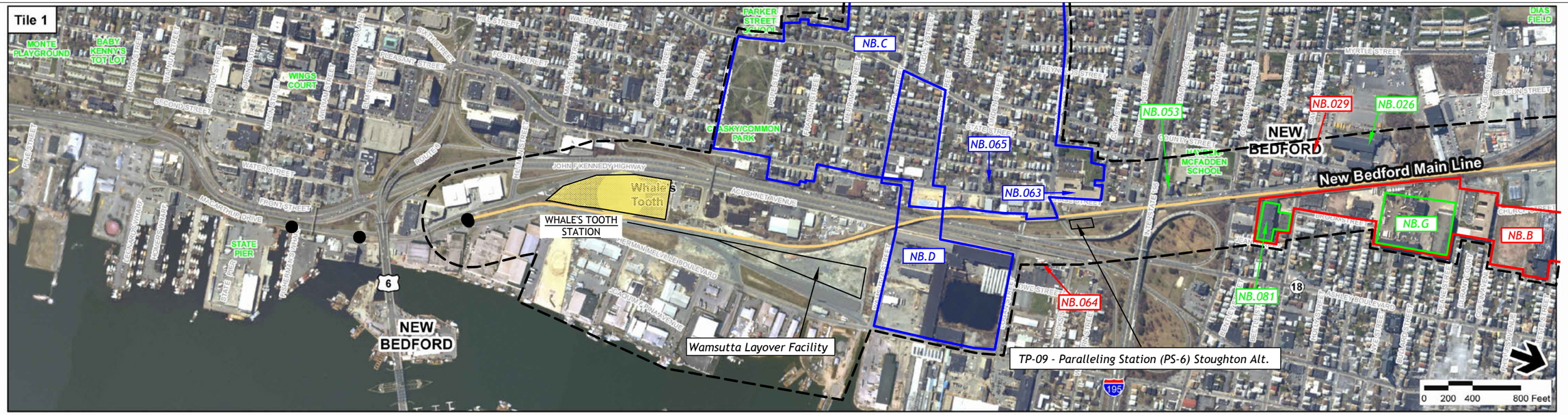
Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-11. Historic Intensive Survey.



Legend

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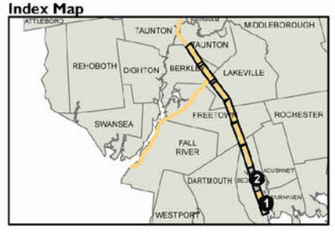

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-12. Historic Intensive Survey.

3/5/2012
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Legend

- Proposed Rail Alternative
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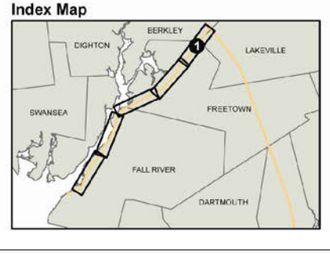

Moving Massachusetts Forward massDOT

SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-13. Historic Intensive Survey.

Tile 1

FREETOWN STATION

Freetown

SOUTH MAIN STREET

FREETOWN

Fall River Secondary

FREETOWN FALL RIVER ST FOREST

79

24

ANNETS MEMORIAL HIGHWAY

Assonet River

TP-10 - Paralleling Station (PS-4) Stoughton Alt.

FALL RIVER

LEONARD ROAD

LAURENDS DRIVE

ANNETS HIGHWAY

POWDERHORN DRIVE

NORTH MAIN STREET

STATE FOREST ROAD

FREETOWN

0 200 400 800 Feet

Tile 2

ANNETS MEMORIAL HIGHWAY

RIDGEHILL ROAD

ASSONET CENTRAL GROUND

SOUTH MAIN STREET

FREETOWN COMMON

Ft.D

MILL STREET

ASSONET ROAD

FREETOWN

Fall River Secondary

Ft.C

Terry Brook

TP-10 - Paralleling Station (PS-4) Stoughton Alt.

FREETOWN FALL RIVER ST FOREST

0 200 400 800 Feet

3/5/2012
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Legend

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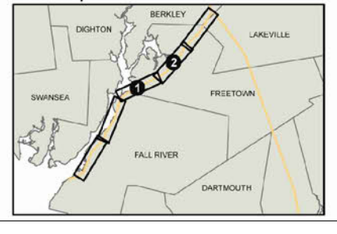

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

Appendix C-14. Historic Intensive Survey.

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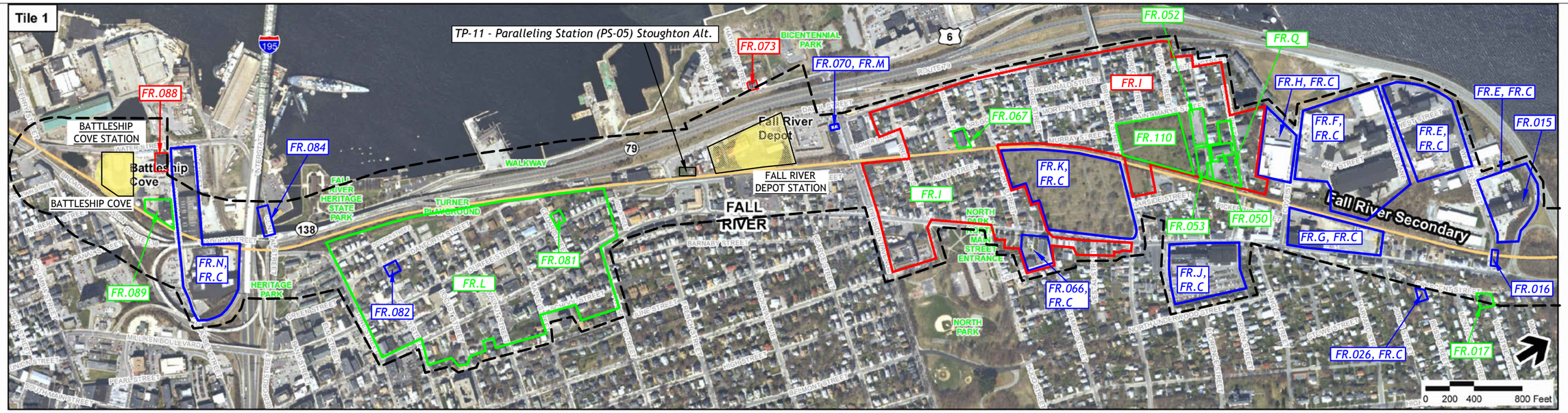

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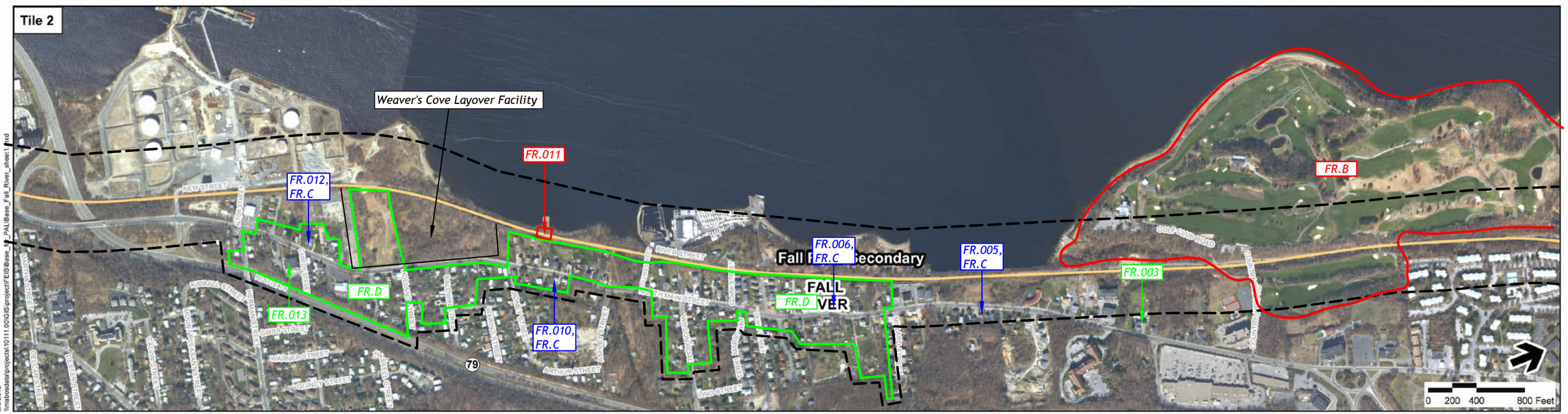

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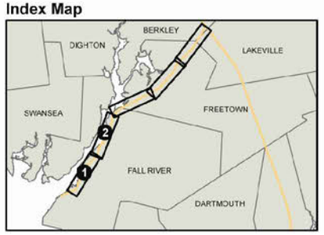

Moving Massachusetts Forward. massDOT

SOUTH COAST RAIL

Fall River Secondary to Myricks Junction

PAL

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc.
Modified By: PAL May 2013

3/5/2012
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APPENDIX E
Addendum

Historic Properties Surveyed and Eligible, Forms and Evaluation Sheets

Revised and Updated, May 2013

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Fall River		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Fall River

Place *(neighborhood or village):*

Name of Area: Wellington-Brownell Street Area

Present Use: Residential, Ecclesiastical, Commercial, and Institutional

Construction Dates or Period: Late-19th to Early 20th C.

Overall Condition: Good

Major Intrusions and Alterations: Late-20th C. building infill.

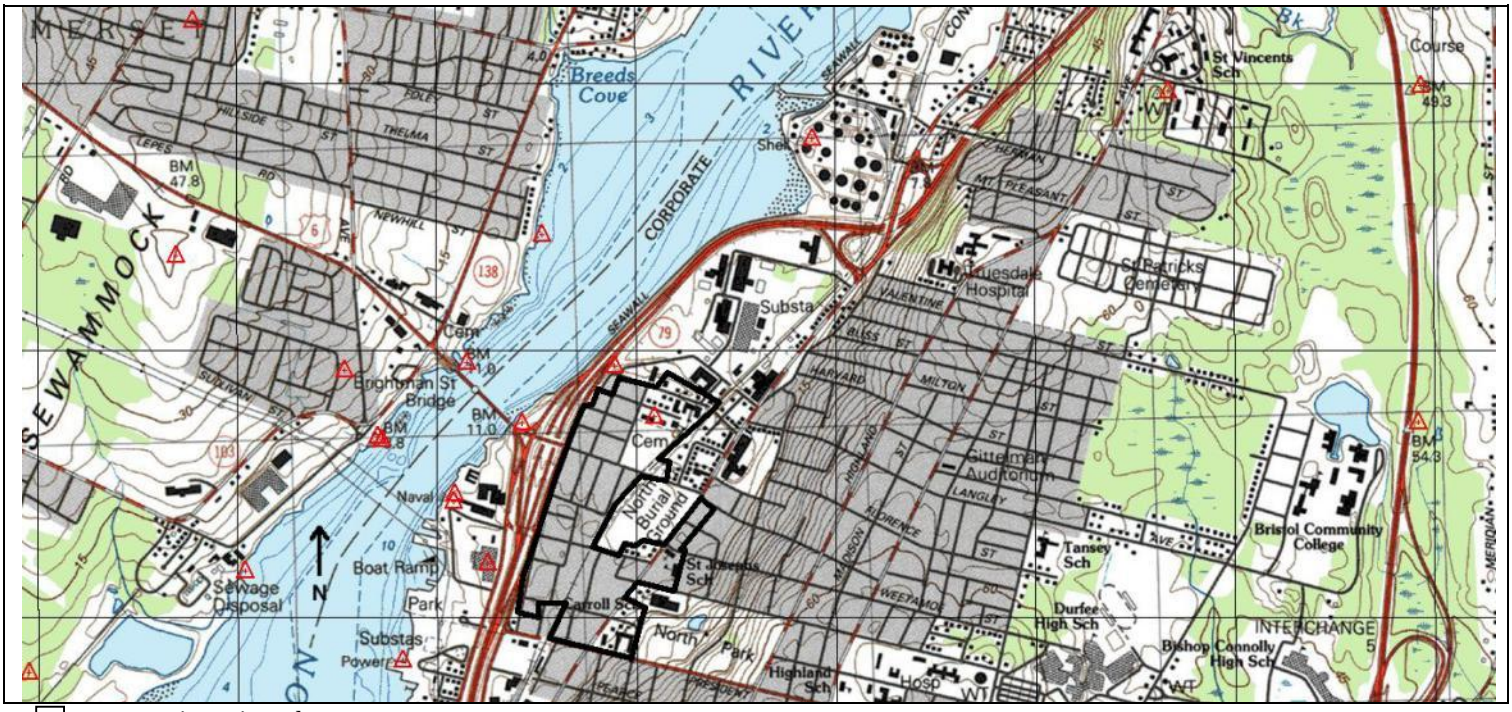
Acreage: Approx. 85

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012
Revised, April 2013

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Wellington-Brownell Street Area is an approximately 85-acre, half-mile-long asymmetrical residential district generally bound by North Main Street to the east, Essex Street to the north, Lindsey Street to the west, and President Avenue to the south. The area is set in a high-traffic, highly-dense, urban area, along the western bank of the Taunton River. The area is bisected by the Fall River Secondary Railroad right-of-way. The area includes the following north-to-south-running streets (from east to west): North High (west side only), Rock (west side only), North Main (portions), Wiley, Almy, Thompson, Murray, St. Mary, Morton, Oregon, North Court, Fulton, McDonald, and Lindsey (east side only). It also includes the following east-to-west-running streets (from north to south): Essex, Wellington (portions), Suffolk (portions), Norfolk (portions), Brightman (portions), Weetamoe (portions), George, Cory, Ballard, Hood (portions), Railroad, Brownell (portions), and President Avenue (portions). The district contains approximately 335 properties dating from the late nineteenth to early twentieth century. Multi-family dwellings are a common building form in the area and architectural styles include the Italianate, Second Empire, Bungalow, Colonial Revival and Shingle. Some buildings have been altered with synthetic siding and replacement windows, but the overall area retains its architectural integrity and setting. One property, Saint Matheiu's Church (FLR.440), is listed on the National Register of Historic Places as part of the Fall River Multiple Property Area (Frontiero 1983).

HISTORICAL NARRATIVE

Early development within the Wellington-Brownell Street Area concentrated along North Main Street (ca. 1700-1725), one of the first major thoroughfares in the city of Fall River. The street grid south of Essex Street was laid out by 1850 and became denser after the development of several neighboring textile mills in the late nineteenth and early twentieth century. The area, formerly known as Mechanicsville, increased in development during the 1870s, in tandem with the opening of nearby textile mills located outside of the area, such as the Mechanics Mills, Sagamore Mills, Border City Mill, and the Foster Spinning Company.

As Fall River's textile industry evolved during the mid- to late-nineteenth century, multi-family houses were erected throughout the city to accommodate the increase in industry. These properties were typically constructed in the Italianate and French Second Empire styles. In the Wellington-Brownell Street Area, although it is likely many examples of these properties originally bore characteristics of these styles, only a few have remained intact, including the three-story, French Second Empire style, mansard-roofed residences at 1297 North Main Street and St. Michael's Rectory along Essex Street and the Italianate style duplexes at 117 Fulton Street. Many triple-decker buildings are located throughout the district. These properties, with examples such as the strip of multi-family residences along Cory Street (# 255, 245, 239, and 229), do not presently bear any particular style of architecture.

The northern portion of the Wellington-Brownell Street Area, north of Brightman Street around the North End Roman Catholic Area, developed primarily between 1890 and 1910. Previously, this section contained a single estate, the Leonard Brightman Estate, and the Saint John's Roman Catholic Cemetery established in 1850. Saint John's Cemetery is the second Catholic Cemetery founded in Fall River; Saint Mary's Cemetery, located on Amity Street, is the first. By 1895 approximately 50 percent of the lots between Brightman and Essex streets were built up, and by 1905 almost all the lots were developed, several with multiple residences per parcel. The majority of the structures accommodated two or more families in the form of tenements or triple-deckers.

French and Portuguese immigrants, intermingled along Wellington, Suffolk, Norfolk, and Fulton streets dominated the population. The residents were primarily employed as laborers and in the local textile industry. The neighborhood small businesses, such as grocers and bakeries, generally concentrated closer to Brightman Street. The most substantial buildings in the area were Saint Matthew's Roman Catholic Church (MHC No. FLR.440) built in 1893 at the corner of Saint Mary's and Wellington streets and Saint Michael's Roman Catholic Church built in 1896 on Essex Street just north of Saint Matthew's. Saint Matthew's was constructed to serve the local French population, while Saint Michael's served the Portuguese residents of the neighborhood. Saint Matthew's church was demolished in 1990, but Saint Matthew's Convent and Parochial School buildings remain and have been converted into residences. Saint Michael's Church, accompanied by a Rectory and Parochial School, remains active. Prior to the expansion of St. Michael's Church Complex in the mid-twentieth century, they used the buildings at 158 Wellington Street and 277 Brightman Street to house the Sunday School and Hall in the early twentieth century. St. Michael's also purchased the former Fulton Street School at the corner of Fulton and Wellington streets, not extant, for its first Parochial School.

The Wellington-Brownell Area, south of Brightman Street contained multiple additional religious properties scattered within the residential neighborhood. These properties include Saint Joseph's Roman Catholic Church (MHC No. FLR.240) and its associated Rectory and School at the corner of North Main and Weetamoe streets; the former Brownell Street Baptist Chapel constructed in 1871 at 290 Brownell Street, now a residence; and the Friends' Burial Ground at the west terminus of Hood Street, currently owned by the Swansea Monthly Meeting Society. This small burial ground was established ca. 1880, but the east half of the property was lost to the development of multi-family residences on Hood Street over the existing burials between 1890 and 1910.

Due to significant non-historic modifications including the introduction of synthetic materials and additions, the Wellington-Brownell Street Area does not retain sufficient integrity to be eligible for listing in the National Register of Historic Places.

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Brady, Jonathan House	15 Almy Street	ca. 1850	Greek Revival		C
	Kelly, C.L. House	28 Almy Street	ca. 1860	Vernacular		C
	Multi-family Residence	31 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Residence	37 Almy Street	ca. 1910	Colonial Revival		C
	Multi-family Residence	43 Almy Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Baylies, William House	48 Almy Street	ca. 1850	Greek Revival; altered		C
	Ferguson Tenement	53 Almy Street	ca. 1870	Vernacular		C
	Ferguson, Jonathan House	57 Almy Street	ca. 1870	Vernacular; altered		C
	Multi-family Residence	62 Almy Street	ca. 1890	Victorian Eclectic		C
	Residence	71 Almy Street	ca. 1870	Italianate		C
	Residence	74 Almy Street	ca 1890	Italianate		C
	Forest, J. House	81 Almy Street	ca. 1880	Vernacular		C
	Residence	88 Almy Street	ca. 1990	Vernacular		NC
	Bliffin House	93 Almy Street	ca. 1870	Italianate		C
	Green, T. House	96 Almy Street	ca. 1870	Italianate; altered		C
	Multi-family Residence	104 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker	24	C
	Multi-family Residence	105 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	110 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker	24	C
	Residence	115 Almy Street	2007	Vernacular		NC
	Multi-family Residence	120 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker	24	C
	Multi-family Residence	121 Almy Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Garage	132 Almy Street	ca. 1920	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	92 Ballard Street	ca. 1900	Victorian Eclectic/ Triple Decker	25	C
	Residence	95 Ballard Street	ca. 1880	Second Empire		C
	Multi-family Residence	101 Ballard Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Residence	102 Ballard Street	ca. 1890	Italianate; altered	25	C
	Residence	103 Ballard Street	ca. 1900	Vernacular		C
	Altham, T. Tenement	105 Ballard Street	ca. 1870	Italianate; altered		C
	Multi-family Residence	114 Ballard Street	ca. 1910	Victorian Eclectic/ Triple Decker	25	C
	Residence	114R Ballard Street	ca. 1910	Queen Anne	25	C
	Residence	48 Boomer Street	ca. 1910	Second Empire		C
	St. John's Cemetery	Brightman Street	ca. 1850	N/A	8	C
	Oak Tree Burial Ground	Brightman Street	ca. 1850	N/A	15	C
	Multi-family Residence	138 Brightman Street	ca. 1900	Victorian Eclectic/Triple Decker		C
	Commercial Building	139 Brightman Street	ca. 1920	Vernacular; altered		C
FLR.47	Multi-family Residence	142 Brightman Street	ca. 1895	Queen Anne/ Triple Decker		C
	Commercial Building	152 Brightman Street	ca. 1890	Italianate		C
	Multi-family Residence	147 Brightman Street	ca. 1890	Italianate		C
	Multi-family Residence	154 Brightman Street	ca. 1900	Victorian Eclectic; altered/ Triple Decker		C
	Wagon Shed	157 Brightman Street	ca. 1890	vernacular; highly altered		C
	Multi-family Residence	177 Brightman Street	ca. 1910	Victorian Eclectic; altered/ Triple Decker		C
	Residential-Commercial Building	187 Brightman Street	ca. 1910	Queen Anne; altered/ Triple Decker		C
	Multi-family Residence	190 Brightman Street	ca. 1890	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residential-Commercial Building	198 Brightman Street	ca. 1890	Victorian Eclectic; altered/ Triple Decker		C
	Multi-family Residence	209 Brightman Street	ca. 1890	Vernacular	17	C
FLR.48	Multi-family Residence	212 Brightman Street	ca. 1895	Queen Anne/ Triple Decker		C
	Residence	219 Brightman Street	ca. 1880	Vernacular		C
	Residence	223 Brightman Street	ca. 1880	Vernacular; altered		C
FLR.49	North Variety Store – Residence	226Brightman Street	ca. 1870	Italianate; altered		C
	Multi-family Residence	227 Brightman Street	ca. 1900	Victorian Eclectic		C
	Clark House	229 Brightman Street	ca. 1880	Vernacular		C
	Commercial Building	235 Brightman Street	ca. 1900	Vernacular; altered		C
	Multi-family Residence	269 Brightman Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Saint Michael's Hall	277 Brightman Street	ca. 1910	Vernacular; highly altered		C
	Multi-family Residence	168 Brownell Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Watt, W.J. Apartments	169 Brownell Street	ca. 1880	Vernacular		C
	Multi-family Residence	184 Brownell Street	ca. 1890	Italianate		C
	Watt, W.J. Apartments	185 Brownell Street	ca. 1880	Vernacular		C
	Multi-family Residence	195 Brownell Street	ca. 1900	Queen Anne	26	C
	Condominiums	196 Brownell Street	2012	Colonial Revival		NC
	Multi-family Residence	230 Brownell Street	ca. 1880	Vernacular		C
	Multi-family Residence	244 Brownell Street	ca. 1900	Vernacular		C
	Residence	266 Brownell Street	ca. 2005	Colonial Revival		NC
	Residence	278 Brownell Street	ca. 2005	Colonial Revival		NC
	Ferguson House	285 Brownell Street	ca. 1880	Italianate		C
	Brownell Street First Baptist Church – Residence	290 Brownell Street	1871	Vernacular; highly altered		C
	Multi-family Residence	295 Brownell Street	ca. 1890	Queen Anne		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	304 Brownell Street	ca. 1910	Queen Anne		C
	Hodnet, P. House	317 Brownell Street	ca. 1880	Second Empire		C
	Tenement	322 Brownell Street	ca. 1880	Second Empire		C
	Multi-family Residence	327 Brownell Street	ca. 1900	Queen Anne/ Triple Decker		C
	Clyde, M. House	332 Brownell Street	ca. 1850	Greek Revival		C
	Ripley Apartments	3 Burns Street	ca. 1880	Vernacular		C
	Broadbent Apartments	4 Burns Street	ca. 1880	Vernacular		C
	Ripley Apartments	13 Burns Street	ca. 1880	Vernacular		C
	Travis House	26 Burns Street	ca. 1880	Vernacular		C
	Residence	8 Clinton Street	ca. 1930	Vernacular		C
	Mechanics Mill Company Tenement	84 Cory Street	ca. 1880	Queen Anne; altered		C
	Commercial Building	87 Cory Street	ca. 1930	Vernacular		C
	Mrs. Tierney Apartments	96 Cory Street	ca. 1880	Queen Anne/ Triple Decker		C
	Multi-family Residence	101 Cory Street	ca. 1900	Victorian Eclectic/ Triple Decker	22	C
	Mrs. Tierney House	106 Cory Street	ca. 1870	Vernacular; altered		C
	Residence	113 Cory Street	ca. 1900	Victorian Eclectic; altered	22	C
	Multi-family Residence	116 Cory Street	ca. 1890	Queen Anne/ Triple Decker		C
	Multi-family Residence	123 Cory Street	ca. 1910	Victorian Eclectic/ Triple Decker	22	C
	Multi-family Residence	150 Cory Street	ca. 1910	Victorian Eclectic; altered		C
	Multi-family Residence	174 Cory Street	ca. 1900	Victorian Eclectic		C
	Residence	180 Cory Street	ca. 1990	Vernacular		NC
	Residence	184 Cory Street	ca. 1960	Vernacular		NC
	Residence	192 Cory Street	ca. 1980	Vernacular		NC
	Multi-family Residence	229 Cory Street	ca. 1910	Queen Anne/ Triple Decker		C
	Residence	239 Cory Street	ca. 1910	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	245 Cory Street	ca. 1910	Queen Anne/ Triple Decker		C
	Multi-family Residence	251 Cory Street	ca. 1910	Queen Anne/ Triple Decker		C
	Multi-family Residence	255 Cory Street	ca. 1910	Queen Anne/ Triple Decker	1	C
	Multi-family Residence	268 Cory Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	276 Cory Street	ca. 1890	Italianate		C
	Multi-family Residence	287 Cory Street	ca. 1890	Victorian Eclectic; altered		C
	Higney House	290 Cory Street	ca. 1880	Italianate		C
	Multi-family Residence	295 Cory Street	ca. 1890	Italianate		C
	Multi-family Residence	302 Cory Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Stebbins, E. House	305 Cory Street	ca. 1880	Vernacular		C
	Multi-family Residence	314 Cory Street	ca. 1890	Second Empire		C
	Residence	157 Essex Street	ca. 1920	Vernacular		C
	Multi-family Residence	164 Essex Street	ca. 1910	Vernacular		C
	Multi-family Residence	200 Essex Street	ca. 1910	Victorian Eclectic/ Triple Decker	9	C
	Saint Michael's Roman Catholic Church	207 Essex Street	1896; 1921-1922	Neo-Gothic Revival		C
	Saint Michael's Rectory	207 Essex Street	1902	Second Empire	6	C
	Saint Michael's Parochial School	207 Essex Street	1957	Vernacular		C
	Multi-family Residence	216 Essex Street	ca. 1910	Victorian Eclectic/ Triple Decker	9	C
	Multi-family Residence	242 Essex Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Residence	9 Fulton Street	ca. 2005	Colonial Revival/Duplex		NC
	Residence	27 Fulton Street	ca. 1890	Vernacular		C
	Multi-family Residence	40 Fulton Street	ca. 1910	Victorian Eclectic		C
	Multi-family Residence	51 Fulton Street	ca. 1900	Queen Anne; altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	56 Fulton Street	ca. 1890	Italianate		C
	Multi-family Residence	69 Fulton Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	74 Fulton Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	77 Fulton Street	ca. 1890	Vernacular		C
	Multi-family Residence	86 Fulton Street	ca. 1890	Vernacular		C
	Multi-family Residence	100 Fulton Street	ca. 1910	Colonial Revival; altered	2	C
	Multi-family Residence	116 Fulton Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	117 Fulton Street	ca. 1890	Italianate	5, 11	C
	Multi-family Residence	129 Fulton Street	ca. 1890	Italianate	5, 11	C
	Commercial Building	138 Fulton Street	ca. 1890	Vernacular; altered		C
	Residence	163 Fulton Street	ca. 1890	Victorian Eclectic		C
	Residence	183 Fulton Street	ca. 1920	Vernacular/ Bungalow		C
	Mechanics Mill Company Tenement	117 George Street	ca. 1880	Victorian Eclectic; highly altered		C
	Mechanics Mill Company Tenement	131 George Street	ca. 1880	Victorian Eclectic; highly altered		C
	Mechanics Mill Company Tenement	149 George Street	ca. 1880	Vernacular; altered		C
	Higney House	152 George Street	ca. 1880	Vernacular		C
FLR.121	Corbett House	164 George Street	ca. 1880	Italianate; highly altered		C
	Travis Barn	183 George Street	ca. 1880	Vernacular		C
	Residence	196 George Street	ca. 1920	Vernacular		C
	Residence	204 George Street	ca. 1920	Vernacular		C
FLR.122	Residence	205 George Street	ca. 1890	Italianate	20	C
FLR.123	Tenement	210 George Street	ca. 1885	Italianate		C
FLR.124	Cory, J.B. Tenement	215 George Street	ca. 1875	Italianate; altered	20	C
	Friends' Burial Ground	Hood Street	ca. 1800	N/A		C
	Multi-family Residence	21 Hood Street	ca. 1900	Victorian Eclectic/ Triple Decker		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	27 Hood Street	ca. 190	Victorian Eclectic		C
	Multi-family Residence	34 Hood Street	ca. 1890	Victorian Eclectic; altered		C
	Multi-family Residence	35 Hood Street	ca. 1910	Victorian Eclectic		C
	Multi-family Residence	38 Hood Street	ca. 1900	Victorian Eclectic		C
	Wiley, R. House	47 Lindsey Street	ca. 1860	Greek Revival; altered		C
	Commercial Building	101 Lindsey Street	ca. 1930	Vernacular		C
	Residence	127 Lindsey Street	ca. 1890	Italianate; altered		C
	Residence	145 Lindsey Street	ca. 1950	Vernacular/ Ranch		NC
	Residence	161 Lindsey Street	ca. 1980	Vernacular/ Ranch		NC
	Commercial Building	177 Lindsey Street	ca. 1930	Vernacular; altered		C
	Multi-family Residence	183 Lindsey Street	ca. 1900	Victorian Eclectic		C
	Residence	197 Lindsey Street	ca. 1900	Vernacular; altered		C
	Sullivan Building	205 Lindsey Street	ca. 1880	Victorian Eclectic; altered		C
	Mechanics Mill Company Tenement	243 Lindsey Street	ca. 1870	Vernacular		C
	Residence	253 Lindsey Street	ca. 1920	Vernacular		C
FLR.193	Mechanics Mill Company Tenement	261 Lindsey Street	ca. 1875	Vernacular; altered		C
	Mechanics Mill Company Tenement	279 Lindsey Street	ca. 1870	Vernacular; altered		C
	Mechanics Mill Company Tenement	297 Lindsey Street	ca. 1870	Vernacular; highly altered	21	C
	Commercial Building	317 Lindsey Street	ca. 1975	Vernacular	21	C
	Baldwin, George Tenement	337 Lindsey Street	ca. 1870	Italianate; altered		C
	Residence	343 Lindsey Street	ca. 1890	Vernacular		C
	Residence	351 Lindsey Street	ca. 1890	Vernacular		C
	Multi-family Residence	361 Lindsey Street	ca. 1890	Second Empire; altered		C
	Multi-family Residence	365 Lindsey Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	379 Lindsey Street	ca. 1890	Victorian Eclectic	18	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	391 Lindsey Street	ca. 1890	Victorian Eclectic; altered	18	C
	Multi-family Residence	399 Lindsey Street	ca. 1890	Vernacular	18	C
	Residence	409 Lindsey Street	ca. 1890	Vernacular	18	C
	Multi-family Residence	437 Lindsey Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	451 Lindsey Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	471 Lindsey Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	489 Lindsey Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Tenement	499 Lindsey Street	ca. 1890	Vernacular		C
	Multi-family Residence	521 Lindsey Street	ca. 1910	Queen Anne/ Triple Decker		C
	Multi-family Residence	19 Malvey Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	30 Malvey Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	33 Malvey Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	34 Malvey Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	44 Malvey Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	47 Malvey Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Residence	27 McDonald Street	ca. 1890	Vernacular/ altered		C
	Multi-family Residence	27B McDonald Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Residence	28 McDonald Street	ca. 1890	Vernacular		C
	Multi-family Residence	33 McDonald Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	38 McDonald Street	ca. 2005	Colonial Revival		NC
	Multi-family Residence	46 McDonald Street	ca. 1900	Queen Anne	19	C
	Commercial Garage	54 McDonald Street	ca. 1920	Italianate	19	C
	Multi-family Residence	55 McDonald Street	2007	Vernacular		NC
	Residence	66 McDonald Street	ca. 1880	Vernacular; altered	19	C
	Residence	83 McDonald Street	ca. 1890	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	86 McDonald Street	ca. 1900	Queen Anne; altered		C
	Multi-family Residence	89 McDonald Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1 Morton Street	ca. 1900	Victorian Eclectic		C
	Residence	9 Morton Street	ca. 1880	Vernacular		C
FLR.223	Multi-family Residence	19 Morton Street	ca. 1875	Italianate		C
	Reed & Davenport Tenement	33 Morton Street	ca. 1880	Vernacular		C
	Multi-family Residence	34 Morton Street	ca. 1900	Victorian Eclectic; altered		C
	Ferguson House	43 Morton Street	ca. 1880	Victorian Eclectic; altered		C
	Multi-family Residence	44 Morton Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	53 Morton Street	ca. 1890	Vernacular		C
	Residence	54 Morton Street	ca. 1890	Vernacular		C
	Powers Tenement	62 Morton Street	ca. 1880	Vernacular	4	C
	Multi-family Residence	63 Morton Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	74 Morton Street	ca. 1890	Vernacular	4	C
	Multi-family Residence	77 Morton Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	81 Morton Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	86 Morton Street	ca. 1890	Vernacular	4	C
	Multi-family Residence	16 Murray Street	ca. 1890	Vernacular		C
FLR.225	Multi-family Residence	20 Murray Street	ca. 1890	Victorian Eclectic		C
FLR.226	Multi-family Residence	35 Murray Street	ca. 1885	Vernacular		C
	Multi-family Residence	46 Murray Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Residence	48 Murray Street	ca. 1890	Vernacular		C
	Multi-family Residence	49 Murray Street	ca. 1900	Vernacular		C
	Multi-family Residence	60R Murray Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
FLR.227	Residence	60 Murray Street	ca. 1890	Vernacular; altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.228	Residence	79 Murray Street	ca. 1915	Colonial Revival; Shingle Style		C
	Multi-family Residence	89 Murray Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	90 Murray Street	ca. 1900	Victorian Eclectic/ Triple Decker	16	C
	Multi-family Residence	99 Murray Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Bakery – Residential Building	15 Norfolk Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	22 Norfolk Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Residence	23 Norfolk Street	ca. 1890	Vernacular		C
	Multi-family Residence	53 Norfolk Street	ca. 1890	Victorian Eclectic		C
	Residence	60 Norfolk Street	ca. 190	Victorian Eclectic	13	C
	Multi-family Residence	67 Norfolk Street	ca. 1890	Victorian Eclectic; altered		C
	Residence	68 Norfolk Street	ca. 1890	Victorian Eclectic	13	C
	Multi-family Residence	73 Norfolk Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	83 Norfolk Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	90 Norfolk Street	ca. 1890	Vernacular	13	C
	Multi-family Residence	90A Norfolk Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	90B Norfolk Street	ca. 1900	Vernacular		C
	Residence	91 Norfolk Street	ca. 1900	Vernacular		C
	Multi-family Residence	11 North Court Street	ca. 1900	Colonial Revival		C
	Devine, T. Tenement	19 North Court Street	ca. 1890	Vernacular		C
	Devine, T. Tenement	21 North Court Street	ca. 1880	Italianate; altered		C
	Devine, T. Tenement	25 North Court Street	ca. 1880	Vernacular		C
	Devine, T. Tenement	27 North Court Street	ca. 1880	Vernacular		C
	Devine, T. Tenement	33 North Court Street	ca. 1880	Vernacular		C
	Multi-family Residence	35 North Court Street	ca. 1890	Victorian Eclectic; altered/ Triple Decker		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	36 North Court Street	ca. 1890	Vernacular		C
	Tenement	42 North Court Street	ca. 1880	Vernacular		C
	Tenement	45 North Court Street	ca. 1880	Vernacular		C
	Riley, T. Tenement	58 North Court Street	ca. 1880	Vernacular		C
	Commercial Building	63 North Court Street	ca. 1950	Vernacular		C
	Condominium	70 North Court Street	ca. 1980	Colonial Revival		NC
	Commercial Building	81 North Court Street	ca. 1930	Vernacular; altered		C
	Commercial Gas Station	1101 North Main Street	ca. 1960	Vernacular		NC
	Residence	1110 North Main Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1114 North Main Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1116 North Main Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1120 North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1128 North Main Street	ca. 1890	Vernacular		C
	Philanthropic Burial Society Building	1138 North Main Street	ca. 1880	Italianate; altered		C
	Residential – Commercial Building	1150 North Main Street	1905	Victorian Eclectic		C
	Jenny, Charles House	1166 North Main Street	ca. 1870	Italianate; altered	28	C
	Residential – Commercial Building	1174 North Main Street	ca. 1890	Victorian Eclectic; altered	28	C
	Multi-family Residence	1190 North Main Street	ca. 1900	Victorian Eclectic	28	C
	Multi-family Residence	1198 North Main Street	ca. 1900	Victorian Eclectic	28	C
	Multi-family Residence	1212 North Main Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1222 North Main Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1132 North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1240 North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1251 North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	1264 North Main Street	ca. 1890	Victorian Eclectic/ Triple Decker		
	Multi-family Residence	1264R North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1267 North Main Street	ca. 1900	Victorian Eclectic; altered/ Triple Decker	3	C
	Multi-family Residence	1274 North Main Street	ca. 1900	Vernacular; altered		C
	Multi-family Residence	1286 North Main Street	ca.1890	Victorian Eclectic		C
	Multi-family Residence	1287 North Main Street	ca. 1900	Victorian Eclectic	3	C
	Multi-family Residence	1297 North Main Street	ca. 1890	Victorian Eclectic	3	C
	Multi-family Residence	1298 North Main Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	1305 North Main Street	ca. 1900	Victorian Eclectic		C
	Commercial Building	1308 North Main Street	ca. 1930	Vernacular		C
	Hood, F. House	1319 North Main Street	ca. 11850	Italianate; altered		C
	Commercial Building	1320 North Main Street	ca. 1960	Vernacular		NC
	Multi-family Residence	1350 North Main Street	ca. 1900	Victorian Eclectic		C
FLR.240	Saint Joseph's Roman Catholic Church	1355 North Main Street	1880	High Victorian Gothic	7	NR
	Saint Joseph's Rectory	1355 North Main Street	ca. 1890	Second Empire		NR
	Saint Joseph's Parochial School	1355 North Main Street	ca. 1920	Neoclassical		NR
	Multi-family Residence	1379 North Main Street	ca. 1900	Second Empire	29	C
	Multi-family Residence	1383 North Main Street	ca. 1900	Second Empire	29	C
	Brown, W.R. House	1395 North Main Street	ca. 1880	Vernacular	29	C
	Residential – Commercial Building	1405 North Main Street	ca. 1900	Victorian Eclectic		C
	Residential – Commercial Building	1405R North Main Street	ca. 1900	Vernacular		C
	Multi-family Residence	1411 North Main Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1427 North Main Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Commercial Building	1447 North Main Street	ca. 1970	Vernacular		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	1461 North Main Street	ca. 1900	Vernacular		C
	Multi-family Residence	1465 North Main Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	1475 North Main Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	1483 North Main Street	ca. 1890	Victorian Eclectic		C
	Multi-family Residence	6 Oregon Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Westport Manufacturing Waste Department Building	7 Oregon Street	1918	Vernacular Industrial	23	C
	Multi-family Residence	21 Oregon Street	ca. 1910	Victorian Eclectic/ Triple Decker	23	C
	Residence	31 Oregon Street	ca. 1900	Vernacular; altered		C
	Multi-family Residence	32 Oregon Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	42 Oregon Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	45 Oregon Street	ca. 1910	Victorian Eclectic/ Triple Decker	23	C
	Garage	45R Oregon Street	ca. 1910	Vernacular		C
	Multi-family Residence	68 Oregon Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
FLR.296	Multi-family Residence	79 Oregon Street	ca. 1890	Vernacular		C
	Multi-family Residence	91 Oregon Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
FLR.297	Mechanics Mill Company Tenement	98 Oregon Street	ca. 1880	Vernacular		C
	Multi-family Residence	105 Oregon Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	113 Oregon Street	ca. 1910	Colonial Revival		C
	Mechanics Mill Company Tenement	120 Oregon Street	ca. 1880	Vernacular		C
	Multi-family Residence	123 Oregon Street	ca. 1890	Vernacular		C
	Commercial Building	250 President Avenue	ca. 1920	Neoclassical		C
	Commercial Building	266 President Avenue	ca. 1930	Vernacular		C
	Commercial Building	278 President Avenue	ca. 1980	Vernacular		NC

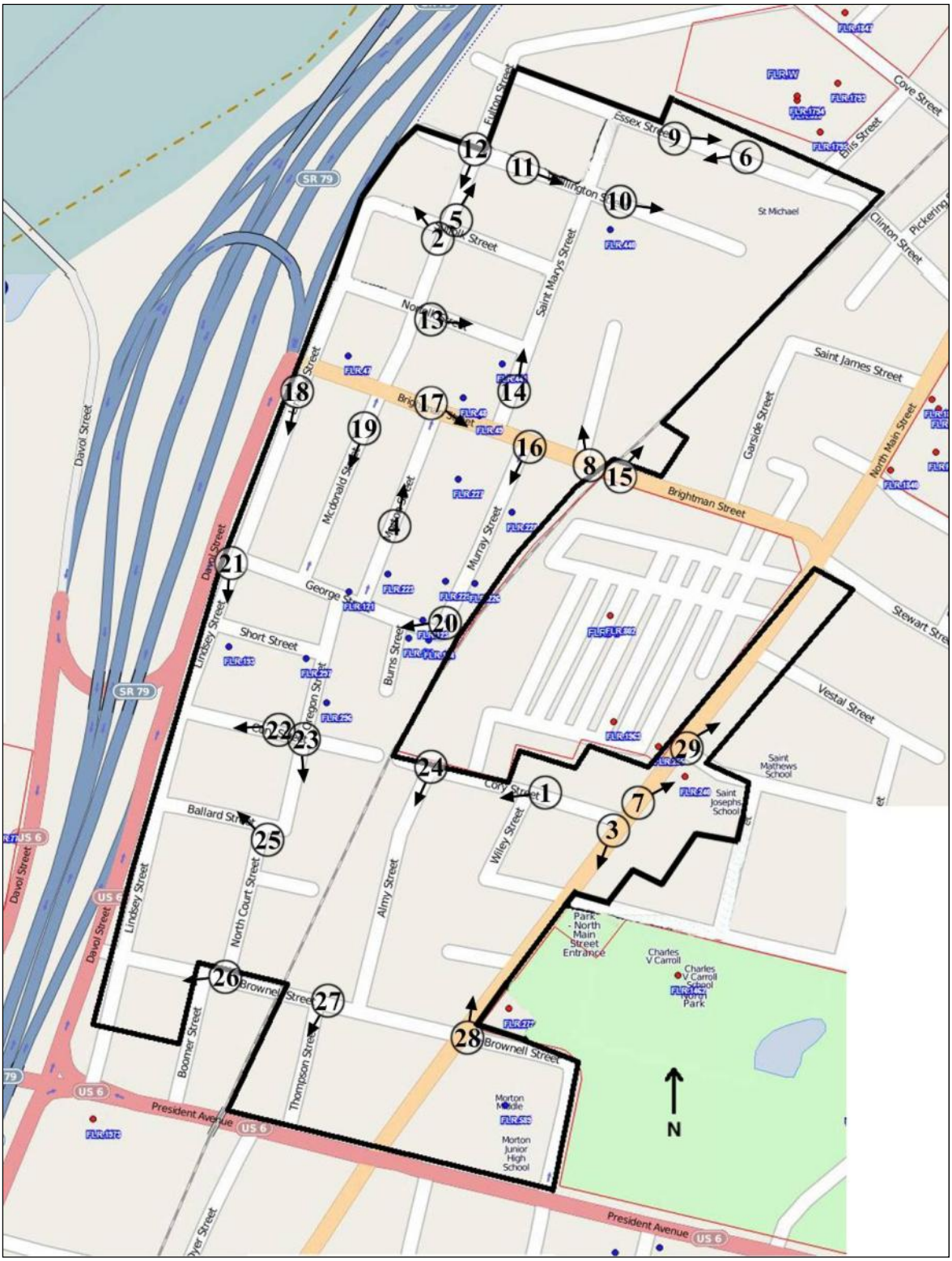
MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Commercial Building	290 President Avenue	ca. 1950	Vernacular		NC
FLR.589	Morton, James Madison Jr. High School	(376-) 400 President Avenue	1923	English Revival		Demolished
	Residential	25 Railroad Avenue	ca. 1890	Vernacular		C
FLR.440	Saint Mathieu's Church	Saint Mary's Street	1893	High Victorian Gothic		NR; Demolished
	Multi-family Residence	22 Saint Mary's Street	ca. 1910	Victorian Eclectic/ Triple Decker	14	C
FLR.441	Multi-family Residence	36 Saint Mary's Street	ca. 1885	Italianate	14	C
	Tenement	56 Saint Mary's Street	ca. 1890	Vernacular		C
	Residence	82 Saint Mary's Street	ca. 1890	Colonial Revival		C
	Residence	114 Saint Mary's Street	ca. 1890	Vernacular		C
	Multi-family Residence	124 Saint Mary's Street	ca. 1900	Victorian Eclectic	11	C
	Multi-family Residence	152 Saint Mary's Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	159 Saint Mary's Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Tenement	160 Saint Mary's Street	ca. 1890	Vernacular		C
	Multi-family Residence	167 Saint Mary's Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Residence	168 Saint Mary's Street	ca. 1890	Victorian Eclectic		C
	Residence	181 Saint Mary's Street	ca. 1890	Victorian Eclectic; altered		C
	Tenement	111 Short Street	ca. 1890	Vernacular		C
	Multi-family Residence	112 Short Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Tenement	121 Short Street	ca. 1890	Vernacular		C
	Commercial Building	17 Stewart Street	ca. 1940	Vernacular; altered		NC
	Tenement	90 Suffolk Street	ca. 1890	Vernacular	2	C
	Multi-family Residence	96 Suffolk Street	ca. 1900	Victorian Eclectic/ Triple Decker	2	C
	Residence	99 Suffolk Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	105 Suffolk Street	ca. 1900	Victorian Eclectic/ Triple Decker	5	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Multi-family Residence	145 Suffolk Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Residence	148 Suffolk Street	ca. 1910	Victorian Eclectic		C
	Multi-family Residence	160 Suffolk Street	ca. 1900	Victorian Eclectic		C
	Multi-family Residence	161 Suffolk Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Residence	162 Suffolk Street	ca. 1900	Vernacular		C
	Multi-family Residence	170 Suffolk Street	ca. 1890	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	182 Suffolk Street	ca. 1900	Vernacular/ Triple Decker		C
	Residence	25 Thompson Street	ca. 1890	Vernacular		C
	Multi-family Residence	27 Thompson Street	ca. 1880	Victorian Eclectic		C
	Residence	36 Thompson Street	ca. 1880	Italianate		C
	Multi-family Residence	44 Thompson Street	ca. 1890	Italianate/ Triple Decker	27	C
	Residence	45 Thompson Street	ca. 1900	Vernacular; altered		C
	Multi-family Residence	56 Thompson Street	ca. 1910	Queen Anne; altered	27	C
	Multi-family Residence	7 Vestal Street	ca. 1890	Vernacular; altered		C
	Residence	29 Wellington Street	ca. 1890	Vernacular		C
	Tenement	39 Wellington Street	ca. 1890	Vernacular		C
	Tenement	68 Wellington Street	ca. 1890	Vernacular		C
	Residence	81 Wellington Street	ca. 1890	Colonial Revival; altered		C
	Multi-family Residence	82 Wellington Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Residence	96 Wellington Street	ca. 1890	Vernacular		C
	Residence	99 Wellington Street	ca. 1890	Victorian Eclectic	11	C
	Multi-family Residence	106 Wellington Street	ca. 1900	Victorian Eclectic; altered/ Triple Decker		C
	Multi-family Residence	107 Wellington Street	ca. 1910	Victorian Eclectic/ Triple Decker	11	C
	Residence	114 Wellington Street	ca. 1890	Italianate; altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Hall – Residential Building	158 Wellington Street	ca. 1890	Vernacular	10	C
	Multi-family Residence	170 Wellington Street	ca. 1910	Victorian Eclectic/ Triple Decker	10	C
	Multi-family Residence	182 Wellington Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Saint Mathieu's Convent	189 Wellington Street	ca. 1920	Colonial Revival		C
	Multi-family Residence	192 Wellington Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Saint Mathieu's Parochial School	231 Wellington Street	ca. 1915	Colonial Revival		C
	Multi-family Residence	2 Wiley Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	12 Wiley Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	18 Wiley Street	ca. 1910	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	20 Wiley Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Multi-family Residence	29 Wiley Street	ca. 1900	Victorian Eclectic/ Triple Decker		C
	Residence	34 Wiley Street	ca. 1920	Vernacular		C
	Multi-family Residence	40 Wiley Street	ca. 1910	Victorian Eclectic/ Triple Decker	1	C

NR Property is listed in the National Register in the Fall River Multiple Resources Area nomination
C Contributing property to the district
NC Non-contributing property to the district

KEY TO PHOTOGRAPHS



2. 90 and 96 Suffolk Street and 100 Fulton Street (l-r), view looking northwest.

3. 1267, 1287, and 1297 North Main Street (r-l), view looking south.

4. 62, 74, and 86 Morton Street, view looking north.

5. 105 Suffolk Street and 117 and 129 Fulton Street (l-r), view looking northeast.

6. St. Michael's Rectory at 207 Essex Street, view looking west.

7. Saint Joseph's Roman Catholic Church (FLR.240), at 1355 North Main Street, view looking northeast.

8. Saint John's Cemetery, Brightman Street, view looking north.

9. 200 and 216 Essex Street (l-r), view looking east.

10. 158 and 170 Wellington Street (l-r), view looking east.

11. 99 and 107 Wellington Street (r-l) and 124 Saint Mary's Street, view looking southeast.

12. 117 and 129 (r-l) Fulton Street, view looking south.

13. 60, 68, and 90 Norfolk Street (l-r), view looking east.

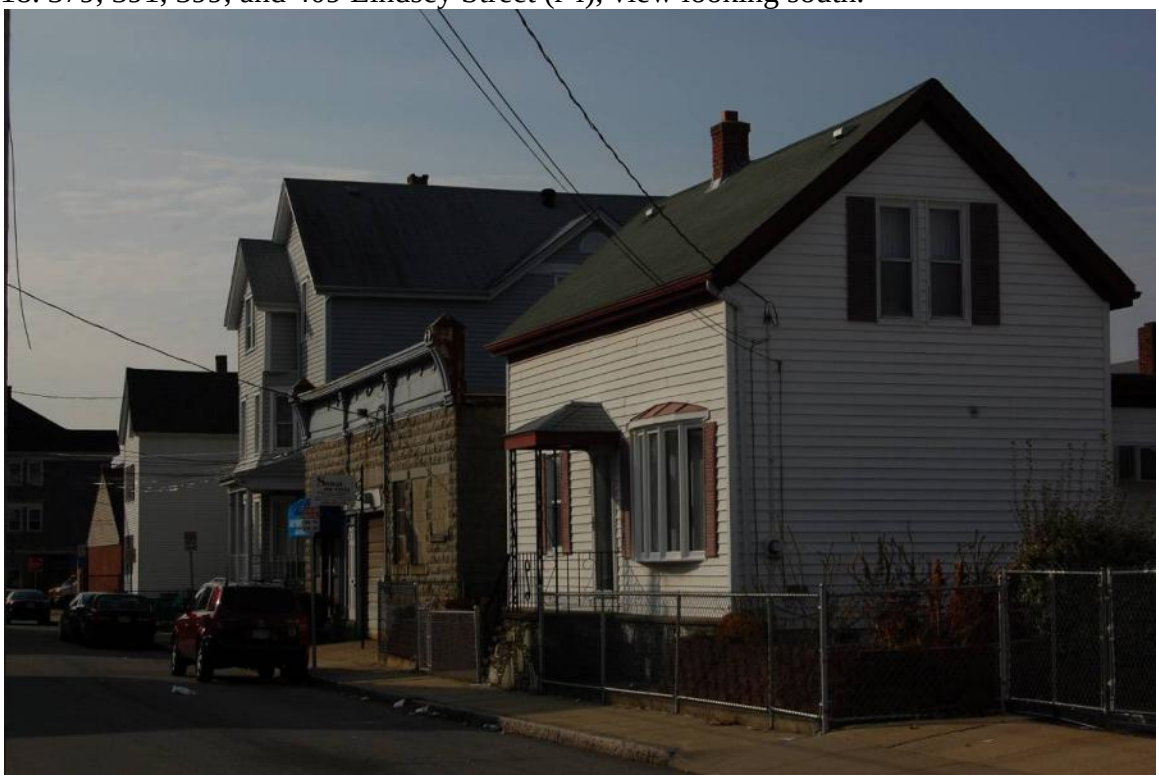
14. 22 and 36 Saint Mary's Street (l-r), view looking northeast.

15. Oak Tree Burial Ground, Brighton Street, view looking east.

16. 90 Murray Street, view looking southwest.

17. Corner of Brightman and Morton streets, view looking southeast.

18. 379, 391, 399, and 409 Lindsey Street (r-l), view looking south.



19. 46, 54, and 66 (l-r) McDonald Street, view looking southwest.

20. 215 and 205 George Street (FLR.124 and FLR.122) (l-r), view looking west.

21. Corner of George and Lindsey streets, view looking south.

22. 101, 113, and 123 Cory Street (r-l), view looking west.

23. 7, 21, and 45 Oregon Street (r-l), view looking south.

24. 6, 32, and 56 Almy Street (l-r), view looking southwest.

25. Ballard Street, view looking northwest.

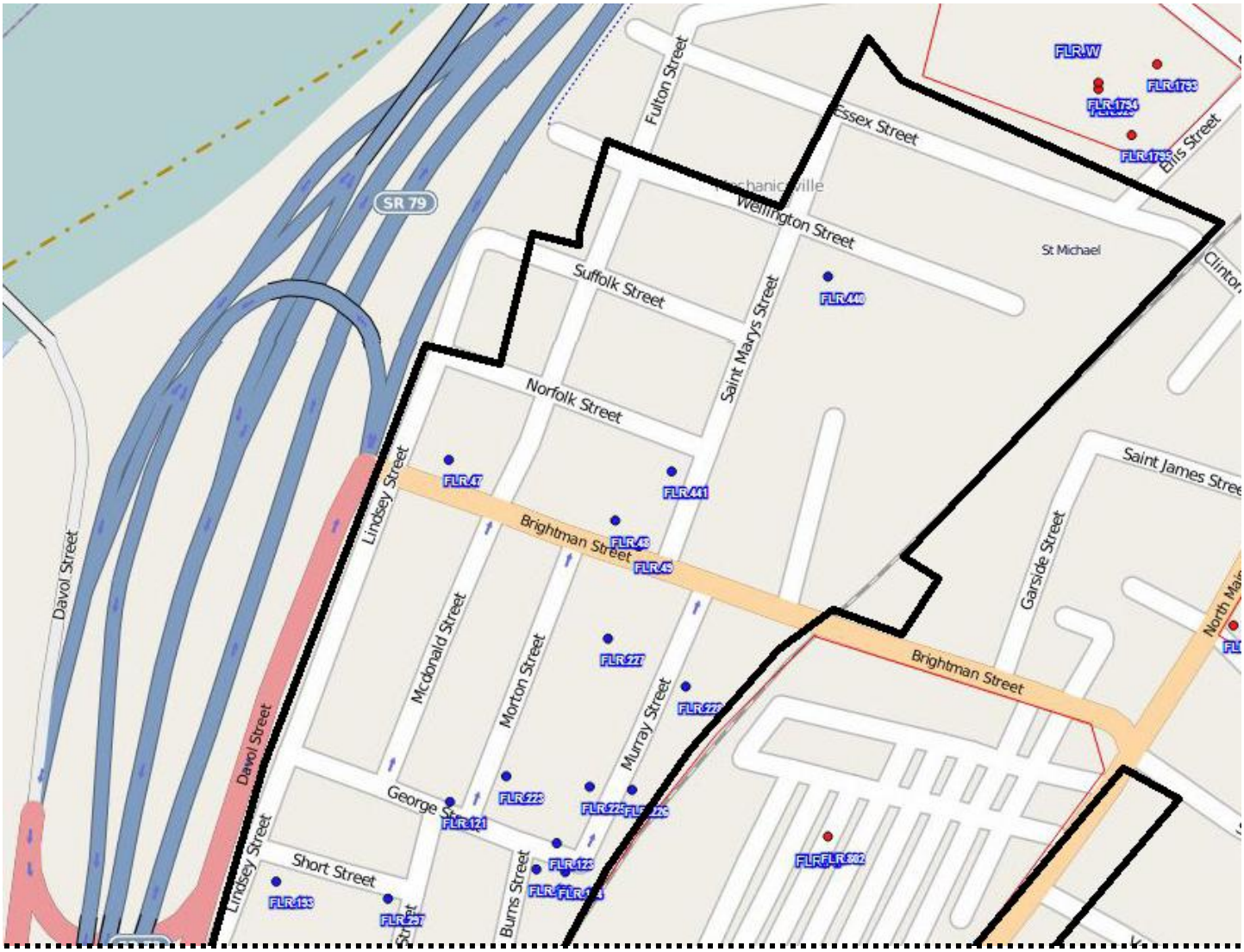
26. Corner of Brownell and Boomer streets, view looking west.

27. 44 and 56 Thompson Street (l-r), view looking southwest.

28. 1166, 1174, 1190, and 1198 North Main Street (l-r), view looking northeast.

29. 1379, 1383, and 1395 North Main Street (r-l), view looking northeast.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta, http://maps.mhc-macris.net

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton	TAU.K	See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Weir Village

Name of Area: Weir Village Area

Present Use: Residential, Ecclesiastical, Institutional, and Commercial

Construction Dates or Period: late 18th c. to mid-20th c.

Overall Condition: Good

Major Intrusions and Alterations: Demolition of two significant mill complexes.

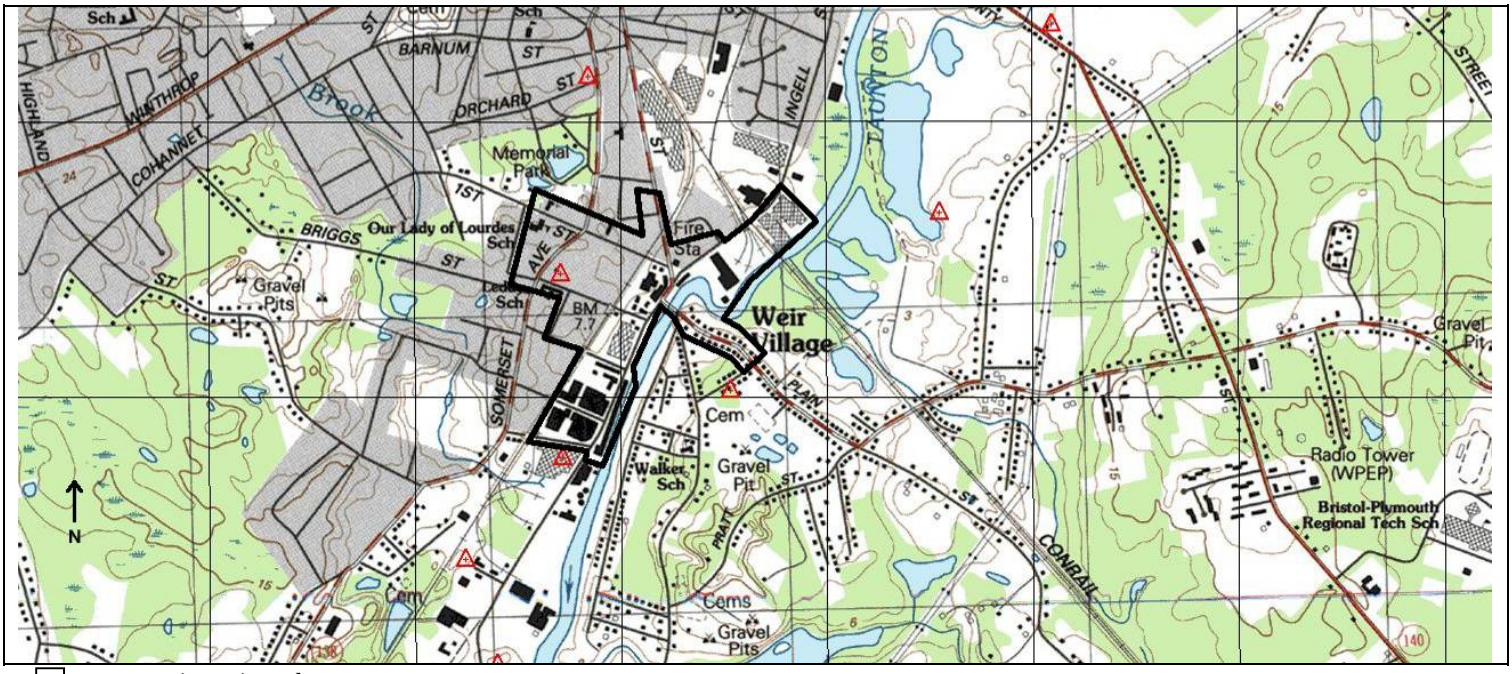
Acreage: Approx. 90

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012
Revised April, 2013

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Weir Village Area is an approximately 90 acre, irregularly shaped group of approximately 71 buildings, centered at the intersection of Ingell, Plain, Weir, West Water, and First streets. The area is bounded to the north by First Street (extending north to include a portion of Fay Street), to the south by Fifth Street, to the east by Beacon Street, and to the west by Presbrey Court. The area extends on either side of the Attleboro Secondary Railroad right-of-way at the Ingell Street rail crossing. This form updates the existing 1979 inventory form for the Weir Village Area (TAU.K) (T.W. 1979).

The industrial-based area is centered on either side of Ingell and West Water streets, which run along the Taunton River with tangential residential neighborhoods to the east and west and light commercial activity at the center. The area is a grouping of remnants of large-scale textile and stove manufacturing facilities constructed during the early to late nineteenth century. While once densely built-up, multiple demolitions in the recent past have created prominent tracts of vacant land within the area. Since 1983, two of the three most prominent related mill complexes (the Taunton Copper Manufacturing Company (TAU.315) and half of the Old Weir Stove Company (TAU.319) have been demolished, as well as the Taunton Pearl Works at 98 Ingell Street (TAU.298) on the north side of the rail right-of-way, resulting in the removal of essential components of the area's historic industrial fabric. With few exceptions, the remaining residential and commercial properties that date to the period of significance have also lost integrity in the introduction of synthetic materials and non-historic alterations.

The area contains individually listed National Register properties. The Cohannet Mills No. 3 (TAU.AG; National Register listed) encompasses four buildings: the Cohannet Mill No. 3 (TAU.297); Boiler House (TAU.736); Cotton Storehouse (TAU.690); and Engine Room (TAU.735). Properties listed in the National Register as part of the Taunton Multiple Resource Area (MRA) National Register Nomination in 1984 consist of the Sylvanus N. Staples House (TAU.310), H.P. Thomas House (TAU.341), Francis D. Williams House (TAU.320), Stone House (TAU.323), Captain David Vickery House (TAU.326), Alfred Paull House (TAU.294), Weir Engine House (TAU.296), and the now partially demolished Old Weir Stove Company (TAU.319) (Fitch 1983).

HISTORICAL NARRATIVE

Weir Village emerged in the nineteenth century as the commercial port and shipbuilding center that accommodated the booming industrial city of Taunton. The site was ideal as an inland port for coastal trade in the city due to its location along the Taunton River, which was (at the time) the northernmost point of ship navigability, one mile south of Taunton center. The Taunton River provided access to nearby communities for importing agricultural goods and exporting raw materials and manufactured products from the city. The area served as a center for several manufacturing companies that produced stoves, iron, copper, and brick.

Although Weir Village was most significant during the late nineteenth century, it had developed as a residential community by 1727. After the Revolutionary War, the local economy expanded and Weir Village became a major distribution center for iron, brick, and nails to local cities including New York, Providence, and Newport, with shipyards, iron foundries, and brick manufacturing shops constructed along the river. Early industries in Weir Village included the Taunton Copper Manufacturing Company (TAU.315), established to provide materials for ship hulls and fittings; the

prolific Taunton Iron Works (TAU.318); the Weir Stove Company (TAU.316, TAU.319), which became one of the country's most significant manufacturers of the Glenwood Range; and the Union Stove Lining Company (TAU.317), which supplied the local stove manufacturing business. In 1835, the introduction of the Taunton Branch Railroad contributed to efficiency in trade and accessibility of products through the Weir Village Area. Two additional railroad lines were constructed through the area, including the New Bedford Railroad in 1840 and the Middleboro Railroad in 1853. By the late nineteenth century, as Taunton's textile industry was prevailing, Cohannet Mill No 3 (TAU.AG) (the only remaining property associated with this period in the area) was constructed in 1890 at the northeastern corner of the Weir Village Area.

Although the most significant manufacturing properties within the Weir Village Area have been demolished, a few notable buildings associated with the industrial development of the area remain. These include early residential properties constructed of locally produced materials, such as the brick Allen House (TAU.304) and P. Dunbar House (TAU.305), built ca. 1830. There are residences of sea captains who managed local trading companies, Capt. David Vickery House (TAU.326), constructed ca. 1795, and Capt. Benjamin Burt House (TAU.324), built ca. 1820; and properties constructed by locally prominent manufacturers, including the Stone House (TAU.323), a multi-family boarding house built by lumber business tycoon George Williams in ca. 1847. Commercial buildings include the highly-altered Commercial Block (TAU.299), built ca. 1870, and ecclesiastical properties include the Sacred Heart Roman Catholic Church, constructed ca. 1905, which replaced a ca. 1860 Greek Revival style church. The Weir Engine House (TAU.296) stand as a testimony to Taunton's public service facilities built in conjunction with economic and physical growth. Other notable properties include the Sylvanus Staples House (TAU.310), associated with the most prominent industrialist in the Weir Village Area. With partner William Philips, Sylvanus Staples launched the most productive iron, coal, and lime freighting business in Taunton (Siergiej 2006; Walling 1852; 1858; Beers 1871; Everts & Richards 1895; Fitch 1983; T.W. 1979).

Since 1979, several institutional, commercial, and residential properties listed on the MHC Inventory have been demolished, including the Commercial Building at Weir Street (TAU.295), Weir Grammar School (TAU.309), B. Porter House (TAU.312), and the Staples Block (TAU.300). Due to the loss of key industrial complexes significant to the integrity of the area [Taunton Pearl Works (TAU.309), Taunton Copper Manufacturing Company (TAU.315), portions of the Old Weir Stove Company (TAU.319), Taunton Crucible Company (TAU.314), and the Taunton Iron Works (TAU.318)], Weir Village has lost a considerable amount of historic and architectural integrity and is therefore evaluated as not eligible for listing in the National Register of Historic Places.

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W., T.
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Walling, Henry F.
1852 *Bristol County, Massachusetts*. C. & A. Taber, Boston, MA.

1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.AG	Cohannet Mill No. 3	120 Ingell Street	ca. 1890	Richardsonian Romanesque	10	NR
	Residence	2 Bradford Place	ca. 1890	Vernacular		C
	Residence	5 Bradford Place	ca. 1890	Italianate		C
	Residence	7 Bradford Place	ca. 1890	Vernacular		C
	Presbrey, R.T. House	9 Charles Street	ca. 1870	Italianate; altered		C
	Residence	10 Charles Street	ca. 1880	Italianate		C
	Residence	12 Charles Street	ca. 1880	Vernacular		C
	Residence	13 Charles Street	ca. 1880	Vernacular	26	C
	Parker, J.B. House	16 Charles Street	ca. 1870	Vernacular/Cape; Queen Anne addition		C
	Crane, H. House	17 Charles Street	ca. 1870	Italianate	26	C
	Residence	18 Charles Street	ca. 1880	Vernacular		C
	Residence	19 Charles Street	ca. 1880	Vernacular		C
	Residence	2 First Street	ca. 1910	Vernacular	17	C
	Multi-family Residence	3 First Street	ca. 1880	Vernacular		C
	Residence	4 First Street	ca. 1890	Queen Anne; altered	17	C
	Commercial Building	11 First Street	ca. 1995	Vernacular		NC
	Burt, W. House	13 First Street	ca. 1870	Italianate		C
TAU.301	Welcome, S. P. C. House	14 First Street	ca. 1790	Federal; highly altered	18	C
	Eddy, A.L. House	16 First Street	ca. 1850	Greek Revival/Cape		C
TAU.302	Ashley, N. House	17 First Street	ca. 1845	Greek Revival	19	C
	Methodist Church Parsonage	18 First Street	ca. 1855	Greek Revival		C
TAU.303	Staples, A. J. House	21 First Street	ca. 1845	Greek Revival	19	C
TAU.304	Allen and Norcot House	22 First Street	ca. 1850	Greek Revival	4	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Paul, George House	23 First Street	ca. 1850	Greek Revival	19	C
TAU.305	Dunbar, P. House	24 First Street	ca. 1850	Greek Revival/Cape	4	C
TAU.306	Blood and Willard House	26 First Street	ca. 1850	Greek Revival/Cape	20	C
	Residence	30 First Street	ca. 1860	Greek Revival		C
	Sacred Heart Catholic Church – Annunciation of the Lord Catholic Church	31 First Street	1874	Gothic Revival	5	C
TAU.307	Smith, Samuel House	32 First Street	ca. 1860	Greek Revival/ Italianate; highly altered	20	C
	Multi-family Residence	41 First Street	ca. 1920	Colonial Revival		C
	Multi-family Residence	43 First Street	ca. 1920	Colonial Revival	1	C
	Residence	44 First Street	ca. 1910	Queen Anne	21	C
	Multi-family Residence	45 First Street	ca. 1920	Colonial Revival	1	C
	Residence	46 First Street	ca. 1920	Colonial Revival	21	C
	Multi-family Residence	47 First Street	ca. 1920	Colonial Revival	1	C
	Sisters of Mercy Convent	51 First Street	ca. 1920	Colonial Revival		C
	Our Lady of Lourdes Catholic School	52 First Street	1963	Vernacular	21	NC
	Residence	55 First Street	ca. 1910	Queen Anne; altered		C
	Residence	56 First Street	ca. 1910	Queen Anne		C
	Residence	57 First Street	ca. 1910	Vernacular; altered		C
	Residence	58 First Street	ca. 1910	Vernacular		C
	Glenwood Range Company Enamel Shop	15 Fourth Street	ca. 1905	Vernacular; altered	41	C
	City of Taunton Public Works Operations Center	90 Ingell Street	2001	Vernacular	16	NC
TAU.298	Taunton Pearl Works	98 Ingell Street	ca. 1890	Vernacular	16	Demolished
	Ashley, N. House	115 Ingell Street	ca. 1875	Vernacular		C
	Condominiums	117 Ingell Street	ca. 2010	Colonial Revival		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.297	Cohannet Mill No. 3	120 Ingell Street	ca. 1890	Richardsonian Romanesque	10	C*
TAU.736	Cohannet Mill No. 3 Boiler House	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
TAU.690	Cohannet Mill No. 3 Cotton Storehouse	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
TAU.735	Cohannet Mill No. 3 Engine Room	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
	Church, W.B. House	121 Ingell Street	ca. 1870	Italianate; highly altered	15	C
	Mrs. Reed House	125 Ingell Street	ca. 1880	Vernacular		C
	Commercial Building	131 Ingell Street	ca. 1950	Vernacular; highly altered		C
	Commercial Building	140 Ingell Street	ca. 1930	Vernacular	28	C
	Weir Bridge	Plain Street	1953	N/A	31	C
TAU.320	Williams, Francis D. House	3 Plain Street	ca. 1830	Greek Revival	8	NR
TAU.321	Talbot, Lemuel T. House	7 (9) Plain Street	ca. 1845	Greek Revival		C
	Residence	9 Plain Street	ca. 1940	Vernacular; highly altered		C
	Commercial Building	10 Plain Street	ca. 1970	Vernacular	34	NC
TAU.322	Residence	13 Plain Street	ca. 1845	Greek Revival		C
	Residence	13R Plain Street	ca. 1900	Vernacular		C
TAU.323	Stone House	15(-17) Plain Street	1847	Greek Revival	7	NR
	Presbrey, S.W. House	16 Plain Street	ca. 1850	Greek Revival; altered		C
	Presbrey, Capt. B. House	18 Plain Street	ca. 1850	vernacular; highly altered		C
	Multi-family Residence	19 Plain Street	2008	Vernacular		NC
TAU.324	Burt, Capt. Benjamin House	20 Plain Street	ca. 1820	Federal		C
	Residence	22 Plain Street	ca. 1900	Vernacular		C
	Williams, G.W. House	23 Plain Street	ca. 1850	Vernacular/Cape		C
TAU.325	Williams, G.W. House	26 Plain Street	ca. 1845	Vernacular		C
	Church, S.L. House	29 Plain Street	ca. 1870	Vernacular; altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	30 Plain Street	ca. 1910	Colonial Revival/Cape	35	C
	Residence	32 Plain Street	ca. 1910	Colonial Revival/Cape	35	C
TAU.326	Vickery, Capt. David House	33 Plain Street	ca. 1795	Federal	36	NR
	Residence	34 Plain Street	ca. 1965	Vernacular/Cape		NC
	Residence	35 Plain Street	ca. 1890	Vernacular; altered	36	C
	Vickery, Capt. David House	37 Plain Street	ca. 1820	Vernacular/Cape; altered	36	C
	Residence	38 Plain Street	ca. 1900	Vernacular		C
	Dorgan, J. House	39 Plain Street	ca. 1880	Greek Revival		C
	Clark, Mary A. House	42 Plain Street	ca. 1880	Vernacular; altered		C
	Residence	42A Plain Street	ca. 1950	Ranch		NC
	Residence	44 Plain Street	ca. 1920	Colonial Revival		C
	Multi-family Residence	9 Presbrey Court	ca. 1920	Colonial Revival		C
	Residence	21 Presbrey Court	ca. 1890	Colonial Revival		C
	Residence	23 Presbrey Court	ca. 1910	Bungalow		C
	Residence	25 Presbrey Court	ca. 1910	Colonial Revival		C
	Residence	6 Second Street	ca. 1910	Colonial Revival; altered		C
	Foundry Building	9 Second Street	ca. 1945	Vernacular		C
	Residence	10 Second Street	ca. 1890	Vernacular		C
	Williams – Paul House	15 Second Street	ca. 1850	Italianate		C
	Crane, A.P. House	16 Second Street	ca. 1850	Greek Revival; altered		C
TAU.311	Godfrey, W. L. House	18 Second Street	ca. 1845	Greek Revival		C
	Condominiums	19 Second Street	2012	Colonial Revival		NC
	Lincoln, H.R. House	20 Second Street	ca. 1840	Greek Revival		C
TAU.310	Staples, Sylvanus N. House	21 Second Street	ca. 1837	Greek Revival	2	NR

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	22 Second Street	ca. 1890	Vernacular		C
	Residence	24 Second Street	ca. 1920	Colonial Revival		C
	Residence	25 Second Street	ca. 1890	Vernacular	2	C
	Paul, Charles H. House	26 Second Street	ca. 1870	Italianate; highly altered		C
	Stevens, Charles H. House	27 Second Street	ca. 1840	Greek Revival; altered	2	C
	Dean, A. House	29 Second Street	ca. 1880	Vernacular; altered		C
	Phillips, J.B. House	30 Second Street	ca. 1860	Vernacular; altered		C
TAU.309	Weir Grammar School	35 School Street	ca. 1860	Renaissance Revival/Gothic Revival		Destroyed by Fire 1984
	Second Street School – Edward F. Leddy Elementary School	36 Second Street	1954	Colonial Revival	25	C
	Commercial Building	283 Somerset Avenue	ca. 1950	Vernacular; altered		C
	Multi-family Residence	300 Somerset Avenue	ca. 1900	Queen Anne		C
TAU.340	Dunbar, P. House	308 Somerset Avenue	ca. 1860	Greek Revival		C
	Annunciation of the Lord Catholic Church Parish and Rectory	311 Somerset Avenue	ca. 1890	Colonial Revival	6	C
	Davis, H.L. House	314 Somerset Avenue	ca. 1880	Italianate		C
TAU.341	Thomas, H. P. House	322 Somerset Avenue	1887	Queen Anne		NR
	Presbrey House	323 Somerset Avenue	ca. 1850	Italianate/Queen Anne; altered	23	C
	Residence	329 Somerset Avenue	ca. 1890	Colonial Revival		C
	Hathaway, Benjamin B. House	330 Somerset Avenue	ca. 1870	Italianate	23	C
	Residence	336 Somerset Avenue	ca. 1900	Vernacular		C
TAU.342	Presbrey, C. C. House	343 Somerset Avenue	ca. 1858	Greek Revival		C
	Crapo Funeral Home	350 Somerset Avenue	ca. 1990	Colonial Revival	24	NC
	Wright, J. House	351 Somerset Avenue	ca. 1850	Italianate		C

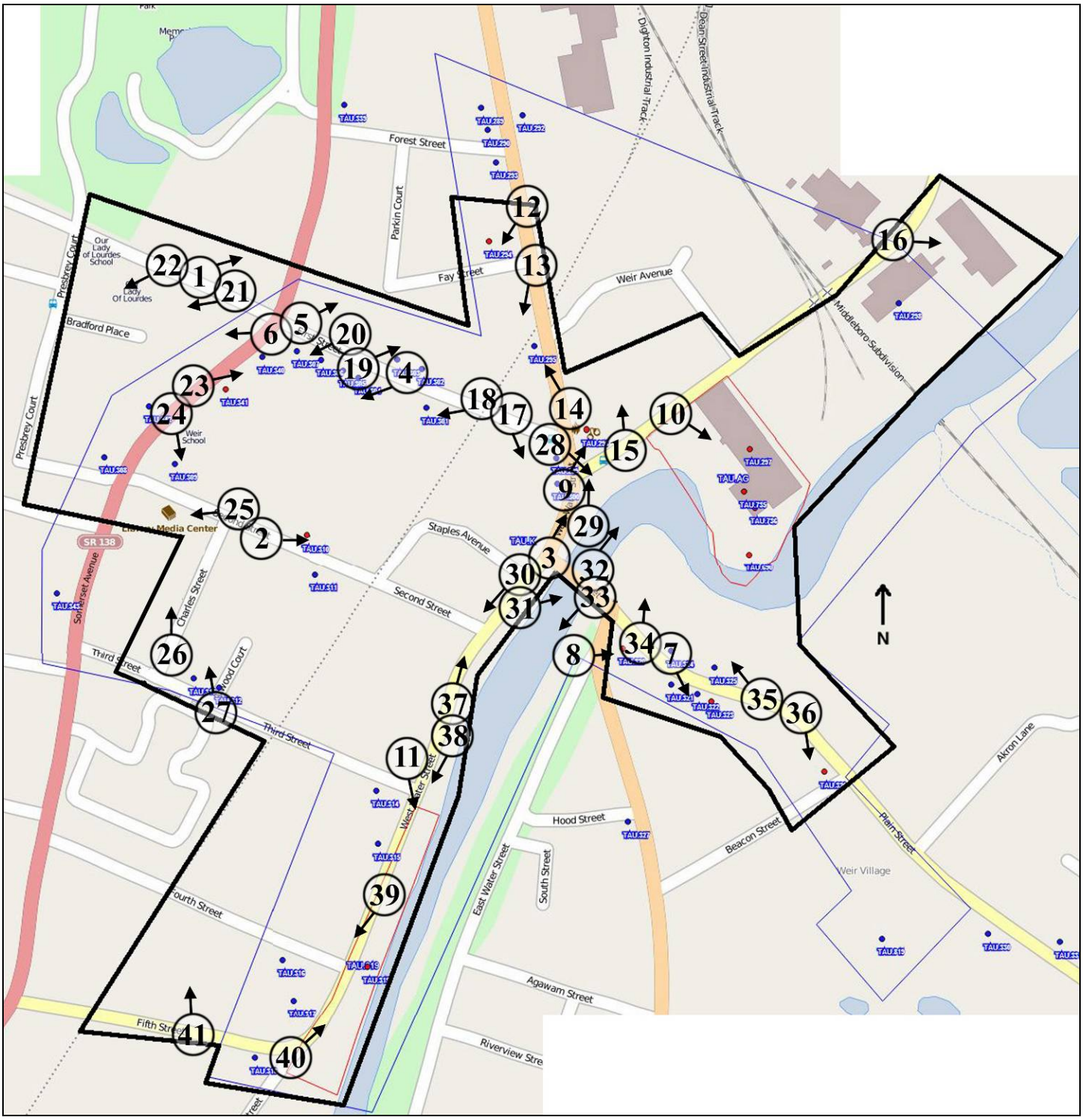
MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.308	Staples House	365 Somerset Avenue	ca. 1865	Italianate; highly altered		C
TAU.312	Porter, B. House	25-27 Third Street	ca. 1845	Greek Revival		Demolished
	Multi-Family Residence	27 Third Street	ca. 1990	Colonial Revival		NC
TAU.313	Stevens, C.H. House	33(-35) Third Street	ca. 1845	Greek Revival	27	C
TAU.294	Paul, Alfred House	467 Weir Street	ca. 1855	Second Empire	12	NR
	Residence	481 Weir Street	ca. 1890	Queen Anne		C
	Paul, J. House	487 Weir Street	ca. 1855	Greek Revival		C
	Commercial Building	491 Weir Street	ca. 1960	Colonial Revival		NC
	Commercial Building	515 Weir Street	ca. 1980	Vernacular		NC
TAU.295	Weir Fruit	519 Weir Street	ca. 1890	Italianate	14	C
	Blood, L. House	527 Weir Street	ca. 1850	Italianate	14	C
TAU.296	Weir Engine House	530 Weir Street	1889	Vernacular/ Queen Anne	9	NR
TAU.315	Taunton Copper Manufacturing Company	West Water Street	ca. 1890	Vernacular		Demolished
	Peters Bros. Commercial Block	3 West Water Street	ca. 1930	Neoclassical		C
	Commercial Building	13 West Water Street	ca. 1940	Vernacular		C
	Commercial Building	47 West Water Street	ca. 1980	Vernacular		NC
TAU.299	Commercial Block	65-73 (67) West Water Street	ca. 1870	Vernacular	3	C
	Commercial Block	91 West Water Street	ca. 2000	Vernacular		NC
	Commercial Building	109 West Water Street	ca. 1960	Vernacular		NC
	Residence-Commercial Building	123 West Water Street	ca. 1890	Vernacular; altered		C
	Auto Garage/Filling Station	157 West Water Street	ca. 1920	Vernacular; altered		C
	William, J.R. House	161 West Water Street	ca. 1850	Vernacular; altered		C
	Phoenix Manufacturing Company Mill	175 West Water Street	ca. 1870	Vernacular	37	C
	Industrial Building	245 West Water Street	ca. 1950	Vernacular	37	NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.314	Taunton Crucible Company	267 West Water Street	ca. 1870	Vernacular		Demolished
	Weir Stove Company – Glenwood Range Company Foundry	391 West Water Street	ca. 1920	Vernacular		C
TAU.316	Weir Stove Company	395 West Water Street	ca. 1895	Renaissance Revival	39	C
TAU.317	Union Stove Lining Company	395 West Water Street	ca. 1890-1950	Vernacular	39	C
TAU.319	Old Weir Stove Company	441 West Water Street	ca. 1902	Renaissance Revival; partially demolished	11, 40	NR

* Properties contributing to the individually listed NR property, Cohannet Mill No. 3 (TAU.AG).

NR Property is listed in the National Register of Historic Places
C Contributing property to the district
NC Non-contributing property to the district

PHOTO KEY


Forest Street
Parkin Court
Fay Street
Weir Avenue
Bradford Place
Presbrey Court
Our Lady of Lourdes School
Lady Of Lourdes
Weir School
Media Center
SR 138
Somerset Avenue
Charles Street
Staples Avenue
Second Street
Third Street
Hood Court
Fourth Street
Fifth Street
Riverview Street
Agawam Street
West Water Street
East Water Street
South Street
Hood Street
Beacon Street
Plain Street
Akron Lane
Weir Village
Middleboro Subdivision
Digiton Industrial Track
Dean Street Industrial Track
N

2. 21 (TAU.310), 25 and 27 Second Street (r-l), view looking east.

3. Commercial Block, 65-73 West Water Street (TAU.299), view looking northwest.

4. Allen House, 22 First Street (TAU.304) and P. Dunbar House, 24 First Street (TAU.305) (l-r), view looking west.

5. Annunciation of the Lord/Sacred Heart Roman Catholic Church, 31 First Street, view looking northeast.

6. Annunciation of the Lord Catholic Church Rectory, 311 Somerset Avenue, view looking northwest.

7. Stone House, 15 Plain Street (TAU.323), view looking southeast.

8. Francis D. Williams House (TAU.320), 3 Plain Street, view looking southeast from East Water Street.

9. Weir Engine House, 530 Weir Street (TAU.296), view looking east from Weir Street.

10. Cohannet Mill No. 3, 120 Ingell Street (TAU.AG), view looking northwest.

11. Old Weir Stove Company, 441 West Water Street (TAU.319), view looking southeast.

12. Alfred Paul House, 467 Weir Street (TAU.294), view looking southwest.

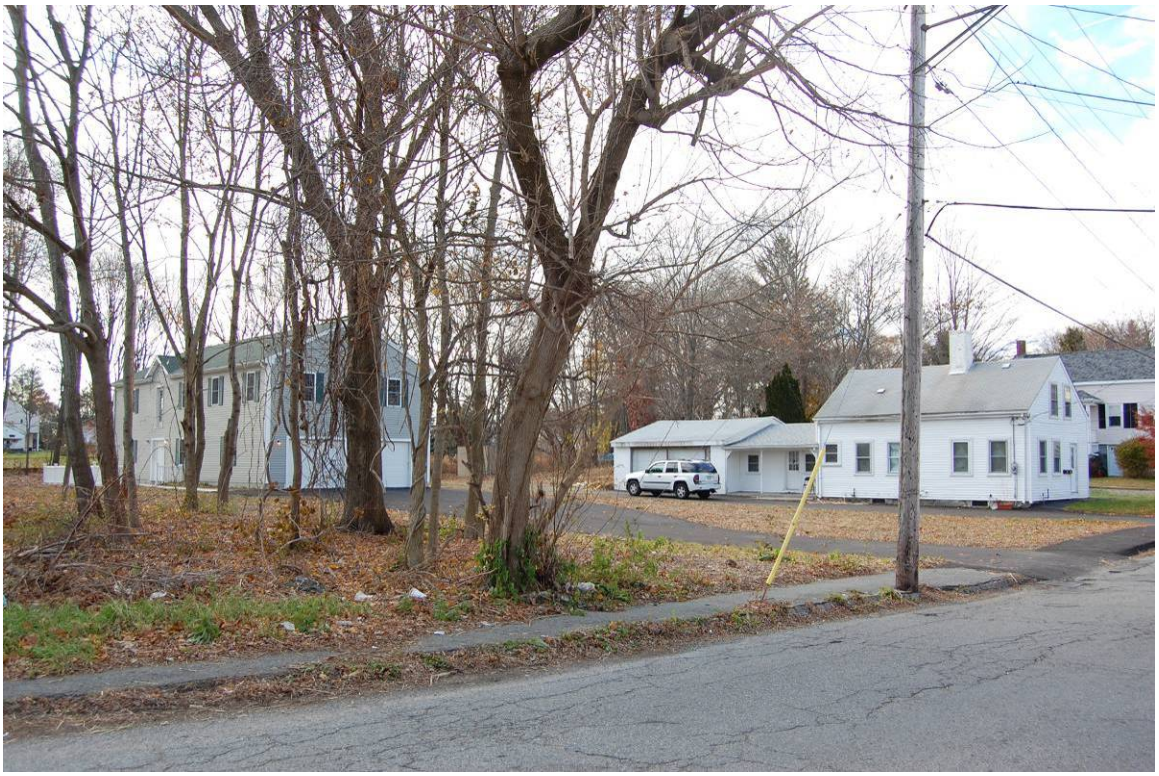
13. Weir Street, View looking southwest.

14. Commercial Building, 519 Weir Street (TAU.295) and 527 Weir Street (r-l), view looking northwest.

15. 121 Ingell Street, view looking north.

16. 90 Ingell Street, view looking east. Former site of Taunton Pearl Works (TAU.298).

17. 2 and 4 First Street (l-r), view looking southeast.



18. S.P.C. Welcome House, 14 First Street (TAU.301), view looking west.

19. 17 (TAU.302), 21 (TAU.303) and 23 First Street (r-l), view looking east.

20. 26 and 32 First Street (TAU.306 and TAU.302), view looking west.

21. 44 and 46 First Street (l-r), view looking west.

22. Our Lady of Lourdes Catholic School, 52 First Street, view looking west.

23. 332 Somerset Avenue (TAU.341) and 330 Somerset Avenue, view looking east.

24. 350 Somerset Avenue, view looking south.

25. Second Street School - Edward F. Leddy Elementary School, 36 Second Street, view looking west.

26. 13 and 17 Charles Street (r-l), view looking north.

27. C.H. Stevens House, 33 Third Street (TAU.313), view looking northeast,

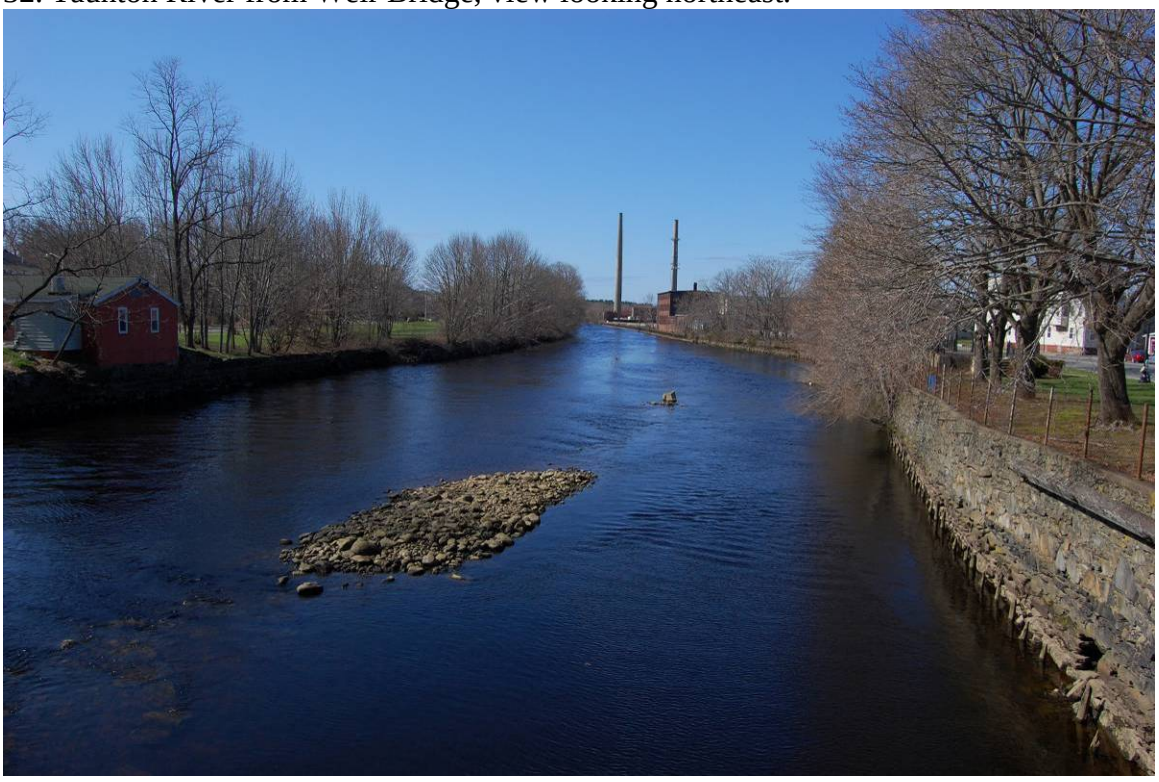
28. 140 Ingell Street, view looking southeast.

29. Intersection of Weir and Ingell streets, view looking north.

30. West Water Street, view looking southwest.

31. Weir Bridge, view looking northeast.

32. Taunton River from Weir Bridge, view looking northeast.



33. Taunton River from Weir Bridge, view looking southwest.

34. 10 Plain Street, view looking northeast.

35. 30 and 32 Plain Street (l-r), view looking northwest.

36. 33 (TAU.326), 35 and 37 Plain Street (r-l), view looking southeast.

37. 175 - 245 West Water Street (r-l), view looking north.

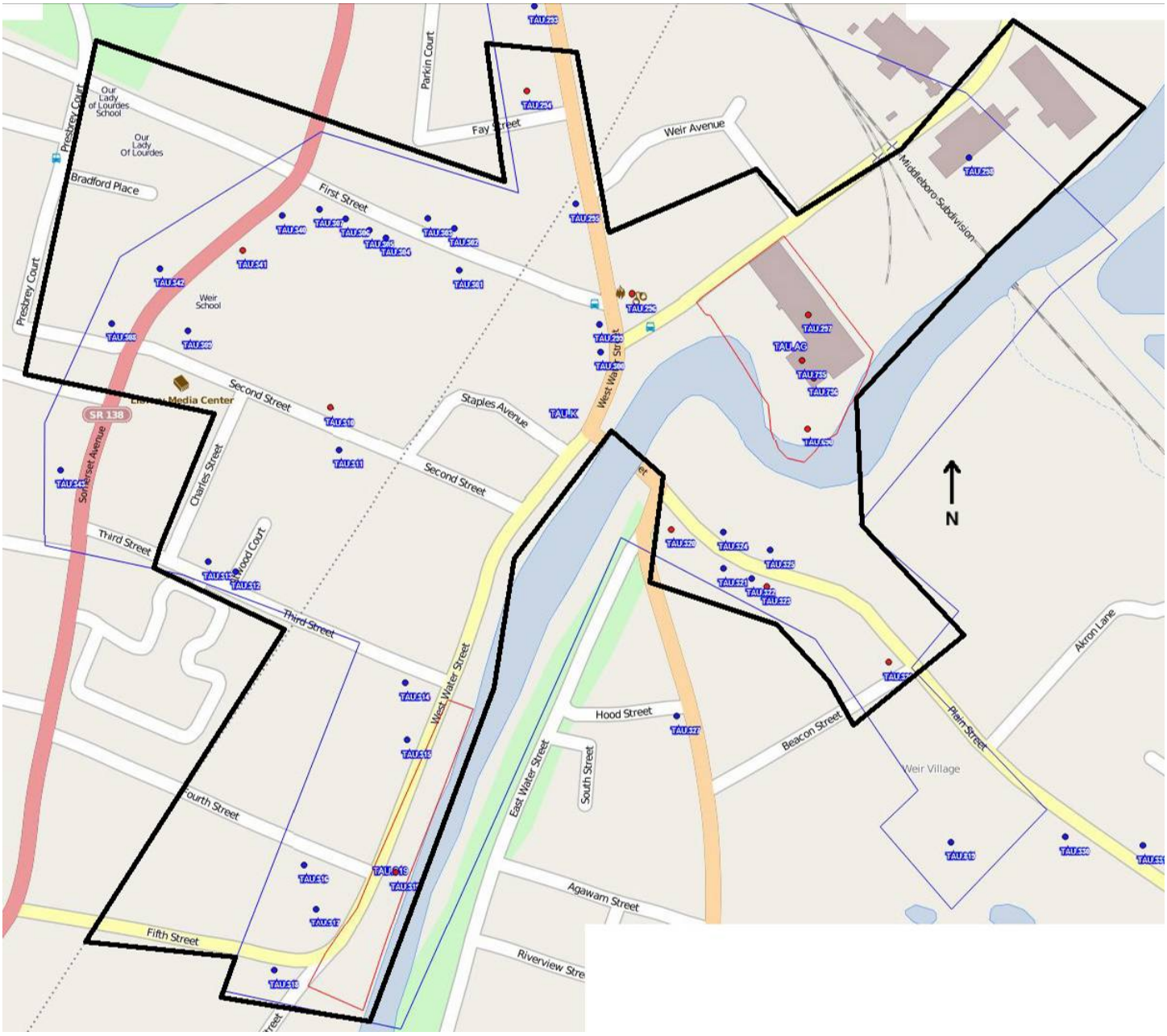
38. West Water Street, view looking southwest.

39. 395 West Water Street (TAU.316 and TAU.317), view looking southwest.

40. 441 West Water Street (TAU.319), view looking northeast.

41. 15 Fourth Street, view looking north.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary
  *not to scale

Information from MACRIS Maps 2.0 Beta, http://maps.mhc-macris.net

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Downtown Taunton/Taunton Green

Name of Area: Hodges Avenue Area

Present Use: Residential, Industrial

Construction Dates or Period: 1860 - 1930

Overall Condition: Good

Major Intrusions and Alterations: None

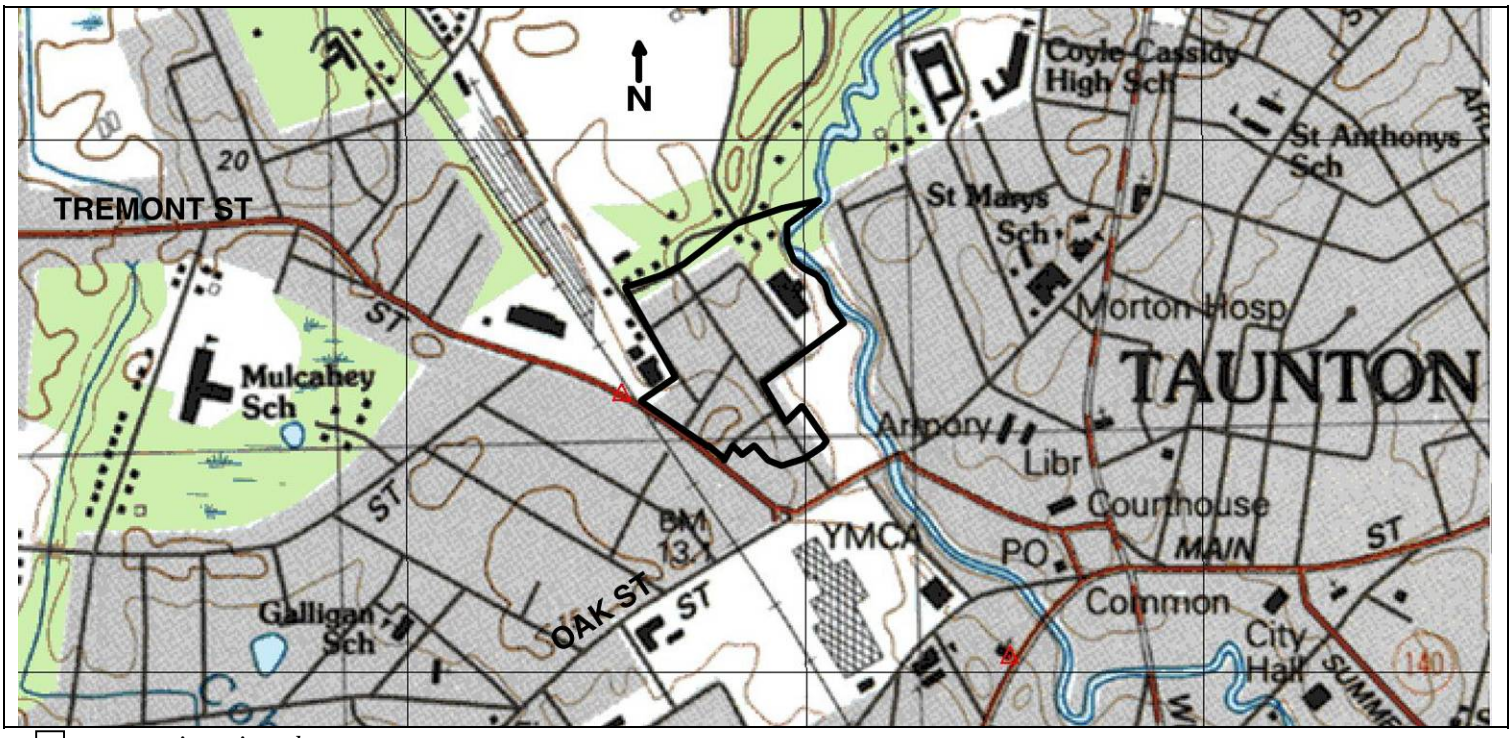
Acreage: Approx. 22

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012
Revised April, 2013

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Hodges Avenue Area is an irregularly shaped neighborhood located on the northeast side of the MBTA right-of-way near Tremont Street. It is primarily multi-family residential housing centered along Hodges Avenue, demarcated by Morton Street to the north, Chandler Street to the east, and Tremont Street to the southwest. The area is comprised of 72 properties sited close to the street on lots relatively equal in size with scattered, mature vegetation between each property.

The buildings within the Hodges Avenue Area represent vernacular interpretations of popular domestic styles from the late-eighteenth and early-nineteenth century including Italianate, Queen Anne, Second Empire and Colonial Revival, as seen in varying degrees of ornamentation at 6 Morton Street and 26 Hodges Avenue. Most were constructed as two- to two-and-one-half-story multi-family houses, primarily oriented with the gable end to the street for working class families (9-15 Hodges Avenue). A few of the houses in the area, such as 6 Morton Street (ca. 1890) and 19 Dana Street (ca. 1900), were originally constructed at a smaller scale as one-and-one-half-story, single-family houses, but have since been converted into multi-family residences. The most prominent residence in the Hodges Avenue Area is at 43 Chandler Street. This Italianate-style house was constructed for George F. Pratt, a Bristol County treasurer, ca. 1880 with an Italianate-style, one-and-one-half-story carriage house at the rear of the property. Most of the Pratt House's architectural details remain with few modern replacement materials.

Although the area was predominately residential, some industrial and commercial properties were located on Chandler Avenue. The two-story, Italianate-style, brick industrial loft at 33 Chandler Street was constructed for the Canoe River Mill in 1875 for the production of cotton textiles. The mill complex was expanded throughout the twentieth-century by its second occupants, the Diamond Textile Mill, but the main loft remains relatively intact. An ice plant was constructed at 12 Chandler Street, directly opposite the Canoe River Mill Complex, in the early twentieth century. The one-story, brick ice factory building with a wood-frame monitor was converted to apartments in the late twentieth century.

Some mid- to late-twentieth century infill has also occurred, but the area still retains its original streetscape and setting. Over time, some houses have been modified to meet current needs primarily with the replacement of exterior materials and windows; however most structures retain their original massing and form.

HISTORICAL NARRATIVE

The Hodges Avenue Area was a fairly remote area in Taunton until the mid- to late-nineteenth century. It was farmland, primarily owned by William Hodges in the late-eighteenth and early-nineteenth centuries. Hodges was a descendant of one of Taunton's "twelve-shilling men," also named William Hodges, who came to the settlement after the original forty-six families and paid twelve shillings into a common fund for the right to share in any subsequent land divisions. The younger Hodges owned the property along the north side of Tremont Street and most likely constructed the house at 23 Tremont Street ca. 1830. Hodges' son William C. Hodges inherited the property from his father in the 1850s. William C.'s sister, Mrs. Mary C. Hodges-Dean, had acquired the property from her brother by 1871. Mary had married Robert S. Dean in 1832 and lived at his estate 51 Tremont Street (now demolished), but she continued to retain her own significant amount of real estate. The couple divorce in 1874 and she moved back to her property at 23 Tremont Street where she ran a boarding house (Hanna 2007; Dunbar 1836; Walling 1858; Beers 1871; Sampson 1874).

At approximately the same time Mrs. Dean acquired the property along Tremont Street, Hodges and Chandler avenues and Norton (now Morton) and Dana streets were laid out and Granite Street was extended past Tremont Street, most likely by the Hodges family. Housing lots were also laid out and by 1871 five residences were constructed; one has since been demolished. One of these buildings, at 12 Morton Street, was constructed by Miss Rebekah Ashley for use as a boarding house ca. 1870. E.C. Strange also built several houses along Chandler Avenue and Morton in the 1870s and 1880s (47 Chandler Avenue and 10 Morton Street), presumably to house employees of his nearby Strange Cylinder Saw Manufacturing Company (not extant). Mrs. Mary C. Dean constructed two additional tenements on her property by 1886 (4 Granite Street and 3 Columbus Avenue). By 1895, Mrs. Dean had divided the remainder of her property and sold it for residential development (Beers 1871; Walker 1886; Everts and Richards 1895).

Most of the housing in the area is typical Taunton worker housing constructed in the late-nineteenth and early-twentieth centuries. However, unlike many other areas of Taunton, this neighborhood did not appear to develop around or by a single mill or company. The area surrounding the neighborhood was heavily built up with mills and factories, including the White Warner and Co. Stove Foundry between Dana Street and the New York, New Haven, and Hartford Railroad right-of-way; the Dean Cotton & Machine Co. Works along the Mill Rive off Washington Street; and the William Mason & Co. Machine Works at Westminster and Washington streets. The majority of these industrial complexes are not extant. Within the Hodges Avenue Area were several smaller manufacturers including the Canoe River Mill at 33 Chandler Street who produced cotton textiles; the P.P. Case Co. at 11 Granite Street manufacturer of top roll covers used in the textile industry; and an ice plant at 12 Chandler Street. The third County Jail was constructed at the corner of Chandler and Hodges avenues, across from Columbus Avenue, in 1873. The jail was demolished and replaced by a Taunton Community Housing complex in the 1960s. A large addition was added to the south end of the Canoe River Mill loft building at 33 Chandler Street in the mid- to late twentieth century. Residential construction within the area increased in the early twentieth century as a reaction to the success of the surrounding industries; however many were modified throughout the twentieth century with replacement windows and exterior materials.

Due to the loss and alteration of manufacturing complexes, and the lack of cohesion derived from identifiable significant associations to Taunton's history, the Hodges Avenue Area is not eligible for listing in the National Register of Historic Places (Sanborn 1898; Everts and Richards 1895; Hanna 2007).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	4 Chandler Avenue	ca. 1890	Italianate	7	C
	Residence	6 Chandler Avenue	ca. 1920	Colonial Revival – altered	7	NC
	Ice Plant	12 Chandler Avenue	ca. 1910	Italianate	7, 15	C
	Residence	30 Chandler Avenue	ca. 1900	Italianate		C
	Canoe River Mill – Diamond Textile Mills, Inc.	33 Chandler Street	ca. 1880; ca. 1990 addition	Italianate/Loft	4, 5	C
	Pratt, George F. House	43 Chandler Street	ca. 1880	Italianate	3	C
	Pratt, George F. Carriage House	43 Chandler Street	ca. 1880	Italianate	3	C
	Strange, E.C. House	47 Chandler Street	ca. 1870	Vernacular		C
	Residence	3 Columbus Avenue	ca. 1870	Italianate		C
	Residence	4 Columbus Avenue	ca. 1890	Queen Anne – altered	14	C
	Residence	6 Columbus Avenue	ca. 1890	Italianate	14	C
	Residence	7 Columbus Avenue	ca. 1900	Queen Anne – altered		C
	Residence	8 Columbus Avenue	ca. 1900	Queen Anne - altered	14	C
	Residence	9 Columbus Avenue	ca. 1900	Queen Anne		C
	Residence	9 Dana Street	ca. 1900	Vernacular	12	C
	Residence	11 Dana Street	ca. 1990	Colonial Revival/Cape		NC
	Residence	19 Dana Street	ca. 1900	Vernacular		C
	Residence	3 Granite Street	ca. 1890	Italianate – altered		C
	Dean, Mrs. Mary Tenement	4 Granite Street	ca. 1880	Italianate		C
	Residence	5 Granite Street	ca. 1890	Italianate		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	10 Granite Street	ca. 1890	Italianate – altered		C
	Case, Pardon P. Residence and Factory	11 Granite Street	ca. 1880	Italianate – altered		C
	Residence	13 Granite Street	ca. 1890	Vernacular		C
	Dean, Mrs. Mary Tenement	14 Granite Street	ca. 1880	Italianate		C
	Residence	9 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	10 Hodges Avenue	ca. 1890	Italianate – altered		C
	Residence	11 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	12 Hodges Avenue	ca. 1890	Colonial Revival		C
	Residence	13 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	14 Hodges Avenue	ca. 1890	Italianate		C
	Residence	15 Hodges Avenue	ca. 1890	Vernacular	1	C
	Holmes, C. R. House	16 Hodges Avenue	ca. 1880	Italianate – altered		C
	Paul, J. House	17 Hodges Avenue	ca. 1870	Second Empire	1	C
	Residence	18 Hodges Avenue	ca. 1895	Italianate		C
	Eddy House	19 Hodges Avenue	ca. 1870	Italianate – altered		C
	Residence	20 Hodges Avenue	ca. 1895	Italianate		C
	Residence	26 Hodges Avenue	ca. 1900	Queen Anne	2	C
	Residence	30 Hodges Avenue	ca. 1900	Queen Anne	8	C
	Residence	32 Hodges Avenue	ca. 1900	Queen Anne	8	C
	Residence	33 Hodges Avenue	ca. 1890	Italianate		C
	Residence	34 Hodges Avenue	ca. 1890	Italianate	8	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	35 Hodges Avenue	ca. 1890	Italianate – altered		C
	Residence	36 Hodges Avenue	ca. 1880	Italianate	8	C
	Residence	37 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	39 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	40 Hodges Avenue	ca. 1890	Italianate		C
	Residence	41 Hodges Avenue	ca. 1910	Colonial Revival		C
	Residence	43 Hodges Avenue	ca. 1910	Queen Anne		C
	Residence	44 Hodges Avenue	ca. 1890	Italianate		C
	Residence	45 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	46 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	47 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	48 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	50 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	51 Hodges Avenue	ca. 1960	Ranch		NC
	Residence	52 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	2 Morton Street	ca. 1880	Italianate	11	C
	Residence	4 Morton Street	ca. 1900	Queen Anne		C
	Residence	5 Morton Street	ca. 1920	Queen Anne		C
	Residence	6 Morton Street	ca. 1890	Italianate		C
	Residence	9 Morton Street	ca. 1900	Queen Anne		C
	Strange, E.C. Tenement	10 Morton Street	ca. 1880	Vernacular	10	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Ashley, Miss Rebekah Boarding House	12 Morton Street	ca. 1870	Italianate - Queen Anne alterations	10	C
	Residence	16 Morton Street	ca. 1910	Queen Anne	9	C
	Residence	18 Morton Street	ca. 1950	Ranch	9	NC
	Residence	19 Morton Street	ca. 1910	Queen Anne		C
	Residence	21 Morton Street	ca. 1910	Queen Anne		C
	Garrish, Charles H. House	22 Morton Street	ca. 1880	Italianate – altered	9	C
	Residence	23 Morton Street	ca. 1910	Queen Anne		C
	Residence	21 Tremont Street	ca. 1900	Colonial Revival/ Duplex	13	C
	Hodges, W.C. – Dean, M.C. House	23 Tremont Street	ca. 1830	Federal – altered	13	C
	Residence	27 Tremont Street	ca. 1890	Italianate		C

C Contributing property to the district
NC Non-contributing property to the district

KEY TO PHOTOGRAPHS

Base map acquired from www.google.com.

2. 26 Hodges Avenue, at corner of Columbus Avenue, view looking west.

3. 43 Chandler Avenue, view looking north.

4. 33 Chandler Avenue, view looking east.

5. 33 Chandler Street, view looking north.

6. Hodges Avenue, view looking northwest.

7. Chandler Avenue, view looking northeast.

8. Hodges Avenue at Granite Street, view looking south.

9. Morton Avenue, view looking northeast.

10. Morton Street, view looking west.

11. 2 Morton Street, view looking north.

12. Dana Street, view looking north.

13. Tremont Street, view looking southeast.

14. Columbus Street, view looking east.

15. 12 Chandler Street, view looking west.

16. Granite Street, view looking northeast.

17. View looking northeast toward Granite Street across Tremont Street.

APPENDIX E-1

Areas
(alphabetical by community)

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Somerset		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Berkley

Place *(neighborhood or village):* Myricks, Grove, and Mill Streets

Name of Area: Myricks Street Area

Present Use: Residential

Construction Dates or Period: Mid-19th to Early-20th C.

Overall Condition: Good

Major Intrusions and Alterations: None

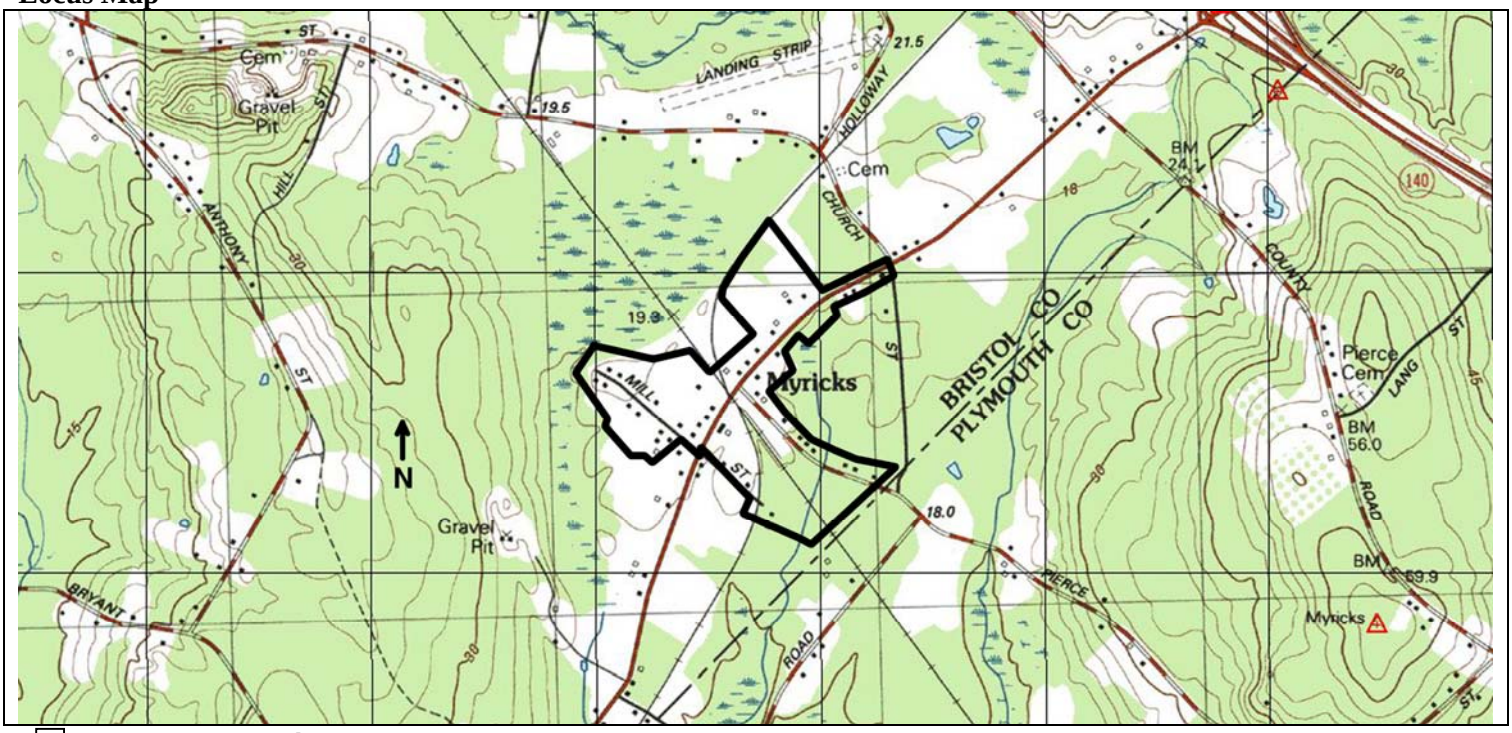
Acreage: 110

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Myricks Street Area is a 110-acre, rural residential area, with one church and schoolhouse located at near the town line with Lakeville. The primary corridor runs north-south along a small section of Myricks Street between Church Street (north) and Mill Street (south). It encompasses Grove Street, which extends east from the center of the district. The New Bedford Main Line and Fall River Secondary right-of-ways intersection bisects the area just south of Grove Street at Myricks Junction. The district includes approximately 49 properties, of which 34 contribute to its architectural significance. Contributing properties consist primarily of modest, one to one-and-one-half-story, gabled residences constructed between the mid-nineteenth century and early twentieth century in the Greek Revival, Italianate, and Colonial Revival styles.

Most of the residences constructed in the town of Berkley that date to the mid-nineteenth century are either center- or side-hall Greek Revival/Italianate style buildings with end chimneys. Myricks is the only area in town with examples of fully developed, Greek Revival style properties. Approximately 30% of the contributing properties in the Myricks Street Area retain elements of the Greek Revival style. The best-preserved example is at 12 Grove Street, constructed ca. 1860. Other well-preserved examples include 60 Myricks Street and the Myricks Methodist Church at 93 Myricks Street. Slightly modified examples include 10 and 14 Grove Street, 16 and 17 Mill Street, 62 Myricks Street (MHC 1981).

In Berkley, the majority of residential properties dating to the mid-nineteenth to early twentieth century are one-and-one-half to two-story buildings with Queen Anne style detailing. One property in Myricks serves as a representative example of this style, the residence at 82 Myricks Street, constructed ca. 1880. The area also contains one well-preserved example of a Colonial Revival style house at 12 Mill Street, and Myricks School at 80 Myricks Street, both constructed ca. 1900.

HISTORICAL NARRATIVE

Originally part of Taunton, the Myricks Street Area was part of a village developed in the mid-nineteenth century called Myricks Station, which consisted of a single thoroughfare, Myricks Street. With the introduction of the New Bedford and Taunton Railroad, between 1839 and 1940 Myrick's Station grew as a railroad transshipment center for agricultural goods produced in the region. A second line was constructed by the Fall River Railroad between 1844 and 1846 in the area, which was also known as Myricks Depot, and Myricks Junction. Although the village was well-known for its associations with the railroad, it was surpassed as a major railroad junction by commercial and industrial hubs in Taunton and Middleborough. While overshadowed, Myricks Station continued to be considered a locally important community center. It hosted the Bristol County Central Cattle Show and Fair from 1858 to 1876 and was the location of two institutions, the Myricks Academy (original building no longer extant), a private preparatory school founded in 1853, and the Greek Revival style, United Methodist Church on the corner of Church and Myricks Streets (Dunbar 1836; Hutt 1924).

Between 1852 and 1858, Myricks Station expanded with the development of Grove Street, and a small section of what would later become Mill Street. In 1879, Myricks Station was annexed to the town of Berkley, and by 1895, the growing village of Myricks Station became known as the "Myricks" and also "Myricksville." During the late nineteenth century, the area also had a general store, wagon shop, blacksmith shop, railroad station, post office, and village school (formerly the private Myricks Academy). A sawmill, box factory, and feed mill were located on the village outskirts. By 1871, a

small textile mill (no longer extant) was constructed an in area between what is now 6 and 12 Mill Street. Myricks suffered a devastating fire in 1904, which destroyed the Myricks Academy building and a number of residences in the village. Soon after Myricks lost the school (around 1910), and in its place, the town constructed a second Neoclassical style Myricks School building with a pedimented gable front and belfry (Hutt 1924; Fall River News 1899; Everts & Richards 1895; Walling 1852; 1858).

Today, the Myricks Street Area remains as a small, residential area with the Myricks School (now American Legion Post 121) and the United Methodist Church still in use (Terry 1997).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Commercial Building	3 Grove Street	ca. 1992	Vernacular		NC
	Residence	4 Grove Street	ca. 2002	Raised Ranch		NC
	Commercial Building	6 Grove Street	ca. 1956	Vernacular		NC
	Residence	8 Grove Street	ca. 1900	Gothic Revival		C
	Gas Storage Building	9 Grove Street	ca. 2000	Vernacular		NC
	Residence	10 Grove Street	ca. 1860	Greek Revival		C
	Residence	12 Grove Street	ca. 1860	Greek Revival	2	C
	Residence	14 Grove Street	ca. 1860	Greek Revival	2	C
	Residence	16 Grove Street	ca. 1983	Vernacular		NC
	Commercial Complex	19 Grove Street	ca. 1986-2003	Vernacular		NC
	Residence	20 Grove Street	ca. 1880	Vernacular		C
	Residence	21 Grove Street	ca. 1990	Ranch		NC
	Residence	22 Grove Street	ca. 1830	Vernacular		C
	Residence	24 Grove Street	ca. 1860	Vernacular		C
	Residence	1 Mill Street	ca. 1920; ca. 1980 alterations	Vernacular (altered)		C
	Residence	3 Mill Street	ca. 1900	Vernacular		C
	Residence	4 Mill Street	ca. 1900	Vernacular		C
	Residence	6 Mill Street	ca. 1900	Vernacular		C
	Residence	9 Mill Street	ca. 1900	Vernacular		C
	Residence	11 Mill Street	ca. 1990	Saltbox		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	12 Mill Street	ca. 1900	Colonial Revival	5	C
	Residence	15 Mill Street	ca. 1930	Vernacular		C
	Residence	16 Mill Street	ca. 1860	Greek Revival		C
	Residence	17 Mill Street	ca. 1855	Greek Revival		C
	Residence	22 Mill Street	ca. 1900	Vernacular		C
	Residence	28 Mill Street	ca. 1940	Vernacular		C
	Residence	59 Myricks Street	ca. 1890	Vernacular		C
	Residence	60 Myricks Street	ca. 1860	Greek Revival		C
	Residence	61 Myricks Street	ca. 1929	Vernacular		C
	Residence	62 Myricks Street	ca. 1860	Greek Revival		C
	Warehouse	63 Myricks Street	ca. 1972-1997	Vernacular		NC
	Residence	64 Myricks Street	ca. 1850	Vernacular		NC
	Residence	66 Myricks Street	ca.1940	Vernacular		C
	Residence	67 Myricks Street	ca. 1986	Reverse Salt Box		NC
	Residence	68 Myricks Street	ca. 1775	Federal		C
	Residence	70 Myricks Street	ca.1900	Bungalow		C
	Residence	71 Myricks Street	ca. 1940	Ranch		NC
	Residence	72 Myricks Street	ca. 1780	Federal		C
	Residence	74 Myricks Street	ca. 1955	Ranch		NC
	Residence	75 Myricks Street	ca. 1840	Federal		C
	Residence	76 Myricks Street	ca. 1800	Cape Cod		C
	Myricks School	80 Myricks Street	ca. 1900	Neoclassical	3	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	82 Myricks Street	ca. 1880	Queen Anne	6	C
	Residence	87 Myricks Street	ca. 1880	Vernacular	1	C
	Myricks Methodist Church Parsonage	89 Myricks Street	ca. 1830	Greek Revival	1	C
	Myricks Methodist Church	93 Myricks Street	ca. 1838	Greek Revival	1,4	C

C Contributing property to the district
NC Non-contributing property to the district

There are no properties previously listed in MACRIS or shown on the MACRIS Maps 2.0 Beta, http://maps.mhc-macris.net.

12 Mill Street, view looking northeast.

Myricks School (ca. 1900), 80 Myricks Street, view looking northwest.

82 Myricks Street, view looking north.

Cover: Streetscape showing (l-r) United Methodist Church, 89 Myricks Street, and 87 Myricks Street, view looking east.

Myricks United Methodist Church (ca. 1839), 93 Myricks Street, view looking southwest.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Myricks Street Area is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level in the areas of Community Development and Architecture for its role as an important rail junction village in town during the mid-nineteenth and early twentieth centuries and for its representation of residential architecture from that period. The area particularly contains several well-preserved examples of Greek Revival style buildings at 12 Grove Street, constructed ca. 1860) and the Myricks Methodist Church (ca. 1839) as well as excellent examples of the Colonial Revival (12 Mill Street, constructed ca. 1900) and Queen Anne (82 Myricks Street, constructed ca. 1880) style of architecture.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Norwood		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Canton

Place *(neighborhood or village):* Canton Center

Name of Area: Washington Street Area

Present Use: Institutional and Residential

Construction Dates or Period: mid 19th century – early-20th century
Overall Condition: Good

Major Intrusions and Alterations: None

Acreage: Approx. 30 acres

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December 2012

Locus Map

☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Washington Street Area encompasses the Canton Center Area (CAN.L) that was determined eligible for National Register listing as a historic district by MHC in 1991. The Washington Street Area is a linear area roughly 0.3 miles long stretching along Washington Street between Chapel Street on the north and Revere Street on the south. The MBTA Stoughton Line right-of-way (former New York, New Haven, and Hartford Railroad) runs east-west through the southern end of the area, north of Revere Street. Within the area, the west side of Washington Street is lined with a mix of 12 residential and institutional structures, including a Catholic parochial school complex, former high school, library, and former church. The east side of Washington Street, including Savin Hill and Centre streets, has 18 residential and institutional structures, including a post office and town offices. Most of the area's approximately 55 historic resources date from the mid-eighteenth to mid-twentieth century.

The residential architecture in the area is a combination of vernacular worker housing, primarily concentrated along Centre and Savin Hill streets, and higher style along Washington Street. The residences were built in a variety of styles including Greek Revival, Italianate, Queen Anne, Stick, and Colonial Revival (CAN.165, CAN.166, CAN.167, CAN.168, and CAN.234). The majority of the housing is comprised of simple side-hall plan cottages with varied degrees of Greek Revival, Italianate, or Queen Anne ornament constructed in the mid- to late-nineteenth century (CAN.232, CAN.233, CAN.301, CAN.311, CAN.312, CAN.313, CAN.317). Most of the houses are of wood frame construction and while many have been altered; most retain their original massing and form, and many have intact original materials.

The civic and institutional architecture anchors both ends of the area. Most buildings were constructed in the early twentieth century. However, the Canton Town Hall, or Memorial Hall (CAN.103; MHC DOE 1997), was constructed in 1878 by Stephen C. Earle of Worcester, MA and John M. Higgins on the northeast corner of Washington and Sherman streets at the north end of the district. The Canton Public Library (CAN.78; MHC DOE 2001) is located on the southwest corner of Washington and Sherman streets. This Classical Revival style building was designed by Winslow and Bigelow, a Boston architectural firm, and constructed by L.P. Soule and Sons in 1901. North of the library is a Classical Revival style, Telephone Exchange building constructed between 1937. At the southern end of the district, on the northwest corner of Washington and Revere streets, is the Canton High School, or Hemenway School (CAN.77). The Classical Revival school was originally two stories tall, five bays wide by three bays deep and was converted into elderly housing in 1983. Directly across from the high school, on the east side of Washington Street, is the Canton Main Branch of the U.S. Post Office (CAN.106) constructed in 1935. Originally a one-story, five-bay-by-four-bay, Classical Revival style building with a rear ell, the building was enlarged by an addition built ca. 1960 on the east (rear) elevation. The area also includes two religiously affiliated properties. Located at the north end of the district, on the corner of Chapel and Washington streets, the late-Gothic Revival style Trinity Episcopal Church at 824 Washington Street (CAN.86) was originally constructed in 1897 a and converted into Schlossberg and Sons Funeral Chapel in 1970. The Saint John the Evangelist Roman Catholic Church Complex at 700 Washington Street includes the historic Rectory (CAN.231) a two-story, four-bay-by-three-bay, Colonial Revival style residence constructed in 1889, a parochial elementary school (1956, altered), and church (1963).

HISTORICAL NARRATIVE

The Washington Street Area was originally part of the area known as Canton Village in the late eighteenth century. Canton Village, later known as South Canton, was linked to the original Canton Center located to the north by the north-

south route of Washington Street. While the original Canton Center remained the civic and residential hub, South Canton developed into the commercial core of town by the early nineteenth century. South Canton's industrial dominance also expanded during this period with the establishment of iron foundries and a rolling mill, located just south of the Canton Center Area's southern boundary. By the late nineteenth and early twentieth centuries, Canton Village/South Canton had surpassed the original Canton Center as the commercial and institutional center and remains so to the present as Canton Center.

Washington Street was originally a native trail adapted by the colonial settlers in the mid- to late seventeenth century. Washington Street was laid out as the north-south route connecting the Blue Hill Summit settlement in the north end of Canton with the villages to the south, primarily Ponkapoag Plantation, Packeen Plain (the original Canton Center), and later South Canton. Several taverns and small mills were established along Washington Street in the early eighteenth century, which crossed over the east branch of the Neponset River near present-day Revere Street. The road network was expanded in the late eighteenth to early nineteenth centuries linking Washington Street with other road networks like Turnpike Street (Route 138) via cross roads like Bolivar Street (MHC 1979:3-4).

Residential development in and around the Canton Center Area grew with the expansion of industry. Located just south of the district's southern boundary was the Kinsley Iron and Machine Company (not extant) established in the late nineteenth century. The Revere Copper Works, later the Plymouth Rubber Company, located west of Washington Street on Revere Street and out of the area's boundary, began operation in the early-nineteenth century by Paul Revere (Krim 1999). In reaction to the establishment of these larger industrial complexes, the working class and immigrant populations grew in South Canton throughout the rest of the nineteenth and into the early twentieth century. The worker housing developed during that time was dominated by vernacular, side-hall plan cottages with Greek Revival, Italianate, and Second Empire details like the residences found on Savin Hill, Centre, and Traverse streets and Ames Avenue. Several houses were built along the spur of the Stoughton Branch Railroad near present-day Ames Street. These houses are primarily vernacular with some Colonial Revival detailing like 23-25 Ames Avenue and the Charles Grimes House at 36 Ames Avenue (CAN.312). Several mill owners and professionals constructed houses along Washington Street north of the Revere Works as well. Many of these houses, such as the Judge Thomas E. Grover House at 776 Washington Street (CAN.168) and Carriage House (CAN.169) constructed in the Stick Style ca. 1880, were converted to mixed-use professional offices and residences in the twentieth century. A prominent citizen in the area was Lyman Kinsley, third generation owner of the Kinsley Iron and Machine Company, who owned large amounts of residential and commercial property in South Canton along Washington Street in the mid- and late nineteenth century (Walling 1855). Oliver Ames of nearby Easton and his heirs succeeded Kinsley as president of the company in 1859 until its close in 1909. Members of the Ames family also owned several properties along Washington Street, including a few of the properties possessed earlier by Kinsley (Sherman 1876).

Commercial development in South Canton also expanded through the nineteenth century; however it emerged primarily along Washington Street south of the Neponset River, not within the boundary of the Canton Center Area. In 1855 the Canton Center Area included the Neponset Bank and a single store near the South Canton Railroad Station (Walling 1855). By 1896 commercial ventures in the area expanded to include several grocers and markets, a plumbing supply store, the Wellington Hotel, and a bakery (Sanborn 1896) in a block known as Washington Square. Washington Square was demolished ca. 1995 and replaced with a multiple-unit condominium complex and the original, wood-frame bank building was replaced by a concrete block building in the twentieth century.

Unlike the commercial area south of the Neponset River, the portion of Washington Street at Canton Center between Chapel Street and Revere Street contained a high concentration of institutional buildings. The earliest is the Canton Town Hall, or Memorial Hall, at 801 Washington Street (CAN.103; MHC DOE 1997). The Gothic Revival style hall was designed by Stephen Carpenter Earle of Worcester and constructed in 1878 as a memorial to the soldiers who died in the Civil War Casualties from Canton. Earle was most known for the design of churches and other civic buildings throughout

New England, but this is possibly the only town hall he designed (Withey 1970; Bergen 1997). Just south of the town hall is the Classical Revival Canton Public Library at 786 Washington Street (CAN.78; MHC DOE 2001) designed by Boston architectural firm Winslow and Bigelow and constructed in 1901 by L.P. Soule and Son of Boston. The structure and property was donated to the town by philanthropist Augustus Hemenway. In response to the rise of the population of Canton in the early twentieth century, the construction of a new high school building was proposed. The site of the former estate of Frank M. Ames at the intersection of Revere and Washington Streets was selected and, with the assistance of a large contribution from Augustus Hemenway, the Hemenway School, or Canton High School (CAN.77) designed in the Classical Revival style by Thomas M. James Company of Boston was opened in 1911 (Healey 2012). The school now serves as an elderly housing complex with a large addition on the west (rear) elevation. The Main Canton Branch of the U.S. Post Office (CAN.106) was built across from the high school in 1935. The building's construction was overseen and administered by the Works Progress Administration (WPA). During that time Louis A. Simon was serving as the Supervising Architect in the U.S. Department of the Treasury and directed the construction of many civic buildings, including the Canton Post Office, for the WPA. Concurrently, the telephone was beginning to gain popularity and in 1937 the first dedicated Telephone Exchange building in Canton was constructed at the northwest corner of Washington and Sherman Streets. This Classical Revival style building now serves as a doctor's office.

In 1861, the Saint John the Evangelist Catholic parish was established in Canton by Father John Flatley. There had been a small Catholic population in Canton since the early nineteenth century; however, with the influx of Irish immigrants to work in the multiple industries thriving in the area, a larger permanent structure was needed for services. In 1862, the Catholic diocese purchased the estate of Frank M. Ames at and built the Saint John the Evangelist Church in 1867 (not extant) and the Rectory (CAN.231) in 1889 (Canton 1997). The former Trinity Episcopal Church (CAN.86) constructed in 1897. The design of the rubble-stone, late-Gothic Revival church is attributed to Reverend Hermon Gaylord Wood, a missionary of the Diocese of Massachusetts who was responsible for the construction of five small fieldstone churches across eastern Massachusetts. The congregation moved to a new building by 1970 and the Schlossberg and Son funeral home now utilizes the building as funeral chapel (Viens 1993).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	19 Ames Avenue	ca. 1900	Shingle Style		C
	Residence	23-25 Ames Avenue	ca. 1900	Colonial Revival	4	C
CAN.317	Kinsley Iron and Machine Company Tool Shed/Michael Keliher – George O'Brien House	29 Ames Avenue	ca. 1880	Vernacular		C
CAN.313	Charles Grimes – Isabella Grenham House	38 Ames Avenue	ca. 1918	Bungalow		C
CAN.312	Charles Grimes House	36 Ames Avenue	ca. 1915	Colonial Revival	5	C
CAN.311	Kinsley Iron and Machine Company Worker Housing	34 Ames Avenue	ca. 1850	Vernacular		C
	Residence	54 Ames Avenue	ca. 1900	Vernacular		C
CAN.301	Elbridge G. Holmes House	24 Centre Street	ca. 1870	Italianate		C
	Residence	32 Centre Street	ca. 1860	Greek Revival	3	C
	Residence	40 Centre Street	ca. 1850	Greek Revival		C
	Residence	31 Savin Hill Street	ca. 1880	Italianate		C
	Residence	2 Traverse Street	ca. 1860	Greek Revival		C
	Residence	12 Traverse Street	ca. 1850	Italianate		C
CAN.77	Hemenway School – Canton High School	660 Washington Street	1911	Classical Revival	1	C
CAN.106	U.S. Post Office – Canton Main Branch	661 Washington Street	1935	Classical Revival	8	C
CAN.231	Saint John the Evangelist Church Rectory	700 Washington Street	ca. 1889	Colonial Revival	1	C
	Saint John the Evangelist Church	700 Washington Street	ca. 1965	Contemporary		NC
	Saint John the Evangelist Elementary School	700 Washington Street	ca. 1960	N/A		NC
	Commercial Building	710 Washington Street	ca. 1970	N/A		NC
CAN.165	William Billings House	726 Washington Street	1836	Greek Revival		C
CAN.232	Zeno Wright House	741 Washington Street	ca. 1848	Greek Revival		C
CAN.166	Samuel M. Capen House	742 Washington Street	ca. 1880	Queen Anne		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
CAN.233	J. Mann House	751 Washington Street	ca. 1850	Greek Revival		C
CAN.167	Joseph Leavitt – Dr. A. R. House	756-758 Washington Street	1846	Greek Revival		C
CAN.168	Judge Thomas E. Grover House	776 Washington Street	ca. 1880	Stick Style		C
CAN.169	James Billings Carriage Barn	780 Washington Street	ca. 1842	Colonial Revival		C
CAN.170	Judge Thomas E. Grover Carriage Barn	782 Washington Street	ca. 1880	Stick Style		C
CAN.78	Canton Public Library	786 Washington Street	1901	Classical Revival	7	MHC-DOE; C
	Canton Telephone Exchange	800 Washington Street	1937	Classical Revival	2	C
CAN.103	Canton Town Hall – Memorial Hall	801 Washington Street	1878	Gothic Revival	6	MHC-DOE; C
CAN.234	Francis W. Deane – Charles H. French House	814 Washington Street	ca. 1850	Colonial Revival		C
CAN.86	Trinity Episcopal Church	824 Washington Street	1897	late Gothic Revival	9	C

MHC-DOE Property was determined eligible for the National Register by the Massachusetts Historical Commission
C Contributing property to the area
NC Non-contributing property to the area

Telephone Exchange Building (800 Washington Street) and Canton Public Library (786 Washington Street) on right. View looking south from Canton Town Hall (801 Washington Street).

32 Centre Street. view looking north.

23-25 Ames Avenue, view looking south.

Charles Grimes House (36 Ames Avenue), view looking northeast.

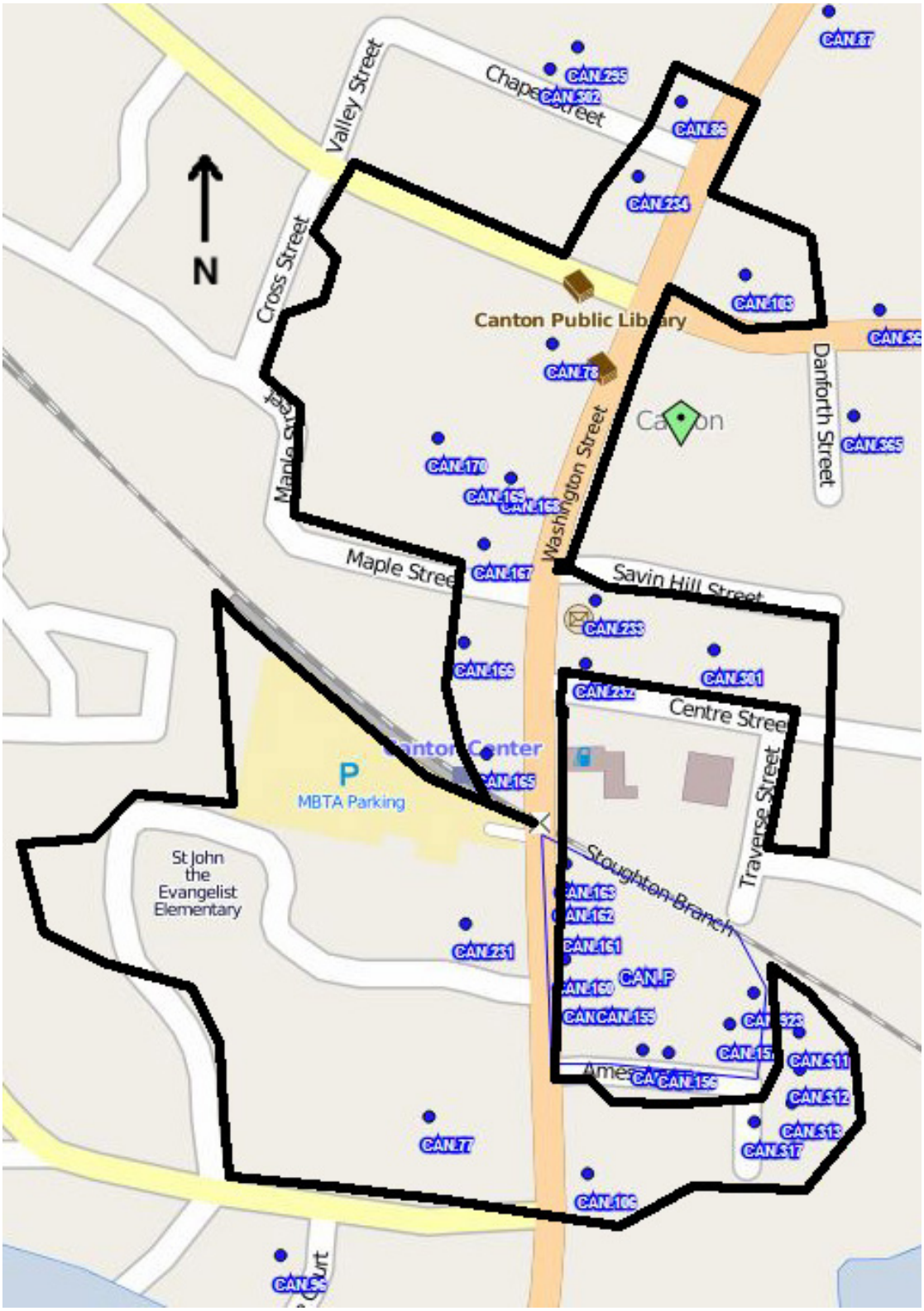
Canton Town Hall (801 Washington Street), view looking northeast from Washington Street at Sherman Avenue.

Canton Public Library (786 Washington Street), view looking northwest.

Canton Branch of U.S. Post Office (661 Washington Street), view looking northeast.

Trinity Episcopal Church (824 Washington Street), view looking northwest.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Washington Street Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its role in the growth and development of the historic Canton town center from its early settlement period through the twentieth century, and under Criterion C in the area of Architecture for its collection of nineteenth and twentieth century residential and institutional buildings that represent a range of architectural styles and levels of ornamentation and form a coherent unit. The area encompasses and extends the Canton Center Area (CAN.L; MHC DOE 1991) and includes two individual properties Canton Town Hall, or Memorial Hall (CAN.103; MHC DOE 1997) and the Canton Public Library (CAN.78; MHC DOE 2001), a historic district and individual properties that were previously determined eligible for National Register listing by MHC.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Brockton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Easton

Place *(neighborhood or village):* North Easton

Name of Area: Holmes-Linden Streets Area

Present Use: Residential

Construction Dates or Period: mid-19th c. – late 19th c.

Overall Condition: Good

Major Intrusions and Alterations: None

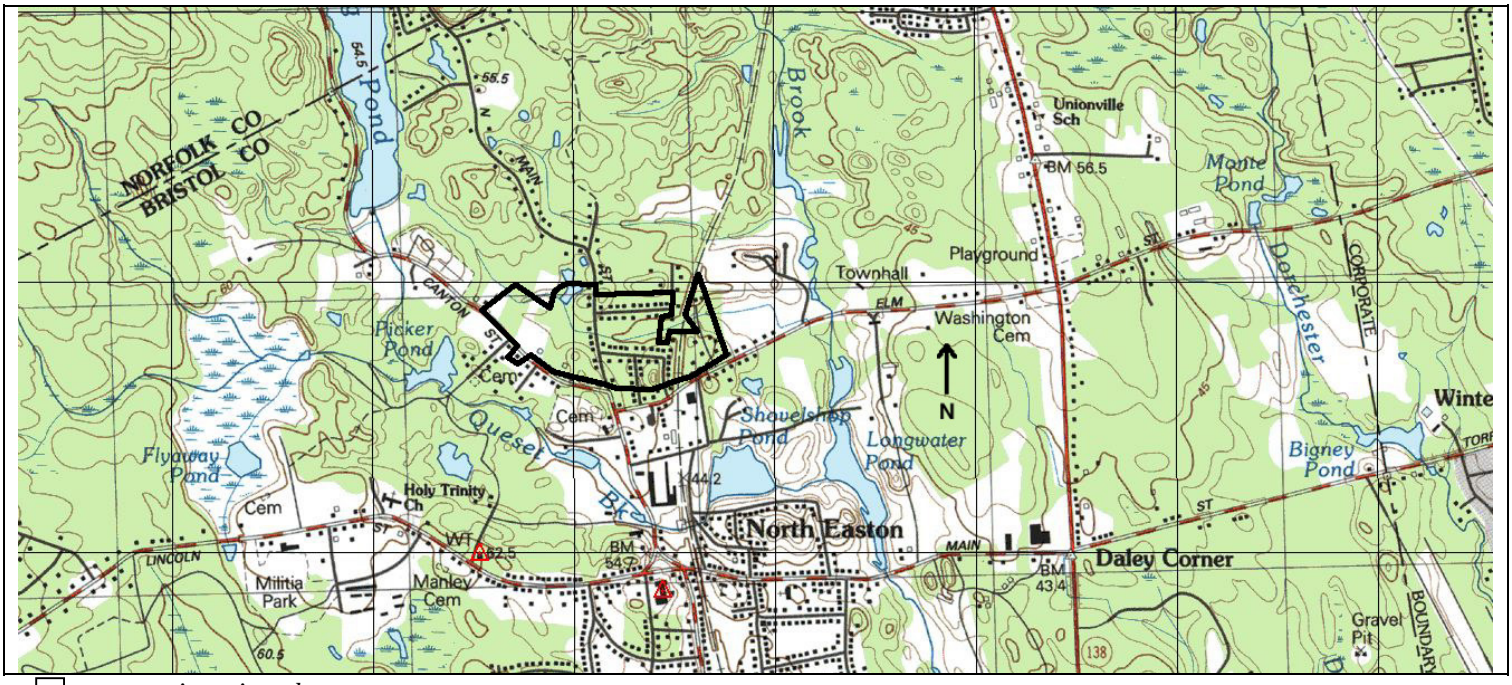
Acreage: Approx. 35

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Holmes-Linden Streets Area is a cohesive grouping of residential buildings that is bounded by Holmes Street to the North, Mullen Lane to the east, the North Easton Historic District (NR listed 11/3/1972) to the south, and Brookside Avenue to the west. This area encompasses approximately 400 feet of the MBTA Stoughton Railroad ROW. The majority of buildings in the neighborhood consist of simple, one to two-story wood-frame residences constructed in the early nineteenth to early twentieth centuries to house middle class tradesmen and workers employed at the Ames Shovel and Tool Company (multiple MHC numbers) outside the area at 28 Main Street and other factories historically located in North Easton. The area includes 78 properties of which 74 contribute to its historic and architectural significance.

Prevalent architectural styles and building forms include single-family, Greek Revival, Italianate, Queen Anne, and Bungalow houses notably along Linden and Holmes streets and Mullen Lane. Perhaps the earliest of the residences is the Edwin S. Russell House at 31 Canton Street, a one-and-one-half-story, center-hall Cape with an attached one-and-one-half-story New England style barn. It was originally constructed in the early nineteenth century and retains much of its original material. The majority of the nineteenth-century houses were designed for single, working families and have understated ornamentation most commonly represented in porch details as represented by 23 Linden Street and 43 North Main Street. Houses along the Canton Street, numbers 1 through 29 Canton Street, from this period are arranged close together, with similar set-back from the road and lot size. Styles and forms are dominated by center-hall Cape and side-hall, front-gable cottages. The Queen Anne style is represented by the Henry Holmes House, 39 North Main Street, which displays decorative eaves trim and a spindlework porch. A cluster of three similar early-twentieth-century Bungalows with characteristic front porches under the roof line, shed dormers, and exposed rafter tails is located at 22, 24, and 25 Holmes Street.

A few houses were designed and built as multi-family dwellings by nearby manufacturing companies. Examples of this type include the three houses at 1, 3, and 5 North Main Street constructed by the O. Ames & Sons Company in the mid- to late nineteenth century. William King owned several residences scattered throughout the area. These Ames buildings are different from other Ames Company housing in Easton, such as the tenements in the Andrews - Mechanic Streets Area (EST.V) and on Elm Street near the factory buildings that were designed in a distinct T-shape duplex fashion and organized in a regimented row with equal set-back from the street. The three residences on North Main Street are arranged in an irregular group and have varied massing; one with a T-shape plan, one with an L-shape plan, and one rectangular. They range from one-and-one-half-story to two stories and appear, based on architectural features, to pre-date the duplexes on Elm Street.

HISTORICAL NARRATIVE

The northern section of Easton was originally developed during the second wave of town settlement about 1700 directly north of what is now South Easton Green. The growth of the village moved northward from the Green along Washington Street, with secondary roads leading to Bay Road and in the direction of Taunton and Boston. When Easton was incorporated as a town in 1725 there were only about 60 families living in the area, heavily concentrated around the Green and Washington Street. In the mid-eighteenth century Canton, Main, and Lincoln streets in North Easton were laid out to connect the town with Stoughton and the Massachusetts Bay Path. Although some farming occurred in outlying areas, industry was the main economic force in Easton, centered around Furnace Village in the eastern portion of town and North Easton. The industrial success in the north resulted in a shift of the town's civic center from Easton Center to North Easton in the second half of the nineteenth century. Many civic buildings, including the Oakes Ames Memorial Hall

(EST.1) (1879-81) and the Ames Free Library (EST.3) (1883), designed by H.H. Richardson and located in the H.H. Richardson Historic District (National Historic Landmark 1987) were constructed during this time (Easton 2008; MHC 1981).

Multiple industrial ventures were established in North Easton in the early- to mid-eighteenth century, including an iron forge, saw mills, and a grist mill. However, the only industries within the Holmes-Linden Street Area were the William King Awl Factory on King Street and the R.G. Randall Boot Shop on North Main Street north of Holmes Street. William King built his factory ca. 1850 and residence (28 Linden Street) ca. 1860 on what was known as King Street, now Linden Street. He also constructed multiple residences on North Main and Pleasant streets, presumably for employee housing. By 1890, King had sold portions of his property along North Main Street for residential development. Randall had sold his property to E.W. Gilmore, a local industrialist, by 1886. The property's use under Gilmore's ownership is undetermined, but many residents along North Main Street are listed as working in the shoe manufacturing industry, likely nearby (Beers 1871; Walker 1886; Everts and Richards 1895; US Census 1890).

Gilmore also owned a hinge factory off North Main Street just south of the Holmes-Linden Streets Area. His factory was second only to the Ames Shovel Company established in 1803, also located just south of the area boundary. Although neither operation had any of their manufacturing facilities within the boundary, both companies owned property of the area in the form of worker housing. At the beginning of the nineteenth century, a surge in immigrant population, especially Irish immigrants, led to a need for more residential housing. Many duplex houses and tenements, primarily owned by the Ames company, were constructed throughout North Easton. As the immigrant population settled, many purchased land and built their own single-family homes, like Timothy Galvin, an Irish immigrant who purchased land from King ca. 1890 and constructed a house on the west side of North Main Street. Galvin built a second house adjacent to the first ca. 1900 and rented it to his son John Galvin. Both Galvins were involved in the shoe making industry in Easton. The Irish population remained the dominant ethnicity in North Easton into the late nineteenth century, and was joined by a high concentration of Swedish and Canadian immigrants, who settled elsewhere in town (Beers 1871; Walker 1886; MHC 1981; Everts and Richards 1895).

The oldest structures in the district are located on Canton Street, most notably the Edwin S. Russell House and Barn at 31 Canton Street constructed in the early nineteenth century. Russell was a farmer and bootmaker, whose heirs sold the property to Oliver Ames and Sons Corporation in the late nineteenth century. The property on the north side of Canton Street between the Russell House and North Main Street was primarily developed between the mid- and late-nineteenth-century for single-family residences. Most of the families who resided there were skilled tradesmen working in the local shovel and awl factories. These families were primarily Irish or of Irish decent (Anon.1851; Walling 1858; Beers 1871; Walker 1886; Everts and Richards 1895; US Census 1850, 1880).

Holmes Street, originally known as Gilmore Lane, was laid out near the original site of Randall's Boot Shop and housing lots were sold by Gilmore's heirs in the late-nineteenth and early-twentieth centuries. The street was later renamed for Henry Holmes, who owned the house at the southeast corner of Holmes and North Main streets. Concurrently, Linden and King streets were also being developed with residential lots. Between 1885 and 1895, approximately 15 new single-family houses were constructed along these streets (Everts and Richard 1895).

Residential development continued into the twentieth century, filling in between existing structures. Most of these homes were owner occupied; in contrast to the worker tenements owned by the Ames Corporation along Elm and Mechanics Streets. Although the historic factories have ceased operations in North Easton, the residential character of the Holmes-Linden Streets Area remains relatively unaltered with little modern infill.

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	1 Canton Street	ca. 1930	Four-square		C
	Willis, J. House	7 Canton Street	ca. 1860	Greek Revival Cape		C
	Tilden, Mrs. F. House	9 Canton Street	ca. 1870	Greek Revival		C
	Sunbery, G. House	13 Canton Street	ca. 1870	Italianate		C
	White, Mrs. Latitia House	17 Canton Street	ca. 1870	Vernacular		C
	Residence	19 Canton Street	ca. 1880	Vernacular		C
	Welch, Mrs. Margaret House	21 Canton Street	ca. 1870	Italianate		C
	McEntee, James House	23 Canton Street	ca. 1870; ca. 1980	Vernacular - altered		NC
	McEntee, Patrick House	25 Canton Street	ca. 1870	Italianate	1	C
	Murphy, Mrs. Hannah House	27 Canton Street	ca. 1860	Greek Revival	1	C
	Hefferman, James House	29 Canton Street	ca. 1860	Cape	1	C
	Russell, Edwin S. House	31 Canton Street	ca. 1830	Cape	3	C
	Russell, Edwin S. Barn	31 Canton Street	ca. 1830	Vernacular	3	C
	Residence	7 Holmes Street	ca. 1900	Vernacular		C
	Residence	10 Holmes Street	ca. 1890	Italianate		C
	Residence	11 Holmes Street	ca. 1910	Vernacular		C
	Residence	12 Holmes Street	ca. 1910	Vernacular		C
	Residence	13 Holmes Street	ca. 1930	Colonial Revival		C
	Residence	14 Holmes Street	ca. 1910	Queen Anne		C
	Residence	15 Holmes Street	ca. 1940	Cape		C
	Residence	18 Holmes Street	ca. 1910	Vernacular		C
	Residence	20 Holmes Street	ca. 1910	Vernacular		C
	Residence	21 Holmes Street	ca. 1920	Vernacular		C
	Residence	22 Holmes Street	ca. 1920	Bungalow	5	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	24 Holmes Street	ca. 1920	Craftsman Bungalow	5	C
	Residence	25 Holmes Street	ca. 1920	Bungalow		C
	Residence	9 King Avenue	ca.1990	Colonial Revival		NC
	Residence	11 King Avenue	ca. 1890	Italianate		C
	Residence	15 King Avenue	ca. 1890	Italianate		C
	Marshall, J.H. House	19 King Avenue	ca. 1880	Queen Anne		C
	Residence	21 King Avenue	ca. 1890	Vernacular		C
	Residence	25 King Avenue	ca. 1890	Queen Anne		C
	Residence	31 King Avenue	ca. 1890	Vernacular		C
	Residence	1 Linden Street	ca. 1970	Ranch		NC
	Residence	6 Linden Street	ca. 1890	Queen Anne		C
	Residence	10 Linden Street	ca. 1950	Cape		C
	Residence	11 Linden Street	ca. 1920	Cape		C
	Residence	12 Linden Street	ca. 1910	Queen Anne		C
	Residence	14 Linden Street	ca. 1910	Vernacular		C
	Residence	18 Linden Street	ca. 1910	Queen Anne		C
	Residence	20 Linden Street	ca. 1900	Vernacular		C
	Residence	23 Linden Street	ca. 1900	Queen Anne		C
	Residence	24 Linden Street	ca. 1910	Vernacular		C
	Residence	26 Linden Street	ca. 1910	Queen Anne		C
	Residence	27 Linden Street	ca. 1910	Queen Anne		C
	King, William House	28 Linden Street	ca. 1860	Greek Revival	2	C
	Flood, T. House	6 Mullen Lane	ca. 1860	Greek Revival		C
	Residence	8 Mullen Lane	ca. 1870; ca. 1990	Vernacular – altered		C
	Residence	9 Mullen Lane	ca. 1890	Vernacular		C
	Residence	11 Mullen Lane	ca. 1890	Italianate		C
	Mullen, H. House	21 Mullen Lane	ca. 1890	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	23 Mullen Lane	ca. 1920	Vernacular		C
	O. Ames & Sons Worker Housing	1 North Main Street	ca. 1890	Four-square		C
	O. Ames & Sons Worker Housing	3 North Main Street	ca. 1870	Cape		C
	O. Ames & Sons Worker Housing	5 North Main Street	ca. 1860	Cape		C
	Residence	12 North Main Street	ca. 1870	Greek Revival		C
	Murphy, John House	16 North Main Street	ca. 1890	Italianate		C
	Galvin, Timothy House	18 North Main Street	ca. 1890	Italianate		C
	Galvin, John House	20 North Main Street	ca. 1900	Italianate		C
	McEntee, John House	24 North Main Street	ca. 1890	Cape		C
	Residence	27 North Main Street	ca. 1890	Queen Anne		C
	William King Worker Housing	30 North Main Street	ca. 1850	Cape		C
	Residence	36 North Main Street	ca. 1910	Queen Anne		C
	Holmes, Henry House	39 North Main Street	ca. 1900	Queen Anne	4	C
	Residence	42 North Main Street	ca. 1850	Cape		C
	Residence	43 North Main Street	ca. 1890	Cape		C
	Residence	44 North Main Street	ca. 1890	Italianate		C
	Residence	6 Pleasant Street	ca. 1940	Colonial Revival Cape		C
	Residence	7 Pleasant Street	ca. 1930	Colonial Revival Cape		C
	Residence	8 Pleasant Street	ca. 1940	Colonial Revival Cape		C
	Residence	9 Pleasant Street	ca. 2000	Colonial Revival		NC
	Residence	10 Pleasant Street	ca. 1920	Colonial Revival Bungalow		C
	Residence	11 Pleasant Street	ca. 1900	Italianate		C
	William King Worker Housing	12 Pleasant Street	ca. 1860	Vernacular		C
	Residence	15 Pleasant Street	ca. 1900	Italianate		C
	Residence	16 Pleasant Street	ca. 1900	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	17 Pleasant Street	ca. 1900	Italianate		C
	Residence	18 Pleasant Street	ca. 1900	Queen Anne		C
	Residence	19 Pleasant Street	ca. 1900	Italianate		C

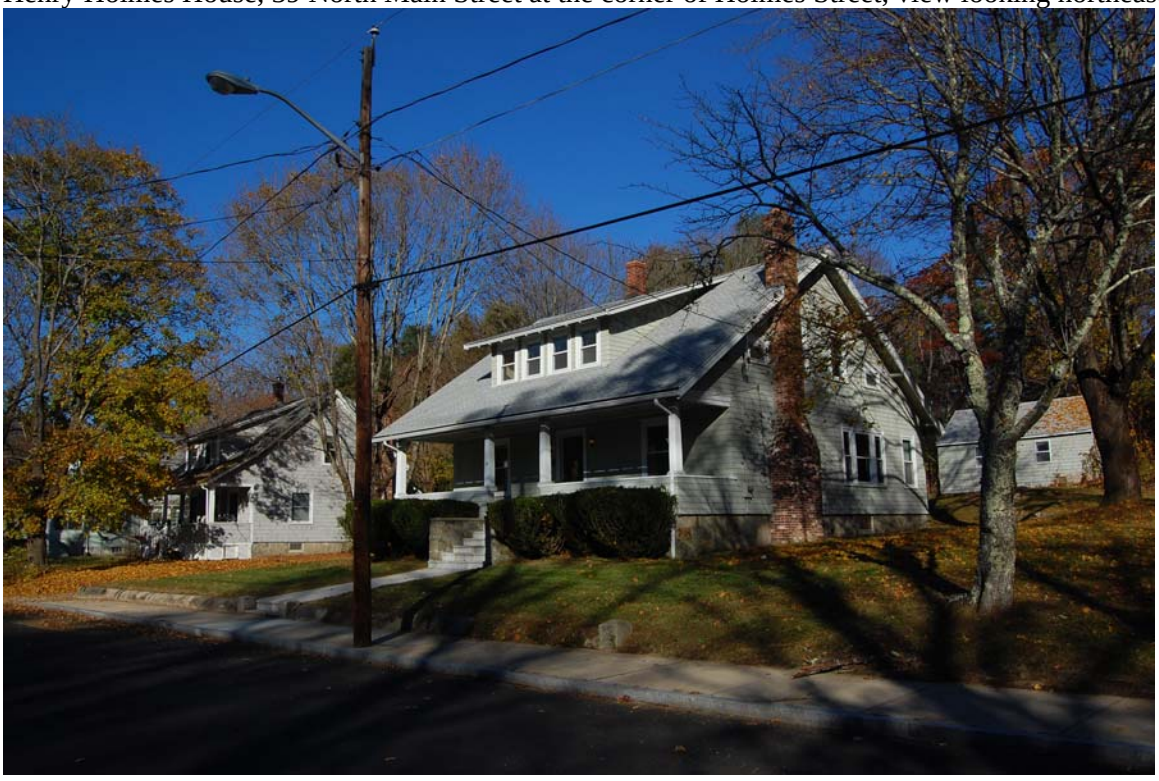
C Contributing property to the area
NC Non-contributing property to the area

There are no properties previously listed in MACRIS or shown on the MACRIS Maps 2.0 Beta, http://maps.mhc-macris.net.

William King House, 28 Linden Street, view looking northeast.

Edwin S. Russell House and Barn, 39 Canton Street, view looking northeast.

Henry Holmes House, 39 North Main Street at the corner of Holmes Street, view looking northeast.



22 and 24 Holmes Street, view looking northwest.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Holmes-Linden Streets Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its associations with the residential and industry related housing development of North Easton, and under Criterion C in the area of Architecture as an intact neighborhood of nineteenth- through early-twentieth-century skilled tradesmen workers and middle class housing, including good examples of period styles and forms.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Brockton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Easton

Place *(neighborhood or village):* North Easton

Name of Area: Center Street Area

Present Use: Residential

Construction Dates or Period: early 19th c. – early 20th c.

Overall Condition: Good

Major Intrusions and Alterations: None

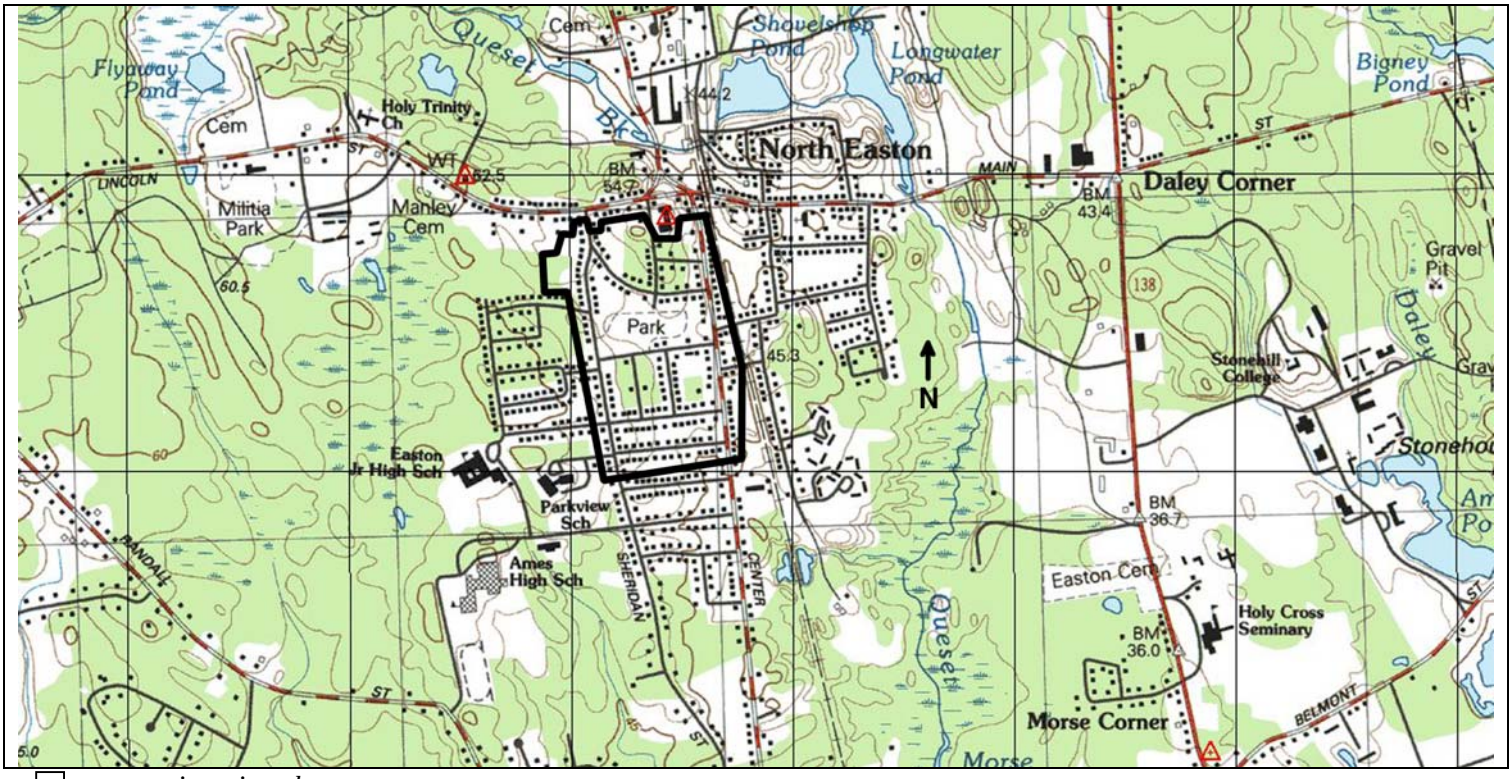
Acreage: Approx. 140

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Center Street Area is a roughly rectangular area bounded by the North Easton Historic District (NR listed 11/3/1972) to the north, the MBTA Stoughton Line right-of-way to the east, Spooner Street to the south and Sheridan Avenue to the west. The residential streets are laid out around a park established in 1930. The area includes 203 properties, of which 177 contribute to its historic and architectural significance.

Development in the area began along Center and Day streets in the mid-nineteenth century and continued to spread southeast between Sheridan Avenue and Center Street in the latter half of the nineteenth century and into the twentieth century. Park, and Spooner streets and Columbus Avenue were laid out in the late nineteenth century with rectangular lotsof uniform size for modest residences. Some examples of mid-nineteenth-century worker housing are located at 56, 60 and 62 Day Street; however, the majority of the area consists of a one-and-one-half-story to two-and-one-half-story single-family residences constructed in the mid-nineteenth to mid-twentieth centuries for factory workers and professionals. These simple, wood-frame side-hall and Cape Cod cottages, like those found along Sheridan Avenue and Hayward Street, have varying degrees of Gothic Revival, Greek Revival, Italianate, Second Empire, Queen Anne, and Colonial Revival ornamentation. High style examples of these styles are found primarily along the northern end of Sheridan Avenue, and Center and Day streets. Early and mid-twentieth-century buildings are located along Columbus and Spooner streets and infilled vacant lots throughout the area.

Although residential architecture dominates the district, there are a few scattered commercial buildings that primarily date to the late-nineteenth and early-twentieth centuries along Center and Park streets. Louis Adams Frothingham Memorial Park, an open green space with recreational and maintenance facilities, was laid out in 1930 between Park Street and Sheridan Avenue. The Louis Adams Frothingham Memorial Park Gates and Marker (EST.909 and EST.910) are located on Sheridan Avenue. There is also one religious property in the area, Saint Mark's Episcopal Church, at the corner of Center and Columbus Streets. This church was originally constructed in ca. 1890 in the Queen Anne style as the First Baptist Church and renovated ca. 1940 after a major fire. The only institutional building in the area, the Ames Gymnasium-Frothingham Hall at 15 Barrows Street, was originally built ca. 1900 to accompany the Oliver Ames High School directly across the street. The gymnasium was renovated into the headquarters of the Red Cross and used as a Legion Hall in the 1920s. Some of the buildings in the area have been altered by the installation of synthetic siding and replacement of original doors and windows, but they retain their original forms, architectural ornamentation, and setting within the streetscape and overall grouping of buildings.

HISTORICAL NARRATIVE

The north section of Easton was originally developed during the second wave of settlement around 1700 directly north of what is now South Easton Green. The growth of the village moved northward from the Green along Washington Street, with secondary roads leading to Bay Road and Taunton and Boston beyond that. When Easton was incorporated as a town in 1725 there were only about 60 families living in the area, heavily concentrated around the Green and Washington Street. In the mid-eighteenth century Canton, Main and Lincoln streets in North Easton were laid out to connect the town with Stoughton and the Massachusetts Bay Path. Although some farming occurred in outlying areas, industry was the main economic force in Easton, centered around Furnace Village in the eastern portion of town and North Easton. The industrial success in the north resulted in a shift of the town's civic center from Easton Center to North Easton in the

second half of the nineteenth century. Many civic buildings, including the Oakes Ames Memorial Hall (EST.1) (1879-81) and the Ames Free Library (EST.3) (1883), designed by H.H. Richardson and located in the H.H. Richardson Historic District, National Historic Landmark 1987) were constructed during this time (Easton 2008; MHC 1981).

The development of North Easton was due largely to the Oliver Ames & Sons Corporation, a shovel manufacturer, which established the Ames Shovel Works in 1803 off North Main Street. The Ames family contributed to the economic and social stability of the area offering employment to residents and funds for the construction of churches, a railroad station and civic structures, including a town hall, library, school, and community center. Ames Corporation also built extensive worker housing throughout North Easton, but primarily concentrated around Elm, Oliver, and Lincoln streets. These structures are now part of the North Easton Historic District (NR listed 1972) (Brown 1972).

The residential neighborhood to the south focused on Center Street and grew similarly to the North Easton Historic District, but lacked the large scale industrial and civic structures. Center Street was laid out in the late eighteenth century as a connection between Easton Center and North Easton. Few houses were scattered along the street into the mid-nineteenth century. By 1871, the north end of Center Street, near the intersection with Main Street in North Easton, contained multiple residences built on relatively small lots. Day Street, which connects Lincoln and Center Streets; Barrows Street, which connects Day and Lincoln Streets; and Oakland Street were platted with larger lots than on Center Street. Several of the buildings were constructed as residences for prominent Easton citizens. Sanford B. Strout, who was clerk and treasurer Easton from 1873 to 1876, built his house at 7 Oakland Street. He left Easton soon after and became Post Master in Evergreen, AL and the house was purchased by J.C. Goward. The Goward family owned multiple properties in the area, including 38, 40, and 99 Center Street. Josiah G. Goward owned the property at 63 Center Street which consisted of a house and slaughter house (not extant). One of the most notable residents, who lived in one of the area's most high-style houses at 37 Center Street (EST.45), was Rear Admiral George F.F. Wilde. Wilde attended the Naval Academy at Annapolis and was the commander on the U.S.S. *Dolphin*; the first steel vessel to circumnavigate the globe between 1885 and 1888.

Sheridan, Walnut (now Park), Hayward, and Belmont (now Spooner) streets, along with Columbus Avenue, were all laid out ca. 1890. Most of the early construction focused around Columbus Avenue and Park Streets. Lots relatively equal in size and shape were platted for construction of single-family homes. Residents along these streets were former renters of the company housing owned by the Ames Corporation or other wealthy businessmen. Some houses in this area were built on speculation by builders like George H. Dewitt. Dewitt was a carpenter and then opened a lumber yard and building supply store at the corner of Park and Center Streets ca. 1900. His houses, some he sold and some he rented, are located along Center Street and Columbus Avenue. At the turn of the twentieth century, the residents of Columbus Avenue were employed in a variety of trades including a fish dealer, baker, barber, bookkeeper, painter, and in the shoe and shovel industry. Residential construction during the early to mid-twentieth century resulted in the filling in of the neighborhood with modest, single-family homes.

South of Day Street is the Louis A. Frothingham Memorial Park, which stretches between Center Street and Sheridan Street. Louis A. Frothingham was a Boston lawyer who served in the U.S. House of Representatives from 1921 to 1928. He married Mary Shreve Ames (Frothingham), daughter of Frederick Lothrop Ames, of North Easton in 1916. The couple purchased the Anna A. Ames Gymnasium (15 Barrows Street) to function as a headquarters for the Red Cross and the American Legion. Louis Frothingham died suddenly in 1928, and Mrs. Frothingham decided to create a park in memory of her husband. She purchased the land from Josiah Goward, which already contained a pond he used to harvest ice for his slaughter house. Mrs. Frothingham hired Joseph Lee of Harvard University to design the park, which contained tennis courts, practice fields, baseball diamonds, a field house, gym equipment and a wading pond. The park was dedicated September 27, 1930. Joseph Lee (1862-1937), trained as a lawyer but practiced as a social worker, author, and philanthropist. He dedicated much of his life to strengthening communities through playgrounds and play, eliminating social problems, and promoting social legislation. He was often referred to as "the grandfather of play" and was the

founder and President of the Massachusetts Civic League from 1897 to 1937 (MHS nd; Vogler 2005). As memorial to her husband, a large boulder with a bronze plaque (EST.910) was installed and a formal gated entrance (EST.909) was placed at the corner of Park and Sheridan streets. The park became a center for recreational and social activity in Easton and had a full time overseer who lived in a cottage built by Mrs. Frothingham (46 Sheridan Street). The pond was filled in 1936 for safety reasons. Much of the park remains the same today as it was originally designed.

There was very little commercial development within the area. Besides George Dewitt's lumber yard and Josiah Goward's slaughter house, the only other significant business was William A. Wheaton's Carriage Factory at 110 Center Street. The complex later housed a blacksmith and wheelwright and painting company, and currently serves as the restaurant. There were several shops located within residences throughout the area, such as the bakery with a full size oven at 70 Center Street. The bakery and oven were converted to living space by 1925. The area has remained relatively unaltered since the early twentieth century, retaining its primarily residential neighborhood character and setting.

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Ames Gymnasium – Frothingham, Louis A. Memorial Hall	15 Barrows Street	ca. 1900	Colonial Revival	6	C
	Ames, Mrs. R.L. House	16 Barrows Street	ca. 1890	Italianate		C
	Residence	19 Barrows Street	ca. 1900	Italianate		C
	Residence	23 Barrows Street	ca. 2000	Colonial Revival		NC
	Residence	25 Barrows Street	ca. 1900	Vernacular		C
	Goward, E.T. House	27 Barrows Street	ca. 1890	Italianate		C
	Goward, E.T. House	28 Barrows Street	ca. 1890	Italianate		C
	Goward, E.T. House	29 Barrows Street	ca. 1890	Italianate		C
	Goward, E.T. House	30 Barrows Street	ca. 1890	Italianate		C
	Goward, E.T. House	31 Barrows Street	ca. 1890	Italianate		C
	Thayer House	24 Center Street	ca. 1860	Vernacular/ Cape		C
	Southward, L.C. House	28 Center Street	ca. 1880	Vernacular		C
	Wait, L.N. House	29 Center Street	ca. 1840	Greek Revival/ Cape		C
	Sisson, L. House	34 Center Street	ca. 1870	Italianate		C
	Residence	36 Center Street	ca. 1890	Queen Anne		C
EST.45	Wilde, Admiral George F.F. House	37 Center Street	1885	Second Empire	3	C
	Goward, W.K. House	38 Center Street	ca. 1880	Italianate		C
	Goward, J.F. House	40 Center Street	ca. 1860	Italianate		C
	Residence	43 Center Street	ca. 1930	Tudor Revival – altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Lillie, B.C. House	44 Center Street	ca. 1860	Vernacular		C
	Kelley, S.K. House	45 Center Street	ca. 1880	Italianate		C
	Howard, J. – Packard, Mary House	46 Center Street	ca. 1860	Vernacular		C
	Day, Oliver A. House	47 Center Street	ca. 1860	Italianate		C
	Strout – Randall House	48 Center Street	ca. 1860	Italianate		C
	Carr, Charles House	49 Center Street	ca. 1860	Gothic Revival		C
	Withington, George G. House	50 Center Street	ca. 1880	Italianate		C
	Packard – McNamara House	52 Center Street	ca. 1860	Greek Revival (Italianate additions)		C
	Dana, N.B. House	53 Center Street	ca. 1860	Vernacular		C
	Dana, G.R. House	55 Center Street	ca. 1880	Italianate		C
	Staples, William House	56 Center Street	ca. 1860	Greek Revival		C
	Residence	57 Center Street	ca. 1905	Queen Anne - altered		C
	Packard, Mrs. C. House	62 Center Street	ca. 1880	Queen Anne		C
	Wait, W.P. – Goward, J.F. House	63 Center Street	ca. 1860	Italianate		C
	Residence	64 Center Street	ca. 1910	Queen Anne		C
	Alger House	66 Center Street	ca. 1870	Vernacular		C
	Residence	68R Center Street	ca. 1880	Italianate		C
	Residence	70 Center Street	ca. 1880	Vernacular		C
	Keith, G.E. House	71-73 Center Street	ca. 1880	Italianate		C
	Willis House	74 Center Street	ca. 1860	Vernacular		C
	Stevenson, J.P. – Barrows, J. House	75 Center Street	ca. 1860	Gothic Revival	2	C
	Bailey, James H. House	76 Center Street	ca. 1850	Greek Revival		C
	Shepard, John M. House	77 Center Street	ca. 1860	Italianate	2	C
	Mulligan, M. House	78 Center Street	ca. 1850	Greek Revival		C
	Spooner, E.P. House	79 Center Street	ca. 1880	Italianate	2	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Packard, Fred L. House	83 Center Street	ca. 1870	Vernacular		C
	Myers, Herman House	86 Center Street	ca. 1890	Queen Anne		C
	Myers, H. Barn	86 Center Street	ca. 1890	N/A		C
	Thompson, Horace House	87 Center Street	ca. 1870	Italianate		C
	Residence	88 Center Street	ca. 2000	Colonial Revival		NC
	Howes, Capt. Samuel Judson House	89 Center Street	ca. 1890	Queen Anne		C
	Howes Barn	89 Center Street	ca. 1890	N/A		C
	Residence	90 Center Street	ca. 1925	Craftsman		C
	Residence	92 Center Street	ca. 1950	Cape		C
	First Baptist Church - St. Mark's Episcopal Church	93 Center Street	ca. 1890	Queen Anne		C
	Spooner, R.P. House	94 Center Street	ca. 1870	Italianate		C
	Residence	98 Center Street	ca. 1920	Tudor Revival		C
	Goward - Wilbur House	99 Center Street	ca. 1880	Second Empire		C
	Randall, Oscar House	102 Center Street	ca. 1890	Vernacular		C
	Residence	106 Center Street	ca. 1890	Vernacular		C
	Wheaton Carriage Factory	110 Center Street	ca. 1885	Italianate		C
	Residence	111 Center Street	ca. 2000	Colonial Revival		NC
	Wheaton House	114 Center Street	ca. 1890	Vernacular		C
	Residence	116 Center Street	ca. 1900	Queen Anne		C
	Residence	117 Center Street	ca. 1900	Queen Anne		C
	Residence	118 Center Street	ca. 1910	Vernacular		C
	Residence	119 Center Street	ca. 2010	Vernacular		NC
	Residence	120 Center Street	ca. 1900	Vernacular		C
	Residence	121 Center Street	ca. 1950	Colonial Revival Cape		C
	Read, Lucy A. House	122 Center Street	ca. 1890	Vernacular		C
	Madan, George C. House	124 Center Street	ca. 1890	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	125 Center Street	ca. 1950	Ranch		C
	Residence	14 Chester Avenue	ca. 1960	Colonial Revival Cape		NC
	Residence	15 Chester Avenue	ca. 1960	Colonial Revival		NC
	Residence	18 Chester Avenue	ca. 1980	Dutch Colonial Revival Cape		NC
	Residence	19 Chester Avenue	ca. 1980	Colonial Revival		NC
	Littlefield House	8 Columbus Avenue	ca. 1890	Italianate		C
	Residence	10 Columbus Avenue	ca. 1900	Queen Anne		C
	Food Mart	11 Columbus Avenue	ca. 1970	N/A		NC
	DeWitt, George H. House	12 Columbus Avenue	ca. 1890	Italianate		C
	Residence	13 Columbus Avenue	ca. 1910	Vernacular		C
	Residence	14 Columbus Avenue	ca. 1890	Queen Anne	1	C
	Residence	14A Columbus Avenue	ca. 1920	Vernacular	1	C
	Residence	15 Columbus Avenue	ca. 1900	Vernacular		C
	Residence	16 Columbus Avenue	ca. 1910	Vernacular	1	C
	Robinson, H.J. House	17 Columbus Avenue	ca. 1890	Queen Anne		C
	Wells, Orion House	20 Columbus Avenue	ca. 1890	Italianate		C
	Residence	21 Columbus Avenue	ca. 1900	Vernacular		C
	Residence	22 Columbus Avenue	ca. 1960	Colonial Revival Cape		NC
	Residence	23 Columbus Avenue	ca. 1900	Queen Anne		C
	Fitzgerald, M. House	24 Columbus Avenue	ca. 1900	Vernacular		C
	Residence	25 Columbus Avenue	ca. 1900	Vernacular		C
	DeWitt, George H. House	26 Columbus Avenue	ca. 1890	Vernacular		C
	Residence	28 Columbus Avenue	ca. 1910	Queen Anne		C
	Residence	29 Columbus Avenue	ca. 1930	Colonial Revival		C
	Perry, Thomas House	30 Columbus Avenue	ca. 1890	Vernacular		C
	Hayward, William House	31 Columbus Avenue	ca. 1890	Queen Anne		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	32 Columbus Avenue	ca. 1890	Colonial Revival		C
	Field, R.E. House	33 Columbus Avenue	ca. 1890	Vernacular		C
	Residence	39 Columbus Avenue	ca. 1910	Queen Anne – altered		C
	Residence	1 Dailey Avenue	ca. 1960	Ranch		NC
EST.910	Frothingham, Louis Adams Park Marker	Day Street	1930	N/A		C
	Residence	3 Day Street	ca. 1910	Craftsman Bungalow		C
	Residence	6 Day Street	ca. 1950	Colonial Revival Cape		C
	Carr, G.B. House	8 Day Street	ca. 1890	Queen Anne		C
	Holley House	9 Day Street	ca. 1890	Italianate		C
	Crockett, I.H. House	12 Day Street	ca. 1890	Queen Anne		C
	Residence	14 Day Street	ca. 1900	Queen Anne – altered		C
	Lyons, J. House	24 Day Street	ca. 1870	Italianate		C
	Goward, E.T. House	25 Day Street	ca. 1890	Italianate		C
	Residence	30 Day Street	ca. 1910	Queen Anne		C
	Vaughan, John House	32 Day Street	ca. 1880	Queen Anne - altered		C
	Residence	33 Day Street	ca. 1950	Cape		C
	Lyons, J. House	34 Day Street	ca. 1860	Cape		C
	Grady, Andrew N. House	36 Day Street	ca. 1890	Italianate – altered		C
	Residence	37 Day Street	ca. 1980	Cape		NC
	Barrell, John House	43 Day Street	ca. 1880	Vernacular		C
	Grady, Andrew N. House	44 Day Street	ca. 1880	Queen Anne	5	C
	Sweeny, John House	45 Day Street	ca. 1890	Queen Anne		C
	Sweeny, John House	47 Day Street	ca. 1860	Greek Revival – altered		C
	Lyons, Daniel House	49 Day Street	ca. 1890	Italianate		C
	Residence	50 Day Street	ca. 1870	Vernacular		C
	A. Tisdale Duplex	56 Day Street	ca. 1860	Italianate		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	A. Tisdale Duplex	60 Day Street	ca. 1860	Vernacular		C
	Lyons, Daniel House	61 Day Street	ca. 1860	Italianate		C
	A. Tisdale Duplex	62 Day Street	ca. 1860	Italianate		C
	Commercial Auto Body Shop	7 Hayward Street	ca. 1920	Vernacular		C
	Residence	9 Hayward Street	ca. 1910	Queen Anne		C
	Residence	10 Hayward Street	ca. 1930	Colonial Revival Cape		C
	Residence	11 Hayward Street	ca. 1910	Queen Anne		C
	Residence	12 Hayward Street	ca. 1900	Queen Anne		C
	Residence	13 Hayward Street	ca. 1910	Queen Anne		C
	Residence	14 Hayward Street	ca. 1910	Queen Anne		C
	Residence	15 Hayward Street	ca. 1910	Queen Anne		C
	Residence	16 Hayward Street	ca. 1920	Bungalow		C
	Residence	17 Hayward Street	ca. 1910	Queen Anne		C
	Residence	19 Hayward Street	ca. 1910	Queen Anne		C
	Residence	20 Hayward Street	ca. 1950	Ranch		NC
	Randall, R.G. House	6 Oakland Avenue	ca. 1880	Italianate		C
	Strout, S.B. – Goward, J.C. House	7 Oakland Avenue	ca. 1860	Italianate		C
	Wood, Charles A. House	8 Oakland Avenue	ca. 1880	Italianate		C
	Franklin, M. – Pratt, F. House	9 Oakland Avenue	ca. 1880	Italianate		C
	Donnovan, J. House	14 Oakland Avenue	ca. 1860	Second Empire		C
	Condominiums	4 Park Street	ca. 2010	Colonial Revival		NC
	Condominiums	10-12 Park Street	ca. 1970	Vernacular		NC
	Ellis, Herbert House	14 Park Street	ca. 1890	Italianate		C
	Residence	85 Park Street	ca. 1950	Ranch		NC
EST.909	Frothingham, Louis Adams Park Gate	Sheridan Street	ca. 1930	N/A		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	1 Sheridan Street	ca. 1860	Vernacular		C
	Goward, J.F. – Dailey, C. House	9 Sheridan Street	ca. 1860	Vernacular		C
	Barrett, Jason House	11 Sheridan Street	ca. 1890	Italianate		C
	Slattery, Edmund House	13 Sheridan Street	ca. 1890	Italianate		C
	Ahern, Marie House	15 Sheridan Street	ca. 1890	Colonial Revival		C
	Residence	16 Sheridan Street	ca. 1890	Italianate		C
	Residence	18 Sheridan Street	ca. 2000	Colonial Revival Cape		NC
	Residence	19 Sheridan Street	ca. 1890	Queen Anne		C
	Dailey, C. House	22 Sheridan Street	ca. 1890	Italianate		C
	Dailey, C. Barn	22 Sheridan Street	ca. 1890	Italianate		C
	Residence	23 Sheridan Street	ca. 1890	Queen Anne		C
	Coughlin, Dennis House	27 Sheridan Street	ca. 1890	Queen Anne		C
	O'Connor, J.J. House	31 Sheridan Street	ca. 1890	Italianate		C
	Residence	32 Sheridan Street	ca. 1910	Colonial Revival	4	C
	Residence	34 Sheridan Street	ca. 1920	Four-Square	4	C
	Stanton, Patrick House	35 Sheridan Street	ca. 1890	Queen Anne		C
	Residence	37 Sheridan Street	ca. 1900	Queen Anne		C
	Residence	39 Sheridan Street	ca. 1940	Cape		C
	Residence	43 Sheridan Street	ca. 1920	Four-Square		C
	Frothingham Memorial Park Caretaker's Cottage	46 Sheridan Street	ca. 1930	Colonial Revival		C
	Residence	47 Sheridan Street	ca. 1980	Colonial Revival		NC
	Residence	51 Sheridan Street	ca. 1910	Colonial Revival		C
	Residence	54 Sheridan Street	ca. 1920	Vernacular		C
	Residence	57 Sheridan Street	ca. 1920	Colonial Revival		C
	Residence	58 Sheridan Street	ca. 1920	Craftsman		C
	Residence	59 Sheridan Street	ca. 1910	Colonial Revival		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	60 Sheridan Street	ca. 1920	Craftsman Bungalow		C
	Residence	61 Sheridan Street	ca. 2000	Colonial Revival		NC
	Residence	62 Sheridan Street	ca. 1940	Colonial Revival Ranch		C
	Residence	63 Sheridan Street	ca. 1950	Colonial Revival Cape		C
	Residence	64 Sheridan Street	ca. 1950	Colonial Revival Cape		C
	Residence	67 Sheridan Street	ca. 1950	Colonial Revival Cape		C
	Residence	70 Sheridan Street	ca. 1970	Colonial Revival Cape		NC
	Residence	72 Sheridan Street	ca. 1930	Dutch Colonial Revival		C
	Residence	74 Sheridan Street	ca. 1930	Dutch Colonial Revival		C
	Residence	75 Sheridan Street	ca. 1930	Colonial Revival		C
	Residence	76 Sheridan Street	ca. 1960	Ranch		NC
	Residence	83 Sheridan Street	ca. 1900	Italianate		C
	Residence	87 Sheridan Street	ca. 1960	Vernacular		NC
	Residence	89 Sheridan Street	ca. 1910	Vernacular		C
	Residence	3 Spooner Street	ca. 2010	Colonial Revival		NC
	Residence	7 Spooner Street	ca. 1910	Queen Anne		C
	Residence	8 Spooner Street	ca. 1960	Colonial Revival		NC
	Residence	10 Spooner Street	ca. 1960	Colonial Revival		NC
	Residence	11 Spooner Street	ca. 1950	Ranch		C
	Residence	13 Spooner Street	ca. 1930	Tudor Revival		C
	Residence	14 Spooner Street	ca. 1920	Craftsman Bungalow		C
	Residence	15 Spooner Street	ca. 1910	Queen Anne		C
	Residence	16 Spooner Street	ca. 1900	Queen Anne		C
	Residence	17 Spooner Street	ca. 1910	Queen Anne		C
	Residence	18 Spooner Street	ca. 1930	Colonial Revival		C
	Residence	20 Spooner Street	ca. 1050	Cape		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	21 Spooner Street	ca. 1950	Ranch		C
	Residence	23 Spooner Street	ca. 1910	Queen Anne		C
	Residence	24 Spooner Street	ca. 1940	Tudor Revival		C
	Residence	26 Spooner Street	ca. 1930	Colonial Revival		C
	Residence	27 Spooner Street	ca. 1980	Colonial Revival		NC
	Residence	28 Spooner Street	ca. 1940	Colonial Revival Cape		C
	Residence	29 Spooner Street	ca. 1940	Colonial Revival Cape		C
	Residence	30 Spooner Street	ca. 1900	Vernacular		C
	O'Connor, David House	31 Spooner Street	ca. 1890	Italianate		C
	Residence	32 Spooner Street	ca. 1920	Bungalow		C
	Residence	34 Spooner Street	ca. 1950	Ranch		C
	Residence	35 Spooner Street	ca. 1930	Dutch Colonial Revival		C

C Contributing property to the district
NC Non-contributing property to the district

West side of Center Street, view looking northwest.

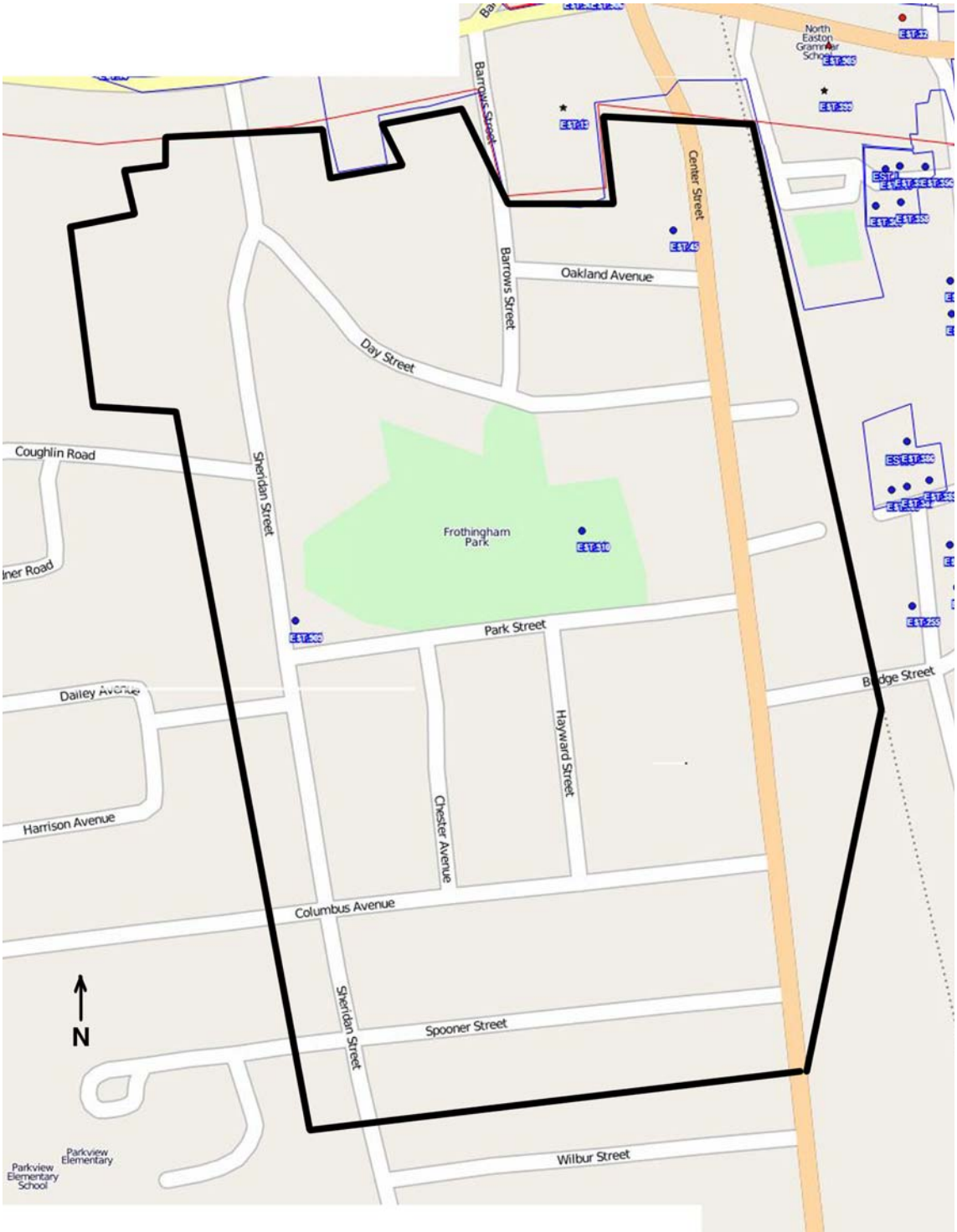
37 Center Street, view looking southwest.

East side of Sheridan Street, view looking southeast.

44 Day Street, view looking south.

15 Barrows Street, view looking northwest.

AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Center Street Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its association with the industrial and residential development of North Easton and under Criterion C in the area of Architecture as an intact neighborhood representing a range of nineteenth- and early-twentieth-century architectural styles. The area is notable for the park donated by Mary Shreve Ames (Frothingham) in honor of U.S. Representative Louis A. Frothingham, and several of the buildings were constructed as residences for prominent Easton citizens.

Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form for Easton Center Area, EST.I.

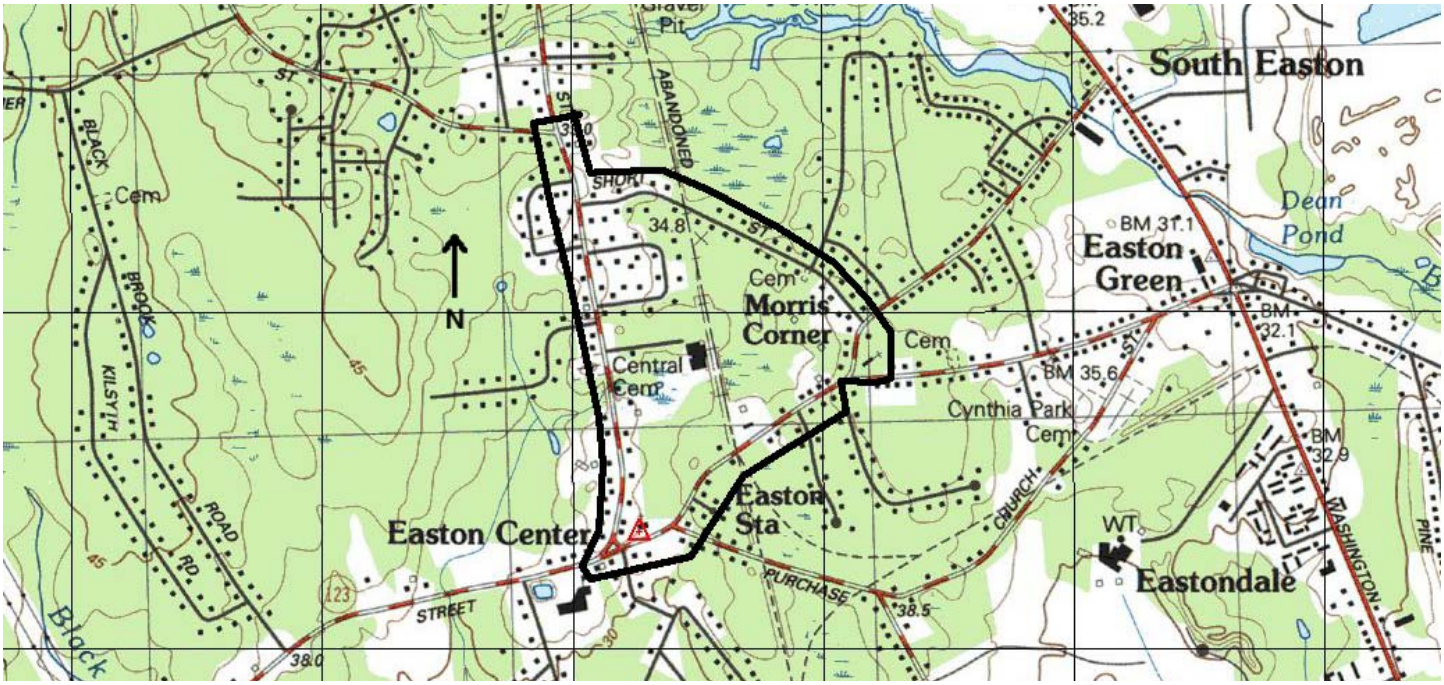
ARCHITECTURAL DESCRIPTION (Continued)

A field survey in December 2012 verified that the Easton Center Area appears to be largely unchanged since it was previously surveyed in 1998. The survey confirmed that there are 58 contributing properties out of about 120 total properties. They are predominantly modest residential and utilitarian buildings of high integrity and indicative of the Federal, Greek Revival, Queen Anne, Italianate, and Colonial Revival styles of architecture. The Area Data Sheet reflects the most current updates for all properties within the area that are listed in the MHC Inventory. The survey confirmed that the Easton Center Area is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C for its association with nineteenth-century residential, civic, and agricultural activities in Easton and for its well-preserved collection of residential architecture.

BIBLIOGRAPHY and/or REFERENCES (Continued)

Johnson, Sanford
1998 *MHC Form A: Easton Center*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

LOCUS MAP



AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
EST.826	Central Cemetery	Center Street	1803			C
EST.926	Soldiers' Monument – Civil War Monument	Center Street	1881			C
EST.191	Clark House	285 Center Street	ca. 1840	Greek Revival		C
	Stone Wall	285 Center Street	ca. 1900			C
EST.46	Edson House	300 Center Street	1812	Federal		C
	Barn	300 Center Street	ca. 1900	New England		C
	Stone Wall	300 Center Street	ca. 1900			C
EST.192	Howard, Miranda House	314 Center Street	ca. 1840	Vernacular		C
EST.193	Residence	321 Center Street	ca. 1850	Greek Revival		C
	Barn	321 Center Street	ca. 1850	Vernacular/ Queen Anne		C
	Stone Wall	321 Center Street	ca. 1890			C
EST.194	Leonard, A. William House	347 Center Street	ca. 1860	Queen Anne/ Greek Revival		C
	Barn	347 Center Street	ca. 1900	New England		C
EST.195	Leonard, H. L. House	348 Center Street	ca. 1890	Vernacular		C
	Barn	348 Center Street	ca. 1900	New England		C
EST.196	Residence	349 Center Street	ca. 1870	Italianate		C
	Barn	349 Center Street	ca. 1870	Connected		C
EST.197	Residence	367 Center Street	ca. 1940	Cape Cod, Colonial Revival		C
EST.198	Residence	409 Center Street	ca. 1850	Vernacular		C
	Barn	409 Center Street	ca. 1970	Vernacular		NC
EST.199	Residence	414 Center Street	ca. 1920	Colonial Revival		C
EST.200	Residence	425 Center Street	ca. 1940	Cape Cod, Colonial Revival		C
	Garage	425 Center Street	ca. 1940	Vernacular		C
EST.201	Reed, David House	429 Center Street	ca. 1840	Greek Revival		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
EST.202	Residence	432 Center Street	ca. 1860	Vernacular	2	C
	Garage	432 Center Street	ca. 1940	Vernacular		C
EST.203	Residence	433 Center Street	ca. 1860	Vernacular		C
	Barn	433 Center Street	ca. 1900	New England		C
EST.204	Residence	434 Center Street	ca. 1860	Vernacular	2	C
EST.946	Granite Marker	434 Center Street	1974			NC
EST.205	Easton Evangelical Congregational Church	Depot Street	ca. 1885	Gothic Revival		C
EST.947	Old Colony Railroad	Depot Street	1866			C
EST.206	Residence	259 Depot Street	ca. 1860	Vernacular		C
EST.207	Residence	261 Depot Street	ca. 1860	Vernacular	1	C
EST.208	Ripley, Clifton House	263 Depot Street	ca. 1840	Vernacular	1	C
	Shed	263 Depot Street	ca. 1900	Vernacular		C
EST.209	Residence	336 Depot Street	ca. 1840	Vernacular		C
	Garage	336 Depot Street	ca. 1940	Vernacular		C
EST.210	Easton Center School House	350 Depot Street	1856	Greek Revival		C
EST.211	Residence	354 Depot Street	ca. 1870	Italianate		C
EST.212	Reed, Rev. William House	364 Depot Street	1786	Federal		C
	Barn	364 Depot Street	ca. 1900	New England		C
EST.213	Mason, George House	369 Depot Street	ca. 1870	Vernacular		C
	Shed	369 Depot Street	ca. 1900	Vernacular		C
EST.214	Residence	375 Depot Street	ca. 1860	Vernacular		C
EST.215	Clapp, Fred House	3 Purchase Street	ca. 1860	Greek Revival/ Italianate		C
	Garage	3 Purchase Street	ca. 1940	Vernacular		C
EST.216	Lincoln, Stillman House	6 Purchase Street	ca. 1860	Greek Revival		C
	Stone Wall	6 Purchase Street	ca. 1900			C
EST.817	Howard, Oliver Cemetery	Short Street	1803			C

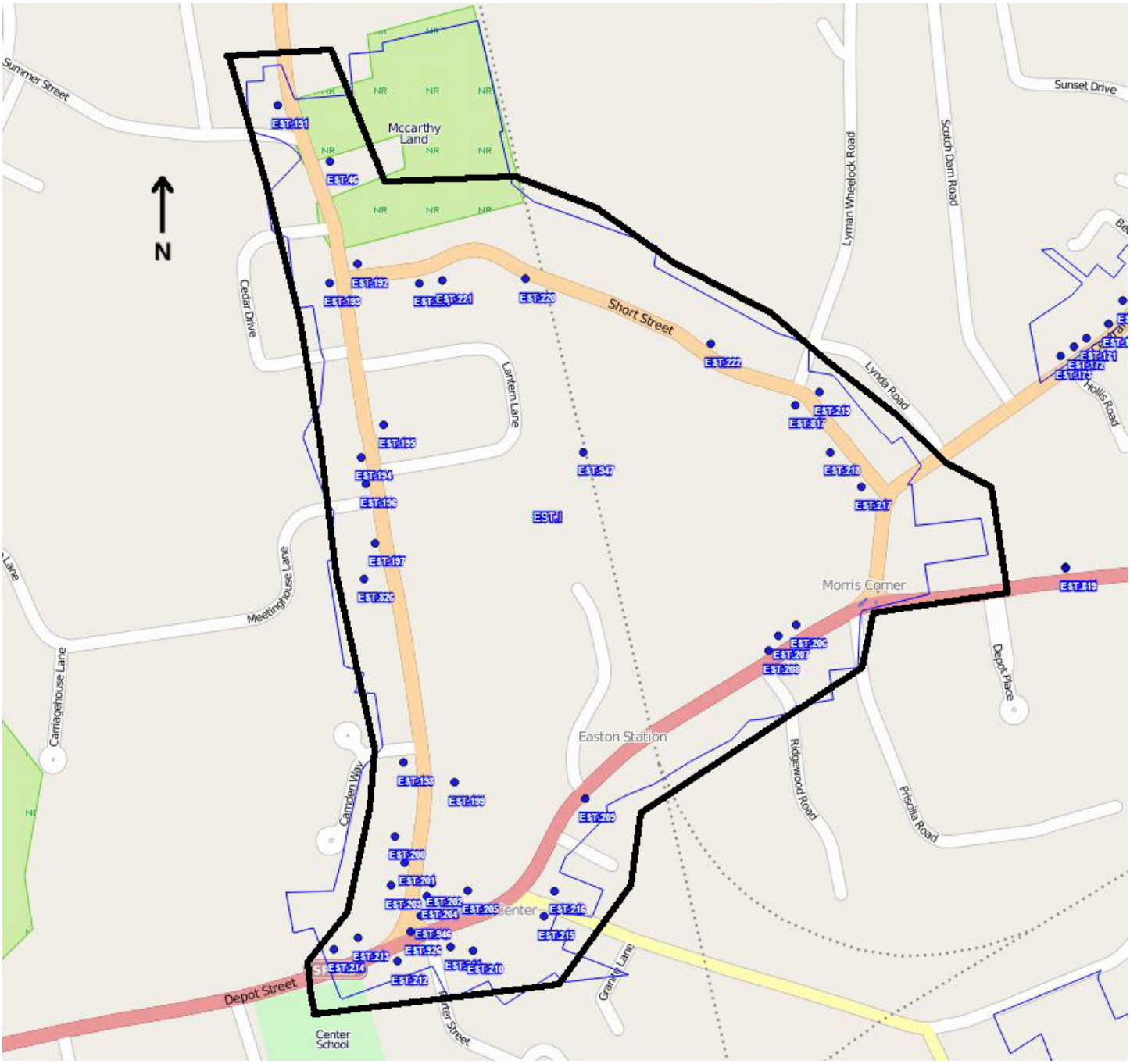
MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
EST.217	Residence	4 Short Street	ca. 1870	Vernacular		C
EST.218	Residence	14 Short Street	ca. 1900	Bungalow		C
EST.219	Residence	25 Short Street	ca. 1940	Cape Cod, Colonial Revival		C
EST.222	Howard, Oliver House	31 Short Street	ca. 1815	Federal		C
EST.220	Residence	76 Short Street	ca. 1840	Half Cape Cod, Colonial		C
EST.221	Residence	104 Short Street	ca. 1940	Cape Cod, Colonial Revival		C
EST.224	Residence	106 Short Street	ca. 1940	Cape Cod, Colonial Revival		C

C Contributing property to the district
NC Non-contributing property to the district

261 and 263 Depot Street (l-r), view looking southwest.

432 and 434 Center Street (l-r), view looking south.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta. http://maps.mhc-macris.net

FORM A - AREA
Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Boulevard
Boston, Massachusetts 02125

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Brockton	I	46, 817, 826, 190-191, 222, 926, 946, 947

Town Easton

Place Easton Center

Area Name Easton Center

Present Uses Residential/Civic

Construction Dates Ca. 1786-1990

Overall Condition
Fair to good

Major Intrusions and Alterations
Many modern buildings; synthetic siding; additions;

PHOTOGRAPH
(3"x3" or 3 1/2"x5" black and white only) Label photos on back with town and address for all buildings shown. Record film roll and negative numbers here on the form. Staple 1-2 photos to left side of form over this space. Attach additional photos to continuation sheets.

Roll Negatives

SKETCH MAP
Draw a map of the area indicating properties within it. Circle and number properties for which individual inventory forms exist. Label streets including route numbers, if any. Attach a continuation sheet if space is not sufficient here. Indicate north.

Acreage Approximately 250
Recorded by Sanford Johnson
Organization Massachusetts Historical Commission
Date (month/year) 9/98

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MASS. HIST. COMM

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

AREA FORM

ARCHITECTURAL DESCRIPTION ☑ *see continuation sheet*

Describe architectural, structural and landscape features and evaluate in terms of other areas in the community.

The Easton Center Area consists of Center Street from Depot to Summer Street, Depot Street from School Street to Short Street and all of Short Street. In the eighteenth century, it was the civic and social center of the town, however, those functions moved to the village of North Easton during the nineteenth century. The area is approximately 250 acres and is developed primarily with residences, a church, a store and two small cemeteries. A total of 58 historic resources exist among approximately 120 buildings, structures and objects. Historic resources date from the late 1700's to the late twentieth century. Land is wooded and flat with a small stream and disused railroad right-of-way bisecting the area. The predominant architectural style is the Victorian Eclectic but Federal, Greek Revival, Colonial Revival and a Bungalow building also exist. Workmanship and design quality are of a modest type, found in many farming towns developed during the period. Most residences are one or two stories and occupy spacious lots, formerly used for agriculture. The architectural landmark of the area is the 1885 Evangelical Congregational Church (MHC # 205) at the northeast corner of Center and Depot Streets. The Shingle style structure, larger and more ornate than all others in Easton Center, commands an important corner site. Another significant location is the northwest corner of Center and Depot Streets, where the town house stood until 1943. The former site of the town house is a large corner lot that is now occupied by a Ranch style residence. Between the two sites on an island in Center Street is the 1882 Civil War Monument (MHC # 926) which serves as the town's official symbol.

HISTORICAL NARRATIVE ☑ *see continuation sheet*

Explain historical development of the area. Discuss how this area relates to the historical development of the community.

PRE-INDUSTRIAL PERIOD 1723-1830

The Village of Easton Center has historically been the site of a church, local governmental activity and residential settlement but little commercial or industrial activity. The area's first church was built in 1750 and its successor building survives today. Town meetings were held in the meetinghouse until a town house was built for the purpose around 1830. Despite the efforts by town officials and voters to form a community center easily accessible to all residents, economic forces would prevail in determining that North Easton become the functional town center. Easton Center did not have enough natural, industrial or commercial attraction to bring people from other parts of town, as did the Ames Shovel Shop in North Easton (MHC Areas B, E), and so remains a village of secondary importance.

Settlement in Easton Center was begun around 1723 by Benjamin Drake who moved a mile north from Church Street in that year. Population increased slowly after the town voted narrowly in favor of building a meetinghouse at the central location in 1750. Religious and civic activities were then relocated to the northwest corner of Center and Depot Streets from Church Street. The Reverend Solomon Prentice had provided spiritual guidance at the original church since 1745 and continued in this new building. Roads in Easton Center were laid out from the 1710s to the 1730s and were improved around 1752, shortly after construction of the first Easton Center Meetinghouse. By the 1780s, residents had built the town pound on Depot Street and a powder house on Center Street near the meetinghouse, neither of which survives. The presence of the church is reflected on the 1795 Nathan Selee map of Easton, as is Depot Street (then called

BIBLIOGRAPHY and/or REFERENCE ☑ *see continuation sheet*

☑ *Recommended as a National Register District. If checked, you must attach a National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Town	**Property Address**
Easton	Center, Depot, Short, Purchase Streets
Area(s)	**Form No.**
Easton Center	I

ARCHITECTURAL DESCRIPTION

The most notable building in the Easton Center Area is the **Evangelical Congregational Church**, built in **1885 (MHC # 205)** to replace a previously burned church. The Shingle style building has a steeply pitched cross-gabled roof clad in slate shingles, walls shingled in stagger-butt pattern, stained glass lancet windows on the facade and a corner tower with pinnacles and blind gables. Large paneled doors with an arched hood and a band of stained glass above provide access to the vestibule. Projecting gables on the west and east sides expand the plan. The original tall slender spire with finial and weathervane has been removed from atop the tower and replaced with a shorter spire. Sympathetically designed entry porches have been added to the facade and the west side and a two story ell added at the east side. A small wood clapboard barn from the late nineteenth century survives behind the church and an outdoor chapel has been built in the wooded area nearby. While the church has been altered by construction of an entry porch, a side addition and removal of part of the tower, it remains in good condition.

The Federal style **William Reed House at 364 Depot Street (MHC # 212)** was constructed in 1786. The site is significant for its location across from the former town house and the Congregational Church. Also, the house looks directly at the Civil War Monument at the corner of Depot and Center Streets. Two chimneys mark the roofline of the five-bay by two-bay house with an ell expanding the plan at the rear. An attached barn bearing a plaque indicating the 1786 construction date is located at the east side. It is in good condition and is comparable in style to the **Edson House at 300 Center Street (MHC # 46, ca. 1800)** and the **Oliver Howard House** at **31 Short Street (MHC # 222, ca. 1815)**, the other Federal style residences in Easton Center. The Edson House is similar in form to the Reed House but is removed by nearly a mile from the principal intersection of the Center. The two and one-half-story, wood clapboard house has a ridge-hipped roof and a rear shed-roofed ell. The plan is a five-bay by two-bay plan with regular openings across the facade. A notable barn built in the nineteenth century with an ogee-form ventilator on the roof peak occupies the back yard. Stone walls surround the house and separate it from the large open fields on both sides. It is well-maintained and retains integrity of design and materials. The house at **31 Short Street (MHC # 222)** is also a Federal style farmhouse, built around 1815. The two and one-half-story building is built on a five-bay by two-bay plan with a one-story ell at the right side. The center entry is lit by a fanlight and is flanked by pilasters with a hood above. Other ornament includes gable returns and a molded cornice. A stone wall is at the front of the property line and a detached shed and garage are also on the lot.

Greek Revival style design is represented by the **Clark House at 285 Center Street (MHC # 190)**. The five-bay by two-bay, one and one-half-story cottage has been expanded at the rear with a one-story ell. Wood shingle siding, a center chimney and 12/12 double hung sash are distinctive features of the ca. 1840 building. Low stone walls lining the corner lot add to the historical appearance of the house. The **former Center Schoolhouse at 350 Depot Street, built 1856 (MHC # 210)**, is a front-gabled Greek Revival building ornamented with a prominent frieze, gable returns and corner pilasters. The three-bay building is clad in wood shingles and has a one-story ell at the left (east) side. It is set back from the road and now houses a musical instrument store. The **David Reed House** at **429 Center Street (MHC # 201, ca. 1840)** is a Greek Revival style residence oriented perpendicular to the road. The ca. 1840 five-bay, two-story cottage is enlarged by an ell at the left (west) side with attached two car garage. Decorative elements include the peaked window hoods over the 6/6 double-hung sash and the two gabled dormers. **Four hundred nine Center Street (MHC # 198, ca. 1850)** is a two-story, front-gabled house of three bays with a one and one-half-story rear addition. Gambrel dormers light the upper stories of the addition and 2/2 double-hung sash, extended on the first story, light the remainder of the house. A hipped porch covers the full width of the facade and is supported by jigsawn posts with classically molded caps. The exterior is clad in vinyl clapboards.

Three-fifty-four Depot Street (MHC #211) is a well-maintained, front-gabled Victorian Eclectic style home built around 1870. The three by two-bay plan is enlarged at the east side with a one-story, three sided bay window and by a hipped porch across the facade. The side-hall entry is a double-leaf door with hood mold. Windows are 2/2 double-hung sash, also with hoods and a paired arched sash exists in the gable peak. A molded cornice and gable returns further articulate the exterior, which is clad in vinyl clapboards. The **Mason House at 369 Depot Street (MHC #213, ca. 1870)** is a Victorian Eclectic style design typical of the neighborhood. The three by two-bay, front-gabled plan is expanded by a two-story bay at the right (east) side wall and a 3/4 width porch attached to the facade. Ornament consists mainly of the 2/2 double-hung sash with flat hoods and plain trim. An outbuilding built around 1900 occupies the back yard. Residences at **3 and 6 Purchase Street (MHC #s 215, 216)** are also well-maintained Victorian Eclectic style designs built around 1870. Both are two-story, front-gabled, three-bay forms clad in wood clapboards with ornamental window hoods and entry porches. Three Purchase Street is enlarged with projecting bays at the sides of the plan and has a detached two-bay garage. Six Purchase Street is distinguished by stone walls that line the perimeter of the corner lot. Another pair of

similar farmhouses is located at **347 and 348 Center Street (MHC #s 194, 195, ca. 1870, ca. 1890)**. Both are front-gabled, two-story residences with detached barns. The two-bay by three-bay plans are expanded by side ells and are ornamented with Victorian Eclectic elements such as Stick Style ornament, gable returns, corner pilasters and hooded windows. The foundation of 348 is brick and 347 is uncut stone. The side-hall entry at 347 has a Stick style hood and windows at 348 have molded cornices with hoods over the 2/2 double-hung sash.

Four-fourteen Center Street (MHC # 199, ca. 1920) is a large two and one-half-story Colonial Revival style house built around 1920. The five-bay by two-bay plan is enlarged by the attached garage. Windows are 12/12 double-hung sash with beaded trim and the center entry is ornamented with pilasters and a flat hood. A picket fence and stone wall mark the front of the property line. The house at **425 Center Street (MHC # 200)** was built around 1940 in the Bungalow form with a prominent shed dormer and gabled center entry porch with segmental arched ceiling. Windows are distinctive 4/1 double-hung sash which impart a Prairie style sensibility. A large side addition which shares the window type has been made to the south wall.

Many modern residences have been built in the area. The densest construction has been on Short Street which has six historic resources and 36 buildings. Intrusions exist elsewhere but not at this level of frequency. The other change that has detracted most from the area is the 1943 demolition of the town house at the northwest corner of Center and Depot Streets. The prominent corner lot is now occupied by a ranch style residence.

There are two cemeteries in Easton Center, both opened in 1803. Center Street is the site of the **Central Cemetery (MHC # 826)**, a plot of about two acres with approximately 150 markers in a variety of stone types. Slate is predominant on graves predating 1840 and many are cut with death's head motifs and poetic verse. After 1840, white limestone became common with urn and willow carvings. Six limestone obelisks about ten feet in height mark the graves of prominent residents. Granite stones appeared after the mid-nineteenth century and remain the most common stone type. An uncut stone retaining wall separates the burial ground from the road and several ornamental cedar trees are located with in the boundaries of the cemetery. The **Oliver Howard Cemetery (MHC # 817)** is on Short Street and contains approximately 12 headstones and five footstones in its half acre. Markers are made primarily of slate with four limestone examples. An uncut stone wall marks the edge of the graveyard, which is unornamented and contains burials from 1803 to 1835.

The **Civil War Monument (MHC # 926, 1882)** in the middle of Center Street at its intersection with Depot Street is the focal point of Easton Center. The granite statue of a soldier with rifle at parade rest is twenty-five feet tall and faces south from an island in Center Street. The square base, engraved with the names of 43 dead veterans, is surmounted by four columns supporting a second block ornamented with wreaths on four sides.

HISTORICAL NARRATIVE - PRE INDUSTRIAL PERIOD 1723-1830

Bridgewater Road). Center Street and Short Street do not appear, possibly because they were narrow paths only. The neighborhood's first school was built of wood in 1793 and replaced with a brick building in 1818. The 1750 church was replaced in 1817 on the same location northwest of the corner of Depot and Center Streets. A farmer and reverend named William Reed built the Federal style **Reed House** at **364 Depot Street (MHC # 212)** in 1786. Other resources built prior to 1830 include the **Oliver Howard House (MHC # 222** on Short Street in ca. 1815 and the Federal style residence at **300 Center Street (Edson House, MHC #46)**.

Two cemeteries were opened in the area in 1803. **The Oliver Howard Cemetery (MHC # 817)** on Short Street is the resting place of approximately twelve members of the Howard Family, interred between 1803 and 1835. The first burial was an unnamed Howard child in 1803, followed by two War of 1812 veterans named Asaph and Thomas Howard. Oliver Howard, himself a veteran, probably of the Revolution, was interred in 1835 at the age of 80. The **Central Cemetery** on **Center Street (MHC # 826)** was originally an agricultural field owned by Benjamin Bates. Bethuel Drake was the first of over two hundred interments in the cemetery by the end of the nineteenth century. Land for the Central Cemetery was allocated in 1803 to replace the **Church Street Old Burying Ground (MHC # 877)**, established around 1715.

EARLY INDUSTRIAL PERIOD 1830-1870

By 1830, a building used exclusively as a town house had been built across Depot Street from the second Congregational Meetinghouse building, constructed 1817. The 1830 map depicts the meetinghouse as a three-bay, front gabled building with a tower.

Center Street, connecting the growing industrial village of North Easton with Easton Center, was two and one quarter rods wide. This was exceeded only by the 3 1/2 to 4-rod width of the Boston to Taunton Turnpike, now Washington Street (State Route 138), and indicates the importance of the road between the center and the industrial village.

The 1818 brick school building was replaced again in 1856 with the building that is now located at **350 Depot Street (MHC # 210)** across from the **Evangelical Congregational Church (MHC # 205)**. The Greek Revival style school was built in 1856 and remained in use until 1931. It served for a short time as a Veterans of Foreign Wars meeting hall before being adapted for commercial use. At least five farmers, named Packard, Edson, Clark, Howard and Reed, occupied the neighborhood in 1830. The Packard Farm was located at the present site of the Easton Center School and was bought by the town in 1838 for use as the poor farm. The former **William Reed House** survives at **364 Depot Street (MHC # 212)**. Oliver Howard lived in the Federal style house at **31 Short Street (MHC # 222),** the Clark Family occupied the Greek Revival house at **285 Center Street (MHC # 190)** and the Edson family was at **300 Center Street (MHC #46).**

By 1851, the village had approximately 22 homeowners and perhaps 100 residents in addition to the poor house, church, school, pound, town house and cemeteries. Growth was slow in agricultural Easton Center because farming was not abundantly profitable compared to the industry in the village of North Easton. The **Old Colony Railroad (MHC #947)** entered Easton Center in 1866 when the company built a spur line through the town that left the main line near Canton and rejoined it at Taunton, but it failed to encourage large scale industry in Easton Center. The passenger and freight stations were west of Center Street and north of Depot. The rails are now gone and the right of way is a narrow path through the woods with no significant cuts, fills or bridges. By 1886, a blacksmithy, cider mill and a shop, possibly the Lackie and Davis Boot Shop, had been built in Easton Center. Despite the presence of the railroad and some small businesses, there was no post office in the neighborhood until 1893.

Several buildings from the mid-nineteenth century remain in Easton Center. The third **Center Schoolhouse** survives as a musical instrument store at **350 Depot Street (MHC # 210, 1856)**. The **Reed House at 429 Center Street (MHC # 201)**, built ca. 1840, also has Greek Revival style elements and was formerly the home of David Read. His widow lived here until around the turn of the 20th century when the occupant is noted as Miss Read, possibly a daughter. The house at **31 Short Street (MHC # 222)** is a Federal style residence built around 1815 by the farmer Oliver Howard. It was occupied in 1851 by T. Howard. The five by two-bay form with one-story right side ell remains unaltered from its appearance in a historic photo. Houses at **285 and at 314 Center Street (MHC #s 190, 192)** were built for farm families in the mid-nineteenth century, possibly for Daniel Clark and Miranda Howard, respectively. The Federal style **Edson House at 300 Center Street (MHC # 46)** was occupied by the Edson family from at least 1851 to 1871.

LATE INDUSTRIAL PERIOD 1870-1915

Easton Center was populated mostly by farmers in the Late Industrial Period in spite of its weak soil and being the civic center of the town. Some industries much smaller than those in North and South Easton existed and no stores are apparent in the historical record. Residents were most frequently farmers as noted in resident directory listings and by large lots still surrounding many of the homes. A post office was operated from only 1893 to 1910 at **429 Center Street (MHC # 201)**. The focus of the town in most respects had migrated to North Easton with the growth of the Ames Shovel Company **(MHC # 4, Area B)** in the Early Industrial Period.

The house at **285 Center Street (MHC # 190)** was built around 1840, possibly for the 1851 occupant D. Clark whose family remained here into the 1900s. Daniel A. Clark was a retired carpenter in 1889. His son, Daniel F. Clark, was working here as a carpenter and farmer by that time and remained on the property until after the turn of the century. The 1871 map indicates a carpenter shop just north of the Clark house which is no longer existent. The **Edson House at 300 Center Street (MHC # 46)** was occupied by another Clark family member by 1886. In 1871-1886, **31 Short Street (MHC # 222)** was the home of Jabez Mayall, a farmer who worked the land with his two sons James and Joseph. **Three-fourteen Center Street (MHC # 192)** was built in the mid-nineteenth century and was occupied by Miranda Howard in the 1880s. Ms. Howard was a soapmaker according to the resident directory from 1889. Two remarkably similar houses face each other across **Center Street at 347 and 348 (MHC #s 194, 195)**. Built in the third quarter of the nineteenth century, they were occupied by William A. Leonard and Mrs. H. L. Leonard in 1889. William Leonard worked as a heelmaker at the Ross Heel company on Washington Street in South Easton. A representative architectural design from the late nineteenth century is at **6 Purchase Street (MHC # 216)**. This was built around 1885 for a farmer named Stillman Lincoln

according to the resident directories from 1889 and 1911. A similarly designed home is across the street at **3 Purchase Street (MHC # 215)** and may have been built simultaneously.

Later nineteenth century buildings were typically built in the Victorian Eclectic style, except for the **Evangelical Congregational Church (MHC # 205)**, which is a large, ornate Shingle style design. It was built in 1883-1885 to replace a burned church built on this site in 1832. The church continues in use today but has been altered by the replacement of a shortened spire above the tower and the addition of shed porches at the front and side entries and a two-story addition at the east side of the building. A relocated rail-related outbuilding and a wooded meeting area with a gazebo are in the back of the church yard. A new alms house with barn was built in 1874 on the current site of the Center School on School Street. It was under the care of Charlie Scott in 1906 and remained an active farm until 1940. One of the town's two lock-ups was built of brick at the alms house in 1886, the other being in North Easton. The Easton Center Post Office, opened in 1893, operated only until 1910 at the **David Reed House (429 Center Street, MHC # 201),** when services moved to South Easton. **The Civil War Monument (MHC # 926)**, erected 1882 at the corner of Center and Depot Streets remains as an indication of the significance Easton Center once enjoyed. Forty-three names of dead veterans are inscribed on the square granite base. The statue of a soldier with rifle at parade rest is twenty-five feet tall and serves as the town's municipal symbol.

The presence of the street railway beginning in 1899 did not inspire a great deal of suburban development and survived for only a decade in this part of town. It was a part of the Mansfield and Easton Street Railway system that entered the Center from the west on Depot Street and turned north on Center Street. This streetcar line was one of two in town and connected Easton Center with Brockton, Stoughton and Raynham and Mansfield during the years 1899-1909. The other was the Brockton and Taunton line which served the vicinity of North Easton and South Easton and endured until 1932. The **Old Colony Railroad (MHC #947),** built a branch from Easton Center to Eastondale in 1888 along Purchase Street, five years after which all trackage in Easton was leased by the New York, New Haven and Hartford Railroad. From the time of the construction of the Old Colony Railroad in 1866 until after the mid-twentieth century, the Easton Center Depot was located east of Center Street and south of Short Street. Access was from Center Street. This was just to the south of the cider mill which was built around 1870 but no longer survives.

EARLY MODERN PERIOD 1915-1945

There were surely farmers left in the area during this period but it was at this time that they began to be joined by non-agricultural workers. By 1920, residents of Easton Center included a clerk named Clifton Ripley and his wife Ruth near **263 Depot Street (MHC # 208)**, a manufacturer of lasts (shoe patterns) named Fred Clapp at **3 Purchase Street (MHC # 215)**, a shovel factory worker named George Mason near **369 Depot Street (MHC # 213)** and a wood chopper named D. Washburn on Central near Short Street. The occupations of these residents probably necessitated daily travel to their jobs. The shovelworker George Mason most likely had to get to the Ames Shovel Company **(MHC # 4, Area B)** in North Easton, as did the clerk Ripley. The street railway in this part of town had gone out of business in 1909, indicating the likelihood of travel by automobile. Despite the presence of streetcars and automobiles, residential construction during the twentieth century was slow. The Colonial Revival style house at **414 Center Street (MHC # 199),** built around 1920 and **425 Center Street, (MHC #200, ca. 1940)** are early representatives of the trend toward suburban development in the area. Four fourteen Center Street has an attached garage indicating the automobile oriented nature of the owner.

Cape Cod Houses built in the 1940s are present in the area at **25 Short Street (MHC # 219), 367 Center Street (MHC # 197)** 224 **104 and 106 Short Street (MHC # 221, ~~191~~)**. These are modest-scaled three and five-bay, side-gabled residences clad in wood clapboards and shingles. Most have 6/6 double-hung sash and the house at **106 Short Street (MHC # ~~191~~)** has a multiple pane 224 picture window in the facade. Suburban construction of this type also took place off Central Street on Hollis Street in ca. 1948.

The **Old Colony Railroad (MHC #947),** after 1893 part of the New York, New Haven and Hartford, went bankrupt in 1935 and was reorganized in 1947. The alms house was in use by the town as a farm until the poor were moved to Middleborough in 1940. The house, barn and lock-up were sold in 1942 and later demolished to make way for the Center School. Demolition of the town hall at the northwest corner of Center and Depot Streets occurred in 1943 with subsequent town meetings held at the high school gym. In 1925, the **Evangelical Congregational Church (MHC # 205)** vestry was the site of a Ku Klux Klan rally of several hundred men, according to recollections of a resident mentioned in the book "Easton's Neighborhoods".

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Town
Easton

Property Address
Center, Depot, Short, Purchase Streets

Area(s)
Easton Center

Form No.
I

MODERN PERIOD 1945-1960

The New York, New Haven and Hartford Railroad went bankrupt again in 1961, was reorganized as part of the giant Penn Central Company in 1968. Service south of Easton Center was stopped at that time. A large number of homes was built between 1963 and 1975 according to USGS maps from those years. Split-level, Neo-Colonial, Garrison and other late twentieth century styles occupy the area. Short Street has experienced the highest degree of recent development but the surviving resources continue to impart a sense of the historic appearance of Easton Center. Large yards recall agricultural fields that surrounded the farms and the busy intersection of Center and Depot Streets helps recall the town's formerly principal civic focus, Easton Center.

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
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Boston, Massachusetts 02125

Town	**Property Address**
Easton	Center, Depot, Short, Purchase Streets
Area(s)	**Form No.**
Easton Center	I

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220 Morrissey Boulevard
Boston, Massachusetts 02125

Community Easton

Property Address Center, Short, Depot Streets

Area(s) Easton Center

Form No. I

National Register of Historic Places Criteria Statement Form

Check all that apply:

Individually eligible Eligible only in a historic district

Contributing to a potential historic district Potential historic district X

Criteria: X A B X C D

Criteria considerations: A B C D E F G

Statement of significance by: Sanford Johnson

The criteria that are checked in the above sections must be justified here.

The Easton Center Area is eligible for the National Register of Historic Places as a district under criteria A and C. The neighborhood contains elements of its nineteenth century residential, civic and agricultural activities on Depot, Short and Center Streets. The focus of the district is at the intersection of Depot and Center Streets, now the location of the Evangelical Congregational Church and the granite Civil War Monument. The town hall had stood at the northwest corner of until the 1940s. In addition to the church and statue, there are Federal, Greek Revival, Victorian Eclectic, Colonial Revival and Cape Cod style residences. Resources retain integrity of design and association and are eligible at the local level.

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Town Easton
Property Address Center, Depot, Short, Purchase Streets
Area(s) Easton Center
Form No. I

Modern Buildings are not Represented on District Data Sheet

Inv#	St#	Street Name	Property Name	Date	Architectural Style
946	434	Center Street	Granite Marker	1974	N/A
205		Depot Street	Congregational Church	1885	Shingle
206	259	Depot Street	House	ca. 1860	No Style
207	261	Depot Street	House	ca. 1860	No Style
208	263	Depot Street	Ripley House	ca. 1840	No Style
	263	Depot Street	Shed	ca. 1900	No Style
209	336	Depot Street	House	ca. 1840	No Style
	336	Depot Street	Garage	ca. 1940	No Style
210	350	Depot Street	Former Center Schoolhouse	1856	Greek Revival
211	354	Depot Street	House	ca. 1870	Victorian Eclectic
212	364	Depot Street	William Reed House	1786	Federal
	364	Depot Street	Barn	ca. 1900	No Style
213	369	Depot Street	Mason House	ca. 1870	Victorian Eclectic
	369	Depot Street	Shed	ca. 1900	No Style
214	375	Depot Street	House	ca. 1860	Victorian Eclectic
215	3	Purchase Street	Clapp House	ca.1870	Victorian Eclectic
	3	Purchase Street	Garage	ca. 1940	No Style
216	6	Purchase Street	Stillman Lincoln House	ca. 1870	Victorian Eclectic
	6	Purchase Street	Stone wall	ca. 1900	N/A
817		Short Street	Oliver Howard Cemetery	1803	N/A
217	4	Short Street	House	ca. 1870	Victorian Eclectic
218	14	Short Street	House	ca. 1900	Bungalow
219	25	Short Street	House	ca. 1940	Cape Cod
222	31	Short Street	Oliver Howard House	ca. 1815	Federal
220	76	Short Street	House	ca. 1840	No Style
221	104	Short Street	House	ca. 1940	Cape Cod
~~191~~ 224	106	Short Street	House	ca. 1940	Cape Cod

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
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Boston, Massachusetts 02125

Town
Easton

Property Address
Center, Depot, Short, Purchase Streets

Area(s)
Easton Center

Form No.
I

Modern Buildings are not Represented on District Data Sheet

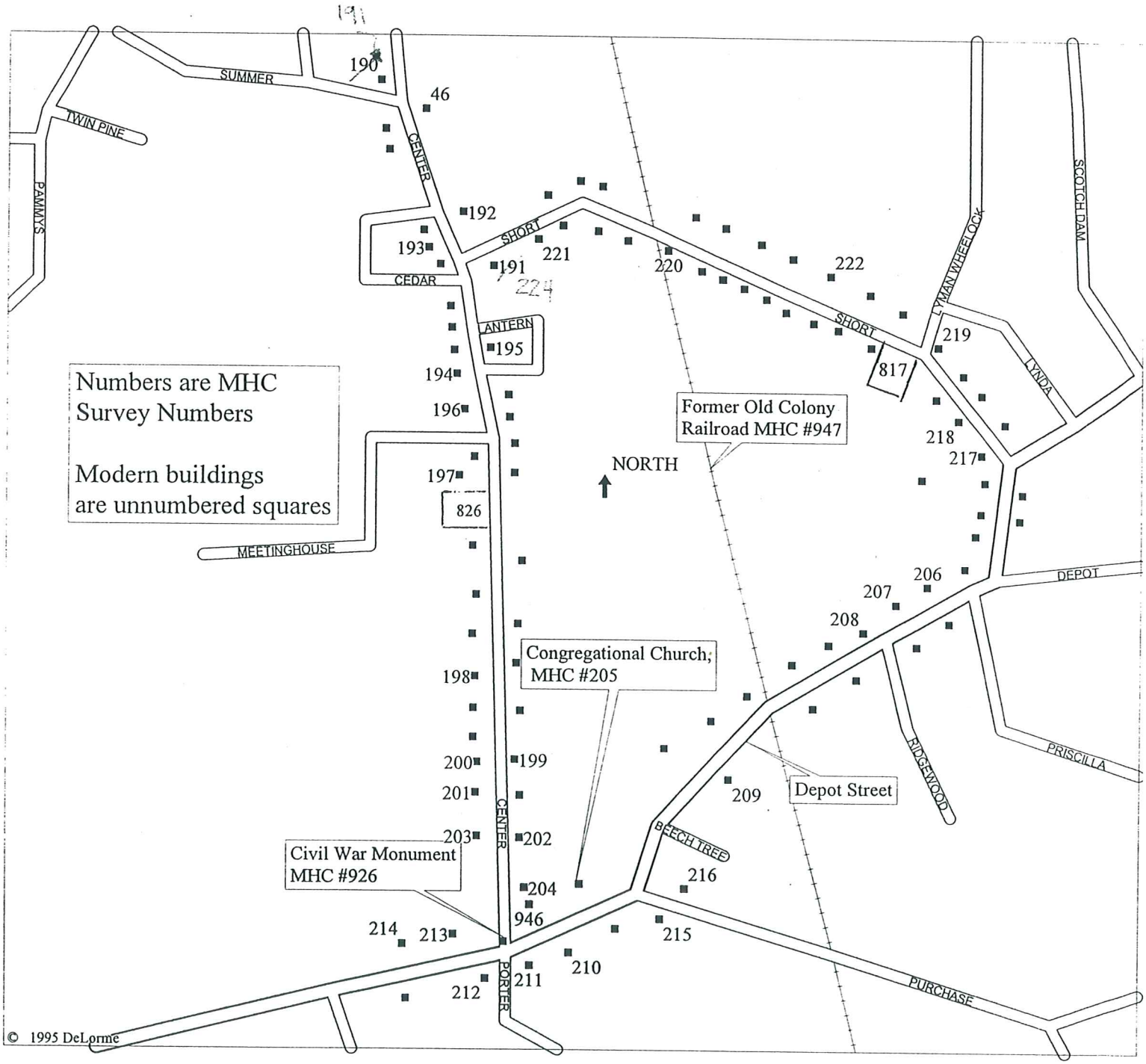
Inv#	St#	Street Name	Property Name	Date	Architectural Style
947			Former Old Colony RR	1866	N/A
826		Center Street	Central Cemetery	1803	N/A
926		Center Street	Civil War Monument	1882	N/A
~~190~~ 191		285 Center Street	Clark House	ca. 1840	Greek Revival
		285 Center Street	Stone Wall	ca. 1900	N/A
46		300 Center Street	Edson House	ca. 1800	Federal
		300 Center Street	Barn	ca. 1900	No Style
		300 Center Street	Stone Wall	ca. 1900	N/A
192		314 Center Street	Miranda Howard House	ca. 1840	No Style
193		321 Center Street	House	ca. 1850	Greek Revival
		321 Center Street	Barn	ca. 1890	Victorian Eclectic
		321 Center Street	Stone Wall	ca. 1900	N/A
194		347 Center Street	Wm. Leonard House	ca. 1870	Victorian Eclectic
		347 Center Street	Barn	ca. 1900	Victorian Eclectic
195		348 Center Street	H. L. Leonard House	ca. 1890	Victorian Eclectic
		348 Center Street	Barn	ca. 1900	Victorian Eclectic
196		349 Center Street	House	ca. 1870	Victorian Eclectic
		349 Center Street	Barn	ca.1870	No Style
197		367 Center Street	House	ca. 1940	Cape Cod
198		409 Center Street	House	ca. 1850	Victorian Eclectic
		409 Center Street	Barn	ca. 1970	No Style
		409 Center Street	Stone wall	ca. 1900	N/A
199		414 Center Street	House	ca. 1920	Colonial Revival
200		425 Center Street	House	ca. 1940	Bungalow
		425 Center Street	Garage	ca. 1940	No Style
201		429 Center Street	David Reed House	ca. 1840	Greek Revival
202		432 Center Street	House	ca. 1860	Victorian Eclectic
		432 Center Street	Garage	ca. 1940	No Style
203		433 Center Street	House	ca. 1860	Victorian Eclectic
		433 Center Street	Shed	ca. 1900	No Style
204		434 Center Street	House	ca. 1860	Victorian Eclectic

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Town	**Property Address**
Easton	Center, Depot, Short, Purchase Streets
Area(s)	**Form No.**
Easton Center	I

Modern Buildings are Unnumbered Squares



INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
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Boston, MA 02125

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Easton	Center, Depot, Short Purchase Streets

Area(s)	Form No.
Easton Center	I

INVENTORY FORM CONTINUATION SHEET

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Town
Easton

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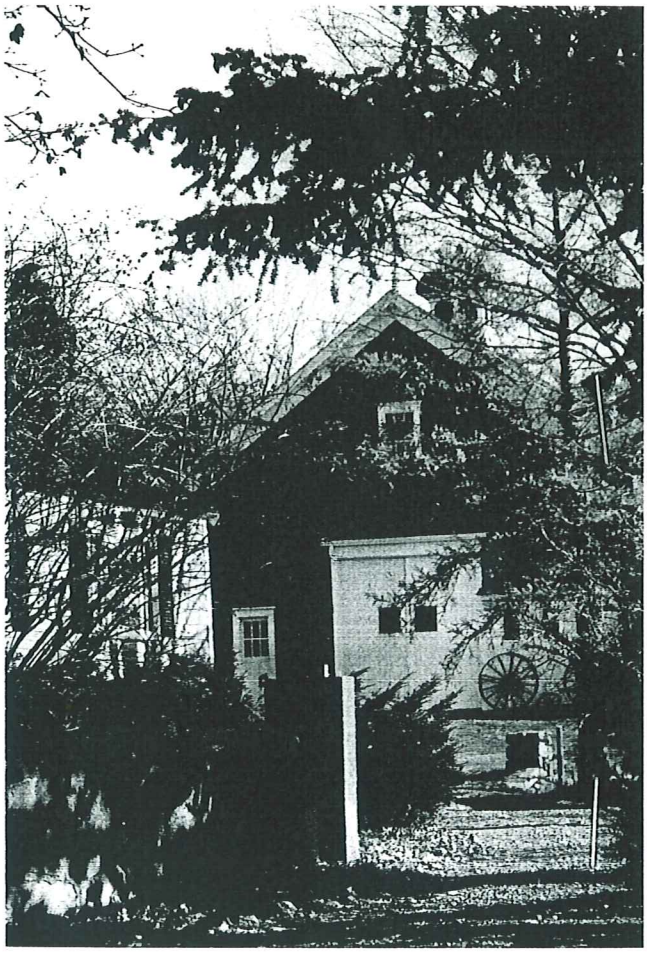
Easton Center	I



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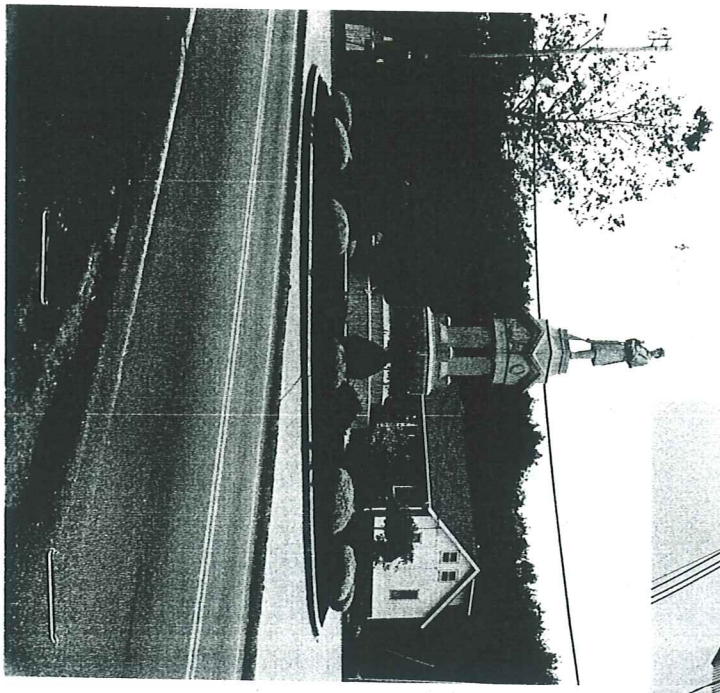
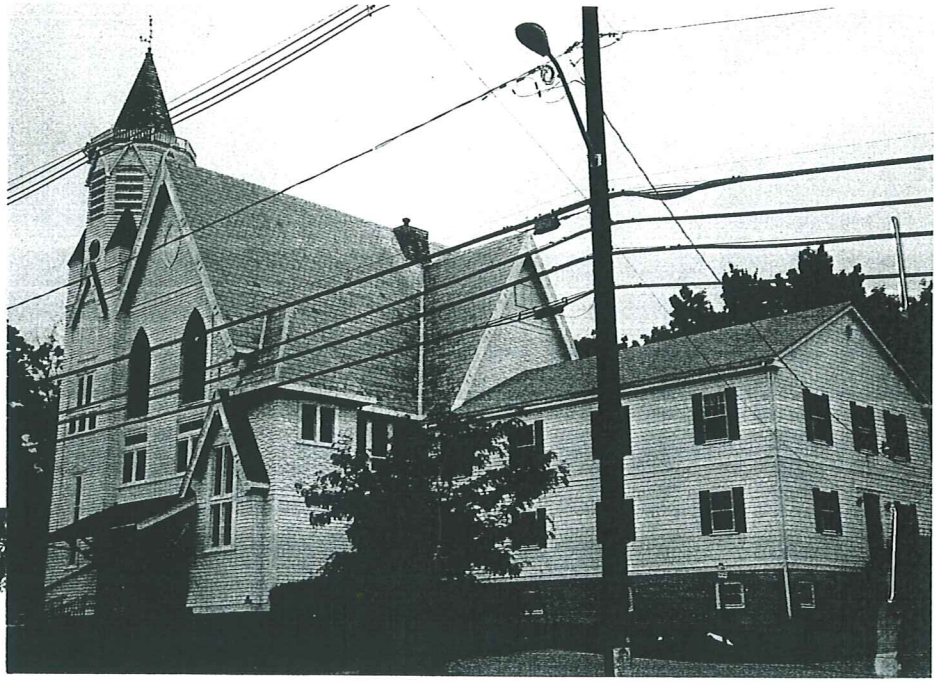
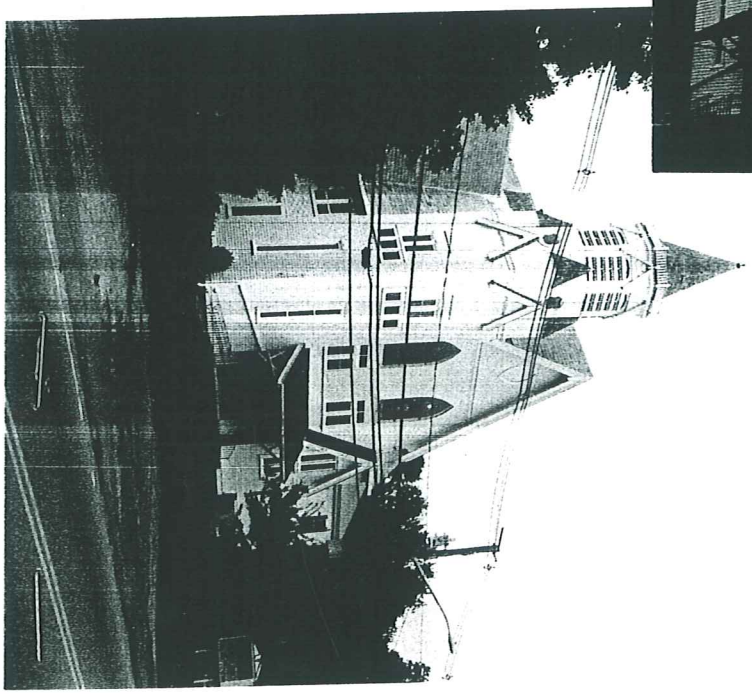
Easton Center	I







INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
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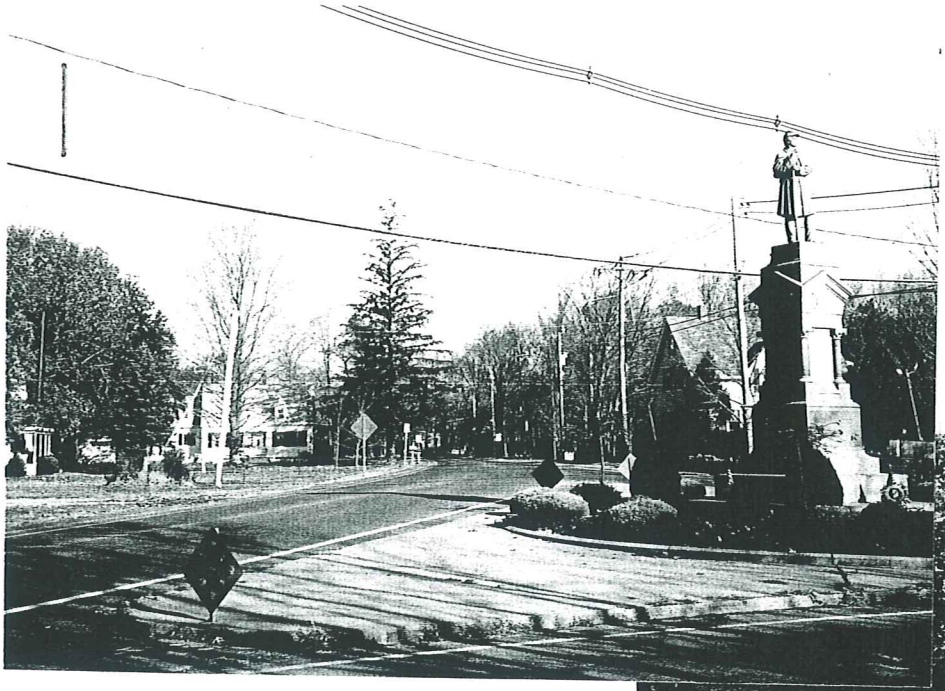
Boston, Massachusetts 02125

Town	**Property Address**
Easton	Center, Depot, Short, Purchase Streets
Area(s)	**Form No.**
Easton Center	I



Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form for Hayward-Pool Area, EST.K.

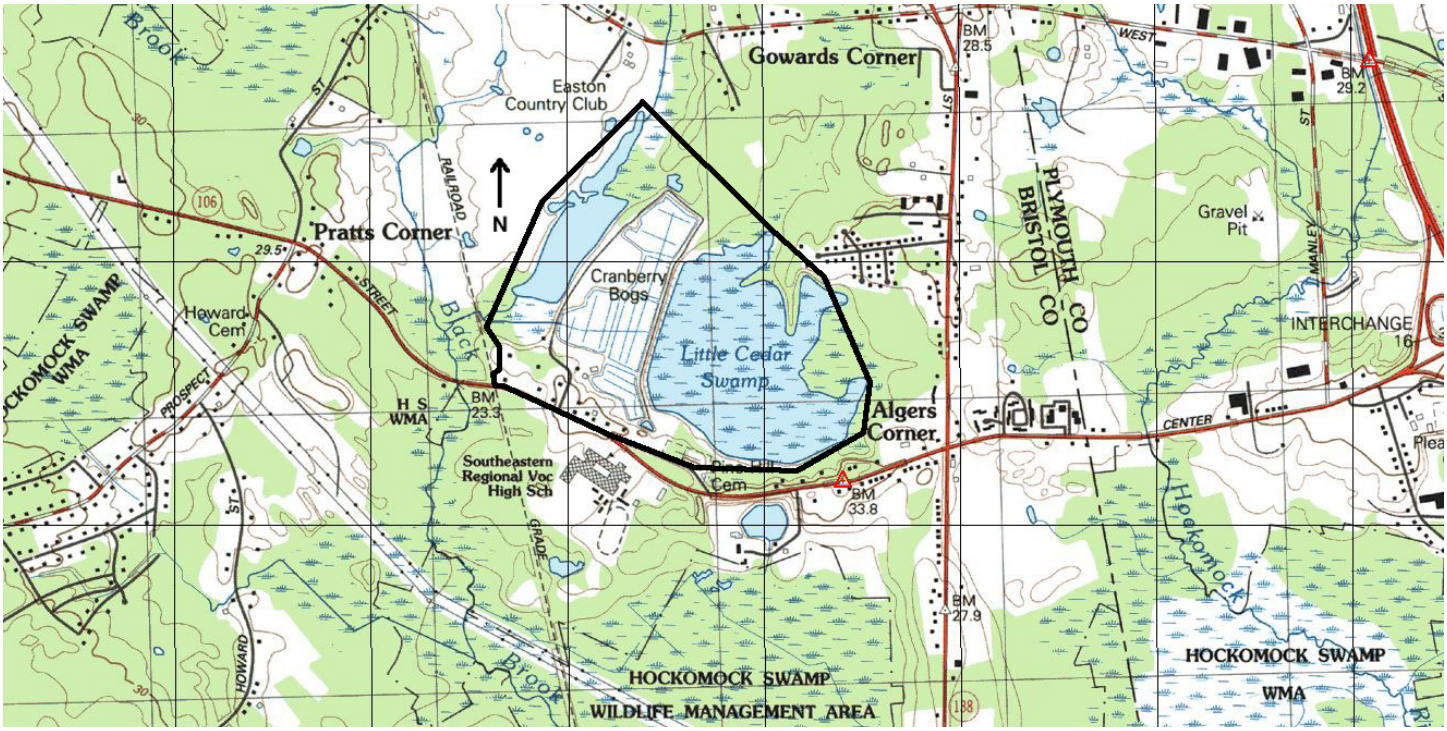
ARCHITECTURAL DESCRIPTION (Continued)

A field survey in December 2012 verified that the Hayward-Pool Area appears to be largely unchanged since it was previously surveyed in 1998. The survey confirmed that there are at least 10 contributing properties of high architectural and historical integrity. Due to access restrictions, a site visit to the Morse Brothers Cranberry Bog (EST.948), which includes Morse Brothers Company Building #1 (EST.252), Morse Brothers Company Building #2 (EST.253), Morse Brothers Company Shed #1 (EST.252), and Morse Brothers Company Shed #2 (EST.252) was not possible to complete photography and documentation and to determine integrity. The Area Data Sheet reflects the most current updates for all properties within the area that are listed in the MHC Inventory. The survey confirmed that the Hayward-Pool Area is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C for its association with nineteenth-century residential, agricultural, and light industrial activities in Easton and for its well-preserved collection of residential architecture in the Colonial, Federal, Greek Revival, and Colonial Revival styles.

BIBLIOGRAPHY and/or REFERENCES (Continued)

Johnson, Sanford
1998 *MHC Form A: Hayward-Pool Area*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

LOCUS MAP



AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

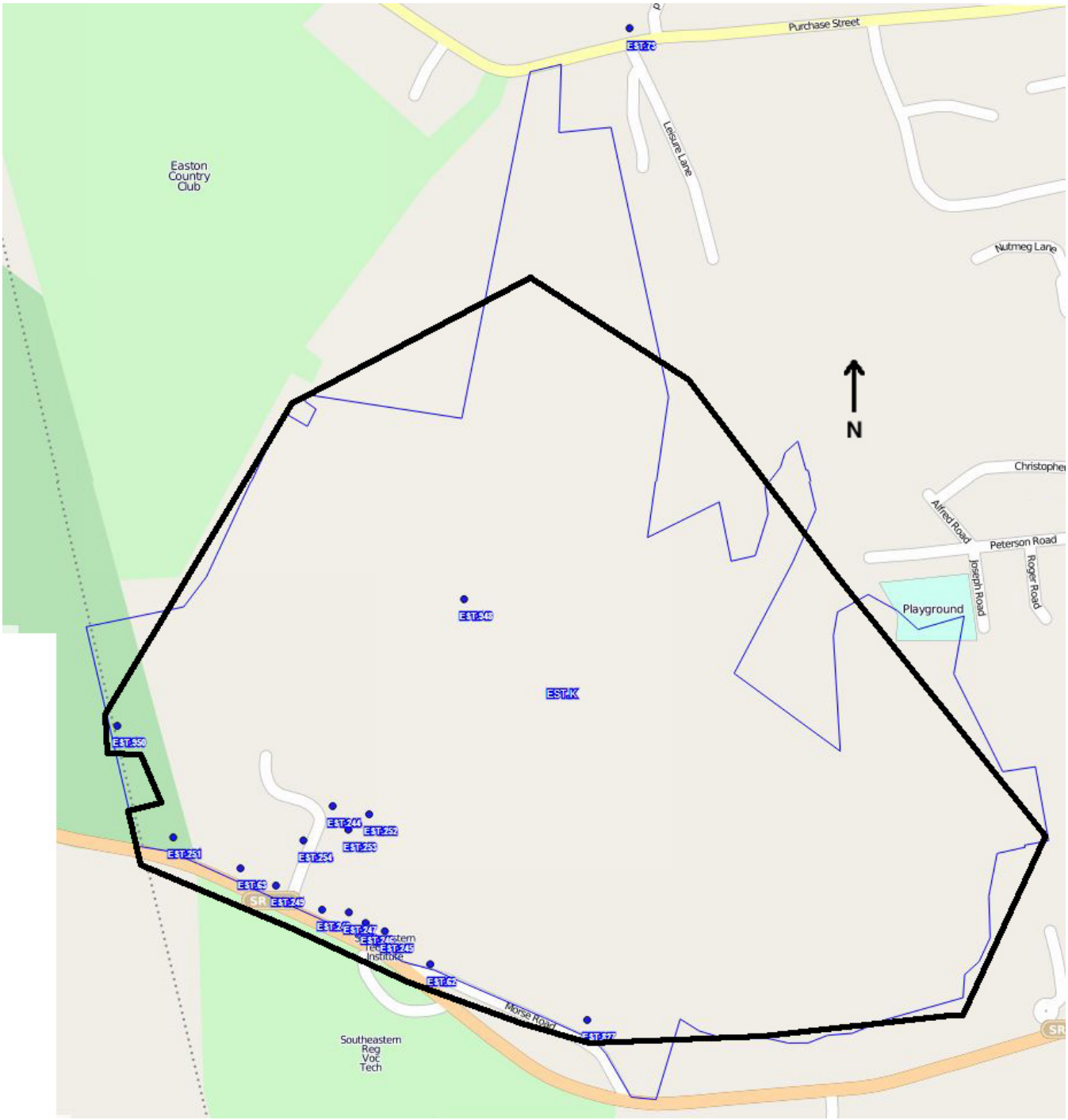
MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
EST.948	Morse Brothers Cranberry Bog	Foundry Street	1910			C
EST.252	Morse Brothers Cranberry Company Building #1	Foundry Street	1910	Colonial Revival		C
EST.253	Morse Brothers Cranberry Company Building #2	Foundry Street	1910	Colonial Revival		C
EST.254	Morse Brothers Cranberry Company Shed #1	Foundry Street	1910	Colonial Revival		C
EST.244	Morse Brothers Cranberry Company Shed #2	Foundry Street	1910	Colonial Revival		C
EST.950	Old Colony Railroad	Foundry Street	1866			C
EST.62	Red, The House	227 Foundry Street	1778	Federal		C
EST.245	Hayward, Edward, R. House	239 Foundry Street	1870	Italianate	1	C
EST.246	Hayward, Harold – Gershman House	243Foundry Street	1928	Colonial Revival	1	C
EST.247	Hayward, Edward B. House	247 Foundry Street	1880	Queen Anne	2	C
EST.248	Hayward, Joseph Jr. House	261 Foundry Street	1810	Federal		C
EST.249	Pool, Harrison House	263 Foundry Street	1870	Greek Revival		C
EST.63	Poule House	269 Foundry Street	1780	Colonial		C
EST.251	Hayward, Edward – Pool, Dea. Samuel House	285 Foundry Street	1770	Colonial		C
EST.827	Pine Grove Cemetery	Morse Road	1796			C

C Contributing property to the district
NC Non-contributing property to the district

Edward B. Hayward House (EST.247), view looking north.

Harold Hayward – Gershman House (EST.246) and Edward Hayward, R. House (EST.245) (l-r), view looking northwest.

AREA MAP

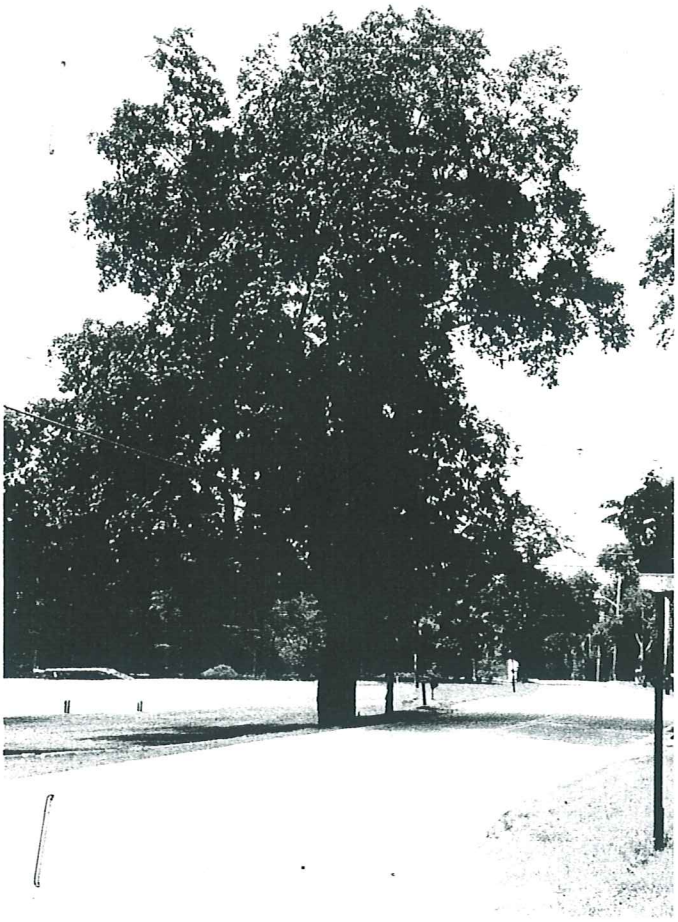


- MHC Inventory
- National Register Listed
- = area boundary
  *not to scale

Information from MACRIS Maps 2.0 Beta. http://maps.mhc-macris.net/

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Brockton	K	62, 63, 244-254, 827, 947, 948



Town Easton

Place

Area Name Hayward-Pool Area

Present Uses Residential, Agricultural, Burial Ground

Construction Dates 1770-1928

Overall Condition
Good-Excellent

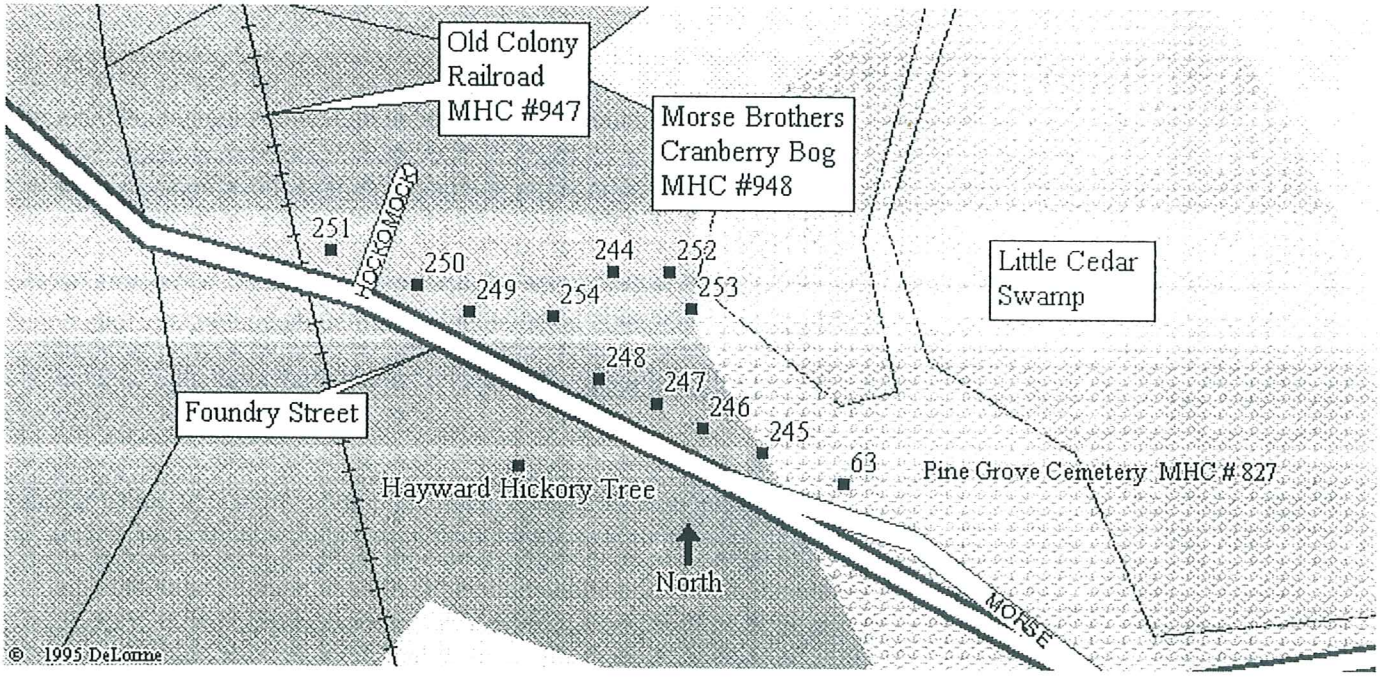
Major Intrusions and Alterations

Acreage Approximately 60

Recorded by Sanford Johnson

Organization Easton Historical Commission

Date (month/year) 7/98



Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

AREA FORM

ARCHITECTURAL DESCRIPTION ☑ *see continuation sheet*

Describe architectural, structural and landscape features and evaluate in terms of other areas in the community.

The Hayward-Pool Area is named for two families who settled the area around 1713. The landscape is wooded rolling hills with a cranberry bog and cedar swamp at the north side, totaling about 60 acres. The area is on the north side of Foundry Street and includes the former Old Colony Railroad at its western end and the Pine Grove Cemetery at the east end of Morse Road. The length of Morse Road runs parallel to Foundry Street for approximately one quarter mile at the eastern end of the area. Resource types include residences, barns, stone walls, a cranberry bog with four associated structures and a cemetery. Building styles are Colonial, Federal, Greek Revival, Shingle, Victorian Eclectic and Colonial Revival, rendered in wood. Land use has been agricultural, light industrial and is now mainly residential with the exception of the cranberry bog. Buildings in the area are located on large adjacent lots on the north side of Foundry Street, imparting a linear village sensibility. The lack of a crossroads precludes a sense of geographical depth. Buildings are in good to excellent condition and retain integrity of design, materials and setting in most cases. The modern vocational school adjacent to the southern edge of the area is of a far larger scale than homes in the neighborhood.

The 1778 Joseph Hayward "Red House" at 227 Foundry Street (MHC #63) is a Federal style design of five bays and two and one-half stories with a large center chimney. The two-room plan is expanded by an attached Colonial Revival style garage with arched doorway. Distinctive elements include the 12/12 double-hung sash and Federal entry surround. Walls are clad in vinyl clapboards, the roof in asphalt shingles and the foundation is built of cut granite. A barn was attached to the east side of the house according to an 1895 map but does not survive. The house is in good condition.

HISTORICAL NARRATIVE ☑ *see continuation sheet*

Explain historical development of the area. Discuss how this area relates to the historical development of the community.

PRE INDUSTRIAL PERIOD 1713-1830

The history of the Hayward-Pool Area is characterized primarily by agricultural activities carried out amid light industry such as sawmilling and precision measuring instrument manufacture. European settlement in the area was carried out by residents moving east from Alger's Corner (Foundry and Prospect Streets) and west from Pratt's Corner (Foundry and Washington Streets) in the early 1700s. Edward and Hannah Hayward built a house around 1713 on the site of 227 Foundry Street in order to harvest the marsh hay and cedar trees growing to the north and to dig clay for bricks. The swampy ground also provided an opportunity to manufacture iron products from bog iron. Sons of the Haywards, Edward Jr. and Joseph, had both built houses in the area by 1780 and continued to harvest the marsh hay and cedar trees. Foundry Street had been extended as a town way by 1782 between the Red House (227 Foundry Street, MHC #63) and Prospect Street. By 1830 there were at least three houses between Prospect and Turnpike Streets, (227, 261, 285 Foundry Street, MHC #s 63, 248, 251) occupied by Haywards and by selectman John Pool. A variety of small scale industries, including sawmilling by George Washington Hayward, and precision measuring instrument manufacture by John and Horace Pool, had begun operations in the area by 1830 which continued into the early twentieth century.

BIBLIOGRAPHY and/or REFERENCE ☑ *see continuation sheet*

☑ *Recommended as a National Register District. If checked, you must attach a National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

Town	**Property Address**
Easton	Foundry, Morse Streets

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Area(s)	**Form No.**
Hayward - Pool	K

ARCHITECTURAL DESCRIPTION

The **Joseph Hayward Jr. House** at **261 Foundry Street, (MHC # 248)** built ca. 1810, is one of three side-gabled, one and one-half-story cottages in the area. The Federal style five-bay facade is lit by 12/12 double-hung sash placed close to the eave and the center entry is ornamented by pilasters and a frieze. A large brick chimney marks the center of the roofline. Wood shingled walls are supported by the cut granite foundation. An expanse of grassy yard separates the house with detached 19th century barn from its neighbors. The buildings are in good condition and retain integrity of setting and materials. The ca. 1850 **Horace M. Pool House at 269 Foundry Street (MHC # 250)** is a Greek cottage similar to 261 Foundry Street. The five-bay facade is lit by 6/6 double-hung sash and has a center entry with full-length sidelights. Wood clapboards sheath the facade and wood shingles are on the side elevations. The attached barn and large yard remain from the period of agricultural use. A third cottage is located at **285 Foundry Street (Edward Hayward/Deacon Pool House, MHC # 251)** and is the oldest of the group, built around 1770. The Colonial style house has a center chimney, 2/2 double-hung sash very close to the overhanging eave and a jetty on the gable ends. It is clad in wood clapboard and expanded at the rear by a one-story addition.

The **Edward R. Hayward House at 239 Foundry Street (MHC # 245)** is a two and one-half-story Victorian Eclectic style residence built around 1870. The side-gabled plan is expanded by a one-story ell at the right (east) elevation and by two bays on the first story of the facade. Round-headed sash light the gable peaks. Walls are clad in vinyl clapboards and windows are 1/1 modern sash. The **Edward B. Hayward House at 247 Foundry Street (MHC # 247)** is a large ornate Shingle style residence built for the civil engineer and surveyor around 1880. The three bay, cross-gabled plan is three bays deep and is expanded by porches at the facade and left (west) elevation. Decorative elements include the stagger butt pattern shingles, turned porch posts with jigsawn brackets, vergeboards and a wide frieze. A front-gabled barn built in the 19th century is attached at the right side of the well-maintained house. The scale and level of ornament mark this as the architectural centerpiece of the Hayward-Pool Area. The **Harrison Pool House at 263 Foundry Street (MHC # 249)** is a one and one-half story, front gabled Victorian Eclectic style residence built around 1870. The three-bay by two-bay plan is expanded by a left side ell with a modern shed dormer on the front slope of the roof. The house has been altered by the addition of vinyl siding and 1/1 double-hung sash. A high stone wall that may have been part of a barn foundation occupies the back yard.

The buildings of the **Morse Brothers Cranberry Bog (MHC # 244)** appear to have been built around 1910 when the bog was first commercially harvested. The two wood clapboard structures at the driveway are one-story, pyramidal hipped forms with 12/12 double-hung sash, but, few other distinguishing elements. A pair of two-story wood shingled buildings are located further north of Foundry Street and appear to serve as storage and administration offices. These are located at the western edge of the bog and may post-date the original bog-related buildings. The bog is wet, low-lying ground adjacent to the little Cedar Swamp.

The **Hayward/Gershman House at 243 Foundry Street (MHC # 246)** is a Colonial Revival style residence built in 1928. The side-gabled, two and one-half-story wood-shingled building is ornamented with a Colonial Revival center entry porch with gabled roof and segmental arched ceiling. A one-story enclosed porch occupies the left (west) wall and is topped by a balustrade. Windows are 6/6 double-hung sash and two chimneys mark the roofline. A detached wood shingled garage is in the back yard and may have been built during the first half of the twentieth century.

The **Pine Grove Cemetery (MHC #827)** is at the eastern end of Morse Street and occupies approximately one acre of flat ground surrounded by pine forest. A cast-iron gate set in concrete footings marks the entry to the cemetery which contains approximately 100 stones cut in slate, limestone and granite. Three limestone obelisks mark the resting places of some of the more prosperous residents which include many Pool and Hayward family members. A low stone wall separates the burial ground from the road.

The Hayward-Pool Area is a cohesive group of residences with a strong historical association to one another through shared family ownership. The distinct boundaries and lack of intrusions and alterations on the north side of Foundry Street facilitate the historic appearance of the neighborhood.

INVENTORY FORM CONTINUATION SHEET

Town	**Property Address**
Easton	Foundry, Morse Streets

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Boston, Massachusetts 02125

Area(s)	**Form No.**
Hayward - Pool	K

HISTORICAL NARRATIVE - PRE INDUSTRIAL PERIOD - 1713-1830

The **Edward Hayward/Deacon Samuel Pool House at 285 Foundry Street (MHC #251)** may have been built around 1770. The Deacon (1736-1830) occupied the house until his death and it was later owned by selectman, town clerk and treasurer, John Pool (1769-1865). Mr. Pool was the father of the founders of the measuring instrument company, John Jr. and Horace Pool. The **"Red House" at 227 Foundry Street (MHC # 63)** was built in 1778 for the lumberman and farmer Joseph Hayward (1738-1825) who donated land for the **Pine Grove Cemetery in 1796 (MHC # 827),** in which many members of both the Hayward and Pool families are buried. The **Joseph Hayward Jr. House at 261 Foundry Street (MHC #248)** was built around 1810 and was occupied by Joseph's descendants who farmed the land until 1996. The property remains in the Hayward family.

EARLY INDUSTRIAL PERIOD 1830-1870

By 1830, North Easton, South Easton and the Foundry Village had all been industrialized to a large degree while the Hayward-Pool area was not noted as such on the map published in that year. This is explained by the relatively small scale of the operations here in comparison to the other villages. The John and H. M. Pool Company, makers of surveying, leveling and other precision measuring instruments, were the principal industrialists in the neighborhood and employed only three to eight people during the 1800s. The company's products included levels, theodolites, protractors, compasses, gunsights and measuring chains. Production began around 1825 and continued into the twentieth century with products being recognized for quality of manufacture by mechanics' groups over a long period of time. One of the family members branched into the manufacture of thermometers in mid-century at Alger's Corner. The H. M. Pool surveying instrument company was based in a building no longer extant between **285 and 269 Foundry Street (MHC #s 251, 250)** as seen by instrument and thermometer glass still on the ground.

The **Harrison Pool House at 263 Foundry Street (MHC #249)**, built around 1850 for Mr. Pool (1816-1869), was later occupied by John M. Pool (1824-1904) who operated the instrument factory two doors to the west. John Pool occupied the house until his death in 1904 and was the final operative of the instrument factory. Harrison Pool's brother and boss Horace (1803-1878) occupied the house at **269 Foundry Street (MHC # 250)**, built around 1850. This was later occupied by Anne M. Richmond, possibly a widowed daughter.

Members of the Hayward family also contributed to economic growth in the neighborhood, although in more traditional ways than the Pools. Edward Hayward's grandson George occupied the **Red House** at **227 Foundry Street (MHC # 63)** during much of the nineteenth century and farmed the land. George Washington Hayward (1807-1880) also produced charcoal, operated a steam sawmill, raised and cured hops on the property from around 1869 through the end of the period. He learned hop growing from his cousin Cyrus in Hamilton, New York, a well documented center of hop culture. The hop harvest was a time of intensive labor by many temporary employees and required the construction of a considerable structure for drying and storage. In 1884, Hayward hired 50 boys to pick his crop. The hop kiln and barn, built 1868, were just west of the house according to the 1871 Beers map and may have stood until after 1895. In 1829, G.W. Hayward brought a hickory tree from Ohio with exceptionally large nuts which still stands across the street from the Hayward - Pool Area on the grounds of the Southeastern Regional Vocational Technical High School.

The **Old Colony Railroad (MHC #947)** was constructed west of the area in 1866. The company built a spur line through Easton that left the main line near Canton and rejoined it at Taunton, but it failed to encourage large scale industry in the town. A spur was built south of the Hayward - Pool Area to transport product of the Hayward saw mill.

LATE INDUSTRIAL PERIOD 1870-1915

Settlement patterns and activities established during the Early Industrial Period continued in the Late Industrial. Hop production at the G. W. Hayward Farm endured until at least 1886, long after it was not commonly produced in this region of the country. The steam sawmill augmented hop production income for the Haywards from the late 1860s and produced a million board feet of lumber in its

first year of operation. Indeed, there is a rail siding in the vicinity on the 1895 atlas indicating the mill shipped a great deal of lumber. Not more than six families lived within the boundaries of the area and were able to carry on the three distinct industries of milling, measuring instrument manufacture and charcoal production in addition to the agricultural activities. The mathematical instrument company continued to operate under the management of John M. Pool until after 1889 according to the resident directory of that year. The Brockton and Taunton Street Railway began operations around 1896 on the length of Washington Street and bypassed the Hayward-Pool Area at Alger's Corner to the east. It continued operation into the Early Modern Period.

Residents built several notable homes during the period including the ornate Shingle style **E. B. Hayward House at 247 Foundry Street (MHC # 247)**. Edward B. (1861-1948) and Mary Ann Hayward built this home ca. 1885 while Mr. Hayward worked as a civil engineer, insurance salesman and surveyor. At the turn of the century, Mr. Hayward worked as surveyor to the Ames family of shovel manufacturers **(MHC Areas B, E).**

The **Edward R. Hayward House at 239 Foundry Street (MHC # 245)**, built around 1870, was occupied by Mr. Hayward (1837-1915) until at least 1911. Mr. Hayward worked as a farmer and lumber dealer, utilizing the steam sawmill constructed by his father George Washington Hayward on the south side of Foundry Street in 1869. This mill burned in 1873, was rebuilt and burned again in 1889. Other Haywards in the area in the Late Industrial Period included the farmer Nahum Hayward and his relative William W. Hayward who tuned pianos.

The **Morse Brothers Cranberry Bog (MHC # 244)** on Foundry Street opened in 1910 under the name Meadow Lea Bog which comprises the southwest corner of Little Cedar Swamp. The swamp had attracted the area's original settlers in the eighteenth century for its cedar trees, marsh hay and bog iron and continues to provide agricultural products to the present day. Two small wood clapboard sheds exist near the street and probably were built around the time of the bog's first cranberry operations. Two other shingled buildings constructed during the first half of the twentieth century exist farther north of Foundry Street. The bog was owned by a resident of Carver until 1958 when the Morse Brothers bought the property.

EARLY MODERN PERIOD 1915-1945

By 1940, according to maps created by the W. P. A., land in the area was in use as pasture with few planted crops. Approximately one-half the buildings in the neighborhood were agricultural residences while others were residential. Morse Road was a segment of Foundry Street that had been bypassed between 1921 and 1936, lending sense of isolation to the **Pine Grove Cemetery (MHC #827)**.

In 1920, Edward B. and Mary Ann Hayward and their children, Beth, E. Carleton and Kenneth resided at **247 Foundry Street (MHC # 247)**. Mr. Hayward worked as engineer for the Meadow Lea Cranberry Company which later became the **Morse Brothers Cranberry Bog (MHC # 244)**. The children worked respectively as a teacher, farmer and civil engineer. In 1939, Mr. Hayward worked for the firm Hayward and Hayward, possibly another name for his surveying company. The Colonial Revival style **Hayward/Gershman House at 243 Foundry Street (MHC # 246)**, was built around 1928 for Harold and Mable Hayward. Mr. Hayward worked as the manager of Hayward Motors on Washington Street according to 1939 the resident directory. The only Pool family members in the neighborhood according to the resident directory in 1929 were Herbert A. Poole, his wife Addie and a daughter named Mayna. Herbert worked as a chemist in Brockton.

MODERN PERIOD 1945-1960

With the exception of the cranberry bog, industrial and agricultural activities have ceased and the neighborhood is now residential. The **Joseph Hayward Jr. House at 261 Foundry Street (MHC #248)** was occupied by Joseph's descendants who farmed the land until 1996. The property remains in the Hayward family. A third sawmill was constructed at the **Edward R. Hayward House at 239 Foundry Street (MHC # 245)** in 1954 but does not survive. The Southeast Regional Vocational Technical High School across Foundry Street from the Hayward Pool Area was built in 1967 on land occupied in 1886 by E. B. Hayward's sawmilling operations.

INVENTORY FORM CONTINUATION SHEET

Town	Property Address
Easton	Foundry, Morse Streets

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Area(s)	Form No.
Hayward - Pool	K

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Tomlan, Michael. Tinged with Gold: Hop Culture in the United States. Athens, Georgia: University of Georgia Press, 1992.

Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Boulevard
Boston, Massachusetts 02125

Community Easton
Property Address Foundry, Morse Streets

Area(s) Hayward-Pool
Form No. K

National Register of Historic Places Criteria Statement Form

Check all that apply:

Individually eligible Eligible only in a historic district

Contributing to a potential historic district Potential historic district X

Criteria: X A B X C D

Criteria considerations: A B C D E F G

Statement of significance by: Sanford Johnson
The criteria that are checked in the above sections must be justified here.

The Hayward-Pool Area is eligible for the National Register of Historic Places as a district under criteria A and C. The neighborhood is primarily residential but retains elements from its time as an agricultural and light industrial district. Three barns survive to indicate the locations of former farms and a cranberry bog is still in business. Residences formerly owned by members of the Pool family, proprietors of the precision measuring instrument company, are located in the district. Residences are built in the Colonial, Federal, Greek Revival, Shingle and Colonial Revival styles and retain integrity of design, materials and association.

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, MA 02125

Town Easton
Property Address Foundry, Morse Street
Area(s) Hayward-Pool
Form No. K

Inv#	St #	Street Name	Property Name	Date	Architectural Style
253		Foundry Street	Morse Brothers Cranberry Bog Building #2	ca. 1910	Colonial Revival
252		Foundry Street	Morse Brothers Cranberry Bog Building #1	ca. 1910	Colonial Revival
244		Foundry Street	Morse Brothers Cranberry Bog Shed #2	ca. 1910	Colonial Revival
254		Foundry Street	Morse Brothers Cranberry Bog Shed #1	ca. 1910	Colonial Revival
63	~~227~~	Foundry Street	Red House	1778	Federal
	~~227~~	Foundry Street	Stone Wall	ca. 1900	N/A
245	239	Foundry Street	Edward R. Hayward House	ca. 1870	Victorian Eclectic
246	243	Foundry Street	Hayward/Gershman House	ca. 1928	Colonial Revival
	243	Foundry Street	Garage	ca. 1940	No Style
247	247	Foundry Street	Edward B. Hayward House	ca. 1880	Shingle style
	247	Foundry Street	Barn	ca. 1900	N/A
248	261	Foundry Street	Joseph Hayward Jr. House	ca. 1810	Federal
	261	Foundry Street	Barn	ca. 1980	N/A
249	263	Foundry Street	Harrison Pool House	ca. 1870	Victorian Eclectic
	263	Foundry Street	Stone Wall	ca. 1900	N/A
63 ~~250~~	269	Foundry Street	Horace Pool House	ca. 1850	Greek Revival
	269	Foundry Street	Barn	ca. 1900	N/A
251	285	Foundry Street	Edward Hayward/Deacon Pool House	ca. 1770	Colonial
827		Morse Road	Pine Grove Cemetery	1796	N/A
~~947~~			Former Old Colony Railroad	1866	N/A
948		Foundry Street	Morse Brothers Cranberry Bog	1910	N/A

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, Massachusetts 02125

Town	**Property Address**
Easton	Foundry, Morse Streets

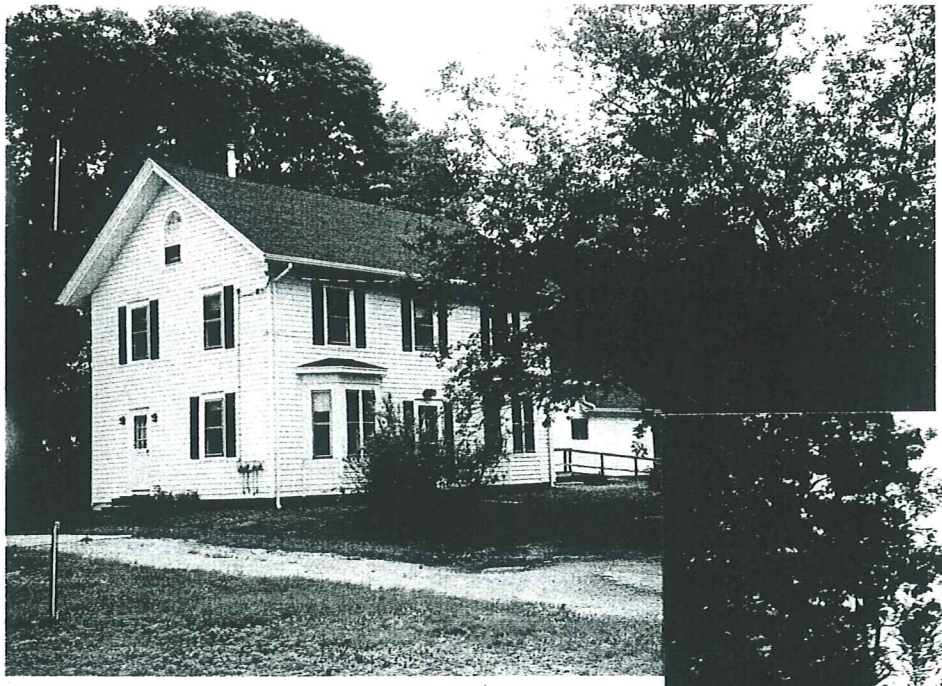
Area(s)	**Form No.**
Hayward - Pool	K

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, MA 02125

Town	**Property Address**
Easton	Center, Depot, Short Purchase Streets

Area(s)	**Form No.**
Easton Center	I K



INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, MA 02125

Town	**Property Address**
Easton	Center, Depot, Short Purchase Streets
Area(s)	**Form No.**
Easton Center	I K

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, MA 02125

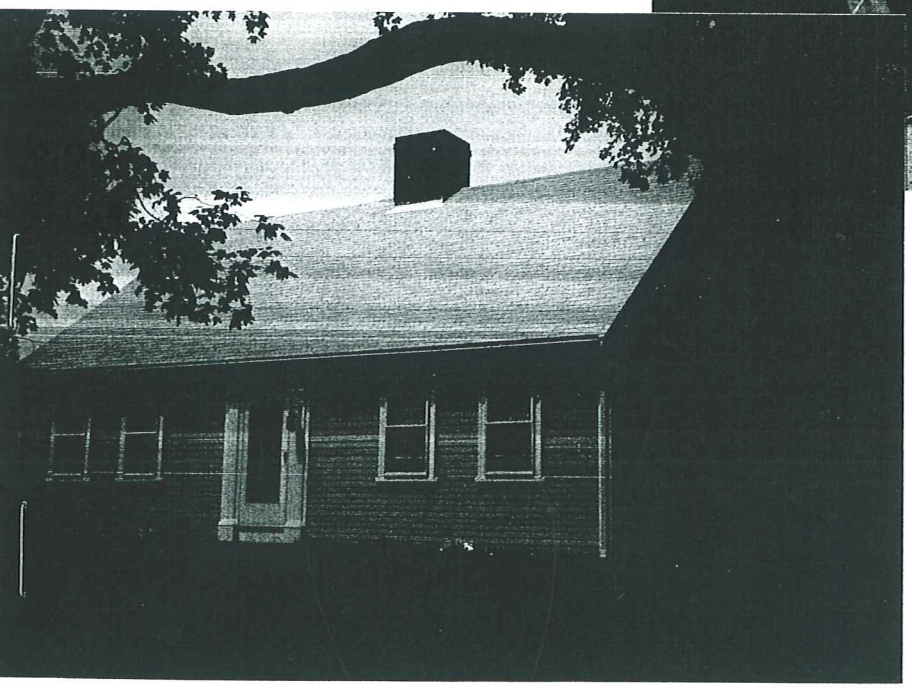
Town	**Property Address**
Easton	Center, Depot, Short Purchase Streets

Area(s)	**Form No.**
Easton Center	I K

INVENTORY FORM CONTINUATION SHEET

Massachusetts Historical Commission
220 Morrissey Boulevard
Massachusetts Archives Building
Boston, MA 02125

Town	**Property Address**
Easton	Center, Depot, Short Purchase Streets
Area(s)	**Form No.**
Easton Center	I K



FORM A - AREA

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Somerset		

Town/City: Fall River

Place *(neighborhood or village):*

Photograph

Name of Area: Fall River Country Club Golf Course

Present Use: Recreational

Construction Dates or Period: 1922 (Nine-Hole Course); 1975 (18-Hole Course); 1990 (Clubhouse)

Overall Condition: Good

Major Intrusions and Alterations: 1899-1990: Demolition, remodeling, and reconstruction of three clubhouses; several reconfigurations in the course layout; land infill and boundary modifications; and expansion of a nine-hole course to eighteen.

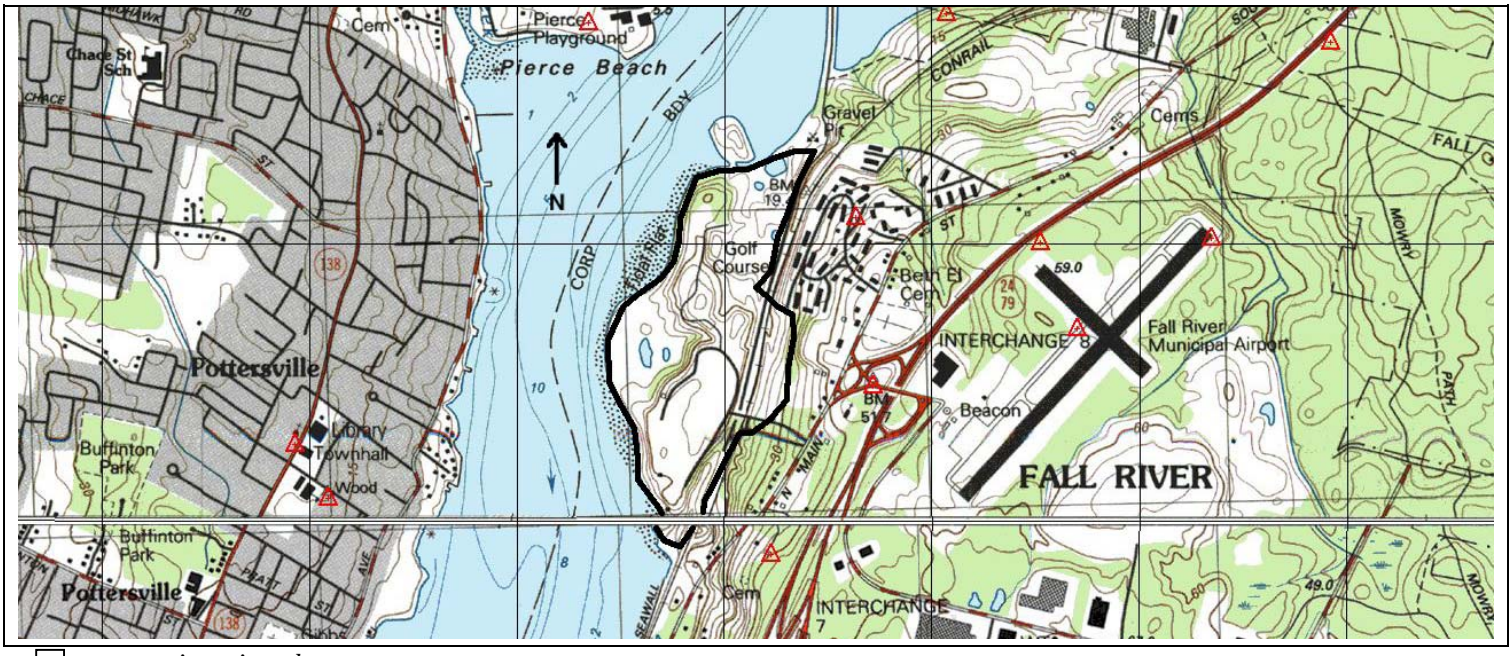
Acreage: Approx. 124.5

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

Oriented north to south, the Fall River Country Club Golf Course Area is an irregular, generally oval-shaped, 124.5-acre, eighteen-hole golf course that hugs the shoreline of the Taunton River at 4232 North Main Street. Set along the eastern shore of the Taunton River, the golf course is isolated from North Main Street, a major commercial thoroughfare, as it is screened by a forested corridor that lines the eastern boundary and located at the end of a narrow entrance road. A small section of the property extends beyond the Fall River Secondary Railroad right-of-way, north of Country Club Road. The course sits on a relatively flat, slightly rolling topography, bound to the north, south, and west by the sinuous Taunton River and to the east by the Fall River Secondary Railroad right-of-way. Extending east from the right-a-way, alongside Country Club Road, is a rectangular approximately 10.3-acre section of the course (added between 1974 and1975) oriented north to south that includes two "holes" (Hole No. 6 and Hole No. 7), bound to the north by the South Winds Apartment Complex, the south by the Rope Walk Condominium Complex, and to the east by both land occupied by the Fall River Elks Lodge and private, residential properties. A round peninsula connected by a thin strip of land marks the northern tip of the golf course with access to two holes (Hole No. 4 and Hole No. 4).

Typical of twentieth-century golf courses, the heavily manicured landscape encompasses an entry road; clubhouse; pedestrian/golf-cart paths leading members through the eighteen-hole course; holes of tees, fairways, greens, and sandpits; and vegetation, including aesthetic corridors of mixed coniferous and deciduous trees, individual plantings, and man-made ponds. Country Club Road, a private, narrow, paved entrance road to the course, is an L-shaped road that runs west from North Main Street, over the railroad right-of-way, with a sharp, southern turn to the large, paved parking lot of the clubhouse. Sitting at the southern tip of the Fall River Country Club Golf Course Area, the clubhouse is a north-facing, asymmetrical, two-story, nine-bay by five-bay, Neocolonial style building with a cross-gambrel roof constructed between 1989 and 1990. The building is characterized by its Neocolonial elements, including clipped, gambrel-roofed, protruding bays and a centered porch on the northern facade supported by a colonnade with exaggerated Doric capitals. Fenestration is irregular with bay, ribboned, and picture windows.

Since it was expanded from a nine- to eighteen-hole course in 1975, the layout has remained as it is today, with an irregular course of eighteen holes predominantly oriented north to south and an equally irregular circulation path leading members sequentially to each hole. The course starts and finishes approximately 150-feet north of the clubhouse, with Hole No. 1 and Hole No. 18 parallel to one-another.

HISTORICAL NARRATIVE

The Fall River Country Club Golf Course was designed by A.H. Fenn in 1899 as a nine-hole course with emphasized views of the Taunton River waterfront that could be easily accessed by the railroad and local streetcar lines. An advertisement of this course in a golf directory from 1900 describes it as located at "Somerset Junction," four miles north of the Fall River railroad station. Since its inception, the course has been modified repeatedly to meet the needs interests of members. Between 1900 and 1922, the nine-hole layout was rearranged twice. From early on in the golf course's history, the administration sought to expand the site from nine holes to eighteen; however, more land was required to complete the initiative. Between 1950 and 1951, filled land was created at the center of the western boundary "from

dredging of the Taunton River channel, which was deposited in the lowlands" (Buckley 1990:7). As the soil required settling before it could be developed, the course could not be enlarged for another twenty years. Between 1974 and 1975, the property was finally expanded into an eighteen-hole course.

In its current state, the country club property includes portions of a nine-hole golf course that date to 1922. As the layout of the course has changed, several different clubhouses have been constructed over the course of the property's history. The original 1899 clubhouse burned in a fire in 1909, and was replaced by the second clubhouse in 1910 that was remodeled by 1975. In 1989, the building was demolished for the construction of a new, third clubhouse, completed in 1990 (Buckley 1990). After decades of modifications to the landscape and buildings, the property no longer retains integrity as a late-nineteenth- to early twentieth-century golf course. Due to the loss of historic buildings and structures, Fall River Country Club Golf Course is not eligible for listing in the National Register of Historic Places.

BIBLIOGRAPHY and/or REFERENCES

Buckley, Edmund
1990 *The History of Fall River Country Club*. Fall River Country Club History Committee, Fall River, MA.

Everts & Richards
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Fall River Country Club Golf Course Area entrance, view looking northwest.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Fall River		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Fall River

Place *(neighborhood or village):* Steep Brook

Name of Area: North Main Street Area

Present Use: Commercial and Residential

Construction Dates or Period: Mid-18th to early-20th C.

Overall Condition: Good

Major Intrusions and Alterations: None

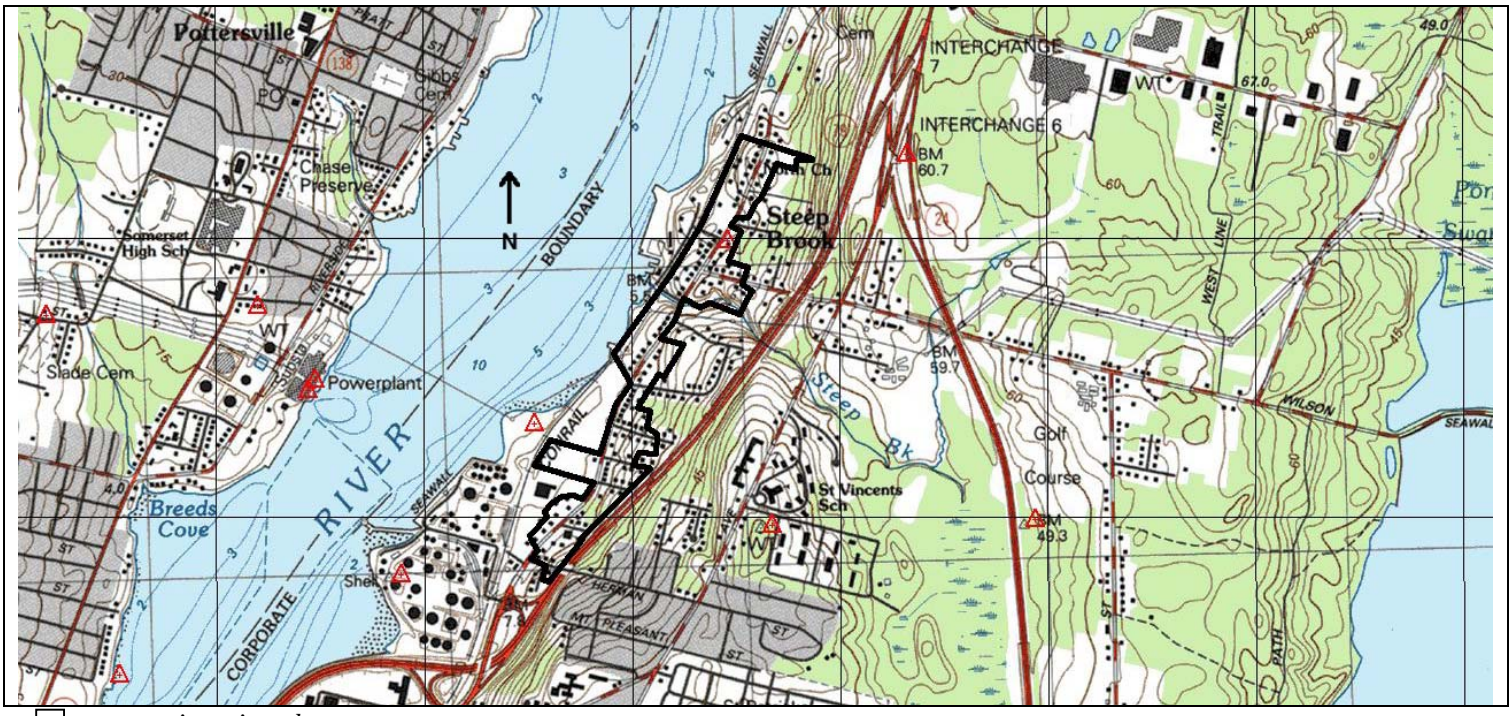
Acreage: Approx. 85

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The North Main Street Area is an approximately 85-acre, one-mile-long, residential corridor along North Main Street, including portions of (from north to south) Glendale Street, Winslow Street, Terry Lane, Clark Street, Wilson Road, Collins Street, Sidney Street, Baldwin Street, Holland Street, Haskell Street, Canedy Street, Wayland Street, Herman Street, and Homestead Street. The area is set within a high-traffic area, with moderately spaced, modest residences along the east bank of the Taunton River. It is roughly bounded by the Fall River Secondary Railroad Line right-of-way to the west, Millard Street to the north, Route 79 to the east, and Herman Street to the south. The area encompasses 157 properties with contributing properties dating from the mid nineteenth to the early twentieth century.

Building styles and forms represented in the area include Federal, Italianate, French Second Empire, Classical Revival, Craftsman, Colonial Revival, Dutch Colonial Revival, Bungalow, and Cape Cod. Some buildings have been altered with synthetic siding and replacement windows, but the overall area retains its architectural integrity and setting. Three of the properties along North Main Street are individually listed in the National Register of Historic Places as part of the Fall River MRA, including the Squire William B. Canedy House (FLR.274), a Federal style residence at 2634 North Main Street constructed ca. 1806; the Borden-Winslow House (FLR.275), a Georgian style residence at 3063 North Main Street constructed ca. 1740; and the Greek Revival style North Christian Congregational Church (FLR.241) with Gothic Revival style ornamentation, which was constructed in 1842.

HISTORICAL NARRATIVE

The North Main Street Area is a mixed residential and commercial district with contributing properties dating from the mid-eighteenth to the early twentieth century. It first developed as part of the early village of Steep Brook, which is known for retaining most of the surviving pre-industrial properties in the city of Fall River. Early development concentrated along North Main Street (ca. 1700-1725), one of the first major thoroughfares. The earliest identified property within the area is the ca. 1740 Borden-Winslow House (FLR.275).

Into the early nineteenth century, a number of residential properties were constructed within the North Main Street Area. Several of these buildings remain intact, including the ca. 1806 Squire William B. Canedy House (FLR.274), ca. 1820 residence at 3325 North Main Street (FLR.279), ca. 1825 Elisha Simmons House (FLR.281), ca. residence at 3320 North Main Street (FLR.278), and the ca. 1830 Davis House (FLR.282). In response to the residential growth, the North Christian Congregational Church (FLR.241) was constructed in 1842 at the northern end of the district just north of Glendale Street. The church is not only one of the four earliest to survive in the city, but it is the only existing Greek Revival ecclesiastical property. The remaining three, including the Unitarian Church (FLR.263), First Baptist Church (FLR.259), and St. Mary's Church (FLR.499), were constructed outside of the district in the Gothic Revival style (Frontiero 1982; Giza 1980; MHC 1982; Walling 1852; 1858).

From the mid-nineteenth to early twentieth century, while other areas in Fall River increased in density with textile industry worker housing, the North Main Street Area saw an increase in general residential construction. Properties range from modest to moderately scaled, single-family homes to multi-family tenements in the Italianate, French Second Empire, Classical Revival, Craftsman, Colonial Revival, Dutch Colonial Revival, Bungalow, and Cape Cod styles. Examples of these property types are located throughout the district. More modest properties include the two simple,

single-family, one-story, half- and full-Cape Cod style residences are located at the northern boundary of the area at 3562 and 3576 North Main Street. Larger-scale single-family houses include the one-and-one-half-story, Queen Anne style residence at 2759 Haskell Street, which is closer to the lower end of the district and the two-story, gable-front residence at 3100 North Main Street, which is centrally located within the district. Multi-family properties are represented as well, such as the Italianate style residence at 3404 North Main Street and the two-and-one-half story, three-bay by six-bay gable-front Italianate tenement at 3000 North Main Street (Beers 1871; Everts & Richards 1895; Sanborn Map Company 1933; 1933-1950.

BIBLIOGRAPHY and/or REFERENCES

Beers, Frederic W.
1871 *Atlas of Bristol County, Massachusetts.* F.W. Beers and Company, New York, NY.

Everts & Richards Co.
1895 *Atlas of Bristol County, Massachusetts*. On file, Freetown Historical Society, Freetown, MA.

Frontiero, Wendy
1982 *National Register of Historic Places Multiple Resource Area for Fall River, Massachusetts*. Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Giza, Patricia
1980 *MHC Form B: North Christian Congregational Church*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Massachusetts Historical Commission (MHC)
1982 *MHC Reconnaissance Report: City of Fall River*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Sanborn Map Company
1933 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

1933-
1950 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

Walling, Henry F.
1852 *Bristol County, Massachusetts*. C. & A. Taber, Boston, MA.

1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.910	Clark Street Bridge	Clark Street	ca. 1905			C
FLR.274	Canedy, Squire William B. House	2634 North Main Street	ca. 1806	Federal	4	C NRMRA NRIND, 1983
FLR.275	Borden – Winslow House	3063 North Main Street	ca. 1740	Georgian	3	C NRMRA NRIND, 1983
FLR.277	Green Dragon Inn	3262 North Main Street	ca. 1880	French Second Empire		C
FLR.278	Residence	3320 North Main Street	ca. 1830	Federal		C
FLR.279	Residence	3325 North Main Street	ca. 1820	Federal	5	C
FLR.280	Residence	3499 North Main Street	ca. 1870	Second Empire		C
FLR.281	Simmons, Elisha House	3519 North Main Street	ca. 1825	Federal		C
FLR.241	North Christian Congregational Church	3538 North Main Street	1842	Greek Revival/ Gothic Revival	2	C NRMRA NRIND, 1983
FLR.282	Davis House	3548 North Main Street	ca. 1830	Federal		C

NRMRA
NRIND Property individually listed in the National Register in the Fall River Multiple Resources Area nomination
C Contributing property to the district

Residences at 3404, 3512, and 3520 North Main Street and North Christian Congregational Church (FLR.241) (l-r), view looking north.

Borden-Winslow House (FLR.275), view looking northeast.

Residence at 2614 North Main Street and Squire William B. Canedy House (FLR.274) (l-r), view looking southwest.

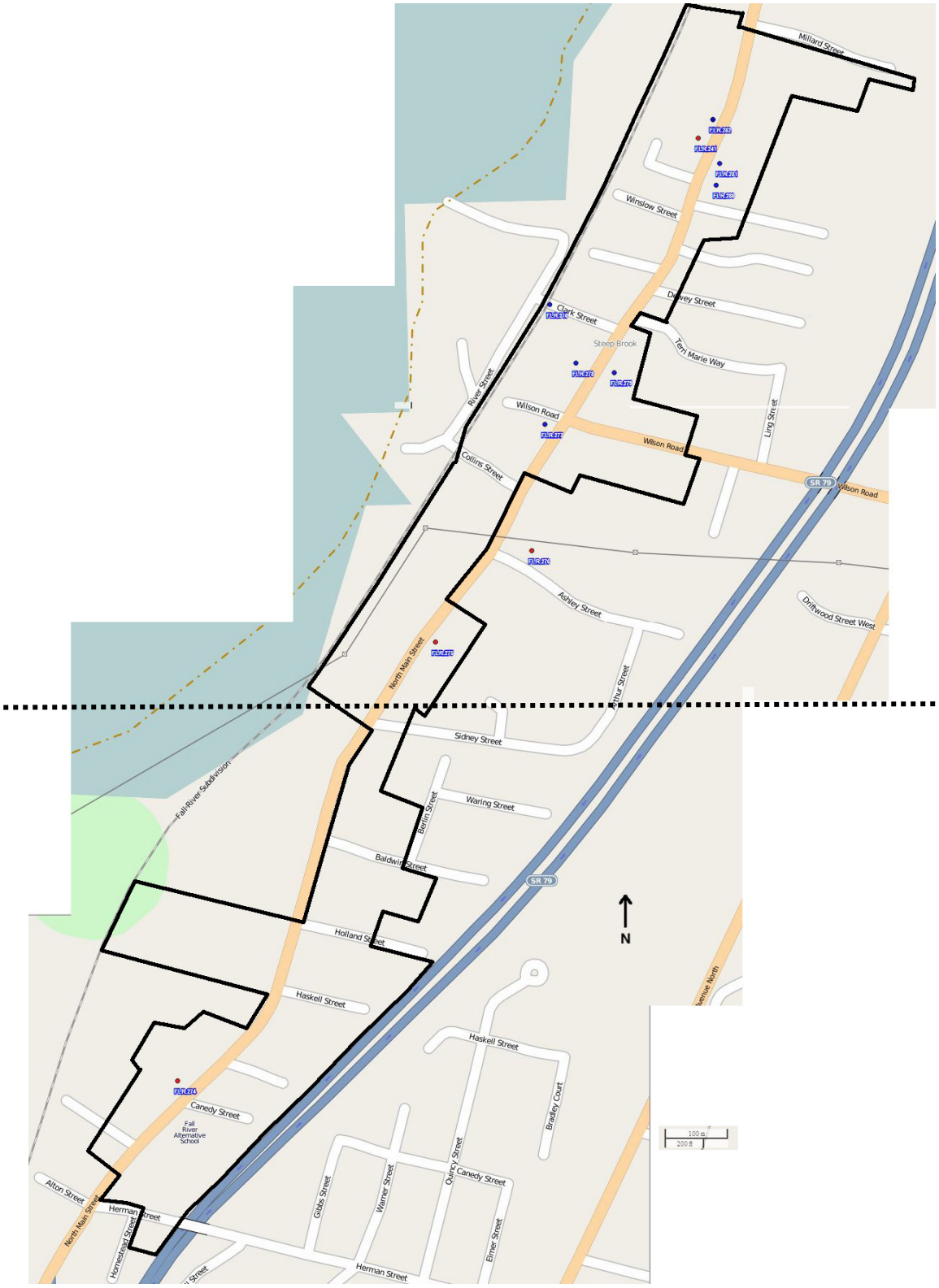
Residences at 3562 and 3576 North Main Street (l-r), view looking north.

Residence at 3325 North Main Street (FLR.279), view looking northeast.

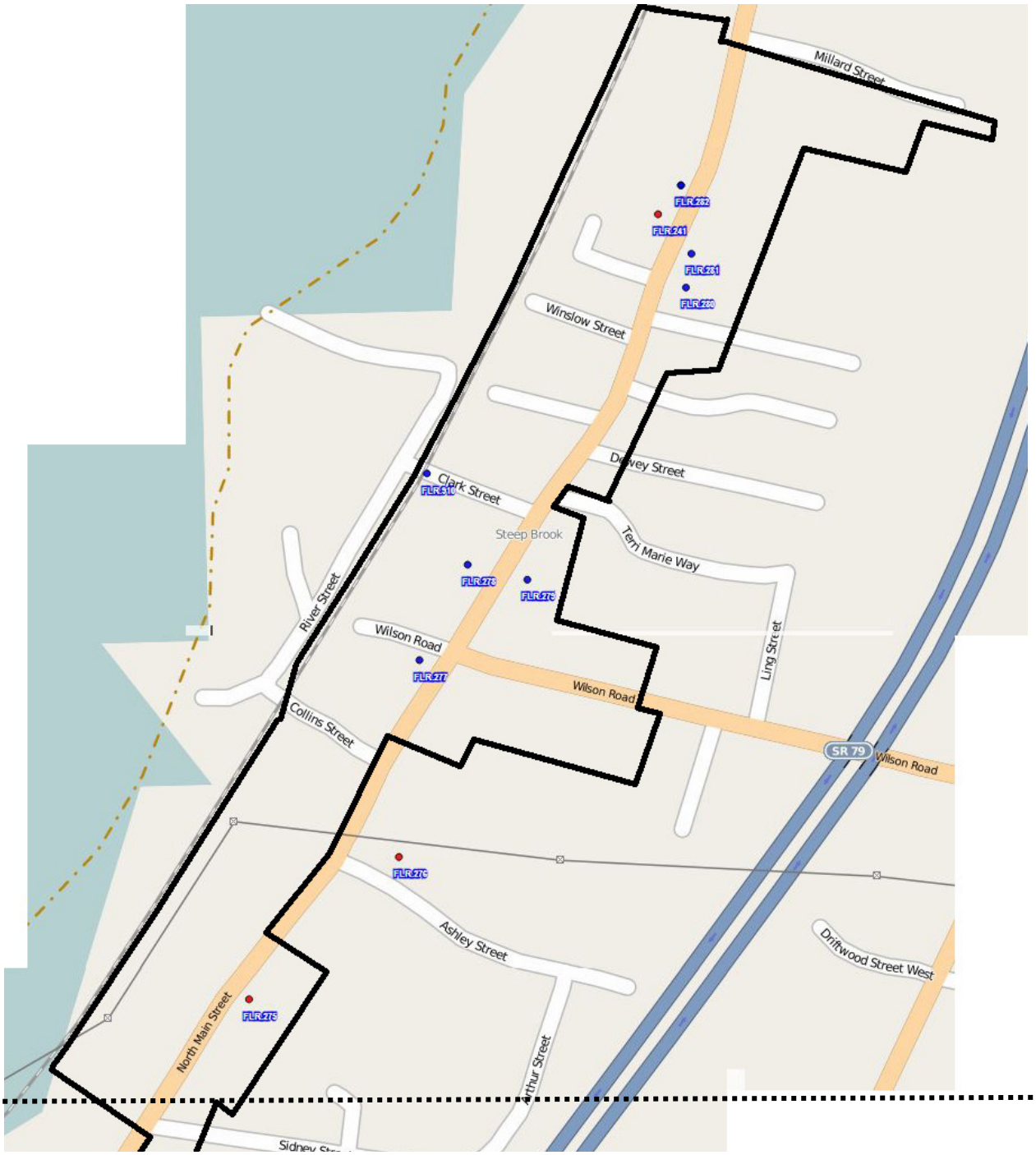
William J. Wiley Middle School, view looking southwest.

Residences at 3100 and 3112 North Main Street (l-r), view looking north.

AREA MAP


Millard Street
Winslow Street
Clark Street
Steep Brook
Terri Marie Way
Dickey Street
River Street
Wilson Road
Collins Street
Ling Street
SR 79
Ashley Street
Driftwood Street West
North Main Street
Arthur Street
Sidney Street
Fall River Subdivision
Waring Street
Benin Street
Baldwin Street
Holland Street
Haskell Street
Canedy Street
Fall River Alternative School
Alton Street
Herman Street
Homestead Street
Gibbs Street
Warner Street
Quincy Street
Bradley Court
Elmer Street
N
1
2

1. AREA MAP

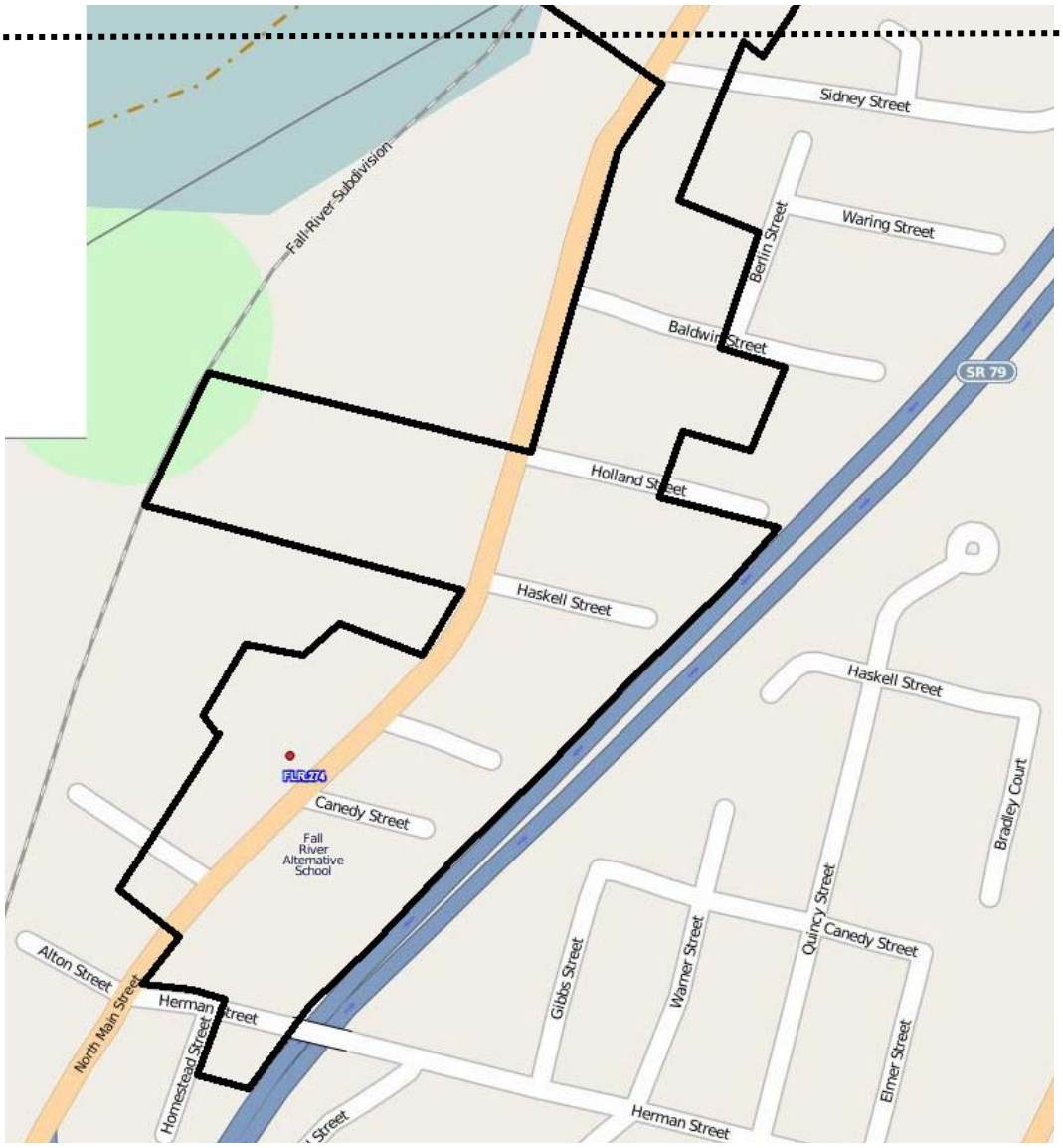


- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta http://maps.mhc-macris.net/

2. AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The North Main Street Area is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level in the areas of community development and architecture. The area is eligible under Criterion A for its important local associations with mid-eighteenth to early nineteenth century residential development of the Steep Brook area along the east bank of the Taunton River. The area is also eligible under Criterion C for its good collection of well-preserved, intact, pre-industrial residential, institutional, and ecclesiastical architecture in Taunton.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Fall River		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Fall River

Place *(neighborhood or village):*

Name of Area: Wellington-Brownell Street Area

Present Use: Residential, Ecclesiastical, Commercial, and Institutional

Construction Dates or Period: Late-19th to Early 20th C.

Overall Condition: Good

Major Intrusions and Alterations: Late-20th C. building infill.

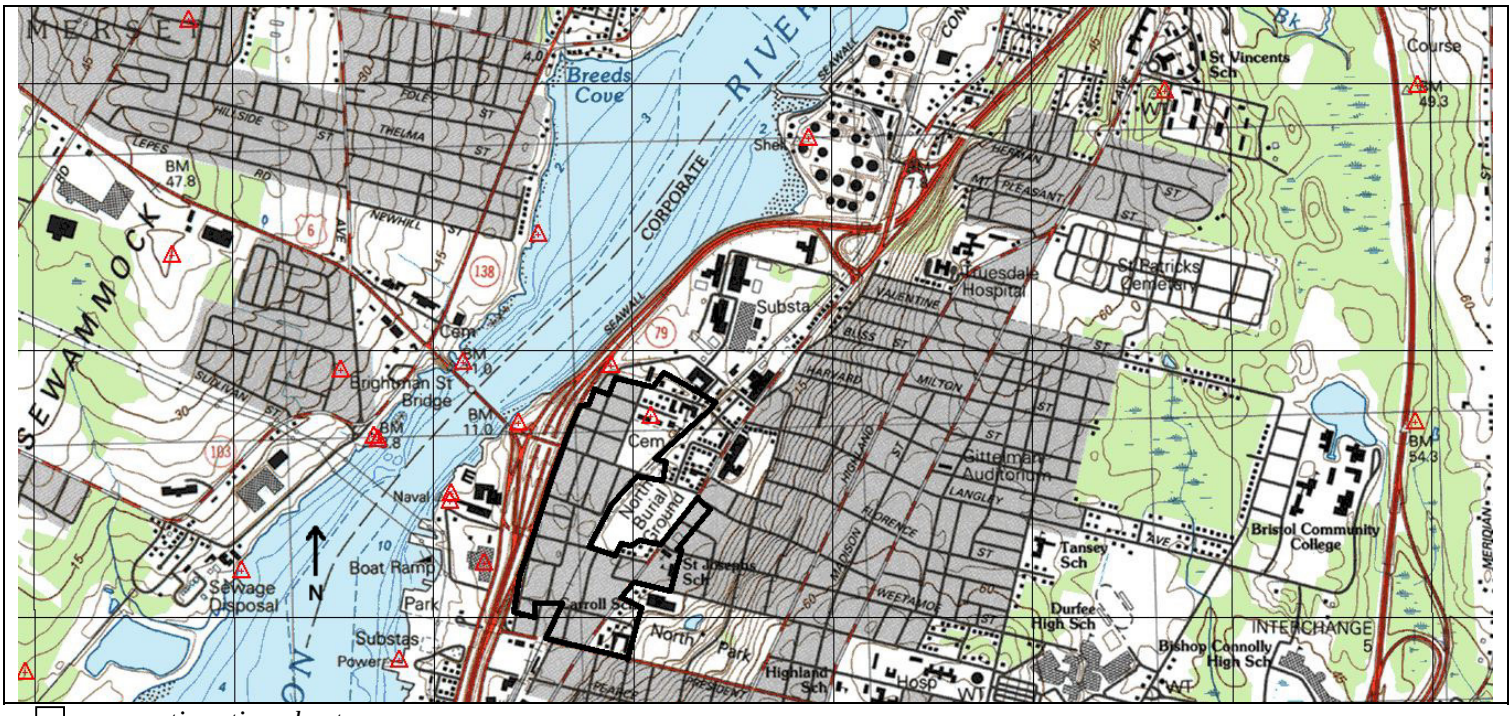
Acreage: Approx. 85

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Wellington-Brownell Street Area is an approximately 85-acre, half-mile-long asymmetrical residential district generally bound by North Main Street to the east, Essex Street to the north, Lindsey Street to the west, and President Avenue to the south. The area is set in a high-traffic, highly-dense, urban area, along the western bank of the Taunton River. The area is bisected by the Fall River Secondary Railroad right-of-way. The area includes the following north-to-south-running streets (from east to west): North High (west side only), Rock (west side only), North Main (portions), Wiley, Almy, Thompson, Murray, St. Mary, Morton, Oregon, North Court, Fulton, McDonald, and Lindsey (east side only). It also includes the following east-to-west-running streets (from north to south): Essex, Wellington (portions), Suffolk (portions), Norfolk (portions), Brightman (portions), Weetamoe (portions), George, Cory, Ballard, Hood (portions), Railroad, Brownell (portions), and President Avenue (portions). The district contains approximately 335 properties dating from the late nineteenth to early twentieth century. Multi-family dwellings are a common building form in the area and architectural styles include the Italianate, Second Empire, Bungalow, Colonial Revival and Shingle. Some buildings have been altered with synthetic siding and replacement windows, but the overall area retains its architectural integrity and setting. Two properties are listed on the National Register of Historic Places as part of the Fall River Multiple Property Area, including the Anawan Firehouse #6 (FLR.273) and Saint Matheiu's Church (FLR.440) (Frontiero 1983).

HISTORICAL NARRATIVE

Early development within the Wellington-Brownell Street Area concentrated along North Main Street (ca. 1700-1725), one of the first major thoroughfares in the city of Fall River. The street grid south of Essex Street was laid out by 1850 and became denser after the development of several neighboring textile mills in the late nineteenth and early twentieth century. The area, formerly known as Mechanicsville, increased in development during the 1870s, in tandem with the opening of nearby textile mills located outside of the area, such as the Mechanics Mills, Sagamore Mills, Border City Mill, and the Foster Spinning Company.

As Fall River's textile industry evolved during the mid- to late-nineteenth century, multi-family houses were erected throughout the city to accommodate the increase in industry. These properties were typically constructed in the Italianate and French Second Empire styles. In the Wellington-Brownell Area, although it is likely many examples of these properties originally bore characteristics of these styles, only a few have remained intact, including the three-story, French Second Empire style, mansard-roofed residences at 1297 North Main Street and St. Michael's Rectory along Essex Street and the Italianate style duplexes at 117 Fulton Street. Many triple-decker buildings are located throughout the district. These properties, with examples such as the strip of multi-family residences along Cory Street (# 255, 245, 239, and 229), do not presently bear any particular style of architecture.

Due to significant non-historic modifications including the introduction of synthetic materials and additions, the Wellington-Brownell Street Area does not retain sufficient integrity to be eligible for listing in the National Register of Historic Places.

BIBLIOGRAPHY and/or REFERENCES

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Everts & Richards Co.
1895 *Atlas of Bristol County, Massachusetts*. On file, Freetown Historical Society, Freetown, MA.

Frontiero, Wendy
1982 *National Register of Historic Places Multiple Resource Area for Fall River, Massachusetts*. Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

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1933-1950 *Bristol County, Fall River, Massachusetts Insurance Maps*. Sanborn Map Company, New York, NY.

Walling, Henry F.
1852 *Bristol County, Massachusetts*. C. & A. Taber, Boston, MA.

1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.47	Residence	142 Brightman Street	1895	Queen Anne, Triple-decker		C
FLR.48	Residence	212 Brightman Street	1895	Queen Anne, Triple-decker		C
FLR.49	North Variety Store	226 Brightman Street	1870	Italianate		C
FLR.121	Residence	164 George Street	1885	Italianate		C
FLR.122	Residence	205 George Street	1885	Italianate		C
FLR.123	Residence	210 George Street	1885	Italianate		C

Continuation sheet 2

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.124	Residence	215 George Street	1875	Italianate		C
FLR.193	Mechanics Mill Tenement	261 Lindsey Street	1875			C
FLR.223	Residence	19 Morton Street	1875	Italianate		C
FLR.225	Residence	20 Murray Street	1880	Victorian Eclectic		C
FLR.226	Residence	35 Murray Street	1885			C
FLR.227	Residence	60 Murray Street	1880			C
FLR.228	Residence	79 Murray Street	1915	Colonial Revival, Shingle Style		C
FLR.273	Anawan Firehouse #6	1181 North Main Street	1873	Italianate	8	NRMRA NRDIS, 1983
FLR.240	Saint Joseph's Roman Catholic Church	1355 North Main Street		High Victorian Gothic	7	C
FLR.296	Residence	79 Oregon Street	1880			C
FLR.297	Residence	98 Oregon Street	1900			C
FLR.589	Morton, James Madison Jr. High School	400 President Avenue	1923	English Revival		C
FLR.440	Saint Mathieu's Church	Saint Mary's Street	1893	High Victorian Gothic		NRMRA NRIND, 1983
FLR.441	Residence	36 Saint Mary's Street	1885	Italianate		C

NRMRA
NRIND Property individually listed in the National Register in the Fall River Multiple Resources Area nomination
C Contributing property to the district

Residence at 100 Suffolk Street (foreground), view looking west.

Residences at 1297, 1287, and 1267 North Main Street, view looking southeast.

Residences at 62, 74, and 86 Morton Street, view looking northwest.

Residence at 105 Suffolk Street and residences at 117 and 129 Fulton Street (r-l), view looking northeast down Fulton Street.

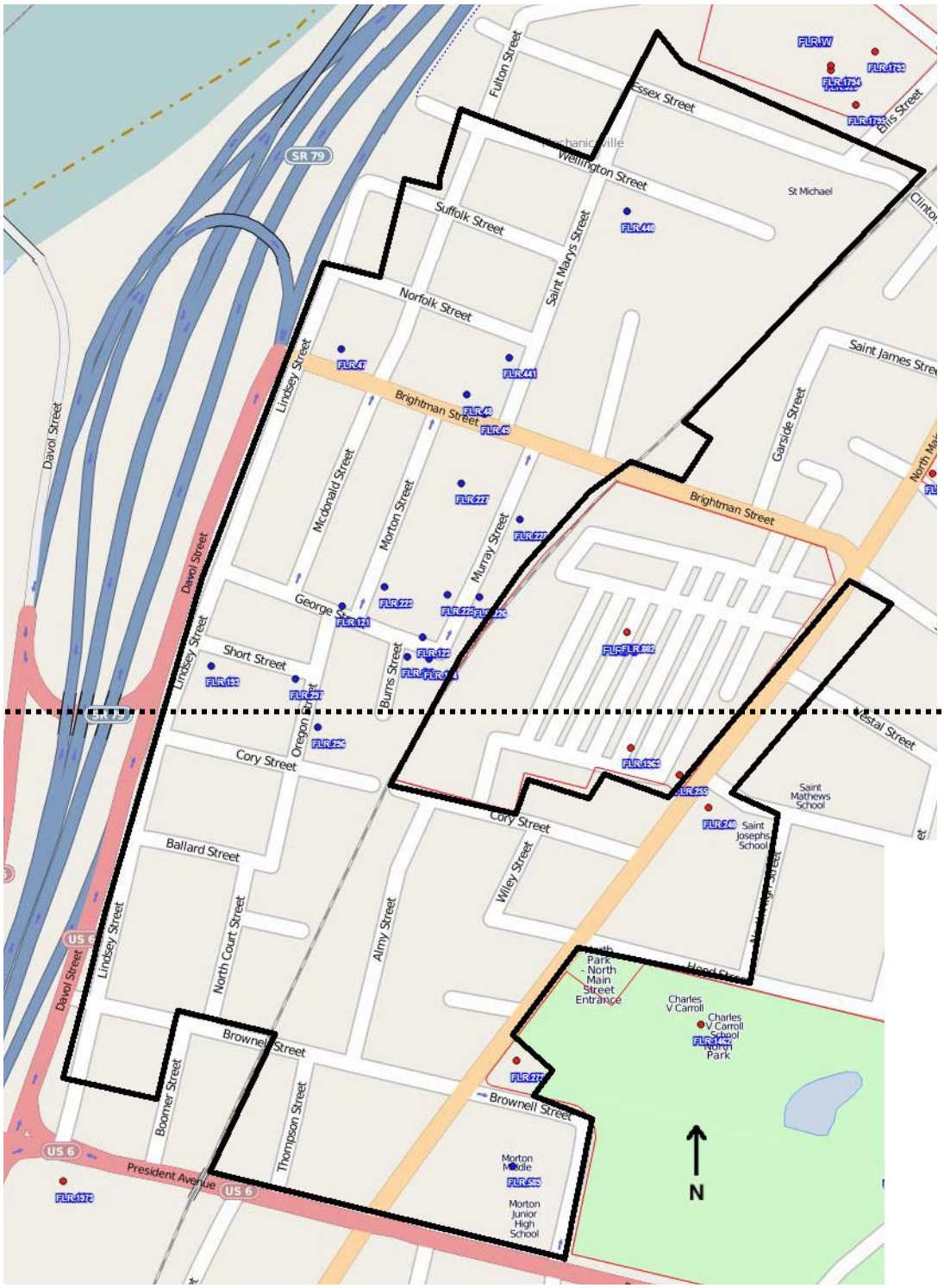
St. Michael's Rectory, view looking southwest down Essex Street.

Saint Joseph's Roman Catholic Church (FLR.240), view looking northeast.

Anawan Firehouse #6 (FLR.273), view looking southeast.

St. Joseph's Cemetery, view looking northwest

AREA MAP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Burns Street
Oregon Street
Cory Street
Ballard Street
Wiley Street
Almy Street
North Court Street
Brownell Street
Boomer Street
Thompson Street
President Avenue
Vestal Street
Saint Mathews School
Saint Josephs School
Charles V Carroll School
Morton Middle
Morton Junior High School
St Michael
SR 79
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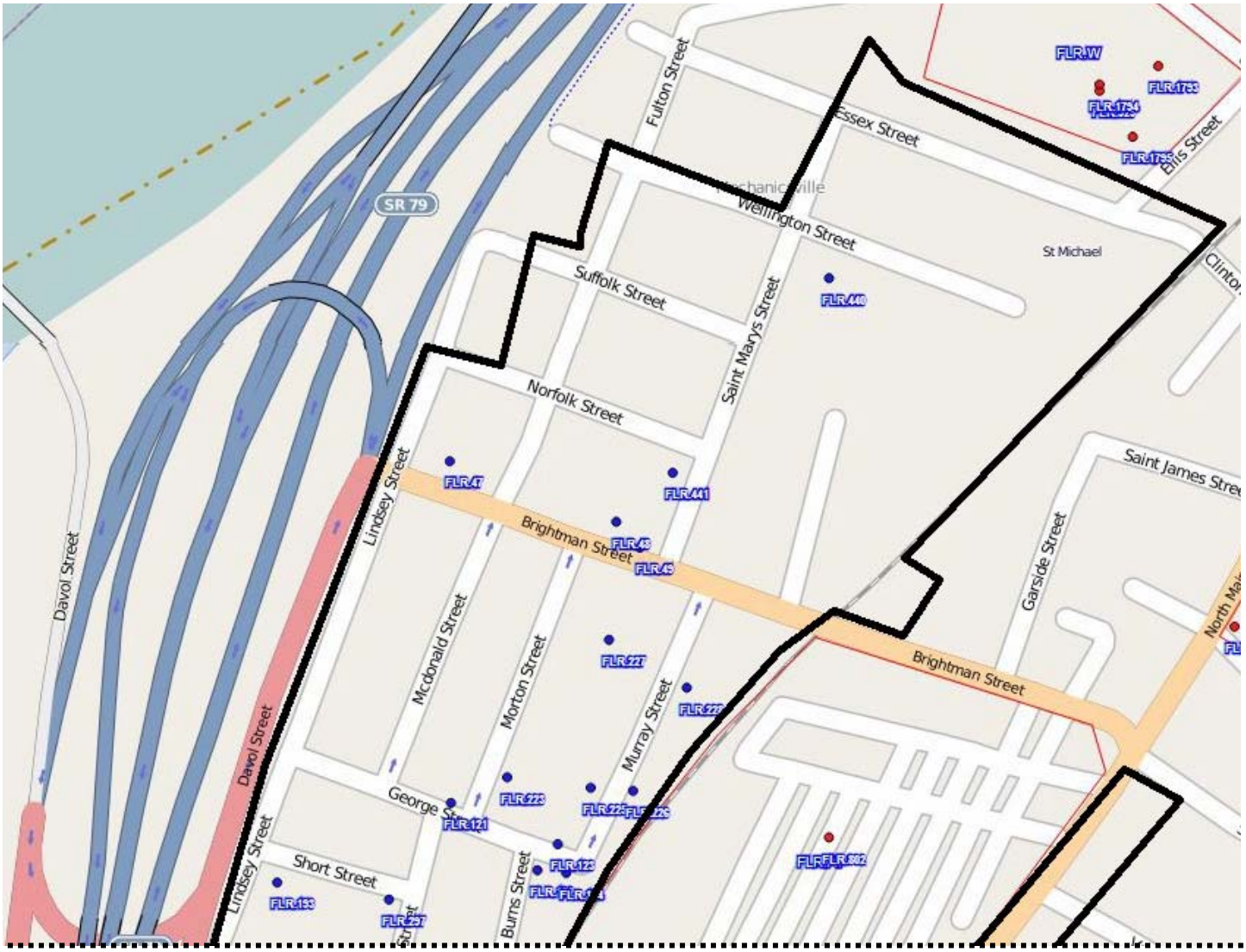


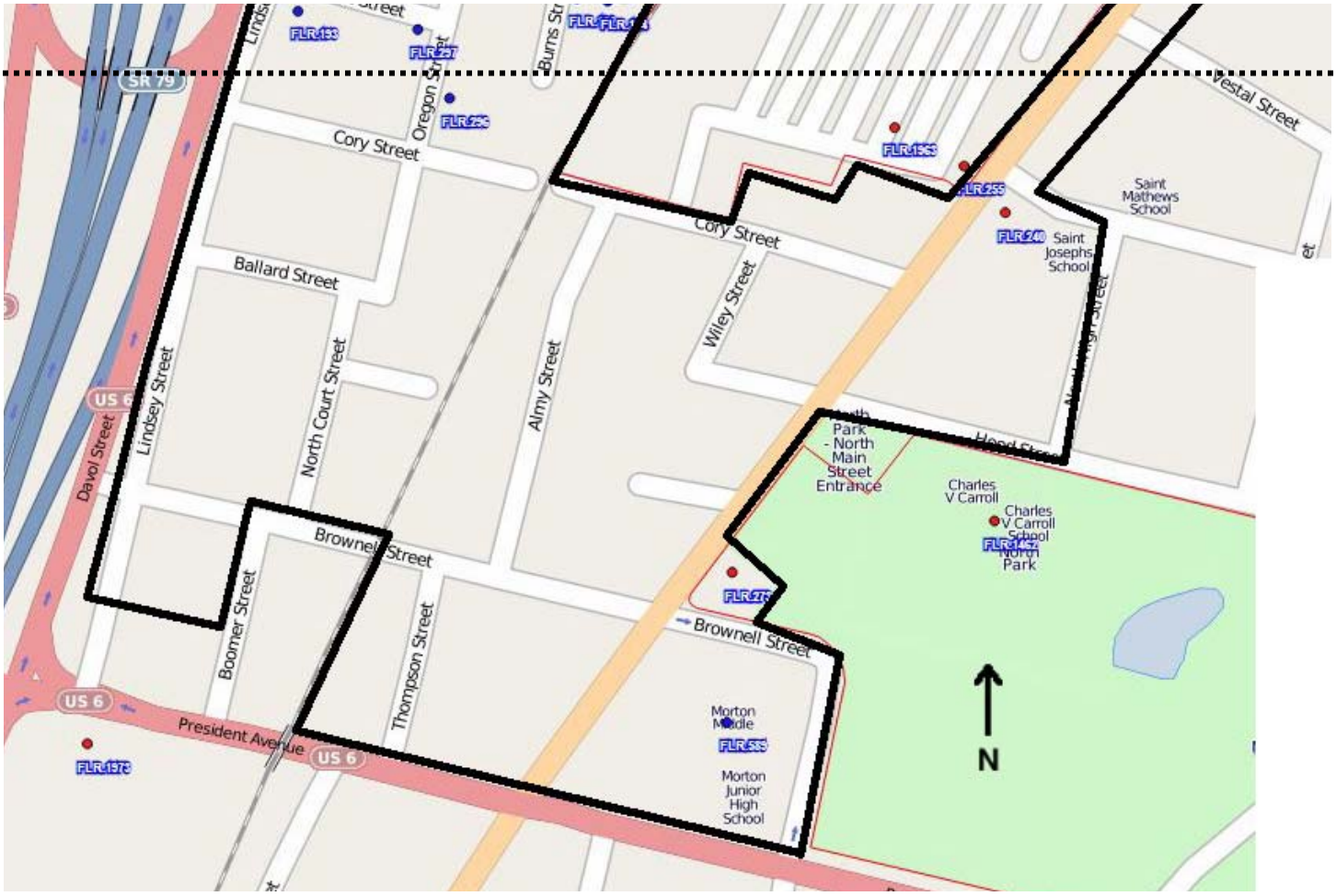
- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

2. AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net

FORM A - AREA

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Fall River		See data sheet

Town/City: Fall River

Place *(neighborhood or village):*

Name of Area: Pearce-Durfee Street Area

Present Use: Commercial and Residential

Construction Dates or Period: Mid-18th to Mid-20th C.

Overall Condition: Good

Major Intrusions and Alterations: Late-20th C. building infill and some demolition.

Acreage: Approx. 145

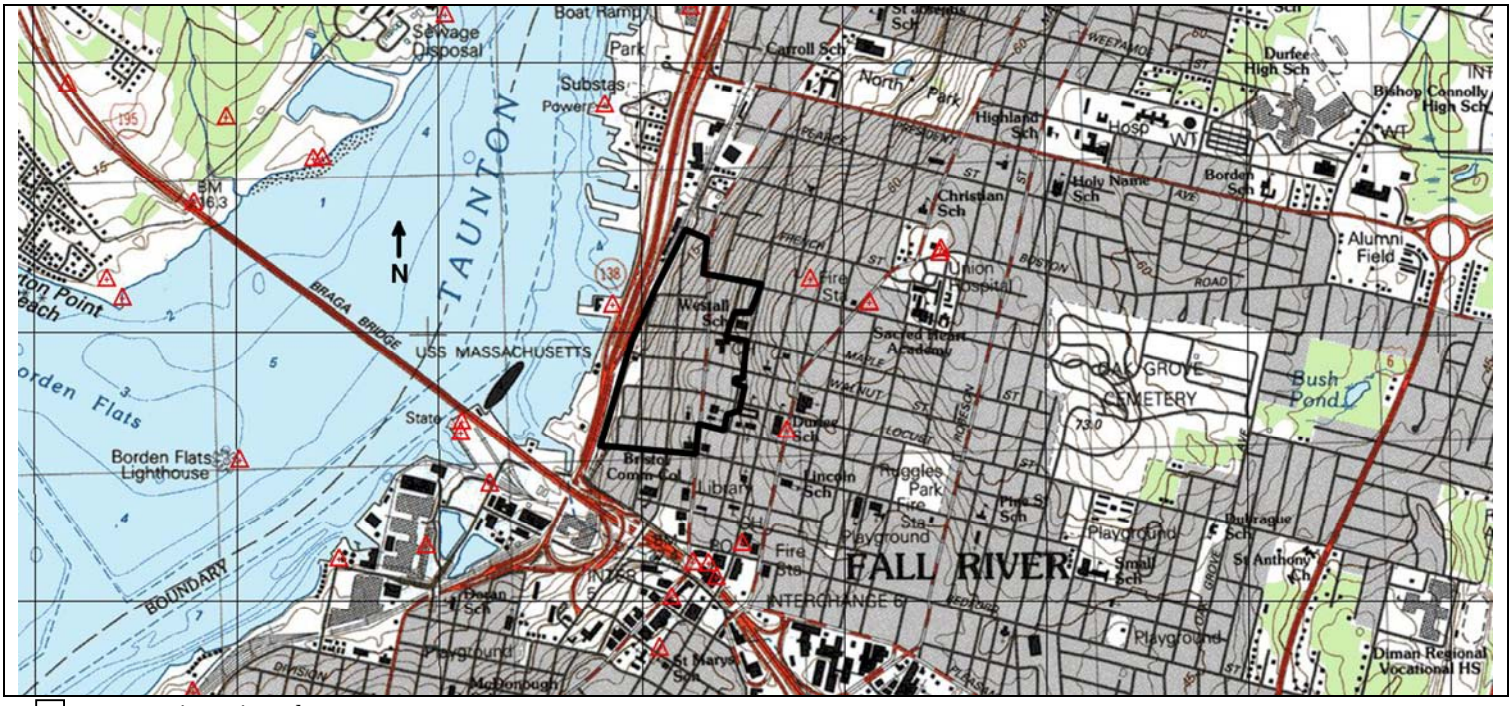
Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Photograph

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Durfee Street Area is a large, approximately 145-acre, one-mile-long residential area roughly bound by the Fall River Secondary Railroad Line right-of-way to the west, Odd Street to the north, the Highland Historic District (part of the Fall River MRA, 1983) to the east, and Pine Street to the south. The area encompasses approximately 177 contributing properties constructed from the mid-nineteenth through the early twentieth century in a wide range of architectural styles.

The contributing buildings in the area generally possess a high degree of architectural integrity and are in good condition. The Lafayette-Durfee House (FLR.56) is individually listed on the National Register of Historic Places. The John M. Earle House (FLR.1538), Rienzi W. Thurston House (FLR.1392), First Baptist Church (FLR.259), Quequechan Club (FLR.262), Fall River Knights of Columbus (FLR.264), William Lindsey House (FLR.265), John Mace Smith House (FLR.266), Bristol County Superior Courthouse and Registry of Deeds (FLR.254), and the Nathan Read House (FLR.268) are listed on the National Register of Historic Places as part of the Fall River Multiple Resource Area (Frontiero 1983). Two properties within the area appear eligible for individual listing in the National Register, the St. Michael's Roman Catholic Church at 199 Essex Street and the residence at 524 Durfee Street.

HISTORICAL NARRATIVE

Early development within the Durfee Street Area concentrated along North Main Street (ca. 1700-1725), one of the first major thoroughfares in the city of Fall River. The street grid south of Odd Street was laid out by 1850 and became denser after the development of several neighboring textile mills and properties associated with the coal industry in the late nineteenth and early twentieth century (Walling 1852; 1858).

The earliest identified property within the area is the National Register listed, ca. 1747 Georgian style Lafayette-Durfee House (FLR.56) at 94 Cherry Street. Originally, the Lafayette Durfee House was located on the east side of North Main Street near the site of the Bristol County Registry of Deeds (FLR.254) and was reportedly built by prominent politician Thomas Durfee III. The property has been moved twice. When North Main Street was widened in 1837, the building was moved to the west side of the street at the present location of 116 North Main Street. After the property was sold in 1874, the property was moved to its present location to make room for a brick building with a mansard roof (no longer extant) (Dolan 1980).

As Fall River's textile industry evolved during the mid- to late-nineteenth century, and the William F. Thomas Coal Yard and the Globe Coal Company (est. 1881; not extant) developed along the Old Colony Railroad Line just outside the western boundary of the area, multi-family housing units were erected to accommodate the increase in industry. These properties were typically constructed in the Italianate and French Second Empire styles. Many buildings within the Durfee Street Area reflect this period, including the multi-family, three story, three-bay Italianate style triple-deckers at 533 North Main Street and the Louis L. Bernard House (FLR.269). Another excellent example is the 524 Durfee Street House, a two-story Italianate style tenement. French Second Empire style examples are located along Durfee Street, such as the three-story, Mansard-roofed properties at 121 Cherry Street (FLR.58), 106-108 Cherry Street (FLR.57), Smaller examples include the one-and-one-half-story, Italianate multi-family Josiah Brown House (FLR.1606), Nathaniel Ford House (FLR.1607), and the Johnathan I. Hillard House (FLR.1608), and the Cook-Standing House (FLR.209).

A few properties within the district stand as a testament to Fall River's economic stability in the nineteenth century, due to success in the textile industry. The Bristol County Superior Courthouse and Registry of Deeds (FLR.254) located at 441 North Main Street is one of only a few landmark public properties in the city. The building is a large-scale Richardsonian Romanesque constructed in 1889 as the Bristol County Superior Courthouse. In 1930, a building to house Registry of Deeds was attached to the property and designed to compliment the original courthouse in design and massing. Originally constructed circa 1861, the Quequechan Club (FLR.262) was renovated in the 1890s in the Colonial Revival style with pilasters, a pedimented roof, and Doric porch supports, shortly after the property was established as a social club. The club catered to prominent business men, including chief executives of mills and other individuals associated with the textile industry (Giza 1981a; Giza 1981b; MHC 1982; Frontiero 1983).

Since 2008, the following properties listed on the MHC Inventory have been demolished: the circa 1870 Italianate style Pickering House (FLR.87) at 488 Durfee Street, the circa 1922 Spanish Eclectic Wilfred Tudeau House (FLR.1613) at 321 North Main Street, the circa 1885 residence at 532-542 North Main Street (FLR.1604), the Unitarian Society in Fall River (FLR.263) (individually listed on the National Register as part of the Fall River MRA), and the circa 1863 Victorian Eclectic Isaac B. Chace Tenement House (FLR.1590).

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Giza, Patricia
1981 *MHC Form B: Bristol County Superior Courthouse and Registry of Deeds*. On File, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Giza, Patricia and Pam Fox
1981 *MHC Form B: Quequechan Club*. On File, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Massachusetts Historical Commission (MHC)
1982 *MHC Reconnaissance Report: City of Fall River.* On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Walling, Henry F.
1852 *Bristol County, Massachusetts*. C. & A. Taber, Boston, MA.

1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.56	Lafayette – Durfee House	94 Cherry Street	ca. 1747	Georgian	2	NR
FLR.57	Residence	106 – 108 Cherry Street	ca. 1885	French Second Empire	2	C
FLR.58	Residence	121 Cherry Street	ca. 1870	French Second Empire		C
FLR.59	Church of New Jerusalem	190 Cherry Street	ca. 1885	Stick Style, Victorian Gothic		C
FLR.75	Residence	95 Danforth Street	ca. 1865	Italianate		C
FLR.76	Residence	145 Danforth Street	ca. 1840	Greek Revival		C
FLR.1712	Residence	267 Durfee Street	ca. 1855	Greek Revival		C
FLR.85	Anthony, C. M. House	313 Durfee Street	ca. 1880	French Second Empire		C
FLR.1526	Earle, John M. House	352 Durfee Street	ca. 1890	Italianate		NR
FLR.86	Davis, William House	432 Durfee Street	ca. 1870	French Second Empire		C
FLR.1711	Borden, Melvin House	452 Durfee Street	ca. 1861	Greek Revival, Italianate		C
FLR.88	Gray, H. O. House	554 Durfee Street	ca. 1868	Greek Revival, Italianate		C
FLR.581	Residence	564 Durfee Street	ca. 1868	Italianate		C
FLR.581	Residence	574 Durfee Street	ca. 1868	Greek Revival		C
FLR.89	Thurston, Edwin C. House	601 Durfee Street	ca. 1840	Greek Revival		C
FLR.1639	Anthony, George H. Tenement House	244 Locust Street	ca. 1898	Queen Anne		C
FLR.1638	Wilcox, Robert A. Tenement House	253 Locust Street	ca. 1885	Italianate		C
FLR.1637	Newton, Elizabeth S. Tenement House	254 Locust Street	ca. 1887	Italianate		C
FLR.1636	Anthony House	268 Locust Street	ca. 1850	Greek Revival		C
FLR.1635	McNernet, John F. House	278 Locust Street	ca. 1925	Craftsman		C
FLR.1634	Earle, Slade W. Tenement House #2	279 Locust Street	ca. 1875	Italianate		C
FLR.1629	Horton, Hiram House	154 Maple Street	ca. 1859	Italianate	5	C

Continuation sheet 3

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.208	Standing, John House	159 Maple Street	ca. 1877	French Second Empire		C
FLR.1628	Earl, John M. House # 1	174 Maple Street	ca. 1861	Italianate	5	C
FLR.209	Cook – Standing House	183-185 Maple Street	ca. 1855	Victorian Eclectic	9	C
FLR.1627	Davis, Capt. Elijah G. House	186-188 Maple Street	ca. 1894	Italianate	5	C
FLR.1626	Residence	250-252 Maple Street	ca. 1900	Queen Anne		C
FLR.1625	Pevers, Martha B. House	256 Maple Street	ca. 1905	Queen Anne		C
FLR.1392	Thurston, Rienzi W. House	291 Maple Street	ca. 1889	Queen Anne		NR
FLR.215	Residence	40 May Street	ca. 1845	Greek Revival		C
FLR.259	First Baptist Church	200-228 North Main Street	ca. 1850	Gothic Revival		NR
FLR.1616	Borden, Capt. Thomas House	238 – 242 North Main Street	ca. 1850; ca. 1980 additions	Neocolonial		NC
FLR.1615	Erik Building	260 North Main street	ca. 1961	International		C
FLR.1614	Saint Demetrios Greek Orthodox Church	289 North Main street	ca. 1954	Neo Gothic Revival		C
FLR.262	Quequechan Club	292-306 North Main Street	ca. 1861; ca. 1878; ca. 1895; ca. 1920	Colonial Revival	7	NR
FLR.1612	New England Telephone and Telegraph Building	326 North Main Street	ca. 1940	Art Deco	7	C
FLR.1611	Anthony, Edward S. House	355 North Main Street	ca. 1887	Queen Anne		C
FLR.264	Fall River Knights of Columbus	368 North Main Street	ca. 1875	French Second Empire		NR
FLR.265	Lindsey, William House	373 North Main Street	ca. 1890	Greek Revival		NR
FLR.266	Smith, John Mace House	399 North Main Street	ca. 1844	Greek Revival		NR
FLR.1610	Social Security Administration Office	400 North Main street	ca. 1969	International		NC
FLR.267	Covel, A. S. House	422 North Main Street	ca. 1871	French Second Empire		C
FLR.254	Bristol County Registry of Deeds	441 North Main Street	ca. 1889; ca. 1930	Richardsonian Romanesque	6	NR

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
FLR.1609	Herman, Lewis Office	446 North Main Street	ca. 1949	Moderne		C
FLR.1608	Hillard, Johnathan I. House	485 North Main Street	ca. 1858	Italianate		C
FLR.268	Read Nathan House	506 North Main Street	ca. 1845	Greek Revival		NR
FLR.1607	Ford, Nathaniel House	507 North Main Street	ca. 1858	Italianate	4	C
FLR.1606	Brown, Josiah House	521 North Main Street	ca. 1858	Italianate	4	C
FLR.1605	Borden, George A. House	522 North Main Street	ca. 1880	Italianate		C
FLR.1603	Doyle, John E. Tenement House	535-537 North Main Street	ca. 1915	Colonial Revival, Triple-decker		C
FLR.269	Barnard, Louis L. House	549 North Main Street	ca. 1870	Italianate	3, 4	C
FLR.271	Residence	650 North Main Street	ca. 1840	Greek Revival		C
FLR.1589	Residence	120 Pine Street	ca. 1830	Federal, Greek Revival		C
FLR.1588	Residence	156 Pine Street	ca. 1890	Vernacular		C
FLR.1587	Residence	166 Pine Street	ca. 1910	Queen Anne, Triple Decker		C
FLR.1586	Herrick House	178 Pine Street	ca. 1917	Neo Gothic Revival		C
FLR.1579	Westall, John Tenement House	89 Prospect Street	ca. 1864	Italianate		C
FLR.1574	Borden, George H. House	87 School Street	ca. 1881	Queen Anne		C
FLR.455	Hartley, Dr. James W. House	162 Walnut Street	ca. 1868	French Second Empire	8	C
FLR.1554	Residence	263 Walnut Street	ca. 1920	Colonial Revival		C
FLR.1553	Brayton, Mary Tenement House	277-279 Walnut Street	ca. 1892	Italianate		C

NR Property individually listed in the National Register of Historic Places
C Contributing property to the district
NC Non-contributing property to the district

Residence at 86 Cherry Street, Lafayette-Durfee House (FLR.56), and residence at 106-108 Cherry Street (FLR.57) (l-r), view looking northeast.

Multi-family tenement at 553 North Main Street and Louis L. Bernard House (FLR.269) at 549 North Main Street (l-r), view looking northeast.

Residence at 553 North Main Street, Louis L. Bernard House (FLR.269), Josiah Brown House (FLR.1606), and the Nathaniel Ford House (FLR.1607) (r-l), view looking northeast.

Captain Elijah G. Davis House (FLR.1627), John M. Earl House #1 (FLR.1628), and Hiram Horton House (FLR.1629), view looking northwest down Maple Street.

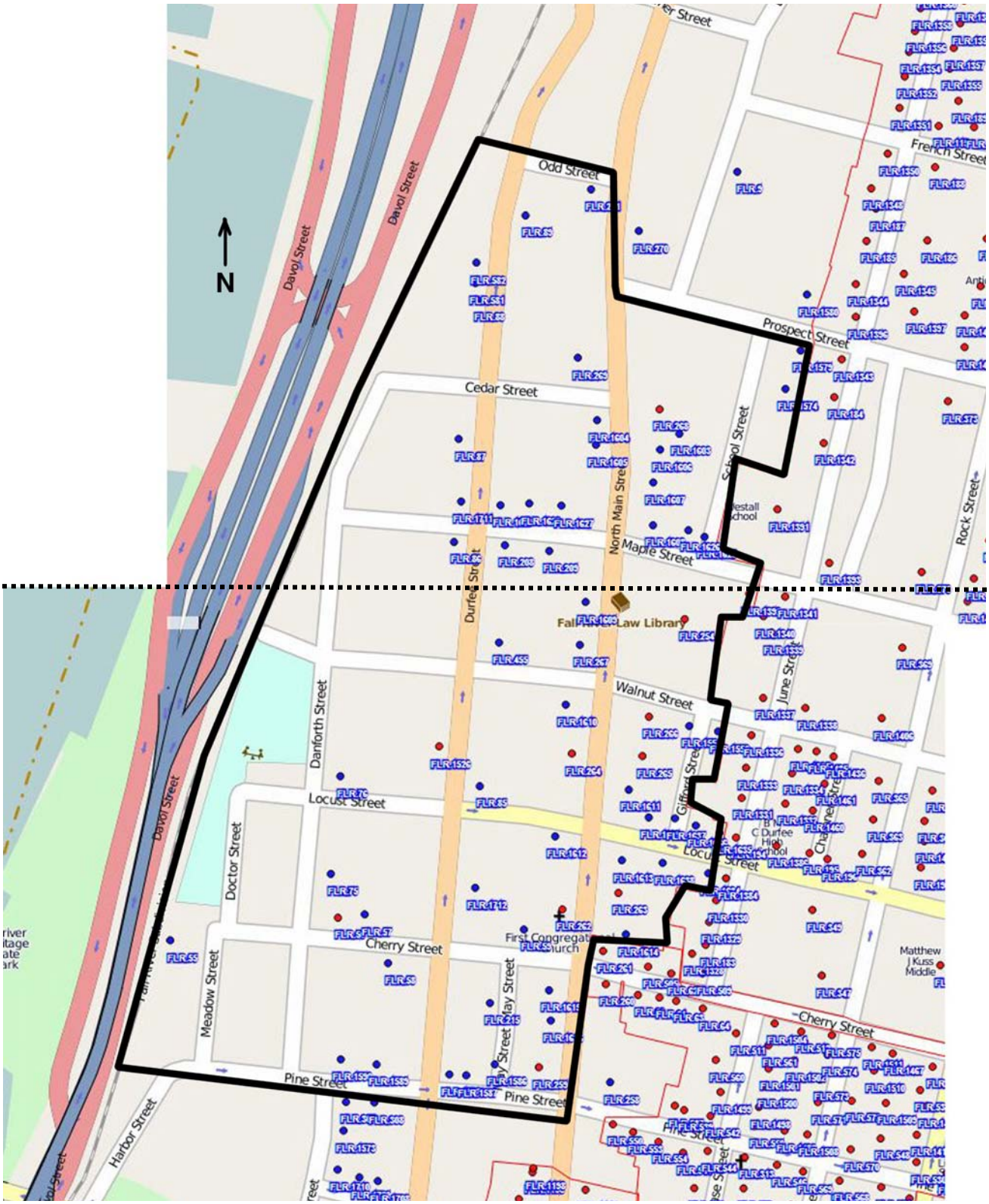
Bristol County Superior Courthouse and Registry of Deeds (FLR.254), view looking southeast.

Quequechan Club (FLR.262) and New England Telephone and Telegraph Building (FLR.1612) (l-r), view looking northwest.

Residence at 422 North Main Street (foreground) and Dr. James W. Hartley House (FLR.455), view looking northwest down Walnut Street.

Cook-Standing House (FLR.209) at 185 Maple Street, view looking southeast.

AREA MAP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French Street
Fall River Law Library
First Congregational Church
Matthew J Kuss Middle

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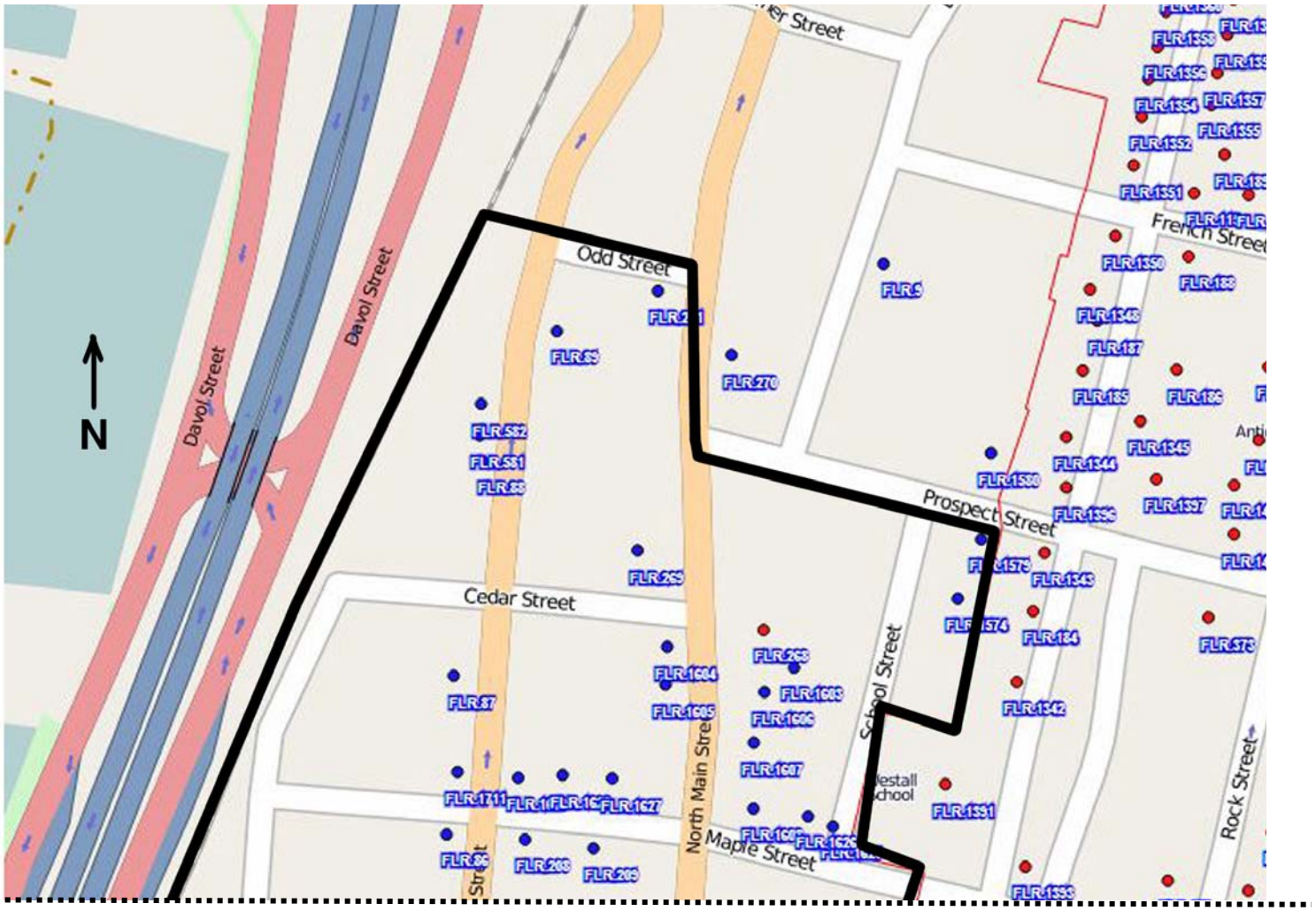
1. AREA MAP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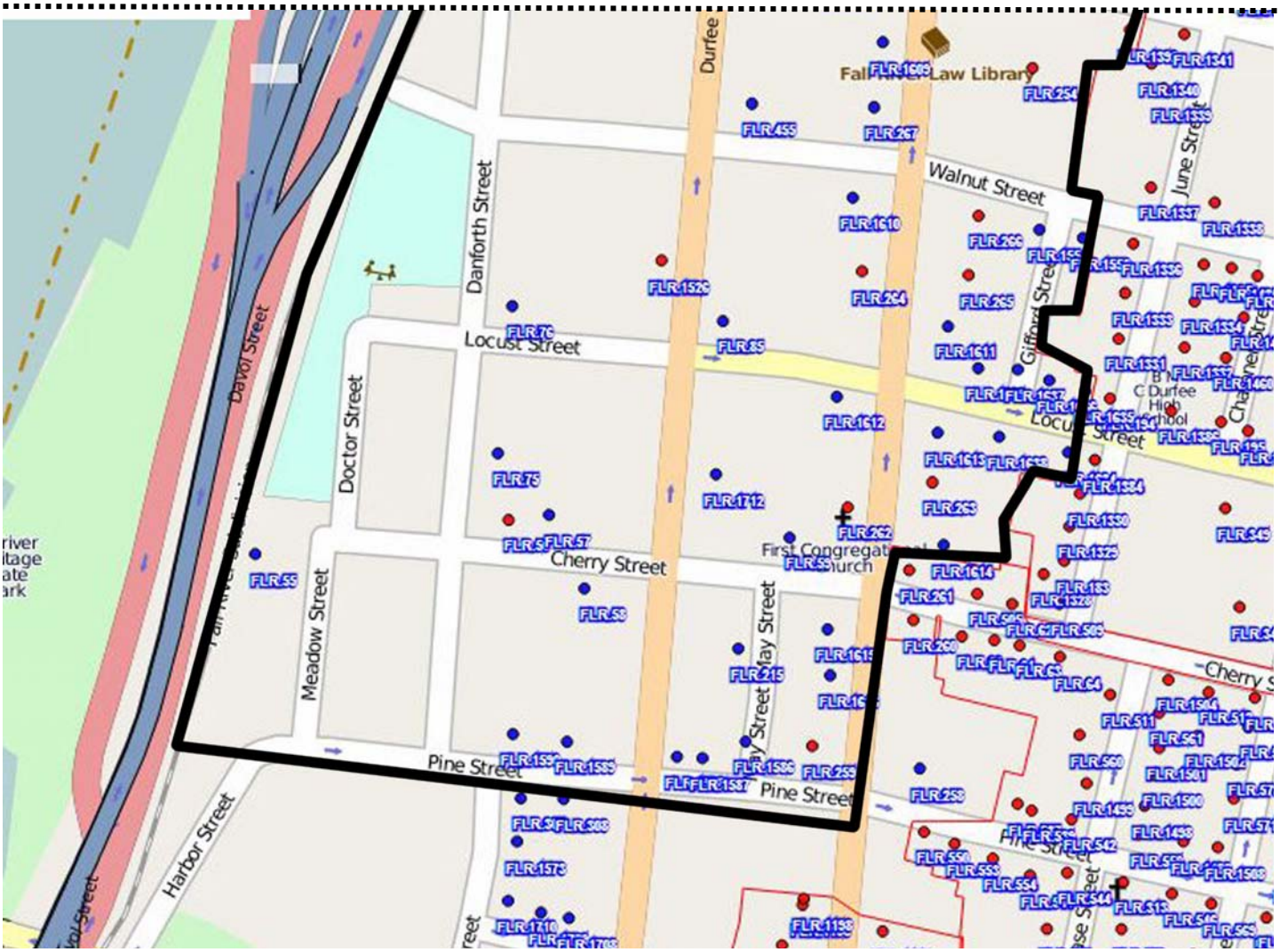
2. AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Durfee Street Area is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level in the areas of community development and architecture. The area is eligible under Criterion A for its important associations with the mid-nineteenth through the mid-twentieth century residential development along North Main Street that spurred from Fall River's booming textile and coal industry. The area is also eligible under Criterion C as an excellent example of an intact mid-nineteenth to mid-twentieth century neighborhood with a well-preserved collection of single- and multi-family residential architecture in a wide range of styles.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Somerset		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Freetown

Place *(neighborhood or village):*

Name of Area: Slab Bridge Road Area

Present Use: Residential

Construction Dates or Period: Late-18th to Early-20th C.

Overall Condition: Good

Major Intrusions and Alterations: Assonet Railroad Depot demolished after 1871

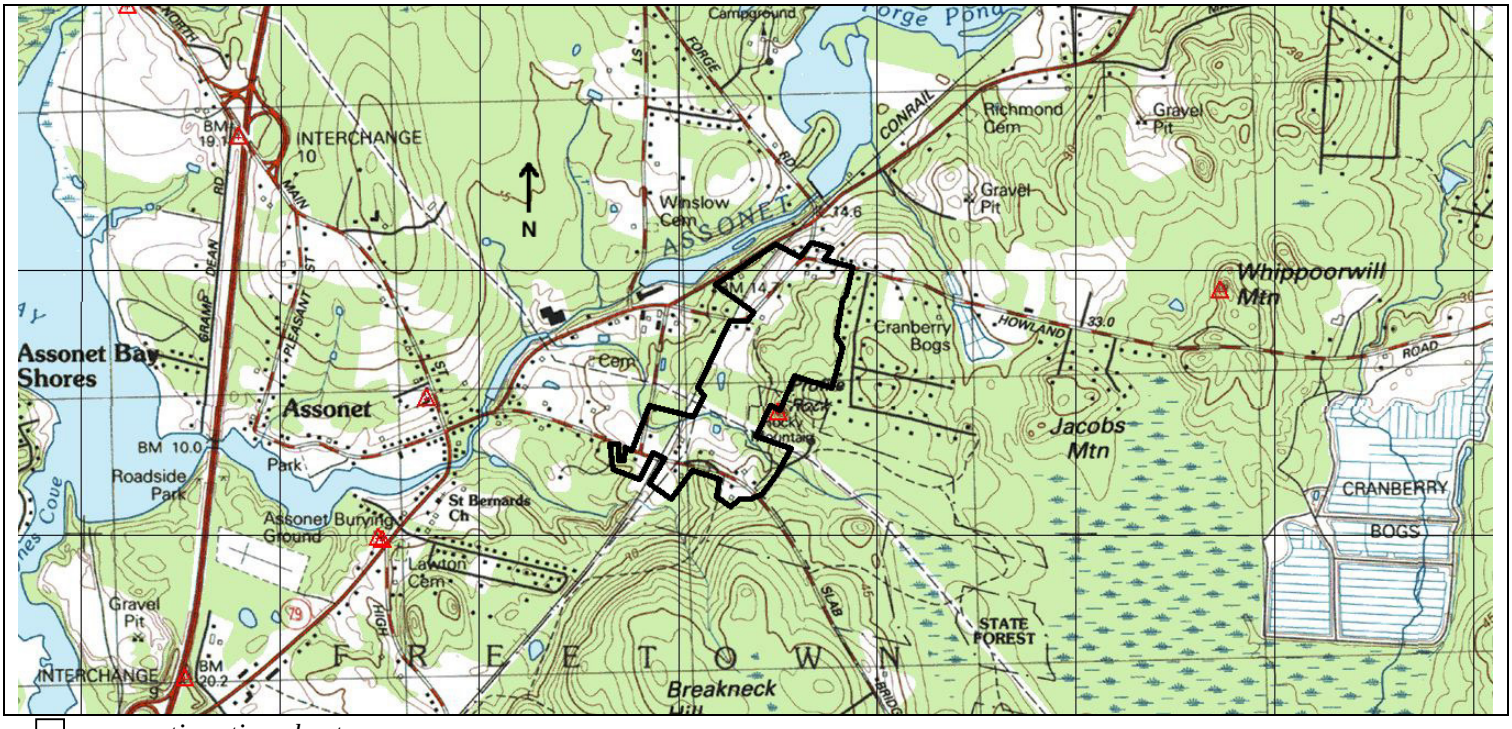
Acreage: Approx. 85

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Slab Bridge Road Area is an 85-acre, relatively rural, residential, 0.5-mile corridor south of the Assonet River, flanked by modest residential properties. It extends predominantly along the eastern boundary of the Fall River Secondary Railroad Line, encompassing portions of Forge Road, Howland Road, and Slab Bridge Road. The area reaches across the right-of-way to include portions of Richmond Road, Elm Street, and Walnut Street. It is located just east of the Assonet Historic District (FRE.A). Comprised of 19 properties, the area has 13 contributing properties that contribute to its architectural significance. These properties consist primarily of modest Vernacular, Cape Cod, Colonial Revival, and Bungalow style residences constructed between the late eighteenth and early twentieth century within close proximity to the no longer extant Assonet Railroad Depot, which was located on the northwestern corner of the railroad crossing with Slab Bridge Road. The majority of the contributing properties are in excellent condition, with slight modifications including front porch additions, window replacement, and the installation of synthetic siding.

The center of the area consists of a large 18.39-acre property at 12 Forge Road, consisting of a highly (and continuously) altered ca. 1880 residence, a ca. 1900 gabled utilitarian building (likely a potato house) with fieldstone walls, a large ca. 1900 English style barn, two ca. 1900 barns, a cranberry bog and quarry. The second largest lot within the area is provides space for the Freetown Historical Society Museum located at 1 Slab Bridge Road. The museum consists of a collection of moved buildings (that are non-contributing to the Slab Bridge Road Area) associated with the history of Freetown, such as the Mason Corner School, Wilson Sawmill, and the Advent Chapel.

Three properties on Forge Road were surveyed in 1978 for inclusion in the MHC Inventory. The residence at 21 Forge Road (FRE.66) is a one-story, five-bay by two-bay, wood-frame gable-front, center hall plan, Federal style building built on the western side of Forge Road, approximately 300 feet from the corner of Forge and Howland Roads. Similar in style and located in close proximity on the southeastern corner of Forge Road and Howland Road, the ca. 1780 residence at 26 Forge Road (FRE.67) has been altered with the addition of late twentieth century dormers to the east-facing facade. Directly across Howland Road sits the residence at 28 Forge Road (FRE.68), which is a two story, five-bay by two-bay, gable front, wood-framed Colonial Revival style building constructed ca. 1880.

HISTORICAL NARRATIVE

The rural, residential Slab Bridge Road Area is a byproduct of the late eighteenth to early twentieth century residential, commercial, and industrial hub of Assonet Village, located just west of the district. The first roads likely to have been laid out within the Slab Bridge Road Area lie at the northeastern corner. Richmond and Forge Road were constructed in the late eighteenth century, shortly after the development of Assonet Village. The oldest properties within the area boundary, 21 Forge Road (FRE.66) and 26 Forge Road (FRE.67) (slightly modified), are examples of late eighteenth century architecture in the town, as single-story, five-bay by two-bay properties with centered chimneys (MHC 1981).

By 1835, the Old Colony and Newport Railroad was constructed through district on a north to south axis from the northernmost intersection of Richmond Road and Forge Road, intersecting Forge Road along the western boundary of 12 Forge Road, to Elm Street along the western boundary of 1 Slab Bridge Road (currently the Freetown Historical Society Museum). An associated railroad station, the Assonet Depot (no longer extant) was also constructed within bounds of the area, on the northwestern corner intersection with Elm Street (Walling 1852; 1858; Beers 1871).

The largest property, centrally located within the area at 12 Forge Road, has been owned by descendants of the Evans family since at least 1852. The Evans family has been in Freetown since at least 1780. Until the mid-twentieth century, the Evans' property reportedly included the area which is now 14, 16, 20, and 22 Forge Road. The lot, which includes a cranberry bog, quarry, and two ca. 1900 utilitarian buildings, likely extended southeast to include a portion of land that is now part of Freetown Fall River State Forest (Walling 1852; Franklin 1902; Member of Evans Family 2012).

Few buildings were constructed within the town of Freetown from the late nineteenth to early twentieth century a. The only construction that took place occurred outside of the denser village centers. Approximately 60% of the contributing residences in the Slab Bridge Road Area date to this period and are in the Vernacular or Colonial Revival style, with one Bungalow style building. Included in this group is the vernacular style residence at 8 Richmond Road, which was likely an ecclesiastical property associated with a church in the early twentieth century. Indications include the religious ornamentation above the centrally located gable peak window on the facade. Other excellent examples of buildings constructed during this period include the one-and-one-half-story, three-bay by three-bay, gable-front, tin roof, Vernacular style residence at 4 Walnut Street (ca. 1900) and the two-story, five-bay by two-bay, side-gabled Colonial Revival style residence at 28 Forge Road (FRE.68).

The Freetown Historical Society and Museum has been located at 1 Slab Bridge Road since its founding in 1968. Since it was originated, the society has grown from a small property with a single building, which has since been expanded. Today, the organization maintains over 11-acres of land with ten historic buildings. Though this property contains several properties significant to the history of Freetown, it is not contributing to the district since the buildings likely have been moved from other locations in town (Freetown Historical Society 2013).

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Member of Evans Family
2012 Personal Communication. November 20, 2012.

Walling, Henry F.
1852 *Bristol County, Massachusetts*. C. & A. Taber, Boston, MA.

1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	30 Elm Street	ca. 1915	Colonial Revival/Cape Cod		C
	Residence	12 Forge Road	ca. 1880	Colonial Revival	4	C
	Residence	14 Forge Road	ca. 1960	Ranch		NC
	Residence	16 Forge Road	ca.1980	Vernacular		NC
	Residence	20 Forge Road	ca. 1955	Ranch		NC
FRE.66	Residence	21 Forge Road	ca. 1780	Colonial /Cape Cod		C
	Residence	22 Forge Road	ca. 1965	Neocolonial		NC
FRE.67	Residence	26 Forge Road	ca. 1777	Colonial/Cape Cod	2	C
FRE.68	Residence	28 Forge Road	ca. 1895	Colonial Revival	3	C
	Residence	2 Howland Road	ca. 1935	Colonial Revival/Cape Cod		C
	Residence	4 Howland Road	ca. 1935	Colonial Revival/Cape Cod	7	C
	Residence	6 Howland Road	ca. 1902; large late 20th century addition	Vernacular		C
	Residence	8 Richmond Road	ca. 1880	Vernacular	5	C
	Freetown Historical Society Museum Building	1 Slab Bridge Road	ca. 1870; completely remodeled ca. 1975	Vernacular		NC
	Residence	4 Slab Bridge Road	ca.1870; extensively remodeled ca. 1990	Vernacular		C
	Residence	5 Slab Bridge Road	ca. 1840	Vernacular/Greek Revival		C
	Residence	11 Slab Bridge Road	ca. 1965	Vernacular		NC
	Residence	12 Slab Bridge Road	ca. 1890	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	15 Slab Bridge Road	ca. 1923	Bungalow	6	C
	Residence	4 Walnut Street	ca. 1900	Vernacular	1	C

C Contributing property to the district
NC Non-contributing property to the district

Residence at 26 Forge Road (FRE.67), ca. 1777, view looking north.

Residence at 28 Forge Road (FRE.68), ca. 1880, view looking southeast.

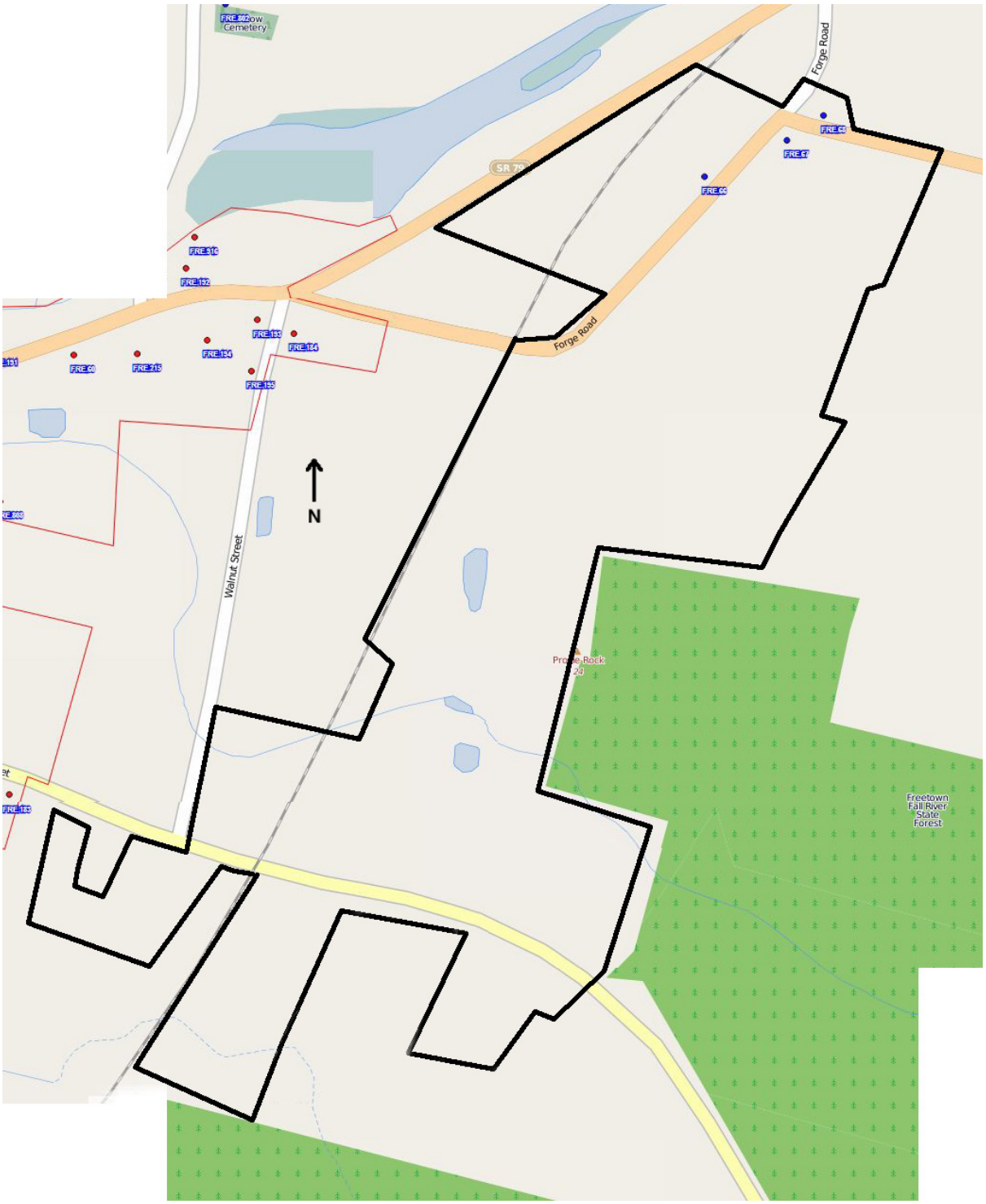
12 Forge Road, Evans family property, utilitarian building (likely a potato house) and English barn view looking south.

Vernacular style residence at 8 Richmond Road, ca. 1880, view looking southeast.

Bungalow style residence at 15 Slab Bridge Road, ca. 1923 view looking south.

Howland Road, Colonial Revival Cape Cod Style residence at 4 Howland Road, ca. 1935, view looking northeast.

AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Slab Bridge Road Area is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level in the areas of settlement and architecture. The area is eligible under Criterion A for its important associations with early settlement patterns as a byproduct of the development of the nearby Assonet Village. The area is also under Criterion C as an excellent and intact development of late-eighteenth to early-twentieth-century residential architecture. The area includes two late-eighteenth-century thoroughfares at Richmond and Forge Roads and provides a collection of well-preserved Vernacular and Colonial Revival style residential buildings that is absent from village centers within Freetown.

Prepared by PAL, December 2012

This continuation sheet is a supplement to the existing inventory form Assonet Cedar Swamp Area, LAK.D.

ARCHITECTURAL DESCRIPTION (Continued)

A field survey in December 2012 verified that the Assonet Cedar Swamp Area appears to be largely unchanged since the previous survey in 2002. The area encompasses about 75% of the Beechwoods/Pierce Avenue Area (LAK.G). At the time the existing form was drafted, the Beechwoods/Pierce Avenue Area Form had not been completed. The Area Data Sheet reflects the most current updates for all properties within the area that are listed in the MHC Inventory.

While noted as historically or architecturally significant properties in the previous form, the following properties are located outside of the Assonet Cedar Swamp Area boundary:

- Hafford House (LAK.24) and the Hafford Cemetery (LAK.802) at 177 County Road.
- Howland Cemetery (LAK.806) at Howland Road.
- Lang Street Cemetery – Pierce Cemetery (LAK.808) at Lang Street.

The survey confirmed that the Assonet Cedar Swamp Area is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C for its association with nineteenth-century residential, civic, and agricultural activities in Easton and for its well-preserved collection of residential architecture

BIBLIOGRAPHY and/or REFERENCES (Continued)

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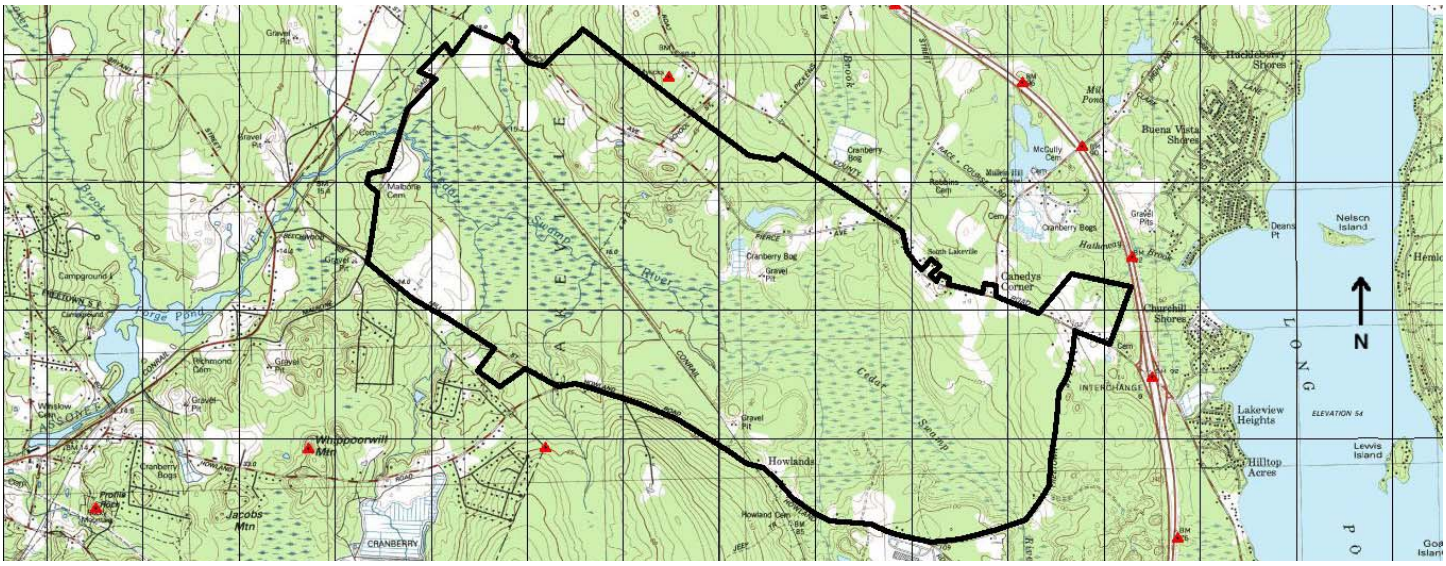
2002 *MHC Area Form: Assonet Cedar Swamp*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Leonard, Kenneth
2002 *MHC Area Form: Beechwoods/Pierce Avenue*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

LOCUS MAP



AREA DATA SHEET

The following is a selection of properties within the area that are either included in the previous form and/or listed in the state register.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
LAK.911	Colonial Road / "The Woodland Path"	Colonial Road	ca. 1715-1840			C
LAK.15	South Lakeville School	119 County Street	ca. 1925	Colonial Revival	3	C
LAK.14	Alexander Canedy House	140 County Street	1815	Federal		C
LAK.922	Brehaut, John Twin Silos	141 County Street	ca. 1880	Vernacular		C
LAK.16	Old Sampson Tavern	161 County Street	ca. 1830			C
LAK.24	Samuel Hafford House	177 County Street	ca. 1724			C
LAK.802	Hafford Cemetery	177 County Street	ca. 1799			C
LAK.119	Washburn, Salmon M. Hose	2 Freetown Street	ca. 1838	Cape Cod, Colonial		C
LAK.121	Winslow, Asa – Baker, Marcus House	8 Freetown Street	ca. 1825	Federal		C
LAK.910	Howland Bridge Road over Howland Brook	Howland Road	19th C.			C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
LAK.906	Howland Road Bridge over Conrail	Howland Road	19th C.			C
LAK.806	Howland Cemetery	Howland Road	Early 19th C.			C
LAK.32	Howland, Eseck – Sears, Earl House	83 Howland Road	ca. 1750	Federal	1	C
LAK.805	Lang Street (The Pierce) Cemetery	Lang Street				C
LAK.807	Malbone Cemetery	Malbone Street	Late 18th C.			C
LAK.93	Pierce / Haskins House	21 Malbone Street	ca. 1810			C
	Haskins – David Mill Site	Mill Street	Mid-19th C.			C
LAK.94	Farm	11 Mill Street	Early 19th C.			C
	Saw Mill Site	Pierce Avenue	1713-1765			C
LAK.913	Colonial Granite Quarry	Pierce Avenue	ca. 1730-1780			C
LAK.914	Horse Block	Pierce Avenue	19th C.			C
	John Pierce House Site	Pierce Avenue	1725-1890			C
LAK.915	Quarry	Pierce Avenue	ca. 1875-1940			C
	Josiah Holloway House Site	Pierce Avenue	ca. 1725-1850			C
	Philander Pierce House Site	Pierce Avenue	ca. 1860			C
LAK.916	Logging Road Causey	Pierce Avenue	Late 18th century			C
	Grist Mill Site	Pierce Avenue	ca. 1765			C
LAK.917	Baptismal Pulpit	Pierce Avenue	ca. 1760			C
LAK.809	Staples – Smith Cemetery	Pierce Avenue				C
LAK.924	Elkanah's Bridge	Pierce Avenue				C
LAK.805	Pierce Cemetery	1 Pierce Avenue				C
LAK.95	A. Pierce House	8 Pierce Avenue	ca. 1860	Greek Revival		C
LAK.20	Hermon and Phillip Pierce House	18 Pierce Avenue	ca. 1792	Cape Cod		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
LAK.96	Levi Pierce House	22 Pierce Avenue	ca. 1820	Cape Cod		C
LAK.97	Enos Pierce House	44 Pierce Avenue	ca. 1830	Cape Cod		C
LAK.912	Balancing Stone	48 Pierce Avenue				C
LAK.12	Allen, Samuel House	59 Pierce Avenue	ca. 1765	Cape Cod		C
LAK.98	School	71 Pierce Avenue	Early 19th C.	Federal	2	C
LAK.99	Hoard House	71 Pierce Avenue	ca. 1800	Greek Revival		C
	Oliver Pierce House	85 Pierce Avenue	ca. 1810	Federal		C
	Jirah Winslow House	105 Pierce Avenue	1826-1830	Federal		C
LAK.102	Winslow Estate Annex House	114 Pierce Avenue	Mid-19th C.	Greek Revial		C

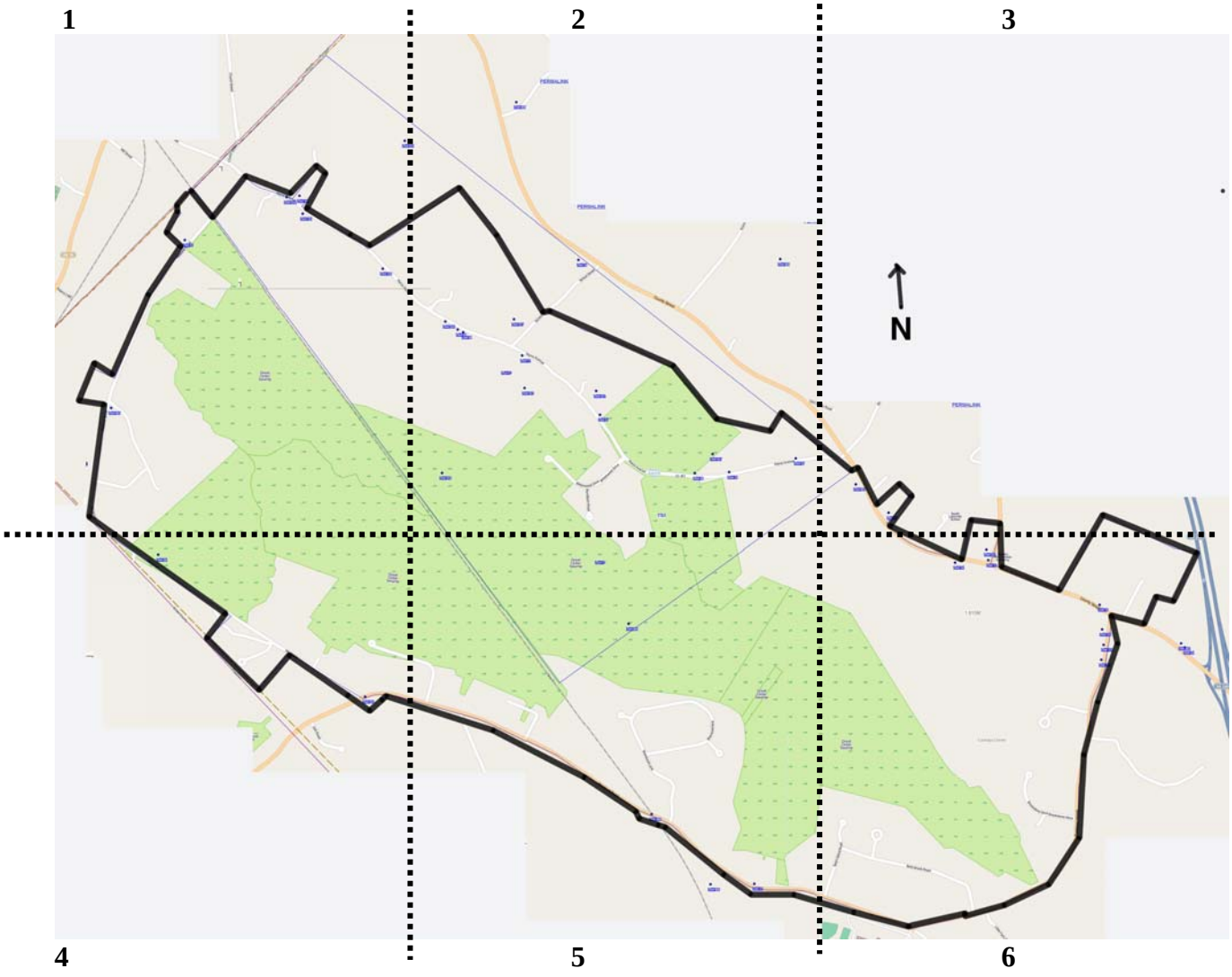
C Contributing property to the district
NC Non-contributing property to the district

Howland, Eseck – Sears, Earl House (LAK.32), view looking northwest.

School (LAK.98), view looking southeast.

South Lakeville School (LAK.15), view looking northwest.

AREA MAP (6 Sections)



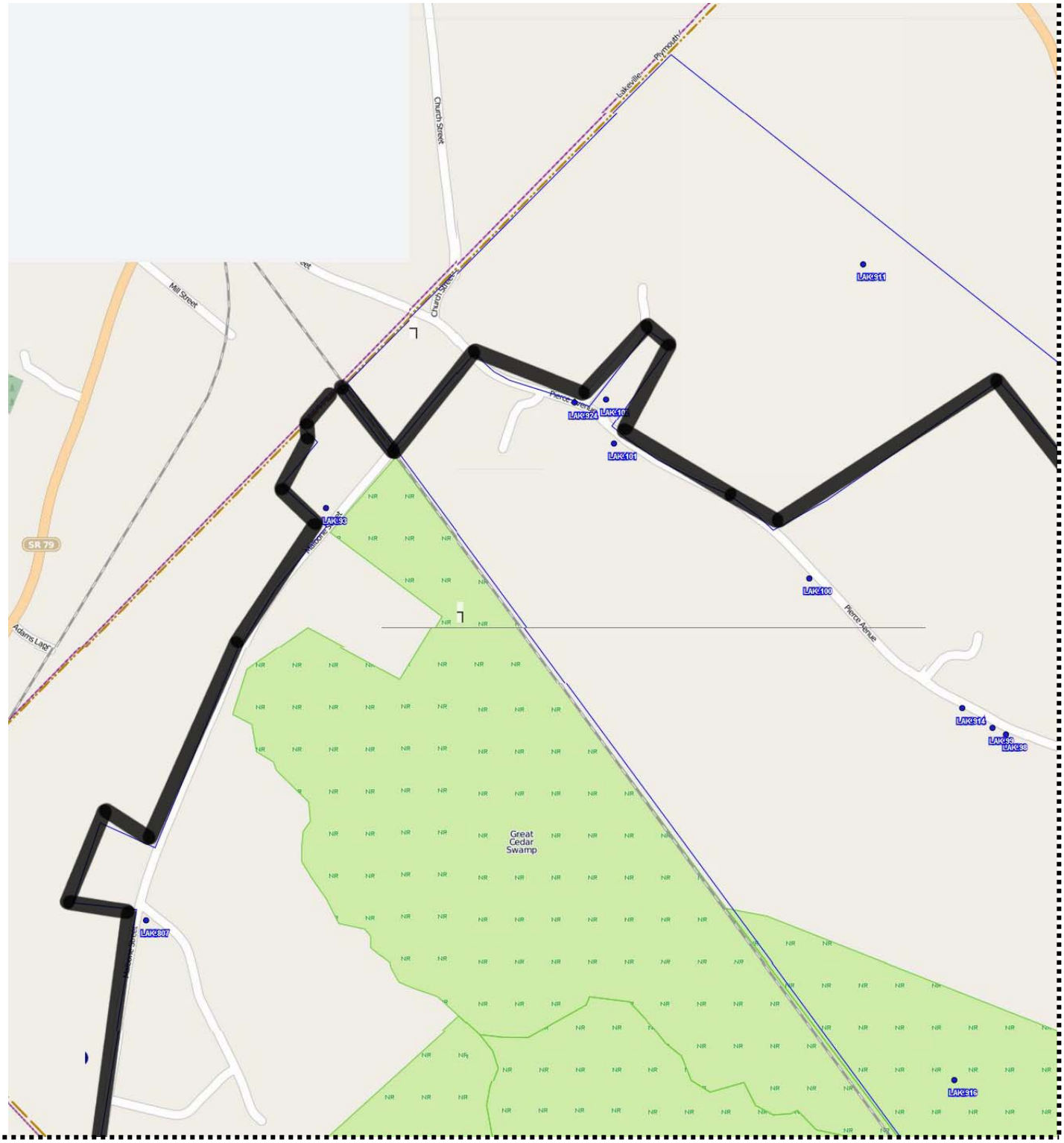
- MHC Inventory
- National Register Listed

\ = area boundary

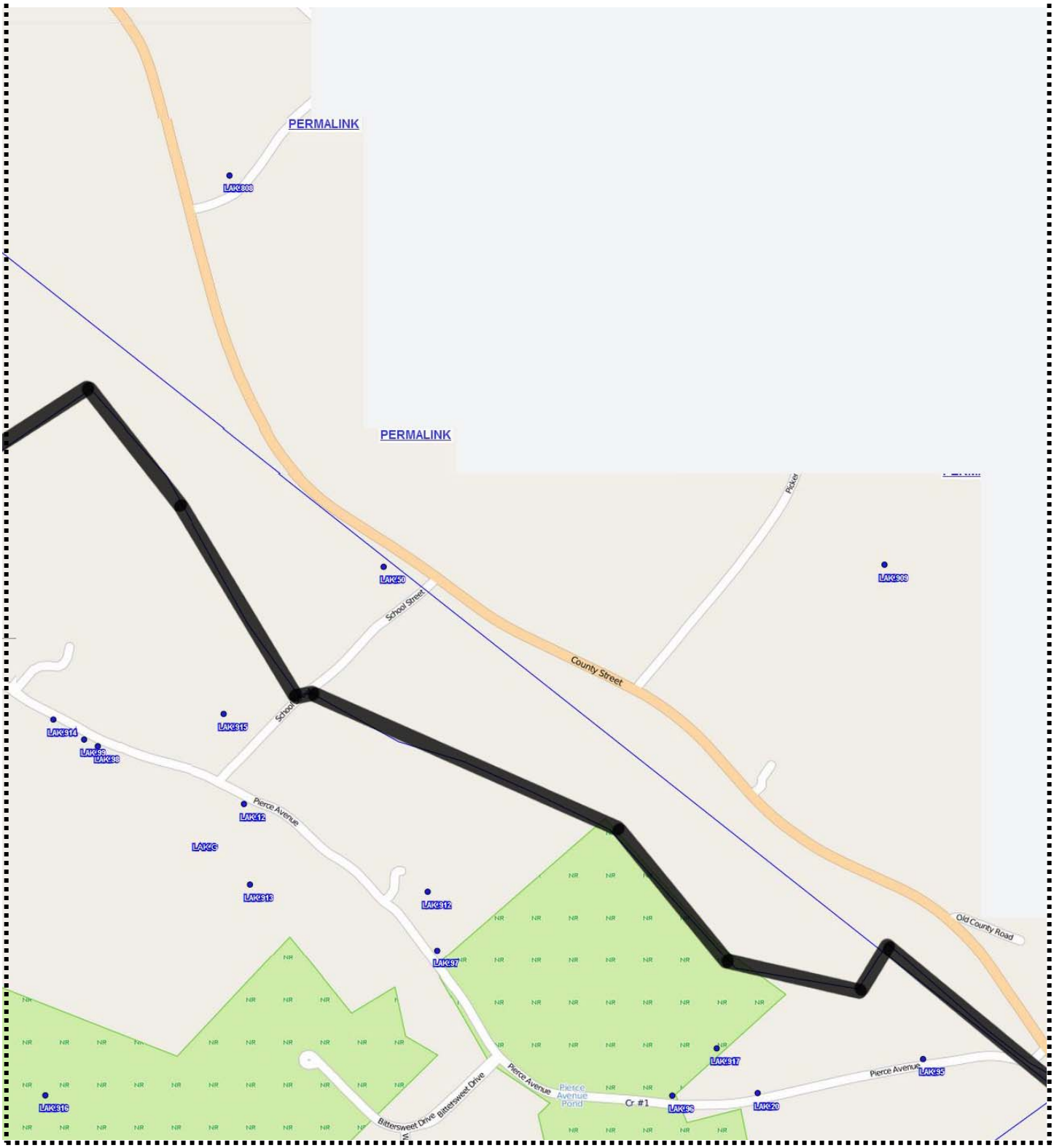
*not to scale

Information from MACRIS Maps 2.0 Beta
http://maps.mhc-macris.neT

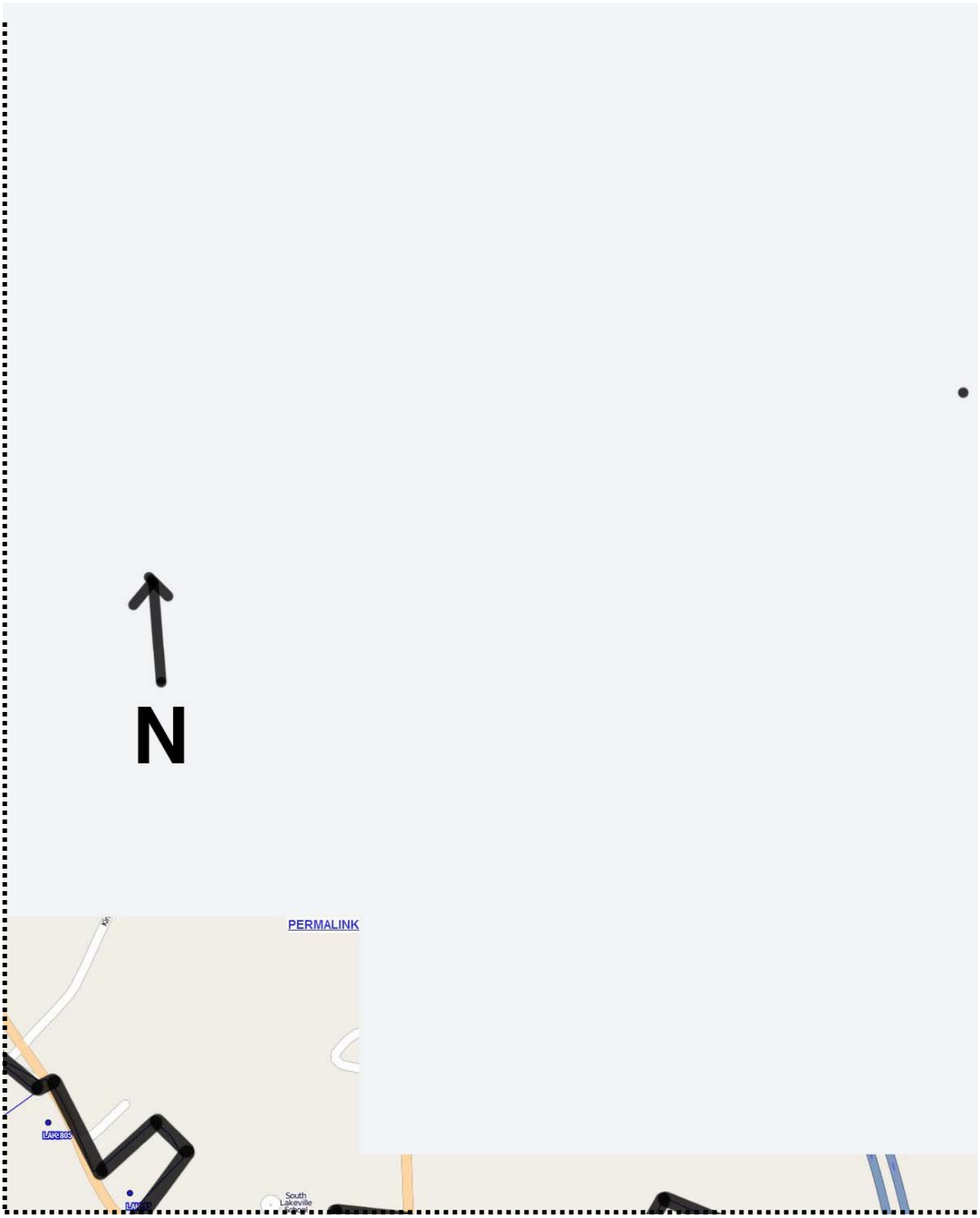
1. AREA MAP


Church Street
Mill Street
Pierce Ave
Pierce Avenue
SR 79
Adams Lane
Great Cedar Swamp
LAK:911
LAK:924
LAK:101
LAK:93
LAK:100
LAK:914
LAK:807
LAK:916

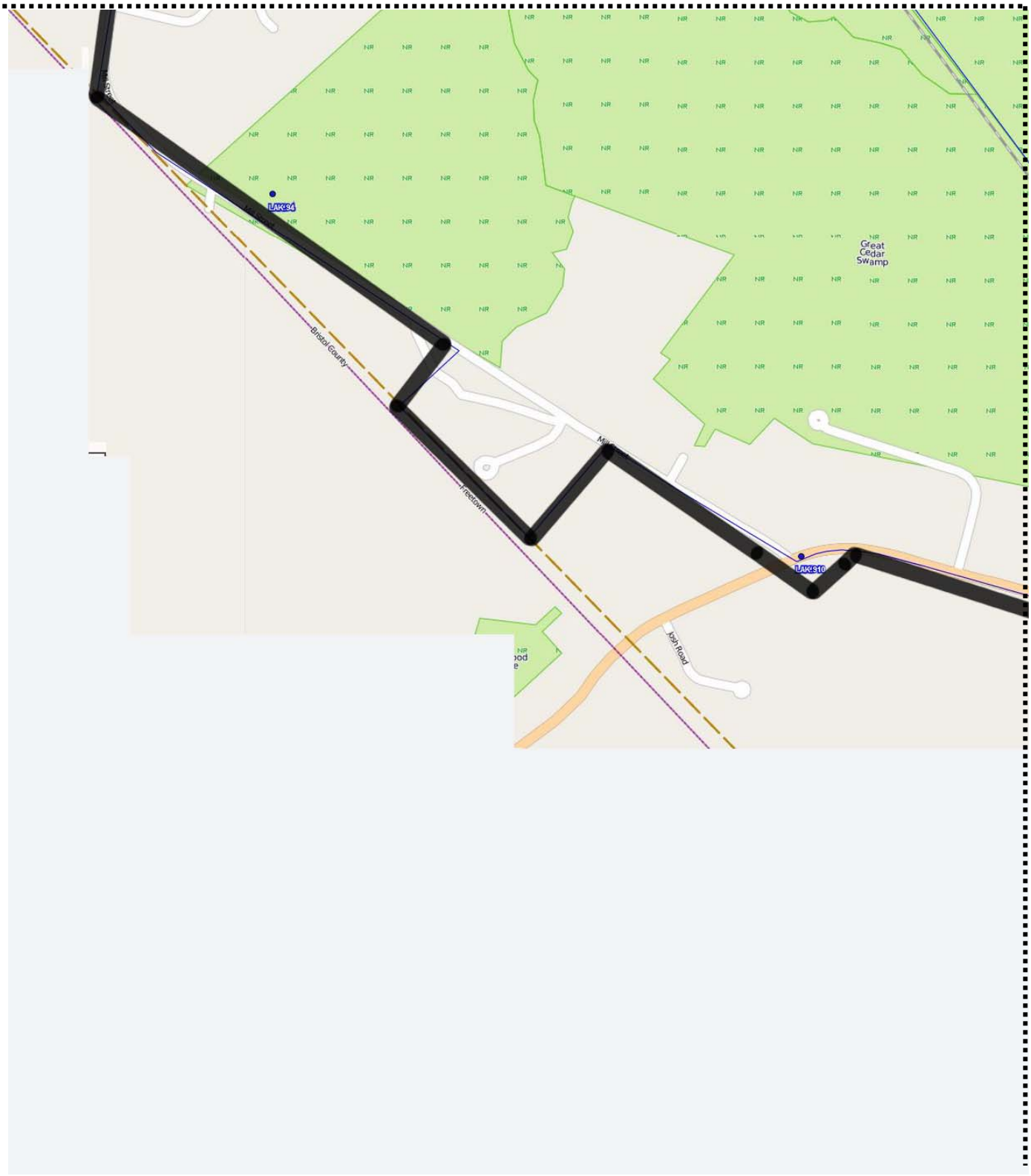
2. AREA MAP


PERMALINK
LAK:808
PERMALINK
LAK:50
School Street
County Street
LAK:909
LAK:914
LAK:99
LAK:98
LAK:915
School
Pierce Avenue
LAK:12
LAK:C
LAK:913
LAK:912
LAK:97
Old County Road
LAK:917
Pierce Avenue
LAK:95
LAK:916
Bittersweet Drive
Bittersweet Drive
Pierce Avenue
Pierce Avenue Pond
Cr #1
LAK:96
LAK:20

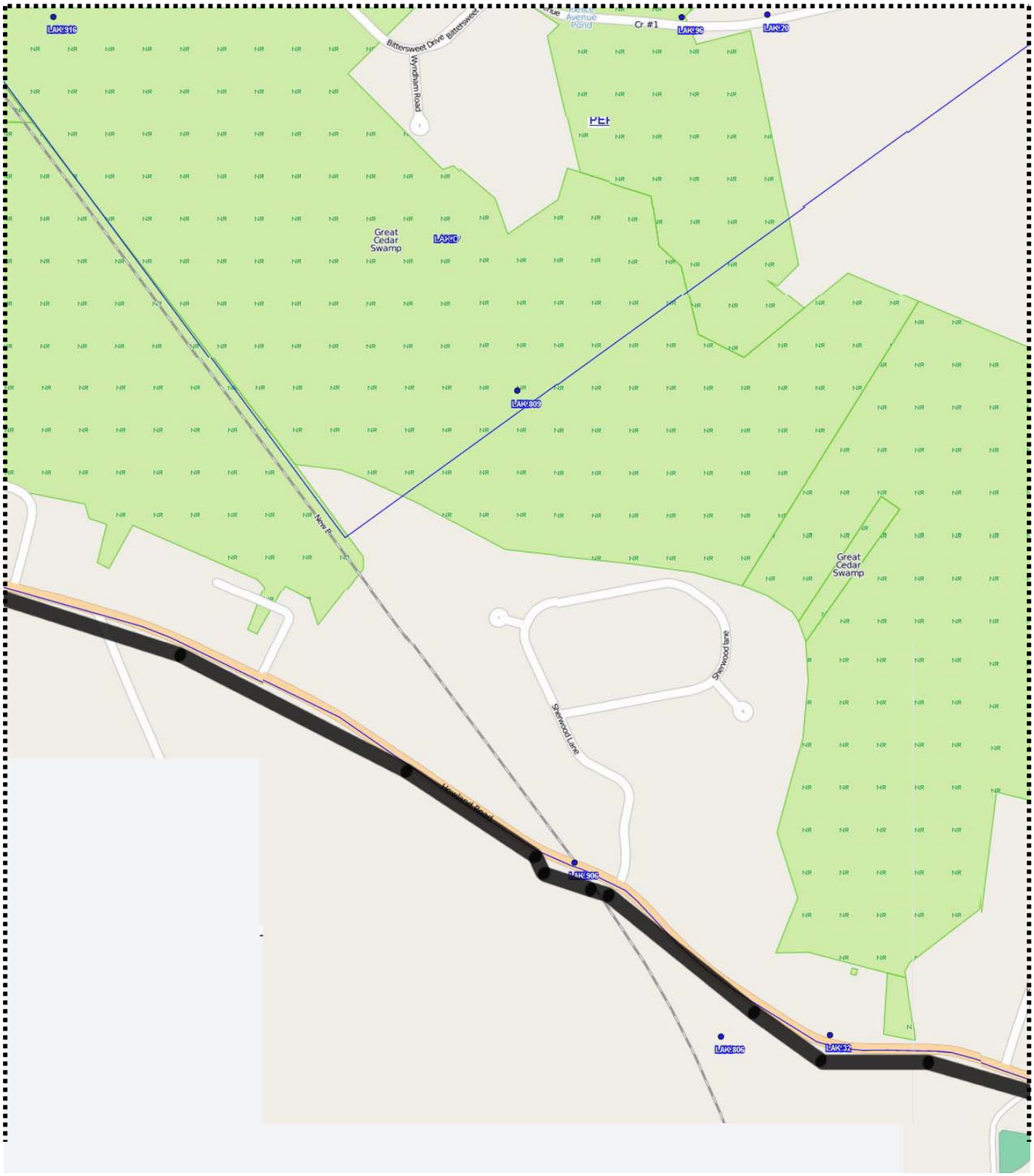
3. AREA MAP



4. AREA MAP


LAK:94
Great Cedar Swamp
Bristol County
Freetown
LAK:910
Josh Road

5. AREA MAP


LAK:816
Bittersweet Drive
Wyndham Road
Cr #1
LAK:96
LAK:20
Great Cedar Swamp
LAK:D
LAK:809
Great Cedar Swamp
Sherwood Lane
Sherwood Lane
LAK:906
LAK:805
LAK:32

6. AREA MAP

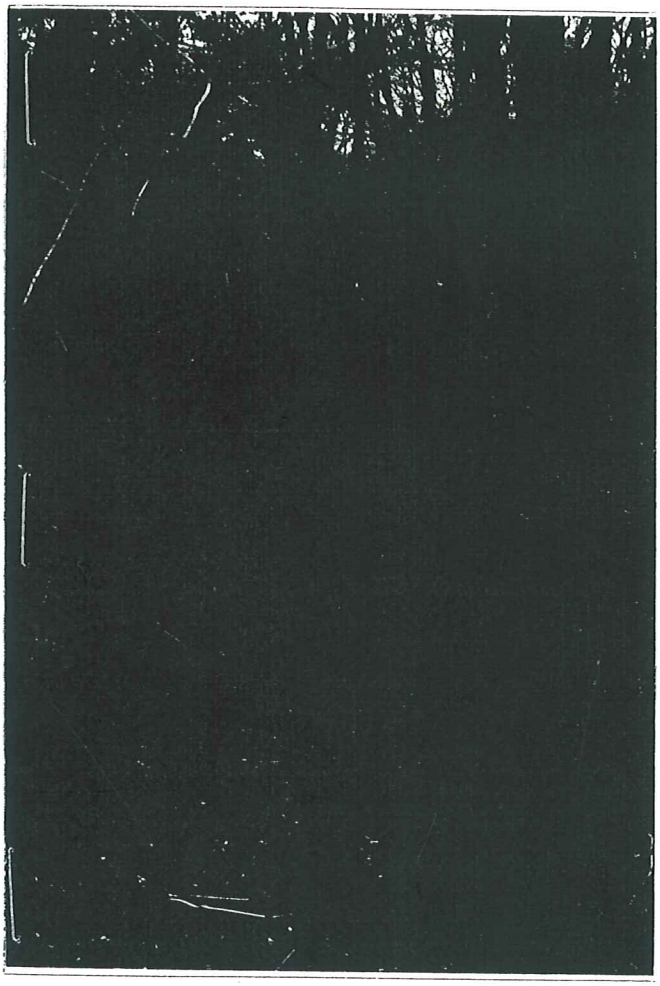
LAK:805
South Lakeville School
LAK:14
LAK:13
SR 140
County Street
LAK:16
LAK:119
LAK:120
LAK:802
LAK:24
SR 140
Great Cedar Swamp
Canedys Corner
Brookstone Drive
Brookstone Drive
Sears Island Road
Bells Brook Road

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
4,7,8,13,14,33	Assawompsett Pd.	D	Attached

12-18, 20, 21, 32, 93-102, 202, 805-808, 906, 910-917

Massachusetts Historical Commission
Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125



Sketch Map

see attached map

Town Lakeville

Place *(neighborhood or village)* South Lakeville

Name of Area Assonet Cedar Swamp

Present Use Nature preserve, residential

Construction Dates or Period
Cultural resources: Late 18th century through present

Overall Condition Good

Major Intrusions and Alterations
Modern residential infill and railroad line

Acreage 2669.14

Recorded by S.P. Berg/C. Longiaru for PAL

Organization DEM - Heritage Landscape Inventory

Date *(month/day/year)* December 2002

RECEIVED
JUL 9 2003
MASS. HIST. COMM

Follow Massachusetts Historical Commission Survey Manual for instructions for completing this form.

Massachusetts Historical Commission
Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

Area(s) D

Form No. 12-14, 20, 24, 32, 73-192, 202, 205, 206, 208, 210-217

☒ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form*

DESCRIPTION

Introduction

The Assonet Cedar Swamp Area, which includes the 800-acre swamp itself as well as the upland areas immediately surrounding it, is recognized as both a natural and a cultural resource. The common theme linking the area and distinguishing it from its surroundings is the presence of land use patterns related to the swamp. Early settlers used the Cedar Swamp as a source of wood for shingles. Over time various land uses, ranging from farms to mills to quarries to cranberry bogs, were established around the perimeter. Some of these uses continue today while evidence of others exists only as fragments or remnants in the landscape. The swamp is now valued primarily as natural habitat and open space. Along with the Assawompsett Pond complex, the Assonet Cedar Swamp was identified in the town's 2001 Open Space and Recreation Plan as one of Lakeville's two largest and most important environmental resources. The surrounding area, particularly Pierce Avenue, is also considered one of the community's most scenic and historic landscapes.

Assonet Cedar Swamp is located in the southwestern portion of Lakeville near the Berkley and Freetown town lines. The study area encompasses approximately 2669.14-acres. The central feature is the Cedar Swamp itself, with the Cedar Swamp River at its core. The six roads that form the perimeter of the area each have a distinctive character and unique relationship to the swamp. They are: Pierce Avenue and County Road on the north, Malbone Street on the west, Mill Street and Howland Road on the south, and Freetown Street on the east.

While the swamp itself is preserved as a wildlife sanctuary, changes are occurring rapidly around the perimeter that could dramatically impact the visual and environmental quality of this fragile area. The purpose of this inventory form is to look at the swamp in relation to its surroundings and to explore the interdependence of natural and cultural resources in creating the quintessential cultural landscape.

Assonet Cedar Swamp

(Note: the primary source for this section was the 2001 [Draft]Lakeville Open Space and Recreation Plan).

Lakeville is divided into three major drainage basins as part of the Taunton River watershed: the Nemasket River, the Assonet River, and the Poquoy Brook subwatersheds. The Cedar Swamp River part of the Assonet drainage area within Assonet Cedar Swamp. It originates southeast of the swamp in an area known as Rocky Woods and flows northwest through the center of the swamp, widening at its western end before becoming the Assonet River near the southwest corner of the swamp, turning to flow southwest. Along this short course, it is joined by several small tributaries, the largest of which is Holloway Brook, which joins the Cedar Swamp River from the north near the center of the swamp. Apart from the great ponds, Assonet Cedar Swamp is Lakeville's largest wetland.

The Assonet Cedar Swamp lies on either side of the Cedar Swamp River, extending up to half a mile from the river in either direction for a length of roughly three miles (verify distances). It is a low-lying area characterized by poorly-drained soils formed in freshwater organic deposits underlain by glaciofluvial deposits. This soil association, known as Freetown-Swansee-Scarboro soils, is represented in approximately 11% of Lakeville's land area and is typically

found in swamps and depressions.

These poorly drained soils provide an ideal habitat for Coastal Atlantic White Cedar, which is found in limited areas along the East Coast and is becoming globally rare. However, the name Assonet Cedar Swamp is somewhat of a misnomer today as the primary canopy vegetation is Red Maple intermingled with cedar, hemlock and Yellow Birch. There are only four cedar-dominated stands remaining, comprising about 50 acres, or 6% of the 800-acre swamp. The understory consists of Sweet Pepperbush and occasional Mountain Holly, with Sphagnum moss occurring throughout the area. Unusual flora includes pitcher plants, cowslips, and Smilacina triflium (which is very rare in southeastern Massachusetts). The remnant farms around the perimeter of the Cedar Swamp, especially Pierce Avenue, also provide valuable grassland-by-forest habitat, which is becoming increasingly rare as more land is converted for development or reverts to forest.

The Assonet Cedar Swamp is also home to two rare insects, the Hessel's Hairstreak butterfly (Mitoura hesseli) and the Water-willow Stemborer Moth (Papipema sulphurata) both of which are wetlands-dependent species. The Hessel's Hairstreak butterfly relies entirely on the Atlantic White Cedar as a host, thus decline in cedar population offers a direct threat to the butterfly population as well. The cedar swamp also provides habitat suited to some of the rare turtles of southeastern Massachusetts, as well as to numerous species of birds, waterfowl and mammals. The Cedar Swamp has been identified by the Massachusetts Natural Heritage and Endangered Species Program as an ecologically valuable but vulnerable site, which supports an array of natural communities and rare plant species.

The Cedar Swamp is part of an 809-acre wildlife sanctuary owned by the Massachusetts Audubon Society. However, it is not a pristine area, as an active CSX freight line bisects the swamp. The New Bedford and Taunton Railroad originally constructed the line in 1840. The railroad enters the northwest corner of the swamp and extends in a southeast direction to roughly the center of the southern edge of the swamp. At this point, the line exits the swamp area undergrade below Howland Road. The freight line is part of the Stoughton Branch Alternative for the proposed New Bedford/Fall River Commuter Rail Extension Project, which would provide commuter rail service for southeastern Massachusetts. Proposed improvements to the existing track and railbed would consist of rehabilitation of the track bed, ditches, ballast, ties and rail, grade crossing and the construction of passing siding. Other impacts to the swamp area include several new subdivisions along Howland Road and Freetown Road that are located close to the swamp and have the potential to affect local hydrology. Alteration of the hydrologic regime is the single greatest threat facing the Assonet Cedar Swamp.

County Road/Pierce Avenue

Several historic resources are centered at the northeast corner of the Cedar Swamp area, located at the intersection of County Road and Freetown Street. An early eighteenth century residence, the Hafford House (MHC 24) ca. 1724, and the Hafford Cemetery (MHC 802) from ca. 1799 are located at 177 County Road. On the same side of the road, to the west is the Old Sampson House Tavern at 161 County Street (MHC 16). Constructed in ca. 1830, the building served as a way station for stagecoaches that once ran between New Bedford and Boston. County Road has remained a well-traveled thoroughfare since the nineteenth century. County Road forms the northern edge of the swamp area for about one mile.

Continuing west on County Road to the intersection with Highland Road is the crossroads community of Canedy's Corner. During the nineteenth century, the residents of County Road were predominantly farmers with large parcels of land on the south side of the road that extended to the northern edge of the swamp. One surviving example is the ca. 1815 Alexander Canedy House at 33-40 County Road (MHC 14). The property consists of a large irregular lot

that borders the northern perimeter of the swamp. On the opposite side of the street is the Zebulon Leonard Canedy House at 141 Highland Road (MHC 13). A modern subdivision abuts the western edge of the Z.L Canedy House lot. South Lakeville School (MHC 15) stands on the west side of the subdivision. Constructed in 1925, the schoolhouse replaced the earlier Canedy School (d.1853-1883). On the opposite side of the road, to the west is Keith Cemetery, a small family cemetery dating from the late nineteenth century.

Pierce Avenue, which intersects with County Road about one mile west of Canedy's Corner, is a historic road paralleling the northern edge of the swamp through an area known as "The Beechwoods," a name assigned during the colonial era because of the locale's dense beechwood forest. For most of its length, Pierce Avenue is a scenic area with open fields, skillfully constructed stone walls, and well-preserved nineteenth century houses and barns. The road extends 2.5 miles from County Road west to Malbone Street near the Berkley line. Located on hilly terrain above the swamp, Pierce Avenue retains its original curved alignment and conforms to the land's irregular topography. The road is extremely scenic and features a number of well-preserved nineteenth century farmhouses and outbuildings. Stone walls along with a canopy of deciduous hardwood trees enhance the rural character of Pierce Avenue.

Nineteenth century architectural styles represented on Pierce Avenue include Federal, Cape Cod, and Greek Revival. Historic residences on Pierce Avenue are sparsely spaced and sited close to the road's edge. Pierce Avenue originally bisected the parcels of early settlers, as the lot's extremities were impassable due to the natural surroundings. Several house sites in Pierce Avenue have been identified with Pierce family members. The Lakeville Historic Commission is in the process of submitting an MHC Area Form for Pierce Avenue Beechwoods Community, which includes 25 historic resources. Consult the form for a more detailed discussion of the Beechwoods Community.

Holloway Brook runs behind the residences on the north side of the eastern half of Pierce Avenue. On the brook, behind the Levi Pierce House at 22 Pierce Avenue (MHC), are the foundations of an eighteenth century gristmill and sawmill. The 100 acres associated with this house have been recently purchased through a Conservation Restriction granted to the Wildlands of Southeastern Massachusetts. In 1785, a gristmill replaced the sawmill. Continuing east on the brook is a stone Baptismal Pulpit (MHC) with stairs, which reportedly dates from the 1760s. One of the most interesting historic features of the Beechwoods area is the late eighteenth century Logging Road Causeway (MHC) through the swamp. Constructed in the late eighteenth century, the causeway is a mounded dirt path that extends approximately 1300 feet across the swamp.

Other historic industry on Pierce Avenue included granite quarrying, which originated in the early to mid eighteenth century. A northbound colonial road or "The Woodland Path" was established off of Pierce Avenue in the early eighteenth century. The road served as a public highway until the early nineteenth century. The path, now a farm road leads to Lang St. Cemetery. East of the path is Elisha's Rocks, a bedrock cliff overlooking the Beechwoods community. At the foot of the overlook are the visible traces of a colonial-era quarry. Open extraction pits and cuts associated with the early quarry remain.

Two nineteenth century granite quarry sites are located north of the swamp. One of these operated from 1875 to 1940 near the northwest corner of Pierce and School Streets. The quarry site is set back from the road and is largely overgrown. The site includes a dilapidated steam engine room, collapsed cables and other hardware, and extraction pits. The once heavily quarried outcropping is discernable from Pierce Avenue.

Granite outcroppings are prevalent in the area surrounding the swamp. There are a number of glacial erratics visible from Pierce Avenue. One erratic of local import is a large balancing boulder supported by three granite prongs. Located on the north side of Pierce Avenue, precariously positioned stones such as this one are common throughout

southeastern New England. Much attention has been given to spherical erratics of the region with some individuals attributing their unusual placement to cultural traditions and not to geological processes. Regardless of their association, the erratics are an integral component of the natural landscape of the cedar swamp area.

Malbone Street

Located on the west side of the swamp is Malbone Street, which hosts a small cemetery, one early nineteenth century residence and two late nineteenth century homes. An active CSX freight line crosses the northern end of the street at-grade. Malbone Cemetery (MHC) is located on the east side of the street at the corner with Emerson Road. Only about 1,000 square feet in size, a fieldstone perimeter wall surrounds the cemetery. There are approximately 12 slate headstones of relatively simple design. Most are illegible and in poor condition. There are at least as many more that are broken off just above ground level. A modern residential subdivision dwarfs the small cemetery, with more modern residential infill across the street. Malbone Street extends south and intersects with Mill Street, the southern boundary of the cedar swamp area.

Mill Street/Howland Road

Mill Street is sparsely populated and retains its rural character. The north side of the street consists of a large farm located at 11 Mill Street. The 69-acre farm dates from the early nineteenth century. The vacant farmhouse is the only intact farm bordering the south side of the swamp. Mill Brook meanders through the farm's large rolling field. This farm, known as the Reynolds Farm, has been largely preserved through a recent conservation Restriction granted to the Massachusetts Audubon Society. A section of Old Mill Street remains south of Mill Street, across from the farm. Remnants of the Haskins-Davis Mill, a mid-nineteenth century mill, are located off of Old Mill Street on Mill Brook. A dirt path provides access to Old Mill Street and to the mill site. Dense woods buffer Old Mill Street from Mill Street. The mill site consists of two stone lined raceways with a north-south alignment. The raceways feature large dry laid granite slabs. The west raceway is wider and contains finished stones while the east raceway exhibits a more crude construction.

Continuing east on Mill Street to Howland Road is Howland Brook. A stone slab bridge spans the tributary near the northwest corner of Mill Street and Howland Road. The southwest corner of the intersection is the approximate location of the former Hunting House. Howland Road consists of modern residential infill with two subdivisions located on the north side of the street. A large subdvision borders the southeastern part of the swamp. The northernmost parcels of this subdivision have parcels that extend into the swamp.

Situated between the two subdivisions is the Earl Sears – E.P. Douglas House (ca. 1750) (MHC 32), the only historic residence on this section of Howland Road, between Mill Street and Freetown Street. The house was constructed for Eseck Howland. North of the Sears House is Sears Island, a north-south oriented drumlin on the southern edge of the cedar swamp. Howland Cemetery (MHC) is located on a rise on the south side of the road, just west of the Sears House. The cemetery is well south of the road and shielded from view by dense woods. On the same side of the street, to the east is the campus of Apponequet Regional High School.

Freetown Street

From near the northeastern corner of the school property, Freetown Street extends in a northerly direction to County Road. The road serves as the eastern boundary for the cedar swamp area and consists almost entirely of modern residences. An area known as Rocky Woods, a substantial granite outcropping, borders the east side of the road. The

outcropping rises above the road in an easterly direction and extends south into Freetown. According to local ethnohistorical accounts, the caves and similar formations within this unique geological feature have seventeenth century associations. Purportedly, King Phillip may have spent the last night of his life in a cave (King Phillip's Cave) in the densely wooded area of Rocky Woods. Further north on Freetown Street are two late eighteenth century residences on the west side of the street, just south of County Road.

HISTORICAL SIGNIFICANCE

Prehistoric archaeological significance

The Taunton River drainage has been a focal point of archaeological interest to both avocational and professional archaeologists for more than a century. Members of the MAS have carried out numerous investigations of prehistoric sites in the combined Taunton/Nemasket drainage. The large number of recorded prehistoric sites in proximity to Cedar Swamp reflects the favorable environmental conditions that existed in the Taunton River drainage throughout the prehistoric period. The Taunton River, along with its major tributary the Nemasket River, provided a primary avenue of transportation from the coastal lowland to Narragansett Bay. Anadromous fish traveled up these waterways, making the large ponds in the Assawompsett district major focus of prehistoric settlement. These areas have a high probability to contain evidence of intensive prehistoric land use (Thorbahn et al. 1980; Thorbahn 1982).

Diagnostic cultural material from a relatively large number of sites has provided evidence of a very long sequence of Native American settlement and subsistence activities within this geographic region. The inventory of known prehistoric sites within the Taunton River drainage basin, when viewed as interrelated components of a large and complex settlement system, provides a context for the Cedar Swamp area. The swamp is within a general environmental setting composed of a mosaic of large ponds, wetlands, and well-drained uplands that was intensively used by Native American populations throughout the prehistoric period. The known prehistoric sites in the Assawompsett Pond/Wapanucket district contain evidence of repeated use over at least 10,000 years from the PaleoIndian to Late Woodland periods.

Due to the commanding view of the Cedar Swamp River and surrounding wetlands from the highland occupied by Pierce Avenue and the proximity of the landscape to Assawompset Pond complex the Cedar Swamp landscape is likely to be sensitive for prehistoric archaeological remains. Within the landscape there are four identified prehistoric sites, all of which are transitory with no temporal affiliation.

Historic significance

The following is extracted from MHC Area Form for Beechwoods/Pierce Avenue (March 2002) by Kenneth Leonard, Lakeville Historical Commission.

Colonial development of the Beechwoods area evolved almost entirely independent of Middleborough proper, which it was a part of until 1853 (Leonard 2002). Earliest settlement of the Assonet Swamp area began in 1709 with the arrival of Isaac Pierce and Benjamin Booth families who were Quakers from Scituate. Known as Middleborough's West Parish at Precinct Village, only three families were associated with the village. The community become independent of Middleborough by exploiting the rich and diverse natural resources of the swamp area for the development of mills, forges and quarries. Several of its members who attended Baptist services at Swansea portioned Middleborough for tax abatement. Their first serious religious affiliations centered around the Rev.

Ebenezer Hinds Baptist Church which was founded in the 1750s. Their only apparent social or commercial associations outside their own community developed with the Thomas Nelson settlement on Assawampsett Neck with whom they shared their Baptist affiliation with Hinds, intermarried sparingly, and exchanged smithing personal.

It was only after the Revolutionary War, during which they had formed their own exclusive units of fighting men, that the Beechwoods people started emigrating into the downtown Middleborough area in any numbers. Prior to that, those who left went either to the south, Freetown and Rochester were popular destinations, or to the western frontier. Now for the first time, did one of their own people get to hold political office in Middleborough, even though, from very shortly after its beginnings, Beechwoods and its families had constituted a significant portion of Middleborough's population and wealth (Leonard 2002).

The construction of railroads during the Early Industrial Period (1830-1870) connected Lakeville with larger population centers in New Bedford and Taunton. Despite the introduction of the railroad, land surrounding the Assonet Cedar Swamp remained agricultural in use or undeveloped. The southern edge of the swamp area during this period featured a handful of farms spread out along Howland Road. A stop on the New Bedford & Taunton Railroad, Howland Station was located on the south side of Howland Road. East of the railroad line was a school and a sawmill. Other residential and agricultural development around the swamp centered on County Road, near Canedy's Corners. In the twentieth century, the swamp area remained sparsely populated until the end of the century, when the town experienced a rise in residential development. Land adjacent to the swamp continues to be developed today.

Historic archaeological significance

Within the Cedar Swamp landscape the primary locus of archaeological sites dating to the historic period is along Pierce Avenue at the northern margin of the swamp. The area was first settled by European-Americans in 1709 with lots fronted along Pierce Avenue and ran down into the swamp. The primary types of sites associated with the area are mill sites, quarry sites and domestic sites. An eighteenth and nineteenth century gristmill and mid eighteenth century sawmill both operated along the waterways of the landscape. Both these early industrial structures are still identifiable by dams and foundations. Additionally, two historic granite quarries, which utilized the naturally occurring outcrops of bedrock, have been identified in the area. Finally, at least three house sites have been identified in the area, including the Philander Pierce House site, the Josiah Holloway House site, and the John Pierce House Site, as well as the bermed logging causeway. (Lakeville Historical Tour Committee 2001). Taken together these resources have the potential to provide new information regarding the early domestic and economic development of southeastern Massachusetts.

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Maps

----- *Town of Lakeville, Mass.* Anonymous.
----- *Map of Lakeville, Mass.* Anonymous.
1903 *Town of Lakeville Plymouth County.* L.J. Richards Co.
1879 *Map of Lakeville, Mass.* Anonymous.
1958 *Town of Lakeville, MA.* Allen, Rogers M., Gladys G. Vigers.
----- *Town of Lakeville Assessor's Plans*. Various surveyors and dates.

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(D)

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93-102, 102, 804, 802
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NATIONAL REGISTER OF HISTORIC PLACES CRITERIA STATEMENT

The Beechwoods Area/Pierce Avenue is eligible for listing in the National Register under Criteria A, C and D at the local level. It is eligible for Criterion A for its association with the town's early settlement, development and industry. Pierce Avenue meets Criterion C for its collection of highly intact nineteenth century residences, which retain integrity of location, setting, feeling and association. The district is also eligible under D for its assortment of historic sites that include mills, quarries and domestic sites.

Additionally, the Assonet Cedar Swamp is preserved as a wildlife sanctuary that is susceptible to environmental changes within its immediate surroundings. The Massachusetts Natural Heritage and Endangered Species Program has identified the swamp as an ecologically valuable but vulnerable site, which supports an array of natural communities and rare plant species.

ASSONET CEDAR SWAMP
DATA SHEET

MHC AREA	AREA NAME	PLACE	ASSESS NO.	MHC NO.	ADDRESS	HISTORIC NAME	DATE	STYLE/FORM	ASSOCIATED RESOURCES	NR STATUS
	Assonet Cedar Swamp	Lakeville	5:14	15	119 County Street	South Lakeville School	ca. 1925			
	Assonet Cedar Swamp	Lakeville	4-15:33	16	161 County Street	Old Sampson Tavern	ca. 1830			
	Assonet Cedar Swamp	Lakeville			-- County Street	Pierce Cemetery				
	Assonet Cedar Swamp	Lakeville	4-20:14	14	33-40 County Street	Alexander Canedy House	ca. 1815			
	Assonet Cedar Swamp	Lakeville		24	177 County Street	Samuel Hafford House	ca. 1724			
	Assonet Cedar Swamp	Lakeville	:33	802	177 County Street	Hafford Cemetery	ca. 1799			
	Assonet Cedar Swamp	Lakeville	11:14	13	141 Highland Avenue	Zebulon Leonard Canedy House	ca. 1820			
	Assonet Cedar Swamp	Lakeville	5:13	32	-- Howland Road	Earl Sears/E.P. Douglas House	ca. 1750			
	Assonet Cedar Swamp	Lakeville			-- Howland Road	Howland Cemetery	Early 19th c.			
	Assonet Cedar Swamp	Lakeville		93	-- Malbone Street	Pierce/Haskins House	ca. 1810			
	Assonet Cedar Swamp	Lakeville			Howland Brook/Howland Road.	Stone slab bridge	19th c. (?)			
	Assonet Cedar Swamp	Lakeville			-- Malbone Street	Malbone Cemetery	Late 18th c.			
	Assonet Cedar Swamp	Lakeville			-- Mill Street	Haskins-David Mill Site	mid-19th c.			
	Assonet Cedar Swamp	Lakeville			11 Mill Street	Farm	early-mid 19th c.			
	Assonet Cedar Swamp	Lakeville	1:7	12	251 Pierce Avenue	Samuel Allen House	ca. 1765	Cape		
	Beechwoods Community	Lakeville	1-2:7		-- Colonial Road	Colonial Road/"The Woodland Path"	ca. 1715-1840			

ASSONET CEDAR SWAMP
DATA SHEET

MHC AREA	AREA NAME	PLACE	ASSESS NO.	MHC NO.	ADDRESS	HISTORIC NAME	DATE	STYLE/FORM	ASSOCIATED RESOURCES	NR STATUS
	Beechwoods Community	Lakeville			-- Location unknown	Lang St. (The Pierce) Cemetery	mid-18th c.			
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Saw Mill Site	ca. 1713-1765			
	Beechwoods Community	Lakeville	3-11:7		-- Pierce Avenue	Balancing Stone				
	Beechwoods Community	Lakeville	1-2:7		-- Pierce Avenue	Colonial Granite Quarry	ca. 1730-1780			
	Beechwoods Community	Lakeville	2-2:7		-- Pierce Avenue	Horse Block				
	Beechwoods Community	Lakeville	1-7:7		-- Pierce Avenue	John Pierce House Site	ca. 1725-1890			
	Beechwoods Community	Lakeville	2-1:7		-- Pierce Avenue	19th c. - 20th c. Quarry	ca. 1875-1940		Road	
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Josiah Holloway House Site	Ca. 1725 -1850			
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Philander Pierce House Site	ca 1860s			
	Beechwoods Community	Lakeville	1-5D:8		-- Pierce Avenue	Logging Road Causey	Late 18th c.			
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Grist Mill Site	ca. 1765			
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Baptismal Pulpit	ca. 1760s			
	Beechwoods Community	Lakeville	2-2:8		-- Pierce Avenue	Saw Mill Site	ca. 1785			
	Beechwoods Community	Lakeville	1-3:8		8 Pierce Avenue	A. Pierce House	ca. 1860	Greek Revival		
	Beechwoods Community	Lakeville	1:14	20	18 Pierce Avenue	Hermon & Phillip Pierce House	ca. 1792	Cape		
	Beechwoods Community	Lakeville	2-2:8		22 Pierce Avenue	Levi Pierce House	Late 1820s	Cape	2 barns, stone walls	
	Beechwoods Community	Lakeville	3-20:7		44 Pierce Avenue	Enos Pierce House	ca. 1830s	Cape		

ASSONET CEDAR SWAMP
DATA SHEET

MHC AREA	AREA NAME	PLACE	ASSESS NO.	MHC NO.	ADDRESS	HISTORIC NAME	DATE	STYLE/FORM	ASSOCIATED RESOURCES	NR STATUS
	Beechwoods Community	Lakeville	1-6:7		71 Pierce Avenue	School	early 19th c.	Federal		
	Beechwoods Community	Lakeville	2-2:7		71 Pierce Avenue	Hoard House	ca. 1800s	Greek Revival		
	Beechwoods Community	Lakeville	2-3:7		85 Pierce Avenue	Oliver Pierce House	ca. 1810	Federal		
	Beechwoods Community	Lakeville	7-2:4		105 Pierce Avenue	Jirah Winslow House	ca. 1826-1830	Cape-2 ½ story side gabled	Stone bull pen, Barn	
	Beechwoods Community	Lakeville	7-4:4		114 Pierce Avenue	Winslow Estate Annex House	mid-19th c.	Greek Revival		

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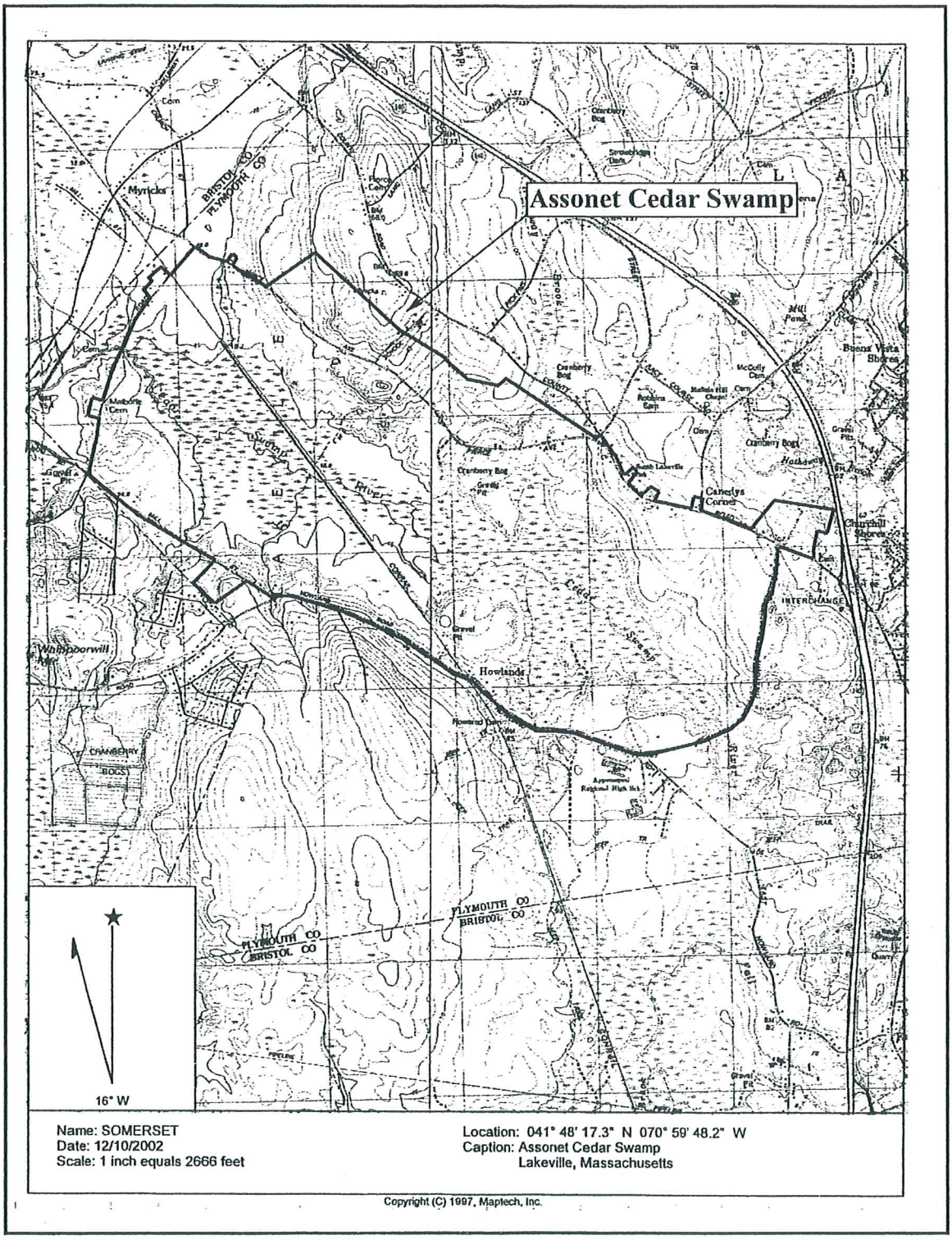


Figure 1. USGS Map

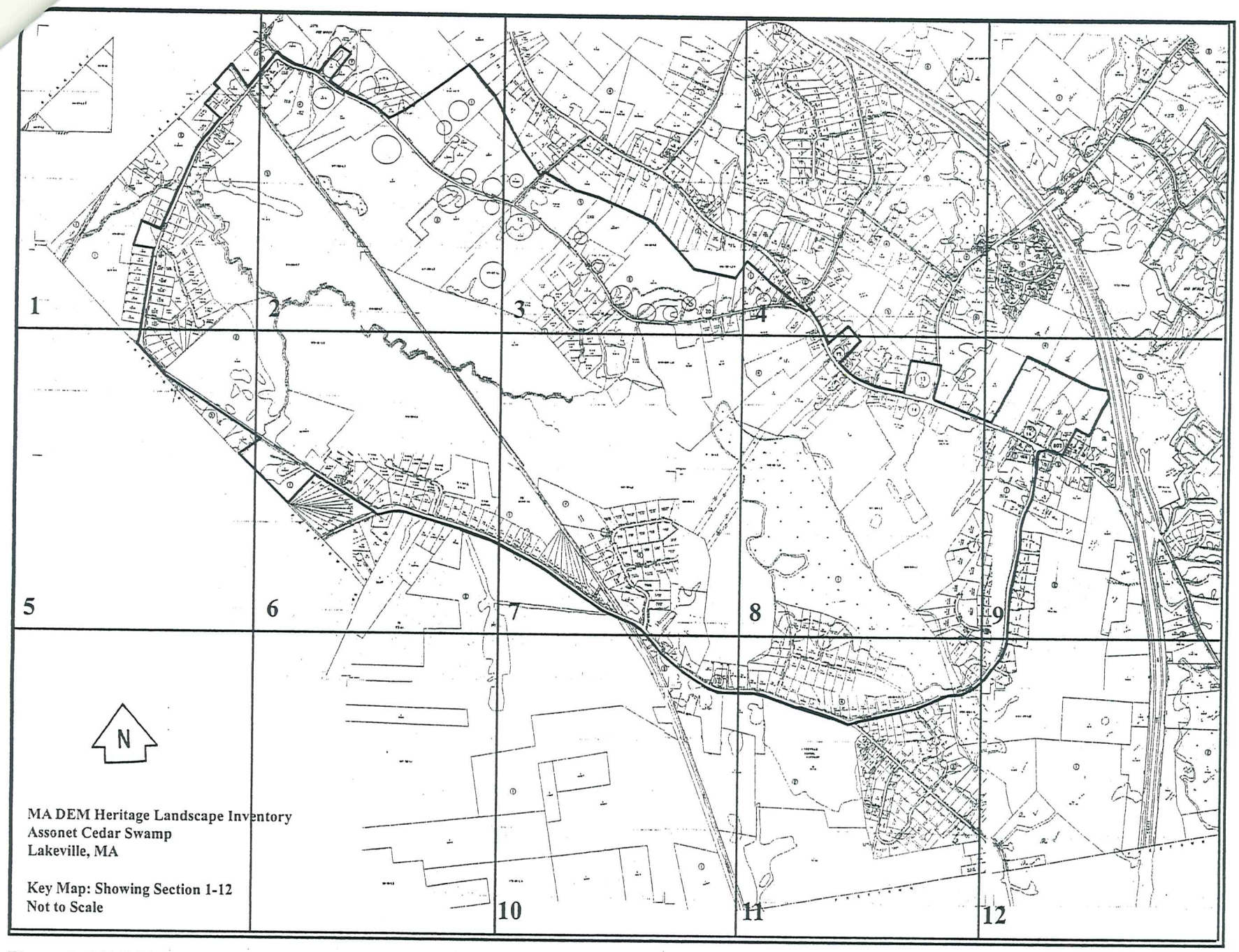
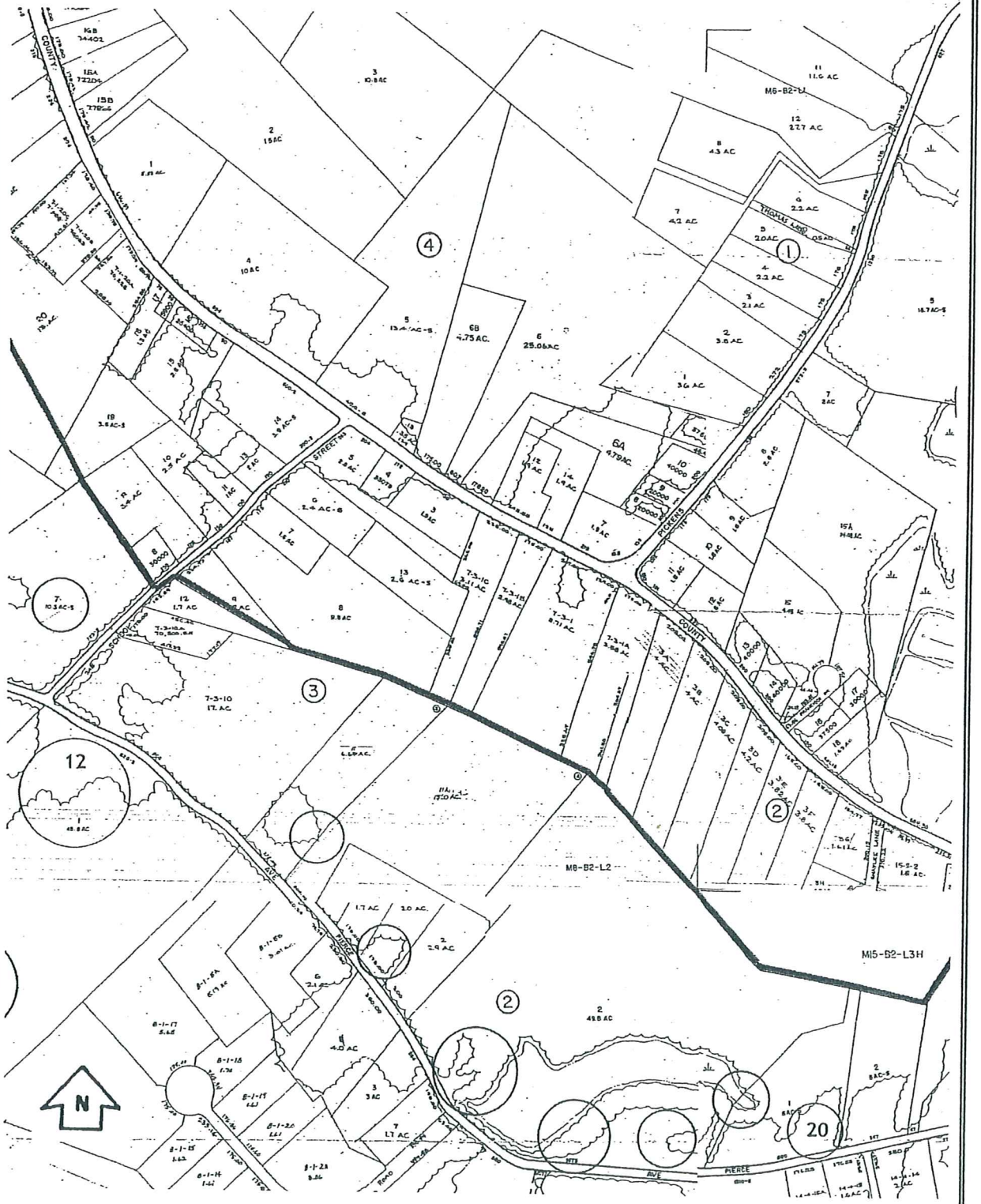


Figure 1. MA DEM Heritage Landscape Inventory: Assonet Cedar Swamp Key Map

12-16, 20-24, 32, 93-102, 802, 804, 102, 706, 710, 717



Assonet Cedar Swamp
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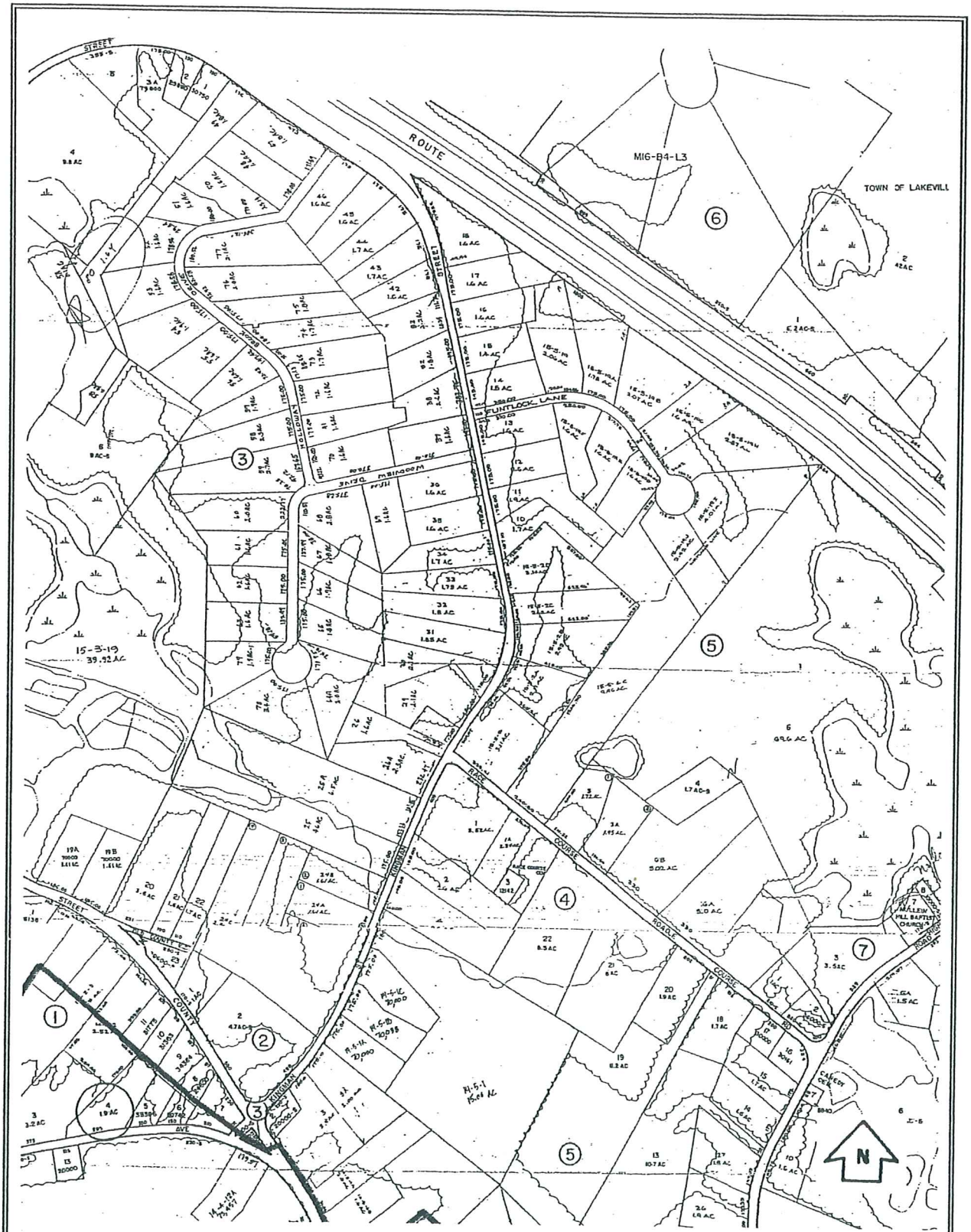
Lakeville



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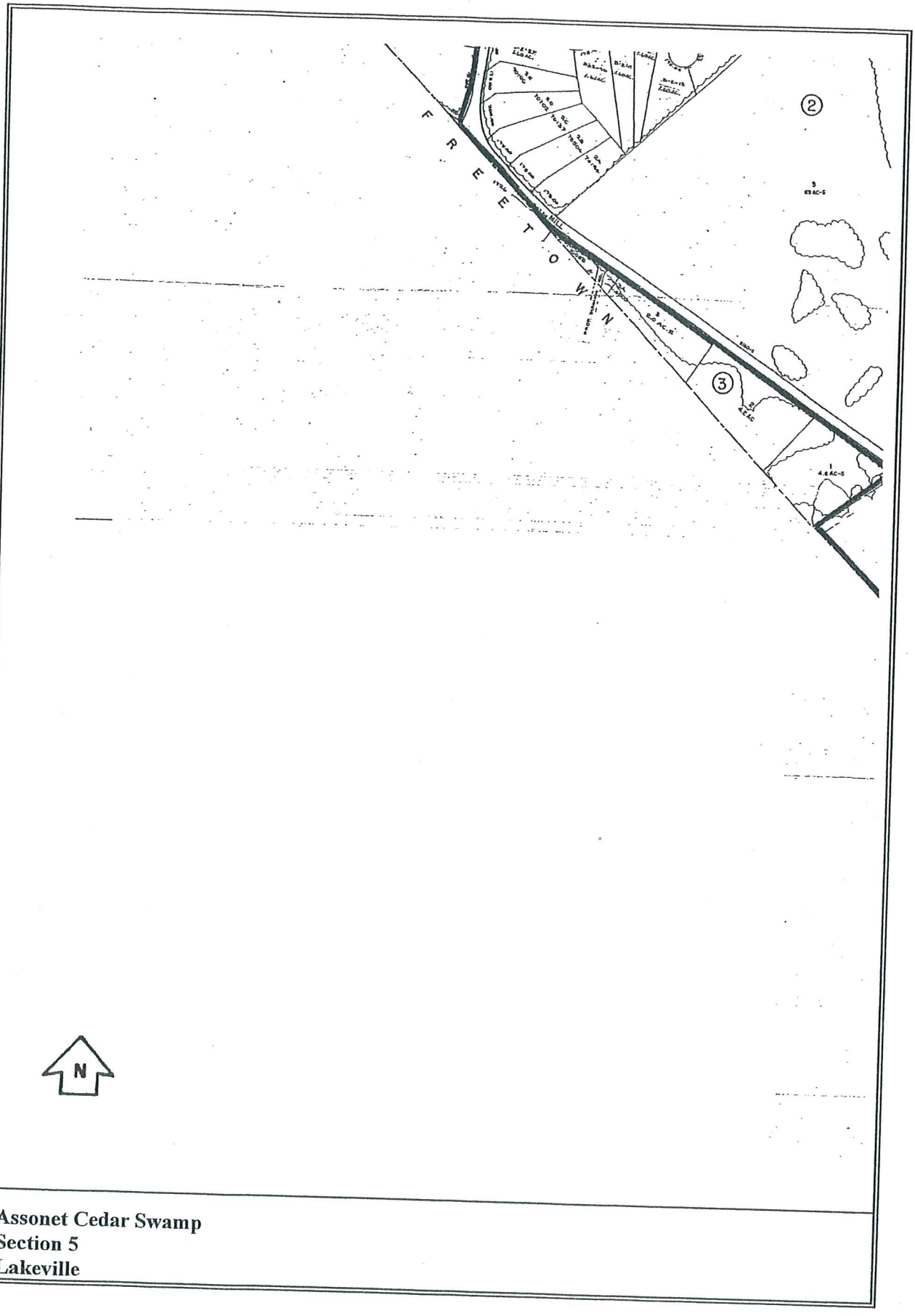

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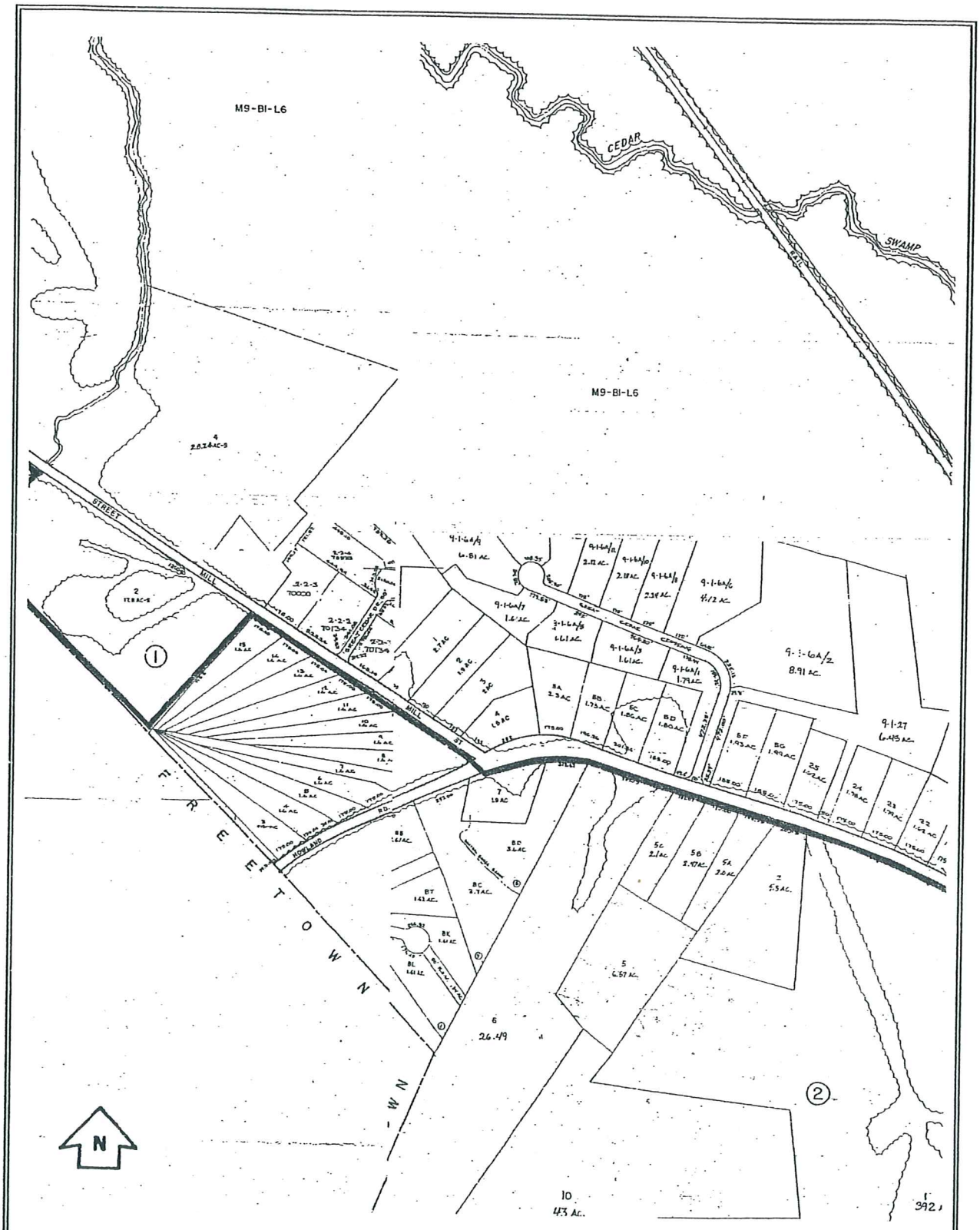

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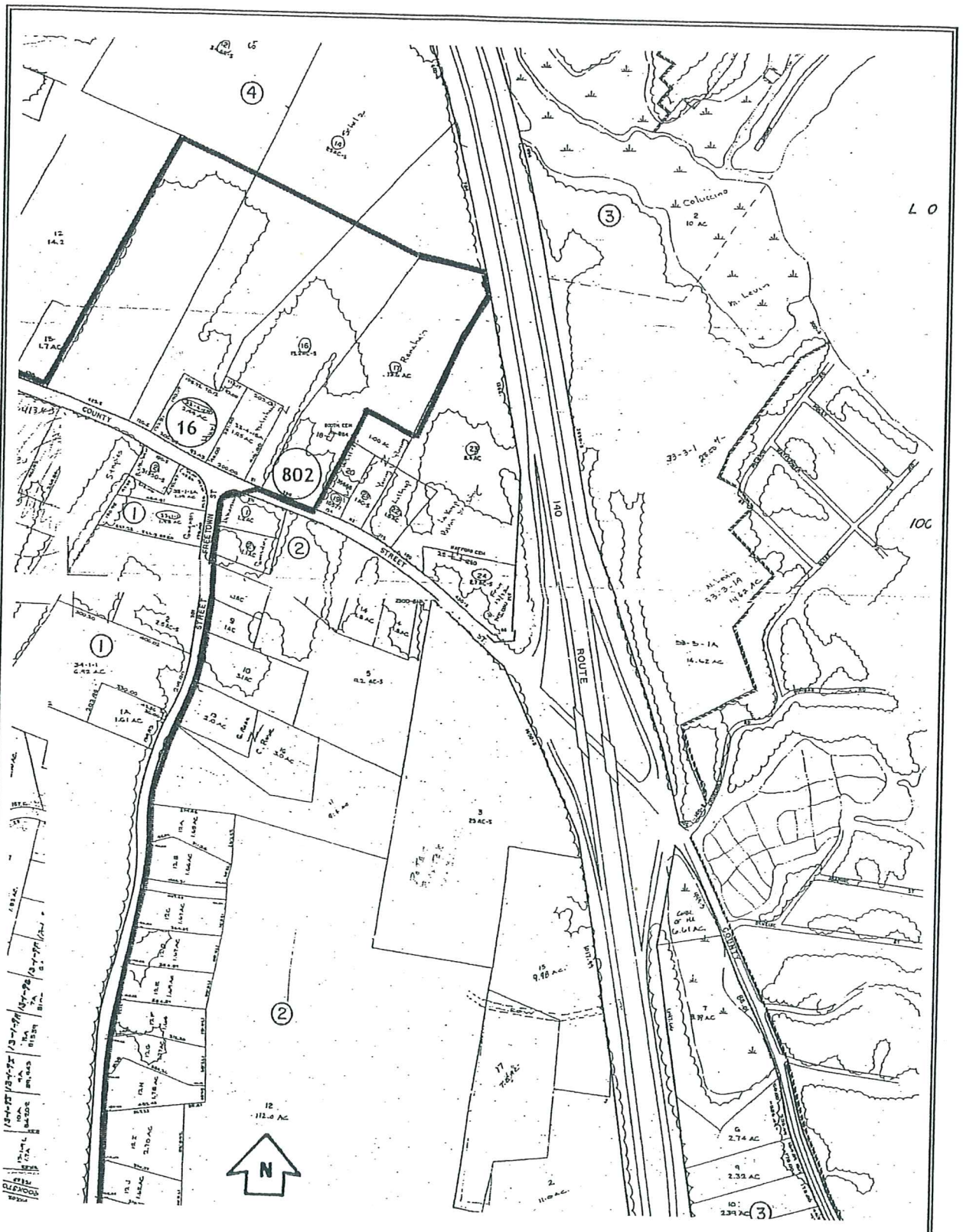

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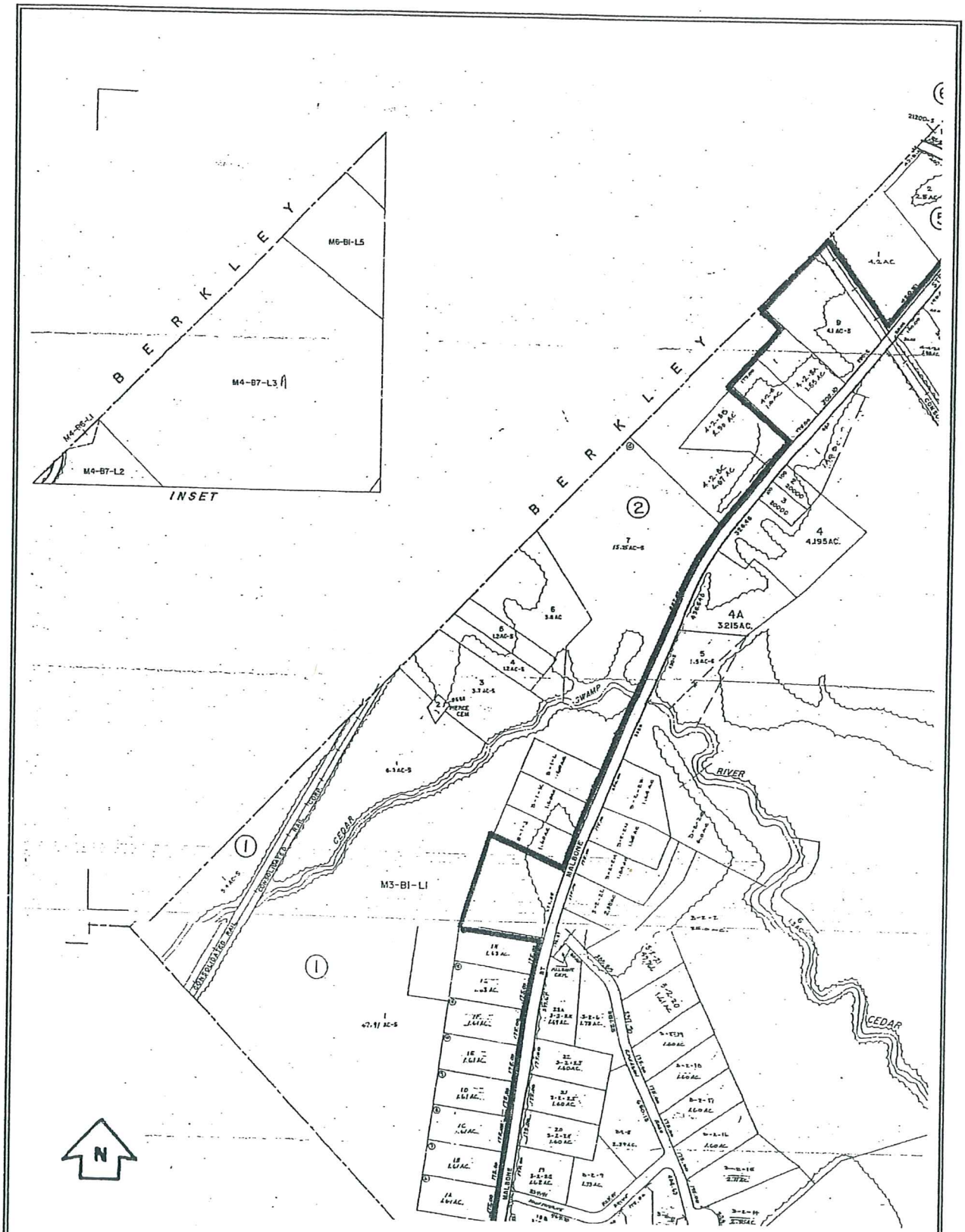

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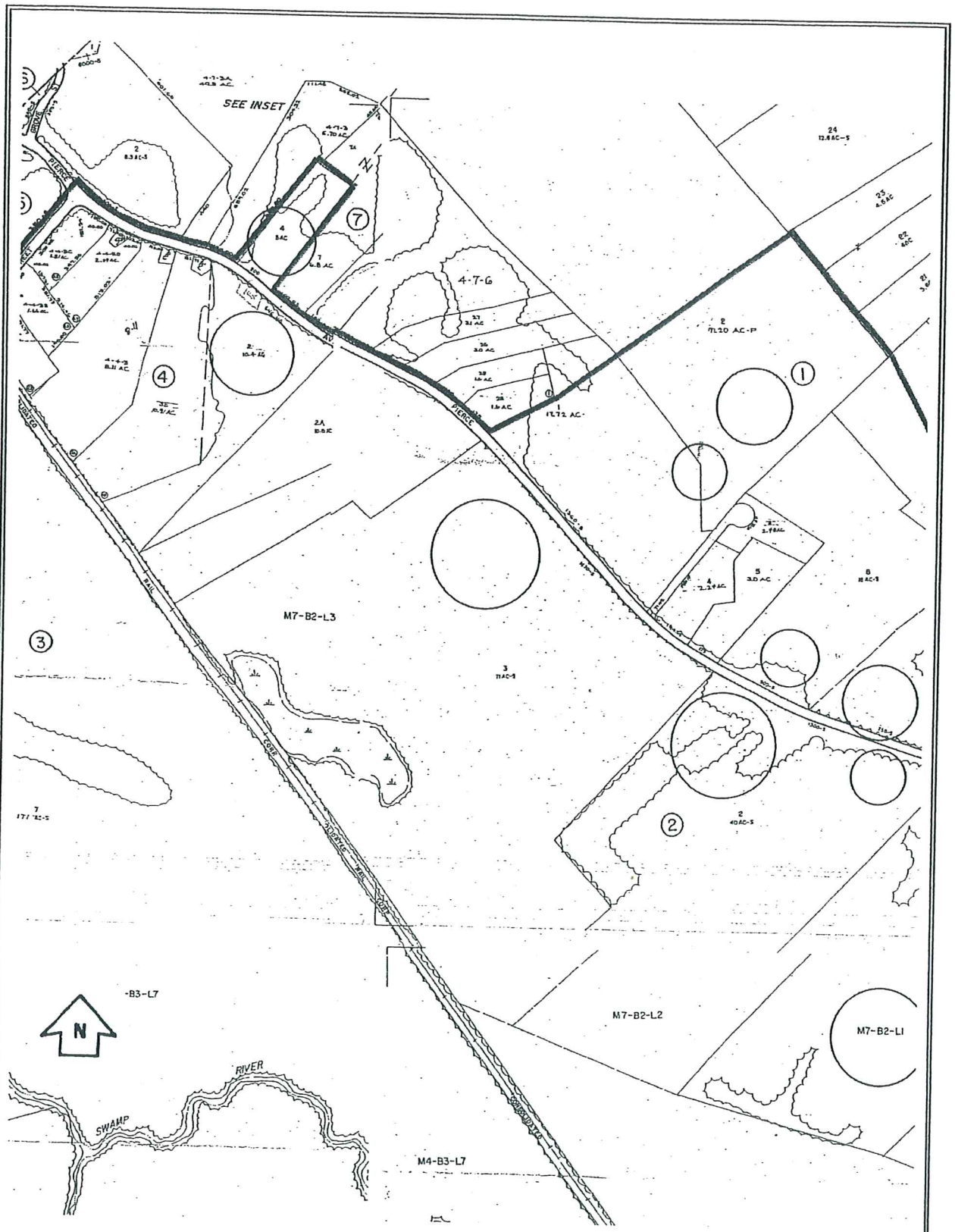

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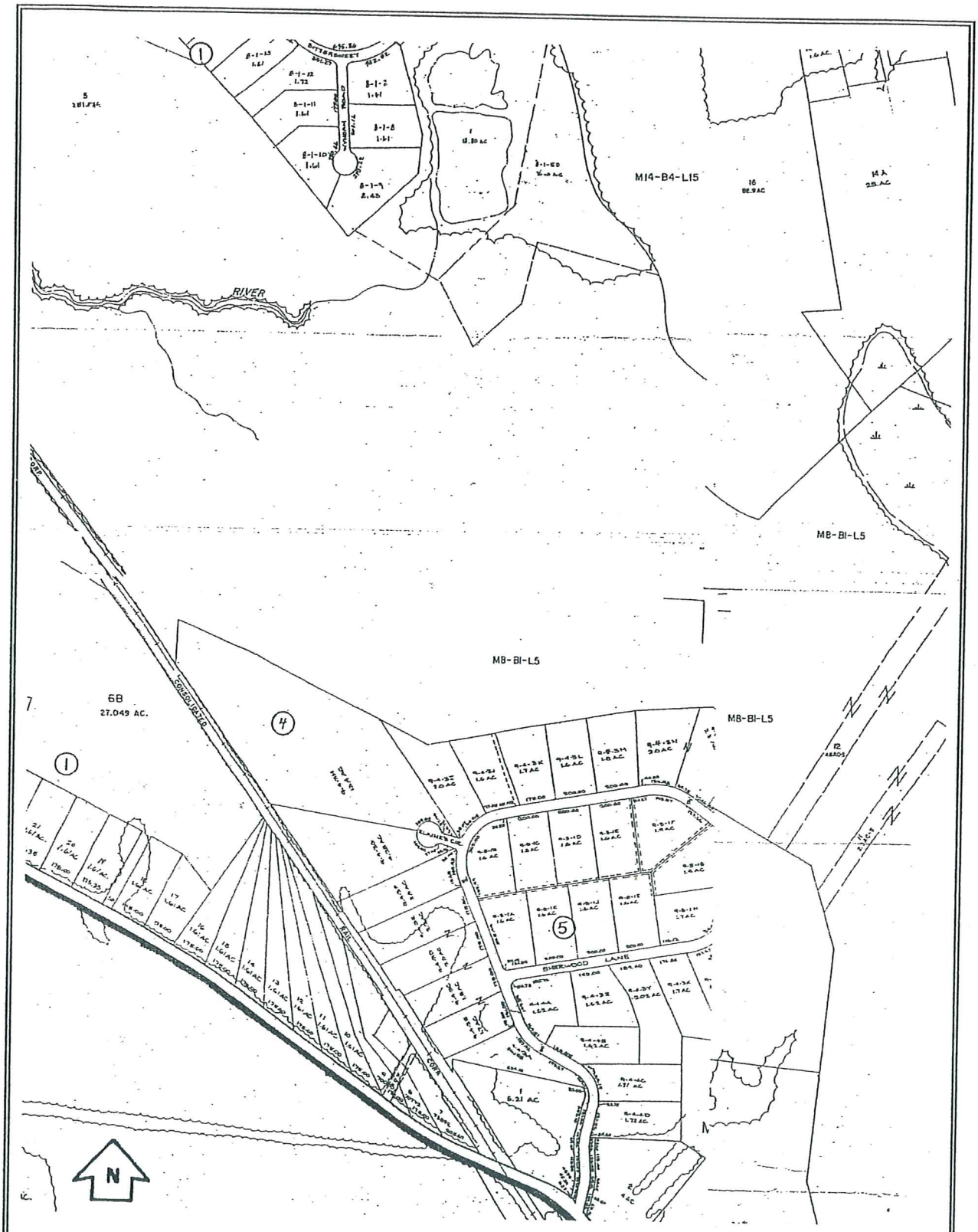

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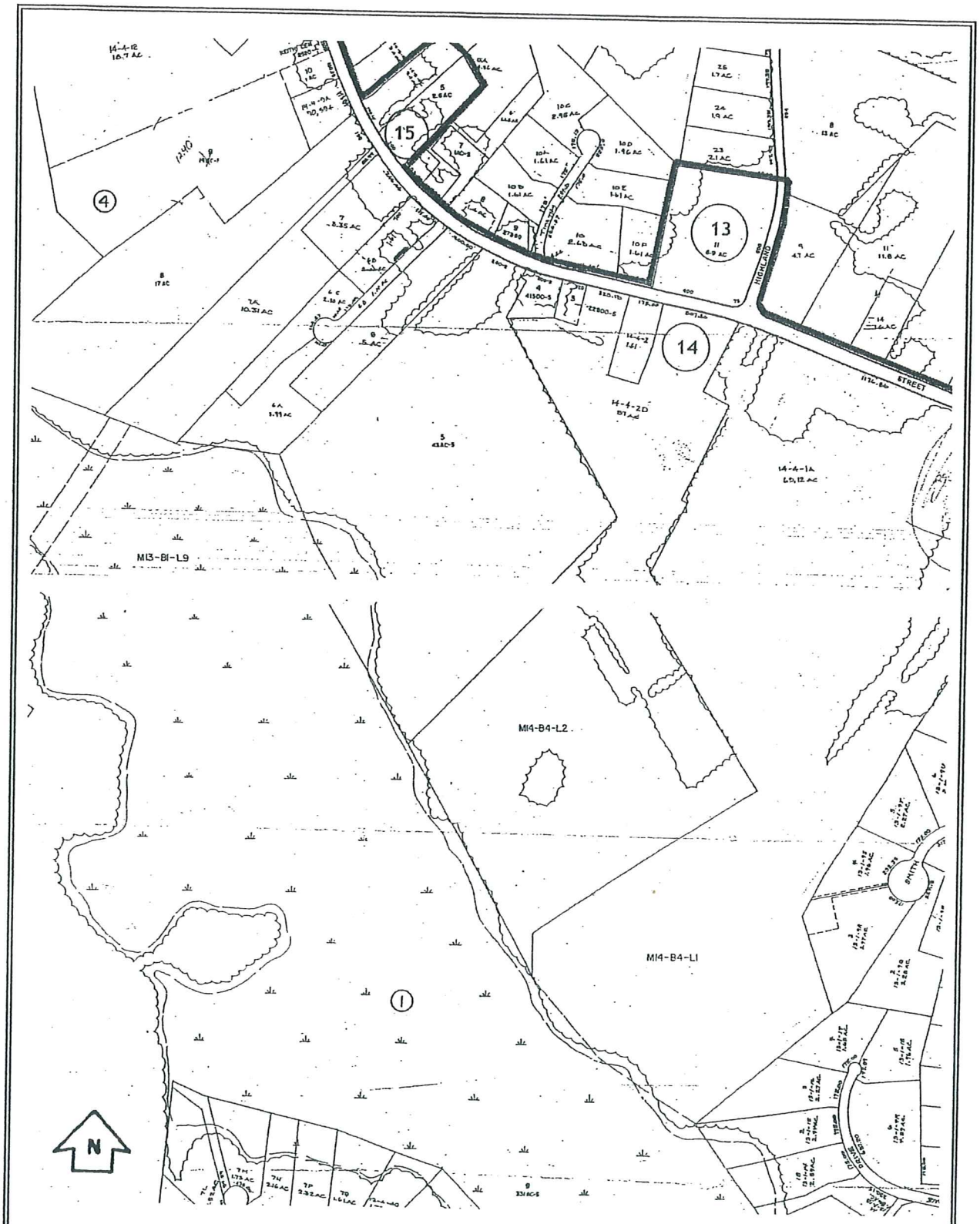

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Assonet Cedar Swamp
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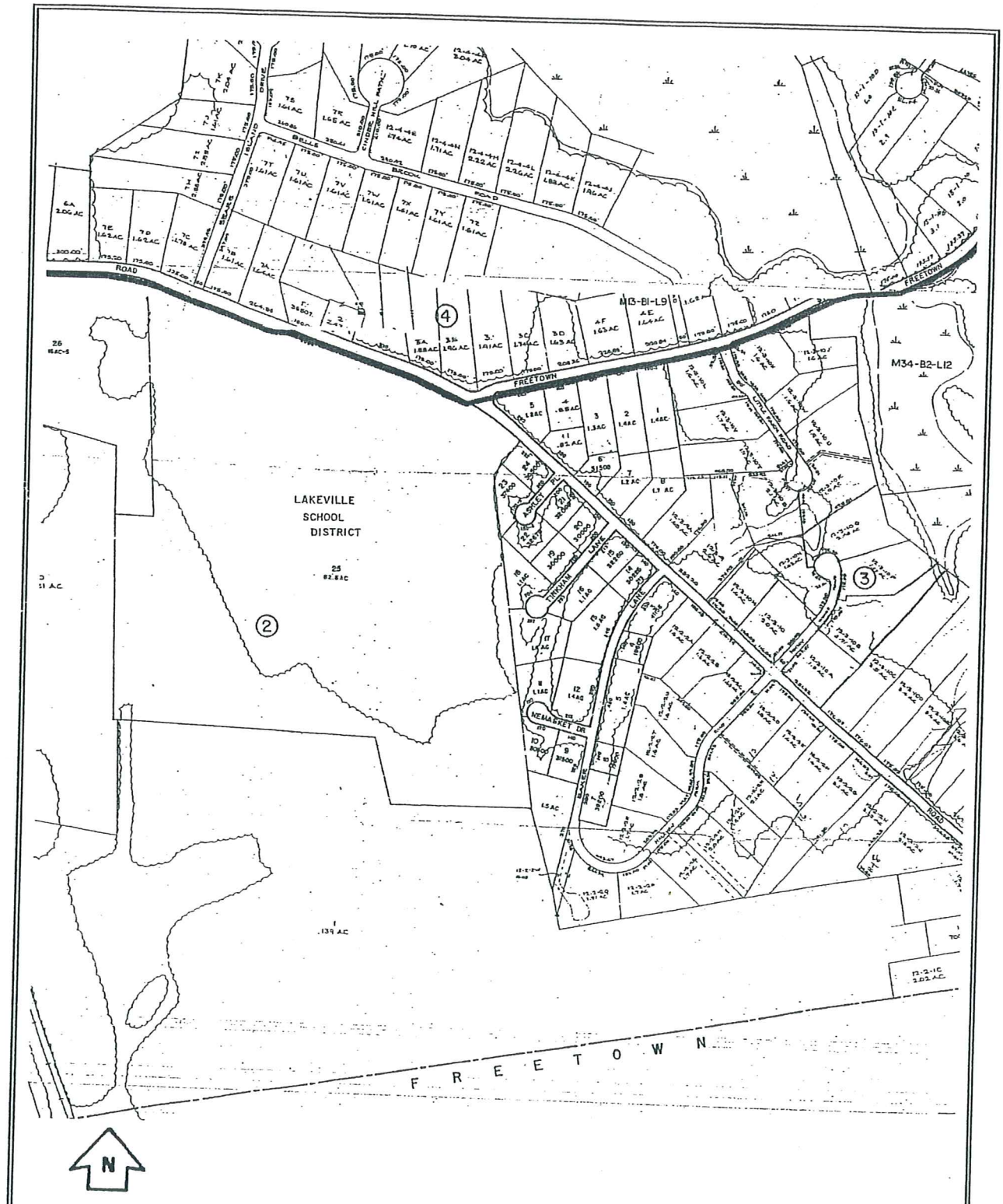

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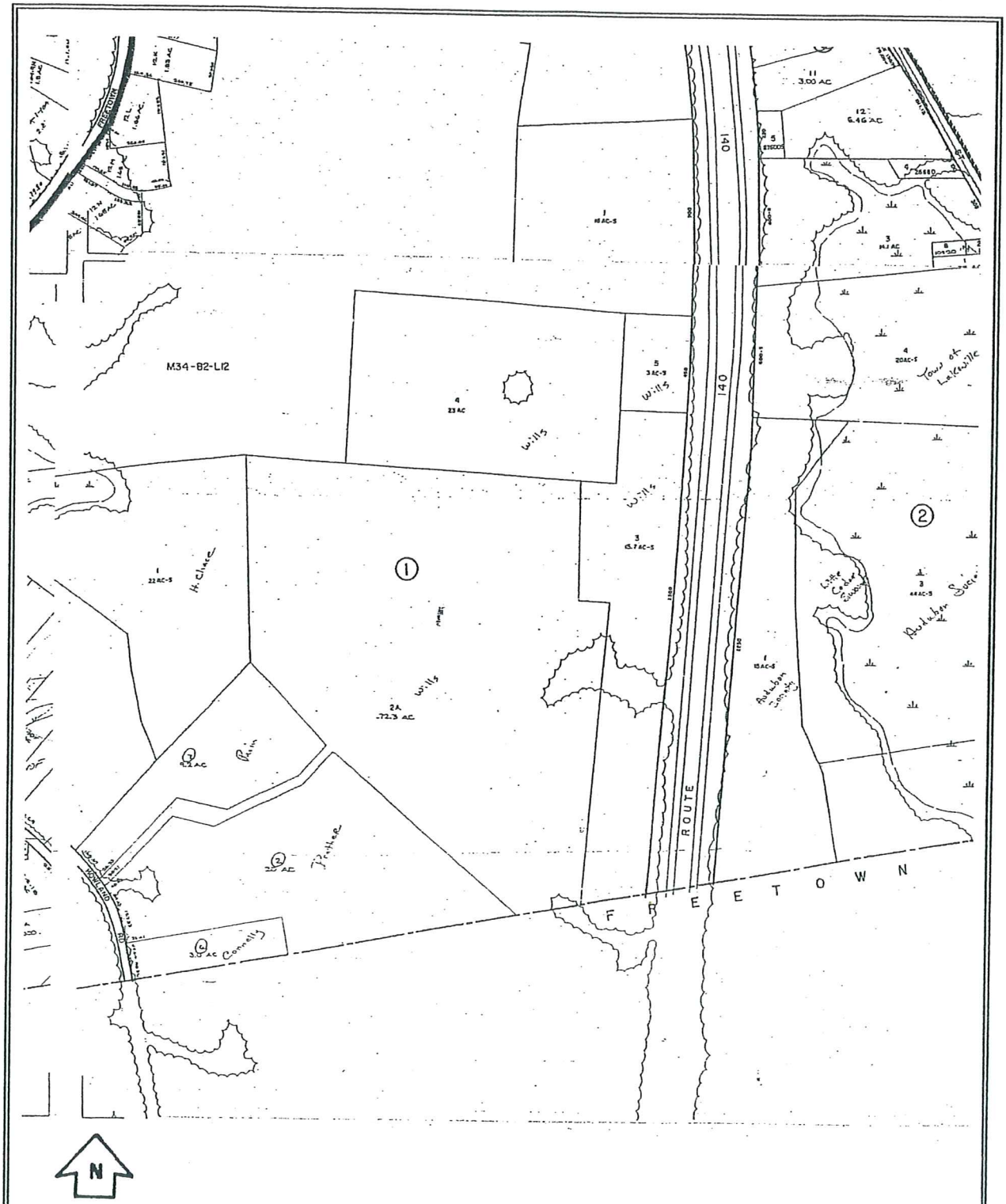

Assonet Cedar Swamp
Section 12
Lakeville

VENTORY FORM CONTINUATION SHEET

Community:
Lakeville

Property Address:
Assonet Cedar Swamp

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Form No. 12-16, 20, 21 3. 73-102 Box 203 No. 706, 710-717

List of Photographs

1. Historic path associated with Herman Pierce, Assonet Cedar Swamp
2. 22 Pierce Avenue, Assonet Cedar Swamp
3. Holloway Brook behind 22 Pierce Avenue
4. Cedar Swamp River, Assonet Cedar Swamp Wildlife Sanctuary
5. Cranberry Bog, Snake Hole Meadow, Assonet Cedar Swamp
6. 71 Pierce Avenue, Assonet Cedar Swamp
7. 71 Pierce Avenue, Assonet Cedar Swamp
8. Levi Pierce House, 22 Pierce Avenue, Assonet Cedar Swamp
9. Jirah Winslow House/Old Bull Pen, 105 Pierce Avenue, Assonet Cedar Swamp
10. 11 Mill Street, Assonet Cedar Swamp

INVENTORY FORM CONTINUATION SHEET

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Lakeville

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PHOTOGRAPHS

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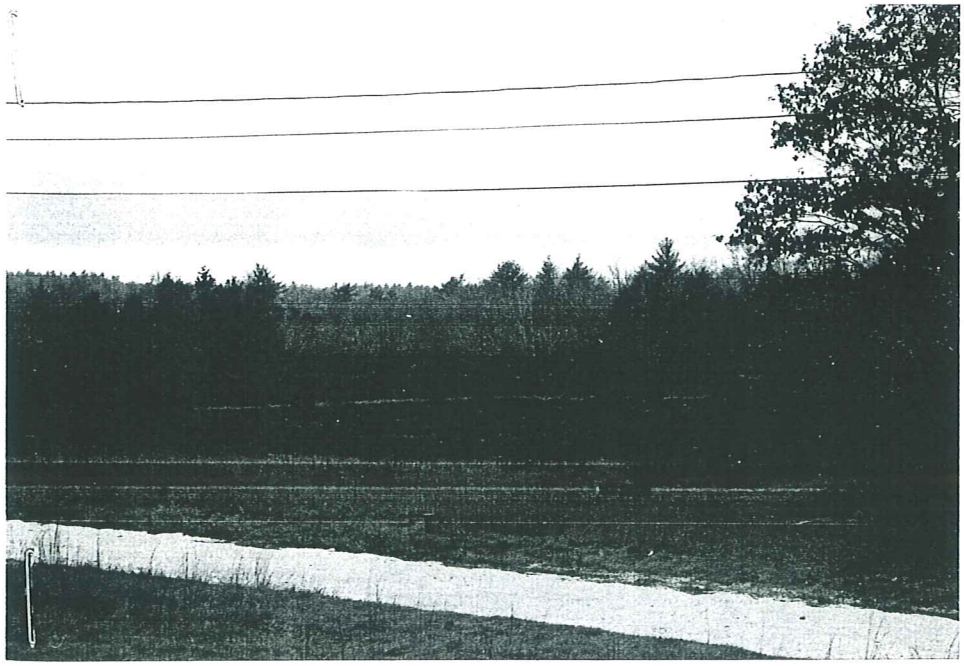

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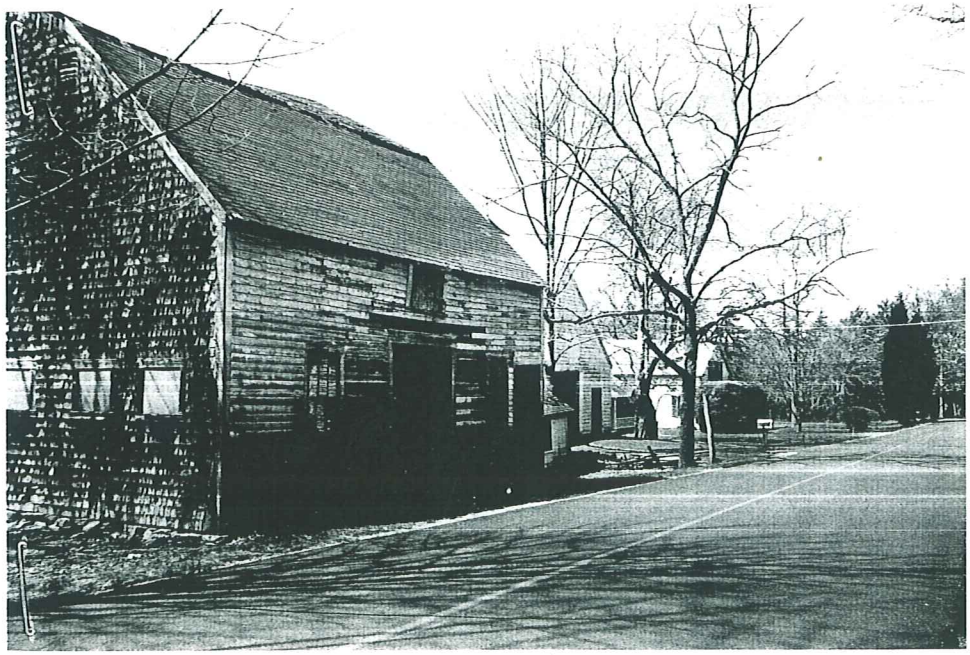
PHOTOGRAPHS

6.



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PHOTOGRAPHS

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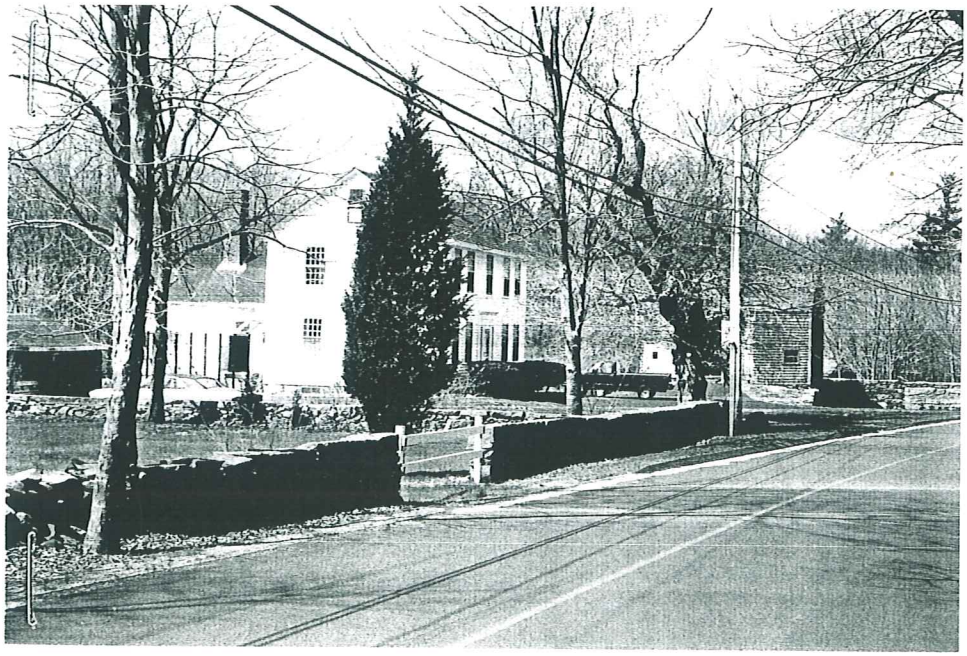


9.

INVENTORY FORM CONTINUATION SHEET

Community:
Lakeville

Property Address:
Assonet Cedar Swamp

Massachusetts Historical Commission
Massachusetts Archives Facility
220 Morrissey Boulevard
Boston, Massachusetts 02125

Area(s)

Form No.

PHOTOGRAPHS

10

FORM A - AREA

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
92, 98	New Bedford North		NBE.D,I,J,U 613

Town/City: New Bedford

Place *(neighborhood or village):*

Name of Area: Brook Street Industrial and Commercial Area

Present Use: Commercial, Industrial

Construction Dates or Period: 1900-1950

Overall Condition: Fair

Major Intrusions and Alterations: Demolition of multiple contributing industrial buildings within area.

Acreage: Approx. 25

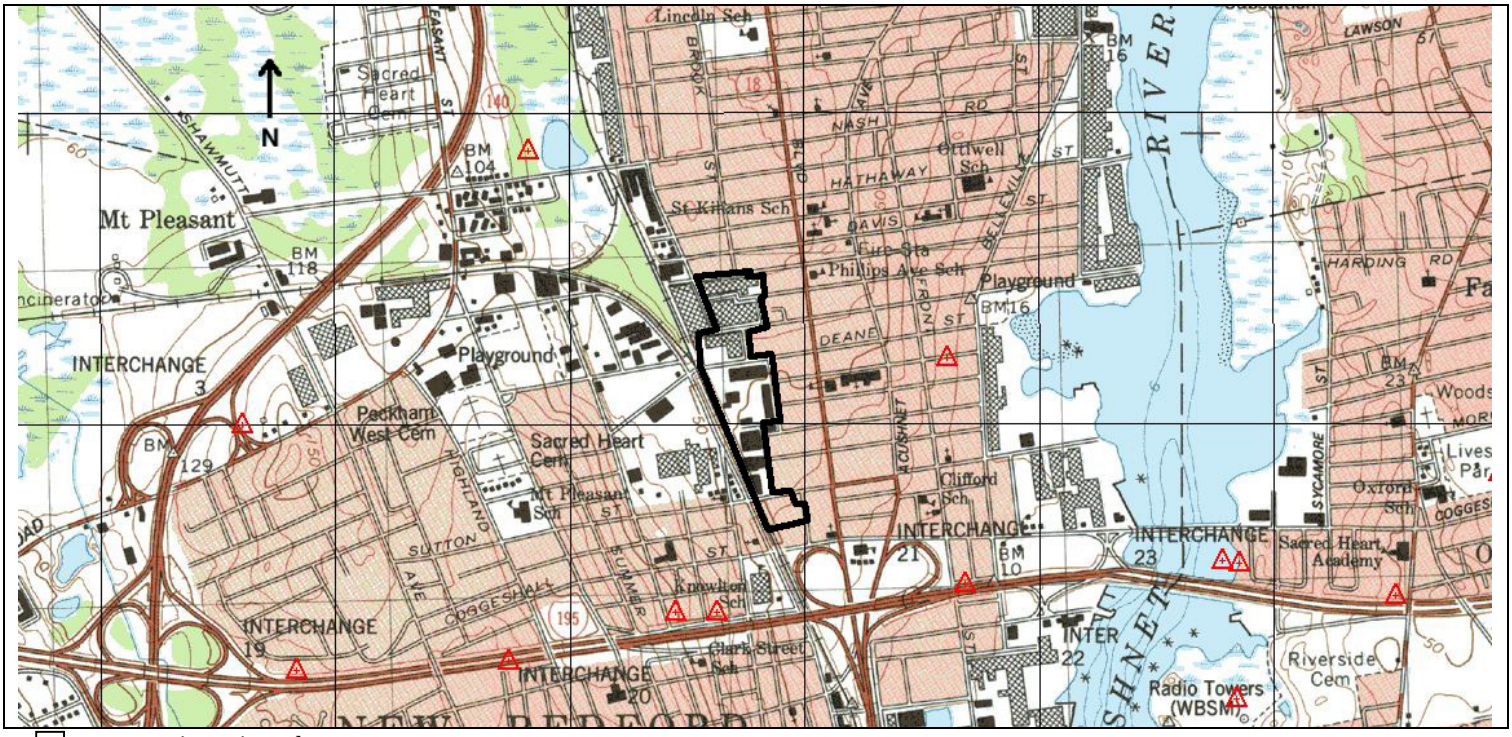
Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Photograph

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Brook Street Industrial and Commercial Area is a roughly-triangular, north-south oriented corridor occupying about 21 acres of level land on the north side of New Bedford's downtown. It is approximately 0.5 miles long (north to south), 850 feet wide at its north end, and 400 feet wide at its south end. The area is bounded by residential neighborhoods of multi-unit dwellings north of Sawyer Street and east of Brook Street and defined by the raised railroad right-of-way of the New Bedford Main Line (historically the New York, New Haven & Hartford RR) to the west. The New Bedford Cotton Storage Warehouse Company (NBE.613) bounds the south end of the area, beyond which is a marginal band of commercial and residential buildings truncated by an Interstate 195 interchange ramp. The area is a grouping of large-scale textile, food production, and warehousing facilities constructed in rapid succession during the early twentieth century. While once densely built-up, multiple demolitions in the recent past have created prominent tracts of vacant land within the area and removed essential components of its historical industrial fabric. All of the resources within the area were previously surveyed in the 1970s, before the demolitions occurred, and are documented on Massachusetts Historical Commission's inventory forms, which should be consulted for additional information. Extant buildings within these properties are described from north to south, below, with references to their original inventory numbers provided.

The New Bedford Cotton Mills Corporation (NBE.J) Storehouse and Bin Room are the sole remnants of a multi-building complex that occupied an approximately 5.5-acre block between Coffin Avenue to the south and Collette Street to the north. The Weave Shed, Main Mill, and Engine House are now demolished, leaving 5.1 acres of vacant land that divide the connected Storehouse and Bin Room from the remainder of the area to the south. The Storehouse is a relatively small (140 by 84 feet), but typical example of an early twentieth-century cotton storage warehouse. The two-story building utilizes fire-resistive brick and timber mill loft construction techniques and has a shallow-pitched "flat" roof with open soffits and exposed beveled rafter tails, windowless common brick walls, and a granite foundation. Multiple truck loading bays are sheltered under an iron and sheet metal awning along the north elevation. The other elevations are blank. Openings have been cut into the northeast corner of the building for large plate glass display windows. The Bin Room is attached to the west end of the Storehouse. This one-story brick building has a rectangular 34-by-78-foot plan and faces Collette Street. Like the Storehouse, it utilized standard fire-resistive construction and is identical in style and materials to the larger building. The symmetrical, three-bay-wide street facade has a pair of large, segmental-arched, wood sash windows flanking an altered entry bay. The south elevation is blank. The west elevation, which is also blank, is a concrete block wall constructed when the attached Main Mill was demolished.

The Taber Mill (NBE.I) complex retains two of its four original buildings: the Spinning Mill and Picker House. The buildings, now conjoined by a recent full-height hyphen, occupy approximately 1.9 acres on the north and east sides of a city block between Coffin Avenue to the north and Dean Street to the south. The Spinning Mill is a typical early–twentieth century mill loft of fire-resistive brick and timber construction. The 10-bay-by-33-bay (125-by-370-foot) building has a shallow-pitched flat roof with open plank soffits and exposed beveled rafter tails. Common brick walls rise from a granite basement level and are divided into bays with piers that terminate at the roof line. Shallow corbelling overhangs the recessed bays. Window openings span the full width of the bays and have segmental arch lintels, granite sills, and replacement sash set in aluminum frame-and-panel infill. Roman-arched loading bays are now filled with window and panels. The Spinning Mill has suffered from the removal of a large proportion of its original fabric: three full-height light courts, each at least 3,000 square feet in plan, have been cut into the south elevation. The Picker House

duplicates the style and materials of the Spinning Mill, but lacks the open soffits at the roof line. This smaller, three-story loft is six-by-ten bays (60 by 100 feet) in plan. A connected Store House has been removed from the east side of this building. To the northwest of the existing complex, across Quansett Street, the former location of the Taber Mill Boiler House and Weave Shed is now a vacant lot.

National Spun Silk Company Oneko Mills (NBE.U) consists of three buildings occupying three contiguous parcels totaling 7.85 acres. The asphalt-paved lots take up a majority of a city block defined by the railroad right-of-way to the west, Brook Street to the east, Deane Street to the north, and Tallman Street and the Dawson's Brewery complex to the south. Three of five original buildings survive: Mill No. 3 creates a street wall on Deane Street Mill, No. 2 creates a street wall on Brook Street, and the Power House is located in the interior of the complex. Mill No. 3 is a Beaux Arts Style mill loft with a reinforced concrete, Turner-type, mushroom column frame. The five-story, five-bay-by-thirteen-bay (132-by-354-foot) structure was designed for a future expansion that would have doubled the building on its east side. This never occurred, and so the north facade is asymmetrical and the west elevation presents raw concrete framing with sheet metal and metal sash window infill (now painted). The north, east, and west elevations have typical Beaux-Arts organization and detailing utilizing brick and cast concrete in lieu of ornamental stonework. A rusticated ashlar basement level is divided from the upper floors with a belt course. Bays on the upper floors are divided by piers with concrete bases and capitals and by paneled cast concrete and brick spandrels. Bands of multi-light metal windows that duplicate the appearance of wood sash fill the bays between piers. The elevations are crowned with a heavy stepped parapet with cast concrete ornamentation dentils and crown molding. The words "National Spun Silk Co. Inc." are cast into the would-be center of the north facade. Mill No. 2 is a typical early–twentieth century mill loft of fire-resistive brick and timber construction. The four-story, 6-by-36-bay (70-by-335-foot) building has a shallow-pitched flat roof with a corbelled, dentiled cornice. Common brick walls rise from a granite basement level and are divided into bays with piers that flare at the roof line into segmental arch hoods over the bays. Window openings have segmental arch lintels, concrete sills, and replacement double-hung sash under original wood arched transom windows. An entry at the southeast corner of the building is sheltered under a wood and iron canopy and fitted with two paneled wood doors. The Power House is Beaux Arts Style brick and cast concrete building that presents a simplified version of Mill No. 3's decorative scheme. The building is organized into three blocks that create a stepped roofline. Its shallow pitched flat roofs have a raised parapet with cast concrete coping and cornices. The brick walls are penetrated at regular intervals with high window openings ornamented with cast concrete blocks the corners and holding multi-light steel sash. The basement story is faced with cast concrete replicating ashlar masonry and divided from the upper story by a belt course. A large Weave Shed and attached Blacksmith Shop, Boiling and Drying House, and Sorting House, all formerly located on the south edge of the complex, are now demolished.

Dawson's Brewery (NBE.D) Bottling Plant and Garage occupies three parcels fronting Brook Street, to the east, with the New Bedford Main Line railroad right-of-way to the west. The original Brewery has been demolished and its vacant 0.75 acre-parcel divides the Bottling Plant to the north from the Garage to the south. The Bottling Plant is an altered example of mid twentieth-century, light industrial architecture. Constructed in two phases, it is one and two stories in height and has an irregular rectangular footprint approximately 180 feet square. The west half is concrete frame, pier-and-spandrel construction with brick panels and steel industrial sash. The east half is brick on the south elevation and the remainder of the building is wrapped in a Butler-type prefabricated facade. The Garage faces Brook Street at its intersection with Sawyer Street with its rear wall in direct contact with the railroad embankment. This utilitarian brick building with steel and concrete framing is one story in height and has a trapezoidal footprint measuring 188 by 117 feet at its greatest extent. Shallow parapets ring the roof and are topped with clay tile coping. The east elevation is pierced with four concrete-framed garage doors and north and south elevations are blank. A steel slab door is set within a plain opening in the penultimate north bay of the east elevation.

The New Bedford Cotton Storage Warehouse Company – North Stores and Annex Building (NBE.613) occupies a 1.5-acre lot south of Sawyer Street. The Warehouse directly abuts the New Bedford Main Line railroad right-of-way, but its

covered freight platform adjoining the tracks has been removed. This building is an outsized example of a typical early twentieth-century storehouse executed in fire-resistive mill loft-type construction. The six-story structure towers over neighboring buildings and is 10 bays wide (108 feet) and 30 bays (373 feet) long. Its shallow-pitched "flat" roof has a low brick parapet and a prominent four-story stair tower. The brick walls are divided into bays on the north and west elevations with shallow projecting piers. A majority of the small, segmental arch widow openings retain their wood six-light sash. There are no windows on the west and south elevations. The east elevation has a row of segmental arch windows in the ground floor for the office, where the primary personnel entry is set into a deep, unornamented brick surround. Loading bays extending the full height of the building on the north elevation and retain most of their two-leaf wood panel doors divided by cast concrete sills and lintels. The Warehouse is divided transversely via brick firewalls into seven different storage areas. The Annex, located to the north of the Warehouse, is a one-story structure with a rectangular plan measuring 82 by 164 feet. It has a shallow-pitched shed roof with plank fascia boards and a projecting shingled tower at the southwest corner (the former connection point of a pedestrian bridge to the North Stores). The rusticated concrete block walls are blank on the west and east elevations, excepting a newly-cut garage bay on the west. The north elevation has two vehicle doors and a grouping of two windows and a personnel door at its east end. These openings have concrete surrounds and are now filled with panels. The Annex is divided into two storage areas by a firebreak wall.

HISTORICAL NARRATIVE

The Brook Street Industrial and Commercial Area developed ca. 1905 to ca. 1925 as part of the greater growth and industrial expansion of New Bedford in the early twentieth century. The area is primarily associated with the city's textile manufacturing base, which had emerged as an important driver of the city's economy beginning in the late nineteenth century following the collapse of the whaling industry. Geographically, this industrial expansion primarily occurred in two corridors – the port district along the Acushnet River and along the historical New York, New Haven, and Hartford Railroad line (now) in the north central part of the city, where the Brook Street Industrial Corridor is located.

Industrial development of the previously vacant area began in 1883 with the establishment of the Oneko Mills woolen mill (redeveloped as the National Spun Silk Company - see below) (Pease and Hough 1889:170). Dawson's Brewery (NBE.D, see related form) established its beer brewery (now demolished) in 1899 on Brook Street and enlarged the facility ca. 1910 with the construction of the eastern half of the current Bottling Plant as a storage building and ice plant. This was approximately doubled in size to its current dimensions in 1946 to create the extant Bottling Plant. In 1947, the existing Garage was added at the south end of the complex. The brewery closed sometime after 1970 following several changes of ownership and name. At an unknown date, the original brewery was demolished and the Bottling Plant altered with the existing prefabricated enclosures. The Garage is now used by a towing and repair company (Everts & Richards 1895; Healey 1978; Sanborn Map Co. 1906, 1924, 1950; Walker Lithograph and Publishing Co. 1911).

Following Dawson's Brewery was the Taber Mill (NBE.I, see related form), incorporated 1906 by Frederic Taber, with surviving components of the complex constructed in 1907. This fully-integrated silk and cotton cloth mill was once approximately double its current size and has suffered from extensive demolition. A Store House was attached to the existing Picker House, fronting Dean Street. To the northeast and across Coffin Avenue from the Spinning Mill was a massive weave shed with an attached Boiler House and Machine Shop. Taber Mill employed 1,200 hands who operated 120 carding machines and 3,000 looms producing novelty fabrics. The collapse of the cotton textile market resulted in the company's bankruptcy and ultimate closure in 1936. The mill complex was auctioned and subsequently occupied by various light manufacturing and warehousing concerns. By 1997, the weave shed had been demolished and the remaining Spinning Mill and Picker House have been redeveloped into residences, with the Spining Mill being heavily altered in the process (HistoricAerials.com 2009; Sanborn Map Co. 1906, 1924, 1950; Stone 1930:206; Shields 1977a; Walker Lithograph and Publishing Co. 1911).

The New Bedford Cotton Storage Warehouse Company constructed its North Stores Warehouse (NBE.613, see related form) facility ca. 1910 alongside the tracks of the New York, New Haven & Hartford Railroad and, by 1924, had expanded it with the Annex Building for paper and twine storage. The company was established in 1910 and its leadership included textile industrialists within the city. It pioneered the public warehousing business in New Bedford and led the city in cotton warehousing. The North Stores Warehouse was one of three built by the company in New Bedford that provided a combined floor space area of 660,000 square feet; the other two being the Terminal Stores near the city center, and the Union Stores, at the north end of the city. The warehouse was used particularly for cotton products, although it also housed some household and paper goods. Such facilities provided an essential service for the textile trade by supplying ancillary storage space for mills. They also leant fluidity and increased profitability to the cotton goods market by allowing producers and traders to hold raw materials and/or finished goods and exchange them at optimum market conditions (Sanborn Map Co. 1906, 1924, 1950; Shields 1977b; Stone 1930:197-199; 217-218).

The National Spun Silk Company Mill (NBE.U) was constructed between 1918 and 1920, after silk manufacturer Klots Throwing Company established the firm as an independent offshoot in 1916 to take advantage of the emergent national defense-related market for spun silk products. The company purchased the Oneko Woolen Mills complex and completely redeveloped the site to build the existing Mill Nos. 2 and 3 and Power House; as well as the now-demolished Mill No. 1 (a weave shed) and connected Blacksmith Shop, Boiling and Drying House, and Sorting House (all three now demolished). Spun silk is a specialty product manufactured from waste remaining from the manufacture of higher-quality "thrown" silk yarns made from the raw silk of silkworms' cocoons. Before 1914, few American companies engaged in silk spinning, as it was a more difficult and technically demanding product with limited market potential and a high level of competition from manufacturers in Europe and Asia. Trade disturbances resulting from World War I, combined with new defense-related markets for silk products, resulted in the development of an American spun silk manufacturing industry. The majority of the project was used in cloth powder bags for large guns. The National Spun Silk Company mill was one only seven in the country (and one of two in Massachusetts) manufacturing spun silk and, during its early years, over 90 percent of its product was sold to the government. As of 1930, the National Spun Silk Co. employed 2,500 operatives who operated 42,000 spindles and 186 looms. Its success was short-lived however. By 1950 the company had vacated its premises, which were subsequently (and currently) occupied by a variety of light industrial and manufacturing concerns. National Spun Silk Co. was one of the last and largest of the silk companies to be founded in New Bedford, whose silk industry was not established until after 1900. Beyond specialized products like that of the National Spun Silk Co., New Bedford silk companies manufactured broad silks and mixed silk and cotton fabrics for fine clothing. By 1930, New Bedford hosted at least five major silk manufactures employing several thousand hands (Sanborn Map Co. 1924, 1950; Shields 1977c; Stone 1930:214-215; Walker Lithograph and Publishing Co. 1911; United States Tariff Commission 1918:21, 61, 69-72).

Last to establish itself in the Brook Street Industrial Area was the New Bedford Cotton Mills Corporation (NBE.J), which, ca. 1910, constructed a large, integrated cotton mill complex. The facility, which included the extant Storehouse and Bin Room, occupied the entire city block between Oneko Lane to the east and Church Street to the west. Thee company was incorporated in 1909 for the manufacture of fine cotton goods. In 1928 it merged with other mills in New Bedford and North Adams to form the Associated Textile Companies trust, which was perhaps the largest singled fine cotton goods organization in the country. The complex was used for its original purpose until the 1950s, when its ownership was broken up amongst various manufacturing concerns, not all textile-related. Sometime after 1997, the weave shed, main mill, and power house, and office within the complex were all demolished, leaving only the attached Storehouse and Bin Room at the northeast corner of the parcel. These are now used as a thrift shop (HistoricAerials.com 2009; Sanborn Map Co. 1906, 1924, 1950; Stone 1930:203-204; Shields 1977d; Walker Lithograph and Publishing Co. 1911).

The Brook Street Industrial and Commercial Area is recommended not eligible for listing in the National Register. The demolition of critical historical components of several complexes (New Bedford Cotton Mills, Taber Mills, and Dawson's Brewery) has created large vacant lots within the area that have severely compromised its integrity. Two properties,

National Spun Silk Company's Oneko Mills (NBE.U) and the New Bedford Cotton Storage Company – North Stores (NBE.613) were found to have significance and integrity sufficient to render them eligible for listing in the National Register individually. Updated MHC Building and Area forms and Criteria Statement Forms have been prepared for these two properties.

BIBLIOGRAPHY and/or REFERENCE

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1977b New Bedford Storage Warehouse North Stores. MHC Form B – Building Form. On file, Massachusetts Historical Commission, Boston, MA.

1977c National Spun Silk Mill (NBE.U). MHC Form A – Area Form. On file, Massachusetts Historical Commission, Boston, MA.

1997d New Bedford Cotton Mills Corporation (NBE.J). MHC Form A – Area Form. On file, Massachusetts Historical Commission, Boston, MA

Stone, Orra L.
1930 *History of Massachusetts Industries, Volume I.* The S.J. Clarke Publishing Co., Boston, MA.

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1918 *Silk and Manufactures of Silk*. Tariff Information Series – No. 3. Government Printing Office, Washington, DC.

Walker Lithograph & Publishing Company
1911 *Map of the City of New Bedford, Mass*. Walker Lithograph & Publishing Company, Boston, MA

AREA DATA SHEET

MHC Number	Assessor's Map/Plat/Lot Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
NBE.J	98-263	New Bedford Cotton Mills - Storehouse and Bin House	306 Collette St.	Ca. 1910	Vernacular industrial loft		C
NBE.J	98-261	Demolished / Vacant	-	-	-		NC
NBE.J	98-262	Demolished / Vacant	-	-	-		NC
NBE.J	98-264	Demolished / Vacant	-	-	-		NC
NBE.J	98-3	Demolished / Vacant	-	-	-		NC
NBE.I	98-253	Taber Mill Spinning Mill	211 Dean St.	1907	Vernacular industrial loft		C
NBE.I	98-252	Demolished / Vacant	-	-	-		NC
NBE.I	98-53	Taber Mill Picker House	211 Dean St.	1907	Vernacular industrial loft		C
NBE.U	98-254	National Spun Silk Company Oneko Mills Mill No.3	83 Brook St.	1920	Beaux Arts		RNRE
NBE.U	98-255	National Spun Silk Company Oneko Mills Mill No. 2	79 Brook St.	1918	Vernacular industrial loft		RNRE
NBE.U	98-128	National Spun Silk Company Oneko Mills Power House	37-73 Brook St.	1920	Beaux Arts		RNRE
NBE.D	92-305	Dawson's Brewery Bottling Plant	39-49 Brook St.	Ca. 1910 / 1946	Vernacular industrial		C
NBE.D	92-148	Demolished / Vacant	-	-	-		NC
NBE.D	92-25	Dawson's Brewery Garage	11-13 Brook St.	1947	Vernacular industrial		C
NBE.613	92-45	New Bedford Cotton Storage Warehouse Company North Stores and Annex Building	19 Jean St.	Ca. 1910 / ca.1920	Vernacular industrial loft		RNRE

RNRE Property is recommended individually eligible for National Register listing, PAL 2013.
C Contributing property to the area
NC Non-contributing property to the area

Taber Mill Spinning Mill and Picker House (NBE.I).

National Spun Silk Company Oneko Mills Mill No.3 (NBE.U).

National Spun Silk Company Oneko Mills Power House (NBE.U).

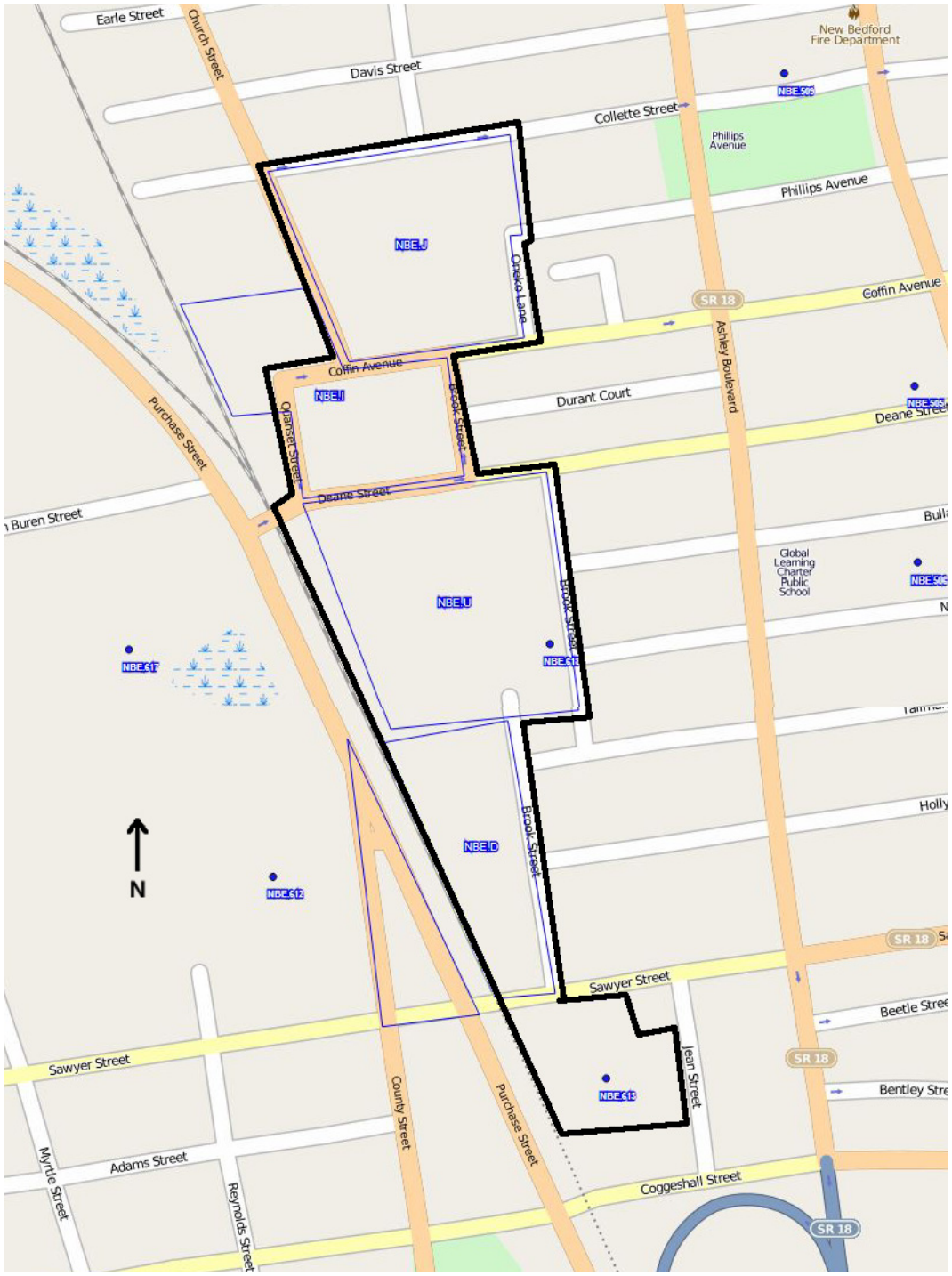
National Spun Silk Company Oneko Mills Mill No. 2 (NBE.U).

Dawson's Brewery Bottling Plant (NBE.D).

Dawson's Brewery Garage (NBE.D).

New Bedford Cotton Storage Warehouse Company North Stores and Annex Building (NBE.613).

AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
98	New Bedford North	NBE.U	-

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: New Bedford

Place *(neighborhood or village):*

Name of Area: National Spun Silk Co. – Oneko Mills

Present Use: Industrial

Construction Dates or Period: 1918-1920

Overall Condition: Fair

Major Intrusions and Alterations: Demolition of Mill No. 1, Boiling and Drying House, and Sorting House

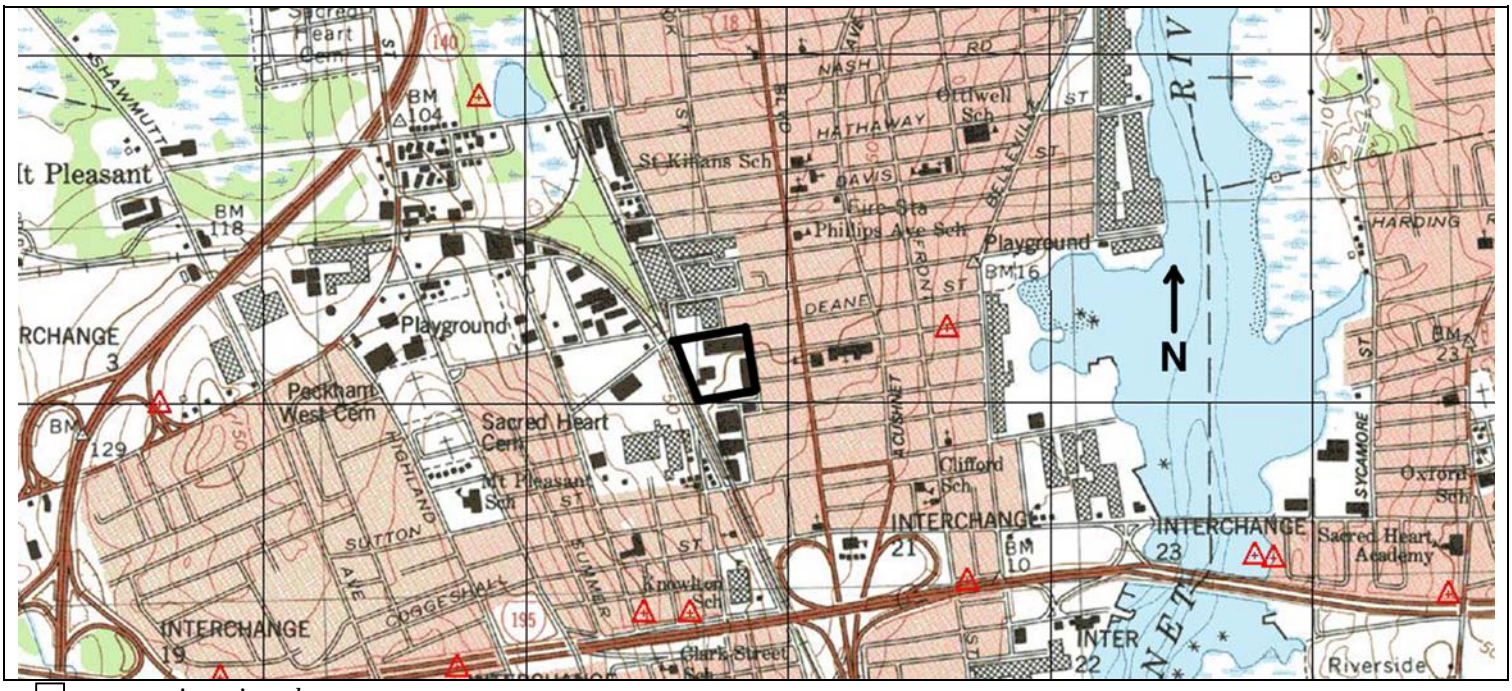
Acreage: Approx 6

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

National Spun Silk Company Oneko Mills (NBE.U) consists of three buildings occupying three contiguous parcels totaling 7.85 acres. The asphalt-paved lots take up a majority of a city block defined by the railroad right-of-way to the west, Brook Street to the east, Deane Street to the north, and Tallman Street and the Dawson's Brewery complex to the south.

Three of five original buildings survive: Mill No. 3 creates a street wall on Deane Street Mill, No. 2 creates a street wall on Brook Street, and the Power House is located in the interior of the complex. Mill No. 3 is a Beaux Arts Style mill loft with a reinforced concrete, Turner-type, mushroom column frame. The five-story, five-bay-by-thirteen-bay (132-by-354-foot) structure was designed for a future expansion that would have doubled the building on its east side. This never occurred, and so the north facade is asymmetrical and the west elevation presents raw concrete framing with sheet metal and metal sash window infill (now painted). The north, east, and west elevations have typical Beaux-Arts organization and detailing utilizing brick and cast concrete in lieu of ornamental stonework. A rusticated ashlar basement level is divided from the upper floors with a belt course. Bays on the upper floors are divided by piers with concrete bases and capitals and by paneled cast concrete and brick spandrels. Bands of multi-light metal windows that duplicate the appearance of wood sash fill the bays between piers. The elevations are crowned with a heavy stepped parapet with cast concrete ornamentation dentils and crown molding. The words "National Spun Silk Co. Inc." are cast into the would-be center of the north facade. Mill No. 2 is a typical early–twentieth century mill loft of fire-resistive brick and timber construction. The four-story, 6-by-36-bay (70-by-335-foot) building has a shallow-pitched flat roof with a corbelled, dentiled cornice. Common brick walls rise from a granite basement level and are divided into bays with piers that flare at the roof line into segmental arch hoods over the bays. Window openings have segmental arch lintels, concrete sills, and replacement double-hung sash under original wood arched transom windows. An entry at the southeast corner of the building is sheltered under a wood and iron canopy and fitted with two paneled wood doors. The Power House is Beaux Arts Style brick and cast concrete building that presents a simplified version of Mill No. 3's decorative scheme. The building is organized into three blocks that create a stepped roofline. Its shallow pitched flat roofs have a raised parapet with cast concrete coping and cornices. The brick walls are penetrated at regular intervals with high window openings ornamented with cast concrete blocks the corners and holding multi-light steel sash. The basement story is faced with cast concrete replicating ashlar masonry and divided from the upper story by a belt course. A large Weave Shed and attached Blacksmith Shop, Boiling and Drying House, and Sorting House, all formerly located on the south edge of the complex, are now demolished.

HISTORICAL NARRATIVE

The National Spun Silk Company Mill (NBE.U) was constructed between 1918 and 1920, after silk manufacturer Klots Throwing Company established the firm as an independent offshoot in 1916 to take advantage of the emergent national defense-related market for spun silk products. The company purchased the Oneko Woolen Mills complex and completely redeveloped the site to build the existing Mill Nos. 2 and 3 and Power House; as well as the now-demolished Mill No. 1 (a weave shed) and connected Blacksmith Shop, Boiling and Drying House, and Sorting House (all three now demolished). Spun silk is a specialty product manufactured from waste remaining from the manufacture of higher-quality "thrown" silk yarns made from the raw silk of silkworms' cocoons. Before 1914, few American companies engaged in silk spinning, as

it was a more difficult and technically demanding product with limited market potential and a high level of competition from manufacturers in Europe and Asia. Trade disturbances resulting from World War I, combined with new defense-related markets for silk products, resulted in the development of an American spun silk manufacturing industry. The majority of the project was used in cloth powder bags for large guns. The National Spun Silk Company mill was one only seven in the country (and one of two in Massachusetts) manufacturing spun silk and, during its early years, over 90 percent of its product was sold to the government. As of 1930, the National Spun Silk Co. employed 2,500 operatives who operated 42,000 spindles and 186 looms. Its success was short-lived however. By 1950 the company had vacated its premises, which were subsequently (and currently) occupied by a variety of light industrial and manufacturing concerns. National Spun Silk Co. was one of the last and largest of the silk companies to be founded in New Bedford, whose silk industry was not established until after 1900. Beyond specialized products like that of the National Spun Silk Co., New Bedford silk companies manufactured broad silks and mixed silk and cotton fabrics for fine clothing. By 1930, New Bedford hosted at least five major silk manufactures employing several thousand hands (Sanborn Map Co. 1924, 1950; Shields 1977; Stone 1930:214-215; United States Tariff Commission 1918:21, 61, 69-72; Walker Lithograph and Publishing Co. 1911)

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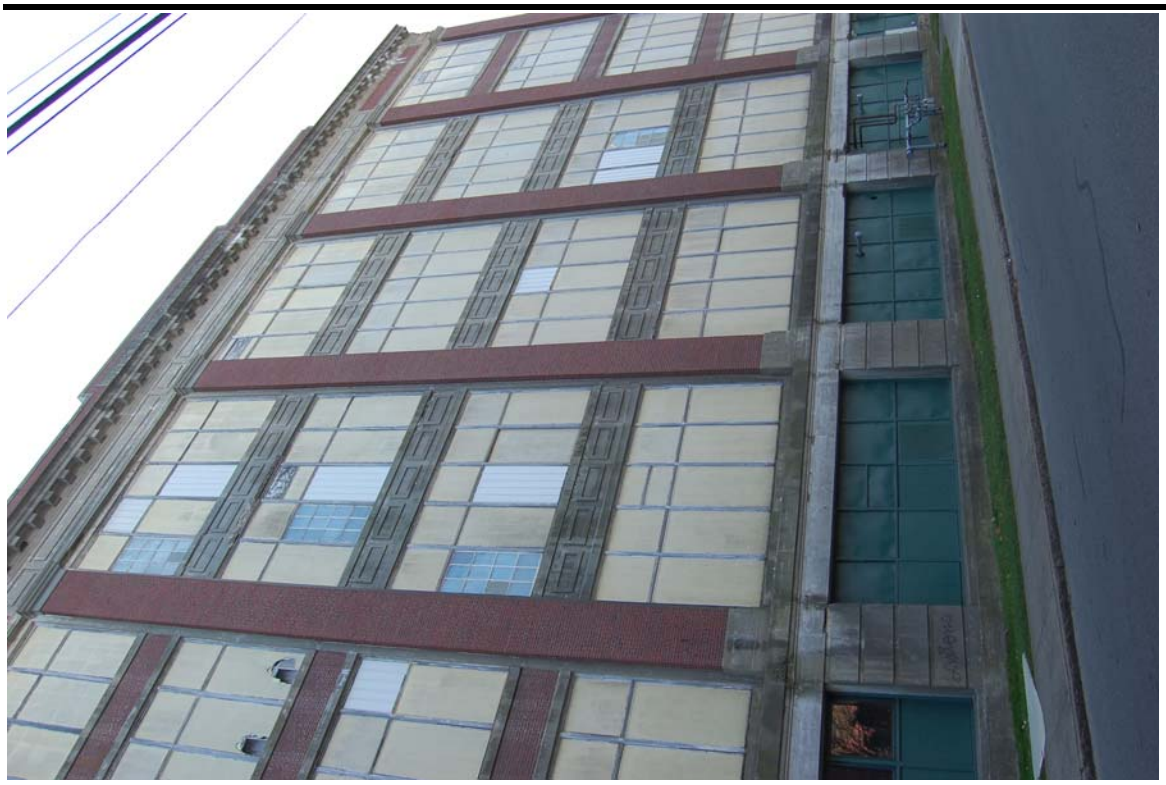
AREA DATA SHEET

MHC Number	Assessor's Map/Plat/Lot Number	Property Name	Address	Const. Date	Style/Form	Photo No.	National Register Status
NBE.U	98-254	National Spun Silk Company Oneko Mills Mill No.3	83 Brook St.	1920	Beaux Arts	2,3,4	RE
NBE.U	98-255	National Spun Silk Company Oneko Mills Mill No. 2	79 Brook St.	1918	Vernacular industrial loft	5	RE
NBE.U	98-128	National Spun Silk Company Oneko Mills Power House	37-73 Brook St.	1920	Beaux Arts	6	RE

NE Not Eligible
RE Recommended Eligible

National Spun Silk Company Oneko Mills Mill No.3.

Rear elevation of National Spun Silk Company Oneko Mills Mill No.3.

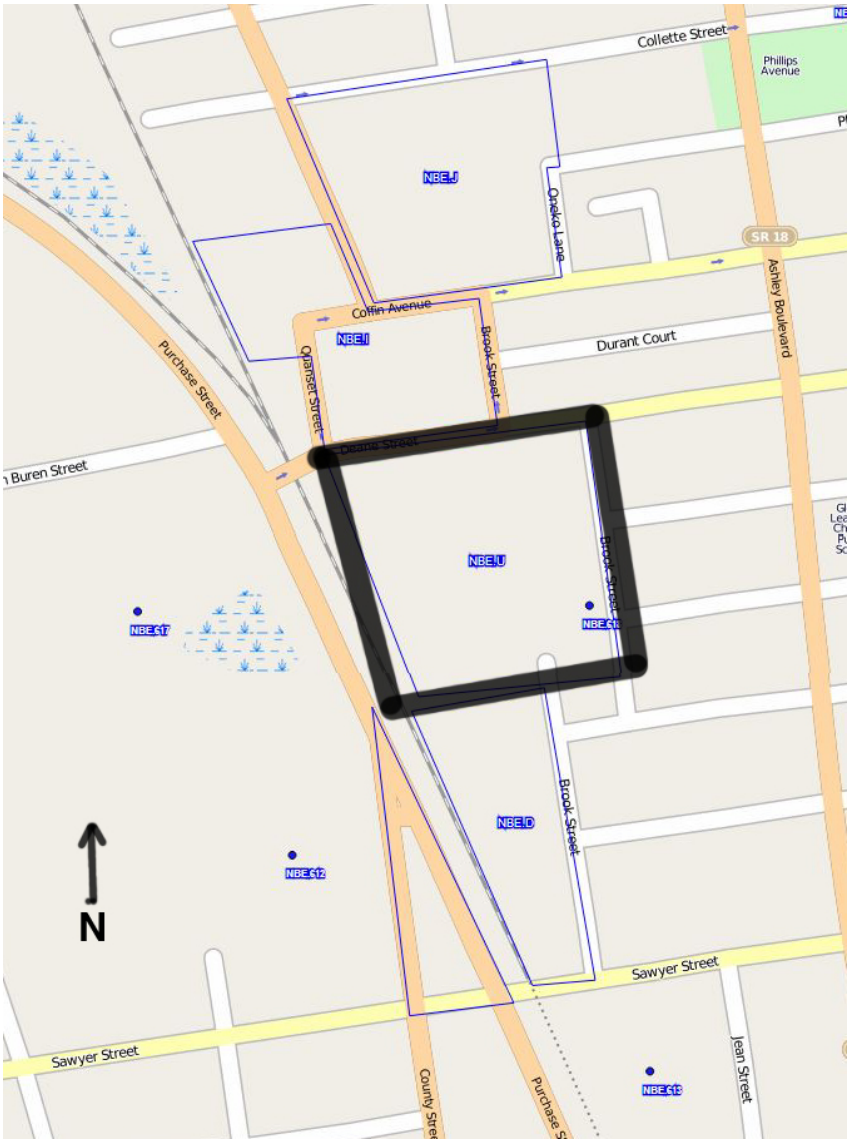


Facade detail of National Spun Silk Company Oneko Mills Mill No.3.

National Spun Silk Company Oneko Mills Mill No. 2.

National Spun Silk Company Oneko Mills Power House.

Map of MHC Inventoried Properties



- State Register Listed
- National Register Listed
- = area boundary

Information from MACRIS Maps 2.0 Beta. http://maps.mhc-macris.net

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The National Spun Silk Company Oneko Mills is eligible for listing in the National Register under Criterion A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex has important associations with the development of New Bedford's silk industry, a significant component of the city's larger textile economy. Under Criterion C, the complex is significant for its architecturally-distinguished Neo-Classical architecture and for its examples of early twentieth century brick and concrete mill loft construction.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Raynham

Place *(neighborhood or village):* Gilmoretown

Name of Area: Carver Street Area

Present Use: Residential

Construction Dates or Period: Ca. 1850 - 1944

Overall Condition: Good

Major Intrusions and Alterations: There have been no major changes in the area. Some buildings have been modified, as discussed in the narrative.

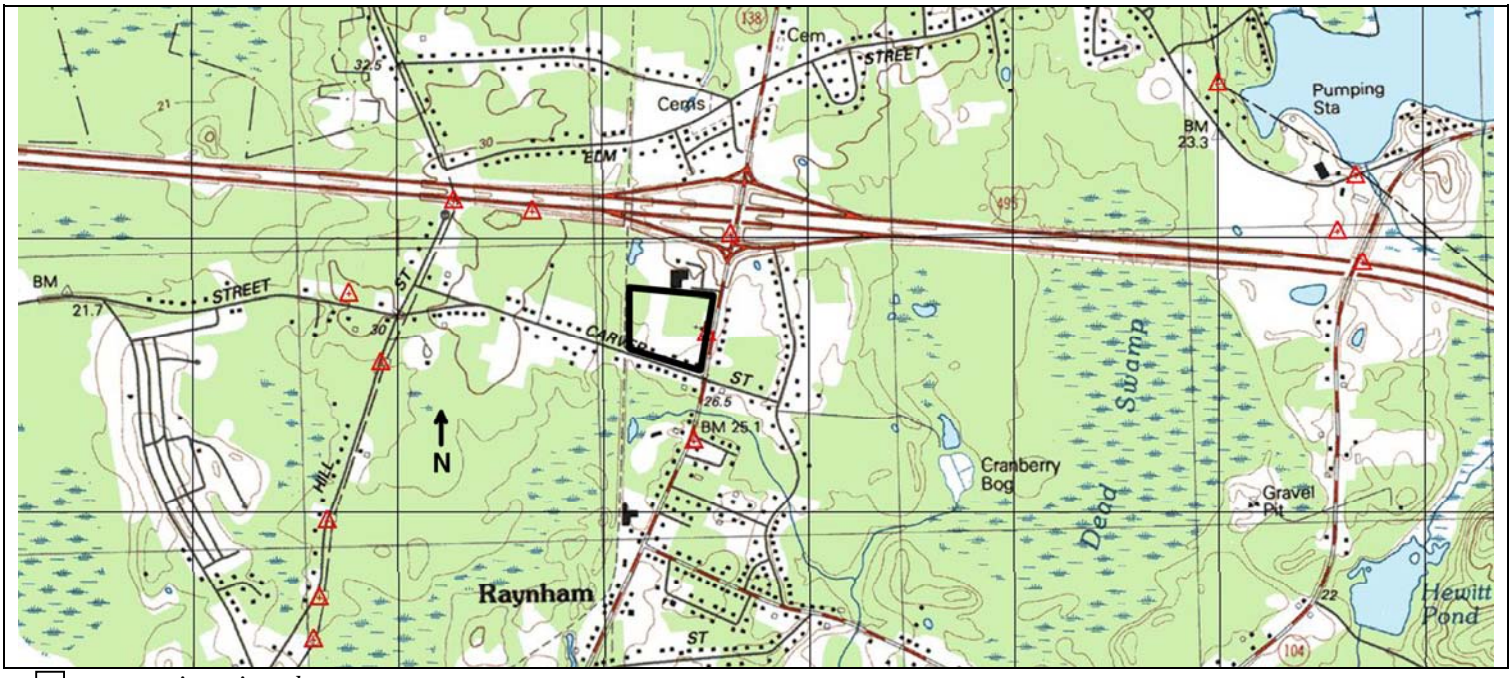
Acreage: Approx. 35

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Carver Street Area is a 35-acre mixed-use area at the northwest corner of Broadway and Carver Street in North Raynham. It sits along a high-traffic area, encompassing an area with a small cluster middle-class, residential properties along one street and a hall/school building and ecclesiastical buildings along the main road. The area is bounded to the north by a supermarket and to the west by the Stoughton Railroad Line right-of-way. It consists of a collection of five contributing residential, civic, and religious properties either constructed in situ or moved to the area between ca. 1850 and 1944 and two additional, non-contributing, mid-twentieth-century ranch style residences.

Along Broadway, from north to south, sits the contributing North Raynham Congregational Church (1875), North Raynham Congregational Church Rectory (likely constructed ca. 1930 and moved to site between 1940 and 1944), and Hall/School No. 8 (ca. 1855-1858). Along Carver Street, from east to west, sits the non-contributing Residence at 306 Carver Street (ca. 1965), the contributing H.P. Crocker House (ca. 1858-1871), the non-contributing Residence at 288 Carver Street (ca. 1965), and the contributing G.H. Lincoln House (ca. 1830-1855).

The properties contributing to the Carver Street Area generally retain a high degree of architectural integrity. The North Raynham Congregational Church is a one-and-one-half story, front-gabled, wood framed Gothic Revival style church with an asphalt shingle roof, vinyl siding, and a granite block foundation. It has pointed arch, mixed stained glass and replacement windows, a large square spire and entry extending from the southern elevation, and a large two-story mid-twentieth century addition on the north elevation. The Rectory, a ca. 1915 building that was likely moved just south of the church around 1940, is a two-story, three-bay by two-bay, American Foursquare style building with an asphalt-shingle-sheathed hipped roof, vinyl siding, replacement windows, a rusticated concrete block foundation, and a full-length front porch.

The Hall/School No. 8 is a wood-frame, two-story, two-bay by six-bay, gable-front, Greek Revival style building with a ventilator extending from the bracketed asphalt roof. The building has a returned cornice at the gable ends, full-height corner pilasters, molded window frames, clapboard siding, unidentified foundation, and paired main entrances on the east-facing facade.

The H.P. Crocker House is a wood-frame, one-and-one-half story, three-bay by four-bay, gable front vernacular style building with a one-story rear addition, asphalt roof, vinyl siding, replacement windows, and two Queen Anne style porches. A large, New England style barn sheathed in vinyl siding with a roof monitor sits to the northeast of the house.

The G.H. Lincoln House is a wood-frame, one-and-one-half-story, early Italianate style building with a cross gabled roof lined in ornamental vergeboards on the south-facing facade, and a Queen Anne style dentiled wrap-around porch consisting of paired column supports and a turned/sawn balustrade. The building has an asphalt shingle roof, clapboard siding, paired windows at the gable ends, and an attached, twentieth century three-bay car garage.

Modifications to buildings include the addition of non-historic, replacement windows, synthetic siding, and large twentieth-century additions on the North Raynham Congregational Church and the G.H. Lincoln House.

HISTORICAL NARRATIVE

The Carver Street Area developed as a residential and institutional block at the corner of a major thoroughfare, the Taunton to South Boston Turnpike, and the predominantly residential Carver Street during the mid-nineteenth to early twentieth century. The area is located within a larger section of North Raynham previously known as "Gilmoretown," where several members of the locally prominent Gilmore family lived, and where Cassander and Henry T. Gilmore operated a shoe manufacturing company established ca. 1855 (Sanford 1870:34).

Development of the Carver Street Area began in 1806 with the construction of the Taunton to South Boston Turnpike through North Raynham, followed by the construction of Carver Street shortly afterward. The first extant property constructed within the district was the G.H. Lincoln House between 1830 and 1855 on the north side of Carver Street, approximately 600 feet from the intersection with the turnpike. By 1871, an early owner of the property, G. Herbert Lincoln, was identified as a farmer, "house dealer," member of the Massachusetts House of Representatives, and blacksmith. He operated a blacksmith shop along the turnpike within the area, approximately in the same location as the present North Raynham Congregational Church. Shortly after construction of the Lincoln House, the Hall/School No. 8 was built between 1855 and 1858 on the corner of the turnpike and Carver Street, and operated as a school until at least 1895. A second residential property, the H.P. Crocker House, was constructed between 1858 and 1871 on Carver Street between the Hall/School No. 8 and the G.H. Lincoln House property (MHC 1981; Smith 1830; Walling 1855; 1858; Beers 1871; Gifford 1871; Everts & Richards 1895).

Although map research has determined the Hall/School No. 8 to have been constructed between 1855 and 1858, little historical background on the property has been identified. Presently, the building, renamed "Gilmore Hall," after the Gilmore family, is owned by the town and serves as town offices (Rowcroft 2005:19).

The North Raynham Congregational Church was established on December 29, 1875 and remained active until at least 1954. A late twentieth century observation of the building indicates how the church may have once historically appeared. The observation, made by the Massachusetts Department of Transportation, states that a weather vane rod extended from the multi-colored slate roof spire of the church. The building is still used for ecclesiastical purposes. Since 1998, the property has operated as the Agape Chapel (SC 1898:111; Mass DOT 2001).

The North Raynham Congregational Church Rectory was either constructed on-site or moved from a different location between 1940 and 1944. As an American foursquare style building with a rusticated concrete block foundation, this property is more typical of 1930 architecture; therefore, it is more likely that the building was moved to its present location in the 1940s than constructed in situ (MHC 1981:6; Mass DPW 1941; IRS 1989; USGS 1940; 1944; Agape Chapel 2013).

In the mid- to late-nineteenth century, the majority of buildings constructed in Raynham were small transitional Greek Revival to Italianate style cottages. The two residential properties within the Carver Street Area that date to this period, consisting of the Italianate/Queen Anne style G.H. Lincoln House (ca. 1830-1855) and the Vernacular/Queen Anne style H.P. Crocker House (ca. 1858-1871), stand out from the rest in town as they are larger houses.

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1858 *Bristol County, Massachusetts*. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	North Raynham Schoolhouse	964 Broadway	ca. 1855-1971	Greek Revival	4	C
	North Raynham Congregational Church and Rectory	1002 Broadway	1875 (Church), ca. 1905 (Rectory)	Gothic Revival (Church), American Foursquare (Rectory)	7, 8	C
	H.P. Crocker House	268 Carver Street	ca. 1830-1855	Gothic Revival/Queen Anne Porch	1, 5	C
	Residence	288 Carver Street	ca. 1965	Ranch	1, 3	NC
	G.H. Lincoln House	294 Carver Street	ca. 1871	Vernacular/Queen Anne Porch	2, 3, 6	C
	Residence	306 Carver Street	ca. 1965	Ranch	2	NC

C Contributing property
NC Non-contributing property

There are no properties previously listed in MACRIS or shown on the MACRIS Maps 2.0 Beta, http://maps.mhc-macris.net.

Carver Street, view looking northwest with (l-r) 288 Carver Street, H.P. Crocker House, and 306 Carver Street.

Carver Street, view looking northwest with (l-r) 288 Carver Street and H.P. Crocker House.

Hall/School No. 8, view looking north.

G.H. Lincoln House, view looking northwest.

H.P. Crocker House, view looking northwest.

North Raynham Congregational Church, view looking northwest.

North Raynham Congregational Church Rectory, view looking southwest.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Carver Street Area is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C at the local level in the areas of community development and architecture. Under Criterion A, the area has important associations with mid-nineteenth- to early-twentieth century development of the small area of Taunton formerly referred to as "Gilmoretown." Under Criterion C, the area is significant for its collection of residential and institutional architecture constructed (or moved to its present site) between 1850 and 1944 in the Greek Revival, Gothic Revival, and Queen Anne style.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Raynham

Place *(neighborhood or village):* North Raynham; Prattville

Name of Area: Broadway-Center Street Area

Present Use: Commercial, Institutional, and Residential

Construction Dates or Period: mid-19th to mid-20th C.

Overall Condition: Good

Major Intrusions and Alterations: The introduction of several non-historic properties and modifications to individual buildings, including major non-historic additions, non-historic replacement windows, and synthetic siding.

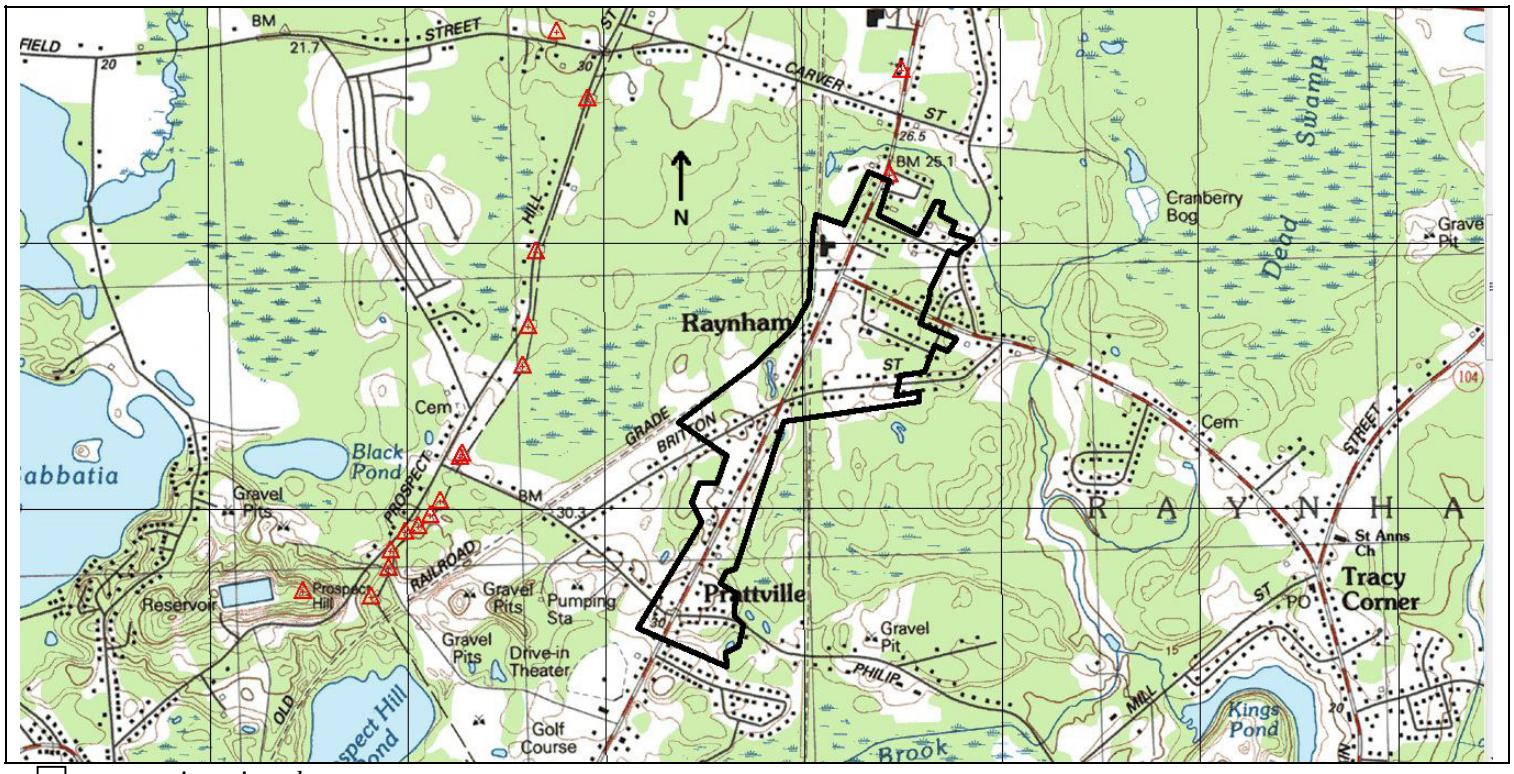
Acreage: Approx. 130

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area Letter Form Nos.
See data sheet

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Broadway-Center Street Area is an approximately 130 acre, 1.5 mile-long, linear area along Broadway (State Route 138) in North Raynham. The residential, commercial, and institutional, and ecclesiastical neighborhood extends along either side of Broadway and include secondary roads: Gilmore Street, Lincoln Avenue, Center Street, Baker Road, Britton Street, Thiels Way, Oak Street, and King Philip Street. The area also encompasses portions of the Stoughton Railroad Line right-of-way and abuts the west side of the Whittenton Branch Railroad Line right-of-way. Of the 151 residential, commercial, and industrial properties within the area, approximately 82 are contributing.

The area consists primarily of residences, but also contains 12 commercial properties, a vacant school, and a non-historic post office. Construction dates of historic properties range from approximately 1860 to 1960, and architectural styles represented range from the Greek Revival to the Colonial Revival, along with numerous Bungalow and Cape Cod residences and the Frates Dairy Bottle Building – a notable example of commercial roadside architecture.

The Colonial Revival style North Raynham School constructed on Baker Street in 1922 and the Novelty style Frates Dairy Bottle Building, constructed about 1930 are two architecturally significant properties. Numerous residential properties within the area range in style and architectural integrity. Styles include Greek Revival, Italianate, Colonial Revival, Craftsman, American Foursquare, Bungalow, and Vernacular. One of the best preserved properties in the area is the Greek Revival style residence located at 825 Broadway on the corner of Gilmore Street. It retains its historic plan and materials, but has been converted for commercial use (Andrews 1984; Sanborn Map Company 1937). Some of the buildings retain their architectural integrity, while the majority have been altered by window replacement, the installation of synthetic siding, and modern additions, particularly along Broadway.

HISTORICAL NARRATIVE

The Broadway-Center Street Area contains institutional, commercial, and residential properties along and off of Broadway that date from the mid-nineteenth to mid-twentieth century. The area first developed after construction of the Taunton to South Boston Turnpike (presently Broadway/State Route 138), which was constructed through North Raynham in 1806. Until 1830, there was relatively little development in the area, with seven residences and one school, School No. 3 (no longer extant). At this time, the only major roads were the turnpike, Britton Street, Oak Street, and King Philip Street. In the 1850s, the northernmost section developed around a shoe-manufacturing firm established by brothers Cassander and Henry T. Gilmore, and the area north of Britton Street became known as “Gilmoretown.” Gilmore Street was laid out during this period. The shoe manufacturing building was located just north of the area boundary and is no longer extant. By 1855, 19 residences were constructed in addition to a blacksmith shop (no longer extant) just north of the intersection of King Philip Street and Broadway and the entire area was considered to be part of the village of Prattville, within Raynham District No. 3. Three years later, members of the Gilmore family constructed residences surrounding the shoe manufacturing building (MHC 1981; Sanford 1870:34; Smith 1830; Walling 1855).

After 1858, the tracks of the Old Colony Railroad were laid out through the area and a depot (no longer extant) was constructed at the right-of-way intersection with Broadway. In the second half of the nineteenth century after the introduction of the railroad, development was predominantly industrial. By 1871, the Old Colony Railroad maintained an office on Gilmore Street. At this time, approximately five residential buildings, a general store, and a mill developed in Gilmoretown, while a shoe store and a second general store were constructed at the southern end of the area, near the Broadway/King Philip Street intersection (all no longer extant). By 1895, a branch of the Old Colony Railroad extended from the depot intersection towards the New York, New Hampshire, and Boston Railroad Line in Taunton. A second blacksmith shop, post office, shoe factory, and a warehouse and shop complex (all no longer extant) were built adjacent to the railroad tracks. Along Broadway, from the southern end of the area, a chapel was constructed; closer to the Broadway/Britton Street intersection, the Taunton Lumber Company complex and Center Street were developed. By the early twentieth century, a poultry farm had been constructed along the railroad tracks across from Center Street, and the Nelson Rivet Company complex was located to the north along Broadway (Walling 1858; Beers 1871; Everts & Richards 1895).

The Broadway-Center Street Area is evaluated as not eligible for listing in the National Register of Historic Places because it has lost historical associations with the Old Colony Railroad and the Gilmore Shoe Manufacturing Firm. Only a few non-residential properties that date to the nineteenth and early twentieth centuries are still intact. Though there are properties that retain architectural integrity, the collection of contributing properties within the area does not retain integrity, as many properties have been substantially altered to accommodate a change in use since the period of significance. Since it is likely to have important historical associations in addition to being an excellent example of Novelty commercial architecture, the Frates Dairy Bottle Building is recommended to be individually evaluated for National Register eligibility in the future.

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Smith, Annin & Company Lithographers
1830 Map of Raynham, Massachusetts. Boston, MA.

Walling, Henry F.
1855 Map of the Town of Raynham, Bristol County, Massachusetts. Augustus Kollner, Philadelphia, PA.

1858 Bristol County, Massachusetts. John L. Smith & Co., Boston, MA.

AREA DATA SHEET

The following is a selection of properties within the district that are either referenced in the form and/or retain architectural integrity.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	22 Baker Road	ca. 1920	Craftsman		C
	North Raynham School	53 Baker Road	1922	Colonial Revival	8	C
	Residence	77 Baker Road	ca. 1930	Bungalow	2	C
	Residence	85 Baker Road	ca. 1930	Bungalow	2	C
	Residence	295 Britton Street	ca. 1920	Foursquare		C
	Residence	305 Britton Street	ca. 1920	Foursquare		C
	Residence	440 Broadway	ca. 1900	Vernacular/ Queen Anne		C
	Residence and Barn	466 Broadway	ca. 1840	Greek Revival	5	C
	Frates Dairy Bottle Building	785 Broadway	ca. 1930	Novelty	7	C
	Residence	814 Broadway	ca. 1900; Early 20th C Additions	Vernacular	3	NC
	Residence	825 Broadway	ca. 1850	Greek Revival	4	C
	Residence	826 Broadway	ca. 1900	Vernacular	3	C
	Residence	866 Broadway	ca. 1920	Bungalow		C
	Residence	137 Center Street	ca. 1900	Vernacular/ Queen Anne		C
	Residence	21 Gilmore Street	ca. 1840	Greek Revival	1	C
	Residence	33 Gilmore Street	ca. 1840	Greek Revival	1	C
	Residence	43 Gilmore Street	ca. 1840	Greek Revival		C
	Residence	334 King Philip Street	ca. 1920	Bungalow	6	C

C Contributing property
NC Non-contributing property

Bungalow style residences at 77 (foreground) and 85 Baker Road, view looking west.

Mixed use properties at 826 (foreground) and 814 Broadway, view looking southwest.

Residence at 825 Broadway, view looking southeast.

Residence at 466 Broadway, view looking southwest.

Residence at 334 King Phillip Street, view looking northeast.

Frates Dairy Bottle Building at 785 Broadway, view looking northeast.

North Raynham School at 53 Baker Road, view looking southeast.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Norwood, Brockton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Stoughton

Place *(neighborhood or village):* Downtown Stoughton

Name of Area: Downtown Stoughton

Present Use: Commercial, Industrial, Institutional, Residential

Construction Dates or Period: early-19th c. – mid-20th c.

Overall Condition: Good

Major Intrusions and Alterations: Increase construction of modern infill in the commercial center and some loss of industrial complexes within the last 20 years.

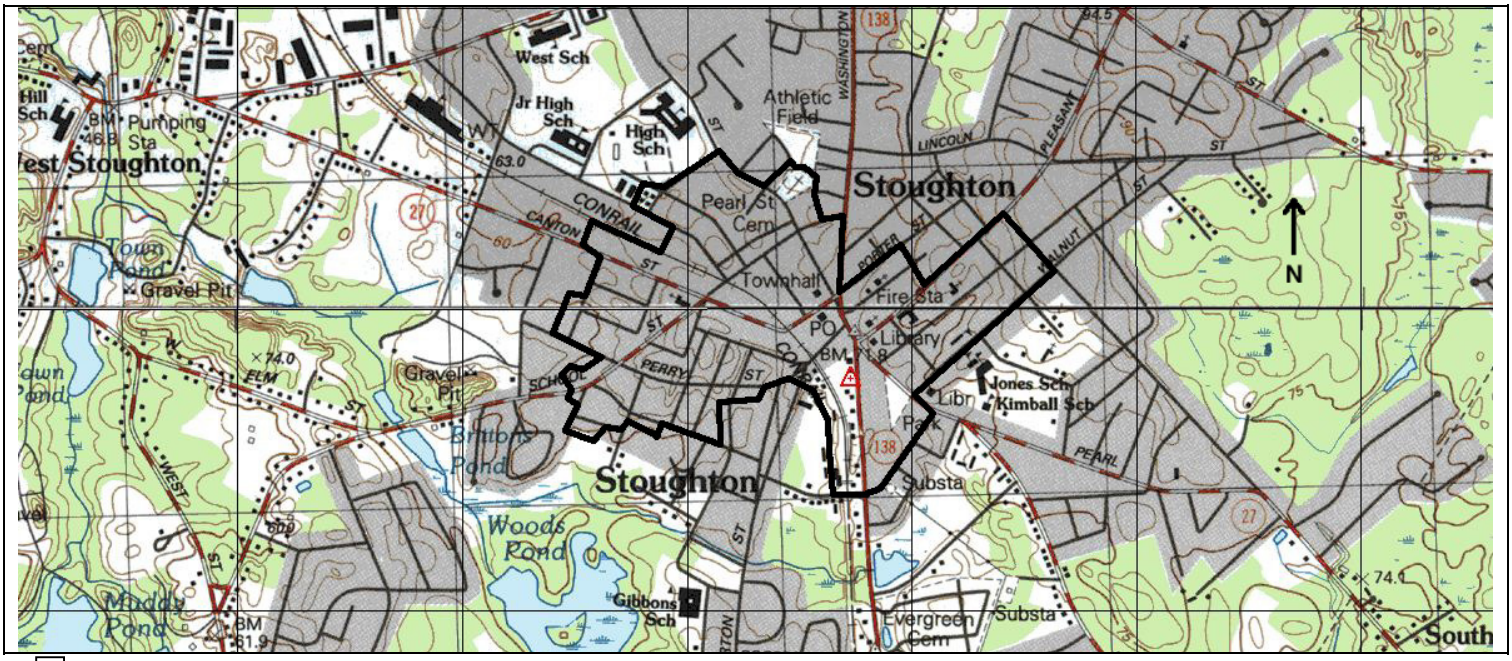
Acreage: Approx. 225 acres

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Downtown Stoughton Area is a cohesive grouping of commercial, institutional, industrial, and residential buildings radiating out from the intersection of Washington, Pearl, Porter, Wyman, Park, and Pleasant streets. The civic and commercial portion of the area, centered at the intersection of Washington, Wyman, Porter and Pearl streets was previously surveyed as the Stoughton Square Area (STG.A) in 1987.

Washington Street, laid out in 1806, is the main north-south route bisecting the district through Stoughton Square. Just west of the commercial block are complexes of industrial buildings, primarily focused along the MBTA Stoughton Line right-of-way (former New York, New Haven, and Hartford Railroad). The largest of these complexes were the Mystic Rubber Company at the corner of Summer and Wyman streets (STG.2) and the Meade Rubber Company at 25 Brock Street (STG.1). The institutional and commercial architecture is dominated by the Romanesque Revival and Classical Revival styles, represented in the Stoughton Town Hall at 10 Pearl Street (STG.12; MHC DOE 1988) constructed in 1881 and the Stoughton Trust Company at 810 Washington Street (STG.41) built in 1917. Some of the commercial properties along Washington, Porter and Wyman have been altered with modern storefront additions and replacement materials and there has been some loss of commercial and industrial properties in the late-twentieth century has allowed for modern infill within the area. However, overall core of the area forms a unified and well-preserved town center concentration of industrial and commercial buildings.

Residential neighborhoods extend out from Stoughton Square to the west along Perry, School, Pearl and Canton streets and to the east along Freeman, Pleasant, Seaver and Walnut streets. The residential streets west of Stoughton Square contain simple, side-hall plan, one to one-and-one-half-story, gable-front cottages and two-story single and multiple family houses with varied degrees of Greek Revival, Italianate, Queen Anne, and Colonial Revival ornamentation constructed between the mid-nineteenth century and mid-twentieth century. Clapp, Winter and Perry streets are comprised almost entirely of these housing types. The earliest houses date from the late eighteenth century, at 137, 145, and 156 Pleasant Street (STG.20, STG.21, STG.22). The west side contains the modest and working class housing focused around the factories, including one employee row house, the S.C. & J.G. Phinney Worker Housing, or "The Ten Commandments," at the corner of Perry and School streets (STG.77) built in 1876. The large, Queen Anne style Phinney House at 81 Summer Street (STG.30), built in 1854 and later expanded, is the most high style building along these streets. The streets east of Stoughton Square typically contain more substantial homes with a higher degree of ornamentation, primarily in the Gothic Revival, Queen Anne and Colonial Revival styles constructed between the mid-nineteenth century and mid-twentieth century. These houses are larger in scale with a more formal expression of architectural styles, such as in a group of two-story, front-gable residences originally designed in the Greek Revival style in 1854, with later modifications at 15, 31, 35, and 43 Walnut Street (STG.32, STG.33, STG.34, STG.35). The Colonial Revival and Queen Anne style Charles Welch House at 60 Chestnut Street (STG.4) constructed ca. 1880 is perhaps the most imposing. Most of the houses are wood frame construction and have been altered, including converting some from single-family to multiple-family use. However, most retain their original massing and form, and several have intact original materials.

HISTORICAL NARRATIVE

The Downtown Stoughton Area, also known as Stoughton Center or Stoughton Square, was originally settled in the mid-eighteenth century and included present-day Pearl and Summer streets as primary transportation routes. The first meeting house was built in 1744 (not extant) at the corner of Pleasant and Washington streets, and the first school (not extant) was constructed in 1768 at the corner of Pleasant and Park streets. Markers installed by the Stoughton Historical Commission indicate their original locations (STG.900 and STG.901). The first cemetery, the Pearl Street Cemetery (STG.800) was formally established in 1748 approximately one-quarter mile north of the center at the northern boundary of the district (Berg 2002). The area also was the site of the first parish church, the first public library, and the railroad station.

After a series of devastating fires in the nineteenth and early twentieth centuries, few of the early houses or commercial shops remain in the center. The original wood frame buildings that were destroyed were replaced with concrete and brick structures throughout the nineteenth and early twentieth centuries, such as the building at 232 Pearl Street and the Monks Block (STG.39) at the corner of Washington and Porter streets. Two of the last remaining wood commercial structures are Dr. Swan's Block at 752-770 Washington Street (STG.38) (1904) and the Britton Block at the corner of Washington and Pearl (STG.37)(1899). The most prominent and high style commercial structure built in the square is the Stoughton Trust Company building at 810 Washington Street (STG.41). This brick bank was constructed in a highly visible locale at the corner of Washington and Park streets in 1917 for the trust company that established in 1911. The business eventually merged with five other banks and grew to such a size that it was able to serve the large manufacturing corporations in the area. The Stoughton Railroad Station at 53 Wyman Street (STG.44) sits just west of the commercial core on the MBTA Stoughton line right of way (former New York, New Haven, and Hartford Railroad). The building was designed by Charles Brigham of Boston for the Boston and Providence Railroad, later the New York, New Haven and Hartford Railroad, in 1888. Brigham also designed many prominent buildings in Boston, such as the Second Church of Christ Science and the old Boston Museum in Copley Square (not extant) (Petruzzo and Woodward 1987e, 1987b, 1987p; Lebovich 1973; Withey 1970).

Downtown Stoughton contains the town's most prominent institutional and ecclesiastical buildings, including the town hall, library and multiple churches. Most of these civic properties were built in the late-nineteenth and early-twentieth centuries at a time of economic prosperity and population growth for the town. The Stoughton Town Hall at 10 Pearl Street (STG.12; MHC DOE 1988) was designed by Samuel J.F. Thayer of Boston and constructed in 1881. Thayer was known for his public buildings, which also include the town hall in Brookline, MA and the Providence, RI City Hall. When opened, the brick town hall housed the town offices, post office, public library, fire department, jail, and community theater. The library quickly outgrew the space at the town hall and the Lucius Clapp Memorial Library, or Stoughton Public Library, at 6 Park Street (STG.11; NR listed 1992) was built in 1903. The building was designed by Walter Atherton, who was born in Stoughton, and constructed on the site of the first school. This was the first building solely dedicated for use as a library in Stoughton and became the headquarters of the historical society and museum in 1970. A new post office building was constructed in 1939 at 19 Park Street, which now houses private offices. The Stoughton Fire Department (STG.6) constructed their new headquarters at 30 Freeman Street in 1927. Like the library, this brick, Classical Revival style building was the first permanent structure built in Stoughton dedicated for use at a fire station, and is still used for that purpose with the aid of a large mid-twentieth century addition (Petruzzo and Woodward n.d. b, 1988d; Withey 1970; McLoughlin 1978).

The early First Parish Universalist Church on Washington Street burned in 1966 and was replaced with the current structure on the Church Green. Other churches located near the center include the Stoughton Methodist Church at 100 Pleasant Church (STG.19) constructed in 1865-1866 for the congregation that had been active since 1806. The Methodist Church is accompanied by a ca. 1895 parsonage on Pleasant Street and the Greek Revival style Park School (STG.29) on Seaver Street. The Park School originally served as a public district school until 1917. Just north of the Methodist Church is the Trinity Episcopal Church at 34 Freeman Street (STG.7) originally constructed in 1898 and expanded to its current

configuration in the early twentieth century. The Trinity Episcopal congregation moved to a new church in the 1970s and the building now houses the Christadelphian Ecclesia Church. The Catholic Church of the Immaculate Conception is located in the neighborhood west of Commercial Street. The original Catholic Church constructed at the corner of Canton and School streets in 1859 was replaced with the current structure in the 1970s. The Sacred Heart Convent on School Street and the Saint Mary's Parochial School/Gymnasium building on Atherton Street, adjacent to the church lot, were also demolished by the 1990s (Petruzzo and Woodward 1987k, 1987n, n.d. c; Sanborn 1923, 1949).

The majority of the industrial properties in the downtown area are located west of Washington Street, close to the railroad for the easy transportation of goods and materials. By the mid-eighteenth century, the majority of the industries in the area involved specialized shoe making preformed from the home or small workshops. These cottage industries developed into centralized shops distributing products locally and to Boston by the turn of the nineteenth century. The rapid success of these businesses grew into the formal organization of factories in the mid-nineteenth century. The earliest remaining of these properties is the S.C. & J.G. Phinney Boot Counter Manufacturing Company (STG.31) at the corner of Summer and Winter streets. Sylvanus C. Phinney began the manufacturing of boot and shoe counters, a component of boot and shoe construction, in 1848 at this location and it became one of the largest manufacturers in Stoughton until it closed in 1908. Phinney also partnered with George Walker and built a second factory adjacent to the first for the manufacturing of shoe lasts (not extant). The shoe industry reached its peak about 1865 in Stoughton and rapidly declined after the end of the Civil War. Opposite Phinney's factory, at the corner of Summer and Canton streets, the Mystic Rubber Company (STG.2) was established in 1877 for the production of rubberized cloth and merged with the Hall Rubber Company of Boston in 1889 to form the Stoughton Rubber Company. The property has since been converted into tenant-occupied mixed commercial and office spaces (see MHC inventory form). The Mystic and Stoughton rubber companies were two of several industries that made an important contribution to Stoughton's manufacturing economy between ca. 1880 and World War II. Another substantial company in the Downtown Stoughton area is the Meade Rubber Company at 25 Brock Street (STG.1), which was established by Stoughton native James Meade in 1916 for the manufacturing of rubber products. The Meade Rubber Company was closed by 1949, and the complex had taken over by L. Albert & Son, sellers of used rubber machinery (see MHC inventory form) (MHC 1979; Petruzzo and Woodward 1988c, 1987l, 1987j; Bailey 1879; Sanborn 1891, 1923, 1949).

Although the industrial complexes were primarily located on the west side of the downtown, one extant complex, the George E. Belcher Company (STG.3), was developed on the east side of the area. George Belcher purchased the shoe last business from George Walker, Phinney's former business partner, and constructed the current complex in 1893. The company closed in the 1960s and had been one of Stoughton's largest employers. Other than Stoughton's involvement with the rubber and shoe industry, there was the P.M. Withington Furniture and Undertaker Company on Porter Street (STG.23) that was in business from the 1860s until the 1980s. The building now houses multiple retail stores and professional offices (Petruzzo and Woodward 1987f, n.d. a).

Early residential settlement occurred primarily along Pearl and Summer streets within the district in the early eighteenth century; however little remains from that period. The earliest documented extant residences date to the late-eighteenth century and are located along Pleasant Street near Chestnut Street. Three of these properties were built by Christopher Wadsworth, who owned a large amount of property in the area, ca. 1775 (STG.20, STG.21, STG.22). The population grew steadily into the early nineteenth century, until it tripled between 1830 and 1870 primarily due to the appearance of a large Irish population between 1840 and 1855. The rise in population also corresponded to the surge in manufacturing in the area and the development of residences for industrialist leaders, factory workers, and professionals. This division of housing stock is roughly defined east-west by Washington Street. Professionals, such as doctors, merchants, and landowners clustered on the east side, and workers on the west side around the factories. John G. Phinney worked at S.C. & J.G. Phinney, successful manufacturers of shoe counters, founded by his father who resided at the Phinney House at 81 Summer Street (STG.30) opposite the Phinney factory on the west side. Mr. Phinney was active in town affairs as chairman of the Town Hall building committee and organized the Stoughton Water Co. Charles Welch, who lived at the

Welch House at 60 Chestnut Street (STG.4), worked as a young man for Phinney Counter, later becoming a member of the firm and eventually retiring as its president. Welch was a large benefactor to the town contributing land for public parks. This development trend remained through the early twentieth century with the influx of more immigrants and the construction of large numbers of one-and-one-half-story cottages and side-hall plan houses on the west and more substantial houses on the east side of the area. Growth in the residential neighborhoods slowed after the 1940s in the downtown area as the focus shifted to the subdivisions that constructed throughout the town (MHC 1979; Petruzzo and Woodward 1987c, 1987d, 1987g, 1987q, 1987i, 1987m, 1987h, 1987o, 1988b, 1988a). Downtown Stoughton continues to serve as the civic, commercial, and institutional core of the town.

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n.d. c *MHC Form B – Trinity Episcopal Church, Stoughton.* On file at MHC, Boston, MA.

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1987h *MHC Form B – L.M. Flint House, Stoughton*. On file at MHC, Boston, MA.

1987i *MHC Form B – Martin Wales House, Stoughton*. On file at MHC, Boston, MA.

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1987k *MHC Form B – Mystic Rubber Company, Stoughton.* On file at MHC, Boston, MA.

1987l *MHC Form B – N.S. Atwood House, Stoughton*. On file at MHC, Boston, MA.

1987m *MHC Form B – Park School, Stoughton*. On file at MHC, Boston, MA.

1987n *MHC Form B – S.C. & J.G. Phinney Worker Housing.* On file at MHC, Boston, MA.

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AREA DATA SHEET

This data sheet includes all properties in the MHC Inventory and additional properties selected for their architectural and/or historic integrity

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
STG.A	Stoughton Square	Washington, Wyman, Porter, and Pearl streets				RNRE
STG.1	Meade Rubber Company	25 Brock Street	1916	Vernacular/loft		RNRE
STG.2	Mystic Rubber Company	2 Canton Street	1877	Vernacular/loft		RNRE
STG.3	George E. Belcher Company	Capen and Pleasant streets	1893	Vernacular/loft		C
STG.4	Charles Welch House	60 Chestnut Street	ca. 1880	Colonial Revival		C
STG.5	International Order of Odd Fellows Hall	7 Freeman Street	1892	Queen Anne		C
STG.6	Stoughton Fire Station	30 Freeman Street	1927	Classical Revival		C
STG.7	Trinity Episcopal Church	34 Freeman Street	1898	Shingle Style		C
STG.9	First Stoughton Public Library/Residence	Morton Square	ca. 1850	Vernacular		C
STG.11	Stoughton Public Library	6 Park Street	1903	Classical Revival	1	MHC-DOE
STG.900	First School Marker	6 Park Street	unknown	n/a		C
	Stoughton U.S. Post Office	19 Park Street	1939	Classical Revival		C
STG.800	Pearl Street Cemetery	Pearl Street	1748	n/a	2	RNRE
STG.37	Britton Block	Pearl and Washington streets	1899	Queen Anne	3	C
STG.12	Stoughton Town Hall	10 Pearl Street	1881	Romanesque Revival	4	MHC-DOE
STG.13	Daniel French House	34 Pearl Street	ca. 1847	Italianate		C
	Lehan Block	232 Pearl Street	ca. 1920	Classical Revival		C
STG.77	S.C. & J.G. Phinney Worker Housing/ "The Ten Commandments"	Perry and School streets	1876	Vernacular		C
STG.901	Site of First Meeting House Marker	Pleasant and Washington streets	1908	n/a		C
STG.15	James Hill House	52 Pleasant Street	1837	Vernacular		C
STG.16	Wales French House	58 Pleasant Street	1876	Italianate		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
STG.17	Samuel Paul House	64 Pleasant Street	1823	Vernacular		C
STG.18	Henry Drake House	68 Pleasant Street	1841	Italianate		C
STG.19	Methodist Church	100 Pleasant Street	1865-1866	Italianate		C
STG.20	Christopher Wadsworth House	137 Pleasant Street	1775	Vernacular/ Cape		C
STG.21	Christopher Wadsworth Barn/House	145 Pleasant Street	1775	Vernacular/ Salt-box		C
STG.22	John Osgood Jr. House	156 Pleasant Street	1775	Vernacular/ Cape		C
STG.23	P.M. Withington Furniture and Undertaker	Porter Street	1860	Vernacular	8	C
STG.25	J.W. Elastic Web Company	Rose Street	1936	Vernacular		C
STG.29	Park School	Seaver Street	1859	Greek Revival		C
STG.27	Reverend Edward Richmond House	15 Seaver Street	1812	Federal	7	C
STG.28	George Belcher House	33 Seaver Street	1887	Queen Anne		C
STG.30	Phinney House	81 Summer Street	1854	Queen Anne (remodeled)		C
STG.31	S.C. & J.G. Phinney Boot Counter Manu. Co.	Summer and Winter streets	1848	Vernacular		C
STG.32	W.O. Faxon House	15 Walnut Street	1854	Italianate (remodeled)		C
STG.33	Martin Wales House	31 Walnut Street	1854	Greek Revival		C
STG.34	N.S. Atwood House	35 Walnut Street	1854	Greek Revival (altered)		C
STG.35	L.M. Flint House	43 Walnut Street	1854	Greek Revival		C
STG.38	Dr. Swan's Block	752-770 Washington Street	1904	Queen Anne		C
STG.39	Monks Block	Washington and Porter streets	1886	Romanesque Revival		C
STG.40	State Theater	807 Washington Street	1927	Classical Revival		C
STG.41	Stoughton Trust Company	810 Washington Street	1917	Classical Revival	5	C
STG.42	Porter Coal and Wood Co.	893 Washington Street	1876	Vernacular		C
STG.44	Stoughton Railroad Station	3 Wyman Street	1888	Romanesque Revival		C

MHC-DOE	Property was determined eligible for the National Register by the Massachusetts Historical Commission
RNRE	Property is recommended individually eligible for National Register listing, PAL 2013.
C	Contributing property to the district
NC	Non-contributing property to the district

Pearl Street Cemetery, view looking northeast.

Commercial block at corner of Pearl and Washington streets, view south from west side of Pearl Street.

Stoughton Town Hall, view looking west from Pearl Street.

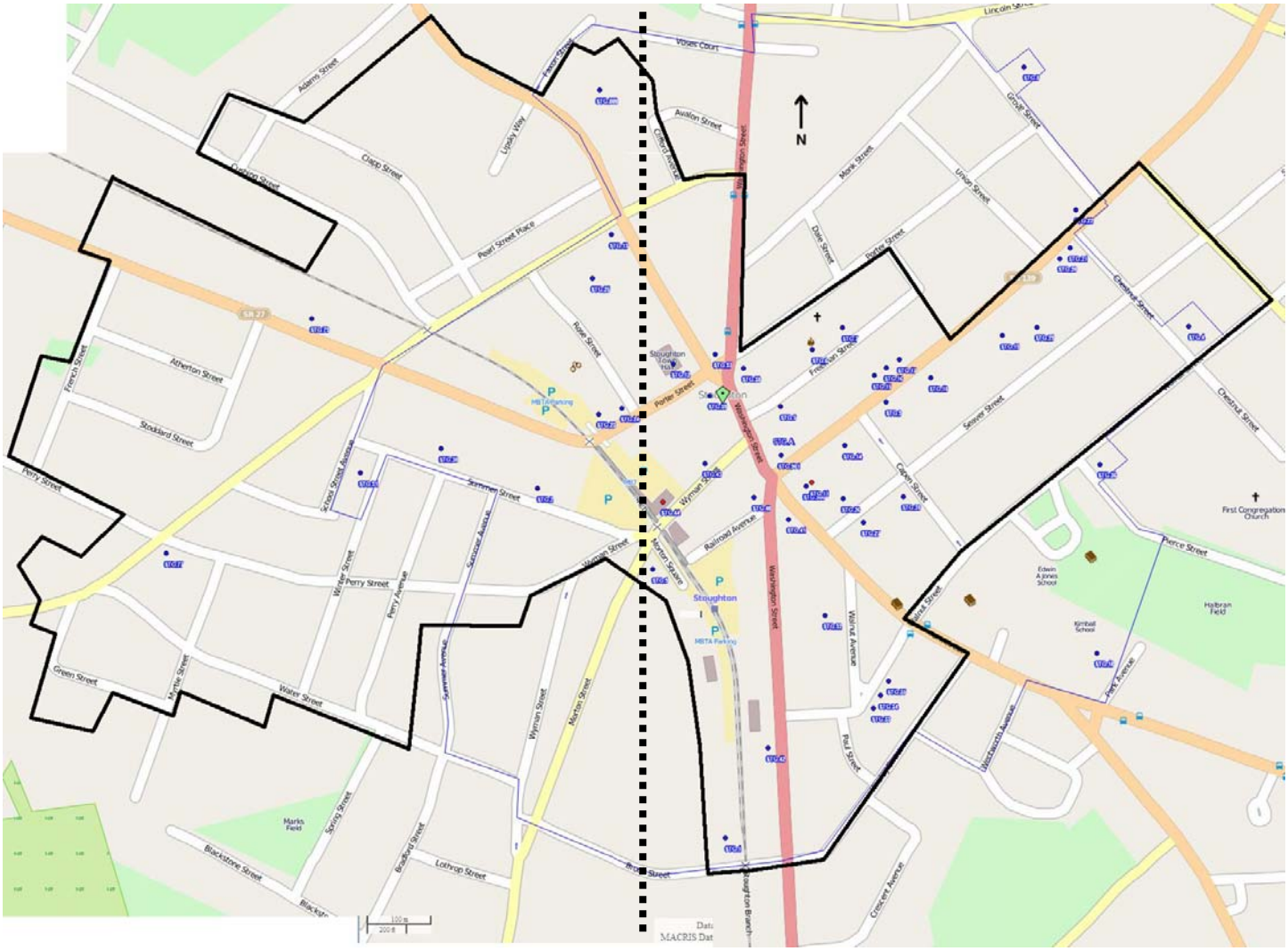
Stoughton Trust Company Building, view looking southeast from west side of Washington Street.

Residences on Winter Street, view looking northeast.

Residences on Seaver Street, view looking northeast.

S.C. & J.G. Phinney Boot Counter Manufacturing Company, view south from the north side of Summer Street.

AREA MAP



1 2

- MHC Inventory
- National Register Listed

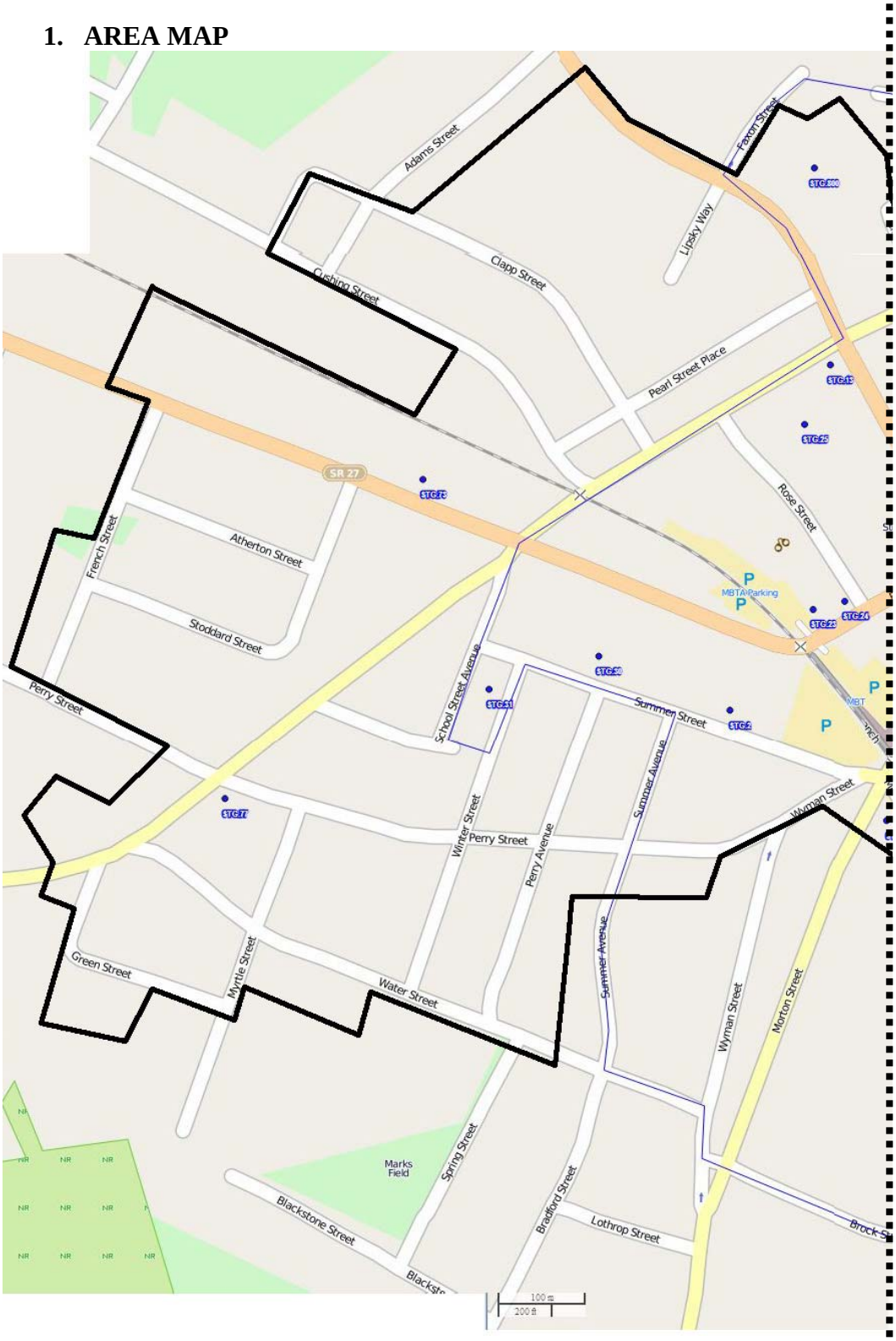
\ = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net

1. AREA MAP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Clapp Street
Lipsky Way
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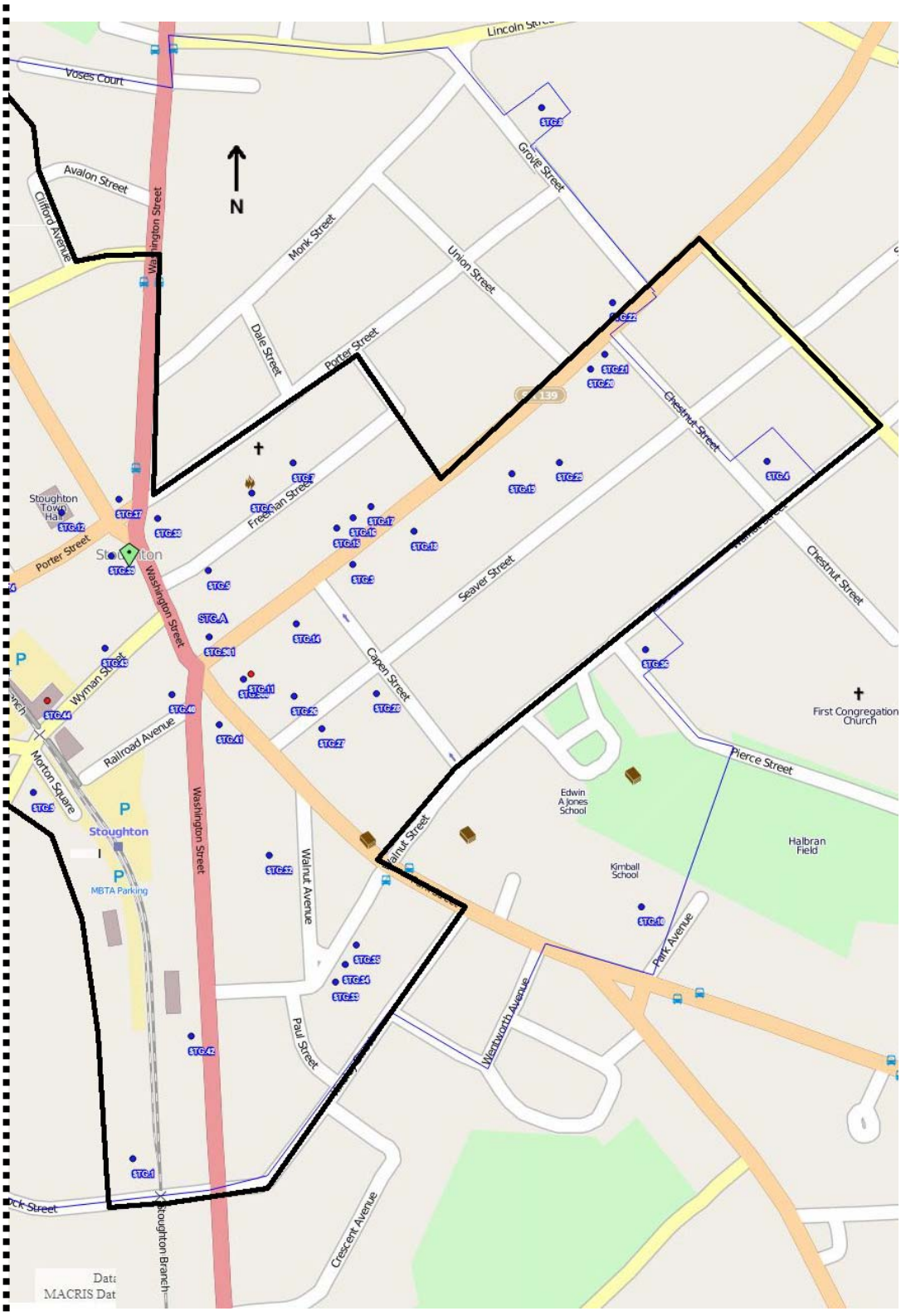
Rose Street
SR 27
French Street
Atherton Street
Stoddard Street
Perry Street
School Street Avenue
Summer Street
Winter Street
Perry Avenue
Summer Avenue
Wyman Street
Green Street
Myrtle Street
Water Street
Spring Street
Bradford Street
Lothrop Street
Morton Street
Blackstone Street
Marks Field
MBTA Parking

2. AREA MAP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Avalon Street
Clifford Avenue
Washington Street
Monk Street
Grove Street
Union Street
Dale Street
Porter Street
Chestnut Street
Freeman Street
Seaver Street
Capen Street
Railroad Avenue
Morton Square
Wyman Street
Walnut Avenue
Paul Street
Wentworth Avenue
Park Avenue
Pierce Street
Crescent Avenue
Stoughton Branch
Stoughton Town Hall
Stoughton
MBTA Parking
First Congregation Church
Edwin A Jones School
Kimball School
Halbran Field
N

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area Letter Form Nos.
STG.A See data sheet

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Downtown Stoughton Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its role in the growth and development of the town center and industries from its early settlement period through the twentieth century, and under Criterion C in the area of Architecture for its collection of the town's most prominent nineteenth and twentieth century institutional and ecclesiastical buildings, including the town hall, library and multiple churches, as well as commercial, industrial, and residential buildings that represent a range of architectural styles and levels of ornamentation and form a coherent unit.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Taunton Center

Name of Area: Taunton Center Area

Present Use: Residential, Institutional

Construction Dates or Period: 18th to mid-20th c.

Overall Condition: Good

Major Intrusions and Alterations: None

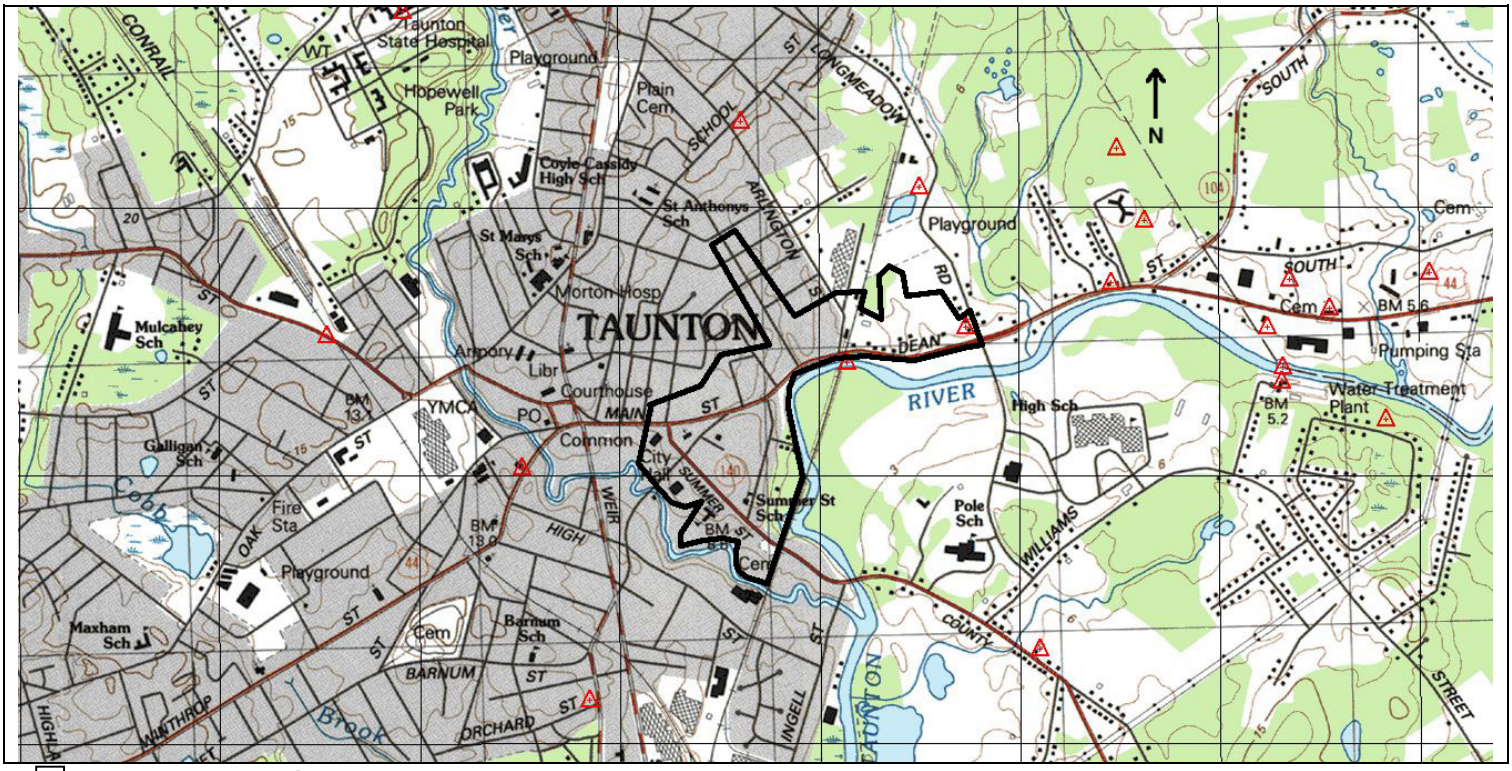
Acreage: Approx. 115

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Taunton Center Area is a large, irregularly shaped area located along the north and west sides of the Taunton River east and west of the MBTA Stoughton Line railroad right-of-way. The area encompasses three previously documented districts/areas and abuts the Taunton Green Historic District (TAU.C; National Register listed) to the west. The Church Green Historic District (TAU.A; National Register listed), is characterized by 22 structures immediately surrounding the Church Green at the intersections of Church Green, Dean and Summer streets and is encompassed in the larger Church Green Local Historic District (LHD) (TAU.AC). The Ashland Street Area (TAU.H) includes 27 mid-nineteenth- to early-twentieth-century residences located on Ashland Street between Dean and Washburn streets. The Taunton Center Area encompasses approximately 155 properties, of which 140 contribute to the historic character and significance of the area. Contributing properties are primarily residential and civic, with a few commercial buildings, constructed from the late eighteenth century through the early-twentieth century.

Most of the commercial and civic buildings are concentrated around the Church Green, located at the junction of Summer, Dean and Main Streets. This triangular-shaped green contains the only religious property in the neighborhood and one of the oldest churches in Taunton; the First Parish Church (TAU.1) was originally constructed in 1829-1830 in the early Gothic Revival style. A chapel addition designed by the Massachusetts architectural firm Hartwell and Swasey was constructed in 1869. Adjacent to the Church, near the intersection of Main and Summer streets, is the Taunton City Hall (TAU.4), originally constructed in 1848 and extensively remodeled in 1896 in the Renaissance Revival style. In front of the City Hall, in a triangular-shaped lawn at the intersection of Summer and Main, is the Robert Treat Paine Statue (TAU.900) by artist Richard Edwin Brooks. The statue was erected ca. 1902 by the Taunton Historical Society and the Sons of the American Revolution.

Commercial architecture in the adjacent district surrounding the Taunton Green was primarily constructed during the upsurge in fire-proof architecture and designed in the Italianate Style; however, the commercial architecture in the Taunton Center Area reflects a transition from the Italianate style to the Second Empire Style, as seen in the Leonard Block at 107 Main Street (TAU.3). This four-story, brick building was constructed in 1870 and houses the Star Theater on the second and third floors in the early twentieth century. The Italianate style Old Colony Railroad Station at 40 Dean Street (TAU.45; National Register listed) was constructed by the Old Colony Railroad ca. 1876 when it ran an extension branch through Taunton. The building is the only extant railroad depot in Taunton and has been converted into professional offices.

Three schools were built in the area spanning a time frame of almost 100 years. The earliest is the Italianate style Bristol Academy (TAU.7) built adjacent to the First Parish Church on Church Green in 1852. This private secondary school was designed by renowned architect Richard Upjohn and constructed by local Taunton builders Hale, Walker and Sherman. Nearly 75 year later, a two-story, Colonial Revival style public school was built at the corner of Summer and Prospect Streets. The Summer Street School (TAU.76), constructed in 1917, was designed by Gustavus L. Smith who also designed three other schools in Taunton in the late nineteenth century. The most recent and largest school building in the area is the Taunton Catholic Middle School (TAU.64), or Monsignor James Coyle High School, which was constructed in 1933 on the site of the former N.H. Skinner Estate to serve initially as a parochial high school.

Surrounding the small central concentration of civic and commercial properties, the area is comprised of predominantly high style residential neighborhoods. Prevalent architectural styles include examples of Federal, Greek Revival, Gothic Revival, Italianate, Second Empire, Stick, Shingle, Classical Revival, Colonial Revival, Craftsman, and Spanish Colonial Revival. The residences along Summer Street, between the Church Green and the railroad right-of-way, are sited on narrow lots close to the road and represent a range of styles from Federal to Colonial Revival and date between 1830 and 1930. Single family homes dominant, but there are several original multi-family houses including the Colonial Revival style duplex at 86 Summer Street (TAU.72). Most of the single-family houses along Summer Street are intact (TAU.59, TAU.60, and TAU.63), although some have been converted to multi-family use (TAU.65, TAU.67, and TAU.68). The orientation and scale of the houses along Prospect Street is similar to those along Summer Street; however these residences reflect a higher concentration of later styles like Queen Anne, Second Empire, and Craftsman (TAU.75, TAU.211, and TAU.37).

Larger lots along the north side of Church Green, Dean Street, and Ashland Street contain high-style houses like the Charles Newbury House at 24 Church Green (TAU.17), constructed in 1905 in the Colonial Revival style and the Italianate style Charles R. Atwood House at 30 Dean Street (TAU.41), built ca. 1850. Both houses were originally set back from the road with landscaped grounds. Today the Newbury House has been converted into professional offices with parking lots, but the Atwood House and grounds remain relatively intact. Several of these large residential properties, like the Newbury House, were converted into professional offices in the twentieth century. Substantial houses such as the Dr. Charles Hubbard House at 14 Church Green (1844), the Barney Deane House at 48 Church Green (1829), and the Theodore Dean House at 26 Dean Street (1866) have been converted into a bank, real estate office, and attorney's office, respectively (TAU.18, TAU.11, and TAU.40).

HISTORICAL NARRATIVE

The Taunton Center Area contains the historic civic and religious center of Taunton since initial settlement in the early seventeenth century. The Church Green, originally known as the Meetinghouse Common, was laid out ca. 1640 by the original settlers. The settlers arrived from Dorchester, MA about 1637 led by Elizabeth Poole and built the first meetinghouse, a public school, and houses at the Church Green. They also built houses along Dean Street east of the Green. These first settlers were primarily farmers who also utilized the nearby Taunton River for fishing. Over time, residential development expanded onto Summer and Winter (now Longmeadow Road) streets. Industry developed outside the Taunton Center Area in villages like Whittenton to the north, but most of the early commercial and civic activity occurred in the core of the settlement at the Church Green (MHC 1981).

The Center remained Taunton's residential, civic and commercial hub into the late seventeenth and eighteenth centuries. Within a 50-year period, the town constructed a second meetinghouse (ca. 1720), the first jail (ca. 1747), and the first Bristol County courthouse (ca. 1746) on or near the Church Green; all of these buildings have been replaced. The first building for a private secondary school chartered in 1794 was constructed on the Green in 1794 and replaced by the current Bristol Academy (TAU.7) structure designed by renowned architect Richard Upjohn in 1852. The area also includes Taunton's oldest cemetery, Neck of Land Cemetery (TAU.804), on Summer Street. This cemetery was active between 1687 and 1889 and contains burials from some of Taunton's earliest prominent citizens, notably members of the Leonard and Dean families. Concurrently, several routes, including Summer and Dean streets, were extended to connect the center with the outlying areas of Taunton. This aided secondary residential and industrial settlements to develop throughout Taunton while retaining the center as the civic core. During the Revolutionary War, the nearby Taunton Green to the west became the militia training ground and also drew commercial activities away from the Church Green. This transition solidified the Church Green's role as primarily a civic and upper-class residential neighborhood (MHC 1981; Hennedy 2006; Rose 1978).

None of the earliest structures remain on Dean Street today, but have been replaced by the eighteenth and nineteenth century estates of Taunton's upper class citizens. The Dean family, one of Taunton's earliest families and successful farmers, merchants and manufacturers, owned large tracts of the land along Dean Street. Abiezer Dean built one of the grandest houses at 68 Dean Street (TAU.51; National Register listed) ca. 1798. It was later sold to George Hartshorn in 1905, a descendent of the Hartshorns who founded the Dean Cotton Mill in what is today Lakeville. Theodore Dean built the house at 26 Dean Street (TAU.40) in 1866. He was the last owner of the Taunton Iron Works and president of the Bristol County National Bank in 1878. Dean's neighbor, Charles R. Atwood, was a wholesale grocer in Weir Village and built the large house at 30 Dean Street (TAU.41) ca. 1850. The properties on Church Green and Prospect Street also reflect the wealth and affluence of Taunton's nineteenth-century citizens. In 1850, the area surrounding the Church Green contained the houses of lawyers, doctors, merchants, and manufacturers, including Dr. H.B. Hubbard (14 Church Green, TAU.18; ca. 1844), a local physician; Thomson Newbury (24 Church Green, TAU.17; ca. 1830), a merchant and manufacturer of oil cloth; and Anselm Bassett (37 Church Green, TAU.15; ca. 1825), a counselor at the County Court House (MHC 1981; Sampson 1878; Babbitt 1850; Lawson 1978).

Ashland Street was one of the first neighborhoods developed on speculation in Taunton. The principal speculator was Edmund Bennett, a local lawyer and judge, who came to Taunton in 1848 and later became the first mayor in 1865. Bennett's partner, William A. Crocker, was a local copper manufacturer who also owned a house on Dean Street. Bennett and Crocker sold large parcels of land on Ashland Street as early as 1870 to prominent professionals and industrialists such as Francis Bassett (20 Ashland Street, TAU.203; 1892) and Elisha T. Jackson (30 Ashland Street, TAU.204; 1883), who were partners in an insurance firm. Several of the houses on Ashland Street were reportedly moved there from other unknown areas of Taunton. The principal of the local high school purchased the property at the corner of Ashland and Belmont streets ca. 1870 and moved a ca. 1845 house, known as the John P. Swinterton House (TAU.207) from another location in Taunton to the lot. Ashland Street appeared much as it does today by the early twentieth century with most of the house lots built up (Winters 1979a-b; Beers 1871; Dean 1855).

Due to such a high concentration of wealthy residents, specialty services catering to their leisure activities developed in the area. The Winthrop Club at 1 Church Green (TAU.20) was built ca. 1890 as a private club for gentlemen. The Taunton Boat Club was built around the same time as the Winthrop Club located by the Taunton River on Dean Street directly across from Elm Street. The Boat Club closed by the 1930s and the building was eventually demolished.

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.A	Church Green Historic District	Church Green and Dean Street	1638 – ca. 1940	Multiple		NR
TAU.AC	Church Green Local Historic District	Church Green, Summer and Dean Streets	18th century – ca. 1940	Multiple		LHD
TAU.H	Ashland Street	Ashland Street	ca. 1840 – ca. 1920	Multiple		C
TAU.44	Woodward, William House	117 Arlington Street	1830	Federal		NR*
TAU.43	Taunton Girls Club	119 (131) Arlington Street	1890	Stick Style		C*
TAU.42	Dean - Hartshorn Estate Barn/Taunton Girls Club	131 Arlington Street	ca. 1800	Federal, Other		C*
TAU.203	Bassett House	20 Ashland Street	1892	Queen Anne, Shingle Style		C
TAU.204	Jackson, Elisha T.	30 Ashland Street	1883	Stick Style		C
TAU.205	Dickerman, Minnie L. House	35 Ashland Street	1898	Shingle Style	5	C
TAU.206	Residence	39 Ashland Street	ca. 1845	Italianate	5	C
TAU.207	Swinerton, John P. House	40 Ashland Street	ca. 1845	Greek Revival		C
TAU.208	Residence	57 Ashland Street	ca. 1855	Italianate		C
TAU.209	Residence	72 Ashland Street	ca. 1910	Colonial Revival		C
TAU.26	White, Albert R. House	2 Chestnut Street	1937	Colonial Revival		C*
TAU.27	Bassett, Charles Jarvis Hunt House	20 Chestnut Street	1851	Gothic Revival	4	NR*
TAU.28	Curtis, Norman House	23 Chestnut Street	1955	Post-war Suburban Ranch		NC*
TAU.1	First Parish Church	Church Green	1829-1930; 1869; 1965	Gothic Revival	2	C**
TAU.901	Taunton Vietnam Memorial Fountain and Marker	Church Green	1968	N/A		NC**
TAU.19	World War II Servicemen Building	Church Green	1940	Craftsman		Demolished
TAU.20	Winthrop Club	1 Church Green	ca. 1890	Queen Anne		C**
TAU.18	Hubbard, Dr. H.B House	14 Church Green	ca. 1844	Italianate - altered		C**

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.17	Hicks - Newbury House	24 Church Green	ca. 1830	Late-Georgian		C**
TAU.16	Apartments	31 Church Green	1970	Colonial Revival		NC**
TAU.15	Bassett, Anselm House	37 Church Green	ca. 1825	Federal		C**
TAU.11	Dean - Deane House	48 Church Green	1829	Adam	1	C**
TAU.10	Warner, Judge Richard House	52 Church Green	1919	Colonial Revival	1	C**
TAU.9	Pitts, Abner – Colby, George House	57 Church Green	1836	Federal - altered	1	C**
TAU.8	Foster, Charles House	60 Church Green	ca. 1850	Federal		C**
TAU.7	Bristol Academy – Old Colony Historical Society	66 Church Green	1852	Italianate		C**
TAU.6	Mason, Col. Fredrick – Mason, Maurice House	72 Church Green	ca. 1902; 1960	Shingle Style		C**
TAU.5	Rait, James – Mason, Col. Fredrick House	79 Church Green	ca. 1873	Colonial Revival		C**
TAU.14	Crocker, George Agustus House	2 Dean Street	1858	Second Empire		C**
TAU.12	Williams, Alfred House	3 Dean Street	1899	Colonial Revival		C**
TAU.13	Simerdon, Frank House	5 Dean Street	1910	Tudor Revival		C**
TAU.38	Townsend House	11 Dean Street	1899; altered 1970	Colonial Revival		C*
TAU.39	Williams, Franklin B. House	24 Dean Street	1891	Colonial Revival		C*
TAU.40	Dean, Theodore House	26 Dean Street	1866	Italianate		NR*
TAU.41	Atwood, Charles R. House	30 Dean Street	ca.1850	Italianate		NR*
TAU.45	Old Colony Railroad Station	40 Dean Street	ca. 1876	Italianate		NR*
TAU.46	Reed, William and Chester House	44 Dean Street	ca. 1855	Federal/Cape		C*
TAU.47	Colby, Irving – Ferris, Melton House	50 Dean Street	1927	Colonial Revival		C*
TAU.48	Residence	52 Dean Street	1870	Early-Colonial Revival/Cape	3	C*
TAU.49	Thorpe – Witherell House	56 Dean Street	ca. 1885	Italianate	3	C*
TAU.50	Crossman House	60 Dean Street	ca. 1880	Second Empire		C*

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.51	Dean – Hartshorn House	68 Dean Street	ca. 1798	Federal		NR*
TAU.52	Newbury, Harriet House	80 Dean Street	ca. 1920	Colonial Revival		C*
TAU.54	Dean – Kingman House	88 Dean Street	ca. 1870	Italianate		C*
TAU.35	Nereo, Dr. Arthur House	11 Elm Street	ca. 1960	Colonial Revival		NC*
TAU.34	Fairbanks – Williams House	19 Elm Street	ca. 1852	Italianate		NR*
TAU.36	Johnson, Richard House	22 Elm Street	ca. 1950	Post-war Suburban Ranch		NC*
TAU.55	Leonard, George House	30 Leonard Court	ca. 1840; moved ca. 1870	Greek Revival		C*
TAU.900	Paine, Robert Treat Statue	Main Street & Summer Street	ca. 1902	N/A	2	C**
TAU.21	Morton Block	80 Main Street	ca. 1840	Federal		C**
TAU.3	Leonard Block	107 Main Street	1870	Second Empire		C**
TAU.75	Smith, Walter House	1 Prospect Street	1896	Queen Anne		C*
TAU.210	Residence	9 Prospect Street	ca. 1840; moved ca. 1900	Greek Revival		C
TAU.211	Reed, H. G. House	15 Prospect Street	ca. 1870	Second Empire		C
TAU.212	Clapp, Rev. Thomas House	35 Prospect Street	ca. 1730; moved ca. 1900	Federal		C
TAU.37	Dickerman, Henry A. House	63 Prospect Street	1908	Craftsman/ Four-Square		C*
TAU.58	A & P Supermarket	21 Spring Street	1949	Colonial Revival		NC*
TAU.918	Summer Street Bridge	Summer Street	1934	N/A		demolished
TAU.804	Neck of Land Cemetery	Summer Street	1687-1889	N/A		NR*
TAU.4	Taunton City Hall	15 Summer Street	1848; 1896	Gothic Revival, Renaissance Revival		C**
TAU.56	First National Store Building	23 Summer Street	1950	Modern		NC*
TAU.57	Taunton Inn	33 Summer Street	1929	Colonial Revival		C*
TAU.84	Barton, Charles E. House	40 Summer House	ca. 1859	Italianate		C*

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU. 83	Creedway Apartments	42 Summer Street	1925	Colonial Revival		C*
TAU.59	Tisdale, Henry W. House	43 Summer Street	ca. 1835	Federal		C*
TAU.82	Reed, William Hale House	44 Summer House	1890	Colonial Revival		C*
TAU.60	Brown, Thomas and James House	45 Summer Street	ca. 1825	Federal; later Gothic Revival		C*
TAU.81	Metropolitan Life Insurance Building	48 Summer Street	1958	Classical Revival		NC*
TAU.61	Howe, Dr. Charles House	49 Summer Street	ca. 1872	Italianate		C*
TAU.62	Williams – Pratt House	51 Summer Street	ca. 1825	Federal		C*
TAU.80	Williams – Dunbar House	54 Summer Street	1850	Federal		C*
TAU.79	Vickery – Baylies House	56 Summer Street	1830	Greek Revival		NR*
TAU.63	Dean, Abiezar House	57 Summer Street	ca. 1835	Federal		NR*
TAU.78	Church, Thomas L. House	58 Summer Street	ca. 1879	Queen Anne		C*
TAU.64	Catholic Middle School	59 Summer Street	1933	Classical Revival		C*
TAU.77	Vickery, Benjamin House	62 Summer Street	ca. 1875	Italianate		C*
TAU.65	Hall, J. W. D. House	65 Summer Street	1860	Italianate		C*
TAU.66	Barker, Anson J. House	67 Summer Street	1885	Gothic Revival		C*
TAU.76	Summer Street School	68 Summer Street	1917	Colonial Revival		C*
TAU.67	Field, Lewis E. House	71 Summer Street	1871	Colonial Revival		C*
TAU.68	Deane, Alta L. House	77 Summer Street	ca. 1905	Late-Italianate		C*
TAU.74	Godfrey, J. M. House	78 Summer Street	ca. 1850	Vernacular		C*
TAU.73	Carver, C. H. Shop	80 Summer Street	ca. 1850; altered ca. 1880	Vernacular		C*
TAU.72	Residence	86 Summer Street	ca. 1886	Colonial Revival/ Duplex		C*
TAU.71	Blake, Samuel House	90 Summer Street	ca. 1850	Italianate		C*
TAU.70	Neck of Land School	91 Summer Street	ca. 1850	Federal		C*
TAU.29	Bassett, C. J. H. House	2 Vine Street	ca. 1850	Greek Revival		C*

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.30	Tisdale, J. House	4 Vine Street	ca. 1850	Greek Revival		C*
TAU.31	Barker, Eleanor House	8 Vine Street	1966	Colonial Revival		NC*
TAU.33	Residence	9 Vine Street	ca. 1850	Vernacular Cottage		C*
TAU.32	Powers, Kenneth	10 Vine Street	1950	Modified Cape Cod		NC*

NR Property is Individually listed in the National Register
LHD Local Historic District
C Contributing property to the district
NC Non-contributing property to the district
* Property contributes to the Church Green Local Historic District
** Property contributes to the Church Green National Register Historic District and the Church Green Local Historic District

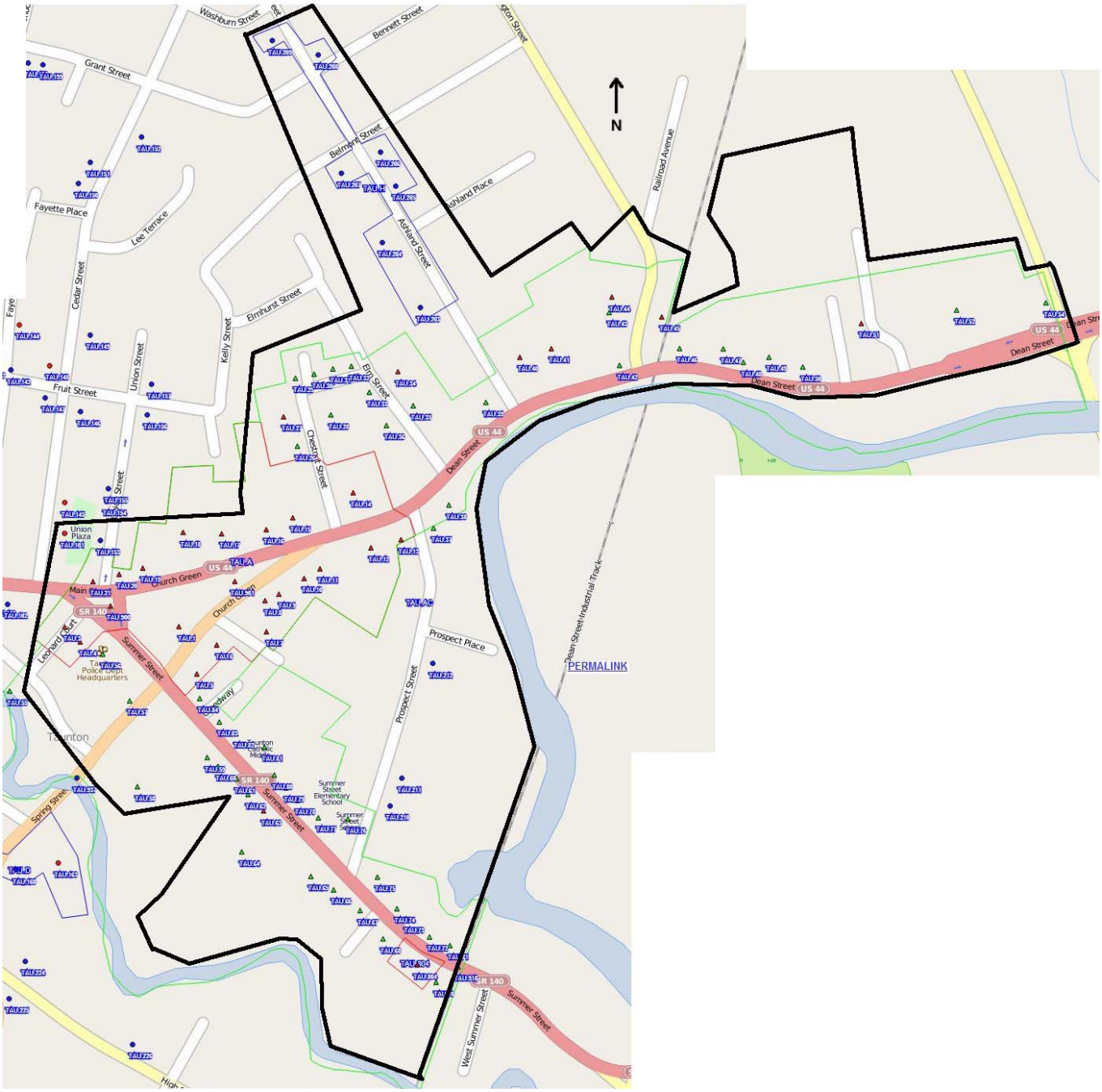
Church Green, view looking east.

52 and 56 Dean Street, view looking northeast.

20 Chestnut Street, view looking west.

35, 37, and 39 Ashland Street, view looking southeast.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta http://maps.mhc-macris.net

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Taunton Center Area is recommended eligible for listing in the National Register under Criteria A and C at the local level in the area of Community Planning and Development and Architecture. Under Criterion A, the area is significant for its associations with the original settlement of Taunton at Church Green and the surrounding development of the early commercial and civic core of the city. The Church Green functioned as the earliest center of religious and governmental activity in the settlement, which today remain virtually unchanged. Under Criterion C, the area is significant as an intact collection of commercial, civic and high-style residential properties dating from the eighteenth- to the early twentieth century, including one of the earliest examples of Gothic Revival-style architecture in the City, the First Parish Church, and buildings designed by renowned architects, such as Richard Upjohn and Gustavus L. Smith. The proposed boundary primarily follows the existing Church Green Local Historic District boundaries, extending out to include Prospect Street and the Ashland Street Area. It encompasses the National Register listed Church Green Historic District (TAU.A;), which is encompassed in the larger Church Green Local Historic District (LHD) (TAU.AC), and the Ashland Street Area (TAU.H).

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):*

Name of Area: High Street Area

Present Use: Residential

Construction Dates or Period: early-19th to early-20th c.

Overall Condition: Good

Major Intrusions and Alterations: None

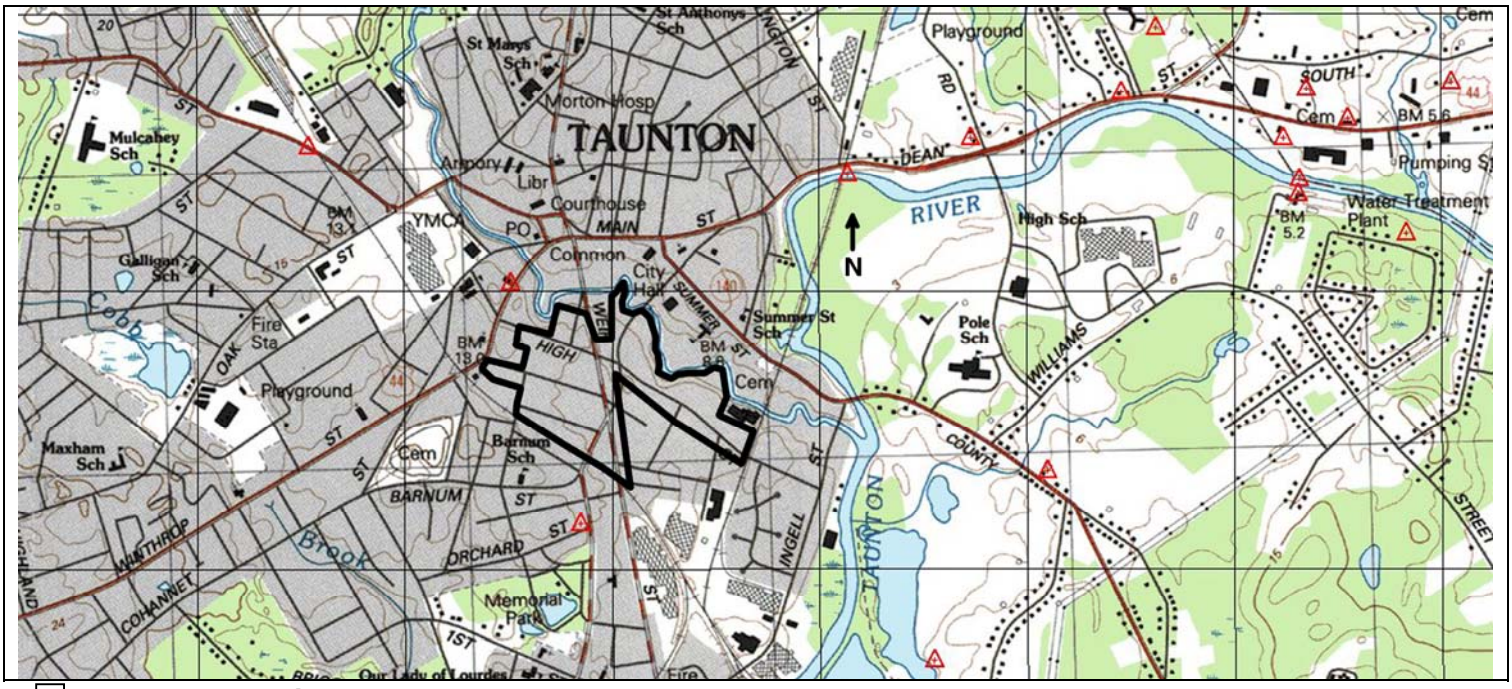
Acreage: Approx. 100

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The High Street Area is a residential neighborhood bounded by the Mill River to the north, the Stoughton Line right-of-way to the east, the Attleboro Secondary right-of-way to the south, and Winthrop Street to the west. The area is located primarily along High and Weir streets with extensions along Bow, Harrison, Spring and Webster streets, including approximately 75 properties. The High Street Area encompasses the previously surveyed Spring Street Area (TAU.D), Harrison Street Area (TAU.I), and Webster Street Area (TAU.J).

The majority of the historic buildings in the High Street Area are Victorian period Italianate and Queen Anne residences constructed between 1870 and 1910, although several examples of earlier Colonial, Federal, Greek Revival, Second Empire, and Italianate residences and a smaller number of early twentieth century styles such as Craftsman, English Revival, Colonial Revival and are also present. Most buildings retain a high degree of architectural integrity and minor alterations include window replacement and the installation of synthetic siding.

The oldest buildings are the James Sproat House at 9 Spring Street (TAU.160), a colonial period Cape constructed ca. 1760, and the two-and-one-half-story, center chimney house with end gable overhangs at 220 Weir Street (TAU.285) , built ca. 1775. Two, two-and-one-half-story, center-hall plan Federal style houses exhibit different forms of the period, the John Holloway House at 10 Spring Street (TAU.161) built ca. 1830 with side gable roof and end chimneys, and the Mercy Williams House at 12 Spring Street (TAU.162), a built ca. 1825 with hipped roof. The Greek Revival style is well represented throughout the area, with one-and-one-half-story examples such as the A. Hunter House at 145 High Street (TAU.219) built ca. 1850 and the Lucius Williams House at 6 Spring Street (TAU.158), built ca. 1840, as well as the two-story G.L. Bosworth House, 8 Spring Street (TAU.159), constructed in brick ca. 1835. Many houses display transitional Greek Revival and Italianate detailing, with the best example being the Sarah A. Haskins House, 18 Harrison Street (TAU.231; NR listed 1984), which incorporates corner pilasters, wide frieze, cornice modillions, and a Doric porch. Houses in the Italianate and Queen Anne styles comprise the majority of the residential properties in the area, such as the large Edmund Bennett House at 46 Harrison Street (TAU.235) built as an estate residence in 1855. Other notable houses from this period include the sidehall Italianate style L.W. Wilmarth House at 32 Harrison Street (TAU.234) built ca. 1850 and the Second Empire style Hack Hanan House at 30 Harrison Street (TAU.233) built ca. 1860.

There are a few industrial and historic commercial buildings in the area, most notably two designed in the Italianate style, the imposing Albert Field Tack Company (TAU.163; NR listed 1984) built in 1868 and the H.B. Lothrop Store at 210 Weir Street (TAU.284; NR listed 1984) built ca. 1855.

Overall, while some buildings have been altered through window replacement and residing, original massing, details, and relationship of buildings to each other result in well-preserved historic streetscapes, both along the Weir and High streets corridors and the quieter residential side streets.

HISTORICAL NARRATIVE

The predominantly residential High Street Area (ca. 1850-1890) in central Taunton was settled starting in the early eighteenth century south of the Mill River, where landowners established farms and small-scale manufactories by the early eighteenth century. One of the first residents, James Sproat, built a Cape at 9 Spring Street (TAU.160) ca. 1760

where he held with extensive landholdings with a corn and cattle farmer named Thayer that they sold to new settlers. Sproat also owned a snuff mill on the Mill River at the site now occupied by Albert Field Tack Works (TAU.163) (T.W. 1979). Roswell Ballard further developed the industrial potential of the Mill River area through the construction of a wool carding and dying mill in the early eighteenth century. By the 1820s, the High and Weir streets area began to attract working and middle class residential construction as an outgrowth of the major iron and other industrial concentrations to the north and east on the Mill River and to the south along Weir Street. The A. Hunter House (TAU.219) was built ca. 1847 by a foreman at the Taunton Locomotive Works.

By 1850, residences along with a blacksmith shop and a Universalist Church, were clustered around the intersections of High, Weir, and Spring streets. This section of central Taunton developed rapidly with industries and nearby residential neighborhoods in the second half of the nineteenth century. Although Weir Street was a major north-south thoroughfare connecting with Taunton Green, this section remained primarily residential with a few scattered businesses such as blacksmith shop, bakery, and H.B. Lothrop Store at 210 Weir Street (TAU.284; NR listed 1984) built ca. 1855. The majority of the land along Webster and Harrison streets west of Weir Street was owned by two major industrialists, William Mason and Albert Field, and taken up by large estates such as that of the Edmund Bennett House at 46 Harrison Street (TAU.235). Like Sproat earlier in the nineteenth century, Field and Mason sold off house lots to home owners from the 1850s through 1870s.

The neighborhood were built up rapidly with working and middle class single-family houses. Residents were employed in the nearby Weir and central Taunton industries as treasurers, sales agents, bookkeepers, foremen, mill operators, machinists, and tack makers. The area also attracted a large population of businessmen and merchants who operated or were employed at businesses in central Taunton such as a milliner, travel agent, dry goods store owner, and physician (Winters 1979a, 1979b, 1979c; Adams 1861). Several carpenters and builders, likely engaged in the rapidly growing building trades also lived in the area.

The largest structure built in the area was the Albert Field Tack Company (TAU.163; NR listed 1984), a sprawling factory that supplanted the original industries off Spring Street in 1868 and provided one of the key local employment opportunities and economic incentives for the neighborhood's expansion in the late nineteenth century. Field began small-scale production in the 1820s in rooms leased from Roswell Ballard . By 1850, Field purchased the mill and was producing an expanded line of gimp and upholstery tacks, brads and shoe nails. He built the large office building in 1868 when products were being sold world-wide. The company expanded to occupy a second factory across the street and a third in Fairhaven, MA by the 1880s, and in 1896 was acquired by the Atlas Tack Company in 1896. It closed in 1902 and later was used for other purposes (Winters 1979d).

Limited new infill residential construction in the area occurred during the early twentieth century. Robert M. Leach, treasurer of one of the stove companies lived at 44 Harrison Street (TAU.236) in 1920. The area continues to remain as a primarily residential enclave south of Taunton Center.

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AREA DATA SHEET

The following is a list of properties within the district that are included in the MHC Inventory.

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.D	Spring Street	Spring Street	1760 - 1870			C
TAU.I	Harrison Street	Harrison Street	1850 - 1900			C
TAU.J	Webster Street	Webster Street	1850 - 1900			C
TAU.237	Tucker, George W. House	8 Harrison Avenue	ca. 1855	Greek Revival		C
TAU.238	Love, J. Robert House	14 Harrison Avenue	ca. 1855	Gothic Revival		C
TAU.231	Haskins, Sarah A. House	18 Harrison Street	ca. 1852	Greek Revival, Italianate		NR
TAU.232	Atwood, G. T. House	27 Harrison Street	ca. 1870	Queen Anne (highly altered)		NC
TAU.233	Hack, Hanan House	30 Harrison Street	ca. 1860	Second Empire, Stick Style	4	C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.234	Wilmarth, L. W.-Morse, H.W. House	32 Harrison Street	ca. 1850	Italianate		C
TAU.236	Leach, Robert M. House	44 Harrison Street	ca. 1902	Colonial Revival, Shingle Style		C
TAU.235	Bennett, Edmund Estate	46 Harrison Street	ca. 1855	Italianate		C
TAU.217	Lovering, W.C. House	140 High Street	ca. 1870; ca. 1920 remodelled	Second Empire		C
TAU.218	Atwood, George B. House	141 High Street	ca. 1850	Greek Revival		C
TAU.219	Hunter, A. House	145 High Street	ca. 1847	Greek Revival		C
TAU.220	Perrin-Godfrey House	147 High Street	ca. 1854	Italianate		C
TAU.221	Hayward, Dr. J. W. House	148 High Street	ca. 1875	Stick Style		C
TAU.222	Residence	151 High Street	ca. 1940	English Revival		C
TAU.223	Townsend, William House	154 High Street	ca. 1885	Queen Anne		C
TAU.224	White, Esther S. and White, Lloyd House	170 High Street	ca. 1915	Craftsman		C
TAU.225	Field, Henry Jr. House	175 High Street	ca. 1873	Queen Anne		C
TAU.226	Coyle House	196 High Street	ca. 1800	Vernacular		C
TAU.227	Williams, A. G. House	215 High Street	ca. 1885	Colonial Revival, Queen Anne		C
TAU.228	Walker, G. L. House	218 High Street	ca. 1890	Queen Anne, Shingle Style	2	C
TAU.229	William, Enos D. House	220 High Street	ca. 1890	Queen Anne		C
TAU.158	Williams, Lucius M. House	6 Spring Street	ca. 1840	Greek Revival	3	C
TAU.159	Bosworth, G. L House	8 Spring Street	ca. 1835	Greek Revival	3	C
TAU.160	Sproat House	9 Spring Street	ca. 1760	Federal	7	C
TAU.161	Holloway, John House	10 Spring Street	ca. 1830	Federal, Colonial Revival		C
TAU.162	Williams, Mercy – Caswell, Elijah House	12 Spring Street	ca. 1825	Federal, Italianate		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.163	Field, Albert Tack Works	19 Spring Street	ca. 1868	Italianate	6	NR
TAU.245	McNamara, Catherine House	2 Webster Street	ca. 1889	Queen Anne	5	C
TAU.246	Godfrey, Gordon H. House	7 Webster Street	ca. 1885	Italianate		C
TAU.247	Residence	10 Webster Street	ca. 1860	Italianate		C
TAU.248	Curtis, C. House	13 Webster Street	ca. 1865	Italianate, Queen Anne		C
TAU.249	Hood, A. S. House	16 Webster Street	ca. 1860	Italianate		C
TAU.282	Morey – Dickerman House	114 Weir Street	1828	Federal		C
TAU.283	Caswell, B. House	146 Weir Street	ca. 1850	Greek Revival		C
TAU.284	Lothrop, H. B. Store	210 Weir Street	ca. 1855	Italianate		NR
TAU.285	Residence	220 Weir Street	ca. 1775	Georgian		C
TAU.287	Residence	258 Weir Street	ca. 1905	Queen Anne		C

C Contributing property
NC Non-contributing property
NR National Register listed property

218 and 220 High Street (l-r), looking northwest.

6 and 8 Spring Street (l-r), looking northwest.

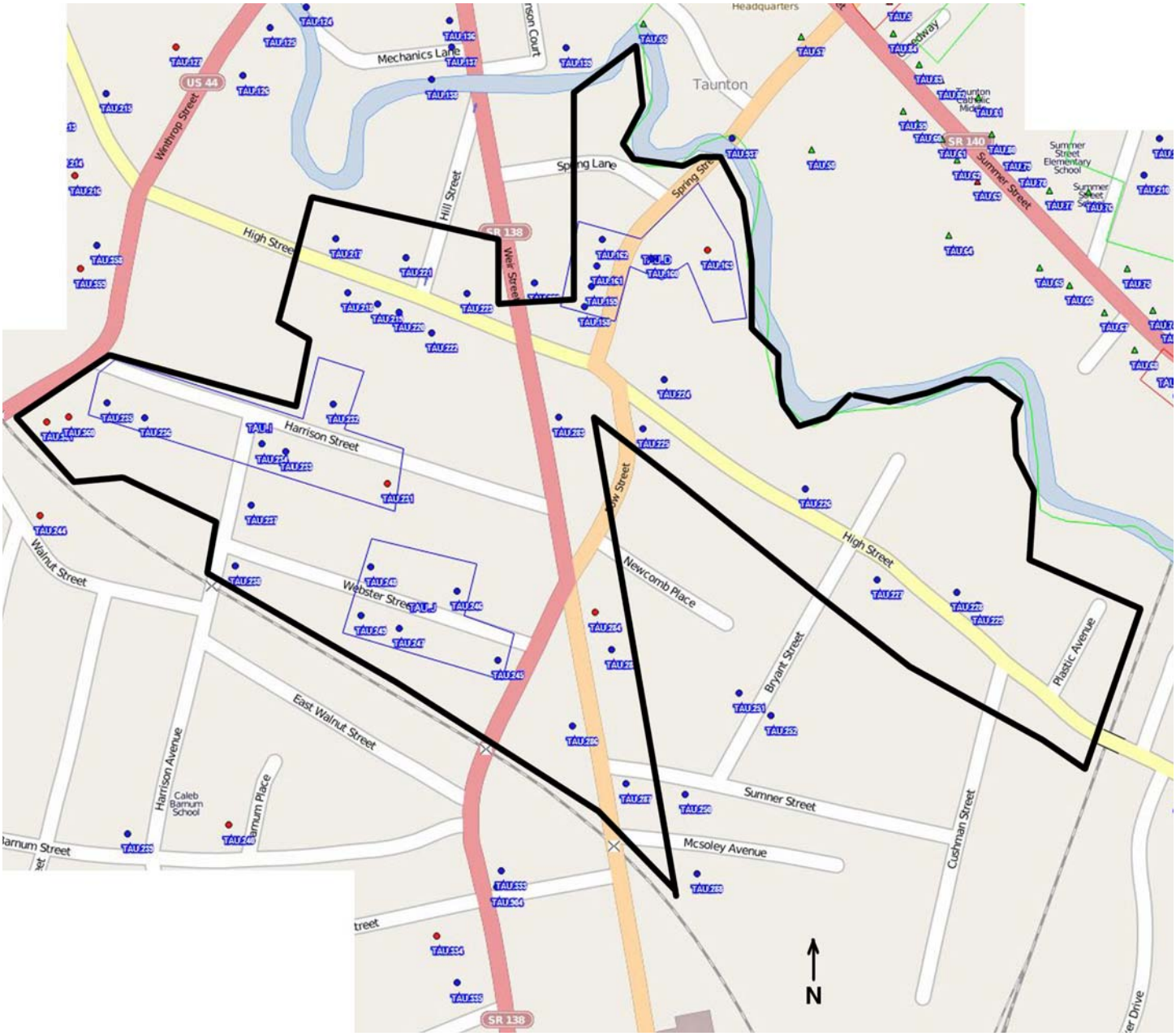
28 and 30 Harrison Street (l-r), looking south.

2, 4, 6, 8, Webster Street (l-r), looking southwest**.**

Albert Field Tack Company, 19 Spring Street, looking southeast.

Sproat House, 9 Spring Street, looking east.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☐ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The High Street Area is eligible for listing in the National Register of Historic Places at the local level under Criterion A in the areas of Community Development for important associations with nineteenth-century working and middle class residential development associated with Taunton's major industrial expansion in the second half of the century; and under Criterion C in the area of Architecture for its excellent collection of well-preserved residential architecture from ca. 1760 to ca. 1940, primarily notable for fine examples of Greek Revival and Italianate style architecture constructed between ca. 1830 and ca. 1880.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Whittenton

Name of Area: Whittenton Mills Area

Present Use: Residential

Construction Dates or Period: mid-19th c. to late-19th c.

Overall Condition: Good

Major Intrusions and Alterations: None. Some individual building modifications have occurred as noted in text.

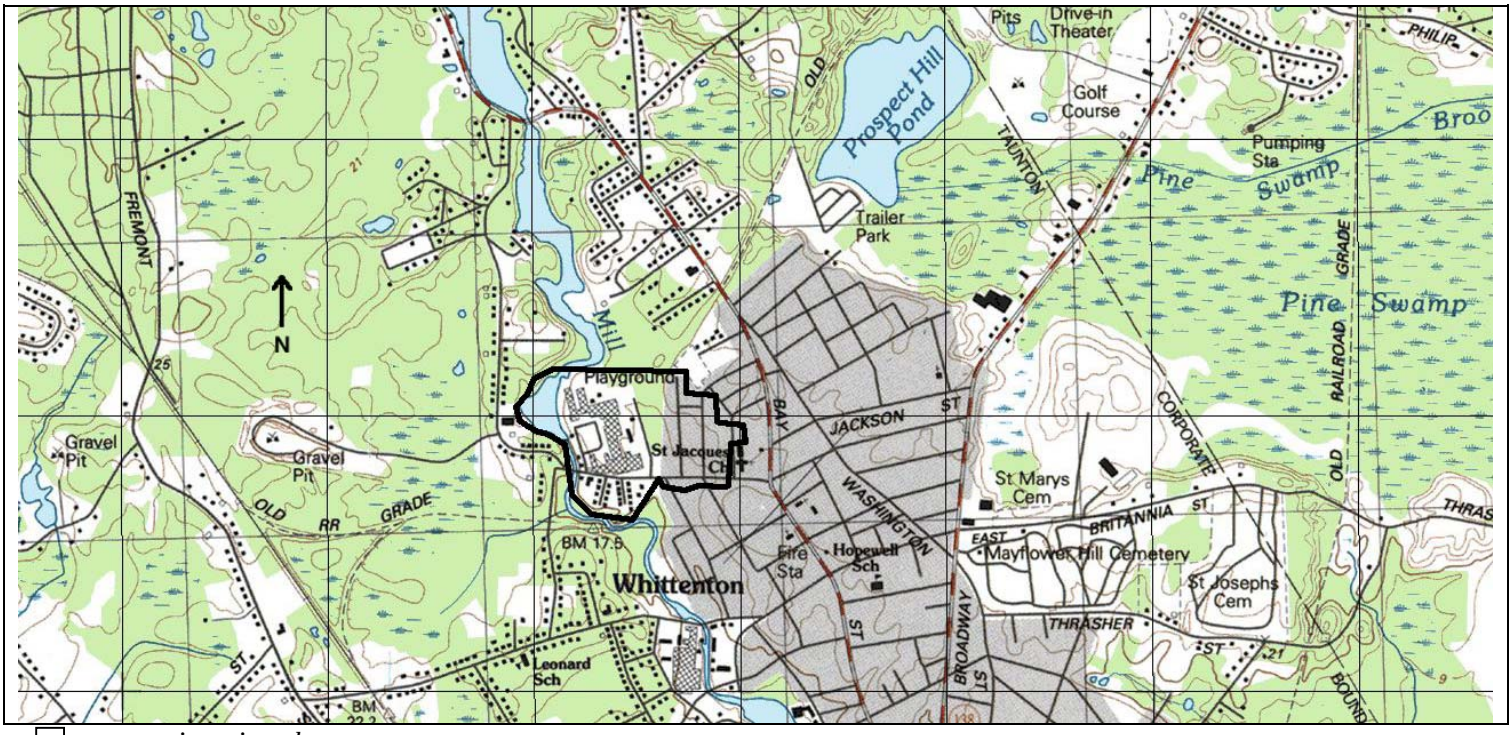
Acreage: Approx.60

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Whittenton Mills Area is centered on Whittenton Street, east of the Mill River, and spans the MBTA Whittenton Railroad Branch right-of-way. The area encompasses 86 residential, commercial, and industrial properties associated with the Whittenton Mills Complex (TAU.T), but not included within the district when it was listed in the National Register as a Historic District in 1984 as part of the Taunton Multiple Resource Area (MRA).

The area primarily consists of modest, nineteenth-century, one-and-one-half-story, wood-frame, identical worker housing that forms distinct streetscapes along First, Second, Third, Fourth, and Fifth avenues. Examples include Greek Revival style duplexes with side gable roofs, shed dormers, and interior chimneys such as 8 First Avenue (TAU.482) and 3 Fourth Avenue (TAU.477), as well as similar Greek Revival style single-family residences with front or side gable roofs such as 21 Third Avenue. A row of six, two- to two-and-one-half-story apartment buildings were constructed on the north side of Whittenton Street between Fourth and Fifth avenues in the early twentieth century. These multi-family units differed from the residences on First through Fifth avenues in that the living units were not arranged side-by-side, but stacked vertically. One boarding house constructed in the mid-nineteenth century is located at the west end of the area at 426 Whittenton Street (TAU.483) and is the only remaining structure of its kind within the area. Although many of the houses in the area have been altered by window and door replacement and the installation of synthetic siding and additions, the buildings retain their original arrangement and the area retains its setting of compact housing with direct views of the mill.

Beside residential buildings, the area also includes a number of associated industrial and commercial buildings along Whittenton Street. The former Whittenton Manufacturing Company Stable at 436 Whittenton Street (TAU.484) is an Italianate-style building constructed ca. 1860 and converted into retail space and storage. Further east on Whittenton Street is a block of one-to-three-story wood-frame and brick commercial buildings and warehouses; including a late-nineteenth-century market at 336 Whittenton Street (TAU.476), Poole Silver Company complex at 324 Whittenton Street (ca.1895) (TAU.475), and late-nineteenth-century mixed-use commercial and residential properties such as 33D and 292 Whittenton Street. There is limited modern infill, such as the mid- to late-twentieth-century food mart at 309 Whittenton Street. The majority of buildings in the area are intact. A few buildings are no longer extant including the Whittenton Railroad Station. The station was located on the north side of Whittenton Street, east of the railroad tracks, and was demolished in the 1940s.

HISTORICAL NARRATIVE

The Whittenton Mills Area, formerly known as Ancient Whittenton, was first settled in the mid-seventeenth century and was the site of a small manufacturing village. James Leonard established the earliest industry, the Whittenton Forge, in 1669 on the current site of the Whittenton Mills Complex. The forge produced iron products under the control of the Leonard family for over 150 years.

In 1805 iron manufacturing in Whittenton ceased and was replaced with a nail factory established by Samuel Crocker, Thomas Bush, and Charles Richmond. Crocker and Richmond, former employees at the Leonard forge, and Bush expanded the factory soon after its founding to include a spinning house for textiles (not extant). The manufacturing of textiles began as a cottage industry in the area; the yarn spun at the mill was provided to nearby farmers' homes to be woven on hand looms. However, with the distribution of the Slater looms in the 1810s, weaving became a full-scale

manufacturing industry at Whittenton. Crocker and Richmond, along with other investors, formed the Taunton Manufacturing Corporation in 1824 with interests in copper rolling, iron, and cotton and wool manufacturing in Taunton, which included the Whittenton Mill. At that time, Whittenton Mill's landholdings included the complex's industrial buildings and several ca. 1830-1840 tenements along First and Second avenues south of Whittenton Street, directly opposite the mill complex. The corporation dissolved after 10 years and the Whittenton Mills, owned by James K. Mills and Co. of Boston, came under the management and partial ownership of Willard Lovering by 1836. Lovering, an experienced textile manufacturer from Providence and Woonsocket, RI, and his three sons purchased the mill in 1858 and invested in the development and expansion of the complex (MHC 1981; Fitch 1980; Winters 1979a).

The Loverings expanded both the mill complex and the surrounding area to include approximately 30 mill buildings "powered by both water wheels and Corliss steam engines," and over 200 company-owned tenements (Winters 1979a). Planned streets were laid out and additional tenements were constructed on Third, Fourth, and Fifth avenues east of the mill complex ca. 1860 for the growing population of immigrant, primarily French Canadian, employees. In addition to the improvements to the mill complex and housing, the Loverings installed a horse-drawn street railcar system in the 1860s and 1870s. The system formed a loop that linked Taunton Green to the south via major roads including Broadway, Bay, Whittenton, Warren and West Brittania streets. The system allowed the Whittenton population easier access to other areas in Taunton, and also expanded the available work force to include more remote areas of city. Whittenton Mills and its holdings were sold by Willard Loverings heirs in 1910 to the Lynne family of Boston, who later auctioned the company-owned housing in 1920 (Winters 1979a; MHC 1981).

Commercial ventures independent from the mill developed along the south side of Whittenton Street between Cottage and Fifth avenues in the late-nineteenth century to support the mill worker population. By 1893, the block included a diner, multiple storefronts, general market, billiard room and saloon, barber shop, shoe shop, and fruit and meat markets. It also included the Poole, Roche & Co., a sliver plating manufacturing company that produced Britanniaware, a product similar to pewter that gained popularity in the mid-nineteenth century. The company was organized by George Poole and Edward F. Roche in 1892 and took on a third partner, Louise Busiere, soon after. They built a factory on Whittenton Street in 1893 that had expanded to its present form by the 1930s. Poole's sons assumed control of the business after Poole's death. Poole's sons retired in 1946 and sold the business to an investment group lead by Sidney Kane of Providence, RI. Under new management, the company expanded to include a sterling silver department in 1946 and a brass division in 1964. The Poole Silver Company joined the Towle Manufacturing Co. of Newburyport, MA, makers of sterling and silver plated flatware, in the 1970s. The property is currently vacant (Everts and Richards 1895; Sanborn 1893, 1937; Winters 1979d).

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1979b *MHC Form B – 8-10 First Avenue*. On file at MHC, Boston, MA.

1979c *MHC Form B – Koss' Market*. On file at MHC, Boston, MA.

1979d *MHC Form B – Poole Silver Company.* On file at MHC, Boston, MA.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.T	Whittenton Mills Complex	Whittenton Street	1805 - 1895		2	NR
	Whittenton Manufacturing Company Worker Housing	4 First Avenue	ca. 1830	Greek Revival		C
TAU.482	Whittenton Manufacturing Company Worker Housing	8 – 10 First Avenue	ca. 1830	Greek Revival		C
TAU.477	Whittenton Manufacturing Company Worker Housing	1.5 – 3 Fourth Avenue	ca. 1830	Greek Revival		C
TAU.480	Whittenton Manufacturing Company Worker Housing	1 – 3 Second Avenue	ca. 1860	Gothic Revival	3	C
	Whittenton Manufacturing Company Worker Housing	21 Third Avenue	ca. 1860	Greek Revival	5	
TAU.476	Commercial	Whittenton Street	ca. 1890	N/A		C
TAU.475	Poole Silver Company	Whittenton Street	1893	Richardsonian Romanesque	6	C
TAU.491	Whittenton Manufacturing Company	Whittenton Street	1878			C
TAU.492	Whittenton Manufacturing Company Dying Rooms	Whittenton Street	1857			C
TAU.488	Whittenton Manufacturing Company Offices	Whittenton Street	1858			C
TAU.486	Whittenton Manufacturing Company Picker House	Whittenton Street	1880			C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.490	Whittenton Manufacturing Company Pickering # 3	Whittenton Street	1878			C
TAU.487	Whittenton Manufacturing Company Storage	Whittenton Street	1858			C
TAU.493	Whittenton Manufacturing Company Storehouse	Whittenton Street	1895			C
TAU.489	Whittenton Manufacturing Company Waste House	Whittenton Street	1880			C
TAU.485	Whittenton Manufacturing Company Weave House	Whittenton Street	1880			C
TAU.478	Whittenton Manufacturing Company Worker Housing	311 Whittenton Street	ca. 1875	Italianate		C
TAU.479	Residence	372 Whittenton Street	ca. 1840	Greek Revival		C
TAU.481	Whittenton Manufacturing Company Worker Housing	410 Whittenton Street	ca. 1830	Greek Revival	4	C
TAU.483	Whittenton Manufacturing Company Worker Housing	426 – 428 Whittenton Street	ca. 1830	Federal		C
TAU.484	Whittenton Manufacturing Company Stables	436 Whittenton Street	ca. 1860	Italianate		C

NR Property is listed in the National Register
C Contributing property to the district
NC Non-contributing property to the district

Whittenton Manufacturing Company Weaving House, view looking northeast.

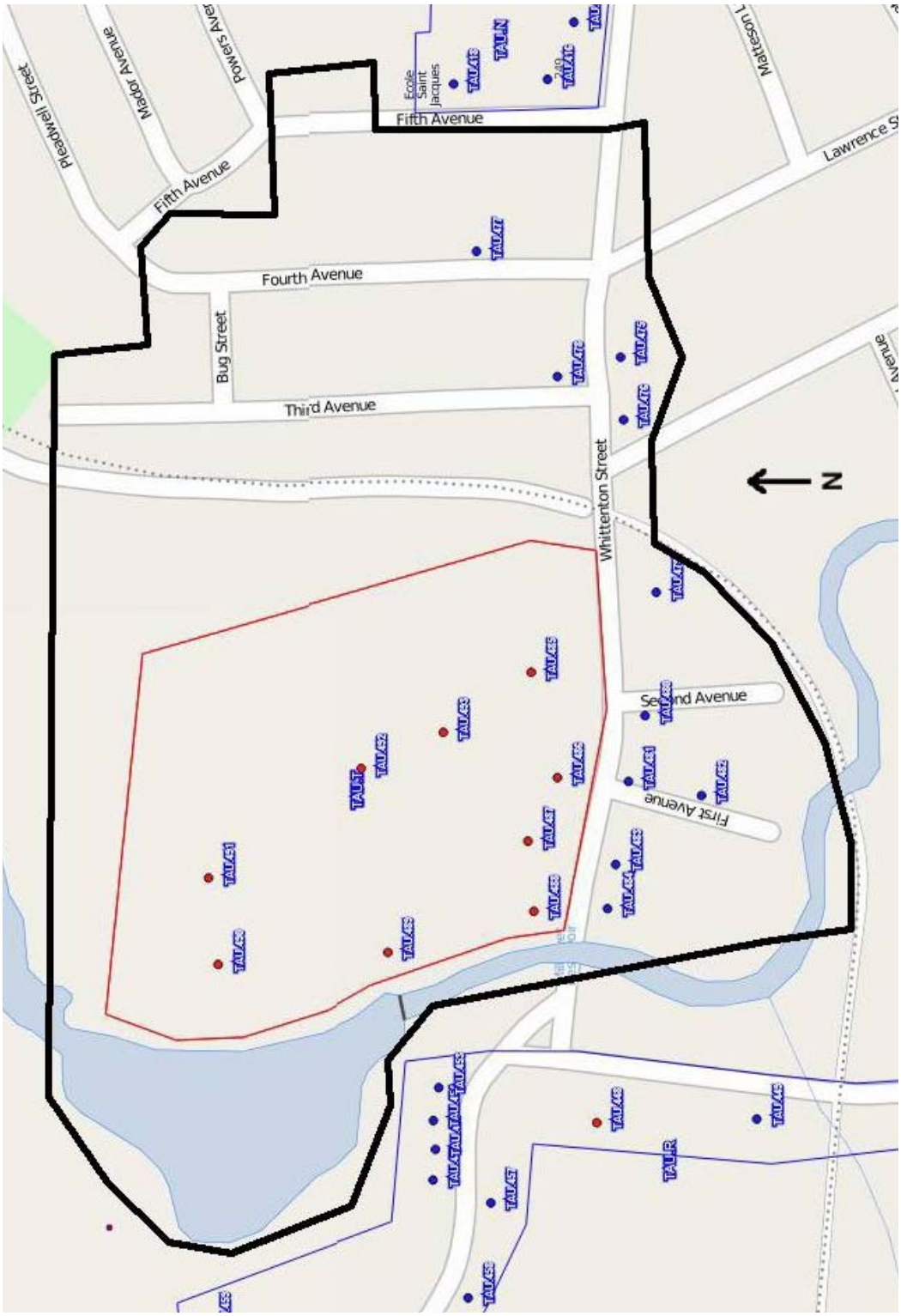
1-3 Second Avenue, view looking northwest.

410 Whittenton Street, view looking southeast.

21 Third Avenue, view looking east.

Poole Silver Company, view looking southwest.

AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Whittenton Mills Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its associations with the nineteenth-century industrial development of Taunton and under Criterion C in the area of Architecture as a highly intact example of a nineteenth-century mill village in Taunton. The area encompasses 86 residential, commercial, and industrial properties associated with the Whittenton Mills Complex (TAU.T), but not included within the district when it was listed in the National Register as a Historic District in 1984 as part of the Taunton Multiple Resource Area.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Britanniaville

Name of Area: Reed and Barton Worker Housing Area

Present Use: Residential

Construction Dates or Period: mid-19th c. to late-19th c.

Overall Condition: Good

Major Intrusions and Alterations: None

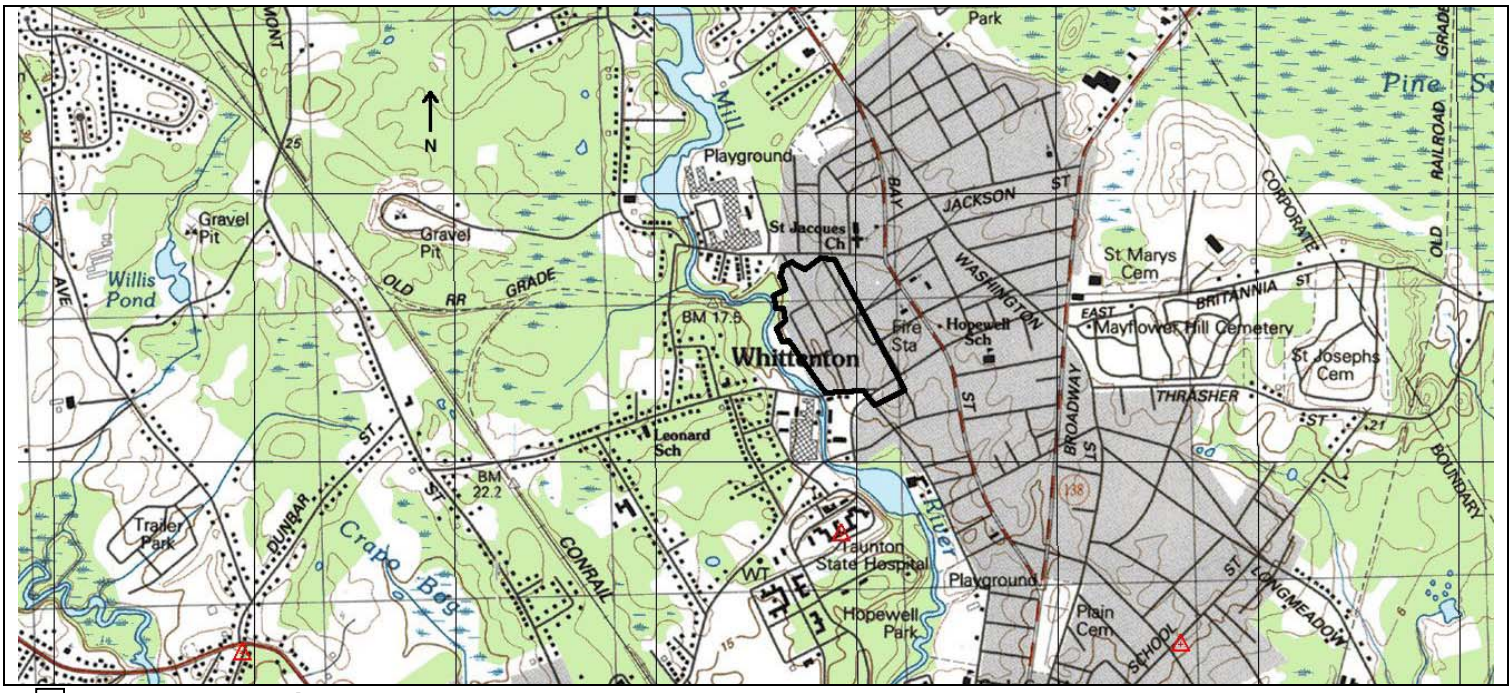
Acreage: Approx. 25

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Reed and Barton Worker Housing Area is a compact neighborhood of worker housing located along Meadow, Cottage, and Lawrence streets, to the southeast of the MBTA Whittenton Branch right-of-way. The area is located to the northeast of the Reed and Barton Complex (TAU.Q; National Register listed, Taunton Multiple Resource Area (MRA) (1984)). The Thomas Nichols Three-Decker District (TAU.AI; National Register listed, Taunton MRA, 1984) is located within the village boundary. In total, the area encompasses 117 properties, of which 113 contribute to the historic character and significance of the area.

The Reed and Barton Worker Housing Area developed primarily in the nineteenth and early twentieth centuries with one-and-one-half- to two-and-one-half-story, wood-frame residences, a common type of worker housing constructed in Taunton during this period. The majority of the buildings exhibit the Greek Revival or Italianate style in varying degrees of ornamentation, with a few examples of the Two-Decker building type. Three Three-Decker houses along West Brittania Street (TAU.433, TAU.434, TAU.435), including the Thomas Nichols Three-Deckers built in 1914, are a less common form found in Taunton. Single-family, side-hall plan, duplexes, and Two-Decker housing was more popular, such as those located along Cottage Street (TAU.472, TAU.470, and TAU.471). Among the other residences on Cottage Street is a group of 12 cottages (7-24 Cottage Street) built by the Reed and Barton Company for its employees in the late nineteenth century. This collection of houses represents two distinct forms, the side-hall cottage and the duplex. Reed and Barton later built more examples of these types as well as Two-Deckers in the area.

Many of the houses on the north side of West Brittania Street were the residences of owners and operators of the Reed and Barton Company and display higher degrees of ornamentation than those on Cottage and Lawrence streets. The Greek Revival style house at 69 West Brittania Street was constructed ca. 1860 for George Brabrook, a partner in the company. The house at 79 West Brittania Street was built ca. 1840 and occupied by Nathan Lawrence who worked as a laborer, then overseer, and finally as superintendant of the Brittania Department at Reed and Barton. Not all the residents of this portion of West Brittania Street worked for Reed and Barton, however; James D. Albro, who owned a grocery on Bay Street, built the house at 95 West Brittania Street ca. 1880.

A few properties scattered within the Reed and Barton Worker Housing Area are mixed-use buildings constructed in the late nineteenth century that housed shops on the first story and residences above. Most of these structures were later modified to convert the commercial spaces into additional housing. One of the largest buildings in the area, 7 Lawrence Avenue, was used as a recreation center in the 1930s, later as the hall for the Catholic Order of Foresters in 1950, and has since been converted into apartments. The Whittenton Substation was built at the corner of Meadow Place and Meadow Street in 1930, demolishing at least four nineteenth-century workers' houses. The brick, Classical Revival-style substation, although small in size, is one of the most elaborately designed buildings in the district with a pedimented, limestone door surround, brick quoins, and deep cornice. A panel in the parapet on the east (facade) elevation reads "1930." Over time, buildings in the area have been altered to meet current needs, and some have been converted from single-family to multi-family use. However, most retain their original massing and form, and several have intact exterior material, contributing to the unified character of the historic mill-related industrial neighborhood.

HISTORICAL NARRATIVE

The Reed and Barton Worker Housing Area is an intact grouping of mid-nineteenth-century structures that provide a strong link to working-class life in a mill village in Taunton into the mid-twentieth century, and the neighborhood retains strong associations with the adjacent Reed and Barton Mill Complex. The area, known as Britanniaville, is one of Taunton's first industrial villages established in 1830 by the construction of the Taunton Britannia Manufacturing Company building on the north side of the Mill River. Several factories and forges were already in production in the area surrounding the Britannia Company site, including the Whittenton Mill (1805) to the north and Hopewell Iron Works (ca.1739) to the south. The Taunton Britannia Manufacturing Company closed about 1835 and left a portion of the holdings and its equipment to two employees, Henry G. Reed and Charles E. Barton. Reed and Barton, with the aid of their partner Gustavus Leonard, re-established a Britannia works on its existing site. The company became internationally known for their Britanniaware and expanded into the sterling silver market in the late nineteenth century. Encouraged by the success of Reed and Barton, rival companies, including Rogers Silverware on West Waters Street in Taunton and Poole Silver on nearby Whittenton Street near Lawrence Street, were established in the late nineteenth century. These companies drew from the concentration of skilled metal workers in the area, who were essential to business success. Industry in Taunton, primarily in the textile sector, declined after World War II; however Reed and Barton remained a thriving business and is still internationally known for their product (MHC 1981).

With the establishment of the Taunton Britannia Manufacturing Company at this location in 1830 came the steady development of a village to house its workers. After Reed and Barton took over control in 1835, the factory grew exponentially between 1860 and 1880 with the addition of multiple buildings to the complex, and the residential neighborhood expanded. By 1881 Lawrence, State, and the north end of Cottage streets were laid out, and housing lots were planned. By 1895 more than half of these lots were built upon, and Meadow Street and Meadow Avenue were added. A streetcar system that linked the Taunton Green to the south via major roads including Broadway, Bay, Whittenton, and West Britannia streets was installed in the 1870s. The system allowed easier access for the Britanniaville population to other areas of Taunton, further aiding in the rapid development of the area. During the ensuing decades into the early twentieth century, working class housing filled in vacant lots in the city's mill villages along these transit lines, while upper class neighborhoods developed elsewhere (Dunbar 1836; Beers 1871; Walker 1881; Everts and Richards 1895; MHC 1981; Fitch 1983).

The late-nineteenth-century population of Britanniaville, similar to the nearby Whittenton neighborhood, was comprised primarily of French Canadian and Polish immigrant mill workers who were also primarily Catholic. With the growth of this particular group of immigrants came the establishment of multiple Catholic churches and religious organizations in the surrounding area, including the Catholic Order of Foresters. This fraternal organization, originally founded by Irish Catholics to provide insurance benefits to its members, had a meeting hall at 7 Lawrence Street that was later converted into a recreation center for the neighborhood (MHC 1981; Winters 1981; Sanborn 1950).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.AI	Nichols, Thomas Three-Deckers	80-88 West Britannia Street	1914	Italianate/ Three-Decker		NR
	Reed and Barton Worker Housing	7 Cottage Street	ca. 1860	Greek Revival		C
	Reed and Barton Worker Housing	8 Cottage Street	ca. 1850	Vernacular		
TAU.469	Reed and Barton Worker Housing	9 Cottage Street	ca. 1860	Greek Revival		C
	Reed and Barton Worker Housing	10 Cottage Street	ca. 1880	Italianate – altered		C
	Reed and Barton Worker Housing	11 Cottage Street	ca. 1860	Greek Revival		C
	Reed and Barton Worker Housing	13 Cottage Street	ca. 1860	Greek Revival/ Duplex		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Reed and Barton Worker Housing	16 Cottage Street	ca. 1870	Italianate		C
TAU.470	Reed and Barton Worker Housing	17 Cottage Street	ca. 1860	Greek Revival/ Duplex	2	C
	Reed and Barton Worker Housing	18 Cottage Street	ca. 1870	Italianate – altered		C
	Reed and Barton Worker Housing	23 Cottage Street	ca. 1860	Greek Revival/ Duplex	2	C
	Reed and Barton Worker Housing	24 Cottage Street	ca. 1870	Italianate – altered		C
TAU.471	Reed and Barton Worker Housing	27 Cottage Street	ca. 1890	Vernacular/ Two-Decker	3	C
TAU.472	Reed and Barton Worker Housing	28 Cottage Street	ca. 1870	Italianate		C
	Residence	43 Cottage Street	ca. 1890	Queen Anne – altered	4	C
	Recreation Center – Residence	7 Lawrence Street	ca. 1920	Vernacular		C
	Whittenton Substation	corner of Meadow Street and Meadow Place	1930	Classical Revival		C
	Burns, David House	55 West Britannia Street	ca. 1890	Queen Anne – altered	1	C
TAU.432	Burbank, Jahaziah House	61 West Britannia Street	ca. 1849	Greek Revival-Italianate	1	C
TAU.433	Nichols, Thomas Three-Decker	68 West Britannia Street	1914	Italianate - altered/ Three-Decker		NR
	Brabrook, George House	69 West Britannia Street	ca. 1860	Greek Revival	1	C
	Lawrence, Nathan House	79 West Britannia Street	ca. 1840	Federal – altered		C
TAU.434	Nichols, Thomas Three-Decker	80 West Britannia Street	1914	Italianate/ Three-Decker		NR
TAU.435	Three Decker	88 West Britannia Street	1914	Italianate - altered/ Three-Decker		C
	Albro, James D. House	95 West Britannia Street	ca.1880	Vernacular		C

NR Property is listed in the National Register of Historic Places
C Contributing property to the district
NC Non-contributing property to the district

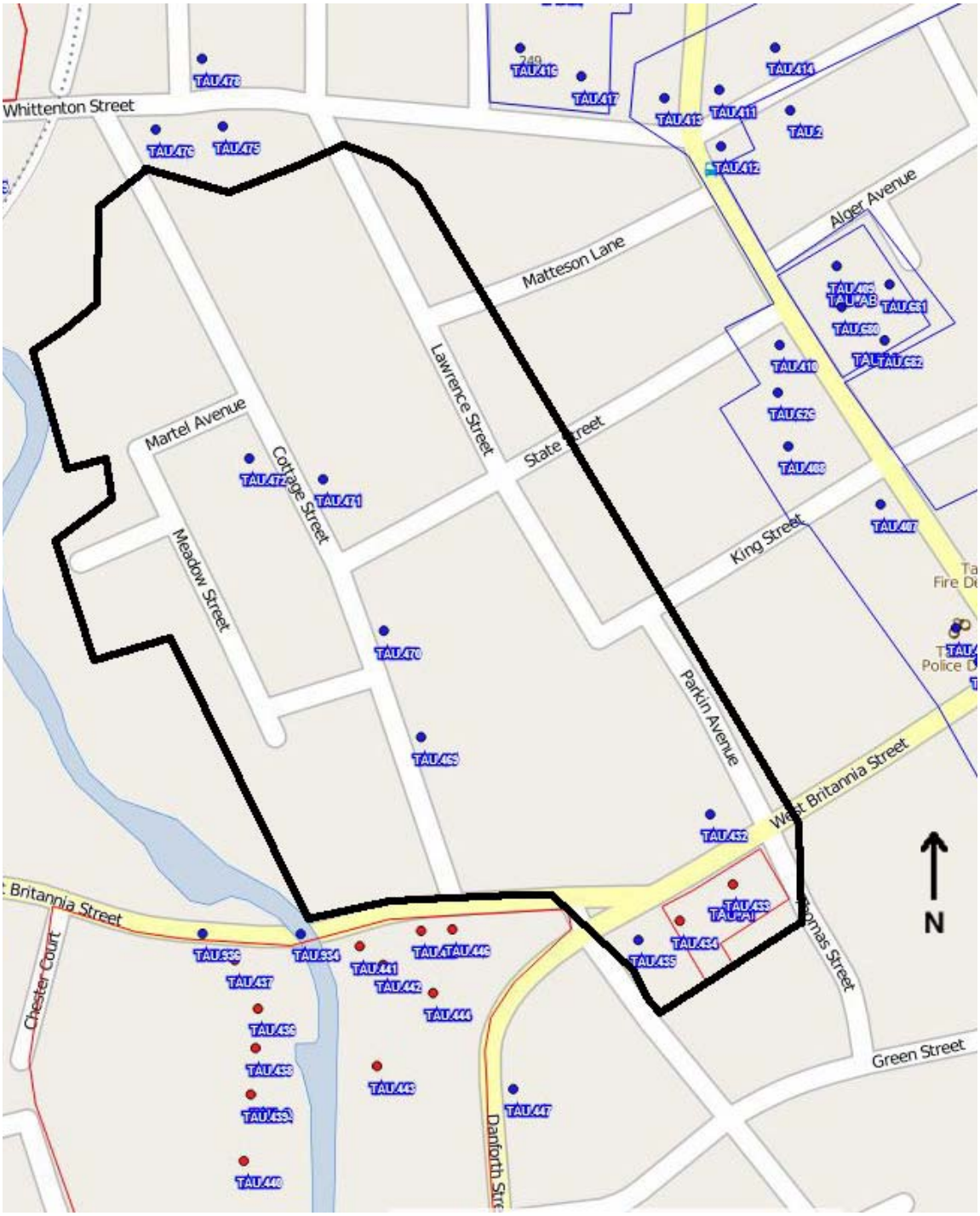
17 and 23 Cottage Street, view looking southeast.

25, 27, and 29 Cottage Street, view looking northeast.

Residences on Cottage Street, view looking northeast.

Residences on Meadow Street, view looking northwest.

AREA MAP



- MHC Inventory
- National Register Listed

\ = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Reed and Barton Worker Housing Area is recommended eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its associations with the industrial and residential development of Taunton, specifically the nearby Reed and Barton Complex (TAU.Q; NR listed, Taunton MRA,1984). and under Criterion C in the area of Architecture as a good and intact example of a nineteenth-century mill village in Taunton, including the Thomas Nichols Three-Decker District (TAU.AI; NR listed, Taunton MRA, 1984) and a range of single and multi-family housing types and styles.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton	TAU.R	See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Whittenton

Name of Area: Ancient Whittenton Area

Present Use: Residential

Construction Dates or Period: 1730 to late-19th c.

Overall Condition: Good

Major Intrusions and Alterations: None

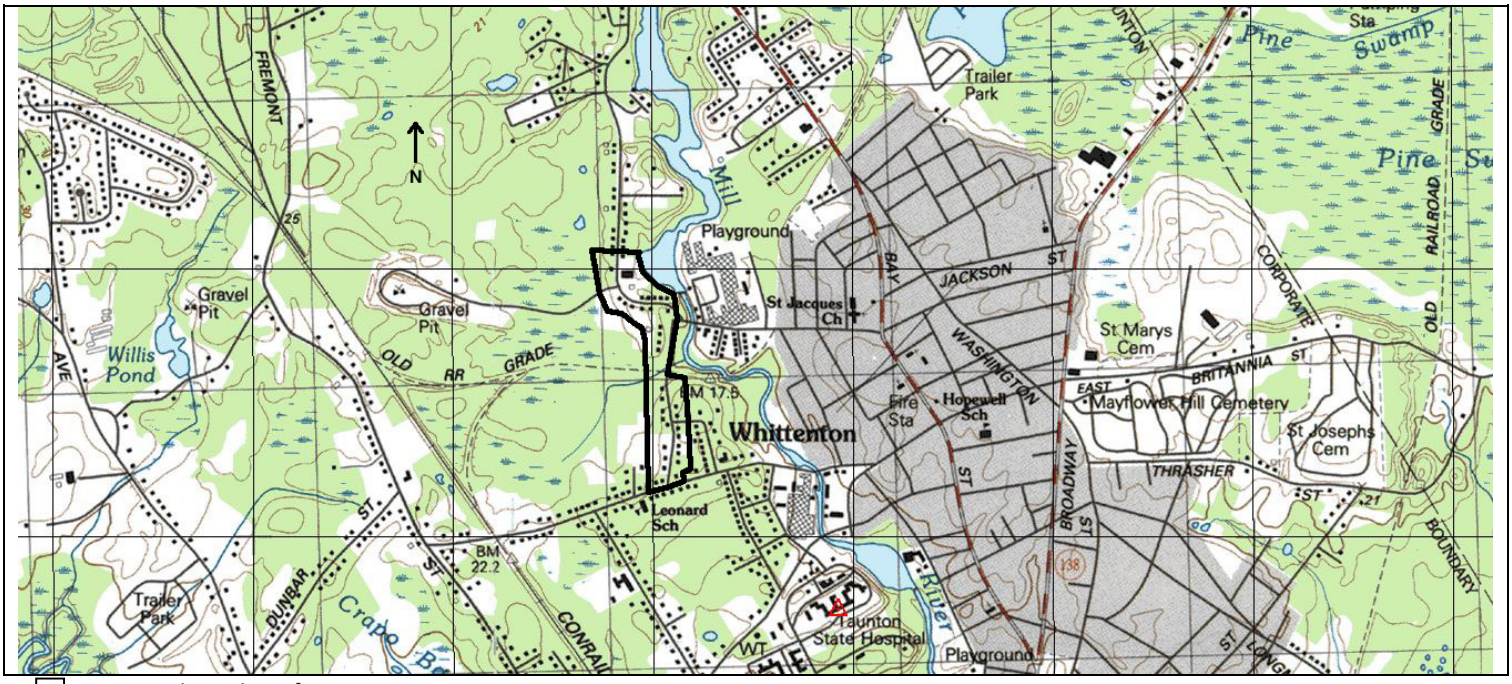
Acreage: Approx. 22

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Ancient Whittenton Area (MHC No. TAU.R) is a linear area roughly one-half-mile in length located on Whittenton and Warren streets, which intersects the Whittenton Branch railroad right-of-way at the Warren Street railroad crossing. The area encompasses 41 properties, of which 27 contribute to the historic and architectural significance of the area. One of the properties, the Capt. James Leonard House at 3 Warren Street (TAU.448), was listed individually in the National Register in 1984 as part of the Taunton Multiple Resource Area (MRA).

The houses primarily consist of Cape Cod Cottages, worker housing duplexes, and higher style residences dating to the eighteenth and nineteenth centuries. At least four houses constructed in the eighteenth century still exist in the area, of which the earliest is the James Leonard House at 487 Whittenton Street (TAU.453). The Leonard House was originally built ca. 1730 and has been altered, but still retains its gambrel roof form. Other early homes in the area include the Georgian style Captain James Leonard House at 3 Warren Street (TAU.448) constructed in 1752 and the residences at 493 and 505 Whittenton Street (TAU.454, TAU.456). The houses at 493 and 505 Whittenton Street were originally erected as Georgian-style Capes ca. 1780 and were later modified into duplex worker housing. This group of worker housing located along Whittenton Street also includes multiple Greek Revival style and vernacular cottages. These cottages were designed in various forms ranging from one-and-one-half-story duplexes such as 499 Whittenton Street (TAU.455) to two-story, multiple-family structures such as 513 Whittenton Street.

The majority of the higher style residences in the area were constructed during the nineteenth century and represent a variety of popular domestic styles in varying degrees of applied Greek Revival, Second Empire, Queen Anne, Stick Style, and Colonial Revival ornamentation. The most prominent of these includes the two-story, Queen Anne-style L.L. Wilbur House at 32 Warren Street (TAU.450) and the Stick Style former Whittenton Manufacturing Company Supply House at 45 Warren Street (TAU. 452). The Dutch Colonial Revival-style residence at 50 Warren Street illustrates the more modest house type built along Whittenton Street in the early twentieth century. Over time, houses have been altered to meet current needs, and some have been converted from single-family to multi-family use. However, most retain their original massing and form, and several have intact exterior cladding and trim. The construction of multiple Ranch and Colonial Revival-style homes in the mid-to late twentieth century filled in gaps between the older residences, but does not detract from the historic character of the area.

HISTORICAL NARRATIVE

The Ancient Whittenton Area was first settled in the late seventeenth century. By 1699 James Leonard I established the Wittington Iron Works, later known at Whittenton, along the Mill River with three of his sons, Joseph, Benjamin, and Uriah. The Leonard's also built a grist mill on the east bank of the river. James I left the property to his heirs upon his death in 1691. It remained in the Leonard family until 1805 when Samuel Crocker, Thomas Bush, and Charles Richmond, former employees of the Leonards, leased the water rights and built a nail factory where the grist mill was originally located. Crocker, Bush, and Richmond, later just Crocker and Richmond, expanded the venture to include cotton yarn spinning and eventually cloth manufacturing. The mill, known as the Whittenton Mill Company (TAU.T), was incorporated with the property of the "Taunton Manufacturing Company" in 1823 until it dissolved in 1835. The company

was eventually purchased by Charles Lovering, a former manager and partial owner, with his sons in 1858. The mill and all its property was sold to the Lynn family of Boston ca. 1910 by Lovering's heirs (MHC 1981; Winters 1979a; Emery 1891.

Although the Whittenton Mill Company sits outside the boundaries of the Ancient Whittenton Area, the development of the residential neighborhood along Warren and Whittenton streets has strong associations with the development of the mill and industries in the area for most of its history. The Whittington Iron Works founder, James Leonard I, built what is reported the oldest house in the area at 487 Whittenton Street (TAUN.453) about 1730. James I's descendants, most notably Captain James Leonard and Deacon Nathaniel Leonard, also established residences in the area at 3 and 36 Warren Street (TAU.448 and TAU.451) in the eighteenth and early nineteenth centuries. Charles Lovering, owner of the mill from 1858 until his death in the 1870s, lived at 15 Warren Street (TAU.449). This house was originally constructed by Tarvis Danforth ca. 1825 and eventually purchased by the Whittenton Mill Company. The Whittenton Mill Company also constructed modest worker housing along Whittenton Street; a company trend that would continue into the late nineteenth century in this area and in the adjacent Whittenton Mills Area (TAU.T) (Winters 1979a-1979e; Dunbar 1836; Walling 1858).

Unlike the housing along Whittenton Street and within the Whittenton Mills Area (TAU.T), which were primarily owned by the mill, property along Warren Street within the Ancient Whittenton Area was held by independent land owners. These owners and occupants were not members of the Leonard family, but did have associations with the manufacturing industries. The 1855 Taunton City Directory lists boarding houses at 9 and 27 Warren Street. These establishments were owned by Daniel Buck and Palmer Austin respectively and both catered primarily to housing mill workers. The owners and residents of the single-family houses were engaged in industry-related professions; for example Gardner Strange, a machinist, who built the house at 45 Warren Street (TAU.452) ca. 1850. Samuel Ramsdell, an overseer, owned the house at 33 Warren Street in 1858. These residences were later owned and altered by the Whittenton Mill Company for use as a supply house and most likely supervisor housing (Walling 1858; Dean 1855; Beers 1871).

The only nineteenth-century property identified with no direct relationship to the industries in the area is 42 Warren Street built by Noah Warren, a farmer, ca. 1800. George Warren inherited the property upon Noah's death ca. 1860 and lived in the house through the 1870s. By 1895, George's son, George B. Warren, had constructed a separate house at 46 Warren Street and rented out the older homestead. George B. Warren, unlike his predecessors, became a shipping clerk in a factory. After the sale of the Whittenton Mills ca. 1910 the residential landscape changed with new construction creating a denser neighborhood on Warren Street. Eleven residences were constructed within the area between 1930 and 2010, including multiple houses on property formerly owned by the Whittenton Company. The history of the neighborhood through the present day continues to reflect its origins as an enclave of housing that remains relatively unaltered (Dunbar 1836; Dean 1855; Walling 1858; Beers 1871; Everts & Richards 1895; Census 1870, 1910).

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1979b *MHC Form B – Danforth, Jarvis House*. On file at MHC, Boston, MA.

1979c *MHC Form B – Leonard, Captain James House*. On file at MHC, Boston, MA.

1979d *MHC Form B – Leonard, James House*. On file at MHC, Boston, MA.

1979e *MHC Form B – Wilbur, L.L. House*. On file at MHC, Boston, MA.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	1 Warren Street	ca. 1890	Vernacular		C
TAU.448	Leonard, Captain James House	3 Warren Street	ca. 1752	Georgian – altered		NR
	Residence	7 Warren Street	ca. 1950	Colonial Revival		NC
	Buck, Daniel Boarding House	9 Warren Street	ca. 1830	Georgian – altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.449	Danforth, Jarvis House	15 Warren Street	ca. 1825	Federal		C
	Residence	24 Warren Street	ca. 1990	Ranch		NC
	Residence	25 Warren Street	ca. 1920	Colonial Revival Four-square		C
	Austin, Palmer Boarding House	27 Warren Street	ca. 1840	Greek Revival Cape – altered		C
	Residence	28 Warren Street	ca. 1980	Ranch		NC
	Residence	31 Warren Street	ca. 1950	Ranch		NC
TAU.450	Wilbur, L. L. House	32 Warren Street	ca. 1880	Queen Anne, Stick Style		C
	Ramsdell, Samuel House	33 Warren Street	ca. 1850	Italianate		C
	Residence	34 Warren Street	ca. 1890	Queen Anne		C
TAU.451	Leonard, Deacon Nathaniel House	36 Warren Street	ca. 1800	Federal Cape		C
	Residence	37 Warren Street	ca. 1960	Colonial Revival		NC
	Residence	40 Warren Street	ca. 1940	Tudor Revival		NC
	Warren, Noah House	42 Warren Street	ca. 1800	Cape - altered		C
TAU.452	Whittenton Manufacturing Company Supply House	45 Warren Street	1850; 1870	Stick Style (remodeled)		C
	Warren, George B. House	46 Warren Street	ca. 1900	Queen Anne – altered		C
	Residence	48 Warren Street	ca. 1890	Second Empire		C
	Residence	50 Warren Street	ca. 1920	Dutch Colonial Revival		C
	Residence	51 Warren Street	ca. 1960	Ranch		NC
	Residence	55 Warren Street	ca. 1960	Colonial Revival		NC
	Residence	311 West Brittania Street	ca. 1890	Colonial Revival – altered		C
	Residence	480 Whittenton Street	ca. 1950	Colonial Revival Cape		NC
TAU.453	Leonard, James House	487 Whittenton Street	ca. 1730	Georgian – altered		C
TAU.454	Residence	493 Whittenton Street	ca. 1780	Georgian – altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	498 Whittenton Street	ca. 2005	Colonial Revival		NC
TAU.455	Residence	499 - 501 Whittenton Street	ca. 1830	Greek Revival		C
	Residence	504-506 Whittenton Street	ca. 1850	Greek Revival – altered		C
TAU.456	Residence	505 Whittenton Street	ca. 1780	Georgian – altered		C
TAU.457	Residence	512 – 514 Whittenton Street	ca. 1840	Greek Revival – altered		C
	Residence	513 Whittenton Street	ca. 1860	Greek Revival – altered		C
	Residence	524 Whittenton Street	ca. 1840	Vernacular		C
TAU.458	Residence	528 Whittenton Street	ca. 1830	Greek Revival		C
	Residence	536 Whittenton Street	ca. 1860	Greek Revival		C
	Residence	562 Whittenton Street	ca. 1960	Ranch		NC
TAU.459	Residence	583 - 585 Whittenton Street	ca. 1870	Cape		C

NR Property is listed in the National Register
C Contributing property to the district
NC Non-contributing property to the district

524, 528, and 536 Whittenton Street, view looking southwest.

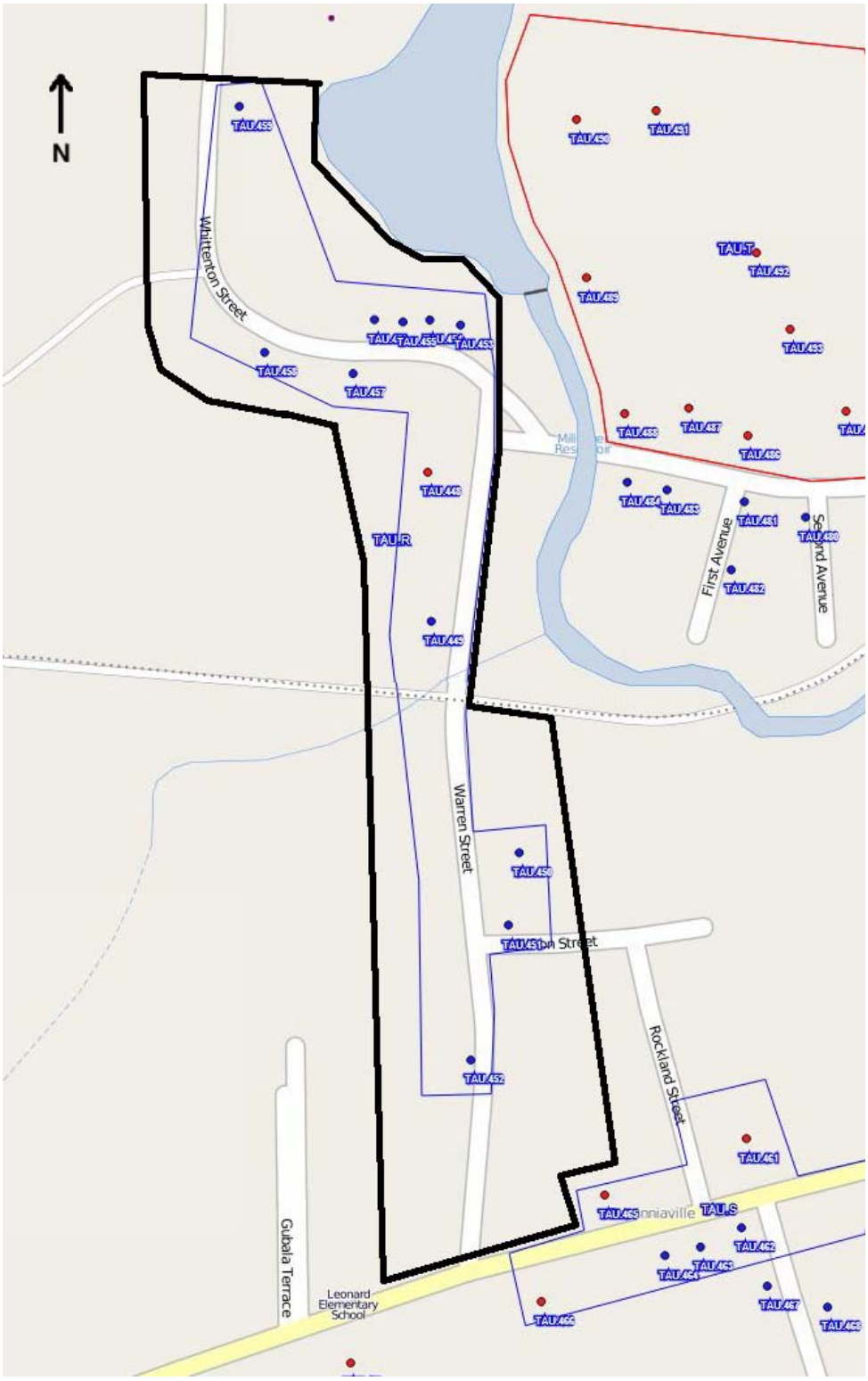
3 Warren Street (TAU.448), view looking northwest.

15 Warren Street (TAU.449), view looking northwest.

32 Warren Street (TAU.450), view looking southeast.

45 Warren Street (TAU.452), view looking northwest.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc.net

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Ancient Whittenton Area is eligible for listing in the National Register at the local level under Criterion A in the area of Community Planning and Development for its associations with the early residential settlement and industrial development of the Whittenton section of Taunton, including members of the prominent local Leonard family and the nearby Whittenton Mills Area (TAU.T); and under Criterion C in the area of Architecture for its collection of intact, historic residential architecture dating from the early eighteenth through early twentieth centuries.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton	TAU.K	See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Weir Village

Name of Area: Weir Village Area

Present Use: Residential, Ecclesiastical, Institutional, and Commercial

Construction Dates or Period: late 18th c. to mid-20th c.

Overall Condition: Good

Major Intrusions and Alterations: Demolition of two significant mill complexes.

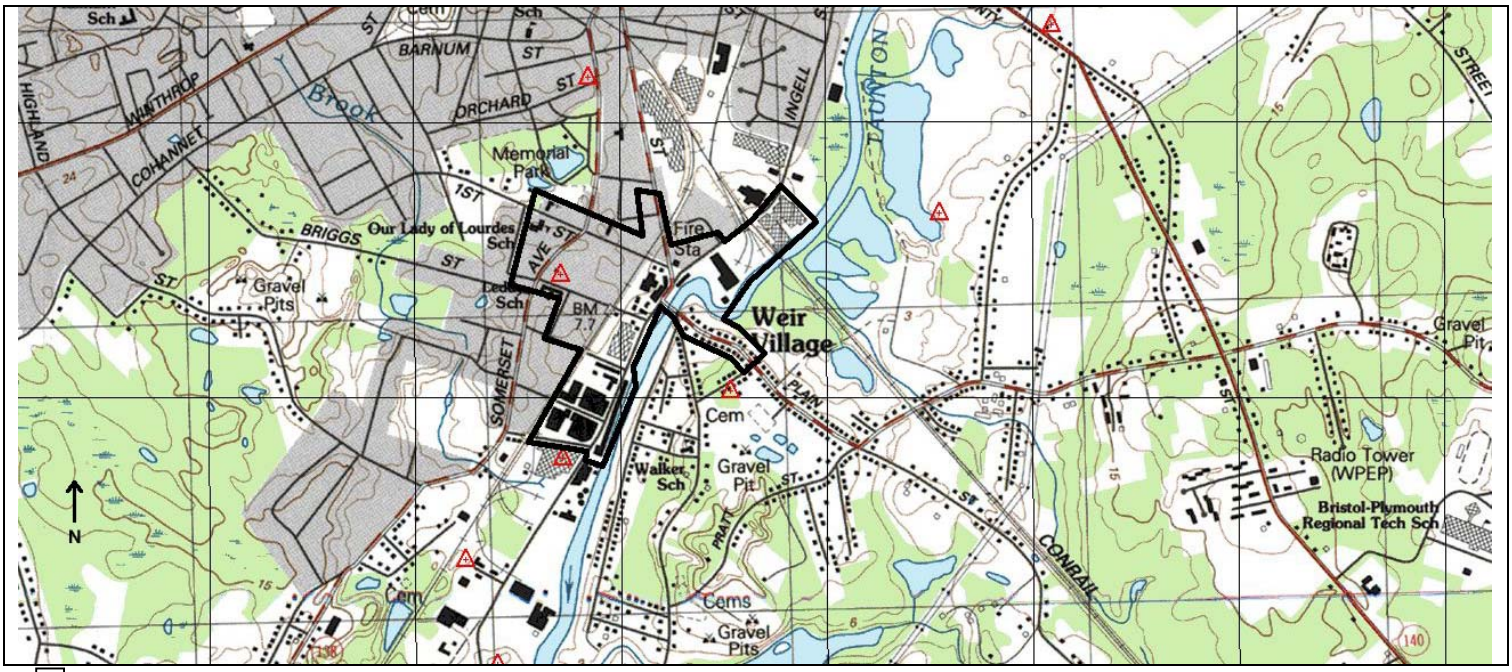
Acreage: Approx. 90

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Weir Village Area is an approximately 90 acre, irregularly shaped group of approximately 71 buildings, centered at the intersection of Ingell, Plain, Weir, West Water, and First streets. The area is bounded to the north by First Street (extending north to include a portion of Fay Street), to the south by Fifth Street, to the east by Beacon Street, and to the west by Presbrey Court. The area extends on either side of the Attleboro Secondary Railroad right-of-way at the Ingell Street rail crossing. This form updates the existing 1979 inventory form for the Weir Village Area (TAU.K) (T.W. 1979).

The industrial-based area is centered on either side of Ingell and West Water streets, which run along the Taunton River with tangential residential neighborhoods to the east and west and light commercial activity at the center. The area is a grouping of remnants of large-scale textile and stove manufacturing facilities constructed during the early to late nineteenth century. While once densely built-up, multiple demolitions in the recent past have created prominent tracts of vacant land within the area. Since 1983, two of the three most prominent related mill complexes (the Taunton Copper Manufacturing Company (TAU.315) and half of the Old Weir Stove Company (TAU.319) have been demolished, resulting in the removal of essential components of the area's historic industrial fabric. With few exceptions, the remaining residential and commercial properties that date to the period of significance have also lost integrity in the introduction of synthetic materials and non-historic alterations.

The area contains individually listed National Register properties. The Cohannet Mills No. 3 (TAU.AG; National Register listed) encompasses four buildings: the Cohannet Mill No. 3 (TAU.297); Boiler House (TAU.736); Cotton Storehouse (TAU.690); and Engine Room (TAU.735). Properties listed in the National Register as part of the Taunton Multiple Resource Area (MRA) National Register Nomination in 1984 consist of the Sylvanus N. Staples House (TAU.310), H.P. Thomas House (TAU.341), Francis D. Williams House (TAU.320), Stone House (TAU.323), Captain David Vickery House (TAU.326), Alfred Paull House (TAU.294), Weir Engine House (TAU.296), and the now partially demolished Old Weir Stove Company (TAU.319) (Fitch 1983).

HISTORICAL NARRATIVE

Weir Village emerged in the nineteenth century as the commercial port and shipbuilding center that accommodated the booming industrial city of Taunton. The site was ideal as an inland port for coastal trade in the city due to its location along the Taunton River, which was (at the time) the northernmost point of ship navigability, one mile south of Taunton center. The Taunton River provided access to nearby communities for importing agricultural goods and exporting raw materials and manufactured products from the city. The area served as a center for several manufacturing companies that produced stoves, iron, copper, and brick.

Although Weir Village was most significant during the late nineteenth century, it had developed as a residential community by 1727. After the Revolutionary War, the local economy expanded and Weir Village became a major distribution center for iron, brick, and nails to local cities including New York, Providence, and Newport, with shipyards, iron foundries, and brick manufacturing shops constructed along the river. Early industries in Weir Village included the Taunton Copper Manufacturing Company (TAU.315), established to provide materials for ship hulls and fittings; the

prolific Taunton Iron Works (TAU.318); the Weir Stove Company (TAU.316, TAU.319), which became one of the country's most significant manufacturers of the Glenwood Range; and the Union Stove Lining Company (TAU.317), which supplied the local stove manufacturing business. In 1835, the introduction of the Taunton Branch Railroad contributed to efficiency in trade and accessibility of products through the Weir Village Area. Two additional railroad lines were constructed through the area, including the New Bedford Railroad in 1840 and the Middleboro Railroad in 1853. By the late nineteenth century, as Taunton's textile industry was prevailing, Cohannet Mill No 3 (TAU.AG) (the only remaining property associated with this period in the area) was constructed in 1890 at the northeastern corner of the Weir Village Area.

Although the most significant manufacturing properties within the Weir Village Area have been demolished, a few notable buildings associated with the industrial development of the area remain. These include early residential properties constructed of locally produced materials, such as the brick Allen House (TAU.304) and P. Dunbar House (TAU.305), built ca. 1830. There are residences of sea captains who managed local trading companies, Capt. David Vickery House (TAU.326), constructed ca. 1795, and Capt. Benjamin Burt House (TAU.324), built ca. 1820; and properties constructed by locally prominent manufacturers, including the Stone House (TAU.323), a multi-family boarding house built by lumber business tycoon George Williams in ca. 1847. Commercial buildings include the highly-altered Commercial Block (TAU.299), built ca. 1870, and ecclesiastical properties include the Sacred Heart Roman Catholic Church, constructed ca. 1905, which replaced a ca. 1860 Greek Revival style church. The Weir Engine House (TAU.296) stand as a testimony to Taunton's public service facilities built in conjunction with economic and physical growth. Other notable properties include the Sylvanus Staples House (TAU.310), associated with the most prominent industrialist in the Weir Village Area. With partner William Philips, Sylvanus Staples launched the most productive iron, coal, and lime freighting business in Taunton (Siergiej 2006; Walling 1852; 1858; Beers 1871; Everts & Richards 1895; Fitch 1983; T.W. 1979).

Since 1979, several institutional, commercial, and residential properties listed on the MHC Inventory have been demolished, including the Commercial Building at Weir Street (TAU.295), Weir Grammar School (TAU.309), B. Porter House (TAU.312), and the Staples Block (TAU.300). Due to the loss of key industrial complexes significant to the integrity of the area [Taunton Pearl Works (TAU.309), Taunton Copper Manufacturing Company (TAU.315), portions of the Old Weir Stove Company (TAU.319), Taunton Crucible Company (TAU.314), and the Taunton Iron Works (TAU.318)], Weir Village has lost a considerable amount of historic and architectural integrity and is therefore evaluated as not eligible for listing in the National Register of Historic Places.

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.AG	Cohannet Mill No. 3	120 Ingell Street	ca. 1890	Richardsonian Romanesque	10	NR
TAU.301	Welcome, S. P. C. House	14 First Street	ca. 1790	Federal		C
TAU.302	Ashley, N. House	17 First Street	ca. 1845	Greek Revival		C
TAU.303	Staples, A. J. House	21 First Street	ca. 1845	Greek Revival		C
TAU.304	Allen House	22 First Street	ca. 1850	Greek Revival		C
TAU.305	Dunbar, P. House	24 First Street	ca. 1850	Cape Cod		C
TAU.306	Blood, H. House	26 First Street	ca. 1850	Greek Revival		C
TAU.307	Smith, Samuel House	32 First Street	ca. 1860	Greek Revival/ Italianate		C
TAU.297	Cohannet Mill No. 3	120 Ingell Street	ca. 1890	Richardsonian Romanesque	10	C*
TAU.736	Cohannet Mill No. 3 Boiler House	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
TAU.690	Cohannet Mill No. 3 Cotton Storehouse	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
TAU.735	Cohannet Mill No. 3 Engine Room	120 Ingell Street	ca. 1890	Richardsonian Romanesque		C*
TAU.320	Williams, Francis D. House	3 Plain Street	ca. 1830	Greek Revival	9	NR
TAU.321	Talbot, Lemuel T. House	9 Plain Street	ca. 1845	Greek Revival		C
TAU.322	Residence	13 Plain Street	ca. 1845	Greek Revival		C
TAU.323	Stone House	15-17 Plain Street	ca. 1847	Greek Revival	8	NR
TAU.324	Burt, Capt. Benjamin House	20 Plain Street	ca. 1820	Federal		C
TAU.325	Williams, G.W. House	26 Plain Street	ca. 1845	Vernacular		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
TAU.326	Vickery, Capt. David House	33 Plain Street	ca. 1795	Federal		NR
TAU.311	Godfrey, W. L. House	18 Second Street	ca. 1845	Greek Revival		C
TAU.310	Staples, Sylvanus N. House	21 Second Street	ca. 1837	Greek Revival		NR
TAU.340	Dunbar, P. House	312 Somerset Avenue	ca. 1860	Greek Revival		C
TAU.341	Thomas, H. P. House	322 Somerset Avenue	ca. 1887	Queen Anne		NR
TAU.342	Presbrey, C. C. House	343 Somerset Avenue	ca. 1858	Greek Revival		C
TAU.308	Staples House	365 Somerset Avenue	ca. 1865	Italianate		C
TAU.313	Stevens, C.H. House	33-35 Third Street	ca. 1845	Greek Revival		C
TAU.290	Seekell House	Weir Street	ca. 1850	Greek Revival		C
TAU.294	Paull, Alfred House	467 Weir Street	ca. 1860	French Second Empire		NR
TAU.296	Weir Engine House	530 Weir Street	1889	Vernacular/ Queen Anne		NR
TAU.319	Old Weir Stove Company	West Water Street	ca. 1902	Renaissance Revival		NR
TAU.317	Union Stove Lining Company	West Water and Fifth Streets	ca. 1888	Vernacular		C
TAU.316	Weir Stove Company	West Water and Fourth Streets	ca. 1900	Renaissance Revival		C
TAU.299	Commercial Block	65-73 West Water Street	ca. 1870	Vernacular	3	C

* Properties contributing to the individually listed NR property, Cohannet Mill No. 3 (TAU.AG).

NR Property listed in the National Register of Historic Places
C Contributing property to the area

Note: Taunton Copper Manufacturing Company (TAU.315; NR listed 1984) is not included in the data sheet, as it has been demolished.

Residences at 27, 25, and 23 Second Street (l-r), view looking east.

Commercial Block (TAU.299), view looking northwest down West Water Street.

Allen House (TAU.304) and P. Dunbar House (TAU.305) (l-r), view looking west.

Sacred Heart Roman Catholic Church, view looking northeast from First Street.

Rectory at 311 Somerset Avenue, view looking northwest.

Stone House (TAU.323), view looking southeast from Plain Street.

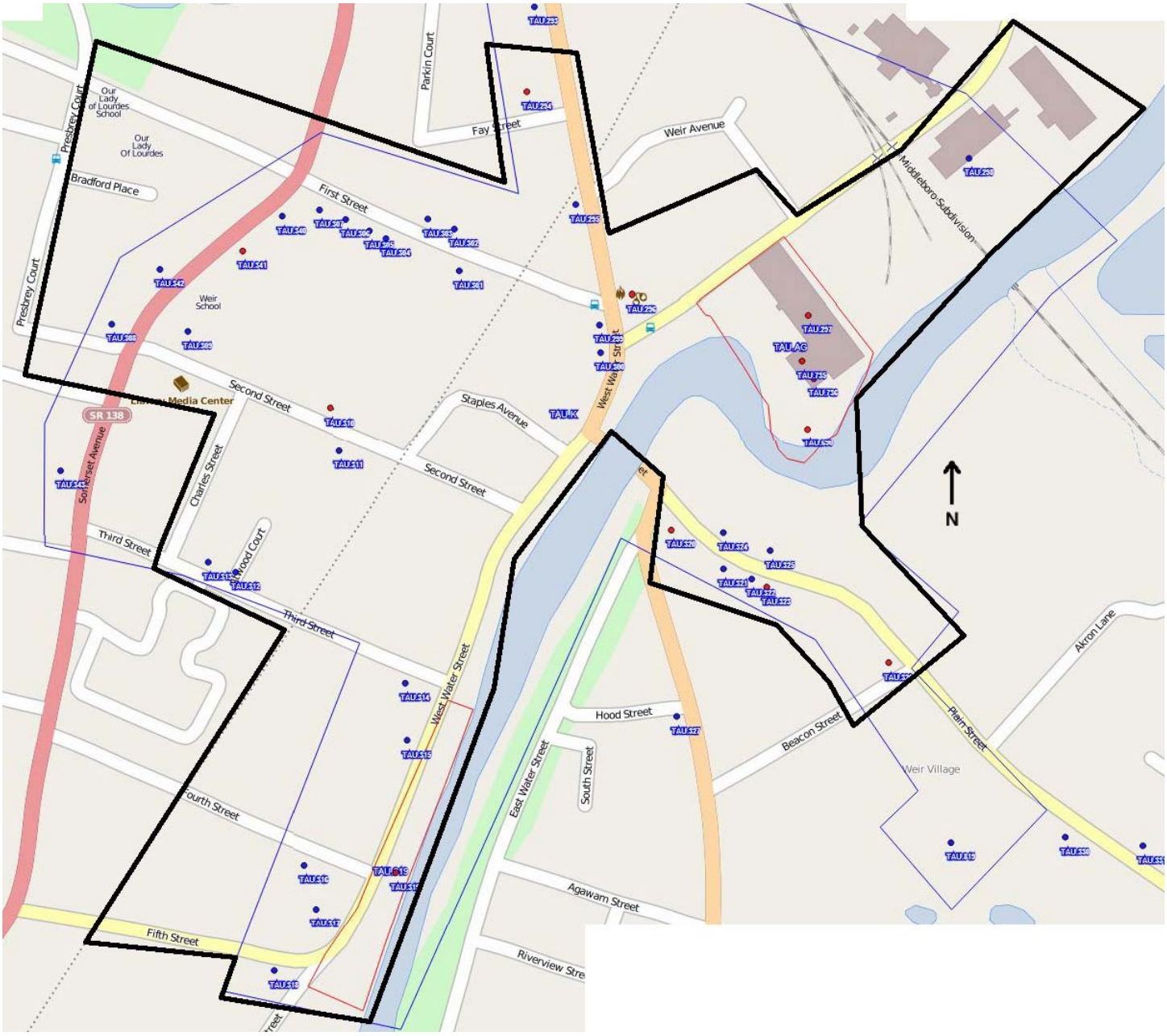
Francis D. Williams House (TAU.320), view looking southeast from Plain Street.

Weir Engine House (TAU.296), view looking east from Weir Street.

Cohannet Mill No. 3 (TAU.AG), view looking northwest down Ingell Street.

Old Weir Stove Company (TAU.319), view looking southeast down West Water Street.

AREA MAP



- MHC Inventory
- National Register Listed
- = area boundary
- *not to scale

Information from MACRIS Maps 2.0 Beta http://maps.mhc-macris.net

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):*

Name of Area: Hart Street Area

Present Use: Residential

Construction Dates or Period: mid-19th to early-20th c.

Overall Condition: Good

Major Intrusions and Alterations: None

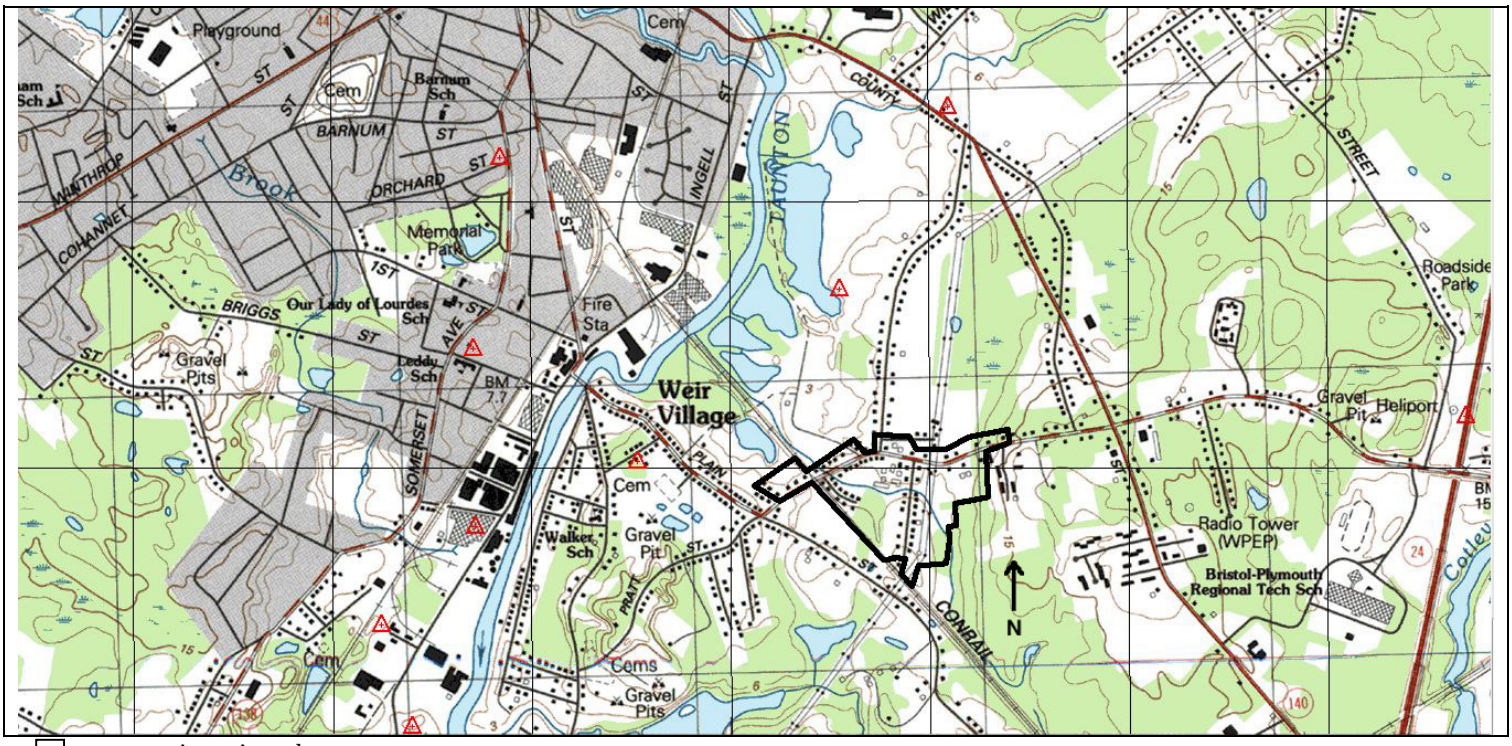
Acreage: Approx. 45

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Hart Street Area is an irregularly-shaped area located in East Taunton, east of the Taunton River. The area is primarily residential centered along Hart Street, demarcated by the intersection of Columbus Boulevard and Linden Street to the north and William Avenue to the south. Alegi Street and Williams Avenue on the south side of the area dead-end at the MBTA Stoughton Line right-of-way, which runs along the southwest boundary. The buildings are sited relatively close to the street with scattered, mature vegetation between each property. Lots in the eastern section of the area are larger with more open green space than the lots in the western part of the area. The area encompasses 73 properties, of which 60 contribute to its historic character and architectural significance.

The buildings within the Hart Street Area represent vernacular domestic interpretations of popular late-nineteenth- and early-twentieth-century styles including Greek Revival, Italianate, Queen Anne and Colonial Revival. Most were originally constructed as single-family houses, primarily oriented with the gable end to the street (79 and 81 Hart Street). A row of nine, gable-front vernacular cottages arranged on narrow, long lots on the south side of Hart Street were constructed to house the influx of working class residents in the early twentieth century (43-57½ Hart Street). Although only a few worker cottages in the area have been definitely linked to specific companies, it is possible others were built by the J.W. Hart & Company Brickyard (not extant) which constructed two worker houses at 1 and 5 Fayal Avenue ca. 1900. Although most of the smaller worker cottages lack any or have very little stylistic detail, several larger, older residences have more architectural ornamentation such as 99 Hart Street. This Queen Anne style residence was constructed ca. 1880 for the prominent early Taunton Williams family, who also owned houses at 20 and 104 Hart Street.

Several of the properties originally contained a house with multiple accompanying commercial and agricultural outbuildings. Grocery stores were located at 28 and 39 Hart Street and 114 Linden Street in the early twentieth century. Two of these have since been converted fully into residences and one is vacant. There was also a lumber yard and oil and ice company along Hart Street in the 1940s (69 and 93 Hart Street). Williams Avenue was primarily agricultural and hosted to a poultry farm at 5 Williams Avenue and a greenhouse business at 30 Williams Avenue.

Over time, some houses in the Hart Street Area have been altered to meet current needs, and some have been converted from single-family to multi-family use. Several of the properties with agricultural outbuildings show deterioration from deferred maintenance. However, most structures retain their original massing and form, and several have intact original materials. Some mid- to late-twentieth century infill has also occurred, but the area still retains its original streetscape and setting. The one property listed in the MHC Inventory, 59 Hart Street (TAU.582), has been highly altered.

HISTORICAL NARRATIVE

The Hart Street Area was a fairly remote section in the east side of Taunton until the late nineteenth century. It was originally farmland, primarily owned by the locally prominent Hart and Williams families from the seventeenth through the nineteenth centuries. The Williams' were some of the earliest settlers in the seventeenth century and among the original landowners in Taunton's North and South Purchase. Establishing themselves primarily as farmers in East Taunton, they owned large amounts of land on the north and south sides of Hart Street. Several members of the Williams family are linked to former agricultural properties within the Hart Street area including the E. Williams House at 59 Hart Street (TUA.582) and the G.R. Williams House at 99 Hart Street.

The Hart family, like other long-standing families in Taunton including the Staples, Williams, and Godfrey families, established a brick factory in 1870. The J.W. Hart & Company brick yard was located on the east bank of the Taunton River near Hart and Linden Streets. Hart merged with the I.L. Stiles & Sons Brick Co. of Connecticut in 1913. The company was renamed Stiles & Hart Brick Company and had manufacturing locations at both the original J.W Hart & Company site off Hart Street and in Bridgewater, MA. The company vacated their Taunton yard in 1964 and consolidated the operation at a facility on Cook Street in Bridgewater. Today, the Stiles & Hart Brick Company is the only remaining brick manufacturer in Massachusetts (Sampson 1895; Williams 1979; Anon. 2012).

Residential construction along Hart Street increased in the early twentieth century with the success and expansion of the Stiles & Hart Brick Company and nearby Weir Village. Unlike other mill areas of Taunton where much of the housing was constructed near the factories on company property, many of the houses along Hart and Alegi Streets were built independently for the working class. By 1920, the Irish and Polish immigrants in the city, who had emigrated in the nineteenth century, were joined by a large Italian population. Italians built the Italian Social Club at 2 Columbus Boulevard in the early twentieth century. A 1979 interview with a former employee of the former J.W Hart & Company Amedeo Alegi reported that he began working in the brickyard in 1911 and lived at 86 Hart Street in the 'suburb' of Weir Village; as the Hart Street area was reportedly referred to in the early twentieth century (Williams 1979). Alegi's brother, Armando Alegi, lived at 39 Hart Street and owned a grocery store at 28 Hart Street. Amedeo Alegi mentioned a fellow worker, Gildo Mozzone, who later ran a construction company with his family at 69 Hart Street. The Mozzones eventually purchased the original J.W Hart & Company brickyard property site off Hart Street from Stiles and Hart in 1965. Although the brickyards are now vacant, the residential neighborhood still reflects the area's early roots in agriculture and its early twentieth century development as a working class neighborhood (Census 1920; Williams 1979; Polk 1940; Sampson 1930; Hanna 2007).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	3 Alegi Avenue	ca. 1920	Bungalow		C
	Residence	4 Alegi Avenue	ca. 1920	Vernacular		C
	Residence	5 Alegi Avenue	ca. 1930	Vernacular		C
	Residence	6 Alegi Avenue	ca. 1920	Vernacular		C
	Residence	7 Alegi Avenue	ca. 1930	Bungalow		C
	Residence	8 Alegi Avenue	ca. 1930	Vernacular		C
	Residence	10 Alegi Avenue	ca. 1930	Vernacular		C
	Residence	12 Alegi Avenue	ca. 1930	Vernacular		C
	Italian Social Club	2 Columbus Boulevard	ca. 1930	Vernacular		C
	J.W. Hart & Co. Worker Housing	1 Fayal Avenue	ca. 1900	Vernacular	2	C
	J.W. Hart & Co. Worker Housing	5 Fayal Avenue	ca. 1900	Vernacular	2	C
	Residence	16 Hart Street	ca. 1900	Queen Anne – altered		C
	Williams – Delane House	20 Hart Street	ca. 1860	Greek Revival		C
	Residence	22 Hart Street	ca. 2010	Colonial Revival		NC
	Residence	23 Hart Street	ca. 1920	Colonial Revival		C
	Residence	24 Hart Street	ca. 1900	Vernacular		C
	Residence	26 Hart Street	ca. 1910	Vernacular		C
	Residence	28 Hart Street	ca. 1950	Vernacular		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Belolli House	28½ Hart Street	ca. 1910	Colonial Revival		C
	Alegi House	30 Hart Street	ca. 1910	Vernacular		C
	Residence	33 Hart Street	ca. 1900	Vernacular		C
	Residence	37 Hart Street	ca. 1900	Vernacular		C
	Alegi, Armando House	39 Hart Street	ca. 1890	Vernacular		C
	Residence	43 Hart Street	ca. 1900	Vernacular		C
	Residence	45 Hart Street	ca. 1900	Vernacular		C
	Residence	47 Hart Street	ca. 1900	Vernacular		C
	Residence	49 Hart Street	ca. 1900	Vernacular		C
	Residence	51 Hart Street	ca. 1900	Vernacular	1	C
	Residence	53 Hart Street	ca. 1900	Vernacular	1	C
	Residence	55 Hart Street	ca. 1900	Vernacular	1	C
	Residence	55½ Hart Street	ca. 1900	Vernacular		C
	Residence	57½ Hart Street	ca. 1900	Vernacular		C
TAU.582	Williams, E. House	59 Hart Street	ca. 1865	Greek Revival – highly altered		C
	Residence	61 Hart Street	ca. 2010	Colonial Revival		NC
	Residence	65 Hart Street	ca. 2010	Colonial Revival		NC
	Mozzone House and Lumber Yard	69 Hart Street	ca. 1860	Greek Revival – altered/Cape		C
	Residence	76 Hart Street	ca. 1980	Colonial Revival/ Duplex		NC
	Residence	79 Hart Street	ca. 1890	Vernacular		C
	Residence	80 Hart Street	ca. 1920	Bungalow		C
	Williams, B. House	81 Hart Street	ca. 1880	Italianate – altered		C
	Residence	85 Hart Street	ca. 1900	Vernacular		C
	Residence	86 Hart Street	ca. 1930	Bungalow		C
	Residence	88 Hart Street	ca. 1900	Vernacular		C
	Residence	90 Hart Street	ca. 1920	Bungalow		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence (Vacant)	91 Hart Street	ca. 1900	Vernacular		C
	Residence	93 Hart Street	ca. 1870	Italianate – altered		C
	Residence	98 Hart Street	ca. 2000	Colonial Revival		NC
	Williams, G.H. House	99 Hart Street	ca. 1880	Queen Anne	3	C
	Residence	102 Hart Street	ca. 1960	Ranch		NC
	Williams, Everett A. House	104 Hart Street	ca. 1860	Greek Revival – altered		C
	Residence	110 Linden Street	ca. 1920	Bungalow		C
	Residence	110R Linden Street	ca. 1980	Colonial Revival/Cape		NC
	Gorda, Thomas House	114 Linden Street	ca. 1900	Colonial Revival/ Four-Square		C
	Gorda, Thomas Grocery Store	114 Linden Street	ca. 1910	Vernacular		C
	Residence	4 Williams Avenue	ca. 1880	Italianate		C
	Mozzone Poultry Farm	5 Williams Avenue	ca. 1880	Italianate		C
	Residence	7 Williams Avenue	ca. 2010	Colonial Revival		NC
	Residence	17 Williams Avenue	ca. 1900	Vernacular		C
	Residence	18 Williams Avenue	ca. 1900	Vernacular		C
	Residence	19 Williams Avenue	ca. 1880	Italianate – altered		C
	Residence	20 Williams Avenue	ca. 1890	Vernacular		C
	Residence	21 Williams Avenue	ca. 1880	Italianate – altered		C
	Residence	22 Williams Avenue	ca. 1890	Vernacular		C
	Residence	24 Williams Avenue	ca. 1970	Cape		NC
	Residence	25 Williams Avenue	ca. 2010	Vernacular		NC
	Residence	26 Williams Avenue	ca. 1870	Vernacular		C
	Residence	29 Williams Avenue	ca. 1970	Cape		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	30 Williams Avenue	ca. 1910	Vernacular		C
	Residence	35 Williams Avenue	ca. 1970	Ranch		NC
	Residence	53 Williams Avenue	ca. 1930	Vernacular		C
	Residence	63 Williams Avenue	ca. 1930	Bungalow		C
	Residence	69 Williams Avenue	ca. 1890	Vernacular/ Duplex		C
	Residence and Barns	73 Williams Avenue	ca. 1830	Vernacular	4	C

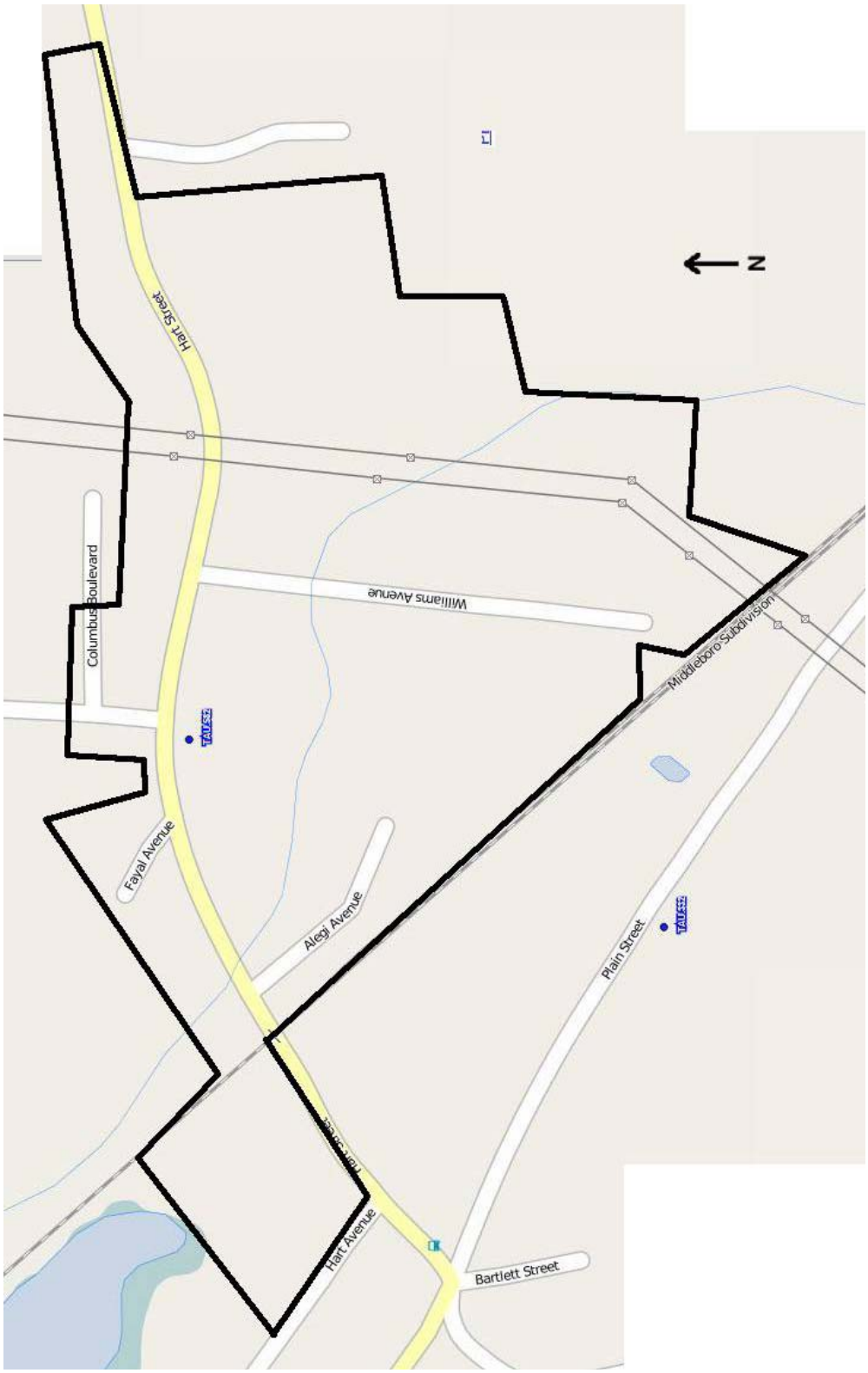
C Contributing property to the district
NC Non-contributing property to the district

1 and 5 Fayal Avenue, view looking northwest.

99 Hart Street, view looking southeast.

Barns on Williams Avenue, view looking southeast.

AREA MAP



- MHC Inventory
- National Register Listed

= area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Quinn R. Stuart, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Hart Street Area is recommended eligible for listing in the National Register at the local level under Criteria A and C in the areas of Planning and Development and Architecture. Under Criterion A, the area is significant for its role in the settlement in East Taunton in the seventeenth and eighteenth centuries and for its role in the establishment of the Italian and Portuguese immigrant populations in Taunton in the early twentieth century. Under Criterion C, the area is significant as an intact example of a late-nineteenth- to early-twentieth century worker housing village. Although some of the structures have been altered, the majority of the buildings retain their original setting, design and materials.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		See data sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Downtown Taunton/Taunton Green

Name of Area: Tremont Street Area

Present Use: Residential

Construction Dates or Period: Ca. 1850-1890

Overall Condition: Good

Major Intrusions and Alterations: There have been no major changes in the area. Some buildings have been modified, as discussed in the narrative.

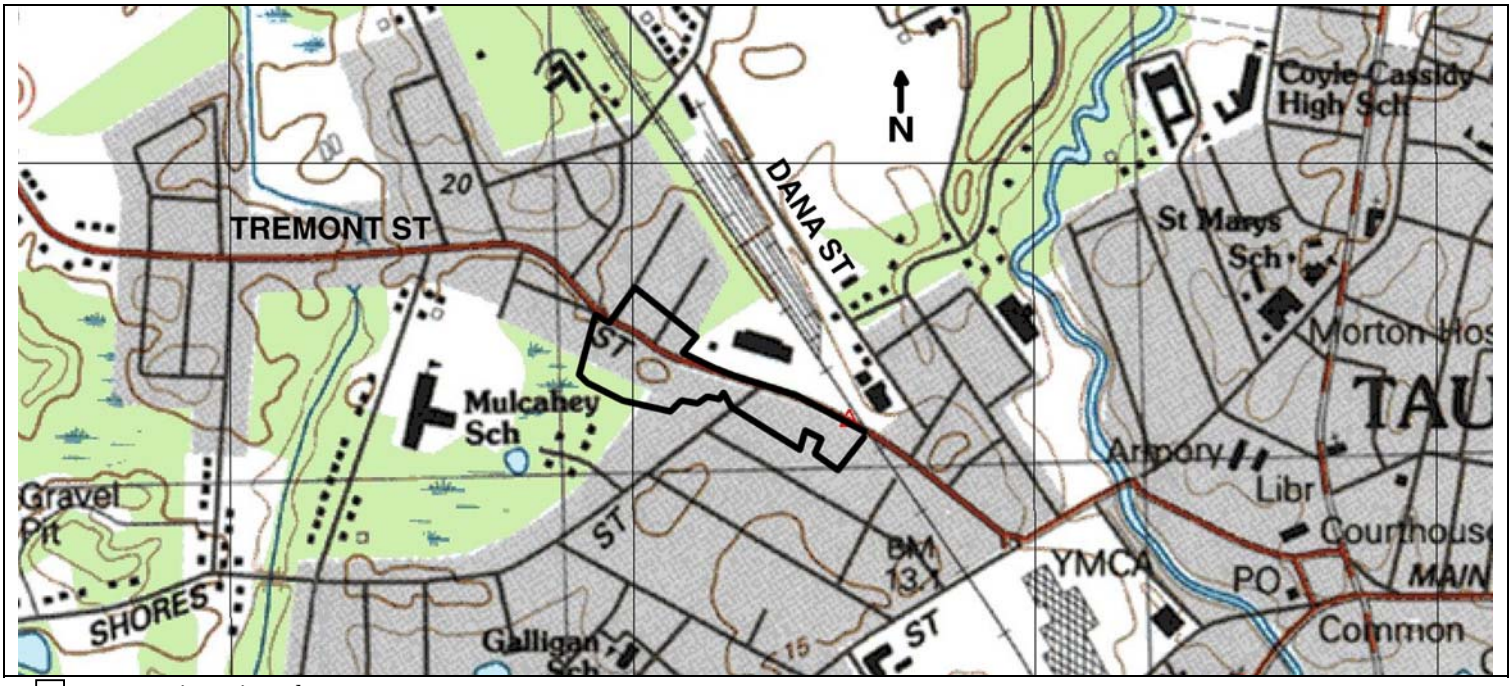
Acreage: Approx. 11

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Tremont Street Area is an 11-acre, linear corridor along Tremont Street extending north from the Attleboro Secondary grade crossing at Tremont Street to Horton Street It encompasses 28 residential properties that are situated in a relatively dense area, with approximately 30 feet between each building. Just outside of the area, to the north, lies a commercial complex. The residences were constructed between ca. 1850 and 1890 predominantly in the Italianate and Greek Revival style with select buildings in the French Second Empire and Queen Anne style. The houses are one-and-one-half to two-and-one-half story, wood-frame structures, usually with full-width or entrance porches, set back approximately 50 feet from the street. All of the buildings in the area retain their original siting, massing, and some of their ornamental features, but some have been altered through window replacement and the installation of vinyl siding.

With 16 Italianate, 9 Greek Revival, 1 French Second Empire, and 1 Queen Anne style building(s), the area has several properties that stand out as excellent examples of their style. The Harvey Claflen House, built ca. 1870, and the N.S. Mason House (TAU.494), built in 1865, are well-preserved examples of the Italianate style with bracketed eaves and paired, arched windows in the gable of the facade. While the one-and-one-half-story Claflen House has a full-width porch supported by simple, fluted columns, the two-and-one-half-story Mason House (TAU.494) has an elaborate, dentilated, wrap-around porch with heavily bracketed columns, pendants, and a delicate balustrade. Excellent representations of the Greek Revival style are also located within the area, including the T. Halloway – D.M Ferren House, built ca. 1850, is a typical one-and-one-half-story, low pitched, gable-front, three-bay building with a molded cornice, gable-end returns, and a simple entablature door surround. Similar in massing and treatment of the door surround and eaves, the H. Worsley House (TAU.495), built ca. 1850, has corner pilasters flanking the north-facing facade.

One property within the area, the N.S. Mason House (TAU.494), is individually listed in the National Register, as part of the 1984 Taunton MRA and another property, the H. Worsley House (TAU.495) is listed in the MHC Inventory.

HISTORICAL NARRATIVE

The predominantly residential Tremont Street Area (ca. 1850-1890) was developed during an area-wide street improvement project (with Bay, Somerset, and Weir streets) that would provide a stronger connection between surrounding residential (and industrial) areas with central services around Taunton Green (Fitch 1984). Likely attributed to road improvements, the Tremont Street Area was considered home to several middle-class laborers. In 1858, of the surveyed residents within the Tremont Street Area, the majority worked in industry, including three machinists and one overseer of the Rhodes Tack Works (outside of area). The tack works was operated by members of the Rhodes family, established by Stephen Rhodes in Taunton, until the business was relocated to New Bedford in 1891. Other resident occupations included one blacksmith and two unknown positions. By 1871, the occupations of area residents had transitioned, with the majority of surveyed individuals working as blacksmiths, with one machinist, one employee of the Boston and New York Express, one teacher, and one grocer (Adams 1861).

Properties such as the N.S. Mason House (TAU.494), built ca. 1865, and the Harvey Claflen House, built ca. 1870, illustrate the popularity of highly-ornamented Italianate design on side-hall buildings for the middle class after the Civil War (Winters 1980:30). Others, such as the T. Halloway – D.M Ferren House, built ca. 1850, and H. Worsley House

(TAU.495), built ca. 1850, represent one of the more popular building types constructed in the early to mid-nineteenth century often used by foremen and laborers who lived within close proximity to Taunton's industries. These side-hall plan residences were typically oriented with the gable end facing the street, to accommodate narrow residential lots in the city (Winters 1980:26).

Throughout the history of the Tremont Street Area, it has had one, small, local, commercial property that ran out of the rear of the residence at 40 Tremont Street. Ca. 1937, a small printing shop was constructed along the southern boundary of the property. By 1950, the shop expanded for the manufacturing of "die cut fabrics" (Sanborn Map Company 1937; 1950).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Clark, B. House	30 Tremont Street	ca. 1850	Greek Revival	1	C
	Clark, W. House	32 Tremont Street	ca. 1850	Greek Revival	1	C
	Coddington Estate	34 Tremont Street	ca. 1880	Italianate	1	C
	Murphy, W.B. House	36 Tremont Street	ca. 1870	French Second Empire	1	C
	Tinkham, J. House	38 Tremont Street	ca. 1860	Greek Revival		C
	Claflen, Harvey House	40 Tremont Street	ca. 1870	Italianate	5	C
	Smith, H. House	42 Tremont Street	ca. 1850	Greek Revival		C
	Halloway, T. – Ferren, D.M House	46 Tremont Street	ca. 1850	Greek Revival		C
	Dalglish, R. House	48 Tremont Street	ca. 1850	Greek Revival		C
	Walker, F. – French, L. House	50 Tremont Street	ca. 1850	Greek Revival		C
	Newhall, William House	52 Tremont Street	ca. 1870	Italianate (Altered)		C
TAU.494	Mason, N. S. House	58 Tremont Street	ca. 1865	Italianate	3	NR
	Mason, N.S. Apartment House	60 Tremont Street	ca. 1880	Italianate		C
	Mason, N.S. Apartment House	62 Tremont Street	ca. 1880	Italianate		C
TAU.495	Worsley, H. House	64 Tremont Street	ca. 1850	Greek Revival	4	C
	Briggs House	68 Tremont Street	ca. 1870	Italianate		C
	Residence	69 Tremont Street	ca. 1890	Italianate		C
	Drake, C. House	70 Tremont Street	ca. 1890	Italianate		C
	Cleary, W. House	71 Tremont Street	ca. 1870	Italianate		C
	Residence	73 Tremont Street	ca. 1890	Queen Anne		C
	Drake, J.C. House	74 Tremont Street	ca. 1850	Italianate		C
	Residence	75 Tremont Street	ca. 1890	Italianate		C
	Smith, W. House	77 Tremont Street	ca. 1870	Italianate		C
	Swan, George House	78 Tremont Street	ca. 1860	Greek Revival	2	C

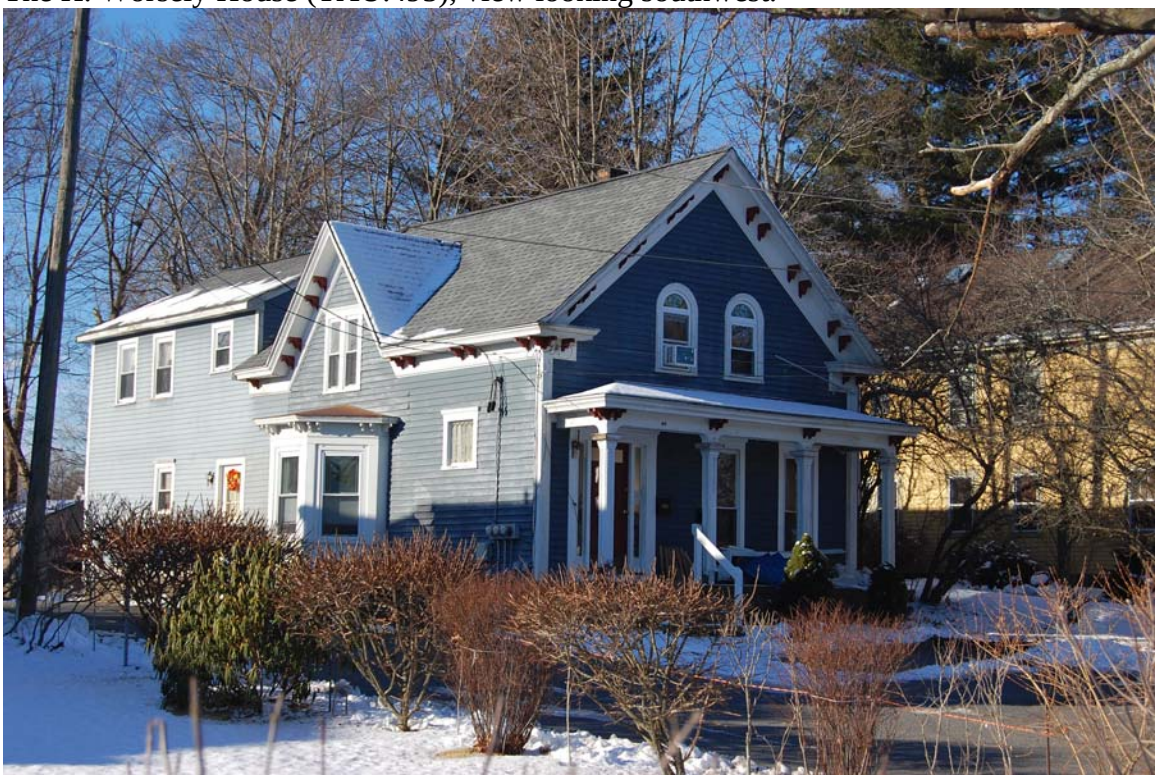
MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Halloway, M.M. House	80 Tremont Street	ca. 1870	Greek Revival	2	C
	Briggs, George House	82 Tremont Street	ca. 1880	Italianate	2	C
	Residence	83 Tremont Street	ca. 1890	Italianate		C
	Haskins Apartment House	84 Tremont Street	ca. 1880	Italianate	2	C

NR Property is listed in the National Register of Historic Places
C Contributing property to the district

George Swan House, M.M. Halloway House, George Briggs House, and Haskins Apartment House (l-r), view looking west.

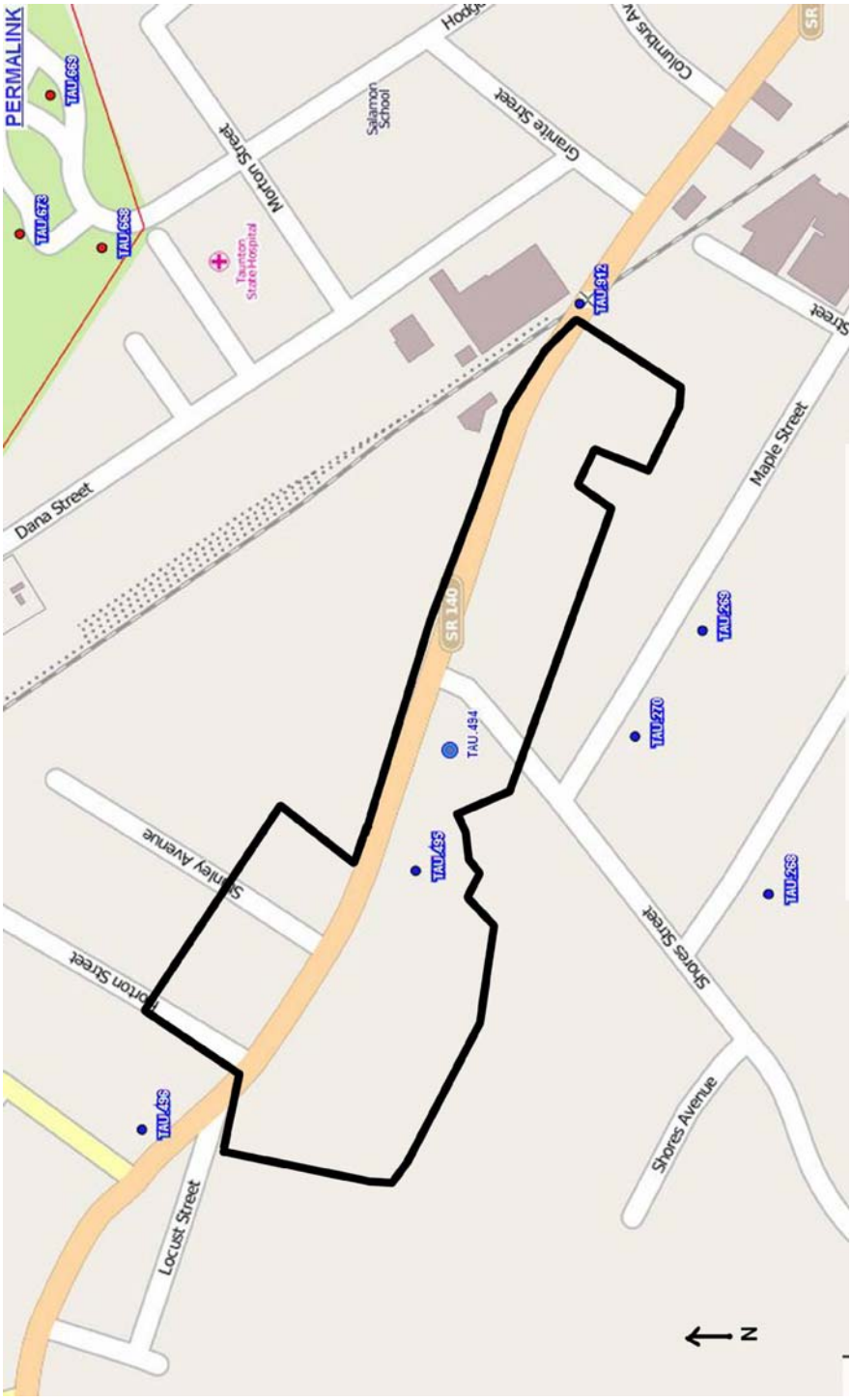
N.S. Mason House (TAU.494), view looking southwest.

The H. Worsely House (TAU.495), view looking southwest.



The Harvey Claflen House, view looking southwest.

AREA MAP



- MHC Inventory
- National Register Listed

\ = area boundary

*not to scale

Information from MACRIS Maps 2.0 Beta

http://maps.mhc-macris.net/

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Tremont Street Area is eligible for listing in the National Register of Historic Places under Criteria A and C at the local level in the areas of community development and architecture. Under Criterion A, the area has important associations with mid-nineteenth-century residential development of the Taunton development surrounding Taunton Green. Under Criterion C, the area is significant for its excellent collection of well-preserved Italianate and Greek Revival style residential architecture constructed between ca. 1850 and ca. 1890.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Taunton		

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: Taunton

Place *(neighborhood or village):* Downtown Taunton/Taunton Green

Name of Area: Hodges Avenue Area

Present Use: Residential, Industrial

Construction Dates or Period: 1860 - 1930

Overall Condition: Good

Major Intrusions and Alterations: None

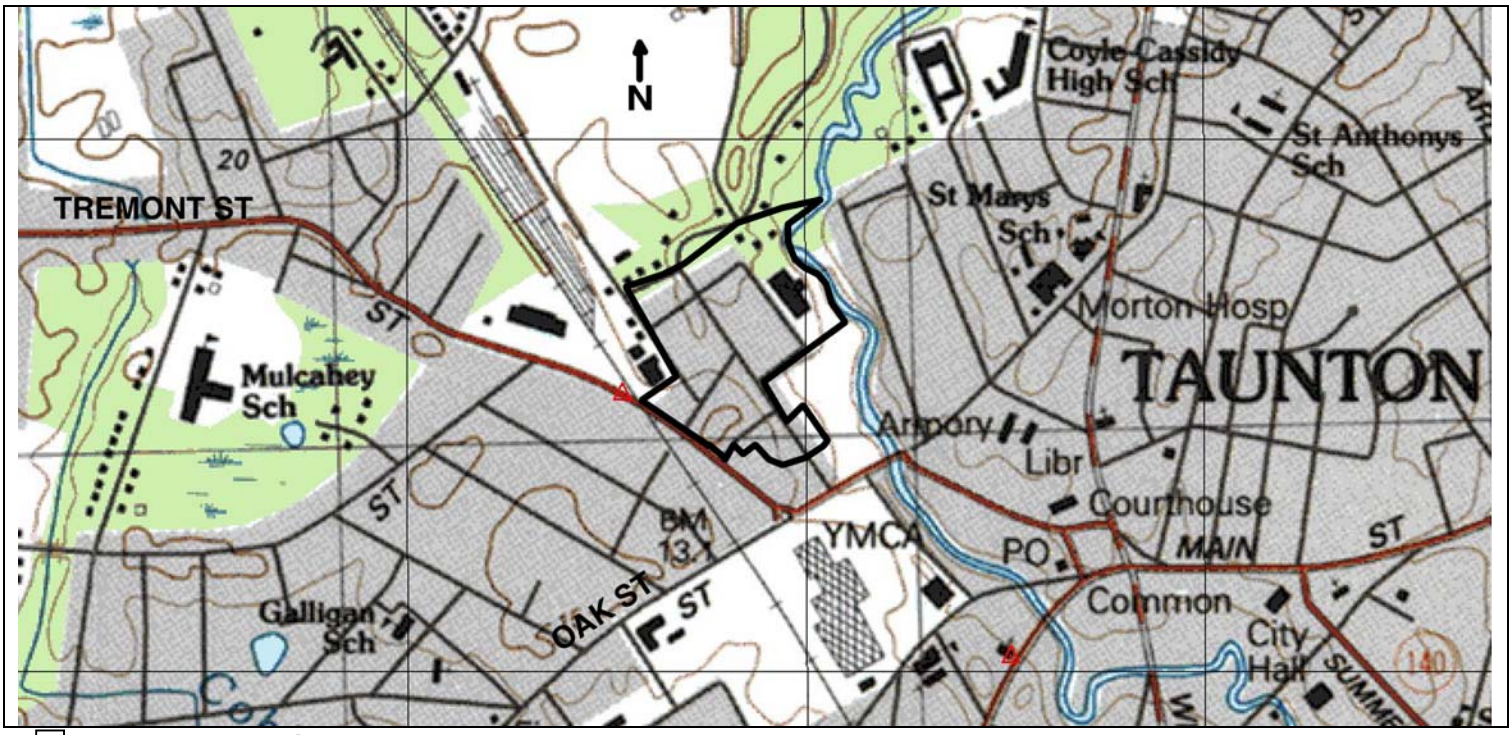
Acreage: Approx. 22

Recorded by: Q. Stuart, K. Miller, A. Cahoon

Organization: PAL

Date *(month/year):* December, 2012

Locus Map



☐ *see continuation sheet*

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Hodges Avenue Area is an irregularly shaped neighborhood located on the northeast side of the MBTA right-of-way near Tremont Street. It is primarily multi-family residential housing centered along Hodges Avenue, demarcated by Morton Street to the north, Chandler Street to the east, and Tremont Street to the southwest. The area is comprised of 72 properties sited close to the street on lots relatively equal in size with scattered, mature vegetation between each property.

The buildings within the Hodges Avenue Area represent vernacular interpretations of popular domestic styles from the late-eighteenth and early-nineteenth century including Italianate, Queen Anne, Second Empire and Colonial Revival, as seen in varying degrees of ornamentation at 6 Morton Street and 26 Hodges Avenue. Most were constructed as two- to two-and-one-half-story multi-family houses, primarily oriented with the gable end to the street for working class families (9-15 Hodges Avenue). A few of the houses in the area, such as 6 Morton Street (ca. 1890) and 19 Dana Street (ca. 1900), were originally constructed at a smaller scale as one-and-one-half-story, single-family houses, but have since been converted into multi-family residences. The most prominent residence in the Hodges Avenue Area is at 43 Chandler Street. This Italianate-style house was constructed for George F. Pratt, a Bristol County treasurer, ca. 1880 with an Italianate-style, one-and-one-half-story carriage house at the rear of the property. Most of the Pratt House's architectural details remain with few modern replacement materials.

Although the area was predominately residential, some industrial and commercial properties were located on Chandler Avenue. The two-story, Italianate-style, brick industrial loft at 33 Chandler Street was constructed for the Canoe River Mill in 1875 for the production of cotton textiles. The mill complex was expanded throughout the twentieth-century by its second occupants, the Diamond Textile Mill, but the main loft remains relatively intact. An ice plant was constructed at 12 Chandler Street, directly opposite the Canoe River Mill Complex, in the early twentieth century. The one-story, brick ice factory building with a wood-frame monitor was converted to apartments in the late twentieth century.

Some mid- to late-twentieth century infill has also occurred, but the area still retains its original streetscape and setting. Over time, some houses have been modified to meet current needs primarily with the replacement of exterior materials and windows; however most structures retain their original massing and form.

HISTORICAL NARRATIVE

The Hodges Avenue Area was a fairly remote area in Taunton until the mid- to late-nineteenth century. It was farmland, primarily owned by William Hodges in the late-eighteenth and early-nineteenth centuries. Hodges was a descendant of one of Taunton's "twelve-shilling men," also named William Hodges, who came to the settlement after the original forty-six families and paid twelve shillings into a common fund for the right to share in any subsequent land divisions. The younger Hodges owned the property along the north side of Tremont Street and most likely constructed the house at 23 Tremont Street ca. 1830. Hodges' son William C. Hodges inherited the property from his father in the 1850s. William C.'s sister, Mrs. Mary C. Hodges-Dean, had acquired the property from her brother by 1871. Mary had married Robert S. Dean in 1832 and lived at his estate 51 Tremont Street (now demolished), but she continued to retain her own significant amount of real estate. The couple divorce in 1874 and she moved back to her property at 23 Tremont Street where she ran a boarding house (Hanna 2007; Dunbar 1836; Walling 1858; Beers 1871; Sampson 1874).

Continuation sheet 1

At approximately the same time Mrs. Dean acquired the property along Tremont Street, Hodges and Chandler avenues and Norton (now Morton) and Dana streets were laid out and Granite Street was extended past Tremont Street, most likely by the Hodges family. Housing lots were also laid out and by 1871 five residences were constructed; one has since been demolished. One of these buildings, at 12 Morton Street, was constructed by Miss Rebekah Ashley for use as a boarding house ca. 1870. E.C. Strange also built several houses along Chandler Avenue and Morton in the 1870s and 1880s (47 Chandler Avenue and 10 Morton Street), presumably to house employees of his nearby Strange Cylinder Saw Manufacturing Company (not extant). Mrs. Mary C. Dean constructed two additional tenements on her property by 1886 (4 Granite Street and 3 Columbus Avenue). By 1895, Mrs. Dean had divided the remainder of her property and sold it for residential development (Beers 1871; Walker 1886; Everts and Richards 1895).

Most of the housing in the area is typical Taunton worker housing constructed in the late-nineteenth and early-twentieth centuries. However, unlike many other areas of Taunton, this neighborhood did not appear to develop around or by a single mill or company. The area surrounding the neighborhood was heavily built up with mills and factories, including the White Warner and Co. Stove Foundry between Dana Street and the New York, New Haven, and Hartford Railroad right-of-way; the Dean Cotton & Machine Co. Works along the Mill Rive off Washington Street; and the William Mason & Co. Machine Works at Westminster and Washington streets. The majority of these industrial complexes are not extant. Within the Hodges Avenue Area were several smaller manufacturers including the Canoe River Mill at 33 Chandler Street who produced cotton textiles; the P.P. Case Co. at 11 Granite Street manufacturer of top roll covers used in the textile industry; and an ice plant at 12 Chandler Street. The third County Jail was constructed at the corner of Chandler and Hodges avenues, across from Columbus Avenue, in 1873. The jail was demolished and replaced by a Taunton Community Housing complex in the 1960s. A large addition was added to the south end of the Canoe River Mill loft building at 33 Chandler Street in the mid- to late twentieth century. Residential construction within the area increased in the early twentieth century as a reaction to the success of the surrounding industries; however many were modified throughout the twentieth century with replacement windows and exterior materials.

Due to the loss and alteration of manufacturing complexes, and the lack of cohesion derived from identifiable significant associations to Taunton's history, the Hodges Avenue Area is not eligible for listing in the National Register of Historic Places (Sanborn 1898; Everts and Richards 1895; Hanna 2007).

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AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	4 Chandler Avenue	ca. 1890	Italianate		C
	Residence	6 Chandler Avenue	ca. 1920	Colonial Revival – altered		NC
	Ice Plant	12 Chandler Avenue	ca. 1910	Italianate		C
	Residence	30 Chandler Avenue	ca. 1900	Italianate		C
	Canoe River Mill – Diamond Textile Mills, Inc.	33 Chandler Street	ca. 1880; ca. 1990 addition	Italianate/Loft	4	C
	Pratt, George F. House	43 Chandler Street	ca. 1880	Italianate	3	C
	Pratt, George F. Carriage House	43 Chandler Street	ca. 1880	Italianate	3	C
	Strange, E.C. House	47 Chandler Street	ca. 1870	Vernacular		C
	Residence	3 Columbus Avenue	ca. 1870	Italianate		C
	Residence	4 Columbus Avenue	ca. 1890	Queen Anne – altered		C
	Residence	6 Columbus Avenue	ca. 1890	Italianate		C
	Residence	7 Columbus Avenue	ca. 1900	Queen Anne – altered		C
	Residence	8 Columbus Avenue	ca. 1900	Queen Anne - altered		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	9 Columbus Avenue	ca. 1900	Queen Anne		C
	Residence	9 Dana Street	ca. 1900	Vernacular		C
	Residence	11 Dana Street	ca. 1990	Colonial Revival/Cape		NC
	Residence	19 Dana Street	ca. 1900	Vernacular		C
	Residence	3 Granite Street	ca. 1890	Italianate – altered		C
	Dean, Mrs. Mary Tenement	4 Granite Street	ca. 1880	Italianate		C
	Residence	5 Granite Street	ca. 1890	Italianate		C
	Residence	10 Granite Street	ca. 1890	Italianate – altered		C
	Case, Pardon P. Residence and Factory	11 Granite Street	ca. 1880	Italianate – altered		C
	Residence	13 Granite Street	ca. 1890	Vernacular		C
	Dean, Mrs. Mary Tenement	14 Granite Street	ca. 1880	Italianate		C
	Residence	9 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	10 Hodges Avenue	ca. 1890	Italianate – altered		C
	Residence	11 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	12 Hodges Avenue	ca. 1890	Colonial Revival		C
	Residence	13 Hodges Avenue	ca. 1890	Italianate	1	C
	Residence	14 Hodges Avenue	ca. 1890	Italianate		C
	Residence	15 Hodges Avenue	ca. 1890	Vernacular	1	C
	Holmes, C. R. House	16 Hodges Avenue	ca. 1880	Italianate – altered		C
	Paul, J. House	17 Hodges Avenue	ca. 1870	Second Empire	1	C
	Residence	18 Hodges Avenue	ca. 1895	Italianate		C

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Eddy House	19 Hodges Avenue	ca. 1870	Italianate – altered		C
	Residence	20 Hodges Avenue	ca. 1895	Italianate		C
	Residence	26 Hodges Avenue	ca. 1900	Queen Anne	2	C
	Residence	30 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	32 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	33 Hodges Avenue	ca. 1890	Italianate		C
	Residence	34 Hodges Avenue	ca. 1890	Italianate		C
	Residence	35 Hodges Avenue	ca. 1890	Italianate – altered		C
	Residence	36 Hodges Avenue	ca. 1880	Italianate		C
	Residence	37 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	39 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	40 Hodges Avenue	ca. 1890	Italianate		C
	Residence	41 Hodges Avenue	ca. 1910	Colonial Revival		C
	Residence	43 Hodges Avenue	ca. 1910	Queen Anne		C
	Residence	44 Hodges Avenue	ca. 1890	Italianate		C
	Residence	45 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	46 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	47 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	48 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	50 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	51 Hodges Avenue	ca. 1960	Ranch		NC

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo Number	Status
	Residence	52 Hodges Avenue	ca. 1900	Queen Anne		C
	Residence	2 Morton Street	ca. 1880	Italianate		C
	Residence	4 Morton Street	ca. 1900	Queen Anne		C
	Residence	5 Morton Street	ca. 1920	Queen Anne		C
	Residence	6 Morton Street	ca. 1890	Italianate		C
	Residence	9 Morton Street	ca. 1900	Queen Anne		C
	Strange, E.C. Tenement	10 Morton Street	ca. 1880	Vernacular		C
	Ashley, Miss Rebekah Boarding House	12 Morton Street	ca. 1870	Italianate - Queen Anne alterations		C
	Residence	16 Morton Street	ca. 1910	Queen Anne		C
	Residence	18 Morton Street	ca. 1950	Ranch		NC
	Residence	19 Morton Street	ca. 1910	Queen Anne		C
	Residence	21 Morton Street	ca. 1910	Queen Anne		C
	Garrish, Charles H. House	22 Morton Street	ca. 1880	Italianate – altered		C
	Residence	23 Morton Street	ca. 1910	Queen Anne		C
	Residence	21 Tremont Street	ca. 1900	Colonial Revival/ Duplex		C
	Hodges, W.C. – Dean, M.C. House	23 Tremont Street	ca. 1830	Federal – altered		C
	Residence	27 Tremont Street	ca. 1890	Italianate		C

C Contributing property to the district
NC Non-contributing property to the district

26 Hodges Avenue, view looking west.

43 Chandler Avenue, view looking northeast.

33 Chandler Avenue, view looking southeast.

APPENDIX E-2
Addendum

Individual Properties
(alphabetical by community)

Revision and Addendum to 12 Individual Properties, March 15, 2013
Per MHC Comment Letter dated February 21, 2013, Map ID #s:

FR.003
FR.011
FR.050
FR.052
FR.053
FR.067
FR.110 (new form)
Ft.002
NB.010
NB.029
Ra.001
Ra.011

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
X-03-0005	Somerset		FLR.0284

Town/City: Fall River

Place: *(neighborhood or village)*:

Address: 4042 North Main Street

Historic Name: Hathaway, Jael House

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1785

Sources: Rosebrock 1977, Earl 1877, Hurd 1883

Style/Form: Federal

Architect/Builder: Unknown

Exterior Material:

Foundation: Parged Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
One detached, English style barn

Major Alterations *(with dates):*
Early-20th-century front porch addition, mid- to late-20th-century modifications in materials.

Condition: Fair

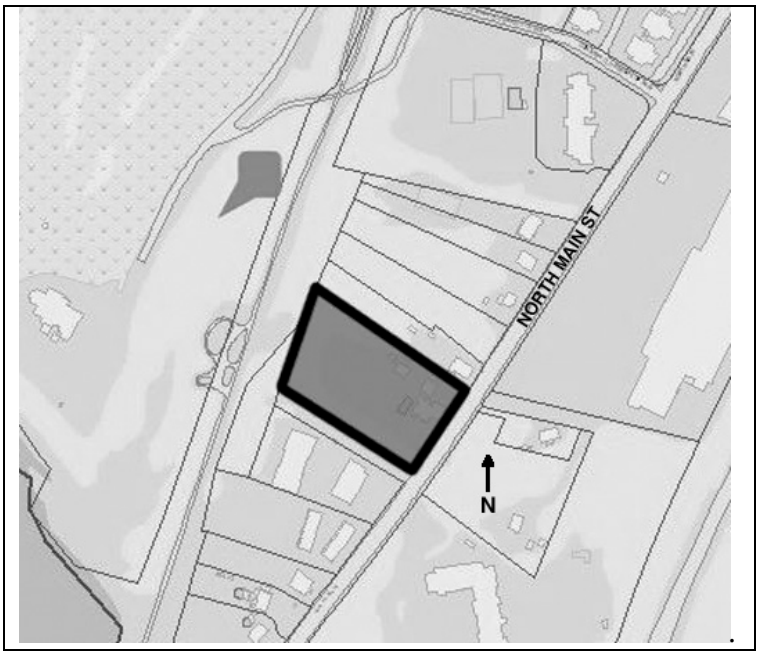
Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 2.5

Setting: The property is located along a thoroughfare in a mixed residential and commercial area, approximately 400 feet east of the Fall River Secondary right-of-way.

Photograph

Locus Map



Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Jael Hathway House at 4042 North Main Street, built circa 1785, is a rectangular, two-and-one-half-story, five-bay by three-bay, side-gabled, wood-framed, Federal style house with early 19th century and similarly styled one-story rear hipped-roof ell additions sheathed in clapboard and vinyl siding. The house shares a relatively flat, slightly sloping lot with a circa 1820 English barn, a non-historic outbuilding, and pool. A non-historic wooden fence extends across the eastern boundary line, interrupted by two sets of granite stairs, a walkway, and a paved driveway. Plantings immediately surround the footprint of the house. The building has an asphalt roof pierced by a large central brick chimney, wood-shingle siding, and a parged stone foundation. A molded cornice wraps around the roofline of the building, with returns at the gable end. Across the east-facing facade, the cornice is dentilated. The main entrance is simple, with Doric columns and pilasters with a beveled door surround and dentilated cornice. The fenestration is regular, with original openings and similarly styled six-over-one mixed historic double-hung wood sash and non-historic vinyl windows that have decorative exterior shutters. The detached English barn is a rectangular, side-gabled building oriented east, with an asphalt roof, clapboard siding, and a foundation not visible from the public way. The barn features prominent iron-strap hinged wooden doors built of diagonal boards with a simple door surround and a molded cornice. A similarly designed hay door and two-over-two double hung wood sash window, along with an iron hay fork, sit within a dominant centered gable. The façade also features two non-historic, single-pane, fixed windows with decorative exterior shutters.

HISTORICAL NARRATIVE

The property is reported to have been commissioned by Jael Hathaway, captain of a Freetown battalion of Loyalists during the American Revolution around 1785. The Jael Hathaway House was prominently situated on a raised landscape along a thoroughfare. The portion of Freetown that included this property was annexed to Fall River in 1858. A written description of the property from 1894 described the building as having a wood divided door, secured with a horizontal wood beam at the main entrance (French 1894:122). The first owner, for whom the house is named, was a former American Revolutionary War Loyalist captain named Jael Hathaway (1719-1811). Following his marriage in 1785, Hathaway allegedly bought the property for his new wife, Elizabeth. Between two wives, Hathaway bore nine children. The property subsequently remained in the Hathaway family for over a century, falling under the ownership of his son Russell, and his grandson David (State of Massachusetts 1739; Earl 1877; Hurd 1883; Winslow n.d.; Rosenbrock 1977).

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National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

The Jael Hathaway House at 4042 North Main Street in Fall River (FLR.0284) is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C, for its associations with a Revolutionary War Loyalist captain and as a rare surviving early local example of a Federal style house with an intact nineteenth-century barn.

Prepared by PAL, March 2013

This continuation sheet is a supplement to the existing inventory form.

HISTORICAL NARRATIVE (Continued)

Historical maps, census data, and nineteenth-century histories of Fall River do not provide any definitive information concerning the origins and use of Ashley's Lane and the associated wharf on the Taunton River. The Ashley family held a notable place in the history of Steep Brook, an early agricultural community along the Taunton River in Fall River. Maps of the mid and late nineteenth century show William, William H., and Job B. Ashley residing about 0.25 miles north of Ashley's Lane, on the east side of North Main Street. One of these residences, the Ashley House at 3159 North Main Street (FLR.276; now demolished) was listed in the National Register as part of the Fall River Multiple Resource Nomination in 1983. No maritime pursuits are recorded in historical documents for these persons. William Ashley is recorded in various documents as a trader and farmer. His son William H. Ashley identified himself as a grocer and was also a director on the boards of the Montaup and Weetamoe Mills in the city. During the nineteenth century, the wharf itself was located behind the properties of Henry Elsbury (a/k/a Elsbree). This name does not appear in standard histories of the city, although Henry Elsbree appears in the census rolls of the period as a farmer (Briggs Directory and Publishing Co. 1888; Earl 1877; Everts & Richards 1895; Hurd 1883; Rosebrock 1977; US Bureau of the Census 1850, 1880; Walker 1883; Walling 1852;).

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FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
	Fall River		

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Locus Map

Town/City: Fall River

Place *(neighborhood or village):* 207 Essex Street

Name of Area: St. Michael's Roman Catholic Church

Present Use: Ecclesiastical

Construction Dates or Period: 1896 - 1957

Overall Condition: Good

Major Intrusions and Alterations: None

Acreage: 2.180

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date *(month/year):* March, 2013

☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The St. Michael's Roman Catholic Church complex is comprised of three buildings located at the southwest corner of Essex and the Fall River Main Line railroad right-of-way. St. Michael's Roman Catholic Church (1896; 1921-22) sits on a property with the former French Second Empire style St. Michael's Rectory (1902) to the west and the Mid-Twentieth-Century Modern style St. Michael's School (1957) to the east. The topography is raised and retained by a concrete wall. Paved walkways and two sets of concrete stairs with iron railings fill in the remaining open land on the lot.

St. Michael's Roman Catholic Church was constructed in 1896 as a "basement" church and completed in 1921-1922. It is a rectangular-shaped, three-bay by six-bay, gabled Neo-Gothic Revival style brick building with a two-story central nave, flanking one-story aisles, and a contrasting high-style facade of wood-frame construction sheathed in concrete. The three-bay by one-bay, north-facing facade is divided into three sections, comprised from west to east of the nave, an aisle, and an aisle with a rectangular tower. This elevation has shaped parapet roofs with copper flashing, concrete panel sheathing distressed to resemble stucco, full-height corbelled concrete pilasters, a concrete sill sheathed in marble, and a concrete foundation. The prominent, central nave features a large, elaborate stained glass Tudor arch window with cast stone tracery and a concrete frame. Both aisle facades have small rounded-arch stained glass windows with cast stone tracery. All wood paneled doors are surrounded by thick concrete frames sheathed in marble, with flanking pointed marble pilasters and carved terracotta panels.

The remainder of the building consists of a gable-front nave and flanking flat-roofed additions with a copper cornice, stretcher bond brick walls with a soldier trim, and a concrete foundation. Thick brick pilasters capped with concrete decorate the walls of the aisles. The fenestration is regular with stained glass cast-stone tracery windows, concrete lintels, and concrete sills. The nave has Tudor arch windows, the aisles have paired trefoil arched windows with a concrete frame, and the additions have singular trefoil arched windows.

Constructed in 1902, St. Michael's Rectory is a rectangular, two-story, three-bay by four-bay, wood-framed, French Second Empire building with a hipped mansard roof. Since the period of significance, the rectory has been altered with the introduction of vinyl siding and vinyl replacement windows.

St. Michael's School was constructed in 1957 as a two-story, brick Mid-Twentieth-Century Modern style building with an irregular plan. The building has parapet roof with copper coping, a tall, narrow, brick chimney piercing the center of the flat roof, and two flanking bays extending from the north elevation. Above the main entrance are two inset terra cotta panels with ecclesiastical ornamentation and a slender terra cotta Latin cross extending from the parapet.

HISTORICAL NARRATIVE

The St. Michael's Roman Catholic Church was constructed in 1896 as a basement church to serve a large community of immigrants from the Azorean Islands of Portugal, who settled in Fall River in the late-nineteenth century. In 1902, the church expanded to include a French Second Empire style rectory adjacent to St. Michael's Church on Essex Street, which has since lost architectural integrity. By 1915, there was a significant influx of Portuguese to the city. In the early twentieth century, a few churches associated with the Portuguese community were constructed, but these are no longer

extant. Between 1921 and 1922, major additions were made to the basement church by the Charles Hodgate Company of Boston, MA, who constructed a Neo-Gothic Revival concrete building and facade. The center of a large Portuguese community, the church provided house calls while the church was temporarily closed while under construction. These house calls were carried out by Father John de Fontes Ferraz (Pastor from 1917 until 1944), who conducted baptisms and other religious ceremonies. After the church renovations were completed, the parish began looking for sites to house their school. In 1930, the parish purchased the Fulton Street School from the City of Fall River and four years later the parish received the Lindsey Street School (no longer extant) as a donation. It was not until 1957, when the parish purchased land to the east of the church to construct a new school (MHC 1982; St. Michael's Parish 2012).

St. Michael's Roman Catholic Church was built in an area with several religious buildings and structures, including St. Michael's Rectory, St. Matthew's Convent, St. Matthew's School, St. John's Cemetery, and St. Joseph's Church complex to the south (Sanborn Map Company 1933; 1933-1950). The building's construction occurred during a transitional period in Fall River history when construction in Fall River was moving from ecclesiastical buildings to educational buildings. Several massive ecclesiastical buildings were constructed in the late nineteenth century. Catholic properties built during this era included Saint Joseph's Roman Catholic Church (MHC No. FLR.240) and several properties constructed by Louis G. Destremps, a local architect of Catholic properties, including Saint Anne's Roman Catholic Church (MHC No. FLR.1534), Saint Anne's Rectory (MHC No. FLR.1535), Saint Anne's Convent (MHC No. FLR.1521), St. Joseph's Orphanage (MHC No. FLR. 1536), Notre Dame School (MHC No. FLR.1529), and the Jesus Marie Convent (FLR.1528) (MHC 1982).

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St. Michael's Parish, Fall River, MA
2012 "History," *St. Michael's Parish, Fall River, MA.* Available On-line at: http://smpfr.org/parish/history.

AREA DATA SHEET

MHC Number	Property Name	Address	Const. Date	Style/Form	Photo No.	Status
	St. Michael's Roman Catholic Church	207 Essex Street	1896; additions 1921-22	Neo-Gothic Revival	1, 2	C
	St. Michael's Rectory	207 Essex Street	1902	French Second Empire	1, 3	C
	St. Michael's School	207 Essex Street	1957	Contemporary	1, 4	C

C Contributing property to the area
NC Non-contributing property to the area

Photograph 2. St. Michael's Church, view southeast.

Photograph 3. St. Michael's Rectory, view southwest.

Photograph 4. St. Michael's School, view southwest.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

The St. Michael's Roman Catholic Church Complex at 207 Essex Street, consisting of a contributing church with two secondary buildings (church rectory and school), is eligible at the local level under Criteria A and C for its associations with the growing Portuguese community of Fall River in the early to mid-twentieth century and as an excellent example of an ecclesiastical Neo-Gothic Revival style. The period of significance for the complex extends from 1896, when the property was first developed, until 1957, when the St. Michael's School was constructed adjacent to the church as a replacement for two deteriorating school buildings located several blocks away from the church. The church is a well-preserved example the Neo-Gothic Revival style, which was uncommon in late-nineteenth- to early-twentieth-century Fall River. The 1921-1922 Neo-Gothic Revival style church building and facade was constructed by Charles Hodgate Company of Boston, MA. The property was first developed in 1896 as a basement church to serve a large community of immigrants from the Azorean Islands of Portugal. In 1902, the church expanded to include a French Second Empire style rectory just west of St. Michael's Church on Essex Street. The Mid-Twentieth-Century Modern style school was constructed in 1957 to accommodate the growing church community. Although the rectory has been altered with the introduction of vinyl siding and vinyl replacement windows, it retains integrity and architectural context within the complex with its original massing and form.

St. Michael's Roman Catholic Church Complex is also eligible as a contributing resource to the North End Roman Catholic Historic District, which also includes St. John's Cemetery, St. Matthew's School, and St. Matthew's Convent. Together, these abutting properties are eligible at the local level as a historic district under Criteria A and C. Under Criterion A, the district has important historical associations with the massive influx of foreign-born immigrants who filled manual labor positions at Fall River textile manufacturing companies and with the separation of immigrant communities by the Catholic church in the mid-nineteenth to early twentieth century. St. Michael's Roman Catholic Church was developed to accommodate the growing Portuguese community; St. Matthew's Church (also known as St.

Mathieu's Church; demolished in 1990), Convent, and School were developed for the French-Canadian community; and St. John's Cemetery accommodated the Irish population. The district's period of significance begins in 1850, with the establishment of the predominantly Irish St. John's Cemetery. The principal period of development occurred before1920, when Fall River's industrial economy collapsed due to the lowering of prices and competition with manufacturing companies in southern United States after World War I. The institutions continued to serve their respective congregations to varying degrees. The period of significance extends to 1957 when St. Michael's School was erected. The district is also eligible under Criterion C for its excellent local examples of Celtic style funerary art at St. John's Cemetery and uncommon ecclesiastical Neo-Gothic Revival style architecture at St. Michael's Church.

Prepared by PAL, March 2013

This continuation sheet is a supplement to the existing inventory form.

HISTORICAL NARRATIVE (Continued)

Developed to accommodate the St. Mathew's Church community, St. Matthew's Convent was constructed about 1920 within the St. Matthew's Church complex between St. Matthew's Church (constructed in 1893 and demolished in 1990) and St. Matthew's School (constructed ca. 1915). The convent is included in the Wellington-Brownell Street Area, along with other Roman Catholic properties in close proximity (such as the St. Michael's Church Complex and St. John's Cemetery).

St. Mathew's Church (otherwise known as St. Mathieu's Church) was likely constructed in response to the rapidly expanding immigrant community in the mid- to late-nineteenth century. Massive groups of French Canadian and Portuguese individuals were immigrating to the city to work in the textile mills. Until the construction of St. Anne's Church (FLR.AP) in 1869, St. Mary's Church (FLR.432) was the only Catholic institution in Fall River. St. Mathew's Church was built in 1893, likely to accommodate the French-Canadian Catholic community from St. Mary's Church (Everts & Richards 1895; Herald News Staff 1937).

St. Matthew's Church closed in 1989 following its final mass on Sunday, June 25 due to a decline in parishioners, a lack of clergy, and disrepair of the church building. Decline in church membership has been attributed to the construction of Massachusetts Route 79, which "disseminated" the community in the mid-twentieth century. The wood-framed church sheathed in stone bore two dominant, flanking towers on its facade, one of which had a large crack in the buttress—a dangerous condition that deemed the property a safety hazard to the neighborhood. Due to the crack and other major structural issues, without necessary funding to stabilize the building, the church was slated for demolition. Despite much opposition from former parishioners, the church was torn down in November 1990 (St. Matthew's Church; Foley 1990).

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Foley, Jack (Staff Photographer)
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1937 "First Catholic Church Built in Fall River Century Ago: Membership Has Increased Greatly Since Erection of St. John the Baptist Wooden Chapel; Many Parishes Established," *Herald News*. July 22. Fall River, MA.

St. Matthew's Church
n.d. "St. Mathieu's Church, Fall River, MA." Fall River Public Library Vertical Files, Fall River Drawer, Churches-Catholic (St. Matthew's). Fall River Public Library, Fall River, MA.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☒ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

St. Matthew's Convent is eligible for the National Register as a contributing resource to the North End Roman Catholic Historic District, which also includes St. Michael's Church Complex, St. Matthew's School, and St. John's Cemetery. Together, these abutting properties are eligible at the local level as a historic district under Criteria A and C. Under Criterion A, the district has important historical associations with the massive influx of foreign-born immigrants who filled manual labor positions at Fall River textile manufacturing companies and with the separation of immigrant communities by the Catholic church in the mid-nineteenth to early twentieth century. St. Michael's Roman Catholic Church was developed to accommodate the growing Portuguese community; St. Matthew's Church (also known as St. Mathieu's Church; demolished in 1990), Convent, and School were developed for the French-Canadian community; and St. John's Cemetery accommodated the Irish population. The district's period of significance begins in 1850, with the establishment of the predominantly Irish St. John's Cemetery. The principal period of development occurred before1920, when Fall River's industrial economy collapsed due to the lowering of prices and competition with manufacturing companies in southern United States after World War I. The institutions continued to serve their respective congregations to varying degrees. The period of significance extends to 1957 when St. Michael's School was erected. The district is also eligible under Criterion C for its excellent local examples of Celtic style funerary art at St. John's Cemetery and uncommon ecclesiastical Neo-Gothic Revival style architecture at St. Michael's Church.

Prepared by PAL, March 2013

This continuation sheet is a supplement to the existing inventory form.

HISTORICAL NARRATIVE (Continued)

Developed to accommodate the St. Mathieu's Church community, St. Mathieu's School was constructed about 1915 within the St. Mathieu's Church complex southeast of St. Mathieu's Church (constructed in 1893 and demolished in 1990). The school is associated with the St. Mathieu's Convent (constructed ca. 1920) and is included in the Wellington-Brownell Street Area, along with other Roman Catholic properties in close proximity (such as the St. Michael's Church Complex and St. John's Cemetery).

St. Mathew's Church (also known as St. Mathieu's Church) was likely constructed in response to Fall River's rapidly expanding immigrant community in the mid- to late nineteenth century. Massive groups of French Canadian and Portuguese individuals were immigrating to the city to work in the city's textile mills. Until the construction of St. Anne's Church (FLR.AP) in 1869, St. Mary's Church (FLR.432) was the only Catholic institution in Fall River. St. Mathew's Church was built in 1893, likely to accommodate the French-Canadian Catholic community from St. Mary's Church (Everts & Richards 1895; Herald News Staff 1937).

St. Mathieu's Church closed in 1989 following its final mass on Sunday, June 25 due to a decline in parishioners, a lack of clergy, and disrepair of the church building. Decline in church membership has been attributed to the construction of Massachusetts Route 79, which "disseminated" the community in the mid-twentieth century. The wood-framed church sheathed in stone bore two dominant, flanking towers on its facade, one of which had a large crack in the buttress—a dangerous condition that deemed the property a safety hazard to the neighborhood. Due to the crack and other major structural issues, without necessary funding to stabilize the building, the church was slated for demolition. Despite much opposition from former parishioners, the church was torn down in November 1990 (St. Mathieu's Church; Foley 1990).

BIBLIOGRAPHY and/or REFERENCES (Continued)

Flynn, Sean
1990 "Council Rejects Waiver to Raze St. Mathieu's," *The Herald News*. April 25. Page 1. Fall River, MA.

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Herald News Staff
1937 "First Catholic Church Built in Fall River Century Ago: Membership Has Increased Greatly Since Erection of St. John the Baptist Wooden Chapel; Many Parishes Established," *The Herald News*. July 22. Fall River, MA.

St. Matthew's Church
n.d. "St. Mathieu's Church, Fall River, MA." Fall River Public Library Vertical Files, Fall River Drawer, Churches-Catholic (St. Matthew's). Fall River Public Library, Fall River, MA.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☒ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

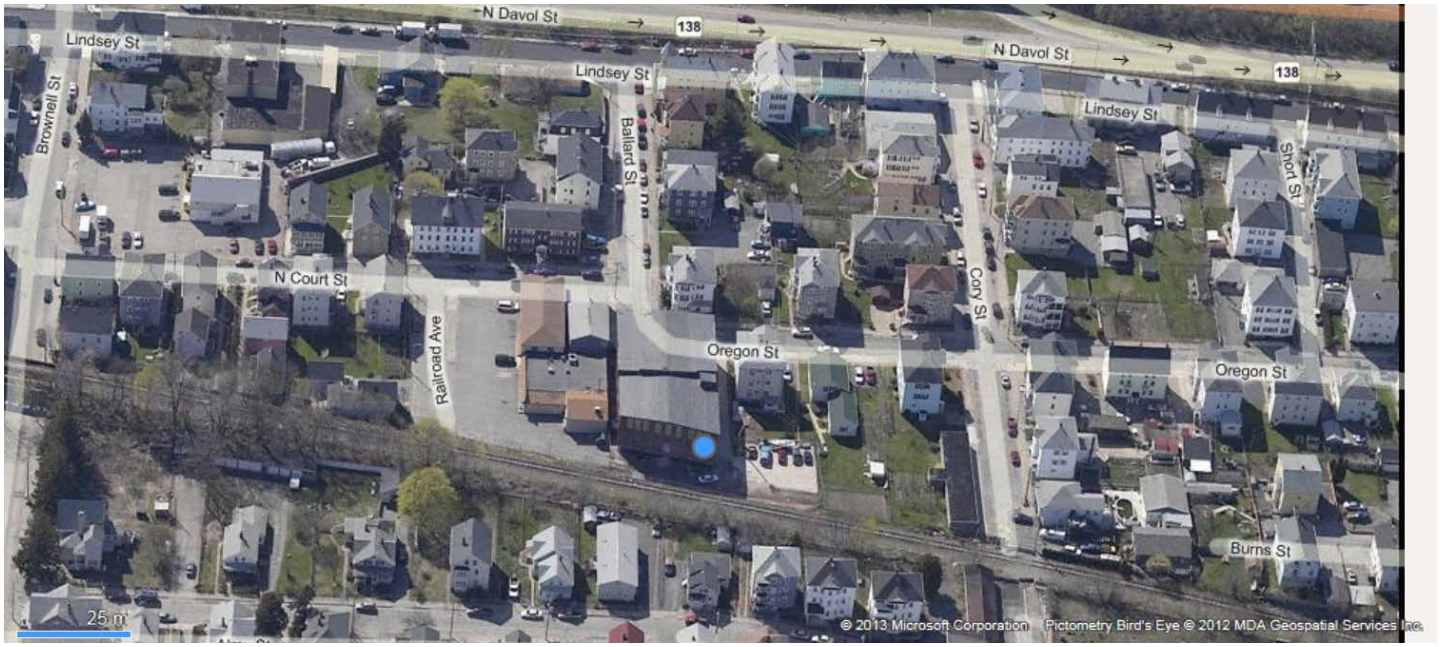
St. Matthew's School is also eligible as a contributing resource to the North End Roman Catholic Historic District, which also includes St. Michael's Church Complex, St. Matthew's Convent, and St. John's Cemetery. Together, these abutting properties are eligible at the local level as a historic district under Criteria A and C. Under Criterion A, the district has important historical associations with the massive influx of foreign-born immigrants who filled manual labor positions at Fall River textile manufacturing companies and with the separation of immigrant communities by the Catholic church in the mid-nineteenth to early twentieth century. St. Michael's Roman Catholic Church was developed to accommodate the growing Portuguese community; St. Matthew's Church (also known as St. Mathieu's Church; demolished in 1990), Convent, and School were developed for the French-Canadian community; and St. John's Cemetery accommodated the Irish population. The district's period of significance begins in 1850, with the establishment of the predominantly Irish St. John's Cemetery. The principal period of development occurred before1920, when Fall River's industrial economy collapsed due to the lowering of prices and competition with manufacturing companies in southern United States after World War I. The institutions continued to serve their respective congregations to varying degrees. The period of significance extends to 1957 when St. Michael's School was erected. The district is also eligible under Criterion C for its excellent local examples of Celtic style funerary art at St. John's Cemetery and uncommon ecclesiastical Neo-Gothic Revival style architecture at St. Michael's Church.

Prepared by PAL, March 2013

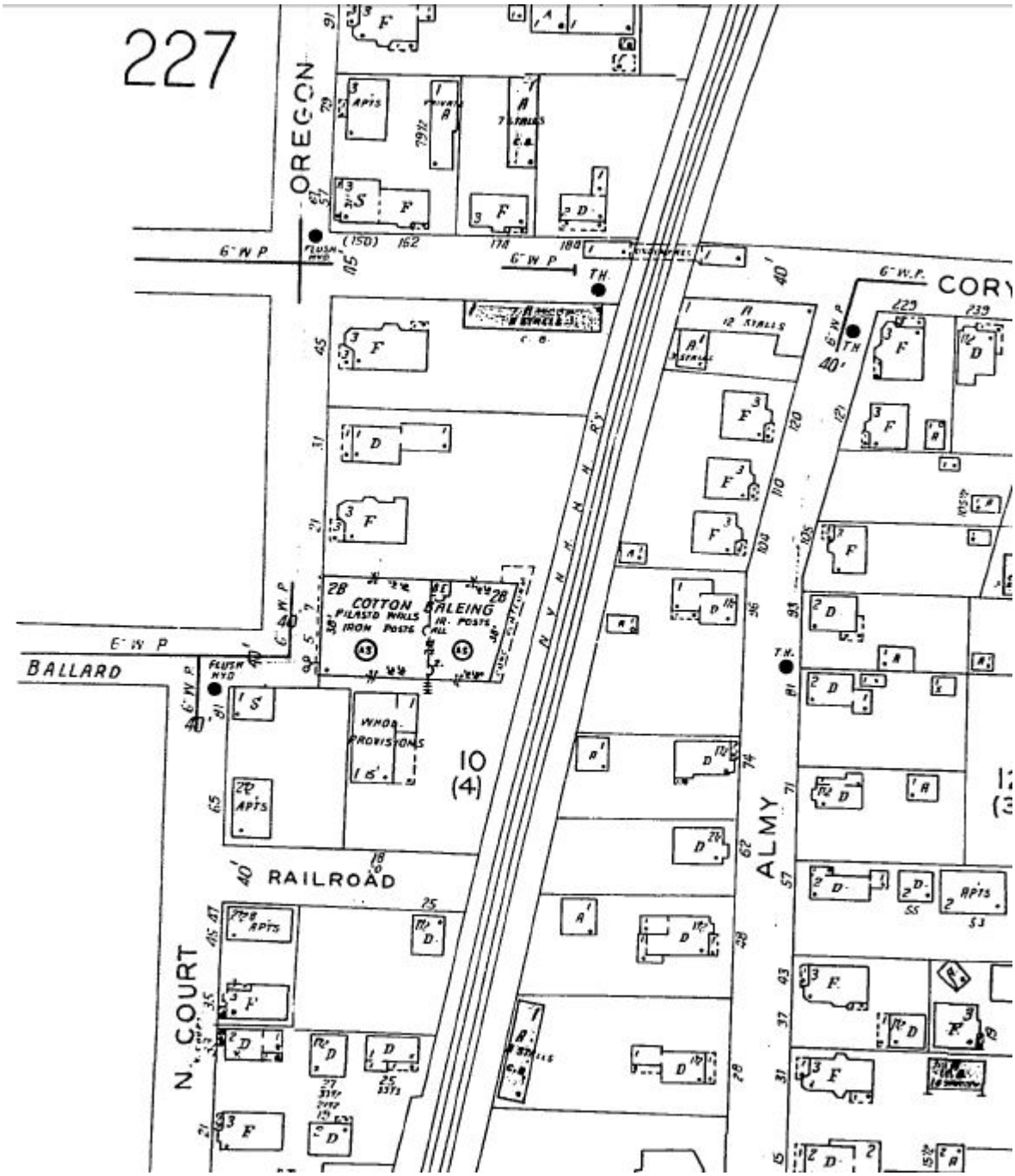
This continuation sheet is a supplement to the existing inventory form.

ARCHITECTURAL DESCRIPTION (Continued)

The Westport Manufacturing Waste Department building is a freestanding mill loft neighbored by an un-related commercial building and late-nineteenth and early twentieth-century, multi-family houses and tenements. Historical map research and field survey shows that there are no buildings or residences in the neighborhood associated with the historical operations of the Westport Manufacturing Company, whose primary center of operations was in the town of Westport (Sanborn Map Company 1905, 1933, 1950).



Aerial view of the Westport Manufacturing Waste Department building oriented west (Bing 2012).



Excerpt from a 1950 Sanborn map showing the Westport Manufacturing Waste Department building and its surroundings. Oriented north. (Sanborn 1950).

FORM E – BURIAL GROUND

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number | USGS Quad | Area(s) | Form Number

Town: Fall River

Place *(neighborhood or village):* North End

Address or Location: Northeast corner of Brightman Street and St. Mary Street

Name: St. John's Cemetery

Ownership: ☐ *Public* ☒ *Private*

Approximate Number of Stones: 600

Earliest Death Date: 1858

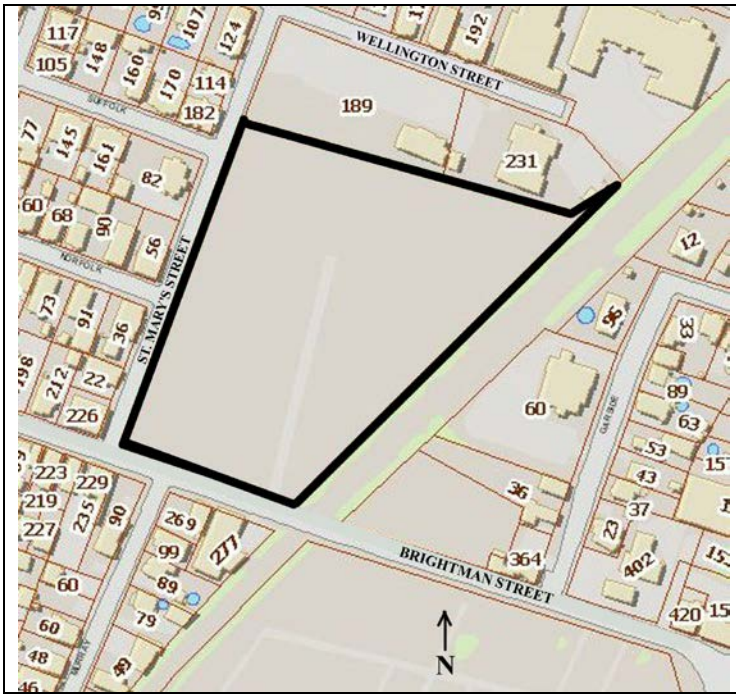
Latest Death Date: 1891

Landscape Architect: Unknown

Condition: Fair

Photograph

Locus Map



Acreage: Approximately 4

Setting: Located within a dense, urban, primarily residential Wellington-Brownell Street Area along the northwest border of the Fall River Secondary railroad right-of-way. St. Mathieu's School and Convent abut to north (church demolished 1990).

Recorded by: K. Miller, A. Cahoon

Organization: PAL

Date (*month / year):* March 2013

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

VISUAL/DESIGN ASSESSMENT

St. John's Cemetery is an approximately 4-acre Irish-American Catholic cemetery that was established in 1850 and remained active until 1891. Maintained by the Catholic Diocese of Fall River, the cemetery is located on the corner of Brightman Street and St. Mary Street in the North End of the city. The property is immediately surrounded by a late-twentieth-century residential neighborhood to the south and west, Roman Catholic ecclesiastical-associated properties to the north, and the Fall River Secondary railroad right-of-way to the east.

The cemetery sits on a relatively flat, roughly rectangular parcel of land with an approximately 4-feet tall, rough-cut granite block wall capped with large, flush, rectangular-shaped granite blocks lining the southern boundary line and entrance at Brightman Street. There is one, central, vehicular entrance piercing the granite block wall with a simple iron dual swing gate. A granite block post with a concrete cap stands at the eastern end of the gate bearing a copper panel with raised lettering that reads, "ST. JOHN'S CEMETERY/ESTABLISHED 1850." A simple iron picket fence lines the western boundary at St. Mary Street, and a chain-link fence bounds the northern and eastern sides of the cemetery. Through the dual swing gate, a paved vehicular path lined with regularly spaced bushes terminates at the center of the property.

The gravestones, which date from 1858 to 1891, are predominantly of granite material, though there are marble and limestone stones. Monuments vary in shape, with simple, rounded and flat-topped headstones, pedestal monuments topped with draped urns or crosses, and flush markers. Iconography applied to the stones primarily consists of carved ivy, flora, Latin and Gothic crosses often combined with the acronym "IHS" or a crown, and Celtic crosses. Inscriptions are relatively brief with basic information (name, family relation, date of birth, date of death), yet stand out from the majority of burial grounds with the inclusion of "native of" a parish and/or county in Ireland.

A few stones include carved or sculpted Celtic crosses. The most notable is the large, Celtic cross monument for Catherine and Catherine C. Morris, who died in 1881 and 1889. With highly detailed carved Celtic ornamentation and "IHS" carved in the center of the cross, this stone is reminiscent of the larger-scale Celtic high crosses found in monastery burial grounds in rural Ireland. The cemetery is in fair condition, with several buried, out of plumb, fallen, damaged, and illegible stones.

HISTORICAL NARRATIVE

Established in 1850, St. John's Cemetery is one of the oldest Catholic cemeteries in Fall River. St. Mary's Cemetery on Amity Street has been attributed as the first. It is likely that St. John's Cemetery was associated with the Irish parishioners of the earliest Catholic Church in Fall River. St. John the Baptist Church was a small, wood-frame building constructed at the present site of St. Mary's Roman Catholic Cathedral (FLR.432) on Spring Street. The 0.24-acre lot was purchased on February 18, 1835 and St. John the Baptist Church was built two years later. In response to the growing Irish community consisting of individuals who immigrated to work in the Fall River mills following the Great Irish Famine between 1845 and 1852, the church was enlarged with a moderately sized rear addition and basement. Because this did not accommodate the fast growing community, the building was moved to Second Street [the present location of St. Mary's Rectory (FLR.432)] to make room for the construction of a larger church. In 1852, parishioners began construction of the Gothic Revival style St. Mary's Church, designed by "America's first Catholic ecclesiastical architect" Patrick Charles Keeley (Giza 1981). By 1855, the church was completed. St. John the Baptist Church was lost in a fire on July 12, 1856. St. Mary's Church was considered a parish until it was consecrated by the Roman Catholic Bishop of Boston in 1901. The church became a cathedral in 1904 with the creation of

the Fall River Diocese. According to the inscriptions, the Irish buried at St. John's Cemetery were native of parishes and counties all over Ireland (Herald News Staff 1937; Clement 2009; Diocese of Fall River).

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Photograph 2. St. John's Cemetery, view northwest.

Photograph 3. St. John's Cemetery, view northwest.

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☒ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller, and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

St. John's Cemetery is eligible for listing in the National Register of Historic Places at the local level under Criteria A and C. Under Criterion A, the cemetery has important historical associations with mid-to-late nineteenth century Irish immigration and the Irish community in the city of Fall River. With headstones that date from 1858 to 1891, the property is one of the earliest Roman Catholic burial grounds in the city of Fall River and serves as a burial site for approximately 600 Irish community residents. Under Criterion C, the Irish cemetery has excellent, intact examples of mortuary monuments with Celtic style carvings and sculpture.

St. John's Cemetery is also eligible as a contributing resource to the North End Roman Catholic Historic District, which also includes St. Michael's Church Complex, St. Matthew's School, and St. Matthew's Convent. Together, these abutting properties are eligible at the local level as a historic district under Criteria A and C. Under Criterion A, the district has important historical associations with the massive influx of foreign-born immigrants who filled manual labor positions at Fall River textile manufacturing companies and with the separation of immigrant communities by the Catholic church in the mid-nineteenth to early twentieth century. St. Michael's Roman Catholic Church was developed to accommodate the growing Portuguese community; St. Matthew's Church (also known as St. Mathieu's Church; demolished in 1990), Convent, and School were developed for the French-Canadian community; and St. John's Cemetery accommodated the Irish population. The district's period of significance begins in 1850, with the establishment of the predominantly Irish St. John's Cemetery. The principal period of development occurred before1920, when Fall River's industrial economy collapsed due to the lowering of prices and competition with manufacturing companies in southern United States after World War I. The institutions continued to serve their respective congregations to varying degrees. The period of significance extends to 1957 when St. Michael's School was erected. The district is also eligible under Criterion C for its excellent local examples of Celtic style funerary art at St. John's Cemetery and the ecclesiastical Neo-Gothic Revival style architecture at St. Michael's Church.

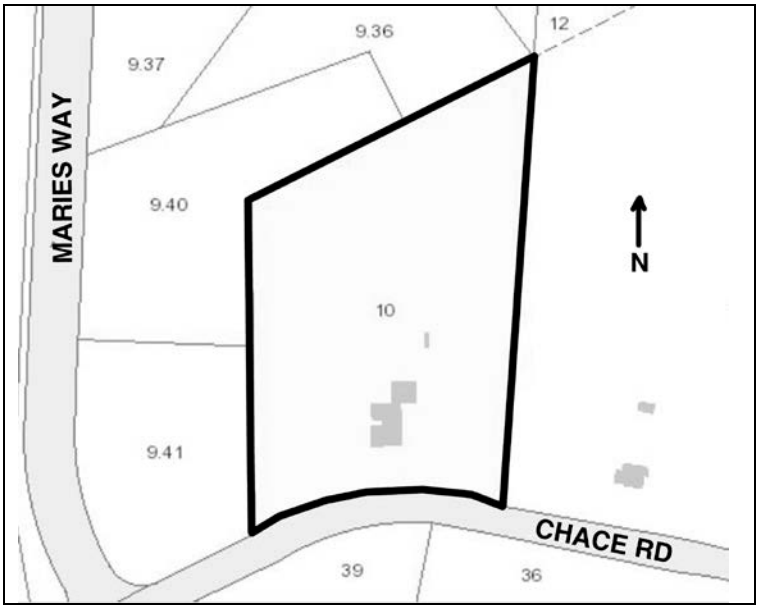
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
228-10-0-R	Assawompset Pond		FRE.166

Photograph

Locus Map



Town/City: Freetown

Place: *(neighborhood or village)*:

Address: 76 Chace Road

Historic Name: Cummings, George House

Uses: Present: Residential

Original: Residential

Date of Construction: Circa 1806

Source: Thomas 1978; Style/Visual Inspection

Style/Form: Cape

Architect/Builder: Unknown

Exterior Material:

Foundation: Granite

Wall/Trim: Wood Clapboard

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: One detached 19th-century barn.

Major Alterations *(with dates):* Mid-19th-century rear addition and inset entry porch.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 2.593

Setting: Within a predominantly rural, residential area, the building is oriented south toward a commercial cranberry bog across Chace Road and north of a heavily forested landscape. The property is located approximately 400 feet west of the New Bedford Main Line right-of-way

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The George Cummings House is a rectangular, five-bay by three-bay, one-story, wood framed Cape Cod cottage constructed circa 1806, with a late-nineteenth-century, one-story, side-gabled, rear addition that extends east and a secondary Queen Anne-style inset porch. The building has a side gable asphalt roof, wood clapboard siding, a mortared granite foundation, and a central brick chimney. The south-facing building sits on a slightly sloping, moderately wooded lot with plantings dotting the property. A short wood picket fence extends along the road, breaking for an unpaved driveway loop that surrounds the building. A molded wooden cornice wraps around the building at the roof line. Fenestration on the building consists of rectangular openings with wood molded lintels and sills and twelve-over-twelve double-hung windows. The main entrance piercing the center of the facade has a plain surround and a replacement wood paneled door with four lights. The secondary two-bay by two-bay Queen Anne-style inset porch is supported by three turned posts and a free classic balustrade. A detached barn constructed circa 1820 stands in the northeast corner of the property, with vertical wood sheathing board siding, an asphalt roof, and a central cupola piercing the ridgeline.

HISTORICAL NARRATIVE

The George Cummings House was constructed circa 1806, most likely for the man whom the house is named. George Cummings was involved in town as a selectman and town assessor, and served in the war of 1812. George Cummings belonged to the second Freetown company (of two) for the War of 1812. In 1834, and between 1836 and 1837, George Cummings became a town assessor, and collectively raised a total of $4,500 for the town. Between 1837 and 1839, and again in 1841, Cummings was elected as one of the town selectmen (J.H. Franklin & Co. 1902:75, 140, 146). By the mid- to late-nineteenth century, the property was transferred into the Chace family, and in 1871, is listed under the ownership of A.H. Chace. By the 1880s, O. Chace owned the property and his heirs took over by 1895 (Beers 1871; Everts & Richards 1895; Thomas 1978).

Other examples of late eighteenth- to early nineteenth-century Cape Cod style properties throughout Freetown include the Charles A. Morton House (MHC No. FRE.133), the Hathaway House (MHC No. FRE.163), Dr. James Ashley House (MHC No. FRE.100), the Hopkins-Briggs House (MHC No. FRE.9), the Dr. Bradford Braley House (MHC No. FRE.150), and residences at 26 Forge Road (MHC No. FRE.67), and 21 Forge Road (MHC No. FRE.66).

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1981 *MHC Reconnaissance Survey Report: Town of Freetown*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

Thomas, Helen
1978 *MHC Building Form: George Cummings House (FRE.166)*. Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

View looking northwest towards the barn.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M. Miller and Virginia H. Adams, PAL, Pawtucket, RI, March 2013
The criteria that are checked in the above sections must be justified here.

The George Cummings House and Barn property at 76 Chace Road in Freetown is eligible for listing in the National Register at the local level under Criteria A and C for its association with town historical development and as a representative and well-preserved example of an early-nineteenth-century five-bay Cape Cod house and large nineteenth-century barn, owned by the Chace family until at least the end of the century.

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
125-13	New Bedford North		NBE.641

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Photograph

Town/City: New Bedford

Place *(neighborhood or village):* 627-637 Tarkiln Hill Road

Name of Area: Lambeth Rope Company

Present Use: Commercial and light industrial

Construction Dates or Period: 1893, 1918

Overall Condition: Good

Major Intrusions and Alterations: Ropewalk was divided into 3 free-standing structures (2000s)

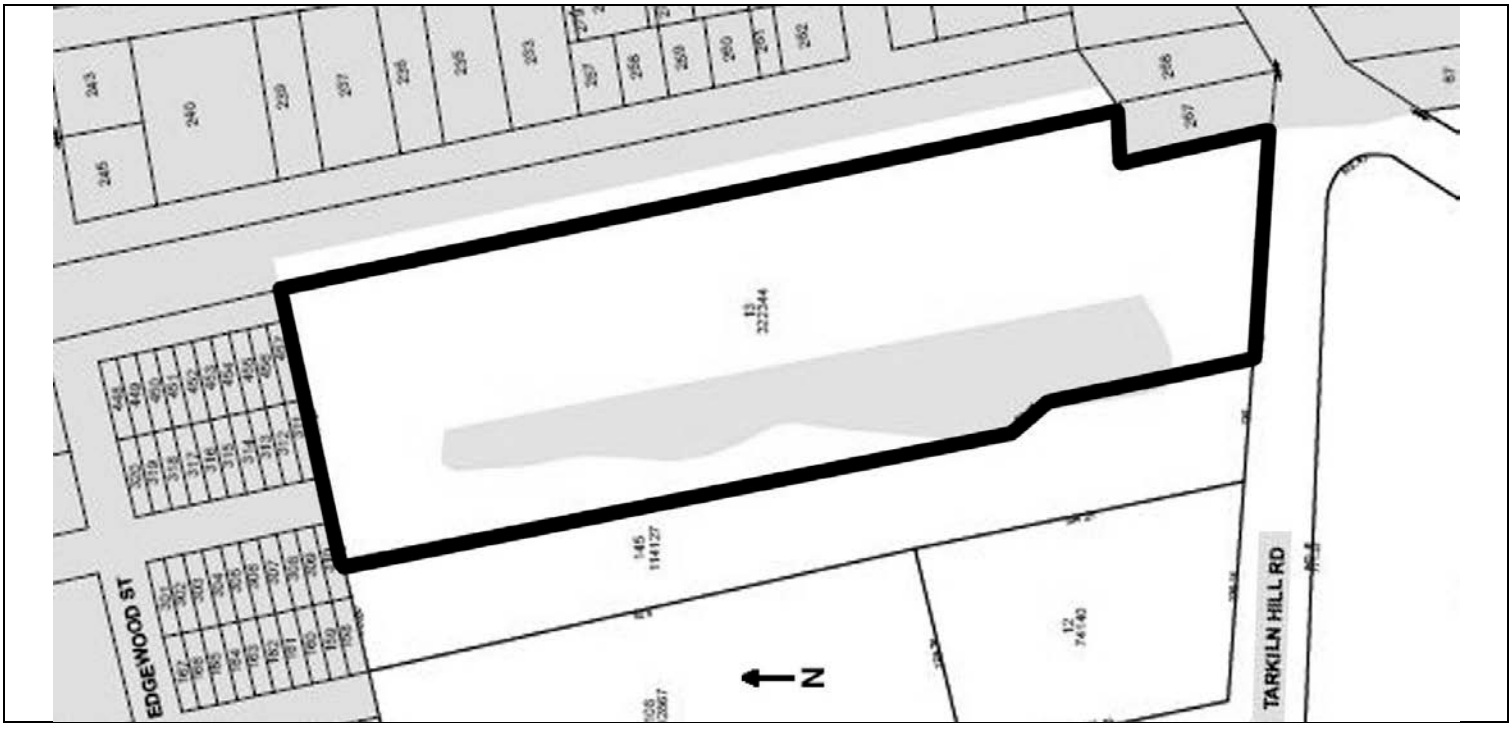
Acreage: 7.4

Recorded by: J. Daly, A.Cahoon

Organization: PAL

Date *(month/year):* March 2013

Locus Map



Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The Lambeth Rope Company Complex (MHC No. NBE.641) is made up of three vernacular industrial buildings organized on a north-south axis across a single land parcel: the Office, the Winding and Braiding Loft, and the Ropewalk. These last two buildings are connected in a headhouse and shed configuration. Open areas within the parcel are surfaced with asphalt pavement and gravel.

The Office is a one-story, five-bay-by-five-bay, brick building constructed in a typical early twentieth century industrial vernacular style. Its irregular rectangular plan faces south toward Tarklin Hill Road and is organized into a main block to the east and a wing to the west. A shed roof ell has been added to the north (rear) elevation and the wing expanded on its south side with a flat-roofed addition. The cross-hipped roof is sheathed with slate shingles and capped on the main block with a painted iron vent and flanking skylights. A hip roof dormer is located on the rear roof slope. The primary entry is located within a small projecting brick vestibule that extends from the center of the south elevation. A modern aluminum and glass door is set within a plain metal channel surround. The walls are laid in common bond with occasional Flemish bond courses and have a corbelled cornice. The rectangular window openings have quarry-faced granite window sills and lintels and are now filled with modern, one-over-one replacement aluminum units. Some window openings on the south elevation are now combined to form larger commercial-type openings. A modern awning runs across the front of the building. The foundation is poured concrete.

The Winding and Braiding Loft is a typical early-twentieth century industrial vernacular building with load-bearing brick exterior walls and an iron and wood timber internal frame of fire-resistive construction. The two-story, six-bay-by-eight-bay, mill loft has an irregular rectangular plan with a three-story stair tower on the west elevation and a one-story ell and high square chimney on the north elevation. The chimney has a flared top accented with drip corbelling. The subtly-pitched "flat" gable roof has open soffits, with wood ogee-profile cornice molding and exposed beveled rafter tails. The brick walls are laid in common bond and feature regularly spaced, tall window openings with segmental arch window openings. The walls extend to grade, with no visible foundation. Original windows are fifteen-over-fifteen, double-hung, wood sash in the main block of the mill, and various configurations of multi-light wood sash in the stair tower and ell. The windows have narrow wood brickmolds and wood sills. Approximately 50 percent of the window sash has been replaced with aluminum units with multi-light fixed or awning configurations.

The Ropewalk is a long, narrow, one-story building measuring about 800 feet long and 35 feet wide. The building was formerly attached to the rear (north) elevation of the Winding and Braiding Loft, but has been detached from that building and also subdivided into three free-standing structures by means of demolition of roughly 20 to 25-foot segments of the Ropewalk. The building has a shed roof with rubber membrane sheathing, open soffits with replacement plank cornice molding, and beveled rafter tails. Walls are brick laid in common bond with regularly-spaced windows set high on the east and west elevations. The windows have brick segmental arch lintels, wood sills, and ten-light fixed wood sash. As constructed, multiple wood and iron queen post trusses were used to support the ceiling and create clear-span interior spaces. Some of these trusses have now been replaced with wood posts. Select windows have been replaced with modern, vertical-lift garage doors on the Ropewalk's east elevation. A small, Butler-type, prefabricated metal Warehouse has been added to the north end of the east elevation.

A fourth building, a former railroad freight house, is now visually and functionally associated with the rope-making complex. However, this freight house is located on a separate land parcel and has no historical association with the operations of the Lambeth Rope Company. It is therefore excluded from the area boundaries.

HISTORICAL NARRATIVE

Lambeth Rope Company of New Bedford was established in 1893 for the manufacture of Lambeth Cotton Transmission Rope and Lambeth Mill Bandings, specialized products used for mechanical power transmission systems in textile mills and factories. The patent(s) for this product were held by the English firm of Thomas Hart, Ltd., which was founded in 1789 for the manufacture of rope drive products. There does not appear to have been any association of personnel between the two companies. The company constructed the Office, Winding and Braiding Loft, and the southern third of the Ropewalk in 1894 and expanded the Ropewalk to its present footprint in 1918. The mill architect was Frank A. Walker, who is not included in standard twentieth-century biographical dictionaries. The Lambeth Rope Company was a sister corporation to the Bennett Manufacturing Company and Columbia Spinning Companies of New Bedford. Following the death of Frank R. Hadley, the president of all three firms, in 1907, financial irregularities were found in the sister company that resulted in the reorganization of the Lambeth Rope Company. In 1905, the New England Cotton Yarn Corporation acquired most of the stock in the firm. Demand for rope drive products experienced a steady decline after World War I due to the demise of regional manufacturing and the widespread adoption of electric power for industrial machines. Subsequently, Lambeth Rope Company diversified into synthetic rope products for commercial fishing and other specialty applications. The company ceased operation about 1988 and, after a ten-year vacancy, was acquired by the Tarkiln Hill Realty Corporation, who also acquired the neighboring Freight House. The modifications and Warehouse addition to the Ropewalk occurred after this acquisition. The buildings are currently let to commercial and light industrial tenants (Allen 1999; *American Wool And Cotton Reporter* 1919:633; Anonymous 1934; Boston Evening Transcript 1897:2; Daigle 1977; *The Gazette* 1939:17; Massachusetts Bureau of Statistics of Labor 1897:231; Sanborn Map Company 1924; *Textile World Record* 1905:170; Wadlin 1900:31).

The Lambeth Rope Company was a relatively late surviving example of New Bedford's rope and cordage trade, which was primarily fueled by the city's nautical economy. New Bedford Cordage Company, established 1842 between Court, Park, Ash, and Kempton streets (no longer extant), was a primary example of this business, although there were multiple small ropewalks documented in the city during the nineteenth century. Lambeth Rope Company supplied the city's textile and manufacturing economy, not maritime pursuits, which explains its late success relative to the cordage industry at large. Prior to the advent of compact, powerful electric motors that could power manufacturing equipment; the predominant mode of power transmission within mills and factories was through mechanical drive trains. English precedent for these systems was iron gears and shafting. In the Unites States, such systems were largely supplanted by leather belts and pulleys, which proved more adaptable to American limitations on materials and technology, and structural engineering. The use of rope for power transmission was uncommon in both countries throughout mid-nineteenth century but began to receive serious study in the latter part of the century, particularly after 1890. Such systems were found to have advantages over leather belting in their lower first cost, higher efficiency, their relative elasticity that provided smoothness and evenness of power, facility for distributing power to multiple drives within a factory, quiet working, and the ease of repair. These advantages were especially noteworthy in situations where there were irregular floor plans, or where high drive speeds or large amounts of power were necessary. Lambeth Rope had a high reputation in its field for flexibility and long-wearing properties. The rope was constructed of four strands of cotton, each strand being formed of a bundle of hundreds of lightly-twisted, fine yarns that were protected with outer spiral wrapping of yarns to shield the interior core bundles (Flather 1900:1-5; 83; Hunter and Bryant 1991:130-133; Pease and Hough 1889:169-170).

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AREA DATA SHEET

MHC Number	Assessor's Map/Plat/Lot Number	Property Name	Address	Const. Date	Style/Form	Photo No.	Status
NBE.641	125-13	Lambeth Rope Company Office	627 Tarkiln Hill	1894	Industrial Vernacular	1	C
NBE.641	125-13	Lambeth Rope Company Winding and Braiding Loft	637 Tarkiln Hill Rd.	1894	Industrial Vernacular	2	C
NBE.641	125-13	Lambeth Rope Company Ropewalk	637 Tarkiln Hill Rd.	1894/1918	Industrial Vernacular	3, 4	C
N/A	125-13	Warehouse	637 Tarkiln Hill Rd.	Ca. 2000	Prefabricated structure	4	NC

C Contributing property to the district.
NC Non-contributing property to the district.

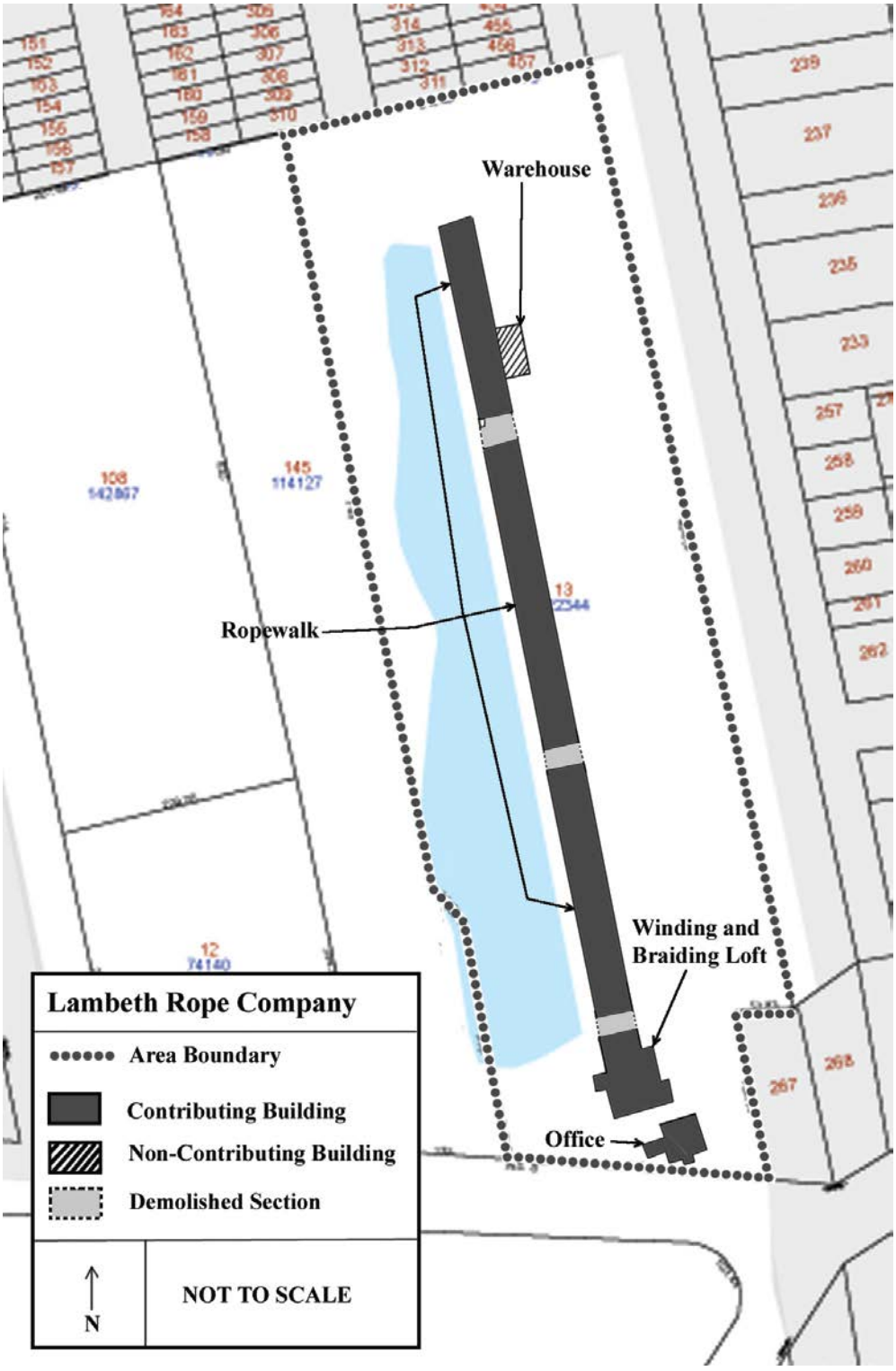
Photo 1. Lambeth Rope Company Office.

Photo 2. Lambeth Rope Company Winding and Braiding Loft.

Photo 3. Southern third of the Lambeth Rope Company Ropewalk.

Photo 4. Northern two-thirds of the Ropewalk.

Area map of the Lambeth Rope Company complex.



National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by John J. Daly, and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The Lambeth Rope Company complex is recommended eligible for National Register listing under Criteria A and C at the local level in the areas of industry and architecture. Under Criterion A, the complex, as a manufacturer of a specialized mill product, is significant for its associations with New Bedford's economically-significant textile industry. Under Criterion C, the complex represents an unusual example of a specialized rope manufacturing facility, including a rare surviving ropewalk building in the city. No other ropewalks are documented for New Bedford in the MHC's Inventory.

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
91 199	New Bedford North		

Photograph

Locus Map

Recorded by: K. Miller, Q. Stuart, A. Cahoon
Organization: PAL
Date (*month / year)*: March 2013

Town/City: New Bedford

Place: *(neighborhood or village)*:

Address: 1097 County Street

Historic Name: Christ Presbyterian Church

Uses: Present: Ecclesiastical

Original: Ecclesiastical

Date of Construction: 1924-1950 (Moved or Constructed)

Source: Sanborn Map Company 1924; 1924-1950

Style/Form: Gothic Revival

Architect/Builder:

Exterior Material:

Foundation: Concrete Block

Wall/Trim: Vinyl

Roof: Asphalt Shingle

Outbuildings/Secondary Structures: None

Major Alterations *(with dates):* None

Condition: Good

Moved: no ☐ **yes** ☒ **Date:** 1924-1950 (may have been moved)

Acreage: 0.17

Setting: Set on the corner of Sawyer Street and County Street in a predominantly residential, urban neighborhood, the building faces the New Bedford Main Line right-of-way, which is located 250 feet east.

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The Christ Presbyterian Church is a rectangular, wood-framed, one-and-one-half-story, gable-front Gothic Revival style building with a one-room rear addition either constructed or moved to its present location between 1924 and 1950. The church has a small, steeply-pitched, hipped-roof, enclosed belfry that sits on the ridgeline of the asphalt roof, vinyl siding, and a raised rusticated concrete block foundation. Large brackets line the overhanging eaves. A prominent, full-width concrete staircase leads from County Street to two main entrances with gabled roofs, rounded arch lights, Gothic arch verge boards, pendants, and large brackets. The facade bears a central paired Gothic arch window with a carved wood lintel adorned with a fleur-de-lis. A tall and narrow brick chimney pierces the roof of the rear addition. Fenestration is regular, with simple rectangular openings, replacement doors, and 1/1 replacement windows. The original small rear addition is detailed similarly to the main block and contains a secondary front-gabled entrance.

HISTORICAL NARRATIVE

On the corner of Sawyer Street and County Street, the simple, wood-framed, Gothic Revival style Christ Presbyterian Church with a small, rear addition was either constructed or moved to its present location between 1924 and 1950, during a time when New Bedford's population peaked. As the Gothic Revival style was popular in the United States from 1840 to 1880, this property is a late example of its type (provided, it was constructed rather than moved from a previous location).

In New Bedford, the Gothic Revival style was most prevalent in residences of the 1840s. The best-preserved and widely identified example in the area is the Gothic Cottage-style William J. Rotch House (MHC No. NBE.210), constructed by renowned architect, A.J. Davis. Gothic Revival style churches were constructed in New Bedford in the mid-nineteenth century, including the granite-block, First Congregational Church (MHC No. NBE.2733, 1838), also by Davis, and the wood-framed, high-style First Congregational Church at Lund's Corner (MHC No. NBE.561, 1867), and into the late nineteenth century. with the Grace Episcopal Church (MHC No. NBE.2720, 1880) constructed by Boston Architects Van Bunt and Howe. By the twentieth century when the Christ Presbyterian Church was established, New Bedford's churches were usually Catholic in denomination and typically constructed in the Eclectic style, specifically Colonial Revival, Neoclassical, and even Tuscan (MHC 1981, Sanborn Map Company 1924; 1924-1950; Walker 1911). Little is known about the social history of the Christ Presbyterian Church. Today, the property operates as a Spanish Seventh Day Adventist Church. Due to lack of architectural integrity and historical associations, the property is not eligible for listing in the National Register.

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FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
1 - 13	Taunton		

Photograph

Locus Map

Town/City: Raynham

Place: *(neighborhood or village)*:

Address: 521 Prospect Hill Street

Historic Name: Lincoln – Wilbur House

Uses: Present: Agricultural/Residential

Original: Agricultural/Residential

Date of Construction: Circa 1820

Source: Anon. 1795; Smith, Annin & Co 1830

Style/Form: Cape Cod cottage

Architect/Builder: Unknown

Exterior Material:

Foundation: Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
Detached New England Barn, c. 1870
Detached Chicken Coop, c. 1940; Detached Barn, c. 1950

Major Alterations *(with dates):*
Late-19th-century modifications to the fenestration and the addition of synthetic windows in the late-20th-century.

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 19.3

Setting: The property extends between Prospect Hill Street and the west side of the Stoughton Line right-of-way in a rural, predominantly residential community located at the north end of Raynham.

Recorded by: K. Miller, Q. Stuart, A. Cahoon, J. Scofield
Organization: PAL
Date (*month / year*): March 2013

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION

The house at 521 Prospect Hill Street sits on a slightly sloping, narrow, rectangular lot predominantly wooded with a small portion dedicated to open space for farming. This property contains a house, barn, and chicken coop, with a gravel driveway leading to the main entrances of the south-facing house and the west-facing barn. Shrubbery and small trees surround the sill of the house. The house, which is oriented south, is a rectangular, two-bay by three-bay, one-story, wood-framed, side-gabled vernacular style building with two increasingly smaller connected work sheds extending from the east elevation that are similarly designed and oriented. The building has side-gable asphalt-clad roofs, wood shingle siding, and a mortared granite foundation. A narrow, brick chimney is centered on the ridge of the main portion of the house and an off-center, corbelled brick chimney is located on the easternmost ell.

A detached New England barn constructed circa 1870 is located southeast of the house and faces west. The barn has an asphalt shingle roof, wood shingle siding, a hay door, and large, hinged, wood paneled barn doors on the west-facing facade, and an attached rear shed. A second, one-story barn dating to approximately 1950 is located near the south boundary of the property. The c. 1950 barn is constructed of wood.

A chicken coop built circa 1940 is sited near the street in the northwest corner of the property and faces west. The building is constructed of mortared granite blocks and has shed roof covered with tin. A hay door and a hinged, board-and-batten door are located on the facade. A shed-roofed wood addition extends from the north elevation. The walls of the addition are sheathed with plywood. A large wood-paneled sliding door connects the west elevation of the addition to the chicken coop. A single-room, non-historic addition extends from the east elevation of the shed-roof addition.

HISTORICAL NARRATIVE

The property at 521 Prospect Hill Street (formerly known as 88 Prospect Hill Street) was developed as a small-scale farmstead by the Lincoln and Wilbur families of Raynham during the nineteenth century. The Town of Raynham separated from Taunton and incorporated in 1731, but the north end of Raynham remained largely undeveloped. Prospect Hill Road does not appear on a 1795 map of Raynham, and it is not likely that any residences existed in this location prior to 1800. Prospect Hill Street and the Lincoln –Wilbur House first appear on historic maps in 1830 (Anonymous 1795; Smith, Annin and Company 1830).

Rufus Lincoln is shown as the owner of the house on the 1830 map. Lincoln was born in Raynham around 1811 to Samuel and Lucy Lincoln. He maintained a small farmstead at the 521 Prospect Hill Street property from at least 1830 until his death in 1868. In 1850, Lincoln lived in the house with his wife Hannah, two children Lucy and Eliza, and his mother Lucy. Lincoln's farm was among the smallest of the 116 farms in Raynham recorded in the 1860 agricultural census. It encompassed 25 improved and 30 unimproved acres, valued at $900 (equivalent to approximately $22,667 in 2012) while many of the surrounding farms in Raynham were valued between $1,000 to $6,000 (equivalent to approximately $25,185 to $151,110 in 2012). In 1860, Lincoln owned one horse, two cows and produced 50 bushels of corn (Commonwealth of Massachusetts 1867; US Census 1850-1880; 1860).

Rufus Lincoln's daughter Eliza married Thomas Tisdel Wilbur on May 18, 1867, whose parents, Elbridge S. B. (also listed in census records as Elbridge S. P. or Elbridge P.) and Eliza A. Wilbur owned the adjacent house to the north. Thomas Wilbur was employed as a shoemaker in 1867 and moved into Eliza Lincoln Wilbur's family house after their marriage. By 1880, the couple had three children, Walter T., Hiram B. and Lucy M., and Elbridge Wilbur was living in the house at this time and is listed in the

US Census as a farmer. The number of farms in Raynham steadily decreased from 141 in 1850 to approximately 70 in 1880, as local manufacturing industries grew. Compared to the other farms in Raynham, the Lincoln-Wilbur family farm remained small in size, but the value of its products met the local average. In 1880, the farm is listed under Thomas T. Wilbur and encompassed 10 cultivated acres in addition to woodland. Of this land, one acre contained an apple orchard of about 30 trees and one acre was used to grow potatoes. The Wilburs owned 1 horse, 2 cows, 2 other cattle, 1 swine, and 15 poultry; and produced 8 tons of hay, 100 cords of wood, 50 bushels of potatoes, 100 pounds of butter, and 300 dozen eggs, along with minimal amounts of honey and corn.

Given the limited number of livestock owned by Rufus Lincoln and low production levels of the farm in 1860, Thomas Wilbur likely built the New England barn on the property circa 1870. Gable-front New England type barns became popular in the region by the 1830s and were preferable over narrower, side gabled barn forms typically used in the preceding decades. Farmers in New England recognized several advantages of this new barn type. The placement of the main drive floor parallel to the roof ridge allowed for a building of greater width and accommodated the as-needed construction additional bays at rear gable end. The front gable orientation of the roof also drained rain and melting snow to the side of the barn rather than into the barn yard. The barn and ells on the house first appear on a historic map in 1895, although outbuildings were not depicted on the previous historic maps of Raynham (Beers 1871; Everts and Richards 1895; US Census 1850-1880; Visser 1997:74-79).

The Wilbur family owned the property at 521 Prospect Hill Street until 1911 when Eliza and Thomas Wilbur's son Hiram B. Wilbur sold it to Elizabeth F. Mills of Boston. When Eliza Wilbur died in 1881, her estate was not processed through probate court. Eliza Lincoln Wilbur's sister Lucy had deeded her half interest in the property to Eliza and Thomas Wilbur on July 24, 1868 and Thomas T. Wilbur deeded the property to Hiram B. Wilbur on March 16, 1910. Thomas T. Wilbur remarried in 1882 to Susan C. Caswell and died on March 18, 1929. Hiram B. Wilbur's siblings, Walter T. Wilbur and Lucy Millard also transferred their interest in additional surrounding property in 1929 (BRCD 1911a, 1911b, 1929a).

When Elizabeth Mills acquired all interest in the property on July 8, 1911, it consisted of three tracts of land with buildings. The property remained the same size until 1933. Elizabeth Mills's niece, Mabelle B. Gilson of Brattleboro, Vermont transferred interest in the property to Florence A. Tracy et al. on April 7, 1925 through a deed recorded on May 21, 1929. Tracey sold the property to Ellery C. Dean on November 28, 1925 and he mortgaged it through Security Cooperative Bank in May 1929. Following the onset of the Great Depression that fall, Dean lost the property through foreclosure and Security Cooperative Bank began a public auction process in December 1932. Raymond A. and Marion T. Haglund purchased a 19.3-acre portion of the estate on August 4, 1933. The current (2013) boundaries of the property date to this sale and are visible as the south half of a plan of the property, dated April 4, 1933. The chicken coop and second barn on the property were constructed between 1933 and 1960. They do not appear on the 1933 plan but are visible on a 1960 aerial photo of Raynham. A smaller shed marked on the 1933 plan is not extant. The Haglund family owned the property from 1933 until 1959 when Robert E. and Maria S. Salley purchased it. The Salley family is the current owner (BRCD 1911a, 1911b, 1925a, 1925b, 1929a, 1929b, 1929c, 1933a, 1933b, 1933c, 1959, 1987, 2003; NETR 2011).

The property at 521 Prospect Hill Street has lost architectural integrity through non-historic modifications of the fenestration, and introduction of non-historic, synthetic materials. Furthermore, the property is a modest, small-scale example of a nineteenth century farmstead in Raynham on which minimal surplus goods were produced. It lacks strong historical associations with the town's agricultural development or other industries that would make it eligible for listing in the National Register of Historic Places.

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1933c Plan of Farm in Raynham, Mass. Surveyed for Security Co-operative Bank, April 4, 1933. Plan Book 24, p. 96c.

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View looking northeast towards the property at 521 Prospect Hill Road, including the residence and barn.

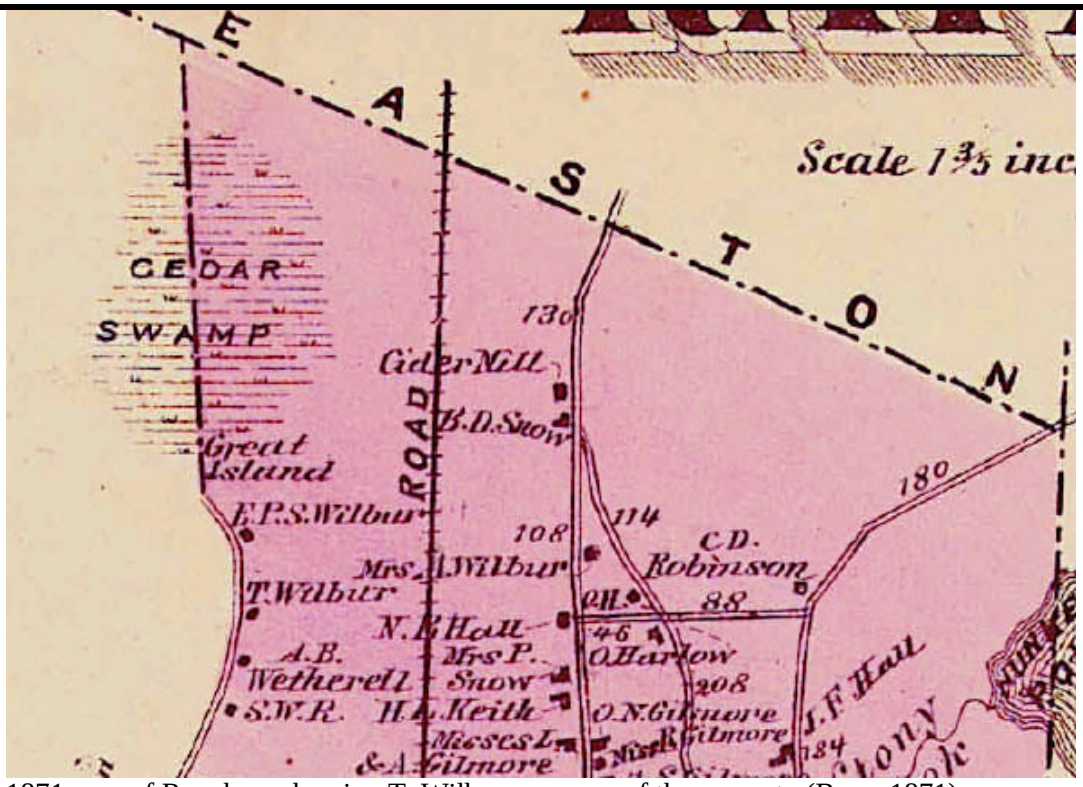
View looking southeast at house.

View looking east at house.

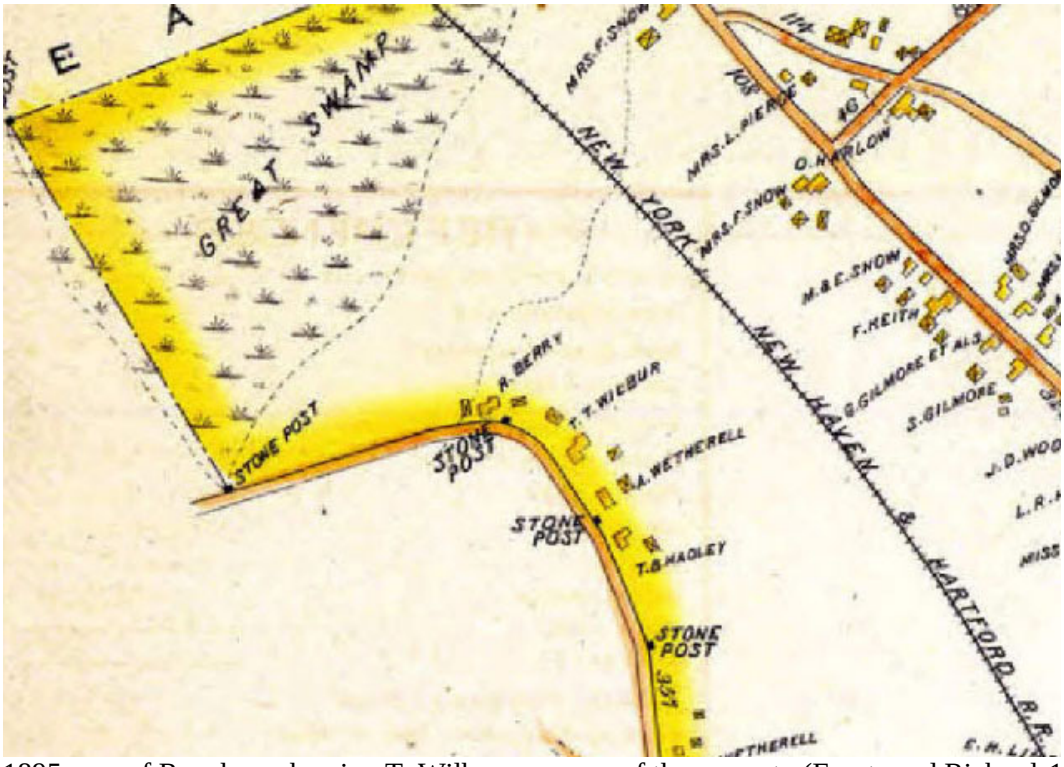
View looking east at the barn.

View looking southeast at the chicken coop.

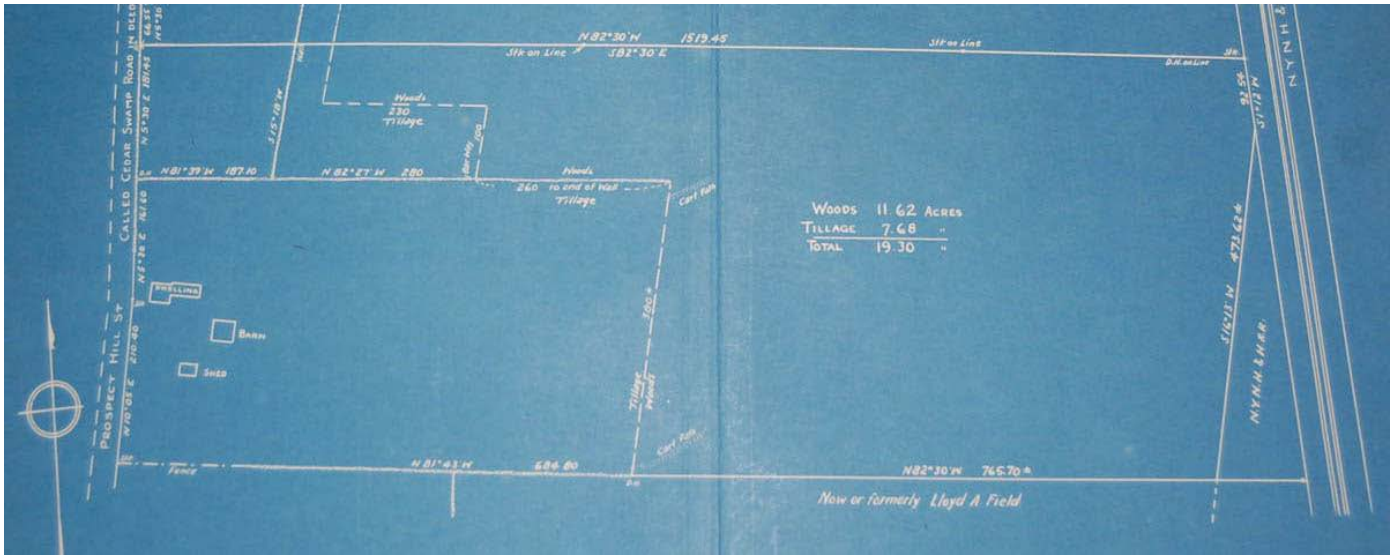
Aerial image of mid-twentieth century barn on property (www.bing.com).



1871 map of Raynham showing T. Wilbur as owner of the property (Beers 1871).



1895 map of Raynham showing T. Wilbur as owner of the property (Everts and Richards1895).



1933 plan of the property (BCRD 1933c).

2013 aerial view of the property (Bing 2013).

FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
10A-7	Taunton		

Town/City: Raynham

Place: *(neighborhood or village)*:

Address: 385 Thrasher Street

Historic Name: Dog Kennel and Track Property

Uses: Present: Vacant

Original: Residential/Commercial/Recreational

Date of Construction: Circa 1880 (House); early 1960s (Dog Kennel and Track Property)

Source: Beers 1871; Everts & Richards 1895

Style/Form: Late Nineteenth Century Vernacular

Architect/Builder: Unknown

Exterior Material:

Foundation: Parged Stone

Wall/Trim: Wood Shingle

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
Detached shed; remnants of detached dog kennel

Major Alterations *(with dates):*
Collapse of outbuilding, c. 2012

Condition: Poor

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: 8.48

Setting: The property is located on the southwest corner of Thrasher Street and East Britannia Street, along the east side of the Stoughton Line right-of-way, 700 feet southeast of the Britannia Street railroad crossing and 850 feet west of the Taunton city boundary.

Photograph

Locus Map

Recorded by: K. Miller, Q. Stuart, A. Cahoon and J. Scofield

Organization: PAL

Date (*month / year)*: March 2013

☐ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The approximately eight-acre Dog Kennel and Track Property is the site of a former dog kennel and training facility that includes remnants of a fenced kennel and dog run, a podium, and a large, oval, dirt track that abuts the railroad line. The kennel, track, and run date to the early 1960s. The property also includes a late-nineteenth century house and a non-historic shed. The property sits on a slightly sloping lot within a landscape of cleared land, swamp, and a mixed coniferous forest.

The house is located southeast corner of the lot along Thrasher Street and faces south. It is a one-and-a-half-story, five-bay by two-bay, wood-frame building constructed circa 1880. The house has an asphalt-shingled side-gable roof, wood shingle siding, a parged masonry foundation and a gambrel roofed rear ell. A full-length porch with wood square posts extends across the facade, which features a centered flush dormer. A molded cornice wraps around the entire roofline with returns at the gable ends, and a brick chimney is centered on the ridge of the main portion of the house. The ell has a similar brick interior chimney and four gable dormers.

Approximately 70 feet northeast of the house sits small, wood-framed, gable-front shed with a low-pitched, asphalt roof and wide, wood plank siding. At a distance of 25 feet, northwest of this shed are the remnants of the moderately-sized, wood-framed Acadian style barn used as a dog kennel. Formerly a one-story, side-gabled, wood-frame building with character-defining shed-roofed stables along either side, the property completely collapsed between 2011 and 2012. A 1.4-acre dog run with 11 remaining runs lined with chained link fences is located just to the north of the dog kennel remnants. A chain-link fence surrounds the dog kennel ruin and dog run area, while a second divided chain-link fence surrounds the area between the small shed and the dog kennel ruin. Running alongside the west boundary of the property, is a ¼-mile dog racing track with a small, rectangular, wood-framed, enclosed announcer's podium oriented west and located just east of the track.

Currently, the entire site is vacant and the house has been mothballed.

HISTORICAL NARRATIVE

This property was originally developed for residential use in the late nineteenth century, but served as a dog kennel and training facility during the late-twentieth century. Located on the Raynham – Taunton boundary, the land now encompassed as 385 Thrasher Street remained unimproved pine swamp in 1855. East Britannia and Thrasher streets appear on an 1871 map of Raynham, but no buildings are depicted in this location. The extant house first appears on historic maps in 1895 with its rear ell and two outbuildings. T.R. Hawes is noted as the owner of the property on the 1895 map. Thomas R. Hawes, who worked as a tripe manufacturer, lived in Raynham by 1880 with his wife Elvira O. (also listed as Elizabeth), daughter Emma L. and three boarders. Hawes moved from New Bedford to Raynham between 1870 and 1880 and was likely the first resident of the house (Beers 1871; Everts and Richards 1895; US Census 1870, 1880; Walling 1855).

The property consisted of three land tracts from at least 1921 through 1955, including one parcel with building and another with ten acres of swamp. John Petecki amassed the three tracts in 1918 through purchases from Sarah A. Nichols (heir of Thomas O'Falvey) and Frank N. Kelly. He subsequently sold the property to Stephen and Maria Szura on July 23, 1921. The Szuras were Polish immigrants and housed boarders engaged in local industries. John J. and Jeanne O'Rourke purchased it from the Szuras on July 1, 1955 and owned the property for ten years. According to city directories, John O'Rourke was employed as a mechanic at Blanchard Chevrolet in Bridgewater, Massachusetts through 1962 and is listed as living at 116 Thrasher Street. John O'Rourke likely created the dog kennel and training facility on the property in the early 1960s. His occupation changed in the

city directory listing from mechanic in 1962 to Willow Racing Kennel in 1965. The dog track first appears on a historic topographic map in 1964 and on an aerial photograph in 1960, but does not appear on the 1960 topographic map of Raynham. Local residents confirmed that this property was used to kennel and train dogs that raced at the Raynham Park track less than three miles to the north, but that no actual racing or gambling occurred at 385 Thrasher Street (BCRD 1918a, 1918b, 1921, 1955, 1965; Calvin 2013; NETR 2011; Polk 1957-1965; Thompson 2013; US Census 1930).

With state legislation in 1935, Massachusetts became the first state in New England to conduct greyhound racing. Organized dog racing had begun in the United States by 1919 after the first track with a mechanized rabbit was installed in Emeryville, California. Western farmers, who used greyhounds to protect their crops and pastures, had previously held informal dog races for entertainment during which the dogs chased live rabbits and bets were placed. Massachusetts dog tracks included Wonderland Greyhound Park established in Revere in 1934, the Taunton Dog Track established in1935 and the Raynham Park/Taunton-Raynham Greyhound Park established in Raynham in1940. These dog racing facilities typically included a kennel building to house the dogs, a racing track, and dog runs. By the 1960s, tracks were required to abide by the following provisions under state law: “a track must be located at least two miles from churches, schools and housing developments” (Telegraphy 1964:2). A total of 12 dog racing tracks existed in New England in Connecticut, Massachusetts, New Hampshire, Rhode Island and Vermont during the peak of the sport. Approximately 46 active horse racing tracks also existed in the United States by 1944, which elevated the popularity of animal racing and associated gambling as a recreational event (Temple 2011:9-12).

Dog racing reached its height in popularity in the 1980s, when Wonderland Greyhound Park and the Raynham Park “outdrew more than twice the combined attendance of the Bruins, Celtics, and Patriots” (Temple 2011:10). As the sport rose in popularity, public awareness brought much opposition. Although the tracks at Raynham and Wonderland had long histories, remaining active in the state until about 2009 when Massachusetts voters approved a dog racing ban, they no longer retain any historic fabric (Ebbert 2008).

Lawrence J. Freccero of Medford, Joseph Correnti of Somerville and Joseph LoGuidice of Somerville purchased the property at 385 Thrasher Street from O’Rourke on November 5, 1965, which then contained one parcel with buildings and a second parcel with ten acres of swamp land. No dog kennel, training or racing facilities are mentioned in the deeds. Freccero, Correnti and LoGuidice owned the property for 17 years until May 7, 1965 when it was purchased by World Wide Farms, Incorporated of 659 North Main Street in Randolph, Massachusetts. Arnold Freedman, who is also listed in deeds with an address at 659 North Main Street in Randolph, acquired the property in 1987 and sold it to Gary P. O’Neil of Raynham on June 8, 1989. The property was subsequently transferred to Sentry Federal Savings Bank and Joseph F. Costa III (BCRD 1965, 1982, 1987, 1989, 1994, 1995).

Dog racing has a 75-year history in New England and is an important part of the twentieth-century recreational context of Massachusetts. Although the industry attracted crowds of spectators to Taunton and Raynham during its heyday, the Dog Kennel and Track at 385 Thrasher Street is an ancillary training facility developed late in the region’s active period of dog racing. The facility is in poor condition and has not been used as a kennel or dog training facility for at least 20 years. The late-nineteenth century-house on the property is a modest example of rural residential architecture for the time period and does not have any known significant historic associations.

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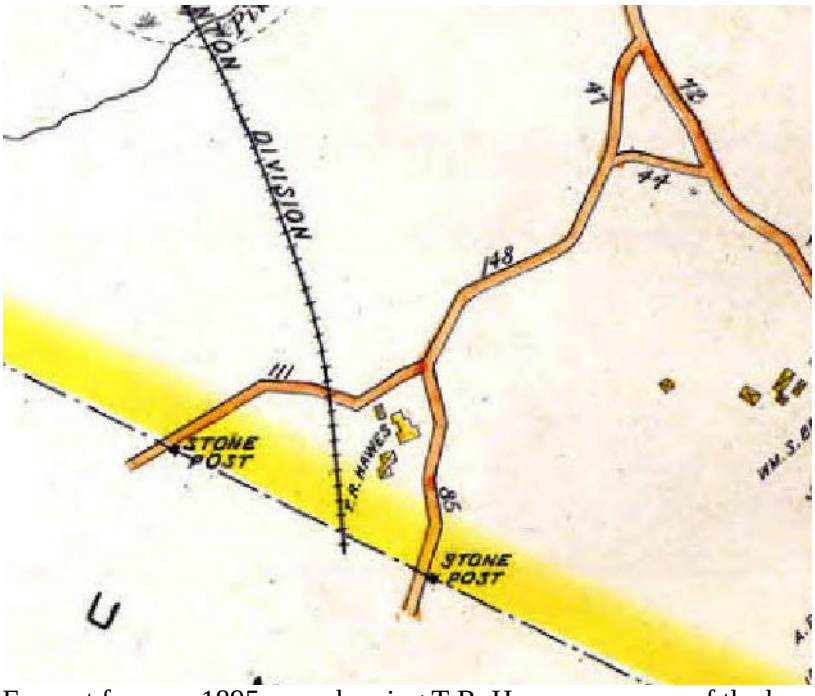
View looking north at house.

View looking southwest at house.

View looking north at non-historic shed.



Excerpt from an 1895 map showing T.R. Hawes as owner of the house (Everts and Richards 1895).

Aerial view of the Dog Kennel and Track Property oriented east (Bing 2012)

ADDENDUM TO APPENDIX E-2

Individual Properties
(alphabetical by community)

B Form for ID Be.006, 1 Macomber Street, Berkley

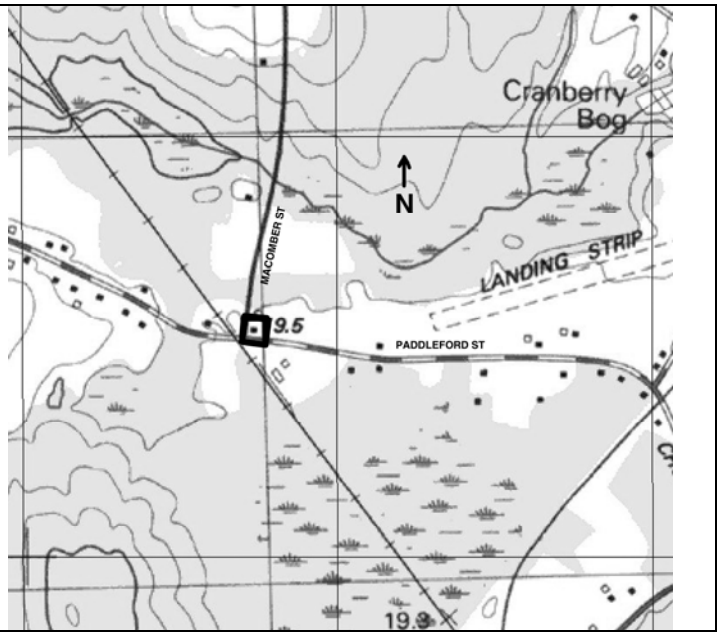
FORM B – BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number	USGS Quad	Area(s)	Form Number
	Somerset		

Photograph

Locus Map



Town/City: Berkley

Place: *(neighborhood or village)*:

Address: 1 Macomber Street

Historic Name:

Uses: Present: Residential

Original: Residential

Date of Construction: circa 1860

Source: Style, Beers 1871

Style/Form: Vernacular Italianate

Architect/Builder: Unknown

Exterior Material:

Foundation: Stone

Wall/Trim: Wood Clapboard

Roof: Asphalt Shingle

Outbuildings/Secondary Structures:
One detached, late-20th-century, single-bay garage;
One rear, attached, mid-to-late-19th-century, English-style barn.

Major Alterations *(with dates):* None

Condition: Good

Moved: **no** ☒ **yes** ☐ **Date:**

Acreage: Less than 1 acre

Setting: The building is located within a rural, residential area on the northeastern corner of Padelford Street and Macomber Street, approximately 50 feet east of the New Bedford Main Line railroad crossing at Padelford Street.

Recorded by: K. Miller, Q. Stuart, A. Cahoon

Organization: PAL

Date (*month / year)*: December 2012

☒ Recommended for listing in the National Register of Historic Places.
If checked, you must attach a completed National Register Criteria Statement form.

ARCHITECTURAL DESCRIPTION:

The residence at 1 Macomber Street is an asymmetrical, generally rectangular, two-story, three-bay by five-bay, wood-framed Italianate-style farmhouse constructed circa 1860 with a wrap-around built-in classical-style porch, an attached rear Italianate-style addition, and connected barn. The property sits on a relatively level lot with a detached non-historic garage and swimming pool located just northeast of the house. The manicured landscape is dotted with coniferous and deciduous trees, shrubbery, and other plantings. The building has an asphalt shingle roof, wood clapboard siding, and a mortared stone foundation. A tall corbelled brick chimney and pedimented dormers pierce the front-gabled roof. A molded cornice and thick frieze wraps around the roofline with gable returns and corner pilasters. The house is oriented west, with a prominently centered gable featuring three rounded-arch windows. The intermittent wrap-around porch is supported with a Doric colonnade. Fenestration is regular, with rectangular openings and historic 6/6 double-hung wood sash windows embellished with protruding pedimented and arched lintels. Constructed circa 1870, the rear connected barn has large, hinged, double wood paneled doors on the west elevation and a simple, full-width, side entry porch on the east elevation. Non-historic 10-pane double doors allow entry on the north elevation. A 20th century, front-gabled, detached garage with an asphalt shingle roof and wood shingle siding is located just southeast of house.

HISTORICAL NARRATIVE

The farmhouse at 1 Macomber Street was constructed in the vernacular Italianate style circa 1860 directly across Macomber Street from the New Bedford and Taunton Railroad line in the village Myricksville. Built just west of the village center, the property was located within the boundary of Taunton until 1879, when Myricksville was annexed to the town of Berkley. Early residents of the farmhouse included members of the Padelford and Macomber families, who were prominent in Taunton's history (Beers 1871; Everts & Richards 1895).

The Padelfords settled in Taunton in the mid-18th century as a farming family, who transitioned into the fields of law and medicine by the late 19th century. "Miss" A. Padelford occupied the farmstead in 1871. Likely Abigail Padelford, she was daughter of Edward Padelford, who by 1850, owned a 70-acre farm worth $1,000, at an unspecified location in Taunton (US Census 1850; Beers 1871; Emery 1893; Hurd 1900).

By 1880, the property at 1 Macomber Street (a farm worth $3,000) was purchased by George W. Macomber, who lived in the house with his wife, Mary T., and three children, E. Florence, Lena Borden, and Joseph Blair until at least 1900. The Macomber family was one of the first in Taunton. In 1637, John Macomber, "the progenitor of a very large and influential body of settlers," paid 12 shillings for land, having "the right to future divisions to extinguish the Indian title." In the mid- to late- nineteenth century, the majority of Macomber family members resided in Myricksville center. "Mr. Macomber's" variety store was the only store in town (Beers 1871; Emery 1893; Everts and Richards 1895; US Census 1850-1880; Hurd 1900; US Census 1900).

Italianate cottage style residences were common in Berkley throughout the town's early industrial period, spanning from 1830 to 1870. These properties were typically constructed with either side hall or center hall plans and gable-end chimneys. The application of rounded-arch windows within the gable ends was also common. The most elaborately-designed Italianate style residence in Berkley is a circa 1865 with a two gable-end chimneys on South Main Street. At this time, the town was identified as "almost exclusively an agricultural town and as such reported 125 farms in 1865, producing Indian corn, potatoes, and various fruits" (MHC 1981:6-7).

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Massachusetts Historical Commission (MHC)
1981 *MHC Reconnaissance Survey Report: Town of Berkley*. On file, Massachusetts Historical Commission, Office of the Secretary of State, Boston, MA.

United States (US) Census
1900 Berkley, Massachusetts.

[Delete this page if no Criteria Statement is prepared]

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☐ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Kathleen M.. Miller and Virginia H. Adams, PAL, Pawtucket, RI, December 2012
The criteria that are checked in the above sections must be justified here.

The building at 1 Macomber Street is eligible for individual listing in the National Register of Historic Places at the local level under Criterion C as an excellent and intact example of a moderate- to large-scale, lightly detailed, mid- to late-nineteenth-century Italianate style residence. Constructed circa 1860 as a dwelling, the property gained significance as a farmhouse with the addition of a connected barn between 1860 and 1880. The building is a well-preserved representative example of the farmhouse building type from Berkley's historic agricultural period. Set aside from similarly styled properties in town that are with gable-end chimneys, the building appears to be locally unique in its gable-piercing chimney placement.

APPENDIX F
Addendum

Historic Resources Surveyed and Not Eligible, Out of APE, or Demolished Forms

Revised and Updated, May 2013

Ta.U (see Appendix E-1 Addendum)
NB.029 (see Appendix E-2 Addendum)
Ft.002 (see Appendix E-2 Addendum)

APPENDIX H
Addendum

Correspondence

Updated May 2013

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

April 10, 2013

REPLY TO
ATTENTION OF

Regulatory Division (CENAE-R)
File No.: NAE-2007–00698

Ms. Jean Fox, South Coast Rail Project Manager
Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116

Dear Ms. Fox:

We are continuing consultation under §106 of the National Historic Preservation Act concerning your Department of the Army (DA) permit application to discharge fill material into wetlands in order to re-establish commuter service from Boston to New Bedford and Fall River, and our ongoing preparation of a Final Environmental Impact Statement (FEIS) concerning same. We have completed our review of the following reports prepared by Public Archaeology Laboratory (PAL) on behalf of MassDOT and Vanasse Hangen Brustlin, Inc.:

- Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, January 2013 (including appendices)
- Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternatives, South Coast Rail Project, February 2013
- Archaeological Assessment, Relocated Stoughton Station and Dana Street Station, Stoughton and Whittenton Alternatives, South Coast Rail Project," dated March 15, 2013.

We have also considered and enclosed herewith comments received from the Massachusetts Historical Commission, dated February 21, 2013 and April 3, 2013. At this time, the following additional information is necessary for us to finalize our determinations of eligibility for listing of certain properties in the National Register of Historic Places, and effects of your undertaking on those properties:

1. Effects analysis (direct and indirect/determination of adverse effect) and updated mapping to include the following properties considered eligible for the National Register:
    a. George Cummings House (Ft.002) in Freetown
    b. Joel Hathaway House (FR.003) in Fall River
    c. St. Mathews Convent (FR.052) in Fall River
    d. St. Mathews School (FR.053) in Fall River
    e. St. John's Cemetery (FR.110, previously unsurveyed) in Fall River

2. Effects analysis/recommendations and mapped location for the direct effects to the Dighton and Somerset/Old Colony Railroad, which is located in the Fall River Line Railroad Corridor (Ea. A) and North Easton Historic District (Ea. B), and has been identified as a contributing element of the district but has not been identified on any

project maps and was not included in any of the effects analyses.

3. Map ID and any new designation reflecting the Area status of FR.050 (St Michaels Church, St Michaels Rectory, St Michaels School) and changes to the effects analysis that results from this Area status, if any (effects determination for the location as an individual property was previously provided).

4. Area inventory forms for the Hodges Avenue and Weir Village Historic District areas in Taunton (eligibility of and effects upon these resources could be a factor in ascertaining compliance with the U.S. EPA Guidelines for Specification of Disposal Sites for Dredged or Fill Material at 40 CFR 230.10 *et seq.*).

Upon receipt of this information we will coordinate further with the consulting parties and proceed to our final determinations of eligibility and effect to be published in the FEIS/FEIR.

At this time, we believe that the following resource areas mentioned by MHC can be addressed in a Programmatic Agreement:

1. Outstanding archaeological issues, including electrification infrastructure including catenaries, as-yet un-designed off-right-of-way work areas, and intensive survey in sensitive areas of Dana Street and Stoughton Stations and Rte. 138 grade separation.

2. Effects analysis and avoidance/treatment plans for the Braley Cemetery, Freetown, and Captain Elisha Harvey Gravesite, North Easton.

3. Any revisions or investigations associated with the Wellington/Brownell Street Area or North End Catholic Area in Fall River beyond the data categories requested for any of individual properties listed above.

We expect to continue consultation with your office and the consulting parties pursuant to 36 CFR 800.6 in order to resolve adverse effects by seeking ways to avoid, minimize and/or mitigate adverse effects to deemed-eligible properties.

If you have any questions regarding this letter, please contact me or Alan Anacheka-Nasemann at (978) 318-8214, or via email at: alan.r.anacheka-nasemann@usace.army.mil.

Sincerely,

Karen K. Adams
Chief, Permits and Enforcement Branch

Enclosures

Copy(ies) furnished:

Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah), 20 Black Brook Road, Aquinnah, Massachusetts 02353
Ramona Peters, Mashpee Wampanoag Tribe, 483 Great Neck Road South, Mashpee, Massachusetts 02649
Doug Harris, Narragansett Indian Tribe, 4375-B South County Trail, Charlestown, Rhode Island 02813
Brona Simon, State Historic Preservation Officer, Massachusetts Historical Commission, 220 Morrissey Boulevard, Boston, Massachusetts 02125
Lisa Standley, Ph.D., Vanasse Hangen Brustlin, Inc., 99 High Street, Boston, Massachusetts 02110
Deborah C. Cox, The Public Archaeology Laboratory, Inc. 210 Lonsdale Avenue, Pawtucket, Rhode Island 02860

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

April 3, 2013

Karen Kirk Adams
Chief, Permits and Enforcement Branch
New England District
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. Adams:

Staff of the Massachusetts Historical Commission (MHC), office of the State Historic Preservation Officer, have reviewed your letters, the draft technical archaeological report *Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternatives, South Coast Rail Project* and *Archaeological Assessment, Relocated Stoughton Station and Dana Street Station, Stoughton and Whittenton Alternatives, South Coast Rail Project, Stoughton and Taunton, Massachusetts*, historic resources intensive survey reports, and MHC area forms, prepared by the PAL, received March 4, 6, 20 and 25, 2013, and attended a consultation meeting on February 14, 2013, for the project referenced above. The MHC will also provide technical comments to the PAL on the draft technical archaeological report under separate cover.

The Corps has requested the MHC's concurrence with the Corps' preliminary determinations of National Reigster-eligibility and project effect findings described in these technical reports for the Stoughton and Whittenton Electric rail project alternatives.

The MHC concurs with the majority of the Corps' determinations of National Register-eligibility under the National Register criteria provided for the individual properties included in the final historic resources survey report and with the following exceptions. It is the opinion of the MHC that the property at 521 Prospect Hill in Raynham and the Dog Kennel and Track at 385 Thrasher Street in Raynham meet the criteria of eligibility for listing in the National Register of Historic Places under criteria A and C of the National Register at the local level.

The MHC also concurs with the majority of determinations of National Register-eligibility for the potential historic districts under the National Register criteria provided in the final historic resources survey report (Appendix E, received separately March 20, 2013) with the following exceptions. The MHC requires additional information, including additional current color photographs keyed to a map and data sheet for the following areas: Hodges Avenue and Weir Village Areas in Taunton and the Wellington/Brownell Street Area in Fall River. While the larger Wellington Brownell Street Area in Fall River may not appear to meet the criteria of eligibility for listing in the National Register of Historic Places, it is possible that the smaller identified North End Roman Catholic Area might be expanded beyond those religious structures and features to include some residential areas.

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

At this time, the MHC concurs with the majority of the findings of project effects included in the matrix as part of Appendix A, Table 5-1 in PAL's report, but understands that as the project planning progresses, additional changes may be made to the project, thereby resulting in additional or lessened effects to historic resources.

The MHC notes that Appendix A, Table 5-1 of PAL's report does not include a finding of effect on the North Easton Historic District through the rebuilding of an estimated 2000 feet of the rail bed, track, and equipment associated with the Dighton and Somerset/Old Colony Railroad, which is located within the North Easton Historic District which is listed in the National Register. The MHC requests that the Corps submit additional information for the proposed treatment of this stretch of rail bed, including plans and scope of work, together with your determination of effect when such information becomes available.

The MHC concurs with the Corps' preliminary determinations of eligibility for archaeological resources presented in the PAL's draft technical archaeological report under criteria A and D of the National Register. The MHC concurs with the Corps' determinations of adverse effect to significant archaeological resources described in PAL's draft archaeological report (pp.233-234).

As described on pages 233 and 234 of the PAL's archaeological report, and as noted in the archaeological assessment for Stoughton and Taunton station relocations, additional archaeological investigations may be warranted for archaeologically sensitive project elements, for which design and geotechnical information are not yet fully developed. These areas include, but may not be limited to, the Route 138 Grade crossing in Taunton, the railroad right-of-way adjacent to the Braley Cemetery in Freetown, the relocated Stoughton Station in Stoughton and Dana Street Station in Taunton, and catenary structures, access roads, equipment storage and materials staging areas. Proposed layover facilities, electrical substations and parallel station designs and locations may also require assessment as the project design is further refined. Current project information for the preferred alternative, including scaled existing and proposed conditions project plans, should be submitted to the MHC for review and comment as they are developed, along with the Corps' opinion regarding the need for additional archaeological survey.

The MHC notes that another historic cemetery, the Captain Elisha Harvey Gravesite, dating to 1757 and/or 1775, is located directly adjacent to the current railroad right-of-way at 25 Elm Street in Easton, within the National Register-listed North Easton Historic District. The Captain Elisha Harvey Gravesite is not individually included in the MHC's Inventory. The cemetery is administered by the Town of Easton and the parcel is currently marked by a granite plaque. MHC recommends that additional information, including consultation with the Easton Historical Commission, parcel-level documentary research and/or field survey, be provided to determine the boundaries of the cemetery in relation to the project impact area, and to assist in the development of a written archaeological site avoidance and protection plan for the cemetery.

The MHC recommends that project planners consider the feasibility of avoidance and protection for the 14 significant archaeological sites and cemeteries, including the Skunk Trapper Site and Saws Woods Site in the Hockomock Swamp; King Phillip Street Site, Chickering Road Site and East Britannia Street Sites in Pine Swamp in Easton, Raynham and Taunton; and the Circling Hawk Site, Cold Toad Site, Overlook North Site, Overlook South Site and Quartz Vein Site within the Lower Taunton River Archaeological District in Freetown; and the Braley Cemetery in Freetown. If the preferred project alternative includes the Whittenton Branch right-of-way, then project planners should also consider avoidance and protection of the Mel's Diner Site, Brown Couch Site, ATV Trail Site and Cedar Swamp Site.

Written archaeological site avoidance and protection plans should be developed in consultation with MHC to avoid and preserve these sites during construction, and incorporated as stipulations into any

Memorandum of Agreement (MOA) developed for the project. If avoidance is not feasible, then the MHC recommends that site examination archaeological surveys (950 CMR 70) be conducted for the fourteen (14) sites referenced above. The purpose of the site examinations is to gather sufficient information to determine the exact horizontal and vertical boundaries of the sites, their internal configuration, and data contents, so that a determination of significance and National Register-eligibility can be made by the Corps and submitted to the MHC for review and comment. The results of the site examinations will provide information to assist in further consultation to avoid, minimize or mitigate any adverse effects to significant archaeological resources.

These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions or require more information at this time, please contact Brandee Loughlin, Preservation Planner or Jonathan K. Patton, Archaeologist, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Kathleen Atwood, USACOE-NED
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
John A. Peters, Jr., Massachusetts Commission on Indian Affairs
A. Kenneth Alves, Assonet Band, Wampanoag Nation
Jean Fox, MADOT
Andrew Brennan, MBTA
Holly Palmgren, MBTA
Secretary Richard K. Sullivan, EEA, Attn: Aisling O'Shea, MEPA Unit
Stephen C. Smith, SRPEDD
Historical Commissions: Canton, Stoughton, Sharon, Easton, Taunton, Berkley, Lakeville, Attleborough, Fall River, Freetown, New Bedford
Deborah C. Cox, PAL
Rita Walsh, VHB, Inc.

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

February 21, 2013

Karen Kirk Adams
Chief, Permits and Enforcement Branch
New England District
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Attn: Alan Anacheka-Nasemann

RE: South Coast Rail Project, Southeastern Massachusetts. MHC #RC.15924. EEA#14346.
CE-NAE-2007-00698.

Dear Ms. Adams:

Staff of the Massachusetts Historical Commission (MHC), office of the State Historic Preservation Officer, have reviewed your letter, received January 22, 2013, and the technical memorandum describing the results of intensive (locational) archaeological survey, prepared by the PAL, and historic resources intensive survey report, and attended a consultation meeting on February 14, 2013, for the project referenced above.

These documents describe historic and archaeological resource identification efforts for the Stoughton and Whittenton Electric rail project alternatives. The Corps has requested the MHC's concurrence with the Corps' preliminary determinations of eligibility and effect described in these documents. The MHC requires additional information to comment on the Corps' draft findings, including the following:

- The MHC requests additional information and photographs of the residence and barn at 521 Prospect Hill in Raynham (Map ID# Ra.001).

- The MHC also requests additional historical and contextual information for the dog kennel and track property at 385 Thrasher Street in Raynham (Map ID# Ra.011).

- The MHC cannot concur with your finding that the George Cummings House (MHC# FRE.166; Map ID# Ft.002) does not meet the criteria of eligibility for listing in the National Register of Historic Places (NRHP). It is the opinion of the MHC that the George Cummings House, including its barn, meets the criteria of eligibility for listing in the NRHP under criteria A and C at the local level as a representative and well-preserved example of its time period and architectural style.

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(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

- The MHC cannot concur with your finding that the Christ Presbyterian Church (Map ID# NB.029) meets the criteria of eligibility for individual listing in the NRHP. The structure appears to be a highly altered, vinyl-sided building of unknown date of construction and origin. The MHC does not believe that this structure retains sufficient integrity of materials, setting, workmanship, or feeling to meet the criteria of eligibility for listing in the NRHP.

- The MHC requests additional information regarding the Lambeth Rope Complex (MHC#NBE.0641, Map ID# NB.010). Specifically, the MHC requests an MHC Form A (Area Form) with complete data sheet, parcel map, and photographs of each structure be completed and submitted for review.

- The MHC also requests additional information regarding the railroad bridge near Ashley Street (Map ID# FR.011), including additional information regarding the lane passing under the bridge and the wharf that it leads to along the Taunton River.

- The MHC cannot concur with your finding that the Jael Hathaway House at 4042 North Main Street (MHC# FLR.0284, Map ID# FR.003) does not meet the criteria of eligibility for listing in the National Register of Historic Places (NRHP). It is the opinion of the MHC that the Jael Hathaway House meets the criteria of eligibility for listing in the NRHP under criteria A and C at the local level as a rare surviving federal period house in Fall River with an intact 19th century barn.

- The MHC requests additional information regarding the school and rectory associated with the St. Michael's Roman Catholic Church (Map ID# FR.050). Please submit an MHC Form A (Area Form) for these properties.

- The MHC requests additional information regarding the St. Matthew's School and St. Matthew's Convent (MAP ID #s FR.052 & FR.053). Were there historically other structures associated with the school and convent, such as a church or rectory? Given their proximity to the St. Michael's Roman Catholic Church, is there a potential district in this area? Are these properties perhaps included in the Wellington Area?

- The MHC requests additional information regarding St. John's Cemetery in Fall River. Please prepare and submit an inventory form for this property together with an evaluation of the property's potential eligibility for listing in the NRHP.

- The MHC also requests additional information regarding the Westport Manufacturing Company Waste Department (Map ID# FR.067). Specifically, what types of properties are immediately adjacent to the structure? Were there historically additional structures nearby that were associated with this building, and if so, do any of these survive?

The MHC looks forward to review of this additional information when it becomes available. The MHC also looks forward to review of the Area Forms that were discussed in the reports but not yet complete by time of submission.

The MHC looks forward to reviewing the draft technical archaeological report for the intensive (locational) survey and to receipt of the MHC Inventory forms not included in the historic

properties survey. The MHC anticipates providing additional comments after reviewing these materials.

These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). If you have any questions or require more information at this time, please contact Brandee Loughlin, Preservation Planner, or Jonathan K. Patton, Archaeologist, at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Kathleen Atwood, USACOE-NED
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
John A. Peters, Jr., Massachusetts Commission on Indian Affairs
A. Kenneth Alves, Assonet Band, Wampanoag Nation
Jean Fox, MADOT
Andrew Brennan, MBTA
Holly Palmgren, MBTA
Secretary Richard K. Sullivan, EEA, Attn: Aisling O'Shea, MEPA Unit
Stephen C. Smith, SRPEDD
Historical Commissions:
Canton, Stoughton, Sharon, Easton, Taunton, Berkley, Lakeville, Attleborough, Fall River, Freetown, and New Bedford
Deborah C. Cox, PAL
Rita Walsh, VHB, Inc.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

January 18, 2013

REPLY TO
ATTENTION OF

Regulatory Division (CENAE-R)
File No.: NAE-2007–00698

Ms. Brona Simon, State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, Massachusetts 02125

Via FEDEX

Dear Ms. Simon:

We are continuing consultation under §106 of the National Historic Preservation Act on the proposal by the Massachusetts Department of Transportation (MassDOT) to discharge fill material into wetlands in order to re-establish commuter service from Boston to New Bedford and Fall River. Thank you for your correspondence of October 10, 2012 affirming the research designs and methodologies for historic and archaeological resources surveys for the Stoughton and Whittenton Alternatives.

We have received and herewith attach the following documents prepared by Public Archaeology Laboratory (PAL) on behalf of MassDOT and Vanasse Hangen Brustlin, Inc.:

- Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, January 2013 (Technical Report)
- Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternative Right-of-ways [sic], and Stoughton Alternative Stations, South Coast Rail Project, January 2013 (Technical Memorandum)

Please note that these documents contain MassDOT's/PAL's recommendations concerning both eligibility for listing of identified properties within the National Register of Historic Places, and the proposed project's potential effects on same. In order to expedite the Section 106 process, and pursuant to Federal Regulations at 36 CFR Part 800, 33 CFR 325, and *Interim Guidance for Implementing Appendix C of 33 CFR 325 with the revised Advisory Council on Historic Preservation Regulations at 36 CFR Part 800* (April 2005), the Corps is adopting these reports as our draft determinations of eligibility and effects (including adverse effects) that are expected to accrue within the Area of Potential Effects from construction of South Coast Rail if a Department of the Army permit is issued for either alignment. We expect to disclose these findings (sans locational or other confidential data) in the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) anticipated to be published in spring of 2013.

Specifically, we are seeking your concurrence with the identification of historic properties, and the draft findings of eligibility and effect, so as to ensure that we will have a

robust environmental review well documented in the Environmental Consequences - Cultural Resources chapter of the FEIS/FEIR. That document will include our final determinations of eligibility and effect, and will be provided to your office, the Advisory Council on Historic Preservation, and other consulting parties at that time. Please provide your written comments on the attached reports within 30 days of your receipt of this letter and its attachments.

Thereafter, we expect to continue consultation with your office and other consulting parties pursuant to 36 CFR 800.6 in order to resolve adverse effects by seeking ways to avoid, minimize and/or mitigate adverse effects to deemed-eligible properties.

If you have any questions regarding this letter, please contact me or Alan Anacheka-Nasemann at (978) 318-8214, or via email at: alan.r.anacheka-nasemann@usace.army.mil.

Sincerely,

Karen K. Adams
Chief, Permits and Enforcement Branch

Enclosures

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

January 18, 2013

REPLY TO
ATTENTION OF

Regulatory Division (CENAE-R)
File No.: NAE-2007–00698

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535-1546

Via: FEDEX

Dear Ms. Washington:

We are continuing consultation under §106 of the National Historic Preservation Act on the proposal by the Massachusetts Department of Transportation (MassDOT) to discharge fill material into wetlands in order to re-establish commuter service from Boston to New Bedford and Fall River.

We have received and herewith attach the following documents prepared by Public Archaeology Laboratory (PAL) on behalf of MassDOT and Vanasse Hangen Brustlin, Inc.:

- Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, January 2013 (Technical Report)
- Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternative Right-of-ways [sic], and Stoughton Alternative Stations, South Coast Rail Project, January 2013 (Technical Memorandum)

Please note that these documents contain MassDOT's/PAL's recommendations concerning both eligibility for listing of identified properties within the National Register of Historic Places, and the proposed project's potential effects on same. In order to expedite the Section 106 process, and pursuant to Federal Regulations at 36 CFR Part 800, 33 CFR 325, and *Interim Guidance for Implementing Appendix C of 33 CFR 325 with the revised Advisory Council on Historic Preservation Regulations at 36 CFR Part 800* (April 2005), the Corps is adopting these reports as our draft determinations of eligibility and effects (including adverse effects) that are expected to accrue within the Area of Potential Effects from construction of South Coast Rail if a Department of the Army permit is issued for either alignment. We expect to disclose these findings (sans locational or other confidential data) in the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) anticipated to be published in spring of 2013.

Specifically, we are seeking your concurrence with the identification of historic properties, and the draft findings of eligibility and effect, so as to ensure that we will have a robust environmental review well documented in the Environmental Consequences - Cultural

Resources chapter of the FEIS/FEIR. That document will include our final determinations of eligibility and effect, and will be provided to your office, the Advisory Council on Historic Preservation, and other consulting parties at that time. Please provide your written comments on the attached reports within 30 days of your receipt of this letter and its attachments.

Thereafter, we expect to continue consultation with your office and other consulting parties pursuant to 36 CFR 800.6 in order to resolve adverse effects by seeking ways to avoid, minimize and/or mitigate adverse effects to deemed-eligible properties.

If you have any questions regarding this letter, please contact me or Alan Anacheka-Nasemann at (978) 318-8214, or via email at: alan.r.anacheka-nasemann@usace.army.mil.

Sincerely,

Karen K. Adams
Chief, Permits and Enforcement Branch

Enclosures

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

January 18, 2013

REPLY TO
ATTENTION OF

Regulatory Division (CENAE-R)
File No.: NAE-2007–00698

Doug Harris, Preservationist for Ceremonial Landscapes
Narragansett Indian Tribal Historic Preservation Office
4375-B South County Trail
Charlestown, RI 02813

Via: FEDEX

Dear Mr. Harris:

We are continuing consultation under §106 of the National Historic Preservation Act on the proposal by the Massachusetts Department of Transportation (MassDOT) to discharge fill material into wetlands in order to re-establish commuter service from Boston to New Bedford and Fall River.

We have received and herewith attach the following documents prepared by Public Archaeology Laboratory (PAL) on behalf of MassDOT and Vanasse Hangen Brustlin, Inc.:

- Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, January 2013 (Technical Report)
- Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternative Right-of-ways [sic], and Stoughton Alternative Stations, South Coast Rail Project, January 2013 (Technical Memorandum)

Please note that these documents contain MassDOT's/PAL's recommendations concerning both eligibility for listing of identified properties within the National Register of Historic Places, and the proposed project's potential effects on same. In order to expedite the Section 106 process, and pursuant to Federal Regulations at 36 CFR Part 800, 33 CFR 325, and *Interim Guidance for Implementing Appendix C of 33 CFR 325 with the revised Advisory Council on Historic Preservation Regulations at 36 CFR Part 800* (April 2005), the Corps is adopting these reports as our draft determinations of eligibility and effects (including adverse effects) that are expected to accrue within the Area of Potential Effects from construction of South Coast Rail if a Department of the Army permit is issued for either alignment. We expect to disclose these findings (sans locational or other confidential data) in the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) anticipated to be published in spring of 2013.

Specifically, we are seeking your concurrence with the identification of historic properties, and the draft findings of eligibility and effect, so as to ensure that we will have a robust environmental review well documented in the Environmental Consequences - Cultural Resources chapter of the FEIS/FEIR. That document will include our final determinations of

eligibility and effect, and will be provided to your office, the Advisory Council on Historic Preservation, and other consulting parties at that time. Please provide your written comments on the attached reports within 30 days of your receipt of this letter and its attachments.

Thereafter, we expect to continue consultation with your office and other consulting parties pursuant to 36 CFR 800.6 in order to resolve adverse effects by seeking ways to avoid, minimize and/or mitigate adverse effects to deemed-eligible properties.

If you have any questions regarding this letter, please contact me or Alan Anacheka-Nasemann at (978) 318-8214, or via email at: alan.r.anacheka-nasemann@usace.army.mil.

Sincerely,

Karen K. Adams
Chief, Permits and Enforcement Branch

Enclosures

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

January 18, 2013

REPLY TO
ATTENTION OF

Regulatory Division (CENAE-R)
File No.: NAE-2007–00698

Ms. Ramona Peters, Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Rd. S.
Mashpee, MA 02649

Via: FEDEX

Dear Ms. Peters:

We are continuing consultation under §106 of the National Historic Preservation Act on the proposal by the Massachusetts Department of Transportation (MassDOT) to discharge fill material into wetlands in order to re-establish commuter service from Boston to New Bedford and Fall River.

We have received and herewith attach the following documents prepared by Public Archaeology Laboratory (PAL) on behalf of MassDOT and Vanasse Hangen Brustlin, Inc.:

- Historic Resources Intensive Survey, Evaluation, and Effects, South Coast Rail Project, January 2013 (Technical Report)
- Intensive (Locational) Archaeological Survey, Stoughton and Whittenton Alternative Right-of-ways [sic], and Stoughton Alternative Stations, South Coast Rail Project, January 2013 (Technical Memorandum)

Please note that these documents contain MassDOT's/PAL's recommendations concerning both eligibility for listing of identified properties within the National Register of Historic Places, and the proposed project's potential effects on same. In order to expedite the Section 106 process, and pursuant to Federal Regulations at 36 CFR Part 800, 33 CFR 325, and *Interim Guidance for Implementing Appendix C of 33 CFR 325 with the revised Advisory Council on Historic Preservation Regulations at 36 CFR Part 800* (April 2005), the Corps is adopting these reports as our draft determinations of eligibility and effects (including adverse effects) that are expected to accrue within the Area of Potential Effects from construction of South Coast Rail if a Department of the Army permit is issued for either alignment. We expect to disclose these findings (sans locational or other confidential data) in the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) anticipated to be published in spring of 2013.

Specifically, we are seeking your concurrence with the identification of historic properties, and the draft findings of eligibility and effect, so as to ensure that we will have a robust environmental review well documented in the Environmental Consequences - Cultural Resources chapter of the FEIS/FEIR. That document will include our final determinations of

eligibility and effect, and will be provided to your office, the Advisory Council on Historic Preservation, and other consulting parties at that time. Please provide your written comments on the attached reports within 30 days of your receipt of this letter and its attachments.

Thereafter, we expect to continue consultation with your office and other consulting parties pursuant to 36 CFR 800.6 in order to resolve adverse effects by seeking ways to avoid, minimize and/or mitigate adverse effects to deemed-eligible properties.

If you have any questions regarding this letter, please contact me or Alan Anacheka-Nasemann at (978) 318-8214, or via email at: alan.r.anacheka-nasemann@usace.army.mil.

Sincerely,

Karen K. Adams
Chief, Permits and Enforcement Branch

Enclosures

Appendix 4.9-A

Air Quality Modeling Documentation

Appendix
Air Quality

- DEP Protocol Letter
- MOBILE6.2 Input Files
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)
- MOBILE6.2 Output Files
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)
- Hot Spot: Microscale (Local) Analysis
  - Intersection Receptor Maps
  - CAL3QHC Input Files
    - Carbon Monoxide (CO)
    - Particulate Matter 10 (PM_{10})
    - Particulate Matter 2.5 ($PM_{2.5}$)
  - CAL3QHC Output Files
    - Carbon Monoxide (CO)
    - Particulate Matter 10 (PM_{10})
    - Particulate Matter 2.5 ($PM_{2.5}$)
  - Microscale Results
    - Carbon Monoxide (CO)
    - Particulate Matter 10 (PM_{10})
    - Particulate Matter 2.5 ($PM_{2.5}$)
- Mesoscale (Regional) Analysis
  - CTPS Model Data
  - Rapid Bus Alternative
  - Train Emissions
- Layover Facilities Emissions
- Emission Factors for Locomotives

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DEP Protocol Letter

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Vanasse Hangen Brustlin, Inc.

May 27, 2009

Ref: 10111.00

Ms. Susan Lyon
Chief, Transportation Management Programs
Bureau of Waste Prevention
Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

Re: The South Coast Rail Project
Air Quality Modeling Protocol

Dear Ms. Lyon:

I am writing to request your office's concurrence on the air quality modeling approach for the South Coast Rail Project generally in Norton, Fall River, East Taunton, Easton, Freetown, New Bedford, North Easton, Raynham, and Taunton, Massachusetts.

A Draft Environmental Impact Report (DEIR) is currently being prepared. This DEIR will include a detailed air quality and traffic study. The air quality study will evaluate the regional (mesoscale) impacts of the proposed project and the local (microscale) impacts of the proposed project.

Mesoscale Analysis

The Central Transportation Planning Staff (CTPS) will be providing the mesoscale emissions for each of the alternatives being reviewed and we will extract the areas that cover, at a minimum, all roadway links that are projected to experience an increase of 10% in traffic due to the project and that experience level-of-service (LOS) designation of "D" or lower under existing and/or future conditions.

The air quality study will follow the Massachusetts DEP May 1991 guidelines for preparing mesoscale analyses. This analysis will calculate the VOC, NO_x ,PM_{10}, $PM_{2.5}$,CO and CO_2emissions from motor vehicle traffic in the project area. The modeling parameters will include lengths of roadway, vehicle speeds, and the average daily traffic volumes. This analysis will evaluate the change in emissions during the ozone season (summer) due to the changes in these parameters for the existing (2008) and future 2030 No-Build, and 2030 Build for each Alterative being reviewed.

101 Walnut Street
Post Office Box 9151
Watertown, Massachusetts 02471-9151
617.924.1770 ▪ FAX 617.924.2286
email: info@vhb.com
www.vhb.com

Microscale Analysis

The microscale analysis will use the Environmental Protection Agency's (EPA) CAL3QHC computer model and will be based on the procedures outlined in the EPA's "Guideline for Modeling Carbon Monoxide from Roadway Intersections." The microscale analysis will analyze the year 2008 as existing, 2016 as the year of completion and 2030 as the future analysis year. The microscale analysis will include existing and future proposed roadway geometry, traffic signal timings, and peak-hour traffic volumes. This analysis will evaluate the carbon mondoxide (CO) concentrations, Particulate Matter (PM_{10}) and $PM_{2.5}$ during the CO season (winter) at sensitive receptor locations.

The air quality study will include a microscale analysis that evaluates the CO, PM_{10} and $PM_{2.5}$ at nearby intersections. The intersections that will be modeled will be selected based upon an evaluation of the traffic data (Level-of-Service and traffic volumes). In addition to the required highest three traffic volume and worst three level-of-service intersections, one intersection in the vicinity of each proposed station will be assessed for emissions. The emissions from the trains at these study intersections will also be included. The microscale modeling parameters that will be used are included in Exhibit 3.

The emission factors used in the mesoscale and microscale analysis will be obtained from the EPA's MOBILE6.2 emissions model (official update to MOBILE 6 as of May 19, 2004) for use in the air quality study. MOBILE6.2 will be run using input files consistent with the current State Implementation Plan emission factors, which will reflect Massachusetts' specific emission control programs and registration distribution.

Background Values

The background concentrations for CO, PM_{10} and $PM_{2.5}$ that will be used for the microscale analysis are based on the most recent three years of monitoring data available (2005 through 2007)[1]. The background concentrations for CO will be assumed to be 3.0 ppm for the 1-hour concentrations. A Persistence Factor of 0.70 was calculated for use in determining the 8-hour concentrations from the 1-hour concentrations. A background concentration of 30.7 ug/m^3 for the PM_{10} 24-hour concentrations, 26.7 ug/m^3 for the $PM_{2.5}$ 24-hour concentrations and 9.2 ug/m^3 for the annual $PM_{2.5}$ concentrations are proposed based on area monitoring sites.

If you have any questions regarding the air quality analysis, please feel free to contact me at (617) 924-1770. Your cooperation in this matter is greatly appreciated.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Thomas F. Wholley
Director of Air Quality Services

Enclosures

[1] 2005 through 2007 Annual Reports on Air Quality in New England, United States Environmental Protection Agency, Region 1, Office of Environmental Measurement and Evaluation, North Chelmsford, MA 01863, Ecosystems Assessment Unit, http://www.epa.gov/region01/lab/reportsdocuments.html

Table 1

Mobile 6.2 Input File	Commands	Description
* MA DEP Input File for Summer Ozone		Input File Note
File originally prepared by Craig Woleader		Input File Note
* Filename = MA10_SUM.inp		Input File Note
**********Header Section **********		
MOBILE6 INPUT FILE		
POLLUTANTS: HC CO NOX CO2	POLLUTANTS:	Hydrocarbons, Carbon Monoxide, Nitrogen Oxide
REPORT FILE: MA10_SUM.txt REPLACE	REPORT FILE:	Name of Output file
RUN DATA		
**********Run Section **********		Input File Note
> ********** SUMMER**********		Echo to Output file
* Pollutant output format		
EXPRESS HC AS VOC:	EXPRESS HC AS VOC:	Expresses Hydrocarbons as Volatile Organic Compounds
* Mass. specific user inputs -- require external data file		Input File Note
REG DIST: MA_REG05.D	REG DIST:	Massachusetts registration file
I/M DESC FILE: 09NEWIM.D	I/M DESC FILE:	Massachusetts Enhanced I/M program inputs for 2000+ calendar year.
	Note: See Table 2 for details.	
STAGE II REFUELING: 91 3 84. 84.	STAGE II REFUELING:	This Stage II Program started in 1991, was phased in over 3 years and was 84% efficient for LDGVs, LDGTs, and HDGVs
* Inputs for LEV II		Input File Note
94+ LDG IMP: MA_LEV2.D	94+ LDG IMP:	94+ LDG IMPLEMENTATION FOR LEVII EXHAUST - LEV II in 2004 w/ ZEV
T2 EXH PHASE-IN: LEV2EXH.D	T2 EXH PHASE-IN:	Defines phase-in schedules to be modeled for the Tier 2 exhaust standards
T2 EVAP PHASE-IN: LEV2EVAP.D	T2 EVAP PHASE-IN:	Defines phase-in schedules to be modeled for the Tier 2 evaporative emission standards

Mobile 6.2 Input File	Commands	Description
T2 CERT: LEV2CERT.D	T2 CERT:	Specifies alternative Tier 2 50,000 mile certification standards and used to model effects of California's LEV II program.
* Meteorological inputs		Input File Note
MIN/MAX TEMP: 70.4 93.7	MIN/MAX TEMP:	Minimum and Maximum temperatures as set forth in the Massachusetts SIP
* Fuel Inputs		Input File Note
FUEL RVP: 6.8	FUEL RVP:	Specifies the fuel Reid Vapor Pressure (RVP) representing the average fuel volatility for the Massachusetts area
FUEL PROGRAM: 2 N	FUEL PROGRAM:	Models a reformulated gasoline (RFG) program for a northern region
**********Scenario Section **********		Input File Note
**********Summer Freeway **********		Input File Note
SCENARIO RECORD: MA Freeway 2.71 mph	SCENARIO RECORD:	Labels the individual scenarios
CALENDAR YEAR: 2010	CALENDAR YEAR:	Calendar year of scenario evaluated
EVALUATION MONTH: 7	EVALUATION MONTH:	Specifies July 1 as time period for evaluation
AVERAGE SPEED: 2.71 Freeway 92.0 0.0 0.0 8.0	AVERAGE SPEED:	Sets an average speed of 2.71 for the Freeway roadway classification (this is the minimum speed input for Freeways) and shows 92% of VMT on freeways and 8% of VMT on freeway ramps

NOTE: The scenario records for freeways continue in increments of 1 MPH to a maximum of 60.7 MPH. For arterials, the scenario records begin at a minimum of 2.5 MPH and continue in increments of 1 MPH to a maximum of 65 MPH

Table 2

Mobile 6.2 I/M File	Commands	Description
> Mass. Enhanced I/M program inputs for 2009 calendar year, filename = MA_IM09.D File originally prepared by Craig Woleader, revised 7/6/04.		Echo to Output file Input File Note
********** I/M Program #1 ********** >New Annual OBD Exhaust I/M program for Light Duty MY 1996-2007 vehicles <=8,500 lb GVWR * I/M Grace Period Set to 1 (i.e. exempt 1 newest model year) to Reflect New Vehicle Exemption and LEP		Echo to Output file Input File Note
I/M PROGRAM: 1 2009 2050 1 TRC OBD I/M	I/M PROGRAM:	This I/M program started in 2009 and ends in 2050
I/M MODEL YEARS: 1 1996 2007	I/M MODEL YEARS:	This I/M program tests model years 1996 through 2007
I/M VEHICLES: 1 22222 11111111 1	I/M VEHICLES:	This command calculates I/M benefits for light-duty gasoline vehicles (cars and light-duty trucks) as well as the class HDGV2B
I/M STRINGENCY: 1 20.0	I/M STRINGENCY:	This command sets the stringency rate (the expected exhaust inspection failure rate for pre-1981 model year vehicles) at 20 percent.
I/M COMPLIANCE: 1 96.0	I/M COMPLIANCE:	This command sets the compliance (the percentage of vehicles in the fleet that complete the I/M program and receive either a certificate of compliance or waiver) at 96 percent.
I/M WAIVER RATES: 1 0.0 1.0	I/M WAIVER RATES:	This command sets the waiver rate at 0.0 percent for pre-1981 model years and 1.0 percent for 1981 and later model years
I/M GRACE PERIOD: 1 1	I/M GRACE PERIOD:	This command sets the age at which vehicles first become subject to I/M testing at 1 year old.
********** I/M Program #2 ********** > New Annual OBD Exhaust I/M program for Light Duty and Medium duty MY 2008 and later vehicles <=14,000 lb GVWR		Echo to Output file
* I/M Grace Period Set to 1 (i.e. exempt 1 newest model year) to Reflect New Vehicle Exemption and LEP		Input File Note
I/M PROGRAM: 2 2009 2050 1 TRC OBD I/M	I/M PROGRAM:	This I/M program started in 2009 and ends in 2050
I/M MODEL YEARS: 2 2008 2050	I/M MODEL YEARS:	This I/M program tests model years 2008 through 2050
I/M VEHICLES: 2 11111 12222222 2	I/M VEHICLES:	This command calculates I/M benefits for gasoline buses and heavy-duty gasoline vehicle classes with the exception of the HDGV2B class

Mobile 6.2 I/M File	Commands	Description
I/M STRINGENCY: 2 20.0	I/M STRINGENCY:	This command sets the stringency rate (the expected exhaust inspection failure rate for pre-1981 model year vehicles) at 20 percent.
I/M COMPLIANCE: 2 96.0	I/M COMPLIANCE:	This command sets the compliance (the percentage of vehicles in the fleet that complete the I/M program and receive either a certificate of compliance or waiver) at 96 percent.
I/M WAIVER RATES: 2 0.0 1.0	I/M WAIVER RATES:	This command sets the waiver rate at 0.0 percent for pre-1981 model years and 1.0 percent for 1981 and later model years
I/M GRACE PERIOD: 2 1	I/M GRACE PERIOD:	This command sets the age at which vehicles first become subject to I/M testing at 1 year old.
********** I/M Program #3 **********		
> New OBD Exhaust I/M program for Light Duty MY 1996-2007 vehicles <=8,500 lb GVWR		Echo to Output file
* I/M Grace Period Set to 1 (i.e. exempt 1 newest model year) to Reflect New Vehicle Exemption and LEP		Input File Note
I/M PROGRAM: 3 2009 2050 1 TRC EVAP OBD	I/M PROGRAM:	This I/M program started in 2009 and ends in 2050, is a biennial program, and is a test only program with an OBD I/M inspection test type
I/M MODEL YEARS: 3 1996 2007	I/M MODEL YEARS:	This I/M program tests model years 1996 through 2007
I/M VEHICLES: 3 22222 11111111 1	I/M VEHICLES:	This command calculates I/M benefits for light-duty gasoline vehicles (cars and light-duty trucks) as well as the class HDGV2B
I/M STRINGENCY: 3 20.0	I/M STRINGENCY:	This command sets the stringency rate (the expected exhaust inspection failure rate for pre-1981 model year vehicles) at 20 percent.
I/M COMPLIANCE: 3 96.0	I/M COMPLIANCE:	This command sets the compliance (the percentage of vehicles in the fleet that complete the I/M program and receive either a certificate of compliance or waiver) at 96 percent.
I/M WAIVER RATES: 3 0.0 1.0	I/M WAIVER RATES:	This command sets the waiver rate at 0.0 percent for pre-1981 model years and 1.0 percent for 1981 and later model years
I/M GRACE PERIOD: 3 1	I/M GRACE PERIOD:	This command sets the age at which vehicles first become subject to I/M testing at 1 year old.
********** I/M Program #4 **********		
> New Annual OBD Evap I/M program MY 2008 and later for all Light Duty vehicles <=14,000 lb GVWR		Echo to Output file

Mobile 6.2 I/M File	Commands	Description
* I/M Grace Period Set to 1 (i.e. exempt 5 newest model year) to Reflect New Vehicle Exemption and LEP		Input File Note
I/M PROGRAM: 4 2009 2050 1 TRC EVAP OBD	I/M PROGRAM:	This I/M program started in 2009 and ends in 2050
I/M MODEL YEARS: 4 2008 2050	I/M MODEL YEARS:	This I/M program tests model years 2008 through 2050
I/M VEHICLES: 4 22222 11111111 1	I/M VEHICLES:	This command calculates I/M benefits for light-duty gasoline vehicles (cars and light-duty trucks)
I/M STRINGENCY: 4 20.0	I/M STRINGENCY:	This command sets the stringency rate (the expected exhaust inspection failure rate for pre-1981 model year vehicles) at 20 percent.
I/M COMPLIANCE: 4 96.0	I/M COMPLIANCE:	This command sets the compliance (the percentage of vehicles in the fleet that complete the I/M program and receive either a certificate of compliance or waiver) at 96 percent.
I/M WAIVER RATES: 4 0.0 1.0	I/M WAIVER RATES:	This command sets the waiver rate at 0.0 percent for pre-1981 model years and 1.0 percent for 1981 and later model years
I/M GRACE PERIOD: 4 1	I/M GRACE PERIOD:	This command sets the age at which vehicles first become subject to I/M testing at 1 year old.

Exhibit 3

MICROSCALE MODELING PARAMETERS

Idle Emission Factor

The Idling Emission Factor was developed using MOBILE 6.2 with the settings as indicated for the microscale free-flow analysis, except with the speed set at 2.5 miles per hour. The resulting gram per vehicle-mile factor was converted to grams per vehicle per hour by multiplying by 2.5 miles per hour.

CAL3QHC Inputs

Averaging Time	60 Minutes
Surface Roughness	175 cm (office)
Settling and Deposition velocity	0 cm/second
Windspeed	1 meter/second
Range of Wind Directions	10° increments from 0° to 360°
Stability Class	Use Class "D"
Mixing Height	1000 meters
Source Height	0.33 meters

PM 2.5 Background Calculation

Data from Annual Reports on Air Quality in New England 2005 through 2007

Year	Arithmetic Mean* (Micrograms/meter3)	24-Hour** (Micrograms/meter3)
2005	10.2	29.5
2006	8.1	24.5
2007	9.2	26.0

*** Values represent annual arithmetic mean**

**** 24-Hour values represent 98th percentile**

Annual Background Calculation

(659 Globe Street, Fall River Massachusetts)

Pollutant	Arithmetic Mean (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM2.5	9.2	---	9.2

* Average value of 2005, 2006, and 2007

24-Hour Background Calculation

(659 Globe Street, Fall River Massachusetts)

Pollutant	24-Hour (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM2.5	26.7	---	26.7

* Average value of 2005, 2006, and 2007

PM 10 Background Calculation

Data from Annual Reports on Air Quality in New England 2005 through 2007

Year	Arithmetic Mean* (Micrograms/meter3)	24-Hour** (Micrograms/meter3)
2005	18.6	37.0
2006	15.4	31.0
2007	13.7	24.0

*** Values represent annual arithmetic mean**

**** 24-Hour values represent 2nd highest**

Background Calculation

(Harrison Avenue, Boston Massachusetts)

Pollutant	Arithmetic Mean (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM10	15.9	---	15.9

* Average value of 2005, 2006, and 2007

24-Hour Background Calculation

(Harrison Avenue, Boston Massachusetts)

Pollutant	24-Hour (Micrograms/meter3)	Molecular Weight	Background Concentration (Micrograms/meter3)
PM10	30.7	---	30.7

* Average value of 2005, 2006, and 2007

MOBILE6.2 Input Files

- Carbon Monoxide (CO)
- Particulate Matter 10 (PM_{10})
- Particulate Matter 2.5 ($PM_{2.5}$)

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MOBILE6.2 Input Files

- Carbon Monoxide (CO)

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```
* 2008 Inventory Analysis - Typical Ozone Day for RFP
* Filename 08_RFP.INP created by Craig Woleader 8/2/08
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA08_WIN.tb1 REPLACE
REPORT FILE       :MA08_WIN.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2008 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : MA_IM08.D

ANTI-TAMP PROG    :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMPERATURE:  22.8 38.3

* Fuel inputs
FUEL RVP          : 13.5
FUEL PROGRAM      : 2 N

DIESEL FRACTIONS  :
```

0.000 0.000 0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002
0.002 0.001 0.001 0.001 0.000 0.001 0.001 0.003 0.001 0.002
0.000 0.015 0.009 0.056 0.070
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.176 0.176 0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243
0.176 0.285 0.267 0.212 0.255 0.295 0.249 0.251 0.188 0.175
0.182 0.186 0.219 0.184 0.170
0.385 0.385 0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480
0.375 0.472 0.480 0.366 0.400 0.344 0.285 0.333 0.314 0.253
0.208 0.197 0.168 0.130 0.106
0.674 0.674 0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744
0.715 0.565 0.810 0.803 0.644 0.654 0.605 0.525 0.389 0.356
0.376 0.108 0.136 0.154 0.148
0.830 0.830 0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813
0.610 0.686 0.570 0.733 0.607 0.729 0.685 0.725 0.631 0.350
0.305 0.186 0.209 0.343 0.091
0.884 0.884 0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914
0.923 0.901 0.908 0.898 0.903 0.876 0.804 0.844 0.782 0.702
0.679 0.554 0.529 0.568 0.628
0.977 0.977 0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992
0.990 0.981 0.976 0.975 0.959 0.982 0.965 0.963 0.945 0.902
0.875 0.857 0.791 0.796 0.846
0.972 0.972 0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991
0.995 0.993 0.993 0.995 0.992 0.986 0.995 0.981 0.993 0.971
0.982 0.977 0.993 0.987 0.986
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961
0.972 0.985 0.971 0.941 0.905 0.965 0.940 0.907 0.964 0.609
0.880 1.000 0.778 0.500 1.000

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 1
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

```
* Massachusetts DEP - MA 2016 WINTER
* Filename MA16_WIN.INP
* revised 8/24/07 with new temperatures and IM program inputs
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA16_WIN.tb1 REPLACE
REPORT FILE       : MA16_WIN.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2016 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 22.8  38.3

* Fuel inputs
FUEL RVP          : 13.5
FUEL PROGRAM      : 2 N

* 2005 Diesel Sales fractions adjusted for Calendar year 2016
DIESEL FRACTIONS  :
```

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002 0.002 0.001
0.001 0.001 0.000 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243 0.176 0.285
0.267 0.212 0.255 0.295 0.249
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480 0.375 0.472
0.480 0.366 0.400 0.344 0.285
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744 0.715 0.565
0.810 0.803 0.644 0.654 0.605
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813 0.610 0.686
0.570 0.733 0.607 0.729 0.685
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914 0.923 0.901
0.908 0.898 0.903 0.876 0.804
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992 0.990 0.981
0.976 0.975 0.959 0.982 0.965
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991 0.995 0.993
0.993 0.995 0.992 0.986 0.995
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961 0.972 0.985
0.971 0.941 0.905 0.965 0.940

********** Scenario Section **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0

*****THROUGH*****

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 1
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0

********** End of This Run **********
END OF RUN

MA30_WIN.INP

```
* Massachusetts DEP - MA 2030 WINTER
* Filename MA30_WIN.INP
* revised 8/24/07 with new temperatures and IM inputs
* revised 12/7/07 for PM2.5/10 and CO2 for Anne McGahan
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA30_WIN.tb1 REPLACE
REPORT FILE       : MA30_WIN.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2030 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 22.8  38.3

* Fuel inputs
FUEL RVP          : 13.5
```

FUEL PROGRAM : 2 N

* 2005 Diesel Sales Fractions adjusted for Calendar Year 2030
DIESEL FRACTIONS :

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
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0.001 0.001 0.001 0.001 0.001
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005
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0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.176 0.176
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.385 0.385
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
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0.674 0.674 0.674 0.674 0.674
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.830 0.830
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.884 0.884
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

****THROUGH****

SCENARIO RECORD : MA Freeway speed 61 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 62 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

****THROUGH****

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Scenario Section PM 10 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

****THROUGH****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

****THROUGH****

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 1
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

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MOBILE6.2 Input Files

- Particulate Matter 10 (PM_{10})

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```
* 2008 Inventory Analysis - Typical Ozone Day for RFP
* Filename 08_RFP.INP created by Craig Woleader 8/2/08
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA08_SUM.tb1 REPLACE
REPORT FILE       :MA08_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2008 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : MA_IM08.D

ANTI-TAMP PROG    :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
```

MIN/MAX TEMPERATURE: 70.4 93.7

* Fuel inputs
FUEL RVP : 6.8
FUEL PROGRAM : 2 N

DIESEL FRACTIONS :
0.000 0.000 0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002
0.002 0.001 0.001 0.001 0.000 0.001 0.001 0.003 0.001 0.002
0.000 0.015 0.009 0.056 0.070
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.176 0.176 0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243
0.176 0.285 0.267 0.212 0.255 0.295 0.249 0.251 0.188 0.175
0.182 0.186 0.219 0.184 0.170
0.385 0.385 0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480
0.375 0.472 0.480 0.366 0.400 0.344 0.285 0.333 0.314 0.253
0.208 0.197 0.168 0.130 0.106
0.674 0.674 0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744
0.715 0.565 0.810 0.803 0.644 0.654 0.605 0.525 0.389 0.356
0.376 0.108 0.136 0.154 0.148
0.830 0.830 0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813
0.610 0.686 0.570 0.733 0.607 0.729 0.685 0.725 0.631 0.350
0.305 0.186 0.209 0.343 0.091
0.884 0.884 0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914
0.923 0.901 0.908 0.898 0.903 0.876 0.804 0.844 0.782 0.702
0.679 0.554 0.529 0.568 0.628
0.977 0.977 0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992
0.990 0.981 0.976 0.975 0.959 0.982 0.965 0.963 0.945 0.902
0.875 0.857 0.791 0.796 0.846
0.972 0.972 0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991
0.995 0.993 0.993 0.995 0.992 0.986 0.995 0.981 0.993 0.971

0.982 0.977 0.993 0.987 0.986
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961
0.972 0.985 0.971 0.941 0.905 0.965 0.940 0.907 0.964 0.609
0.880 1.000 0.778 0.500 1.000

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH******

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15
********** End of This Run **********
END OF RUN

```
* Massachusetts DEP - MA 2016
* Filename MA16_SUM.INP
* revised 8/24/07 with new temperatures and IM inputs
* revised 12/7/07 to add PM2.5/10 and CO2 for Anne McGahan
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA16_SUM.tb1 REPLACE
REPORT FILE       : MA16_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2016 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 70.4 93.7

* Fuel inputs
FUEL RVP          : 6.8
FUEL PROGRAM      : 2 N
```

* 2005 Diesel Sales Fractions adjusted for Calendar Year 2016
DIESEL FRACTIONS :
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002 0.002 0.001
0.001 0.001 0.000 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243 0.176 0.285
0.267 0.212 0.255 0.295 0.249
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480 0.375 0.472
0.480 0.366 0.400 0.344 0.285
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744 0.715 0.565
0.810 0.803 0.644 0.654 0.605
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813 0.610 0.686
0.570 0.733 0.607 0.729 0.685
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914 0.923 0.901
0.908 0.898 0.903 0.876 0.804
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992 0.990 0.981
0.976 0.975 0.959 0.982 0.965
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991 0.995 0.993
0.993 0.995 0.992 0.986 0.995
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961 0.972 0.985
0.971 0.941 0.905 0.965 0.940

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2016
EVALUATION MONTH : 7

AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****
SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

MA30_SUM.INP

```
* Massachusetts DEP - MA 2030
* Filename MA30_SUM.INP
* revised 8/24/07 with new temperatures and IM inputs
* revised 12/7/07 to add PM2.5/10 and CO2 for Anne McGahan
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA30_SUM.tb1 REPLACE
REPORT FILE       : MA30_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2030 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 70.4 93.7

* Fuel inputs
FUEL RVP          : 6.8
```

FUEL PROGRAM : 2 N

* 2005 Diesel Sales Fractions adjusted for Calendar Year 2030
DIESEL FRACTIONS :

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001
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0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
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0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
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0.830 0.830 0.830 0.830 0.830
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
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0.884 0.884 0.884 0.884 0.884
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
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1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********THROUGH**********

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********THROUGH**********

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Scenario Section PM 10 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********THROUGH*********

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********THROUGH*********

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

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MOBILE6.2 Input Files

- Particulate Matter 2.5 ($PM_{2.5}$)

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```
* 2008 Inventory Analysis - Typical Ozone Day for RFP
* Filename 08_RFP.INP created by Craig Woleader 8/2/08
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA08_SUM.tb1 REPLACE
REPORT FILE       :MA08_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2008 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : MA_IM08.D

ANTI-TAMP PROG    :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
```

MIN/MAX TEMPERATURE: 70.4 93.7

* Fuel inputs
FUEL RVP : 6.8
FUEL PROGRAM : 2 N

DIESEL FRACTIONS :
0.000 0.000 0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002
0.002 0.001 0.001 0.001 0.000 0.001 0.001 0.003 0.001 0.002
0.000 0.015 0.009 0.056 0.070
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003
0.003 0.006 0.013 0.017 0.019
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006
0.005 0.012 0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018
0.016 0.021 0.048 0.065 0.060
0.176 0.176 0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243
0.176 0.285 0.267 0.212 0.255 0.295 0.249 0.251 0.188 0.175
0.182 0.186 0.219 0.184 0.170
0.385 0.385 0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480
0.375 0.472 0.480 0.366 0.400 0.344 0.285 0.333 0.314 0.253
0.208 0.197 0.168 0.130 0.106
0.674 0.674 0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744
0.715 0.565 0.810 0.803 0.644 0.654 0.605 0.525 0.389 0.356
0.376 0.108 0.136 0.154 0.148
0.830 0.830 0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813
0.610 0.686 0.570 0.733 0.607 0.729 0.685 0.725 0.631 0.350
0.305 0.186 0.209 0.343 0.091
0.884 0.884 0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914
0.923 0.901 0.908 0.898 0.903 0.876 0.804 0.844 0.782 0.702
0.679 0.554 0.529 0.568 0.628
0.977 0.977 0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992
0.990 0.981 0.976 0.975 0.959 0.982 0.965 0.963 0.945 0.902
0.875 0.857 0.791 0.796 0.846
0.972 0.972 0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991
0.995 0.993 0.993 0.995 0.992 0.986 0.995 0.981 0.993 0.971

0.982 0.977 0.993 0.987 0.986
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961
0.972 0.985 0.971 0.941 0.905 0.965 0.940 0.907 0.964 0.609
0.880 1.000 0.778 0.500 1.000

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH******

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2008
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15
********** End of This Run **********
END OF RUN

```
* Massachusetts DEP - MA 2016
* Filename MA16_SUM.INP
* revised 8/24/07 with new temperatures and IM inputs
* revised 12/7/07 to add PM2.5/10 and CO2 for Anne McGahan
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA16_SUM.tb1 REPLACE
REPORT FILE       : MA16_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2016 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 70.4 93.7

* Fuel inputs
FUEL RVP          : 6.8
FUEL PROGRAM      : 2 N
```

* 2005 Diesel Sales Fractions adjusted for Calendar Year 2016
DIESEL FRACTIONS :
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002 0.002 0.001
0.001 0.001 0.000 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243 0.176 0.285
0.267 0.212 0.255 0.295 0.249
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480 0.375 0.472
0.480 0.366 0.400 0.344 0.285
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744 0.715 0.565
0.810 0.803 0.644 0.654 0.605
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813 0.610 0.686
0.570 0.733 0.607 0.729 0.685
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914 0.923 0.901
0.908 0.898 0.903 0.876 0.804
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992 0.990 0.981
0.976 0.975 0.959 0.982 0.965
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991 0.995 0.993
0.993 0.995 0.992 0.986 0.995
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961 0.972 0.985
0.971 0.941 0.905 0.965 0.940

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2016
EVALUATION MONTH : 7

AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

*****THROUGH*****
SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2016
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

MA30_SUM.INP

```
* Massachusetts DEP - MA 2030
* Filename MA30_SUM.INP
* revised 8/24/07 with new temperatures and IM inputs
* revised 12/7/07 to add PM2.5/10 and CO2 for Anne McGahan
* revised 4/25/08 to remove 15 year vehicle age exemption from IM program file per Don Cooke
*
***************     Header Section     ***************
MOBILE6 INPUT FILE
*
PARTICULATES      :
POLLUTANTS        : HC CO NOX CO2
DATABASE OUTPUT   :
WITH FIELDNAMES   :
AGGREGATED OUTPUT :
SPREADSHEET       :
EMISSIONS TABLE   : MA30_SUM.tb1 REPLACE
REPORT FILE       : MA30_SUM.txt REPLACE
*
RUN DATA
***************     Run Section     ***************
> *** Mass. 2030 with LEV II Program ***

* Pollutant output format
EXPRESS HC AS VOC  :

* Mass. specific user inputs -- require external data file
REG DIST          : 2005_REG.D
I/M DESC FILE     : 09NEWIM.D

STAGE II REFUELING :
91 3 84. 84.

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS   : 0.10

* Inputs for LEV II
94+ LDG IMP       : MA_LEV2.D
T2 EXH PHASE-IN   : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT           : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP      : 70.4 93.7

* Fuel inputs
FUEL RVP          : 6.8
```

FUEL PROGRAM : 2 N

* 2005 Diesel Sales Fractions adjusted for Calendar Year 2030
DIESEL FRACTIONS :

0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
0.001 0.001 0.001 0.001 0.001
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005
0.005 0.005 0.005 0.005 0.005
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176 0.176
0.176 0.176 0.176 0.176 0.176
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385 0.385
0.385 0.385 0.385 0.385 0.385
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674 0.674
0.674 0.674 0.674 0.674 0.674
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830 0.830
0.830 0.830 0.830 0.830 0.830
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884 0.884
0.884 0.884 0.884 0.884 0.884
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977 0.977
0.977 0.977 0.977 0.977 0.977
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972 0.972
0.972 0.972 0.972 0.972 0.972
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786 0.786
0.786 0.786 0.786 0.786 0.786

********** Scenario Section PM 2.5 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********THROUGH**********

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********THROUGH**********

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 2.5
DIESEL SULFUR : 15

********** Scenario Section PM 10 **********

********** Freeway Scenarios **********

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)

CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Freeway speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********THROUGH*********

SCENARIO RECORD : MA Freeway speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** Arterial Scenarios **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 3 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 3 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

SCENARIO RECORD : MA Arterial speed 4 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 4 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********THROUGH*********

SCENARIO RECORD : MA Arterial speed 65 mph
CALENDAR YEAR : 2030
EVALUATION MONTH : 7
AVERAGE SPEED : 65 Arterial 0.0 100.0 0.0 0.0
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV
PARTICLE SIZE : 10
DIESEL SULFUR : 15

********** End of This Run **********
END OF RUN

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MOBILE6.2 Output Files

- Carbon Monoxide (CO)
- Particulate Matter 10 (PM_{10})
- Particulate Matter 2.5 ($PM_{2.5}$)

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MOBILE6.2 Output Files

- Carbon Monoxide (CO)

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Converting Date: 9/18/2009

Mobile Output File: C:\Run-new\MA08_WIN.TXT
Excel File: C:\Run-new\MA08_WIN.TXT

Mobile Emission Rate

Speed	Type	VOC	CO	NOx
2.7	Freeway	3.0100	27.8800	2.4400
2.7	Freeway	3.0100	27.8800	2.4400
3	Freeway	2.6800	26.2800	2.3900
3	Freeway	2.6800	26.2800	2.3900
4	Freeway	1.9000	22.5600	2.2900
4	Freeway	1.9000	22.5600	2.2900
5	Freeway	1.4300	20.3300	2.2300
5	Freeway	1.4300	20.3300	2.2300
6	Freeway	1.1900	18.7200	2.1200
6	Freeway	1.1900	18.7200	2.1200
7	Freeway	1.0500	17.5100	2.0000
7	Freeway	1.0500	17.5100	2.0000
8	Freeway	0.9400	16.6000	1.9200
8	Freeway	0.9400	16.6000	1.9200
9	Freeway	0.8600	15.8900	1.8500
9	Freeway	0.8600	15.8900	1.8500
10	Freeway	0.8000	15.3300	1.8000
10	Freeway	0.8000	15.3300	1.8000
11	Freeway	0.7500	14.8700	1.7500
11	Freeway	0.7500	14.8700	1.7500
12	Freeway	0.7100	14.5000	1.6900
12	Freeway	0.7100	14.5000	1.6900
13	Freeway	0.6700	14.1900	1.6400
13	Freeway	0.6700	14.1900	1.6400
14	Freeway	0.6500	13.9200	1.5900
14	Freeway	0.6500	13.9200	1.5900
15	Freeway	0.6200	13.6900	1.5600
15	Freeway	0.6200	13.6900	1.5600
16	Freeway	0.6000	13.5100	1.5300
16	Freeway	0.6000	13.5100	1.5300
17	Freeway	0.5900	13.4100	1.5100
17	Freeway	0.5900	13.4100	1.5100
18	Freeway	0.5700	13.3200	1.5000
18	Freeway	0.5700	13.3200	1.5000
19	Freeway	0.5600	13.2400	1.4900
19	Freeway	0.5600	13.2400	1.4900
20	Freeway	0.5500	13.1700	1.4800
20	Freeway	0.5500	13.1700	1.4800

21	Freeway	0.5400	13.1000	1.4700
21	Freeway	0.5400	13.1000	1.4700
22	Freeway	0.5300	13.0400	1.4600
22	Freeway	0.5300	13.0400	1.4600
23	Freeway	0.5300	12.9900	1.4500
23	Freeway	0.5300	12.9900	1.4500
24	Freeway	0.5200	12.9400	1.4400
24	Freeway	0.5200	12.9400	1.4400
25	Freeway	0.5100	12.8900	1.4400
25	Freeway	0.5100	12.8900	1.4400
26	Freeway	0.5100	12.8500	1.4300
26	Freeway	0.5100	12.8500	1.4300
27	Freeway	0.5000	12.8100	1.4300
27	Freeway	0.5000	12.8100	1.4300
28	Freeway	0.4900	12.7700	1.4200
28	Freeway	0.4900	12.7700	1.4200
29	Freeway	0.4900	12.7400	1.4200
29	Freeway	0.4900	12.7400	1.4200
30	Freeway	0.4800	12.7100	1.4200
30	Freeway	0.4800	12.7100	1.4200
31	Freeway	0.4800	12.7000	1.4200
31	Freeway	0.4800	12.7000	1.4200
32	Freeway	0.4700	12.7000	1.4200
32	Freeway	0.4700	12.7000	1.4200
33	Freeway	0.4700	12.7100	1.4200
33	Freeway	0.4700	12.7100	1.4200
34	Freeway	0.4700	12.7100	1.4200
34	Freeway	0.4700	12.7100	1.4200
35	Freeway	0.4600	12.7200	1.4200
35	Freeway	0.4600	12.7200	1.4200
36	Freeway	0.4600	12.7900	1.4200
36	Freeway	0.4600	12.7900	1.4200
37	Freeway	0.4600	12.8600	1.4300
37	Freeway	0.4600	12.8600	1.4300
38	Freeway	0.4500	12.9200	1.4400
38	Freeway	0.4500	12.9200	1.4400
39	Freeway	0.4500	12.9800	1.4400
39	Freeway	0.4500	12.9800	1.4400
40	Freeway	0.4500	13.0500	1.4500
40	Freeway	0.4500	13.0500	1.4500
41	Freeway	0.4500	13.1300	1.4600
41	Freeway	0.4500	13.1300	1.4600
42	Freeway	0.4500	13.2000	1.4800
42	Freeway	0.4500	13.2000	1.4800
43	Freeway	0.4400	13.2700	1.4900
43	Freeway	0.4400	13.2700	1.4900
44	Freeway	0.4400	13.3400	1.5000

44	Freeway	0.4400	13.3400	1.5000
45	Freeway	0.4400	13.4200	1.5200
45	Freeway	0.4400	13.4200	1.5200
46	Freeway	0.4400	13.5100	1.5400
46	Freeway	0.4400	13.5100	1.5400
47	Freeway	0.4400	13.5800	1.5600
47	Freeway	0.4400	13.5800	1.5600
48	Freeway	0.4400	13.6600	1.5700
48	Freeway	0.4400	13.6600	1.5700
49	Freeway	0.4300	13.7400	1.6000
49	Freeway	0.4300	13.7400	1.6000
50	Freeway	0.4300	13.8300	1.6200
50	Freeway	0.4300	13.8300	1.6200
51	Freeway	0.4300	13.9100	1.6500
51	Freeway	0.4300	13.9100	1.6500
52	Freeway	0.4300	14.0000	1.6800
52	Freeway	0.4300	14.0000	1.6800
53	Freeway	0.4300	14.0900	1.7100
53	Freeway	0.4300	14.0900	1.7100
54	Freeway	0.4300	14.1900	1.7500
54	Freeway	0.4300	14.1900	1.7500
55	Freeway	0.4300	14.2900	1.7800
55	Freeway	0.4300	14.2900	1.7800
56	Freeway	0.4200	14.3800	1.8200
56	Freeway	0.4200	14.3800	1.8200
57	Freeway	0.4200	14.4800	1.8600
57	Freeway	0.4200	14.4800	1.8600
58	Freeway	0.4200	14.5900	1.9200
58	Freeway	0.4200	14.5900	1.9200
59	Freeway	0.4200	14.7000	1.9700
59	Freeway	0.4200	14.7000	1.9700
60	Freeway	0.4200	14.8100	2.0300
60	Freeway	0.4200	14.8100	2.0300
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
60.7	Freeway	0.4200	14.8800	2.0600
2.5	Arterial	3.2400	28.8900	2.4100
2.5	Arterial	3.2400	28.8900	2.4100
3	Arterial	2.6200	25.9200	2.3300
3	Arterial	2.6200	25.9200	2.3300

4	Arterial	1.8400	22.2000	2.2300
4	Arterial	1.8400	22.2000	2.2300
5	Arterial	1.3700	19.9700	2.1700
5	Arterial	1.3700	19.9700	2.1700
6	Arterial	1.1900	18.4400	2.0500
6	Arterial	1.1900	18.4400	2.0500
7	Arterial	1.0600	17.3400	1.9600
7	Arterial	1.0600	17.3400	1.9600
8	Arterial	0.9600	16.5200	1.9000
8	Arterial	0.9600	16.5200	1.9000
9	Arterial	0.8800	15.8900	1.8500
9	Arterial	0.8800	15.8900	1.8500
10	Arterial	0.8200	15.3800	1.8100
10	Arterial	0.8200	15.3800	1.8100
11	Arterial	0.7700	14.9500	1.7500
11	Arterial	0.7700	14.9500	1.7500
12	Arterial	0.7400	14.6000	1.6900
12	Arterial	0.7400	14.6000	1.6900
13	Arterial	0.7100	14.3000	1.6500
13	Arterial	0.7100	14.3000	1.6500
14	Arterial	0.6800	14.0500	1.6100
14	Arterial	0.6800	14.0500	1.6100
15	Arterial	0.6600	13.8300	1.5800
15	Arterial	0.6600	13.8300	1.5800
16	Arterial	0.6300	13.6200	1.5400
16	Arterial	0.6300	13.6200	1.5400
17	Arterial	0.6100	13.4400	1.5100
17	Arterial	0.6100	13.4400	1.5100
18	Arterial	0.6000	13.2800	1.4900
18	Arterial	0.6000	13.2800	1.4900
19	Arterial	0.5800	13.1400	1.4600
19	Arterial	0.5800	13.1400	1.4600
20	Arterial	0.5700	13.0100	1.4400
20	Arterial	0.5700	13.0100	1.4400
21	Arterial	0.5600	12.9000	1.4200
21	Arterial	0.5600	12.9000	1.4200
22	Arterial	0.5400	12.8000	1.4000
22	Arterial	0.5400	12.8000	1.4000
23	Arterial	0.5300	12.7100	1.3900
23	Arterial	0.5300	12.7100	1.3900
24	Arterial	0.5200	12.6200	1.3700
24	Arterial	0.5200	12.6200	1.3700
25	Arterial	0.5100	12.5400	1.3600
25	Arterial	0.5100	12.5400	1.3600
26	Arterial	0.5100	12.5000	1.3500
26	Arterial	0.5100	12.5000	1.3500
27	Arterial	0.5000	12.4500	1.3400

27	Arterial	0.5000	12.4500	1.3400
28	Arterial	0.4900	12.4100	1.3300
28	Arterial	0.4900	12.4100	1.3300
29	Arterial	0.4900	12.3700	1.3200
29	Arterial	0.4900	12.3700	1.3200
30	Arterial	0.4800	12.3400	1.3100
30	Arterial	0.4800	12.3400	1.3100
31	Arterial	0.4800	12.3400	1.3100
31	Arterial	0.4800	12.3400	1.3100
32	Arterial	0.4700	12.3400	1.3100
32	Arterial	0.4700	12.3400	1.3100
33	Arterial	0.4700	12.3400	1.3100
33	Arterial	0.4700	12.3400	1.3100
34	Arterial	0.4600	12.3500	1.3000
34	Arterial	0.4600	12.3500	1.3000
35	Arterial	0.4600	12.3500	1.3000
35	Arterial	0.4600	12.3500	1.3000
36	Arterial	0.4500	12.4200	1.3100
36	Arterial	0.4500	12.4200	1.3100
37	Arterial	0.4500	12.4900	1.3200
37	Arterial	0.4500	12.4900	1.3200
38	Arterial	0.4500	12.5500	1.3200
38	Arterial	0.4500	12.5500	1.3200
39	Arterial	0.4500	12.6200	1.3300
39	Arterial	0.4500	12.6200	1.3300
40	Arterial	0.4400	12.6700	1.3300
40	Arterial	0.4400	12.6700	1.3300
41	Arterial	0.4400	12.7500	1.3500
41	Arterial	0.4400	12.7500	1.3500
42	Arterial	0.4400	12.8200	1.3600
42	Arterial	0.4400	12.8200	1.3600
43	Arterial	0.4400	12.8900	1.3700
43	Arterial	0.4400	12.8900	1.3700
44	Arterial	0.4400	12.9600	1.3800
44	Arterial	0.4400	12.9600	1.3800
45	Arterial	0.4400	13.0200	1.3900
45	Arterial	0.4400	13.0200	1.3900
46	Arterial	0.4300	13.1000	1.4100
46	Arterial	0.4300	13.1000	1.4100
47	Arterial	0.4300	13.1800	1.4300
47	Arterial	0.4300	13.1800	1.4300
48	Arterial	0.4300	13.2600	1.4400
48	Arterial	0.4300	13.2600	1.4400
49	Arterial	0.4300	13.3300	1.4600
49	Arterial	0.4300	13.3300	1.4600
50	Arterial	0.4300	13.3900	1.4800
50	Arterial	0.4300	13.3900	1.4800

51	Arterial	0.4300	13.4800	1.5000
51	Arterial	0.4300	13.4800	1.5000
52	Arterial	0.4200	13.5600	1.5300
52	Arterial	0.4200	13.5600	1.5300
53	Arterial	0.4200	13.6400	1.5500
53	Arterial	0.4200	13.6400	1.5500
54	Arterial	0.4200	13.7100	1.5800
54	Arterial	0.4200	13.7100	1.5800
55	Arterial	0.4200	13.7900	1.6000
55	Arterial	0.4200	13.7900	1.6000
56	Arterial	0.4200	13.8800	1.6300
56	Arterial	0.4200	13.8800	1.6300
57	Arterial	0.4200	13.9700	1.6700
57	Arterial	0.4200	13.9700	1.6700
58	Arterial	0.4200	14.0600	1.7000
58	Arterial	0.4200	14.0600	1.7000
59	Arterial	0.4200	14.1500	1.7400
59	Arterial	0.4200	14.1500	1.7400
60	Arterial	0.4100	14.2300	1.7700
60	Arterial	0.4100	14.2300	1.7700
61	Arterial	0.4100	14.3300	1.8200
61	Arterial	0.4100	14.3300	1.8200
62	Arterial	0.4100	14.4300	1.8700
62	Arterial	0.4100	14.4300	1.8700
63	Arterial	0.4100	14.5200	1.9100
63	Arterial	0.4100	14.5200	1.9100
64	Arterial	0.4100	14.6200	1.9600
64	Arterial	0.4100	14.6200	1.9600
65	Arterial	0.4100	14.7000	2.0000
65	Arterial	0.4100	14.7000	2.0000

Converting Date: 9/11/2009

Mobile Output File: C:\Run-new\MA16_WIN.TXT
Excel File: C:\Run-new\MA16_WIN.TXT

Mobile Emission Rate

Speed	Type	VOC	CO	NOx
2.7	Freeway	1.4100	19.1800	0.7600
3	Freeway	1.2600	18.1400	0.7400
4	Freeway	0.9000	15.7300	0.7100
5	Freeway	0.6800	14.2800	0.6900
6	Freeway	0.5700	13.2200	0.6600
7	Freeway	0.5000	12.4100	0.6200
8	Freeway	0.4500	11.8000	0.5900
9	Freeway	0.4100	11.3300	0.5700
10	Freeway	0.3800	10.9500	0.5600
11	Freeway	0.3600	10.6500	0.5400
12	Freeway	0.3400	10.4000	0.5200
13	Freeway	0.3200	10.1900	0.5100
14	Freeway	0.3100	10.0100	0.4900
15	Freeway	0.3000	9.8500	0.4800
16	Freeway	0.2900	9.7300	0.4700
17	Freeway	0.2800	9.6800	0.4700
18	Freeway	0.2800	9.6200	0.4600
19	Freeway	0.2700	9.5800	0.4600
20	Freeway	0.2700	9.5300	0.4600
21	Freeway	0.2600	9.5000	0.4600
22	Freeway	0.2600	9.4600	0.4500
23	Freeway	0.2500	9.4300	0.4500
24	Freeway	0.2500	9.4000	0.4500
25	Freeway	0.2500	9.3700	0.4500
26	Freeway	0.2400	9.3400	0.4500
27	Freeway	0.2400	9.3200	0.4400
28	Freeway	0.2400	9.3000	0.4400
29	Freeway	0.2400	9.2800	0.4400
30	Freeway	0.2300	9.2600	0.4400
31	Freeway	0.2300	9.2600	0.4400
32	Freeway	0.2300	9.2600	0.4400
33	Freeway	0.2300	9.2600	0.4400
34	Freeway	0.2300	9.2600	0.4400
35	Freeway	0.2200	9.2700	0.4400
36	Freeway	0.2200	9.3200	0.4400
37	Freeway	0.2200	9.3700	0.4500
38	Freeway	0.2200	9.4200	0.4500
39	Freeway	0.2200	9.4700	0.4500
40	Freeway	0.2200	9.5200	0.4500

41	Freeway	0.2200	9.5800	0.4600
42	Freeway	0.2200	9.6300	0.4600
43	Freeway	0.2200	9.6900	0.4600
44	Freeway	0.2200	9.7400	0.4700
45	Freeway	0.2100	9.8000	0.4700
46	Freeway	0.2100	9.8600	0.4800
47	Freeway	0.2100	9.9100	0.4800
48	Freeway	0.2100	9.9700	0.4900
49	Freeway	0.2100	10.0300	0.4900
50	Freeway	0.2100	10.1000	0.5000
51	Freeway	0.2100	10.1600	0.5100
52	Freeway	0.2100	10.2200	0.5200
53	Freeway	0.2100	10.2800	0.5300
54	Freeway	0.2100	10.3600	0.5400
55	Freeway	0.2100	10.4300	0.5500
56	Freeway	0.2100	10.5000	0.5600
57	Freeway	0.2100	10.5800	0.5700
58	Freeway	0.2100	10.6600	0.5900
59	Freeway	0.2100	10.7400	0.6000
60	Freeway	0.2100	10.8100	0.6200
60.7	Freeway	0.2100	10.8700	0.6300
60.7	Freeway	0.2100	10.8700	0.6300
60.7	Freeway	0.2100	10.8700	0.6300
60.7	Freeway	0.2100	10.8700	0.6300
60.7	Freeway	0.2100	10.8700	0.6300
2.5	Arterial	1.5200	19.8900	0.7500
3	Arterial	1.2300	17.9600	0.7200
4	Arterial	0.8700	15.5500	0.6900
5	Arterial	0.6600	14.1000	0.6700
6	Arterial	0.5700	13.0900	0.6400
7	Arterial	0.5100	12.3700	0.6100
8	Arterial	0.4600	11.8400	0.5900
9	Arterial	0.4300	11.4200	0.5700
10	Arterial	0.4000	11.0800	0.5600
11	Arterial	0.3800	10.8000	0.5400
12	Arterial	0.3600	10.5600	0.5300
13	Arterial	0.3400	10.3700	0.5100
14	Arterial	0.3300	10.2000	0.5000
15	Arterial	0.3200	10.0500	0.4900
16	Arterial	0.3100	9.9100	0.4800
17	Arterial	0.3000	9.7900	0.4700
18	Arterial	0.2900	9.6900	0.4600
19	Arterial	0.2800	9.5900	0.4600
20	Arterial	0.2800	9.5100	0.4500
21	Arterial	0.2700	9.4300	0.4400
22	Arterial	0.2600	9.3600	0.4400
23	Arterial	0.2600	9.3000	0.4300

24	Arterial	0.2500	9.2500	0.4300
25	Arterial	0.2500	9.1900	0.4200
26	Arterial	0.2500	9.1600	0.4200
27	Arterial	0.2400	9.1400	0.4200
28	Arterial	0.2400	9.1100	0.4100
29	Arterial	0.2400	9.0900	0.4100
30	Arterial	0.2300	9.0700	0.4100
31	Arterial	0.2300	9.0700	0.4100
32	Arterial	0.2300	9.0700	0.4100
33	Arterial	0.2300	9.0700	0.4100
34	Arterial	0.2200	9.0700	0.4100
35	Arterial	0.2200	9.0800	0.4100
36	Arterial	0.2200	9.1300	0.4100
37	Arterial	0.2200	9.1800	0.4100
38	Arterial	0.2200	9.2300	0.4100
39	Arterial	0.2200	9.2800	0.4100
40	Arterial	0.2200	9.3200	0.4200
41	Arterial	0.2200	9.3800	0.4200
42	Arterial	0.2200	9.4300	0.4200
43	Arterial	0.2100	9.4900	0.4300
44	Arterial	0.2100	9.5400	0.4300
45	Arterial	0.2100	9.5800	0.4300
46	Arterial	0.2100	9.6400	0.4400
47	Arterial	0.2100	9.7000	0.4400
48	Arterial	0.2100	9.7500	0.4500
49	Arterial	0.2100	9.8100	0.4500
50	Arterial	0.2100	9.8600	0.4600
51	Arterial	0.2100	9.9200	0.4700
52	Arterial	0.2100	9.9800	0.4700
53	Arterial	0.2100	10.0300	0.4800
54	Arterial	0.2100	10.0900	0.4900
55	Arterial	0.2100	10.1400	0.4900
56	Arterial	0.2100	10.2100	0.5000
57	Arterial	0.2100	10.2800	0.5100
58	Arterial	0.2100	10.3400	0.5200
59	Arterial	0.2100	10.4100	0.5300
60	Arterial	0.2100	10.4700	0.5400
61	Arterial	0.2100	10.5400	0.5600
62	Arterial	0.2100	10.6100	0.5700
63	Arterial	0.2100	10.6800	0.5900
64	Arterial	0.2100	10.7500	0.6000
65	Arterial	0.2100	10.8200	0.6100

Mobile Output File: C:\Run\MA30_WIN.TXT
Excel File: C:\Run\MA30_WIN.TXT

Mobile Emission Rate

Speed	Type	VOC	CO	NOx
2.7	Freeway	1.2000	19.2700	0.3000
2.7	Freeway	1.2000	19.2700	0.3000
3	Freeway	1.0600	18.2000	0.2900
3	Freeway	1.0600	18.2000	0.2900
4	Freeway	0.7500	15.6800	0.2800
4	Freeway	0.7500	15.6800	0.2800
5	Freeway	0.5600	14.1700	0.2700
5	Freeway	0.5600	14.1700	0.2700
6	Freeway	0.4600	13.0800	0.2500
6	Freeway	0.4600	13.0800	0.2500
7	Freeway	0.4000	12.2600	0.2400
7	Freeway	0.4000	12.2600	0.2400
8	Freeway	0.3600	11.6400	0.2200
8	Freeway	0.3600	11.6400	0.2200
9	Freeway	0.3300	11.1700	0.2100
9	Freeway	0.3300	11.1700	0.2100
10	Freeway	0.3000	10.7800	0.2000
10	Freeway	0.3000	10.7800	0.2000
11	Freeway	0.2800	10.4800	0.2000
11	Freeway	0.2800	10.4800	0.2000
12	Freeway	0.2700	10.2300	0.1900
12	Freeway	0.2700	10.2300	0.1900
13	Freeway	0.2600	10.0300	0.1800
13	Freeway	0.2600	10.0300	0.1800
14	Freeway	0.2400	9.8500	0.1700
14	Freeway	0.2400	9.8500	0.1700
15	Freeway	0.2300	9.7000	0.1700
15	Freeway	0.2300	9.7000	0.1700
16	Freeway	0.2300	9.5800	0.1600
16	Freeway	0.2300	9.5800	0.1600
17	Freeway	0.2200	9.5200	0.1600
17	Freeway	0.2200	9.5200	0.1600
18	Freeway	0.2200	9.4700	0.1600
18	Freeway	0.2200	9.4700	0.1600
19	Freeway	0.2100	9.4200	0.1600
19	Freeway	0.2100	9.4200	0.1600
20	Freeway	0.2100	9.3800	0.1600
20	Freeway	0.2100	9.3800	0.1600
21	Freeway	0.2000	9.3400	0.1600

21	Freeway	0.2000	9.3400	0.1600
22	Freeway	0.2000	9.3100	0.1600
22	Freeway	0.2000	9.3100	0.1600
23	Freeway	0.2000	9.2800	0.1600
23	Freeway	0.2000	9.2800	0.1600
24	Freeway	0.1900	9.2500	0.1600
24	Freeway	0.1900	9.2500	0.1600
25	Freeway	0.1900	9.2200	0.1600
25	Freeway	0.1900	9.2200	0.1600
26	Freeway	0.1900	9.1900	0.1600
26	Freeway	0.1900	9.1900	0.1600
27	Freeway	0.1900	9.1700	0.1600
27	Freeway	0.1900	9.1700	0.1600
28	Freeway	0.1800	9.1500	0.1600
28	Freeway	0.1800	9.1500	0.1600
29	Freeway	0.1800	9.1300	0.1600
29	Freeway	0.1800	9.1300	0.1600
30	Freeway	0.1800	9.1100	0.1600
30	Freeway	0.1800	9.1100	0.1600
31	Freeway	0.1800	9.1100	0.1600
31	Freeway	0.1800	9.1100	0.1600
32	Freeway	0.1800	9.1200	0.1600
32	Freeway	0.1800	9.1200	0.1600
33	Freeway	0.1700	9.1200	0.1600
33	Freeway	0.1700	9.1200	0.1600
34	Freeway	0.1700	9.1300	0.1600
34	Freeway	0.1700	9.1300	0.1600
35	Freeway	0.1700	9.1300	0.1600
35	Freeway	0.1700	9.1300	0.1600
36	Freeway	0.1700	9.1900	0.1600
36	Freeway	0.1700	9.1900	0.1600
37	Freeway	0.1700	9.2400	0.1600
37	Freeway	0.1700	9.2400	0.1600
38	Freeway	0.1700	9.2900	0.1600
38	Freeway	0.1700	9.2900	0.1600
39	Freeway	0.1700	9.3400	0.1700
39	Freeway	0.1700	9.3400	0.1700
40	Freeway	0.1700	9.3900	0.1700
40	Freeway	0.1700	9.3900	0.1700
41	Freeway	0.1700	9.4500	0.1700
41	Freeway	0.1700	9.4500	0.1700
42	Freeway	0.1700	9.5000	0.1700
42	Freeway	0.1700	9.5000	0.1700
43	Freeway	0.1700	9.5500	0.1700
43	Freeway	0.1700	9.5500	0.1700
44	Freeway	0.1600	9.6000	0.1700
44	Freeway	0.1600	9.6000	0.1700

45	Freeway	0.1600	9.6700	0.1700
45	Freeway	0.1600	9.6700	0.1700
46	Freeway	0.1600	9.7300	0.1800
46	Freeway	0.1600	9.7300	0.1800
47	Freeway	0.1600	9.7800	0.1800
47	Freeway	0.1600	9.7800	0.1800
48	Freeway	0.1600	9.8400	0.1800
48	Freeway	0.1600	9.8400	0.1800
49	Freeway	0.1600	9.9000	0.1800
49	Freeway	0.1600	9.9000	0.1800
50	Freeway	0.1600	9.9600	0.1800
50	Freeway	0.1600	9.9600	0.1800
51	Freeway	0.1600	10.0300	0.1900
51	Freeway	0.1600	10.0300	0.1900
52	Freeway	0.1600	10.0900	0.1900
52	Freeway	0.1600	10.0900	0.1900
53	Freeway	0.1600	10.1500	0.1900
53	Freeway	0.1600	10.1500	0.1900
54	Freeway	0.1600	10.2300	0.1900
54	Freeway	0.1600	10.2300	0.1900
55	Freeway	0.1600	10.3000	0.2000
55	Freeway	0.1600	10.3000	0.2000
56	Freeway	0.1600	10.3700	0.2000
56	Freeway	0.1600	10.3700	0.2000
57	Freeway	0.1600	10.4400	0.2000
57	Freeway	0.1600	10.4400	0.2000
58	Freeway	0.1600	10.5200	0.2100
58	Freeway	0.1600	10.5200	0.2100
59	Freeway	0.1600	10.6000	0.2100
59	Freeway	0.1600	10.6000	0.2100
60	Freeway	0.1600	10.6700	0.2200
60	Freeway	0.1600	10.6700	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
60.7	Freeway	0.1600	10.7200	0.2200
2.5	Arterial	1.2900	20.0400	0.3100
2.5	Arterial	1.2900	20.0400	0.3100
3	Arterial	1.0400	18.0300	0.3000
3	Arterial	1.0400	18.0300	0.3000
4	Arterial	0.7300	15.5100	0.2800

4	Arterial	0.7300	15.5100	0.2800
5	Arterial	0.5400	14.0000	0.2700
5	Arterial	0.5400	14.0000	0.2700
6	Arterial	0.4600	12.9700	0.2600
6	Arterial	0.4600	12.9700	0.2600
7	Arterial	0.4100	12.2400	0.2500
7	Arterial	0.4100	12.2400	0.2500
8	Arterial	0.3700	11.6900	0.2400
8	Arterial	0.3700	11.6900	0.2400
9	Arterial	0.3400	11.2700	0.2300
9	Arterial	0.3400	11.2700	0.2300
10	Arterial	0.3100	10.9200	0.2300
10	Arterial	0.3100	10.9200	0.2300
11	Arterial	0.3000	10.6500	0.2200
11	Arterial	0.3000	10.6500	0.2200
12	Arterial	0.2800	10.4100	0.2100
12	Arterial	0.2800	10.4100	0.2100
13	Arterial	0.2700	10.2200	0.2000
13	Arterial	0.2700	10.2200	0.2000
14	Arterial	0.2600	10.0500	0.2000
14	Arterial	0.2600	10.0500	0.2000
15	Arterial	0.2500	9.9000	0.1900
15	Arterial	0.2500	9.9000	0.1900
16	Arterial	0.2400	9.7700	0.1900
16	Arterial	0.2400	9.7700	0.1900
17	Arterial	0.2300	9.6500	0.1900
17	Arterial	0.2300	9.6500	0.1900
18	Arterial	0.2300	9.5500	0.1800
18	Arterial	0.2300	9.5500	0.1800
19	Arterial	0.2200	9.4600	0.1800
19	Arterial	0.2200	9.4600	0.1800
20	Arterial	0.2100	9.3700	0.1800
20	Arterial	0.2100	9.3700	0.1800
21	Arterial	0.2100	9.3000	0.1700
21	Arterial	0.2100	9.3000	0.1700
22	Arterial	0.2100	9.2400	0.1700
22	Arterial	0.2100	9.2400	0.1700
23	Arterial	0.2000	9.1800	0.1700
23	Arterial	0.2000	9.1800	0.1700
24	Arterial	0.2000	9.1200	0.1700
24	Arterial	0.2000	9.1200	0.1700
25	Arterial	0.1900	9.0700	0.1700
25	Arterial	0.1900	9.0700	0.1700
26	Arterial	0.1900	9.0500	0.1700
26	Arterial	0.1900	9.0500	0.1700
27	Arterial	0.1900	9.0200	0.1600
27	Arterial	0.1900	9.0200	0.1600

28	Arterial	0.1800	9.0000	0.1600
28	Arterial	0.1800	9.0000	0.1600
29	Arterial	0.1800	8.9700	0.1600
29	Arterial	0.1800	8.9700	0.1600
30	Arterial	0.1800	8.9500	0.1600
30	Arterial	0.1800	8.9500	0.1600
31	Arterial	0.1800	8.9600	0.1600
31	Arterial	0.1800	8.9600	0.1600
32	Arterial	0.1800	8.9600	0.1600
32	Arterial	0.1800	8.9600	0.1600
33	Arterial	0.1700	8.9700	0.1600
33	Arterial	0.1700	8.9700	0.1600
34	Arterial	0.1700	8.9700	0.1600
34	Arterial	0.1700	8.9700	0.1600
35	Arterial	0.1700	8.9700	0.1600
35	Arterial	0.1700	8.9700	0.1600
36	Arterial	0.1700	9.0300	0.1600
36	Arterial	0.1700	9.0300	0.1600
37	Arterial	0.1700	9.0800	0.1600
37	Arterial	0.1700	9.0800	0.1600
38	Arterial	0.1700	9.1300	0.1600
38	Arterial	0.1700	9.1300	0.1600
39	Arterial	0.1700	9.1800	0.1600
39	Arterial	0.1700	9.1800	0.1600
40	Arterial	0.1700	9.2200	0.1600
40	Arterial	0.1700	9.2200	0.1600
41	Arterial	0.1700	9.2800	0.1600
41	Arterial	0.1700	9.2800	0.1600
42	Arterial	0.1600	9.3400	0.1700
42	Arterial	0.1600	9.3400	0.1700
43	Arterial	0.1600	9.3900	0.1700
43	Arterial	0.1600	9.3900	0.1700
44	Arterial	0.1600	9.4400	0.1700
44	Arterial	0.1600	9.4400	0.1700
45	Arterial	0.1600	9.4900	0.1700
45	Arterial	0.1600	9.4900	0.1700
46	Arterial	0.1600	9.5500	0.1700
46	Arterial	0.1600	9.5500	0.1700
47	Arterial	0.1600	9.6000	0.1700
47	Arterial	0.1600	9.6000	0.1700
48	Arterial	0.1600	9.6600	0.1700
48	Arterial	0.1600	9.6600	0.1700
49	Arterial	0.1600	9.7100	0.1800
49	Arterial	0.1600	9.7100	0.1800
50	Arterial	0.1600	9.7600	0.1800
50	Arterial	0.1600	9.7600	0.1800
51	Arterial	0.1600	9.8200	0.1800

51	Arterial	0.1600	9.8200	0.1800
52	Arterial	0.1600	9.8800	0.1800
52	Arterial	0.1600	9.8800	0.1800
53	Arterial	0.1600	9.9400	0.1800
53	Arterial	0.1600	9.9400	0.1800
54	Arterial	0.1600	9.9900	0.1900
54	Arterial	0.1600	9.9900	0.1900
55	Arterial	0.1600	10.0500	0.1900
55	Arterial	0.1600	10.0500	0.1900
56	Arterial	0.1600	10.1100	0.1900
56	Arterial	0.1600	10.1100	0.1900
57	Arterial	0.1600	10.1800	0.1900
57	Arterial	0.1600	10.1800	0.1900
58	Arterial	0.1600	10.2500	0.2000
58	Arterial	0.1600	10.2500	0.2000
59	Arterial	0.1600	10.3100	0.2000
59	Arterial	0.1600	10.3100	0.2000
60	Arterial	0.1600	10.3700	0.2000
60	Arterial	0.1600	10.3700	0.2000
61	Arterial	0.1600	10.4400	0.2100
61	Arterial	0.1600	10.4400	0.2100
62	Arterial	0.1600	10.5100	0.2100
62	Arterial	0.1600	10.5100	0.2100
63	Arterial	0.1600	10.5800	0.2100
63	Arterial	0.1600	10.5800	0.2100
64	Arterial	0.1600	10.6500	0.2200
64	Arterial	0.1600	10.6500	0.2200
65	Arterial	0.1600	10.7100	0.2200
65	Arterial	0.1600	10.7100	0.2200

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MOBILE6.2 Output Files

- Particulate Matter 10 (PM_{10})

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2008 PM_{10} Output File – Freeway

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* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Freeway 2.71 mph (= minimum allowed freeway speed)

* File 1, Run 1, Scenario 129.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. Ppm
Diesel Fuel Sulfur Content:   15. Ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
          GVWR:            <6000     >6000     (All)
                ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3513    0.3732    0.1467           0.0366    0.0005    0.0014    0.0862    0.0040
1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:    0.0000    0.0000    0.0000    0.0000    0.0000   ------   ------   ------    0.0000    0.0000
         GASPM:    0.0040    0.0039    0.0039    0.0039    0.0425   ------   ------   ------    0.0205    0.0051
        ECARBON:   ------   ------   ------   ------   ------    0.1077    0.0277    0.1313   ------    0.0114
        OCARBON:   ------   ------   ------   ------   ------    0.0304    0.0399    0.0655   ------    0.0057
           SO4:    0.0005    0.0006    0.0006    0.0006    0.0012    0.0002    0.0003    0.0009    0.0002    0.0006
  Total Exhaust PM:    0.0045    0.0045    0.0045    0.0045    0.0438    0.1382    0.0679    0.1976    0.0207
0.0228
         Brake:    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125
0.0125
          Tire:    0.0080    0.0080    0.0080    0.0080    0.0085    0.0080    0.0080    0.0247    0.0040    0.0094
       Total PM:    0.0250    0.0251    0.0251    0.0251    0.0648    0.1588    0.0884    0.2349    0.0372
0.0448
          SO2:    0.0067    0.0087    0.0115    0.0095    0.0164    0.0030    0.0052    0.0131    0.0033    0.0091
          NH3:    0.1015    0.1015    0.1015    0.1015    0.0451    0.0068    0.0068    0.0270    0.0113
0.0925
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 130.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

 Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. Ppm
```

Diesel Fuel Sulfur Content: 15. Ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0039	0.0039	0.0039	0.0425	------	------	------	0.0205	0.0051
ECARBON:	------	------	------	------	------	0.1077	0.0277	0.1313	------	0.0114
OCARBON:	------	------	------	------	------	0.0304	0.0399	0.0655	------	0.0057
SO4:	0.0005	0.0006	0.0006	0.0006	0.0012	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0045	0.0045	0.0045	0.0045	0.0438	0.1382	0.0679	0.1976	0.0207	0.0228
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0247	0.0040	0.0094
Total PM:	0.0250	0.0251	0.0251	0.0251	0.0648	0.1588	0.0884	0.2349	0.0372	0.0448
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0030	0.0052	0.0131	0.0033	0.0091
NH3:	0.1015	0.1015	0.1015	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 131.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. Ppm
Diesel Fuel Sulfur Content: 15. Ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0039	0.0039	0.0039	0.0425	------	------	------	0.0205	0.0051
ECARBON:	------	------	------	------	------	0.1077	0.0277	0.1313	------	0.0114
OCARBON:	------	------	------	------	------	0.0304	0.0399	0.0655	------	0.0057
SO4:	0.0005	0.0006	0.0006	0.0006	0.0012	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0045	0.0045	0.0045	0.0045	0.0438	0.1382	0.0679	0.1976	0.0207	0.0228
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0247	0.0040	0.0094
Total PM:	0.0250	0.0251	0.0251	0.0251	0.0648	0.1588	0.0884	0.2349	0.0372	0.0448
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0030	0.0052	0.0131	0.0033	0.0091
NH3:	0.1015	0.1015	0.1015	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

THROUGH

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 192.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0041	0.0040	0.0040	0.0040	0.0423	------	------	------	0.0205	0.0052
ECARBON:	------	------	------	------	------	0.1077	0.0277	0.1313	------	0.0114
OCARBON:	------	------	------	------	------	0.0304	0.0399	0.0655	------	0.0057
SO4:	0.0002	0.0004	0.0004	0.0004	0.0017	0.0002	0.0003	0.0009	0.0001	0.0004
Total Exhaust PM:	0.0043	0.0045	0.0045	0.0045	0.0441	0.1382	0.0679	0.1976	0.0206	0.0228

Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125

Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0247 0.0040 0.0094

Total PM: 0.0249 0.0250 0.0250 0.0250 0.0651 0.1588 0.0884 0.2349 0.0371 0.0447

SO2: 0.0068 0.0088 0.0115 0.0096 0.0163 0.0030 0.0052 0.0131 0.0033 0.0091

NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

2008 PM_{10} Output File – Arterial

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 193.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
          GVWR:            <6000     >6000     (All)
                ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3513    0.3732    0.1467           0.0366    0.0005    0.0014    0.0862    0.0040
1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:   0.0000    0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
         GASPM:   0.0040    0.0039    0.0039    0.0039    0.0425    ------    ------    ------    0.0205    0.0051
        ECARBON:   ------    ------    ------    ------    ------    0.1077    0.0277    0.1313    ------    0.0114
        OCARBON:   ------    ------    ------    ------    ------    0.0304    0.0399    0.0655    ------    0.0057
           SO4:   0.0005    0.0006    0.0006    0.0006    0.0012    0.0002    0.0003    0.0009    0.0002    0.0006
  Total Exhaust PM:    0.0045    0.0045    0.0045    0.0045    0.0437    0.1382    0.0679    0.1976    0.0207
0.0228
         Brake:   0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125    0.0125
0.0125
          Tire:   0.0080    0.0080    0.0080    0.0080    0.0085    0.0080    0.0080    0.0247    0.0040    0.0094
       Total PM:    0.0250    0.0251    0.0251    0.0251    0.0648    0.1588    0.0884    0.2349    0.0372
0.0448
          SO2:   0.0067    0.0087    0.0115    0.0095    0.0164    0.0030    0.0052    0.0131    0.0033    0.0090
          NH3:   0.1015    0.1015    0.1015    0.1015    0.0451    0.0068    0.0068    0.0270    0.0113
0.0925
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 194.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
```

Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0039	0.0039	0.0039	0.0425	------	------	------	0.0205	0.0051
ECARBON:	------	------	------	------	------	0.1077	0.0277	0.1313	------	0.0114
OCARBON:	------	------	------	------	------	0.0304	0.0399	0.0655	------	0.0057
SO4:	0.0005	0.0006	0.0006	0.0006	0.0012	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0045	0.0045	0.0045	0.0045	0.0437	0.1382	0.0679	0.1976	0.0207	0.0228
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0247	0.0040	0.0094
Total PM:	0.0250	0.0251	0.0251	0.0251	0.0648	0.1588	0.0884	0.2349	0.0372	0.0448
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0030	0.0052	0.0131	0.0033	0.0090
NH3:	0.1015	0.1015	0.1015	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* ##########################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 195.
* ##########################

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0040 0.0039 0.0039 0.0039 0.0425 ------ ------ ------ 0.0205 0.0051
ECARBON: ------ ------ ------ ------ ------ 0.1077 0.0277 0.1313 ------ 0.0114
OCARBON: ------ ------ ------ ------ ------ 0.0304 0.0399 0.0655 ------ 0.0057
SO4: 0.0005 0.0006 0.0006 0.0006 0.0012 0.0002 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0045 0.0045 0.0045 0.0045 0.0437 0.1382 0.0679 0.1976 0.0207 0.0228
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0247 0.0040 0.0094
Total PM: 0.0250 0.0251 0.0251 0.0251 0.0648 0.1588 0.0884 0.2349 0.0372 0.0448
SO2: 0.0067 0.0087 0.0115 0.0095 0.0164 0.0030 0.0052 0.0131 0.0033 0.0090
NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

THROUGH

* #
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 256.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.3513 0.3732 0.1467 0.0366 0.0005 0.0014 0.0862 0.0040 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0041 0.0040 0.0040 0.0040 0.0423 ------ ------ ------ 0.0205 0.0052
ECARBON: ------ ------ ------ ------ ------ 0.1077 0.0277 0.1313 ------ 0.0114
OCARBON: ------ ------ ------ ------ ------ 0.0304 0.0399 0.0655 ------ 0.0057
SO4: 0.0002 0.0004 0.0004 0.0004 0.0017 0.0002 0.0003 0.0009 0.0001 0.0004
Total Exhaust PM: 0.0043 0.0045 0.0045 0.0045 0.0441 0.1382 0.0679 0.1976 0.0206 0.0228
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125

Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0247 0.0040 0.0094
Total PM: 0.0249 0.0250 0.0250 0.0250 0.0651 0.1588 0.0884 0.2349 0.0371 0.0447
SO2: 0.0068 0.0088 0.0115 0.0096 0.0163 0.0030 0.0052 0.0131 0.0033 0.0091
NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

2016 PM_{10} Output File - Freeway
* #
* MA Freeway 2.71 mph (= minimum allowed freeway speed)

* File 1, Run 1, Scenario 129.
* #

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0036	0.0036	0.0036	0.0137	------	------	------	0.0205	0.0038
ECARBON:	------	------	------	------	------	0.0748	0.0058	0.0285	------	0.0025
OCARBON:	------	------	------	------	------	0.0211	0.0083	0.0145	------	0.0013
SO4:	0.0005	0.0006	0.0006	0.0006	0.0014	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0151	0.0960	0.0143	0.0439	0.0207	0.0081
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0813	0.0372	0.0301
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* #
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 130.
* #

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm

Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0036	0.0036	0.0036	0.0137	------	------	------	0.0205	0.0038
ECARBON:	------	------	------	------	------	0.0748	0.0058	0.0285	------	0.0025
OCARBON:	------	------	------	------	------	0.0211	0.0083	0.0145	------	0.0013
SO4:	0.0005	0.0006	0.0006	0.0006	0.0014	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0151	0.0960	0.0143	0.0439	0.0207	0.0081
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0813	0.0372	0.0301
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* ##########################
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 131.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0038 0.0036 0.0036 0.0036 0.0137 ------ ------ ------ 0.0205 0.0038
ECARBON: ------ ------ ------ ------ ------ 0.0748 0.0058 0.0285 ------ 0.0025
OCARBON: ------ ------ ------ ------ ------ 0.0211 0.0083 0.0145 ------ 0.0013
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0002 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0151 0.0960 0.0143 0.0439 0.0207
0.0081
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125
0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0248 0.0040 0.0094
Total PM: 0.0248 0.0248 0.0248 0.0248 0.0362 0.1166 0.0349 0.0813 0.0372
0.0301
SO2: 0.0066 0.0087 0.0115 0.0095 0.0163 0.0029 0.0052 0.0130 0.0033 0.0092
NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113
0.0923

THROUGH

* ##########################
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 192.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV
MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2778 0.4263 0.1677 0.0370 0.0001 0.0015 0.0858
0.0037 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000
0.0000
GASPM: 0.0040 0.0038 0.0038 0.0038 0.0131 ------ ------ ------ 0.0205
0.0039
ECARBON: ------ ------ ------ ------ ------ 0.0748 0.0058 0.0285 ------ 0.0025
OCARBON: ------ ------ ------ ------ ------ 0.0211 0.0083 0.0145 ------ 0.0013
SO4: 0.0002 0.0004 0.0004 0.0004 0.0020 0.0002 0.0003 0.0009 0.0001
0.0005
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0152 0.0960 0.0143 0.0439
0.0206 0.0081

Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125

Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0248 0.0040 0.0094

Total PM: 0.0247 0.0248 0.0248 0.0248 0.0362 0.1166 0.0349 0.0813 0.0371 0.0301

SO2: 0.0067 0.0088 0.0115 0.0096 0.0161 0.0029 0.0052 0.0130 0.0033 0.0093

NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

2016 PM_{10} Output File – Arterial

* #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 193.
* #

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0138	------	------	------	0.0205	0.0038
ECARBON:	------	------	------	------	------	0.0748	0.0058	0.0285	------	0.0025
OCARBON:	------	------	------	------	------	0.0211	0.0083	0.0145	------	0.0013
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0151	0.0960	0.0143	0.0439	0.0207	0.0081
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0813	0.0372	0.0301
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 194.
* #

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm

Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0138	------	------	------	0.0205	0.0038
ECARBON:	------	------	------	------	------	0.0748	0.0058	0.0285	------	0.0025
OCARBON:	------	------	------	------	------	0.0211	0.0083	0.0145	------	0.0013
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0151	0.0960	0.0143	0.0439	0.0207	0.0081
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0813	0.0372	0.0301
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* ##########################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 195.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0138 ------ ------ ------ 0.0205 0.0038
ECARBON: ------ ------ ------ ------ ------ 0.0748 0.0058 0.0285 ------ 0.0025
OCARBON: ------ ------ ------ ------ ------ 0.0211 0.0083 0.0145 ------ 0.0013
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0002 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0151 0.0960 0.0143 0.0439 0.0207 0.0081
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0248 0.0040 0.0094
Total PM: 0.0248 0.0248 0.0248 0.0248 0.0362 0.1166 0.0349 0.0813 0.0372 0.0301
SO2: 0.0066 0.0087 0.0115 0.0095 0.0163 0.0029 0.0052 0.0130 0.0033 0.0092
NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

THROUGH

* #
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 256.
* #

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2778 0.4263 0.1677 0.0370 0.0001 0.0015 0.0858 0.0037 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0040 0.0038 0.0038 0.0038 0.0131 ------ ------ ------ 0.0205 0.0039
ECARBON: ------ ------ ------ ------ ------ 0.0748 0.0058 0.0285 ------ 0.0025
OCARBON: ------ ------ ------ ------ ------ 0.0211 0.0083 0.0145 ------ 0.0013
SO4: 0.0002 0.0004 0.0004 0.0004 0.0020 0.0002 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0152 0.0960 0.0143 0.0439 0.0206 0.0081
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125

Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0248 0.0040 0.0094
Total PM: 0.0247 0.0248 0.0248 0.0248 0.0362 0.1166 0.0349 0.0813 0.0371 0.0301
SO2: 0.0067 0.0088 0.0115 0.0096 0.0161 0.0029 0.0052 0.0130 0.0033 0.0093
NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

MA30_SUM.PM

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA30_SUM.INP (file 1, run 1).                            *
************************************************************************

* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)
* File 1, Run 1, Scenario 1.
* ##########################

Calendar Year:  2030
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
Reformulated Gas:  Yes

Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
GVWR:             <6000  >6000    (All)
------  ------  ------  ------  ------  ------  ------  ------  ------  ------
VMT Distribution:  0.2607  0.4379  0.1723          0.0375  0.0000  0.0015  0.0864  0.0036
1.0000
-------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
Lead:  0.0000  0.0000  0.0000  0.0000  0.0000  ------  ------  ------  0.0000  0.0000
GASPM:  0.0034  0.0033  0.0033  0.0033  0.0080  ------  ------  ------  0.0142  0.0033
ECARBON:  ------  ------  ------  ------  ------  0.0000  0.0034  0.0083  ------  0.0007
OCARBON:  ------  ------  ------  ------  ------  0.0000  0.0049  0.0043  ------  0.0004
SO4:  0.0005  0.0006  0.0006  0.0006  0.0014  0.0000  0.0003  0.0009  0.0002  0.0006
Total Exhaust PM:  0.0039  0.0039  0.0039  0.0039  0.0094  0.0000  0.0086  0.0135  0.0144
0.0050
Brake:  0.0053  0.0053  0.0053  0.0053  0.0053  0.0000  0.0053  0.0053  0.0053  0.0053
Tire:  0.0020  0.0020  0.0020  0.0020  0.0021  0.0000  0.0020  0.0062  0.0010  0.0024
Total PM:  0.0112  0.0112  0.0113  0.0112  0.0169  0.0000  0.0159  0.0250  0.0207  0.0127
SO2:  0.0064  0.0087  0.0115  0.0095  0.0163  0.0000  0.0052  0.0130  0.0033  0.0092
NH3:  0.0994  0.1012  0.1017  0.1013  0.0451  0.0000  0.0068  0.0270  0.0113  0.0918
-------------------------------------------------------------------------------------------------------------------

* ##########################
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 2.
* ##########################

Calendar Year:  2030
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
```

Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0080 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0112 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* ##########################
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 3.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0080 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004

SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0112 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 64.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0035 0.0035 0.0035 0.0074 ------ ------ ------ 0.0142 0.0034
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0002 0.0004 0.0004 0.0004 0.0021 0.0000 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0095 0.0000 0.0086 0.0135 0.0143
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0112 0.0112 0.0170 0.0000 0.0159 0.0250 0.0206 0.0127
SO2: 0.0065 0.0087 0.0115 0.0095 0.0161 0.0000 0.0052 0.0130 0.0033 0.0093
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)

* File 1, Run 1, Scenario 65.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0034	0.0033	0.0033	0.0033	0.0081	------	------	------	0.0142	0.0033
ECARBON:	------	------	------	------	------	0.0000	0.0034	0.0083	------	0.0007
OCARBON:	------	------	------	------	------	0.0000	0.0049	0.0043	------	0.0004
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0000	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0094	0.0000	0.0086	0.0135	0.0144	0.0050
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0000	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0000	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0113	0.0169	0.0000	0.0159	0.0250	0.0207	0.0127
SO2:	0.0064	0.0087	0.0115	0.0095	0.0163	0.0000	0.0052	0.0130	0.0033	0.0092
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

---

* ##########################
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 66.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0081 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144 0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0113 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 67.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0081 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144 0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0113 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 128.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0074	------	------	------	0.0142	0.0034
ECARBON:	------	------	------	------	------	0.0000	0.0034	0.0083	------	0.0007
OCARBON:	------	------	------	------	------	0.0000	0.0049	0.0043	------	0.0004
SO4:	0.0002	0.0004	0.0004	0.0004	0.0021	0.0000	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0095	0.0000	0.0086	0.0135	0.0143	0.0050
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0000	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0000	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0112	0.0112	0.0170	0.0000	0.0159	0.0250	0.0206	0.0127
SO2:	0.0065	0.0087	0.0115	0.0095	0.0161	0.0000	0.0052	0.0130	0.0033	0.0093
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)
* File 1, Run 1, Scenario 129.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 130.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054

Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 131.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 192.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0040 0.0038 0.0038 0.0038 0.0081 ------ ------ ------ 0.0205 0.0037
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0002 0.0004 0.0004 0.0004 0.0021 0.0000 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0206
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0371 0.0274
SO2: 0.0065 0.0087 0.0115 0.0095 0.0161 0.0000 0.0052 0.0130 0.0033 0.0093
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 193.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000

GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207 0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0312 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 194.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207 0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0312 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* ##########################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 195.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0088	------	------	------	0.0205	0.0036
ECARBON:	------	------	------	------	------	0.0000	0.0037	0.0090	------	0.0008
OCARBON:	------	------	------	------	------	0.0000	0.0053	0.0046	------	0.0004
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0000	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0102	0.0000	0.0093	0.0146	0.0207	0.0054
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0000	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0000	0.0080	0.0248	0.0040	0.0095
Total PM:	0.0247	0.0247	0.0247	0.0247	0.0312	0.0000	0.0299	0.0520	0.0372	0.0274
SO2:	0.0064	0.0087	0.0115	0.0095	0.0163	0.0000	0.0052	0.0130	0.0033	0.0092
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

**********THROUGH*********

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 256.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

GVWR: <6000 >6000 (All)

VMT Distribution:	0.2607	0.4379	0.1723	0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0081	------	------	------	0.0205	0.0037
ECARBON:	------	------	------	------	------	0.0000	0.0037	0.0090	------	0.0008
OCARBON:	------	------	------	------	------	0.0000	0.0053	0.0046	------	0.0004
SO4:	0.0002	0.0004	0.0004	0.0004	0.0021	0.0000	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0102	0.0000	0.0093	0.0146	0.0206	0.0054
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0000	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0000	0.0080	0.0248	0.0040	0.0095
Total PM:	0.0247	0.0247	0.0247	0.0247	0.0313	0.0000	0.0299	0.0520	0.0371	0.0274
SO2:	0.0065	0.0087	0.0115	0.0095	0.0161	0.0000	0.0052	0.0130	0.0033	0.0093
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

MOBILE6.2 Output Files

- Particulate Matter 2.5 ($PM_{2.5}$)

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2008 $PM_{2.5}$ Output File - Freeway

```
*******************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                   *
* Input file: MA08_SUM.INP (file 1, run 1).                        *
*******************************************************************************
* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)

* File 1, Run 1, Scenario 1.
* ##########################

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
          GVWR:            <6000     >6000     (All)
               ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3513    0.3732    0.1467           0.0366    0.0005    0.0014    0.0862    0.0040
1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:    0.0000    0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
         GASPM:    0.0037    0.0036    0.0036    0.0036    0.0381    ------    ------    ------    0.0142    0.0046
        ECARBON:    ------    ------    ------    ------    ------    0.0991    0.0255    0.1208    ------    0.0105
        OCARBON:    ------    ------    ------    ------    ------    0.0279    0.0367    0.0602    ------    0.0053
           SO4:    0.0005    0.0006    0.0006    0.0006    0.0012    0.0002    0.0003    0.0009    0.0002    0.0006
  Total Exhaust PM:    0.0042    0.0042    0.0042    0.0042    0.0393    0.1272    0.0625    0.1819    0.0144
0.0210
         Brake:    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053
0.0053
          Tire:    0.0020    0.0020    0.0020    0.0020    0.0021    0.0020    0.0020    0.0062    0.0010    0.0024
       Total PM:    0.0115    0.0116    0.0115    0.0116    0.0468    0.1345    0.0698    0.1934    0.0207
0.0287
          SO2:    0.0067    0.0087    0.0115    0.0095    0.0164    0.0030    0.0052    0.0131    0.0033    0.0091
          NH3:    0.1015    0.1015    0.1015    0.1015    0.0451    0.0068    0.0068    0.0270    0.0113
0.0925
 -------------------------------------------------------------------------------------------------------------------
```

* ##########################
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 2.
* ##########################

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0381	------	------	------	0.0142	0.0046
ECARBON:	------	------	------	------	------	0.0991	0.0255	0.1208	------	0.0105
OCARBON:	------	------	------	------	------	0.0279	0.0367	0.0602	------	0.0053
SO4:	0.0005	0.0006	0.0006	0.0006	0.0012	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0393	0.1272	0.0625	0.1819	0.0144	0.0210
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0115	0.0116	0.0115	0.0116	0.0468	0.1345	0.0698	0.1934	0.0207	0.0287
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0030	0.0052	0.0131	0.0033	0.0091
NH3:	0.1015	0.1015	0.1015	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* ##########################
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 3.
* ##########################

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh

GVWR: <6000 >6000 (All)

VMT Distribution: 0.3513 0.3732 0.1467 0.0366 0.0005 0.0014 0.0862 0.0040 1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000

GASPM: 0.0037 0.0036 0.0036 0.0036 0.0381 ------ ------ ------ 0.0142 0.0046

ECARBON: ------ ------ ------ ------ ------ 0.0991 0.0255 0.1208 ------ 0.0105

OCARBON: ------ ------ ------ ------ ------ 0.0279 0.0367 0.0602 ------ 0.0053

SO4: 0.0005 0.0006 0.0006 0.0006 0.0012 0.0002 0.0003 0.0009 0.0002 0.0006

Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0393 0.1272 0.0625 0.1819 0.0144 0.0210

Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053

Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024

Total PM: 0.0115 0.0116 0.0115 0.0116 0.0468 0.1345 0.0698 0.1934 0.0207 0.0287

SO2: 0.0067 0.0087 0.0115 0.0095 0.0164 0.0030 0.0052 0.0131 0.0033 0.0091

NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

THROUGH

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 64.
* #

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh

GVWR: <6000 >6000 (All)

VMT Distribution: 0.3513 0.3732 0.1467 0.0366 0.0005 0.0014 0.0862 0.0040 1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0038 0.0037 0.0037 0.0037 0.0379 ------ ------ ------ 0.0142 0.0047
ECARBON: ------ ------ ------ ------ ------ 0.0991 0.0255 0.1208 ------ 0.0105
OCARBON: ------ ------ ------ ------ ------ 0.0279 0.0367 0.0602 ------ 0.0053
SO4: 0.0002 0.0004 0.0004 0.0004 0.0017 0.0002 0.0003 0.0009 0.0001 0.0004
Total Exhaust PM: 0.0040 0.0041 0.0041 0.0041 0.0396 0.1272 0.0625 0.1819 0.0143 0.0209
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0113 0.0115 0.0115 0.0115 0.0471 0.1345 0.0698 0.1934 0.0206 0.0286
SO2: 0.0068 0.0088 0.0115 0.0096 0.0163 0.0030 0.0052 0.0131 0.0033 0.0091
NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

2008 $PM_{2.5}$ Output File - Arterial

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 65.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
          GVWR:            <6000     >6000     (All)
                ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3513    0.3732    0.1467           0.0366    0.0005    0.0014    0.0862    0.0040
1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:   0.0000    0.0000    0.0000    0.0000    0.0000    ------    ------    ------    0.0000    0.0000
         GASPM:   0.0037    0.0036    0.0036    0.0036    0.0381    ------    ------    ------    0.0142    0.0046
        ECARBON:   ------    ------    ------    ------    ------    0.0991    0.0255    0.1208    ------    0.0105
        OCARBON:   ------    ------    ------    ------    ------    0.0279    0.0367    0.0602    ------    0.0053
           SO4:   0.0005    0.0006    0.0006    0.0006    0.0012    0.0002    0.0003    0.0009    0.0002    0.0006
  Total Exhaust PM:    0.0042    0.0042    0.0042    0.0042    0.0393    0.1272    0.0625    0.1819    0.0144
0.0210
         Brake:   0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053
0.0053
          Tire:   0.0020    0.0020    0.0020    0.0020    0.0021    0.0020    0.0020    0.0062    0.0010    0.0024
       Total PM:    0.0115    0.0116    0.0115    0.0116    0.0468    0.1345    0.0698    0.1934    0.0207
0.0287
          SO2:   0.0067    0.0087    0.0115    0.0095    0.0164    0.0030    0.0052    0.0131    0.0033    0.0090
          NH3:   0.1015    0.1015    0.1015    0.1015    0.0451    0.0068    0.0068    0.0270    0.0113
0.0925
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 66.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2008
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. Ppm
```

Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0381	------	------	------	0.0142	0.0046
ECARBON:	------	------	------	------	------	0.0991	0.0255	0.1208	------	0.0105
OCARBON:	------	------	------	------	------	0.0279	0.0367	0.0602	------	0.0053
SO4:	0.0005	0.0006	0.0006	0.0006	0.0012	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0393	0.1272	0.0625	0.1819	0.0144	0.0210
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0115	0.0116	0.0115	0.0116	0.0468	0.1345	0.0698	0.1934	0.0207	0.0287
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0030	0.0052	0.0131	0.0033	0.0090
NH3:	0.1015	0.1015	0.1015	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

---

* ############################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 67.
* ############################

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000

Composite Emission Factors (g/mi):

Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0381 ------ ------ ------ 0.0142 0.0046
ECARBON: ------ ------ ------ ------ ------ 0.0991 0.0255 0.1208 ------ 0.0105
OCARBON: ------ ------ ------ ------ ------ 0.0279 0.0367 0.0602 ------ 0.0053
SO4: 0.0005 0.0006 0.0006 0.0006 0.0012 0.0002 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0393 0.1272 0.0625 0.1819 0.0144 0.0210
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0115 0.0116 0.0115 0.0116 0.0468 0.1345 0.0698 0.1934 0.0207 0.0287
SO2: 0.0067 0.0087 0.0115 0.0095 0.0164 0.0030 0.0052 0.0131 0.0033 0.0090
NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

THROUGH

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 256.
* ##########################

Calendar Year: 2008
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.3513 0.3732 0.1467 0.0366 0.0005 0.0014 0.0862 0.0040 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0041 0.0040 0.0040 0.0040 0.0423 ------ ------ ------ 0.0205 0.0052
ECARBON: ------ ------ ------ ------ ------ 0.1077 0.0277 0.1313 ------ 0.0114
OCARBON: ------ ------ ------ ------ ------ 0.0304 0.0399 0.0655 ------ 0.0057
SO4: 0.0002 0.0004 0.0004 0.0004 0.0017 0.0002 0.0003 0.0009 0.0001 0.0004
Total Exhaust PM: 0.0043 0.0045 0.0045 0.0045 0.0441 0.1382 0.0679 0.1976 0.0206 0.0228
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125 0.0125

Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0080 0.0080 0.0247 0.0040 0.0094
Total PM: 0.0249 0.0250 0.0250 0.0250 0.0651 0.1588 0.0884 0.2349 0.0371 0.0447
SO2: 0.0068 0.0088 0.0115 0.0096 0.0163 0.0030 0.0052 0.0131 0.0033 0.0091
NH3: 0.1015 0.1015 0.1015 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0925

2016 $PM_{2.5}$ Output File – Freeway

```
*********************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                        *
* Input file: MA16_SUM.INP (file 1, run 1).                         *
*********************************************************************

* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)

* File 1, Run 1, Scenario 1.
* ##########################

                    Calendar Year:  2016
                         Month:  July
          Gasoline Fuel Sulfur Content:   30. ppm
           Diesel Fuel Sulfur Content:   15. ppm
              Particle Size Cutoff:  2.50 Microns
                Reformulated Gas:  Yes

    Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
         GVWR:           <6000    >6000    (All)
              ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.2778   0.4263   0.1677          0.0370   0.0001   0.0015   0.0858   0.0037
1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
         Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
        GASPM:   0.0035   0.0034   0.0034   0.0034   0.0124   ------   ------   ------   0.0142   0.0035
       ECARBON:   ------   ------   ------   ------   ------   0.0688   0.0053   0.0262   ------   0.0023
       OCARBON:   ------   ------   ------   ------   ------   0.0194   0.0076   0.0134   ------   0.0012
          SO4:   0.0005   0.0006   0.0006   0.0006   0.0014   0.0002   0.0003   0.0009   0.0002   0.0006
  Total Exhaust PM:   0.0039   0.0039   0.0039   0.0039   0.0138   0.0884   0.0132   0.0405   0.0144
0.0075
        Brake:   0.0053   0.0053   0.0053   0.0053   0.0053   0.0053   0.0053   0.0053   0.0053
0.0053
         Tire:   0.0020   0.0020   0.0020   0.0020   0.0021   0.0020   0.0020   0.0062   0.0010   0.0024
       Total PM:   0.0113   0.0113   0.0113   0.0113   0.0213   0.0957   0.0205   0.0520   0.0207
0.0152
          SO2:   0.0066   0.0087   0.0115   0.0095   0.0163   0.0029   0.0052   0.0130   0.0033   0.0092
          NH3:   0.1006   0.1014   0.1017   0.1015   0.0451   0.0068   0.0068   0.0270   0.0113
0.0923
 ---------------------------------------------------------------------------------------------------------------

* ##########################
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 2.
```

* ############################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677	0.0370	0.0001	0.0015	0.0858	0.0037		1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0035	0.0034	0.0034	0.0034	0.0124	------	------	------	0.0142	0.0035
ECARBON:	------	------	------	------	------	0.0688	0.0053	0.0262	------	0.0023
OCARBON:	------	------	------	------	------	0.0194	0.0076	0.0134	------	0.0012
SO4:	0.0005	0.0006	0.0006	0.0006	0.0014	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0138	0.0884	0.0132	0.0405	0.0144	0.0075
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0213	0.0957	0.0205	0.0520	0.0207	0.0152
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* ############################
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 3.
* ############################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

GVWR: <6000 >6000 (All)

VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0035	0.0034	0.0034	0.0034	0.0124	------	------	------	0.0142	0.0035
ECARBON:	------	------	------	------	------	0.0688	0.0053	0.0262	------	0.0023
OCARBON:	------	------	------	------	------	0.0194	0.0076	0.0134	------	0.0012
SO4:	0.0005	0.0006	0.0006	0.0006	0.0014	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0138	0.0884	0.0132	0.0405	0.0144	0.0075
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0213	0.0957	0.0205	0.0520	0.0207	0.0152
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

THROUGH

* ##########################
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 64.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

GVWR: <6000 >6000 (All)

VMT Distribution:	0.2778	0.4263	0.1677		0.0370	0.0001	0.0015	0.0858	0.0037	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0119	------	------	------	0.0142	0.0036
ECARBON:	------	------	------	------	------	0.0688	0.0053	0.0262	------	0.0023

OCARBON: ------ ------ ------ ------ ------ 0.0194 0.0076 0.0134 ------ 0.0012
SO4: 0.0002 0.0004 0.0004 0.0004 0.0020 0.0002 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0140 0.0884 0.0132 0.0405 0.0143 0.0075
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0113 0.0113 0.0113 0.0214 0.0957 0.0205 0.0520 0.0206 0.0152
SO2: 0.0067 0.0088 0.0115 0.0096 0.0161 0.0029 0.0052 0.0130 0.0033 0.0093
NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

2016 $PM_{2.5}$ Output File – Arterial

```
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 65.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #
Calendar Year:  2016
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All
Veh
          GVWR:            <6000     >6000     (All)
               ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2778    0.4263    0.1677           0.0370    0.0001    0.0015    0.0858    0.0037
1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:    0.0000    0.0000    0.0000    0.0000    0.0000   ------   ------   ------    0.0000    0.0000
         GASPM:    0.0034    0.0033    0.0033    0.0033    0.0125   ------   ------   ------    0.0142    0.0035
        ECARBON:   ------   ------   ------   ------   ------    0.0688    0.0053    0.0262   ------    0.0023
        OCARBON:   ------   ------   ------   ------   ------    0.0194    0.0076    0.0134   ------    0.0012
           SO4:    0.0005    0.0006    0.0006    0.0006    0.0013    0.0002    0.0003    0.0009    0.0002    0.0006
  Total Exhaust PM:    0.0039    0.0039    0.0039    0.0039    0.0138    0.0884    0.0132    0.0405    0.0144
0.0075
         Brake:    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053    0.0053
0.0053
          Tire:    0.0020    0.0020    0.0020    0.0020    0.0021    0.0020    0.0020    0.0062    0.0010    0.0024
       Total PM:    0.0113    0.0113    0.0113    0.0113    0.0213    0.0957    0.0205    0.0520    0.0207
0.0152
          SO2:    0.0066    0.0087    0.0115    0.0095    0.0163    0.0029    0.0052    0.0130    0.0033    0.0092
          NH3:    0.1006    0.1014    0.1017    0.1015    0.0451    0.0068    0.0068    0.0270    0.0113
0.0923
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 66.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

Calendar Year:  2016
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
```

Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677	0.0370	0.0001	0.0015	0.0858	0.0037		1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0034	0.0033	0.0033	0.0033	0.0125	------	------	------	0.0142	0.0035
ECARBON:	------	------	------	------	------	0.0688	0.0053	0.0262	------	0.0023
OCARBON:	------	------	------	------	------	0.0194	0.0076	0.0134	------	0.0012
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0138	0.0884	0.0132	0.0405	0.0144	0.0075
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0213	0.0957	0.0205	0.0520	0.0207	0.0152
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.0130	0.0033	0.0092
NH3:	0.1006	0.1014	0.1017	0.1015	0.0451	0.0068	0.0068	0.0270	0.0113	0.0923

* ##########################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 67.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	(All)							
VMT Distribution:	0.2778	0.4263	0.1677	0.0370	0.0001	0.0015	0.0858	0.0037		1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000

GASPM: 0.0034 0.0033 0.0033 0.0033 0.0125 ------ ------ ------ 0.0142 0.0035
ECARBON: ------ ------ ------ ------ ------ 0.0688 0.0053 0.0262 ------ 0.0023
OCARBON: ------ ------ ------ ------ ------ 0.0194 0.0076 0.0134 ------ 0.0012
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0002 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0138 0.0884 0.0132 0.0405 0.0144 0.0075
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0113 0.0113 0.0113 0.0113 0.0213 0.0957 0.0205 0.0520 0.0207 0.0152
SO2: 0.0066 0.0087 0.0115 0.0095 0.0163 0.0029 0.0052 0.0130 0.0033 0.0092
NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

THROUGH

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 128.
* ##########################

Calendar Year: 2016
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2778 0.4263 0.1677 0.0370 0.0001 0.0015 0.0858 0.0037 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0035 0.0035 0.0035 0.0119 ------ ------ ------ 0.0142 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0688 0.0053 0.0262 ------ 0.0023
OCARBON: ------ ------ ------ ------ ------ 0.0194 0.0076 0.0134 ------ 0.0012
SO4: 0.0002 0.0004 0.0004 0.0004 0.0020 0.0002 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0140 0.0884 0.0132 0.0405 0.0143 0.0075
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0020 0.0020 0.0062 0.0010 0.0024

Total PM: 0.0112 0.0113 0.0113 0.0113 0.0214 0.0957 0.0205 0.0520 0.0206 0.0152

SO2: 0.0067 0.0088 0.0115 0.0096 0.0161 0.0029 0.0052 0.0130 0.0033 0.0093

NH3: 0.1006 0.1014 0.1017 0.1015 0.0451 0.0068 0.0068 0.0270 0.0113 0.0923

MA30_SUM.PM

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA30_SUM.INP (file 1, run 1).                            *
************************************************************************

* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)
* File 1, Run 1, Scenario 1.
* ##########################

Calendar Year:  2030
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
Diesel Fuel Sulfur Content:   15. ppm
Particle Size Cutoff:  2.50 Microns
Reformulated Gas:  Yes

Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
GVWR:             <6000  >6000    (All)
------  ------  ------  ------  ------  ------  ------  ------  ------  ------
VMT Distribution:  0.2607  0.4379  0.1723          0.0375  0.0000  0.0015  0.0864  0.0036
1.0000
-------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
Lead:  0.0000  0.0000  0.0000  0.0000  0.0000  ------  ------  ------  0.0000  0.0000
GASPM:  0.0034  0.0033  0.0033  0.0033  0.0080  ------  ------  ------  0.0142  0.0033
ECARBON:  ------  ------  ------  ------  ------  0.0000  0.0034  0.0083  ------  0.0007
OCARBON:  ------  ------  ------  ------  ------  0.0000  0.0049  0.0043  ------  0.0004
SO4:  0.0005  0.0006  0.0006  0.0006  0.0014  0.0000  0.0003  0.0009  0.0002  0.0006
Total Exhaust PM:  0.0039  0.0039  0.0039  0.0039  0.0094  0.0000  0.0086  0.0135  0.0144
0.0050
Brake:  0.0053  0.0053  0.0053  0.0053  0.0053  0.0000  0.0053  0.0053  0.0053  0.0053
Tire:  0.0020  0.0020  0.0020  0.0020  0.0021  0.0000  0.0020  0.0062  0.0010  0.0024
Total PM:  0.0112  0.0112  0.0113  0.0112  0.0169  0.0000  0.0159  0.0250  0.0207  0.0127
SO2:  0.0064  0.0087  0.0115  0.0095  0.0163  0.0000  0.0052  0.0130  0.0033  0.0092
NH3:  0.0994  0.1012  0.1017  0.1013  0.0451  0.0000  0.0068  0.0270  0.0113  0.0918
-------------------------------------------------------------------------------------------------------------------

* ##########################
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 2.
* ##########################

Calendar Year:  2030
Month:  July
Gasoline Fuel Sulfur Content:   30. ppm
```

Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0080 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0112 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* ##########################
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 3.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0080 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004

SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0112 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 64.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0035 0.0035 0.0035 0.0074 ------ ------ ------ 0.0142 0.0034
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0002 0.0004 0.0004 0.0004 0.0021 0.0000 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0095 0.0000 0.0086 0.0135 0.0143
0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0112 0.0112 0.0170 0.0000 0.0159 0.0250 0.0206 0.0127
SO2: 0.0065 0.0087 0.0115 0.0095 0.0161 0.0000 0.0052 0.0130 0.0033 0.0093
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)

* File 1, Run 1, Scenario 65.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0034	0.0033	0.0033	0.0033	0.0081	------	------	------	0.0142	0.0033
ECARBON:	------	------	------	------	------	0.0000	0.0034	0.0083	------	0.0007
OCARBON:	------	------	------	------	------	0.0000	0.0049	0.0043	------	0.0004
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0000	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0094	0.0000	0.0086	0.0135	0.0144	0.0050
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0000	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0000	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0113	0.0113	0.0169	0.0000	0.0159	0.0250	0.0207	0.0127
SO2:	0.0064	0.0087	0.0115	0.0095	0.0163	0.0000	0.0052	0.0130	0.0033	0.0092
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

---

* ##########################
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 66.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0081 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144 0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0113 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 67.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0034 0.0033 0.0033 0.0033 0.0081 ------ ------ ------ 0.0142 0.0033
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0034 0.0083 ------ 0.0007
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0049 0.0043 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0039 0.0039 0.0039 0.0039 0.0094 0.0000 0.0086 0.0135 0.0144 0.0050
Brake: 0.0053 0.0053 0.0053 0.0053 0.0053 0.0000 0.0053 0.0053 0.0053 0.0053
Tire: 0.0020 0.0020 0.0020 0.0020 0.0021 0.0000 0.0020 0.0062 0.0010 0.0024
Total PM: 0.0112 0.0112 0.0113 0.0113 0.0169 0.0000 0.0159 0.0250 0.0207 0.0127
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 128.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0074	------	------	------	0.0142	0.0034
ECARBON:	------	------	------	------	------	0.0000	0.0034	0.0083	------	0.0007
OCARBON:	------	------	------	------	------	0.0000	0.0049	0.0043	------	0.0004
SO4:	0.0002	0.0004	0.0004	0.0004	0.0021	0.0000	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0039	0.0039	0.0039	0.0039	0.0095	0.0000	0.0086	0.0135	0.0143	0.0050
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0000	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0000	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0112	0.0112	0.0112	0.0112	0.0170	0.0000	0.0159	0.0250	0.0206	0.0127
SO2:	0.0065	0.0087	0.0115	0.0095	0.0161	0.0000	0.0052	0.0130	0.0033	0.0093
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

* ##########################
* MA Freeway 2.71 mph (= minimum allowed freeway speed)
* File 1, Run 1, Scenario 129.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Freeway speed 3 mph
* File 1, Run 1, Scenario 130.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054

Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Freeway speed 4 mph
* File 1, Run 1, Scenario 131.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0014 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918

*********THROUGH**********

* #
* MA Freeway speed 65 mph
* File 1, Run 1, Scenario 192.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0040 0.0038 0.0038 0.0038 0.0081 ------ ------ ------ 0.0205 0.0037
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0002 0.0004 0.0004 0.0004 0.0021 0.0000 0.0003 0.0009 0.0001 0.0005
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0206
0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0313 0.0000 0.0299 0.0520 0.0371 0.0274
SO2: 0.0065 0.0087 0.0115 0.0095 0.0161 0.0000 0.0052 0.0130 0.0033 0.0093
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial 2.5 mph (= minimum allowed arterial speed)
* File 1, Run 1, Scenario 193.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036
1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000

GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207 0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0312 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* #
* MA Arterial speed 3 mph
* File 1, Run 1, Scenario 194.
* #

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV MC All Veh
GVWR: <6000 >6000 (All)
------ ------ ------ ------ ------ ------ ------ ------ ------ ------
VMT Distribution: 0.2607 0.4379 0.1723 0.0375 0.0000 0.0015 0.0864 0.0036 1.0000

Composite Emission Factors (g/mi):
Lead: 0.0000 0.0000 0.0000 0.0000 0.0000 ------ ------ ------ 0.0000 0.0000
GASPM: 0.0037 0.0036 0.0036 0.0036 0.0088 ------ ------ ------ 0.0205 0.0036
ECARBON: ------ ------ ------ ------ ------ 0.0000 0.0037 0.0090 ------ 0.0008
OCARBON: ------ ------ ------ ------ ------ 0.0000 0.0053 0.0046 ------ 0.0004
SO4: 0.0005 0.0006 0.0006 0.0006 0.0013 0.0000 0.0003 0.0009 0.0002 0.0006
Total Exhaust PM: 0.0042 0.0042 0.0042 0.0042 0.0102 0.0000 0.0093 0.0146 0.0207 0.0054
Brake: 0.0125 0.0125 0.0125 0.0125 0.0125 0.0000 0.0125 0.0125 0.0125 0.0125
Tire: 0.0080 0.0080 0.0080 0.0080 0.0085 0.0000 0.0080 0.0248 0.0040 0.0095
Total PM: 0.0247 0.0247 0.0247 0.0247 0.0312 0.0000 0.0299 0.0520 0.0372 0.0274
SO2: 0.0064 0.0087 0.0115 0.0095 0.0163 0.0000 0.0052 0.0130 0.0033 0.0092
NH3: 0.0994 0.1012 0.1017 0.1013 0.0451 0.0000 0.0068 0.0270 0.0113 0.0918
---

* ##########################
* MA Arterial speed 4 mph
* File 1, Run 1, Scenario 195.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2607	0.4379	0.1723		0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0036	0.0036	0.0036	0.0088	------	------	------	0.0205	0.0036
ECARBON:	------	------	------	------	------	0.0000	0.0037	0.0090	------	0.0008
OCARBON:	------	------	------	------	------	0.0000	0.0053	0.0046	------	0.0004
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0000	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0102	0.0000	0.0093	0.0146	0.0207	0.0054
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0000	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0000	0.0080	0.0248	0.0040	0.0095
Total PM:	0.0247	0.0247	0.0247	0.0247	0.0312	0.0000	0.0299	0.0520	0.0372	0.0274
SO2:	0.0064	0.0087	0.0115	0.0095	0.0163	0.0000	0.0052	0.0130	0.0033	0.0092
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

**********THROUGH*********

* ##########################
* MA Arterial speed 65 mph
* File 1, Run 1, Scenario 256.
* ##########################

Calendar Year: 2030
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh

GVWR: <6000 >6000 (All)

VMT Distribution:	0.2607	0.4379	0.1723	0.0375	0.0000	0.0015	0.0864	0.0036	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0081	------	------	------	0.0205	0.0037
ECARBON:	------	------	------	------	------	0.0000	0.0037	0.0090	------	0.0008
OCARBON:	------	------	------	------	------	0.0000	0.0053	0.0046	------	0.0004
SO4:	0.0002	0.0004	0.0004	0.0004	0.0021	0.0000	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0042	0.0042	0.0042	0.0042	0.0102	0.0000	0.0093	0.0146	0.0206	0.0054
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0000	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0000	0.0080	0.0248	0.0040	0.0095
Total PM:	0.0247	0.0247	0.0247	0.0247	0.0313	0.0000	0.0299	0.0520	0.0371	0.0274
SO2:	0.0065	0.0087	0.0115	0.0095	0.0161	0.0000	0.0052	0.0130	0.0033	0.0093
NH3:	0.0994	0.1012	0.1017	0.1013	0.0451	0.0000	0.0068	0.0270	0.0113	0.0918

Hot Spot: Microscale (Local) Analysis

- Intersection Receptor Maps
- CAL3QHC Input Files
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)
- CAL3QHC Input Files
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)
- Microscale Results
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)

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Hot Spot: Microscale (Local) Analysis

- Intersection Receptor Maps

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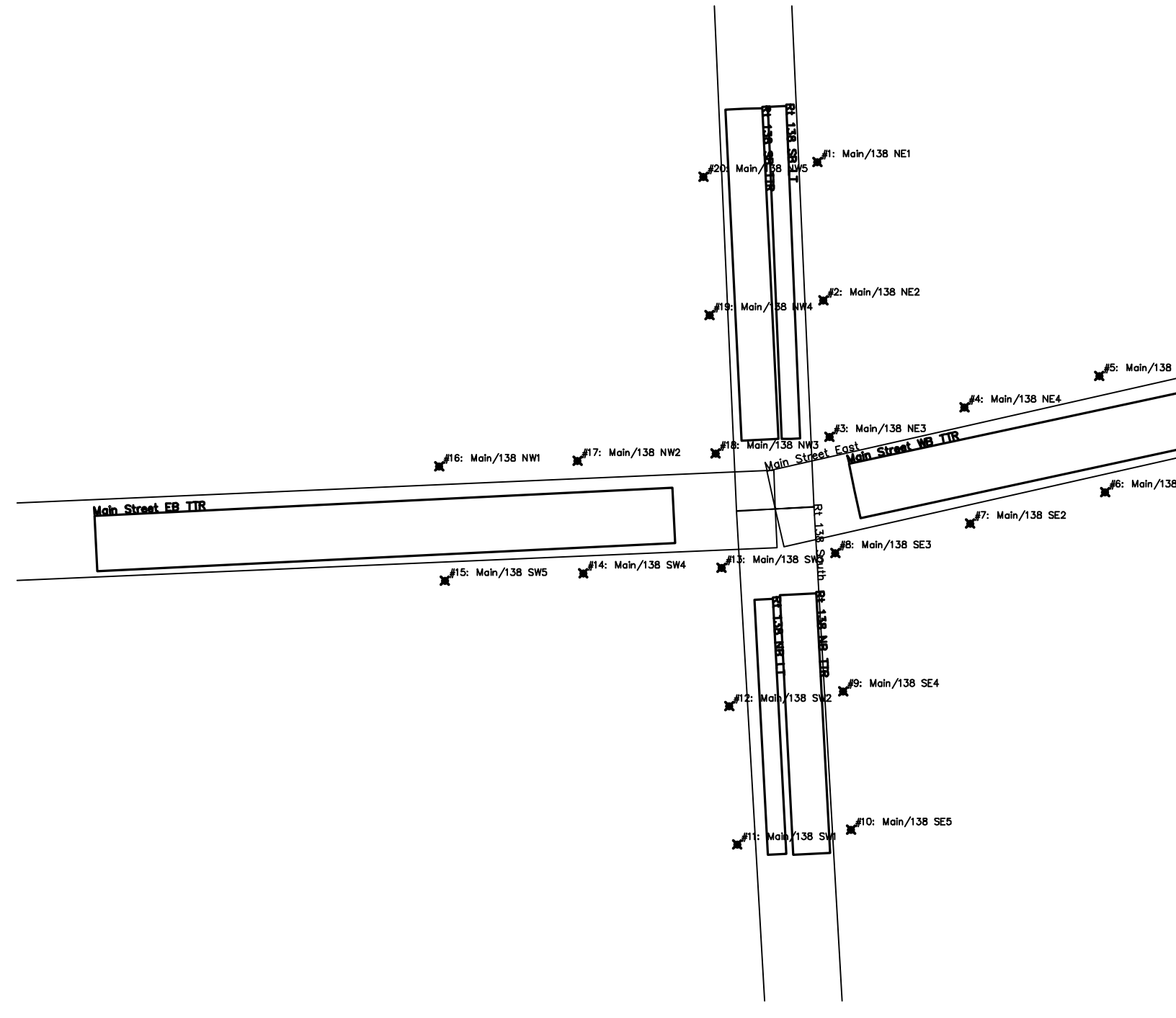
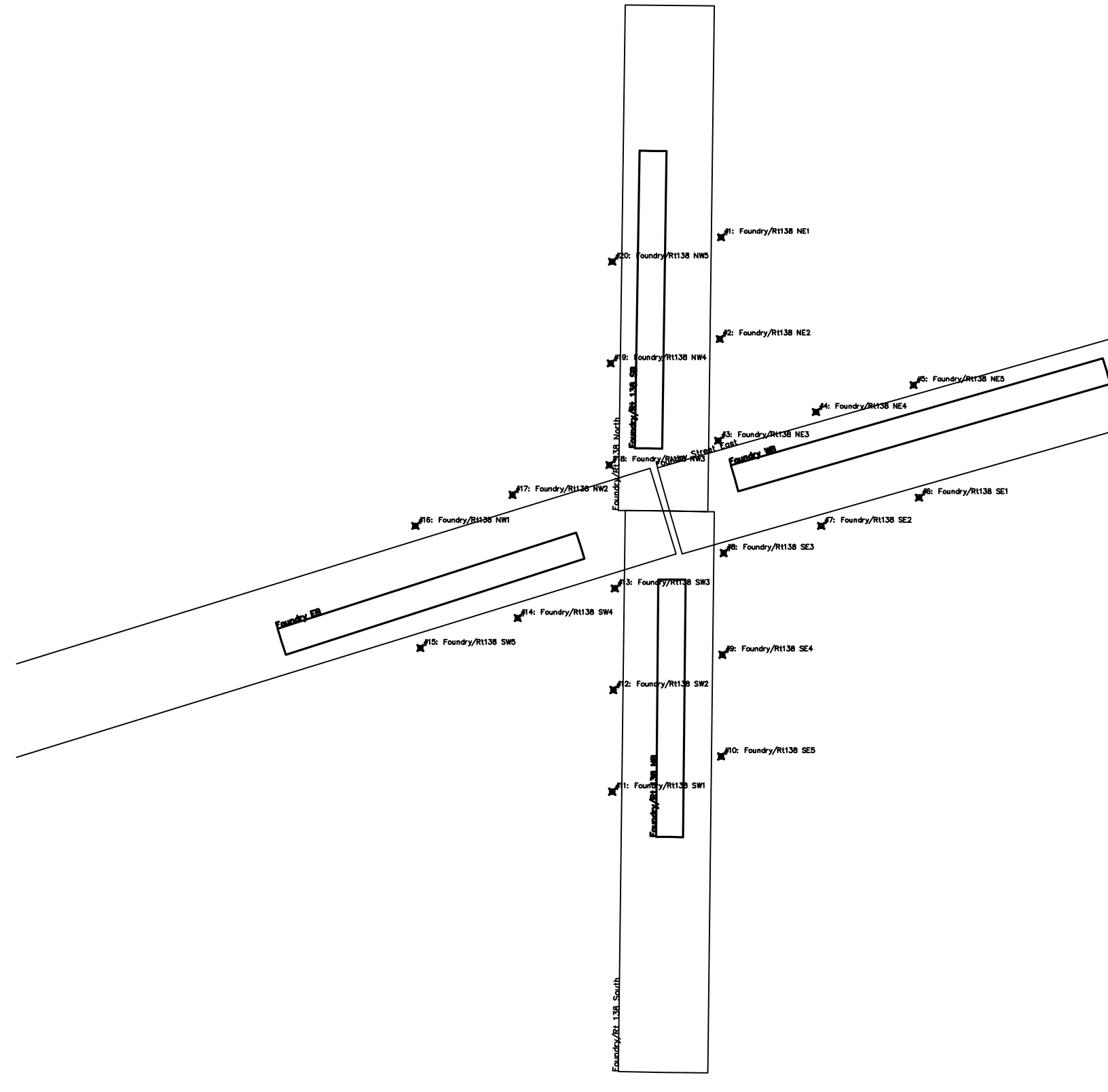
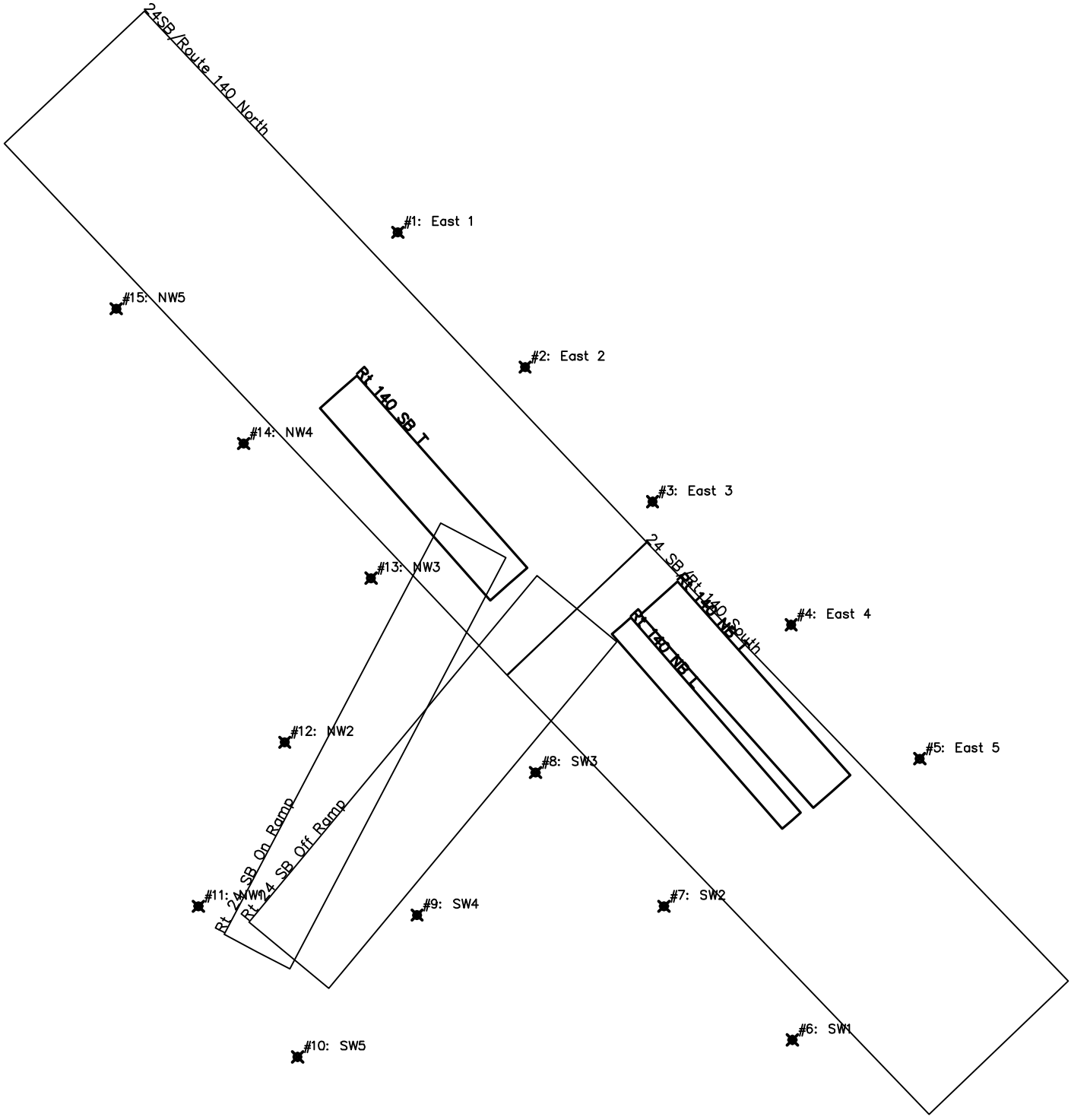
Rt 44 EB LT
Rt 44 East
Rt 44 WB LT
#1: Rt 44/Longmeadow NE1
#2: Rt 44/Longmeadow NE2
#3: Rt 44/Longmeadow NE3
#4: Rt 44/Longmeadow NE4
#5: Rt 44/Longmeadow NE5
#6: Rt 44/Longmeadow SE1
#7: Rt 44/Longmeadow SE2
#8: Rt 44/Longmeadow SE3
#9: Rt 44/Longmeadow SE4
#10: Rt 44/Longmeadow SE5
#11: Rt 44/Longmeadow SW1
#12: Rt 44/Longmeadow SW2
#13: Rt 44/Longmeadow SW3
#14: Rt 44/Longmeadow SW4
#15: Rt 44/Longmeadow SW5
#16: Rt 44/Longmeadow NW1
#17: Rt 44/Longmeadow NW2
#18: Rt 44/Longmeadow NW3
#19: Rt 44/Longmeadow NW4
#20: Rt 44/Longmeadow NW5

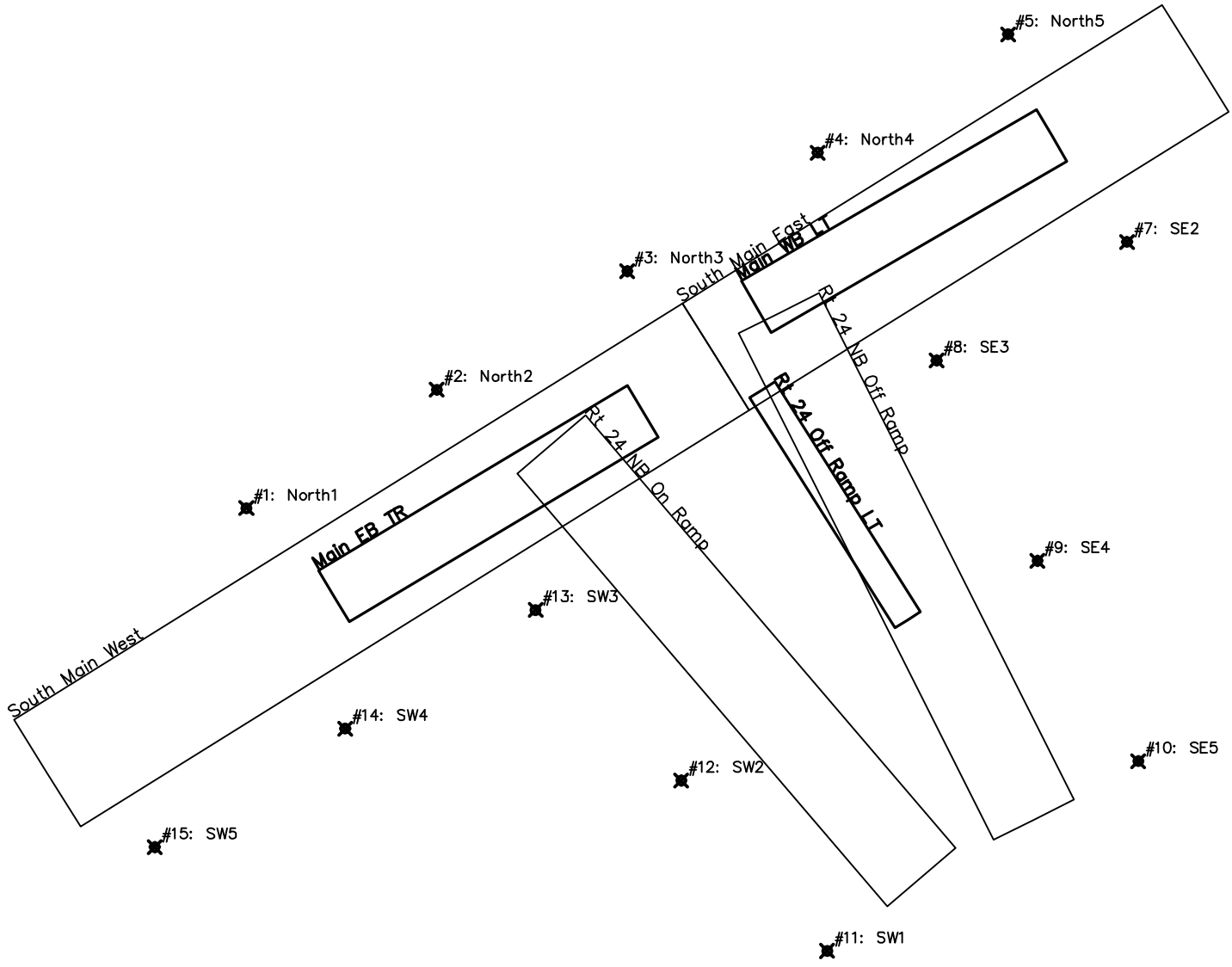

Rt 138 SB LT
Rt 138 SB TR
#1: Main/138 NE1
#20: Main/138 SW5
#2: Main/138 NE2
#19: Main/138 NW4
#5: Main/138
#4: Main/138 NE4
#3: Main/138 NE3
#18: Main/138 NW3
Main Street WB TTR
#16: Main/138 NW1
#17: Main/138 NW2
Main Street East
#6: Main/138
Main Street EB TTR
#7: Main/138 SE2
Rt 138 South
#8: Main/138 SE3
#15: Main/138 SW5
#14: Main/138 SW4
#13: Main/138 SW3
Rt 138 NB LT
Rt 138 NB TR
#9: Main/138 SE4
#12: Main/138 SW2
#10: Main/138 SE5
#11: Main/138 SW1

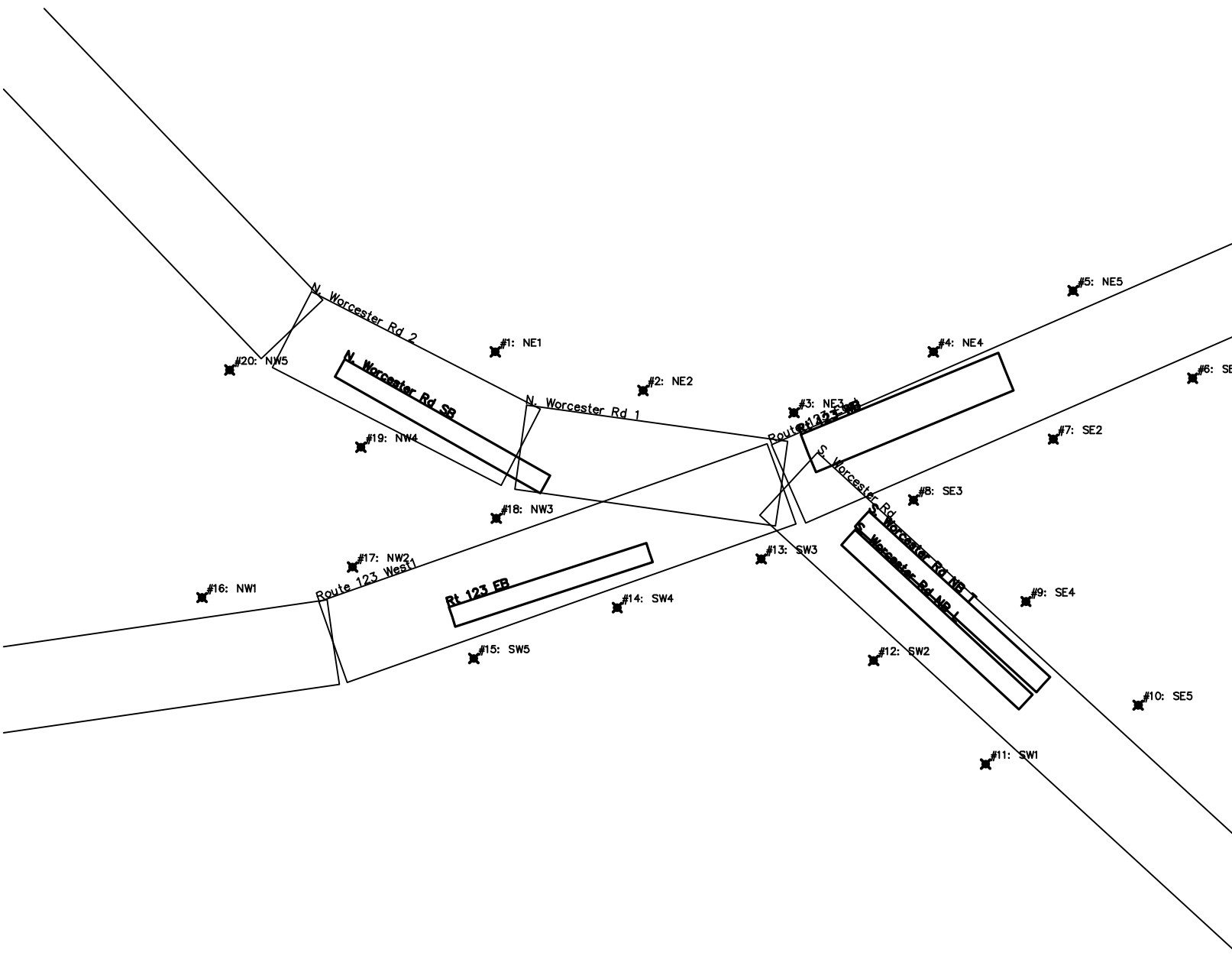
#1: NB Dov/Pres NE1
#2: NB Dov/Pres NE2
#3: NB Dov/Pres NE3
#4: NB Dov/Pres NE4
#5: NB Dov/Pres NE5
#6: NB Dov/Pres SE1
#7: NB Dov/Pres SE2
#8: NB Dov/Pres SE3
#9: NB Dov/Pres SE4
#10: NB Dov/Pres SE5
#11: NB Dov/Pres SW1
#12: NB Dov/Pres SW2
#13: NB Dov/Pres SW3
#14: NB Dov/Pres SW4
#15: NB Dov/Pres NW1
#16: NB Dov/Pres NW2
#17: NB Dov/Pres NW3
#18: NB Dov/Pres NW4
#19: NB Dov/Pres NW5
#20: NB Dov/Pres NW6
#21: SB Dov/Pres NE1
#22: SB Dov/Pres NE2
#23: SB Dov/Pres NE3
#24: SB Dov/Pres NE4
#25: SB Dov/Pres NE5
#26: SB Dov/Pres SE1
#27: SB Dov/Pres SE2
#28: SB Dov/Pres SE3
#29: SB Dov/Pres SE4
#30: SB Dov/Pres SE5
#31: SB Dov/Pres SW1
#32: SB Dov/Pres SW2
#33: SB Dov/Pres SW3
#34: SB Dov/Pres SW4
#35: SB Dov/Pres NW1
#36: SB Dov/Pres NW2
#37: SB Dov/Pres NW3
#38: SB Dov/Pres NW4
#39: SB Dov/Pres NW5
#40: SB Dov/Pres NW6
NB Duval Street S
SB Duval S
NB Duval Street N
SB Duval
NDov/President East
NB Dov/President West
SDov/President West
SB Dov/President East

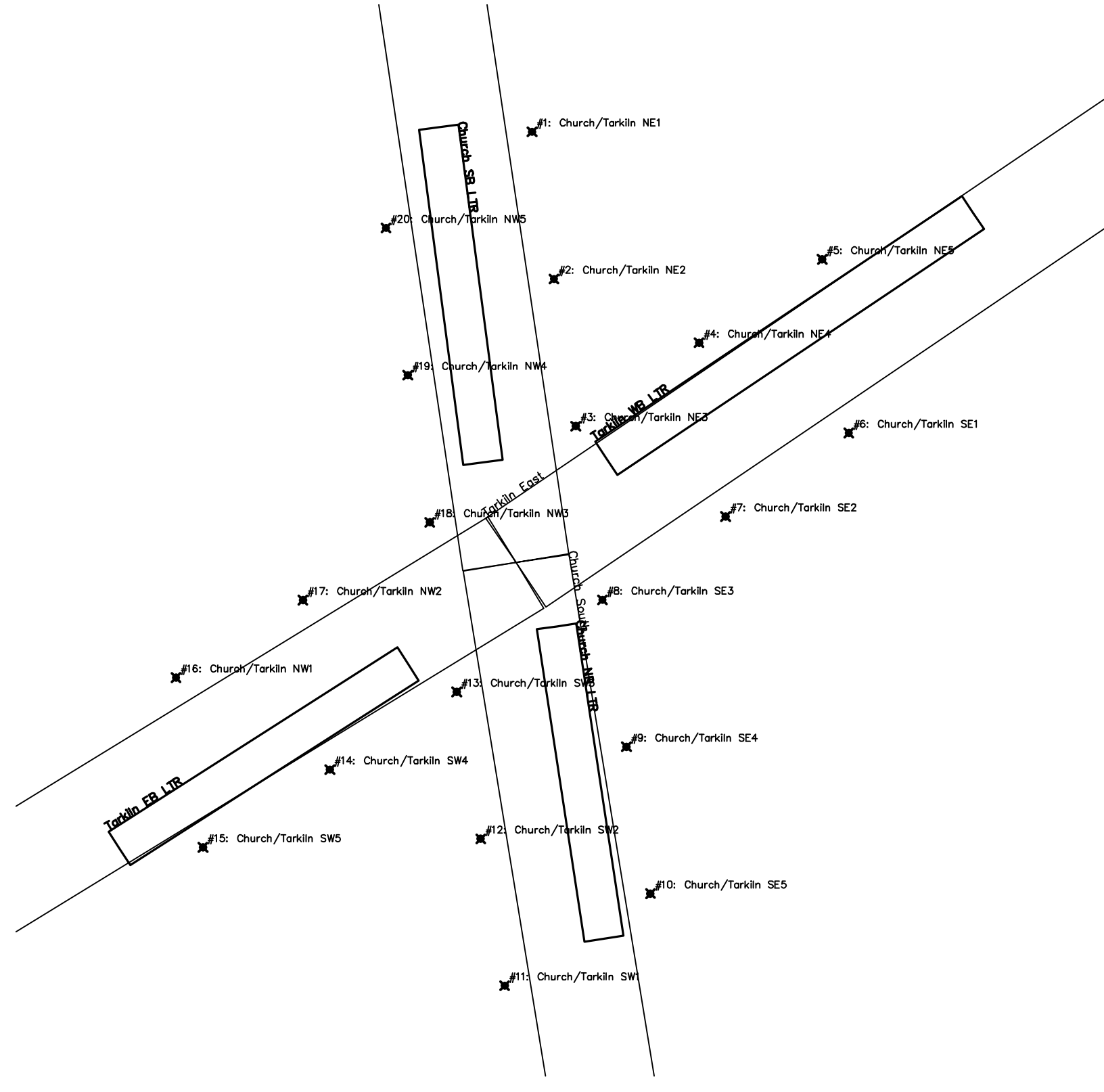

#1: Foundry/Rt138 NE1
#20: Foundry/Rt138 NW5
#2: Foundry/Rt138 NE2
#19: Foundry/Rt138 NW4
#5: Foundry/Rt138 NE5
#4: Foundry/Rt138 NE4
#3: Foundry/Rt138 NE3
#18: Foundry/Rt138 NW3
#17: Foundry/Rt138 NW2
#16: Foundry/Rt138 NW1
#6: Foundry/Rt138 SE1
#7: Foundry/Rt138 SE2
#8: Foundry/Rt138 SE3
#13: Foundry/Rt138 SW3
#14: Foundry/Rt138 SW4
#15: Foundry/Rt138 SW5
#9: Foundry/Rt138 SE4
#12: Foundry/Rt138 SW2
#10: Foundry/Rt138 SE5
#11: Foundry/Rt138 SW1
Foundry/Rt.138 North
Foundry/Rt.138 SB
Foundry/Rt.138 NB
Foundry/Rt.138 South
Foundry Street East
Foundry WB
Foundry EB

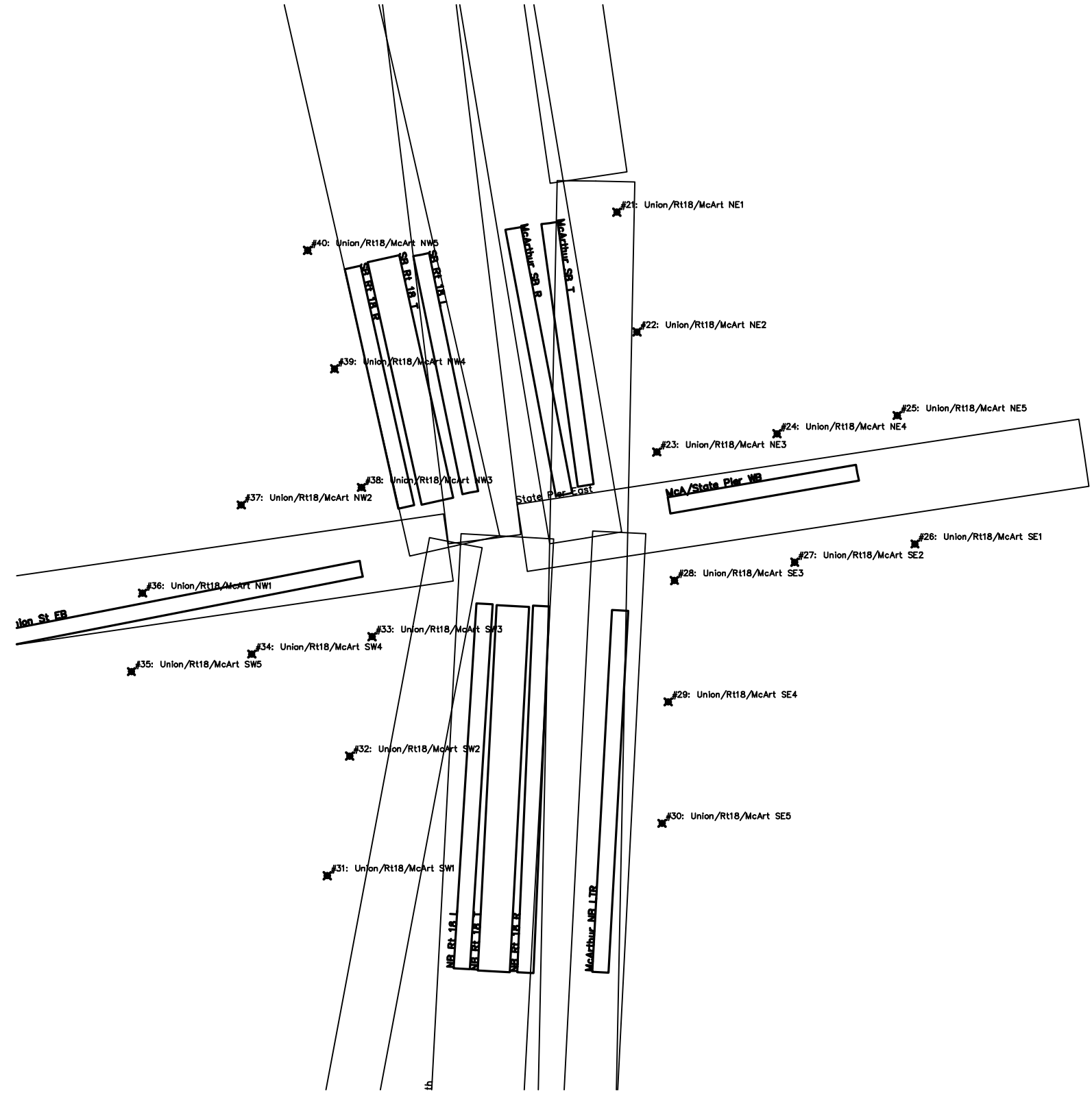
Runway 14/32
Runway 14L/32R
Runway 14R/32L
Taxiway A
Taxiway B
Taxiway C
Taxiway D
Taxiway E
Taxiway F
Taxiway G
Taxiway H
Taxiway J
Taxiway K
Taxiway L
Taxiway M
Taxiway N
Taxiway P
Taxiway Q
Taxiway R
Taxiway S
Taxiway T
Taxiway U
Taxiway V
Taxiway W
Taxiway Y
Taxiway Z
Taxiway A1
Taxiway A2
Taxiway A3
Taxiway A4
Taxiway A5
Taxiway A6
Taxiway A7
Taxiway A8
Taxiway A9
Taxiway A10
Taxiway A11
Taxiway A12
Taxiway A13
Taxiway A14
Taxiway A15
Taxiway A16
Taxiway A17
Taxiway A18
Taxiway A19
Taxiway A20
Taxiway

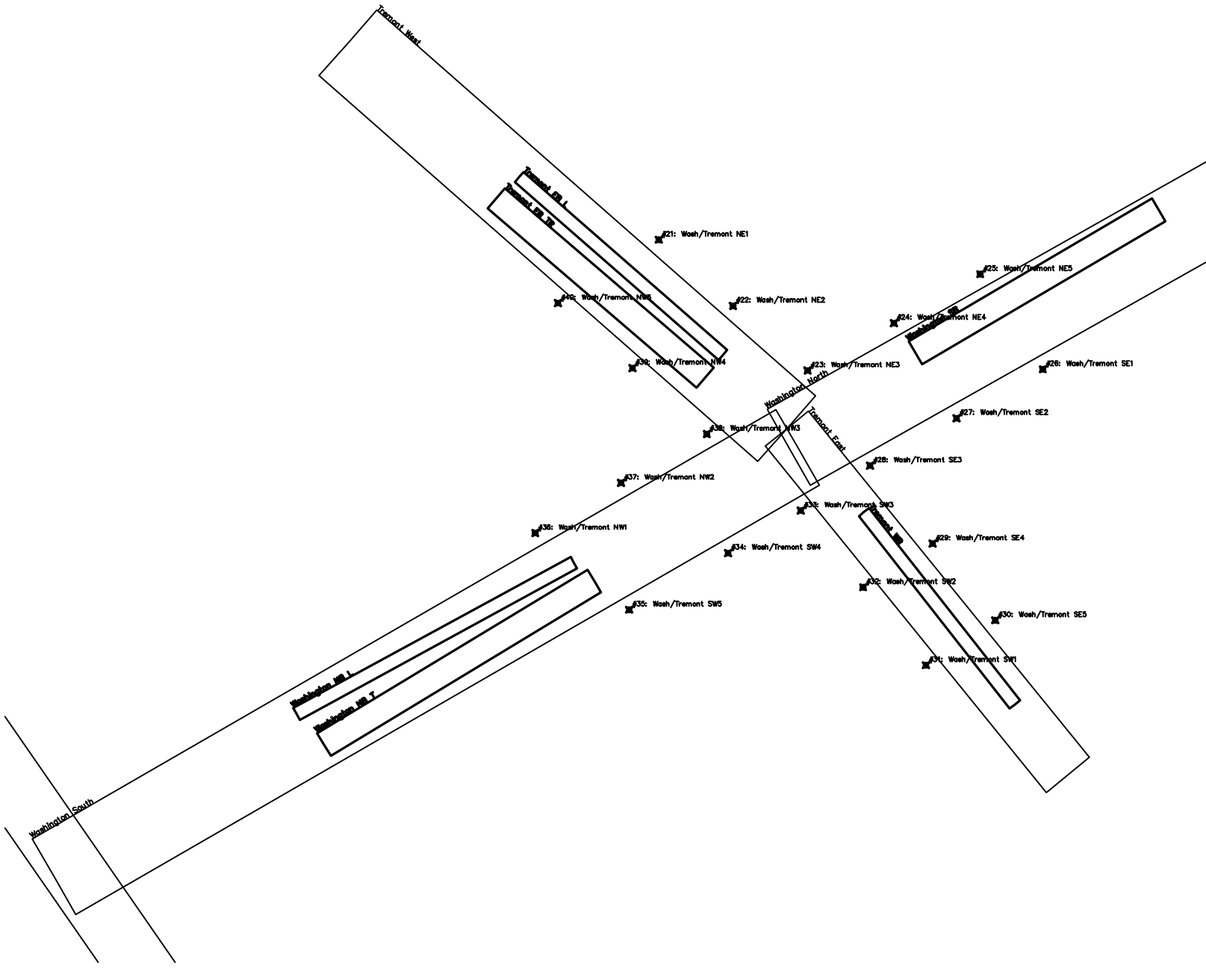

24SB/Route 140 North
#1: East 1
#15: NW5
#2: East 2
Rt 140 SB T
#14: NW4
#3: East 3
#13: NW3
24 SB/Rt 140 South
Rt 140 NB T
#4: East 4
Rt 140 NB L
#12: NW2
#5: East 5
#8: SW3
Rt 24 SB On Ramp
Rt 24 SB Off Ramp
#11: NW1
#9: SW4
#7: SW2
#6: SW1
#10: SW5


#5: North5
#4: North4
#7: SE2
#3: North3
South Main East
Main WB LT
Rt 24 NB Off Ramp
#8: SE3
#2: North2
Rt 24 Off Ramp LT
Rt 24 NB On Ramp
#1: North1
Main FB TR
#9: SE4
#13: SW3
South Main West
#14: SW4
#10: SE5
#12: SW2
#15: SW5
#11: SW1


N. Worcester Rd 2
N. Worcester Rd SB
N. Worcester Rd 1
Route 123 East
S. Worcester Rd
S. Worcester Rd NB 1
Route 123 West1
Rt 123 EB
#1: NE1
#2: NE2
#3: NE3
#4: NE4
#5: NE5
#6: SE
#7: SE2
#8: SE3
#9: SE4
#10: SE5
#11: SW1
#12: SW2
#13: SW3
#14: SW4
#15: SW5
#16: NW1
#17: NW2
#18: NW3
#19: NW4
#20: NW5


#1: Church/Tarkiln NE1
Church SB LTR
#20: Church/Tarkiln NW5
#5: Church/Tarkiln NE5
#2: Church/Tarkiln NE2
#4: Church/Tarkiln NE4
#19: Church/Tarkiln NW4
Tarkiln WB LTR
#3: Church/Tarkiln NE3
#6: Church/Tarkiln SE1
Tarkiln East
#18: Church/Tarkiln NW3
#7: Church/Tarkiln SE2
Church South
#17: Church/Tarkiln NW2
#8: Church/Tarkiln SE3
Church NB LTR
#16: Church/Tarkiln NW1
#13: Church/Tarkiln SW3
#9: Church/Tarkiln SE4
#14: Church/Tarkiln SW4
Tarkiln EB LTR
#12: Church/Tarkiln SW2
#15: Church/Tarkiln SW5
#10: Church/Tarkiln SE5
#11: Church/Tarkiln SW1


#21: Union/Rt18/McArt NE1
#40: Union/Rt18/McArt NW5
SB_RT_18_R
SB_RT_18_T
SB_RT_18_L
McArthur_SB_R
McArthur_SB_T
#22: Union/Rt18/McArt NE2
#39: Union/Rt18/McArt NW4
#25: Union/Rt18/McArt NE5
#24: Union/Rt18/McArt NE4
#23: Union/Rt18/McArt NE3
#38: Union/Rt18/McArt NW3
#37: Union/Rt18/McArt NW2
State Pier East
McA/State Pier WB
#26: Union/Rt18/McArt SE1
#27: Union/Rt18/McArt SE2
#28: Union/Rt18/McArt SE3
#36: Union/Rt18/McArt NW1
Union St EB
#33: Union/Rt18/McArt SW3
#34: Union/Rt18/McArt SW4
#35: Union/Rt18/McArt SW5
#29: Union/Rt18/McArt SE4
#32: Union/Rt18/McArt SW2
#30: Union/Rt18/McArt SE5
#31: Union/Rt18/McArt SW1
NB_RT_18_L
NB_RT_18_T
NB_RT_18_R
McArthur_NB_LTR


Tremont West
Tremont Rte 1
Tremont Rte 7a
#21: Wash/Tremont NE1
#25: Wash/Tremont NE5
#40: Wash/Tremont NW5
#22: Wash/Tremont NE2
Washington Rte 7
#24: Wash/Tremont NE4
#38: Wash/Tremont NW4
#23: Wash/Tremont NE3
#26: Wash/Tremont SE1
Washington North
Tremont East
#27: Wash/Tremont SE2
#39: Wash/Tremont NW3
#28: Wash/Tremont SE3
#37: Wash/Tremont NW2
#33: Wash/Tremont SW3
Tremont Rte 7
#36: Wash/Tremont NW1
#29: Wash/Tremont SE4
#34: Wash/Tremont SW4
#32: Wash/Tremont SW2
#35: Wash/Tremont SW5
#30: Wash/Tremont SE5
Washington Rte 1
#31: Wash/Tremont SW1
Washington Rte 7
Washington South

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Hot Spot: Microscale (Local) Analysis

- CAL3QHC Input Files
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)

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Hot Spot: Microscale (Local) Analysis

Cal3QHC - Input Files

- Carbon Monoxide (CO)

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East Taunton 2008 Existing - CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'Existing Condition' 7 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 205 72.225 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 790 72.225 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1000 72.225 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2350 12.67 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3335 12.67 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1580 12.54 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 525 12.54 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 No Build - CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 No Build' 7 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 49.725 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 49.725 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 49.725 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 9.32 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 9.32 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.19 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 9.19 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 No-Build - CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 No Build' 7 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 50.1 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 50.1 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 50.1 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 9.22 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 9.22 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.07 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 9.07 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Diesel) – CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 49.725 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 49.725 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 49.725 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 12.69 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 9.32 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 9.32 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.19 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 9.19 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 8.87 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 8.87 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 8.87 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Electric) – CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 49.725 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 49.725 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 49.725 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 9.32 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 9.32 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.19 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 9.19 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Diesel) – CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 Build with Mitigation' 11 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 50.1 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 50.1 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 50.1 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 12.69 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 9.22 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 9.22 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.07 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 9.07 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 8.87 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 8.87 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 8.87 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Electric) – CO

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 Build with Mitigation' 11 1 0 'C'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 50.1 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 50.1 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 50.1 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 9.22 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 9.22 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 9.07 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 9.07 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0 1 48
1 0 4 1000 0 'Y' 10 0 36

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Hot Spot: Microscale (Local) Analysis

Cal3QHC - Input Files

- Particulate Matter 10 (PM_{10})

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East Taunton 2008 Existing – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'Existing Condition' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 205 0.113 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 790 0.113 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1000 0.113 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2350 0.0453 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3335 0.0453 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1580 0.0453 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 525 0.0453 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 No-Build – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 No Build' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.075 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 0.075 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 0.075 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 0.0301 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 0.0301 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0301 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 0.0301 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 No-Build – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 No Build' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.0685 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 0.0685 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 0.0685 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 0.0274 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 0.0274 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0274 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 0.0274 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Diesel) – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.075 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.075 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.075 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 1.53 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0301 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0301 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0301 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0301 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 1.03 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 1.03 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 1.03 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Electric) – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.075 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.075 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.075 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0301 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0301 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0301 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0301 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Diesel) – PM_{10}

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.0685 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.0685 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.0685 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0.83 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0274 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0274 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0274 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0274 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0.267 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0.267 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0.267 1 48
1 0 4 1000 5 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Electric) – PM_{10}

```
'South Coast Rail (Taunton)'  60  175  0  0  15  0.3048  1  0
'East 1'  11858.27  -3406.06  6
'East 2'  11909.82  -3460.54  6
'East 3'  11961.38  -3515.01  6
'East 4'  12017.46  -3564.81  6
'East 5'  12069.51  -3618.96  6
'SW1'  12017.96  -3732.72  6
'SW2'  11965.99  -3678.65  6
'SW3'  11914.01  -3624.58  6
'SW4'  11866.05  -3682.24  6
'SW5'  11817.72  -3739.59  6
'NW1'  11777.59  -3678.67  6
'NW2'  11812.52  -3612.3  6
'NW3'  11847.45  -3545.93  6
'NW4'  11795.9  -3491.46  6
'NW5'  11744.34  -3436.98  6
'2030 Build with Mitigation'  11  1  0  'P'
 2
'Rt 140 NB L'  'AG'  11948.78  -3565.21  12017.56  -3644.08  1  10  1
90  40  3  285  0.0685  1600  1  3
 2
'Rt 140 NB T'  'AG'  11964  -3553.94  12033.91  -3632.25  1  20  2
90  0  3  976  0.0685  1600  1  3
 2
'Rt 140 SB T'  'AG'  11903.11  -3548.31  11834.33  -3470.57  1  20  2
90  50  3  1129  0.0685  1600  1  3
 2
'Train Queue'  'AG'  9191.51  -7114.1  9538.83  -7502.06  1  20  2
120  70  3  5  0  1600  1  3
 1
'24SB/Route 140 North'  'AG'  11930.76  -3558.31  11727.31  -3343.33  2467  0.0274  1  78
 1
'24 SB/Rt 140 South'  'AG'  11930.76  -3558.31  12101.47  -3735.9  3830  0.0274  1  78
 1
'Rt 24 SB Off Ramp'  'AG'  11930.76  -3558.31  11814.19  -3698.46  1440  0.0274  1  42
 1
'Rt 24 SB On Ramp'  'AG'  11888.83  -3530.64  11801.27  -3697.02  647  0.0274  1  30
1
'Train Line 1'  'AG'  -3325.63  6855.07  10135.78  -8168.58  5  0  1  48
 1
'Train Line 2'  'AG'  10124.73  -8177.77  12559.4  -12250.66  5  0  1  48
 1
'Train Line 3'  'AG'  -3319.6  6871.82  -6541.35  11486.7  5  0  1  48
1  0  4  1000  0  'Y'  10  0  36
```

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Hot Spot: Microscale (Local) Analysis

Cal3QHC - Input Files

- Particulate Matter 2.5 ($PM_{2.5}$)

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East Taunton 2008 Existing – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'Existing Condition' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 205 0.0725 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 790 0.0725 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1000 0.0725 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2350 0.029 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3335 0.029 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1580 0.029 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 525 0.029 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 No-Build – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 No Build' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.038 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 0.038 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 0.038 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 0.0152 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 0.0152 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0152 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 0.0152 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 No-Build – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 No Build' 7 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.0318 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 965 0.0318 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1085 0.0318 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2385 0.0127 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3775 0.0127 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0127 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 620 0.0127 1 30
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Diesel) – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.038 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.038 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.038 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 1.53 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0152 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0152 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0152 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0152 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 1.00 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 1.00 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 1.00 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2016 Build Mitigated (Electric) – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2016 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.038 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.038 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.038 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0152 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0152 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0152 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0152 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Diesel) – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.0318 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.0318 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.0318 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0.83 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0127 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0127 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0127 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0127 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0.259 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0.259 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0.259 1 48
1 0 4 1000 0 'Y' 10 0 36

East Taunton 2030 Build Mitigated (Electric) – $PM_{2.5}$

'South Coast Rail (Taunton)' 60 175 0 0 15 0.3048 1 0
'East 1' 11858.27 -3406.06 6
'East 2' 11909.82 -3460.54 6
'East 3' 11961.38 -3515.01 6
'East 4' 12017.46 -3564.81 6
'East 5' 12069.51 -3618.96 6
'SW1' 12017.96 -3732.72 6
'SW2' 11965.99 -3678.65 6
'SW3' 11914.01 -3624.58 6
'SW4' 11866.05 -3682.24 6
'SW5' 11817.72 -3739.59 6
'NW1' 11777.59 -3678.67 6
'NW2' 11812.52 -3612.3 6
'NW3' 11847.45 -3545.93 6
'NW4' 11795.9 -3491.46 6
'NW5' 11744.34 -3436.98 6
'2030 Build with Mitigation' 11 1 0 'P'
2
'Rt 140 NB L' 'AG' 11948.78 -3565.21 12017.56 -3644.08 1 10 1
90 40 3 285 0.0318 1600 1 3
2
'Rt 140 NB T' 'AG' 11964 -3553.94 12033.91 -3632.25 1 20 2
90 0 3 976 0.0318 1600 1 3
2
'Rt 140 SB T' 'AG' 11903.11 -3548.31 11834.33 -3470.57 1 20 2
90 50 3 1129 0.0318 1600 1 3
2
'Train Queue' 'AG' 9191.51 -7114.1 9538.83 -7502.06 1 20 2
120 70 3 5 0 1600 1 3
1
'24SB/Route 140 North' 'AG' 11930.76 -3558.31 11727.31 -3343.33 2467 0.0127 1 78
1
'24 SB/Rt 140 South' 'AG' 11930.76 -3558.31 12101.47 -3735.9 3830 0.0127 1 78
1
'Rt 24 SB Off Ramp' 'AG' 11930.76 -3558.31 11814.19 -3698.46 1440 0.0127 1 42
1
'Rt 24 SB On Ramp' 'AG' 11888.83 -3530.64 11801.27 -3697.02 647 0.0127 1 30
1
'Train Line 1' 'AG' -3325.63 6855.07 10135.78 -8168.58 5 0 1 48
1
'Train Line 2' 'AG' 10124.73 -8177.77 12559.4 -12250.66 5 0 1 48
1
'Train Line 3' 'AG' -3319.6 6871.82 -6541.35 11486.7 5 0 1 48
1 0 4 1000 0 'Y' 10 0 36

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Hot Spot: Microscale (Local) Analysis

Cal3QHC - Output Files

- Carbon Monoxide (CO)
- Particulate Matter 10 (PM_{10})
- Particulate Matter 2.5 ($PM_{2.5}$)

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Hot Spot: Microscale (Local) Analysis

Cal3QHC - Output Files

- Carbon Monoxide (CO)

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East Taunton 2008 Existing - CO

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 9/15/ 9
TIME : 15:43: 0

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT) X1	Y1	X2	Y2	*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11978.3	-3599.0	*	45.	139.	AG	86.	100.0	1.0	10.0	0.26	2.3
2. Rt 140 NB T	*	11964.0	-3553.9	11964.0	-3554.0	*	0.	138.	AG	0.	100.0	1.0	20.0	0.26	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11806.7	-3439.4	*	145.	318.	AG	215.	100.0	1.0	20.0	0.80	7.4
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2350.	12.7	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3335.	12.7	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1580.	12.5	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	525.	12.5	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 9/15/ 9
TIME : 15:43: 0

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	* CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	* 90	40	3.0	205	1600	72.22	1	3
2. Rt 140 NB T	* 90	0	3.0	790	1600	72.22	1	3
3. Rt 140 SB T	* 90	50	3.0	1000	1600	72.22	1	3

RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (FT) X	Y	Z *
1. East 1	* 11858.3	-3406.1	6.0 *
2. East 2	* 11909.8	-3460.5	6.0 *
3. East 3	* 11961.4	-3515.0	6.0 *
4. East 4	* 12017.5	-3564.8	6.0 *
5. East 5	* 12069.5	-3619.0	6.0 *
6. SW1	* 12018.0	-3732.7	6.0 *
7. SW2	* 11966.0	-3678.7	6.0 *
8. SW3	* 11914.0	-3624.6	6.0 *
9. SW4	* 11866.0	-3682.2	6.0 *
10. SW5	* 11817.7	-3739.6	6.0 *
11. NW1	* 11777.6	-3678.7	6.0 *
12. NW2	* 11812.5	-3612.3	6.0 *
13. NW3	* 11847.5	-3545.9	6.0 *
14. NW4	* 11795.9	-3491.5	6.0 *
15. NW5	* 11744.3	-3437.0	6.0 *

JOB: South Coast Rail (Taunton) RUN: Existing Condition

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.5	1.4	1.0	0.4	0.5	1.2	0.9	0.6
10.	* 0.0	0.0	0.0	0.0	0.0	1.1	1.0	1.5	1.3	1.1	0.4	0.6	1.2	1.0	0.7
20.	* 0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.3	1.3	1.1	0.4	0.6	1.1	1.0	0.7
30.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	1.1	0.6	0.7	1.1	1.0	0.7
40.	* 0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.1	0.9	0.8	0.8	0.7	1.1	1.1	0.7
50.	* 0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.1	0.6	0.6	1.1	0.9	1.1	1.1	0.7
60.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.0	0.6	0.4	1.1	1.0	1.2	1.1	0.7
70.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.0	0.6	0.4	1.2	1.1	1.3	1.1	0.7
80.	* 0.0	0.0	0.0	0.0	0.0	0.8	1.0	1.0	0.6	0.3	1.1	1.2	1.4	1.2	0.9
90.	* 0.0	0.0	0.0	0.0	0.0	0.7	1.1	1.1	0.5	0.2	1.1	1.2	1.6	1.3	1.0
100.	* 0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.1	0.4	0.1	0.9	1.2	1.7	1.4	1.3
110.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.1	0.2	0.0	0.5	1.1	1.8	1.7	1.5
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.7	0.9	0.1	0.0	0.3	0.9	1.7	1.5	1.5
130.	* 0.3	0.4	0.3	0.1	0.1	0.1	0.4	0.6	0.0	0.0	0.2	0.7	1.4	1.3	1.3
140.	* 0.8	0.8	0.7	0.4	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.6	1.0	0.8	0.8
150.	* 1.3	1.2	1.1	0.8	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.6	0.5	0.4
160.	* 1.5	1.3	1.2	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.3	0.1
170.	* 1.6	1.4	1.3	1.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.2	0.1
180.	* 1.5	1.4	1.4	1.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.1	0.0
190.	* 1.3	1.4	1.2	1.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 1.0	1.3	1.3	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0
210.	* 1.0	1.2	1.4	0.9	0.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0
220.	* 1.0	1.1	1.5	1.1	1.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.9	1.0	1.4	1.3	1.0	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.8	1.0	1.1	1.3	0.9	0.0	0.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.8	1.0	1.1	1.5	1.0	0.0	0.1	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.8	1.1	1.2	1.5	1.2	0.0	0.1	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.8	1.1	1.1	1.5	1.3	0.0	0.2	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.8	1.1	1.2	1.3	1.3	0.1	0.3	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.7	1.0	1.2	1.3	1.4	0.1	0.4	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.6	0.8	1.1	1.1	1.3	0.2	0.4	0.7	0.7	0.0	0.0	0.0	0.1	0.0	0.0
310.	*	0.4	0.5	0.8	0.7	0.9	0.7	0.8	1.0	0.7	0.0	0.0	0.0	0.2	0.1	0.1
320.	*	0.2	0.3	0.3	0.3	0.3	1.0	1.1	1.4	0.8	0.0	0.0	0.0	0.6	0.4	0.2
330.	*	0.1	0.1	0.1	0.1	0.1	1.3	1.4	1.7	0.8	0.1	0.0	0.1	1.0	0.6	0.3
340.	*	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.8	1.1	0.3	0.1	0.3	1.2	0.8	0.5
350.	*	0.0	0.0	0.0	0.0	0.0	1.2	1.4	1.7	1.3	0.6	0.2	0.5	1.3	0.8	0.6
360.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.5	1.4	1.0	0.4	0.5	1.2	0.9	0.6
------	*	----------														
MAX	*	1.6	1.4	1.5	1.5	1.4	1.4	1.4	1.8	1.4	1.1	1.2	1.2	1.8	1.7	1.5
DEGR.	*	170	170	220	250	290	340	330	340	0	10	70	80	110	110	120

THE HIGHEST CONCENTRATION OF 1.80 PPM OCCURRED AT RECEPTOR REC8 .

East Taunton 2016 No Build - CO

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 9/15/ 9
TIME : 11:33:25

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	59.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	148.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	9.3	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	9.3	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.2	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	9.2	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 9/15/ 9
TIME : 11:33:25

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	* CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	* 90	40	3.0	285	1600	49.72	1	3
2. Rt 140 NB T	* 90	0	3.0	965	1600	49.72	1	3
3. Rt 140 SB T	* 90	50	3.0	1085	1600	49.72	1	3

RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (FT) X	Y	Z *
1. East 1	* 11858.3	-3406.1	6.0 *
2. East 2	* 11909.8	-3460.5	6.0 *
3. East 3	* 11961.4	-3515.0	6.0 *
4. East 4	* 12017.5	-3564.8	6.0 *
5. East 5	* 12069.5	-3619.0	6.0 *
6. SW1	* 12018.0	-3732.7	6.0 *
7. SW2	* 11966.0	-3678.7	6.0 *
8. SW3	* 11914.0	-3624.6	6.0 *
9. SW4	* 11866.0	-3682.2	6.0 *
10. SW5	* 11817.7	-3739.6	6.0 *
11. NW1	* 11777.6	-3678.7	6.0 *
12. NW2	* 11812.5	-3612.3	6.0 *
13. NW3	* 11847.5	-3545.9	6.0 *
14. NW4	* 11795.9	-3491.5	6.0 *
15. NW5	* 11744.3	-3437.0	6.0 *

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.8	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	1.1	0.7	0.3	0.4	0.9	0.8	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.0	0.9	0.3	0.4	0.8	0.8	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.8	0.8	0.4	0.5	0.8	0.8	0.5
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.6	0.5	0.8	0.8	0.5
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.4	0.8	0.8	0.9	0.9	0.6
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.6
70.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.8	0.5	0.3	0.9	0.8	0.9	0.8	0.7
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.9	0.5	0.3	0.9	1.0	0.9	0.9	0.8
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.1	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.9	0.3	0.1	0.6	0.9	1.2	1.0	0.9
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.9	0.2	0.0	0.4	0.8	1.3	1.1	1.1
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.5	0.8	0.1	0.0	0.2	0.6	1.2	1.3	1.1
130.	* 0.3	0.2	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.5	1.0	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.4	0.7	0.6	0.6
150.	* 1.1	0.9	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.2	0.1
170.	* 1.1	0.9	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.1	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.7	1.0	0.9	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.7	0.8	1.0	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.8	0.8	1.1	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.2	0.9	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.7	0.8	0.8	1.2	1.0	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.6	0.8	0.9	1.0	1.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.5	0.7	0.9	0.9	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.4	0.7	0.8	0.8	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.5	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.2	0.2	0.3	0.7	0.8	0.9	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.2	1.1	1.2	0.6	0.0	0.0	0.1	0.8	0.4	0.2
340.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.3	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.9	0.5	0.1	0.4	1.0	0.7	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.8	0.5
------	*	----------														
MAX	*	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.3	1.1	0.9	0.9	1.0	1.3	1.3	1.1
DEGR.	*	150	160	170	250	290	330	330	340	10	20	60	80	110	120	110

THE HIGHEST CONCENTRATION OF 1.30 PPM OCCURRED AT RECEPTOR REC13.

East Taunton 2030 No-Build – CO

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:37:48

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	60.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	149.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	9.2	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	9.2	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.1	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	9.1	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:37:48

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	*	90	40	3.0	285	1600	50.10	1	3
2. Rt 140 NB T	*	90	0	3.0	965	1600	50.10	1	3
3. Rt 140 SB T	*	90	50	3.0	1085	1600	50.10	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.8	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	1.1	0.7	0.3	0.4	0.9	0.8	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.8	0.9	0.3	0.5	0.8	0.8	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.7	0.8	0.4	0.5	0.8	0.8	0.5
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.6	0.5	0.8	0.8	0.5
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.4	0.7	0.7	0.8	0.8	0.5
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.6
70.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.7
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.9	0.5	0.3	0.8	1.0	0.9	0.9	0.8
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.1	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.9	0.3	0.1	0.6	0.9	1.2	1.0	0.9
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.9	0.2	0.0	0.4	0.8	1.3	1.1	1.0
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.5	0.8	0.1	0.0	0.2	0.6	1.2	1.2	1.1
130.	* 0.3	0.2	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.5	1.0	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.4	0.6	0.6	0.6
150.	* 1.1	0.9	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.1
170.	* 1.0	0.9	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.1	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.7	1.0	0.9	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.7	0.8	1.0	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.7	0.7	1.1	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.1	0.9	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.7	0.8	0.8	1.2	0.9	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.6	0.8	0.9	1.0	1.1	0.1	0.2	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.5	0.7	0.9	0.9	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.4	0.7	0.8	0.8	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.5	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.2	0.2	0.3	0.7	0.8	0.9	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.0	1.0	1.2	0.6	0.0	0.0	0.1	0.8	0.4	0.2
340.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.3	0.9	0.5	0.1	0.4	1.0	0.7	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.8	0.5
------	*	----------														
MAX	*	1.1	1.1	1.1	1.2	1.2	1.0	1.1	1.3	1.1	0.9	0.9	1.0	1.3	1.2	1.1
DEGR.	*	150	160	170	260	290	330	340	340	10	20	60	80	110	120	120

THE HIGHEST CONCENTRATION OF 1.30 PPM OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Diesel) – CO

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 9/15/ 9
TIME : 11:33:36

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	59.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	148.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	40.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	9.3	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	9.3	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.2	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	9.2	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	8.9	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	8.9	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	8.9	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 9/15/ 9
TIME : 11:33:36

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	*	90	40	3.0	285	1600	49.72	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	49.72	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	49.72	1	3
4. Train Queue	*	120	70	3.0	5	1600	12.69	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.9	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.0	1.1	0.8	0.3	0.5	0.9	0.9	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.0	0.9	0.3	0.5	0.9	0.9	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.8	0.8	0.4	0.5	0.8	0.8	0.6
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.7	0.5	0.9	0.9	0.7
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.6	0.4	0.8	0.8	0.9	0.9	0.8
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.7
70.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.5	0.3	0.9	0.8	1.0	0.8	0.8
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.9	0.5	0.3	0.9	1.0	1.0	0.9	0.9
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.2	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.0	0.3	0.1	0.6	1.0	1.2	1.0	1.0
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.9	0.2	0.0	0.4	0.9	1.5	1.1	1.1
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.6	0.8	0.1	0.0	0.2	0.7	1.3	1.4	1.1
130.	* 0.3	0.4	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.6	1.1	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.5	0.7	0.6	0.6
150.	* 1.1	1.0	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.2	0.1
170.	* 1.1	1.0	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.2	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.8	1.0	1.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.8	0.9	1.1	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.8	0.8	1.2	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.2	0.9	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.8	0.8	0.9	1.2	1.0	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.7	0.9	0.9	1.0	1.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.6	0.9	0.9	1.0	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.5	0.7	0.9	0.9	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.6	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.3	0.2	0.3	0.8	0.8	1.0	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.2	1.1	1.2	0.6	0.0	0.0	0.1	0.8	0.6	0.3
340.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.4	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.9	0.6	0.1	0.4	1.0	0.8	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.9	0.5
------	*	----------														
MAX	*	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.4	1.1	0.9	0.9	1.0	1.5	1.4	1.1
DEGR.	*	150	190	230	250	290	330	330	340	10	20	60	80	110	120	110

THE HIGHEST CONCENTRATION OF 1.50 PPM OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Electric) – CO

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 9/15/ 9
TIME : 11:33:46

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	59.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	148.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	9.3	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	9.3	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.2	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	9.2	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 9/15/ 9
TIME : 11:33:46

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	*	90	40	3.0	285	1600	49.72	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	49.72	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	49.72	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.9	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.0	1.1	0.8	0.3	0.5	0.9	0.9	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.0	0.9	0.3	0.5	0.9	0.9	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.8	0.8	0.4	0.5	0.8	0.8	0.6
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.7	0.5	0.9	0.9	0.7
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.6	0.4	0.8	0.8	0.9	0.9	0.8
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.7
70.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.5	0.3	0.9	0.8	1.0	0.8	0.8
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.9	0.5	0.3	0.9	1.0	1.0	0.9	0.9
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.2	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.0	0.3	0.1	0.6	1.0	1.2	1.0	1.0
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.9	0.2	0.0	0.4	0.9	1.5	1.1	1.1
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.6	0.8	0.1	0.0	0.2	0.7	1.3	1.4	1.1
130.	* 0.3	0.4	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.6	1.1	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.5	0.7	0.6	0.6
150.	* 1.1	1.0	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.2	0.1
170.	* 1.1	1.0	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.2	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.8	1.0	1.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.8	0.9	1.1	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.8	0.8	1.2	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.2	0.9	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.8	0.8	0.9	1.2	1.0	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.7	0.9	0.9	1.0	1.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.6	0.9	0.9	1.0	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.5	0.7	0.9	0.9	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.6	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.3	0.2	0.3	0.8	0.8	1.0	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.2	1.1	1.2	0.6	0.0	0.0	0.1	0.8	0.6	0.3
340.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.4	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.9	0.6	0.1	0.4	1.0	0.8	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	1.0	0.6	0.3	0.4	0.9	0.9	0.5
------	*	----------														
MAX	*	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.4	1.1	0.9	0.9	1.0	1.5	1.4	1.1
DEGR.	*	150	190	230	250	290	330	330	340	10	20	60	80	110	120	110

THE HIGHEST CONCENTRATION OF 1.50 PPM OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Diesel) – CO

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 7/ 2/ 9
TIME : 9: 2: 1

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	60.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	149.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	40.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	9.2	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	9.2	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.1	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	9.1	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	8.9	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	8.9	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	8.9	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 7/ 2/ 9
TIME : 9: 2: 1

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	*	90	40	3.0	285	1600	50.10	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	50.10	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	50.10	1	3
4. Train Queue	*	120	70	3.0	5	1600	12.69	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.9	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	1.1	0.8	0.3	0.5	0.9	0.9	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.9	0.9	0.3	0.5	0.9	0.8	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.7	0.8	0.4	0.5	0.8	0.8	0.6
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.7	0.5	0.9	0.9	0.7
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.6	0.4	0.7	0.8	0.9	0.9	0.8
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.7
70.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.8
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.9	0.5	0.3	0.8	1.0	0.9	0.9	0.9
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.2	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.9	0.3	0.1	0.6	1.0	1.2	1.0	1.0
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.9	0.2	0.0	0.4	0.9	1.5	1.1	1.1
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.5	0.8	0.1	0.0	0.2	0.7	1.3	1.3	1.1
130.	* 0.3	0.2	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.6	1.1	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.5	0.7	0.6	0.6
150.	* 1.1	1.0	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.1
170.	* 1.1	1.0	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.1	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.7	1.0	0.9	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.8	0.9	1.1	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.8	0.8	1.2	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.2	0.9	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.8	0.8	0.8	1.2	1.0	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.7	0.9	0.9	1.0	1.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.6	0.9	0.9	1.0	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.5	0.7	0.9	0.9	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.6	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.2	0.2	0.3	0.8	0.8	0.9	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.2	1.0	1.2	0.6	0.0	0.0	0.1	0.8	0.6	0.3
340.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.4	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.9	0.6	0.1	0.4	1.0	0.8	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.9	0.5
------	*	----------														
MAX	*	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.4	1.1	0.9	0.9	1.0	1.5	1.3	1.1
DEGR.	*	150	160	230	250	290	330	340	340	10	20	60	80	110	120	110

THE HIGHEST CONCENTRATION OF 1.50 PPM OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Electric) – CO

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38: 2

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	60.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	149.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	9.2	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	9.2	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	9.1	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	9.1	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38: 2

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
1. Rt 140 NB L	*	90	40	3.0	285	1600	50.10	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	50.10	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	50.10	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT) X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.9	0.5
10.	* 0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	1.1	0.8	0.3	0.5	0.9	0.9	0.5
20.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.9	0.9	0.3	0.5	0.9	0.8	0.5
30.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.7	0.8	0.4	0.5	0.8	0.8	0.6
40.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.7	0.6	0.7	0.5	0.9	0.9	0.7
50.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.6	0.4	0.7	0.8	0.9	0.9	0.8
60.	* 0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.7
70.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.9	0.5	0.3	0.9	0.8	0.9	0.8	0.8
80.	* 0.0	0.0	0.0	0.0	0.0	0.7	0.9	0.9	0.5	0.3	0.8	1.0	0.9	0.9	0.9
90.	* 0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.4	0.2	0.8	1.0	1.2	0.9	0.9
100.	* 0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.9	0.3	0.1	0.6	1.0	1.2	1.0	1.0
110.	* 0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.9	0.2	0.0	0.4	0.9	1.5	1.1	1.1
120.	* 0.1	0.1	0.1	0.0	0.0	0.2	0.5	0.8	0.1	0.0	0.2	0.7	1.3	1.3	1.1
130.	* 0.3	0.2	0.3	0.1	0.0	0.1	0.3	0.5	0.0	0.0	0.2	0.6	1.1	1.0	1.0
140.	* 0.7	0.6	0.6	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.5	0.7	0.6	0.6
150.	* 1.1	1.0	0.9	0.6	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.5	0.3	0.3
160.	* 1.1	1.1	1.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.1
170.	* 1.1	1.0	1.1	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.2	0.0
180.	* 1.0	1.0	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.0
190.	* 1.0	1.1	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0
200.	* 0.7	1.0	0.9	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0
210.	* 0.7	0.9	1.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
220.	* 0.8	0.9	1.1	0.9	0.8	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
230.	* 0.8	0.8	1.2	1.0	0.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
240.	* 0.7	0.7	0.9	1.1	0.8	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
250.	* 0.7	0.7	0.9	1.2	0.9	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
260.	* 0.8	0.8	0.8	1.2	1.0	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
270.	* 0.7	0.8	0.8	1.1	1.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
280.	* 0.7	0.9	0.9	1.0	1.1	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
290.	* 0.6	0.9	0.9	1.0	1.2	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0

300.	*	0.5	0.7	0.9	0.9	1.0	0.1	0.3	0.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0
310.	*	0.3	0.4	0.6	0.6	0.7	0.3	0.6	0.6	0.5	0.0	0.0	0.0	0.2	0.1	0.0
320.	*	0.1	0.2	0.2	0.2	0.3	0.8	0.8	0.9	0.5	0.0	0.0	0.0	0.5	0.3	0.1
330.	*	0.0	0.1	0.1	0.1	0.1	1.2	1.0	1.2	0.6	0.0	0.0	0.1	0.8	0.6	0.3
340.	*	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.4	0.8	0.3	0.1	0.2	1.0	0.7	0.3
350.	*	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.3	0.9	0.6	0.1	0.4	1.0	0.8	0.4
360.	*	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.2	0.9	0.6	0.3	0.4	0.9	0.9	0.5
------	*	----------														
MAX	*	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.4	1.1	0.9	0.9	1.0	1.5	1.3	1.1
DEGR.	*	150	160	230	250	290	330	340	340	10	20	60	80	110	120	110

THE HIGHEST CONCENTRATION OF 1.50 PPM OCCURRED AT RECEPTOR REC13.

Hot Spot: Microscale (Local) Analysis

Cal3QHC - Output Files

- Particulate Matter 10 (PM_{10})

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East Taunton 2008 Existing – PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 6/29/ 9
TIME : 16:39:21

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11978.3	-3599.0	*	45.	139.	AG	0.	100.0	1.0	10.0	0.26	2.3
2. Rt 140 NB T	*	11964.0	-3553.9	11964.0	-3554.0	*	0.	138.	AG	0.	100.0	1.0	20.0	0.26	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11806.7	-3439.4	*	145.	318.	AG	0.	100.0	1.0	20.0	0.80	7.4
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2350.	0.0	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3335.	0.0	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1580.	0.0	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	525.	0.0	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 6/29/ 9
TIME : 16:39:21

1. Rt 140 NB L	*	90	40	3.0	205	1600	0.11	1	3
2. Rt 140 NB T	*	90	0	3.0	790	1600	0.11	1	3
3. Rt 140 SB T	*	90	50	3.0	1000	1600	0.11	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: Existing Condition

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	*	CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	*	0.	0.	0.	0.	0.	5.	5.	6.	5.	4.	1.	2.	4.	4.	3.
10.	*	0.	0.	0.	0.	0.	4.	4.	6.	5.	4.	1.	2.	4.	4.	3.
20.	*	0.	0.	0.	0.	0.	4.	4.	5.	5.	4.	2.	2.	4.	3.	3.
30.	*	0.	0.	0.	0.	0.	4.	4.	5.	4.	4.	2.	2.	4.	3.	3.
40.	*	0.	0.	0.	0.	0.	4.	4.	5.	3.	3.	3.	3.	4.	4.	3.
50.	*	0.	0.	0.	0.	0.	4.	4.	4.	3.	2.	4.	3.	4.	4.	3.
60.	*	0.	0.	0.	0.	0.	4.	4.	4.	2.	2.	5.	4.	4.	4.	3.
70.	*	0.	0.	0.	0.	0.	4.	4.	4.	2.	2.	5.	4.	4.	4.	3.
80.	*	0.	0.	0.	0.	0.	3.	4.	4.	2.	1.	5.	5.	5.	4.	3.
90.	*	0.	0.	0.	0.	0.	3.	4.	4.	2.	1.	4.	5.	6.	4.	4.
100.	*	0.	0.	0.	0.	0.	2.	4.	5.	2.	0.	4.	5.	6.	5.	4.
110.	*	0.	0.	0.	0.	0.	2.	4.	4.	1.	0.	2.	4.	7.	6.	5.
120.	*	0.	0.	0.	0.	0.	1.	3.	4.	0.	0.	2.	3.	7.	6.	6.
130.	*	2.	2.	1.	1.	0.	0.	1.	2.	0.	0.	1.	3.	6.	5.	5.
140.	*	3.	3.	3.	2.	1.	0.	0.	1.	0.	0.	0.	2.	4.	3.	3.
150.	*	5.	5.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	3.	2.	2.
160.	*	5.	5.	5.	4.	3.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
170.	*	5.	5.	5.	4.	4.	0.	0.	0.	0.	0.	0.	2.	2.	1.	0.
180.	*	5.	5.	5.	4.	4.	0.	0.	0.	0.	0.	0.	2.	2.	1.	0.
190.	*	5.	5.	5.	4.	4.	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.
200.	*	4.	5.	5.	4.	4.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	*	3.	4.	6.	4.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	*	4.	4.	6.	4.	4.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	*	3.	4.	6.	5.	4.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
240.	*	3.	3.	5.	5.	4.	0.	0.	3.	1.	0.	0.	0.	0.	0.	0.
250.	*	3.	3.	4.	6.	4.	0.	0.	3.	2.	0.	0.	0.	0.	0.	0.
260.	*	3.	4.	4.	6.	5.	0.	1.	3.	2.	0.	0.	0.	0.	0.	0.
270.	*	3.	4.	4.	6.	6.	0.	1.	3.	3.	0.	0.	0.	0.	0.	0.
280.	*	3.	4.	4.	5.	6.	0.	1.	3.	3.	0.	0.	0.	0.	0.	0.
290.	*	3.	4.	4.	5.	6.	1.	1.	3.	3.	0.	0.	0.	0.	0.	0.

300. * 2. 3. 4. 4. 5. 1. 2. 3. 3. 0. 0. 0. 0. 0. 0.
310. * 2. 2. 3. 3. 3. 2. 3. 4. 3. 0. 0. 0. 1. 1. 0.
320. * 1. 1. 1. 1. 2. 4. 4. 5. 3. 0. 0. 0. 2. 1. 1.
330. * 0. 0. 0. 0. 0. 5. 5. 6. 4. 0. 0. 0. 3. 2. 1.
340. * 0. 0. 0. 0. 0. 5. 6. 7. 4. 1. 0. 1. 4. 3. 2.
350. * 0. 0. 0. 0. 0. 5. 5. 7. 5. 2. 1. 2. 4. 4. 2.
360. * 0. 0. 0. 0. 0. 5. 5. 6. 5. 4. 1. 2. 4. 4. 3.
------*----------
MAX * 5. 5. 6. 6. 6. 5. 6. 7. 5. 4. 5. 5. 7. 6. 6.
DEGR. * 160 190 220 260 280 330 340 340 0 20 70 90 120 120 120

THE HIGHEST CONCENTRATION OF 7. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 No-Build – PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 6/29/ 9
TIME : 16:39: 3

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	0.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	0.0	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	0.0	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	0.0	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 6/29/ 9
TIME : 16:39: 3

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.08	1	3
2. Rt 140 NB T	*	90	0	3.0	965	1600	0.08	1	3
3. Rt 140 SB T	*	90	50	3.0	1085	1600	0.08	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	4.	4.	4.	4.	2.	1.	1.	3.	3.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	1.	1.	3.	3.	2.
20.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	1.	2.	2.	2.	2.
30.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	2.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	2.	2.	3.	2.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	3.	2.	3.	2.	2.
60.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
70.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	3.	2.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	4.	4.	3.	3.
100.	* 0.	0.	0.	0.	0.	2.	3.	4.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	3.	3.	1.	0.	2.	3.	5.	4.	4.
120.	* 0.	0.	0.	0.	0.	1.	2.	3.	0.	0.	1.	2.	5.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	1.	2.	4.	3.	3.
140.	* 2.	2.	2.	1.	1.	0.	0.	1.	0.	0.	0.	2.	3.	2.	2.
150.	* 4.	4.	3.	2.	1.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
160.	* 4.	4.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
170.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	1.	0.
180.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.
190.	* 3.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 3.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	3.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	2.	4.	4.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	2.	3.	4.	4.	0.	0.	2.	2.	0.	0.	0.	0.	0.	0.
270.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	3.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. * 2. 2. 3. 3. 4. 1. 1. 2. 2. 0. 0. 0. 0. 0. 0.
310. * 1. 2. 2. 2. 2. 2. 2. 2. 2. 0. 0. 0. 1. 0. 0.
320. * 0. 1. 1. 1. 1. 3. 3. 3. 2. 0. 0. 0. 1. 1. 0.
330. * 0. 0. 0. 0. 0. 4. 4. 4. 2. 0. 0. 0. 2. 2. 1.
340. * 0. 0. 0. 0. 0. 4. 4. 4. 3. 1. 0. 1. 3. 2. 1.
350. * 0. 0. 0. 0. 0. 4. 4. 4. 3. 2. 0. 1. 3. 2. 2.
360. * 0. 0. 0. 0. 0. 4. 4. 4. 4. 2. 1. 1. 3. 3. 2.
------*----------

MAX * 4. 4. 4. 4. 4. 4. 4. 4. 4. 3. 3. 4. 5. 4. 4.
DEGR. * 160 170 220 250 280 340 340 350 0 20 70 90 110 120 120

THE HIGHEST CONCENTRATION OF 5. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 No-Build – PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:39:11

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	0.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	0.0	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	0.0	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	0.0	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:39:11

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.07	1	3
2. Rt 140 NB T	*	90	0	3.0	965	1600	0.07	1	3
3. Rt 140 SB T	*	90	50	3.0	1085	1600	0.07	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	2.	1.	1.	3.	2.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	2.	1.	1.	2.	2.	2.
20.	* 0.	0.	0.	0.	0.	3.	3.	3.	3.	3.	1.	1.	2.	2.	2.
30.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	1.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
60.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	2.	2.	2.	2.
70.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	2.	2.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	4.	3.	2.
100.	* 0.	0.	0.	0.	0.	2.	3.	3.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	2.	3.	1.	0.	2.	3.	4.	4.	3.
120.	* 0.	0.	0.	0.	0.	1.	2.	3.	0.	0.	1.	2.	4.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	0.	2.	4.	3.	3.
140.	* 2.	2.	2.	1.	1.	0.	0.	1.	0.	0.	0.	1.	2.	2.	2.
150.	* 3.	3.	3.	2.	1.	0.	0.	0.	0.	0.	0.	1.	2.	1.	1.
160.	* 3.	3.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	0.
170.	* 4.	3.	4.	3.	2.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 3.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	* 3.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 2.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	2.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	2.	3.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	3.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	2.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
270.	* 2.	2.	2.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. * 2. 2. 2. 2. 4. 1. 1. 2. 2. 0. 0. 0. 0. 0. 0.
310. * 1. 1. 2. 2. 2. 1. 2. 2. 2. 0. 0. 0. 0. 0. 0.
320. * 0. 1. 1. 1. 1. 3. 3. 3. 2. 0. 0. 0. 1. 1. 0.
330. * 0. 0. 0. 0. 0. 4. 3. 4. 2. 0. 0. 0. 2. 2. 1.
340. * 0. 0. 0. 0. 0. 4. 4. 4. 3. 1. 0. 1. 3. 2. 1.
350. * 0. 0. 0. 0. 0. 3. 4. 4. 3. 2. 0. 1. 3. 2. 1.
360. * 0. 0. 0. 0. 0. 3. 3. 4. 3. 2. 1. 1. 3. 2. 2.
------*----------
MAX * 4. 3. 4. 4. 4. 4. 4. 4. 3. 3. 3. 3. 4. 4. 4.
DEGR. * 170 170 220 260 280 340 340 340 0 20 70 90 110 120 120

THE HIGHEST CONCENTRATION OF 4. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Diesel)– PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:27

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	5.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	1.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	1.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	1.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:27

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.08	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.08	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.08	1	3
4. Train Queue	*	120	70	3.0	5	1600	1.53	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	4.	4.	4.	4.	2.	1.	1.	3.	3.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	4.	3.	1.	2.	3.	3.	2.
20.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	1.	2.	3.	2.	2.
30.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	2.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	3.	3.	4.	2.	2.	2.	2.	3.	3.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	3.	2.	3.	3.	2.
60.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
70.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	4.	3.	3.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	4.	4.	3.	3.
100.	* 0.	0.	0.	0.	0.	2.	3.	4.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	3.	3.	1.	0.	2.	3.	5.	4.	4.
120.	* 0.	0.	0.	0.	0.	1.	2.	3.	0.	0.	1.	2.	5.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	1.	2.	4.	3.	4.
140.	* 2.	2.	2.	1.	1.	0.	0.	1.	0.	0.	0.	2.	3.	2.	2.
150.	* 4.	4.	3.	2.	1.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
160.	* 4.	4.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
170.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	1.	0.
180.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.
190.	* 3.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 3.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	3.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	3.	4.	4.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	3.	3.	4.	4.	0.	0.	2.	2.	0.	0.	0.	0.	0.	0.
270.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	3.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. * 2. 2. 3. 3. 4. 1. 1. 2. 2. 0. 0. 0. 0. 0. 0.
310. * 1. 2. 2. 2. 2. 2. 2. 2. 2. 0. 0. 0. 1. 0. 0.
320. * 0. 1. 1. 1. 1. 3. 3. 3. 2. 0. 0. 0. 2. 1. 0.
330. * 0. 0. 0. 0. 0. 4. 4. 4. 2. 0. 0. 0. 2. 2. 1.
340. * 0. 0. 0. 0. 0. 4. 4. 5. 3. 1. 0. 1. 3. 2. 1.
350. * 0. 0. 0. 0. 0. 4. 4. 5. 3. 2. 1. 1. 3. 3. 2.
360. * 0. 0. 0. 0. 0. 4. 4. 4. 4. 2. 1. 1. 3. 3. 2.
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MAX * 4. 4. 4. 4. 4. 4. 4. 5. 4. 3. 3. 4. 5. 4. 4.
DEGR. * 160 170 220 250 280 340 340 340 0 20 70 90 120 120 120

THE HIGHEST CONCENTRATION OF 5. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Electric) – PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:33

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:33

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.08	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.08	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.08	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

	*	COORDINATES (FT)			*
RECEPTOR	*	X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	4.	4.	4.	4.	2.	1.	1.	3.	3.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	4.	3.	1.	2.	3.	3.	2.
20.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	1.	2.	3.	2.	2.
30.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	2.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	3.	3.	4.	2.	2.	2.	2.	3.	3.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	3.	2.	3.	3.	2.
60.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
70.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	4.	3.	3.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	4.	4.	3.	3.
100.	* 0.	0.	0.	0.	0.	2.	3.	4.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	3.	3.	1.	0.	2.	3.	5.	4.	4.
120.	* 0.	0.	0.	0.	0.	1.	2.	3.	0.	0.	1.	2.	5.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	1.	2.	4.	3.	4.
140.	* 2.	2.	2.	1.	1.	0.	0.	1.	0.	0.	0.	2.	3.	2.	2.
150.	* 4.	4.	3.	2.	1.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
160.	* 4.	4.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
170.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	1.	0.
180.	* 4.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.
190.	* 3.	4.	4.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 3.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	3.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	3.	4.	4.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	3.	3.	4.	4.	0.	0.	2.	2.	0.	0.	0.	0.	0.	0.
270.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	3.	3.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	3.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. * 2. 2. 3. 3. 4. 1. 1. 2. 2. 0. 0. 0. 0. 0. 0.
310. * 1. 2. 2. 2. 2. 2. 2. 2. 2. 0. 0. 0. 1. 0. 0.
320. * 0. 1. 1. 1. 1. 3. 3. 3. 2. 0. 0. 0. 2. 1. 0.
330. * 0. 0. 0. 0. 0. 4. 4. 4. 2. 0. 0. 0. 2. 2. 1.
340. * 0. 0. 0. 0. 0. 4. 4. 5. 3. 1. 0. 1. 3. 2. 1.
350. * 0. 0. 0. 0. 0. 4. 4. 5. 3. 2. 1. 1. 3. 3. 2.
360. * 0. 0. 0. 0. 0. 4. 4. 4. 4. 2. 1. 1. 3. 3. 2.
------*----------

MAX * 4. 4. 4. 4. 4. 4. 4. 5. 4. 3. 3. 4. 5. 4. 4.
DEGR. * 160 170 220 250 280 340 340 340 0 20 70 90 120 120 120

THE HIGHEST CONCENTRATION OF 5. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Diesel) – PM_{10}

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:47

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 5.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	3.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.3	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.3	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.3	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:47

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.07	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.07	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.07	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.83	1	3

RECEPTOR LOCATIONS

	*	COORDINATES (FT)			*
RECEPTOR	*	X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0. *	5.	5.	5.	5.	5.	8.	8.	9.	8.	7.	6.	6.	8.	8.	7.
10. *	5.	5.	5.	5.	5.	8.	8.	9.	8.	8.	6.	6.	8.	7.	7.
20. *	5.	5.	5.	5.	5.	8.	8.	8.	8.	8.	6.	6.	7.	7.	7.
30. *	5.	5.	5.	5.	5.	8.	8.	8.	8.	7.	6.	6.	7.	7.	7.
40. *	5.	5.	5.	5.	5.	8.	8.	8.	7.	7.	7.	7.	7.	7.	7.
50. *	5.	5.	5.	5.	5.	8.	8.	8.	7.	7.	8.	7.	7.	7.	7.
60. *	5.	5.	5.	5.	5.	8.	8.	8.	7.	6.	8.	8.	7.	7.	7.
70. *	5.	5.	5.	5.	5.	8.	8.	8.	7.	6.	8.	8.	8.	7.	7.
80. *	5.	5.	5.	5.	5.	7.	8.	8.	7.	6.	8.	8.	8.	7.	7.
90. *	5.	5.	5.	5.	5.	7.	8.	8.	6.	6.	8.	8.	9.	8.	8.
100. *	5.	5.	5.	5.	5.	6.	8.	8.	6.	5.	7.	8.	9.	8.	8.
110. *	5.	5.	5.	5.	5.	6.	8.	8.	6.	5.	6.	8.	10.	9.	8.
120. *	5.	5.	5.	5.	5.	6.	7.	8.	5.	5.	6.	7.	10.	9.	9.
130. *	6.	6.	6.	5.	5.	5.	6.	7.	5.	5.	6.	7.	9.	8.	8.
140. *	7.	7.	7.	6.	6.	5.	5.	6.	5.	5.	5.	6.	8.	7.	7.
150. *	8.	8.	8.	7.	6.	5.	5.	5.	5.	5.	5.	6.	7.	6.	6.
160. *	9.	8.	9.	8.	7.	5.	5.	5.	5.	5.	5.	6.	6.	6.	5.
170. *	9.	8.	8.	8.	8.	5.	5.	5.	5.	5.	5.	6.	6.	6.	5.
180. *	8.	8.	8.	8.	8.	5.	5.	5.	5.	5.	5.	6.	6.	5.	5.
190. *	8.	8.	8.	8.	8.	5.	5.	5.	5.	5.	5.	6.	6.	5.	5.
200. *	8.	8.	8.	8.	8.	5.	5.	5.	5.	5.	5.	5.	6.	5.	5.
210. *	7.	8.	9.	8.	8.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
220. *	7.	8.	9.	8.	8.	5.	5.	6.	5.	5.	5.	5.	5.	5.	5.
230. *	7.	7.	8.	8.	8.	5.	5.	6.	6.	5.	5.	5.	5.	5.	5.
240. *	7.	7.	8.	8.	8.	5.	5.	7.	6.	5.	5.	5.	5.	5.	5.
250. *	7.	7.	8.	9.	8.	5.	5.	7.	6.	5.	5.	5.	5.	5.	5.
260. *	7.	7.	8.	9.	8.	5.	5.	7.	6.	5.	5.	5.	5.	5.	5.
270. *	7.	8.	8.	9.	9.	5.	6.	7.	6.	5.	5.	5.	5.	5.	5.
280. *	7.	8.	8.	8.	9.	5.	6.	7.	7.	5.	5.	5.	5.	5.	5.
290. *	7.	8.	8.	8.	9.	5.	6.	6.	7.	5.	5.	5.	5.	5.	5.

300. * 6. 7. 8. 8. 8. 6. 6. 7. 7. 5. 5. 5. 5. 5. 5.
310. * 6. 6. 7. 7. 7. 6. 7. 7. 7. 5. 5. 5. 6. 5. 5.
320. * 5. 6. 6. 6. 6. 8. 8. 8. 7. 5. 5. 5. 6. 6. 6.
330. * 5. 5. 5. 5. 5. 9. 8. 9. 7. 5. 5. 5. 7. 7. 6.
340. * 5. 5. 5. 5. 5. 9. 9. 9. 8. 6. 5. 6. 8. 7. 6.
350. * 5. 5. 5. 5. 5. 8. 9. 9. 8. 7. 5. 6. 8. 7. 6.
360. * 5. 5. 5. 5. 5. 8. 8. 9. 8. 7. 6. 6. 8. 8. 7.
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MAX * 9. 8. 9. 9. 9. 9. 9. 9. 8. 8. 8. 8. 10. 9. 9.
DEGR. * 160 160 220 250 280 340 340 340 0 20 70 90 110 120 120

THE HIGHEST CONCENTRATION OF 10. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Electric) – PM_{10}

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:41

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:38:41

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.07	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.07	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.07	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	2.	1.	1.	3.	2.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	2.	1.	1.	3.	2.	2.
20.	* 0.	0.	0.	0.	0.	3.	3.	3.	3.	3.	1.	1.	2.	2.	2.
30.	* 0.	0.	0.	0.	0.	3.	3.	3.	3.	2.	1.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	3.	2.	2.	2.	2.
60.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	1.	3.	2.	2.	2.	2.
70.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	2.	2.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	4.	3.	3.
100.	* 0.	0.	0.	0.	0.	2.	3.	3.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	2.	3.	1.	0.	2.	3.	4.	4.	3.
120.	* 0.	0.	0.	0.	0.	1.	2.	3.	0.	0.	1.	2.	4.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	0.	2.	4.	3.	3.
140.	* 2.	2.	2.	1.	1.	0.	0.	1.	0.	0.	0.	1.	2.	2.	2.
150.	* 3.	3.	3.	2.	1.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
160.	* 4.	4.	4.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	0.
170.	* 4.	3.	4.	3.	2.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 3.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	* 3.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 2.	3.	3.	3.	3.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	3.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	2.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	2.	3.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
270.	* 2.	2.	2.	4.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. * 2. 2. 2. 3. 4. 1. 1. 2. 2. 0. 0. 0. 0. 0. 0.
310. * 1. 2. 2. 2. 2. 1. 2. 2. 2. 0. 0. 0. 0. 0. 0.
320. * 0. 1. 1. 1. 1. 3. 3. 3. 2. 0. 0. 0. 1. 1. 0.
330. * 0. 0. 0. 0. 0. 4. 4. 4. 2. 0. 0. 0. 2. 2. 1.
340. * 0. 0. 0. 0. 0. 4. 4. 4. 3. 1. 0. 1. 3. 2. 1.
350. * 0. 0. 0. 0. 0. 3. 4. 4. 3. 2. 0. 1. 3. 2. 2.
360. * 0. 0. 0. 0. 0. 3. 3. 4. 3. 2. 1. 1. 3. 2. 2.
------*----------
MAX * 4. 4. 4. 4. 4. 4. 4. 4. 3. 3. 3. 3. 4. 4. 4.
DEGR. * 170 160 220 260 280 340 340 340 0 20 70 90 110 120 120

THE HIGHEST CONCENTRATION OF 4. ug/m**3 OCCURRED AT RECEPTOR REC13.

Hot Spot: Microscale (Local) Analysis

Cal3QHC - Output Files

- Particulate Matter 2.5 ($PM_{2.5}$)

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East Taunton 2008 Existing – $PM_{2.5}$

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 6/29/ 9
TIME : 16:39:29

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION * LINK COORDINATES (FT) * LENGTH BRG TYPE VPH EF H W V/C QUEUE
* X1 Y1 X2 Y2 * (FT) (DEG) (G/MI) (FT) (FT) (VEH)
---*---*---

1. Rt 140 NB L * 11948.8 -3565.2 11978.3 -3599.0 * 45. 139. AG 0. 100.0 1.0 10.0 0.26 2.3
2. Rt 140 NB T * 11964.0 -3553.9 11964.0 -3554.0 * 0. 138. AG 0. 100.0 1.0 20.0 0.26 0.0
3. Rt 140 SB T * 11903.1 -3548.3 11806.7 -3439.4 * 145. 318. AG 0. 100.0 1.0 20.0 0.80 7.4
4. 24SB/Route 140 North* 11930.8 -3558.3 11727.3 -3343.3 * 296. 317. AG 2350. 0.0 1.0 78.0
5. 24 SB/Rt 140 South * 11930.8 -3558.3 12101.5 -3735.9 * 246. 136. AG 3335. 0.0 1.0 78.0
6. Rt 24 SB Off Ramp * 11930.8 -3558.3 11814.2 -3698.5 * 182. 220. AG 1580. 0.0 1.0 42.0
7. Rt 24 SB On Ramp * 11888.8 -3530.6 11801.3 -3697.0 * 188. 208. AG 525. 0.0 1.0 30.0

JOB: South Coast Rail (Taunton) RUN: Existing Condition

DATE : 6/29/ 9
TIME : 16:39:29

1. Rt 140 NB L	*	90	40	3.0	205	1600	0.07	1	3
2. Rt 140 NB T	*	90	0	3.0	790	1600	0.07	1	3
3. Rt 140 SB T	*	90	50	3.0	1000	1600	0.07	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: Existing Condition

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	3.	3.	4.	4.	2.	1.	1.	3.	2.	2.
10.	* 0.	0.	0.	0.	0.	3.	3.	4.	3.	3.	1.	1.	3.	2.	2.
20.	* 0.	0.	0.	0.	0.	3.	2.	4.	3.	3.	1.	1.	2.	2.	2.
30.	* 0.	0.	0.	0.	0.	2.	2.	3.	3.	3.	2.	2.	2.	2.	2.
40.	* 0.	0.	0.	0.	0.	2.	2.	3.	2.	2.	2.	2.	2.	2.	2.
50.	* 0.	0.	0.	0.	0.	3.	3.	3.	2.	2.	3.	2.	2.	2.	2.
60.	* 0.	0.	0.	0.	0.	2.	2.	3.	2.	1.	3.	2.	2.	2.	2.
70.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	3.	3.	3.	2.	2.
80.	* 0.	0.	0.	0.	0.	2.	3.	3.	2.	1.	3.	3.	3.	2.	2.
90.	* 0.	0.	0.	0.	0.	2.	3.	3.	1.	1.	3.	3.	4.	3.	2.
100.	* 0.	0.	0.	0.	0.	1.	3.	3.	1.	0.	2.	3.	4.	3.	3.
110.	* 0.	0.	0.	0.	0.	1.	2.	3.	1.	0.	2.	3.	4.	4.	3.
120.	* 0.	0.	0.	0.	0.	1.	2.	2.	0.	0.	1.	2.	4.	4.	4.
130.	* 1.	1.	1.	0.	0.	0.	1.	2.	0.	0.	0.	2.	4.	3.	3.
140.	* 2.	2.	2.	1.	0.	0.	0.	1.	0.	0.	0.	2.	2.	2.	2.
150.	* 3.	3.	3.	2.	1.	0.	0.	0.	0.	0.	0.	2.	2.	1.	1.
160.	* 4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	2.	2.	1.	0.
170.	* 4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
180.	* 3.	4.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	* 3.	4.	3.	3.	3.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
200.	* 2.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
210.	* 2.	3.	4.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 2.	3.	4.	3.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
230.	* 2.	2.	4.	3.	3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 2.	2.	3.	3.	2.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
250.	* 2.	2.	3.	4.	3.	0.	0.	2.	1.	0.	0.	0.	0.	0.	0.
260.	* 2.	2.	2.	4.	3.	0.	0.	2.	2.	0.	0.	0.	0.	0.	0.
270.	* 2.	2.	3.	4.	3.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
280.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.
290.	* 2.	2.	3.	3.	4.	0.	1.	2.	2.	0.	0.	0.	0.	0.	0.

300. *	2.	2.	3.	3.	3.	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.
310. *	1.	1.	2.	2.	2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.
320. *	0.	1.	1.	1.	1.	2.	3.	3.	2.	0.	0.	0.	1.	1.	0.
330. *	0.	0.	0.	0.	0.	3.	4.	4.	2.	0.	0.	0.	2.	2.	1.
340. *	0.	0.	0.	0.	0.	4.	4.	4.	3.	1.	0.	1.	3.	2.	1.
350. *	0.	0.	0.	0.	0.	3.	4.	4.	3.	2.	0.	1.	3.	2.	2.
360. *	0.	0.	0.	0.	0.	3.	3.	4.	4.	2.	1.	1.	3.	2.	2.
------*															
MAX *	4.	4.	4.	4.	4.	4.	4.	4.	4.	3.	3.	3.	4.	4.	4.
DEGR. *	170	190	220	250	280	340	340	340	0	20	70	90	120	110	120

THE HIGHEST CONCENTRATION OF 4. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 No-Build – $PM_{2.5}$

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 6/29/ 9
TIME : 16:39:38

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	0.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	0.0	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	0.0	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	0.0	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

DATE : 6/29/ 9
TIME : 16:39:38

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.04	1	3
2. Rt 140 NB T	*	90	0	3.0	965	1600	0.04	1	3
3. Rt 140 SB T	*	90	50	3.0	1085	1600	0.04	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2016 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	2.	1.	1.
10.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	1.	1.	1.
20.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
30.	* 0.	0.	0.	0.	0.	2.	1.	2.	1.	1.	1.	1.	1.	1.	1.
40.	* 0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
50.	* 0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
60.	* 0.	0.	0.	0.	0.	2.	1.	2.	1.	1.	2.	1.	1.	1.	1.
70.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	1.	2.	2.	2.	1.	1.
80.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	1.	1.
90.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	2.	1.
100.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	1.	2.	2.	2.	2.
110.	* 0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	2.	2.	2.	2.
120.	* 0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	1.	1.	2.	2.	2.
130.	* 1.	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.	2.	2.
140.	* 1.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
160.	* 2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	* 2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	* 2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	* 1.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	* 1.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 1.	1.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	* 1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
260.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	* 1.	1.	2.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 0. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 2. 1. 2. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 1.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
360. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
------*----------
MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 2. 2. 2. 2. 2.
DEGR. * 160 190 170 240 270 340 340 350 0 10 60 90 120 120 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 No-Build – $PM_{2.5}$

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:39:45

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11787.0	-3417.0	*	175.	318.	AG	0.	100.0	1.0	20.0	0.87	8.9
4. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2385.	0.0	1.0	78.0		
5. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3775.	0.0	1.0	78.0		
6. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
7. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	620.	0.0	1.0	30.0		

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

DATE : 6/29/ 9
TIME : 16:39:45

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.03	1	3
2. Rt 140 NB T	*	90	0	3.0	965	1600	0.03	1	3
3. Rt 140 SB T	*	90	50	3.0	1085	1600	0.03	1	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2030 No Build

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	1.	1.	2.	2.	1.	0.	1.	1.	1.	1.
10.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	0.	1.	1.	1.	1.
20.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	0.	1.	1.	1.	1.
30.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	1.	1.	1.	1.	1.
40.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
50.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
60.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
70.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	1.	1.	1.
80.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	2.	1.	1.
90.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	2.	1.	1.
100.	* 0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	1.	2.	1.	1.
110.	* 0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	1.	1.	2.	2.	1.
120.	* 0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.	2.	2.	2.
130.	* 0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.	2.	1.
140.	* 1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	* 2.	1.	1.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
160.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
190.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	* 1.	1.	2.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
260.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	* 1.	1.	1.	1.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 0. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 1. 1. 1. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 0. 1. 1. 1.
360. * 0. 0. 0. 0. 0. 1. 1. 2. 2. 1. 0. 1. 1. 1. 1.
------*----------
MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 1. 1. 2. 2. 2.
DEGR. * 170 160 210 240 280 340 340 340 0 20 70 80 110 110 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Diesel) – $PM_{2.5}$

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:40:11

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	5.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	1.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	1.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	1.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:40:11

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.04	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.04	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.04	1	3
4. Train Queue	*	120	70	3.0	5	1600	1.53	1	3

RECEPTOR LOCATIONS

	*	COORDINATES (FT)			*
RECEPTOR	*	X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) *	REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	*	0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	2.	1.	1.
10.	*	0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	1.	1.	1.
20.	*	0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
30.	*	0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
40.	*	0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
50.	*	0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
60.	*	0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	2.	1.	1.	1.	1.
70.	*	0.	0.	0.	0.	0.	1.	2.	2.	1.	1.	2.	2.	2.	1.	1.
80.	*	0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	1.	1.
90.	*	0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	2.	2.
100.	*	0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	1.	2.	2.	2.	2.
110.	*	0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	2.	2.	2.	2.
120.	*	0.	0.	0.	0.	0.	0.	1.	2.	0.	0.	1.	1.	2.	2.	2.
130.	*	1.	1.	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.	2.	2.	2.
140.	*	1.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	*	2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
160.	*	2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	*	2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	*	2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	*	2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	*	1.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	*	1.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	*	1.	1.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	*	1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	*	1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	*	1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
260.	*	1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	*	1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	*	1.	1.	2.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	*	1.	1.	2.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 1. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 2. 1. 2. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 2. 1. 1.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
360. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
------*----------

MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 2. 2. 2. 2. 2.
DEGR. * 160 190 170 240 270 340 330 350 0 10 60 90 120 120 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2016 Build Mitigated (Electric) – $PM_{2.5}$

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:40: 6

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:40: 6

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.04	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.04	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.04	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2016 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	2.	1.	1.
10.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	0.	1.	1.	1.	1.
20.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
30.	* 0.	0.	0.	0.	0.	2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
40.	* 0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
50.	* 0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
60.	* 0.	0.	0.	0.	0.	2.	2.	2.	1.	1.	2.	1.	1.	1.	1.
70.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	1.	2.	2.	2.	1.	1.
80.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	1.	1.
90.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	2.	2.	2.	2.	2.
100.	* 0.	0.	0.	0.	0.	1.	2.	2.	1.	0.	1.	2.	2.	2.	2.
110.	* 0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	2.	2.	2.	2.
120.	* 0.	0.	0.	0.	0.	0.	1.	2.	0.	0.	1.	1.	2.	2.	2.
130.	* 1.	1.	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.	2.	2.	2.
140.	* 1.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
160.	* 2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	* 2.	2.	2.	2.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
190.	* 2.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	* 1.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	* 1.	2.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 1.	1.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	* 1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 1.	1.	2.	2.	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
260.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	* 1.	1.	2.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	* 1.	1.	2.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 1. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 2. 1. 2. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 2. 1. 1.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
360. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 1. 2. 1. 1.
------*----------

MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 2. 2. 2. 2. 2.
DEGR. * 160 190 170 240 270 340 330 350 0 10 60 90 120 120 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Diesel) – $PM_{2.5}$

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 7/ 2/ 9
TIME : 13:29: 2

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)		(G/MI)		(FT)	(FT)		(VEH)
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	3.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.3	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.3	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.3	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 7/ 2/ 9
TIME : 13:29: 2

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.03	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.03	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.03	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.83	1	3

RECEPTOR LOCATIONS

	*	COORDINATES (FT)			*
RECEPTOR	*	X	Y	Z	*
1. East 1	*	11858.3	-3406.1	6.0	*
2. East 2	*	11909.8	-3460.5	6.0	*
3. East 3	*	11961.4	-3515.0	6.0	*
4. East 4	*	12017.5	-3564.8	6.0	*
5. East 5	*	12069.5	-3619.0	6.0	*
6. SW1	*	12018.0	-3732.7	6.0	*
7. SW2	*	11966.0	-3678.7	6.0	*
8. SW3	*	11914.0	-3624.6	6.0	*
9. SW4	*	11866.0	-3682.2	6.0	*
10. SW5	*	11817.7	-3739.6	6.0	*
11. NW1	*	11777.6	-3678.7	6.0	*
12. NW2	*	11812.5	-3612.3	6.0	*
13. NW3	*	11847.5	-3545.9	6.0	*
14. NW4	*	11795.9	-3491.5	6.0	*
15. NW5	*	11744.3	-3437.0	6.0	*

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	1.	1.	2.	2.	1.	0.	1.	1.	1.	1.
10.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	0.	1.	1.	1.	1.
20.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	1.	1.	1.	1.	1.
30.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	1.	1.	1.	1.	1.
40.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
50.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
60.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
70.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	1.	1.	1.
80.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	2.	1.	1.
90.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	2.	2.	1.	1.
100.	* 0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	1.	2.	1.	1.
110.	* 0.	0.	0.	0.	0.	0.	1.	2.	0.	0.	1.	1.	2.	2.	2.
120.	* 0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.	2.	2.	2.
130.	* 0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.	2.	2.
140.	* 1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	* 2.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
160.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
190.	* 1.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	* 1.	1.	2.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
260.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 0. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 1. 1. 1. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 0. 1. 1. 1.
360. * 0. 0. 0. 0. 0. 1. 1. 2. 2. 1. 0. 1. 1. 1. 1.
------*----------
MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 1. 2. 2. 2. 2.
DEGR. * 170 160 210 240 280 340 340 340 0 20 70 90 120 110 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

East Taunton 2030 Build Mitigated (Electric) – $PM_{2.5}$

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221 PAGE 1

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:39:59

The MODE flag has been set to P for calculating PM averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 ug/m**3

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
	*	X1	Y1	X2	Y2	*									
1. Rt 140 NB L	*	11948.8	-3565.2	11989.8	-3612.2	*	62.	139.	AG	0.	100.0	1.0	10.0	0.36	3.2
2. Rt 140 NB T	*	11964.0	-3553.9	11964.1	-3554.1	*	0.	138.	AG	0.	100.0	1.0	20.0	0.32	0.0
3. Rt 140 SB T	*	11903.1	-3548.3	11772.7	-3400.9	*	197.	318.	AG	0.	100.0	1.0	20.0	0.91	10.0
4. Train Queue	*	9191.5	-7114.1	9192.0	-7114.7	*	1.	138.	AG	0.	100.0	1.0	20.0	0.00	0.0
5. 24SB/Route 140 North	*	11930.8	-3558.3	11727.3	-3343.3	*	296.	317.	AG	2467.	0.0	1.0	78.0		
6. 24 SB/Rt 140 South	*	11930.8	-3558.3	12101.5	-3735.9	*	246.	136.	AG	3830.	0.0	1.0	78.0		
7. Rt 24 SB Off Ramp	*	11930.8	-3558.3	11814.2	-3698.5	*	182.	220.	AG	1440.	0.0	1.0	42.0		
8. Rt 24 SB On Ramp	*	11888.8	-3530.6	11801.3	-3697.0	*	188.	208.	AG	647.	0.0	1.0	30.0		
9. Train Line 1	*	-3325.6	6855.1	10135.8	-8168.6	*	*****	138.	AG	5.	0.0	1.0	48.0		
10. Train Line 2	*	10124.7	-8177.8	12559.4	-12250.7	*	4745.	149.	AG	5.	0.0	1.0	48.0		
11. Train Line 3	*	-3319.6	6871.8	-6541.4	11486.7	*	5628.	325.	AG	5.	0.0	1.0	48.0		

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

DATE : 6/29/ 9
TIME : 16:39:59

1. Rt 140 NB L	*	90	40	3.0	285	1600	0.03	1	3
2. Rt 140 NB T	*	90	0	3.0	976	1600	0.03	1	3
3. Rt 140 SB T	*	90	50	3.0	1129	1600	0.03	1	3
4. Train Queue	*	120	70	3.0	5	1600	0.00	1	3

RECEPTOR LOCATIONS

	COORDINATES (FT)		
RECEPTOR	X	Y	Z
1. East 1	11858.3	-3406.1	6.0
2. East 2	11909.8	-3460.5	6.0
3. East 3	11961.4	-3515.0	6.0
4. East 4	12017.5	-3564.8	6.0
5. East 5	12069.5	-3619.0	6.0
6. SW1	12018.0	-3732.7	6.0
7. SW2	11966.0	-3678.7	6.0
8. SW3	11914.0	-3624.6	6.0
9. SW4	11866.0	-3682.2	6.0
10. SW5	11817.7	-3739.6	6.0
11. NW1	11777.6	-3678.7	6.0
12. NW2	11812.5	-3612.3	6.0
13. NW3	11847.5	-3545.9	6.0
14. NW4	11795.9	-3491.5	6.0
15. NW5	11744.3	-3437.0	6.0

JOB: South Coast Rail (Taunton) RUN: 2030 Build with Mitigation

MODEL RESULTS

REMARKS : In search of the angle corresponding to
the maximum concentration, only the first
angle, of the angles with same maximum
concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (ug/m**3) * REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15
0.	* 0.	0.	0.	0.	0.	1.	1.	2.	2.	1.	0.	1.	1.	1.	1.
10.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	0.	1.	1.	1.	1.
20.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	1.	1.	1.	1.	1.
30.	* 0.	0.	0.	0.	0.	1.	1.	2.	1.	1.	1.	1.	1.	1.	1.
40.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
50.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
60.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
70.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	1.	1.	1.
80.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	1.	2.	1.	1.
90.	* 0.	0.	0.	0.	0.	1.	1.	1.	1.	0.	1.	2.	2.	1.	1.
100.	* 0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	1.	1.	2.	1.	1.
110.	* 0.	0.	0.	0.	0.	0.	1.	2.	0.	0.	1.	1.	2.	2.	2.
120.	* 0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.	2.	2.	2.
130.	* 0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.	2.	2.
140.	* 1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
150.	* 2.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
160.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
170.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
180.	* 2.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
190.	* 1.	2.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
200.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
210.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
220.	* 1.	1.	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
230.	* 1.	1.	2.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
240.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
250.	* 1.	1.	1.	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
260.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
270.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
280.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
290.	* 1.	1.	1.	2.	2.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.

300. * 1. 1. 1. 1. 2. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0.
310. * 0. 1. 1. 1. 1. 1. 1. 1. 1. 0. 0. 0. 0. 0. 0.
320. * 0. 0. 0. 0. 0. 1. 1. 1. 1. 0. 0. 0. 1. 0. 0.
330. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
340. * 0. 0. 0. 0. 0. 2. 2. 2. 1. 0. 0. 0. 1. 1. 0.
350. * 0. 0. 0. 0. 0. 2. 2. 2. 2. 1. 0. 0. 1. 1. 1.
360. * 0. 0. 0. 0. 0. 1. 1. 2. 2. 1. 0. 1. 1. 1. 1.
------*----------
MAX * 2. 2. 2. 2. 2. 2. 2. 2. 2. 1. 1. 2. 2. 2. 2.
DEGR. * 170 160 210 240 280 340 340 340 0 20 70 90 120 110 120

THE HIGHEST CONCENTRATION OF 2. ug/m**3 OCCURRED AT RECEPTOR REC13.

Hot Spot: Microscale (Local) Analysis

- Microscale Results
  - Carbon Monoxide (CO)
  - Particulate Matter 10 (PM_{10})
  - Particulate Matter 2.5 ($PM_{2.5}$)

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Hot Spot: Microscale (Local) Analysis

Microscale Results

- Carbon Monoxide (CO)

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1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Norton	**Barrowsville**		**North Worcester Street at Route 123/Main Street**													
			1	3.5	3.4	3.5	3.5				3.4	3.5	3.5			
			2	3.7	3.6	3.6	3.6				3.6	3.6	3.6			
		Northeast	3	**3.8**	**3.7**	**4.1**	**4.1**				**3.7**	**4.2**	**4.2**			
			4	3.7	3.5	3.8	3.8				3.5	3.8	3.8			
			5	3.6	3.5	3.6	3.6				3.5	3.6	3.6			
			1	3.6	3.4	3.5	3.5				3.4	3.5	3.5			
			2	3.7	3.6	3.7	3.7				3.6	3.7	3.7			
		Southeast	3	**3.9**	**3.8**	**3.8**	**3.8**				**3.8**	**3.8**	**3.8**			
			4	3.8	3.6	3.8	3.8				3.6	3.7	3.7			
			5	3.7	3.6	3.6	3.6				3.6	3.6	3.6			
			1	3.5	3.5	3.7	3.7				3.4	3.6	3.6			
			2	3.6	3.5	3.7	3.7				3.5	3.7	3.7			
		Southwest	3	**3.8**	**3.6**	**3.7**	**3.7**				**3.6**	**3.7**	**3.7**			
			4	3.8	3.5	3.6	3.6				3.5	3.6	3.6			
			5	3.7	3.5	3.6	3.6				3.5	3.6	3.6			
			1	3.6	3.5	3.5	3.5				3.5	3.5	3.5			
			2	3.7	3.6	3.7	3.7				3.6	**3.7**	**3.7**			
		Northwest	3	3.7	**3.6**	**3.7**	**3.7**				**3.6**	3.6	3.6			
			4	**3.8**	3.5	3.6	3.6				3.5	3.6	3.6			
			5	3.5	3.4	3.5	3.5				3.4	3.5	3.5			
	East Taunton		**Route 140 at the Route 24**													
East Taunton	**North**		**Southbound Ramps**													
			1	4.6	4.1			4.1	4.1		4.1			4.1	4.1	
			2	**4.4**	**4.1**			**4.2**	**4.2**		**4.1**			**4.1**	**4.1**	
		East	3	4.5	4.1			4.2	4.2		4.1			4.2	4.2	
			4	4.5	4.2			4.2	4.2		4.2			4.2	4.2	
			5	4.4	4.2			4.2	4.2		4.2			4.2	4.2	
			1	4.4	4.2			4.2	4.2		4.0			4.2	4.2	
			2	**4.4**	**4.1**			**4.1**	**4.1**		**4.1**			**4.1**	**4.1**	
		Southwest	3	4.8	4.3			4.4	4.4		4.3			4.4	4.4	
			4	4.4	4.1			4.1	4.1		4.1			4.1	4.1	
			5	4.1	3.9			3.9	3.9		3.9			3.9	3.9	
			1	4.2	3.9			3.9	3.9		3.9			3.9	3.9	
			2	**4.2**	**4.0**			**4.0**	**4.0**		**4.0**			**4.0**	**4.0**	
		Northwest	3	4.8	4.3			4.5	4.5		4.3			4.5	4.5	
			4	4.7	4.3			4.4	4.4		4.2			4.3	4.3	
			5	4.5	4.1			4.1	4.1		4.1			4.1	4.1	

1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016						2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Easton	**Easton Village**		**Route 138 at Main Street**													
			1	4.7	4.4			4.3	4.3		4.4			4.3	4.3	
			2	**4.8**	**4.5**			**4.5**	**4.5**		**4.5**			**4.5**	**4.5**	
		Northeast	3	4.8	4.5			4.4	4.4		4.5			4.4	4.4	
			4	4.7	4.4			4.3	4.3		4.4			4.3	4.3	
			5	4.1	3.9			3.9	3.9		3.9			3.9	3.9	
			1	4.4	4.1			4.1	4.1		4.1			4.1	4.1	
			2	4.5	4.3			4.4	4.4		4.3			4.6	4.6	
		Southeast	3	4.7	4.6			4.4	4.4		4.5			4.4	4.4	
			4	**5.1**	**4.6**			**4.5**	**4.5**		4.6			**4.5**	**4.5**	
			5	4.7	4.6			4.4	4.4		**4.7**			4.4	4.4	
			1	4.7	4.6			4.5	4.5		4.6			4.5	4.5	
			2	4.7	4.4			4.4	4.4		4.4			4.4	4.4	
		Southwest	3	4.9	**4.7**			4.5	4.5		**4.7**			4.5	4.5	
			4	**5.0**	4.5			**4.7**	**4.7**		4.5			**4.7**	**4.7**	
			5	4.5	4.2			4.3	4.3		4.2			4.1	4.1	
			1	4.7	4.3			4.2	4.2		4.3			4.2	4.2	
			2	5.0	4.5			4.6	4.6		4.5			4.6	4.6	
		Northwest	3	4.8	4.5			4.4	4.4		4.5			4.4	4.4	
			4	5.0	4.4			4.5	4.5		4.4			4.5	4.5	
			5	**5.1**	**4.6**			**4.6**	**4.6**		**4.6**			**4.6**	**4.6**	
Fall River	**Fall River Depot**		**North Davol Street at President Avenue**													
			1	3.7	3.5	3.5	3.5				3.5	3.5	3.5			
			2	3.8	3.6	3.8	3.8				3.6	3.8	3.8			
		Northeast	3	4.5	4.1	3.9	3.9				4.1	3.9	3.9			
			4	**4.5**	**4.1**	**4.1**	**4.1**				**4.1**	**4.1**	**4.1**			
			5	4.5	4.1	4.0	4.0				4.1	3.9	3.9			
			1	4.2	4.0	4.0	4.0				4.0	3.9	3.9			
			2	4.3	4.0	3.9	3.9				4.0	3.9	3.9			
		Southeast	3	4.4	4.1	4.2	4.2				4.1	4.2	4.2			
			4	**4.5**	**4.2**	**4.1**	**4.1**				**4.2**	**4.1**	**4.1**			
			5	4.0	3.8	4.0	4.0				3.8	4.0	4.0			
			1	4.0	3.8	3.8	3.8				3.8	3.9	3.9			
			2	4.6	4.1	4.1	4.1				4.1	4.1	4.1			
		Southwest	3	**4.7**	**4.2**	**4.2**	**4.2**				**4.2**	**4.2**	**4.2**			
			4	4.2	4.0	3.8	3.8				4.0	3.8	3.8			
			5	4.3	4.0	3.9	3.9				4.0	3.9	3.9			
			1	4.1	3.9	3.8	3.8				3.9	3.8	3.8			
			2	4.1	3.9	3.8	3.8				3.9	3.8	3.8			
		Northwest	3	**4.6**	**4.0**	**4.1**	**4.1**				**4.0**	**4.0**	**4.0**			
			4	3.9	3.7	3.7	3.7				3.7	3.7	3.7			
			5	3.8	3.6	3.6	3.6				3.6	3.6	3.6			

1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016						2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Fall River	**Fall River Depot**		**South Davol Street at President Avenue**													
			1	4.0	3.7	3.7	3.7				3.7	3.7	3.7			
			2	4.1	3.8	3.8	3.8				3.8	3.8	3.8			
		Northeast	3	**4.2**	**3.9**	**4.0**	**4.1**				**3.9**	**4.0**	**4.0**			
			4	4.0	3.7	3.8	3.8				3.7	3.8	3.8			
			5	4.2	3.8	3.8	3.8				3.8	3.8	3.8			
			1	4.2	3.9	3.9	3.9				3.9	3.9	3.9			
			2	4.3	3.9	3.9	3.9				3.9	3.9	3.9			
		Southeast	3	**4.3**	**4.0**	**4.0**	**4.0**				**4.0**	**4.0**	**4.0**			
			4	3.9	3.8	3.8	3.8				3.8	3.8	3.8			
			5	3.7	3.6	3.6	3.6				3.6	3.6	3.6			
			1	3.8	3.7	3.7	3.7				3.7	3.7	3.7			
			2	3.9	3.8	3.8	3.8				3.8	3.8	3.8			
		Southwest	3	**4.4**	**3.9**	**3.9**	**3.9**				**3.9**	**3.9**	**3.9**			
			4	3.7	3.7	3.6	3.6				3.7	3.6	3.6			
			5	3.6	3.4	3.3	3.3				3.4	3.3	3.3			
			1	3.6	3.5	3.4	3.4				3.5	3.4	3.4			
			2	3.8	3.7	3.6	3.6				3.7	3.6	3.6			
		Northwest	3	4.6	4.2	4.1	4.1				4.1	4.0	4.0			
			4	**4.6**	**4.2**	**4.2**	**4.2**				**4.2**	**4.2**	**4.2**			
			5	4.4	4.0	4.0	4.0				4.0	4.0	4.0			
Freetown	**Freetown**		**South Main Street at Route 24 Northbound Ramps**													
			1	3.4	4.0			4.0	4.0		3.9			3.9	3.9	
			2	3.5	3.9			3.9	3.9		3.8			3.8	3.8	
		North	3	3.5	3.9			3.9	3.9		3.9			3.9	3.9	
			4	**3.5**	**4.1**			**4.1**	**4.1**		**4.1**			**4.1**	**4.1**	
			5	3.5	4.0			4.0	4.0		4.0			4.0	4.0	
			1	3.5	3.8			3.8	3.8		3.8			3.8	3.8	
			2	3.4	4.0			4.0	4.0		3.9			3.9	3.9	
		Southeast	3	**3.6**	**4.0**			**4.0**	**4.0**		**4.0**			**4.0**	**4.0**	
			4	3.4	3.7			3.7	3.7		3.7			3.7	3.7	
			5	3.3	3.4			3.4	3.4		3.4			3.4	3.4	
			1	3.2	3.4			3.4	3.4		3.4			3.4	3.4	
			2	3.3	3.6			3.6	3.6		3.6			3.6	3.6	
		Southwest	3	**3.4**	**4.0**			**4.1**	**4.1**		**4.0**			**4.0**	**4.0**	
			4	3.4	3.7			3.7	3.7		3.7			3.7	3.7	
			5	3.4	3.7			3.7	3.7		3.7			3.7	3.7	

1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016						2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
New Bedford	King's Highway		Church Strret at Tarkiln Road													
			1	3.6	3.6	3.5	3.6				3.5	3.6	3.6			
			2	3.9	3.6	3.5	3.7				3.6	3.8	3.7			
		Northeast	3	4.0	3.8	3.8	3.9				3.8	**4.1**	3.9			
			4	**4.0**	**3.8**	**3.8**	**4.0**				**3.8**	3.9	**4.0**			
			5	3.8	3.6	3.6	3.8				3.5	3.8	3.8			
			1	3.8	3.6	3.6	3.7				3.6	3.7	3.8			
			2	3.9	3.6	3.6	3.7				3.6	3.9	3.7			
		Southeast	3	**4.1**	**3.8**	**3.7**	**3.8**				**3.8**	**4.0**	**3.8**			
			4	4.1	3.8	3.6	3.8				3.8	3.9	3.8			
			5	3.6	3.6	3.6	3.7				3.6	3.6	3.7			
			1	3.7	3.5	3.5	3.6				3.5	3.6	3.6			
			2	3.9	3.6	3.5	3.6				3.6	3.8	3.6			
		Southwest	3	4.1	3.8	3.7	3.9				3.8	4.0	3.8			
			4	**4.1**	**3.9**	**3.9**	**4.0**				**3.9**	**4.0**	**4.0**			
			5	3.9	3.7	3.6	3.9				3.7	3.8	3.9			
			1	3.9	3.7	3.6	3.8				3.7	3.8	3.8			
			2	3.9	3.7	3.7	3.7				3.7	3.8	3.7			
		Northwest	3	4.0	**3.8**	**3.8**	**3.8**				**3.8**	**4.0**	**3.8**			
			4	**4.1**	3.7	3.6	3.8				3.7	3.8	3.8			
			5	3.6	3.6	3.6	3.6				3.6	3.7	3.6			
Raynham	Raynham Park		Route 138 at Found Street/Route 106			Whittenton Electric	Whittenton Diesel					Whittenton Electric	Whittenton Diesel			
			1	4.1	3.8	3.8	3.8				3.8	3.8	3.8			
			2	4.1	3.9	3.9	3.9				3.9	3.9	3.9			
		Northeast	3	4.4	**4.1**	**4.2**	**4.2**				**4.1**	**4.1**	**4.1**			
			4	**4.5**	4.0	4.1	4.1				4.0	4.1	4.1			
			5	4.1	4.0	4.0	4.0				4.0	4.0	4.0			
			1	4.1	3.9	3.9	3.9				3.9	3.9	3.9			
			2	4.2	3.9	3.9	3.9				3.9	3.9	3.9			
		Southeast	3	**4.3**	**4.0**	**4.0**	**4.0**				**4.0**	**4.0**	**4.0**			
			4	4.3	4.0	4.0	4.0				4.0	4.0	4.0			
			5	4.1	3.8	3.9	3.9				3.8	3.9	3.9			
			1	4.1	3.8	3.9	3.9				3.8	3.9	3.9			
			2	**4.3**	**4.1**	**4.1**	**4.1**				**4.1**	**4.1**	**4.1**			
		Southwest	3	4.2	4.0	4.0	4.0				4.0	4.0	4.0			
			4	4.0	3.9	3.9	3.9				3.9	3.9	3.9			
			5	3.8	3.7	3.8	3.8				3.7	3.7	3.7			
			1	3.8	3.8	3.8	3.8				3.8	3.8	3.8			
			2	4.0	3.8	3.8	3.8				3.8	3.8	3.8			
		Northwest	3	4.3	4.0	4.0	4.0				4.0	4.0	4.0			
			4	**4.3**	**4.0**	**4.0**	**4.0**				**4.0**	**4.0**	**4.0**			
			5	4.2	3.9	4.0	4.0				3.9	4.0	4.0			

1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016						2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Dean Street		Route 44 at Longmeadow Road													
			1	4.1	3.7			3.7	3.7		3.7			3.7	3.7	
			2	4.2	3.9			3.9	3.9		3.9			3.9	3.9	
		Northeast	3	5.2	4.6			4.5	4.5		4.6			4.5	4.5	
			4	5.1	4.6			4.5	4.5		4.6			4.5	4.5	
			5	**5.2**	**4.6**			**4.7**	**4.7**		**4.6**			**4.6**	**4.6**	
			1	4.7	4.3			4.3	4.3		4.3			4.3	4.3	
			2	4.5	4.1			4.2	4.2		4.1			4.2	4.2	
		Southeast	3	**4.7**	**4.3**			**4.4**	**4.4**		**4.3**			**4.4**	**4.4**	
			4	4.4	4.1			4.0	4.0		4.1			4.0	4.0	
			5	4.4	4.0			4.0	4.0		4.0			4.0	4.0	
			1	4.3	4.0			4.0	4.0		4.0			4.0	4.0	
			2	4.4	4.1			4.1	4.1		4.1			4.1	4.1	
		Southwest	3	**5.4**	**4.7**			**4.8**	**4.8**		**4.7**			**4.8**	**4.8**	
			4	5.2	4.5			4.7	4.7		4.5			4.7	4.7	
			5	5.2	4.6			4.6	4.6		4.6			4.6	4.6	
			1	4.7	4.3			4.4	4.4		4.3			4.4	4.4	
			2	4.8	4.2			4.4	4.4		4.2			4.4	4.4	
		Northwest	3	**5.1**	**4.5**			**4.6**	**4.6**		**4.5**			**4.6**	**4.6**	
			4	4.4	4.0			3.9	3.9		4.1			3.9	3.9	
			5	4.1	3.9			3.9	3.9		3.9			3.9	3.9	
Taunton	Taunton Depot		Route 140 at the Route 24 Northbound Ramps without Slip Ramp													
			1	3.6	3.5	3.5	3.5				3.5	3.5	3.5			
			2	3.9	3.7	3.7	3.7				3.7	3.7	3.7			
		Northeast	3	5.0	4.6	4.8	4.8				4.6	4.8	4.8			
			4	5.0	4.7	4.7	4.6				4.7	4.7	4.7			
			5	**5.1**	**4.7**	**4.8**	**4.7**				**4.7**	**4.8**	**4.8**			
			1	5.2	4.7	4.7	4.7				4.7	4.7	4.7			
			2	5.1	4.7	4.8	4.7				4.7	4.7	4.7			
		South	3	**5.3**	**4.8**	**4.9**	**4.9**				**4.8**	**4.9**	**4.9**			
			4	5.2	4.8	4.8	4.7				4.8	4.8	4.8			
			5	5.1	4.7	4.7	4.6				4.7	4.7	4.7			
			1	5.2	4.8	4.7	4.6				4.8	4.6	4.6			
			2	5.2	4.8	4.6	4.5				4.8	4.6	4.6			
		Northwest	3	**5.2**	**4.9**	**4.7**	**4.6**				**4.9**	**4.7**	**4.7**			
			4	4.0	3.8	3.8	3.8				3.8	3.8	3.8			
			5	3.7	3.6	3.6	3.6				3.6	3.6	3.6			

1 Hour CO Results

Background 3.0

Town	Station	Quadrant	Intersection/Receptors	2008	2016						2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	**Taunton Depot**		**Washington Street at Tremont Street**													
			1	4.3	4.0	4.1	4.1				4.0	4.1	4.1			
			2	4.4	4.0	4.2	4.2				4.0	4.2	4.2			
		Northeast	3	4.4	4.0	4.0	4.0				4.0	4.0	4.0			
			4	4.8	4.2	4.2	4.2				4.2	4.2	4.2			
			5	**4.8**	**4.2**	**4.2**	**4.2**				**4.3**	**4.2**	**4.2**			
			1	4.4	4.0	4.1	4.1				4.0	4.1	4.1			
			2	4.3	4.0	3.9	3.9				4.0	3.9	3.9			
		Southeast	3	**4.5**	**4.2**	**4.2**	**4.2**				**4.2**	**4.2**	**4.2**			
			4	4.1	3.9	4.0	4.0				3.8	4.0	4.0			
			5	4.0	3.7	3.7	3.7				3.7	3.7	3.7			
			1	3.9	3.7	3.7	3.7				3.7	3.7	3.7			
			2	4.1	3.8	3.7	3.7				3.8	3.7	3.7			
		Southwest	3	**4.4**	**4.0**	**4.0**	**4.0**				**3.9**	**4.0**	**4.0**			
			4	4.1	3.8	3.8	3.8				3.8	3.8	3.8			
			5	4.0	3.7	3.9	3.9				3.8	4.0	4.0			
			1	3.9	3.7	3.8	3.8				3.7	3.8	3.8			
			2	4.1	3.8	3.8	3.8				3.8	3.8	3.8			
		Northwest	3	4.5	4.1	4.1	4.1				4.1	4.1	4.1			
			4	**4.9**	**4.4**	**4.3**	**4.3**				**4.4**	**4.3**	**4.3**			
			5	4.5	4.0	4.2	4.2				4.0	4.2	4.2			
New Bedford	**Whale's Tooth**		**Union Street at McCarthur at Route 18 at State Pier**													
			1	4.3	3.9	3.9	3.9				4.3	4.3	4.3			
			2	4.4	**4.0**	**4.0**	**4.0**				**4.3**	**4.3**	**4.3**			
		Northeast	3	**4.5**	3.9	4.1	4.1				4.2	4.3	4.3			
			4	3.8	3.7	3.7	3.7				3.9	3.9	3.9			
			5	3.6	3.4	3.5	3.5				3.6	3.6	3.6			
			1	3.7	3.4	3.5	3.5				3.6	3.6	3.6			
			2	3.9	3.6	3.7	3.7				3.9	3.9	3.9			
		Southeast	3	4.3	4.0	4.0	4.0				4.3	4.4	4.4			
			4	4.5	4.1	4.0	4.0				4.4	4.4	4.4			
			5	**4.5**	**4.2**	**4.1**	**4.1**				**4.5**	**4.6**	**4.6**			
			1	4.2	3.7	3.8	3.8				4.1	4.2	4.2			
			2	4.2	3.9	4.0	4.0				4.2	4.3	4.3			
		Southwest	3	**4.7**	**4.2**	**4.2**	**4.2**				**4.7**	**4.7**	**4.7**			
			4	4.3	3.9	3.9	3.9				4.2	4.4	4.4			
			5	4.0	3.7	3.7	3.7				4.1	4.1	4.1			
			1	4.9	4.4	4.0	4.0				4.7	4.3	4.3			
			2	4.0	3.7	3.8	3.8				4.0	4.1	4.1			
		Northwest	3	**4.9**	**4.4**	**4.5**	**4.5**				**4.8**	**4.8**	**4.8**			
			4	4.7	4.2	4.2	4.2				4.6	4.6	4.6			
			5	4.7	4.1	4.2	4.2				4.5	4.5	4.5			

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Norton	**Barrowsville**		**North Worcester Street at Route 123/Main Street**													
			1	2.5	2.4	2.5	2.5				2.4	2.5	2.5			
			2	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
		Northeast	3	**2.7**	**2.6**	**2.9**	**2.9**				**2.6**	**2.9**	**2.9**			
			4	2.6	2.5	2.7	2.7				2.5	2.7	2.7			
			5	2.5	2.5	2.5	2.5				2.5	2.5	2.5			
			1	2.5	2.4	2.5	2.5				2.4	2.5	2.5			
			2	2.6	2.5	2.6	2.6				2.5	2.6	2.6			
		Southeast	3	**2.7**	**2.7**	**2.7**	**2.7**				**2.7**	**2.7**	**2.7**			
			4	2.7	2.5	2.7	2.7				2.5	2.6	2.6			
			5	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
			1	2.5	2.5	2.6	2.6				2.4	2.5	2.5			
			2	2.5	2.5	2.6	2.6				2.5	2.6	2.6			
		Southwest	3	**2.7**	**2.5**	**2.6**	**2.6**				**2.5**	**2.6**	**2.6**			
			4	2.7	2.5	2.5	2.5				2.5	2.5	2.5			
			5	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
			1	2.5	2.5	2.5	2.5				2.5	2.5	2.5			
			2	2.6	2.5	2.6	2.6				2.5	**2.6**	**2.6**			
		Northwest	3	2.6	**2.5**	**2.6**	**2.6**				**2.5**	2.5	2.5			
			4	**2.7**	2.5	2.5	2.5				2.5	2.5	2.5			
			5	2.5	2.4	2.5	2.5				2.4	2.5	2.5			
	East Taunton		**Route 140 at the Route 24 Southbound Ramps**													
East Taunton	**North**															
			1	3.2	2.9			2.9	2.9		2.9			2.9	2.9	
			2	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
		East	3	**3.2**	**2.9**			**2.9**	**2.9**		**2.9**			**2.9**	**2.9**	
			4	3.2	2.9			2.9	2.9		2.9			2.9	2.9	
			5	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
			1	3.1	2.9			2.9	2.9		2.8			2.9	2.9	
			2	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
		Southwest	3	**3.4**	**3.0**			**3.1**	**3.1**		**3.0**			**3.1**	**3.1**	
			4	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
			5	2.9	2.7			2.7	2.7		2.7			2.7	2.7	
			1	2.9	2.7			2.7	2.7		2.7			2.7	2.7	
			2	2.9	2.8			2.8	2.8		2.8			2.8	2.8	
		Northwest	3	**3.4**	**3.0**			**3.2**	**3.2**		**3.0**			**3.2**	**3.2**	
			4	3.3	3.0			3.1	3.1		2.9			3.0	3.0	
			5	3.2	2.9			2.9	2.9		2.9			2.9	2.9	

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Easton	**Easton Village**		**Route 138 at Main Street**													
			1	3.3	3.1			3.0	3.0		3.1			3.0	3.0	
			2	**3.4**	**3.2**			**3.2**	**3.2**		**3.2**			**3.2**	**3.2**	
		Northeast	3	3.4	3.2			3.1	3.1		3.2			3.1	3.1	
			4	3.3	3.1			3.0	3.0		3.1			3.0	3.0	
			5	2.9	2.7			2.7	2.7		2.7			2.7	2.7	
			1	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
			2	3.2	3.0			3.1	3.1		3.0			3.2	3.2	
		Southeast	3	3.3	3.2			3.1	3.1		3.2			3.1	3.1	
			4	**3.6**	**3.2**			**3.2**	**3.2**		3.2			**3.2**	**3.2**	
			5	3.3	3.2			3.1	3.1		**3.3**			3.1	3.1	
			1	3.3	3.2			3.2	3.2		3.2			3.2	3.2	
			2	3.3	3.1			3.1	3.1		3.1			3.1	3.1	
		Southwest	3	3.4	**3.3**			3.2	3.2		**3.3**			3.2	3.2	
			4	**3.5**	3.2			**3.3**	**3.3**		3.2			**3.3**	**3.3**	
			5	3.2	2.9			3.0	3.0		2.9			2.9	2.9	
			1	3.3	3.0			2.9	2.9		3.0			2.9	2.9	
			2	3.5	3.2			3.2	3.2		3.2			3.2	3.2	
		Northwest	3	3.4	3.2			3.1	3.1		3.2			3.1	3.1	
			4	3.5	3.1			3.2	3.2		3.1			3.2	3.2	
			5	**3.6**	**3.2**			**3.2**	**3.2**		**3.2**			**3.2**	**3.2**	
Fall River	**Fall River Depot**		**North Davol Street at President Avenue**													
			1	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
			2	2.7	2.5	2.7	2.7				2.5	2.7	2.7			
		Northeast	3	3.2	2.9	2.7	2.7				2.9	2.7	2.7			
			4	**3.2**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			5	3.2	2.9	2.8	2.8				2.9	2.7	2.7			
			1	2.9	2.8	2.8	2.8				2.8	2.7	2.7			
			2	3.0	2.8	2.7	2.7				2.8	2.7	2.7			
		Southeast	3	3.1	2.9	2.9	2.9				2.9	2.9	2.9			
			4	**3.2**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			5	2.8	2.7	2.8	2.8				2.7	2.8	2.8			
			1	2.8	2.7	2.7	2.7				2.7	2.7	2.7			
			2	3.2	2.9	2.9	2.9				2.9	2.9	2.9			
		Southwest	3	**3.3**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			4	2.9	2.8	2.7	2.7				2.8	2.7	2.7			
			5	3.0	2.8	2.7	2.7				2.8	2.7	2.7			
			1	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			2	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
		Northwest	3	**3.2**	**2.8**	**2.9**	**2.9**				**2.8**	**2.8**	**2.8**			
			4	2.7	2.6	2.6	2.6				2.6	2.6	2.6			
			5	2.7	2.5	2.5	2.5				2.5	2.5	2.5			

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Fall River	**Fall River Depot**		**South Davol Street at President Avenue**													
			1	2.8	2.6	2.6	2.6				2.6	2.6	2.6			
			2	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
		Northeast	3	**2.9**	**2.7**	**2.8**	**2.9**				**2.7**	**2.8**	**2.8**			
			4	2.8	2.6	2.7	2.7				2.6	2.7	2.7			
			5	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			1	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			2	3.0	2.7	2.7	2.7				2.7	2.7	2.7			
		Southeast	3	**3.0**	**2.8**	**2.8**	**2.8**				**2.8**	**2.8**	**2.8**			
			4	2.7	2.7	2.7	2.7				2.7	2.7	2.7			
			5	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
			1	2.7	2.6	2.6	2.6				2.6	2.6	2.6			
			2	2.7	2.7	2.7	2.7				2.7	2.7	2.7			
		Southwest	3	**3.1**	**2.7**	**2.7**	**2.7**				**2.7**	**2.7**	**2.7**			
			4	2.6	2.6	2.5	2.5				2.6	2.5	2.5			
			5	2.5	2.4	2.3	2.3				2.4	2.3	2.3			
			1	2.5	2.5	2.4	2.4				2.5	2.4	2.4			
			2	2.7	2.6	2.5	2.5				2.6	2.5	2.5			
		Northwest	3	3.2	2.9	2.9	2.9				2.9	2.8	2.8			
			4	**3.2**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			5	3.1	2.8	2.8	2.8				2.8	2.8	2.8			
Freetown	**Freetown**		**South Main Street at Route 24 Northbound Ramps**													
			1	2.4	2.8			2.8	2.8		2.7			2.7	2.7	
			2	2.5	2.7			2.7	2.7		2.7			2.7	2.7	
		North	3	2.5	2.7			2.7	2.7		2.7			2.7	2.7	
			4	**2.5**	**2.9**			**2.9**	**2.9**		**2.9**			**2.9**	**2.9**	
			5	2.5	2.8			2.8	2.8		2.8			2.8	2.8	
			1	2.5	2.7			2.7	2.7		2.7			2.7	2.7	
			2	2.4	2.8			2.8	2.8		2.7			2.7	2.7	
		Southeast	3	**2.5**	**2.8**			**2.8**	**2.8**		**2.8**			**2.8**	**2.8**	
			4	2.4	2.6			2.6	2.6		2.6			2.6	2.6	
			5	2.3	2.4			2.4	2.4		2.4			2.4	2.4	
			1	2.2	2.4			2.4	2.4		2.4			2.4	2.4	
			2	2.3	2.5			2.5	2.5		2.5			2.5	2.5	
		Southwest	3	**2.4**	**2.8**			**2.9**	**2.9**		**2.8**			**2.8**	**2.8**	
			4	2.4	2.6			2.6	2.6		2.6			2.6	2.6	
			5	2.4	2.6			2.6	2.6		2.6			2.6	2.6	

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
New Bedford	King's Highway		Church Strret at Tarkiln Road													
			1	2.5	2.5	2.5	2.5				2.5	2.5	2.5			
			2	2.7	2.5	2.5	2.6				2.5	2.7	2.6			
		Northeast	3	2.8	2.7	2.7	2.7				2.7	**2.9**	2.7			
			4	**2.8**	**2.7**	**2.7**	**2.8**				**2.7**	2.7	**2.8**			
			5	2.7	2.5	2.5	2.7				2.5	2.7	2.7			
			1	2.7	2.5	2.5	2.6				2.5	2.6	2.7			
			2	2.7	2.5	2.5	2.6				2.5	2.7	2.6			
		Southeast	3	**2.9**	**2.7**	**2.6**	**2.7**				**2.7**	**2.8**	**2.7**			
			4	2.9	2.7	2.5	2.7				2.7	2.7	2.7			
			5	2.5	2.5	2.5	2.6				2.5	2.5	2.6			
			1	2.6	2.5	2.5	2.5				2.5	2.5	2.5			
			2	2.7	2.5	2.5	2.5				2.5	2.7	2.5			
		Southwest	3	2.9	2.7	2.6	2.7				2.7	2.8	2.7			
			4	**2.9**	**2.7**	**2.7**	**2.8**				**2.7**	**2.8**	**2.8**			
			5	2.7	2.6	2.5	2.7				2.6	2.7	2.7			
			1	2.7	2.6	2.5	2.7				2.6	2.7	2.7			
			2	2.7	2.6	2.6	2.6				2.6	2.7	2.6			
		Northwest	3	2.8	**2.7**	**2.7**	**2.7**				**2.7**	**2.8**	**2.7**			
			4	**2.9**	2.6	2.5	2.7				2.6	2.7	2.7			
			5	2.5	2.5	2.5	2.5				2.5	2.6	2.5			
Raynham	Raynham Park		Route 138 at Found Street/Route 106			Whittenton Electric	Whittenton Diesel					Whittenton Electric	Whittenton Diesel			
			1	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			2	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
		Northeast	3	3.1	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			4	**3.2**	2.8	2.9	2.9				2.8	2.9	2.9			
			5	2.9	2.8	2.8	2.8				2.8	2.8	2.8			
			1	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			2	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
		Southeast	3	**3.0**	**2.8**	**2.8**	**2.8**				**2.8**	**2.8**	**2.8**			
			4	3.0	2.8	2.8	2.8				2.8	2.8	2.8			
			5	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			1	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			2	**3.0**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
		Southwest	3	2.9	2.8	2.8	2.8				2.8	2.8	2.8			
			4	2.8	2.7	2.7	2.7				2.7	2.7	2.7			
			5	2.7	2.6	2.7	2.7				2.6	2.6	2.6			
			1	2.7	2.7	2.7	2.7				2.7	2.7	2.7			
			2	2.8	2.7	2.7	2.7				2.7	2.7	2.7			
		Northwest	3	3.0	2.8	2.8	2.8				2.8	2.8	2.8			
			4	**3.0**	**2.8**	**2.8**	**2.8**				**2.8**	**2.8**	**2.8**			
			5	2.9	2.7	2.8	2.8				2.7	2.8	2.8			

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Dean Street		Route 44 at Longmeadow Road													
		Northeast	1	2.9	2.6			2.6	2.6		2.6			2.6	2.6	
			2	2.9	2.7			2.7	2.7		2.7			2.7	2.7	
			3	3.6	3.2			3.2	3.2		3.2			3.2	3.2	
			4	3.6	3.2			3.2	3.2		3.2			3.2	3.2	
			5	**3.6**	**3.2**			**3.3**	**3.3**		**3.2**			**3.2**	**3.2**	
		Southeast	1	3.3	3.0			3.0	3.0		3.0			3.0	3.0	
			2	3.2	2.9			2.9	2.9		2.9			2.9	2.9	
			3	**3.3**	**3.0**			**3.1**	**3.1**		**3.0**			**3.1**	**3.1**	
			4	3.1	2.9			2.8	2.8		2.9			2.8	2.8	
			5	3.1	2.8			2.8	2.8		2.8			2.8	2.8	
		Southwest	1	3.0	2.8			2.8	2.8		2.8			2.8	2.8	
			2	3.1	2.9			2.9	2.9		2.9			2.9	2.9	
			3	**3.8**	**3.3**			**3.4**	**3.4**		**3.3**			**3.4**	**3.4**	
			4	3.6	3.2			3.3	3.3		3.2			3.3	3.3	
			5	3.6	3.2			3.2	3.2		3.2			3.2	3.2	
		Northwest	1	3.3	3.0			3.1	3.1		3.0			3.1	3.1	
			2	3.4	2.9			3.1	3.1		2.9			3.1	3.1	
			3	**3.6**	**3.2**			**3.2**	**3.2**		**3.2**			**3.2**	**3.2**	
			4	3.1	2.8			2.7	2.7		2.9			2.7	2.7	
			5	2.9	2.7			2.7	2.7		2.7			2.7	2.7	
Taunton	Taunton Depot		Route 140 at the Route 24 Northbound Ramps without Slip Ramp													
		Northeast	1	2.5	2.5	2.5	2.5				2.5	2.5	2.5			
			2	2.7	2.6	2.6	2.6				2.6	2.6	2.6			
			3	3.5	3.2	3.4	3.4				3.2	3.4	3.4			
			4	3.5	3.3	3.3	3.2				3.3	3.3	3.3			
			5	**3.6**	**3.3**	**3.4**	**3.3**				**3.3**	**3.4**	**3.4**			
		South	1	3.6	3.3	3.3	3.3				3.3	3.3	3.3			
			2	3.6	3.3	3.4	3.3				3.3	3.3	3.3			
			3	**3.7**	**3.4**	**3.4**	**3.4**				**3.4**	**3.4**	**3.4**			
			4	3.6	3.4	3.4	3.3				3.4	3.4	3.4			
			5	3.6	3.3	3.3	3.2				3.3	3.3	3.3			
		Northwest	1	3.6	3.4	3.3	3.2				3.4	3.2	3.2			
			2	3.6	3.4	3.2	3.2				3.4	3.2	3.2			
			3	**3.6**	**3.4**	**3.3**	**3.2**				**3.4**	**3.3**	**3.3**			
			4	2.8	2.7	2.7	2.7				2.7	2.7	2.7			
			5	2.6	2.5	2.5	2.5				2.5	2.5	2.5			

8 Hour CO Results

Factor 0.7 **Background** 2.1

Town	Station	Quadrant	Intersection/Receptors	2008	2016					2030					
				Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	**Taunton Depot**		**Washington Street at Tremont Street**													
			1	3.0	2.8	2.9	2.9				2.8	2.9	2.9			
			2	3.1	2.8	2.9	2.9				2.8	2.9	2.9			
		Northeast	3	3.1	2.8	2.8	2.8				2.8	2.8	2.8			
			4	3.4	2.9	2.9	2.9				2.9	2.9	2.9			
			5	**3.4**	**2.9**	**2.9**	**2.9**				**3.0**	**2.9**	**2.9**			
			1	3.1	2.8	2.9	2.9				2.8	2.9	2.9			
			2	3.0	2.8	2.7	2.7				2.8	2.7	2.7			
		Southeast	3	**3.2**	**2.9**	**2.9**	**2.9**				**2.9**	**2.9**	**2.9**			
			4	2.9	2.7	2.8	2.8				2.7	2.8	2.8			
			5	2.8	2.6	2.6	2.6				2.6	2.6	2.6			
			1	2.7	2.6	2.6	2.6				2.6	2.6	2.6			
			2	2.9	2.7	2.6	2.6				2.7	2.6	2.6			
		Southwest	3	**3.1**	**2.8**	**2.8**	**2.8**				**2.7**	**2.8**	**2.8**			
			4	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
			5	2.8	2.6	2.7	2.7				2.7	2.8	2.8			
			1	2.7	2.6	2.7	2.7				2.6	2.7	2.7			
			2	2.9	2.7	2.7	2.7				2.7	2.7	2.7			
		Northwest	3	3.2	2.9	2.9	2.9				2.9	2.9	2.9			
			4	**3.4**	**3.1**	**3.0**	**3.0**				**3.1**	**3.0**	**3.0**			
			5	3.2	2.8	2.9	2.9				2.8	2.9	2.9			
New Bedford	**Whale's Tooth**		**Union Street at McCarthur at Route 18 at State Pier**													
			1	3.0	2.7	2.7	2.7				3.0	3.0	3.0			
			2	3.1	**2.8**	**2.8**	**2.8**				**3.0**	**3.0**	**3.0**			
		Northeast	3	**3.2**	2.7	2.9	2.9				2.9	3.0	3.0			
			4	2.7	2.6	2.6	2.6				2.7	2.7	2.7			
			5	2.5	2.4	2.5	2.5				2.5	2.5	2.5			
			1	2.6	2.4	2.5	2.5				2.5	2.5	2.5			
			2	2.7	2.5	2.6	2.6				2.7	2.7	2.7			
		Southeast	3	3.0	2.8	2.8	2.8				3.0	3.1	3.1			
			4	3.2	2.9	2.8	2.8				3.1	3.1	3.1			
			5	**3.2**	**2.9**	**2.9**	**2.9**				**3.2**	**3.2**	**3.2**			
			1	2.9	2.6	2.7	2.7				2.9	2.9	2.9			
			2	2.9	2.7	2.8	2.8				2.9	3.0	3.0			
		Southwest	3	**3.3**	**2.9**	**2.9**	**2.9**				**3.3**	**3.3**	**3.3**			
			4	3.0	2.7	2.7	2.7				2.9	3.1	3.1			
			5	2.8	2.6	2.6	2.6				2.9	2.9	2.9			
			1	3.4	3.1	2.8	2.8				3.3	3.0	3.0			
			2	2.8	2.6	2.7	2.7				2.8	2.9	2.9			
		Northwest	3	**3.4**	**3.1**	**3.2**	**3.2**				**3.4**	**3.4**	**3.4**			
			4	3.3	2.9	2.9	2.9				3.2	3.2	3.2			
			5	3.3	2.9	2.9	2.9				3.2	3.2	3.2			

Hot Spot: Microscale (Local) Analysis

Microscale Results

- Particulate Matter 10 (PM_{10})

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24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Norton	Barrowsville			North Worcester Street at Route 123/Main Street													
		Northeast		1	46.5	46.1	46.5	46.5				46.1	46.1	46.1			
				2	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
				3	46.9	46.5	46.9	46.9				46.5	46.9	46.9			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Southeast		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
		Southwest		1	46.5	46.5	46.5	46.5				46.1	46.5	46.5			
				2	46.5	46.5	46.5	46.5				46.1	46.5	46.5			
				3	46.9	46.5	46.9	46.9				46.5	46.5	46.5			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Northwest		1	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				4	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.5	46.1	46.1	46.1				46.1	46.1	46.1			
East Taunton	East Taunton North			Route 140 at the Route 24 Southbound Ramps													
		East		1	47.7	47.3			47.3	47.3		47.3			47.3	49.3	
				2	47.7	47.3			47.3	47.3		46.9			47.3	48.9	
				3	48.1	47.3			47.3	47.3		47.3			47.3	49.3	
				4	48.1	47.3			47.3	47.3		47.3			47.3	49.3	
				5	48.1	47.3			47.3	47.3		47.3			47.3	49.3	
		Southwest		1	47.7	47.3			47.3	47.3		47.3			47.3	49.3	
				2	48.1	47.3			47.3	47.3		47.3			47.3	49.3	
				3	48.5	47.3			47.7	47.7		47.3			47.3	49.3	
				4	47.7	47.3			47.3	47.3		46.9			46.9	48.9	
				5	47.3	46.9			46.9	46.9		46.9			46.9	48.9	
		Northwest		1	47.7	46.9			46.9	46.9		46.9			46.9	48.9	
				2	47.7	47.3			47.3	47.3		46.9			46.9	48.9	
				3	48.5	47.7			47.7	47.7		47.3			47.3	49.7	
				4	48.1	47.3			47.3	47.3		47.3			47.3	49.3	
				5	48.1	47.3			47.3	47.3		47.3			47.3	49.3	

24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Easton	**Easton Village**			**Route 138 at Main Street**													
				1	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
				2	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
		Northeast		3	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
				4	47.7	47.3			46.9	46.9		46.9			46.9	46.9	
				5	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
				1	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
				2	47.3	47.3			47.3	47.3		46.9			47.3	47.3	
		Southeast		3	48.1	47.7			47.7	47.7		47.3			47.3	47.3	
				4	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
				5	47.7	47.7			47.3	47.3		47.3			47.3	47.3	
				1	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
				2	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
		Southwest		3	48.1	47.7			47.7	47.7		47.3			47.3	47.3	
				4	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
				5	47.7	47.3			47.3	47.3		46.9			46.9	46.9	
				1	47.7	47.3			46.9	46.9		46.9			46.9	46.9	
				2	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
		Northwest		3	48.1	47.7			47.7	47.7		47.3			47.3	47.3	
				4	47.7	47.3			47.3	47.3		47.3			47.3	47.3	
				5	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
Fall River	**Fall River Depot**			**North Davol Street at President Avenue**													
				1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Northeast		3	47.3	46.9	46.9	46.9				46.9	46.9	**46.9**			
				4	47.3	46.9	46.9	**46.9**				46.9	46.9	46.9			
				5	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				1	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				2	47.3	46.9	46.9	**46.9**				46.5	46.9	**46.9**			
		Southeast		3	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				5	46.9	46.5	46.9	46.9				46.5	46.5	46.5			
				1	46.9	46.5	46.9	46.9				46.5	46.5	46.5			
				2	47.3	46.9	46.9	46.9				46.9	46.9	**46.9**			
		Southwest		3	47.7	47.3	46.9	**46.9**				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				5	47.3	46.9	46.5	46.5				46.5	46.5	46.5			
				1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	47.3	46.9	46.5	46.5				46.5	46.5	46.5			
		Northwest		3	47.7	47.3	46.9	**46.9**				46.9	46.9	**46.9**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			

24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Fall River	Fall River Depot			**South Davol Street at President Avenue**													
		Northeast		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.5	46.5	**46.5**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
		Southeast		1	47.3	46.9	46.9	46.9				46.9	46.5	46.5			
				2	47.3	46.9	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.9	46.9	**46.9**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
		Southwest		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.9	46.9	**46.9**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.5	46.5	46.1	46.1				46.5	46.1	46.1			
		Northwest		1	46.5	46.5	46.5	46.5				46.1	46.1	46.1			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.7	47.3	47.3	**47.3**				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.9	46.9	**46.9**			
				5	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
Freetown	Freetown			**South Main Street at Route 24 Northbound Ramps**													
		North		1	46.5	46.9			46.9	46.9		46.9			46.9	46.9	
				2	46.5	46.9			46.9	46.9		46.9			46.9	46.9	
				3	46.5	46.9			46.9	46.9		46.9			46.9	**46.9**	
				4	46.5	47.3			47.3	**47.3**		46.9			46.9	46.9	
				5	46.5	47.3			47.3	47.3		46.9			46.9	46.9	
		Southeast		1	46.5	46.9			46.9	46.9		46.9			46.9	46.9	
				2	46.5	46.9			46.9	46.9		46.9			46.9	46.9	
				3	46.5	47.3			47.3	**47.3**		46.9			46.9	**46.9**	
				4	46.1	46.5			46.5	46.5		46.5			46.5	46.5	
				5	46.1	46.5			46.5	46.5		46.5			46.5	46.5	
		Southwest		1	46.1	46.5			46.5	46.5		46.1			46.1	46.1	
				2	46.1	46.5			46.5	46.5		46.5			46.5	46.5	
				3	46.5	46.9			46.9	**46.9**		46.9			46.9	**46.9**	
				4	46.5	46.9			46.9	46.9		46.9			46.9	46.9	
				5	46.5	46.5			46.5	46.5		46.5			46.5	46.5	

24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
New Bedford	King's Highway			**Church Strret at Tarkiln Road**													
		Northeast		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.5	46.9	**46.9**			
				4	47.3	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Southeast		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.5	46.5	46.5			
				4	46.9	46.5	46.5	46.5				46.5	46.5	**46.5**			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Southwest		1	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.9	46.9	**46.9**				46.9	46.9	**46.9**			
				4	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Northwest		1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				3	47.3	46.5	46.9	**46.9**				46.5	46.5	**46.5**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
Raynham	Raynham Park			**Route 138 at Found Street/Route 106**													
							Whittenton Electric	**Whittenton Diesel**					**Whittenton Electric**	**Whittenton Diesel**			
		Northeast		1	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				2	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				3	48.1	47.3	47.3	47.3				47.3	47.3	47.3			
				4	47.7	46.9	47.3	47.3				46.9	46.9	46.9			
				5	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
		Southeast		1	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				2	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				3	47.7	47.3	47.3	47.3				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				5	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
		Southwest		1	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				2	47.7	46.9	46.9	46.9				46.9	46.9	46.9			
				3	47.7	47.3	47.3	47.3				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Northwest		1	46.9	46.9	46.9	46.9				46.5	46.5	46.5			
				2	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				3	47.7	47.3	47.3	47.3				46.9	46.9	46.9			
				4	47.7	46.9	46.9	46.9				46.9	46.9	46.9			
				5	47.3	46.9	46.9	46.9				46.9	46.9	46.9			

24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Dean Street			Route 44 at Longmeadow Road													
		Northeast		1	47.3	46.9			46.5	46.5		46.5			46.5	46.5	
				2	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
				3	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
				4	48.1	47.3			47.7	47.7		47.3			47.3	47.3	
				5	48.5	47.3			47.7	47.7		47.3			47.3	47.3	
		Southeast		1	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
				2	48.1	47.3			47.3	47.3		46.9			47.3	47.3	
				3	48.1	47.3			47.7	47.7		47.3			47.3	47.3	
				4	47.7	46.9			46.9	46.9		46.9			46.9	46.9	
				5	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
		Southwest		1	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
				2	47.7	47.3			46.9	46.9		46.9			46.9	46.9	
				3	49.3	48.1			48.1	48.1		47.7			47.7	47.7	
				4	48.9	47.7			47.7	47.7		47.3			47.7	47.7	
				5	48.5	47.7			47.7	47.7		47.3			47.3	47.3	
		Northwest		1	48.1	47.3			47.3	47.3		47.3			47.3	47.3	
				2	48.1	47.3			47.7	47.7		47.3			47.3	47.3	
				3	48.9	47.7			47.7	47.7		47.7			47.7	47.7	
				4	47.3	46.9			46.9	46.9		46.9			46.9	46.9	
				5	47.3	46.9			46.9	46.9		46.5			46.5	46.5	
Taunton	Taunton Depot			Route 140 at the Route 24 Northbound Ramps without Slip Ramp													
		Northeast		1	46.5	46.5	46.5	46.5				46.5	46.5	46.5			
				2	47.3	46.9	46.9	46.5				46.9	46.5	46.5			
				3	48.9	48.1	48.5	48.1				48.1	48.1	48.1			
				4	48.9	48.1	48.1	48.1				48.1	48.1	48.1			
				5	48.9	48.1	48.1	48.1				48.1	48.1	48.1			
		South		1	48.9	48.1	48.5	48.1				48.1	48.1	48.1			
				2	48.9	48.1	48.1	48.1				48.1	48.1	48.1			
				3	49.3	48.5	48.5	48.5				48.5	48.1	48.1			
				4	49.3	48.1	48.1	48.1				49.3	48.1	48.1			
				5	49.3	48.5	48.1	48.1				48.9	48.1	48.1			
		Northwest		1	49.3	48.5	48.1	48.1				48.1	48.1	48.1			
				2	49.3	48.5	48.1	48.1				48.1	48.1	48.1			
				3	49.3	48.5	48.1	48.1				48.1	48.1	48.1			
				4	47.3	46.9	46.9	46.9				46.9	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			

24 Hour PM10 Results

Factor 0.4 **Background** 45.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	**Taunton Depot**			**Washington Street at Tremont Street**													
				1	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				2	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
		Northeast		3	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				4	47.7	47.3	47.3	47.3				46.9	46.9	46.9			
				5	47.7	47.3	46.9	46.9				46.9	46.9	46.9			
				1	47.7	46.9	46.9	46.9				46.9	46.9	46.9			
				2	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
		Southeast		3	47.7	47.3	47.3	47.3				46.9	47.3	47.3			
				4	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				5	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Southwest		3	47.7	46.9	46.9	46.9				46.9	46.9	46.9			
				4	47.3	46.9	46.9	46.9				46.5	46.5	46.5			
				5	47.3	46.5	46.5	46.5				46.5	46.5	46.5			
				1	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				2	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
		Northwest		3	48.1	47.3	47.3	47.3				47.3	47.3	47.3			
				4	48.1	47.3	47.3	47.3				46.9	46.9	46.9			
				5	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
New Bedford	**Whale's Tooth**			**Union Street at McCarthur at Route 18 at State Pier**													
				1	47.3	46.9	47.3	47.3				46.9	46.9	46.9			
				2	47.3	46.9	46.9	**46.9**				46.9	46.9	46.9			
		Northeast		3	47.3	46.9	46.9	46.9				46.9	46.9	**46.9**			
				4	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
				5	46.5	46.5	46.5	46.5				46.1	46.1	46.1			
				1	46.5	46.5	46.5	46.5				46.1	46.1	46.1			
				2	46.9	46.5	46.5	46.5				46.5	46.5	46.5			
		Southeast		3	47.3	46.9	46.9	46.9				46.9	46.9	**46.9**			
				4	47.7	46.9	47.3	**47.3**				46.9	46.9	46.9			
				5	47.7	46.9	47.3	47.3				46.9	46.9	46.9			
				1	47.3	46.9	46.9	46.9				46.5	46.9	46.9			
				2	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
		Southwest		3	48.1	47.3	47.3	**47.3**				46.9	47.3	**47.3**			
				4	47.3	46.9	46.9	46.9				46.9	46.9	46.9			
				5	47.3	46.5	46.9	46.9				46.5	46.5	46.5			
				1	48.1	47.3	46.9	46.9				47.3	46.9	46.9			
				2	47.3	46.5	46.9	46.9				46.5	46.5	46.5			
		Northwest		3	48.1	47.3	47.3	**47.3**				47.3	47.3	**47.3**			
				4	47.7	47.3	47.3	47.3				46.9	46.9	46.9			
				5	47.7	46.9	47.3	47.3				46.9	46.9	46.9			

Hot Spot: Microscale (Local) Analysis

Microscale Results

- Particulate Matter 2.5 ($PM_{2.5}$)

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24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Norton	**Barrowsville**			**North Worcester Street at Route 123/Main Street**													
				1	30.1	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northeast		3	30.5	30.1	30.5	30.5				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southeast		3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				1	30.1	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southwest		3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northwest		3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.1	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.1	30.1	30.1	30.1				30.1	30.1	30.1			
East Taunton	**East Taunton North**			**Route 140 at the Route 24 Southbound Ramps**													
				1	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				2	31.3	30.5			**30.5**	30.5		30.5			**30.5**	30.5	
		East		3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				1	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				2	31.3	30.5			**30.5**	30.5		30.5			**30.5**	30.5	
		Southwest		3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	30.9	30.1			30.1	30.1		30.1			30.1	30.1	
				1	30.9	30.5			30.5	30.5		30.1			30.1	30.1	
				2	30.9	30.5			30.5	30.5		30.1			30.5	30.5	
		Northwest		3	31.3	30.5			**30.5**	30.5		30.5			**30.5**	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	31.3	30.5			30.5	30.5		30.5			30.5	30.5	

24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Easton	**Easton Village**			**Route 138 at Main Street**													
				1	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				2	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
		Northeast		3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				5	30.5	30.1			30.1	30.1		30.1			30.1	30.1	
				1	30.9	30.5			30.5	30.5		30.1			30.1	30.1	
				2	30.9	30.5			30.5	30.5		30.1			30.5	30.5	
		Southeast		3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				1	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				2	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
		Southwest		3	31.3	30.5			30.9	30.9		30.5			30.5	30.5	
				4	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				5	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				1	30.9	30.5			30.5	30.5		30.5			30.1	30.1	
				2	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
		Northwest		3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
Fall River	**Fall River Depot**			**North Davol Street at President Avenue**													
				1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northeast		3	30.9	30.5	**30.5**	30.5				30.1	**30.1**	30.1			
				4	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				1	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				2	30.9	30.1	30.5	30.5				30.1	30.1	30.1			
		Southeast		3	30.9	30.1	**30.5**	30.5				30.1	30.1	30.1			
				4	30.9	30.5	30.5	30.5				30.1	**30.1**	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.9	30.5	30.5	30.5				30.1	**30.1**	30.1			
		Southwest		3	30.9	30.5	**30.5**	30.5				30.5	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northwest		3	30.9	30.5	**30.5**	30.5				30.5	**30.1**	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			

24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Fall River	Fall River Depot			South Davol Street at President Avenue													
		Northeast		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southeast		1	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.1	30.5	30.5				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southwest		1	30.5	30.1	30.1	30.1				34.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.5	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.1	30.1	30.1	30.1				29.7	29.7	29.7			
		Northwest		1	30.1	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				4	30.9	30.5	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
Freetown	Freetown			South Main Street at Route 24 Northbound Ramps													
		North		1	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
				2	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				3	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				4	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				5	30.1	30.5			30.5	30.5		30.5			30.5	30.5	
		Southeast		1	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				2	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				3	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				4	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
				5	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
		Southwest		1	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
				2	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
				3	30.1	30.5			30.5	30.5		30.1			30.1	30.1	
				4	30.1	30.1			30.1	30.1		30.1			30.1	30.1	
				5	30.1	30.1			30.1	30.1		30.1			30.1	30.1	

24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
New Bedford	King's Highway			Church Strret at Tarkiln Road													
		Northeast		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southeast		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
Raynham	Raynham Park			Route 138 at Found Street/Route 106													
							Whittenton Electric	Whittenton Diesel					Whittenton Electric	Whittenton Diesel			
		Northeast		1	30.5	30.5	30.5	30.5				30.1	30.1	30.1			
				2	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				3	31.3	30.5	30.5	30.5				30.5	30.5	30.5			
				4	30.9	30.5	30.5	30.5				30.5	30.5	30.5			
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
		Southeast		1	30.9	30.1	30.5	30.5				30.1	30.1	30.1			
				2	30.5	30.5	30.5	30.5				30.1	30.1	30.1			
				3	30.9	30.5	30.5	30.5				30.5	30.5	30.5			
				4	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
		Southwest		1	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				2	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				3	30.9	30.5	30.5	30.5				30.5	30.5	30.5			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.5	30.5	30.5				30.5	30.5	30.5			
				4	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1			

24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	**Dean Street**			**Route 44 at Longmeadow Road**													
		Northeast		1	30.5	30.1			30.1	30.1		30.1			30.1	30.1	
				2	30.9	30.1			30.5	30.5		30.1			30.1	30.1	
				3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				5	31.3	30.9			30.5	30.5		30.5			30.5	30.5	
		Southeast		1	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				2	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				3	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				4	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				5	30.9	30.5			30.5	30.5		30.1			30.1	30.1	
		Southwest		1	30.9	30.5			30.5	30.5		30.1			30.1	30.1	
				2	30.9	30.5			30.5	30.5		30.5			30.5	30.5	
				3	31.7	30.9			30.9	30.9		30.5			30.5	30.5	
				4	31.7	30.5			30.9	30.9		30.5			30.5	30.5	
				5	31.7	30.5			30.9	30.9		30.5			30.5	30.5	
		Northwest		1	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				2	31.3	30.5			30.5	30.5		30.5			30.5	30.5	
				3	31.7	30.9			30.9	30.9		30.5			30.5	30.5	
				4	30.9	30.5			30.5	30.5		30.1			30.1	30.1	
				5	30.5	30.1			30.5	30.5		30.1			30.1	30.1	
Taunton	**Taunton Depot**			**Route 140 at the Route 24 Northbound Ramps without Slip Ramp**													
		Northeast		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.5	30.1	30.1			
				3	31.7	30.9	**30.9**	30.9				30.9	**30.9**	30.9			
				4	31.7	30.9	30.9	30.9				30.9	30.9	30.9			
				5	31.7	30.9	30.9	30.9				30.9	30.9	30.9			
		South		1	31.7	30.9	30.9	30.9				30.9	30.9	30.9			
				2	31.7	30.9	30.9	30.9				30.9	30.9	30.9			
				3	32.1	30.9	**31.3**	30.9				31.3	**30.9**	30.9			
				4	32.1	30.9	30.9	30.9				32.1	30.9	30.9			
				5	32.1	30.9	30.9	30.9				32.1	30.9	30.9			
		Northwest		1	32.1	30.9	30.9	30.9				30.9	30.9	30.9			
				2	32.1	30.9	**30.9**	30.9				30.9	**30.9**	30.9			
				3	32.1	30.9	30.9	30.9				30.9	30.9	30.9			
				4	30.5	30.5	30.1	30.1				30.5	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			

24 Hour PM2.5 Results

Factor 0.4 **Background** 29.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Taunton Depot			**Washington Street at Tremont Street**													
		Northeast		1	30.9	30.1	30.5	30.5				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.5	**30.5**	30.5				30.1	30.1	30.1			
				4	30.9	30.5	30.5	30.5				30.5	**30.5**	30.5			
				5	30.9	30.5	30.5	30.5				30.5	30.5	30.5			
		Southeast		1	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				2	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
				3	31.3	30.5	**30.5**	30.5				30.5	**30.5**	30.5			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Southwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				3	30.9	30.5	**30.5**	30.5				30.1	**30.5**	30.5			
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
		Northwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1			
				2	30.9	30.1	30.1	30.1				30.1	30.1	30.1			
				3	31.3	30.5	**30.5**	30.5				30.5	**30.5**	30.5			
				4	31.3	30.5	30.5	30.5				30.5	30.5	30.5			
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1			
New Bedford	Whale's Tooth			**Union Street at McCarthur at Route 18 at State Pier**													
		Northeast		1	30.9	30.1	30.5	30.5				30.1	30.1	30.1	-	-	
				2	30.5	30.1	30.1	30.5				30.1	30.1	30.1	-	-	
				3	30.9	30.1	30.1	30.5				30.1	30.1	30.1	-	-	
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				5	30.1	30.1	30.1	30.1				30.1	29.7	30.1	-	-	
		Southeast		1	30.1	30.1	30.1	30.1				30.1	29.7	30.1	-	-	
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				3	30.9	30.5	30.1	30.5				30.1	30.1	30.1	-	-	
				4	30.9	30.1	30.5	30.5				30.1	30.1	30.1	-	-	
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1	-	-	
		Southwest		1	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				3	30.9	30.5	30.5	30.5				30.5	30.5	30.1	-	-	
				4	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				5	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
		Northwest		1	30.9	30.5	30.1	30.1				30.1	30.1	30.1	-	-	
				2	30.5	30.1	30.1	30.1				30.1	30.1	30.1	-	-	
				3	31.3	30.5	30.5	30.5				30.5	30.5	30.1	-	-	
				4	30.9	30.5	30.5	30.5				30.1	30.1	30.1	-	-	
				5	30.9	30.5	30.5	30.5				30.1	30.1	30.1	-	-	

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Norton	**Barrowsville**			**North Worcester Street at Route 123/Main Street**													
		Northeast		1	11.8	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southeast		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southwest		1	11.8	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.8	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.8	11.8	11.8	11.8				11.8	11.8	11.8			
East Taunton	**East Taunton North**			**Route 140 at the Route 24 Southbound Ramps**													
		East		1	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				2	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				3	12.0	11.9			**11.9**	11.9		11.9			**11.9**	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
		Southwest		1	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				2	12.0	11.9			**11.9**	11.9		11.9			**11.9**	11.9	
				3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	11.9	11.8			11.8	11.8		11.8			11.8	11.8	
		Northwest		1	11.9	11.9			11.9	11.9		11.8			11.8	11.8	
				2	11.9	11.9			**11.9**	11.9		11.8			**11.9**	11.9	
				3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	12.0	11.9			11.9	11.9		11.9			11.9	11.9	

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Easton	**Easton Village**			**Route 138 at Main Street**													
				1	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				2	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
		Northeast		3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				5	11.9	11.8			11.8	11.8		11.8			11.8	11.8	
				1	11.9	11.9			11.9	11.9		11.8			11.8	11.8	
				2	11.9	11.9			11.9	11.9		11.8			11.9	11.9	
		Southeast		3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				1	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				2	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
		Southwest		3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				5	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				1	11.9	11.9			11.9	11.9		11.9			11.8	11.8	
				2	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
		Northwest		3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
Fall River	**Fall River Depot**			**North Davol Street at President Avenue**													
				1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northeast		3	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				1	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
		Southeast		3	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
		Southwest		3	11.9	11.9	11.9	11.9				11.9	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		3	11.9	11.9	11.9	11.9				11.9	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Fall River	Fall River Depot			South Davol Street at President Avenue													
		Northeast		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southeast		1	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southwest		1	11.9	11.8	11.8	11.8				12.6	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.8	11.8	11.8	11.8				11.7	11.7	11.7			
		Northwest		1	11.8	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.9	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
Freetown	Freetown			South Main Street at Route 24 Northbound Ramps													
		North		1	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
				2	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				3	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				4	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				5	11.8	11.9			11.9	11.9		11.9			11.9	11.9	
		Southeast		1	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				2	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				3	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				4	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
				5	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
		Southwest		1	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
				2	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
				3	11.8	11.9			11.9	11.9		11.8			11.8	11.8	
				4	11.8	11.8			11.8	11.8		11.8			11.8	11.8	
				5	11.8	11.8			11.8	11.8		11.8			11.8	11.8	

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
New Bedford	King's Highway			Church Strret at Tarkiln Road													
		Northeast		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southeast		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
Raynham	Raynham Park			Route 138 at Found Street/Route 106													
							Whittenton Electric	Whittenton Diesel					Whittenton Electric	Whittenton Diesel			
		Northeast		1	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				3	12.0	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
		Southeast		1	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
		Southwest		1	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016						2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Dean Street			Route 44 at Longmeadow Road													
		Northeast		1	11.9	11.8			11.8	11.8		11.8			11.8	11.8	
				2	11.9	11.8			11.9	11.9		11.8			11.8	11.8	
				3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				5	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
		Southeast		1	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				2	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				3	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				4	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				5	11.9	11.9			11.9	11.9		11.8			11.8	11.8	
		Southwest		1	11.9	11.9			11.9	11.9		11.8			11.8	11.8	
				2	11.9	11.9			11.9	11.9		11.9			11.9	11.9	
				3	12.1	11.9			11.9	11.9		11.9			11.9	11.9	
				4	12.1	11.9			11.9	11.9		11.9			11.9	11.9	
				5	12.1	11.9			11.9	11.9		11.9			11.9	11.9	
		Northwest		1	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				2	12.0	11.9			11.9	11.9		11.9			11.9	11.9	
				3	12.1	11.9			11.9	11.9		11.9			11.9	11.9	
				4	11.9	11.9			11.9	11.9		11.8			11.8	11.8	
				5	11.9	11.8			11.9	11.9		11.8			11.8	11.8	
Taunton	Taunton Depot			Route 140 at the Route 24 Northbound Ramps without Slip Ramp													
		Northeast		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.9	11.8	11.8			
				3	12.1	11.9	11.9	11.9				11.9	11.9	11.9			
				4	12.1	11.9	11.9	11.9				11.9	11.9	11.9			
				5	12.1	11.9	11.9	11.9				11.9	11.9	11.9			
		South		1	12.1	11.9	11.9	11.9				11.9	11.9	11.9			
				2	12.1	11.9	11.9	11.9				11.9	11.9	11.9			
				3	12.2	11.9	12.0	11.9				12.0	11.9	11.9			
				4	12.2	11.9	11.9	11.9				12.2	11.9	11.9			
				5	12.2	11.9	11.9	11.9				12.2	11.9	11.9			
		Northwest		1	12.2	11.9	11.9	11.9				11.9	11.9	11.9			
				2	12.2	11.9	11.9	11.9				11.9	11.9	11.9			
				3	12.2	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.9	11.8	11.8				11.9	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			

Annual PM2.5 Results

Factor 0.08 **Background** 11.7

Town	Station	Quadrant	Receptor Location	Intersection/Receptors	2008	2016					2030					
					Existing	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus	No Build	Attelboro Electric	Atteboro Diesel	Stoughton Electric	Stroughton Diesel	Rapid Bus
Taunton	Taunton Depot			**Washington Street at Tremont Street**													
		Northeast		1	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				4	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
				5	11.9	11.9	11.9	11.9				11.9	11.9	11.9			
		Southeast		1	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				3	12.0	11.9	11.9	11.9				11.9	11.9	11.9			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Southwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.8	11.9	11.9			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	12.0	11.9	11.9	11.9				11.9	11.9	11.9			
				4	12.0	11.9	11.9	11.9				11.9	11.9	11.9			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
New Bedford	Whale's Tooth			**Union Street at McCarthur at Route 18 at State Pier**													
		Northeast		1	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.9				11.8	11.8	11.8			
				3	11.9	11.8	11.8	11.9				11.8	11.8	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.8	11.8	11.8	11.8				11.8	11.7	11.8			
		Southeast		1	11.8	11.8	11.8	11.8				11.8	11.7	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.8	11.9				11.8	11.8	11.8			
				4	11.9	11.8	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
		Southwest		1	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	11.9	11.9	11.9	11.9				11.9	11.9	11.8			
				4	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				5	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
		Northwest		1	11.9	11.9	11.8	11.8				11.8	11.8	11.8			
				2	11.9	11.8	11.8	11.8				11.8	11.8	11.8			
				3	12.0	11.9	11.9	11.9				11.9	11.9	11.8			
				4	11.9	11.9	11.9	11.9				11.8	11.8	11.8			
				5	11.9	11.9	11.9	11.9				11.8	11.8	11.8			

Mesoscale (Regional) Analysis

- CTPS Model Data
- Rapid Bus Alternative
- Train Emissions

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Mesoscale (Regional) Analysis

- CTPS Model Data

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South Coast Rail Air Quality Mesoscale Results

	TOTAL EMSSIONS							
Alternative	CO-Winter	NOx	VOC	CO2	PM2.5	PM10	VMT	VHT
				look below for Tons/year				
	kg/day	kg/day	kg/day	kg/day	kg/day	kg/day	Avg daily	Avg daily
Existing	1,852,715.1	212,844.2	75,306.9	69,130,131.4	4,534.4	6,632.2	125,719,800.0	4,203,768.0
No-Build (TSM)	1,162,045.5	20,878.3	24,803.9	76,170,121.3	1,704.7	3,671.1	133,778,821.0	4,464,879.0
Attleboro Electric	1,159,470.0	20,835.0	24,748.0	75,999,344.0	1,703.0	3,665.0	133,482,252.0	4,442,755.0
Difference	(2,575.5)	(43.3)	(55.9)	(170,777.3)	(1.7)	(6.1)	(296,569.0)	(22,124.0)
Attleboro Diesel	1,159,930.3	20,867.4	24,757.6	76,034,198.7	1,704.0	3,667.4	133,522,400.0	4,444,185.0
Difference	(2,115.2)	(10.9)	(46.3)	(135,922.5)	(0.7)	(3.7)	(256,421.0)	(20,694.0)
Stoughton Electric	1,159,586.0	20,837.5	24,751.0	76,006,518.2	1,703.2	3,665.6	133,482,899.0	4,443,176.0
Difference	(2,459.5)	(40.8)	(52.9)	(163,603.1)	(1.5)	(5.5)	(295,922.0)	(21,703.0)
Stoughton Diesel	1,160,161.2	20,869.5	24,762.5	76,049,553.9	1,704.4	3,667.8	133,550,116.0	4,444,815.0
Difference	(1,884.3)	(8.7)	(41.5)	(120,567.4)	(0.3)	(3.4)	(228,705.0)	(20,064.0)
Whittenton Electric	1,160,155.0	20,847.0	24,762.0	76,045,234.0	1,704.0	3,667.0	133,550,803.0	4,444,876.0
Difference	(1,890.5)	(31.3)	(41.9)	(124,887.3)	(0.7)	(4.1)	(228,018.0)	(20,003.0)
Whittenton Diesel	1,160,543.9	20,874.7	24,780.6	76,080,802.5	1,705.4	3,669.4	133,604,860.0	4,450,380.0
Difference	(1,501.6)	(3.5)	(23.3)	(89,318.7)	0.7	(1.8)	(173,961.0)	(14,499.0)
Rapid Bus	1,161,433.2	20,882.5	24,794.6	76,152,071.7	1,706.4	3,672.8	133,697,326.0	4,450,872.0
Difference	(612.3)	4.2	(9.3)	(18,049.6)	1.7	1.7	(81,495.0)	(14,007.0)

South Coast Rail Air Quality Mesoscale Results

	TOTAL EMSSIONS							
Alternative				CO2				
				CO2 Converted to Tons/Year	Annualization Factor[1]=	365	Kg to Tons (1000kg/1Ton)=	1000
Existing				25,232,498.0				
No-Build (TSM)				27,802,094.3				
Attleboro Electric				27,739,760.6				
				(62,333.70)				
Attleboro Diesel				27,752,482.5				
				(49,611.73)				
Stoughton Electric				27,742,379.1				
Difference				(59,715.12)				
Stoughton Diesel				27,758,087.2				
Difference				(44,007.08)				
Whittenton Electric				27,756,510.4				
				(45,583.85)				
Whittendon Diesel				27,769,492.9				
				(32,601.34)				
Rapid Bus				27,795,506.2				
				(6,588.11)				

1: Based on CTPS' Calculation of Annualization Factor which used the commuter rail ridership information.

South Coast Rail Air Qu South Coast Rail Air Quality Mesoscale Results

Alternative	CTPS EMISSIONS WITHOUT SCR TRAIN EMISSIONS							
	CO-Winter	NOx	VOC	CO2	PM2.5	PM10	VMT	VHT
	kg/day	kg/day	kg/day	kg/day	kg/day	kg/day	Avg daily	Avg daily
Existing	1,852,715	212,844	75,307	69,130,131	4,534	6,632	125,719,800	4,203,768
No-Build (TSM)	1,162,045	20,878	24,804	76,170,121	1,705	3,671	133,778,821	4,464,879
Attleboro Electric	1,159,470	20,835	24,748	75,999,344	1,703	3,665	133,482,252	4,442,755
Difference								
Attleboro Diesel	1,159,917	20,843	24,757	76,029,115	1,704	3,667	133,522,400	4,444,185
Difference								
Stoughton Electric	1,159,586	20,837	24,751	76,006,518	1,703	3,666	133,482,899	4,443,176
Difference	(2,459.5)	(40.8)	(52.9)	(163,603.1)	(1.5)	(5.5)	(295,922.0)	(21,703.0)
Stoughton Diesel	1,160,149	20,847	24,762	76,044,858	1,704	3,667	133,550,116	4,444,815
Difference	(1,896.5)	(31.3)	(42.0)	(125,262.8)	(0.6)	(3.7)	(228,705.0)	(20,064.0)
Whittenton Electric	1,160,155	20,847	24,762	76,045,234	1,704	3,667	133,550,803	4,444,876
Difference								
Whittenton Diesel	1,160,532	20,853	24,780	76,076,229	1,705	3,669	133,604,860	4,450,380
Difference								
Rapid Bus	1,161,430	20,869	24,792	76,129,499	1,706	3,672	133,697,326	4,450,872
Difference								

South Coast Rail Air Qu South Coast Rail Air Quality Mesoscale Results

	SCR TRAIN EMISSIONS (1)							
Alternative	CO-Winter	NOx	VOC	CO2	PM2.5	PM10	VMT	VHT
	kg/day	kg/day	kg/day	kg/day	kg/day	kg/day	Avg daily	Avg daily
Existing								
No-Build (TSM)								
Attleboro Electric								-
Difference								
Attleboro Diesel	13.3	24.4	0.6	5,083.7	0.4	0.4		
Difference								
Stoughton Electric								
Difference								
Stoughton Diesel	12.2	22.5	0.6	4,695.5	0.4	0.4		
Difference								
Whittenton Electric								
Difference								
Whittenton Diesel	11.9	21.9	0.6	4,573.2	0.4	0.4		
Difference								
Rapid Bus	3.2	13.5	2.6	22,572.7	0.4	0.8		
Difference								

1 Based on estimated train mileage for SCR and EPA Train Emissions information - see XX

Mesoscale (Regional) Analysis

- Rapid Bus Alternative

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Mesoscale Analysis Summary - Rapid Bus Alternative

Bus Route (To/From)	No. of Buses	Local Roads: RT[1] Distance in miles (Bus Station to freeways[2])	Freeways: RT[1] Distance in miles (freeways[2] to Route 24)	Freeways: RT[1] Distance in miles (Route 24 to South Station)	Emissions (kg/day): CO-W	Nox	VOC	CO_2 [3]	PM2.5	PM10
Whale's Tooth Station - King's Hwy Station - South Station	50	3.24	40.35	78.85	1.21	5.18	0.97	8552.73	0.15	0.32
Fall River Depot Station - Freetown Station - South Station	42	9.61	4.67	91.95	0.89	3.66	0.73	6232.94	0.11	0.23
Galleria Station - South Station	34	1.60	1.28	78.85	0.55	2.36	0.44	3882.11	0.07	0.14
Taunton Depot Station - South Station	34	7.67	0.00	74.54	0.56	2.29	0.46	3904.88	0.07	0.15
				Emissions Total	***3.21***	***13.49***	***2.59***	***22572.65***	***0.40***	***0.84***

****Notes:***

1. RT = Round Trip

2. Any other freeways included in the bus routes that leads to Route 24

3. CO_2 concentrations are expressed in tons per year

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Mesoscale (Regional) Analysis

- Train Emissions

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Train Emissions

Number of Trains 38
19
4

Alternatives	From	To	Miles	Emission Factor (kg) $PM_{2.5}$	PM_{10}	HC	NOX	CO	CO2
Stoughton									
	Weir Junction	Canton Junction	20.51	0.20	0.21	0.33	12.73	6.92	2,653.77
	Canton Junction	South Station	14.70	0.02	0.02	0.02	0.96	0.52	200.25
				0.22	**0.22**	**0.35**	**13.69**	**7.44**	**2,854.03**
Including Southern Triangle				**0.45**	**0.46**	**0.73**	**28.39**	**15.43**	**5,920.26**
Whittenton									
	Weir Junction	Whittenton Junction	1.89	0.02	0.02	0.03	1.17	0.64	244.57
	Whittenton Junction	Stoughton	1.88	0.02	0.02	0.03	1.16	0.63	242.70
	Stoughton	Canton Junction	16.17	0.16	0.16	0.26	10.04	5.45	2,092.97
	Canton Junction	South Station	14.70	0.02	0.02	0.02	0.96	0.52	200.25
				0.21	**0.22**	**0.34**	**13.34**	**7.25**	**2,780.50**
Including Southern Triangle				**0.44**	**0.46**	**0.72**	**28.04**	**15.24**	**5,846.73**
Attleboro									
	Weir Junction	Attleboro Bypass	12.51	0.12	0.13	0.20	7.76	4.22	1,618.45
	Attleboro Bypass	Canton Junction	14.00	0.01	0.01	0.02	0.91	0.50	190.72
	Canton Junction	South Station	14.70	0.02	0.02	0.02	0.96	0.52	200.25
				0.15	**0.16**	**0.25**	**9.64**	**5.24**	**2,009.42**
Including Southern Triangle				**0.39**	**0.40**	**0.63**	**24.34**	**13.23**	**5,075.66**
Southern Triangle									
New Bedford Mainline	Cotley Junction	Weir Junction	1.42	0.01	0.01	0.02	0.88	0.48	183.17
	Myricks Junction	Cotley Junction	3.60	0.04	0.04	0.06	2.23	1.21	465.67
	New Bedford	Myricks Junction	14.82	0.07	0.08	0.12	4.60	2.50	959.01
				0.12	**0.13**	**0.20**	**7.71**	**4.19**	**1,607.85**
Fall River Secondary	Cotley Junction	Weir Junction	1.42	0.01	0.01	0.02	0.88	0.48	183.17
	Myricks Junction	Cotley Junction	3.60	0.04	0.04	0.06	2.23	1.21	465.67
	Fall River	Myricks Junction	12.51	0.06	0.06	0.10	3.88	2.11	809.54
				0.11	**0.11**	**0.18**	**6.99**	**3.80**	**1,458.39**
Northeast Corridor									
Northeast Corridor (South)	Attleboro Bypass	Canton Junction	14.00	0.01	0.01	0.02	0.91	0.50	190.72
Northeast Corridor (North)	Canton Junction	South Station	14.70	0.02	0.02	0.02	0.96	0.52	200.25
				0.03	**0.03**	**0.05**	**1.88**	**1.02**	**390.97**

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SOUTH COAST RAIL

Technical Report
Air Quality
Draft

Layover Facilities Emissions

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CO2 Emissions at Layover Facilities

Convert Mwh to lbs	1107	lbs	
Convert lbs to tons	0.0005	tons	

		kwh	Mwh	tons/yr	kg/d
Layover facilities	6 hours/day	258	0.258	1271.5	129.6651

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SOUTH COAST RAIL

Technical Report
Air Quality
Draft

Emission Factors for Locomotives

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Technical Highlights

Emission Factors for Locomotives

The Environmental Protection Agency (EPA) has established emission standards for oxides of nitrogen (NOx), hydrocarbons (HC), carbon monoxide (CO), particulate matter (PM) and smoke for newly manufactured and remanufactured locomotives. These standards, which are codified at 40 CFR part 1033, include several sets of emission standards with applicability dependent on the date a locomotive is first manufactured. The first set of standards (Tier 0) applies to most locomotives originally manufactured before 2001. The most stringent set of standards (Tier 4) applies to locomotives originally manufactured in 2015 and later. This fact sheet describes EPA's estimates of the typical in-use emission rates for locomotives subject to these standards, as well as the previous standards.

It is important to emphasize that this fact sheet relies on many simplifying assumptions. Thus emission rates calculated as described in this fact sheet should be considered as approximations.

Estimated Locomotive Emission Rates by Tier

EPA has estimated average emission rates, given in grams per brake horsepower-hour (g/bhp-hr), for uncontrolled locomotives and those required to meet the various emission standards. Emissions were estimated for two different types of operation: a low power cycle representing operation in a switch yard, and a higher power cycle representative of general line-haul operation. These estimates are shown in Tables 1 and 2. Note that plus signs in the table indicate that a given tier of standards was revised in a 2008 rulemaking (73 FR 37096, June 30, 2008). For example, locomotives originally manufactured in years 2002-2004 were initially subject to the original Tier 1 standards, but will be required to meet revised Tier 1 standards (also known as Tier 1+ standards) when remanufactured. See the regulatory text for a more precise explanation of which standards apply to which locomotives.

EPA United States Environmental Protection Agency

Office of Transportation and Air Quality
EPA-420-F-09-025
April 2009

It is important to note that there can be significant variability in in-use emission rates, especially for uncontrolled locomotives. Also, a single locomotive's emission rate can vary throughout its life as the engine ages and as ambient conditions change. Thus the values presented here are intended to reflect the average emission rates. It is also worth noting that these emission estimates were developed in the context of adopting new emission standards. This is especially important for the CO emission factors. Because EPA's CO emission standards were intended to cap CO emissions at pre-control levels (which were relatively low), we have not projected any reductions in CO emission factors. However, recent testing indicates that emission controls designed to reduce PM and HC emissions are also reducing CO emissions. Thus the CO emission rates presented here may be too high and should be used with some caution. A similar effect may also apply for HC emissions from Tier 0 and Tier 1 locomotives (but not the Tier 0+ and Tier 1+ locomotives).

Table 1 - Line-Haul Emission Factors (g/bhp-hr)

	PM_{10}	HC	NO_x	CO
UNCONTROLLED	0.32	0.48	13.00	1.28
TIER 0	0.32	0.48	8.60	1.28
TIER 0+	0.20	0.30	7.20	1.28
TIER 1	0.32	0.47	6.70	1.28
TIER 1+	0.20	0.29	6.70	1.28
TIER2	0.18	0.26	4.95	1.28
TIER 2+ & TIER 3	0.08	0.13	4.95	1.28
TIER 4	0.015	0.04	1.00	1.28
+ INDICATES THAT THESE ARE THE REVISED STANDARDS IN 40 CFR PART 1033				

Table 2 - Switch Emission Factors (g/bhp-hr)

	PM_{10}	HC	NO_x	CO
UNCONTROLLED	0.44	1.01	17.40	1.83
TIER 0	0.44	1.01	12.60	1.83
TIER 0+	0.23	0.57	10.60	1.83
TIER 1	0.43	1.01	9.90	1.83
TIER 1+	0.23	0.57	9.90	1.83
TIER2	0.19	0.51	7.30	1.83
TIER 2+	0.11	0.26	7.30	1.83
TIER 3	0.08	0.26	4.50	1.83
TIER 4	0.015	0.08	1.00	1.83
+ INDICATES THAT THESE ARE THE REVISED STANDARDS IN 40 CFR PART 1033				

Conversion to Gram per Gallon Emission Factors

It is often useful to express emission rates as grams of pollutant emitted per gallon of fuel consumed (g/gal). This can be done by multiplying the emission rates in Table 1 or 2 by a conversion factor relating the fuel consumption (gal/hr) and the usable power (bhp) of the engine. EPA has estimated different conversion factors for different types of locomotive service as shown in Table 3. The two primary reasons for the differences are variations in locomotive age and duty cycle. Fuel efficiency tends to be worse for older locomotive designs and for locomotives used in low power applications such as switching. Note that the g/gal emission factors presented at the end of this fact sheet can be converted back to g/bhp-hr by dividing them by the conversion factors shown here.

Table 3
Conversion Factors (bhp-hr/gal)

Locomotive Application	Conversion Factor (bhp-hr/gal)
Large Line-Haul and Passenger	20.8
Small Line-Haul	18.2
Switching	15.2

Conversion to Gram per Ton-Mile Emission Factors

In some cases, it can be helpful to express emission factors as grams emitted per ton-mile of freight hauled. However, this can also be very problematic because the amount of engine work required for each ton-mile varies significantly with a variety of factors. For example, it takes more work to haul freight through mountainous terrain than across flat areas. Since EPA does not have detailed information about these variations, we cannot provide accurate g/ton-mile emission rates. However, very approximate national average values can be calculated based on data collected by the Association of American Railroads for revenue ton-miles and fuel consumption, which show that about one gallon of fuel is consumed by the railroads to haul 400 tons-miles of freight. Thus dividing g/gal emission rates by 400 ton-miles/gal gives approximate g/ton-mile emission rates.

Emission Inventory Estimation

Total emissions can be calculated by multiplying the emission factors (in g/gal) by the fuel consumption rates (in million-gal/yr) to give annual emission rates (in metric tons per year). Multiplying this metric estimate by 1.102 gives standard U.S. tons (or short tons) per year.

EPA has estimated that locomotives consume approximately 4 billion gallons of diesel fuel each year. This includes national/regional freight service, switching, local freight service, and passenger service. The relative amounts of fuel used in the United States for these four different types of operation are shown in Table 4. The great majority of fuel consumed by locomotives each year is used in line-haul freight service by the largest railroads. Smaller amounts are also used in

switching and passenger service, and by very small railroads. For the purpose of this fact sheet, we are aggregating the largest railroads with smaller railroads that are fully subject to EPA's emission requirements. This includes regional railroads as well as other railroads such as those that are owned by large businesses. The local freight category includes only those railroads that meet our regulatory definition of "small railroad" (40 CFR 1033.901) to qualify for small business allowances under our regulations. These railroads are included in this fact sheet as local whether or not they are truly local in nature. The passenger category includes local commuter railroads and AMTRAK.

Table 4 - Locomotive Fuel Consumption by Service Category	
National and Regional Freight Line-haul	88%
National Freight Switching	7%
Local Freight	<2%
Passenger	3%

Other Pollutants

The preceding emission factors include those pollutants for which EPA has set emission standards. However, other pollutants may also be of interest.

The broad category of volatile organic compounds (VOC) is a slightly different way of aggregating the organic pollutants controlled by our HC emission standards. In our rulemaking analysis (http://www.epa.gov/otaq/regs/nonroad/420r08001a.pdf), we estimated that VOC emissions can be assumed to be equal to 1.053 times the HC emissions. Similarly, PM emissions can be expressed as PM_{10} (which includes all particles up to 10 microns in diameter) or $PM_{2.5}$ (which includes only those particles up to 2.5 microns in diameter). $PM_{2.5}$ emissions can be estimated as 0.97 times the PM_{10} emissions, meaning that nearly all of the PM is less than 2.5 microns in diameter.

Gram per gallon emissions of sulfur dioxide (SO_2) and carbon dioxide (CO_2) are largely independent of engine parameters and are primarily dependent on fuel properties. Locomotive-specific emission rates are not presented here. Instead, SO_2 and CO_2 emission rates should be calculated based on the properties of the specific fuel being used by the locomotives. These emission rates can also be assumed to be the same as for other diesel engines operating on similar fuel. Note that special caution should be used when estimating SO_2 emission rates since the sulfur content of diesel fuel varies much more than the carbon content. Also, while the vast majority of sulfur in the fuel is typically converted to SO_2, up to 5 percent of the sulfur is oxidized further to sulfate (and forms particulate matter), so that the fraction of fuel sulfur emitted as SO_2 may be as low as 95 percent. Examples of these calculations are shown below based on inputs described in the NONROAD technical document NR-009c (http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2004/420p04009.pdf).

SO_2 (g/gal) = (fuel density) × (conversion factor) × (64 g SO_2/32 g S) × (S content of fuel)

Consider the example where the density of diesel fuel is 3200 g/gal, the fraction of fuel sulfur converted to SO_2 is 97.8 percent, and the sulfur content of the fuel is 300 ppm.

SO_2 (g/gal) = (3200) × (0.978) × (2.00) × (300×10^{-6}) = 1.88 g/gal

CO_2 (g/gal) = (fuel density) × (44 g CO_2/12 g C) × (C content of fuel)

Consider the example where the density of diesel fuel is 3200 g/gal and the carbon content of the fuel is 87 percent by mass.

CO_2 (g/gal) = (3200) × (3.67) × (0.87) = 10,217 g/gal

Other trace pollutants such as N_2O, methane, and many air toxics are more dependent on engine parameters. At this time, however, EPA does not have detailed emission rates for these pollutants from locomotives. Where estimates are needed for N_2O or methane, you may assume that emissions of these pollutants from locomotives are similar to those of other diesel engines with similar technology. For N_2O, you may assume the emissions are proportional to total NOx. For methane, you may assume the emissions are proportional to total hydrocarbons. Note however, that the presence of catalyzed components in the exhaust can significantly affect these ratios. So it is best to compare emissions from uncatalyzed locomotives to emissions from other uncatalyzed diesel engines. While this same approach could be used for air toxics (assuming that air toxic emissions are proportional to total hydrocarbons), EPA has estimated air toxic emissions from locomotives. These estimates are described in the National Emission Inventory documentation (see ftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002nei_mobile_nonroad_methods.pdf - appendix C).

Projected Future Emission Factors

Tables 5-7 give the expected fleet average NOx, PM_{10}, and HC emission factors by calendar year for the four categories of locomotives (the same four categories as are shown in Table 4). The steady decline in these emission factors reflects the penetration of the various tiers of locomotives into the fleet over time. More detail regarding the assumptions on which these projections were based can be found in the Regulatory Impact Analysis for the 2008 rulemaking (http://www.epa.gov/otaq/regs/nonroad/420r08001a.pdf)

For More Information

You can access the rule and related documents on EPA's Office of Transportation and Air Quality (OTAQ) Web site at: www.epa.gov/otaq/locomotives.htm.

For more information on this rule, please contact the Assessment and Standards Division information line at:

U.S. Environmental Protection Agency
Office of Transportation and Air Quality
2000 Traverwood Drive
Ann Arbor, MI 48105
Voicemail: (734) 214-4636
E-mail: asdinfo@epa.gov

Table 5 – NOx Emission Factors (g/gal)

Calendar Year	Large Line-haul	Large Switch	Small Railroads	Passenger/Commuter	Overall Average
2006	180	250	242	244	188
2007	175	249	242	229	183
2008	169	243	242	214	177
2009	165	241	242	200	172
2010	157	236	242	183	165
2011	149	235	242	167	157
2012	144	227	242	157	152
2013	139	225	242	147	147
2014	135	217	242	138	143
2015	129	215	240	131	137
2016	121	208	239	119	129
2017	114	206	237	112	122
2018	108	202	236	105	117
2019	103	200	233	98	112
2020	99	187	231	93	107
2021	94	185	228	88	102
2022	89	177	225	83	97
2023	84	172	223	78	92
2024	79	162	220	73	87
2025	74	150	217	68	81
2026	69	144	215	64	77
2027	65	138	212	60	72
2028	61	132	209	56	68
2029	57	126	206	52	64
2030	53	119	203	49	60
2031	49	112	200	46	56
2032	46	105	197	42	52
2033	43	98	193	39	49
2034	40	91	190	36	46
2035	37	84	187	33	43
2036	35	77	184	30	40
2037	33	71	180	28	38
2038	31	67	177	26	36
2039	29	63	174	24	34
2040	28	60	171	23	32

Table 6 – PM_{10} Emission Factors (g/gal)

Calendar Year	Large Line-haul	Large Switch	Small Railroads	Passenger/Commuter	Overall Average
2006	6.4	6.5	6.5	6.5	6.4
2007	6.3	6.5	6.5	6.4	6.3
2008	5.1	5.5	5.7	5.1	5.1
2009	4.9	5.5	5.7	5.0	4.9
2010	4.7	5.4	5.7	4.8	4.7
2011	4.4	5.3	5.7	4.5	4.5
2012	4.1	5.1	5.7	4.2	4.2
2013	3.8	5.0	5.6	3.9	3.9
2014	3.6	4.8	5.6	3.6	3.7
2015	3.4	4.8	5.5	3.4	3.5
2016	3.1	4.6	5.5	3.1	3.3
2017	2.9	4.5	5.4	2.8	3.0
2018	2.7	4.4	5.4	2.6	2.8
2019	2.5	4.4	5.4	2.3	2.6
2020	2.3	4.1	5.3	2.1	2.5
2021	2.2	4.0	5.3	2.0	2.4
2022	2.0	3.9	5.3	1.8	2.2
2023	1.9	3.7	5.2	1.7	2.1
2024	1.7	3.5	5.2	1.5	1.9
2025	1.6	3.2	5.1	1.4	1.8
2026	1.5	3.1	5.1	1.2	1.6
2027	1.4	3.0	5.1	1.1	1.5
2028	1.3	2.8	5.0	1.0	1.4
2029	1.1	2.7	5.0	0.9	1.3
2030	1.0	2.5	4.9	0.8	1.2
2031	1.0	2.4	4.8	0.7	1.1
2032	0.9	2.2	4.8	0.7	1.0
2033	0.8	2.1	4.7	0.6	0.9
2034	0.7	1.9	4.6	0.6	0.9
2035	0.7	1.7	4.6	0.5	0.8
2036	0.6	1.6	4.5	0.5	0.7
2037	0.6	1.5	4.4	0.4	0.7
2038	0.5	1.4	4.4	0.4	0.6
2039	0.5	1.3	4.3	0.4	0.6
2040	0.4	1.2	4.2	0.3	0.5

Table 7 - HC Emission Factors (g/gal)

Calendar Year	Large Line-haul	Large Switch	Small Railroads	Passenger/Commuter	Overall Average
2006	9.5	15.0	11.7	9.7	10.0
2007	9.3	15.0	11.7	9.5	9.8
2008	9.0	14.5	11.7	9.3	9.5
2009	8.7	14.5	11.7	9.1	9.1
2010	8.3	14.1	11.7	8.6	8.8
2011	7.7	14.0	11.7	8.1	8.2
2012	7.1	13.3	11.7	7.5	7.6
2013	6.5	13.3	11.7	6.9	7.1
2014	6.1	12.7	11.7	6.3	6.7
2015	5.7	12.6	11.7	5.8	6.3
2016	5.1	12.0	11.7	5.2	5.7
2017	4.6	11.8	11.7	4.6	5.2
2018	4.2	11.5	11.7	4.1	4.8
2019	3.9	11.4	11.7	3.5	4.5
2020	3.6	10.5	11.7	3.1	4.2
2021	3.4	10.4	11.7	2.9	4.0
2022	3.2	9.8	11.7	2.7	3.8
2023	3.0	9.5	11.7	2.4	3.6
2024	2.8	8.9	11.7	2.2	3.4
2025	2.6	8.0	11.7	2.0	3.1
2026	2.5	7.6	11.7	1.8	2.9
2027	2.3	7.3	11.7	1.6	2.8
2028	2.1	6.9	11.7	1.5	2.6
2029	2.0	6.5	11.7	1.3	2.4
2030	1.9	6.2	11.7	1.2	2.3
2031	1.7	5.8	11.7	1.1	2.2
2032	1.6	5.5	11.7	1.0	2.0
2033	1.5	5.1	11.7	0.9	1.9
2034	1.4	4.7	11.7	0.8	1.8
2035	1.3	4.4	11.7	0.7	1.7
2036	1.2	4.0	11.7	0.7	1.6
2037	1.2	3.7	11.7	0.6	1.5
2038	1.1	3.6	11.7	0.6	1.4
2039	1.1	3.4	11.7	0.5	1.4
2040	1.0	3.2	11.7	0.5	1.3

Appendix 4.10-A

Open Space Municipal Correspondence

Transportation
Land Development
Environmental
Services

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Marc Rousseau
Planning & Community Development Department
Town of Easton
136 Elm Street
North Easton, MA 02356

RE: South Coast Rail Project

Dear Sir,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Easton (see attached figures):

SITE NAME	OWNER	MANAGER
Fields associated with Center Elementary School	Town of Easton	Town of Easton School Department
Conservation Land	Town of Easton	Town of Easton Conservation Commission
Conservation Land	Town of Easton	Town of Easton Conservation Commission
Conservation Land	Town of Easton	Town of Easton Conservation Commission
Conservation Land	Town of Easton	Town of Easton Conservation Commission
Conservation Land	Town of Easton	Town of Easton Conservation Commission
Fields associated with Oliver Ames School & Easton Middle School	Town of Easton	Town of Easton School Department
Ricker Field	Town of Easton	Town of Easton Conservation Commission
Fields associated with Southeastern Reg Voc Tech HS	Town of Easton	Town of Easton Regional School District
Town Land	Town of Easton	Town of Easton Board of Selectmen
Town Land	Town of Easton	Town of Easton Board of Selectmen

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

99 High Street, 10th Floor
Boston, Massachusetts 02110-2354
617.728.7777 ▪ FAX 617.728.7782
email: info@vhb.com
www.vhb.com

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and any of the following information, if known:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property
- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

TAUNTON
RAYNHAM
Hockomock Swamp ACEC
Stoughton Line
Raynham Park
EASTON
HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA
TOWN LAND
PROSPECT HILL STREET
INTERSTATE 495
ELM STREET WEST
MOWRY STREET
ASTHEA STREET
BRIDGE STREET
OAK STREET
BROADWAY
ELM STREET EAST
138
106
PROSPECT STREET
James J. Adams Library
Southeastern Reg Voc Tech
Southeastern Technical Institute
MORSE ROAD
0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\STGN_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
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- MBTA Commuter Rail
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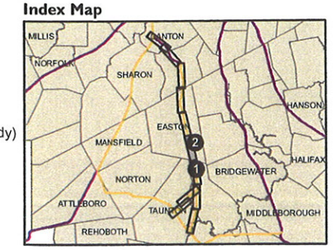
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-9c

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA
EASTON CONSERVATION LAND
Hockomock Swamp ACEC
CAROLINE ROAD
PORTER STREET
KENNEDY CIRCLE
GRANITE LANE
JUSTIN DRIVE
PURCHASE STREET
EASTON
Stoughton Line
123
CHURCH STREET
RIDGEWOOD ROAD
FRISCILLA ROAD
DEPOT PLACE
DEPOT STREET
CENTRAL STREET
LYNDA ROAD
LYMAN WHEELOCK ROAD
SHORT STREET
LAWTON LANE
CEDAR DRIVE
CENTER STREET
SUMMER STREET
SHERIDAN STREET
LAUREL DRIVE
GARY LANE
JUDITH ROAD
STAMPER ROAD
WATER DEPT. LAND
0 200 400 800 Feet

Tile 2

RICKER FIELD
Ames Free Library of Easton, Inc.
FROTHINGHAM PARK
Easton Village
STANDLEY ROAD
WILBUR STREET
SPOONER STREET
HAYWARD STREET
PARK STREET
DAN STREET
BARROWS STREET
LINCOLN STREET
MAIN STREET
KING AVENUE
SULLIVAN AVENUE
MECHANIC STREET
OLIVER STREET
PLEASANT STREET
LINDEN STREET
HOLMES STREET
ARTHUR ROAD
MULLEN LANE
ELM STREET
POND STREET
CENTER STREET
Stoughton Line
BALDWIN STREET
AVIS CIRCLE
WILLIAMS STREET
REYNOLDS STREET
JENNY LIND STREET
PINE LANE
MAPLE STREET
BEAVER STREET
EASTON
WATER DEPT. LAND
SHEEP PASTURE
SHEEP PASTURE
SHEEP PASTURE
CONSERVATION LAND
CHERRY RIDGE LANE
COSMA ROAD
RIVERSIDE TERRACE
TWEDGEWOOD DRIVE
STOUGHTON
Stoughton Memorial Conservation Land
WHITMAN'S BROOK DRIVE
CONSERVATION LAND
North Easton
0 200 400 800 Feet

11/13/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\STGN_Oct08.mxd

Legend

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- Public Open Space
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- DEP Wetlands
- DEP Open Water

Index Map

EOT

SOUTH COAST RAIL

Figure 5-9d

Weir Junction to Canton Junction
Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Subject: Town-owned Land Abutting Rail ROW
Attachments: Town-owned Land Abutting Rail ROW.xls

From: Danielson, Stephanie [mailto:SDanielson@easton.ma.us]
Sent: Friday, February 06, 2009 1:26 PM
To: Standley, Lisa
Subject: Town-owned Land Abutting Rail ROW

Lisa,

Attached is the list of town-owned land abutting the Rail ROW. Since no parcel identification is provided, it is hard to tell what the parcels are in the list VHB sent. This list does not include property owned by the Southeastern Regional School District, as it is not town-owned and does not include fields associated with Oliver Ames High School and the Middle School, since these are no where near the ROW.

Stephanie Danielson
Land Use Agent

Department of Planning & Community Development
Town of Easton
136 Elm Street
Easton, MA 02356

Help make the earth a greener place. If at all possible resist printing this e-mail and join us in saving paper.

MAP_PAR_ID	SITE_NAME	STREET_NAM	MANAGER	COMMENTS
12R-4	Prospect Street Area	29 Prospect Street	Conservation Commission	Conservation Land
38U-62	Depot Street Area	288 Depot Street	Conservation Commission	Conservation Land
27U-34	Water Commission Land	100 Baldwin Street	Water Commissioners	
38U-54	Purchase Street Area	61R Purchase Street	Town of Easton Selectmen	
4U-3	Wedgewood Drive Area	73 Wedgewood Drive	Town of Easton Selectmen	Conservation restriction
16R-27	Foundry Street Area	272 Foundry Street	Conservation Commission	conservation land
12R-8	Prospect Street Area	36 Prospect Street	Town of Easton Selectmen	
38U-57	Purchase Street Area	51 Purchase Street	Town of Easton Selectmen	Foreclosure Decree 04-20-1988
32U-21	Water Commission Land	218R Center Street	Water Commissioners	
27U-32	Old Baldwin Street Dump Area	95R Baldwin Street	Conservation Commission	conservation land
22U-8	DPW Garage	130 Center Street	Town of Easton Selectmen	DPW Barn
4U-93	Water Commission Land	34R Miller Road	Water Commissioners	
4U-123	Cobblestone Road Area	16R Cobblestone Road	Conservation Commission	conservation land

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Jim Hartnett, Director of Planning
City of Fall River
1 Government Center, 5th Floor
Fall River, MA 02722

RE: South Coast Rail Project

Dear Sir,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the City of Fall River (see attached figures):

SITE NAME	OWNER	MANAGER
Bicentennial Park	City of Fall River	City of Fall River Parks and Recreation Department
Griffin Playground	City of Fall River	City of Fall River Parks and Recreation Department
Heritage Park	City of Fall River	City of Fall River Parks and Recreation Department
Walkway	City of Fall River	City of Fall River Parks and Recreation Department
Kennedy Park (2 parcels)	City of Fall River	City of Fall River Parks and Recreation Department
North Park	City of Fall River	City of Fall River Parks and Recreation Department
Turner Playground	City of Fall River	(unavailable)
(Unnamed - see attached Figure 5.3a, Tile 2)	City of Fall River	(unavailable)

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and provide the following information:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property

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email: info@vhb.com
www.vhb.com

- Brief description/uses of the property
- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\FRToMJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
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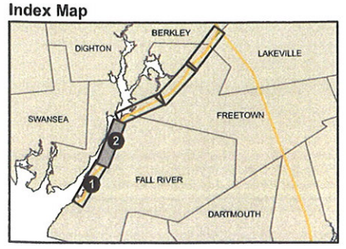
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-3a

Fall River Secondary to Myricks Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

Fall River Secondary

FALL RIVER

FREETOWN

Freetown

SOUTH MAIN STREET

NORTH MAIN STREET

LEEWARD ROAD

FOUR WINDS DRIVE

HORIZON WAY

POINTS WEST DRIVE

RIDGE HILL ROAD

COPICUT ROAD

NOTTINGHAM WAY

SIMPSON LANE

GREEN LANE

ELM STREET

WALNUT STREET

OLD MAIN STREET

MILL STREET

LOCUST STREET

RIVERS EDGE WAY

RICHMOND ROAD

FORGE ROAD

HOWLAND ROAD

SWEETMOSE DRIVE

SASSAMON TRACE

PROFILE ROAD

HIGH STREET

UNNAMED ROAD

AM VETS MEMORIAL HIGHWAY

24

79

Rattlesnake Brook

Terry Brook

Assonet Ri

FREETOWN FALL RIVER STATE FOREST

0 200 400 800 Feet

11/13/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\FRToMJ_Oct08.mxd

Legend

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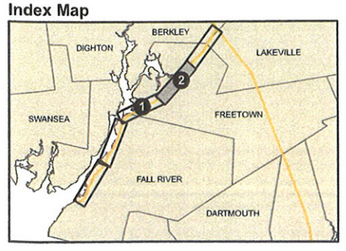

EOT

SOUTH COAST RAIL

Figure 5-3b

Fall River Secondary to Myricks Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Laurie A. Carvalho
Freetown Planning & Land Use Administrator
3 North Main Street
Assonet, MA 02702

RE: South Coast Rail Project

Dear Madam,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Freetown (see attached figures):

SITE NAME	OWNER	MANAGER
Bosworth Lot	Town of Freetown	Town of Freetown Conservation Commission
Forge Pond	Town of Freetown	Town of Freetown Board of Selectmen
Freetown Common	Town of Freetown	Town of Freetown Department of Public Works
Hathaway Park	Town of Freetown	Town of Freetown Parks and Recreation Department
Porter Pasture	Town of Freetown	Town of Freetown Parks and Recreation Department

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

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Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

Fall River Secondary

FALL RIVER

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Freetown

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NORTH MAIN STREET

LEEWARD ROAD

FOUR WINDS DRIVE

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HOWLAND ROAD

WEETAMOE DRIVE

SASSAMON

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AMVETS MEMORIAL HIGHWAY

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79

FREETOWN FALL RIVER STATE FOREST

Rattlesnake Brook

Terry Brook

Assonet Ri

0 200 400 800 Feet

11/13/2008
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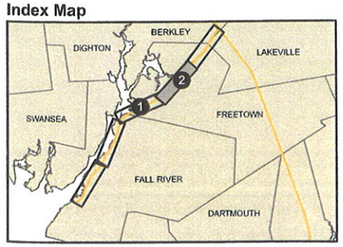
Index Map



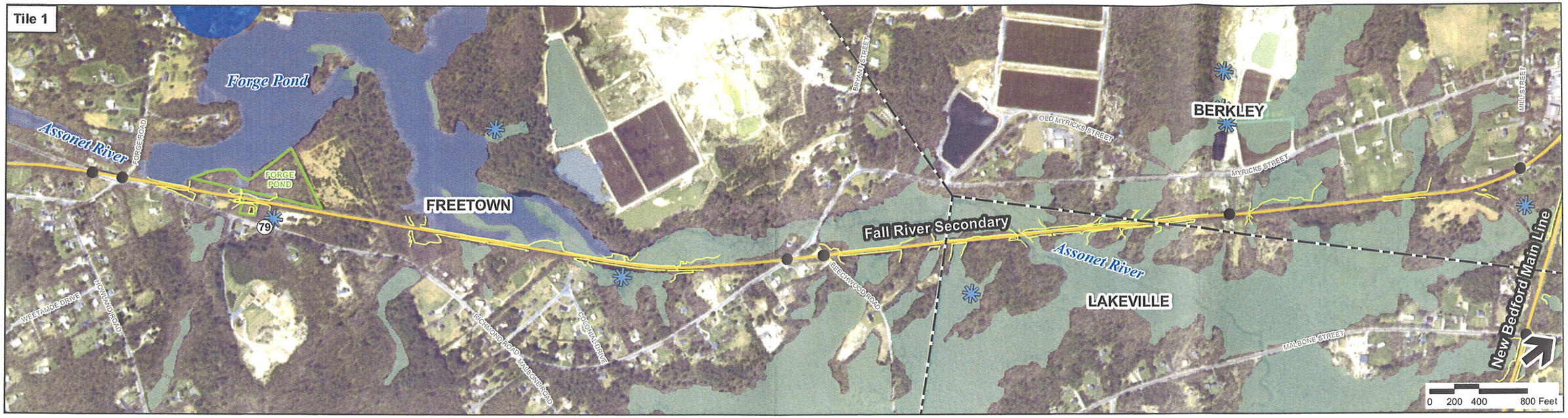
EOT

SOUTH COAST RAIL

Figure 5-3b

Fall River Secondary to Myricks Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc



11/12/2008
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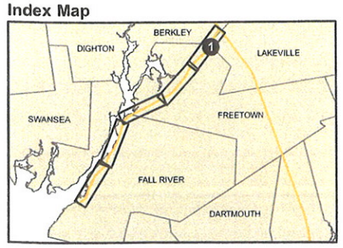

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

SOUTH COAST RAIL

Figure 5-3c

Fall River Secondary to Myricks Junction

Tile 1

Tile 2

11/12/2008
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Legend

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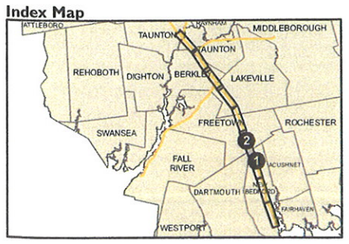


EOT

SOUTH COAST RAIL

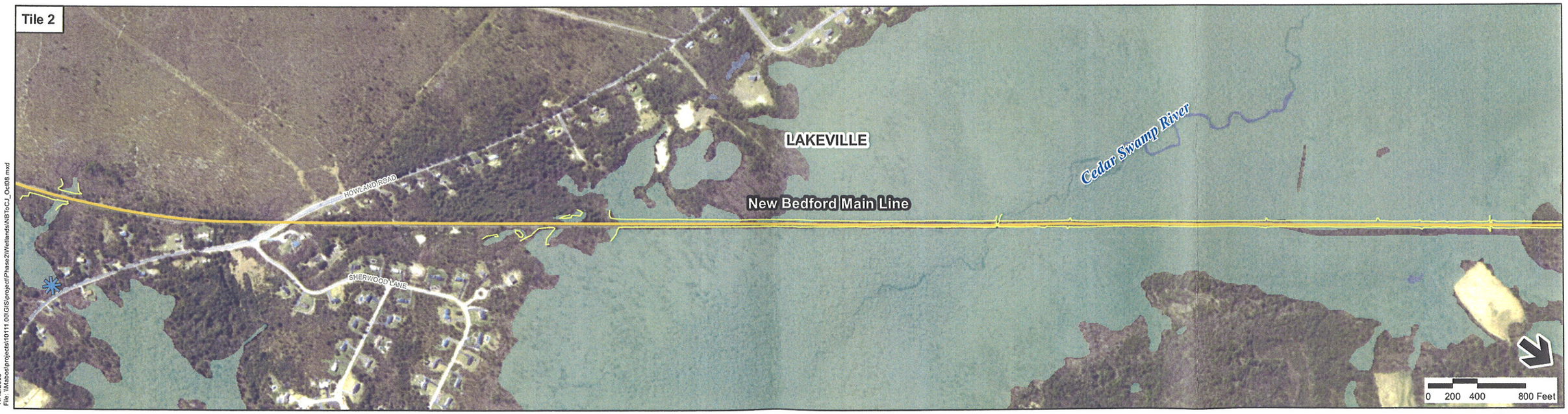
Figure 5-4b

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2



11/12/2008
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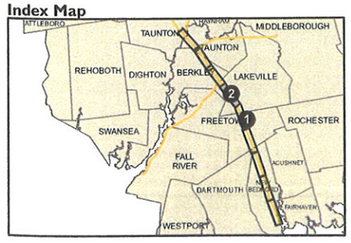


EOT

SOUTH COAST RAIL

Figure 5-4c

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

TOWN OF FREETOWN
OFFICE OF THE
PLANNING/LAND USE ADMINISTRATOR
TOWN HALL, 3 NORTH MAIN STREET
ASSONET, MASSACHUSETTS
508-644-2270

January 27, 2009

Lisa Standley, Ph.D.
C/O Vanasse Hangen Brustlin, Inc.
99 High Street, 10th floor
Boston, MA 02110-2354

RE: South Coast Rail Project

Dear Madam,

Per your written request dated December 23, 2008 (Re: 10111.31) enclosed are several maps depicting parcels of land within the town of Freetown that are currently protected and/or being used for active/passive recreation in proximity of the proposed South Coast Rail Project.

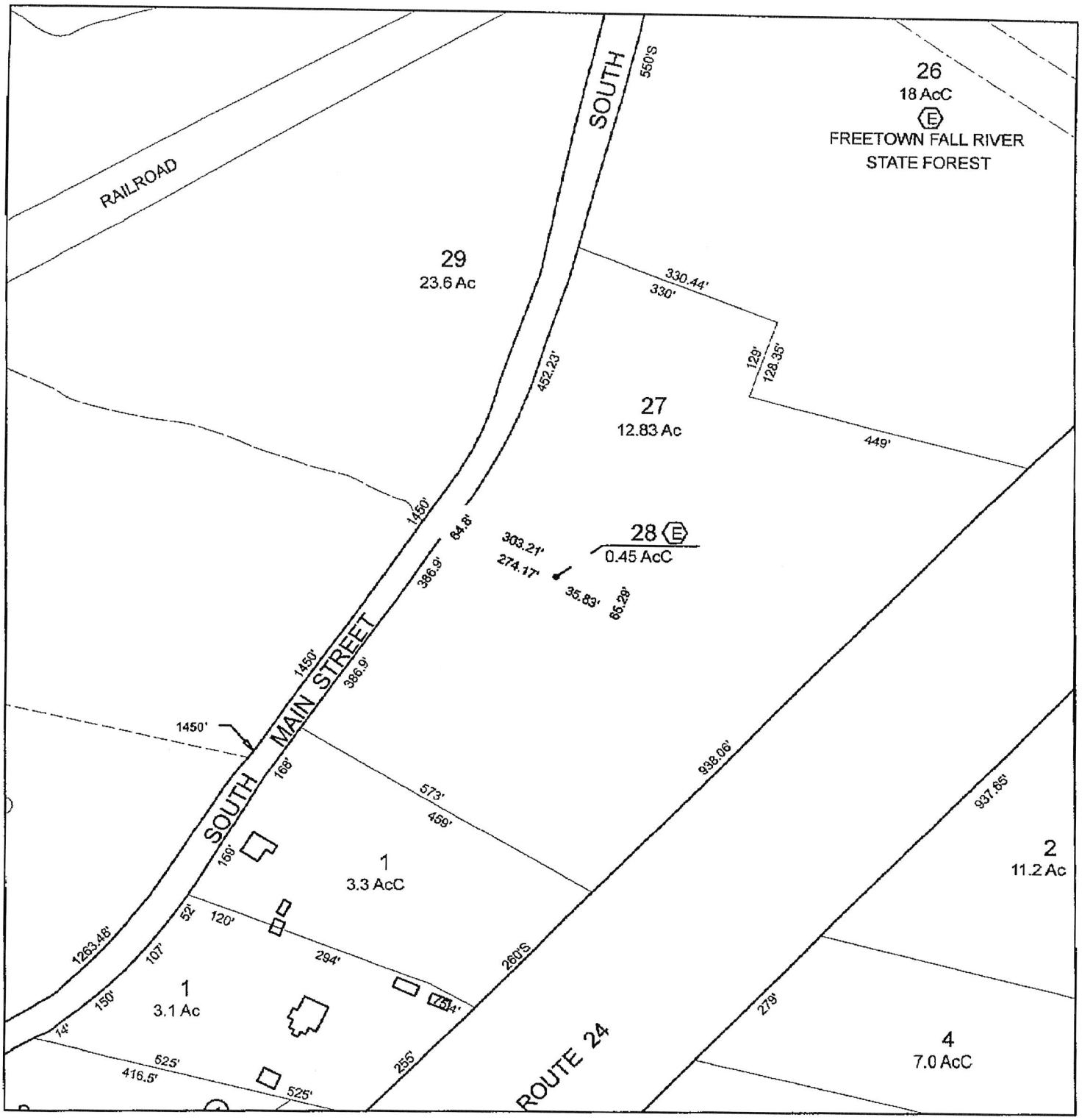
Location	Description of Property	Owners Address
Map 233 Lot 28	DEP Interim Wellhead Zone I	Town of Freetown
Map 211 Lot 182	Hathaway Park	Town of Freetown
Map 211 Lots 148, 149	Assonet Burying Ground	Town of Freetown
Map 204 Lots 14 & 16	Boy's Club of Fall River	PO Box 215
	Recreation	Fall River, MA 02720
Map 206 Lot 23	Boy's Club of Fall River	
Map 204 Lot 17	Wildlands Trust of SE MA	PO Box 2282
	Recreation	Duxbury, MA 02332
Map 204 Lot 22	Wildlands Trust of SE MA	
Map 233 Lot 31	Freetown Conservation Land	Town of Freetown

If you need any further assistance, please feel free to contact me at 508-644-2270 extension 1402.

Very truly yours,

Laurie Carvalho

Laurie Carvalho
Town of Freetown
Planning/Land Use Administrator

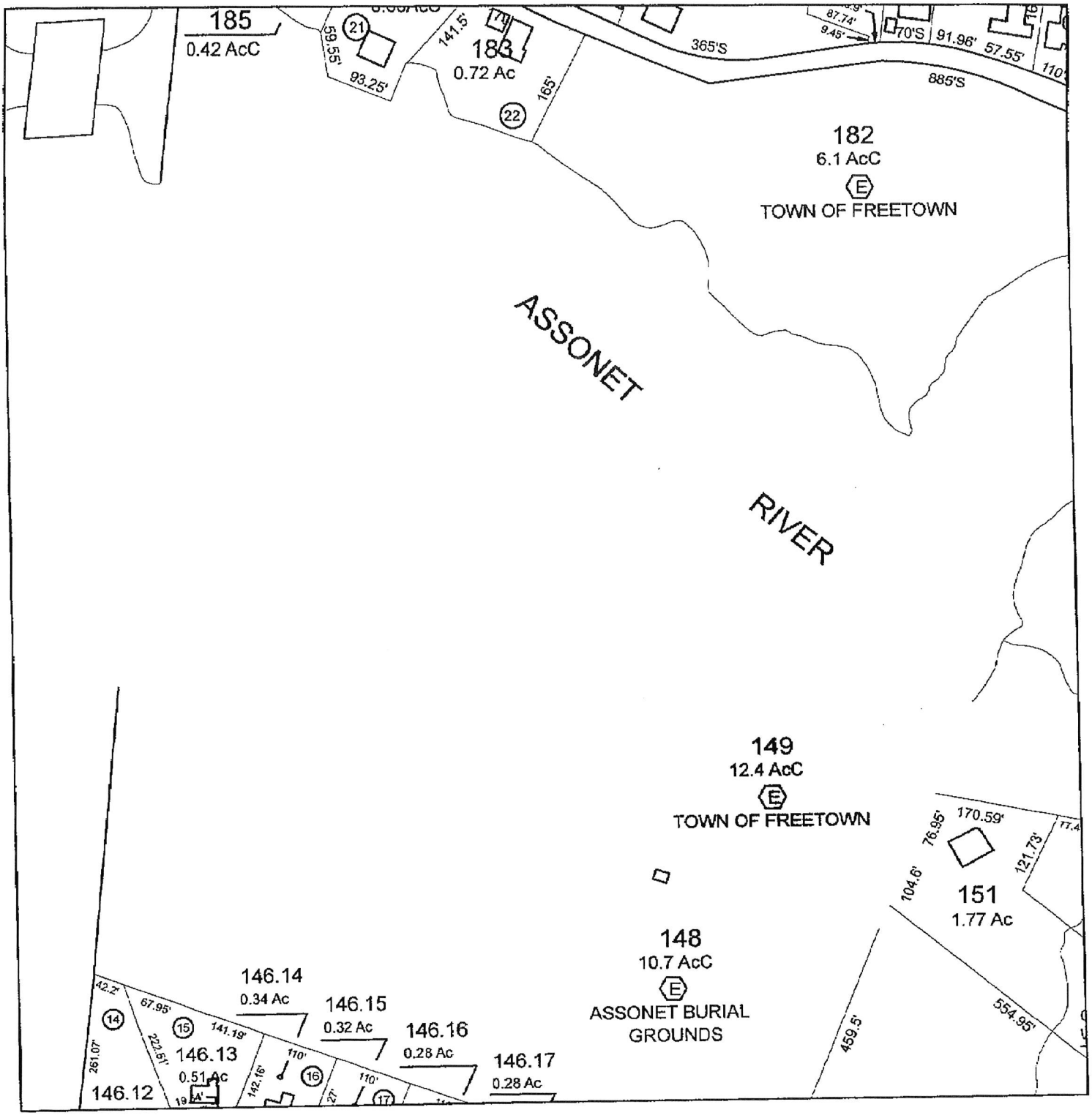


Map 233 Lot 28 DEP Interim Wellhead Zone 1

Freetown, MA

0 200 400 Feet

1/27/2009



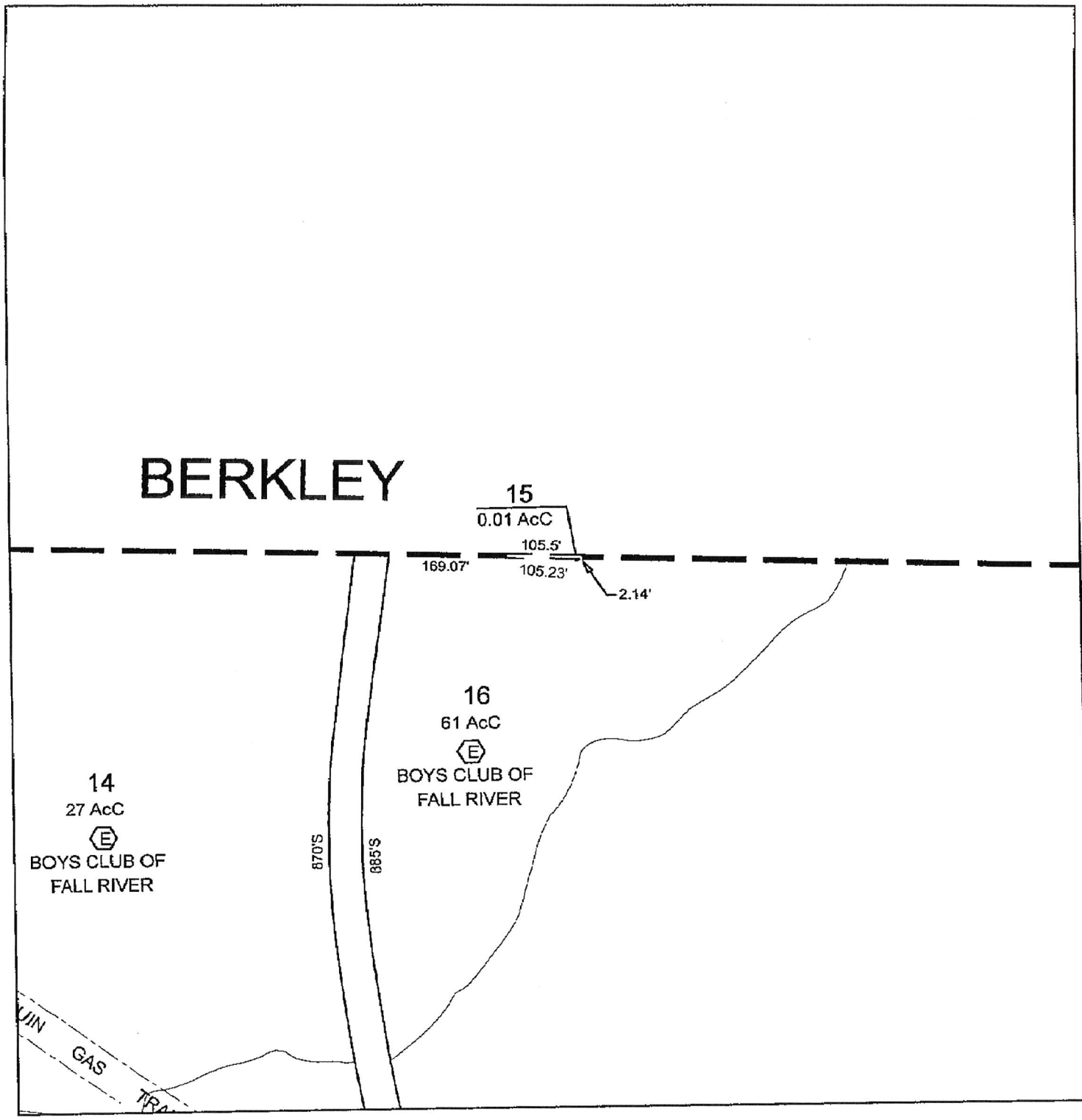
Hathaway Park & Freetown Burying Ground Lots 182, 148, 149

Freetown, MA

0 200 400 Feet

1/27/2009

Map 211



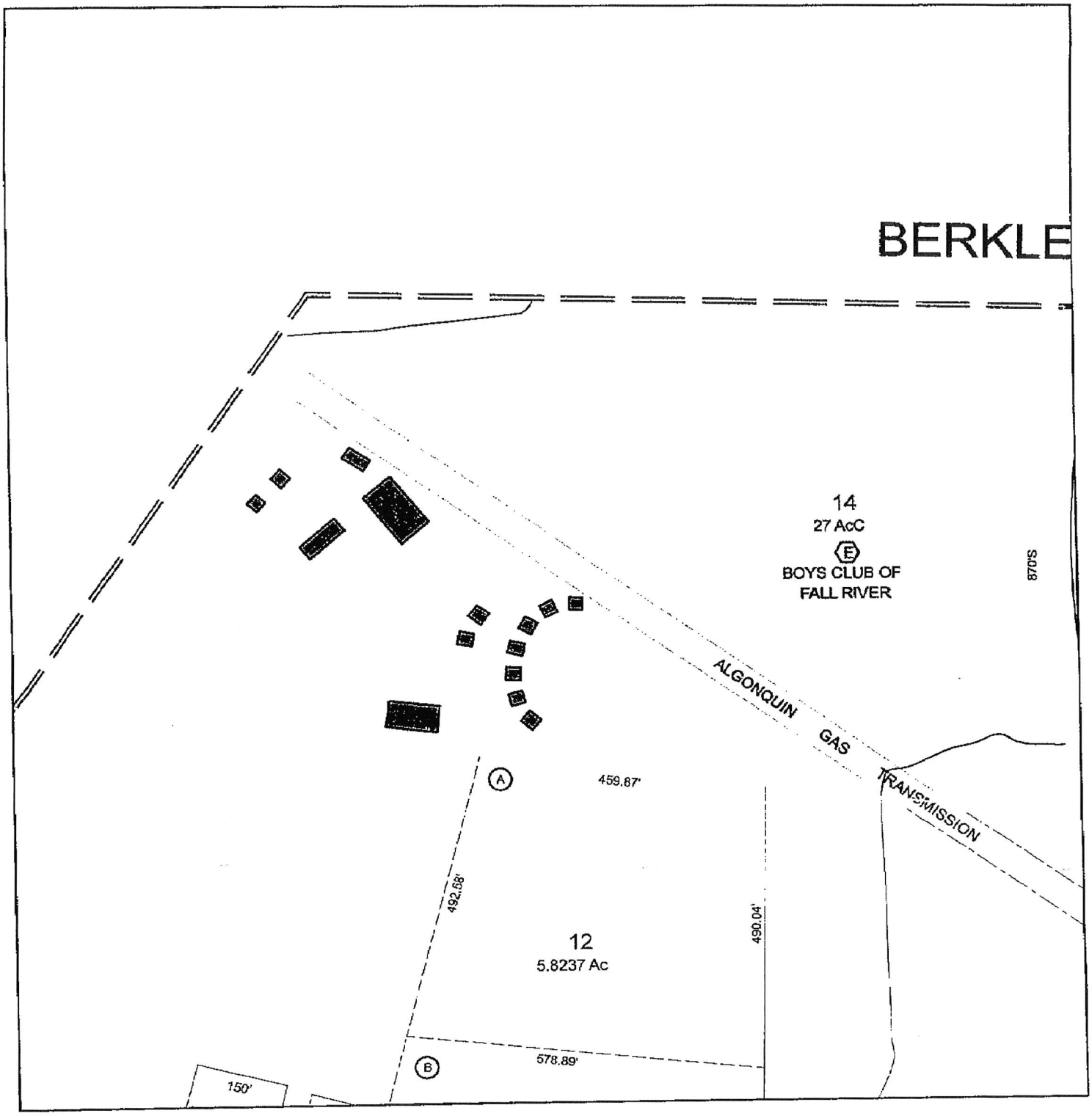
Boy's Club of Fall River Map 204 Lots 14 & 16

Freetown, MA

0 200 400 Feet

1/27/2009

N
W E
S

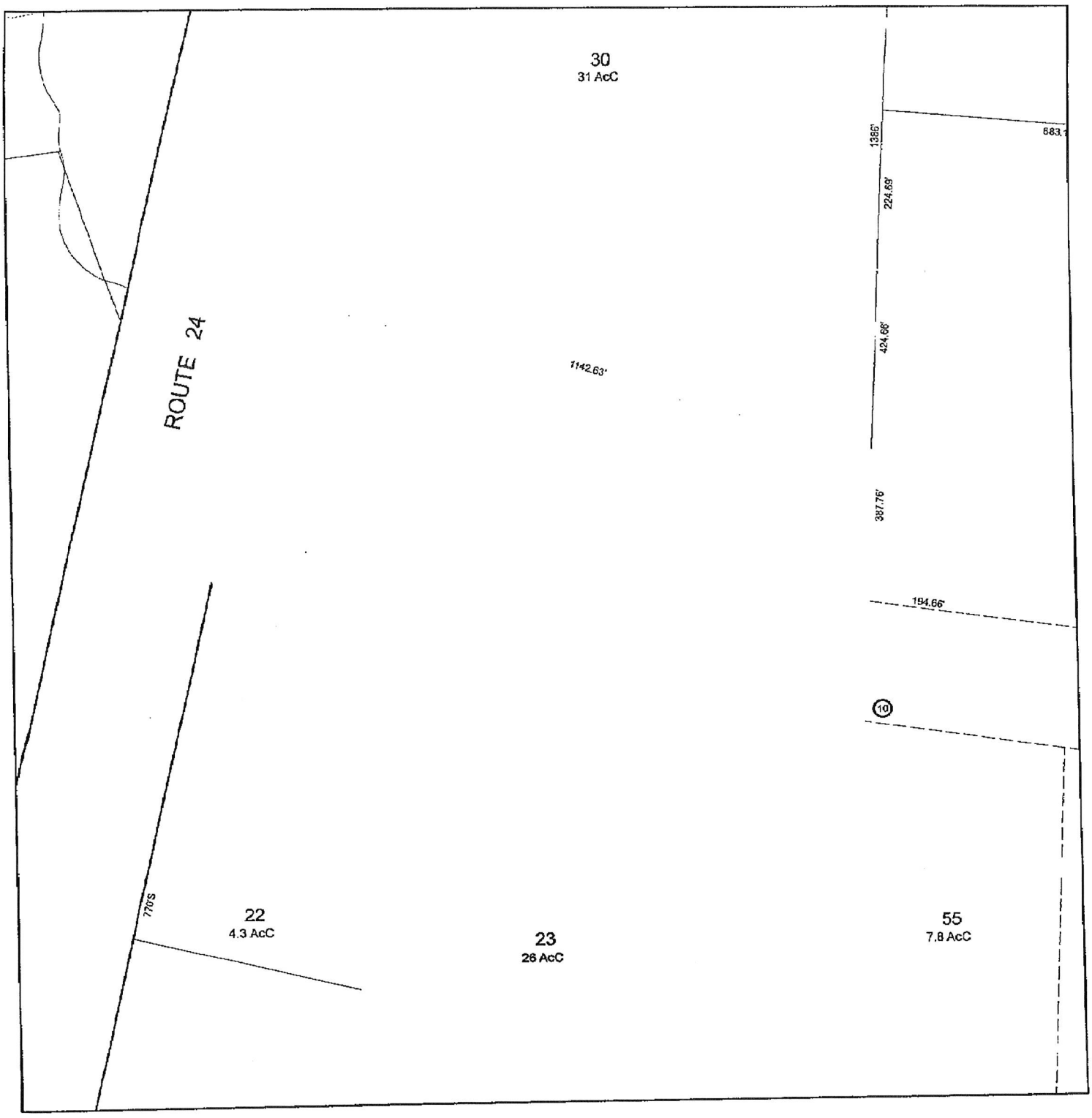


Boy's Club Camp Ground 127 N. Main St. Map 204 Lot 14

Freetown, MA

0 230 460 Feet

1/27/2009



Boys Club Camp Map 206 Lot 023

Freetown, MA

0 289 578 Feet

1/27/2009

N
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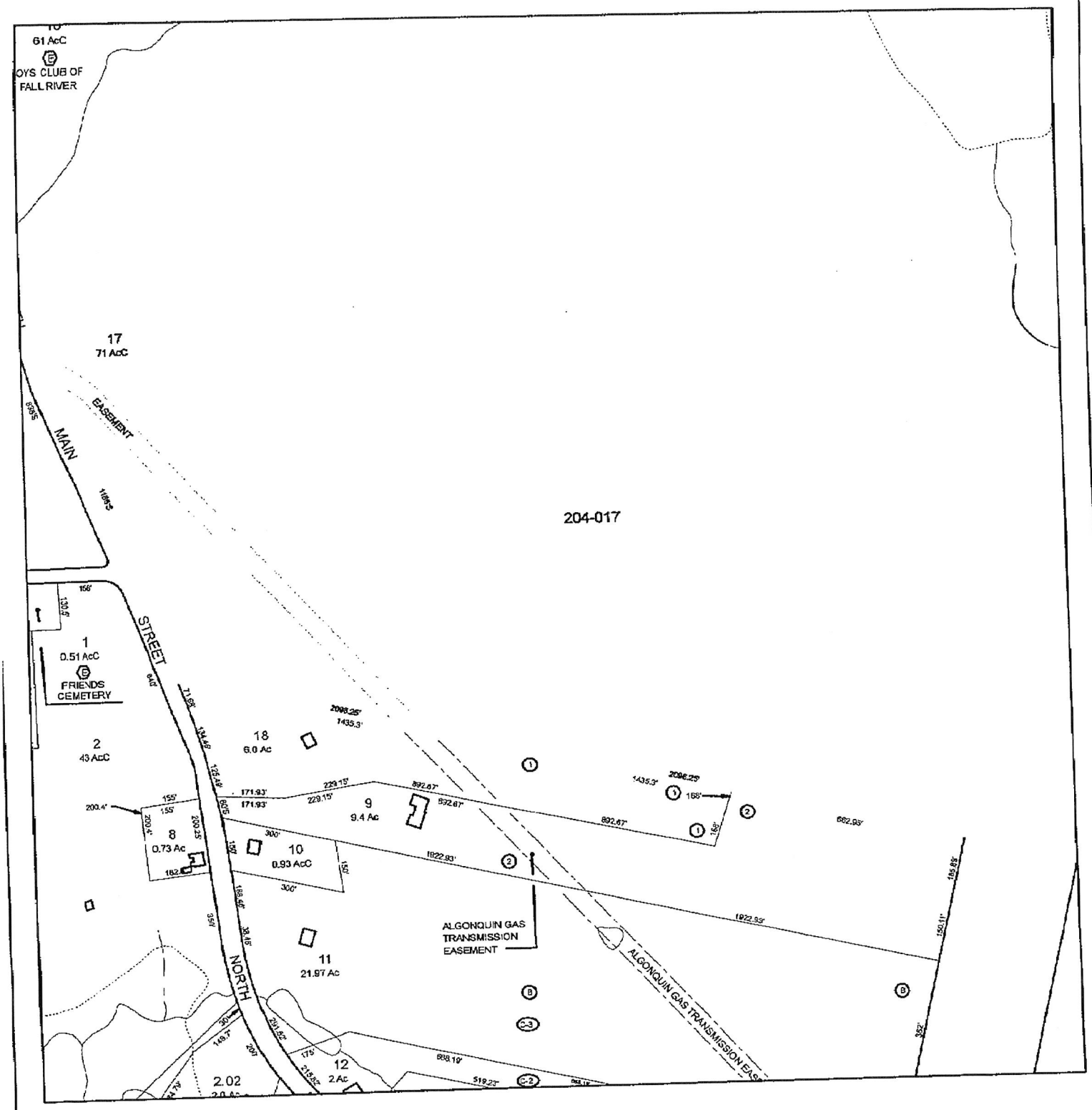


Wildlands Trust of SE Mass, Inc. Map 204 Lot 017

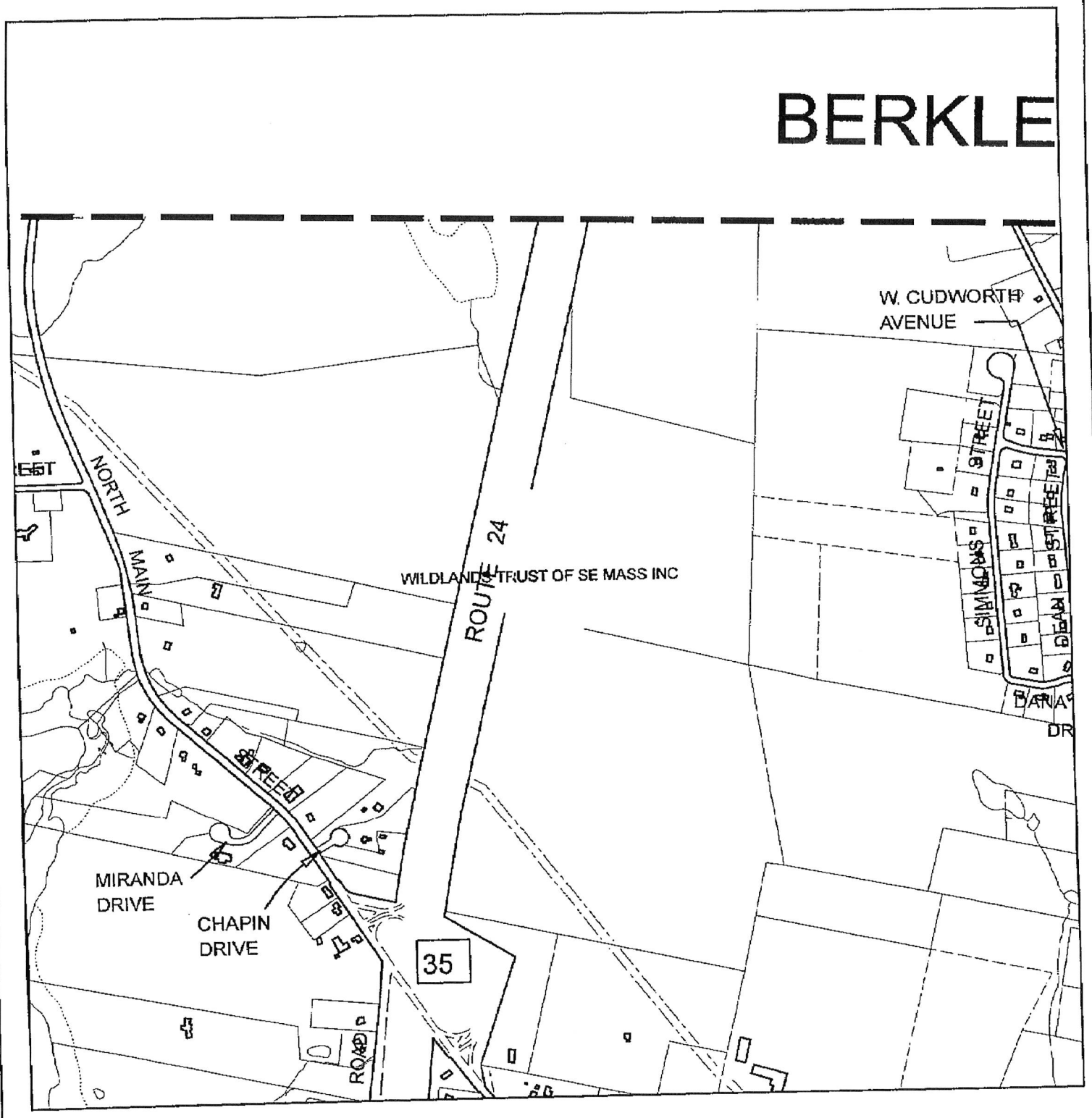
Freetown, MA

N
W E
S

0 364 728

Feet

1/27/2009

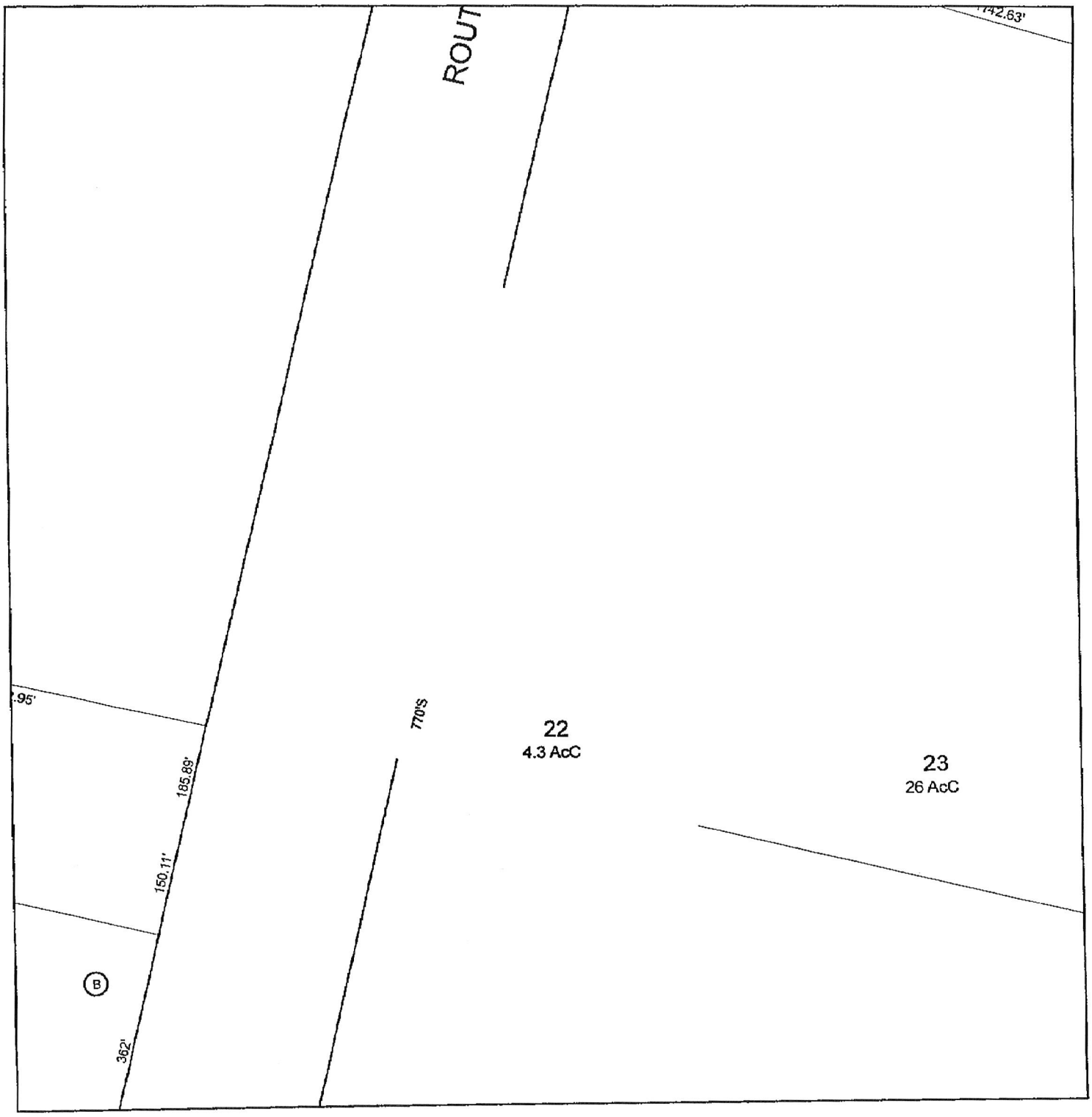


Wildlands Trust of SE Mass, Inc.
Freetown, MA

0 843 1,686 Feet

1/27/2009

N W E S

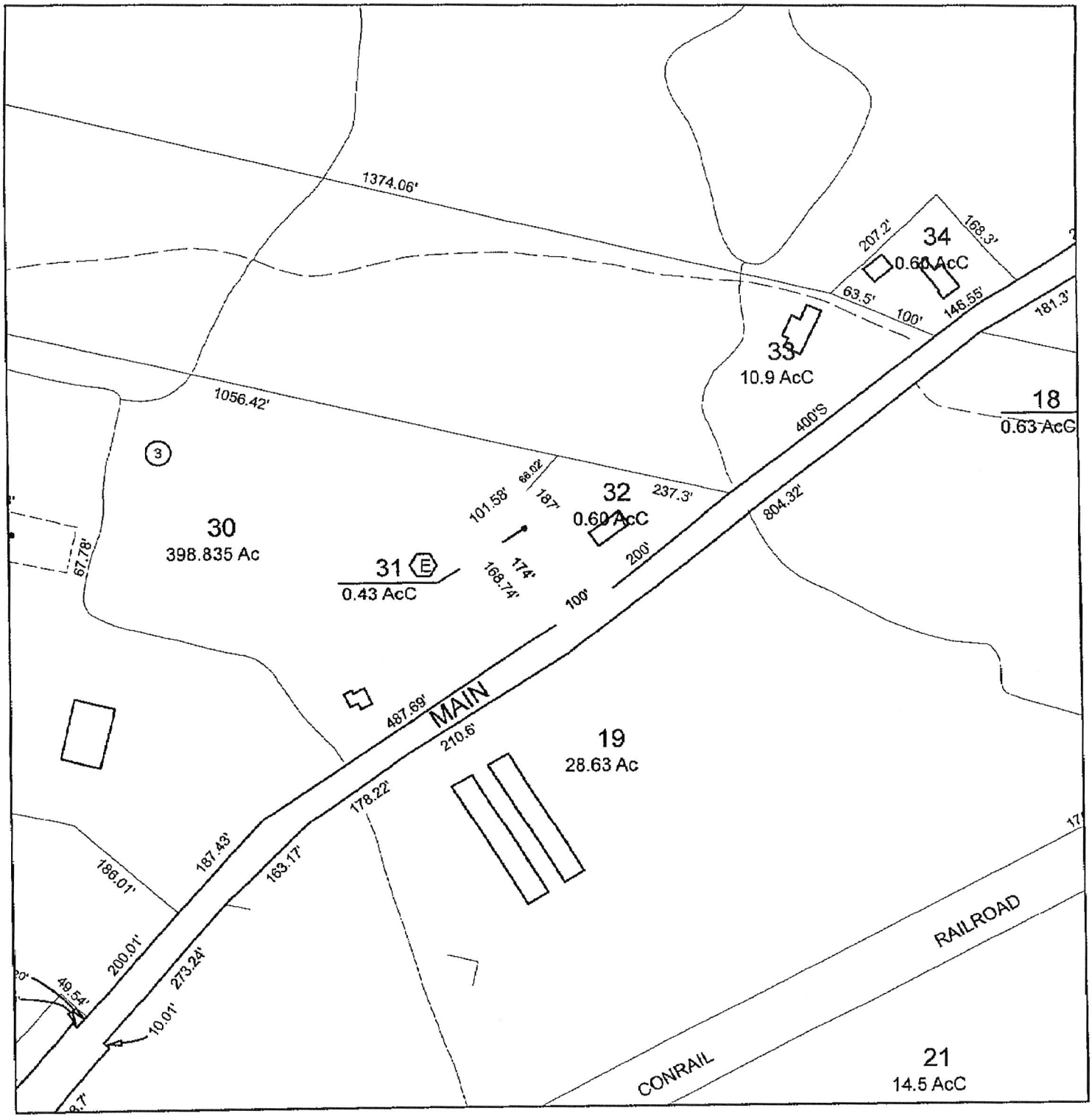


Wildlands Trust of SE MA Map 204 Lot 22
Freetown, MA

0 200 400
Feet

1/27/2009

N
W E
S



Freetown Conservation Land Map 233 Lot 31

Freetown, MA

0 200 400 Feet

N W E S

1/27/2009

T17

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Land Development
Environmental
Services

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January 28, 2009

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Laurie A. Carvalho
Town of Freetown Planning/Land Use Administrator
Town Hall
3 North Main Street
Assonet, MA 02702

RE: South Coast Rail Project

Dear Ms. Carvalho,

On behalf of the Executive Office of Transportation and Public Works (EOT), I would like to thank you for your prompt confirmation of Freetown properties currently protected and/or being used for active/passive recreation in proximity to the proposed South Coast Rail Project.

We are currently reviewing the provided information and supporting maps and will contact you with any questions. In the meantime, if you should have any questions, please call me at (617) 924-1770.

Your assistance with this request is greatly appreciated.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Kristen L. Peach

for Lisa Standley, Ph.D.
Chief Environmental Scientist

cc. Kristina Egan, EOT

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Boston, Massachusetts 02110-2354
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email: info@vhb.com
www.vhb.com

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Lakeville Planning Board
ATTN: James Marot, Chairman
346 Bedford Street
Lakeville, MA 02347

RE: South Coast Rail Project

Dear Sir,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Lakeville (see attached figures):

SITE NAME	OWNER	MANAGER
Fields associated with Apponquet Regional High School (2 parcels)	M102/M146	Regional School District

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and provide the following information:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property
- Map of the property (if available)

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Boston, Massachusetts 02110-2354
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email: info@vhb.com
www.vhb.com

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

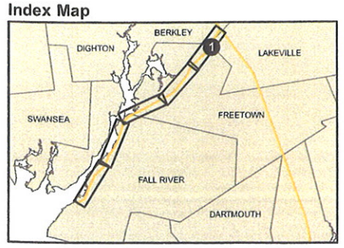
cc. Kristina Egan, EOT

11/12/2008
File: \\Maboss\projects\10111.00\GIS\project\Phase2\Wetlands\FRToMJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



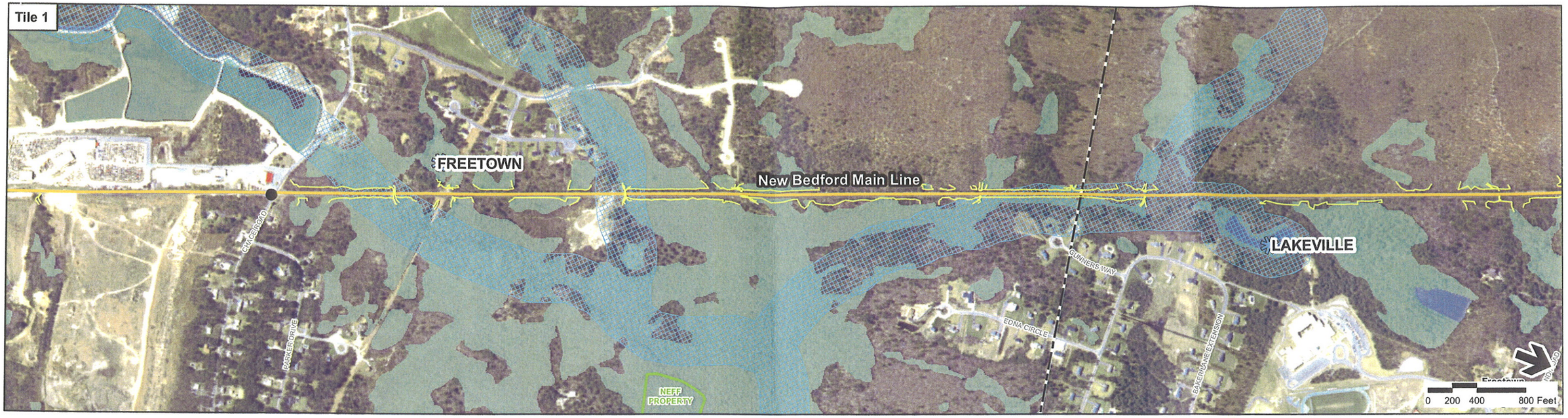
Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

SOUTH COAST RAIL

Figure 5-3c

Fall River Secondary to Myricks Junction

Tile 1



Tile 2

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\WetlandsNBToCJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- NHESP Certified Vernal Pools
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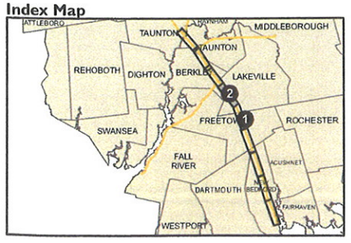
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-4c

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

LAKEVILLE

BERKLEY

TAUNTON
East Taunton
(South)

New Bedford Main Line

Fall River Secondary

Middleborough Secondary

Myricks Junction

MAPLE STREET
MILL STREET
MYRICK STREET
GROVE STREET
PIERCE AVENUE
CHURCH STREET
GADELFORD STREET
MACOMBER STREET
HILL STREET
PLAIN STREET EAST
BLOSSOM LANE
ORCHARD STREET
ROSE LANE
PLAIN STREET WEST
TURTLE LANE
PLAIN STREET
DEBRA DRIVE
CRABAPPLE DRIVE
COTLEY STREET
GALLERIA MALL DRIVE

79
24

0 200 400 800 Feet

11/13/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\NBToCJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
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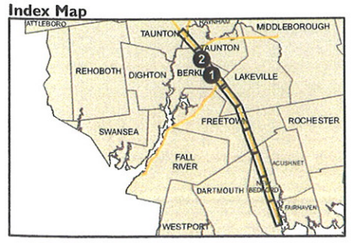
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-4d

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

TAUNTON
LAKEVILLE
MIDDLEBOROUGH
Middleborough Secondary
Middleborough Center
Middleborough Main Line
SHIRLEY ROAD
RICHMOND STREET
BIRCHWOOD DRIVE
MIDDLEBORO AVENUE
CROSS STREET
TAUNTON STREET
NORTH PRECINCT STREET
LEONARD STREET
BEDFORD STREET
KENNETH WELCH DRIVE
PARK ROAD
MASSASOIT STATE PARK
DERRY PARK DRIVE
WESTSIDE PLAYGROUND
UNNAMED ROAD
HILLSIDE AVENUE
WEST GROVE STREET
WEST STREET
VINE STREET
ELM STREET
COURTLAND STREET
COURTLAND AVENUE
BOURNE STREET
SOUTHMAYD STREET
OAK STREET
WORCESTER STREET
ROCK STREET
WOODLAND STREET
MAYFLOWER AVENUE
MITCHELL STREET
NEMASKET RIVER
Media Center
Mary K. Goode Elementary School
Henry B Burkland Intermed
CLARK STREET WEST
CLARK STREET EAST
PROSPECT STREET
EAST GROVE STREET
INTERSTATE 495
HASKELL CIRCLE
CREST DRIVE
0 200 400 800 Feet

11/13/2008
File \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\Midd_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commuter Rail
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
- Public Water Supplies
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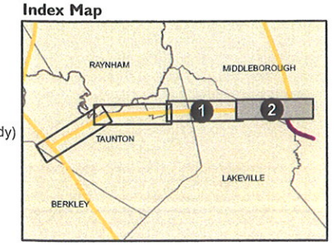
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-7b

Middleborough Secondary

Source: MassGIS, VHB
Prepared by: Vanasse Hangen Brustlin, Inc.

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Ruth McCawley Geoffroy, Town Planner
Middleborough Town Hall
10 Nickerson Avenue
Middleborough, MA 02346

RE: South Coast Rail Project

Dear Madam,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Middleborough (see attached):

SITE NAME	OWNER	MANAGER
Fields associated with Henry Burkland Elementary School	Town of Middleborough	Town of Middleborough School Department
Fields associated with Mary K Goode Elementary School	Town of Middleborough	Town of Middleborough School Department
Oliver Mill Park	Town of Middleborough	Town of Middleborough Parks Department
Westside Playground	Town of Middleborough	Town of Middleborough Parks Department

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and provide the following information:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property

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Boston, Massachusetts 02110-2354
617.728.7777 ▫ FAX 617.728.7782
email: info@vhb.com
www.vhb.com

- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

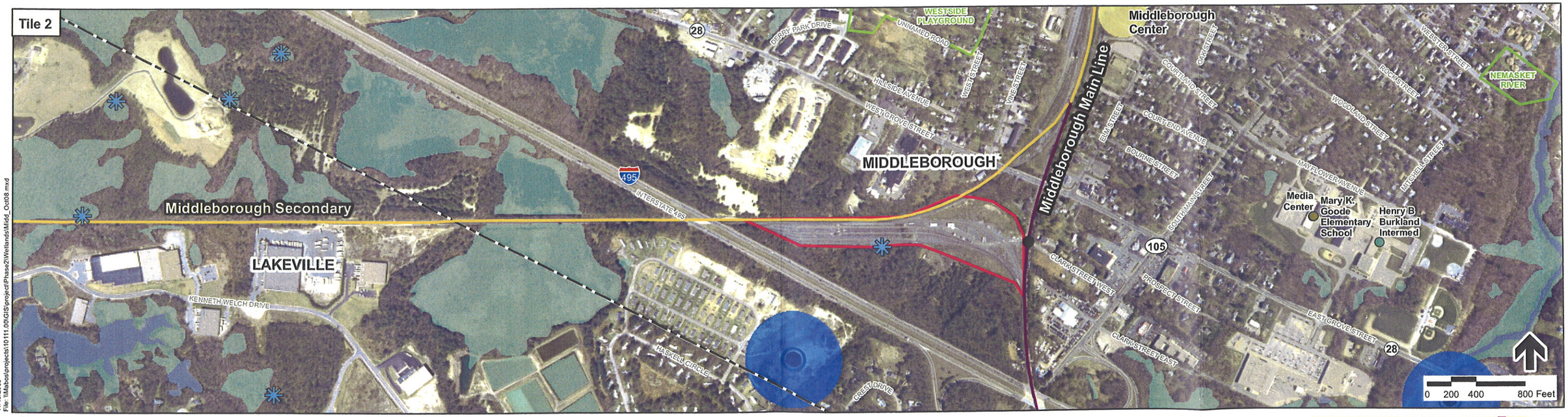
Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Map

cc. Kristina Egan, EOT

Tile 1

Tile 2



11/13/2008
File: \\Mabos\projects\10111.00\GIS\projectPhase2\WetlandsMidd_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commuter Rail
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
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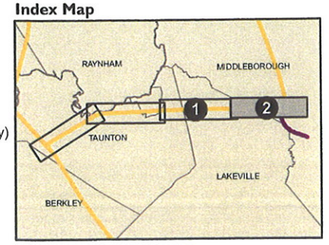
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-7b

Middleborough Secondary

Source: MassGIS, VHB
Prepared by: Vanasse Hangen Brustlin, Inc.

Subject: Middleborough open space properties--finally
Attachments: SCR-Open space map.pdf

From: Joyce Rowley [mailto:jrowley@middleborough.com]
Sent: Wednesday, February 11, 2009 4:21 PM
To: Standley, Lisa
Subject: Middleborough open space properties--finally

Hi, Lisa;
Attached is a pdf of the open space within ½ mile of the proposed village station site, and the Everett Street site. Open space within ½ mile of the layover site is for all intents and purposes the same as the village station site. Ownership is color coded, text below indicates ownership other than Town, or separate town agency. Middleborough Gas & Electric is not the same as the Town.

Below are the properties by number:
Village station, Layover sites

1. Westside school, West End playground. 11 acres. As name implies, playground, tot lot, two ball fields.
2. Middleborough Gas & Electric
3. Public library ½ acre
4. Police station ½ acre
5. Flora Clarke School ½ acre, school admin office
6. Pearl Street property 1 acre, unknown use
7. Town Hall (3 acre) and Lincoln Lynch School (not in service, 1.5 acre)
8. School Street School (historic school) 1 acre
9. Thomas Sproat Pierce Park, 24 acres, pool, skateboard park, fields
10. Mayflower Burkland School, 38.61 acres, Field of Dreams, 7.1 acres, 5 baseball diamonds, 3 basketball courts, two playgrounds, opne vield, indoor pool, ADA accessible.

Everett Street station site

11. Oliver Mill Park on Nemasket River, 5.16 acres, historic and passive recreation use, picnic tables, trails and bridges, herring run/fish ladder, canoe launch
12. Conservation Commission-owned 16.5 acres adjacent to Oliver Mill, passive recreation and wildlife viewing.
13. Town-owned Animal Shelter and waste water treatment plant, 9.6 acres total
14. Conservation-owned canoe launch area at end of Settler's Crossing, about 2 acres
15. Middleborough Water Department-owned well site, 31.2 acres total
16. Town-owned, 16.0 acres, unknown use.

Sorry it took so long—the info is not all in one place, and we have some really bizarre software called Integraph.

Regards,
Joyce E. Rowley, AICP
Staff Planner
Town of Middleborough
20 Centre Street
Middleborough, MA 02346
tel: 508-946-2425

N

W E

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14

16

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1

10

Town of Middleborough Open Space Properties Within 1/2 mile of Proposed South Coast Rail Station Sites

0 1000 2000 3000

Feet

Legend

1/2 mi radius Village Center Site	CONSERVATION COMMISSION
1/2 mile radius Everett Street Site 1	MIDDLEBOROUGH WATER DEPARTMENT
1/2 mile radius SCR	TOWN OF MIDDLEBOROUGH ALL
Everett Street Station Site 1	Comm of MA Open Space
Layover Station	THE WILDLANDS TRUST
Village Center site	RAILROAD

Middleborough Planning Department 2.11.09

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December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

David A. Kennedy, City Planner
New Bedford Planning Department
City Hall, Room 303,
133 William Street
New Bedford, MA 02740

RE: South Coast Rail Project

Dear Sir,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the City of New Bedford (see attached figures):

SITE NAME	OWNER	MANAGER
Fields associated with Ashley and Phillips Avenue Schools	City of New Bedford	City of New Bedford School Department
Baby Kenny's Tot Lot	City of New Bedford	City of New Bedford Parks and Recreation Department
Belleville Ave Playground	City of New Bedford	City of New Bedford Parks and Recreation Department
Brooklawn Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Clasky/Common Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Coast Guard Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Dias Field	City of New Bedford	City of New Bedford Parks and Recreation Department
Edward James Playground	City of New Bedford	City of New Bedford Parks and Recreation Department
Fisherman's Wharf Pier #3	City of New Bedford	(Unavailable)
Fields associated with Hayden-McFadden and Mount Pleasant Schools	City of New Bedford	City of New Bedford School Department
Hicks-Logan Play Area	City of New Bedford	City of New Bedford Parks and Recreation Department
Fields associated with Lincoln School	City of New Bedford	City of New Bedford School Department
Marine Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Monte Playground	City of New Bedford	City of New Bedford Parks and Recreation Department
Fields associated with	City of New Bedford	City of New Bedford School Department
Playground associated with Parker Street School	City of New Bedford	City of New Bedford School Department
Pine Hill Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Rasmus Tonnessen Park	City of New Bedford	City of New Bedford Parks and Recreation Department
Riverside Park	City of New Bedford	City of New Bedford Parks and Recreation Department

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Boston, Massachusetts 02110-2354
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email: info@vhb.com
www.vhb.com

SITE NAME	OWNER	MANAGER
Salvation Army Play Area	City of New Bedford	(Unavailable)
Recreation area associated with Satellite Village	City of New Bedford	City of New Bedford Housing Authority
Wings Ct	City of New Bedford	City of New Bedford Parks and Recreation Department

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

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- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property
- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

Nativity Prep School
New Bedford Free Public Library
SALVATION ARMY PLAY AREA
BABY KENNY'S TOT LOT
WINGS COURT
Greater New Bedford Community Health Center, Inc.
John Avery Parker
Child and Family Services
CLASKY/COMMON PARK
Whale's Tooth
State Pier
Fisherman's Wharf Pier #3
NEW BEDFORD
Hayden/McFadden
St Anthony Elem
HICKS-LOGAN PLAY AREA
Phillips Avenue
New Bedford Main Line
JOHN P KENNEDY HIGHWAY
ACUSHNET AVENUE
HERMAN MELVILLE BOULEVARD
JOAQUIM PRINA AVENUE
MACARTHUR DRIVE
WATER STREET
PURCHASE STREET
COUNTY STREET
HILL STREET
WALDEN STREET
FOSTER STREET
MAYFIELD STREET
CAMPBELL STREET
WILLIS STREET
PEARL STREET
POPE STREET
FRANKLIN STREET
MERRIMAC STREET
HAZARD STREET
STUDLEY STREET
ASHLAND PLACE
LINDEN STREET
REYNOLDS STREET
WELD STREET
STATE STREET
CLARK STREET
PENNIMAN STREET
CEDAR GROVE STREET
PECKHAM STREET
ADAMS STREET
MYRTLE STREET
BEACON STREET
VAN BUREN STREET
CHURCH STREET
BROOK STREET
JEAN STREET
SAWYER STREET
GOODELL HILL STREET
BENTLEY STREET
BESTLE STREET
HOLLY STREET
TILLMAN STREET
DEAN STREET
DURANT COURT
COFFIN AVENUE
BULLARD STREET
PHILLIPS AVENUE
INTERSTATE 195
WAMSUTTA STREET
LOGAN STREET
HOWE STREET
HICKS STREET
WASHBURN STREET
MADISON STREET
SCHOOL STREET
UNION STREET
WILLIAM STREET
MECHANICS LANE
ELM STREET
SECOND STREET
PIKE STREET
ROUTE 6
18
195

Dartmouth Secondary
STANLEY STREET
MOUNT PLEASANT STREET
ALFRED BESSETTE MEMORIAL HIGHWAY
140
KINGS HIGHWAY
Kings Highway
LAMBETH STREET
NEW BEDFORD
New Bedford Main Line
KING STREET
EDISON STREET
BROOK STREET
NASH ROAD
DAVIS STREET
BRUCE STREET
HATHAWAY STREET
TUKHAM STREET
WHITMAN STREET
EUGENIA STREET
ASHLEY BOULEVARD
GLENWOOD STREET
QUEEN STREET
CENTRAL AVENUE
SAW STREET
CLIFFORD STREET
PARKDALE STREET
IRVINGDALE STREET
CARLISLE STREET
SEABURY STREET
MAYWOOD STREET
LAFAYETTE STREET
MILFORD STREET
BROOKLAWN AVENUE
WOODS STREET
PARK AVENUE
TARKILN HILL ROAD
WORCESTER STREET
BROCKTON STREET
OLIVER STREET
PRESCOTT STREET
HAWES STREET
MAIN STREET
CHAFFEE STREET
Abraham Lincoln
Charles S Ashley
Little People's College
18
140

0 200 400 800 Feet

11/13/2008
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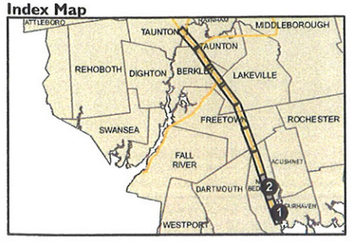
Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Zone A Surface Water Supply Protection Areas
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-4a

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

ACUSHNET CEDAR SWAMP STATE RES

ACUSHNET CEDAR SWAMP STATE RES

NEW BEDFORD

New Bedford Main Line

DARTMOUTH

JOHN VERTENTE BOULEVARD

SAMUEL PARKER BOULEVARD

140

ALFRED BESSETTE MEMORIAL HIGHWAY

AMANDA AVENUE

CHARLES S. MCCOMBS BOULEVARD

IRENE STREET

MAXINE STREET

DOREEN STREET

WELBY ROAD

PHILLIPS ROAD

DUCHAINE BOULEVARD

0 200 400 800 Feet

Tile 2

DARTMOUTH

QUANAPOAG ROAD

CHIPAWAY ROAD

FREETOWN

New Bedford Main Line

BRALEY ROAD

NEW BEDFORD

0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\101111.00\GIS\project\Phase2\Wetlands\NBToCJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
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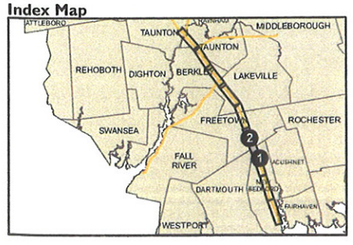

EOT

SOUTH COAST RAIL

Figure 5-4b

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Transportation
Land Development
Environmental
Services

imagination | innovation | energy Creating results for our clients and benefits for our communities

December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Town Planner
Town of Raynham
558 South Main Street
Raynham, MA 02767

RE: South Coast Rail Project

Dear Sir or Madam,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Raynham (see attached figures):

SITE NAME	OWNER	MANAGER
Borden Colony Recreation Area	Town of Raynham	Town of Raynham Recreation Commission
Dam Lot Brook Conservation Area	Town of Raynham	Town of Raynham Conservation Commission
Fields associated with Laliberte and Merrill Schools	Town of Raynham	Town of Raynham School Department
Pine Swamp	Town of Raynham	Town of Raynham Conservation Commission
Terra Property	City of Taunton	City of Taunton Conservation Commission
Woodland Conservation	Town of Raynham	Town of Raynham Conservation Commission

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and provide the following information:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property
- Map of the property (if available)

99 High Street, 10th Floor
Boston, Massachusetts 02110-2354
617.728.7777 • FAX 617.728.7782
email: info@vhb.com
www.vhb.com

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

New Bedford Main Line

Cotley Junction

Library
Bristol-
Plymouth
Voc Tech

Cotley River

RAYNHAM

Middleborough Secondary

TAUNTON

BERKLEY

East
Taunton
(South)

ALLISON AVENUE
MOZZONE BOULEVARD
COUNTY STREET
PLAIN STREET
INDUSTRIAL DRIVE
AMVETS MEMORIAL HIGHWAY
STEVENS STREET
PINEHILL STREET
AZALEA DRIVE
GARDEN STREET
WOODLAWN STREET
CASWELL STREET
CENTER STREET
QUINN STREET
RED LANE
BATTLE ROW

140
24

0 200 400 800 Feet

SAWMILL HILL STREET
SOUTH STREET EAST
OLD COLONY AVENUE
LIBERTY STREET
MIDDLEBORO AVENUE
DOWNY CIRCLE
SEAVER STREET
KING STREET
NORTH FRENCH STREET
CHURCH STREET
SHIRLEY ROAD
PARK PLACE
PARK ROAD
MASSASOIT
STATE
PARK

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commut er Rail
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
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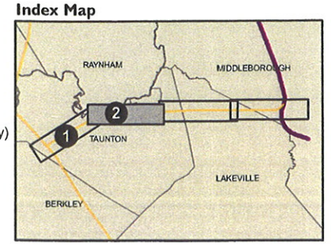
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-7a

Middleborough Secondary

Source: MassGIS, VHB
Prepared by: Vanasse Hangen Brustlin, Inc.

Tile 1

Tile 2

Attleboro Secondary
New Bedford Main Line
Whittenton Junction
Whittenton Branch
Rebuild Bridge
Mill River
Prospect Hill Pond
TAUNTON
Whittenton
RAYNHAM
PLAYGROUND
Noblin Well Site
Noblin Well Site
Stoughton Line
Northbrook Academy
138
0 200 400 800 Feet

JOANNE DRIVE
LORI LANE
DUNBAR STREET
FREMONT STREET
JUSTINE LANE
WEST BRITANNIA STREET
ELDRIDGE STREET
ROCKLAND STREET
MEADOW STREET
COTTAGE STREET
LAWRENCE STREET
MATTESON LANE
STATE STREET
ALGER AVENUE
WHITTENTON STREET
FIRST AVENUE
THIRD AVENUE
FOURTH AVENUE
FIFTH AVENUE
WASHINGTON STREET
JACKSON STREET
WILSON AVENUE
VAN BUREN STREET
VAN BUREN COURT STREET
BUTLER STREET
MADOR AVENUE
RAY STREET
PLEADWELL STREET
TAYLOR STREET
GARFIELD STREET
WAVERLY STREET
RICHARD STREET
RUSSELL STREET
LISA DRIVE
ABBEY LANE
SUNSET DRIVE
KURTS PLACE
HOFFMAN STREET
THERESA STREET
BROADWAY
CODY LANE
SCADDING STREET
PROSPECT HILL STREET
REGAN CIRCLE
GREENVIEW LANE
REDWOOD DRIVE
ANDREW AVENUE
EMMA AVENUE
ROBERT AVENUE
MIDDLE STREET
NORMAN AVENUE
KINGPHILIP STREET
BRITTON STREET
GILMORE STREET
CENTER STREET
THE S WAY
DANIELS ROAD
SACHEM ROAD

11/12/2008
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Legend

- Community Health Centers
- Hospitals
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- Schools
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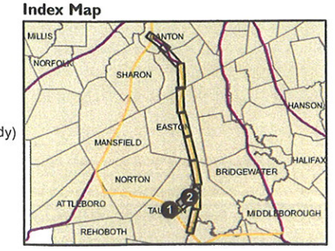
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-9a

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

New Bedford Main Line

Weir Junction

Taunton River

Taunton

TAUNTON

Stoughton Line

RAYNHAM

Taunton Catholic Middle

Summer Street School

PLONKA PROPERTY

PINE SWAMP CONSERVATION AREA

Northbrook Academy

0 200 400 800 Feet

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commuter Rail
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
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- Public Water Supplies
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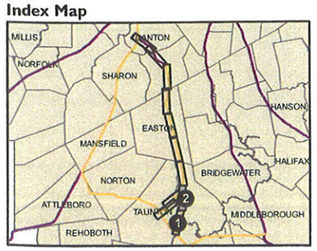
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

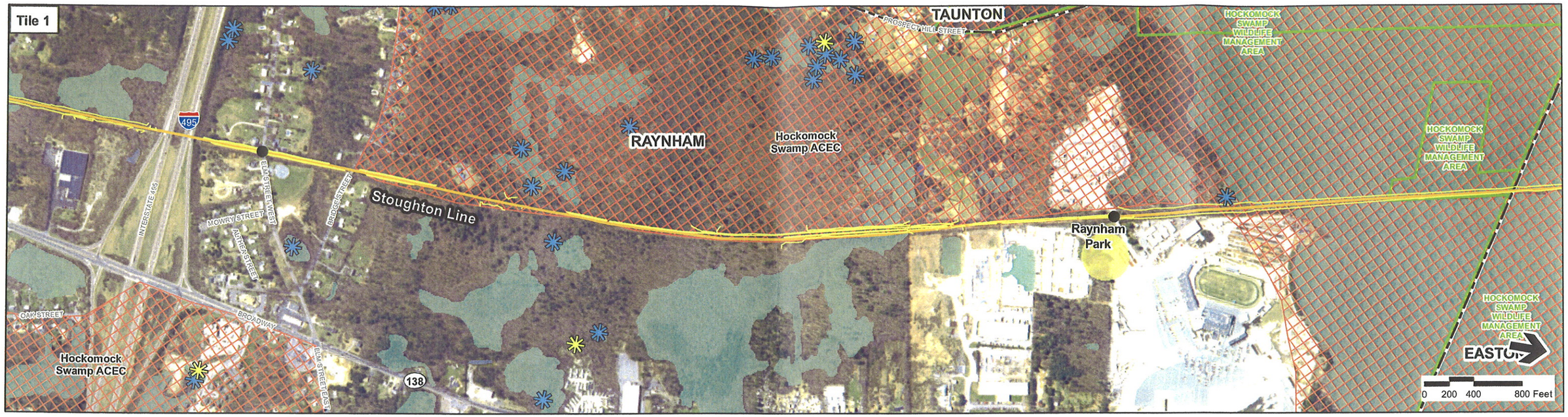
SOUTH COAST RAIL

Figure 5-9b

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1



Tile 2

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
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- MBTA Commuter Rail
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- NHESP Potential Vernal Pools
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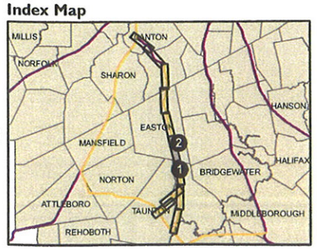
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-9c

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

Bristol-Plymouth Voc Tech Library

TAUNTON

RAYNHAM

Cotley River

TERRA PROPERTY

WOODLAND CONSERVATION

DAM LOT BROOK CONSERVATION AREA

Merrill Elementary School

Laliberte Elementary School

Hockomock Swamp ACEC

INDUSTRIAL DRIVE
COUNTY STREET
140
POOLE STREET
MARSH DRIVE
INDIAN TEA LOOP DRIVE
WILLIAMS STREET
ROUNDTABLE LANE
PRINCESS KATE CIRCLE
24
AMVETS MEMORIAL HIGHWAY
HART STREET
OLD HART STREET
WILLIAMS AVENUE
COLONIAL DRIVE
PAUL REVERE TERRACE
MIDDLEBORO AVENUE
SOUTH STREET WEST
SOUTH STREET
0 200 400 800 Feet

SOUTH STREET WEST
WARREN STREET WEST
ROUTE 44
ORCHARD STREET
SUNSET DRIVE
JUDSON STREET
WARREN STREET EAST
MACY STREET
SULLY ROAD
TELL ROAD
RUTH ELLEN ROAD
BARBARA ROAD
EDWARD ROAD
FRANCINE ROAD
MICHAEL ROAD
NICHOLAS ROAD
ELEANOR ROAD
KING STREET
OLD KING STREET
LOCUST STREET
DARRINGTON DRIVE
PLEASANT STREET

11/12/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rapid Bus Alternative
- Proposed Station Site
- MBTA Commuter Rail Station
- MBTA Commuter Rail
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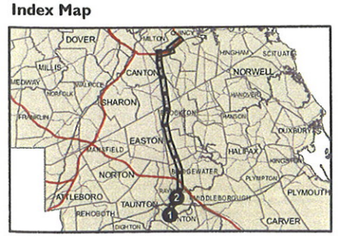
Index Map



EOT

SOUTH COAST RAIL

Figure 5-10a

Alternative 5 - Rapid Bus

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

RAYNHAM

BRIDGEWATER

WEST BRIDGEWATER

Hockomock Swamp ACEC

Reversible Busway

AMVETS MEMORIAL HIGHWAY

INTERSTATE 495

HOCKOMOCK SWAMP WILDLIFE MANAGEMENT AREA

HANDI KIDS

LOCUST STREET

PLEASANT STREET

FRUIT STREET

PINE STREET

BEALS ROAD

FAIRWAY DRIVE

GLORIA DRIVE

OLD PLEASANT STREET

MAPLE STREET

FIRST STREET

ELM STREET

SCOTLAND STREET

0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\101111 00\GIS\Project\Phase2\Wetlands\Zipper\Zipper_Oct08pg1.mxd

Legend

- Community Health Centers
- Hospitals
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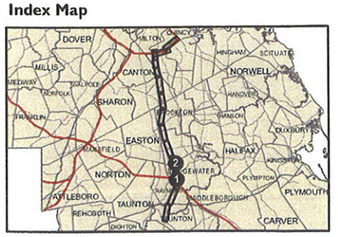

EOT

SOUTH COAST RAIL

Figure 5-10b

Alternative 5 - Rapid Bus

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Transportation
Land Development
Environmental
Services

imagination | innovation | energy Creating results for our clients and benefits for our communities

December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Planning Board
Town of Stoughton
10 Pearl Street
Stoughton, MA 02072

RE: South Coast Rail Project

Dear Sir or Madam,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the Town of Stoughton (see attached figures):

SITE NAME	OWNER	MANAGER
Cedar Swamp	Town of Stoughton	Town of Stoughton Conservation Commission
Former Shiretown Parcel	Town of Stoughton	Town of Stoughton Conservation Commission
Halbran Field	Town of Stoughton	Town of Stoughton Recreation Department
Fields associated with Gibbons School	Town of Stoughton	Town of Stoughton Recreation Department
Fields associated with Jones School and High School	Town of Stoughton	Town of Stoughton Recreation Department
Lehan Field	Town of Stoughton	Town of Stoughton Recreation Department
Libby Farm	Town of Stoughton	Town of Stoughton Conservation Commission
Lipsky Field	Town of Stoughton	Town of Stoughton Recreation Department
Marks Field	Town of Stoughton	Town of Stoughton Recreation Department
Meads Meadow	Town of Stoughton	Town of Stoughton Recreation Department
North Stoughton Tot Lot	Town of Stoughton	Town of Stoughton Recreation Department
Fields associated with West Elementary School	Town of Stoughton	Town of Stoughton Recreation Department
Stoughton Memorial Conservation Land	Town of Stoughton	Town of Stoughton Conservation Commission
T.L. Edwards Estate	Town of Stoughton	Town of Stoughton Conservation Commission
Woods Pond	Town of Stoughton	Town of Stoughton Conservation Commission
Bird Street Conservation Area	Town of Stoughton	Town of Stoughton Conservation Commission
Elm Street Field	(unavailable)	(unavailable)
D. Forbes Estate	(unavailable)	(unavailable)

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

99 High Street, 10th Floor
Boston, Massachusetts 02110-2354
617.728.7777 ▪ FAX 617.728.7782
email: info@vhb.com
www.vhb.com

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

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- Brief description/uses of the property
- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

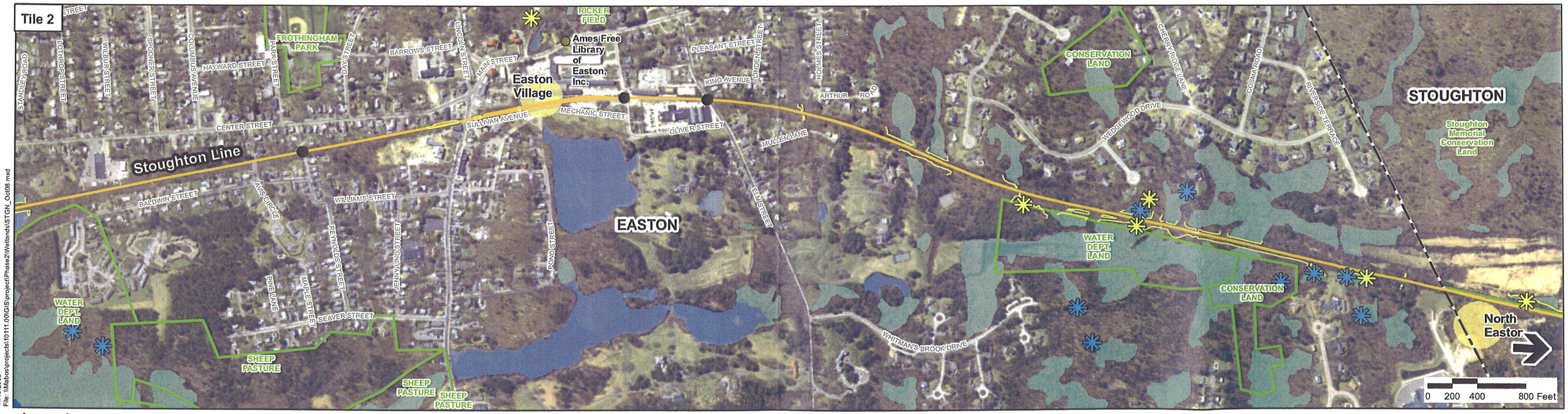
Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2



11/13/2008
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Legend

- Community Health Centers
- Hospitals
- Libraries
- Colleges
- Schools
- Town Boundaries
- Proposed Rail Alternative
- Grade Crossings
- Proposed Station Site
- Existing Layover Facilities
- MBTA Commuter Rail Station
- MBTA Commuter Rail
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- NHESP Potential Vernal Pools
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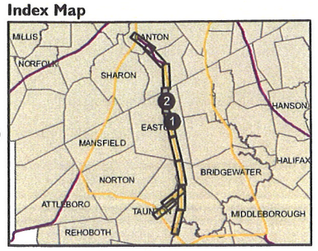
- Public Water Supplies
- Zone I (400ft buffer of Public Water Supplies)
- Area of Critical Envrionmental Concern (ACEC)
- Public Open Space
- Flagged Wetland (Previous Study)
- DEP Wetlands
- DEP Open Water

Index Map



EOT

SOUTH COAST RAIL

Figure 5-9d

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

Stoughton Line

STOUGHTON

North Easton

Stoughton Memorial Conservation Land

Libby Farm

CEDAR SWAMP

MEADS MEADOW

D. FORBES ESTATE

BOLIVAR SWIMMING AREA

WD PROPERTY OFF PLEASANT STREET

Stoughton Public Library

Edwin A Jones School

Media Center

O'Donnell Middle School Library Media Center

West Elementary School Library

Stoughton High Media Center

CANTON

MORTON STREET
SUMMER AVENUE
WYMAN STREET
SUMMER STREET
MALCOLM ROAD
MARRON AVENUE
BIRD STREET
FOREST ROAD
HOLLAND AVENUE
COURTNEY AVENUE
COLUMBUS AVENUE
PLAIN STREET
BELL STREET
ROGERS DRIVE
GREG ROAD
DIVO DRIVE
BROOKS STREET
SMYTH STREET
WASHINGTON STREET
WALNUT AVENUE
CRESCENT AVENUE
PINDELEY STREET
WALNUT STREET
PARK STREET
PARK AVENUE
CAY STREET
BRICKEL ROAD
SHIRLEY ROAD
SUMMER STREET
LUCAS DRIVE
STEPHANIE DRIVE
KELSEY DRIVE
HALBRAN
138
27

FIELD
SPRING STREET
WATER STREET
MAPLE STREET
ELM STREET FIELD
DRAKE AVENUE
MEMORIAL DRIVE
BROOK STREET
TOSCA DRIVE
MECHANIC STREET
BAILEY STREET
PERRY STREET
WINTER STREET
PERRY AVENUE
SUMMER AVENUE
STODDARD STREET
LIPSKY FIELD
ATHERTON STREET
CANTON STREET
EVANS DRIVE
SCHOOL STREET
SUMMER STREET
CUSHING STREET
CENTRAL STREET
STATION STREET
CROSS STREET
PINE STREET
NORTH STREET
SPRINGDALE AVENUE
HORAN WAY
CAREY CIRCLE
FIORELLO ROAD
GONSALVES WAY
DUGGAN STREET
MARJORIE ROAD
JANICE ROAD
JOYCE DRIVE
MOREAU STREET
TRUDY TERRACE
REBECA ROAD
ROSE STREET
CLAPP STREET
PEARL STREET PLACE
ADAMS STREET
PEARL STREET
LIPSKY WAY
PARSONS STREET
COMMERCIAL STREET
RECORD STREET
COLUMBIA STREET
DONAHUE WAY
PORTER STREET
GREEMAN STREET
BOLIVAR ST
CABOT

0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\STGN_Oct08.mxd

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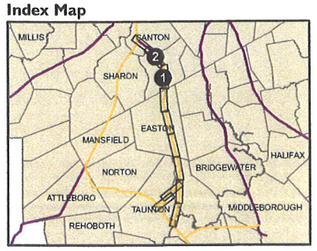


EOT

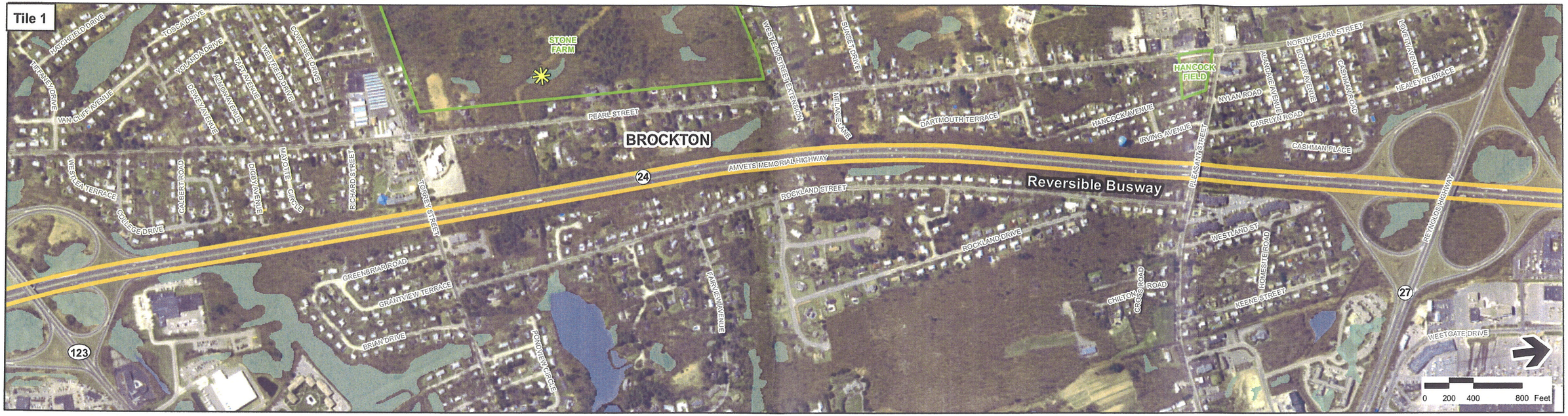
SOUTH COAST RAIL

Figure 5-9e

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1



Tile 2

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Legend

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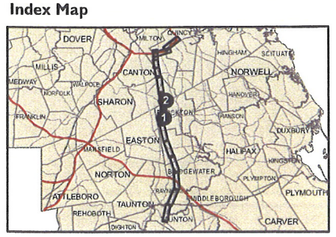

EOT

SOUTH COAST RAIL

Figure 5-10d

Alternative 5 - Rapid Bus

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\Zipper\Zipper_Oct08rp1.mxd

Legend

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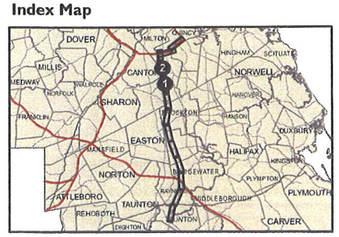

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Figure 5-10e

Alternative 5 - Rapid Bus

Transportation
Land Development
Environmental
Services

imagination | innovation | energy Creating results for our clients and benefits for our communities

December 23, 2008

Vanasse Hangen Brustlin, Inc.

Ref: 10111.31

Michael J. Ferreira
Community Development Director
City of Taunton
45 School Street
Taunton, MA 02780

RE: South Coast Rail Project

Dear Sir,

The Executive Office of Transportation and Public Works (EOT) is proposing a transportation project to provide public transportation between Boston and the cities of Fall River and New Bedford within the Commonwealth's South Coast region. The South Coast Rail project is undergoing a joint state (MEPA) and federal (NEPA) environmental review process. An Environmental Notification Form (ENF) was submitted for review under MEPA on November 17, 2008. As noted in the ENF, based upon Massachusetts Geographic Information Systems (MassGIS), segments of the South Coast Rail alternatives are in proximity to open space owned by the City of Taunton (see attached figures):

SITE NAME	OWNER	MANAGER
Fields associated with Bristol Plymouth Regional Technical School	City of Taunton	City of Taunton School Department
Bunk Pond	City of Taunton	City of Taunton Conservation Commission
Dever State School/Watson Pond	(unavailable)	(unavailable)
Memorial Park	City of Taunton	City of Taunton Parks and Recreation Department
Mill River Park	City of Taunton	City of Taunton Parks and Recreation Department
Plonka Property	City of Taunton	City of Taunton Conservation Commission
Fields associated with Taunton High School	City of Taunton	City of Taunton School Department
Terra Property	City of Taunton	City of Taunton Conservation Commission
Union Plaza	City of Taunton	City of Taunton Parks and Recreation Department
Weir Park	City of Taunton	City of Taunton Parks and Recreation Department
Woodward Springs	City of Taunton	City of Taunton Conservation Commission
(Unnamed)	City of Taunton	City of Taunton Parks and Recreation Department

Source: MassGIS
Note: Each site identified in this table may not be depicted on the attached figures.

We ask that you confirm that this list of public open space properties is accurate and complete, and confirm the use (passive recreation, active recreation, etc) for each property that is in proximity to the proposed alternatives. Proximity is defined as those parcels that abut, could potentially abut, or are within a ½-mile of a potential station location or existing or proposed rail right-of-way.

99 High Street, 10th Floor
Boston, Massachusetts 02110-2354
617.728.7777 ▪ FAX 617.728.7782
email: info@vhb.com
www.vhb.com

If there are protected public parks or recreation areas that are not on this list, we kindly request that you identify them and provide the following information:

- Name and address of parcel
- Owner's name (if not owned by the Town)
- Size (in acres) of the property
- Brief description/uses of the property
- Map of the property (if available)

Your assistance with this request is greatly appreciated. If we do not hear from you before January 16, 2009, we will be following up via phone. In the meantime, if you have any questions, please call me at (617) 924-1770.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Lisa Standley

Lisa Standley, Ph.D.
Chief Environmental Scientist

Enclosure: Site Locus Maps

cc. Kristina Egan, EOT

Tile 1

Tile 2

LAKEVILLE

New Bedford Main Line

Fall River Secondary

Myricks Junction

BERKLEY

TAUNTON
East Taunton
(South)

Middleborough Secondary

0 200 400 800 Feet

11/13/2008
File: \\Maboslprojects\10111.00\GIS\projectPhase2\Wetlands\NBToCJ_Oct08.mxd

Legend

- Community Health Centers
- Hospitals
- Libraries
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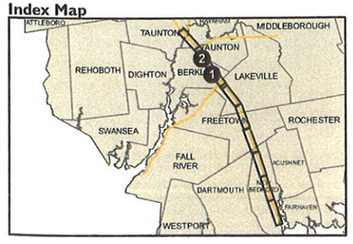
Index Map



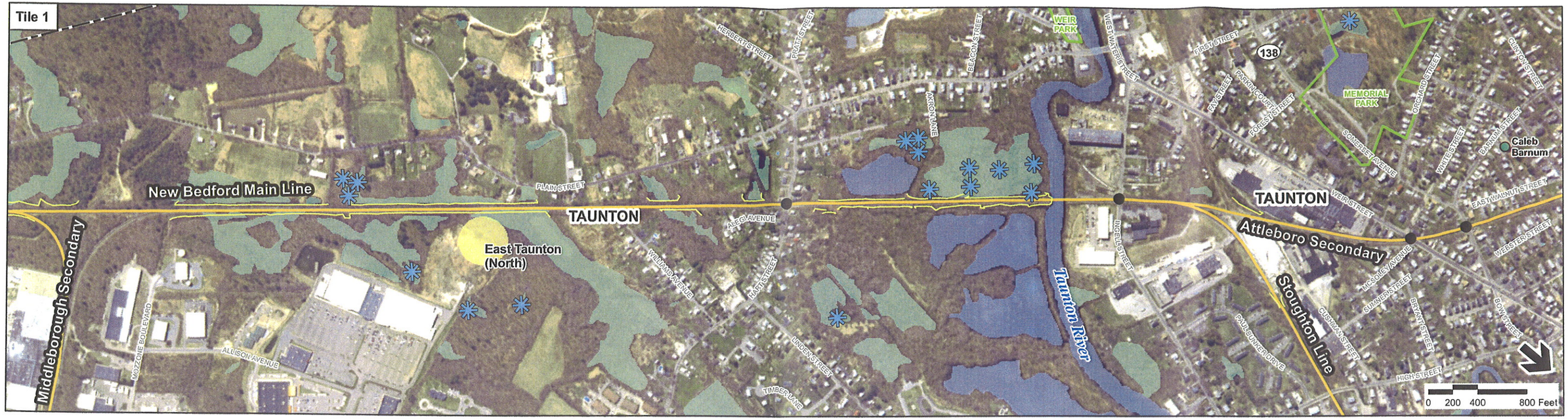
EOT

SOUTH COAST RAIL

Figure 5-4d

New Bedford Main Line to Weir Junction

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc



11/13/2008
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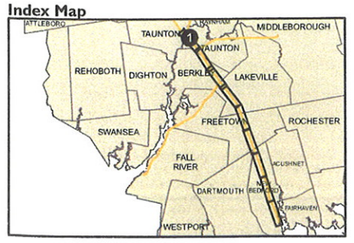


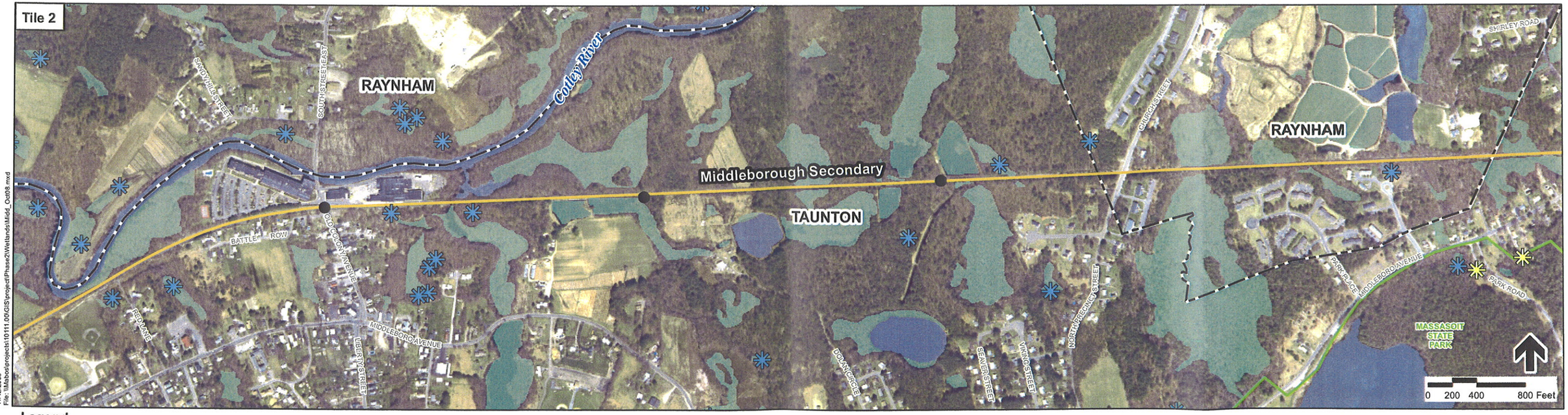
Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Figure 5-4e

New Bedford Main Line to Weir Junction

Tile 1

Tile 2



11/12/2008
File: \\Mabos\projects\10111.00\GIS\project\Phase2\Wetlands\Midd_Oct08.mxd

Legend

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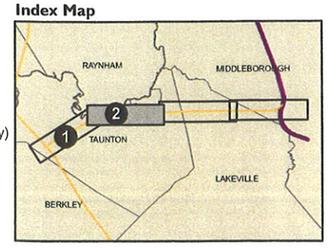


EOT

SOUTH COAST RAIL

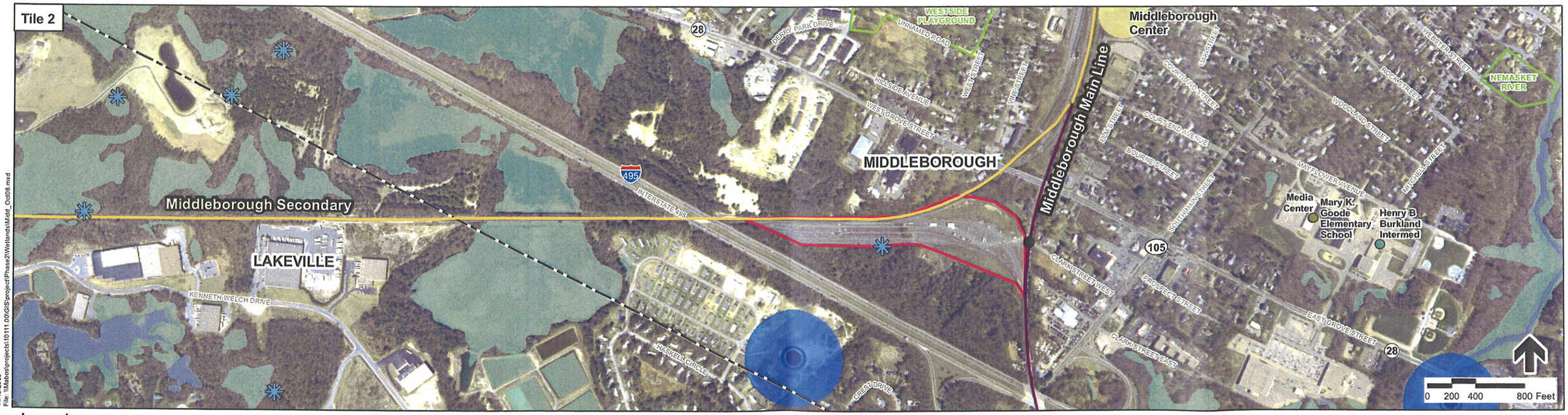
Figure 5-7a

Middleborough Secondary

Source: MassGIS, VHB
Prepared by: Vanasse Hangen Brustlin, Inc.

Tile 1

Tile 2



11/13/2008
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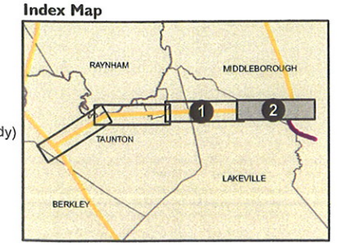

EOT

SOUTH COAST RAIL

Figure 5-7b

Middleborough Secondary

Source: MassGIS, VHB
Prepared by: Vanasse Hangen Brustlin, Inc.

Tile 1

Tile 2

Attleboro Secondary

New Bedford Main Line

Whittenton Branch

Stoughton Line

Whittenton Junction

Rebuild Bridge

TAUNTON

Whittenton

RAYNHAM

Mill River

Prospect Hill Pond

PLAYGROUND

Noblin Well Site

Noblin Well Site

Northbrook Academy

JOANNE DRIVE
LORI LANE
DUNBAR STREET
FREMONT STREET
JUSTINE LANE
WEST BRITANNIA STREET
GILBRIDGE STREET
ROCKLAND STREET
MEADOW STREET
COTTAGE STREET
LAWRENCE STREET
STATE STREET
ALGER AVENUE
MATTESON LANE
WHITTENTON STREET
FIRST AVENUE
THIRD AVENUE
FOURTH AVENUE
FIFTH AVENUE
MADOR AVENUE
SIXTH STREET
WASHINGTON STREET
JACKSON STREET
VAN BUREN STREET
WILSON AVENUE
VAN BUREN STREET
BUTLER STREET
TAYLOR STREET
GARFIELD STREET
WAVERLY STREET
PLEASANT STREET
RICHARD STREET
RUSSELL STREET
LISA DRIVE
ABBEY LANE
SUNSET DRIVE
KURTS PLACE
HOFFMAN STREET
THERESA STREET
BROADWAY
138
0 200 400 800 Feet

WHITTENTON STREET
SCADDING STREET
PROSPECT HILL STREET
REGAN CIRCLE
GREENVIEW LANE
REDWOOD DRIVE
ANDREW AVENUE
EMMA AVENUE
ROBERT AVENUE
MIDDLE STREET
NORMAN AVENUE
THERESA STREET
HOFFMAN STREET
KURTS PLACE
SUNSET DRIVE
RUSSELL STREET
LISA DRIVE
ABBEY LANE
PLAYGROUND
CODY LANE
KING PHILIP STREET
BRITTON STREET
BROADWAY
THIS WAY
BAKER ROAD
CENTER STREET
GILMORE STREET
SAGAMORE ROAD
138
0 200 400 800 Feet

11/12/2008
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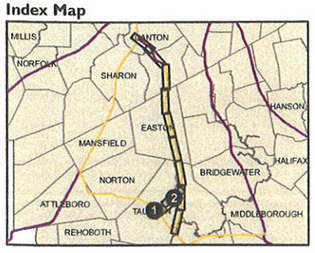

EOT

SOUTH COAST RAIL

Figure 5-9a

Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1

Tile 2

New Bedford Main Line

Weir Junction

Taunton River

Taunton Catholic Middle

Summer Street School

Taunton

TAUNTON

Stoughton Line

RAYNHAM

PLONKA PROPERTY

PINE SWAMP CONSERVATION AREA

Northbrook Academy

0 200 400 800 Feet

11/12/2008
File: \\Mabos\projects\10111 00\GIS\project\Phase2\Wetlands\STGN_Oct08.mxd

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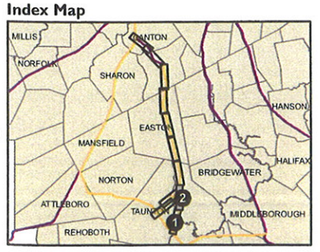


EOT

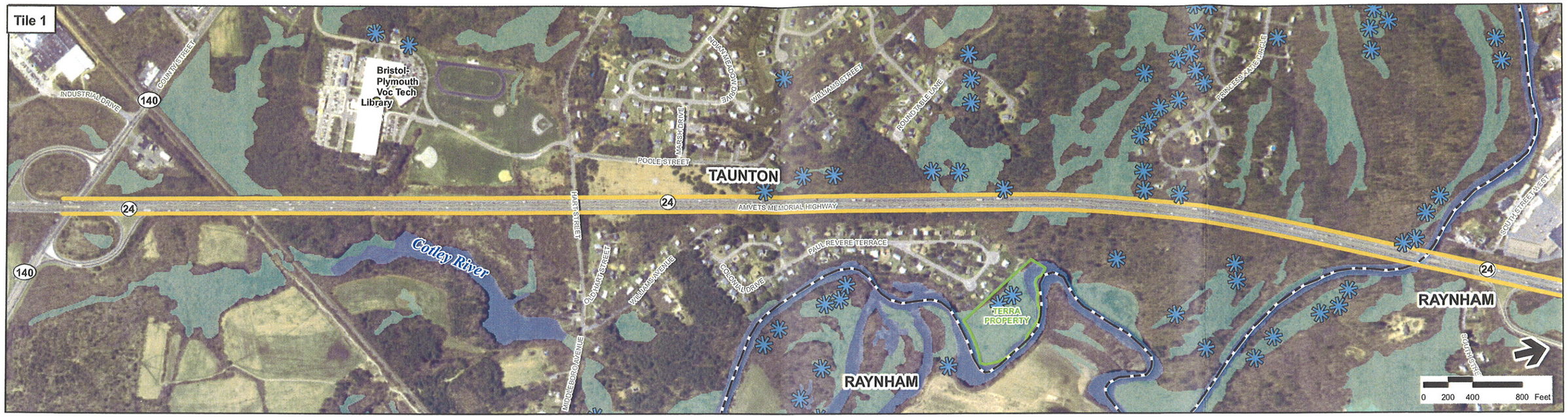
SOUTH COAST RAIL

Figure 5-9b

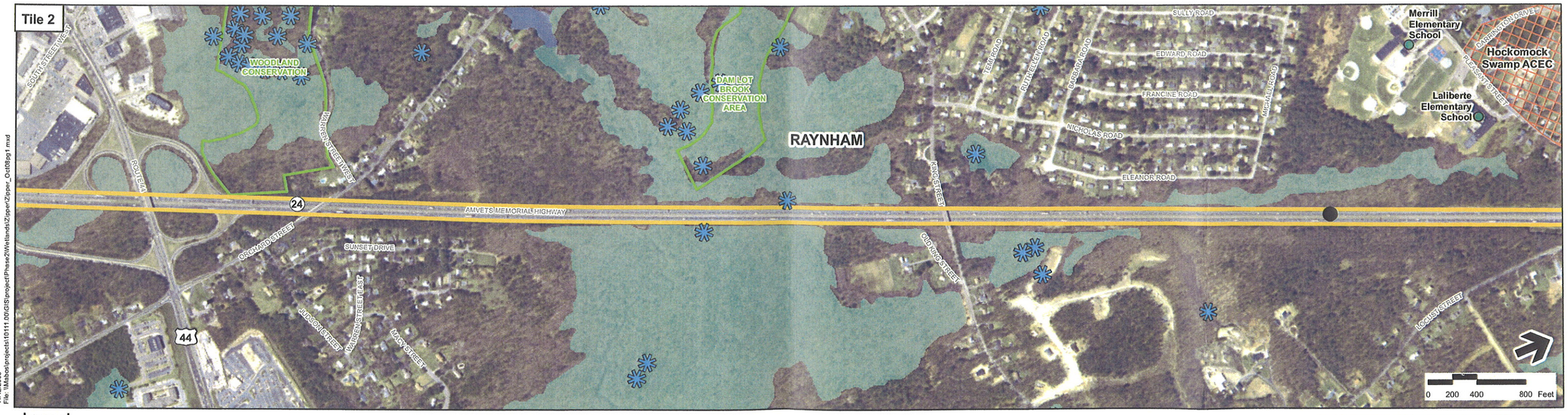
Weir Junction to Canton Junction Stoughton Line

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Tile 1



Tile 2



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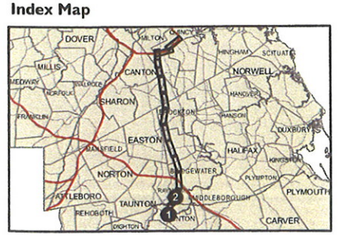

EOT

SOUTH COAST RAIL

Figure 5-10a

Alternative 5 - Rapid Bus

Source: MassGIS
Prepared by: Vanasse Hangen Brustlin, Inc

Appendix 4.11-A

Farmland Conversion Impact Rating Forms

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name Of Project: South Coast Rail - Freetown Station	Federal Agency Involved: Corps of Engineers
Proposed Land Use: Commuter Railroad Station	County And State: Bristol County, MA
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated: -	Average Farm Size: 51 (Bristol County)
Major Crop*(s)*: -	Farmable Land In Govt. Jurisdiction: Acres: %		Amount Of Farmland As Defined in FPPA: Acres: %	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	3.0			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	4.8	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	3.0			
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	100	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	7			
2. Perimeter In Nonurban Use	10	6			
3. Percent Of Site Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	0			
5. Distance From Urban Builtup Area	15	0			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	0			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	10			
TOTAL SITE ASSESSMENT POINTS	160	28	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	100	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	28	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	128	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name Of Project: South Coast Rail - North Easton Station	Federal Agency Involved: Corps of Engineers
Proposed Land Use: Commuter Railroad Station	County And State: Bristol and Norfolk Counties, MA

PART II *(To be completed by NRCS)*	Date Request Received By NRCS		
Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).* Yes ☑ No ☐		Acres Irrigated: -	Average Farm Size: 51 (Bristol) 44 (Norfolk)
Major Crop*(s)*: -	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	7.3			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	8.8	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	6.9			
B. Total Acres Statewide And Local Important Farmland	0.4			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	100	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	11			
2. Perimeter In Nonurban Use	10	8			
3. Percent Of Site Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	0			
5. Distance From Urban Builtup Area	15	0			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	0			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	10			
TOTAL SITE ASSESSMENT POINTS	160	34	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	100	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	34	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	134	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name Of Project: South Coast Rail -Taunton Depot Station	Federal Agency Involved: Corps of Engineers
Proposed Land Use: Commuter Railroad Station	County And State: Bristol County, MA

PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated: -	Average Farm Size: 51 (Bristol County)

Major Crop*(s)*: -	Farmable Land In Govt. Jurisdiction: Acres: %	Amount Of Farmland As Defined in FPPA: Acres: %
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	5.7			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	13.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland	5.7			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	100	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	0			
2. Perimeter In Nonurban Use	10	5			
3. Percent Of Site Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	0			
5. Distance From Urban Builtup Area	15	0			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	0			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	10			
TOTAL SITE ASSESSMENT POINTS	160	20	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	100	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	20	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	120	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request	
Name of Project South Coast Rail - Dana Street Station		Federal Agency Involved U.S. Army Corps of Engineers	
Proposed Land Use Commuter Railroad Station		County and State Bristol County, Ma	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS	Person Completing Form:
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s) -	Farmable Land In Govt. Jurisdiction Acres: %	Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0.2			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	4.9			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	0			
2. Perimeter In Non-urban Use	(10)	0			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	0			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	10			
TOTAL SITE ASSESSMENT POINTS	160	15	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100		0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	15	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260		0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

Appendix 4.12-A

Whittenton Branch Solid Waste Concern and Dana Street Station Memos

Appendix B: Whittenton Branch Solid Waste Concern and Dana Street Station Memos

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□ran□portation
Land □evelop□ ent
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Services

VHB Vanasse Hangen Brustlin, Inc.

101 Walnut Street
P. O. Box 9151
Watertown, MA 02471-9151
617 924 1770
FAX 617 924 2286

Me□ orandu□

To: File

Date: August 31, 2012

Project No.: 10111.00

From: Katherine Kudzma
Paul A. McKinlay, PG, LSP

Re: Whittenton Branch Solid Waste Concern,
Taunton and Raynham, Massachusetts

On behalf of the Massachusetts Department of Transportation (MassDOT), VHB has conducted a limited review of the current use of a portion of the inactive Whittenton Branch railroad right-of-way (ROW) that lies between Prospect Hill Street, Regan Circle, and the property at 184 Broadway in Raynham, Massachusetts (the Site). This limited review was conducted to evaluate fill material reportedly present on the ROW, specifically for the presence of Oil and/or Hazardous Material (OHM) which could have the potential to impact the future development of the Site for the South Coast Rail Whittenton Alternative (the Project). New England Recycling, Inc. (NER), having a primary address at 565 Winthrop Street in Taunton, Massachusetts (Taunton Facility), stores their material at 138 (Rear) Broadway in Raynham, Massachusetts (Raynham Facility), partially within the Site boundary as an unauthorized use. It should be noted that NER is also affiliated with G. Lopes Construction Company of Taunton, Massachusetts. A Site location map showing the vicinity of the Site is provided as **Figure 1**. An aerial photograph depicting relevant Site features and adjacent areas is provided as **Figure 2**.

Description of Files Reviewed

On May 16, 2012, VHB visited the Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office to review the permit file associated with the NER Raynham Facility that, as noted above, is partially within the railroad ROW. The following is a list of pertinent documents:

- June 9, 1992 Notice of Noncompliance (NON) from MassDEP for the Raynham Facility (NON-SE-92-4002). Violations noted included the presence of refuse and brush dumped on the property within 100 feet of a potential wetlands resource area and within an Interim Well Head Protection Area.

- May 17, 1993 MassDEP field notes describing the Raynham Facility. Inspectors noted pile of construction and demolition (C&D) debris with solid waste (tires, wood waste metal stripping, brick, concrete, insulation, paper bags, and plastic buckets); piles of telephone poles with creosote, and a roll-off containing metal, pipes, fences, and rebar.

- August 25, 1993 letter from Fasanella Johnson & Wood P.C. (FJ&W) attorneys to MassDEP stating that NER does not have a stockpile or any metals or wood demolition materials at the Raynham Facility.

- September 9, 1993 NON from MassDEP for the Raynham Facility (NON-SE-93-4028). Violations noted included:

- The processing of solid waste in absence of a site assignment from the regulating board of health or MassDEP due to the presence of solid waste commingled with asbestos, brick, and concrete (ABC) rubble. Also noted was the processing of C&D debris in absence of an approval from MassDEP.
- No site assignment was obtained for operations such as solid waste processing, nor has the Operator obtained a permit from MassDEP. The operator is in violation of 310 CMR 19.000.
- In addition, MassDEP noted that the previous NON dated June 1992 had not been addressed.

- September 21, 1993 letter from FJ&W stating that the operator no longer accepts non pre-sorted ABC rubble, no solid waste is currently stockpiled at the property, and the Taunton and Raynham Conservation Commissions were satisfied with the operator's actions taken toward achieving wetland compliance.

- October 19, 1993 letter of provisional compliance to NON-SE-93-4028 from MassDEP to NER regarding the Raynham Facility. The letter states that MassDEP considers NER to have complied with NON-SE-93-4028. Based on documents, it appears the NON-SE-92-4002 was also addressed through these actions, although an express letter from MassDEP providing notice of compliance was not obtained during the file review.

- November 1, 1993 sketch prepared by G. Lopes Construction, Inc. showing items stored on-site including loam, mulch, stump chips, split stumps, roots and stone.

- December 8, 1993 letter from MassDEP to NER addressing several issues surrounding the facility operations. The letter reiterates that issues of noncompliance for the processing of ABC commingled with solid waste assigned NON-SE-93-4028 have been rectified; the ABC processing operation may be conditionally exempt; stump chipping at the facility requires an application or remedial plan; and an application must be made to MassDEP if the operator intends to compost material at the facility.

- November 16, 1993 letter from FJ&W providing documentation to confirm that the operations at the Raynham Facility are conditionally exempt in accordance with 310 CRM 16.05(3)(i).

- April 11, 1994 letter from MassDEP to Gilbert J. Lopes (NER) in response to proposal to conduct stump processing at the Raynham Facility. MassDEP stated that this activity would be conditionally exempt when conducted in accordance with 310 CRM 16.05(1).

- December 1994 permit (BWP SW 17) for recycling operation involving stumps, which is not conditionally exempt due to speculative accumulation (stumps may not be removed from Site within 90 days due to variations in deliveries).

- September 2006 Beneficial Use Determination (BUD) application for NER prepared by Green Seal Environmental, Inc. The permit specifies the proposed project as the reuse of post-consumer asphalt shingles and lists NER's Taunton Facility as that which requires approval. NER intended to process and mix the shingles materials with ABC and soil to create a sub-grade road base material to be used for road-base construction project throughout Massachusetts. All sorting of material would be conducted at the Taunton Facility, while the mixing of the road-base (shingles and gravel) would be conducted at the Raynham Facility. Laboratory analysis of the material was to be conducted on a load-by-load basis to evaluate for the presence of asbestos.

- Draft January 2007 BUD prepared by MassDEP for the re-use of pre and post consumer asphalt roofing shingles by NER. MassDEP describes the Raynham Facility operations as an existing sand and gravel, ABC rubble recycling, and wood waste composting operation. MassDEP approves the use of asphalt roofing shingles as a feedstock material at the Raynham Facility for the

manufacture/production of a sub-grade road base construction material. The approval specifies that one sample of each load must be tested for the presence of ACM.

- April 10, 2007 letter from MassDEP to Mr. Gilbert Lopes of NER providing draft provisional approval of the BUD for the reuse of asphalt roofing shingles.

- April 14, 2007 letter from the North Raynham Water District stating that the Raynham Facility is within a Zone II water supply area. A request was made to install monitoring wells and test for sodium and hydrocarbons because the asphalt being received by the facility could contain oil, gasoline, and road salts.

- September 5, 2007 article from the Enterprise Newspaper in Brockton, Massachusetts about the complaints the abutting residents have regarding the Raynham Facility. The article cited an agreement that the company made four years prior to construct a 1,000-foot-long, 8-foot-high berm planted with small evergreen trees along an old railroad bed to rectify the noise and dust problem.

During a visit to municipal offices on April 26, 2012, VHB also reviewed files pertaining to the Site at the selectman's office. A Notice of Administrative Completeness from MassDEP to NER dated November 15, 2006 was obtained. This letter pertained to the BUD for the reuse of asphalt roofing shingles.

VHB reviewed the MassDEP online waste site database for releases of OHM that may have occurred at the Site. One disposal site was identified on the G. Lopes Construction Raynham Yard located off Route 138. The disposal site was assigned Release Tracking Number (RTN) 4-22319 in December 2009 when approximately 50 gallons of hydraulic oil leaked from a ruptured line of an excavator to the underlying soil. An approximately 20 by 25 foot area was impacted, from which approximately 12 tons of impacted soil was removed and transported off-Site. The disposal site achieved a Class A-2 Response Action Outcome (RAO) in January 2010, which indicates that contaminant concentrations were not reduced to background levels but a Condition of No Significant Risk was achieved. Based on figures provided in the RAO report, the disposal site appears to be located approximately 250 feet south of the railroad ROW. Due to the nature of the release and the proximity to the Site, this disposal site is not expected to impact environmental media within the ROW.

File Review Summary

VHB conducted a review of available MassDEP permits and reports, as well as relevant municipal files. As indicated in the files, the Raynham Facility has received two enforcement notices from MassDEP (NON-SE-93-4028 and NON-SE-92-4002). NON-SE-93-4028 was issued in response to NER's failure to act after receiving NON-SE-92-4002. In October 1993, MassDEP stated that NER had complied with NON-SE-93-4028. Although a letter of compliance was not provided for NON-SE-92-4002, the areas of noncompliance appear to have been addressed in response to NON-SE-93-4028 and associated correspondences. The permit file also contained an approved BUD application. Finally, one MassDEP state-listed disposal site (RTN 4-22319) is located on the Raynham Facility property but is not likely to impact environmental media at the Site.

Site Reconnaissance

On July 23, 2012 VHB conducted a Site visit of the Raynham Facility and Site, which was guided by Norman Crowley of NER. A portable computer with GPS receiver was utilized by VHB personnel to determine the limits of the railroad ROW while in the field.

The western end of the ROW closest to Prospect Hill Pond was noted to abut a large pile of stumps and tree limbs that was encroaching upon the ROW. The pile was associated with the NER stump composting process whereby the stumps are initially stored until soft enough to be machine ground and then stored until composted for resale. In addition to the stumps, minor amounts of domestic waste and

boulders were observed in the pile. A second large pile containing sand, gravel, stumps, and minor debris was noted on another portion of the ROW located within NER's area of operation. According to Mr. Crowley, the piles on the Site are constantly changing as NER imports and exports the materials and no testing is performed for material processed at the Raynham Facility. Mr. Crowley stated that the Raynham Facility does not currently process asphalt shingles and they do not accept painted concrete. In addition, he stated that any material that contains undesirable items such as railroad ties is segregated and shipped to another facility. VHB did not note any significant stressed vegetation, staining, or odors at the time of the Site visit.

The remainder of the ROW in the vicinity of Regan Circle was observed to be densely vegetated. Landscaped trees and shrubs were noted in the ROW behind four properties on Regan Circle. Site photographs taken by VHB are attached to this memo.

Findings

Based on a review of MassDEP files pertaining to the Raynham Facility, the following materials appear to be permitted for storage at the NER Facility: post-consumer asphalt shingles (non-asbestos containing materials), pre-sorted ABC rubble, wood waste, sand and gravel. VHB observed these materials during the Site visit in July 2012, in addition to minor amounts of debris including buckets, plastic bags, wire, and rebar. Material was stored partially within the railroad ROW, a use not authorized by the railroad. The solid waste/debris noted does not appear to constitute a release of OHM to the environment as defined by the Massachusetts Contingency Plan (310 CMR 40.00). Although no staining was observed during the Site visit, several pieces of large machinery were observed throughout the Site and may have the potential to release minor amounts of OHM to the environment.

Conclusions

The ROW is currently occupied by what appears to be material containing stumps, compost, sand, gravel, boulders, and minor amounts of solid waste and debris. NER has indicated that this material is frequently relocated and new material brought into the Site and as such, could likely be relocated. Once the ROW has been restored and/or material has been permanently re-located, laboratory data could be obtained to assess for the presence of OHM.

Attachments:

- Figure 1 - Site Location Map
- Figure 2 – Site Plan
- Site Photographs
- File Review Documentation

\\MABOS\projects\10111.00\GIS\project\OHM\Figure 1 - Site Location Map Whittenton.mxd

Source: USGS 2001 Topographic Map

0 2,000 4,000 Feet

Vanasse Hangen Brustlin, Inc.

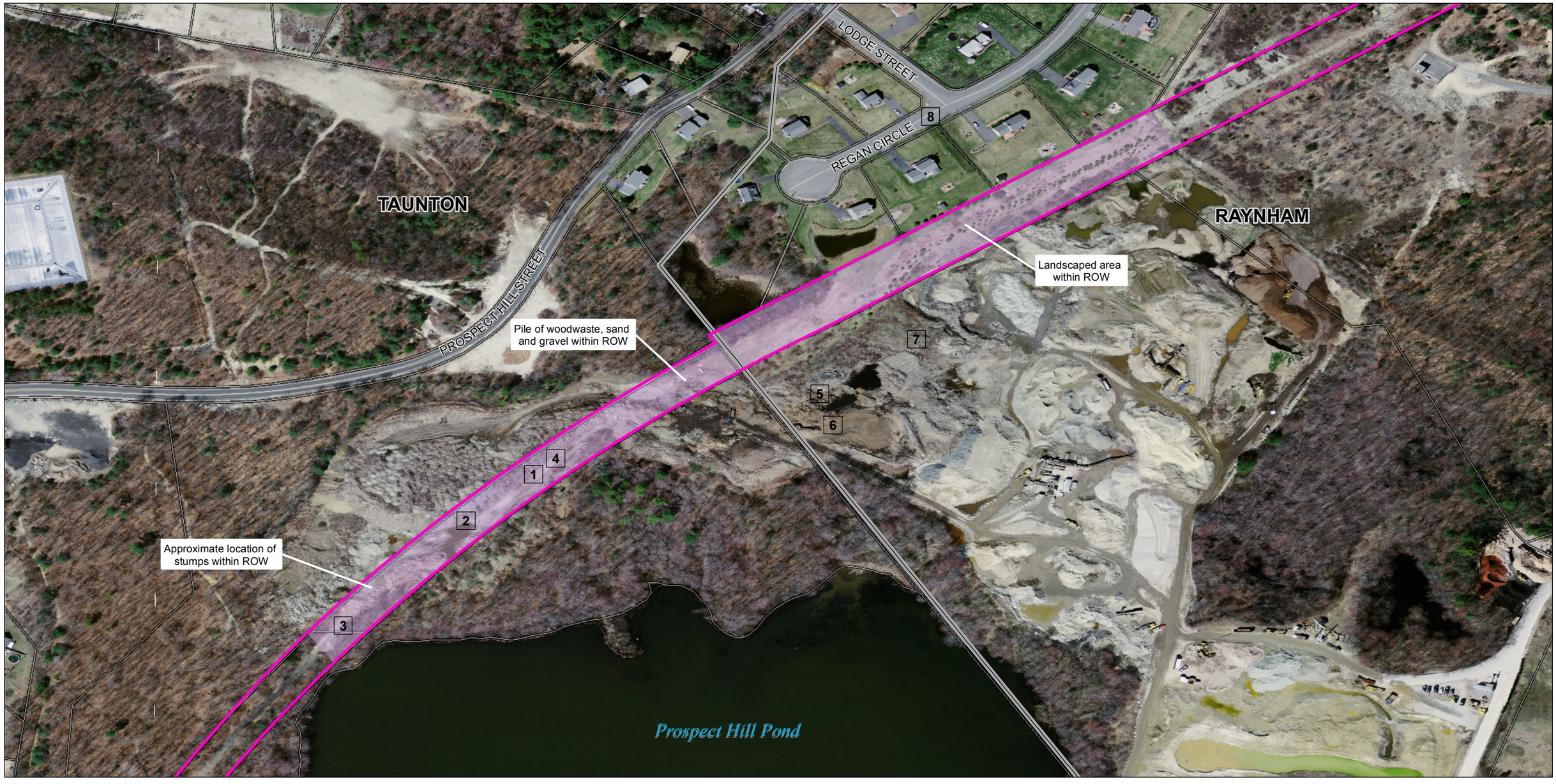
Legend

Site

FIGURE 1

Site Location Map
Railroad Right-of-Way
Raynham and Taunton, Massachusetts

\\MABOS\projects\10111.00\GIS\project\OHM\Figure 2 - Whittenton Solid Waste.mxd



Source: USGS 2008 Aerial Imagery

0 250 500 Feet

Legend

- Railroad Right-of-Way (ROW)
- Altered Portion of ROW
- Assessor's Parcels
- Town Boundary
- 6 Photograph Location (Approximate)

Vanasse Hangen Brustlin, Inc.

FIGURE 2

Site Plan
Railroad Right-of-Way
Raynham and Taunton, Massachusetts

Railroad Right-of-Way
Taunton and Raynham, Massachusetts
Site Photos Taken on July 23, 2012
by Vanasse Hangen Brustlin, Inc.

Photo #1: View of southwestern end of Site taken facing southwest. Railroad right-of-way (ROW) in center.

Photo #2: View of southwestern end of Site taken southwest depicting piles of wood waste.

Photo #3: View of ROW at closest point to Prospect Hill Pond, taken facing southwest.

Photo #4: View of central portion of Site taken facing northeast.

Railroad Right-of-Way
Taunton and Raynham, Massachusetts
Site Photos Taken on July 23, 2012
by Vanasse Hangen Brustlin, Inc.

Photo #5: Photo taken northeast showing abutting piles of sand and gravel. ROW at center of photo.

Photo #6: Example of undesirable debris segregated from material by NER for disposal at alternate facility.

Photo #7: View of ROW, taken facing northwest. ROW is located in vegetated area on right side of picture.

Photo #8: View of portion of ROW abutting residential development on Regan Circle. ROW is located behind landscaped trees behind shed.

□ran□portation
Land □evelop□ent
□nviron□ental
Services

VHB Vanasse Hangen Brustlin, Inc.

101 Walnut Street
P. O. Box 9151
Watertown, MA 02471-9151
617 924 1770
FAX 617 924 2286

Me□orandu□

To: File

Date: August 31, 2012

Project No.: 10111.00

From: Katherine Kudzma
Paul A. McKinlay, PG, LSP

Re: MassDEP File Review for Proposed Dana Street Station in Taunton, Massachusetts

---

On behalf of the Massachusetts Department of Transportation (MassDOT), VHB has conducted a review of the Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup (BWSC) online database to identify state-listed disposal sites located in the vicinity of the proposed Dana Street Station in Taunton, Massachusetts (the Site). VHB also reviewed to historic Sanborn Fire Insurance maps available online through ProQuest in order to establish a general Site history. The Site as referenced in this memo encompasses various design options for the proposed station (the Project), which is part of the Whittenton Alternative of the South Coast Rail (SCR) project. The footprints depicted in these options encompass or occupy a portion of the parcels detailed in the following table:

□arcel □Ma□□ot□	□ddress	□cres □otal □arcel□	*Current □se*
54-441	60 Hodges Avenue	157.20 (Partial)	Municipal/Undeveloped Land
54-448	Dana Street	0.44	Vacant Land
54-449	Dana Street	0.45	Vacant Land
54-450	Dana Street	0.47	Vacant Land
54-451	Dana Street	0.48	Vacant Land
54-452	Dana Street	0.50	Vacant Land
54-453	Dana Street	0.49	Vacant Land
54-454	Dana Street	0.35	Vacant Land
54-455	Dana Street	0.35	Vacant Land
54-171	140 Dana Street	1.22	Telecommunications Facility
54-457	Railroad	N/A (Partial)	Railroad/Vacant Land

It should be noted that parcel 54-457 is a portion of the existing railroad right-of-way (ROW); however, the proposed station footprint options appear to make use of the vacant land in this parcel immediately to northeast of the existing tracks and the parcel is addressed in this memo. A Site location map showing the vicinity of the Site is provided as **Figure 1**. A Site plan depicting relevant Site features is provided as **Figure 2**.

Summary of Files Reviewed

Three disposal sites were identified on the Site or within close proximity and are detailed below.

Dana and Danforth Streets, Release Tracking Number (RTN) 4-11241

A release of fuel oil at 140 Dana Street from an underground storage tank (UST) was reported to MassDEP in March 1995 and assigned RTN 4-11241. Based on a review of available reports, the properties (and portion of the Site) assessed under RTN 4-11241 appears to encompass the City of Taunton Assessor's parcels Map 54, Lots 448 through 455 and Map 54, Lot 171 as displayed on **Figure 2**.

According to the Phase I Initial Site Investigation (ISI) prepared for RTN 4-11241 by Hermenau & Hermenau Consulting Engineers (HHCE) in 2006, two 10,000-gallon fuel oil aboveground storage tanks (ASTs), and one 1,000-gallon gasoline UST have been removed from the Site; however, one 500-gallon waste oil UST remained abandoned at the property (as of the date of the report).

Soil and groundwater testing conducted during the Phase I ISI revealed exceedances of the applicable regulatory reporting thresholds for extractable petroleum hydrocarbons (EPH), and volatile petroleum hydrocarbons (VPH) at the property. In addition, metals including arsenic, barium, cadmium, and lead were detected above the reporting thresholds; however, these contaminants were attributed to background and deemed not reportable to the MassDEP by HHCE. The Phase I ISI summarized proposed future response actions, which would ultimately result in closure of the disposal site. However, according to the MassDEP database, no reports have been submitted since the Phase I ISI in 2006, which indicates that the disposal site may not be in compliance with applicable regulations.

The presence of a potentially out-of-compliance disposal site on the Site suggests that contamination was identified on the Site and is a potential concern for the proposed project.

Tank #13 Cottage #8, 60 Hodges Avenue, RTN 4-13181

A release of No. 2 fuel oil discovered during the removal of a 1,000-gallon UST was reported to MassDEP in July 1997 and assigned RTN 4-13181. The disposal site achieved a Class A-2 RAO in September 2004, which indicates that contamination has not been reduced to background levels but a Condition of No Significant Risk has been achieved. The disposal site is located approximately 450 feet east of the Site. Based on proximity and response actions conducted, the disposal site is not expected to impact environmental media at the Site.

Former Nason Oil, 7 Perry Avenue, RTNs, 4-289 and 4-16050

A release of petroleum was discovered at 7 Perry Avenue in 1986 during an environmental assessment and assigned RTN 4-16050 in April 1987. A second release of petroleum discovered during the removal of an abandoned 500-gallon UST at 7 Perry Avenue was reported to MassDEP in February 2001 and assigned RTN 4-16050. The property has a long history of use for petroleum product storage between 1913 and 1986. Both disposal sites have achieved a Class A-2 Response Action Outcome (RAO), RTN 4-289 in November 1998 and RTN 4-16050 in February 2002. A Class A-2 RAO indicates that contamination has not been reduced to background levels but a Condition of No Significant Risk has been achieved. Based on the direction of groundwater flow and proximity to the Site, the disposal sites are not expected to impact environmental media at the Site.

Site History

The 1888 Sanborn map is the oldest record obtained during this review and depicts railroad tracks on and abutting the Site. According to the Phase I ISI prepared for RTN 4-11241 by HHCE in August 2006, the portion of the Site west of Dana Street has also has a history of use as an active freight yard (at least from the 1900s to 1980s), Agway retail (1950s to 1960s), Service Transport Company trucking business (1978 to 1996), and the temporary storage of bituminous concrete (1999). This portion of the Site also has a history of petroleum storage dating back to at least 1937. According to the 1937 Sanborn map, the portion of the Site west of Dana Street contained a feed house, motor oils store house, fuel oil tanks, offices, and a railroad yard. The majority of the Site is currently vacant and contains overgrown vegetation. A

telecommunications facility, including equipment and a metal tower is located in a fenced enclosure on the southernmost portion of the Site (see Figure 2).

Sanborn maps dating back to 1937 depict the portion of the Site on 60 Hodges Avenue (Map 54, Lot 441) as undeveloped land. Based on existing aerial imagery, this portion of the Site may have been used for agricultural purposes in the past.

According to the Sanborn maps, land immediately to the south of the Site (known as 28 Dana Street) was utilized for coal storage since at least 1888. The Staples Coal Company occupied the property sometime around 1893. By 1937, the Royal Coal Company occupied land south of the Site and contained twelve, 60 foot tall concrete coal silos, which remain. Sometime between 1937 and 1950 the property began being used as a scrap iron yard. This property, abutting the Site, is currently used as a scrap yard.

Conclusions

During a review of the MassDEP online database, available online Sanborn maps, and a drive-by Site reconnaissance, VHB identified the following environmental concerns for the Site:

- The Site is partially occupied by an active state-listed disposal site (RTN 4-11241). The disposal may be out-of-compliance with the applicable regulations and the lack of documentation online suggests that remedial actions have not been conducted to mitigate contamination identified and documented in the Phase I ISI report. Contaminants that exist at the Site above applicable regulatory standards include petroleum constituents and metals.

- The Site and abutting property to the south has a long history of industrial use. For example, the property at 28 Dana Street is currently used as a scrap yard. The Site itself was formerly utilized as a truck business, Agway distributor location, and for the temporary storage of bituminous concrete. The extent to which these industrial activities have impacted the Site is unknown.

- The portion of the Site on 60 Hodges Avenue appears to have always been undeveloped; however, the property may have been utilized for agricultural purposes. Pesticides or herbicides may have been utilized on the property and have the potential to impact environmental media at this portion of the Site.

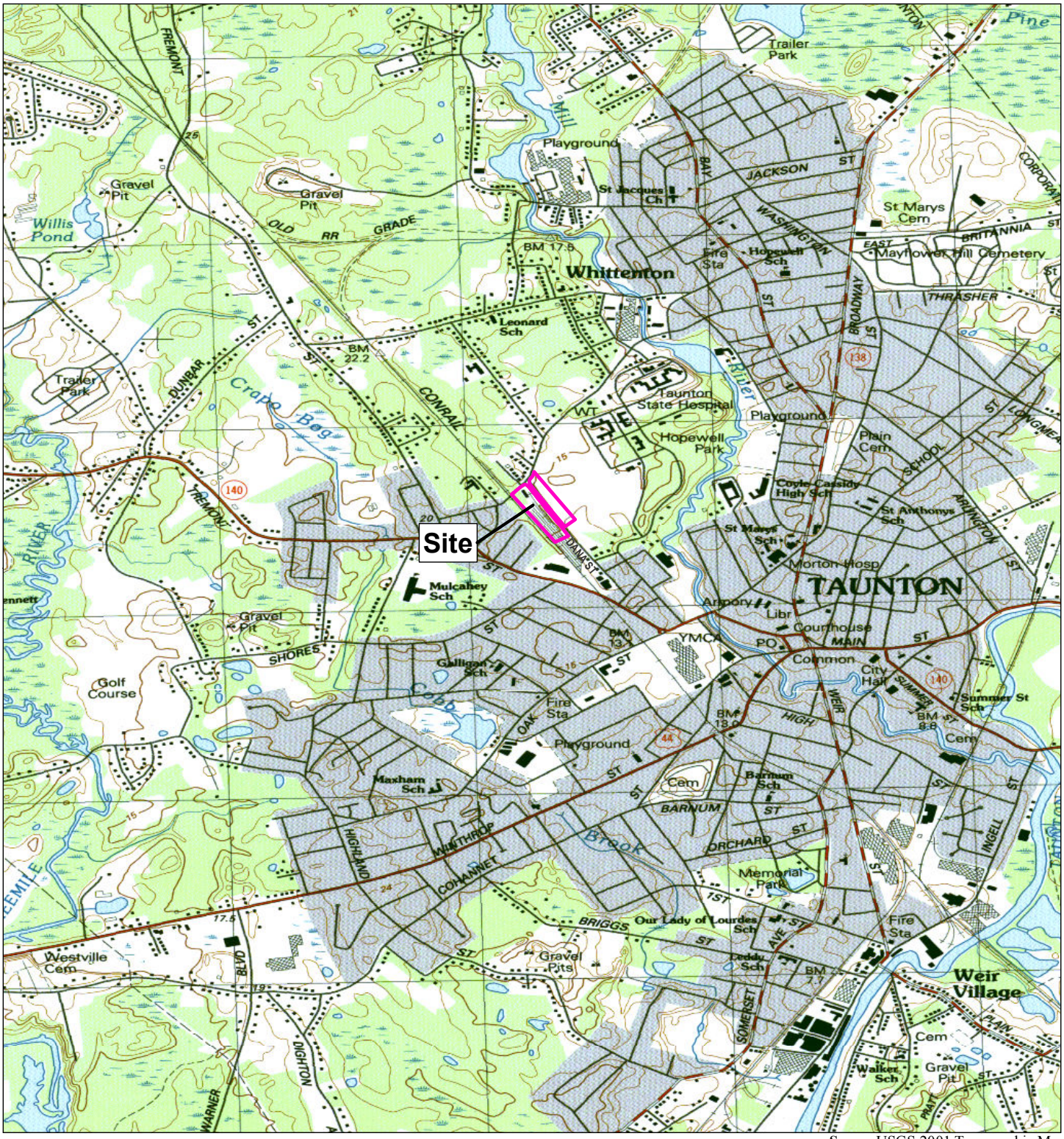
- Finally, the portion of the Site west of Dana Street was formerly occupied by a railroad yard since at least 1888. Contaminants associated with former railroad operations include metals and semi-volatile organic compounds (SVOCs). Urban fill, which can contain metals and polycyclic aromatic hydrocarbons (PAHs) may have also been placed on the Site in order to fill in wetland areas. Finally, a vegetation control program may have been implemented in the railroad right-of-way and may have introduced lead, arsenic, and other pesticide/herbicide-related contaminants into Site soils.

In summary, the Site environmental media have the potential to be impacted by numerous sources related to industrial and agricultural uses. In addition, known contamination associated with the disposal site assigned RTN 4-11241 has been documented on the Site.

Prior to construction, it is recommended that a plan be developed to properly handle and manage Site soil and groundwater that may be contaminated, which would likely incorporate pre-characterization of media requiring management. Soils should be handled in a manner that protects the health and safety of workers, nearby receptors, and visitors to the Site. In addition, impacted soil and groundwater should be managed in accordance with applicable regulations and policies prior to leaving the Site, should export be required.

Attachments:
Figure 1 - Site Location Map
Figure 2 – Site Plan
File Review Documentation

\\MABOS\projects\10111.00\GIS\project\OHM\Figure 1 - Site Location Map Dana St.mxd



Source: USGS 2001 Topographic Map

0 2,500 5,000 Feet

Vanasse Hangen Brustlin, Inc.

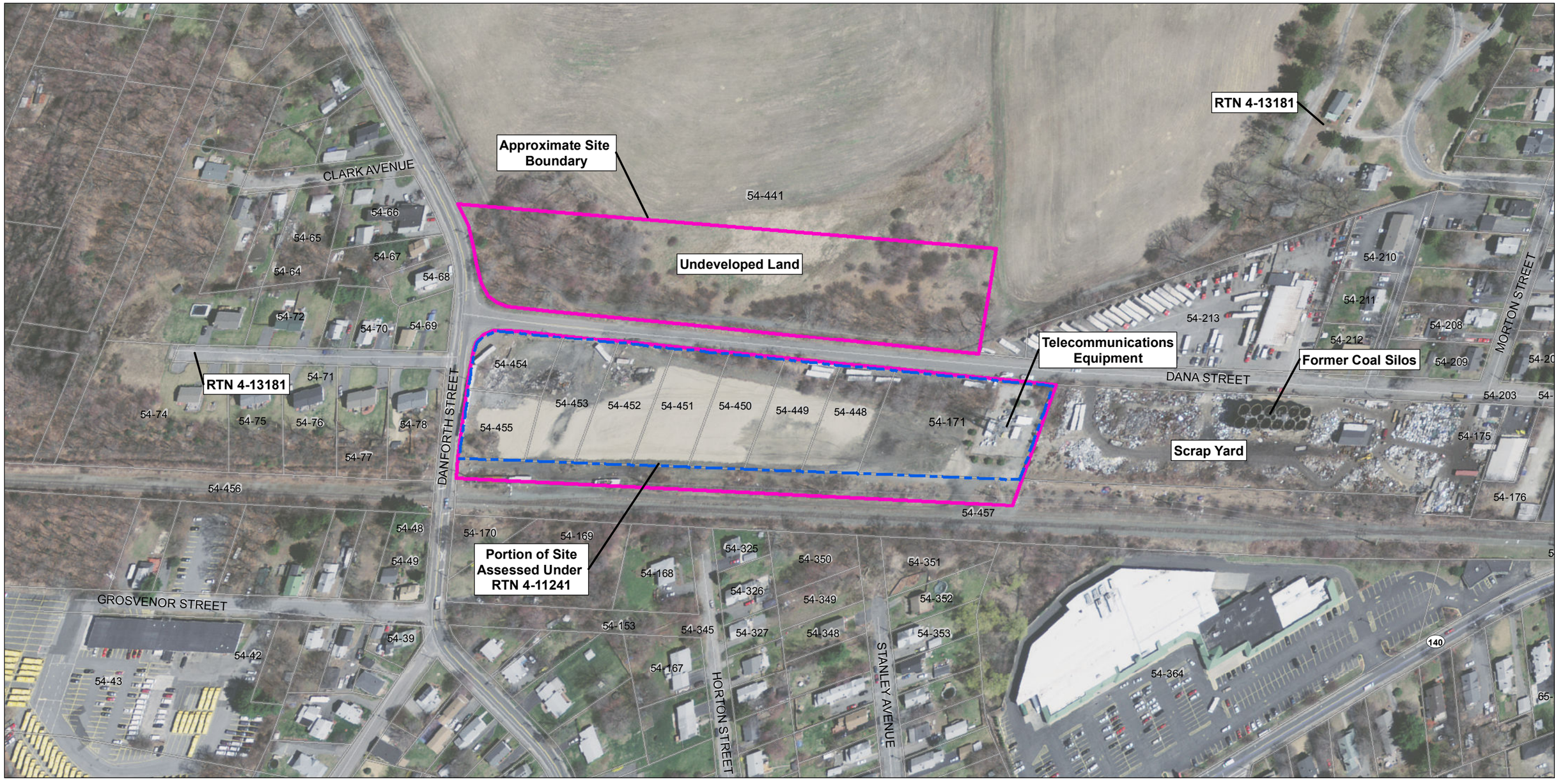
Legend

Approximate Site Location

FIGURE 1

Site Location Map
Dana Street Station
Taunton, Massachusetts

\\MABOS\projects\10111.00\GIS\project\OHM\Figure 2 - Dana St Station.mxd



Source: USGS 2008 Aerial Imagery

0 200 400 Feet

Legend

- Approximate Site Boundary
- Portion of Site Assessed Under RTN 4-11241
- Assessor's Parcels

Vanasse Hangen Brustlin, Inc.

FIGURE 2

Site Plan
Dana Street Station
Taunton, Massachusetts

Appendix 4.12-B

Stoughton Station Phase I Environmental Site Assessment

ASTM E 1527-05 Phase I Environmental Site Assessment

South Coast Rail Project

Stoughton Station
Stoughton, Massachusetts

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116-3969

Prepared by

Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, Massachusetts 02471

July 2012

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South Coast Rail Project

Stoughton Station
Stoughton, Massachusetts

Prepared for

massDOT

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116-3969

Prepared by

VHB *Vanasse Hangen Brustlin, Inc.*

101 Walnut Street
Watertown, Massachusetts 02471

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Environmental Professional:

Paul A. McKinlay, PG, LSP

July 2012

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Table of Contents

Executive Summary **ES-1**

ES-1 Introduction ES-1
ES-2 Site Location and Vicinity Description ES-1
ES-3 Records Review ES-2
ES-4 Site History Overview ES-2
ES-5 Phase I Findings ES-3

1 Introduction **1-1**

1.1 Purpose and Scope of Work 1-1
1.2 Significant Assumptions, Limitations, Exceptions, and Data Gaps 1-2
1.3 Terms and Conditions 1-2
1.4 User Reliance 1-3

2 Site Description **2-1**

2.1 Site Location and Description 2-1
2.2 Site and Vicinity General Characteristics 2-1
2.3 Present Ownership and Current Use of the Property 2-2
2.4 Description of Structures, Roads, and Other Site Improvements 2-2
2.5 Current Uses of Adjoining Properties 2-3

3 User-Provided Information **3-1**

3.1 Title Records 3-1
3.2 Environmental Liens or Activity and Use Limitations 3-1
3.3 Specialized Knowledge 3-1
3.4 Commonly Known or Reasonable Ascertainable Information 3-1
3.5 Reason for Performing Phase I 3-1
3.6 Previous Environmental Reports 3-2

4 Records Review **4-1**

4.1 Standard Environmental Record Sources 4-1
4.2 Local Records Review 4-8
4.3 Physical Setting Sources 4-13
4.4 Historical Use Information 4-14
4.5 Site History Overview 4-17

5 Site Reconnaissance 5-1

5.1 Methodology and Limiting Conditions 5-1
5.2 General Site Setting 5-1
5.3 Exterior Observations and Surface Conditions 5-1
5.4 Interior Observations 5-4

6 Interviews 6-1

6.1 Interview with Owner, Site Manager/Occupants, or Knowledgeable Person 6-1
6.2 Interviews with Local Government Officials 6-1

7 Findings and Conclusions 7-1

7.1 Recognized Environmental Conditions 7-1
7.2 Potential Environmental Concerns 7-6

8 Opinion 8-1

9 References 9-1

10 Signature and Qualifications of Environmental Professional 10-1

11 List of Common Acronyms 11-1

List of Tables

Table No.	Title	Page
2-1	List of Parcels	2-1
2-2	Parcel Ownership	2-2
2-3	Description of Structures	2-3
4-1	MassDEP File Review	4-4
4-2	Assessor's Information	4-8
4-3	Tax Map Information	4-10
7-1	Identified Recognized Environmental Conditions	7-2
8-1	Summary of Phase I Opinion	8-3

List of Figures

Figure No.	Title
1	Site Location Map
2	Local Area Map
3	Site Plan
4	MassGIS Site Scoring Map

Appendices

Appendix	Description
A	Limitations
B	Environmental Data Resources, Inc. (EDR) Database Report
C	Massachusetts Department of Environmental Protection (MassDEP) File Review Documentation
D	Relevant Municipal Documents
E	Sanborn Maps
F	Historic Topographic Maps
G	Historic Aerial Photographs
H	Site Photographs

Executive Summary

ES-1 Introduction

Vanasse Hangen Brustlin, Inc. (VHB) was retained by the Massachusetts Department of Transportation (MassDOT) (the "Client") to conduct a Phase I Environmental Site Assessment (Phase I ESA) for the proposed Stoughton Station in the center of Stoughton, Massachusetts, located in Norfolk County, hereinafter referred to as the Site. The Site is being considered for potential acquisition and development during the South Coast Rail Project, which aims to restore passenger rail transportation from South Station in Boston to the South Coast of Massachusetts (the Project).

This Phase I ESA has been completed in general compliance with ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (the Standard) and generally conforms to the US Environmental Protection Agency's All Appropriate Inquiries guidance pursuant to regulations at 40 CFR Part 312. The Client is also the User of this report. Pursuant to Section 3.2.93 of the Standard, "the User has specific obligations for completing a successful application of this practice as outlined in Section 6" of the Standard.

The purpose of this Phase I ESA is to identify, to the extent feasible pursuant to the process described in the Standard, Recognized Environmental Conditions (RECs) in connection with the property. The Phase I ESA was completed utilizing the Standard as guidance.

The report should be read in its entirety to gain a comprehensive understanding of the findings presented in this Executive Summary.

ES-2 Site Location and Vicinity Description

The Site is located at 42°07'20" north latitude and 71°06'09" west longitude. The Universal Transverse Mercator (UTM) coordinates for the approximate center of the Site are 4,665,491 meters north and 326,202 meters east.

The Site consists of six parcels and totals 428,630 square feet (equivalent to 9.84 acres). The parcel identification obtained from the City of Stoughton Tax Assessor, address, acreage, and current use of each is provided in the following table.

Table ES-1 List of Parcels

Parcel (Map-Lot)	*Address*	*Acres*	*Current Use*
054-110	2 Canton Street	2.16	Business Park (Multiple Tenants)
053-102	25 Brock Street	4.42	Warehouse (Business Unknown)
054-401	48 Wyman Street	0.11	Vacant Store/Garage
054-407	Morton Street	0.20	Vacant Lot
054-406	Morton Square	1.90	Repair Garage/Industrial Storage Yard
053-101	25 Brock Street	1.05	Commercial (Communications Company)

The Site is located in a mixed use area of Stoughton, consisting of industrial, commercial and residential properties. A Site Location and Local Area Map showing the vicinity of the Site is provided as Figure 1. A plan depicting the Site and relevant site features is included as Figure 2.

ES-3 Records Review

VHB reviewed the Environmental Data Resources, Inc. (EDR) computer database search results, the Massachusetts Department of Environmental Protection (MassDEP) Waste Site Lookup database, and relevant municipal files for properties that have or could potentially environmentally impact the subject Site. Based on information obtained from these sources, VHB determined that a MassDEP file review was necessary. After reviewing select files during the MassDEP file review, it was determined that on-Site releases have occurred and nearby releases of oil and/or hazardous materials (OHM) have the potential to impact the Site. These releases are therefore discussed as RECs in Section 7.1.

ES-4 Site History Overview

Based on historical sources and previous environmental reports, the Site appears to have been developed since at least the late 1800s. As shown in Sanborn maps from 1885 to 1923, the property at 2 Canton Street was occupied by a rubber company, while the property at 48 Wyman Street was occupied by residential structures. In addition, the vacant land just off Morton Street (Parcel 054-507) appears to have been undeveloped during this time period. The properties at 25 Brock Street and off Morton Square were occupied by a lumber yard, dwelling, and horse sheds as shown in Sanborn maps from 1891 to 1906. A rubber company at 25 Brock Street and the Murphy Coal Company off Morton Square are first depicted in the 1923 Sanborn map. The Murphy Coal Company currently remains off Morton Square. By 1949, the property at 2 Canton Street was

utilized as a shoe manufacturing company, and 28 Wyman Street was vacant. The most recent Sanborn map from 1966 shows the 48 Wyman Street property occupied by a lumber storage building and the property at 25 Brock Street depicted as a shoe and latex manufacturer. Presently, the property at 2 Canton Street is occupied by a business park and parking area, while 25 Brock Street is occupied by a commercial business. The property at 48 Wyman Street is occupied by a vacant store/garage. The railroad tracks located adjacent to the Site have been in existence since the mid-1880s.

ES-5 Phase I Findings

The goal of the Phase I ESA is to identify RECs as defined by the Standard. This section identifies known or suspected RECs, historical RECs and potential environmental concerns (*de minimis* conditions). During the Phase I ESA, VHB identified nine RECs and three potential environmental concerns associated with the Site. VHB's opinion is limited by the conditions prevailing at the time the work was performed and the applicable regulatory requirements in effect.

To meet the requirements of Section 12.8 of the Standard, the statement below shall be included to preface the conclusions of this report.

"We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of 865 Central Avenue, the Site. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property except for the following:"

Recognized Environmental Conditions

Nine RECs were identified during the Phase I ESA, as listed below. Detailed information on the identified RECs is provided in Section 7.1. The nine RECs include:

- 2 Canton Street, Former Use of the Property and On-Site Disposal Site (4-875, 4-18753, and RTN 4-21470,);
- Off 17 Morton Square, Murphy Coal Company, On-Site Automotive Repair, Petroleum Storage, and Disposal Site (RTN 4-13478);
- 25 Brock Street, Industrial Use of the Property and On-Site Disposal Site (RTN 4-13476);
- 48 Wyman Street, Use of Property as a Machine Shop;
- 931 Washington Street, Current Auto Repair and Former Filling Station (Off-Site);
- 24-46 Morton Street, Off-Site Chemical Company;
- 945 Washington Street, Active Drycleaning Business (Off-Site);
- 45 Wyman Street, Former Petroleum Storage at Stoughton Train Station (Off-Site); and

- 825 Washington Street, Nearby Disposal Sites and Former Filling Station (RTNs 4-12937, 4-11868, 4-13560, and 4-13682).

Potential Environmental Concerns

Three potential environmental concerns or *de minimis* conditions have been identified for the Site.

1) Based on the age of buildings, which may be demolished for the South Coast Rail project, asbestos containing materials, including roof flashing, tiles, and other materials, as well as lead based paint, may be present.
2) Due to the Site's densely developed location, close proximity to a railroad right-of-way and a long history of industrial and commercial use, urban fill may have been used to fill portions of the Site. Urban fill can contain metals and polycyclic aromatic hydrocarbons (PAHs) originating from coal/wood ash, tar, and/or slag.
3) Due to the close proximity of the railroad tracks and a suspected implementation of a vegetation control program in the vicinity of the railroad tracks, there is a possibility that lead, arsenic and other contaminants from pesticides are present in Site soil.

1 Introduction

1.1 Purpose and Scope of Work

Vanasse Hangen Brustlin, Inc. (VHB) was retained by the Massachusetts Department of Transportation (MassDOT) (the "Client") to conduct a Phase I Environmental Site Assessment (Phase I ESA) for the proposed Stoughton Station in the center of Stoughton, Massachusetts, located in Norfolk County, hereinafter referred to as the Site. The Site is being considered for potential acquisition and development during the South Coast Rail Project, which aims to restore passenger rail transportation from South Station in Boston to the South Coast of Massachusetts (the Project).

This Phase I ESA has been completed in general compliance with ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (the Standard) and generally conforms to US Environmental Protection Agency's guidance for All Appropriate Inquiries pursuant to regulations at 40 CFR Part 312. The Client is also the User of this report. Pursuant to Section 3.2.93 of the Standard, "the User has specific obligations for completing a successful application of this practice as outlined in Section 6" of the Standard.

The purpose of this Phase I ESA is to identify, to the extent feasible pursuant to the process described in the Standard, Recognized Environmental Conditions (RECs) in connection with the property. The Phase I ESA was completed utilizing the ASTM Standard as guidance. RECs are defined in the Standard as "*the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.*"

The scope of services provided in the Agreement for the Phase I ESA includes the following:

- An inquiry by an "Environmental Professional" as defined in Section 312.21 of the All Appropriate Inquiries rule;

- Interviews with past and present owners, operators, and occupants, or abutters if the property is abandoned, in an effort to gather any specialized knowledge or experience with regard to the subject property;
- A review of historical sources, including, but not limited to, chain of title documents, aerial photographs, building department records, and land use records to determine previous uses and occupancy since first development;
- Searches for recorded environmental cleanup liens against the facility that are filed under federal, state or local law;
- A review of federal, state, or local government records; and
- A visual inspection of the facility and surrounding properties.

The scope of the Phase I ESA did not include a vapor intrusion evaluation or any environmental testing or sampling of soil, water, air, or soil vapor. Pursuant to Section 7.5.2.1 of the Standard, VHB was not required to independently verify information provided by others to complete the Phase I ESA.

1.2 Significant Assumptions, Limitations, Exceptions, and Data Gaps

VHB noted the following data gaps during this investigation:

- VHB was not able to interview the current or former key site managers who are likely to have a good knowledge of the uses and physical characteristics of the Site.
- The title documents for the Site were not reviewed.
- The User did not provide information as required by Appendix 3 of the ASTM Phase I ESA Standard.
- A site reconnaissance was not performed for the interior of the buildings located on the Site. The interior of the property located at 25 Brock Street could also not be viewed from public roadways and was not visited.

These data gaps could affect the findings of this report and where appropriate, have been conservatively incorporated as environmental concerns. However, upon obtaining the additional data, the findings may be re-evaluated.

1.3 Terms and Conditions

This Phase I ESA is subject to the terms of the agreement between VHB and the Client, and the Limitations included in Appendix A. Other than those limitations expressly provided in Appendix A and/or specified in Section 1.2, completion of the Phase I ESA was not subject to significant assumptions, limitations, or exceptions to the Standard.

1.4 User Reliance

This Phase I ESA was completed solely for Client (MassDOT) subject to the terms, conditions and limitations referenced herein and as issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and VHB, shall be at the User's sole risk.

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2

Site Description

2.1 Site Location and Description

The Site consists of six parcels and totals 428,630 square feet (equivalent to 9.84 acres). The parcel identification obtained from the City of Stoughton Tax Assessor, address, acreage, and current use of each parcel is provided below in the following table.

Table 2-1 List of Parcels

Parcel (Map-Lot)	Address	Acres	Current Use
054-110	2 Canton Street	2.16	Business Park (Multiple Tenants)
053-102	25 Brock Street	4.42	Warehouse (Business Unknown)
054-401	48 Wyman Street	0.11	Vacant Store/Garage
054-407	Morton Street	0.20	Vacant Lot
054-406	Morton Square	1.90	Repair Garage/Industrial Storage Yard
053-101	25 Brock Street	1.05	Commercial (Communications Company)

A Site Location and Local Area Map showing the vicinity of the Site is provided as **Figure 1.** A Site Plan depicting the Site and relevant site features is included as Figure 2.

2.2 Site and Vicinity General Characteristics

The Site is located in a mixed commercial, industrial, and residential area of Stoughton. The Site is situated around an active commuter rail station known as Stoughton Station. Topography at the Site is slopes gently upward to the northeast. Land on the southwestern portion of the Site is approximately ten feet below the nearby railroad tracks. The approximate elevation of the Site ranges from 210 feet above mean sea level at

the southwest corner, to 230 feet above sea level at the northeast corner. The nearest surface water body is Wood's Pond, which is located approximately 2,000 feet southwest of the Site. Wood's Pond is part of the Neponset River watershed.

2.3 Present Ownership and Current Use of the Property

The present ownership of each parcel comprising the Site is provided in the following table.

Table 2-2 Parcel Ownership

Parcel (Map-Lot)	Address	Ownership Information
054-110	2 Canton Street	Stoughton Center Business Park, LLC.
053-102	25 Brock Street	Juckett, M. & Corbett, T. Trustees Beta Realty Trust
054-401	48 Wyman Street	Quality Auto Parts of Stoughton C/O C. H. Beckford
054-407	Morton Street	Gouveia, Nelson E. & Kenneth; Hobson, Eileen
054-406	Morton Square	Murphy Coal Company, Inc.
053-101	25 Brock Street	Juckett, M. & Corbett, T. Trustees Beta Realty Trust

A business park, offices, warehouses, repair garage, and associated parking areas are located on the Site as noted in Section 2.1.

2.4 Description of Structures, Roads, and Other Site Improvements

The following table describes structures that are currently located on the Site parcels. The majority of the parcels are paved or covered with buildings. However; parcel 054-407 is unpaved and undeveloped. In addition, parcels 054-406, 053-102, and 053-101 are unpaved. Entrance to the parcels is off main roads, which include Morton Street, Brock Street, Wyman Street, and Canton Street.

Table 2-3 Description of Structures

Parcel (Map-Lot)	Address	Structures
054-110	2 Canton Street	One 33,819 square foot mill building, three stories, brick exterior, tar and gravel roof, constructed in about 1910, gas heat. One 12,699 square foot mill building, two stories, brick exterior, tar and gravel roof, constructed in about 1910, gas heat. One 26,699 square foot mill building, two stories, clapboard exterior, tar and gravel roof, constructed in about 1910, gas heat.
053-102	25 Brock Street	One 6,440 square foot commercial warehouse, one story, clapboard exterior, asphalt roof, constructed in 1925, oil heat. One 2,240 square foot commercial warehouse, one story, stone exterior, asphalt roof, constructed in 1910, oil heat. One shed (detailed information not available).
054-401	48 Wyman Street	One 4,611 square foot warehouse building, one story, corrugated steel exterior, membrane roof, constructed in 1960, oil heat.
054-407	Morton Street	Undeveloped land.
054-406	Morton Square	One 3,900 square foot, auto repair garage, one story, aluminum exterior, metal roof, constructed in 1950, gas heat.
053-101	25 Brock Street	One 19,458 square foot mill building, two stories, primarily brick exterior, tar and gravel roof, gas heat.

2.5 Current Uses of Adjoining Properties

The following properties and features surround the Site:

North

- MBTA-owned parking lot
- MBTA railroad tracks
- Route 27

East

- Historic Stoughton train station at 45 Wyman Street
- Portuguese National Club building and parking lot at 21 Railroad Avenue
- Warehouse located at 27 Railroad Avenue
- Vacant gas station at 825 Washington Street
- Auto repair shop at 931 Washington Street
- MBTA-owned parking lot and private lots
- Residential properties

South

- Stores at 945 Washington Street
- Residential properties

West

- Alpha Chemical Services of 24-46 Morton Street
- Demolished structure at 3 Morton Street
- Nightclub located at 63 Wyman Street
- St. Vincent De Paul Society at 18 Canton Street
- Residential properties

Properties located in the vicinity of the Site are used for industrial, commercial and/or residential purposes. A Local Area Map showing the vicinity of the Site and surrounding properties is provided as Figure 2.

3

User-Provided Information

3.1 Title Records

Title records were not reviewed for the Site. Historic property ownership and use were obtained from documents reviewed at municipal offices and other available environmental reports for the Site.

3.2 Environmental Liens or Activity and Use Limitations

The User did not provide information regarding environmental liens or Activity and Use Limitations relative to the subject Site.

3.3 Specialized Knowledge

The User did not provide information regarding any specialized knowledge relative to the subject Site.

3.4 Commonly Known or Reasonable Ascertainable Information

The User did not provide information regarding commonly known or reasonably ascertainable information regarding the Site.

3.5 Reason for Performing Phase I

This Phase I ESA was performed for property acquisition purposes.

3.6 Previous Environmental Reports

The User did not provide VHB with previous environmental reports pertaining to the Site. However, environmental reports pertaining to the Site were obtained through MassDEP and are summarized in Section 4.1.1.

4

Records Review

VHB conducted environmental database and municipal file reviews to help identify RECs on the Site and properties in the vicinity of the Site that have had a release or pose a threat of release of OHM that may impact the environmental quality of the Site. VHB reviewed federal and state environmental databases supplied by Environmental Data Resources, Inc. (EDR). VHB also conducted a targeted review of files available from MassDEP. The results of the records review are summarized below.

4.1 Standard Environmental Record Sources

EDR provided a report dated April 23, 2012, summarizing available and reasonably ascertainable information from standard environmental record sources at the minimum distances required in Section 8.2.1 of the Standard. A copy of the EDR report is provided in Appendix B, which includes a more detailed description of each database.

Sites with minimal address information that may be located in close proximity to the Site are listed separately in the database report as Orphan sites. A search was conducted of Orphan site locations to estimate distance and direction from the Site. Based on information contained in the EDR report and information derived from local maps, one of the listed Orphan sites is within the search radius of the Site and is discussed in Section 4.1.1. The remaining Orphan sites are not located within the search radius of the Site and/or are not likely to affect Site environmental media, including soil and groundwater quality; however, this determination was made with incomplete or limited information.

A summary of the EDR findings is described below.

- **National Priorities List (NPL); 1 mile** - A database operated by the EPA as an inventory of hazardous materials disposal sites that have been reported to the Federal government and been determined to be a priority for a Federal cleanup. No NPL sites were identified within the specified search radius.

- **Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Sites; 0.5 mile** - A database operated by the EPA as an inventory of potential hazardous materials sites that have been reported to the Federal government. No CERCLIS sites were identified within the search radius.
- Resource Conservation and Recovery Information System (RCRIS) under the Resource Conservation and Recovery Act (RCRA) includes the following databases:
  - **Corrective Action Sites (CORRACTS); 1 mile -** A database operated by the EPA as an inventory of hazardous waste treatment, storage and disposal facilities requiring a Federal oversight. One RCRA CORRACTS sites was identified within the specified search radius. Jet Line Services, Inc. of 441R Canton Street is located approximately 3,000 feet to the northwest of the Site and is therefore not expect to impact Site environmental media.
  - **Transportation, Storage Disposal Facility (TSD); 0.5 mile** - A database operated by the EPA as an inventory of hazardous waste treatment, storage and disposal facilities. No RCRA TSD sites were identified within the specified search radius.
  - **RCRA Generators (GN); Target Property and Adjoining Properties** - A database operated by the EPA as an inventory of hazardous waste generators who store hazardous waste on their properties. Two Conditionally Exempt Small Quantity Generators (CESQG) are located within the search radius at 931 Washington Street and 46 Morton Street. The property at 931 Washington Street is detailed is detailed in Section 4.1.1. Alpha Chemical Services of 46 Morton Street has been listed as a CESQG since 2004, and wastes transported from the property under manifest include lead, 1,1,1-trichloroethane, hydrofluoric acid, and dimethyl-benzene. The company manufactures acid sanitizer, disinfectants, mildew preventatives, and liquid chlorinating products. The presence of this company abutting the Site is discussed as a REC in Section 7. No Large Quantity Generators (LQG) or Small Quantity Generators (SQG) were listed on the database for the specified search area.
- **Emergency Response Notification System (ERNS); Target Property** - A database operated by the EPA as an inventory of hazardous materials or petroleum spills. The Site was not listed in the ERNS database.
- **Facility Index System (FINDS); Target Property** - A database operated by the EPA as an inventory of environmental permitted facilities (air, water, hazardous materials). The Site was not listed in the FINDS database.
- Toxic Chemical Release Inventory System (TRIS), Toxic Substances Control Act (TSCA), FIFRA/TSCA Tracking System (FTTS), Section 7 Tracking System (SSTS); target property - TRIS identifies facilities which release toxic chemicals to air, water and land in reportable quantities under SARA Title III. TSCA identifies manufacturers and importers of chemical substances included in the TSCA list. FTTS tracks administrative cases and pesticide enforcement actions and compliance related to the Federal Insecticide, Fungicide & Rodenticide Act

(FIFRA) and TSCA. SSTS tracks the types and amounts of pesticides being produced. The Site is not listed on these databases.

- **State Hazardous Waste Sites (SHWS) and Release Sites; 1 mile -** A database which shows information on releases of OHM that have been reported to the MassDEP and are on the Release List. A total of 42 SHWS sites were identified within a 1 mile radius of the Site. In addition, 58 Release sites were identified within 1 mile of the Site. Those properties that have the potential to adversely affect the Site are discussed in greater detail in Section 4.1.1. All remaining SHWS and Release sites are unlikely to have an adverse impact to the subject Site due to the distance, direction, nature and/or regulatory status.
- **Solid Waste Landfills (SWL); 0.5 mile** - A database of active and closed solid waste landfills. No SWL sites were identified within the specified search radius.
- **Underground Storage Tanks (UST); Target Property and Adjoining Properties -** A database of underground storage tank registered in the Commonwealth of Massachusetts. A total of two UST sites were listed in the specified search area at 825 and 931 Washington Street. These properties are described in Section 4.1.1.
- **Leaking Underground Storage Tanks (LUST); 0.5 mile** – A database of leaking underground storage tank facilities. A total of 46 LUST sites were identified within the specified search area. LUST properties that have a potential to impact environmental media at the Site are discussed in Section 4.1.1 below. All remaining LUST sites are not expected to adversely impact environmental media at the Site based on proximity to the Site.
- **Leaking Aboveground Storage Tanks (LAST); 0.5 mile** – A database of leaking aboveground storage tanks. Twelve LAST properties were listed within the specified search radius. Based on proximity to the Site and/or regulatory status, the LAST properties are not expected to impact environmental media at the Site.
- **Institutional Control Sites (INST CONTROL); Target Property and Adjoining Properties –** A database of sites with Activity and Use Limitations (AULs) which establish limits and conditions of the future use of a contaminated property. One INST CONTROL site was listed within the specified search radius. The on-Site AUL at 2 Canton Street is discussed in Section 4.1.1 below.
- **Drycleaners (DRYCLEANERS); 0.25 mile** – A listing of MassDEP's regulated dry cleaning facilities that use perchloroethylene under MassDEP's Environmental Results Program. One drycleaner was identified within the specified search radius. Pearl Cleaners of 945 Washington Street is located approximately 100 feet southeast of the Site and discussed in Section 7.
- **Other Databases** – There are many additional federal, state and local databases searched by EDR, including Brownfields, PCB Activity Database (PADS), Toxic Substances Control Act (TSCA), Formerly Used Defense Sites (FUDS), Manufactured Gas Plant database and others listed in the EDR report which is located in Appendix B. One manufactured gas plant and one Mines listed were noted in the report. Stoughton Gas and Electric was listed on School Street but is believed to be located approximately 350 feet north of the Site based on historic Sanborn maps. A quarry known as T. L. Edwards, Inc. involved the mining of

granite and is located over 1,000 feet west of the Site. Based on proximity, these properties are not expected to impact the Site. No other sites are listed within the specified search radius for the remaining databases.

4.1.1 Summary of Reports Reviewed at MassDEP

Available records were reviewed electronically on the MassDEP on-line file review database and in person at the MassDEP Northeast Regional Office. The MassDEP UST Query Tool was also searched online. Information obtained during the reviews is summarized below. Copies of relevant documents obtained during the MassDEP review are included in Appendix C.

Table 4-1 MassDEP File Review

Site Description	RTN	Summary
Old Factory/ Machine Shop 25R Brock Street	4-13476	November 1997: Release occurred and Immediate Response Action activities began May 1999: Class A-1 Response Action Outcome achieved August 1999: Class A-1 Response Action Outcome reaffirmed
J.F. Corcoran Shoe Company 2 Canton Street	4-875 4-21470 4-18753	April 1990: Discovery of past release (RTN 4-875) Post-April 1990: Discovery of second disposal site (RTN 4-21470) during remediation activities under RTN 4-875 October 2004: Discovery of third disposal site (RTN 4-18753) October 2009: Class A-3 Response Action Outcome achieved for three disposal sites
Off 17 Morton Square	4-13478	November 1997: Identification of disposal site May 1998: Class A-1 Response Action Outcome achieved
825 Washington Street	4-11868 4-12937 4-13560 4-13682	January 1996: Identification of disposal site (RTN 4-11868) December 1996: Class A-1 Response Action Outcome achieved (RTN 4-11868) January 1997: Second disposal site identified (RTN 4-12937) November 1997: Third disposal site identified (RTN 4-13560) February 1998: Fourth disposal site identified (RTN 4-13682) Current Status: RTNs 4-12937, 4-13560, and 4-13682 currently in Remedy Operation Status
931 Washington Street	--	March 1947: Installation of a 3,000 gallon gasoline Underground Storage Tank 1986: Site permitted as a Conditionally Exempt Small Quantity Generator Since 1986: Manifests indicate the transportation of ignitable hazardous waste from property
Stoughton Center to 441 Rear Canton Street	4-22289	November 2009: Release occurred
Former Sunoco 990 Washington Street	4-265 4-18650 4-18968	January 1987: Release occurred (RTN 4-265) September 1994: Class A-2 Release Action Outcome submitted (RTN 4-265) August 2004: Second release occurred (RTN 4-18650) February 2005: Third release occurred (RTN 4-18968) August 2005: Class A-2 Release Action Outcome achieved (RTNs 4-18650 and 4-18968)

Table 4-1 MassDEP File Review (continued)

Site Description	RTN	Summary
Market 31 Porter Street	4-17655	January 2003: Release occurred March 2003: Class A-1 Response Action Outcome achieved

4.1.1.1 Old Factory/Machine Shop, 25R Brock Street, RTN 4-13476

A disposal site at 25R Brock Street was assigned RTN 4-13476 in November 1997 for a release of approximately 15 gallons of No. 2 fuel oil. The release occurred when a 275-gallon AST tipped over and began leaking from a pipe. The Site at this time was utilized by several tenants for woodworking, a security business, a phone repair shop, and machine shop. An Immediate Response Action was conducted to excavate impacted soil (37 tons total), which was stockpiled on the property. No activities were conducted between November 1997 and May 1999. Soil samples were later collected in 1999, and the disposal site achieved a Class A-1 Response Action Outcome (RAO) in May 1999. The Class A-1 RAO indicates that contaminant concentrations were reduced to background and a Condition of No Significant Risk was achieved. The RAO was revised and resubmitted to MassDEP in August 1999 after an audit found that private wells were located within 500 feet of the Site. This finding did not change the report conclusions. The presence of a disposal site on the Site is discussed as a REC in Section 7.

4.1.1.2 J.F. Corcoran Shoe Company, 2 Canton Street, RTNs 4-875, 4-21470, 4-18753

A disposal site located at 2 Canton Street was assigned RTN 4-875 in April 1990 for a release of No. 6 fuel oil within the courtyard area of the property. The release was discovered during the removal of one 500-gallon gasoline UST and one 6,000-gallon No. 6 fuel oil UST in November 1989. Response actions included the soil and groundwater sampling, excavation of a former drywell, in-situ chemical oxidation, (ISCO) treatment, and contaminated soil excavation. RTN 4-21470 was assigned to the property for petroleum contamination discovered during the removal of an abandoned 3,000-gallon fuel oil UST, constituting a second disposal site. In addition, a third disposal site was assigned RTN 4-18753 in October 2004 for the detection of separate phase product in two piezometers. A Class A-3 RAO was achieved for all three disposal sites in October 2009. The Class A-3 RAO indicates that contaminant concentrations were not reduced to background levels, and a Condition of No Significant Risk is dependent upon the implementation of an AUL on the property. The disposal site encompasses the northern and central portions of the property. The AUL area encompasses the footprints of the buildings located on the northwestern half of the Site. The presence of a disposal site on the Site is considered a REC as discussed in Section 7.

4.1.1.3 Off 17 Morton Square, RTN 4-13478

A disposal site on the property behind 17 Morton Square (owned by Murphy Oil Company), was assigned RTN 4-13478 in November 1997 when a representative from MassDEP identified an oil-stained area and improperly stored waste oil at the property. A total of 2.68 tons of soil was excavated from the stained area, and confirmatory samples were collected. Waste oil being improperly stored was also removed from the property under a uniform hazardous waste manifest. The disposal site achieved a Class A-1 RAO in May 1998, which indicates that a Condition of No Significant Risk was achieved and contaminant levels were reduced to background. However, the disposal site is located on the Site and is therefore discussed as a REC in Section 7.

4.1.1.4 825 Washington Street, RTNs 4-11868, 4-12937, 4-13560, 4-13682

A disposal site at 825 Washington Street was assigned RTN 4-11868 in January 1996 for the detection of VOCs in the basement of the neighboring VFW building. A soil vapor extraction system was installed to mitigate the vapors, and a Class A-1 RAO was achieved in December 1996. A Class A-1 RAO indicates that contaminant levels were reduced to background and a Condition of No Significant Risk was achieved.

A second disposal site at the property was assigned RTN 4-12937 in January 1997 when an odor was again noticed in the basement of the neighboring building. Five USTs were removed from the property in 1997. Samples collected during the tank removal indicated that PAHs were present on the property above reportable concentrations and RTN 4-13682 was assigned to the property in February 1998. Finally, RTN 4-13560 was assigned to the Site in November 1997 when separate phase product was measured in one bedrock monitoring well installed at the property. These three RTNs are currently in Remedy Operation Status (linked under RTN 4-12937). According to reports reviewed for the disposal sites, the local groundwater flow direction varies, but generally appears to flow in an easterly direction. There is limited data between the source of petroleum and the Site, and in addition, PAHs were detected in soils on the western side of the gas station building (closest to the Site). The property containing the disposal site is located approximately 150 feet east of the Site. This disposal site is therefore discussed as a REC in Section 7.

4.1.1.5 Ruggiero & Son Inc., 931 Washington Street

According to the MassDEP online UST Query, the property at 931 Washington Street was formerly the location of a 3,000 gallon gasoline UST, which was installed in March 1947. The tank was constructed of steel and had no recorded leak detection or protection system. The property has also been permitted as a Conditionally Exempt Small Quantity Generator (CESQG) since 1986. Manifests have been used to document transportation of ignitable hazardous waste, such as petroleum distillates, from the property since this time. This property is located approximately 50 feet east of the Site.

In addition, the former presence of a filling station and petroleum storage at this location is discussed as a REC in Section 7.

4.1.1.6 Stoughton Center to 441 Rear Canton Street, RTN 4-22289

RTN 4-22289 was assigned to a release of diesel fuel, which occurred as a result of a mechanical failure within the engine compartment of a construction vehicle in November 2009. Between 10 and 25 gallons of fuel was released along 0.9 miles of roadway and remediated with absorbent materials. Although the release occurred on a roadway abutting the Site, based on a small amount of fuel released and regulatory status, the disposal site is not expected to impact the Site.

4.1.1.7 Former Sunoco, 990 Washington Street, RTNs 4-265, 4-18968 and 4-18650

A disposal site at 990 Washington Street was assigned RTN 4-265 in January 1987 when a release of petroleum compounds was detected in groundwater in two monitoring wells. A Class A-2 RAO was submitted for this disposal site in September 1994. A second disposal site at the property was assigned RTN 4-18650 in August 2004 for a release of petroleum constituents to groundwater. The release was designated a 72-hour reporting condition because several private wells were found to be located within 500 feet of the property. However, it was later determined that these wells were used for irrigation purposes only. A third release at the property was assigned RTN 4-18968 in February 2005. This release was detected during the removal of gasoline USTs, dispensers and piping at the property. The disposal sites associated with RTNs 4-18968 and 4-18650 achieved a Class A-2 RAO in August 2005, which indicates that concentrations of contaminants were not reduced to background levels but a Condition of No Significant Risk was achieved. The disposal site is located approximately 500 feet south of the Site. Analytical results of groundwater samples collected from monitoring wells between the Site and the disposal site were found to be below applicable regulatory thresholds, and therefore the disposal site is not expected to impact the Site.

4.1.1.8 Market, 31 Porter Street, RTN 4-17655

A disposal site at 31 Porter Street was assigned RTN 4-17655 in January 2003 for a release of approximately 50 gallons of diesel fuel from a delivery truck. Visibly impacted snow and ice was removed and absorbent materials were placed to clean up the spill. A Class A-1 RAO was achieved in March 2003. Based on the regulatory status and nature of the release, the disposal site is not expected to adversely impact environmental media at the Site.

4.2 Local Records Review

VHB personnel visited the Town of Stoughton municipal offices in April 2012 to review available files. The following is a summary of the files reviewed by department.

4.2.1 Assessor's Office

VHB obtained information regarding the Site from the Town of Stoughton Tax Assessor's. The following table describes the each parcel's identification, address, area, and current use as described on the property field cards.

Table 4-2 Assessor's Information

Parcel (Map-Lot)	Address	Acres	Current Use
054-110	2 Canton Street	2.16	Business Park (Multiple Tenants) and Parking Lots
053-102	25 Brock Street	4.42	Warehouse (Business Unknown)
054-401	48 Wyman Street	0.11	Vacant Store/Garage
054-407	Morton Street	0.20	Vacant Lot
054-406	Morton Square	1.90	Repair Garage/Industrial Storage Yard
053-101	25 Brock Street	1.05	Commercial (Communications Company)

The property field cards for the Site and associated assessor's map are included in Appendix D.

4.2.2 Fire Prevention Office

The Town of Stoughton Fire Prevention office was visited on April 26, 2012. Information was provided for the Site and abutting properties by Kathy McGrady, the Administrative Assistant, is summarized in this section.

25 Brock Street

Date	Document
6/15/1993	Tank removal record and application permit for one 15,000-gallon No. 4 fuel oil and one 10,000-gallon gasoline tank at Cain Manufacturing. Removal was performed by Hersee and transported by Enviro Product & Services to Mid City Scrap in Westwood, Massachusetts. No contamination is noted. Tank removal receipt was provided for the 10,000-gallon tank.
6/15/1993	Application for removal and tank disposal receipt for one 1,000-gallon gasoline tank. Removal to be conducted by Scott K. Hersee.
03/10/1999	Tank removal record for one 275-gallon aboveground tank. The record notes "Outside tank removal for placement of new tank. Staining on ground from previous problems with this location. This tank seemed to have no leaks." Tank disposal receipt was provided.
10/14/2000	Tank removal record for one 275-gallon steel aboveground tank from a rear deck. No contamination is noted. Tank disposal receipt was provided.

2 Canton Street

Date	Document
11/17/1989	Record of tank removal for one 500-gallon gasoline and one 5,000-gallon tank of unknown product. Removal conducted by J.F. McNamara. The permit does not indicate whether any notifications were made to MassDEP for contamination. Tank disposal receipts were provided.
11/13/1992	Record of tank removal for one 10,000-gallon No. 4 fuel oil tank from the Corcoran Shoe factory conducted by Clean Harbors. No indication of contamination. Tank disposal receipt was provided.
8/26/2008	Application for removal of a 3,000-gallon No. 6 fuel oil tank from Stoughton Center Business Park conducted by Cyn Environmental. Woodard and Curran was the consultant and RTN 4-21470 was assigned for contamination.

17 Morton Square (Murphy Coal Co.)

Date	Document
None	Record of storage tanks at this location. Three 15,000-gallon and two 10,000-gallon ASTs. Contents not noted.

3 Morton Square (New England Furniture)

Date	Document
1/3/1997	One 1,000-gallon tank. Contents not noted. Tank disposal receipt provided.

42 Morton Street (Alpha Chemical Company)

Date	Document
5/17/1993	Application for the removal of one 1,000-gallon fuel oil tank. Tank disposal receipt was provided.

45-47 Wyman Street (Historic Stoughton Train Station)

Date	Document
1/3/1997	Record of removal and application for removal for four 330-gallon above ground No. 2 heating oil tanks. Tank disposal receipts were provided.

26 Brock Street (Across the Street from 25 Brock Street)

Date	Document
8/11/1993	Tank removal record and application for 500-gallon fuel oil tank. No notation on permit regarding contamination. Tank disposal receipt was provided.

4.2.3 Zoning/Planning/Engineering Department

During a visit to this office on April 25, 2012, VHB was provided with the two tax maps applicable to the Site (numbers 53 and 54). The zoning for each parcel was noted from the original tax maps as follows.

Table 4-3 Tax Map Information

Parcel (Map-Lot)	*Address*	*Zoning*
054-110	2 Canton Street	General Business
053-102	25 Brock Street	Industrial
054-401	48 Wyman Street	Central Business District
054-407	Morton Street	Industrial
054-406	Morton Square	Industrial
053-101	25 Brock Street	Industrial

In addition, the Town Engineer provided VHB with sewer connection diagrams pertaining to selected parcels. Based on these diagrams, the property at 48 Wyman Street appears to have been connected to the Town sewer system in 1961. Sewer diagrams were provided for 25 Brock Street dated January 1983, and 2 Canton Street dated August 2004. However; these later records may pertain to connections that were altered or repaired. The Environmental Affairs Officer in Stoughton also stated that a sewer pipe running through the 25 Brock Street property was retro-fitted with a sleeve as a repair at one point in time. An engineer for the Town stated that the central portion of Stoughton where the Site is located is served by municipal sewer.

The Town's Environmental Affairs Officer, James B. Conlon, stated that there are state-listed hazardous waste sites located in the vicinity of the Site. He was not aware of any recent filling activities in the area, but he believes that there are wetlands located in the forested area behind 25 Brock Street.

4.2.4 Board of Health

There were no files pertaining to environmental conditions at the Site at the Stoughton Board of Health office. A café located at 2 Canton Street is permitted by the Board. Information pertaining to the drinking water supply is contained in Section 4.2.6.

4.2.5 Building Department

The Stoughton Building Department was visited on April 25, 2012. A file was available for parcels of the Site that have specific numbered addresses. The majority of permits did not pertain to environmental concerns at the Site and included remodeling, plumbing, electrical, or sign permits. The following permits were reviewed regarding environmental conditions at the Site:

- October 26, 1979 letter from Stoughton Fire Prevention summarizing inspection findings at 25 Brock Street. Noted that a rear building with 'Rick's Kitchen' as tenant had an oil burner and oil storage in violation of CMR 4.00 and Fire Prevention Regulation #3 including an improper chimney.
- October 30, 1979 letter from Building and Zoning stating that the venting of the oil burner at 25 Brock Street was not a proper, safe installation.
- December 23, 1991 application for permit to perform electrical work at Murphy Coal (off 17 Morton Square). Proposed electrical work was "to install new service for fuel pumps."
- July 23, 1992 permit for 27-29 Wyman Street, noted as Railroad Station, to install conversion burners in the basement.
- Undated plan of 2 Canton Street depicting floor plan. A 2,500 gallon fuel oil tank, gas pump, 500-gallon gasoline tank, and three transformers are depicted on the property.

4.2.6 Water and Sewer

According to Stoughton Department of Public Works records, properties located within the vicinity of the Site are serviced by municipal water and sewer, private drinking water wells, and/or septic systems. Potable wells are located on Morton Street, within 500 feet of the Site, as noted in other environmental reports and the EDR Radius Report.

A portion of properties in the vicinity of the Site are believed to be serviced by the Stoughton municipal water supply, which is acquired from seven public wells on the western boundary of the Town. In addition, the Town purchases water from the Canton, Easton, and Sharon water departments.

As noted in Section 4.2.3, the Town Engineer had records of municipal sewer connection for 2 Canton Street, 25 Brock Street, and 48 Wyman Street. In addition, a non-potable well is located at 2 Canton Street (and has been located at the Site since the 1880's according to Sanborn maps). According to available environmental reports, the property at 2 Canton Street is serviced by municipal water. There are no Zone II public drinking water supplies located within a quarter mile of the Site.

4.2.7 City Clerk's Office

During the municipal file review on April 25, 2012, the Town Clerk provided VHB with a folder of all commercial petroleum storage permits in the Town. One permit pertaining to the Site was found. The permit was dated March 19, 2012 and allows Murphy Coal & Oil to use the buildings and structures located at Morton Square for the "keeping, storage, manufacture, or sale of flammables, combustibles, or explosives."

4.2.8 Summary of Records Review

VHB reviewed the EDR computer database search results, MassDEP Waste Site Lookup database, and relevant municipal files for properties that have or could potentially impact environmental conditions at the subject Site. Based on information obtained during the Phase I ESA, VHB determined that a MassDEP file review was necessary. After reviewing select files during the MassDEP file review, it was determined that potential and documented releases of OHM at the Site and nearby properties have the potential to impact the Site. The potential/documented releases of OHM are therefore discussed as RECs in Section 7.1.

4.3 Physical Setting Sources

The following section describes the physical resources of the project Site including topography, soils and surficial geology, bedrock geology, groundwater, wetlands, surface water, and floodplains.

4.3.1 Topography

The topography of the Site is generally flat with the exception of an approximately ten foot difference between the railroad tracks and parcels located on the southwest portion of the Site (25 Brock Street and Morton Square). Land surrounding the Site slopes gradually upward to the northwest, and gradually downward to the southwest toward Wood's Pond. The Site has a mean elevation of 225 feet above sea level.

4.3.2 Soils/Surficial Geology

According to the U.S. Department of Agriculture's (USDA) National Cooperative Soil Survey (NCSS) information, the majority of the Site is mapped as urban land. The southwestern portion of the Site may consist of the Walpole soil layer, which is a poorly drained sandy loam with slow infiltration rates. Land to the east and west of the Site consists of the Merrimac soil layer, which is a somewhat excessively drained fine sandy loam with high infiltration rates.

4.3.3 Bedrock Geology

According to the Bedrock Geology Map of Massachusetts by E-an Zen (1983), the bedrock for the Site vicinity is mapped as Dedham Granite, which is a light grayish-pink to greenish-grey, equigranular to slightly porphyritic, variably altered, granite south and west of Boston.

4.3.4 Groundwater

According to the Massachusetts Geographic Information System (MassGIS) Site Scoring Map dated April 23, 2012 and provided as Figure 3, the Site is not located within any current or potential drinking water sources, including EPA sole source aquifers, medium or high yield aquifers, Zone II or Zone A drinking water protection areas or Interim Wellhead Protection Areas (IWPAs).

Groundwater flow direction may be affected by surface topography and subsurface hydrogeologic characteristics. Based on surrounding topography, the groundwater flow direction at the Site is inferred to flow from the northeast to the southwest.

4.3.5 Wetlands

A small wetland is depicted on the Site in the MassGIS Site Scoring Map (Figure 3). In addition, the map also shows wetlands and a FEMA 100-year floodplain immediately to the south of the Site across Brock Street.

4.3.6 Surface Water

The nearest surface water body is Wood's Pond, which is located approximately 2,000 feet southwest of the Site. Wood's Pond is part of the Neponset River watershed. It should also be noted that Mead's Meadow is located approximately 700 feet southeast of the Site, and appears to sometimes contain standing water based on aerial photographs.

4.3.7 Floodplains

According to the Flood Insurance Rate Map (FIRM) for the Town of Stoughton, Massachusetts, Norfolk County, dated June 1, 1982 (Map Number 2502530001B), the Site is located in "Zone C", which pertains to areas of minimal flooding. The FIRM is included in **Appendix D**.

4.4 Historical Use Information

The following sections describe the historical use information that is evident on Sanborn maps, topographic maps, and aerial photography.

4.4.1 Sanborn Maps

Sanborn maps are a uniform series of large-scale detailed maps dating from 1867 through 1991 that depict the commercial, industrial, and residential sections of cities. These maps historically assisted fire insurance agents in determining the degree of hazard associated with a particular property. Sanborn maps are currently used to track the changing site conditions and property uses.

The Sanborn library was searched by EDR. Sanborn maps dated 1885, 1891, 1896, 1901, 1906, 1912, 1923, 1949, and 1966 were available for the Site and surrounding properties. Copies of the Sanborn maps are provided in Appendix E. A summary of the maps is provided below:

Year: 1885

This map depicts the property at 2 Canton Street as Mystic Rubber (rubber clothing company), powered by steam heat and coal fuel. The factory includes several buildings for grinding, spreading fabric, coat making, and storage. The southeastern

half of the property appears to be undeveloped with the exception of a small railroad spur. Several smaller buildings are located in the vicinity of the property at 48 Wyman Street, which include a two-story dwelling, gentleman's hall, and railroad passenger station. The railroad tracks are depicted in a similar location as they currently exist, except there are three sets of tracks labeled the Old Colony Railroad. The western half of the property off of Morton Square and Brock Street is not depicted in this map. However; a vacant dwelling, lumber storage, wagon shed, and lumber piles are shown on the eastern half of the property.

Years: 1891, 1896, and 1901

The 1891 map depicts 2 Canton Street as the Stoughton Rubber Company. A two and a half story freight house occupies the southeastern half of the property. The property at 48 Wyman Street is occupied by a two story dwelling. Land to the south of 48 Wyman Street and east of the Railroad Avenue properties is occupied by an Engine House and Turn Table (not located on the Site). The southwestern portion of the Site off Morton Square and Brock Street is occupied by the Samuel Paul Lumber Yard, which includes lumber sheds and storage. The 1896 map is generally similar to the 1891 map, except a horse shed, store house, and dwellings are shown on the property at 25 Brock Street. The 1901 maps are similar to the 1896 maps.

Year: 1906

The 2 Canton Street property is depicted as the Stoughton Rubber Co. in this map. The locations of buildings at the property are similar to those shown in earlier maps. The property at 48 Wyman Street continues to be occupied by a dwelling. Vacant sheds and storage occupied the properties off Morton Square and Brock Street at the southwestern portion of the Site. In addition, there are about six or seven sets of railroad tracks abutting the Site, in comparison to three in the previous map. The property off Morton Street appears to be vacant, although the street name shown for this property on the map is Summer Street.

Year: 1912

The 2 Canton Street property in this map continues to be occupied by the Stoughton Rubber Company. The smaller buildings on the northern and western portions of the property have been replaced by large mill buildings. The company includes stitching and folding rooms, shipping, heater rooms, and cutting rooms. The property continues to utilize steam and coal energy. The property at 48 Wyman Street remains unchanged from previous maps. Summer Street has been labeled Morton Square on the eastern side of the Morton Street property. The properties on the southwestern portion of the Site are occupied by sheds and a wagon house (the lumber yards are no longer present).

Year: 1923

In the 1923 map, the properties at 2 Canton Street and 48 Wyman Street remain unchanged from previous maps. However; the property at Morton Square is occupied by the Murphy Coal Co. Inc., which includes a coal shed, lumber shed, and scales. The 25 Brock Street property is occupied by the Meade Rubber Company, manufacturers of heels and rubberized cloth. The facility includes steam heat, coal fuel with a vulcanizer, two buried petroleum tanks, engine room, and mill room. A smaller gas tank is also shown at the front of the property closest to Brock Street. The former presence of petroleum storage at the Site is discussed in Section 7.

Year: 1949

In the 1949 map, the property at Morton Square (Murphy Coal Co.) remains unchanged. The southwester portion of 2 Canton Street continues to be occupied by a factory, which is now called the Joseph F. Corcoran Shoe Company. The facility has eleven types of rooms for shoe-making, but the building is in the same configuration as in previous maps. The property at 48 Wyman Street is vacant (no buildings present). The property at 25 Brock Street is occupied by L. Albert & Son used rubber machinery. The building is generally the same as in the 1923 map, except two additional larger warehouses have been constructed to the northwest (similar to those currently present on the Site).

Year: 1966

In the 1966 map, the factory at 2 Canton Street is still a shoe manufacturer. Based on recent aerials, it appears that this parcel was subdivided after this time, because the current property configuration shows the parcel boundary at the edge of buildings 1, 10, and 9. The southeastern half of the property is occupied by a parking lot. The property at 48 Wyman Street is occupied by a lumber storage building. A filling station is located east of the Site on Washington Street (off-Site). The Murphy Coal Co. on Morton Square is similar to the 1949 map, except five large fuel oil tanks are located at the center portion of the property. The property at 25 Brock Street is utilized for manufacturing shoe materials and latex. The facility buildings are used for storage, and engine room, and offices. Two buried petroleum tanks are still shown on the property. On the opposite side of the railroad tracks, at the corner of Brock Street and Washington Street is an auto repair facility with filling station (off-Site).

4.4.2 Topographic Maps

Historical U.S. Geological Survey (USGS) topographic maps showing the Site for the years 1894, 1941, 1948, 1951, 1958, 1963, 1971, 1975, 1979, and 1985 were obtained from EDR and reviewed. Copies of the historical topographic maps are included in Appendix F.

Beginning in the 1894 map, railroad tracks are shown running through the center of the Site. The Site is located in a moderately developed area of Stoughton (Stoughton

Center) and all roads that are used to access the Site currently are depicted. The 1941 map depicts the factory on 25 Brock Street, and also shows a wetland area on the southwestern corner of the Site. This wetland area is present up until the 1975 map. The remaining maps do not show any significant Site features such as buildings, but do depict the area surrounding the Site as moderately developed. Railroad tracks are depicted on all maps.

4.4.3 Aerial Photography

VHB personnel obtained and reviewed aerial photographs from EDR dated 1957, 1961, 1969, 1974, 1978, 1985, 1991, 1996, 2006, and 2008 for the Site and vicinity. Copies of the aerial photographs are included in Appendix G.

The 1957 photograph shows 48 Wyman Street as a vacant property. The Murphy Coal Oil property on Morton Square appears to not contain any large trees and is primarily occupied by a warehouse building and a row of five ASTs. The property at 25 Brock Street is shown as a facility with several buildings. There appears to be a ditch to the west of the facility that may contain standing water. Two Canton Street generally appears similar to its present configuration. The building at 48 Wyman Street first appears in the 1969 photograph. By 1978, the Site and Site features generally match their current appearance. The Murphy Coal Oil property becomes increasingly vegetated as the photographs progress to the present day. The 1996 map shows a parking area has been constructed on the Railroad Avenue properties, and the Murphy Coal Company appears to be storing an increasing amount of trailers/machinery on their property. The 2006 and 2008 photographs are very similar to the present day appearance of the property.

4.5 Site History Overview

Based on historical sources and previous environmental reports, the Site appears to have been developed since at least the late 1800s. As shown in Sanborn maps from 1885 to 1923, the property at 2 Canton Street was occupied by a rubber company, while the property at 48 Wyman Street was occupied by residential dwellings. In addition, the vacant land just off Morton Street (Parcel 054-507) appears to have always been undeveloped. The properties at 25 Brock Street and off Morton Square were occupied by a lumber yard, dwelling, and horse sheds as shown in Sanborn maps from 1891 to 1906. A rubber company at 25 Brock Street and the Murphy Coal Company off Morton Square are first depicted in the 1923 Sanborn map. The Murphy Coal Company currently remains off Morton Square. By 1949, the property at 2 Canton Street was utilized as a shoe manufacturing company, and 28 Wyman Street was vacant. The most recent Sanborn map from 1966 shows the 48 Wyman Street property occupied by a lumber storage building and the property at 25 Brock Street depicted as a shoe and latex manufacturer. Presently, the property at 2 Canton Street is occupied by a business park and parking area, while 25 Brock Street is occupied by a commercial business. The property at 48 Wyman Street is occupied by

a vacant store/garage. The railroad tracks located adjacent to the Site have been in existence since the mid-1880's.

5

Site Reconnaissance

5.1 Methodology and Limiting Conditions

A Site reconnaissance was conducted by Katherine Kudzma and Paul McKinlay of VHB on April 26, 2012 for visual and reasonably identifiable indications of RECs as defined by ASTM E 1527-05 and All Appropriate Inquiries guidance. Interior portions of the Site buildings were not accessed. Information obtained at the time of the site reconnaissance is presented in the following sections.

There were no limiting weather conditions at the time of the site reconnaissance. Photographs taken during the site visits are provided in Appendix H.

5.2 General Site Setting

The Site is located in Stoughton center and accessed via Morton Square, Wyman Street, Canton Street, Morton Street, and Brock Street. The area surrounding the Site is located in a developed, mixed use (commercial, industrial and residential) area of Stoughton. The Town of Stoughton is located in Norfolk County, approximately 16 miles south of the City of Boston.

5.3 Exterior Observations and Surface Conditions

Exterior observations of each parcel comprising the Site are summarized below. VHB personnel did not note any odors, pools of liquid, stains or corrosion, ponds or lagoons, stressed vegetation, or other observable feature of note, other than those specifically described herein.

2 Canton Street (Parcel 054-110)

The property at 2 Canton Street is currently occupied by the Trackside Plaza, a commercial business park. The southeastern half of the property is an asphalt paved

parking area. A portion of the parking lot was utilized for commuter parking associated with the abutting train station, while the portion of the lot closest to the building on the property was customer parking. The lot appeared to be in good condition and recently paved. Businesses within the large building on the property include the "Salon Sundara" beauty salon, "Padhale Deli Polish Food," "Praise Academy" dance school, "Why Weight Fitness" gym, "CV Café," "Henson Jackson" art gallery, "New England Martial Art," "Co Graphics & Signs," "Pattavina Networks" computer repair, "Sha'ar Hashmayim Messianic Congregation," "Mad Al's Doghouse" café, and "Berlus Realty." The building is comprised of several units, which appear to be connected by indoor walkways. A large smokestack is located in the central portion of the building. Portions of the Site not covered by the building are asphalt paved.

25 Brock Street (Parcel 053-102 and 053-101)

The parcel at 25 Brock Street is occupied by three buildings. The warehouse-style buildings on the central portion of the Site appeared to be one-story and in poor condition. Overhead electric wires run through the parcel, and several pole-mounted transformers were noted. A large brick mill-style building abuts Brock Street and appears to be occupied by commercial tenants. The tenants of the building could not be determined due to property access restrictions. The area in front of the building was asphalt-paved with small landscaped area. Loading docks are located on the western portion of the building. A dirt access road runs along the eastern side of the building.

48 Wyman Street (Parcel 054-401)

The parcel located at 48 Wyman Street is primarily occupied by a one-story building with corrugated steel exterior. A small shed was also noted on the northern portion of the Site. Signs on the building stated "Quality Auto Parts Automotive Finishes," "NAPA Auto Parts," and "Machine Shop Service, Truck-Auto-Marine, Foreign and Domestic." The building was vacant at the time of the Site visit and windows were covered with paper from the inside. The building has a large garage door on the southern face. In addition, several small areas of concrete and asphalt paving surrounded the building. Two large electric boxes, one of which may be associated with the abutting train station, were located against the western building face. Three pole-mounted transformers were noted at the property's western corner.

Morton Square (Parcel 054-406)

This parcel, owned by Murphy Coal Oil Company, is accessible via Morton Square, Brock Street, or Morton Street. VHB was not able to walk around the interior of the parcel; however, observations were made from the parcel boundaries. The parcel contains large piles of gravel, cut trees, wood pieces, and sand. Vehicles were scattered throughout the property and included a large snow plow, fuel delivery vehicle, and at least five pieces of heavy equipment. Five ASTs were noted at the central portion of the parcel. The tanks were grey, painted steel and there was a small concrete wall surrounding the tanks of unknown condition, which may have been

constructed as a secondary leak containment structure. The parcel does not appear to be paved. The ground surface appeared to be a dark grey color in some locations, which may be unnatural and caused by the former use of the property for coal distribution. A warehouse style building is located on the eastern side of the parcel and could not be accessed.

5.3.1 Polychlorinated Biphenyls

At the time of the site reconnaissance, several pole-mounted electrical transformers were observed throughout the Site. Pad-mounted transformers were noted at the 2 Canton Street and 48 Wyman Street properties. VHB did not observe any other materials or structures indicating the presence of polychlorinated biphenyls at the Site.

5.3.2 Monitoring Wells

One monitoring well was observed at 2 Canton Street on the eastern side of the property.

5.3.3 Storage Tanks and Subsurface Utilities

Storage tanks were observed during the site reconnaissance at the Murphy Coal Company property. Five large ASTs are present at the central portion of this parcel. As indicated on the property field cards, several of the Site parcels may be heated with oil and not have gas service. In general, electric service appeared to consist of overhead wires.

5.3.4 Adjacent Properties

During the Site reconnaissance, VHB observed the following abutting/adjacent properties that may have the potential to impact environmental media at the Site:

- Former gasoline filling station at 825 Washington Street;
- Automotive Repair at 931 Washington Street;
- Pearl Cleaners (dry cleaning) at 945 Washington Street; and
- Alpha Chemical Services, Inc. of 42 Morton Street (manufacturers of cleaning and sanitizing products).

The potential for these properties to impact the Site is discussed in Section 7.

5.4 Interior Observations

A site reconnaissance of the interior of the buildings was not conducted.

5.4.1 Floor Drains and Sumps

The interior of the buildings was not observed; therefore, the presence of floor drains and sumps is unknown.

5.4.2 Hazardous Materials/Petroleum Products Storage, Handling, and Staining

VHB did not observe any hazardous materials, petroleum products or staining at the Site; however, the interior of the Site building was not observed.

5.4.3 Storage Tanks

Evidence of interior storage tanks was not observed during site reconnaissance.

6 Interviews

6.1 Interview with Owner, Site Manager/Occupants, or Knowledgeable Person

An interview with the owner, site manager/occupants, or knowledgeable person was not conducted and is discussed as a data gap in Section 1.2.

6.2 Interviews with Local Government Officials

During the municipal file reviews conducted in April 2012, the Town of Stoughton municipal employees from select departments were asked for information regarding the Site. This information has been included in the municipal file review portion (Section 4.2) of this report.

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7

Findings and Conclusions

The goal of the Phase I ESA is to identify RECs as defined by the Standard. This section identifies known or suspected RECs, historical RECs and potential environmental concerns (*de minimis* conditions). During the Phase I ESA, VHB identified nine RECs and three potential environmental concerns associated with the Site. VHB's opinion is limited by the conditions prevailing at the time the work was performed and the applicable regulatory requirements in effect.

To meet the requirements of Section 12.8 of the Standard, the statement below shall be included to preface the conclusions of this report.

"We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of 865 Central Avenue, the Site. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property except for the following:"

7.1 Recognized Environmental Conditions

Nine RECs were identified during the Phase I ESA, as described in this section and summarized in Table 7-1.

Table 7-1 Identified Recognized Environmental Conditions

Address	Site Description	RTN	Rationale
2 Canton Street	Former Use of the Property and On-Site Disposal Site	4-875 4-18753 4-21470	Former petroleum storage Industrial uses Existing contamination
Off 17 Morton Square	Murphy Coal Company On-Site Automotive Repair, Petroleum Storage, and Disposal Site	4-13478	Industrial uses Record of environmental contamination
25 Brock Street	Industrial Use of the Property and On-Site Disposal Site	4-13476	Industrial uses Former petroleum storage Presence of on-Site disposal site
48 Wyman Street	Use of the Property as a Machine Shop	--	Inaccessible property Unknown status of storage tanks Historical use of property
931 Washington Street	Current Auto Repair and Former Filling Station	--	Former and current use of property
24-46 Morton Street	Off-Site Chemical Company	--	Storage of chemicals and petroleum
945 Washington Street	Active Drycleaning Business	--	Use of chemical solvents at the property
45 Wyman Street	Former Petroleum Storage at Stoughton Train Station	--	Former petroleum storage
825 Washington Street	Nearby Disposal Sites and Former Filling Station	4-12937 4-11868 4-13560 4-13682	Four identified releases at property Lack of information regarding groundwater flow Presence of a plume of petroleum constituents in groundwater

7.1.1 2 Canton Street Former Use of Property and On-Site Disposal Site (RTNs 4-21470, 4-875, and 4-18753)

A disposal site located at 2 Canton Street was assigned RTN 4-875 for a release of petroleum discovered during the removal of two underground storage tanks (USTs) in 1989. A second disposal site was assigned RTN 4-21470 for petroleum contamination discovered during the removal of an additional UST. A third disposal site was assigned RTN 4-18753 in October 2004 for the detection of separate phase product in two piezometers. The presence of contamination is associated with the industrial uses of the property, which have included operation by the Mystic Rubber clothing company, Stoughton Rubber Company, and Joseph F. Corcoran Shoe

Company. A Class A-3 Response Action Outcome (RAO) was achieved for all three disposal sites in October 2009, which indicates that contaminant concentrations were not reduced to background, and a Condition of No Significant Risk is dependent upon the implementation of an activity and use limitation (AUL) on the property. The former petroleum storage, industrial uses, and existing contamination on the Site are deemed a REC.

7.1.2 Off 17 Morton Square Murphy Coal Company, On-Site Automotive Repair, Petroleum Storage, and Disposal Site (RTN 4-13478)

An on-Site disposal site on the property off Morton Square owned by Murphy Oil Company was assigned RTN 4-13478 in November 1997 when a representative from MassDEP identified an oil-stained area and improperly stored waste oil at the property. The disposal site achieved a Class A-1 RAO in May 1998, which indicates that a Condition of No Significant Risk was achieved and contaminant levels were reduced to background.

According to Sanborn maps, the property has been occupied by Murphy Coal Company since at least 1923, and formerly contained a coal shed and scales. The company is currently permitted for three 15,000-gallon and two 10,000-gallon above ground storage tanks (ASTs) associated with the sale and distribution of fuel oil. The ASTs have been present since at least 1957 according to historic aerial photographs and the current condition of the tanks is unknown. The assessor's card also indicates that the property is used as an automotive repair garage. Former repair operations at the property may have required the use of OHM including petroleum products, solvents, and other OHM. These OHM have the potential to contaminate environmental media when not handled or disposed of properly. In addition, during the Site reconnaissance, several piles of fill (gravel, sand, stumps), and pieces of heavy machinery were also observed on the property. The origin of the fill material is unknown, and machinery can leak petroleum or fluids to the environment when not properly maintained. These industrial uses of the property and record of environmental contamination are deemed a REC.

7.1.3 25 Brock Street Former Use of the Property and On-Site Disposal Site (RTN 4-13476)

The two Site parcels with an address of 25 Brock Street have an extensive history of industrial uses, including operation by the Meade Rubber Company in the early 1900s, L. Albert & Son rubber machinery in the mid-1900s, and a latex and shoe materials manufacturer around 1966. According to recent environmental reports, the property has also been used as a machine shop. According to the Fire Department, five petroleum ASTs have been removed from the Site. No information was available regarding the condition of the tanks or analytical testing of the surrounding

environmental media. Furthermore, a complaint was filed by the Fire Department in 1979 noting an oil storage violation at the property. According to the assessor's cards, two of the Site buildings are currently heated with oil.

In addition, a disposal site located at 25R Brock Street was assigned RTN 4-13476 in November 1997 for a release of approximately 15 gallons of No. 2 fuel oil. The release occurred when a 275-gallon AST tipped over and began leaking from a pipe. The disposal achieved a Class A-1 Response Action Outcome (RAO) in August 1999, which indicates that contaminant concentrations were reduced to background and a Condition of No Significant Risk was achieved. The industrial uses of the property, former petroleum storage, and presence of an on-Site disposal site are deemed a REC.

7.1.4 48 Wyman Street Former Use of the Property as a Machine Shop

The property at 48 Wyman Street comprises a portion of the Site, and was formerly used for the sale of automotive parts, and as a machine shop. Former repair operations at the property may have required the use of OHM including petroleum products, solvents, and other chemicals. These OHM have the potential to contaminate environmental media when not handled or disposed of properly. In addition, the property is noted by the assessor's to be heated with oil and the condition of any storage tanks at the property is unknown. VHB was unable to access and observe the interior of the building located on the Site and has conservatively assumed that a REC is present associated with former site use including a machine shop and petroleum storage.

7.1.5 931 Washington Street Current Auto Repair and Former Filling Station (Off-Site)

The property located at 931 Washington Street was formerly the location of a gasoline station as depicted in the 1966 Sanborn map. An associated 3,000-gallon gasoline UST, which was installed in March 1947, has been removed from the property according to the MassDEP UST Query database. No information was available regarding the condition of the tank or analytical testing of the surrounding environmental media. The property has also been permitted as a Conditionally Exempt Small Quantity Generator (CESQG) since 1986 and is currently used for automotive repair. Manifests have been used to transport ignitable hazardous waste, such as petroleum distillates, from the property since this time. These chemicals have the potential to contaminate environmental media when not handled or disposed of properly. The property is located approximately 50 feet east of the Site. The former use of the property as a gasoline station and current use for automotive repair in close proximity to the Site are deemed a REC.

7.1.6 24-46 Morton Street Off-Site Chemical Company

Alpha Chemical Company located at 24-46 Morton Street abuts the Site to the west. The company has been listed as a RCRA CESQG since 2004, and wastes transported from the property under manifest include lead, 1,1,1-trichloroethane, hydrofluoric acid, and dimethyl-benzene. The company manufactures acid sanitizer, disinfectants, mildew preventatives, and liquid chlorinating products. Large aboveground tanks were noted against the western exterior of the company's building during the Site reconnaissance. In addition, a 1,000-gallon fuel oil tank was removed from the property in 1993 and there was no information provided by the Fire Department regarding analytical testing or environmental observations. Chemicals and petroleum stored at the property have the potential to have been released to the environment due to improper handling, disposal, or maintenance of containment structures. The storage of chemicals and petroleum at the property are therefore deemed a REC.

7.1.7 945 Washington Street Active Drycleaning Business (Off-Site)

Pearl Drycleaners of 945 Washington Street is listed with the MassDEP as a regulated drycleaning facility. This status indicates that the business utilizes perchloroethylene (PCE), a chemical solvent. When not properly disposed, PCE can contaminate soil and is highly mobile in groundwater. The property is located less than 100 feet southeast of the Site. The chemical handling practices of the drycleaning business are unknown and there is currently no publically available testing data for soil or groundwater between the Site and property. Therefore, the use of chemical solvents at the property is a deemed a REC.

7.1.8 45 Wyman Street Former Petroleum Storage at Stoughton Train Station (Off-Site)

The historic Stoughton train station constructed in 1888 and located at 45 Wyman Street was formerly heated using three 330-gallon above ground storage tanks located in the building's basement. According to the Stoughton Fire Department, the tanks were removed in 1997; however, no information was provided regarding the condition of the tanks or the surrounding basement floor. There is a potential for petroleum to have been released to the surrounding environment during fuel deliveries, or if the tanks and piping were improperly maintained. The station is located less than 50 feet northeast of the Site. Therefore, the former petroleum storage in close proximity to the Site is deemed a REC.

7.1.9 825 Washington Street Nearby Disposal Sites and Former Filling Station (RTNs 4-12937, 4-11868, 4-13560, and 4-13682)

Four releases have been identified at the former gasoline station located at 825 Washington Street. The primary contaminants are petroleum constituents, which are currently undergoing remediation. A definite groundwater flow direction has not been established at this property, which is located approximately 150 feet east of the Site. In addition, only one monitoring well exists between the disposal site and Site, which has been frequently dry and therefore may have not been installed at a sufficient depth to detect contamination. Due to this lack of information and the presence of a plume of petroleum constituents in groundwater, the disposal sites at this property are deemed a REC.

7.2 Potential Environmental Concerns

Three potential environmental concerns or *de minimis* conditions have been identified for the Site.

1) Based on the age of buildings, which may be demolished for the South Coast Rail project, asbestos containing materials, including roof flashing, tiles, and other materials, as well as lead based paint, may be present.
2) Due to the Site's densely developed location, close proximity to a railroad right-of-way and a long history of industrial and commercial use, urban fill may have been used to fill portions of the Site. Urban fill can contain metals and PAHs originating from coal/wood ash, tar, and/or slag.
3) Due to the close proximity of the railroad tracks and a suspected implementation of a vegetation control program in the vicinity of the railroad tracks, there is a possibility that lead, arsenic and other contaminants are present in Site soil.

8

Opinion

According to the Phase I ESA Standard, the report shall include an opinion of the impact on the Site of the conditions identified in the Findings Section. VHB's opinion is limited by the conditions prevailing at the time the work was performed and the applicable regulatory requirements in effect. VHB has ranked the potential for each REC to adversely impact the Site as Low, Moderate or High or deemed lesser issues as potential environmental concerns or *de minimis* conditions in accordance with the Standard. The Phase I Opinion for the RECs are as follows and is summarized in Table 8-1:

- **REC #1 –** The presence of three disposal sites and former industrial activities at 2 Canton Street represent a **High** potential to adversely impact the Site. Petroleum contamination has been identified at the property (a portion of the Site), and has not been remediated to background levels. An AUL is necessary at the property to maintain a Condition of No Significant Risk. Also, the extent to which former industrial activities may have impacted environmental media at the Site may not have been fully explored during previous investigations. Based on the size of the property, there may be areas that require additional assessment for the presence of OHM.
- **REC #2 –** The industrial uses of the Murphy Coal Company (parcel 054-406), and associated disposal site represents a **Moderate** potential to adversely impact the Site. A release of oil has occurred at this property (a portion of the Site); however, contamination has been remediated to background levels. In addition, large quantities of petroleum continue to be stored at the property, which is also used for automotive repair, and storage of fill materials. The extent to which these industrial uses may have impacted environmental media at the Site is unknown.
- **REC #3 –** The industrial activities and disposal site located at 25 Brock Street represent a **Moderate** potential to adversely impact the Site. A release of petroleum has occurred at the property (a portion of the Site); however, contamination was remediated to background concentrations. Additional petroleum storage has been recorded at the property, and the condition of the tanks or environmental media in the former tank locations has not been documented. In addition, the extent to which industrial activities may have impacted environmental media at the Site is unknown.

- **REC #4 –** The use of 48 Wyman Street as a machine shop represents a **Moderate** potential to adversely impact the Site. Former repair operations at the property may have required the use of oil and/or hazardous materials including petroleum products, solvents, and other chemicals. These chemicals have the potential to contaminate environmental media when not handled or disposed of properly. The extent to which the use of the property as a machine shop may have impacted environmental media is unknown.
- **REC #5 –** The presence of a former filling station and current automotive repair at 931 Washington Street represents a **Moderate** potential to adversely impact the Site. The condition of the property following the removal of a UST from the property is unknown. In addition, repair operations at the property may require the use of oil and/or hazardous materials including petroleum products, solvents, and other chemicals. The property is located in close proximity to the Site and contamination (if present) has the potential to migrate via groundwater to the Site.
- **REC #6 –** The presence of a chemical company abutting the Site represents a **Moderate** potential to adversely impact the Site. The chemical handling and storage practices at Alpha Chemical Company are unknown. In addition, fuel tank was removed from the property and the state of environmental media in the location of the tank is unknown. The property is located in close proximity to the Site and contamination (if present) has the potential to migrate via groundwater to the Site.
- **REC #7 –** The presence of a drycleaning business located adjacent to the Site represents a **Low** potential to adversely impact the Site. The business is an active user of PCE according to the MassDEP database, and the chemical handling practices of the business are unknown. The property is located in close proximity to the Site and contamination (if present) has the potential to migrate via groundwater to the Site.
- **REC #8 –** The former petroleum storage at 45 Wyman Street represents a **Low** potential to adversely impact the Site. Three ASTs were removed from the basement of the property in 1997; however no information was provided regarding the condition of the tanks or surrounding basement floor. The property is located in close proximity to the Site and contamination (if present) has the potential to migrate via groundwater to the Site.
- **REC #9 –** The presence of a former filling station at 825 Washington Street with four associated reported releases represents a **Moderate** potential to adversely impact the Site. A plume of petroleum constituents is actively undergoing remediation at the property, which is located in close proximity to the Site. In addition, sufficient data was not provided to demonstrate that groundwater located between the source area and the Site is not impacted.

Potential Environmental Concerns:

1) The potential presence of building materials containing asbestos, lead based paint or other hazardous materials is considered to have a low potential to adversely impact environmental media at the Site. According to 310 CMR

40.0317(12), releases from building materials that are in good repair and still serving their original intended use are not required to be reported under the MCP. However; hazardous building materials must still be properly managed during demolition.

2) Urban fill is considered to have a low potential to adversely impact the Site. Certain releases related to the presence of coal, coal ash, or wood ash are not required to be reported under the MCP in accordance with 310 CMR 40.0317(9). However, soil containing urban fill must still be properly managed during construction.

3) Pesticides applied in association with a vegetation control program are considered to have a low potential to adversely impact environmental media at the Site. According to 310 CMR 40.0317(8)(c), releases resulting from the application of pesticides in a manner consistent with their labeling is exempt from reporting under the MCP. However; soil containing concentrations of pesticides above applicable regulatory thresholds must still be properly managed during construction.

Table 8-1 Summary of Phase I Opinion

Address	Site Description	Phase I Opinion	Rationale
2 Canton Street	Former Use of the Property and On-Site Disposal Site	High	Petroleum contamination has not been remediated to background levels Extent of impact due to former site activities is unknown
Off 17 Morton Square	Murphy Coal Company On-Site Automotive Repair, Petroleum Storage, and Disposal Site	Moderate	Extent of impact due to former site activities is unknown
25 Brock Street	Industrial Use of the Property and On-Site Disposal Site	Moderate	Extent of impact due to former site activities and petroleum storage is unknown
48 Wyman Street	Use of the Property as a Machine Shop	Moderate	Extent of impact due to former site activities is unknown
931 Washington Street	Current Auto Repair and Former Filling Station	Moderate	Extent of impact due to former site activities is unknown Proximity to the Site
24-46 Morton Street	Off-Site Chemical Company	Moderate	Extent of impact due to former site activities is unknown
945 Washington Street	Active Drycleaning Business	Low	Chemical handling practices are unknown
45 Wyman Street	Former Petroleum Storage at Stoughton Train Station	Low	Information regarding removal of ATS is unavailable
825 Washington Street	Nearby Disposal Sites and Former Filling Station	Moderate	Insufficient data on plume of petroleum constituents

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9

References

Bedrock Geology Map of Massachusetts, E-an Zen, 1983.

Class A-1 RAO prepared for Stoughton Center to 441 Rear Canton Street (RTN 4-22289) by Tetra Tech EC, Inc., dated January 2010.

Class A-1 RAO prepared for 26 Porter Street (RTN 4-17655) by Cyn Environmental Services, dated March 2003.

Class A-1 RAO prepared for 825 Washington Street (RTN 4-11868) by Tyree Organization, Ltd., dated January 1997.

Class A-1 RAO prepared for 25 Brock Street (RTN 4-13476) by Norfolk Environmental, dated August 1999.

Class A-2 RAO prepared for 990 Washington Street (RTNs 4-18650, 4-18969) by EnviroTrac, Ltd. Dated August 2005.

Class A-3 RAO prepared for 2 Canton Street by Woodard and Curran, dated October 2009.

EDR Aerial Photographs, Years: 1957, 1961, 1969, 1974, 1978, 1985, 1991, 1996, 2006, and 2008.

Environmental Data Resources, Inc. (EDR) Radius Map with GeoCheck, April 23, 2012.

Historic Sanborn Fire Insurance Maps, Years: 1885, 1891, 1896, 1901, 1906, 1912, 1923, 1949, and 1966.

Immediate Response Action Completion Report and RAO prepared for 17 Morton Square (off) (RTN 4-13478) by Coneco Engineers & Scientists, dated May 1998.

Massachusetts Geographic Information Systems (MassGIS), Bureau of Waste Site Cleanup, Site Scoring Map, April 23, 2012.

Stoughton, Massachusetts Planning/Building/Health/Zoning/Tax Assessor's Departments, April 2012.

Stoughton, Massachusetts Fire Prevention Department, April 2012.

USGS Topographic Maps, Brockton, Blue Hills, and Dedham Quadrangles, Years: 1894, 1941, 1948, 1951, 1958, 1963, 1971, 1975, 1979, and 1985.

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10

Signature and Qualifications of Environmental Professional

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Environmental Professional: _____ 7/17/2012

Paul A. McKinlay, PG, LSP | Date

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11

List of Common Acronyms

AAI	All Appropriate Inquiries
AST	Aboveground Storage Tank
ASTM	American Society of Testing and Materials
DPW	Department of Public Works
EDR	Environmental Data Resources
EPH	Extractable Petroleum Hydrocarbons
ESA	Environmental Site Assessment
LUST	Leaking Underground Storage Tanks
MassDEP	Massachusetts Department of Environmental Protection
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MtBE	Methyl Tertiary Butyl Ether
OHM	Oil and/or Hazardous Materials
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
RAM	Release Abatement Measure
RAO	Response Action Outcome
RCS/RCGW	Reportable Concentration for Soil or Groundwater
RCRA	Resource Conservation and Recovery Act
RECs	Recognized Environmental Conditions
RTN	Release Tracking Number
SHWS	State Hazardous Waste Sites
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
UTM	Universal TransMercator
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons

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Figures

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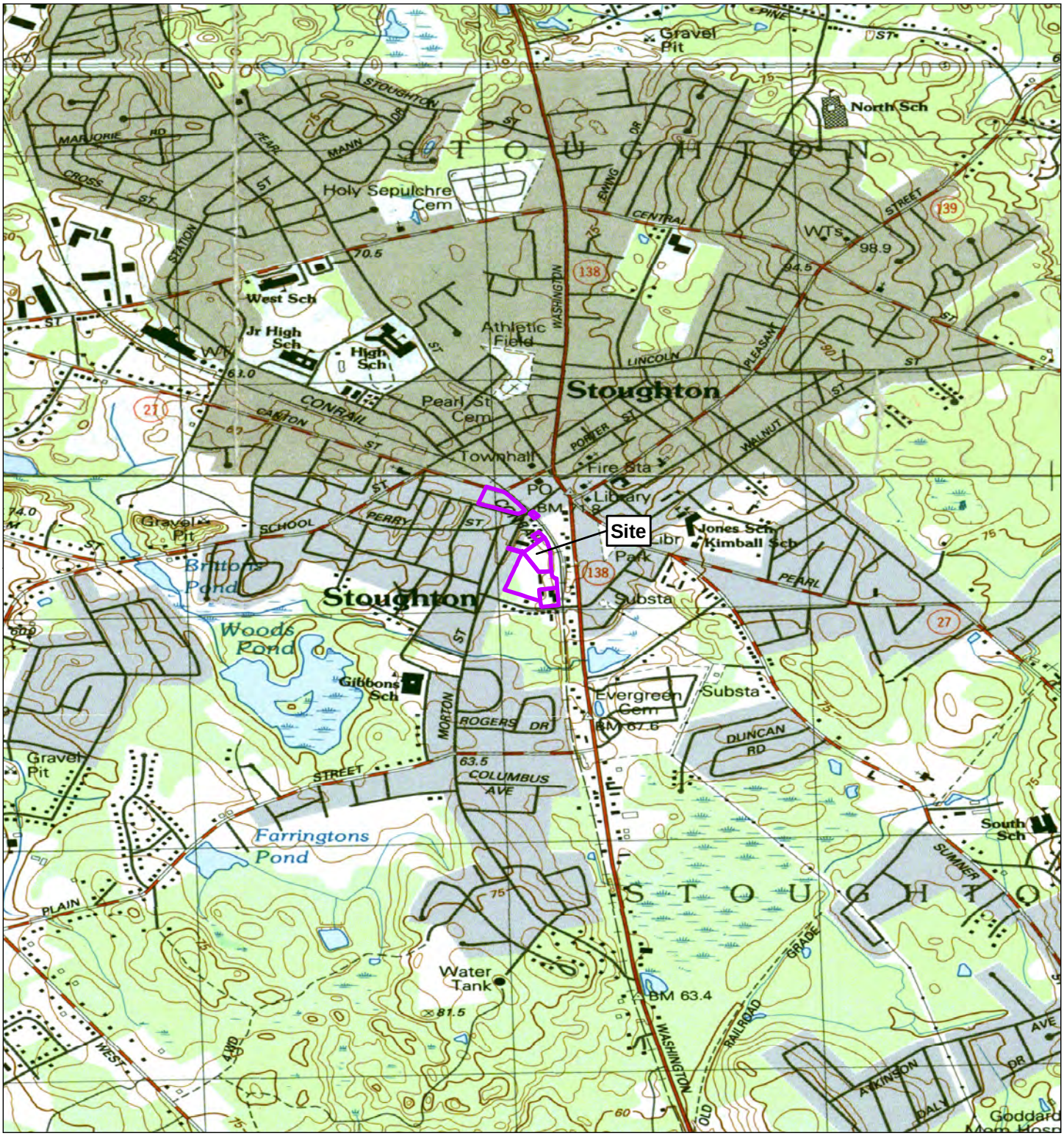
\\MABOS\projects\10111.00\GIS\project\OHM\Figure 1 - Site Locus Map.mxd



0 2,000 4,000 Feet

Source: USGS (2001)

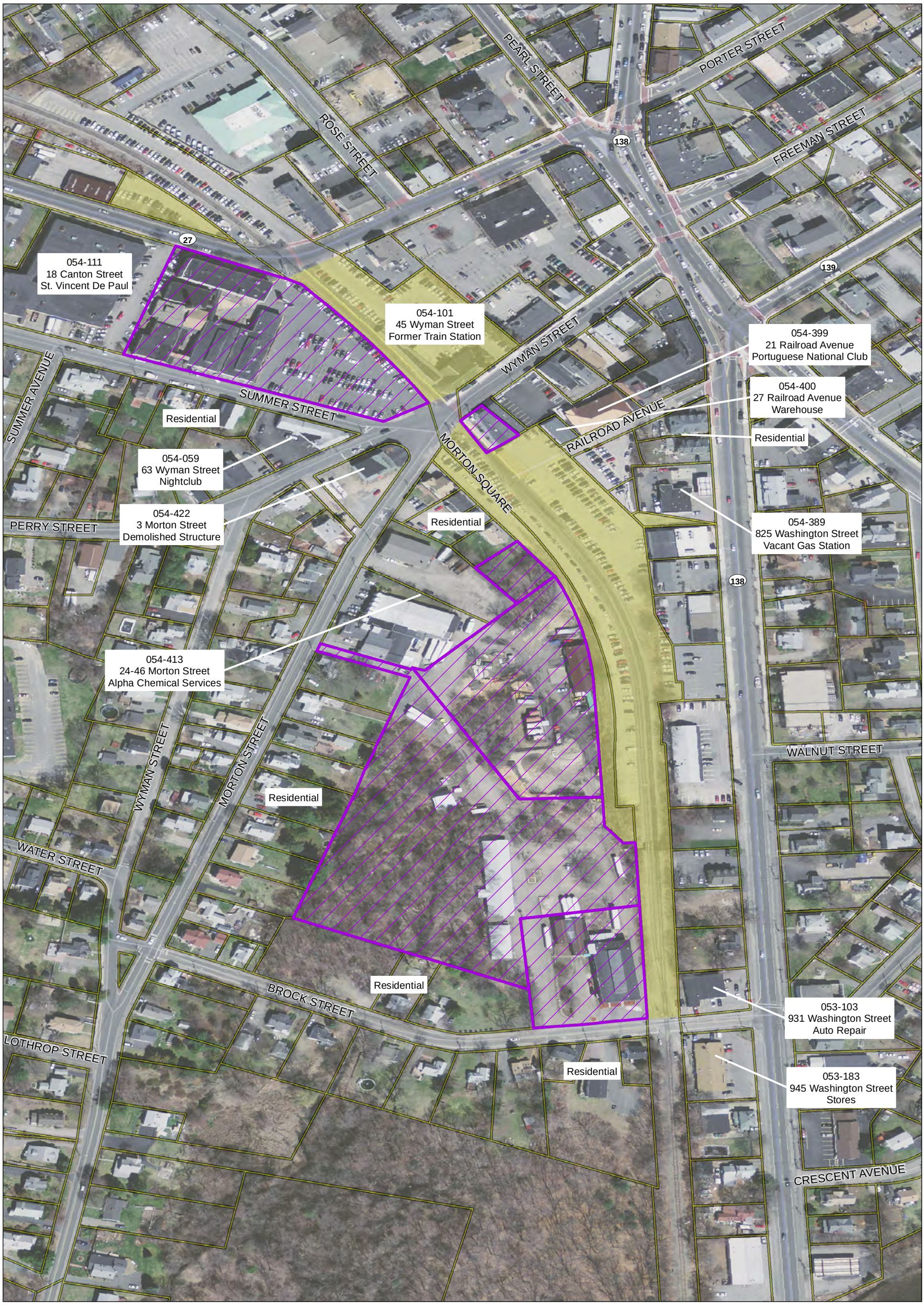
Vanasse Hangen Brustlin, Inc.

Legend

Site

FIGURE 1

Site Location Map
South Coast Rail Project
Stoughton Station
Stoughton, Massachusetts



Source: MassGIS 2005 Aerial Imagery

0 200 400 Feet

Legend

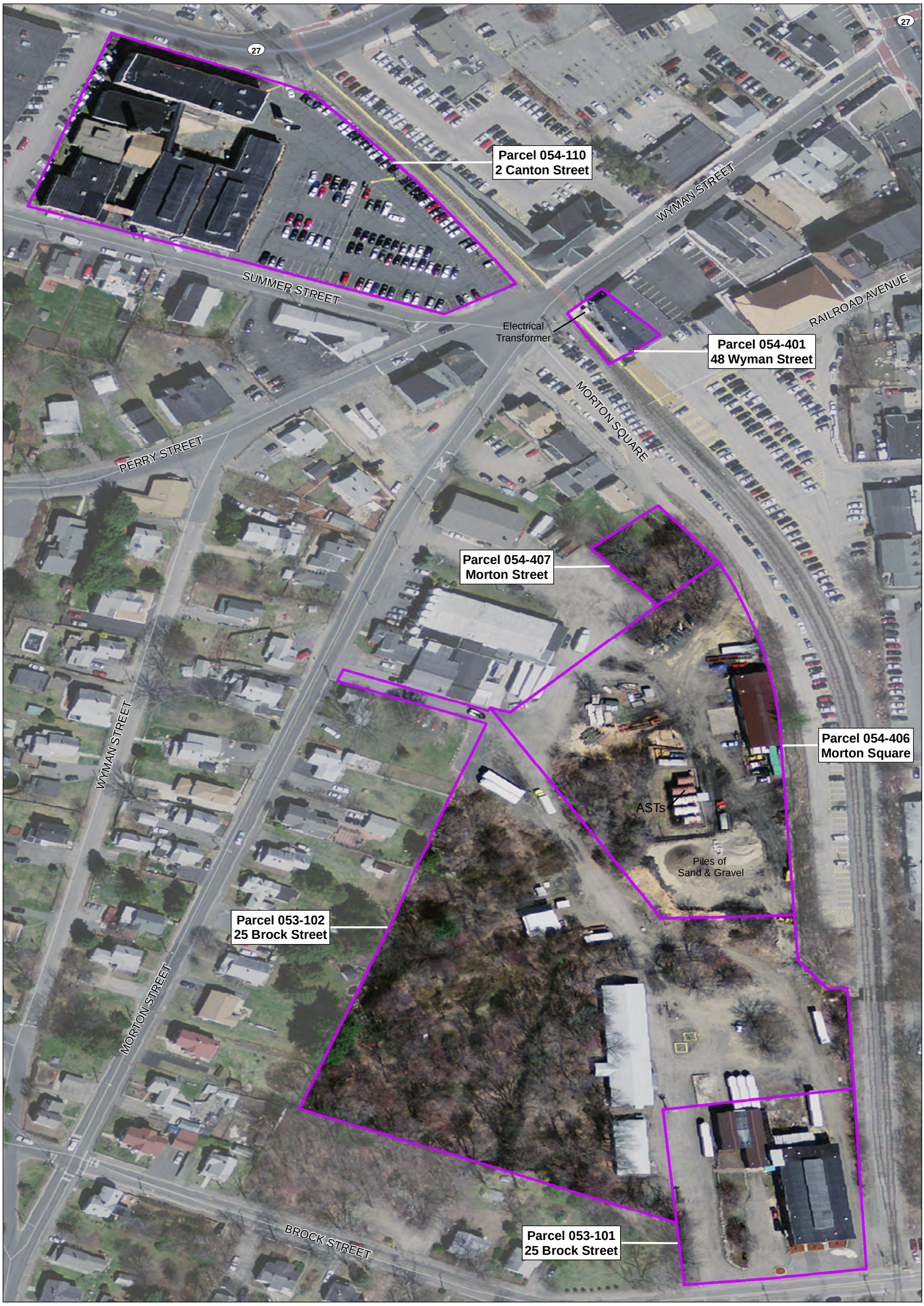
Site

MBTA Parcels Included in Station Design

Vanasse Hangen Brustlin, Inc.

FIGURE 2

Local Area Map
South Coast Rail Project
Stoughton Station
Stoughton, Massachusetts



Source: MassGIS 2005 Aerial Imagery

0 125 250 Feet

Legend

Site

Vanasse Hangen Brustlin, Inc.

FIGURE 3

Site Plan
South Coast Rail Project
Stoughton Station
Stoughton, Massachusetts

MassDEP - Bureau of Waste Site Cleanup

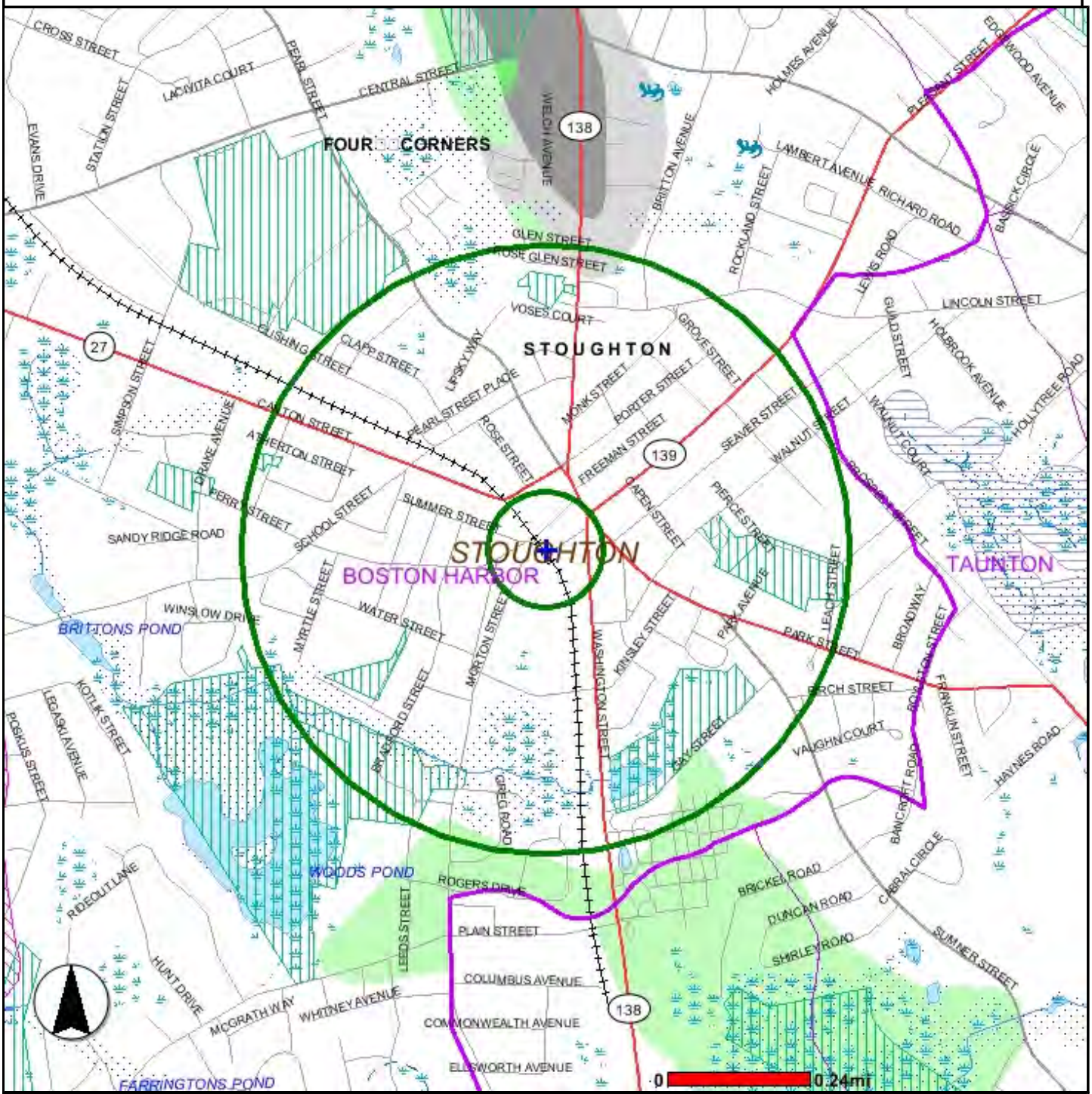
MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

Site Name:
Stoughton Station
Stoughton, MA
RTN:
NAD83 MA Coordinates:
232834mE, 874851mN

April 23, 2012

The information shown on this map is the best available at the date of printing. For more information please refer to www.mass.gov/mgis/massgis.htm

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, Sub; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

NHESP: Est Rare Weland Habitat, Certified Vernal Pool

DEP Permitted Solid Waste Landfill

Figure 4

Appendix A Limitations

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Limitations

The following limitations exist:

- This report has been prepared for the sole and exclusive use of the Client. It is subject to and issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and VHB, shall be at the User's sole risk.
- In conducting this assessment, VHB has obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information.
- The objectives of the assessment described in this report were to assess the physical characteristics of the subject property with respect to overt evidence of past or present use, storage, and/or disposal of oil or hazardous materials, as defined in applicable state and federal environmental laws and regulations, and to gather information regarding current and past operations and environmental conditions at and in the vicinity of the subject property.
- Where access was denied or conditions obscured, VHB makes no report on such areas.
- No attempt has been made to assess the compliance status of any past or present Owner or Operator of the Site with any federal, state, or local laws or regulations.
- The findings, observations, and conclusions presented in this report are limited by the scope of services outlined in our Agreement, which reflects schedule and budgetary constraints imposed, by the Client for the current phase of environmental assessment. Furthermore, the assessment has been performed in accordance with generally accepted engineering practices and standards set forth in ASTM E 1527-05. No other warranty, expressed or implied, is made.
- The assessment presented in this report is based solely upon information gathered to date. Should further environmental or other relevant information be developed at a later date, the Client should bring the information to the attention of VHB as soon as possible. Based upon an evaluation, VHB may modify the report and its conclusions.
- The EDR Environmental Data Resources Inc. (EDR) Radius Map with GeoCheck was conducted under the Notice of Disclaimer/Waiver of Liability included in the summary report.

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Appendix B
Environmental Data Resources, Inc. (EDR) Database Report

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Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.2s
April 23, 2012

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	7
Orphan Summary	555
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-11
Physical Setting Source Map Findings	A-13
Physical Setting Source Records Searched	A-33

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

WYMAN STREET/BROCK STREET
STOUGHTON, MA 02072

COORDINATES

Latitude (North):	42.1221000 - 42° 7' 19.56''
Longitude (West):	71.1024000 - 71° 6' 8.64''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	326208.7
UTM Y (Meters):	4665258.5
Elevation:	227 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	42071-B1 BLUE HILLS, MA
Most Recent Revision:	1985
South Map:	42071-A1 BROCKTON, MA
Most Recent Revision:	1987
Southwest Map:	42071-A2 MANSFIELD, MA
Most Recent Revision:	1987
West Map:	42071-B2 NORWOOD, MA
Most Recent Revision:	1985

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2010
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Facility Database/Transfer Stations

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST ---------- Underground Storage Tanks on Indian Land

FEMA UST ---------- Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information
LUCIS ---------- Land Use Control Information System
LIENS ---------- Liens Information Listing

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Historical Spill List

Other Ascertainable Records

DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
FUDS ---------- Formerly Used Defense Sites
CONSENT ---------- Superfund (CERCLA) Consent Decrees
ROD ---------- Records Of Decision
UMTRA ---------- Uranium Mill Tailings Sites
TRIS ---------- Toxic Chemical Release Inventory System
TSCA ---------- Toxic Substances Control Act
FTTS ---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS ---------- FIFRA/TSCA Tracking System Administrative Case Listing
SSTS ---------- Section 7 Tracking Systems
ICIS ---------- Integrated Compliance Information System
PADS ---------- PCB Activity Database System
MLTS ---------- Material Licensing Tracking System
RADINFO ---------- Radiation Information Database
FINDS ---------- Facility Index System/Facility Registry System
RAATS ---------- RCRA Administrative Action Tracking System

NPDES NPDES Permit Listing
ENF Enforcement Action Cases
AIRS Permitted Facilities Listing
LEAD Lead Inspection Database
INDIAN RESERV Indian Reservations
SCRD DRYCLEANERS State Coalition for Remediation of Drycleaners Listing
FINANCIAL ASSURANCE Financial Assurance Information Listing
GWDP Ground Water Discharge Permits
COAL ASH DOE Sleam-Electric Plan Operation Data
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER PCB Transformer Registration Database

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 08/19/2011 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
JET LINE SERVICES INC	***441R CANTON STREET***	***WNW 1/2 - 1 (0.806 mi.)***	***S76***	***436***

Federal RCRA generators list

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 11/10/2011 has revealed that there are

5 RCRA-CESQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RUGGIERO & SON INC	*931 WASHINGTON ST*	*SSE 0 - 1/8 (0.027 mi.)*	*C15*	*92*
STOUGHTON TOWN OF	*10 PEARL ST*	*N 0 - 1/8 (0.080 mi.)*	*F27*	*123*
SULLIVAN ROSANIA & IACONO ORTH	*85 PARK ST*	*ENE 0 - 1/8 (0.111 mi.)*	*39*	*161*

Lower Elevation	Address	Direction / Distance	Map ID	Page
ALPHA CHEMICAL SERVICES INC	*46 MORTON ST.*	*WNW 0 - 1/8 (0.021 mi.)*	*B5*	*30*
STOUGHTON AUTO BODY INC	*1069 WASHINGTON ST*	*S 1/8 - 1/4 (0.237 mi.)*	*I46*	*222*

State- and tribal - equivalent CERCLIS

SHWS: Contains information on releases of oil and hazardous materials that have been reported to DEP.

A review of the SHWS list, as provided by EDR, and dated 02/28/2012 has revealed that there are 42 SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
OLD FACTORY/MACHINE SHOP	*25 R BROCK ST*	*SSE 0 - 1/8 (0.023 mi.)*	*C7*	*55*
Compliance Status: Release Action Outcome				
NO LOCATION AID	*825 WASHINGTON ST RTE 1*	*NNE 0 - 1/8 (0.024 mi.)*	*D9*	*60*
Compliance Status: Release Action Outcome				
GETTY SERVICE STATION	*825 WASHINGTON ST*	*NNE 0 - 1/8 (0.024 mi.)*	*D11*	*66*
Compliance Status: Tier II Release .				
MARKET	*31 PORTER ST*	*NNW 0 - 1/8 (0.025 mi.)*	*A13*	*88*
Compliance Status: Release Action Outcome				
CORNER SCHOOL	*49 ROSE ST*	*NNW 0 - 1/8 (0.061 mi.)*	*E26*	*114*
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
NO LOCATION AID	*CANTON AND SCHOOL ST*	*NW 0 - 1/8 (0.107 mi.)*	*38*	*159*
Compliance Status: Release Action Outcome				
FRAGAS BROS MARKET	*105 PORTER ST*	*NNE 1/8 - 1/4 (0.180 mi.)*	*42*	*177*
Compliance Status: Release Action Outcome				
STOUGHTON AUTOMOTIVE CORP	*663 WASHINGTON ST*	*N 1/8 - 1/4 (0.245 mi.)*	*J50*	*232*
Compliance Status: Release Action Outcome				
NO LOCATION AID	*645 WASHINGTON ST*	*N 1/4 - 1/2 (0.304 mi.)*	*K51*	*243*
Compliance Status: Response Action Outcome Not Required				
Compliance Status: Release Action Outcome				
CENTRAL ST	*232 PEARL ST*	*NNW 1/4 - 1/2 (0.404 mi.)*	*L55*	*272*
Compliance Status: Release Action Outcome				
NO LOCATION AID	*223 PEARL ST*	*NNW 1/4 - 1/2 (0.406 mi.)*	*L56*	*275*
Compliance Status: Downgradient Property Status				
NEW STOUGHTON SQUARE	*521-525 WASHINGTON ST*	*N 1/4 - 1/2 (0.488 mi.)*	*N58*	*280*
Compliance Status: LSP No Further Action				
NO LOCATION AID	*309 PARK ST*	*ESE 1/2 - 1 (0.528 mi.)*	*O61*	*288*
Compliance Status: Release Action Outcome				
CUMBERLAND FARMS	*499 WASHINGTON ST*	*N 1/2 - 1 (0.528 mi.)*	*N62*	*290*
Compliance Status: Release Action Outcome				
Compliance Status: Response Action Outcome Not Required				

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CUMBERLAND FARMS 499 WASHINGTO	***12 WELCH AVE***	***N 1/2 - 1 (0.539 mi.)***	***64***	***339***
Compliance Status: Response Action Outcome Not Required				
CUMBERLAND FARMS #2001	***110 BIRCH ST***	***ESE 1/2 - 1 (0.556 mi.)***	***O65***	***344***
Compliance Status: Response Action Outcome Not Required				
1032 CENTRAL ST	***397 413-423 WASHINGTON***	***N 1/2 - 1 (0.624 mi.)***	***P68***	***380***
Compliance Status: Release Action Outcome				
DONAHUE TRUCK SERV CO INC FMR	***75 LAMBERT AVE***	***NNE 1/2 - 1 (0.717 mi.)***	***71***	***387***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***372 WASHINGTON ST***	***N 1/2 - 1 (0.785 mi.)***	***R74***	***414***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
NO LOCATION AID	***354-360 WASHINGTON ST***	***N 1/2 - 1 (0.811 mi.)***	***R78***	***492***
Compliance Status: Response Action Outcome Not Required				
POLE 161A	***WASHINGTON ST***	***N 1/2 - 1 (0.820 mi.)***	***R79***	***494***
Compliance Status: Release Action Outcome				
PINECREST III REALTY PARTNERS	***428-440 PEARL ST***	***NNW 1/2 - 1 (0.825 mi.)***	***T81***	***498***
Compliance Status: Downgradient Property Status				
A&A CLEANERS FMR	***434-450 PEARL ST***	***NNW 1/2 - 1 (0.842 mi.)***	***T82***	***501***
Compliance Status: Release Action Outcome				
PINECREST III REALTY PARTNERS	***438 PEARL ST***	***NNW 1/2 - 1 (0.851 mi.)***	***T84***	***513***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***600 PARK ST***	***ESE 1/2 - 1 (0.940 mi.)***	***V89***	***540***
Compliance Status: Response Action Outcome Not Required				
STIVALETTA REALTY TRUST	***630 PARK ST***	***ESE 1/2 - 1 (0.991 mi.)***	***92***	***553***
Compliance Status: LSP No Further Action				

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	***46 MORTON ST***	***WNW 0 - 1/8 (0.021 mi.)***	***B4***	***28***
Compliance Status: Release Action Outcome				
KELLEY BROS CONSTRUCTION CORP	***118 CUSHING ST***	***NW 1/4 - 1/2 (0.307 mi.)***	***52***	***259***
Compliance Status: No Further Action (DEP Determined)				
CENTRAL AUTO SALVAGE	***1152 WASHINGTON ST***	***S 1/4 - 1/2 (0.394 mi.)***	***54***	***266***
Compliance Status: Tier 1C Release .				
ASHMOUNT DISCOUNT	***1204 WASHINGTON ST***	***S 1/4 - 1/2 (0.488 mi.)***	***M59***	***281***
Compliance Status: No Further Action (DEP Determined)				
BROOKFIELD ENGINEERING LAB INC	***240 CUSHING ST***	***NW 1/2 - 1 (0.535 mi.)***	***63***	***304***
Compliance Status: Response Action Outcome Not Required				
Compliance Status: Tier 1B Release.				
NO LOCATION AID	***145 SIMPSON ST***	***NW 1/2 - 1 (0.575 mi.)***	***66***	***356***
Compliance Status: Downgradient Property Status				
NO LOCATION AID	***369 CANTON ST***	***WNW 1/2 - 1 (0.693 mi.)***	***Q69***	***383***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***396 AND 383 CANTON ST***	***WNW 1/2 - 1 (0.706 mi.)***	***Q70***	***385***
Compliance Status: Downgradient Property Status				
NO LOCATION AID	***11 MCGRATH HWY***	***SW 1/2 - 1 (0.753 mi.)***	***73***	***411***
Compliance Status: Release Action Outcome				

Lower Elevation	Address	Direction / Distance	Map ID	Page
JET LINE SERVICES INC	***441R CANTON ST***	***WNW 1/2 - 1 (0.806 mi.)***	***S75***	***425***
Compliance Status: Downgradient Property Status				
Compliance Status: Release Action Outcome				
SAM'S AUTO SERVICE	***452 CANTON ST***	***WNW 1/2 - 1 (0.808 mi.)***	***S77***	***487***
Compliance Status: LSP No Further Action				
ARK-LES CORPORATION	***1490 CENTRAL ST***	***NW 1/2 - 1 (0.842 mi.)***	***U83***	***504***
Compliance Status: Release Action Outcome				
PROPERTY	***1551 CENTRAL ST***	***WNW 1/2 - 1 (0.933 mi.)***	***86***	***520***
Compliance Status: Tier 1C Release .				
GILL MACHINE SHOP	***151 SOUTHWORTH CT***	***WNW 1/2 - 1 (0.934 mi.)***	***87***	***533***
Compliance Status: Downgradient Property Status				
Compliance Status: Downgradient Property Status Terminated				
PRECISION DOOR & WINDOW	***466 SUMMER ST***	***SE 1/2 - 1 (0.936 mi.)***	***88***	***539***
Compliance Status: LSP No Further Action				
COHENNO INC	***92 EVANS DRIVE***	***NW 1/2 - 1 (0.945 mi.)***	***91***	***547***
Compliance Status: Release Action Outcome				

State and tribal leaking storage tank lists

LUST: Sites within the Releases Database that have a UST listed as its source.

A review of the LUST list, as provided by EDR, and dated 02/28/2012 has revealed that there are 12 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PROPERTY	***2 CANTON ST***	***0 - 1/8 (0.000 mi.)***	***A2***	***8***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome Not Required				
**Additional key fields are available in the Map Findings section*				
GETTY SERVICE STATION	***825 WASHINGTON ST***	***NNE 0 - 1/8 (0.024 mi.)***	***D11***	***66***
Facility Status: Response Action Outcome Not Required				
Facility Status: Response Action Outcome Not Required				
CORNER SCHOOL	***49 ROSE ST***	***NNW 0 - 1/8 (0.061 mi.)***	***E26***	***114***
Facility Status: Response Action Outcome				
NO LOCATION AID	***35 WALNUT ST***	***E 0 - 1/8 (0.098 mi.)***	***29***	***126***
Facility Status: Response Action Outcome				
GETTY #30743	***724 WASHINGTON ST***	***N 1/8 - 1/4 (0.134 mi.)***	***H40***	***163***
Facility Status: Response Action Outcome				
NO LOCATION AID	***20 SCHOOL ST***	***N 1/8 - 1/4 (0.191 mi.)***	***43***	***182***
Facility Status: Response Action Outcome				
STOUGHTON AUTOMOTIVE CORP	***663 WASHINGTON ST***	***N 1/8 - 1/4 (0.245 mi.)***	***J50***	***232***
Facility Status: Response Action Outcome				
NO LOCATION AID	***645 WASHINGTON ST***	***N 1/4 - 1/2 (0.304 mi.)***	***K51***	***243***
Facility Status: Response Action Outcome				
MUTUAL OIL CO INC #37	***608 WASHINGTON ST***	***N 1/4 - 1/2 (0.340 mi.)***	***K53***	***261***
Facility Status: Response Action Outcome				

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CENTRAL ST	***232 PEARL ST***	***NNW 1/4 - 1/2 (0.404 mi.)***	***L55***	***272***

Lower Elevation	Address	Direction / Distance	Map ID	Page
GAS CONTAMINATED WATER	***990 WASHINGTON ST***	***SSE 0 - 1/8 (0.103 mi.)***	***G33***	***135***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome				
**Additional key fields are available in the Map Findings section*				
FORMER GROSSMAN'S	***1202-1214 WASHINGTON ST***	***S 1/4 - 1/2 (0.485 mi.)***	***M57***	***276***
Facility Status: Response Action Outcome				

LAST: The Leaking Aboveground Storage Tanks database

A review of the LAST list, as provided by EDR, and dated 02/28/2012 has revealed that there are 3 LAST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NO LOCATION AID	***21 PARK AVE***	***NNE 0 - 1/8 (0.045 mi.)***	***D21***	***105***
Facility Status: Response Action Outcome				
TOWN WASTE OIL RECLAMATION	***26 ROSE ST***	***NNW 0 - 1/8 (0.047 mi.)***	***E22***	***109***
TRUCK DEPOT-REPAIR AREA	***793 WASHINGTON ST***	***NNE 0 - 1/8 (0.048 mi.)***	***23***	***110***
Facility Status: Response Action Outcome				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Protection's Summary Listing of all the Tanks Registered in the State of Massachusetts.

A review of the UST list, as provided by EDR, and dated 01/20/2012 has revealed that there are 6 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GREEN VALLEY OIL STATION #3064	***825 WASHINGTON ST***	***NNE 0 - 1/8 (0.024 mi.)***	***D10***	***63***
RUGGIERO & SON INC	***931 WASHINGTON ST***	***SSE 0 - 1/8 (0.027 mi.)***	***C14***	***91***
NEW ENGLAND TELE	***862 WASHINGTON ST***	***E 0 - 1/8 (0.027 mi.)***	***16***	***99***
GETTY #30743	***724 WASHINGTON ST***	***N 1/8 - 1/4 (0.134 mi.)***	***H40***	***163***
GETTY STATION #30327	***663 WASHINGTON ST***	***N 1/8 - 1/4 (0.245 mi.)***	***J49***	***230***

Lower Elevation	Address	Direction / Distance	Map ID	Page
SOUTH SHORE PETRO	***990 WASHINGTON ST***	***SSE 0 - 1/8 (0.103 mi.)***	***G31***	***130***

AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Environmental Protection's Summary Listing of all the Tanks Registered in the State of Massachusetts.

A review of the AST list, as provided by EDR, and dated 10/22/2009 has revealed that there is 1 AST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GETTY STATION #30327	*663 WASHINGTON ST*	*N 1/8 - 1/4 (0.245 mi.)*	*J49*	*230*

State and tribal institutional control / engineering control registries

INST CONTROL: Activity and Use Limitations establish limits and conditions on the future use of contaminated property, and therefore allow cleanups to be tailored to these uses.

A review of the INST CONTROL list, as provided by EDR, and dated 02/28/2012 has revealed that there are 3 INST CONTROL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PROPERTY	*2 CANTON ST*	*0 - 1/8 (0.000 mi.)*	*A2*	*8*
CORNER SCHOOL	*49 ROSE ST*	*NNW 0 - 1/8 (0.061 mi.)*	*E26*	*114*
NO LOCATION AID	*645 WASHINGTON ST*	*N 1/4 - 1/2 (0.304 mi.)*	*K51*	*243*

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

RELEASE: MA Release Tracking Database.

A review of the RELEASE list, as provided by EDR, and dated 02/28/2012 has revealed that there are 58 RELEASE sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PROPERTY	*2 CANTON ST*	*0 - 1/8 (0.000 mi.)*	*A2*	*8*
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome Not Required				
**Additional key fields are available in the Map Findings section*				
OLD FACTORY/MACHINE SHOP	*25 R BROCK ST*	*SSE 0 - 1/8 (0.023 mi.)*	*C7*	*55*
Facility Status: Response Action Outcome				
NO LOCATION AID	*825 WASHINGTON ST RTE 1*	*NNE 0 - 1/8 (0.024 mi.)*	*D9*	*60*
Facility Status: Response Action Outcome				
GETTY SERVICE STATION	*825 WASHINGTON ST*	*NNE 0 - 1/8 (0.024 mi.)*	*D11*	*66*
Facility Status: Response Action Outcome Not Required				
Facility Status: Response Action Outcome Not Required				
MARKET	*31 PORTER ST*	*NNW 0 - 1/8 (0.025 mi.)*	*A13*	*88*
Facility Status: Response Action Outcome				
NO LOCATION AID	*21 PARK AVE*	*NNE 0 - 1/8 (0.045 mi.)*	*D21*	*105*
Facility Status: Response Action Outcome				
TOWN WASTE OIL RECLAMATION	*26 ROSE ST*	*NNW 0 - 1/8 (0.047 mi.)*	*E22*	*109*

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TRUCK DEPOT-REPAIR AREA	***793 WASHINGTON ST***	***NNE 0 - 1/8 (0.048 mi.)***	***23***	***110***
Facility Status: Response Action Outcome				
CORNER SCHOOL	***49 ROSE ST***	***NNW 0 - 1/8 (0.061 mi.)***	***E26***	***114***
Facility Status: Response Action Outcome				
NO LOCATION AID	***35 WALNUT ST***	***E 0 - 1/8 (0.098 mi.)***	***29***	***126***
Facility Status: Response Action Outcome				
NO LOCATION AID	***CANTON AND SCHOOL ST***	***NW 0 - 1/8 (0.107 mi.)***	***38***	***159***
Facility Status: Response Action Outcome				
GETTY #30743	***724 WASHINGTON ST***	***N 1/8 - 1/4 (0.134 mi.)***	***H40***	***163***
Facility Status: Response Action Outcome				
FRAGAS BROS MARKET	***105 PORTER ST***	***NNE 1/8 - 1/4 (0.180 mi.)***	***42***	***177***
Facility Status: Response Action Outcome				
NO LOCATION AID	***20 SCHOOL ST***	***N 1/8 - 1/4 (0.191 mi.)***	***43***	***182***
Facility Status: Response Action Outcome				
STOUGHTON AUTOMOTIVE CORP	***663 WASHINGTON ST***	***N 1/8 - 1/4 (0.245 mi.)***	***J50***	***232***
Facility Status: Response Action Outcome				
NO LOCATION AID	***645 WASHINGTON ST***	***N 1/4 - 1/2 (0.304 mi.)***	***K51***	***243***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome				
**Additional key fields are available in the Map Findings section*				
MUTUAL OIL CO INC #37	***608 WASHINGTON ST***	***N 1/4 - 1/2 (0.340 mi.)***	***K53***	***261***
Facility Status: Response Action Outcome				
CENTRAL ST	***232 PEARL ST***	***NNW 1/4 - 1/2 (0.404 mi.)***	***L55***	***272***
Facility Status: DEP No Further Action				
Facility Status: Response Action Outcome				
NO LOCATION AID	***223 PEARL ST***	***NNW 1/4 - 1/2 (0.406 mi.)***	***L56***	***275***
Facility Status: Downgradient Property Status				
NEW STOUGHTON SQUARE	***521-525 WASHINGTON ST***	***N 1/4 - 1/2 (0.488 mi.)***	***N58***	***280***
Facility Status: LSP Opinion,No Further Action				
CUMBERLAND FARMS 2001	***309 PARK ST***	***ESE 1/2 - 1 (0.528 mi.)***	***O60***	***283***
NO LOCATION AID	***309 PARK ST***	***ESE 1/2 - 1 (0.528 mi.)***	***O61***	***288***
Facility Status: Response Action Outcome				
CUMBERLAND FARMS	***499 WASHINGTON ST***	***N 1/2 - 1 (0.528 mi.)***	***N62***	***290***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome				
**Additional key fields are available in the Map Findings section*				
CUMBERLAND FARMS 499 WASHINGTO	***12 WELCH AVE***	***N 1/2 - 1 (0.539 mi.)***	***64***	***339***
Facility Status: Response Action Outcome Not Required				
CUMBERLAND FARMS #2001	***110 BIRCH ST***	***ESE 1/2 - 1 (0.556 mi.)***	***O65***	***344***
Facility Status: Response Action Outcome Not Required				
F C PHILLIPS INC	***471 WASHINGTON ST***	***N 1/2 - 1 (0.579 mi.)***	***P67***	***359***
1032 CENTRAL ST	***397 413-423 WASHINGTON***	***N 1/2 - 1 (0.624 mi.)***	***P68***	***380***
Facility Status: Response Action Outcome				
DONAHUE TRUCK SERV CO INC FMR	***75 LAMBERT AVE***	***NNE 1/2 - 1 (0.717 mi.)***	***71***	***387***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome Not Required				
SHELL FMR	***386 WASHINGTON ST***	***N 1/2 - 1 (0.738 mi.)***	***72***	***398***
Facility Status: Response Action Outcome				

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NO LOCATION AID	***372 WASHINGTON ST***	***N 1/2 - 1 (0.785 mi.)***	***R74***	***414***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome				
**Additional key fields are available in the Map Findings section*				
NO LOCATION AID	***354-360 WASHINGTON ST***	***N 1/2 - 1 (0.811 mi.)***	***R78***	***492***
Facility Status: Response Action Outcome Not Required				
POLE 161A	***WASHINGTON ST***	***N 1/2 - 1 (0.820 mi.)***	***R79***	***494***
Facility Status: Response Action Outcome				
RESIDENCE	***61 RAYBURN RD***	***NNW 1/2 - 1 (0.823 mi.)***	***80***	***496***
Facility Status: Response Action Outcome				
PINECREST III REALTY PARTNERS	***428-440 PEARL ST***	***NNW 1/2 - 1 (0.825 mi.)***	***T81***	***498***
Facility Status: Downgradient Property Status				
A&A CLEANERS FMR	***434-450 PEARL ST***	***NNW 1/2 - 1 (0.842 mi.)***	***T82***	***501***
Facility Status: Response Action Outcome				
PINECREST III REALTY PARTNERS	***438 PEARL ST***	***NNW 1/2 - 1 (0.851 mi.)***	***T84***	***513***
Facility Status: Response Action Outcome				
NO LOCATION AID	***600 PARK ST***	***ESE 1/2 - 1 (0.940 mi.)***	***V89***	***540***
Facility Status: Response Action Outcome Not Required				
B&C CONSTRUCTION	***600 PARK ST***	***ESE 1/2 - 1 (0.940 mi.)***	***V90***	***544***
Facility Status: Waiver Completion Statement,Permanent				
STIVALETTA REALTY TRUST	***630 PARK ST***	***ESE 1/2 - 1 (0.991 mi.)***	***92***	***553***
Facility Status: LSP Opinion,No Further Action				

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	***46 MORTON ST***	***WNW 0 - 1/8 (0.021 mi.)***	***B4***	***28***
Facility Status: Response Action Outcome				
GAS CONTAMINATED WATER	***990 WASHINGTON ST***	***SSE 0 - 1/8 (0.103 mi.)***	***G33***	***135***
Facility Status: Response Action Outcome				
Facility Status: Response Action Outcome				
**Additional key fields are available in the Map Findings section*				
KELLEY BROS CONSTRUCTION CORP	***118 CUSHING ST***	***NW 1/4 - 1/2 (0.307 mi.)***	***52***	***259***
Facility Status: DEP No Further Action				
CENTRAL AUTO SALVAGE	***1152 WASHINGTON ST***	***S 1/4 - 1/2 (0.394 mi.)***	***54***	***266***
FORMER GROSSMAN'S	***1202-1214 WASHINGTON ST***	***S 1/4 - 1/2 (0.485 mi.)***	***M57***	***276***
Facility Status: Response Action Outcome				
ASHMOUNT DISCOUNT	***1204 WASHINGTON ST***	***S 1/4 - 1/2 (0.488 mi.)***	***M59***	***281***
Facility Status: DEP No Further Action				
BROOKFIELD ENGINEERING LAB INC	***240 CUSHING ST***	***NW 1/2 - 1 (0.535 mi.)***	***63***	***304***
Facility Status: Response Action Outcome Not Required				
NO LOCATION AID	***145 SIMPSON ST***	***NW 1/2 - 1 (0.575 mi.)***	***66***	***356***
Facility Status: Downgradient Property Status				
NO LOCATION AID	***369 CANTON ST***	***WNW 1/2 - 1 (0.693 mi.)***	***Q69***	***383***
Facility Status: Response Action Outcome				
NO LOCATION AID	***396 AND 383 CANTON ST***	***WNW 1/2 - 1 (0.706 mi.)***	***Q70***	***385***
Facility Status: Downgradient Property Status				
NO LOCATION AID	***11 MCGRATH HWY***	***SW 1/2 - 1 (0.753 mi.)***	***73***	***411***
Facility Status: Response Action Outcome				

Lower Elevation	Address	Direction / Distance	Map ID	Page
JET LINE SERVICES INC	***441R CANTON ST***	***WNW 1/2 - 1 (0.806 mi.)***	***S75***	***425***
Facility Status: Downgradient Property Status				
Facility Status: Response Action Outcome				
SAM'S AUTO SERVICE	***452 CANTON ST***	***WNW 1/2 - 1 (0.808 mi.)***	***S77***	***487***
Facility Status: LSP Opinion,No Further Action				
ARK-LES CORPORATION	***1490 CENTRAL ST***	***NW 1/2 - 1 (0.842 mi.)***	***U83***	***504***
Facility Status: Response Action Outcome				
ARK LES CORPORATION	***EVANS DR***	***NW 1/2 - 1 (0.852 mi.)***	***U85***	***519***
Facility Status: Response Action Outcome				
PROPERTY	***1551 CENTRAL ST***	***WNW 1/2 - 1 (0.933 mi.)***	***86***	***520***
GILL MACHINE SHOP	***151 SOUTHWORTH CT***	***WNW 1/2 - 1 (0.934 mi.)***	***87***	***533***
Facility Status: Downgradient Property Status				
PRECISION DOOR & WINDOW	***466 SUMMER ST***	***SE 1/2 - 1 (0.936 mi.)***	***88***	***539***
Facility Status: LSP Opinion,No Further Action				
COHENNO INC	***92 EVANS DRIVE***	***NW 1/2 - 1 (0.945 mi.)***	***91***	***547***
Facility Status: Response Action Outcome				

Other Ascertainable Records

RCRA-NonGen: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA-NonGen list, as provided by EDR, and dated 11/10/2011 has revealed that there are 9 RCRA-NonGen sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ACME BOOT CO	***2 CANTON STREET***	***0 - 1/8 (0.000 mi.)***	***A3***	***25***
JOES SHELL INC	***825 WASHINGTON ST***	***NNE 0 - 1/8 (0.024 mi.)***	***D8***	***59***
NEW ENGLAND TELE	***862 WASHINGTON ST***	***E 0 - 1/8 (0.027 mi.)***	***16***	***99***
STOUGHTON DYE HOUSE INC	***20 FREEMAN ST***	***NNE 0 - 1/8 (0.105 mi.)***	***36***	***145***
DEQE OFFICE OF RESPONSE	***FIRST STA***	***WNW 0 - 1/8 (0.106 mi.)***	***37***	***149***
ALS AUTO REPAIR & TOWING INC	***68 CUSHING ST***	***NW 1/8 - 1/4 (0.199 mi.)***	***44***	***191***
STOUGHTON AUTOMOTIVE CORP	***663 WASHINGTON ST***	***N 1/8 - 1/4 (0.245 mi.)***	***J50***	***232***

Lower Elevation	Address	Direction / Distance	Map ID	Page
INSURANCE AUTO BODY INC	***950 WASHINGTON ST***	***SSE 0 - 1/8 (0.033 mi.)***	***C18***	***102***
SUNOCO SERVICE STA	***990 WASHINGTON ST***	***SSE 0 - 1/8 (0.103 mi.)***	***G32***	***133***

MINES: Mines Master Index File. The source of this database is the Dept. of Labor, Mine Safety and Health Administration.

A review of the MINES list, as provided by EDR, and dated 08/18/2011 has revealed that there is 1 MINES site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
T L EDWARDS INC		W 1/8 - 1/4 (0.224 mi.)	45	194

DRYCLEANERS: A listing of Department of Environmental Protection regulated drycleaning facilities that use perchloroethylene under the Environmental Results Program.

A review of the DRYCLEANERS list, as provided by EDR, and dated 01/23/2012 has revealed that there is 1 DRYCLEANERS site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PEARL CLEANERS INC	945 WASHINGTON ST	SSE 0 - 1/8 (0.029 mi.)	C17	101

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the Manufactured Gas Plants list, as provided by EDR, has revealed that there is 1 Manufactured Gas Plants site within approximately 1 mile of the target property.

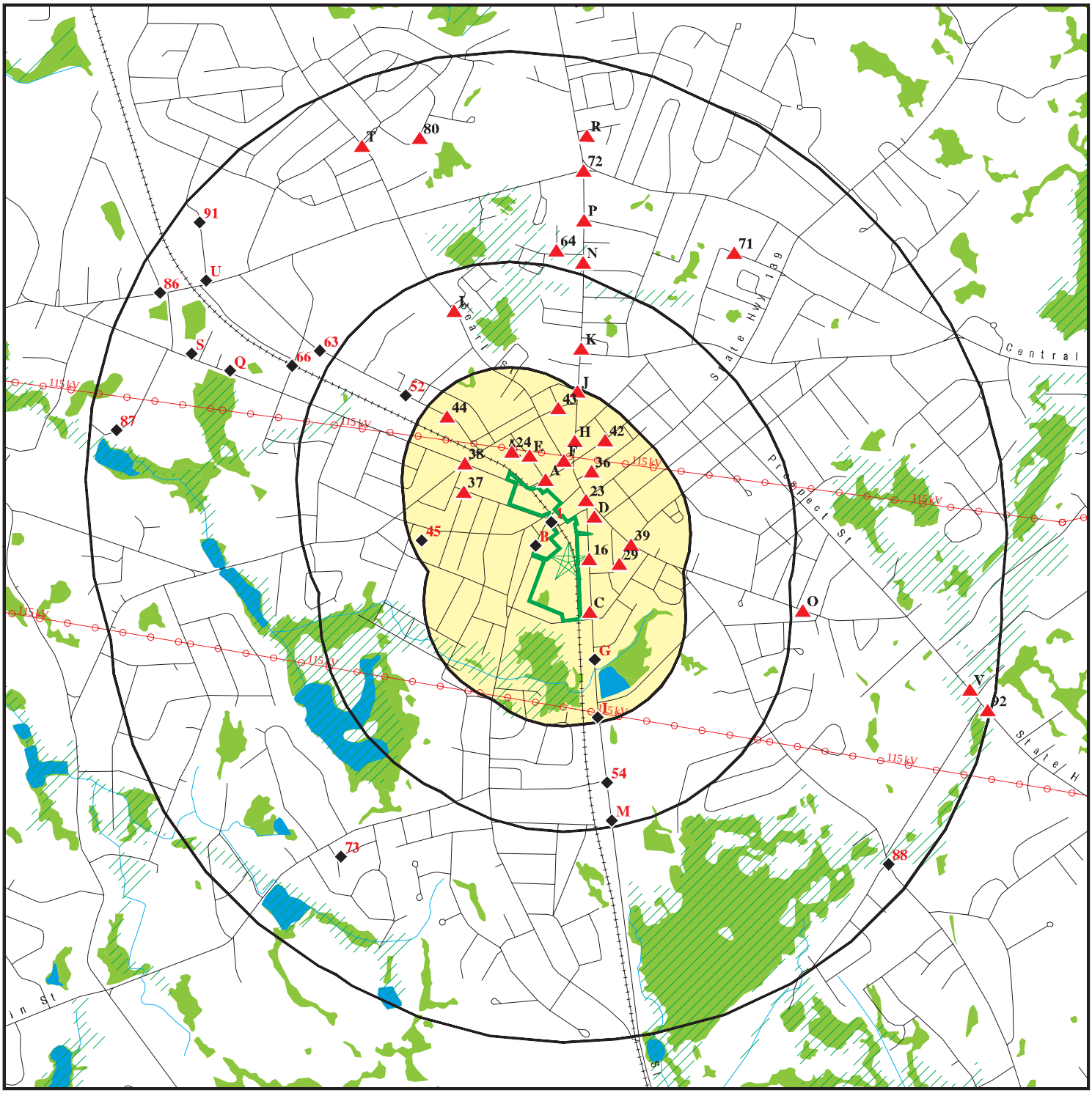
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STOUGHTON GAS AND ELECTRIC CO	SCHOOL STREET	NNW 0 - 1/8 (0.051 mi.)	24	112

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 23 records.

Site Name	Database(s)
0.2 MILES SOUTH OF CANTON BORDER	SHWS, RELEASE
RTE 139 EXIT	SHWS, RELEASE
NO LOCATION AID	SHWS, RELEASE
NO LOCATION AID	SHWS, RELEASE
DORCHESTER BROOK	SHWS, RELEASE
STOUGHTON CENTER TO 441 REAR CANTO	SHWS, RELEASE
OFF BAY ST	SHWS, RELEASE
CORNER OF CENTRAL ST	SHWS, RELEASE
NEAR 72 WHEELER CIR	SHWS, RELEASE
HORAN OIL CO.	LAST, RELEASE
MASS DPW MAINT DEPOT	UST, FINANCIAL ASSURANCE
GAGRLER REALTY	UST, FINANCIAL ASSURANCE
STOUGHTON STATION 45 WYMAN ST.	ERNS
WOLLASTON STATION NORTHBOUND TRACK	ERNS
NORTH STOUGHTON INDUSTRIAL PARK DE	FINDS
STOUGHTON	FINDS
STOUGHTON SCHOOL DEPT	SPILLS
A A WILL SAND & GRAVEL CORP.	MINES
STOUGHTON WATER DIVISION	ICIS
NORTH STOUGHTON INDUSTRIAL PARK DE	ICIS
LEO FIORI & SONS	MANIFEST
CAMPANELLI REALTY TRUST	MANIFEST
VICTOR FORD	MANIFEST

OVERVIEW MAP - 3308239.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

National Wetland Inventory

Areas of Critical Environmental Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton MA 02072 LAT/LONG: 42.1221 / 71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY #: 3308239.2s DATE: April 23, 2012 2:36 pm

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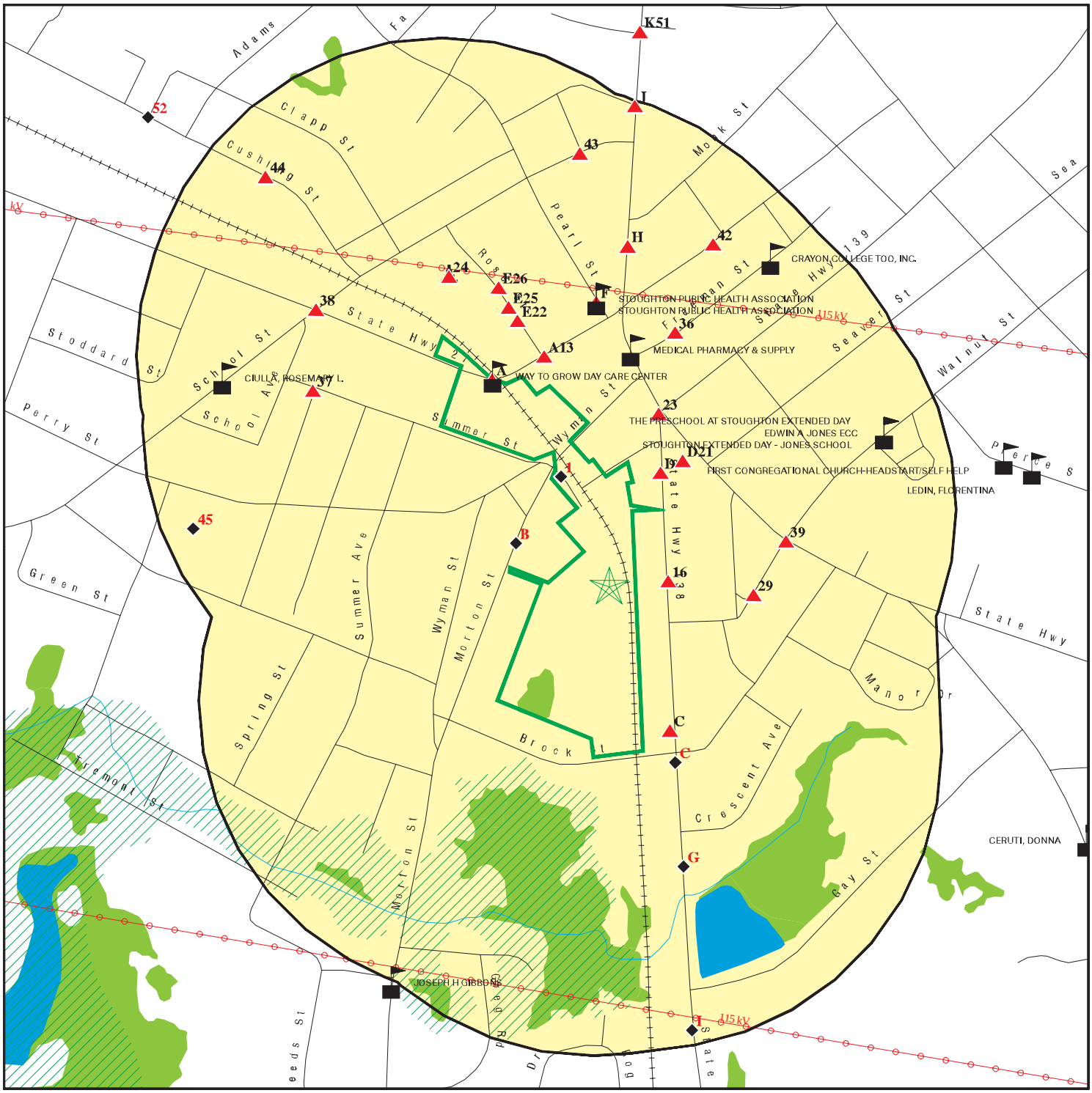
DETAIL MAP - 3308239.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Critical Environmental Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Stoughton Station	CLIENT: Vanasse Hangen Brustlin, Inc.
ADDRESS: Wyman Street/Brock Street Stoughton MA 02072	CONTACT: Katie Kudzma
LAT/LONG: 42.1221 / 71.1024	INQUIRY #: 3308239.2s DATE: April 23, 2012 2:36 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	1.000		0	0	0	0	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	1	NR	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		4	1	NR	NR	NR	5
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		7	2	7	26	NR	42
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		5	3	4	NR	NR	12
LAST	0.500		3	0	0	NR	NR	3
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		4	2	NR	NR	NR	6

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AST	0.250		0	1	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		2	0	1	NR	NR	3
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
RELEASE	1.000		13	4	9	32	NR	58
SPILLS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen	0.250		7	2	NR	NR	NR	9
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
MINES	0.250		0	1	NR	NR	NR	1
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		1	0	NR	NR	NR	1
ENF	TP		NR	NR	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
LEAD	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
FINANCIAL ASSURANCE	TP		NR	NR	NR	NR	NR	0
GWDP	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	1.000		1	0	0	0	NR	1

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1 **MURPHY COAL & OIL** **MANIFEST** **S109773099**
25 MORTON SQ. **N/A**
< 1/8 **STOUGHTON, MA 02072**
1 ft.

CT MANIFEST:

Relative:
Lower

Actual:
226 ft.

Waste:

Manifest No:	CTF1131247
Waste Occurence:	1
UNNA:	3082
Hazard Class:	9
US Dot Description:	ENV. HAZARDOUS SUBSTANCE LIQUID NOS
No of Containers:	004
Container Type:	DM
Quantity:	220
Weight/Volume:	G
Additional Description:	Not reported
Handling Code:	Not reported
Date Record Was Last Modified:	5/26/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	CTF1131247
Waste Occurence:	1
EPA Waste Code:	F002
Recycled Waste?:	F
Date Record Was Last Modified:	5/26/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	2003
Manifest ID:	CTF1131247
TSDF EPA ID:	CTD021816889
TSDF Name:	UNITED OIL RECOVERY INC
TSDF Address:	136 GRACEY AVE
TSDF City,St,Zip:	MERIDEN, CT 06450
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	7/9/2003
Transporter EPA ID:	CTD021816889
Transporter Name:	UNITED OIL RECOVERY INC
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MP7813443012
Generator Phone:	Not reported
Generator Mailing Addr:	25 MORTON SQ. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Not reported

MURPHY COAL & OIL (Continued) **S109773099**

Discrepancies:	No
Date Shipped:	7/9/2003
Date Received:	7/10/2003
Last modified date:	5/26/2004
Last modified by:	IG
Comments:	Not reported

A2
< 1/8
1 ft.

PROPERTY
2 CANTON ST
STOUGHTON, MA 02072

Site 1 of 3 in cluster A

LUST **S101026672**
SPILLS **N/A**
RELEASE
INST CONTROL
LEAD

Relative: Higher

Actual: 231 ft.

LUST:

Facility:

Facility ID:	4-0000875
Current Status:	**Response Action Outcome**
Status Date:	10/9/2009
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	4/15/1990
Category:	NONE
Associated ID:	4-0000875
Phase:	PHASE IV
Response Action Outcome:	A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	PETROLEUM
Quantity:	Not reported

Location:

Location Type:	MANUFACT

Source:

Source Type:	UST

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	10/9/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type:	An activity type that is related to an Audit
Action Stat:	Audit Follow-up Completion Statement Received
Action Date:	1/6/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type:	An activity type that is related to an Audit
Action Stat:	Notice of Non-compliance related to an Audit
Action Date:	11/16/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been

PROPERTY (Continued) **S101026672**

reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 3/13/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 10/9/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/24/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 9/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 4/15/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 8/18/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/19/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has

PROPERTY (Continued) **S101026672**

been implemented.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/8/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 11/1/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Legal Notice Published
Action Date: 11/4/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/9/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

PROPERTY (Continued) **S101026672**

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 3/13/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/10/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/26/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/19/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/1/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/30/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO

PROPERTY (Continued) **S101026672**

Action Stat: Level III - Comprehensive Audit
Action Date: 11/16/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/23/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/2/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 8/18/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

PROPERTY (Continued) **S101026672**

Facility:
- Facility ID: 4-0018753
- **Current Status:** **Response Action Outcome Not Required**
- Status Date: 10/24/2005
- Source Type: UST
- Release Town: STOUGHTON
- Notification Date: 11/1/2004
- Category: 72 HR
- Associated ID: 4-0000875
- Phase: Not reported
- Response Action Outcome: -
- Oil Or Haz Material: Oil

Chemical:
- Chemical: FUEL OIL
- Quantity: Not reported

Location:
- Location Type: COMMERCIAL

Source:
- Source Type: UST

Action:
- Action Type: Immediate Response Action
- Action Stat: Oral Approval of Plan or Action
- Action Date: 11/1/2004
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Written Plan Received
- Action Date: 1/12/2005
- Response Action Outcome: Not reported

- Action Type: RAO Not Required
- Action Stat: Linked to a Tier Classified Site
- Action Date: 1/6/2005
- Response Action Outcome: Not reported

- Action Type: RAO Not Required
- Action Stat: Linked to a Tier Classified Site
- Action Date: 10/24/2005
- Response Action Outcome: Not reported

- Action Type: RNF
- Action Stat: Reportable Release under MGL 21E
- Action Date: 1/12/2005
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Status or Interim Report Received
- Action Date: 5/9/2005
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Level I - Technical Screen Audit
- Action Date: 8/11/2006
- Response Action Outcome: Not reported

PROPERTY (Continued) **S101026672**

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/14/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/16/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/2/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/3/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/9/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/24/2003
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/24/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/24/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification

PROPERTY (Continued) **S101026672**

Action Date: 8/30/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/2/2004
Response Action Outcome: Not reported

Facility:
Facility ID: 4-0021470
Current Status: **Response Action Outcome Not Required**
Status Date: 10/31/2008
Source Type: UST
Release Town: STOUGHTON
Notification Date: 8/26/2008
Category: 72 HR
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: #6 FUEL OIL
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UST

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/26/2008
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 8/27/2008
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 9/5/2008
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/31/2008
Response Action Outcome: Not reported

PROPERTY (Continued) **S101026672**

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/26/2008
Response Action Outcome: Not reported

MA Spills:

Facility ID:	9-9999	Spill ID:	S89-0703
Staff Lead:	MORAN, M	Date Entered:	Not reported
Last Entered:	19891213	First Response:	19891010
Spill Date:	Not reported	Spill Time:	Not reported
Report Date:	19891010	Report Time:	11:30
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	#2 FUEL OIL	Other Material:	Not reported
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	GALLONS	Qty Actual:	GALLONS
CAS No:	Not reported	PCB Lev (ppm):	NONE
Source:	U.S.T.	Other Source:	Not reported
Incident:	OTHER RELEASE >	Other Incdnt:	DETECTION
Cleanup Type:	SSC	Contractor:	NOT USED
Referral:	NO	LUST Elig:	---
Report Prep:	Not reported	Category:	Not reported
Notifier:	P HALL		
Notif Tel:	Not reported		
Days/Close:	0		

Release:
Facility ID: 4-0000875
Primary ID: 4-0000875
Official City: STOUGHTON
Notification: 4/15/1990
Category: NONE
Current Status: Response Action Outcome
Status Date: 10/9/2009
Phase: PHASE IV
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: Audit Follow-up Completion Statement Received

PROPERTY (Continued) **S101026672**

Action Date: 1/6/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 11/16/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 3/13/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 10/9/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/24/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 9/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 4/15/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 8/18/2004

PROPERTY (Continued) **S101026672**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/19/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/8/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 11/1/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Legal Notice Published
Action Date: 11/4/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/9/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

PROPERTY (Continued) **S101026672**

reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 3/13/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/10/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/26/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/19/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/1/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has

PROPERTY (Continued) **S101026672**

been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/30/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 11/16/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/23/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/2/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 8/18/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

PROPERTY (Continued) **S101026672**

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: MANUFACT

Source:
Source Type: UST

Facility ID: 4-0018753
Primary ID: 4-0000875
Official City: STOUGHTON
Notification: 11/1/2004
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 10/24/2005
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/12/2005
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 1/6/2005
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/24/2005
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/12/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/9/2005
Response Action Outcome: Not reported

PROPERTY (Continued) **S101026672**

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 8/11/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/14/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/16/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/2/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/3/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/9/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/24/2003
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/1/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/24/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal

PROPERTY (Continued) **S101026672**

Action Date: 10/24/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/30/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/2/2004
Response Action Outcome: Not reported

Chemical:
Chemical: FUEL OIL
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Facility ID: 4-0021470
Primary ID: Not reported
Official City: STOUGHTON
Notification: 8/26/2008
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 10/31/2008
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/26/2008
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 8/27/2008
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 9/5/2008
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/31/2008

PROPERTY (Continued) **S101026672**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/31/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/26/2008
Response Action Outcome: Not reported

Chemical:
Chemical: #6 FUEL OIL
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UST

INST CONTROL:
Release Tracking Number: 4-0000875
Action Type: AUL
Action Stat: LEGNOT
Action Date: 11/4/2009
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Release Tracking Number: 4-0000875
Action Type: AUL
Action Stat: RECPT
Action Date: 10/9/2009
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

LEAD:
Community: Stoughton
Unit: 100
Inspector Name: James Weydt
Inspector License Number: 1196
Activity Type: INSPECT
Activity Date: 08/29/2004
Start Work Date: Not reported
Activity Descriptions: Comprehensive Initial Inspection
Outcomes: No Hazards Found

Community: Stoughton
Unit: 100
Inspector Name: James Weydt
Inspector License Number: 1196
Activity Type: COMPLIANCE
Activity Date: 08/29/2004

PROPERTY (Continued) **S101026672**

Start Work Date: Not reported
Activity Descriptions: Letter of Full Initial Insp Comp
Outcomes: Issued

A3 **ACME BOOT CO** **RCRA-NonGen** **1000195511**
2 CANTON STREET **FINDS** **MAD066626961**
< 1/8 **STOUGHTON, MA 02072**
1 ft.

Site 2 of 3 in cluster A

Relative:
Higher

Actual:
231 ft.

RCRA-NonGen:
Date form received by agency: 08/18/1980
Facility name: ACME BOOT CO
Facility address: 2-16 CANTON ST
STOUGHTON, MA 02072
EPA ID: MAD066626961
Mailing address: PO BOX 749
CLARKSVILLE, TN 37040
Contact: B-J SEAY
Contact address: PO BOX 749
CLARKSVILLE, TN 37040
Contact country: US
Contact telephone: (615) 552-2000
Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: ACME BOOT CO
Owner/operator address: PO BOX 749
CLARKSVILLE, TN 37040
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/01/1990
Owner/Op end date: 06/03/1991

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

ACME BOOT CO (Continued) **1000195511**

Historical Generators:
Date form received by agency: 08/18/1980
Facility name: ACME BOOT CO
Classification: Not a generator, verified

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/14/1986
Date achieved compliance: 09/18/1986
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/21/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 04/17/1986
Date achieved compliance: 09/18/1986
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/30/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 04/17/1986
Date achieved compliance: 07/14/1986
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/21/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported

ACME BOOT CO (Continued) **1000195511**

Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 09/18/1986
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/14/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 09/18/1986
Evaluation lead agency: State

Evaluation date: 04/17/1986
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Formal Enforcement Agreement or Order
Date achieved compliance: 07/14/1986
Evaluation lead agency: State

Evaluation date: 04/17/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 09/18/1986
Evaluation lead agency: State

FINDS:

Registry ID: 110001938583

Environmental Interest/Information System

AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

B4
WNW
< 1/8
0.021 mi.
112 ft.

46 MORTON ST
STOUGHTON, MA

Site 1 of 3 in cluster B

SHWS **S101020538**
RELEASE **N/A**
SPILLS

Relative:
Lower

Actual:
219 ft.

SHWS:

Facility ID:	4-0011611
Release Town:	STOUGHTON
Notification Date:	8/30/1995
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	11/1/1995
Phase:	Not reported
Response Action Outcome:	A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	SODIUM DICHLOROISOCYANURATE
Quantity:	72 pounds

Location:

Location Type:	COMMERCIAL
Location Type:	INDUSTRIAL

Source:

Source Type:	Not reported

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Approval of Plan
Action Date:	9/1/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/7/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	8/30/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	11/1/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	8/30/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

(Continued) **S101020538**

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/1/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0011611
Primary ID: Not reported
Official City: STOUGHTON
Notification: 8/30/1995
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 11/1/1995
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 9/1/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/7/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/30/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/1/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/30/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/1/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

(Continued) **S101020538**

Chemical:
Chemical: SODIUM DICHLOROISOCYANURATE
Quantity: 72 pounds

Location:
Location Type: COMMERCIAL
Location Type: INDUSTRIAL

Source:
Source Type: Not reported

MA Spills:

Facility ID:	0000	Spill ID:	S87-0579
Staff Lead:	KEARNS, R	Date Entered:	19871022
Last Entered:	19871022	First Response:	19870914
Spill Date:	19870914	Spill Time:	9
Report Date:	19870914	Report Time:	10
Case Closed:	YES	Mat Type:	HAZARDOUS
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	SODIUM TRIPOLYPHOSPHATE	Other Material:	Not reported
Qty Reported:	NONE	Qty Actual:	NONE
Qty Reported:	BAGS	Qty Actual:	BAGS
CAS No:	Not reported	PCB Lev (ppm):	Not reported
Source:	PIPE/HOSE/LINE	Other Source:	Not reported
Incident:	SPILL	Other Incdnt:	Not reported
Cleanup Type:	Not reported	Contractor:	NOT USED
Referral:	NO	LUST Elig:	Not reported
Report Prep:	Not reported	Category:	Not reported
Notifier:	Not reported		
Notif Tel:	Not reported		
Days/Close:	1		

B5 **ALPHA CHEMICAL SERVICES INC** **RCRA-CESQG** **1000238838**
WNW **46 MORTON ST.** **TRIS** **02072LPHCH46**
< 1/8 **STOUGHTON, MA 02072** **SSTS**
0.021 mi. **FINDS**
112 ft. **Site 2 of 3 in cluster B**

Relative: Lower

Actual: 219 ft.

RCRA-CESQG:
Date form received by agency: 07/27/2004
Facility name: ALPHA CHEMICAL SERVICES INC
Facility address: 46 MORTON ST
STOUGHTON, MA 02072
EPA ID: MAD051782316
Mailing address: PO BOX 431
STOUGHTON, MA 020720000
Contact: MARK JUCKETT
Contact address: PO BOX 431
STOUGHTON, MA 02072
Contact country: US
Contact telephone: (617) 344-8688
Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time;

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	CORPORATION WAYNE JUCKETT PRESIDENT
Owner/operator address:	PO BOX 431 STOUGHTON, MA 02072
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1900
Owner/Op end date:	Not reported

Owner/operator name:	ALPHA CHEMICAL SERVICES INC
Owner/operator address:	PO BOX 431 STOUGHTON, MA 02072
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	03/01/1953
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	08/13/1980
Facility name:	ALPHA CHEMICAL SERVICES INC
Classification:	Small Quantity Generator

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Date form received by agency: 08/13/1980
Facility name: ALPHA CHEMICAL SERVICES INC
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D008
Waste name: LEAD

Waste code: U134
Waste name: HYDROFLUORIC ACID (C,T)

Waste code: U226
Waste name: ETHANE, 1,1,1-TRICHLORO-

Waste code: U239
Waste name: BENZENE, DIMETHYL- (I,T)

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/20/1988
Date achieved compliance: 01/23/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/17/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/20/1988
Date achieved compliance: 01/23/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/10/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Evaluation Action Summary:

Evaluation date:	07/27/2004
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

Evaluation date:	03/07/1995
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

Evaluation date:	09/25/1991
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

Evaluation date:	01/23/1989
Evaluation:	COMPLIANCE SCHEDULE EVALUATION
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

Evaluation date:	07/20/1988
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Generators - General
Date achieved compliance:	01/23/1989
Evaluation lead agency:	State

Evaluation date:	07/20/1988
Evaluation:	FOCUSED COMPLIANCE INSPECTION
Area of violation:	Generators - General
Date achieved compliance:	01/23/1989
Evaluation lead agency:	State

TRIS:

Click this hyperlink while viewing on your computer to access
1 additional US_TRIS: record(s) in the EDR Site Report.

SSTS:

Product:	ACID SANITIZER
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	00915200018010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product:	ALGAECIDE + SUPPLEMENTALS
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	00144800212010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	TERMINATE
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	01032400067010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	READY TO USE SANITIZER
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	01032400107010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	QUATERNARY DISINFECTANT
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	00183900047065253
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	PINE DISINFECTANT + SUPPLEMENTALS
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	00183900101010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	MILDEW PREVENTATIVE
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	04737100052010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	LIQUID SOFT SAN+ SUPPLEMENTS
Contact:	Not reported
Status:	Not reported
Registration Number:	010634MA001
Report Year:	2007
Permit:	Registered
Product Number:	00183900108010634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Disinfectant, germicide, sanitizer
Product Use:	All other products
UOM:	Not reported
Market:	Marketed in the United States
Region:	01
Zero product:	Not reported
Pesticide RUP report:	Not reported

Product:	LIQUID CHLORINATIONG PRODUCT AND SUPPLEMENTS
Contact:	Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 01063420003
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: KENNEL- SOL HC
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 04737100129062472
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: KENNEL- SOL
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 06447200001
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ICS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00495900015010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: GLASS + MULTI SURFACE CLEANER DISINFECTANT + SUPPLEMENTALS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 01034200085010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: DETERGENT DISINFECTANT PUMP SPRAY +SUPPLEMENTALS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00183900083010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: BIOCIDE + SUPPLEMENTALS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00144800339010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: BIO CHECK
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Report Year: 2007
Permit: Registered
Product Number: 04737100131071336
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: AP ACID SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00683600083083106
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA SAN 400 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 01063400027
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA SAN 300 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 01063400019
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA DYNE
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00495900018010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA BAC 10 + SUPPLEMENTALS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00183900086010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA BAC 1.6
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered
Product Number: 00183900050010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ALPHA BAC + SUPPLEMENTALS
Contact: Not reported
Status: Not reported
Registration Number: 010634MA001
Report Year: 2007
Permit: Registered

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product Number: 01032400081010634
Product Type: End-use blend, formulation, or concentrate
Product Class: Disinfectant, germicide, sanitizer
Product Use: All other products
UOM: Not reported
Market: Marketed in the United States
Region: 01
Zero product: Not reported
Pesticide RUP report: Not reported

Product: ACID SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 9152-18
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: TERMINATE
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10324-67
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: PINE DISINFECTANT+SUPPLEMENT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 1839-101
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product:	NEUTRAFECT
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2008
Permit:	Not reported
Product Number:	47371-131
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	1
Zero product:	No
Pesticide RUP report:	2

Product:	MILDEW PREVENTATIVE
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2008
Permit:	Not reported
Product Number:	47371-52
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	1
Zero product:	No
Pesticide RUP report:	2

Product:	LIQUID SOFT SAN
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2008
Permit:	Not reported
Product Number:	1839-108
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	1
Zero product:	No
Pesticide RUP report:	2

Product:	LIQUID CHLORINATIONG PRODUCT AND SUPPLEMENTS
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2008
Permit:	Not reported
Product Number:	10634-20003
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: KENNEL-SOL HC
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 47371-129-62472
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: KENNEL-SOL
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 62472-1
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ICS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 4959-15
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: HYPERFEC 256
Contact: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 47371-129
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: GLASS&MULTI-SURFACE CLEANER DISINFECTANT+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10324-85
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: GENEFECT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 6836-75
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: BIOCIDE+SUPPLEMENT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 1448-339
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: AP ACID SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 6836-83
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA SAN 400 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10634-27
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA SAN 300 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10634-19
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA DYNE
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Report Year: 2008
Permit: Not reported
Product Number: 4959-18
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC 10+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 1839-86
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC 1.6
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 1839-50
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC +SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10324-81
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Zero product: No
Pesticide RUP report: 2

Product: ALGAECIDE+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 1448-212
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: RTU SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2008
Permit: Not reported
Product Number: 10324-107
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: 1
Zero product: No
Pesticide RUP report: 2

Product: GLASS&MULTI-SURFACE CLEANER DISINFECTANT+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 10324-85-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: HYPERFEC 256
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product Number: 47371-129-85023
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ICS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 4959-15-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: KENNEL-SOL
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 62472-1
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: KENNEL-SOL HC
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 47371-129-62472
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product:	LIQUID CHLORINATIONG PRODUCT AND SUPPLEMENTS
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2009
Permit:	Not reported
Product Number:	10634-20003
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Insecticide-Fungicide
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	Not reported
Zero product:	No
Pesticide RUP report:	2

Product:	LIQUID SOFT SAN
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2009
Permit:	Not reported
Product Number:	1839-108-10634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	Not reported
Zero product:	No
Pesticide RUP report:	2

Product:	MILDEW PREVENTATIVE
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2009
Permit:	Not reported
Product Number:	47371-52-10634
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported
Product Use:	Not reported
UOM:	Not reported
Market:	Marketed in the United States
Region:	Not reported
Zero product:	No
Pesticide RUP report:	2

Product:	NEUTRAFECT
Contact:	Not reported
Status:	Not reported
Registration Number:	010634-MA-001
Report Year:	2009
Permit:	Not reported
Product Number:	47371-131-85023
Product Type:	End-use blend, formulation, or concentrate
Product Class:	Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: PINE DISINFECTANT+SUPPLEMENT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 1839-101-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: RTU SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 10324-107-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: TERMINATE
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 10324-67-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ACID SANITIZER
Contact: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 9152-18-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALGAECIDE+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 1448-212-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC +SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 10324-81-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC 1.6
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 1839-50-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA BAC 10+SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 1839-86-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA DYNE
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 4959-18-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA SAN 300 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 10634-19
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: ALPHA SAN 400 AND SUPPLEMENTS
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Report Year: 2009
Permit: Not reported
Product Number: 10634-27
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: AP ACID SANITIZER
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 6836-83-83106
Product Type: End-use blend, formulation, or concentrate
Product Class: Insecticide-Fungicide
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: BIOCIDE+SUPPLEMENT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 1448-339-10634
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported
Zero product: No
Pesticide RUP report: 2

Product: GENEFECT
Contact: Not reported
Status: Not reported
Registration Number: 010634-MA-001
Report Year: 2009
Permit: Not reported
Product Number: 6836-75-85023
Product Type: End-use blend, formulation, or concentrate
Product Class: Not reported
Product Use: Not reported
UOM: Not reported
Market: Marketed in the United States
Region: Not reported

ALPHA CHEMICAL SERVICES INC (Continued) **1000238838**

Zero product: No
Pesticide RUP report: 2

FINDS:

Registry ID: 110000310716

Environmental Interest/Information System

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

SSTS (Section Seven Tracking System) evolved from the FIFRA and TSCA Enforcement System (FATES). SSTS tracks the registration of all pesticide-producing establishments and tracks annually the types and amounts of pesticides, active ingredients, and related devices that are produced, sold, or distributed each year.

B6 **ALPHA CHEMICAL** **MANIFEST** **S109758810**
WNW **46 MORTON ST** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.021 mi.
112 ft. **Site 3 of 3 in cluster B**

Relative:
Lower

Actual:
219 ft.

CT MANIFEST:

Waste:
Manifest No: MAM509395
Waste Occurence: 1
UNNA: 1760
Hazard Class: 8

ALPHA CHEMICAL (Continued) **S109758810**

US Dot Description: compounds, cleaning liquid
No of Containers: 005
Container Type: DF
Quantity: 275
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Manifest No: MAM509395
Waste Occurence: 2
UNNA: 1760
Hazard Class: 8
US Dot Description: compounds, cleaning liquid
No of Containers: 024
Container Type: DF
Quantity: 120
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: MAM509395
Waste Occurence: 1
EPA Waste Code: D002
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Manifest No: MAM509395
Waste Occurence: 2
EPA Waste Code: D002
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1999
Manifest ID: MAM509395
TSDF EPA ID: CTD000604488
TSDF Name: CLEAN HARBORS OF CONNECTICUT, INC.
TSDF Address: 51 BRODERICK RD
TSDF City,St,Zip: BRISTOL, CT 06010
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: 10/21/1999
Transporter EPA ID: MAD039322250
Transporter Name: CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: 10/25/1999
Trans 2 EPA ID: MAD039322250
Trans 2 Name: CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

ALPHA CHEMICAL (Continued) **S109758810**

Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAD051782316
Generator Phone:	7813448688
Generator Mailing Addr:	46 MORTON ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Not reported
Discrepancies:	No
Date Shipped:	10/21/1999
Date Received:	10/25/1999
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

C7 **OLD FACTORY/MACHINE SHOP** **SHWS** **S102967655**
SSE **25 R BROCK ST** **RELEASE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.023 mi.
124 ft. **Site 1 of 7 in cluster C**

Relative:
Higher

Actual:
227 ft.

SHWS:

Facility ID:	4-0013476
Release Town:	STOUGHTON
Notification Date:	11/8/1997
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	5/28/1999
Phase:	Not reported
Response Action Outcome:	A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	#2 FUEL OIL
Quantity:	Not reported

Location:

Location Type:	INDUSTRIAL
Location Type:	RESIDNTIAL

Source:

Source Type:	UNKNOWN

Action:

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	11/14/1997
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	5/28/1999

OLD FACTORY/MACHINE SHOP (Continued) **S102967655**

Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/6/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Revised Statement or Transmittal Received
Action Date: 8/9/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

OLD FACTORY/MACHINE SHOP (Continued) **S102967655**

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 6/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0013476
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/8/1997
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 5/28/1999
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/14/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/28/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

OLD FACTORY/MACHINE SHOP (Continued) **S102967655**

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/6/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/9/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Revised Statement or Transmittal Received
Action Date: 8/9/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 6/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: #2 FUEL OIL
Quantity: Not reported

Location:
Location Type: INDUSTRIAL
Location Type: RESIDNTIAL

Source:
Source Type: UNKNOWN

D8 NNE < 1/8 0.024 mi. 125 ft. **JOES SHELL INC**
825 WASHINGTON ST
STOUGHTON, MA 02072
Site 1 of 6 in cluster D

RCRA-NonGen **1000375857**
FINDS **MAD982754905**

Relative: Higher

Actual: 230 ft.

RCRA-NonGen:

Date form received by agency:	02/05/1989
Facility name:	JOES SHELL INC
Facility address:	825 WASHINGTON ST STOUGHTON, MA 02072
EPA ID:	MAD982754905
Contact:	ANTHONY-D SILVER
Contact address:	825 WASHINGTON ST STOUGHTON, MA 02072
Contact country:	US
Contact telephone:	(617) 344-9851
Contact email:	Not reported
EPA Region:	01
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	ANTHONY D SILVER
Owner/operator address:	825 WASHINGTON ST STOUGHTON, MA 02072
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	10/16/2004
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110003483301

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of

JOES SHELL INC (Continued) **1000375857**

events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

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D9 **NO LOCATION AID** **SHWS S103812407**
NNE **825 WASHINGTON ST RTE 138** **RELEASE N/A**
< 1/8 **STOUGHTON, MA 02072**
0.024 mi.
125 ft. **Site 2 of 6 in cluster D**

Relative:
Higher

Actual:
230 ft.

SHWS:

Facility ID:	4-0011868
Release Town:	STOUGHTON
Notification Date:	1/2/1996
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	1/3/1997
Phase:	Not reported
Response Action Outcome:	A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	UNKNOWN CHEMICAL OF TYPE - OIL
Quantity:	Not reported

Location:

Location Type:	COMMERCIAL
Location Type:	RESIDNTIAL

Source:

Source Type:	UNKNOWN

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	12/13/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	RLFA
Action Stat:	FOLFLD
Action Date:	1/2/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/2/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	RLFA
Action Stat:	FOLOFF

NO LOCATION AID (Continued) **S103812407**

Action Date: 1/4/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/1/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/17/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 1/3/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/2/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/29/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/30/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/1/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0011868
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/2/1996
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 1/3/1997
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been

NO LOCATION AID (Continued) **S103812407**

reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/13/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 1/2/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/2/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 1/4/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/1/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/17/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 1/3/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/2/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/29/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

NO LOCATION AID (Continued) **S103812407**

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/30/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/1/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UNKNOWN

D10 GREEN VALLEY OIL STATION #30646 **UST U003000299**
NNE 825 WASHINGTON ST **FINANCIAL ASSURANCE N/A**
< 1/8 STOUGHTON, MA 02072
0.024 mi.
125 ft. Site 3 of 6 in cluster D

Relative: Higher

Actual: 230 ft.

UST:
Facility ID: 12683

Facility:
Owner Id: 10180
Owner: GREEN VALLEY OIL LLC
Owner Address: 9 DEXTER RD
Owner City,St,Zip: EAST PROVIDENCE, RI 02914
Telephone: (800) 289-4388
Description: Gas Station
Fire Dept. ID: 21285
Date of Inspection: Not reported

Date Installed: 01/01/1975
Status Date: 09/24/1997
Tank ID: 1
Tank Status: Removed
Tank Useage: MV
Tank Material: Reinforced
Tank Contents: 1 Wall
Tank Leak Detection: Inventory Record-Keeping
Pipe Material: Steel
Pipe Container: Suction: Check Valve @ Tank
Pipe Leak Detection: Suction: Check Valve at Tank
Serial Number: Not reported
Aboveground: No
Capacity: 8000
Contents: Gasoline

GREEN VALLEY OIL STATION #30646 (Continued) **U003000299**

Date Installed:	01/01/1975
Status Date:	09/24/1997
Tank ID:	2
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	1 Wall
Tank Leak Detection:	Inventory Record-Keeping
Pipe Material:	Steel
Pipe Container:	Suction: Check Valve @ Tank
Pipe Leak Detection:	Suction: Check Valve at Tank
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000
Contents:	Gasoline

Date Installed:	01/01/1971
Status Date:	09/24/1997
Tank ID:	3
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Steel
Tank Contents:	1 Wall
Tank Leak Detection:	Inventory Record-Keeping
Pipe Material:	Steel
Pipe Container:	Suction: Check Valve @ Tank
Pipe Leak Detection:	Suction: Check Valve at Tank
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000
Contents:	Diesel

Date Installed:	01/01/1971
Status Date:	Not reported
Tank ID:	4
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Steel
Tank Contents:	1 Wall
Tank Leak Detection:	Inventory Record-Keeping
Pipe Material:	Steel
Pipe Container:	Suction: Check Valve @ Tank
Pipe Leak Detection:	Suction: Check Valve at Tank
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000
Contents:	Gasoline

Date Installed:	01/01/1971
Status Date:	09/24/1997
Tank ID:	5
Tank Status:	**Removed**
Tank Useage:	Other
Tank Material:	Steel

GREEN VALLEY OIL STATION #30646 (Continued) **U003000299**

Tank Contents:	1 Wall
Tank Leak Detection:	Inventory Record-Keeping
Pipe Material:	Steel
Pipe Container:	1 Wall
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	550
Contents:	Waste Oil

Date Installed:	01/01/1971
Status Date:	09/24/1997
Tank ID:	6
Tank Status:	**Removed**
Tank Useage:	Other
Tank Material:	Steel
Tank Contents:	1 Wall
Tank Leak Detection:	Inventory Record-Keeping
Pipe Material:	Steel
Pipe Container:	1 Wall
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	550
Contents:	Other

Date Installed:	10/09/1997
Status Date:	07/21/2010
Tank ID:	7
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Interstitial Space Monitor
Serial Number:	Not reported
Aboveground:	No
Capacity:	12000
Contents:	Gasoline

Date Installed:	10/09/1997
Status Date:	07/21/2010
Tank ID:	8
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Interstitial Space Monitor
Serial Number:	Split 5K/6K

GREEN VALLEY OIL STATION #30646 (Continued) **U003000299**

Aboveground: No
Capacity: 11000
Contents: Gasoline/D

MA FINANCIAL ASSURANCE 2:
Facility Id: 12683
Description: Gas Station
Work Phone: (800) 289-4388

D11 **GETTY SERVICE STATION** **SHWS S102618679**
NNE **825 WASHINGTON ST** **LUST N/A**
< 1/8 **STOUGHTON, MA 02072** **RELEASE**
0.024 mi.
125 ft. **Site 4 of 6 in cluster D**

Relative: Higher

Actual: 230 ft.

SHWS:
Facility ID: 4-0012937
Release Town: STOUGHTON
Notification Date: 4/4/1997
Category: TWO HR
Associated ID: 4-0012937
Current Status: **Tier II, A site/release receiving a total NRS score of less than 350, unless the site meets any of the Tier 1 Inclusionary Criteria (see above). Permits are not required at Tier 2 sites/releases and response actions may be performed under the supervision of an LSP without prior DEP approval. All pre-1993 transition sites that have accepted waivers are categorically Tier 2 sites.**
Status Date: 4/8/1998
Phase: PHASE V
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 8/22/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/22/1997
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 1/10/2000
Response Action Outcome: Not reported

Action Type: RLFA

GETTY SERVICE STATION (Continued) **S102618679**

Action Stat: FLDRUN
Action Date: 12/7/2011
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 5/20/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/18/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/2/2009
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/21/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/28/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/11/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/18/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Level I - Technical Screen Audit
Action Date: 12/21/2005
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 9/14/2000

GETTY SERVICE STATION (Continued) **S102618679**

Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/28/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/25/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 10/1/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/16/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/18/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/30/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 7/12/2011
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/4/1997
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/5/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/8/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 5/1/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/8/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/11/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/16/2009
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/7/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/21/2000
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/30/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 5/1/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 7/12/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT

GETTY SERVICE STATION (Continued) **S102618679**

Action Date: 11/4/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/18/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 11/4/2008
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/14/1997
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/20/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 9/27/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/2/2009
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 6/18/1999
Response Action Outcome: Not reported

LUST:

Facility:
Facility ID: 4-0013560
Current Status: **Response Action Outcome Not Required**
Status Date: 4/8/1998
Source Type: UST
Release Town: STOUGHTON

GETTY SERVICE STATION (Continued) **S102618679**

Notification Date: 12/17/1997
Category: 72 HR
Associated ID: 4-0012937
Phase: PHASE V
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: 12 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Action:
Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/27/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 4/20/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 12/17/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 3/8/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/5/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/3/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action

GETTY SERVICE STATION (Continued) **S102618679**

Action Stat: Status or Interim Report Received
Action Date: 10/6/1999
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/8/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 10/20/2005
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/29/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/27/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/31/1997
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/21/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998

GETTY SERVICE STATION (Continued) **S102618679**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/28/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/11/2006
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/9/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 5/20/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/14/1998
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 6/18/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/7/2001
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/11/2006
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/12/1999
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/17/1997
Response Action Outcome: Not reported

Facility:
Facility ID: 4-0013682
Current Status: Response Action Outcome Not Required
Status Date: 4/8/1998
Source Type: UST
Release Town: STOUGHTON
Notification Date: 2/12/1998
Category: 120 DY
Associated ID: 4-0012937
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: BENZO(A)ANTHRACENE
Quantity: 27 parts per million
Chemical: BENZO(A)PYRENE
Quantity: 27 parts per million
Chemical: BENZO(B)FLUORANTHENE
Quantity: 1.87 parts per million
Chemical: EPH
Quantity: 590 parts per million
Chemical: INDENO
Quantity: 27 parts per million
Chemical: NAPHTHALENE
Quantity: 34.2 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: UST

Action:
Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/5/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/8/1998
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 6/18/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/7/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/27/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/19/1998
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/4/2010
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/28/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/3/2001
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2002
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site

GETTY SERVICE STATION (Continued) **S102618679**

Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 5/20/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/12/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/18/2010
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 9/25/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/28/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/6/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/14/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Release:
- Facility ID: 4-0012937
- Primary ID: 4-0012937
- Official City: STOUGHTON
- Notification: 4/4/1997
- Category: TWO HR
- Current Status: TIERII
- Status Date: 4/8/1998
- Phase: PHASE V
- Response Action Outcome: -
- Oil / Haz Material Type: Oil

Action:
- Action Type: Immediate Response Action
- Action Stat: Imminent Hazard Evaluation Received
- Action Date: 8/22/1997
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Status or Interim Report Received
- Action Date: 8/22/1997
- Response Action Outcome: Not reported

- Action Type: Phase 2
- Action Stat: Scope of Work Received
- Action Date: 1/10/2000
- Response Action Outcome: Not reported

- Action Type: RLFA
- Action Stat: FLDRUN
- Action Date: 12/7/2011
- Response Action Outcome: Not reported

- Action Type: Tier Classification
- Action Stat: Tier 2 Extension
- Action Date: 5/20/2004
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Completion Statement Received
- Action Date: 2/12/1998
- Response Action Outcome: Not reported

- Action Type: Phase 5
- Action Stat: RMRINT
- Action Date: 10/18/2007
- Response Action Outcome: Not reported

- Action Type: Phase 5
- Action Stat: Remedy Operation Status Report Received
- Action Date: 4/2/2009
- Response Action Outcome: Not reported

- Action Type: Tier Classification
- Action Stat: Tier 2 Extension
- Action Date: 4/22/2003
- Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/21/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/28/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/11/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/18/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Level I - Technical Screen Audit
Action Date: 12/21/2005
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 9/14/2000
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/28/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/25/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 10/1/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/16/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/18/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received

GETTY SERVICE STATION (Continued) **S102618679**

Action Date: 4/30/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 7/12/2011
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/4/1997
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/5/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/8/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 5/1/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/8/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/11/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/16/2009
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/7/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/21/2000
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/30/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 5/1/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 7/12/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 11/4/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/18/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 11/4/2008
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/14/1997
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.

GETTY SERVICE STATION (Continued) **S102618679**

Action Date: 5/20/1997
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 9/27/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/2/2009
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 6/18/1999
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Facility ID: 4-0013560
Primary ID: 4-0012937
Official City: STOUGHTON
Notification: 12/17/1997
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 4/8/1998
Phase: PHASE V
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/27/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 4/20/2006

GETTY SERVICE STATION (Continued) **S102618679**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 12/17/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 3/8/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/5/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/3/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/6/1999
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/8/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 10/20/2005
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/29/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/27/2000
Response Action Outcome: Not reported

GETTY SERVICE STATION (Continued) **S102618679**

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/31/1997
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/21/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 4/22/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/28/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 10/11/2006
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/9/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 5/20/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received

GETTY SERVICE STATION (Continued) **S102618679**

Action Date: 4/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/14/1998
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 6/18/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/7/2001
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 10/11/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/12/1999
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/17/1997
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: 12 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Facility ID: 4-0013682
Primary ID: 4-0012937
Official City: STOUGHTON
Notification: 2/12/1998
Category: 120 DY
Current Status: Response Action Outcome Not Required
Status Date: 4/8/1998
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

GETTY SERVICE STATION (Continued) **S102618679**

Action:

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/5/2004
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	RTN Linked to TCLASS Via Tier Classification Submittal
Action Date:	4/8/1998
Response Action Outcome:	Not reported

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	2/12/1998
Response Action Outcome:	Not reported

Action Type:	Release Abatement Measure
Action Stat:	Completion Statement Received
Action Date:	6/18/1999
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/7/2001
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	9/27/2000
Response Action Outcome:	Not reported

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	6/19/1998
Response Action Outcome:	Not reported

Action Type:	Release Abatement Measure
Action Stat:	Completion Statement Received
Action Date:	10/4/2010
Response Action Outcome:	Not reported

Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	8/28/2002
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	Tier 2 Extension
Action Date:	4/22/2003
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	10/3/2001
Response Action Outcome:	Not reported

Action Type:	RNF

GETTY SERVICE STATION (Continued) **S102618679**

Action Stat: Reportable Release under MGL 21E
Action Date: 2/12/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2002
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 5/20/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/12/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/18/2010
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 9/25/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/16/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/28/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/6/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/14/1998

GETTY SERVICE STATION (Continued) **S102618679**

Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/8/1998
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/8/1998
Response Action Outcome: Not reported

Chemical:
Chemical: BENZO(A)ANTHRACENE
Quantity: 27 parts per million
Chemical: BENZO(A)PYRENE
Quantity: 27 parts per million
Chemical: BENZO(B)FLUORANTHENE
Quantity: 1.87 parts per million
Chemical: EPH
Quantity: 590 parts per million
Chemical: INDENO
Quantity: 27 parts per million
Chemical: NAPHTHALENE
Quantity: 34.2 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: UST

D12
NNE
< 1/8
0.025 mi.
130 ft.

Relative: Higher

Actual: 230 ft.

GETTY PETROLEUM **MANIFEST** **S109772392**
825 WASHINGTON ST. **N/A**
STOUSHTON, MA

Site 5 of 6 in cluster D

CT MANIFEST:

Waste:
Manifest No: CTF0581364
Waste Occurence: 1
UNNA: 1993
Hazard Class: 3
US Dot Description: FLAMMABLE LIQUID N.O.S.
No of Containers: 001
Container Type: TT
Quantity: 75
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: CTF0581364
Waste Occurence: 1

GETTY PETROLEUM (Continued) **S109772392**

EPA Waste Code: D001
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1997
Manifest ID: CTF0581364
TSDF EPA ID: CTD021816889
TSDF Name: UNITED OIL RECOVERY INC./UIS DBA ADVANCED LIQ. REC
TSDF Address: 136 GRACEY AVE.
TSDF City,St,Zip: MERIDEN, CT 06451
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: Not reported
Transporter EPA ID: NYD006801245
Transporter Name: TYREE ORGANIZATION
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
Trans 2 Address: Not reported
Trans 2 City,St,Zip: CT
Trans 2 Country: USA
Trans 2 Phone: Not reported
EPA ID: MP6173440448
Generator Phone: Not reported
Generator Mailing Addr: 825 WASHINGTON ST.
Generator Mailing Town: STOUSHTON
Generator Mailing State: MA
Generator Mailing Zip: Not reported
Generator Mailing Country: USA
Special Handling: Not reported
Discrepancies: Not reported
Date Shipped: 9/26/1997
Date Received: Not reported
Last modified date: 4/26/2004
Last modified by: IG
Comments: Not reported

A13 **MARKET** **SHWS** **S105810890**
NNW **31 PORTER ST** **RELEASE** **N/A**
< 1/8 **STOUGHTON, MA 02072** **LEAD**
0.025 mi.
132 ft. **Site 3 of 3 in cluster A**

Relative:
Higher

Actual:
232 ft.

SHWS:
Facility ID: 4-0017655
Release Town: STOUGHTON
Notification Date: 1/9/2003
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 3/14/2003
Phase: Not reported

MARKET (Continued) **S105810890**

Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material: Oil

Chemical:
Chemical: DIESEL FUEL
Quantity: 50 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: VEHICLE

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 3/14/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/17/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 3/14/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0017655
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/9/2003
Category: TWO HR
Current Status: Response Action Outcome

MARKET (Continued) **S105810890**

Status Date: 3/14/2003
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 3/14/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/9/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/17/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 3/14/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: DIESEL FUEL
Quantity: 50 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: VEHICLE

LEAD:
Community: Stoughton
Unit: Not reported
Inspector Name: Mark Selenkow
Inspector License Number: 1277

MARKET (Continued) **S105810890**

Activity Type:	INSPECT
Activity Date:	06/01/2000
Start Work Date:	12/26/2001
Activity Descriptions:	Comprehensive Initial Inspection
Outcomes:	Hazards Found
Community:	Stoughton
Unit:	Not reported
Inspector Name:	Francis Bifano
Inspector License Number:	3240
Activity Type:	INSPECT
Activity Date:	03/05/2002
Start Work Date:	12/26/2001
Activity Descriptions:	Final Deleading Reinspection
Outcomes:	Passed
Community:	Stoughton
Unit:	Not reported
Inspector Name:	Francis Bifano
Inspector License Number:	3240
Activity Type:	COMPLIANCE
Activity Date:	03/05/2002
Start Work Date:	12/26/2001
Activity Descriptions:	Letter of Full Deleading Comp
Outcomes:	Issued

C14 **RUGGIERO & SON INC** **UST** **1000235211**
SSE **931 WASHINGTON ST** **FINANCIAL ASSURANCE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.027 mi.
140 ft. **Site 2 of 7 in cluster C**

Relative:
Higher

Actual:
227 ft.

UST:

Facility ID:	12635

Facility:

Owner Id:	5883
Owner:	RUGGIERO & SON INC
Owner Address:	931 WASHINGTON ST
Owner City,St,Zip:	STOUGHTON, MA 02072
Telephone:	Not reported
Description:	Other
Fire Dept. ID:	21285
Date of Inspection:	Not reported
Date Installed:	03/25/1947
Status Date:	Not reported
Tank ID:	1
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported

RUGGIERO & SON INC (Continued) **1000235211**

Aboveground: No
Capacity: 3000
Contents: Gasoline

MA FINANCIAL ASSURANCE 2:
Facility Id: 12635
Description: Other
Work Phone: Not reported

C15 **RUGGIERO & SON INC** **RCRA-CESQG 1004715776**
SSE **931 WASHINGTON ST** **FINDS MAD051775047**
< 1/8 **STOUGHTON, MA 02072** **MANIFEST**
0.027 mi.
140 ft. **Site 3 of 7 in cluster C**

Relative: Higher

Actual: 227 ft.

RCRA-CESQG:
Date form received by agency: 12/16/1986
Facility name: RUGGIERO & SON INC
Facility address: 931 WASHINGTON ST
STOUGHTON, MA 02072
EPA ID: MAD051775047
Contact: GUIDO-J RUGGIERO
Contact address: 931 WASHINGTON ST
STOUGHTON, MA 03072
Contact country: US
Contact telephone: (617) 344-0648
Contact email: Not reported
EPA Region: 01
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: GUIDO J & MILDRED J RUGGIERO
Owner/operator address: 931 WASHINGTON ST
STOUGHTON, MA 03072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Owner/operator name: RUGGIERO & SON INC
Owner/operator address: 931 WASHINGTON ST

RUGGIERO & SON INC (Continued) **1004715776**

STOUGHTON, MA 03072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/08/1991
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003435408

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

MANIFEST:
GEN Cert Date: 9/5/2007
Transporter Recpt Date: 9/5/2007

RUGGIERO & SON INC (Continued) **1004715776**

Number Of Containers: 1
Container Type: G
Waste Code1: D001, ,
Waste Code2: D039
Waste Code3: Not reported
Comment: Not reported
Fee Exempt Code: 4
TSDF Name: United Oil Recovery Inc
TSDF ID: RID084802842
TSDF Date: 9/6/2007
Date Imported: 9/5/2003 2:39:16 PM
Transporter 2 Name: Not reported
Transporter 2 ID: CTD021816889
Manifest Docket Number: 000084543UIS
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 11/14/2007
Transporter Recpt Date: 11/14/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 11/15/2007
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: 000059120UIS
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 9/5/2007
Transporter Recpt Date: 9/5/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 9/6/2007
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0249004
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 12/22/2004
Transporter Recpt Date: 12/22/2004
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 12/22/2004
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0249004
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS

RUGGIERO & SON INC (Continued) **1004715776**

Quantity:	5
WT/Vol Units:	G
Item Number:	4151
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	12/22/2004
Transporter Recpt Date:	12/22/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	12/22/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0234995
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	10/12/2004
Transporter Recpt Date:	10/12/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	10/12/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	000023672UIS
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	2/7/2007
Transporter Recpt Date:	2/7/2007
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	2/7/2007
EPA ID:	MAD051775047
Transporter 2 ID:	CTD021816889
Manifest Docket Number:	RIG0235661
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	8/4/2004
Transporter Recpt Date:	8/4/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	8/4/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0238663
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	8

RUGGIERO & SON INC (Continued) **1004715776**

WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	5/28/2004
Transporter Recpt Date:	5/28/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	5/28/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0238663
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	8
WT/Vol Units:	G
Item Number:	18246
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	5/28/2004
Transporter Recpt Date:	5/28/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	5/28/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0226662
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	7
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	3/17/2004
Transporter Recpt Date:	3/17/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	3/17/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0226662
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	7
WT/Vol Units:	G
Item Number:	15058
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	3/17/2004
Transporter Recpt Date:	3/17/2004
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	3/17/2004
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0146588
Waste Description:	NAP PET
Quantity:	5
WT/Vol Units:	G

RUGGIERO & SON INC (Continued) **1004715776**

Item Number:	1
Transporter Name:	CYCLE SOLVE
Transporter EPA ID:	RID982194987
GEN Cert Date:	7/7/1999
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	000089131GBF
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	9/20/2006
Transporter Recpt Date:	9/20/2006
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	9/20/2006
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0292445
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	7/12/2006
Transporter Recpt Date:	7/12/2006
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	7/12/2006
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0276401
Waste Description:	RQ WASTE PETROLEUM DISTILLATES NOS
Quantity:	5
WT/Vol Units:	G
Item Number:	a
Transporter Name:	UNITED INDUSTRIAL SERVICES
Transporter EPA ID:	CTD021816889
GEN Cert Date:	5/3/2006
Transporter Recpt Date:	5/3/2006
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	5/3/2006
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0228988
Waste Description:	RQ WASTE PETROLEUM DISTILLATE NOS
Quantity:	6
WT/Vol Units:	G
Item Number:	a

RUGGIERO & SON INC (Continued) **1004715776**

Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 1/8/2004
Transporter Recpt Date: 1/8/2004
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 1/8/2004
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0224966
Waste Description: WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 8/14/2003
Transporter Recpt Date: 8/14/2003
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 8/14/2003
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0228483
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS
Quantity: 8
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 10/23/2003
Transporter Recpt Date: 10/23/2003
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 10/23/2003
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0277279
Waste Description: RQ WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 2/22/2006
Transporter Recpt Date: 2/22/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 2/22/2006
EPA ID: MAD051775047
Transporter 2 ID: Not reported

Manifest Docket Number: RIG0216978
Waste Description: WASTE PETROLEUM DISTILLATES NOS
Quantity: 5
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES

RUGGIERO & SON INC (Continued) **1004715776**

Transporter EPA ID:	CTD021816889
GEN Cert Date:	6/2/2003
Transporter Recpt Date:	6/2/2003
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	6/2/2003
EPA ID:	MAD051775047
Transporter 2 ID:	Not reported

Click this hyperlink while viewing on your computer to access
13 additional RI MANIFEST: record(s) in the EDR Site Report.

16
East
< 1/8
0.027 mi.
145 ft.

NEW ENGLAND TELE
862 WASHINGTON ST
STOUGHTON, MA 02072

RCRA-NonGen **1000690455**
FINDS **MAD000639161**
UST
FINANCIAL ASSURANCE

Relative:
Higher

Actual:
228 ft.

RCRA-NonGen:

Date form received by agency:	10/06/1980
Facility name:	NEW ENGLAND TELE
Facility address:	862 WASHINGTON ST STOUGHTON, MA 02072
EPA ID:	MAD000639161
Mailing address:	99 HIGH ST BOSTON, MA 02110
Contact:	ALEX MACARTHUR
Contact address:	99 HIGH ST BOSTON, MA 02110
Contact country:	US
Contact telephone:	(617) 743-5904
Contact email:	Not reported
EPA Region:	01
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	NEW ENGLAND TELE
Owner/operator address:	99 HIGH ST BOSTON, MA 02110
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	10/16/2004
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No

NEW ENGLAND TELE (Continued) **1000690455**

Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110003414680

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

UST:
Facility ID: 12647

Facility:
Owner Id: 9144
Owner: VERIZON MASSACHUSETTS
Owner Address: P.O. BOX 6360
Owner City,St,Zip: SYRACUSE, NY 13217
Telephone: (413) 432-8486
Description: Utilities
Fire Dept. ID: 21285
Date of Inspection: 05/20/2009

Date Installed: 05/07/1976
Status Date: 10/08/1996
Tank ID: 1
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 1000
Contents: Diesel

Date Installed: 05/07/1976
Status Date: 10/22/1996

NEW ENGLAND TELE (Continued) **1000690455**

Tank ID:	2
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	3000
Contents:	Fuel Oil

Date Installed:	10/12/1996
Status Date:	Not reported
Tank ID:	3
Tank Status:	**In Use**
Tank Useage:	Other
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Steel
Pipe Container:	2 Walls
Pipe Leak Detection:	Suction: Check Valve at Tank w/ Interstitial Monitor
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000
Contents:	Diesel

MA FINANCIAL ASSURANCE 2:

Facility Id:	12647
Description:	Utilities
Work Phone:	(413) 432-8486

C17 **PEARL CLEANERS INC** **DRYCLEANERS** **S106488776**
SSE **945 WASHINGTON ST** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.029 mi.
153 ft. **Site 4 of 7 in cluster C**

Relative:
Lower

Actual:
226 ft.

DRYCLEANERS:

Facility ID:	293889
DEP Region Code:	SE
Contact:	Not reported
Classification Type:	Active use of Perc

C18 **INSURANCE AUTO BODY INC** **RCRA-NonGen** **1000426789**
SSE **950 WASHINGTON ST** **FINDS** **MAD095870143**
< 1/8 **STOUGHTON, MA 02072**
0.033 mi.
173 ft. **Site 5 of 7 in cluster C**

Relative:
Lower

Actual:
226 ft.

RCRA-NonGen:

Date form received by agency:	11/20/1984
Facility name:	INSURANCE AUTO BODY INC
Facility address:	950 WASHINGTON ST STOUGHTON, MA 02072
EPA ID:	MAD095870143
Contact:	NORTON ARONSON
Contact address:	950 WASHINGTON ST STOUGHTON, MA 02072
Contact country:	US
Contact telephone:	(617) 344-7807
Contact email:	Not reported
EPA Region:	01
Land type:	Private
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Violation Status:	No violations found

Evaluation Action Summary:

Evaluation date:	04/17/1986
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

INSURANCE AUTO BODY INC (Continued) **1000426789**

FINDS:

Registry ID: 110003448519

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

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C19 **TOM'S AUTO BODY** **MANIFEST** **S109766425**
SSE **950 WASHINGTON ST.** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.033 mi.
173 ft. **Site 6 of 7 in cluster C**

Relative: Lower

Actual: 226 ft.

CT MANIFEST:

Waste:

Manifest No:	MAG098031
Waste Occurence:	1
UNNA:	1263
Hazard Class:	FLAMMABLE
US Dot Description:	WASTE PAINT RELATED MATERIALS, LIQUID
No of Containers:	001
Container Type:	TT
Quantity:	55
Weight/Volume:	G
Additional Description:	Y
Handling Code:	T01
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAG098031
Waste Occurence:	1
EPA Waste Code:	D035
Recycled Waste?:	F
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	1992
Manifest ID:	MAG098031
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address:	130 FREIGHT STREET
TSDF City,St,Zip:	WATERBURY, CT 06702
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	6/2/1992

TOM'S AUTO BODY (Continued) **S109766425**

Transporter EPA ID:	MAD980672125
Transporter Name:	AUTO BODY SOLVENT RECOVERY CORP.
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAV000017134
Generator Phone:	6173414040
Generator Mailing Addr:	950 WASHINGTON ST.
Generator Mailing Town:	STOUGHTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	6/2/1992
Date Received:	6/5/1992
Last modified date:	4/27/2004
Last modified by:	IG
Comments:	Not reported

C20 **CARL'S AUTO BODY** **MANIFEST** **S109759578**
SSE **950 WASHINGTON ST** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.033 mi.
173 ft. **Site 7 of 7 in cluster C**

Relative:
Lower

Actual:
226 ft.

CT MANIFEST:

Waste:

Manifest No:	MAC435220
Waste Occurence:	1
UNNA:	1993
Hazard Class:	FLAMMABLE
US Dot Description:	WASTE FLAMMABLE LIQUID, NOS
No of Containers:	001
Container Type:	TT
Quantity:	45
Weight/Volume:	G
Additional Description:	Y
Handling Code:	T01
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAC435220
Waste Occurence:	1
EPA Waste Code:	D001
Recycled Waste?:	F
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

CARL'S AUTO BODY (Continued) **S109759578**

Detail:

Year:	1989
Manifest ID:	MAC435220
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address:	130 FREIGHT STREET
TSDF City,St,Zip:	WATERBURY, CT 06702
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	12/5/1989
Transporter EPA ID:	ILD099202681
Transporter Name:	CHEMICAL WASTE MANAGEMENT, INC. (TRANSPORTER)
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAD095870143
Generator Phone:	6173447807
Generator Mailing Addr:	950 WASHINGTON STREET
Generator Mailing Town:	STOUGHTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	12/5/1989
Date Received:	12/8/1989
Last modified date:	4/27/2004
Last modified by:	IG
Comments:	Not reported

D21 **NO LOCATION AID** **LAST** **S102087817**
NNE **21 PARK AVE** **RELEASE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.045 mi.
239 ft. **Site 6 of 6 in cluster D**

Relative:
Higher

Actual:
232 ft.

LAST:

Facility ID:	4-0010179
Source Type:	AST
Release Town:	STOUGHTON
Notification Date:	12/28/1993
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	12/30/1999
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

NO LOCATION AID (Continued) **S102087817**

Chemical:
Chemical: #2 FUEL OIL
Quantity: 15 gallons

Location:
Location Type: RESIDNTIAL

Source:
Source Type: AST

Action:
Action Type: FTLI
Action Stat: APPREC
Action Date: 12/31/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Not Required - Fee Credited-FMCRA Use Only
Action Date: 7/9/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: FTLI
Action Stat: Action Status or AUL Terminated
Action Date: 12/30/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/31/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 1/3/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/28/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: FTLI
Action Stat: APPACC
Action Date: 1/5/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/27/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S102087817**

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 12/30/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/3/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 7/6/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0010179
Primary ID: Not reported
Official City: STOUGHTON
Notification: 12/28/1993
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 12/30/1999
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: FTLI
Action Stat: APPREC
Action Date: 12/31/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Not Required - Fee Credited-FMCRA Use Only
Action Date: 7/9/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S102087817**

Action Type: FTLI
Action Stat: Action Status or AUL Terminated
Action Date: 12/30/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/31/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 1/3/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/28/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: FTLI
Action Stat: APPACC
Action Date: 1/5/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/27/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 12/30/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/3/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 2/7/1994

NO LOCATION AID (Continued) **S102087817**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 7/6/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: #2 FUEL OIL
Quantity: 15 gallons

Location:
Location Type: RESIDNTIAL

Source:
Source Type: AST

E22 **TOWN WASTE OIL RECLAMATION** **LAST** **S109146625**
NNW **26 ROSE ST** **RELEASE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.047 mi.
248 ft. **Site 1 of 3 in cluster E**

Relative:
Higher

Actual:
233 ft.

LAST:
Facility ID: 4-0020125
Source Type: AST
Release Town: STOUGHTON
Notification Date: 10/23/2006
Category: TWO HR
Associated ID: Not reported
Current Status: **Tier 1D, a release where the responsible party fails to provide a required submittal to DEP by a specified deadline.**
Status Date: 10/30/2007
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: WASTE OIL
Quantity: 40 gallons

Location:
Location Type: MUNICIPAL

Source:
Source Type: AST

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/23/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 10/23/2006
Response Action Outcome: Not reported

TOWN WASTE OIL RECLAMATION (Continued) **S109146625**

Release:
- Facility ID: 4-0020125
- Primary ID: Not reported
- Official City: STOUGHTON
- Notification: 10/23/2006
- Category: TWO HR
- Current Status: TIER1D
- Status Date: 10/30/2007
- Phase: Not reported
- Response Action Outcome: -
- Oil / Haz Material Type: Oil

Action:
- Action Type: Release Disposition
- Action Stat: Reportable Release under MGL 21E
- Action Date: 10/23/2006
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Oral Approval of Plan or Action
- Action Date: 10/23/2006
- Response Action Outcome: Not reported

Chemical:
- Chemical: WASTE OIL
- Quantity: 40 gallons

Location:
- Location Type: MUNICIPAL

Source:
- Source Type: AST

23
NNE
< 1/8
0.048 mi.
255 ft.

TRUCK DEPOT-REPAIR AREA **LAST** **S102967657**
793 WASHINGTON ST **RELEASE** **N/A**
STOUGHTON, MA 02072

Relative: Higher

Actual: 233 ft.

LAST:
- Facility ID: 4-0013478
- Source Type: AST
- Release Town: STOUGHTON
- Notification Date: 11/10/1997
- Category: TWO HR
- Associated ID: Not reported
- **Current Status:** **Response Action Outcome**
- Status Date: 6/2/1998
- Phase: Not reported
- Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
- Oil Or Haz Material: Oil

Chemical:
- Chemical: WASTE OIL
- Quantity: 150 gallons

Location:
- Location Type: INDUSTRIAL

TRUCK DEPOT-REPAIR AREA (Continued) **S102967657**

Source:
Source Type: AST

Action:
Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 6/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 6/4/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/25/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/10/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/10/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0013478
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/10/1997
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 6/2/1998
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Completion Statement Received

TRUCK DEPOT-REPAIR AREA (Continued) **S102967657**

Action Date: 6/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 6/4/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/25/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/10/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 11/10/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: WASTE OIL
Quantity: 150 gallons

Location:
Location Type: INDUSTRIAL

Source:
Source Type: AST

24
NNW
< 1/8
0.051 mi.
267 ft.

STOUGHTON GAS AND ELECTRIC CO
SCHOOL STREET
STOUGHTON, MA 2072

Manufactured Gas Plants **1008408490**
N/A

Relative:
Higher

Actual:
233 ft.

Manufactured Gas Plants:
No additional information available

E25
NNW
< 1/8
0.054 mi.
284 ft.

DAVID O'NEIL
36 ROSE STREET
STONINGTON, MA 02072

Site 2 of 3 in cluster E

MANIFEST **S109763925**
N/A

Relative:
Higher

Actual:
234 ft.

CT MANIFEST:

Waste:

Manifest No:	MAC726759
Waste Occurence:	1
UNNA:	9189
Hazard Class:	ORM-E
US Dot Description:	HAZARDOUS WASTE SOLIDS, NOS
No of Containers:	002
Container Type:	DM
Quantity:	1000
Weight/Volume:	P
Additional Description:	Y
Handling Code:	S01
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAC726759
Waste Occurence:	1
EPA Waste Code:	D018
Recycled Waste?:	F
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	1991
Manifest ID:	MAC726759
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address:	130 FREIGHT STREET
TSDF City,St,Zip:	WATERBURY, CT 06702
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	3/26/1991
Transporter EPA ID:	MAD082303777
Transporter Name:	CYN OIL CORPORATION,
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAP000057852
Generator Phone:	5089978697
Generator Mailing Addr:	36 ROSE STREET
Generator Mailing Town:	STONINGTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA

DAVID O'NEIL (Continued) **S109763925**

Special Handling:	Yes
Discrepancies:	No
Date Shipped:	3/26/1991
Date Received:	3/29/1991
Last modified date:	4/27/2004
Last modified by:	IG
Comments:	Not reported

E26 **CORNER SCHOOL** **SHWS** **1000520019**
NNW **49 ROSE ST** **LUST** **N/A**
< 1/8 **STOUGHTON, MA 02072** **RELEASE**
0.061 mi. **INST CONTROL**
324 ft. **Site 3 of 3 in cluster E**

Relative:
Higher

Actual:
235 ft.

SHWS:

Facility ID:	4-0010574
Release Town:	STOUGHTON
Notification Date:	6/24/1994
Category:	72 HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	9/30/1994
Phase:	Not reported
Response Action Outcome:	A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	#4 FUEL OIL
Quantity:	Not reported
Chemical:	#6 FUEL OIL
Quantity:	Not reported

Location:

Location Type:	INDUSTRIAL

Source:

Source Type:	FUELTANK
Source Type:	PIPE
Source Type:	UST

Action:

Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	9/30/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Action Type:	An activity type that is related to an Audit
Action Stat:	NOA
Action Date:	8/6/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Action Type:	Activity and Use Limitation
Action Stat:	Amendment Received or Issued

CORNER SCHOOL (Continued) **1000520019**

Action Date: 5/14/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 9/19/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RFI
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RTCLET
Action Date: 10/1/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 7/5/1994

CORNER SCHOOL (Continued) **1000520019**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 9/21/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 7/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/24/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 9/8/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/30/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

CORNER SCHOOL (Continued) **1000520019**

reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

LUST:

Facility:
Facility ID: 4-0010574
Current Status: **Response Action Outcome**
Status Date: 9/30/1994
Source Type: UST
Release Town: STOUGHTON
Notification Date: 6/24/1994
Category: 72 HR
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Oil Or Haz Material: Oil

Chemical:
Chemical: #4 FUEL OIL
Quantity: Not reported
Chemical: #6 FUEL OIL
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: FUELTANK
Source Type: PIPE
Source Type: UST

Action:
Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 9/30/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 8/6/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Amendment Received or Issued

CORNER SCHOOL (Continued) **1000520019**

Action Date: 5/14/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 9/19/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RFI
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RTCLET
Action Date: 10/1/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 7/5/1994

CORNER SCHOOL (Continued) **1000520019**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 9/21/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 7/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/24/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 9/8/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/30/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

CORNER SCHOOL (Continued) **1000520019**

reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Release:
Facility ID: 4-0010574
Primary ID: Not reported
Official City: STOUGHTON
Notification: 6/24/1994
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 9/30/1994
Phase: Not reported
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 9/30/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 8/6/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Amendment Received or Issued
Action Date: 5/14/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/5/1994

CORNER SCHOOL (Continued) **1000520019**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 9/19/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RFI
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: RTCLET
Action Date: 10/1/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 7/5/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 9/21/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 7/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

CORNER SCHOOL (Continued) **1000520019**

reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Activity and Use Limitation
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/24/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 9/8/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 2/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/30/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 5/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 2/15/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Chemical:
Chemical: #4 FUEL OIL
Quantity: Not reported
Chemical: #6 FUEL OIL
Quantity: Not reported

CORNER SCHOOL (Continued) **1000520019**

Location:
Location Type: INDUSTRIAL

Source:
Source Type: FUELTANK
Source Type: PIPE
Source Type: UST

INST CONTROL:
Release Tracking Number: 4-0010574
Action Type: AUL
Action Stat: ACTAUD
Action Date: 2/15/2001
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

Release Tracking Number: 4-0010574
Action Type: AUL
Action Stat: AMEND
Action Date: 5/14/2002
Response Action Outcome: A3 - A permanent solution has been achieved. Contamination has not been reduced to background and an Activity and use Limitation (AUL) has been implemented.

F27 **STOUGHTON TOWN OF** **RCRA-CESQG 1004716008**
North **10 PEARL ST** **FINDS MAD075365692**
< 1/8 **STOUGHTON, MA 02072**
0.080 mi.
425 ft. **Site 1 of 2 in cluster F**

Relative:
Higher

Actual:
235 ft.

RCRA-CESQG:
Date form received by agency: 08/15/1980
Facility name: STOUGHTON TOWN OF
Facility address: 10 PEARL ST
STOUGHTON, MA 02072
EPA ID: MAD075365692
Contact: UNKNOWN UNKNOWN
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: (999) 999-9999
Contact email: Not reported
EPA Region: 01
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from

STOUGHTON TOWN OF (Continued) **1004716008**

the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	STOUGHTON TOWN OF
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	12/08/1991
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110003443550

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

F28
North
< 1/8
0.080 mi.
425 ft.

TOWN OF STOUGHTON/DPT.PUB.WKS
10 PEARL ST
STOUGHTON, MA 02072

Site 2 of 2 in cluster F

MANIFEST **S109759298**
N/A

Relative:
Higher

Actual:
235 ft.

CT MANIFEST:

Waste:

Manifest No:	CTF0734344
Waste Occurence:	1
UNNA:	1993
Hazard Class:	3
US Dot Description:	FLAMMABLE LIQUID N.O.S.
No of Containers:	001
Container Type:	TT
Quantity:	160
Weight/Volume:	G
Additional Description:	Not reported
Handling Code:	Not reported
Date Record Was Last Modified:	4/26/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	CTF0734344
Waste Occurence:	1
EPA Waste Code:	D001
Recycled Waste?:	F
Date Record Was Last Modified:	4/26/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	1998
Manifest ID:	CTF0734344
TSDF EPA ID:	CTD021816889
TSDF Name:	UNITED OIL RECOVERY INC./UIS DBA ADVANCED LIQ. REC
TSDF Address:	136 GRACEY AVE.
TSDF City,St,Zip:	MERIDEN, CT 06451
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	8/27/1998
Transporter EPA ID:	CTD021816889
Transporter Name:	UNITED OIL RECOVERY INC./UIS DBA ADVANCED LIQ. REC
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAD075365692
Generator Phone:	7813442112
Generator Mailing Addr:	950 CENTRAL ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA

TOWN OF STOUGHTON/DPT.PUB.WKS (Continued) **S109759298**

Special Handling:	Not reported
Discrepancies:	No
Date Shipped:	8/27/1998
Date Received:	8/27/1998
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

29
East
< 1/8
0.098 mi.
520 ft.

NO LOCATION AID **LUST** **S102967645**
35 WALNUT ST **RELEASE** **N/A**
STOUGHTON, MA 02072

Relative:
Higher

Actual:
232 ft.

LUST:

Facility:

Facility ID:	4-0013443
Current Status:	**Response Action Outcome**
Status Date:	2/27/1998
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	10/22/1997
Category:	72 HR
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	#2 FUEL OIL
Quantity:	100 parts per million

Location:

Location Type:	RESIDNTIAL

Source:

Source Type:	UST

Action:

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	10/22/1997
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	2/27/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	10/22/1997
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S102967645**

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/17/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0013443
Primary ID: Not reported
Official City: STOUGHTON
Notification: 10/22/1997
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 2/27/1998
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/22/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/27/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/22/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/17/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S102967645**

Chemical:
Chemical: #2 FUEL OIL
Quantity: 100 parts per million

Location:
Location Type: RESIDNTIAL

Source:
Source Type: UST

G30 **SUN MAINTANCES** **MANIFEST** **S109772313**
SSE **990 WASHINGTON ST.** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.103 mi.
542 ft. **Site 1 of 6 in cluster G**

Relative:
Lower

Actual:
216 ft.

CT MANIFEST:

Waste:
Manifest No: MAG135736
Waste Occurence: 1
UNNA: 1203
Hazard Class: 3
US Dot Description: WASTE GASOLINE & WATER MIXTURE
No of Containers: 001
Container Type: TT
Quantity: 75
Weight/Volume: G
Additional Description: Y
Handling Code: T50
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: MAG135736
Waste Occurence: 1
EPA Waste Code: D018
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1994
Manifest ID: MAG135736
TSDF EPA ID: CTD072138969
TSDF Name: ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address: 130 FREIGHT STREET
TSDF City,St,Zip: WATERBURY, CT 06725
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: 1/26/1994
Transporter EPA ID: MAD082303777
Transporter Name: CYN OIL CORPORATION,
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported

SUN MAINTANCES (Continued) **S109772313**

Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MP6172977107
Generator Phone:	6172977107
Generator Mailing Addr:	990 WASHINGTON ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	1/26/1994
Date Received:	2/1/1994
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

Waste:

Manifest No:	MAG159109
Waste Occurence:	1
UNNA:	1203
Hazard Class:	3
US Dot Description:	WASTE GASOLINE MIXTURE
No of Containers:	001
Container Type:	TT
Quantity:	91
Weight/Volume:	G
Additional Description:	Y
Handling Code:	T40
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAG159109
Waste Occurence:	1
EPA Waste Code:	D001
Recycled Waste?:	F
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	1993
Manifest ID:	MAG159109
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES
TSDF Address:	130 FREIGHT ST. WATERBURY
TSDF City,St,Zip:	CT 06725
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	1/31/1993
Transporter EPA ID:	MAD082303777
Transporter Name:	CYN OIL CORPORATION,
Transporter Country:	USA

SUN MAINTANCES (Continued) **S109772313**

Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MP6172977107
Generator Phone:	6172977107
Generator Mailing Addr:	990 WASHINGTON ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	1/31/1993
Date Received:	2/1/1994
Last modified date:	4/27/2004
Last modified by:	IG
Comments:	Not reported

G31 **SOUTH SHORE PETRO** **UST** **U001006999**
SSE **990 WASHINGTON ST** **FINANCIAL ASSURANCE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.103 mi.
542 ft. **Site 2 of 6 in cluster G**

Relative:
Lower

Actual:
216 ft.

UST:

Facility ID:	12678

Facility:

Owner Id:	10241
Owner:	SOUTH SHORE PETRO
Owner Address:	12 BRIGGS RD
Owner City,St,Zip:	LEXINGTON, MA 02420
Telephone:	(781) 771-8293
Description:	Gas Station
Fire Dept. ID:	21285
Date of Inspection:	04/21/2010

Date Installed:	04/18/1972
Status Date:	Not reported
Tank ID:	1
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000

SOUTH SHORE PETRO (Continued) **U001006999**

Contents: Gasoline

Date Installed: 04/18/1972
Status Date: Not reported
Tank ID: 2
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 4000
Contents: Gasoline

Date Installed: 04/18/1972
Status Date: Not reported
Tank ID: 3
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 2000
Contents: Gasoline

Date Installed: 04/18/1972
Status Date: Not reported
Tank ID: 4
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 5000
Contents: Gasoline

Date Installed: 10/14/1990
Status Date: 02/24/2005
Tank ID: 5

SOUTH SHORE PETRO (Continued) **U001006999**

Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

Date Installed:	10/14/1990
Status Date:	02/24/2005
Tank ID:	6
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

Date Installed:	10/14/1990
Status Date:	02/24/2005
Tank ID:	7
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Diesel

Date Installed:	09/01/2008
Status Date:	Not reported
Tank ID:	8
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Flexible

SOUTH SHORE PETRO (Continued) **U001006999**

Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	124027
Aboveground:	No
Capacity:	15000
Contents:	Gasoline

Date Installed:	09/01/2008
Status Date:	Not reported
Tank ID:	9
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Flexible
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	124023
Aboveground:	No
Capacity:	9000
Contents:	Gasoline/D

MA FINANCIAL ASSURANCE 2:

Facility Id:	12678
Description:	Gas Station
Work Phone:	(781) 771-8293

G32 **SUNOCO SERVICE STA** **RCRA-NonGen** **1000908568**
SSE **990 WASHINGTON ST** **FINDS** **MA5000001891**
< 1/8 **STOUGHTON, MA 02072**
0.103 mi.
542 ft. **Site 3 of 6 in cluster G**

Relative:
Lower

Actual:
216 ft.

RCRA-NonGen:

Date form received by agency:	08/28/2006
Facility name:	SUNOCO SERVICE STA
Facility address:	990 WASHINGTON ST STOUGHTON, MA 02072
EPA ID:	MA5000001891
Mailing address:	BRYAN J. GIRAN 1735 MARKET STREET 12TH FLOOR PHILADELPHIA, PA 191030000
Contact:	BRYAN GIRAN
Contact address:	1735 MARKET STREET 12TH FLOOR PHILADELPHIA, PA 191031699
Contact country:	US
Contact telephone:	(215) 977-6580
Contact email:	BJGIRAN@SUNOCOINC.COM
EPA Region:	01
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	SUNOCO INC
Owner/operator address:	1735 MARKET STREET 12TH FLOOR

SUNOCO SERVICE STA (Continued) **1000908568**

PHILADELPHIA, PA 19103
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 07/07/1994
Owner/Op end date: Not reported

Owner/operator name: SUN CO INC (R & M)
Owner/operator address: 1735 MARKET STREET 12TH FLOOR
PHILADELPHIA, PA 19103
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 07/07/1994
Facility name: SUNOCO SERVICE STA
Classification: Small Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110003370593

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

G33
SSE
< 1/8
0.103 mi.
542 ft.

GAS CONTAMINATED WATER
990 WASHINGTON ST
STOUGHTON, MA 02072

Site 4 of 6 in cluster G

LUST
SPILLS
RELEASE

S101020942
N/A

Relative:
Lower

Actual:
216 ft.

LUST:

Facility:

Facility ID:	4-0000265
Current Status:	**Response Action Outcome**
Status Date:	9/20/1994
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	1/15/1987
Category:	NONE
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Not reported

Chemical:

Chemical:	UNKNOWN
Quantity:	Not reported

Location:

Location Type:	FORMER
Location Type:	GASSTATION

Source:

Source Type:	UST

Action:

Action Type:	Phase 2
Action Stat:	Tier 1A or Priority Submittal Approved
Action Date:	12/17/1987
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	3/11/1987
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	1/15/1987
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	9/20/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Facility:

Facility ID:	4-0018650

GAS CONTAMINATED WATER (Continued) **S101020942**

Current Status:	**Response Action Outcome**
Status Date:	8/25/2005
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	8/31/2004
Category:	72 HR
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported

Location:

Location Type:	COMMERCIAL
Location Type:	RESIDNTIAL

Source:

Source Type:	UST

Action:

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	8/31/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	10/25/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	IRA Assessment Only
Action Date:	8/31/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	12/22/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	10/25/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	8/31/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

GAS CONTAMINATED WATER (Continued) **S101020942**

Action Type:	Immediate Response Action
Action Stat:	Level I - Technical Screen Audit
Action Date:	11/4/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	8/25/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/3/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	2/22/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Facility:

Facility ID:	4-0018968
Current Status:	**Response Action Outcome**
Status Date:	8/25/2005
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	2/25/2005
Category:	72 HR
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	154.9

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	UST

Action:

Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	4/26/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	8/25/2005

GAS CONTAMINATED WATER (Continued) **S101020942**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/6/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 4/26/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 2/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 4/26/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

MA Spills:

Facility ID:	0000	Spill ID:	N93-0439
Staff Lead:	MACAFEE, K	Date Entered:	Not reported
Last Entered:	19930504	First Response:	19930412
Spill Date:	19930412	Spill Time:	Not reported
Report Date:	19930412	Report Time:	10:20AM
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	------	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	MISCELLANEOUS OIL	Other Material:	Not reported
Qty Reported:	SHEEN	Qty Actual:	SHEEN
Qty Reported:	----------	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	----------
Source:	UNKNOWN	Other Source:	Not reported
Incident:	UNKNOWN	Other Incdnt:	Not reported
Cleanup Type:	Not reported	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO

GAS CONTAMINATED WATER (Continued) **S101020942**

Report Prep:	Not reported	Category:	Not reported
Notifier:	BILL VERDONE/EPA		
Notif Tel:	Not reported		
Days/Close:	0		

Facility ID:	0000	Spill ID:	S88-0387
Staff Lead:	KEARNS, R	Date Entered:	19881228
Last Entered:	19881228	First Response:	19880622
Spill Date:	19880622	Spill Time:	Not reported
Report Date:	19880622	Report Time:	01:30PM
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	GASOLINE	Other Material:	Not reported
Qty Reported:	NONE	Qty Actual:	NONE
Qty Reported:	_____	Qty Actual:	_____
CAS No:	Not reported	PCB Lev (ppm):	Not reported
Source:	U.S.T.	Other Source:	Not reported
Incident:	Not reported	Other Incdnt:	Not reported
Cleanup Type:	Not reported	Contractor:	NOT USED
Referral:	NO	LUST Elig:	Not reported
Report Prep:	Not reported	Category:	Not reported
Notifier:	Not reported		
Notif Tel:	Not reported		
Days/Close:	1		

Facility ID:	0000	Spill ID:	S90-0825
Staff Lead:	MORAN, M	Date Entered:	19920226
Last Entered:	19920226	First Response:	19901107
Spill Date:	Not reported	Spill Time:	Not reported
Report Date:	19901106	Report Time:	02:30PM
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	OTHER MATERIAL -->	Other Material:	GAS CONTAMINATED WATER
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	----------	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	NONE
Source:	OTHER SOURCE >	Other Source:	TANK INSTALL
Incident:	OTHER RELEASE >	Other Incdnt:	WATER DISCHARGE
Cleanup Type:	SC	Contractor:	NOT USED
Referral:	NO	LUST Elig:	YES
Report Prep:	Not reported	Category:	Not reported
Notifier:	LT FAVRET/FD		
Notif Tel:	Not reported		
Days/Close:	1		

Release:

Facility ID:	4-0000265
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	1/15/1987
Category:	NONE
Current Status:	Response Action Outcome
Status Date:	9/20/1994
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not

GAS CONTAMINATED WATER (Continued) **S101020942**

been reduced to background.
Oil / Haz Material Type: Not reported

Action:
Action Type: Phase 2
Action Stat: Tier 1A or Priority Submittal Approved
Action Date: 12/17/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/11/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/20/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: FORMER
Location Type: GASSTATION

Source:
Source Type: UST

Facility ID: 4-0018650
Primary ID: Not reported
Official City: STOUGHTON
Notification: 8/31/2004
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 8/25/2005
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/31/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF

GAS CONTAMINATED WATER (Continued) **S101020942**

Action Stat: Reportable Release under MGL 21E
Action Date: 10/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 8/31/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 12/22/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 10/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 11/4/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 2/22/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: GASOLINE
Quantity: Not reported

GAS CONTAMINATED WATER (Continued) **S101020942**

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UST

Facility ID: 4-0018968
Primary ID: Not reported
Official City: STOUGHTON
Notification: 2/25/2005
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 8/25/2005
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 4/26/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/6/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 4/26/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action

GAS CONTAMINATED WATER (Continued) **S101020942**

Action Date: 2/25/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 4/26/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: GASOLINE
Quantity: 154.9

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

G34 **SUNOCO SERVICE STA** **MANIFEST** **S109756918**
SSE **990 WASHINGTON ST** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.103 mi.
542 ft. **Site 5 of 6 in cluster G**

Relative: Lower

Actual: 216 ft.

CT MANIFEST:

Waste:
Manifest No: MAH458655
Waste Occurence: 1
UNNA: 1203
Hazard Class: 3
US Dot Description: gasahol, gasoline
No of Containers: 001
Container Type: TT
Quantity: 60
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: MAH458655
Waste Occurence: 1
EPA Waste Code: D001
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1996
Manifest ID: MAH458655
TSDF EPA ID: CTD072138969
TSDF Name: ENVIRONMENTAL WASTE RESOURCES INC
TSDF Address: 130 FREIGHT ST
TSDF City,St,Zip: WATERBURY, CT 06702

SUNOCO SERVICE STA (Continued) **S109756918**

TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	2/8/1996
Transporter EPA ID:	MAD082303777
Transporter Name:	CYN OIL CORP
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MA5000001891
Generator Phone:	2152468577
Generator Mailing Addr:	990 WASHINGTON ST
Generator Mailing Town:	STOUGHTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Not reported
Discrepancies:	Not reported
Date Shipped:	2/8/1996
Date Received:	2/16/1996
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

G35 **SUN COMPANY INC.** **MANIFEST** **S109772314**
SSE **990 WASHINGTON ST.** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.103 mi.
542 ft. **Site 6 of 6 in cluster G**

Relative:
Lower

Actual:
216 ft.

CT MANIFEST:

Waste:

Manifest No:	MAG158732
Waste Occurence:	1
UNNA:	1203
Hazard Class:	3
US Dot Description:	WASTE GASOLINE MIXTURE
No of Containers:	001
Container Type:	TT
Quantity:	297
Weight/Volume:	G
Additional Description:	Y
Handling Code:	T40
Date Record Was Last Modified:	4/26/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAG158732
Waste Occurence:	1
EPA Waste Code:	D001
Recycled Waste?:	F

SUN COMPANY INC. (Continued) **S109772314**

Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:

Year:	1994
Manifest ID:	MAG158732
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address:	130 FREIGHT STREET
TSDF City,St,Zip:	WATERBURY, CT 06702
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	6/2/1994
Transporter EPA ID:	MAD082303777
Transporter Name:	CYN OIL CORPORATION,
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MP6172977320
Generator Phone:	6172977320
Generator Mailing Addr:	990 WASHINGTON ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	6/2/1994
Date Received:	6/7/1994
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

36
NNE
< 1/8
0.105 mi.
555 ft.

STOUGHTON DYE HOUSE INC
20 FREEMAN ST
STOUGHTON, MA 02072

RCRA-NonGen **1000424925**
FINDS **MAD045913381**
MANIFEST

Relative:
Higher

Actual:
236 ft.

RCRA-NonGen:

Date form received by agency:	09/02/2003
Facility name:	STOUGHTON DYE HOUSE
Facility address:	20 FREEMAN ST STOUGHTON, MA 02072
EPA ID:	MAD045913381
Contact:	FRANK BARTOLOMEO
Contact address:	20 FREEMAN ST STOUGHTON, MA 02072
Contact country:	US
Contact telephone:	(508) 394-3711

STOUGHTON DYE HOUSE INC (Continued) **1000424925**

Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: STOUGHTON DYE HOUSE INC
Owner/operator address: 20 FREEMAN ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 05/29/1997
Owner/Op end date: 07/10/2003

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 06/14/1983
Facility name: STOUGHTON DYE HOUSE
Classification: Conditionally Exempt Small Quantity Generator

Facility Has Received Notices of Violations:
Regulation violated: SR - 340(1)(k)
Area of violation: Generators - Pre-transport
Date violation determined: 06/29/1997
Date achieved compliance: 06/29/2002
Violation lead agency: State
Enforcement action: INFORMAL WRITTEN NOTIFICATION
Enforcement action date: 08/05/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 331(1)

STOUGHTON DYE HOUSE INC (Continued) **1000424925**

Area of violation:	Generators - Manifest
Date violation determined:	06/29/1997
Date achieved compliance:	06/29/2002
Violation lead agency:	State
Enforcement action:	INFORMAL WRITTEN NOTIFICATION
Enforcement action date:	08/05/1997
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	SR - 340(1)(j)
Area of violation:	Generators - Pre-transport
Date violation determined:	06/29/1997
Date achieved compliance:	06/29/2002
Violation lead agency:	State
Enforcement action:	INFORMAL WRITTEN NOTIFICATION
Enforcement action date:	08/05/1997
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	SR - 251(4)
Area of violation:	Generators - General
Date violation determined:	06/29/1997
Date achieved compliance:	06/29/2002
Violation lead agency:	State
Enforcement action:	INFORMAL WRITTEN NOTIFICATION
Enforcement action date:	08/05/1997
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported
Area of violation:	Formal Enforcement Agreement or Order
Date violation determined:	02/18/1987
Date achieved compliance:	12/09/1987
Violation lead agency:	State
Enforcement action:	WRITTEN INFORMAL
Enforcement action date:	03/23/1987
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported
Area of violation:	Generators - General

STOUGHTON DYE HOUSE INC (Continued) **1000424925**

Date violation determined: 04/22/1986
Date achieved compliance: 12/09/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/06/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 06/29/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 06/29/2002
Evaluation lead agency: State

Evaluation date: 06/29/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 06/29/2002
Evaluation lead agency: State

Evaluation date: 06/29/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Manifest
Date achieved compliance: 06/29/2002
Evaluation lead agency: State

Evaluation date: 02/18/1987
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Formal Enforcement Agreement or Order
Date achieved compliance: 12/09/1987
Evaluation lead agency: State

Evaluation date: 12/09/1986
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/22/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 12/09/1987
Evaluation lead agency: State

FINDS:

Registry ID: 110003433240

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport,

STOUGHTON DYE HOUSE INC (Continued) **1000424925**

and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

MANIFEST:

GEN Cert Date:	1/5/1994
Transporter Recpt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	F002
Waste Code2:	Not reported
Waste Code3:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	CHEM PAK CORP
TSDF ID:	RID084802842
TSDF Date:	Not reported
Date Imported:	7/18/1994
Transporter 2 Name:	Not reported
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0042685
Waste Description:	RQ WASTE PERCHLOROETHYLENE
Quantity:	300
WT/Vol Units:	P
Item Number:	1
Transporter Name:	CYCLE SOLVE CORP
Transporter EPA ID:	RID982194987
GEN Cert Date:	1/5/1994
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD045913381
Transporter 2 ID:	Not reported

37
WNW
< 1/8
0.106 mi.
562 ft.

DEQE OFFICE OF RESPONSE **RCRA-NonGen** **1000197802**
FIRST STA **MANIFEST** **MAD980732630**
BRIDGEWATER, MA 02324

Relative:
Higher

Actual:
230 ft.

RCRA-NonGen:

Date form received by agency:	11/16/1982
Facility name:	DEQE OFFICE OF RESPONSE
Facility address:	FIRST STA BRIDGEWATER, MA 02324
EPA ID:	MAD980732630
Mailing address:	1 WINTER ST BOSTON, MA 02108
Contact:	JEFFREY GOULD
Contact address:	1 WINTER ST BOSTON, MA 02108
Contact country:	US

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Contact telephone: (617) 292-5648
Contact email: Not reported
EPA Region: 01
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: MA DEQE OFFICE OF RESPONSE
Owner/operator address: 1 WINTER ST
BOSTON, MA 02108
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/08/1991
Owner/Op end date: Not reported

Owner/operator name: CANNONS ENG CORP
Owner/operator address: 1 WINTER ST
BOSTON, MA 02108
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: State
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: F001
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: K049
Waste name: SLOP OIL EMULSION SOLIDS FROM THE PETROLEUM REFINING INDUSTRY

Violation Status: No violations found

NY MANIFEST:
EPA ID: MAD980732630
Country: USA
Mailing Name: COMMONWEALTH OF MASSACHUSETTS

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Mailing Contact:	MICHAEL F. CONWAY
Mailing Address:	1 WINTER STREET
Mailing Address 2:	Not reported
Mailing City:	BOSTON
Mailing State:	MA
Mailing Zip:	02072
Mailing Zip4:	Not reported
Mailing Country:	USA
Mailing Phone:	617-292-5630

Document ID:	NYO2160981
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA-005
Trans2 State ID:	Not reported
Generator Ship Date:	830103
Trans1 Recv Date:	830103
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	830103
Part A Recv Date:	030308
Part B Recv Date:	030308
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	05000
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	83

Document ID:	NYO2983095
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821128
Trans1 Recv Date:	821128
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821129
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	04800
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	82

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Document ID:	NYO2983104
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821128
Trans1 Recv Date:	821128
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821130
Part A Recv Date:	030110
Part B Recv Date:	030110
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	04800
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983113
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821129
Trans1 Recv Date:	821129
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821201
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	05000
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983122
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821204
Trans1 Recv Date:	821204
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821204
Part A Recv Date:	030112

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Part B Recv Date:	030112
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD080469935
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	06000
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983131
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821202
Trans1 Recv Date:	821202
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821202
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	04000
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983149
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821207
Trans1 Recv Date:	821207
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821208
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00400
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	005

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Container Type: DM - Metal drums, barrels
Handling Method: L Landfill.
Specific Gravity: 100
Waste Code: Not reported
Quantity: 03790
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 069
Container Type: DM - Metal drums, barrels
Handling Method: L Landfill.
Specific Gravity: 100
Year: 82

Document ID: NYO2983158
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MA-005
Trans2 State ID: Not reported
Generator Ship Date: 821208
Trans1 Recv Date: 821208
Trans2 Recv Date: Not reported
TSD Site Recv Date: 821209
Part A Recv Date: 030104
Part B Recv Date: 030104
Generator EPA ID: MAD980732630
Trans1 EPA ID: MAD062179890
Trans2 EPA ID: Not reported
TSDF ID: NYD049836679
Waste Code: F005 - UNKNOWN
Quantity: 00025
Units: Y - Cubic yards* (.85 tons)
Number of Containers: 001
Container Type: DT - Dump trucks
Handling Method: L Landfill.
Specific Gravity: 100
Year: 82

Document ID: NYO2983176
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MA005
Trans2 State ID: Not reported
Generator Ship Date: 821214
Trans1 Recv Date: 821214
Trans2 Recv Date: Not reported
TSD Site Recv Date: 821215
Part A Recv Date: 030104
Part B Recv Date: 030104
Generator EPA ID: MAD980732630
Trans1 EPA ID: MAD062179890
Trans2 EPA ID: Not reported
TSDF ID: NYD049836679
Waste Code: X000 - DECUSE ONLY
Quantity: 01320
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 024
Container Type: DM - Metal drums, barrels
Handling Method: L Landfill.

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Specific Gravity:	100
Waste Code:	Not reported
Quantity:	02860
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	052
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Waste Code:	Not reported
Quantity:	00220
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	004
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Waste Code:	Not reported
Quantity:	00220
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	004
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Waste Code:	Not reported
Quantity:	00030
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983185
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821213
Trans1 Recv Date:	821213
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821214
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	F005 - UNKNOWN
Quantity:	00039
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983203

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821227
Trans1 Recv Date:	821227
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821228
Part A Recv Date:	030110
Part B Recv Date:	030110
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00080
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Waste Code:	Not reported
Quantity:	03905
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	071
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO3030804
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	821209
Trans1 Recv Date:	821209
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821210
Part A Recv Date:	030104
Part B Recv Date:	030104
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	F005 - UNKNOWN
Quantity:	00039
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO2983167
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Trans2 State ID:	Not reported
Generator Ship Date:	830106
Trans1 Recv Date:	830106
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	830107
Part A Recv Date:	030309
Part B Recv Date:	030309
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	F001 - UNKNOWN
Quantity:	03740
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	068
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	83

Document ID:	NYO2983212
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MA005
Trans2 State ID:	Not reported
Generator Ship Date:	830103
Trans1 Recv Date:	830103
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	830104
Part A Recv Date:	030309
Part B Recv Date:	030309
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00160
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	002
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Waste Code:	Not reported
Quantity:	04070
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	074
Container Type:	DM - Metal drums, barrels
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	83

Document ID:	NYB6760656
Manifest Status:	Completed copy
Trans1 State ID:	TY14550PA
Trans2 State ID:	Not reported
Generator Ship Date:	941024

DEQE OFFICE OF RESPONSE (Continued) **1000197802**

Trans1 Recv Date:	941024
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	941025
Part A Recv Date:	Not reported
Part B Recv Date:	941102
Generator EPA ID:	MAD980732630
Trans1 EPA ID:	PAD146714878
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D008 - LEAD 5.0 MG/L TCLP
Quantity:	44980
Units:	P - Pounds
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	94

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38 **NO LOCATION AID** **SHWS** **S106344143**
NW **CANTON AND SCHOOL ST** **RELEASE** **N/A**
< 1/8 **STOUGHTON, MA 02072**
0.107 mi.
564 ft.

Relative:
Higher

Actual:
232 ft.

SHWS:

Facility ID:	4-0018314
Release Town:	STOUGHTON
Notification Date:	3/19/2004
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	5/24/2004
Phase:	Not reported
Response Action Outcome:	A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material:	Not reported

Chemical:

Chemical:	DIESEL
Quantity:	260 gallons

Location:

Location Type:	RESIDNTIAL
Location Type:	ROADWAY

Source:

Source Type:	VEHICLE

Action:

Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	3/19/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	3/19/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

NO LOCATION AID (Continued) **S106344143**

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/24/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/23/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/24/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0018314
Primary ID: Not reported
Official City: STOUGHTON
Notification: 3/19/2004
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 5/24/2004
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Not reported

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

NO LOCATION AID (Continued) **S106344143**

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/24/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 3/19/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/23/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/24/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: DIESEL
Quantity: 260 gallons

Location:
Location Type: RESIDNTIAL
Location Type: ROADWAY

Source:
Source Type: VEHICLE

39
ENE
< 1/8
0.111 mi.
586 ft.

SULLIVAN ROSANIA & IACONO ORTH **RCRA-CESQG 1000287503**
85 PARK ST **FINDS MAD981212103**
STOUGHTON, MA 02072

Relative:
Higher

Actual:
237 ft.

RCRA-CESQG:
Date form received by agency: 07/07/1986
Facility name: SULLIVAN ROSANIA & IACONO ORTHOPED
Facility address: 85 PARK ST
STOUGHTON, MA 02072
EPA ID: MAD981212103
Mailing address: PO BOX 30
STOUGHTON, MA 02072
Contact: KENNETH-J DARRIGO
Contact address: PO BOX 30
STOUGHTON, MA 02072

SULLIVAN ROSANIA & IACONO ORTH (Continued) **1000287503**

Contact country: US
Contact telephone: (617) 344-3535
Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: SULLIVAN ROSANIA & IACONO ORTH
Owner/operator address: PO BOX 30
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/08/1991
Owner/Op end date: Not reported

Owner/operator name: DRS SULLIVAN/ ROSANIA & IACONO
Owner/operator address: PO BOX 30
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No

SULLIVAN ROSANIA & IACONO ORTH (Continued) **1000287503**

Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D011
Waste name: SILVER

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 02/01/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

FINDS:

Registry ID: 110003467481

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

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H40 **GETTY #30743** **LUST U003000263**
North **724 WASHINGTON ST** **UST N/A**
1/8-1/4 **STOUGHTON, MA 02072** **RELEASE**
0.134 mi. **FINANCIAL ASSURANCE**
707 ft. **Site 1 of 2 in cluster H**

Relative: Higher

Actual: 234 ft.

LUST:

Facility:
Facility ID: 4-0000480
Current Status: **Response Action Outcome**
Status Date: 2/26/2009
Source Type: UST
Release Town: STOUGHTON
Notification Date: 1/15/1988
Category: NONE
Associated ID: Not reported

GETTY #30743 (Continued) **U003000263**

Phase: PHASE V
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: GASSTATION

Source:
Source Type: UST

Action:
Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/1/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/19/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 1/31/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action

GETTY #30743 (Continued) **U003000263**

Action Stat: Interim Deadline Letter Issued
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/23/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 7/2/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 10/31/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 1/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 8/11/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 3/29/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 12/20/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

GETTY #30743 (Continued) **U003000263**

reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/17/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/17/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/6/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/26/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/18/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/15/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINI
Action Date: 7/15/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 7/15/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4

GETTY #30743 (Continued) **U003000263**

Action Stat:	Written Plan Received
Action Date:	10/23/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Completion Statement Received
Action Date:	10/5/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Status or Interim Report Received
Action Date:	6/8/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Status or Interim Report Received
Action Date:	11/27/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	5/18/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	TREGS
Action Stat:	WAVACC
Action Date:	3/10/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	TREGS
Action Stat:	WAVREC
Action Date:	3/11/1993
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	An activity type that is related to an Audit
Action Stat:	NAFNVD
Action Date:	6/3/1993
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Compliance and Enforcement Action
Action Stat:	ACO
Action Date:	9/5/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	10/13/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been

GETTY #30743 (Continued) **U003000263**

reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/8/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVSIG
Action Date: 2/25/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/16/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/26/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/8/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Periodic Review Opinion Evaluating Temp Solution
Action Date: 6/15/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1988
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 2/21/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/22/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action

GETTY #30743 (Continued) **U003000263**

Action Stat:	ACO
Action Date:	8/25/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Status or Interim Report Received
Action Date:	2/13/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	3/10/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Extension
Action Date:	4/22/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

UST:

Facility ID:	12670

Facility:

Owner Id:	139
Owner:	GETTY PETROLEUM MARKETING INC
Owner Address:	86 DOREMUS AVE
Owner City,St,Zip:	NEWARK, NJ 07105
Telephone:	(401) 434-1322
Description:	Gas Station
Fire Dept. ID:	21285
Date of Inspection:	Not reported

Date Installed:	04/30/1973
Status Date:	11/14/2006
Tank ID:	1
Tank Status:	**Removed**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	1 Wall
Tank Leak Detection:	Approved In-Tank Monitor
Pipe Material:	Reinforced
Pipe Container:	1 Wall
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	10000
Contents:	Gasoline

Date Installed:	04/30/1973
Status Date:	11/14/2006

GETTY #30743 (Continued) **U003000263**

Tank ID: 2
Tank Status: Removed
Tank Useage: MV
Tank Material: Reinforced
Tank Contents: 1 Wall
Tank Leak Detection: Approved In-Tank Monitor
Pipe Material: Reinforced
Pipe Container: 1 Wall
Pipe Leak Detection: Product Line Leak Detector
Serial Number: Not reported
Aboveground: No
Capacity: 10000
Contents: Gasoline

Date Installed: 04/30/1973
Status Date: 11/14/2006
Tank ID: 3
Tank Status: Removed
Tank Useage: MV
Tank Material: Reinforced
Tank Contents: 1 Wall
Tank Leak Detection: Approved In-Tank Monitor
Pipe Material: Reinforced
Pipe Container: 1 Wall
Pipe Leak Detection: Product Line Leak Detector
Serial Number: Not reported
Aboveground: No
Capacity: 10000
Contents: Gasoline

Release:
Facility ID: 4-0000480
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/15/1988
Category: NONE
Current Status: Response Action Outcome
Status Date: 2/26/2009
Phase: PHASE V
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Not reported

Action:
Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/1/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

GETTY #30743 (Continued) **U003000263**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/19/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 1/31/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 5/24/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/23/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 7/2/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 10/31/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 1/9/1996

GETTY #30743 (Continued) **U003000263**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 8/11/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 3/29/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 12/20/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/17/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/17/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/6/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

GETTY #30743 (Continued) **U003000263**

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/26/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/18/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/15/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINI
Action Date: 7/15/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 7/15/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 10/23/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 10/5/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/8/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/27/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/18/2004

GETTY #30743 (Continued) **U003000263**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVACC
Action Date: 3/10/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVREC
Action Date: 3/11/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 6/3/1993
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: ACO
Action Date: 9/5/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/13/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/8/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVSIG
Action Date: 2/25/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/16/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/26/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

GETTY #30743 (Continued) **U003000263**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/8/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Periodic Review Opinion Evaluating Temp Solution
Action Date: 6/15/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1988
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 2/21/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/22/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: ACO
Action Date: 8/25/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 2/13/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 3/10/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 4/22/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

GETTY #30743 (Continued) **U003000263**

Location:
Location Type: GASSTATION

Source:
Source Type: UST

MA FINANCIAL ASSURANCE 2:
Facility Id: 12670
Description: Gas Station
Work Phone: (401) 434-1322

H41 **MUTUAL STATION #63** **MANIFEST** **S109773101**
North **724 WASHINGTON ST.** **N/A**
1/8-1/4 **STOUGHTON, MA**
0.134 mi.
707 ft. **Site 2 of 2 in cluster H**

Relative:
Higher

Actual:
234 ft.

CT MANIFEST:

Waste:
Manifest No: MAK027858
Waste Occurence: 1
UNNA: 1203
Hazard Class: 3
US Dot Description: gasahol, gasoline
No of Containers: 001
Container Type: TT
Quantity: 250
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: MAK027858
Waste Occurence: 1
EPA Waste Code: D001
Recycled Waste?: F
Date Record Was Last Modified: 4/26/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1998
Manifest ID: MAK027858
TSDF EPA ID: CTD021816889
TSDF Name: UNITED OIL RECOVERY INC./UIS DBA ADVANCED LIQ. REC
TSDF Address: 136 GRACEY AVE.
TSDF City,St,Zip: MERIDEN, CT 06451
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: 7/15/1998
Transporter EPA ID: MAD082303777
Transporter Name: CYN OIL CORPORATION,
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: 7/22/1998

MUTUAL STATION #63 (Continued) **S109773101**

Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MP7813448989
Generator Phone:	7813448989
Generator Mailing Addr:	724 WASHINGTON ST. STOUGHTON
Generator Mailing Town:	Not reported
Generator Mailing State:	MA
Generator Mailing Zip:	Not reported
Generator Mailing Country:	USA
Special Handling:	Not reported
Discrepancies:	Yes
Date Shipped:	7/15/1998
Date Received:	7/31/1998
Last modified date:	4/26/2004
Last modified by:	IG
Comments:	Not reported

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42 **FRAGAS BROS MARKET** **SHWS** **S100362251**
NNE **105 PORTER ST** **RELEASE** **N/A**
1/8-1/4 **STOUGHTON, MA 02072**
0.180 mi.
952 ft.

Relative:
Higher

Actual:
236 ft.

SHWS:

Facility ID:	4-0000791
Release Town:	STOUGHTON
Notification Date:	1/15/1990
Category:	NONE
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	7/18/2003
Phase:	PHASE IV
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Not reported

Chemical:

Chemical:	UNKNOWN
Quantity:	Not reported

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	8/5/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 2
Action Stat:	Completion Statement Received

FRAGAS BROS MARKET (Continued) **S100362251**

Action Date:	12/31/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	2/13/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	8/5/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 4
Action Stat:	Written Plan Received
Action Date:	3/21/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	7/18/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	An activity type that is related to an Audit
Action Stat:	NOA
Action Date:	3/14/1997
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 3
Action Stat:	Completion Statement Received
Action Date:	12/31/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDRUN
Action Date:	1/21/2009
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	TREGS
Action Stat:	LSPFA
Action Date:	8/5/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	10/16/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

FRAGAS BROS MARKET (Continued) **S100362251**

Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Non-Compliance Issued
Action Date:	9/4/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	11/21/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	DEPRET
Action Date:	2/1/1991
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	1/15/1990
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Release Abatement Measure
Action Stat:	Level I - Technical Screen Audit
Action Date:	2/19/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Tier 2 Extension
Action Date:	10/2/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	8/6/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Release:

Facility ID:	4-0000791
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	1/15/1990
Category:	NONE
Current Status:	Response Action Outcome
Status Date:	7/18/2003
Phase:	PHASE IV
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type:	Not reported

Action:

FRAGAS BROS MARKET (Continued) **S100362251**

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 8/5/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 12/31/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 2/13/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/5/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 3/21/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 7/18/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 3/14/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 12/31/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 1/21/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: LSPFA
Action Date: 8/5/1996

FRAGAS BROS MARKET (Continued) **S100362251**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/16/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 9/4/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 11/21/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: DEPRET
Action Date: 2/1/1991
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 2/19/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 10/2/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/6/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

FRAGAS BROS MARKET (Continued) **S100362251**

Source:
Source Type: Not reported

43
North
1/8-1/4
0.191 mi.
1011 ft.

NO LOCATION AID **LUST** **S105200658**
20 SCHOOL ST **RELEASE** **N/A**
STOUGHTON, MA 02072

Relative:
Higher

Actual:
237 ft.

LUST:

Facility:
Facility ID: 4-0016693
Current Status: **Response Action Outcome**
Status Date: 1/3/2007
Source Type: UST
Release Town: STOUGHTON
Notification Date: 10/20/2001
Category: TWO HR
Associated ID: Not reported
Phase: PHASE IV
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: #2 FUEL OIL
Quantity: 440 gallons

Location:
Location Type: RESIDNTIAL

Source:
Source Type: UST

Action:
Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/21/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/27/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 4/24/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S105200658**

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 12/2/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 6/30/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/23/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 1/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/22/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/4/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/25/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/10/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/18/2002

NO LOCATION AID (Continued) **S105200658**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 10/23/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 10/27/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/23/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/12/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/21/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S105200658**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 12/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 2/23/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/26/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 1/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/21/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/6/2002

NO LOCATION AID (Continued) **S105200658**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/1/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/4/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/26/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0016693
Primary ID: Not reported
Official City: STOUGHTON
Notification: 10/20/2001

NO LOCATION AID (Continued) **S105200658**

Category:	TWO HR
Current Status:	Response Action Outcome
Status Date:	1/3/2007
Phase:	PHASE IV
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type:	Oil

Action:

Action Type:	Immediate Response Action
Action Stat:	Modified Revised or Updated Plan Received
Action Date:	2/21/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	5/27/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	4/24/2007
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	RLFA
Action Stat:	FLDD1A
Action Date:	10/20/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	10/18/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/2/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Level I - Technical Screen Audit
Action Date:	6/30/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Level I - Technical Screen Audit
Action Date:	12/23/2005
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO

NO LOCATION AID (Continued) **S105200658**

Action Stat: RAO Statement Received
Action Date: 1/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/22/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/4/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/25/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/10/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 10/23/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 10/27/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S105200658**

reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/23/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/12/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/21/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 12/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 2/23/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/26/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3

NO LOCATION AID (Continued) **S105200658**

Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 1/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/21/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/6/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 11/1/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/4/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S105200658**

reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 10/20/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/26/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 10/18/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: #2 FUEL OIL
Quantity: 440 gallons

Location:
Location Type: RESIDNTIAL

Source:
Source Type: UST

44
NW
1/8-1/4
0.199 mi.
1052 ft.

ALS AUTO REPAIR & TOWING INC
68 CUSHING ST
STOUGHTON, MA 02072

RCRA-NonGen **1000102596**
FINDS **MAD985269810**
MANIFEST

Relative:
Higher

Actual:
228 ft.

RCRA-NonGen:
Date form received by agency: 02/24/1988
Facility name: ALS AUTO REPAIR & TOWING INC
Facility address: 68 CUSHING ST
STOUGHTON, MA 02072
EPA ID: MAD985269810
Contact: ALBERT-F COLLETT JR
Contact address: 68 CUSHING ST
STOUGHTON, MA 02072
Contact country: US
Contact telephone: (617) 344-1029
Contact email: Not reported
EPA Region: 01
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

ALS AUTO REPAIR & TOWING INC (Continued) **1000102596**

Owner/Operator Summary:
Owner/operator name: ALBERT F COLLETT JR
Owner/operator address: 68 CUSHING ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Owner/operator name: ALS AUTO REPAIR & TOWING INC
Owner/operator address: 68 CUSHING ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/01/1990
Owner/Op end date: 06/03/1991

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003486291

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource

ALS AUTO REPAIR & TOWING INC (Continued) **1000102596**

Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

MANIFEST:

GEN Cert Date:	6/19/2002
Transporter Recpt Date:	Not reported
Number Of Containers:	0
Container Type:	Not reported
Waste Code1:	D001
Waste Code2:	Not reported
Waste Code3:	Not reported
Comment:	Not reported
Fee Exempt Code:	Not reported
TSDF Name:	Chem-Pak Corporation
TSDF ID:	RID084802842
TSDF Date:	Not reported
Date Imported:	12/2/2002
Transporter 2 Name:	Not reported
Transporter 2 ID:	Not reported
Manifest Docket Number:	RIG0197215
Waste Description:	WASTE COMBUSTIBLE LIQUID N.O.S.
Quantity:	32
WT/Vol Units:	G
Item Number:	9865
Transporter Name:	CYCLE SOLVE CORPORATION
Transporter EPA ID:	RID982194987
GEN Cert Date:	6/19/2002
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD985269810
Transporter 2 ID:	Not reported

Manifest Docket Number:	RIG0189824
Waste Description:	WASTE COMBUSTIBLE LIQUID N.O.S.
Quantity:	15
WT/Vol Units:	G
Item Number:	1
Transporter Name:	CYCLE SOLVE CORPORATION
Transporter EPA ID:	RID982194987
GEN Cert Date:	1/2/2002
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD985269810
Transporter 2 ID:	Not reported

Manifest Docket Number:	RIG0193323
Waste Description:	WASTE COMBUSTIBLE LIQUID N.O.S.
Quantity:	15

ALS AUTO REPAIR & TOWING INC (Continued) **1000102596**

WT/Vol Units:	G
Item Number:	5360
Transporter Name:	CYCLE SOLVE CORPORATION
Transporter EPA ID:	RID982194987
GEN Cert Date:	3/27/2002
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD985269810
Transporter 2 ID:	Not reported

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45 West 1/8-1/4 0.224 mi. 1185 ft.

Relative: Lower

Actual: 214 ft.

T L EDWARDS INC **MINES** **1011173829**
N/A

NORFOLK (County), MA

MINES:

Mine ID:	1901061
SIC code(s):	14230 00000 00000 00000 00000 00000
Entity name:	STOUGHTON QUARRY
Company:	T L EDWARDS INC
State FIPS code:	25
County FIPS code:	021
Status:	1
Status date:	20081211
Operation Class:	non-Coal Mining
Number of shops:	0
Number of plants:	0
Latitude:	42 07 22
Longitude:	071 06 33

Violations Details:

Violation Number:	4571133
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/08/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	321
Paid Penalty:	321
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	321
Year:	2003

T L EDWARDS INC (Continued) **1011173829**

	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	4571134
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/08/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	265
Paid Penalty:	265
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	265
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	4571135
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/08/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	346
Paid Penalty:	346
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	346
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

T L EDWARDS INC (Continued) **1011173829**

Violation Number:	4571136
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/08/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	214
Paid Penalty:	214
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	214
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	4571137
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/09/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/06/2004
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	217
Paid Penalty:	217
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	217
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	4571138
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/09/2003

T L EDWARDS INC (Continued) **1011173829**

Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	321
Paid Penalty:	321
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	321
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	4571139
Mine Name:	STOUGHTON QUARRY
Date Issued:	10/09/2003
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	10/09/2003
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	214
Paid Penalty:	214
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	214
Year:	2003
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6012273
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/13/2004
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc

T L EDWARDS INC (Continued) **1011173829**

Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/14/2004
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	60.00
Paid Penalty:	60.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	60.00
Year:	2004
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6012274
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/13/2004
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/17/2004
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	60.00
Paid Penalty:	60.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	60.00
Year:	2004
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6012275
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/13/2004
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite

T L EDWARDS INC (Continued) **1011173829**

Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/17/2004
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	60.00
Paid Penalty:	60.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	60.00
Year:	2004
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6047258
Mine Name:	STOUGHTON QUARRY
Date Issued:	08/07/2007
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	08/07/2007
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	425.00
Paid Penalty:	425.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	425.00
Year:	2007
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6047259
Mine Name:	STOUGHTON QUARRY
Date Issued:	08/07/2007
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active

T L EDWARDS INC (Continued) **1011173829**

Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	09/06/2007
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	285.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	285.00
Year:	2007
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6047260
Mine Name:	STOUGHTON QUARRY
Date Issued:	08/07/2007
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	08/08/2007
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	285.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	285.00
Year:	2007
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6047261
Mine Name:	STOUGHTON QUARRY
Date Issued:	08/07/2007
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	08/08/2007

T L EDWARDS INC (Continued) **1011173829**

Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2007
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	7739996
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/08/2002
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/09/2002
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	340.00
Paid Penalty:	340.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	340.00
Year:	2002
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	7739997
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/08/2002
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/02/2002
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	55.00

T L EDWARDS INC (Continued) **1011173829**

Paid Penalty:	55.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	55.00
Year:	2002
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572352
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572353
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	308.00
Paid Penalty:	138.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed

T L EDWARDS INC (Continued) **1011173829**

Assessment Amount:	138.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572354
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	308.00
Paid Penalty:	308.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	308.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572355
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2010
	Stoughton, MA 02072

T L EDWARDS INC (Continued) **1011173829**

County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572356
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	224.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	224.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572357
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	224.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	224.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

T L EDWARDS INC (Continued) **1011173829**

Violation Number:	8572358
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/27/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572359
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/27/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572360
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010

T L EDWARDS INC (Continued) **1011173829**

Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572361
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	224.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	224.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572362
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc

T L EDWARDS INC (Continued) **1011173829**

Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/16/2010
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Received
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572363
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(d)(1)
Date Abated:	01/26/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	2,000.00
Paid Penalty:	0.00
Assessment Status code:	Received
Assess. Case Status code:	InContest
Assessment Amount:	2,000.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8572364
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite

T L EDWARDS INC (Continued) **1011173829**

Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(d)(1)
Date Abated:	01/26/2010
Citation/Order:	Order
Sig and Sub Designation:	Y
Proposed Penalty:	4,800.00
Paid Penalty:	0.00
Assessment Status code:	Received
Assess. Case Status code:	InContest
Assessment Amount:	4,800.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572365
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(d)(1)
Date Abated:	01/26/2010
Citation/Order:	Order
Sig and Sub Designation:	Y
Proposed Penalty:	2,000.00
Paid Penalty:	0.00
Assessment Status code:	Received
Assess. Case Status code:	InContest
Assessment Amount:	2,000.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8572366
Mine Name:	STOUGHTON QUARRY
Date Issued:	01/26/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active

T L EDWARDS INC (Continued) **1011173829**

Status Date:	12/11/2008
Action Type:	104(d)(1)
Date Abated:	01/26/2010
Citation/Order:	Order
Sig and Sub Designation:	Y
Proposed Penalty:	2,000.00
Paid Penalty:	0.00
Assessment Status code:	Received
Assess. Case Status code:	InContest
Assessment Amount:	2,000.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8575841
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8575842
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010

T L EDWARDS INC (Continued) **1011173829**

Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8575843
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8575844
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00

T L EDWARDS INC (Continued) **1011173829**

Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8575845
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	8575846
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	285.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed

T L EDWARDS INC (Continued) **1011173829**

Assessment Amount:	285.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8575847
Mine Name:	STOUGHTON QUARRY
Date Issued:	05/25/2010
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	05/25/2010
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	946.00
Paid Penalty:	946.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	946.00
Year:	2010
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6056356
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072

T L EDWARDS INC (Continued) **1011173829**

County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6056357
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6056358
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

T L EDWARDS INC (Continued) **1011173829**

Violation Number:	6056359
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6056360
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6056361
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/22/2008

T L EDWARDS INC (Continued) **1011173829**

Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/22/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6056362
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/23/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/23/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6065863
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/15/2009
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc

T L EDWARDS INC (Continued) **1011173829**

Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/16/2009
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2009
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6065818
Mine Name:	STOUGHTON QUARRY
Date Issued:	12/10/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	12/10/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

Violation Number:	6065819
Mine Name:	STOUGHTON QUARRY
Date Issued:	12/10/2008
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite

T L EDWARDS INC (Continued) **1011173829**

Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	12/10/2008
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	190.00
Paid Penalty:	190.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	190.00
Year:	2008
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6065861
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/15/2009
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/15/2009
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2009
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	6065862
Mine Name:	STOUGHTON QUARRY
Date Issued:	04/15/2009
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active

T L EDWARDS INC (Continued) **1011173829**

Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	04/15/2009
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	285.00
Paid Penalty:	285.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	285.00
Year:	2009
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8645030
Mine Name:	STOUGHTON QUARRY
Date Issued:	02/15/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/15/2011
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	190.00
Paid Penalty:	190.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	190.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8645031
Mine Name:	STOUGHTON QUARRY
Date Issued:	02/15/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/15/2011

T L EDWARDS INC (Continued) **1011173829**

Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8645032
Mine Name:	STOUGHTON QUARRY
Date Issued:	02/15/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/16/2011
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00
Paid Penalty:	100.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	100.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8645033
Mine Name:	STOUGHTON QUARRY
Date Issued:	02/15/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/16/2011
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	100.00

T L EDWARDS INC (Continued) **1011173829**

Paid Penalty: 100.00
Assessment Status code: Closed
Assess. Case Status code: Proposed
Assessment Amount: 100.00
Year: 2011
Stoughton, MA 02072
County Name: Norfolk
P.O. Box: Not reported

Violation Number: 8645034
Mine Name: STOUGHTON QUARRY
Date Issued: 02/15/2011
Address Type: MineLocation
Address: 1185 Turnpike St. (Rear)
Operator: T L Edwards Inc
Contractor ID: Not reported
Controller Name: Terry L Edwards
Mined Material: Crushed, Broken Granite
Ownership Date: 05/01/1997
Mine Type: Surface
Mine Status: Active
Status Date: 12/11/2008
Action Type: 104(a)
Date Abated: 02/16/2011
Citation/Order: Citation
Sig and Sub Designation: N
Proposed Penalty: 100.00
Paid Penalty: 100.00
Assessment Status code: Closed
Assess. Case Status code: Proposed
Assessment Amount: 100.00
Year: 2011
Stoughton, MA 02072
County Name: Norfolk
P.O. Box: Not reported

Violation Number: 8645035
Mine Name: STOUGHTON QUARRY
Date Issued: 02/15/2011
Address Type: MineLocation
Address: 1185 Turnpike St. (Rear)
Operator: T L Edwards Inc
Contractor ID: Not reported
Controller Name: Terry L Edwards
Mined Material: Crushed, Broken Granite
Ownership Date: 05/01/1997
Mine Type: Surface
Mine Status: Active
Status Date: 12/11/2008
Action Type: 104(a)
Date Abated: 02/16/2011
Citation/Order: Citation
Sig and Sub Designation: N
Proposed Penalty: 100.00
Paid Penalty: 100.00
Assessment Status code: Closed
Assess. Case Status code: Proposed

T L EDWARDS INC (Continued) **1011173829**

Assessment Amount:	100.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8645036
Mine Name:	STOUGHTON QUARRY
Date Issued:	02/16/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	02/16/2011
Citation/Order:	Citation
Sig and Sub Designation:	Y
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8648519
Mine Name:	STOUGHTON QUARRY
Date Issued:	06/09/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	06/09/2011
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2011
	Stoughton, MA 02072

T L EDWARDS INC (Continued) **1011173829**

County Name:	Norfolk
P.O. Box:	Not reported
Violation Number:	8648520
Mine Name:	STOUGHTON QUARRY
Date Issued:	06/09/2011
Address Type:	MineLocation
Address:	1185 Turnpike St. (Rear)
Operator:	T L Edwards Inc
Contractor ID:	Not reported
Controller Name:	Terry L Edwards
Mined Material:	Crushed, Broken Granite
Ownership Date:	05/01/1997
Mine Type:	Surface
Mine Status:	Active
Status Date:	12/11/2008
Action Type:	104(a)
Date Abated:	06/09/2011
Citation/Order:	Citation
Sig and Sub Designation:	N
Proposed Penalty:	127.00
Paid Penalty:	127.00
Assessment Status code:	Closed
Assess. Case Status code:	Proposed
Assessment Amount:	127.00
Year:	2011
	Stoughton, MA 02072
County Name:	Norfolk
P.O. Box:	Not reported

I46 **STOUGHTON AUTO BODY INC** **RCRA-CESQG** **1000424926**
South **1069 WASHINGTON ST** **FINDS** **MAD047072913**
1/8-1/4 **STOUGHTON, MA 02072**
0.237 mi.
1254 ft. **Site 1 of 3 in cluster I**

Relative:
Lower

Actual:
217 ft.

RCRA-CESQG:

Date form received by agency:	07/31/1984
Facility name:	STOUGHTON AUTO BODY INC
Facility address:	1069 WASHINGTON ST STOUGHTON, MA 02072
EPA ID:	MAD047072913
Contact:	ERNEST MILLMAN
Contact address:	1069 WASHINGTON ST STOUGHTON, MA 02072
Contact country:	US
Contact telephone:	(617) 344-4830
Contact email:	Not reported
EPA Region:	01
Land type:	Private
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less

STOUGHTON AUTO BODY INC (Continued) **1000424926**

of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: STOUGHTON AUTO BODY INC
Owner/operator address: 1069 WASHINGTON ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/08/1991
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT

STOUGHTON AUTO BODY INC (Continued) **1000424926**

MIXTURES.

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 11/07/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

FINDS:

Registry ID: 110003433838

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

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I47 **STOUGHTON AUTO BODY INC** **MANIFEST** **S109758685**
South **1069 WASHINGTON ST** **N/A**
1/8-1/4 **STOUGHTON, MA 02072**
0.237 mi.
1254 ft. **Site 2 of 3 in cluster I**

Relative:
Lower

Actual:
217 ft.

CT MANIFEST:

Waste:
Manifest No: ctf1177619
Waste Occurence: 1
UNNA: 1993
Hazard Class: 3
US Dot Description: FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.
No of Containers: 1
Container Type: TT
Quantity: 100
Weight/Volume: G
Additional Description: Not reported
Handling Code: Not reported
Date Record Was Last Modified: 9/1/2006
DEO Who Last Modified Record: JEB

STOUGHTON AUTO BODY INC (Continued) **S109758685**

Waste CD:
- Manifest No: ctf1177619
- Waste Occurence: 1
- EPA Waste Code: F003
- Recycled Waste?: F
- Date Record Was Last Modified: 9/1/2006
- DEO Who Last Modified Record: JEB

Detail:
- Year: 2005
- Manifest ID: ctf1177619
- TSDF EPA ID: CTD021816889
- TSDF Name: UNITED OIL RECOVERY, INC.
- TSDF Address: 136 GRACEY AVENUE
- TSDF City,St,Zip: MERIDEN, CT 06451
- TSDF Country: USA
- TSDF Telephone: (203)238-6745
- Transport Date: 6/2/2005
- Transporter EPA ID: NJD080631369
- Transporter Name: VEOLIA ES TECHNICAL SOLUTIONS LLC
- Transporter Country: USA
- Transporter Phone: (973)691-7321
- Trans 2 Date: Not reported
- Trans 2 EPA ID: Not reported
- Trans 2 Name: Not reported
- Trans 2 Address: Not reported
- Trans 2 City,St,Zip: CT
- Trans 2 Country: USA
- Trans 2 Phone: Not reported
- EPA ID: MAD047072913
- Generator Phone: 6173444830
- Generator Mailing Addr: 1069 WASHINGTON ST
- Generator Mailing Town: STOUGHTON
- Generator Mailing State: MA
- Generator Mailing Zip: 02072
- Generator Mailing Country: USA
- Special Handling: Not reported
- Discrepancies: Not reported
- Date Shipped: 6/2/2005
- Date Received: 6/8/2005
- Last modified date: 9/1/2006
- Last modified by: JEB
- Comments: Not reported

Waste:
- Manifest No: CTF1178134
- Waste Occurence: 1
- UNNA: 1993
- Hazard Class: 3
- US Dot Description: FLAMMABLE LIQUIDS, N.O.S.
- No of Containers: 1
- Container Type: TT
- Quantity: 110
- Weight/Volume: G
- Additional Description: Not reported

STOUGHTON AUTO BODY INC (Continued) **S109758685**

Handling Code: Not reported
Date Record Was Last Modified: 6/3/2005
DEO Who Last Modified Record: CJS

Waste CD:
Manifest No: CTF1178134
Waste Occurence: 1
EPA Waste Code: F003
Recycled Waste?: F
Date Record Was Last Modified: 6/3/2005
DEO Who Last Modified Record: CJS

Detail:
Year: 2004
Manifest ID: CTF1178134
TSDF EPA ID: CTD021816889
TSDF Name: UNITED OIL RECOVERY, INC.
TSDF Address: 14 WEST MAIN STREET
TSDF City,St,Zip: MERIDEN, CT 06451
TSDF Country: USA
TSDF Telephone: (203)238-6745
Transport Date: 11/11/2004
Transporter EPA ID: NJD080631369
Transporter Name: ONYX ENVIRONMENTAL SERVICES, L.L.C.
Transporter Country: USA
Transporter Phone: (973)691-7321
Trans 2 Date: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
Trans 2 Address: Not reported
Trans 2 City,St,Zip: CT
Trans 2 Country: USA
Trans 2 Phone: Not reported
EPA ID: MAD047072913
Generator Phone: 6173444830
Generator Mailing Addr: 1069 WASHINGTON ST
Generator Mailing Town: STOUGHTON
Generator Mailing State: MA
Generator Mailing Zip: 02072
Generator Mailing Country: USA
Special Handling: Not reported
Discrepancies: Not reported
Date Shipped: 11/11/2004
Date Received: 11/17/2004
Last modified date: 6/3/2005
Last modified by: CJS
Comments: Not reported

I48
South
1/8-1/4
0.237 mi.
1254 ft.

STOUGHTON AUTO BODY
1069 WASHINGTON ST
STOUGHTON, MA 02072

Site 3 of 3 in cluster I

MANIFEST **S109758684**
N/A

Relative:
Lower

Actual:
217 ft.

CT MANIFEST:

Waste:

Manifest No:	MAG115457
Waste Occurence:	1
UNNA:	1263
Hazard Class:	FLAMMABLE
US Dot Description:	WASTE PAINT RELATED MATERIALS
No of Containers:	001
Container Type:	TT
Quantity:	180
Weight/Volume:	G
Additional Description:	Y
Handling Code:	T01
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Waste CD:

Manifest No:	MAG115457
Waste Occurence:	1
EPA Waste Code:	D001
Recycled Waste?:	F
Date Record Was Last Modified:	4/27/2004
DEO Who Last Modified Record:	IG

Detail:

Year:	1992
Manifest ID:	MAG115457
TSDF EPA ID:	CTD072138969
TSDF Name:	ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address:	130 FREIGHT STREET
TSDF City,St,Zip:	WATERBURY, CT 06702
TSDF Country:	USA
TSDF Telephone:	Not reported
Transport Date:	9/8/1992
Transporter EPA ID:	MAD980672125
Transporter Name:	AUTO BODY SOLVENT RECOVERY CORP.
Transporter Country:	USA
Transporter Phone:	Not reported
Trans 2 Date:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
Trans 2 Address:	Not reported
Trans 2 City,St,Zip:	CT
Trans 2 Country:	USA
Trans 2 Phone:	Not reported
EPA ID:	MAD047072913
Generator Phone:	6173444830
Generator Mailing Addr:	1069 WASHINGTON ST.
Generator Mailing Town:	STOUGHTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA

STOUGHTON AUTO BODY (Continued) **S109758684**

Special Handling: Yes
Discrepancies: Not reported
Date Shipped: 9/8/1992
Date Received: 9/11/1992
Last modified date: 4/27/2004
Last modified by: IG
Comments: Not reported

Waste:
Manifest No: MAC721708
Waste Occurence: 1
UNNA: 1993
Hazard Class: FLAMMABLE
US Dot Description: WASTE FLAMMABLE LIQUID, NOS
No of Containers: 001
Container Type: TT
Quantity: 50
Weight/Volume: G
Additional Description: Y
Handling Code: T01
Date Record Was Last Modified: 4/27/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: MAC721708
Waste Occurence: 1
EPA Waste Code: D001
Recycled Waste?: F
Date Record Was Last Modified: 4/27/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1990
Manifest ID: MAC721708
TSDF EPA ID: CTD072138969
TSDF Name: ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address: 130 FREIGHT STREET
TSDF City,St,Zip: WATERBURY, CT 06702
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: 4/11/1990
Transporter EPA ID: ILD099202681
Transporter Name: CHEMICAL WASTE MANAGEMENT, INC. (TRANSPORTER)
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
Trans 2 Address: Not reported
Trans 2 City,St,Zip: CT
Trans 2 Country: USA
Trans 2 Phone: Not reported
EPA ID: MAD047072913
Generator Phone: 6173444830
Generator Mailing Addr: 1069 WASHINGTON ST.

STOUGHTON AUTO BODY (Continued) **S109758684**

Generator Mailing Town: STOUGHTON
Generator Mailing State: MA
Generator Mailing Zip: 02072
Generator Mailing Country: USA
Special Handling: Yes
Discrepancies: No
Date Shipped: 4/11/1990
Date Received: 4/16/1990
Last modified date: 4/27/2004
Last modified by: IG
Comments: Not reported

Waste:
Manifest No: CTC0244864
Waste Occurence: 1
UNNA: 1263
Hazard Class: FLAMMABLE
US Dot Description: WASTE PAINT RELATED MATERIAL, LIQUID
No of Containers: 001
Container Type: TT
Quantity: 140
Weight/Volume: G
Additional Description: Y
Handling Code: T01
Date Record Was Last Modified: 4/27/2004
DEO Who Last Modified Record: IG

Waste CD:
Manifest No: CTC0244864
Waste Occurence: 1
EPA Waste Code: D001
Recycled Waste?: F
Date Record Was Last Modified: 4/27/2004
DEO Who Last Modified Record: IG

Detail:
Year: 1989
Manifest ID: CTC0244864
TSDF EPA ID: CTD072138969
TSDF Name: ENVIRONMENTAL WASTE RESOURCES, INC.
TSDF Address: 130 FREIGHT STREET
TSDF City,St,Zip: WATERBURY, CT 06702
TSDF Country: USA
TSDF Telephone: Not reported
Transport Date: 4/14/1989
Transporter EPA ID: ILD099202681
Transporter Name: CHEMICAL WASTE MANAGEMENT, INC. (TRANSPORTER)
Transporter Country: USA
Transporter Phone: Not reported
Trans 2 Date: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
Trans 2 Address: Not reported
Trans 2 City,St,Zip: CT
Trans 2 Country: USA

STOUGHTON AUTO BODY (Continued) **S109758684**

Trans 2 Phone:	Not reported
EPA ID:	MAD047072913
Generator Phone:	6173444830
Generator Mailing Addr:	1069 WASHINGTON ST.
Generator Mailing Town:	STOUGHTON
Generator Mailing State:	MA
Generator Mailing Zip:	02072
Generator Mailing Country:	USA
Special Handling:	Yes
Discrepancies:	No
Date Shipped:	4/14/1989
Date Received:	4/18/1989
Last modified date:	4/27/2004
Last modified by:	IG
Comments:	Not reported

J49 **GETTY STATION #30327** **UST** **U003655201**
North **663 WASHINGTON ST** **AST** **N/A**
1/8-1/4 **STOUGHTON, MA 02072** **FINANCIAL ASSURANCE**
0.245 mi.
1294 ft. **Site 1 of 2 in cluster J**

Relative:
Higher

Actual:
240 ft.

UST:

Facility ID:	12677

Facility:

Owner Id:	10180
Owner:	GREEN VALLEY OIL LLC
Owner Address:	9 DEXTER RD
Owner City,St,Zip:	EAST PROVIDENCE, RI 02914
Telephone:	(800) 289-4388
Description:	Gas Station
Fire Dept. ID:	21285
Date of Inspection:	06/21/2010

Date Installed:	04/24/1982
Status Date:	Not reported
Tank ID:	1
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	1 Wall
Tank Leak Detection:	SIRA
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

Date Installed:	04/24/1982
Status Date:	Not reported
Tank ID:	2
Tank Status:	**In Use**

GETTY STATION #30327 (Continued) **U003655201**

Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	1 Wall
Tank Leak Detection:	SIRA
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

Date Installed:	04/24/1982
Status Date:	Not reported
Tank ID:	3
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	1 Wall
Tank Leak Detection:	SIRA
Pipe Material:	Reinforced
Pipe Container:	2 Walls
Pipe Leak Detection:	Product Line Leak Detector
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

AST:

Facility ID:	12677
Owner Id:	10180
Owner:	GREEN VALLEY OIL LLC
Owner Address:	9 DEXTER RD
Owner City,St,Zip:	EAST PROVIDENCE, RI 02914
Telephone:	(800) 289-4388
Description:	Gas Station
Fire Dept. ID:	21285
Date of Inspection:	5/2/2007
Inspector:	George Nice
Overfill Prevention:	1
Spill Prevention:	1

Tank Info:

Facility ID:	12677
Tank ID:	4
Serial Number:	Not reported
Aboveground:	Yes
Capacity:	245
Contents:	Waste Oil
Tank Status:	In Use
Tank Use:	Other
Tank Material:	Steel
Tank Construction:	2 Walls
Tank Leak Detection:	Not reported
Pipe Material:	Steel
Pipe Construction:	1 Wall

GETTY STATION #30327 (Continued) **U003655201**

Pipe Leak Detection: Not reported

MA FINANCIAL ASSURANCE 2:
Facility Id: 12677
Description: Gas Station
Work Phone: (800) 289-4388

J50 **STOUGHTON AUTOMOTIVE CORP** **RCRA-NonGen** **1000424929**
North **663 WASHINGTON ST** **FINDS** **MAD981887763**
1/8-1/4 **STOUGHTON, MA 02072** **SHWS**
0.245 mi. **LUST**
1294 ft. **Site 2 of 2 in cluster J** **RELEASE**

Relative: Higher

Actual: 240 ft.

RCRA-NonGen:
Date form received by agency: 12/05/1986
Facility name: STOUGHTON AUTOMOTIVE CORP
Facility address: 663 WASHINGTON ST
STOUGHTON, MA 02072
EPA ID: MAD981887763
Contact: ONEIL GERALD
Contact address: 663 WASHINGTON ST
STOUGHTON, MA 02072
Contact country: US
Contact telephone: (617) 344-8906
Contact email: Not reported
EPA Region: 01
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: STOUGHTON AUTOMOTIVE CORP
Owner/operator address: 663 WASHINGTON ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 11/29/1990
Owner/Op end date: 07/01/1999

Owner/operator name: STOUGHTON AUTOMOTIVE CORP
Owner/operator address: 663 WASHINGTON ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code: D001

Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003470404

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

SHWS:

Facility ID:	4-0010742
Release Town:	STOUGHTON
Notification Date:	9/7/1994
Category:	72 HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	6/1/1998
Phase:	PHASE III
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	WASTE OIL
Quantity:	200 parts per million

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Location:
Location Type: COMMERCIAL

Source:
Source Type: CAP
Source Type: UST

Action:
Action Type: An activity type that is related to an Audit
Action Stat: FOLCD
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 6/1/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 4/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 9/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 9/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Action Date: 12/15/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/29/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/12/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/15/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/26/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 9/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 9/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Action Type:	RLFA
Action Stat:	FLDRAN
Action Date:	8/4/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	7/11/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	6/1/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	An activity type that is related to an Audit
Action Stat:	NOA
Action Date:	7/26/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	9/7/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	8/21/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	8/23/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	9/7/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

LUST:

Facility:

Facility ID:	4-0010742
Current Status:	**Response Action Outcome**
Status Date:	6/1/1998
Source Type:	UST
Release Town:	STOUGHTON

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Notification Date: 9/7/1994
Category: 72 HR
Associated ID: Not reported
Phase: PHASE III
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: WASTE OIL
Quantity: 200 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: CAP
Source Type: UST

Action:
Action Type: An activity type that is related to an Audit
Action Stat: FOLCD
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 6/1/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 4/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 9/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 9/11/1995

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/15/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/29/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/12/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/15/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/26/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 9/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 9/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 8/4/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 7/11/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/1/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 7/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 9/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/21/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 8/23/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/7/1994

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0010742
Primary ID: Not reported
Official City: STOUGHTON
Notification: 9/7/1994
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 6/1/1998
Phase: PHASE III
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: An activity type that is related to an Audit
Action Stat: FOLCD
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/9/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 6/1/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 4/2/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 9/7/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 9/11/1995

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/8/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/15/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/29/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/12/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/15/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Level III - Comprehensive Audit
Action Date: 12/2/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/26/1996
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	9/11/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	9/11/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDRAN
Action Date:	8/4/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	7/11/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	6/1/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	An activity type that is related to an Audit
Action Stat:	NOA
Action Date:	7/26/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	9/7/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	8/21/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	8/23/1996
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	9/7/1994

STOUGHTON AUTOMOTIVE CORP (Continued) **1000424929**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: WASTE OIL
Quantity: 200 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: CAP
Source Type: UST

K51 **NO LOCATION AID** **SHWS S100829741**
North **645 WASHINGTON ST** **LUST N/A**
1/4-1/2 **STOUGHTON, MA 02072** **RELEASE**
0.304 mi. **INST CONTROL**
1603 ft. **Site 1 of 2 in cluster K**

Relative: Higher

Actual: 240 ft.

SHWS:
Facility ID: 4-0000237
Release Town: STOUGHTON
Notification Date: 1/15/1987
Category: NONE
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 11/30/2010
Phase: PHASE IV
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: PIPE

Action:
Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/14/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 10/5/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/5/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 6/12/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/31/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 2/2/2012
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 9/19/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: RMRINI
Action Date: 3/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 9/19/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 3/23/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 9/28/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action

NO LOCATION AID (Continued) **S100829741**

Action Stat: Notice of Non-Compliance Issued
Action Date: 1/8/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/14/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 2/27/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 3/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/14/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 4/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: RMRINI
Action Date: 10/5/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 5/25/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 12/13/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/30/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Revised Statement or Transmittal Received
Action Date: 2/19/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 1/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Status or Interim Report Received
Action Date: 11/30/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/11/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/11/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 12/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure

NO LOCATION AID (Continued) **S100829741**

Action Stat: Completion Statement Received
Action Date: 5/17/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/12/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Level I - Technical Screen Audit
Action Date: 9/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/21/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Amendment Received or Issued
Action Date: 8/27/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Action Status or AUL Terminated
Action Date: 10/3/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Level I - Technical Screen Audit
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 9/1/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 12/1/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/7/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: RMRFIN
Action Date: 4/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 10/12/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 12/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: RAOEQ
Action Date: 8/8/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4

NO LOCATION AID (Continued) **S100829741**

Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 6/8/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 12/1/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Facility ID: 4-0018789
Release Town: STOUGHTON
Notification Date: 11/4/2004
Category: 120 DY
Associated ID: Not reported
Current Status: **Response Action Outcome Not Required**
Status Date: 8/31/2005
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 12700 parts per billion
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 9900 parts per billion
Chemical: C9 THRU C12 ALIPHATIC HYDROCARBONS
Quantity: 31000 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 8/31/2005
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/4/2004
Response Action Outcome: Not reported

NO LOCATION AID (Continued) **S100829741**

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/4/2004
Response Action Outcome: Not reported

LUST:

Facility:
Facility ID: 4-0018460
Current Status: **Response Action Outcome**
Status Date: 10/18/2004
Source Type: UST
Release Town: STOUGHTON
Notification Date: 6/3/2004
Category: 120 DY
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: C11 THRU C22 AROMATIC HYDROCARBONS
Quantity: 31000 parts per billion
Chemical: C19 THRU C36 ALIPHATIC HYDROCARBONS
Quantity: 49000 parts per billion
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 260 parts per million
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 1400 parts per million
Chemical: C9 THRU C18 ALIPHATIC HYDROCARBONS
Quantity: 69000 parts per billion
Chemical: NAPTHALENE
Quantity: 40 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 10/18/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Release:
Facility ID: 4-0000237
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/15/1987
Category: NONE
Current Status: Response Action Outcome
Status Date: 11/30/2010
Phase: PHASE IV
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Not reported

Action:
Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/14/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 10/5/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/5/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 6/12/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/31/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 2/2/2012
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 9/19/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: RMRINI
Action Date: 3/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 9/19/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 3/23/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 9/28/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 1/8/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/14/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 2/27/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 3/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3

NO LOCATION AID (Continued) **S100829741**

Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/14/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 4/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: RMRINI
Action Date: 10/5/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 5/25/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 12/13/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/30/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Revised Statement or Transmittal Received
Action Date: 2/19/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 1/13/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Status or Interim Report Received
Action Date: 11/30/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/11/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/11/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 12/3/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/17/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/12/1997
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation

NO LOCATION AID (Continued) **S100829741**

Action Stat: Level I - Technical Screen Audit
Action Date: 9/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/21/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Amendment Received or Issued
Action Date: 8/27/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Action Status or AUL Terminated
Action Date: 10/3/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Activity and Use Limitation
Action Stat: Level I - Technical Screen Audit
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 9/1/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 12/1/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/7/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: RMRFIN
Action Date: 4/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 10/12/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

NO LOCATION AID (Continued) **S100829741**

reduced to background.

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 12/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: RAOEQ
Action Date: 8/8/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 8/31/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 8/26/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 6/8/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 12/1/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S100829741**

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: PIPE

Facility ID: 4-0018460
Primary ID: Not reported
Official City: STOUGHTON
Notification: 6/3/2004
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 10/18/2004
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 10/18/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: C11 THRU C22 AROMATIC HYDROCARBONS
Quantity: 31000 parts per billion
Chemical: C19 THRU C36 ALIPHATIC HYDROCARBONS
Quantity: 49000 parts per billion
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 260 parts per million
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 1400 parts per million
Chemical: C9 THRU C18 ALIPHATIC HYDROCARBONS
Quantity: 69000 parts per billion
Chemical: NAPTHALENE
Quantity: 40 parts per million

Location:
Location Type: COMMERCIAL

NO LOCATION AID (Continued) **S100829741**

Source:
Source Type: UST

Facility ID: 4-0018789
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/4/2004
Category: 120 DY
Current Status: Response Action Outcome Not Required
Status Date: 8/31/2005
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 8/31/2005
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/4/2004
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/4/2004
Response Action Outcome: Not reported

Chemical:
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 12700 parts per billion
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 9900 parts per billion
Chemical: C9 THRU C12 ALIPHATIC HYDROCARBONS
Quantity: 31000 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: Not reported

INST CONTROL:
Release Tracking Number: 4-0000237
Action Type: AUL
Action Stat: AMEND
Action Date: 8/27/2003
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.

Release Tracking Number: 4-0000237
Action Type: AUL
Action Stat: RECPT
Action Date: 1/13/1997
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not

NO LOCATION AID (Continued) **S100829741**

been reduced to background.

Release Tracking Number: 4-0000237
Action Type: AUL
Action Stat: TERMIN
Action Date: 10/3/2005
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.

Release Tracking Number: 4-0000237
Action Type: AUL
Action Stat: TSAUD
Action Date: 9/19/2001
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.

Release Tracking Number: 4-0000237
Action Type: AUL
Action Stat: TSAUD
Action Date: 10/24/2001
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.

52
NW
1/4-1/2
0.307 mi.
1622 ft.

KELLEY BROS CONSTRUCTION CORP **SHWS** **U003000200**
118 CUSHING ST **UST** **N/A**
STOUGHTON, MA 02072 **RELEASE**
FINANCIAL ASSURANCE

Relative:
Lower

Actual:
222 ft.

SHWS:
Facility ID: 4-0000684
Release Town: STOUGHTON
Notification Date: 4/15/1989
Category: NONE
Associated ID: Not reported
Current Status: **No Further Action (DEP Determined)**
Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 4/15/1989
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: DEPNFA
Action Date: 8/2/1996

KELLEY BROS CONSTRUCTION CORP (Continued) **U003000200**

Response Action Outcome: Not reported

UST:
Facility ID: 12651

Facility:
Owner Id: 3685
Owner: KENNETH KELLEY
Owner Address: 25 WALNUT ST
Owner City,St,Zip: STOUGHTON, MA 02072
Telephone: Not reported
Description: Contractor
Fire Dept. ID: 21285
Date of Inspection: Not reported

Date Installed: 05/06/1966
Status Date: Not reported
Tank ID: 1
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Steel
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 3000
Contents: Gasoline

Date Installed: 05/06/1966
Status Date: Not reported
Tank ID: 2
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Steel
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 3000
Contents: Diesel

Release:
Facility ID: 4-0000684
Primary ID: Not reported
Official City: STOUGHTON
Notification: 4/15/1989
Category: NONE
Current Status: DEP No Further Action

KELLEY BROS CONSTRUCTION CORP (Continued) **U003000200**

Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 4/15/1989
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: DEPNFA
Action Date: 8/2/1996
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: Not reported

MA FINANCIAL ASSURANCE 2:
Facility Id: 12651
Description: Contractor
Work Phone: Not reported

K53 **MUTUAL OIL CO INC #37** **LUST** **U004014119**
North **608 WASHINGTON ST** **UST** **N/A**
1/4-1/2 **STOUGHTON, MA 02072** **RELEASE**
0.340 mi. **FINANCIAL ASSURANCE**
1795 ft. **Site 2 of 2 in cluster K**

Relative: Higher

Actual: 240 ft.

LUST:

Facility:
Facility ID: 4-0000468
Current Status: **Response Action Outcome**
Status Date: 3/23/1995
Source Type: UST
Release Town: STOUGHTON
Notification Date: 11/9/1987
Category: NONE
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: GASSTATION

MUTUAL OIL CO INC #37 (Continued) **U004014119**

Source:
Source Type: UST

Action:
Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/13/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/21/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVACC
Action Date: 12/13/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 4/16/1991
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 8/2/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/9/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVREC
Action Date: 4/18/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/21/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/23/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

MUTUAL OIL CO INC #37 (Continued) **U004014119**

Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	11/9/1987
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	TREGS
Action Stat:	WAVSIG
Action Date:	11/30/1989
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	3/23/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	12/13/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

UST:

Facility ID:	12671

Facility:

Owner Id:	4635
Owner:	MUTUAL OIL CO INC
Owner Address:	PO BOX 250
Owner City,St,Zip:	BROCKTON, MA 02303
Telephone:	(508) 583-5777
Description:	Gas Station
Fire Dept. ID:	21285
Date of Inspection:	Not reported

Date Installed:	04/30/1982
Status Date:	Not reported
Tank ID:	1
Tank Status:	**Removed**
Tank Useage:	Marina
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Steel
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	4000
Contents:	Gasoline

Date Installed:	05/01/1979

MUTUAL OIL CO INC #37 (Continued) **U004014119**

Status Date: Not reported
Tank ID: 2
Tank Status: Removed
Tank Useage: Marina
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Steel
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 4000
Contents: Gasoline

Date Installed: 04/30/1966
Status Date: Not reported
Tank ID: 3
Tank Status: Removed
Tank Useage: Marina
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Steel
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 4000
Contents: Gasoline

Release:
Facility ID: 4-0000468
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/9/1987
Category: NONE
Current Status: Response Action Outcome
Status Date: 3/23/1995
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Not reported

Action:
Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/13/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 11/21/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

MUTUAL OIL CO INC #37 (Continued) **U004014119**

Action Type: TREGS
Action Stat: WAVACC
Action Date: 12/13/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 4/16/1991
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 8/2/1990
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/9/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVREC
Action Date: 4/18/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/21/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/23/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 11/9/1987
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: TREGS
Action Stat: WAVSIG
Action Date: 11/30/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 3/23/1995

MUTUAL OIL CO INC #37 (Continued) **U004014119**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 12/13/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: GASSTATION

Source:
Source Type: UST

MA FINANCIAL ASSURANCE 2:
Facility Id: 12671
Description: Gas Station
Work Phone: (508) 583-5777

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54 **CENTRAL AUTO SALVAGE** **SHWS** **S101041488**
South **1152 WASHINGTON ST** **RELEASE** **N/A**
1/4-1/2 **STOUGHTON, MA 02072** **SPILLS**
0.394 mi.
2080 ft.

Relative:
Lower

Actual:
216 ft.

SHWS:
Facility ID: 4-0001154
Release Town: STOUGHTON
Notification Date: 3/26/1992
Category: NONE
Associated ID: Not reported
Current Status: **Tier 1C, a site/release receiving a total NRS score of less than 450 and equal to or greater than 350. A site/release receiving a total NRS score of less than 350, but which also meets any of the Tier 1 Inclusionary Criteria specified in 310 CMR 40.0520(2)(a), is also classified a Tier 1C. These sites/releases require a permit and the response actions may be performed under the supervision of a Licensed Site Professional(LSP) without prior DEP approval, unless such an approval is specifically required by DEP.**
Status Date: 5/19/2000
Phase: PHASE IV
Response Action Outcome: -
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN CHEMICAL OF UNKNOWN TYPE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: Not reported

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Action:

Action Type:	FTLI
Action Stat:	APPREC
Action Date:	7/30/2010
Response Action Outcome:	Not reported

Action Type:	FTLI
Action Stat:	APPREC
Action Date:	8/1/2008
Response Action Outcome:	Not reported

Action Type:	Phase 3
Action Stat:	Completion Statement Received
Action Date:	3/1/2004
Response Action Outcome:	Not reported

Action Type:	FTLI
Action Stat:	APPACC
Action Date:	9/8/2010
Response Action Outcome:	Not reported

Action Type:	FTLI
Action Stat:	APPACC
Action Date:	12/11/2007
Response Action Outcome:	Not reported

Action Type:	TREGS
Action Stat:	LSPFA
Action Date:	5/19/2000
Response Action Outcome:	Not reported

Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Enforcement Conference
Action Date:	6/14/2007
Response Action Outcome:	Not reported

Action Type:	Phase 2
Action Stat:	Completion Statement Received
Action Date:	10/30/2003
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	Permit Effective Date
Action Date:	12/13/2000
Response Action Outcome:	Not reported

Action Type:	FTLI
Action Stat:	APPACC
Action Date:	9/5/2008
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	5/19/2000
Response Action Outcome:	Not reported

Action Type: FTLI

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Action Stat: APPREC
Action Date: 8/17/2009
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: ACO
Action Date: 12/8/2003
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 7/29/2003
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 8/30/2011
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 10/21/2009
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 6/29/2007
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 8/2/2011
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 5/19/2000
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 5/3/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 3/26/1992
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: PREAPP
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 4/19/2000

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/26/1992
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 5/19/2000
Response Action Outcome: Not reported

Release:
Facility ID: 4-0001154
Primary ID: Not reported
Official City: STOUGHTON
Notification: 3/26/1992
Category: NONE
Current Status: TIER1C
Status Date: 5/19/2000
Phase: PHASE IV
Response Action Outcome: -
Oil / Haz Material Type: Not reported

Action:
Action Type: FTLI
Action Stat: APPREC
Action Date: 7/30/2010
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 8/1/2008
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 3/1/2004
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 9/8/2010
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 12/11/2007
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPFA
Action Date: 5/19/2000
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Action Stat: Notice of Enforcement Conference
Action Date: 6/14/2007
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 10/30/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 12/13/2000
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 9/5/2008
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/19/2000
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 8/17/2009
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: ACO
Action Date: 12/8/2003
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 7/29/2003
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 8/30/2011
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPACC
Action Date: 10/21/2009
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 6/29/2007
Response Action Outcome: Not reported

Action Type: FTLI
Action Stat: APPREC
Action Date: 8/2/2011

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 5/19/2000
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 5/3/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 3/26/1992
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: PREAPP
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 4/19/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 3/26/1992
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 5/19/2000
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN CHEMICAL OF UNKNOWN TYPE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: Not reported

MA Spills:

Facility ID:	0000	Spill ID:	S92-0080
Staff Lead:	BRENNAN, S	Date Entered:	Not reported
Last Entered:	19920304	First Response:	Not reported
Spill Date:	Not reported	Spill Time:	Not reported
Report Date:	19920214	Report Time:	09:05AM
Case Closed:	YES	Mat Type:	UNKNOWN
Virgin Waste:	WASTE	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	UNKNOWN	Other Material:	UNKNOWN

CENTRAL AUTO SALVAGE (Continued) **S101041488**

Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	----------	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	----------
Source:	DRUM	Other Source:	Not reported
Incident:	DUMPING	Other Incdnt:	Not reported
Cleanup Type:	---	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	JOSEPH CRONIN/ABBUTTER		
Notif Tel:	Not reported		
Days/Close:	1		

L55 **CENTRAL ST** **SHWS** **S102555591**
NNW **232 PEARL ST** **LUST** **N/A**
1/4-1/2 **STOUGHTON, MA 02072** **RELEASE**
0.404 mi.
2134 ft. **Site 1 of 2 in cluster L**

Relative: Higher

Actual: 227 ft.

SHWS:

Facility ID:	4-0012778
Release Town:	STOUGHTON
Notification Date:	1/14/1997
Category:	120 DY
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	1/14/1997
Phase:	Not reported
Response Action Outcome:	B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	BENZO(A)ANTHRACENE
Quantity:	740 parts per billion
Chemical:	BENZ[E]ACEPHENANTHRYLENE
Quantity:	800 parts per billion

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/14/1997
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/14/1997
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	1/14/1997
Response Action Outcome:	Remedial actions have not been conducted because a level of No

CENTRAL ST (Continued) **S102555591**

Significant Risk exists.

LUST:

Facility:

Facility ID:	4-0000548
Current Status:	**DEPNFA**
Status Date:	8/6/1996
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	4/20/1988
Category:	NONE
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Not reported

Chemical:

Chemical:	UNKNOWN
Quantity:	Not reported

Location:

Location Type:	SCHOOL

Source:

Source Type:	UST

Action:

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	4/20/1988
Response Action Outcome:	Not reported

Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	4/20/1988
Response Action Outcome:	Not reported

Action Type:	TREGS
Action Stat:	DEPNFA
Action Date:	8/6/1996
Response Action Outcome:	Not reported

Release:

Facility ID:	4-0000548
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	4/20/1988
Category:	NONE
Current Status:	DEP No Further Action
Status Date:	8/6/1996
Phase:	Not reported
Response Action Outcome:	-
Oil / Haz Material Type:	Not reported

Action:

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)

CENTRAL ST (Continued) **S102555591**

Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/20/1988
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 4/20/1988
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: DEPNFA
Action Date: 8/6/1996
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: SCHOOL

Source:
Source Type: UST

Facility ID: 4-0012778
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/14/1997
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 1/14/1997
Phase: Not reported
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/14/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/14/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 1/14/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Chemical:
Chemical: BENZO(A)ANTHRACENE
Quantity: 740 parts per billion

CENTRAL ST (Continued) **S102555591**

Chemical: BENZ[E]ACEPHENANTHRYLENE
Quantity: 800 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: Not reported

L56 **NO LOCATION AID** **SHWS** **S107517237**
NNW **223 PEARL ST** **RELEASE** **N/A**
1/4-1/2 **STOUGHTON, MA 02072**
0.406 mi.
2144 ft. **Site 2 of 2 in cluster L**

Relative: Higher

Actual: 227 ft.

SHWS:
Facility ID: 4-0019502
Release Town: STOUGHTON
Notification Date: 11/28/2005
Category: 120 DY
Associated ID: Not reported
Current Status: **Downgradient Property Status**
Status Date: 2/17/2006
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: 1,1-DICHLOROETHANE
Quantity: .0511 parts per million
Chemical: TRICHLOROETHENE
Quantity: .398 parts per million
Chemical: VINYL CHLORIDE
Quantity: .0471 parts per million

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/28/2005
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 2/21/2006
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/17/2006
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/28/2005
Response Action Outcome: Not reported

NO LOCATION AID (Continued) **S107517237**

Release:
- Facility ID: 4-0019502
- Primary ID: Not reported
- Official City: STOUGHTON
- Notification: 11/28/2005
- Category: 120 DY
- Current Status: Downgradient Property Status
- Status Date: 2/17/2006
- Phase: Not reported
- Response Action Outcome: -
- Oil / Haz Material Type: Hazardous Material

Action:
- Action Type: RNF
- Action Stat: Reportable Release under MGL 21E
- Action Date: 11/28/2005
- Response Action Outcome: Not reported

- Action Type: Downgradient Property Status
- Action Stat: Fee Received - FMCRA Use Only
- Action Date: 2/21/2006
- Response Action Outcome: Not reported

- Action Type: Downgradient Property Status
- Action Stat: Transmittal, Notice, or Notification Received
- Action Date: 2/17/2006
- Response Action Outcome: Not reported

- Action Type: Release Disposition
- Action Stat: Reportable Release under MGL 21E
- Action Date: 11/28/2005
- Response Action Outcome: Not reported

Chemical:
- Chemical: 1,1-DICHLOROETHANE
- Quantity: .0511 parts per million
- Chemical: TRICHLOROETHENE
- Quantity: .398 parts per million
- Chemical: VINYL CHLORIDE
- Quantity: .0471 parts per million

Location:
- Location Type: Not reported

Source:
- Source Type: Not reported

M57 **FORMER GROSSMAN'S** **LUST** **S110822305**
South **1202-1214 WASHINGTON STREET** **RELEASE** **N/A**
1/4-1/2 **STOUGHTON, MA**
0.485 mi.
2561 ft. **Site 1 of 2 in cluster M**

Relative:
Lower

Actual:
210 ft.

LUST:

Facility:
- Facility ID: 4-0023118
- **Current Status:** **Response Action Outcome**
- Status Date: 6/8/2011

FORMER GROSSMAN'S (Continued) **S110822305**

Source Type: UST
Release Town: STOUGHTON
Notification Date: 2/14/2011
Category: 72 HR
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material: Oil

Chemical:
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: 100 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 2/14/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: BOL
Action Stat: SHPFAC
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 5/16/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: BOL
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/17/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received

FORMER GROSSMAN'S (Continued) **S110822305**

Action Date: 6/8/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 4/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/8/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/14/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 1/10/2012
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNFE
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0023118
Primary ID: Not reported
Official City: STOUGHTON
Notification: 2/14/2011
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 6/8/2011
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 2/14/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Written Plan Received

FORMER GROSSMAN'S (Continued) **S110822305**

Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: BOL
Action Stat: SHPFAC
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 5/16/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: BOL
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/17/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 6/8/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 4/26/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/8/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/14/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 1/10/2012
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

FORMER GROSSMAN'S (Continued) **S110822305**

Action Type: RNFE
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: 100 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

N58 **NEW STOUGHTON SQUARE** **SHWS** **S100829742**
North **521-525 WASHINGTON ST** **RELEASE** **N/A**
1/4-1/2 **STOUGHTON, MA 02072**
0.488 mi.
2574 ft. **Site 1 of 2 in cluster N**

Relative: Higher

Actual: 241 ft.

SHWS:
Facility ID: 4-0001274
Release Town: STOUGHTON
Notification Date: 7/15/1993
Category: NONE
Associated ID: Not reported
Current Status: **LSP No Further Action**
Status Date: 3/20/1995
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: OFFSITE

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/16/1994
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPNFA
Action Date: 3/20/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/15/1993
Response Action Outcome: Not reported

NEW STOUGHTON SQUARE (Continued) **S100829742**

Release:
- Facility ID: 4-0001274
- Primary ID: Not reported
- Official City: STOUGHTON
- Notification: 7/15/1993
- Category: NONE
- Current Status: LSP Opinion,No Further Action
- Status Date: 3/20/1995
- Phase: Not reported
- Response Action Outcome: -
- Oil / Haz Material Type: Not reported

Action:
- Action Type: A Notice sent to a Potentially Responsible Party (PRP)
- Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
- Action Date: 5/16/1994
- Response Action Outcome: Not reported

- Action Type: TREGS
- Action Stat: LSPNFA
- Action Date: 3/20/1995
- Response Action Outcome: Not reported

- Action Type: Release Disposition
- Action Stat: Valid Transition Site
- Action Date: 7/15/1993
- Response Action Outcome: Not reported

Chemical:
- Chemical: UNKNOWN
- Quantity: Not reported

Location:
- Location Type: COMMERCIAL

Source:
- Source Type: OFFSITE

M59 **ASHMOUNT DISCOUNT** **SHWS** **S101038945**
South **1204 WASHINGTON ST** **RELEASE** **N/A**
1/4-1/2 **STOUGHTON, MA 02072** **SPILLS**
0.488 mi.
2575 ft. **Site 2 of 2 in cluster M**

Relative:
Lower

Actual:
210 ft.

SHWS:
- Facility ID: 4-0001351
- Release Town: STOUGHTON
- Notification Date: 10/1/1993
- Category: NONE
- Associated ID: Not reported
- **Current Status:** **No Further Action (DEP Determined)**
- Status Date: 8/2/1997
- Phase: Not reported
- Response Action Outcome: -
- Oil Or Haz Material: Not reported

Chemical:
- Chemical: UNKNOWN
- Quantity: Not reported

ASHMOUNT DISCOUNT (Continued) **S101038945**

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 10/1/1993
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: DEPNFA
Action Date: 8/2/1997
Response Action Outcome: Not reported

Release:
Facility ID: 4-0001351
Primary ID: Not reported
Official City: STOUGHTON
Notification: 10/1/1993
Category: NONE
Current Status: DEP No Further Action
Status Date: 8/2/1997
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 10/1/1993
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: DEPNFA
Action Date: 8/2/1997
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: Not reported

MA Spills:

Facility ID:	0000	Spill ID:	S91-0510
Staff Lead:	PACKARD, R	Date Entered:	19920302
Last Entered:	19920302	First Response:	19910822
Spill Date:	19910822	Spill Time:	Not reported
Report Date:	19910822	Report Time:	03:03PM
Case Closed:	YES	Mat Type:	HAZARDOUS

ASHMOUNT DISCOUNT (Continued) **S101038945**

Virgin Waste:	WASTE	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	CHLORINE	Other Material:	Not reported
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	----------	Qty Actual:	----------
CAS No:	07782-50-5	PCB Lev (ppm):	NONE
Source:	DRUM	Other Source:	Not reported
Incident:	----------	Other Incdnt:	Not reported
Cleanup Type:	---	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	DEP CHIEF FOWLER		
Notif Tel:	Not reported		
Days/Close:	1		

O60 **CUMBERLAND FARMS 2001** **LUST** **1004286665**
ESE **309 PARK ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.528 mi.
2788 ft. **Site 1 of 3 in cluster O**

Relative:
Higher

Actual:
253 ft.

LUST:

Facility:

Facility ID:	4-0000797
Current Status:	**A site where Remedy Operation Status has been terminated.**
Status Date:	5/18/2010
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	9/22/1989
Category:	NONE
Associated ID:	4-0000797
Phase:	PHASE V
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported

Location:

Location Type:	COMMERCIAL
Location Type:	GASSTATION

Source:

Source Type:	UST

Action:

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/22/1989
Response Action Outcome:	Not reported
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	8/10/1999
Response Action Outcome:	Not reported
Action Type:	Phase 5
Action Stat:	Inspection and Monitoring Report Received

CUMBERLAND FARMS 2001 (Continued) **1004286665**

Action Date: 2/27/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 9/22/1989
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 2/14/1992
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/23/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Enforcement Conference
Action Date: 1/26/2000
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Action Status or AUL Terminated
Action Date: 5/18/2010
Response Action Outcome: Not reported

CUMBERLAND FARMS 2001 (Continued) **1004286665**

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 7/22/2002
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 11/1/1996
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 12/16/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 12/16/2002
Response Action Outcome: Not reported

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 2/14/1992
Response Action Outcome: Not reported

Release:
Facility ID: 4-0000797
Primary ID: 4-0000797
Official City: STOUGHTON
Notification: 9/22/1989
Category: NONE
Current Status: ROSTRM
Status Date: 5/18/2010
Phase: PHASE V
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/22/1989

CUMBERLAND FARMS 2001 (Continued) **1004286665**

Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 8/10/1999
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 2/27/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 9/22/1989
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 2/14/1992
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 6/23/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Enforcement Conference
Action Date: 1/26/2000
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

CUMBERLAND FARMS 2001 (Continued) **1004286665**

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Action Status or AUL Terminated
Action Date: 5/18/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 7/22/2002
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 11/1/1996
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 12/16/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 12/16/2002
Response Action Outcome: Not reported

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/11/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 2/14/1992
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: GASSTATION

CUMBERLAND FARMS 2001 (Continued) **1004286665**

Source:
Source Type: UST

O61 **NO LOCATION AID** **SHWS** **S105200610**
ESE **309 PARK ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.528 mi.
2788 ft. **Site 2 of 3 in cluster O**

Relative: Higher

Actual: 253 ft.

SHWS:
Facility ID: 4-0016542
Release Town: STOUGHTON
Notification Date: 9/3/2001
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 11/9/2001
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: 8 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: PIPE

Action:
Action Type: Release Abatement Measure
Action Stat: RMRINI
Action Date: 9/5/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/9/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/9/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 9/3/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit

NO LOCATION AID (Continued) **S105200610**

Action Date: 6/8/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Release or TOR Less than Reporting Requirement
Action Date: 9/3/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0016542
Primary ID: Not reported
Official City: STOUGHTON
Notification: 9/3/2001
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 11/9/2001
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Release Abatement Measure
Action Stat: RMRINI
Action Date: 9/5/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/9/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/9/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 9/3/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 6/8/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Release or TOR Less than Reporting Requirement

NO LOCATION AID (Continued) **S105200610**

Action Date: 9/3/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: GASOLINE
Quantity: 8 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: PIPE

N62 North 1/2-1 0.528 mi. 2790 ft. **CUMBERLAND FARMS** **SHWS S105039546**
499 WASHINGTON ST **LUST N/A**
STOUGHTON, MA 02072 **RELEASE**

Site 2 of 2 in cluster N

Relative: Higher

Actual: 241 ft.

SHWS:
Facility ID: 4-0013877
Release Town: STOUGHTON
Notification Date: 5/16/1998
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 2/24/1999
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: 10 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: Not reported

Action:
Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 2/1/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced

CUMBERLAND FARMS (Continued) **S105039546**

to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/16/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/27/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/16/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 2/25/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Facility ID: 4-0015547
Release Town: STOUGHTON
Notification Date: 6/16/2000
Category: 72 HR
Associated ID: 4-0010492
Current Status: **Response Action Outcome Not Required**
Status Date: 10/20/2000
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: 2 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

CUMBERLAND FARMS (Continued) **S105039546**

Source Type: UST

Action:

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/16/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/7/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/28/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/20/2000
Response Action Outcome: Not reported

CUMBERLAND FARMS (Continued) **S105039546**

LUST:

Facility:

Facility ID:	4-0010492
Current Status:	**Response Action Outcome**
Status Date:	6/27/2003
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	5/20/1994
Category:	72 HR
Associated ID:	4-0010492
Phase:	PHASE V
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil and Hazardous Material

Chemical:

Chemical:	BENZENE
Quantity:	302 parts per million
Chemical:	GASOLINE
Quantity:	302 parts per million

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	UST

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	5/21/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	Remedy Operation Status Submittal Received
Action Date:	4/4/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	7/25/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	8/29/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	8/29/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

CUMBERLAND FARMS (Continued) **S105039546**

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 3/6/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 5/6/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 9/4/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/28/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 5/24/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/11/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/27/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/20/1994

CUMBERLAND FARMS (Continued) **S105039546**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/23/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 4/12/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/10/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 9/14/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 3/7/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 5/29/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 1/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

CUMBERLAND FARMS (Continued) **S105039546**

Action Type:	Tier Classification
Action Stat:	RTN Linked to TCLASS Via Tier Classification Submittal
Action Date:	10/20/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	8/29/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	3/23/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Immediate Response Action
Action Stat:	Imminent Hazard Evaluation Received
Action Date:	10/14/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Phase 2
Action Stat:	Completion Statement Received
Action Date:	12/18/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	8/22/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Facility:

Facility ID:	4-0015547
Current Status:	**Response Action Outcome Not Required**
Status Date:	10/20/2000
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	6/16/2000
Category:	72 HR
Associated ID:	4-0010492
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	2 inches

Location:

Location Type:	COMMERCIAL

Source:

CUMBERLAND FARMS (Continued) **S105039546**

Source Type: UNKNOWN
Source Type: UST

Action:
Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/16/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/7/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/28/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/20/2000
Response Action Outcome: Not reported

CUMBERLAND FARMS (Continued) **S105039546**

Release:

Facility ID:	4-0010492
Primary ID:	4-0010492
Official City:	STOUGHTON
Notification:	5/20/1994
Category:	72 HR
Current Status:	Response Action Outcome
Status Date:	6/27/2003
Phase:	PHASE V
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type:	Oil and Hazardous Material

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	5/21/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	Remedy Operation Status Submittal Received
Action Date:	4/4/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	7/25/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	8/29/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	8/29/1995
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	Remedy Operation Status Submittal Received
Action Date:	3/6/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	5/6/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 4

CUMBERLAND FARMS (Continued) **S105039546**

Action Stat: Completion Statement Received
Action Date: 9/4/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/28/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 5/24/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/11/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 6/27/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/20/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/23/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 4/12/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

CUMBERLAND FARMS (Continued) **S105039546**

reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 9/10/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 9/14/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/18/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 3/7/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 5/29/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 1/24/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/20/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/29/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action

CUMBERLAND FARMS (Continued) **S105039546**

Action Stat: Completion Statement Received
Action Date: 3/23/1995
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 10/14/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 12/18/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/22/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: BENZENE
Quantity: 302 parts per million
Chemical: GASOLINE
Quantity: 302 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Facility ID: 4-0013877
Primary ID: Not reported
Official City: STOUGHTON
Notification: 5/16/1998
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 2/24/1999
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced

CUMBERLAND FARMS (Continued) **S105039546**

to background or a threat of release has been eliminated.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 2/1/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 1/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/16/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 2/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/27/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/16/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 2/25/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: GASOLINE
Quantity: 10 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: Not reported

Facility ID: 4-0015547
Primary ID: 4-0010492
Official City: STOUGHTON
Notification: 6/16/2000

CUMBERLAND FARMS (Continued) **S105039546**

Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 10/20/2000
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/20/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/16/2000
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/7/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 2/28/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/21/2000
Response Action Outcome: Not reported

CUMBERLAND FARMS (Continued) **S105039546**

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 10/20/2000
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: 2 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN
Source Type: UST

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63 NW 1/2-1 0.535 mi. 2825 ft.

Relative: Lower

Actual: 213 ft.

BROOKFIELD ENGINEERING LAB INC
240 CUSHING ST
STOUGHTON, MA 02072

RCRA-CESQG FINDS SHWS MANIFEST MANIFEST RELEASE

1000333073
MAD001005115

RCRA-CESQG:
Date form received by agency: 03/01/1983
Facility name: BROOKFIELD ENGINEERING LAB INC
Facility address: 240 CUSHING ST
STOUGHTON, MA 02072
EPA ID: MAD001005115
Contact: DAVID ETHIER
Contact address: 240 CUSHING ST
STOUGHTON, MA 02072
Contact country: US
Contact telephone: (617) 344-4310
Contact email: Not reported
EPA Region: 01
Land type: Private
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: BROOKFIELD ENG LAB
Owner/operator address: 240 CUSHING ST
STOUGHTON, MA 02072
Owner/operator country: US

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/01/1990
Owner/Op end date: Not reported

Owner/operator name: BROOKFIELD ENGRING LAB INC
Owner/operator address: 240 CUSHING ST
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 10/16/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: F001
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Facility Has Received Notices of Violations:
Regulation violated: SR - 682
Area of violation: Generators - Pre-transport
Date violation determined: 09/22/1992
Date achieved compliance: 09/22/1992
Violation lead agency: State
Enforcement action: VERBAL INFORMAL
Enforcement action date: 09/22/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 05/31/1985
Date achieved compliance: 09/03/1985
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/19/1985
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 02/09/1998
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/22/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 09/22/1992
Evaluation lead agency: State

Evaluation date: 03/04/1987
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/03/1985
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/31/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 09/03/1985
Evaluation lead agency: State

FINDS:

Registry ID: 110001938574

Environmental Interest/Information System
AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer System

SHWS:

Facility ID:	4-0019807
Release Town:	STOUGHTON
Notification Date:	5/26/2006
Category:	72 HR
Associated ID:	4-0013964
Current Status:	**Response Action Outcome Not Required**
Status Date:	5/29/2007
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	UNKNOWN CHEMICAL OF TYPE - OIL
Quantity:	36 inches

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	Not reported

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	7/24/2006
Response Action Outcome:	Not reported
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	7/11/2006
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	7/24/2006
Response Action Outcome:	Not reported
Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 9/16/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/14/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/26/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/26/2006
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 6/18/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/28/2006
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 5/29/2007
Response Action Outcome: Not reported

Facility ID: 4-0013964
Release Town: STOUGHTON
Notification Date: 6/18/1998

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Category: TWO HR
Associated ID: 4-0013964
Current Status: **Tier 1B, A site/release where an NRS score of less than 550 and equal t or greater than 450. These sites/releases require a permit and the response actions may be performed under the supervision of a Licensed Site Professional (LSP) without prior DEP approval, unless such an approval is specifically required by DEP.**
Status Date: 5/21/1999
Phase: PHASE V
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: 1,1,1-TRICHLOROETHANE
Quantity: 41700 parts per billion

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/7/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/16/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/14/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/23/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/18/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/5/2008
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Stat: Completion Statement Received
Action Date: 2/26/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/20/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Level II - Audit Inspection
Action Date: 12/31/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 12/29/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/6/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/9/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/5/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/24/1999

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: As-Built Construction Report Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/9/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 4/18/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/16/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 7/14/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 9/28/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 10/27/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/23/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: RMRINT
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/8/1999
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 8/18/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/9/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Level II - Audit Inspection
Action Date: 12/29/2011
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 12/23/2002
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/1/2003
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/10/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPMTG
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 8/24/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/3/2005
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/25/2005
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/28/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 12/3/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 8/18/2003
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 10/17/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 10/17/2002
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/2/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 5/22/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/24/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 3/4/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/8/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 10/26/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/23/1998
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/23/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/11/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/9/2010
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 7/2/1999
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 1/14/2005
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/26/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPMTG
Action Date: 9/23/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 10/23/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 9/19/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 11/14/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/15/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/1/2004
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 2/1/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 6/23/1999
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: BWS02
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 1/13/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/23/1999
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Immediate Response Action
Action Stat: Level II - Audit Inspection
Action Date: 8/16/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/26/1999
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/9/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/18/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/11/2009
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 5/17/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 11/7/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/17/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 3/24/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/2/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 5/12/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 6/18/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 9/16/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 8/16/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 6/18/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 12/20/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 3/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/12/2001
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/13/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/2/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/27/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/22/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/5/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/9/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/6/2007
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 10/21/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 11/6/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 11/30/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: RMRINT

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 5/18/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 12/31/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/21/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/9/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/5/2008
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 5/23/2001
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 7/28/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 11/1/2002
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: RLFA
Action Stat: FLDDO
Action Date: 5/18/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 1/26/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/9/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/14/2004
Response Action Outcome: Not reported

Action Type: BWS20
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 10/26/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/3/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/8/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/10/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/25/2005
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 10/20/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/5/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/5/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/7/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 2/23/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/21/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/18/1998
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 9/28/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 12/1/2011
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 5/29/2007
Response Action Outcome: Not reported

MANIFEST:
GEN Cert Date: 9/9/1997
Transporter Recpt Date: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Number Of Containers: 0
Container Type: Not reported
Waste Code1: F006
Waste Code2: F002
Waste Code3: F002
Comment: Not reported
Fee Exempt Code: Not reported
TSDF Name: NORTHLAND ENVIRONMENTAL INC
TSDF ID: RID040098352
TSDF Date: Not reported
Date Imported: 9/21/1998 3:51:23 PM
Transporter 2 Name: Not reported
Transporter 2 ID: Not reported
Manifest Docket Number: MAJ184077
Waste Description: HW LIQ
Quantity: 275
WT/Vol Units: G
Item Number: 2
Transporter Name: CYN OIL CORP
Transporter EPA ID: MAD082303777
GEN Cert Date: 3/20/1997
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD001005115
Transporter 2 ID: Not reported

Manifest Docket Number: MAJ184903
Waste Description: HW LIQ
Quantity: 150
WT/Vol Units: G
Item Number: 2
Transporter Name: Not reported
Transporter EPA ID: MAD082303777
GEN Cert Date: 6/23/1997
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD001005115
Transporter 2 ID: Not reported

Manifest Docket Number: MAJ184266
Waste Description: HWLIQ
Quantity: 50
WT/Vol Units: G
Item Number: 2
Transporter Name: Not reported
Transporter EPA ID: MAD082303777
GEN Cert Date: 5/6/1997
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD001005115
Transporter 2 ID: Not reported

Manifest Docket Number: MAJ185053
Waste Description: HW LIQ

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Quantity:	330
WT/Vol Units:	G
Item Number:	1
Transporter Name:	CYN OIL CORP
Transporter EPA ID:	MAD082303777
GEN Cert Date:	7/23/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported
Manifest Docket Number:	MAJ183655
Waste Description:	HW LIQ
Quantity:	100
WT/Vol Units:	G
Item Number:	2
Transporter Name:	CYN OIL CORP
Transporter EPA ID:	MAD08230377
GEN Cert Date:	9/9/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported
Manifest Docket Number:	MAJ183655
Waste Description:	HW LIQ
Quantity:	300
WT/Vol Units:	G
Item Number:	1
Transporter Name:	CYN OIL CORP
Transporter EPA ID:	MAD08230377
GEN Cert Date:	9/9/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported
Manifest Docket Number:	MAJ184077
Waste Description:	HW LIQ
Quantity:	110
WT/Vol Units:	G
Item Number:	1
Transporter Name:	CYN OIL CORP
Transporter EPA ID:	MAD082303777
GEN Cert Date:	3/20/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported
Manifest Docket Number:	MAJ184903
Waste Description:	TETRACHLOROETHYLENE
Quantity:	200

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

WT/Vol Units:	G
Item Number:	1
Transporter Name:	Not reported
Transporter EPA ID:	MAD082303777
GEN Cert Date:	6/23/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported
Manifest Docket Number:	MAJ184266
Waste Description:	TCE
Quantity:	300
WT/Vol Units:	G
Item Number:	1
Transporter Name:	Not reported
Transporter EPA ID:	MAD082303777
GEN Cert Date:	5/6/1997
Transporter Recpt Date:	Not reported
Transporter 2 Recpt Date:	Not reported
TSDF Recpt Date:	Not reported
EPA ID:	MAD001005115
Transporter 2 ID:	Not reported

NY MANIFEST:

EPA ID:	MAD001005115
Country:	USA
Mailing Name:	BROOKFIELD ENGINEERING LABS
Mailing Contact:	EILEEN CARTER
Mailing Address:	240 CUSHING STREET
Mailing Address 2:	Not reported
Mailing City:	STOUGHTON
Mailing State:	MA
Mailing Zip:	02072
Mailing Zip4:	2398
Mailing Country:	USA
Mailing Phone:	508-923-5000
Document ID:	NYB9612342
Manifest Status:	Not reported
Trans1 State ID:	MER000500595
Trans2 State ID:	Not reported
Generator Ship Date:	09/04/2002
Trans1 Recv Date:	09/04/2002
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	09/04/2002
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD001005115
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	ME915995
Waste Code:	D007 - CHROMIUM 5.0 MG/L TCLP
Quantity:	41100

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Units: P - Pounds
Number of Containers: 001
Container Type: DT - Dump trucks
Handling Method: T Chemical, physical, or biological treatment.
Specific Gravity: 01.00
Year: 2002

Release:
Facility ID: 4-0013964
Primary ID: 4-0013964
Official City: STOUGHTON
Notification: 6/18/1998
Category: TWO HR
Current Status: TIER1B
Status Date: 5/21/1999
Phase: PHASE V
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/7/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/16/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/14/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/23/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/18/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/5/2008
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 2/26/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/20/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Level II - Audit Inspection
Action Date: 12/31/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 12/29/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/6/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/9/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/5/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/24/1999
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Phase 4
Action Stat: As-Built Construction Report Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/9/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 4/18/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/16/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 7/14/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 9/28/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 10/27/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/23/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: RMRINT
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/8/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 8/18/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/9/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Level II - Audit Inspection
Action Date: 12/29/2011
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 12/23/2002
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 8/1/2003
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/10/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPMTG
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 8/24/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/3/2005
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/25/2005
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/28/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/3/2002
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Release Abatement Measure
Action Stat: Level I - Technical Screen Audit
Action Date: 8/18/2003
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 10/17/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 10/17/2002
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/2/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 5/22/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/24/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 3/4/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/8/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 10/26/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 12/23/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 7/23/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/11/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/9/2010
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 7/2/1999
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 1/14/2005
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 11/26/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPMTG
Action Date: 9/23/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 10/23/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 9/19/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/14/2003
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/15/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/1/2004
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 2/1/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 6/23/1999
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: BWS02
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 1/13/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 7/23/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level II - Audit Inspection

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 8/16/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/26/1999
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/15/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/9/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 6/18/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/11/2009
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 5/17/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 11/7/2006
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/17/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 3/24/2006
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/2/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 5/12/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 6/18/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 9/16/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 8/16/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 6/18/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 12/20/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 3/24/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/12/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 2/13/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/2/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/27/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/22/1998
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/5/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/9/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/6/2007
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 10/21/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 11/6/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 11/30/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: RMRINT
Action Date: 11/29/2006
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/29/2006
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 5/18/1999
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 12/31/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/15/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/21/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 6/9/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 12/5/2008
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 5/23/2001
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 10/20/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 7/28/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 11/1/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 5/18/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 1/26/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/9/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/14/2004
Response Action Outcome: Not reported

Action Type: BWS20
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 10/26/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/3/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/8/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/10/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/25/2005
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/20/1998
Response Action Outcome: Not reported

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/5/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 12/5/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/7/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 2/23/2007
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 5/21/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/18/1998
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 9/28/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 12/1/2011
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 5/29/2007
Response Action Outcome: Not reported

Chemical:
Chemical: 1,1,1-TRICHLOROETHANE
Quantity: 41700 parts per billion

Location:
Location Type: INDUSTRIAL

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Source:
Source Type: UNKNOWN

Facility ID: 4-0019807
Primary ID: 4-0013964
Official City: STOUGHTON
Notification: 5/26/2006
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 5/29/2007
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/24/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/11/2006
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/24/2006
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 5/21/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 9/16/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/14/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received

BROOKFIELD ENGINEERING LAB INC (Continued) **1000333073**

Action Date: 5/29/2007
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 5/26/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/26/2006
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 6/18/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/28/2006
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 5/29/2007
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: 36 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: Not reported

64
North
1/2-1
0.539 mi.
2847 ft.

Relative:
Higher

Actual:
238 ft.

CUMBERLAND FARMS 499 WASHINGTON ST **SHWS S105043595**
12 WELCH AVE **RELEASE N/A**
STOUGHTON, MA 02072

SHWS:
Facility ID: 4-0016125
Release Town: STOUGHTON
Notification Date: 3/19/2001
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome Not Required**
Status Date: 7/19/2001
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Not reported

Chemical:
Chemical: GASOLINE VAPORS
Quantity: Not reported

CUMBERLAND FARMS 499 WASHINGTON ST (Continued) **S105043595**

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/17/2001
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 5/30/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/20/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 7/19/2001
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 7/19/2001
Response Action Outcome: Not reported

Action Type: RLFA

CUMBERLAND FARMS 499 WASHINGTON ST (Continued) **S105043595**

Action Stat: FOLOFF
Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/20/2001
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/27/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/11/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/22/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/30/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/4/2001
Response Action Outcome: Not reported

Release:
Facility ID: 4-0016125
Primary ID: Not reported
Official City: STOUGHTON
Notification: 3/19/2001
Category: TWO HR
Current Status: Response Action Outcome Not Required

CUMBERLAND FARMS 499 WASHINGTON ST (Continued) **S105043595**

Status Date: 7/19/2001
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/17/2001
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: RFI
Action Date: 12/21/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 5/30/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/20/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 7/19/2001
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 3/19/2001
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 7/19/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF

CUMBERLAND FARMS 499 WASHINGTON ST (Continued) **S105043595**

Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/20/2001
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDDO
Action Date: 3/20/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/27/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/11/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/22/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/30/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/21/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 4/4/2001
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE VAPORS
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

O65 **CUMBERLAND FARMS #2001** **SHWS** **1000162724**
ESE **110 BIRCH ST** **LUST** **N/A**
1/2-1 **STOUGHTON, MA 02072** **UST**
0.556 mi. **RELEASE**
2934 ft. **Site 3 of 3 in cluster O** **FINANCIAL ASSURANCE**

Relative:
Higher

Actual:
254 ft.

SHWS:

Facility ID:	4-0011157
Release Town:	STOUGHTON
Notification Date:	2/24/1995
Category:	72 HR
Associated ID:	4-0000797
Current Status:	**Response Action Outcome Not Required**
Status Date:	2/20/1996
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported
Chemical:	UNKNOWN CHEMICAL OF TYPE - OIL
Quantity:	4 inches

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	UST
Source Type:	W/INVDISC

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	2/20/1996
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/30/1999
Response Action Outcome:	Not reported
Action Type:	RAO Not Required
Action Stat:	Linked to a Tier Classified Site
Action Date:	2/20/1996
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/3/1997
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/13/1995
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	3/29/1995
Response Action Outcome:	Not reported

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 11/1/1996
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 9/14/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/27/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/13/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 7/11/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/28/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/24/1995
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: ACOP
Action Date: 4/26/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/6/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/15/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 3/14/1996
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/18/1995
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/28/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/17/1995
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/28/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/10/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/16/1996
Response Action Outcome: Not reported

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFVIO
Action Date: 4/22/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Unilateral Order Issued
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/27/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

LUST:

Facility:
Facility ID: 4-0011157
Current Status: **Response Action Outcome Not Required**
Status Date: 2/20/1996
Source Type: UST
Release Town: STOUGHTON
Notification Date: 2/24/1995
Category: 72 HR
Associated ID: 4-0000797
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: Not reported
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: 4 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST
Source Type: W/INVDISC

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	2/20/1996
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/30/1999
Response Action Outcome:	Not reported

Action Type:	RAO Not Required
Action Stat:	Linked to a Tier Classified Site
Action Date:	2/20/1996
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/3/1997
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/13/1995
Response Action Outcome:	Not reported

Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	3/29/1995
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	Permit Effective Date
Action Date:	11/1/1996
Response Action Outcome:	Not reported

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	2/20/1996
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Modified Revised or Updated Plan Received
Action Date:	9/14/1995
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	8/27/1996
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	2/13/1998
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Stat: Status or Interim Report Received
Action Date: 7/11/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/28/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/24/1995
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: ACOP
Action Date: 4/26/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/6/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/15/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 3/14/1996
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/18/1995
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/28/1997

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/17/1995
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/28/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/10/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/16/1996
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFVIO
Action Date: 4/22/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Unilateral Order Issued
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/27/1998
Response Action Outcome: Not reported

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

UST:
Facility ID: 12669

Facility:
Owner Id: 1602
Owner: CUMBERLAND FARMS INC
Owner Address: 100 CROSSING BLVD
Owner City,St,Zip: FRAMINGHAM, MA 01702
Telephone: (800) 225-9702
Description: Gas Station
Fire Dept. ID: 21285
Date of Inspection: 05/29/2009

Date Installed: 08/01/1989
Status Date: Not reported
Tank ID: 1
Tank Status: In Use
Tank Useage: MV
Tank Material: Reinforced
Tank Contents: 2 Walls
Tank Leak Detection: Interstitial Monitoring
Pipe Material: Flexible
Pipe Container: 2 Walls
Pipe Leak Detection: Interstitial Space Monitor
Serial Number: Not reported
Aboveground: No
Capacity: 8000
Contents: Gasoline

Date Installed: 08/01/1989
Status Date: Not reported
Tank ID: 2
Tank Status: In Use
Tank Useage: MV
Tank Material: Reinforced
Tank Contents: 2 Walls
Tank Leak Detection: Interstitial Monitoring
Pipe Material: Flexible
Pipe Container: 2 Walls
Pipe Leak Detection: Interstitial Space Monitor
Serial Number: Not reported
Aboveground: No
Capacity: 8000
Contents: Gasoline

Date Installed: 08/01/1989
Status Date: Not reported
Tank ID: 3

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Reinforced
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Flexible
Pipe Container:	2 Walls
Pipe Leak Detection:	Interstitial Space Monitor
Serial Number:	Not reported
Aboveground:	No
Capacity:	8000
Contents:	Gasoline

Release:

Facility ID:	4-0011157
Primary ID:	4-0000797
Official City:	STOUGHTON
Notification:	2/24/1995
Category:	72 HR
Current Status:	Response Action Outcome Not Required
Status Date:	2/20/1996
Phase:	Not reported
Response Action Outcome:	-
Oil / Haz Material Type:	Oil

Action:

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	2/20/1996
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/30/1999
Response Action Outcome:	Not reported
Action Type:	RAO Not Required
Action Stat:	Linked to a Tier Classified Site
Action Date:	2/20/1996
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/3/1997
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	12/13/1995
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	3/29/1995
Response Action Outcome:	Not reported
Action Type:	Tier Classification

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Stat: Permit Effective Date
Action Date: 11/1/1996
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 9/14/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/27/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/13/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 7/11/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/28/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 2/24/1995
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: ACOP
Action Date: 4/26/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/6/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 2/20/1996

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/15/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 3/14/1996
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/18/1995
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/28/1997
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/17/1995
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/28/1995
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 2/20/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/10/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/16/1996
Response Action Outcome: Not reported

CUMBERLAND FARMS #2001 (Continued) **1000162724**

Action Type: RLFA
Action Stat: FOLFLD
Action Date: 2/25/1995
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFVIO
Action Date: 4/22/1996
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Unilateral Order Issued
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 5/2/1996
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 2/27/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/19/1995
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: Not reported
Chemical: UNKNOWN CHEMICAL OF TYPE - OIL
Quantity: 4 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST
Source Type: W/INVDISC

MA FINANCIAL ASSURANCE 2:
Facility Id: 12669
Description: Gas Station
Work Phone: (800) 225-9702

66
NW
1/2-1
0.575 mi.
3036 ft.

NO LOCATION AID
145 SIMPSON ST
STOUGHTON, MA 02072

SHWS **S103250171**
RELEASE **N/A**

Relative:
Lower

Actual:
207 ft.

SHWS:

Facility ID:	4-0013823
Release Town:	STOUGHTON
Notification Date:	5/6/1998
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Downgradient Property Status**
Status Date:	1/31/2007
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	1,1,1-TRICHLOROETHANE
Quantity:	3900 parts per billion

Location:

Location Type:	COMMERCIAL
Location Type:	RESIDNTIAL

Source:

Source Type:	UNKNOWN

Action:

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	3/31/1998
Response Action Outcome:	Not reported
Action Type:	Compliance and Enforcement Action
Action Stat:	NOIM
Action Date:	2/17/1999
Response Action Outcome:	Not reported
Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	10/23/1998
Response Action Outcome:	Not reported
Action Type:	Downgradient Property Status
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	5/4/1999
Response Action Outcome:	Not reported
Action Type:	Compliance and Enforcement Action
Action Stat:	NOIM
Action Date:	6/11/1998
Response Action Outcome:	Not reported
Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	5/4/1998
Response Action Outcome:	Not reported
Action Type:	Downgradient Property Status

NO LOCATION AID (Continued) **S103250171**

Action Stat: Transmittal, Notice, or Notification Received
Action Date: 1/31/2007
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NOIM
Action Date: 10/23/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Not Required - Fee Refunded-FMCRA Use Only
Action Date: 5/14/2007
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/4/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 1/17/2007
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 2/6/2007
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/3/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 3/1/1999
Response Action Outcome: Not reported

Release:
Facility ID: 4-0013823
Primary ID: Not reported
Official City: STOUGHTON
Notification: 5/6/1998
Category: TWO HR
Current Status: Downgradient Property Status
Status Date: 1/31/2007
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/31/1998
Response Action Outcome: Not reported

NO LOCATION AID (Continued) **S103250171**

Action Type: Compliance and Enforcement Action
Action Stat: NOIM
Action Date: 2/17/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 10/23/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 5/4/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NOIM
Action Date: 6/11/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 5/4/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 1/31/2007
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NOIM
Action Date: 10/23/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Not Required - Fee Refunded-FMCRA Use Only
Action Date: 5/14/2007
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/4/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 1/17/2007
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 2/6/2007
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received

NO LOCATION AID (Continued) **S103250171**

Action Date: 5/3/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 3/1/1999
Response Action Outcome: Not reported

Chemical:
Chemical: 1,1,1-TRICHLOROETHANE
Quantity: 3900 parts per billion

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UNKNOWN

P67 **F C PHILLIPS INC** **LUST** **S105200269**
North **471 WASHINGTON ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.579 mi.
3059 ft. **Site 1 of 2 in cluster P**

Relative: Higher

Actual: 241 ft.

LUST:

Facility:
Facility ID: 4-0000206
Current Status: **(Remedy Operation Status): A site where a remedial system which relies upon Active Operation and Maintenance is being operated for the purpose of achieving a Permanent Solution.**
Status Date: 9/23/2005
Source Type: UST
Release Town: STOUGHTON
Notification Date: 1/15/1987
Category: NONE
Associated ID: Not reported
Phase: PHASE V
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: VOCS
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UST

Action:
Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/21/2009

F C PHILLIPS INC (Continued) **S105200269**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 9/28/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 10/7/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Level II - Audit Inspection
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 10/12/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 7/22/1994
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 1/29/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/20/1999
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/16/1997
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/17/1996
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/22/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/28/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/15/1998
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1987
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/23/2005
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 4/16/1986
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 8/16/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPMTG
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 9/22/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/18/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/28/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 4/5/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/24/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/19/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/21/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINI
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 1/19/2000
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 3/6/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/18/1995
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/30/1997
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: BWSC05
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/25/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/15/2001
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/27/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 12/10/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 3/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/28/2001
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 4/11/1990
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 8/28/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/24/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 9/19/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Level II - Audit Inspection
Action Date: 6/17/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 2/1/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/22/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 12/9/1999
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/20/2000
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 6/17/2010
Response Action Outcome: Not reported

Action Type: BWS20
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/17/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/23/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Tier 1A or Priority Submittal Approved
Action Date: 7/9/1991
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/23/1994
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 11/4/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Tier 1A or Priority Submittal Approved
Action Date: 12/10/1987
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/12/2001
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 12/29/1994
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 12/31/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 3/2/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/22/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/21/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 9/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 3/6/2000
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 12/10/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 5/25/2010
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 4/11/1990
Response Action Outcome: Not reported

Release:
Facility ID: 4-0000206
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/15/1987
Category: NONE
Current Status: REMOPS
Status Date: 9/23/2005
Phase: PHASE V
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 9/28/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 10/7/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/20/2007
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Level II - Audit Inspection
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 10/12/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 7/22/1994
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 1/29/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/20/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/16/1997
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/17/1996
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/22/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/28/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/15/1998
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 1/15/1987
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/23/2005
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/16/1986
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 8/16/2002
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: PIP
Action Stat: PIPMTG
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 9/22/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/18/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/28/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 4/5/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/24/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/19/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/21/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINI
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 1/19/2000
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PLANDT
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 3/6/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/18/1995
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 12/30/1997
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: BWSC05
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/18/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/25/2002
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/22/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 8/15/2001
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/27/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 12/10/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 3/26/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 6/28/2001
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 4/11/1990
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 8/28/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/20/2007
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/24/2006
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 9/19/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/21/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/22/2010
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Phase 5
Action Stat: Level II - Audit Inspection
Action Date: 6/17/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 2/1/2002
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/22/1999
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 12/9/1999
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 6/20/2000
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 6/17/2010
Response Action Outcome: Not reported

Action Type: BWS20
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/17/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/20/2009
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 3/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/23/2005
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/23/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 4/2/2008
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/19/2011
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Tier 1A or Priority Submittal Approved
Action Date: 7/9/1991
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 11/23/1994
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 11/4/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

F C PHILLIPS INC (Continued) **S105200269**

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Tier 1A or Priority Submittal Approved
Action Date: 12/10/1987
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 1/12/2001
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 12/31/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 3/2/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1B Classification
Action Date: 12/29/1994
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/22/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/21/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received

F C PHILLIPS INC (Continued) **S105200269**

Action Date: 9/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 9/17/2004
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 3/17/2003
Response Action Outcome: Not reported

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 3/19/2010
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: PIPDLY
Action Date: 3/6/2000
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 12/10/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/25/2010
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 4/11/1990
Response Action Outcome: Not reported

Chemical:
Chemical: VOCS
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UST

P68 **1032 CENTRAL ST** **SHWS S105522233**
North **397 413-423 WASHINGTON ST** **RELEASE N/A**
1/2-1 **STOUGHTON, MA 02072**
0.624 mi.
3297 ft. **Site 2 of 2 in cluster P**

Relative:
Higher

Actual:
242 ft.

SHWS:
Facility ID: 4-0017036
Release Town: STOUGHTON
Notification Date: 4/25/2002

1032 CENTRAL ST (Continued) **S105522233**

Category:	120 DY
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	2/8/2006
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity:	613 parts per billion
Chemical:	C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity:	2950 parts per billion
Chemical:	C9 THRU C10 AROMATIC HYDROCARBONS
Quantity:	364 parts per million

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Downgradient Property Status
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	5/6/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	4/25/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Downgradient Property Status
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	5/6/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	4/25/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Downgradient Property Status
Action Stat:	Modified Transmittal Received - DPS Transfer
Action Date:	4/8/2009
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Downgradient Property Status
Action Stat:	Level I - Technical Screen Audit
Action Date:	6/24/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

1032 CENTRAL ST (Continued) **S105522233**

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/8/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0017036
Primary ID: Not reported
Official City: STOUGHTON
Notification: 4/25/2002
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 2/8/2006
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 5/6/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 4/25/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 5/6/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/25/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Downgradient Property Status
Action Stat: Modified Transmittal Received - DPS Transfer
Action Date: 4/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 6/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

1032 CENTRAL ST (Continued) **S105522233**

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/8/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 613 parts per billion
Chemical: C5 THRU C8 ALIPHATIC HYDROCARBONS
Quantity: 2950 parts per billion
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 364 parts per million

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Q69 **NO LOCATION AID** **SHWS** **S106344111**
WNW **369 CANTON ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.693 mi.
3661 ft. **Site 1 of 2 in cluster Q**

Relative:
Lower

Actual:
180 ft.

SHWS:
Facility ID: 4-0018204
Release Town: STOUGHTON
Notification Date: 1/3/2004
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 2/25/2004
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: TRANSFORMER OIL
Quantity: 25 gallons

Location:
Location Type: ROADWAY
Location Type: UTILEASE

Source:
Source Type: TRANSFORM

Action:
Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/3/2004

NO LOCATION AID (Continued) **S106344111**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0018204
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/3/2004
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 2/25/2004
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/3/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 2/25/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/9/2004

NO LOCATION AID (Continued) **S106344111**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 1/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: TRANSFORMER OIL
Quantity: 25 gallons

Location:
Location Type: ROADWAY
Location Type: UTILEASE

Source:
Source Type: TRANSFORM

Q70 **NO LOCATION AID** **SHWS** **S104847604**
WNW **396 AND 383 CANTON ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.706 mi.
3726 ft. **Site 2 of 2 in cluster Q**

Relative:
Lower

Actual:
180 ft.

SHWS:
Facility ID: 4-0015172
Release Town: STOUGHTON
Notification Date: 12/2/1999
Category: 120 DY
Associated ID: Not reported
Current Status: **Downgradient Property Status**
Status Date: 11/30/2000
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: BENZO[A]ANTHRACENE
Quantity: 5.5 milligrams per kilogram
Chemical: BENZO[A]PYRENE
Quantity: 3.7 milligrams per kilogram
Chemical: BENZO[B]FLUORANTHENE
Quantity: 3.1 milligrams per kilogram

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E

NO LOCATION AID (Continued) **S104847604**

Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/30/2000
Response Action Outcome: Not reported

Release:
Facility ID: 4-0015172
Primary ID: Not reported
Official City: STOUGHTON
Notification: 12/2/1999
Category: 120 DY
Current Status: Downgradient Property Status
Status Date: 11/30/2000
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/2/1999
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/30/2000
Response Action Outcome: Not reported

Chemical:
Chemical: BENZO[A]ANTHRACENE
Quantity: 5.5 milligrams per kilogram
Chemical: BENZO[A]PYRENE
Quantity: 3.7 milligrams per kilogram
Chemical: BENZO[B]FLUORANTHENE
Quantity: 3.1 milligrams per kilogram

Location:
Location Type: Not reported

Source:
Source Type: Not reported

71
NNE
1/2-1
0.717 mi.
3784 ft.

DONAHUE TRUCK SERV CO INC FMR
75 LAMBERT AVE
STOUGHTON, MA 02072

SHWS **S104774430**
LUST **N/A**
LAST
RELEASE

Relative:
Higher

Actual:
279 ft.

SHWS:

Facility ID:	4-0015768
Release Town:	STOUGHTON
Notification Date:	9/18/2000
Category:	TWO HR
Associated ID:	4-0015768
Current Status:	**Response Action Outcome**
Status Date:	10/22/2004
Phase:	PHASE II
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	WASTE OIL
Quantity:	1200 parts per billion

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	AST
Source Type:	DRUMS

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	10/22/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	11/9/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDD1A
Action Date:	9/18/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	11/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Non-Compliance Issued
Action Date:	3/13/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Action Type:	Compliance and Enforcement Action
Action Stat:	Unilateral Order Issued
Action Date:	6/24/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	4/13/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/16/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Legal Notice Published
Action Date:	12/3/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	11/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	10/7/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	9/18/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	1/16/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Level I - Technical Screen Audit
Action Date:	4/29/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	FLDISS
Action Date:	9/8/2000

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/22/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Penalty Assessment Notice Issued
Action Date: 6/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/14/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 10/22/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 2/12/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

LUST:

Facility:
Facility ID: 4-0018474
Current Status: **Response Action Outcome Not Required**
Status Date: 10/22/2004
Source Type: UST
Release Town: STOUGHTON
Notification Date: 6/15/2004
Category: 72 HR
Associated ID: 4-0015768

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: DIESEL FUEL
Quantity: 364 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

Action:
Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/21/2009
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/22/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/22/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/15/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/22/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/20/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/15/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 12/3/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/20/2003
Response Action Outcome: Not reported

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/29/2004
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/22/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 10/22/2004
Response Action Outcome: Not reported

LAST:
Facility ID: 4-0015768
Source Type: AST
Release Town: STOUGHTON
Notification Date: 9/18/2000
Category: TWO HR
Associated ID: 4-0015768
Current Status: **Response Action Outcome**
Status Date: 10/22/2004
Phase: PHASE II
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: WASTE OIL
Quantity: 1200 parts per billion

Location:
Location Type: COMMERCIAL

Source:
Source Type: AST
Source Type: DRUMS

Action:
Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 10/22/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 11/9/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDD1A
Action Date: 9/18/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 3/13/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Unilateral Order Issued
Action Date: 6/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 4/13/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/16/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 12/3/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/7/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/18/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/16/2001

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 4/29/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 9/8/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/22/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Penalty Assessment Notice Issued
Action Date: 6/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/14/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 10/22/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 2/12/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Release:

Facility ID:	4-0015768
Primary ID:	4-0015768
Official City:	STOUGHTON
Notification:	9/18/2000
Category:	TWO HR
Current Status:	Response Action Outcome
Status Date:	10/22/2004
Phase:	PHASE II
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type:	Oil

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	10/22/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	11/9/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDD1A
Action Date:	9/18/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	11/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Non-Compliance Issued
Action Date:	3/13/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Compliance and Enforcement Action
Action Stat:	Unilateral Order Issued
Action Date:	6/24/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	4/13/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNF

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Action Stat:	Reportable Release under MGL 21E
Action Date:	1/16/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Legal Notice Published
Action Date:	12/3/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	11/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	10/7/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	9/18/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	1/16/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Level I - Technical Screen Audit
Action Date:	4/29/2004
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	FLDISS
Action Date:	9/8/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/22/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	11/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Penalty Assessment Notice Issued
Action Date: 6/24/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/14/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 10/22/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 2/12/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 11/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: WASTE OIL
Quantity: 1200 parts per billion

Location:
Location Type: COMMERCIAL

Source:
Source Type: AST
Source Type: DRUMS

Facility ID: 4-0018474
Primary ID: 4-0015768
Official City: STOUGHTON
Notification: 6/15/2004
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 10/22/2004
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/21/2009

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 7/22/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/22/2004
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/15/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 7/22/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/20/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/15/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 12/3/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/20/2003
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/29/2004
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 10/22/2004
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via IRA Completion Statement
Action Date: 10/22/2004
Response Action Outcome: Not reported

DONAHUE TRUCK SERV CO INC FMR (Continued) **S104774430**

Chemical:
Chemical: DIESEL FUEL
Quantity: 364 parts per million

Location:
Location Type: COMMERCIAL

Source:
Source Type: UST

72
North
1/2-1
0.738 mi.
3898 ft.

Relative:
Higher

Actual:
244 ft.

SHELL FMR **LUST** **S103546651**
386 WASHINGTON ST **RELEASE** **N/A**
STOUGHTON, MA 02072

LUST:

Facility:
Facility ID: 4-0014245
Current Status: **Response Action Outcome**
Status Date: 9/15/2011
Source Type: UST
Release Town: STOUGHTON
Notification Date: 10/13/1998
Category: 72 HR
Associated ID: Not reported
Phase: PHASE V
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UST

Action:
Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 7/8/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 10/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 10/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

SHELL FMR (Continued) **S103546651**

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 2/25/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 9/1/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/16/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 9/18/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 2/8/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 4/4/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Extension
Action Date: 9/5/2008

SHELL FMR (Continued) **S103546651**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 9/18/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 9/26/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 10/3/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level III - Comprehensive Audit
Action Date: 7/8/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/23/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 2/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

SHELL FMR (Continued) **S103546651**

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 10/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/11/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 3/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 7/8/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/28/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 10/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 9/5/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 8/5/2005

SHELL FMR (Continued) **S103546651**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 2/25/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 10/16/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/19/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/2/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/15/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/18/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

SHELL FMR (Continued) **S103546651**

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 10/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: AFUPLN
Action Date: 9/5/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 12/18/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 2/25/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/23/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Level II - Audit Inspection
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 1/5/2012

SHELL FMR (Continued) **S103546651**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/14/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 3/18/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/5/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/5/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: As-Built Construction Report Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/20/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

SHELL FMR (Continued) **S103546651**

Release:

Facility ID:	4-0014245
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	10/13/1998
Category:	72 HR
Current Status:	Response Action Outcome
Status Date:	9/15/2011
Phase:	PHASE V
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type:	Oil

Action:

Action Type:	An activity type that is related to an Audit
Action Stat:	Notice of Non-compliance related to an Audit
Action Date:	7/8/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	10/13/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	10/14/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	RMRINT
Action Date:	9/8/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	Status or Interim Report Received
Action Date:	2/25/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 5
Action Stat:	Status or Interim Report Received
Action Date:	9/8/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	9/1/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	An activity type that is related to an Audit

SHELL FMR (Continued) **S103546651**

Action Stat:	NAFNVD
Action Date:	5/13/2011
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Written Plan Received
Action Date:	11/16/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Status or Interim Report Received
Action Date:	9/18/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	2/8/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDRAN
Action Date:	4/4/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Tier Classification
Action Stat:	Tier 2 Extension
Action Date:	9/5/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Phase 4
Action Stat:	Notice of Delay in Meeting RA Deadline Received
Action Date:	9/18/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Completion Statement Received
Action Date:	9/26/2002
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Release Abatement Measure
Action Stat:	Status or Interim Report Received
Action Date:	10/3/2000
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level III - Comprehensive Audit
Action Date:	7/8/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been

SHELL FMR (Continued) **S103546651**

reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 4/21/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 10/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/23/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 2/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 10/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/11/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 3/14/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Compliance and Enforcement Action

SHELL FMR (Continued) **S103546651**

Action Stat: Notice of Non-Compliance Issued
Action Date: 7/8/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/28/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 10/15/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Submittal Retracted
Action Date: 9/5/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Inspection and Monitoring Report Received
Action Date: 8/5/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 2/25/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Completion Statement Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

SHELL FMR (Continued) **S103546651**

reduced to background.

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 10/16/2002
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/19/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 3/2/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/15/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/18/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 10/14/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: AFUPLN
Action Date: 9/5/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 12/18/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 2/25/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5

SHELL FMR (Continued) **S103546651**

Action Stat: Remedy Operation Status Submittal Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Report Received
Action Date: 9/8/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/23/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: Level II - Audit Inspection
Action Date: 5/13/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 7/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 1/5/2012
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/14/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 3/18/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Remedy Operation Status Submittal Received
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 2/28/2011
Response Action Outcome: A permanent solution has been achieved. Contamination has not been

SHELL FMR (Continued) **S103546651**

reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 3/5/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: RMRINT
Action Date: 9/8/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 5
Action Stat: Status or Interim Report Received
Action Date: 3/5/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 4
Action Stat: As-Built Construction Report Received
Action Date: 8/5/2004
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Abatement Measure
Action Stat: Completion Statement Received
Action Date: 8/20/2009
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: GASOLINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL

Source:
Source Type: UST

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73 NO LOCATION AID **SHWS S103812152**
SW 11 MCGRATH HWY **RELEASE N/A**
1/2-1 QUINCY, MA 02169
0.753 mi.
3976 ft.

Relative: Lower

Actual: 217 ft.

SHWS:
Facility ID: 3-0018086
Release Town: QUINCY
Notification Date: 3/10/1999
Category: 120 DY
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 3/19/2001
Phase: PHASE II

NO LOCATION AID (Continued) **S103812152**

Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: BENZO[A]ANTHRACENE
Quantity: 5.1 milligrams per kilogram
Chemical: BENZO[A]PYRENE
Quantity: 4.2 milligrams per kilogram
Chemical: BENZO[B]FLUORANTHENE
Quantity: 3 milligrams per kilogram
Chemical: DIBENZO[A,H]ANTHRACENE
Quantity: 1.1 milligrams per kilogram
Chemical: INDENO(1,2,3-CD)PYRENE
Quantity: 2.7 milligrams per kilogram

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 3/22/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S103812152**

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 3-0018086
Primary ID: Not reported
Official City: QUINCY
Notification: 3/10/1999
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 3/19/2001
Phase: PHASE II
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 5/26/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 3/22/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **S103812152**

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 3/19/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: BENZO[A]ANTHRACENE
Quantity: 5.1 milligrams per kilogram
Chemical: BENZO[A]PYRENE
Quantity: 4.2 milligrams per kilogram
Chemical: BENZO[B]FLUORANTHENE
Quantity: 3 milligrams per kilogram
Chemical: DIBENZO[A,H]ANTHRACENE
Quantity: 1.1 milligrams per kilogram
Chemical: INDENO(1,2,3-CD)PYRENE
Quantity: 2.7 milligrams per kilogram

Location:
Location Type: Not reported

Source:
Source Type: Not reported

R74
North
1/2-1
0.785 mi.
4147 ft.

NO LOCATION AID **SHWS** **1000521440**
372 WASHINGTON ST **RELEASE** **N/A**
STOUGHTON, MA 02072 **SPILLS**

Site 1 of 3 in cluster R

Relative:
Higher

Actual:
243 ft.

SHWS:
Facility ID: 4-0016566
Release Town: STOUGHTON
Notification Date: 9/18/2001
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 11/19/2001
Phase: Not reported
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: CHLORINE
Quantity: Not reported

NO LOCATION AID (Continued) **1000521440**

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/19/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 6/9/2004
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/31/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RLFA
Action Stat: FLDD1U
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/19/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Facility ID: 4-0013806
Release Town: STOUGHTON

NO LOCATION AID (Continued) **1000521440**

Notification Date:	4/13/1998
Category:	120 DY
Associated ID:	4-0013806
Current Status:	**Response Action Outcome**
Status Date:	5/8/2003
Phase:	PHASE III
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil and Hazardous Material

Chemical:

Chemical:	C5-C8 ALIPHATICS
Quantity:	33000 parts per billion
Chemical:	C9-C12 ALIPHATICS
Quantity:	15000 parts per billion
Chemical:	TOLUENE
Quantity:	7320 parts per billion
Chemical:	TPH
Quantity:	8200 parts per billion

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	5/20/2003
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Phase 2
Action Stat:	Completion Statement Received
Action Date:	5/31/2001
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	PIP
Action Stat:	Legal Notice Published
Action Date:	4/22/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	4/13/1999
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	8/4/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Tier Classification
Action Stat:	Tier 2 Classification

NO LOCATION AID (Continued) **1000521440**

Action Date: 4/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/8/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 7/8/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/28/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/26/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 4/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/23/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/8/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **1000521440**

Facility ID:	4-0016760
Release Town:	STOUGHTON
Notification Date:	11/27/2001
Category:	72 HR
Associated ID:	Not reported
Current Status:	**Response Action Outcome Not Required**
Status Date:	11/5/2002
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	7.5 inches

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	UNKNOWN

Action:

Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	2/15/2002
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	11/27/2001
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	3/21/2003
Response Action Outcome:	Not reported
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	12/24/2001
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/22/2002
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	1/22/2002
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/25/2002
Response Action Outcome:	Not reported
Action Type:	RLFA
Action Stat:	FOLOFF

NO LOCATION AID (Continued) **1000521440**

Action Date: 3/29/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/24/2002
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 11/5/2002
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/27/2001
Response Action Outcome: Not reported

Release:
Facility ID: 4-0013806
Primary ID: 4-0013806
Official City: STOUGHTON
Notification: 4/13/1998
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 5/8/2003
Phase: PHASE III
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil and Hazardous Material

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/20/2003
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 5/31/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 4/22/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

NO LOCATION AID (Continued) **1000521440**

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 8/4/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 6/8/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 7/8/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Notice of Delay in Meeting RA Deadline Received
Action Date: 3/28/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/26/2001
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 4/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/23/2000
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/8/2003

NO LOCATION AID (Continued) **1000521440**

Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: C5-C8 ALIPHATICS
Quantity: 33000 parts per billion
Chemical: C9-C12 ALIPHATICS
Quantity: 15000 parts per billion
Chemical: TOLUENE
Quantity: 7320 parts per billion
Chemical: TPH
Quantity: 8200 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Facility ID: 4-0016566
Primary ID: Not reported
Official City: STOUGHTON
Notification: 9/18/2001
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 11/19/2001
Phase: Not reported
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/19/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 6/9/2004
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/31/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RLFA
Action Stat: FLDD1U

NO LOCATION AID (Continued) **1000521440**

Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: FLDISS
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 9/18/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/19/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Chemical:
Chemical: CHLORINE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Facility ID: 4-0016760
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/27/2001
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 11/5/2002
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: RLFA
Action Stat: FOLOFF
Action Date: 2/15/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/27/2001

NO LOCATION AID (Continued) **1000521440**

Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 3/21/2003
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 12/24/2001
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/22/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 1/22/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/25/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 3/29/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/24/2002
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 11/5/2002
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/27/2001
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: 7.5 inches

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

NO LOCATION AID (Continued) **1000521440**

MA Spills:

Facility ID:	0000	Spill ID:	S91-0788
Staff Lead:	MORAN, M	Date Entered:	Not reported
Last Entered:	19920107	First Response:	19911211
Spill Date:	Not reported	Spill Time:	Not reported
Report Date:	19911211	Report Time:	05:10
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	GASOLINE	Other Material:	Not reported
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	GALLONS	Qty Actual:	GALLONS
CAS No:	Not reported	PCB Lev (ppm):	NONE
Source:	OTHER SOURCE >	Other Source:	LEAK DETECTOR
Incident:	OTHER RELEASE >	Other Incdnt:	MALFUNCTION
Cleanup Type:	---	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	DON HALL/MOBIL SERV STA		
Notif Tel:	Not reported		
Days/Close:	1		

Facility ID:	0000	Spill ID:	S92-0361
Staff Lead:	MORAN, M	Date Entered:	Not reported
Last Entered:	19920527	First Response:	19920526
Spill Date:	19920526	Spill Time:	Not reported
Report Date:	19920526	Report Time:	02:30PM
Case Closed:	YES	Mat Type:	UNKNOWN
Virgin Waste:	------	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	OTHER MATERIAL -->	Other Material:	LEAK ALARM FAILURE
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	GALLONS	Qty Actual:	GALLONS
CAS No:	Not reported	PCB Lev (ppm):	----------
Source:	OTHER SOURCE >	Other Source:	LEAK ALARM
Incident:	OTHER RELEASE >	Other Incdnt:	TEST FAILURE
Cleanup Type:	---	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	EMERIDA SARABIA/MOBIL		
Notif Tel:	Not reported		
Days/Close:	1		

Facility ID:	0000	Spill ID:	S92-0291
Staff Lead:	MORAN, M	Date Entered:	Not reported
Last Entered:	19920507	First Response:	19920421
Spill Date:	19920421	Spill Time:	Not reported
Report Date:	19920421	Report Time:	02:35PM
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	Not reported	Other Impact:	Not reported
Material:	GASOLINE	Other Material:	Not reported
Qty Reported:	1-10	Qty Actual:	----------
Qty Reported:	GALLONS	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	NONE
Source:	OTHER SOURCE >	Other Source:	UNKNOWN
Incident:	OTHER RELEASE >	Other Incdnt:	UNKNOWN

NO LOCATION AID (Continued) **1000521440**

Cleanup Type:	---	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	KEITH HAGUE, MOBIL		
Notif Tel:	Not reported		
Days/Close:	1		

Facility ID:	4-1008	Spill ID:	S90-0719
Staff Lead:	PINAUD, L	Date Entered:	Not reported
Last Entered:	19901017	First Response:	19901001
Spill Date:	19901001	Spill Time:	Not reported
Report Date:	19901001	Report Time:	12:30PM
Case Closed:	YES	Mat Type:	PETROLEUM
Virgin Waste:	VIRGIN	Contam Soil:	Not reported
Env Impact:	SOIL	Other Impact:	Not reported
Material:	GASOLINE	Other Material:	Not reported
Qty Reported:	UNKNOWN	Qty Actual:	UNKNOWN
Qty Reported:	----------	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	NONE
Source:	U.S.T.	Other Source:	Not reported
Incident:	OVERFILL	Other Incdnt:	Not reported
Cleanup Type:	---	Contractor:	NOT USED
Referral:	SA	LUST Elig:	---
Report Prep:	Not reported	Category:	Not reported
Notifier:	SCOTT GOTSCHALL/MOBIL OIL		
Notif Tel:	Not reported		
Days/Close:	1		

S75 **JET LINE SERVICES INC** **SHWS** **S106508911**
WNW **441R CANTON ST** **LUST** **N/A**
1/2-1 **STOUGHTON, MA 02072** **RELEASE**
0.806 mi. **ENF**
4254 ft. **Site 1 of 3 in cluster S**

Relative:
Lower

Actual:
184 ft.

SHWS:

Facility ID:	4-0000757
Release Town:	STOUGHTON
Notification Date:	7/25/1989
Category:	NONE
Associated ID:	Not reported
Current Status:	**Downgradient Property Status**
Status Date:	12/11/1998
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil and Hazardous Material

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported
Chemical:	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL
Quantity:	Not reported
Chemical:	WASTE OIL
Quantity:	Not reported

Location:

Location Type:	INDUSTRIAL
Location Type:	STORAG FAC

Source:

JET LINE SERVICES INC (Continued) **S106508911**

Source Type: UNKNOWN
Source Type: UST

Action:
Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 3/6/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Adequately Regulated
Action Date: 7/3/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 1/28/1992
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

JET LINE SERVICES INC (Continued) **S106508911**

Action Type: Partial RAO for this RTN
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: RAO Statement Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 1/28/1992
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 3/16/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Facility ID: 4-0019444
Release Town: STOUGHTON
Notification Date: 11/7/2005
Category: 72 HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 11/3/2006
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Not reported

Chemical:
Chemical: EPH
Quantity: Not reported
Chemical: VOC'S
Quantity: Not reported

Location:
Location Type: RESIDNTIAL
Location Type: WATERBODY

JET LINE SERVICES INC (Continued) **S106508911**

Source:
Source Type: UNKNOWN

Action:
Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/3/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDD1U
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 1/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 10/17/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/8/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/22/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

JET LINE SERVICES INC (Continued) **S106508911**

Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	1/6/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	11/3/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/6/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	10/12/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	10/9/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	11/7/2006
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

LUST:

Facility:

Facility ID:	4-0000757
Current Status:	**Downgradient Property Status**
Status Date:	12/11/1998
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	7/25/1989
Category:	NONE
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil and Hazardous Material

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported
Chemical:	UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL
Quantity:	Not reported
Chemical:	WASTE OIL

JET LINE SERVICES INC (Continued) **S106508911**

Quantity: Not reported

Location:
Location Type: INDUSTRIAL
Location Type: STORAG FAC

Source:
Source Type: UNKNOWN
Source Type: UST

Action:
Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 3/6/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Adequately Regulated
Action Date: 7/3/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 1/28/1992

JET LINE SERVICES INC (Continued) **S106508911**

Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: RAO Statement Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 1/28/1992
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 3/16/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Release:
Facility ID: 4-0000757
Primary ID: Not reported
Official City: STOUGHTON
Notification: 7/25/1989
Category: NONE
Current Status: Downgradient Property Status
Status Date: 12/11/1998
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil and Hazardous Material

Action:
Action Type: Downgradient Property Status

JET LINE SERVICES INC (Continued) **S106508911**

Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 3/6/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Adequately Regulated
Action Date: 7/3/1996
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/25/1989
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 5/30/2006
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVDN
Action Date: 1/28/1992
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: Fee Received - FMCRA Use Only
Action Date: 12/14/1998

JET LINE SERVICES INC (Continued) **S106508911**

Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: Revised Statement or Transmittal Received
Action Date: 1/21/1999
Response Action Outcome: Not reported

Action Type: Partial RAO for this RTN
Action Stat: RAO Statement Received
Action Date: 12/11/1998
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 1/28/1992
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 3/16/1992
Response Action Outcome: Not reported

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: Not reported
Chemical: UNKNOWN CHEMICAL OF TYPE - HAZARDOUS MATERIAL
Quantity: Not reported
Chemical: WASTE OIL
Quantity: Not reported

Location:
Location Type: INDUSTRIAL
Location Type: STORAG FAC

Source:
Source Type: UNKNOWN
Source Type: UST

Facility ID: 4-0019444
Primary ID: Not reported
Official City: STOUGHTON
Notification: 11/7/2005
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 11/3/2006
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.

JET LINE SERVICES INC (Continued) **S106508911**

Oil / Haz Material Type: Not reported

Action:

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/3/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDD1U
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 11/7/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 1/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 10/17/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 11/8/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/22/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action

JET LINE SERVICES INC (Continued) **S106508911**

Action Stat: Written Plan Received
Action Date: 1/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 11/3/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 1/6/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/12/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 10/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Fee Received - FMCRA Use Only
Action Date: 11/7/2006
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: EPH
Quantity: Not reported
Chemical: VOC'S
Quantity: Not reported

Location:
Location Type: RESIDNTIAL
Location Type: WATERBODY

Source:
Source Type: UNKNOWN

MA ENFORCEMENT :
Facility ID: NON-BO-00-2047
Name: WESTERN OIL INC
Facility Type: NON
Address 1: 389 CHARLES ST
Address 2: PROVIDENCE, RI 02904
Reg: BO
Issue Date: 2000-10-24 00:00:00
Facility ID: NON-BO-00-2047

JET LINE SERVICES INC (Continued) **S106508911**

Second Name: ENVIRONMENTAL COMP CORP
Comments: Not reported
Prog: Hazardous Waste

S76
WNW
1/2-1
0.806 mi.
4254 ft.

Relative:
Lower

Actual:
184 ft.

JET LINE SERVICES INC
441R CANTON STREET
STOUGHTON, MA 02072

Site 2 of 3 in cluster S

RCRA-TSDF **1000122251**
CERC-NFRAP **MAD062179890**
CORRACTS
RCRA-LQG
PADS
RAATS
MANIFEST
MANIFEST
FINANCIAL ASSURANCE

RCRA-TSDF:
Date form received by agency: 03/01/2010
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Site name: ENVIRONMENTAL COMPLIANCE CORPORATION
Facility address: 441R CANTON ST
STOUGHTON, MA 02072
EPA ID: MAD062179890
Mailing address: CANTON ST
STOUGHTON, MA 02072
Contact: WILLIAM C MORRIS
Contact address: GRACEY AVE
MERIDEN, CT 06451
Contact country: US
Contact telephone: (203) 238-6751
Telephone ext.: 8113
Contact email: BMORRIS@UNITEDINDUSTRIALSERVICES.COM
EPA Region: 01
Land type: Private
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste
Classification: Large Quantity Generator
Description: Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:
Owner/operator name: DEAN SULLIVAN
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private

JET LINE SERVICES INC (Continued) **1000122251**

Owner/Operator Type: Operator
Owner/Op start date: 10/01/2007
Owner/Op end date: Not reported

Owner/operator name: DAVID J. CARABETTA
Owner/operator address: 47 GRACEY AVENUE
MERIDEN, CT 06451
Owner/operator country: US
Owner/operator telephone: (203) 238-6751
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 08/16/2001
Owner/Op end date: Not reported

Owner/operator name: ENVIRONMENTAL COMPLIANCE CORPORATION
Owner/operator address: PO BOX 180
STOUGHTON, MA 02072
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/01/1979
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: Yes
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: Yes
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: Yes
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 03/01/2010
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 04/25/2008
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 04/25/2008
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 02/15/2006
Facility name: ENVIRONMENTAL COMPLIANCE CORP

JET LINE SERVICES INC (Continued) **1000122251**

Classification: Large Quantity Generator

Date form received by agency: 03/31/2004
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 06/23/2003
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 05/01/2003
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Large Quantity Generator

Date form received by agency: 02/25/2002
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Site name: ENVIRONMENTAL COMPLIANCE CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 03/13/2000
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Not a generator, verified

Date form received by agency: 03/31/1998
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Site name: ENVIRONMENTAL COMPLIANCE CORPORATION
Classification: Small Quantity Generator

Date form received by agency: 02/26/1996
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Site name: ENVIRONMENTAL COMPLIANCE CORP.
Classification: Large Quantity Generator

Date form received by agency: 04/07/1992
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Site name: JET-LINE SERVICES
Classification: Large Quantity Generator

Date form received by agency: 11/19/1980
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Small Quantity Generator

Date form received by agency: 08/18/1980
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Small Quantity Generator

Date form received by agency: 08/08/1980
Facility name: ENVIRONMENTAL COMPLIANCE CORP
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: K049
Waste name: SLOP OIL EMULSION SOLIDS FROM THE PETROLEUM REFINING INDUSTRY

Waste code: K051
Waste name: API SEPARATOR SLUDGE FROM THE PETROLEUM REFINING INDUSTRY

JET LINE SERVICES INC (Continued) **1000122251**

Waste code: K052
Waste name: TANK BOTTOMS (LEADED) FROM THE PETROLEUM REFINING INDUSTRY

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D008
Waste name: LEAD

Waste code: D011
Waste name: SILVER

Waste code: D018
Waste name: BENZENE

Biennial Reports:

Last Biennial Reporting Year: 2011

Annual Waste Handled:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 83.4

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 83.4

Corrective Action Summary:

JET LINE SERVICES INC (Continued) **1000122251**

Event date: 09/30/1991
Event: RFI Imposition

Event date: 06/22/1992
Event: RFA Completed, Assessment was a PA-Plus.

Event date: 04/06/1993
Event: CA Prioritization, Facility or area was assigned a medium corrective action priority.

Event date: 09/10/2002
Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

Event date: 09/10/2002
Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Event date: 09/30/2010
Event: CA550NR

Event date: 09/30/2010
Event: Date For Remedy Selection (CM Imposed)

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 09/24/2008
Date achieved compliance: 09/15/2009
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 09/15/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Universal Waste - Small Quantity Handlers
Date violation determined: 09/24/2008
Date achieved compliance: 09/15/2009
Violation lead agency: State

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 09/15/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 09/24/2008
Date achieved compliance: 09/15/2009
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 09/15/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Contingency Plan and Emergency Procedures
Date violation determined: 09/24/2008
Date achieved compliance: 09/15/2009
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 09/15/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General Facility Standards
Date violation determined: 11/01/2006
Date achieved compliance: 05/22/2007
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 11/01/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 39150
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Container Use and Management
Date violation determined: 11/01/2006
Date achieved compliance: 05/22/2007
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement action date: 11/01/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 39150
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 11/01/2006
Date achieved compliance: 05/22/2007
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 11/01/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 39150
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 11/01/2006
Date achieved compliance: 05/22/2007
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 11/01/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 39150
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Manifest/Records/Reporting
Date violation determined: 11/01/2006
Date achieved compliance: 05/22/2007
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 11/01/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 39150
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)
Area of violation: TSD - General Facility Standards
Date violation determined: 09/21/2001
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001

JET LINE SERVICES INC (Continued) **1000122251**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(2)
Area of violation: TSD - General Facility Standards
Date violation determined: 09/21/2001
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(4)
Area of violation: TSD - General Facility Standards
Date violation determined: 09/21/2001
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(2)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/11/2000
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(9)(b)(c)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/11/2000
Date achieved compliance: 07/09/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/11/2000
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(4)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/11/2000
Date achieved compliance: 09/21/2001
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 07/10/2001
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 11000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/25/1995
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1) 515(1)
Area of violation: TSD IS-Manifest/Records/Reporting
Date violation determined: 08/25/1995
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4) 514(1)
Area of violation: TSD IS-General Facility Standards
Date violation determined: 08/25/1995
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4) 524(1)
Area of violation: TSD - Container Use and Management
Date violation determined: 08/25/1995
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4) 694(2)
Area of violation: TSD - General Facility Standards
Date violation determined: 08/25/1995
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4) 695(5)
Area of violation: TSD - Tank System Standards
Date violation determined: 08/25/1995
Date achieved compliance: 08/26/1997
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State

JET LINE SERVICES INC (Continued) **1000122251**

Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(4)
Area of violation: TSD - Tank System Standards
Date violation determined: 08/25/1995
Date achieved compliance: 08/28/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2) 524(4)(a)
Area of violation: TSD - Preparedness and Prevention
Date violation determined: 08/25/1995
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 682
Area of violation: TSD - Container Use and Management
Date violation determined: 08/25/1995
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 685(1)
Area of violation: TSD - Container Use and Management
Date violation determined: 08/25/1995
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 692(5)(b)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/24/1994
Date achieved compliance: 10/01/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 692(5)(c)1.
Area of violation: TSD - Tank System Standards
Date violation determined: 03/24/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 904
Area of violation: TSD - Financial Requirements
Date violation determined: 03/24/1994
Date achieved compliance: 01/26/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 694(2)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/24/1994
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000

JET LINE SERVICES INC (Continued) **1000122251**

Paid penalty amount: Not reported

Regulation violated: SR - 514(1)
Area of violation: TSD IS-General Facility Standards
Date violation determined: 03/24/1994
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 692(5)(b)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/24/1994
Date achieved compliance: 10/01/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 514(1)
Area of violation: TSD IS-General Facility Standards
Date violation determined: 03/24/1994
Date achieved compliance: 08/27/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 694(2)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/24/1994
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Regulation violated: SR - 822(1)(2)(3)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 687(1)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 682
Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994
Date achieved compliance: 08/26/1997
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 685(4)

JET LINE SERVICES INC (Continued) **1000122251**

Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 685(4)
Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 516(1)(2)
Area of violation: TSD IS-General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 03/09/1995
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 682
Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994
Date achieved compliance: 08/26/1997
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4)
Area of violation: TSD - General Facility Standards

JET LINE SERVICES INC (Continued) **1000122251**

Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: CONSENT ORDER, NO PENALTIES
Enforcement action date: 09/03/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 687(2)(b)
Area of violation: TSD - Container Use and Management
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 694(3)(c)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 685(1)
Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994

JET LINE SERVICES INC (Continued) **1000122251**

Date achieved compliance: 08/26/1997
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: CONSENT ORDER, NO PENALTIES
Enforcement action date: 09/03/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 687(1)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 687(1)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 08/22/1996
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 03/05/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 13000
Paid penalty amount: Not reported

Regulation violated: SR - 695(2)
Area of violation: TSD - Tank System Standards
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995

JET LINE SERVICES INC (Continued) **1000122251**

Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 822(1)(2)(3)(4)
Area of violation: TSD - General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 05/27/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 516(1)(2)
Area of violation: TSD IS-General Facility Standards
Date violation determined: 03/11/1994
Date achieved compliance: 03/09/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 515(1)(c)
Area of violation: TSD IS-Manifest/Records/Reporting
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 685(1)
Area of violation: Generators - Pre-transport
Date violation determined: 03/11/1994
Date achieved compliance: 08/26/1997
Violation lead agency: State

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/22/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 515(1)(c)
Area of violation: TSD IS-Manifest/Records/Reporting
Date violation determined: 03/11/1994
Date achieved compliance: 08/25/1995
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 12/29/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 38000
Paid penalty amount: Not reported

Regulation violated: SR - 515(a)
Area of violation: Transporters - General
Date violation determined: 11/21/1991
Date achieved compliance: 07/16/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Transporters - General
Date violation determined: 11/21/1991
Date achieved compliance: 07/16/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 685(1)
Area of violation: Generators - General
Date violation determined: 11/21/1991
Date achieved compliance: 07/16/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 311
Area of violation: Transporters - Manifest and Recordkeeping
Date violation determined: 11/21/1991
Date achieved compliance: 07/16/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 263.20(b)
Area of violation: Generators - Exports
Date violation determined: 09/18/1991
Date achieved compliance: 01/10/1992
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 12/13/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 04/20/1988
Date achieved compliance: 05/10/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 04/20/1988
Date achieved compliance: 05/10/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/17/1988

JET LINE SERVICES INC (Continued) **1000122251**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 03/30/1987
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 03/30/1987
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 04/01/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 09/29/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 04/01/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 09/29/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 09/29/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 04/01/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 09/29/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 07/25/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 04/01/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Closure/Post-Closure
Date violation determined: 07/25/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 07/25/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 07/25/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 09/16/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - Financial Requirements
Date violation determined: 03/26/1986
Date achieved compliance: 04/30/1986
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 04/01/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 01/16/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/17/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State

JET LINE SERVICES INC (Continued) **1000122251**

Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 01/16/1986
Date achieved compliance: 08/25/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 01/27/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 07/02/1985
Date achieved compliance: 08/09/1985
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/01/1985
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 04/24/1985
Date achieved compliance: 07/17/1985
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/14/1985
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 06/08/2011
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/25/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation lead agency: State

Evaluation date: 09/23/2009
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/15/2009
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/01/2009
Evaluation: COMPLIANCE ASSISTANCE VISIT
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 06/23/2009
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/02/2009
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/24/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 09/15/2009
Evaluation lead agency: State

Evaluation date: 09/24/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 09/15/2009
Evaluation lead agency: State

Evaluation date: 09/24/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Universal Waste - Small Quantity Handlers
Date achieved compliance: 09/15/2009
Evaluation lead agency: State

Evaluation date: 09/24/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Contingency Plan and Emergency Procedures
Date achieved compliance: 09/15/2009
Evaluation lead agency: State

Evaluation date: 07/31/2008

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 06/26/2007
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/22/2007
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 05/22/2007
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 05/22/2007
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 05/22/2007
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Container Use and Management
Date achieved compliance: 05/22/2007
Evaluation lead agency: State

Evaluation date: 11/01/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Manifest/Records/Reporting
Date achieved compliance: 05/22/2007
Evaluation lead agency: State

Evaluation date: 09/05/2006
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation lead agency: State

Evaluation date: 08/24/2005
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/13/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/20/2004
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/05/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/06/2002
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/30/2002
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/21/2001
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 09/21/2001
Evaluation lead agency: State

Evaluation date: 07/10/2001
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: TSD - General Facility Standards
Date achieved compliance: 09/21/2001
Evaluation lead agency: State

Evaluation date: 03/14/2001
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/29/2000

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 09/21/2001
Evaluation lead agency: State

Evaluation date: 08/11/2000
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - General Facility Standards
Date achieved compliance: 07/09/2001
Evaluation lead agency: State

Evaluation date: 08/11/2000
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - General Facility Standards
Date achieved compliance: 09/21/2001
Evaluation lead agency: State

Evaluation date: 05/13/1999
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/27/1998
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/04/1997
Evaluation: GROUNDWATER MONITORING EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/26/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 05/27/1998
Evaluation lead agency: State

Evaluation date: 08/26/1997
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/25/1996
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: TSD - General Facility Standards
Date achieved compliance: 05/27/1998
Evaluation lead agency: State

Evaluation date: 08/22/1996
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Tank System Standards
Date achieved compliance: 10/01/1995
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 08/26/1997
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/26/1997
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 08/27/1995
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/28/1995
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Preparedness and Prevention
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 08/25/1995

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Manifest/Records/Reporting
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 05/27/1998
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-General Facility Standards
Date achieved compliance: 08/27/1995
Evaluation lead agency: State

Evaluation date: 08/25/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Container Use and Management
Date achieved compliance: 08/27/1995
Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - Tank System Standards
Date achieved compliance: 10/01/1995
Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/25/1995
Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD IS-General Facility Standards
Date achieved compliance: 08/27/1995
Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - Financial Requirements
Date achieved compliance: 01/26/1995

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation lead agency: State

Evaluation date: 03/24/1994
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 08/25/1995
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Container Use and Management
Date achieved compliance: 08/25/1995
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 08/22/1996
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Manifest/Records/Reporting
Date achieved compliance: 08/25/1995
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Tank System Standards
Date achieved compliance: 08/25/1995
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-General Facility Standards
Date achieved compliance: 03/09/1995
Evaluation lead agency: State

Evaluation date: 03/11/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General Facility Standards
Date achieved compliance: 05/27/1998
Evaluation lead agency: State

Evaluation date: 03/11/1994

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 08/26/1997
Evaluation lead agency: State

Evaluation date: 12/28/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/16/1992
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 11/21/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 07/16/1992
Evaluation lead agency: State

Evaluation date: 11/21/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Transporters - Manifest and Recordkeeping
Date achieved compliance: 07/16/1992
Evaluation lead agency: State

Evaluation date: 11/21/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Transporters - General
Date achieved compliance: 07/16/1992
Evaluation lead agency: State

Evaluation date: 09/18/1991
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Generators - Exports
Date achieved compliance: 01/10/1992
Evaluation lead agency: EPA

Evaluation date: 06/13/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/25/1991
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: EPA

Evaluation date: 02/22/1990
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation lead agency: State

Evaluation date: 05/10/1989
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/20/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 05/10/1989
Evaluation lead agency: State

Evaluation date: 03/30/1987
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Formal Enforcement Agreement or Order
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 03/13/1987
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/29/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 09/29/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 07/25/1986
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: TSD - Closure/Post-Closure
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 07/25/1986
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: TSD - General
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 07/11/1986
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/26/1986

JET LINE SERVICES INC (Continued) **1000122251**

Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 04/30/1986
Evaluation lead agency: State

Evaluation date: 01/16/1986
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: TSD - General
Date achieved compliance: 08/25/1987
Evaluation lead agency: State

Evaluation date: 08/09/1985
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/17/1985
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/08/1985
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/02/1985
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: TSD - General
Date achieved compliance: 08/09/1985
Evaluation lead agency: State

Evaluation date: 04/24/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 07/17/1985
Evaluation lead agency: State

CERC-NFRAP:
Site ID: 0102403
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: Deferred to RCRA

CERCLIS-NFRAP Site Contact Details:
Contact Sequence ID: 1335246.00000
Person ID: 1270187.00000

CERCLIS-NFRAP Assessment History:
Action: DISCOVERY
Date Started: Not reported
Date Completed: 07/30/1991
Priority Level: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Action: PRELIMINARY ASSESSMENT
Date Started: Not reported
Date Completed: 06/22/1992
Priority Level: Deferred to RCRA (Subtitle C)

Action: ARCHIVE SITE
Date Started: Not reported
Date Completed: 05/09/1996
Priority Level: Not reported

CORRACTS:

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 04/06/1993
Action: CA075ME - CA Prioritization, Facility or area was assigned a medium corrective action priority
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 06/22/1992
Action: CA050PA - RFA Completed, Assessment was a PA-Plus
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 09/10/2002
Action: CA725YE - Current Human Exposures Under Control, Yes, Current Human Exposures Under Control has been verified
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: 09/30/2002
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 09/10/2002
Action: CA750YE - Migration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal

JET LINE SERVICES INC (Continued) **1000122251**

Original schedule date: 09/30/2002
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 09/30/1991
Action: CA100 - RFI Imposition
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 09/30/2010
Action: CA550NR
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: MAD062179890
EPA Region: 01
Area Name: ENTIRE FACILITY
Actual Date: 09/30/2010
Action: CA400 - Date For Remedy Selection (CM Imposed)
NAICS Code(s): 562211 562219
Hazardous Waste Treatment and Disposal
Other Nonhazardous Waste Treatment and Disposal
Original schedule date: Not reported
Schedule end date: Not reported

PADS:
EPAID: MAD062179890
Facility name: JET LINE SVCS INC
Facility Address: 441 R CANTON ST PO BOX 180
STOUGHTON, MA 2072
Facility country: US
Generator: No
Storer: No
Transporter: Yes
Disposer: No
Research facility: No
Smelter: No
Facility owner name: JET LINE SVCS INC
Contact title: Not reported
Contact name: DRAWAS NEAL M SR
Contact tel: (617)344-2510
Contact extension: Not reported
Mailing address: 441 R CANTON ST PO BOX 180
STOUGHTON, MA 2072
Mailing country: US
Cert. title: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Cert. name: Not reported
Cert. date: 12/21/1988
Date received: 3/21/1990

NY MANIFEST:
EPA ID: MAD062179890
Country: USA
Mailing Name: ENVIRONMENTAL COMPLIANCE CORP
Mailing Contact: TIMOTHY MATHEWS
Mailing Address: PO BOX 180
Mailing Address 2: Not reported
Mailing City: STOUGHTON
Mailing State: MA
Mailing Zip: 02072
Mailing Zip4: Not reported
Mailing Country: USA
Mailing Phone: 617-344-2510

Document ID: NYO1019232
Manifest Status: TSDF copy
Trans1 State ID: Not reported
Trans2 State ID: Not reported
Generator Ship Date: 810626
Trans1 Recv Date: Not reported
Trans2 Recv Date: Not reported
TSD Site Recv Date: 810619
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MAD062179890
Trans1 EPA ID: Not reported
Trans2 EPA ID: Not reported
TSDF ID: Not reported
Waste Code: Not reported
Quantity: Not reported
Units: Not reported
Number of Containers: Not reported
Container Type: Not reported
Handling Method: Not reported
Specific Gravity: Not reported
Year: 80-81

Document ID: NYO1019277
Manifest Status: TSDF copy
Trans1 State ID: Not reported
Trans2 State ID: Not reported
Generator Ship Date: 810626
Trans1 Recv Date: Not reported
Trans2 Recv Date: Not reported
TSD Site Recv Date: 810610
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MAD062179890
Trans1 EPA ID: Not reported
Trans2 EPA ID: Not reported
TSDF ID: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Waste Code:	Not reported
Quantity:	Not reported
Units:	Not reported
Number of Containers:	Not reported
Container Type:	Not reported
Handling Method:	Not reported
Specific Gravity:	Not reported
Year:	80-81

Document ID:	NYA7434774
Manifest Status:	Completed copy
Trans1 State ID:	000000000
Trans2 State ID:	000000000
Generator Ship Date:	890706
Trans1 Recv Date:	890706
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	890707
Part A Recv Date:	890717
Part B Recv Date:	890712
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	05078
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	89

Document ID:	NYO1716894
Manifest Status:	Completed copy
Trans1 State ID:	MA 005
Trans2 State ID:	Not reported
Generator Ship Date:	821011
Trans1 Recv Date:	821011
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821012
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	K052 - TANK BTM(LEADED) FM PETR REF INDUSTRY
Quantity:	00020
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

JET LINE SERVICES INC (Continued) **1000122251**

Document ID:	NYO1716903
Manifest Status:	Completed copy
Trans1 State ID:	MA 005
Trans2 State ID:	Not reported
Generator Ship Date:	821011
Trans1 Recv Date:	821011
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821012
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	K052 - TANK BTM(LEADED) FM PETR REF INDUSTRY
Quantity:	00020
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO1716984
Manifest Status:	Completed copy
Trans1 State ID:	NYMA005
Trans2 State ID:	Not reported
Generator Ship Date:	821006
Trans1 Recv Date:	821006
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821007
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D008 - LEAD 5.0 MG/L TCLP
Quantity:	00020
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYO1717002
Manifest Status:	Completed copy
Trans1 State ID:	NYMA005
Trans2 State ID:	Not reported
Generator Ship Date:	821006
Trans1 Recv Date:	821006
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	821007
Part A Recv Date:	Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD049836679
Waste Code:	D008 - LEAD 5.0 MG/L TCLP
Quantity:	00020
Units:	Y - Cubic yards* (.85 tons)
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	82

Document ID:	NYA7434783
Manifest Status:	Completed copy
Trans1 State ID:	000000000
Trans2 State ID:	000000000
Generator Ship Date:	890706
Trans1 Recv Date:	890706
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	890707
Part A Recv Date:	890717
Part B Recv Date:	890712
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	Not reported
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	05908
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	89

Document ID:	NYA8287515
Manifest Status:	Completed copy
Trans1 State ID:	MA588491
Trans2 State ID:	MA44904
Generator Ship Date:	890911
Trans1 Recv Date:	890911
Trans2 Recv Date:	890913
TSD Site Recv Date:	890914
Part A Recv Date:	890918
Part B Recv Date:	890920
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	MAD062179890
Trans2 EPA ID:	MAD062179890
TSDF ID:	NYD043815703
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	00055
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001

JET LINE SERVICES INC (Continued) **1000122251**

Container Type:	DM - Metal drums, barrels
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	89

Document ID:	NYA6130827
Manifest Status:	Completed copy
Trans1 State ID:	V-95494NY
Trans2 State ID:	Not reported
Generator Ship Date:	870428
Trans1 Recv Date:	870428
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	870429
Part A Recv Date:	870513
Part B Recv Date:	870505
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	NYD051809952
Trans2 EPA ID:	Not reported
TSDF ID:	NYD051817682
Waste Code:	M001 - WASTE OIL (STATE OF MASS.)
Quantity:	37500
Units:	P - Pounds
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	87

Document ID:	NYA6130845
Manifest Status:	Completed copy
Trans1 State ID:	U95206NY
Trans2 State ID:	Not reported
Generator Ship Date:	870429
Trans1 Recv Date:	870429
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	870430
Part A Recv Date:	870513
Part B Recv Date:	870505
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	NYD051809952
Trans2 EPA ID:	Not reported
TSDF ID:	NYD051817682
Waste Code:	M001 - WASTE OIL (STATE OF MASS.)
Quantity:	21420
Units:	P - Pounds
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	87

Document ID:	NYA5302062
Manifest Status:	Completed copy
Trans1 State ID:	W93453(NY

JET LINE SERVICES INC (Continued) **1000122251**

Trans2 State ID:	Not reported
Generator Ship Date:	870521
Trans1 Recv Date:	870521
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	870522
Part A Recv Date:	870603
Part B Recv Date:	870604
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	NYD046765574
Trans2 EPA ID:	Not reported
TSDF ID:	NYD051817682
Waste Code:	M001 - WASTE OIL (STATE OF MASS.)
Quantity:	28100
Units:	P - Pounds
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	87

Document ID:	NYA6130737
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	V-96638NY
Trans2 State ID:	Not reported
Generator Ship Date:	870320
Trans1 Recv Date:	870320
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	870321
Part A Recv Date:	870401
Part B Recv Date:	870417
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	NYD051809952
Trans2 EPA ID:	Not reported
TSDF ID:	NYD051817682
Waste Code:	M001 - WASTE OIL (STATE OF MASS.)
Quantity:	34560
Units:	P - Pounds
Number of Containers:	001
Container Type:	DT - Dump trucks
Handling Method:	L Landfill.
Specific Gravity:	100
Year:	87

Document ID:	NYA5302071
Manifest Status:	Completed copy
Trans1 State ID:	U93453(NY
Trans2 State ID:	Not reported
Generator Ship Date:	870526
Trans1 Recv Date:	870526
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	870527
Part A Recv Date:	870604
Part B Recv Date:	870604
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	NYD046765574

JET LINE SERVICES INC (Continued) **1000122251**

Trans2 EPA ID: Not reported
TSDF ID: NYD051817682
Waste Code: M001 - WASTE OIL (STATE OF MASS.)
Quantity: 37600
Units: P - Pounds
Number of Containers: 001
Container Type: DT - Dump trucks
Handling Method: L Landfill.
Specific Gravity: 100
Year: 87

Document ID: NYA6130746
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: TN-32114(
Trans2 State ID: Not reported
Generator Ship Date: 870327
Trans1 Recv Date: 870327
Trans2 Recv Date: Not reported
TSD Site Recv Date: 870328
Part A Recv Date: 870422
Part B Recv Date: 870407
Generator EPA ID: MAD062179890
Trans1 EPA ID: NYD051809952
Trans2 EPA ID: Not reported
TSDF ID: NYD051817682
Waste Code: M001 - WASTE OIL (STATE OF MASS.)
Quantity: 00020
Units: Y - Cubic yards* (.85 tons)
Number of Containers: 001
Container Type: DT - Dump trucks
Handling Method: L Landfill.
Specific Gravity: 100
Year: 87

Document ID: Not reported
Manifest Status: Not reported
Trans1 State ID: CTD021816889
Trans2 State ID: Not reported
Generator Ship Date: 2010-06-10
Trans1 Recv Date: 2010-06-10
Trans2 Recv Date: Not reported
TSD Site Recv Date: 2010-06-11
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MAD062179890
Trans1 EPA ID: Not reported
Trans2 EPA ID: Not reported
TSDF ID: NYD080469935
Waste Code: Not reported
Quantity: 43160.0
Units: P - Pounds
Number of Containers: 1.0
Container Type: TT - Cargo tank, tank trucks
Handling Method: B Incineration, heat recovery, burning.
Specific Gravity: 1.0

JET LINE SERVICES INC (Continued) **1000122251**

Year:	2010
Manifest Tracking Num:	000137416UIS
Import Ind:	N
Export Ind:	N
Discr Quantity Ind:	Y
Discr Type Ind:	N
Discr Residue Ind:	N
Discr Partial Reject Ind:	N
Discr Full Reject Ind:	N
Manifest Ref Num:	Not reported
Alt Fac RCRA Id:	Not reported
Alt Fac Sign Date:	Not reported
Mgmt Method Type Code:	H040

Document ID:	Not reported
Manifest Status:	Not reported
Trans1 State ID:	CTD021816889
Trans2 State ID:	Not reported
Generator Ship Date:	2010-06-10
Trans1 Recv Date:	2010-06-10
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	2010-06-11
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	Not reported
Trans2 EPA ID:	Not reported
TSDF ID:	NYD080469935
Waste Code:	Not reported
Quantity:	51600.0
Units:	P - Pounds
Number of Containers:	1.0
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	1.0
Year:	2010
Manifest Tracking Num:	000137417UIS
Import Ind:	N
Export Ind:	N
Discr Quantity Ind:	Y
Discr Type Ind:	N
Discr Residue Ind:	N
Discr Partial Reject Ind:	N
Discr Full Reject Ind:	N
Manifest Ref Num:	Not reported
Alt Fac RCRA Id:	Not reported
Alt Fac Sign Date:	Not reported
Mgmt Method Type Code:	H040

Document ID:	Not reported
Manifest Status:	Not reported
Trans1 State ID:	CTD021816889
Trans2 State ID:	Not reported
Generator Ship Date:	2010-06-15
Trans1 Recv Date:	2010-06-15

JET LINE SERVICES INC (Continued) **1000122251**

Trans2 Recv Date:	Not reported
TSD Site Recv Date:	2010-06-19
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	Not reported
Trans2 EPA ID:	Not reported
TSDF ID:	NYD080469935
Waste Code:	Not reported
Quantity:	50940.0
Units:	P - Pounds
Number of Containers:	1.0
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	1.0
Year:	2010
Manifest Tracking Num:	000137426UIS
Import Ind:	N
Export Ind:	N
Discr Quantity Ind:	Y
Discr Type Ind:	N
Discr Residue Ind:	N
Discr Partial Reject Ind:	N
Discr Full Reject Ind:	N
Manifest Ref Num:	Not reported
Alt Fac RCRA Id:	Not reported
Alt Fac Sign Date:	Not reported
Mgmt Method Type Code:	H040

Document ID:	Not reported
Manifest Status:	Not reported
Trans1 State ID:	CTD021816889
Trans2 State ID:	Not reported
Generator Ship Date:	2010-06-29
Trans1 Recv Date:	2010-06-29
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	2010-06-30
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	Not reported
Trans2 EPA ID:	Not reported
TSDF ID:	NYD080469935
Waste Code:	Not reported
Quantity:	51580.0
Units:	P - Pounds
Number of Containers:	1.0
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	1.02
Year:	2010
Manifest Tracking Num:	000137459UIS
Import Ind:	N
Export Ind:	N
Discr Quantity Ind:	Y
Discr Type Ind:	N

JET LINE SERVICES INC (Continued) **1000122251**

Discr Residue Ind:	N
Discr Partial Reject Ind:	N
Discr Full Reject Ind:	N
Manifest Ref Num:	Not reported
Alt Fac RCRA Id:	Not reported
Alt Fac Sign Date:	Not reported
Mgmt Method Type Code:	H040

Document ID:	Not reported
Manifest Status:	Not reported
Trans1 State ID:	CTD021816889
Trans2 State ID:	Not reported
Generator Ship Date:	2010-07-14
Trans1 Recv Date:	2010-07-14
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	2010-07-14
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MAD062179890
Trans1 EPA ID:	Not reported
Trans2 EPA ID:	Not reported
TSDF ID:	NYD080469935
Waste Code:	Not reported
Quantity:	49800.0
Units:	P - Pounds
Number of Containers:	1.0
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	1.02
Year:	2010
Manifest Tracking Num:	000137479UIS
Import Ind:	N
Export Ind:	N
Discr Quantity Ind:	Y
Discr Type Ind:	N
Discr Residue Ind:	N
Discr Partial Reject Ind:	N
Discr Full Reject Ind:	N
Manifest Ref Num:	Not reported
Alt Fac RCRA Id:	Not reported
Alt Fac Sign Date:	Not reported
Mgmt Method Type Code:	H040

Click this hyperlink while viewing on your computer to access
15 additional NY_MANIFEST: record(s) in the EDR Site Report.

MANIFEST:

GEN Cert Date:	9/22/2006
Transporter Recpt Date:	9/22/2006
Number Of Containers:	1
Container Type:	TT
Waste Code1:	MA99
Waste Code2:	D005
Waste Code3:	Not reported
Comment:	gen date approx
Fee Exempt Code:	Not reported

JET LINE SERVICES INC (Continued) **1000122251**

TSDF Name: United Oil Recovery Inc
TSDF ID: RID084802842
TSDF Date: 9/22/2006
Date Imported: 9/21/2007 5:11:56 PM
Transporter 2 Name: Not reported
Transporter 2 ID: CTD021816889
Manifest Docket Number: 001707449JJK
Waste Description: OILY SOLIDS
Quantity: 150
WT/Vol Units: P
Item Number: 75370658
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 11/6/2007
Transporter Recpt Date: 11/6/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 11/6/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001707449JJK
Waste Description: OILY LIQUID
Quantity: 55
WT/Vol Units: G
Item Number: 75370657
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 11/6/2007
Transporter Recpt Date: 11/6/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 11/6/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001707389JJK
Waste Description: OILY LIQUID
Quantity: 100
WT/Vol Units: G
Item Number: 902
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 9/13/2007
Transporter Recpt Date: 9/13/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 9/13/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001707389JJK
Waste Description: OILY SOLIDS
Quantity: 200
WT/Vol Units: P
Item Number: 903
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 9/13/2007
Transporter Recpt Date: 9/13/2007

JET LINE SERVICES INC (Continued) **1000122251**

Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 9/13/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001707272JJK
Waste Description: OILY LIQUID
Quantity: 50
WT/Vol Units: G
Item Number: 48897856
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 7/24/2007
Transporter Recpt Date: 7/24/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 7/24/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001707272JJK
Waste Description: OILY SOLIDS
Quantity: 200
WT/Vol Units: P
Item Number: 48897857
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 7/24/2007
Transporter Recpt Date: 7/24/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 7/24/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: NYB1921581
Waste Description: OIL DEBRIS
Quantity: 30
WT/Vol Units: Y
Item Number: 1
Transporter Name: JET LINE
Transporter EPA ID: MAD062179890
GEN Cert Date: 3/8/1990
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAC666673
Waste Description: METAL HYDROX
Quantity: 2766
WT/Vol Units: G
Item Number: 1
Transporter Name: JET LINE
Transporter EPA ID: MAD062179890
GEN Cert Date: 5/25/1989
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

TSDF Recpt Date: Not reported
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 000155247GBF
Waste Description: COMBUSTIBLE LIQUID NOS, COMBUSTIBLE
Quantity: 3700
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 3/14/2007
Transporter Recpt Date: 3/14/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 3/14/2007
EPA ID: MAD062179890
Transporter 2 ID: CTD021816889

Manifest Docket Number: 001701875JJK
Waste Description: OILY SOLIDS
Quantity: 50
WT/Vol Units: P
Item Number: 48908840
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 3/30/2007
Transporter Recpt Date: 3/30/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 3/30/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001482164JJK
Waste Description: OILY LIQUID
Quantity: 100
WT/Vol Units: G
Item Number: 48906715
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 3/6/2007
Transporter Recpt Date: 3/6/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 3/6/2007
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001482164JJK
Waste Description: OILY SOLIDS
Quantity: 200
WT/Vol Units: P
Item Number: 48906714
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 3/6/2007
Transporter Recpt Date: 3/6/2007
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 3/6/2007

JET LINE SERVICES INC (Continued) **1000122251**

EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001482244JJK
Waste Description: OILY SOLIDS
Quantity: 150
WT/Vol Units: P
Item Number: 50364
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 9/22/2006
Transporter Recpt Date: 9/22/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 9/22/2006
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: 001482244JJK
Waste Description: WASTE OIL
Quantity: 300
WT/Vol Units: P
Item Number: 50363
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 9/22/2006
Transporter Recpt Date: 9/22/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 9/22/2006
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAU191244
Waste Description: WASTE OIL
Quantity: 55
WT/Vol Units: G
Item Number: 45459
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 7/20/2006
Transporter Recpt Date: 7/20/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 7/20/2006
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAU191244
Waste Description: OILY SOLIDS
Quantity: 200
WT/Vol Units: P
Item Number: 45458
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 7/20/2006
Transporter Recpt Date: 7/20/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 7/20/2006
EPA ID: MAD062179890

JET LINE SERVICES INC (Continued) **1000122251**

Transporter 2 ID: Not reported

Manifest Docket Number: MAQ855886
Waste Description: COMBUSIBLE LIQUID NOS,
Quantity: 2500
WT/Vol Units: G
Item Number: a
Transporter Name: UNITED INDUSTRIAL SERVICES
Transporter EPA ID: CTD021816889
GEN Cert Date: 8/25/2006
Transporter Recpt Date: 8/25/2006
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: 8/25/2006
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAU109067
Waste Description: OILY SOLIDS
Quantity: 800
WT/Vol Units: P
Item Number: 47162
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 4/1/2006
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAU109106
Waste Description: OILY SOLIDS
Quantity: 300
WT/Vol Units: P
Item Number: 48202
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 4/1/2006
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD062179890
Transporter 2 ID: Not reported

Manifest Docket Number: MAU109063
Waste Description: OILY SOLIDS
Quantity: 300
WT/Vol Units: P
Item Number: 47079
Transporter Name: FLEET ENVIRONMENTAL
Transporter EPA ID: MAR000504928
GEN Cert Date: 4/1/2006
Transporter Recpt Date: Not reported
Transporter 2 Recpt Date: Not reported
TSDF Recpt Date: Not reported
EPA ID: MAD062179890
Transporter 2 ID: Not reported

JET LINE SERVICES INC (Continued) **1000122251**

Click this hyperlink while viewing on your computer to access
24 additional RI MANIFEST: record(s) in the EDR Site Report.

MA FINANCIAL ASSURANCE 1:

EPA Id:	MAD062179890
Closure Insurance Policy Amt:	$142,000.00
Steadfast Insurance Co Effective Date1:	1/09/2007
Steadfast Insurance Co Effective Date2:	5/02/2009
Sudden Accidental Insurance Amt:	Not reported
Sudden Accidental Insurance Notes:	$8 million - $1 6 million annual aggregate.

S77 **SAM'S AUTO SERVICE** **SHWS** **U000228103**
WNW **452 CANTON ST** **UST** **N/A**
1/2-1 **STOUGHTON, MA 02072** **AST**
0.808 mi. **RELEASE**
4268 ft. **Site 3 of 3 in cluster S** **FINANCIAL ASSURANCE**

Relative: Lower

Actual: 184 ft.

SHWS:

Facility ID:	4-0000832
Release Town:	STOUGHTON
Notification Date:	1/15/1990
Category:	NONE
Associated ID:	Not reported
Current Status:	**LSP No Further Action**
Status Date:	1/4/1999
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	GASOLINE
Quantity:	Not reported

Location:

Location Type:	COMMERCIAL
Location Type:	GASSTATION

Source:

Source Type:	UNKNOWN

Action:

Action Type:	TREGS
Action Stat:	LSPNFA
Action Date:	1/4/1999
Response Action Outcome:	Not reported
Action Type:	TAG
Action Stat:	GRNTEN
Action Date:	6/30/2000
Response Action Outcome:	Not reported
Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	1/15/1990
Response Action Outcome:	Not reported
Action Type:	TAG
Action Stat:	GRNTST

SAM'S AUTO SERVICE (Continued) **U000228103**

Action Date: 10/1/1999
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 9/3/1998
Response Action Outcome: Not reported

UST:
Facility ID: 12680

Facility:
Owner Id: 10460
Owner: SALIM GHANTOUS
Owner Address: 452 CANTON ST
Owner City,St,Zip: STOUGHTON, MA 02072
Telephone: (781) 344-8483
Description: Gas Station
Fire Dept. ID: 21285
Date of Inspection: 07/28/2010

Date Installed: 03/31/1961
Status Date: Not reported
Tank ID: 1
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 3000
Contents: Gasoline

Date Installed: 03/31/1961
Status Date: Not reported
Tank ID: 2
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 3000
Contents: Gasoline

SAM'S AUTO SERVICE (Continued) **U000228103**

Date Installed:	03/31/1961
Status Date:	Not reported
Tank ID:	3
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	2000
Contents:	Gasoline

Date Installed:	03/31/1973
Status Date:	Not reported
Tank ID:	4
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	275
Contents:	Diesel

Date Installed:	11/11/1989
Status Date:	Not reported
Tank ID:	5
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Cathodic
Tank Contents:	2 Walls
Tank Leak Detection:	Interstitial Monitoring
Pipe Material:	Cathodic
Pipe Container:	2 Walls
Pipe Leak Detection:	Interstitial Space Monitor
Serial Number:	Not reported
Aboveground:	No
Capacity:	10000
Contents:	Gasoline

Date Installed:	11/11/1989
Status Date:	Not reported
Tank ID:	6
Tank Status:	**In Use**
Tank Useage:	MV
Tank Material:	Cathodic

SAM'S AUTO SERVICE (Continued) **U000228103**

Tank Contents: 2 Walls
Tank Leak Detection: Interstitial Monitoring
Pipe Material: Cathodic
Pipe Container: 2 Walls
Pipe Leak Detection: Interstitial Space Monitor
Serial Number: Not reported
Aboveground: No
Capacity: 8000
Contents: Gasoline

Date Installed: 11/11/1989
Status Date: Not reported
Tank ID: 7
Tank Status: In Use
Tank Useage: MV
Tank Material: Cathodic
Tank Contents: 2 Walls
Tank Leak Detection: Interstitial Monitoring
Pipe Material: Cathodic
Pipe Container: 2 Walls
Pipe Leak Detection: Interstitial Space Monitor
Serial Number: Not reported
Aboveground: No
Capacity: 6000
Contents: Gasoline

AST:
Facility ID: 12680
Owner Id: 10180
Owner: GREEN VALLEY OIL LLC
Owner Address: 9 DEXTER RD
Owner City,St,Zip: EAST PROVIDENCE, RI 02914
Telephone: (800) 289-4388
Description: Gas Station
Fire Dept. ID: 21285
Date of Inspection: 5/2/2007
Inspector: George Nice
Overfill Prevention: 1
Spill Prevention: 1

Tank Info:
Facility ID: 12680
Tank ID: 8
Serial Number: Not reported
Aboveground: Yes
Capacity: 275
Contents: Waste Oil
Tank Status: In Use
Tank Use: Not reported
Tank Material: Steel
Tank Construction: 1 Wall
Tank Leak Detection: Not reported
Pipe Material: Steel
Pipe Construction: 1 Wall
Pipe Leak Detection: Not reported

SAM'S AUTO SERVICE (Continued) **U000228103**

Release:
- Facility ID: 4-0000832
- Primary ID: Not reported
- Official City: STOUGHTON
- Notification: 1/15/1990
- Category: NONE
- Current Status: LSP Opinion,No Further Action
- Status Date: 1/4/1999
- Phase: Not reported
- Response Action Outcome: -
- Oil / Haz Material Type: Oil

Action:
- Action Type: TREGS
- Action Stat: LSPNFA
- Action Date: 1/4/1999
- Response Action Outcome: Not reported

- Action Type: TAG
- Action Stat: GRNTEN
- Action Date: 6/30/2000
- Response Action Outcome: Not reported

- Action Type: Release Disposition
- Action Stat: Valid Transition Site
- Action Date: 1/15/1990
- Response Action Outcome: Not reported

- Action Type: TAG
- Action Stat: GRNTST
- Action Date: 10/1/1999
- Response Action Outcome: Not reported

- Action Type: Compliance and Enforcement Action
- Action Stat: Notice of Non-Compliance Issued
- Action Date: 9/3/1998
- Response Action Outcome: Not reported

Chemical:
- Chemical: GASOLINE
- Quantity: Not reported

Location:
- Location Type: COMMERCIAL
- Location Type: GASSTATION

Source:
- Source Type: UNKNOWN

MA FINANCIAL ASSURANCE 2:
- Facility Id: 12680
- Description: Gas Station
- Work Phone: (781) 344-8483

R78 **NO LOCATION AID** **SHWS** **S103043666**
North **354-360 WASHINGTON ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.811 mi.
4282 ft. **Site 2 of 3 in cluster R**

Relative:
Higher

Actual:
242 ft.

SHWS:
Facility ID: 4-0013729
Release Town: STOUGHTON
Notification Date: 3/10/1998
Category: 120 DY
Associated ID: 4-0013806
Current Status: **Response Action Outcome Not Required**
Status Date: 4/13/1999
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: GASOLINE
Quantity: 33 parts per million

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 8/4/1998
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1998
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E

NO LOCATION AID (Continued) **S103043666**

Action Date: 3/10/1998
Response Action Outcome: Not reported

Release:
Facility ID: 4-0013729
Primary ID: 4-0013806
Official City: STOUGHTON
Notification: 3/10/1998
Category: 120 DY
Current Status: Response Action Outcome Not Required
Status Date: 4/13/1999
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Tier Classified Site
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: RTN Linked to TCLASS Via Tier Classification Submittal
Action Date: 4/13/1999
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 8/4/1998
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1998
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 3/10/1998
Response Action Outcome: Not reported

Chemical:
Chemical: GASOLINE
Quantity: 33 parts per million

Location:

NO LOCATION AID (Continued) **S103043666**

Location Type: Not reported

Source:
Source Type: Not reported

R79
North
1/2-1
0.820 mi.
4332 ft.

Relative:
Higher

Actual:
242 ft.

POLE 161A **SHWS S104000731**
WASHINGTON ST **RELEASE N/A**
STOUGHTON, MA 02072

Site 3 of 3 in cluster R

SHWS:
Facility ID: 4-0014808
Release Town: STOUGHTON
Notification Date: 6/24/1999
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 8/13/1999
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material: Oil

Chemical:
Chemical: TRANSFORMER OIL
Quantity: 12 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: TRANSFORM

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/7/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 3/29/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition

POLE 161A (Continued) **S104000731**

Action Stat: Reportable Release under MGL 21E
Action Date: 6/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:
Facility ID: 4-0014808
Primary ID: Not reported
Official City: STOUGHTON
Notification: 6/24/1999
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 8/13/1999
Phase: Not reported
Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/7/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 3/29/2005
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 6/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 8/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 6/24/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: RNF

POLE 161A (Continued) **S104000731**

Action Stat: Reportable Release under MGL 21E
Action Date: 8/13/1999
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: TRANSFORMER OIL
Quantity: 12 gallons

Location:
Location Type: COMMERCIAL

Source:
Source Type: TRANSFORM

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80 NNW 1/2-1 0.823 mi. 4344 ft. **RESIDENCE** **LUST** **S110303623**
61 RAYBURN RD **RELEASE** **N/A**
STOUGHTON, MA 02072

Relative: Higher

Actual: 236 ft.

LUST:

Facility:
Facility ID: 4-0022465
Current Status: **Response Action Outcome**
Status Date: 4/23/2010
Source Type: UST
Release Town: STOUGHTON
Notification Date: 3/9/2010
Category: 72 HR
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material: Oil

Chemical:
Chemical: #2 FUEL OIL
Quantity: 190 parts per million

Location:
Location Type: RESIDNTIAL

Source:
Source Type: UST

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/12/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/9/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO

RESIDENCE (Continued) **S110303623**

Action Stat: RAO Statement Received
Action Date: 4/23/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNFE
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 4/23/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 3/9/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 5/11/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/4/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Release:
Facility ID: 4-0022465
Primary ID: Not reported
Official City: STOUGHTON
Notification: 3/9/2010
Category: 72 HR
Current Status: Response Action Outcome
Status Date: 4/23/2010
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/12/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 3/9/2010
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO

RESIDENCE (Continued) **S110303623**

Action Stat:	RAO Statement Received
Action Date:	4/23/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RNFE
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	4/23/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	3/9/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	RLFA
Action Stat:	FLDRUN
Action Date:	5/11/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.
Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	5/4/2010
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:

Chemical:	#2 FUEL OIL
Quantity:	190 parts per million

Location:

Location Type:	RESIDNTIAL

Source:

Source Type:	UST

T81 **PINECREST III REALTY PARTNERS** **SHWS** **S108962881**
NNW **428-440 PEARL ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.825 mi.
4354 ft. **Site 1 of 3 in cluster T**

Relative:
Higher

Actual:
237 ft.

SHWS:

Facility ID:	4-0020807
Release Town:	STOUGHTON
Notification Date:	10/3/2007
Category:	72 HR
Associated ID:	Not reported
Current Status:	**Downgradient Property Status**
Status Date:	10/2/2008
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	ACETONE

PINECREST III REALTY PARTNERS (Continued) **S108962881**

Quantity: Not reported
Chemical: PCE
Quantity: 6 parts per billion
Chemical: TOLUENE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/2/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/28/2007
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/10/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/22/2008
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 10/3/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 10/3/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/2/2008
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/10/2007
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/9/2007
Response Action Outcome: Not reported

PINECREST III REALTY PARTNERS (Continued) **S108962881**

Release:
- Facility ID: 4-0020807
- Primary ID: Not reported
- Official City: STOUGHTON
- Notification: 10/3/2007
- Category: 72 HR
- Current Status: Downgradient Property Status
- Status Date: 10/2/2008
- Phase: Not reported
- Response Action Outcome: -
- Oil / Haz Material Type: Hazardous Material

Action:
- Action Type: Downgradient Property Status
- Action Stat: Transmittal, Notice, or Notification Received
- Action Date: 10/2/2008
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Level I - Technical Screen Audit
- Action Date: 12/28/2007
- Response Action Outcome: Not reported

- Action Type: RNF
- Action Stat: Reportable Release under MGL 21E
- Action Date: 12/10/2007
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Status or Interim Report Received
- Action Date: 2/22/2008
- Response Action Outcome: Not reported

- Action Type: Release Disposition
- Action Stat: Reportable Release under MGL 21E
- Action Date: 10/3/2007
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: IRA Assessment Only
- Action Date: 10/3/2007
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Completion Statement Received
- Action Date: 10/2/2008
- Response Action Outcome: Not reported

- Action Type: Immediate Response Action
- Action Stat: Written Plan Received
- Action Date: 12/10/2007
- Response Action Outcome: Not reported

- Action Type: A Notice sent to a Potentially Responsible Party (PRP)
- Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
- Action Date: 10/9/2007
- Response Action Outcome: Not reported

PINECREST III REALTY PARTNERS (Continued) **S108962881**

Chemical:
Chemical: ACETONE
Quantity: Not reported
Chemical: PCE
Quantity: 6 parts per billion
Chemical: TOLUENE
Quantity: Not reported

Location:
Location Type: COMMERCIAL

Source:
Source Type: UNKNOWN

T82 **A&A CLEANERS FMR** **SHWS** **S105522050**
NNW **434-450 PEARL ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.842 mi.
4445 ft. **Site 2 of 3 in cluster T**

Relative: Higher

Actual: 238 ft.

SHWS:
Facility ID: 4-0015961
Release Town: STOUGHTON
Notification Date: 1/26/2001
Category: TWO HR
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 9/30/2002
Phase: Not reported
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: TETRACHLOROETHENE
Quantity: 20 parts per billion

Location:
Location Type: COMMERCIAL
Location Type: RESIDNTIAL
Location Type: ROADWAY

Source:
Source Type: UNKNOWN

Action:
Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 5/14/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 6/14/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received

A&A CLEANERS FMR (Continued) **S105522050**

Action Date: 9/30/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/30/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/4/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 4/11/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/22/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 1/22/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/11/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Release:
Facility ID: 4-0015961
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/26/2001
Category: TWO HR
Current Status: Response Action Outcome
Status Date: 9/30/2002
Phase: Not reported
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Compliance and Enforcement Action
Action Stat: NORA

A&A CLEANERS FMR (Continued) **S105522050**

Action Date: 5/14/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 6/14/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 9/30/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 9/30/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/4/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 4/11/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/22/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 1/22/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/11/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Chemical:
Chemical: TETRACHLOROETHENE
Quantity: 20 parts per billion

Location:

A&A CLEANERS FMR (Continued) **S105522050**

Location Type: COMMERCIAL
Location Type: RESIDNTIAL
Location Type: ROADWAY

Source:
Source Type: UNKNOWN

U83 **ARK-LES CORPORATION** **SHWS** **U003966374**
NW **1490 CENTRAL ST** **UST** **N/A**
1/2-1 **STOUGHTON, MA 02072** **RELEASE**
0.842 mi. **FINANCIAL ASSURANCE**
4448 ft. **Site 1 of 2 in cluster U**

Relative:
Lower

Actual:
198 ft.

SHWS:
Facility ID: 4-0000603
Release Town: STOUGHTON
Notification Date: 1/15/1989
Category: NONE
Associated ID: Not reported
Current Status: **Response Action Outcome**
Status Date: 7/9/2003
Phase: PHASE III
Response Action Outcome: B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil Or Haz Material: Oil and Hazardous Material

Chemical:
Chemical: PETROLEUM
Quantity: Not reported
Chemical: SOLVENTS, PAINTS, ETC
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UNKNOWN

Action:
Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 7/7/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 4/10/1999
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 7/9/2003

ARK-LES CORPORATION (Continued) **U003966374**

Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 5/5/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 2/26/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 3/17/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 7/28/1995
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 2/26/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/29/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PLANDT
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

ARK-LES CORPORATION (Continued) **U003966374**

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/12/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 1/7/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 7/24/1989
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 9/29/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TREGS
Action Stat: LSPFA
Action Date: 7/28/1995
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: BWS03
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 6/22/1999
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 10/26/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 3/24/2003

ARK-LES CORPORATION (Continued) **U003966374**

Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPMTG
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 10/17/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 10/1/1996
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 7/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 5/20/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1989
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

ARK-LES CORPORATION (Continued) **U003966374**

Action Type:	TAG
Action Stat:	GRNTST
Action Date:	10/1/1999
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	BWS20
Action Stat:	APPROV
Action Date:	Not reported
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	PIP
Action Stat:	Written Plan Received
Action Date:	4/10/1999
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	TAG
Action Stat:	GRNTEN
Action Date:	6/30/2001
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Tier Classification
Action Stat:	Tier 1C Classification
Action Date:	7/28/1995
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

UST:

Facility ID:	12656

Facility:

Owner Id:	396
Owner:	ARK-LES CORPORATION
Owner Address:	1490 CENTRAL ST
Owner City,St,Zip:	STOUGHTON, MA 02072
Telephone:	(617) 924-2330
Description:	Other
Fire Dept. ID:	21285
Date of Inspection:	Not reported

Date Installed:	04/22/1960
Status Date:	Not reported
Tank ID:	1
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported

ARK-LES CORPORATION (Continued) **U003966374**

Aboveground:	No
Capacity:	Not reported
Contents:	Gasoline

Date Installed:	04/22/1962
Status Date:	Not reported
Tank ID:	2
Tank Status:	**Removed**
Tank Useage:	Not reported
Tank Material:	Steel
Tank Contents:	Not reported
Tank Leak Detection:	Not reported
Pipe Material:	Not reported
Pipe Container:	Not reported
Pipe Leak Detection:	Not reported
Serial Number:	Not reported
Aboveground:	No
Capacity:	Not reported
Contents:	Waste Oil

Release:

Facility ID:	4-0000603
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	1/15/1989
Category:	NONE
Current Status:	Response Action Outcome
Status Date:	7/9/2003
Phase:	PHASE III
Response Action Outcome:	B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil / Haz Material Type:	Oil and Hazardous Material

Action:

Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	7/7/2003
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	8/3/2001
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	PIP
Action Stat:	PIPDLY
Action Date:	4/10/1999
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	7/9/2003
Response Action Outcome:	Remedial actions have not been conducted because a level of No

ARK-LES CORPORATION (Continued) **U003966374**

Significant Risk exists.

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 5/5/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 2/26/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Public Comment Period Initiated on Submittal
Action Date: 3/17/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 7/28/1995
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 2/26/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 9/29/1997
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PLANDT
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG
Action Stat: GRNTST
Action Date: 7/1/2000
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action

ARK-LES CORPORATION (Continued) **U003966374**

Action Stat:	Modified Revised or Updated Plan Received
Action Date:	8/12/2002
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	1/7/2003
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	7/24/1989
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	PIP
Action Stat:	Public Involvement Petition Received
Action Date:	9/29/1997
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	TREGS
Action Stat:	LSPFA
Action Date:	7/28/1995
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	BWS03
Action Stat:	APPROV
Action Date:	Not reported
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	8/3/2001
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	6/22/1999
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	10/26/1998
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Immediate Response Action
Action Stat:	Oral Plan Denied and/or Written Plan Requested
Action Date:	3/24/2003
Response Action Outcome:	Remedial actions have not been conducted because a level of No

ARK-LES CORPORATION (Continued) **U003966374**

Significant Risk exists.

Action Type: PIP
Action Stat: PIPDLY
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: PIPMTG
Action Date: 2/25/1998
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RLFA
Action Stat: FLDRUN
Action Date: 10/17/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 10/1/1996
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Permit Extension Received
Action Date: 7/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 5/20/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Modified Revised or Updated Plan Received
Action Date: 8/3/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1989
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2000
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG

ARK-LES CORPORATION (Continued) **U003966374**

Action Stat: GRNTST
Action Date: 10/1/1999
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: BWS20
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 4/10/1999
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: TAG
Action Stat: GRNTEN
Action Date: 6/30/2001
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 7/28/1995
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Chemical:
Chemical: PETROLEUM
Quantity: Not reported
Chemical: SOLVENTS, PAINTS, ETC
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UNKNOWN

MA FINANCIAL ASSURANCE 2:
Facility Id: 12656
Description: Other
Work Phone: (617) 924-2330

T84 **PINECREST III REALTY PARTNERS** **SHWS** **S105735999**
NNW **438 PEARL ST** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.851 mi.
4493 ft. **Site 3 of 3 in cluster T**

Relative:
Higher

Actual:
239 ft.

SHWS:
Facility ID: 4-0017483
Release Town: STOUGHTON
Notification Date: 12/3/2002
Category: 120 DY
Associated ID: Not reported

PINECREST III REALTY PARTNERS (Continued) **S105735999**

Current Status:	**Response Action Outcome**
Status Date:	7/16/2009
Phase:	PHASE II
Response Action Outcome:	B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	ACETONE
Quantity:	5300 parts per billion
Chemical:	TOLUENE
Quantity:	1500 parts per billion

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Immediate Response Action
Action Stat:	IRA Assessment Only
Action Date:	10/3/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	7/16/2009
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Enforcement Conference
Action Date:	5/18/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Non-Compliance Issued
Action Date:	8/21/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	1/20/2003
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Tier Classification
Action Stat:	Tier 2 Classification
Action Date:	10/15/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.
Action Type:	Compliance and Enforcement Action
Action Stat:	ACOP
Action Date:	8/21/2007

PINECREST III REALTY PARTNERS (Continued) **S105735999**

Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 11/14/2005
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/10/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/22/2008
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/28/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/15/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 1
Action Stat: Level I - Technical Screen Audit
Action Date: 12/19/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 7/28/2009
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

PINECREST III REALTY PARTNERS (Continued) **S105735999**

Action Type:	Tier Classification
Action Stat:	Level I - Technical Screen Audit
Action Date:	12/19/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Phase 1
Action Stat:	Completion Statement Received
Action Date:	10/15/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Phase 2
Action Stat:	Scope of Work Received
Action Date:	10/15/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	10/2/2008
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Release:

Facility ID:	4-0017483
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	12/3/2002
Category:	120 DY
Current Status:	Response Action Outcome
Status Date:	7/16/2009
Phase:	PHASE II
Response Action Outcome:	B1 - Remedial actions have not been conducted because a level of No Significant Risk exists.
Oil / Haz Material Type:	Hazardous Material

Action:

Action Type:	Immediate Response Action
Action Stat:	IRA Assessment Only
Action Date:	10/3/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	7/16/2009
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Enforcement Conference
Action Date:	5/18/2007
Response Action Outcome:	Remedial actions have not been conducted because a level of No Significant Risk exists.

PINECREST III REALTY PARTNERS (Continued) **S105735999**

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 8/21/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 1/20/2003
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 10/15/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Compliance and Enforcement Action
Action Stat: ACOP
Action Date: 8/21/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 11/14/2005
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/10/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/22/2008
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 12/28/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/15/2007

PINECREST III REALTY PARTNERS (Continued) **S105735999**

Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 1
Action Stat: Level I - Technical Screen Audit
Action Date: 12/19/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 7/28/2009
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/3/2002
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Tier Classification
Action Stat: Level I - Technical Screen Audit
Action Date: 12/19/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 10/15/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 10/15/2007
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/2/2008
Response Action Outcome: Remedial actions have not been conducted because a level of No Significant Risk exists.

Chemical:
Chemical: ACETONE
Quantity: 5300 parts per billion
Chemical: TOLUENE
Quantity: 1500 parts per billion

Location:
Location Type: Not reported

Source:
Source Type: Not reported

U85 **ARK LES CORPORATION** **LUST** **S100351991**
NW **EVANS DR** **RELEASE** **N/A**
1/2-1 **STOUGHTON, MA 02072**
0.852 mi.
4499 ft. **Site 2 of 2 in cluster U**

Relative:
Lower

Actual:
199 ft.

LUST:

Facility:

Facility ID:	4-0000597
Current Status:	**Response Action Outcome**
Status Date:	5/12/1994
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	1/15/1989
Category:	NONE
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	PETROLEUM
Quantity:	Not reported

Location:

Location Type:	INDUSTRIAL

Source:

Source Type:	UST

Action:

Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	11/13/1998
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	5/12/1994
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type:	Release Disposition
Action Stat:	Valid Transition Site
Action Date:	1/15/1989
Response Action Outcome:	A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Release:

Facility ID:	4-0000597
Primary ID:	Not reported
Official City:	STOUGHTON
Notification:	1/15/1989
Category:	NONE
Current Status:	Response Action Outcome
Status Date:	5/12/1994
Phase:	Not reported

ARK LES CORPORATION (Continued) **S100351991**

Response Action Outcome: A1 - A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.
Oil / Haz Material Type: Oil

Action:
Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 11/13/1998
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 5/12/1994
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1989
Response Action Outcome: A permanent solution has been achieved. Contamination has been reduced to background or a threat of release has been eliminated.

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: INDUSTRIAL

Source:
Source Type: UST

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86 WNW 1/2-1 0.933 mi. 4925 ft. **PROPERTY** **SHWS** **S101037116**
1551 CENTRAL ST **RELEASE** **N/A**
STOUGHTON, MA 02072 **SPILLS**

Relative: Lower

Actual: 189 ft.

SHWS:
Facility ID: 4-0014851
Release Town: STOUGHTON
Notification Date: 9/27/1999
Category: TWO HR
Associated ID: Not reported
Current Status: **Tier 1C, a site/release receiving a total NRS score of less than 450 and equal to or greater than 350. A site/release receiving a total NRS score of less than 350, but which also meets any of the Tier 1 Inclusionary Criteria specified in 310 CMR 40.0520(2)(a), is also classified a Tier 1C. These sites/releases require a permit and the response actions may be performed under the supervision of a Licensed Site Professional(LSP) without prior DEP approval, unless such an approval is specifically required by DEP.**
Status Date: 6/30/2011
Phase: PHASE IV
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:

PROPERTY (Continued) **S101037116**

Chemical: TETRACHLOROETHENE
Quantity: 60 parts per billion

Location:
Location Type: COMMERCIAL
Location Type: INDUSTRIAL
Location Type: RESIDNTIAL
Location Type: ROADWAY
Location Type: WATERBODY

Source:
Source Type: UNKNOWN

Action:
Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 9/27/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 6/27/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/6/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/7/2006
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 10/7/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Written Plan Received
Action Date: 12/5/2005
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 10/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Plan Denied and/or Written Plan Requested
Action Date: 6/28/2000
Response Action Outcome: Not reported

PROPERTY (Continued) **S101037116**

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 10/24/2007
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/27/1999
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/17/2003
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: ACTIVE
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/7/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 3/9/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/11/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/14/2009
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 12/14/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 11/16/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN

PROPERTY (Continued) **S101037116**

Action Date: 3/3/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 2/1/2005
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/24/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 9/15/2006
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Revised Statement or Transmittal Received
Action Date: 11/16/2004
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 3/9/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 3/4/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 6/30/2011
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 11/18/2002
Response Action Outcome: Not reported

PROPERTY (Continued) **S101037116**

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 9/27/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: RMRINI
Action Date: 11/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/22/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/22/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 1/9/2012
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 12/6/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/17/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 11/18/2002
Response Action Outcome: Not reported

Action Type: BWS30
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/29/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received

PROPERTY (Continued) **S101037116**

Action Date: 8/4/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/31/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/4/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/11/2001
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/27/2001
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 5/26/2005
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 5/11/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/25/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/26/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 7/28/2004
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 12/27/2000
Response Action Outcome: Not reported

PROPERTY (Continued) **S101037116**

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 1/27/2000
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/27/1999
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 6/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 12/1/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 6/30/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/6/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/29/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 1/24/2003
Response Action Outcome: Not reported

Release:
Facility ID: 4-0014851
Primary ID: Not reported
Official City: STOUGHTON
Notification: 9/27/1999
Category: TWO HR
Current Status: TIER1C
Status Date: 6/30/2011
Phase: PHASE IV
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

PROPERTY (Continued) **S101037116**

Action:

Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	9/27/1999
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Written Plan Received
Action Date:	6/27/2000
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	3/6/2003
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	9/7/2006
Response Action Outcome:	Not reported
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	10/7/2011
Response Action Outcome:	Not reported
Action Type:	Phase 4
Action Stat:	Written Plan Received
Action Date:	12/5/2005
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	11/22/2000
Response Action Outcome:	Not reported
Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	10/28/2011
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Oral Plan Denied and/or Written Plan Requested
Action Date:	6/28/2000
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	10/24/2007
Response Action Outcome:	Not reported
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/27/1999
Response Action Outcome:	Not reported
Action Type:	Release Abatement Measure

PROPERTY (Continued) **S101037116**

Action Stat: Status or Interim Report Received
Action Date: 7/17/2003
Response Action Outcome: Not reported

Action Type: BWS03
Action Stat: ACTIVE
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/7/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 3/9/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/11/2005
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 9/14/2009
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 12/14/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Completion Statement Received
Action Date: 11/16/2004
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 3/3/2005
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: An activity type that is related to an Audit
Action Stat: NOA
Action Date: 2/1/2005

PROPERTY (Continued) **S101037116**

Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 10/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/24/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Level I - Technical Screen Audit
Action Date: 9/15/2006
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Revised Statement or Transmittal Received
Action Date: 11/16/2004
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Legal Notice Published
Action Date: 3/9/2001
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Permit Effective Date
Action Date: 3/4/2003
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 6/30/2011
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Revised Statement or Transmittal Received
Action Date: 11/18/2002
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: IRA Assessment Only
Action Date: 9/27/1999
Response Action Outcome: Not reported

PROPERTY (Continued) **S101037116**

Action Type: Immediate Response Action
Action Stat: RMRINI
Action Date: 11/28/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/22/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 8/22/2011
Response Action Outcome: Not reported

Action Type: Phase 4
Action Stat: Status or Interim Report Received
Action Date: 1/9/2012
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Approval of Plan
Action Date: 12/6/2002
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Status or Interim Report Received
Action Date: 7/17/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 11/18/2002
Response Action Outcome: Not reported

Action Type: BWS30
Action Stat: APPROV
Action Date: Not reported
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 11/29/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 8/4/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 12/31/2003
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received

PROPERTY (Continued) **S101037116**

Action Date: 5/4/2007
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 6/11/2001
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 11/22/2000
Response Action Outcome: Not reported

Action Type: Phase 2
Action Stat: Scope of Work Received
Action Date: 9/27/2001
Response Action Outcome: Not reported

Action Type: Phase 3
Action Stat: Completion Statement Received
Action Date: 5/26/2005
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Written Plan Received
Action Date: 5/11/2001
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/25/2000
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 7/26/2000
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 7/28/2004
Response Action Outcome: Not reported

Action Type: PIP
Action Stat: Public Involvement Petition Received
Action Date: 12/27/2000
Response Action Outcome: Not reported

Action Type: Release Abatement Measure
Action Stat: Written Plan Received
Action Date: 1/27/2000
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 9/27/1999
Response Action Outcome: Not reported

PROPERTY (Continued) **S101037116**

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 6/21/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Legal Notice Published
Action Date: 12/1/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 1C Classification
Action Date: 6/30/2011
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 2/6/2004
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 3/29/2002
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 11/12/2002
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FLDRAN
Action Date: 1/24/2003
Response Action Outcome: Not reported

Chemical:
Chemical: TETRACHLOROETHENE
Quantity: 60 parts per billion

Location:
Location Type: COMMERCIAL
Location Type: INDUSTRIAL
Location Type: RESIDNTIAL
Location Type: ROADWAY
Location Type: WATERBODY

Source:
Source Type: UNKNOWN

MA Spills:

Facility ID:	0000	Spill ID:	S90-0615
Staff Lead:	MORAN, M	Date Entered:	Not reported
Last Entered:	19900821	First Response:	19900816
Spill Date:	19900815	Spill Time:	Not reported
Report Date:	19900816	Report Time:	12:15AM
Case Closed:	YES	Mat Type:	HAZARDOUS
Virgin Waste:	WASTE	Contam Soil:	Not reported

PROPERTY (Continued) **S101037116**

Env Impact:	Not reported	Other Impact:	Not reported
Material:	OTHER MATERIAL -->	Other Material:	HAZ WASTE LIQUIDS
Qty Reported:	----------	Qty Actual:	----------
Qty Reported:	----------	Qty Actual:	----------
CAS No:	Not reported	PCB Lev (ppm):	----------
Source:	OTHER SOURCE >	Other Source:	IMPROPER DISPOS
Incident:	OTHER RELEASE >	Other Incdnt:	STOLEN MATERIAL
Cleanup Type:	SC	Contractor:	NOT USED
Referral:	NO	LUST Elig:	NO
Report Prep:	Not reported	Category:	Not reported
Notifier:	LARRY CAPWELL		
Notif Tel:	Not reported		
Days/Close:	-1		

87
WNW
1/2-1
0.934 mi.
4929 ft.

GILL MACHINE SHOP **SHWS S104546451**
151 SOUTHWORTH CT **RELEASE N/A**
STOUGHTON, MA 02072

Relative:
Lower

Actual:
181 ft.

SHWS:

Facility ID:	4-0013789
Release Town:	STOUGHTON
Notification Date:	4/23/1998
Category:	TWO HR
Associated ID:	Not reported
Current Status:	**Downgradient Property Status Terminated**
Status Date:	3/23/2006
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Hazardous Material

Chemical:

Chemical:	TETRACHLOROETHYLENE
Quantity:	30 parts per billion

Location:

Location Type:	RESIDNTIAL

Source:

Source Type:	UNKNOWN

Action:

Action Type:	An activity type that is related to an Audit
Action Stat:	Notice of Non-compliance related to an Audit
Action Date:	3/23/2006
Response Action Outcome:	Not reported
Action Type:	Downgradient Property Status
Action Stat:	Level III - Comprehensive Audit
Action Date:	3/23/2006
Response Action Outcome:	Not reported
Action Type:	Downgradient Property Status
Action Stat:	Transmittal, Notice, or Notification Received
Action Date:	10/1/2001
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Imminent Hazard Evaluation Received

GILL MACHINE SHOP (Continued) **S104546451**

Action Date: 6/30/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 2/17/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/26/1998
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 5/6/1999
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 5/26/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Notice of Non-Compliance Issued
Action Date: 6/2/2000
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Not Required - Fee Credited-FMCRA Use Only
Action Date: 4/14/2004
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/23/1998
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 4/20/1998
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Fee Received - FMCRA Use Only
Action Date: 10/2/2001
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level I - Technical Screen Audit
Action Date: 6/12/2006
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Status or Interim Report Received
Action Date: 7/7/2000
Response Action Outcome: Not reported

GILL MACHINE SHOP (Continued) **S104546451**

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 1/10/2000
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: NORA
Action Date: 2/17/1999
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Action Status or AUL Terminated
Action Date: 3/23/2006
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 7/23/1998
Response Action Outcome: Not reported

Facility ID: 4-0014951
Release Town: STOUGHTON
Notification Date: 8/25/1999
Category: 120 DY
Associated ID: Not reported
Current Status: **Downgradient Property Status**
Status Date: 10/1/2001
Phase: PHASE II
Response Action Outcome: -
Oil Or Haz Material: Hazardous Material

Chemical:
Chemical: BERYLLIUM
Quantity: .7 parts per million

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Action:
Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/1/2001
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: Tier Classification

GILL MACHINE SHOP (Continued) **S104546451**

Action Stat: Tier 2 Classification
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/25/1999
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/25/1999
Response Action Outcome: Not reported

Release:
Facility ID: 4-0013789
Primary ID: Not reported
Official City: STOUGHTON
Notification: 4/23/1998
Category: TWO HR
Current Status: DPSTRM
Status Date: 3/23/2006
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: An activity type that is related to an Audit
Action Stat: Notice of Non-compliance related to an Audit
Action Date: 3/23/2006
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Level III - Comprehensive Audit
Action Date: 3/23/2006
Response Action Outcome: Not reported

Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/1/2001
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Imminent Hazard Evaluation Received
Action Date: 6/30/1998
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 2/17/1999
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Plan Received
Action Date: 5/26/1998
Response Action Outcome: Not reported

GILL MACHINE SHOP (Continued) **S104546451**

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	5/6/1999
Response Action Outcome:	Not reported

Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	5/26/1998
Response Action Outcome:	Not reported

Action Type:	Compliance and Enforcement Action
Action Stat:	Notice of Non-Compliance Issued
Action Date:	6/2/2000
Response Action Outcome:	Not reported

Action Type:	Downgradient Property Status
Action Stat:	Fee Not Required - Fee Credited-FMCRA Use Only
Action Date:	4/14/2004
Response Action Outcome:	Not reported

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	4/23/1998
Response Action Outcome:	Not reported

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	4/20/1998
Response Action Outcome:	Not reported

Action Type:	Downgradient Property Status
Action Stat:	Fee Received - FMCRA Use Only
Action Date:	10/2/2001
Response Action Outcome:	Not reported

Action Type:	Downgradient Property Status
Action Stat:	Level I - Technical Screen Audit
Action Date:	6/12/2006
Response Action Outcome:	Not reported

Action Type:	Immediate Response Action
Action Stat:	Status or Interim Report Received
Action Date:	7/7/2000
Response Action Outcome:	Not reported

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	1/10/2000
Response Action Outcome:	Not reported

Action Type:	Compliance and Enforcement Action
Action Stat:	NORA
Action Date:	2/17/1999
Response Action Outcome:	Not reported

Action Type:	Downgradient Property Status
Action Stat:	Action Status or AUL Terminated

GILL MACHINE SHOP (Continued) **S104546451**

Action Date: 3/23/2006
Response Action Outcome: Not reported

Action Type: Compliance and Enforcement Action
Action Stat: Interim Deadline Letter Issued
Action Date: 7/23/1998
Response Action Outcome: Not reported

Chemical:
Chemical: TETRACHLOROETHYLENE
Quantity: 30 parts per billion

Location:
Location Type: RESIDNTIAL

Source:
Source Type: UNKNOWN

Facility ID: 4-0014951
Primary ID: Not reported
Official City: STOUGHTON
Notification: 8/25/1999
Category: 120 DY
Current Status: Downgradient Property Status
Status Date: 10/1/2001
Phase: PHASE II
Response Action Outcome: -
Oil / Haz Material Type: Hazardous Material

Action:
Action Type: Downgradient Property Status
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 10/1/2001
Response Action Outcome: Not reported

Action Type: Phase 1
Action Stat: Completion Statement Received
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Transmittal, Notice, or Notification Received
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: Tier Classification
Action Stat: Tier 2 Classification
Action Date: 8/31/2000
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 8/25/1999
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/25/1999

GILL MACHINE SHOP (Continued) **S104546451**

Response Action Outcome: Not reported

Chemical:
Chemical: BERYLLIUM
Quantity: .7 parts per million

Location:
Location Type: Not reported

Source:
Source Type: Not reported

88
SE
1/2-1
0.936 mi.
4940 ft.

PRECISION DOOR & WINDOW **SHWS S100042055**
466 SUMMER ST **RELEASE N/A**
STOUGHTON, MA 02072

Relative:
Lower

Actual:
211 ft.

SHWS:
Facility ID: 4-0000743
Release Town: STOUGHTON
Notification Date: 1/15/1990
Category: NONE
Associated ID: Not reported
Current Status: **LSP No Further Action**
Status Date: 7/27/1994
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: MANUFACT

Source:
Source Type: UNKNOWN

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1990
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPNFA
Action Date: 7/27/1994
Response Action Outcome: Not reported

Release:
Facility ID: 4-0000743
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/15/1990
Category: NONE
Current Status: LSP Opinion,No Further Action

PRECISION DOOR & WINDOW (Continued) **S100042055**

Status Date: 7/27/1994
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1990
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPNFA
Action Date: 7/27/1994
Response Action Outcome: Not reported

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: MANUFACT

Source:
Source Type: UNKNOWN

V89 **NO LOCATION AID** **SHWS S102088503**
ESE **600 PARK ST** **LUST N/A**
1/2-1 **STOUGHTON, MA 02072** **RELEASE**
0.940 mi.
4962 ft. **Site 1 of 2 in cluster V**

Relative: Higher

Actual: 237 ft.

SHWS:
Facility ID: 4-0011625
Release Town: STOUGHTON
Notification Date: 8/29/1995
Category: 72 HR
Associated ID: Not reported
Current Status: **Response Action Outcome Not Required**
Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: DIESEL FUEL
Quantity: 11600 milligrams per kilogram

Location:
Location Type: COMMERCIAL

Source:
Source Type: ABANCAP
Source Type: UST

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/1/1995
Response Action Outcome: Not reported

NO LOCATION AID (Continued) **S102088503**

Action Type: RAO Not Required
Action Stat: Linked to a Transition Site - Obsolete Status
Action Date: 8/2/1996
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/30/1995
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 10/27/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/27/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/29/1995
Response Action Outcome: Not reported

LUST:

Facility:
Facility ID: 4-0011625
Current Status: **Response Action Outcome Not Required**
Status Date: 8/2/1996
Source Type: UST
Release Town: STOUGHTON
Notification Date: 8/29/1995
Category: 72 HR
Associated ID: Not reported
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: DIESEL FUEL
Quantity: 11600 milligrams per kilogram

Location:
Location Type: COMMERCIAL

NO LOCATION AID (Continued) **S102088503**

Source:
Source Type: ABANCAP
Source Type: UST

Action:
Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 9/1/1995
Response Action Outcome: Not reported

Action Type: RAO Not Required
Action Stat: Linked to a Transition Site - Obsolete Status
Action Date: 8/2/1996
Response Action Outcome: Not reported

Action Type: RLFA
Action Stat: FOLOFF
Action Date: 8/30/1995
Response Action Outcome: Not reported

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 10/27/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Completion Statement Received
Action Date: 10/27/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Oral Approval of Plan or Action
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 8/29/1995
Response Action Outcome: Not reported

Action Type: Immediate Response Action
Action Stat: Written Approval of Plan
Action Date: 8/29/1995
Response Action Outcome: Not reported

Release:
Facility ID: 4-0011625
Primary ID: Not reported
Official City: STOUGHTON
Notification: 8/29/1995
Category: 72 HR
Current Status: Response Action Outcome Not Required
Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

NO LOCATION AID (Continued) **S102088503**

Action:

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	9/1/1995
Response Action Outcome:	Not reported
Action Type:	RAO Not Required
Action Stat:	Linked to a Transition Site - Obsolete Status
Action Date:	8/2/1996
Response Action Outcome:	Not reported
Action Type:	RLFA
Action Stat:	FOLOFF
Action Date:	8/30/1995
Response Action Outcome:	Not reported
Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	10/27/1995
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Completion Statement Received
Action Date:	10/27/1995
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Oral Approval of Plan or Action
Action Date:	8/29/1995
Response Action Outcome:	Not reported
Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	8/29/1995
Response Action Outcome:	Not reported
Action Type:	Immediate Response Action
Action Stat:	Written Approval of Plan
Action Date:	8/29/1995
Response Action Outcome:	Not reported

Chemical:

Chemical:	DIESEL FUEL
Quantity:	11600 milligrams per kilogram

Location:

Location Type:	COMMERCIAL

Source:

Source Type:	ABANCAP
Source Type:	UST

V90 **B&C CONSTRUCTION** **LUST** **S105200442**
ESE **600 PARK ST** **LAST** **N/A**
1/2-1 **STOUGHTON, MA 02072** **RELEASE**
0.940 mi.
4962 ft. **Site 2 of 2 in cluster V**

Relative:
Higher

Actual:
237 ft.

LUST:

Facility:

Facility ID:	4-0001028
Current Status:	**Waiver Completion Statement, Permanent**
Status Date:	8/2/1996
Source Type:	UST
Release Town:	STOUGHTON
Notification Date:	1/15/1991
Category:	NONE
Associated ID:	Not reported
Phase:	Not reported
Response Action Outcome:	-
Oil Or Haz Material:	Oil

Chemical:

Chemical:	PETROLEUM
Quantity:	Not reported

Location:

Location Type:	COMMERCIAL
Location Type:	FORMER

Source:

Source Type:	AST
Source Type:	UST

Action:

Action Type:	An activity type that is related to an Audit
Action Stat:	NAFNVD
Action Date:	10/1/1992
Response Action Outcome:	Not reported
Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	11/27/1990
Response Action Outcome:	Not reported
Action Type:	TREGS
Action Stat:	REMSIT
Action Date:	8/26/1996
Response Action Outcome:	Not reported
Action Type:	TREGS
Action Stat:	WAVACC
Action Date:	12/30/1992
Response Action Outcome:	Not reported
Action Type:	TREGS
Action Stat:	WAVSIG
Action Date:	12/21/1992
Response Action Outcome:	Not reported
Action Type:	TREGS
Action Stat:	WAVREC
Action Date:	7/15/1992

B&C CONSTRUCTION (Continued) **S105200442**

Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1991
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/9/1991
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WCSPRM
Action Date: 8/2/1996
Response Action Outcome: Not reported

LAST:
Facility ID: 4-0001028
Source Type: AST
Release Town: STOUGHTON
Notification Date: 1/15/1991
Category: NONE
Associated ID: Not reported
Current Status: **Waiver Completion Statement Permanent**
Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Oil

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: FORMER

Source:
Source Type: AST
Source Type: UST

Action:
Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 10/1/1992
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/27/1990
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: REMSIT
Action Date: 8/26/1996
Response Action Outcome: Not reported

B&C CONSTRUCTION (Continued) **S105200442**

Action Type: TREGS
Action Stat: WAVACC
Action Date: 12/30/1992
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVSIG
Action Date: 12/21/1992
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 7/15/1992
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1991
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/9/1991
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WCSPRM
Action Date: 8/2/1996
Response Action Outcome: Not reported

Release:
Facility ID: 4-0001028
Primary ID: Not reported
Official City: STOUGHTON
Notification: 1/15/1991
Category: NONE
Current Status: Waiver Completion Statement,Permanent
Status Date: 8/2/1996
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Oil

Action:
Action Type: An activity type that is related to an Audit
Action Stat: NAFNVD
Action Date: 10/1/1992
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 11/27/1990
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: REMSIT
Action Date: 8/26/1996

B&C CONSTRUCTION (Continued) **S105200442**

Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVACC
Action Date: 12/30/1992
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVSIG
Action Date: 12/21/1992
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WAVREC
Action Date: 7/15/1992
Response Action Outcome: Not reported

Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 1/15/1991
Response Action Outcome: Not reported

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 4/9/1991
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: WCSPRM
Action Date: 8/2/1996
Response Action Outcome: Not reported

Chemical:
Chemical: PETROLEUM
Quantity: Not reported

Location:
Location Type: COMMERCIAL
Location Type: FORMER

Source:
Source Type: AST
Source Type: UST

91
NW
1/2-1
0.945 mi.
4990 ft.

Relative:
Lower

Actual:
203 ft.

COHENNO INC
92 EVANS DRIVE
STOUGHTON, MA 02072

RCRA-CESQG **1000208176**
FINDS **MAD982755852**
SHWS
UST
RELEASE
AIRS
FINANCIAL ASSURANCE

RCRA-CESQG:
Date form received by agency: 12/10/2009
Facility name: COHENNO INC
Facility address: 92 EVANS DR
STOUGHTON, MA 02072
EPA ID: MAD982755852

COHENNO INC (Continued) **1000208176**

Contact:	NANCY HAMILTON
Contact address:	92 EVANS DR STOUGHTON, MA 020720000
Contact country:	US
Contact telephone:	(781) 344-4042
Contact email:	Not reported
EPA Region:	01
Land type:	Private
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	COHENNO INC
Owner/operator address:	92 EVANS DR STOUGHTON, MA 02072
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	11/15/1990
Owner/Op end date:	Not reported

Owner/operator name:	COHENNO INC
Owner/operator address:	92 EVANS DR STOUGHTON, MA 02072
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	11/15/1990
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No

COHENNO INC (Continued) **1000208176**

User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 11/07/1988
Facility name: COHENNO INC
Classification: Not a generator, verified

Hazardous Waste Summary:
Waste code: D039
Waste name: TETRACHLOROETHYLENE

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/25/1991
Date achieved compliance: 05/31/1991
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/09/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 05/31/1991
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/25/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 05/31/1991
Evaluation lead agency: State

FINDS:

Registry ID: 110006815615

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MA-EPICS - Massachussetts Environmental Protection Integrated Computer

COHENNO INC (Continued) **1000208176**

System

SHWS:

Facility ID:	4-0020947
Release Town:	STOUGHTON
Notification Date:	12/7/2007
Category:	120 DY
Associated ID:	Not reported
Current Status:	**Response Action Outcome**
Status Date:	4/9/2008
Phase:	Not reported
Response Action Outcome:	A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil Or Haz Material:	Oil

Chemical:

Chemical:	C9 THRU C10 AROMATIC HYDROCARBONS
Quantity:	523 milligrams per kilogram

Location:

Location Type:	Not reported

Source:

Source Type:	Not reported

Action:

Action Type:	Response Action Outcome - RAO
Action Stat:	Level I - Technical Screen Audit
Action Date:	5/28/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Response Action Outcome - RAO
Action Stat:	RAO Statement Received
Action Date:	4/9/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	RNF
Action Stat:	Reportable Release under MGL 21E
Action Date:	12/7/2007
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	Release Disposition
Action Stat:	Reportable Release under MGL 21E
Action Date:	12/7/2007
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type:	A Notice sent to a Potentially Responsible Party (PRP)
Action Stat:	A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date:	2/29/2008
Response Action Outcome:	A permanent solution has been achieved. Contamination has not been reduced to background.

COHENNO INC (Continued) **1000208176**

UST:
Facility ID: 12648

Facility:
Owner Id: 1415
Owner: COHENNO INCORPORATED
Owner Address: 92 EVANS DR
Owner City,St,Zip: STOUGHTON, MA 02072
Telephone: (781) 344-4042
Description: Truck/Transport
Fire Dept. ID: 21285
Date of Inspection: 07/01/2010

Date Installed: 04/24/1966
Status Date: 12/02/1988
Tank ID: 1
Tank Status: Removed
Tank Useage: MV
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 10000
Contents: Diesel

Date Installed: 04/24/1966
Status Date: Not reported
Tank ID: 2
Tank Status: Removed
Tank Useage: Not reported
Tank Material: Steel
Tank Contents: Not reported
Tank Leak Detection: Not reported
Pipe Material: Not reported
Pipe Container: Not reported
Pipe Leak Detection: Not reported
Serial Number: Not reported
Aboveground: No
Capacity: 5000
Contents: Gasoline

Date Installed: 12/02/1988
Status Date: Not reported
Tank ID: 3
Tank Status: In Use
Tank Useage: MV
Tank Material: Cathodic
Tank Contents: 2 Walls
Tank Leak Detection: Interstitial Monitoring
Pipe Material: Flexible

COHENNO INC (Continued) **1000208176**

Pipe Container: 2 Walls
Pipe Leak Detection: Suction: Check Valve at Tank w/ Line Tightness
Serial Number: 126676
Aboveground: No
Capacity: 12000
Contents: Diesel

Release:
Facility ID: 4-0020947
Primary ID: Not reported
Official City: STOUGHTON
Notification: 12/7/2007
Category: 120 DY
Current Status: Response Action Outcome
Status Date: 4/9/2008
Phase: Not reported
Response Action Outcome: A2 - A permanent solution has been achieved. Contamination has not been reduced to background.
Oil / Haz Material Type: Oil

Action:
Action Type: Response Action Outcome - RAO
Action Stat: Level I - Technical Screen Audit
Action Date: 5/28/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Response Action Outcome - RAO
Action Stat: RAO Statement Received
Action Date: 4/9/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: RNF
Action Stat: Reportable Release under MGL 21E
Action Date: 12/7/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: Release Disposition
Action Stat: Reportable Release under MGL 21E
Action Date: 12/7/2007
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Action Type: A Notice sent to a Potentially Responsible Party (PRP)
Action Stat: A MassDEP piece of correspondence was issued (approvals, NORs, etc.
Action Date: 2/29/2008
Response Action Outcome: A permanent solution has been achieved. Contamination has not been reduced to background.

Chemical:
Chemical: C9 THRU C10 AROMATIC HYDROCARBONS
Quantity: 523 milligrams per kilogram

Location:
Location Type: Not reported

COHENNO INC (Continued) **1000208176**

Source:
Source Type: Not reported

AIRS:
Facility Status: APPROV
Permit Code: AQ02
Permit Name: Non-Major Comprehensive Approval
DEP Region: SE
Application Tracking Number: W080366
Date Closed: 8/23/2006
DEP Region Number: 296699
Applicant Name: PERKINS PRECOAT
Applicant Address: 92 EVANS DR
Applicant City,St,Zip: STOUGHTON, MA 020720000
Applicant Telephone: 7813418291

Facility Status: APPROV
Permit Code: AQ02
Permit Name: Non-Major Comprehensive Approval
DEP Region: SE
Application Tracking Number: P22689
Date Closed: 4/22/1999
DEP Region Number: 296699
Applicant Name: PERKINS PRECOAT
Applicant Address: 92 EVANS DR
Applicant City,St,Zip: STOUGHTON, MA 020720000
Applicant Telephone: 7813418291

MA FINANCIAL ASSURANCE 2:
Facility Id: 12648
Description: Truck/Transport
Work Phone: (781) 344-4042

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92 ESE 1/2-1 0.991 mi. 5231 ft. **STIVALETTA REALTY TRUST** **SHWS** **S100537146**
630 PARK ST **RELEASE** **N/A**
STOUGHTON, MA 02072

Relative: Higher

Actual: 246 ft.

SHWS:
Facility ID: 4-0000818
Release Town: STOUGHTON
Notification Date: 7/15/1993
Category: NONE
Associated ID: Not reported
Current Status: **LSP No Further Action**
Status Date: 3/8/1994
Phase: Not reported
Response Action Outcome: -
Oil Or Haz Material: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

STIVALETTA REALTY TRUST (Continued) **S100537146**

Source:
Source Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/15/1993
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPNFA
Action Date: 3/8/1994
Response Action Outcome: Not reported

Release:
Facility ID: 4-0000818
Primary ID: Not reported
Official City: STOUGHTON
Notification: 7/15/1993
Category: NONE
Current Status: LSP Opinion,No Further Action
Status Date: 3/8/1994
Phase: Not reported
Response Action Outcome: -
Oil / Haz Material Type: Not reported

Action:
Action Type: Release Disposition
Action Stat: Valid Transition Site
Action Date: 7/15/1993
Response Action Outcome: Not reported

Action Type: TREGS
Action Stat: LSPNFA
Action Date: 3/8/1994
Response Action Outcome: Not reported

Chemical:
Chemical: UNKNOWN
Quantity: Not reported

Location:
Location Type: Not reported

Source:
Source Type: Not reported

Count: 23 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
COHASSET	S109765778	LEO FIORI & SONS	CUSHING HIGHWAY	02072	MANIFEST
NORFOLK COUNTY	M300004072	A A WILL SAND & GRAVEL CORP.	A A WILL CANTON PLANT		MINES
NORFOLK COUNTY	2011979914	STOUGHTON STATION 45 WYMAN ST.	STOUGHTON STATION 45 WYMAN ST.		ERNS
NORFOLK COUNTY	2011978838	WOLLASTON STATION NORTHBOUND TRACK	WOLLASTON STATION NORTHBOUND T		ERNS
STOUGHTON	S102967685	0.2 MILES SOUTH OF CANTON BORDER	RT 138	02072	SHWS, RELEASE
STOUGHTON	S105125215	RTE 139 EXIT	RT 24 N	02072	SHWS, RELEASE
STOUGHTON	S105810799	NO LOCATION AID	139 RT 24N	02072	SHWS, RELEASE
STOUGHTON	U003302680	MASS DPW MAINT DEPOT	RT 27	02072	UST, FINANCIAL ASSURANCE
STOUGHTON	S108034521	NO LOCATION AID	9 20 AND 45 MAPLE ST	02072	SHWS, RELEASE
STOUGHTON	S105914183	DORCHESTER BROOK	100 ATKINSON AVE	02072	SHWS, RELEASE
STOUGHTON	S109763618	CAMPANELLI REALTY TRUST	180 CAMPANELLI INDUSTRIAL PARK		MANIFEST
STOUGHTON	S110055673	STOUGHTON CENTER TO 441 REAR CANTO	CANTON ST		SHWS, RELEASE
STOUGHTON	U000228104	GAGRLER REALTY	KAY WAY & RT 139	02072	UST, FINANCIAL ASSURANCE
STOUGHTON	S101047231	STOUGHTON SCHOOL DEPT	MORTON ST	02072	SPILLS
STOUGHTON	S103812317	OFF BAY ST	ROBINETTE RD	02072	SHWS, RELEASE
STOUGHTON	S110684490	HORAN OIL CO.	125 SIMPSON RD		LAST, RELEASE
STOUGHTON	1011600209	STOUGHTON WATER DIVISION	STOUGHTON MA		ICIS
STOUGHTON	1005552602	NORTH STOUGHTON INDUSTRIAL PARK DE	TECHNOLOGY CENTER DR	02072	FINDS
STOUGHTON	1011566921	NORTH STOUGHTON INDUSTRIAL PARK DE	TECHNOLOGY CENTER DR	02072	ICIS
STOUGHTON	1004519072	STOUGHTON	TOWN OF	02072	FINDS
STOUGHTON	S109758829	VICTOR FORD	WASHINGTON ST		MANIFEST
STOUGHTON	S102088485	CORNER OF CENTRAL ST	WASHINGTON ST	02072	SHWS, RELEASE
STOUGHTON	S105810871	NEAR 72 WHEELER CIR	WHEELER CIR	02072	SHWS, RELEASE

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 09/07/2011
Date Data Arrived at EDR: 10/12/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 141

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 09/07/2011
Date Data Arrived at EDR: 10/12/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 141

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 09/07/2011
Date Data Arrived at EDR: 10/12/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 141

Source: EPA
Telephone: N/A
Last EDR Contact: 04/05/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/27/2011
Date Data Arrived at EDR: 02/27/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 14

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/05/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/10/2010
Date Data Arrived at EDR: 01/11/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/12/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 12/28/2011
Date Data Arrived at EDR: 02/27/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 14

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/05/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/19/2011
Date Data Arrived at EDR: 08/31/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 132

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/13/2012
Next Scheduled EDR Contact: 05/28/2012
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 11/10/2011
Date Data Arrived at EDR: 01/05/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 04/04/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 11/10/2011
Date Data Arrived at EDR: 01/05/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 04/04/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 11/10/2011
Date Data Arrived at EDR: 01/05/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 04/04/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 11/10/2011
Date Data Arrived at EDR: 01/05/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 04/04/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/30/2011
Date Data Arrived at EDR: 12/30/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/12/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/30/2011
Date Data Arrived at EDR: 12/30/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/12/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 10/03/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 04/03/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: Site Transition List

Contains information on releases of oil and hazardous materials that have been reported to DEP.

Date of Government Version: 02/28/2012
Date Data Arrived at EDR: 03/01/2012
Date Made Active in Reports: 03/29/2012
Number of Days to Update: 28

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 04/12/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facility Database/Transfer Stations

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/01/2012
Date Data Arrived at EDR: 01/11/2012
Date Made Active in Reports: 02/17/2012
Number of Days to Update: 37

Source: Department of Environmental Protection
Telephone: 617-292-5989
Last EDR Contact: 04/09/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Listing
Sites within the Leaking Underground Storage Tank Listing that have a UST listed as its source.

Date of Government Version: 02/28/2012
Date Data Arrived at EDR: 03/01/2012
Date Made Active in Reports: 03/29/2012
Number of Days to Update: 28
Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 04/12/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Quarterly

LAST: Leaking Aboveground Storage Tank Sites
Sites within the Releases Database that have a AST listed as its source.

Date of Government Version: 02/28/2012
Date Data Arrived at EDR: 03/01/2012
Date Made Active in Reports: 03/29/2012
Number of Days to Update: 28
Source: Department of Environmental Protection
Telephone: 617-292-5500
Last EDR Contact: 04/12/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Semi-Annually

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/07/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 34
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/02/2011
Date Data Arrived at EDR: 11/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 7
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2011
Date Data Arrived at EDR: 11/01/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 10
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/03/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/23/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 11/01/2011
Date Data Arrived at EDR: 11/21/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 50

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 08/19/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 25

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Summary Listing of all the Tanks Registered in the State of Massachusetts
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/20/2012
Date Data Arrived at EDR: 01/24/2012
Date Made Active in Reports: 02/21/2012
Number of Days to Update: 28

Source: Department of Fire Services, Office of the Public Safety
Telephone: 617-556-1035
Last EDR Contact: 01/24/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Quarterly

AST: Aboveground Storage Tank Database
Registered Aboveground Storage Tanks.

Date of Government Version: 10/22/2009
Date Data Arrived at EDR: 10/28/2009
Date Made Active in Reports: 11/06/2009
Number of Days to Update: 9

Source: Department of Public Safety
Telephone: 617-556-1035
Last EDR Contact: 04/16/2012
Next Scheduled EDR Contact: 08/06/2012
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/01/2011
Date Data Arrived at EDR: 11/21/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 50

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2011
Date Data Arrived at EDR: 11/01/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 10

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/03/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/02/2011
Date Data Arrived at EDR: 11/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 7

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 07/01/2011
Date Data Arrived at EDR: 08/26/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 18

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 08/19/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 25

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/23/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 11/28/2011
Date Data Arrived at EDR: 11/29/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 42

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/10/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: Sites With Activity and Use Limitation
Activity and Use Limitations establish limits and conditions on the future use of contaminated property, and therefore allow cleanups to be tailored to these uses.

Date of Government Version: 02/28/2012
Date Data Arrived at EDR: 03/01/2012
Date Made Active in Reports: 03/29/2012
Number of Days to Update: 28
Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 04/10/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 08/04/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/03/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/27/2011
Date Data Arrived at EDR: 06/27/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 78
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 04/03/2012
Next Scheduled EDR Contact: 07/09/2012
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 03/26/2012
Next Scheduled EDR Contact: 07/09/2012
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 10/07/2011
Date Data Arrived at EDR: 12/09/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 32
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/06/2012
Next Scheduled EDR Contact: 06/18/2012
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 09/09/2011
Date Data Arrived at EDR: 09/16/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 04/03/2012
Next Scheduled EDR Contact: 06/04/2012
Data Release Frequency: Varies

LIENS: Liens Information Listing

A listing of environmental liens.

Date of Government Version: 07/12/2011
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 10/05/2011
Number of Days to Update: 34

Source: Department of Environmental Protection
Telephone: 617-292-5628
Last EDR Contact: 02/27/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 10/04/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/03/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Annually

MA SPILLS: Historical Spill List

The Spills Database was the release notification tracking system for spills that occurred prior to October 1, 1993. This information should be considered to be primarily of historical interest since all of the listed spills have either been cleaned up or assigned new tracking numbers and moved to the Reportable Releases or Sites Transition List databases.

Date of Government Version: 09/30/1993
Date Data Arrived at EDR: 12/03/2003
Date Made Active in Reports: 12/31/2003
Number of Days to Update: 28

Source: Department of Environmental Protection
Telephone: 617-292-5720
Last EDR Contact: 12/03/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

RELEASE: Reportable Releases

Contains information on all releases of oil and hazardous materials that have been reported to DEP

Date of Government Version: 02/28/2012
Date Data Arrived at EDR: 03/01/2012
Date Made Active in Reports: 03/29/2012
Number of Days to Update: 28

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 04/12/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 11/10/2011
Date Data Arrived at EDR: 01/05/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 04/04/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/29/2011
Date Data Arrived at EDR: 08/09/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 94

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/07/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/16/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/12/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 01/25/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 36

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/02/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/28/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 27

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/14/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/28/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 09/08/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 21

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/07/2012
Next Scheduled EDR Contact: 06/18/2012
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/28/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/28/2012
Next Scheduled EDR Contact: 07/09/2012
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/27/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/27/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 03/26/2012
Next Scheduled EDR Contact: 07/09/2012
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/17/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/12/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/10/2012
Date Data Arrived at EDR: 01/12/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 49

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/10/2012
Next Scheduled EDR Contact: 07/23/2012
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 79

Source: EPA
Telephone: (617) 918-1111
Last EDR Contact: 03/13/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/27/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Biennially

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPDES: NPDES Permit Listing
Listing of treatment plants in Massachusetts that hold permits to discharge to groundwater.

Date of Government Version: 02/09/2012
Date Data Arrived at EDR: 02/20/2012
Date Made Active in Reports: 04/13/2012
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 508-767-2781
Last EDR Contact: 04/02/2012
Next Scheduled EDR Contact: 06/04/2012
Data Release Frequency: Varies

DRYCLEANERS: Regulated Drycleaning Facilities
A listing of Department of Environmental Protection regulated drycleaning facilities that use perchloroethylene under the Environmental Results Program.

Date of Government Version: 01/23/2012
Date Data Arrived at EDR: 01/31/2012
Date Made Active in Reports: 02/17/2012
Number of Days to Update: 17

Source: Department of Environmental Protection
Telephone: 617-292-5633
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Action Cases
A listing of enforcement action cases tracked by Department of Environmental Protection programs, including Solid Waste and Hazardous Waste.

Date of Government Version: 08/01/2004
Date Data Arrived at EDR: 09/01/2004
Date Made Active in Reports: 10/01/2004
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 617-292-5979
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Varies

AIRS: Permitted Facilities Listing
A listing of Air Quality permit applications.

Date of Government Version: 01/23/2012
Date Data Arrived at EDR: 01/25/2012
Date Made Active in Reports: 01/31/2012
Number of Days to Update: 6

Source: Department of Environmental Protection
Telephone: 617-292-5789
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Varies

LEAD: Lead Inspection Database
The Massachusetts Childhood Lead Poisoning Prevention Program data of lead inspection for the state.

Date of Government Version: 12/30/2011
Date Data Arrived at EDR: 01/12/2012
Date Made Active in Reports: 02/17/2012
Number of Days to Update: 36

Source: Department of Health & Human Services, Childhood Lead Poisoning Prevention Progr
Telephone: 617-624-5757
Last EDR Contact: 03/26/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/16/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Varies

FINANCIAL ASSURANCE 2: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tanks. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 10/21/2011
Date Data Arrived at EDR: 10/25/2011
Date Made Active in Reports: 11/18/2011
Number of Days to Update: 24

Source: Office of State Fire Marshal
Telephone: 978-567-3100
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/16/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: N/A

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/16/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/03/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/16/2012
Next Scheduled EDR Contact: 06/25/2012
Data Release Frequency: Varies

FINANCIAL ASSURANCE 3: Financial Assurance Information listing

Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay

Date of Government Version: 10/25/2011
Date Data Arrived at EDR: 10/25/2011
Date Made Active in Reports: 11/18/2011
Number of Days to Update: 24

Source: Department of Environmental Protection
Telephone: 617-292-5970
Last EDR Contact: 04/11/2012
Next Scheduled EDR Contact: 07/16/2012
Data Release Frequency: Varies

FINANCIAL ASSURANCE 1: Financial Assurance Information Listing

Information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/01/2010
Date Data Arrived at EDR: 12/23/2010
Date Made Active in Reports: 02/03/2011
Number of Days to Update: 42

Source: Department of Environmental Protection
Telephone: 617-292-5970
Last EDR Contact: 02/21/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Varies

GWDP: Ground Water Discharge Permits

The Ground Water Discharge Permits datalayer (formerly known as Groundwater Discharge Points) is a statewide point dataset containing approximate locations of permitted discharges to groundwater.

Date of Government Version: 09/01/2011
Date Data Arrived at EDR: 11/08/2011
Date Made Active in Reports: 12/05/2011
Number of Days to Update: 27

Source: MassGIS
Telephone: 617-556-1150
Last EDR Contact: 02/07/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 02/20/2012
Date Data Arrived at EDR: 02/20/2012
Date Made Active in Reports: 03/15/2012
Number of Days to Update: 24

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/20/2012
Next Scheduled EDR Contact: 06/04/2012
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 07/20/2011
Date Made Active in Reports: 08/11/2011
Number of Days to Update: 22

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/17/2012
Next Scheduled EDR Contact: 07/30/2012
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/10/2012
Date Data Arrived at EDR: 02/09/2012
Date Made Active in Reports: 03/09/2012
Number of Days to Update: 29

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/09/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 01/26/2012
Date Made Active in Reports: 03/06/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/24/2011
Date Made Active in Reports: 06/30/2011
Number of Days to Update: 6

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/27/2012
Next Scheduled EDR Contact: 06/11/2012
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data
Hazardous waste manifest information.

Date of Government Version: 02/22/2012
Date Data Arrived at EDR: 02/28/2012
Date Made Active in Reports: 04/05/2012
Number of Days to Update: 37

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 08/19/2011
Date Made Active in Reports: 09/15/2011
Number of Days to Update: 27

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/19/2012
Next Scheduled EDR Contact: 07/02/2012
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Areas of Critical Environmental Concern Datalayer: The Areas of Critical Environmental Concern (ACEC) datalayer shows the location of areas that have been designated ACECs by the Secretary of Environmental Affairs. ACEC designation requires greater environmental review of certain kinds of proposed development under state jurisdiction within the ACEC boundaries. The ACEC Program is administered by the Department of Environmental Management (DEM) on behalf of the Secretary of Environmental Affairs. The Massachusetts Coastal Zone Management (MCZM) Office managed the original Coastal ACEC Program from 1978 to 1993, and continues to play a key role in monitoring coastal ACECs. Procedures for ACEC designation and the general policies governing the effects of designation are contained in the ACEC regulations (301 CMR 12.00). The ACEC datalayer has been compiled by MCZM and DEM and includes both coastal and inland areas.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

STOUGHTON STATION
WYMAN STREET/BROCK STREET
STOUGHTON, MA 02072

TARGET PROPERTY COORDINATES

Latitude (North):	42.1221 - 42° 7' 19.56''
Longitude (West):	71.1024 - 71° 6' 8.64''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	326208.7
UTM Y (Meters):	4665258.5
Elevation:	227 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	42071-B1 BLUE HILLS, MA
Most Recent Revision:	1985
South Map:	42071-A1 BROCKTON, MA
Most Recent Revision:	1987
Southwest Map:	42071-A2 MANSFIELD, MA
Most Recent Revision:	1987
West Map:	42071-B2 NORWOOD, MA
Most Recent Revision:	1985

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

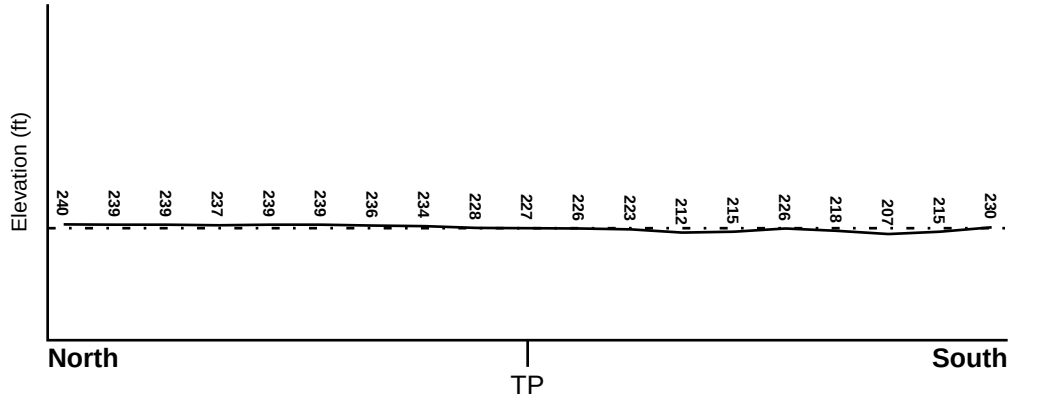
TOPOGRAPHIC INFORMATION

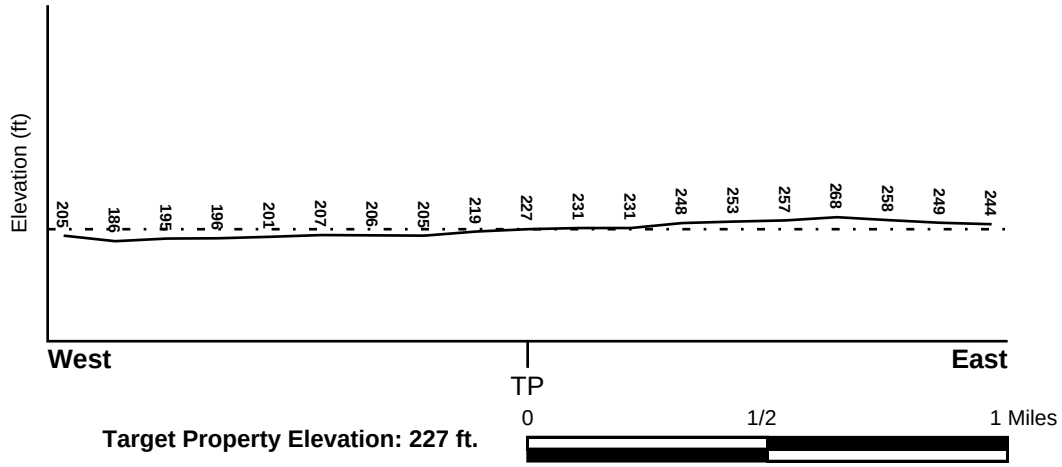
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General WSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





0 1/2 1 Miles

Target Property Elevation: 227 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
NORFOLK, MA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 2502530001B - FEMA Q3 Flood data

Additional Panels in search area: 2502530004B - FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BROCKTON	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
2	1/8 - 1/4 Mile NNW	SW
8	1/2 - 1 Mile ESE	VARIES
C13	1/2 - 1 Mile North	NNW

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

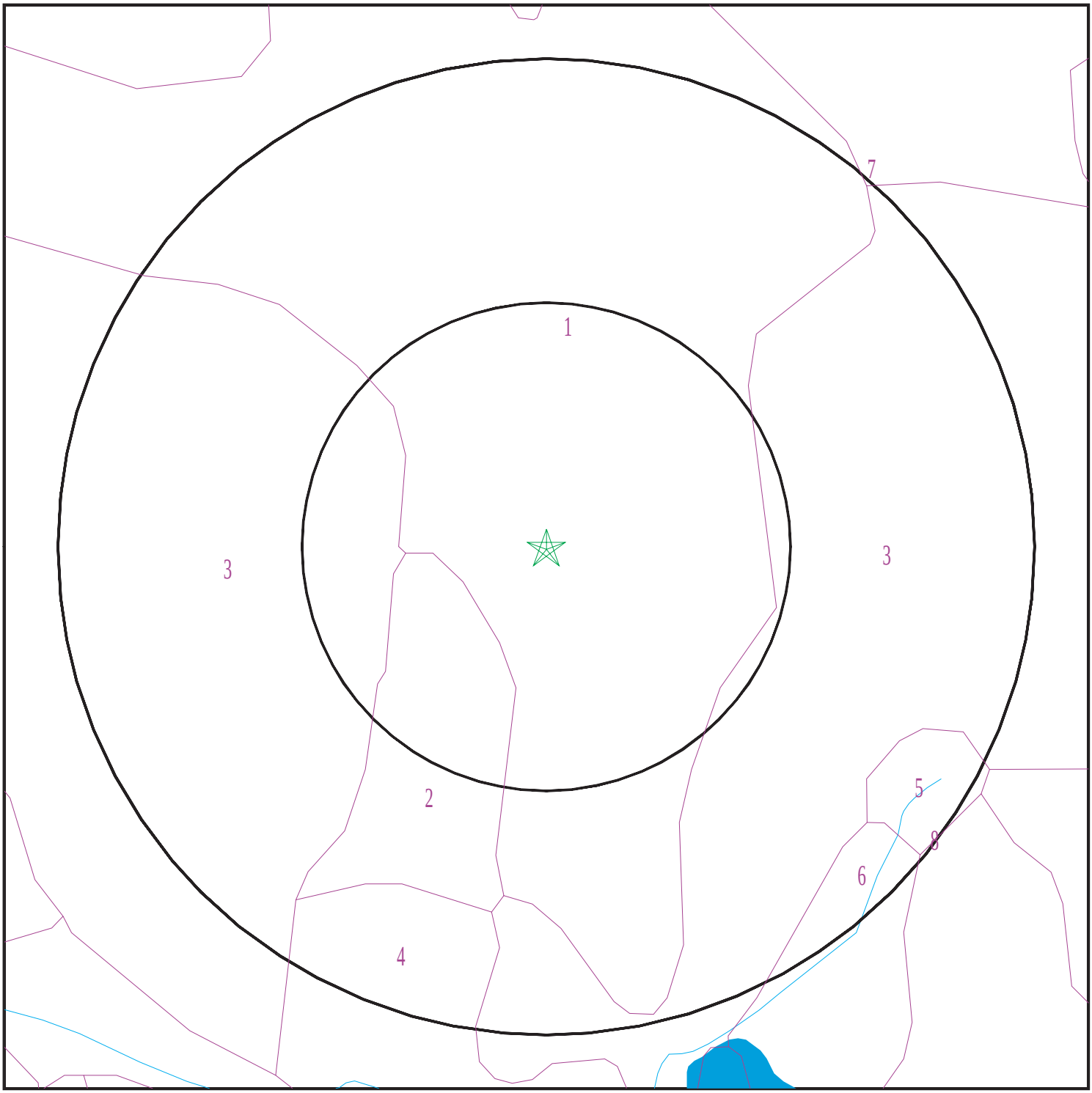
Era:	Precambrian
System:	Precambrian
Series:	Z ganitic rocks
Code:	Zg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3308239.2s



SITE NAME:	Stoughton Station	CLIENT:	Vanasse Hangen Brustlin, Inc.
ADDRESS:	Wyman Street/Brock Street Stoughton MA 02072	CONTACT:	Katie Kudzma
LAT/LONG:	42.1221 / 71.1024	INQUIRY #:	3308239.2s
		DATE:	April 23, 2012 2:37 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name:	Urban land
Soil Surface Texture:	
Hydrologic Group:	Not reported
Soil Drainage Class:	
Hydric Status: Unknown	
Corrosion Potential - Uncoated Steel:	Not Reported
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 0 inches

No Layer Information available.

Soil Map ID: 2

Soil Component Name:	Walpole
Soil Surface Texture:	sandy loam
Hydrologic Group:	Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
Soil Drainage Class:	Poorly drained
Hydric Status: Partially hydric	
Corrosion Potential - Uncoated Steel:	Low
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 15 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 4.5
2	9 inches	12 inches	sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 4.5
3	12 inches	59 inches	stratified coarse sand to loamy fine sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 4.5

Soil Map ID: 3

Soil Component Name: Merrimac

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	fine sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	18 inches	22 inches	gravelly loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	22 inches	59 inches	sr to sand to very gravelly coarse sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 4

Soil Component Name: Freetown

Soil Surface Texture: muck

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	muck	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:
2	14 inches	59 inches	muck	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:

Soil Map ID: 5

Soil Component Name: Udorthents

Soil Surface Texture: muck

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:
Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 6

Soil Component Name: Freetown

Soil Surface Texture: muck

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	59 inches	muck	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:

Soil Map ID: 7

Soil Component Name: Canton

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	fine sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	3 inches	18 inches	fine sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
3	18 inches	59 inches	gravelly loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Map ID: 8

Soil Component Name: Udorthents

Soil Surface Texture: variable

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class:
Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	variable	Not reported	Not reported	Max: 141.14 Min: 0.42	Max: Min:
2	5 inches	59 inches	variable	Not reported	Not reported	Max: 141.14 Min: 0.42	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
4	USGS3319321	1/4 - 1/2 Mile SSE
A6	USGS3319312	1/4 - 1/2 Mile SE
A7	USGS3319303	1/4 - 1/2 Mile SSE
B10	USGS3319271	1/2 - 1 Mile SSE
B11	USGS3319263	1/2 - 1 Mile SSE
D15	USGS3319243	1/2 - 1 Mile SSE
D16	USGS3319240	1/2 - 1 Mile SSE
D17	USGS3319239	1/2 - 1 Mile SSE
D18	USGS3319235	1/2 - 1 Mile SSE
D19	USGS3319234	1/2 - 1 Mile SSE
E20	USGS3319229	1/2 - 1 Mile SSE
E21	USGS3319228	1/2 - 1 Mile SSE
E22	USGS3319225	1/2 - 1 Mile SSE
E23	USGS3319227	1/2 - 1 Mile SSE
E24	USGS3319224	1/2 - 1 Mile SSE
E25	USGS3319217	1/2 - 1 Mile SSE
26	USGS3319440	1/2 - 1 Mile North

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

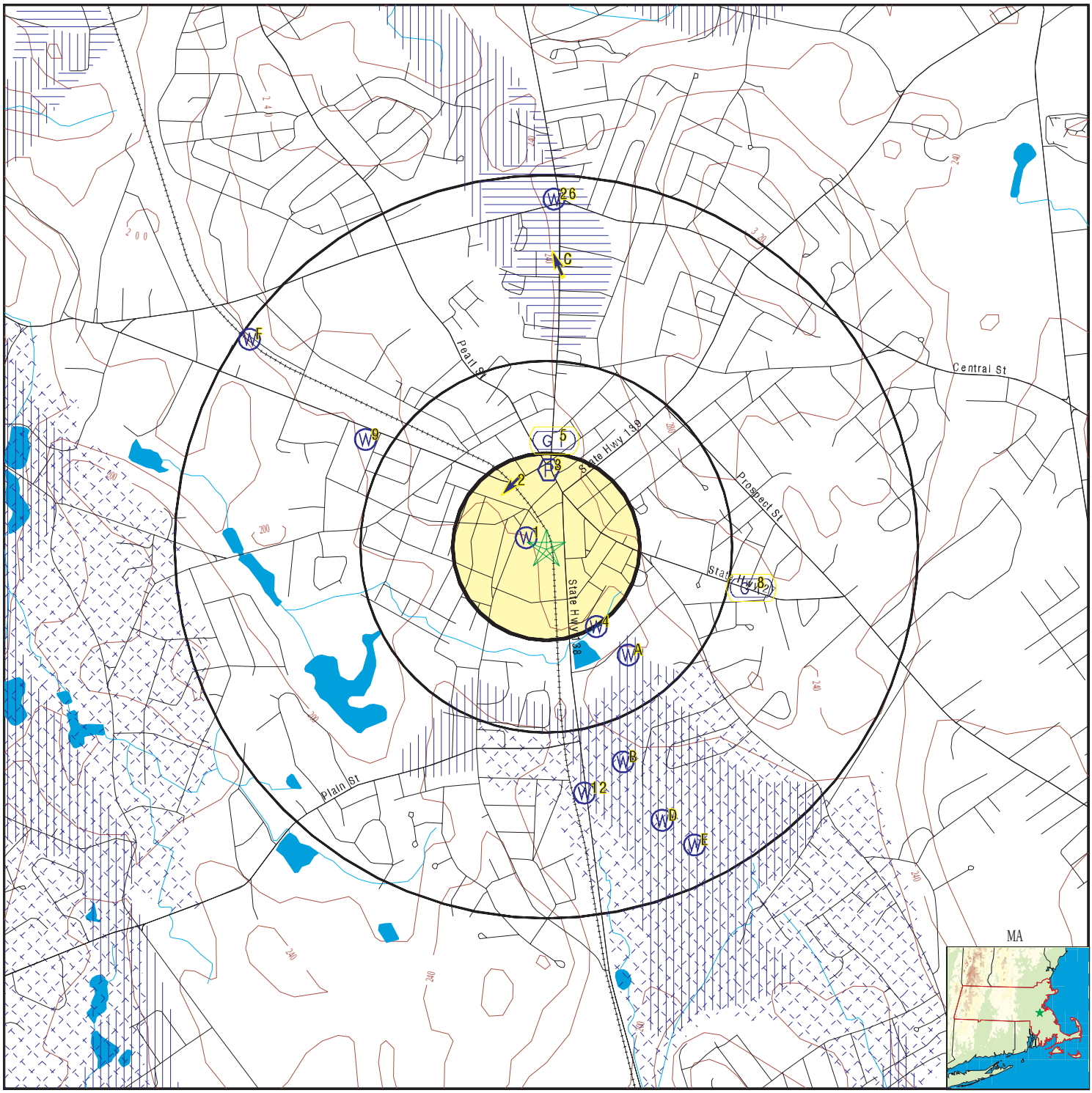
MAP ID	WELL ID	LOCATION FROM TP
3	MA4285001	1/8 - 1/4 Mile North

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	MA7000000001956	0 - 1/8 Mile WNW
9	MA7000000001978	1/2 - 1 Mile WNW
12	MA7000000001859	1/2 - 1 Mile South
C14	MA7000000002047	1/2 - 1 Mile North
F27	MA7000000002013	1/2 - 1 Mile NW
F28	MA7000000002010	1/2 - 1 Mile NW

PHYSICAL SETTING SOURCE MAP - 3308239.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location

- Potentially Productive Aquifers
- Not Potentially Productive Aquifers
- DEP Approved Zone IIs
- EPA Designated Sole Src. Aq.

SITE NAME:	Stoughton Station	CLIENT:	Vanasse Hangen Brustlin, Inc.
ADDRESS:	Wyman Street/Brock Street Stoughton MA 02072	CONTACT:	Katie Kudzma
LAT/LONG:	42.1221 / 71.1024	INQUIRY #:	3308239.2s
		DATE:	April 23, 2012 2:37 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
1 **WNW** **0 - 1/8 Mile** **Lower**	**MA WELLS**	**MA7000000001956**

Objectid:	585		
Fac name:	ALPHA CHEMICAL SERVICES INC		
Address:	46 MORTON ST		
Town:	STOUGHTON	Region:	4
Rtn:	Not Reported	Hw id:	MAD051782316
Sw id:	Not Reported		
Sseis id:	0		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Not Reported
Lqg ma:	Not Reported	Lqg rcra:	Not Reported
Lqtu:	Y	Tsdf:	Not Reported
Swd:	Not Reported		
Fac id:	132207		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000001956

Objectid:	1460
Base Map:	Digitized on screen using digital orthophoto base map (DOQ)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	CB
L meth:	OTH
L src 1:	KNOW
L src 2:	Not Reported
L src 3:	Not Reported
L date:	08/24/2000
Fac id:	132207

---

2 **NNW** **1/8 - 1/4 Mile** **Higher**	Site ID:	4-0000875	**AQUIFLOW**	**5388**
	Groundwater Flow:	SW		
	Shallowest Water Table Depth:	Not Reported		
	Deepest Water Table Depth:	Not Reported		
	Date:	12/1989		

	Database	EDR ID Number
3 **North** **1/8 - 1/4 Mile** **Higher**	**FRDS PWS**	**MA4285001**

Pwsid:	MA4285001	Epa region:	01
State:	MA	County:	Norfolk
Pws name:	STRIAR JEWISH COMMUNITY CENTER		
Population Served:	380	Pwssvcconn:	1
PWS Source:	Groundwater		
Pws type:	NTNCWS		
Status:	Active	Owner type:	Private
Facility id:	1		
Facility name:	WELL # 1		
Facility type:	Well	Treatment process:	ion exchange
Treatment objective:	iron removal		

Contact name:	PAUL BROOKS		
Original name:	STRIAR JEWISH COMMUNITY CENTER		
Contact phone:	7813412016	Contact address1:	445 CENTRAL STREET
Contact address2:	Not Reported		
Contact city:	STOUGHTON		
Contact zip:	02072		

Pwsid:	MA4285001	Epa region:	01
State:	MA	County:	Norfolk
Pws name:	STRIAR JEWISH COMMUNITY CENTER		
Population Served:	380	Pwssvcconn:	1
PWS Source:	Groundwater		
Pws type:	NTNCWS		
Status:	Active	Owner type:	Private
Facility id:	2		
Facility name:	TANK #1		
Facility type:	Storage	Treatment process:	ion exchange
Treatment objective:	iron removal		
Contact name:	PAUL BROOKS		
Original name:	STRIAR JEWISH COMMUNITY CENTER		
Contact phone:	7813412016	Contact address1:	445 CENTRAL STREET
Contact address2:	Not Reported		
Contact city:	STOUGHTON		
Contact zip:	02072		

Pwsid:	MA4285001	Epa region:	01
State:	MA	County:	Norfolk
Pws name:	STRIAR JEWISH COMMUNITY CENTER		
Population Served:	380	Pwssvcconn:	1
PWS Source:	Groundwater		
Pws type:	NTNCWS		
Status:	Active	Owner type:	Private
Facility id:	3		
Facility name:	WELL #1 TREATMENT PLANT		
Facility type:	Treatment_plant	Treatment process:	ion exchange
Treatment objective:	iron removal		
Contact name:	PAUL BROOKS		
Original name:	STRIAR JEWISH COMMUNITY CENTER		
Contact phone:	7813412016	Contact address1:	445 CENTRAL STREET
Contact address2:	Not Reported		
Contact city:	STOUGHTON		
Contact zip:	02072		

PWS ID:	MA4285001
Date Initiated:	9304 Date Deactivated: Not Reported
PWS Name:	STRIAR JEWISH COMMUNITY CENTER 445 CENTRAL STREET STOUGHTON, MA 020720000
Addressee / Facility:	Mailing STRIAR JEWISH COMMUNITY CENTER 445 CENTRAL STREET STOUGHTON, MA 020720000

Facility Latitude:	42 07 30	Facility Longitude:	071 06 10
City Served:	Not Reported		
Treatment Class:	Untreated	Population:	00000025

Violations information not reported.

ENFORCEMENT INFORMATION:

Truedate:	03/31/2009	Pwsid:	MA4285001
Pwsname:	OLD COLONY YMCA		
Retpopsrvd:	380	Pwstypecod:	NTNC
Vioid:	04V0001	Contaminant:	COLIFORM (TCR)
Viol. Type:	Monitoring, Routine Major (TCR)		
Complperbe:	7/1/2003 0:00:00		
Complperen:	9/30/2003 0:00:00	Enfdate:	11/18/2003 0:00:00
Enf action:	State Formal NOV Issued		
Violmeasur:	Not Reported		

Truedate:	03/31/2009	Pwsid:	MA4285001
Pwsname:	OLD COLONY YMCA		
Retpopsrvd:	380	Pwstypecod:	NTNC
Vioid:	1	Contaminant:	COLIFORM (TCR)
Viol. Type:	MCL, Monthly (TCR)		
Complperbe:	7/1/2006 0:00:00		
Complperen:	7/31/2006 0:00:00	Enfdate:	6/20/2007 0:00:00
Enf action:	State Formal NOV Issued		
Violmeasur:	Not Reported		

Truedate:	03/31/2009	Pwsid:	MA4285001
Pwsname:	OLD COLONY YMCA		
Retpopsrvd:	380	Pwstypecod:	NTNC
Vioid:	1	Contaminant:	COLIFORM (TCR)
Viol. Type:	MCL, Monthly (TCR)		
Complperbe:	7/1/2006 0:00:00		
Complperen:	7/31/2006 0:00:00	Enfdate:	6/20/2007 0:00:00
Enf action:	State Compliance Achieved		
Violmeasur:	Not Reported		

Truedate:	03/31/2009	Pwsid:	MA4285001
Pwsname:	OLD COLONY YMCA		
Retpopsrvd:	380	Pwstypecod:	NTNC
Vioid:	2	Contaminant:	COLIFORM (TCR)
Viol. Type:	MCL, Monthly (TCR)		
Complperbe:	8/1/2006 0:00:00		
Complperen:	8/31/2006 0:00:00	Enfdate:	6/20/2007 0:00:00
Enf action:	State Formal NOV Issued		
Violmeasur:	Not Reported		

Truedate:	03/31/2009	Pwsid:	MA4285001
Pwsname:	OLD COLONY YMCA		
Retpopsrvd:	380	Pwstypecod:	NTNC
Vioid:	2	Contaminant:	COLIFORM (TCR)
Viol. Type:	MCL, Monthly (TCR)		
Complperbe:	8/1/2006 0:00:00		
Complperen:	8/31/2006 0:00:00	Enfdate:	6/20/2007 0:00:00
Enf action:	State Compliance Achieved		
Violmeasur:	Not Reported		

System Name:	STRIAR JEWISH COMMUNITY CENTER		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	7/1/2003 0:00:00 - 9/30/2003 0:00:00		
Violation ID:	04V0001		
Enforcement Date:	11/18/2003 0:00:00	Enf. Action:	State Formal NOV Issued

ENFORCEMENT INFORMATION:

System Name:	STRIAR JEWISH COMMUNITY CENTER		
Violation Type:	Monitoring, Routine Major (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	7/1/2003 0:00:00 - 9/30/2003 0:00:00		
Violation ID:	04V0001		
Enforcement Date:	11/18/2003 0:00:00	Enf. Action:	State Formal NOV Issued
System Name:	STRIAR JEWISH COMMUNITY CE		
Violation Type:	Monitoring, Regular		
Contaminant:	NITRATE		
Compliance Period:	1995-07-01 - 1995-09-30		
Violation ID:	9600001V		
Enforcement Date:	1996-06-04	Enf. Action:	State Formal NOV Issued

CONTACT INFORMATION:

Name:	OLD COLONY YMCA	Population:	380
Contact:	JOHN RICKETTS	Phone:	7813412016
Address:	C/O JOHN RICKETTS		
Address 2:	320 MAIN STREET		
	BROCKTON, MA 02301		

4
SSE **FED USGS** **USGS3319321**
1/4 - 1/2 Mile
Lower

Agency cd:	USGS	Site no:	420708071060101
Site name:	MA-S2W 139		
Latitude:	420708	EDR Site id:	USGS3319321
Longitude:	0710601	Dec lat:	42.1189883
Dec lon:	-71.0997711	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	210.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Undulating		
Site type:	Ground-water other than Spring	Date construction:	1961
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	21.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1961-07-01	Ground water data end date:	1961-07-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

5
North
1/4 - 1/2 Mile
Higher

Site ID:	4-0000480	**AQUIFLOW**	**5397**
Groundwater Flow:	Not Reported		
Shallowest Water Table Depth:	5.46		
Deepest Water Table Depth:	11.75		
Date:	8/22/1997		

A6
SE
1/4 - 1/2 Mile
Lower

FED USGS **USGS3319312**

Agency cd:	USGS	Site no:	420705071055401
Site name:	MA-S2W 140		
Latitude:	420705	EDR Site id:	USGS3319312
Longitude:	0710554	Dec lat:	42.118155
Dec lon:	-71.09782639	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	225.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Undulating		
Site type:	Ground-water other than Spring	Date construction:	1961
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	28.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1961-07-01	Ground water data end date:	1961-07-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

A7
SSE
1/4 - 1/2 Mile
Higher

FED USGS **USGS3319303**

Agency cd:	USGS	Site no:	420703071055601
Site name:	MA-S2W 151		
Latitude:	420703	EDR Site id:	USGS3319303
Longitude:	0710556	Dec lat:	42.11759944
Dec lon:	-71.0983819	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	230.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Undulating		
Site type:	Ground-water other than Spring	Date construction:	1954
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	32.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1954-10-01	Ground water data end date:	1954-10-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

8
ESE
1/2 - 1 Mile
Higher

AQUIFLOW **5390**

Site ID:	4-0000797
Groundwater Flow:	VARIES
Shallowest Water Table Depth:	4.23
Deepest Water Table Depth:	5.61
Date:	1/19/1990

9
WNW
1/2 - 1 Mile
Lower

MA WELLS **MA7000000001978**

Objectid:	443		
Fac name:	VEOLIA ES TECHNICAL SOLUTIONS LLC		
Address:	230 CANTON ST		
Town:	STOUGHTON	Region:	4
Rtn:	Not Reported	Hw id:	MA5000004713
Sw id:	Not Reported		
Sseis id:	0		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Y
Lqg ma:	Not Reported	Lqg rcra:	Not Reported
Lqtu:	Y	Tsdf:	Not Reported

Swd:	Not Reported		
Fac id:	331436		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000001978

Objectid:	969
Base Map:	Digitized on screen using digital orthophoto base map (DOQ)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	CB
L meth:	OTH
L src 1:	KNOW
L src 2:	Not Reported
L src 3:	Not Reported
L date:	11/05/1998
Fac id:	331436

B10
SSE **FED USGS** **USGS3319271**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420650071055601
Site name:	MA-S2W 154		
Latitude:	420650	EDR Site id:	USGS3319271
Longitude:	0710556	Dec lat:	42.1139883
Dec lon:	-71.0983819	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	210.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	1954
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	34.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1954-10-01	Ground water data end date:	1954-10-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B11
SSE
1/2 - 1 Mile
Lower | **FED USGS** | **USGS3319263**

Agency cd:	USGS	Site no:	420648071055601
Site name:	MA-S2W 153		
Latitude:	420648	EDR Site id:	USGS3319263
Longitude:	0710556	Dec lat:	42.11343278
Dec lon:	-71.0983819	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	210.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	1954
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	57.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1954-10-01	Ground water data end date:	1954-10-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

12
South
1/2 - 1 Mile
Lower | **MA WELLS** | **MA7000000001859**

Objectid:	444		
Fac name:	ACE AUTO BODY		
Address:	1209 WASHINGTON ST		
Town:	STOUGHTON	Region:	4
Rtn:	Not Reported	Hw id:	MAD980917827
Sw id:	Not Reported		
Sseis id:	0		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Not Reported
Lqg ma:	Not Reported	Lqg rcra:	Not Reported
Lqtu:	Y	Tsdf:	Not Reported

Swd:	Not Reported		
Fac id:	134352		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000001859

Objectid:	1067
Base Map:	Not applicable (NA)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	FDU
L meth:	Feature located using GPS Coarse Acquisition Code: Differentially Corrected
L src 1:	SV
L src 2:	Not Reported
L src 3:	Not Reported
L date:	12/14/1999
Fac id:	134352

C13
North
1/2 - 1 Mile
Higher

Site ID:	4-0000206	**AQUIFLOW**	**5395**
Groundwater Flow:	NNW		
Shallowest Water Table Depth:	4.6		
Deepest Water Table Depth:	6.6		
Date:	7/1987		

C14
North
1/2 - 1 Mile
Higher

MA WELLS **MA7000000002047**

Objectid:	1299		
Fac name:	FC PHILLIPS INC		
Address:	471 WASHINGTON ST		
Town:	STOUGHTON	Region:	4
Rtn:	Not Reported	Hw id:	MAD001005123
Sw id:	Not Reported		
Sseis id:	1192498		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Not Reported
Lqg ma:	Y	Lqg rcra:	Not Reported
Lqtu:	Not Reported	Tsdf:	Not Reported
Swd:	Not Reported		
Fac id:	131202		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000002047

Objectid:	1011
Base Map:	Digitized on screen using digital orthophoto base map (DOQ)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	CB
L meth:	OTH
L src 1:	KNOW
L src 2:	Not Reported
L src 3:	Not Reported
L date:	11/17/1998
Fac id:	131202

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

D15
SSE
1/2 - 1 Mile
Lower | **FED USGS** | **USGS3319243**

Agency cd:	USGS	Site no:	420642071054801
Site name:	MA-S2W 205		
Latitude:	420642	EDR Site id:	USGS3319243
Longitude:	0710548	Dec lat:	42.11176639
Dec lon:	-71.0961597	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19830409
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	28.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

D16
SSE
1/2 - 1 Mile
Lower | **FED USGS** | **USGS3319240**

Agency cd:	USGS	Site no:	420641071055001
Site name:	MA-S2W 206		
Latitude:	420641	EDR Site id:	USGS3319240
Longitude:	0710550	Dec lat:	42.1114886
Dec lon:	-71.09671528	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000

Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19830411
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	39.5
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

D17
SSE **FED USGS** **USGS3319239**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420641071054701
Site name:	MA-S2W 204		
Latitude:	420641	EDR Site id:	USGS3319239
Longitude:	0710547	Dec lat:	42.1114886
Dec lon:	-71.0958819	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19830407
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	36.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported

Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

D18
SSE **FED USGS** **USGS3319235**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420640071055001
Site name:	MA-S2W 207		
Latitude:	420640	EDR Site id:	USGS3319235
Longitude:	0710550	Dec lat:	42.1112108
Dec lon:	-71.09671528	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19830412
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	18.5
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1983-04-12	Ground water data end date:	1983-04-12
Ground water data count:	1		

Ground-water levels, Number of Measurements: 0

D19
SSE **FED USGS** **USGS3319234**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420640071054801
Site name:	MA-S2W 203		
Latitude:	420640	EDR Site id:	USGS3319234
Longitude:	0710548	Dec lat:	42.1112108
Dec lon:	-71.0961597	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19830406
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	25.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

E20
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS3319229**

Agency cd:	USGS	Site no:	420638071054401
Site name:	MA-S2W 208		
Latitude:	420638	EDR Site id:	USGS3319229
Longitude:	0710544	Dec lat:	42.11065528
Dec lon:	-71.0950486	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19680000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	43.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

E21
SSE **FED USGS** **USGS3319228**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420638071054301
Site name:	MA-S2W 209		
Latitude:	420638	EDR Site id:	USGS3319228
Longitude:	0710543	Dec lat:	42.11065528
Dec lon:	-71.0947708	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19680000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	40.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E22
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS3319225**

Agency cd:	USGS	Site no:	420637071054401
Site name:	MA-S2W 213		
Latitude:	420637	EDR Site id:	USGS3319225
Longitude:	0710544	Dec lat:	42.1103775
Dec lon:	-71.0950486	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19760000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	48.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

E23
SSE
1/2 - 1 Mile
Lower

FED USGS **USGS3319227**

Agency cd:	USGS	Site no:	420638071054101
Site name:	MA-S2W 210		
Latitude:	420638	EDR Site id:	USGS3319227
Longitude:	0710541	Dec lat:	42.11065528
Dec lon:	-71.09421528	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000

Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19680000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	40.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

E24
SSE **FED USGS** **USGS3319224**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420637071054101
Site name:	MA-S2W 211		
Latitude:	420637	EDR Site id:	USGS3319224
Longitude:	0710541	Dec lat:	42.1103775
Dec lon:	-71.09421528	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19680000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	40.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported

Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

E25
SSE **FED USGS** **USGS3319217**
1/2 - 1 Mile
Lower

Agency cd:	USGS	Site no:	420636071054201
Site name:	MA-S2W 212		
Latitude:	420636	EDR Site id:	USGS3319217
Longitude:	0710542	Dec lat:	42.1100997
Dec lon:	-71.094493	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	BROCKTON	Map scale:	24000
Altitude:	210.		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	05		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Narragansett. Massachusetts, Rhode Island. Area = 1330 sq.mi.		
Topographic:	Lake, swamp or marsh		
Site type:	Ground-water other than Spring	Date construction:	19680000
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	STRATIFIED DEPOSITS, UNDIFFERENTIATED		
Well depth:	Not Reported	Hole depth:	27.
Source of depth data:	driller		
Project number:	442505800		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

26
North **FED USGS** **USGS3319440**
1/2 - 1 Mile
Higher

Agency cd:	USGS	Site no:	420808071060901
Site name:	MA-S2W 198		
Latitude:	420808	EDR Site id:	USGS3319440
Longitude:	0710609	Dec lat:	42.135655
Dec lon:	-71.1019936	Coor meth:	M
Coor accr:	F	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	25
State:	25	County:	021
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	240.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	Charles. Massachusetts. Area = 1130 sq.mi.		
Topographic:	Undulating		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	28.0	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	Not Reported		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

F27
NW
1/2 - 1 Mile
Lower

MA WELLS **MA7000000002013**

Objectid:	1131		
Fac name:	ARK LES CORP		
Address:	1490 CENTRAL ST		
Town:	STOUGHTON	Region:	4
Rtn:	4-0000603	Hw id:	MAD001024363
Sw id:	Not Reported		
Sseis id:	1192492		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Not Reported
Lqg ma:	Not Reported	Lqg rcra:	Not Reported
Lqtu:	Y	Tsdf:	Not Reported
Swd:	Not Reported		
Fac id:	131196		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000002013

Objectid:	1333
Base Map:	Digitized on screen using digital orthophoto base map (DOQ)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	CB
L meth:	OTH
L src 1:	KNOW
L src 2:	Not Reported
L src 3:	Not Reported
L date:	11/17/1998
Fac id:	131196

F28
NW
1/2 - 1 Mile
Lower

MA WELLS **MA7000000002010**

Objectid:	82		
Fac name:	ENVIRONMENTAL COMPLIANCE CORPORATION		
Address:	441R CANTON ST		
Town:	STOUGHTON	Region:	4
Rtn:	Not Reported	Hw id:	MAD062179890
Sw id:	Not Reported		
Sseis id:	0		
Npdes id:	Not Reported	Air:	Not Reported
Gwd:	Not Reported	Hwr:	Not Reported
Lqg ma:	Y	Lqg rcra:	Y
Lqtu:	Not Reported	Tsdf:	Y
Swd:	Not Reported		
Fac id:	131588		
Source id:	Not Reported	Site name:	Not Reported
Latitude:	0		
Longitude:	0		
Type:	Not Reported	Zii num:	0
Pws id:	Not Reported	Site id:	MA7000000002010

Objectid:	1457
Base Map:	Digitized on screen using digital orthophoto base map (DOQ)
L acc est:	Estimated horizontal accuracy is+/-100 ft (30.5m)
L type:	CB
L meth:	OTH
L src 1:	KNOW
L src 2:	Not Reported
L src 3:	Not Reported
L date:	11/05/1998
Fac id:	131588

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: MA Radon

Radon Test Results

County	% of sites>4 pCi/L	Median
NORFOLK	21	1.9

Federal EPA Radon Zone for NORFOLK County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 02072

Number of sites tested: 4

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	2.600 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	3.150 pCi/L	75%	25%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Massachusetts Geographic Information System (MassGIS) Datalayers
Source: Executive Office of Environmental Affairs

Public Water Supply Database: The Public Water Supply datalayer contains the locations of public community surface and groundwater supply sources and public non-community supply sources as defined in 310 CMR 22.00.

OTHER STATE DATABASE INFORMATION

Areas of Critical Environmental Concern Datalayer: The Areas of Critical Environmental Concern (ACEC) datalayer shows the location of areas that have been designated ACECs by the Secretary of Environmental Affairs. ACEC designation requires greater environmental review of certain kinds of proposed development under state jurisdiction within the ACEC boundaries. The ACEC Program is administered by the Department of Environmental Management (DEM) on behalf of the Secretary of Environmental Affairs. The Massachusetts Coastal Zone Management (MCZM) Office managed the original Coastal ACEC Program from 1978 to 1993, and continues to play a key role in monitoring coastal ACECs. Procedures for ACEC designation and the general policies governing the effects of designation are contained in the ACEC regulations (301 CMR 12.00). The ACEC datalayer has been compiled by MCZM and DEM and includes both coastal and inland areas.

EPA Designated Sole Source Aquifers Datalayer: The Sole Source Aquifer datalayer was compiled by the Department of Environmental Protection (DEP) Division of Water Supply (DWS). Seven Sole Source Aquifers have been designated by the US Environmental Protection Agency (EPA) for Massachusetts. A Sole Source Aquifer (SSA) is an aquifer designated by US EPA as the sole or principal source of drinking water for a given aquifer service area; that is, an aquifer which is needed to supply 50% or more of the drinking water for that area and for which there are no reasonably available alternative sources should that aquifer become contaminated. The aquifers were defined by a EPA hydrogeologist.

Aquifers Datalayer: MassGIS produced an aquifer datalayer composed of 20 individual panels, generally based on the boundaries of the major drainage basins. Areas of high and medium yield were mapped. This datalayer includes polygon attribute coding to help in the identification of areas in which cleanup of hazardous waste sites must meet drinking water standards, as defined in the Massachusetts Contingency Plan (MCP) (310 CMR 40.00000).

Non-Potential Drinking Water Source Areas: Non-Potential Drinking Water Source Areas (NPDWSA) are regulatory in nature, representing one of many considerations used in determining the standards to which ground water must be cleaned in the event of a release of oil or hazardous material. NPDWSAs are not based on existing water quality and do not indicate poor ambient conditions.

DEP Approved Zone IIs Datalayer: The Department of Environmental Protection (DEP) approved Zone IIs datalayer was compiled by the DEP Division of Water Supply (DWS). The database contains 281 approved Zone IIs statewide. As stated in 310 CMR 22.02, a Zone II is "that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation.) It is bounded by the groundwater divides which result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone IIs shall extend up gradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary)." These data are used in association with the Public Water Supplies datalayer. The following describes certain unique features of this association.

- Any proposed new well which will pump at least 100,000 gallons per day must have a Zone II delineation completed and approved by DEP prior to the well coming on line.
- Additionally, a new source may not be on-line yet, but other, older wells may fall within its Zone II boundary.
- Further, existing wells must have a Zone II delineated as a condition of receiving a water withdrawal permit under the Water Management Act.

RADON

State Database: MA Radon
Source: Department of Health
Telephone: 413-586-7525
Radon Test Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION

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Appendix C
MassDEP File Review Documentation

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UST Query Tool - Results Page

Your query has returned **1** match(es). You are viewing Page **1** of **1** | Back to Query Page | Find Leaks & Spills

Facility: GREEN VALLEY OIL STATION #30646

Address:
825 WASHINGTON ST
STOUGHTON, MA, 02072
County: NORFOLK

DFS Facility ID#: 12683

Phone: (800) 289-4388

Description:
Gas Station

Owner: GREEN VALLEY OIL LLC

Address:
9 DEXTER RD
EAST PROVIDENCE, RI, 02914

Operator: JAMES E STEWART

Address:
9 DEXTER RD
EAST PROVIDENCE, RI, 02914

Inspection Information

Info Updated Date: 3/22/2011
Last Third Party Date:
COC Expires: 2/19/2014

Overfill Prevention: No Information Available
Spill Prevention: No Inspection Information

FP290 - Tank Info:

ID	Installation Date	Capacity	Contents	Status	Status Date	Use	Tank Material	Tank Type	Pipe Material	Pipe Type	Tank Leak Detection	Pipe Leak Detection
1	1/1/1975	8000	Gasoline	Removed	9/24/1997	MV	Reinforced	1 Wall	Steel	Suction: Check Valve @ Tank	Inventory Record-Keeping	Suction: Check Valve at Tank
2	1/1/1975	4000	Gasoline	Removed	9/24/1997	MV	Reinforced	1 Wall	Steel	Suction: Check Valve @ Tank	Inventory Record-Keeping	Suction: Check Valve at Tank
3	1/1/1971	4000	Diesel	Removed	9/24/1997	MV	Steel	1 Wall	Steel	Suction: Check Valve @ Tank	Inventory Record-Keeping	Suction: Check Valve at Tank
4	1/1/1971	4000	Gasoline	Removed		MV	Steel	1 Wall	Steel	Suction: Check Valve @ Tank	Inventory Record-Keeping	Suction: Check Valve at Tank
5	1/1/1971	550	Waste Oil	Removed	9/24/1997	Other	Steel	1 Wall	Steel	1 Wall	Inventory Record-Keeping	
6	1/1/1971	550	Other	Removed	9/24/1997	Other	Steel	1 Wall	Steel	1 Wall	Inventory Record-Keeping	
7	10/9/1997	12000	Gasoline	Removed	7/21/2010	MV	Reinforced	2 Walls	Reinforced	2 Walls	Interstitial Monitoring	Interstitial Space Monitor
8	10/9/1997	11000	Gasoline/D	Removed	7/21/2010	MV	Reinforced	2 Walls	Reinforced	2 Walls	Interstitial Monitoring	Interstitial Space Monitor

Your query has returned **1** match(es). You are viewing Page **1** of **1** | Back to Query Page | Find Leaks & Spills

Go to Page | 1 |

^ top

MassDEP Home | UST Home | | Contacts | Site Policies

UST Query Tool - Results Page

Your query has returned **1** match(es). You are viewing Page **1** of **1** | Back to Query Page | Find Leaks & Spills

Facility: RUGGIERO & SON INC **DFS Facility ID#: 12635** **Owner: RUGGIERO & SON INC**

Address:
931 WASHINGTON ST
STOUGHTON, MA, 02072
County: NORFOLK

Phone:

Description:
Other

Address:
931 WASHINGTON ST
STOUGHTON, MA, 02072

Operator: RUGGIERO & SON, INC

Address:

, MA,

Inspection Information

Info Updated Date:
Last Third Party Date:
COC Expires:

Overfill Prevention: No Information Available
Spill Prevention: No Inspection Information

FP290 - Tank Info:

ID	Installation Date	Capacity	Contents	Status	Status Date	Use	Tank Material	Tank Type	Pipe Material	Pipe Type	Tank Leak Detection	Pipe Leak Detection
1	3/25/1947	3000	Gasoline	Removed			Steel					

Your query has returned **1** match(es). You are viewing Page **1** of **1** | Back to Query Page | Find Leaks & Spills

Go to Page | 1 |

^ top

MassDEP Home | UST Home | | Contacts | Site Policies

UST Query Tool - Results Page

Your query has returned **1** match(es). You are viewing Page **1** of **1** | Back to Query Page | Find Leaks & Spills

Facility: SOUTH SHORE PETRO

Address:
990 WASHINGTON ST
STOUGHTON, MA, 02072
County: NORFOLK

DFS Facility ID#: 12678

Phone: (781) 771-8293

Description:
Gas Station

Owner: SOUTH SHORE PETRO

Address:
12 BRIGGS RD
LEXINGTON, MA, 02420

Operator: MONSY JACOB

Address:
12 BRIGGS RD
LEXINGTON, MA, 02421

Inspection Information

Info Updated Date: 5/4/2010
Last Third Party Date: 4/21/2010
COC Expires: 2/22/2015

Overfill Prevention: No Information Available
Spill Prevention: No Inspection Information

FP290 - Tank Info:

ID	Installation Date	Capacity	Contents	Status	Status Date	Use	Tank Material	Tank Type	Pipe Material	Pipe Type	Tank Leak Detection	Pipe Leak Detection
1	4/18/1972	4000	Gasoline	Removed			Steel					
2	4/18/1972	4000	Gasoline	Removed			Steel					
3	4/18/1972	2000	Gasoline	Removed			Steel					
4	4/18/1972	5000	Gasoline	Removed			Steel					
5	10/14/1990	8000	Gasoline	Removed	2/24/2005	MV	Reinforced	2 Walls	Reinforced	2 Walls	Interstitial Monitoring	Product Line Leak Detector
6	10/14/1990	8000	Gasoline	Removed	2/24/2005	MV	Reinforced	2 Walls	Reinforced	2 Walls	Interstitial Monitoring	Product Line Leak Detector
7	10/14/1990	8000	Diesel	Removed	2/24/2005	MV	Reinforced	2 Walls	Reinforced	2 Walls	Interstitial Monitoring	Product Line Leak Detector
8	9/1/2008	15000	Gasoline	In Use		MV	Reinforced	2 Walls	Flexible	2 Walls	Interstitial Monitoring	Product Line Leak Detector
9	9/1/2008	9000	Gasoline/D	In Use		MV	Reinforced	2 Walls	Flexible	2 Walls	Interstitial Monitoring	Product Line Leak Detector

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Class A-3 Response Action Outcome Statement

RTN: 4-00875

221889.00

DISPOSAL SITE
2 Canton Street
Stoughton, MA 02072

October 2009

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

TABLE OF CONTENTS

SECTION PAGE NO.

1. INTRODUCTION 1-1

2. SITE BACKGROUND AND HISTORY 2-1

2.1 Site Location and Description 2-1
2.2 Site Surroundings and General Setting 2-1
2.3 Owner / Operator and Operations History 2-2

3. RELEASE HISTORY AND PREVIOUS RESPONSE ACTIONS 3-1

3.1 Release History 3-1
3.2 Summary of Pre-2008 Response Actions at Disposal Site 3-1

4. W&C RESPONSE ACTIONS 4-1

4.1 Release Abatement Measure Activities 4-1
4.2 Immediate Response Action Activities 4-2
4.3 Confirmatory Soil Sampling 4-3
4.4 Monitoring well INstallation 4-4
4.4.1 August 2008 4-4
4.4.2 June 2009 4-4
4.5 Groundwater and NAPL Gauging 4-4
4.6 Vacuum Extraction 4-5
4.7 Groundwater Sampling 4-6
4.8 Soil Gas Probe Installation and Soil Gas Sampling 4-6
4.9 Indoor Sampling 4-7
4.10 Ambient Air Sampling 4-8
4.11 NAPL Sampling 4-8
4.12 petroleum Paneling 4-9
4.13 Site Survey 4-10

5. SITE CONDITIONS 5-1

5.1 Site Geology and Hydrogeology 5-1
5.1.1 Topography and Surface Water 5-1
5.1.2 Overburden and Bedrock Geology 5-1
5.1.3 Site Hydrogeology 5-1
5.2 Nature and Extent of the Disposal Site 5-1
5.2.1 Soil 5-1
5.2.2 Groundwater 5-2
5.2.3 Indoor Air 5-3
5.3 Conceptual Site Model and Disposal Site Boundary 5-3

6. MCP REPRESENTATIVENESS EVALUATION AND DATA USABILITY ASSESSMENT 6-1

6.1 Representativeness Evaluation 6-2
6.1.1 Conceptual Site Model 6-2
6.1.2 Use of Field Screening Data 6-2
6.1.3 Sampling Rationale 6-2

6.1.4 Number, Spatial Distribution, and Handling of Samples 6-4
6.1.5 Temporal Distribution of Samples 6-4
6.1.6 Completeness 6-4
6.1.7 Inconsistency and Uncertainty 6-5
6.1.8 Information Considered Unrepresentative 6-5
6.2 Data Usability Assessment 6-5
6.2.1 Analytical Data Usability Assessment 6-5
6.2.1.1 Evaluation for CAM Compliant Data 6-6
6.2.1.2 Evaluation for CAM Non-Compliant, Non-CAM and Pre-CAM Data 6-8
6.2.1.3 Data Evaluation Criteria 6-9
6.2.2 Field Data Usability Assessment 6-9
6.2.3 Rejection of Analytical Data as the Result of Gross Failure 6-9
6.3 Conclusions of the REDUA 6-10

7. SUMMARY OF THE METHOD 3 RISK CHARACTERIZATION 7-1

8. CLASS A-3 RAO STATEMENT 8-1

8.1 RAO Category and Disposal Site Boundaries 8-1
8.2 Demonstration Of No Significant Risk 8-1
8.3 Demonstration that Sources Are Eliminated Or Controlled 8-1
8.4 Feasibility of Approaching Background 8-1
8.4.1 Soil 8-2
8.4.2 Groundwater 8-2
8.4.3 Cost-Benefit Analysis 8-3
8.5 Relationship to Other Response Action Outcomes 8-3
8.6 Post-Closure Operation, Maintenance, or Monitoring 8-3
8.7 Demonstration of a Permanent Solution 8-4
8.8 Licensed Site Professional Opinion 8-4

9. CONCLUSIONS 9-1

10. REFERENCES 10-1

LIST OF TABLES

TABLE

Table 1: Summary of Soil Analytical Results
Table 2: Summary of Groundwater and NAPL Gauging Measurements
Table 3: Summary of Groundwater Analytical Results
Table 4: Summary of Soil Gas Analytical Results
Table 5: Summary of Indoor Air Analytical Results
Table 6: Summary of Ambient Air Analytical Results
Table 7: Summary of Samples Included in the Data Quality Assessment

LIST OF FIGURES

FIGURE	
Figure 1:	Site Locus
Figure 2:	Site Plan
Figure 3:	MassGIS 21E Priority Resource Map

APPENDICES

APPENDIX	
Appendix A:	BWSC Transmittal Form 104
Appendix B:	Laboratory Analytical Reports
Appendix C:	Monitoring Well Construction Logs
Appendix D:	Hazardous Waste Manifests – Vacuum Extraction Events
Appendix E:	Method 3 Risk Characterization
Appendix F:	New Fields Environmental Report
Appendix G:	Notice of Activity and Use Limitation (AUL)

1. INTRODUCTION

Woodard & Curran Inc. (W&C) has prepared this Class A-3 Response Action Outcome (RAO) Statement for the Disposal Site identified by the Massachusetts Department of Environmental Protection (MassDEP) Release Tracking Number (RTN) 4-00875 (the Site). The Site is situated along a portion of the property located at 2 Canton Street in Stoughton, Massachusetts (the Property). This RAO Statement has been prepared on behalf of Stoughton Center Business Park, LLC (the current property owner) in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000; MassDEP 2007a). The Site generally consists of the courtyard area of the Property and portions of the Site buildings, which have been impacted by petroleum hydrocarbons and related constituents as a result of two leaking underground storage tanks (USTs) that formerly serviced the existing buildings at the Property. Response actions have been conducted at the Site since 1989 (when the release was discovered) and most recently included excavation of petroleum-impacted soil under a Release Abatement Measure (RAM) Plan submitted to the MassDEP in August 2008 (W&C, 2008a). During the course of investigation and remediation activities conducted under the RTN 4-00875, two additional reportable conditions were triggered resulting in the assignment of two new RTNs (4-18753 and 4-21470). These RTNs were later linked to the Site's primary RTN 4-00875, and therefore individual RAO Statements are not required. Figure 1 depicts the location of the Site (Site Locus). Figure 2 (Site Plan) provides an illustration of the Site that is the subject of this Class A-3 RAO Statement and how it relates to the property lines for the 2 Canton Street property.

This RAO Statement has been prepared in accordance with the MCP at 310 CMR 40.1036. In accordance with 310 CMR 40.1035, a Class A RAO is applicable to the Site because:

1) A Permanent Solution has been achieved; and
2) Response actions have been conducted to:
    a) Achieve a level of No Significant Risk (NSR);
    b) Eliminate or control sources of oil and/or hazardous materials (OHM); and
    c) Where feasible, reduce to the extent possible, the level of OHM concentrations in the environment to background.

Pursuant to 310 CMR 40.1036(2), a category Class A-3 RAO is applicable to the Site because:

1) A Permanent Solution has been achieved;
2) The level of OHM in the environmental has not been reduced to background;
3) One or more Activity and Use Limitations (AULs) is required to maintain a level of NSR; and
4) OHM at the disposal site do not exceed an applicable Upper Concentration Limit (UCL) in soil or groundwater.

The RAO Statement Transmittal Form (BWSC104) is being provided via electronic transmission with this report (refer to Appendix A). A copy of the recorded Notice of AUL supporting the Class A-3 RAO Statement will be provided to the Chief Municipal Officer, the Board of Health, the Zoning Official, and the Building Code Enforcement Official, no less than 30 days after it has been recorded with the Norfolk County Registry of Deeds, pursuant to 310 CMR 40.1403(7)(a).

2. SITE BACKGROUND AND HISTORY

2.1 SITE LOCATION AND DESCRIPTION

The Site is located at 2 Canton Street (Route 27) in a mixed residential and commercial area of Stoughton, Massachusetts. The Property is identified by the Town of Stoughton's Assessor's Map 54 as Parcel 110, occupying approximately 2.16 acres of land. The Property, which is currently owned by Stoughton Center Business Park, LLC, is zoned for "general business". A Site Locus map (Figure 1) and a Site Plan (Figure 2) are attached. The coordinates of the Property are:

- Latitude / Longitude: 42.124298 / 71.104401
- UTM coordinates: 326049.4 mE, 4665506.5 mN (Zone 19)

The eastern portion of the Property consists of an asphalt-paved parking lot that is used for customer and commuter parking for the adjacent Massachusetts Bay Transit Authority (MBTA) commuter rail line. The western portion of the Property is currently improved with four interconnected, masonry and wood-framed mill buildings, which have a combined footprint of 73,046 square feet and are currently used for office, retail, studio, and storage space. An asphalt-paved courtyard area is situated within the center of these buildings, which also encompasses a fenced in playground area and limited customer parking. Each of the individual buildings has been assigned a name by the property owner and includes the "A," "B," "C," "D," "E," and "F" Buildings. As shown on Figure 2, the A-Building forms the northeastern boundary of the courtyard area, the B-Building forms the southeastern boundary, C-Building forms the southwestern boundary, the D- and E-Buildings form the western boundary, and the F-building forms the northwestern boundary. Note that only the A-, C- and F-Buildings are situated within the Disposal Site boundary. A covered overhead walkway connects the A-, C- and F-Buildings.

The A-Building is currently occupied by a variety of tenants including a framed art store, a martial arts studio, several artist studios, a house of worship, and a plumbing company; the F-Building is currently occupied by a day care facility and additional studio space; and the C-Building is occupied by a fitness center and an elevator shaft. None of the buildings contain a recessed basement, although small crawl spaces are located below the day care facility situated in the F-Building and the customer lobby situated within the A-Building.

The Site encompasses an approximately 5,200-square foot area located within the courtyard area of the Property, as well as portions of the A-, C-, and F-Buildings, occupying an approximate total area of 20,183-quare feet (Figure 2). Access to the Site is unrestricted and is obtained via an asphalt-paved driveway off of Canton Street adjacent to the eastern corner of the A-Building.

The Site is serviced with municipal water and sewer, natural gas, and electricity. A natural gas line runs along the southwestern portion of the Site within the courtyard area, parallel to the C-Building.

2.2 SITE SURROUNDINGS AND GENERAL SETTING

The Site is located in a mixed commercial and residential area of Stoughton, Massachusetts. Railroad tracks for the MBTA commuter line directly abut portions of the Property to the northeast and east. Canton Street borders the Site to the northeast, across from which is an MBTA vehicle parking lot and various commercial and residential properties. A commercial property and its associated parking lot abut the Site property to the west. Summer Street borders the Property to the south, across from which are several residential properties.

Review of the Massachusetts Geographic Information System (MassGIS; 2009) 21E Priority Resource Map (Figure 3) indicates that the Site is not located over or within 500 feet of a potentially productive aquifer, a Sole Source

aquifer, an Interim Wellhead Protection Area (IWPA), an approved Zone II groundwater supply area, or any other feature triggering a GW-1 classification. Additionally, there are no Areas of Critical Environmental Concern (ACECs), habitats of Species of Special Concern, habitats of Threatened or Endangered Species, fish habitats, vernal pools, or Protected Open Space located within 500 feet of the Site. The Site is not located in a 100-year floodplain. The nearest surface water body to the Site is a small unnamed brook and associated wetlands located approximately 3,000 feet downgradient to the southwest. Woods and Brittons Ponds are located further southwest of the Site.

2.3 OWNER / OPERATOR AND OPERATIONS HISTORY

Information regarding the historical use of the Property was obtained from information provided in previous environmental reports, including a review of Sanborn Fire Insurance Maps that were provided within the 2003 Phase I Initial Site Investigation (Continental Remediation Systems, Inc., 2003a).

As previously described, the Property currently consists of a commercial facility used for office, retail, studio, and storage space. The Property has been utilized for its current use since the early 1990s. Prior to that time, the Property had been used for manufacturing operations, including the manufacture of rubbing clothing between the late 1800s and the early 1930s and the manufacture of footwear between the 1930s and late 1960s.

Information obtained from available Sanborn Fire Insurance Maps indicates that the current buildings on the Property were in existence in 1912, with the current building configuration relatively unchanged since the late 1950s. Although three underground storage tanks (USTs) (one 500-gallon gasoline, one 6,000-gallon No. 6 fuel oil, and one 3,000-gallon No. 6 fuel oil) were removed from the Site between 1989 and 2008, they are not clearly depicted on any of the available Sanborn maps.

Sanborn maps also indicate the historic presence of railroad tracks to the immediate northeast of the Site. Additionally, the Stoughton Gas and Electric Co. was formerly located further north of the Site across Canton Street as depicted in the 1896, 1901, and 1906 Sanborns.

3. RELEASE HISTORY AND PREVIOUS RESPONSE ACTIONS

3.1 RELEASE HISTORY

In November 1989, a release of No. 6 fuel oil was discovered within the courtyard area of the Property during the removal of one (1) 500-gallon gasoline UST and one (1) 6,000-gallon No. 6 fuel oil UST. Subsequent investigation of soil at the Site identified petroleum-impacted soils within the footprint of the courtyard. At that time, it was determined that oil in soil associated with the 6,000-gallon tank did not appear to have migrated beyond the courtyard area. Also at that time, groundwater was found to be free of petroleum impact. MassDEP subsequently assigned RTN 4-00875 to the release in April 1990.

3.2 SUMMARY OF PRE-2008 RESPONSE ACTIONS AT DISPOSAL SITE

This section provides a summary of the response actions that have been performed for the Disposal Site associated with RTN 4-00875 prior to 2008. Response actions conducted by Woodard and Curran in 2008 and 2009 are described in Section 4.

On November 17, 1989 (pre-MCP), a release of No. 6 fuel oil was discovered within the courtyard area of the Site by Gale Associates, Inc. (Gale) during the removal of a 500-gallon gasoline UST and a 6,000-gallon No. 6 fuel oil UST. Specifically, petroleum impacts were encountered within the vicinity of the No. 6 fuel oil UST at approximately four feet below ground surface (ft bgs) and was observed to extend in both a northerly and southerly direction from the tank. In addition to the two USTs, approximately 20 cubic yards of petroleum-impacted soil were excavated from the courtyard area and removed from the Site.

In September 1989, six soil borings (B-1 through B-6) were advanced at the Property. Groundwater monitoring wells were installed within five of the borings (B-1, B-3, B-4, B-5, and B-6) with screen intervals ranging from 3.5 to 17 ft bgs. Soil samples were collected from borings B-1 and B-4 at depths ranging from 0.5 to 6 ft bgs and were submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and/or extractable metals. Additional soil samples were collected from the tank excavation areas and were submitted for laboratory analysis of TPH and/or volatile organic compounds (VOCs). Results of the soil sampling indicated that concentrations of TPH were present in soil samples collected within the vicinity of the former No. 6 fuel oil UST.

In October 1989, groundwater samples were collected from the five monitoring wells installed at the Property in September 1989 and one existing monitoring well (B-7) and were analyzed for TPH, VOCs, base/neutral extractable organic compounds (B/Ns), oil/grease, and dissolved drinking water metals. TPH was detected in groundwater collected from the tank grave. Groundwater analytical data also indicated the presence of lead and barium in the groundwater sample collected from monitoring well B-3, located along the western edge of the Property. The presence of lead within groundwater was attributed to surface water runoff from nearby parking areas, while the presence of barium was attributed to indigenous soil and rock. Oil and grease were detected in groundwater samples collected from monitoring wells B-4 and B-6 (located along the southern and northern portions of the Property, respectively) and were attributed to surficial releases of oil/grease and/or off-site sources. No VOCs or B/Ns were detected in analyzed groundwater samples in October 1989 (Gale, 1989).

Six additional soil borings (B-8 through B-13) were advanced at the Property in January 1990 (Gale, 1990), one of which (B-8) was advanced outside of the courtyard area and was completed as a monitoring well. Soil samples were collected from borings B-9, B-10, B-11, and B-13 at depths ranging from 0 to 12 ft bgs and were analyzed for TPH. A groundwater sample was also collected from monitoring well B-8 and was analyzed for TPH and VOCs. Analytical results indicated that TPH concentrations ranging from 29 to 52,000 milligrams per kilogram (mg/kg) were detected in soil samples within the courtyard area of the Property, particularly those located between 6 and 12 ft bgs. The

groundwater sample collected from B-8 (located to the southeast of the Site building) did not contain detectable concentrations of TPH or VOCs.

According to the combined Immediate Response Action Completion Statement and Class C RAO Statement report prepared by Avier Environmental, Inc. (AE; 2006b), a 6x8x10 foot drywell containing sludge impacted with VOCs and metals was discovered along the western portion of the Property by Gale in January 1990. The contents of this drywell were later excavated and removed off-site in August 1990. Confirmatory soil samples collected from underlying soils indicated that no VOCs were detected, thereby indicating that contaminant migration from the dry well had not occurred. No additional work was conducted at the Site between August 1990 and October 1996.

In October 1996, Sage Environmental, Inc. (Sage) conducted an additional subsurface investigation at the Site, which confirmed the presence of No. 6 petroleum-impacted soils within the courtyard area at depths between 7 to 14 feet bgs. Additional subsurface activities were conducted by Sage in December 1997 and January 1998, consisting of the installation of four monitoring wells (MW-1 through MW-4) at the Property (MW-1 and MW-2 within the courtyard area; MW-3 and MW-4 within the footprint of the Site building), the advancement of one additional soil boring (B-1, located within the footprint of the building), the collection and laboratory analysis of soil and groundwater samples, and groundwater gauging. One soil sample was collected from each of the installed monitoring wells at depths ranging from 9 to 11 ft bgs and was submitted for laboratory analysis of extractable and volatile hydrocarbons (EPH/VPH) and TPH (for MW-1, MW-2, and MW-3 only). Additionally, one soil sample was collected from soil boring B-1 within the Site building and submitted for laboratory analysis of TPH. Analytical results of the 1997 and 1998 soil sampling indicated the presence of EPH and VPH constituents within soil samples collected from the courtyard area (MW-1 and MW-2), with the highest concentrations observed within MW-1, which is located along the southern corner of the courtyard area. Soil samples collected from MW-3 and MW-4 (both located within the building footprint) did not contain detectable levels of any analyzed constituents.

Groundwater samples were collected from MW-2 through MW-4 by Sage on January 5 and 22, 1998, which were analyzed for EPH and VPH. Groundwater analytical results indicated that low levels (i.e., below applicable RCGW-2 Reportable Concentrations) of VPH and/or EPH were detected in monitoring wells MW-2 and MW-4. The groundwater sample collected from MW-3 did not contain detectable concentrations of any analyzed constituents. Groundwater gauging data obtained in January 1998 indicated that groundwater flows in a south/southwesterly direction. Additionally, light non-aqueous phase liquid (LNAPL) was observed within monitoring well MW-1 with a measured thickness of 0.24 inches (Sage, 1998).

In 2002 and early 2003, additional investigations and pilot and/or full-scale in-situ chemical oxidation (ISCO) of subsurface soils were reportedly conducted, although the details of these activities are unclear.

In April 2003, a Phase I Initial Site Assessment and Tier Classification (classifying the Site as a Tier II disposal site) was filed for the Site by Continental Remediation Services, Inc. (CRS, 2003a). A Class A-2 Response Action Outcome (RAO) Statement was filed for the Site in June 2003 (CRS, 2003b), which concluded that, based on the results of a Method 1 risk characterization, no further response actions were necessary and a permanent solution had been achieved at the Site.

In September 2004, the Site was audited by the MassDEP who later issued a Notice of Audit Findings/Notice of Noncompliance (NOAF/NON) in November 2004 (MassDEP, 2004a) due to deficiencies cited in the Class A-2 RAO. Among other noted deficiencies, MassDEP found that a Method 1 RC was disqualified from use in the RAO due to the detection of the C9-C10 aromatic hydrocarbon fraction with a concentration greater than applicable Method 1 soil standards thereby invalidating the Class A-2 RAO. The audit also stated that soil characterization of the courtyard and potential indoor air impacts was inadequate.

Between September and December 2004, additional soil, groundwater, soil gas, and indoor air data were collected by Action Environmental, Inc. (AEI) to address the findings of the Audit (AEI, 2005a). These additional response actions included the re-sampling of soil within vicinity of MW-4 (labeled as AE-101) within the 8 to 10 ft bgs depth interval where a high PID response was previously recorded, as well as additional soil and groundwater sampling within the courtyard area. Additionally, AEI installed 11 soil gas sampling points (SG-1 through SG-11) at the Site and submitted four (4) soil gas samples (SG-1, SG-2, SG-7, and SG-11) collected within vicinity of the day care facility for laboratory analysis of air phase hydrocarbons (APH) to evaluate the potential for vapor migration into the occupied structures. Also, one (1) indoor air sample was collected from the crawl space located below the day care facility. The results of the supplemental investigation conducted by AEI in 2004 indicated that, while a critical exposure pathway did not exist at the Site in relation to vapor migration within the day care facility, additional response actions were necessary to address RTN 4-00875.

During groundwater gauging in October 2004, LNAPL with a measured thickness greater than its ½-inch Upper Concentration Limit (UCL) was observed within two ¾-inch piezometers (MW-6 and MW-7) on-Site, thereby triggering a 72-hour reportable condition. MassDEP was verbally notified by AEI of the release on November 1, 2004 and granted verbal approval of an IRA Plan for the bailing of NAPL from the monitoring wells and to conduct additional assessment of the Site. RTN 4-18753 was assigned to the release. RTN 4-18753 was later linked to the primary RTN 4-00875 via BWSC-107 in October 2005.

In January 2005, an IRA Plan was submitted by AEI to the MassDEP to address the NAPL release (AEI, 2005b). In February 2005, a Modified IRA Plan was submitted to MassDEP to perform pilot and full-scale ISCO of subsurface soils. ISCO remediation activities were conducted at the Site between March 2005 and June 2006. IRA Status reports were submitted to MassDEP in May 2005 and October 2005 (AEI, 2005c and 2006a, respectively), which summarized IRA activities that were conducted at the Site during each reporting period. IRA activities conducted between January 2005 and October 2005 included NAPL bailing from monitoring wells, installation of additional monitoring wells, pilot and full-scale ISCO treatment of subsurface soils, and post-treatment monitoring of soil and groundwater.

In August 2005, Phase II Comprehensive Site Assessment (CSA) and a Phase III Remedial Action Plan reports were submitted to MassDEP by AEI (AEI 2005d; 2005e, respectively), which summarized the Phase II assessment activities conducted at the Site between September 2004 and June 2005, as well as the selected remedial alternative to address subsurface contamination at the Site. Activities conducted during the Phase II included the advancement of additional soil borings and monitoring wells, soil and groundwater sampling, groundwater gauging, and a groundwater elevation survey. Additionally, a Method 1 RC was conducted, the results of which indicated that a condition of NSR had not been achieved at the Site. Therefore, it was concluded that additional response actions were necessary (AEI, 2005d). The selected remedial alternative was continued ISCO of soil and groundwater at the Site (AEI, 2005e), which would be conducted under the continuing IRA.

On September 7, 2006, a combined IRA Completion Statement and Class C-2 RAO Statement were submitted for the Site by Avier Environmental (AE; 2006b) indicating that IRA activities had been completed and that a Temporary Solution had been achieved. Ongoing activities related to the IRA continued under a RAM.

In September 2006, AE submitted a RAM Plan (AE, 2006c) outlining proposed RAM activities for the Site, which included the installation of two additional soil borings/monitoring wells, the gauging and monitoring of groundwater quality within the monitoring well network, and post-remedial monitoring to determine and document the effectiveness of the response actions. A RAM Status report summarizing RAM activities conducted at the Site in November 2006 was submitted to MassDEP in February 2007 (AE, 2007). According to the RAM Status report, groundwater monitoring, a groundwater flow survey, and NAPL measurement and bailing were conducted in November 2006. The RAM Status report also presented a modification to the previous RAM Plan, which proposed the installation of four,

rather than two, monitoring wells at the Site to delineate the extent of NAPL. These additional soil borings/monitoring wells were never installed at the Site.

4. W&C RESPONSE ACTIONS

This section describes the investigation and remediation activities completed at the Site by Woodard and Curran between August 2008 and the present.

4.1 RELEASE ABATEMENT MEASURE ACTIVITIES

In July 2008, Woodard & Curran was retained by Stoughton Center Business Park, LLC for environmental services in relation to the fuel oil release associated with RTN 4-00875. In August 2008, W&C submitted a RAM Plan (W&C, 2008a) for the Site which superseded the September 2006 RAM Plan previously prepared by Avier Environmental and associated modifications outlined in the February 2007 RAM Status Report. The objective of the August 2008 RAM was to remove petroleum-impacted soils that were acting as a continuing source of NAPL previously observed in monitoring wells.

On August 13, 2008, W&C personnel conducted gauging of the nine monitoring wells (MW-1, MW-4, MW-5, MW-6, MW-7, AE-201, AE-202, AE-203, AE-204) that were present at the Property at that time to better understand Site conditions prior to initiation of RAM activities. Depth to groundwater during the August 2008 gauging event ranged from approximately 4.8 ft bgs within former monitoring well MW-5 (within the courtyard area) to 10.32 ft bgs within monitoring well AE-202 (adjacent to Canton Street). NAPL with an approximate thickness of 0.02 feet was observed within monitoring well MW-7, which was formerly located within the center of the courtyard (near the fenced in playground). NAPL was also observed to be present with considerable thickness within monitoring well MW-6, which was formerly located adjacent to the current location of WC-2 within the courtyard area. W&C was unable to estimate the measurable thickness of the NAPL in this well due to the high viscosity of the product (which continually became entrained within the interface probe). No other wells were found to contain NAPL during the August 13, 2008 gauging event.

RAM activities began on August 20, 2008 and were completed on August 29, 2008. The general approach for the RAM was to work in sections within the courtyard area to reduce the weight-bearing burden on nearby compacted soils and adjacent structures, and for health and safety reasons. As a result, several smaller excavations were conducted and backfilled rather than having one large open excavation area. In general, the excavation area was separated into four quadrants: northeast, northwest, southeast, and southwest. All excavation activities were conducted by Cyn Environmental (Cyn) of Stoughton, Massachusetts (under subcontract to, and direction of, W&C). Headspace screening was continually conducted during excavation activities using a photoionization detector (PID) equipped with a 10.6 electron volt (eV) lamp to monitor work space and to help guide excavation of impacted soils. Excavation of each area continued until soils no longer appeared visually impacted or until further excavation was impeded by the presence of surrounding structures and/or the influx of groundwater into the excavation. Prior to backfilling each quadrant, grab soil samples were collected from the bottom and side walls of each quadrant, which were later composited into five soil samples representative of the bottom and four side walls of the main excavation area (i.e., all four quadrants) conducted under the RAM.

Excavation activities began in the southwest quadrant, which was anticipated to be the most heavily impacted area of the Site based on NAPL measured in monitoring wells within this area during the August 13, 2008 gauging event. In general, the top 6-8 feet of unimpacted overburden soils were excavated and temporarily stockpiled for re-use as back fill. Overburden soils were observed to consist of sandy fill materials containing coal ash, cinders, brick, glass and slag from the ground surface to approximately 7 feet bgs, followed by a 1-2 foot thickness of brown peat. Petroleum-impacted soils were observed at depths ranging from 8-13 feet bgs. A dense lodgment till layer consisting of fine sand, silt, and clay was encountered within each excavation area at depths ranging from approximately 12-16 feet bgs. Oil was also observed along (and in some areas embedded within) the clay layer. Visually impacted oily

soils and clay were excavated to an approximate average depth of 12.5 feet bgs when groundwater slowly began to percolate into the bottom of the excavation.

During implementation of the RAM, an IRA condition was triggered due to the discovery of an unknown, abandoned 3,000-gallon fuel oil UST within the west/southwestern portion of the Site. Therefore, excavation activities associated with the newly discovered tank were conducted separately under an IRA, while the remainder of excavation activities at the Site was conducted under the RAM. Response actions conducted under the IRA are discussed further in Section 4.2.

Approximately 850 cubic yards of material (both unimpacted and impacted) was generated during RAM/IRA excavation activities, of which roughly 386 cubic yards consisted of petroleum-impacted material and were transported by Cyn off-site for disposal at Aggregate Industries in Stoughton, Massachusetts. The removed 3,000 gallon fuel oil UST was transported off-site by Cyn to the James G. Grant Co. Inc. facility located in Readville, Massachusetts. Several large boulders, and minor amounts of construction debris consisting of concrete (e.g., foundation/conduits), brick, and field stone were also encountered at varying depths across the Site during excavation activities, some of which was retained for use as backfill in the excavation.

As depth to groundwater at the Site ranges from approximately 6 to 10.5 feet bgs, some dewatering activities were required. Approximately 213 gallons of an oil/water mixture were generated over the course of the RAM and IRA. The generated water was pumped out using a vacuum truck and transported offsite to Cyn's Stoughton facility under a Hazardous Waste Manifest as a waste.

As previously described, confirmatory soil samples that were collected throughout the course of the RAM were composited into representative samples reflecting the bottom and sidewalls of the main excavation area (i.e., the larger excavation conducted under the RAM) following completion of excavation activities. The confirmatory samples were submitted for VPH and EPH, both with target analytes. Analytical results for the soil sampling are discussed in Section 4.3.

Because the existing monitoring well network within the courtyard area was destroyed during implementation of RAM and IRA activities, three monitoring wells were installed in this area upon completion of RAM/IRA activities on August 28, 2008 to define post-excavation Site conditions. The details of monitoring well installation and subsequent sampling of groundwater from these wells is discussed in Section 4.4. Soil samples were not obtained during installation of the three replacement wells because representative soil samples were collected from the area following excavation activities (i.e., confirmatory soil sampling).

Upon completion of RAM and IRA excavation activities at the Site, the entire courtyard area was re-graded with approximately 18 inches of bluestone and finished with asphalt pavement. Re-grading and paving activities were conducted between September 2 and 4, 2008, and included the installation of a fenced-in area finished with 3 feet of bark mulch on top of the asphalt pavement along the northwestern portion of the Site, which currently used as an outdoor play area for the on-Site day care facility.

4.2 IMMEDIATE RESPONSE ACTION ACTIVITIES

As previously mentioned, an IRA condition was triggerd during implementation of RAM activities at the Site due to the discovery of an unknown, abandoned, leaking 3,000-gallon fuel oil UST within the west/southwestern corner of the Site. The tank was discovered during excavation of the west/southwestern quadrant on August 25, 2008. At approximately 1:00pm, a portion of a steel tank was observed protruding from the northeastern corner of the southwestern quadrant, adjacent to a former dry-well structure. Further excavation of soils surrounding the northern half of the tank revealed an access portal within the tank. At that time, excavation activities ceased, the tank was opened, and the contents of the tank were pumped into the vacuum truck. It was estimated that approximately 1.5

feet of an oil/water mixture was present in the tank. The Stoughton Fire Department was promptly notified of the tank discovery. The remainder of the day was spent by Cyn cleaning out the contents of the tank.

On August 26, 2008, following approval from, and under a permit granted by, the Stoughton Fire Department, Cyn began excavation of the tank. As compacted soils surrounding the tank were excavated, petroleum-saturated soils were noted in underlying soils, thereby triggering a new reporting condition. The MassDEP was verbally notified of the 2-hour release at approximately 11:30am by John Thompson of W&C, the LSP for the Site. MassDEP verbally granted approval for the removal of the tank, as well as up to 25 cubic yards of impacted soils under an IRA. Release Tracking Number 4-21470 was assigned by MassDEP to the 2-hour release, which was later linked to the primary RTN (4-00875) via BWSC-105 on October 23, 2008.

Upon its removal, the newly discovered fuel oil tank was estimated to have a capacity of approximately 3,000-gallons. Numerous holes of all sizes (including an approximately 8" gash along the northeast corner) were noted along the tank bottom and sidewalls. It appeared that some holes were likely due to puncture of the tank during the earlier application of ISCO.

As the oil observed in and around the newly discovered UST was similar to the NAPL previously encountered in Site monitoring wells, as well as within the southwest quadrant, it was difficult to segregate fuel oil impacts resulting from the formerly removed 6,000-gallon fuel oil UST and the abandoned 3,000-gallon fuel oil UST. As such, excavation of soils within the southwest quadrant continued under the IRA, while soils within the remainder of the excavation (and upgradient of the 3,000-gallon UST) were handled under the RAM already in progress (as previously described in Section 4.1). It is estimated that approximately 20 cubic yards of petroleum-impacted soils were excavated and transported off-site under the IRA.

Following excavation and stockpiling of impacted soils within the vicinity of the newly discovered UST, four confirmatory soil samples were collected from the bottom and southern, western, and northern sidewalls, field screened, and placed on ice for future laboratory submittal. The excavation was then backfilled with imported bluestone.

A combined Release Abatement Measure Completion and Immediate Response Action Completion report (W&C, 2008b) was submitted to MassDEP on October 23, 2008, describing the RAM and IRA activities that were conducted at the Site in August 2008.

4.3 CONFIRMATORY SOIL SAMPLING

Following excavation activities at the Site, W&C collected a total of nine confirmatory soil samples from the bottoms and side walls of the two excavation areas to characterize post-remediation conditions at the Site. Specifically, five soil samples were collected from the main excavation area (Bottom, East Side Wall, South Side Wall, West Side Wall, and North Side Wall), and four soil samples were collected from the UST excavation area (UST-Bottom, UST-SW South, UST-SW West, and UST-SW North). Soil samples were submitted to Alpha Analytical Laboratories (Alpha) for analysis of VPH and EPH, both with target analytes. A summary of soil analytical results is presented on Table 1. As shown, VPH and EPH fractions, as well as several PAHs were detected in one or more soil samples. C11-C22 aromatic hydrocarbons and C19-C36 aliphatic hydrocarbons were detected in all nine samples, the highest concentrations of which were detected within the RAM excavation area. Lighter fractions C9-C10 aromatic hydrocarbons and C9-C12 aliphatic hydrocarbons were detected in four soil samples: three within the RAM excavation area and one within the IRA excavation area. Of the eleven detected PAHs, eight of them had maximum detected concentrations below MassDEP background values for 'natural' soils (MassDEP, 2002a); acenaphthene, naphthalene and 2-methylnaphthalene were the only three PAHs detected with maximum concentrations greater than applicable background values. The C9-C10 aromatic hydrocarbon fraction was the only constituent detected

with a concentration (176 mg/kg) greater than its most stringent Method 1 standard (100 mg/kg; S-1/GW-2), which was collected from the bottom of the main excavation area. Laboratory analytical reports for confirmatory soil samples collected at the Site in August 2008 are presented in Appendix B.

4.4 MONITORING WELL INSTALLATION

4.4.1 August 2008

In August 2008, W&C contracted with Geosearch, Inc. (Geosearch) of Fitchburg, Massachusetts to install three (3) monitoring wells (WC-1 through WC-3) at the Site using hollow stem auger techniques. The objective of the well installation was to establish a monitoring well network within the courtyard area to replace those destroyed during excavation activities. The intent was to install the wells to an approximate depth of 20 ft bgs; however, due to refusal that was encountered in several locations across the southern half of the courtyard, two of the wells (WC-1 and WC-2) were installed to approximately 13-15 ft bgs, as described below.

The monitoring wells were installed on August 28, 2008 and were each constructed of six-inch diameter schedule-40 polyvinyl chloride (PVC) with a screen slot size of 0.01 inch. WC-1 was installed to an approximate depth of 15 ft bgs, WC-2 to approximately 13 ft bgs, and WC-3 to approximately 19 ft bgs. Each of the wells was screened across the bottom 10 feet, with the screen straddling the water table (ranging from 6 to 9 ft bgs in this area of the Site). A sand pack was placed in the annular space between the borehole and the well and was extended one to two feet above the screen. A two-foot bentonite seal was placed above the sand pack and sand was extended to the surface. The wells were completed with flush-mounted roadboxes following subsequent re-paving of the entire courtyard area between September 2 and 4, 2009. Monitoring well construction details for monitoring wells WC-1 through WC-3 are presented on the drilling logs included in Appendix C.

4.4.2 June 2009

In June 2009, W&C contracted with New England Geotech (NEG) of Jamestown, Rhode Island to install two (2) additional monitoring wells (WC-4 and WC-5) at along the northern portion of the Property to further delineate Site conditions within this area. Field activities were conducted on June 30, 2009. Monitoring well WC-4 was installed to an approximate depth of 14.5 ft bgs using direct push drilling techniques along the northwestern corner of the Property in the alley way between the A- and F-Buildings. WC-4 was constructed of one-inch diameter schedule-40 PVC with a screen slot size of 0.01 inch, and was screened over the bottom ten feet, with the screen straddling the water table (approximately 8 ft bgs). A sand pack was placed in the annular space between the borehole and the well and was extended one to two feet above the screen. A two-foot bentonite seal was placed above the sand pack and sand was extended to the surface. The well was completed with a flush-mounted roadbox.

Prior to completion of the second proposed monitoring well (WC-5) within the grassy area adjacent to Canton Street near the northern corner of the Site building, an existing well (B-6, which was apparently installed in December 1989) was discovered within the vicinity of proposed WC-5 and was in good condition; therefore, WC-5 was not installed.

Monitoring well construction details for monitoring well WC-4 are presented on the drilling logs included in Appendix C.

4.5 GROUNDWATER AND NAPL GAUGING

Numerous gauging events have been conducted at the Site between August 13, 2008 and June 30, 2009. Gauging was conducted using an oil/water interface probe, and each well was gauged to the highest point on the PVC riser within the well. A summary of each of the gauging events is provided below.

As previously described, W&C conducted a gauging event prior to implementation of RAM activities in August 2008 that included all nine of the monitoring wells that were present at the Property at that time. NAPL with an approximate thickness of 0.02 feet was observed within monitoring well MW-7, formerly located within the center of the courtyard. NAPL was also observed to be present within monitoring well MW-6, which was formerly located adjacent to the current location of WC-2 within the courtyard area. W&C was unable to estimate the measurable thickness of the NAPL in this well due to the high viscosity of the NAPL.

Since several of the monitoring wells that were formerly located in the courtyard area were destroyed in the process of the RAM excavation, three replacement monitoring wells (WC-1, WC-2, and WC-3) were installed in the courtyard area following RAM activities. These three courtyard wells were gauged a total of twelve times between November 10, 2008 and June 30, 2009 to document fluctuations in groundwater elevation and NAPL thickness. NAPL was not observed within WC-1 or WC-2 during any of these twelve gauging events. However, residual levels of NAPL were observed within WC-3 following excavation activities. NAPL was initially observed in WC-3 with an approximate thickness of 0.01 foot on November 10, 2008.

The remaining monitoring wells located outside of the courtyard area (WC-4, B-6, MW-4, AE-202, and AE-203) were each gauged prior to each groundwater sampling event. NAPL has not been observed in any monitoring wells following excavation activities other than WC-3.

Average depth to groundwater observed within the courtyard area following excavation activities is approximately 8 ft bgs. Depth to groundwater outside of the courtyard area ranges from 6.21 ft bgs at MW-4 (inside the fitness center) to 10.42 ft bgs at AE-202 (in grassy area adjacent to Canton Street and the eastern-most corner of the Site building). A summary of depth to groundwater measurements and NAPL measurements are presented in Table 2.

4.6 VACUUM EXTRACTION

Prior to each sampling event (generally the day before each groundwater sampling event), W&C contracted with Cyn to conduct vacuum extraction of the three courtyard monitoring wells to facilitate well development, purging of stagnant water within the water column, and removal of measurable NAPL within present in WC-3. During each "vac-out" event, each of the courtyard wells was pumped three separate times for approximately 20 to 30 minutes each, allowing for groundwater re-charge in between rounds. Monitoring well WC-4 (installed on June 29, 2009) and existing monitoring well B-6 (discovered on June 29, 2009) were also developed via vacuum extraction during the June 30, 2009 vac-out event. Waste manifests documenting proper disposal of the oil and water mixture generating during each vac-out event are provided in Appendix D. A summary of the total extracted amount during each vac-out event (cumulative among all wells) is provided on the following table:

Date	Total Amount Extracted (gallons)
11/10/2008	99
4/14/2009	105
5/14/2009	144
5/29/2009	142
6/15/2009	99
6/30/2009	316

4.7 GROUNDWATER SAMPLING

W&C collected groundwater samples during three separate groundwater sampling events conducted on November 12, 2008, April 15, 2009, and July 1, 2009. Monitoring wells WC-1, WC-2, WC-3, MW-4, AE-202, and AE-203 were sampled during each of the three sampling events, while WC-4 and B-6 were each only sampled during the July 2009 sampling event (following installation/discovery).

As previously described, W&C gauged each well prior to sampling using an oil/water interface probe. Additionally, vacuum extraction was conducted within the three courtyard wells prior to each of the sampling events, and within the two newly installed/discovered wells (WC-4 and B-6) prior to the June 2009 sampling event.

Immediately prior to sampling, each well was developed by purging approximately three well volumes using a peristaltic pump. A peristaltic pump was used to collect groundwater sampling via low flow/low stress sampling techniques in order to limit the evacuation rate and drawdown of each well. A groundwater sample was collected from each well into pre-preserved containers provided by the analytical laboratory, packed on ice, and submitted under chain-of-custody protocol to the applicable laboratory for analysis of EPH and VPH, both with target analytes. Groundwater samples collected in November 2008 were submitted to Resource Laboratories, Inc. (RL), while groundwater samples collected in April and July 2009 were submitted to Alpha.

Of the eight monitoring wells sampled between November 2008 and July 2009, only two contained detectable concentrations of analyzed constituents: WC-1 and WC-3. Only three constituents (C9-C10 aromatics, C11-C22 aromatics, and C19-C36 aliphatics) were detected in groundwater samples collected from WC-1, which is located along the southern portion of the courtyard. Groundwater samples collected from monitoring well WC-3 (located along the northern portion of the courtyard) exhibited the highest frequency of detection and the highest detectable concentrations of VPH and EPH constituents among the three Site monitoring wells. The following constituents were detected in groundwater samples collected from this monitoring location during at least one of the three groundwater monitoring events: C9-C10 aromatic hydrocarbons, C9-C12 aliphatic hydrocarbons, benzene, ethylbenzene, o- and m/p-xylenes, C11-C22 aromatic hydrocarbons, 2-methylnaphthalene, naphthalene, acenaphthene, and fluorene. VPH and EPH hydrocarbon fractions (C9-C10 aromatics, C9-C12 aliphatics, C11-C22 aromatics, and C19-C36 aliphatics) were those constituents that exhibited the highest detected concentrations in Site groundwater (180, 130, 213, and 210 micrograms per liter [ug/L], respectively). The remaining EPH and VPH constituents that were detected in groundwater exhibited much lower concentrations than hydrocarbon fractions.

Groundwater analytical results are summarized in Table 3. Laboratory analytical reports for each groundwater sampling event are presented in Appendix B.

4.8 SOIL GAS PROBE INSTALLATION AND SOIL GAS SAMPLING

On April 15, 2009, three permanent soil gas sampling points were installed at the Site, which were located adjacent to each of the three courtyard monitoring wells and within fifteen feet of the existing buildings (Figure 2). In general, the soil gas probes were installed in accordance with MassDEP's "Standard Operating Procedure for Indoor Air Contamination" (MassDEP 2007b) (Toolbox 3). The sampling points were installed by drilling through the asphalt pavement and advancing stainless steel sampling ports attached to Teflon tubing to approximately one foot above the water table (6.5 ft bgs for SG-1; 6 ft bgs for SG-2 and SG-3). The tubing was run through a rubber stopper inside a protective PVC sleeve which was cemented into the pavement and secured with a flush-mount road box. The tubing was purged and readings were collected using a PID. Thirty minute composite samples were then collected from each of the sampling locations using 2.7 L Summa© canisters equipped with low-flow regulators (< 10 ml/min air flow). Samples were submitted to Alpha for analysis for APH.

A summary of soil gas data collected at the Site on April 15, 2009 is presented in Table 4. The Laboratory analytical report for these air data is presented in Appendix B. As shown on Table 4, seven APH constituents were detected in one or more soil gas samples collected from the Site: benzene, C5-C8 aliphatics, C9-C10 aromatics, C9-C12 aliphatics, m&p- and o-xylenes, and toluene. For all constituents except C9-C12 aliphatics, the highest detected concentrations were observed in the soil gas sample collected from SG-1, which is located adjacent to monitoring well WC-3 (within the northern corner of the courtyard area and where residual NAPL remains). For C9-C12 aliphatics, the highest concentration was found in the soil gas sample collected from SG-2, which is located adjacent to monitoring well WC-1. Soil gas concentrations were compared to MassDEP soil gas screening levels for evaluating indoor air impacts (MassDEP 2002b). As shown on Table 4, all detected constituent concentrations in soil gas were below their respective MassDEP soil gas screening levels, thereby indicating that vapor intrusion impacts to the Site building are unlikely.

4.9 INDOOR SAMPLING

On June 30, 2009, W&C collected an indoor air sample from the on-Site day care facility to evaluate the potential for vapor intrusion from the subsurface to indoor air. The indoor air sample was collected over a twelve-hour period using a 6L Summa© canister equipped with a low-flow regulator (< 10 ml/min air flow). The air sample was submitted to Alpha Woods Hole Labs (Alpha Woods Hole) for analysis of EPA Method TO-15 (Modified) and to Alpha for analysis of APH. Modification of the TO-15 analysis is an expansion of the target analyte list for more than 80 volatile paraffin, isoparaffin, aromatic, naphthene, and olefin (collectively known as "PIANO") compounds and was requested in support of forensic paneling of the indoor air and ambient air samples, as further described in Section 4.12.

Three APH constituents were detected in the indoor air sample collected in June 2009: toluene, C5-C8 aliphatics, and C9-C12 aliphatics. Of these, C9-C12 aliphatics were detected with the highest concentration (499 microgams per cubic meter [ug/m^3]). Given that concentrations of this constituent in soil gas samples (which were collected from the subsurface, within closer proximity both laterally and vertically to the Site and residual NAPL in WC-3) were lower than that observed within IA-101 and because the measured concentrations of constituents in indoor air (particularly that measured for C9-C12 aliphatics) did not correlate with the results of the petroleum paneling conducted for the NAPL sample (which, if present, would be the suspected source of indoor air contamination as a result of the Site release), background interferences were suspected.

Accordingly, a Site walk through was conducted and building occupants were interviewed to collect information that might reveal an alternate contributing source of petroleum hydrocarbons to indoor air. During the walk through, it was discovered that the filter within the furnace servicing the central air conditioning system was clogged and had not been changed in well over a year. Furthermore, it was discovered that the central air conditioning was inappropriately configured (i.e., it was configured to recirculate the air within the day care, rather than draw on an outdoor source of fresh air). It was also discovered that cleaning crews were allowed to smoke cigarettes while servicing the Site building each night. Appropriate modifications were subsequently made to the central air conditioning and additional indoor air sampling was conducted on August 6, 2009, including the collection of one indoor air sample from the fitness center in the C-Building (IA-102); one within the day care facility within the same vicinity as IA-101 (IA-103); one within the crawl space beneath the day care (IA-104); and, one within the lobby area of the F-Building (IA-105). All four indoor air samples collected in August 2009 were submitted to Alpha for laboratory analysis of APH. A summary of APH indoor air analytical data is presented on Table 5. Analytical laboratory reports for indoor air data (for both APH and TO-15 analysis) are provided in Appendix B.

Analytical results for the August 2009 indoor air sampling event indicate that concentrations of petroleum hydrocarbons dropped significantly between the two sampling rounds, thereby confirming that background interference contributed to the concentrations of petroleum hydrocarbons observed in the June 2009 sampling round.

Therefore, the indoor air sample collected in June 2009 (IA-101) is considered to be unrepresentative of Site conditions.

Toluene, C5-C8 aliphatics, and C9-C12 aliphatics were again, the only three constituents detected in indoor air during the August 2009 sampling round. The maximum detected concentration of each constituent was found in the sample collected from the fitness center (IA-102). A comparison of indoor air data to Residential Typical Indoor Air Concentrations (MassDEP 2008a) indicates that, with the exception of data obtained from IA-102, the maximum detected concentrations of C5-C8 and C9-C12 aliphatics are below the 75th percentile value for typical indoor air concentrations within a residence, while the maximum detected concentration of toluene is below the 50th percentile concentration for the August 2009 indoor air samples. It was concluded that the elevated concentrations found within IA-102 are likely attributed to background conditions associated with building construction itself (and/or the operations conducted within) rather than being a result of the former release. The logic behind this is that no VOCs or VPH have ever been detected in soil or groundwater samples collected within this location (MW-4 and AE-101), as previously described, and no NAPL has been documented at MW-4 since its installation in 1998. Additionally, concentrations of volatile constituents in soil gas collected outside of the fitness center indicate that soil gas concentrations are below MassDEP screening levels that are likely to result in indoor air impacts. Regardless, the fitness center was conservatively included in the Disposal Site Boundary and the data points obtained from within the fitness center (soil, groundwater, and indoor air) were retained for use in the risk characterization (presented in Appendix E).

Results of TO-15 analysis are discussed in Section 4.12. The TO-15 indoor air data were not used in the risk characterization but represent an additional line of evidence in the evaluation of the vapor intrusion pathway as described in Section 4.12.

4.10 AMBIENT AIR SAMPLING

Ambient air samples were collected concurrently with soil gas samples collected in April 2009 and the indoor air sample collected in June 2009. The ambient air sample collected in April 2009 (labeled as "Ambient") was collected from the center of the courtyard area, adjacent to the children's play ground, using a 2.7L canister. The ambient air sample collected in June 2009 (labeled as "AA-101") was collected from the northern most corner of the courtyard area, using a 6L canister. Both ambient air samples were submitted for laboratory analysis of APH. As shown on Table 6, no analyzed constituents were detected in ambient air in April 2009, while C5-C8 aliphatics was the only constituent detected in ambient air in August 2009. The laboratory analytical reports for ambient air samples are presented in Appendix B.

4.11 NAPL SAMPLING

Forensic profiling was conducted on a sample of oil collected from monitoring well WC-3 to evaluate if any volatile hydrocarbons measured in indoor air originate with residual NAPL at the Site. On June 30, 2009, W&C collected a NAPL sample from monitoring well WC-3 and submitted it to Alpha Woods Hole for laboratory analysis of EPA Methods 8015 (Modified) and 8260 (Modified). EPA Method 8015 provides a high resolution 'fingerprint' of the NAPL, from which product composition can be determined. EPA Method 8260 measures over 80 volatile chemicals found within the PIANO classes and provides a detailed compositional profile of volatile hydrocarbons that compose NAPL.

The compositional features of NAPL were determined using gas chromatography analysis of the oil sample collected from WC-3, as described in the data deliverable report prepared for W&C by New Fields Environmental (New Fields; 2009). Results of the NAPL forensic profiling indicate that the product was composed of a mixture of petroleum fuels consisting of approximately 80% C10-C25 hydrocarbons (consistent with the features of diesel/Fuel #2 oil) and approximately 20% C25-C40 hydrocarbons (consistent with the features of a heavy fuel oil). Results also indicate

that the NAPL is moderately weathered. The NAPL sample exhibited very low concentrations of volatile hydrocarbons and no benzene was found in the sample. In addition to determining the relative composition of the NAPL, New Fields also estimated what the vapor phase composition of each volatile hydrocarbon present in the NAPL would potentially be using Raoult's Law. This information was later compared to the indoor and ambient air composition, the results of which indicate that the chemistry of the NAPL vapor and that of indoor air are different and that NAPL is likely not the source of volatile hydrocarbons found in indoor air. Further description of NAPL forensic profiling, NAPL vapor, indoor air, and ambient air is provided in Section 4.12.

The laboratory analytical report for the NAPL sample is presented in Appendix B. The Newfields report is included in Appendix F.

4.12 PETROLEUM PANELING

As previously described in Section 4.11, W&C contracted with New Fields to conduct forensic profiling of NAPL, as well as indoor air and ambient air samples collected at the Site in June 2009, the results of which would be used to evaluate whether volatile hydrocarbons measured within indoor and/or ambient air are due to the presence of residual NAPL at the Site. Fingerprinting and compositional analysis of a NAPL sample from WC-3 was conducted and compositional analysis of one indoor air (IA-101) and one ambient air (AA-101) was conducted and reported out by New Fields (refer to Appendix F). Air samples were submitted to Alpha Woods Hole for analysis of EPA Method TO-15 (Modified). Modification of the TO-15 analysis is an expansion of the target analyte list for more than 80 volatile paraffin, isoparaffin, aromatic, naphthene, and olefin (collectively known as "PIANO") compounds, which is useful for compositional and source analysis.

Results of the TO-15 analysis indicate that concentrations of volatile hydrocarbons in indoor air as measured by TO-15 were relatively low; toluene was the constituent with the highest detected concentration 5.01 ug/m^3 in IA-101. Concentrations of other constituents were less than 5 ug/m^3. The hydrocarbon class composition of the volatile hydrocarbons present within IA-101 was found to be Paraffins (30%); Isoparaffins (27%); Aromatics (34%); Naphthenes (6%); and Olefins (2%). BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), dominated by toluene, made of 22% of the volatile organics measured in IA-101. Benzene was detected in indoor air at 0.766 ug/m^3.

Similarly, concentrations of volatile hydrocarbons in the ambient air sample AA-101 were low, with toluene being the highest detected constituent (1.02 ug/m^3). The hydrocarbon class composition of the volatile hydrocarbons present within AA-101 was found to be Paraffins (20%); Isoparaffins (34%); Aromatics (36%); Naphthenes (6%); and Olefins (4%). BTEX compounds, dominated by toluene, made of 26% of the volatile organics measured in AA-101. Benzene was detected in indoor air at 0.383 ug/m^3.

Results of the petroleum profiling of air and NAPL indicate that the volatile hydrocarbon chemical compositions between indoor air and NAPL vapor are significantly different. Most significantly, the indoor air contains 2% olefins (relatively unstable hydrocarbons in the environment) whereas the NAPL vapor contains no such olefin chemicals. Furthermore, the indoor air hydrocarbon composition and the outdoor air composition are much more similar in relative composition and both contain approximately the same proportions of PIANO compounds, including olefins.

Based on the results of the petroleum profiling, W&C asserts that the concentrations of volatile constituents (contained within both TO-15 and APH) measured in indoor air are not attributed to residual amounts of NAPL at the Site but are instead reflective of background conditions at the Site (i.e., building configuration, use of cleaning chemicals within the individual tenant spaces, smoking in the building, and/or ambient air). This argument is bolstered by the fact that lower concentrations of detected constituents were found in the indoor air sample collected from the crawl space beneath the day care facility than those collected from the floor above the crawl space.

Furthermore, results of the petroleum profiling indicate that ambient air could also be a source of volatile hydrocarbons observed within indoor air, as the indoor and ambient air samples analyzed in June 2009 were more compositionally similar to each other rather than either one resembling the NAPL profile and the ambient air sample collected in August 2009 exhibited detectable concentrations of C5-C8 aliphatic hydrocarbons.

4.13 SITE SURVEY

On July 17, 2009, W&C performed a survey of all eight existing monitoring wells at the Property (WC-1, WC-2, WC-3, WC-4, B-6, MW-4, AE-202, and AE-203) to document relative groundwater elevations and to determine groundwater flow direction. Elevations were surveyed relative to an arbitrary benchmark of 100.00 feet established on the 2 Canton Street property. Based on gauging data and information obtained from the Site survey, it was concluded that a distinct groundwater flow direction could not be calculated. Similarly, information contained in previous reports indicates an inconsistent groundwater flow direction; with some reports citing a southerly flow, while other cite south/southwesterly and southeasterly flow directions. It is likely that subsurface structures and/or the presence of underground utilities influence groundwater flow patterns underneath the Site. Based upon regional geography and the distribution of hydrocarbons released at the site, the groundwater flow is likely flowing towards the south/southwest across the Site.

5. SITE CONDITIONS

5.1 SITE GEOLOGY AND HYDROGEOLOGY

The following sections present an assessment of the topography, overburden soil and bedrock geology, and hydrogeologic conditions at the Site.

5.1.1 Topography and Surface Water

Based on information presented in the Phase II CSA (AE, 2005d), the ground surface of the Site ranges from approximately 216-226 feet above mean sea level. The topography of the Property is relatively flat, gently sloping downward from the northwest to the southeast.

The closest surface water to the Site is a small unnamed brook and associated wetland areas located approximately 3,000 feet to the southwest. Woods and Brittons Ponds and associated wetlands are situated further southwest of the Site. There are no wetlands within 500 feet of the Site.

5.1.2 Overburden and Bedrock Geology

Based on Site observations, overburden soils were observed to consist of sandy fill materials containing coal ash, cinders, brick, glass and slag from the ground surface to approximately 7 feet bgs, followed by a 1-2 foot thickness of brown peat. A dense lodgment till layer consisting of fine sand, silt, and clay was encountered within each excavation area at depths ranging from approximately 12-16 feet bgs. Soil beneath the confining layer generally consists of fine to medium sand. These soils and stratigraphy indicate a distal glaciofluvial or glaciolacustrine depositional environment for native soils, overlying lodgement till.

Bedrock outcrops are not present at the Site or on the 2 Canton Street property. Bedrock was not encountered during Site investigation; however, refusal was encountered at several locations during monitoring well installation within the courtyard area at an approximate depth of 13 ft bgs. According to the Bedrock Geologic Map of Massachusetts (Zen, 1983), the subject property is underlain by Dedham Granite of the Proterozoic Z era within the Milford-Dedham Zone (tertiary and older rocks), which consists of light grayish-pink to greenish-gray, equigranular to slightly porphyritic, variably altered, granite south and west of Boston.

5.1.3 Site Hydrogeology

Information obtained from previous Site investigations and field observations indicated that groundwater generally flows in a south/southwesterly direction across the Site and is encountered at depths of approximately 6 to 10 feet below ground surface. As previously mentioned in Section 4.13, evaluation of the recent groundwater elevation data from the groundwater monitoring wells located on the Property (WC-1, WC-2, WC-3, WC-4, MW-4, AE-202, AE-203 and B-6) indicates that current hydrogeologic conditions are variable, with likely influences from underground structures and/or utilities. As indicated in the Phase II CSA Report (AE, 2005d), groundwater velocity is estimated to be approximately 105 feet/year, based on a soil permeability for fine sand (fill) of 3.6 feet/day and a porosity of 30%.

5.2 NATURE AND EXTENT OF THE DISPOSAL SITE

5.2.1 Soil

The source of release is two leaking fuel oil USTs formerly located at the Site. Based on information obtained from previous site investigations and recent Site observations, the extent of petroleum impacted soil at the Site is

estimated to cover an area of approximately 5,200 square feet. The thickness of soil impacted by fuel oil over this area (prior to its excavation) is estimated to range between 7 foot and 13 feet. As described in Section 4.1, approximately 400 cubic yards of petroleum impacted soil were excavated and transported off-site during RAM and IRA activities conducted in August 2008.

Soil data obtained from 16 soil samples are available to characterize current Site conditions: five (5) confirmatory soil samples (Bottom, East Side Wall, South Side Wall, West Sidewall, and North Side Wall) collected from the main excavation area; four (4) confirmatory soil samples (UST-Bottom, UST-SW South, UST-SW North, and UST-SW West) collected from the UST excavation area; and seven soil samples (MW-1, AE-101 (6-8'), AE-101 (8-10'), AE-106, AE-108, AE-202, and AE-607) collected by previous consultants outside of the excavation area prior to excavation activities. All soil samples were submitted for analysis of VPH and EPH, both with target analytes. Additionally, AE-101 (8-10') was analyzed for volatile organic compounds, none of which were detected. It should also be noted that no VPH or EPH constituents were detected in the soil sample AE-101 (6-8'), and that no analyzed constituents were detected in soil sample AE-203.

EPH fractions were those constituents detected with the highest frequency and concentrations. EPH concentrations were highest within two soil samples collected prior to excavation activities and outside of the excavation area (MW-1 and AE-607, both of which are located along the southern portion of the Site). All three EPH fractions were detected in these two samples with concentrations ranging from 170 mg/kg of C9-C19 aliphatics in MW-1 to 652 mg/kg of C19-C36 aliphatics in AE-607. C11-C22 aromatic hydrocarbons and C19-C36 aliphatic hydrocarbons were also detected in all nine confirmatory soil samples, with the highest concentrations (749 and 476 mg/kg, respectively) observed within the soil sample collected from the bottom of the main excavation area. C9-C18 aliphatic hydrocarbons were detected in seven confirmatory soil samples, again with the highest concentration (505 mg/kg) found in the bottom of the main excavation. C11-C22 aromatics were detected in AE-202 and C19-C36 aliphatics were detected in AE-101 and AE-202, both of which were detected at much lower concentrations than the other soil samples.

A total of 15 PAHs were detected in soil, in both confirmatory samples and those collected outside of the excavation area. The locations of the highest concentrations of PAHs were scattered across the various samples, although PAHs were detected most frequently in soil samples AE-202, UST-Bottom, and UST-SW South. Of these, PAHs classified as carcinogenic (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene) were detected in only two confirmatory soil samples (UST-SW-South and UST-Bottom) and one sample located outside of the excavation area (AE-202). Concentrations of PAHs were relatively low relative to EPH fractions. Additionally, the maximum detected concentrations of several PAHs including anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]fluoranthene, benzo[k]fluoranthene, chrysene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene were below applicable MassDEP background values for natural soil, as shown on Table 2 of the Risk Characteriztion (provided in Appendix E).

A total of four VPH constituents were detected in Site soils: C5-C8 and C9-C12 aliphatics, C9-C10 aromatics, and m/p-xylenes. In general, VPH constituents were detected at lower concentrations relative to EPH fractions. 5-C8 aliphatics and m/p-xylenes were only detected one time at very low concentrations within AE-108 and MW-1, respectively. C9-C10 aromatics and C9-C12 were each detected in seven soil samples, the highest concentrations of which were found within MW-1 and the sample collected from the bottom of the main excavation area.

5.2.2 Groundwater

Groundwater data were collected during three separate sampling events conducted at the Property in November 2008, April 2009, and July 2009. A total of 20 groundwater samples were collected from the eight monitoring wells

sampled across the Property (WC-1 through WC-4, MW-4, B-6, AE-202, and AE-203) and were analyzed for VPH and EPH, both with target analytes. Only groundwater samples collected from WC-1 and WC-3 exhibited detected levels of certain analyzed constituents. No analyzed constituents were detected in groundwater samples collected from the other five monitoring wells located within the Site boundary (WC-2, WC-4, MW-4, B-6, and AE-202). No analyzed constituents were detected within monitoring well AE-203 during any of the three sampling events.

Only three constituents (C9-C10 aromatics, C11-C22 aromatics, and C19-C36 aliphatics) were detected in groundwater samples collected from WC-1, which is located along the southern portion of the Site. Groundwater samples collected from monitoring well WC-3 (located along the northern portion of the courtyard) exhibited the highest frequency of detection and the highest detectable concentrations of VPH and EPH constituents among the three Site monitoring wells. The following constituents were detected in groundwater samples collected from this monitoring location during at least one of the three monitoring events: C9-C10 aromatic hydrocarbons, C9-C12 aliphatic hydrocarbons, benzene, ethylbenzene, o- and m/p-xylenes, C11-C22 aromatic hydrocarbons, 2-methylnaphthalene, naphthalene, aceanaphthene, and fluorene. VPH and EPH hydrocarbon fractions (C9-C10 aromatics, C9-C12 aliphatics, C11-C22 aromatics, and C19-C36 aliphatics) were those constituents that exhibited the highest detected concentrations in Site groundwater (180, 130, 213, and 210 mg/L, respectively). The remaining EPH and VPH constituents that were detected in groundwater exhibited much lower concentrations than hydrocarbon fractions.

5.2.3 Indoor Air

Four indoor air samples were collected from the Site building in August 2009, which represent current indoor air conditions at the Site: IA-102 (collected from the fitness center), IA-103 (collected from the day care), IA-104 (collected from the crawl space beneath the day care), and IA-105 (collected from the lobby area of the F-Building). Although one indoor air sample (IA-101) was collected from the tenant space occupied by the day care facility in June 2009, this sample was concluded to be unrepresentative of current Site conditions, as described in Section 4.9, above. Therefore, W&C did not consider analytical data obtained from this indoor air sample for use in the risk characterization.

Indoor air samples were submitted for laboratory analysis of air phase hydrocarbons (APH) via MassDEP APH methodology. Only three constituents were detected in indoor air: C5-C8 aliphatic hydrocarbons, C9-C12 aliphatic hydrocarbons, and toluene. The maximum detected concentrations of C5-C8 aliphatics, C9-C12 aliphatics, and toluene (227, 98.8, and 14.6 ug/m^3, respectively) were all found in the indoor air sample collected from the fitness center (IA-102). These three constituents were also detected in the remaining three indoor air samples at slightly lower concentrations, especially for the sample collected from the crawl space beneath the day care facility (IA-104).

5.3 CONCEPTUAL SITE MODEL AND DISPOSAL SITE BOUNDARY

Petroleum impacts at the Site are the result of one (1) leaking 6,000-gallon fuel oil UST removed from the Site in 1989 and one (1) leaking 3,000-gallon fuel oil UST removed in 2008 as discussed in Sections 3.0 and 4.0. The UST releases resulted in petroleum impacts to sandy fill soils within the courtyard area of the Property at depths between approximately 8 and 13 ft bgs. Petroleum saturated soils were observed in several areas of the Site during excavation activities, particularly within the area of the 3,000-gallon fuel oil UST. In August 2008, the 3,000-gallon UST and approximately 400 cubic yards of petroleum-impacts soils were removed from the Site under a combined RAM and IRA. Soil excavation was guided by the visual presence of petroleum-impacted soils and/or headspace screening results. All observed grossly contaminated soils were excavated and removed off-site. The excavation area included the entire courtyard and was extended to within approximately ten lateral feet of the building footprint along the northern, western, and southern side of the courtyard. Soil excavation continued until no pooled or seeping NAPL was observed within subsurface soils or until excavation was impeded by the presence of surrounding

structures and/or the influx of groundwater into the excavation. Prior to backfilling this portion of the Site, it was noted that some residual NAPL remained along the northern wall within the northwestern corner of the main excavation area. However, the presence of the building impeded further excavation of soil within this area.

Results of confirmatory soil sampling following excavation activities indicate that concentrations of EPH and VPH in Site soils have decreased substantially as a result of soil excavation. Additionally, groundwater samples obtained during three separate sampling events indicate that Site groundwater has been minimally impacted by the release and confirmed that remedial activities were successful in removing the source (i.e., the leaking UST and petroleum-impacted soils). However, residual levels (approximately 0.01 feet) of measurable NAPL remain within the northwestern corner of the courtyard, in the vicinity where complete excavation of visually impacted soils could not be achieved due to the presence of the building. NAPL gauging conducted between November 2008 and June 2009 indicates that NAPL thickness within this well has achieved steady state and is not increasing. The NAPL thickness at this location has remained steady at 0.01 feet. Information gathered from the various gauging events conducted at the Site between November 2008 and June 2009 has also confirmed that the extent of the NAPL observed was limited in area. Therefore, it is concluded that although some residual NAPL remains, the majority of grossly impacted soils that constituted source material were removed and that NAPL thickness will decrease over time due to natural attenuation processes.

Soil data collected following excavation activities in August 2008, groundwater data collected in November 2008, April 2009, and July 2009, soil gas data collected in April 2009, and indoor air data collected in August 2009 were the data considered most representative of current Site conditions and were relied upon to define the Disposal Site boundary. Older soil data collected prior to excavation activities (in December 1997, September and October 2004 and January 2005) outside of the excavation area were also conservatively considered representative of current conditions. Based on the available Site data and observations made in the field, the Disposal Site extends from a portion of the C-Building, encompasses the entire courtyard area, includes the A- and F-Buildings, and continues to the edge of the Property along Canton Street. The Disposal Site boundary is depicted in Figure 2.

The defined boundary of the Disposal Site is considered to be very conservative, as several of the data points included within the Site exhibit no to very little impacts, such as the soil data included from AE-202 (located along the eastern corner of the Site, adjacent to Canton Street), as well as MW-4 and AE-101 (both located within the fitness center in the C-Building). Inclusion of a portion of the C-Building within the Site boundary is especially conservative since soil and groundwater data obtained from this area indicate very little impact and the indoor air sample (IA-102) collected from this tenant space is considered representative of background conditions, as discussed in Section 4.9. Additionally, groundwater samples collected from monitoring wells WC-4 and B-6 in July 2009 did not contain detectable concentrations of analyzed constituents; however, since these two locations were only sampled once and are located in close proximity to the Site buildings, they were conservatively included within the Disposal Site boundary. It should be noted that the monitoring location AE-203 (located just east of the courtyard entrance) was excluded from the Site boundary since soil and groundwater data collected from this location did not contain detectable concentrations of analyzed constituents.

The potential for adverse exposures resulting from the Site to future trespassers, current and future day care participants and facility workers, current utility workers, and future construction/utility workers are discussed in further detail in the Method 3 Risk Characterization included in Appendix E. This Risk Characterization indicates that a Condition of No Significant Risk has been achieved at the Site under current and certain future Site conditions and relied upon implementation of an AUL prohibiting future residential and institutional use of the Site. Additional response actions will not be required and a permanent solution has been achieved.

6. MCP REPRESENTATIVENESS EVALUATION AND DATA USABILITY ASSESSMENT

A comprehensive data quality review was performed to confirm that the appropriate Response Action Performance Standards (RAPs) have been achieved with respect to data quality and use in accordance with 310 CMR 40.0191(2)(c). The data quality review included both a Representativeness Evaluation and a Data Usability Assessment (REDUA) as summarized below. The data quality review was performed in consideration of MassDEP's Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Response Actions Conducted Under the MCP (WSC-CAM-VII A) (MassDEP 2004b), as well as MassDEP's MCP Representativeness Evaluations and Data Usability Assessments (REDUA) Policy (#WSC-07-350) (MassDEP 2007c).

As part of this process, quality assurance indicators were utilized in order evaluate sample collection and measurement error. These indicators have been examined in the context of the intended use of the data, and an overall assessment of the data for rendering a waste site cleanup opinion. The LSP opinion of data quality and usability was rendered relative to an evaluation of current understanding of the nature and extent of the release at the Disposal Site, and the potential migration of contaminants within the subsurface attributable to the Disposal Site.

Approximately 400 cubic yards of petroleum-impacted soils were excavated from the Site in August 2008. Confirmatory soil sampling was conducted following completion of RAM and IRA activities. Only soil data collected within the courtyard area following excavation activities and soil data collected outside of the excavation areas prior to remediation activities (i.e., are still present at the Site) were used in the Method 3 Risk Characterization. Additionally, data obtained from three rounds of groundwater sampling, one round of soil gas sampling, and two rounds of indoor air sampling are considered to be reflective of post-excavation conditions and were, therefore, used in the decision making process for the Method 3 RC and Class A-3 RAO. Therefore, older soil data collected from the excavation area and all groundwater data collected prior to remediation that were not used in the Method 3 Risk Characterization have also been excluded from the REDUA.

The REDUA focuses on data obtained from the following environmental samples:

- Two soil samples (AE-101 [6-8'] and AE-101 [8-10']) collected in September 2004;
- Two soil samples (AE-106 and AE-108) collected in October 2004;
- One soil sample (AE-202) collected in January 2005;
- One soil sample (AE-607) collected in September 2006;
- Nine confirmatory soil samples (Bottom, East Side Wall, West Side Wall, North Side Wall, South Side Wall, UST-SW West, UST-SW-North, UST-SW-South, UST-Bottom) collected in August 2008;
- Six groundwater samples (WC-1, WC-2, WC-3, MW-4, AE-202, and AE-203), one field duplicate groundwater sample (WC-101), and one trip blank sample collected in November 2008;
- Six groundwater samples (WC-1, WC-2, WC-3, MW-4, AE-202, and AE-203) and one trip blank sample collected in April 2009;
- Three soil gas samples (SG-1, SG-2, and SG-3) collected in April 2009;
- One ambient air sample (Ambient) collected in April 2009;
- One indoor air sample (IA-101) collected in June 2009;
- One ambient air sample (AA-101) collected in June 2009;
- Eight groundwater samples (WC-1, WC-2, WC-3, WC-4, MW-4, AE-202, AE-203, and B-6) collected in July 2009; and,
- Four indoor air samples (IA-102, IA-103, IA-104, and IA-105) collected in August 2009.

It should be noted that although data obtained from indoor air, ambient air, and NAPL samples collected from the Site in June 2009 and analyzed for EPA Methods TO-15 (Modified), EPH Method 8015 (Modified), and/or EPA Method 8260 (Modified) were used for project making decisions, the quality of these data were previously reviewed by New Fields (New Fields 2009), a discussion of which is provided in the New Fields report provided in Appendix F. According to the New Fields report, these data were found to be "accurate and traceable and met laboratory established method data quality objectives." Additionally, although data from one soil sample (MW-1) collected from the Site outside of the excavation area in September 2006 was used in the Class A-3 and Method 3 RC, analytical laboratory reports for soil sample MW-1 were unavailable; therefore these data were not included in the REDUA.

6.1 REPRESENTATIVENESS EVALUATION

The Representativeness Evaluation is an evaluation and demonstration of the adequacy of the spatial and temporal data sets used to support the decisions in this Class A-3 RAO, including the appended Method 3 risk characterization. Per MassDEP guidance (MassDEP 2007a), the elements of the Representativeness Evaluation are presented in the following sections.

6.1.1 Conceptual Site Model

A full discussion of the Conceptual Site Model is included in Section 5.3.

6.1.2 Use of Field Screening Data

Field screening in the form of headspace screening and visual observation was used to assist in evaluation of the presence and relative magnitude of petroleum hydrocarbons present in Site soils during Site investigation and remedial activities. The objective of soil excavation activities was to remove petroleum-impacted soils that were resulting in measurable NAPL thickness above the UCL criterion of ½-inch, as well as potentially acting as a continuing source of contamination to groundwater beneath the Site. During remedial activities, jar headspace screening for total organic vapors (TOVs) with a photoionization detector (PID) and visual identification of petroleum-containing soils (specifically pooled and/or seeping NAPL) were used to guide the excavation process in both vertical and lateral directions. Excavation of each area continued until soils no longer appeared visually impacted or until further excavation was impeded by the presence of surrounding structures and/or the influx of groundwater into the excavation. Headspace data was also used to assist in selection of samples for laboratory analysis and as a secondary indicator of the absence or presence of VOC impacts at a particular sample location.

Prior to back-filling each excavation area, the majority of impacted soil was removed (as feasible) and headspace screening was conducted to confirm the visual observations made during remediation activities. Headspace readings measured in the field ranged from 0 to 67.9 parts per million by volume (ppmV), indicating that relatively low concentrations of volatile petroleum hydrocarbons were present in post-excavation soils. Field screening results correlate well with subsequent post-remediation confirmatory and groundwater analytical results, which show relatively lower concentrations of petroleum hydrocarbons compared with pre-remediation results. Additionally, post-remediation monitoring shows that the excavation activities were relatively successful in eliminating the source of separate-phase NAPL at the Site. Only one location in the Site continues to have measurable NAPL (WC-3), however the measured thickness (0.01 feet) in this monitoring location is below the ½-inch UCL criteria.

6.1.3 Sampling Rationale

As discussed in Section 5.3, petroleum impacts at the Site are the result of two leaking fuel oil USTs that were formerly located at the Site. Soil and groundwater data collected prior to remedial activities indicate that concentrations of one or more EPH constituents in excess of Method 1 standards were formerly present at the Site.

Additionally, NAPL with a thickness greater than the ½-inch UCL criteria was observed at several locations at the Site. As such, soil excavation activities were conducted in August 2008 to remove impacted soil and groundwater at the Site. Following soil remediation, confirmatory soil samples were collected from the base and sidewalls of two excavation areas completed at the Site to confirm that remedial goals had been achieved. Additionally, groundwater, soil gas, ambient and indoor air sampling was conducted following excavation activities to document post-remediation conditions at the Site.

As described in Section 4.3, confirmatory soil samples were collected throughout the course of RAM and IRA activities prior to back filling each excavation area in with unimpacted material and clean fill. Numerous grab samples were composited into representative samples reflecting the bottom and sidewalls of the main excavation area conducted under the RAM, as well as the 3,000-gallon UST excavation area conducted under the IRA. Visual observations and jar headspace screening were used to aid in the selection of soil samples within the excavation areas. In general, soil samples were collected from the 5 to 13 foot depth interval, which coincides with the general depth of the petroleum impacted soil across the Site and the depth of the excavated 3,000-gallon fuel oil UST. Confirmatory soil samples were analyzed for VPH and EPH, both with target analytes. Given the size of the excavated areas (with a combined area of approximately 4,800 square feet) and the type of release (i.e., petroleum), the number, location, and analytical methods are appropriate to characterize current soil conditions at the Site.

Following remediation, three monitoring wells were installed at the Site to replace several wells that were destroyed during excavation activities. The monitoring wells were installed to an approximate depth of 13 to 19 ft bgs and were screened across the water table. Groundwater samples were collected from both on-Site wells and wells located on the Property but outside the Disposal Site boundary during three separate sampling events (November 2008, April 2009, and July 2009) to document post-excavation conditions. Groundwater samples were analyzed for VPH and EPH, both with target analytes. Given the location of the monitoring wells relative to the excavation areas and the former USTs that served as a source of release at the Site, the number, location, and analytical methods are adequate to characterize current groundwater conditions at the Site and across the 2 Canton Street property.

In April 2009, three permanent soil gas probes were installed at the Site and one soil gas sample was collected from each sampling point to evaluate if a complete vapor intrusion pathway from the subsurface to the indoor air of the overlying structure exists. Soil gas samples were collected in areas proximate to the three Site monitoring wells and within ten feet laterally of the Site building and were submitted for analysis of APH. Given the size of the Disposal Site relative to the Site buildings, the number and location of the soil gas samples are adequate to evaluate vapor conditions across the Site.

To further assess if vapor migration from the subsurface to indoor air within the building is occurring, indoor air samples were collected within the Site building from five different locations in June and August 2009. The locations of the indoor air samples were selected based on proximity to the release areas, as well as the current use within proximity of each sampling location (i.e., occupied office/retail space, day care, etc.). Given the configuration of the Site buildings (which consist of four interconnected structures) and the square footage of each area sampled, the number and location of indoor air sampling is appropriate to assess the potential for vapor intrusion within the building. Although the indoor air sampling was only conducted once during the warmer summer months (and therefore may not capture seasonal fluctuation), indoor air conditions within the Site building are not anticipated to change significantly between the summer and winter due to the nature of the heating and cooling systems within the buildings. The portion of the Site building where the majority of indoor air samples were collected is situated over a portion of the Disposal Site (and in close proximity to residual NAPL present within WC-3) is heated and cooled through the use of central air conditioning and is negatively pressurized. Therefore, the windows within this portion of the building remain closed year round, thereby reducing the amount of dilution that may occur. Ambient air sampling was also conducted in conjunction with the soil gas and indoor air sampling to rule out potential interference contributed by outside sources (i.e., vehicle exhaust, use of gasoline powered lawn mowers, etc.). All ambient and

indoor air samples were analyzed for APH. The ambient and indoor air samples collected in June 2009 was also analyzed for Modified TO-15 (which quantifies PIANO volatiles) in support of forensic paneling, as described in Section 4.12

6.1.4 Number, Spatial Distribution, and Handling of Samples

With respect to the spatial distribution, sample locations were selected based on the relative location of observed release areas. The number and location of samples were sufficient to define the nature and extent of OHM impacts in groundwater as discussed in Sections 4 and 5.

All samples were handled, stored, and transported in accordance with the requirements of the specific method requirements, according to lab reports and field notes.

6.1.5 Temporal Distribution of Samples

The petroleum impacts at the Site are attributed to two leaking USTs formerly located at the Site. Given that these USTs and the majority of impacted soils have been removed, it is likely that release conditions have been mitigated.

Multiple rounds of post-remediation groundwater sampling and NAPL monitoring were conducted to sufficiently define the nature and extent of petroleum contamination and to document trends in groundwater elevation and NAPL thickness. Although oil-saturated soils were formerly contributing to the occurrence of LNAPL above UCLs (W&C, 2008c), groundwater monitoring showed that the LNAPL was relatively immobile (W&C, 2008a) as evidenced by the relatively low concentrations of analyzed constituents within groundwater both before and after excavation. This observation, coupled with the fact that source area soils have been removed from the Site, residual NAPL at the Site is less than the UCL criteria, and that NAPL has not been observed within any other Site monitoring wells, suggest the analytical data presented in the appended Method 3 Risk Characterization are representative of current Site conditions.

Although available, groundwater data collected from the Site prior to excavation activities are no longer representative of current Site conditions and were therefore excluded from the Method 3 Risk Characterization, this Class A-3 RAO, and the REDUA.

Indoor air sampling was conducted in June and August 2009. Although seasonal fluctuation in indoor air conditions may not be adequately reflected through the results of the summer 2009 sampling, significant changes in indoor air conditions are not anticipated given that the portion of the Site building overlying the Disposal Site is heated and cooled via central air conditioning, thereby reducing the amount of dilution that may occur through ventilation.

6.1.6 Completeness

No data gaps have been identified to date. All collected samples were analyzed as planned and sampling locations are appropriately distributed across the Site. The results of field screening coupled with analytical data in support of this evaluation indicate that a continuing source of environmental contamination does not exist. Confirmatory soil sampling, multiple rounds of groundwater sampling, soil gas sampling, and indoor air sampling were all conducted following excavation activities to sufficiently define the nature and extent of contamination and to establish contaminant trends over time.

As previously mentioned in Section 6.1.3, indoor air samples were also collected to assess potential impacts from the Site to indoor air quality. Therefore, no data gaps were identified during the Representativeness Evaluation.

6.1.7 Inconsistency and Uncertainty

All of the contaminants detected in soil and groundwater at the Site are consistent with the release of fuel oil from the former 6,000-gallon and 3,000-gallon fuel oil USTs.

Soil data collected from the courtyard area and all groundwater data collected at the Site prior to the August 2008 remediation activates were excluded from the REDUA as these data are no longer considered representative of current Site conditions. Although exclusion of these data may contribute some uncertainty to the RAO, soil concentrations have dropped significantly since completion of soil excavation activities and it is likely that soil data adequately reflect current Site conditions. Additionally, groundwater data indicate that groundwater beneath the Site has been minimally impacted by the release. Therefore, it is likely that Disposal Site conditions are stable and/or decreasing over time. All data collected to date are consistent with the current Conceptual Site Model.

As previously mentioned in Section 4.9, constituent concentrations within the indoor air sample collected from the Site in June 2009 (IA-101) were more than double those observed in indoor air samples collected from the Site in August 2009. Additionally, information collected following collection of the June 2009 indicated that background interference likely attributed to the observed concentrations within the air sample. Therefore, IA-101 was concluded to be uncharacteristic of actual Site conditions and was therefore excluded from use in the risk characterization.

Additional indoor air samples were collected in August 2009 and were analyzed for APH and VOCs, which is judged appropriate based on the release history. As with all indoor air sampling, there is an inherent amount of uncertainty regarding the representativeness of the indoor air samples with regard to indoor air concentrations related to the Disposal Site versus background sources (e.g., occupant activities, building materials). Exclusion of the June 2009 indoor air data from the risk characterization adds some uncertainty to the assessment. However, given that suspected interferences were identified and corrected prior to the August 2009 indoor air sampling, it is likely that the June 2009 data are anomalous and that the August 2009 data are more representative of actual Site conditions.

6.1.8 Information Considered Unrepresentative

Information considered unrepresentative of Site conditions is discussed in Section 6.1.7 above.

6.2 DATA USABILITY ASSESSMENT

The purpose of the data usability assessment is to evaluate the quality of the dataset and to determine its usability in a representativeness evaluation. A data usability assessment includes a field component and an analytical component. The field component evaluates the sampling method, sample preservation, sample handling and holding times to establish compliance with the applicable methods and protocols and thereby confirm that the samples analyzed at the laboratory are representative of the sampling point. The analytical data usability assessment is used to evaluate whether the analytical data points are scientifically valid and defensible and of a sufficient level of precision, accuracy, and sensitivity to be used in the representativeness evaluation.

6.2.1 Analytical Data Usability Assessment

The Analytical Data Usability Assessment is intended to evaluate whether analytical data points are scientifically valid and defensible, and of a sufficient level of precision, accuracy, and sensitivity to:

- Delineate the Disposal Site boundary;
- Adequately characterize risk;
- Demonstrate elimination/control of uncontrolled sources;
- Demonstrate achievement of background, to the extent feasible; and,
- Demonstrate achievement of a condition of No Significant Risk at the Disposal Site.

An analytical data usability assessment was performed for all laboratory data collected for decision making for this Class A-3 RAO, with the exception of soil sample MW-1, for which laboratory analytical reports were not available. For the purposes of this REDUA, only data generally reflective of current Site conditions are included in the data usability assessment, including soil data collected outside of the excavation area in December 1997, September and October 2004, January 2005, February 2006, and confirmatory soil data collected within the excavation area in August 2008; groundwater data collected in November 2008, April 2009, and July 2009; soil gas data collected in April 2009; oil data collected in June 2009; and indoor air data collected in June and August 2009. Please note that although indoor air data collected from IA-101 in June 2009 are not considered representative of Site conditions, data from this sample was included in the analytical data usability assessment since it was used for project decision making.

6.2.1.1 Evaluation for CAM Compliant Data

The first step in the analytical data usability assessment was to review each data set to determine whether the data achieved Presumptive Certainty as defined in WSC-CAM-VII A. Data that meet Presumptive Certainty criteria are also referred to as "CAM Compliant" data. CAM Compliant means that an analytical result: (1) was determined using an MCP Analytical Method detailed in the CAM; (2) complies with the method-specific QC analytical requirements specified in the CAM; (3) includes an evaluation of the compliance with method-specific performance standards with deficiencies narrated, as necessary; and (4) was reported in the format specified in the CAM for MCP analytical data.

The report format specified in the CAM requires the analytical laboratory to provide an Analytical Report Certification for each set of samples submitted for analysis. The Certification requires the laboratory to answer the following questions:

A. Were all the samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set?

B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?

C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty," as described in Section 2.0 of the MassDEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?

D. Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?

E. Were all QC performance standards and recommendations for the specified analytical method(s) achieved?

F. Were results for all analyte-list compounds/elements for the specified method(s) reported?

An affirmative response to questions A, B, C & D and a response to questions E & F is required for Presumptive Certainty Status. Each of the Analytical Report Certifications was reviewed for compliance with the Presumptive Certainty requirements. This Class A-3 RAO includes CAM Compliant Data contained within the following analytical reports:

Soil:	Geo Labs, Inc. reports 115156-115157, 156086-156095, 160169-160172, and 602215; and Alpha Analytical Laboratories laboratory report L0812877; and
Groundwater:	Resource Laboratories, LLC report 15678 and Alpha Analytical Laboratory reports L0904740 and L0908955.

Analytical data for soil gas, indoor air, and ambient air samples are not included in CAM methods and are therefore considered "non-CAM" data. Additionally, the laboratory analytical report containing data for soil sample AE-607 did not meet CAM criteria as the case narrative was missing and therefore these data are considered CAM-Non compliant. Accordingly, air data and soil data for AE-607 are discussed separately from CAM Compliant Data in Section 6.2.1.2.

The remaining data are considered CAM Compliant and are discussed further below. Lab reports containing data collected by W&C are included in Appendix B. Soil data collected between September 2004 and February 2006 were previously submitted to MassDEP and, therefore, associated laboratory analytical reports for these data not presented herein. A summary of all the samples used in the Class A-3 RAO and included in the REDUA is presented on Table 8, which also presents specific information for each data package included in the REDUA, including whether or not qualifications were applied to the data.

Review of the Analytical Report Certifications for each lab deliverable indicated that with the exception of soil samples contained within Lab Report L0812877, each of the aforementioned data sets meet Presumptive Certainty Requirements. As indicated by a negative response to Question C, soil data for one soil sample ("South Side Wall") collected in August 2008 and contained within Lab Report L0812877 did not meet Presumptive Certainty requirements due to its submission for laboratory analysis of VPH without adequate methanol preservative. However, this deficiency was noted immediately following sample receipt at the laboratory and the soil sample was appropriately preserved for VPH analysis. Although some volatile analytes may have been lost between the time the sample was collected and when it was preserved at the laboratory, it was determined this potential low bias would not render the data as unusable. Additionally for VPH analysis, eight of the nine soil samples included within the lab packet did not meet the recommended methanol to soil due to insufficient soil in the vials. As a result, the detection limits would be relatively elevated; however, the sample results should be otherwise unbiased. In all cases, the methanol was completely covering the soil. To be conservative, all sample results are considered to be estimated; detected values in affected samples were qualified with a J and non-detected results were qualified with a UJ It should be noted that the VPH method requires additional methanol (up to 2 milliliters of methanol per gram of soil) in the case of highly organic matrices.

Questions A through D were answered affirmatively for all remaining data contained within the aforementioned lab reports. However, certain QC performance standards (Question E) were not met for some of these data sets, thereby requiring a review of the QC performance for individual samples or data sets to assess the usability of the data in question. Additionally, results for all analyte-list compounds for the specified methods were not reported (Question F). Therefore, the results of the analytical data usability assessment for affected data are summarized by data packet below.

August 2008 Soil Samples (Lab Report L0812877): For VPH analysis, the surrogate recoveries for the soil sample identified as "UST-SW South" were outside of acceptance criteria. However, re-analysis was not required since the sample was non-detect for all target analytes. Thus, no qualifications were applied to the data. For EPH analysis, the laboratory control sample (LCS)/LCS duplicate (LCSD) relative percent difference (RPD) associated with soil sample "West Side Wall" were above acceptance criteria for several constituents. However, the individual LCS/LCSD recoveries were within method limits. Thus, no qualifications were applied to the data.

November 2008 Groundwater Samples (Lab Report 15678): For VPH analysis, surrogate recoveries for groundwater sample identified as "WC-2" were below acceptance criteria due to matrix interference. Re-analysis showed similar results. As such, some volatile analytes may have been lost during analysis. However, no analytes were detected. All non-detected results were qualified as estimated ("UJ"). This finding was determined not to sufficiently bias any data points such that they would be rendered unusable.

April 2009 Groundwater Samples (Lab Report L0904740): VPH results for all samples within this data packet had LCSD recoveries below acceptance criteria for pentane. However, results for target carbon ranges and analytes were within method criteria and, therefore, no qualifiers were applied to the data.

July 2009 Groundwater Samples (Lab Report L0908955): For EPH analysis, LCS/LCSD RPD for all samples was above acceptance criteria for nonane. However, the individual LCS/LCSD recoveries are within method limits. Therefore, the data were accepted without qualification. No other QC issues were identified for this data packet.

6.2.1.2 Evaluation for CAM Non-Compliant, Non-CAM and Pre-CAM Data

All soil and groundwater data included within the REDUA are CAM Compliant with the exception of soil sample AE-607 for which the case narrative was missing from the lab report. Additionally, air data (i.e., soil gas, ambient air, and indoor air) and NAPL data are unable to achieve Presumptive Certainty as defined in MassDEP's REDUA policy (MassDEP 2007a). Instead, a traditional approach to assessment of precision, accuracy, and sensitivity was taken to evaluate these data. Each of these parameters is discussed below, with a summary of the selected assessment methods and measures. In summary, all air and NAPL data, and data collected from soil sample AE-607 were determined to be of acceptable precision, accuracy, and sensitivity that are useable for project discussions.

Non-CAM Data:

This RAO includes the following analytical reports for Non-CAM data:

Soil Gas: Alpha Analytical Laboratory report L0904776;

Indoor Air: Alpha Analytical Laboratory reports L0909849 and L0910717; and,

` Ambient Air: Alpha Analytical Laboratory reports L0904776 and L0909849;

Precision: Precision is a measure of mutual agreement among individual measurements, under prescribed conditions (i.e., random error). Precision may be evaluated qualitatively or quantitatively. Qualitative assessments of precision are based upon evaluations of larger data sets and will consider the range of concentrations encountered for a complete data set for a location or area. For this small air data set, precision was evaluated quantitatively.

Quantitatively, precision is generally expressed as the RPD between duplicate samples. Duplicates are two samples that are handled in an identical manner and the RPD of the measured results represents the precision (reproducibility) of the measurements. The laboratory performed duplicate analysis of select constituents for one air sample from each lab report (L0904776, L0909849, and L0910717). All constituents exhibited relatively low RPD results (i.e., <15%), indicating good precision with respect to the laboratory's preparation and/or analysis of samples.

Accuracy: Accuracy is the degree of agreement of a measurement with an accepted reference or true value. The difference between the measurement and the true value is usually expressed as a percentage or ratio. Accuracy is a measure of the bias that exists in a system. For the air dataset (including soil gas, indoor air and ambient air), the accuracy of the laboratory analytical procedures was measured through a review of laboratory control sample results (LCS; or blank spike). With one exception, the percent recoveries for each analyzed constituent within the lab control sample analysis were within the specified acceptable percent recovery limits (70-130%) for each laboratory report, indicating that no chemicals of interest were lost (resulting in a potential low bias in the data) or that chemical concentrations were not accurately quantitated (resulting in a potential high bias in the results). For EPH analyses contained within lab report L0904776 (for April 2009 soil gas samples), the LCS recovery for naphthalene was outside acceptance criteria. However, all associated results for naphthalene were non-detect and, therefore, data were accepted without qualification.

Sensitivity: Sensitivity is the ability of the method to detect the contaminant of concern at the concentration of interest, expressed as the Reporting Limit. Sensitivity was evaluated based on a review of the sample quantitation and reported quantitation limits. The review indicates the detection limits for each of the indoor samples were appropriately low (i.e., at or near 14 ug/m^3) for specified compounds.

Sensitivity was also evaluated based on a review of laboratory cross-contamination using method blank results. All constituents were non-detect within the method blank analyses provided within each applicable laboratory report.

CAM Non-Compliant Data:

Soil: GeoLabs, Inc. report 0602215

Quality control sheets from this laboratory report were unavailable; therefore, data usability of this sample was evaluated qualitatively based on a review of the analytical results from the lab report. Review of analytical data sheets for soil sample AE-607 indicate that surrogate recoveries were below acceptance criteria for 1-chlorooctadecane for analysis of EPH fractions. Therefore, all associated results for EPH fractions were qualified as estimated. Surrogates for the remaining analyzed constituents (i.e., PAHs) were within acceptable limits and were therefore accepted without qualification. Review of analytical data for this soil sample indicates that sufficiently low detection limits were achieved to support project making decisions. Based on the above, it was determined that data for this one sample are of sufficient quality to support the RAO.

6.2.1.3 Data Evaluation Criteria

For some soil samples, reporting limits for VPH and EPH analyses were elevated due to dilution. As a result, surrogate recoveries were not recovered for certain compounds within one soil sample (UST-SW-South). The elevated reporting limits are an unavoidable, but acceptable consequence enabling quantification of target analytes, which exceed the calibration range. A review of the affected samples indicates a sufficiently low detection limit was achieved to support decision making in the RAO.

6.2.2 Field Data Usability Assessment

A review of the applicable field quality control elements was performed for the samples collected by Woodard & Curran. Sample containers were packed on ice in coolers immediately after collection and labeling and were accompanied by complete chain-of-custody forms from the time of sample collection until laboratory delivery. All samples were received at the analytical laboratory on ice. Chemical preservation was appropriate for all samples. Contaminants were not detected in trip blanks.

Additionally, blind field duplicate samples were collected during two of the groundwater sampling events (November 2008 and April 2009) to evaluate field sampling procedures and analytical precision. Results of duplicate sampling indicate an acceptable level of precision as a result of both field sampling and laboratory procedures.

Based on the foregoing, Woodard and Curran concludes that field quality control requirements have been met and the samples analyzed are representative of the sample point location.

6.2.3 Rejection of Analytical Data as the Result of Gross Failure

No analytical data were rejected due to evidence of gross failure during any laboratory process.

6.3 CONCLUSIONS OF THE REDUA

All data used in support of this Class A-3 RAO Statement were reviewed to confirm that the appropriate Response Action Performance Standards (RAPS) have been achieved with respect to data quality and use in accordance with the MCP. This process included both a Representativeness Evaluation and Data Usability Assessment. Results of the data usability assessment indicate that all data generated in support of the Class A-3 RAO were of sufficient quality and of a sufficient level of precision, accuracy and completeness to support the RAO. Review of the data indicate that the soil, groundwater, indoor air, and surface water data meet the primary data quality objectives (DQOs) of the project, which were to provide data that would support decisions with respect to delineation of the disposal site boundaries, and the estimation of exposures point concentrations for various media at the Site and 2 Canton Street property. Additionally, results of the representative evaluation indicate that data collected at the Site are adequately representative of Disposal Site conditions and that the collected data are of comparable quality over the entire sampling period.

7. SUMMARY OF THE METHOD 3 RISK CHARACTERIZATION

A characterization of risk to human health, safety, public welfare, and the environment was completed for the Disposal Site located at 2 Canton Street in Stoughton, Massachusetts. This Method 3 Risk Characterization (Method 3 RC), included in full in Appendix E, has been prepared in support of this Class A-3 RAO Statement, in accordance with 310 CMR 40.1046(2). This risk characterization has been performed in accordance with procedures outlined in the Massachusetts Contingency Plan (MCP; 310 CMR 40.0900) and in a manner consistent with scientifically acceptable risk assessment practices established by MassDEP and United States Environmental Protection Agency (USEPA).

An Activity and Use Limitation (AUL) has been implemented for a portion of the Property containing the disposal site ("Portion of the Property") that restricts future uncontrolled residential or institutional use of the Site. For the purposes of this Method 3 RC, only those activities and uses of the Portion of the Property consistent with the AUL were evaluated. As previously described, an AUL is a legal instrument that defines certain land activities and uses that are consistent with maintaining a condition of No Significant Risk (NSR) at a disposal site. The specific permitted and prohibited uses associated with the proposed AUL are described in more detail in Section 1.3 of the Method 3 RC. In general, the AUL prohibits future use of the Site for residential or institutional purposes due to the presence of petroleum vapors within indoor air. A copy of implemented AUL is provided in Appendix G.

The results of the Method 3 RC indicate that a condition of NSR of harm to human health, public welfare, safety, and the environment has been achieved at the Site, assuming implementation of the aforementioned AUL, and that the Site is thus eligible for a Class A-3 RAO.

Soil, groundwater, and indoor air were each identified as a media of concern for the evaluation. Chemicals of potential concern (COPCs) identified in various media at the Site include petroleum hydrocarbons and related constituents (i.e., PAHs). Based on current and potential future use of Site, human health risks were quantified for the following scenarios:

- Trespasser: Although trespassers may currently access the Site Currently, there are no complete exposure pathways for trespassers under current Site conditions as Site soils are either paved or covered by the Site building(s). However, it was assumed that in the future, trespassers could come into contact with COPCs in surface (0-3 ft bgs) or subsurface soils (0-15 ft bgs) should currently covered soils be dislocated and brought to the surface. The trespasser receptor is assumed to be a youth, 6-19 years of age which captures the age range with the highest potential for exposure (younger children are assumed to be less likely present at the Site or present under adult supervision). Potential exposure pathways to soil COPCs include dermal contact with soil, incidental ingestion of soil, and inhalation of fugitive dust. The Property is connected to municipal water and it is therefore unlikely that a trespasser would come into direct contact with contaminated groundwater. Although visitors or customers may also be intermittently present at the Site, the trespasser scenario is assumed to be protective of other receptors that are anticipated to have a lower frequency or intensity of exposure to Site soils.
- Day Care Participant: A portion of the Site building is occupied by a children's day care facility. Therefore, child day care participants were evaluated for exposure to COPCs present in Site soil and indoor air. Under current Site conditions there are no complete exposure pathways for soil since Site soils are either covered by pavement or are located beneath the existing Site building. However, it was assumed that in the future, day care participants could come into contact with COPCs in surface (0-3 ft bgs) or subsurface soils (0-15 ft bgs), should currently covered soils be dislocated and brought to the surface. Potential exposure pathways to soil COPCs include dermal contact with soil, incidental ingestion of soil, and inhalation of fugitive dust. There is a potentially complete exposure pathway for indoor air under both current and future Site conditions and, therefore, current and future day care participants were evaluated for inhalation exposures to volatile

COPCs present in indoor air. The Property is connected to municipal water and it is therefore unlikely that a day care participant would come into direct contact with contaminated groundwater. To streamline the risk assessment, current and future exposures to indoor air and future exposure to Site soils were quantitatively evaluated in a combined current/future day care participant scenario. It should be noted that the risk characterization specifically evaluated day care workers who have a work shift of 11 hours per day (normal operating hours of the day care are 7am to 6pm). Since the length of a typical workday is usually 8 hours, estimated risks for the day care worker are assumed to be protective of other facility workers at the Site.

- Facility Worker: The Site is currently used for office and retail space, as well as for a day care facility, artist studios, and other commercial uses. Presently, all impacted soils are either covered by the existing buildings or by asphalt pavement. Therefore, under current conditions, the only complete exposure pathway for facility workers is the inhalation of COPCs that may be present within indoor air.

  In the future, it is possible that a facility worker may be exposed to COPCs in soil 0-15 ft bgs while installing or maintaining landscaping or while engaged in other outdoor activities involving direct contact with soil, assuming that soils may become exposed and displaced in the future. Potential routes of exposure may include dermal contact with and incidental ingestion of soil, and inhalation of fugitive dust. For convenience, a combined current/future facility worker scenario was assumed in which both soil and indoor air exposures were evaluated to reflect potential exposures under both current and future conditions. Routes of exposure evaluated for the current/future facility worker scenario include dermal contact with and incidental ingestion of soil, inhalation of fugitive dust, and inhalation of indoor air. The Property is connected to municipal water and it is therefore unlikely that a facility worker would come into direct contact with contaminated groundwater.

- Utility Worker: It was assumed that current utility workers may come into contact with impacted Site soils and groundwater or may inhale volatile COPCs that accumulate in ambient air of an excavation pit or trench during emergency repair or maintenance of existing utilities at the Site. Potential exposure pathways include dermal contact with and incidental ingestion of soils, inhalation and ingestion of fugitive dust, dermal contact with groundwater and inhalation of volatile COPCs in ambient air of an excavation pit or trench. Ingestion of groundwater was deemed unlikely to occur for this scenario; therefore, this exposure pathway was not evaluated for the utility worker scenario. The utility worker is assumed to be an adult over 18 years of age who may become exposed to impacted soils or groundwater across any portion of the Site.

- Construction Worker: It was assumed that future construction workers may come into contact with impacted Site soils and groundwater during future site redevelopment activities, or may inhale volatile COPCs that accumulate in ambient air of an excavation pit or trench. Potential exposure pathways therefore include dermal contact with and incidental ingestion of soils, inhalation and ingestion of fugitive dust, dermal contact with groundwater and inhalation of volatile COPCs in ambient air of an excavation pit or trench. As with the utility worker, it was assumed that ingestion of groundwater was unlikely to occur; therefore, this exposure pathway was not evaluated. The construction worker is assumed to be an adult over 18 years of age who may become exposed to impacted soils or groundwater across any portion of the Site.

The MCP indicates that a condition of No Significant Risk of harm to human health exists or has been achieved if:

- No Cumulative Receptor Cancer Risk is greater than a Cumulative Cancer Risk Limit of 1×10^{-5};
- No Cumulative Receptor Noncancer Risk is greater than a Cumulative Noncancer Risk Limit of 1.0; and,
- No EPC is greater than an applicable suitably analogous public health standard.

Cumulative receptor non-cancer risks were compared to one, the MCP Cumulative Non-cancer Risk Limit. The cumulative receptor cancer risks were compared to the MCP Cumulative Cancer Risk Limit, which is an ELCR equal

to one in one hundred thousand (1×10^{-5}). Human Health Risk Assessment calculations showed that cumulative cancer and non-cancer risk estimates for the potential current and/or future receptors evaluated are below MCP risk limits. Therefore, a condition of No Significant Risk to human health exists for current and future conditions for all evaluated receptors, assuming implementation of the aforementioned AUL restricting future residential and institutional use of the Site.

Based on observations made and information collected during environmental investigations of the Disposal Site, conditions at the Disposal Site do not pose a threat of physical harm or bodily injury to people. Furthermore, W&C did not identify release-related conditions that may pose a risk to public safety. Therefore, a condition of No Significant Risk of harm to safety has been achieved at the Disposal Site.

There is no adverse impact to the surrounding community from the Site. A comparison of Site EPCs to MCP UCLs (310 CMR 40.0995(5)) indicates that EPCs for both soil and groundwater are below UCLs. Therefore, a condition of No Significant Risk of harm to Public Welfare has been achieved at the Site.

There are currently no complete exposure pathways on-site for terrestrial receptors, and groundwater concentrations of COPCs are unlikely to result in ecologically significant surface water concentrations in the nearby surface water bodies. Therefore, a condition of No Significant Risk of harm to the environment has been achieved at the Disposal Site under current and future conditions.

8. CLASS A-3 RAO STATEMENT

This section describes the RAO category and Disposal Site boundaries. It also provides a demonstration that sources are eliminated or controlled and a condition of No Significant Risk exists. A copy of the Class A-3 RAO Statement Transmittal Form (BWSC-104) was included in the eDEP online filing and is presented in Appendix A.

8.1 RAO CATEGORY AND DISPOSAL SITE BOUNDARIES

This RAO Statement applies to the entire disposal site located along a portion of the 2 Canton Street property, as shown on Figure 2. As documented herein, a Class A-3 RAO is applicable to the Site because: 1) a Permanent Solution has been achieved; 2) the level of OHM in the environment has not been reduced to background; 3) a Notice of Activity and Use Limitation has been implemented to maintain a condition of No Significant Risk; and 4) OHM at the disposal site do not exceed an applicable UCL in soil or groundwater. A copy of the AUL implemented for the Portion of the Property is provided in Appendix G.

The disposal site boundary defined for MassDEP RTN 4-00875 was delineated during various environmental investigations conducted at the Site, as previously described in Sections 3 through 5. The approximate horizontal extent of the disposal site is shown on Figure 2. Within this area, the Disposal Site is situated at depths ranging from 5 to 13 ft bgs. A confining till layer that bounds the bottom of the Site is present at an approximate depth of 12 to 16 ft bgs.

8.2 DEMONSTRATION OF NO SIGNIFICANT RISK

Based upon the findings of the Method 3 Risk Characterization (as summarized in Section 7 and presented in full in Appendix E), a condition of No Significant Risk of harm to human health, safety, public welfare, or the environment can be demonstrated for current property use and for future restricted property use after implementation of an AUL.

8.3 DEMONSTRATION THAT SOURCES ARE ELIMINATED OR CONTROLLED

To achieve a Class A RAO, all continuing sources of OHM which are resulting or likely to result in an increase in concentrations of OHM in an environmental medium must be eliminated or controlled. Release conditions at the Site are attributable to the former use and storage of fuel oil within two known USTs at the property. All known USTs have been removed from the Site, as well as approximately 400 cubic yards of petroleum-impacted soils that were acting as a continuing source of subsurface contamination. Therefore, the primary release sources have been eliminated.

The results of confirmatory soil sampling conducted following completion of excavation activities indicate that soil excavations were effective in reducing the overall contaminant mass relative to pre-remedial conditions. This observation coupled with the results of post-remedial groundwater monitoring and sampling indicate that petroleum-impacted soils are no longer serving as a continuing source of OHM to other environmental media. Furthermore, groundwater concentrations are not anticipated to increase overtime or with distance from the Site, due to the natural subsurface attenuation and dilution processes that occur with groundwater migration, the absence of a continuing source of OHM to groundwater following remediation.

8.4 FEASIBILITY OF APPROACHING BACKGROUND

Excavation activities completed at the Site under the RAM and IRA included the removal of approximately 400 cubic yards of petroleum-impacted soils from multiple excavation areas within the disposal site boundary. These response actions resulted in a condition of No Significant Risk at the Site and have achieved a Permanent Solution. Thus, the minimum performance standards for response actions outcomes have been met. However, the response actions did

not result in the achievement of background conditions at the Site. With limited exceptions, most compounds remaining at the Site (petroleum constituents), would not exist in the environment absent the Site, the background levels for most compounds are considered non-detect. Pursuant to the MCP, this evaluation considers the feasibility of performing response action to be beyond the benefits associated with achieving a Permanent Solution, in order to achieve or approach background for these compounds. Separate feasibility evaluations were conducted for soil and groundwater and are presented in the following sections.

8.4.1 Soil

W&C asserts that Site conditions support the conclusion that achieving or approaching background is not feasible. In accordance with MassDEP's policy "Conducting Feasibility Evaluations Under the MCP" (Policy #WSC-04-160, July 16, 2004) (MassDEP, 2004c), remedial actions to achieve or approach background may be considered categorically infeasible (i.e., the incremental cost of conducting remedial action would be substantial and almost always disproportionate to the incremental benefit of risk reduction) if any one of four conditions are met (MassDEP, 2004b). At this Site, soil conditions are consistent with two of the four the categorical infeasibility criteria of the policy. First, comparison of the seven COPCs in soil (refer to Table 2 in Appendix E) to the list of degradable compounds listed in the policy indicate that at least two COPCs (acenapthene and naphthalene) are listed as degradable (non-persistent). It is categorically infeasible to achieve or approach background for degradable compounds in soil. The remaining five soil COPCs (including petroleum hydrocarbon fractions that are assumed to consist of, in part or whole, No. 6 fuel oil) are either listed as persistent or can be conservatively treated as persistent. However, as stated in Section 9.3.3 of the Policy, for sites at which there are multiple (co-located) contaminants where it has been determined to be infeasible to achieve or approach background for any one of the co-located contaminants then it is unnecessary to evaluate the feasibility of achieving or approaching background for the remaining co-located contaminants.

Second, as stated in Section 9.3.2.1 of the Policy, it is considered infeasible to achieve or approach background when any portion of remedial work requires excavation under the foundation of a building or other permanent structure such that the integrity of the structure would be impaired. As previously stated, complete excavation of petroleum-impacted soils could not be conducted within the northwestern corner of the courtyard due to the presence of the Site building. This is the only area of the Site were residual NAPL remains. Therefore, it is categorically infeasible to achieve or approach background for petroleum impacted soils within this portion of the Site.

In summary, site conditions indicate that it is categorically infeasible to achieve or approach background for COPCs in Site soils. Therefore, it is unnecessary to conduct a Site-specific feasibility evaluation for Site soils as described in the policy.

8.4.2 Groundwater

Similarly, it is infeasible to achieve or approach background for degradable compounds in groundwater. At this Site, groundwater conditions are consistent with the categorical infeasibility criteria of the policy. Comparison of the 12 COPCs for Site groundwater (refer to Table 4 in Appendix E) to the list of degradable compounds listed in the policy indicate that six COPCs are classified as degradable (non-persistent). It is categorically infeasible to achieve or approach background for degradable compounds in groundwater. The remaining 6 COPCs are either listed as persistent or can be conservatively treated as persistent (including petroleum hydrocarbon fractions that are assumed to consist of, in part or whole, No. 6 fuel oil). Background in groundwater shall be considered approached for persistent compounds in areas classified as GW-1, GW-2, or GW-3 if the concentrations of each persistent compound at each Exposure Point are at or below ½ the applicable Method 1 groundwater standards as specified in 310 CMR 40.0900. As presented in the Method 3 Risk Characterization, the groundwater affected by these persistent compounds is classified as GW-2/GW-3 under both current and future site conditions. Comparison of the maximum detected concentration for each COPC in groundwater to established Method 1 GW-2 and/or GW-3

standards (as shown on Table 3) indicates that the maximum concentrations are below ½ of the applicable standards, and therefore background has been approached for persistent compounds in groundwater. As such, it is unnecessary to conduct a Site-specific feasibility evaluation for Site groundwater as described in the policy.

8.4.3 Cost-Benefit Analysis

W&C asserts that Site conditions (both soil and groundwater) support the conclusion that achieving or approaching background is not feasible, as described in Sections 8.4.1 and 8.4.2 above. Nevertheless, W&C also conservatively conducted a "Benefit-Cost Evaluation" for the Site to further document that it is infeasible to achieve or approach background.

As specified within Section 9.3.3.4 of MassDEP guidance (MassDEP, 2004c), "it shall be considered feasible to conduct remedial actions to achieve background conditions if the additional costs to remediate beyond a NSR condition are equal to or less than 20 percent of the cost to remediate to NSR." Several remedial activities have taken place to achieve NSR at the Site, including extensive excavation and off-site disposal of petroleum-impacted soil and groundwater in August 2008. The approximate total cost to remediate the Site to a condition of NSR is $150,000. This estimate, which is conservative, is exclusive of remedial activities conducted prior to August 2008. Additional remedial actions conducted prior to August 2008 would only add to the total cost. All accessible petroleum-impacted soils and groundwater were excavated during RAM and IRA activities in August 2008. Only soils located beneath a portion of the Site building and those soils located beneath the water table remain. It is estimated that an additional $50,000 would be required to further remove these inaccessible soils and/or impacted groundwater, including disposal costs as well as costs associated with significant dewatering that would be required to access soils below the water table. The estimated incremental costs to achieve or approach background, therefore, results in a cost estimate greater than 20 percent of the cost to achieve NSR. Therefore, under 310 MCR 40.0860(5)(b), the likely costs of conducting further remediation are not justified by the foreseeable benefits of that cleanup effort and, therefore, a remedial action that would achieve or approach background is not feasible or practical.

8.5 RELATIONSHIP TO OTHER RESPONSE ACTION OUTCOMES

To date, three RTNs (4-00875, 4-18753, and 4-21470) have been assigned to release conditions occurring on the 2 Canton Street property. Descriptions of the release conditions and response actions completed are summarized in Sections 3.0 and 4.0 of this report.

This Class A-3 RAO Statement will complete response action requirements for RTN 4-00875. Since the remaining two RTNs (4-18753 and 4-21470) were linked to the Site's primary RTN 4-00875, RAO Statements are not required for these secondary RTNs. In addition, the IRA activities conducted in response to the release conditions associated with these two additional RTNs have been completed as documented in the IRA Completion Statements submitted on September 7, 2006 (for RTN 4-18753) and October 29, 2008 (for RTN 4-21470), so no further response actions are necessary on any portion of the disposal site to maintain a condition of No Significant Risk.

8.6 POST-CLOSURE OPERATION, MAINTENANCE, OR MONITORING

No operation, maintenance, or monitoring will be required to confirm or maintain those conditions at the Site upon which this RAO Statement is based. A Permanent Solution has been achieved for the Site under the criteria for a Class A-3 RAO Statement.

8.7 DEMONSTRATION OF A PERMANENT SOLUTION

A Permanent Solution, as defined in 310 CMR 40.0006, has been achieved for the Disposal Site located at 2 Canton Street, Stoughton, Massachusetts under the criteria for a Class A-3 RAO. The Class A-3 RAO is contingent on the maintenance of an Activity and Use Limitation for the Portion of the Property containing the Disposal Site, the details of which are presented in Appendix G.

8.8 LICENSED SITE PROFESSIONAL OPINION

It is the opinion of the Licensed Site Professional (LSP) of record, John A. Thompson, LSP (#3989), that based on the results from the environmental investigations performed and the findings of the Method 3 Risk Characterization, a Class A-3 RAO, as defined in 310 CMR 40.1046(2), applies to the disposal site located at 2 Canton Street, Stoughton, Massachusetts.

9. CONCLUSIONS

The Response Action Outcome (RAO) Statement presents the rationale for a Class A-3 RAO Statement for the disposal site assigned RTN 4-00875 and at 2 Canton Street, Stoughton, Massachusetts. The Site consists of land impacted by petroleum hydrocarbons and related constituents as a result of two leaking fuel oil underground storage tanks (USTs) that were formerly located at the Site. Petroleum-saturated soils resulting from the two leaking fuel oil USTs were acting as a continuing source of soil and groundwater contamination at the Site. In August 2008, approximately 400 cubic yards of petroleum-impacted soils in August 2008 under Release Abatement Measure (RAM) activities. Additionally, an unknown 3,000-gallon fuel oil UST that was discovered during RAM activities was also removed in August 2008 under Immediate Response Action (IRA) activities. Removal of the UST and petroleum-impacted soils from the Site has resulted in significantly reduced concentrations of petroleum hydrocarbons within soil and groundwater at the Site. While residual levels of petroleum hydrocarbons remain in soil, and to a lesser extent groundwater, LNAPL has not been measured at a thickness greater than the ½-inch Upper Concentration Limit (UCL) during post-remediation monitoring thereby indicating that the remedial goal has been met.

Results of a site-specific Method 3 Risk Characterization indicate that a condition of No Significant Risk to human, health, safety, public welfare, and the environment exists for current uses at the Site. However, to ensure that a level of No Significant Risk remains in place for future Site uses, a Notice of Activity and Use Limitation (AUL) has been implemented that ensures future Site use is consistent with the assumptions and restrictions of the Method 3 Risk Characterization.

The filing of a Class A-3 RAO Statement indicates that: 1) a Permanent Solution has been achieved; 2) the level of oil and/or hazardous material (OHM) in the environment has not been reduced to background; 3) a Notice of AUL is being implemented to maintain a level of No Significant Risk; and 4) OHM at the Site do no exceed an Upper Concentration Limit in soil or groundwater.

10. REFERENCES

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TABLES

TABLE 1
SUMMARY OF SOIL ANALTYICAL RESULTS

2 Canton Street
Stoughton, Massachusetts

Constituent	Sample ID:	MW-1[1]		AE-101		AE-101[2]		AE-106		AE-108		AE-202		AE-607		Bottom		East Side Wall		West Side Wall	
	Sample Date:	12/30/1997		9/10/2004		9/10/2004		10/4/2004		10/4/2004		1/11/2005		2/11/2006		8/29/2008		8/29/2008		8/29/2008	
	Sample Depth:	9-11 ft bgs		6-8 ft bgs		8-10 ft bgs		10-12 ft bgs		10-11 ft bgs		10-12 ft bgs		8-10 ft bgs		10-13 ft bgs		5-9 ft bgs		5-9 ft bgs	
	CAS Number	(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)	
Volatile Petroleum Hydrocarbons (VPH)																					
Benzene	71-43-2	0.270	U	--		0.50	U	0.5	U	0.5	U	--		--		0.968	U	0.249	U	0.246	U
C5-C8 Aliphatics	NA c5-8	100	U	--		1.50	U	1.5	U	**16.4**		--		--		24.2	U	6.23	U	6.15	U
C9-C10 Aromatics	NA c9-10	**870**		--		0.50	U	**1.47**		**28.5**		--		--		**176**	J	**16.9**	J	6.15	U
C9-C12 Aliphatics	NA c9-12	**120**		--		0.50	U	**21.1**		**86.5**		--		--		**165**	J	**16.7**	J	6.15	U
Ethylbenzene	100-41-4	0.270	U	--		0.50	U	0.5	U	0.5	U	--		--		0.968	U	0.249	U	0.246	U
Methyl tert-butyl ether	1634-04-4	0.0540	U	--		0.25	U	0.5	U	0.5	U	--		--		0.484	U	0.125	U	0.123	U
o-Xylene	95-47-6	0.270		--		0.50	U	0.5	U	0.5	U	--		--		0.968	U	0.249	U	0.246	U
p/m-Xylene	106-42-3/108-38-3	**0.8**		--		0.50	U	0.5	U	0.5	U	--		--		0.968	U	0.249	U	0.246	U
Toluene	108-88-3	0.270	U	--		0.50	U	0.5	U	0.5	U	--		--		0.968	U	0.249	U	0.246	U
Extractable Petroleum Hydrocarbons (EPH)																					
2-Methylnaphthalene	91-57-6	**1.6**		0.050	U	--		--		--		0.050	U	**2.07**		**1.72**	J	0.347	U	0.351	U
Acenaphthene	83-32-9	0.560	U	0.100	U	--		--		--		0.100	U	0.118	U	**1.41**	J	0.347	U	0.351	U
Acenaphthylene	208-96-8	0.560	U	0.050	U	--		--		--		0.050	U	0.0588	U	0.383	U	0.347	U	0.351	U
Anthracene	120-12-7	0.560	U	0.050	U	--		--		--		0.050	U	**0.744**		**0.401**	J	0.347	U	0.351	U
Benzo(a)anthracene	56-55-3	0.560	U	0.100	U	--		--		--		**0.236**		0.118	U	0.383	U	0.347	U	0.351	U
Benzo(a)pyrene	50-32-8	0.560	U	0.100	U	--		--		--		**0.241**		0.118	U	0.383	U	0.347	U	0.351	U
Benzo(b)fluoranthene	205-99-2	0.560	U	0.150	U	--		--		--		**0.330**		0.176	U	0.383	U	0.347	U	0.351	U
Benzo(ghi)perylene	191-24-2	0.560	U	0.100	U	--		--		--		**0.134**		0.118	U	0.383	U	0.347	U	0.351	U
Benzo(k)fluoranthene	207-08-9	0.560	U	0.100	U	--		--		--		**0.168**		0.118	U	0.383	U	0.347	U	0.351	U
C11-C22 Aromatics	NA c11-22	**460**		10.0	U	--		--		--		**7.91**		**647**	J	**749**	J	**48.6**	J	**19.1**	J
C19-C36 Aliphatics	NA c19-36	**180**		**12.3**		--		--		--		**11.6**		**652**	J	**476**	J	**35.7**	J	**17.1**	J
C9-C18 Aliphatics	NA c9-18	**170**		10.0	U	--		--		--		10.0	U	**507**	J	**505**	J	**32.6**	J	7.02	U
Chrysene	218-01-9	0.560	U	0.100	U	--		--		--		**0.305**		0.118	U	0.383	U	0.347	U	0.351	U
Dibenzo(a,h)anthracene	53-70-3	0.560	U	0.100	U	--		--		--		0.100	U	0.118	U	0.383	U	0.347	U	0.351	U
Fluoranthene	206-44-0	0.560	U	0.200	U	--		--		--		**0.514**		0.235	U	0.383	U	0.347	U	0.351	U
Fluorene	86-73-7	**1.3**		0.025	U	--		--		--		0.025	U	0.0294	U	0.383	U	0.347	U	0.351	U
Indeno(1,2,3-cd)Pyrene	193-39-5	0.560	U	0.050	U	--		--		--		**0.132**		0.0588	U	0.383	U	0.347	U	0.351	U
Naphthalene[3]	91-20-3	0.560	U	0.050	U	--		--		**4.20**		0.050	U	0.0588	U	**6.49**	J	0.347	U	0.351	U
Phenanthrene	85-01-8	**2.6**		0.050	U	--		--		--		**0.280**		**2.45**		**1.4**	J	0.347	U	0.351	U
Pyrene	129-00-0	0.560	U	0.200	U	--		--		--		**0.450**		0.235	U	**0.44**	J	0.347	U	0.351	U

Notes:
Only soil data collected within the limits of the disposal site boundary are presented.
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
U = Not detected at presented laboratory reporting limit (LRL).
J = Estimated value.
"--" = Constituent not analyzed.
Bold font indicates that the constituent was detected above its LRL.
1. Data for this sample were transcribed from Tables 1 and 2 of the April 27, 2006 Immediate Response Action Status Report prepared by Avier Environmental, Inc.
2. This sample was also submitted for laboratory analysis of volatile organic compounds. However, since no a analyzed constituents were detected, the results are not presented.
3. The maximum detected concentration and the minimum LRL (for non-detects) between EPH and VPH analyses is presented.

TABLE 1
SUMMARY OF SOIL ANALTYICAL RESULTS

2 Canton Street
Stoughton, Massachusetts

Constituent	Sample ID:	North Side Wall		South Side Wall		UST-SW West		UST-SW North		UST-SW South		UST-Bottom	
	Sample Date:	8/29/2008		8/29/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	
	Sample Depth:	5-9 ft bgs		5-9 ft bgs		5-9 ft bgs		5-9 ft bgs		5-9 ft bgs		10-12 ft bgs	
	CAS Number	(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)	
Volatile Petroleum Hydrocarbons (VPH)													
Benzene	71-43-2	0.25	U	0.12	U	0.307	U	0.302	U	0.437	U	0.388	U
C5-C8 Aliphatics	NA c5-8	6.24	U	3	U	7.68	U	7.54	U	10.9	U	9.7	U
C9-C10 Aromatics	NA c9-10	**15**	J	3	U	7.68	U	7.54	U	10.9	U	**33.9**	J
C9-C12 Aliphatics	NA c9-12	**17.6**	J	3	U	7.68	U	7.54	U	10.9	U	**25.6**	J
Ethylbenzene	100-41-4	0.25	U	0.12	U	0.307	U	0.302	U	0.437	U	0.388	U
Methyl tert-butyl ether	1634-04-4	0.125	U	0.06	U	0.154	U	0.151	U	0.218	U	0.194	U
o-Xylene	95-47-6	0.25	U	0.12	U	0.307	U	0.302	U	0.437	U	0.388	U
p/m-Xylene	106-42-3/108-38-3	0.25	U	0.12	U	0.307	U	0.302	U	0.437	U	0.388	U
Toluene	108-88-3	0.25	U	0.12	U	0.307	U	0.302	U	0.437	U	0.388	U
Extractable Petroleum Hydrocarbons (EPH)													
2-Methylnaphthalene	91-57-6	**0.573**	J	0.355	U	0.347	U	0.347	U	0.351	U	**4.16**	J
Acenaphthene	83-32-9	**0.414**	J	0.355	U	0.347	U	0.347	U	0.351	U	**1.04**	J
Acenaphthylene	208-96-8	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Anthracene	120-12-7	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	**0.454**	J
Benzo(a)anthracene	56-55-3	0.355	U	0.355	U	0.347	U	0.347	U	**0.393**	J	0.427	U
Benzo(a)pyrene	50-32-8	0.355	U	0.355	U	0.347	U	0.347	U	**0.353**	J	0.427	U
Benzo(b)fluoranthene	205-99-2	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Benzo(ghi)perylene	191-24-2	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Benzo(k)fluoranthene	207-08-9	0.355	U	0.355	U	0.347	U	0.347	U	**0.492**	J	0.427	U
C11-C22 Aromatics	NA c11-22	**218**	J	**30**		**345**	J	**249**	J	**41.3**	J	**560**	J
C19-C36 Aliphatics	NA c19-36	**159**	J	**25.5**		**273**	J	**209**	J	**41.7**	J	**329**	J
C9-C18 Aliphatics	NA c9-18	**121**	J	**16.5**		**75**	J	**48.4**	J	7.02	U	**88.8**	J
Chrysene	218-01-9	0.355	U	0.355	U	**0.354**	J	0.347	U	**0.49**	J	0.427	U
Dibenzo(a,h)anthracene	53-70-3	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Fluoranthene	206-44-0	0.355	U	0.355	U	0.347	U	0.347	U	**0.987**	J	0.427	U
Fluorene	86-73-7	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Indeno(1,2,3-cd)Pyrene	193-39-5	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	0.427	U
Naphthalene[3]	91-20-3	0.355	U	0.355	U	0.347	U	0.347	U	0.351	U	**2.92**	J
Phenanthrene	85-01-8	**0.532**	J	0.355	U	**0.698**	J	0.347	U	**1.09**	J	**2.62**	J
Pyrene	129-00-0	0.355	U	0.355	U	**0.764**	J	**0.555**	J	**0.815**	J	**1.85**	J

Notes:
Only soil data collected within the limits of the disposal site boundar
ft bgs = Feet below ground surface.
mg/kg = Milligrams per kilogram.
U = Not detected at presented laboratory reporting limit (LRL).
J = Estimated value.
"--" = Constituent not analyzed.
Bold font indicates that the constituent was detected above its LRL.
1. Data for this sample were transcribed from Tables 1 and 2 of the April 27, 2006 Immediate Response Action Status Report prepared by Avier Environmental, Inc.
2. This sample was also submitted for laboratory analysis of volatile organic compounds. However, since no a analyzed constituents were detected, the results are not presented.
3. The maximum detected concentration and the minimum LRL (for non-detects) between EPH and VPH analyses is presented.

TABLE 2
SUMMARY OF GROUNDWATER AND NAPL GAUGING MEASUREMENTS

2 Canton Street
Stoughton, Massachusetts

Date	Measurement Parameter	MW-1	MW-4	MW-5	MW-6	MW-7	AE-201	AE-202	AE-203	AE-204	WC-1	WC-2	WC-3	WC-4	B-6
8/13/2008*	Depth to water	8.32	6.18	4.80	NM	8.26	7.33	10.35	10.25	8.36	NM	NM	NM	NM	NM
	Depth to product	--	--	--	NAPL	8.24	--	--	--	--	NM	NM	NM	NM	NM
	Total Thickness Product	--	--	--	NM	0.02	--	--	--	--	--	--	--	--	--
11/10/2008	Depth to water		NM					NM	NM		8.32	8.07	8.87	NM	NM
	Depth to product		NM					NM	NM		--	--	8.86	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
11/12/2008	Depth to water		6.56					11.65	10.55		8.74	8.20	9.21	NM	NM
	Depth to product		NM					NM	NM		--	--	--	NM	NM
	Total Thickness Product		--					--	--		--	--	--	--	--
4/14/2009	Depth to water		NM					NM	NM		7.61	7.11	8.35	NM	NM
	Depth to product		NM					NM	NM		--	--	8.34	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
4/15/2009	Depth to water		6.08					9.82	9.71		7.81	7.20	8.34	NM	NM
	Depth to product		--					--	--		--	--	8.33	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
4/28/2009	Depth to water		NM					NM	NM		7.87	7.31	8.41	NM	NM
	Depth to product		NM					NM	NM		sheen	sheen	8.40	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
5/7/2009	Depth to water		NM					NM	NM		7.25	7.38	8.38	NM	NM
	Depth to product		NM					NM	NM		sheen	NP	8.37	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
5/14/2009	Depth to water		NM					NM	NM		8.11	7.54	8.61	NM	NM
	Depth to product		NM					NM	NM		NP	NP	8.60	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
5/22/2009	Depth to water		NM					NM	NM		8.23	7.68	8.80	NM	NM
	Depth to product		NM					NM	NM		NP	NP	8.79	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
5/29/2009	Depth to water		NM					NM	NM		8.18	7.62	8.76	NM	NM
	Depth to product		NM					NM	NM		NP	NP	8.75	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
6/11/2009	Depth to water		NM					NM	NM		8.48	7.93	8.965	NM	NM
	Depth to product		NM					NM	NM		--	--	8.950	NM	NM
	Total Thickness Product		--					--	--		--	--	0.015	--	--
6/15/2009	Depth to water		NM					NM	NM		8.45	7.91	8.99	NM	NM
	Depth to product		NM					NM	NM		--	--	8.98	NM	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
6/30/2009	Depth to water		NM					NM	NM		7.89	7.30	8.93	6.92	NM
	Depth to product		NM					NM	NM		--	--	8.92	--	NM
	Total Thickness Product		--					--	--		--	--	0.01	--	--
7/1/2009	Depth to water		6.01					9.85	9.79		7.95	7.38	8.98	6.98	8.30
	Depth to product		--					--	--		--	--	8.970	--	NP
	Total Thickness Product		--					--	--		--	--	0.01	--	--
	Average Depth to Water:	8.32	6.21	4.80	NM	8.26	7.33	10.42	10.08	8.36	8.07	7.59	8.70	6.95	8.30
	Average Product Thickness:	--	--	--	NM	0.02	--	--	--	--	--	--	0.01	--	--

Notes:
* = Data represent pre-excavation conditions at the Site; not representative of current Site conditions.
NM = Not measured.
NAPL = Non-aqueous phase liquid (NAPL) present; could not estimate thickness due to the viscosity of the product.
"--" = NAPL not present; not applicable.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL DATA - POST-EXCAVATION CONDITIONS

2 Canton Street
Stoughton, Massachusetts

Constituent	Sample ID:	Method 1 Groundwater		WC-1			WC-2			WC-3		
	Sample Date:	Standards[1] (ug/L)		11/12/2008[1]	4/15/2009	7/1/2009	11/12/2008	4/15/2009	7/1/2009	11/12/2008	4/15/2009	7/1/2009
	CAS Number	GW-2	GW-3	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Volatile Petroleum Hydrocarbons (VPH)												
Benzene	71-43-2	2,000	10,000	1 U	2 U	2 U	1 UJ	2 U	2 U	**9**	2 U	**3.28**
C5-C8 Aliphatics	NA c5-8	3,000	50,000	100 U	50 U	50 U	100 UJ	50 U	50 U	100 U	50 U	50 U
C9-C10 Aromatics	NA c9-10	7,000	50,000	100 U	**73.7**	50 U	100 UJ	50 U	50 U	**180**	**150**	**158**
C9-C12 Aliphatics	NA c9-12	5,000	50,000	100 U	50 U	50 U	100 UJ	50 U	50 U	**130**	50 U	**68.5**
Ethylbenzene	100-41-4	20,000	5,000	2 U	2 U	2 U	2 UJ	2 U	2 U	**5**	**6.8**	**5.69**
Methyl tert butyl ether	1634-04-4	50,000	50,000	2 U	3 U	3 U	2 UJ	3 U	3 U	2 U	3 U	3 U
o-Xylene	95-47-6	9,000	5,000	2 U	2 U	2 U	2 UJ	2 U	2 U	**11**	**7.65**	**12**
p/m-Xylene	106-42-3/108-38-3	9,000	5,000	2 U	2 U	2 U	2 UJ	2 U	2 U	**16**	**7.92**	**13.2**
Toluene	108-88-3	50,000	40,000	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U
Extractable Petroleum Hydrocarbons (EPH)												
2-Methylnaphthalene	91-57-6	2,000	20,000	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	**6.9**	**21.7**	10.5 U
Acenaphthene	83-32-9	NA	6,000	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	**0.7**	10 U	10.5 U
Acenaphthylene	208-96-8	10,000	40	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Anthracene	120-12-7	NA	30	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Benzo(a)anthracene	56-55-3	NA	1,000	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Benzo(a)pyrene	50-32-8	NA	500	0.2 U	10.2 U	10.8 U	0.2 UJ	10.6 U	10.4 U	0.2 U	10 U	10.5 U
Benzo(b)fluoranthene	205-99-2	NA	400	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Benzo(ghi)perylene	191-24-2	NA	20	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Benzo(k)fluoranthene	207-08-9	NA	100	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
C11-C22 Aromatics	NA c11-22	50,000	5,000	200 U	**203**	108 U	200 UJ	106 U	104 U	200 U	**213**	**172**
C19-C36 Aliphatics	NA c19-36	NA	50,000	**210**	102 U	108 U	200 UJ	106 U	104 U	200 U	100 U	105 U
C9-C18 Aliphatics	NA c9-18	5,000	50,000	200 U	102 U	108 U	200 UJ	106 U	104 U	200 U	100 U	105 U
Chrysene	218-01-9	NA	70	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Dibenzo(a,h)anthracene	53-70-3	NA	40	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Fluoranthene	206-44-0	NA	200	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Fluorene	86-73-7	NA	40	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	**0.8**	10 U	10.5 U
Indeno(1,2,3-cd)Pyrene	193-39-5	NA	100	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Naphthalene[2]	91-20-3	1,000	20,000	0.5 U	10 U	10 U	0.5 UJ	10 U	10 U	**17**	**30.9**	**16.7**
Phenanthrene	85-01-8	NA	10,000	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U
Pyrene	129-00-0	NA	20	0.5 U	10.2 U	10.8 U	0.5 UJ	10.6 U	10.4 U	0.5 U	10 U	10.5 U

Notes:
Only data collected from monitoring wells within the Site boundary are presented.
ug/L = Micrograms per liter.
U = Not detected at the presented laboratory reporting limit (LRL).
J = Estimated value.
Bold font indicates that the constituent was detected above its LRL.
1. The maximum detected concentration and the minimum LRL
(for non-detects) among the primary and duplicate sample is presented.
2. The maximum detected concentration (for detects) and the minimum LRL
(for non-detects) between results from EPH and VPH analyses is presented.
3. Located outside of Disposal Site boundary.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL DATA - POST-EXCAVATION CONDITIONS

2 Canton Street
Stoughton, Massachusetts

Constituent	Sample ID:	MW-4[3]			AE-202[3]			WC-4[3]	B-6[3]
	Sample Date:	11/12/2008	4/15/2009	7/1/2009	11/12/2008	4/15/2009	7/1/2009	7/1/2009	7/1/2009
	CAS Number	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Volatile Petroleum Hydrocarbons (VPH)									
Benzene	71-43-2	1 U	2 U	2 U	1 U	2 U	2 U	2 U	2 U
C5-C8 Aliphatics	NA c5-8	100 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U
C9-C10 Aromatics	NA c9-10	100 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U
C9-C12 Aliphatics	NA c9-12	100 U	50 U	50 U	100 U	50 U	50 U	50 U	50 U
Ethylbenzene	100-41-4	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methyl tert butyl ether	1634-04-4	2 U	3 U	3 U	2 U	3 U	3 U	3 U	3 U
o-Xylene	95-47-6	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
p/m-Xylene	106-42-3/108-38-3	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Toluene	108-88-3	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Extractable Petroleum Hydrocarbons (EPH)									
2-Methylnaphthalene	91-57-6	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Acenaphthene	83-32-9	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Acenaphthylene	208-96-8	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Anthracene	120-12-7	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Benzo(a)anthracene	56-55-3	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Benzo(a)pyrene	50-32-8	0.2 U	10.5 U	10.3 U	0.2 U	11.2 U	11.2 U	10.5 U	10.3 U
Benzo(b)fluoranthene	205-99-2	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Benzo(ghi)perylene	191-24-2	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Benzo(k)fluoranthene	207-08-9	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
C11-C22 Aromatics	NA c11-22	200 U	105 U	103 U	200 U	112 U	112 U	105 U	103 U
C19-C36 Aliphatics	NA c19-36	200 U	105 U	103 U	200 U	112 U	112 U	105 U	103 U
C9-C18 Aliphatics	NA c9-18	200 U	105 U	103 U	200 U	112 U	112 U	105 U	103 U
Chrysene	218-01-9	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Dibenzo(a,h)anthracene	53-70-3	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Fluoranthene	206-44-0	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Fluorene	86-73-7	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Indeno(1,2,3-cd)Pyrene	193-39-5	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Naphthalene[2]	91-20-3	0.5 U	10 U	10 U	0.6 U	10 U	10 U	10 U	10 U
Phenanthrene	85-01-8	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U
Pyrene	129-00-0	0.5 U	10.5 U	10.3 U	0.6 U	11.2 U	11.2 U	10.5 U	10.3 U

Notes:
Only data collected from monitoring wells within the Site boundary are presented.
ug/L = Micrograms per liter.
U = Not detected at the presented laboratory reporting limit (LRL).
J = Estimated value.
Bold font indicates that the constituent was detected above its LRL.
1. The maximum detected concentration and the minimum LRL
(for non-detects) among the primary and duplicate sample is presented.
2. The maximum detected concentration (for detects) and the minimum LRL
(for non-detects) between results from EPH and VPH analyses is presented.
3. Located outside of Disposal Site boundary.

TABLE 4
SUMMARY OF SOIL GAS ANALYTICAL RESULTS

2 Canton Street
Stoughton, Massachusetts

Constituent	CAS No.	MassDEP Soil Gas Screening Levels for Evaluating Indoor Air Impacts [1]	SG-1	SG-2	SG-3	
			4/15/2009	4/15/2009	4/15/2009	
Air Petroleum Hydrocarbons (APH)						
Benzene	71-43-2	NA	3.54	2.39	2	U
C5-C8 Aliphatics	NA c5-8	111,000	290	231	168	
C9-C10 Aromatics	NA c9-10	104,000	59.3	29.7	18.0	
C9-C12 Aliphatics	NA c9-12	117,000	387	420	256	
m&p-Xylenes	108-38-3/106-42-3	94,000	7.43	4.19	4	U
o-Xylene	95-47-6	94,000	4.26	2.57	2	U
Toluene	108-88-3	36,000	6.73	2.75	2	U

Notes:
All concentrations are shown in units of micrograms per cubic meter (ug/m^3).
Only detected constituents are presented; only samples with at least one detection are presented.
U = Not detected at presented laboratory reporting limit (LRL).
1. Massachusetts Department of Environmental Protection (MassDEP) (2002). Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MassDEP VPH/EPH Approach, Final Policy, October 31. Table 4-10.
NA = Not available.

TABLE 5
SUMMARY OF INDOOR AIR ANALYTICAL RESULTS

2 Canton Street
Stoughton, Massachusetts

Constituent	CAS No.	IA-101 [1] (day care)	IA-102 [2] (fitness center)	IA-103 (day care)	IA-104 (crawl space)	IA-105 (lobby)
		6/30/2009	8/6/2009	8/6/2009	8/6/2009	8/6/2009
Air Petroleum Hydrocarbons (APH)						
Toluene	108-88-3	4.65	14.6	3.84	2.00 U	5.09
C5-C8 Aliphatics	NA c5-8	116	227	70.3	29.2	119
C9-C12 Aliphatics	NA c9-12	499	98.8	89.6	22.4	14.0 U

Notes:
All concentrations are shown in micrograms per cubic meter (ug/m^3).
Only detected constituents are presented.
"--" = Constituent not analyzed.
1. Not representative of current Site conditions; presented for comparison purposes only.
2. Sample not within Disposal Site boundary; presented for comparative purposes only.

TABLE 6
SUMMARY OF AMBIENT AIR ANALYTICAL RESULTS

2 Canton Street
Stoughton, Massachusetts

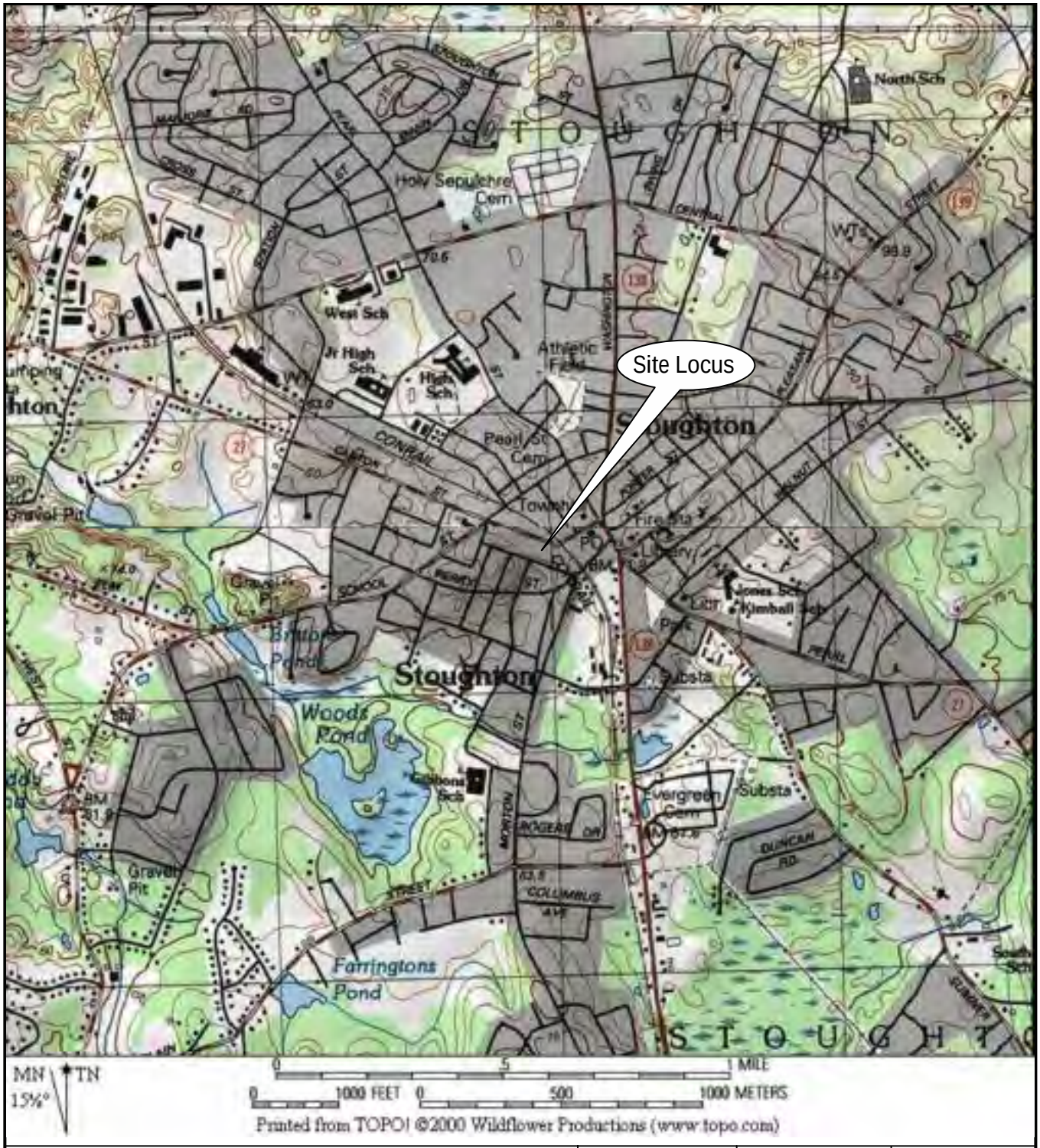
Constituent	CAS No.	Ambient		AA-101	
		4/15/2009		6/30/2009	
Air Petroleum Hydrocarbons (APH)					
1,3-Butadiene	106-99-0	2	U	2	U
Benzene	71-43-2	2	U	2	U
C5-C8 Aliphatics	NA c5-8	12	U	18.7	
C9-C10 Aromatics	NA c9-10	10	U	10	U
C9-C12 Aliphatics	NA c9-12	14	U	14	U
Ethylbenzene	100-41-4	2	U	2	U
m&p-Xylenes	108-38-3/106-42-3	4	U	4	U
Methyl tert butyl ether	1634-04-4	2	U	2	U
Naphthalene	91-20-3	2	U	2	U
o-Xylene	95-47-6	2	U	2	U
Toluene	108-88-3	2	U	2	U

Notes:
All concentrations are shown in units of micrograms per cubic meter (ug/m^3).
U = Not detected at presented laboratory reporting limit (LRL).

TABLE 7
SUMMARY OF SAMPLES INCLUDED IN THE DATA QUALITY ASSESSMENT
2 Canton Street
Stoughton, Massachusetts

Analtyical Laboratory	Laboratory Report	Sample Matrix	Sample ID	Sample Date	Sample Objective	Laboratory Analysis	CAM Compliant Data?	Presumptive Certainty		QC Issues
								Question E	Question F	
GeoLabs, Inc.	155156-155157	Soil	AE-101(6-8')	9/10/2004	Site characterization	EPH with targets	Yes	Yes	Yes	None
			AE-101(8-10')	9/10/2004	Site characterization	VPH with targets; VOCs	Yes	Yes	Yes	None
GeoLabs, Inc.	156086-156095	Soil	AE-106	10/4/2004	Site characterization	VPH with targets	Yes	Yes	Yes	None
			AE-108	10/4/2004	Site characterization	VPH with targets	Yes	Yes	Yes	None
GeoLabs, Inc.	160169-160172	Soil	AE-202	1/11/2005	Site characterization	EPH with targets	Yes	Yes	Yes	None
GeoLabs, Inc.	602215	Soil	AE-607	2/11/2006	Site characterization	EPH with targets	No	NA	NA	Surrogate recoveries below acceptance criteria - all results qualified as estimated (J).
Alpha Analytical	L0812877	Soil	Bottom	8/29/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	Question C answered in the negative for VPH in South Side Wall due to improper sampling technique; 1:1 methanol ratios not met for VPH for all but South Side Wall - all detected results are qualified as estimated (J), non-detects are accepted without qualification; elevated DLs for VPH due to dilution (elevated concentrations); VPH-surrogate recoveries for UST-SW South are above acceptance criteria (ND-re-analyses not required); EPH-LCS/LCSD RPDs for West Side Wall are above acceptance criteria (but fall within method limits)
			East Side Wall	8/29/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			West Side Wall	8/29/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			North Side Wall	8/29/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			South Side Wall	8/29/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			UST-SW West	8/26/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			UST-SW North	8/26/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			UST-SW South	8/26/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
			UST-Bottom	8/26/2008	Confirmatory sampling	EPH deluxe; VPH deluxe	Yes	No	Yes	
Resource Laboratories, LLC	15678	Groundwater	WC-1	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	VPH-Surrogate recoveries below acceptance criteria (matrix interference) for WC-2 (all samples results were non-detect and were qualified as estimated with a UJ) ; elevated DLs for VPH due to dilution
			WC-2	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			WC-3	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			MW-4	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-202	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-203	11/12/2008	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			WC-101	11/12/2008	Post-excavation condition review; duplicate for WC-1	EPH deluxe; VPH deluxe	Yes	No	Yes	
			Trip Blank	11/12/2008	Post-excavation condition review	VPH deluxe	Yes	No	Yes	
Alpha Analytical	L0904740	Groundwater	WC-1	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	VPH-LCSD recoveries for all samples were below acceptance criteria for pentane (but target carbon ranges and analytes within method criteria)
			WC-2	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			WC-3	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			MW-4	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-202	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-203	4/15/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			Trip Blank	4/15/2009	Post-excavation condition review	VPH deluxe	Yes	No	Yes	
Alpha Analytical	L0904776	Soil gas	SG-1	4/15/2009	Post-excavation condition review	APH	No	Yes	Yes	LCS recovery for naphthalene is outside acceptance limit (associated samples were non-detect and the results were therefore not qualified)
			SG-2	4/15/2009	Post-excavation condition review	APH	No	Yes	Yes	
			SG-3	4/15/2009	Post-excavation condition review	APH	No	Yes	Yes	
			Ambient	4/15/2009	Post-excavation condition review	APH	No	Yes	Yes	
Alpha Analytical	L0908955	Groundwater	WC-1	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	EPH-LCS/LCSD RPD for all samples is above the acceptance criteria (individual LCS/LCSD recoveries are within method limits)
			WC-2	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			WC-3	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			WC-4	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			MW-4	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-202	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			AE-203	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
			B-6	7/1/2009	Post-excavation condition review	EPH deluxe; VPH deluxe	Yes	No	Yes	
Alpha Analytical	L0909849	Indoor and Ambient Air	IA-101	6/30/2009	Post-excavation condition review	APH	No	Yes	Yes	None
			AA-101	6/30/2009	Post-excavation condition review	APH	No	Yes	Yes	
Alpha Analytical	L0910717	Indoor Air	IA-102	8/5/2009	Confirmatory sampling	APH	No	Yes	Yes	None
			IA-103	8/5/2009	Confirmatory sampling	APH	No	Yes	Yes	
			IA-104	8/5/2009	Confirmatory sampling	APH	No	Yes	Yes	
			IA-105	8/5/2009	Confirmatory sampling	APH	No	Yes	Yes	
Alpha Woods Hole Labs	ETR 0907004	Indoor and Ambient Air	IA-101	6/30/2009	Petroleum profiling	PIANO Volatiles	No	NA	NA	
			AA-101	6/30/2009	Petroleum profiling	PIANO Volatiles	No	NA	NA	
Alpha Woods Hole Labs	ETR 0907006	Oil	NAPL - WC-3	6/30/2009	Petroleum profiling	PIANO Volatiles	No	NA	NA	

FIGURES



Base Map Source:
TOPO!™ © 2000
Wildflower Productions

LAT: 42°07'27.45"
LONG: 71°06'17.21"

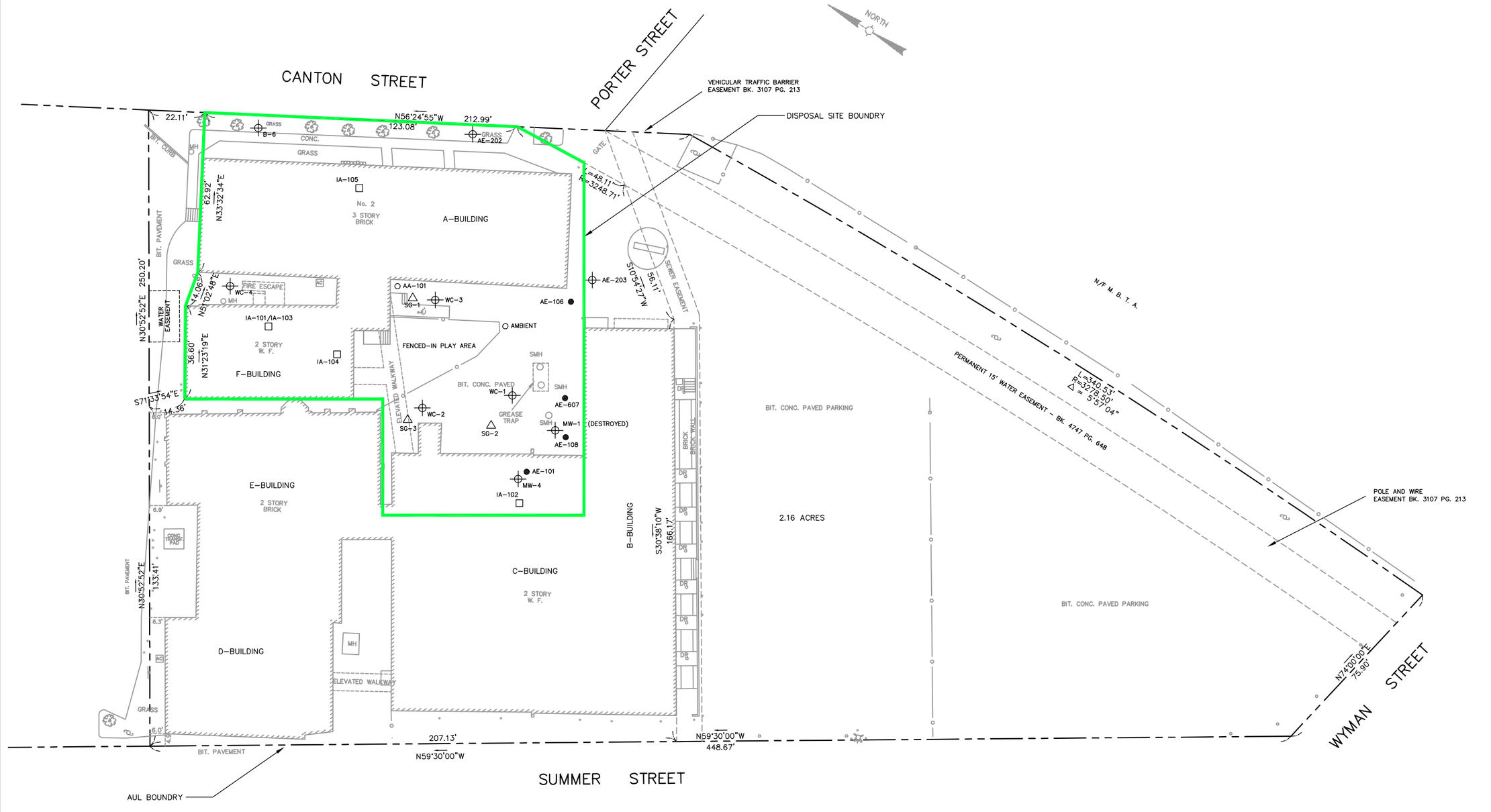
DES.BY:	DR.BY: MES	CK.BY: AE

2 Canton Street
Stoughton, MA 02072

FIGURE 1
SITE LOCUS

SCALE: AS SHOWN	JOB NO.: 221889.00
DATE: SEPTEMBER 2009	FILE NAME:

COMMITMENT & INTEGRITY
DRIVE RESULTS
980 Washington St, Suite 325
Dedham, MA 02026
T: 800.446.5518



LEGEND

- PROPERTY BOUNDRY
- DISPOSAL SITE BOUNDARY
- MONITORING WELL
- SOIL BORING
- SOIL GAS
- INDOOR AIR
- AMBIENT AIR

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

Dedham, Massachusetts 02026
800.446.5518 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

SITE PLAN

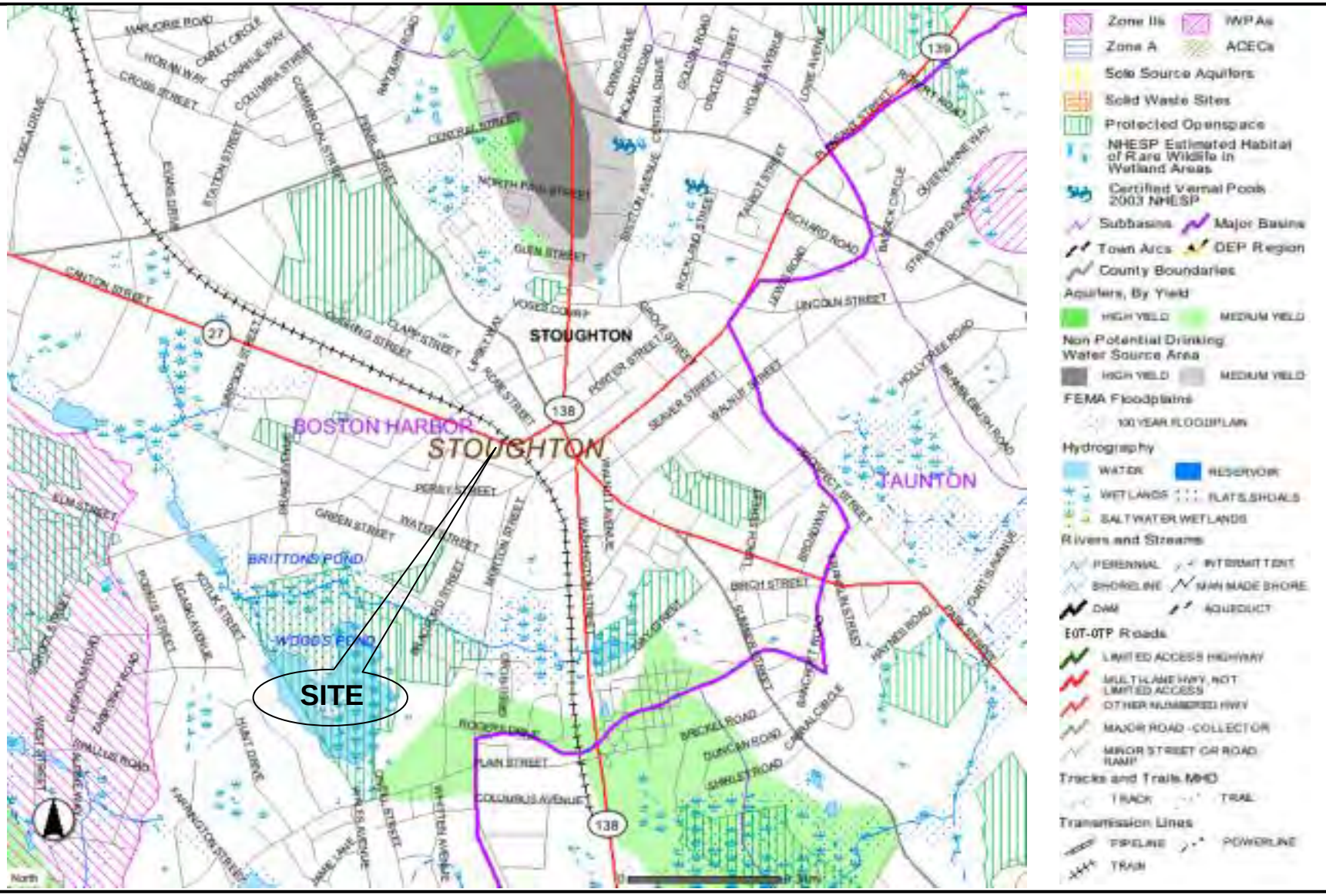
CHECKED BY: AE
221889-SITE_PLAN_rev.dwg
DESIGNED BY: AE
DRAWN BY: MP

STOUGHTON CENTER
BUSINESS PARK, LLC

2 CANTON ST
STOUGHTON, MA 02072

JOB NO: 221889
DATE SEPTEMBER 2009
SCALE: 1" = 40'

Figure 2



WOODARD &CURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS

980 Washington St, Suite 325
Dedham, MA 02026
T: 800.446.5518

21E PRIORITY RESOURCES MAP	2 CANTON STREET STOUGHTON, MA 02072	JOB NO.: 221889.00
		DATE: SEPTEMBER 2009
DESIGNED BY:	CHECKED BY: AE	SCALE:
DRAWN BY: MES		FIGURE 3

APPENDIX G: NOTICE OF ACTIVITY AND USE LIMITATION

Bk 27121 P574 #112882
10-08-2009 @ 01:12p

SEE PLAN FILED IN PLAN BOOK 595 PAGE 63-64

RECEIVED AND RECORDED
NORFOLK COUNTY
REGISTRY OF DEEDS
DEDHAM, MA
CERTIFY
William P O'Donnell
WILLIAM P. O'DONNELL, REGISTER

Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: Former JF Corcoran Shoe Company
DEP Release Tracking No.(s): RTN 4-00875

This Notice of Activity and Use Limitation ("Notice") is made as of this 8th day of October, 2009, by Stoughton Center Business Park, LLC of 2 Canton Street, Stoughton, Massachusetts, 02072, together with its successors and assigns (collectively "Owner").

WITNESSETH:

WHEREAS, Stoughton Center Business Park, LLC is the owner in fee simple of that certain parcel of land located in Stoughton, Norfolk County, Massachusetts with the buildings and improvements thereon, pursuant to a deed recorded with the Norfolk Registry of Deeds in Book 19492, Page 29;

WHEREAS, said parcel(s) of land, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Norfolk Registry of Deeds in Plan Book 404, Plan 154;

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in Exhibit A-1, attached hereto and made a part hereof. The Portion of the Property is shown on a sketch plan attached hereto and filed herewith for registration;

WHEREAS, the Portion of the Property comprises all of a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

MARGINAL REFERENCE BOOK 19492 PAGE 29

The language in these forms are part of promulgated regulations and cannot be modified in any way unless so noted (within brackets) in the form itself.

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or groundwater and/or (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated 10/7/09, (which is attached hereto as Exhibit C and made a part hereof);

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Activities and uses on the Portion of the Property involving industrial, retail or commercial development and operations including, but not limited to, day care facilities, educational facilities (provided that they do not offer overnight housing), offices, retail businesses, warehouses/storage areas, restaurants, vehicular and pedestrian traffic, parking and parking garages, landscaping, hardscaping, and routine maintenance of hardscaped or landscaped areas;

(ii) Emergency utility work including excavation, maintenance and repairs to site utilities;

(iii) Short-term (i.e., less than six months) construction, development, excavation and/or other subsurface activities, including, without limitation, non-emergency utility work and re-grading activities;

(iv) Such other activities or uses which, in the Opinion of a Licensed Site Professional (LSP), shall present no greater risk of harm to health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph; and

(v) Such other activities and uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Portion of the Property as a single- or multi-family residence, including but not limited to townhouses, condominiums and/or apartments; and,

(ii) Use of the Portion of the Property for "institutional" use as defined in the MCP 310 CMR 40.0006, such as any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility, or correctional facility, where such facility in whole or in part provides overnight housing.

(iii) Any long-term (more than 6 months) activity involving disturbance of soil at the Portion of the Property unless such activity is evaluated by a LSP who renders an Opinion that states that such disturbance is consistent with maintaining a condition of No Significant Risk.

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) A Soil Management Plan must be developed and implemented prior to the initiation of any planned long-term (more than 6 months) invasive activity to be performed with respect to soil at the Portion of the Property. The Soil Management Plan must be prepared by a LSP in accordance with the soil management procedures of the MCP at 310 CMR 40.0030 et seq.; and

(ii) A Health and Safety Plan must be developed and implemented prior to the initiation of any planned long-term (more than 6 months) invasive activity with respect to soil at the Portion of the Property. The Health and Safety Plan must be prepared by a Certified Industrial Hygienist or other qualified individual sufficiently trained in health and safety protocols. The Plan should clearly describe the nature of the oil and/or hazardous materials located in soils throughout the Portion of the Property where invasive activities are planned and specifically identify the types of personal protective equipment, monitoring devices, and engineering controls necessary to ensure that workers are not exposed (in a manner inconsistent with the MCP or this AUL) via dermal contact, ingestion, and/or the inhalation of particulate dusts/vapors. Workers who may come in contact with soil at the Portion of the Property must be informed that soil impacted by oil and/or hazardous materials is located throughout the Portion of the Property and be made aware that all activities in such areas must be performed in compliance with the requirements of the Health and Safety Plan. The Plan must be available on-site throughout the course of the work.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards. If at such time in the future any activities, uses and/or exposures upon which this Notice are proposed to change, further assessment of Site conditions and evaluation by an LSP are required to determine if a condition of No Significant Risk exists for all potentially exposed receptors under such proposed use.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry(ies) of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this 24th day of September, 2009.

Stoughton Center Business Park, LLC

Steve Kelley
Managing Member

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss 9/24, 2009

The language in these forms are part of promulgated regulations and cannot be modified in any way unless so noted (within brackets) in the form itself.

On this 24th day of Sept, 2009, before me, the undersigned notary public, personally appeared Steve Kelley, proved to me through satisfactory evidence of identification, which were personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Official Signature and Seal of Notary

ETHAN SCHAFF NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS MY COMMISSION EXPIRES OCT. 31, 2014

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: October 7, 2009

John A. Thompson

LSP Seal:

COMMONWEALTH OF MASSACHUSETTS JOHN A. THOMPSON NO. 3989 REGISTERED LICENSED SITE PROFESSIONAL

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss October 7, 2009

On this 7th day of October, 2009, before me, the undersigned notary public, personally appeared John A. Thompson, proved to me through satisfactory evidence of identification, which were license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Official Signature and Seal of Notary

My Commission Expires: June 25, 2015

PATRICIA A. WENSKEVICH NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS

EXHIBIT A
LEGAL DESCRIPTION OF PARCEL OF LAND CONTAINIG AREA SUBJECT TO AUL

EXHIBIT A

(Description of the property at 2 Canton Street, Stoughton Mass.)

That certain parcel of unregistered land in the Town of Stoughton, Norfolk County, Commonwealth of Massachusetts located on southwesterly side of Canton Street bounded and described as follows:

Beginning on the most westerly corner of the parcel hereon described on the point on northeasterly sideline of Summer Street such point located 448.67 feet distance from intersection of Wyman Street thence running:

N30°52'52"E	two hundred fifty and 20/100 (250.20) feet to a point on southwesterly sideline of Canton Street ; thence turning and running
S56°24'55"E	along said southwesterly sideline of Canton Street two hundred twelve and 99/100 (212.99) feet to a point, thence turning and running
southerly	by the curve to the right having radius three thousand two hundred seventy eight and 50/100 (3278.50) feet to a point on northerly sideline of Wyman Street; thence turning and running
S74°00'00"W	along said northerly sideline of Wyman Street seventy five and 90/100 (75.90) feet to a point on northeasterly sideline of Summer Street; thence turning and running
N59°30'00"W	along northeasterly sideline of Summer Street four hundred forty eight and 67/100 (448.67) feet to the point of beginning.

Containing 2.16 acres of land.

EXHIBIT A-1
LEGAL DESCRIPTION OF AUL AREA

EXHIBIT A-1

(Description of Area Subject to AUL)

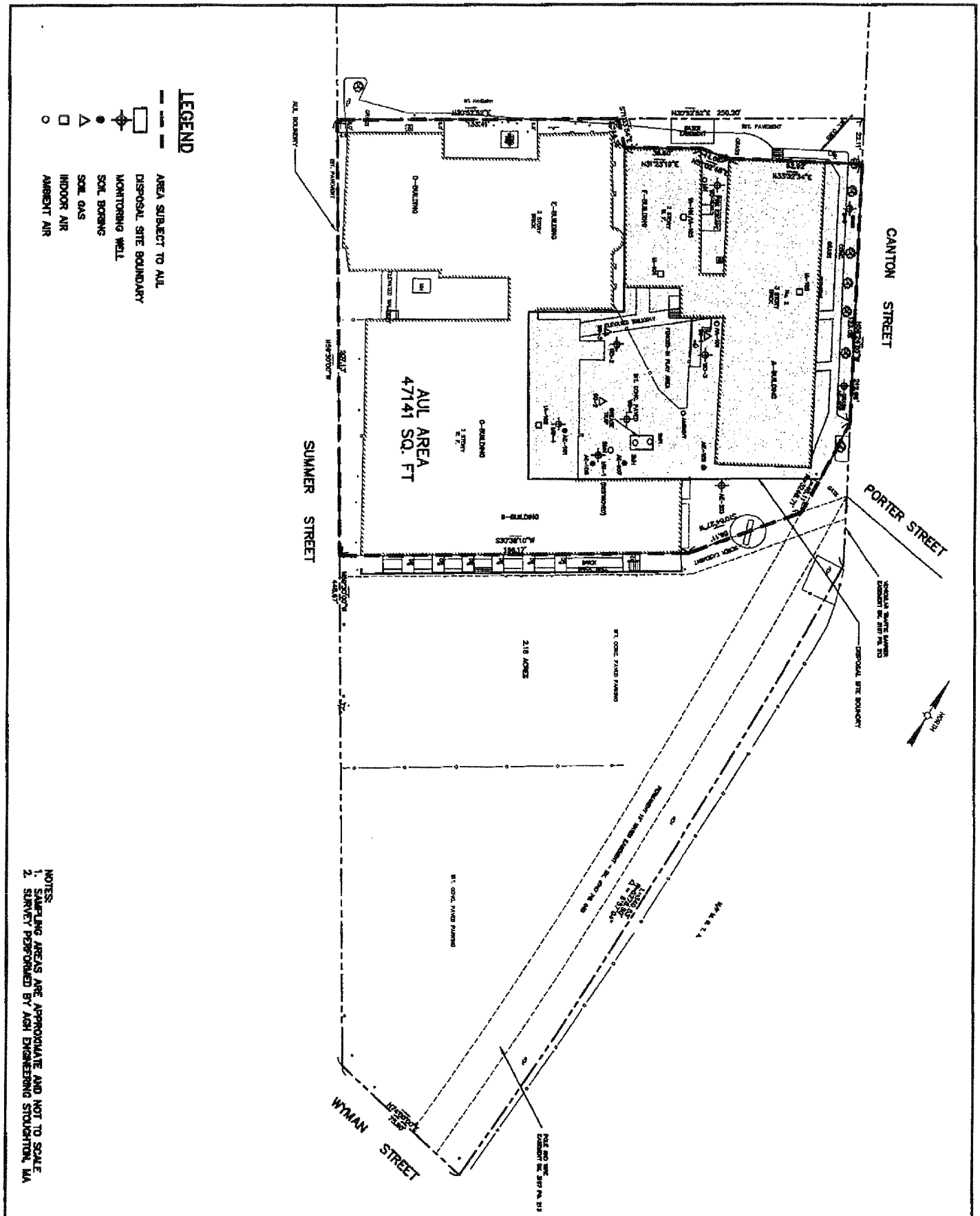
That certain parcel of unregistered land in the Town of Stoughton, Norfolk County, Commonwealth of Massachusetts located on northerly side of Summer Street bounded and described as follows:

Beginning on the most westerly corner of the parcel hereon described on the point on northeasterly sideline of Summer Street such point located 448.67 feet distance from intersection of Wyman Street thence running:

N30°52'52"E	one hundred thirty three and 41/100 (133.41) feet to a point; thence turning and running
S71°33'54"E	fourteen and 36/100 (14.36) feet to a point; thence turning and running
N31°23'19"E	thirty six and 60/100 (36.60) feet to a point; thence turning and running
N51°02'48"E	fourteen and 06/100 (14.06) feet to a point; thence turning and running
N33°32'34"E	sixty two and 92/100 (62.92) feet to a point on southwesterly sideline of Canton Street thence, turning and running
S56°24'55"E	along said southwesterly sideline of Canton Street one hundred twenty three and 08/100 (123.08) feet to a point, thence turning and running
southerly	by the curve to the right having radius three thousand two hundred forty eight and 71/100 (3248.71) feet to a point; thence turning and running
S10°54'27"W	fifty six and 11/100 (56.11) feet to a point; thence turning and running
S30°38'10"W	one hundred sixty six and 17/100 (166.17) feet to a point on northeasterly sideline of Summer Street; thence turning and running
N59°30'00"W	along northeasterly sideline of Summer Street two hundred seven and 13/100 (207.13) feet to the point of beginning.

Containing 47,141 square feet.

EXHIBIT B
SKETCH PLAN SHOWING RELATIONSHIP OF PROPERTY SUBJECT TO AUL TO DISPOSAL SITE BOUNDARIES



WOODARD & CURRAN COMMITMENT & INTEGRITY DRIVE RESULTS	EXHIBIT B SKETCH PLAN OF DISPOSAL SITE	STOUGHTON CENTER BUSINESS PARK, LLC	JOB NO: 221889 DATE: SEPT. 2022 SCALE: 1"=40'
980 Washington Street Dedham, Massachusetts 02026 800.446.5618 | www.woodardcurran.com	DESIGNED BY: AE DRAWN BY: MP CHECKED BY: AE 221889-SITE_PLAN_rev.dwg	2 CANTON STREET STOUGHTON, MA 02072	EXHIBIT B

EXHIBIT C
AUL OPINION

EXHIBIT C
ACTIVITY AND USE LIMITATION OPINION

Site Name: Former JF Corcoran Shoe Company
2 Canton Street, Stoughton, Massachusetts
MassDEP Release Tracking Number: 4-00875

In accordance with the requirements of 310 CMR 40.1074, this Activity and Use Limitation (AUL) Opinion has been prepared to support a Notice of Activity and Use Limitation for the Disposal Site to which the Massachusetts Department of Environmental Protection (MassDEP) has assigned Release Tracking Number (RTN) 4-00875 (the "Site"). The Site is located along the northern portion of the property located at 2 Canton Street in Stoughton, Massachusetts.

SITE HISTORY

The Site is located at 2 Canton Street in an area of mixed commercial and residential use in Stoughton, Massachusetts (the "Property"). The eastern portion of the Property consists of an asphalt-paved parking lot that is used for customer and commuter parking for the adjacent Massachusetts Bay Transit Authority (MBTA) commuter rail line. The western portion of the Property is currently improved with four interconnected, masonry and wood-framed mill buildings. These buildings, which have a combined footprint of approximately 73,046 square feet, are currently used for office, retail, studio, and storage space.

The Site includes a portion of the "C-Building", encompasses the entire courtyard area, includes the "A-Building" and "F-Building," and extends to the edge of the Property along Canton Street. The A-Building is currently occupied by a variety of tenants including a framed art store, a martial arts studio, several artist studios, a house of worship, and a plumbing company; the F-Building is currently occupied by a day care facility and additional studio space; and the C-Building is occupied by a fitness center and an elevator. None of the buildings contains a recessed basement, although small crawl spaces are located below the day care facility situated in the F-Building and the customer lobby situated within the A-Building. The AUL applies to the northern portion of the Property, which contains the buildings and courtyard area. A brief description of the primary sources of oil and/or hazardous materials (OHM) at the Site is provided below.

Two underground storage tanks (USTs) formerly located within the courtyard area of the Property served as the source of the Site release(s). One 6,000-gallon fuel oil UST was removed from the Site in November 1989 and one 3,000-gallon fuel oil UST was removed in August 2008. Both tanks were observed to be leaking upon their removal and soil and groundwater impacts within the courtyard area have since been documented. Several investigatory and remedial activities have been conducted at the Site to date, including the removal of the leaking fuel oil USTs, excavation of approximately 400 cubic yards of petroleum-impacted soils, collection of soil, groundwater, soil gas, and

indoor air data, as well as groundwater and NAPL removal, gauging, and monitoring. Despite the extensive soil removal that was conducted in August 2008, residual levels of petroleum hydrocarbons persist in soil, groundwater, and indoor air at the Site, including residual NAPL with a measurable thickness of approximately 0.01 feet within monitoring well WC-3, located along the northwestern corner the courtyard.

REASON FOR ACTIVITY AND USE LIMITATION

In September 2009, a Method 3 Risk Characterization (Method 3 RC) was conducted to evaluate existing soil, groundwater, and indoor air data collected from the Disposal Site to determine whether a condition of No Significant Risk (NSR) to human health, safety, public welfare and the environment exists in support of permanent Site closure. The results of the Method 3 RC indicate that a condition of NSR existed for future trespassers, current and future day care participants, current and future facility workers, current utility workers, and future construction workers potentially exposed to constituents present within Site soil, groundwater, and/or indoor air (day care participants and facility workers only). However, a condition of NSR could not be achieved for future hypothetical residents due to the presence of volatile constituents within indoor air. Therefore, an AUL is required to mitigate future human health risks associated with chronic exposures to volatile constituents that could migrate from the subsurface into the indoor air of an overlying structure (i.e., residence).

In order to ensure that a condition of NSR is maintained at the Site, an AUL is necessary to "lock in" the assumptions and restrictions of the Method 3 RC regarding future Site activities and uses. This AUL is applicable to only a Portion of the Property, which comprises the entire Disposal Site, as described in Exhibit A-1 and depicted in Exhibit B.

The permitted and restricted activities and obligations/conditions of the AUL (if applicable) are summarized in the following paragraphs.

1. Activities and Uses Consistent with the AUL Opinion.

The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Activities and uses on the Portion of the Property involving industrial, retail or commercial development and operations including, but not limited to, day care facilities, educational facilities (provided that they do not offer overnight housing), offices, retail businesses, warehouses/storage areas, restaurants, vehicular and pedestrian traffic, parking and parking garages, landscaping, hardscaping, and routine maintenance of hardscaped or landscaped areas;

(ii) Emergency utility work including excavation, maintenance and repairs to site utilities;

(iii) Short-term (i.e., less than six months) construction, development, excavation and/or other subsurface activities, including, without limitation, non-emergency utility work and re-grading activities;

(iv) Such other activities or uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph; and

(v) Such other activities and uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent with the AUL Opinion.
Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Portion of the Property as a single- or multi-family residence, including but not limited to townhouses, condominiums and/or apartments; and,

(ii) Use of the Portion of the Property for "institutional" use as defined in the MCP 310 CMR 40.0006, such as any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility, or correctional facility, where such facility in whole or in part provides overnight housing.

(iii) Any long-term (more than 6 months) activity involving disturbance of soil at the Portion of the Property unless such activity is evaluated by a LSP who renders an Opinion that states that such disturbance is consistent with maintaining a condition of No Significant Risk.

3. Obligations and Conditions Set Forth in the AUL Opinion.
If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) A Soil Management Plan must be developed and implemented prior to the initiation of any planned long-term (more than 6 months) invasive activity to be performed with respect to soil at the Portion of the Property. The Soil Management Plan must be prepared by a LSP in accordance with the soil management procedures of the MCP at 310 CMR 40.0030 et seq.; and

(ii) A Health and Safety Plan must be developed and implemented prior to the initiation of any planned long-term (more than 6 months) invasive activity with respect to soil at the Portion of the Property. The Health and Safety Plan must be

prepared by a Certified Industrial Hygienist or other qualified individual sufficiently trained in health and safety protocols. The Plan should clearly describe the nature of the oil and/or hazardous materials located in soils throughout the Portion of the Property where invasive activities are planned and specifically identify the types of personal protective equipment, monitoring devices, and engineering controls necessary to ensure that workers are not exposed (in a manner inconsistent with the MCP or this AUL) via dermal contact, ingestion, and/or the inhalation of particulate dusts/vapors. Workers who may come in contact with soil at the Portion of the Property must be informed that soil impacted by oil and/or hazardous materials is located throughout the Portion of the Property and be made aware that all activities in such areas must be performed in compliance with the requirements of the Health and Safety Plan. The Plan must be available on-site throughout the course of the work.

LSP CERTIFICATION

Name of Organization: Woodard & Curran Inc.

LSP Name: John A. Thompson **Title:** Vice President

Telephone: (781) 251-0200

I attest that I have personally examined and am familiar with the information contained in this AUL Opinion, including the Risk Characterization and Notice of AUL accompanying this attestation, and in my professional judgment, the Risk Characterization, Notice of AUL, and this AUL Opinion comply with the provision of M.G.L. c. 21A, §§ 19-19J, 309 CMR, M.G.L. c. 21 E, 310 CMR 40.0000 and all other laws, regulations, orders, permits, and approvals applicable to such response actions. I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I willfully submit information which I know to be false, inaccurate, or incomplete.

LSP Signature: _____ LSP Seal:

Date: 10/07/09

License Number: 3989

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC113A

ACTIVITY & USE LIMITATION (AUL) OPINION FORM

Pursuant to 310 CMR 40.1056 & 40.1070 - 40.1084 (Subpart J)

Release Tracking Number
4 - 875

A. DISPOSAL SITE LOCATION:

1. Disposal Site Name: JF CORCORAN SHOE CO INC

2. Street Address: 2 CANTON ST

3. City/Town: STOUGHTON 4. ZIP Code: 02072-0000

B. THIS FORM IS BEING USED TO: (check one)

☑ 1. Provide the LSP Opinion for a **Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1074.

☐ 2. Provide the LSP Opinion for an **Evaluation of Changes in Land Uses/Activities and/or Site Conditions after a Response Action Outcome Statement,** pursuant to 310 CMR 40.1080. Include BWSC113A as an attachment to BWSC113. Section A and C do not need to be completed.

☐ 3. Provide the LSP Opinion for an **Amended Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1081(4).

☐ 4. Provide the LSP Opinion for a **Partial Termination of a Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1083(3).

☐ 5. Provide the LSP Opinion for a **Termination of a Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1083(1)(d).

☐ 6. Provide the LSP Opinion for a **Grant of Environmental Restriction**, pursuant to 310 CMR 40.1071.

☐ 7. Provide the LSP Opinion for an **Amendment of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1081(3).

☐ 8. Provide the LSP Opinion for a **Partial Release of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1083(2).

☐ 9. Provide the LSP Opinion for a **Release of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1083(1)(c).

☐ 10. Provide the LSP Opinion for a **Confirmatory Activity and Use Limitation**, pursuant to 310 CMR 40.1085(4).

(Unless otherwise noted above, all sections of this form (BWSC113A) must be completely filled out, printed, stamped, signed with black ink and attached as an exhibit to the AUL Document to be recorded and/or registered with the Registry of Deeds and/or Land Registration Office.)

C. AUL INFORMATION:

1. Is the address of the property subject to AUL different from the disposal site address listed above?

☑ a. No ☐ b. Yes If yes, then fill out address section below.

2. Street Address: _____

3. City/Town: _____ 4. ZIP Code: _____

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC113A

ACTIVITY & USE LIMITATION (AUL) OPINION FORM

Pursuant to 310 CMR 40.1056 & 40.1070 - 40.1084 (Subpart J)

Release Tracking Number
4 - 875

D. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B indicates that a **Notice of Activity and Use Limitation** is being registered and/or recorded,* the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1074;

> *if Section B indicates that an **Evaluation of Changes in Land Uses/Activities and/or Site Conditions after a Response Action Outcome Statement*** is being submitted, this evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1080;

> *If Section B indicates that an **Amended Notice of Activity and Use Limitation or Amendment to a Grant of Environmental Restriction** is being registered and/or recorded,* the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 40.1081;

> *if Section B indicates that a **Termination or a Partial Termination of a Notice of Activity and Use Limitation, or a Release or Partial Release of a Grant of Environmental Restriction** is being registered and/or recorded,* the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1083;

> *if Section B indicates that a **Grant of Environmental Restriction** is being registered and/or recorded,* the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1071;

> *if Section B indicates that a **Confirmatory Activity and Use Limitation** is being registered and/or recorded,* the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1085(4);

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 3989

2. First Name: JOHN A 3. Last Name: THOMPSON

4. Telephone: 7812510200 5. Ext.: 6. FAX:

7. Signature: John A Thompson 8. Date: 10/7/2009 mm/dd/yyyy

9. LSP Stamp:

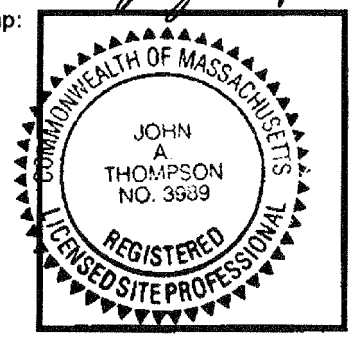


EXHIBIT D
DOCUMENTATION OF SIGNING AUTHORITY

MANAGING MEMBER'S CERTIFICATE OF INCUMBENCY
Stoughton Center Business Park, LLC

I, Steven Kelley, Managing Member of Stoughton Center Business Park, LLC (the "Limited Liability Corporation"), do hereby certify that the following resolution was adopted by the Managers of the Corporation (David Kelley, Steven Kelley, and Philip Costa) and that such resolution has not been amended, modified or rescinded and is in full force and effect as of the date hereof:

Resolved, that Steven Kelley, Managing Member, following compliance with appropriate Limited Liability Corporation policies and procedures, is hereby authorized and directed in the Limited Liability Corporation's name and on its behalf to execute the Notice of Activity and Use Limitation for the property located at 2 Canton Street, Stoughton, Massachusetts, any such determination to be conclusively evidenced by the doing or performing of any such act or thing or the execution and delivery of any such instrument, certificate or document. Any such actions taken prior hereto by said individual, not inconsistent with these resolutions, is hereby confirmed, ratified and approved.

Dated: 9/23/09

Managing Member's Signature

STEVEN KELLEY
Managing Member's Printed Name

THE STATE OF MASSACHUSETTS

Norfolk, ss.

On this 23rd day of September, 2009, before me, the undersigned notary public, personally appeared STEVEN KELLEY, proved to me through satisfactory evidence of identification, which was ☐ photographic identification with signature issued by a federal or state governmental agency, ☐ oath or affirmation of a credible witness, ☐ personal knowledge of the undersigned, to be the person whose name is signed on the preceding or attached document(s), and acknowledged to me that he signed it voluntarily for its stated purpose as the Managing Member of the Stoughton Center Business Park, LLC.

(*official seal*)

, Notary
Notary's Printed Name Lee S. Kaplan

LEE S. KAPLAN
Commission Expires on 1/19/2012
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS

A true copy from Lib. 27121 Fol. 574
in Norfolk County Registry of Deeds
Dedham, MA
Certify: William P. O'Donnell
Register

NORFOLK ENVIRONMENTAL

Reply to: 1244 Broadway
Raynham, MA 02767-1973
Phone (508) 822-5500
Fax (508) 822-1611

August 6, 1999

South East Regional Office
20 Riverside Drive
Lakeville MA 02347

RE: Response Action Outcome Amendment
25 Brock Street,
Stoughton, MA
RTN # 4-13476
Norfolk Job No. 238.002

Dear Mr. Martin:

Please find attached the amended RAO submittal forms relative to the 25 Brock Street property, RTN # 4-13476.

Norfolk has reviewed the groundwater classification at above address and is amending our previous RAO to a GW1 setting. Recently upon review of Stoughton Town Hall record we identified two (2) potable wells on Morton Street within 500 feet of the 25 Brock Street property. This alteration does not affect the conclusion of the RAO.

If you have any questions or comments concerning this amendment please call the undersigned at 508-822-5500.

Sincerely,

NORFOLK ENVIRONMENTAL, INC.

Aileen McDonnell
Project Scientist

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RESPONSE ACTION OUTCOME (RAO) REPORT PURSUANT TO MCP 310 CMR 40.1000

For the property located at:

**25 BROCK STREET,
STOUGHTON, MA.**

RELEASE TRACKING NUMBER 4-13476

NORFOLK PROJECT NO. 265.002

Prepared for:

**Mr. Earl Cain
P.O. Box 3565
Hommossassa Springs, Florida 34447**

**Prepared by:
NORFOLK ENVIRONMENTAL
1244 Broadway
Raynham, MA 02767
(508) 822 5500**

August 6, 1999

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE LOCATION AND DESCRIPTION 1

3.0 MASSACHUSETTS CONTINGENCY PLAN SETTING 2

4.0 DESCRIPTION OF RELEASE 2

5.0 STATUS OF REMEDIAL ACTIONS 2

6.0 RESPONSE ACTIONS PERFORMED BY NORFOLK 3

6.1 CONFIRMATORY ANALSIS 3

7.0 MANAGEMENT OF REMEDIATION WASTE 4

8.0 ACHIEVEMENT OF NO SIGNIFICANT RISK 4

9.0 FEASIBILITY EVALUATION 4

10.0 ADDITIONAL ACTIVITIES 4

11.0 NOTICATION TO PUBLIC OFFICIALS 4

12.0 LICENCED SITE PROFESSIONAL 4

APPENDIX A SITE PLAN
APPENDIX B BILL OF LADING
APPENDIX C LABORATORY RESULTS

1.0 INTRODUCTION

This Response Action Outcome (RAO) statement has been prepared upon the request of Mr. Earl Cain, current owner of the 25 Brock Street property, Stoughton, Massachusetts. Norfolk Environmental was retained by Mr. Earl Cain to submit a Response Action Outcome (RAO) to close out a State Spill Incident which occurred on November 5, 1997 (RTN 4-13476). The Immediate Response Action (IRA) was performed by others during November 1997, and included the excavation of up to 40 cubic yards of soil. The information provided hereafter is based on conversations with Mr. Earl Cain (owner), Mr. Edmund Solari (tenant and proprietor of MDM Machine Shop, 25 Brock Street) and a review of available DEP files.

- **Person Conducting Immediate Response Action:** Mr. Earl Cain
- **Relationship to Site:** Owner
- **Contact:** Mr. Earl Cain
- **Address:** P.O. Box 3565, Homossassa Springs, Florida 34447
- **Telephone:** (508) 824-9173

2.0 SITE LOCATION AND DESCRIPTION

The Site is located at 25 Brock Street near the center of the Town of Stoughton. The Site consists of two parcels totaling 5.35 acres of land on Lots 104 and 105, Stoughton Assessor's Maps 48 and 49. The MBTA railroad property abuts the eastern border of the Site. The Site is located at an approximate elevation of 65 meters above sea level according to the USGS 15 Minute Topographic Map for the Brockton quadrangle. The land slopes down westwards to a wetland area and small brook on the western portion of the property and northwards towards to a wetland area located on the abutting property to the north. Please refer to Figure 1 - Site Locus.

The Site is improved by three buildings. Building #1, located on Lot 104, is a large two story wood frame structure constructed of red brick. This building currently operates as ECCM, Inc. (a phone repair shop, woodworking shop, warehouse/storage area, and office area), and a security and advertising business. Building #2, located on Lot 105, is a single store wood frame structure supported by pier and beams. This building currently operates as Suburban Insulation and the MDM machine shop. Building #3, located on Lot 105, is constructed of fieldstone and wood, and currently operated as a machine shop.

Surrounding Receptors

The Site is located in an area of residential, commercial and industrial use. Residential properties abut the western and southern property lines. Commercial, industrial and residential properties abut the northern and eastern property lines. The MBTA railroad tracks directly abut the Site to the east. The nearest schools, the Jones School and the Kimball School are located one-half mile northeast of the Site.

3.0 MASSACHUSETTS CONTINGENCY PLAN SETTING

Groundwater Classification

Based on the review of Stoughton Town Hall records and the New England Data Map, Mass GIS maps prepared for the 25 Brock Street property, the Site is within an area of GW-1 classified groundwater. The Site is within 500 feet of two (2) potable private water supply wells located on Morton Street in Stoughton, Massachusetts. The Site not located within an Interim Wellhead Protection Area, within a Zone A of a Class A surface water body, or within an approved Zone II area of contribution of a municipal water supply well. The Site groundwater is also classified GW-2/GW-3.

Soil Classification

The Reportable Concentration category for a release to soil where the soil is at or within 500 feet of a residential dwelling, a residentially owned property, school, playground, recreational area or park is RCS-1. The RCS-1 concentration for total petroleum hydrocarbons (TPH) is 200 mg/Kg. The reportable quantity for diesel fuel oil is 10 gallons. The soil at the location of the spill has an exposure potential of S-2 on the basis that the soil is accessible but a child's frequency and intensity of use are both considered to be low according to 310 CMR 40.0933(4)(a) and (b).

A cleanup goal of 200 mg/kg based on the strictest (S-1/GW-1) MCP soil exposure standards were selected, in order to avoid the necessity of filing an Activity and Use Limitation for this property.

4.0 DESCRIPTION OF THE RELEASE

On November 5, 1997 between 3:30 and 4.00 p.m., approximately 15 gallons or less of #2 heating oil was reported to have leaked from a 0.25 inch (inside diameter) pipe associated with a 275 (or 235)-gallon aboveground storage tank (AST). The 275-gallon AST was located centrally on the south side of Building #2, the MDM Machine Shop. According to Mr. Edmund Solari, the release occurred when the AST accidentally tipped over against the side of Building #2, after it was filled. On behalf of Mr. Solari the Stoughton Fire Department made the initial oral notification to the Department of Environmental Protection (DEP) on November 8, 1997 at 12:20 p.m. The DEP issued a release tracking number (RTN) 4-13476 for the Site. Oil contaminated soil was observed in the vicinity of the release area.

5.0 STATUS OF REMEDIAL ACTIONS

Doyle Enterprises (Doyle) was contracted by Mr. Earl Cain to coordinate the assessment and remediation of the #2 fuel oil release. Mr. John Higgins of Envirosense, New Hampshire, was initially hired as Licensed Site Professional. A verbal IRA was approved by the DEP for the excavation of up to 25 cubic yards of soil as part as subsurface investigation to determine the point source and the extent of contamination.

Between November 14 and 26, 1998, Doyle Enterprises coordinated the excavation of petroleum contaminated soil in the location of the release. Doyle excavated in total approximately 40 cubic yards of soil in association with the AST release. Contaminated soil was stockpiled on 6 mil polyethylene liner on site, 75 to 80 feet east of the release area at the west wall of Building #1. Please refer to Figure One - Site Locus for the

location of the former soil stockpile. The excavation was reportedly backfilled with clean granular fill. Shortly thereafter, Doyle activities at the Site ceased. The soil stockpile remained on-site since November 1997 and no further action regarding the closure of the Number 2 fuel oil release had been performed prior to May 1999.

6.0 RESPONSE ACTIONS PERFORMED BY NORFOLK

On May 3, 1999 Norfolk advanced four (4) soil borings in the vicinity of the former 275-gallon AST spill area to a maximum depth of six (6) feet below grade. Groundwater was encountered between three (3) and five (5) feet below grade. The locations of each soil boring are located on Figure 2 - Site Plan.

Soils encountered in the vicinity of the spill area included granular fill (gray, medium to coarse grained sand and gravel), which varied in depth from 6 inches to four feet below grade. Below the fill material native soils were encountered. Native soils included: dark brown sandy loam and gravel; gray, fine to medium sand and gravel; gray/rust colored fine to medium grained sand; rust colored medium to coarse grained sand and silt; and rust colored fine grained silty sand. Fine gravel to large cobbles were encountered at varies depths below grade.

Olfactory or visual evidence of oil contaminated soil was not observed. Soil samples at one foot intervals were retained for field screening with an HNu brand Photo Ionizing Detector (PID), equipped with a 10.2 ev lamp, using the standard DEP jar-headspace procedure. PID readings indicated non-detectable levels for Total Volatile Organic compounds. Refer to Table 1 for a summary of PID analysis.

Table 1 - Photo Ionizing Detection

Soil Boring ID	Depth of boring (feet)	Soil Boring Location	PID reading (ppm)
B-1	6'	1' through 6'	ND
B-2	6'	2' through 6'	ND
B-3	5'	2' through 5'	ND
B-4	3'	one sample @ 3'	0.4

Note: ND = not detected

6.1 Confirmatory Analysis

Soil samples taken form the groundwater interface were sent to ESS Laboratories, of Warwick, Rhode Island, Massachusetts, for confirmatory TPH analysis via EPA Method 8100.

Table 4 - ESS Analytical Results /Total Petroleum Hydrocarbons (TPH)

Sample ID	TPH mg/Kg
B1 @ 4'	ND
B2 @5'	ND
B3 @ 5'	ND
B4 @ 3'	ND
DEP Mtd. 1/GW-1/S-1 Cleanup Standard	**200**

Notes: ND = Not Detectable above Laboratory Reporting Limit

Concentrations of TPH were non-detectable in soil samples taken from the groundwater interface in soil samples B1 through B4. Norfolk has concluded that petroleum contaminated soil was adequately excavated by Doyle to background levels. No further excavation is required at the Site. Refer to Appendix B for Laboratory Results.

7.0 MANAGEMENT OF REMEDIATION WASTE

A total of 37.01 tons of Number 2 fuel oil contaminated soil excavated and stockpile on Site by Doyle between November 14 and 26, 1997, were transported by B and C Construction of Stoughton, MA under an LSP certified Bill of Lading on May 14, 1999 to the Bardon Trimount facility in Stoughton, Massachusetts for Hot/cold asphalt recycling. Refer to Bill of Lading, attached as Appendix A.

8.0 ACHIEVEMENT OF NO SIGNIFICANT RISK

In accordance with the Method I Risk Characterization set forth in 310 CMR 40.0973 (7), it is the conclusion of Norfolk Environmental that, as a result of the above described TPH analyses, a level of "no significant risk" has been achieved for soils and groundwater at the Site and that a Class A-1 Response Action Outcome (RAO) has been achieved. As described above, Norfolk has determined that levels of petroleum contaminants in the soils in the vicinity of the #2 fuel oil spill origin were removed to non-detectable levels.

9.0 FEASIBILITY EVALUATION

A Feasibility Evaluation is not required under the MCP with an A-1 RAO Statement, at which soil concentrations are non-detectable below cleanup standards and can be reasonably assumed to at background levels.

10.0 ADDITIONAL ACTIVITIES

No further remedial or investigation activities are scheduled or deemed necessary for this Site. The Site does not require an Activity and Use Limitation in the deed based upon a Class A-1 RAO.

11.0 NOTIFICATION TO PUBLIC OFFICIALS

In accordance with public involvement requirements of the MCP, the Chief Municipal Officer and Board of Health in Stoughton, Massachusetts have been notified in writing about remedial activities performed at the Site.

12.0 LICENSED SITE PROFESSIONAL OPINION

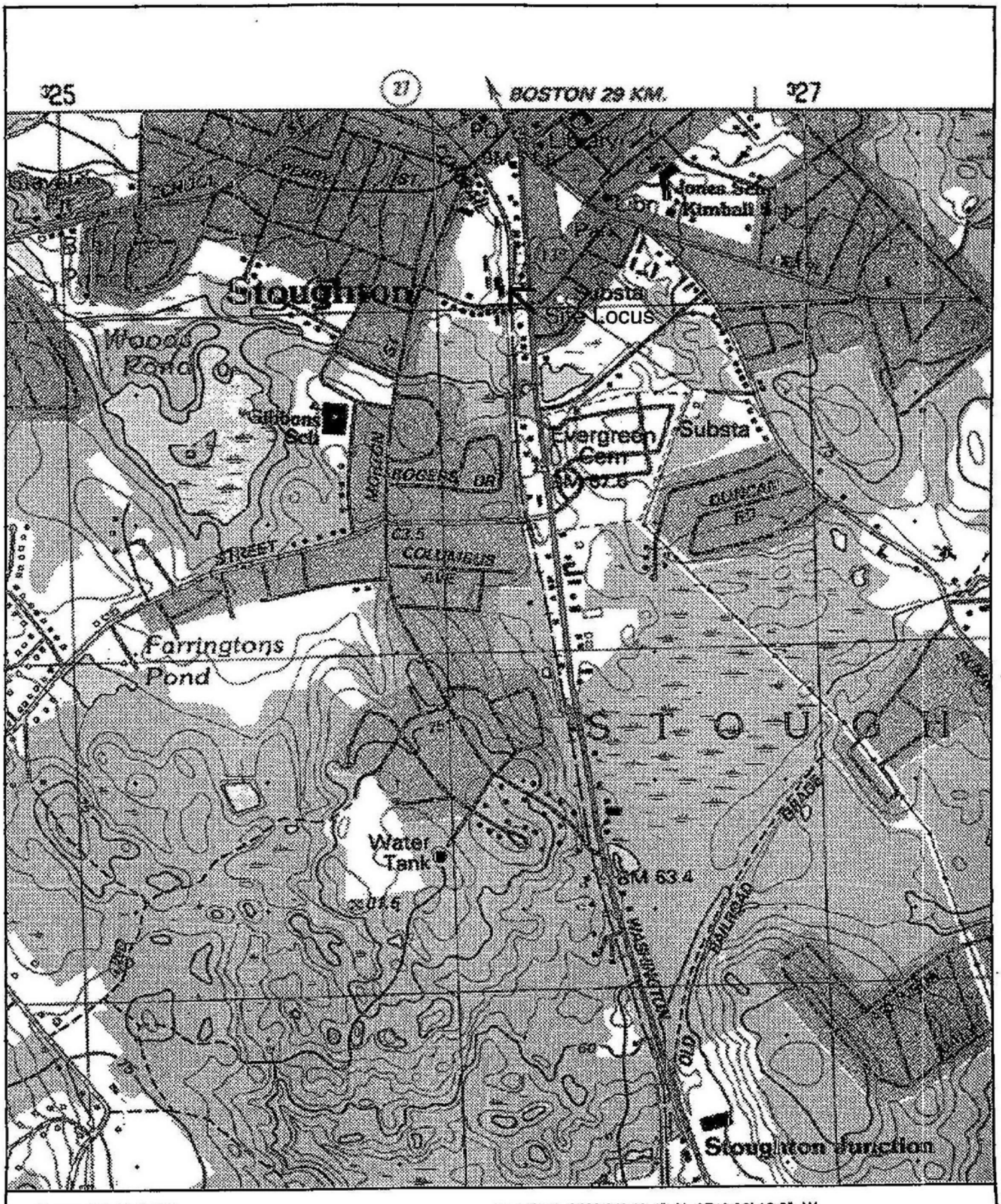
I, Brian V. Moran, P.E., a Licensed Site Professional in the Commonwealth of Massachusetts, License # 7351, attest by my signature and stamp appearing below that the Response Action Outcome described herein, has been conducted in conformance with the Massachusetts Department of Environmental Protection.

Please call the undersigned at (508)-822-5500 if you have any questions or comments on the above submittal.

Regards,
Norfolk Environmental

Aileen McDonnell
Project Scientist

Brian V. Moran, P.E.
Licensed Site Professional



Name: BROCKTON
Date: 5/26/99
Scale: 1 inch equals 1142 feet

Location: 042° 06' 43.4" N 071° 06' 10.3" W
Caption: FIGURE 1: SITE LOCUS
25 BROCK STREET
STOUGHTON, MA

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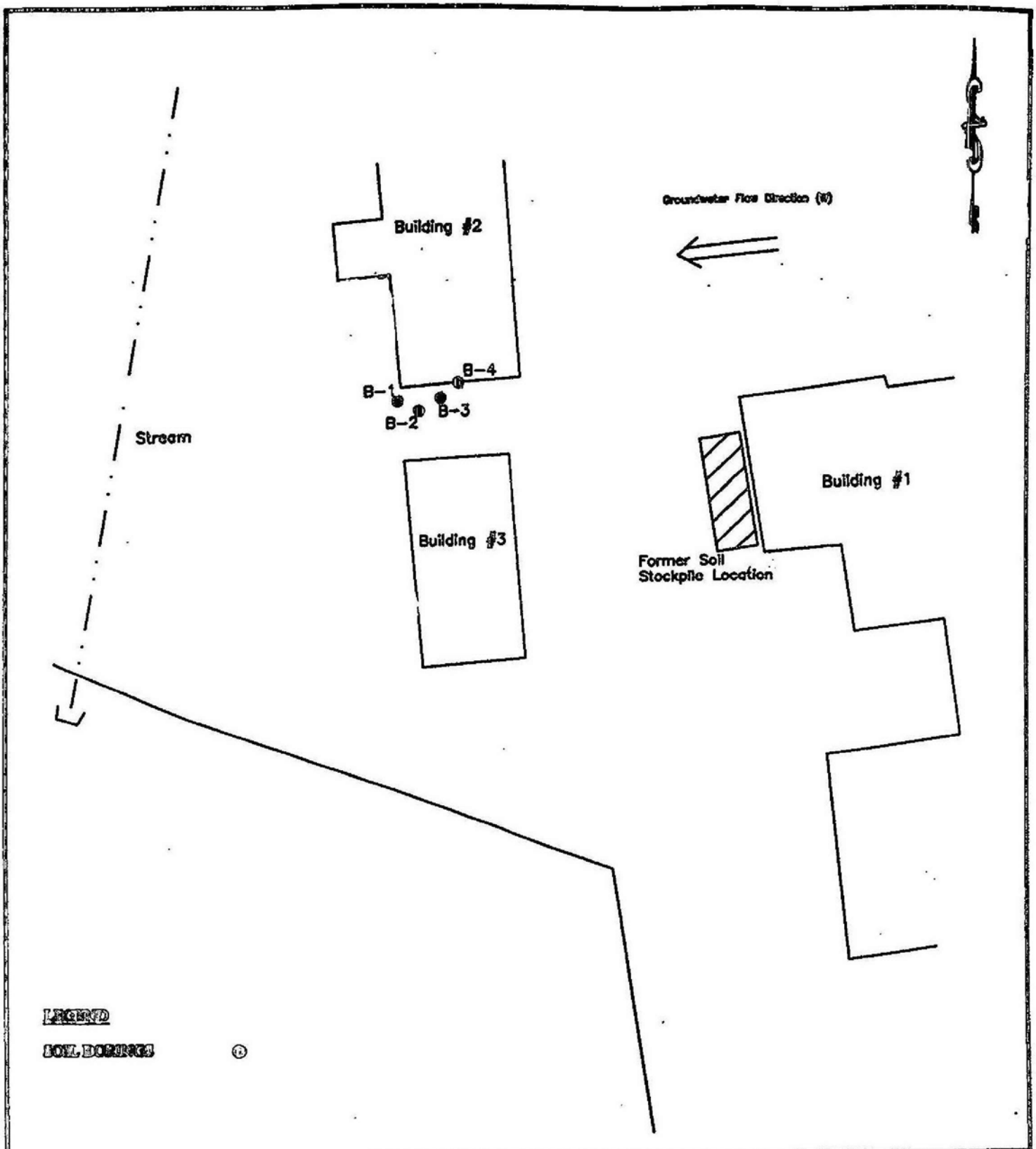

Date	Ch'ck	Revisions

Figure 2 - Site Plan
25 BROCK STREET
STOUGHTON, MASSACHUSETTS

Designed by:
Drawn by: AMM
Checked by: AMM
Approved by: BVM

Scale: not to scale
Date: MAY 28, 1998

NORFOLK ENVIRONMENTAL
CONSULTING ENGINEERS & LAND SURVEYORS
1244 BROADWAY (RT. 138)
RAYNHAM, MA.
1-(508)-822-5900

SHEET
1 OF 1

265.002

SCANNED

IMMEDIATE RESPONSE ACTION COMPLETION REPORT/
RESPONSE ACTION OUTCOME
COMMERCIAL PROPERTY
OFF 17 MORTON SQUARE
STOUGHTON, MASSACHUSETTS
RTN 4-13478

SUBMITTED TO:

Mr. David M. Tonaszuck
Bureau of Waste Site Clean-up
DEP-Southeast Region
20 Riverside Drive
Lakeville, Massachusetts 02347

May 22, 1998
Project No. 3866

CONECO
Engineers & Scientists

SCANNED

Civil Design & Land Planning
Geotechnical Engineering
Environmental Consulting
Regulatory Compliance & Permitting

May 22, 1998
Project No. 3866

Mr. David M. Tonaszuck
Bureau of Waste Site Clean-up
DEP-Southeast Region
20 Riverside Drive
Lakeville, Massachusetts 02347

RE: **Immediate Response Action Completion Report /Response Action Outcome**
Commercial Property
Off 17 Morton Square
Stoughton, Massachusetts
RTN 4-13478

Dear Mr. Tonaszuck:

Coneco Engineers and Scientists (CONECO) has been contracted to perform a Immediate Response Action (IRA) and Response Action Outcome (RAO) at the commercial property located at Off 17 Morton Square in Stoughton, Massachusetts, hereinafter, the "Site." The enclosed report was prepared in accordance with the Massachusetts Contingency Plan (310 CMR 40.0000) and is based on the Immediate Response Action (IRA) Plan recently completed at the Site. In summary, it is the opinion of CONECO that the IRA analytical results indicate that a condition of "No Significant Risk" exists for soil and groundwater at the Site. An Immediate Response Action Completion Form (BWSC-105) and Response Action Outcome Form (BWSC-104) are presented as Appendix A (Tab 1).

CONECO's oversight and assessment findings are detailed in the attached report. If there are any questions, please contact the undersigned.

Sincerely,
Coneco Engineers and Scientists

Thomas B. Heyner, Jr.
Project Manager

Nicholas A. Lanney, P.E., L.S.P.
Principal

TBH:NAL;tc
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TABLE OF CONTENTS

1.0 Introduction 1
1.1 Background 1
1.2 Scope of Services 1

2.0 Site Overview 2
2.1 Site Parameters 2
2.2 Topography and Drainage 3
2.3 Sensitive Receptors 3
2.4 Geology (Literature Review) 3

3.0 Immediate Response Action Activities 4
3.1 Contaminated Soil Excavation and Disposal 4
3.3 Field Screening 5
3.4 Confirmatory Analysis 5
3.5 Remediation Waste 5

4.0 Analytical Results 6

5.0 Method 1 Risk Characterization 6
5.1 Soil Categories 6
5.2 Soil Exposure Point Concentrations and Method 1 Risk Characterization 7
5.3 Groundwater Categories 7
5.4 Groundwater Method 1 Risk Characterization 8
5.5 Summary of Risk 8

6.0 Response Action Outcome 9

7.0 Limitations 10

TABLES

Table 1 - Field Screening Results - January 5, 1998 5

Table 2 - Method 1 Risk Characterization - Soil 7

Table 3 - GW-1 / GW-2 Groundwater Classification Criteria 8

FIGURES

Figure 1	Site Locus Map
Figure 2	Site Plan

APPENDICES

Appendix A	Response Action Outcome Statement (BWSC-104) Immediate Response Action (IRA) Transmittal Form (BWSC-105)	Tab 1
Appendix B	Site Photographs	Tab 2
Appendix C	Standard Operating Procedures	Tab 3
Appendix D	Bill of Lading Uniform Hazardous Waste Manifest	Tab 4
Appendix E	Original Laboratory Data, Laboratory QA/QC, Methods, and Chain of Custody	Tab 5
Appendix F	Public Notifications	Tab 6

1.0 INTRODUCTION

1.1 Background

Available information related to the release at the Site is as follows:

On November 10, 1997, Mr. David Tonaszuck of the Department of Environmental Protection (DEP) - Southeastern Regional Office (SERO) issued a Notice of Responsibility (NOR) to the owner of the Site for stained areas of soil and improperly stored waste oil. According to the owner of the Site, the stained areas of soil are the result of former equipment storage which has been removed from the Site. As such, the quantity of the motor oil release is unknown and observed to be limited to a 8-foot by 9-foot area of the Site.

1.2 Scope of Services

In accordance with our contract, CONECO has performed an Immediate Response Action and Response Action Outcome (RAO) at the commercial property located at Off 17 Morton Square in Stoughton, Massachusetts. Consistent with applicable guidelines for an "Immediate Response Action" and "Response Action Outcome" as presented in the MCP (310 CMR 40.0000), the objective of this IRA was to remove petroleum-contamination soils impacted by the release of motor oil to background concentrations, remove the improperly-stored waste oil at the Site, and determine whether groundwater had been impacted by the release. To accomplish this objective, CONECO performed the following tasks:

1. A Site-specific Health and Safety Plan was updated and implemented for CONECO on-Site investigatory personnel.

2. On December 5, 1997, five shallow, hand-dug test holes were performed at the Site to delineate the release as well as obtain soil samples to submit for disposal criteria laboratory analysis. Soil samples from the test holes were composited into a single soil sample for disposal criteria analysis at a Massachusetts-certified laboratory.

3. On December 31, 1997, Mr. David Tonaszuck of DEP-SERO granted verbal permission to conduct an IRA which included the removal of up to 10 cubic yards of petroleum contaminated soil and the proper disposal of the waste oil at a licensed disposal facility.

4. Contaminated soils were excavated on January 5, 1998 and transported under a Bill of Lading to the Bardon Trimount Facility located in Stoughton, Massachusetts for destruction for asphalt batching.

5. Representative soil samples were collected from the bottom and sidewalls of the excavation area. Soil samples were screened in the field for volatile compounds (VCs) utilizing a HNu Model HW-101 10.2 eV photoionization detector (PID) and total petroleum hydrocarbons (TPH) by a Petroflag® Hydrocarbon Analyzer. Select soil samples from the

bottom and sidewalls of the excavation were submitted to a Massachusetts-certified laboratory for analysis of total petroleum hydrocarbons (TPH) as diesel range organics (DRO) by EPA Method 8100.

6. The improperly stored waste oil at the Site was transported to a licensed facility on March 18, 1998.

7. As determined by the above investigations, the conditions of the Site were evaluated within the scope and meaning of the Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, Chapter 21E of the Massachusetts General Laws, and the MCP (310 CMR 40.0000).

2.0 SITE OVERVIEW

2.1 Site Parameters

The Site is located on Morton Street approximately 600 feet south of the intersection of Perry Street in Stoughton, Massachusetts. A Site Locus Map and Site Plan are provided for reference as Figures 1 and 2, respectively. Site photographs are presented as Appendix B (Tab 2).

Coordinates:	UTM 4,665,050 meters N UTM 326,175 meters E (Zone 19)
Ownership:	The current Site owner is Murphy Coal Co., Inc.
Structures:	A rectangular, two-story building with a footprint area of approximately 40,000 square feet occupies the western portion of the Site. According to available information, the building was constructed prior to 1960.
Occupancy & Use:	The Site is utilized as a commercial property. Three 10,000-gallons fuel oil aboveground storage tanks (ASTs) are located at the Site. The building at the Site is leased to M&M Trucking as a vehicle maintenance facility.
Utilities:	No subsurface utilities were identified in the vicinity of the excavation area at the Site.
Site Access/ Barriers:	The Site is accessed from Morton Street which is located to the east of the Site or from the MBTA station which is located to the north of the Site. Train tracks for the MBTA adjoin the Site to the west.

Surface Water: There are no surface water bodies on the Site. The closest surface water body is an unnamed lake located approximately 1,450 feet south of the Site.

Population: Residential properties are located within a 500-foot radius of the Site. According to a population density map for the Town of Stoughton, the approximate population within a 500-foot radius of the Site is 25 to 75.

Institutions: No institutions, as defined in 310 CMR 40.0006, were identified within a 500-foot radius of the Site.

2.2 Topography and Drainage

Based upon a review of the 1987 Brockton USGS (7.5 x 15 minute) quadrangle map, the Site is located approximately 226 feet above mean sea level (MSL). Site topography is relatively flat. Regional topography within a 0.5-mile radius of the Site is relatively flat with topographic elevation ranging from 200 to 240 feet above MSL.

According to the June 1, 1982 Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Town of Stoughton, Community Panel Number 250253 0001-B, the Site is designated as being within "Zone C," defined as an area of minimal flooding potential.

2.3 Sensitive Receptors

A Site Scoring Map, prepared by the Massachusetts GIS, was reviewed at the DEP-NERO on February 16, 1998. This map denotes aquifer yields, wellhead protection areas, water supplies, NHESP Estimated Habitats of Rare Wetlands Wildlife & Priority Habitats, Areas of Critical Environmental Concern, and other potentially sensitive receptors located within 500 feet and a 0.5-mile radius of the Site. Potentially sensitive receptors were also identified through the surficial Site inspection.

According to the GIS map, the Site is not located within an environmentally sensitive area. Zone 2 wellhead protection areas are located approximately 1-mile north and west of the Site. A Zone 2, Interim Wellhead Protection Area, Zone A of a Class A surface water body is located approximately 0.5 miles south of the Site. An area depicted as protected open space is located approximately 1,000 feet east of the Site. No additional potentially sensitive receptors were identified on the GIS map and during the Site inspection.

2.4 Geology (Literature Review)

According to the "USGS Bedrock Geologic Map of Massachusetts" (E-an Zen, 1983), Bedrock at the Site consists of the Dedham Granite, described as light grayish-pink to greenish-gray, equigranular to slightly porphyritic granite.

3.0 IMMEDIATE RESPONSE ACTION ACTIVITIES

The objective of the IRA is to removed soil contaminated by the release of motor oil at the Site, remove the improperly-stored waste oil at the Site, and determine whether groundwater has been impacted by the release. Contaminated soil was to be removed to concentrations consistent with Background Conditions at the Site.

Prior to excavation activities, a waste profile of the petroleum-contaminated soil at the Site was submitted for acceptance at Bardon Trimount in Stoughton, Massachusetts. On December 31, 1997, Mr. David Tonaszuck of DEP-SERO granted verbal permission to conduct an IRA which included the removal of up to 10 cubic yards of petroleum contaminated soil and the proper disposal of waste oil at a licensed disposal facility.

3.1 Contaminated Soil Excavation and Disposal

Mr. Thomas Hevner of CONECO arrived at the Site at 8:00 a.m. on January 5, 1998. Weather conditions during the excavation activities was clear with ambient temperatures of 50° F. During the excavation activities, the Site was inspected by Mr. Nicholas A. Lanney, P.E., L.S.P. of CONECO.

Petroleum-contaminated soils were excavated in the area impacted by the release by Hersee Company of Stoughton, Massachusetts, with oversight by Mr. Thomas Hevner of CONECO. Hersee Company personnel utilized a Case 580 backhoe during the excavation of petroleum-contaminated soils. Contaminated soil was directly loaded into a triaxial dump truck for transport to Bardon Trimount in Stoughton, Massachusetts.

The vertical and horizontal extent of the soil impacted by the petroleum release was delineated utilizing visual and olfactory observations as well as an HNu PID and a Petroflag Hydrocarbon Analyzer. The results of the field screening are presented in Section 3.2. Soils impacted by the petroleum release exhibited a dark gray to black-colored petroleum staining.

Overburden stratigraphy within the excavation consisted of field grass and gravel surface underlain by fill to a depth of approximately 1.5 feet below grade. The fill material was comprised of a buff to black-colored gravelly silty sand. Bedrock was not encountered during the IRA excavation activities.

Field and instrument observations indicate that the release had impacted a 9-foot by 8-foot horizontal area which did not extend beyond 1.5 feet below grade. A clear demarcation between contaminated soil and clean soil was evident at the horizontal and vertical extents of the release-impacted soil. Since the water table was observed during the excavation activities to be located at 2.5 feet below grade, it is the opinion of CONECO that the release did not impact the water table.

At the completion of the excavation, confirmatory soil samples were collected for laboratory analysis (See Section 3.3). CONECO departed the Site at 2:30 p.m.

3.3 Field Screening

Representative soil samples collected from the excavation were placed in clean, tightly sealed glass jars with aluminum foil cover liners for in-field screening using a PID and Petroflag Hydrocarbon Analyzer. A discussion of these procedure and standard operating protocols are included in Appendix C (Tab 3). Headspace procedures were performed in accordance with DEP Policy WSC 94-400. Table 1 presents the Field Screening Results.

Table 1 - Field Screening Results - January 5, 1998

Sample No.	Location	Depth (feet)	PID Reading (ppm)	Field Screening for TPH as Motor Oil (mg/kg)
S-1	Base	1.5	ND	29
S-2	Base	1.5	3.0	177

Note: ND = Not Detected above the instrument's minimum detection limit of 0.2 parts per million per volume (ppmv).
--- = Field Screening for TPH as Motor Oil not performed.

3.4 Confirmatory Analysis

The two base composite soil samples were composited into a single soil sample and placed in a clean 4-ounce glass jar for laboratory analysis of TPH as DRO by EPA Method 8100. The soil sample was delivered by courier on January 5, 1998, to New England Testing Laboratory located in North Providence, Rhode Island. Sampling locations are shown on Figure 2.

3.5 Remediation Waste

In accordance with 310 CMR 40.0030 (Management Procedures for Remediation Waste) and 310 CMR 30.000 (Massachusetts Hazardous Waste Regulations), the contaminated soil at the Site was removed under a Bill of Lading. A total of 2.68 tons of soil were removed from the Site on January 5, 1998, and transported to the Bardon Trimount located in Stoughton, Massachusetts for asphalt batching. A copy of the Bill of Lading is presented in Appendix D (Tab 4).

In accordance with 310 CMR 30.000 (Massachusetts Hazardous Waste Regulations), the improperly stored waste oil at the Site was disposed at a licensed facility. On March 18, 1998, 165 gallons of waste oil was transported to United Oil Recovery, Inc. by Advance Liquid Recycling. A Uniform Hazardous Waste Manifest is presented in Appendix D (Tab 4).

4.0 ANALYTICAL RESULTS

TPH was not detected above laboratory quantification limits in the composite soil sample from the base of the excavation. Original laboratory data, laboratory QA/QC, methods, and the chain-of-custody forms are included as Appendix E (Tab 5). Figure 2 presents the locations of the confirmatory soil samples and a summary of the analytical results.

5.0 METHOD 1 RISK CHARACTERIZATION

Under the MCP (310 CMR 40.0000), once a property has been classified as a Disposal Site, a risk assessment is necessary to demonstrate that a condition of "No Significant Risk" to health, safety, public welfare, and the environment exists at the Site. Otherwise, further remedial actions are required to achieve a condition of "No Significant Risk."

To determine whether further action is required at the Site, it is first necessary to determine whether a condition of "No Significant Risk" exists using Method 1 Risk Characterization procedures. The following sections present the classifications of soil and groundwater for an MCP Method 1 Risk Characterization, and the applicable threshold concentrations for the contaminants present at the Site.

5.1 Soil Categories

According to the MCP, 310 CMR 40.0933, soil at a given site must be classified as either S-1, S-2, or S-3, based upon exposure potential according to three criteria: frequency of use, intensity of the use, and accessibility. The most stringent classification for each contaminant is then used to determine the level at which contamination poses "No Significant Risk" to affected receptors. The Site soil is described as follows:

Frequency of Use: High. Adults reside at the Site and children may be present as infrequent visitors.

Intensity of Use: Low. Passive activities, such as walking and bird watching, will not have the potential to disturb the soil.

Accessibility: The area of soil contamination is located between 0 and 1.5 feet below surface grade and is considered accessible since it is unpaved.

Using these parameters, soil at the Disposal Site is classified as Category S-2.

5.2 Soil Exposure Point Concentrations and Method 1 Risk Characterization

The MCP, 310 CMR 40.0975(6)(a-c), presents the Method 1 soil category S-1, S-2, and S-3 standards associated with groundwater categories GW-1 through GW-3. The Site does not meet the criteria for GW-1 or GW-2 soil classifications.

The concentrations at the Site are compared to the applicable S-2/GW-2&3 standards to determine whether a condition of "No Significant Risk" currently exists at the Site. To account for foreseeable futures uses of the Site, the concentrations at the Site are compared to the applicable S-1/GW-2&3 standards to determine whether a condition of "No Significant Risk" exists at the Site in the future, if the exposure scenario were altered.

For the purposes of this risk characterization, exposure point concentrations in soil at the Disposal Site consist of the composite soil sample from the base of the excavation. Since TPH was not detected above laboratory quantification limit in the base composite soil sample, one-half of the analyte's detection limit was factored into the calculation of the soil exposure point concentration. Table 2 presents the Method 1 Risk Characterization for the Site soils.

Table 2 - Method 1 Risk Characterization - Soil

Classification	TPH in mg/kg
S-1/GW-3	800
S-2/GW-3	2,000
Exposure Point Concentrations	5

Notes: **Bold** - Exceeds applicable Method 1 Risk Characterization Standard.

Since the exposure point concentration for TPH is below the applicable TPH Method 1 Risk Characterization Standard, a condition of "No Significant Risk" exists for current and future uses of soil at the Site.

5.3 Groundwater Categories

As listed at 310 CMR 40.0932, groundwater at all locations is classified as category GW-3, based upon its potential to discharge to surface water. Groundwater can also be classified as GW-1 based upon potential to be used as drinking water supply, and as GW-2, based upon the potential for inhalation of vapors of oil or hazardous materials in indoor air. The most stringent classification for each contaminant is then used to determine the level at which contamination poses "No Significant Risk" to affected receptors.

The GW-1 groundwater classification evaluation for the Site, based upon a DEP Priority Resources Map, is presented in Table 3.

Table 3 - GW-1 / GW-2 Groundwater Classification Criteria

GW-1 Criteria	GW-1 Classification
1) within the Zone II for a public water supply	No
2) within an Interim Wellhead Protection Area	No
3) within a Potentially Productive Aquifer	No
4) within the Zone A of a Class A surface water body used as a public water supply	No
5) at any point located 500 or more feet from a public water supply distribution pipeline	No
6) at any groundwater sampling point located within 500 feet of a private water supply well	No
GW-2 Criteria	**GW-2 Classification**
1) Located within 30 feet of an occupied building and average annual depth to water is less than 15 feet	No

Under these criteria, the groundwater at the Site is subject to GW-3 groundwater classifications.

5.4 Groundwater Method 1 Risk Characterization

The laboratory results demonstrate that the horizontal and vertical extent of the soil impacted by the release have been delineated at the Disposal Site. TPH as DRO was not detected above laboratory quantification limits. Since the vertical extent of the soil impacted by the release has been delineated at the Site and groundwater was not encountered during the excavation activities, a condition of "No Significant Risk" exists for groundwater at the Disposal Site.

5.5 Summary of Risk

Conditions at the Site were evaluated in respect to the definition of an "Imminent Hazard" as presented in 310 CMR 40.0950. As such, conditions which would represent an "Imminent Hazard" are not present at the Site. Background conditions were not evaluated as part of this investigation.

Since the exposure point concentration for TPH is below the applicable TPH Method 1 Risk Characterization Standard, a condition of "No Significant Risk" exists for current and future uses of soil at the Site. The petroleum release at the Disposal Site did not impact groundwater and as such, a condition of "No Significant Risk" exists for groundwater at the Disposal Site.

6.0 RESPONSE ACTION OUTCOME

Environmental conditions of the Disposal Site were evaluated in a manner consistent with guidelines presented in the "Massachusetts Contingency Plan" (310 CMR 40.0000). As a result of a release of an unknown quantity of motor oil to a limited area at the Site and the observation of improperly stored waste oil at the Site, a RNF was submitted to the DEP and the Site was subsequently listed as DEP File No. 4-13478.

On December 31, 1997, Mr. David Tonaszuck of DEP-SERO granted verbal permission to conduct an IRA which included the removal of up to 10 cubic yards of petroleum contaminated soil and to properly dispose of the waste oil at a licensed disposal facility. The objective of this IRA was to remove petroleum-contamination soils impacted by the release of motor oil to background concentrations and determine whether groundwater had been impacted by the release. Petroleum-contaminated soil was to be removed to concentrations consistent with Background Conditions at the Site.

Immediate Response Action

- On January 5, 1998, 2.68 tons of petroleum contaminated soil were excavated at the Site and transported to Bardon Trimount in Stoughton, Massachusetts for destruction by asphalt batching. On March 18, 1998, 165 gallons of waste oil was transported to United Oil Recovery, Inc. by Advance Liquid Recycling.

- A clear demarcation between contaminated soil and clean soil was evident at the horizontal and vertical extents of the release-impacted soil. Field screening of composite soil samples at the Site with a PID and Hydrocarbon Analyzer supported this visual observation.

- Overburden stratigraphy within the excavation consisted of field grass and gravel surface underlain by fill to a depth of approximately 1.5 feet below grade. The fill material was comprised of a buff to black-colored gravelly silty sand. Bedrock was not encountered during the IRA excavation activities. Upon further excavation, the water table was determined to be located at a depth of 2.5 feet below grade.

Risk Characterization

- The exposure point concentration for TPH is below the applicable TPH Method 1 Risk Characterization Standard. A condition of "No Significant Risk" exists for current and future uses of soil at the Site.

- The vertical extent of the soil impacted by the release has been delineated at the Site and groundwater was observed at a depth of 1-foot below the base of the excavation. As such, it is the opinion of CONECO that groundwater was not impacted by the release of motor oil at the Site. A condition of "No Significant Risk" exists for groundwater at the Disposal Site.

- Since the TPH concentration in soil at each sampling location are below the applicable Method 1 S-1 standard as specified in 310 CMR 40.0900, background concentrations in soil are considered approached by CONECO. Additionally, since groundwater was not impacted by the release at the Disposal Site, an evaluation of whether background concentrations have been approached in groundwater is not applicable.

- The intent of the IRA was remove petroleum contaminated soils to background concentrations, remove the improperly-stored waste oil at the Site, and determine whether groundwater had been impacted by the release. As such, the objectives of the IRA have been accomplished and an IRA Completion Statement (BWSC-105) is presented as Appendix A (Tab 1).

Response Action Outcome

- A Permanent Solution has been achieved and the level of TPH in soil approach background. Groundwater was not impacted by the release of motor oil at the Site.

- A condition of "No Significant Risk" exists for current and future uses of soil and groundwater at the Disposal Site.

- The IRA has eliminated all threats of release (i.e., improperly stored waste oil and exterior equipment storage).

- Conditions for a Class A-1 RAO have been met at the Site in accordance with 310 CMR 40.1035 and 40.1036(1). Copies of public notice requirements, and the original DEP transmittal forms are included in Appendices F (Tab 6) and A (Tab 1), respectively.

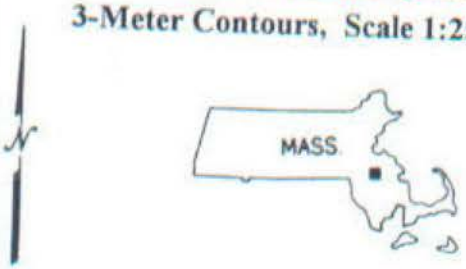
7.0 LIMITATIONS

The conclusions expressed by CONECO in this report are based solely on the references cited. Observations were made under the conditions stated. Information provided by federal, state, and local agencies contacted was relied upon as accurate and complete. The purpose of this study was to establish via a limited scope of work whether there is evidence that a release of oil or hazardous materials has occurred at the Site or that a threat of release exists. This report represents CONECO's opinion relative to such evidence. Unless otherwise specified in the scope of work, CONECO accepts no responsibility for client performance of recommendations as may be offered in this report. No attempt was made to investigate Site owner or operator compliance with federal, state, or local laws and regulations in connection with Site usage.

With specific regard to subsurface explorations, data obtained from the test borings may not be wholly representative of the nature of subsurface conditions at locations other than the actual test location. Variable conditions may only become evident upon further exploration. Should

additional information become available concerning this Site or neighboring properties in the future, that information should be made available to CONECO for review so that the conclusions presented in this report may be modified as necessary.

U.S.G.S. 1987 Brockton Quadrangle
3-Meter Contours, Scale 1:25,000



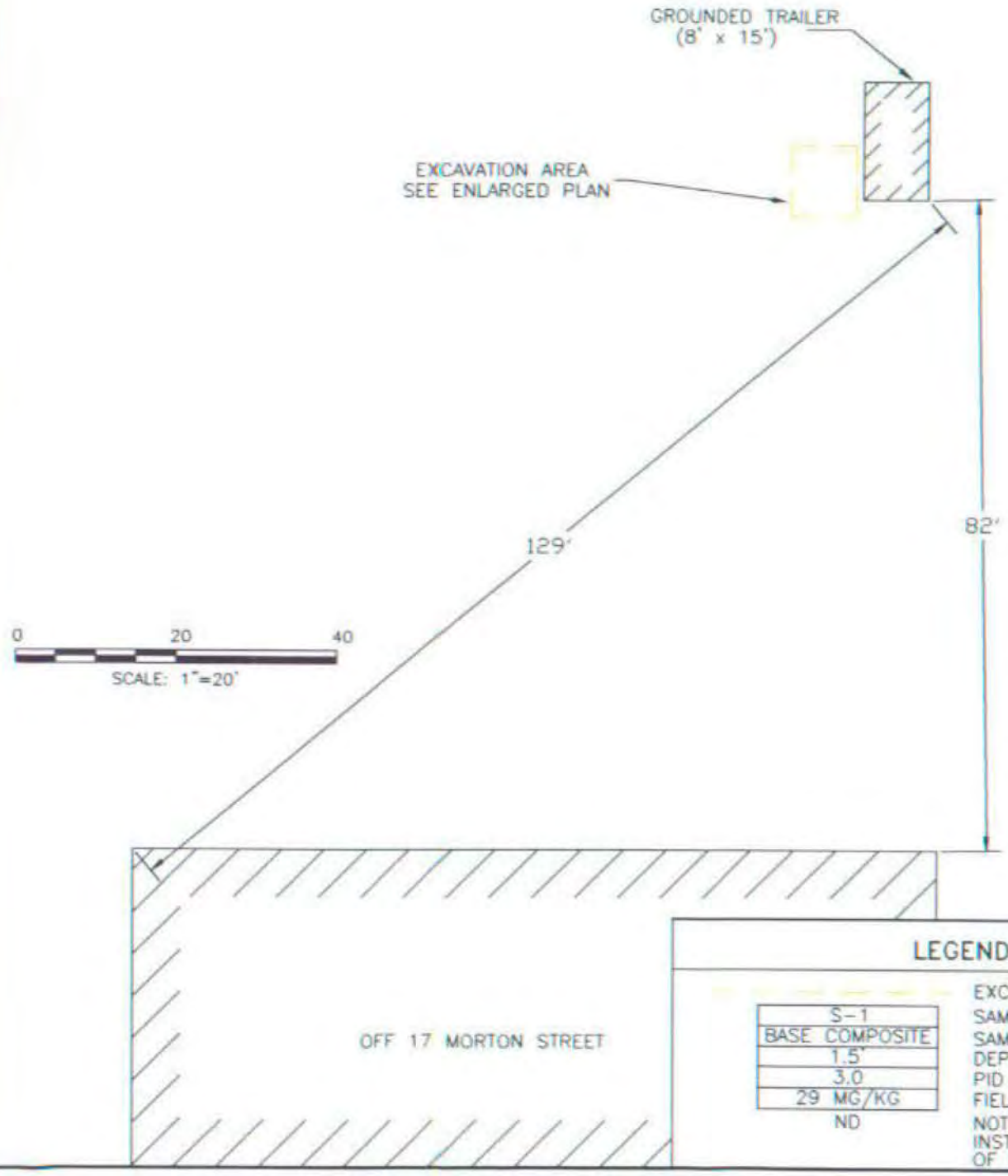
UTM Coordinates: 4,665,250 mN 326,175 mE

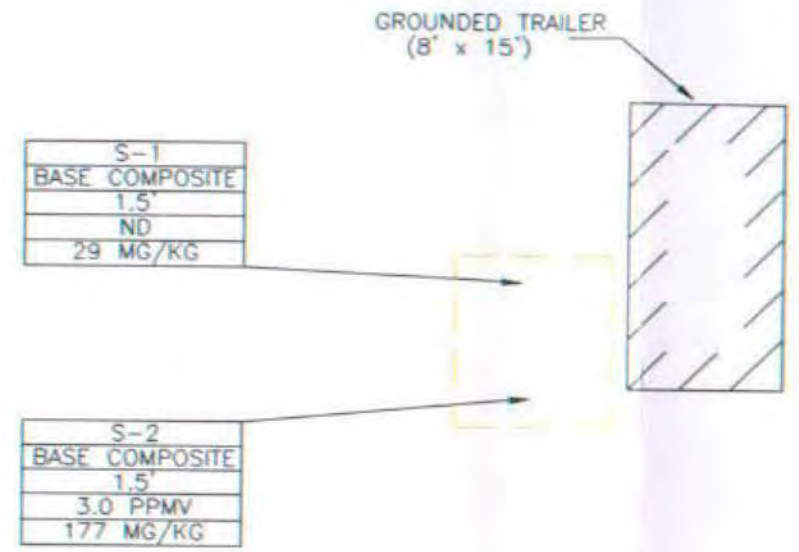
CONECO ENVIRONMENTAL

Site Locus Map

Commercial Property
Off 17 Morton Square
Stoughton, Massachusetts

FIGURE 1





* S-1 & S-2 COMPOSITED INTO A SINGLE SOIL SAMPLE FOR LABORATORY ANALYSIS. TPH AS DRO (EPA 8100) RESULT = BELOW LABORATORY QUANTIFICATION LIMIT OF 10 MG/KG.

ENLARGED PLAN

0 10 20

SCALE: 1"=10'

LEGEND

S-1
BASE COMPOSITE
1.5'
3.0
29 MG/KG
ND

EXCAVATION LIMITS
SAMPLE NUMBER
SAMPLE LOCATION
DEPTH BELOW GRADE
PID IN PPMV
FIELD TPH IN MG/KG
NOT DETECTED ABOVE MIN. INSTRU. DETECTION LIMIT OF 0.2 PPMV

CONECO
Engineers & Scientists
4 FIRST STREET, BRIDGEWATER, MASSACHUSETTS (508) 697-3191

	DRAWN	CHECKED	APPROVED
BY	T.B.H.		
DATE	3/10/98		

SITE PLAN

COMMERCIAL PROPERTY
OFF 17 MORTON SQUARE
STOUGHTON, MASSACHUSETTS

SCALE	PROJECT NO.	DRAWING NUMBER
AS NOTED	3866	FIGURE 2

Site Photographs

Photo 1: View of excavation area from east.

Photo 2: View of excavation area from east.

SCANNED
RECEIVED
JAN - 3 1997
D.E.P.
SOUTHEAST REGION

RESPONSE ACTION OUTCOME (RAO) STATEMENT

GETTY SERVICE STATION
825 WASHINGTON STREET
STOUGHTON, MA
MADEP RTN 4-11868

Prepared for:

GETTY PETROLEUM CORP
MASSASOIT AVENUE & DEXTER ROAD
EAST PROVIDENCE, RHODE ISLAND 02914

DECEMBER 11, 1996

Prepared by:

TYREE ORGANIZATION, LTD.
9 OTIS STREET
WESTBOROUGH, MASSACHUSETTS 01581

Matthew J. Lyne
Environmental Scientist
Project Manager

Craig E. Blake, P.E., LSP

Member
The Tyree Organization

TABLE OF CONTENTS

1.0 INTRODUCTION
2.0 BACKGROUND
3.0 VAPOR MONITORING PROGRAM AND SVES OPERATION
4.0 SAMPLING RESULTS
    4.1 Soil Sampling and Analysis
    4.2 Air Sampling and Analysis
5.0 RISK ASSESSMENT
6.0 MANAGEMENT OF REMEDIATION WASTE
7.0 CONCLUSIONS
8.0 SUMMARY
9.0 DISCLAIMER

FIGURES

1. SITE LOCATION MAP
2. SITE PLAN
3. LOCATION OF PRIVATE WELLS
4. SOIL SAMPLE LOCATION MAP -1/26/96

TABLES

1. SUMMARY OF AIR MONITORING
2. SUMMARY OF SOIL ANALYTICAL DATA-1/25/96
3. SUMMARY OF AIR ANALYTICAL DATA- 5/15/96

APPENDICES

A. DRILLING LOGS
B. LABORATORY ANALYTICAL REPORT
C. HAZARDOUS WASTE MANIFEST
D. DEP TRANSMITTAL FORM

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1.0 INTRODUCTION

The following information is provided in support of a Class A-1 Response Action Outcome Statement prepared in accordance with the Massachusetts Contingency Plan (MCP) 310 CMR 40.1000 for the Getty Service Station located at 825 Washington Street, Stoughton, Massachusetts (the "site"). A Site Location Map and a Site Plan are included as Figures 1 and 2, respectively. This statement provides the required information necessary to support a finding that the reported gasoline released to the environment at the site has been reduced to a level of No Significant Risk as defined by (MCP) 310 CMR 40.1036(1).

2.0 BACKGROUND

The subject property is located approximately 200 feet south of the intersection of Washington Street (Route 138) and Park Avenue (Route 27) in Stoughton, Massachusetts. The property contains a one-story building which is used as a service station with one dispenser island. The site maintains four active gasoline underground storage tanks (USTs) located on the north side of the property.

On January 2, 1996, organic vapors were detected in the basement of the Veterans of Foreign Wars (VFW) building, located at 837 Washington Street, Stoughton, Massachusetts. The VFW building is located along the southern property boundary of the site. The source of the vapors has not been determined, but Getty Petroleum Corp. (Getty) voluntarily began a vapor assessment program. The Massachusetts Department of Environmental Protection (DEP) was contacted of the probable release on January 2, 1996, by Michelle Grenier of the Stoughton Environmental Office. Since the origin of the release was believed to be the service station, the DEP issued Getty the release tracking number 4-11868 identifying the service station as a disposal site. On January 4, 1996, Michael Moran of the DEP verbally approved an Immediate Response Action Plan which consisted of installing a soil vapor extraction system (SVES) to recover the organic vapors and conducting additional assessment. On January 18, 1996, DEP issued a Notice of Responsibility (NOR) to Getty for the release.

3.0 VAPOR MONITORING PROGRAM AND SVES OPERATION

On January 2, 1996, Tyree Organization, Ltd. (Tyree) was retained by Getty to assess the reported detection of organic odors in the basement of the VFW building located at 837 Washington Street. A Tyree environmental scientist monitored organic vapor levels in the basement of the VFW building, as well as the Getty Service Station, using a photoionization detector (PID). The area of the basement located along the northern side of the VFW building exhibited the highest PID readings, which were monitored between 58 parts per million (ppm) and 96 ppm. There were no detectable levels of volatile organics in the ground floor of the VFW building or in the Getty Service Station.

From January 2, 1996 through September 24, 1996, the VFW basement was monitored on 46 occasions. PID readings ranged from 86 ppm on January 2, 1996, to below detection limits on September 24, 1996. A summary of the Air Monitoring Data is included on Table 1.

On January 4, 1996, Tyree completed the installation of the SVES and operation of the SVES commenced. The SVES consisted of two vapor extraction wells located on the southern side of the Getty Service Station, adjacent to the VFW basement wall. A Rotron blower was used as the vacuum source to extract VOC vapors from the vadose zone. One 55-gallon drum of granular activated carbon (GAC) was used to treat the vapors prior to discharge to the atmosphere. The SVES was housed in a portable trailer which was surrounded by concrete barriers. Influent and effluent vapors were monitored using a PID. During the monitoring period, influent PID readings ranged from an initial reading of 100 ppm monitored on January 15, 1996 to 1.8 ppm monitored on June 19, 1996. Effluent PID readings ranged from 0 ppm to 40 ppm periodically during the six months that the SVES was in operation. Due to the PID reading of 40 ppm in the SVES effluent on February 23, 1996, the granular activated carbon air treatment vessel was replaced on March 15, 1996. A summary of the Air Monitoring Data is included as Table 1.

Due of the consistently low levels of organic vapors in the influent of the SVES and the non detectable organic vapors in the VFW basement, Tyree shut the SVES off on June 26, 1996. During the period between June 26, 1996, through September 24, 1996, vapors were monitored in the VFW basement on 8 occasions. Organic vapors were not detected during any of the monitoring events. On October 1, 1996, the SVES was removed from the site.

4.0 SAMPLING RESULTS

4.1 Soil Sampling and Analysis

On January 25, 1996, five soils borings, designated as SB-1, SB-2, SB-3, SB-4, and SB-5 were advanced between the VFW building and the Getty Service Station. The locations of the soil borings are depicted on Figure 3, Soil Boring Location Map.

Soil samples were obtained continously throughout drilling operations to approximately 6 to 8 feet below grade, where refusal was encountered. Groundwater was not encountered at any of the boring locations. Soil samples collected from the split spoon sampler were field screened for volatile organic compounds (VOCs) using a PID. PID readings ranged from below detection limits to 7.2 ppm. PID readings are included on the Boring Logs found in Appendix A.

Soil samples exhibiting the highest PID measurements were submitted to Environmental Testing Laboratories, Inc. (ETL), in Farmingdale, New York, a state certified laboratory for analysis of VOCs plus MTBE by EPA Method 8240 and Total Lead. According to the laboratory analytical report, lead was reported as detected in soil samples SB-1, SB-2, SB-3, SB-4, and SB-5, but

below the MCP Method 1 S-1/GW-1 Soil Standard. All additional compounds analyzed for by the specified analytical methods were reported below detection limits for all soil samples. A summary of the soil analytical data is included as Table 2 and depicted in Figure 4. The laboratory analytical report is included in Appendix B.

4.2 Air Sampling and Analysis

On May 15-16, air samples were collected from the VFW basement and from the SVES influent and effluent. Air samples were collected by passing 2 liters of air through a carbon vial. The carbon vials were submitted to ETL for the analysis of VOCs by EPA Method 8240. Results of the analysis indicated that all the compounds analyzed for by the specified method were below detection limits for all four samples collected. A summary of the air analytical data is included in Table 3 and the laboratory analytical report is included in Appendix B.

5.0 RISK ASSESSMENT

The MCP requires that all feasible means should be taken to mitigate the impacts of any release until a level of "No Significant Risk" has been achieved. The MCP also requires that the remedial actions taken to reduce the risks associated with the release shall reduce, to the extent feasible, the concentrations of oil and hazardous material to "background" levels that would exist in absence of the release. A review of Tables 2 and 3 shows benzene, toluene, ethyl-benzene, total xylenes (BTEX), methyl tert-butyl ether (MTBE) have been reduced to background levels. The concentration of lead in soil samples collected was was below the DEP accepted lead background level of 99 ppm. Therefore, a level of No Significant Risk has been documented as being attained at this site.

6.0 MANAGEMENT OF REMEDIATION WASTE

As a result of drilling activities on January 25, 1996 at the site, three 55-gallon drums containing drill cuttings were generated. The drums were disposed at Environmental Waste Resources, an approved disposal facility in Waterbury, Connecticut. A hazardous waste manifest for this waste is included in Appendix C.

Due to the replacement of GAC for the SVES, 200 pounds of GAC were disposed of at an approved disposal facility. According to the GAC supplier, the GAC is not hazardous and does not require the hazardous waste manifest procedures.

7.0 CONCLUSIONS

Based on site observations and analytical tests performed on confirmatory soil samples, the following conclusions have been reached:

1. The reported release of gasoline to the environment that occurred at 825 Washington Street, Massachusetts has been successfully mitigated by implementing soil vapor extraction.

2. A permanent solution has been achieved and background levels of contaminants have been achieved.

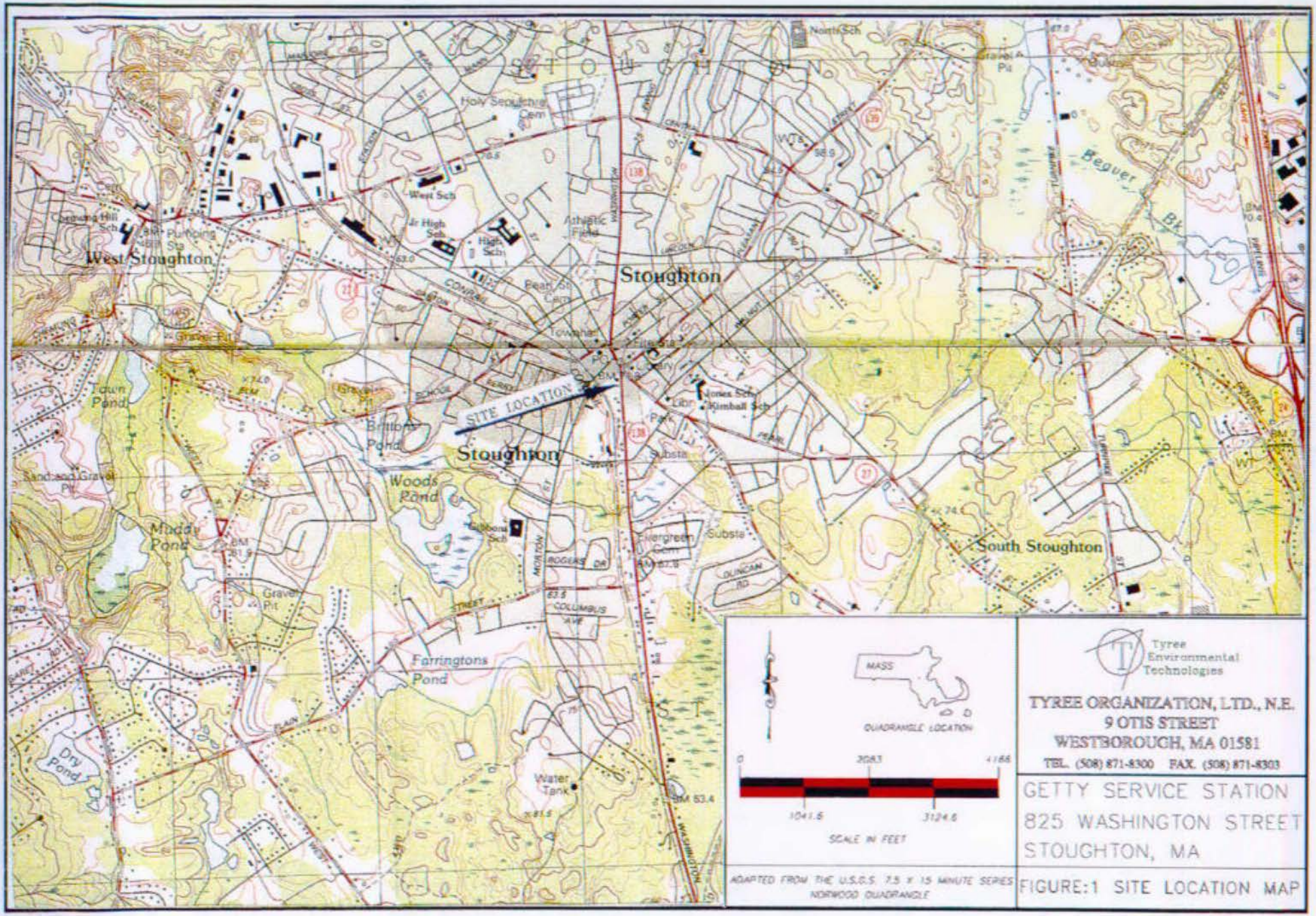
3. The conditions of a Class A-1, Response Action Outcome, as outlined in 310 CMR 40.1036(1) have been met.

8.0 SUMMARY

In accordance with the MCP 310 CMR 40.0000, a Class A-1 Response Action Outcome (RAO) Statement is being submitted to MADEP.

9.0 DISCLAIMER

This Response Action Outcome (RAO) Statement has been prepared for the use of Getty Petroleum Corp and/or its designated agents. Reasonable due diligence was exercised by the staff of Tyree Organization, Ltd. in performing field work and writing this document. The conclusions provided by Tyree in this report are based solely on the information reported in this document. Future investigative site information which was not available to Tyree at the time of this statement may result in a modification of the conclusions stated above. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur. This investigation and report has been conducted in accordance with generally accepted practices. No other warranty, expressed or implied, is made.



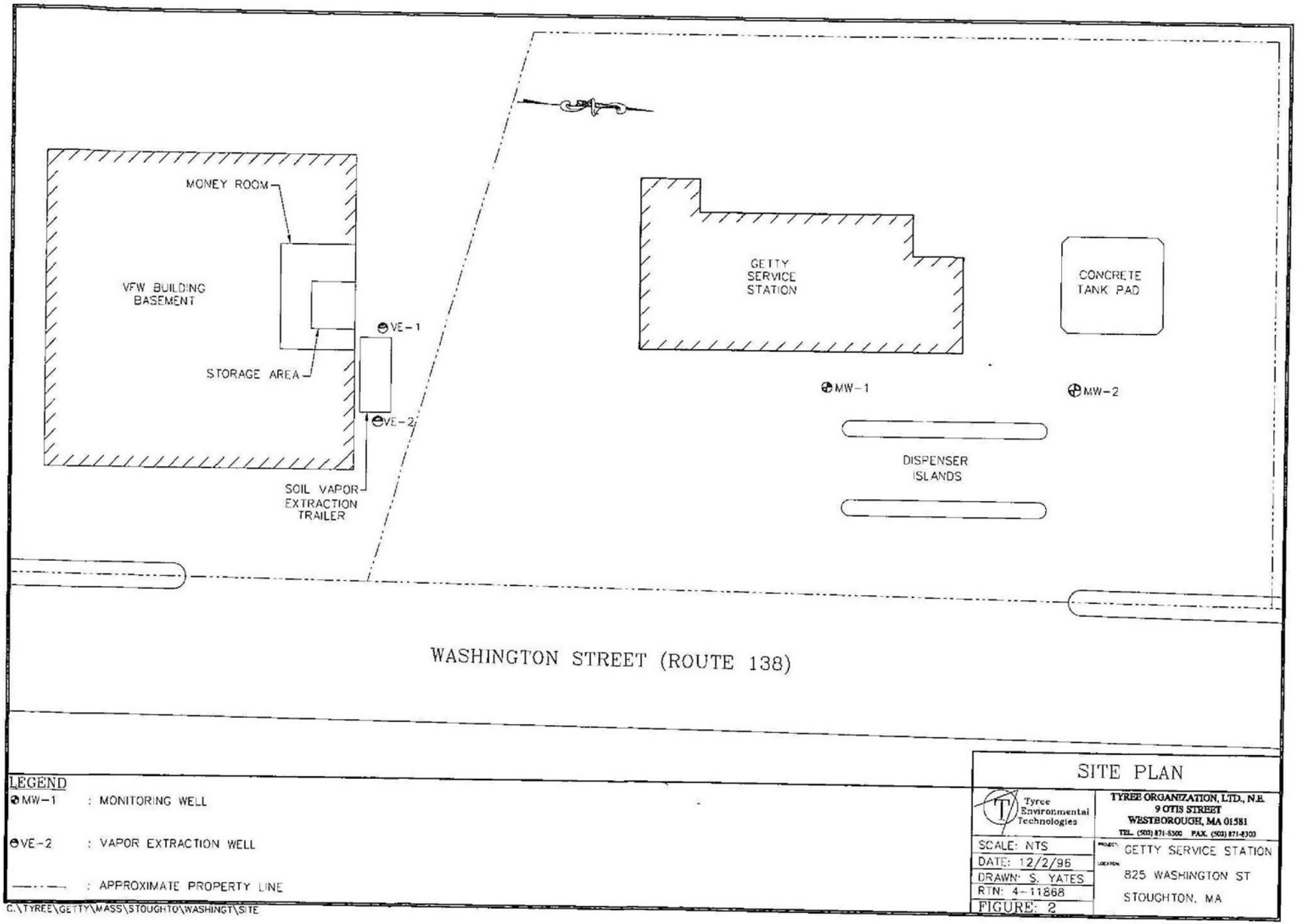
ADAPTED FROM THE U.S.G.S. 7.5 X 15 MINUTE SERIES NORWOOD QUADRANGLE

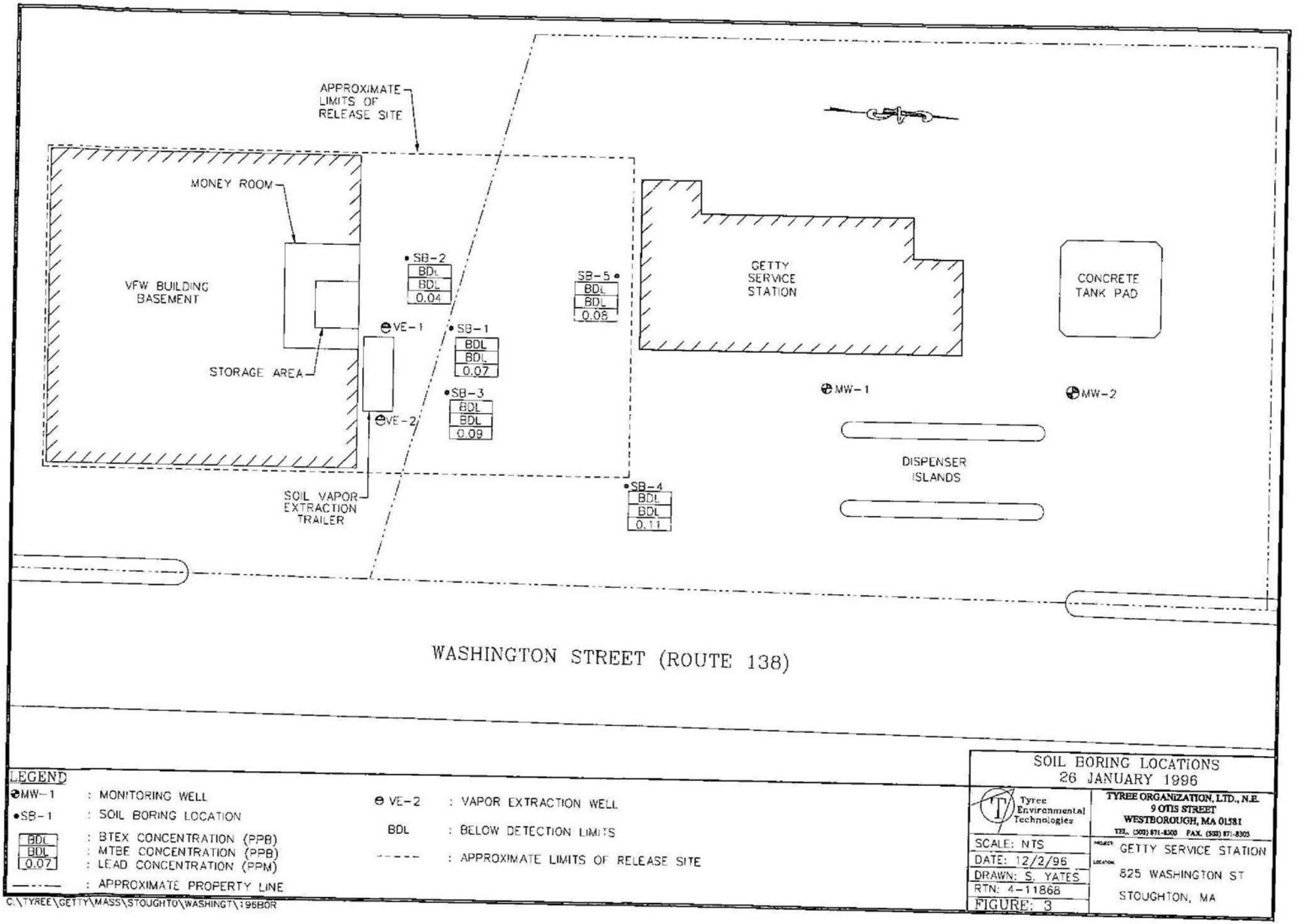
Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-8300 FAX. (508) 871-8303

GETTY SERVICE STATION
825 WASHINGTON STREET
STOUGHTON, MA

FIGURE:1 SITE LOCATION MAP


MONEY ROOM
VFW BUILDING BASEMENT
STORAGE AREA
VE-1
VE-2
SOIL VAPOR EXTRACTION TRAILER
GETTY SERVICE STATION
CONCRETE TANK PAD
MW-1
MW-2
DISPENSER ISLANDS
WASHINGTON STREET (ROUTE 138)
LEGEND
MW-1 : MONITORING WELL
VE-2 : VAPOR EXTRACTION WELL
: APPROXIMATE PROPERTY LINE
SITE PLAN
Tyree Environmental Technologies
TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-8300 FAX. (508) 871-8303
SCALE: NTS
DATE: 12/2/96
DRAWN: S. YATES
RTN: 4-11868
FIGURE: 2
PROJECT: GETTY SERVICE STATION
LOCATION: 825 WASHINGTON ST
STOUGHTON, MA
C:\TYREE\GETTY\MASS\STOUGHTO\WASHINGT\SITE



LEGEND

- MW-1 : MONITORING WELL
- SB-1 : SOIL BORING LOCATION
- BDL / BDL / 0.07 : BTEX CONCENTRATION (PPB) / MTBE CONCENTRATION (PPB) / LEAD CONCENTRATION (PPM)
- ——— : APPROXIMATE PROPERTY LINE
- VE-2 : VAPOR EXTRACTION WELL
- BDL : BELOW DETECTION LIMITS
- - - - - : APPROXIMATE LIMITS OF RELEASE SITE

C:\TYREE\GETTY\MASS\STOUGHTO\WASHINGT\196B0R

SOIL BORING LOCATIONS
26 JANUARY 1996

Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-8300 FAX. (508) 871-8305

SCALE: NTS
DATE: 12/2/96
DRAWN: S. YATES
RTN: 4-11868
FIGURE: 3

PROJECT: GETTY SERVICE STATION
LOCATION: 825 WASHINGTON ST
STOUGHTON, MA

TABLE 1

SUMMARY OF AIR MONITORING

Getty Service Station
825 Washington Street
Stoughton, Massachusetts

Date	PID Influent (VE-1)	PID Influent (VE-2)	PID Influent (Combined)	PID Effluent	VFW Basement PID	SVES On / Off
2-Jan-96	SVES NOT IN OPERATION				86	Off
15-Jan-96	110	5.0	57.5	20.0	< 1	On
19-Jan-96	100	< 1	50	11.5	< 1	On
23-Jan-96	55	< 1	27.5	9.0	< 1	On
25-Jan-96	30	< 1	15	8.8	< 1	On
30-Jan-96	40	< 1	20	6.2	< 1	On
2-Feb-96	19	2.0	10.5	7.0	< 1	On
12-Feb-96	25	2.0	13.5	18.0	< 1	On
21-Feb-96	34	< 1	17	29.0	< 1	On
22-Feb-96	105	30.0	67.5	40.0	25	Off
23-Feb-96	100	4.0	52	40.0	< 1	On
27-Feb-96	102	37.0	69.5	30.7	< 1	On
29-Feb-96	38	2.0	20	18.0	< 1	On
6-Mar-96	40	4.0	22	20.0	< 1	On
12-Mar-96	44	2.0	23	22.0	< 1	On
15-Mar-96	19	2.0	10.5	0.0	< 1	On
18-Mar-96	52	0.2	26.1	5.6	< 1	On
26-Mar-96	38	1.8	19	14.2	< 1	On
2-Apr-96	20	1.8	10.9	7.2	< 1	On
4-Apr-96	19	2	10.5	1	< 1	On
9-Apr-96	34	< 1	17	9	< 1	On
15-Apr-96	10.6	2.2	6.4	6.8	< 1	On
22-Apr-96	8.2	< 1	4	3.8	< 1	Off
23-Apr-96	SVES NOT IN OPERATION				< 1	Off
25-Apr-96	SVES NOT IN OPERATION				< 1	Off
30-Apr-96	SVES NOT IN OPERATION				< 1	Off
3-May-96	SVES NOT IN OPERATION				62	Off
6-May-96	SVES NOT IN OPERATION				8.8	Off
7-May-96	SVES NOT IN OPERATION				20	Off
8-May-96	SVES NOT IN OPERATION				44	Off
9-May-96	16.2	1	8.6	5.2	< 1	On

All PID readings are in parts per million (ppm).
All PID readings were taken with a HNu PI-101 photoionization detector.

Member
The Tyree Organization

TABLE 1 (Continued)

SUMMARY OF AIR MONITORING

Getty Service Station
825 Washington Street
Stoughton, Massachusetts

Date	PID Influent (VE-1)	PID Influent (VE-2)	PID Influent (Combined)	PID Effluent	VFW Basement PID	SVES On / Off
15-May-96	7.2	0	3.6	5.8	< 1	On
21-May-96	6.2	0	3.1	0	< 1	On
29-May-96	6.8	0	3.4	0	< 1	On
6-Jun-96	3.8	0	1.9	0	< 1	On
13-Jun-96	3.8	0	1.9	0.6	< 1	On
19-Jun-96	1.8	0	0.9	0.4	< 1	On
24-Jun-96	2.2	0	1.1	1.4	< 1	On
26-Jun-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
28-Jun-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
3-Jul-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
9-Jul-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
17-Jul-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
1-Aug-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
27-Aug-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off
24-Sep-96	S V E S	N O T	I N	O P E R A T I O N	< 1	Off

All PID readings are in parts per million (ppm).
All PID readings were taken with a HNu PI-101 photoionization detector.

TABLE 2

SUMMARY OF SOIL ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

25-Jan-96

ANALYTE	SB-1 S-3 Depth= 4-6'	SB-2 S-5 Depth= 6-8'	SB-3 S-4 Depth= 5-7'	SB-4 S-4 Depth= 5-6'	SB-5 S-3 Depth= 4-6'	MCP Method 1
Benzene (ppb)	< 0.23	< 0.23	< 0.23	< 0.24	< 0.23	10,000
Toluene (ppb)	< 0.22	< 0.22	< 0.22	< 0.23	< 0.22	90,000
Ethylbenzene(ppb)	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	80,000
Xylenes (ppb)	< 0.49	< 0.49	< 0.50	< 0.51	< 0.49	500,000
Total BTEX (ppb)	BDL	BDL	BDL	BDL	BDL	
MTBE (ppb)	< 0.65	< 0.64	< 0.66	< 0.67	< 0.64	3,000
Lead (ppm)	0.072	0.043	0.093	0.117	0.079	*300

ppb: parts per billion, micrograms per kilogram (ug/kg).
ppm: parts per million, micrograms per kilogram (mg/kg).
SB: Soil Boring.
MCP Method 1: MCP Method 1 Soil Standards for soil classified as S-1/GW-1.
BDL: Below detection limits.
All additional compounds analyzed for by the specified analytical methods were BDL for all soil samples.
*: DEP accepted background level for lead is 99 ppm.

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TABLE 3

SUMMARY OF AIR ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

5/15/96-5/16/96

ANALYTE	VFW-Basement SVES On	VFW-Basement SVES Off	SVES Influent (VE-1)	SVES Effluent
Benzene	< 14	< 14	< 17	< 17
Toluene	< 128	< 128	< 16	< 16
Ethylbenzene	< 29	< 29	< 13	< 13
Xylenes	< 282	< 282	< 36	< 36
Total BTEX	BDL	BDL	BDL	BDL
MTBE	< 138	< 138	< 47	< 47

Results reported as micrograms per cubic meter (ug/m^3)
VFW: Veterans of Foreign Wars building located adjacent to Getty Service Station.
SVES: Soil Vapor Extraction System.
BDL: Below detection limits.
All additional compounds analyzed for by the specified analytical methods were BDL for all soil samples.

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BORING LOG

BORING LOG NAME

B-1 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION
PROJECT: 825 WASHINGTON STREET
LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96
LOGGED BY: Matthew Lyne
DRILLER: Sean Lyons/Wayne Atha
RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/3.4	30	24	Grey, medium sand with some gravel
		25		
3		33		
		41		
4	S-3/7.2	63	24	Grey, medium sand and gravel. Sample sent to lab
		38		
5		44		
		55		
6	S-4/NA	53	0	Auger refusal at 6.5'
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.
Hole Dia.: N/A
Depth: 6.5 ft

WELL DATA

Riser Type: N/A
Riser Dia.: N/A
Riser Length: N/A
Interval: N/A

Screen Type: N/A
Screen Dia.: N/A
Screen Length: N/A
Slot: N/A
Interval: N/A

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: N/A

GROUT / SEAL

Type: N/A
Volume Used: N/A
Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO
Size: N/A
Concrete Pad: ☐ YES ☒ NO
Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO
Method: N/A
Amt. Purged: N/A
Date: N/A

LEGEND

NA = Not Available
PPM = parts per million
EOB = end of boring

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME

B-2 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION

PROJECT: 825 WASHINGTON STREET

LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96

LOGGED BY: Matthew Lyne

DRILLER: Sean Lyons/Wayne Atha

RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	35	18	Grey, coarse sand with some gravel
		30		
3		30		
		25		
4	S-3/<1	27	12	Spoon refusal at 5ft
		30.50		
5	S-4/NA	24	3	
		50		
6	S-5/<1	15	12	Light brown, coarse sand. Auger refusal at 7.5ft
		40		Sample sent to lab
7		50		
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.

Hole Dia.: N/A

Depth: 7.5 ft

WELL DATA

Riser Type: N/A

Riser Dia.: N/A

Riser Length: N/A

Interval: N/A

Screen Type: N/A

Screen Dia.: N/A

Screen Length: N/A

Slot: N/A

Interval: N/A

FILTER PACK

Source: N/A

Composition: N/A

Volume Used: N/A

Interval: N/A

GROUT / SEAL

Type: N/A

Volume Used: N/A

Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO

Size: N/A

Concrete Pad: ☐ YES ☒ NO

Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO

Method: N/A

Amt. Purged: N/A

Date: N/A

LEGEND

NA = Not Applicable

PPM = parts per million

EOB = end of boring

trace=1-10%

little=10-20%

some=20-30%

and=30-50%

very fine sand=0.6-0.13mm

fine sand=0.13-0.25mm

medium sand=0.25-0.50mm

course sand=0.5-1mm

very course sand=1-2mm

pebble=2-4mm

gravel=4-64mm

cobble=64-256mm

boulder=256mm

groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME: B-3 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION
PROJECT: 825 WASHINGTON STREET
LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96
LOGGED BY: Matthew Lyne
DRILLER: Sean Lyons/Wayne Atha
RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	58	18	Brown, fine sand with some gravel
3		63		
		50		
		40		
4	S-3/NA	86	0	Spoon refusal at 4.5ft
5	S-4/<1	16	12	Orange, fine sand with some gravel
		33		Sample sent to lab
6		44		
		53		
7	S-5/NA	50	0	Auger refusal at 8ft
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.
Hole Dia.: N/A
Depth: 8 ft

WELL DATA

Riser Type: N/A
Riser Dia.: N/A
Riser Length: N/A
Interval: N/A

Screen Type: N/A
Screen Dia.: N/A
Screen Length: N/A
Slot: N/A
Interval: N/A

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: N/A

GROUT / SEAL

Type: N/A
Volume Used: N/A
Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO
Size: N/A
Concrete Pad: ☐ YES ☒ NO
Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO
Method: N/A
Amt. Purged: N/A
Date: N/A

LEGEND

NA = Not Applicable
PPM = parts per million
EOB = end of boring

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME: B-4 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION
PROJECT: 825 WASHINGTON STREET
LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96
LOGGED BY: Matthew Lyne
DRILLER: Sean Lyons/Wayne Atha
RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	22	18	Light brown, medium sand with some gravel
3		25		
		40		
4		40		
	S-3/<1	22	12	Grey, fine sand with some gravel
5		50		
	S-4/<1	24	12	Brown clay. Sample sent to lab
6		24,50		
	S-5/NA		0	Auger refusal at 7ft
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.
Hole Dia.: N/A
Depth: 7 ft

WELL DATA

Riser
Type: N/A
Riser Dia.: N/A
Riser Length: N/A
Interval: N/A

Screen
Type: N/A
Screen Dia.: N/A
Screen Length: N/A
Slot: N/A
Interval: N/A

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: N/A

GROUT / SEAL

Type: N/A
Volume Used: N/A
Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO
Size: N/A
Concrete Pad: ☐ YES ☒ NO
Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO
Method: N/A
Amt. Purged: N/A
Date: N/A

LEGEND

NA = Not Appplicable
PPM = parts per million
EOB = end of boring

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME

B-5 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION

PROJECT: 825 WASHINGTON STREET

LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96

LOGGED BY: Matthew Lyne

DRILLER: Sean Lyons/Wayne Atha

RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	33	18	Brown, medium sand with some gravel
		32		
3		42		
		35		
4	S-3/<1	23	12	Brown, medium sand with some gravel
		50		Auger refusal at 6ft. Sample sent to lab
5		100		
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.

Hole Dia.: N/A

Depth: 6 ft

WELL DATA

Riser

Type: N/A

Riser Dia.: N/A

Riser Length: N/A

Interval: N/A

Screen

Type: N/A

Screen Dia.: N/A

Screen Length: N/A

Slot: N/A

Interval: N/A

FILTER PACK

Source: N/A

Composition: N/A

Volume Used: N/A

Interval: N/A

GROUT / SEAL

Type: N/A

Volume Used: N/A

Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO

Size: N/A

Concrete Pad: ☐ YES ☒ NO

Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO

Method: N/A

Amt. Purged: N/A

Date: N/A

LEGEND

PPM = parts per million

EOB = end of boring

trace=1-10%

little=10-20%

some=20-30%

and=30-50%

very fine sand=0.6-0.13mm

fine sand=0.13-0.25mm

medium sand=0.25-0.50mm

course sand=0.5-1mm

very course sand=1-2mm

pebble=2-4mm

gravel=4-64mm

cobble=64-256mm

boulder=256mm

groundwater table

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Summary of Historical Site Information

Getty Service Station No. 30646
825 Washington Street
Stoughton, Massachusetts
MassDEP RTNs: 4-12937, 4-13560 & 4-13682

Site Location

The site at 825 Washington Street, Stoughton, Massachusetts, is located approximately 200 feet south of the junction of Washington Street and Park Street. The Universal Transverse Mercator (UTM) coordinates for the site are 4,665,611 meters north and 326,270 meters east. The latitudinal and longitudinal coordinates of the site are 42º7'24" north and 71º6'6" west, respectively. A Site Location Map is included as **Figure 1**.

Site Description

The site is currently utilized for automobile repair and gasoline dispensing purposes. The property slopes slightly to the south, with an area about 0.33 acres in size. There is a one-story concrete-block building with two service bays, a canopy, and two underground gasoline tanks at the site. The locations of the on-site structures are depicted in **Figure 2**.

The site is located in an area of mixed commercial and residential use. The site is abutted by a residential dwelling to the north, Washington Street to the east, a Veteran's of Foreign Wars (VFW) building to the south, and a train station parking lot to the west. Located across Washington Street to the east are a real estate office and a printing office.

Potential Receptors

According to the Town of Stoughton Health Department records, two private wells are located approximately 400 feet east of the site at 48 Park Street and 31 Walnut Avenue. According to the Town of Stoughton Water Department, both residences are connected to the town water supply.

The identification of natural resources within 500 feet of the site was determined by using the Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup (BWSC) Site Scoring Map in conjunction with a confirmatory site reconnaissance. According to the Site Scoring Map, no surface waters, no public drinking water supplies, and no areas of critical concern are located within 500 feet of the site.

A site reconnaissance confirmed that there are no institutions within 500 feet of the site. Based on a database search conducted by New England DataMap Corporation (NEDC) located in Dedham, Massachusetts, the estimated residential population within 0.5 miles of the site is approximately 9,520 persons. The average number of on-site workers at any given time was estimated to be 3 people.

Site History

The current owner of the property is Joe's Shell, Inc. of Stoughton, Massachusetts, who has owned the property since 1976. The site is currently utilized by Getty Properties Corp., who has leased the property since 1990, for gasoline dispensing and automotive repair services. According to records maintained at the Stoughton Building Department, the property has been used as a gasoline station since 1956.

Release History

Tyree was contacted by Getty Properties Corp. (Getty) on January 2, 1996, to respond to a complaint of odors in the basement of the adjacent VFW building located at 837 Washington Street. A Tyree environmental scientist monitored the VFW building, as well as the Getty Station at 825 Washington Street, using a photoionization detector (PID) and an explosion/oxygen meter to detect the presence of volatile organic compound (VOC) vapors. PID readings ranging from 58 parts per million (ppm) to 96 ppm were reported in the VFW basement on the northern side of the building. No explosive or oxygen deficient atmospheres were detected using the explosion/oxygen meter.

Immediate Response Actions for Vapors (RTN: 4-11868)

Michael Moran of the MassDEP Southeast Regional office was notified of the site conditions on January 2, 1996, by Michelle Grenier of the Town of Stoughton Environmental Office. Release Tracking Number (RTN) 4-11868 was assigned to the site. MassDEP granted verbal approval of an Immediate Response Action (IRA), which consisted of the monitoring of VOC vapors within the VFW building and the implementation of a soil vapor extraction system (SVES). Two vapor extraction wells SVE-1 and SVE-2 were installed on the northern side of the VFW building on January 3, 1996. The SVES was started on January 15, 1996. A 1-horsepower Rotron blower was used for the vacuum source to extract vapors from the subsurface and a 55-gallon vapor phase granular activated carbon drum was used for the treatment of vapors prior to discharge to the atmosphere. Additionally, the IRA consisted of the tightness testing of the underground storage tanks (USTs) at the Getty Station. An IRA Plan was submitted to the MassDEP outlining the conditions which were previously verbally approved.

An **IRA Status Report** dated April 24, 1996, was submitted to the MassDEP detailing the monitoring results of the SVES and the vapor levels in the VFW building. The USTs and associated piping at the Getty Station were tested for tank tightness and were found to be tight. In order to determine the source of the VOC vapors in the VFW building, five soil borings were installed in the area between the Getty Station and the VFW. Results of the soil sampling did not indicate the presence of VOCs in soil.

An **IRA Completion Report**, dated October 28, 1996, was submitted to the MassDEP detailing the results of the VOC vapor monitoring program. The IRA Completion Report concluded that VOC vapors were not detected in the VFW building with the SVES off for a period of four months. Therefore, it was determined that an IRA was no longer required at the site.

A **Response Action Outcome** (RAO), dated December 11, 1996, was submitted to the MassDEP. The RAO concluded that a level of "No Significant Risk", as defined by the MCP, had been documented as being attained at the site and that the conditions of a Class A-1 RAO were met. The RAO also documented that attempts to identify the source of the vapors through the advancement of soil borings in the area between the Getty Station and the VFW building were unsuccessful.

Immediate Response Actions for Vapor (RTN: 4-12937)

Tyree was contacted by Mr. Roy Lupino, an official of the VFW, late in the day on January 27, 1997, to respond to a subsequent complaint of organic odors in the VFW building. Mr. Roy Lupino stated that the organic odor was encountered in the morning when an office door in the basement was opened, but the odor very quickly dissipated to a non-detectable level. A Tyree environmental scientist assessed the VFW building, as well as the Getty Service Station, early in the morning on January 28, 1997. Using a PID and explosion/oxygen meter, air in the first floor, basement, outside the VFW building, and inside the Getty Service Station, was monitored for VOC vapors. The area of the basement on the northern side of the VFW building exhibited a PID reading of 14 ppm. Other areas of the VFW building and the Getty Station were monitored with a PID, but all other PID readings were less than 1 ppm. No explosive or oxygen deficient atmospheres were detected using the explosion/oxygen meter. During the inspection of the property, there was no visual evidence of petroleum staining on the pavement. Also, there were no catch basins located near the VFW building or the Getty Service Station.

The purpose of the January 28, 1997, assessment was to determine if an imminent hazard existed and if a notifiable release had occurred in accordance with the Massachusetts Contingency Plan (MCP). Based on the results of the investigation which established that there was no imminent hazard, it was the opinion of the Licensed Site Professional (LSP)-of-Record for the site that no reportable release, as defined by the MCP, had occurred.

Based on the knowledge that the vapor release was not a one time occurrence, as initially thought based on the lack of success in identifying any potential sources, Getty and the LSP-of-Record decided to initiate a more extensive investigation of possible contamination sources. As a voluntary precautionary measure, it was decided to reactivate the on-site SVE system.

On February 12, 1997, the two existing vapor extraction wells on the southern side of the Getty station were reconnected to the SVES. The SVES was installed to maintain non-hazardous conditions at the site until the source of the vapors could be found. A 1 horsepower Rotron blower is used to extract vapors from the vadose zone. One 55-gallon drum of granular activated carbon (GAC) was used to treat the vapors prior to discharge to the atmosphere.

In discussions with Getty, there was a question as to how to define the ongoing remediation activities at the site in accordance with the MCP. A telephone conversation was held with Mr. Robert Kearns of the MassDEP Southeast Regional Office and it was determined by the MassDEP that a new release notification should be made. Mr. Kearns was verbally notified of the new release conditions and verbal approval of an IRA was granted on April 4, 1997. **The Release Notification Form and IRA Plan** was submitted on May 28, 1997. RTN 4-12937 was assigned to the site.

On September 24, 1997, Tyree excavated and removed five USTs from the site. The USTs consisted of one 8,000-gallon gasoline UST, two 4,000-gallon gasoline USTs, one 4,000-gallon diesel UST, and one 550-gallon fuel oil UST. A 550-gallon waste oil UST was abandoned in place with a concrete slurry due to its proximity to the building foundation. One of the 4,000-gallon USTs was made of fiberglass construction, while the other 4 USTs were made of steel construction. No holes were reported in the USTs during removal. During the tank removals, the septic system was removed. The site was later connected to the town sewer system.

Release Notification Form (RTN: 4-13682)

During tank removal activities, excavated soil was monitored with a PID. During the removal of the 4,000-gallon gasoline UST and the diesel UST, PID readings of greater than 200 ppm were reported. Due to the site already being listed due to a release of gasoline, a new notification was not made. As documented in the IRA Completion Report submitted to the MassDEP on February 13, 1998, approximately 921 tons of soil were excavated and later removed from the site for recycling. Also, the **IRA Completion Report** indicated that Polynuclear Aromatic Hydrocarbons (PAHs) were detected in confirmatory soil samples which exceeded the reportable concentrations for soil classified as RCS-1. Therefore, a **Release Notification Form** was submitted to the MassDEP on February 13, 1998, for the 120-day reporting condition. RTN 4-13682 was assigned to the release.

Immediate Response Actions for Separate Phase Hydrocarbons (RTN: 4-13560)

On November 20, 1997, three bedrock monitoring wells, MW-3, MW-4, and MW-5, were installed on-site. During a groundwater gauging event on December 17, 1997, separate phase hydrocarbons (SPH) were reported in well MW-3, at a thickness of 0.92 feet. Mr. Robert Kearns of the MassDEP was notified of the 72-hour reporting condition on December 17, 1997. RTN 4-13560 was assigned to the release and MassDEP granted verbal approval of an IRA to monitor and bail SPH from on-site wells. An **IRA Plan** was submitted to the MassDEP on February 13, 1998, detailing the previously approved IRA.

On April 8, 1998, a **Phase I Initial Site Investigation and Tier Classification** was submitted to the MassDEP. The Phase I Report concluded that the site should be tier classified as Tier II and an imminent hazard was not present at the time of tier classification.

On July 14, 1998, an **IRA Plan Modification** was submitted to the MassDEP for the installation of four additional bedrock monitoring wells and disposal of drill cuttings and well bailings. On October 12, 1998, an **IRA Status Report** was submitted to the MassDEP detailing the status of the site activities. Four bedrock monitoring wells, MW-6, MW-7, MW-8 and MW-9, were installed at the property. The IRA Status Report indicated that monitoring of the new wells would continue on a weekly basis.

On December 16, 1998, a **Release Abatement Measure (RAM) Plan** was submitted to the MassDEP proposing an aquifer pump test on monitoring well MW-8 to determine which monitoring wells were hydraulically connected to one another. The RAM Plan was approved by MassDEP in a letter dated March 8, 1999

On April 8, 1999, an **IRA Status Report** was submitted to the MassDEP detailing the groundwater gauging and sampling activities conducted at the site. Groundwater gauging data indicated that SPH was not detected in on-site monitoring wells from January through March 1999.

An **IRA Plan Modification**, dated April 21, 1999, was submitted to the MassDEP for the proposed monitoring well pump out using a vac-truck. It was proposed that monitoring well MW-3 would be pumped out on a weekly basis using a vac-truck. The weekly pump out would continue for a six-week period, whereby groundwater samples would be collected to determine its effectiveness. Monitoring well MW-3 was pumped out with a vac-truck on a weekly basis for six weeks during May and June of 1999. A total of 125 gallons of a waste gasoline and water mixture were pumped out and transported off site for disposal. Despite the well pump outs, concentrations of gasoline related compounds in MW-3 did not decrease as expected.

A **RAM Completion Report**, dated June 16, 1999, was submitted to the MassDEP, detailing the results of the aquifer pump test performed on monitoring wells, MW-7 and MW-8. Since MW-8 did not recharge sufficiently, the pump test was performed on MW-7 only. It was concluded that MW-8 was hydraulically connected to MW-7. It did not appear that the other wells were hydraulically connected to MW-7.

An **IRA Status Report** was submitted on March 10, 2000. The IRA Status Report indicated that SPH levels in monitoring well MW-3 been reported as non-detectable during the monitoring event on December 15, 1999.

A **Phase II Comprehensive Site Assessment** (CSA), dated August 4, 2000, was submitted to the MassDEP. The Phase II CSA concluded, based on a groundwater model developed by The BIOSCREEN Version 1.3, developed by the Environmental Protection Agency (EPA), that gasoline impacted groundwater is most likely present off-site and downgradient at a distance of approximately 195 feet from the former USTs. Also, soil in the area near the former fuel oil UST is still impacted.

A **Phase III Remedial Action Plan** (RAP), dated September 13, 2000, was submitted to the MassDEP. The Phase III RAP indicated that bioremediation was the selected alternative to remediate the gasoline-impacted groundwater and soil excavation was the selected alternative to remediate the oil-impacted soil.

On October 22, 2001, a **Phase IV Remedy Implementation Plan** (RIP) was submitted to the MassDEP. Due to the multiple sources of oil and hazardous materials (OHM) at the site, a combination of remedial actions was proposed. Excavation of up to 230 cubic yards of soil was proposed to reduce levels of PAH compounds in the vicinity of the former fuel oil UST. A product recovery system was proposed to reduce levels of NAPL detected in monitoring well MW-10, and bioremediation was proposed after NAPL at the site has been reduced to non-detectable levels.

During April 29, 2002 through May 2, 2002, soil excavation activities were undertaken at the site to remove PAH impacted soil in the rear of the property and to install trenching for an automated NAPL recovery system. Approximately 220 tons of impacted soil was removed from the site and stockpiled on-site. On June 10 and 11, 2002, the soil was transported to American Reclamation Corp. in Charlton, Massachusetts, for recycling.

After removal of the impacted soil at the rear of the property, 9 confirmatory soil samples were collected from the excavation sidewalls and submitted to Geolabs, Inc. of Braintree, Massachusetts, a state certified laboratory, for laboratory analysis of Extractable Petroleum Hydrocarbons (EPH) with target analytes by MassDEP Method EPH. Clean backfill material was installed in the excavation area to grade.

According to the laboratory analytical report, numerous PAH compounds were encountered in soil samples, S-33, S-36, and S-37 at concentrations above the site's applicable MCP Method 1 Soil Standards.

On May 2, 2002, trenching activities were completed in order to install a conduit to monitoring well MW-10 for the purpose of installing an automated NAPL recovery system. The conduit is used to allow for the installation of plastic tubing that connects a pneumatic pump in monitoring well MW-10 to a compressor that is located behind the on-site building. The pneumatic pump is used to pump NAPL out of the well on an automated basis. Additionally, the horizontal piping that was installed in the ground during the tank replacement project in 1997 was extended to an area behind the on-site building for possible future use. Monitoring well MW-3 was also connected to the horizontal piping so that it could be used as a future remediation well, if necessary.

The NAPL recovery system commenced operation on October 23, 2002. A pneumatic pump and compressor were connected to monitoring well MW-10. Weekly operation and maintenance visits were made on October 29, 2002, November 5, 2002, November 12, 2002, November 18, 2002, November 25, 2002 and December 2, 2002. Subsequently, operation and maintenance visits were changed to monthly. Operation and maintenance visits continued on a monthly basis until the NAPL recovery system was shutdown on August 20, 2004.

Operation and maintenance of the NAPL recovery system included inspection of the system to assure proper operation, measuring the amount of NAPL removed, and gauging of monitoring wells MW-3 and MW-10. The NAPL recovery system was shut down on August 20, 2004 due to continued non-detect readings for product in monitoring well MW-10. On October 18, 2004, a total of 100 gallons of a NAPL/groundwater mixture was removed from two Department of Transportation (DOT) drums located on-site. A total of approximately 265 gallons of NAPL/groundwater mixture has been removed from the site to date.

Phase V OM&M/IRA Status Reports were submitted to the MassDEP detailing activities at the site on September 30, 2003, March 4, 2004, September 24, 2004 and March 7, 2005.

The IRA for RTN 4-13560 was closed with an **IRA Completion Report** on March 7, 2005. A ROS Report with a Substantial Hazard Evaluation (SHE) was submitted on April 7, 2005, with a finding that no substantial hazard exists at the site. In accordance with 310 CMR 40.0893 (2)(e), ROS Reports documenting the monitoring of the site conditions will be submitted to the MassDEP every six months until a level of No Significant Risk is achieved at the site.

Following execution of the access agreement to the offsite property located at 820-826 Washington Street on February 1, 2010, additional assessment activities which included the advancement of four (4) soil borings (SB-102, SB-104, SB-105 and SB-106) and two (2) soil gas points (SG-3 and SG-4) were conducted on March 4, 2010, to potentially support submittal of an RAO. Furthermore, additional parameters were collected from select groundwater monitoring wells to support the potential RAO submittal. In addition, Level 1 Soil Gas screening activities were conducted to evaluate potential vapor migration into onsite and offsite occupied structures.

Based on the additional assessment activities conducted during March 2010 it has been concluded that the Average soil concentrations fall within Method 1 risk assessment standards. Soil Gas Screening activities conducted on SG-1 through SG-4 do not indicate that vapor migration into occupied structures is occurring. However, groundwater concentrations relative to MW-10 and MW-11 from the March 12, 2010 sampling effort do not fall within Method 1 risk assessment standards.

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PHASE II
COMPRHENSIVE SITE ASSESSMENT

VOLUME I OF II

Getty Service Station
825 Washington Street
Stoughton, MA

DEP RTNs: 4-12937, 4-13560, & 4-13682

August 4, 2000

Prepared for:

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TABLE OF CONTENTS

	PAGE
1.0 Introduction	1
2.0 Property History	1
2.1 Current and Past Use and Ownership	1
2.2 Release History	2
3.0 Site Hydrogeological Characteristics	6
3.1 Characterization of Geological Conditions and Soil Analysis	6
3.2 Characterization of Hydrogeological Conditions	8
3.2.1 Groundwater Gauging Results	8
3.2.2 Seasonal Groundwater Flow Variations	8
3.2.3 Determination of Hydraulic Conductivity	8
3.3 Description of the Potential for Flooding	9
4.0 Environmental Fate and Transport of Oil and/or Hazardous Materials	9
4.1 Benzene	9
4.2 Toluene	10
4.3 Ethylbenzene	10
4.4 Xylenes	10
4.5 MTBE	10
4.6 Naphthalene	11
4.7 VPH Fractions	11
4.8 EPH Fractions, PAHs	11
5.0 Nature and Extent of Petroleum Impact	11
5.1 Results of Groundwater Analytical Data	11
5.1.1 Horizontal Extent of Impact in Groundwater and Soil	12
5.1.2 Vertical Extent of Impact in Groundwater and Soil	13
5.1.3 Results of Indoor Air Sampling	14
5.2 Disposal Site Definition	14
6.0 Regulatory File Review	15
6.1 Federal and State File Review	15
6.1.1 MADEP File Review	15
6.1.2 CERCLA Sites	16
6.1.3 ERNS Sites	16
6.1.4 RCRA Sites	17
6.1.5 NPL Sites	18
6.1.6 SWL Sites	18
6.1.7 Registered UST Sites	18
6.1.8 State Spill List	19
7.0 Risk Assessment	20
8.0 Conclusions	20
9.0 Disclaimer	22

FIGURES

Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: Disposal Site Boundary
Figure 4: Private Well Location Map
Figure 5: Soil Sample Location Map-UST Removals
Figure 6: Groundwater Elevation and Concentration Map: 6/21/00
Figure 7: Bedrock Contour Map
Figure 8: Soil Boring Location Map

TABLES

Table 1: Summary of Soil Analytical Data
Table 2: Summary of Groundwater Gauging Data: 6/21/00
Table 3: Summary of Groundwater Analytical Data: 3/23/00
Table 4: Summary of Groundwater Analytical Data: 6/21/00
Table 5: Bedrock Elevation Data

APPENDICES

Appendix A: Summary of Historical Soil Data
Appendix B: Soil Boring/Monitoring Well Logs
Appendix C: Summary of Historical Groundwater Gauging Data
Appendix D: Historical Groundwater Contour Maps
Appendix E: Summary of Historical Groundwater Sampling Data
Appendix F: Air Study Results
Appendix G: Groundwater Modeling Report
Appendix H: Risk Characterization (with MassGIS Map)
Appendix I: New England DataMap Database Report
Appendix J: Laboratory Analytical Reports

1.0 INTRODUCTION

Tyree Organization, Ltd. (Tyree) has been retained by Getty Properties Corp. (Getty) to conduct environmental activities at the Getty Service Station, located at 825 Washington Street, Stoughton, Massachusetts (herein, referred to as "the property"). As required by the Massachusetts Contingency Plan (MCP), Getty is required to perform a Phase II Comprehensive Site Assessment (CSA) for the site. The scope of work included: a reconnaissance of the property and surrounding area, a survey of the private water wells in the area, the installation of one groundwater monitoring well, and the subsequent soil and groundwater sampling. Additionally, past soil and groundwater monitoring data were reviewed to determine site hydrogeological characteristics, fate and transport of compounds, nature and extent of impact, exposure assessment, and risk characterization. This Phase II CSA was performed in accordance with 310 CMR 40.0835 through 40.0836 of the MCP and Massachusetts General Law (M.G.L.) Chapter 21-E.

2.0 PROPERTY HISTORY

2.1 Current and Past Use and Ownership

The property is located approximately 200 feet south of the intersection of Washington Street and Park Street in Stoughton, Massachusetts. A Site Location Map is included as Figure 1. The property slopes slightly to the south, with an area approximately 0.33 acres in size. A one-story concrete-block building with two service bays is located on the southern portion of the property. The building has an approximate area of approximately 1,900 square feet. A Site Plan is included as Figure 2. The disposal site is defined as the area having documented petroleum impacted soil and/or groundwater. The disposal site boundary is depicted in Figure 3.

The current owner of the property is Joe's Shell, Inc. of Stoughton, MA, who has owned the property since 1976. The site is currently utilized by Getty Properties Corp., who has leased the property since 1990, for gasoline dispensing and automotive repair services. According to records maintained at the Stoughton Building Department, the property has been used as a gasoline station since 1956.

The property is located in an area of mixed commercial and residential use. The property is abutted to the north by a residential dwelling, to the east by Washington Street, to the south by a Veteran's of Foreign Wars (VFW) building, and to the west by a parking lot for a train station. Across Washington Street are commercial properties including a real estate office and a printing business.

2.2 Release History

Tyree was contacted by Getty on January 2, 1996, to respond to a complaint of odors in the basement of the adjacent VFW building located at 837 Washington Street. A Tyree environmental scientist monitored the VFW building, as well as the Getty Station at 825 Washington Street, using a photoionization detector (PID) and an explosion/oxygen meter to detect the presence of volatile organic compound (VOC) vapors. PID readings ranging from 58 parts per million (ppm) to 96 ppm were reported in the VFW basement on the northern side of the building. No explosive or oxygen deficient atmospheres were detected using the explosion/oxygen meter.

Michael Moran of the DEP-Southeast Regional office was notified of the site conditions on January 2, 1996, by Michelle Grenier of the Town of Stoughton Environmental Office. Release Tracking Number (RTN) 4-11868 was assigned to the site. DEP granted verbal approval of an IRA, which consisted of the monitoring of VOC vapors within the VFW building and the implementation of a soil vapor extraction system (SVES). Two vapor extraction wells SVE-1 and SVE-2 were installed on the northern side of the VFW building on January 3, 1996. The SVES was started on January 15, 1996. A 1 horsepower Rotron blower was used for the vacuum source to extract vapors from the subsurface and a 55-gallon vapor phase granular activated carbon drum was used for the treatment of vapors prior to discharge to the atmosphere. Additionally, the IRA consisted of the tightness testing of the underground storage tanks (USTs) at the Getty Station. An IRA Plan was submitted to the DEP outlining the conditions which were previously verbally approved.

An IRA Status Report dated April 24, 1996, was submitted to the DEP detailing the monitoring results of the SVES and the vapor levels in the VFW building. The USTs and associated piping at the Getty Station were tested for tank tightness and were found to be tight. In order to determine the source of the VOC vapors in the VFW building, five soil borings were installed in the area between the Getty Station and the VFW. Results of the soil sampling did not indicate the presence of VOCs in soil.

An IRA Completion Report, dated October 28, 1996, was submitted to the DEP detailing the results of the VOC vapor monitoring program. The IRA Completion Report concluded that VOC vapors were not detected in the VFW building with the SVES off for a period of four months. Therefore, it was determined that an IRA was longer required at the site.

A Response Action Outcome (RAO), dated December 11, 1996, was submitted to the DEP. The RAO concluded that a level of "No Significant Risk", as defined by the MCP, had been documented as being attained at the site and that the conditions of a Class A-1 RAO were met. The RAO also documented that attempts to identify the source of the vapors through the advancement of soil borings in the area between the Getty Station and the VFW building were unsuccessful.

Tyree was contacted by Mr. Roy Lupino, an official of the VFW, late in the day on January 27, 1997, to respond to a subsequent complaint of organic odors in the VFW building. Mr. Roy Lupino stated that the organic odor was encountered in the morning when an office door in the basement was opened, but the odor very quickly dissipated to a non-detectable level. A Tyree environmental scientist assessed the VFW building, as well as the Getty Service Station, early in the morning on January 28, 1997. Using a PID and explosion/oxygen meter, air in the first floor, basement, outside the VFW building, and inside the Getty Service Station, was monitored for VOC vapors. The area of the basement on the northern side of the VFW building exhibited a PID reading of 14 ppm. Other areas of the VFW building and the Getty Station were monitored with a PID, but all other PID readings were less than 1 ppm. No explosive or oxygen deficient atmospheres were detected using the explosion/oxygen meter. During the inspection of the property, there was no visual evidence of petroleum staining on the pavement. Also, there were no catchbasins located near the VFW building or the Getty Service Station.

The purpose of the January 28, 1997, assessment was to determine if an imminent hazard existed and if a notifiable release had occurred in accordance with the Massachusetts Contingency Plan (MCP). Based on the results of the investigation which established that there was no imminent hazard, it was the opinion of the LSP-of-Record for the site that no reportable release, as defined by the MCP, had occurred.

Based on the knowledge that the vapor release was not a one time occurrence, as initially thought based on the lack of success in identifying any potential sources, Getty and the LSP-of-Record decided to initiate a more extensive investigation of possible contamination sources. As a voluntary precautionary measure, it was decided to reactivate the on-site SVE system.

On February 12, 1997, the two existing vapor extraction wells on the southern side of the Getty station were reconnected to the SVES. The SVES was installed to maintain non-hazardous conditions at the site until the source of the vapors could be found. A 1 horsepower Rotron blower is used to extract vapors from the vadose zone. One 55-gallon drum of granular activated carbon (GAC) was used to treat the vapors prior to discharge to the atmosphere.

In discussions with Getty, there was a question as to how to define the ongoing remediation activities at the site in accordance with the MCP. A telephone conversation was held with Mr. Robert Kearns of the DEP Southeast Regional Office and it was determined by the DEP that a new release notification should be made. Mr. Kearns was verbally notified of the new release conditions and verbal approval of an IRA was granted on April 4, 1997. The Release Notification Form and IRA Plan was submitted on May 28, 1997. RTN 4-12937 was assigned to the site.

On September 24, 1997, Tyree excavated and removed five USTs from the site. The USTs consisted of one 8,000-gallon gasoline UST, two 4,000-gallon gasoline USTs, one 4,000-gallon diesel UST, and one 550-gallon fuel oil UST. A 550-gallon waste oil UST was abandoned in place with a concrete slurry due to its proximity to the building foundation. One of the 4,000-gallon USTs was made of fiberglass construction, while the other 4 USTs were made of steel construction. No holes were reported in the USTs during removal. During the tank removals, the septic system was removed. The site was later connected to the town sewer system.

During tank removal activities, excavated soil was monitored with a PID. During the removal of the 4,000-gallon gasoline UST and the diesel UST, PID readings of greater than 200 ppm were reported. Due to the site already being listed due to a release of gasoline, a new notification was not made. As documented in the IRA Completion Report submitted to the DEP on February 13, 1998, approximately 921 tons of soil were excavated and later removed from the site for recycling. Also, the IRA Completion Report indicated that Polynuclear Aromatic Hydrocarbons (PAHs) were detected in confirmatory soil samples which exceeded the reportable concentrations for soil classified as RCS-1. Therefore, a Release Notification Form was submitted to the DEP on February 13, 1998, for the 120-day reporting condition. RTN 4-13682 was assigned to the release.

On November 20, 1997, three bedrock monitoring wells, MW-3, MW-4, and MW-5, were installed on-site. During a groundwater gauging event on December 17, 1997, separate phase hydrocarbons (SPH) were reported in well MW-3, at a thickness of 0.92 feet. Mr. Robert Kearns of the DEP was notified of the 72-hour reporting condition on December 17, 1997. RTN 4-13560 was assigned to the release and DEP granted verbal approval of an IRA to monitor and bail SPH from on-site wells. An IRA Plan was submitted to the DEP on February 13, 1998, detailing the previously approved IRA.

On April 8, 1998, a Phase I Initial Site Investigation and Tier Classification was submitted to the DEP. The Phase I Report concluded that the site should be tier classified as Tier II and an imminent hazard was not present at the time of tier classification.

On July 14, 1998, an IRA Plan Modification was submitted to the DEP for the installation of four additional bedrock monitoring wells and disposal of drill cuttings and well bailings. On October 12, 1998, an IRA Status Report was submitted to the DEP detailing the status of the site activities. Four bedrock monitoring wells, MW-6, MW-7, MW-8 and MW-9, were installed at the property. The IRA Status Report indicated that monitoring of the new wells would continue on a weekly basis.

On December 16, 1998, a RAM Plan was submitted to the DEP for the proposed aquifer pump test on monitoring well MW-8. The RAM Plan was approved by DEP in a letter dated March 8, 1999.

On April 8, 1999, an IRA Status Report was submitted to the DEP detailing the groundwater gauging and sampling activities conducted at the site. Groundwater gauging data indicated that SPH was not detected in on-site monitoring wells from January through March 1999.

An IRA Plan Modification, dated April 21, 1999, was submitted to the DEP for the proposed monitoring well pump out using a vac truck. It was proposed that monitoring well MW-3 would be pumped out on a weekly basis using a vac truck. The weekly pump out would continue for a six week period, whereby groundwater samples would be collected to determine its effectiveness. Monitoring well, MW-3 was pumped out with a vac truck on a weekly basis for six weeks during May and June of 1999. A total of 125 gallons of a waste gasoline and water mixture were pumped out and transported off site for disposal. Despite the well pump outs, concentrations of gasoline related compounds in MW-3 did not decrease as expected.

A RAM Completion Report, dated June 16, 1999, was submitted to the DEP, detailing the results of the aquifer pump test performed on monitoring wells, MW-7 and MW-8. Since MW-8 did not recharge sufficiently, the pump test was performed on MW-7 only. It was concluded that MW-8 was hydraulically connected to MW-7. It did not appear that the other wells were hydraulically connected to MW-7.

The latest IRA Status Report was submitted on March 10, 2000. The IRA Status Report indicated that SPH levels in monitoring well MW-3 been reported as non detectable during the monitoring event on December 15, 1999.

3.0 SITE HYDROGEOLOGIC CHARACTERISTICS

3.1 Characterization of Geologic Conditions

On January 25, 1996, Tyree advanced 5 soil borings in the area between the Getty Station and the adjacent VFW building. One soil sample was collected from just above the bedrock interface, which was encountered at depths of 6 to 8 feet. Groundwater was not encountered during drilling operations. The soil above the bedrock layer consisted of coarse sand and gravel. Soil samples, which were not preserved by methanol, were submitted for laboratory analysis of Volatile Organic Compounds (VOCs) by EPA Method 8020. The results of the soil sampling indicated that none of the compounds analyzed for were detected. A summary of the soil analytical data is included in Appendix A and Boring Logs are included in Appendix B.

During September 24 through 25, 1997, soil samples were collected from the site after removal of three gasoline USTs, one diesel UST, one fuel oil UST, and approximately 900 tons of impacted soil. Soil samples were submitted for analysis of VOCs by 8260 (non-methanol preserved), Volatile Petroleum Hydrocarbons (VPH) with target analytes by DEP Method VPH, Extractable Petroleum Hydrocarbons (EPH) with target analytes by DEP Method EPH, and total lead. The results of the soil sampling indicated that none of the compounds were detected at concentrations in excess of the applicable MCP Method 1 soil standards with the exception of the EPH target analyte compounds detected in the vicinity of the fuel oil UST. A summary of the soil analytical results are shown on Table 1 and the laboratory analytical report is included as Appendix I.

On November 20, 1997, three soil borings were advanced and were later converted into groundwater monitoring wells MW-3, MW-4, and MW-5. The soil above the bedrock layer consisted of sand and silt. Groundwater was not encountered in the overburden material, but bedrock was encountered at depths of 4 to 9 feet. The soil borings were advanced until a water bearing fracture was encountered, which was at depths of 18 to 28 feet. A soil sample from just above the bedrock interface was submitted for laboratory analysis of VOCs by EPA Method 8260, PAHs by EPA Method 8270, VPH without target analytes by DEP VPH, and EPH without target analytes by DEP Method EPH. The results of the soil sampling indicated that the none of the compounds that were analyzed for were detected at concentrations in excess of the applicable MCP Method 1 soil standards with the exception of three PAH compounds, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene. A summary of the soil analytical results are shown on Table 1 and the laboratory analytical is included as Appendix I.

During August 18 through August 20, 1998, four soil borings were advanced and were later converted into monitoring wells MW-6, MW-7, MW-8, and MW-9. The soil above the bedrock layer consisted of sand and gravel. Groundwater was not encountered in the overburden material, but bedrock was encountered at depths of 5 to 9 feet. The soil borings were advanced until a water bearing fracture was encountered, which was at depths of 16 to 20 feet. A soil sample from just above the bedrock interface in boring MW-6 was submitted for laboratory analysis of VOCs by EPA Method 8260, PAHs by EPA Method 8270, VPH without target analytes by DEP VPH, and EPH without target analytes by DEP Method EPH. A sample from MW-7, MW-8, and MW-9 was not submitted for laboratory analysis due to the lack of recovery in the split spoon. The results of the soil sampling indicated that the none of the compounds that were analyzed for were detected at concentrations in excess of the applicable MCP Method 1 soil standards. A summary of the soil analytical results are shown on Table 1 and the laboratory analytical is included as Appendix I.

On June 6, 2000, five borings (SB-20, SB-21, SB-22, SB-23, MW-10) were advanced and one of the borings was later converted into monitoring wells MW-10. The location of the soil borings are depicted on Figure 8. The soil above the bedrock layer consisted of sand and gravel. Groundwater was not encountered during drilling activities, but bedrock was encountered at depths of 5 to 9 feet. The soil boring for MW-10 was advanced until a water bearing fracture was encountered, which was at a depth of 19 feet. A soil sample from just above the bedrock interface in all five borings were submitted for laboratory analysis of EPH with target analytes by DEP Method EPH and an extra sample was collected from MW-10 and submitted for analysis of VPH by DEP Method VPH. The results of the soil sampling indicated that PAHs were detected in SB-20, SB-21, and SB-23 at concentrations the exceed the applicable MCP Method 1 soil standards. All other compounds that were analyzed for were not detected at concentrations in excess of the applicable MCP Method 1 soil standards. A summary of the soil analytical results are shown on Table 1 and the laboratory analytical is included as Appendix I. The soil boring logs are included in Appendix B.

A sample from the three soil borings SB-20, SB-21, and SB-23 were also submitted to Severn Trent Laboratories in Billerica, Massachusetts for analysis of wood and coal ash. The laboratory report indicated that wood ash or coal ash was not identified in any of the three samples. A copy of the laboratory analytical report is included in Appendix I.

3.3 Characterization of Hydrogeologic Conditions

3.3.1 Groundwater Gauging Results

Groundwater monitoring wells were gauged on 109 occasions from December 1997 to June 2000. Due to the lack of groundwater in the overburden, all wells monitored are considered bedrock monitoring wells. Depth to groundwater ranged from approximately 11 to 16 feet below grade during this period. During this period, separate phase hydrocarbons (SPH) were detected in monitoring well MW-3 on many occasions, ranging from non detectable levels to 3.35 feet February 11, 1998. SPH was also detected in MW-4 at a thickness of 0.32 feet on March 23, 2000 and in MW-10 on June 21, 2000 at a thickness of 0.04 feet. SPH was not detected in any other well during this period. The most recent groundwater gauging event performed on June 21, 2000, indicates that groundwater flows to the north and east with a hydraulic gradient of 0.05 feet per foot, which is consistent with historical flow patterns. A summary of the most recent gauging event on June 21, 2000 is shown on Table 2. A groundwater contour map of the most recent gauging event conducted on June 21, 2000, is depicted on Figure 6. A summary of historical groundwater gauging data is included as Appendix C.

3.3.2 Seasonal Groundwater Flow Variations

According to groundwater gauging data, groundwater elevations beneath the property fluctuate approximately 4 feet during the year. Groundwater elevations are highest during the later winter/early spring months and are lowest during the fall months. In general, groundwater at the property flows to the north and east. A summary of historical groundwater elevation data is included in Appendix C.

3.3.3 Determination of Hydraulic Conductivity

The hydraulic conductivity of the aquifer underlying the property was estimated based on physical characterization of soil properties presented in the soil boring logs. The boring logs indicate that the soil consists of sand and silt to a depth of approximately 5 feet, where bedrock was encountered. Since groundwater has never been encountered in the overburden, the hydraulic conductivity of groundwater in the bedrock aquifer can be evaluated using Table 5.2-1 of the DEP Publication # WSC-310-91 Standard References for Monitoring Wells. The bedrock material consists of shale and fractured rock which corresponds to an estimated hydraulic conductivity of approximately 10^{-4} gallons per day per square foot (10^{-5} cm/sec), which is relatively low. A copy of the soil boring logs are included as Appendix B.

3.4 Description of the Potential for Flooding

According to the USGS topographic map for the site and surrounding area (Figure 1), the site is located at approximately 72 feet above mean sea level and is at a higher elevation than most of the surrounding area. Additionally, the closest wetlands area is approximately 0.5 miles downgradient of the site. Due to these conditions, the potential for flooding at the site is unlikely.

4.0 ENVIRONMENTAL FATE AND TRANSPORT OF OIL AND/OR HAZARDOUS MATERIALS

The primary compounds of concern consist of gasoline related compounds, such as benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and VPH fractions. By volume, gasoline is generally made up of 1-3% benzene, 10-25% total BTEX, and 10-15% MTBE. EPH fractions and PAH compounds have also been detected in soil and/or groundwater samples in the area of the former fuel oil UST at the site and are considered compounds of concern. Properties such as mobility, stability, volatility, and bioaccumulative potential are evaluated in this section.

4.1 Benzene

Due to its solubility and organic partition coefficient (Koc), benzene is highly soluble and resistant to sorption, as compared to the other BTEX compounds. Koc reflects the tendency of an organic compound to be adsorbed onto the organic fraction of other soils and is generally independent of other soil properties. This value is expressed as the ratio of the amount of a compound adsorbed per unit weight of organic carbon, to the concentration of the compound in solution at equilibrium. Compounds with a high Koc (greater than 1,000 ml/g) may exhibit high sorption potential in soils and are less likely to leach into groundwater. Koc values less than 100 ml/g, such as benzene, suggest that the compound has a higher potential to leach into groundwater and are considered less stable in the environment

The volatility of a compound can be evaluating by reviewing its Henry's Law Constant. The Henry's Law Constant are quite similar for all the BTEX compounds and therefore benzene has an affinity to change from the liquid phase to the vapor phase. With these characteristics, benzene exhibits high volatility, moderate mobility in soil and groundwater, and limited sorption to soils. The potential for bioaccumulation is considered to be relatively low for this compound.

4.2 Toluene

When compared to benzene, toluene is less soluble and has more potential for sorption. Therefore, toluene is less mobile than benzene and is considered more stable, but is still considered highly mobile when compared to the other compounds of concern. Like benzene, toluene is also highly volatile. The potential for bioaccumulation is considered to be relatively low for this compound.

4.3 Ethylbenzene

When compared to the BTEX group, ethylbenzene has a lower water solubility and high sorption potential. Ethylbenzene represents the least mobile and most stable of the BTEX group, but due to its high Henry's Law constant, it is also highly volatile. The potential for bioaccumulation is considered to be relatively low for this compound.

4.4 Xylenes

The characteristics of xylenes are very similar to that of ethylbenzene. Xylenes exhibits low mobility, high sorption potential, and high stability. Consistent with the other BTEX compounds, xylenes are also highly volatile. The potential for bioaccumulation is considered to be relatively low for this compound.

4.5 MTBE

Methyl tert butyl ether (MTBE) is an organic ether used as an oxygenated octane additive and is found in gasoline at approximately 10% by volume. MTBE is a synthetic chemical and commercially produced to be almost 100% pure. MTBE is relatively mobile and unstable in soils, migrating more rapidly to groundwater than the BTEX group. MTBE exhibits a low potential to sorb to soils and due to its low Henry's Law Constant, MTBE does not exhibit a high potential to change from liquid phase to vapor phase in the environment. Also, due to its man-made production, MTBE is resistant to biodegradation. With respect to the other compounds of concern, MTBE is highly mobile and persistent in the environment. The potential for bioaccumulation is considered to be relatively low for this compound.

4.6 Naphthalene

With respect to the BTEX group, naphthalene exhibits low water solubility and high sorption potential. Therefore, naphthalene has low mobility and high stability in the environment. Due to its low Henry's Law Constant, naphthalene has a low affinity to move from the liquid phase to the vapor phase and is therefore less volatile than the BTEX group. The potential for bioaccumulation is considered to be relatively low for this compound.

4.7 VPH fractions

The VPH fractions are generally mobile, slightly soluble in water, volatilize easily, and have relatively low stability. These compounds do exhibit some influence to biodegradation, but are usually dependent on site specific conditions. VPH fractions are not considered persistent and their potential for bioaccumulation is low.

4.8 EPH fractions, PAHs

EPH fractions and the target analytes of 2-methylnaphthalene and fluoranthene are generally hydrophobic with low water solubility and should biodegrade over time. EPH compounds do not generally migrate as readily as VPH compounds and are more stable due to their hydrophobic properties and higher molecular weights. EPH compounds are not considered persistent and their bioaccumulation potential is very low.

5.0 NATURE AND EXTENT OF PETROLEUM IMPACT

As a result of the reported releases of gasoline and fuel oil from the former USTs on the property, monitoring gives emphasis to VOCs, especially benzene, toluene, ethylbenzene, xylenes, and methyl-tertiary butyl ether. Additionally, laboratory analysis for dissolved metals, EDB, VPH, and EPH has been performed for more recent soil and groundwater sampling events.

5.1 Results of Groundwater Analytical Data

Available groundwater monitoring wells were sampled on March 23, 2000. Samples were collected from each well and submitted for laboratory analysis of VPH/EPH with target analytes by DEP Method VPH/EPH, EDB by EPA Method 504, and dissolved RCRA 8 Metals. Results of the laboratory analytical report indicate that gasoline related compounds were detected in many of the monitoring wells, but exceeded the applicable MCP Method 1 Groundwater Standards in MW-3 and MW-4 only. All other compounds

analyzed were not detected in excess of the applicable MCP Method 1 groundwater standards. A summary of the groundwater sampling data from the March 23, 2000 sampling event is shown on Table 3 and the laboratory analytical reports can be found in Appendix I.

Available groundwater monitoring wells were sampled on June 21, 2000. Samples were collected from each well and submitted for laboratory analysis of VPH with target analytes by DEP Method VPH. Results of the laboratory analytical report indicate that gasoline related compounds were detected in many of the monitoring wells, but exceeded the applicable MCP Method 1 Groundwater Standards in MW-3 and MW-10 only. All other compounds analyzed were not detected in excess of the applicable MCP Method 1 groundwater standards. A summary of the groundwater sampling data from the March 23, 2000 sampling event is shown on Table 4 and the laboratory analytical reports can be found in Appendix I. A groundwater elevation and concentration for the June 21, 2000 sampling event is depicted on Figure 6.

Available groundwater monitoring wells were sampled on 12 occasions from December 1997 through June 2000. Groundwater samples collected from the monitoring wells indicate that compound concentrations have remained relatively consistent since sampling began in December 1997. The highest level of impact has been reported in the samples collected from MW-3 and the most recently installed well, MW-10. The summary of historical groundwater analytical data is included as Appendix E.

5.1.1 Horizontal Extent of Impact in Soil and Groundwater

By evaluating the most recent soil analytical data, it is documented that the horizontal extent of impacted soil was present in the immediate area surrounding the former USTs and in all perimeter borings advanced since 1997. The horizontal extent of impacted soil encompasses these soil sample locations. The horizontal extent of impact in soil is depicted on Figure 3 and is referred to as the disposal site boundary.

The determination of the horizontal extent of impacted groundwater is usually performed by installing downgradient wells until the plume is delineated. Due to the high levels of gasoline related compounds near the property boundary (MW-3 and MW-10), off-site access was attempted. An access agreement was delivered to the owners of the property downgradient of the site at 23 Park Street and 830 Washington Street (Lots 252 and 254 on Figure 4). The owner of the property at 23 Park Street did not approve the access agreement and the owner of the property at 830 Washington Street was reportedly out of the country and was not returning for a few months. Attempts to get approval to install the wells on town property were unsuccessful. A street opening permit to install the wells in the road was denied by the town because the town does not allow the installation

of monitoring wells on town property. Therefore, a groundwater model was used to predict the concentrations of the compounds of concern that exceeded the applicable MCP Method 1 Standards (VPH fractions only) downgradient of the site. The model that was used was BIOSCREEN Version 1.3, developed by the Environmental Protection Agency (EPA). The BIOSCREEN model is based on the Domenico analytical transport model. The model was used to predict the dissolve contaminant plume if no engineered controls of further source reduction measures are implemented.

By evaluating the most recent groundwater analytical data, it is documented that impacted groundwater is present on the northeast portion of the property and most elevated in the areas of MW-3 and MW-4. Using the former UST area as the source area with distance equal to zero, the downgradient distances to wells MW-3, MW-4, MW-5, and MW-6 were used to set up the model. The downgradient distances are 20 feet, 60 feet, 80 feet, and 100 feet, respectively. The exposure point concentrations at these locations were used and their values are shown on the data input form. The first set of data refers to the C5-C8 Aliphatics, the second set of data refers to the C9-C12 Aliphatics, and the third set of data refers to the C9-C10 Aromatics. A discussion of the model inputs can be found in the Groundwater Modeling Report, which is included as Appendix G. Using the exposure point concentrations for the VPH fractions in groundwater and the aquifer characteristics, the model predicts that the concentration of the VPH fractions will be less than the applicable MCP Method 1 standard at a distance of approximately 105 feet downgradient of the source area. Additionally, the model predicted that the levels of the VPH fractions would be below laboratory detection limits at a distance of approximately 195 feet from the source area. The distance of 195 feet from the source area, as well as the existing known site concentrations, was defined as the disposal site boundary and is depicted on Figure 3.

5.1.2 Vertical Extent of Gasoline Impact in Groundwater & Soil

The vertical extent of impacted groundwater was determined by evaluating the monitoring wells logs and groundwater gauging data. The deepest monitoring well is approximately 28 feet and the depth to water has been detected at 11 to 16 feet below grade. Therefore, the vertical extent of groundwater impact is defined as the area from the water table, which is present at a depth of approximately 11 feet below grade, to a depth of 28 feet below grade.

The vertical extent of impacted soil was determined by reviewing the well logs from the installation of the monitoring wells. Since bedrock has been encountered at depths from 4 to 8 feet, soil sampling at depth has been limited. PID readings were reported at depths from 5 to 7 feet in MW-3 and MW-5. In the boring with the highest PID reading (MW-3), it was reported that PID readings decreased at a greater depth. Therefore, the vertical extent of impacted soil is estimated as the area from 5 to 7 feet below grade.

5.1.3 Results of Indoor Air Sampling

On April 15, 1996, a 24-hour indoor air sampling study was conducted in the basement of the VFW building where PID readings had previously been detected. The study was done with the SVES in operation and then later with the SVES turned off. Air samples were collected using a tedlar bag and submitted for laboratory analysis of benzene, toluene, ethylbenzene, xylenes, and MTBE by NIOSH Method 1501. Results of the air sampling indicated that none of the compounds analyzed for were detected. A summary of the air sampling data is included in Appendix F and the laboratory analytical report is included in Appendix I.

During September and October 1997, a second indoor air sampling study was conducted in the basement of the VFW building. The air sampling study consisted of collecting a 24-hour air sample on a weekly basis for four weeks. The samples were collected using a summa cannister and submitted for laboratory analysis of VOCs by NIOSH 1501. The results of the air sampling study indicated that many petroleum compounds and many non-petroleum compounds were detected in the samples. Although, it appeared that these compounds were detected at trace levels and at concentrations much lower than the Occupational Safety and Health Act Permissible Exposure Limit (OSHA PEL). A summary of the air sampling data is included in Appendix F and the laboratory analytical report is included in Appendix I.

Based on the air sampling studies performed to date, the detection of the trace levels of the petroleum related compounds are most likely not attributable to any of the reported releases.

5.2 Release Site Definition

Based on the documented extent of petroleum-impacted soil and groundwater at the site and the groundwater modeling conducted, the release site is defined as the northern and eastern portion of the Getty property located at 825 Washington Street and a portion of the adjacent properties across Washington Street (23 Park Ave, 820-826 & 830 Washington Street) in Stoughton, Massachusetts, which is depicted in Figure 3.

6.0 REGULATORY FILE REVIEW

A file review of federal, state, and local environmental records and databases was conducted for the property and surrounding properties to determine possible nearby releases and their impact. An environmental database search conducted by New England DataMap Technology Corporation (NEDTC) of Dedham, Massachusetts was used as the basis of the federal and state file review. A copy of the NEDTC report is included as Appendix J.

6.1 Federal and State File Review

Federal and state files which were reviewed were: MADEP Master List of State Hazardous Waste Sites, Comprehensive Environmental Response, Compensation, and Liability Index System (CERCLIS), Emergency Response Notification System (ERNS), Resource Conservation Recovery Index System (RCRIS), National Priority List (NPL), Solid Waste Landfills (SWL), Registered USTs, and the State Spills List.

6.1.1 MADEP File Review

The MADEP Master List of State Hazardous Waste Sites was reviewed for properties located within 0.25 miles of the subject property.

According to the New England DataMap Report, the subject property is listed on the MADEP List of Hazardous Waste Sites for the release of petroleum, which was described in Section 2.2 of this report. Four other properties, all approximately 0.25 miles from the site, were also listed on the MADEP list.

Site Name: Citgo/Mutual Service Station
724 Washington Street
Stoughton, MA
DEP Site No. 4-0480
Located approximately 0.25 miles north of the subject property.
This site was listed due to a release of gasoline and given LTBI status in 1988. A groundwater treatment system was in operation at the site during 1990-1992 due to the presence of NAPL in overburden groundwater monitoring wells. No bedrock wells were installed on site. In 1996, a RAM was undertaken to implement bioremediation at the site. Response actions are ongoing at the site.

Site Name: Fragas Brothers Market
105 Porter Street
Stoughton, MA
DEP Site No. 4-0791
Located approximately 0.25 miles north of the subject property.
This site was listed as LTBI in 1990. The site is currently under Phase II status.

Site Name: J.F. Corcoran Shoe Co.
2 Canton Street
Stoughton, MA
DEP Site No. 4-0875
Located approximately 0.25 miles northwest of the subject property.
The site was listed as LTBI in 1990 due to the release of petroleum. The site is currently under Phase II status.

Site Name: Former Service Station
990 Washington Street
Stoughton, MA
DEP Site No. 4-0265
Located approximately 0.25 miles south of the subject property.
The site was listed as LTBI in 1987 due to the release of gasoline. A RAO statement was submitted to the DEP in 1994.

6.1.2 CERCLA Sites

According to the database search conducted by NEDTC, there are no properties listed in the CERCLIS database within 0.5 miles of the subject property. The subject property is not included in the CERCLIS database.

6.1.3 ERNS Sites

According to the database search conducted by NEDTC, there are 2 properties within 0.25 miles of the subject property in the ERNS database. The subject property is not included in the ERNS database.

Site Name: NYNEX
862 Washington Street
Stoughton, MA
Case No.: 511346
Located approximately 500 feet south of subject property.
This site was listed in the ERNS database due to a UST replacement in 1996. No other information was available.

Site Name: Not Given
Wyman Street and Washington Street
Stoughton, MA
Case No.: D60146
Located approximately 500 feet north of subject property.
This site was listed in the ERNS database due to a spill of 50 gallons of diesel fuel in 1995. No other information was available.

6.1.4 RCRA Sites

According to the database search conducted by NEDTC, there are 5 properties within 0.25 miles of the subject property in the RCRIS database. The subject property is not included in the RCRIS database.

Site Name: Alpha Chemical Services
46 Morton Street
Stoughton, MA
ID No. MAD051782316
Located approximately 500 feet southwest of the subject property.
This property is listed in the RCRA database for the generation of 100 to 1,000 kilograms of hazardous waste per month.

Site Name: Ruggiero and Son, Inc.
931 Washington Street
Stoughton, MA
ID No. MAD051775047
Located approximately 1,000 feet south of the subject property.
This property is listed in the RCRA database for the generation of less than 100 kilograms of hazardous waste per month.

Site Name: Stoughton Dye House, Inc.
20 Freeman Street
Stoughton, MA
ID No. MAD045913381
Located approximately 500 feet north of the subject property.
This property is listed in the RCRA database for the generation of less than 100 kilograms of hazardous waste per month.

Site Name: Stoughton Town Hall
10 Pearl Street
Stoughton, MA
ID No. MAD075365692
Located approximately 1,000 feet north of the subject property.
This property is listed in the RCRA database for the generation of less than 100 kilograms of hazardous waste per month.

Site Name: Doctor's Office
85 Park Street
Stoughton, MA
ID No. MAD981212103
Located approximately 500 feet east of the subject property.
This property is listed in the RCRA database for the generation of less than 100 kilograms of hazardous waste per month.

6.1.5 NPL Sites

According to the database search conducted by NEDTC, there are no properties identified within 0.5 miles of the subject property that are included in the NPL database. The subject property is not listed in the NPL database.

6.1.6 SWL Sites

According to the database search conducted by NEDTC, there are no properties located within 0.50 miles of the subject property that are included in the SWL database. The subject property is not listed in the SWL database.

6.1.7 Registered UST Sites

According to the database search conducted by NEDTC, there are two properties within 0.25 miles of the subject property in the Registered UST database. The subject property is also listed in the Registered UST database. The description of the USTs at the property is included in Section 2.2 of this report.

Site Name: New England Telephone Co.
862 Washington Street
Stoughton, MA
Facility ID: 0-012647
Located approximately 500 feet south of the subject property.
This site is listed in the Registered UST database for having a 1,000 gallon UST installed in 1976. No other information was available.

Site Name: Ruggiero and Son, Inc.
931 Washington Street
Stoughton, MA
Facility ID: 0-012635
Located approximately 0.25 miles south of the subject property.
This site is listed in the Registered UST database for the removal of a 3,000 gallon gasoline UST. No other information was available.

6.1.8 State Spills List

According to the database search conducted by NEDTC, there were 2 spill incidences since 1980 within 500 feet of the subject property that are included in the State Spills List database. The subject property was listed in the State Spill List database, which was described in Section 2.2 of this report.

Spill Name: Alpha Chemical Services, Inc.
46 Morton Street
Stoughton, MA
Spill ID: 4-11611
Located approximately 500 feet west of the subject property.
This site was listed in the State Spills database for the release of an 72 pounds of an unknown hazardous material in 1995. No further information was available.

Spill Name: Unlisted
35 Walnut Avenue
Stoughton, *MA*
Spill ID: 4-13443
Located approximately 500 feet east of the subject property.
The site was listed in the State Spills database for the release of No. 2 fuel oil during the assessment of the UST in 1997. No further information was available.

7.0 RISK ASSESSMENT

A risk characterization for soil and groundwater was conducted using the MCP Method 1 approach. The Method 1 approach was used because only soil and groundwater impact have been documented at the site and all the compounds of concern have MCP Method 1 Standards. The site is defined in the risk assessment as the location where compounds of concern have been detected above background levels. The site encompasses a portion of the Getty property and a portion of the adjacent properties located across Washington Street, as shown on Figure 3. The risk characterization and results are included in Appendix H.

The risk assessment indicates that a level of "No Significant Risk" has not been achieved at the site.

8.0 CONCLUSIONS

A Phase II CSA was conducted by Tyree in order to determine the extent of the reported release of gasoline and fuel oil. Due to the reported release of gasoline and fuel oil from the former USTs at the site during 1995 and 1997, soil and groundwater beneath the site has been impacted. Petroleum related compounds have not yet been reduced to levels below the applicable MCP Method 1 Standards.

The horizontal extent of petroleum impact has been defined as a portion of the Getty property and a portion of the two adjacent properties across Washington Street. The vertical extent of petroleum impact has been defined as the area immediate below grade where PAH compounds have been detected to a depth of 28 feet where gasoline related compounds have been detected.

A Phase II Comprehensive Site Assessment was completed by Tyree pursuant to 310 CMR 40.0000. Based on the information presented within this report, Tyree concludes that:

1. Subsurface soils, to a depth of 9 feet below grade, has been impacted from the reported release of petroleum occurring in 1995 and 1997.

2. Groundwater beneath the site, to a depth of 28 feet below grade, has been impacted from the reported release of gasoline.

3. Soil and groundwater sampling conducted in June 2000, indicated petroleum impact is still present on the Getty property.

4. Groundwater at the property is classified as GW-3. Groundwater is also classified as GW-2 in some parts of the site.

5. Based on a Method 1 Risk Assessment, a level of "No Significant Risk", pursuant to 310 CMR 40.0973(7) has not been achieved. Additionally, the requirements of a Response Action Outcome pursuant to 310 CMR 40.1000 have not been achieved. Therefore, further response actions pursuant to 310 CMR 40.0840(1)(a) are required at the site. Further response actions are to be conducted using a Phase III Remedial Action Plan. The Phase III Remedial Action Plan shall be submitted within 30 days of this report.

9.0 DISCLAIMER

This report was been prepared for the use of Getty Properties Corp. Reasonable due diligence was exercised by the staff of Tyree Organization, Ltd. in conducting the research and investigations necessary for the development of this report.

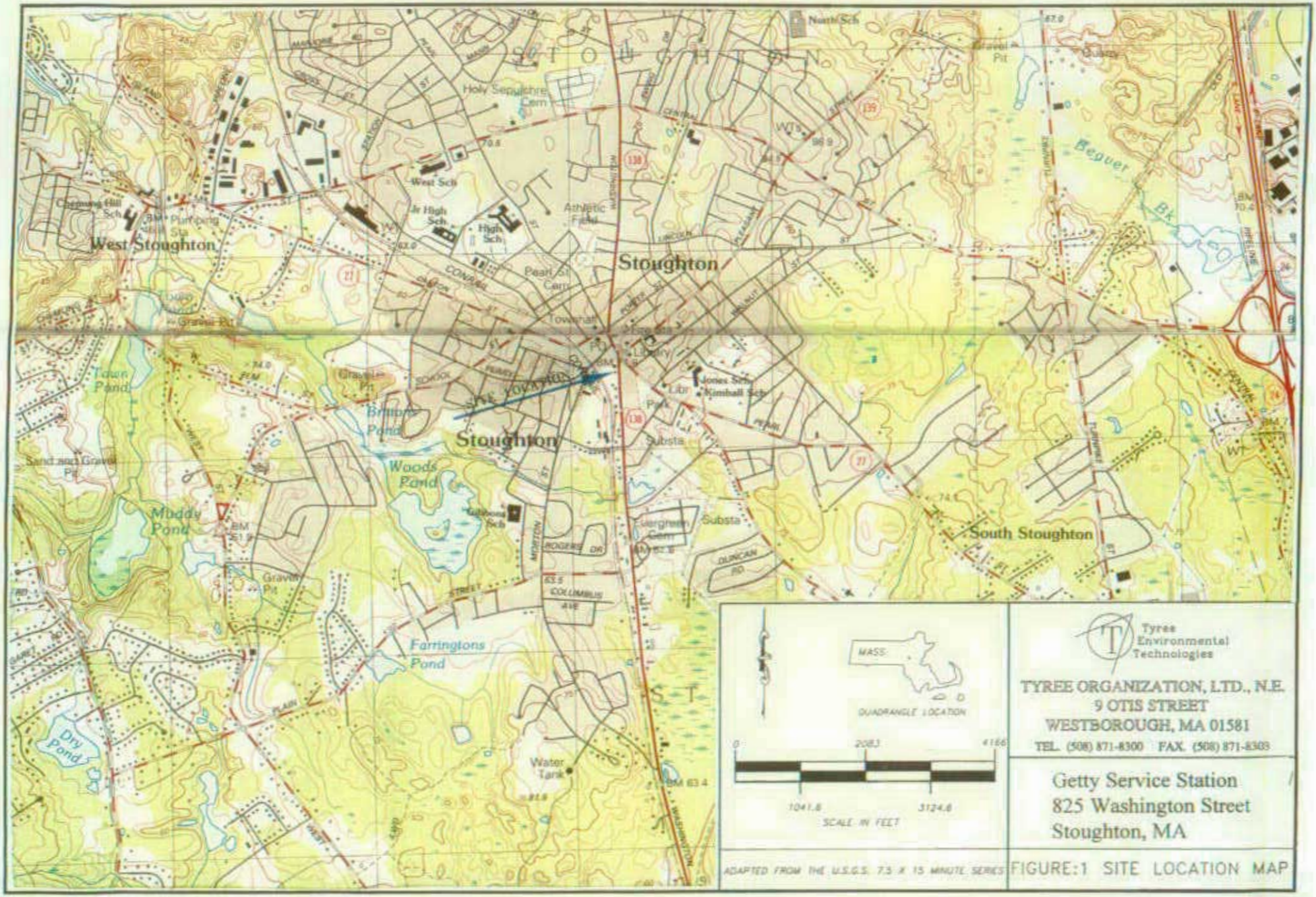
Results of future subsurface investigations may result in a modification of the conclusions stated above. The conclusions presented herein are based upon the current regulatory climate and may require revision if future regulatory changes occur. This investigation and the preparation of this report have been conducted in accordance with generally accepted practices. No other warranty, expressed or implied, is made.

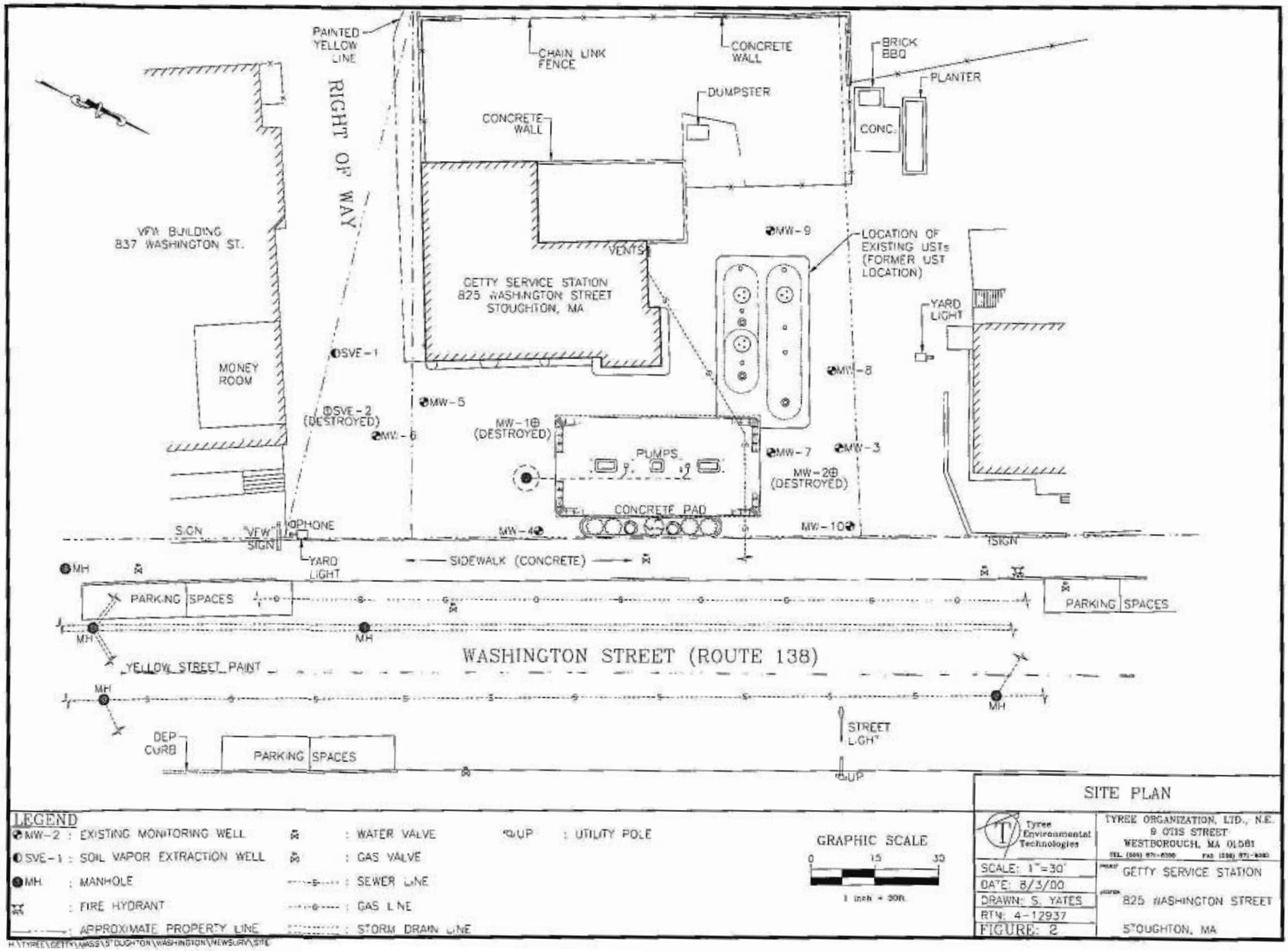
Respectfully Submitted,

Tyree Organization, Ltd.

Matthew J. Lyne
Environmental Project Manager

FIGURES


West Stoughton
Stoughton
Stoughton
South Stoughton
Holy Sepulchre Cem
North Sch
West Sch
Jr High Sch
High Sch
Athletic Field
Pearl Hill Cem
Town Hall
Library
Jones Sch
Kimball Sch
Pump Sta
Gravel Pit
Quarry
Town Pond
Brittins Pond
Woods Pond
Muddy Pond
Farringtons Pond
Dry Pond
Water Tank
Substa
Evergreen Cem
Columbus Sch
Beaver Bk
MASS.
QUADRANGLE LOCATION
0
2083
4166
1041.8
3124.6
SCALE IN FEET
Tyree Environmental Technologies
TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-8300 FAX. (508) 871-8303
Getty Service Station
825 Washington Street
Stoughton, MA
ADAPTED FROM THE U.S.G.S. 7.5 X 15 MINUTE SERIES
FIGURE:1 SITE LOCATION MAP



LEGEND

- MW-2 : EXISTING MONITORING WELL
- SVE-1 : SOIL VAPOR EXTRACTION WELL
- MH : MANHOLE
- : FIRE HYDRANT
- : APPROXIMATE PROPERTY LINE
- : WATER VALVE
- : GAS VALVE
- -S- : SEWER LINE
- -G- : GAS LINE
- : STORM DRAIN LINE
- UP : UTILITY POLE

GRAPHIC SCALE

0 15 30

1 inch = 30ft.

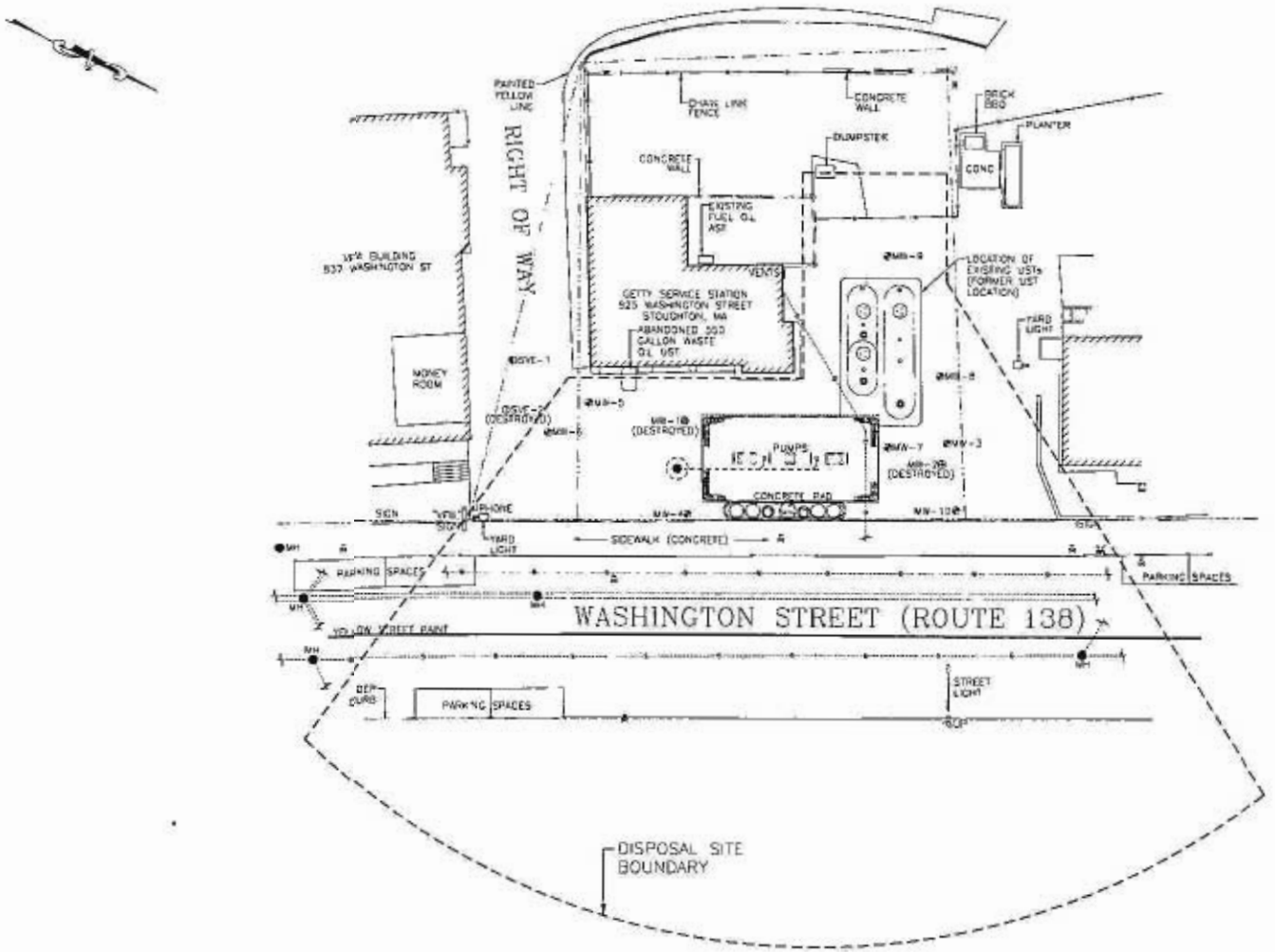
SITE PLAN

Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-6200 FAX (508) 871-6201

SCALE: 1"=30'	PROJECT: GETTY SERVICE STATION
DATE: 8/3/00	LOCATION: 825 WASHINGTON STREET
DRAWN: S. YATES	STOUGHTON, MA
RTN: 4-12937	
FIGURE: 2	

H:\TYREE\GETTY\MASS\STOUGHTON\WASHINGTON\NEWSURV\SITE



LEGEND

- MW-2 : EXISTING MONITORING WELL
- SVE-1 : SOIL VAPOR EXTRACTION WELL
- MH : MANHOLE
- : FIRE HYDRANT
- : APPROXIMATE PROPERTY LINE
- : WATER VALVE
- : GAS VALVE
- : SEWER LINE
- : GAS LINE
- : STORM DRAIN LINE
- UP : UTILITY POLE

GRAPHIC SCALE

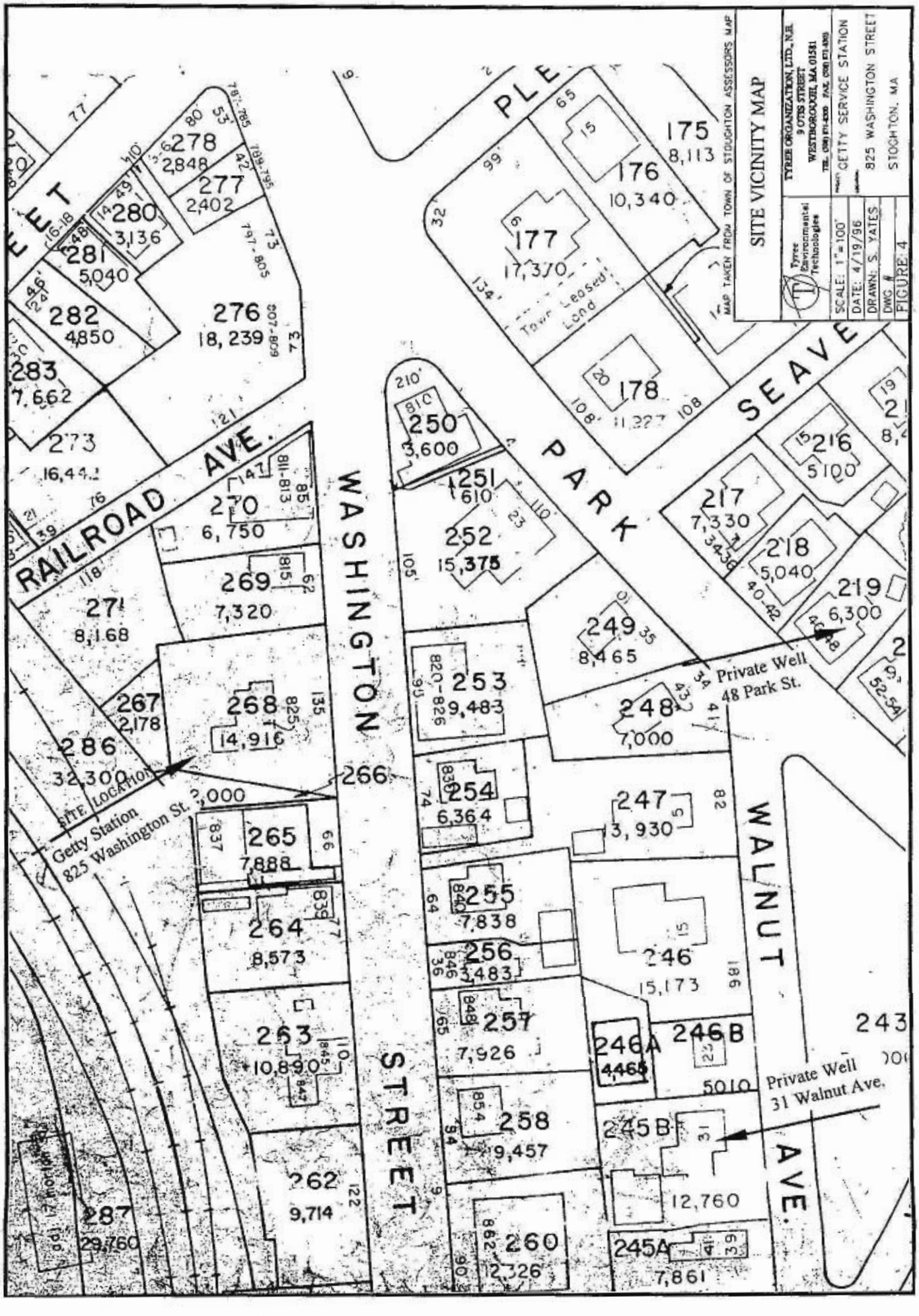
0 15 30

1 inch = 30ft.

DISPOSAL SITE BOUNDARY

Tyree Environmental Technologies	TYREE ORGANIZATION, LTD., N.E. 9 OTIS STREET WESTBOROUGH, MA 01581 TEL. (508) 871-5300 FAX. (508) 871-5303
SCALE: 1"=50'	PROJECT: GETTY SERVICE STATION
DATE: 8/3/00	LOCATION: 825 WASHINGTON STREET
DRAWN: S. YATES	STOUGHTON, MA
RTN: 4-12937	
FIGURE: 3	

H:\TYREE\GETTY\MASS\STOUGHTON\WASHINGTON\NEWSURV\DISPOSAL


SITE VICINITY MAP
MAP TAKEN FROM TOWN OF STOUGHTON ASSESSORS MAP
TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-4300 FAX. (508) 871-4305
Tyree Environmental Technologies
GETTY SERVICE STATION
825 WASHINGTON STREET
STOUGHTON, MA
SCALE: 1" = 100'
DATE: 4/19/96
DRAWN: S. YATES
DWG. #
FIGURE: 4
RAILROAD AVE.
WASHINGTON STREET
PARK
SEAVE
WALNUT AVE.
PLE
ET
Tower Leased Land
Getty Station
825 Washington St.
SITE LOCATION
Private Well
48 Park St.
Private Well
31 Walnut Ave.
Low Point
286
32,300
287
29,760
288
9,714
289
10,890
290
8,573
291
7,888
292
6,364
293
3,930
294
7,838
295
3,483
296
15,173
297
7,926
298
4465
299
5010
300
9,457
301
12,760
302
12,326
303
7,861
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14,916
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7,320
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6,750
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2,178
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16,442
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11,227
322
17,370
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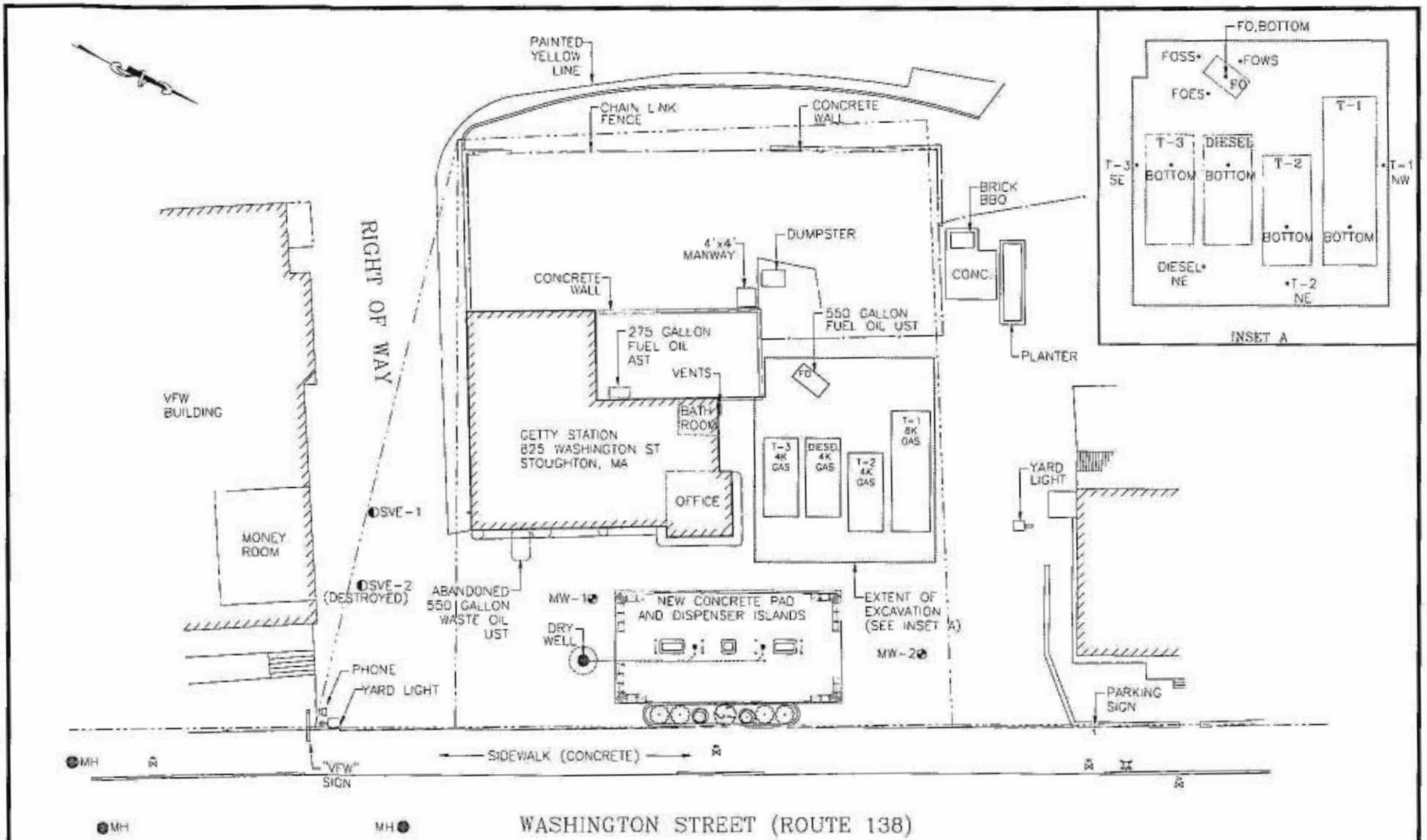
6,300
329
610
330
15,375



LEGEND

- MW-2 : EXISTING MONITORING WELL
- SVE-1: SOIL VAPOR EXTRACTION WELL
- MH : MANHOLE
- WV : WATER VALVE
- ——·——·—— : APPROXIMATE PROPERTY LINE
- FH : FIRE HYDRANT
- T-1 NW : LABORATORY SOIL SAMPLE LOCATION, TANK No. 1 NORTHWEST SIDEWALL

GRAPHIC SCALE

0 15 30

1 inch = 30ft

SOIL SAMPLE LOCATION MAP

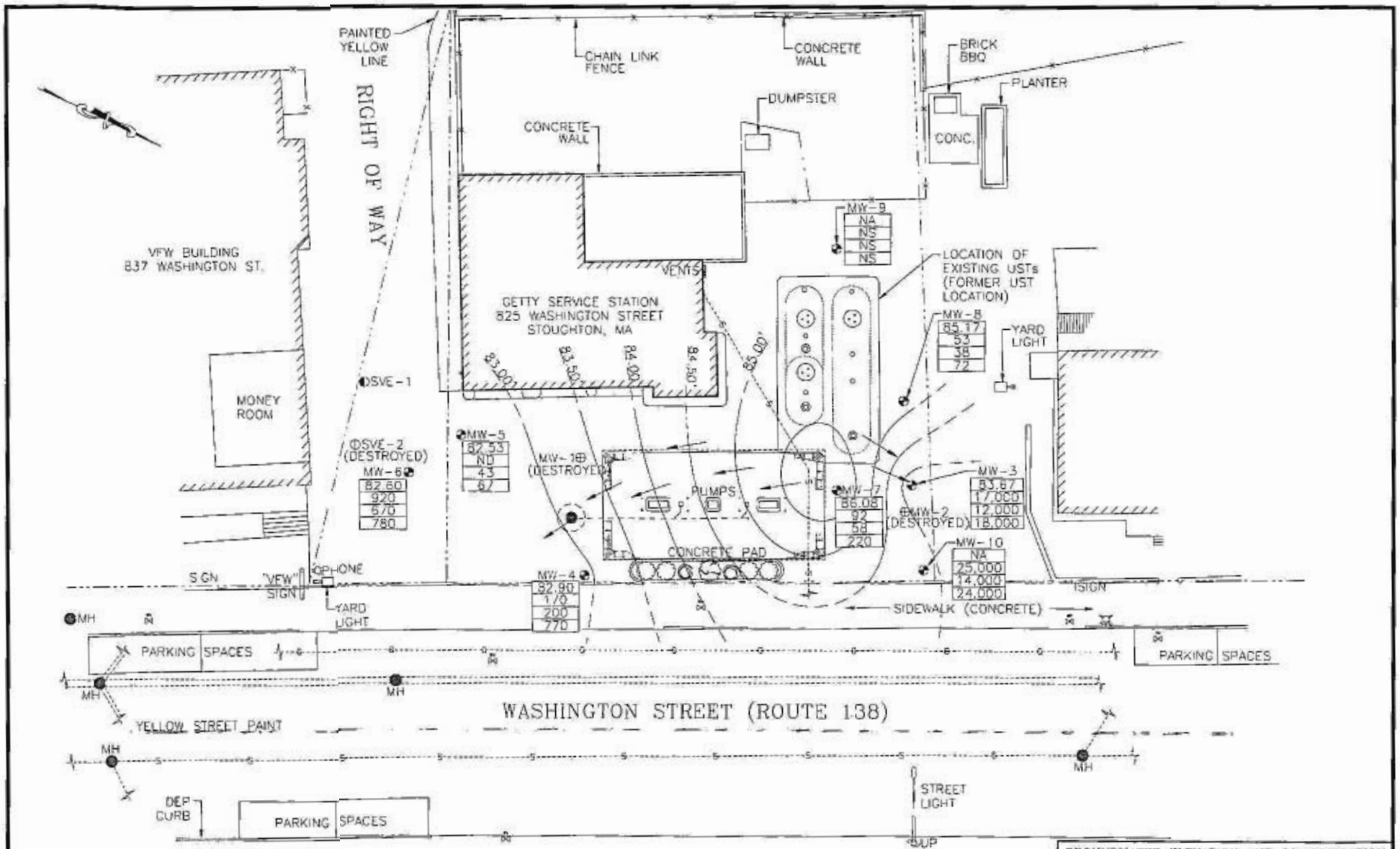
Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-6300 FAX. (508) 871-6309

SCALE: 1"=30'
DATE: 8/3/00
DRAWN: S. YATES
RTN: 4-12937
FIGURE: 5

PROJECT: GETTY SERVICE STATION
825 WASHINGTON STREET
STOUGHTON, MA

H:\TYREE\GETTY\MASS\STOUGHTON\WASHING\GLOSURV\PFSMAP



LEGEND

- MW-4 : EXISTING MONITORING WELL
- 82.90 : GROUNDWATER ELEVATION (ft)
- 170 : C5-C8 ALIPHATICS (ppb)
- 200 : C9-C12 ALIPHATICS (ppb)
- 770 : C9-C10 AROMATICS (ppb)
- 84.00' : GROUNDWATER CONTOUR INTERVAL = 0.5ft DASHED WHERE INFERRED
- APPROXIMATE PROPERTY LINE
- SVE-1 : SOIL VAPOR EXTRACTION WELL
- MH : MANHOLE
- UP : UTILITY POLE
- FH : FIRE HYDRANT
- WV : WATER VALVE
- GV : GAS VALVE
- APPROX. DIRECTION OF GW FLOW
- GAS LINE
- SEWER LINE
- STORM DRAIN LINE
- NA : NOT ANALYZED
- ND : NOT DETECTED

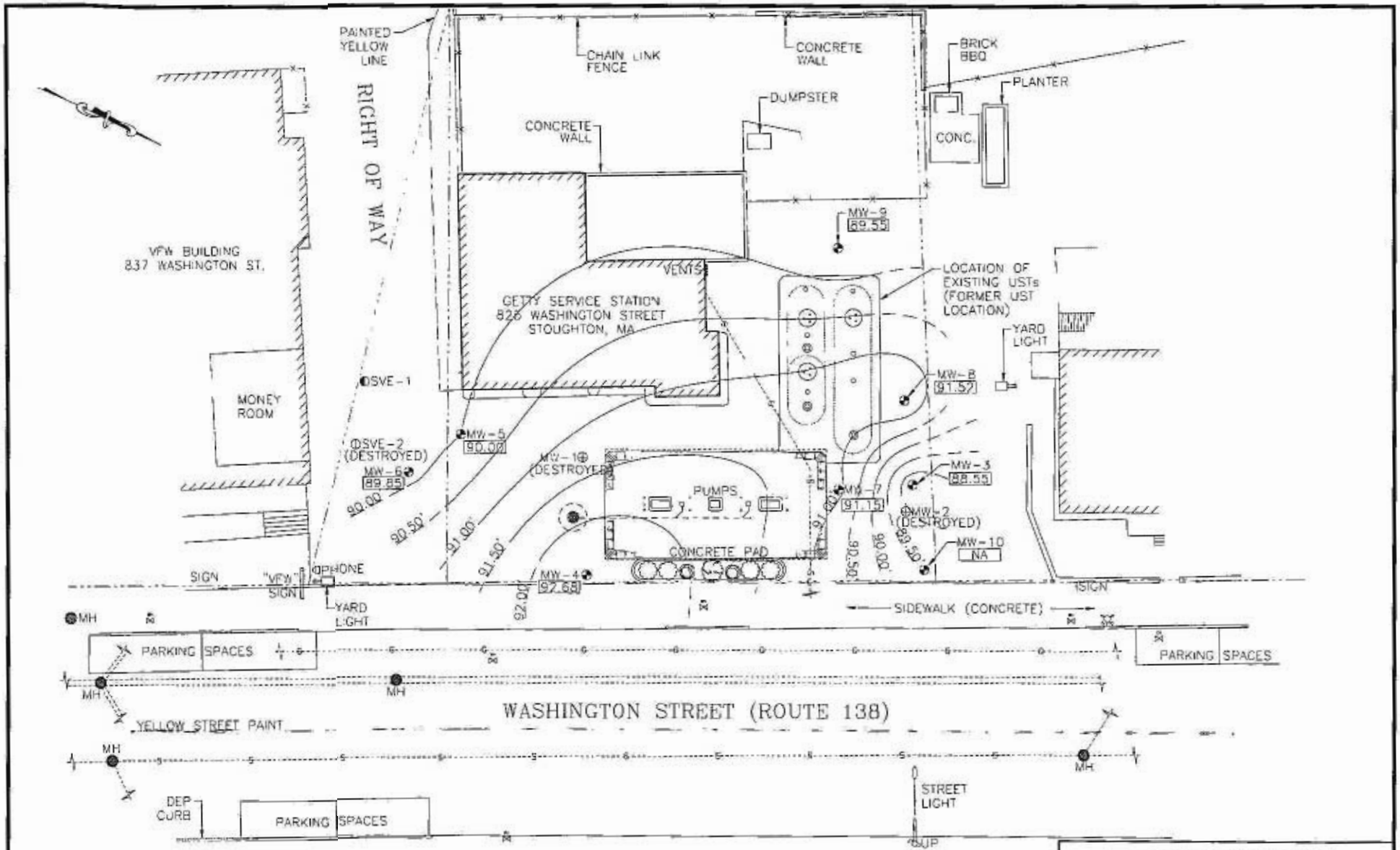
GRAPHIC SCALE
0 15 30
1 inch = 30ft

H:\TYREE\GETTY\MASS\STOUGHTON\WASHINGTON\NEWSURV\6035P

GROUNDWATER ELEVATION AND CONCENTRATION MAP - JUNE 21, 2000

Tyree Environmental Technologies
TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-0000 FAX. (508) 871-5503

SCALE: 1"=30'	PROJECT: GETTY SERVICE STATION
DATE: 6/3/00	LOCATION: 825 WASHINGTON STREET
DRAWN: S. YATES	STOUGHTON, MA
RTN: 4-12937	
FIGURE: 6	



BEDROCK CONTOUR MAP

LEGEND

- SVE-1 : SOIL VAPOR EXTRACTION WELL
- MW-4 : EXISTING MONITORING WELL
- 92.68 : BEDROCK SURFACE ELEVATION (ft)
- 91.00' : BEDROCK SURFACE CONTOUR INTERVAL = 0.5ft
- : APPROXIMATE PROPERTY LINE
- MH : MANHOLE
- UP : UTILITY POLE
- : FIRE HYDRANT
- : WATER VALVE
- : GAS VALVE
- : STORM DRAIN LINE
- : GAS LINE
- : SEWER LINE
- NA : NOT AVAILABLE

GRAPHIC SCALE
0 15 30
1 inch = 30ft

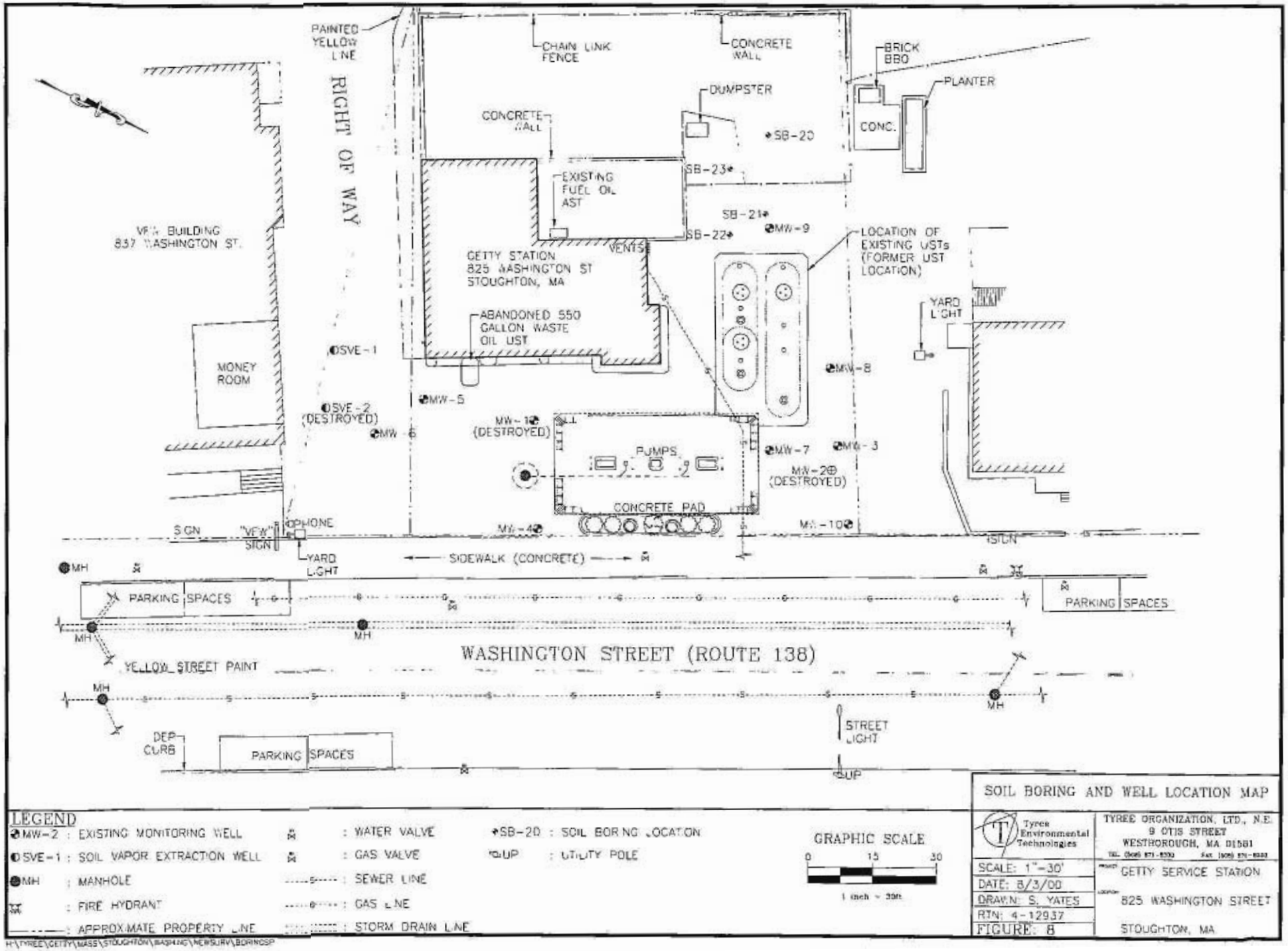
Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-0000 FAX (508) 871-9900

SCALE: 1"=30'
DATE: 8/3/00
DRAWN: S. YATES
RTN: 4-12937
FIGURE: 2

PROJECT: GETTY SERVICE STATION
825 WASHINGTON STREET
STOUGHTON, MA

H:\TYREE\GETTY\MASS\STOUGHTON\WASHINGTON\NEWSURV\BEDROCK



SOIL BORING AND WELL LOCATION MAP

LEGEND

- MW-2 : EXISTING MONITORING WELL
- SVE-1 : SOIL VAPOR EXTRACTION WELL
- MH : MANHOLE
- : FIRE HYDRANT
- : APPROXIMATE PROPERTY LINE
- : WATER VALVE
- : GAS VALVE
- : SEWER LINE
- : GAS LINE
- : STORM DRAIN LINE
- SB-20 : SOIL BORING LOCATION
- UP : UTILITY POLE

GRAPHIC SCALE

0 15 30

1 inch = 30ft

Tyree Environmental Technologies

TYREE ORGANIZATION, LTD., N.E.
9 OTIS STREET
WESTBOROUGH, MA 01581
TEL. (508) 871-5333 FAX. (508) 871-8333

SCALE: 1"=30'	PROJECT: GETTY SERVICE STATION
DATE: 8/3/00	
DRAWN: S. YATES	LOCATION: 825 WASHINGTON STREET
RTN: 4-12937	
FIGURE: 8	STOUGHTON, MA

H:\TYREE\GETTY\MASS\STOUGHTON\BASHNG\NEWSURV\BORINGSP

TABLES

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

SAMPLE	DEPTH	DATE	C5-C8 Aliphatics (ppb)	C9-C12 Aliphatics (ppb)	C9-C10 Aromatics (ppb)	C9-C18 Aliphatics (ppm)	C19-C36 Aliphatics (ppm)	C11-C22 Aromatics (ppm)
SOIL BORINGS/MONITORING WELL INSTALLATIONS								
MW-3	5-7'	11/20/97	NS	NS	NS	NS	NS	NS
MW-4	3-4'	11/20/97	3,300	8,300	3,200	24	320	300
MW-5	5-7'	11/20/97	1,300	1,100	740	< 1	7	8
MW-6	4-5'	8/18/98	< 4.1	< 2.9	537	< 3.92	24	27
MW-10	3-5'	6/6/00	< 2,500	< 500	< 250	< 1	39	23
SB-20	5-7'	6/6/00	NS	NS	NS	9	1,500	430
SB-21	3-5'	6/6/00	NS	NS	NS	110	12,000	2,500
SB-22	7-9'	6/6/00	NS	NS	NS	7	200	78
SB-23	3-5'	6/6/00	NS	NS	NS	< 10	700	720
SOIL EXCAVATION CONFIRMATORY SAMPLES								
Gas T-1 Bottom	8'	9/24/97	NS	NS	NS	< 1	1	< 2
Gas T-1 Northwest	7'	9/24/97	NS	NS	NS	< 1	< 1	< 2
Gas T-2 Bottom	8'	9/24/97	NS	NS	NS	< 1	< 1	< 2
Gas T-2 Northeast	7'	9/24/97	990	< 500	560	< 1	2	9
Gas T-3 Southeast	7'	9/24/97	1,100	1,000	1,500	2	44	35
Gas T-3 Bottom	8'	9/24/97	2,200	1,900	2,000	< 1	29	15
Diesel Bottom	8'	9/24/97	560	< 500	550	5	120	50
Diesel Northeast	7'	9/24/97	3,600	3,900	2,100	3	25	10
Fuel Oil East Side	7'	9/24/97	1,100	15,000	12,000	100	550	340
Fuel Oil West Side	7'	9/24/97	1,200	730	2,000	32	350	530
Fuel Oil South Side	7'	9/24/97	2,400	< 500	1,600	30	390	270
Fuel Oil Bottom	8'	9/24/97	2,800	810	2,000	110	370	590
Exposure Point Concentration:			1,868	4,092	2,399	39	926	349
S-1/GW-2 Method 1 Soil Standard:			100,000	1,000,000	100,000	1,000	2,500	800
S-1/GW-3 Method 1 Soil Standard:			100,000	1,000,000	100,000	1,000	2,500	800

Method 1 S-1/GW-2: Method 1 Cleanup Standard for soil classified as S-1/GW-2. NS: Not Sampled.

Method 1 S-1/GW-3: Method 1 Cleanup Standard for soil classified as S-1/GW-3.

All additional compounds analyzed for by the specified analytical methods were below laboratory detection limits for all samples.

Exposure Point Concentration equals the average concentration of a compound detected.

TABLE 1 (cont'd.)

SUMMARY OF SOIL ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

SAMPLE	DEPTH	DATE	Anthracene (ppm)	Benzo(b) fluoranthene (ppm)	Indeno(1,2,3) pyrene (ppm)	Benzo(a) anthracene (ppm)	Benzo(a) pyrene (ppm)	Benzo(g,h,i) perylene (ppm)	Chrysene (ppm)	Fluoranthene (ppm)	Phenanthrene (ppm)	Pyrene (ppm)
SOIL BORINGS/MONITORING WELL INSTALLATIONS												
MW-3	5-7'	11/20/97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-4	3-4'	11/20/97	< 0.0033	**1.87**	0.679	**1.35**	**1.16**	0.738	1.2	2.36	1.39	1.99
MW-5	5-7'	11/20/97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-6	4-5'	8/18/98	0.102	0.584	0.252	0.407	0.468	0.244	0.518	0.823	0.488	0.667
MW-10	3-5'	6/6/00	< 1	< 0.7	< 0.7	< 0.7	< 0.7	< 1	< 1	< 1	< 1	< 1
SB-20	5-7'	6/6/00	< 1	**14**	**8**	**11**	**8.7**	7	**11**	23	13	21
SB-21	3-5'	6/6/00	48	**140**	**57**	**120**	**86**	68	**130**	270	**210**	270
SB-22	7-9'	6/6/00	< 1	< 0.7	< 0.7	< 0.7	< 0.7	< 1	< 1	< 1	< 1	< 1
SB-23	3-5'	6/6/00	< 10	**44**	**< 7**	**39**	**35**	< 10	**37**	80	60	82
SOIL EXCAVATION CONFIRMATORY SAMPLES												
Gas T-1 Bottom	8'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Gas T-1 Northwest	7'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Gas T-2 Bottom	8'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Gas T-2 Northeast	7'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Gas T-3 Southeast	7'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Gas T-3 Bottom	8'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Diesel Bottom	8'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Diesel Northeast	7'	9/24/97	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fuel Oil East Side	7'	9/24/97	< 2	**10**	**5**	**6**	**6**	3	7	15	10	13
Fuel Oil West Side	7'	9/24/97	8	**50**	**27**	**27**	**27**	20	**31**	59	35	56
Fuel Oil South Side	7'	9/24/97	2	**19**	**12**	**10**	**11**	8	**11**	22	10	22
Fuel Oil Bottom	8'	9/24/97	7	**42**	**22**	**24**	**25**	16	**27**	53	31	52
Exposure Point Concentration:			48	**140**	**57**	**120**	**86**	68	**130**	270	**210**	270
S-1/GW-2 Method 1 Soil Standard:			1,000	0.7	0.7	0.7	0.7	1,000	7	1,000	1,000	700
S-1/GW-3 Method 1 Soil Standard:			1,000	0.7	0.7	0.7	0.7	1,000	7	1,000	100	700

Method 1 S-1/GW-2: Method 1 Cleanup Standard for soil classified as S-1/GW-2.

Method 1 S-1/GW-3: Method 1 Cleanup Standard for soil classified as S-1/GW-3.

All additional compounds analyzed for by the specified analytical methods were below laboratory detection limits for all samples.

NS: Not Sampled.

Exposure Point Concentration equals the maximum concentration of a compound detected.

TABLE 2

SUMMARY OF GROUNDWATER GAUGING DATA

Getty Service Station
825 Washington Street
Stoughton, MA

21-Jun-00

WELL IDENTIFICATION	TOC ELEVATION	DEPTH TO WATER	DEPTH TO SPH	SPH THICKNESS	GROUNDWATER ELEVATION
MW-3	97.55	13.88	ND	ND	83.67
MW-4	96.68	13.78	ND	ND	82.90
MW-5	96.50	13.97	ND	ND	82.53
MW-6	95.85	13.25	ND	ND	82.60
MW-7	97.15	11.07	ND	ND	86.08
MW-8	97.52	12.35	ND	ND	85.17
MW-9	97.55	DRY	ND	ND	DRY
MW-10	NA	13.85	13.81	0.04	NA

Well elevations based on a survey conducted by Tyree on Sept. 10, 1998 are based on an arbitrary datum of 100 feet (fire hydrant).
All measurements are presented in feet.
TOC: Top of casing. ND: Not detected. SPH: Separate Phase Hydrocarbon.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

23-Mar-00

	MW-3*	MW-4*	MW-5	MW-6	MW-7*	MW-8*	MW-9*	Method 1 GW-2	Method 1 GW-3
VPH by DEP Method VPH (ppb)									
Benzene	1,800	500	< 10	< 5	< 5	< 5	< 5	2,000	7,000
Toluene	17,000	10,000	< 10	< 5	< 5	< 5	< 5	6,000	50,000
Ethylbenzene	**4,200**	1,200	20	< 5	< 5	< 5	< 5	30,000	4,000
Xylenes	36,000	6,900	< 30	< 15	< 15	< 15	< 15	6,000	50,000
MTBE	< 5,000	120	18	< 5	< 5	7	< 5	50,000	50,000
Naphthalene	< 5,000	< 100	< 10	< 5	< 5	< 5	< 5	6,000	6,000
C5-C8 Aliphatics	**77,000**	**6,400**	320	< 50	91	< 50	< 50	1,000	4,000
C9-C12 Aliphatics	**22,000**	700	140	< 10	30	13	< 10	1,000	20,000
C9-C10 Aromatics	**48,000**	3,200	410	12	80	15	< 5	5,000	4,000
EPH by DEP Method EPH (ppb)									
Naphthalene	390	67	< 15	< 15	< 15	< 15	NS	6,000	6,000
2-Methylnaphthalene	630	57	< 15	< 15	< 15	< 15	NS	10,000	3,000
Phenanthrene	< 75	17	< 15	< 15	< 15	< 15	NS	NA	50
C9-C18 Aliphatics	15,000	2,000	18	< 15	< 15	< 15	NS	1,000	20,000
C19-C36 Aliphatics	1,000	1,500	< 15	< 15	< 15	120	NS	NA	20,000
C11-C22 Aromatics	1,600	2,000	< 30	< 30	< 30	< 30	NS	50,000	30,000
RCRA 8 Metals (ppm)									
Barium	0.18	0.04	0.14	0.22	0.10	0.06	NS	NA	30,000
Cadmium	0.019	< 0.001	0.005	0.008	< 0.001	< 0.001	NS	NA	10
Lead	0.011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NS	NA	30
EDB by EPA Method 504	18	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	3	50,000

*: GW-2 Method 1 Standard does not apply.

ppb: Parts per billion ppm: Parts per million.

NA: Not Available. NS: No Standard

Method 1 GW-2, GW-3: MCP Method 1 Groundwater Standards for groundwater classified as GW-2 and GW-3.

All additional compounds analyzed for by the specified analytical methods were ND for all samples.

TABLE 4
SUMMARY OF GROUNDWATER ANALYTICAL DATA

Getty Service Station
825 Washington Street
Stoughton, MA

21-Jun-00

	MW-3*	MW-4*	MW-5	MW-6	MW-7*	MW-8*	MW-9*	MW-10*	Method 1 GW-2	Method 1 GW-3
VPH by DEP Method VPH (ppb)										
Benzene	950	< 10	< 5	6	< 5	< 5	NS	< 2,500	2,000	7,000
Toluene	8,900	32	< 5	6	< 5	< 5	NS	7,700	6,000	50,000
Ethylbenzene	2,300	33	< 5	39	< 5	< 5	NS	< 2,500	30,000	4,000
Xylenes	17,800	198	< 15	15	42	< 15	NS	15,900	6,000	50,000
MTBE	< 500	< 10	< 5	31	< 5	< 5	NS	< 2,500	50,000	50,000
Naphthalene	960	18	< 5	< 5	6	< 5	NS	< 2,500	6,000	6,000
C5-C8 Aliphatics	**17,000**	170	< 50	920	92	53	NS	**< 25,000**	1,000	4,000
C9-C12 Aliphatics	12,000	200	43	670	58	38	NS	14,000	1,000	20,000
C9-C10 Aromatics	**18,000**	770	67	780	220	72	NS	**24,000**	5,000	4,000

*: GW-2 Method 1 Standard does not apply.
ppb: Parts per billion ppm: Parts per million.
NA: Not Available. NS: No Standard
Method 1 GW-2, GW-3: MCP Method 1 Groundwater Standards for groundwater classified as GW-2 and GW-3.
All additional compounds analyzed for by the specified analytical methods were ND for all samples.

TABLE 5

BEDROCK ELEVATION DATA

Getty Service Station
825 Washington Street
Stoughton, MA

WELL IDENTIFICATION	WELL ELEVATION	DEPTH TO BEDROCK	BEDROCK ELEVATION
MW-3	97.55	9.00	88.55
MW-4	96.68	4.00	92.68
MW-5	96.50	6.50	90.00
MW-6	95.85	6.00	89.85
MW-7	97.15	6.00	91.15
MW-8	97.52	6.00	91.52
MW-9	97.55	8.00	89.55

All measurements are presented in feet.
Elevations are based on an arbitrary one hundred foot (100') datum.
ND: Not detected.
Depth of Bedrock was estimated from soil boring logs.

APPENDIX A

SUMMARY OF SOIL ANALYTICAL DATA- SOIL BORINGS

Getty Service Station
825 Washington Street
Stoughton, MA

25-Jan-96

ANALYTE	SB-1 S-3 Depth= 4-6'	SB-2 S-5 Depth= 6-8'	SB-3 S-4 Depth= 5-7'	SB-4 S-4 Depth= 5-6'	SB-5 S-3 Depth= 4-6'	Method 1 S-1/GW-2	Method 1 S-1/GW-3
Benzene (ppb)	< 0.23	< 0.23	< 0.23	< 0.24	< 0.23	40,000	40,000
Toluene (ppb)	< 0.22	< 0.22	< 0.22	< 0.23	< 0.22	500,000	500,000
Ethylbenzene(ppb)	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	500,000	500,000
Xylenes (ppb)	< 0.49	< 0.49	< 0.50	< 0.51	< 0.49	500,000	500,000
MTBE (ppb)	< 0.65	< 0.64	< 0.66	< 0.67	< 0.64	100,000	100,000

ppb: parts per billion, micrograms per kilogram (ug/kg).

SB: Soil Boring.

Method 1 S-1/GW-2: MCP Method 1 Standards for soil classified as S-1/GW-2.

Method 1 S-1/GW-3: MCP Method 1 Standards for soil classified as S-1/GW-3.

All additional compounds analyzed for by the specified analytical methods were below detection limits for all soil samples.

SUMMARY OF SOIL ANALYTICAL DATA-GASOLINE AND DIESEL USTS

Getty Service Station
825 Washington Street
Stoughton, MA

24-Sep-97

SAMPLE LOCATION / ANALYTE	T-2 Bottom	T-2 NE	T-1 Bottom	T-1 NW	Diesel Bottom	Diesel NE Side	T-3 SE	T-3 Bottom	Meth. 1 S-1/GW-2	Meth. 1 S-1/GW-3
VOCs by EPA Method 8260										
Benzene (ppb)	< 0.29	< 0.31	< 0.29	< 0.28	< 0.31	< 0.29	< 0.29	< 0.29	40,000	40,000
Toluene (ppb)	< 0.34	< 0.36	< 0.34	< 0.33	< 0.36	< 0.35	< 0.34	< 0.34	500,000	500,000
Ethylbenzene (ppb)	< 0.35	< 0.37	< 0.35	< 0.34	< 0.37	< 0.36	< 0.35	< 0.35	500,000	500,000
Xylenes (ppb)	< 0.95	< 1.00	< 0.93	< 0.92	< 1.00	< 0.95	< 0.95	< 0.93	500,000	500,000
MTBE (ppb)	< 0.7	< 0.74	< 0.68	< 0.68	< 0.74	< 0.7	< 0.7	< 0.68	100,000	100,000
Methylene Chloride (ppb)	< 0.61	< 0.65	< 0.6	< 0.6	< 0.65	< 0.62	< 0.61	< 0.6	100,000	100,000
Tetrachloroethene (ppb)	< 0.29	< 0.31	< 0.29	< 0.28	< 0.31	< 0.29	< 0.29	< 0.29	20,000	20,000
n-Propylbenzene (ppb)	< 0.43	< 0.45	< 0.42	< 0.41	< 0.45	< 0.43	< 0.43	< 0.42	NS	NS
1,3,5-Trimethylbenzene(ppb)	< 0.31	< 0.33	< 0.31	< 0.3	26.5	< 0.32	< 0.31	2.7	NS	NS
2-Chlorotoluene (ppb)	< 0.27	< 0.29	< 0.27	< 0.26	< 0.29	< 0.27	< 0.27	< 0.27	NS	NS
4-Isopropyltoluene (ppb)	< 0.37	< 0.4	< 0.37	< 0.36	5.0	< 0.38	< 0.37	< 0.37	NS	NS
1,2,4-Trimethylbenzene (ppb)	< 0.43	< 0.45	< 0.42	< 0.41	2.2	< 0.43	< 0.43	1.5	NS	NS
1,3-Dichlorobenzene (ppb)	< 0.33	< 0.35	< 0.33	< 0.32	< 0.35	< 0.34	< 0.33	< 0.33	100,000	100,000
1,4-Dichlorobenzene (ppb)	< 0.33	< 0.35	< 0.33	< 0.32	< 0.35	< 0.34	< 0.33	< 0.33	40,000	40,000
n-Butylbenzene (ppb)	< 0.41	< 0.43	< 0.4	< 0.39	< 0.43	< 0.41	< 0.41	< 0.4	NS	NS
1,2-Dichlorobenzene (ppb)	< 0.28	< 0.3	< 0.28	< 0.27	< 0.3	< 0.28	< 0.28	< 0.28	100,000	100,000
Naphthalene (ppb)	< 0.57	< 0.61	< 0.56	< 0.56	1.6	< 0.58	< 0.57	< 0.56	100,000	100,000
Semi-volatiles by GC/MS										
Naphthalene (ppb)	< 69.2	< 73.4	< 67.6	< 67.6	< 42.2	< 40.1	< 39.7	< 39.1	100,000	100,000
2-Methylnaphthalene (ppb)	< 57.8	< 61.3	< 56.4	< 56.4	< 30.5	< 29.0	< 28.6	< 28.2	500,000	500,000
Phenanthrene (ppb)	< 39.4	135	< 38.5	< 38.5	446	< 51.7	144	< 50.3	1,000,000	100,000
Lead (ppm)	6.83	97.6	4.01	NA	NA	NA	69.9	73.7	300	300

*: Analyte detected in blank.
NE: Northeast Sidewall, NW: Northwest Sidewall, SE: Southeast Sidewall, ES: East Sidewall, WS: West Side, SS: South Side.
Method 1 S-1/GW-2: MCP Method 1 Soil Standard for soil classified as S-1/GW-2.
Method 1 S-1/GW-3: MCP Method 1 Soil Standard for soil classified as S-1/GW-3.
VPH: Volatile Petroleum Hydrocarbon. EPH: Extractable Petroleum Hydrocarbon. MTBE: Methyl-tert butyl ether.
NS: No Standard. NA: Not Available.
All additional compounds analyzed for by the specified analytical methods were not detected for all samples.

SUMMARY OF SOIL ANALYTICAL DATA-GASOLINE AND DIESEL USTS

Getty Service Station
825 Washington Street
Stoughton, MA

24-Sep-97

SAMPLE LOCATION / ANALYTE	T-2 Bottom	T-2 NE	T-1 Bottom	T-1 NW	Diesel Bottom	Diesel NE Side	T-3 SE	T-3 Bottom	Meth. 1 S-1/GW-1	Meth. 1 S-1/GW-2	Meth. 1 S-1/GW-3
EPH by MADEP-EPH											
EPH: C9-C18 Aliphatics (ppm)	< 1	< 1	< 1	< 1	5	3	2	< 1		1,000	1,000
EPH: C19-C36 Aliphatics(ppm)	< 1	2	1	< 1	120	25	44	29		2,500	2,500
EPH: C11-C22 Aromatics (ppm)	< 2	9	< 2	< 2	50	10	35	15		800	800
Anthracene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		1,000	1,000
Benzo(b,k)fluoranthene (ppm)	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4		NS	NS
Indeno(1,2,3-cd)pyrene*(ppm)	< 4	< 4	< 4	< 4	< 4	< 4	<4	< 4		0.7	0.7
Benzo(a)anthracene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		0.7	0.7
Benzo(a)pyrene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		0.7	0.7
Benzo(g,h,i)perylene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		1,000	1,000
Chrysene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		7	7
Fluoranthene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		1,000	1,000
Phenanthrene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		1,000	100
Pyrene (ppm)	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		700	700
VPH by MADEP-VPH											
VPH: C5-C8 Aliphatics (ppb)	NA	990	NA	NA	560	3,600	1,100	2,200		100,000	100,000
VPH: C9-C12 Aliphatics (ppb)	NA	< 500	NA	NA	< 500	3,900	1,000	1,900		1,000,000	1,000,000
VPH: C9-C10 Aromatics(ppb)	NA	560	NA	NA	550	2,100	1,500	2,000		100,000	100,000
Benzene (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	< 250		40,000	40,000
Toluene (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	580		500,000	500,000
Ethylbenzene (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	< 250		500,000	500,000
Xylenes (ppb)	NA	< 750	NA	NA	< 750	< 750	< 750	590		500,000	500,000
MTBE (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	< 250		100,000	100,000
Naphthalene (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	< 250		100,000	100,000
1,2,4-Trimethylbenzene (ppb)	NA	< 250	NA	NA	< 250	< 250	< 250	330		NS	NS

*: Includes Dibenzo(a,h)anthracene.
NE: Northeast Sidewall, NW: Northwest Sidewall, SE: Southeast Sidewall, ES: East Sidewall, WS: West Side, SS: South Side.
Method 1 S-1/GW-2: MCP Method 1 Soil Standard for soil classified as S-1/GW-2.
Method 1 S-1/GW-3: MCP Method 1 Soil Standard for soil classified as S-1/GW-3.
VPH: Volatile Petroleum Hydrocarbon. EPH: Extractable Petroleum Hydrocarbon. MTBE: Methyl-tert butyl ether.
NS: No Standard. NA: Not Available. Compounds which exceed standards are noted in bold print.
All additional compounds analyzed for by the specified analytical methods were not detected for all samples.

SUMMARY OF SOIL ANALYTICAL DATA-FUEL OIL UST

Getty Service Station
825 Washington Street
Stoughton, MA

9/24/97-9/25/97

SAMPLE LOCATION / ANALYTE	FO ES	FO WS	FO SS	FO Bottom	Meth. 1 S-1/GW-2	Meth. 1 S-1/GW-3
VOCs by EPA Method 8260						
Benzene (ppb)	< 0.61	< 0.29	< 0.29	< 0.29	40,000	40,000
Toluene (ppb)	< 0.72	< 0.35	< 0.34	< 0.34	500,000	500,000
Ethylbenzene (ppb)	< 0.74	< 0.36	< 0.35	1.3	500,000	500,000
Xylenes (ppb)	10.2	< 0.95	2.8	6.8	500,000	500,000
MTBE (ppb)	< 1.5	< 0.7	< 0.7	< 0.68	100,000	100,000
Methylene Chloride (ppb)	< 1.3	< 0.62	21.1*	< 0.6	100,000	100,000
Tetrachloroethene (ppb)	< 0.61	< 0.29	< 0.29	2.8	20,000	20,000
n-Propylbenzene (ppb)	28.7	< 0.43	< 0.43	1.5	NS	NS
1,3,5-Trimethylbenzene(ppb)	4.0	< 0.32	1.3	7.5	NS	NS
2-Chlorotoluene (ppb)	43.8	< 0.27	< 0.27	58.8	NS	NS
4-Isopropyltoluene (ppb)	< 0.78	< 0.38	< 0.37	4.6	NS	NS
1,2,4-Trimethylbenzene (ppb)	8.0	< 0.43	2.2	1.4	NS	NS
1,3-Dichlorobenzene (ppb)	252	< 0.34	< 0.33	8.1	100,000	100,000
1,4-Dichlorobenzene (ppb)	45.2	< 0.34	< 0.33	< 0.33	40,000	40,000
n-Butylbenzene (ppb)	< 0.85	< 0.41	< 0.41	1.8	NS	NS
1,2-Dichlorobenzene (ppb)	8.6	< 0.28	< 0.28	3.7	100,000	100,000
Naphthalene (ppb)	6.4	< 0.58	3.0	< 0.56	100,000	100,000
Semi-volatiles by GC/MS						
Naphthalene (ppb)	< 416	1,130	< 796	975	100,000	100,000
2-Methylnaphthalene (ppb)	< 300	< 579	< 574	< 566	500,000	500,000
Phenanthrene (ppb)	2,460	30,900	16,900	20,400	1,000,000	100,000
Lead (ppm)	NA	NA	NA	NA	300	

*: Analyte detected in blank.
NE: Northeast Sidewall, NW: Northwest Sidewall, SE: Southeast Sidewall, ES: East Sidewall, WS: West Side, SS: South Side.
Method 1 S-1/GW-2: MCP Method 1 Soil Standard for soil classified as S-1/GW-2.
Method 1 S-1/GW-3: MCP Method 1 Soil Standard for soil classified as S-1/GW-3.
VPH: Volatile Petroleum Hydrocarbon. EPH: Extractable Petroleum Hydrocarbon. MTBE: Methyl-tert butyl ether.
NS: No Standard. NA: Not Available.
All additional compounds analyzed for by the specified analytical methods were not detected for all samples.

SUMMARY OF SOIL ANALYTICAL DATA-FUEL OIL UST

Getty Service Station
825 Washington Street
Stoughton, MA

9/24/97-9/25/97

SAMPLE LOCATION / ANALYTE	FO ES	FO WS	FO SS	FO Bottom	Meth. 1 S-1/GW-2	Meth. 1 S-1/GW-3
EPH by MADEP-EPH						
EPH: C9-C18 Aliphatics (ppm)	100	32	30	110	1,000	1,000
EPH: C19-C36 Aliphatics(ppm)	550	350	390	370	2,500	2,500
EPH: C11-C22 Aromatics (ppm)	**340**	**530**	**270**	**590**	800	800
Anthracene (ppm)	< 2	8	2	7	1,000	1,000
Benzo(b,k)fluoranthene (ppm)	10	50	19	42	NS	NS
Indeno(1,2,3-cd)pyrene*(ppm)	**5**	**27**	**12**	**22**	0.7	0.7
Benzo(a)anthracene (ppm)	**6**	**27**	**10**	**24**	0.7	0.7
Benzo(a)pyrene (ppm)	**6**	**27**	**11**	**25**	0.7	0.7
Benzo(g,h,i)perylene (ppm)	3	20	8	16	1,000	1,000
Chrysene (ppm)	**7**	**31**	**11**	**27**	7	7
Fluoranthene (ppm)	15	59	22	53	1,000	1,000
Phenanthrene (ppm)	10	35	10	31	1,000	100
Pyrene (ppm)	13	56	22	52	700	700
VPH by MADEP-VPH						
VPH: C5-C8 Aliphatics (ppb)	1,100	1,200	2,400	2,800	100,000	100,000
VPH: C9-C12 Aliphatics (ppb)	15,000	730	< 500	810	1,000,000	1,000,000
VPH: C9-C10 Aromatics(ppb)	12,000	2,000	1,600	2,000	100,000	100,000
Benzene (ppb)	< 250	< 250	< 250	< 250	40,000	40,000
Toluene (ppb)	< 250	< 250	< 250	< 250	500,000	500,000
Ethylbenzene (ppb)	< 250	< 250	< 250	< 250	500,000	500,000
Xylenes (ppb)	< 750	< 750	< 750	< 750	500,000	500,000
MTBE (ppb)	< 250	< 250	< 250	< 250	100,000	100,000
Naphthalene (ppb)	290	440	370	370	100,000	100,000
1,2,4-Trimethylbenzene (ppb)	< 250	< 250	< 250	< 250	NS	

*: Includes Dibenzo(a,h)anthracene.
NE: Northeast Sidewall, NW: Northwest Sidewall, SE: Southeast Sidewall, ES: East Sidewall, WS: West Side, SS: South Side.
Method 1 S-1/GW-2: MCP Method 1 Soil Standard for soil classified as S-1/GW-2.
Method 1 S-1/GW-3: MCP Method 1 Soil Standard for soil classified as S-1/GW-3. MTBE: Methyl-tert butyl ether.
VPH: Volatile Petroleum Hydrocarbon. EPH: Extractable Petroleum Hydrocarbon.
NS: No Standard. NA: Not Available. Compounds which exceed standards are noted in bold print.
All additional compounds analyzed for by the specified analytical methods were not detected for all samples.

APPENDIX B

Tyree Environmental Technologies

BORING LOG

BORING LOG NAME

B-2 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION
PROJECT: 825 WASHINGTON STREET
LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96
LOGGED BY: Matthew Lyne
DRILLER: Sean Lyons/Wayne Atha
RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	35	18	Grey, coarse sand with some gravel
		30		
3		30		
		25		
4	S-3/<1	27	12	Spoon refusal at 5ft
		30,50		
5	S-4/NA	24	3	
		50		
6	S-5/<1	15	12	Light brown, coarse sand. Auger refusal at 7.5ft
		40		Sample sent to lab
7		50		
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.
Hole Dia.: N/A
Depth: 7.5 ft

WELL DATA

Riser
Type: N/A
Riser Dia.: N/A
Riser Length: N/A
Interval: N/A

Screen
Type: N/A
Screen Dia.: N/A
Screen Length: N/A
Slot: N/A
Interval: N/A

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: N/A

GROUT / SEAL

Type: N/A
Volume Used: N/A
Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO
Size: N/A
Concrete Pad: ☐ YES ☒ NO
Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO
Method: N/A
Amt. Purged: N/A
Date: N/A

LEGEND

NA = Not Applicable
PPM = parts per million
EOB = end of boring

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME

B-3 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION

PROJECT: 825 WASHINGTON STREET

LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96

LOGGED BY: Matthew Lyne

DRILLER: Sean Lyons/Wayne Atha

RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	58	18	Brown, fine sand with some gravel
		63		
3		50		
		40		
4	S-3/NA	86	0	Spoon refusal at 4.5ft
5	S-4/<1	16	12	Orange, fine sand with some gravel Sample sent to lab
		33		
6		44		
		53		
7	S-5/NA	50	0	Auger refusal at 8ft
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.

Hole Dia.: N/A

Depth: 8 ft

WELL DATA

Riser Type: N/A

Riser Dia.: N/A

Riser Length: N/A

Interval: N/A

Screen Type: N/A

Screen Dia.: N/A

Screen Length: N/A

Slot: N/A

Interval: N/A

FILTER PACK

Source: N/A

Composition: N/A

Volume Used: N/A

Interval: N/A

GROUT / SEAL

Type: N/A

Volume Used: N/A

Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO

Size: N/A

Concrete Pad: ☐ YES ☒ NO

Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO

Method: N/A

Amt. Purged: N/A

Date: N/A

LEGEND

NA = Not Applicable

PPM = parts per million

EOB = end of boring

trace=1-10%

little=10-20%

some=20-30%

and=30-50%

very fine sand=0.6-0.13mm

fine sand=0.13-0.25mm

medium sand=0.25-0.50mm

course sand=0.5-1mm

very course sand=1-2mm

pebble=2-4mm

gravel=4-64mm

cobble=64-256mm

boulder=256mm

groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME

B-4 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION

PROJECT: 825 WASHINGTON STREET

LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96

LOGGED BY: Matthew Lyne

DRILLER: Sean Lyons/Wayne Atha

RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	22	18	Light brown, medium sand with some gravel
		25		
3		40		
		40		
4	S-3/<1	22	12	Grey, fine sand with some gravel
		50		
5	S-4/<1	24	12	Brown clay. Sample sent to lab
		24,50		
6	S-5/NA		0	Auger refusal at 7ft
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA

Drilling Method: H.S.A.

Hole Dia.: N/A

Depth: 7 ft

WELL DATA

Riser Type: N/A

Riser Dia.: N/A

Riser Length: N/A

Interval: N/A

Screen Type: N/A

Screen Dia.: N/A

Screen Length: N/A

Slot: N/A

Interval: N/A

FILTER PACK

Source: N/A

Composition: N/A

Volume Used: N/A

Interval: N/A

GROUT / SEAL

Type: N/A

Volume Used: N/A

Interval: N/A

WELL HEAD COMPLETION

Manhole: ☐ YES ☒ NO

Size: N/A

Concrete Pad: ☐ YES ☒ NO

Size: N/A

WELL DEVELOPMENT

Performed: ☐ YES ☒ NO

Method: N/A

Amt. Purged: N/A

Date: N/A

LEGEND

NA = Not Appplicable

PPM = parts per million

EOB = end of boring

trace=1-10%

little=10-20%

some=20-30%

and=30-50%

very fine sand=0.6-0.13mm

fine sand=0.13-0.25mm

medium sand=0.25-0.50mm

course sand=0.5-1mm

very course sand=1-2mm

pebble=2-4mm

gravel=4-64mm

cobble=64-256mm

boulder=256mm

groundwater table

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Tyree Environmental Technologies

BORING LOG

BORING LOG NAME: B-5 PAGE: 1 of 1

CLIENT: GETTY SERVICE STATION
PROJECT: 825 WASHINGTON STREET
LOCATION: STOUGHTON, MA

DATE STARTED/COMPLETED: 1/25/96
LOGGED BY: Matthew Lyne
DRILLER: Sean Lyons/Wayne Atha
RIG: CME-55 (truck mounted)

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Field Description of Soil
0	S-1/<1			Dark brown fill
1				
2	S-2/<1	33	18	Brown, medium sand with some gravel
3		32		
		42		
4		35		
	S-3/<1	23	12	Brown, medium sand with some gravel
5		50		Auger refusal at 6ft. Sample sent to lab
		100		
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

BORE HOLE DATA
Drilling Method: H.S.A.
Hole Dia.: N/A
Depth: 6 ft

WELL DATA
Riser
Type: N/A
Riser Dia.: N/A
Riser Length: N/A
Interval: N/A

Screen
Type: N/A
Screen Dia.: N/A
Screen Length: N/A
Slot: N/A
Interval: N/A

FILTER PACK
Source: N/A
Composition: N/A
Volume Used: N/A
Interval: N/A

GROUT / SEAL
Type: N/A
Volume Used: N/A
Interval: N/A

WELL HEAD COMPLETION
Manhole: ☐ YES ☒ NO
Size: N/A
Concrete Pad: ☐ YES ☒ NO
Size: N/A

WELL DEVELOPMENT
Performed: ☐ YES ☒ NO
Method: N/A
Amt. Purged: N/A
Date: N/A

LEGEND

PPM = parts per million
EOB = end of boring

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-3 PAGE: 1 of 1

CLIENT: Getty Station No. 30646
PROJECT: 825 Washington Street
LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 11/20/97
LOGGED BY: D. Wood
DRILLER: AM Drilling
RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Completion	Field Description of Soil
0	S-1/0	NA	0		8" road box.
					0-2' Grey, fine to medium sand.
2					
	S-2/0	NA	0		
4					
	*S-3/200	8 8	6		5-7' Grey, fine to medium sand and silt.
6		7 6			
	S-4/0	2 2	4		7-9' Peastone.
8		12 50			9' Bedrock.
10					
12					
14					
16					
18					Note: fracture in rock at 17.5'.
20					EOB @ 19.5'

PPM = parts per million * = sent to lab
N/A = Not available

LEGEND

- water table
- cobbles, boulders, and sand
- competent bedrock

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

BORE HOLE DATA

Drilling Method: Air Rotary
Hole Dia.: 2"
Depth: 19.5'

WELL DATA

Casing
Type: PVC Sch. 40
Dia.: 2"
Length: 14.5'
Interval: 0-14.5'

Screen
Type: PVC Sch. 40
Screen Dia.: 2"
Screen Length: 5'
Slot: 0.020"
Interval: 14.5-19.5'

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: 0-9'

GROUT / SEAL

Type: Grout
Volume Used: N/A
Interval: junc. screen/riser

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO
Size: 8"
Concrete Pad: [X] YES [ ] NO
Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO
Method: Bailing
Amt. Purged: N/A
Date: 12/17/97

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

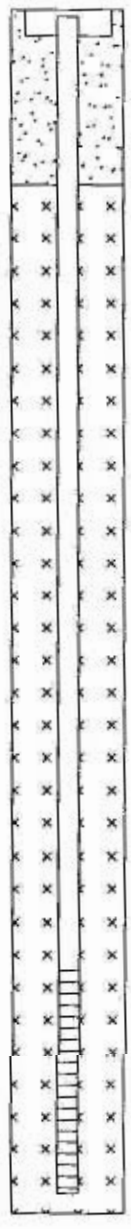
MW-4 PAGE: 1 of 1

CLIENT: Getty Station No. 30646
PROJECT: 825 Washington Street
LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 11/20/97
LOGGED BY: D. Wood
DRILLER: AM Drilling
RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)
0	S-1/0	NA	0
3	*S-2/0	NA	0
6			
9			
12			
15			
18			
21			
24			
27			
30			

Well Completion



Field Description of Soil

8" road box.

0-2' Brown, fine to medium sand and silt.

2-4' Brown, fine to medium sand and silt.

4' Bedrock.

Note: fracture in rock at 23'.

EOB @ 28.5'

PPM = parts per million * = sent to lab
N/A = Not available

LEGEND

- water table
- cobbles, boulders, and sand
- competent bedrock

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm
pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

BORE HOLE DATA

Drilling Method: Air Rotary
Hole Dia.: 2"
Depth: 28.5'

WELL DATA

Casing
Type: PVC Sch. 40
Dia.: 2"
Length: 23.5
Interval: 0-23.5'

Screen
Type: PVC Sch. 40
Screen Dia.: 2"
Screen Length: 5'
Slot: 0.020"
Interval: 23.5-28.5'

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: 0-4'

GROUT / SEAL

Type: Grout
Volume Used: N/A
Interval: junc. screen/riser

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO
Size: 8"
Concrete Pad: [X] YES [ ] NO
Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO
Method: Bailing
Amt. Purged: N/A
Date: 12/17/97

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-5 PAGE: 1 of 1

CLIENT: Getty Station No. 30646
PROJECT: 825 Washington Street
LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 11/21/97
LOGGED BY: D. Wood
DRILLER: AM Drilling
RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Completion	Field Description of Soil
0	S-1/0	NA	0		8" road box. 0-2' Light brown, fine to medium sand and silt.
2	S-2/0	NA	0		2-4' Brown, fine sand and silt.
4					
6	*S-3/10	25 38 60/3"	4		5-7' Light tan, fine sand and silt. 6.5' Bedrock.
8					
10					
12					
14					
16					Note: bedrock fracture at 17'.
18					EOB @ 18'.
20					

BORE HOLE DATA

Drilling Method: Air Rotary
Hole Dia.: 2"
Depth: 18'

WELL DATA

Casing
Type: PVC Sch. 40
Dia.: 2"
Length: 13'
Interval: 0-13'

Screen
Type: PVC Sch. 40
Screen Dia.: 2"
Screen Length: 5'
Slot: 0.020"
Interval: 13-18'

FILTER PACK

Source: N/A
Composition: N/A
Volume Used: N/A
Interval: 0-6.5'

GROUT / SEAL

Type: Grout
Volume Used: N/A
Interval: junc. screen/riser

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO
Size: 8"
Concrete Pad: [X] YES [ ] NO
Size: 2' x 2'

PPM = parts per million
N/A = Not available
* = sent to lab

LEGEND

water table

cobbles, boulders, and sand

competent bedrock

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm
groundwater table

WELL DEVELOPMENT

Performed: [X] YES [ ] NO
Method: Bailing
Amt. Purged: N/A
Date: 12/17/97

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-6 PAGE: 1 of 1

CLIENT: Getty Properties Corp

PROJECT: 825 Washington Street

LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 8/18/98 - 8/20/98

LOGGED BY: D. Wood

DRILLER: American Drilling

RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Construction	Field Description of Soil
0	S-1/0	NA	NA		(Hand dug to 5') 0-2' Dark brown, fine to medium sand and silt.
2	S-2/0	NA	NA		2-5' Dark brown, fine to medium sand and silt.
4					
	NA	NA	NA		5-18' No samples taken.
6					
8					
10					
12					
14					
16				▽	Note: fracture at 16'
18					EOB at 18'
20					

BORE HOLE DATA

Drilling Method: Air Rotary

Hole Dia.: 6 1/4"

Depth: 18'

WELL DATA

Riser

Type: PVC Sch. 40

Riser Dia.: 4"

Riser Length: 12.5'

Interval: 0-13'

Screen

Type: PVC Sch. 40

Screen Dia.: 4"

Screen Length: 5'

Slot: 0.02"

Interval: 13-18'

FILTER PACK

Type: Morie Sand

Composition: NA

Volume Used: NA

Interval: 0-5'

GROUT / SEAL

Type: Bentonite

Volume Used: NA

Interval: 5-6'

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO

Size: 9"

Concrete Pad: [X] YES [ ] NO

Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO

Method: Bailing

Amt. Purged: NA

Date: 8/20/98

ppm = parts per million NA = not applicable
EOB = end of boring TFF = taken from flights
* = sample sent to laboratory

LEGEND

bedrock

filter sand

screen

water table

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm

H:\TYREE\TYREE\LYNE\STOUGHTO\MW6

Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-7 PAGE: 1 of 1

CLIENT: Getty Properties Corp

PROJECT: 825 Washington Street

LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 8/18/98 - 8/20/98

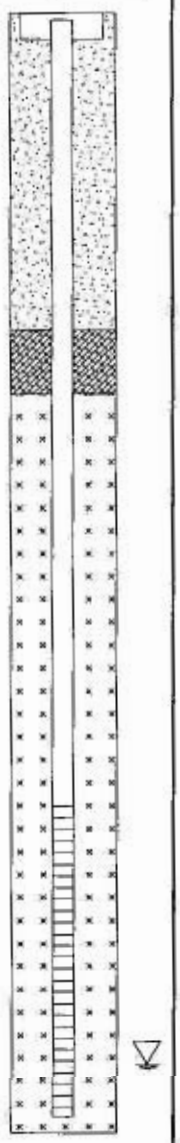
LOGGED BY: D. Wood

DRILLER: American Drilling

RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)
0	S-1/0	NA	NA
2	S-2/0	NA	NA
4			
6	S-3/0	12 6 8 3	12
8			
10			
12			
14			
16			
18			
20			

Well Construction



Field Description of Soil

(Hand dug to 5')

0-2' Grey, sand and gravel. (Fill)

2-5' Grey, sand and gravel. (Fill)

5-7' Grey, sand and gravel. (Fill)

EOB at 17.5'

BORE HOLE DATA

Drilling Method: Air Rotary

Hole Dia.: 6 1/4"

Depth: 17.5'

WELL DATA

Riser

Type: PVC Sch. 40

Riser Dia.: 4"

Riser Length: 12.5'

Interval: 0-12.5'

Screen

Type: PVC Sch. 40

Screen Dia.: 4"

Screen Length: 5'

Slot: 0.02"

Interval: 12.5-17.5'

FILTER PACK

Type: Morie Sand

Composition: NA

Volume Used: NA

Interval: 0-5'

GROUT / SEAL

Type: Bentonite

Volume Used: NA

Interval: 5-6'

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO

Size: 9"

Concrete Pad: [X] YES [ ] NO

Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO

Method: Bailing

Amt. Purged: NA

Date: 8/20/98

ppm = parts per million NA = not applicable
EOB = end of boring TFF = taken from flights
* = sample sent to laboratory

LEGEND

bedrock

filter sand

screen

water table

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-8 PAGE: 1 of 1

CLIENT: Getty Properties Corp

PROJECT: 825 Washington Street

LOCATION: Stoughton, MA

DATE STARTED/COMPLETED: 8/18/98 - 8/20/98

LOGGED BY: D. Wood

DRILLER: American Drilling

RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Construction	Field Description of Soil
0	S-1/0	NA	NA		(Hand dug to 5')
					0-2' Grey, sand and gravel. (Fill)
2	S-2/0	NA	NA		2-5' Grey, sand and gravel. (Fill)
4					
	S-3/0	6 7	12		5-7' Grey, sand and gravel. (Fill)
6		9 5			
	S-4/0	12 6	18		7-9' Grey, sand and gravel. (Fill)
8		5 9			
10					
12					
14					
16					
18					
20					EOB at 20'

BORE HOLE DATA

Drilling Method: Air Rotary

Hole Dia.: 6 1/4"

Depth: 20'

WELL DATA

Riser

Type: PVC Sch. 40

Riser Dia.: 4"

Riser Length: 12.5'

Interval: 0-15'

Screen

Type: PVC Sch. 40

Screen Dia.: 4"

Screen Length: 5'

Slot: 0.02"

Interval: 15-20'

FILTER PACK

Type: Morie Sand

Composition: NA

Volume Used: NA

Interval: 0-5'

GROUT / SEAL

Type: Bentonite

Volume Used: NA

Interval: 5-6'

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO

Size: 9"

Concrete Pad: [X] YES [ ] NO

Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO

Method: Bailing

Amt. Purged: NA

Date: 8/20/98

ppm = parts per million NA = not applicable
EOB = end of boring TFF = taken from flights
* = sample sent to laboratory

LEGEND

bedrock

filter sand

screen

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME

MW-9 PAGE: 1 of 1

CLIENT: Getty Properties Corp

PROJECT: 825 Washington Street

LOCATION: Stoughton, MA

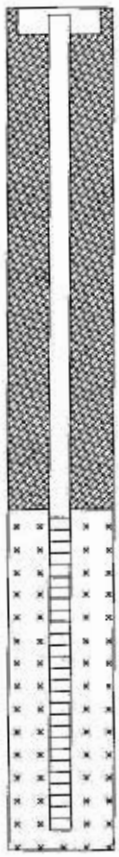
DATE STARTED/COMPLETED: 8/18/98 - 8/20/98

LOGGED BY: D. Wood

DRILLER: American Drilling

RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Construction	Field Description of Soil
0	S-1/0	NA	NA		(Hand dug to 5') 0-2' Grey, sand and gravel. (Fill)
2	S-2/0	NA	NA		2-5' Grey, sand and gravel. (Fill)
4					
	NA	NA	NA		5-13' No samples taken.
6					
8					
10					Note: fracture at 10'
12					
14					EOB at 13'
16					
18					
20					



BORE HOLE DATA

Drilling Method: Air Rotary

Hole Dia.: 6 1/4"

Depth: 13'

WELL DATA

Riser

Type: PVC Sch. 40

Riser Dia.: 4"

Riser Length: 8'

Interval: 0-8'

Screen

Type: PVC Sch. 40

Screen Dia.: 4"

Screen Length: 5'

Slot: 0.02"

Interval: 8-13'

FILTER PACK

Type: Morie Sand

Composition: NA

Volume Used: NA

Interval: NA

GROUT / SEAL

Type: Bentonite

Volume Used: NA

Interval: 0-8'

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO

Size: 9"

Concrete Pad: [X] YES [ ] NO

Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO

Method: Bailing

Amt. Purged: NA

Date: 8/20/98

ppm = parts per million NA = not applicable
EOB = end of boring TFF = taken from flights
* = sample sent to laboratory

LEGEND

bedrock
bentonite
screen

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm

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Tyree Environmental Technologies

MONITORING WELL LOG

WELL LOG NAME: MW-10 PAGE: 1 of 1

CLIENT: Getty Properties Corp
ADDRESS: 825 Washington Street
Stoughton, MA

DATE STARTED/COMPLETED: 6/6/00
LOGGED BY: C. Goguen
DRILLER: American Drilling
RIG: NA

Depth Below Grade	Sample ID / PID (ppm)	Blow Counts	Recov. (IN.)	Well Construction	Field Description of Soil
0	S-1/0	NA	NA		*0-5' Hand dug to 5' consisting of tan dry sand with a lot of rock. Soil sample sent to laboratory.
2					
4					
	S-2/0	18	5		5-7' Tan dry sand with pulverized rock.
6		60/5"			
					7-19.5' Refusal at 7'. Air hammered to 19.5'.
8					
10					
12					
14					
16					
18					
20					EOB at 20'

BORE HOLE DATA

Drilling Method: Air Rotary/ Air Hammer
Hole Dia.: 6 1/4"
Depth: 19'

WELL DATA

Riser
Type: PVC Sch. 40
Riser Dia.: 2"
Riser Length: 9'
Interval: 0-9'

Screen
Type: PVC Sch. 40
Screen Dia.: 2"
Screen Length: 10'
Slot: 0.02"
Interval: 9-19'

FILTER PACK

Type: Morie Sand
Composition: NA
Volume Used: NA
Interval: NA

GROUT / SEAL

Type: Bentonite
Volume Used: NA
Interval: 8-9'

WELL HEAD COMPLETION

Manhole: [X] YES [ ] NO
Size: 8"
Concrete Pad: [X] YES [ ] NO
Size: 2' x 2'

WELL DEVELOPMENT

Performed: [X] YES [ ] NO
Method: Bailing
Amt. Purged: NA
Date: 6/16/00

ppm = parts per million NA = not applicable
EOB = end of boring TFF = taken from flights
* = sample sent to laboratory

LEGEND

bedrock
filter sand
screen

trace=1-10%
little=10-20%
some=20-30%
and=30-50%

very fine sand=0.6-0.13mm
fine sand=0.13-0.25mm
medium sand=0.25-0.50mm
course sand=0.5-1mm
very course sand=1-2mm

pebble=2-4mm
gravel=4-64mm
cobble=64-256mm
boulder=256mm

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Tyree

26 Town Forest Road, Webster, MA 01570 · Fax: 508-640-0301 · Phone: 508-640-0300

April 13, 2012

Massachusetts Department of Environmental Protection
Southeast Region Main Office
20 Riverside Drive
Lakeville, Massachusetts 02347

RE: Remedy Operation Status Report
Former Getty Station No. 30646
825 Washington Street
Stoughton, Massachusetts
MassDEP RTN 4-12937; 4-13560 & 4-13682

To Whom It May Concern:

On behalf of Getty Properties Corp. (GPC), Tyree is submitting the following Remedy Operation Status (ROS) Report for Former Getty Station No. 30646 located at 825 Washington Street in Stoughton, Massachusetts (the site). The following Report submittal has been prepared pursuant to 310 CMR 40.0893 of the Massachusetts Contingency Plan (MCP).

Please note that GPC is considered the Potentially Responsible Party (PRP) for the disposal site related to Release Tracking Numbers (RTNs) 4-12937, 4-13560 and 4-13682. The Licensed Site Professional (LSP) of record is Mr. Robert Berger (LSP No. 7565). Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup (BWSC) Forms (BWSC-108) has been filed via eDEP for the above-referenced location.

Should you have any questions regarding this project or to request copies of the report submittal, please feel free to contact Tyree at (508) 640-0300.

Sincerely,
Tyree

Jeff G Helgerson
Environmental Scientist

Michael Farrell, LSP
Env. Group Manager

cc: Mr. Kevin Shea, Getty Properties Corp.

Tyree
26 Town Forest Road, Webster, MA 01570 · Fax: 508-640-0301 · Phone: 508-640-0300

REMEDY OPERATION STATUS REPORT

Former Getty Station No. 30646
825 Washington Street
Stoughton, Massachusetts

MassDEP RTNs: 4-12937; 4-13560 & 4-13682

April 13, 2012

Prepared for:

Getty Properties Corp.
125 Jericho Turnpike
Jericho, New York 11753

Prepared by:

Tyree
26 Town Forest Road
Webster, Massachusetts 01570

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 STATUS OF COMPREHENSIVE RESPONSE AND REMEDIAL ACTIONS 1
3.0 SIGNIFICANT MODIFICATIONS AND/OR PROBLEMS NOTED 2
3.1 DEP Field Audit 2
3.2 Property Transfer 2
4.0 REMEDIATION WASTE, REMEDIAL WASTEWATER AND/OR REMEDIAL ADDITIVES 3
5.0 MONITORING DATA 3
5.1 Monitoring Well Gauging 3
5.2 Monitoring Well Sampling and Analytical Results 3
5.3 Soil Gas Screening 4
5.4 Monitored Natural Attenuation 4
6.0 CONCLUSIONS/RECOMMENDATIONS 4
7.0 LSP OPINION 5
8.0 PUBLIC NOTIFICATION 5
9.0 DISCLAIMER 6

FIGURES

Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: Groundwater Contour Map (December 8, 2011)

TABLES

Table 1: Summary of Groundwater Gauging Data
Table 2: Summary of Groundwater Analytical Results: Volatile Petroleum Hydrocarbons
Table 3: Summary of Groundwater Analytical Results: Extractable Petroleum Hydrocarbons
Table 4: Summary of Soil Gas Survey Results: Air Phase Hydrocarbons
Table 5: Summary of Groundwater Analytical Results: Monitored Natural Attenuation

APPENDICES

Appendix A: Getty Limited Agency Agreement
Appendix B: Summary of Historical Site Information
Appendix C: DEP Field Audit (December 7, 2011)
Appendix D: Access Agreement Letters (December 16, 2011 and January 4, 2012)
Appendix E: Email Correspondences (January 4 and January 30, 2012)
Appendix F: Offsite Access Agreement
Appendix G: Goldman Environmental Consultants, Inc. Phase I Environmental Site Assessment Report (February 16, 2012)
Appendix H: Copy of Groundwater Laboratory Analytical Report (December 8, 2011)
Appendix I: Public Notification (March 20, 2012)

1.0 INTRODUCTION

On behalf of Getty Properties Corp. (GPC), Tyree is submitting this Remedy Operation Status (ROS) Report for the property located at 825 Washington Street in Stoughton, Massachusetts (the site). Getty is required to submit a ROS Report for the aforementioned site as continual operation, maintenance and/or monitoring of the Comprehensive Remedial Action (CRA) necessary to achieve a Response Action Outcome (RAO) pursuant to 310 CMR 40.1000 of the Massachusetts Contingency Plan (MCP). This ROS Report documents the on-going operation, maintenance, and monitoring activities conducted at the site since the submittal of the October 18, 2011, ROS Status Report.

This report submittal addresses activities conducted at the site between September 30, 2011 and April 1, 2012, along with supporting data that demonstrates the site meets the criteria for ROS. Bureau of Waste Site Cleanup (BWSC) Transmittal Form 108 has been filed concurrently with the submittal of this report via eDEP. A copy of the Getty Limited Agency Agreement is included as **Appendix A**. A Site Location Map and Site Plan are included as **Figures 1 and 2**, respectively. A Summary of Historical Site Information is included as **Appendix B**.

2.0 STATUS OF COMPREHENSIVE RESPONSE AND REMEDIAL ACTIONS

On October 22, 2001, a Phase IV Remedy Implementation Plan (RIP) was submitted to the Massachusetts Department of Environmental Protection (MassDEP). Due to the multiple sources of oil and hazardous materials (OHM) at the site, a combination of remedial actions was proposed which included excavation, enhanced fluid recovery (EFR), product recovery system and bioremediation. Excavation of up to 230 cubic yards of soil was proposed to reduce levels of polycyclic aromatic hydrocarbon (PAH) compounds in the vicinity of the former fuel oil underground storage tank (UST). EFR activities and a product recovery system were proposed to reduce levels of Non-Aqueous Phase Liquid (NAPL) detected in monitoring well MW-10. As a final step to reduce dissolved gasoline-related compounds in groundwater, bioremediation was chosen as the final remedial action.

Between April 29, 2002 and May 2, 2002, soil excavation activities were undertaken at the site to remove PAH impacted soil in the rear of the property and to install trenching for an automated NAPL recovery system. The NAPL recovery system commenced operation on October 23, 2002. A pneumatic pump and compressor were connected to monitoring well MW-10. Operation and maintenance visits continued until the NAPL recovery system was shutdown on August 20, 2004. Because of naturally decreasing concentrations of Volatile Petroleum Hydrocarbons (VPH) in groundwater following the successful removal of the NAPL, bioremediation has not been implemented as a remedial option to date.

The initial ROS submittal, dated April 7, 2005, supported continued groundwater monitoring. In anticipation of possible site closure, additional assessment activities were scheduled in March 2010, which included the advancement of soil borings across the site. Although soil concentrations supported a condition of No Significant Risk, increasing groundwater concentration trends in June and December 2010 delayed RAO submittal.

On July 15, 2010, Tyree submitted a Release Abatement Measure (RAM) Plan to the MassDEP, which described planned activities for the monitoring and management of soils potentially generated as a result of construction activities consisting of the removal of the UST system and associated dispenser and vent piping. On July 20, 2010, Tyree oversaw the removal of one (1) 12,000-gallon double-walled fiberglass gasoline and one (1) 11,000-gallon double-walled fiberglass "split-tank" containing both diesel and gasoline, on behalf of Getty Petroleum Marketing Inc. (GPMI). The two (2) USTs and associated product and vent lines were removed by Getty as gasoline operations are no longer being conducted at the site. Following UST removal activities, a RAM Completion was submitted on October 1, 2010.

During the UST removal activities, soil representative of previous releases was excavated. Confirmatory soil samples collected following UST removal activities will be utilized to support a condition of No Significant Risk for RTN 4-12937.

3.0 SIGNIFICANT MODIFICATIONS AND/OR PROBLEMS NOTED

3.1 DEP Field Audit

On December 7, 2011, Mr. Elliott Jacobs of MASSDEP met with site LSP, Mr. Robert Berger, on the property located at 825 Washington Street in Stoughton, Massachusetts (the project site). Mr. Jacobs was present for the purpose of performing a site inspection as part of a DEP Field Audit. Following the site inspection, Mr. Jacobs requested that Tyree conduct indoor air sampling for volatile organic compounds (VOC's) and air phase hydrocarbons (APH) at the neighboring residence (815 Washington Street). A copy of the DEP Field Audit is included in **Appendix C**.

In response to the conclusions of the DEP Field Audit, Tyree has made several attempts to contact the property owner, Mr. Daniel S. Silva, in hopes of gaining permission to access the residence at 815 Washington Street. Tyree sent an Offsite Access Agreement letter to Mr. Silva on December 16, 2011 and a certified letter containing an Offsite Access Agreement on January 4, 2012. On January 25, 2012, a Tyree representative conducted a site visit to personally inquire about gaining access to the residence. While on site, the Tyree representative observed that the rental units within the residence were occupied; however Mr. Silva's unit appeared unoccupied and unclaimed mail was observed. Consequently, on January 30, 2012, Tyree received a notice that the certified letter had been unclaimed. Copies of the Offsite Access Agreement letters are included in **Appendix D**. In response to not being able to reach the property owner, Tyree notified Mr. Jacobs via email on January 4, 2012 and January 30, 2012 of the efforts to contact Mr. Silva. Copies of the email correspondences with Mr. Jacobs are included in **Appendix E**. Tyree subsequently obtained additional contact information for the property owner and was able to get in contact with Mr. Silva. Tyree prepared an access agreement letter for the property owner, Mr. Daniel S. Silva, to gain permission to access the residence at 815 Washington Street. On March 29, 2012, Mr. Silva signed the access agreement. A copy of the offsite access agreement is included in **Appendix F**.

3.2 Property Transfer

The site, 825 Washington Street, is currently undergoing a property transfer. As a result, Goldman Environmental Consultants, Inc. (GEC) conducted an ASTM Phase I Environmental

Site Assessment and issued a report dated February 16, 2012. GEC recommended a peer review of Tyree's MCP response actions, a subsurface investigation, removal of the onsite in-ground lifts, a physical investigation of a capped pipe and vent pipe located on property, ground penetrating radar (GPR) survey and testing of building materials. A copy of GEC's Phase I Environmental Site Assessment is included in **Appendix G**.

4.0 REMEDIATION WASTE, REMEDIAL WASTEWATER AND/OR REMEDIAL ADDITIVES

No remediation waste, remedial wastewater and/or remedial additives were generated or used during this monitoring period.

5.0 MONITORING DATA

5.1 Monitoring Well Gauging

Prior to collecting groundwater samples, depth-to-groundwater was measured utilizing an interface probe (IP). This probe was also used to assess if NAPL was encountered in any of the monitoring wells. NAPL was not detected (ND) in any of the on-site monitoring wells. After a Tyree representative recorded the fluid level in each groundwater monitoring well, the probe was decontaminated by rinsing the probe with water, liquinox and methanol.

Depth-to-groundwater ranged from 9.83 feet in monitoring well MW-8 to 15.47 feet in monitoring well MW-101 during this monitoring period. The groundwater elevations obtained from the December 8, 2011 groundwater sampling event was used to produce the Groundwater Contour Maps included as **Figure 3**. Based on the Groundwater Contour Maps, apparent groundwater flow is to the east. Groundwater gauging and elevation data for this monitoring period is summarized on **Table 1**.

The hydraulic gradient was calculated to be 0.044 on December 8, 2011. The hydraulic gradient was determined by the difference in groundwater elevations between monitoring wells MW-8 and MW-101 divided by the distance (115 feet) separating both monitoring wells.

5.2 Monitoring Well Sampling and Analytical Results

Groundwater monitoring events have previously been conducted both quarterly and annually to evaluate groundwater conditions. During each groundwater monitoring event, after calculating the volume of water to be removed from each monitoring well, a 1.5-inch disposable bailer was used to purge approximately three (3) to five (5) well volumes from each monitoring well.

On December 8, 2011, groundwater samples were collected from selected monitoring wells. Groundwater samples were submitted under standard chain-of-custody procedures to Accutest Laboratories of New England located in Marlborough, Massachusetts, a state certified laboratory facility (M-MA136), for analysis of volatile petroleum hydrocarbons (VPH) with target analytes, extractable petroleum hydrocarbons (EPH) with target PAH's, and ethanol. Laboratory analytical results reported the following concentrations above applicable Method 1 GW-2 and/or GW-3 Groundwater Standards:

- VPH C5-C8 aliphatics, VPH C9-C10 aromatics and EPH C9-C18 aliphatics collected from MW-10.

A summary of groundwater analytical results have been included as **Table 2** (VPH) and **Table 3** (EPH). Ethanol was not detected in samples collected from MW-3, MW-4 and MW-8. A copy of the December 8, 2011, Groundwater Laboratory Analytical Report is included as **Appendix H**.

5.3 Soil Gas Screening

On December 8, 2011, what is referred to as Level 1 Soil Gas screening activities in the MassDEP Policy #WSC-02-411, 2002, were conducted by purging soil gas points SG-1 through SG-4 of three (3) well volumes prior to vapor collection in a tedlar® bag. The vapor was then screened using a photoionization detector (PID) equipped with a 10.6 electron volt (eV) lamp and calibrated to an isobutylene response and reported as parts per million by volume (ppmv). Level 1 soil vapor screening results are presented in **Table 4** and compared to Soil Gas PID/FID Screening Levels for Evaluating Indoor Air Impacts (Table 4-9) as outlined in the above guidance document.

Although Level 1 soil vapor screening results have historically been below MassDEP guidance document levels, Level 2 soil vapor sampling activities have been conducted in the past (December 23, 2010), in accordance with MassDEP Policy WSC 02-411 to support a Method 3 Risk Characterization with actual concentrations rather than modeling using Level 1 soil vapor screening values. Results of the Air Phase Petroleum Hydrocarbon (APH) sampling are included in **Table 4** and compared to Soil Gas GC Screening Levels for Evaluating Indoor Air Impacts as outlined in MassDEP guidance documents (MassDEP Policy #WSC-02-411, 2002, Table 4-10). Level 2 soil gas sample results from December 23, 2010, indicate concentrations below applicable Soil Gas GC Screening Levels for Evaluating Indoor Air Impacts as collected from SG-1 through SG-4.

5.4 Monitored Natural Attenuation

Monitoring wells have been identified as either located hydraulically “upgradient/background”, located within the “target” area and/or located hydraulically “downgradient/background” of the dissolved-phase petroleum impacted area. Specifically, monitoring well MW-8 has been considered to represent “upgradient/background” conditions, monitoring wells MW-4, MW-10 and MW-11 have been considered representative of the “target” area and monitoring wells MW-100 and MW-101 have been considered representative of the “downgradient/background” area.

During the December 8, 2011, sampling event, Monitored Natural Attenuation (MNA) field parameters; Dissolved Oxygen (DO), Oxygen Reduction Potential (ORP), temperature, conductivity and pH were collected from monitoring wells MW-8, MW-10, MW-11 and MW-101. MNA laboratory parameters; alkalinity, nitrate, nitrite, sulfate, sulfide, dissolved iron and dissolved manganese were not collected during sampling activities on December 8, 2011. A summary of historic MNA field and laboratory parameters collected has been included as **Table 5**.

6.0 CONCLUSIONS/RECOMMENDATIONS

During this monitoring period, groundwater sampling, laboratory analysis, and Level 1 soil gas screening were conducted at the Site. The results of the sampling and screening were as follows:

- **Groundwater:** VPH and EPH concentrations detected in MW-10 on December 8, 2011 exceed the applicable GW-2 and GW-3 standards;
- **Soil Gas:** Level 1 Soil Gas Screening activities conducted on SG-1 through SG-4 indicated PID readings ranging from 0.0 to 0.4 ppmv, and therefore are less than the Soil Gas PID/FID screening levels. Level 2 Soil Gas Screening activities previously conducted on SG-1 through SG-4 indicated concentrations below applicable Soil Gas GC Screening Levels for Evaluating Indoor Air Impacts.

A vapor point will be installed in the earthen basement floor located at 815 Washington Street. Additionally, an indoor air sample will be collected from the basement, the first floor, and an ambient exterior location for laboratory analysis of Air Phase Petroleum Hydrocarbons (APH). This activity is per the DEP field audit conducted on December 7, 2011 and in regards to the VPH and EPH concentrations above GW-2 standards in groundwater samples collected from MW-10 and MW-11, which are in close proximity to the neighboring residence at 815 Washington Street. Although Level 1 Soil Gas Screening results on SG-1 and SG-2, located on the 815 Washington Street property, do not indicate that vapor migration is occurring at the residence; Tyree will perform indoor air sampling for APH in light of the recent MassDEP Interim Final Vapor Intrusion Guidance (WSC#-11-435).

Due to groundwater concentrations of VPH C5-C8 aliphatics, VPH C9-C10 aromatics and EPH C9-C18 aliphatics above Method 1 GW-2 standards from samples collected from monitoring well MW-10; additional monitoring wells will be installed to delineate the downgradient extent of the groundwater impact. Based upon apparent groundwater flow to the east, additional monitoring wells will be installed downgradient of monitoring well MW-10 within Washington Street (Route 138). If monitoring wells are unable to be placed within Washington Street, Tyree will asses the possibility of installing downgradient monitoring wells at the properties located across the street from the service station at 825 Washington Street (the site).

A permanent solution has not yet been achieved. However, the performance standards for ROS have been met; the site poses No Substantial Hazard, and the original source has been removed and/or controlled. In accordance with 310 CMR 40.0893 (2)(e), ROS Reports documenting the monitoring of site conditions will be submitted to the MassDEP every six (6) months until a level of No Significant Risk is achieved at the Site. The next ROS report will be submitted on or before October 7, 2012, unless conditions support the submittal of an RAO Statement.

7.0 LSP OPINION

In the opinion of Mr. Robert Berger, Licensed Site Professional (LSP) of Record, No. 7565, the current response actions are being performed in accordance with the requirements of 310 CMR 40.0893 of the MCP. The next ROS Report is due in October 2012, unless conditions support the submittal of a RAO Statement.

8.0 PUBLIC NOTIFICATION

Pursuant to 310 CMR 40.1403 of the MCP, public notification is required to Mr. Daniel S. Silva (MW-11, SG-1 and SG-2) for monitoring wells and/or soil gas points located on the 815

Washington Street property which were sampled on both December 8, 2011. A copy of the public notification letter to Mr. Daniel S. Silva has been included as **Appendix I**.

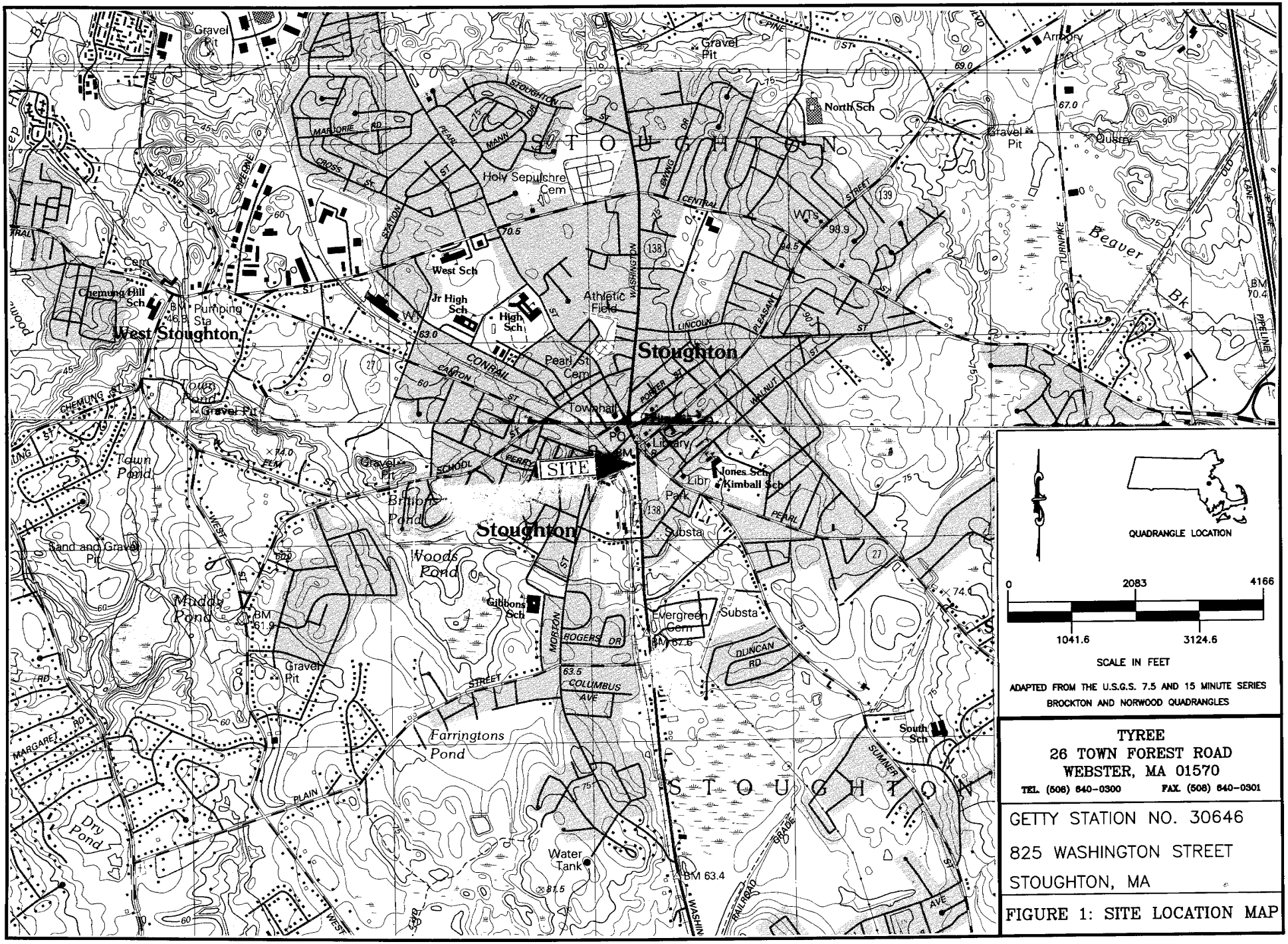
9.0 DISCLAIMER

This ROS Report has been prepared for the use of Getty Properties Corp. (GPC) and/or its designated agents. The staff of Tyree exercised reasonable due diligence during the investigation for and the preparation of this document. The conclusions provided by Tyree in this document are based solely on the information reported in this document. Future site investigative information that was not available to Tyree at the time of this document may result in a modification of the previously stated conclusions. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur. This investigation and document have been conducted in accordance with generally accepted practices. No other warranty, expressed or implied is made.

Sincerely,
Tyree

Jeff G. Helgerson
Environmental Scientist

Michael Farrell, LSP
Env. Group Manager

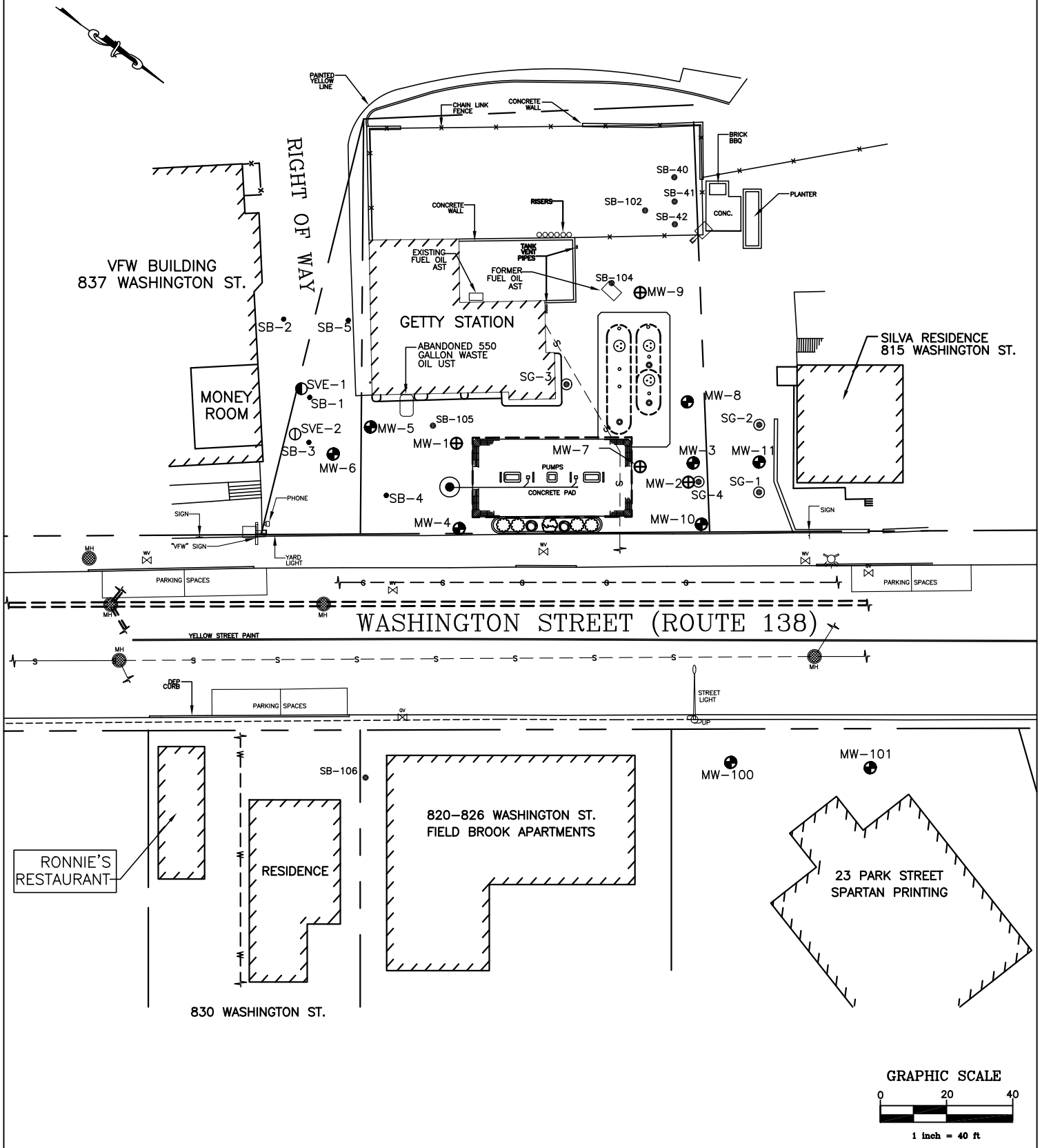


ADAPTED FROM THE U.S.G.S. 7.5 AND 15 MINUTE SERIES
BROCKTON AND NORWOOD QUADRANGLES

TYREE
26 TOWN FOREST ROAD
WEBSTER, MA 01570
TEL. (508) 640-0300 FAX. (508) 640-0301

GETTY STATION NO. 30646
825 WASHINGTON STREET
STOUGHTON, MA

FIGURE 1: SITE LOCATION MAP



GRAPHIC SCALE

0 20 40

1 inch = 40 ft

LEGEND

- ⊕MW-2 : EXISTING MONITORING WELL
- ⊕MW-2 : FORMER MONITORING WELL
- ◐SVE-1 : SOIL VAPOR EXTRACTION WELL
- ◑SVE-1 : ABANDONED SOIL VAPOR EXTRACTION WELL
- ——--——: APPROXIMATE PROPERTY LINE
- SG-1 ◉ : SOIL GAS POINT
- SB-40 • : SOIL BORING

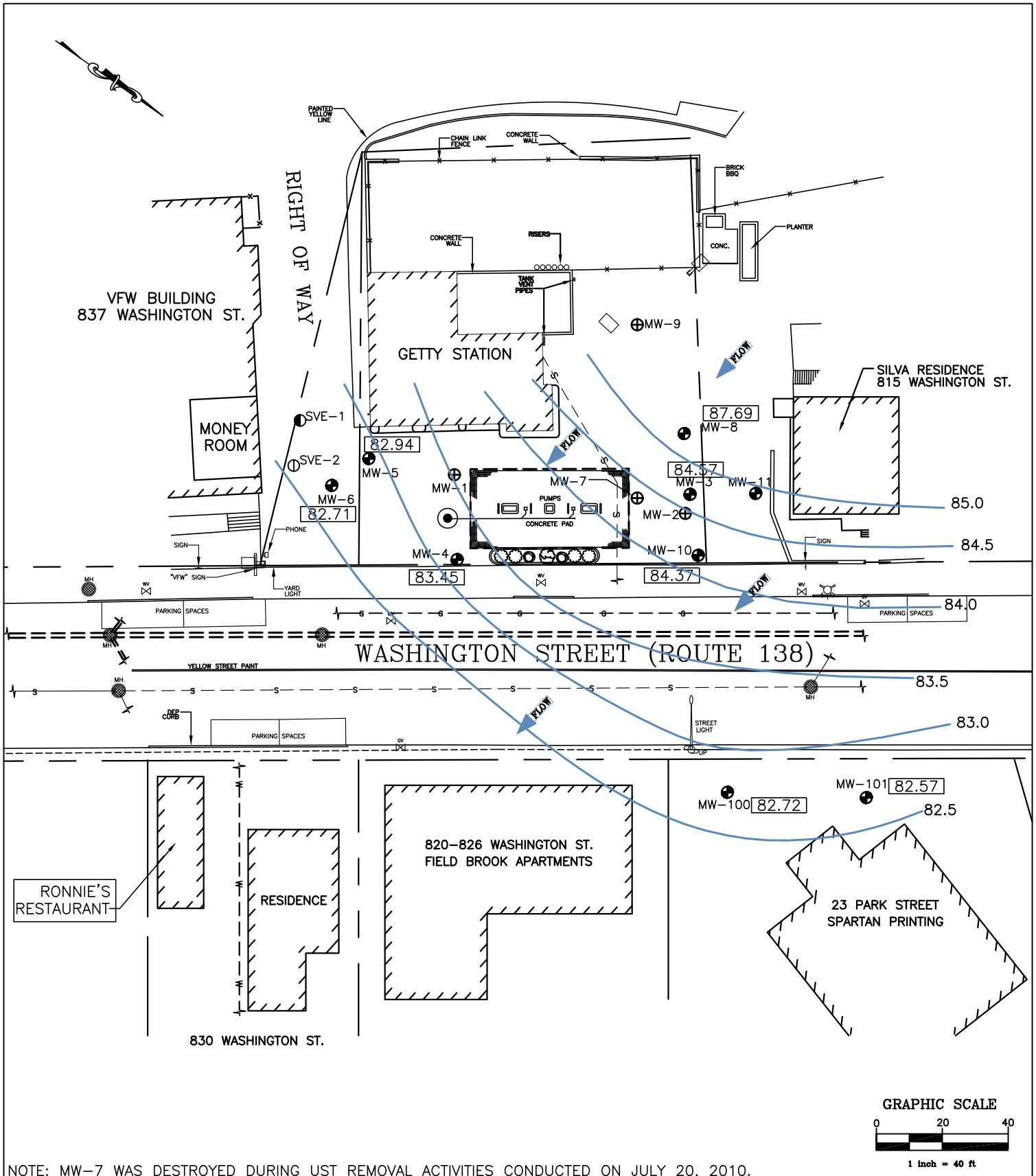
SITE PLAN

Tyree

TYREE
26 TOWN FOREST ROAD
WEBSTER, MA 01570
TEL. (508) 640-0300 FAX. (508) 640-0370

SCALE: 1"= 40'	PROJECT: GETTY STATION #30646
DATE: 4/13/2010	
DRAWN: BTC	LOCATION: 825 WASHINGTON STREET STOUGHTON, MA
RTN: 4-12937	
FIGURE: 2	

U:\ENV\CADD\TYREE\MASS\STOUGHTON\WASHINGTON\NEWSURV\30646 SITE LAYOUTS_2010.dwg



GRAPHIC SCALE

0 20 40

1 inch = 40 ft

NOTE: MW-7 WAS DESTROYED DURING UST REMOVAL ACTIVITIES CONDUCTED ON JULY 20, 2010.

LEGEND

- ⊕MW-2 : EXISTING MONITORING WELL
- ⊕MW-2 : FORMER MONITORING WELL
- ◐SVE-1 : SOIL VAPOR EXTRACTION WELL
- ◑SVE-1 : ABANDONED SOIL VAPOR EXTRACTION WELL
- ——-——: APPROXIMATE PROPERTY LINE
- S-30 ✱ : SOIL SAMPLE LOCATION
- SB-40 • : SOIL BORING-SAMPLE REMOVED
- 84.00' : GROUNDWATER ELEVATION (ft)
- 84.00' : GROUNDWATER CONTOUR INTERVAL = 1.0 ft
- FLOW : APPROX. DIRECTION OF GW FLOW

GROUNDWATER CONTOUR MAP (Dec. 8, 2011)

Tyree

TYREE
26 TOWN FOREST ROAD
WEBSTER, MA 01570
TEL. (508) 640-0300 FAX. (508) 640-0370

SCALE: 1"= 40'	PROJECT: GETTY STATION #30646
DATE: 3/20/2012	
DRAWN: JGH	LOCATION: 825 WASHINGTON STREET STOUGHTON, MA
RTN: 4-12937	
FIGURE: 3	

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SCANNED

CYN ENVIRONMENTAL SERVICES

RECEIVED MAR 14 2003 SOUTH

March 14, 2003

Mr. Dan Crafton
Bureau of Waste Site Cleanup
Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, Massachusetts 02347

RE: ***Response Action Outcome (RAO) Statement, RTN 4-17655***
STOUGHTON, Massachusetts – 26 Porter Street
"Sudden Release" of Diesel Fuel

Potentially Responsible Party (PRP): Quality Beverage
525 Myles Standish Boulevard
Taunton, Massachusetts 02780
Theodore Audet, Vice President of Finance
P(508) 822-6200; F(508) 823-9092

Owner(s): John Negro c/o
26 Porter Street Pub & Restaurant
26 Porter Street
Stoughton, Massachusetts 02072

Town of Stoughton c/o
Stoughton Department of Public Works
950 Central Street
Stoughton, Massachusetts 02072
Lawrence J. Barrett, Director
(781)341-1300, ext. 312

United States Postal Service c/o
Stoughton, Massachusetts US Post Office, Main Office
31 Porter Street
Stoughton, Massachusetts 02072
Michael Watson, Postmaster
(781) 344-5867

P.O. BOX 0119 • 100 TOSCA DRIVE • STOUGHTON, MA 02072-0119 TELEPHONE 781-341-1777 • FAX 781-341-6246
1-800-242-5818 in MA • 1-800-622-6365 outside MA

Dear Mr. Crafton:

The purpose of this submittal is to supply the Massachusetts Department of Environmental Protection (MADEP) with a Response Action Outcome (RAO) Statement report package for the above referenced site. This package has been prepared by Cyn Environmental Services (Cyn) on behalf of Quality Beverage to finalize the site's compliance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. This package has been provided as an attachment to an original Release Notification Form (RNF) (BWSC-103) and an original RAO Statement Transmittal Form (BWSC-104). A copy of each is provided in **Appendix A**. Refer to **Figure 1**, the Site Locus, for the regional location of the site, and **Figure 2**, the Site Plan, for site details and other pertinent information.

Information required for an RAO Statement, as specified in Section 310 CMR 40.1056, is contained in this document as a whole. This RAO Statement report package applies only to the January 9, 2003, reported "Sudden Release" of diesel fuel at the referenced site. Additionally, the package only applies to the disposal site as described in section *"I. Disposal Site Definition and Site Activity and Use [Current and Foreseeable]"* of this report, and as referenced in **Figure 2**, the Site Plan.

History

A tractor-trailer combination vehicle operated by Quality Beverage was in the process of making a routine delivery at the 26 Porter Street Pub & Restaurant on January 9, 2003. While exiting the property via alley at approximately 2:45 PM, the diesel fuel storage tank for the refrigeration unit of the trailer struck an existing fire hydrant, puncturing the tank and causing a release of diesel fuel to the snow and ice covered asphalt ground surface of alley. Unaware of the damage/release, the operator continued to exit the vehicle across Porter Street and into the parking lot of the Stoughton, Massachusetts US Post Office, located at 31 Porter Street. Diesel fuel was released to the snow and ice covered asphalt surface of the roadway and the parking lot. Due to the grade of the roadway, diesel fuel also migrated along the road gutter, and into a number of nearby storm drain catch basins. Within the parking lot, the operator of the vehicle observed the release and parked the vehicle back within the alley.

Quality Beverage contacted the Town of Stoughton Fire Department (SFD) and Cyn to respond to the release. The SFD immediately responded and applied absorbent materials to the impacted surface areas and also applied absorbent boom into a number of the basins. Prior to responding, Cyn contacted the MADEP to report the conditions at approximately 3:55 PM on January 9, 2003. Upon reporting, the MADEP determined that the release was or may have been a disposal site as defined in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. The MADEP also had reason to believe that Quality Beverage was or may have been a potentially responsible party, based on their status as generator, and issued them a Notice of Responsibility (NOR) pursuant to M.G.L. c. 21E & 310 CMR 40.0000. A copy of the NOR, dated January 17, 2003, and inadvertently referencing Release Tracking Number (RTN) 4-17573, rather than the appropriate RTN, 4-17655, is provided in **Appendix B**.

As indicated in the NOR, general response action requirements included the need for conducting an Immediate Response Action (IRA); the need for hiring a spill cleanup contractor; the need for employing or engaging a Licensed Site Professional (LSP) to manage, supervise, or actually perform necessary response actions; and the need for disposing of all generated wastes in accordance with applicable local, state, and federal regulations. At the time of reporting, Cyn also obtained specific approval from the MADEP to apply absorbent materials to the areas of impact; to collect and containerize impacted snow

and ice; to use a vacuum truck or associated equipment to collect puddles of product and/or pump impacted liquids that may be present in any catch basins; and to containerize and properly dispose of any remediation wastes in accordance with federal, state, and local regulations.

Completed Immediate Response Actions

To comply with the MADEP's requests, Cyn was contracted by Quality Beverage to complete the IRA activities and later, to provide LSP services. It should be noted that additional federal, state, and local permits, unless otherwise noted throughout this report, were not needed to conduct the response actions. All site response actions completed by Cyn were done so in compliance with their health and safety plan, and Cyn's health and safety plan is on file and available for review upon request.

January 9, 2003: Cyn responded to the site and based on a visual inspection of the release area, diesel fuel had been released to the snow and ice covered asphalt surface of the alley, Porter Street in the vicinity of the alley, and to portions of the parking lot across Porter Street. Due to the grade of the area, diesel fuel also migrated westerly along the gutter of the south side of Porter Street, into an ice filled storm drain catch basin located approximately 165 feet from the initial release. Diesel fuel also migrated westerly along the gutter of the north side of Porter Street for approximately 65 feet, and then northerly along the gutter of the east side of Rose Street for approximately 490 feet. At this location, a second ice filled catch basin was impacted.

Mr. Richard LaMothe, LSP of Record for the site, responded and also took part in the visual inspection. It was Mr. LaMothe's opinion that the release had been generally contained to the observed locations. MADEP representative Michael Whiteside had also responded, accompanied the LSP during the inspection, and generally agreed with the LSP's opinion.

Cyn responded with heavy equipment that included a vacuum truck, a skid-steer loader, and an industrial street sweeper. The vacuum truck was used to pump the remaining contents of the diesel fuel storage tank that had been damaged. These actions served to completely eliminate the primary source of the release, and thus, the vehicle left the site for a full repair under its own power. The vacuum truck was also used to skim diesel fuel from the surface of limited standing water within the two subject catch basins (i.e., one within Porter Street and one within Rose Street). According to Cyn's vacuum truck operator, the liquid level within the basins appeared to be below that of any discharge piping prior to pumping. The basins themselves were then completely pumped of their liquid contents. As a precautionary measure, two nearby catch basins were also skimmed due to their location proximate to limited vehicle tracking (i.e., two additional basins within Rose Street, approximately 140 feet from Porter Street). Properly trained personnel then entered the two subject basins and where able, removed all solid material. For the most part, however, the basins were generally filled solid with ice. Removed material was placed into three Department of Transportation (DOT) approved 55-gallon drums. The drums were sealed, labeled, and transported from the site for proper disposal.

Utilizing the skid-steer loader and also by hand methods, Cyn removed all visually impacted snow and ice from the alley, roadway, parking lot, and roadside gutters. All collected material was placed into four DOT approved cubic-yard fiberboard containers. Utilizing the street sweeper, Cyn then swept up all absorbent material applied by the SFD. Cyn applied additional absorbent materials to areas in need, sweeping up this material after working it into the asphalt to remove residual diesel fuel and/or staining. All material was incorporated into the existing containers. The containers were then sealed, labeled, and transported from the site for proper disposal.

January 10, 2003: The LSP returned to the site and completed an inspection to ensure that the previously completed activities were sufficient to remediate the release. While on-site, the impacted asphalt surfaces were inspected and noted to be generally clean and free of diesel fuel. A majority of the asphalt surfaces appeared competent with no large voids or cracks that would have allowed the diesel fuel to migrate to subsurface media (i.e., soil and/or groundwater). A small pothole (less than approximately 2 feet in diameter) and some smaller voids and cracks were present within the alley. However, upon investigating the pothole and voids/cracks, it was found that there were multiple layers of asphalt and thus, it was Cyn's opinion that the diesel fuel was contained to the asphalt and could not have penetrated to soil or groundwater.

The LSP also inspected the surrounding area. The temperature on this day resulted in snow and ice melt conditions, with significant puddling, particularly with the roadways. The LSP observed a number of petroleum-based sheens within the roadway, likely due to the high volume of vehicular traffic within the area and not due to the release.

January 10 & 14, 2003: On these occasions, a Field Scientist visited the Town of Stoughton Municipal Offices to obtain drainage plans, and then visited the site to inspect the subject storm drain catch basins and to verify the drainage flow. Flood Hazard/Wetlands/Watershed Maps (Sheet 49) were provided by the Town of Stoughton Engineering Office and were reviewed with engineering personnel. Although the maps were not definitive, according to engineering personnel, all catch basins generally within downtown Stoughton discharge to a natural depression approximately 900 feet southwest of the subject site, between Perry, Wyman, and Summer Streets.

The scientist visited the site and observed all four of the affected basins. Each appeared generally competent and clean and free of any signs of diesel fuel or staining, except for a slight petroleum sheen within the one catch basin within Porter Street. However, as observed by the LSP on the previous day, snow and ice melt conditions and a high volume of vehicular traffic within the area likely accounted for the sheen, not potential residual diesel fuel from the release. Although this was the case, the scientist left a length of absorbent boom within the basin in an effort to control/eliminate the condition.

The scientist then visited the natural depression southwest of the subject site in an effort to observe the discharge. According to the scientist, the outflow was inspected and was noted to be clean and free of any signs of diesel fuel, with no petroleum sheens present on the surface of flowing/standing water.

March 13, 2003: On this occasion, a scientist re-visited the site and removed the absorbent boom that was left within the basin within Porter Street. The boom was double-bagged, sealed, and transported from the site for proper disposal. Upon removal, the basin appeared clean and free of any sign of a petroleum sheen on the surface of standing water within the basin. On this occasion, the scientist also re-inspected the natural depression. The depression was inspected at a location accessed by Summer Street. A steady flow of water was observed discharging from the existing culvert which emanates from beneath Perry Street. The discharge flowed steadily to the south along a natural drainage ditch within the depression. The area was inspected and again, appeared clean and free of any signs of diesel fuel or a petroleum sheen on the surface of flowing/standing water.

Management of Remediation Waste

January 9, 2003: An estimated 1,000 pounds (i.e., three drums) and an estimated 6,000 pounds (i.e., four cubic-yard fiber-board containers) of "State Regulated Waste Oily Solids" (solid catch basin materials, oily absorbent material, snow, and ice) was removed from the site and transported to Cyn Oil Corporation, Stoughton, Massachusetts for proper disposal under Uniform Hazardous Waste Manifest MA Q357182.

Additionally, an estimated 283 gallons of "Petroleum Oil, Combustible Liquid" (diesel fuel and liquid catch basin contents) were removed from the site and transported to Cyn Oil Corporation for proper disposal under Uniform Hazardous Waste Manifest MA Q374148.

March 13, 2003: An estimated 25 pounds (i.e., one bag) of absorbent boom were removed from the site and transported to Cyn Oil Corporation for proper disposal under Alternative Straight Bill of Lading. A copy of each manifest and the Alternative Straight Bill of Lading is provided in **Appendix C**.

Disposal Site Characterization

I. Disposal Site Definition and Site Activity and Use [Current and Foreseeable]

As a roadway, the future use of the site is not expected to change. Properties within the release area generally include municipal buildings, commercial establishments, and multi-level residential apartments. Surrounding areas are generally paved for parking/access/egress, with very few grassy or landscaped areas. There are no known nearby institutions or natural resources, and a review of information within the *Massachusetts National Heritage Atlas, 2000-2001 edition*, indicates that the release area was not within a Priority Habitat of Rare Species or an Established Habitat of Rare Wetlands and Certified Vernal Pools. The natural depression/wetland area southwest of the subject release is unnamed and not indicated on any topographic maps reviewed by Cyn.

With respect to the release area itself (i.e., disposal site), Cyn has defined it as including the following areas/structures:

- Snow and ice covered asphalt areas:
  - Rear of Alley (26 Porter Street), 40 feet long by 35 feet wide,
  - Alley (26 Porter Street), 40 feet long by 12 feet wide,
  - Porter Street (adjacent to alley), 30 feet long by 30 feet wide,
  - Parking Area (31 Porter Street), 30 feet long by 30 feet wide,
  - South Side Gutter of Porter Street, 165 feet long by 2 feet wide,
  - North Side Gutter of Porter Street, 65 feet long by 2 feet wide,
  - East Side Gutter of Rose Street, 490 feet long by 2 feet wide,
- Storm drain catch basins:
  - Porter Street basin, 165 feet from release area,
  - Rose Street basin, 490 feet from Porter Street, and
  - two basins, Rose Street, 140 feet from Porter Street.

The release area, and thus the disposal site, as identified, is located in Stoughton, Massachusetts. As noted, the site is operated as a roadway and thus, its future use is anticipated to remain the same. Information collected from the Norwood, Massachusetts USGS Topographical Map indicates that the disposal site is approximately located at Latitude 42°-07'-30" and Longitude 71°-06'-11". **Figure 2** illustrates the RAO disposal site boundaries and other pertinent site features.

II. Contaminants of Concern

The reported release at the disposal site relates to diesel fuel. In accordance with MADEP Publication # WSC-401-91, the most recent version of the MCP, and the *Implementation of MADEP VPH/EPH Approach, Final Draft, June 2001*, to properly evaluate such a release, it is recommended that the assessment activities evaluate the impacted media for residual concentrations of EPH/VPH and target diesel fuel related parameters.

Soil and Groundwater: Based on the circumstances surrounding the release and Cyn's observations, there is no evidence to suggest that soil or groundwater were impacted by this release; hence, it is the opinion of Cyn that Contaminants of Concern do not exist with respect to soil and groundwater.

Asphalt Surfaces and Storm Drain Catch Basins: Based on the response activities conducted following the release, there is currently no evidence to support that remaining diesel fuel exists. As a result, it is the opinion of Cyn that Contaminants of Concern do not exist with respect to the surfaces/basins.

III. Soil and Groundwater Categorization

Although soil was not impacted by this release, site soil can be categorized based on accessibility, and on the frequency and intensity of use for children and adults. Soil within the release area is beneath the roadway and thus, may be classified as potentially accessible (i.e., 0 to 15' paved). Since the release area is operated as a roadway, it is estimated that adults and children would only be present at a low frequency and conduct low intensity activities that do not have the potential to disturb the soil. Based on these criteria, site soil is categorized as S-3.

According to Massachusetts Geographic Information System data; Massachusetts Surface Water Quality Standard documentation; information obtained from the Town of Stoughton Board of Health (Mr. Jamie Conlon, Health Agent); site reconnaissance; a review of the site conditions; and other sources:

- Groundwater at the disposal site **is not** subject to GW-1 criteria since it is located not in, or in close proximity to, an area defined as a *Current* or *Potential Drinking Water Source Area*;

- Although the average annual depth to groundwater at the site may be 15 feet or less, groundwater at the disposal site **is** subject to GW-2 criteria since it is located within 30 feet of an existing occupied building or structure and, therefore, a potential source of vapors to indoor air; and,

- As is the case for all disposal sites, groundwater at the disposal site is a potential source of discharge to surface water bodies and, therefore, **is** subject to GW-3 criteria.

IV. Pathways, and Exposure Point Determination and Concentrations

Pursuant to Section 310 CMR 40.0925, an evaluation of the contaminant conditions was conducted to define potential exposure point pathways. Exposure point pathways are defined, without limitation, as ingestion, inhalation, and/or dermal absorption of impacted media. Based on the site conditions, all diesel fuel oil and resultant remediation wastes were removed from the site. Thus, based on the current and future nature of the defined disposal site, and the fact that no exposure points remain, a direct route of exposure is not present towards children and/or adults.

Soil and Groundwater: Since the released diesel fuel did not impact these media, it is the opinion of Cyn that exposure points do not remain.

Asphalt Surface and Storm Drain Catch Basins: Since the released diesel fuel and associated remediation wastes were removed from this media, it is the opinion of Cyn that exposure points do not remain.

V. Critical Exposure Pathways and Substantial Release Migration Evaluation

Pursuant to Section 310 CMR 40.0414, an evaluation of critical exposure pathways (CEPs) was conducted. CEPs are defined as those routes by which oil and/or hazardous material(s) released at a disposal site are transported, or are likely to be transported, to human receptors via vapor phase emissions into a living or working space of a pre-school, daycare, school, or occupied residential dwelling; or ingestion, dermal absorption or inhalation of measurable concentrations of oil and/or hazardous materials from drinking water supply wells located at and servicing a pre-school, daycare, school, or occupied residential dwelling. Based on observations of the site, it is unlikely that a potential critical exposure pathway existed at the time of the release. Additionally, due to the completed site activities already mentioned, it is the opinion of Cyn that a critical exposure pathway does not currently exist at the site.

Based on the definition of Substantial Release Migration (SRM) found at 310 CMR 40.0006 and observations of the site, it is the opinion of Cyn that a condition of SRM could have existed with respect to a "release that resulted in the discharge of separate-phase oil to surface waters, subsurface structures, or underground utilities or conduits. However, based on the containment and remediation of the released material from the storm drain catch basins, a condition of SRM does not currently exist at the site.

VI. Imminent Hazard Evaluation

Pursuant to Section 310 CMR 40.0426, an imminent hazard evaluation shall be performed as part of an IRA at sites where a release or threat of release could pose an Imminent Hazard to human health, safety, public welfare, or the environment, as described in 310 CMR 40.0321. Based on a review of the criteria, an Imminent Hazard could have existed with respect to a "release to a roadway that endangers public safety". However, based on the containment and remediation of the released material from the asphalt surfaces, an Imminent Hazard does not currently exist at the site.

Release and Disposal Site Summary/Site Model

A sudden release of up to 50 gallons of diesel fuel occurred at the site as a result of damage to a storage tank on the trailer of a combination vehicle. Fuel was released to snow and ice covered asphalt ground surfaces where it became absorbed within the snow and ice, pooled, and/or due to the grade of the area(s), migrated to and impacted a number of storm drain catch basins. Based on the weather conditions and large amounts of ice within the basins, it appears that diesel fuel released to the basins was contained to the structures. The asphalt surfaces and basin structures appeared relatively competent, and thus, based on the site information, it appears that the diesel fuel was contained solely to the indicated media.

The release area was not within or expected to affect any known sensitive areas. Groundwater was not encountered at the site and since it is unlikely that the release impacted groundwater, entrainment of vapors in indoor air is very unlikely. The pumping of the remaining contents of the storage tank and the vehicle leaving the site served to eliminate the primary source of the release. Additionally, the completed remedial activities have served to reduce the secondary source(s) (i.e., impacted media) of the release.

Findings

Pursuant to 310 CMR 40.1036, a Class A-1 RAO applies to the Disposal Site because:

- a Permanent Solution has been achieved; and
- the level of oil and hazardous material in the environment has been reduced to background.

Pursuant to 310 CMR 40.1003(5), a Class A-1 RAO is achieved at sites where the source of contamination that is likely to result in an increase in the concentration of the contamination in an environmental medium is eliminated or controlled. In this case, the leaking storage tank was pumped, thus serving to completely eliminate the source of the release. Additionally, Cyn responded and applied absorbents and containerized and removed all impacted materials. These completed response actions, including the off-site disposal of all remediation wastes, have completely eliminated the source of further contamination at the site.

Pursuant to 310 CMR 40.0960, the risk of harm to safety shall be characterized based on the data collected pursuant to the response action being performed and the site, receptor, and exposure information identified for the site. It shall also be characterized by comparing current and reasonably foreseeable conditions at the disposal site and in the surrounding environment to applicable safety standards. Additionally, a level of no significant risk to safety exists or has been achieved if the conditions at the disposal site that are related to the release of oil and/or hazardous material do not currently and will not in the foreseeable future pose a threat of physical harm or bodily injury to people.

In this case, all released diesel fuel and associated remediation wastes have been removed from the site so that contaminants of concern, and thus exposure points, do not exist (i.e., background conditions have been met). Since background conditions have been met and the site currently exists as is did prior to the release, a level of no significant risk to safety exists at the site.

In conclusion, a Class A-1 outcome has been achieved and no further action is required at the defined disposal site with respect to this release. Copies of public notification letters to the Town of Stoughton and Chief Municipal Officer and Board of Health, as required pursuant to 310 CMR 1403(3), are provided in **Appendix D**. Should you require additional information or have any questions relative to this submittal, please feel free to contact either of the undersigned at your convenience.

Sincerely,
Cyn Environmental Services

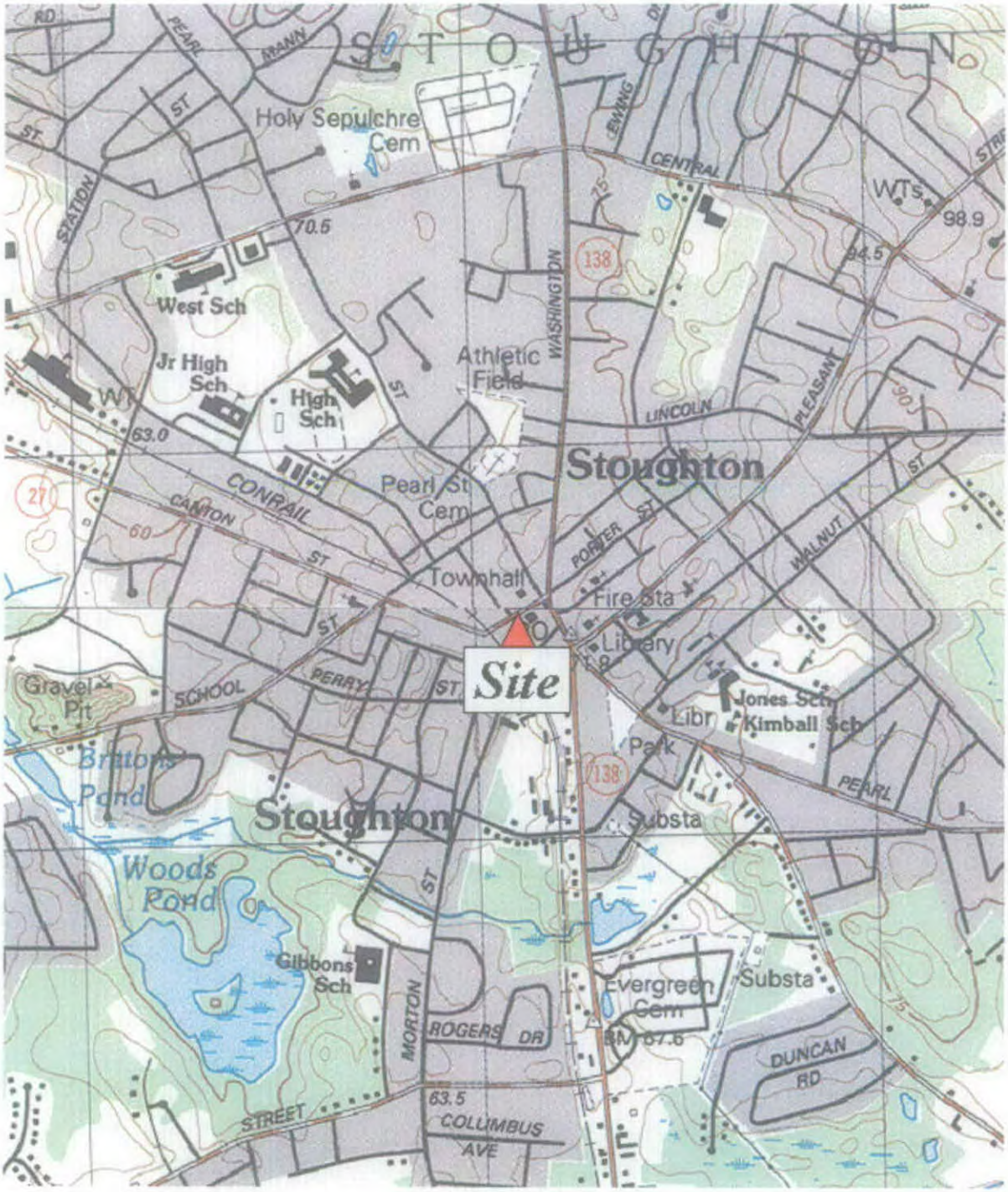
Richard R. LaMothe, LSP
Environmental Scientist, Project Manager

Philip D. McBain, LSP
Senior Project Manager

cc: Theodore Audet, Quality Beverage
John Negro c/o 26 Porter Street Pub & Restaurant
Lawrence J. Barrett, Stoughton Department of Public Works
Michael Watson, Stoughton, Massachusetts US Post Office, Main Office
Cyn File

Figures
Appendix A - RNF and RAO Statement Transmittal Form, *Copies*
Appendix B - Notice of Responsibility, *Copy*
Appendix C - Remediation Waste Documentation, *Copies*
Appendix D - Public Notification Letters, *Copies*

Figures



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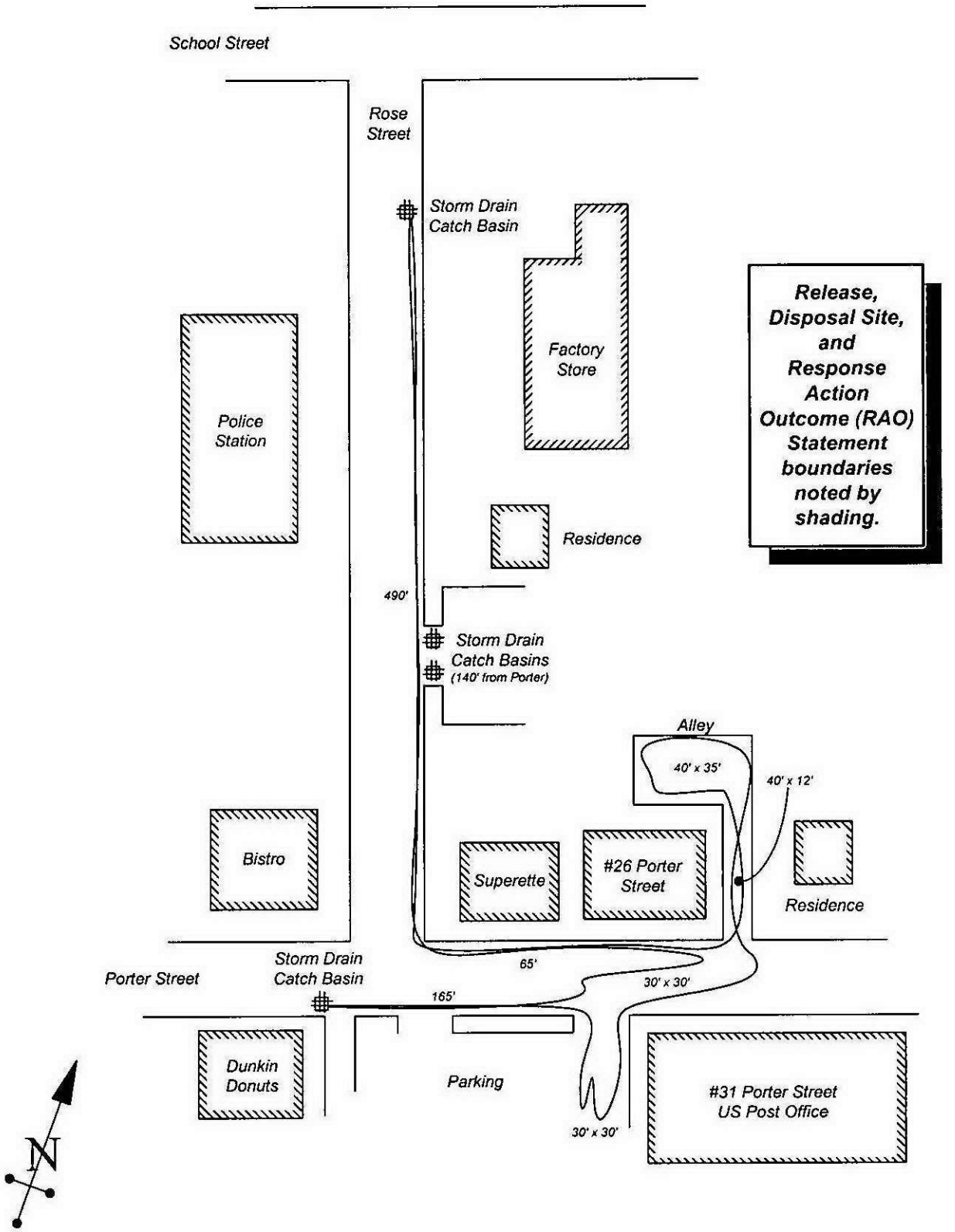
Site Locus
Porter Street, Stoughton, Massachusetts

Drawn:	R. LaMothe	Scale:	1:25,000
Reviewed:	n/a	Project #:	32920L
Date:	03/11/03	Figure #:	1

Cyn Environmental Services
100 Tosca Drive, Stoughton, Massachusetts 02072



Cyn Environmental Services
100 Tosca Drive, Stoughton, Massachusetts 02072

Site Plan
Porter Street, Stoughton, Massachusetts

Drawn:	R. LaMothe	Scale:	As Noted
Reviewed:	n/a	Project #:	32920L
Date:	03/11/03	Figure #:	2

SCANNED

CLASS A-2
RESPONSE ACTION OUTCOME STATEMENT

Former Sunoco Gasoline Station
990 Washington Street
Stoughton, Massachusetts 02072
DUNS# 0366-6047

August 24, 2005

MADEP RTN: 4-18650, 4-18968

Prepared for:

Sunoco, Inc (R&M)
4 Bellows Road
PO Box 1262
Westborough, MA 01581

Prepared by:

EnviroTrac Ltd.
1400 Providence Highway, Suite 2100
Norwood, Massachusetts 02062

A Full Service Environmental Consulting and Contracting Firm

EnviroTrac

EnviroTrac
Environmental Services

LETTER OF TRANSMITTAL

TO: Massachusetts DEP
Southeast Regional Office
22 Riverside Drive
Lakeville, MA 02347

DATE: August 24, 2005

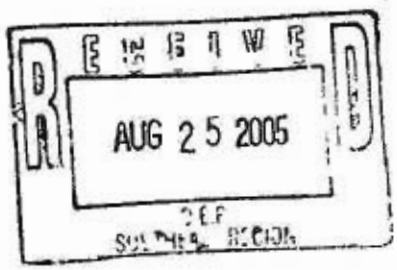
ENCLOSED ARE:

- **BWSC-104 Response Action Outcome (RAO) Transmittal Form**
- **Class A-2 Response Action Outcome (RAO) and Method 1 Risk Characterization**

For

Former Sunoco Gasoline Station
990 Washington Street
Stoughton, MA

RTN 4-18650, 4-18968



TRANSMITTAL FOR: ( ) Approval ( ) Use ( ) As Requested (X) File

Comments:

Copies To: Sunoco, Inc. (R & M)
EnviroTrac Ltd.

By: _____
Eric D. Simpson, P.G.
Senior Project Manager

1400 Providence Highway, Suite 2100, Norwood, MA 02062 (781) 769-5005 Fax: (781) 769-9345

DEP BWSC RAO TECHNICAL SCREENING AUDIT FORM

Disclaimer: This checklist is for use by DEP in reviewing *Response Action Outcome (RAO)* Statements, and may not be relied upon for any other purpose. This checklist is not a comprehensive list of *RAO* requirements, which are fully set forth in MGL c. 21E and 310 CMR 40.0000. Completion of this checklist by DEP does not constitute a final agency decision, and does not create any legal rights or relieve any party of obligations that exist pursuant to applicable laws.

Lead RTN: 4-18968		
SUBMITTAL TYPE (Circle one) (RAO) RAO-P LSP Eval. Opin. Waiver Compl. St. RAO w/ AUL Other: Related RTNs: 4-181650	OHM description: (Source, Type of OHM, Media Affected) release of gasoline from USTs. Site Use: gasoline station - inactive	Date RAO Rcvd 8/25/05

Town: Stoughton Site Name: former Sunoco Station

Address: 990 Washington Street

PRP/OP: Sunoco, Inc. LSP Name: Donald Maggioli

Consultant: EnviroTrac LSP No.: 3427

TECHNICAL SCREENING CHECKLIST

Condition				Page #
I. SITE CONCERNS (Based upon conditions at time of RAO submittal)				
A. Time Critical Conditions	**Yes**	**No**	**?**	
1. ⚑ Applicable GW-2 standard exceeded@ residence/school with no soil gas/indoor air sampling	☐	☑	☐	
2. ⚑ More than 0.5" NAPL observed in any monitoring well	☐	☑	☐	
3. ⚑ One or more data points exceeds UCL	☐	☑	☐	
4. ⚑ EPC in S-1 soil exceeds Method 1 standard and school/residence within 500 feet	☐	☑	☐	
5. ⚑ Site contaminants impacting indoor air	☐	☑	☐	
B. Drinking Water	**Yes**	**No**	**?**	
1. Site within potential drinking water source area (PDWSA)	☐	☑	☐	
2. Site located within IWPA/mapped Zone II	☐	☑	☐	
3. Private/Non- municipal public well(s) located within 500 feet of site	☐	☑	☐	
4. Municipal well(s) located within 1000 feet of site	☐	☑	☐	
5. ⚑ Private well contaminated as a result of site	☐	☑	☐	
6. ⚑ Public water supply contaminated as a result of site	☐	☑	☐	
C Contaminated Soil	**Yes**	**No**	**?**	
1. Category S-3 Soils	☐	☑	☐	
2. Category S-2 Soils	☐	☑	☐	
3. Category S-1 Soils	☑	☐	☐	
D. Site and Area Use	**Yes**	**No**	**?**	
1. Industrial (no children likely to be present)	☐	☑	☐	
2. Commercial (limited presence of children)	☑	☐	☐	
3. School/Institution	☐	☑	☐	
4. Residential	☑	☐	☐	
E. Released OHM [Contaminant Type(s)]	**Yes**	**No**	**?**	
1. Petroleum Fuel Oils	☐	☑	☐	
2. *Gasoline, lube oils, waste oils and other petroleum products*	☑	☐	☐	
3. Metals, coal tar, PCBs, pesticides/herbicides, asbestos	☐	☑	☐	
4. Chlorinated Solvents or Other	☐	☑	☐	
F. Environmental Concerns	**Yes**	**No**	**?**	
1. Site within 500 feet of surface water and/or wetlands	☑	☐	☐	
2. Endangered species habitat, ACEC and/or certified vernal pool within 500 feet	☐	☑	☐	
3. Confirmed contamination of surface water, sediments and/or wetlands with site contaminants	☐	☑	☐	
G. Site Complexity	**Yes**	**No**	**?**	
1. Media other than groundwater or soil affected (surface water, air, sediment)	☐	☑	☐	
2. Co-mingled plumes (i.e., different sources from one or more sites co-mingled)	☐	☐	☑	
3. Bedrock contamination	☐	☑	☐	
If ⚑ conditions currently exist, see supervisor to discuss.				

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II. TECHNICAL ADEQUACY	Citation(s)	Yes	No	?	NA	Page #
A. Remedial Response Actions – Indication That:						
1. Documentation of removal of remediation waste provided	40.0034(5), (6)	☑	☐	☐	☐	
2. Remediation waste properly managed (reqmnts -Air 95%,gw, sw [NPDES], soil properly handled)	40.0031-40.0049	☑	☐	☐	☐	
3. Obtained DEP or other agency approvals and work done in accordance with approvals	40.0100(4), 40.0170(2-3, 5)	☑	☐	☐	☐	
B. Source/Extent Investigations – Indication That:						
1. History of OHM use/storage/disposal at the site included	40.0405(1), 40.0835(4)	☑	☐	☐	☐	
2. Potential source(s) identified, characterized, or abated (septic leach field, floor drain, AST, etc.)	40.0923(2), 40.1003(5)	☑	☐	☐	☐	
3. Extent of contamination defined (including downgradient)	40.0904(2)(a),40.1003(4),(5)	☑	☐	☐	☐	
4. Potential or actual OHM analyzed for and/or evaluated (metals, VPH, VOCs, etc.)	40.0191(2), 40.0904(3)(a), 40.0926(1)	☑	☐	☐	☐	
5. All likely migration pathways (soil/gw/sw/air/sediment) identified/characterized/evaluated	40.0904(2)(c), 40.1004(1)	☑	☐	☐	☐	
6. Proper sample collection technique/preservation/analysis/data reporting	40.0017	☑	☐	☐	☐	
C. Risk Characterization – Indication That:						
1. Background identified or characterized	40.0904(2)(b), 40.1020	☑	☐	☐	☐	
2. Soil/groundwater category properly identified	40.0930	☑	☐	☐	☐	
3. EPC calculation provided (spatial or temporal) and EPC properly calculated	40.0926	☑	☐	☐	☐	
4. Hot Spot(s) addressed, identified (as Hot Spot) and not added in to other EPCs	40.0924(2), 40.0926(3)	☐	☐	☐	☑	
5. Migration Pathways (air, groundwater, etc.) assessed and evaluated in RC (All Methods, media dependent)	40.0904(2)(c), 40.1004(1)(a)	☑	☐	☐	☐	
6. Applicable soil and/or groundwater standards not exceeded (Method 1 or 2) or AUL applied	40.0974, 40.0975	☑	☐	☐	☐	
7. Correct risk characterization method used	40.0941, 40.0942	☑	☐	☐	☐	
8. All receptors accounted for (construction worker, trespassers, wetland, etc.) or AUL applied (Method 3)	40.0920-40.0922	☐	☐	☐	☑	
9. Proper Exposure Scenario assumptions (exposure period, etc.) (Method 3)	40.0923-40.0925	☐	☐	☐	☑	
10. All Exposure Pathways (dermal, inhalation, etc.) evaluated (Method 3)	40.0925	☐	☐	☐	☑	
11. Final RAO for facility/property submitted with total site risk calculated (Method 3)	40.0992, 40.0993(7),(8),(9)	☐	☐	☐	☑	
12. AUL Permitted/Inconsistent Activities, etc. understandable to general public and clearly written	40.0923(4)	☐	☐	☐	☑	
III. Response Action Outcome Statement (RAO) Indication That:						
1. RAO boundaries defined/delineated (clear description/plan of RAO boundaries)	40.1003(4), 40.1056(2)(a)	☑	☐	☐	☐	
2. Relationship of RAO to other RAOs for that location has been defined	40.1056(1)(d)	☑	☐	☐	☐	
3. Correct RAO category	40.1030 – 40.1050	☑	☐	☐	☐	
4. Indication as to whether OHM(s) exceed UCLs presented	40.1056(1)(i)	☑	☐	☐	☐	

DEP BWSC RAO TECHNICAL SCREENING AUDIT FORM

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A. CLASS A – Indication That:	Citation(s)	Yes	No	?	NA	Page #
1. All uncontrolled sources have been eliminated or controlled	40.1035 (2)(b)	☑	☐	☐	☐	
2. Groundwater concentrations do *not* exceed standards in GW-1 area	40.1036(5)(b)	☐	☐	☐	☑	
3. Phase IV, Phase V or Post RAO O&M, where required, has been completed	40.1036(6)	☐	☐	☐	☑	
A-1. CLASS A-1 – Indication That:						
1. A permanent solution has been achieved	40.1036(1)(a)	☐	☐	☐	☐	
2. The level of OHM at the site has been reduced to background	40.1036(1)(a)	☐	☐	☐	☐	
3. Response actions eliminated all threats of release and a release oil and/or hazardous material to the environment has *not* occurred (This question applies to threats of release only)	40.1036(1)(b)	☐	☐	☐	☐	
A-2. CLASS A-2 – Indication That:						
1. A permanent solution has been achieved	40.1036(2)(a)	☑	☐	☐	☐	
2. A background feasibility evaluation has been conducted which demonstrates that achievement of background is not feasible	40.1020(3), 40.1056(2)(e)	☑	☐	☐	☐	
A-3. CLASS A-3 – Indication That:						
1. A permanent solution has been achieved	40.1036(3)(a)	☐	☐	☐	☐	
2. Obligations and Conditions of AUL have been implemented	40.1036(3)(c), 40.1056(2)(g)	☐	☐	☐	☐	
3. Reasonable AUL restrictions to maintain No Significant Risk (deep OHM, long exposure period, etc)	40.1074(2)(d-f, h)	☐	☐	☐	☐	
4. A background feasibility evaluation has been conducted which demonstrates that achievement of background is not feasible	40.1020(3), 40.1056 (2)(e)	☐	☐	☐	☐	
5. Groundwater or Soil OHM concentrations do *not* exceed UCLs	40.1036(3)(d)	☐	☐	☐	☐	
A-4. CLASS A-4 – Indication That:						
1. A permanent solution has been achieved	40.1036(4)(a)	☐	☐	☐	☐	
2. Obligations and Conditions of AUL have been implemented	40.1036 (4)(c), 40.1056(2)(g)	☐	☐	☐	☐	
3. Reasonable AUL restrictions to maintain No Significant Risk (deep OHM, long exposure period, etc)	40.1074(2)(d-f, h)	☐	☐	☐	☐	
4. Groundwater or Soil concentrations exceed UCLs; however: (check only a, b, or c)	40.1036 (4)(d), 40.1036(5)(a)	---	---	---	---	
a. concentrations are consistent with background	40.1036(5)(a)	☐	☐	☐	☐	
b. contaminated soil is *greater* than 15 feet below grade	40.1036 (4)(d), 40.1036(5)(a)	☐	☐	☐	☐	
c. contaminated soil is beneath an engineered barrier	40.1036 (4)(d), 40.1036(5)(a)	☐	☐	☐	☐	
5. Engineered barrier does compare favorably to all other alternatives	40.0859(4), 40.1036(4)(e)	☐	☐	☐	☐	
6. UCL Feasibility Evaluation conducted and shows that achieving UCLs is not feasible	40.1036(4)(e), 40.1056(2)(f)	☐	☐	☐	☐	

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B. CLASS B – Indication That:	Citation(s)	Yes	No	?	NA	
1. Remedial actions have *not* been conducted	40.1045(2)	☐	☐	☐	☐	
2. A level of No Significant Risk does exist	40.1045(1)	☐	☐	☐	☐	
3. Initial Assessment, Phase I, or Phase II has been completed	40.1046(5)	☐	☐	☐	☐	
B-1. CLASS B-1 – Indication That:						
1. One or more AULs are *not* necessary to maintain a level of no significant risk	40.1046(1)	☐	☐	☐	☐	
B-2. CLASS B-2 – Indication That:						
1. Obligations and Conditions of AUL have been implemented	40.1046(2)(a), 40.1056(2)(g)	☐	☐	☐	☐	
2. Reasonable AUL restrictions to maintain No Significant Risk (deep OHM, long exposure period, etc)	40.1074(2)(d-f, h)	☐	☐	☐	☐	
3. Groundwater or Soil OHM concentrations do *not* exceed UCLs	40.1046(2)(b)	☐	☐	☐	☐	
B-3. CLASS B-3 – Indication That:						
1. Obligations and Conditions of AUL have been implemented	40.1046(3)(a), 40.1056(2)(g)	☐	☐	☐	☐	
2. Reasonable AUL restrictions to maintain No Significant Risk (deep OHM, long exposure period, etc)	40.1074(2)(d-f, h)	☐	☐	☐	☐	
3. OHM concentrations exceed UCLs; however: (check only a or b)	40.1046(3)(b),(c)	---	---	---	---	
a. soil is located *greater* than 15 feet from ground surface	40.1046(3)(b)	☐	☐	☐	☐	
b. UCL Feasibility Evaluation was conducted and shows that achieving UCLs is not feasible	40.1046(3)(c)	☐	☐	☐	☐	
C. CLASS C – Indication That:						
1. All substantial hazards have been eliminated	40.1050(1), 40.1056(2)(d)	☐	☐	☐	☐	
2. Soil and/or groundwater concentrations exceed any applicable standards	40.1050(2)(b)	☐	☐	☐	☐	
3. Phase II and Phase III were submitted	40.1050(3), 40.1050(4)(a)	☐	☐	☐	☐	
4. Plan of definitive & enterprising steps to achieve a permanent solution is included	40.1050(5)(a), 40.1056(2)(j)	☐	☐	☐	☐	
5. Statement indicating whether post RAO Active O&M will be conducted is included	40.1056(1)(e)	☐	☐	☐	☐	
6. Plan for post-RAO active O&M is included	40.1056(2)(l)	☐	☐	☐	☐	

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number
4 - 18968

A. SITE LOCATION:

1. Site Name/Location Aid: Former Sunoco Gasoline Station

2. Street Address: 990 Washington Street

3. City/Town: Stoughton 4. ZIP Code: 02150-0000

☐ 5. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
☐ a. Tier 1A ☐ b. Tier 1B ☐ c. Tier 1C ☐ d. Tier 2

6. If a Tier I Permit has been issued, provide Permit Number: _____

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of RAO Statement (if previously submitted): _____ mm/dd/yyyy

☑ 2. Submit a **Response Action Outcome (RAO) Statement**

☑ a. Check here if this RAO Statement covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement. 4 - 18650 ☐ - _____

☐ 3. Submit a **Revised Response Action Outcome Statement**

☐ a. Check here if this Revised RAO Statement covers additional Release Tracking Numbers (RTNs), not listed on the RAO Statement or previously submitted Revised RAO Statements . RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement. ☐ - _____ ☐ - _____

☐ 4. Submit a **Response Action Outcome Partial (RAO-P) Statement**

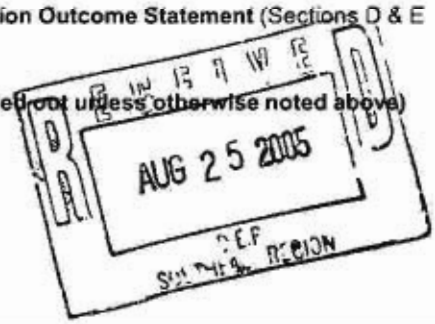
Check above box, if any Response Actions remain to be taken to address conditions associated with this disposal site having the Primary RTN listed in the header section of this transmittal form. This RAO Statement will record only an RAO-Partial Statement for that RTN. A final RAO Statement will need to be submitted that references all RAO-Partial Statements and, if applicable, covers any remaining conditions not covered by the RAO-Partial Statements.

☐ 5. Submit an optional **Phase I Completion Statement** supporting an RAO Statement

☐ 6. Submit a **Periodic Review Opinion evaluating the status of a Temporary Solution** for a Class C RAO Statement (Section E is optional)

☐ 7. Submit a **Retraction** of a previously submitted **Response Action Outcome Statement** (Sections D & E are not required)

(All sections of this transmittal form must be filled out unless otherwise noted above)



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number
4 - 18968

C. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

- ☐ 1. Assessment and/or Monitoring Only
- ☐ 2. Temporary Covers or Caps
- ☐ 3. Deployment of Absorbent or Containment Materials
- ☐ 4. Temporary Water Supplies
- ☐ 5. Structure Venting System
- ☐ 6. Temporary Evacuation or Relocation of Residents
- ☐ 7. Product or NAPL Recovery
- ☐ 8. Fencing and Sign Posting
- ☐ 9. Groundwater Treatment Systems
- ☐ 10. Soil Vapor Extraction
- ☐ 11. Bioremediation
- ☐ 12. Air Sparging
- ☑ 13. Removal of Contaminated Soils
  - ☐ a. Re-use, Recycling or Treatment
    - ☐ i. On Site — Estimated volume in cubic yards: _____
    - ☑ ii. Off Site — Estimated volume in cubic yards: 57.55
      - iia. Facility Name: MTS — Town: Chichester — State: NH
      - iib. Facility Name: _____ — Town: _____ — State: _____
      - iii. Describe: Asphalt Batch/Cold Mix
  - ☐ b. Landfill
    - ☐ i. Cover — Estimated volume in cubic yards: _____
      - Facility Name: _____ — Town: _____ — State: _____
    - ☐ ii. Disposal — Estimated volume in cubic yards: _____
      - Facility Name: _____ — Town: _____ — State: _____
- ☑ 14. Removal of Drums, Tanks or Containers:
  - a. Describe Quantity and Amount: 3- 8,000 Gallon Steel/Fiberglass Underground Storage Tanks
  - b. Facility Name: James A Grant Inc. — Town: Readville — State: MA
  - c. Facility Name: _____ — Town: _____ — State: _____

C. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☐ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

_____

b. Facility Name: _____ Town: _____ State: _____

c. Facility Name: _____ Town: _____ State: _____

☐ 16. Other Response Actions:

Describe: _____

_____

☐ 17. Use of Innovative Technologies:

Describe: _____

D. RESPONSE ACTION OUTCOME CLASS:

Specify the Class of Response Action Outcome that applies to the disposal site, or site of the Threat of Release.
Select **ONLY** one Class.

☐ **1. Class A-1 RAO**: Specify one of the following:

☐ a. Contamination has been reduced to background levels. ☐ b. A Threat of Release has been eliminated.

☑ **2. Class A-2 RAO:** You **MUST** provide justification that reducing contamination to or approaching background levels is infeasible.

☐ **3. Class A-3 RAO**: You **MUST** provide an implemented Activity and Use Limitation (AUL) and justification that reducing contamination to or approaching background levels is infeasible.

☐ **4. Class A-4 RAO**: You **MUST** provide an implemented AUL, justification that reducing contamination to or approaching background levels is infeasible, and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface or below an engineered barrier is infeasible. If the permanent solution relies upon an engineered barrier, you must also provide a Phase III report justifying the selection of the engineered barrier.

D. RESPONSE ACTION OUTCOME CLASS (cont.):

☐ **5. Class B-1 RAO: Specify one of the following:**

☐ a. Contamination is consistent with background levels ☐ b. Contamination is **NOT** consistent with background levels.

☐ **6. Class B-2 RAO**: You **MUST** provide an implemented AUL.

☐ **7. Class B-3 RAO**: You **MUST** provide an implemented AUL and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface is infeasable.

☐ **8. Class C RAO**:Specify one:

☐ a. Monitoring ☐ b. Passive Operation and Maintenance

☐ c. Active Operation and Maintenance (defined at 310 CMR 40.0006)

E. RESPONSE ACTION OUTCOME INFORMATION:

1. Specify the Risk Characterization Method(s) used to achieve the RAO described above:

☑ a. Method 1 ☐ b. Method 2 ☐ c. Method 3

☐ d. Method Not Applicable-Contamination reduced to or consistent with background, or Threat of Release abated

2. Specify all Soil and Groundwater Categories. More than one Soil Category and more than one Groundwater Category may apply at a Site. Be sure to check off all **APPLICABLE** categories.

a. Soil Category(ies) Applicable:

☐ i. S-1/GW-1 ☐ iv. S-2/GW-1 ☐ vii. S-3/GW-1

☑ ii. S-1/GW-2 ☑ v. S-2/GW-2 ☑ viii. S-3/GW-2

☑ iii. S-1/GW-3 ☑ vi. S-2/GW-3 ☑ ix. S-3/GW-3

b. Groundwater Category(ies) Impacted:

☐ i. GW-1 ☐ ii. GW-2 ☐ iii. GW-3 ☑ iv. No Groundwater Impacted

3. Specify remediation conducted.

☐ a. Check here if soil remediation was conducted.

☐ b. Check here if groundwater remediation was conducted.

4. Estimate the number of acres this RAO Statement applies to: 0.3

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number
4 - 18968

F. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *If Section B indicates that either an **RAO Statement, Phase I Completion Statement and/or Periodic Review Opinion** is being provided,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 3427

2. First Name: Donald 3. Last Name: Maggioli

4. Telephone: (781) 769-5005 5. Ext.: 6. FAX: (781) 769-9345

7. Signature:

8. Date: 08/24/05
mm/dd/yyyy

9. LSP Stamp:

COMMONWEALTH OF MASSACHUSETTS
DONALD J. MAGGIOLI
No. 3427
REGISTERED PROFESSIONAL ENGINEER

G. PERSON MAKING SUBMITTAL:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: Sunoco, Inc. (R&M)

3. Contact First Name: William 4. Last Name: Brochu

5. Street: 4 Bellows Road, PO Box 1202 6. Title: Environmental Engineer

7. City/Town: Westborough 8. State: MA 9. ZIP Code: 01581-0000

10. Telephone: (800) 777-6444 11. Ext.: 1357 12. FAX:

H. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON MAKING SUBMITTAL:

☑ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☑ e. Other RP or PRP Specify: Former Operator

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Making Submittal Specify Relationship: _____

I. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☐ 2. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of an RAO Statement that relies on the public way/rail right-of-way exemption from the requirements of an AUL.

☑ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of a RAO Statement with instructions on how to obtain a full copy of the report.

☐ 4. Check here to certify that documentation is attached specifying the location of the Site, or the location and boundaries of the Disposal Site subject to this RAO Statement. If submitting an RAO Statement for a PORTION of a Disposal Site, you must document the location and boundaries for both the portion subject to this submittal and, to the extent defined, the entire Disposal Site.

☐ 5. Check here if required to submit one or more AULs. You must submit an AUL Transmittal Form (BWSC113) and a copy of each implemented AUL related to this RAO Statement. Specify the type of AUL(s) below: (required for Class A-3, A-4, B-2, B-3 RAO Statements)

☐ a. Notice of Activity and Use Limitation b. Number of Notices submitted: _____

☐ c. Grant of Environmental Restriction d. Number of Grants submitted: _____

☑ 6. If an RAO Compliance Fee is required for any of the RTNs listed on this transmittal form, check here to certify that an RAO Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☐ 7. Check here if any non-updatable information provided on this form is incorrect, e.g. Site Address/Location Aid. Send corrections to the DEP Regional Office.

☑ 8. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number
4 - 18968

J. CERTIFICATION OF PERSON MAKING SUBMITTAL:

1. I, William Brochu, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ (Signature) 3. Title: Environmental Engineer

4. For: Sunoco, Inc. (R&M) (Name of person or entity recorded in Section G) 5. Date: _____ mm/dd/yyyy

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section G.

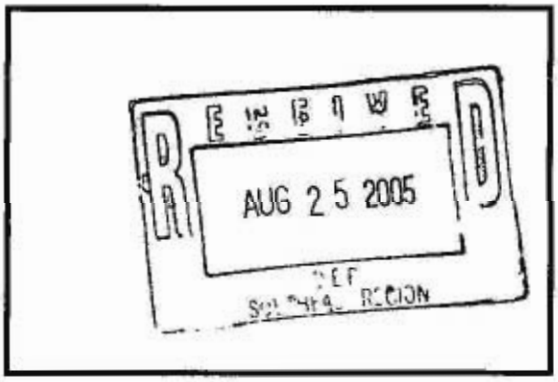
7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)



The following personnel prepared and/or reviewed this report for accuracy, content and quality of presentation

CLASS A-2 RESPONSE ACTION OUTCOME STATEMENT

Former Sunoco Gasoline Station
990 Washington Street
Stoughton, Massachusetts 02072
MADEP RTN: 4-18650, 4-18968

Donald Maggioli, P.E. LSP
Vice President
Senior Reviewer

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Reviewer

For
Jason E. Sherburne
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Report Author

8/24/2005
Date

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 SITE DESCRIPTION, SENSITIVE RECEPTORS, AND REGULATORY STATUS 1
2.1 Site Description and Surrounding Properties 1
2.2 Sensitive Receptors 3
3.0 REGULATORY STATUS AND RESPONSE ACTION HISTORY 4
3.1 RTN 4-0265 4
3.2 RTN 4-18650 4
3.3 RTN 4-18968 6
4.0 REMEDIATION WASTE 6
5.0 DISPOSAL SITE CHARACTERIZATION 7
5.1 Soil and Groundwater Categorization 7
5.2 Definition of Background 7
5.3 Contaminants of Concern (COCs) 7
5.4 Soil 9
5.5 Groundwater 10
5.6 Indoor Air 10
5.7 Surface Water 10
5.8 Sediment 10
6.0 METHOD 1 RISK CHARACTERIZATION 10
6.1 Identification of Current and Reasonably Foreseeable Site Use 10
6.2 Applicable Standards 11
6.3 Potential Receptors and Exposure Potential 11
6.3.1 Human 11
6.3.2 Ecological 11
6.4 Exposure Potential for Future Use 11
6.5 Identification of Exposure Points 12
6.5.1 Soil 12
6.5.2 Groundwater 12
6.5.3 Indoor Air 12
6.6 Potential Impacts to Indoor Air 12
6.7 Substantial Release Migration, Imminent Hazards, and Critical Exposure Pathways 12
6.7.1 Critical Exposure Pathways (CEPs) 12
6.7.2 Conditions of Substantial Release Migration (SRM) 12
6.7.3 Imminent Hazard 13
6.8 Characterization of Risk of Harm to Safety 13
6.9 Characterization of Risk of Harm to the Environment and Public Welfare 13
7.0 FEASIBILITY EVALUATION 14
7.1 Feasibility to Approach Background Conditions 14
7.1.1 Conditions of Categorical Feasibility 14
7.1.2 Conditions of Categorical Infeasibility 14
7.2 Conditions Approaching Background in Soil, Persistent Compounds 15
7.3 Conditions Approaching Background in Groundwater, Persistent Compounds 15
7.4 Feasibility Conclusions 15
8.0 UNCERTAINTY ANALYSIS 16
9.0 FINDINGS AND CONCLUSIONS 16
10.0 PUBLIC NOTICES 17

FIGURES

Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: Surrounding Land Use Map
Figure 4: Mass GIS Map
Figure 5: Groundwater Flow Map

TABLES

Table 1: Summary of Groundwater Analytical Data - VPH
Table 2: Summary of Groundwater Analytical Data – EPH
Table 3: Summary of Groundwater Analytical Data – VOCs
Table 4: Summary of Groundwater Analytical Data – RCRA 8 Metals
Table 5: Summary of Groundwater Analytical Data – MNA
Table 6: Summary of Groundwater Analytical Data – Residential Wells
Table 7: Summary of Soil Analytical Data – UST Excavation Area
Table 8: Summary of Soil Analytical Data – Dispenser Excavation Area
Table 9: Summary of Soil Analytical Data – Exposure Point Concentration
Table 10: Summary of Soil Analytical Data – Pre-Disposal Soil Borings

ATTACHMENTS

Attachment A Copies of Residential Responses
Attachment B Copies of Laboratory Analytical
Attachment C Copies of Public Involvement Notification

1.0 INTRODUCTION

EnviroTrac Ltd. (EnviroTrac) prepared this Class A-2 Response Action Outcome (RAO) on behalf of Sunoco Inc. (R&M) (Sunoco). This RAO applies to a release of petroleum products at a former Sunoco-branded gasoline retail facility located at 990 Washington Street in Stoughton, Massachusetts and was prepared in accordance with the requirements of the Massachusetts Contingency Plan (MCP) 310 CMR 40.0000. This release is related to the gasoline underground storage tanks (USTs) and dispenser piping located at 990 Washington Street.

For the purpose of this report, the "facility" is defined as the area located within the property boundaries of the former Sunoco-branded gasoline station located at 990 Washington Street in Stoughton, Massachusetts. The "disposal site" is defined as the facility and other properties where oil and/or, hazardous material (OHM) have come to be located as a result of a release at the facility. Based on data collected to date, the disposal site consists of impacted soil located beneath portions of the facility.

In accordance with 310 CMR 40.1036, a Class A-2 RAO shall apply to sites where remedial actions have been conducted at a site, a Permanent Solution has been achieved, the level of oil and hazardous materials in the environment has not been reduced to background, and the implementation of an Activity and Use Limitation is not required to maintain a level of No Significant Risk. In order to achieve a Class A RAO or permanent solution, it must be demonstrated that there is a level of no significant risk for both current and future uses of the site. A Method 1 Risk Characterization was conducted in accordance with the MCP and the Characterizing Risks posed by Petroleum Contaminated Sites: Implementation of the Massachusetts Department of Environmental Protection (MADEP) VPH/EPH Approach, Final Policy, October 31, 2002 (VPH/EPH Approach). The risk characterization was prepared to characterize the risk of harm to health, safety, public welfare and the environment for both current and future uses of the disposal site.

2.0 SITE DESCRIPTION, SENSITIVE RECEPTORS, AND REGULATORY STATUS

2.1 Site Description and Surrounding Properties

The site is identified by the Stoughton Assessor's Office as Map 53, Lot 165 and consists of an irregularly shaped 12,780 square foot parcel of land located on Washington Street near the intersection with Crescent Avenue. Refer to **Figure 1** for the regional location of the site and to **Figure 2** for relevant site features. The parcel is an inactive gasoline filling station. The site is developed with an approximately 250 square foot, single-story, kiosk building. The kiosk is situated in the central portion of the lot with paved, former dispenser islands located to the north and south, and a former gasoline UST pad on the northern portion of the property. Gasoline for retail sale was stored within three 8,000-gallon fiberglass double-walled USTs. The USTs, dispensers, and ancillary piping were removed during Immediate Response Action (IRA) activities associated with RTN 4-18968 and summarized in **Section 3.3**.

The facility was utilized as a gasoline service station since approximately 1925. The entire property is covered with either asphalt or concrete with the exception of small landscaped areas located along the property boundaries.

The facility is located in a mixed commercial/residential area of Stoughton, Massachusetts. Surrounding properties include the following:

North: To the north by several residential properties.

South: To the south by Town-owned wetlands.

East: To the east by Town-owned wetlands.

West: To the west by Washington Street, beyond which are several residential and commercial properties.

The building consists of a steel frame over a concrete slab floor, with masonry exterior walls and a flat tar and gravel roof. The building was heated using forced hot air with a natural gas source. Records at the Stoughton Department of Public Works confirm that the building received potable water from municipal supplies and discharged sanitary wastewater to an onsite septic system located in the northern portion of the site.

General site information to which this RAO applies is presented below.

MADEP Release Tracking Number(s):	4-18650, 4-18968
Potentially Responsible Party and Former site operator:	Sunoco, Inc (R&M) 4 Bellows Road PO Box 1262 Westborough, MA 01581
Client Contact:	Mr. William Brochu, Environmental Engineer, Sunoco, Inc. (R&M)
USGS Quadrangle:	Brockton, Massachusetts
Latitude, longitude:	42° 07' 08" N, 71° 06' 04" W (approximate)
UTM Coordinates:	T19 326,324 E, 4,665,098 N (approximate)
Zoning of facility:	General Business
Zoning of Surrounding	General Business and Residential
Property:	Former Gasoline Service Station
Facility SIC #:	5541 Gasoline Filling Stations, Retail
County:	Norfolk County
Assessor's Information:	Map 53/Plot 165

2.2 Sensitive Receptors

According to the Massachusetts Geographic Information System (MassGIS) maps the nearest surface water body is an unnamed Town-owned wetlands located immediately south and east of the site. An unnamed stream is located approximately 650 feet southwest of the site. Zone II of a public water supply well, an Interim Wellhead Protection Area, a Potentially Productive Aquifer (PPA), or a Zone A of a Class A Surface Water Body. Groundwater in the site vicinity is not utilized for water supply or process water.

According to information in the *Massachusetts Natural Heritage Atlas* (2003 edition) and MassGIS databases, there are no estimated habitats of rare wildlife, areas of critical environmental concern, certified vernal pools, priority sites of rare species habitats, or exemplary natural communities within 500 feet of the disposal site.

No schools, hospitals, childcare centers, or long-term health care facilities are located within 1,000 feet of the disposal site. Several residences located north and northeast of the site have basements. Based on groundwater monitoring data, no concentrations of COCs for the site exceed Method 1 GW-2 standards.

Private wells originally identified as drinking water wells by the Town of Stoughton Board of Health and Public Works Department were determined to be used only for irrigation purposes (i.e. non-potable) based on written confirmation with the property owners. Well information is discussed further in Section **3.2**. Specific information regarding the wells is provided below.

Address	Depth	Approximate Distance to Site	Installation Date	Usage	Sample Date
17 Crescent Avenue	20 Feet	50 Feet (Abuts site)	6/22/1985	Irrigation Only	10/13/2004
980 Washington Street	17 Feet	100 Feet	Unknown	Irrigation Only	11/24/2004
20 Crescent Avenue	Unknown	300 Feet	Prior to 1986	Irrigation Only	Access Not Provided
30 Crescent Avenue	15 Feet	400 Feet	Unknown	Irrigation Only	11/3/2004
42 Crescent Avenue	20 Feet	450 Feet	Prior to 1985	Irrigation Only	11/3/2004

No drinking water wells were identified within 500 feet of the site. Refer to **Figure 3** for the location of private wells within vicinity of the site.

According to MassGIS Maps, there are three areas of critical environmental concern (ACEC) located in the vicinity of the site. The MassGIS Map identifies the unnamed Town-owned wetlands which abuts the site to the south and east, Woods Pond located approximately 1,300 feet to the west, and an unnamed open space located approximately 2,300 feet to the northeast of the site as Areas of Critical Environmental Concern (ACECs). Refer to **Figure 4** for the MassGIS map.

3.0 REGULATORY STATUS AND RESPONSE ACTION HISTORY

3.1 RTN 4-0265

During a Phase I investigation conducted by Kurz Associates, Inc. (Kurz) of West Bridgewater, Massachusetts, elevated concentrations of aromatic hydrocarbon compounds were detected in two site groundwater monitoring wells. The Massachusetts Department of Environmental Quality Engineering (DEQE) issued a Notice of Responsibility (NOR) dated March 11, 1987 to Sure Oil and Chemical Company (Sure), the former site owner, of North Grafton, Massachusetts. As a result of the Phase I findings, MADEP later issued RTN 4-0265.

Following the issuance of the NOR, Sure performed additional assessment of the site. As part of this assessment all USTs located at the site were removed. During a UST excavation on August 12, 1987, gasoline impacted soil was observed at a depth of four to eight feet below grade surface (bgs). Approximately 500 cubic yards of impacted soil was excavated for off-site disposal at Consolidated Waste Service in Maine. During the excavation activities, a petroleum sheen was observed in groundwater pooled at the bottom of the excavation. Approximately 1,100 gallons of groundwater was pumped from the excavation to a vacuum truck prior to backfilling. Additional subsurface investigations included the installation of six soil borings to a maximum depth of 23.5 feet bgs, with all six soil borings completed as groundwater monitoring wells identified at POW-1 through POW-6. Groundwater monitoring wells were sampled for purgeable aromatic compounds on November 24, 1987. Results of groundwater sampling indicated elevated concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX) in POW-1 through POW-6. The highest concentrations of BTEX were detected in POW-1 and POW-3 at 3,270 and 5,870 ug/l, respectively. Kurz recommended additional sampling to confirm impacts and possible limited soil excavation.

On September 1, 1994, Corporate Environmental Advisors, Inc. (CEA) of Worcester, Massachusetts prepared a Response Action Outcome (RAO) Statement and LSP Opinion. This report detailed additional soil and groundwater sampling conducted by CEA. Soil sampling results indicated no concentrations of COCs above Method 1 S-1 soil standards. Groundwater sampling indicated no concentrations of COCs above Method 1 GW-2/GW-3 standards. CEA concluded that the site did not pose a significant risk and submitted a Class A-2 RAO.

3.2 RTN 4-18650

As part of a Phase I/Phase II Environmental Site Assessment (ESA) conducted for real estate considerations, EnviroTrac collected groundwater samples from five previously installed monitoring wells at the property. These wells were redesignated MW-1 through MW-5. Groundwater samples from all monitoring wells were submitted in accordance with chain of custody procedures to New England Testing of North Providence, Rhode Island (NET) for volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), volatile organic compounds (VOC) and RCRA 8 metals analyses. During the assessment, EnviroTrac contacted with Mr. James Conlon of the Town of Stoughton Board of Health and Mr. Bill Hammel of the Town of Stoughton Water Department. As part of these discussions Town officials identified five private potable wells located within 500 feet of the site thereby making GW-1 standards applicable.

Analytical results from the August 24, 2004 sampling event documented concentrations of VPH-range analytes in groundwater above applicable Method 1 GW-1 standards in wells MW-1 and

MW-4. EPH-range analytes were detected in groundwater above applicable Method 1 standards in wells MW-3 and MW-4.

The detection of COCs in groundwater monitoring wells MW-1, MW-3 and MW-4 above Method 1 GW-1 Standards within 500 feet of private wells represented a 72-hour reporting condition with the MADEP in accordance with 310 CMR 40.0313(3)(b). Ms. Lori Williamson of the MADEP was informed of the release on August 31, 2004 at 3:55 pm and assigned RTN 4-18650 to the release. MADEP also verbally approved IRA assessment activities to include sampling of nearby drinking water wells. An IRA Plan detailing response activities including site groundwater and residential well sampling was submitted to MADEP on October 22, 2004. EnviroTrac contacted Mr. Conlon of the Board of Health and discussed the 72 hour notification and the plan to sample private wells in the vicinity of the disposal site.

Between October 13, 2004 and November 24 2004 EnviroTrac sampled residential wells located within 500 feet of the site. Groundwater samples were collected from select wells and submitted to NET for EPA Method 524.2 and select Oxygenates analysis which include: methyl tert-butyl ether (MTBE), diisopropyl ether (DIPE), ethylene dibromide (EDB), tert amyl methyl ether (TAME), ethyl tert butyl ether (ETBE), and tert butyl alcohol (TBA). All samples were submitted in accordance with chain of custody procedures to NET. Access was not provided at 20 Crescent Avenue, therefore the well was not sampled. No concentrations of COCs exceeding Method 1 GW-1 standards were detected in groundwater sampled from the residential wells. Due to the location of 20 Crescent Avenue downgradient of wells sampled at 980 Washington Street and 17 Crescent Avenue, and the lack of COCs detected in these wells, it is unlikely COCs are present in the irrigation well located at 20 Crescent Avenue. Refer to **Tables 1 through 6** for a summary of groundwater analytical. A copy of the lab analytical data is included as **Attachment A**.

On November 3, 2004, EnviroTrac sampled on-site site monitoring wells. During the sampling event, all monitoring wells were gauged and sampled. Groundwater samples were submitted to NET for VPH analysis. Groundwater sampled from select wells was also submitted for EPH and VOC analyses. Depth to water (DTW), dissolved oxygen (DO), conductivity, oxidation-reduction potential (ORP), temperature, and pH were measured during the sampling event. No concentrations of COCs exceeding Method 1 GW-2 or GW-3 standards were detected in groundwater sampled from site monitoring wells with the exception of the polycyclic aromatic hydrocarbon (PAH) compound phenanthrene detected above GW-3 standards in well MW-3.

On November 15, 2004, EnviroTrac supervised the installation of soil borings for soil predisposal characterization prior to a planned UST removal. The soil borings were completed by Drilex Environmental of West Boylston, Massachusetts to a maximum explored depth of 12 feet bgs. During installation, an EnviroTrac scientist screened select soil samples with a photoionization detector (PID) in accordance with MADEP jar headspace procedures. Headspace readings ranged from below instrument detection limits (BDL) to a maximum of 86.0 parts per million by volume (ppmv). Predisposal characterization samples were shipped to NET in accordance with chain of custody documentation for analysis of total petroleum hydrocarbons (TPH), VOCs by EPA Method 8260, RCRA-8 metals, polychlorinated biphenyls (PCBs), reactivity, pH, and flashpoint. The results of the analysis indicated that the soil impacts were consistent with gasoline. No concentrations of PCBs were detected, and concentrations of metals were below MADEP published background levels. Only VOCs associated with petroleum compounds were detected. Refer to **Table 10** for a summary of laboratory analytical.

On December 21, 2004, EnviroTrac submitted an IRA Completion Report to the MADEP. The

IRA Completion detailed site activities conducted as part of the IRA Plan and included additional research into potable well usage. EnviroTrac conducted additional research into water usage in the vicinity of the site and prepared questionnaires to each resident with a reported potable wells. Resident responses were received from three residents located within 500 feet of the property and indicated wells at these addresses (17 Crescent Avenue, 20 Crescent Avenue and 30 Crescent Avenue) were used for irrigation purposes only. EnviroTrac performed inspections and sampling of all residences within 500 feet of the site with the exception of 20 Crescent Avenue, which did not provide access. Copies of residential response letters were provided with the IRA Completion Report. Refer to **Attachment A** for copies of residential responses. Due to this additional information Method 1 GW-1 standards do not apply to groundwater at the site. Laboratory analytical data from the most recent sampling event indicated no concentrations of COCs exceeding Method 1 GW-2 or GW-3 standards in groundwater sampled from site monitoring wells with the exception of the polycyclic aromatic hydrocarbon (PAH) compound phenanthrene detected above GW-3 standards in well MW-3 on November 3, 2004.

On February 18, 2005, EnviroTrac submitted a RAM Plan to the MADEP. The RAM Plan was submitted to manage potentially impacted soil and groundwater during the planned removal of the USTs, dispensers, and associated piping.

3.3 RTN 4-18968

On February 23, 2005 Sorco Corporation (Sorco) of Tyngsboro, Massachusetts began the removal of the gasoline USTs, dispensers, and ancillary piping from the facility. During excavation, an EnviroTrac scientist collected soil samples and screened the samples with a calibrated PID in accordance with MADEP jar headspace procedures. On February 23, 2005 PID readings ranging from BDL to 154 ppmv were detected in soil samples collected from the excavation area. On behalf of Sunoco, EnviroTrac contacted Mr. Dan Crafton of MADEP on February 24, 2005 at 2:18 pm to notify MADEP of the 72-hour reporting condition. At the time of reporting, MADEP approved an Immediate Response Action Plan (IRAP) consisting of the removal of the USTs and ancillary piping, the removal and off-site disposal/recycling of up to 750 cubic yards of impacted soil and the removal and disposal of up to 25,000 gallons of water. Mr. Crafton stated that the RAM for RTN 4-18650 was now considered complete and response actions would continue as part of the IRA for RTN 4-18968.

Refer to **Tables 8 through 10** for a summary of the soil analytical data. A copy of the lab analytical data is included as **Attachment B**.

On April 25, 2005, EnviroTrac submitted an IRA Completion Report, a BWSC 106 Release Abatement Measure Transmittal Form detailing the RAM Completion, and a letter detailing the transfer of site investigation from RAM activities to IRA activities. The IRA Completion Report concluded that the condition requiring the IRA, soil exhibiting PID readings greater than 100 ppmv, no longer existed due to the removal of impacted soil. No Imminent Hazard conditions existed or were likely to exist based on data collected to date. No Significant Release Migration (SRM) condition or Critical Exposure Pathways (CEPs) existed at the site.

4.0 REMEDIATION WASTE

Following the completion of the work, 57.55 tons of impacted soil was transported from the site to MTS of Chichester, New Hampshire in accordance with MADEP Bill of Lading (BOL) procedures for asphalt batch recycling on March 4, 2005. Three USTs were removed from the

site and transported to James A. Grant, Inc. on February 24, 2005. The original BOL was submitted to the MADEP on March 3, 2005. No groundwater was removed from the disposal site during completion of IRA activities associated with RTN 4-18968.

5.0 DISPOSAL SITE CHARACTERIZATION

5.1 Soil and Groundwater Categorization

Site soil is categorized based on accessibility and on the frequency and intensity of use for children and adults. Impacted soil at the site is at approximately 4 feet based on a combination of soil sampling and field screening data and is classified as potentially accessible soil (0 to 15' depth, paved surface). This RAO assumes that site use is unrestricted, therefore S-1 standards were used in order to evaluate risk based on potential future residential use. Based on the commercial nature of the property and the zoning of the property as general business, residential development of the site is unlikely. No impacts were detected above Method 3 Upper Concentration Limits (UCLs).

The applicable groundwater categories at the site are GW-2 and GW-3. No private drinking water wells are known to be located within 500 feet of the site, groundwater at the site is not classified as GW-1. Depth to water at the site is less than 15 feet below grade resulting in a GW-2 classification for groundwater within 30 feet of an occupied building, therefore groundwater within MW-3 and MW-4 is classified as GW-2/3 and groundwater within all remaining wells at the site is classified GW-3. Refer to **Figure 5** for the groundwater flow map.

5.2 Definition of Background

As defined in the MCP, 310 CMR 40.0006, background concentrations are defined as those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

- Ubiquitous and consistently present in the environment and in the vicinity of the disposal site of concern;
- Attributable to coal ash or wood ash associated with fill material;
- Releases to groundwater from a public water supply system; or
- Petroleum residues that are incidental to the normal operation of motor vehicles.

MADEP's, "Technical Update Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil", May 2002 documents anticipated background levels of contaminants in soil. Concentrations of metals were detected at the site. Concentrations of arsenic, chromium, and lead were detected at the site below MADEP documented background concentrations.

5.3 Contaminants of Concern (COCs)

Contaminants detected at the disposal site are limited to petroleum products from the former UST system and dispenser piping and materials previously brought on site as fill. The source of soil and groundwater impacts is limited gasoline releases in the dispenser and UST area. The impacts were confirmed by field screening using the PID instrument in accordance with MADEP jar headspace procedures. Impacted soil was removed based on field screening results. Confirmatory soil sampling was conducted to document soil quality after soil excavation was completed.

Analytical methods for both soil and groundwater samples were selected based on the potential sources and in accordance with the MADEP Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach Final Policy October 31, 2002 (VPH/EPH Approach) and the most recent version of the MCP. Groundwater and soil at the disposal site was sampled for EPH, VPH, ethylene dibromide (EDB), RCRA-8 Metals, and VOCs by EPA Method 8260. Soil was sampled for VPH, EPH, PCBs, RCRA-8 Metals, VOCs, and TPH.

No concentrations of PCBs or VOCs were detected above laboratory detection limits in soil samples collected. Concentrations of metals detected were below background concentrations established in Technical Update to WSC/ORS #95-141: Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil.

All chemicals detected at a site are considered COCs, unless there is a specific, justifiable rationale for eliminating the contaminant as a COC. Contaminants may be eliminated from the list of study compounds if they are: 1) detected at concentrations at or below background concentrations or by site specific data; 2) laboratory contaminants; or 3) detected infrequently at low concentrations with respect to the detection limit.

Impacted soil was excavated based on field screening using the PID. The following COCs were identified within soil at the disposal site after impacted soil was removed from the excavations:

- VPH C5-C8 Aliphatics
- VPH C9-C12 Aliphatics
- VPH C9-C10 Aromatics
- Toluene
- Xylenes
- MTBE
- EPH C9-C18 Aliphatics
- EPH C19-C36 Aliphatics
- EPH C11-C22 Aromatics
- **Benzo(a)anthracene**
- **Benzo(a)pyrene**
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene
- **Dibenzo(a,h,)anthracene**
- Fluoranthene
- Phenanthrene
- Pyrene

COCs detected at concentrations above Method 1 Soil S-1 standards are in **bold**. Impacts to soil are further discussed in **Section 5.4**.

The following COCs were identified in groundwater at the disposal site:

- VPH C5-C8 Aliphatics
- VPH C9-C12 Aliphatics
- VPH C9-C10 Aromatics

- Benzene
- Toluene
- Ethylbenzene
- Xylenes
- MTBE
- EPH C9-C18 Aliphatics
- EPH C19-C36 Aliphatics
- EPH C11-C22 Aromatics
- Benzo(a)pyrene
- Benzo(b)fluoranthrene
- Benzo(k)fluoranthrene
- Benzo(g,h,i)perylene
- Chrysene
- Dibenzo(a,h)anthracene
- Fluoranthene
- 2-Methylnaphthalene
- Naphthalene
- **Phenanthrene**
- Pyrene
- Arsenic
- Barium
- Acetone
- Isopropylbenzene
- n-propylbenzene
- Styrene
- 1,2,4-trimethylbenzene
- 1,3,5-trimethylbenzene

COCs detected at concentrations above Method 1 Groundwater GW-3 standards are in **bold**. Impacts to groundwater are further discussed in **Section 5.5**.

5.4 Soil

Endpoint samples were collected after impacted soil was removed. Impacted soil beneath the disposal site is located at a depth of four feet bgs. PAH impacts to soil are likely attributed to historical fill, however no coal or coal ash was observed, therefore these compounds remain considered as COCs. Since potential future uses of the site are unrestricted, Method 1 S-1 standards were compared to laboratory results. Based on current soil sampling results, *benzo(a)anthracene, benzo(a)pyrene and dibenzo*(a,h)anthracene were detected above Method 1 S-1 standards in dispenser island excavation samples collected from the dispenser area number 2. Benzo(a) anthracene was detected at a concentration of 3.2 milligrams per kilogram (mg/kg), above the S-1 standard of 0.7 mg/kg. Concentrations of benzo(a)pyrene and dibenzo(a,h)anthracene were 3.2 and 3.8 mg/kg, respectively, also above the S-1 standard of 0.7 mg/kg for each.

Exposure Point Concentrations (EPCs) were calculated for the USTs, dispensers and associated piping excavations. In accordance with 310 CMR 40.0926(3)(b)2.a, an arithmetic average was calculated using sidewall and bottom concentrations from the excavation. Arithmetic averages were below Method 1 S-1 standards for all COCs. Specifically, the

arithmetic averages for benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene were 0.62 mg/kg, 0.62 mg/kg, and 0.69 mg/kg respectively. These values are below the applicable standard of 0.7 mg/kg for all three COCs, respectively. Refer to **Table 11** for a summary of EPCs.

5.5 Groundwater

Groundwater sampling conducted in November 2004 specified no COC concentrations above Method 1 GW-2/3 standards, except for the presence of Phenanthrene in MW-3 above Method 1 GW-3 standards. Groundwater sampling conducted in March 2005 after the UST excavation specified no COC concentrations above applicable Method 1 standards. All EPCs calculated for site groundwater were below Method 1 GW-2 and GW-3 standards. Monitoring well MW-3 provides groundwater data downgradient of the dispensers and monitoring well MW-1 provides groundwater data downgradient of the USTs. Groundwater beneath the site is not used for a current or potential future drinking water supply; therefore GW-1 standards do not apply to the site. Groundwater beneath the facility is located at depths less than 15 feet; therefore GW-2 standards do apply to the facility. Currently, no concentrations of COCs in groundwater at the site exceed GW-2/3 standards.

5.6 Indoor Air

In accordance with the VPH/EPH Approach, impacts to indoor air are not anticipated due to the lack of COC concentrations above Method 1 GW-2 standards.

5.7 Surface Water

Based on the results of groundwater sampling, the disposal site has not impacted surface water. No concentrations of COCs are present above Method 1 GW-3 standards at the disposal site. Therefore impacts to surface water are not expected

5.8 Sediment

Based on the results of soil and groundwater sampling, the disposal site has not impacted sediment. No concentrations of COCs are present above Method 1 GW-3 standards at the disposal site. Therefore impacts to sediment are not expected

6.0 METHOD 1 RISK CHARACTERIZATION

The purpose of this risk characterization is to evaluate and characterize the potential risk to human health, public welfare, safety, and the environment that may be posed by compounds that were detected in groundwater and soil at the site. This risk characterization was completed in accordance with the requirements outlined in the MCP, 310 CMR 40.0900. The risk characterization is based on current and reasonably foreseeable site use and conditions. This risk characterization applies to the disposal site as depicted on **Figure 2**.

6.1 Identification of Current and Reasonably Foreseeable Site Use

The facility is currently vacant but is scheduled to be redeveloped into a gasoline filling station. Due to the zoning of the parcel as industrial and the commercial economic value of the property, exposures to impacted media will remain similar to that of a retail gasoline station. For the

purpose of this risk characterization, future use of the property is expected to remain commercial; however, potential future uses of the site are not restricted and no such restrictions on future use were used in the determination of risk associated with this portion of the facility. Utility upgrade and/or construction involving excavation activities are likely to occur as part of current or future activities. Residential exposures were considered in the risk characterization as a potential future use.

6.2 Applicable Standards

The applicable standards at the site therefore include S-1 for soils and GW-2 and GW-3 for groundwater.

6.3 Potential Receptors and Exposure Potential

6.3.1 Human

Future potential human receptors at the site may include construction workers, site workers, and customers. Workers at the facility are assumed to be adults. Normal operations at the facility may include an average of two to three employees working from eight to 12 hour shifts five days per week. Customers of the facility would be present only for short durations (10 minutes) during automobile refueling. Construction workers could also be present at the site.

As the future use of the facility is unrestricted, future potential human receptors may include residential receptors including adults and children who would be present at the property for 24 hour days.

Exposure point concentrations of impacted soil are below Method 1 S-1 standards. Therefore, COCs in soil are unlikely to pose an exposure potential to human or environmental receptors even if the soil is exposed via excavation. No exposures are expected to on-site workers or infrequent visitors. Dermal, ingestion, and inhalation exposures to current and future human receptors are not expected. There are no private drinking water wells within 500 feet of the disposal site as detailed in **Section 2.2.**

6.3.2 Ecological

Due to the pavement and the commercial nature of the disposal site and vicinity, ecological habitats are limited and exposure to the soil is unlikely. Also due to the exposure point concentration averages below Method 1 S-1 and GW-2/3 standards, COCs in soil and groundwater are also unlikely to pose an exposure to ecological receptors. Ecological receptors do not exist in the vicinity of the site and the migration of COCs with surface water is unlikely.

6.4 Exposure Potential for Future Use

Future use of the property is expected to remain commercial. However, exposure potential was evaluated for all future use scenarios in the risk characterization. Based on the lack of soil impacts above Method 1 S-1 standards ingestion, inhalation, or direct contact are unlikely for all future receptors.

6.5 Identification of Exposure Points

6.5.1 Soil

EPCs were calculated for soil samples collected from sampling locations located inside the USTs, dispenser and piping areas as detailed on **Figure 2**. The EPC area consists of approximately 6,000 square feet of soil at a depth of four to nine feet bgs. None of the COC concentrations detected in any of the EPC data points were more than 100 times the concentration of any other soil data points used in the EPC. All EPCs concentrations are below Method 1 S-1 standards.

6.5.2 Groundwater

EPCs were calculated for COC concentrations in groundwater at the site were below Method 1 GW-2 and GW-3 standards.

6.5.3 Indoor Air

In accordance with the VPH/EPH Approach impacts to indoor air are unlikely as COC concentrations in groundwater are below Method 1 GW-2 standards.

6.6 Potential Impacts to Indoor Air

In accordance with the VPH/EPH Approach impacts to indoor air are unlikely as COC concentrations in groundwater are below Method 1 GW-2 standards.

6.7 Substantial Release Migration, Imminent Hazards, and Critical Exposure Pathways

6.7.1 Critical Exposure Pathways (CEPs)

Vapor Phase Emissions

No pre-schools, daycares or schools were observed in the site vicinity. Residential structures are located 30 feet to the north of the site. Based on existing data, including the depth to groundwater and current concentrations of COCs at the disposal site, vapor phase emissions from this release are unlikely due to the lack of Method 1 GW-2 standard exceedences.

Drinking Water Exposures

Since groundwater in the vicinity is not utilized for potable water supplies, a CEP related to drinking water supply exposures is not present. COCs related to this disposal site have not migrated any drinking water supply areas.

6.7.2 Conditions of Substantial Release Migration (SRM)

Discharges of Separate-Phase Oil and/or Hazardous Materials

No discharges to surface water, subsurface structures or underground utilities or conduits were observed. Discharges of this nature are unlikely based on current data.

Releases to Ground Surface or Vadose Zone Likely to Exacerbate Groundwater Impacts

No releases to the ground surface occurred. EPC concentrations of COCs in soil are currently below S-1 standards. Therefore current vadose zone impacts are not expected to exacerbate groundwater impacts.

Releases That Have or Are Expected to Migrate Greater Than 200 Feet Per Year

COC concentrations in groundwater at the site were below Method 1 GW-2 and GW-3 standards, therefore migration is not likely to occur from the site.

Releases Likely to Be Detected in a Water Supply Within One Year

Based on the distance and direction of the nearest PPA, it is unlikely that the COCs will migrate the 800 feet to the PPA.

Releases Likely to Be Detected in Surface Water, Wetlands, or Public Water Supply Reservoirs Within One Year

There are no COCs above GW-3 standards, therefore the release is not likely to be detected in surface water or wetlands above Method 1 GW-3 standards.

Releases to Groundwater Likely to Result in Vapor Discharges to a School or Residence

Based on groundwater sampling data the release is unlikely to impact these receptors.

6.7.3 Imminent Hazard

No imminent hazards are known to exist at the site. In addition, based on current and historical data from the facility, an imminent hazard is unlikely to exist as a result of this release.

6.8 Characterization of Risk of Harm to Safety

Conditions of risk of harm to safety as defined by the MCP, including conditions that will pose a threat of physical harm or bodily injury to people are not identified on-site. No rusted or corroded drums or containers are located on the site, no weakened berms are present on the site, and no explosive vapors resulting from the release of oil and/or hazardous material were detected on the site. No unsecured pits, ponds, lagoons, or other dangerous structures, or any uncontained materials have been identified on-site for the storage of reactive chemicals. There are no open or on-going excavations at the disposal site and all wastes generated as part of remedial actions were removed from the disposal site. Existing monitoring wells have eight inch or smaller diameter road boxes which are in good repair, bolted, and secured. The maximum well diameter at the disposal site is four inches.

6.9 Characterization of Risk of Harm to the Environment and Public Welfare

Based upon this risk characterization, EnviroTrac determined that a level of no significant risk to human health or the environment exists with respect to the documented release at the site for current site use. Additionally, no restrictions are proposed for future site use. Based upon this risk characterization, an Activity and Use Limitation (AUL) is not required to maintain a level of no significant risk. As the COC concentrations are not reduced to background, a Class A-2 Response Action Outcome statement is appropriate.

No nuisance odors are present at the disposal site. There are no on-going subsurface investigations that would generate dust, debris, or other deleterious visual impacts. The areas of impact are not expected to negatively impact the usefulness of the property.

7.0 FEASIBILITY EVALUATION

As required by 310 CMR 40.860 (e) an evaluation of the feasibility of reducing the concentrations of OHM at the site to levels that achieve or approach background was conducted. The assessment of the threat of release at the site determined no EPCs in the soil or groundwater of COCs above applicable standards, therefore a condition of no significant risk (NSR) exists at the site.

7.1 Feasibility to Approach Background Conditions

As required by the MCP, the feasibility of implementing additional RAAs and/or extending the operation of existing RAAs in order to reduce COC concentrations to background conditions must be considered. EnviroTrac evaluated the feasibility to approach background conditions as part of this Class A-2 RAO as outlined below. This evaluation was conducted in accordance with MADEP policy WSC-04-160, drafted on July 16, 2004, *Conducting Feasibility Evaluations Under the MCP*. This policy outlines MADEP's position related to conditions of categorical feasibility to achieve background conditions, conditions of categorical infeasibility to achieve background conditions and conditions which meet the definition of approaching background.

7.1.1 Conditions of Categorical Feasibility

Conditions of categorical feasibility include site conditions whereby a level of NSR is reached and the remaining impacts are limited to 20 cubic yards or less of petroleum product impacted soil where such soil is:

- Located less than three feet bgs.
- Not covered by pavement or a permanent structure.
- Is not located within a sensitive environment (i.e. wetlands).
- And is not located in an area where soil removal would substantially interrupt public service or threaten public safety.

At this site, EPCs for soil are below applicable Method 1 S-1 standards (as outlined in **Section 6.5.1**.).

7.1.2 Conditions of Categorical Infeasibility

Conditions of categorical infeasibility include the following site conditions:

- Excavation beneath a permanent structure.
- Remedial actions that would substantially interrupt public service or threaten public safety.
- Remediation of degradable non-persistent contaminants.
- Remediation of persistent contaminants located in S-2 and S-3 soils.

At this site, impacted soil is not located beneath a permanent structure. The conduct of further remedial actions would not likely interrupt public service or threaten public safety as impacted media are located on private property. Although the bulk of soil impacts are located in areas currently categorized as S-2 and S-3 areas, the future use of the site is not restricted, therefore, S-1 standards must apply to the impacted soil areas at depths less than 15 feet bgs. Soil at the site is impacted with the COCs outlined in **Section 5.4**. Of these MTBE, benzo(a)pyrene, and benzo(g,h,i)perylene are considered persistent. The remainder of the COCs in soil are considered non-persistent and degradable, therefore additional remediation of these compounds is considered categorically infeasible.

Groundwater at the disposal site is impacted with the COCs outlined in **Section 5.3**. Of these MTBE, benzo(a)pyrene, benzo(g,h,i)perylene, and arsenic are considered persistent. The remainder of the COCs in groundwater are considered non-persistent and degradable, therefore additional remediation of these compounds is considered categorically infeasible.

7.2 Conditions Approaching Background in Soil, Persistent Compounds

The MADEP guidance document defines conditions approaching background in soil in areas classified as S-1 if the concentration of each persistent contaminant at each sampling location is at or below the Method 1 S-1 standards. For this disposal site, all impacted soil area EPCs are below the applicable Method 1 S-1 standard. Therefore, the persistent contaminants in soil meet conditions approaching background.

7.3 Conditions Approaching Background in Groundwater, Persistent Compounds

The MADEP guidance document defines conditions approaching background in groundwater if EPCs of persistent contaminants in groundwater are below ½ the applicable Method 1 groundwater standard. None of the EPCs for persistent contaminants exceed Method 1 standards. EPCs for the persistent contaminants are currently below ½ the applicable Method 1 GW-2 and GW-3 standards. Therefore, the remaining persistent contaminants meet conditions approaching background.

7.4 Feasibility Conclusions

EnviroTrac reviewed site conditions, remedial actions performed to date, and reviewed conditions of categorical feasibility, infeasibility, and conditions approaching background outlined in the MCP guidance document WSC-04-160. Based on these evaluations, the following conclusions are presented:

- Current site conditions meet a condition of NSR, as documented in this Class A-2 RAO and Method 1 risk characterization report.
- Impacted soil at the site contains persistent and non-persistent compounds.
- Impacted groundwater at the site contains persistent and non-persistent compounds.
- Persistent compounds in soil at the site are currently present at concentrations with EPCs below the applicable Method 1 S-1 standard. Therefore, these compounds meet the definition of approaching background. No additional RAA evaluation for the compounds is necessary.
- Persistent compounds in groundwater at the site are currently present at concentrations below the applicable Method 1 GW-2/GW-3 standards. Therefore, these compounds meet the definition of approaching background. No additional RAA evaluation for the compounds is necessary.

8.0 UNCERTAINTY ANALYSIS

This report, the investigations that support it, and the data collected, are subject to uncertainties, which accompany all investigations. The uncertainties are often a result of the limitations of available technology, the feasibility of further investigation, human error, instrument malfunction, weather, unknown subsurface conditions, safety, data interpretation, dated information, and a number of other factors. The scope of investigations at this, and all disposal sites is limited to that necessary to address site conditions based on the levels and nature of contaminants encountered, potential receptors, and the physical characteristics of the site. The limitations on investigations are related to: financial expenditure vs. value of data collected; physical site features (buildings, roadways, utilities); time, and safety concerns during the completion of investigations. No investigation can sample the entire volume of any media (groundwater, soil, air, sediment, or surface water) at a disposal site. The investigations presented in this report were appropriate in scope and magnitude to address the impacts of COCs reported for this release and the potential receptors of the release.

Soil samples were limited to areas of accessible soil. Soil samples could not be collected from buildings, utilities or below the roadways adjacent to the site. Soil samples collected are likely to represent average concentrations across the site.

Groundwater samples are also limited by the same factors limiting soil sampling. Seasonal groundwater level fluctuations should be adequately addressed by the groundwater sampling conducted to date, however, the sampling conducted is not likely to address all potential site conditions.

Analytical data is subject to a multitude of uncertainties related to sample collection, weather, containers, sample handling, contamination (from non-site related sources), instrument variability and error, etc. Quality Assurance/Quality Control (QA/QC) data (surrogate recoveries, matrix spikes, duplicates, and blanks) help to limit uncertainties. QA/QC data provided with laboratory report are reviewed to determine compliance with the method requirements. Data which fails to meet QA/QC requirements is evaluated to determine its usability. The quantity of data collected increases the confidence in the results provided. Repetitive groundwater sampling events increase the certainty of results based on a review of data trends. Sampling events for soil and groundwater by different samplers on different dates and analyzed in different batches at the laboratory serve to counter potential errors by individuals and instrumentation. Review of multiple sites data over years of service with samplers and laboratories helps to identify and eliminate many uncertainties. Anomalies in data trends and poor QA/QC data often necessitate re-sampling to confirm results. While uncertainties do exist in data collection and analysis presented in this and all reports, appropriate conclusions can be formulated with this data.

9.0 FINDINGS AND CONCLUSIONS

Based upon the results of the Method 1 Risk Characterization and previous investigations, the requirements for a Class A-2 RAO are achieved as outlined below:

1. The site is a former Sunoco-branded gasoline station, located at 990 Washington Street in an general business area of Stoughton, Massachusetts. The site is developed with a

single-story, kiosk building constructed of a steel frame over a concrete slab floor with masonry exterior walls.

2. RTN 4-18650 was assigned after the detection of COCs in groundwater monitoring wells above Method 1 GW-1 standards within 500 feet of private wells created a 72-hour reporting condition. RTN 4-18968 was assigned after a 72-hour reporting condition related to a potential release from the USTs and dispenser piping.

3. The disposal site consists of portions of the property located at 990 Washington Street in Stoughton. Specifically, the site consists of soil at depths of approximately four feet to nine feet bgs in the vicinity of the former USTs and dispensers and of groundwater at depths of six to nine feet bgs.

4. The sources of impact at the site were adequately defined as limited releases in the UST and dispenser area. The three USTs, four dispensers and associated piping were removed. Impacted soil was removed based on field screening. The remaining impacted soil is not a continuing source of impact to soil or groundwater. The remaining impacts are attributed to historic fill materials used to develop the site.

5. The nearest PPA is approximately 800 feet southeast upgradient of the site. Based on the distance and location of the nearest PPA, it is unlikely that the COCs will migrate the 800 feet to the PPA.

6. According to data obtained from the Mass GIS, the disposal site does not lie within a Zone II of a public water supply well, an Interim Wellhead Protection Area, a PPA, or a Zone A of a Class A Surface Water Body. Groundwater in the site vicinity is not utilized for water supply or process water.

7. Since the potential future use of the site is unrestricted, Method 1 S-1 standards apply to soil at the site. Based on the results of soil sampling following excavation, no concentrations of COCs exist in soil above Method 1 S-1 standards. None of the COCs detected in soil at the disposal site exceed UCLs or Method 1 S-3 standards.

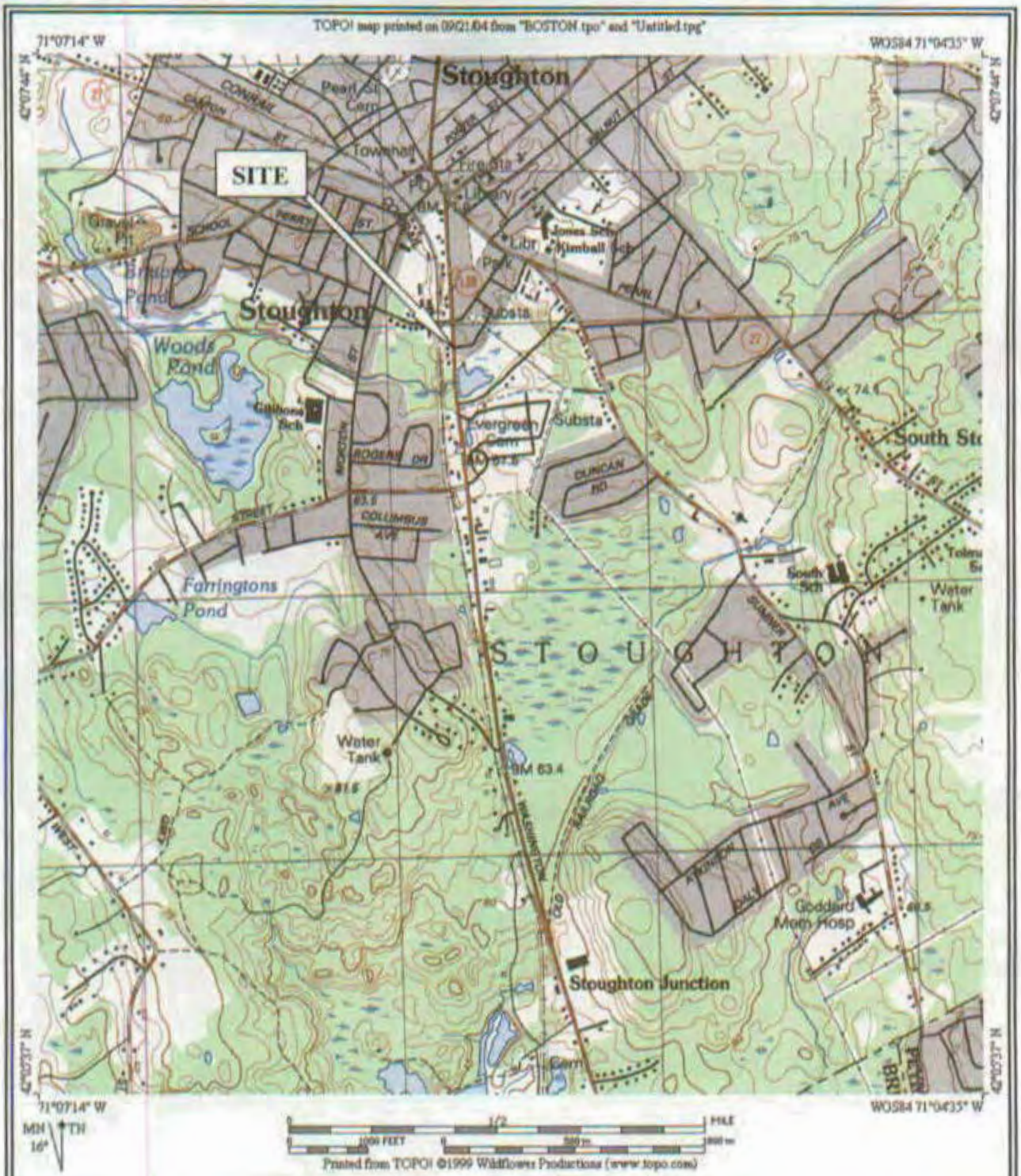
8. Based upon the results of the Method 1 Risk Characterization, a Condition of No Significant Risk to human health, safety, public welfare and the environment exists for current and future site use scenarios. A condition of No Significant Risk of Harm to human health, public welfare, safety, and the environment was achieved for the site. No remediation waste was removed.

9. EPCs calculated for soil at the site are below Method 1 S-1 standards and EPCs calculated for groundwater at the site are below Method 1 GW-2 and GW-3 standards.

10.0 PUBLIC NOTICES

Copies of Public Involvement Notifications submitted to City Officials in accordance with 310 CMR 40.0863 are included as **Attachment C.**

FIGURES



Former Sunoco Gasoline Station
990 Washington Street
Stoughton, Massachusetts

Contour Interval 3 Meters

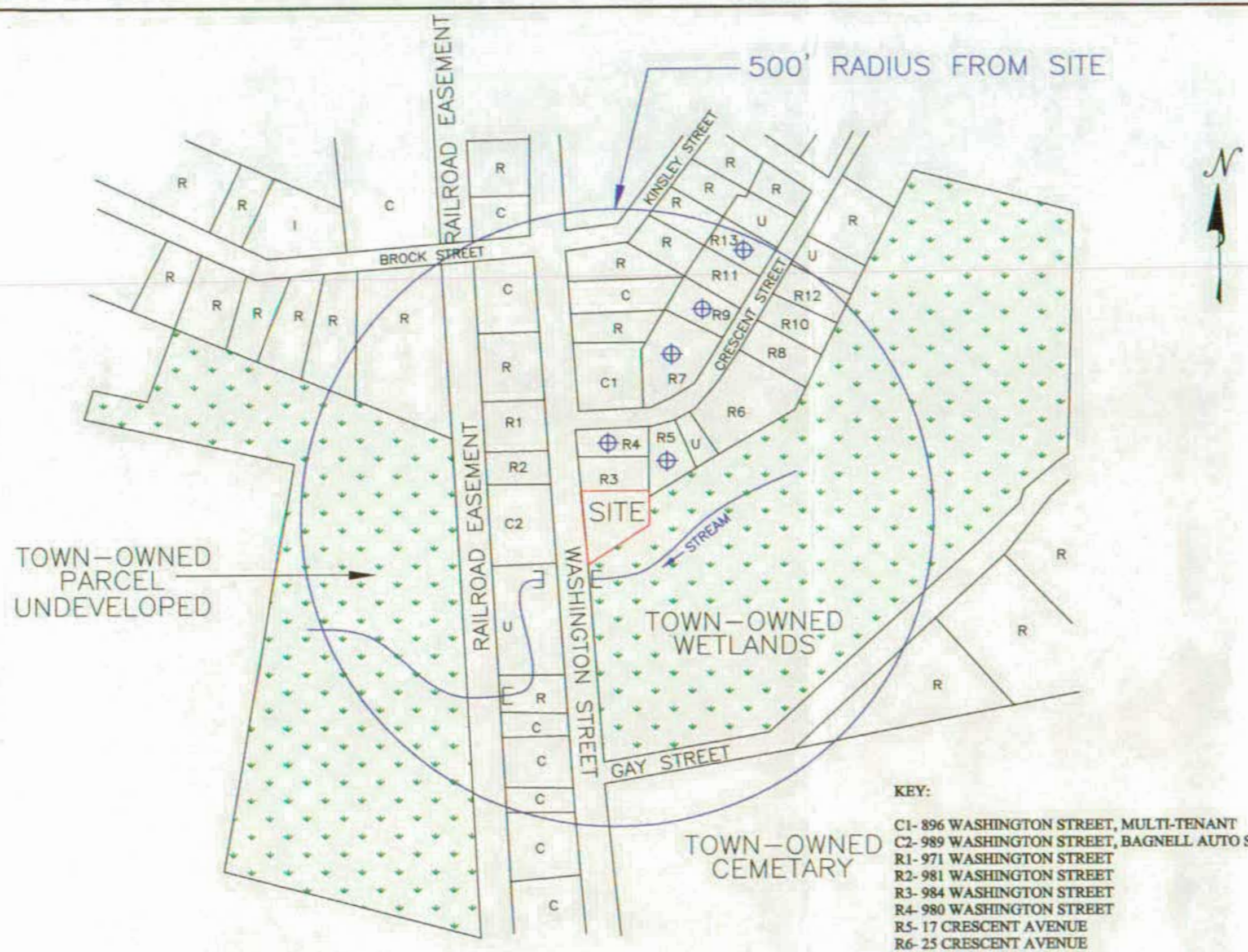
Long: 71°06'04"
Lat: 42°07'08"

FIGURE 1

SITE LOCUS MAP
UNITED STATES GEOLOGICAL SURVEY
MASSACHUSETTS
7.5 MINUTE SERIES

N
W E
S

EnviroTrac



LEGEND

- PROPERTY BOUNDARY
- LOT WITH PRIVATE IRRIGATION WELL
- R RESIDENCE
- C COMMERCIAL
- I INDUSTRIAL
- U UNDEVELOPED
- STREAM, ENTRY CULVERT

FIGURE 3

REVISED: WCH 8/24/2004

SURROUNDING LAND USE

APPROXIMATE SCALE

1-INCH EQUALS 200-FEET

FORMER SUNOCO STATION
990 WASHINGTON STREET
STOUGHTON, MASSACHUSETTS

KEY:

C1- 896 WASHINGTON STREET, MULTI-TENANT
C2- 989 WASHINGTON STREET, BAGNELL AUTO SUPPLY
R1- 971 WASHINGTON STREET
R2- 981 WASHINGTON STREET
R3- 984 WASHINGTON STREET
R4- 980 WASHINGTON STREET
R5- 17 CRESCENT AVENUE
R6- 25 CRESCENT AVENUE
R7- 20 CRESCENT AVENUE
R8- 37 CRESCENT AVENUE
R9- 30 CRESCENT AVENUE
R10- 45 CRESCENT AVENUE
R11- 36 CRESCENT AVENUE
R12- 42 CRESCENT AVENUE

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RESIDENCE
(984 WASHINGTON STREET)

RESIDENCE
(17 CRESCENT AVENUE)

LEACHFIELD

WATERLINE

MW-3

APPROXIMATE LOCATION
OF UST EXCAVATION

FORMER
UST PAD

MW-1

APPROXIMATE BOUNDARY OF
RTN 4-18968

UNDERGROUND TELEPHONE

UNDERGROUND ELECTRIC

DISP #3

GAS LINE

KIOSK

DISP #4

NW-1

NW-3

WW-4

EW-4

NORTH TANK BOTTOM

TRENCH 2-3

TRENCH 1-4

MID TANK BOTTOM

WW-1

EW-2

SOUTH TANK BOTTOM

DISP #1

DISP #2

SW-4

SW-1

MW-2

MW-4

WASHINGTON STREET

CANOPY

4,000
GALLON
UST

2,000
GALLON
UST

HISTORIC SITE
FEATURES

RIPRAP

MW-5

TOWN-OWNED
WETLANDS

N

LEGEND

- PROPERTY BOUNDARY
- CATCH BASIN
- GROUNDWATER MONITORING WELL
- GROUNDWATER EXCEEDING STANDARDS
- SAMPLE LOCATION
- SOIL ABOVE STANDARDS
- EXCAVATION BOUNDARY
- DISPOSAL SITE

FIGURE
2

REVISED
3/21/2005

SITE PLAN WITH
EXCATION LOCATIONS

APPROXIMATE SCALE

1-INCH EQUALS 30-FEET

FORMER SUNOCO STATION
990 WASHINGTON STREET
STOUGHTON, MASSACHUSETTS

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MA DEP - Bureau of Waste Site Cleanup

Site Scoring Map: 500 feet & 0.5 Mile Radii

SITE NAME:
Former Sunoco Station
990 Washington Street
STOUGHTON, MA 02072
[illegible]0708n 710604ew

Site Location

The information shown on this map is the best available at the date of printing. Please refer to the data source descriptions document.

MASS GIS — Massachusetts Geographic Information System — Massachusetts Executive Office of Environmental Affairs - 2005

Roads: Limited Access, Divided, Major Road, Connector, Street, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, Sub; Streams: Perennial, Intermittent, Man Made Shore, Dams

Potentially Productive Aquifers: Medium, High Yield

Non-Potential Drinking Water Source Area: Medium, High Yield

EPA Sole Source Aquifer; FEMA 100-year floodplain

Public Water Supplies: Ground, Surface, Non Community

Approved Zone2; IWPA; Surface Water Supply Zone A

Hydrography: Water Features, Public Surface Water Supply

Wetlands: Fresh, Salt, NHESP Wetlands Habitat

Protected Open Space; ACEC

DEP Permitted Solid Waste Facilities; Certified Vernal Pools

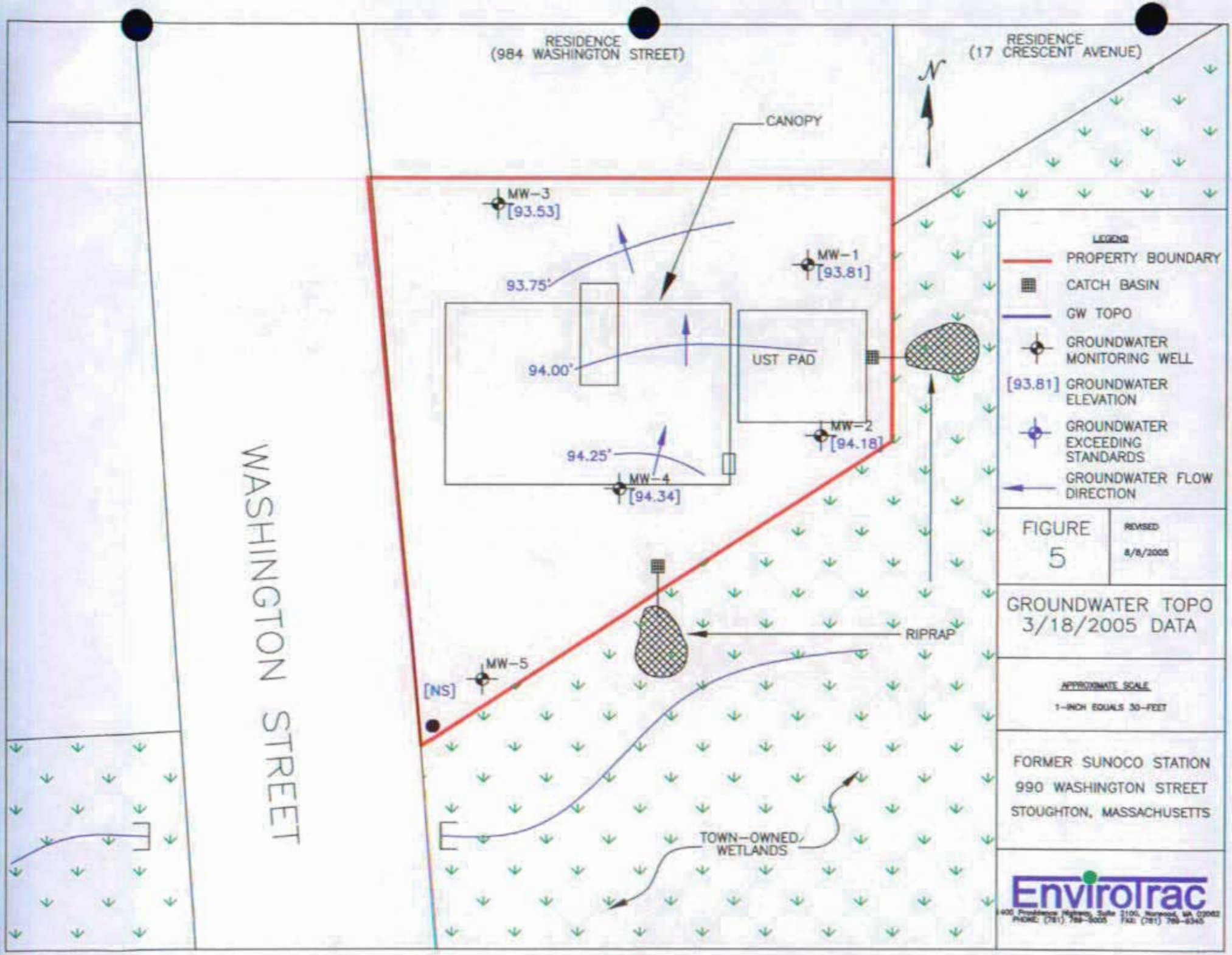
N W E S

SCALE 1:15000

0 1/2 1/2 MILES

0 KILOMETERS 1

June 28, 2005


RESIDENCE
(984 WASHINGTON STREET)
RESIDENCE
(17 CRESCENT AVENUE)
N
CANOPY
MW-3
[93.53]
MW-1
[93.81]
93.75'
94.00'
UST PAD
MW-2
[94.18]
94.25'
MW-4
[94.34]
WASHINGTON STREET
RIPRAP
MW-5
[NS]
TOWN-OWNED
WETLANDS
LEGEND
PROPERTY BOUNDARY
CATCH BASIN
GW TOPO
GROUNDWATER MONITORING WELL
[93.81] GROUNDWATER ELEVATION
GROUNDWATER EXCEEDING STANDARDS
GROUNDWATER FLOW DIRECTION
FIGURE
5
REVISED
8/8/2005
GROUNDWATER TOPO
3/18/2005 DATA
APPROXIMATE SCALE
1-INCH EQUALS 30-FEET
FORMER SUNOCO STATION
990 WASHINGTON STREET
STOUGHTON, MASSACHUSETTS
EnviroTrac

TABLES

TABLE 1

SUMMARY OF GROUNDWATER QUALITY DATA - VPH

Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Well Casing Elev.	Sample Date	Depth to Water (feet)	Ground Water Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	MTBE (µg/L)	VPH C5-C8 Aliphatics (µg/L)	VPH C9-C12 Aliphatics (µg/L)	VPH C9-C10 Aromatics (µg/L)	VPH Naph-thalene (µg/L)	Ethylene dibromide (µg/L)
MW-1	8/24/2004	8.78	91.56	98	52	<5	16	166	106	216	<50	59	<10	--
100.34	11/3/2004	8.78	91.56	<5	<5	<5	<20	ND	<10	<50	<50	<50	<10	--
GW-3	3/18/2005	6.53	93.81	<5	<5	<5	<20	ND	<10	65	77	<50	<10	--
EPC	--	--	--	34	19	3	12	NA	39	102	42	36	5	--
MW-2	8/24/2004	8.78	91.55	<5	<5	<5	<20	ND	18	<50	<50	<50	<10	--
100.33	11/3/2004	8.33	92.00	<5	<5	<5	<20	ND	<10	<50	<50	<50	<10	--
GW-3	3/18/2005	6.15	94.18	<5	<5	<5	<20	ND	<10	<50	75	<50	<10	--
EPC	--	--	--	2.5	2.5	2.5	10	NA	9	25	42	25	5	--
MW-3	8/24/2004	8.25	91.39	<5	<5	<5	<20	ND	<10	<50	<50	<50	<10	--
99.64	11/3/2004	8.10	91.54	<5	<5	<5	<20	ND	<10	<50	<50	<50	<10	--
GW-2/3	3/18/2005	6.11	93.53	<5	<5	<5	<20	ND	<10	<50	81	<50	<10	<0.01
EPC	--	--	--	2.5	2.5	2.5	10	NA	5	25	44	25	5	--
MW-4	8/24/2004	8.21	92.12	<5	<5	7	<20	7	<10	287	<50	1,040	<10	--
98.72	11/6/2004	8.06	92.27	<5	<5	6	<20	6	<10	388	<50	1,210	<10	--
GW-2/3	3/18/2005	5.99	94.34	<5	<5	<5	<20	ND	65	<50	107	113	<10	<0.01
EPC	--	--	--	2.5	2.5	5	10	NA	25	233	52	788	5	0.005
MW-5	8/24/2004	7.08	93.25	<5	<5	<5	<20	ND	15	61	<50	<50	<10	--
97.43	11/3/2004	6.66	93.67	<5	<5	<5	<20	ND	<10	<50	<50	<50	<10	--
GW-3	3/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--
EPC	--	--	--	2.5	2.5	2.5	10	NA	10	43	25	25	5	--
Method 1 Standards		*GW-2*	*2,000*	*6,000*	*30,000*	*6,000*	*NE*	*50,000*	*1,000*	*1,000*	*5,000*	*6,000*	*3*	
		GW-3	*7,000*	*50,000*	*4,000*	*50,000*	*NE*	*50,000*	*4,000*	*20,000*	*4,000*	*6,000*	*50,000*	
Upper Concentration Limit			*70,000*	*100,000*	*100,000*	*100,000*	*NE*	*100,000*	*100,000*	*100,000*	*100,000*	*100,000*	*100,000*	

Notes:

Method I Standards are reported in micrograms per liter (µg/L).
ND is not detected.
MTBE is methyl tert-butyl ether.
BTEX is the sum of benzene, toluene, ethylbenzene and xylenes.
VPH is volatile petroleum hydrocarbons.
Concentrations exceeding the applicable Method 1 Risk Characterization standards are in **bold**

-- is no sample collected
NE is no standard established
<2.0 is less than the laboratory detection limit of 2.0 ug/L.

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TABLE 2
SUMMARY OF EPH GROUNDWATER MONITORING DATA
Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Well	Sample Date	EPH																
		C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics	Acenaph-thene	Acenaph-thylene	Benzo(a) pyrene	Benzo(b) Fluoranthrene	Benzo(k) Fluoranthrene	Benzo (g,h,i) Perylene	Chrysene	Dibenzo(a,h) Anthracene	Fluoranthene	Fluorene	2-Methyl-naphthalene	Naphtha-lene	Phenan-threne	Pyrene
MW-1	8/24/2004	<50	218	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	3	<1	<5
	11/3/2004	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
	3/18/2005	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
EPC	--	25	89	25	2.5	0.5	0.1	0.5	0.5	2.5	1	0.25	2.5	2.5	0.5	1.3	0.5	2.5
MW-2	8/24/2004	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
	11/3/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/18/2005	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
EPC	--	25	25	25	2.5	0.5	0.1	0.5	0.5	2.5	1	0.25	2.5	2.5	0.5	0.5	0.5	2.5
MW-3	8/24/2004	<50	<50	488	<5	<1	5.6	<1	21	<5	15	12.1	15	<5	<1	8	8	12
	11/3/2004	296	1,356	3,745	<5	<1	148	<1	388	131	193	220	291	<5	<1	<1	**83**	**244**
	3/18/2005	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
EPC	--	115	469	1,265	2.5	0.5	51.2	0.5	135.8	45.3	70	77	103	2.5	0.5	3.0	30.5	86.2
MW-4	8/24/2004	<50	218	234	<5	<1	1.5	9	<1	<5	<2	<0.5	<5	<5	6	18	<1	<5
	11/3/2004	<50	405	1,366	<5	<1	26	71	<1	29	71	45	101	<5	6	24	11	33
	3/18/2005	<50	<50	354	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	4	<1	<5
EPC	--	25	216	651	2.5	0.5	9.2	26.8	0.5	11.3	24.3	15.2	35.3	2.5	4.2	15.3	4.0	12.7
MW-5	8/24/2004	<50	<50	<50	<5	<1	<0.2	<1	<1	<5	<2	<0.5	<5	<5	<1	<1	<1	<5
	11/3/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EPC	--	25	25	25	2.5	0.5	0.1	0.5	0.5	2.5	1	0.25	2.5	2.5	0.5	0.5	0.5	2.5
MCP METHOD 1 STANDARDS																		
	GW-2	*1,000*	*NE*	*50,000*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*10,000*	*6,000*	*NE*	*NE*
	GW-3	*20,000*	*20,000*	*30,000*	*5,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*6,000*	*50*	*3,000*
Upper Concentration Limits																		
	GW	*100,000*	*100,000*	*100,000*	*50,000*	*30,000*	*30,000*	*30,000*	*30,000*	*30,000*	*30,000*	*30,000*	*3,000*	*30,000*	*100,000*	*60,000*	*3,000*	*30,000*

Notes:
Results and MCP Method I Standards are reported in micrograms per liter (µg/L).
NE is not established.
Results that are above MCP Method 1 GW-1 standards are in bold
-- is not sampled for this parameter.
Only EPH target compounds detected above laboratory detection limits are included in this table.

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TABLE 3

SUMMARY OF VOC GROUNDWATER MONITORING DATA - VOC Compounds

Former Sunoco Station Station

990 Washington Street

Stoughton, Massachusetts

		8260															
Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	Naptha-lene (ug/L)	Acetone (ug/L)	2-Butanone (MEK) (ug/L)	n-Butyl-benzene (ug/L)	sec-Butyl-benzene (ug/L)	Isopropyl-benzene (ug/L)	n-Propyl-benzene (ug/L)	p-Isopropyl-toluene (ug/L)	Styrene (ug/L)	Trichloro-ethene (ug/L)	1,2,4-Trimethyl-benzene (ug/L)	1,3,5-Trimethyl-benzene (ug/L)
MW-1	8/24/2004	120	69	5.3	27.5	<2.0	<2.0	90	<5.0	<1.0	<1.0	1.7	<1.0	<1.0	3.9	<1.0	<1.0	3.9
	11/3/2004	<1.0	<1.0	<1.0	<3.0	<2.0	<2.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EPC	–	60.25	34.75	2.9	14.5	1	1	46	2.5	0.5	0.5	1.1	0.5	0.5	2.2	0.5	0.5	2.2
MW-2	8/24/2004	<1.0	<1.0	<1.0	<3.0	7.8	<2.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/3/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EPC	–	0.5	0.5	0.5	1.5	7.8	1	2.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
MW-3	8/24/2004	1.6	<1.0	<1.0	<3.0	<2.0	<2.0	8.2	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/3/2004	<1.0	<1.0	<1.0	<3.0	<2.0	<2.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EPC	–	1.05	0.5	0.5	1.5	1	1	5.4	2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
MW-4	8/24/2004	<1.0	<1.0	4.7	5.3	<2.0	<2.0	<5.0	<5.0	<1.0	<1.0	5.2	26	<1.0	<1.0	<1.0	180	24
	11/3/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EPC	–	0.5	0.5	4.7	5.3	1	1	2.5	2.5	0.5	0.5	5.2	26	0.5	0.5	0.5	180	24
MW-5	8/24/2004	<1.0	<1.0	<1.0	<3.0	9.9	<2.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/3/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EPC	–	0.5	0.5	0.5	1.5	9.9	1	2.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
MCP METHOD 1	*GW-2*	*2,000*	*6,000*	*30,000*	*6,000*	*50,000*	*6,000*	*50,000*	*50,000*	*NE*	*NE*	*NE*	*NE*	*NE*	*900*	*300*	*NE*	*NE*
STANDARDS	*GW-3*	*7,000*	*50,000*	*4,000*	*50,000*	*50,000*	*6,000*	*50,000*	*50,000*	*NE*	*NE*	*NE*	*NE*	*NE*	*50,000*	*20,000*	*NE*	*NE*
Upper Concentration Limits																		
	UCL	*70,000*	*100,000*	*100,000*	*100,000*	*100,000*	*60,000*	*100,000*	*100,000*	*NE*	*NE*	*NE*	*NE*	*NE*	*100,000*	*100,000*	*NE*	*NE*

Notes:
-- is data not available.
ND is not detected.
NE is not established.
MTBE is methyl tert-butyl ether.
Results and MCP Method I Standards are reported in micrograms per liter (µg/L).
Only VOC compounds detected above laboratory detection limits are included in this table.

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TABLE 4

SUMMARY OF GROUNDWATER QUALITY DATA - RCRA 8 Metals

Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Well Casing Elev.	Sample Date	Depth to Water (feet)	Ground Water Elevation (feet)	Arsenic (µg/L)	Barium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Lead (µg/L)	Mercury (µg/L)	Selenium (µg/L)	Silver (µg/L)
MW-1	8/24/2004	8.78	91.56	<0.01	0.090	<0.005	<0.005	<0.005	<0.0002	<0.01	<0.005
100.34											
GW-1/3											
MW-2	8/24/2004	8.78	91.55	<0.01	0.053	<0.005	<0.005	<0.005	<0.0002	<0.01	<0.005
100.33											
GW-1/3											
MW-3	8/24/2004	8.25	91.39	<0.01	0.114	<0.005	<0.005	<0.005	<0.0002	<0.01	<0.005
99.64	3/18/2005	6.11	93.53	--	--	--	--	<0.005	--	--	--
GW-1/2/3											
MW-4	8/24/2004	8.21	92.12	0.013	0.051	<0.005	<0.005	<0.005	<0.0002	<0.01	<0.005
98.72											
GW-1/2/3											
MW-5	8/24/2004	7.08	93.25	0.015	0.062	<0.005	<0.005	<0.005	<0.0002	<0.01	<0.005
97.43											
GW-1/3											
	Method 1 Standards		*GW-2*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*
			GW-3	*400*	*30,000*	*10*	*2,000*	*30*	*1*	*80*	*80*
	Upper Concentrtion Limits		*UCLs*	*4,000*	*100,000*	*100*	*20,000*	*300*	*20*	*800*	*400*

Notes:

Method I Standards are reported in micrograms per liter (µg/L).
ND is not detected.
-- is no sample collected
NE is no standard established
<2.0 is less than the laboratory detection limit of 2.0 ug/L.
Concentrations exceeding the applicable Method 1 Risk Characterization standards are in **bold**

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TABLE 5

SUMMARY OF GROUNDWATER QUALITY DATA - MNA

Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Well	Sample Date	Depth to Water (Feet)	Dissolved Oxygen (mg/L)	Temperature (°C)	pH	ORP (mV)	Conductivity (µS)
MW-1	11/03/04	8.78	1.11	NR	7.6	13	630
	03/18/05	6.53	5.75	5.7	7.0	98	810
MW-2	11/03/04	8.33	1.34	NR	10.4	52	440
	03/18/05	6.15	8.27	6.3	6.9	31	750
MW-3	11/03/04	8.10	1.88	NR	10.2	64	580
	03/18/05	6.11	3.65	6.8	6.6	32	700
MW-4	11/03/04	8.05	0.68	NR	11.0	-9	800
	03/18/05	5.99	7.54	5.5	7.1	11	1,070
MW-5	11/03/04	6.66	0.65	NR	7.7	-4	490
	03/18/05	--	--	--	--	--	--

NR- Not Recorded due to inoperable instrument.
-- Means not sampled
ORP is oxidation reduction potential
mV is millivolts
µS is microsiemens
°C is degrees celsius
mg/l is milligrams per liter
MNA is monitored Natural Attenuation

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TABLE 6

SUMMARY OF GROUNDWATER ANALYTICAL - RESIDENTIAL WELL SAMPLING

In the Vicinity of the Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Address	Sample Date	Sample Location	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	1,1-Dichloro-ethane (µg/L)	1,1,1-Tri chloroethane (µg/L)	Methylene chloride (µg/L)	Chloroform (µg/L)	Chloro-methane (µg/L)	DIPE (µg/L)	EDB (µg/L)	TAME (µg/L)	ETBE (µg/L)	TBA (µg/L)
17 Crescent Ave	10/13/2004	Irrigation Well	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Duplicate	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Trip Blank	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
30 Crescent Ave	11/3/2004	Irrigation Well	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Duplicate	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Trip Blank	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
42 Crescent Ave	11/3/2004	Irrigation Well	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Duplicate	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Trip Blank	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
980 Washington Street	11/24/2004	Irrigation Well	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Duplicate	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Trip Blank	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Massachusetts Drinking Water																	
Standards or Guidelines		*GW-1*	*5*	*1,000*	*700*	*10,000*	*70*	*70*	*200*	*5*	*5*	*1,000*	*NE*	*0.02*	*NE*	*NE*	*NE*

Notes:

Method I Standards are reported in micrograms per liter (µg/L).
MTBE is methyl tert-butyl ether.
DIPE is diisopropyl ether
EDB is ethylene dibromide
TAME is tert amyl methyl ether
ETBE is ethyle tert butyl ether
TBA is tert butyl alcohol

Concentrations exceeding the applicable Method 1 Risk Characterization standards are in **bold**
<2.0 is less than the laboratory detection limit of 2.0 ug/L.

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Table 7
SUMMARY OF SOIL QUALITY DATA
UST Excavation Area
Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Date	February 24, 2005											MADEP Concentration in Natural Soil	Method 1 Standards	
Sample ID	EW-2	FW-4	MW-1	MW-4	SW-1	SW-4	NW-1	NW-3	NORTH TANK BOTTOM	MID TANK BOTTOM	SOUTH TANK BOTTOM			
Sample Depth (feet)	8'	10'	4'	8'	8'	12'	6'	8'	12'	12'	12'		S-1/GW-2	S-1/GW-3
Headspace (ppmv)	0.0	13.8	36.1	0.0	5.4	0.0	0.0	2.1	0.0	0.0	0.0	N/A	NA	NA
MA-VPH (mg/Kg)														
C5-C8 Aliphatics	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	--	100	100
C9-C12 Aliphatics	<3.0	<3.0	3.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	--	1,000	1,000
C9-C10 Aromatics	<3.0	8.7	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	--	100	100
Benzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	40	40
Toluene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	500	500
Ethylbenzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	500	500
Xylenes (m,p,o)	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	500	500
MTBE	<0.3	<0.3	1.8	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	100	100
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.5	100	100
MA-EPH (mg/Kg)														
C9-C18 Aliphatics	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	--	1,000	1,000
C19-C36 Aliphatics	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	23	<10.0	<10.0	<10.0	<10.0	--	2,500	2,500
C11-C22 Aromatics	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	--	800	800
Acenaphthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	1,000	1,000
Acenaphthylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	100	100
Anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Benzo (a) anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (a) pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (b) fluoranthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (g,h,i) perylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Benzo (k) fluoranthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	7	7
Chrysene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.0	7	7
Dibenzo (a,h) anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.7	0.7
Fluoranthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.0	1,000	1,000
Fluorene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Indeno (1,2,3-cd) pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	0.7	0.7
2-Methylnaphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	500	500
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	100	100
Phenanthrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.0	1,000	100
Pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.0	700	700
QA/QC Surrogate Recovery	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**			

Notes:
VPH is volatile petroleum hydrocarbons.
EPH is extractable petroleum hydrocarbons.
VPH, EPH results and MCP standards reported in milligrams per kilogram (mg/Kg).
MTBE is methyl tert-butyl ether.
Concentrations in **bold** were detected above Method 1 S-1/GW-3 standards.

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Environmental Services

TABLE 8

SUMMARY OF SOIL QUALITY DATA
Dispenser Excavation Area
Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Date	February 24, 2005						MADEP Concentration in Natural Soil	Method 1 Standards	
Sample ID / Sample Depth (feet)	Disp #1 4'	Disp #2 4'	Disp #3 4'	Disp #4 3'	Trench 1-4 5'	Trench 2-3 4'		S-1/GW-2	S-1/GW-3
Headspace (ppmv)	0.0	0.0	0.0	0.0	0.0	0.0	N/A	NA	NA
MA-VPH (mg/Kg)									
C5-C8 Aliphatics	<3.0	6.5	3.6	<3.0	<3.0	<3.0	--	100	100
C9-C12 Aliphatics	<3.0	9.1	7.0	<3.0	<3.0	5.6	--	1,000	1,000
C9-C10 Aromatics	<3.0	<3.0	5.4	<3.0	<3.0	<3.0	--	100	100
Benzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	40	40
Toluene	<0.3	0.7	<0.3	<0.3	<0.3	<0.3	--	500	500
Ethylbenzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	500	500
Xylenes (m,p,o)	<1.2	1.4	<1.2	<1.2	<1.2	<1.2	--	500	500
MTBE	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	--	100	100
Naphthalene	<1	<1	<1	<1	<1	<1	0.5	100	100
MA-EPH (mg/Kg)									
C9-C18 Aliphatics	<10.0	10	60	<10.0	<10.0	<10.0	--	1,000	1,000
C19-C36 Aliphatics	305	76	69	46	<10.0	29	--	2,500	2,500
C11-C22 Aromatics	258	149	42	16	<10.0	12	--	800	800
Acenaphthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	1,000	1,000
Acenaphthylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	100	100
Anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Benzo (a) anthracene	<0.5	**3.2**	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (a) pyrene	<0.5	**3.2**	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (b) fluoranthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.0	0.7	0.7
Benzo (g,h,i) perylene	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Benzo (k) fluoranthene	<0.5	6.3	<0.5	<0.5	<0.5	<0.5	1.0	7	7
Chrysene	<0.5	3.2	<0.5	<0.5	<0.5	<0.5	2.0	7	7
Dibenzo (a,h) anthracene	<0.5	**3.8**	<0.5	<0.5	<0.5	<0.5	0.5	0.7	0.7
Fluoranthene	<0.5	5.1	<0.5	<0.5	<0.5	<0.5	4.0	1,000	1,000
Fluorene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	1,000	1,000
Indeno (1,2,3-cd) pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	0.7	0.7
2-Methylnaphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	500	500
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	100	100
Phenanthrene	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	3.0	1,000	100
Pyrene	<0.5	6.0	<0.5	<0.5	<0.5	<0.5	4.0	700	700
QA/QC Surrogate Recovery	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**			

Notes:
VPH is volatile petroleum hydrocarbons.
EPH is extractable petroleum hydrocarbons.
VPH, EPH results and MCP standards reported in milligrams per kilogram (mg/Kg).
MTBE is methyl tert-butyl ether.
Concentrations in **bold** were detected above Method 1 S-1/GW-3 standards.

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TABLE 9

SUMMARY OF SOIL QUALITY DATA
Exposure Point Concentration
Former Sunoco Station
990 Washington Street
Stoughton, Massachusetts

Date	February 24, 2005								Exposure Point Concentration	Method 1 Standards	
Sample ID Sample Depth (feet)	Disp #1 4'	Disp #2 4'	Disp #3 4'	Disp #4 3'	Trench 1-4 5'	Trench 2-3 4'	WW-1 4'	NW-1 5'		S-1/GW-2	S-1/GW-3
Headspace (ppmv)	0.0	0.0	0.0	0.0	0.0	0.0	36.1	0.0	4.5	NA	NA
MA-VPH (mg/Kg)											
C5-C8 Aliphatics	<3.0	6.5	3.6	<3.0	<3.0	<3.0	<3.0	<3.0	2.4	100	100
C9-C12 Aliphatics	<3.0	9.1	7.0	<3.0	<3.0	5.8	3.5	<3.0	3.9	1,000	1,000
C9-C10 Aromatics	<3.0	<3.0	5.4	<3.0	<3.0	<3.0	<3.0	<3.0	2.0	100	100
Benzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.15	40	40
Toluene	<0.3	0.7	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	500	500
Ethylbenzene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.15	500	500
Xylenes (m,p,o)	<1.2	1.4	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	0.70	500	500
MTBE	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	1.8	<0.3	0.35	100	100
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	100	100
MA-EPH (mg/Kg)											
C9-C18 Aliphatics	<10.0	10	60	<10.0	<10.0	<10.0	<10.0	<10.0	12.5	1,000	1,000
C19-C36 Aliphatics	305	76	69	46	<10.0	29	<10.0	23	69.8	2,500	2,500
C11-C22 Aromatics	258	149	42	16	<10.0	12	<10.0	<10.0	61.5	800	800
Acenaphthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	1,000	1,000
Acenaphthylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	100	100
Anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	1,000	1,000
Benzo (a) anthracene	<0.5	**3.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	0.7	0.7
Benzo (a) pyrene	<0.5	**3.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	0.7	0.7
Benzo (b) fluoranthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	0.7	0.7
Benzo (g,h,i) perylene	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.48	1,000	1,000
Benzo (k) fluoranthene	<0.5	6.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	7	7
Chrysene	<0.5	3.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	7	7
Dibenzo (a,h) anthracene	<0.5	**3.8**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.69	0.7	0.7
Fluoranthene	<0.5	5.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.86	1,000	1,000
Fluorene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	1,000	1,000
Indeno (1,2,3-cd) pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	0.7	0.7
2-Methylnaphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	500	500
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.25	100	100
Phenanthrene	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.42	1,000	100
Pyrene	<0.5	6.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.97	700	700
QA/QC Surrogate Recovery	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**	**Acceptable**			

Notes:
VPH is volatile petroleum hydrocarbons.
EPH is extractable petroleum hydrocarbons.
VPH, EPH results and MCP standards reported in milligrams per kilogram (mg/Kg).
MTBE is methyl tert-butyl ether.
Concentrations in **bold** were detected above Method 1 S-1/GW-3 standards.
EPC - Exposure Point Concentration for is the arithmetic average of samples from 3' to 6' bgs on 2/24/05

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TABLE 10
SUMMARY OF SOIL QUALITY DATA - PRE DISPOSAL SOIL BORINGS
Sunoco Stoughton 990
990 Washington Street
Stoughton, Massachusetts

Date Sample Depth	11/15/2004 B-1 9-11'	11/15/2004 B-2 8-11'	11/15/2004 B-3 6-8'	11/15/2004 B-4 6-8'	11/15/2004 B-5 8-10'	MADEP Concentration in Natural Soil	Reportable Concentration RCS-1	Method 1 Standard S-1/GW-3
PID (ppm)	22.0	67.0	<0.5	<0.5	86.0	N/A	NE	NE
TPH (mg/kg)								
TPH/GRO	<6.6	<7.0	<7.1	<6.5	13.0	NE	100	100
TPH/DRO	26.8	39.3	181	18.0	118	NE	1,000	1,000
RCRA 5 Metals (mg/kg)								
Arsenic	0.97	--	--	--	--	20	30	30
Cadmium	<0.32	--	--	--	--	2	30	30
Chromium	8.06	--	--	--	--	30	1,000	1,000
Lead	10	--	--	--	--	100	300	300
Mercury	<0.32	--	--	--	--	0.3	20	20
Polychlorinated Biphenyls (mg/kg)								
Aroclor 1016	<0.100	--	--	--	--	NE	2	2
Aroclor 1221	<0.200	--	--	--	--	NE	2	2
Aroclor 1232	<0.100	--	--	--	--	NE	2	2
Aroclor 1242	<0.100	--	--	--	--	NE	2	2
Aroclor 1248	<0.100	--	--	--	--	NE	2	2
Aroclor 1254	<0.100	--	--	--	--	NE	2	2
Aroclor 1260	<0.100	--	--	--	--	NE	2	2
Volatile Organic Compounds (mg/kg)								
Toluene	<0.052	<0.056	<0.056	<0.052	0.120	NE	NE	NE
QA/QC Surrogate Recovery	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable			

Notes:
All results and MCP standards reported in milligrams per kilogram (mg/Kg).
NE is not established.
Only VOC's detected above laboratory limits are listed
PID is photoionization detector.
ppm is parts per million.
Analytes detected above RCS-1 concentrations are in bold.
<0.30 = indicates below laboratory detection limit of 0.30mg/kg

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RESPONSE ACTION OUTCOME STATEMENT

CLASS A-1

RTN# 4-22289

GLOBAL FUEL RELEASE
IMMEDIATE RESPONSE ACTION
STOUGHTON, MASSACHUSETTS

Prepared for:

Tim Burbank
Global Remediation Services
700 Richmond Street
East Taunton, Massachusetts 02718

Prepared by:

TETRA TECH EC, INC.

Tetra Tech, EC Inc.
133 Federal Street, 6th Floor
Boston, MA 02110

January 7, 2010

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1
1.1 Responsible Party 1-1
1.2 Description of the Release 1-1
1.3 Description of Surrounding Area 1-3
1.4 Potential Receptors 1-3
1.5 Applicable Cleanup Criteria 1-4
1.6 Class of Response Action Outcome 1-4

2.0 WORK PERFORMED AND FINDINGS 2-1
2.1 Status of Response Actions 2-1
2.2 Details of and/or Plan for management of Remediation Waste, Remediation Water and/or Remediation Monitoring 2-1

3.0 FINDINGS AND CONCLUSIONS 3-1
3.1 Risk Characterization 3-1
3.2 Presumptive Certainty 3-1
3.3 Need for Activity and Use Limitation 3-1
3.4 Feasibility of Reducing Contaminant Levels to Background 3-1
3.5 LSP Opinion 3-1
3.6 Public Notification Activities 3-1

LIST OF FIGURES

Figure 1 Vicinity Map 1-2
Figure 2 Site Location Map 1-5
Figure 3 MADEP Priority Resource Map 1-6

APPENDICES

Appendix A Notice of Responsibility

Appendix B Photographic Documentation

Appendix C Waste Disposal Bill of Lading

Appendix D Public Notification Letters

1.0 INTRODUCTION

This Response Action Outcome (RAO) Statement has been prepared by Tetra Tech EC, Inc. (TtEC) for Global Remediation Services, Inc (Global) in response to the Notice of Responsibility (NOR), dated December 2, 2009, issued by the Massachusetts Department of Environmental Protection (MADEP) for the release occurring along approximately a one mile portion of Canton Street in Stoughton, Massachusetts (hereinafter referred to as "the Site" Figure 1). On November 13, 2009, at 3:24 PM, Global notified the MADEP of a release to the environment at this site involving diesel fuel. An unknown quantity of diesel fuel was release to a paved surface due to a mechanical failure within the engine compartment of a Global vehicle. The volume of the release was likely greater than 10 gallons and therefore met the 2-hour notification requirements. A copy of the NOR has been included with this document in Appendix A.

1.1 Responsible Party

The responsible party for this release is:

Global Remediation Services, Inc
700 Richmond St
E. Taunton, MA 02718
Attn: Tim Burbank

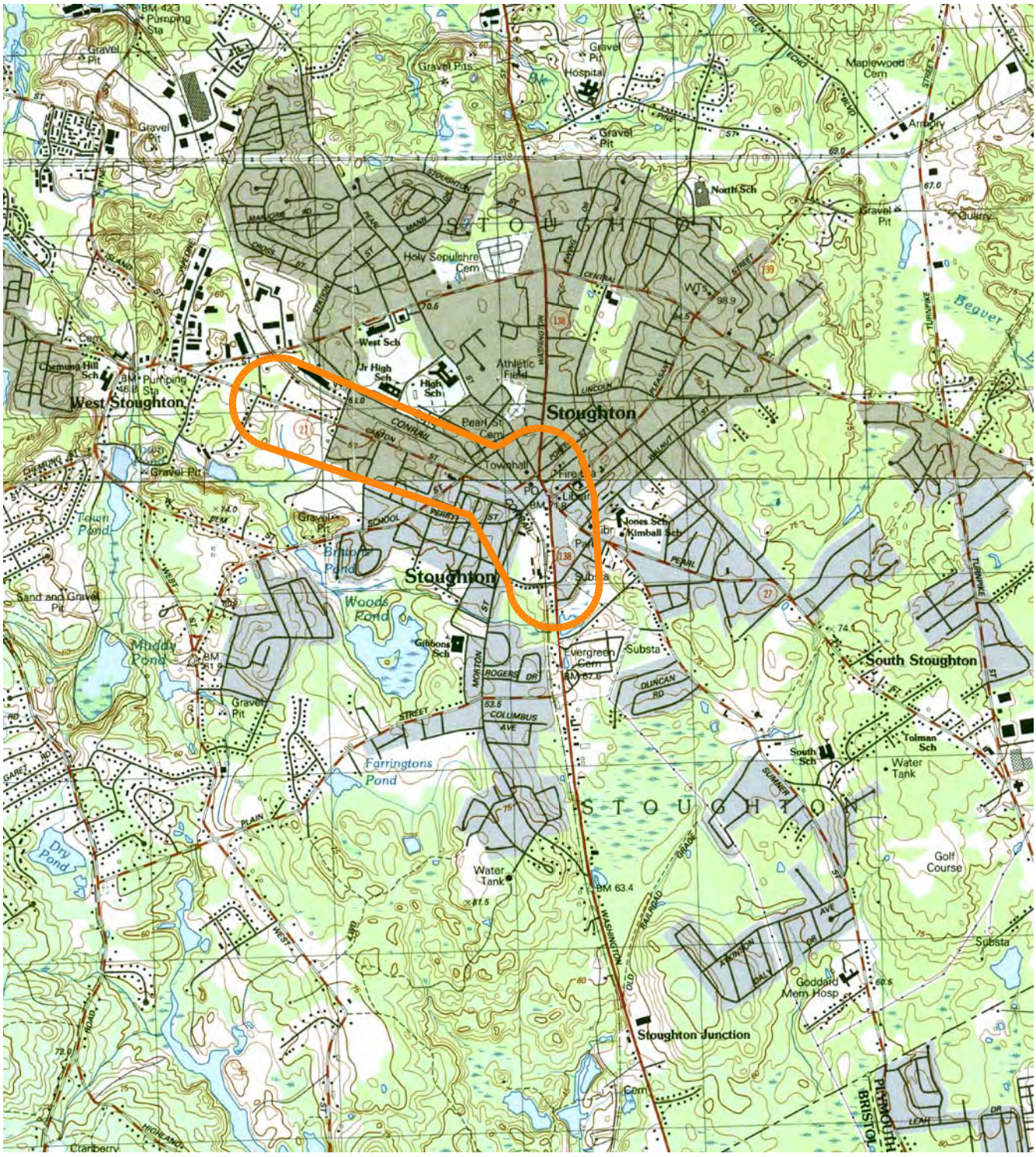
The Licensed Site Professional (LSP) of record is:

Lawrence E. Kahrs, LSP #2890
Tetra Tech EC, Inc
133 Federal Street, 6th Floor
Boston, MA 02110

1.2 Description of the Release

The notification and NOR involved release of diesel fuel from a mechanical failure within the engine compartment of a Global vehicle at approximately 3:00 PM on November 13, 2009. The Global vehicle was transporting non-hazardous water to the United Industrial Services facility located at 441 R Canton Street in Stoughton, Massachusetts. Upon entering the access road to the facility, the driver of the vehicle noticed diesel fuel leaking from the engine compartment. The driver immediately turned off the vehicle and used the on-board spill kit on truck to respond to the release. A five-gallon plastic bucket was used to capture any fuel dripping from the engine compartment and absorbent pads were used to absorb fuel on the roadway. It was also at this time the driver noticed fuel stain on the road surface leading from Canton Street into the United Industrial Services facility. The Stoughton Police Department also responded at this time.

The MADEP was verbally notified at 3:24 PM and response activities were initially conducted by the Stoughton Department of Public Works. The Stoughton DPW applied adsorbent material (sand) to the roadway to mitigate the release. Estimated volume of diesel fuel released is approximately 10 to 25 gallons based on interviews with Global staff and observations of the stained area on the pavement. Global personnel also reviewed the truck's route and determined that evidence of the release had originated near the intersection of Washington Street and Porter Street and extended along Canton Street and into the entrance to the United Industrial Services facility.



TETRA TECH ECI

FIGURE - 1
GLOBAL FUEL RELEASE - STOUGHTON, MA
IMMEDIATE RESPONSE ACTION
VICINITY MAP

FIGURE 1

Source: GOOGLE EARTH

Colantuoni Brothers assisted Global and continued response activities by using a street sweeper to recover the fuel contaminated sand. Two 55 gallon drums of fuel contaminated soil were recovered and later sent to General Chemical Corporation for disposal on December 11, 2009.

Mr. Lawrence E. Kahrs, LSP-of-Record visited the Site at approximately 12:00 PM on November 19, 2009. Mr. Kahrs met with Tim Burbank of Global to review the circumstances of the release and drive the portions of Washington and Canton Streets that were impacted. Mr. Kahrs did not observe any visual evidence of staining on the roadway or impact to the environment at this time.

1.3 Description of Surrounding Area

The area of the release is on the northbound side of RT 27 to the southbound side of Porter Street and continues on the westbound side of Canton Street ending at Mea Terrace (441 R Canton Street, at the United Industrial Services facility). Figure 2 shows the location of the Site and surrounding area. The size of the affected area was estimated to be 0.91miles in length by 6 inches wide. The release was limited to only the traveled way of the Global vehicle and no migration of fuel to the storm sewer system or other utilities was observed.

1.4 Potential Receptors

The Site is a paved surface used exclusively for vehicular traffic. As described above no migration from the roadway to groundwater, storm water or soil occurred during the release or response effort. Stormwater catch basins along the impacted roadway were visually inspected and no migration into these structures was observed. Figure 3 shows the MADEP Priority Resources in the vicinity.

The Site is not located within an existing or potential drinking water source area. The area around the site is serviced by a public water supply and therefore it is assumed that there are no private wells located with in the area of release. For these reasons, category GW-1 does not apply.

There are buildings present within 30 feet of the Site. Therefore, category GW-2 does apply per 310 CMR 40.0932(6) if the ground water depth is 15 ft or less from the spill. The Site is classified as GW-3 due to the potential discharge to surface water.

Receptor Characteristics for the site indicate that the soil is considered potentially accessible due to the paved surface. For this reason and due to the absence of children at the site, category S-1 does not apply. Additionally the only potential human exposure would be to construction workers yielding a low frequency/low intensity adult presence on the site. Therefore soil category S-2 does not apply but category S-3 would be applicable to this release.

An Imminent Hazard evaluation was conducted in accordance with 310 CMR 40.0426 and 40.0950. This evaluation consisted of an assessment of the Site's potential to pose a threat to human health, the environment, safety and public welfare. Based on the quantity of fuel released to the environment, limits of the impacted roadway and the lack of migration observed due to the spill, at no time did this Site present an Imminent Hazard.

Conditions that met the definition of a Substantial Release Migration (SRM) were also assessed, as defined under 310 CMR 40.0413. Based upon the observations summarized above, SRM did not occur at this Site.

Critical Exposure Pathways (CEPs) were also evaluated, as defined under 310 CMR 40.0006. No buildings are present at the site that would allow the migration of vapor-phase emissions or the ingestion, dermal absorption or inhalation of contaminants by human receptors.

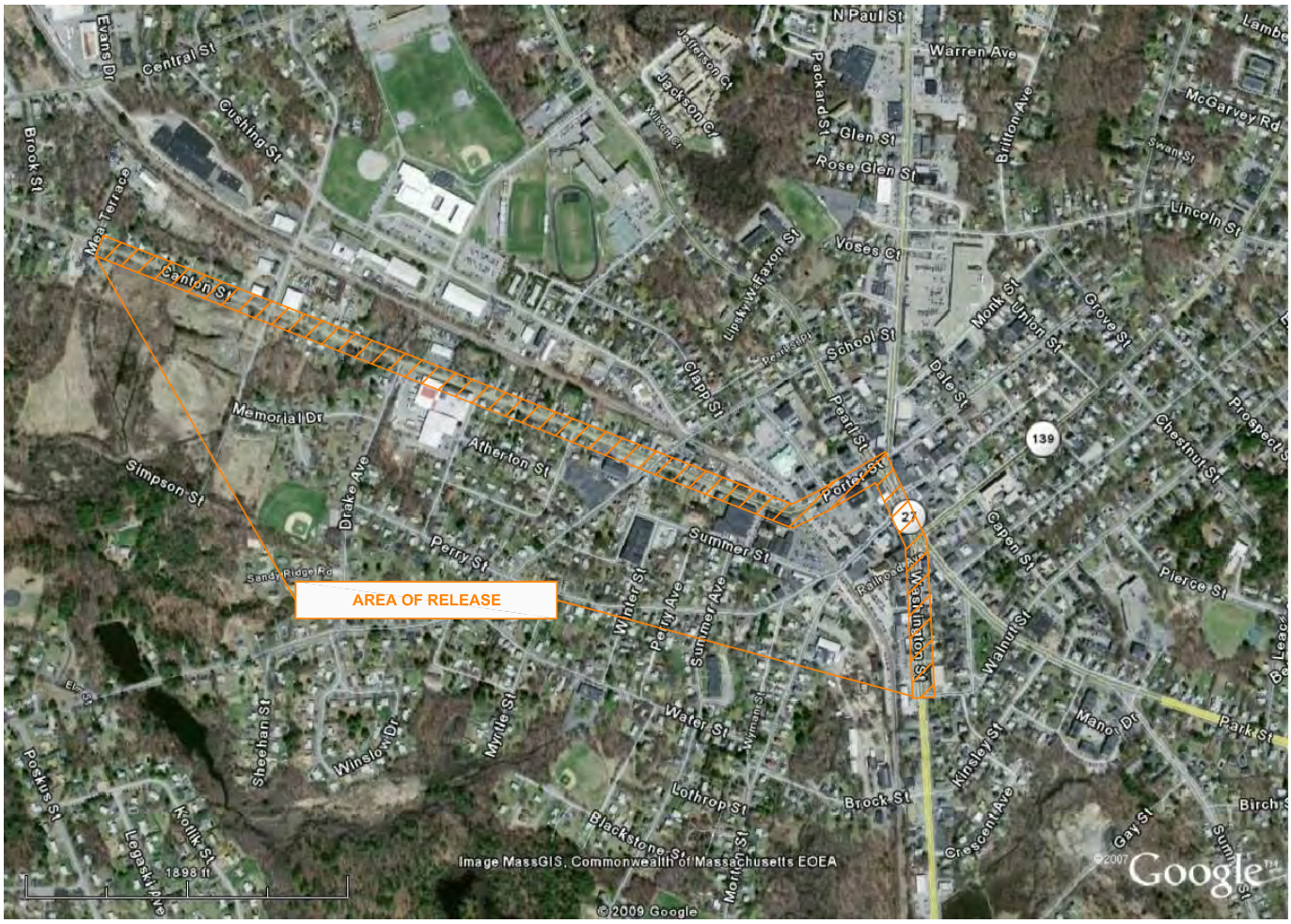
1.5 Applicable Cleanup Criteria

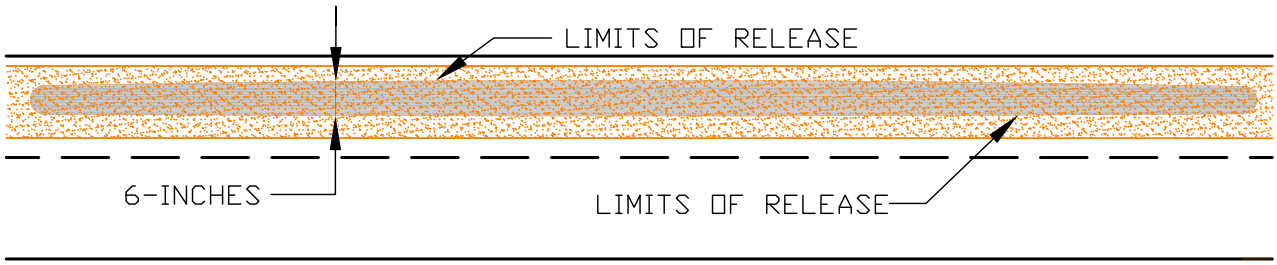
Based upon the information presented above, the applicable cleanup criteria for the Site with S-2/ GW-2&3 has been demonstrated in accordance to regulations imposed by 310 CMR 40.0901(3). Clean up to background levels for the release of a sudden spill confined to the pavement in which the release did not reach soil, groundwater or surface water has been attained with out laboratory data. Demonstration of this has been conducted by means of visual observations, knowledge of the release and a clean up in which the Site has achieved levels of background.

1.6 Class of Response Action Outcome

This RAO Statement presents the data and documentation required to support a Class A-1 RAO for the Site, pursuant to 310 CMR 40.0901(3). A Permanent Solution has been achieved for the Site and no Activity and Use Limitations or on-going remedial operations are necessary. Visual observations, the extents of the release and the cleanup of OHM from pavement have resulted in an achievement of background levels. A description of the response actions conducted at Site can be found in the following sections of this RAO Statement.

This RAO Statement was submitted within 120 days of the date of release and based upon the information presented above, the submission of the RAO fee is waived, per the NOR.





NOTES:

The affected area was estimated to be 0.91miles in length by 6 inches wide. The release was limited to only the traveled way of the Global vehicle and no migration of fuel to thestorm sewer system or other utilities was observed.

SPILL AREA DETAIL

NTS

LEGEND

SPILL AREA

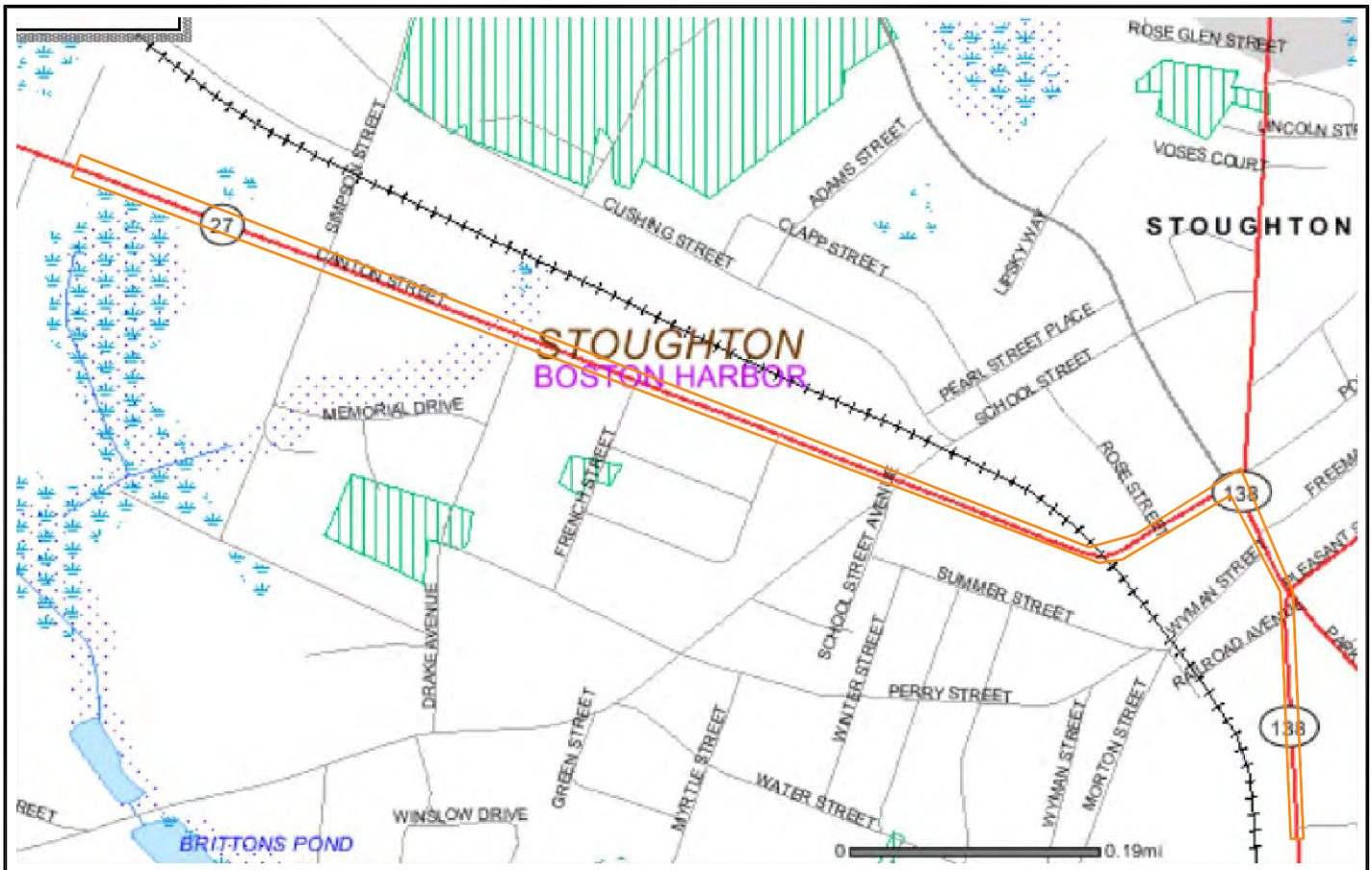
SAND AREA

TETRA TECH ECI

FIGURE - 2
GLOBAL FUEL RELEASE - STOUGHTON, MA
IMMEDIATE RESPONSE ACTION
SITE LOCATION MAP

FIGURE 2

Source: GOOGLE EARTH



DEP MCP 21e Map Legend

- Zone IIs
- IWPAs
- Zone A
- Sole Source Aquifers
- Solid Waste Landfill
- Protected Openspace
- ACECs
- NHESP Estimated Habitat of Rare Wildlife in Wetland Areas
- Certified Vernal Pools 2003 NHESP
- Subbasins
- Mass Major Basins
- DEP Region
- Town Arcs
- County Boundaries

Aquifers, By Yield
- HIGH YIELD
- MEDIUM YIELD

Non Potential Drinking Water Source Area
- HIGH YIELD
- MEDIUM YIELD

FEMA Floodplains
- 100 YEAR FLOODPLAIN

Hydrography
- WATER
- RESERVOIR
- WETLANDS
- SALT WATER WETLANDS
- FLATS,SHOALS

Rivers and Streams
- PERENNIAL
- INTERMITTENT
- SHORELINE
- MAN MADE SHORE
- DAM
- AQUEDUCT

EOT-OTP Roads
- LIMITED ACCESS HIGHWAY
- MULTI LANE HWY, NOT LIMITED ACCESS
- OTHER NUMBERED HWY
- MAJOR ROAD - COLLECTOR
- MINOR STREET OR ROAD, RAMP

Tracks and Trails MHD
- TRACK
- TRAIL

Transmission Lines
- PIPELINE
- POWERLINE
- TRAIN

MASS GIS

TETRA TECH ECI	**FIGURE - 3** **GLOBAL FUEL RELEASE - STOUGHTON, MA** **IMMEDIATE RESPONSE ACTION** **MADEP PRIORTIY RESOURCE MAP**	**FIGURE 3**

Source: MASDEP.GOV

2.0 WORK PERFORMED AND FINDINGS

This portion of the RAO Statement provides the work performed since the original release on November 24, 2009, the findings and a schedule for any remaining tasks.

2.1 Status of Response Actions

Response actions consisting of containment of the leaking engine component and recovery of free product were conducted immediately following the release. This section of the report describes additional response actions conducted at the site. A detailed description of the actions performed to date is as follows:

Initial Response – Immediately after the release occurred, Global initiated response actions using the on-board spill kit on the leaking vehicle. Within two hours of the original release, the Town of Stoughton DPW mobilized and applied a layer of sand to the pavement to mitigate the impact of the spill. Photographic documentation of the response actions conducted at the site has been included in Appendix B.

Site Restoration – Following the mitigation of the release with sand to adsorb the fuel, Colantuoni Brothers used a street sweeper to collect the product from the asphalt roadway. The diesel fuel contaminated sand was placed into two 55 gallon barrels and taken off site prior to disposal.

Disposal of Remediation Waste – Tetra Tech EC arranged disposal of the diesel fuel contaminated soil at General Chemical Corporation of Framingham MA for recycling on December 11, 2009. Absorbent pads used during the initial response activities by Global were bulked with other oily waste for disposal.

Sampling – The observed spill was confined to a paved surface and did not reach soil, surface water or groundwater. After visual observations of the site during remedial efforts and upon completion Global attained applicable cleanup levels without the need of laboratory data. Photographic data of the spill clean up can be found in Appendix B.

2.2 Details of and/or Plan for management of Remediation Waste, Remediation Water and/or Remediation Monitoring

As described above, all remaining remediation waste was removed from the site between November 13 and December 11, 2009. Copies of the disposal documentation and Bill of Ladings for the contaminated soil have been included in Appendix C. No remediation monitoring is proposed for the Site. A summary of the waste removal is tabulated below. Final disposal documentation from General Chemical Corporation is included in Appendix D.

Remediation Waste Summary

Remediation Waste Stream	Date of Removal	Quantity	Units	Disposal Facility
Fuel-soaked Sand	12/11/2009	2	55-Gallon Drums	General Chemical Corp. 138 Leland Street Framingham, MA

3.0 FINDINGS AND CONCLUSIONS

3.1 Risk Characterization

Non applicable under 310 CMR 40.0901(3).

3.2 Presumptive Certainty

All activities were conducted in accordance with industry standards and generally accepted principles, as they apply to environmental assessment and remediation. Diesel fuel was removed from the ground surface using absorbent sand. No further evidence of free product was observed at the Site after this was accomplished. No groundwater, soil or surface water was impacted at any time during the response activities.

3.3 Need for Activity and Use Limitation

The Site meets the requirements for a Class A-1 RAO in which OHM was released onto a paved surface and has been cleaned to background levels under 310 CMR 40.0901(3) and no need for further activity is necessary.

3.4 Feasibility of Reducing Contaminant Levels to Background

This evaluation concluded that the Disposal Site has achieved background levels in the pavement in which the spill occurred.

3.5 LSP Opinion

This RAO has been prepared in accordance with 310 CMR 40.0973(7) and the LSP of Record has determined that a condition of No Significant Risk exists at this site. This determination is based upon the elimination of the source, photographic documentation and a visual observation of the site following the response.

The seal and signature of Larry Kahrs, LSP-of-Record, can be found on the BWSC-104 Form that accompanies this RAO statement.

3.6 Public Notification Activities

Notification letters were provided to the Town of Stoughton Selectmen’s Office in accordance with 310 CMR 40.1403(3)(f). Copies of these notification letters have been included in Appendix D.

APPENDIX A

NOTICE OF RESPONSIBILITY

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE
20 RIVERSIDE DRIVE, LAKEVILLE, MA 02347 508-946-2700

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

December 2, 2009

Global Remediation Services, Inc.
Mr. Tim Burbank
1 Westinghouse Plaza
Suite 4001
Hyde Park, Massachusetts 02137

RE:STOUGHTON - BWSC
Release Tracking Number: **4-22289**
Canton Street - Stoughton Center
NOTICE OF RESPONSIBILITY

URGENT LEGAL MATTER: PROMPT ACTION NECESSARY

Dear Mr. Tim Burbank:

On November 13, 2009 at 3:24 pm the Department of Environmental Protection ("MassDEP") received oral notification of a release and/or threat of release of oil and/or hazardous material at the above referenced property which requires one or more response actions. An unknown quantity of diesel fuel likely greater than 10 gallons was released along approximately a one mile stretch of Canton Street due to a mechanical failure within the engine compartment of a Global Remediation Services, Inc. vehicle. Stoughton Department of Public Works responded to the release and applied sand to the roadway mitigate the release.

The Massachusetts Oil and Hazardous Material Release Prevention and Response Act, M.G.L. c.21E, and the Massachusetts Contingency Plan (the "MCP"), 310 CMR 40.0000, require the performance of response actions to prevent harm to health, safety, public welfare and the environment which may result from this release and/or threat of release and govern the conduct of such actions. The purpose of this notice is to inform you of your legal responsibilities under State law for assessing and/or remediating the release at this property. For purposes of this Notice of Responsibility, the terms and phrases used herein shall have the meaning ascribed to such terms and phrases by the MCP unless the context clearly indicates otherwise.

MassDEP has reason to believe that the release and/or threat of release which has been reported is or may be a disposal site as defined by the M.C.P. MassDEP also has reason to believe that you (as used in this letter, "you" refers to Global Remediation Services, Inc.) are a Potentially Responsible Party (a "PRP") with liability under M.G.L. c.21E §5, for response action costs. This liability is "strict", meaning that it is not based on fault, but solely on your status as owner, operator, generator, transporter, disposer or other person specified in M.G.L. c.21E §5. This liability is also "joint and several", meaning that you may be liable for all response action costs incurred at a disposal site regardless of the existence of any other liable parties.

MassDEP encourages parties with liabilities under M.G.L. c.21E to take prompt and appropriate actions in response to releases and threats of release of oil and/or hazardous materials. By taking prompt action, you may significantly lower your assessment and cleanup costs and/or avoid liability for costs incurred by MassDEP in taking such actions. You may also avoid the imposition of, the amount of or reduce certain permit and/or annual compliance assurance fees payable under 310 CMR 4.00. Please refer to M.G.L. c.21E for a complete description of potential liability. For your convenience, a summary of liability under M.G.L. c.21E is attached to this notice.

You should be aware that you may have claims against third parties for damages, including claims for contribution or reimbursement for the costs of cleanup. Such claims do not exist indefinitely but are governed by laws which establish the time allowed for bringing litigation. MassDEP encourages you to take any action necessary to protect any such claims you may have against third parties.

At the time of oral notification to MassDEP, the following response actions were approved as an Immediate Response Action (IRA):

- Continued assessment.
- Deployment of absorbent/containment materials.
- All Remediation Waste must be properly stored/handled and disposed of within 120 days from the date of generation per 310 CMR 40.0030.

ACTIONS REQUIRED

Additional submittals are necessary with regard to this notification including, but not limited to, the filing of a written IRA Plan, IRA Completion Statement and/or a Response Action Outcome (RAO) statement. **The MCP requires that a fee of $1,200 be submitted to MassDEP when an RAO statement is filed greater than 120 days from the date of initial notification.** Specific approval is required from MassDEP for the implementation of all Immediate Response Actions (IRAs) pursuant to 310 CMR 40.0420. Release Abatement Measures may not be conducted until a RAM Plan is submitted pursuant to 310 CMR 40.0443. Assessment activities, the construction of a fence and/or the posting of signs are actions that are exempt from this approval requirement.

In addition to oral notification, 310 CMR 40.0333 requires that a completed Release Notification Form (BWSC-103, attached) be submitted to MassDEP within sixty (60) calendar days of **November 13, 2009**.

You must employ or engage a Licensed Site Professional (LSP) to manage, supervise or actually perform the necessary response actions at this site. You may obtain a list of the names and addresses of these licensed professionals from the Board of Registration of Hazardous Waste Site Cleanup Professionals by calling (617) 556-1091 or visiting http://www.state.ma.us/lsp. MassDEP has Mr. Larry Kahrs of Foster Wheeler Environmental as the LSP of record for this release.

Unless otherwise provided by MassDEP, potentially responsible parties ("PRP's") have one year from the initial date of notification to MassDEP of a release or threat of a release, pursuant to 310 CMR 40.0300, or from the date MassDEP issues a Notice of Responsibility, whichever occurs earlier, to file with MassDEP one of the following submittals: (1) a completed Tier Classification Submittal; (2) an RAO Statement or, if applicable, (3) a Downgradient Property Status. The deadline for either of the first two

submittals for this disposal site is **November 13, 2010**. If required by the MCP, a completed Tier I Permit Application must also accompany a Tier Classification Submittal.

This site shall not be deemed to have had all the necessary and required response actions taken unless and until all substantial hazards presented by the release and/or threat of release have been eliminated and a level of No Significant Risk exists or has been achieved in compliance with M.G.L. c.21E and the MCP.

If you have any questions relative to this Notice, please contact Jaime Goncalves at the letterhead address or at (508) 946-2773. All future communications regarding this release must reference the following Release Tracking Number: **4-22289**.

Sincerely,

Daniel Crafton, Acting Chief
Emergency Response / Release
Notification Section
Bureau of Waste Site Cleanup

C/JG/re
\\dep-fp-lak-001\Home$\JGoncalves\SERO ER\4-0022289.NOR.12-2-2009.doc

Enclosures: Release Notification Form; BWSC-103 and Instructions
Summary of Liability under M.G.L. c.21E

ec: Board of Health
sgabriel@stoughton-ma.gov

Board of Selectmen
mstankiewicz@stoughton-ma.gov

Fire Dept
sfdscott@gmail.com

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Non-impacted Catchbasin

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Release at intersection of RT 27 and RT 138

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Release Area

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Release Vehicle

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Staining at entrance to United Idustrial Services

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Non-impacted Catchbasin

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

DATE: 11/14/09 **TIME:** **LOCATION:** STOUGHTON MA

COMMENT: Area of Release

Appendix D
Relevant Municipal Documents

This page intentionally left blank.

054	401	0	1 of 1	INDUSTRIAL	TOTAL ASSESSED: 201,900
MAP	LOT	BLOCK	CARD		!5732!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
48		WYMAN ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	QUALITY AUTO PARTS OF STOUGHTO
Owner 2:	C/O C H BECKFORD
Owner 3:	
Street 1:	6 PARKHURST DRIVE
Street 2:	
Twn/City:	LAKEVILLE
St/Prov:	MA
Cntry	
Own Occ:	Y
Postal:	02347
Type:	

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Twn/City:	
St/Prov:	
Cntry	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains .11 Acres of land mainly classified as COM WHS with a(n) WAREHOUSE Building Built about 1960, Having Primarily CORREG STL Exterior and MEMBRANE Roof Cover, with 1 Units, 0 Baths, 2 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
316	97,600		0.110	104,300	201,900	763864.414320807_2870313.83136679
Total Card	97,600		0.110	104,300	201,900	
Total Parcel	97,600		0.110	104,300	201,900	

Source: Market Adj Cost | Total Value per SQ unit /Card: 43.79 | /Parcel: 43.79

User Acct
054 401
GIS Ref
GIS Ref
Insp Date
07/31/08

Entered Lot Size

Total Land: 0.11019

Land Unit Type: A

PREVIOUS ASSESSMENT

Parcel ID: 054 401 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	316	FV	97,600	0	.11	104,300	201,900	201,900		10/26/2011
2011	316	FV	97,600	0	.11	117,400	215,000	215,000	Year End	9/8/2010
2010	316	FV	108,400	0	.11	97,500	205,900	205,900		10/6/2009
2009	316	FV	108,400	0	.11	97,500	205,900	205,900		9/19/2008
2008	316	FV	108,400	0	.11	97,500	205,900	205,900	Year End	10/1/2007
2007	316	FV	99,600	0	.11	57,600	157,200	157,200	YEAR END	9/22/2006
2006	316	FV	99,600	0	.11	57,600	157,200	157,200	YEAR END ROLL	9/20/2005
2005	316	FV	99,600	0	.11	57,600	157,200	157,200	YEAR END ROLL	9/13/2004

SALES INFORMATION

TAX DISTRICT

PAT ACCT. 5732

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
QUALITY AUTO PA	4924-201		4/2/1973		0	No	No			

PRINT

Date	Time
04/25/12	12:44:36

LAST REV

Date	Time
05/04/10	11:42:48
apro	

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	285
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
7/31/2008	MEASURED	517	M.CONNORS
6/20/2001	FIELDREV CHG	201	SCOTT MC
9/11/1997	MEAS&INSPCTD	511	JS
4/10/1981	CONVERSION	999	CONVERSION

Sign: VERIFICATION OF VISIT NOT DATE __/__/__

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	CBD	CEN BUS DI	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
316	COM WHS		4800		Sq Feet	SITE	1.0	0	8.	2.717	CA			EASMNT	-10		0		0	104,328		0				104,300	

Total AC/HA:	0.11019	Total SF/SM:	4799.88	Parcel LUC:	316	COM WHS	Prime NB Desc	COMM AVG

Total:	104,328	Spl Credit		Total:	104,300

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: FY2012

apro

2012

EXTERIOR INFORMATION

Type:	43 - WAREHOUSE		
Sty Ht:	1 - 1 STORY		
(Liv) Units:	1	Total:	1
Foundation:	6 - SLAB		
Frame:	2 - STEEL		
Prime Wall:	18 - CORREG STL		
Sec Wall:	8 - BRICK VEN	25	%
Roof Struct:	4 - FLAT		
Roof Cover:	11 - MEMBRANE		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	C - AVERAGE		
Year Blt:	1960	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	16		
Prim Int Wal	5 - MINIMUM		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	14 - ASPHL TILE		
Sec Floors:	12 - CONCRET	50	%
Bsmnt Flr:			
Bsmnt Gar:			
Electric:	5 - MINIMAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	1 - OIL		
Heat Type:	1 - FORCED H/A		
# Heat Sys:	1		
% Heated:	100	% AC:	0
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	2	Rating:	AVERAGE
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	
Name:	

DEPRECIATION

Phys Cond:	FR - Fair	46.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	46.8	%

CALC SUMMARY

Basic $ / SQ:	36.00
Size Adj.:	1.25000000
Const Adj.:	0.85968882
Adj $ / SQ:	38.686
Other Features:	5000
Grade Factor:	1.00
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	183381
Depreciation:	85822
Depreciated Total:	97559

COMMENTS

FORMERLY NAPA AUTO PARTS VACANT/FOR SALE 5/98,ASKING $139,900 VACANT.

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units	

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	2

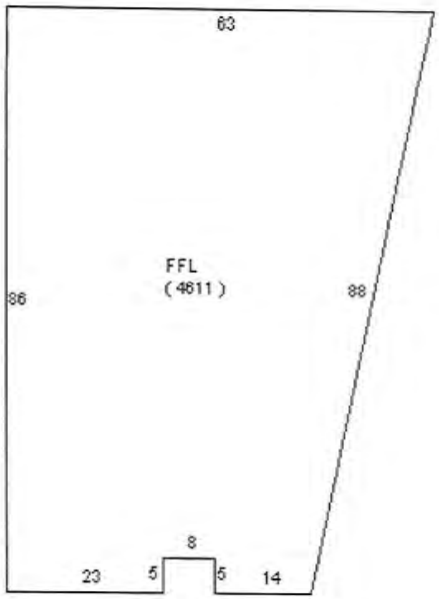
REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

SKETCH



COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:		Ind.Val	

Juris. Factor:		Val/Su Fin:	21.17
Special Features:	0	Val/Su Net:	21.17
Final Total:	97600	Val/Su SzAd	21.17

SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	4,611	38.690	178,381

Net Sketched Area:	4,611	Total:	178,381

Size Ad	4611	Gross Area	4611	FinArea	4611

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:		Total:	

PARCEL ID 054 401 0

IMAGE

AssessPro Patriot Properties, Inc

054	407	0	1 of 1	VACANT	TOTAL ASSESSED: **52,600**
MAP	LOT	BLOCK	CARD		!5736!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
		MORTON ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	GOUVEIA NELSON E & KENNETH
Owner 2:	HOBSON EILEEN
Owner 3:	
Street 1:	17 MORTON SQUARE
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Own Occ:	Y
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	GOUVEIA ISABEL -
Owner 2:	-
Street 1:	17 MORTON SQUARE
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Postal:	02072

NARRATIVE DESCRIPTION

This Parcel contains .2 Acres of land mainly classified as POTENTL

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
131			0.200	52,600	52,600	763905.88356173_2870003.03202587
Total Card			0.200	52,600	52,600	
Total Parcel			0.200	52,600	52,600	

Source: Market Adj Cost | Total Value per SQ unit /Card: N/A | /Parcel: N/A

Entered Lot Size	
Total Land:	0.2006
Land Unit Type:	A

User Acct	054 407
GIS Ref	
GIS Ref	
Insp Date	06/21/01

Patriot Properties Inc.

PREVIOUS ASSESSMENT

Parcel ID: 054 407 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	131	FV		0	.2	52,600	52,600	52,600		10/26/2011
2011	131	FV		0	.2	58,600	58,600	58,600	Year End	9/8/2010
2010	131	FV		0	.2	60,600	60,600	60,600		10/6/2009
2009	131	FV		0	.2	67,500	67,500	67,500		9/19/2008
2008	131	FV		0	.2	71,500	71,500	71,500	Year End	10/1/2007
2007	130	FV		0	.2	102,600	102,600	102,600	YEAR END	9/22/2006
2006	130	FV		0	.2	99,300	99,300	99,300	YEAR END ROLL	9/20/2005
2005	130	FV		0	.2	90,100	90,100	90,100	YEAR END ROLL	9/13/2004

SALES INFORMATION

TAX DISTRICT:

PAT ACCT.: 5736

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
GOUVEIA ISABEL,	26597-496		4/30/2009	ESTATE/DIVOR	1	No	No			
GOUVEIA ISABEL	4243-559		6/15/1965		0	No	No			

PRINT

Date	Time
04/25/12	12:45:04

LAST REV

Date	Time
05/18/09	13:07:51
Therese	

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	290
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
8/4/2008	VACANT LOT	517	M.CONNORS
6/21/2001	FIELDREV CHG	201	SCOTT MC
3/13/1981	CONVERSION	999	CONVERSION

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	I	INDUST	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
131	POTENTL		8720		Sq Feet	SITE	1.0	0	2.65	2.278	4			NONCON	-40				0	52,642	0					52,600	

Total AC/HA:	0.20018	Total SF/SM:	8719.84	Parcel LUC:	131	POTENTL	Prime NB Desc: 4

Total:	52,642	Spl Credit		Total:	52,600

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: FY2012

EXTERIOR INFORMATION

Type:	93 - VACNT LAND
Sty Ht:	
(Liv) Units:	Total: 0
Foundation:	
Frame:	
Prime Wall:	
Sec Wall:	%
Roof Struct:	
Roof Cover:	
Color:	
View / Desir:	

GENERAL INFORMATION

Grade:	
Year Blt:	Eff Yr Blt:
Alt LUC:	Alt %:
Jurisdict:	Fact:
Const Mod:	
Lump Sum Adj:	

INTERIOR INFORMATION

Avg Ht/FL:	
Prim Int Wal	
Sec Int Wall:	%
Partition:	
Prim Floors:	
Sec Floors:	%
Bsmnt Flr:	
Bsmnt Gar:	0
Electric:	
Insulation:	
Int vs Ext:	
Heat Fuel:	
Heat Type:	
# Heat Sys:	0
% Heated:	0 — % AC: 0
Solar HW:	NO — Central Vac: NO
% Com Wal	% Sprinkled

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:		Rating:	
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	0.000000000
Name:	

DEPRECIATION

Phys Cond:		0.0	%
Functional:			%
Economic:			%
Special:	OT - OTHER		%
Override:			%
	Total:	0	%

CALC SUMMARY

Basic $ / SQ:	
Size Adj.:	1.00000000
Const Adj.:	1.00000000
Adj $ / SQ:	
Other Features:	0
Grade Factor:	
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	0
Depreciation:	0
Depreciated Total:	0

COMMENTS

SIDE LOT TO A HOUSE.

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units	

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB

REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

SKETCH

COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:	Ind.Val
Juris. Factor:		Val/Su Fin:	
Special Features:	0	Val/Su Net:	
Final Total:	0	Val/Su SzAd	

SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value

Net Sketched Area:		Total:	
Size Ad		Gross Area	FinArea

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

IMAGE

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:		Total:	

PARCEL ID 054 407 0

AssessPro Patriot Properties, Inc

054	406	0	1 of 1	COMMERCIAL	TOTAL ASSESSED: 169,300
MAP	LOT	BLOCK	CARD		!5735!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
		MORTON SQ, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	MURPHY COAL CO INC
Owner 2:	
Owner 3:	
Street 1:	P O BOX 25- 765 WASHINGTON ST
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry	
Own Occ:	N
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Twn/City:	
St/Prov:	
Cntry	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 1.9 Acres of land mainly classified as AUTOREP with a(n) REPAIR GAR Building Built about 1950, Having Primarily ALUMINUM Exterior and METAL Roof Cover, with 1 Units, 0 Baths, 1 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
332	57,200		1.900	112,100	169,300	763896.823876774_2869774.09617385
Total Card	57,200		1.900	112,100	169,300	
Total Parcel	57,200		1.900	112,100	169,300	

Source: Market Adj Cost | Total Value per SQ unit /Card: 43.41 | /Parcel: 43.41

User Acct	
	054_406
GIS Ref	
GIS Ref	
Insp Date	
	08/04/08
Entered Lot Size	
Total Land:	2.02
Land Unit Type:	A

Patriot Properties Inc.

PREVIOUS ASSESSMENT

Parcel ID: 054 406 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	332	FV	57,200	0	1.9	112,100	169,300	169,300		10/26/2011
2011	332	FV	57,200	0	1.9	131,700	188,900	188,900	Year End	9/8/2010
2010	332	FV	68,100	0	1.9	143,800	211,900	211,900		10/6/2009
2009	332	FV	68,100	0	1.9	143,800	211,900	211,900		9/19/2008
2008	332	FV	68,100	0	1.9	143,800	211,900	211,900	Year End	10/1/2007
2007	332	FV	60,100	0	1.9	143,800	203,900	203,900	YEAR END	9/22/2006
2006	332	FV	60,100	0	1.9	143,800	203,900	203,900	YEAR END ROLL	9/20/2005
2005	332	FV	60,100	0	1.9	143,800	203,900	203,900	YEAR END ROLL	9/13/2004

SALES INFORMATION

TAX DISTRICT

PAT ACCT. 5735

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
MURPHY COAL CO	1510-283		6/15/1922		0	No	No			

PRINT

Date	Time
04/25/12	12:45:31

LAST REV

Date	Time
05/05/11	09:45:51
apro	

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	288
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
8/4/2008	INSPECTED	517	M.CONNORS
6/21/2001	FIELDREV CHG	201	SCOTT MC
9/19/1997	MEAS&INSPCTD	511	JS
4/16/1981	CONVERSION	999	CONVERSION

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	I	INDUST	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
332	AUTOREP		43560		Sq Feet	SITE	1.0	0	2.5	0.750	IF			ACCESS	-25				0	81,675		0				81,700	
332	AUTOREP		0.9		Acres	EXCESS	1.0	0	45,000.	0.750	IF			ACCESS	-25		0		0	30,375		0				30,400	

Total AC/HA:	1.90000	Total SF/SM:	82764.00	Parcel LUC:	332	AUTOREP	Prime NB Desc	IND FAIR

Total:	112,050	Spl Credit		Total:	112,100

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: FY2012

EXTERIOR INFORMATION

Type:	39 - REPAIR GAR		
Sty Ht:	1 - 1 STORY		
(Liv) Units:	1	Total:	1
Foundation:	6 - SLAB		
Frame:	2 - STEEL		
Prime Wall:	3 - ALUMINUM		
Sec Wall:	1 - WOOD SHI	50	%
Roof Struct:	7 - SHED		
Roof Cover:	9 - METAL		
Color:	GREEN		
View / Desir:			

GENERAL INFORMATION

Grade:	D - FAIR		
Year Blt:	1950	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	18		
Prim Int Wal	5 - MINIMUM		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	12 - CONCRETE		
Sec Floors:			%
Bsmnt Flr:			
Bsmnt Gar:			
Electric:	5 - MINIMAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	2 - GAS		
Heat Type:	7 - UNIT HTRS		
# Heat Sys:	1		
% Heated:	100	% AC:	0
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	1	Rating:	FAIR
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	0.000000000
Name:	

DEPRECIATION

Phys Cond:	FR - Fair	46.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	46.8	%

CALC SUMMARY

Basic $ / SQ:	42.00
Size Adj.:	1.07051277
Const Adj.:	0.86318988
Adj $ / SQ:	38.810
Other Features:	2250
Grade Factor:	0.70
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	107527
Depreciation:	50323
Depreciated Total:	57204

COMMENTS

M&M TRUCK REPAIR.

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units	

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	1

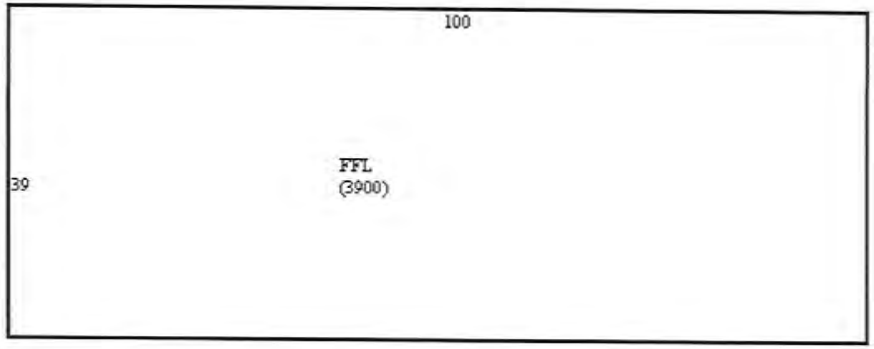
REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

SKETCH



11

COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:		Ind.Val	

Juris. Factor:		Val/Su Fin:	14.67
Special Features:	0	Val/Su Net:	14.67
Final Total:	57200	Val/Su SzAd	14.67

SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	3,900	38.810	151,360

	Net Sketched Area:	3,900		Total:	151,360
Size Ad	3900	Gross Area	3900	FinArea	3900

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

IMAGE

AssessPro Patriot Properties, Inc

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:		Total:	

PARCEL ID 054 406 0

053 MAP | 101 LOT | 0 BLOCK | 1 of 1 CARD | INDUSTRIAL

TOTAL ASSESSED: **301,000**
!5266!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
25		BROCK ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	JUCKETT M & CORBETT T
Owner 2:	TRUSTEES BETA REALTY TRUST
Owner 3:	
Street 1:	46 MORTON ST
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA Cntry: Own Occ: N
Postal:	02072 Type:

PREVIOUS OWNER

Owner 1:	CAIN EARL A -
Owner 2:	C/O JUCKETT WAYNE & CORBETT -
Street 1:	46 MORTON ST
Twn/City:	STOUGHTON
St/Prov:	MA Cntry:
Postal:	02072

NARRATIVE DESCRIPTION

This Parcel contains 1.048 Acres of land mainly classified as FACTORY with a(n) MILL Building Built about 1920, Having Primarily BRICK Exterior and TAR+GRAVEL Roof Cover, with 2 Units, 0 Baths, 3 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
400	141,200		1.048	159,800	301,000	764028.08396429_2869153.97448567
Total Card	141,200		1.048	159,800	301,000	
Total Parcel	141,200		1.048	159,800	301,000	

Source: Market Adj Cost | Total Value per SQ unit /Card: 15.47 | /Parcel: 15.47

Entered Lot Size
Total Land: 1.06
Land Unit Type: A

User Acct
053 101
GIS Ref
GIS Ref
Insp Date
04/05/11

Patriot Properties Inc.

PREVIOUS ASSESSMENT

Parcel ID 053 101 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	400	FV	141,200	0	1.048	159,800	301,000	301,000		10/26/2011
2011	400	FV	138,700	0	1.048	182,600	321,300	321,300	Year End	9/8/2010
2010	400	FV	166,000	0	1.048	244,100	410,100	410,100		10/6/2009
2009	400	FV	166,000	0	1.048	244,100	410,100	410,100		9/19/2008
2008	400	FV	166,000	0	1.048	244,100	410,100	410,100	Year End	10/1/2007
2007	400	FV	148,200	0	1.048	244,100	392,300	392,300	YEAR END	9/22/2006
2006	400	FV	148,200	0	1.048	244,100	392,300	392,300	YEAR END ROLL	9/20/2005
2005	400	FV	148,200	0	1.048	244,100	392,300	392,300	YEAR END ROLL	9/13/2004

SALES INFORMATION

TAX DISTRICT

PAT ACCT. 5266

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
CAIN EARL A,	13482-038		5/28/1999	PORTION/ASSE	518000	No	No			
CAIN EARL A	5967-0403		1/25/1982		101000	No	No			
ONEIL EUGENE J	2915-27		6/15/1950		0	No	No			

PRINT

Date	Time
04/25/12	12:45:56

LAST REV

Date	Time
04/06/11	14:29:24
pamb	

USER DEFINED

Prior Id # 1:	048
Prior Id # 2:	104
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name
4/5/2011	INSPECTED	509	J.DEGREGORIO
10/25/1996	CONVERSION	999	CONVERSION
4/6/1981	CONVERSION	999	CONVERSION

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	I	INDUST	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
400	FACTORY		45659		Sq Feet	SITE	1.0	0	3.5	1.000	IA				0		0		0	159,807		0				159,800	

Total AC/HA: 1.04819 | Total SF/SM: 45659.16 | Parcel LUC: 400 | FACTORY | Prime NB Desc: IND AVG

Total: 159,807 | Spl Credit: | Total: 159,800

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: FY2012

apro

2012

EXTERIOR INFORMATION

Type:	35 - MILL		
Sty Ht:	2 - 2 STORIES		
(Liv) Units:	2	Total:	2
Foundation:	6 - SLAB		
Frame:	1 - WOOD		
Prime Wall:	7 - BRICK		
Sec Wall:			%
Roof Struct:	1 - GABLE		
Roof Cover:	4 - TAR+GRAVEL		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	D+ - FAIR (+)		
Year Blt:	1920	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	12		
Prim Int Wal	5 - MINIMUM		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	12 - CONCRETE		
Sec Floors:	5 - LINO/VINYL	25	%
Bsmnt Flr:			
Bsmnt Gar:			
Electric:	3 - TYPICAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	2 - GAS		
Heat Type:	7 - UNIT HTRS		
# Heat Sys:	1		
% Heated:	100	% AC:	9
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	100

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	3	Rating:	AVERAGE
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:	1	Rating:	AVERAGE
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	0.000000000
Name:	

DEPRECIATION

Phys Cond:	FR - Fair	46.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	46.8	%

CALC SUMMARY

Basic $ / SQ:	20.00
Size Adj.:	0.87848186
Const Adj.:	0.91380620
Adj $ / SQ:	16.055
Other Features:	22576
Grade Factor:	0.78
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	265393
Depreciation:	124204
Depreciated Total:	141189

COMMENTS

. FY-2003 AREA CHANGED FROM 1.05 AC TO 1.04 AC PER PLAN NO. 325 BK-486 DATED 6/6/01.SEWER EASEMENT PER PLAN NO. 179 BK.494 DATED 4/5/02. ALPHA CHEMICAL 2ND FL PLYWOOD.

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	3

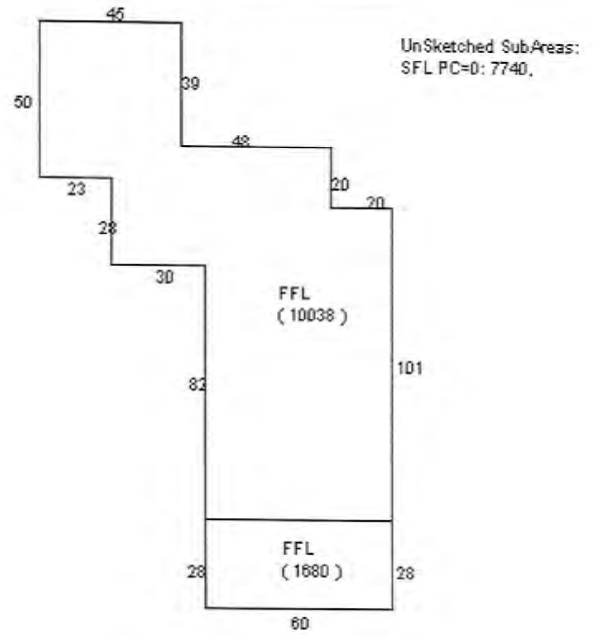
REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

SKETCH



SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	11,718	16.500	193,403
SFL	SECOND FLOOR	7,740	16.060	124,268

	Net Sketched Area:	19,458		Total:	317,671
Size Ad	19458	Gross Area	19458	FinArea	19458

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten
FFL	100	OFC	14		

COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:	Ind.Val
Juris. Factor:		Val/Su Fin:	7.26
Special Features:	0	Val/Su Net:	7.26
Final Total:	141200	Val/Su SzAd	7.26

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:

Total:

PARCEL ID 053 101 0

IMAGE

AssessPro Patriot Properties, Inc

053	102	0	1 of 2	INDUSTRIAL	TOTAL ASSESSED: 334,100
MAP	LOT	BLOCK	CARD		!5267!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
25		BROCK ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	JUCKETT M & CORBETT T
Owner 2:	TRUSTEES BETA REALTY TRUST
Owner 3:	
Street 1:	46 MORTON ST
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Own Occ:	N
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	CAIN EARL A -
Owner 2:	C/O JUCKETT WAYNE & CORBETT -
Street 1:	46 MORTON ST
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Postal:	02072

NARRATIVE DESCRIPTION

This Parcel contains 4.421 Acres of land mainly classified as COM WHS with a(n) WAREHOUSE Building Built about 1925, Having Primarily COMP CLAP Exterior and ASPHALT Roof Cover, with 1 Units, 0 Baths, 0 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
316	72,100	100	4.421	227,200	299,400	763858.368981788_2869375.60846076
Total Card	72,100	100	4.421	227,200	299,400	
Total Parcel	106,800	100	4.421	227,200	334,100	

Source: Market Adj Cost | Total Value per SQ unit /Card: 48.04 | /Parcel: 39.44

Entered Lot Size	
Total Land:	4.47
Land Unit Type:	A

User Acct	053_102
GIS Ref	
GIS Ref	
Insp Date	04/05/11

Patriot Properties Inc.

PREVIOUS ASSESSMENT

Parcel ID: 053 102 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	316	FV	106,800	100	4.421	227,200	334,100	334,100		10/26/2011
2011	316	FV	106,800	100	4.421	256,900	363,800	363,800	Year End	9/8/2010
2010	316	FV	133,700	100	4.421	287,600	421,400	421,400		10/6/2009
2009	316	FV	133,700	100	4.421	287,600	421,400	421,400		9/19/2008
2008	316	FV	133,700	100	4.421	287,600	421,400	421,400	Year End	10/1/2007
2007	316	FV	122,400	100	4.421	287,600	410,100	410,100	YEAR END	9/22/2006
2006	316	FV	122,400	100	4.421	287,600	410,100	410,100	YEAR END ROLL	9/20/2005
2005	316	FV	122,400	100	4.421	287,600	410,100	410,100	YEAR END ROLL	9/13/2004

SALES INFORMATION

TAX DISTRICT

PAT ACCT. 5267

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
CAIN EARL A,	13482-038		5/28/1999	PORTION/ASSE	1	No	No			
CAIN EARL A	5967-0403		1/25/1982		68000	No	No			
ONEIL EUGENE J	2915-27		6/15/1950		0	No	No			

PRINT

Date	Time
04/25/12	12:52:08

LAST REV

Date	Time
04/06/11	14:04:17
pamb	

USER DEFINED

Prior Id # 1:	048
Prior Id # 2:	105
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment
6/1/2009	09-SP-075	RE-ROOF	2,200	C				
3/25/1996	96-035	MANUAL	600	C				
8/9/1995	95-219	MANUAL	1,000	C				

ACTIVITY INFORMATION

Date	Result	By	Name
4/5/2011	INSPECTED	509	J.DEGREGORIO
10/25/1996	MEASURED	999	CONVERSION
4/6/1981	CONVERSION	999	CONVERSION

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	I	INDUST	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
316	COM WHS		80000		Sq Feet	SITE	1.0	0	3.5	0.500	IA			ACCESS	-50		0		0	140,000	0					140,000	
316	COM WHS		2.584		Acres	EXCESS	1.0	0	45,000.	0.750	IA			ACCESS	-25		0		0	87,210	0					87,200	

Total AC/HA:	4.42055	Total SF/SM:	192559.16	Parcel LUC:	316	COM WHS	Prime NB Desc	IND AVG

Total:	227,210	Spl Credit		Total:	227,200

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: AssessPro

therese

2013

EXTERIOR INFORMATION

Type:	43 - WAREHOUSE
Sty Ht:	1 - 1 STORY
(Liv) Units:	1 Total: 2
Foundation:	5 - PIERS
Frame:	1 - WOOD
Prime Wall:	20 - COMP CLAP
Sec Wall:	%
Roof Struct:	1 - GABLE
Roof Cover:	1 - ASPHALT
Color:	
View / Desir:	

GENERAL INFORMATION

Grade:	D- - POOR
Year Blt:	1925 Eff Yr Blt:
Alt LUC:	Alt %:
Jurisdict:	Fact:
Const Mod:	
Lump Sum Adj:	

INTERIOR INFORMATION

Avg Ht/FL:	12
Prim Int Wal	5 - MINIMUM
Sec Int Wall:	%
Partition:	T - TYPICAL
Prim Floors:	2 - SOFTWOOD
Sec Floors:	%
Bsmnt Flr:	
Bsmnt Gar:	
Electric:	6 - NONE
Insulation:	2 - TYPICAL
Int vs Ext:	S
Heat Fuel:	1 - OIL
Heat Type:	7 - UNIT HTRS
# Heat Sys:	1
% Heated:	100 % AC: 0
Solar HW:	NO Central Vac: NO
% Com Wal	% Sprinkled 100

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:		Rating:	
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	0.000000000
Name:	

DEPRECIATION

Phys Cond:	FR - Fair	46.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	46.8	%

CALC SUMMARY

Basic $ / SQ:	36.00
Size Adj.:	1.15115535
Const Adj.:	0.81422293
Adj $ / SQ:	33.743
Other Features:	3993
Grade Factor:	0.63
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	135453
Depreciation:	63392
Depreciated Total:	72061

COMMENTS

SUBURBAN INSULATION, INC. FY-2003 AREA CHANGED FROM 4.3 AC TO 4.4 AC PER PLAN NO. 325 BK-486 DATED 6/6/01..

RESIDENTIAL GRID

1st Res Grid | Desc: | # Units

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals | RMs: | BRs: | Baths: | HB

REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

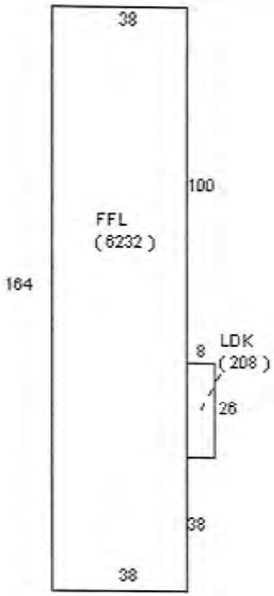
COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ: | AvRate: | Ind.Val

Juris. Factor:		Val/Su Fin:	11.57
Special Features:	0	Val/Su Net:	11.20
Final Total:	72100	Val/Su SzAd	11.57

SKETCH



SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	6,232	33.740	210,284
LDK	LOADING DOCK	208	3.500	728

Net Sketched Area: 6,440 | Total: 211,012

Size Ad | 6232 | Gross Area | 6440 | FinArea | 6232

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value
88	FENCE-6		D	Y	1 80	A	AV	1966	4.80	T	70	316			100			100

More: N | Total Yard Items: 100 | Total Special Featues: | Total: 100

PARCEL ID 053 102 0

IMAGE

AssessPro Patriot Properties, Inc

053 MAP | 102 LOT | 0 BLOCK | 2 of 2 CARD | INDUSTRIAL

TOTAL ASSESSED: **334,100**
!5267!

Town of Stoughton

Patriot Properties Inc.

PROPERTY LOCATION

No	Alt No	Direction/Street/City
		BROCK ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	JUCKETT M & CORBETT T
Owner 2:	TRUSTEES BETA REALTY TRUST
Owner 3:	
Street 1:	46 MORTON ST
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry	
Own Occ:	
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Twn/City:	
St/Prov:	
Cntry	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 4.421 Acres of land mainly classified as COM WHS with a(n) WAREHOUSE Building Built about 1910, Having Primarily STONE Exterior and ASPHALT Roof Cover, with 1 Units, 0 Baths, 1 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
316	34,700		0.000		34,700	763858.368981788_2869375.60846076
Total Card	34,700		0.000		34,700	
Total Parcel	106,800	100	4.421	227,200	334,100	

Source: Market Adj Cost | Total Value per SQ unit /Card: 15.49 | /Parcel: 39.44

Entered Lot Size | Total Land: 4.47 | Land Unit Type: A

PREVIOUS ASSESSMENT

Parcel ID: 053 102 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date

SALES INFORMATION

TAX DISTRICT:

PAT ACCT.: 5267

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

User Acct	
	053_102
GIS Ref	
GIS Ref	
Insp Date	

PRINT

Date	Time
04/25/12	12:52:16

LAST REV

Date	Time
02/02/10	15:13:27
Pamb	

USER DEFINED

Prior Id # 1:	048
Prior Id # 2:	105
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	I	INDUST	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
316	COM WHS		0		Sq Feet	SITE	1.0	0	0.	0.000	IA				0		0		0		0						

Total AC/HA: 0.00000 | Total SF/SM: 0.00 | Parcel LUC: 316 | COM WHS | Prime NB Desc: IND AVG

Total: | Spl Credit | Total:

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: AssessPro

therese

2013

EXTERIOR INFORMATION

Type:	43 - WAREHOUSE		
Sty Ht:	1 - 1 STORY		
(Liv) Units:	1	Total:	2
Foundation:	3 - BRK/STONE		
Frame:	2 - STEEL		
Prime Wall:	9 - STONE		
Sec Wall:			%
Roof Struct:	2 - HIP		
Roof Cover:	1 - ASPHALT		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	D- - POOR		
Year Blt:	1910	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	12		
Prim Int Wal	5 - MINIMUM		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	12 - CONCRETE		
Sec Floors:			%
Bsmnt Flr:			
Bsmnt Gar:			
Electric:	3 - TYPICAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	1 - OIL		
Heat Type:	1 - FORCED H/A		
# Heat Sys:	1		
% Heated:	100	% AC:	0
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	1	Rating:	FAIR
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	0.000000000
Name:	

DEPRECIATION

Phys Cond:	FR - Fair	46.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	46.8	%

CALC SUMMARY

Basic $ / SQ:	36.00
Size Adj.:	1.25000000
Const Adj.:	1.00541532
Adj $ / SQ:	45.244
Other Features:	2250
Grade Factor:	0.63
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	65265
Depreciation:	30544
Depreciated Total:	34721

COMMENTS

PETERSON MACHINE CORP.

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units	

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	1

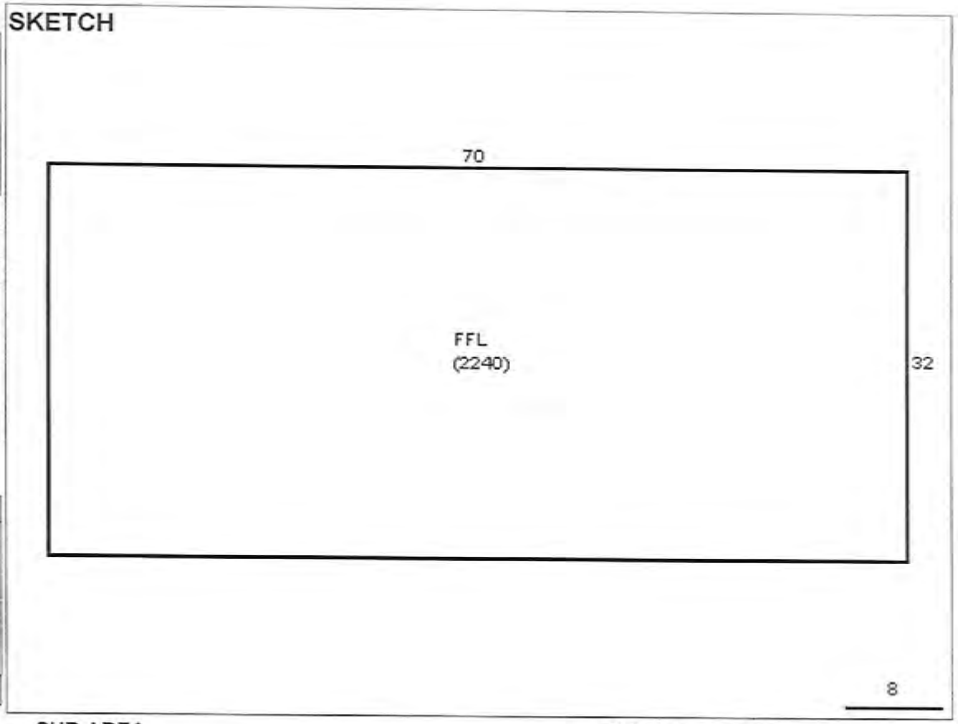
REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

SKETCH



COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:		Ind.Val	0.00000
Juris. Factor:				Val/Su Fin:	15.49
Special Features:	0			Val/Su Net:	15.49
Final Total:	34700			Val/Su SzAd	15.49

SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	2,240	45.240	101,346

Net Sketched Area:	2,240			Total:	101,346
Size Ad	2240	Gross Area	2240	FinArea	2240

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:		Total:	

PARCEL ID

053 102 0

IMAGE

AssessPro Patriot Properties, Inc

054	110	0	1 of 3	INDUSTRIAL	TOTAL ASSESSED: 1,408,500
MAP	LOT	BLOCK	CARD		!5832!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
2		CANTON ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	STOUGHTON CTR BUSINESS PK LLC
Owner 2:	
Owner 3:	
Street 1:	P O BOX 474
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry	
Own Occ:	N
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	2 CANTON STREET CORPORATION -
Owner 2:	-
Street 1:	20 SEARS RD
Twn/City:	MILTON
St/Prov:	MA
Cntry	
Postal:	02186

NARRATIVE DESCRIPTION

This Parcel contains 2.16 Acres of land mainly classified as STORE with a(n) MILL Building Built about 1910, Having Primarily BRICK Exterior and TAR+GRAVEL Roof Cover, with 1 Units, 0 Baths, 6 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
325	291,200	19,000	2.160	677,400	987,600	763470.384003808_2870535.54536491
Total Card	291,200	19,000	2.160	677,400	987,600	
Total Parcel	712,100	19,000	2.160	677,400	1,408,500	

Source: Market Adj Cost | Total Value per SQ unit /Card: 40.33 | /Parcel: 22.29

Entered Lot Size | Total Land: 2.16 | Land Unit Type: A

User Acct	GIS Ref	GIS Ref	Insp Date
054 110			02/26/07

Patriot Properties Inc.

PREVIOUS ASSESSMENT

Parcel ID: 054 110 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date
2012	325	FV	712,100	19000	2.16	677,400	1,408,500	1,408,500		10/26/2011
2011	325	FV	712,100	19000	2.16	762,100	1,493,200	1,493,200	Year End	9/8/2010
2010	325	FV	778,800	24500	2.16	643,600	1,446,900	1,446,900		10/6/2009
2009	325	FV	700,900	24500	2.16	643,600	1,369,000	1,369,000		9/19/2008
2008	325	FV	698,200	24500	2.16	643,600	1,366,300	1,366,300	Year End	10/1/2007
2007	325	FV	581,700	24500	2.16	522,900	1,129,100	1,129,100	YEAR END	9/22/2006
2006	325	FV	581,700	24500	2.16	522,900	1,129,100	1,129,100	YEAR END ROLL	9/20/2005
2005	325	FV	819,900	24500	2.16	550,400	1,394,800	1,394,800	YEAR END ROLL	9/13/2004

PRINT Date	PRINT Time	LAST REV Date	LAST REV Time
04/25/12	12:50:58	01/13/12	09:18:46

pamb

SALES INFORMATION

TAX DISTRICT

PAT ACCT. 5832

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes
2 CANTON STREET	19492-029		7/31/2003	INTRA-CORP	2200000	No	No			
2 CANTON STREET	10719-227		11/4/1994	FORCLOSURE	580000	No	No			
RAIMONDI ROBERT	10520-493		5/26/1994	INTRA-CORP	1	No	No			
COREY S & CARTE	9210-64		2/14/1992	PHY.CHD>SALE	750000	No	No			
JFC SHOE CO INC	4436-700		6/23/1967	OTHER	750000	No	No			

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	394
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	000
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment
8/3/2011	11-S-19	SIGN		O				
7/7/2011	11-112	ALTERATI	25,000	C	12/31/2011			RENOVATE OFFICE FO
8/14/2009	09-150	ALTERATI	1,800	C				NEW INTERIOR PARTI
4/23/2009	09-SP-049	RE-ROOF	6,000	C				
12/10/2008	08-270	ADDITION	10,000	C	1/11/2010			19 X 9 PATIO ENCLO
10/2/2008	08-225	INT FITU	40,000	C				
9/13/2007	07-212	ADD BTHR	9,000	C				
7/30/2007	07-166	ALTERATI	100,000	O				
8/29/2005	05-S-034	SIGN		O				
6/13/2005	05-S-19	SIGN		O				

ACTIVITY INFORMATION

Date	Result	By	Name
12/31/2011	INFO-BLD.DEP	508	C. GILDAY
2/26/2007	INSPECTED	517	M.CONNORS
6/19/2001	FIELDREV CHG	201	SCOTT MC
2/26/2000	INSPECTED	510	KWD
9/19/1997	MEASURED	511	JS

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	GB	GEN BUS	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
325	STORE		94090		Sq Feet	SITE	1.0	0	8.	0.900	CA			SHAPE	-10		0		0	677,448		0				677,400	

Total AC/HA:	2.16001	Total SF/SM:	94090.04	Parcel LUC:	325	STORE	Prime NB Desc	COMM AVG

Total:	677,448	Spl Credit		Total:	677,400

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: AssessPro

therese

2013

EXTERIOR INFORMATION

Type:	35 - MILL		
Sty Ht:	3 - 3 STORIES		
(Liv) Units:	1	Total:	3
Foundation:	3 - BRK/STONE		
Frame:	2 - STEEL		
Prime Wall:	7 - BRICK		
Sec Wall:			50 %
Roof Struct:	4 - FLAT		
Roof Cover:	4 - TAR+GRAVEL		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	C - AVERAGE		
Year Blt:	1910	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	12		
Prim Int Wal	1 - DRYWALL		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	2 - SOFTWOOD		
Sec Floors:			%
Bsmnt Flr:	12 - CONCRETE		
Bsmnt Gar:			
Electric:	3 - TYPICAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	2 - GAS		
Heat Type:	1 - FORCED H/A		
# Heat Sys:	1		
% Heated:	100	% AC:	75
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	100

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	6	Rating:	AVERAGE
A HBth:		Rating:	
OthrFix:	6	Rating:	AVERAGE

OTHER FEATURES

Kits:		Rating:
A Kits:		Rating:
Frpl:		Rating:
WSFlue:		Rating:

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	
Name:	

DEPRECIATION

Phys Cond:	FA - Fair-Avg	44.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	44	%

CALC SUMMARY

Basic $ / SQ:	20.00
Size Adj.:	0.85210335
Const Adj.:	1.03504491
Adj $ / SQ:	17.639
Other Features:	37221
Grade Factor:	1.00
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	519972
Depreciation:	228788
Depreciated Total:	291184

COMMENTS

STOUGHTON CROSSING 98-274: STORAGE UNITS IN BLDG C 1ST.10/2008-94% RENTED PER OWNER..

RESIDENTIAL GRID

1st Res Grid	Desc:		# Units	

Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	6

REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

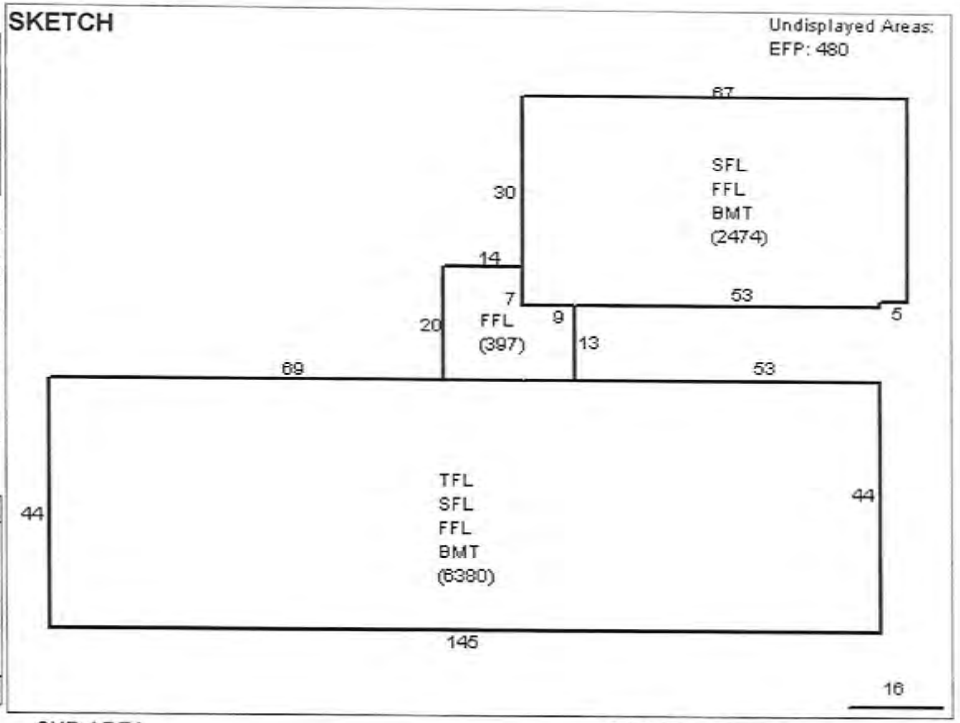
COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:		Ind.Val	

Juris. Factor:		Val/Su Fin:	11.89
Special Features:	0	Val/Su Net:	8.61
Final Total:	291200	Val/Su SzAd	11.89

SKETCH



SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	9,251	17.640	163,181
BMT	BASEMENT	8,854	4.410	39,045
SFL	SECOND FLOOR	8,854	17.640	156,178
TFL	THIRD FLOOR	6,380	17.640	112,539
EFP	ENCL PRCH	480	24.600	11,808

Net Sketched Area:	33,819			Total:	482,751
Size Ad	24485	Gross Area	33819	FinArea	24485

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value
85	PAVING		D	Y	1	45000	A	FR	1988	1.21	T	65	325			19,000			19,000

PARCEL ID 054 110 0

IMAGE

AssessPro Patriot Properties, Inc

More:	N	Total Yard Items:	19,000	Total Special Featues:		Total:	19,000

054	110	0	2 of 3	INDUSTRIAL	TOTAL ASSESSED: 1,408,500
MAP	LOT	BLOCK	CARD		!5832!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
		CANTON ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	STOUGHTON CTR BUSINESS PK LLC
Owner 2:	
Owner 3:	
Street 1:	P O BOX 474
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Own Occ:	
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Twn/City:	
St/Prov:	
Cntry:	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 2.16 Acres of land mainly classified as STORE with a(n) MILL Building Built about 1910, Having Primarily BRICK Exterior and TAR+GRAVEL Roof Cover, with 1 Units, 0 Baths, 2 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
325	151,200		0.000		151,200	763470.384003808_2870535.54536491
Total Card	151,200		0.000		151,200	
Total Parcel	712,100	19,000	2.160	677,400	1,408,500	

Source: Market Adj Cost | Total Value per SQ unit /Card: 12.36 | /Parcel: 22.29

Entered Lot Size | Total Land: 2.16 | Land Unit Type: A

PREVIOUS ASSESSMENT

Parcel ID: 054 110 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date

SALES INFORMATION

TAX DISTRICT:

PAT ACCT.: 5832

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	GB	GEN BUS	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
325	STORE		0		Sq Feet	SITE	1.0	0	0.	0.000	CA																

Total AC/HA: 0.00000 | Total SF/SM: 0.00 | Parcel LUC: 325 | STORE | Prime NB Desc: COMM AVG

Total: | Spl Credit | Total:

PRINT

Date	Time
04/25/12	12:51:06

LAST REV

Date	Time
05/09/10	06:25:38
apro	
5832	

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	394
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

User Acct	GIS Ref	GIS Ref	Insp Date
054_110			

Patriot Properties Inc.

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: AssessPro

therese

2013

EXTERIOR INFORMATION

Type:	35 - MILL		
Sty Ht:	2 - 2 STORIES		
(Liv) Units:	1	Total:	3
Foundation:	3 - BRK/STONE		
Frame:	2 - STEEL		
Prime Wall:	7 - BRICK		
Sec Wall:	2 - CLAPBOAR	25	%
Roof Struct:	4 - FLAT		
Roof Cover:	4 - TAR+GRAVEL		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	C - AVERAGE		
Year Blt:	1910	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	12		
Prim Int Wal	2 - PLASTER		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	2 - SOFTWOOD		
Sec Floors:			%
Bsmnt Flr:	12 - CONCRETE		
Bsmnt Gar:			
Electric:	3 - TYPICAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	2 - GAS		
Heat Type:	1 - FORCED H/A		
# Heat Sys:	1		
% Heated:	100	% AC:	100
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	100

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	2	Rating:	AVERAGE
A HBth:		Rating:	
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:	
A Kits:		Rating:	
Frpl:		Rating:	
WSFlue:		Rating:	

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	
Name:	

DEPRECIATION

Phys Cond:	FA - Fair-Avg	44.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	44	%

CALC SUMMARY

Basic $ / SQ:	20.00
Size Adj.:	0.95433182
Const Adj.:	1.04766738
Adj $ / SQ:	19.996
Other Features:	17676
Grade Factor:	1.00
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	269939
Depreciation:	118773
Depreciated Total:	151166

COMMENTS

RESIDENTIAL GRID

1st Res Grid	Desc:									# Units	
Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												

Totals	RMs:	BRs:	Baths:	HB	2

REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

No Unit	RMS	BRS	FL
Totals			

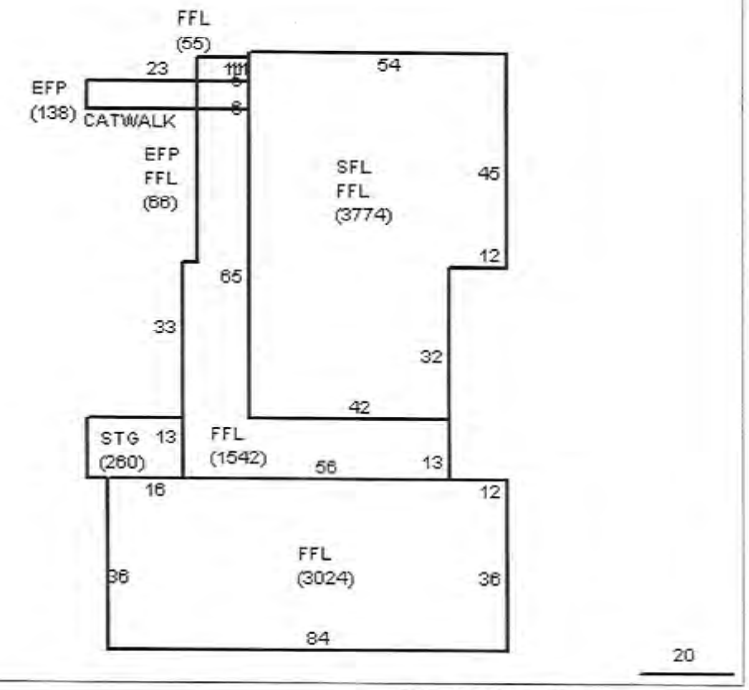
COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:		Ind.Val	

Juris. Factor:		Val/Su Fin:	12.36
Special Features:	0	Val/Su Net:	11.91
Final Total:	151200	Val/Su SzAd	12.36

SKETCH



SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	8,461	20.000	169,190
SFL	SECOND FLOOR	3,774	20.000	75,467
STG	STORAGE	260	6.770	1,760
EFP	ENCL PRCH	204	28.660	5,846

	Net Sketched Area:	12,699		Total:	252,263
Size Ad	12235	Gross Area	12699	FinArea	12235

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:		Total Special Featues:		Total:	

PARCEL ID 054 110 0

IMAGE

AssessPro Patriot Properties, Inc

054	110	0	3 of 3	INDUSTRIAL	TOTAL ASSESSED: 1,408,500
MAP	LOT	BLOCK	CARD		!5832!

Town of Stoughton

PROPERTY LOCATION

No	Alt No	Direction/Street/City
		CANTON ST, STOUGHTON

OWNERSHIP

Unit #:

Owner 1:	STOUGHTON CTR BUSINESS PK LLC
Owner 2:	
Owner 3:	
Street 1:	P O BOX 474
Street 2:	
Twn/City:	STOUGHTON
St/Prov:	MA
Cntry:	
Own Occ:	
Postal:	02072
Type:	

PREVIOUS OWNER

Owner 1:	
Owner 2:	
Street 1:	
Twn/City:	
St/Prov:	
Cntry:	
Postal:	

NARRATIVE DESCRIPTION

This Parcel contains 2.16 Acres of land mainly classified as STORE with a(n) MILL Building Built about 1910, Having Primarily CLAPBOARD Exterior and TAR+GRAVEL Roof Cover, with 1 Units, 0 Baths, 3 HalfBaths, 0 3/4 Baths, 0 Rooms, and 0 Bdrms.

OTHER ASSESSMENTS

Code	Descrip/No	Amount	Com. Int

IN PROCESS APPRAISAL SUMMARY

Use Code	Building Value	Yard Items	Land Size	Land Value	Total Value	Legal Description
325	269,700		0.000		269,700	763470.384003808_2870535.54536491
Total Card	269,700		0.000		269,700	
Total Parcel	712,100	19,000	2.160	677,400	1,408,500	

Source: Market Adj Cost | Total Value per SQ unit /Card: 10.19 | /Parcel: 22.29

Entered Lot Size
Total Land: 2.16
Land Unit Type: A

PREVIOUS ASSESSMENT

Parcel ID: 054 110 0

Tax Yr	Use	Cat	Bldg Value	Yrd Items	Land Size	Land Value	Total Value	Asses'd Value	Notes	Date

SALES INFORMATION

TAX DISTRICT:

PAT ACCT.: 5832

Grantor	Legal Ref	Type	Date	Sale Code	Sale Price	V	Tst	Verif	Assoc PCL Value	Notes

BUILDING PERMITS

Date	Number	Descrip	Amount	C/O	Last Visit	Fed Code	F. Descrip	Comment

ACTIVITY INFORMATION

Date	Result	By	Name

Sign: VERIFICATION OF VISIT NOT DATA __/__/__

PROPERTY FACTORS

Item	Code	Descip	%	Item	Code	Descrip
Z	GB	GEN BUS	100	U		
o				t		
n				l		
Census:				Exmpt		
Flood Haz:						
D				Topo		
s				Street		
t				Traffic		

LAND SECTION (First 7 lines only)

Use Code	Description	LUC Fact	No of Units	Depth / PriceUnits	Unit Type	Land Type	LT Factor	Base Value	Unit Price	Adj	Neigh	Neigh Influ	Neigh Mod	Infl 1	%	Infl 2	%	Infl 3	%	Appraised Value	Alt Class	%	Spec Land	J Code	Fact	Use Value	Notes
325	STORE		0		Sq Feet	SITE	1.0	0	0.	0.000	CA																

Total AC/HA:	0.00000	Total SF/SM:	0.00	Parcel LUC:	325	STORE	Prime NB Desc	COMM AVG

Total: | Spl Credit | Total:

Disclaimer: This Information is believed to be correct but is subject to change and is not warranteed. Database: AssessPro

therese

2013

Patriot Properties Inc.

User Acct	GIS Ref	GIS Ref	Insp Date
054_110			

PRINT

Date	Time
04/25/12	12:51:14

LAST REV

Date	Time
05/09/10	06:25:22
apro	

USER DEFINED

Prior Id # 1:	049
Prior Id # 2:	394
Prior Id # 3:	0
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
Prior Id # 1:	
Prior Id # 2:	
Prior Id # 3:	
ASR Map:	
Fact Dist:	
Reval Dist:	
Year:	
LandReason:	
BldReason:	

EXTERIOR INFORMATION

Type:	35 - MILL		
Sty Ht:	2 - 2 STORIES		
(Liv) Units:	1	Total:	3
Foundation:	3 - BRK/STONE		
Frame:	1 - WOOD		
Prime Wall:	2 - CLAPBOARD		
Sec Wall:			%
Roof Struct:	4 - FLAT		
Roof Cover:	4 - TAR+GRAVEL		
Color:			
View / Desir:			

GENERAL INFORMATION

Grade:	C - AVERAGE		
Year Blt:	1910	Eff Yr Blt:	
Alt LUC:		Alt %:	
Jurisdict:		Fact:	
Const Mod:			
Lump Sum Adj:			

INTERIOR INFORMATION

Avg Ht/FL:	12		
Prim Int Wal	2 - PLASTER		
Sec Int Wall:			%
Partition:	T - TYPICAL		
Prim Floors:	2 - SOFTWOOD		
Sec Floors:			%
Bsmnt Flr:			
Bsmnt Gar:			
Electric:	3 - TYPICAL		
Insulation:	2 - TYPICAL		
Int vs Ext:	S		
Heat Fuel:	2 - GAS		
Heat Type:	1 - FORCED H/A		
# Heat Sys:	1		
% Heated:	100	% AC:	100
Solar HW:	NO	Central Vac:	NO
% Com Wal		% Sprinkled	100

BATH FEATURES

Full Bath		Rating:	
A Bath:		Rating:	
3/4 Bath:		Rating:	
A 3QBth		Rating:	
1/2 Bath:	2	Rating:	AVERAGE
A HBth:	1	Rating:	AVERAGE
OthrFix:		Rating:	

OTHER FEATURES

Kits:		Rating:
A Kits:		Rating:
Frpl:		Rating:
WSFlue:		Rating:

CONDO INFORMATION

Location:	
Total Units:	
Floor:	
% Own:	
Name:	

DEPRECIATION

Phys Cond:	FA - Fair-Avg	44.	%
Functional:			%
Economic:			%
Special:			%
Override:			%
	Total:	44	%

CALC SUMMARY

Basic $ / SQ:	20.00
Size Adj.:	0.84445369
Const Adj.:	0.99000001
Adj $ / SQ:	16.720
Other Features:	33351
Grade Factor:	1.00
Neighborhood Inf:	1.00000000
LUC Factor:	
Adj Total:	481594
Depreciation:	211902
Depreciated Total:	269693

COMMENTS

RESIDENTIAL GRID

1st Res Grid	Desc:									# Units	
Level	FY	LR	DR	D	K	FR	RR	BR	FB	HB	L	O
Other												
Upper												
Lvl 2												
Lvl 1												
Lower												
Totals	RMs:		BRs:		Baths:				HB	2		

REMODELING

Exterior:	
Interior:	
Additions:	
Kitchen:	
Baths:	
Plumbing:	
Electric:	
Heating:	
General:	

RES BREAKDOWN

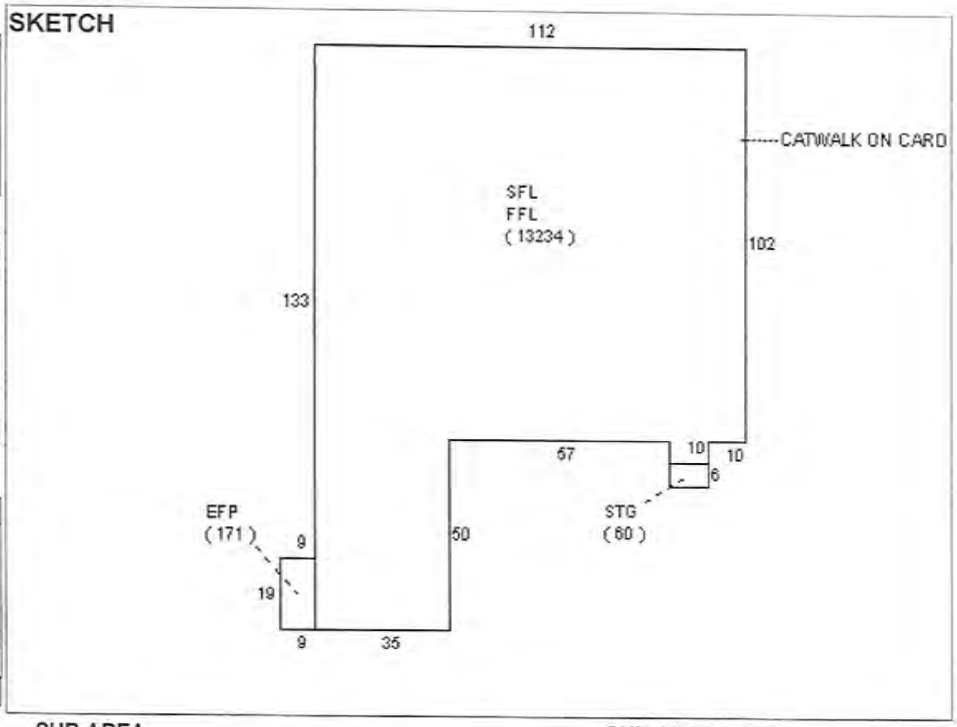
No Unit	RMS	BRS	FL
Totals			

COMPARABLE SALES

Rate	Parcel ID	Typ	Date	Sale Price

WtAv$/SQ:		AvRate:	Ind.Val
Juris. Factor:		Val/Su Fin:	10.19
Special Features:	0	Val/Su Net:	10.10
Final Total:	269700	Val/Su SzAd	10.19

SKETCH



SUB AREA

Code	Description	Area - SQ	Rate - AV	Undepr Value
FFL	FIRST FLOOR	13,234	16.720	221,275
SFL	SECOND FLOOR	13,234	16.720	221,275
EFP	ENCL PRCH	171	30.020	5,134
STG	STORAGE	60	9.330	560

	Net Sketched Area:	26,699		Total:	448,244
Size Ad	26468	Gross Area	26699	FinArea	26468

SUB AREA DETAIL

Sub Area	% Usbl	Descrip	% Type	Qu	# Ten

IMAGE

AssessPro Patriot Properties, Inc

PARCEL ID

054 110 0

SPEC FEATURES/YARD ITEMS

Code	Description	A	Y/S	Qty	Size/Dim	Qual	Con	Year	Unit Price	D/S	Dep	LUC	Fact	NB Fa	Appr Value	JCod	JFact	Juris. Value

More:	N	Total Yard Items:	Total Special Featues:	Total:

TAX MAP 53

TOWN OF STOUGHTON MASSACHUSETTS

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- PROPOSED ROAD
- PRIVATE ROAD
- MATCH LINE
- WATER LINE
- CITY/TOWN LIMIT
- RAILROAD R.O.W.
- EASEMENT
- POWERLINE R.O.W.
- TELEPHONE R.O.W.
- GAS LINE
- 3 PARCEL NUMBER
- 23.4 AC OR 1000 SF AREA
- 74 STREET NUMBER
- 160 DIMENSION
- 160+/- SCALE DIMENSION

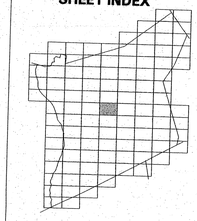
MASSACHUSETTS STATE PLANE, MAINLAND ZONE 4151, UNITS = FEET
NORTH AMERICAN DATUM 1983

PLAN INFORMATION COMPILED FROM RECORD DATA. FOR ASSESSMENT PURPOSES ONLY.

ADJACENT SHEETS

42	54	66
41	53	65
40	52	64

SHEET INDEX



SCALE

100' 0' 100' 200'

SCALE 1 inch = 100 feet

COMPLETION DATE: DECEMBER 2002

DATE OF REVISIONS:

LAST PARCEL NUMBER: 246

JAMES W. SEWALL COMPANY
ESTABLISHED 1880

TAX MAP 54

TOWN OF STOUGHTON MASSACHUSETTS

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- PROPOSED ROAD
- PRIVATE ROAD
- MATCH LINE
- WATER LINE
- CITY/TOWN LIMIT
- RAILROAD R.O.W.
- EASEMENT
- POWERLINE R.O.W.
- TELEPHONE R.O.W.
- GAS LINE
- 3 PARCEL NUMBER
- 23.4 AC OR 1000 SF AREA
- 74 STREET NUMBER
- 160 DIMENSION
- 160+/- SCALE DIMENSION

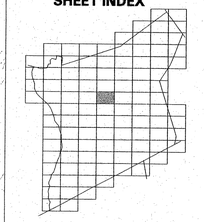
MASSACHUSETTS STATE PLANE, MAINLAND ZONE 4151, UNITS – FEET
NORTH AMERICAN DATUM 1983

PLAN INFORMATION COMPILED FROM RECORD DATA. FOR ASSESSMENT PURPOSES ONLY.

ADJACENT SHEETS

43	55	67
42	54	66
41	53	65

SHEET INDEX



SCALE

100' 0' 100' 200'

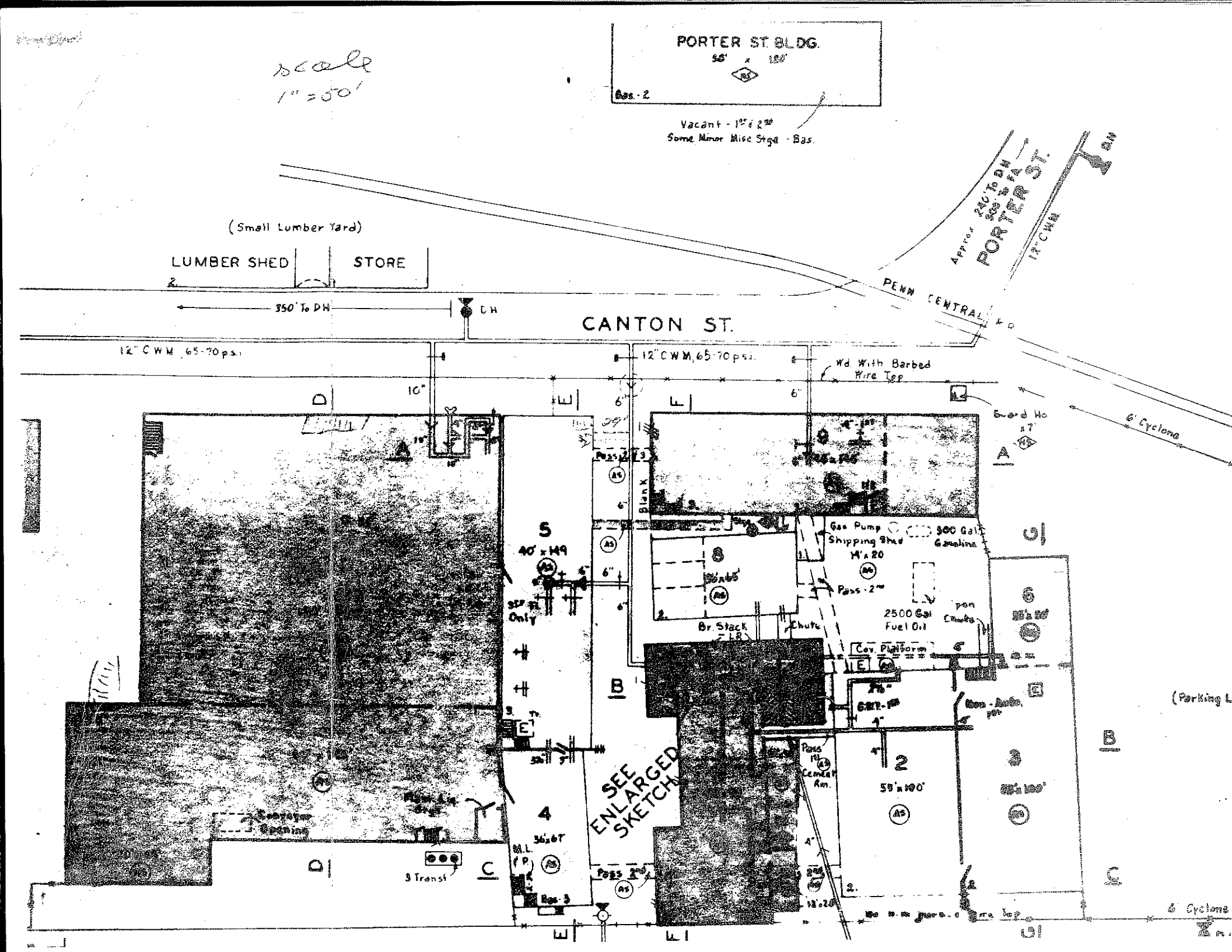
SCALE 1 inch = 100 feet

COMPLETION DATE: DECEMBER 2002

DATE OF REVISIONS:

LAST PARCEL NUMBER: 440

JAMES W. SEWALL COMPANY
ESTABLISHED 1892


scale
1" = 50'
PORTER ST. BLDG.
56' x 120'
Bas. - 2
Vacant - 1st & 2nd
Some Minor Misc Stge - Bas.
(Small Lumber Yard)
LUMBER SHED
STORE
350' To DH
DH
CANTON ST.
PENN CENTRAL R.R.
Approx 240' To DH
PORTER ST.
12" CWM
12" CWM, 65-70 p.s.i.
Wd. With Barbed Wire Top
6' Cyclone
Board Ho
x 7'
Gas Pump
Shipping Shed
14' x 20'
300 Gal
Gasoline
2500 Gal
Fuel Oil
Pass - 2nd
Br. Stack
Chute
Conv. Platform
Pass 1st
Center Rm.
SEE ENLARGED SKETCH
Blank
Pass 2nd
Rec. - 3
Transit
Conveyor Opening
Floor Lift
Steps
(Parking L
6' Cyclone

TOWN OF
STOUGHTON
COMMONWEALTH OF
MASSACHUSETTS

BUILDING AND ZONING DEPARTMENT

TOWN OFFICES: Ten Pearl St./Stoughton, MA. 02072

October 30, 1979

Mr. Eugene O'Neil
P.O. Box 27
Babson Park, MA 02157

RE: 25 BROCK STREET

Dear Mr. O'Neil:

On October 26, 1979 Lieut. Anthony Novello, Stoughton Fire Department, accompanied me on an inspection of the buildings on your property at the above referenced address.

The wooden structure occupied by "Rick's Kitchens" has the following items which must be corrected:

1. The stairs are structurally unsafe.

2. The venting of the oil burner is not a proper, safe installation.

3. All the windows in the unoccupied portion are broken and open and should be boarded up.

The brick building has several windows on the ground level which should be boarded up.

Your prompt attention to this matter is appreciated.

Very sincerely yours,

Charles J. Urciuoli

CHARLES J. URCIUOLI
Building and Zoning Official

cju/c

cc: Lieut. Novello

TOWN OF
STOUGHTON
COMMONWEALTH OF
MASSACHUSETTS

TOWN OFFICES: Ten Pearl St./Stoughton, MA. 02072
30 Freeman Street

Date October 26, 1979

Name Mr. Eugene J. O'Neil, Jr.

52 Clarke Rd.

Needham, Mass. 02192

Re: Inspection of property
25 Brock Street,
Stoughton, Mass. 02072

As a result of an inspection recently of the premises, structure, open land area or vehicle owned, occupied or otherwise under your control, the following recommendations. are submitted and shall serve as a notice of violation of fire laws. These recommendations are made in the interest of fire prevention and to correct conditions that are or may become dangerous as a fire hazard or are in violation of law.

You are hereby notified to remedy said violations name below within 14 days, above date.

Such further action will be taken as the law requires, for failure to comply with the above requirements with the stipulated time.
(Reference: General Laws of Commonwealth of Massachusetts, Chapter 148, Section 30; and the Stoughton Fire Code Article #1)

1. Front building with open windows on street level.

2. Rear building with tenant Rick"s Kitchen.
Oil Burner and Oil Storage in Violation of Cmr 4.00 and Fire Prevention Regulation #3. Including improper chimney.

3. Same building should be boarded up and secured to prevent unauthorized entry.

4. Sprinkler System shut off. Chapter 148 Section 27A in Violation.

We have therefore requesting the Building Inspector take such immediate steps as may be necessary to eliminate this hazardous building or building be well secured and maintain. Since we last talked about the above matter we found no improvement of same.

Your cooperation in this matter will be greatly appreciated and make further action unnecessary.

Very sincerely yours,

Lt. Anthony T. Novello, Inspector
Fire Prevention Bureau.

CC: Building Inspector,
Chief Paul J. Roach,

RECEIVED
OCT 26 1979
BUILDING DEPT.
STOUGHTON, MASS.

MASSACHUSETTS UNIFORM APPLICATION FOR PERMIT TO DO GASFITTING

(Print or Type)

G

Stoughton, Mass. Date 7-23 19 92
City, Town

AT: Building Location 27-29 Wyman St Permit # 205
Owner's Name RAILROAD STATION

Stoughton Type of Occupancy: Comm

New ☐ Renovation ☒ Replacement ☐

#10 M
7-10-92

Plans Submitted Yes ☐ No ☐

	RANGES	HEATER RANGES	OVENS	GRILLES	HEATING BOILERS	FURNACES	UNIT HEATERS	WATER HEATERS	DRYERS	GAS GENERATORS	LABORATORY COCKS	CONVERSION BURNERS	ROOF TOP UNITS	VENTED ROOM HTRS.	DIRECT VENT HTRS.	POOL HEATERS	TESTS	OTHER
SUB-BSMT.																		
BASEMENT												X						
1ST FLOOR																		
2ND FLOOR																		
3RD FLOOR																		
4TH FLOOR																		
5TH FLOOR																		
6TH FLOOR																		
7TH FLOOR																		
8TH FLOOR																		

(Print or Type)

Installing Company Name BAY STATE GAS.

Address 995 BELMONT ST
BROCKTON, MASS.

Check One: Certificate
☑ Corp. 64
☐ Partnership
☐ Firm/Company

Business Telephone _____ Name of Licensed Plumber or Gasfitter

ROBERT HAWMAN

I hereby certify that all of the details and information I have submitted (or entered) in above application are true and accurate to the best of my knowledge and that all plumbing work and installations performed under Permit issued for this application will be in compliance with all pertinent provisions of the Massachusetts State Gas Code and Chapter 142 of the General Laws.

By _____
Title _____
City/Town: _____
APPROVED (OFFICE USE ONLY)

TYPE LICENSE:
☐ Plumber
☐ Gasfitter
☑ Master
☐ Journeyman

Robert Hawman
Signature of Licensed Plumber or Gasfitter

M459
License Number

The Commonwealth of Massachusetts

Department of Public Safety

Office Use Only	
Permit No.	457
Occupancy & Fee Checked (leave blank)	51

BOARD OF FIRE PREVENTION REGULATIONS FPR-11, RULE 8 Effective 1/1/78

APPLICATION FOR PERMIT TO PERFORM ELECTRICAL WORK

All work to be performed in accordance with the Massachusetts Electrical Code, FPR-11

Date 12-23 19 91

City or Town of **STOUGHTON**

To the Inspector of Wires: The undersigned applies for a permit to perform the electrical work described below.

Location (Street & Number) _____ Pole No. _____

Owner or Tenant Murphy Coal

Owner's Address ~~293 Washington St~~ off 17 Morton Aguar

Is this permit in conjunction with a buildiug permit? _____ Yes _____ No

Purpose of Building _____

Service 100 Amps 208 Volts No. of Meters 1

100 Existing 100 New Increased from _____ to _____

Nature of the Proposed Electrical Work To Install New Service For Fuel Pumps

PROPOSED FIXTURES IN DETAIL (See attached schedule, if necessary)

Location of Room	Light Outlets	Sw.	Plugs	Fixt.	Location of Room	Light Outlets	Sw.	Plugs	Fixt.

No. of Sw. Out.		Heat — Type	
No. of Outlets Lt.		Oil	
No. of Rec.		Gas	
No. of Motors	H.P.	Electrical — KW Connected Load	
No. of Signs	Trans.	Hot Water — Motors and Size	
Air Cond.		Steam — Motors and Size	
Range Name Plate Rate		Hot Air — Motors and Size	
Water Heater Name Plate Rate		Misc.	
Clothes Dryer Name Plate Rate			
Total Load			
Size of Main Entrance Sw.			
Size of S. E. Conductors			

Work to Start 12-23 Inspection Date Requested 12-24 Permit Fee 5 00

Signed under the Penalties of Perjury:

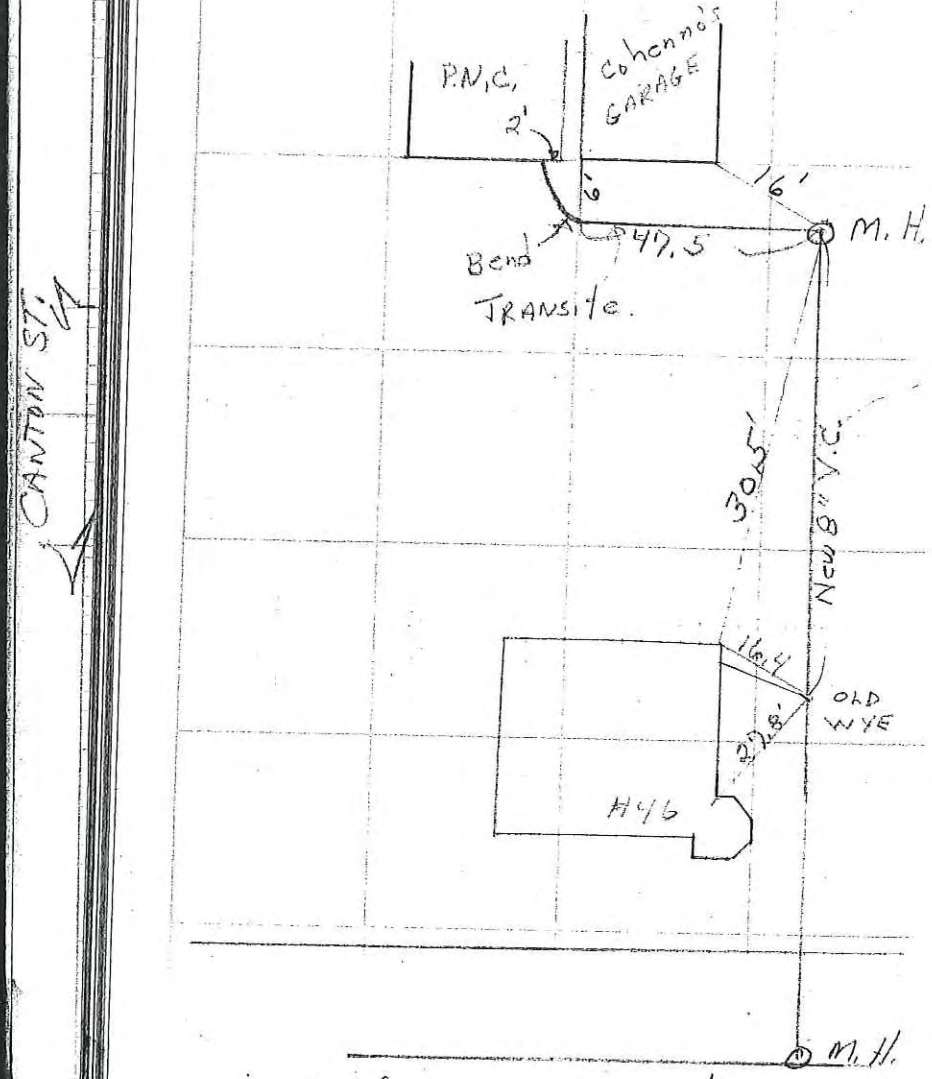
Licensee Leonard Electric (Please print) Signature Roy Leonard (Please sign) License No. A8746

Address Po Box (Street & Number) 411 (City or Town) Stoughton (Zip Code) Ma Tel. No. 617 344 5524

Supplemental information on forms furnished by the inspectors of wires shall be mailed or delivered by the applicant within five (5) working days from the date of said application, if required by the inspector of wires.

PORTUGESE National C/Co
SEWER Comm. R.R. & E.

Aug. 61



Sewer Conn.
Please

TRANSITE Pip

16"

8" Gas.

6

10" Water

8" V.C. Sewer

cut

Please

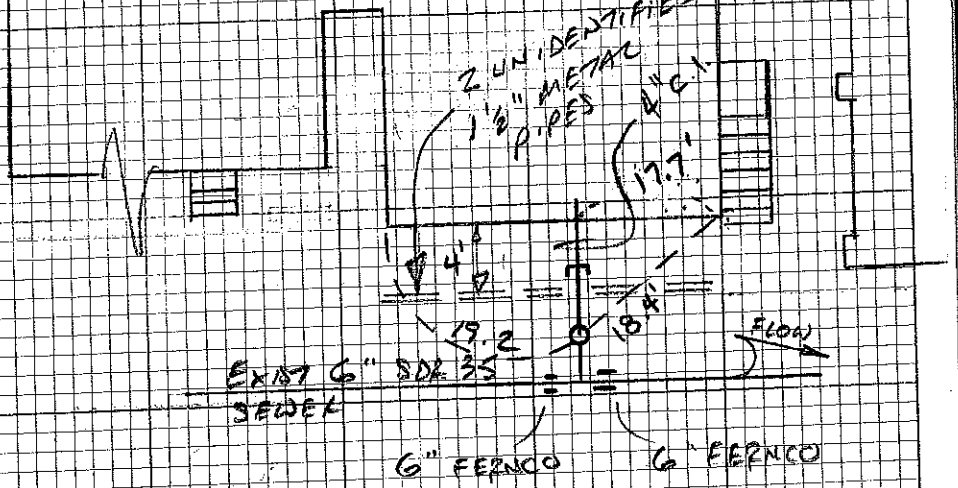
2 CANTON STREET

"WAM TO GROW" DAM CALC

AUG 12, 2004

AGA

WEM



NOTE C.O. TO GRADE COVERED W/METAL COVER

EXISTING 6" SEWER IN PARKING AREA

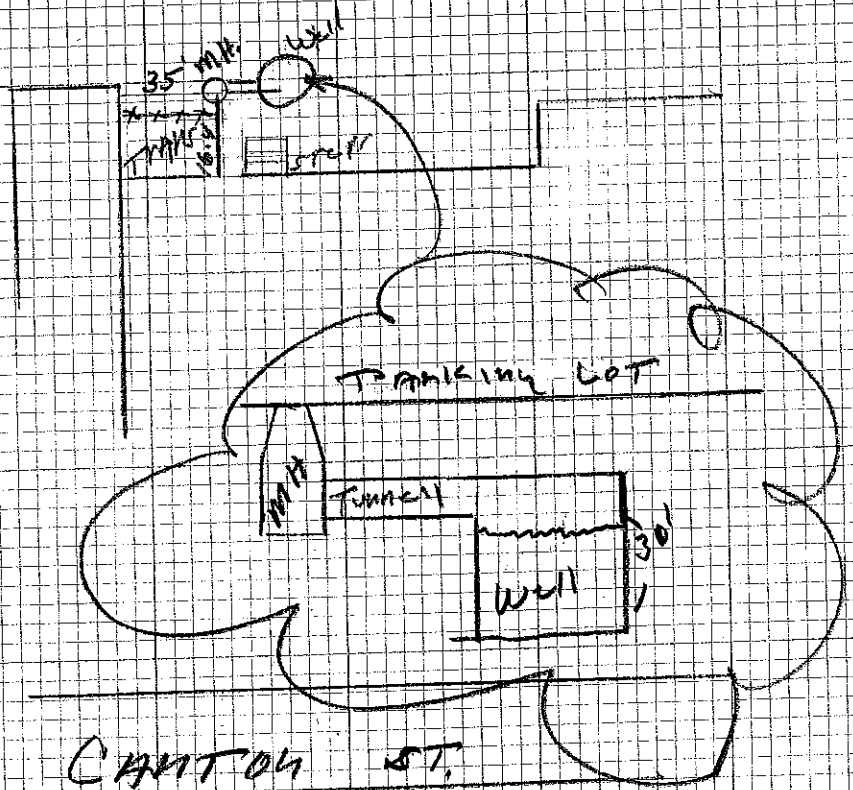
13.0

2'

#2 CANTON ST
(ACME BOOT FACTORY)

Well #991

SUMMER ST.

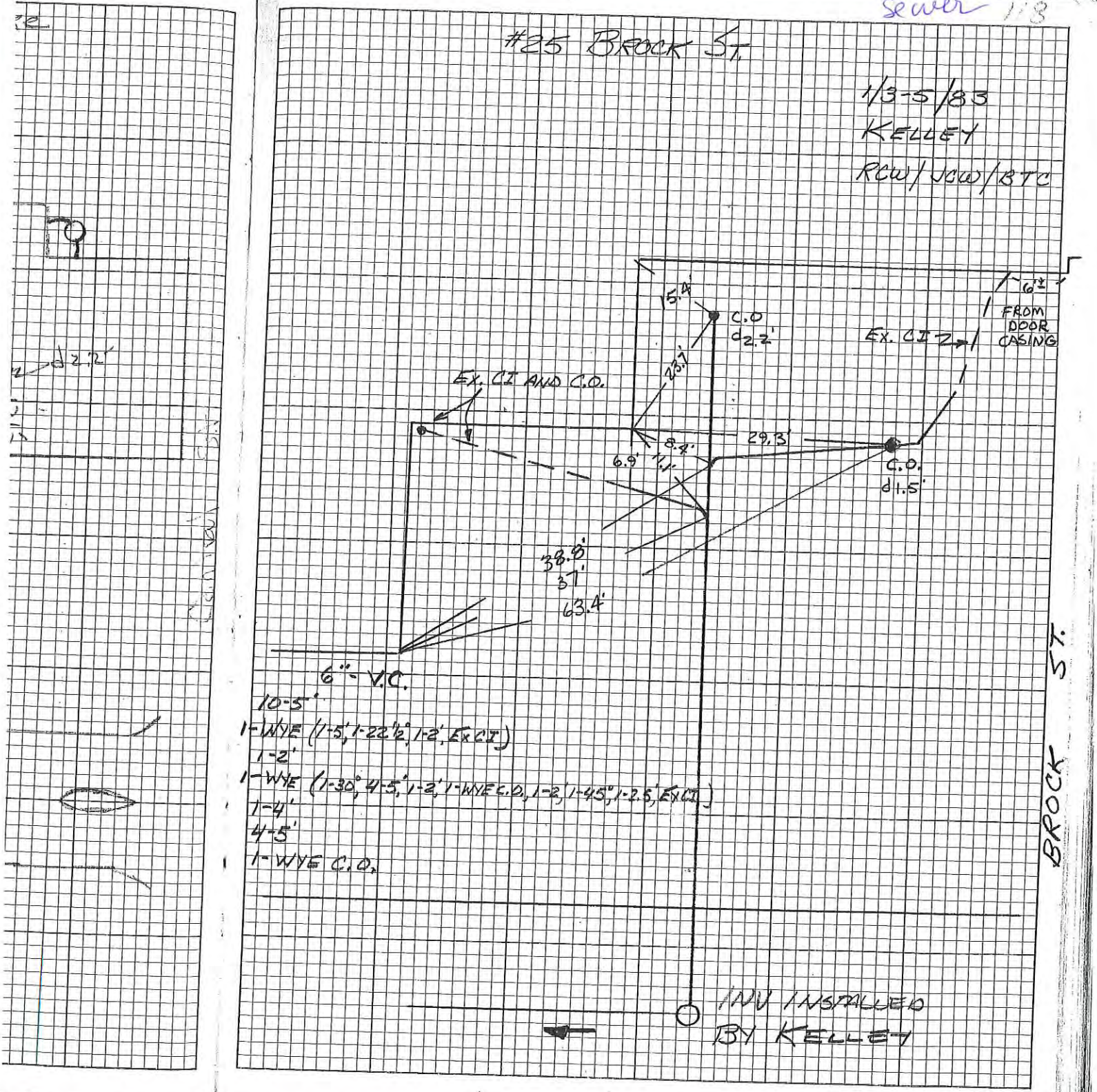


Fence

sewer 1/3

#25 BROCK ST.

1/3-5/83
KELLEY
RCW/JSW/BTC



10-5'
1-WYE (1-5', 1-22½°, 1-2', EX CI)
1-2'
1-WYE (1-30°, 4-5', 1-2', 1-WYE C.O., 1-2', 1-45°, 1-2.5', EX CI)
1-4'
4-5'
1-WYE C.O.

The Commonwealth of Massachusetts

City/Town of Stoughton

FP – 5
(Rev. 12-2008)

Certificate of Registration

Massachusetts General Law, Chapter 148 §13

In accordance with the provisions of Massachusetts General Law, Chapter 148 § 13, the undersigned hereby certifies that:

Person, partnership, corporation or other entity: Murphy Coal & Oil
Name of License Holder

765 Washington Street PO Box 25 Stoughton, MA
Business Address of License Holder

Is the holder of a license granted on April 1, 2012 and subsequently amended on March 31, 2013

For the lawful use of buildings and structures located or to be located at:
Morton Square
Number, Street, and Assessor's Map and Parcel ID

As relates to the keeping, storage, manufacture, or sale of flammables, combustibles, or explosives.

X Eleanor T. Terry 3/16/12 Eleanor T. Terry
Signature of License Holder or Agent — Date — Printed Name

All materials must be stored in accordance with the provisions of Massachusetts General Law, Chapter 148, the Massachusetts Fire Code (527 CMR), and all other applicable laws and regulations, including the terms and conditions of the subject license. Quantities stored may not exceed the maximum quantity specified by the license.

REGISTRATION

This is to certify that the within named license holder has in accordance with the provisions of Massachusetts General Law, Chapter 148 §13 filed with me, a certificate of registration setting forth that the above named entity is the holder of license as relates to the keeping, storage, manufacture, or sale of flammables, combustibles, or explosives at the above described location.

Cheryl Mooney — Signature of Official
Town Clerk — Title
3/19/12 — Date

THIS REGISTRATION AND THE LICENSE MUST BE CONSPICIOUSLY POSTED ON THE LAND FOR WHICH IT IS GRANTED.

$25.

The Commonwealth of Massachusetts

City/Town of Stoughton

Certificate of Registration

FP – 5
(Rev. 12-2008)

Massachusetts General Law, Chapter 148 §13

In accordance with the provisions of Massachusetts General Law, Chapter 148 § 13, the undersigned hereby certifies that:

Person, partnership, corporation or other entity: South Shore Petro, LLC
Name of License Holder

990 Washington Street
Business Address of License Holder

Is the holder of a license granted on April 1, 2012, and subsequently amended on March 30, 2013

For the lawful use of buildings and structures located or to be located at:
990 Washington Street
Number, Street, and Assessor's Map and Parcel ID

As relates to the keeping, storage, manufacture, or sale of flammables, combustibles, or explosives.

XX Mary A Mooney 2/15/12 MONSY M JACOB.
Signature of License Holder or Agent Date Printed Name

All materials must be stored in accordance with the provisions of Massachusetts General Law, Chapter 148, the Massachusetts Fire Code (527 CMR), and all other applicable laws and regulations, including the terms and conditions of the subject license. Quantities stored may not exceed the maximum quantity specified by the license.

REGISTRATION

This is to certify that the within named license holder has in accordance with the provisions of Massachusetts General Law, Chapter 148 §13 filed with me, a certificate of registration setting forth that the above named entity is the holder of license as relates to the keeping, storage, manufacture, or sale of flammables, combustibles, or explosives at the above described location.

Cheryl A Mooney Town Clerk February 23 2012
Signature of Official Title Date

THIS REGISTRATION AND THE LICENSE MUST BE CONSPICIOUSLY POSTED ON THE LAND FOR WHICH IT IS GRANTED.

I just spoke to you on the phone about a 21 E file search for the following properties:

4/25/12

PARCEL ID	ADDRESS	OWNER
054_110	2 Canton Street 1000 Removed	Stoughton Center Business Park, LLC.
053_102	25 Brock Street	Juckett, M. & Corbett, T. Trustees Beta Realty Trust
054_408	15-17 Morton Square	Gouveia Nelson, E. & Kenneth Hobson, Eileen
054_401	48 Wyman Street No Underground	Quality Auto Parts of Stoughton, C/O C H Beckford
054_407	Morton Street (abuts 15-17)	Gouveia Nelson, E. & Kenneth Hobson, Eileen
054_406	Morton Square (next to 25 Brock St?)	Murphy Coal Co. Inc. Above Ground Storage 3 Tanks
053_101	25 Brock Street	Juckett, M. & Corbett, T. Trustees Beta Realty Trust
054_402	Railroad Avenue (Portion of station Parking area) No Tanks	Town of Stoughton
054_403	Railroad Avenue (Portion of station parking area) No Tanks	Town of Stoughton

4/25/12 3:00

Town of Stoughton Tank Removals

Company: Cain Manufacturing

Street: Brock St 25

City: Stoughton **State:** MA

Gasoline:	1-10,000	**Type1:**		**Rem Date1:**	6/15/93	**Contamination1:**	
No 2:		**Type2:**		**Rem Date2:**		**Contamination2:**	
Diesel:		**Type3:**		**Rem Date3:**		**Contamination3:**	
Waste Oil:		**Type4:**		**Rem Date4:**		**Contamination4:**	
Other:	1-15,000	**Type5:**	#4 Oil	**Rem Date5:**	6/15/93	**Contamination5:**	

Removal Company: Hersee **Address:** 1296 Washington Street

Firm Transporting Waste: Enviro Product & Services

Tank Yard: Mid City Scrap Westwood

Inspected By: Lt Jardin

Dep Inspector:

Comments: A 15,000 gallon # 4 Oil and a 10,000 Gasoline tank were removed 6/15/93. There are no notations on the permits regarding contamination.

Date: 1/96

2000 = 1
2001 = 0
2002 0
2003 0
2004 0
2005 0
2006 0
2007 0
2008 = 1
2009 0
2010 0
2011 0
2012 0

Town of Stoughton Tank Removals

Company: New England Furniture

Street: Brock St 26

City: Stoughton **State:** MA

Gasoline:		**Type1:**		**Rem Date1:**		**Contamination1:**	
No 2:	1-500	**Type2:**	Steel	**Rem Date2:**	8/11/93	**Contamination2:**	no
Diesel:		**Type3:**		**Rem Date3:**		**Contamination3:**	
Waste Oil:		**Type4:**		**Rem Date4:**		**Contamination4:**	
Other:		**Type5:**		**Rem Date5:**		**Contamination5:**	

Removal Company: Hersee **Address:** 1296 Washington Street Stoug

Firm Transporting Waste: Enviro Products & Services

Tank Yard: Grants

Inspected By: Lt Jardin

Dep Inspector:

Comments: A 500 gallon fuel oil tank was removed 8/11/93. There is no notation on the permit regarding contamination.

Date: 1/96

Town of Stoughton Tank Removals

Company: MDM Machine

Street: Brock St 25R

City: Stoughton **State:** MA

Gasoline:		**Type1:**		**Rem Date1:**		**Contamination1:**	
No 2:	1-275	**Type2:**	Steel	**Rem Date2:**	10/14/00	**Contamination2:**	
Diesel:		**Type3:**		**Rem Date3:**		**Contamination3:**	
Waste Oil:		**Type4:**		**Rem Date4:**		**Contamination4:**	
Other:		**Type5:**		**Rem Date5:**		**Contamination5:**	

Removal Company: Kelleher **Address:** 265 Plain St. Rockland

Firm Transporting Waste: Same

Tank Yard: Brisco Bailing

Inspected By: Chief Stipp

Dep Inspector:

Comments: No contamination found

Date: 11/16/00

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: $50

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) MDM Machine X _____ (Signature (if applying for permit))

Address 25 R Brock St. (Street) Stoughton (City) MA (State) (Zip)

Removal Contractor

Company Name Kelleher (Print)

Address 265 Plain St. Rockland (Print)

Signature (if applying for permit)

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual _____ (Print)

Address _____ (Print)

Signature (if applying for permit)

☐ IFCI Certified ☐ LSP # _____ Other _____

Tank Information

Tank Location rear deck - 25 R Brock St. (Street Address) (City)

Tank Capacity (gallons) 275 Substance Last Stored # 2 fuel oil

Tank Dimensions (diameter x length) 60x40x27

Remarks: Tank is upright sitting on dock at location. It is empty

Disposal Information

Firm transporting waste _____ State Lic. # _____

Hazardous waste manifest# _____ E.P.A. # _____

Approved tank disposal yard Brisco Bailing Tank yard # 010

Type of inert gas _____ Tank yard address 45 Freight St. Brockton

Approvals

City or Town Stoughton FDID# 21285 Permit# 00-024

Date of issue 10/11/00 Date of expiration 10/14/00

Dig safe approval number: N/A

Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit _____

After removal(s) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Place, Room 1310, Boston, MA 02108-1618

Town of Stoughton Tank Removals

Company: Owner

Street: Brock St. 025 R

City: Stoughton **State:** MA

Gasoline:		**Type1:**	**Rem Date1:**	**Contamination1:**
No 2:	275	**Type2:**	**Rem Date2:** 3/10/99	**Contamination2:**
Diesel:		**Type3:**	**Rem Date3:**	**Contamination3:**
Waste Oil:		**Type4:**	**Rem Date4:**	**Contamination4:**
Other:		**Type5:**	**Rem Date5:**	**Contamination5:**

Removal Company: ATCO Heating **Address:**

Firm Transporting Waste:

Tank Yard: Brisco Bailing #010

Inspected By:

Dep Inspector:

Comments: Outside tank removal for placement of new tank. Staining on ground from previous problems with this location. This tank seemed to have no leaks.

Date: 3/15/99

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Office of the State Fire Marshal

APPLICATION and PERMIT

Fee: $75

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) Stoughton Center Business Park X _____ (Signature (if applying for permit))

Address 2 Canton Street Suite 222 (Street) Stoughton (City) MA (State) 02072 (Zip)

Removal Contractor

Company Name Cyn Environmental (Print)

Address 100 Tosca Drive Stoughton (Print)

Signature (if applying for permit)

----------On file----------

☐ IFCI* Certified Other _____

Contamination Assessment

Co. or Individual Woodard and Curran (Print)

Address 980 Woodard St. Dedham (Print)

Signature (if applying for permit)

_____

☐ IFCI* Certified LSP # 3989 Other _____

Tank Information

Tank Location 2 Canton Street Suite 222 (Street Address) Stoughton (City) MA 02072

Tank Capacity (gallons) 3000 Substance Last Stored #6 oil

Tank Dimensions (diameter x length) 64"x18'

Remarks: Contamination noted. RTN 4-21470 DEP Mike Whiteside

Disposal Information

Firm transporting waste Cyn Environmental State Lic. # MA40

Hazardous waste manifest# 660048JJK E.P.A. # MAD082303777

Approved tank disposal yard Grant CO Tank yard # 008

Type of inert gas CO2 Tank yard address 28 Walcott Street Readville MA

Approvals

City or Town Stoughton FDID# 21285 Permit# 2008-08

Date of issue 8/26/2008 Date of expiration _____

Dig safe approval number: _____ Dig Safe Toll Free Tel. Number · **888-344-7233**

Signature / Title of Officer granting permit Lt. Michael Peck

After removal(s) ("Consumptive Use" fuel oil tanks exempted) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, Department of Fire Services, P.O. Box 1025, State Road, Stow, MA 01775.

*International Fire Code Institute

Town of Stoughton Tank Removals

Company: Stoughton Crossing

Street: Canton St 002

City: Stoughton **State:** MA

Gasoline:		**Type1:**		**Rem Date1:**		**Contamination1:**	
No 2:		**Type2:**		**Rem Date2:**		**Contamination2:**	
Diesel:		**Type3:**		**Rem Date3:**		**Contamination3:**	
Waste Oil:		**Type4:**		**Rem Date4:**		**Contamination4:**	
Other:	1-10,000	**Type5:**	#4	**Rem Date5:**	11/13/92	**Contamination5:**	

Removal Company: Elia Mascioli General Contracti **Address:** 13 1/2 nantasket Ave Hull, Ma

Firm Transporting Waste: Clean Harbors

Tank Yard: Grants

Inspected By: Lt Roach

Dep Inspector:

Comments: A 10,000 gallon #4 oil tank was removed from the Cochoran Shoe factory. There is no indication on the permit of any contamination.

Date: 1/96

Town of Stoughton Tank Removals

Company: Corcoran Shoe

Street: Canton St 002

City: Stoughton **State:** MA

Gasoline:	1-500	**Type1:**	**Rem Date1:**	11/17/89	**Contamination1:**
No 2:		**Type2:**	**Rem Date2:**		**Contamination2:**
Diesel:		**Type3:**	**Rem Date3:**		**Contamination3:**
Waste Oil:		**Type4:**	**Rem Date4:**		**Contamination4:**
Other:		**Type5:**	**Rem Date5:**		**Contamination5:**

Removal Company: J.F. McNamara **Address:** 161 Morton Street,Stoughton

Firm Transporting Waste:

Tank Yard: Grants

Inspected By:

Dep Inspector:

Comments: Permit shows two tanks were removed. 1-500 gasoline and 1-5,000 gallon tank. The permit does not indicate what product was in the 5,000 gallon tank. The permit does indicate that DEP was notified.

Date: 1/96

Town of Stoughton Tank Removals

Company: Town of Stoughton

Street: Wyman St 45-47

City: Stoughton **State:** MA

Gasoline:		**Type1:**		**Rem Date1:**		**Contamination1:**	
No 2:	4-330	**Type2:**	Steel AST	**Rem Date2:**	1/3/97	**Contamination2:**	no
Diesel:		**Type3:**		**Rem Date3:**		**Contamination3:**	
Waste Oil:		**Type4:**		**Rem Date4:**		**Contamination4:**	
Other:		**Type5:**		**Rem Date5:**		**Contamination5:**	

Removal Company: Keystone Environmental **Address:** P.O. Box 143, Stoughton

Firm Transporting Waste: Western Environmental

Tank Yard: Brockton Iron & Steel

Inspected By: Lt. Paul Roach

Dep Inspector:

Comments: 4-330 gallon aboveground storage tanks were removed with no apparent contamination.

Date: 1/3/97

Stoughton Fire Department Tank Location Report

Company: Murphy Coal Co.

Street: Morton Sq 017

City: Stoughton **State:** MA

Contact Name: **Tel #1:**

Owner: **Tel #2:**

Storage Tanks

Gasoline:		**Type1:**	**Installed1:**	**Tested1:**
# 2 Oil:	3-15k, 2-10	**Type2:** AST	**Installed2:**	**Tested2:**
Diesel:		**Type3:**	**Installed3:**	**Tested3:**
Waste Oil:		**Type4:**	**Installed4:**	**Tested4:**
Other:		**Type5:**	**Installed5:**	**Tested5:**

Total Storage: 65,000

Installation Company:

Additional Comments:

Inspected By: Lt. Scott G. Breen

Comments:

Date: 1/96 **Next Inspection:**

Stoughton Fire Department Tank Location Report

Company: Owner

Street: Morton Sq 011

City: Stoughton **State:** MA

Contact Name: **Tel #1:**

Owner: **Tel #2:**

Storage Tanks

Gasoline:		**Type1:**	**Installed1:**	**Tested1:**
# 2 Oil:	1-1,000	**Type2:**	**Installed2:**	**Tested2:**
Diesel:		**Type3:**	**Installed3:**	**Tested3:**
Waste Oil:		**Type4:**	**Installed4:**	**Tested4:**
Other:		**Type5:**	**Installed5:**	**Tested5:**

Total Storage: 1,000

Installation Company:

Additional Comments:

Inspected By: Lt. Scott G. Breen

Comments:

Date: 1/96 **Next Inspection:**

Stoughton Fire Department Tank Location Report

Company:	New England Furniture		
Street:	Morton Sq 003		
City:	Stoughton	**State:**	MA
Contact Name:		**Tel #1:**	
Owner:		**Tel #2:**	

Storage Tanks

Gasoline:		**Type1:**	**Installed1:**	**Tested1:**
# 2 Oil:	1,000	**Type2:**	**Installed2:**	**Tested2:**
Diesel:		**Type3:**	**Installed3:**	**Tested3:**
Waste Oil:		**Type4:**	**Installed4:**	**Tested4:**
Other:		**Type5:**	**Installed5:**	**Tested5:**

Total Storage: 1,000

Installation Company:

Additional Comments:

Inspected By: Lt. Scott G. Breen

Comments:

Date: 1/96 **Next Inspection:**

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF: JAMES G. GRANT CO., INC.
R. 28 WOLCOTT ST.

APPROVED TANK YARD: READVILLE, MA 02137

APPROVED TANK YARD NO. 03501

Tank Yard Ledger 502 CMR 3.03(4) Number: 8 2 0 3 5 8 2

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership JAMES G. GRANT CO., INC. and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE — TITLE — DATE SIGNED 11-17-89

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF: JAMES G. GRANT CO., INC.
R. 28 WOLCOTT ST.

APPROVED TANK YARD: READVILLE, MA 02137

APPROVED TANK YARD NO. 03501

Tank Yard Ledger 502 CMR 3.03(4) Number: 8 2 0 3 5 8 2

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership JAMES G. GRANT CO., INC. and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE — TITLE — DATE SIGNED 11-17-89

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

The Commonwealth of Massachusetts

Department of Public Safety—Division of Fire Prevention

APPLICATION FOR PERMIT FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

DEP notified per Lt. Fawcett

2 Tanks
~~1,000~~ 5,000 Mob
@ 550 (gas)

11-17 (Date) 1989

To: HEAD OF FIRE DEPARTMENT
STOUGHTON
City or Town

C.82 S.40 M.G.L.
DIG SAFE NUMBER
893758 43
Start Date 11-17-89

In accordance with the provisions of Chapter 148, G.L. as provided in Section 38A Application is hereby made by J F McNAMARA + SONS
(Name of Person, Firm or Corporation)

161 MORTON ST. STOUGHTON
Address

For permission to remove and transport underground steel storage tank(s) from
CORCORAN SHOE
2 CANTON ST. STOUGHTON
Street address (city or town)

FDID# 21285 to approved Tank Yard# 03501

State clearly type of inert gas used in steel storage tank _____ Type of inert gas used

Name of Person, Firm, Corporation disposing tank _____

Date issued - rejected 11-17 1989
Date of expiration 11-18 1989 paid/due $20.—

By: John F. McNamara
Signature of Applicant

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC SAFETY—DIVISION OF FIRE PREVENTION

PERMIT

FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

11-17 (Date) 1989

C.82 S.40 M.G.L.
DIG SAFE NUMBER
893758 43
Start Date 11-17-89

In accordance with the provisions of Chapter 148, G.L. as provided in Section 38A this permit is granted to

Name: J.F. McNAMARA + SONS
Full name of person, firm or Corporation

To transport underground steel storage tank(s) to Approved tank yard# 03501

State clearly type of inert gas used in steel storage tank _____

FDID# 21285

Fee paid $ 20.—

steel tank: _____ method

Name and address of contractor disposing tank

Location to which tank will be transported

03501

This P...

DIMENSIONS

Width Length

Tank 1 ----- X -----

Tank 2 ----- X -----

Tank 3 ----- X -----

Tank 4 ----- X -----

Tank 5 ----- X -----
(feet) (feet)

Tank Removed From

(no. street)

(city or town)

Fire Department
Permit # ---
(if applicable)

DIMENSIONS

Width Length

Tank 1 ----- X -----

Tank 2 ----- X -----

Tank 3 ----- X -----

Tank 4 ----- X -----

Tank 5 ----- X -----
(feet) (feet)

Tank Removed From

(no. street)

(city or town)

Fire Department
Permit # ---
(if applicable)

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts
Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 92-32 Date NOV 12 1992

STOUGHTON
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ 25.00

DIG SAFE NUMBER
92463776
start date 11-13-92

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: ELIA A. MASCIOLI GEN. CONT.

Street Address & City or Town: 13½ NANTASKET AVE HULL MA. 02045

Signature of applicant: Elia A. Mascioli

Applicants name printed: ELIA A. MASCIOLI

For permission to remove and transport one underground storage tank from.

Owner: STOUGHTON CROSSING Street Address: SUMMER ST.

Firm transporting waste: Clean Harbors State Lic.#

Hazardous waste manifest # N E.P.A.#

Approved tank yard: Walcott St. Leadville, MA # 03501

Tank yard Address: GRANTS STEEL YEARD

Type of inert gas: Co^2 UL tank #:

Tank capacity: 10,000 Substance last stored: #4

Date of issue: 11-13- 1992 Date of expiration: 11-20- 1992

Signature/Title of Officer granting permit:

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: JAMES G. GRANT CO., INC. R. 28 WOLCOTT ST. READVILLE, MA 02137

APPROVED TANK YARD NO. 03501

Tank Yard Ledger 502 CMR 3.03(4) Number: 9212037

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership ELIA MASCIOLI and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

Ken Grant — SIGNATURE
Vice Pres — TITLE
12-16-92 — DATE SIGNED

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

DIMENSIONS

	Width		Length
Tank 1	-----	X	-----
Tank 2	-----	X	-----
Tank 3	-----	X	-----
Tank 4	-----	X	-----
Tank 5	-----	X	-----
	(feet)		(feet)

10,000 Gal

Tank Removed From
Summer St
(no. street)
Stoughton
(city or town)

Fire Department Permit # 92-32
(if applicable)

(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 93-31 Date 5 / 17 1993

STOUGHTON
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ 25

DIG SAFE NUMBER
93186452
start date 5/14/93

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: American Tank & Boiler

Street Address & City or Town: 40 Ellerton Road Quincy Ma. 02169

Signature of applicant: Raymond C Alongi

Applicants name printed: Raymond C. Alongi

For permission to remove and transport one underground storage tank from.

Owner: ALPHA CHEMICAL Co. Street Address: 42 MORTON ST

Firm transporting waste: A.T.B. Environmental State Lic.# MAV000017229

Hazardous waste manifest # — E.P.A.# —

Approved tank yard: James G. Grant Co. # 03501

Tank yard Address: R28 Wolcott St. Readville Hydepark Ma.

Type of inert gas: Co2 UL tank #: —

Tank capacity: 1,000 Substance last stored: # 2 fuel oil

Date of issue: MAY 17 1993 Date of expiration: MAY 20 1993

Signature/Title of Officer granting permit: Lt Daniel M Jordan

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD — JAMES G. GRANT CO., INC. R. 28 WOLCOTT ST. READVILLE, MA 02137

APPROVED TANK YARD NO. — — — 03501 —

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 3 1 3 1 3 7

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership AMERICAN TANK & Boiler and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 2L285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE — TITLE — 5-17-93 DATE SIGNED

This signed receipt of disposal must be returned to the local head of the fire department FDID# 2L285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88)

(OVER)

MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

DIMENSIONS

	Width		Length
Tank 1	-----	X	-----
Tank 2	-----	X	----- 5,000gal
Tank 3	-----	X	-----
Tank 4	-----	X	-----
Tank 5	-----	X	-----
	(feet)		(feet)

Tank Removed From

42 Boston ST.
(no. street)

Stoughton
(city or town)

Fire Department Permit # 93-31
(if applicable)

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 93-55 Date June 15 1993

Stoughton
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ 25.00

DIG SAFE NUMBER
9 324/25 866 6-17-93
start date ~~6-15-93~~

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: Scott K Hersee

Street Address & City or Town: 1256 Washington ST

Signature of applicant: Scott K Hersee

Applicants name printed: Scott K Hersee

For permission to remove and transport one underground storage tank from.

Owner: Earl Cain Street Address: 25 Brock ST

Firm transporting waste: Environmental Services State Lic.# 316

Hazardous waste manifest # MA 125174 E.P.A.# MP5082381609

Approved tank yard: Grants # _____

Tank yard Address: Nyde Park

Type of inert gas: CO2 UL tank #: _____

Tank capacity: 1000 Substance last stored: gas

Date of issue: 6-15 1993 Date of expiration: 6-18 1993

Signature/Title of Officer granting permit: Lt [signature]

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: JAMES G. GRANT CO., INC.
R. 28 WOLCOTT ST.
READVILLE, MA 02137

APPROVED TANK YARD NO. 03501

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 3 1 3 5 6 3

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Scott Hemsley and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE _____ TITLE _____ 6-16-93 DATE SIGNED

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFI

DIMENSIONS

	Width		Length
Tank 1	-----	X	-----
Tank 2	-----	X	----- 1,000gal
Tank 3	-----	X	-----
Tank 4	-----	X	-----
Tank 5	-----	X	-----
	(feet)		(feet)

Tank Removed From

25 Brock St
(no. street)

Stoughton
(city or town)

Fire Department Permit # 93-55
(if applicable)

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 93-57 Date 6-15 1993

Stoughton
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ 25.00

DIG SAFE NUMBER
93242586
start date 6-13-93

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: Scott Nersee

Street Address & City or Town: 1296 Washington ST

Signature of applicant: Scott K Nersee

Applicants name printed: Scott K Nersee

For permission to remove and transport one underground storage tank from.

Owner: Earl Cain Street Address: 25 Brock ST

Firm transporting waste: Enviroment Serv. State Lic.# 316

Hazardous waste manifest # MAC 175 174 E.P.A.# MA1508238609

Approved tank yard: ~~Grants~~ #

Tank yard Address: ~~Hyde Park~~ WESTPOINT

Type of inert gas: UL tank #:

Tank capacity: 15,000 Substance last stored: ~~#~~ 4

Date of issue: 6-15 1993 Date of expiration: 6-18 1993

Signature/Title of Officer granting permit: Lt

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: JAMES G. GRANT CO., INC.
R. 28 WOLCOTT ST.
READVILLE, MA 02137

APPROVED TANK YARD NO. 03501

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 3 1 3 5 8 0

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership SCOTT HOUSE
and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21283 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE | TITLE | 6-17-93 DATE SIGNED

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21283 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFIC

DIMENSIONS

	Width		Length
Tank 1	-----	X	-----
Tank 2	-----	X	-----
Tank 3	-----	X	-----
Tank 4	-----	X	-----
Tank 5	-----	X	-----
	(feet)		(feet)

10,000

Tank Removed From
25 Brock St.
(no. street)
Stewarton
(city or town)

Fire Department Permit # 93-57
(if applicable)

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 93-80 Date 8-11 19 93

STOUGHTON MA 02072
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ 25.00

DIG SAFE NUMBER
933 26 705
start date 8-10-93

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: Scott K Hersee

Street Address & City or Town: 1296 Washington ST Stoughton

Signature of applicant: Scott K Hersee

Applicants name printed: Scott K Hersee

For permission to remove and transport one underground storage tank from.

Owner: New England Furniture Street Address: 26 Brock ST

Firm transporting waste: Envir. Ser. + Prod. State Lic.# 316

Hazardous waste manifest # MAG 139752 E.P.A.# MA 617-349306(illegible)

Approved tank yard: Grants # _____

Tank yard Address: Readville

Type of inert gas: NA UL tank #: NA

Tank capacity: 500 Substance last stored: #2

Date of issue: 8-11 19 93 Date of expiration: 8-14 19 93

Signature/Title of Officer granting permit: Lt David M Jordan

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: JAMES G. GRANT CO., INC. ~~R. 28 WOLCOTT ST.~~ ~~READVILLE, MA 02137~~

APPROVED TANK YARD NO. ~~03501~~

Tank Yard Ledger 502 CMR 3.03(4) Number: 9314306

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Scott Henry and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE _____ TITLE _____ DATE SIGNED 5-11-93

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

DIMENSIONS

	Width		Length
Tank 1	-----	X	-----
Tank 2	-----	X	----- 500gal
Tank 3	-----	X	-----
Tank 4	-----	X	-----
Tank 5	-----	X	-----
	(feet)		(feet)

Tank Removed From
20 Brock ST
(no. street)
Stoughton
(city or town)

Fire Department Permit # 93-80
(if applicable)

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 97-04 Date January 3, 1997

STOUGHTON MA 02072
City, Town or District

C.82 S.40 M.G.L.

DIG SAFE NUMBER
ABOVEGROUND TANK
start date N/A

Fee Paid: $ NO FEE

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: KEYSTONE ENVIRONMENTAL

Street Address & City or Town: P.O. BOX 143, STOUGHTON, MA 02072

Signature of applicant: Kevin J Stetson

Applicants name printed: KEVIN J. STETSON; OPERATIONS MANAGER

For permission to remove and transport one underground storage tank from.

Owner: STOUGHTON RAILROAD STATION Street Address: 45-47 WYMAN STREET

Firm transporting waste: WEATERN ENVIRONMENTAL State Lic.# MA406

Hazardous waste manifest # MAJ165869 E.P.A.# MA5000000315

Approved tank yard: BRISCO BALING/ BROCKTON IRON & STEEL # 010

Tank yard Address: 45 FREIGHT STREET, BROCKTON, MA 02402

Type of inert gas: DRY ICE (if needed) UL tank #: N/A

Tank capacity: 330 Gallons Substance last stored: #2 HEATING OIL

Date of issue: JANUARY 3, 1997 Date of expiration: 1-7- 1997

Signature/Title of Officer granting permit: H Paul Gould

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK (508) 586-4640

NAME AND ADDRESS OF APPROVED TANK YARD: ~~BRIGGS DALING CORP~~ 45 FREIGHT STREET BROCKTON, MA 02402

APPROVED TANK YARD NO. 0 0 0 1 0

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 7 0 0 0 0 5

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Keystone Envir. P.O.14 Stoughton MA and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 2 1 2 8 5 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE	TITLE	DATE SIGNED
	BMP	1/6/97

This signed receipt of disposal must be returned to the local head of the fire department FDID# 2 1 2 8 5 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 11/95) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

Tank Data

Gallons 330

Previous Contents #2011

Diameter_____ **Length**_____

Date Received 1/6/97

Serial # (if available)_____

Tank I.D. # (Form FP-290)___

Tank Removed From:

45-47 Wyman St
(No. and Street)

Staughton
(City or Town)

Fire Dept. Permit # 97-04

Owner/Operator to mail revised copy of Notification Form(FP-290, or Fp-290R) to: UST Compliance, Office of the State Fire Marshal, 1010 Commonwealth Avenue, Boston, Ma. 02215.

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 97-03 Date January 3, 1997

STOUGHTON MA 02072
City, Town or District

C.82 S.40 M.G.L.

DIG SAFE NUMBER
ABOVEGROUND TANK
start date N/A

Fee Paid: $ NO FEE

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: KEYSTONE ENVIRONMENTAL

Street Address & City or Town: P.O. BOX 143, STOUGHTON, MA 02072

Signature of applicant: Kevin J Stetson

Applicants name printed: KEVIN J. STETSON; OPERATIONS MANAGER

For permission to remove and transport one underground storage tank from.

Owner: STOUGHTON RAILROAD STATION Street Address: 45-47 WYMAN STREET

Firm transporting waste: WEATERN ENVIRONMENTAL State Lic.# MA406

Hazardous waste manifest # MAJ165869 E.P.A.# MA5000000315

Approved tank yard: BRISCO BALING/ BROCKTON IRON & STEEL # 010

Tank yard Address: 45 FREIGHT STREET, BROCKTON, MA 02402

Type of inert gas: DRY ICE (if needed) UL tank #: N/A

Tank capacity: 330 Gallons Substance last stored: #2 HEATING OIL

Date of issue: JANUARY 3, 1997 Date of expiration: 1-7- 1997

Signature/Title of Officer granting permit: Lt Paul Roach

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: BRIGGO BALING CORP, 45 FREIGHT STREET, BROCKTON, MA 02402 (508) 586-4640

APPROVED TANK YARD NO. 0 0 0 1 0

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 7 0 0 0 0 4

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Keystone Envir. P.O. 143 Stoughton MA 02072 and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 21285 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE	TITLE	DATE SIGNED
[signature]	BMP	11/6/97

This signed receipt of disposal must be returned to the local head of the fire department FDID# 21285 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 11/95) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

Tank Data

Gallons 330

Previous Contents #2 oil

Diameter_____ **Length**_____

Date Received 1/6/97

Serial # (if available)_____

Tank I.D. # (Form **FP-290**)___

Tank Removed From:

45-47 Wyman St
(No. and Street)

Stoughton
(City or Town)

Fire Dept. Permit # 97-03

Owner/Operator to mail revised copy of Notification Form(FP-290, or Fp-290R) to: UST Compliance, Office of the State Fire Marshal, 1010 Commonwealth Avenue, Boston, Ma. 02215.

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 97-02 Date January 3, 1997

STOUGHTON MA 02072
City, Town or District

C.82 S.40 M.G.L.

DIG SAFE NUMBER
ABOVEGROUND TANK
start date N/A

Fee Paid: $ NO FEE

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: KEYSTONE ENVIRONMENTAL

Street Address & City or Town: P.O. BOX 143, STOUGHTON, MA 02072

Signature of applicant: Kevin J Stetson

Applicants name printed: KEVIN J. STETSON; OPERATIONS MANAGER

For permission to remove and transport one underground storage tank from.

Owner: STOUGHTON RAILROAD STATION Street Address: 45-47 WYMAN STREET

Firm transporting waste: WEATERN ENVIRONMENTAL State Lic.# MA406

Hazardous waste manifest # MAJ165869 E.P.A.# MA5000000315

Approved tank yard: BRISCO BALING/ BROCKTON IRON & STEEL # 010

Tank yard Address: 45 FREIGHT STREET, BROCKTON, MA 02402

Type of inert gas: DRY ICE (if needed) UL tank #: N/A

Tank capacity: 330 Gallons Substance last stored: #2 HEATING OIL

Date of issue: JANUARY 3, 1997 Date of expiration: 1-7 1997

Signature/Title of officer granting permit: Lt Paul Stack

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

(508) 583-4640

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: BRIGGS BALING CORP, 45 FREIGHT STREET, BROCKTON, MA 02402

APPROVED TANK YARD NO. 0 0 0 0 0

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 7 0 0 0 0 3

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Keystone Enviro. P.O.143 Stoughton, MA 02072 and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDID# 2 1 2 2 5 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE	TITLE	DATE SIGNED
[signature]	BMP	1/6/97

This signed receipt of disposal must be returned to the local head of the fire department FDID# 2 1 2 2 5 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 11/95) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

Tank Data

Gallons 330

Previous Contents #2011

Diameter_____ **Length**_____

Date Received 1/6/97

Serial # (if available)_____

Tank I.D. # (Form FP-290)___

Tank Removed From:

45-47 Wyman St
(No. and Street)

Stoughton
(City or Town)

Fire Dept. Permit # 97-02

Owner/Operator to mail revised copy of Notification Form(FP-290, or Fp-290R) to: UST Compliance, Office of the State Fire Marshal, 1010 Commonwealth Avenue, Boston, Ma. 02215.

FORM F.P. 292
(rev. 9/90)

The Commonwealth of Massachusetts

Department of Public Safety
Division of Fire Prevention and Regulation

APPLICATION FOR PERMIT, AND PERMIT, FOR REMOVAL AND TRANSPORTATION TO APPROVED TANK YARD

FDID# 21285 Permit # 97-01 Date January 3, 1997

STOUGHTON MA 02072
City, Town or District

C.82 S.40 M.G.L.

Fee Paid: $ NO FEE

DIG SAFE NUMBER
ABOVEGROUND TANK
start date N/A

In accordance with the provisions of Chapter 148, Sec. 38A, M.G.L., 527 CMR 9.00 application is hereby made by: KEYSTONE ENVIRONMENTAL

Street Address & City or Town: P.O. BOX 143, STOUGHTON, MA 02072

Signature of applicant: Kevin Stetson

Applicants name printed: KEVIN J. STETSON; OPERATIONS MANAGER

For permission to remove and transport one underground storage tank from.

Owner: STOUGHTON RAILROAD STATION Street Address: 45-47 WYMAN STREET

Firm transporting waste: WEATERN ENVIRONMENTAL State Lic.# MA406

Hazardous waste manifest # MAJ165869 E.P.A.# MA5000000315

Approved tank yard: BRISCO BALING/ BROCKTON IRON & STEEL # 010

Tank yard Address: 45 FREIGHT STREET, BROCKTON, MA 02402

Type of inert gas: DRY ICE (if needed) UL tank #: N/A

Tank capacity: 330 Gallons Substance last stored: #2 HEATING OIL

Date of issue: JANUARY 3, 1997 Date of expiration: 1-7-1997

Signature/Title of Officer granting permit: Lt. Paul Leach

KEEP ORIGINAL AS APPLICATION AND ISSUE DUPLICATE AS PERMIT

RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD: BROCCO BALING CORP, 45 FREIGHT STREET, BROCKTON MA 02402

APPROVED TANK YARD NO. 0 0 0 1 0

Tank Yard Ledger 502 CMR 3.03(4) Number: 9 7 0 0 0 0 2

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Houston Environ. P.O. 143 Stoughton MA 02072 and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards.
A valid permit was issued by LOCAL Head of Fire Department FDID# 2 1 2 8 5 to transport this tank to this yard.
Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE	TITLE	DATE SIGNED
	BKP	1/6/97

This signed receipt of disposal must be returned to the local head of the fire department FDID# 2 1 2 8 5 pursuant to 502 CMR 3:00. (EACH TANK MUST HAVE A RECEIPT OF DISPOSAL)

FORM F.P. 291 (rev. 11/95) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE

Tank Data

Gallons 330

Previous Contents #2011

Diameter_____ **Length**_____

Date Received 1/6/97

Serial # (if available)_____

Tank I.D. # (Form FP-290)___

Tank Removed From:

45-47 Wyman St
(No. and Street)

Stoughton
(City or Town)

Fire Dept. Permit # 97-01

Owner/Operator to mail revised copy of Notification Form(FP-290, or Fp-290R) to: UST Compliance, Office of the State Fire Marshal, 1010 Commonwealth Avenue, Boston, Ma. 02215.

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: $50.-

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) JOHN SEMBROWSKY x _____ (Signature (if applying for permit))

Address 34 FOREST RD (Street) STOUGHTON (City) MA. (State) 02072 (Zip)

Removal Contractor

Company Name _____ (Print)

Address _____ (Print)

Signature (if applying for permit)

_____

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual _____ (Print)

Address _____ (Print)

Signature (if applying for permit)

_____

☐ IFCI Certified ☐ LSP # _____ Other _____

Tank Information

Tank Location 3 MORTON ST (Street Address) STOUGHTON (City)

Tank Capacity (gallons) 1,000 Substance Last Stored FUEL OIL

Tank Dimensions (diameter x length) 4' X 8'

Remarks: _____

Disposal Information

Firm transporting waste C&N ENV. State Lic. # _____

Hazardous waste manifest# _____ E.P.A. # _____

Approved tank disposal yard BROCKTON IRON + STEEL Tank yard # 010

Type of inert gas _____ Tank yard address _____

Approvals

City or Town STOUGHTON FDID# 21285 Permit# 99-21

Date of issue 6/15/99 Date of expiration 6/18/99

Dig safe approval number: 19992407566 Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit Dep. Chief Paul Frost

After removal(s) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Pl.

Form FP 291

Commonwealth of Massachusetts
Department of Fire Services - Office of the State Fire Marshal
RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

NAME AND ADDRESS OF APPROVED TANK YARD

~~(508) 586-4640~~
BRISCO BALING CORP
45 FREIGHT STREET
BROCKTON, MA 02402

APPROVED TANK YARD NO. 00010 Tank Yard Ledger 502 CMR 3.03 (4) Number: 9900413

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership JOHN DEMBROWSKY and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department. FDID# 2 1 2 8 5 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE _____ TITLE GM DATE SIGNED 6/15/99

This signed receipt of disposal **must be returned** to the local head of the fire department FDID# 2 1 2 8 5 pursuant to 502 CMR 3.00.

EACH TANK MUST HAVE A RECEIPT OF DISPOSAL

TANK DATA

Gallons 1000

Previous Contents fuel oil

Diameter _____ Length _____

Date Received _____

Serial # (if available) _____

Tank I.D. # (Form FP-290) _____

TANK REMOVED FROM

3 MORTON ST
(No. and Street)

STOUGHTON
(City or Town)

Fire Department Permit # 99-21

DIG SAFE # 19992407526

Owner/Operator to mail revised copy of Notification Form (FP290, or FP290R) to : UST Compliance, Office of the State Fire Marshal, P.O. Box 1025 State Road, Stow, MA 01775.

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: $50.00

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) EARL CAIN X _____ (Signature (if applying for permit))

Address 25R Brock St (Street) Stoughton (City) MA (State) 02072 (Zip)

Removal Contractor

Company Name ATCO Heating (Print)

Address _____ (Print)

Signature (if applying for permit)

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual _____ (Print)

Address _____ (Print)

Signature (if applying for permit)

☐ IFCI Certified ☐ LSP # _____ Other _____

Tank Information

Tank Location Outside 25R Brock St (Street Address) (City)

Tank Capacity (gallons) 275 Substance Last Stored #2 fuel oil

Tank Dimensions (diameter x length) _____

Remarks: Outside tank - staining on ground - No leaks in tank

Disposal Information

Firm transporting waste _____ State Lic. # _____

Hazardous waste manifest# _____ E.P.A. # _____

Approved tank disposal yard Brisco Bailey Tank yard # #010

Type of inert gas _____ Tank yard address 45 Freight St Brockton

Approvals

City or Town Stoughton FDID# 21255 Permit# 99-19

Date of issue 3/10/99 Date of expiration 3/15/99

Dig safe approval number: N/A

Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit DEC /FC

After removal(s) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Place, Room 1310, Boston, MA 02108-1618.

Commonwealth of Massachusetts
Department of Fire Services - Office of the State Fire Marshal
RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

Form FP 291

NAME AND ADDRESS OF APPROVED TANK YARD

(508) 586-4640
BRISCO BALING CORP
45 FREIGHT STREET
BROCKTON, MA 02402

APPROVED TANK YARD NO. 00010 Tank Yard Ledger 502 CMR 3.03 (4) Number: 9801286

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership ATCO HEATING + A/C and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department. FDID# ____ ____ ____ ____ ____ to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

SIGNATURE _____ TITLE _____ DATE SIGNED 3/11/99

This signed receipt of disposal **must be returned** to the local head of the fire department FDID# ____ ____ ____ ____ ____ pursuant to 502 CMR 3.00.

EACH TANK MUST HAVE A RECEIPT OF DISPOSAL

TANK DATA

Gallons 275 gal

Previous Contents Fuel Oil

Diameter _____ Length _____

Date Received _____

Serial # (if available) _____

Tank I.D. # (Form FP-290) _____

TANK REMOVED FROM

25 Rear Brock St
(No. and Street)

Stoughton
(City or Town)

Fire Department Permit # 990310

Owner/Operator to mail revised copy of Notification Form (FP290, or FP290R) to : UST Compliance, Office of the State Fire Marshal, P.O. Box 1025 State Road, Stow, MA 01775.

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: $50

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) MDM Machine X _____ (Signature (if applying for permit))

Address 25 R Brock St. (Street) Stoughton (City) MA (State) _____ (Zip)

Removal Contractor

Company Name Kelleher (Print)

Address 265 Plain St. Rockland (Print)

Signature (if applying for permit) _____

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual _____ (Print)

Address _____ (Print)

Signature (if applying for permit) _____

☐ IFCI Certified ☐ LSP # _____ Other _____

Tank Information

Tank Location rear deck - 25 R Brock St. (Street Address) (City)

Tank Capacity (gallons) 275 Substance Last Stored # 2 fuel oil

Tank Dimensions (diameter x length) 60x40x27

Remarks: Tank is upright sitting on dock at location. It is empty

Disposal Information

Firm transporting waste _____ State Lic. # _____

Hazardous waste manifest# _____ E.P.A. # _____

Approved tank disposal yard Brisco Bailing Tank yard # 010

Type of inert gas _____ Tank yard address 45 Freight St. Brockton

Approvals

City or Town Stoughton FDID# 21285 Permit# 00-024

Date of Issue 10/11/00 Date of expiration 10/14/00

Dig safe approval number: N/A

Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit _____

After removal(s) send Form FP-200R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Place, Room 1310, Boston, MA 02108-1618

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit.

Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: $50

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) MM Machine Ej Polari x _____ Signature (if applying for permit)

Address 75 R Rock St. Street City State Zip

Removal Contractor

Company Name KELLIHER. Print

Address 265 Plain ST Rockland Print

Signature (if applying for permit)

Fred Kelli

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual _____ Print

Address _____ Print

Signature (if applying for permit)

_____

☐ IFCI Certified ☐ LSP # _____ Other _____

Tank Information

Tank Location _____ Street Address Stoughton City

Tank Capacity (gallons) 275 Substance Last Stored #2

Tank Dimensions (diameter x length) 60X44X27

Remarks: Tank is upright sitting on dock at location empty.

Disposal Information

Firm transporting waste _____ State Lic. # _____

Hazardous waste manifest# _____ E.P.A. # _____

Approved tank disposal yard Berisco Tank yard # 010

Type of inert gas _____ Tank yard address 45 Freight St Stoughton

Approvals

City or Town Stoughton Fire Dept. FDID# 21285 Permit# 00-24

Date of issue 10/11/00 Date of expiration 10/14/05

Dig safe approval number: Dbove Ground tank Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit _____

After removal(s) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Place, Room 1310, Boston, MA 02108-1618.

P-292 (revised 9/96)

1-781-344-3132

Commonwealth of Massachusetts
Department of Fire Services - Office of the State Fire Marshal
RECEIPT OF DISPOSAL OF UNDERGROUND STEEL STORAGE TANK

Form FP 291

(508) 586-4640
BRISCO BALING CORP
46 FREIGHT STREET
BROCKTON, MA 02402

NAME AND ADDRESS OF APPROVED TANK YARD

APPROVED TANK YARD NO. 010 Tank Yard Ledger 502 CMR 3.03 (4) Number: 2000 2268

I certify under penalty of law I have personally examined the underground steel storage tank delivered to this "approved tank yard" by firm, corporation or partnership Kelliher and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards. A valid permit was issued by LOCAL Head of Fire Department. FDID# 2 1 2 8 5 to transport this tank to this yard.

Name and official title of approved tank yard owner or owners authorized representative:

Damaris Eastman — SIGNATURE
Manager — TITLE
11-13-2000 — DATE SIGNED

This signed receipt of disposal **must be returned** to the local head of the fire department FDID# 2 1 2 8 5 pursuant to 502 CMR 3.00.

EACH TANK MUST HAVE A RECEIPT OF DISPOSAL

TANK DATA

Gallons 275

Previous Contents #2

Diameter _____ **Length** _____

Date Received 10/13/00

Serial # (if available) _____

Tank I.D. # (Form FP-290) _____

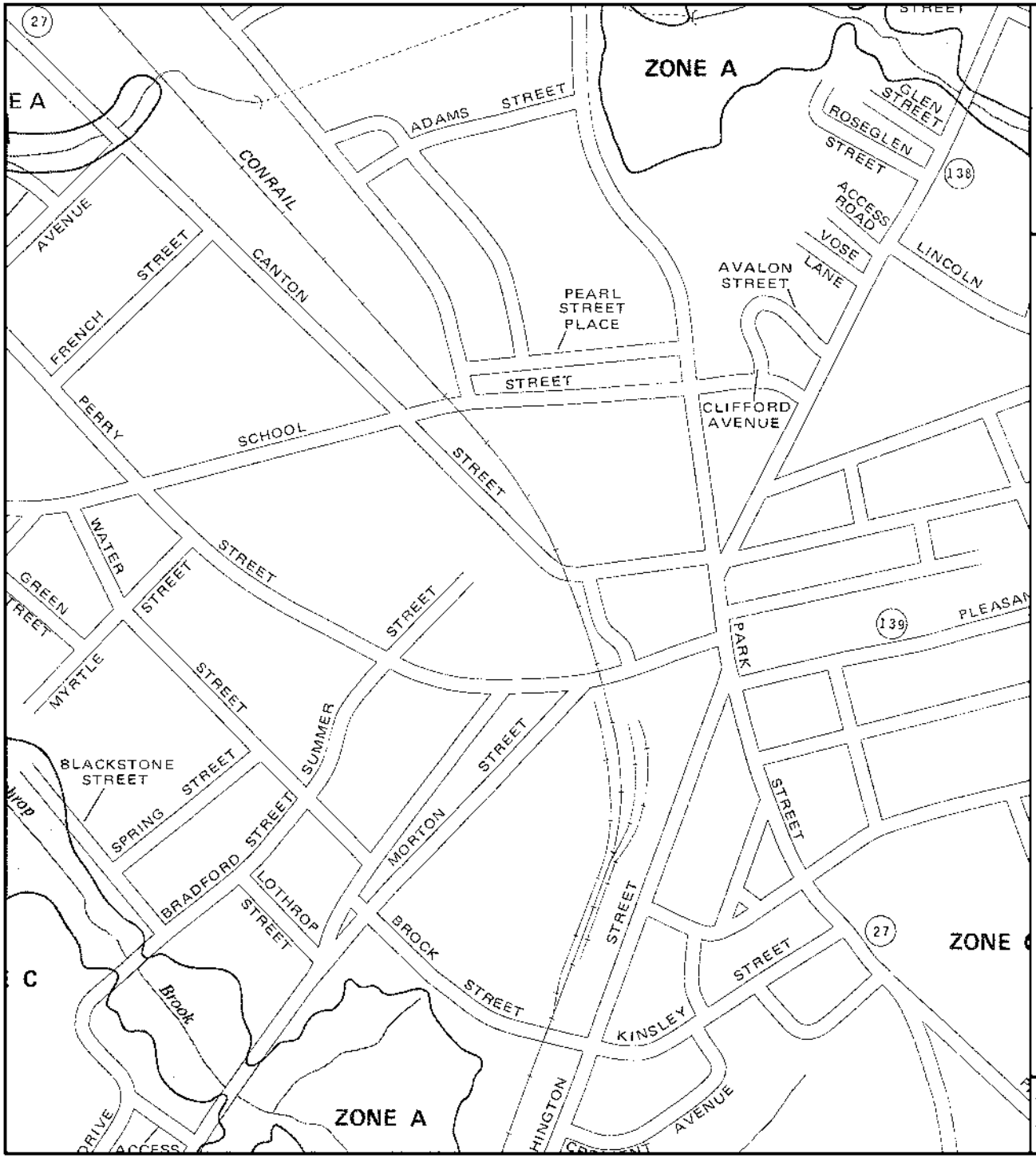
TANK REMOVED FROM

25 R Brock ST
(No. and Street)

Stoughton
(City or Town)

Fire Department Permit # 00-24

Owner/Operator to mail revised copy of Notification Form (FP290, or FP290R) to : UST Compliance, Office of the State Fire Marshal, P.O. Box 1025 State Road, Stow, MA 01775.



APPROXIMATE SCALE

600 0 600 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
STOUGHTON,
MASSACHUSETTS
NORFOLK COUNTY

PANEL 1 OF 4
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
250253 0001 B

EFFECTIVE DATE:
JUNE 1, 1982

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix E
Sanborn Maps

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Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.3
April 23, 2012

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

4/23/12

Site Name:
Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Client Name:
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471

EDR Inquiry # 3308239.3

Contact: Katie Kudzma

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Vanasse Hangen Brustlin, Inc. were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: Stoughton Station
Address: Wyman Street/Brock Street
City, State, Zip: Stoughton, MA 02072
Cross Street:
P.O. # 10111
Project: NA
Certification # 95C3-4A5F-9231

Maps Provided:

1966	1896
1949	1891
1923	1885
1912	
1906	
1901	

Sanborn® Library search results
Certification # 95C3-4A5F-9231

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

The Sanborn Library LLC Since 1866™

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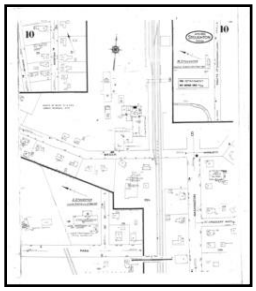
Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1966 Source Sheets

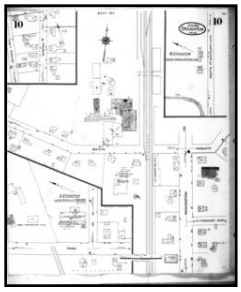
Volume 1, Sheet 8



Volume 1, Sheet 10

1949 Source Sheets

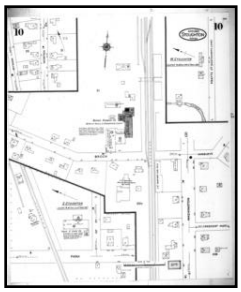
Volume 1, Sheet 8



Volume 1, Sheet 10

1923 Source Sheets

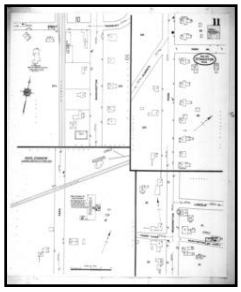
Volume 1, Sheet 8



Volume 1, Sheet 10

1912 Source Sheets

Volume 1, Sheet 10



Volume 1, Sheet 11

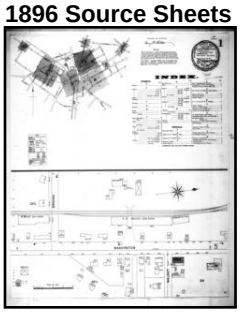
1906 Source Sheets

Volume 1, Sheet 9

1901 Source Sheets

Volume 1, Sheet Keymap/Sheet1

1896 Source Sheets

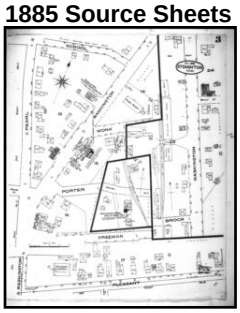


Volume 1, Sheet Keymap/Sheet1

1891 Source Sheets

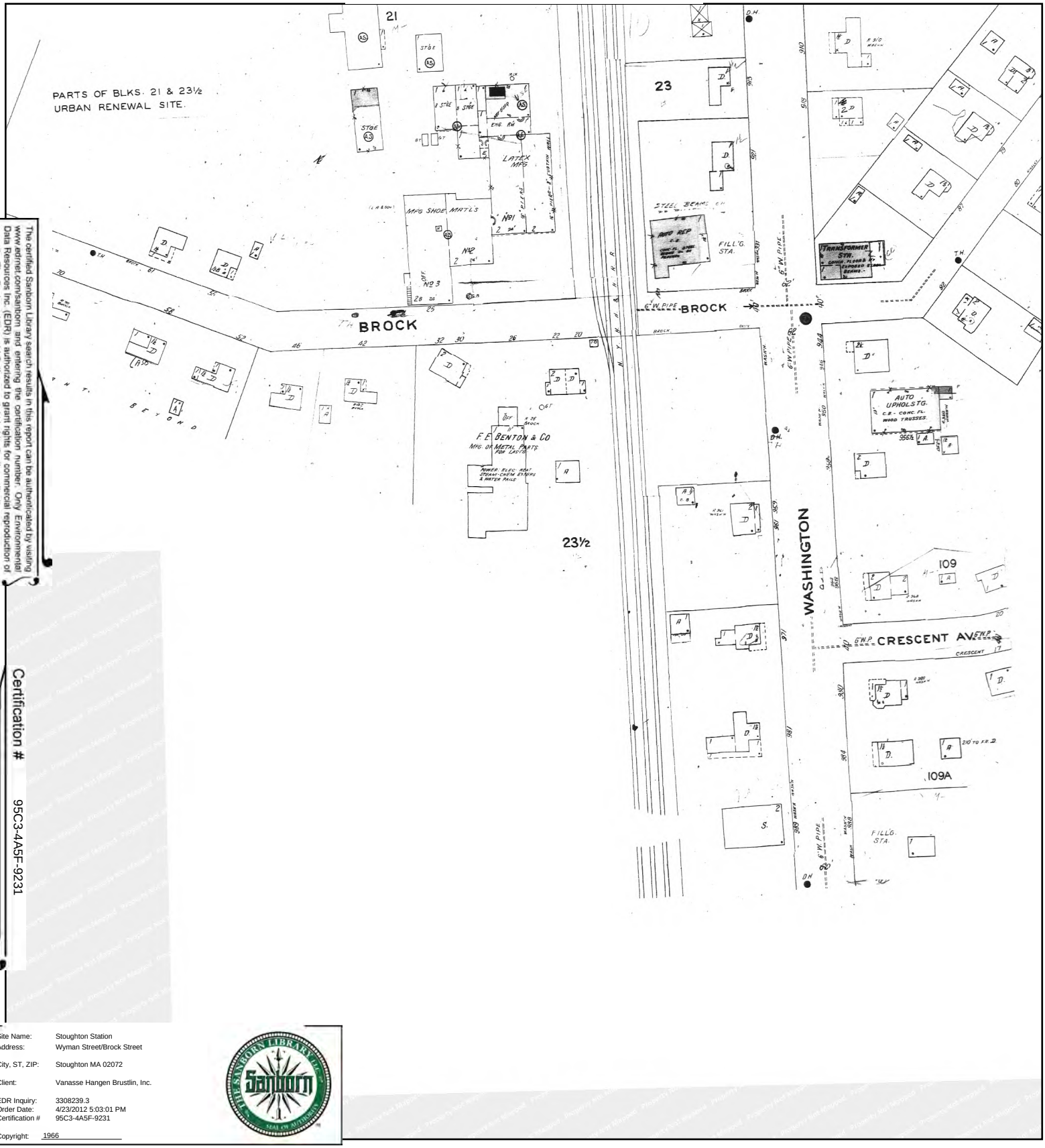
Volume 1, Sheet 3

1885 Source Sheets



Volume 1, Sheet 3

1966 Certified Sanborn Map



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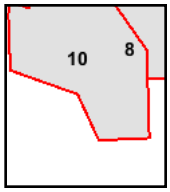
Certification # 95C3-4A5F-9231

Site Name: Stoughton Station
Address: Wyman Street/Brock Street
City, ST, ZIP: Stoughton MA 02072
Client: Vanasse Hangen Brustlin, Inc.
EDR Inquiry: 3308239.3
Order Date: 4/23/2012 5:03:01 PM
Certification # 95C3-4A5F-9231
Copyright: 1966

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

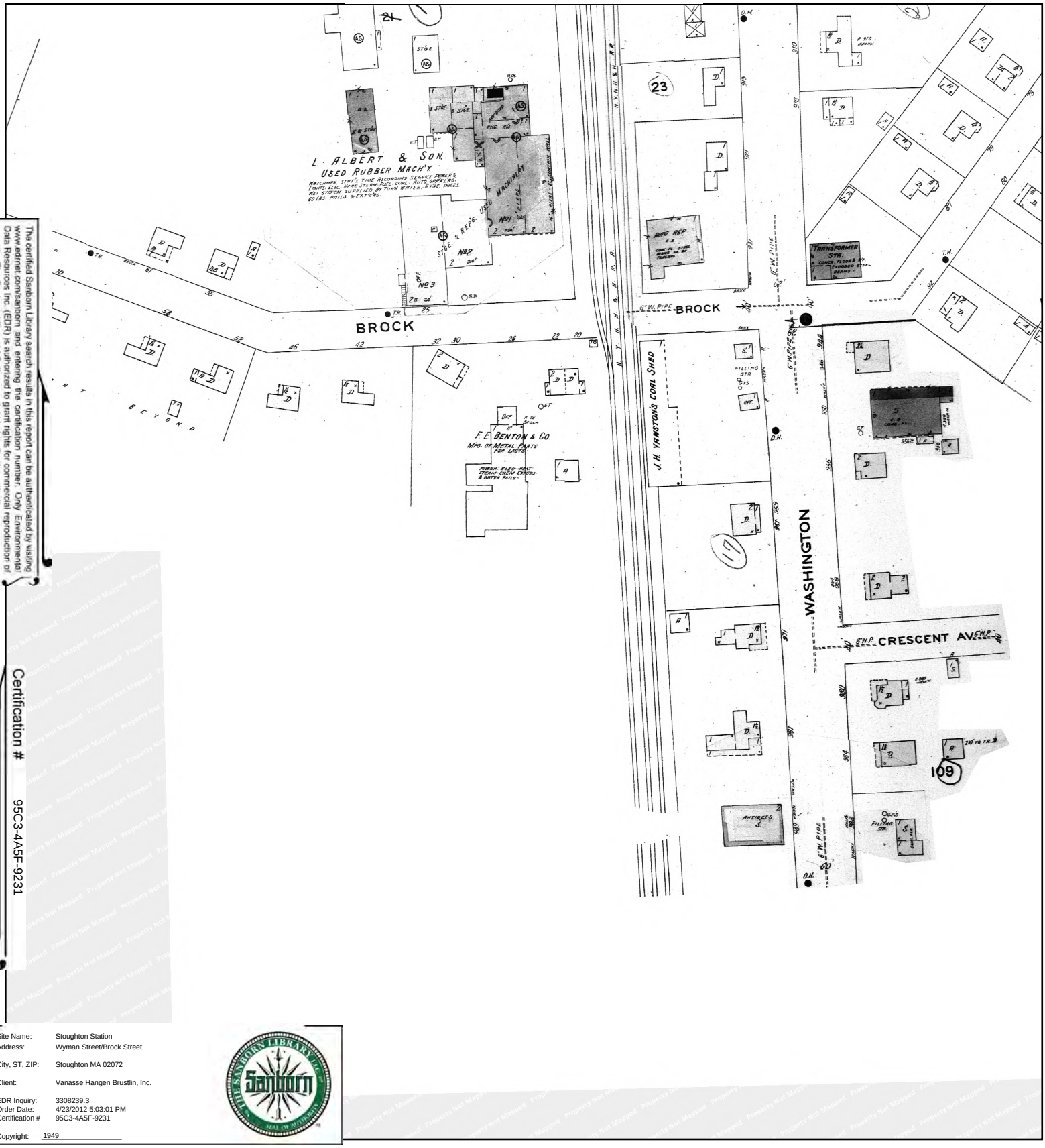
0 Feet 150 300 600



Volume 1, Sheet 8
Volume 1, Sheet 10

N

1949 Certified Sanborn Map



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Certification # 95C3-4A5F-9231

Site Name: Stoughton Station
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City, ST, ZIP: Stoughton MA 02072
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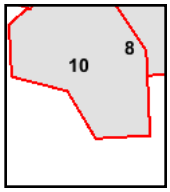

Volume 1, Sheet 8
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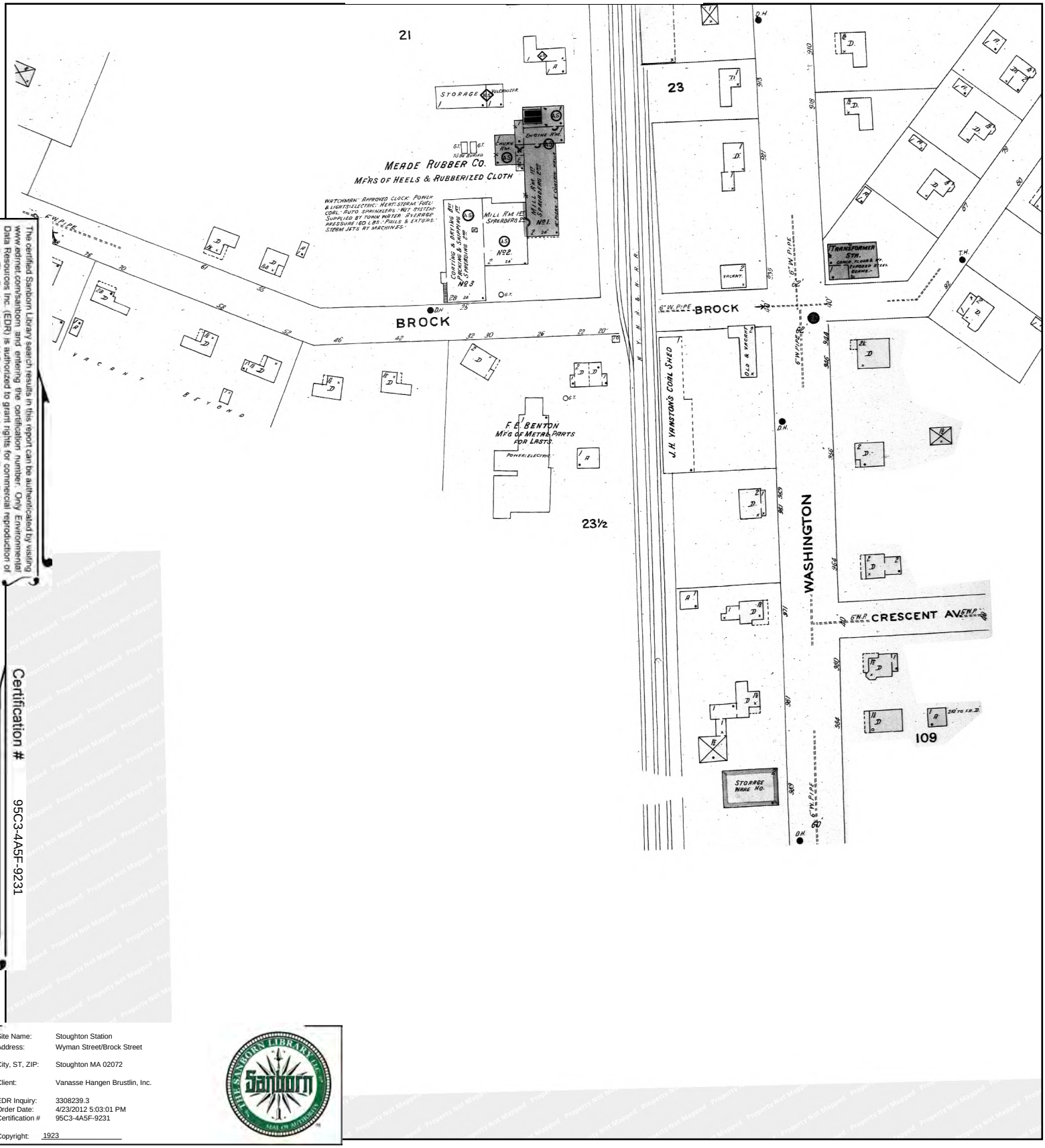
N

1923 Certified Sanborn Map



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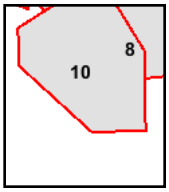

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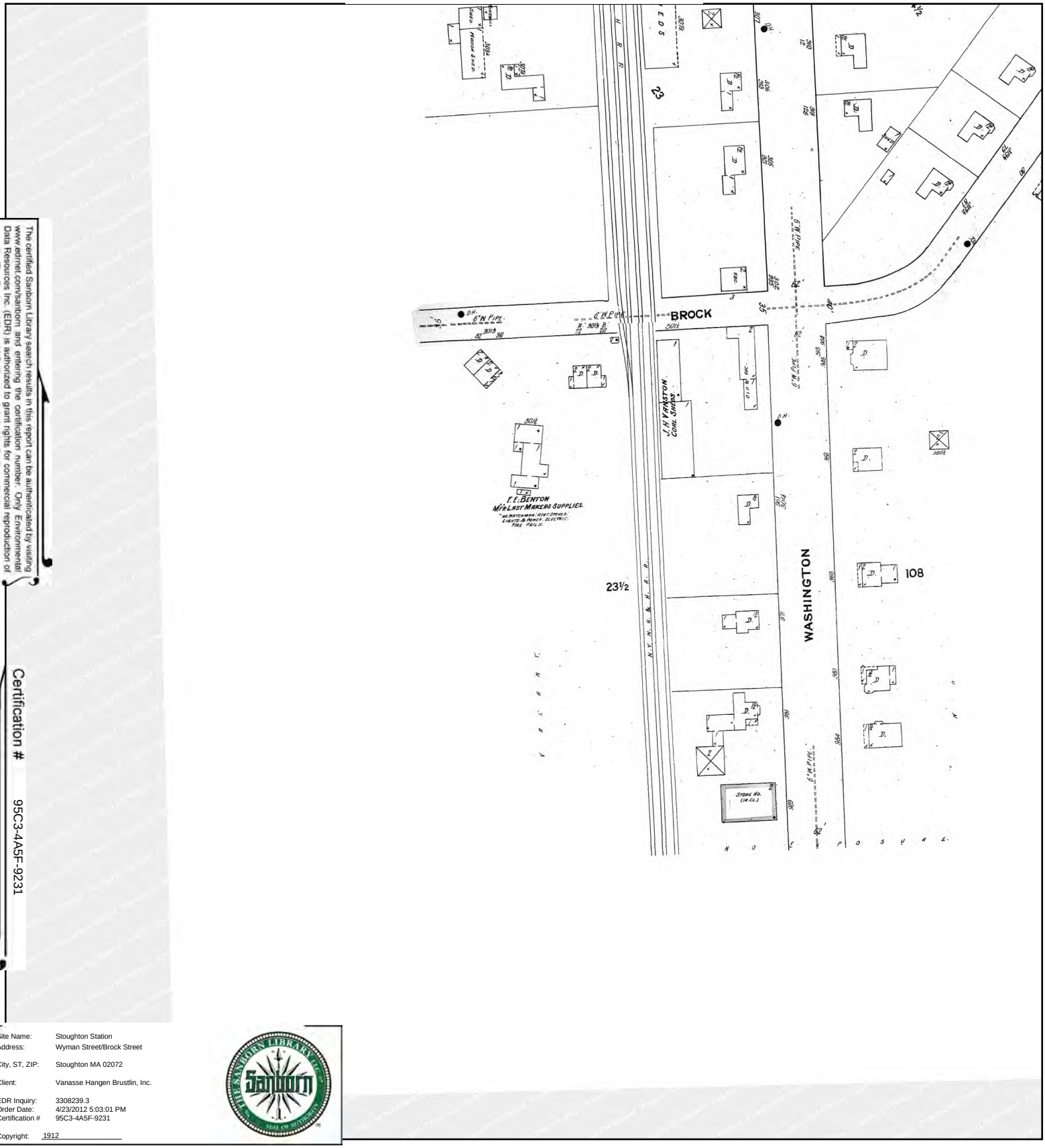

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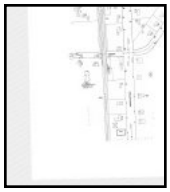

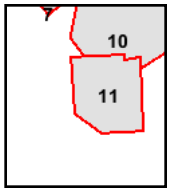

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Volume 1, Sheet 11

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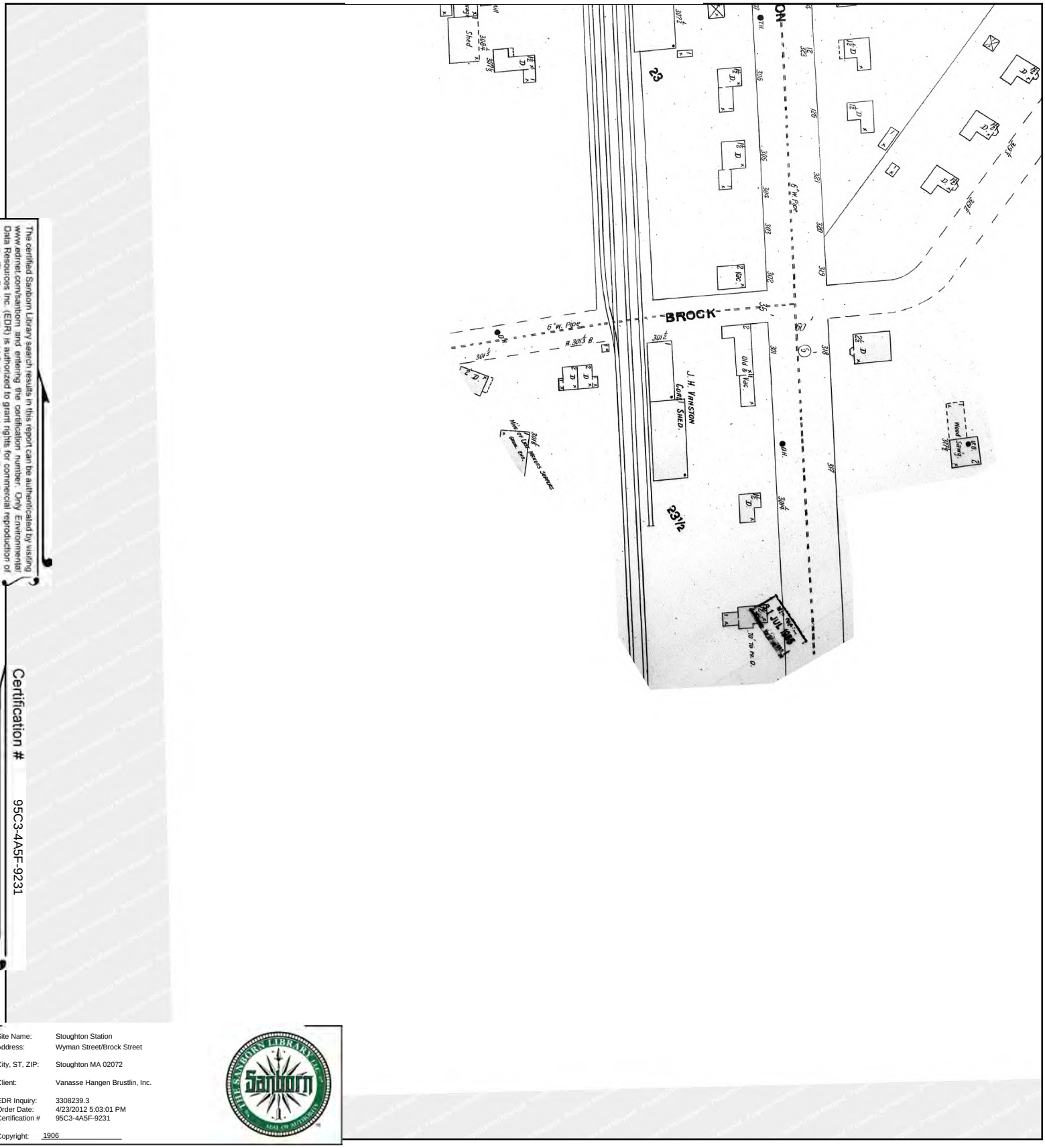

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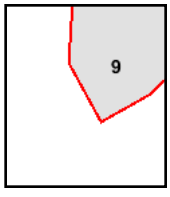

Volume 1, Sheet 9

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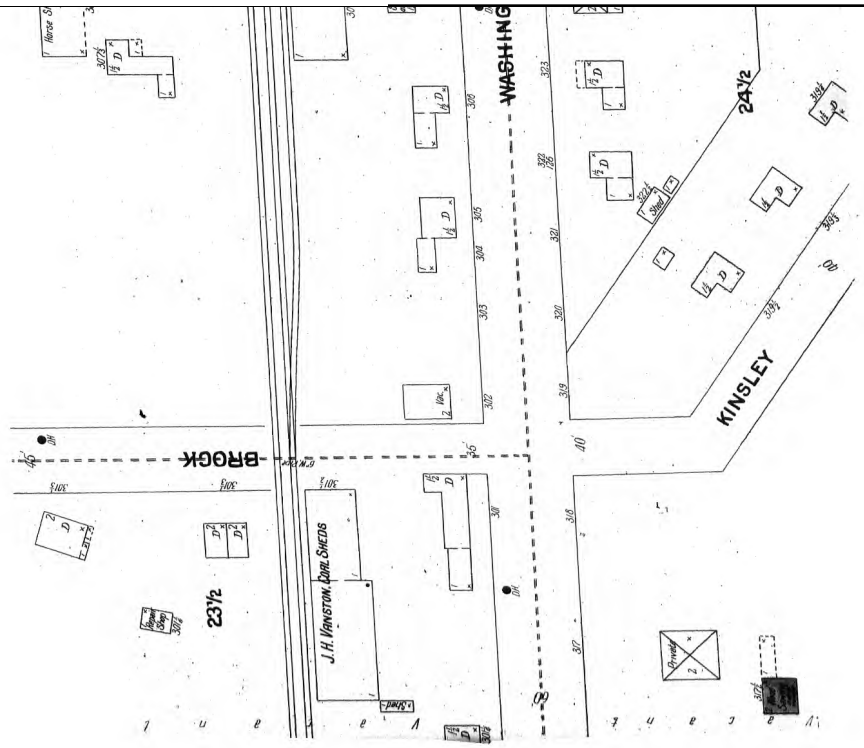

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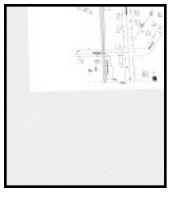

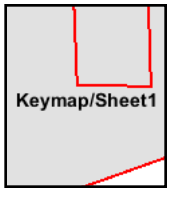

Volume 1, Sheet Keymap/Sheet1

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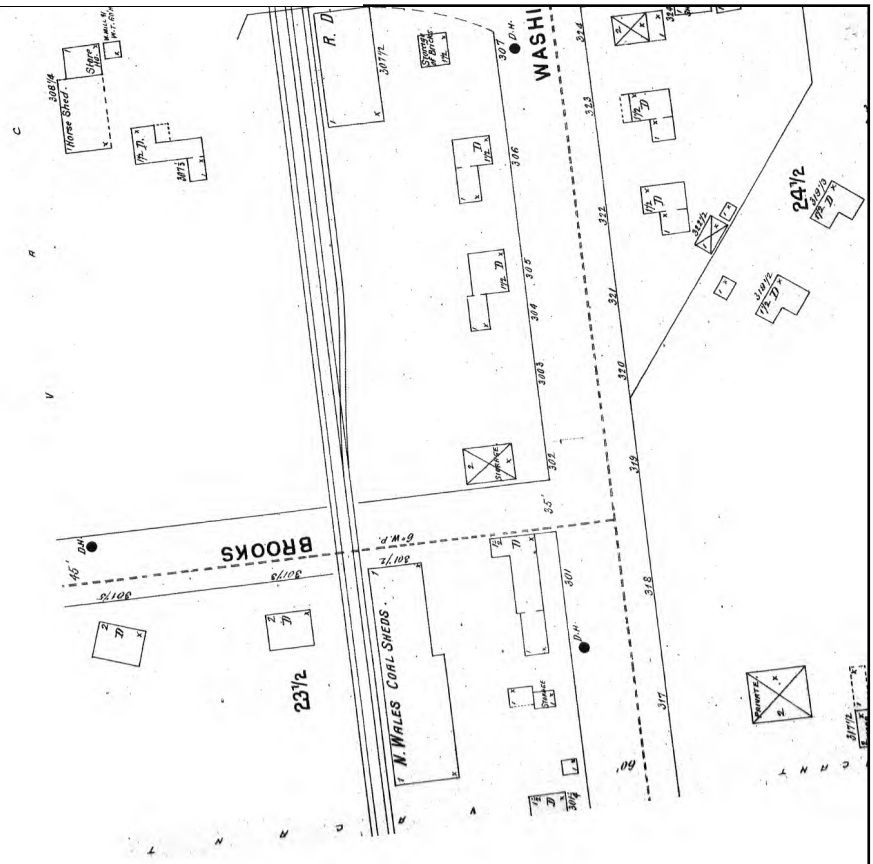

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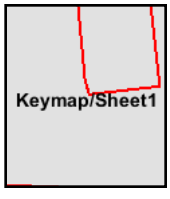

Volume 1, Sheet Keymap/Sheet1

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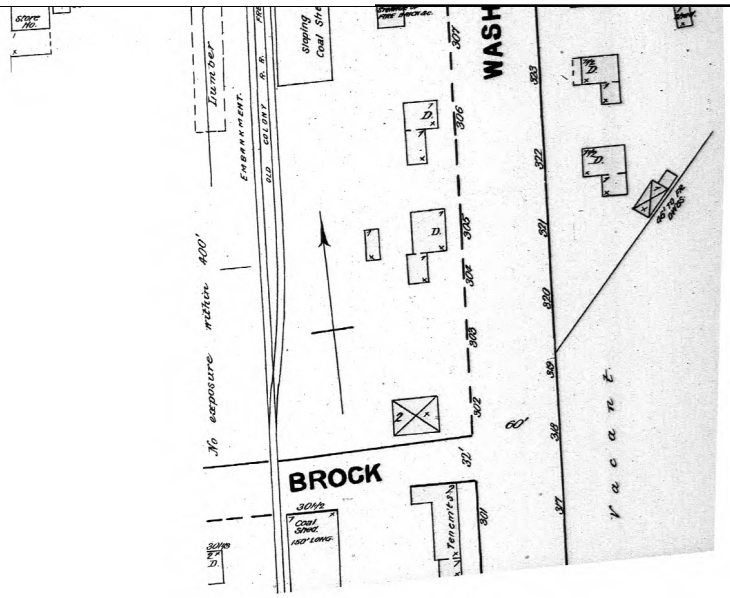

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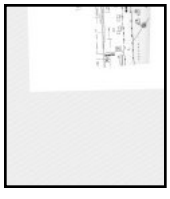

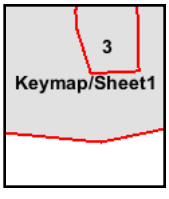

Volume 1, Sheet 3

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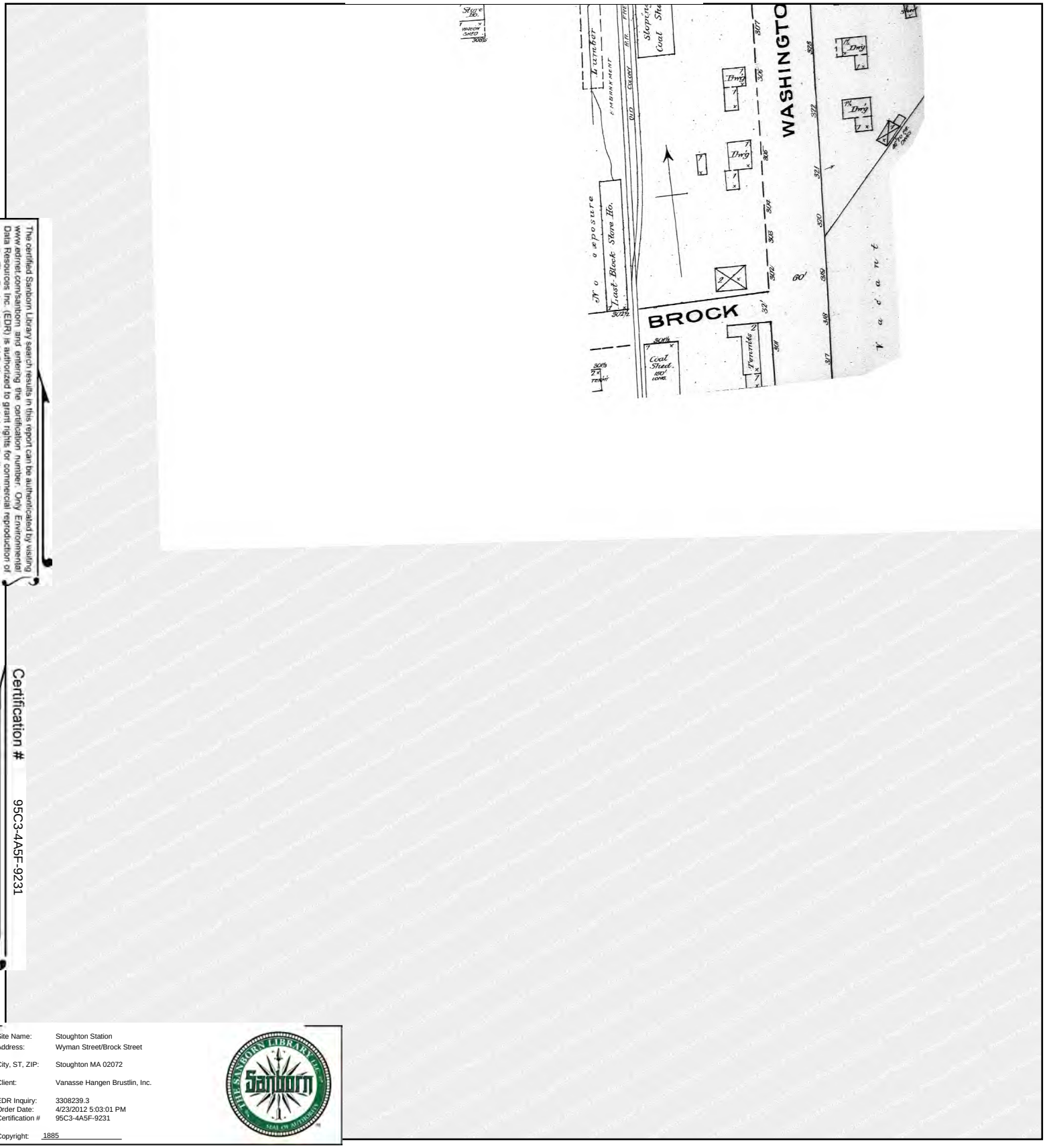
1885 Certified Sanborn Map



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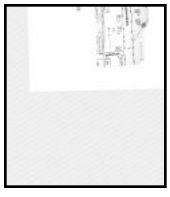

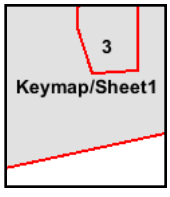

Volume 1, Sheet 3

N

Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.3
April 23, 2012

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

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Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

4/23/12

Site Name:
Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Client Name:
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471

EDR Inquiry # 3308239.3

Contact: Katie Kudzma

EDR® Environmental Data Resources Inc

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City, State, Zip: Stoughton, MA 02072
Cross Street:
P.O. # 10111
Project: NA
Certification # 95C3-4A5F-9231

Maps Provided:

1966	1896
1949	1891
1923	1885
1912	
1906	
1901	

Sanborn® Library search results
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The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

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Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1966 Source Sheets

Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 11

1949 Source Sheets

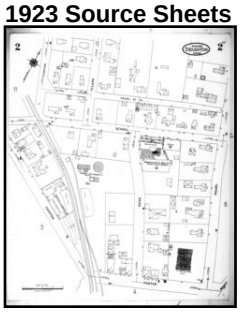
Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 11

1923 Source Sheets


Volume 1, Sheet 2

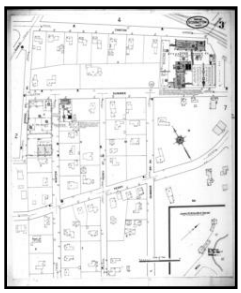
Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 11

1912 Source Sheets

Volume 1, Sheet 2


Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 7

1906 Source Sheets

Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 6

1901 Source Sheets

Volume 1, Sheet 2

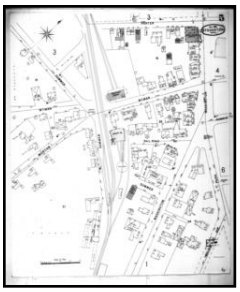
Volume 1, Sheet 3

Volume 1, Sheet 5

1896 Source Sheets

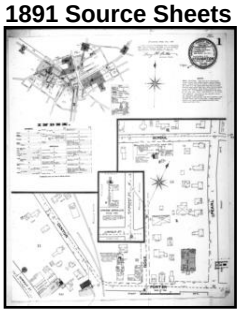
Volume 1, Sheet 2

Volume 1, Sheet 3



Volume 1, Sheet 5

1891 Source Sheets



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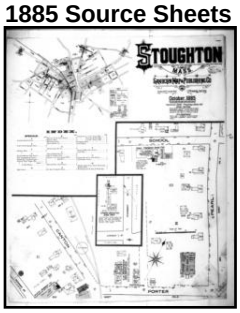
Volume 1, Sheet 2

Volume 1, Sheet 5

1885 Source Sheets

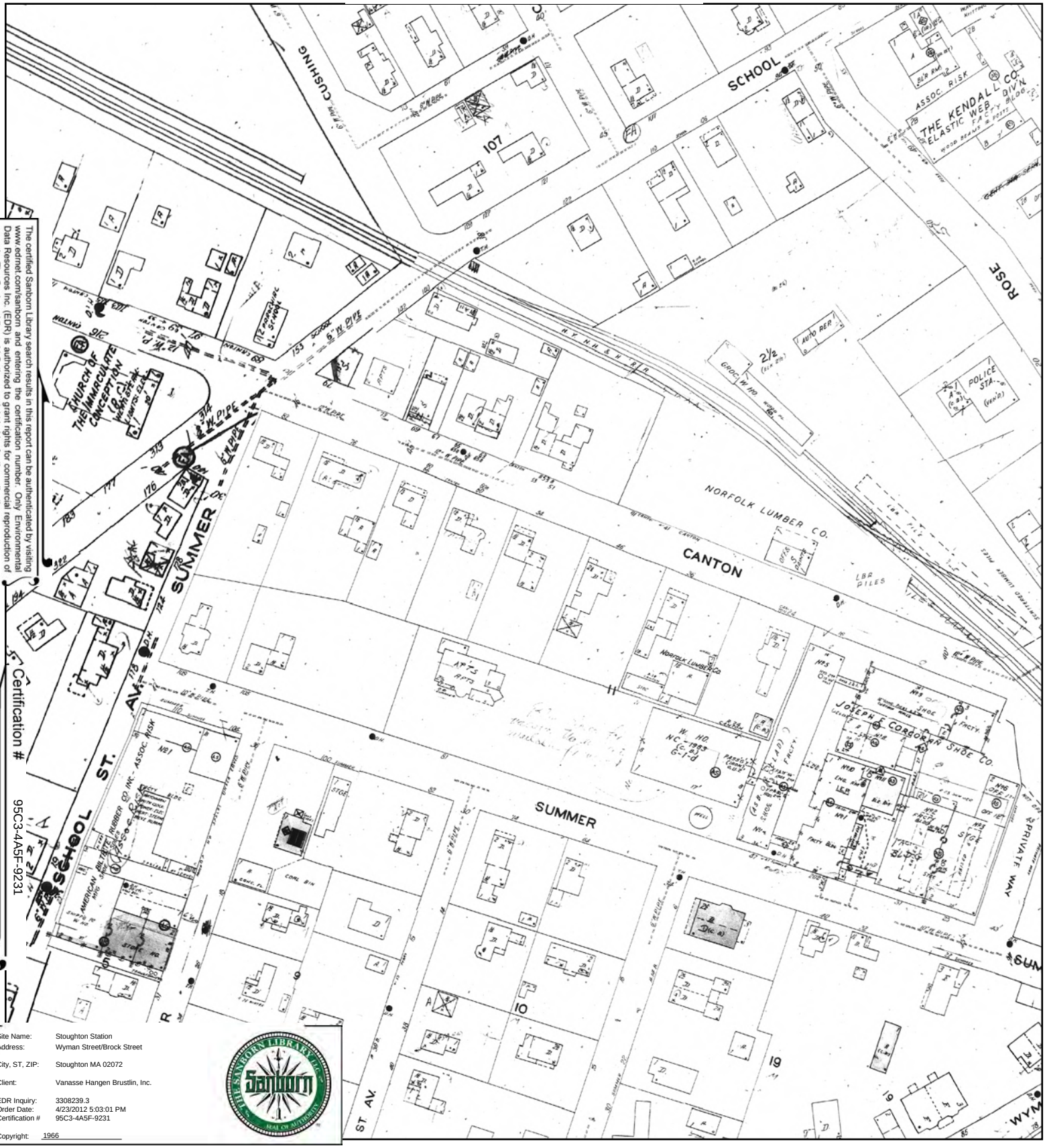


Volume 1, Sheet Keymap/Sheet1

Volume 1, Sheet 2

Volume 1, Sheet 5

1966 Certified Sanborn Map



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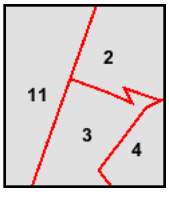

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 11

N

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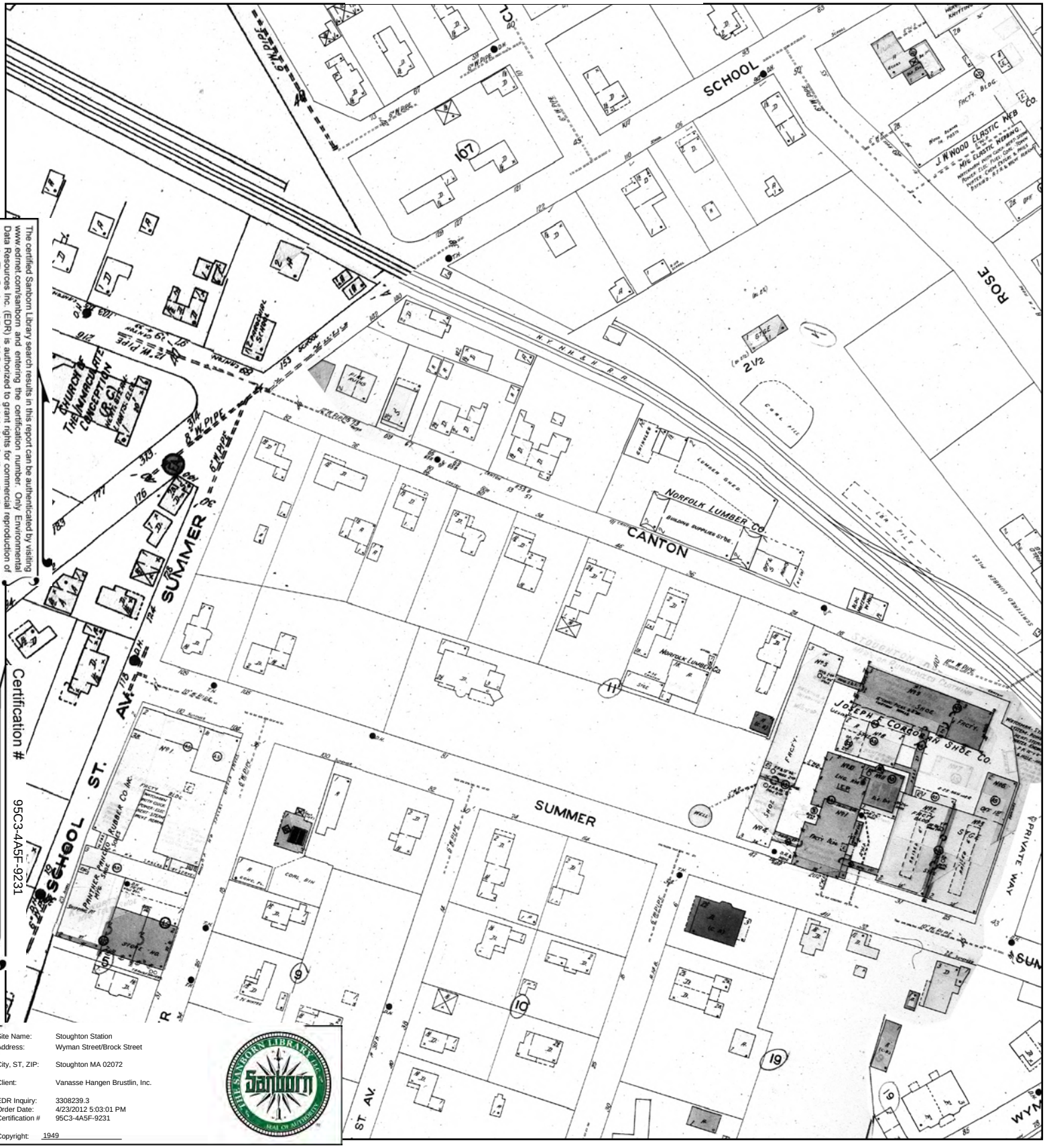

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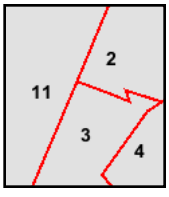

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 11

N

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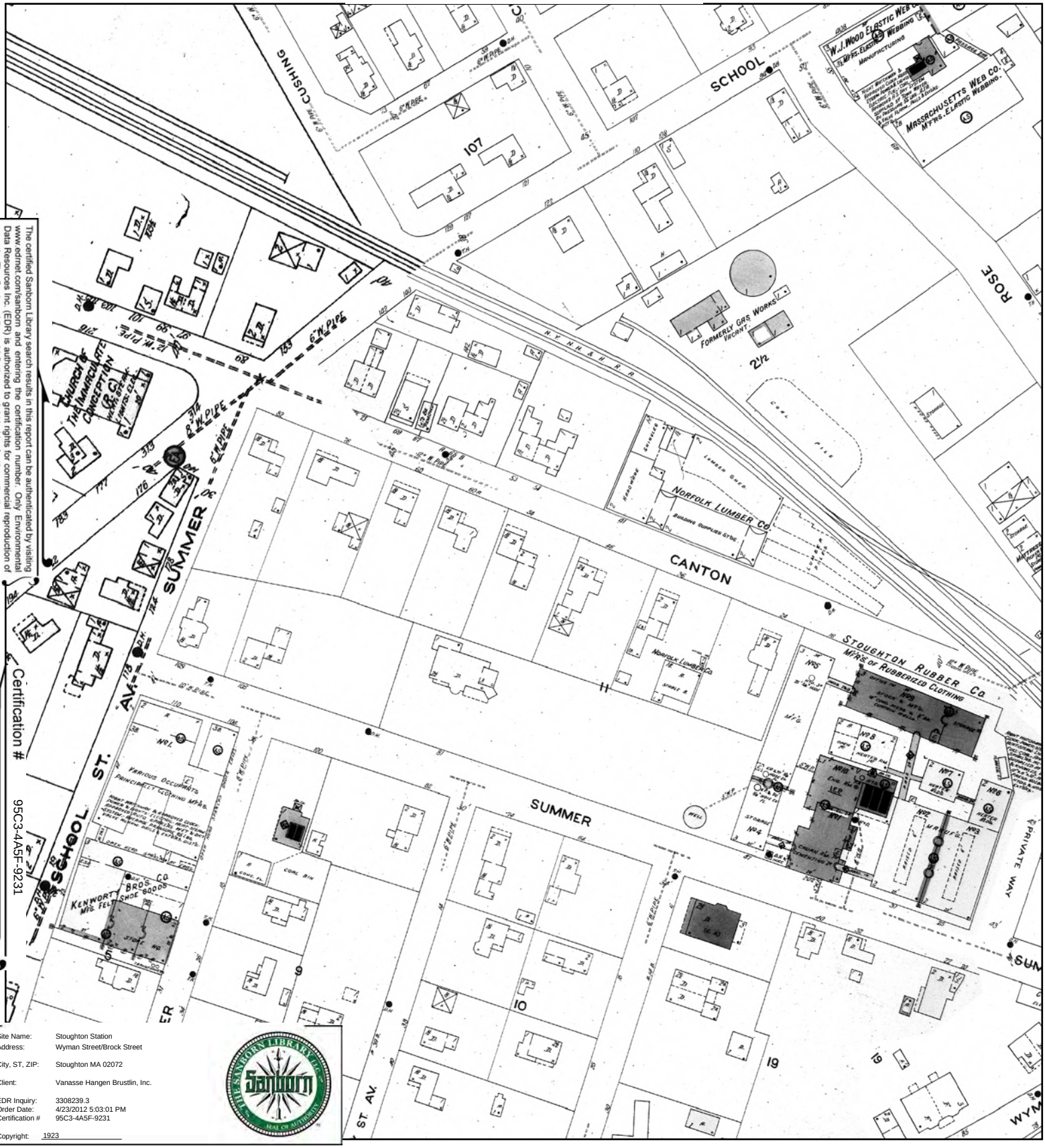

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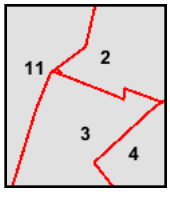
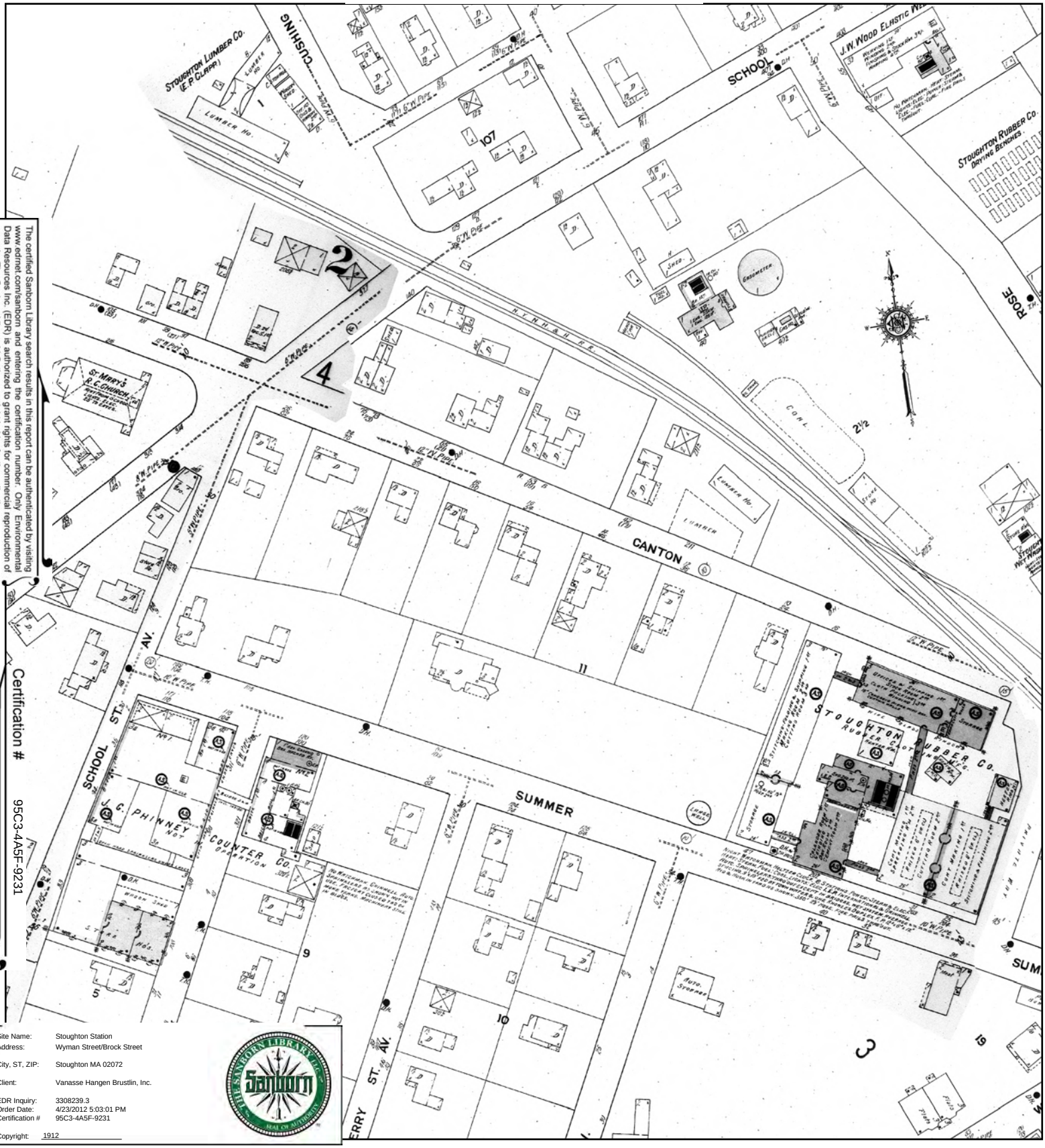


Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 11

N

1912 Certified Sanborn Map



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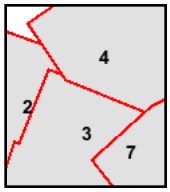

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 7

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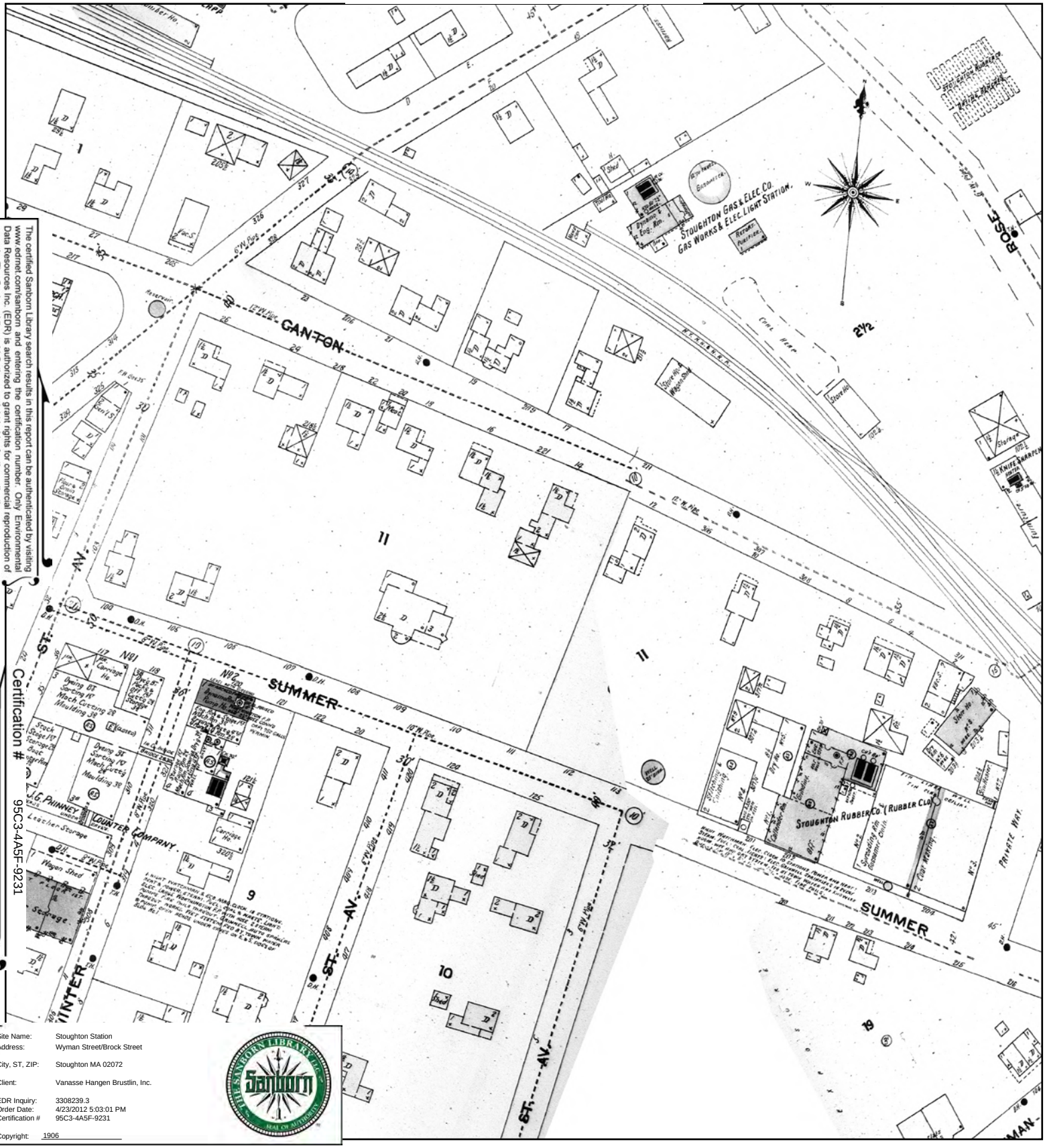
1906 Certified Sanborn Map



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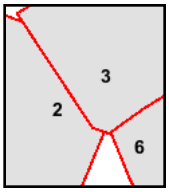

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 6

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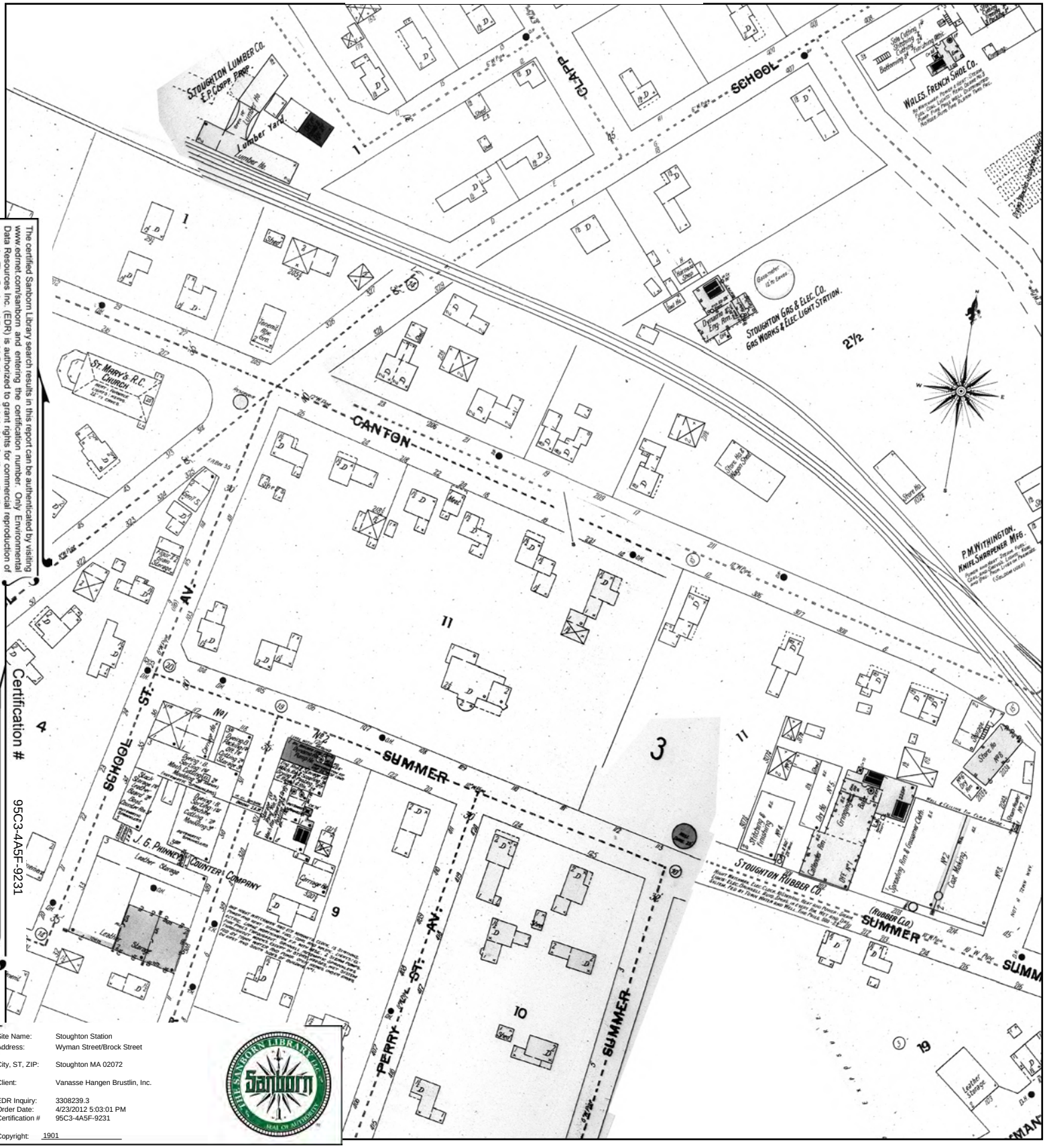

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Client:	Vanasse Hangen Brustlin, Inc.
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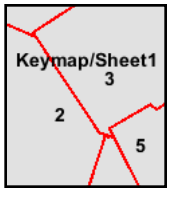

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 5

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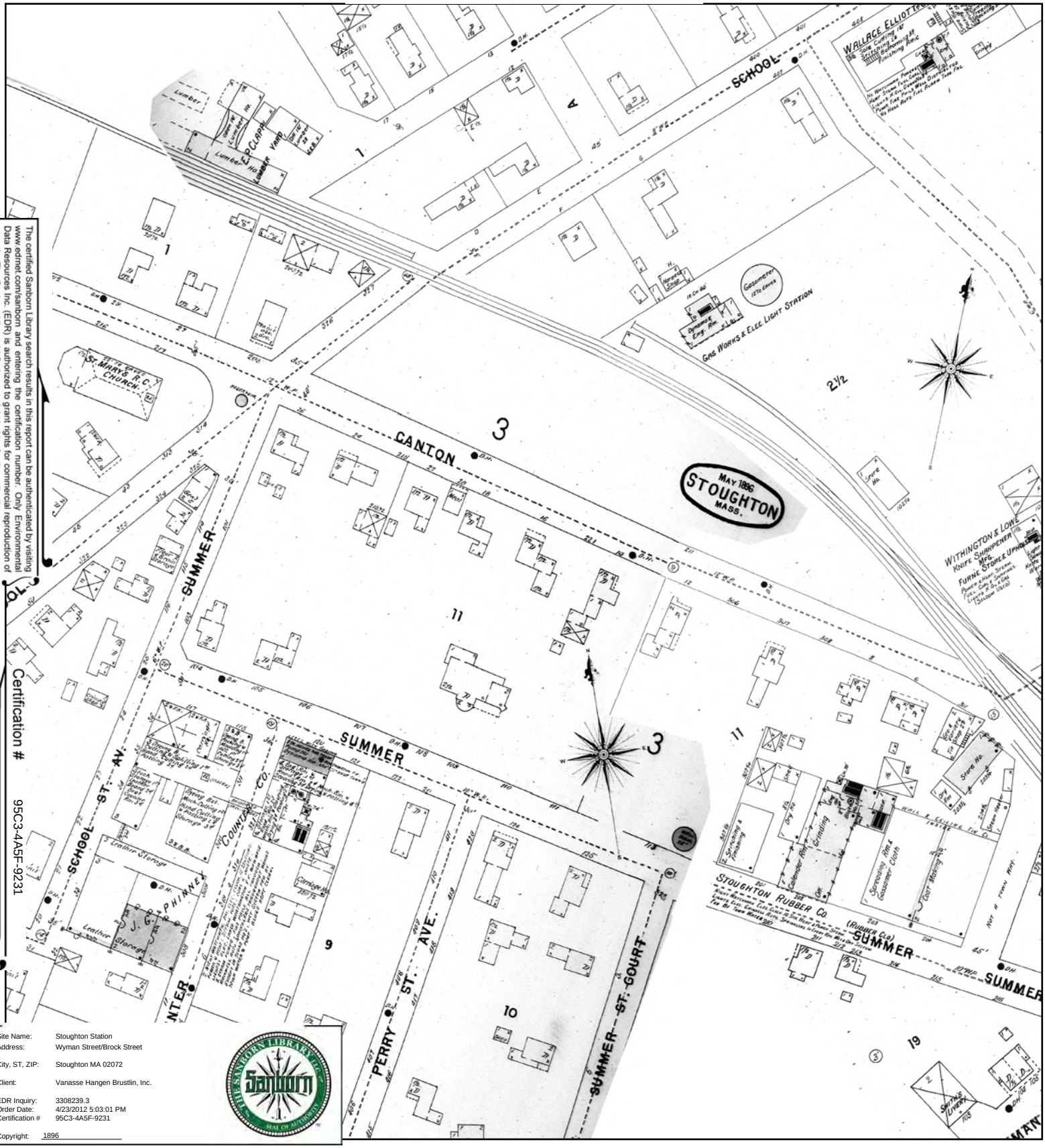
1896 Certified Sanborn Map



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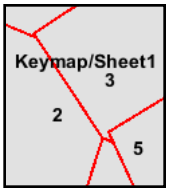

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 5

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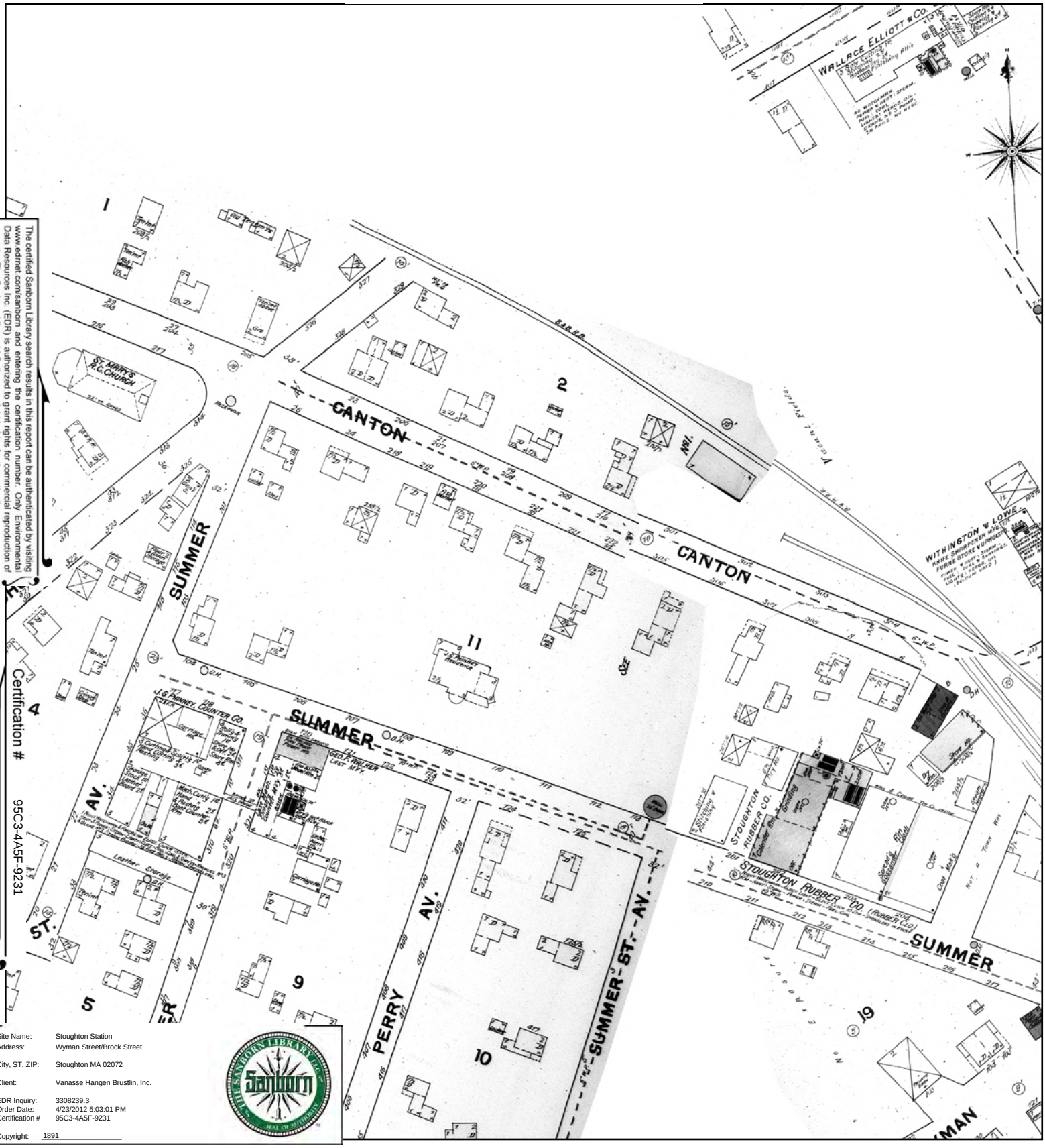
1891 Certified Sanborn Map



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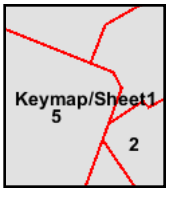
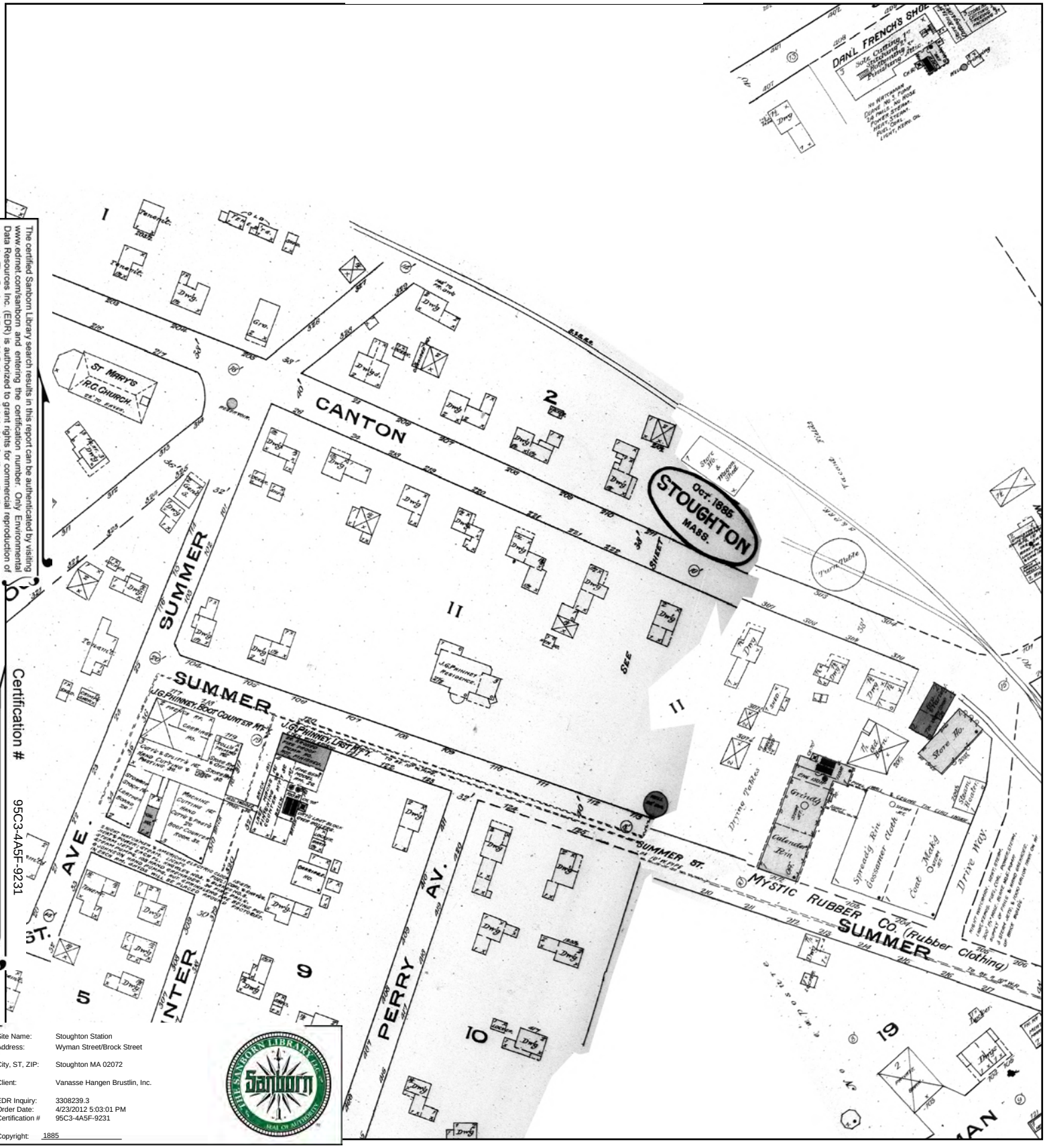


Volume 1, Sheet Keymap/Sheet1
Volume 1, Sheet 2
Volume 1, Sheet 5

N

1885 Certified Sanborn Map


DANL. FRENCH'S SHOE
CANTON
SUMMER
SUMMER
SUMMER ST.
PERRY AV.
ST. MARY'S R.C. CHURCH
J.G. PHINNEY BOOT COUNTER MF.
J.G. PHINNEY LAST MFY.
MYSTIC RUBBER CO. (Rubber Clothing)
Oct. 1885 STOUGHTON MASS.
Sheet
See
Drive Ways
Drive Ways
Store Ho.
Calender Rm.
Spreading Rm.
Cut Making
Grizzly
Drug
Dwlg.
Pensacola
Tenement
Stable
Grocery
Meeting House
Factory
Shop
Boiler House
Engine House
Paint Shop
Varnishing
Finishing
Cutting
Stitching
Packing
Office
Store
Dye House
Wheelwright
Blacksmith
Machine Shop
Carpenter Shop
Boiler Room
Engine Room
Dry House
Gum Room
Mixing
Cutting
Hand
Cutting
Boot Counter
Room
Sole Cutting
Heel Cutting
Sole Stitching
Heel Stitching
Finishing

Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.3
April 23, 2012

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EDR® Environmental Data Resources Inc

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800.352.0050
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Certified Sanborn® Map Report

4/23/12

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Stoughton, MA 02072

Client Name:
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471

EDR Inquiry # 3308239.3

Contact: Katie Kudzma

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City, State, Zip: Stoughton, MA 02072
Cross Street:
P.O. # 10111
Project: NA
Certification # 95C3-4A5F-9231

Maps Provided:

1966	1896
1949	1891
1923	1885
1912	
1906	
1901	

Sanborn® Library search results
Certification # 95C3-4A5F-9231

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
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Sanborn Sheet Thumbnails

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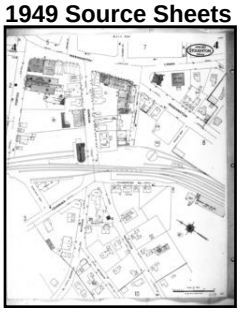
1966 Source Sheets

Volume 1, Sheet 4

Volume 1, Sheet 8

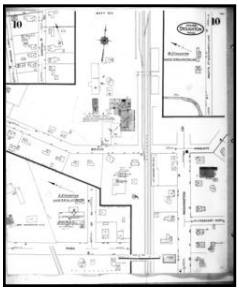
Volume 1, Sheet 10

1949 Source Sheets



Volume 1, Sheet 4

Volume 1, Sheet 8

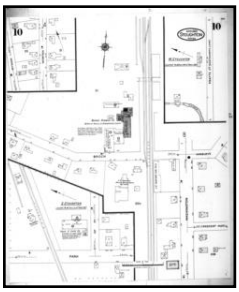


Volume 1, Sheet 10

1923 Source Sheets

Volume 1, Sheet 4

Volume 1, Sheet 8



Volume 1, Sheet 10

1912 Source Sheets

Volume 1, Sheet 7

Volume 1, Sheet 10

1906 Source Sheets

Volume 1, Sheet 6

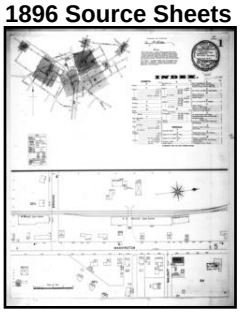
Volume 1, Sheet 9

1901 Source Sheets

Volume 1, Sheet Keymap/Sheet1

Volume 1, Sheet 5

1896 Source Sheets



Volume 1, Sheet Keymap/Sheet1

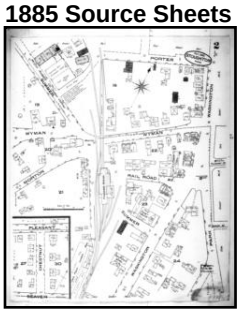
Volume 1, Sheet 5

1891 Source Sheets

Volume 1, Sheet 2

Volume 1, Sheet 3

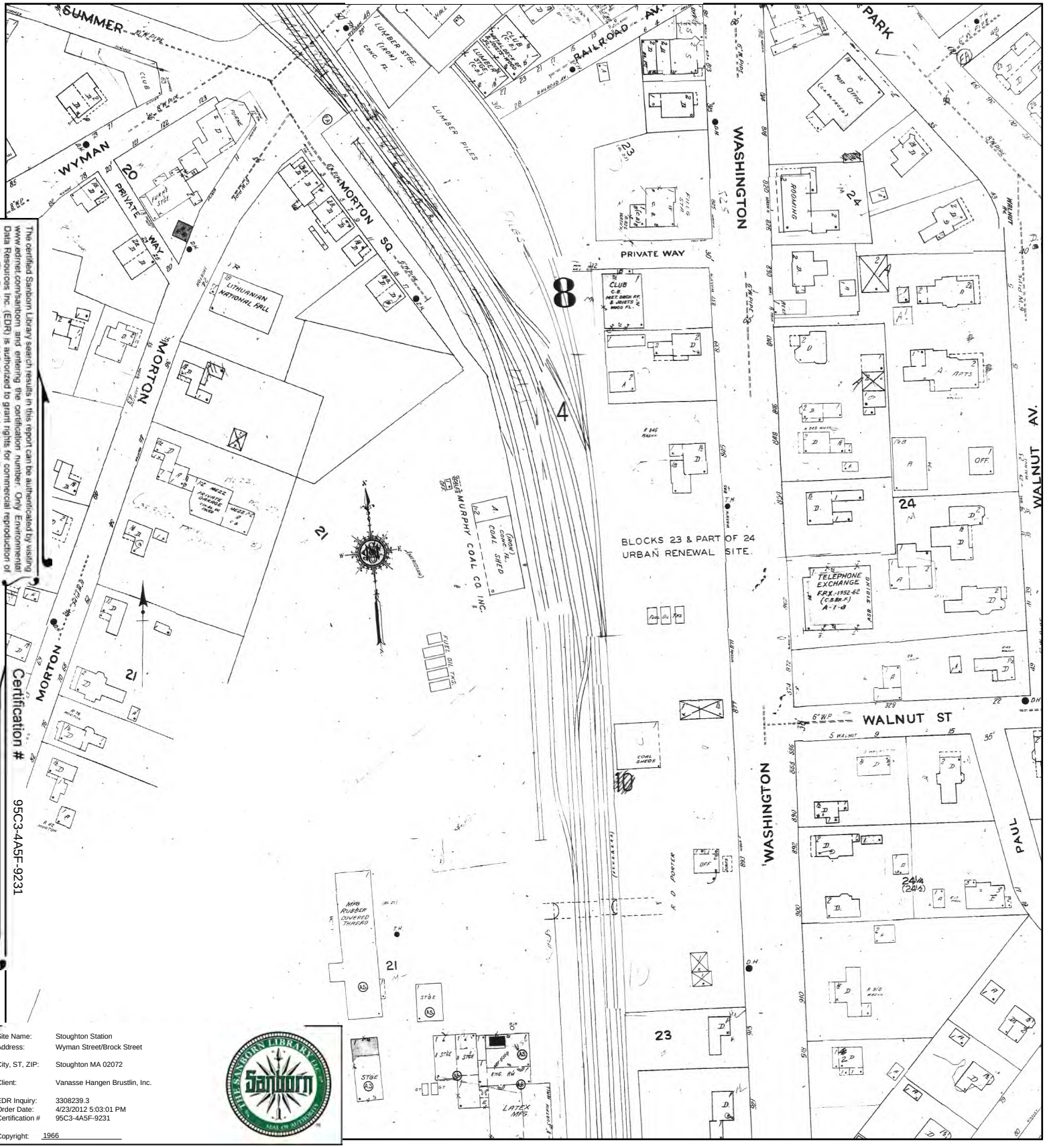
1885 Source Sheets



Volume 1, Sheet 2

Volume 1, Sheet 3

1966 Certified Sanborn Map



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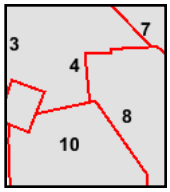

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Volume 1, Sheet 10

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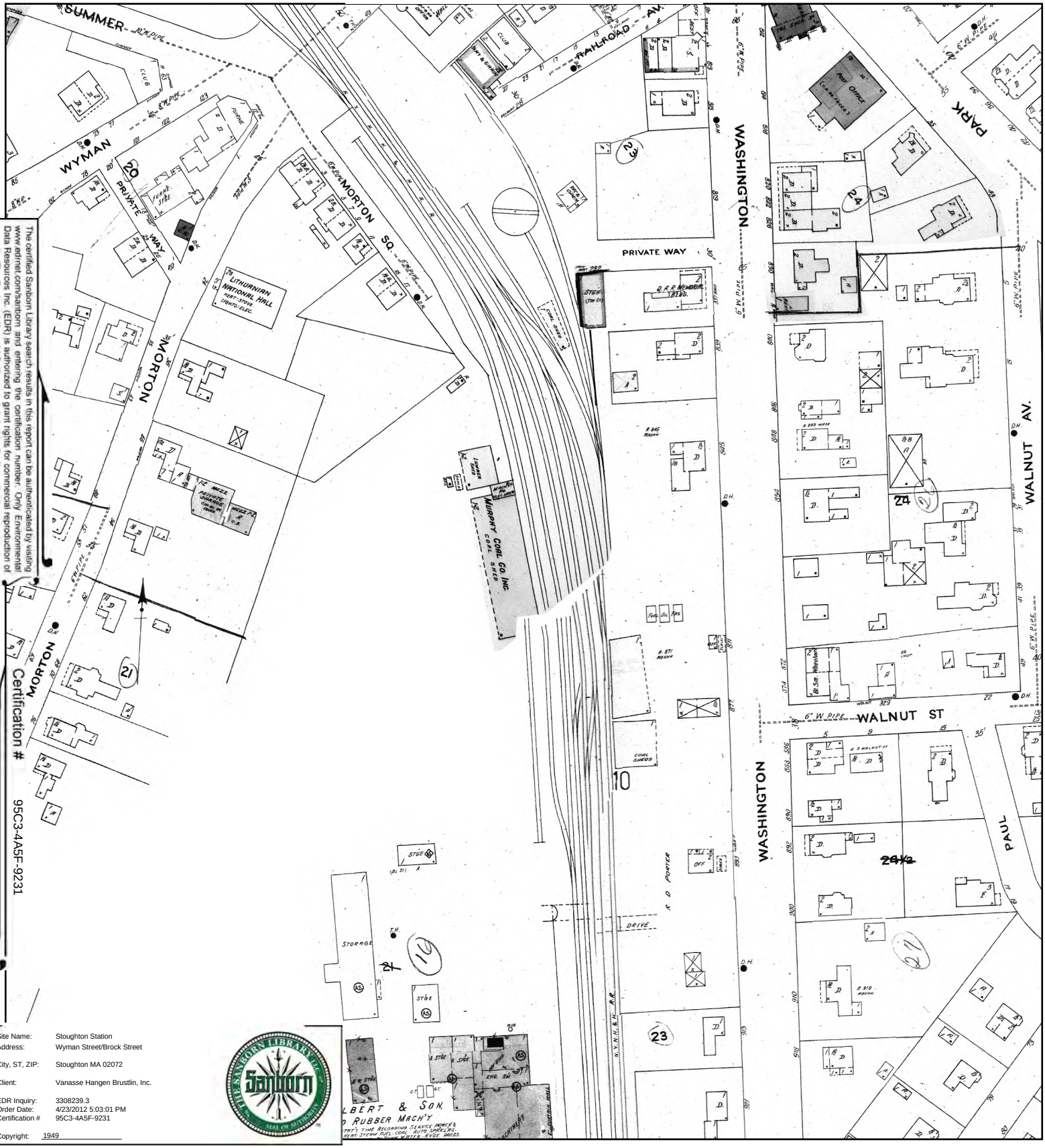

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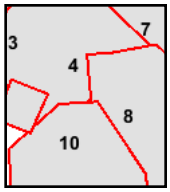

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Volume 1, Sheet 10

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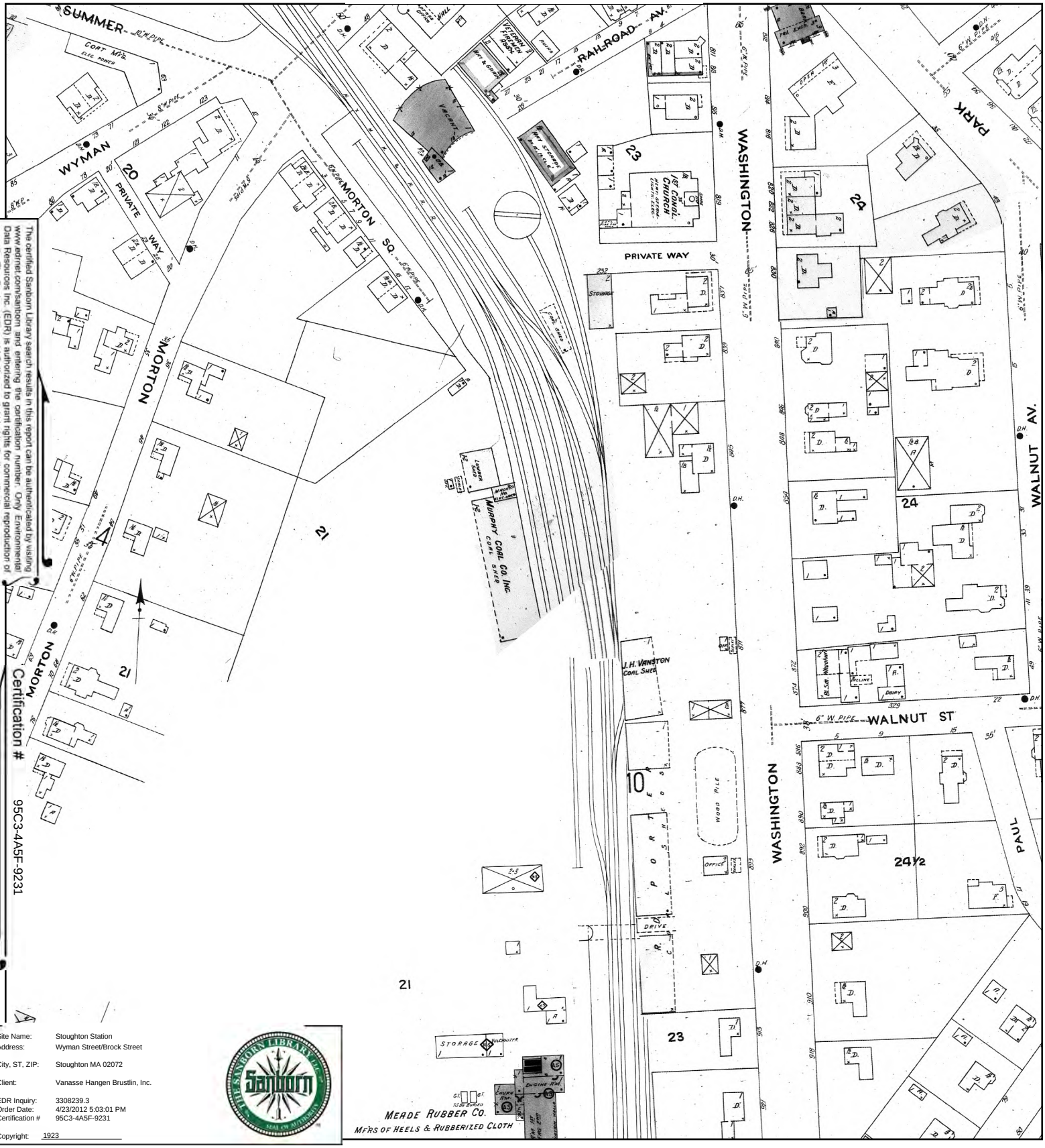

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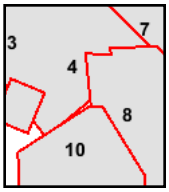

Volume 1, Sheet 4
Volume 1, Sheet 8
Volume 1, Sheet 10

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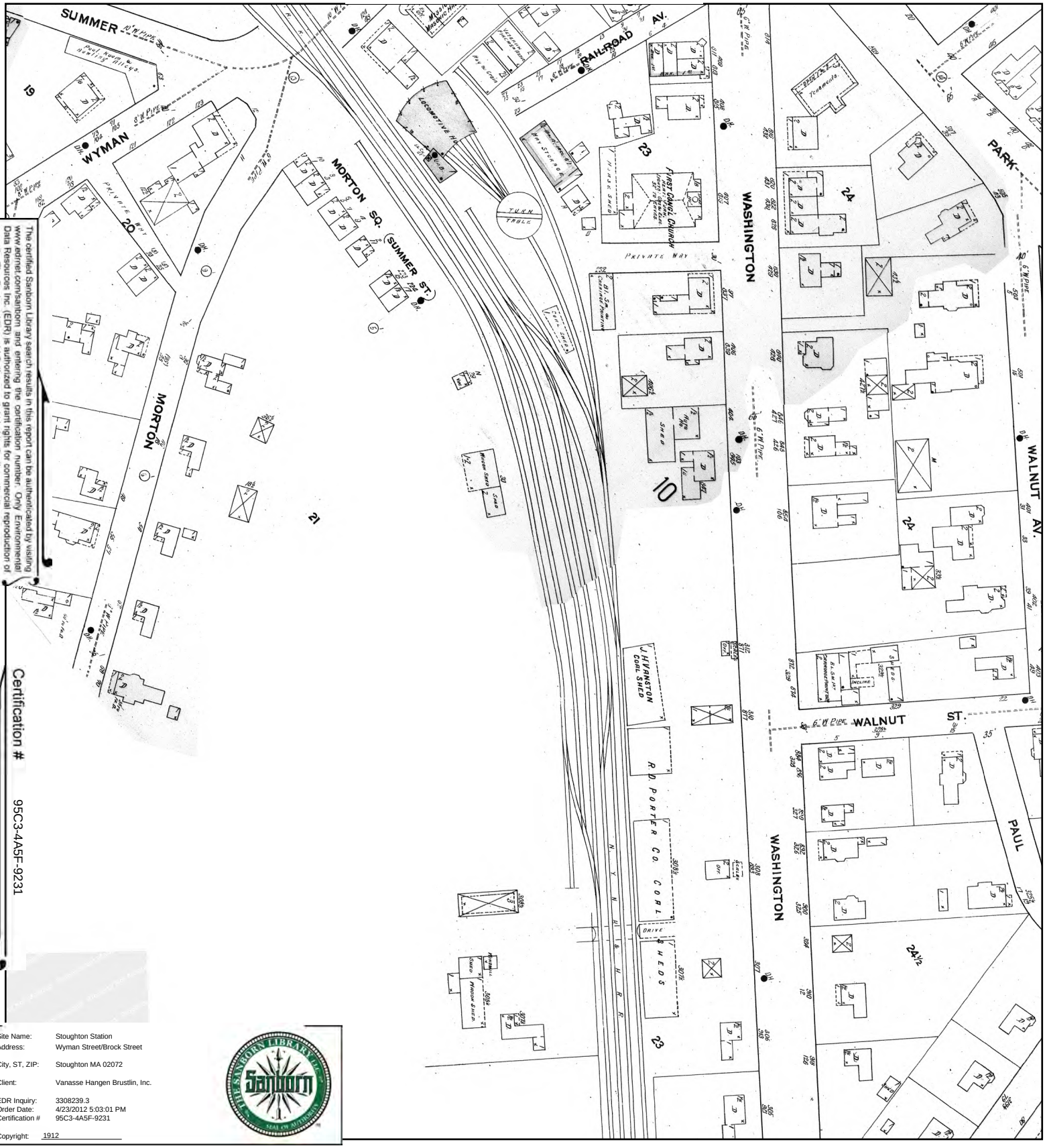

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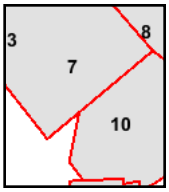

Volume 1, Sheet 7
Volume 1, Sheet 10

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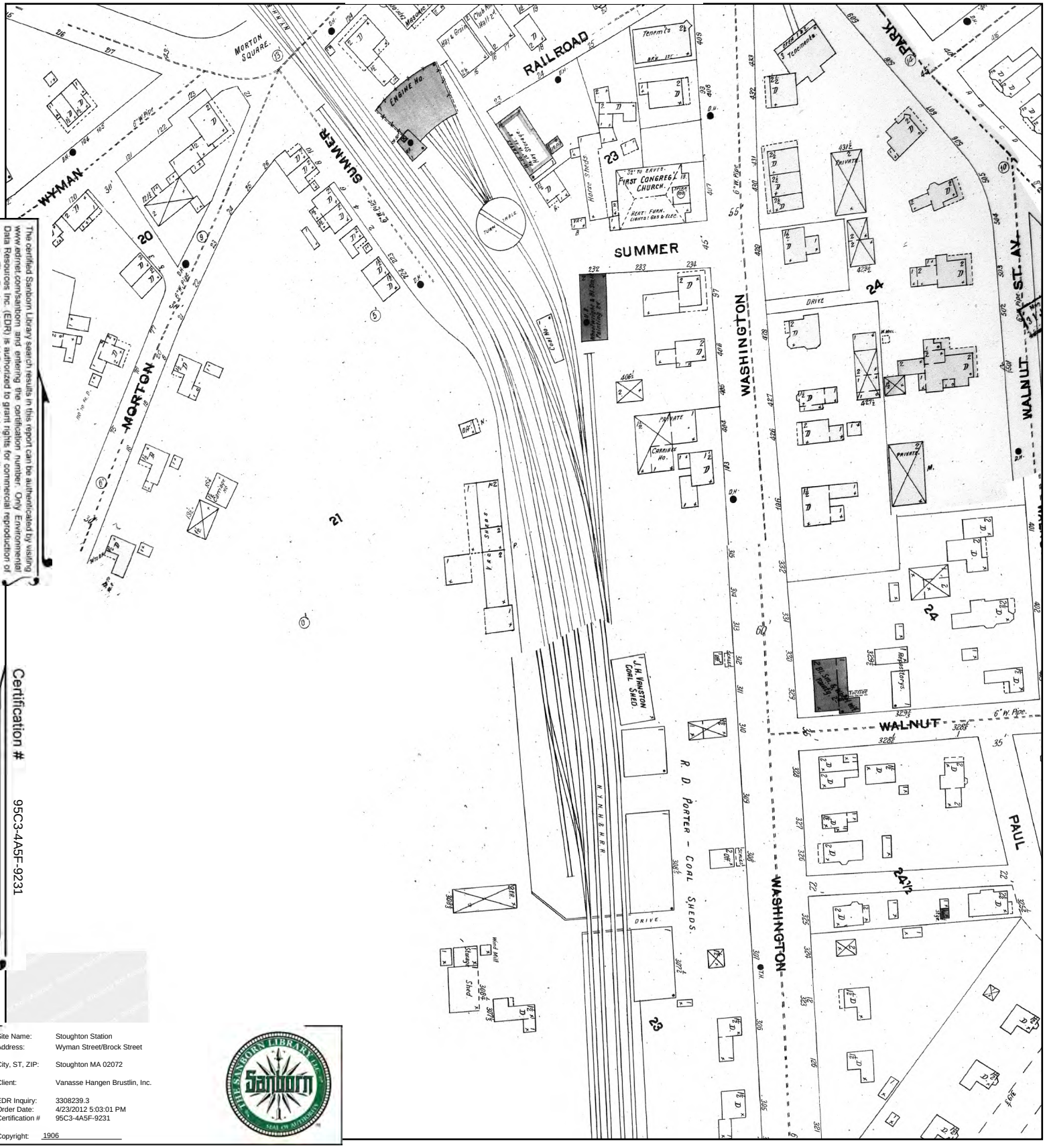

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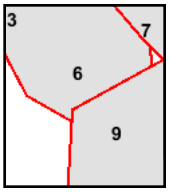

Volume 1, Sheet 6
Volume 1, Sheet 9

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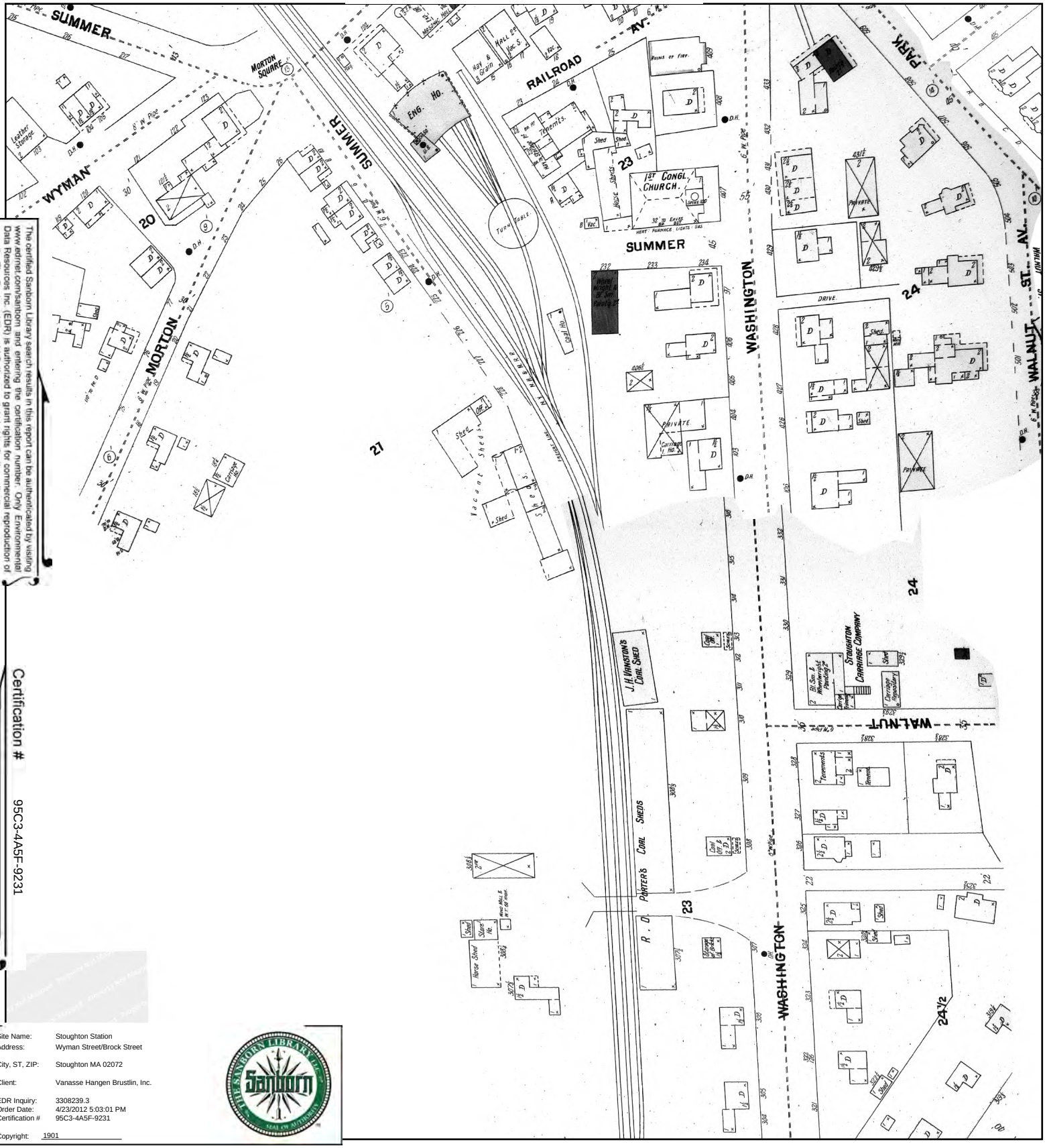

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Certification #	95C3-4A5F-9231
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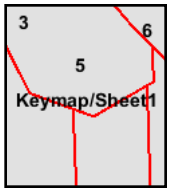

Volume 1, Sheet Keymap/Sheet1
Volume 1, Sheet 5

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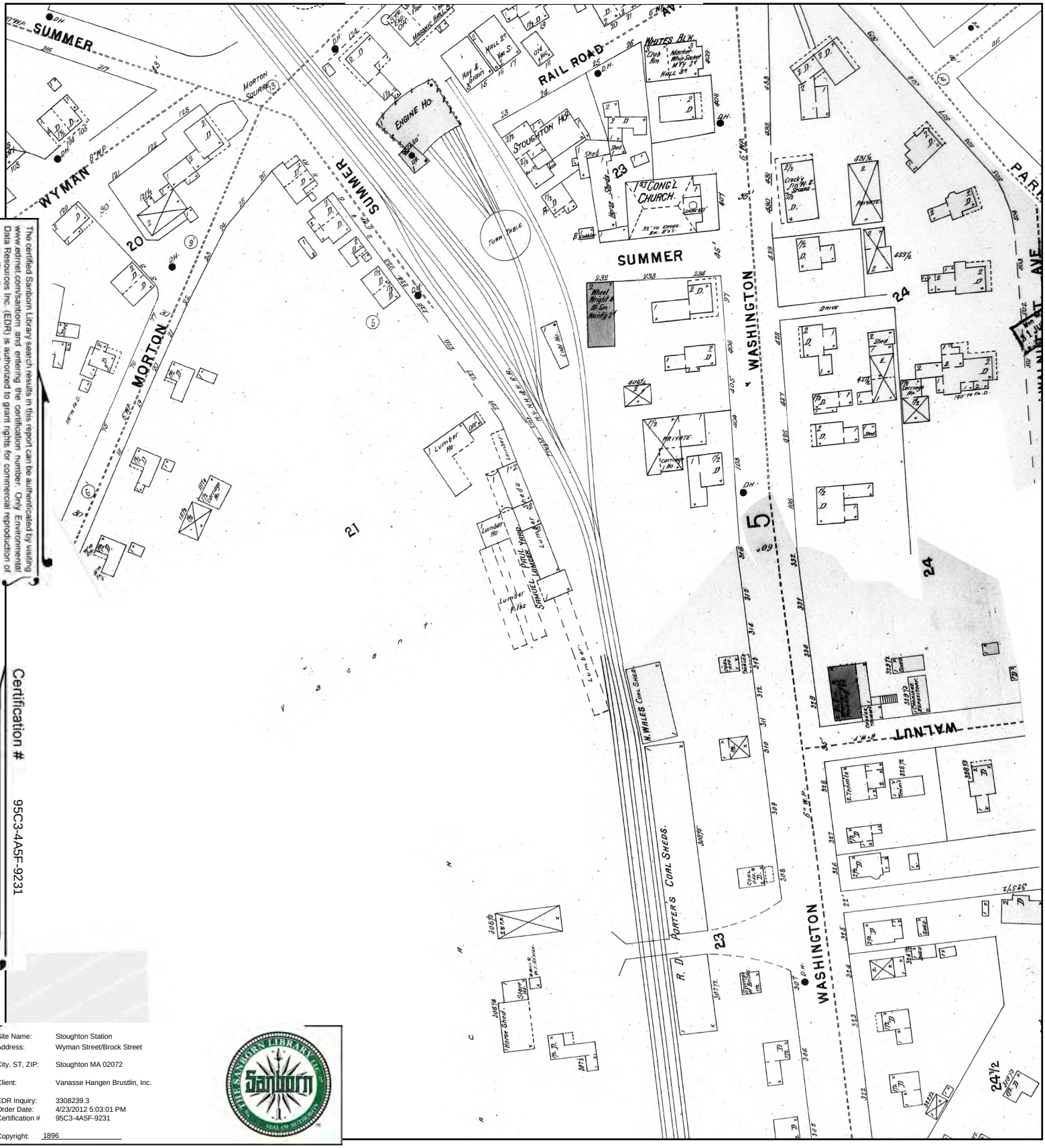
1896 Certified Sanborn Map



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Certification # 95C3-4A5F-9231

Site Name: Stoughton Station
Address: Wyman Street/Brock Street
City, ST, ZIP: Stoughton MA 02072
Client: Vanasse Hangen Brustlin, Inc.
EDR Inquiry: 3308239.3
Order Date: 4/23/2012 5:03:01 PM
Certification # 95C3-4A5F-9231
Copyright: 1896

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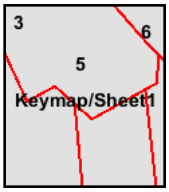

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Volume 1, Sheet 5

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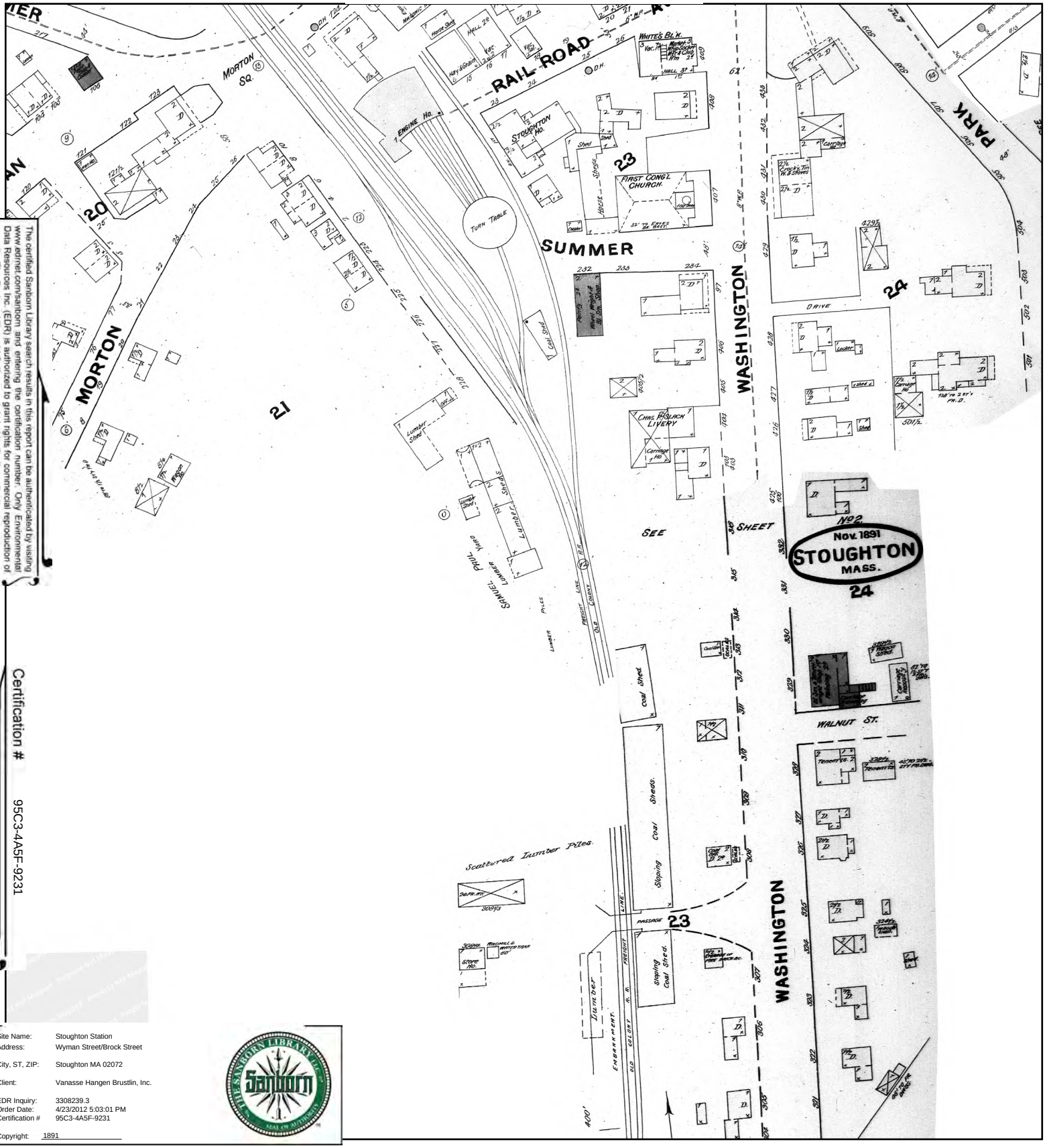

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Client: Vanasse Hangen Brustlin, Inc.
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Order Date: 4/23/2012 5:03:01 PM
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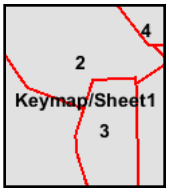

Volume 1, Sheet 2
Volume 1, Sheet 3

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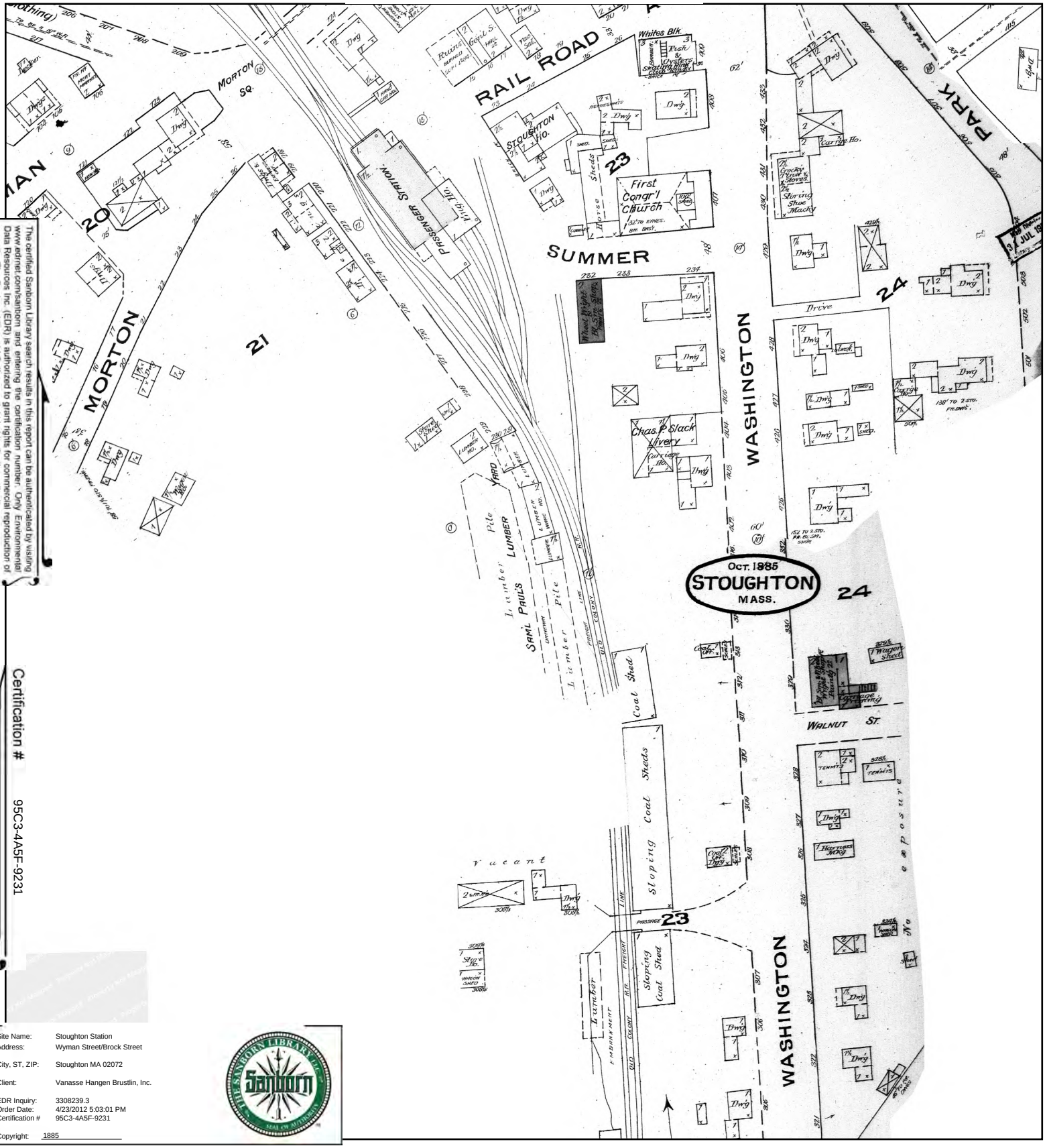
1885 Certified Sanborn Map



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Site Name:	Stoughton Station
Address:	Wyman Street/Brock Street
City, ST, ZIP:	Stoughton MA 02072
Client:	Vanasse Hangen Brustlin, Inc.
EDR Inquiry:	3308239.3
Order Date:	4/23/2012 5:03:01 PM
Certification #	95C3-4A5F-9231
Copyright:	1885

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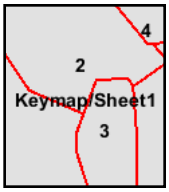

Volume 1, Sheet 2
Volume 1, Sheet 3

0 Feet 150 300 600

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Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.3
April 23, 2012

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

4/23/12

Site Name:
Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Client Name:
Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471

EDR Inquiry # 3308239.3

Contact: Katie Kudzma

EDR® Environmental Data Resources Inc

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Certified Sanborn Results:

Site Name: Stoughton Station
Address: Wyman Street/Brock Street
City, State, Zip: Stoughton, MA 02072
Cross Street:
P.O. # 10111
Project: NA
Certification # 95C3-4A5F-9231

Maps Provided:

1966	1896
1949	1891
1923	1885
1912	
1906	
1901	

Sanborn® Library search results
Certification # 95C3-4A5F-9231

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

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Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1966 Source Sheets

Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 5

Volume 1, Sheet 7

1949 Source Sheets

Volume 1, Sheet 2

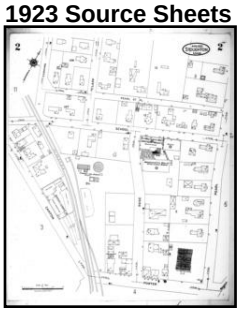
Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 5

Volume 1, Sheet 7

1923 Source Sheets


Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 5

Volume 1, Sheet 7

1912 Source Sheets

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 5

Volume 1, Sheet 7

Volume 1, Sheet 8

1906 Source Sheets

Volume 1, Sheet 3

Volume 1, Sheet 4

Volume 1, Sheet 6

Volume 1, Sheet 7

1901 Source Sheets

Volume 1, Sheet 3

Volume 1, Sheet 4

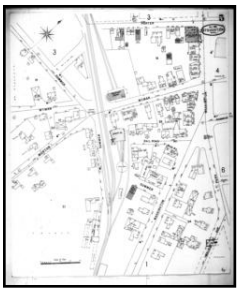
Volume 1, Sheet 5

Volume 1, Sheet 6

1896 Source Sheets

Volume 1, Sheet 3

Volume 1, Sheet 4



Volume 1, Sheet 5

Volume 1, Sheet 6

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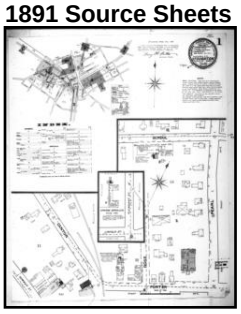

Volume 1, Sheet Keymap/Sheet1

Volume 1, Sheet 2

Volume 1, Sheet 3

Volume 1, Sheet 4

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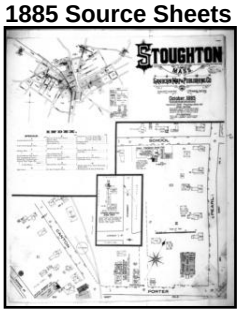

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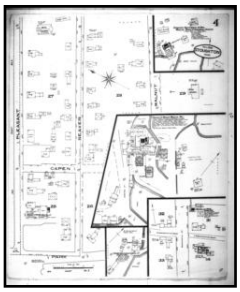
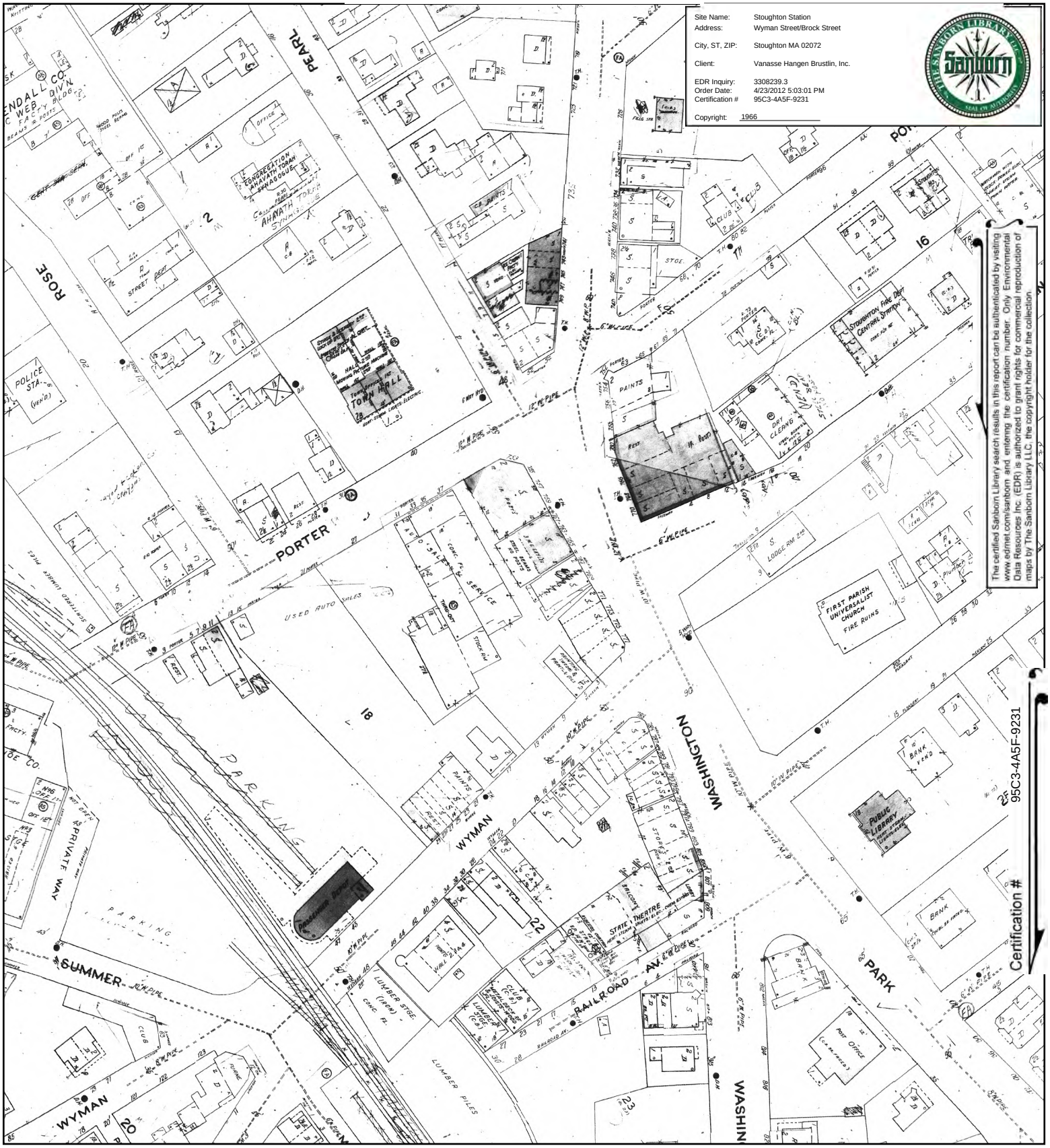
Volume 1, Sheet 2

Volume 1, Sheet 3



Volume 1, Sheet 4

1966 Certified Sanborn Map



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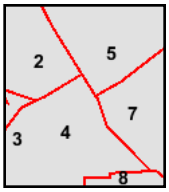

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 5
Volume 1, Sheet 7

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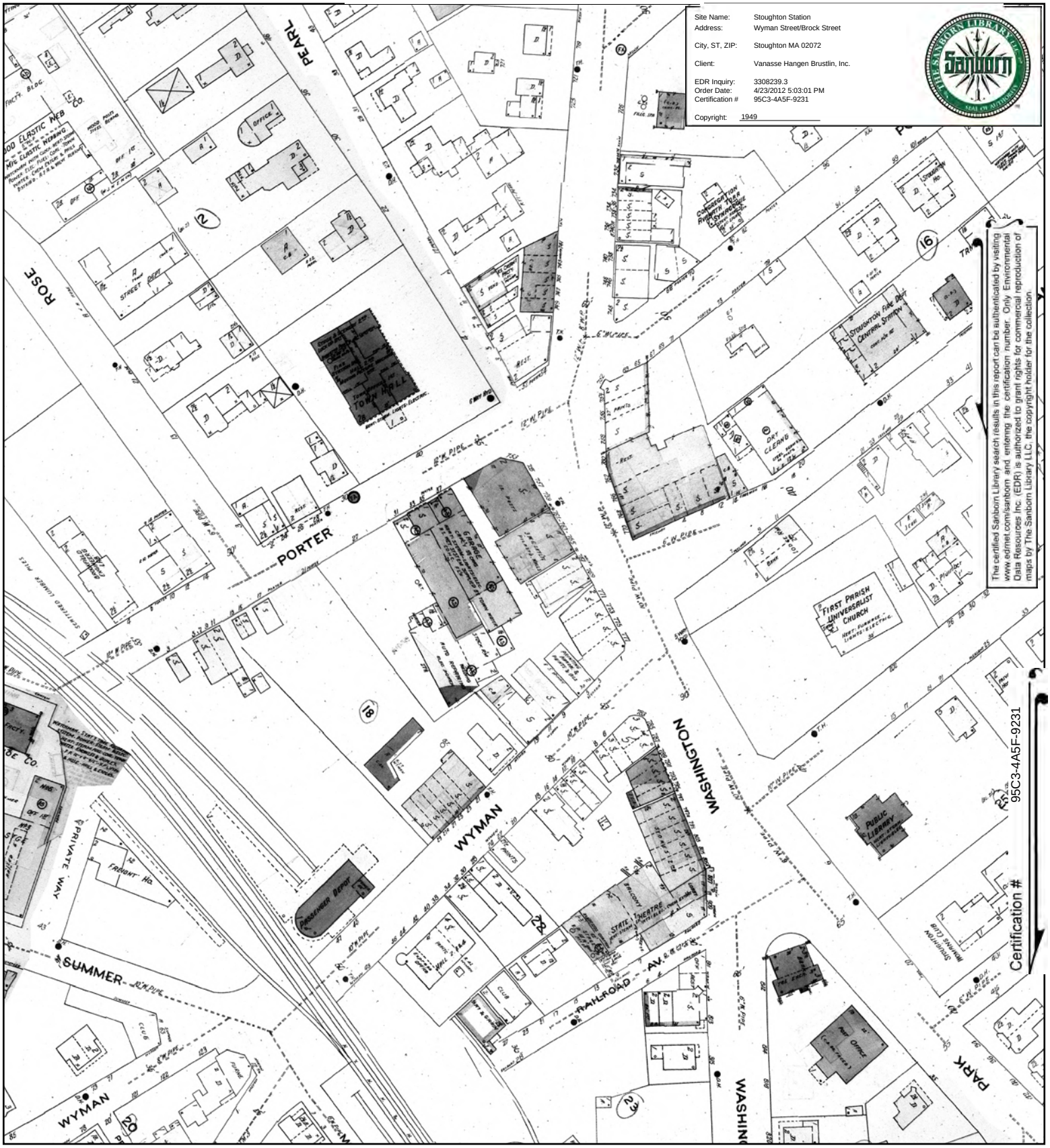

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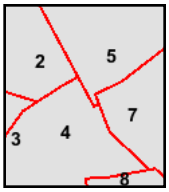

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 5
Volume 1, Sheet 7

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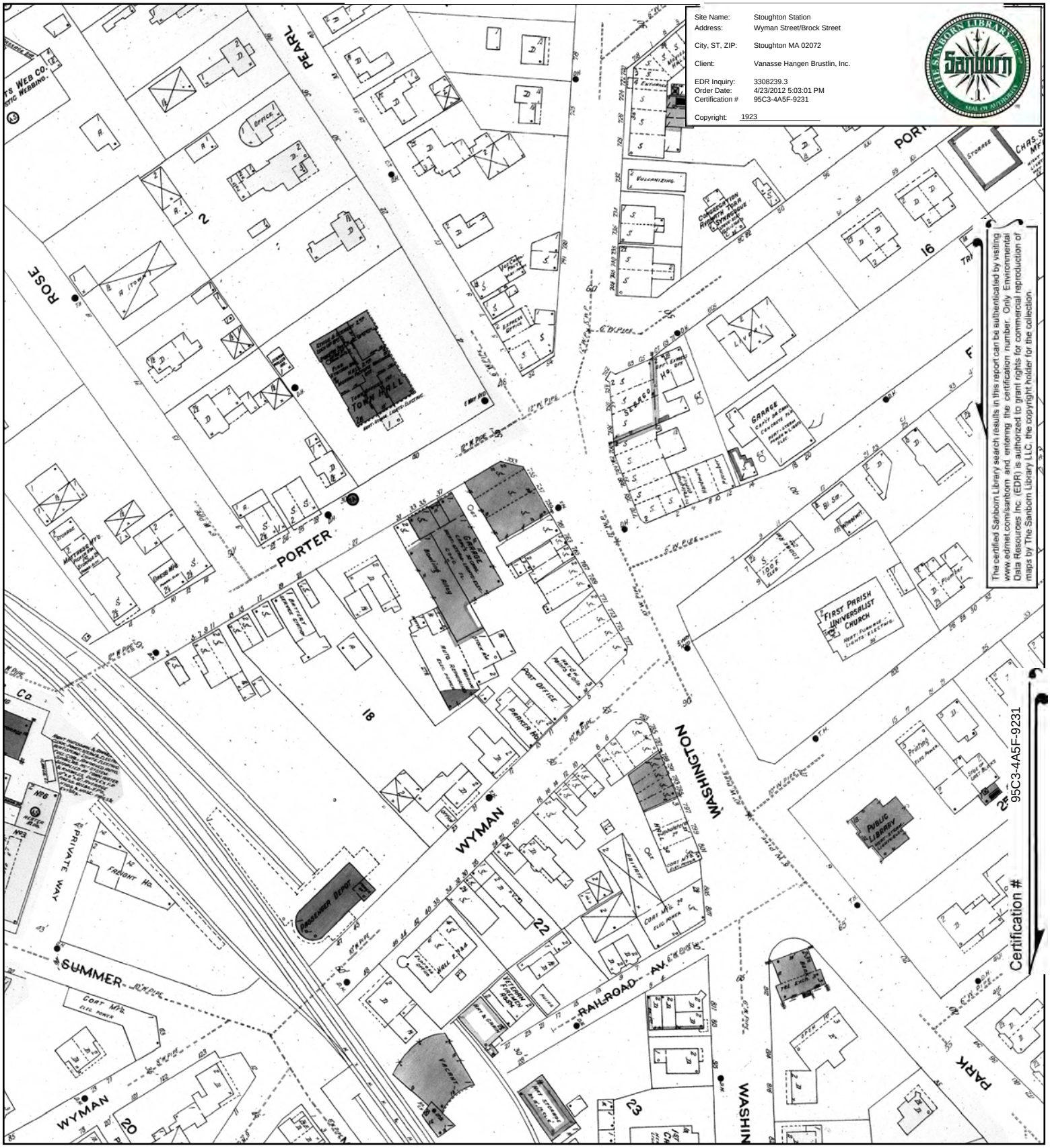

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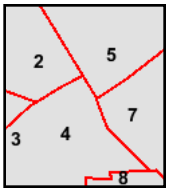

Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 5
Volume 1, Sheet 7

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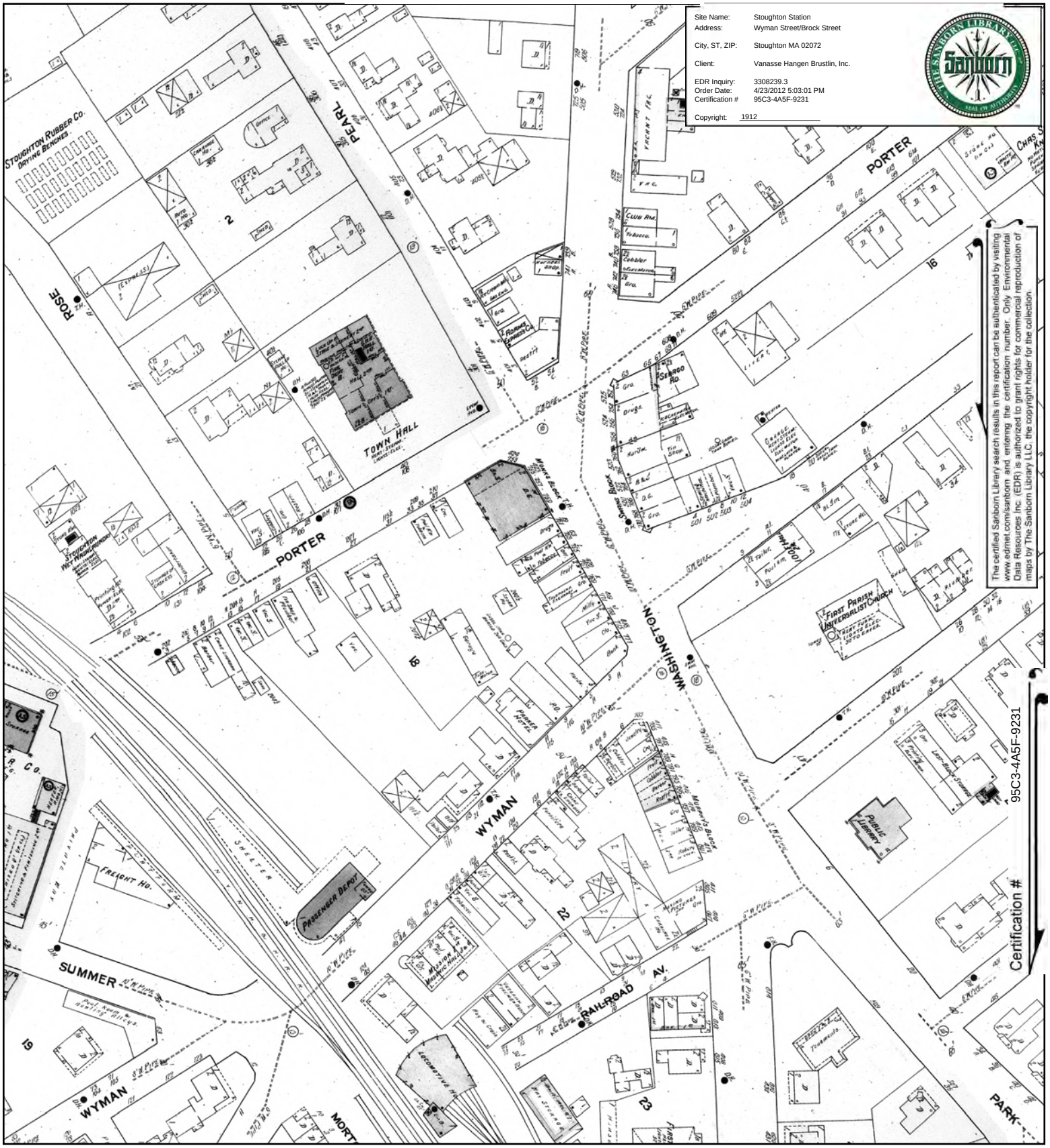

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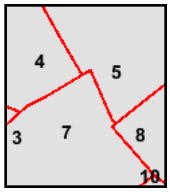

Volume 1, Sheet 3
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Volume 1, Sheet 5
Volume 1, Sheet 7
Volume 1, Sheet 8

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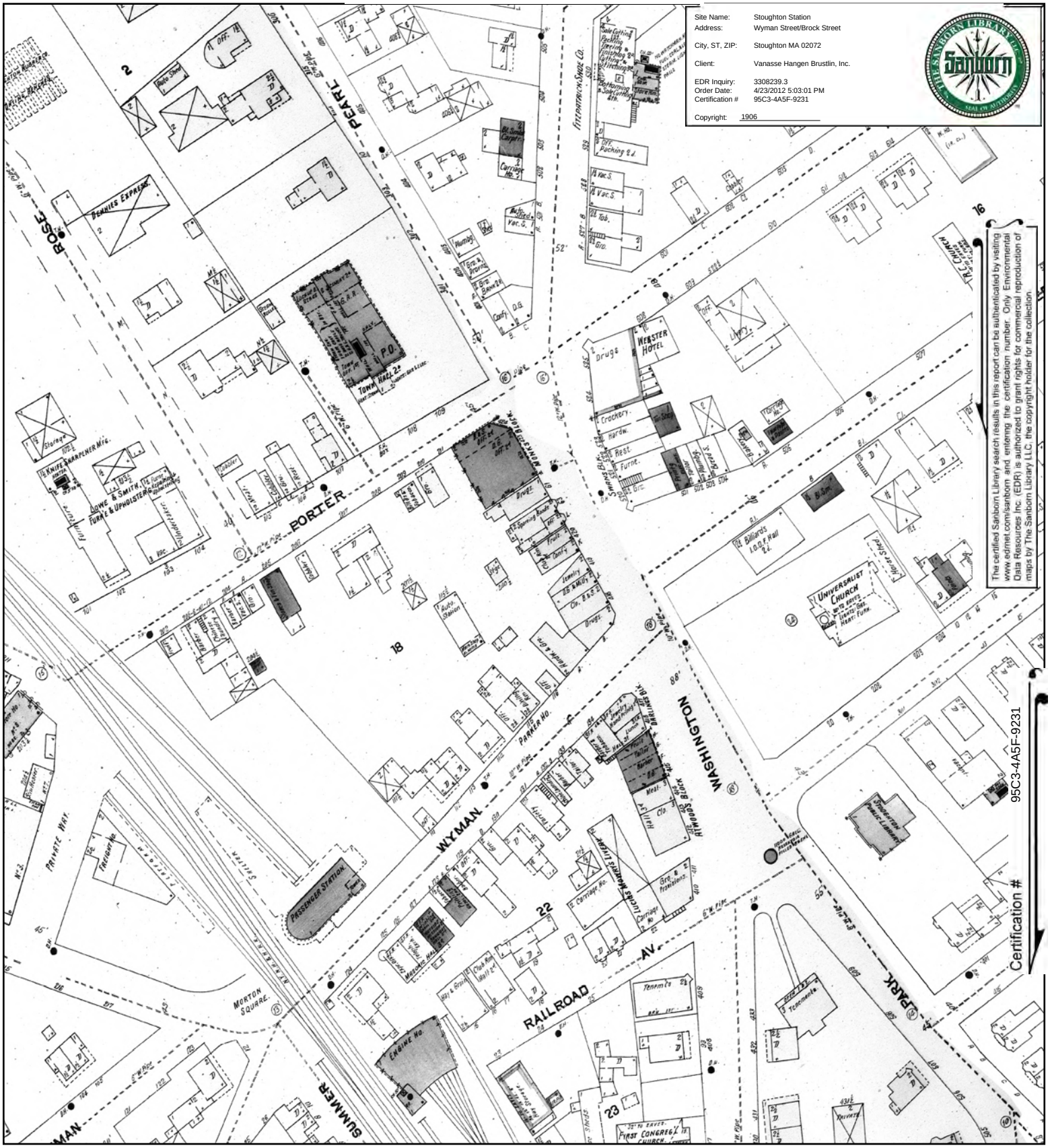

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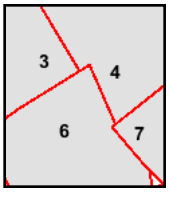

Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 6
Volume 1, Sheet 7

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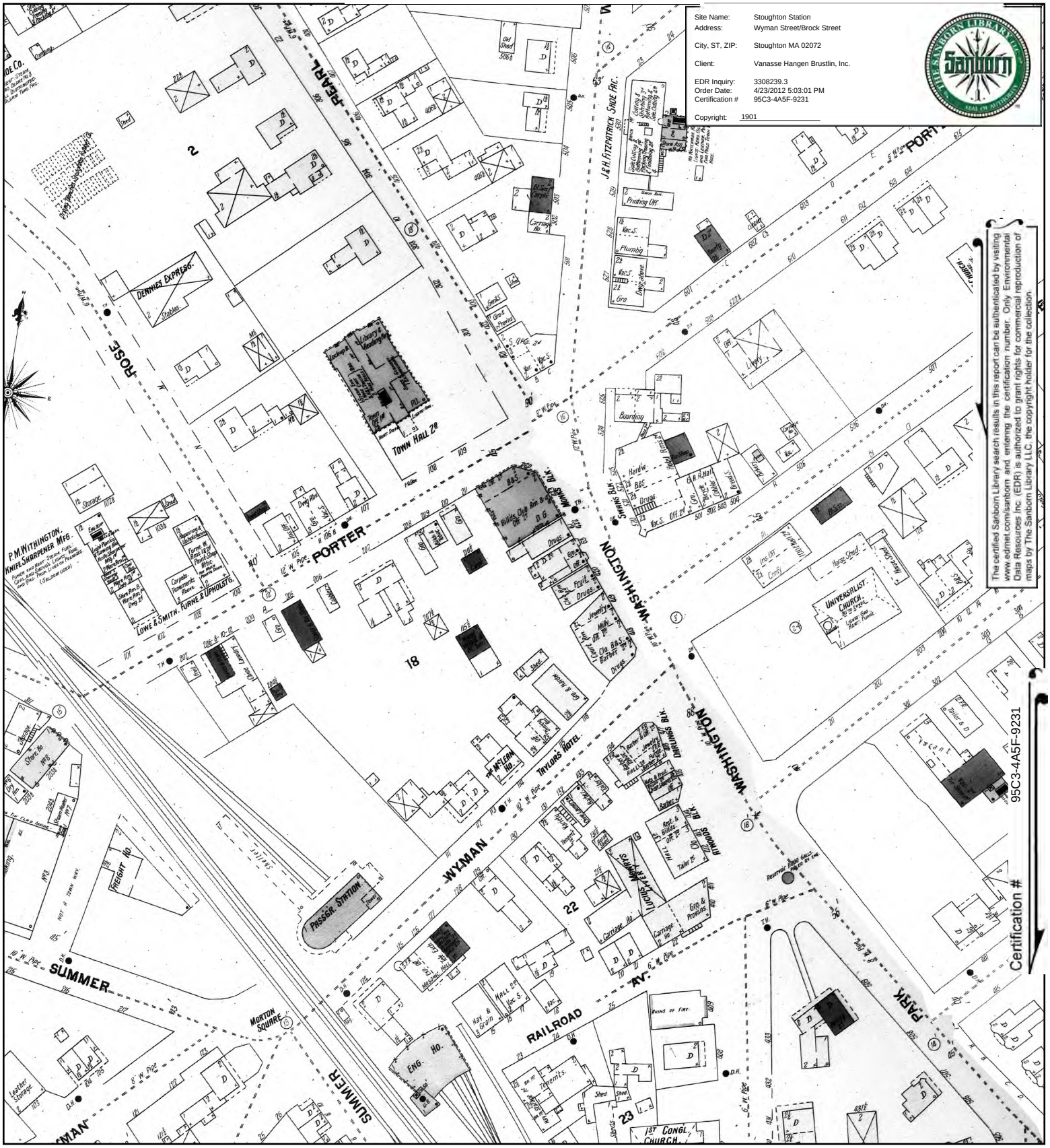

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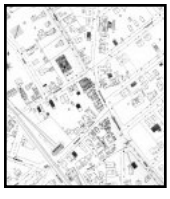

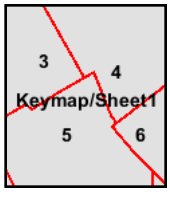

Volume 1, Sheet 3
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Volume 1, Sheet 5
Volume 1, Sheet 6

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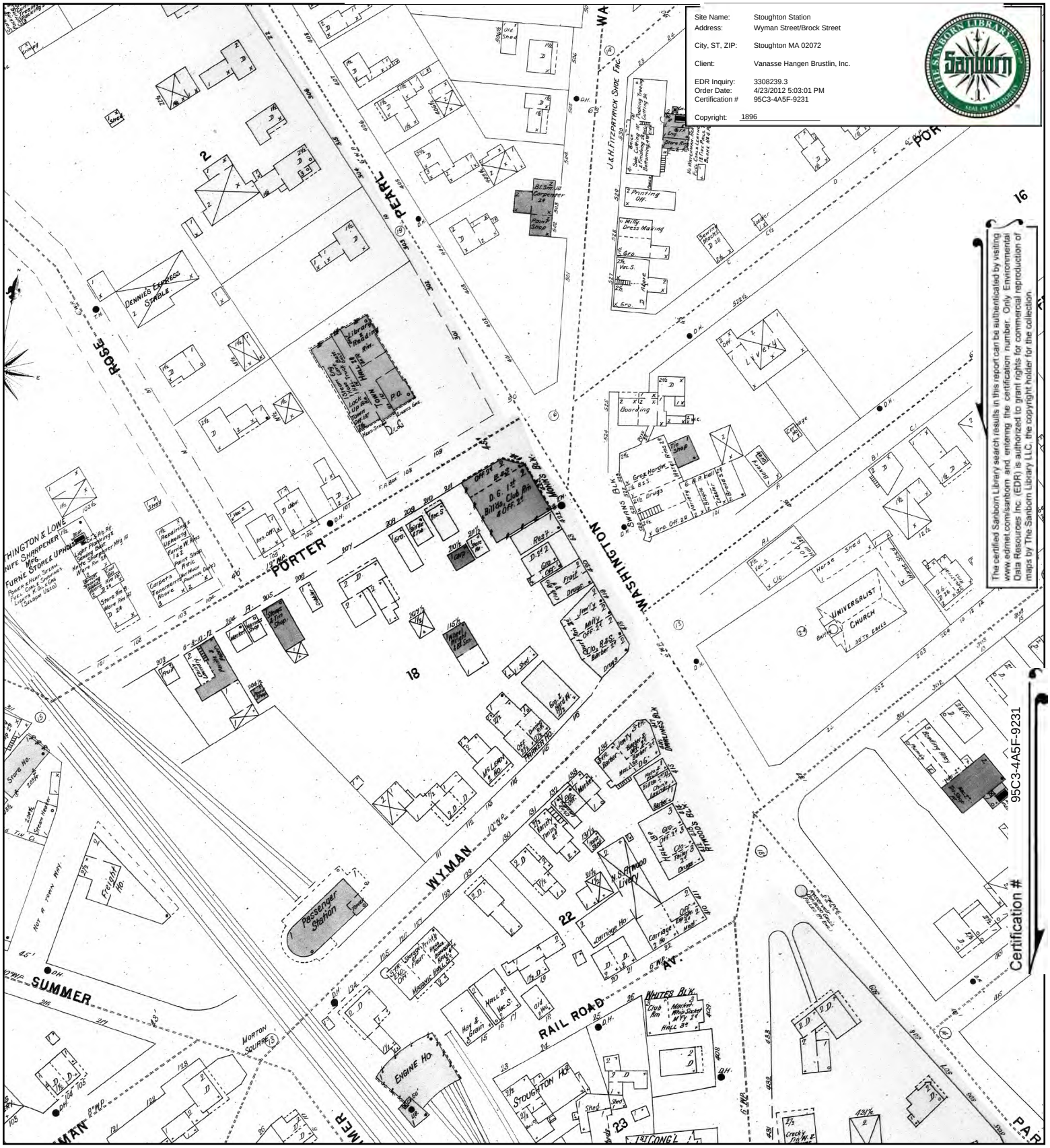

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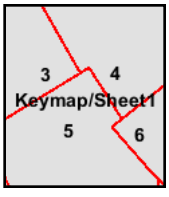

Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 5
Volume 1, Sheet 6

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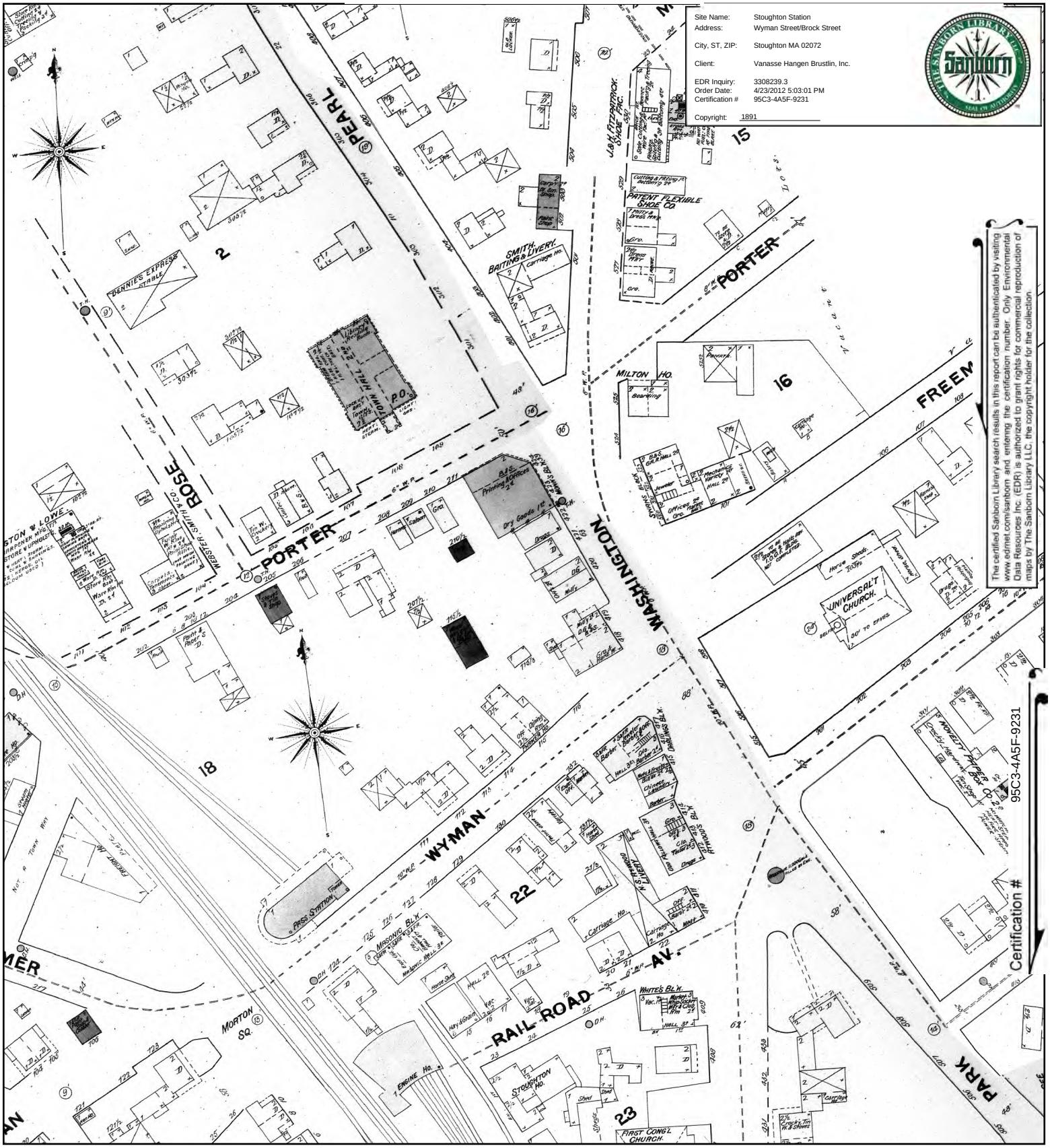

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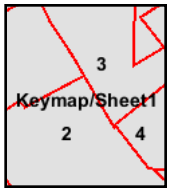

Volume 1, Sheet Keymap/Sheet1
Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4

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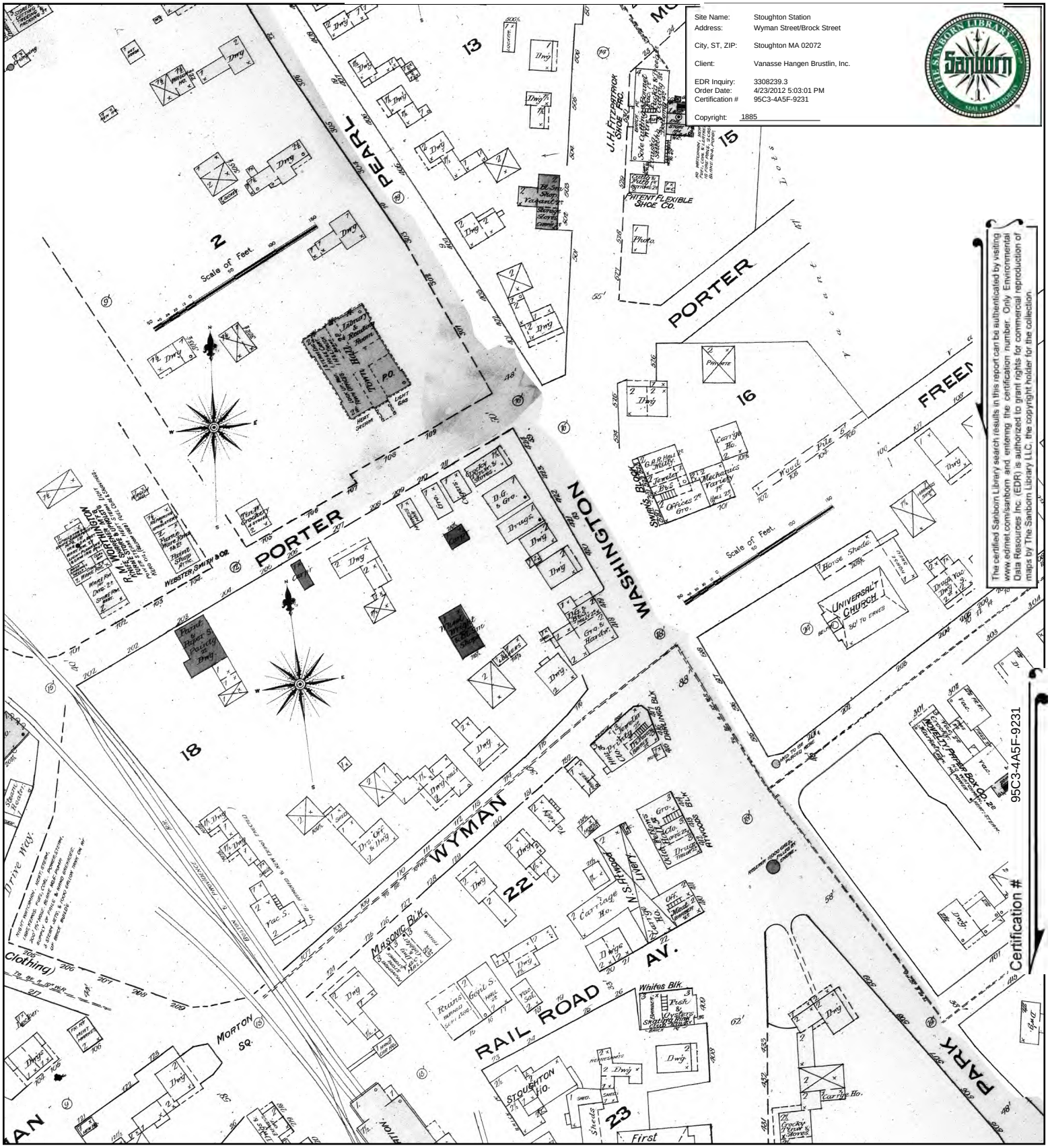

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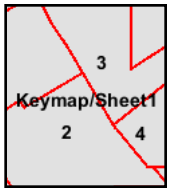

Volume 1, Sheet Keymap/Sheet1
Volume 1, Sheet 2
Volume 1, Sheet 3
Volume 1, Sheet 4

N

Appendix F
Historic Topographic Maps

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Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.4
April 23, 2012

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
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Historical Topographic Map

N	TARGET QUAD NAME: DEDHAM MAP YEAR: 1894 SERIES: 15 SCALE: 1:62500	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

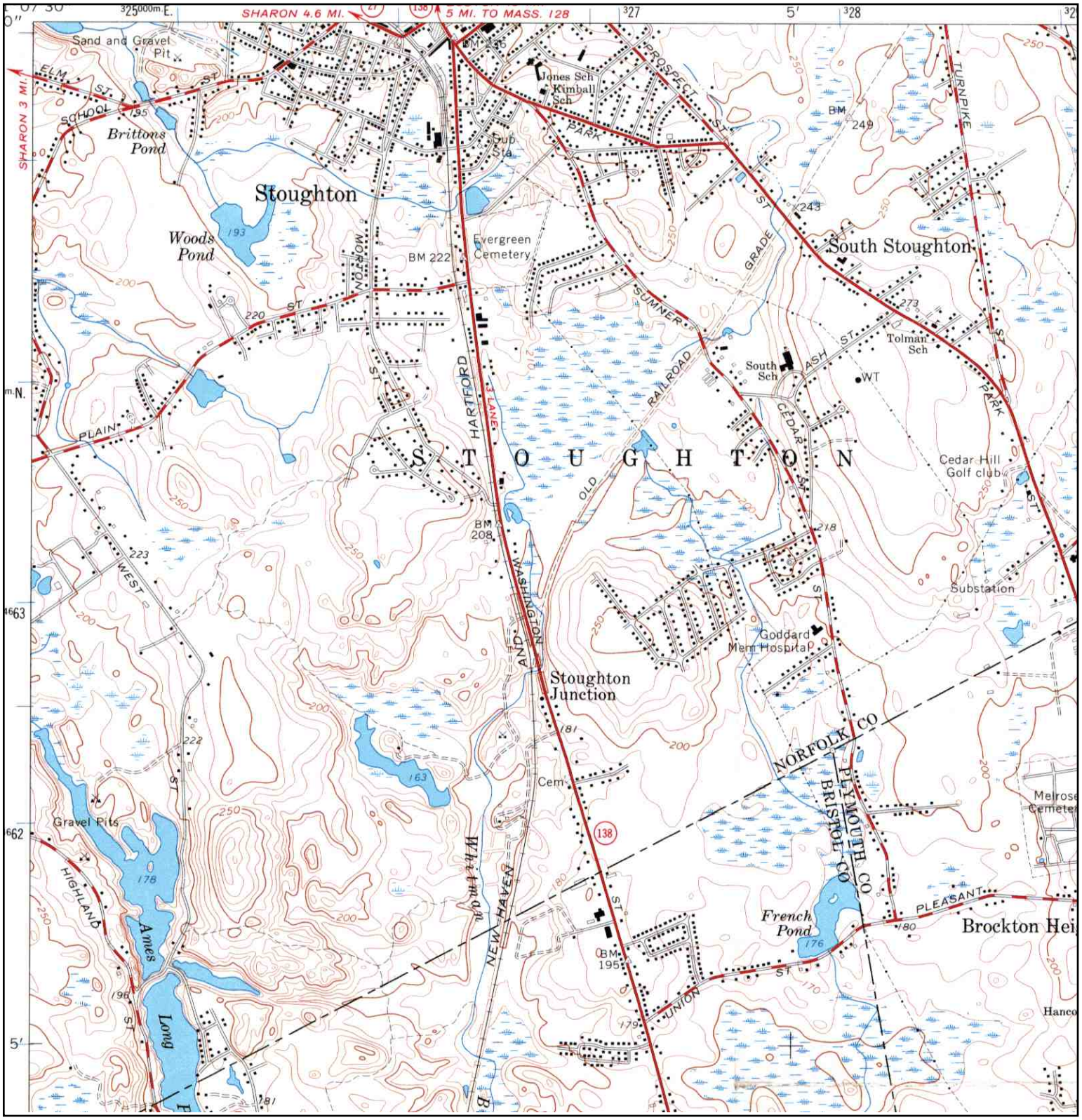
Historical Topographic Map

N	TARGET QUAD NAME: BROCKTON MAP YEAR: 1941 SERIES: 7.5 SCALE: 1:25000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map

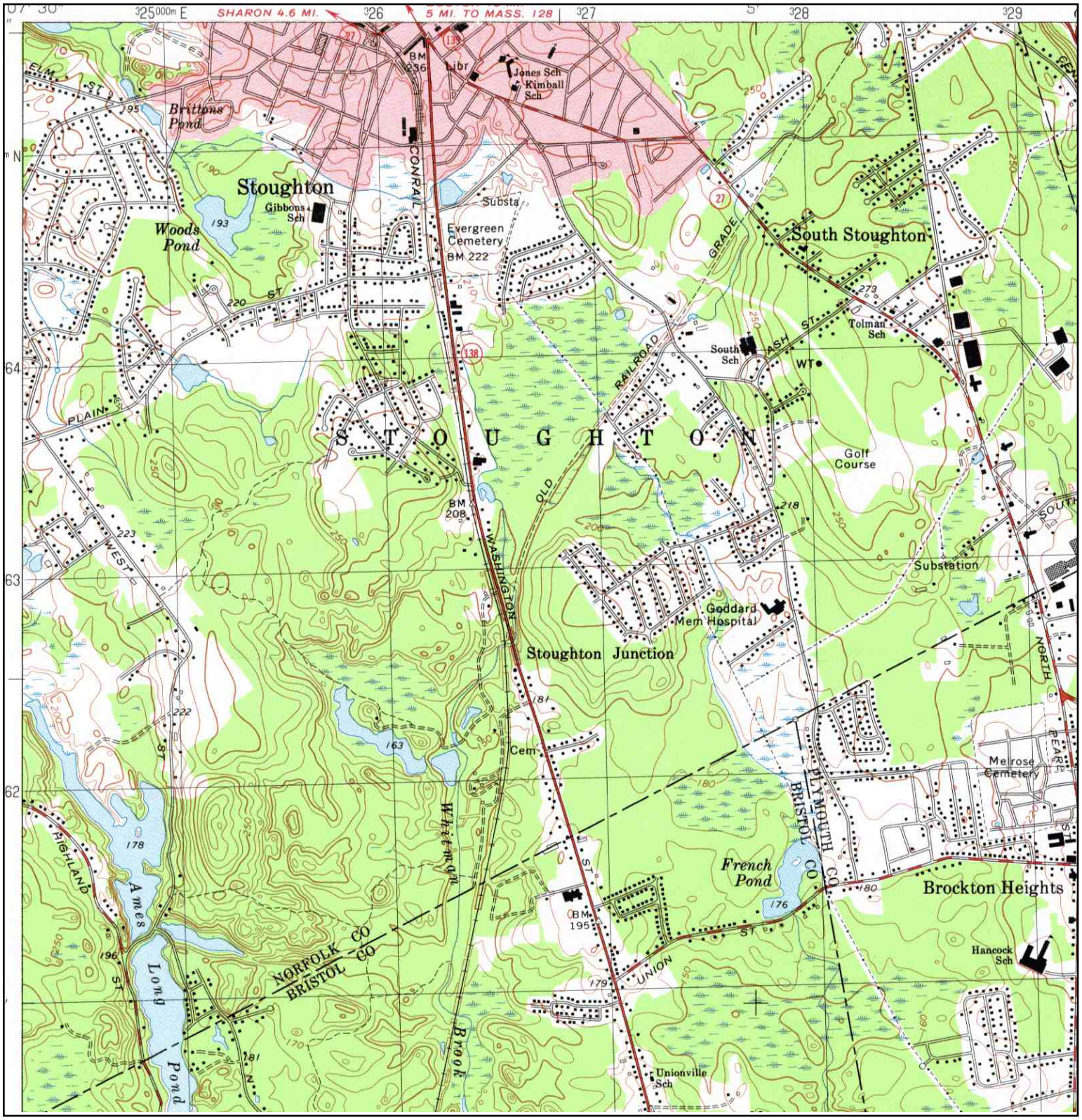
N	TARGET QUAD NAME: BROCKTON MAP YEAR: 1951 CORRECTED FROM :1941 SERIES: 7.5 SCALE: 1:31680	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map



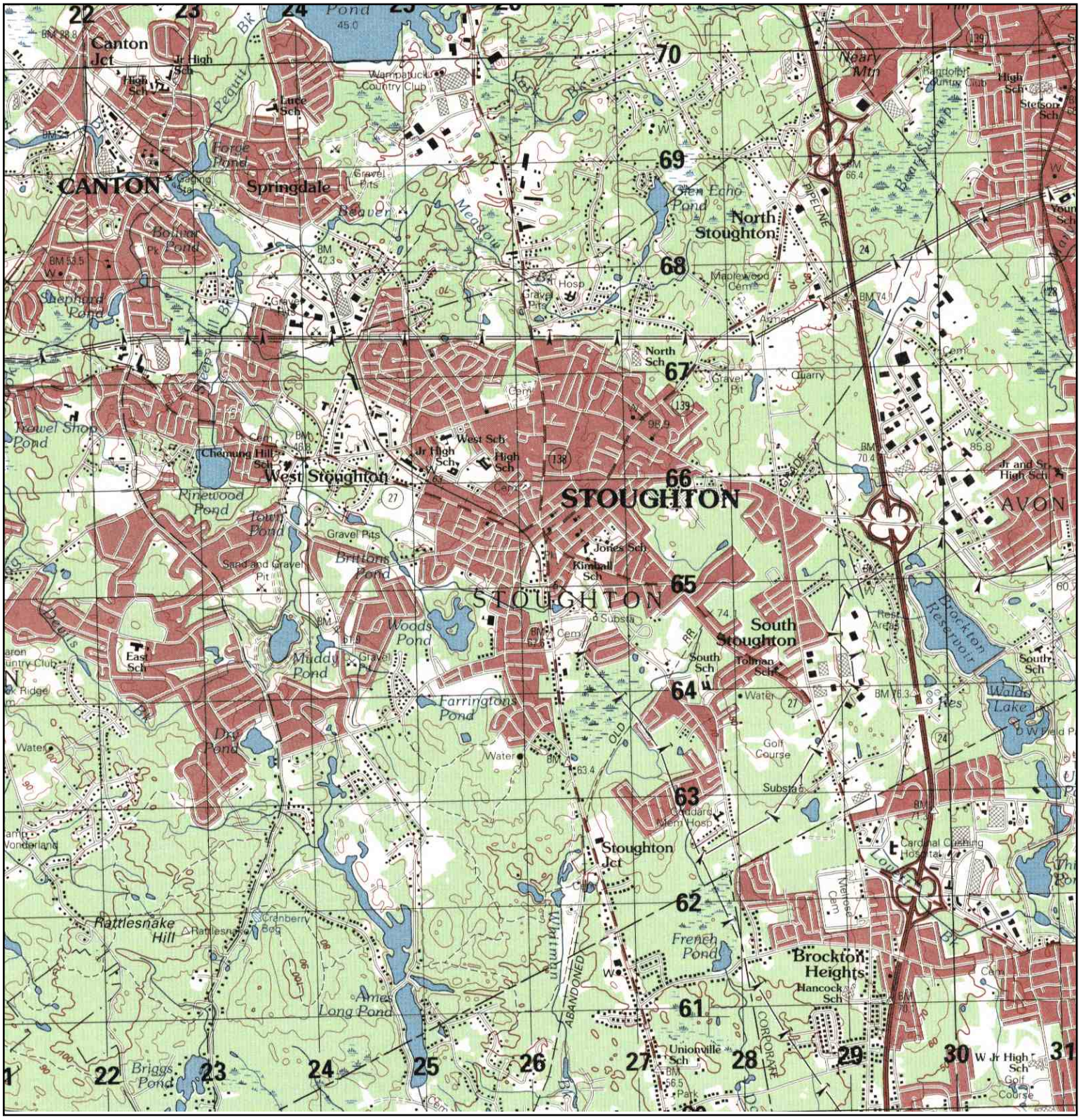
N	TARGET QUAD NAME: BROCKTON MAP YEAR: 1963 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map



N	TARGET QUAD NAME: BROCKTON MAP YEAR: 1975 SERIES: 7.5 SCALE: 1:25000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map


CANTON
Springdale
Canton Jct
Jr High Sch
High Sch
Lucc Sch
Wampatuck Country Club
Pequit Brk
Horde Pond
Gravel Pits
Beaver Brk
Meadow Brk
Bolivar Pond
Shepherd Road
Cem
Hosp
Maplewood Cem
Armory
North Sch
Gravel Pit
Quarry
Travel Shop Pond
Chemung Hill Sch
West Sch
Jr High Sch
High Sch
West Stoughton
Pinewood Pond
Town Pond
Gravel Pits
Sand and Gravel Pit
Britton Pond
STOUGHTON
Jones Sch
Kimball Sch
Woods Pond
Muddy Pond
East Sch
Farringtons Pond
Dry Pond
Water
Golf Course
Substa
South Stoughton
Tolman Sch
South Sch
Brockton Reservoir
Walden Lake
Rest Area
Stoughton Jct
Goddard Mem Hosp
Cardinal Cushing Hospital
Rattlesnake Hill
Cranberry Bog
French Pond
Brockton Heights
Hancock Sch
Melrose Cem
Ames Long Pond
Briggs Pond
Unionville Sch
Park
North Stoughton
Glen Echo Pond
Pipeline
Penn Central
Old Colony
Abandoned
Corporate
Avon
Jr and Sr High Sch
W Jr High Sch
Golf Course
Pond
Brk
Ridge
Ponderland
Country Club
Cem
Park
Water
Golf Course
Substa
Cem
Hosp
Gravel Pits
Sand and Gravel Pit
Cranberry Bog
Rattlesn
Cem
Park
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Historical Topographic Map

N	TARGET QUAD NAME: BROCKTON MAP YEAR: 1987 SERIES: 7.5 SCALE: 1:25000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

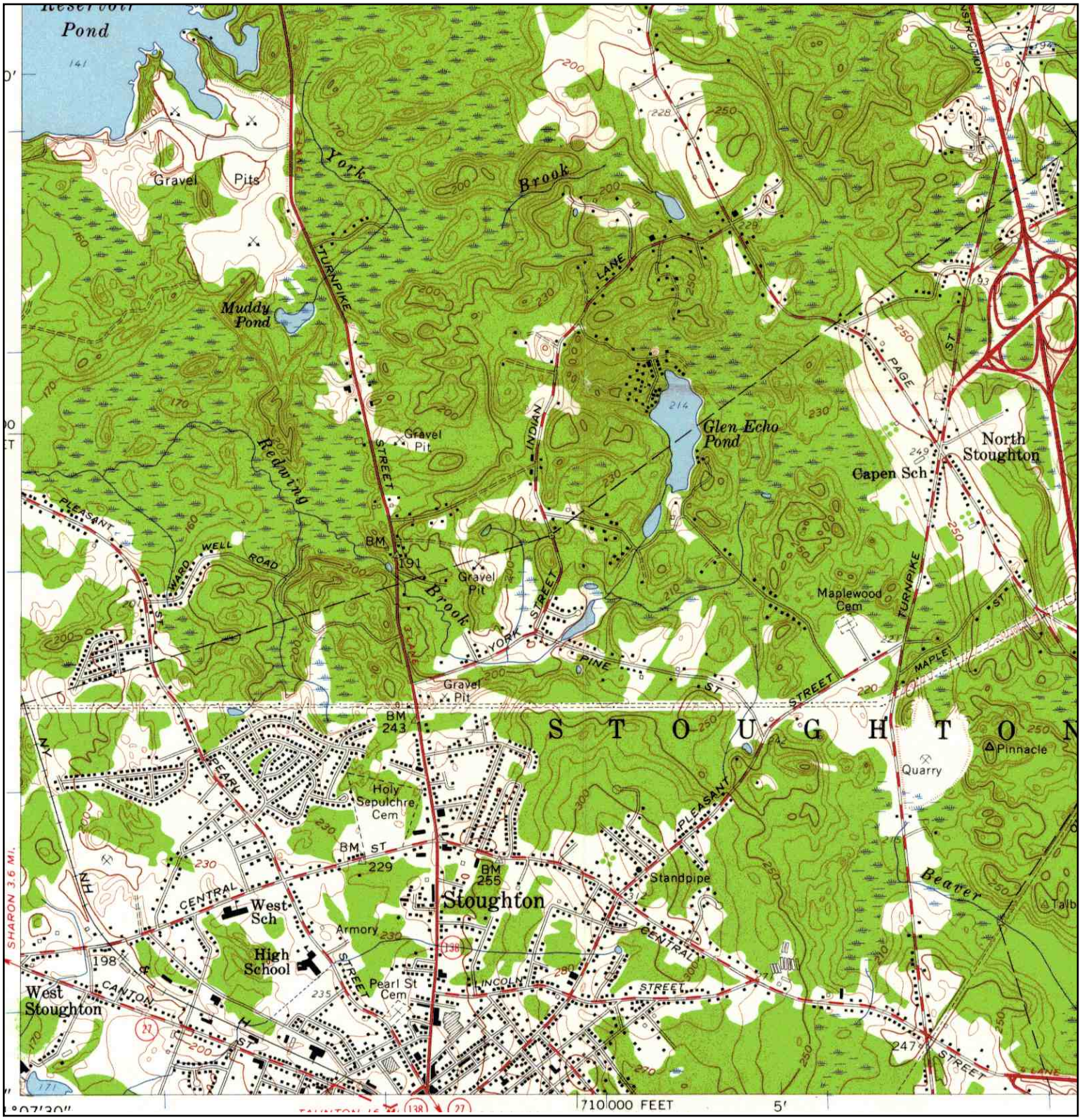
Historical Topographic Map

N	ADJOINING QUAD		SITE NAME:	Stoughton Station	CLIENT: Vanasse Hangen Brustlin, Inc.
	NAME:	BLUE HILLS	ADDRESS:	Wyman Street/Brock Street	CONTACT: Katie Kudzma
	MAP YEAR:	1941		Stoughton, MA 02072	INQUIRY#: 3308239.4
	SERIES:	7.5	LAT/LONG:	42.1221 / -71.1024	RESEARCH DATE: 04/23/2012
	SCALE:	1:25000			

Historical Topographic Map

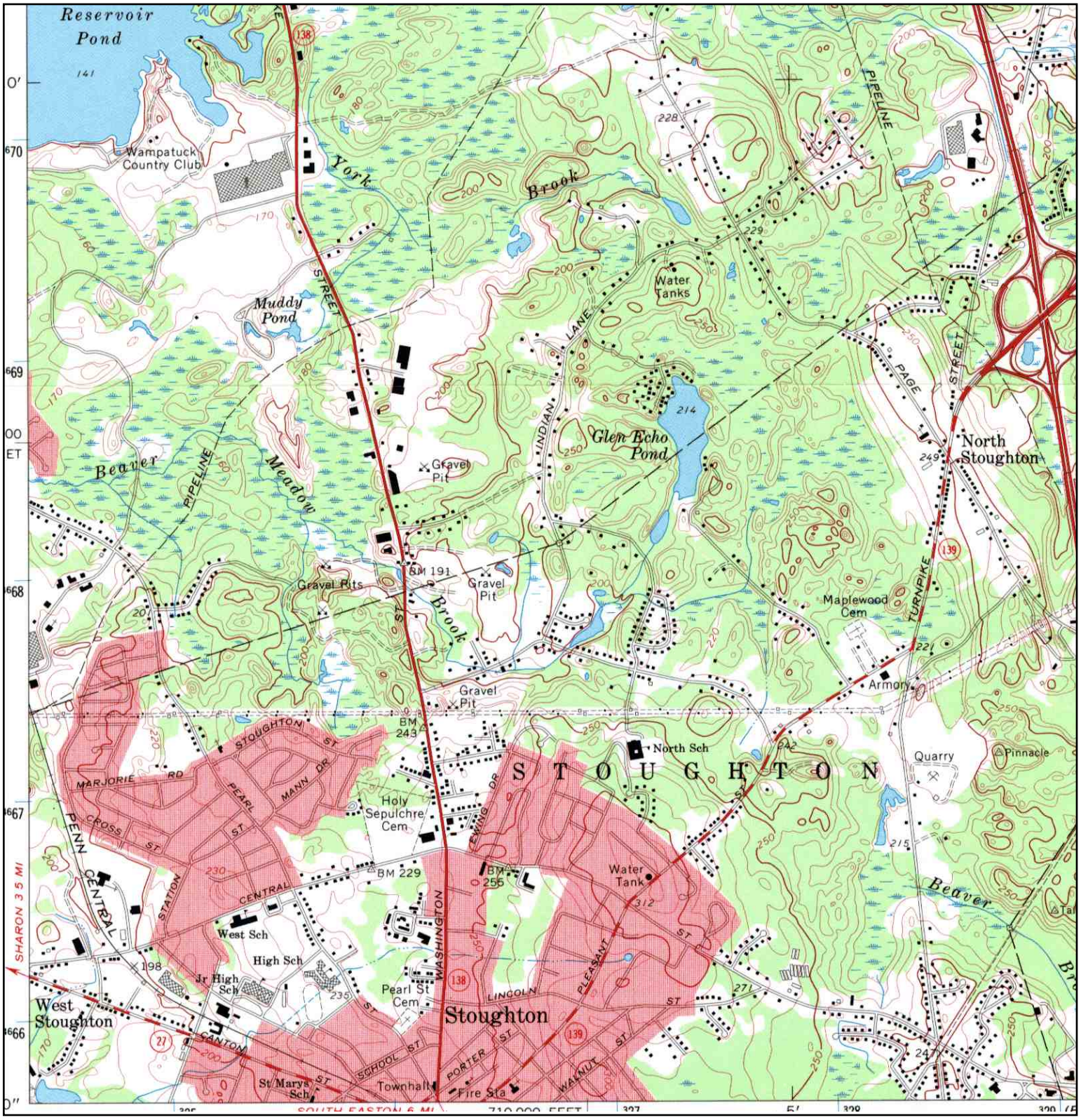
N	ADJOINING QUAD NAME: BLUE HILLS MAP YEAR: 1948 CORRECTED FROM :1941 SERIES: 7.5 SCALE: 1:31680	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map



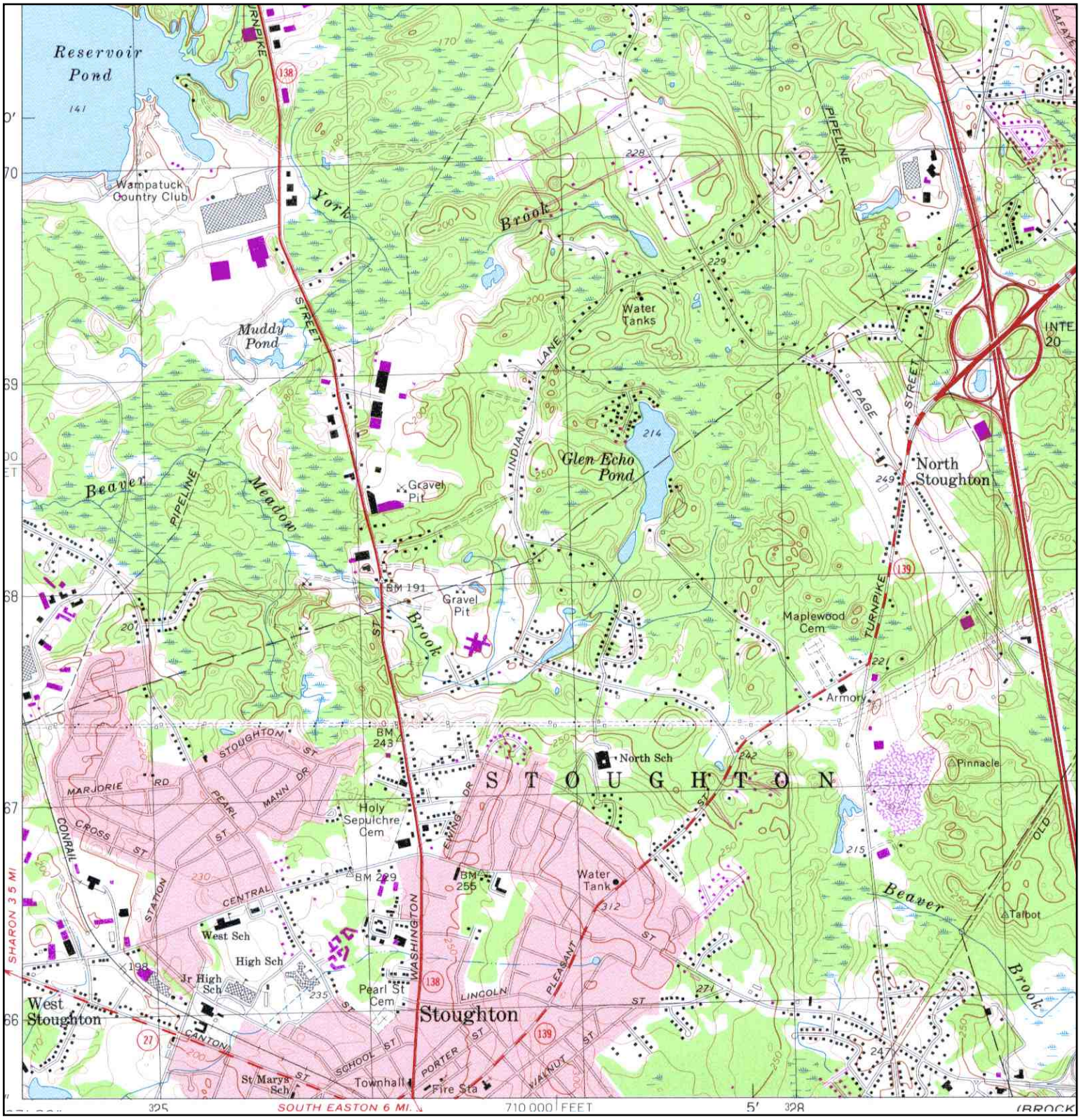
N	ADJOINING QUAD NAME: BLUE HILLS MAP YEAR: 1958 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map



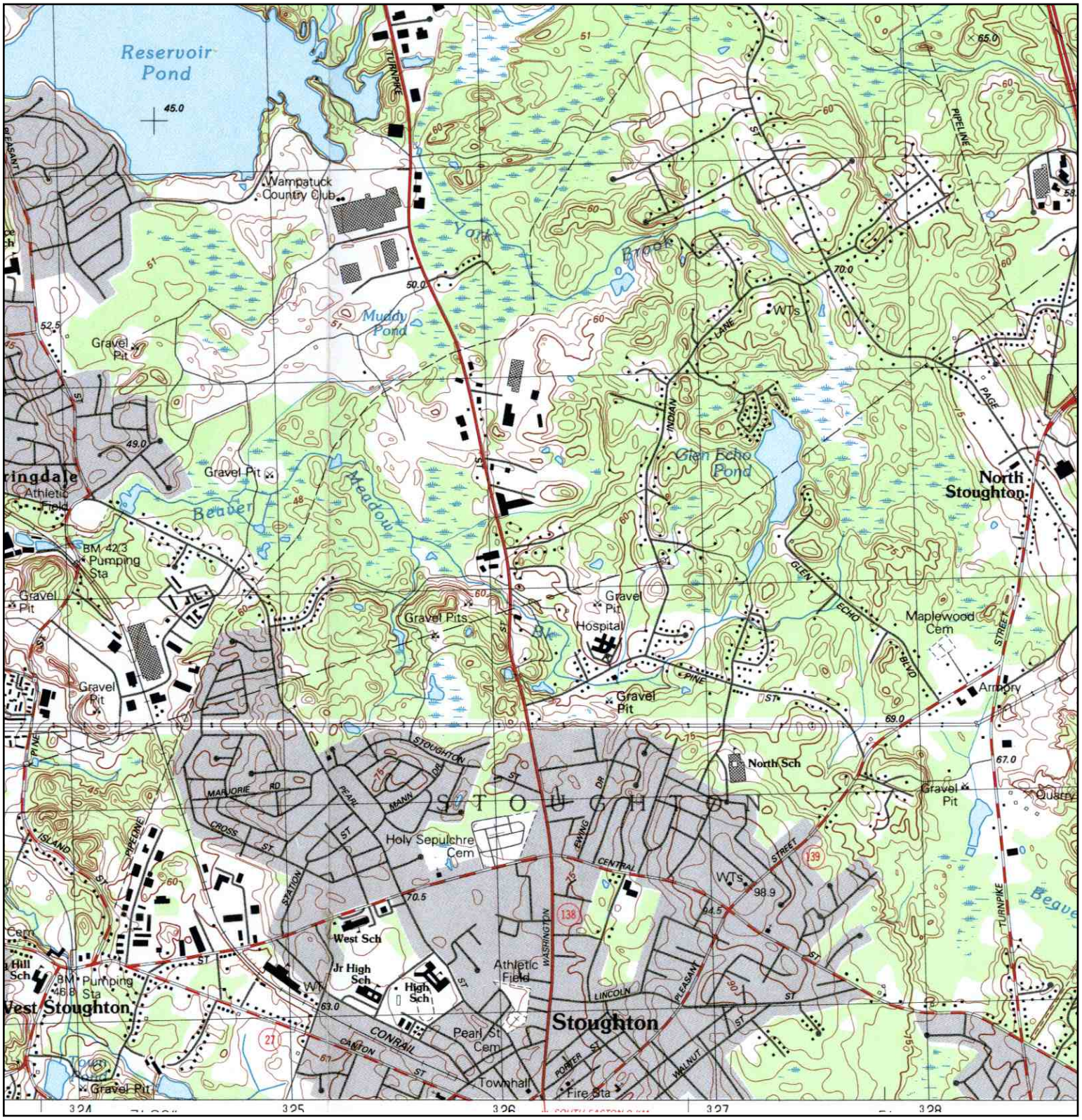
N	ADJOINING QUAD		
	NAME: BLUE HILLS	SITE NAME: Stoughton Station	CLIENT: Vanasse Hangen Brustlin, Inc.
	MAP YEAR: 1971	ADDRESS: Wyman Street/Brock Street	CONTACT: Katie Kudzma
		Stoughton, MA 02072	INQUIRY#: 3308239.4
	SERIES: 7.5	LAT/LONG: 42.1221 / -71.1024	RESEARCH DATE: 04/23/2012
	SCALE: 1:24000		

Historical Topographic Map



N	ADJOINING QUAD NAME: BLUE HILLS MAP YEAR: 1979 PHOTOREVISED FROM :1971 SERIES: 7.5 SCALE: 1:25000	SITE NAME: Stoughton Station ADDRESS: Wyman Street/Brock Street Stoughton, MA 02072 LAT/LONG: 42.1221 / -71.1024	CLIENT: Vanasse Hangen Brustlin, Inc. CONTACT: Katie Kudzma INQUIRY#: 3308239.4 RESEARCH DATE: 04/23/2012

Historical Topographic Map



N	ADJOINING QUAD		SITE NAME:	Stoughton Station	CLIENT: Vanasse Hangen Brustlin, Inc.
	NAME:	NORWOOD	ADDRESS:	Wyman Street/Brock Street	CONTACT: Katie Kudzma
	MAP YEAR:	1985		Stoughton, MA 02072	INQUIRY#: 3308239.4
	SERIES:	7.5	LAT/LONG:	42.1221 / -71.1024	RESEARCH DATE: 04/23/2012
	SCALE:	1:25000			

Appendix G
Historic Aerial Photographs

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Stoughton Station
Wyman Street/Brock Street
Stoughton, MA 02072

Inquiry Number: 3308239.5
April 24, 2012

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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Date EDR Searched Historical Sources:

Aerial Photography April 24, 2012

Target Property:

Wyman Street/Brock Street

Stoughton, MA 02072

Year	***Scale***	***Details***	***Source***
1957	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Date: May 06, 1957	EDR
1961	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Date: March 31, 1961	EDR
1969	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Date: April 13, 1969	EDR
1974	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Date: March 27, 1974	EDR
1978	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Date: April 23, 1978	EDR
1985	Aerial Photograph. Scale: 1"=1000'	Panel #: 42071-A1, Brockton, MA;/Flight Date: April 17, 1985	EDR
1991	Aerial Photograph. Scale: 1"=750'	Panel #: 42071-A1, Brockton, MA;/Flight Date: April 04, 1991	EDR
1996	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Composite DOQQ - acquisition dates: May 07, 1996	EDR
2006	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Year: 2006	EDR
2008	Aerial Photograph. Scale: 1"=500'	Panel #: 42071-A1, Brockton, MA;/Flight Year: 2008	EDR

INQUIRY #: 3308239.5
YEAR: 1957
= 500'
N

INQUIRY #: 3308239.5
YEAR: 1961
= 500'
N

INQUIRY #: 3308239.5
YEAR: 1969
= 500'
N

INQUIRY #: 3308239.5
YEAR: 1974
= 500'
N

INQUIRY #: 3308239.5
YEAR: 1978
= 500'
N

INQUIRY #: 3308239.5
YEAR: 1985
= 1000'
N

INQUIRY #: 3308239.5

YEAR: 1991

= 750'

N

INQUIRY #: 3308239.5
YEAR: 1996
= 500'
N

INQUIRY #: 3308239.5
YEAR: 2006
= 500'
N

INQUIRY #: 3308239.5
YEAR: 2008
= 500'
N

Appendix H
Site Photographs

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South Coast Rail Project
Stoughton Station, Stoughton, Massachusetts
Site Photos Taken on April 26, 2012
by Vanasse Hangen Brustlin, Inc.

Photo #1: View of 48 Wyman Street property, taken facing north.

Photo #2: View of 48 Wyman Street property, taken facing southwest.

Photo #3: Parcel at 48 Wyman shown to the left, taken facing southeast.

Photo #4: View of parking area at 2 Canton Street property, taken facing northwest.

South Coast Rail Project
Stoughton Station, Stoughton, Massachusetts
Site Photos Taken on April 26, 2012
by Vanasse Hangen Brustlin, Inc.

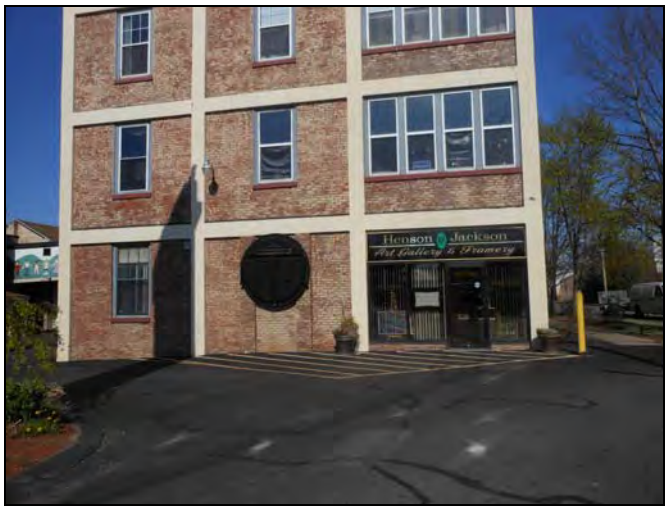

Photo #5: Trackside Plaza located at 2 Canton Street property, taken facing northwest.

Photo #6: A portion of the building at 2 Canton Street, showing an old boiler, taken facing northwest.

Photo #7: The rear of 2 Canton Street, taken facing south.

Photo #8: View of the 2 Canton Street property from Summer Street, taken facing north.

South Coast Rail Project
Stoughton Station, Stoughton, Massachusetts
Site Photos Taken on April 26, 2012
by Vanasse Hangen Brustlin, Inc.

Photo #9: View of the vacant parcel located at Morton Street (Parcel 054-407).

Photo #10: View of Murphy Coal Company parcel, including fuel oil ASTs, located off Morton Square (parcel 054-406), taken facing south.

Photo #11: View of Murphy Coal Company parcel (off Morton Square), taken facing west.

Photo #12: View of ASTs located at Parcel 054-406, taken facing west.

South Coast Rail Project
Stoughton Station, Stoughton, Massachusetts
Site Photos Taken on April 26, 2012
by Vanasse Hangen Brustlin, Inc.

Photo #13: View of 25 Brock Street property from Brock Street showing abutting railroad tracks.

Photo #14: View of 25 Brock Street property from Brock Street.

Photo #15: View of 25 Brock Street property from Brock Street showing additional buildings.

Photo #16: View of storage tanks at Alpha Chemical Company, which abuts the Site to the north and west, taken facing east.

Appendix 4.14-A

Detailed Bridge and Culvert Inventory

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
Stoughton Line									
Bridge over Forge Pond [Pequit Brook]	Fig. 4.14-11a	18' long stone arch bridge (historic)	SR/SC	Open water with a bordering forested wetland associated with Forge Pond/Open Water with a bordering forested wetland associated with Forge Pond	Pond connector.	Freshwater wetland and aquatic (at bridge site only)	DFW & DMF fishery; no wildlife habitat	No	Historic nature of bridge precludes meeting Stream Crossing standards.
Bridge over Mill Brook [Beaver Meadow Brook]	Fig. 4.14-11a	12' long stone arch bridge	UrR/UrR	Forested wetland system associated with Beaver Meadow Brook/ Red Maple wetland with scrub shrub components associated with Beaver Meadow Brook pond system	Perennial stream conveyance.	None	No fishery; no wildlife habitat	No	Meet Stream Crossing standards.
CV-ST 2.47	Fig.4.14-11a	NA	UrR/SO	X/Intermittent stream channel	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 3.40	Fig. 4.14-11a	NA	SCI/SO	X/Intermittent stream channel	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 4.47	Fig. 4.14-11b	2.5'x2.5' stone box culvert, 55' long	SCI/SO	Forested wetland associated with perennial stream/ Perennial stream originating from unnamed pond east of Rt. 138 and flowing into Woods Pond	Perennial stream conveyance.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-ST 4.94	Fig. 4.14-11b	2'x2' stone box culvert, 40' long	SC/SR	Intermittent stream channel connected to ST3 (100 series)/ Intermittent stream channel associated with a pond and its emergent wetland system	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 5.04	Fig. 4.14-11b	12" VCP culvert, 15' long	SCI/SR	X/Isolated depression with standing water and minimal emergent wetland vegetation	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 5.26	Fig. 4.14-11b	3'x3' stone box culvert, 30' long	SCI/SR	Intermittent stream channel/ Intermittent stream channel connected to ST4A (100 series)	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 5.76	Fig. 4.14-11b	4'x5' stone box culvert, 50' long	SC/SO	X/Large forested wetland with an intermittent stream channel	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 5.82	Fig. 4.14-11b	3'x4' stone box culvert, unknown length	SC/SO	Intermittent stream channel connected to ST7/ Large forested wetland with an intermittent stream channel	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-ST 5.94	Fig. 4.14-11b	2'x2' stone box culvert, 55' long	SO/SO	Large open marsh associated with Whitman Brook/ Associated with Whitman Brook	Upland drainage.	None	No fishery; wildlife habitat at Stoughton Memorial Conservation Land	No	Replace in kind
CV-ST 6.17	Fig. 4.14-11b	2'x2' stone box culvert, 50' long	UnO/UnO	Forested wetland associated with intermittent stream/ Forested wetland along intermittent stream connected to ST10 (100 series)	Wetland equalizer.	Freshwater wetland and aquatic adjacent west	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 6.45	Fig. 4.14-11b	2'x2.5' stone box culvert, 75' long	UnO/S-UnO	ND/Intermittent stream	Intermittent stream conveyance.	Freshwater wetland and aquatic adjacent east	No fishery; wildlife habitat at Stoughton Memorial Conservation Land northwest.	No	Meet Stream Crossing Standards.
CV-ST 6.69	Fig. 4.14-11b	3'x3' stone box culvert, 70' long	UnO/UnO	Large forested wetland associated with an intermittent stream (BF 98-101) and Whitman Brook (200 and 300 series)/ Forested wetland with shrub-scrub components	Wetland equalizer.	Freshwater wetland and aquatic adjacent west	No fishery; wildlife habitat in Whitman Brook wetland system	No	Meet Stream Crossing Standards.
Bridge over Cowessett Brook [Whitman Brook]	Fig. 4.14-11b	20' long deck stringer bridge	UnO/UnO	Large forested wetland associated with an intermittent stream (BF 98-101) and Whitman Brook (200 and 300 series)/ Forested wetland with shrub-scrub components	Perennial stream conveyance.	Freshwater wetland and aquatic	DFW & DMF fishery; wildlife habitat in Whitman Brook wetland system	No	Meet Stream Crossing Standards.
CV-ST 6.83	Fig. 4.14-11b	3.5'x5' stone box culvert, 30' long	UnO/UnO	Shrub-scrub wetland associated with intermittent stream to Whitman Brook/ Intermittent stream connected to EA5.3; separated from EA6 [to north] by unpaved walkway	Intermittent stream conveyance.	Freshwater wetland and aquatic	No fishery; wildlife habitat in Whitman Brook wetland system	No	Meet Stream Crossing Standards.
CV-ST 7.06	Fig. 4.14-11b	2.5'x2.5' stone box culvert, 40' long	UnO/UnO	Forested wetland associated with intermittent stream channel, connected to EA7/ Red Maple swamp connected to a larger wetland outside limit of delineation	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 7.21	Fig. 4.14-11b	2.5'x4' stone box culvert, 50' long	UnO/UnO	Intermittent stream channel connected to EA8 and EA10/ Red Maple swamp connected to EA9 under ROW by an intermittent channel	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-ST 7.23	Fig. 4.14-11b	2'x3' stone box culvert, 55' long	UnO/UnO	Intermittent stream channel connected to EA8 and EA10/ Scrub-shrub wetland connected to EA9	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 7.42	Fig. 4.14-11b	4'x6' stone box culvert, 40' long	SR/SR	Intermittent stream/ Intermittent stream	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Replace in kind.
Bridge over Small Creek [Quesett Brook]	Fig. 4.14-11b	15' long deck stringer bridge	UrR/UrC	Detention basin/ Large forested wetland associated with an intermittent stream.	Perennial stream conveyance.	None	DFW & DMF fishery; no wildlife habitat	No	Meet Stream Crossing Standards.
CV-ST 8.76	Fig. 4.14-11b	2'x1' stone box culvert, unknown length	UnO/S-UnO	Large depression connected to EA16 under ROW/X	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-ST 9.22	Fig. 4.14-11c	5'x6' stone box culvert, unknown length	UnO/S-UnO	NA	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 9.35	Fig. 4.14-11c	4'x4' stone box culvert, 50' long	UnO/UnO	Forested wetland connected to EA22 under ROW/ Certified Vernal Pool	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards
CV-ST 9.65	Fig. 4.14-11c	3'x3' stone box culvert, 50' long	UnO/UnO	Red Maple swamp connected to EA24 under ROW/ Forested wetland includes a Certified Vernal Pool	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 9.83	Fig. 4.14-11c	3'x3.5' stone box culvert, unknown length	UnO/UnR	Connected to EA26 under ROW/ ND	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Replace in kind.
No #	Fig. 4.14-11c	1.2'x2' stone box culvert, unknown length	UnO/UnI	ND/X	Upland drainge.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-ST 10.05	Fig. 4.14-11c	2'x2' stone box culvert, 40' long	UnO/UnR	Certified Vernal Pool/ Certified Vernal Pool	Wetland equalizer.	None	No fishery; wildlife habitat	Yes	Meet Stream Crossing Standards.
CV-ST 10.41	Fig. 4.14-11c	18" CIP culvert, 40' long	UnO/UnR	X/X	Upland drainage.	None	No fishery; no wildlife habitat	Yes	Replace in kind.
CV-ST 10.90	Fig. 4.14-11c	12" CMP culvert, 50' long	UnR/UnR	Forested wetland associated with Black Brook wetland system/ Part of the Black Brook wetland system	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
CV-ST 10.95	Fig. 4.14-11c	4'x6' stone box culvert, 40' long	UnO/UnR	Black Brook and its associated wetland system [Crossing 1]	Perennial stream conveyance.	None	DMF fishery; wildlife habitat	Yes	Meet Stream Crossing Standards.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-ST 11.11	Fig. 4.14-11c	18" CIP culvert, 30' long	UnO/UnR	Black Brook and its associated wetland system [Crossing 1]	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
Bridge over Black Brook	Fig. 4.14-11c	12" CIP culvert, 30' long (washed out)	UnO/UnR	Black Brook and its associated wetland system [Crossing 2]	Perennial stream conveyance.	Freshwater wetland and aquatic adjacent west	DMF fishery; wildlife habitat	Yes	Meet Stream Crossing Standards.
CV-ST 11.23	Fig. 4.14-11c	18" CIP culvert, unknown length	UnO/UnO	Hockomock Swamp/ Hockomock Swamp	Upland drainage.	None	No fishery; wildlife habitat in upland	Yes	Replace in kind.
CV-ST 11.33	Fig. 4.14-11c	18" CIP culvert, 40' long	UnO/UnO	Hockomock Swamp/ Hockomock Swamp	Upland drainage.	None	No fishery; wildlife habitat in upland	Yes	Replace in kind.
CV-ST 11.34	Fig. 4.14-11c	18" CIP culvert, 40' long	UnO/UnO	Hockomock Swamp/ Hockomock Swamp	Upland drainage.	None	No fishery; wildlife habitat in upland	Yes	Replace in kind.
CV-ST 11.44	Fig. 4.14-11c	18" DIP/CIP culvert, 30' long	UnO/UnO	Scrub-shrub wetland/ Intermittent stream connected to EA86.	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	Yes	Replace in kind.
CV-ST 11.59	Fig. 4.14-11c	3'x3' stone box culvert, 50' long	UnO/UnO	Forested wetland connected to EA82 under ROW/ Bordering an intermittent stream	Wetland equalizer.	Freshwater wetland and aquatic	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
CV-ST 11.61	Fig. 4.14-11c	36" CMP culvert, 50' long	UnO/UnO	Forested wetland connected to EA82 under ROW/ Bordering an intermittent stream	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
CV-ST 11.65	Fig. 4.14-11c	2'x2' stone box/ 12" CMP culvert, 40' long	UnO/UnO	Forested wetland connected to EA82 under ROW/ Bordering an intermittent stream	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
CV-ST 11.91	Fig. 4.14-11c	8'x6' stone/rail box culvert, 25' long	UnI/UnO	Certified Vernal Pool connected to EA78 under ROW/ Certified Vernal Pool	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	Yes	Meet Stream Crossing Standards.
No #	Fig. 4.14-11c	18" PVC culvert, unknown length	UnO/UnO	ND/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Could be eliminated.
CV-ST 12.09	Fig. 4.14-11c	6'x6' stone/rail box culvert, unknown length	UnO/UnO	Intermittent stream connected to EA67 under ROW/ Certified Vernal Pool	Wetland equalizer.	Freshwater wetland and aquatic	No fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-ST 12.38	Fig. 4.14-11c	8'x6' stone/rail box culvert, 30' long	UnO/UnO	Hockomock Swamp	Wetland equalizer.	Forest	No fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle
CV-ST 12.68	Fig. 4.14-11c	6'x6' stone/rail box culvert, 30' long	UnO/UnO	Hockomock Swamp	Perennial stream conveyance.	Freshwater wetland and aquatic, Forest	DMF fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle
CV-ST 12.99	Fig. 4.14-11c	6'x4' stone/rail box culvert, 30' long	UnO/UnO	Hockomock Swamp	Wetland equalizer.	Forest	No fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle
CV-ST 13.12	Fig. 4.14-11c	6'x4' stone box culvert, 30' long	UnO/UnO	Hockomock Swamp	Wetland equalizer.	Forest	No fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle
CV-ST 13.42	Fig. 4.14-11d	6'x6' stone/rail box culvert, 30' long	UnO/UnO	Hockomock Swamp	Wetland equalizer.	Forest	No fishery; wildlife habitat in wetland system	Yes	Daylight culvert under new trestle
CV-ST 13.83	Fig. 4.14-11d	6'x6' stone box culvert, 50' long	UnO/UnO	Hockomock Swamp	Wetland equalizer.	Forest	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 14.02	Fig. 4.14-11d	4'x4' stone box culvert, 30' long (collapsed)	UnI/UnO	Hockomock Swamp	Wetland equalizer.	Forest adjacent west	No fishery; no wildlife habitat	No	Meet Stream Crossing Standards.
CV-ST 15.80	Fig. 4.14-11d	4'x3' stone box culvert, 25' long	UnCR/UnCR	Red Maple-dominated wetland, connects to R50 under ROW/ Red Maple-dominated wetland, connects to R49 under ROW.	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-ST 16.00	Fig. 4.14-11d	4'x4' stone box culvert, 25' long	UnO/UnO	Red Maple dominated wetland, connects to R49 under Carver Street and R 2 under ROW/ Red Maple-dominated wetland, connects to R44 under ROW	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 16.73	Fig. 4.14-11d	3'x3' stone box culvert, unknown length	UnO/UnO	Red Maple-dominated wetland with associated perennial stream, connects to R113 under ROW/ Red Maple-dominated wetland with associated perennial stream, connects to R116 under ROW	Perennial stream conveyance.	None	Possible fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
Bridge over Pine Swamp Brook 1	Fig. 4.14-11d	15' long wood/stone bridge	UnO/UnO	Red Maple swamp associated with Pine Swamp Brook (R12.1 BF 100-103) and an intermittent stream (R12.1 BF 200-203), connects to R 12.1 (100 series) outside limit of delineation/ Red Maple-dominated wetland associated with Pine Swamp Brook (R12.2 BF 128-131) and an intermittent stream (BF R12.2 BF 161-164)	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat	No	Meet Stream Crossing Standards.
Bridge over Pine Swamp Brook 2	Fig. 4.14-11d	12' long wood bridge	UnO/UnO	Red Maple swamp/ Red Maple-dominated wetland associated with Pine Swamp Brook (R12.2 BF 128-131) and an intermittent stream (R12.2 BF161 to 164)	Wetland equalizer.	Freshwater wetland and aquatic adjacent west	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-ST 18.18	Fig. 4.14-11e	3'x2' stone box culvert, 20' long	UnO/UnO	Connects to T5 under ROW/ Red Maple swamp, connects to T4 under ROW	Wetland equalizer.	Freshwater wetland and aquatic adjacent west	No fishery; wildlife habitat in wetland system	No	Replace in kind.
CV-ST 19.10	Fig. 4.14-11e	2'x2' stone box culvert, 60' long	UrI/UrI	Forested wetland bordering an intermittent stream/ Forested Wetland	Upland drainage.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
Bridge over Taunton River at MP 34.38	Fig. 4.14-11e	118' long deck girder bridge	UrCR/UrR	Taunton River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in Taunton River wetland system	No	Meet Stream Crossing Standards.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
Bridge over Taunton River at MP 34.62	Fig. 4.14-11e	171' long deck girder bridge	UrR/UrO	Taunton River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in Taunton River wetland system	No	Meet Stream Crossing Standards.
Bridge over Taunton River at MP 34.73	Fig. 4.14-11e	176' long deck stringer bridge	UrRC/UrO	Taunton River/Backwater of Taunton River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in Taunton River wetland system	No	Meet Stream Crossing Standards.
Bridge over Mill River	Fig. 4.14-11e	37' long deck girder bridge	UrOI/UrRI	Mill River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in Mill River wetland system	No	Meet Stream Crossing Standards.
New Bedford Main Line									
Bridge over Taunton River at MP 35.56	Fig. 4.14-11e	113' long thru girder bridge	UrI/UrO	Taunton River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in Taunton River wetland system	No	Meet Stream Crossing Standards.
Bridge over Brickyard Road	Fig. 4.14-11e	20' long deck stringer bridge	UrO/UrO	Forested wetland bordering Taunton River and Oakland Mills Pond/ Forested wetland, connected to with TCM1 West	Open upland passage.	None	No fishery; wildlife habitat in wetland system	No	Replace in kind.
No #	Fig. 4.14-11e	2.5'x2' stone box culvert, unknown length	UrO/UrO	Forested wetland bordering Taunton River and Oakland Mills Pond/ Forested wetland, connected to with TCM1 West	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 14.25	Fig. 4.14-11e	2'x2' stone box culvert	SO/UnR	Forested wetland with emergent wetland components/ Connects to TCM7 East via culvert under ROW	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 14.52	Fig. 4.14-12a	3'x3' stone box/36" CMP culvert, unknown length	SO/SO	Red Maple swamp bordering an unnamed perennial stream, connected to TCM14 (200 series)/ Red Maple swamp bordering an unnamed perennial stream in Berkley	Perennial stream conveyance.	None	Possible fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
No #	Fig.4.14-12a	1'x'1 box culvert, unknown length	UnO/UnO	Red Maple swamp connected to TCM14 (100 series) under ROW/ Red Maple swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 14.74	Fig. 4.14-12a	4'x4' stone box culvert, unknown length	UnO/UnO	Red Maple swamp connected to TCM14 (100 series) under ROW/ Red Maple swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Replace in kind.
CV-NB 15.01	Fig. 4.14-12a	4'x6' stone box culvert, 30' long	UnO/UnR	Red Maple swamp connected to BKCM1 under ROW/ Scrub-shrub wetland connected to BKCM8 under ROW	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
Bridge over Cotley River at MP 38.93	Fig. 4.14-12a	20' long deck girder bridge	UnO/UnO	Red Maple swamp associated with Cotley River/ Red Maple swamp bordering Cotley River	Perennial stream conveyance.	Forest; Freshwater wetland and aquatic adjacent west	DFW & DMF fishery; willdife habitat in Cotley River wetland system	No	Meet Stream Crossing Standards.
Bridge over Cotley River at MP 39.46	Fig. 4.14-12a	21' long deck girder bridge	UnO/UnO	Red Maple swamp bordering Cotley River/ Cotley River with adjacent Red Maple swamp	Perennial stream conveyance.	Forest; Freshwater wetland and aquatic adjacent east	DFW & DMF fishery; willdife habitat in Cotley River wetland system	No	Meet Stream Crossing Standards.
CV-NB 16.89	Fig. 4.14-12a	2'x1' stone box/12" CIP culvert, 40' long	UnO/UnO	Red Maple swamp/ Red Maple swamp bordering an intermittent stream	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 17.33	Fig. 4.14-12b	2'x2' stone box culvert, 50' long	UnO/UnR	Red Maple swamp bordering a perennial stream/ Scrub-shrub wetland bordering an unnamed perennial stream	Perennial stream conveyance.	None	Possible fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 17.89	Fig. 4.14-12b	36" CMP culvert, 25' long	UnO/UnO	Unnamed stream [identified as Pierce Brook in USGS topo], Cedar Swamp River (upstream) and Atlantic White Cedar swamp/ Unnamed stream [Pierce Brook] & Cedar Swamp River (downstream) and Atlantic White Cedar swamp.	Perennial stream conveyance.	Freshwater wetland and aquatic, Forest	Possible fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
Bridge over Cedar Swamp River at MP 42.14	Fig. 4.14-12b	21' long timber pile trestle bridge	UnO/UnO	Unnamed stream [identified as Pierce Brook in USGS topo], Cedar Swamp River (upstream) and Atlantic White Cedar swamp/ Unnamed stream [Pierce Brook] & Cedar Swamp River (downstream) and Atlantic White Cedar swamp.	Perennial stream conveyance.	Freshwater wetland and aquatic, Forest	DFW & DMF fishery; wildlife habitat	No	Meet Stream Crossing Standards.

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No #	Fig. 4.14-12b	NA	UnR/UnO	Red Maple swamp/ Red Maple swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 20.37	Fig. 4.14-12b	3'x2' stone box culvert, 45' long	UnR/UnO	Red Maple swamp bordering an intermittent stream/ Red Maple swamp bordering an intermittent stream, connected to LK14	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 20.89	Fig. 4.14-12b	4'x3' stone box culvert, 42' long	UnO/UnO	Red Maple swamp, connected to LK19/ Red Maple swamp bordering an intermittent stream	Wetland equalizer.	Freshwater wetland and aquatic, Forest	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 21.51	Fig. 4.14-12b	Two 3'x3' stone box culverts, unknown length	UnO/UnO	Red Maple swamp/ Red Maple swamp, connected to LK20	Wetland equalizer.	Freshwater wetland and aquatic, Forest	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 21.66	Fig. 4.14-12b	4'x3' concrete and stone box culvert, 35' long	UnO/UnO	Red Maple swamp/ Red Maple swamp, connected to LK20	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 21.68	Fig. 4.14-12b	7'x7' stone box culvert, 30' long	UnO/UnO	Red Maple swamp/ Bordering an unnamed perennial stream, connected to LK21 East	Intermittent stream conveyance.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-NB 21.93	Fig. 4.14-12b	3'x3' stone box culvert, unknown length	UnO/UnO	Red Maple swamp, connected to FRN13/ Intermittent tributary to Fall Brook	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
Bridge over Fall Brook	Fig. 4.14-12b	17' long deck stringer bridge	UnO/UnO	Fall Brook/Fall Brook	Perennial stream conveyance.	Freshwater wetland and aquatic	DFW & DMF fishery; wildlife passage in wetland system	No	Meet Stream Crossing Standards.
CV-NB 22.24	Fig.4.14-12b	6'x3.5' stone box culvert, unknown length	UI/UI	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 22.58	Fig. 4.14-12b	3'x3' stone box culvert, 45' long	SI/SR	Borders a stormwater swale outside the limits of delineation/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 22.71	Fig. 4.14-12c	24" CMP culvert, unknown length	UnI/UnO	Cranberry bog, connected to FRN6B (100 series)/ Red Maple swamp bordering an intermittent stream	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 22.84	Fig. 4.14-12c	3'x1' stone box/24" CIP culvert, 45' long	UnO/UnO	Red Maple swamp bordering an intermittent stream/ Red Maple swamp bordering an intermittent stream	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-NB 23.65	Fig. 4.14-12c	2'x2' stone box/36" VCP culvert, 40' long	UnO/UnO	Red Maple swamp with wet meadow/ Red Maple swamp bordering an intermittent stream, connected to FRN23	Wetland equalizer.	Forest adjacent west	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 24.31	Fig. 4.14-12c	6'x3' stone box culvert, 50' long	UnO/UnO	Open channel/ Forested wetland with intermittent stream connected to NB1	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 26.47	Fig.4.14-12c	8'x3' wood/stone box culvert, 26' long	UrC/UnO	Perennial stream parallel to the ROW/ Perennial stream channel with bordering forested wetland, part of the Acushnet Cedar Swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 26.68	Fig.4.14-12c	5'x5' steel/stone box culvert, 25' long	UrR/UnO	Perennial stream parallel to the ROW/ Perennial stream channel with bordering forested wetland, part of the Acushnet Cedar Swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 26.96	Fig. 4.14-12c	6'x5' steel/stone box culvert, 30' long	UrO/UnO	Perennial stream parallel to the ROW/ Perennial stream channel with bordering forested wetland, part of the Acushnet Cedar Swamp	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-NB 28.47	Fig. 4.14-12d	12" CMP culvert, 20' long	UrC/UrC	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 28.60	Fig. 4.14-12d	36" CMP culvert, unknown length	UrC/UrC	Emergent wetland/ Emergent wetland	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-NB 28.87	Fig. 4.14-12d	36" RCP culvert, 80' long	UrC/UrC	Emergent wetland/ Emergent wetland	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
Fall River Secondary									
CV-FR 0.42	Fig. 4.14-13a	2'x2' stone box culvert, 20' long	UnO/UnR	Intermittent channel/ Intermittent channel crosses ROW and connected to BK2B	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 0.58	Fig. 4.14-13a	10" CMP culvert, 20' long	UnO/UnRC	X/Red Maple Swamp bordering an intermittent stream	Upland drainage.	None	No fishery, wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
Bridge over Cedar Swamp River at MP 41.51	Fig. 4.14-13a	64' long deck stringer bridge	UnO/UnO	Red Maple Swamp and Cedar Swamp River/ Red Maple Swamp, borders an intermittent tributary to Cedar Swamp River	Perennial stream conveyance.	None	DFW & DMF fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-FR 1.14	Fig. 4.14-13a	4'x4' stone box culvert, 20' long	UnO/UnO	Connected to LKF1 under ROW/ Red Maple Swamp connected to FRF 1. Separated from LKF 1.1 by an upland mound	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 1.20	Fig. 4.14-13a	3'x3' stone box culvert, 15' long	UnR/UnO	Intermittent stream channel/ Intermittent stream channel	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-FR 1.47	Fig. 4.14-13a	2.5'x2.5' stone box culvert, 15' long	UnR/UnO	Red Maple Swamp associated with Cedar Swamp River/ Red Maple Swamp associated with Cedar Swamp River	Intermittent stream conveyance.	None	Possible fishery; wildlife habitat in wetland system	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-FR 1.76	Fig. 4.14-13a	3'x3' stone box culvert, 25' long	UnR/UnO	ND/Red Maple Swamp associated with Cedar Swamp River	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-FR 2.13	Fig. 4.14-13a	1.5'x1.5' stone box culvert, 25' long	UnR/UnO	ND/Connected to FRF8 under ROW	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 2.21	Fig. 4.14-13a	4'x4' stone box culvert, 25' long	UnRO/UnO	Red Maple swamp associated with Forge Pond/ Forested wetland associated with Forge Pond, connected to FRF10	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 2.71	Fig. 4.14-13a	18" CIP;2.5'x1.5' stone box culvert, unknown length	UnO/UnR	Forested wetland connected to a larger wetland east of ROW, outside limits of delineation/ Forested wetland connected to a larger wetland east of ROW, outside limits of delineation	Intermittent stream conveyance.	None	No fishery, wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
CV-FR 2.95	Fig. 4.14-13a	2'x3' concrete/stone box culvert, 40' long	UnR/UnR	Intermittent stream channel/ Shrub-scrub wetland bordering an intermittent stream	Intermittent stream conveyance.	Freshwater wetland and aquatic	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
CV-FR 4.50	Fig. 4.14-13a	Two 2'x2' stone box culverts, 30' long	UnO/UnO	Red Maple swamp bordering an unnamed pond/ Red Maple swamp bordering an unnamed pond	Pond connector.	Freshwater wetland and aquatic	DMF fishery; no wildlife habitat	No	Replace in kind.
CV-FR 5.49	Fig. 4.14-13b	3'x2' stone box culvert, unknown length	UnO/UnO	Large Red Maple swamp, connected to Wetland 6 [proposed station site]/ND	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
CV-FR 5.62	Fig. 4.14-13b	12" CMP culvert, 25' long	UnO/UnI	Shrub-scrub wetland/ Forested wetland connected to FRF26.2	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 5.68	Fig.4.14-13b	12" DIP culvert, 20' long	UnO/UnI	Shrub-scrub wetland/ Forested wetland connected to FRF26.2	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 5.72	Fig. 4.14-13b	10" CMP culvert, 25' long	UnO/UnO	X/Forested wetland bordering an intermittent stream	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 5.79	Fig. 4.14-13b	3'x5' stone box culvert, unknown length	UnO/UnO	Separated from FRF26 by stone wall/ Red Maple swamp with an intermittent stream connected to FRF26.1.1	Wetland equalizer.	None	No fishery; wildlife habitat in wetland system	No	Meet Stream Crossing Standards.
Bridge over Farm Road	Fig.4.14-13b	18' long deck stringer bridge	UnI/UnO	X/Scrub-shrub wetland bordering an intermittent stream that connects to FRF29 (200 series)	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 6.01	Fig. 4.14-13b	36" CMP culvert, 100' long	UnI/UnO	X/Forested wetland with an intermittent stream; scrub-shrub wetland bordering an intermittent stream that connects to FRF29 (200 series)	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
Bridge over Farm Road	Fig. 4.14-13b	17' long deck stringer bridge	UnR/UnO	X/X	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 6.86	Fig. 4.14-13b	3'x8' stone box culvert, 30' long	UnR/UnO	Intermittent stream channel under ROW/Intermittent stream channel under ROW	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 7.11	Fig. 4.14-13b	3'x3' stone box culvert, 30' long	UnO/UnO	Intermittent stream channel/Intermittent stream channel	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 7.24	Fig. 4.14-13b	4'x3' stone box culvert, 30' long	SR/SO	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 7.31	Fig. 4.14-13b	4'x3' stone box culvert, 25' long	SR/SO	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 7.58	Fig. 4.14-13b	3.5'x3' stone box culvert, 70' long	SO/SO	Intermittent stream channel/ Small forested wetland connected to FA1A	Intermittent stream conveyance.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 7.60	Fig. 4.14-13b	4'x5' stone box culvert, 50' long	SC/SO	Disturbed forested wetland connected to FA2/ Forested wetland connected to Taunton River	Wetland equalizer.	None	No fishery; no wildlife habitat	No	Replace in kind.

Identification	Figure #	Structure Description	Area Setting: (Ur)ban, (S)uburban, (Un)developed; (C)ommercial, (I)ndustrial or (I)institutional, (O)pen space, (R)esidential (East/West)	ANRAD Wetland Description (East/West) (ND= no ANRAD description, X= no wetland)	Function	CAPS Landscape (see Appendix 4-2)	Connectivity Value (Wildlife Habitat, Fishery)	T&E Species	Environmental Recommendations/Notes
Bridge over Miller's Cove Road	Fig. 4.14-13b	15' long concrete slab bridge	SC/SO	Large forested wetland bordering an intermittent stream that is connected to Taunton River/X	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
Bridge over Collins Street	Fig. 4.14-13b	35' long thru girder bridge	SR/SO	X/X	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
Bridge over Ashley's underpass	Fig. 4.14-13b	23' long timber stringer bridge	SR/SO	X/X	Open upland passage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 8.97	Fig. 4.14-13b	8' arch culvert, 30' long	SO/SI	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Could eliminate.
CV-FR 9.28	Fig. 4.14-13b	8' arch culvert, 32' long	SO/SI	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 11.43	Fig. 4.14-13c	24" CMP/ 18"DIP culvert, 25' long	UrC/UrI	X/X	Upland drainage.	None	No fishery; no wildlife habitat	No	Replace in kind.
CV-FR 11.65	Fig. 4.14-13c	24" CIP culvert, 20' long	UrC/UrI	X/X	Perennial stream conveyance.	None	No fishery; no wildlife habitat	No	Hydraulic analysis. If providing hydrologic control do not alter hydrology; if not providing hydrologic control replace to meet Stream Crossing standards
Bridge over channel near Battleship Cove	Fig. 4.14-13c	20' long timber bridge	UrC/UrI	Forested wetland connected to Taunton River/Disturbed forested wetland connected to FA2	Perennial stream conveyance.	None	No fishery; no wildlife habitat	No	Meet Stream Crossing Standards.

Appendix 4.14-B

University of Massachusetts, Amherst. Conservation Assessment and Prioritization System (CAPS) South Coast Rail Analysis

Conservation Assessment and Prioritization System (CAPS)
South Coast Rail Analysis

September 18, 2009

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Introduction

CAPS (the Conservation Assessment and Prioritization System) was used to assess several alternative routes of the proposed South Coast Rail system in southeastern Massachusetts. A CAPS analysis was conducted for each of the proposed routes (Attleboro, Stoughton, and Stoughton-Whittenton) and compared to a base scenario representing current conditions. Versions of the Stoughton and Stoughton-Whittenton route were analyzed with and without a trestle through Hockomock Swamp. The CAPS landcover grid was modified to include proposed rail lines, and CAPS was run to estimate the Index of Ecological Integrity (IEI) for each route scenario. The difference between the IEI for each route scenario and the base IEI values provided an estimate of the loss in ecological integrity for that route. These differences are expressed graphically and in terms of IEI units. A sensitivity analysis was run to assess the effect of uncertainty in parameters.

Overview of CAPS

The Conservation Assessment and Prioritization System (CAPS) is an ecosystem-based (coarse-filter) approach for assessing the ecological integrity of lands and waters. We define *ecological integrity* as the ability of an area to support biodiversity and the ecosystem processes necessary to sustain biodiversity, over the long term. CAPS is a computer software program and an approach to prioritizing land for conservation based on the assessment of various ecological communities (e.g. forest, shrub swamp,

headwater stream) within an area. This approach combines principles of landscape ecology and conservation biology with the capacity of modern computers to compile spatial data and characterize landscape patterns.

The CAPS approach begins with the characterization of both the developed and undeveloped elements of the landscape (Appendix A). With a computer base map depicting various classes of developed and undeveloped land, we then evaluate a variety of landscape-based variables ("metrics"; Appendix C). A metric may, for example, take into account how well a point in the landscape is connected to similar points, the intensity traffic on nearby roads, or the expected vulnerability to invasions by exotic plants. The results of each metric are rescaled by percentiles for each community so that, for instance, the best 10% of marshes have values ≥ 0.90, and the best 25% have values ≥ 0.75. This is done to adjust for differences in units of measurement among metrics and to account for differences in the range of metric values for each community. The rescaling by community is done to facilitate identifying the "best" of each community, as opposed to the best overall – which is strongly biased towards the dominant, matrix-forming communities.

Various metrics are applied to the landscape and then integrated in weighted linear combinations as models for predicting ecological integrity. The rescaled values are weighted using weights determined by expert teams, to reflect the relative importance of each metric for each community (Appendix D), and then added together to compute an overall IEI. Thus, the final index of ecological integrity for each cell is a weighted combination of the metric outputs for that cell, based on the community the cell falls in. This process results in a final Index of Ecological Integrity (IEI) for each point in the landscape based on models constructed separately for each ecological community.

Because CAPS provides a quantitative assessment of ecological integrity it can be used for comparing various scenarios. In essence, scenario analysis involves running CAPS separately for each scenario, and comparing results to determine the loss (or gain) in IEI units. This scenario testing capability can be used to evaluate and compare the impacts of development projects on habitat conditions as well as the potential benefits of habitat management or environmental restoration. CAPS is an objective and flexible approach for assessing ecological integrity and supporting decision-making for land protection, habitat management, ecological restoration, project review and permitting to protect habitat and biodiversity.

Methods

This analysis was based on the most recent CAPS statewide run (CAPSma 2009; Conservation Assessment and Prioritization System (CAPS) Preliminary Statewide Massachusetts Assessment, June 2, 2009), with modifications as necessary to more fully represent the effects of railroads.

Study area – The study area consisted of the entire Taunton watershed, plus a 5 km buffer around the Northeast Main Line, the New Bedford Corridor, and all rail lines included in various scenarios (Fig. 1). This buffer allows CAPS to capture all changes in

IEI among scenarios. Using the entire Taunton watershed gives CAPS a large enough context to reasonably scale IEI.

Scenarios – Six scenarios were represented in the analysis (scenario abbreviations, used in grid names, are supplied in brackets):

1. [X] Current (base) scenario
2. [A] Attleboro
3. [S] Stoughton at grade
4. [ST] Stoughton with trestle
5. [W] Stoughton-Whittenton at grade
6. [WT] Stoughton-Whittenton with trestle

The base scenario represents the current conditions. It was determined that the Rapid Bus alternative would essentially be the same as the base scenario because this alternative would at most differ in CAPS only in a very slight increase in traffic rate (on the order of 0.01%). In fact one could argue that the bus scenario would actually result in a decrease in traffic.

Fig. 1. Study area for South Coast Rail analysis.

Representing rail lines – We added several new cover types to CAPS to adequately represent rail lines. We split the abandoned rail class into "abandoned rail with tracks" and "abandoned rail without tracks." New classes were added for freight, passenger, and commuter rail lines, as well as "commuter rail line with a trestle" and "commuter rail

line with a retaining wall." Abandoned rail lines represented in CAPS (from MassGIS trains layer) were considered to have no tracks. Existing abandoned rails were replaced where they were more accurately represented in SCR data. The classes of trains (freight, passenger, commuter, and combinations of these) were derived from MassGIS data and SCR data. The number of tracks on each line were estimated based on supplied track numbers in MassGIS data. In general, lines from SCR scenarios were represented as having two sets of tracks, with the exception of the Northeast Corridor from Readville to the Attleboro bypass, which has three sets.

The frequency of trains was estimated as 2 trains/day for freight, as 33 trains/day for commuter (based on a survey of MBTA schedules), and passenger lines were assigned a number of trains/day by line from Amtrack schedules, varying from 2 to 20 trains/day. The number of cars per train were estimated at 25 for freight, 8 for passenger, and 6 for commuter rail.

Abandoned rail beds without tracks were assumed to have lost their ballast due to erosion over time; abandoned rails with tracks were assumed to have retained ballast. All rails were assumed to be unfenced; although commuter rails are generally fenced in populated areas, these areas generally have little value in CAPS anyway.

Parameters for rail lines – New cover types were parameterized by an expert team consisting of Mark Anderson, Andy Finton, and Jessica Dyson, from The Nature Conservancy, James deNormandie from MassAudubon and MassWildlife, and Brad Compton and Scott Jackson from UMass Amherst. The group met on July 16 and came up with a scheme for parameterizing a new variable, terrestrial barriers (Table 1; including barriers on highways and other anthropogenic barriers to movement). This expert team also decided to represent traffic rates for rails based on a multiple of the estimated number of train cars per day. We discounted the traffic rate for trains running over a trestle because collision mortality would be essentially eliminated, although avoidance because of noise would remain essentially unchanged. Parameters used for trains are shown in Table 2. Rail stations were given the same values as the commercial and industrial land cover class.

Analysis – CAPS was run for each scenario. Watershed metrics, which are essentially unaffected by the various scenarios, were used directly from the 2009 statewide run. Direct loss (where rail lines or stations fell on undeveloped land) was calculated by the complete loss of IEI for affected cells. Indirect loss was calculated for each metric, and the integrity model was used to create an overall indirect loss grid for each scenario. Finally, direct and indirect losses were combined to give a delta grid for each scenario. A sensitivity analysis was conducted by varying the relative traffic rate for trains from 1 train car = 5 automobiles to 1 train car = 100 automobiles. The sensitivity analysis was run for the three metrics that are affected by traffic rate: connectedness, similarity, and traffic intensity. The sensitivity analysis gives a range of percent loss for each scenario, to help bracket our uncertainty.

Appendices – Land cover classes and codes are given in Appendix A. Input data sources are described in Appendix B. Appendix C describes the CAPS metrics, and

Appendix D gives the weights used for each metric and community or group of communities. Appendix E lists the GIS grids and coverages supplied with the results. Finally, Appendix F includes detailed images of the IEI change grids.

Table 1. Scheme for assigning values for terrestrial barriers. A feature with multiple values (e.g., double rail with ballast) is assigned the sum of the maximum value and one half of other values.

Value	Terrestrial Barriers
1	No barrier Abandoned rail without tracks Trestle (≥ 3 m high)
2	Single set of rails Ballast Trestle (<3 m high)
3	Standard fence* Double set of rails Abandoned rail with tracks Single rail + ballast
4	Double rail + ballast [Triple rail + ballast =4.5]
5	
6	
7	Jersey barrier
8	Enhanced fence†
9	
10	Noise barrier wall Retaining wall

* Standard fence = 4' chain link, poorly maintained
† Enhanced fence = 10' chain link, barbed ware on top, well-maintained

Table 2. Assignment of scores for terrestrial barriers and traffic rate for rail lines.

Rail type	Ballast?	Number of tracks	Fence?	Terrestrial barrier score	Trains/ day	Cars/train	Traffic rate
Rail trail	No	0	No	1	0	0	cars/day × 20*
Abandoned railbed no tracks	No	0	No	1	0	0	
Abandoned rail with tracks	Yes	1-3	No	single track: 3 double track: 4 triple track: 4.5	0	0	
Train (freight)	Yes	1-3	No		2	25	
Train (passenger)	Yes	1-3	No		*ntrains*	8	
Train (commuter)	Yes	1-3	No		33	6	
Train (freight + passenger)	Yes	1-3	No		Combined	Combined	
Train (freight + commuter)	Yes	1-3	No				
Train (passenger + commuter)	Yes	1-3	No				
Train (freight + passenger + commuter)	Yes	1-3	No				
Train (retaining wall)	No	1-3	Retaining wall: 10	10	33	6	
Train (trestle)†	No	0	No	2	33	6	As above / 3

* Varied for sensitivity analysis, range from 5-100.
† Assumed to be commuter rail.

Results

The results of the CAPS scenario analysis are shown graphically in Fig. 2, Appendix F, and summarized in Table 3. Overall the two routes through Hockomock Swamp showed the greatest estimated loss in ecological integrity, followed by the Attleboro route with considerably less influence (77-80% of the loss for the various Stoughton and Stoughton-Whittenton alternatives). The trestle alternatives through Hockomock Swamp reduced the modeled loss of ecological integrity somewhat, although many of the benefits of a trestle are likely to occur at a local scale below that of the CAPS analysis.

Differences among the various scenarios are obscured to some degree by large sections of the routes common to all the alternatives. To better highlight the differences among the scenarios we computed IEI loss for each scenario only for those sections that were not shared among all alternatives (Fig. 3, Table 3). Focusing only on those sections of the routes that differ among the alternatives serves to further differentiate the Attleboro route as the alternative with the least impact on IEI values.

Table 3. Assessment of South Coast Rail scenarios in terms of IEI units.

Scenario	Loss of IEI Units Full Extent	Loss of IEI Units Excluding Common Route Sections
Base	0.0	0.0
Attleboro	379.3	206.8
Stoughton with trestle	474.5	302.0
Stoughton-Whittenton with trestle	481.8	309.3
Stoughton at grade	484.6	312.1
Stoughton-Whittenton at grade	492.0	319.5

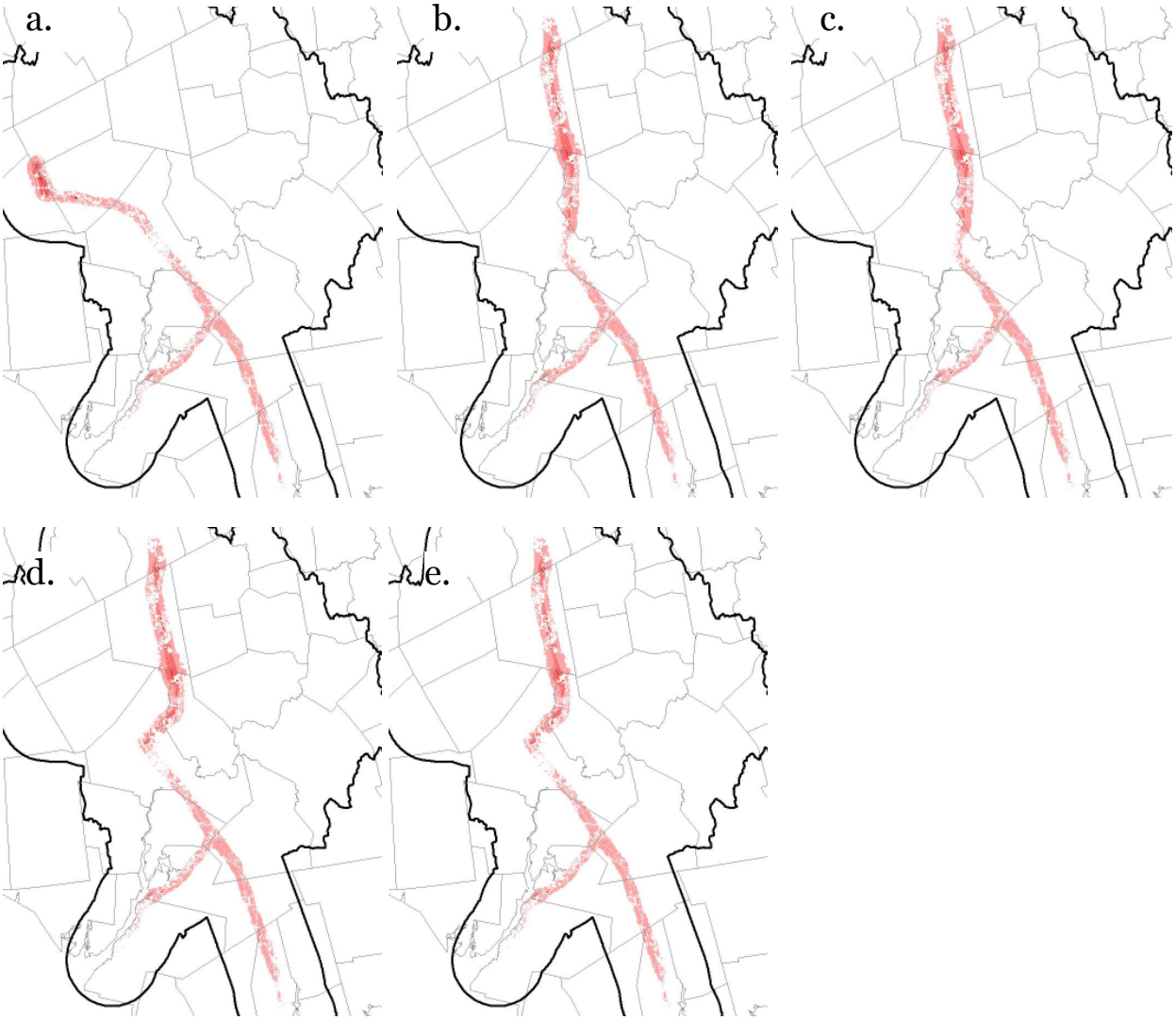


Fig. 2. Modeled loss in ecological integrity for (a) the Attleboro route, (b) the Stoughton route at grade, (c) the Stoughton route with the proposed trestle, (d) Stoughton-Whittenton route at grade, and (e) the Stoughton-Whittenton route with the proposed trestle. Darker areas represent greater loss. See Appendix F for more detailed versions of these images.

Table 4 shows loss split into direct loss (within the footprint of new development) and indirect loss. Not surprisingly, direct loss is a small proportion of the total IEI loss, mostly attributable to stations, because most of the rails would run on land already mapped as developed (such as abandoned rail beds).

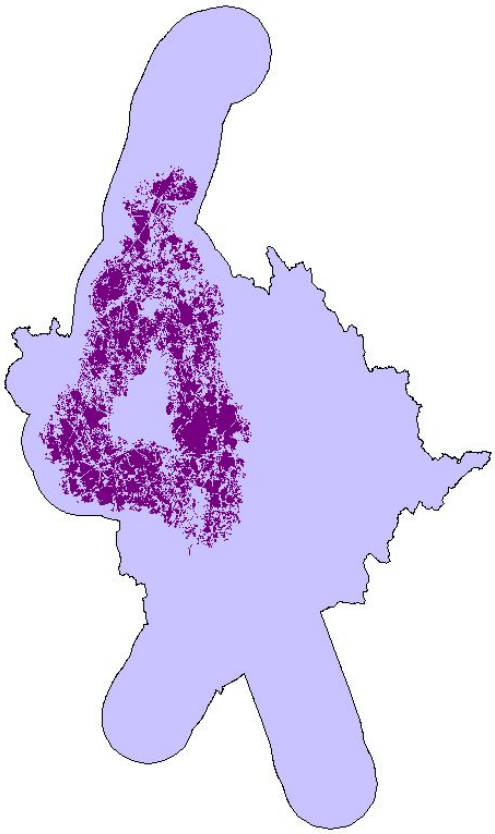


Fig. 3. Areas (denoted in purple) in which the IEI of two or more scenarios differ from each other. Areas that are not highlighted are either unaffected by any of the scenarios, or affected identically by all scenarios.

Table 4. Loss of IEI Units (from Table 3) split into direct and indirect loss.

Scenario	Direct loss (IEI units)	Indirect loss (IEI units)
Base	0.0	0.0
Attleboro	54.6	324.8
Stoughton with trestle	17.6	456.9
Stoughton-Whittenton with trestle	17.7	464.1
Stoughton at grade	17.6	467.1
Stoughton-Whittenton at grade	17.7	474.3

Results of the sensitivity analysis for three metrics, showing the range of expected results given the uncertainty in the effects of train traffic, are given in Table 5. Note that the ranking of the scenarios does not change under either the high or low traffic parameterization, and only the Attleboro route shows more than a very slight change in

percent as compared to the worst-case scenario. The sensitivity analysis suggests that our uncertainty in parameterizing traffic effects of railroads has only a minor effect on the results. (Note that these losses are not directly comparable with those in Table 3, because the sensitivity analysis only takes three metrics into account.)

Table 5. Results of sensitivity analysis for three metrics (connectedness, similarity, and traffic intensity), showing range of loss in acres and loss in terms of percent of worst-case scenario for each scenario, given uncertainty in equivalent traffic rates of trains.

	Loss in IEI units		Range in percent	
Scenario	**Minimum**	**Maximum**	**Minimum**	**Maximum**
Base	0.0	0.0	0.0	0.0
Attleboro	325.5	367.9	82.5	71.2
Stoughton with trestle	379.6	500.5	96.2	96.9
Stoughton-Whittenton with trestle	384.6	506.8	97.5	98.1
Stoughton at grade	390.0	510.4	98.8	98.8
Stoughton-Whittenton at grade	394.6	516.7	100.0	100.0

The bulk of the effect of these scenarios is reflected in three metrics: connectedness, similarity, and traffic intensity. Connectedness, with its broader scale and integration of landscape resistance, is the most relevant single metric. Images of connectedness deltas are shown for four focal areas: Assonet Swamp (Fig. 4), Hockomock Swamp (Fig. 5), Pine Swamp (Fig. 6), and the Attleboro Bypass area (Fig 7). Note that the color gradient used in these four figures are the same, thus they are visually comparable.

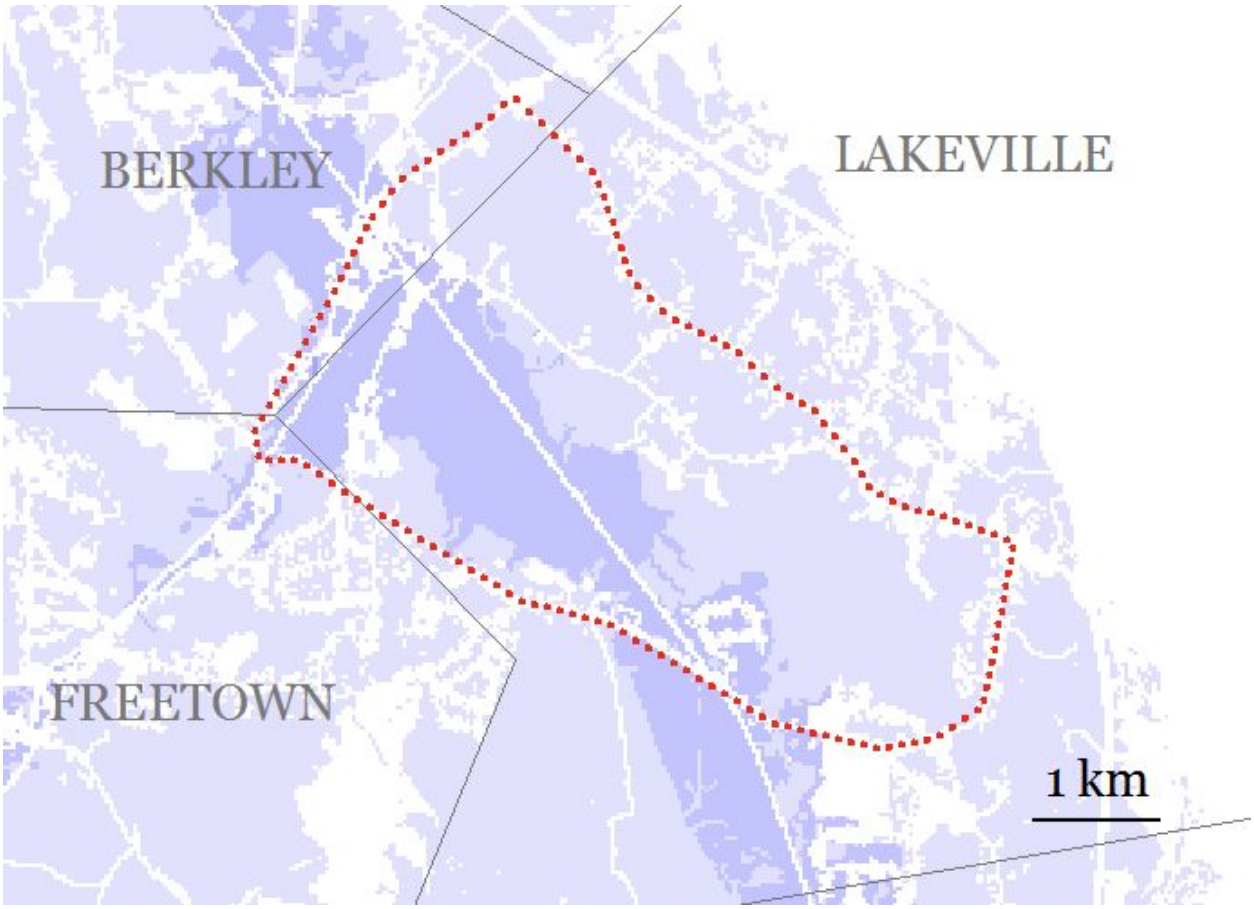


Fig. 4. Connectedness delta (darker areas = higher loss) for Assonet Swamp focal area for all scenarios. Note that color gradient is scaled the same for Figs. 4-7.

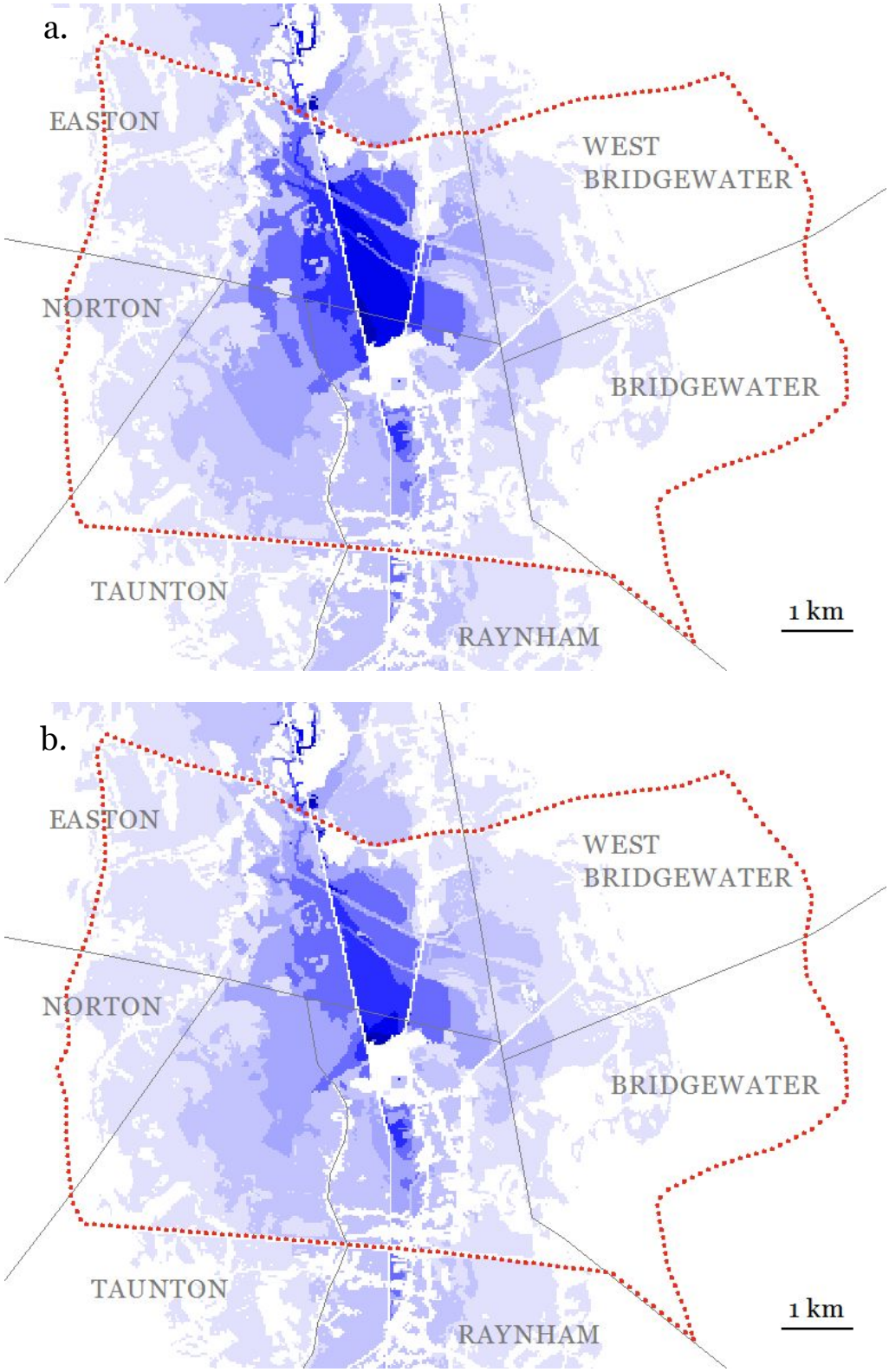


Fig. 5. Connectedness delta (darker areas = higher loss) for Hockomock Swamp focal area for (a) Stoughton at grade, and (b) Stoughton with trestle. The Stoughton and Stoughton-Whittenton scenarios are the same within Hockomock Swamp.

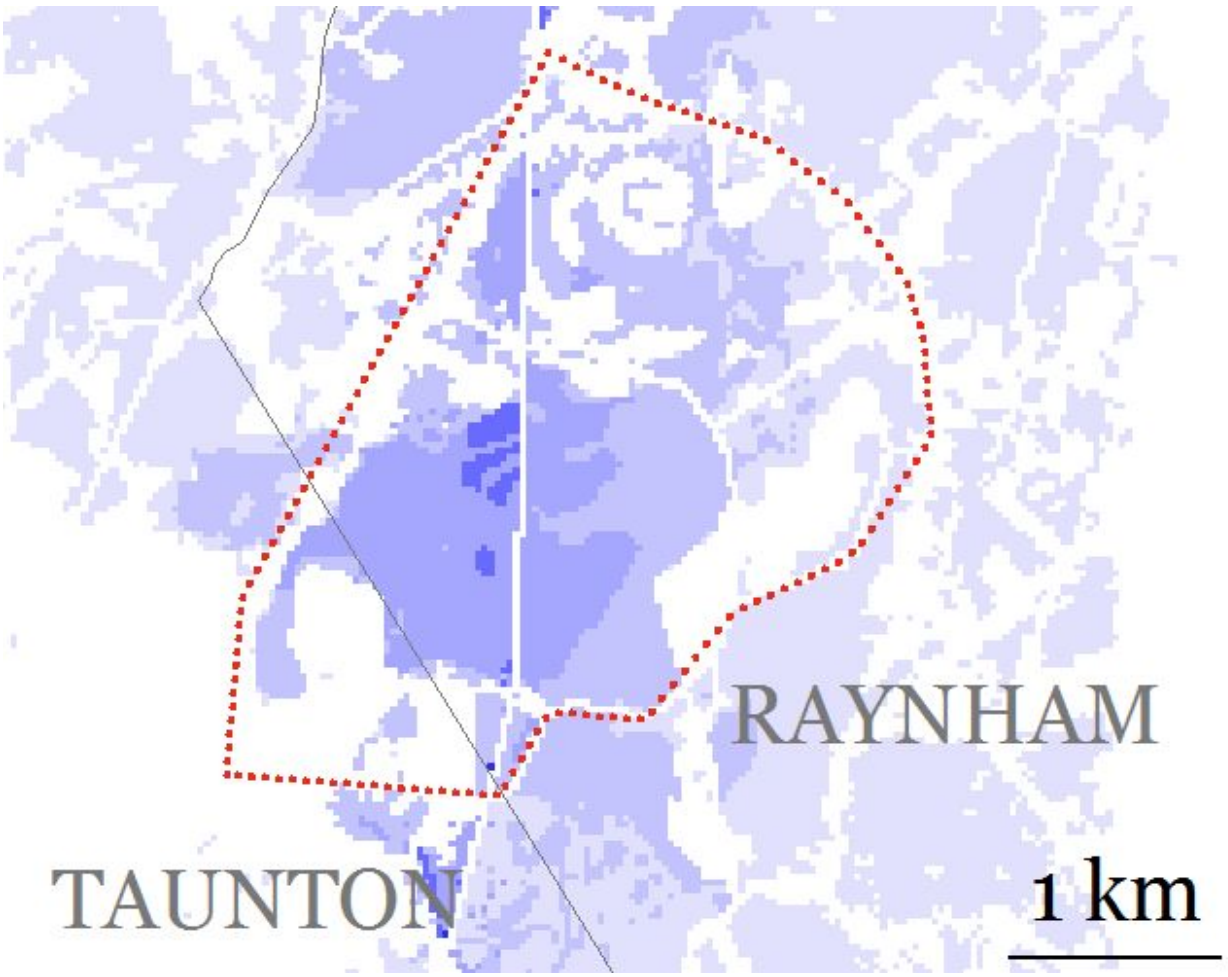


Fig. 6. Connectedness delta (darker areas = higher loss) for Pine Swamp focal area for Stoughton scenarios.

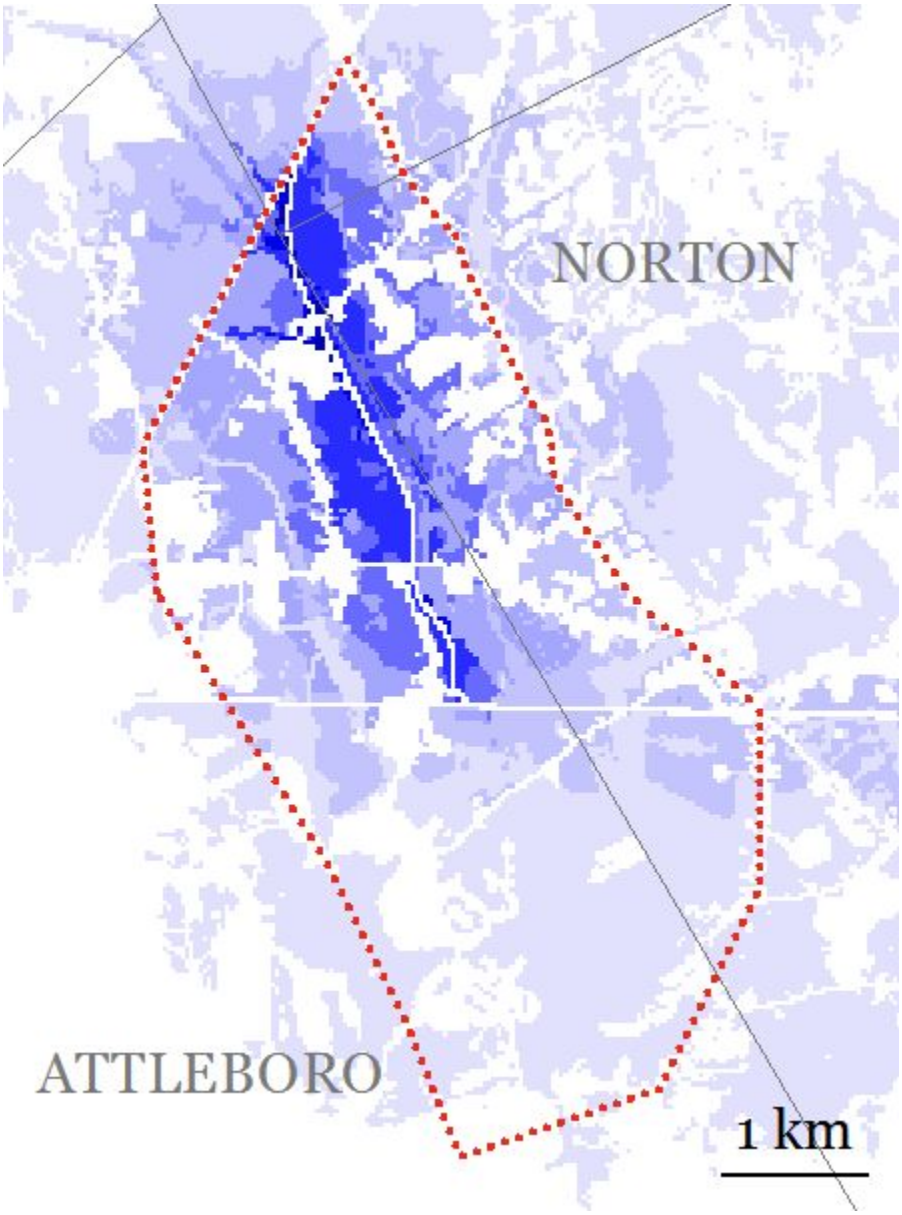


Fig. 7. Connectedness delta (darker areas = higher loss) for Attleboro bypass focal area for the Attleboro scenario.

Appendix A: Land cover classes

Land cover classes are listed below, with numeric codes for each class. New classes added for the South Coast Rail project are italicized.

Developed

1 Cropland
5 Mining
7 Participatory recreation
8 Spectator recreation
9 Water based recreation
10 Multi-family residential
11 High-density residential
12 Medium-density residential
13 Low-density residential
15 Commercial
16 Industrial
17 Urban open
18 Transportation
19 Waste disposal
26 Golf
29 Marina
31 Urban public
34 Cemetery
35 Orchard
36 Nursery
39 Junkyard
41 Train station
61 Large dam
62 Medium dam
63 Small dam
64 Tiny dam
71 Expressway
72 Primary highway
73 Secondary highway
74 Light duty road
75 Unpaved road
77 Rail trail
78 Abandoned railbed no tracks
79 Abandoned rail with tracks
81 Train (freight)
82 Train (passenger)
83 Train (commuter)
84 Train (freight + passenger)
85 Train (freight + commuter)
86 Train (passenger + commuter)
87 Train (freight + passenger + commuter)
88 Train (trestle)
89 Train (retaining wall)
91 Bridge
92 Culvert

Terrestrial

102 Pasture
103 Forest
106 Open land
124 Powerlines
151 Sea cliff
152 Barrier beach system
156 Coastal dune
167 Barrier beach coastal beach
169 Barrier beach coastal dune
191 Deciduous forested wetland
192 Mixed forested wetland
193 Coniferous forested wetland

Palustrine

331 Pond
354 Bog
355 Cranberry bog
357 Deep marsh
358 Shallow marsh
362 Shrub swamp
396 Vernal pool

Riverine

411 First order flatwater
412 First order pool-riffle
413 First order plane-bed
414 First order step-pool
415 First order cascade
421 Second order flatwater
422 Second order pool-riffle

423 Second order plane-bed
424 Second order step-pool
425 Second order cascade
431 Third order flatwater
432 Third order pool-riffle
433 Third order plane-bed
434 Third order step-pool
435 Third order cascade
441 Fourth order flatwater
442 Fourth order pool-riffle
443 Fourth order plane-bed
444 Fourth order step-pool
445 Fourth order cascade
451 Fifth order flatwater
452 Fifth order pool-riffle
453 Fifth order plane-bed
454 Fifth order step-pool
455 Fifth order cascade
461 Sixth order flatwater
462 Sixth order pool-riffle
463 Sixth order plane-bed
464 Sixth order step-pool
465 Sixth order cascade

Lacustrine
532 Lake
581 Reservoir

Estuarine
621 Salt pond
622 Bay
652 Barrier beach pond
661 Salt marsh
668 Barrier beach bog
670 Barrier beach deep marsh
671 Barrier beach marsh
673 Barrier beach shrub swamp
674 Barrier beach deciduous forested wetland
675 Barrier beach coniferous forested wetland
676 Barrier beach mixed forested wetland
677 Barrier beach salt marsh
681 First order estuary
682 Second order estuary
683 Third order estuary
684 Fourth order estuary
685 Fifth order estuary
686 Sixth order estuary

Marine
753 Coastal beach
760 Rocky intertidal
763 Tidal flat
790 Ocean

Appendix B: Input Data Layers

Note: changes from the 2009 preliminary Massachusetts run are denoted with change bars.

Nonforested Uplands – Three of these communities came from the MassGIS 2005 Land Use: pasture, powerlines, and open land (formerly called old fields in CAPS).

Wetlands – We used Massachusetts DEP Wetlands. DEP wetlands were photo-interpreted, and are generally of high quality, although beaver pond disturbance/succession has introduced many "errors," most commonly current shrub swamps mapped as forested wetland. Note that many new coastal wetlands have been added for this run.

Vernal Pools – We used Potential Vernal Pools from MassWildlife's Natural Heritage and Endangered Species Program. Potential vernal pools that fell within a terrestrial type were treated as a single pixel pool (30 m × 30 m). When a potential vernal pool fell within a wetland mapped by DEP, we retained DEP's classification. We added a number of vernal pools and dropped one spurious PVP in the vicinity of proposed rail lines based on surveys by NHESP.

Streams and Rivers – Streams and rivers are based on our work for Natural Heritage and Endangered Species Program's Living Waters project. MassGIS 1:25k stream centerlines were used to define streams. Streams are classified by order and gradient. Order is calculated from the stream centerline data; and gradient is based on the digital elevation model. We identified rivers that flow into the state to correct the order of these stream networks. For rivers wider than 30 m, the open water class from Land Use was used to represent the entire river basin, and the class based on order and gradient was applied to the entire width.

Developed Land – Developed land comes directly from the MassGIS 2005 Land Use. Proposed rail stations were added from SCR data.

Dams – Dams (in four size classes) were developed in collaboration with DEP and Mass Riverways as part of Natural Heritage's Living Waters project. Dams were derived from a MassDEP point shapefile and digitized as lines over stream centerlines overlaid on the MassGIS 1 meter, 1:5000 black and white orthophotos. Dams are treated as a developed type.

Roads and Railroads – Roads are railroads are from MassGIS's 1:25k EOT roads and trains layers. Roads were reclassified into five types based on original road classes as well as surface type (for unpaved roads). We also used interpolated traffic rates from the EOT roads layer. Railroads from MassGIS were mapped in several classes: abandoned railbed without tracks, rail trail, and combinations of freight, passenger, and commuter rail. Additional rail types were mapped for various scenarios from SCR data, including abandoned railbed with tracks, proposed commuter rails, commuter rail on trestle, and

commuter rail with retaining walls. Rail traffic rates were based on an estimated number of trains per day and cars per train.

Elevation – A digital elevation model (DEM) was created by David Goodwin of the UMass Resource Mapping Unit from MassGIS digital terrain model (DTM) elevation contours, elevation points, and topographic breaklines as part of the Living Waters project.

Flow – A flow grid (giving the direction of expected water flow for each cell) based on a digital elevation model was created for all of mainland Massachusetts by our lab as part of the Living Waters project. This flow grid conforms to MassGIS centerline data. We used this flow grid directly.

Aquatic Resistance – We modified the approach of Randhir et al. 2001 (Forest Ecology and Management 143:47-56) to build a time-of-travel grid for each cell in the project area, based on land cover, slope, flow, and stream gradient. This grid was used to define the influence area within the watershed of each point for our watershed metrics.

Point-source Pollution – Point-source pollution was defined by Massachusetts Natural Heritage and Endangered Species Program as part of their Living Waters project. These data are based on an assessment of pollution risk compiled from six DEP and EPA data layers: TRI (Toxic Release Inventory), RCRIS (Resource Conservation and Recovery Information), PCS (Permit Compliance System), MINES (Mineral Industry Locations), IFD (Industrial Facility Discharge Sites), and CERCLIS (Superfund National Priority List Sites) from the EPA Basins 3.0 website (http://www.epa.gov/waterscience/basins/metadata.htm). UST (Underground Storage Tank Locations), GRWTR (Ground Water Discharge Permits), and DEP Solid Waste Facilities point sources are available from MassGIS. See Heritage's Living Waters Technical Report for details.

Imperviousness – Impervious surfaces are from MassGIS. This layer is at 1 m resolution, based on the 2005 orthophotos. Imperviousness is summarized as percent impervious in 30 m cells.

Appendix C: CAPS integrity metrics

These ecological integrity metrics are included in the Conservation Assessment and Prioritization System (CAPS). Integrity metrics include both anthropogenic *stressor* metrics that measure the level of anthropogenic activities exclusively and *resiliency* metrics that measure the combined effect of anthropogenic stressor and landscape context.

Stressor Metrics	
Development & roads	
Habitat loss	Measures the intensity of habitat loss caused by all forms of development in the neighborhood surrounding the focal cell, based on a logistic function of Euclidean distance.
Wetland buffer insults	Measures the adverse effect of impervious surfaces within the 100-foot regulatory buffer around a wetland.
Traffic	Measures the intensity of road and rail traffic (based on measured road traffic rates) in the neighborhood surrounding the focal cell, based on a logistic function of distance.
Microclimate alterations	Measures the adverse effects of induced (human-created) edges on the microclimate of patch interiors, such as moisture, temperature, and wind. The edge effects metric is based on the "worst" edge effect among all adverse edges in the neighborhood surrounding the focal cell, where each adverse edge is evaluated using a "depth-of-edge" function in which the "effect" is scaled using a logistic function of distance.
Pollution	
Road salt	Measures the intensity of road salt application in the watershed above an aquatic focal cell weighted by road class and the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model. This metric is a surrogate for road salt application rates.

Sedimentation	Measures the intensity of road sediment production in the watershed above an aquatic focal cell weighted by road class (i.e., size, substrate, gradient) and the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model. This metric is a surrogate for road sediment production rates.
Nutrient loading	Measures the intensity of fertilizer application in the neighborhood surrounding the focal cell, based on the aquatic distance from the focal cell based on a time-of-flow model to development classes (primarily agriculture and residential land uses). This metric is a surrogate for fertilizer application rate.
Toxic pollution	Measures the intensity of actual or potential point-sources of pollution (such as permitted discharges into streams, municipal and industrial sewage plants, and underground storage tanks) in the watershed above an aquatic focal cell, weighted by type and size of point source and by the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model.
Biotic alterations	
Domestic predators	Measures the intensity of development associated with sources of domestic predators (e.g., cats) in the neighborhood surrounding the focal cell, based on a logistic function of distance to development classes. This metric is a surrogate for domestic predator abundance measured directly in the field.
Edge predators	Measures the intensity of development associated with sources of human commensal mesopredators (e.g., raccoons and skunks) and nest parasites (cowbirds) in the neighborhood surrounding the focal cell, based on a logistic function of distance to development classes. This metric is a surrogate for mesopredator/nest parasite abundance measured directly in the field.
Non-native invasive plants	Measures the intensity of development associated with sources of non-native invasive plants in the neighborhood surrounding the focal cell, based on a logistic function of distance to development classes. This metric is a surrogate for non-native invasive plant abundance measured directly in the field.

Non-native invasive earthworms	Measures the intensity of development associated with sources of non-native invasive earthworms in the neighborhood surrounding the focal cell, based on a logistic function of distance to development classes. This metric is a surrogate for non-native invasive earthworm abundance measured directly in the field.
Hydrological alterations	
Imperviousness	Measures the intensity of impervious surface in the watershed above the focal cell, based on imperviousness and the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model.
Percent impounded	Measures the proportion of the watershed above an aquatic focal cell that is impounded by dams, weighted by the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model.
Upstream road crossings	Measures the number of upstream road crossings per kilometer of stream above an aquatic focal cell weighted by the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model.
Dam intensity	Measures the number of dams in the watershed above an aquatic focal cell weighted by dam size and the modeled "influence value" for each cell, which is the aquatic distance from the focal cell based on a time-of-flow model.

Resiliency Metrics	
Connectedness	Measures the disruption of habitat connectivity caused by all forms of development between each focal cell and surrounding cells as well as the "resistance" of the surrounding undeveloped landscape. A hypothetical organism in a highly connected cell can reach a large area with minimal crossing of "hostile" cells. This metric uses a least-cost path algorithm to determine the area that can be reached from each focal cell. The focal cell gets a "bank account," which represents the distance a hypothetical organism could move through the undeveloped landscape. Each cell is assigned a travel cost, based on a resistance matrix, as a function of its ecological similarity to the focal cell. The algorithm then creates a least-cost hull around the focal cell, representing the maximum distance that can be moved from the cell until the "bank account" is depleted.
Similarity	Measures the amount of similarity between the ecological setting at the focal cell and those of neighboring cells, weighted by a logistic function of distance. Similarity is based on the ecological distance between the focal cell and each neighboring cell, where ecological distance is a multivariate distance across all ecological setting variables.

Appendix D: Metric Parameterizations

This table gives relative weights for each metric by community.

	Development & roads	Habitat loss	Watershed habitat loss	Wetland buffer insults	Road traffic	Microclimate alterations	Pollution	Road salt	Sedimentation	Nutrient loading	Toxic pollution	Biotic alterations	Domestic predators	Edge predators	Non-native invasive plants	Non-native invasive earthworms	Hydrological alterations	Imperviousness	Percent impounded	Upstream road crossings	Dam intensity	Resiliency metrics	Connectedness	Similarity
Terrestrial																								
Forest		2			2	1							1	2	2	2							5	3
Deciduous forested wetland		2		1	2	1		1	1	1	1			1	2	1							4	2
Mixed forested wetland		2		1	2	1		1	1	1	1			1	2	1							4	2
Coniferous forested wetland		2		1	2	1		1	1	1	1			1	2	1							4	2
Powerlines		4			2								1	2	2	1							5	3
Open land		4			2								1	2	2	1							5	3
Pasture		4			2								1	2	2								5	4
Sea cliff		4												1	1								2	1
Barrier beach system		4			2									2	1								2	1
Coastal dune		4			2									3	1								2	1
Barrier beach coastal beach		4			2									3	1								2	1
Barrier beach coastal dune		4			2									3	1								2	1
Palustrine																								

	Development & roads	Habitat loss	Watershed habitat loss	Wetland buffer insults	Road traffic	Microclimate alterations	Pollution	Road salt	Sedimentation	Nutrient loading	Toxic pollution	Biotic alterations	Domestic predators	Edge predators	Non-native invasive plants	Non-native invasive earthworms	Hydrological alterations	Imperviousness	Percent impounded	Upstream road crossings	Dam intensity	Resiliency metrics	Connectedness	Similarity
Bog		2		2	1			2	1	2	1			1	1			1					4	2
Deep marsh		2		2	2			1	1	1	1			1	2			1					4	2
Shallow marsh		2		2	2			1	1	1	1			1	2			1					4	2
Shrub swamp		2		2	2			1	1	1	1			1	2			1					4	2
Pond		2		2	2			1	1	2	1			1	1			1					4	2
Vernal pool		2			2			2	1	1	1			1	1			1					4	2
Cranberry bog		2		2	2			2	1	2	1			1	2			1					4	2
Lacustrine																								
Lake		2		2	1			1	1	2	2			1	1			1					4	2
Reservoir		2		2	1			1	1	2	2			1	1			1					4	2
Riverine																								
First order streams					1	1			1	1	1			1	1			2	1	1	1		6	
Second order streams					1	1			1	1	1			1	1			2	1	1	1		6	
Third order streams					1	1			1	1	1			1	1			2	1	1	1		6	
Fourth order streams					1				1	1	1			1	1			2	1	1	2		6	
Fifth order streams					1				1	1	1			1	1			2	1	1	2		6	
Sixth order streams					1				1	1	1			1	1			2	1	1	2		6	
Estuarine																								

	Development & roads	Habitat loss	Watershed habitat loss	Wetland buffer insults	Road traffic	Microclimate alterations	Pollution	Road salt	Sedimentation	Nutrient loading	Toxic pollution	Biotic alterations	Domestic predators	Edge predators	Non-native invasive plants	Non-native invasive earthworms	Hydrological alterations	Imperviousness	Percent impounded	Upstream road crossings	Dam intensity	Resiliency metrics	Connectedness	Similarity
First order estuary					1				1	1	1			1	1			1	1	1	1		6	
Second order estuary					1				1	1	1			1	1			1	1	1	1		6	
Third order estuary					1				1	1	1			1	1			1	1	1	1		6	
Fourth order estuary					1				1	1	1			1	1			1	1	1	2		6	
Fifth order estuary					1				1	1	1			1	1			1	1	1	2		6	
Sixth order estuary					1				1	1	1			1	1			1	1	1	2		6	
Salt pond		2		2	2				1	2	1			1				1					4	2
Bay					1				1	1	3												6	
Barrier beach pond		2		2	2				1	2	1			1	1			1					4	2
Salt marsh		2	2	2	1				1		2			1				1					3	3
Barrier beach bog		2		2	1				1	2	1			1	1			1					4	2
Barrier beach deep marsh		2		2	2				1	1	1			1	2			1					4	2
Barrier beach marsh		2		2	2				1	1	1			1	2			1					4	2
Barrier beach shrub swamp		2		2	2				1	1	1			1	2			1					4	2
Barrier beach deciduous forested wetland		1		1	2	1			1	1	1			1	2								4	2
Barrier beach mixed forested wetland		2		1	2	1			1	1	1			1	2								4	2
Barrier beach coniferous forested wetland		2		1	2	1			1	1	1			1	2								4	2
Barrier beach salt marsh		2	2	2	1				1		2			1				1					3	3

Tidal flat	Rocky intertidal	Coastal beach	**Marine**	
				Development & roads
2	2	4		Habitat loss
				Watershed habitat loss
				Wetland buffer insults
		2		Road traffic
				Microclimate alterations
				Pollution
				Road salt
1	1			Sedimentation
1				Nutrient loading
3	1			Toxic pollution
				Biotic alterations
				Domestic predators
		3		Edge predators
		1		Non-native invasive plants
				Non-native invasive earthworms
				Hydrological alterations
				Imperviousness
				Percent impounded
				Upstream road crossings
				Dam intensity
				Resiliency metrics
1	2	2		Connectedness
2	1	1		Similarity

Appendix E: GIS Data Directory

This appendix lists all GIS data provided on our FTP site. Each directory is supplied as a .zip file. All data are Arc/Info grids unless otherwise noted.

Grids listed with a trailing dash are provided for each scenario; for instance, iei- refers to grids named ieiX (base scenario), ieiA (Attleboro alternative), etc. Grids for sensitivity analyses are not provided.

Landcover grids (landcover.zip)

landcover\flc-	Landcover map, including roads and streams

Final results (final.zip)

final\iei-	Index of Ecological Integrity
final\delta-	Difference grids from base for each scenario

Scaled landscape metric* results (scaled.zip)

scaled\...	Rescaled landscape metric results

Raw landscape metric* results (raw.zip)

raw\...	Raw (unscaled) landscape metric results

Indirect loss for each landscape metric* (deltas.zip)

deltas\...	Raw (unscaled) landscape metric results

* For a list of landscape metrics and their corresponding grid names, see *CAPS Landscape Metrics*, below.

CAPS Landscape Metrics

The following grids are supplied in the \results folder, both in raw and scaled forms. Raw metrics are the original, unscaled results. Scaled metrics are rescaled by percentiles within each community, thus values of "connect" ≥ 0.90 represent the 10% best locations for connectedness for each community. These scaled metrics were combined using the weights listed in Appendix C to create the final Indices of Ecological Integrity. Note that watershed-based metrics were the same across all scenarios.

Grid name	Landscape metric
Development & roads	
habloss-	Habitat loss
whabloss	Watershed habitat loss
insults	Wetland buffer insults
traffic-	Road traffic
edges-	Microclimate alterations
Pollution	
salt	Road salt
sediment	Sedimentation
fertilize	Nutrient loading
pointsource	Toxic pollution
Biotic alterations	
cats-	Domestic predators
edgepred-	Edge predators
badplants-	Non-native invasive plants
worms-	Non-native invasive earthworms
Hydrological alterations	
imperv	Imperviousness
impound	Percent impounded
roadx	Upstream road crossings
damint	Dam intensity
Resiliency metrics	
connect-	Connectedness
sim-	Similarity

Appendix F: Difference Images

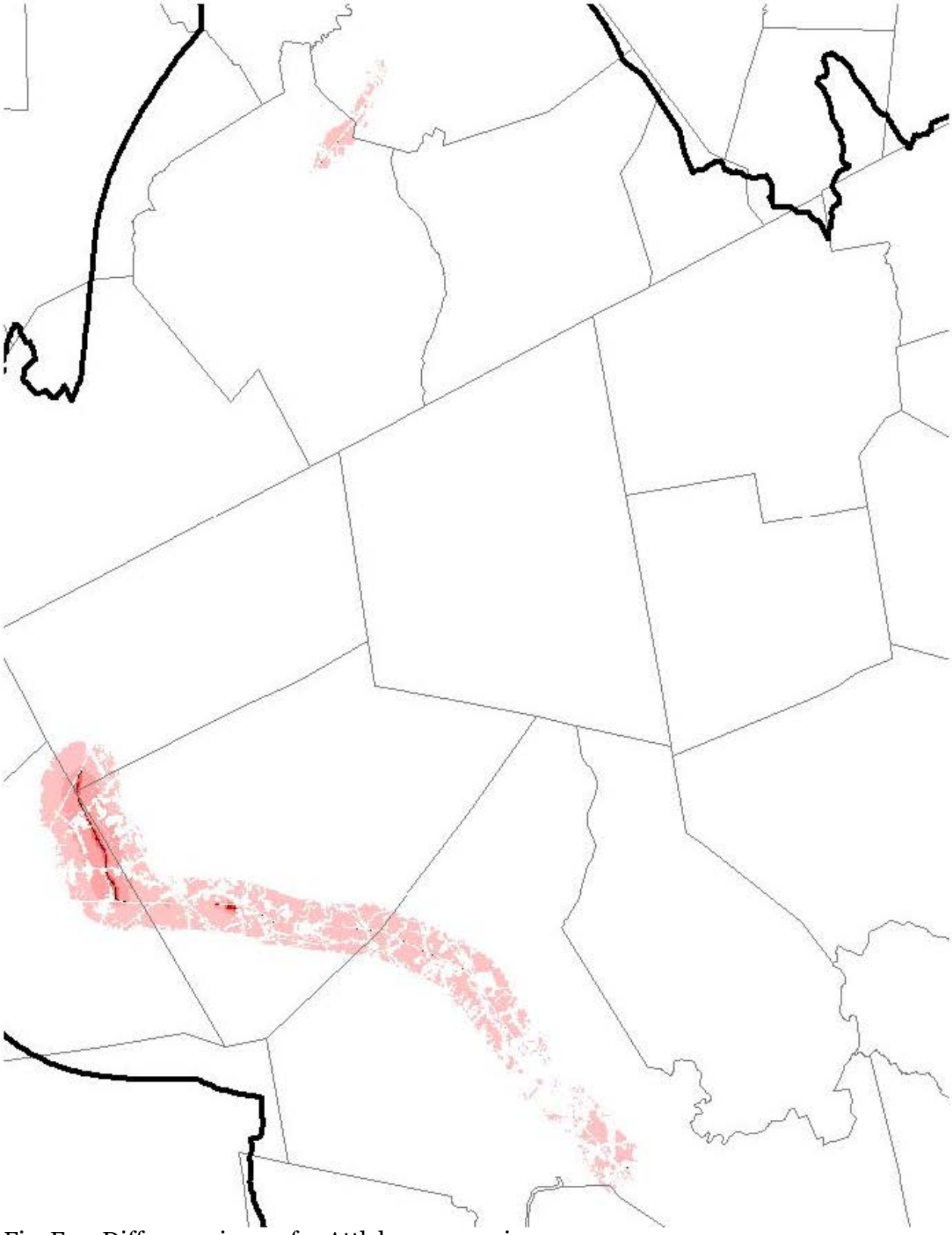


Fig. F-1. Difference image for Attleboro scenario.

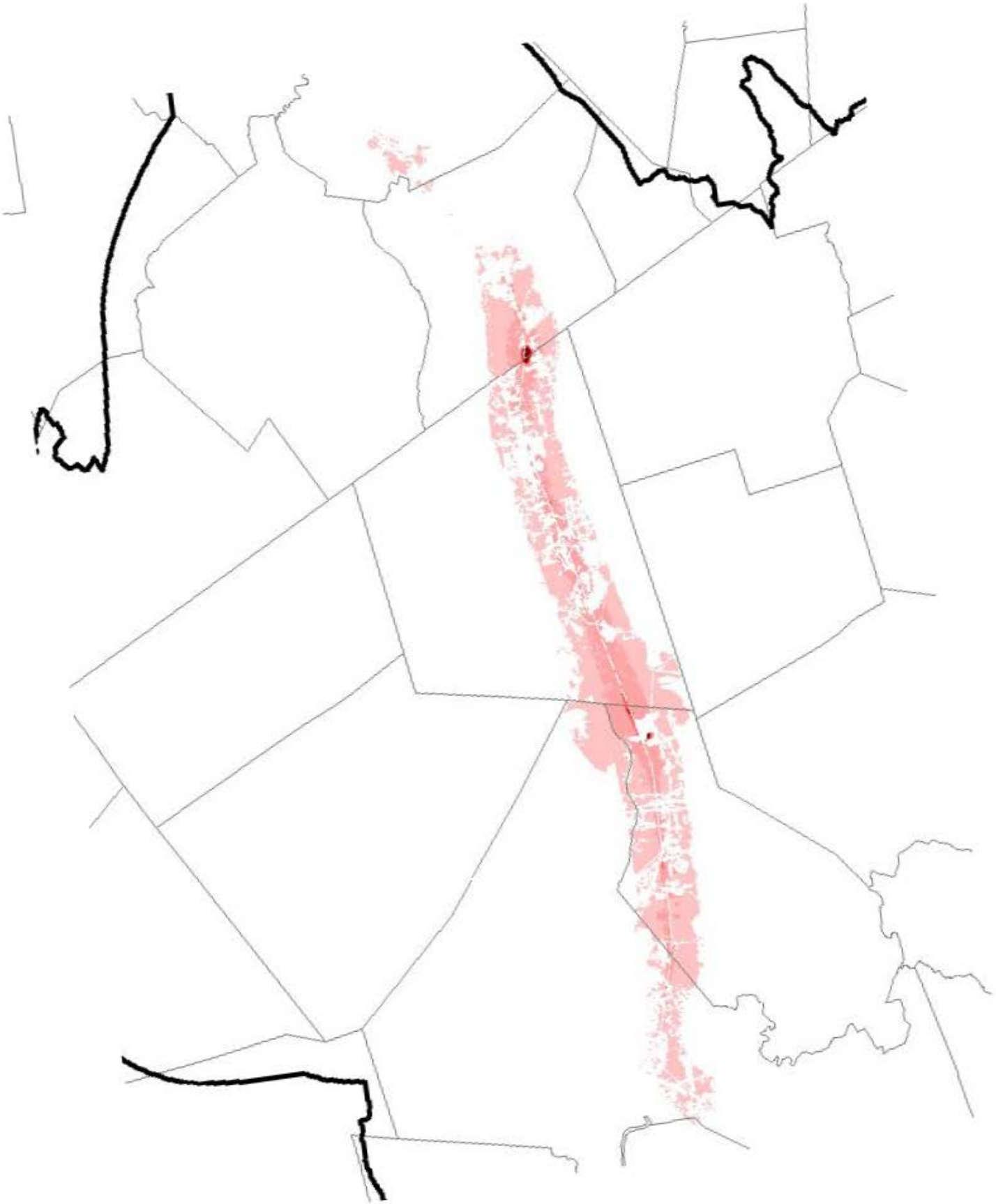


Fig. F-2. Difference image for Stoughton at-grade scenario.

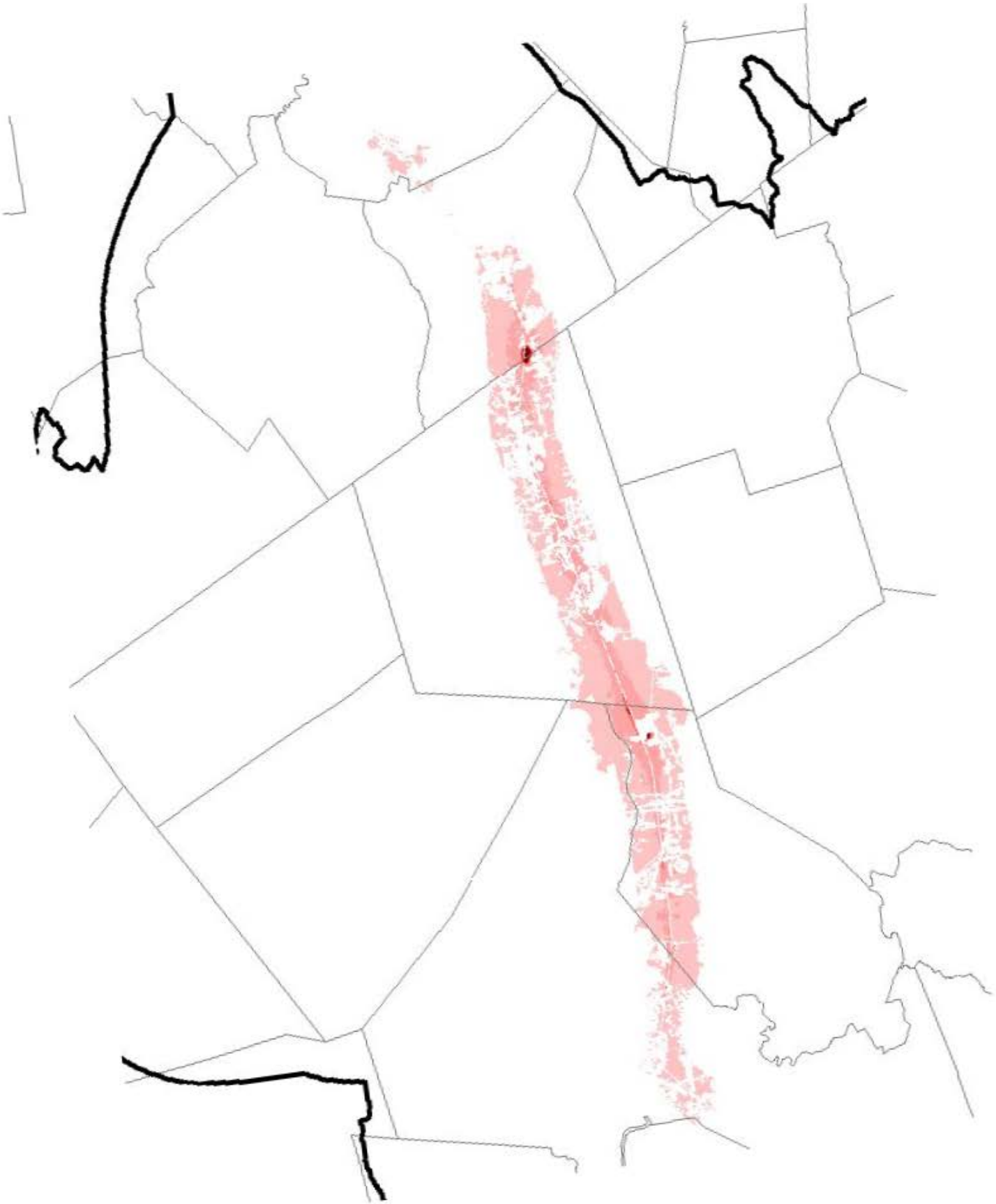


Fig. F-3. Difference image for Stoughton with trestle scenario.

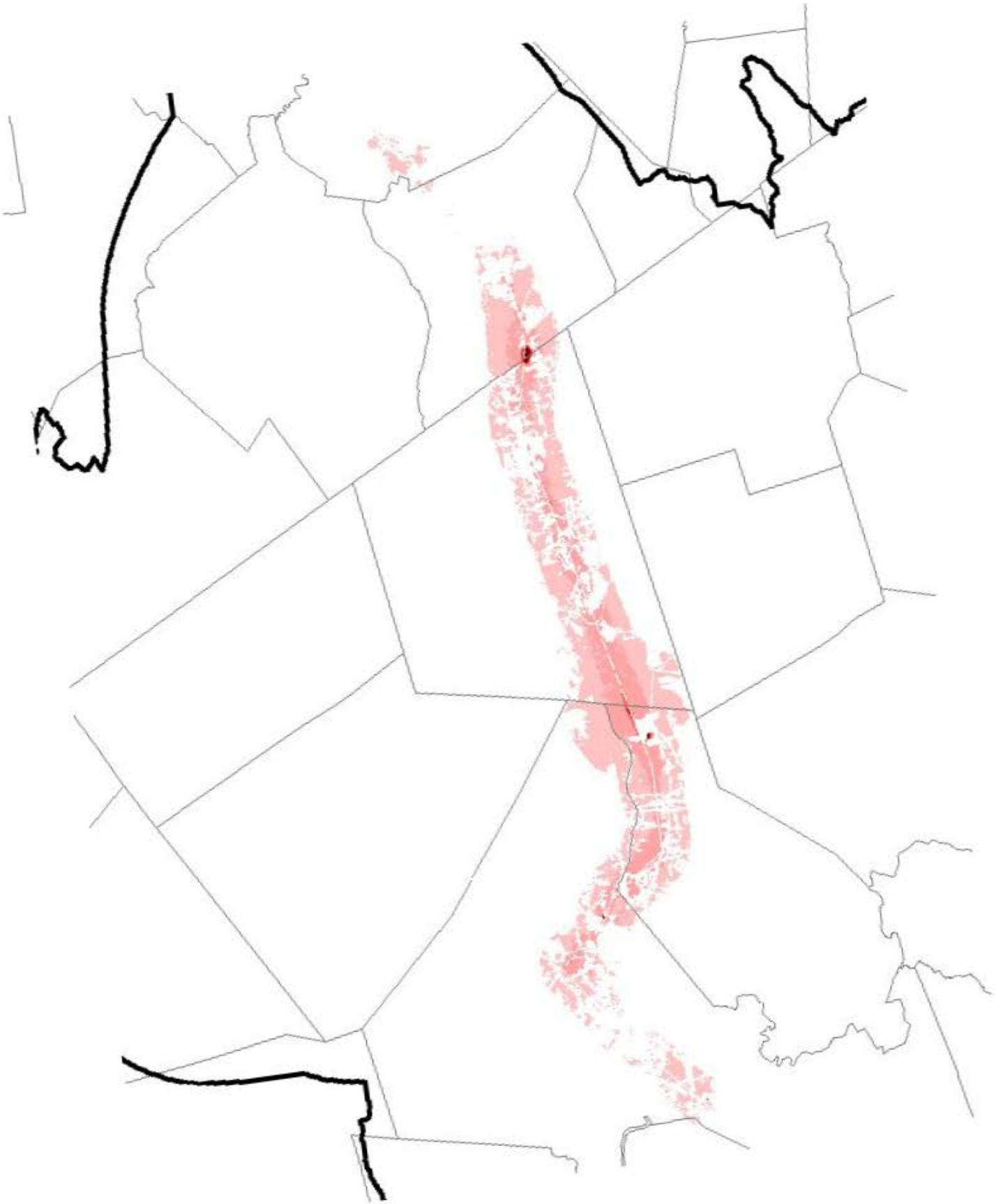


Fig. F-4. Difference image for Stoughton-Whittenton at-grade scenario.

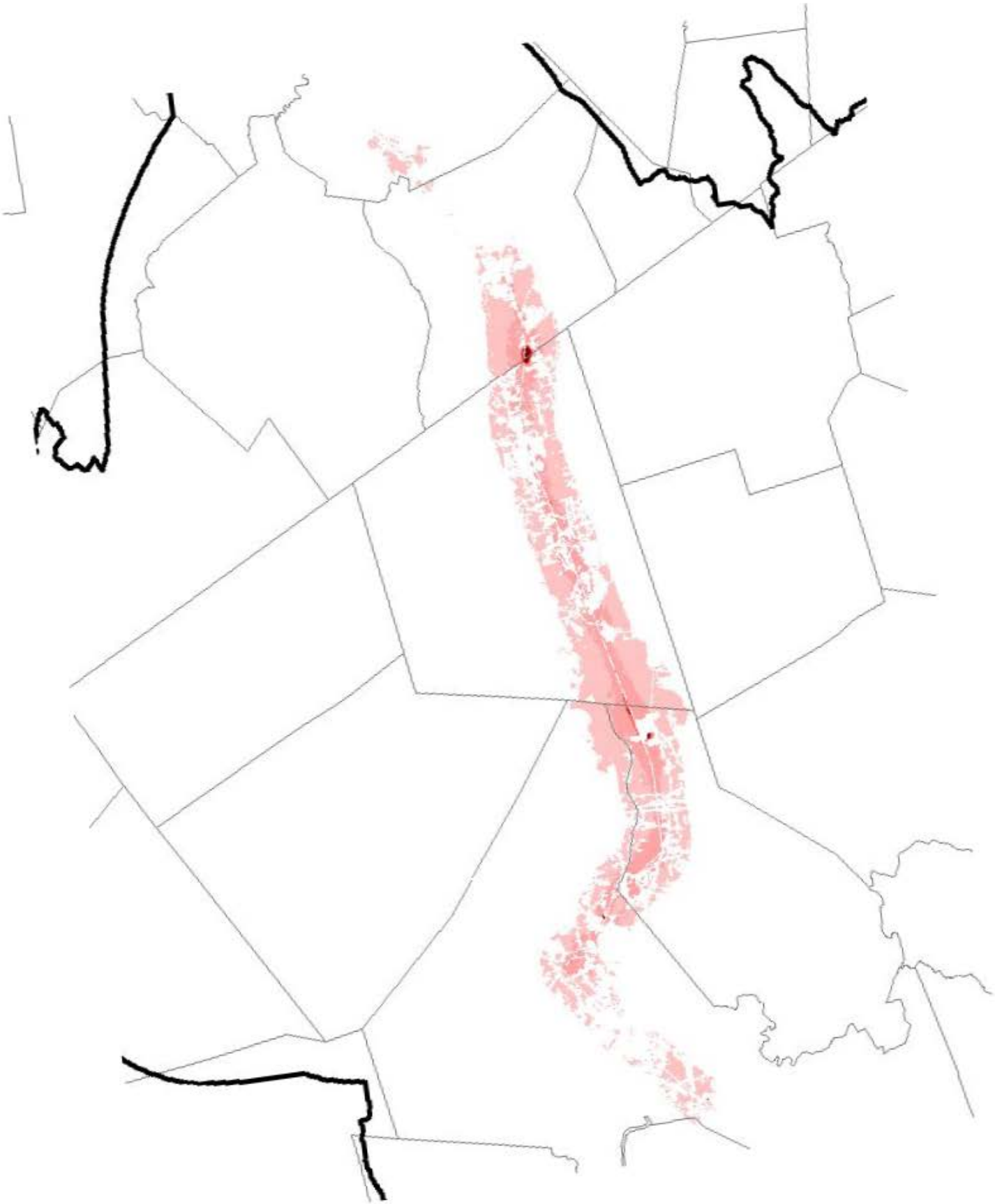


Fig. F-5. Difference image for Stoughton-Whittenton with trestle scenario.

University of Massachusetts, Amherst. Conservation Assessment and Prioritization System (CAPS) South Coast Rail Analysis

CAPS Index of Ecological Integrity Maps
Top 50% of the Landscape By Municipality

\\mabos\projects\10111.00\GIS\project\FEIS\Bridge_Culvert\CAPS_Canton_USGS.mxd

Town of Canton, MA

BOSTON
DEDHAM
MILTON
WESTWOOD
QUINCY
NORWOOD
RANDOLPH
CANTON
STOUGHTON
AVON
SHARON

Bridge over
Forge Pond
(Pequit Brook)

Bridge over
Mill Brook
(Beaver Meadow Brook)

CV-ST 2.47

CV-ST 3.40

Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

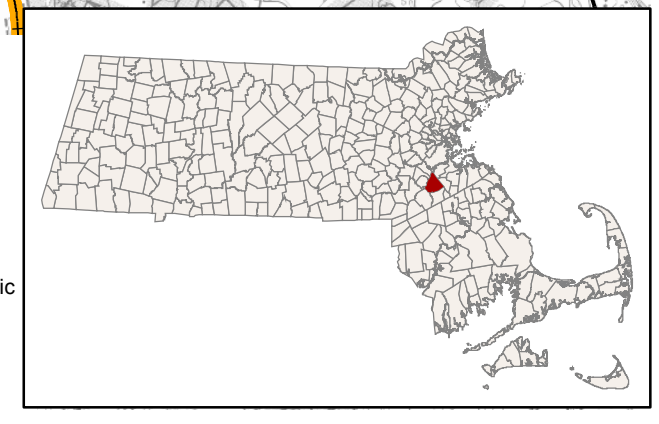
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 1,600 3,200 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

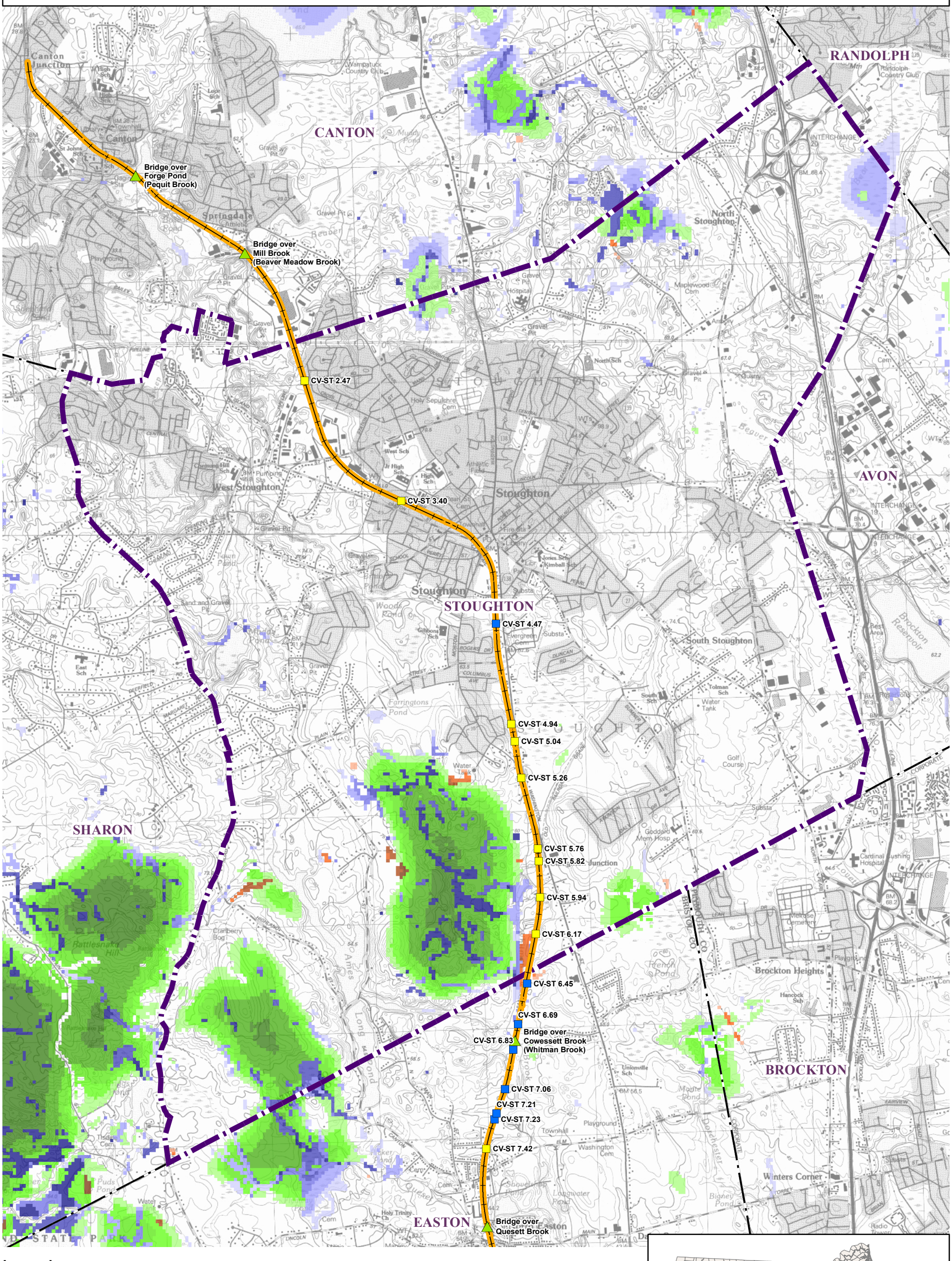
- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



\\mabos\projects\10111.00\GIS\project\FEIS\Bridge_Culvert\CAPS_Stoughton_USGS.mxd

Town of Stoughton, MA



Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

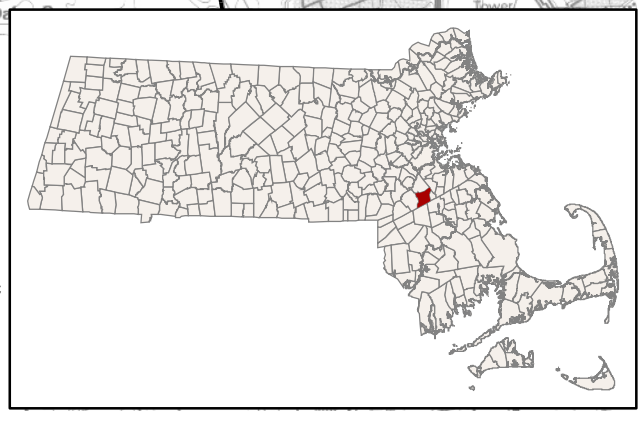
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 1,400 2,800 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

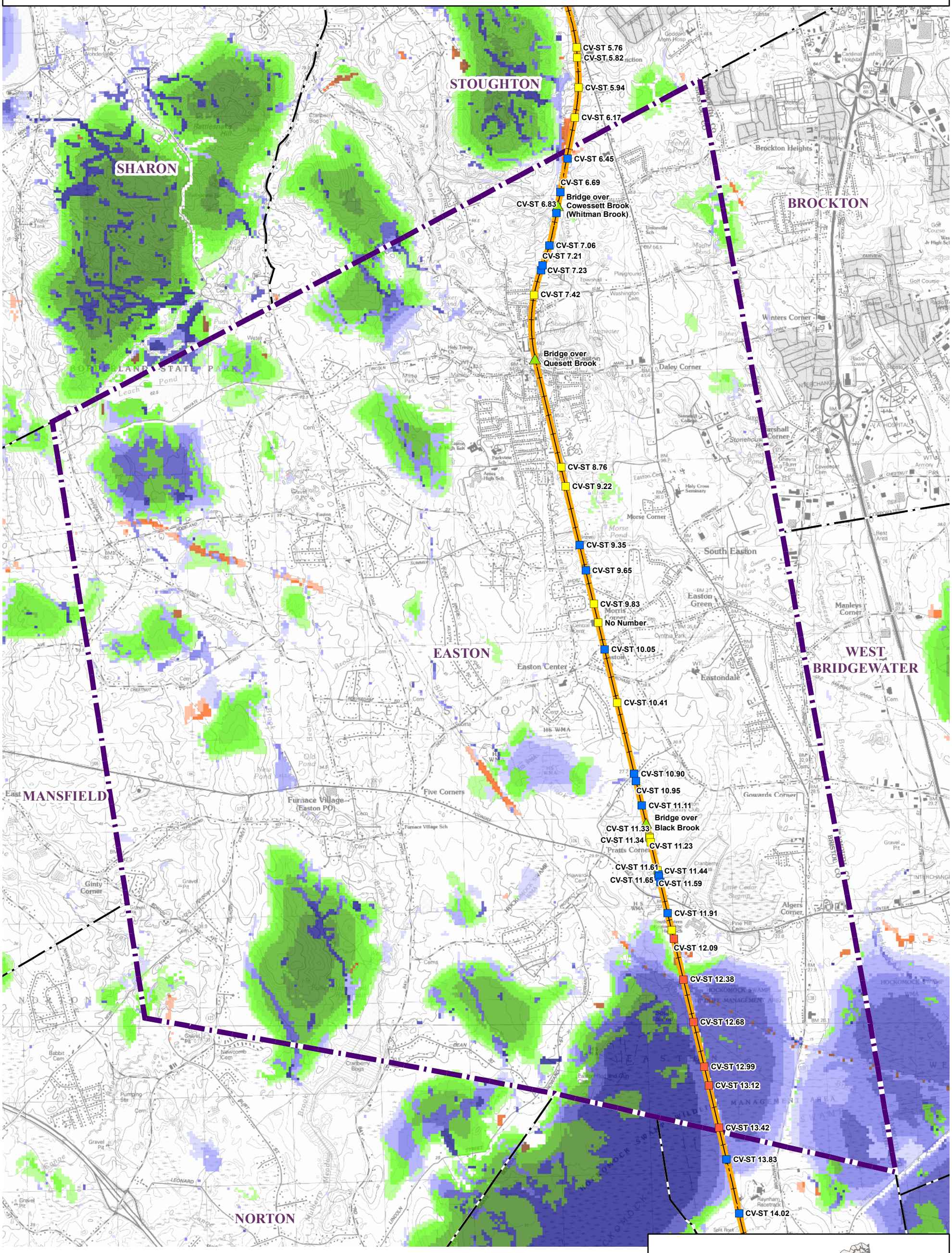
- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



\\mabos\projects\10111.00\GIS\project\FEIS\Bridge_Culvert\CAPS_Easton_USGS.mxd

Town of Easton, MA



Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

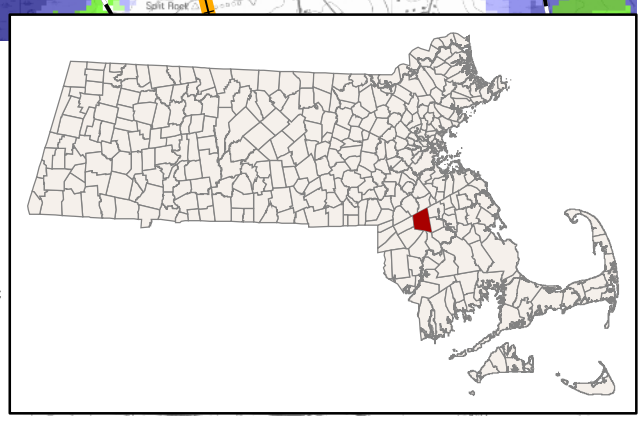
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 1,700 3,400 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



\\mabos\projects\10111.00\GIS\project\FEIS\Bridge_Culvert\CAPS_Raynham_USGS.mxd

Town of Raynham, MA

CV-ST 13.42
CV-ST 13.83
CV-ST 14.02
CV-ST 15.80
CV-ST 16.00
CV-ST 16.73
Bridge over Pine Swamp Brook #1
Bridge over Pine Swamp Brook #2
CV-ST 18.18
CV-ST 19.10
Bridge over Taunton River at MP 34.38
Bridge over Taunton River at MP 34.62
Bridge over Mill River
Bridge over Taunton River at MP 34.73
Bridge over Taunton River at MP 35.56
Bridge over Brickyard Road No Number

BRIDGEWATER
RAYNHAM
TAUNTON
MIDDLEBOROUGH
LAKEVILLE
Raynham Center
Prattville
Tracy Corner
Scotland
East Taunton
Weir Village

Legend

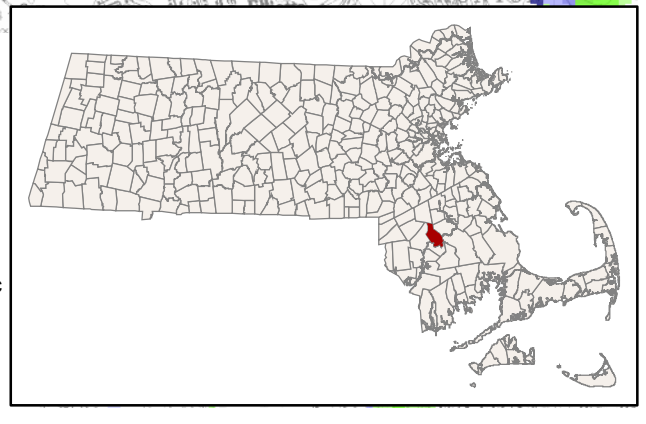
Rail
- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 1,500 3,000 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape
- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



\\mabos\projects\10111.00\GIS\project\FEIS\Bridge_Culvert\CAPS_Taunton_USGS.mxd

Town of Taunton, MA

MANSFIELD
EASTON
WEST BRIDGEWATER
NORTON
BRIDGEWATER
RAYNHAM
MIDDLEBOROUGH
TAUNTON
DIGHTON
BERKLEY
LAKEVILLE
REHOBOTH
FREETOWN

No Number
CV-ST 12.38
CV-ST 12.68
CV-ST 12.99
CV-ST 13.12
CV-ST 13.42
CV-ST 13.83
CV-ST 14.02
CV-ST 15.80
CV-ST 16.00
CV-ST 16.73
Bridge over Pine Swamp Brook #1
Bridge over Pine Swamp Brook #2
CV-ST 18.18
CV-ST 19.10
Bridge over Taunton River at MP 34.73
Bridge over Taunton River at MP 34.38
Bridge over Mill River
Bridge over Taunton River at MP 34.62
Bridge over Taunton River at MP 35.56
No Number
Bridge over Brickyard Road
CV-NB 14.25
CV-NB 14.52
CV-NB 14.74
CV-NB 15.01
Bridge over Cotley River at MP 38.93
Bridge over Cotley River at MP 39.46
CV-NB 16.89
CV-NB 17.33
CV-FR 0.42
CV-FR 0.58
CV-NB 17.89
Bridge over Cedar Swamp River at MP 41.51
CV-FR 1.14
CV-FR 1.20
CV-FR 1.47
CV-FR 1.76
Bridge over Cedar Swamp River at MP 42.14
CV-FR 2.13
CV-FR 2.21
CV-FR 2.71
CV-FR 2.95
No Number
CV-NB 20.37
CV-NB 20.89

Legend

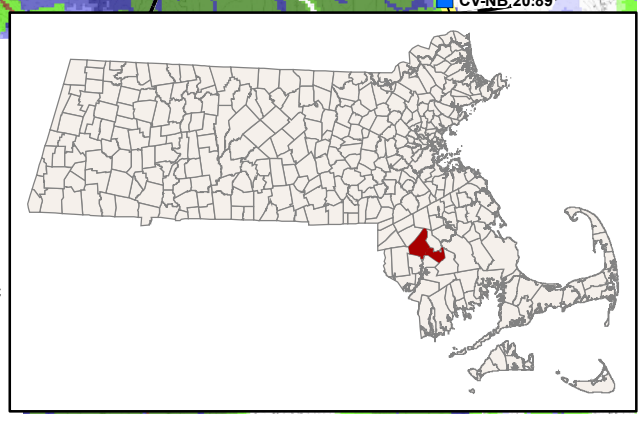
Rail
- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 3,100 6,200 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape
- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



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Town of Berkley, MA

at MP 35.56
Bridge over
Brickyard Road
No Number
CV-NB 14.25
CV-NB 14.52
CV-NB 14.74
CV-NB 15.01
Bridge over
Cotley River
at MP 38.93
Bridge over
Cotley River
at MP 39.46
CV-NB 16.89
CV-NB 17.33
CV-FR 0.42
CV-FR 0.58
CV-NB 17.89
Bridge over
Cedar Swamp River
at MP 41.51
CV-FR 1.14
CV-FR 1.20
CV-FR 1.47
CV-FR 1.76
CV-FR 2.21
CV-FR 2.13
CV-FR 2.71
CV-FR 2.95
CV-FR 4.50
CV-FR 5.68
CV-FR 5.49
CV-FR 5.72
CV-FR 5.62
CV-FR 5.79
CV-FR 6.01
Bridge over
Farm Road
CV-FR 6.86
Bridge over
Farm Road
Bridge over
Cedar Swamp River
at MP 42.14

TAUNTON
BERKLEY
DIGHTON
SOMERSET
FREETOWN
LAKEVILLE

Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

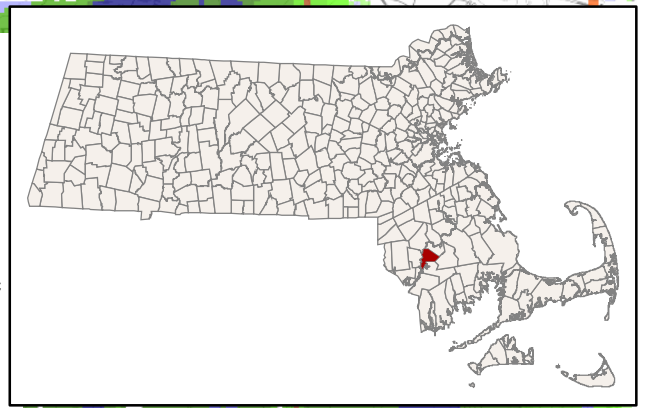
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 1,400 2,800 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



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Town of Lakeville, MA

RAYNHAM
MIDDLEBOROUGH
TAUNTON
BERKLEY
LAKEVILLE
ROCHESTER
FREETOWN

CV-NB 16.89
CV-NB 17.33
CV-FR 0.42
CV-FR 0.58
CV-NB 17.89
Bridge over Cedar Swamp River at MP 41.51
CV-FR 1.14
CV-FR 1.20
Bridge over Cedar Swamp River at MP 42.14
No Number
CV-NB 20.37
CV-NB 20.89
CV-NB 21.51
CV-NB 21.66
CV-NB 21.68
CV-NB 21.93
Bridge over Fall Brook
CV-NB 22.24

Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

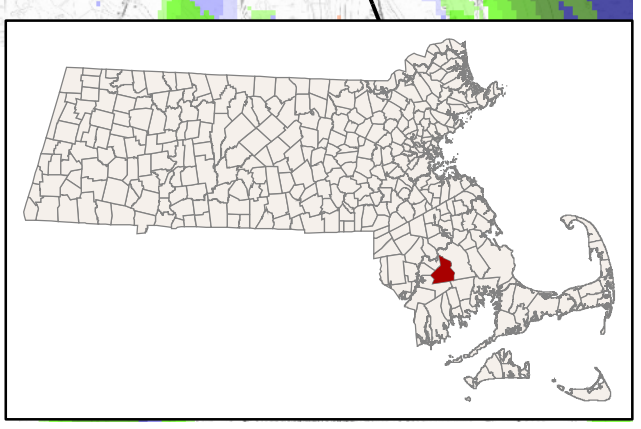
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 2,000 4,000 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



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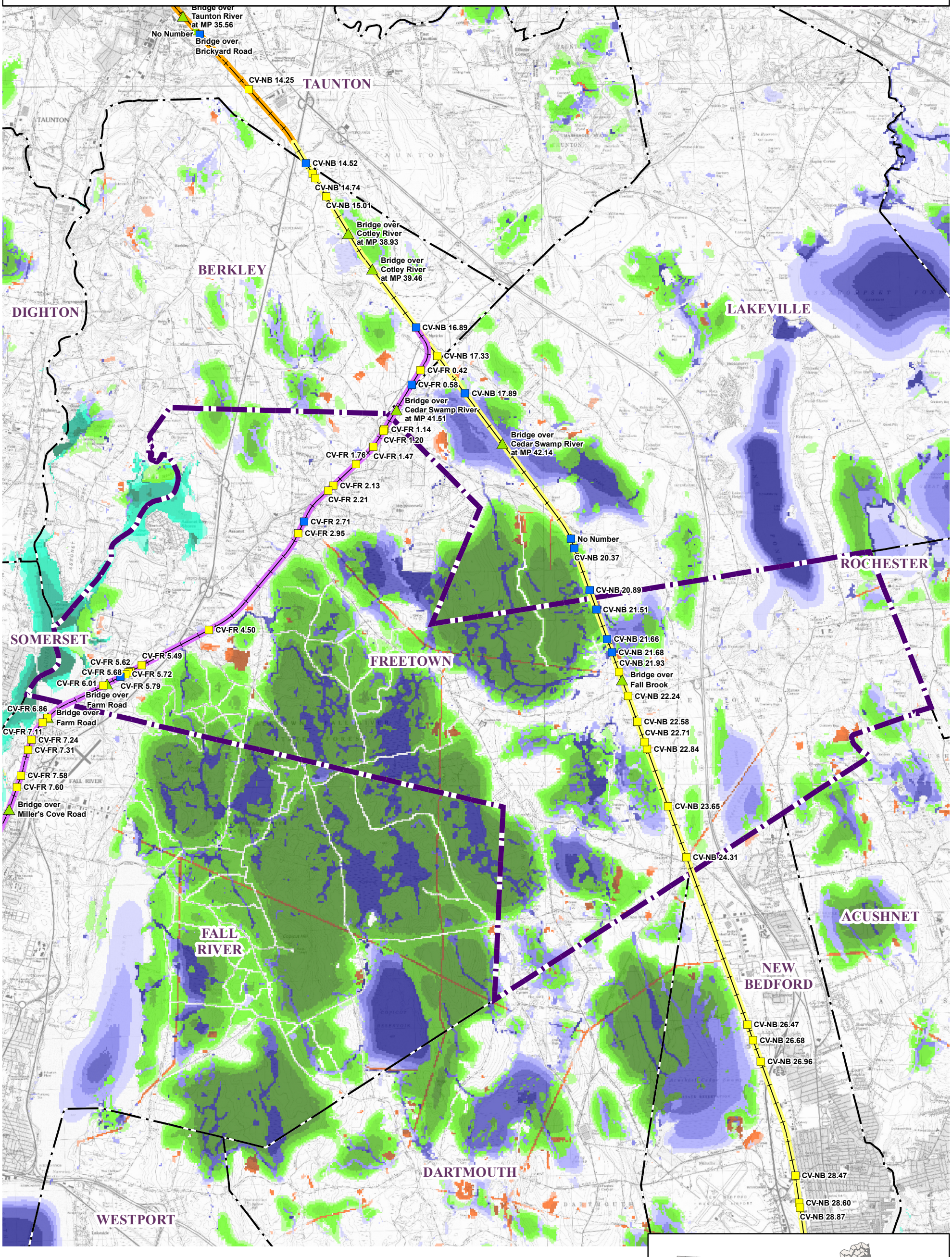
Town of Freetown, MA



Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

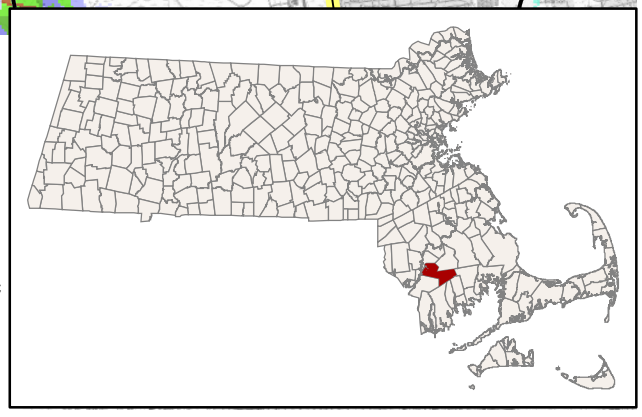
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 3,000 6,000 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



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Town of New Bedford, MA

CV-NB 24.31
CV-NB 26.47
CV-NB 26.68
CV-NB 26.96
CV-NB 28.47
CV-NB 28.60
CV-NB 28.87

FREETOWN
FALL RIVER
ROCHESTER
ACUSHNET
NEW BEDFORD
DARTMOUTH
FAIRHAVEN

Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

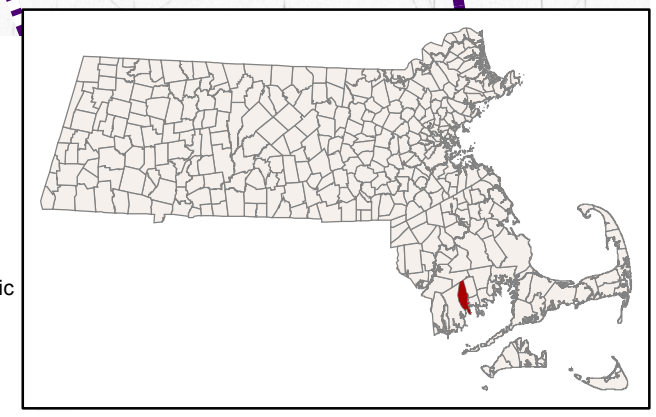
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 2,100 4,200 Feet

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



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Town of Fall River, MA

CV-FR 4.50
CV-FR 5.62
CV-FR 5.49
CV-FR 5.68
CV-FR 5.72
CV-FR 5.79
CV-FR 6.01
Bridge over Farm Road
CV-FR 6.86
CV-FR 7.11
Bridge over Farm Road
CV-FR 7.24
CV-FR 7.31
CV-FR 7.58
CV-FR 7.60
Bridge over Miller's Cove Road
Bridge over Collins Street
Bridge over Ashley's underpass
CV-FR 8.97
CV-FR 9.28
CV-FR 11.43
CV-FR 11.65
Bridge over channel near Battleship Cove

LAKEVILLE
FREETOWN
SWANSEA
SOMERSET
FALL RIVER
DARTMOUTH
WESTPORT
Rhode Island

Legend

Rail

- Fall River Secondary
- New Bedford Main Line
- Stoughton Line

Culverts

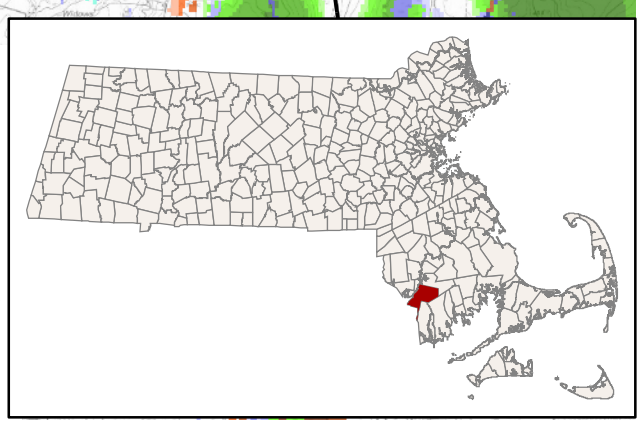
- Hydraulic Analysis, Replace in kind, or Eliminate
- Recommended to be Daylighted
- Recommended to meet MA River and Stream Crossing Standards
- Bridge

0 0.5 1 Miles

CAPS Index of Ecological Integrity
Top 50% of the Landscape

- Coastal Upland
- Coastal Wetland Aquatic
- Forest
- Freshwater Wetland & Aquatic
- Shrubland

50-60% 60-70% 70-80% 80-90% 90-100%



Appendix 4.14-C

Comprehensive Summary of Impacts to Vernal Pools

Comprehensive Summary of Impacts to Vernal Pools

Municipality	Pools Directly Filled	Amount of Fill (Ac.) / Percent Filled	Pools with area of VP Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Upland Buffer Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Surrounding Upland Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted
Stoughton	PVP 23791	0.03 / 17.2%	PVP 23791	0.00 / 0.8%	PVP 23791	0.09 / 12.5%	PVP 23791	0.63 / 6.0%
							PVP 23778	1.72 / 4.8%
					PVP 23784	0.57 / 19.3%	PVP 23784	8.63 / 15.9%
			CVP 2140	0.01 / 1.1%	CVP 2140	0.49 / 20.6%	CVP 2140	
Stoughton Total	1	0.03	2	0.01	3	1.15	4	10.98
Easton	PVP 7222	0.05 / 21.3%	PVP 7222 CVP 2152	0.02 / 1.6%	PVP 7222 CVP 2152	1.19 / 26.8%	PVP 7222 CVP 2152	4.15 / 6.3%
	VP-10	0.00 / 4.7%			VP-10		VP-10	
					VP-3		VP-3	
			PVP 7218	0.00 / 0.4%	PVP 7218	0.28 / 10.0%	PVP 7218	
					VP-6	0.28 / 34.8%	VP-6	
			CVP 2377 VP-11	0.01 / 0.6%	CVP 2377 VP-11	0.41 / 14.5%	CVP 2377 VP-11	
					VP-7		VP-7	
							PVP 7220	
							PVP 7221	
							PVP 7219	
							CVP 2153	
							CVP 2154	
							PVP 7223	
							VP 2	
							VP 4	
							CVP 1827	0.19 / 1.2%
	EA-2	0.02 / 2.3%	EA-2 EA-1	0.04 / 2.0%	EA-2 EA-1	0.28 / 9.4%	EA-2 EA-1	1.39 / 2.9%
	CVP 1462	0.00 / 1.9%			CVP-1462 NCVP-3	0.39 / 13.3%	CVP-1462 NCVP-3	
	NCVP-2	0.01 / 1.1%			NCVP-2	0.41 / 26.6%	NCVP-2	
	CVP 1463	0.01 / 1.5%	CVP 1463	0.07 / 3.6%	CVP 1463	0.26 / 40.5%	CVP 1463	
							PVP 7242	
			PVP 7255 PVP 7256	0.01 / 0.3%	PVP 7255 PVP 7266	0.28 / 11.2%	PVP 7255 PVP 7266	1.60 / 3.4%
							PVP 7254	
							PVP 7324	
							PVP 7257	
							PVP 7325	
					NHESP 1	0.29 / 22.8%	NHESP 1	0.61 / 5.7%
					CVP 1712	0.09 / 8.3%	CVP 1712	1.57 / 2.6%
			CVP 1665		CVP 1665		CVP 1665	
			NHESP 2	0.02 / 1.9%	NHESP 2	0.25 / 12.0%	NHESP 2	
			CVP 1710		CVP 1710		CVP 1710	
Easton Total	6	0.09	13	0.16	22	4.41	36	9.50

Comprehensive Summary of Impacts to Vernal Pools (continued)

Municipality	Pools Directly Filled	Amount of Fill (Ac.) / Percent Filled	Pools with area of VP Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Upland Buffer Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Surrounding Upland Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted
					PVP 20158	0.21 / 33.0%	PVP 20158	0.75 / 16.4%
					NHESP 3	0.11 / 66.9%	NHESP 3	
							PVP 20178	1.99 / 3.5%
							PVP 20179	
							PVP 20181	
							PVP 20182	
							PVP 20186	0.40 / 1.2%
							PVP 20189	
							PVP 20193	0.70 / 4.1%
			VP-12	0.05 / 4.8%	VP-12	0.10 / 13.5%	VP-12	2.11 / 2.2%
							PVP 20197	
							PVP 20233	
Raynham	CVP 1972	0.02 / 1.9%	CVP 1972	0.02 / 4.4%	CVP 1972	0.40 / 23.5%	CVP 1972	
	CVP 1971	0.01 / 7.1%	CVP 1971		CVP 1971		CVP 1971	
							PVP 20198	
							PVP 20196	
							PVP 20195	
							PVP 20208	
							PVP 20209	
							PVP 20210	
							PVP 20211	
							PVP 20214	
							PVP 20215	
	PVP 20231	0.01 / 6.3%	PVP 20231	0.10 / 9.4%	PVP 20231	0.17 / 6.4%	PVP 20231	0.78 / 2.2%
	PVP 20230	0.01/100.0%	PVP 20230	0.06 / 11.9%	PVP 20230	0.11 / 34.0%	PVP 20230	
	PVP 20235	0.03 / 18.3%	PVP 20235	0.13 / 19.9%	PVP 20235	0.16 / 16.1%	PVP 20235	
							PVP 20232	
Raynham Total	5	0.07	6	0.35	8	1.25	27	6.72

Comprehensive Summary of Impacts to Vernal Pools (continued)

Municipality	Pools Directly Filled	Amount of Fill (Ac.) / Percent Filled	Pools with area of VP Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Upland Buffer Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Surrounding Upland Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted
	VP-13	0.08 / 96.4%	VP-13	0.08 / 47.6%	VP-13	0.12 / 12.8%	VP-13	
			PVP 25087	0.12 / 100.0%	PVP 25087	0.23 / 19.3%	PVP 25087	
	PVP 25089	0.01 / 3.3%	PVP 25089		PVP 25089		PVP 25089	
	PVP 25090	0.01 / 6.4%	PVP 25090	0.06 / 3.1%	PVP 25090	0.39 / 11.7%	PVP 25090	
	PVP 25092	0.01 / 13.5%	PVP 25092		PVP 25092		PVP 25092	
							PVP 25099	
							PVP 25091	0.85 / 1.0%
							PVP 25098	
							PVP 25097	
							PVP 25096	
							PVP 25095	
							PVP 25094	
							PVP 250-93	
							PVP 25109	
			PVP 25270	0.02 / 5.6%	PVP 25270	0.07 / 8.1%	PVP 25270	
			PVP 25271	0.03 / 2.8%	PVP 25271	0.01 / 1.4%	PVP 25271	
Taunton							PVP 25278	0.84 / 1.1%
							PVP 25295	
							PVP 25294	
			PVP 25303	0.04 / 2.3%	PVP 25303	0.07 / 7.0%	PVP 25303	
			PVP 25306	0.05 / 1.0%	PVP 25306	0.06 / 15.3%	PVP 25306	
			PVP 25302		PVP 25302		PVP 25302	
							PVP 25304	
							PVP 25305	0.38 / 1.8%
							PVP 25308	
							PVP 25307	
							PVP 25309	
							PVP 25310	
			PVP 25314	0.01 / 7.4%				
			PVP 25317	0.10 / 24.9%	PVP 25317	0.03 / 1.3%	PVP 25317	
					PVP 25316		PVP 25316	0.58 / 1.2%
							PVP 25315	
							PVP 25318	
							PVP 25395	1.29 / 3.9%
							PVP 25397	
Taunton Total	4	0.10	12	0.51	12	0.98	34	3.93

Comprehensive Summary of Impacts to Vernal Pools (continued)

Municipality	Pools Directly Filled	Amount of Fill (Ac.) / Percent Filled	Pools with area of VP Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Upland Buffer Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted	Pools with area of Surrounding Upland Habitat Impacted	Amount of Impact (Ac.) / Percent Impacted
							PVP 2316	0.83 / 3.8%
					PVP 2318	0.43 / 24.9%	PVP 2318	1.60 / 2.6%
					PVP 2319		PVP 2319	
			PVP 2320	0.15 / 5.0%	PVP 2320	0.20 / 23.7%	PVP 2320	
							PVP 2317	
Berkley			PVP 2353	0.05 / 14.1%	PVP 2353	0.05 / 6.3%	PVP 2353	0.39 / 2.1%
							PVP 2354	0.46 / 1.5%
							PVP 2356	
							PVP 2358	
							PVP 2360	0.96 / 6.3%
							PVP 2361	0.02 / 0.1%
Berkley Total	0	0.00	2	0.20	4	0.68	11	4.26
					PVP 11932	0.13 / 2.3%	PVP 11932	0.38 / 2.0%
Lakeville							PVP 11931	0.20 / 0.8%
							PVP 11883	0.12 / 1.4%
Lakeville Total	0	0.00	0	0.00	1	0.13	3	0.70
			PVP 8348	0.00 / 0.3%	PVP 8348	0.04 / 9.2%	PVP 8348	0.42 / 3.0%
							PVP 8362	0.33 / 1.2%
	PVP 8324	0.10 / 8.4%	PVP 8324	0.10 / 5.6%	PVP 8324	0.03 / 3.2%	PVP 8324	0.17 / 1.4%
			PVP 8326	0.02 / 6.6%	PVP 8326	0.02 / 4.5%	PVP 8326	0.48 / 1.9%
					PVP 8308	0.13 / 12.2%	PVP 8308	1.34 / 2.1%
Freetown							PVP 8309	
							PVP 8310	
							PVP 8312	0.46 / 1.6%
							PVP 8313	
	PVP 8284	0.02 / 17.7%			PVP 8284	0.15 / 13.7%	PVP 8284	3.05 / 5.5%
	PVP 8286	0.11 / 59.8%	PVP 8286	0.03 / 9.7%	PVP 8286	0.25 / 15.8%	PVP 8286	
							PVP 8283	
							PVP 8285	
							PVP 8287	
Freetown Total	3	0.23	4	0.15	6	0.62	14	6.26
							CVP 1892	0.23 / 0.7%
							CVP 1893	
New Bedford			CVP 2647	0.03 / 3.5%	CVP 2647	0.03 / 6.6%	CVP 2647	0.28 / 1.5%
							PVP 15554	
							CVP 2525	0.29 / 1.1%
							PVP 15571	0.26 / 0.7%
							PVP 15572	
New Bedford Total	0	0.00	1	0.03	1	0.03	7	1.06
Totals	19	0.53	40	1.42	57	9.26	136	43.40

Appendix 4.15-A

Threatened and Endangered Species Agency Correspondence

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

1/8/2009

Lisa Standley
Vanasse Hangen Brustlin, Inc.
PO Box 9151
101 Walnut St
Watertown MA 02471

RE: Project Location: South Coast Rail (New Bedford/ Fall River Commuter Rail Extension)
Town: Various
NHESP Tracking No.: 98-3735

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat* (PH) and *Estimated Habitat* (EH) as indicated in the *Massachusetts Natural Heritage Atlas* (13th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Priority Habitat 1392 (PH 1392) and *Estimated Habitat 59* (EH59):

Scientific name	Common Name	Taxonomic Group	State Status
Ambystoma laterale	Blue-Spotted Salamander	Amphibian	Special Concern
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 1392 (PH 1392):

Scientific name	Common Name	Taxonomic Group	State Status
Lycopus rubellus	Gypsywort	Plant	Endangered

Priority Habitat 1421 (PH 1421) and *Estimated Habitat 36* (EH36):

Scientific name	Common Name	Taxonomic Group	State Status
Enallagma recurvatum	Pine Barrens Bluet	Damselfly	Threatened
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern
Pseudemys rubriventris pop 1	Northern Red-Bellied Cooter	Reptile	Endangered
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 1421 (PH 1421):

Scientific name	Common Name	Taxonomic Group	State Status
Ammodramus savannarum	Grasshopper Sparrow	Bird	Threatened
Eleocharis tricostata	Three-Angled Spike-Sedge	Plant	Endangered
Sabatia kennedyana	Plymouth Gentian	Plant	Special Concern

Priority Habitat 1349 (PH 1349) and *Estimated Habitat 1* (EH 1):

Scientific name	Common Name	Taxonomic Group	State Status
Lithophane viridipallens	Pale Green Pinion Moth	Butterflies and Moths	Special Concern
Papaipema sulphurata	Water-Willow Stem Borer	Butterflies and Moths	Threatened
Synurella chamberlaini	Coastal Swamp Amphipod	Crustacean	Special Concern
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 1093 (PH 1093) and *Estimated Habitat 951* (EH 951):

Scientific name	Common Name	Taxonomic Group	State Status
Callophrys hesseli	Hessel's Hairstreak	Butterflies and Moths	Special Concern
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern
Somatochlora linearis	Mocha Emerald	Dragonfly	Special Concern
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 620 (PH 620) and *Estimated Habitat 545* (EH 545):

Scientific name	Common Name	Taxonomic Group	State Status
Ambystoma opacum	Marbled Salamander	Amphibian	Threatened

Priority Habitat 1297 (PH 1297) and *Estimated Habitat 1077* (EH 1077):

Scientific name	Common Name	Taxonomic Group	State Status
Callophrys hesseli	Hessel's Hairstreak	Butterflies and Moths	Special Concern

Priority Habitat 12 (PH 12) and *Estimated Habitat 73* (EH 73):

Scientific name	Common Name	Taxonomic Group	State Status
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened

Priority Habitat 12 (PH 12):

Scientific name	Common Name	Taxonomic Group	State Status
Scirpus longii	Long's Bulrush	Plant	Threatened

Priority Habitat 236 (PH 236) and *Estimated Habitat 121* (EH 121):

Scientific name	Common Name	Taxonomic Group	State Status
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened

Priority Habitat 1158 (PH 1158) and *Estimated Habitat 372* (EH 372):

Scientific name	Common Name	Taxonomic Group	State Status
* *Data Sensitive Species*			Endangered

Priority Habitat 1158 (PH 1158):

Scientific name	Common Name	Taxonomic Group	State Status
Panicum rigidulum ssp pubescens	Long-Leaved Panic-Grass	Plant	Threatened

Priority Habitat 298 (PH 298) and *Estimated Habitat 198* (EH 198):

Scientific name	Common Name	Taxonomic Group	State Status
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 1439 (PH 1439) and *Estimated Habitat 948* (EH 948):

Scientific name	Common Name	Taxonomic Group	State Status
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern

Priority Habitat 1239 (PH 1239):

Scientific name	Common Name	Taxonomic Group	State Status
Panicum rigidulum ssp pubescens	Long-Leaved Panic-Grass	Plant	Threatened

Priority Habitat 261 (PH 261) and *Estimated Habitat 153* (EH 153):

Scientific name	Common Name	Taxonomic Group	State Status
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 229 (PH 229) and *Estimated Habitat 111* (EH 111):

Scientific name	Common Name	Taxonomic Group	State Status
* *Data Sensitive Species*			Endangered
* *Data Sensitive Species*			Endangered

Priority Habitat 454 (PH 454) and *Estimated Habitat 350* (EH 350):

Scientific name	Common Name	Taxonomic Group	State Status
Ambystoma opacum	Marbled Salamander	Amphibian	Threatened

Priority Habitat 451 (PH 451) and *Estimated Habitat 328* (EH 328):

Scientific name	Common Name	Taxonomic Group	State Status
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened

Priority Habitat 282 (PH 282) and *Estimated Habitat 179* (EH 179):

Scientific name	Common Name	Taxonomic Group	State Status
Terrapene carolina	Eastern Box Turtle	Reptile	Special Concern

Priority Habitat 924 (PH 924) and *Estimated Habitat 753* (EH 753):

Scientific name	Common Name	Taxonomic Group	State Status
Sterna hirundo	Common Tern	Bird	Special Concern
Sterna dougallii	Roseate Tern	Bird	Endangered

Priority Habitat 926 (PH 926) and *Estimated Habitat 755* (EH 755):

Scientific name	Common Name	Taxonomic Group	State Status
Sterna hirundo	Common Tern	Bird	Special Concern
Sterna dougallii	Roseate Tern	Bird	Endangered

Priority Habitat 1196 (PH 1196):

Scientific name	Common Name	Taxonomic Group	State Status
Scirpus longii	Long's Bulrush	Plant	Threatened

The species listed above are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). * These species are considered "Sensitive Species". They are highly susceptible to collection and are therefore of high concern to Natural Heritage. Information about these species (including presence/absence) can not be released to anyone (especially including release to third parties or published) unless such release is agreed to in writing by the Natural Heritage Program (See Massachusetts Public Records law: M.G.L. chapter 66 section 17D). Fact sheets for most state-listed rare species can be found on our website (www.nhesp.org).

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Amy Coman, Endangered Species Review Assistant, at (508) 389-6364.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JAN 12 2009

Lisa Standley
Vanasse Hangen Brustlin, INC.
101 Walnut Street
P.O. Box 9151
Watertown, Massachusetts, 02471-9151

Dear Ms. Standley,

This is in response to your letter dated December 4, 2008 regarding the Exexcutive Office of Transportation and Public Works (EOT) proposed project to provide transportation from Boston to the cities of Fall River and New Bedford, Massachusetts. Five alternatives are being proposed. One alternative would require the reconstruction of freight rail bridges across the Taunton River in Taunton. Vanhasse Hangen Brustlin, INC. (VHB) has requested information on the presence of any species listed as threatened or endangered and any species of special concern by NOAA's National Marine Fisheries Service (NMFS).

No species listed by NMFS, inclusive of shortnose sturgeon, are present in the Taunton River. Atlantic sturgeon, however, are known to be present primarily during the summer months (i.e. June) at the mouth of the Taunton River, with occasional sturgeon occurring farther upstream. Atlantic sturgeon are considered a Candidate Species as NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. A status review report was completed by the status review team in February 2007. NMFS is currently reviewing the report and other available information to determine if listing under the ESA is warranted. To date, our knowledge indicates that, although the Taunton River doesn't support a spawning population of Atlantic sturgeon, the system is used as a nursery area for Atlantic surgeon (Burkett and Kynard 1993)[1]. Juvenile and sub-adult Atlantic sturgeon two years of age and older have been documented within this river system and it is believed that juveniles remain in riverine and estuarine habitats for 1-6 years (Smith 1985)[2]. Although Atlantic sturgeon are known to be present in the Taunton River, as noted above the species generally occurs at the mouth of the river and as such, it is unlikely for Atlantic sturgeon to occur in the vicinity of your proposed project. As a result, no further coordination with NMFS

Protected Resources Division on the effects of the project on listed species is necessary. Should you have any questions about these comments please contact Danielle Palmer at (978)281-9300 ext. 6518 or by e-mail (Danielle.Palmer@noaa.gov).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

[1]Burkett, C. and B. Kynard. 1993. Sturgeons of the Taunton River and Mt. Hope Bay: Distribution, habitats and movements. Final Report for Project AFC-24-1. Massachusetts Division of Marine Fisheries, Boston, MA. 13 pp.

[2]Smith, T. I. J. 1985. The fishery, biology, and management of Atlantic sturgeon, *Acipenser oxyrhynchus*, in North America. Environmental Biology of Fishes 14(1): 61-72.

File Code: Sec 7 Technical Assistance 2008

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

MAY 1 3 2013

Karen K. Adams
Regulatory Division
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742

RE: South Coast Rail Project

Dear Ms. Adams,

The U.S. Army Corps of Engineers (USACE) is preparing to issue a Final Environmental Impact Statement for the Massachusetts' Department of Transportation's proposed South Coast Rail Project. This project would extend commuter rail service from South Station in Boston to Fall River and New Bedford. The proposed railway would cross the Taunton River in the City of Taunton, MA.

We have reviewed the proposed action and have determined that no species listed under our jurisdiction are likely to be exposed to any direct or indirect effects of the proposed project. Based on this, we do not believe a consultation in accordance with section 7 of the Endangered Species Act of 1973, as amended, is necessary. As such, NMFS Protected Resources Division does not intend to offer additional comments on this proposal. Should project plans change or new information become available that changes the basis for this determination, further coordination should be pursued. If you have any questions regarding these comments, please contact Julie Crocker of my staff (978-282-8480 or Julie.Crocker@noaa.gov).

Sincerely,

for Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

EC: Crocker, F/NER3
Boelke, F/NER4
Anacheka-nasemann, USACE

File Code: Sec 7 No Species 2013

Appendix 4.16-A

Secondary and/or Indirect Wetland Impact Assessment

SOUTH COAST RAIL

SCR SECONDARY and/or INDIRECT WETLAND IMPACT ASSESSMENT

Introduction

The Secretary's Certificate on the Draft EIR (June 29, 2011) stated that "The FEIR should expand upon the analysis of wetlands functions and values in the DEIR/S to include a more detailed analysis for the proposed Stoughton rail. The FEIR should include narrative descriptions of wetlands functions and values of each wetland impacted directly and indirectly by the proposed project. The mitigation plan should describe how the lost functions and values will be mitigated."

The EPA, in its comments on the DEIS/DEIR (May 27, 2011) stated that "The Region … is less concerned about secondary adverse impacts to adjoining wetlands and water bodies where there are existing active rail lines. In contrast, the Region is greatly concerned about secondary adverse impacts to aquatic resources along those portions of the Stoughton and Whittenton corridors where no embankment exists or where a narrow embankment has been abandoned for decades and the forest canopy now is mostly unbroken. Section 4.14 on Biodiversity, Wildlife and Vegetation, presents a thorough description and reasonable evaluation of secondary adverse impacts upon aquatic resources and wetland-dependent wildlife. Still, we believe that the evaluation is lacking adequate detail in a few areas.." Specific issues identified in the EPA letter include:

- *The FEIS should provide a more thorough and specific evaluation of the potential for adverse impacts from canopy clearing, especially across the Hockomock Swamp.*

- *Several types of environmental harm would result from the construction and operation of the Stoughton or Whittenton Alternatives. … The nature, extent, permanence, and severity of these types of secondary impacts need to be more fully evaluated in the FEIS.*

- *The Region seeks a variety of additional information about the extent, nature, and severity of direct and secondary adverse impacts to aquatic resources within the Stoughton and Whittenton rail corridors Until we have evaluated that additional information … we cannot reach conclusions regarding the significance of those adverse impacts and whether those alternatives could comply with section 230.10(c) of the section 404(b)(1) Guidelines.*

MassDOT has developed this methodology for Secondary and/or Indirect Wetland Impact Assessment in response to the requirements of the Certificate and the EPA's comments. A meeting of the Interagency Coordinating Group (ICG) wetland subgroup was held on May 4, 2012 to discuss this proposed methodology. The methodology, particularly the items in the checklist, was subsequently modified to incorporate agency comments.

Secondary and Indirect Impacts

Secondary (indirect) effects are defined in the EPA Regulations at 40 CFR Part 230.11. The EPA regulations state that "Secondary effects are effects on an aquatic ecosystem that are associated iwth a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material . "

Although not specifically addressing impacts to aquatic resources, the CEQ NEPA regulations at 40 CFR Part 1508.8 define indirect effects as ".. effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably forseeable. Indifect effects many include … related effects on air and water and other natural systems, including ecosystems". Although the

MEPA Regulations (314 CMR 11.00) require that an EIR assess potential indirect impacts on the environment, the regulations do not provide a definition.

Indirect impacts are therefore the consequences of an action's direct impacts. While the direct impact of filling a wetland would be the loss of the filled wetland area and the functions and values provided by that specific area, the indirect impacts of that wetland fill would result from the associated changes to the overall size of the wetland, hydrology, cover type, species assemblage, or degree of habitat fragmentation. These types of impacts could adversely affect the ability of the wetland to provide functions and values, or could diminish the functions and values to a degree greater than would be attributed simply due to the loss of area. Isolated fragments of wetlands or waterways may have reduced habitat value, no longer provide viable fish or wildlife habitat or be so isolated that the wetland or waterway fragments are rendered inaccessible to many fish or other aquatic species.

Section 404 jurisdiction over the South Coast Rail project is triggered by the direct discharge of fill material to waters of the United States (vegetated wetlands and water bodies). However, the Corps must consider the probable impacts, including cumulative impacts, of the proposed activity and its intended use, on the public interest. As stated in 33 CFR Section 320.4, permits can only be issued by the Corps if the discharge complies with the Environmental Protection Agency's 404(b)(1) Guidelines. The criteria for evaluating adverse effects (40 CFR 230.10(c), and further elaborated in Subpart D, Section 230.32)) under these guidelines include:

- Significant adverse impacts on …wildlife and special aquatic sites;
- Significant adverse effects on aquatic life and other wildlife dependent on aquatic ecosystems outside of the disposal site ;
- Significant adverse effects of the discharge on aquatic ecosystem diversity, productivity and stability.

For this analysis, indirect (secondary) impacts to wetlands and other waters of the United States include the following effects which could be caused by the placement of fill within jurisdictional wetlands, but occur at a different location or time:

- Changes in wetland functions; or
- Changes in wetland physical/biological characteristics as a result of the direct impacts (loss of wetland).

The types of direct impacts and the indirect impacts that may result include:

- Filling a portion of a wetland (loss of) – reduction in wetland size, Introducing human activity (noise, disturbance);
- Dredging a wetland/pond – change in hydrology, vegetation, habitat;
- Constructing a berm across a wetland – change in hydrology, fragmentation, introduction of disturbed non-wetland conditions, creation of new "edge", interrupt migratory routes;
- Installing a new culvert or changing existing culvert – alter water levels or flow patterns;
- Removing canopy or other vegetation – change light regimes, water temperature, plan community structure;

- Relocating a stream – change flow characteristics; or
- A new discharge of stormwater - alter water levels or flow patterns, or introduce sediments or nutrients.

In addition, the Massachusetts Wetlands Protection Act regulates work within 100 feet of a bordering vegetated wetland based on the presumption that work in close proximity to a wetland may alter the wetland such that its ability to protect the eight Interests of the Act are adversely affected. The Interests of the Act include the protection of public or private water supply, ground water supply, flood control, storm damage prevention, prevention of pollution, protection of land containing shellfish, protection of fisheries, and protection of wildlife habitat. "Alter" is defined in the WPA regulations at 310 CMR 10.04 as

> "to change the condition of any Area Subject to Protection under MGL c. 131, section 40. Examples of alterations include, but are not limited to, the following:
>
> (a) The changing of pre-existing drainage characteristics, flushing characteristics, salinity distribution, sedimentation pattners, flow patterns, and flood retention areas;
>
> (b) The lowering of the water level or water table;
>
> (c) The destruction of vegetation;
>
> (d) The changing of water temperatures, biochemical oxygen demand, and other physical, biological or chemical characteristics of the receiving water."

Geographic Limits of the Analysis

At the meeting, several agency representatives asked that the impact analysis look at wetlands that were more than 100 feet from the right-of-way, and cited studies associated with the Vermont Circumferential Highway that required analysis of the secondary and/or indirect effects of a highway at least 300 feet from the roadway. Subsequent to that meeting, the MassDOT team reviewed the available literature to determine an appropriate geographic limit for the evaluation of secondary and/or indirect impacts to aquatic resources.

There are numerous published studies that document that road construction may adversely affect the hydrology of wetlands upstream and downstream of a new road, and may adversely affect the movement of nutrients, sediment, or wildlife between wetlands (see Biglin, K. and A. Dupigny-Giroux, 2006; Fahrig, L. and T. Rytwinski, 2009; Forman, R.T. and R. D. Deblinger, 2000; Forman, R.T., D. Sperling, J.A. Bissonette, A. P. Clevenger, C.D. Cutshall, V.H. Dale, L. Fahrig, R. France, C.R. Goldman, K. Heanue, J.A. Jones, F.J. Swanson, T. Turrentine, T. C. Winter, 2003; Trombulak, S. C. and C. A. Frissell. 2000; and references cited therein). For newly constructed roads, these effects have been documented to extend 200 to 300 meters from the road. Other studies have focused on the effects of roads, particularly highways, on wetland-dependent wildlife (Eigenbrod et. A. 2009; Forman et al., 2003) and have shown that roads have adverse effects on aquatic wildlife populations as a result of loss of habitat (directly or because roads prevent access to habitat) or as a result of noise, particularly for multi-lane major highways. Forman and Deblinger (2000) coined the phrase "Road-Effect Zone" for the combined area of highway-related secondary and/or indirect effects to natural ecosystems, and considered (based on research by others) that 300 meters was the maximum distance that ecological effects would occur from a highway. Subsequent studies have shown that highway effects are highly

species-specific (Eigenbrod et al.. 2009) and are correlated with the width of the highway, the volume of traffic, and the night/day traffic distribution.

As discussed in the Biodiversity Technical Report, there are few if any studies of the effects of railroads on wildlife, and we were unable to find any published studies of the effects of railroads on aquatic ecosystems. The South Coast Rail project is not comparable to any of the studies of road effects. The entire project uses a railroad bed that was constructed across wetlands in the 1880s. While the effects of new construction of a railroad through wetlands would be comparable to the new construction of a road or highway across wetlands, any hydrological effects on wetlands occurred following construction and have been stable for a century. The replacement of existing culverts, designed according to modern careful standards for stream crossings, will not require any stream channelization and will maintain existing hydrology. Connectivity between wetlands, particularly for fish and small vertebrates that use culverts, would improve.

Railroads do not generate the severe, constant noise levels that are characteristic of a highway. As documented in the Biodiversity Technical Report, on the Southern Triangle (New Bedford Main Line and Fall River Secondary), any given point will experience 20 train pass-bys per day, for an average of 6 seconds per pass. The number of train pass-bys would be 40 per day between Stoughton and Myricks Junction.

On the basis of this review of the literature and a solid understanding of the construction and operations of the South Coast Rail corridor, in comparison to the road-effects of new road construction or the road-effects of an operating highway, we conclude that there is no scientific basis for considering the South Coast Rail's "road-effect zone" for impacts to aquatic resources to extend further than 100 feet from the right-of-way. The sole exception to this conclusion would be restricted to the out-of-service section of the Stoughton Line where there are currently no barriers to the movement of small aquatic vertebrates (vernal pool amphibians, frogs, and turtles) across the railroad embankment. Reconstructing the railroad would introduce a barrier to the movement of such vertebrates and would reduce the area of available habitat, as discussed in the *Biodiversity Technical Report*. The "railroad-effect zone" for such wetland-dependent species could extend to 750 feet from the ROW. These impacts are documented in the *Biodiversity Technical Report*.

Methodology

Indirect (and/or Secondary) impacts to wetlands will be assessed for each within 100 feet of the Stoughton Line between Brock Street in Stoughton and the terminal stations in New Bedford and Fall River, and along the Whittenton Branch from Route 138 in Raynham to the Attleboro Secondary in Taunton, based on the functions and values that the wetland provides and the type and extent of the direct wetland impact and/or work adjacent to the wetland that is the cause of the secondary impact. This is a stepwise process that includes:

- For each wetland, identify the type of direct impact:
  - Loss of wetland area due to placement of fill
  - New culvert
  - Replacement of existing culvert
  - Other
  - Direct discharge of untreated stormwater from a pollutant source

- For each wetland, identify the type of work occurring within 100 feet of the wetland:
  - Improvement of existing freight or commuter rail tracks and increased train service
  - Replacement of track infrastructure on out-of-service rail and addition of train service
- Evaluate secondary and/or indirect impacts based on function-specific considerations using the attached checklist, and
- Provide a summary paragraph for each wetland.

The list of potential effects on functions and values is based on the "considerations and qualifiers" for each wetland function and value, as presented in the Corps of Engineers' "*Highway Methodology Workbook Supplement – Wetland Functions and Values, a Descriptive Approach*" (September 1999). These characteristics are identified in the *Supplement* as the principal characteristics which contribute to the ability of each wetland to provide the indicated function or value. If the direct wetland impact of the proposed action altered these characteristics, it is presumed to alter the ability of the wetland to continue to provide these functions.

REFERENCES CITED

Biglin, K. and A. Dupigny-Giroux. 2006. Mapping the road-effect zone to assess impacts of proposed road segments. Journal of Conservation Planning 2:1-16.

Eigenbrod, F., S.J. Hecnor, and L. Fahrig. 2009. Quantifying the road-effect zone: threshold effects of a motorway on anuran populations in Ontario, Canada. Ecology and Society 14:24. http://www.ecologyandsociety.org/vol14/iss1/art24

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Forman, R.T., D. Sperling, J.A. Bissonette, A. P. Clevenger, C.D. Cutshall, V.H. Dale, L. Fahrig, R. France, C.R. Goldman, K. Heanue, J.A. Jones, F.J. Swanson, T. Turrentine, T. C. Winter. 2003. Road Ecology: Science and Solutions. Island Press. 481 pp.

Trombulak, S. C. and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14:18-30.

SOUTH COAST RAIL

SCR WETLAND INDIRECT IMPACTS CHECKLIST

Indirect Impacts to Massachusetts Wetlands – does the work in the buffer zone or direct wetland impact alter the wetland by:

- Changing drainage characteristics or flow patterns
- Changing water levels
- Altering vegetation (outside of the direct impact area)
- Changing the temperature or biochemical characteristics of a stream or other waterbody

Groundwater Recharge/Discharge – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Result in the loss of gravel or sandy soils present in or adjacent to the wetland
- Eliminate or reduce the association of the wetland with a perennial or intermittent watercourse
- Eliminate the defined or constricted outlet of the wetland
- Change the volume of water reaching the wetland via infiltration or surface runoff
- Reduce water quality within the wetland

Floodflow Alteration – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the hydric soils which are able to absorb and detain water
- Change the constricted outlet (ability of the wetland to pond water)
- Change the ability of the wetland to receive floodflow from surrounding uplands
- Change the sinuosity of the watercourse within the wetland
- Change the density or type of vegetation within the wetland

Fish and Shellfish Habitat – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the size of the wetland that is capable of supporting fish
- Change the connectivity of the wetland with the larger contiguous watercourse
- Reduce stream width to less than 50 feet
- Reduce water quality to a level that would not support fish
- Eliminate shading streamside vegetation

- Eliminate spawning areas (submerged vegetation or gravel beds)
- Introduce new barriers to fish (esp. anadromous /catadromous fish) movement
- Change water velocities so that they are excessive for fish
- Alter sediment load or change turbidity

Sediment/Toxicant/Pathogen Retention – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the opportunity for sediment trapping by slowly moving water or deepwater habitats
- Reduce the duration of water retention in the wetland
- Result in the construction of drainage ditches within the wetland
- Increase water velocity within the wetland
- Reduce the degree of water and vegetation interspersion within the wetland
- Reduce the density or type of wetland vegetation that can trap or retain sediments
- Increase the input of sediment or toxicants to the wetland

Nutrient Removal/Retention/Transformation – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the potential for sediment trapping
- Reduce the seasonal duration of wetland saturation/water ponding
- Reduce the density or type of wetland vegetation, especially emergent vegetation
- Decrease the retention time of water in the wetland
- Increase water velocity within the wetland
- Increase the discharge of nutrients to the wetland

Production Export – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the wildlife food sources that grow within the wetland
- Reduce detritus development
- Reduce wildlife usage of the wetland
- Reduce fish usage of the wetland

- Reduce vegetation density
- Reduce the diversity of wetland plant species or the degree of plant community structure
- Alter the wetland outlet so that production export is reduced

Sediment/Shoreline Stabilization – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Alter the existing bank and root mass
- Reduce the width of the wetland adjacent to the watercourse to less than 10 feet
- Increase flow velocity in the watercourse
- Reduce the density of wetland or aquatic vegetation on the bank
- Eliminate trees or woody shrubs on the bank that provide stabilization

Wildlife Habitat – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce water quality below Class A or B standards
- Fragment the wetland
- Create a barrier between other wetland systems
- Create a barrier to wildlife movement between the wetland and uplands
- Reduce the availability of wildlife food sources
- Reduce the degree of interspersion of vegetation classes/communities
- Change the dominant wetland class
- Reduce wetland vegetation density
- Reduce wetland plant diversity
- Reduce the abundance or diversity of insects
- Substantially reduce the IEI value as determined using CAPS
- Create extensive disturbance likely to introduce invasive plants
- Change hydrology of the wetland such that plant communities or habitats would be expected to change
- Introduce a new noise source with the potential to affect adjacent areas

- Create a canopy gap that could affect microclimate
- Fill a vernal pool
- Fill vernal pool habitat
- Result in the loss of vernal pool upland habitat

Recreation – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Eliminate or reduce public access for fishing or hunting (where permitted)
- Eliminate or reduce access for hiking within the wetland
- Result in the discharge of pollutants to a waterbody or watercourse
- Adversely affect the visual/aesthetic quality of a recreational site
- Affect the ability of the wetland to function as a recreational site

Educational/Scientific Value – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Introduce disturbance to an undisturbed educational site
- Affect access to an educational site
- Affect use for scientific or educational purposes (current use)
- Adversely affect the visual quality of an educational site

Uniqueness/Heritage – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Affect the unique characteristics of the wetland (loss of a wetland class, loss of deep or shallow marsh), especially if a unique plant community is present
- Eliminate historic buildings or dams within the wetland
- Adversely affect an important archaeological site
- Adversely affect a wild and scenic river

Visual Quality/Aesthetics – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Reduce the diversity of wetland classes visible from primary (public) viewing locations
- Eliminate wetland vegetation that provides fall color or masses of blooms
- Introduce signs of disturbance visible from primary viewing locations

- Introduce high noise level at primary viewing locations
- Obstruct sight lines through wetlands

Endangered Species Habitat – does the direct impact to an aquatic resource, or work in uplands immediately adjacent to the wetland:

- Adversely affects critical habitat for a state or federally listed T&E Species within the wetland
- Affect migration of T&E species within a wetland, or between wetland and upland habitats
- Reduce water quality
- Affect the supply of food resources for T&E species using the wetland

Appendix 4.14-B

Potential Land Preservation Areas

SOUTH COAST RAIL

Potential Land Preservation Areas

PPA #	Site Name	Municipality	Size (ac)	Has Priority Habitat	Has Vernal Pools	Notes
P09	Gobi Property	Foxborough, Sharon	191	N	Y	
P14	Municipal Water Source and Future Well Site	Foxborough	77	PH 488 / EH 392	Y	
P17	Canoe River ACEC (MAPC Region)	Foxborough	11	N	N	No wetlands – developable uplands adjacent to Willow St.
P20	Massapoag Sportmen's Club	Sharon	125	N	Y	
P22	Sreda Property	Sharon	88	PH 298 / EH 198	Y	Includes land to north and west of original delineated parcel[1]
P24	Morse Farm	Sharon	40	PH 367 / EH 233	N	
P25	Rattlesnake Hill	Sharon	339	PH 367 / EH 233	Y	
P26	Echo Pond	Stoughton	60	N	Y	
P28	Benson Pond	Stoughton	102	N	Y	
P33	Clover Valley Farm	Easton	94	N	N	Includes additional land outside of original delineated parcel[1]
P34A	Hockomock ACEC (OCPC Region)	Easton	315	PH 1392 / EH 59	Y	Large cranberry bogs
P34B	Hockomock ACEC (OCPC Region)	Easton	131	PH 245 / EH 132	Y	
P34C	Hockomock ACEC (OCPC Region)	Bridgewater	224	PH 1392 / EH 59	Y	Large cluster of vernal pools
P36	Taunton River/South Bridgewater/Cumberland Farm Land	Bridgewater	746	PH 1423 / EH 34	Y	Restoration of ditched farm fields
P37	Taunton River	Bridgewater	151	PH 1423 / EH 34	Y	Includes additional land to east of original delineated parcel[1]
P38	Bird Street Sanctuary	Stoughton	45	N	Y	Small portions of developable upland accessible
P40	Southworth Pond and Lipsky Fields	Stoughton	59	N	N	
P46A	Upper Taunton River	Middleborough	228	PH 1421 / EH 36	Y	
P46B	Upper Taunton River	Raynham	393	PH 282 / EH 179	Y	
P47	Great & Little Cedar Swamps	Halifax,Middleborough	2,579	PH 1332 / EH 966	Y	High priority, includes extensive farm areas
P49	Nemasket River - Farm Protection	Middleborough	186	PH 13 / EH 77	Y	Protection of wetlands in northern portion

Appendix A Potential Land Preservation Areas (continued)

PPA #	Site Name	Municipality	Size (ac)	Has Priority Habitat	Has Vernal Pools	Notes
P50A	Green Heart Corridor	Middleborough	997	N	Y	Cranberry bogs
P50B	Green Heart Corridor	Middleborough	523	PH 226 / EH 107	Y	
P51	Thatcher Pond	Taunton	180	PH 1421 / EH 36	Y	
P52	Runnins River Headwaters	Seekonk	292	PH 724 / EH 661	Y	
P53	Palmer River Aquifer/Zone II Protection Area	Rehoboth	198	N	Y	
P54	Muddy Cove Brook	Dighton	207	N	Y	
P55	Lower Taunton River Protection Area	Berkley	50	N	Y	Area adjacent to existing protected open space
P56	Acidic Fen	Freetown	255	PH 1379	Y	
P58	Greenway Connection	Freetown	1,583	PH 303 / EH 204, PH 1239 / EH 177	Y	Surrounds small box of existing protected open space
P59	Mattapoisett River Aquifer Protection Area	Rochester	1,138	PH 1330 / EH 58	Y	
P60	Aucoot Cove	Marion	49	PH 15 / EH 79	N	Frontage to existing road
P61	Pine Barrens/Aquifer Protection Area	Wareham	1,341	PH 1396 / EH 862 / EH 969. PH 858, PH 859	Y	Developable uplands in central section of parcel
P62	Bioreserve (Infill)	Westport	275	N	Y	
P63A	Acushnet Swamp	Dartmouth	176	PH 1349 / EH 1	Y	
P63B	Acushnet Swamp	Dartmouth	196	PH 1349 / EH 1	N	
P66	Aponagansett Cove	Dartmouth	189	PH 922 / EH 751	Y	
P69	Nasketucket Bay State Reservation Area	Mattapoisett, Fairhaven	185	PH 15 / EH 79	N	

Source: Vanasse Hangen Brustlin, Inc., 2012

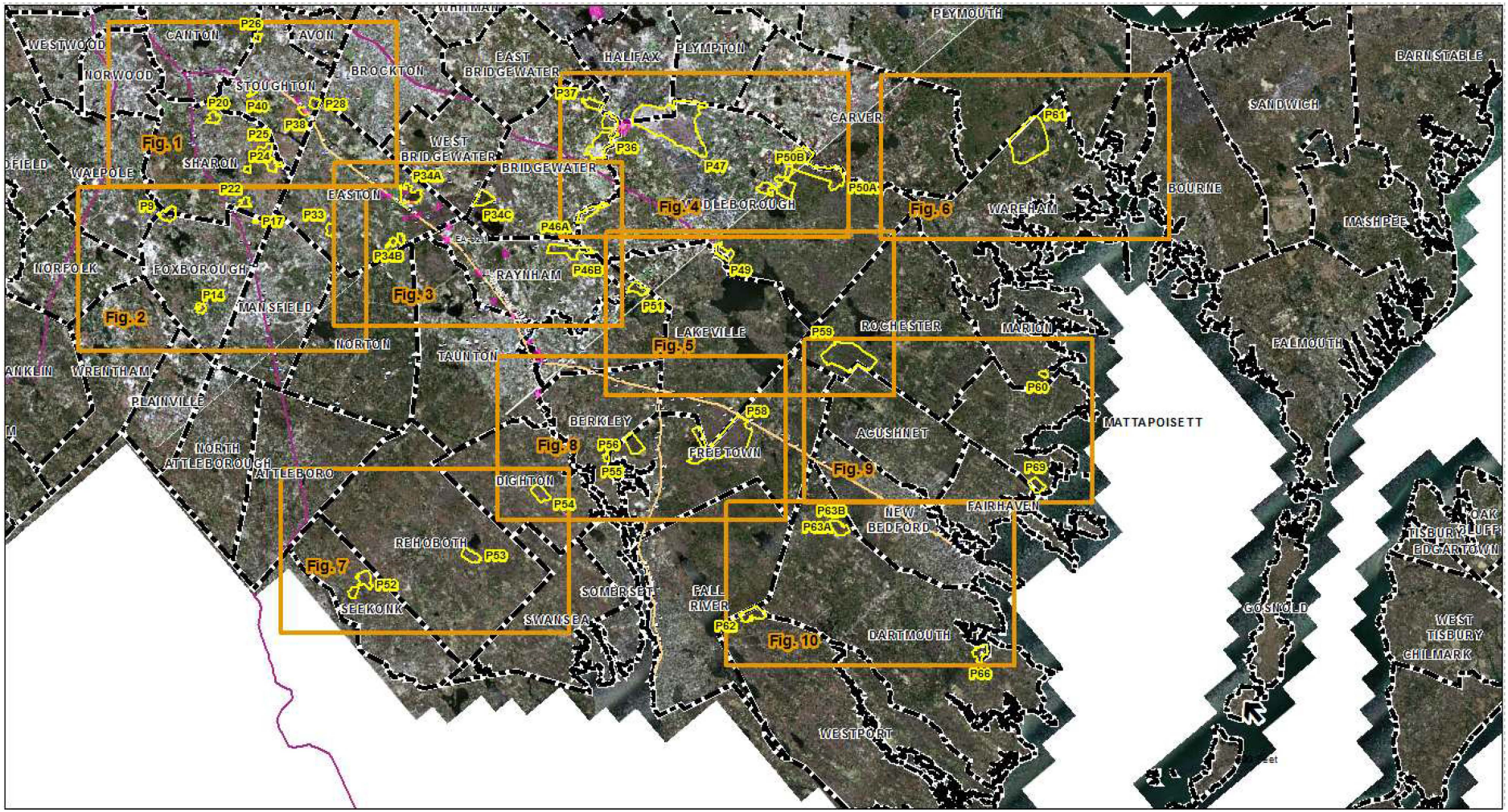
[1] "Original delineated parcel" refers to parcels as shown on the Corridor Plan map.

SOUTH COAST RAIL

Figure Key

Symbol	Description
	Open Water
	Bog
	Cranberry Bog
	Deep Marsh
	Shallow Marsh Meadow or Fen
	Shrub Swamp
	Wooded Swamp Coniferous
	Wooded Swamp Deciduous
	Wooded Swamp Mixed Trees
	South Coast Rail Alignment
	MBTA Commuter Rail
	Protected Open Space
	NHESP Priority Habitat
	Potential Mitigation/Establishment/Restoration Area

Scales are noted in each figure.



Overview of protection opportunities in PPAs. Scale = 1:250,000.

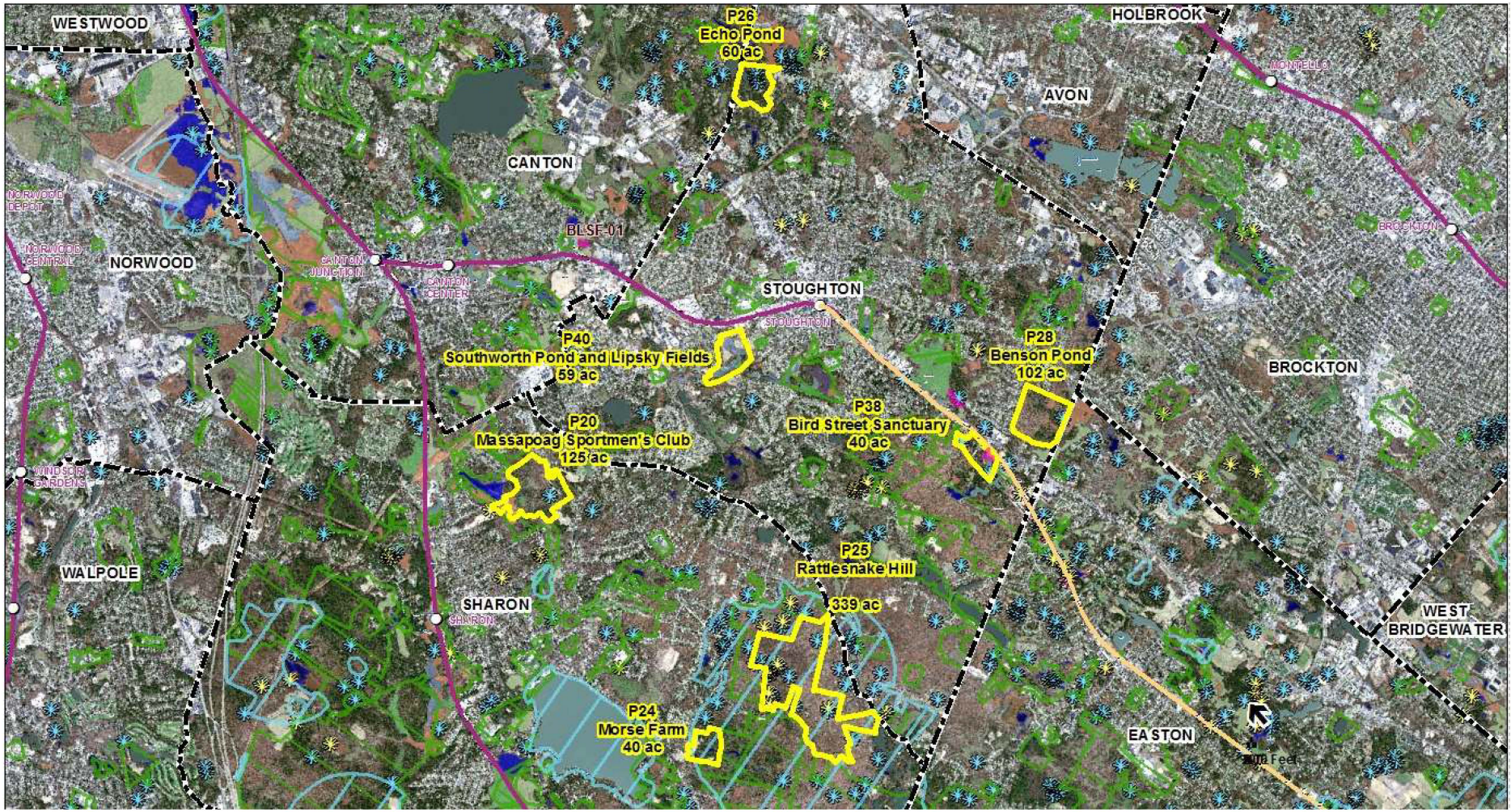


Figure 1. Protection opportunities in Stoughton and northern/eastern Sharon. Scale = 1:50,000.

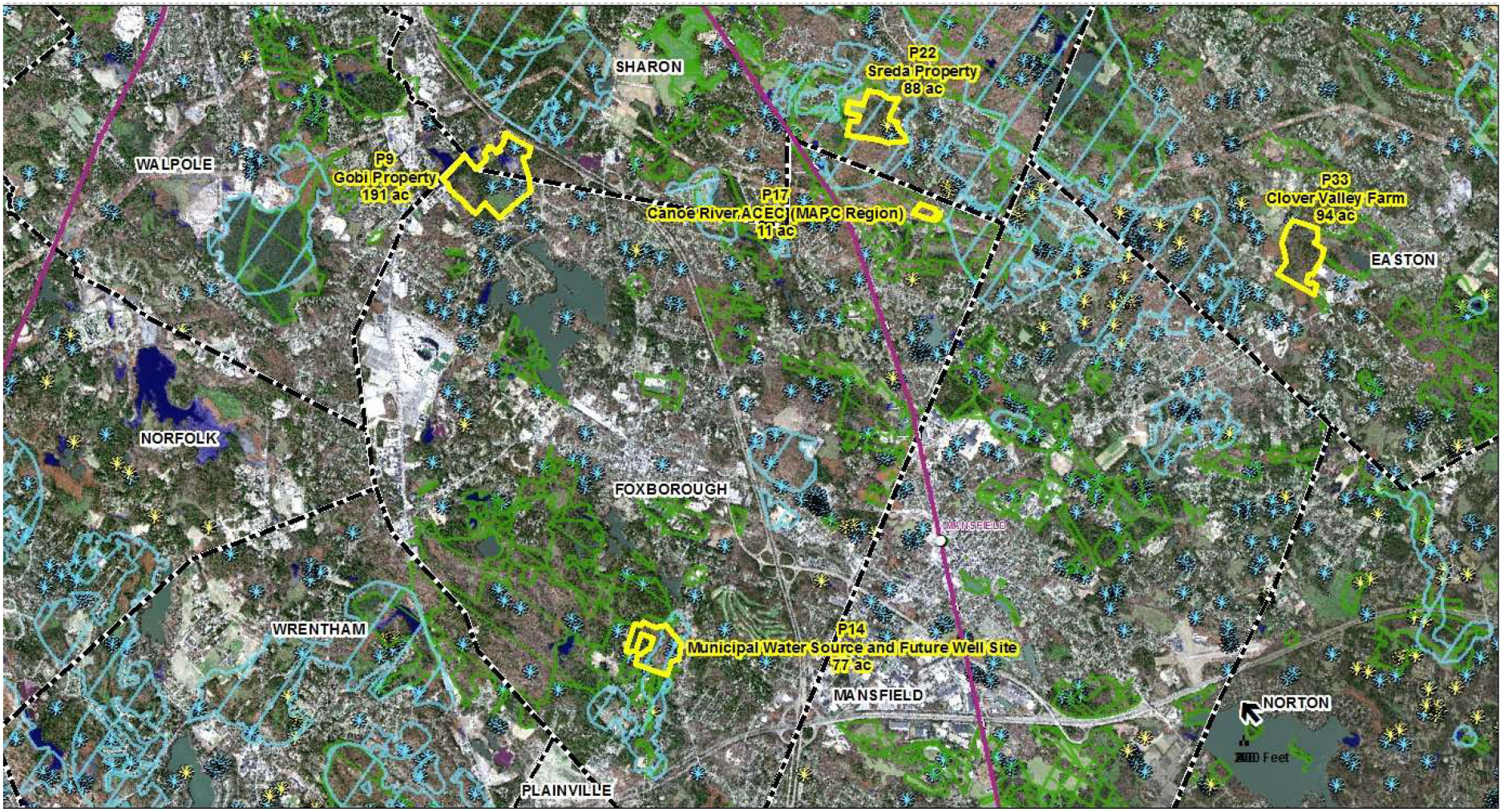


Figure 2. Protection opportunities in southern/western Sharon, Foxborough, and western Easton. Scale = 1:50,000.

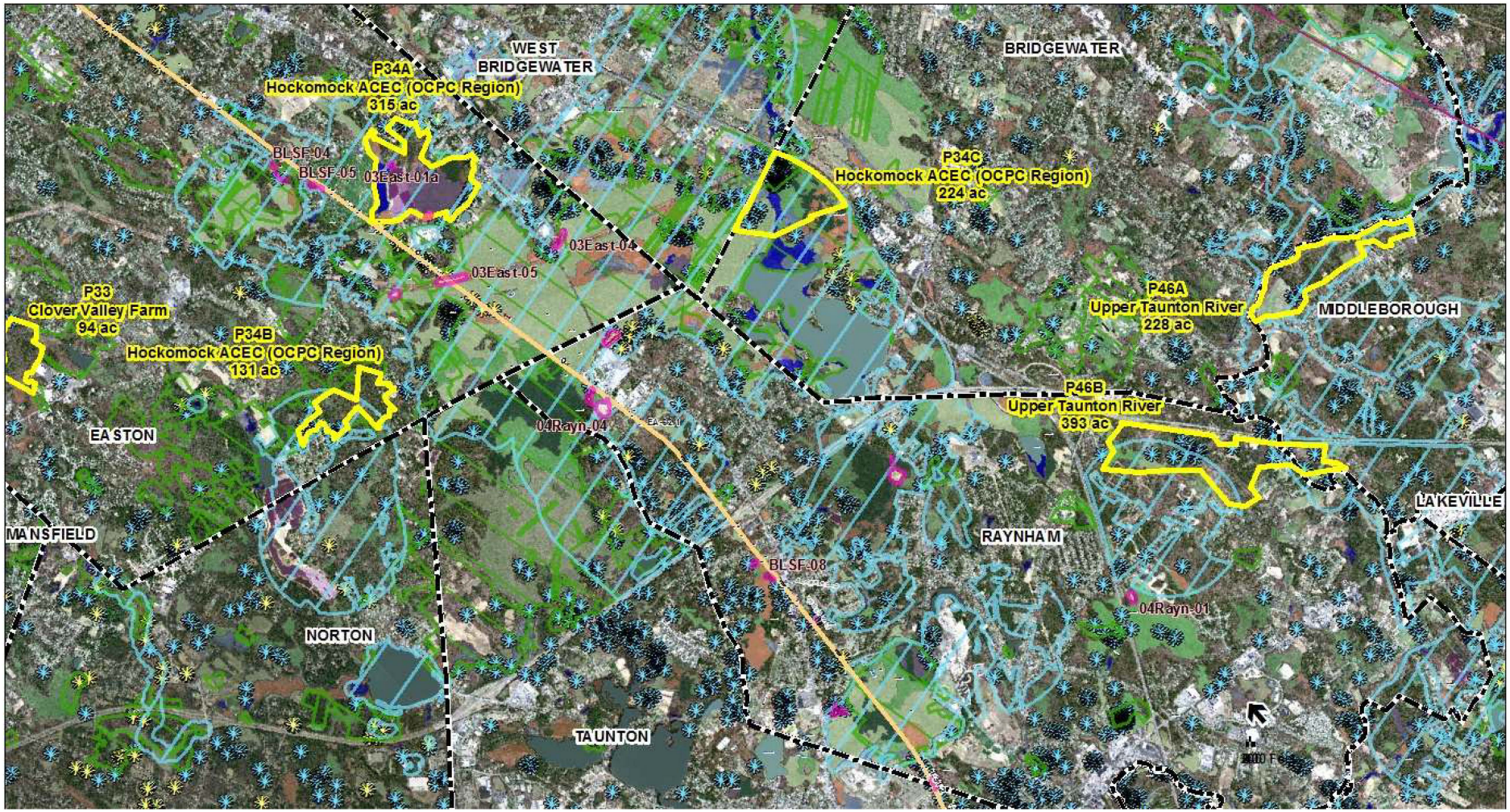


Figure 3. Protection opportunities in eastern/southern Easton, western Bridgewater, northwestern Middleborough, and Raynham. Scale = 1:50,000.

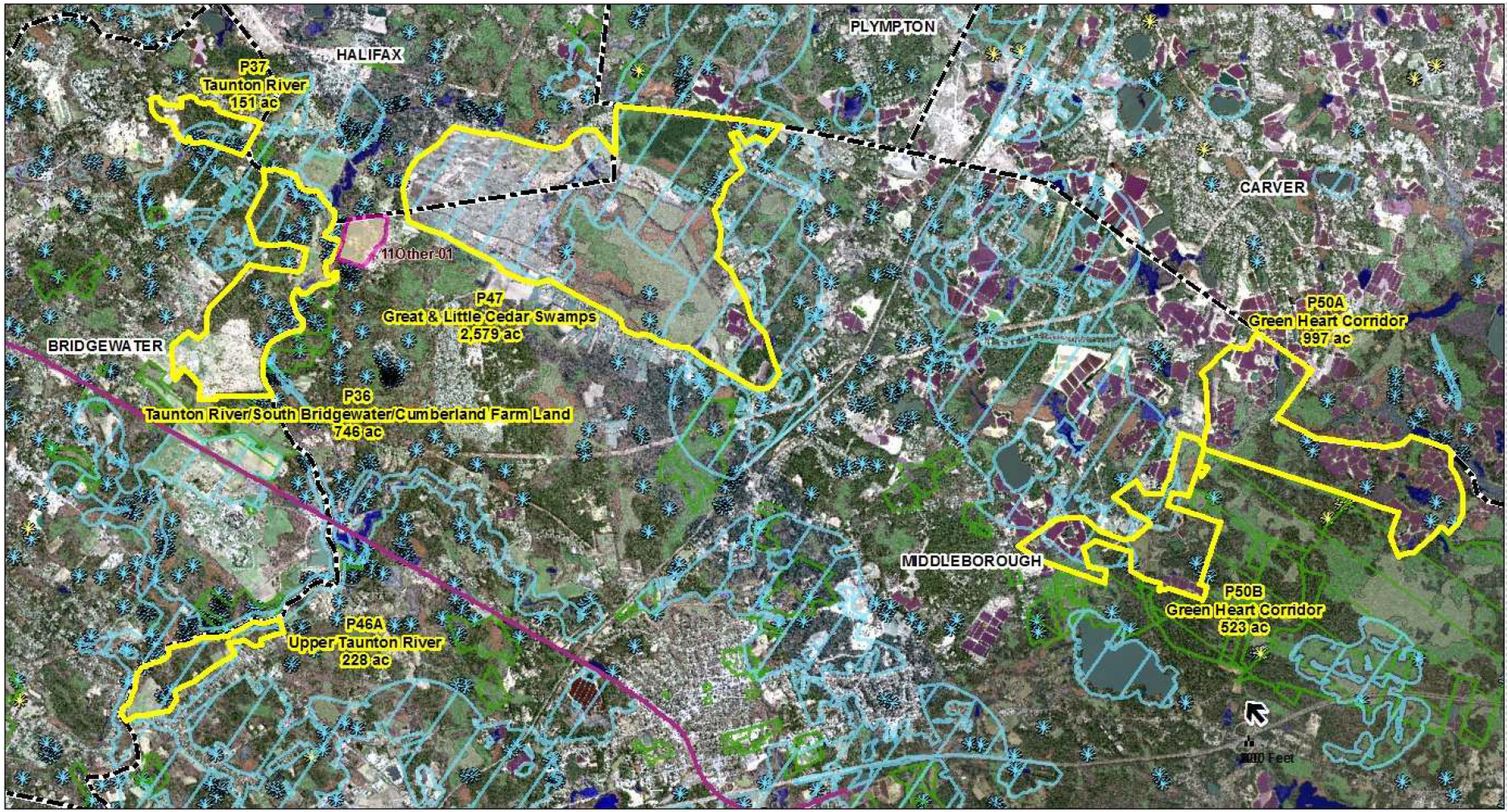


Figure 4. Protection opportunities in eastern Bridgewater, Halifax, and eastern/southern Middleborough. Scale = 1:50,000.

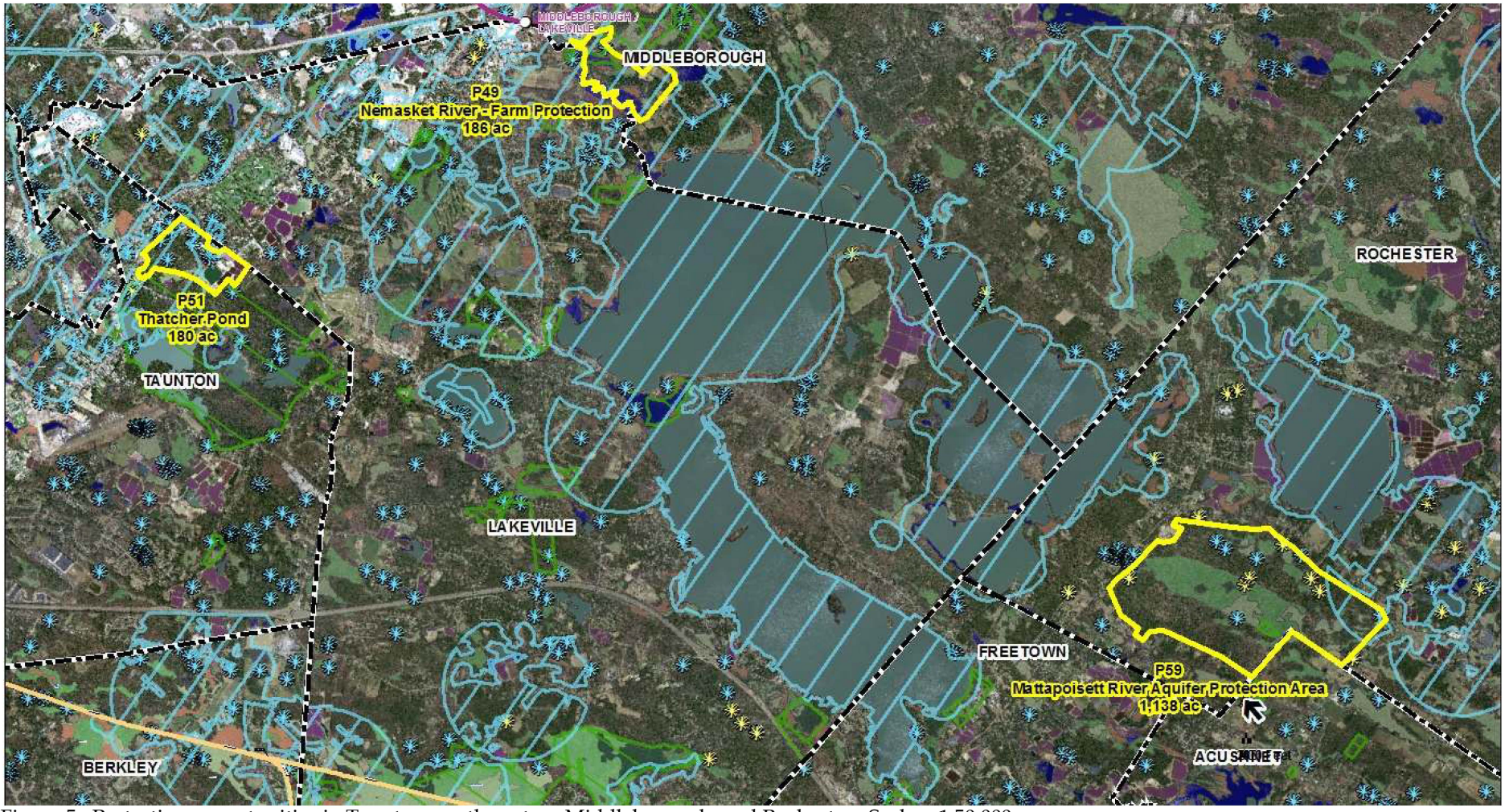


Figure 5. Protection opportunities in Taunton, southwestern Middleborough, and Rochester. Scale = 1:50,000.

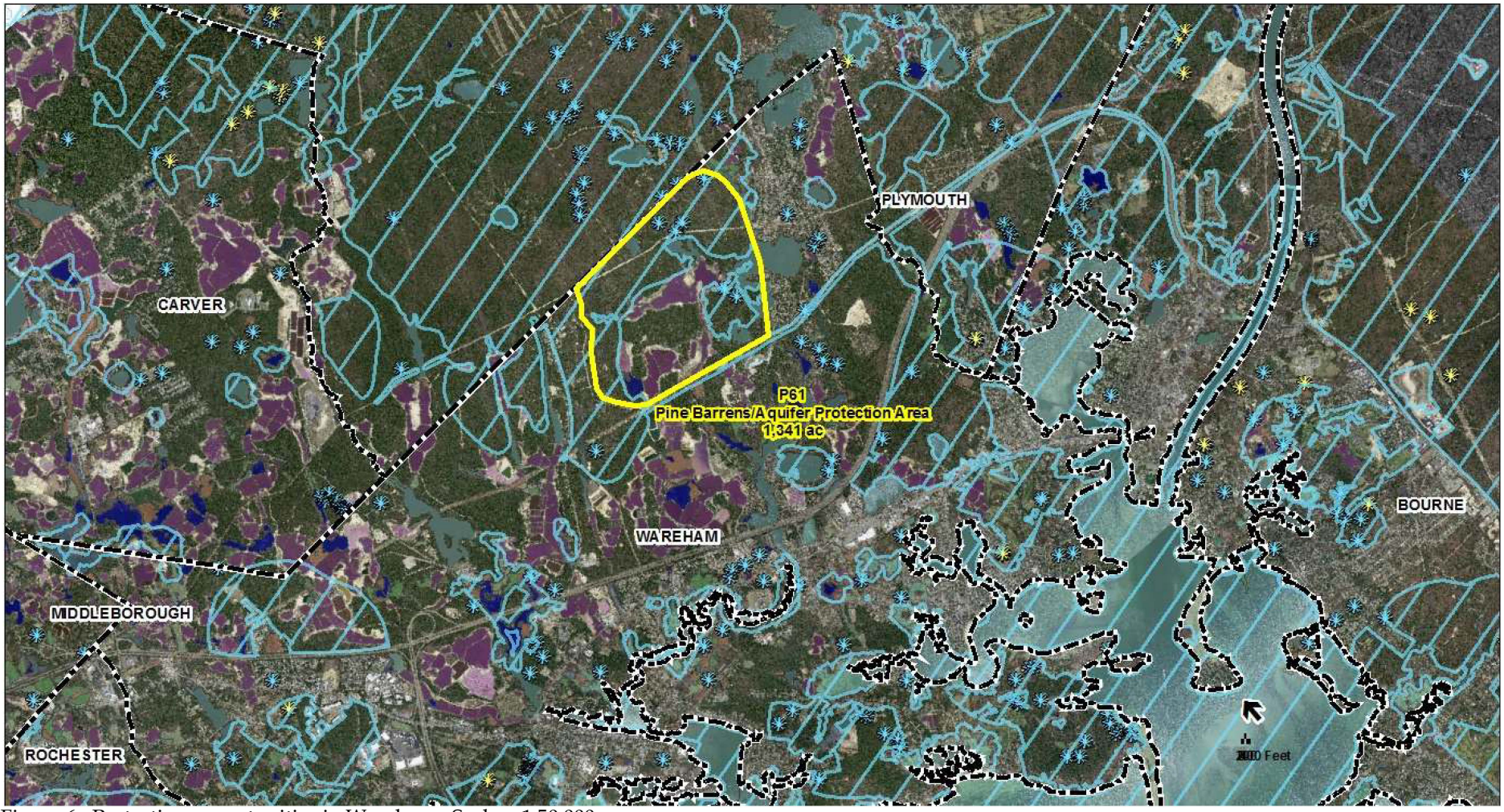


Figure 6. Protection opportunities in Wareham. Scale = 1:50,000.

Figure 7. Protection opportunities in Seekonk, Rehoboth, and Dighton. Scale = 1:50,000.

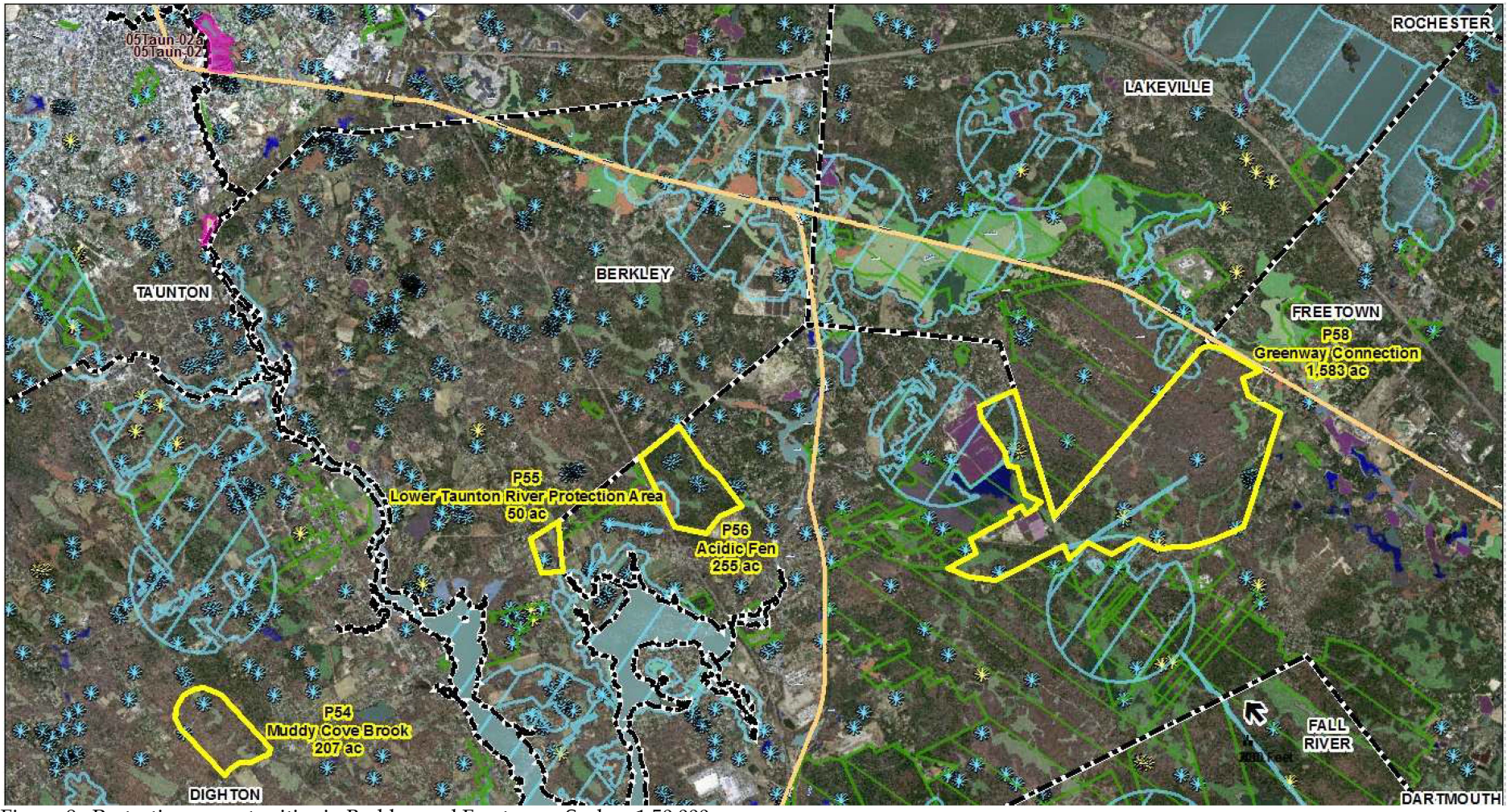


Figure 8. Protection opportunities in Berkley and Freetown. Scale = 1:50,000.

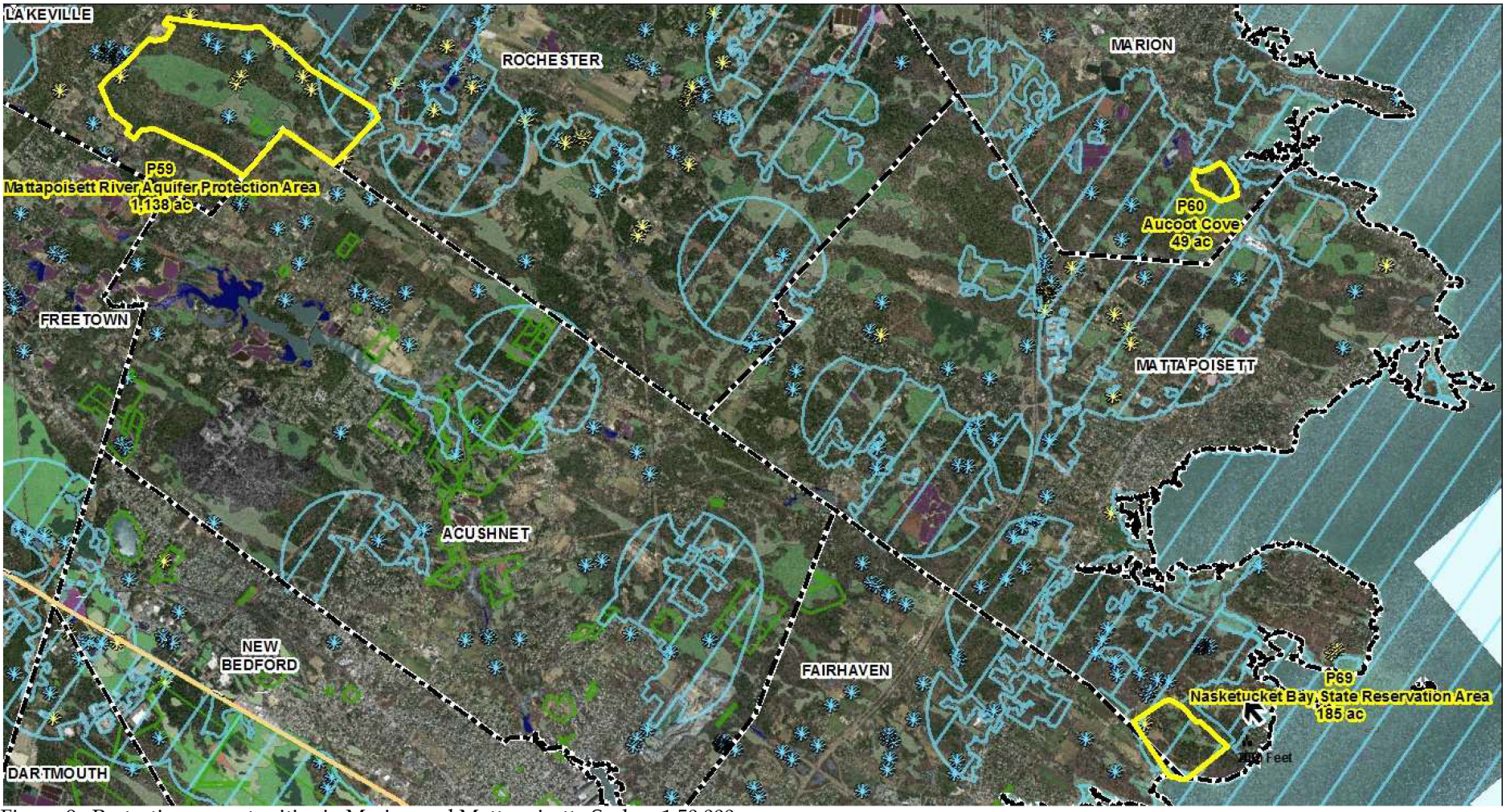


Figure 9. Protection opportunities in Marion and Mattapoisett. Scale = 1:50,000.

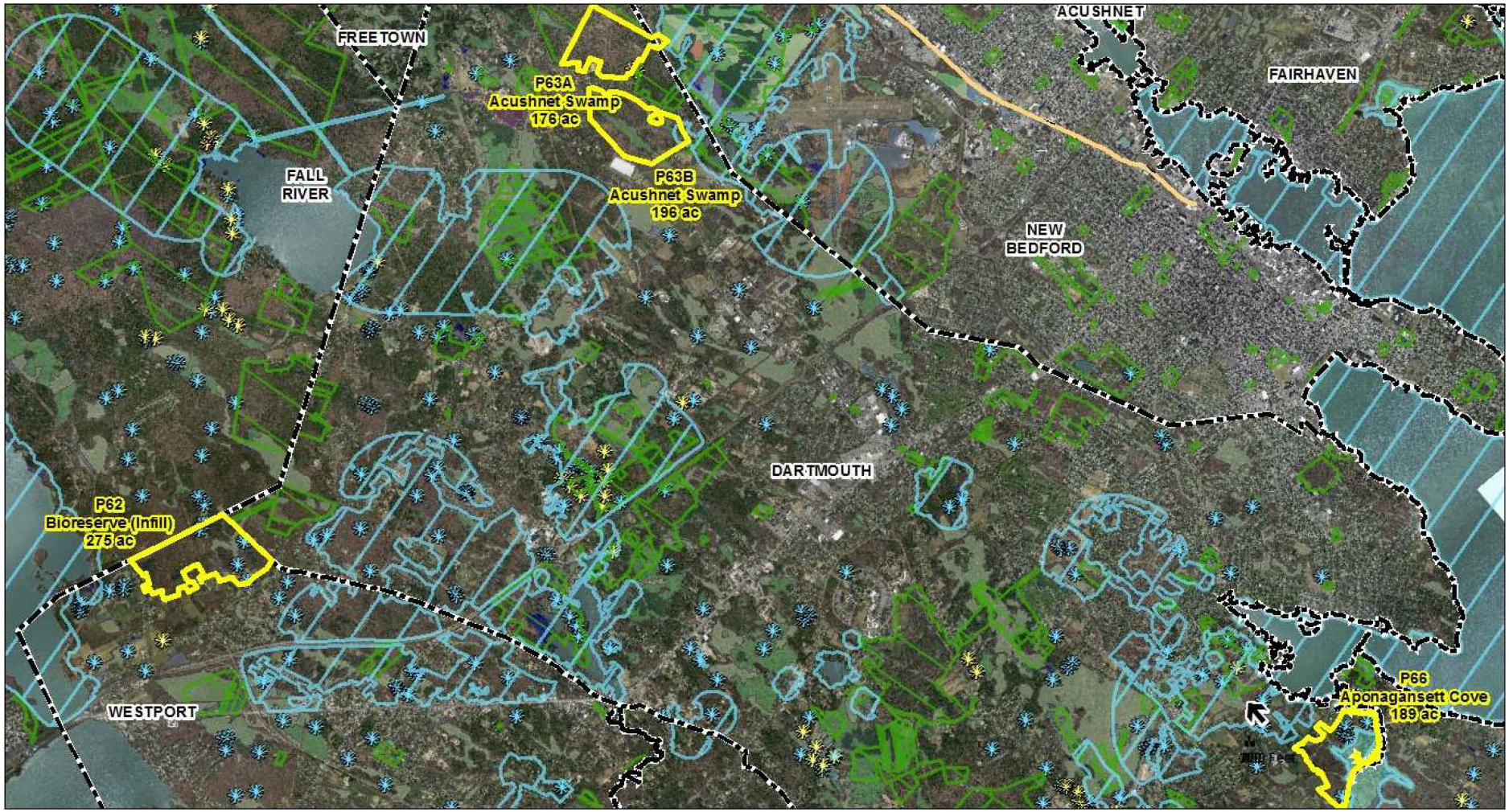


Figure 10. Protection opportunities in Dartmouth, New Bedford, and Westport. Scale = 1:50,000.

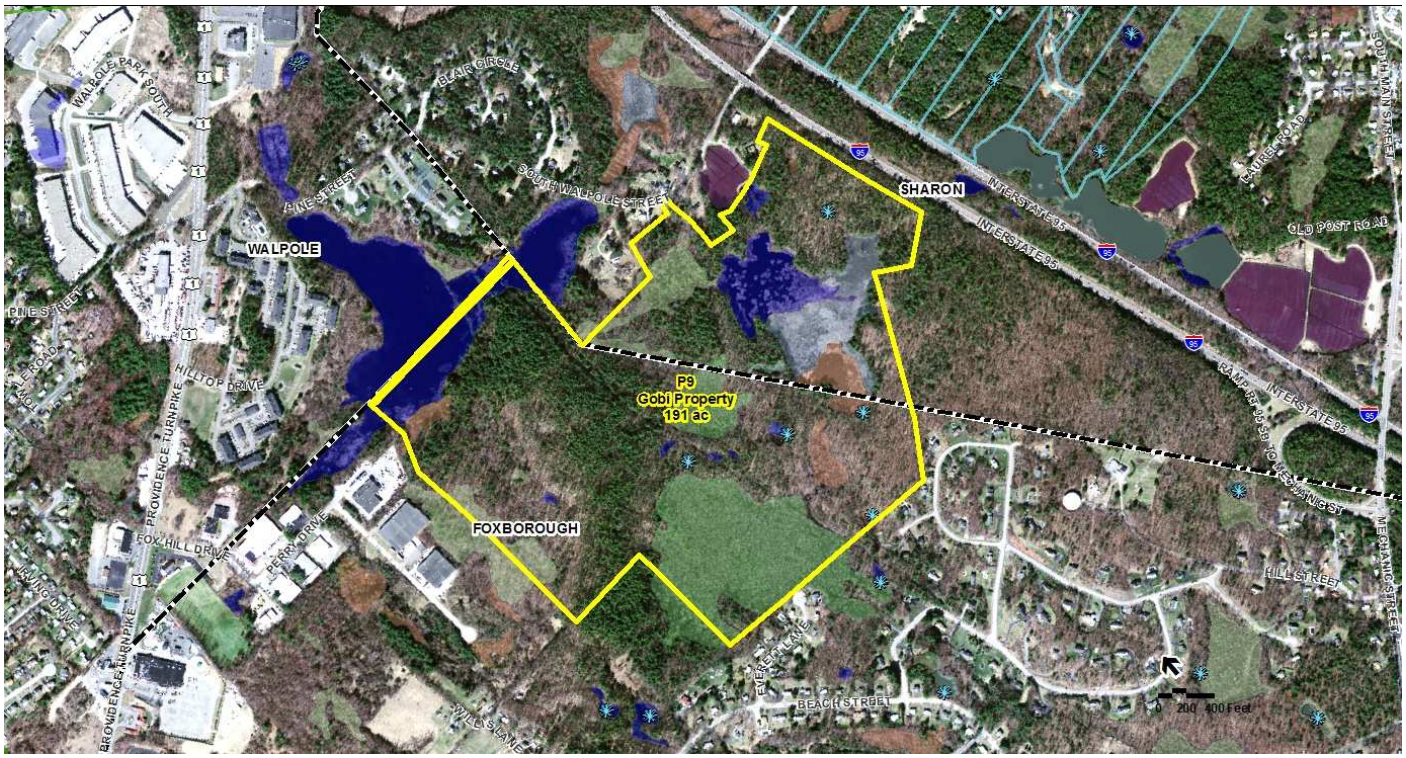


Figure 11. Area P9, Gobi Property. Scale = 1:7,500.

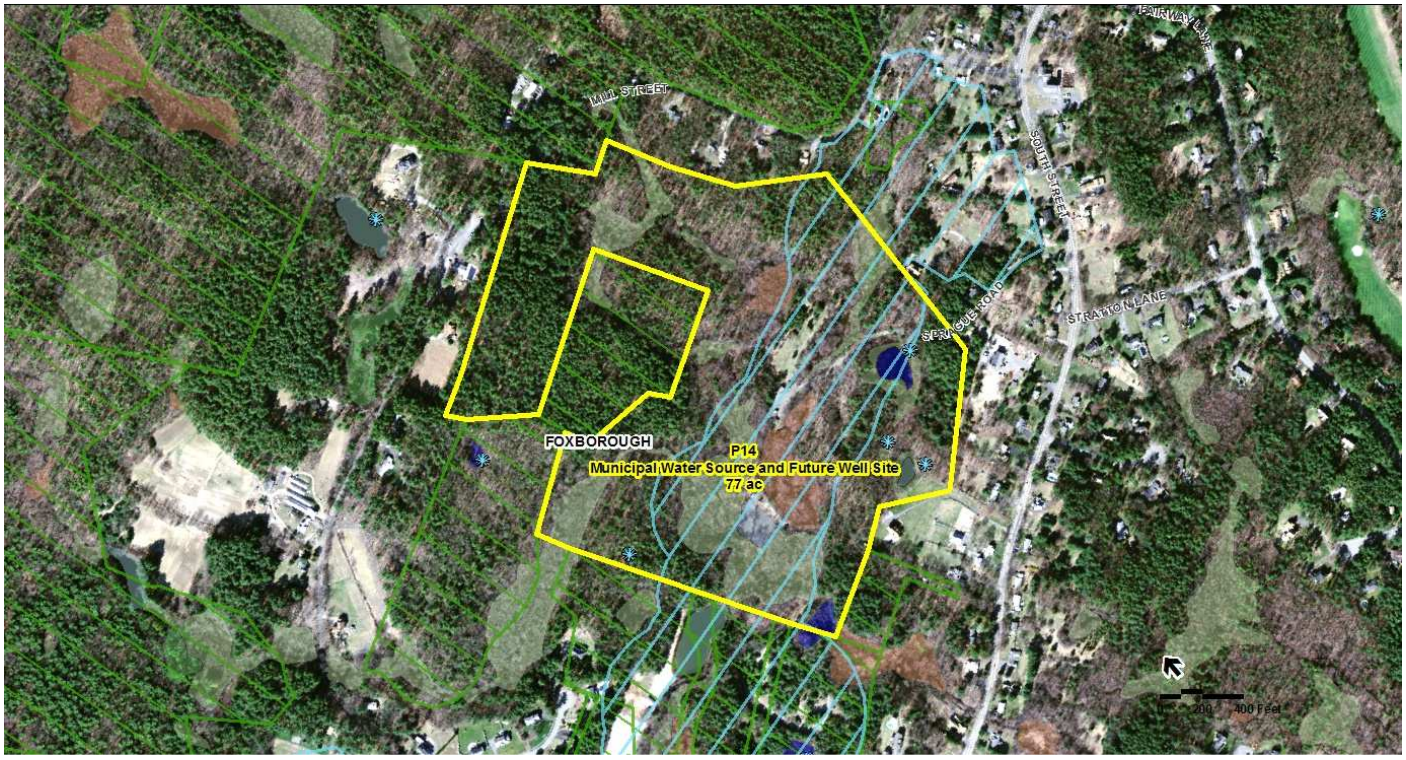


Figure 12. Area P14, Municipal Water Source and Future Well Site. Scale = 1:5,000.

Figure 13. Area P17, Canoe River ACEC (MAPC Region). Scale = 1:2,500.

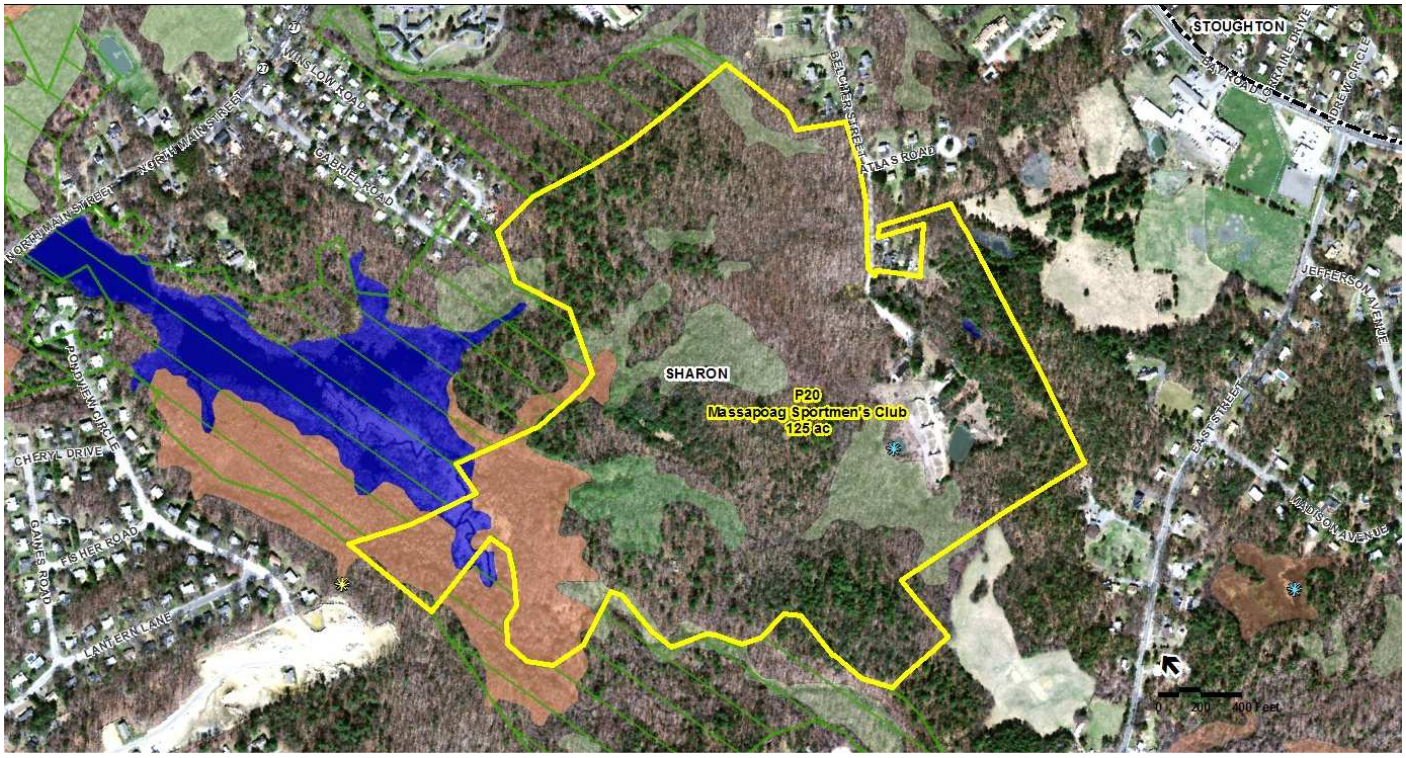


Figure 14. Area P20, Massapoag Sportsmen's Club. Scale = 1:5,000.

Figure 15. Area P22, Sreda Property. Scale = 1:5,000.

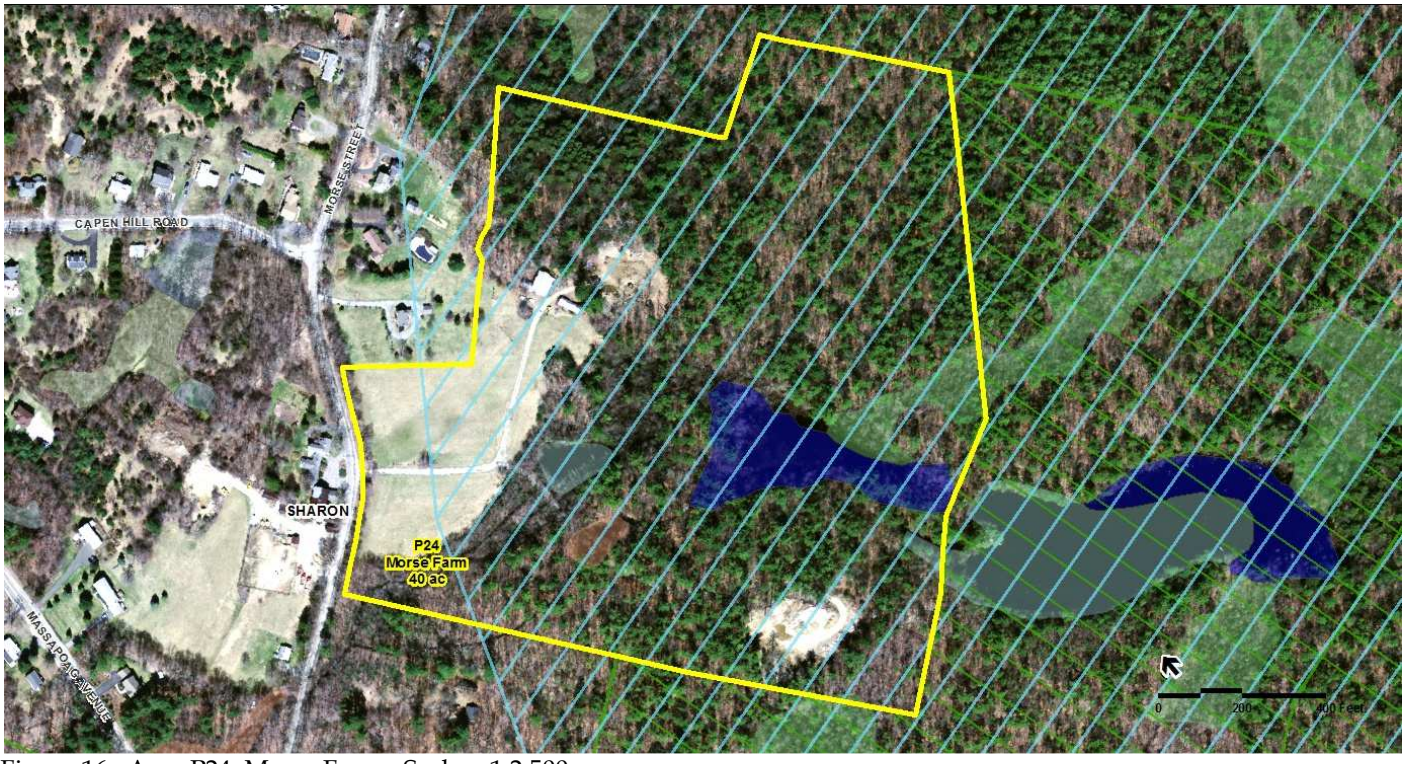


Figure 16. Area P24, Morse Farm. Scale = 1:2,500.

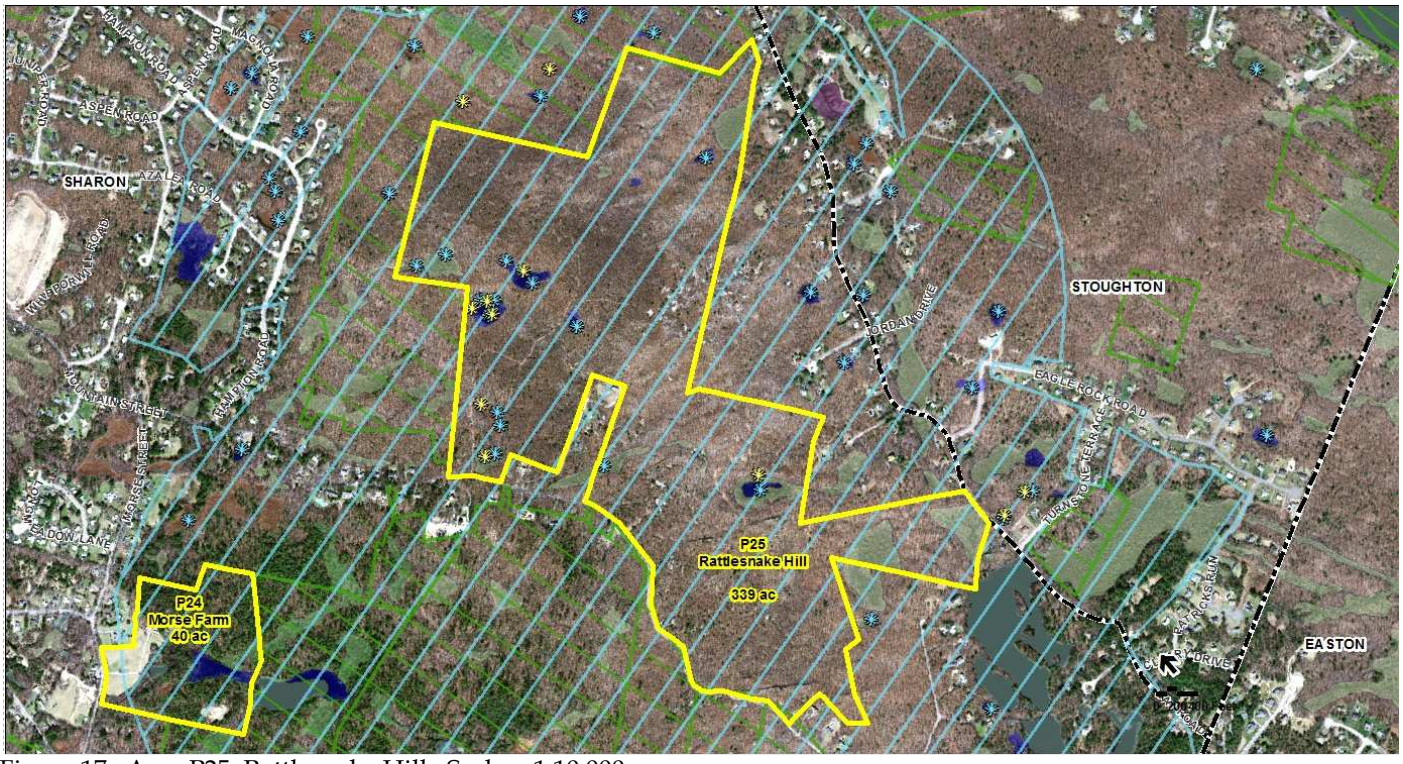


Figure 17. Area P25, Rattlesnake Hill. Scale = 1:10,000.

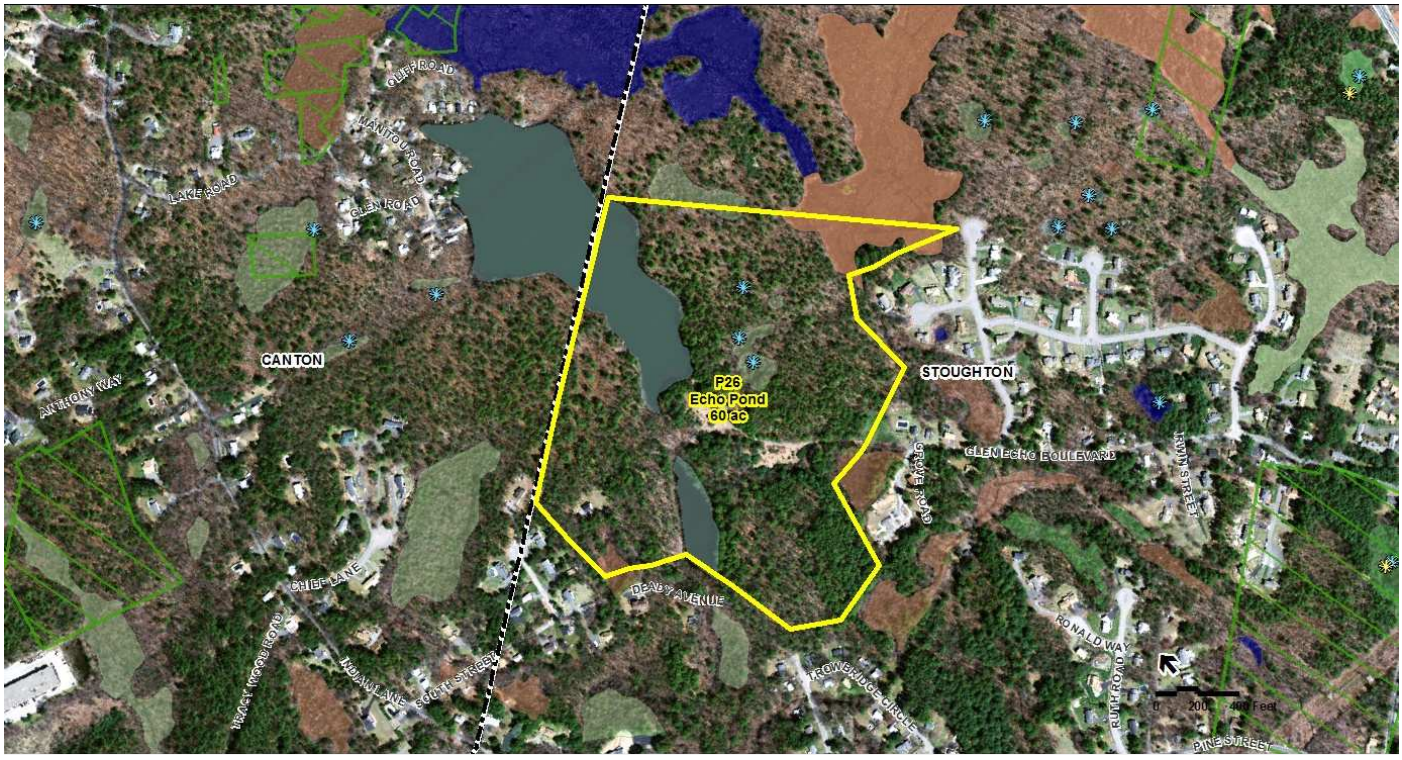


Figure 18. Area P26, Echo Pond. Scale = 1:5,000.

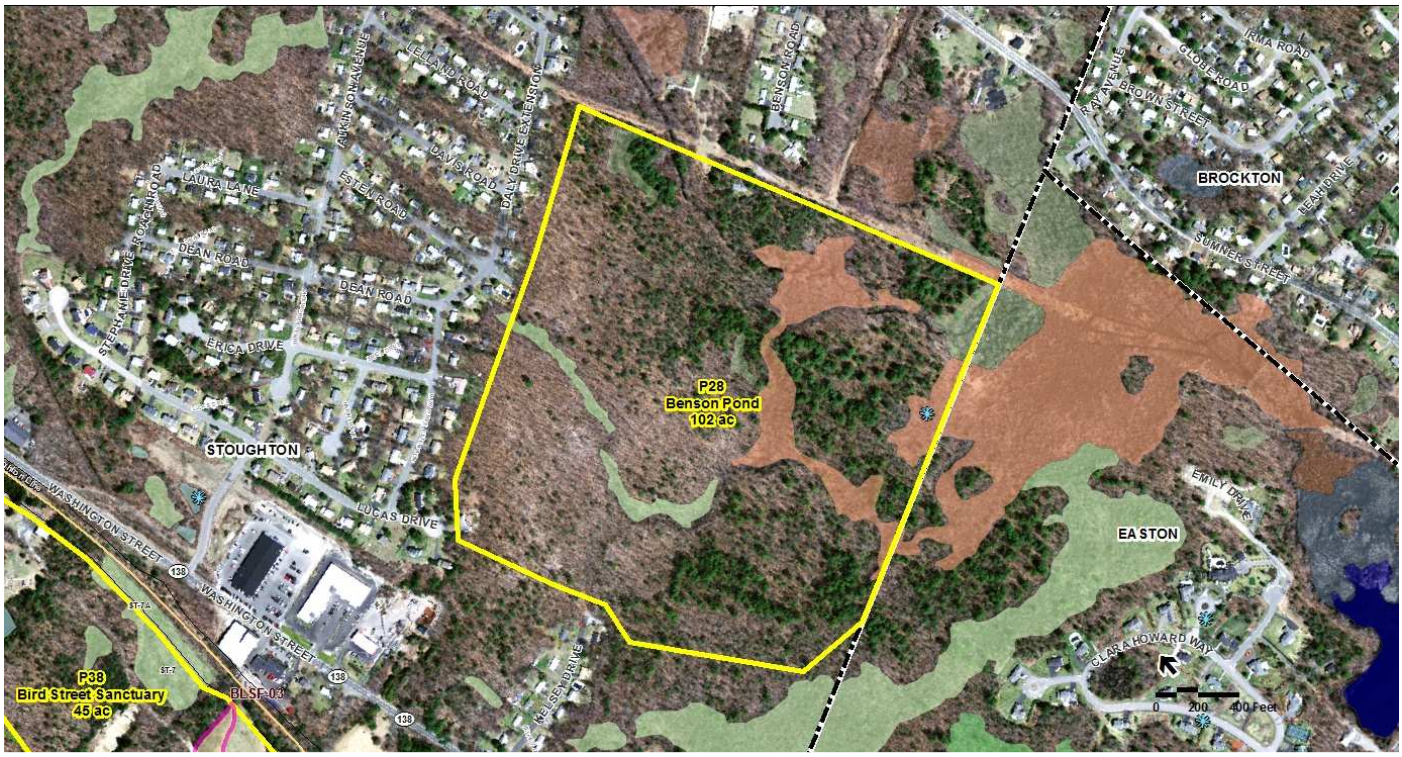


Figure 19. Area P28, Benson Pond. Scale = 1:5,000.

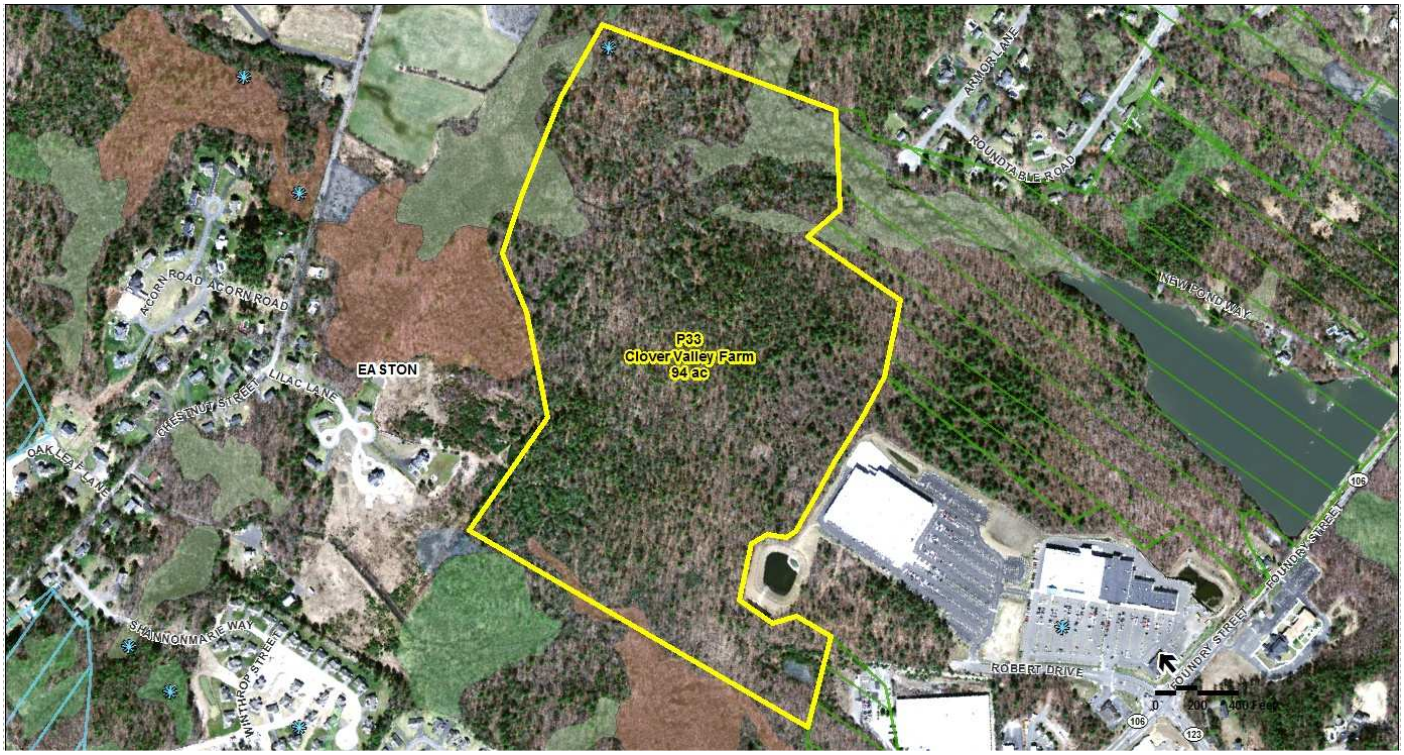


Figure 20. Area P33, Clover Valley Farm. Scale = 1:5,000.

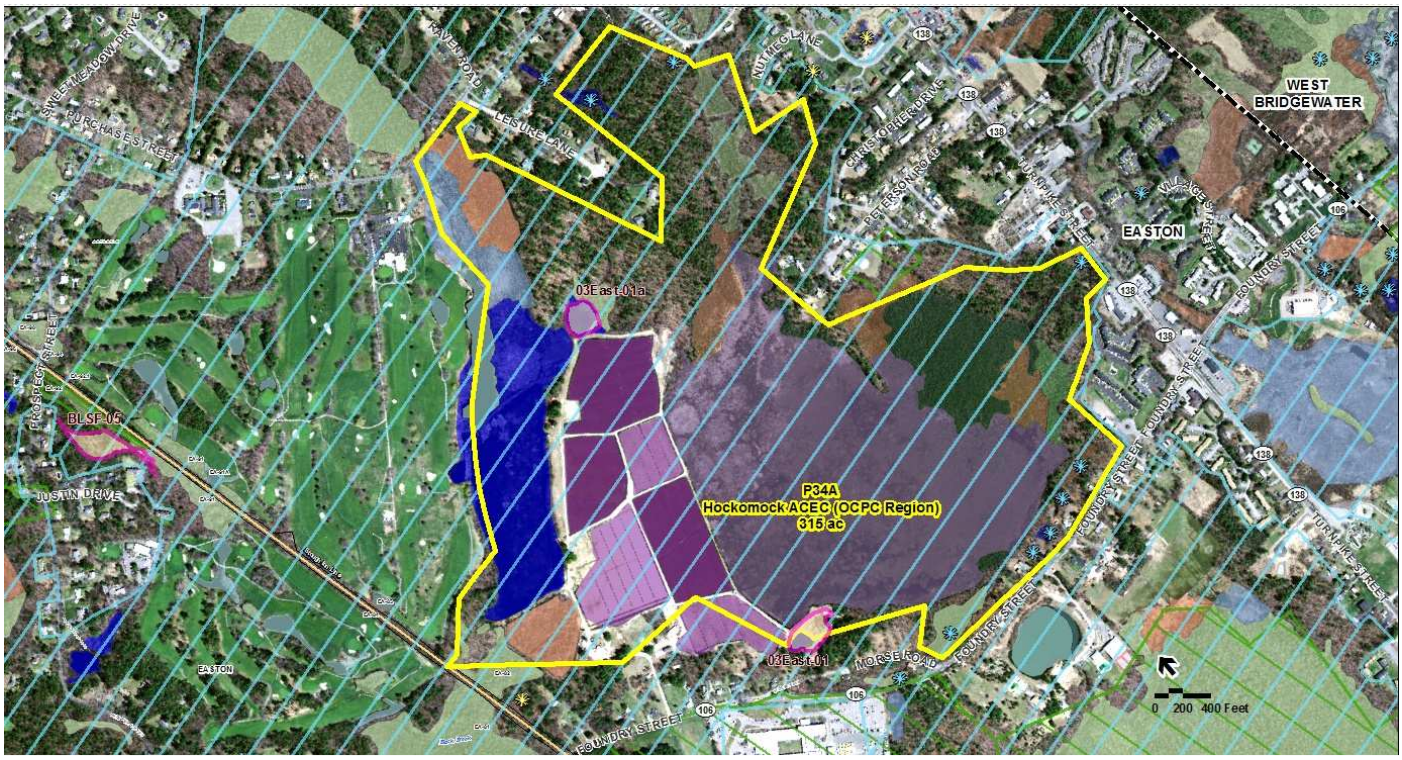


Figure 21. Area P34A, Hockomock ACEC (OCPC Region). Scale = 1:7,500.

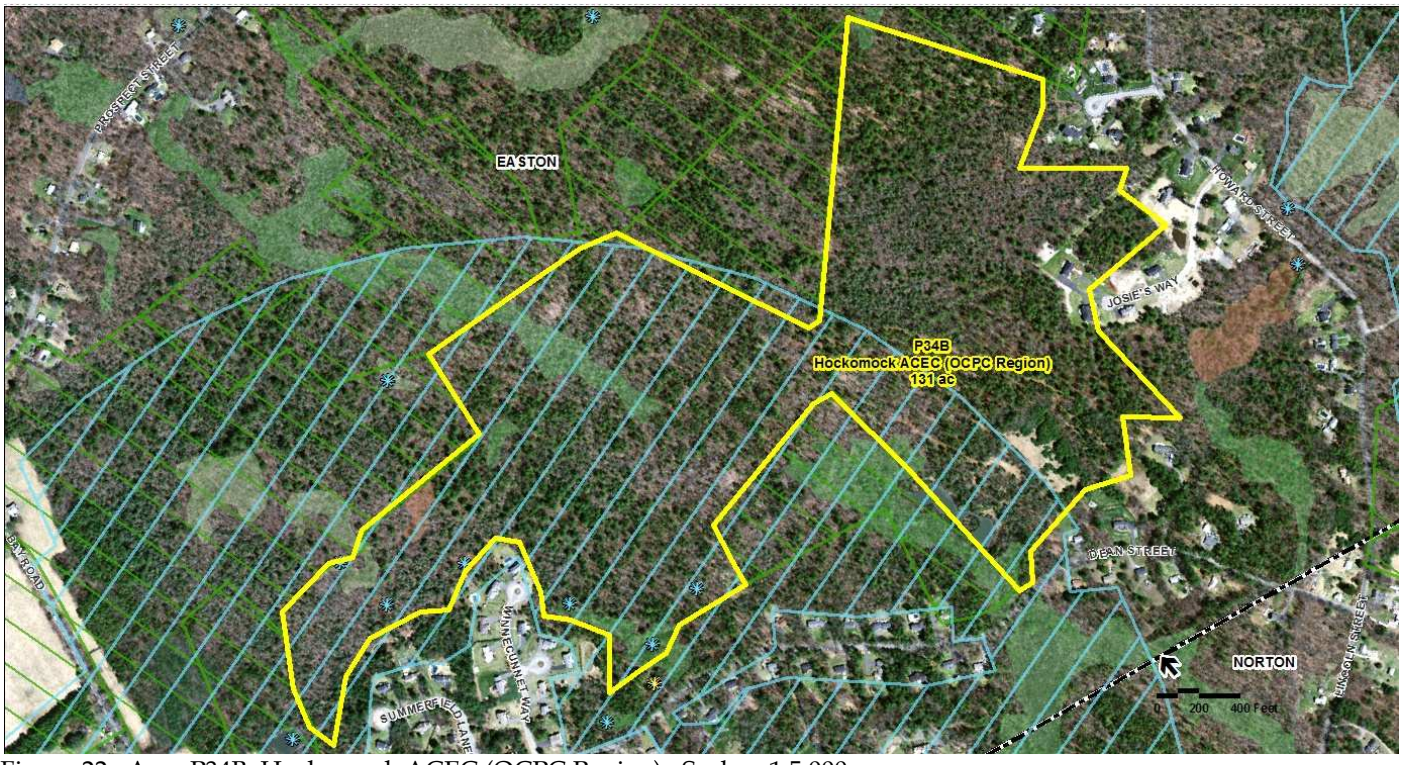


Figure 22. Area P34B, Hockomock ACEC (OCPC Region). Scale = 1:5,000.

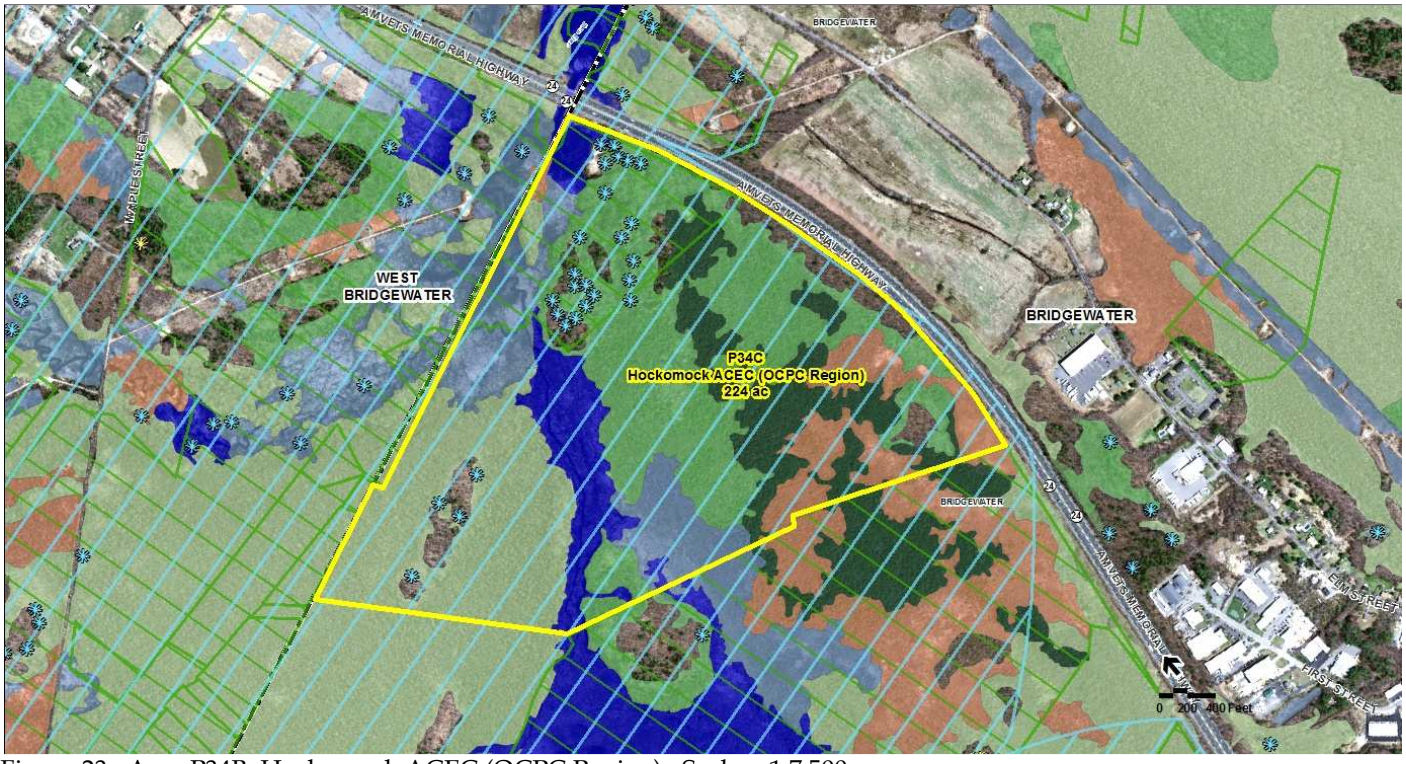


Figure 23. Area P34B, Hockomock ACEC (OCPC Region). Scale = 1:7,500.

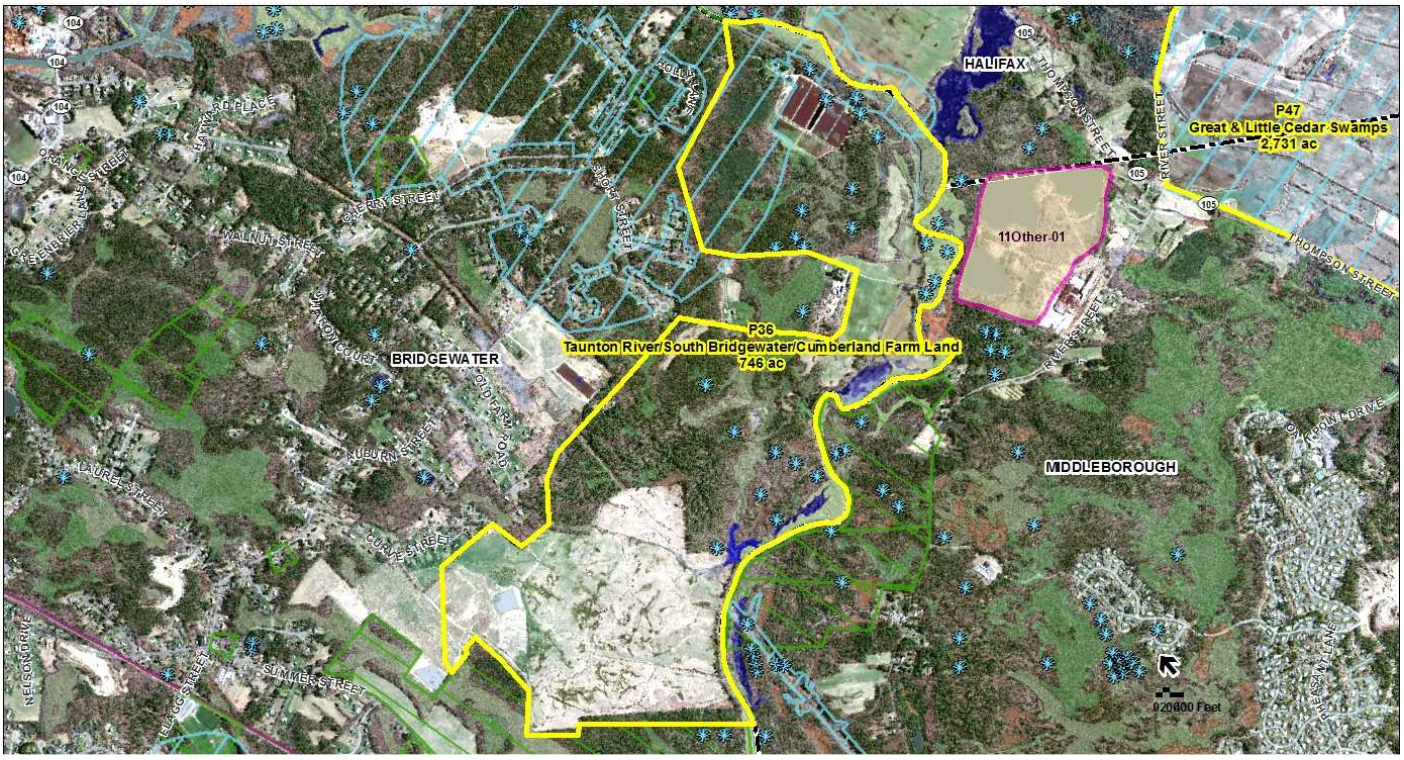


Figure 24. Area P36, Taunton River/South Bridgewater/Cumberland Farm Land. Scale = 1:15,000.

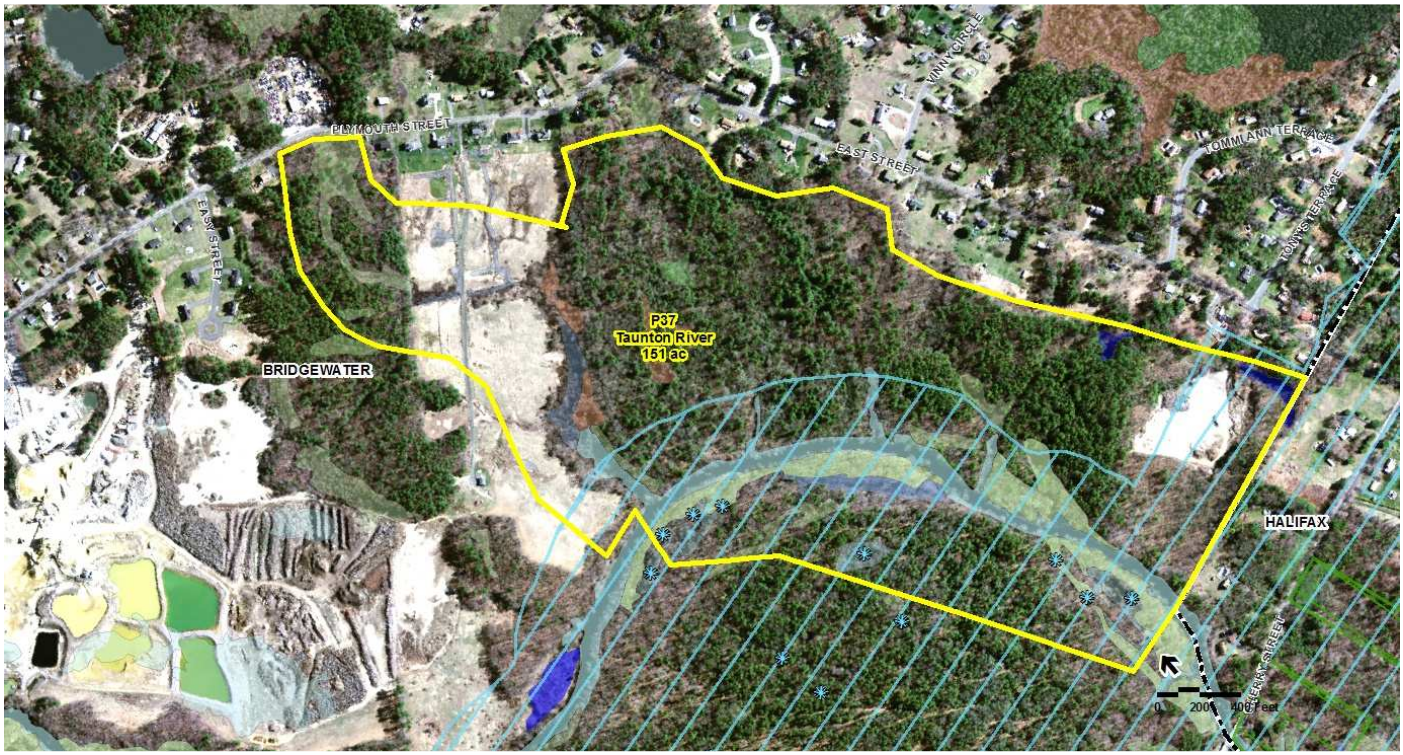


Figure 25. Area P37, Taunton River. Scale = 1:5,000.

Figure 26. Area P38, Bird Street Sanctuary. Scale = 1:5,000.

Figure 27. Area P40, Southworth Pond and Lipsky Fields. Scale = 1:5,000.

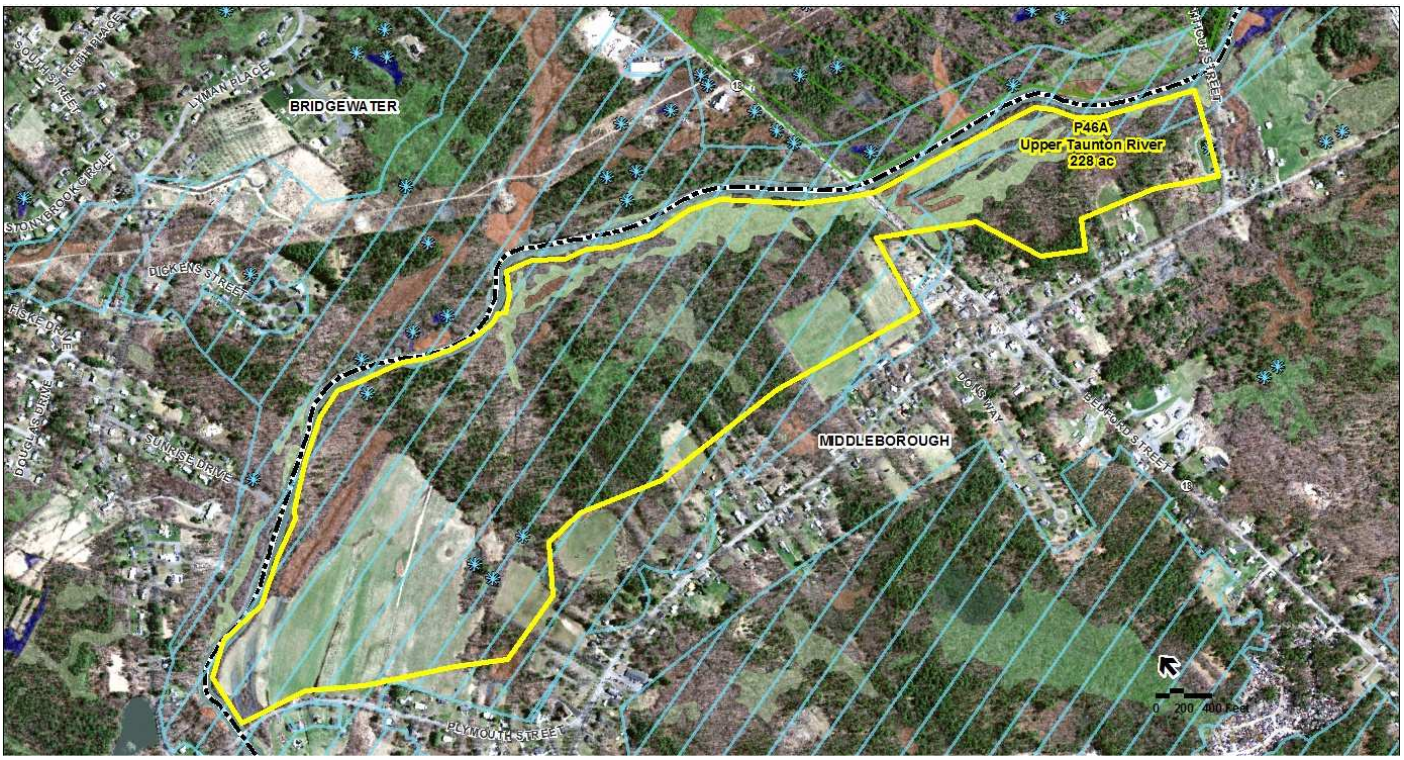


Figure 28. Area P46A, Upper Taunton River. Scale = 1:7,500.

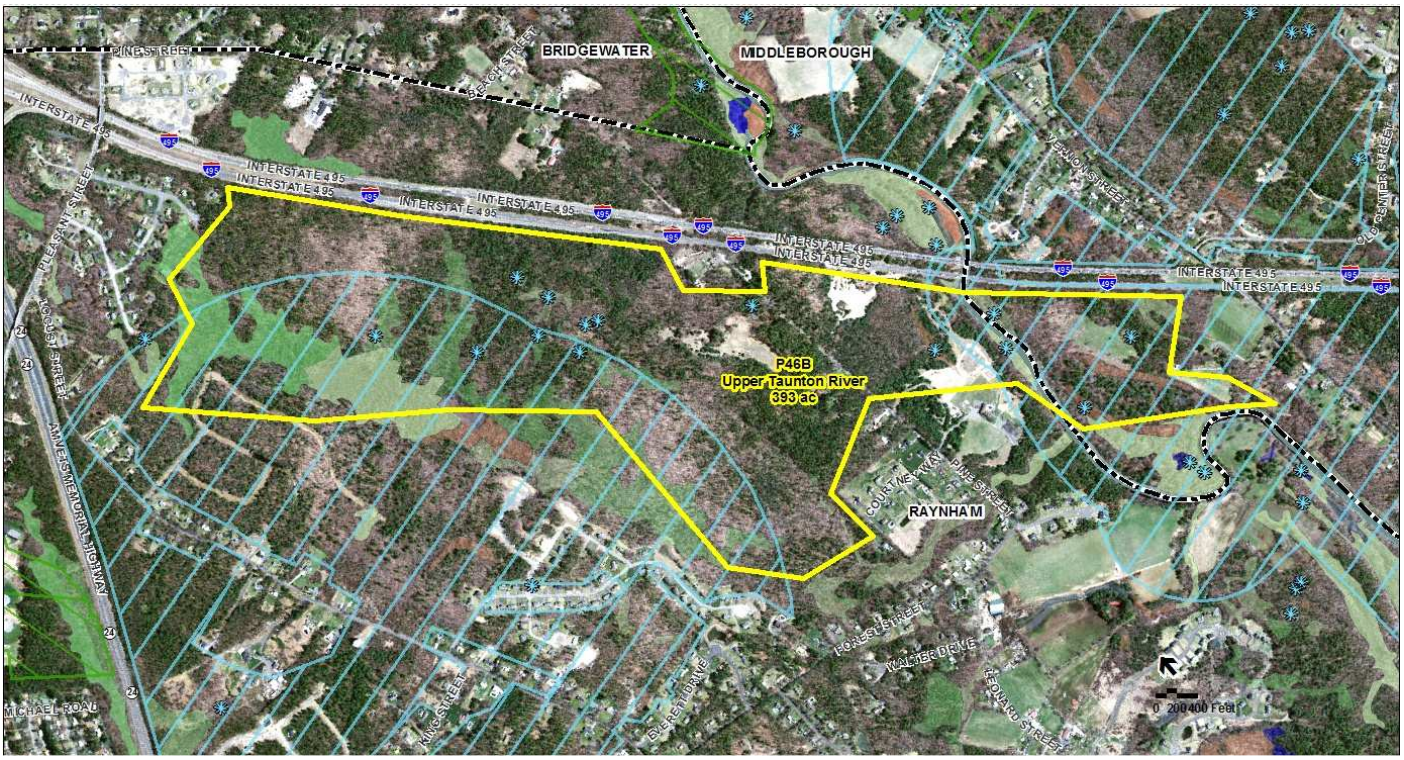


Figure 29. Area P46B, Upper Taunton River. Scale = 1:10,000.

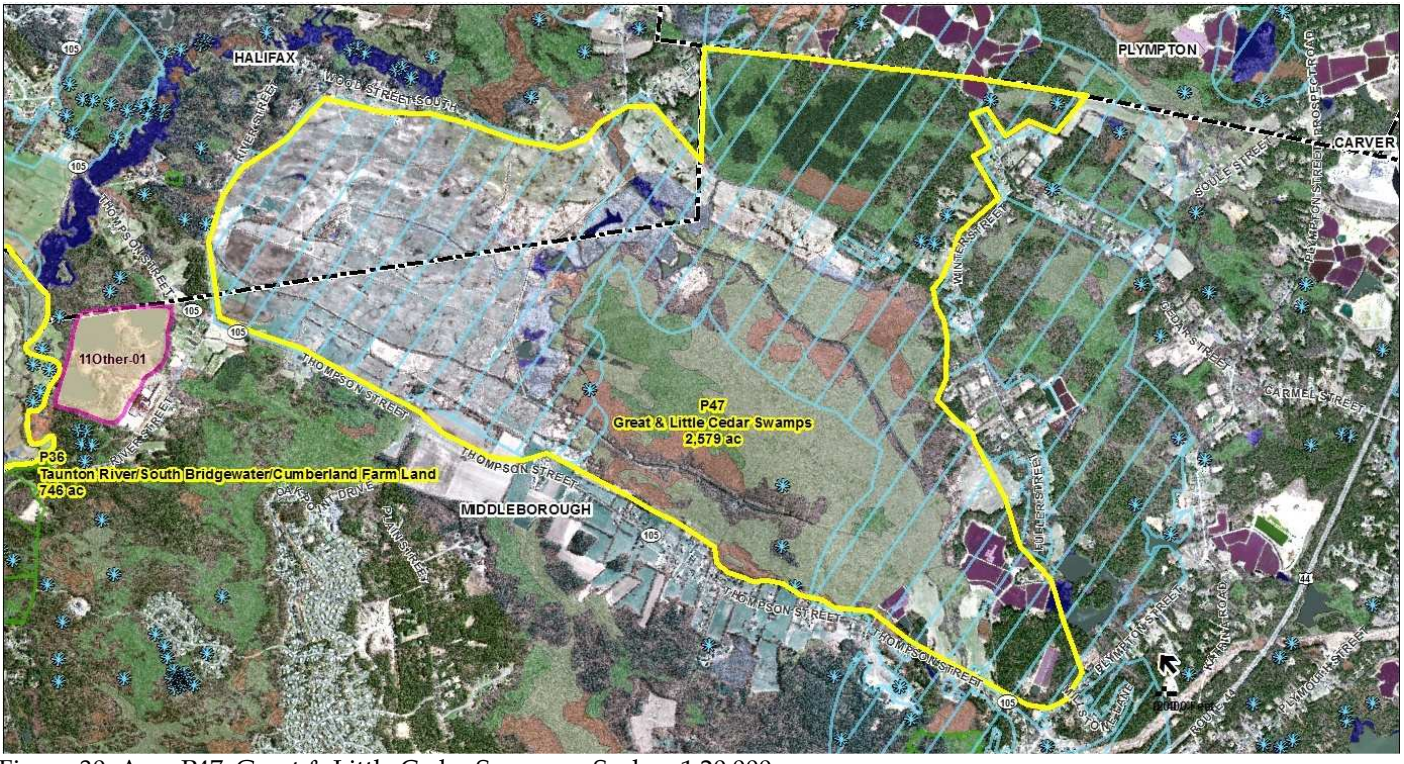


Figure 30. Area P47, Great & Little Cedar Swamps. Scale = 1:20,000.

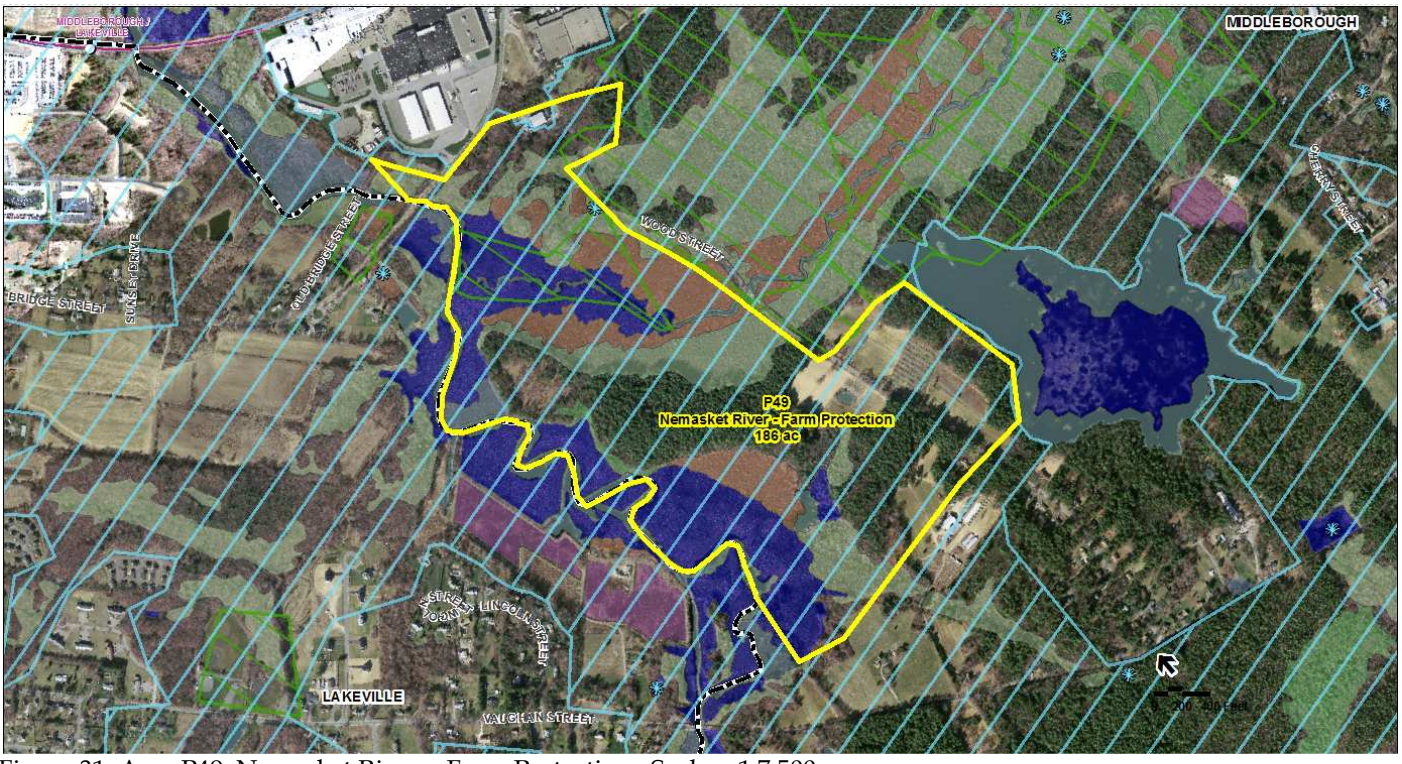


Figure 31. Area P49, Nemasket River – Farm Protection. Scale = 1:7,500.

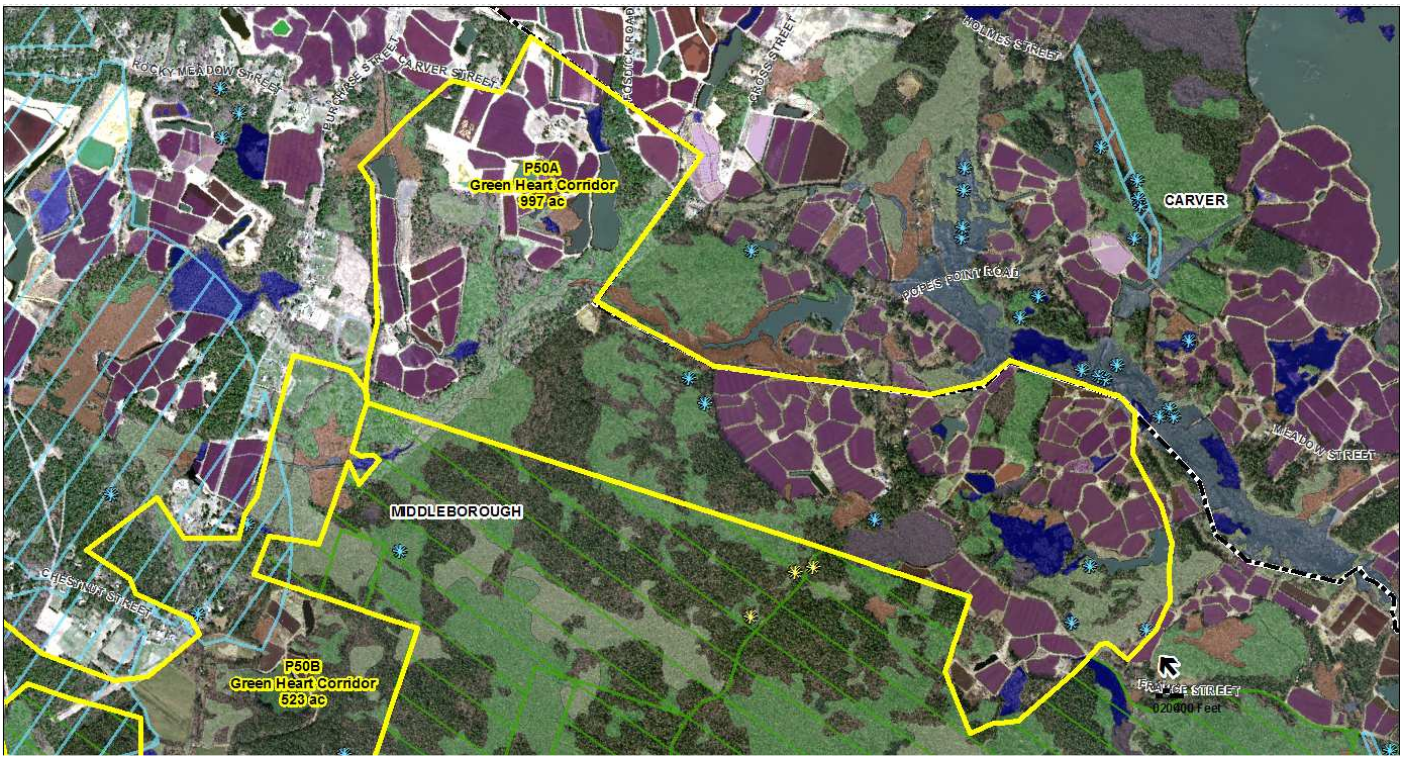


Figure 32. Area P50A, Green Heart Corridor. Scale = 1:15,000.

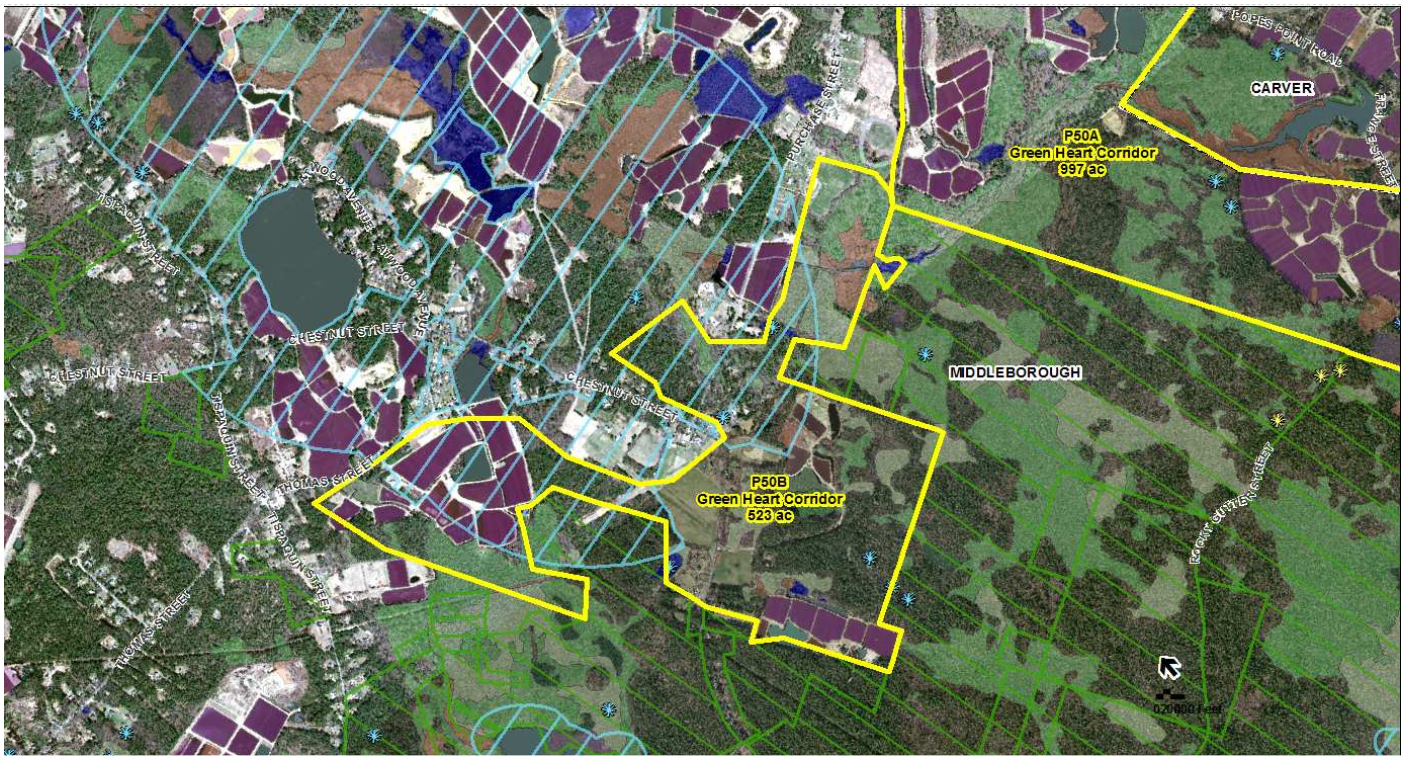


Figure 33. Area P50B, Green Heart Corridor. Scale = 1:15,000.

Figure 34. Area P51, Thatcher Pond. Scale = 1:5,000.

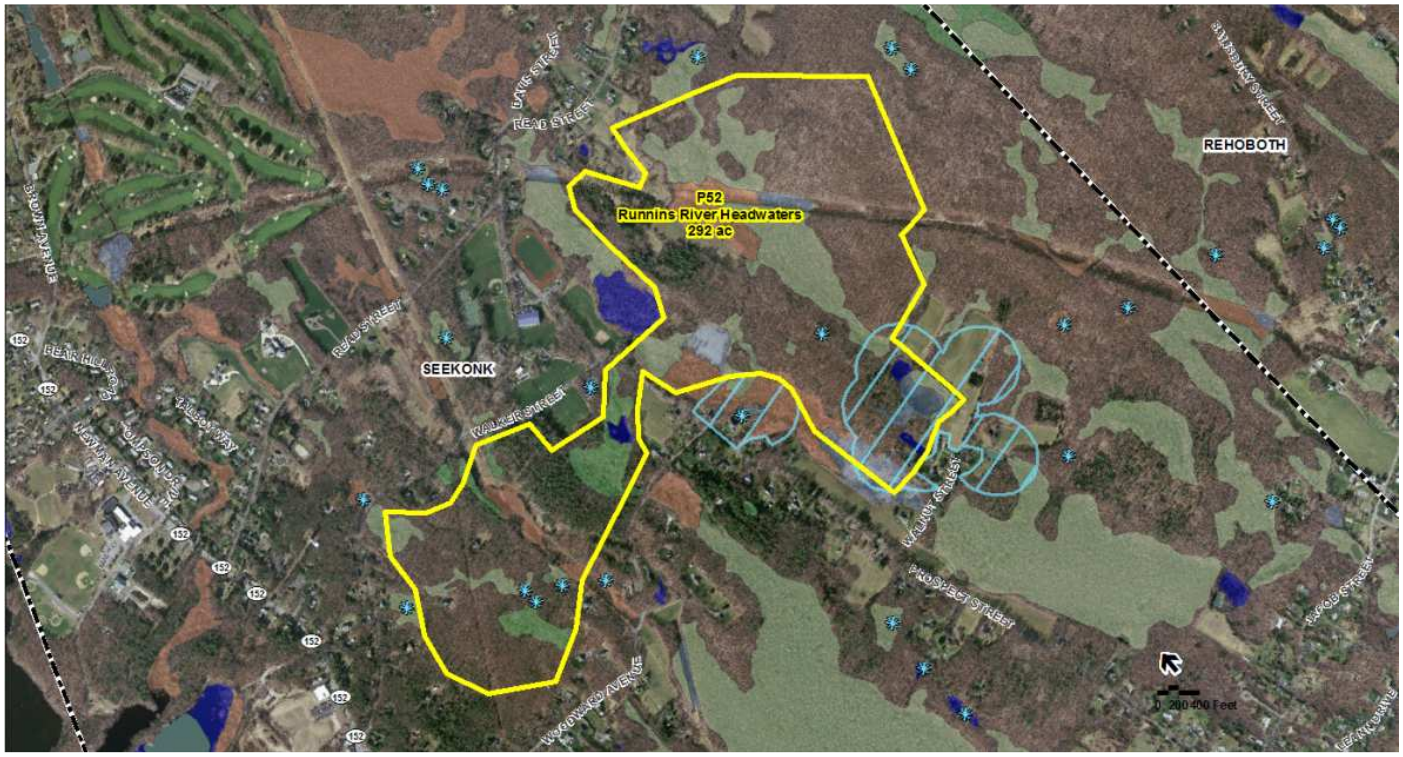


Figure 35. Area P52, Runnins River Headwaters. Scale = 1:10,000.

Figure 36. Area P53, Palmer River Aquifer/Zone II Protection Area. Scale = 1:5,000.

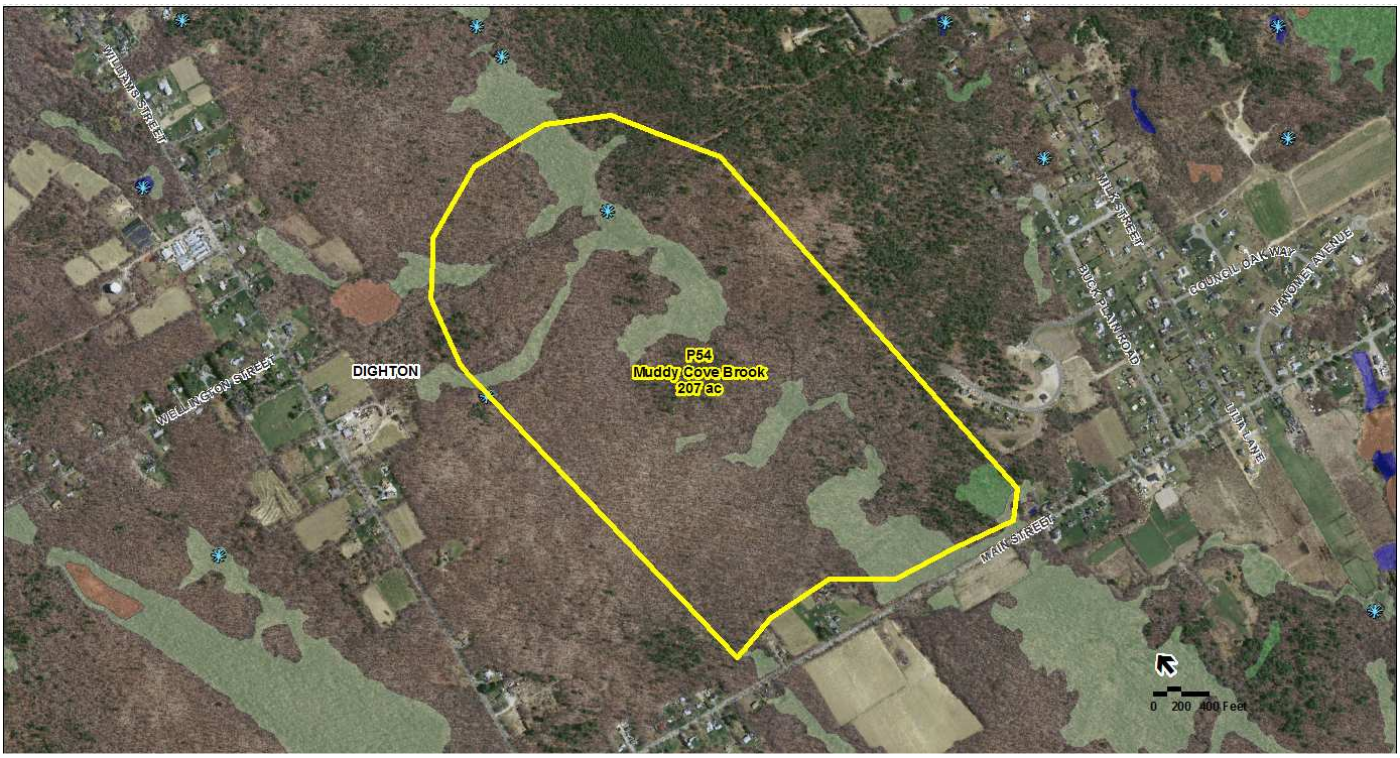


Figure 37. Area P54, Muddy Cove Brook. Scale = 1:7,500.

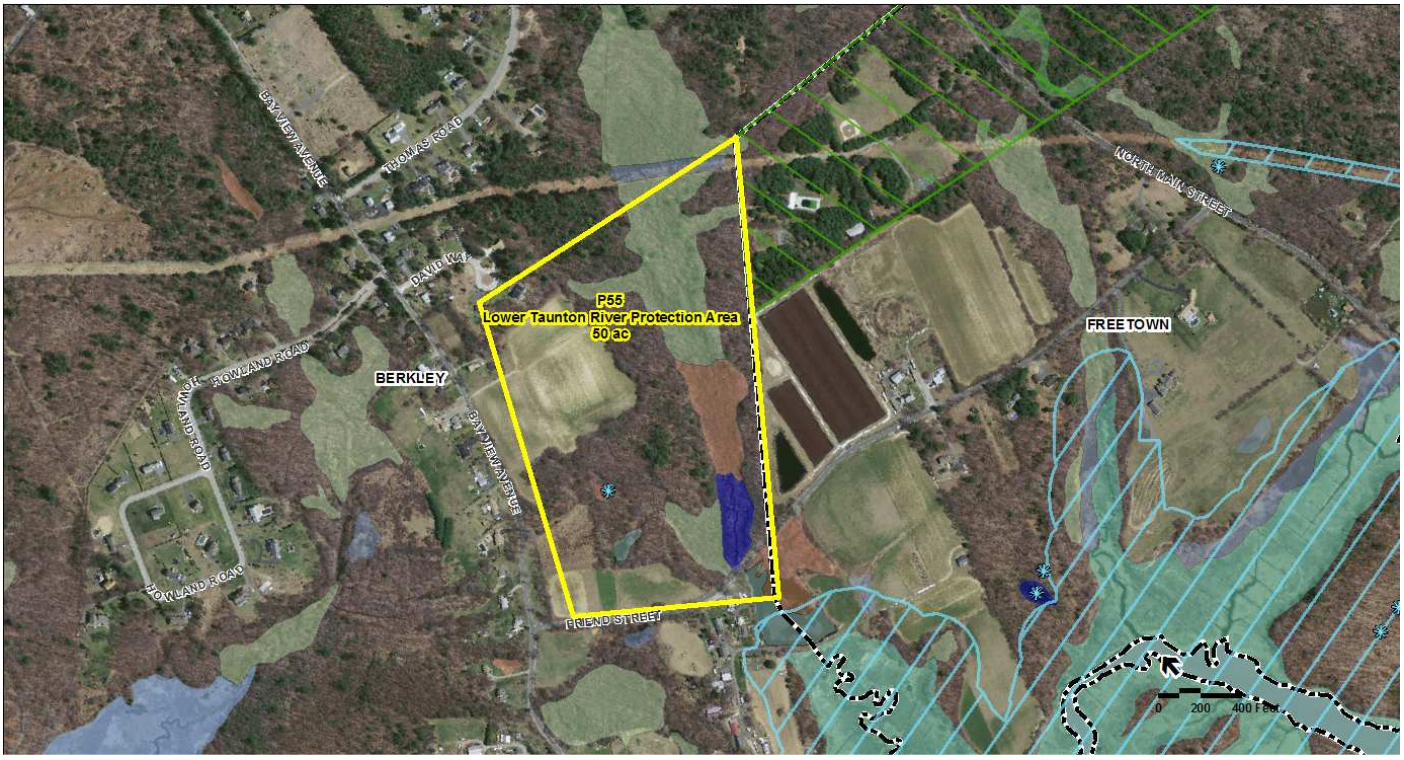


Figure 38. Area P55, Lower Taunton River Protection Area. Scale = 1:5,000.

Figure 39. Area P56, Acidic Fen. Scale = 1:7,500.

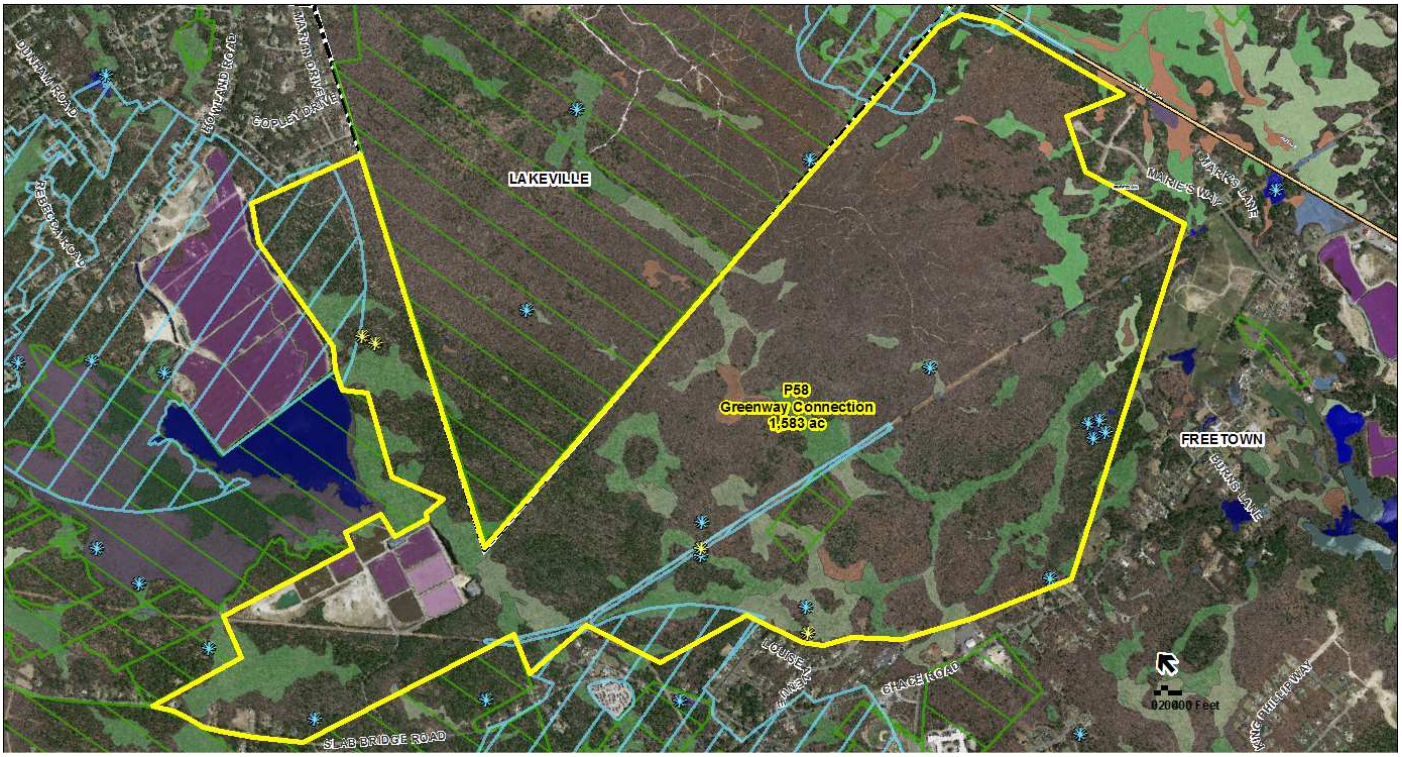


Figure 40 Area P58, Greenway Connection. Scale = 1:15,000.

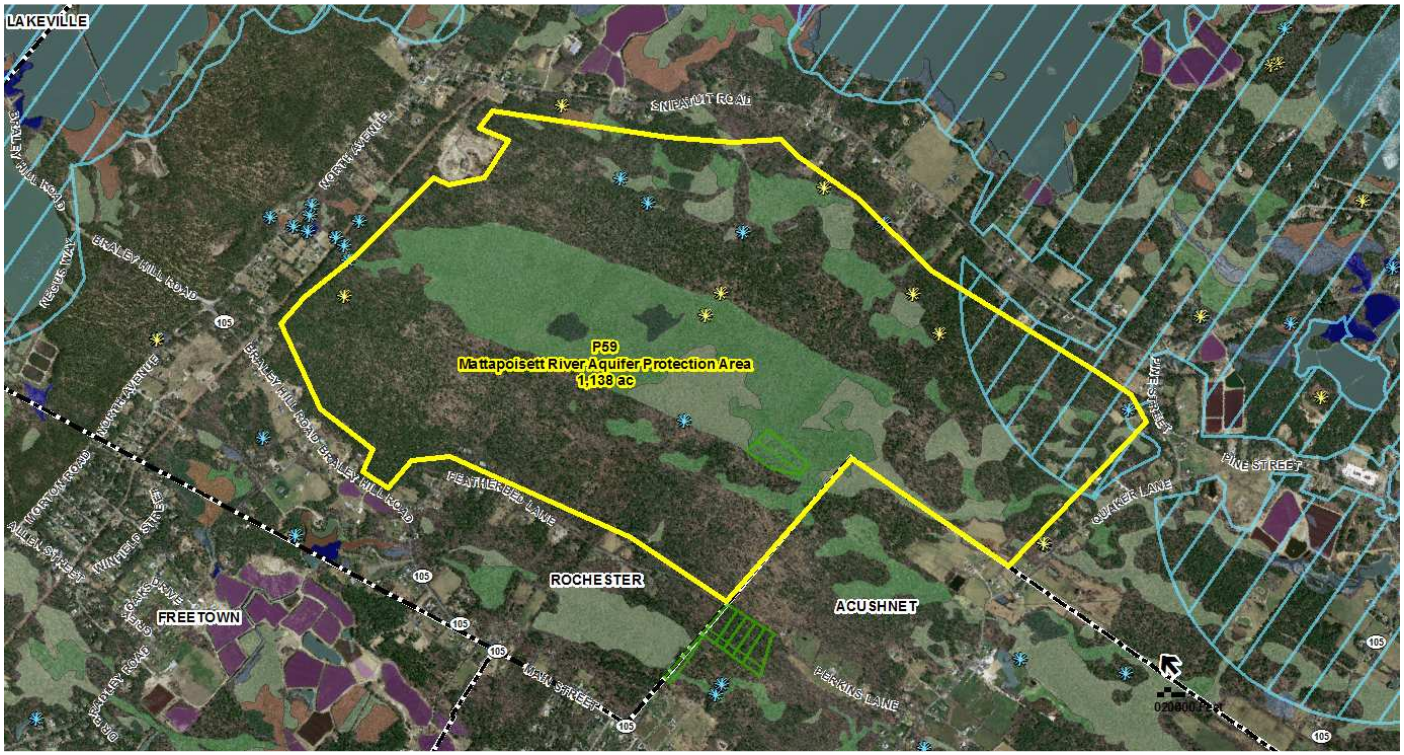


Figure 41. Area P59, Mattapoisett River Aquifer Protection Area. Scale = 1:15,000.

Figure 42. Area P60, Aucoot Cove. Scale = 1:2,500.

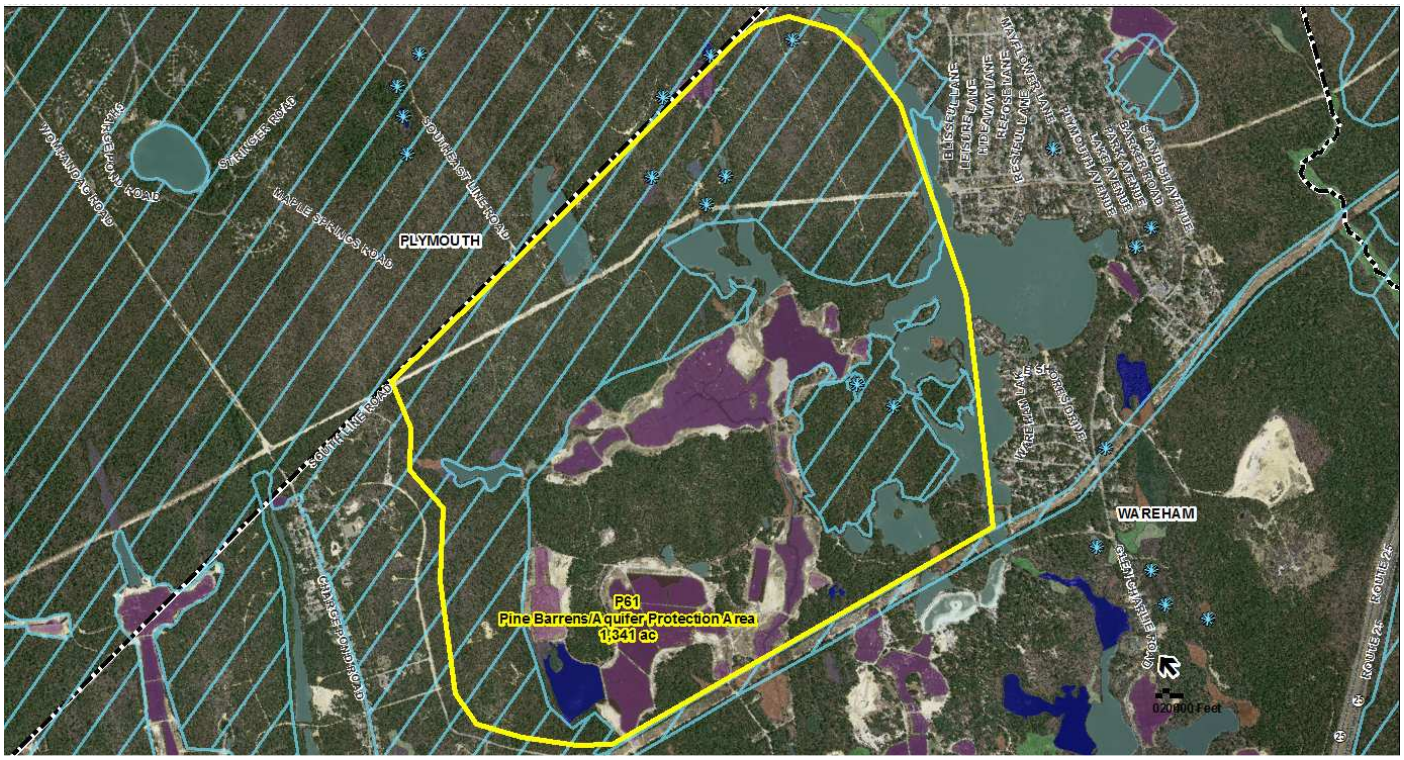


Figure 43. Area P61, Pine Barrens/Aquifer Protection Area. Scale = 1:15,000.

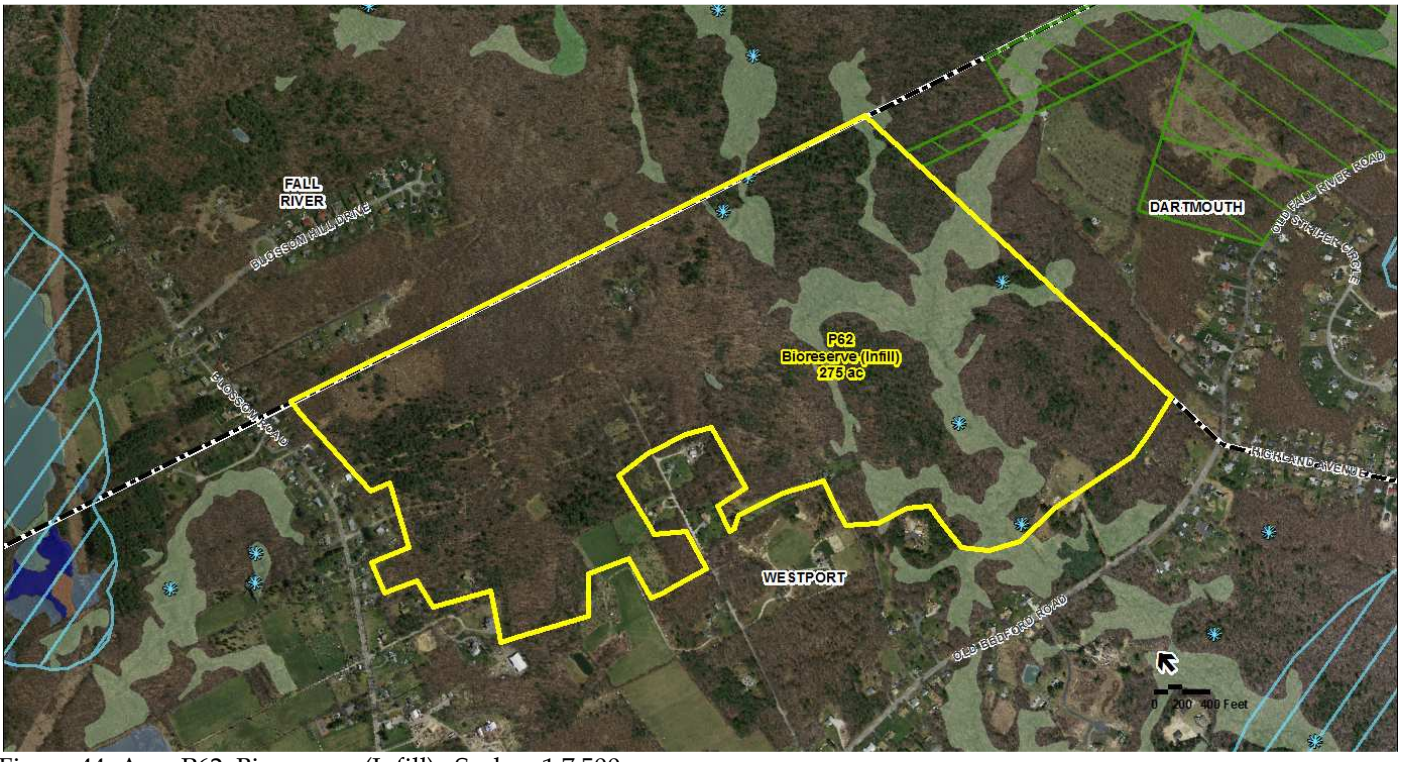


Figure 44. Area P62, Bioreserve (Infill). Scale = 1:7,500.

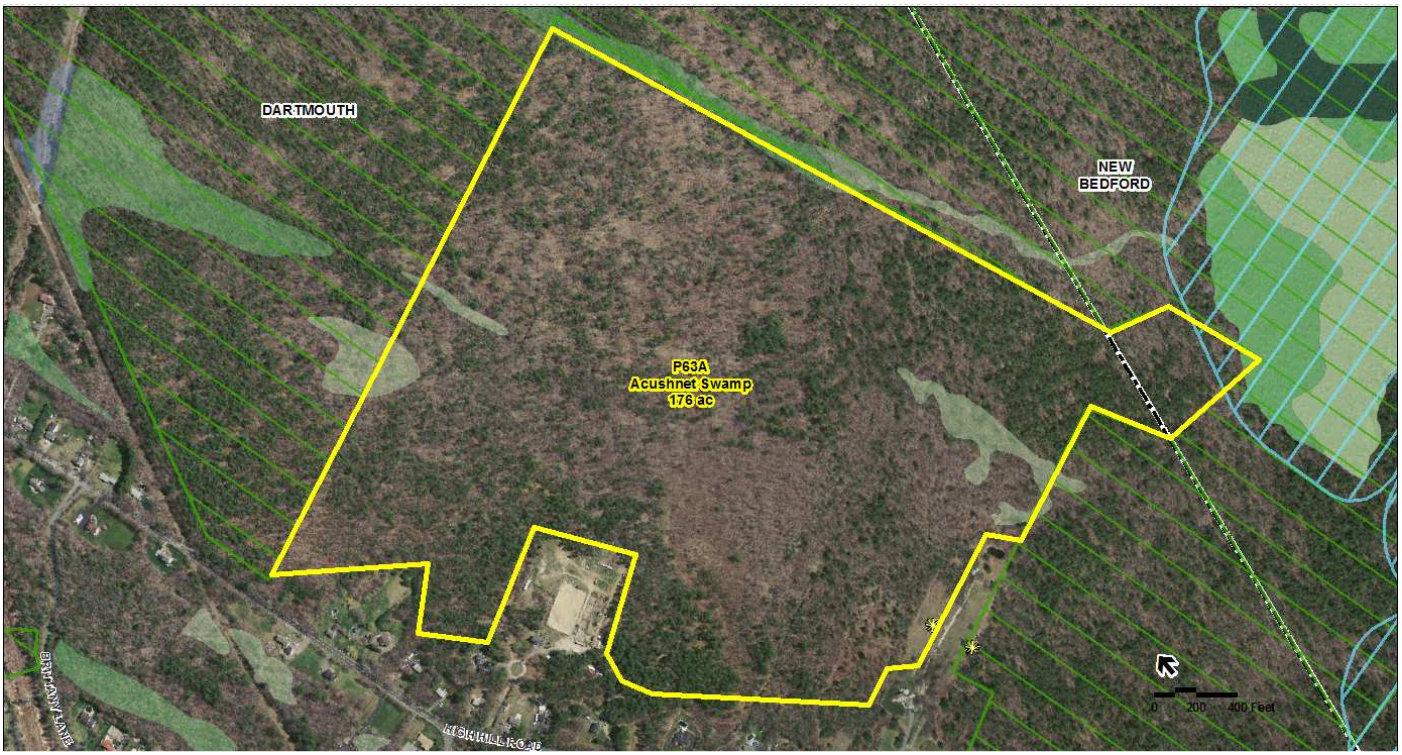


Figure 45. Area P63A, Acushnet Swamp. Scale = 1:5,000.

Figure 46. Area P63B, Acushnet Swamp. Scale = 1:5,000

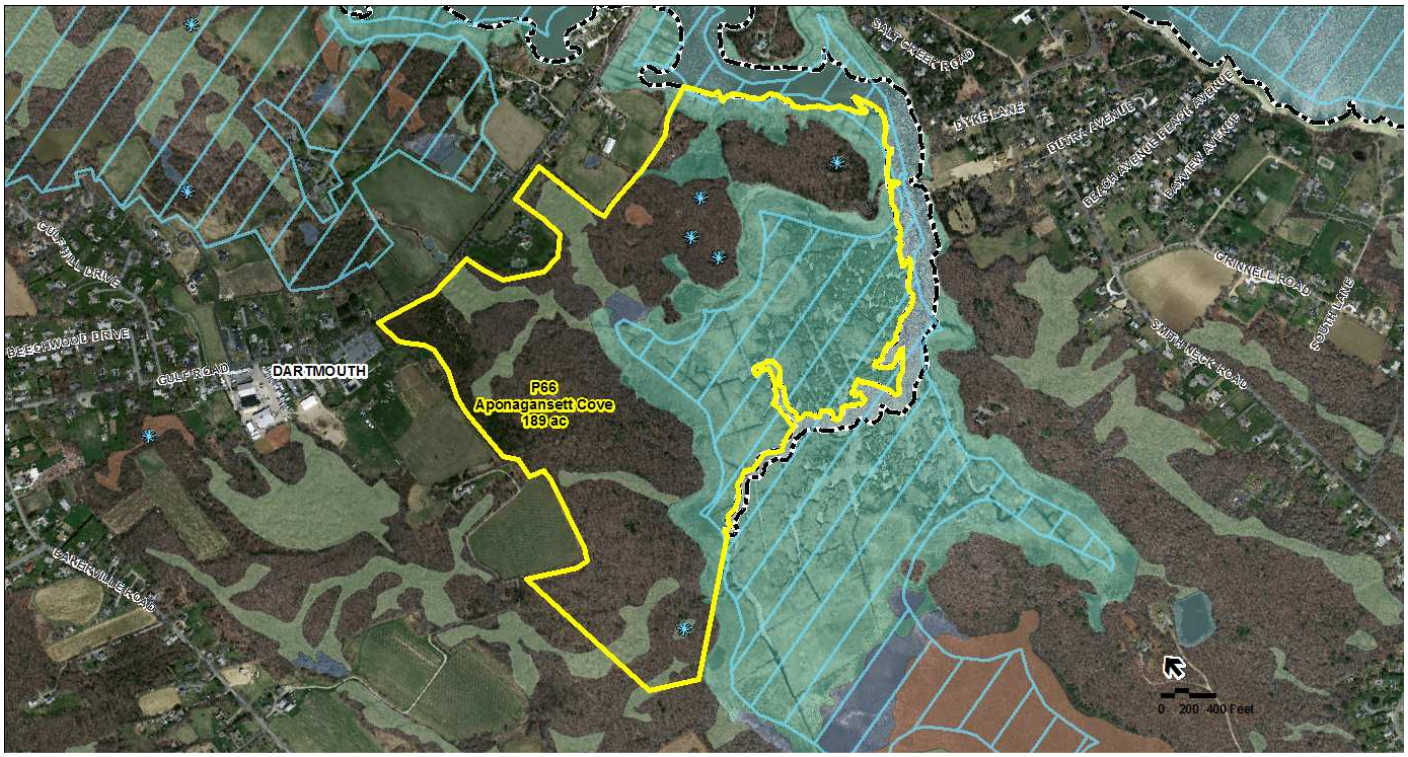


Figure 47. Area P66, Aponagansett Cove. Scale = 1:7,500.

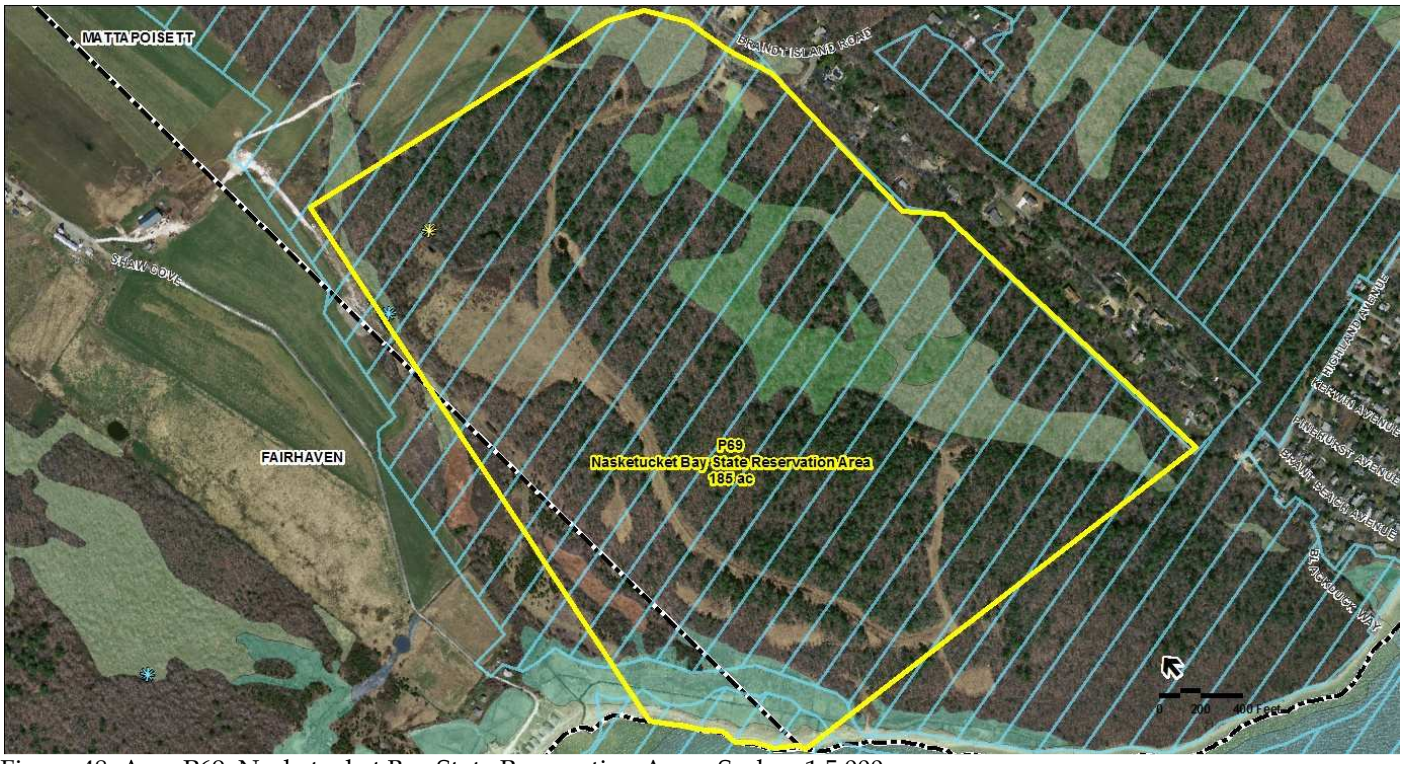


Figure 48. Area P69, Nasketucket Bay State Reservation Area. Scale = 1:5,000.

Appendix 4.17-A

Hockomock Swamp Stormwater Report

Appendix 4.17-A

Hockomock Swamp Stormwater Report

Stormwater Report

Hockomock Swamp Trestle

Easton and Raynham, Massachusetts

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

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Table of Contents

Checklist for Stormwater Report **1**

Stormwater Report Narrative **2**

Project Description **2**

Site Description **2**

Existing Drainage Conditions **3**

Proposed Drainage Conditions **4**

Regulatory Compliance **1**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas
Figure 5: Trestle through Hockomock Swamp - Typical Plan
Figure 6: Trestle through Hockomock Swamp - Typical Section
Figure 7: Trestle through Hockomock Swamp – Typical Elevation

List of Tables

Table 1: Existing Conditions Hydrologic Data
Table 2: Proposed Conditions Hydrologic Data
Table 3: Unit Drainage Area Peak Discharge Rates (cfs*)

List of Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

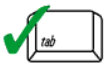
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Infiltration trenches

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☒ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

MassDOT is proposing to construct an 8,500-foot long railroad trestle along the out-of-service portion of the Stoughton Line between Foundry Street in Easton, Massachusetts and the Raynham Park grade crossing in Raynham, Massachusetts (the Project). The trestle would be constructed in order to restore commuter rail service through this corridor while avoiding and minimizing wetland impacts in the Hockomock Swamp. The Project will involve driving piles at 50-foot intervals along the Project corridor, installing pile caps, decking, and ballasted trestle superstructure elements on top of the piles, and constructing retaining walls and embankments on either end of the trestle to return the track to grade. In order to provide stormwater management for runoff from the trestle, infiltration trenches will be constructed beneath the proposed trestle.

The project is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 310 CMR 10.04 and 314 CMR 9.02.

Site Description

The Project site is part of an existing railroad right-of-way located between Foundry Street in Easton and the Raynham Park grade crossing in Raynham (Figures 1 and 2). Tracks and ties were removed from this segment in the 1960s and the embankment which remains through the corridor is utilized by pedestrians and all-terrain vehicles (ATVs).

The corridor is within the Hockomock Swamp Area of Critical Environmental Concern (ACEC) and is surrounded by wetland resources along most of its length. For additional information regarding the wetland resource areas present on the site see the Abbreviated Notices of Resource Area Delineation (ANRADs) for Easton and Raynham prepared by VHB dated May 2011.

The Project site consists of an earthen embankment (fill material and old railroad ballast) that rises approximately 2 to 3 feet above the adjacent wetlands. The embankment is topped by a gravel/dirt track kept relatively free from vegetation by off-road vehicles. According to the National Resources Conservation Service (NRCS), the dominant surface soil below the embankment (covering 80 percent of the area) is

Freetown muck, a soil classified as Hydrologic Soil Group (HSG) D. However, the geotechnical study of the Project corridor determined that the predominant soils within the embankment were loamy fine sands, which may be capable of higher infiltration rates. Based on the soil evaluation, the Project site is not considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour). The poorly drained soils onsite have a low potential for infiltration; According to 1982 Rawls Rates for sandy clay loam, infiltration rates for the soils will be approximately 0.17 inches per hour.

The Project corridor is located within the 100-year flood plain as shown on the FEMA Floodway Maps, Town of Easton, Massachusetts Bristol County, Community Panel Numbers 25005C00064F and 25005C0152F dated July 7, 2009. These maps are included in Appendix B.

Existing Drainage Conditions

The Project site consists of an earthen embankment that rises approximately 2 to 3 feet above the adjacent wetlands. The embankment is topped by a gravel/dirt track kept relatively free from vegetation by off-road vehicles. The sides and some sections of the top of the embankment are covered by brush and saplings. Although slight variations in cover type and soils may occur along the length of the trestle corridor, the contributing watersheds are nearly identical in terms of slope and area. Evaluating a typical or "unit" drainage area for the existing conditions analysis allows for direct comparison to be made between existing and proposed conditions. This unit drainage area would then be replicated along the length of the trestle corridor. For the existing conditions hydrologic analysis, the site was evaluated as a single design point representing runoff from a 300-foot segment of the embankment, or approximately 0.14 acres (6,000 square feet). This segment length was selected because it corresponds to a whole number of proposed spans. In addition, because the existing berm is narrow and level, the use of smaller drainage areas more closely models existing conditions.

Existing Unit Drainage Area – The existing unit drainage area of 0.14 acres was conservatively assumed to be covered with brush in fair condition, discounting the contribution from the gravel/dirt track. Under existing conditions, runoff from this area sheet flows, untreated, to the wetlands on either side of the embankment.

Figure 3 illustrates the existing drainage patterns within a typical unit drainage area. Table 1 provides a summary of the existing conditions hydrologic data.

Table 1
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
EX	Adjacent Wetland	1	0.14	70	6

Proposed Drainage Conditions

The proposed trestle would be constructed on piles and would elevate the track above the existing embankment to avoid wetland impacts. Specifically, the use of a structure significantly reduces the amount of earthwork required to meet the design requirements for a safe high-speed train track while providing proper track support and ballast drainage. The structure will be designed with a minimum of 5 feet of vertical clearance to allow unimpeded movement of wildlife across the embankment. This open space beneath the structure will provide opportunities for the construction of decentralized stormwater management features that can treat runoff from the structure without impacting adjacent wetland resource areas.

Drainage for the trestle is proposed to be handled by evaluating a unit drainage area and repeating that drainage design along the length of the trestle. Minor local modifications to this treatment design may be required during final design. The following is a summary of the proposed unit drainage area and treatment design.

Proposed Unit Drainage Area – Under proposed conditions, drainage will be addressed by a unit design that treats stormwater from the 20-foot wide trestle in 300-foot segments (i.e., six 50-foot spans of trestle deck). The area of this unit design corresponds to the 6,000 square foot area previously evaluated under existing conditions. The unit design will consist of an underdrain collection system within the ballast of the trestle deck leading to downspouts. The downspouts will convey stormwater from the trestle deck and direct it to gravel-lined infiltration trenches beneath the deck. There will be one infiltration trench for each 300 feet of trestle, requiring a total of approximately 30 infiltration trenches along the length of the trestle. Each proposed infiltration trench will each be 16 feet wide by 33 feet long and will be 1 foot deep. The length of the trenches is constrained by the spacing of the pile bents and the 5-foot setback that is required from each pile bent.

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. Table 2 provides a summary of the proposed conditions hydrologic data.

Table 2
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
PR	Adjacent Wetland	1	0.14	98	6

As shown on the typical plans and sections (see Figure 5, 6, and 7), the trestle will consist of a bed of ballast that supports the tracks and ties, with a concrete walkway on one side and a concrete apron on the other. The ballast is off set from the center line of the trestle in order to provide a safe zone along the walkway if workers are present when a train crosses the trestle. The narrower apron on the opposite side of the ballast is an integral part of the structural support for the ballast deck and provides support for a railing.

The surface of the trestle is assumed to be completely impervious because it will be a solid concrete structure. Any rainfall that lands on the ballast or on the exposed portions of the deck will drain through the ballast and be collected by an underdrain prior to discharge. The underdrain will run the length of the trestle and will be connected to downspouts located at intervals along the length of the trestle. These downspouts will be piped to the infiltration trenches that will be located beneath the trestle between sets of pile bents.

The ballast which supports the track within the trestle will capture coarse particulates and drippings from the trains by adsorption onto the stone and minimizes the potential to contaminate stormwater. This ballast will be periodically replaced as part of regular operations and maintenance, and any accumulated materials will be removed at that time. Because train operations do not generate suspended solids and the trestle will not be sanded during winter operations, the trestle will effectively function as a roof and runoff from the trestle is not anticipated to contain suspended solids. Any solids present due to atmospheric deposition will be managed by the infiltration trenches.

The Project site has been designed with a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Minimal disturbance to exiting trees and vegetation;
- Infiltration practices; and
- Decentralized treatment and discharge locations.

Stormwater runoff from all impervious surfaces in proposed conditions will receive treatment for stormwater quality prior to discharge to the existing design points. Under existing conditions no such treatment is provided for stormwater runoff.

By using a series of small, decentralized stormwater management features, existing drainage patterns will be maintained to the maximum extent practicable. Low impact development stormwater management techniques have been incorporated into the design, including minimizing disturbance within environmentally sensitive areas and promoting infiltration. These practices will reduce peak runoff rates, maximize groundwater recharge and treat for water quality. In addition, wetland impacts are avoided that might occur if a centralized stormwater management facility was required.

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the Project fully complies with the MassDEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The BMPs included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges would result from the Project are presented through compliance with Standards 4 through 6.

The proposed outlets from the stormwater management system have been designed to not cause erosion or scour to wetlands or receiving waters. Because of the storage volume within the ballast and infiltration trenches, discharge rates from the trestle will be less than 1 cubic foot per second (cfs) up to the 100-year storm event. Overflow outlets have been designed with stone protection to dissipate flows that may be discharged during large storm events.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Project site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 3 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 3
Unit Drainage Area Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point 1: Adjacent Wetland			
Existing	0.12	0.28	0.56
Proposed	0.05	0.14	0.26

*cubic foot per second

Standard 3: Stormwater Recharge

The Project has been designed to fully comply with Standard 3.

In accordance with the Stormwater Handbook, the Required Recharge Volume for each Unit Drainage Area of the Project is 127 cubic feet. Recharge of stormwater has been provided through the use of infiltration basins which have been sized using the static method. Each infiltration trench will provide 254 cubic feet of recharge and has been designed to drain completely within 72 hours.

A Geotechnical Report that describes subsurface soil conditions is included in Appendix E.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

Standard 4 specifies that "Stormwater Management Systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS)." As previously noted, rail operations generate negligible quantities of TSS. Because the trestle consists of ballast placed inside a solid structure, stormwater runoff must be managed differently than that from ballast placed directly on the ground; however the TSS loading would be similarly negligible.

Each infiltration trench has been designed to meet the 0.5-inch Water Quality Volume for its contributing drainage area. Because of the trestle's configuration and setting, it is not feasible to provide the full 1-inch Water Quality Volume and the 44 percent pretreatment required to receive credit for 80 percent TSS removal under the guidelines contained in the Stormwater Handbook. However, discharges from the trestle can be considered *de minimus* under the guidance provided in Volume 3, Chapter 1 of the Handbook. The Handbook specifies the following criteria for a *de minimus* determination:

- Physical sit conditions preclude installation of a TSS treatment practice.
- The discharge is less than or equal to 1 cfs for runoff associated with the 2-year 24-hour storm.
- 80 percent TSS removal is achieved on an average weighted basis from the site as a whole using the weighted average method.

- The stormwater outlets where additional controls are used to achieve more than 80 percent TSS removal must discharge to the same reach of the same wetland or waterbody as the outlets that achieve less than 80 percent TSS removal.
- Controls are placed at the outlet to prevent erosion or scour of the wetland/stream channel and bank.
- Standard 2 and Standard 3 must be achieved on a site-wide basis.
- Source control and pollution prevention measures that mitigate the impact of the untreated or partially treated discharges are identified in the Pollution Prevention Plan.
- The size of the drainage area contributing runoff to the untreated outlet has been reduced to the maximum extent practicable.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 310 CMR 10.04 and 314 CMR 9.02.

Standard 6: Critical Areas

The Project would discharge treated storm water to a critical area, the Hockomock Swamp Area of Critical Environmental Concern, via overland flow during large storm events. As described above under Standard 4, physical site conditions preclude installation of treatment practices of sufficient size to meet the 1-inch Water Quality Volume and perform 44 percent TSS removal prior to infiltration. However, the trestle meets the requirements of a *de minimus* determination and is not anticipated to negatively impact water quality within the Hockomock Swamp. Proposed source controls and pollution prevention measures will be identified in the Long-Term Pollution Prevention Plan that will be required as part of final design.

For computations and supporting information regarding the sizing of BMPs suitable for treatment of runoff near or to critical areas, see Appendix D.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is not a redevelopment.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project is required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for

the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIS/DEIR. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MassDOT during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

No sanitary sewer lines are known to exist in this area and no subsurface storm drainage structures or pipes are proposed to be constructed in this project area. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

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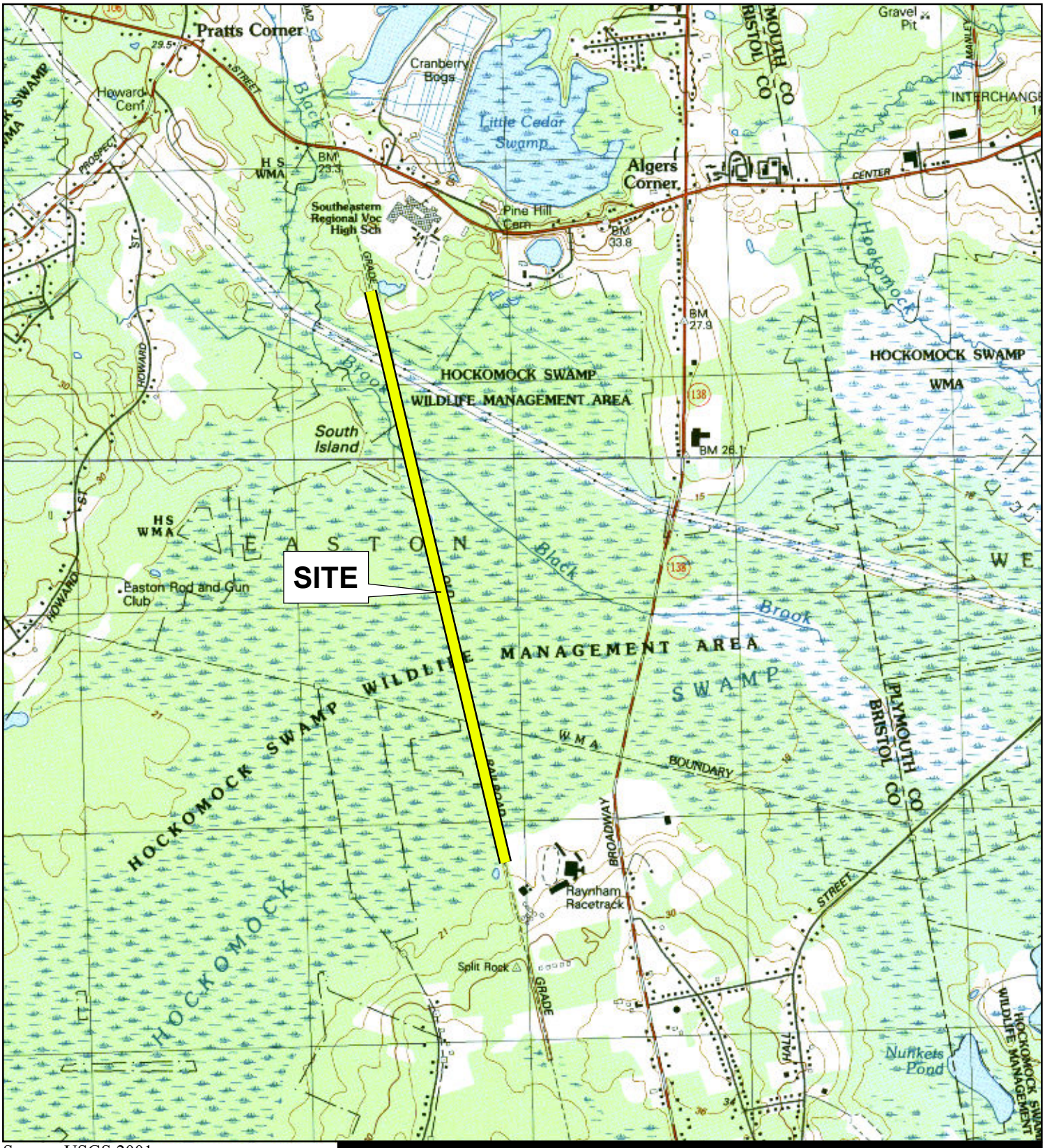


Source: USGS 2001

Vanasse Hangen Brustlin, Inc.

N

0 1,000 2,000 4,000 Feet

USGS Locus Map

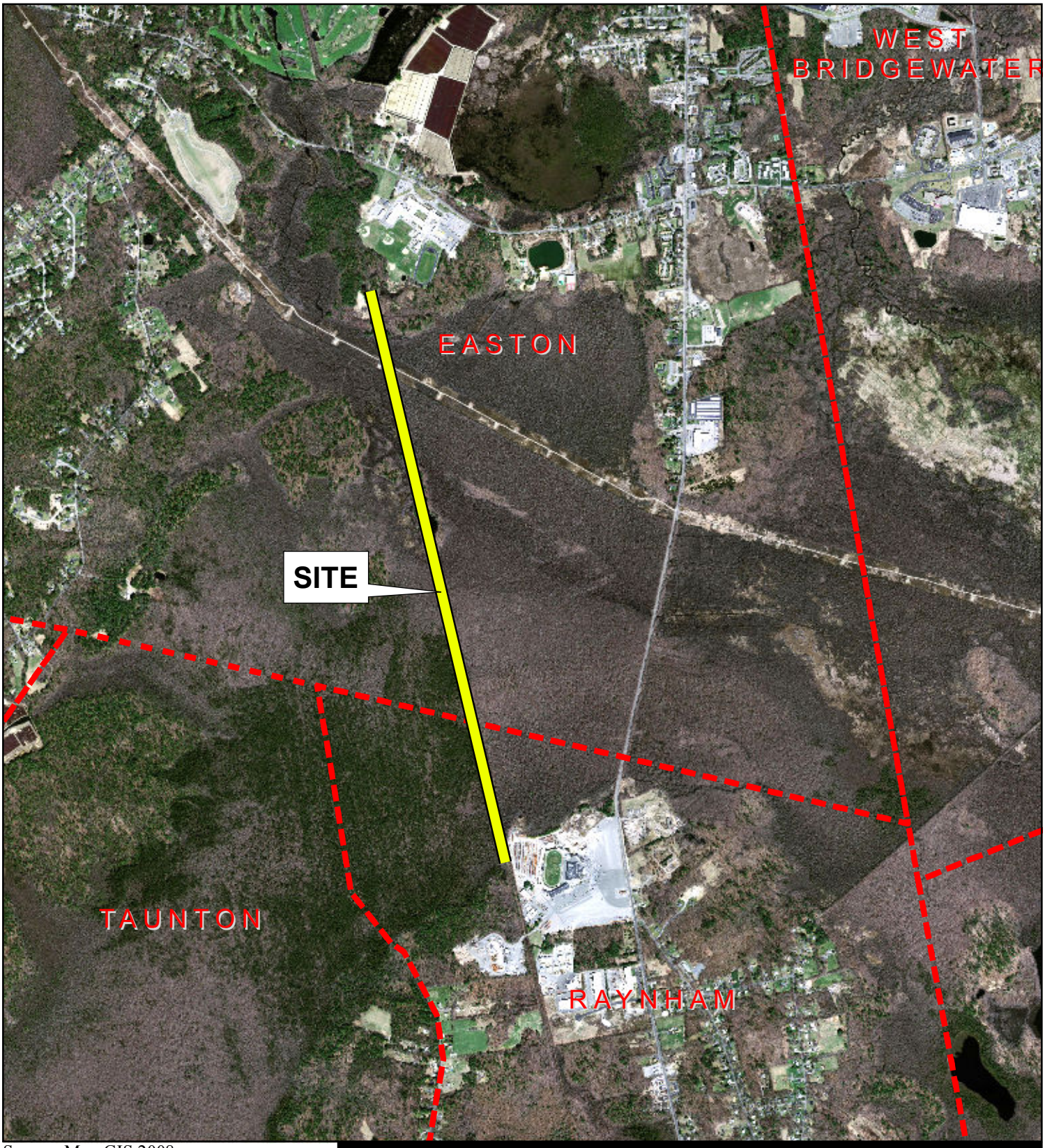
Hockomock Swamp Trestle
South Coast Rail
Easton and Raynham, Massachusetts

Figure 1

May 2012

Project Locations

File Source: \\mabos\projects\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Trestle\Stormwater Figures\Figure 2



Source: MassGIS 2008

Vanasse Hangen Brustlin, Inc.

N

0 1,000 2,000 4,000 Feet

Aerial Map

Hockomock Swamp Trestle
South Coast Rail
Easton and Raynham, Massachusetts

Figure 2

May 2012

Project Locations

WETLAND EA64
(500 SERIES)

EA64-WF-533

EA64

EA64-WF-534

1S

EA64-WF-535

EA63-WF259

EX

EA63-WF260

EA63

EA63-WF261

WETLAI
(200

63
S)

0 15 30 Feet

LEGEND

1 SUBCATCHMENT DRAINAGE AREA DESIGNATION

1 DESIGN POINT

1 WETLAND RESOURCE AREA

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

4-220 SOIL TYPE BOUNDARY

100' BUFFER ZONE

4-219 WETLAND BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

43A SCARBORO MUCKY SAND (D)

73A WHITMAN FINE SANDY LOAM (D)

306B PAXTON FINE SANDY LOAM (C)

602 URBAN LAND

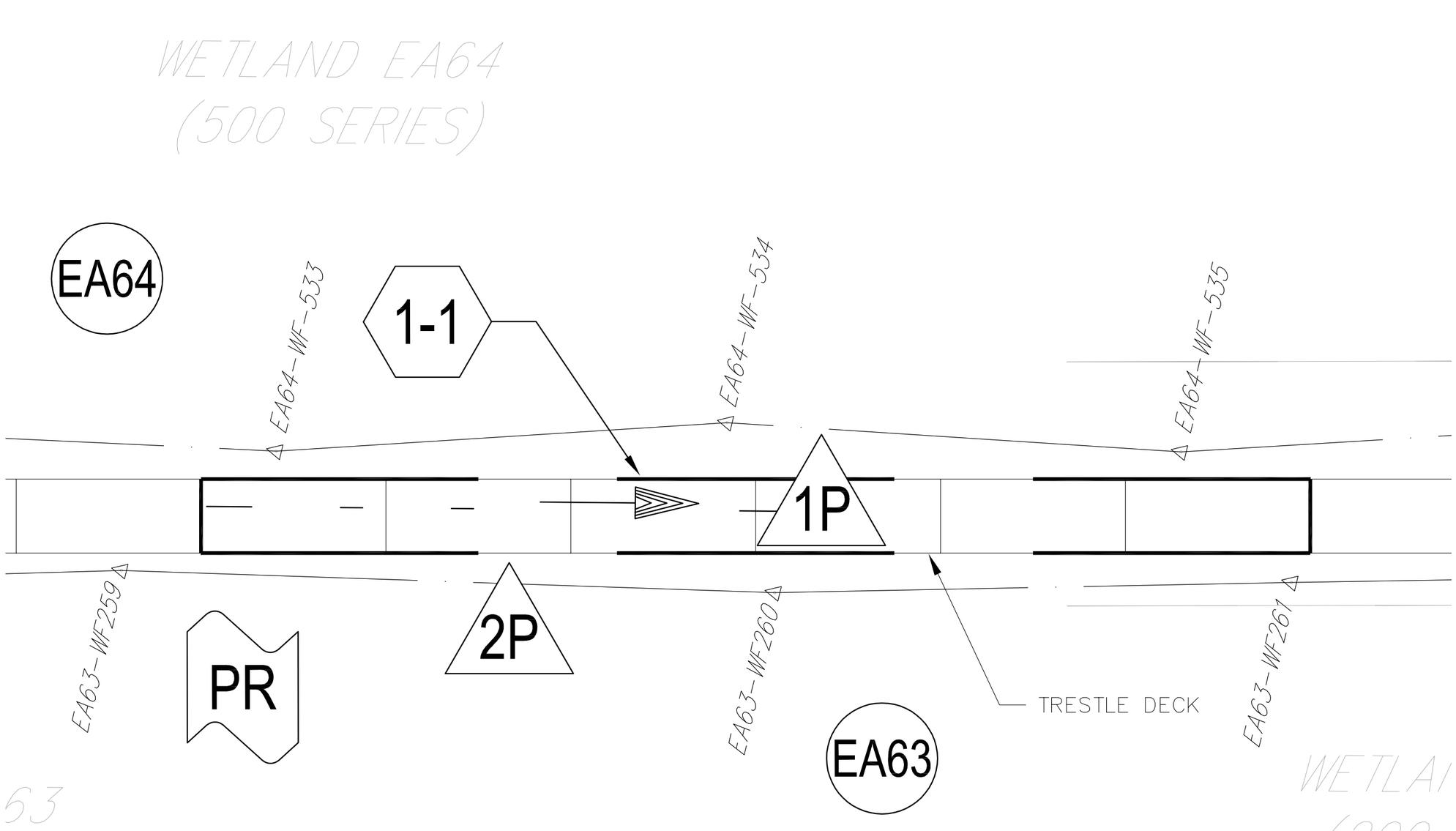
705B CHARLTON-PAXTON FINE SANDY LOAM (B)

Vanasse Hangen Brustlin, Inc.

Figure 3 May 2012

Existing Conditions Drainage Areas

Hockomock Swamp Trestle
Easton & Raynham, Massachusetts



LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — STORAGE/INFILTRATION AREA
- 1 — DESIGN POINT
- 1 — WETLAND RESOURCE AREA
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- 100' BUFFER ZONE
- 4–220 4–219 — WETLAND BOUNDARY

0 15 30 Feet

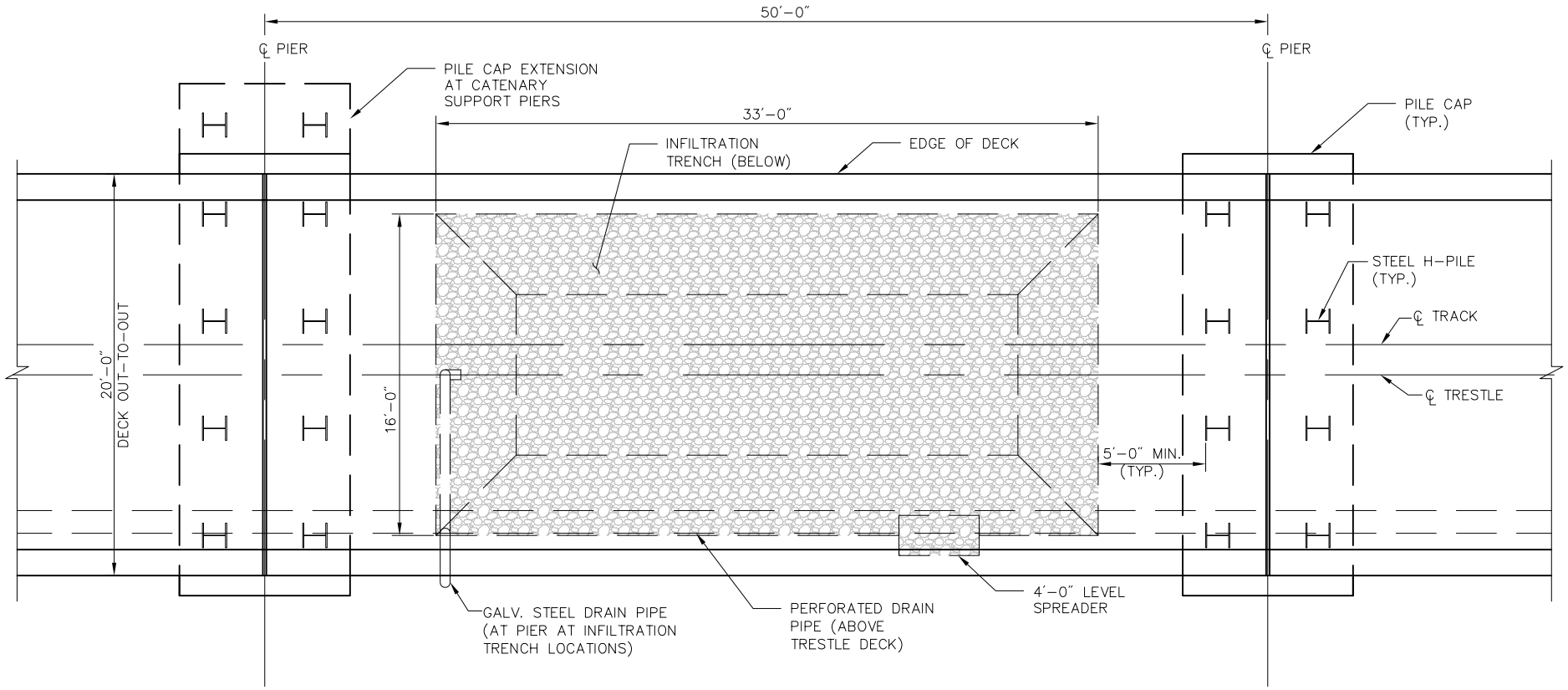
Vanasse Hangen Brustlin, Inc.

Figure 4 May 2012

Proposed Conditions Drainage Areas

Hockomock Swamp Trestle
Easton & Raynham, Massachusetts

\\MABOSDATA\projects\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Figures\Hockomock Trestle.dwg Printing Date: 6/18/2012 8:17 AM



PLAN

SCALE: $\frac{1}{8}$" = 1'-0"

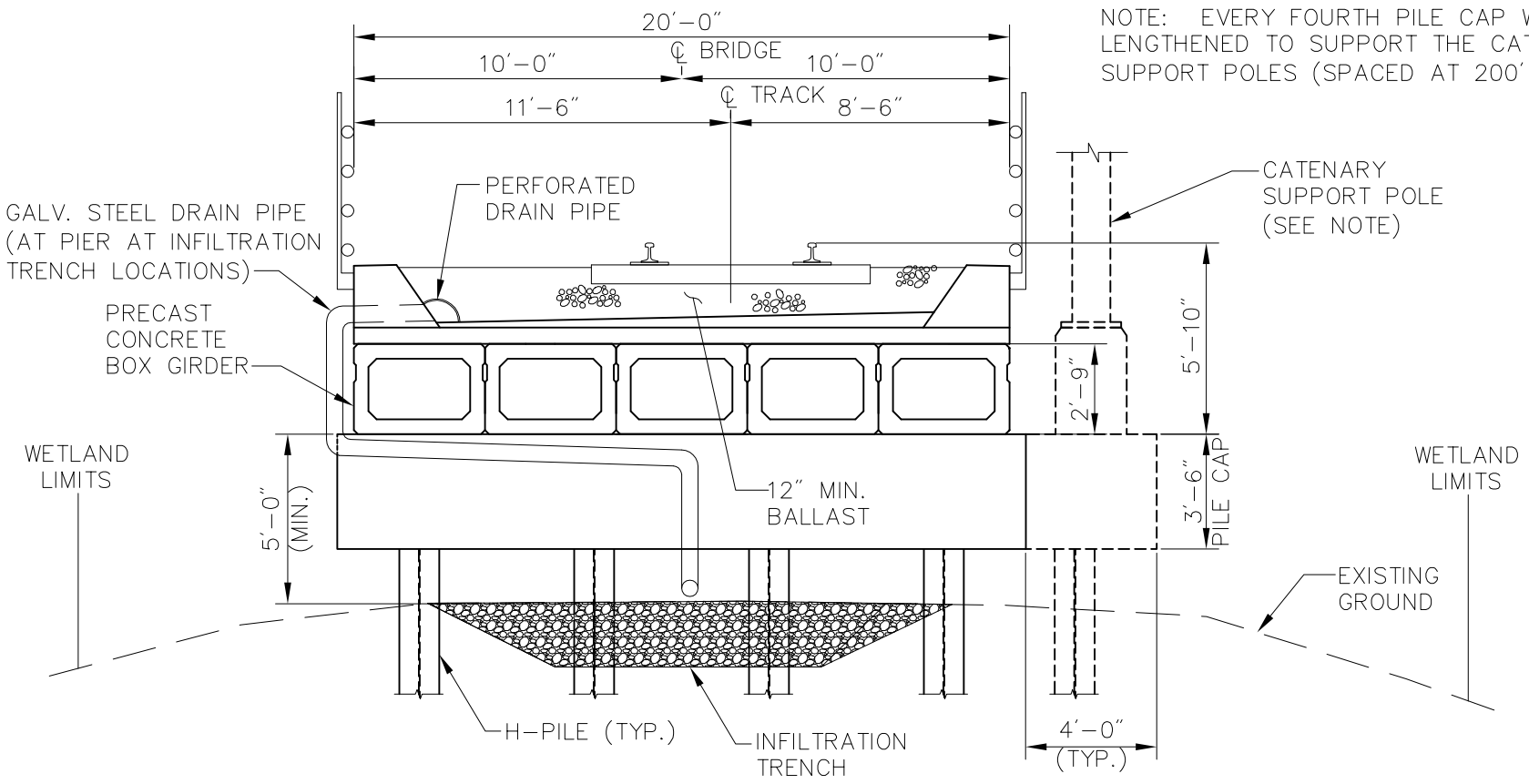
Figure 5

Trestle Through Hockomock Swamp

Typical Plan

Prepared by: VHB

\\MABOSDATA\projects\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Figures\Hockomock Trestle.dwg Printing Date: 6/18/2012 8:19 AM



TYPICAL CROSS SECTION AT PIER

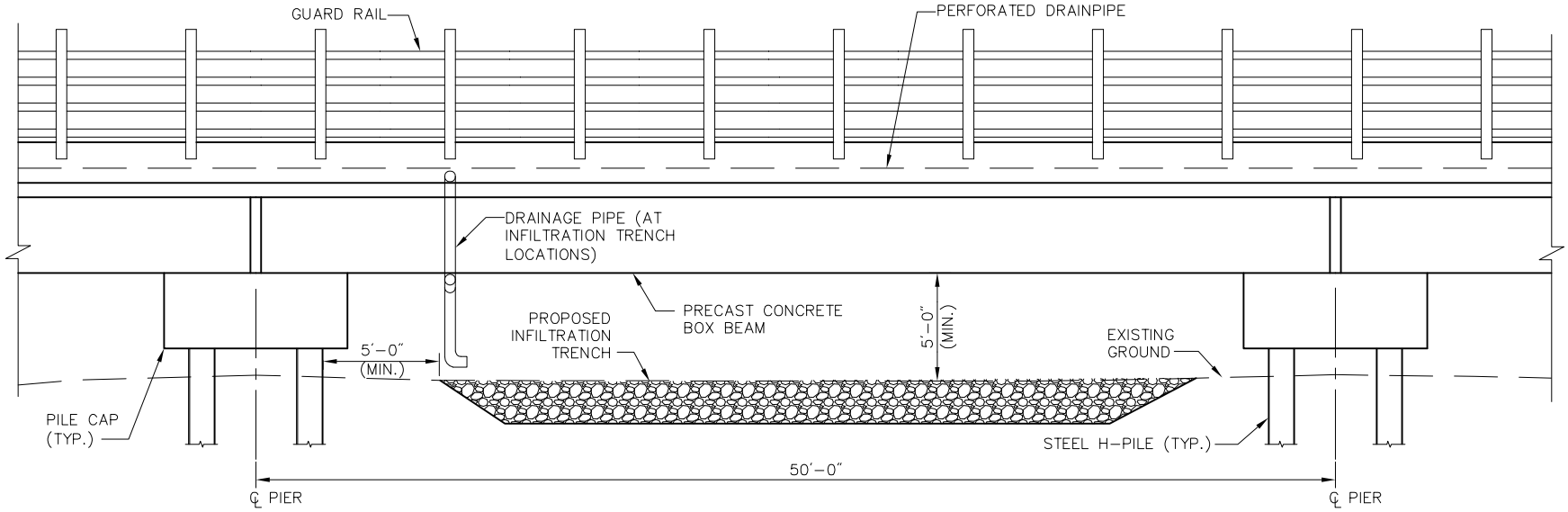
SCALE: 1/8" = 1-0'

Figure 6

Trestle Through Hockomock Swamp
Typical Section

Prepared by: VHB

\\mabos\projects\10111.00\cad\ststudy\Hockomock Trestle.dwg Printing Date: 6/5/2012 11:19 AM



ELEVATION

SCALE: $\frac{1}{8}$" = 1'-0"

FIGURE 7
TRESTLE THROUGH HOCKOMOCK SWAMP

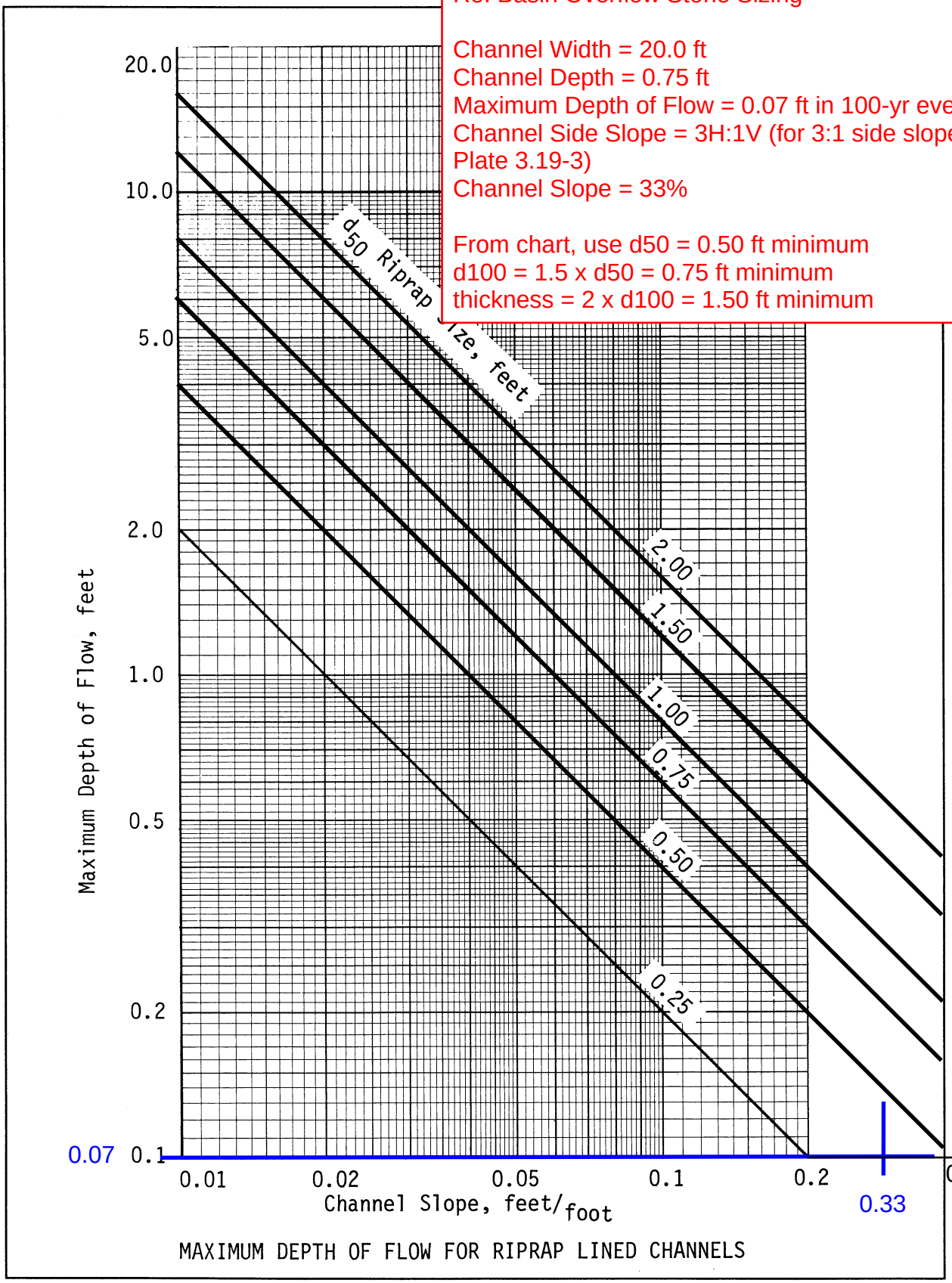
TYPICAL ELEVATION
SOURCE
PREPAREDBY VHB

Appendix A
Standard 1 Computations and Supporting Information

Project No: 10111 Project Name: SCR
Date: June 2012 Location: Easton, MA
Calculated By: EJM
Re: Basin Overflow Stone Sizing

Channel Width = 20.0 ft
Channel Depth = 0.75 ft
Maximum Depth of Flow = 0.07 ft in 100-yr event
Channel Side Slope = 3H:1V (for 3:1 side slope, use Plate 3.19-3)
Channel Slope = 33%

From chart, use d50 = 0.50 ft minimum
d100 = 1.5 x d50 = 0.75 ft minimum
thickness = 2 x d100 = 1.50 ft minimum



Source: VDOT Drainage Manual Plate 3.19-3

*Sizing calculations represent minimum stone size. Larger stone may be required per detail plans.

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Map

234524 M

JOINS PANEL 0152

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0064F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 64 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EASTON, TOWN OF	250053	0064	F

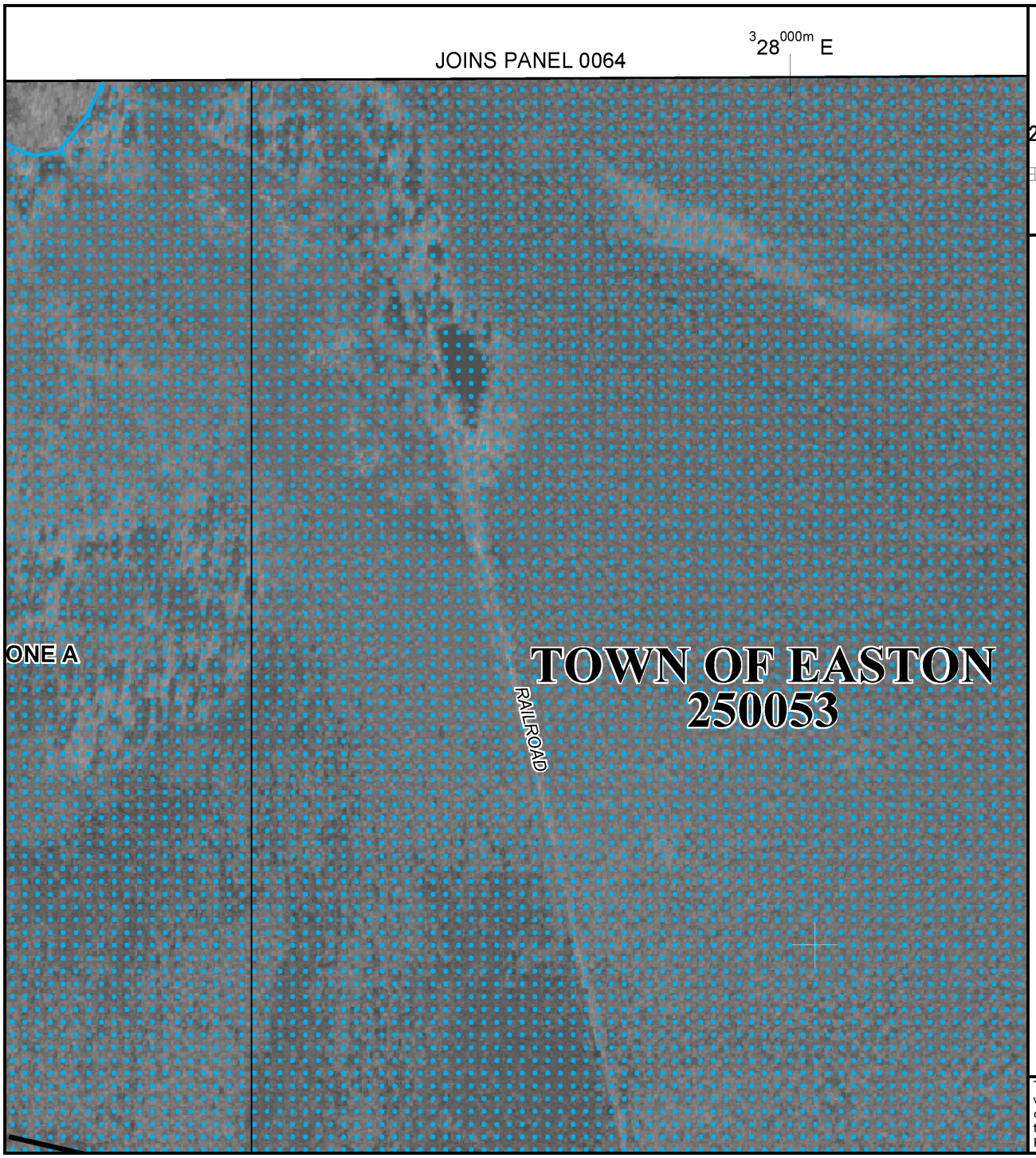
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0064F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0152F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 152 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EASTON, TOWN OF	250053	0152	F
RAYNHAM, TOWN OF	250061	0152	F
TAUNTON, CITY OF	250066	0152	F

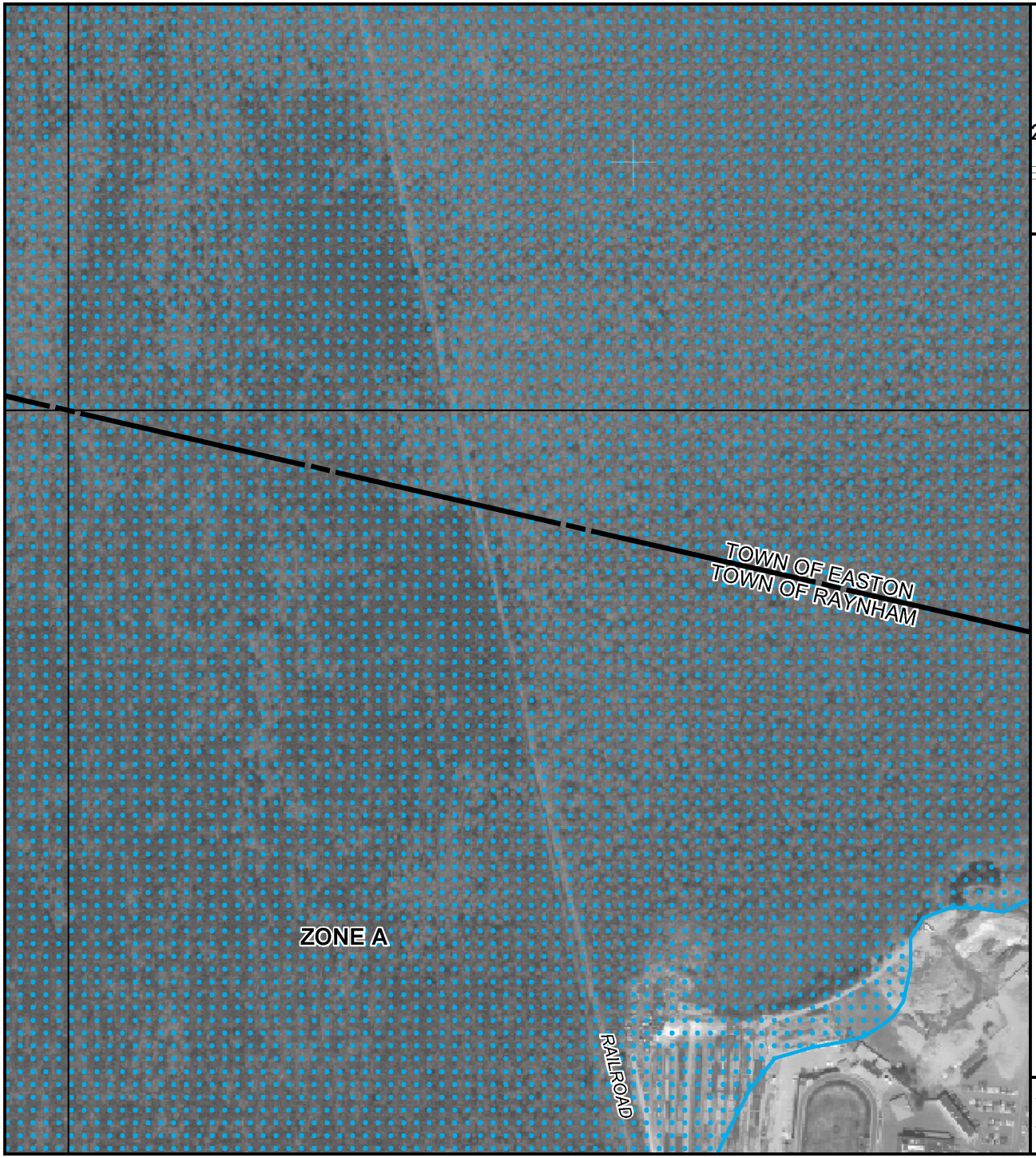
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0152F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0152F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 152 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EASTON, TOWN OF	250053	0152	F
RAYNHAM, TOWN OF	250061	0152	F
TAUNTON, CITY OF	250066	0152	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

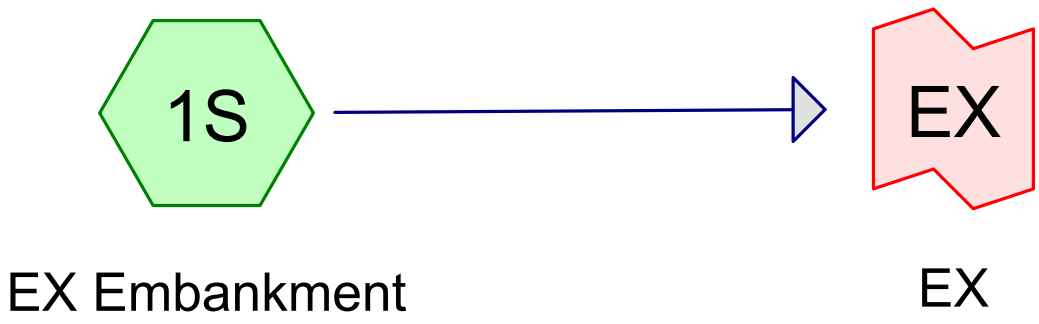
MAP NUMBER
25005C0152F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for TrestleDrainage - 50 ft spans
Prepared by Vanasse Hangen Brustlin, Inc., Printed 6/15/2012
HydroCAD® 10.00 s/n 01234 © 2011 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.138	70	Brush, Fair, HSG C (1S)
0.138	**70**	**TOTAL AREA**

Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX Embankment Runoff Area=6,000 sf 0.00% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=70 Runoff=0.12 cfs 0.010 af

Link EX: EX Inflow=0.12 cfs 0.010 af
Primary=0.12 cfs 0.010 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.010 af Average Runoff Depth = 0.86"
100.00% Pervious = 0.138 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: EX Embankment

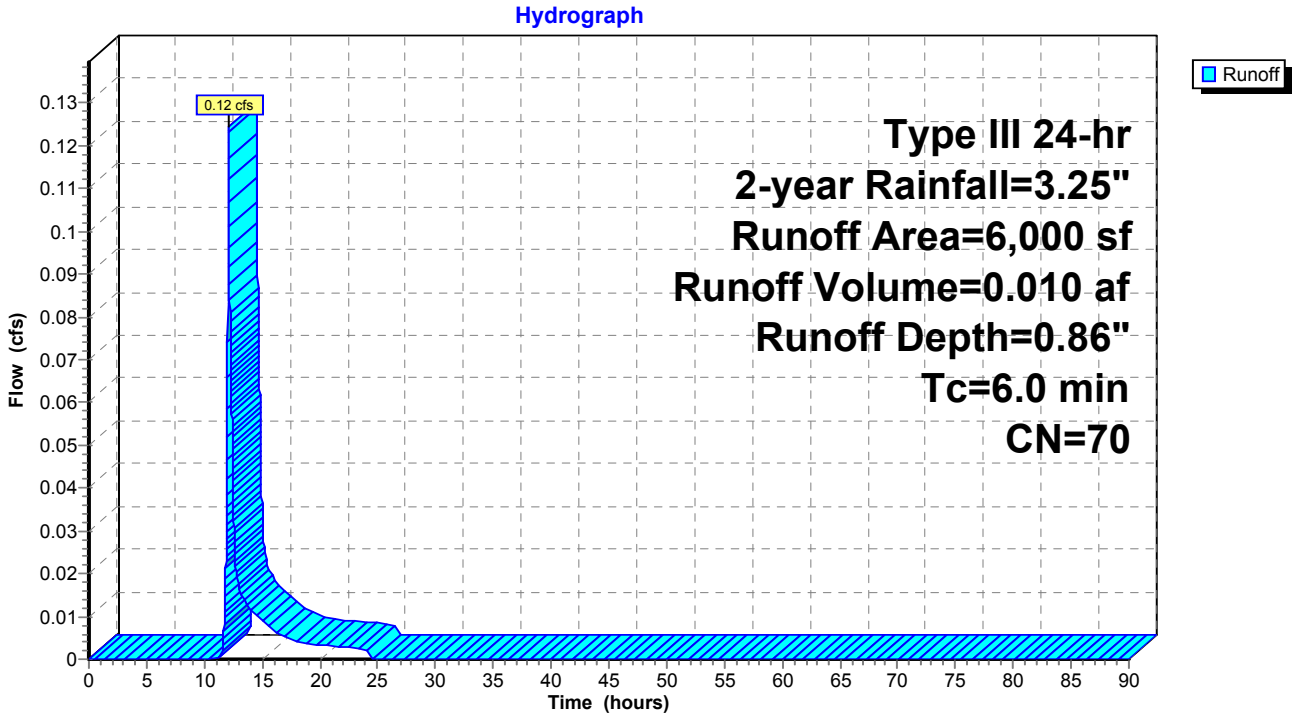
Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
6,000	70	Brush, Fair, HSG C
6,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1S: EX Embankment

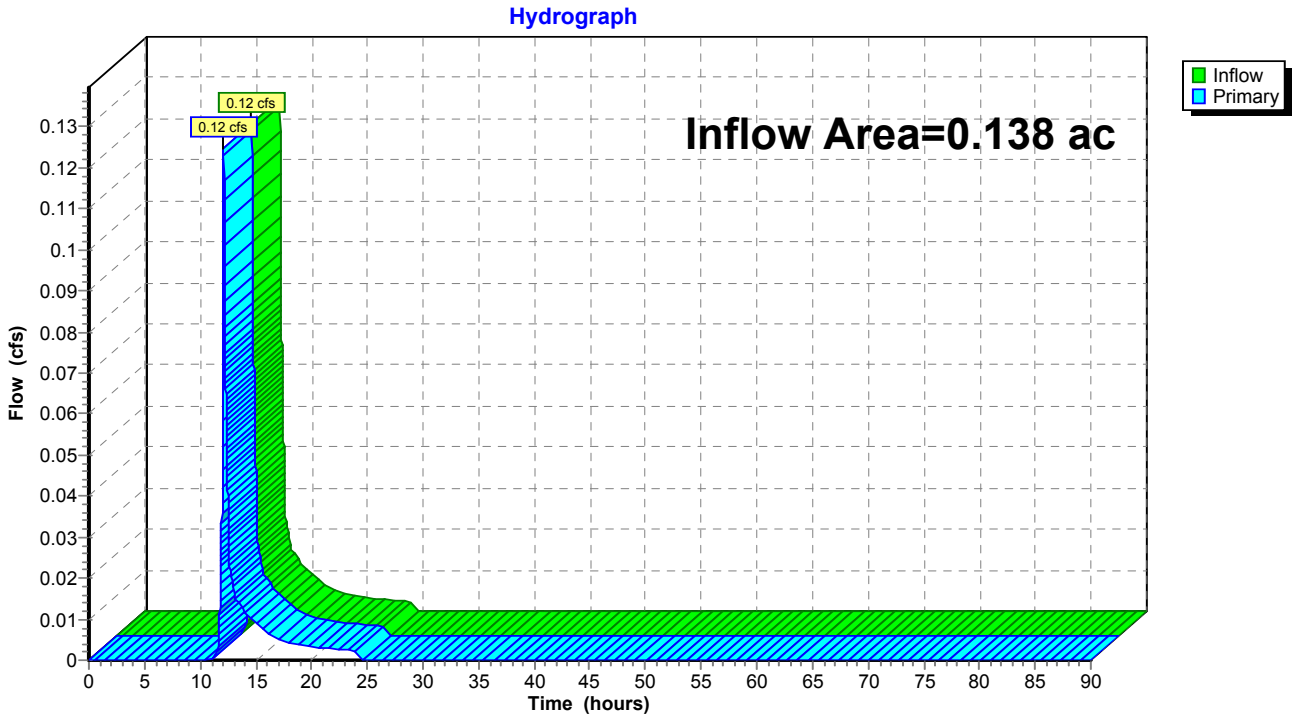


Summary for Link EX: EX

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 0.86" for 2-year event
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 0.010 af
Primary = 0.12 cfs @ 12.10 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link EX: EX



Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX Embankment Runoff Area=6,000 sf 0.00% Impervious Runoff Depth=1.78"
Tc=6.0 min CN=70 Runoff=0.28 cfs 0.020 af

Link EX: EX Inflow=0.28 cfs 0.020 af
Primary=0.28 cfs 0.020 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.020 af Average Runoff Depth = 1.78"
100.00% Pervious = 0.138 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: EX Embankment

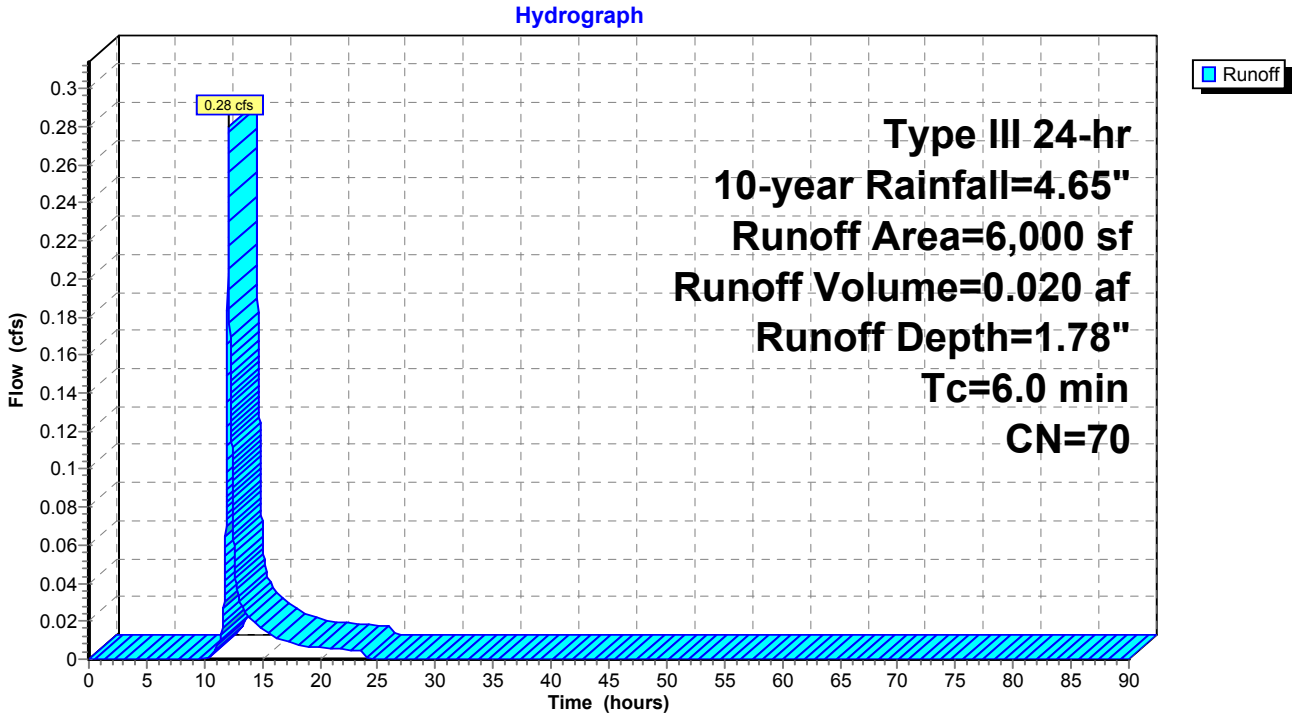
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.65"

Area (sf)	CN	Description
6,000	70	Brush, Fair, HSG C
6,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1S: EX Embankment

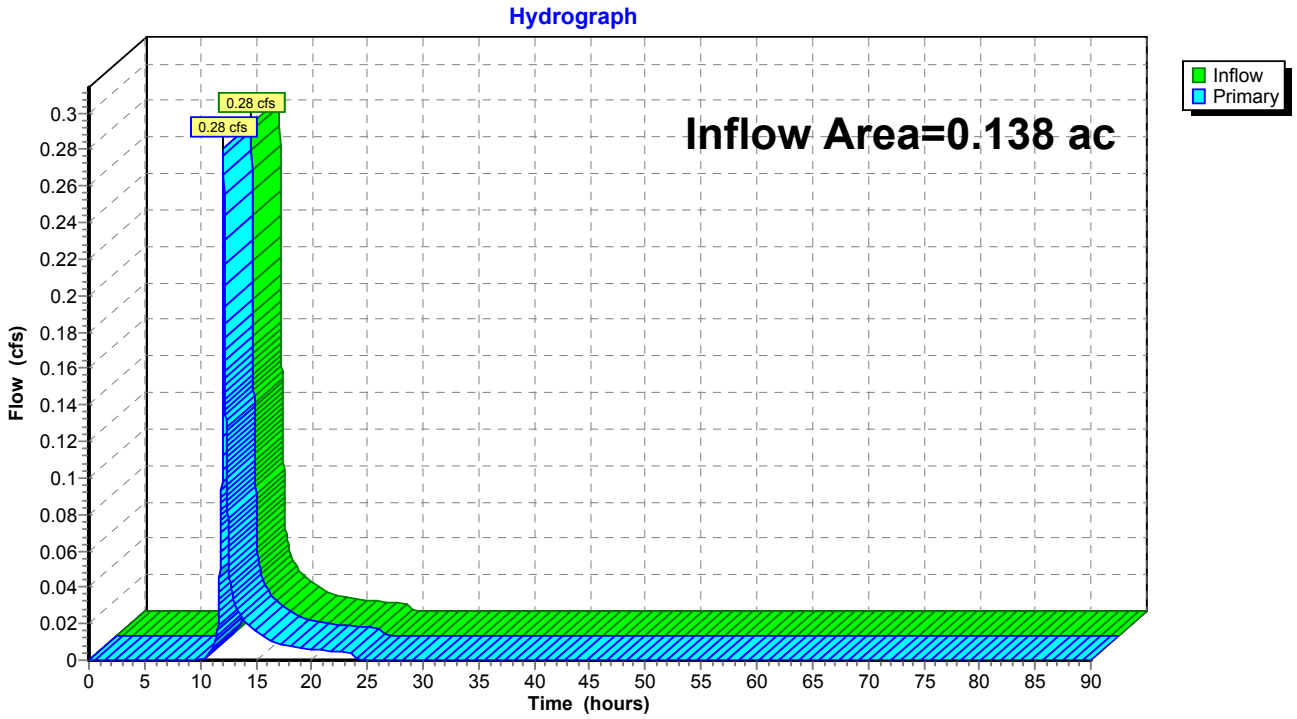


Summary for Link EX: EX

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 1.78" for 10-year event
Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af
Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link EX: EX



Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX Embankment Runoff Area=6,000 sf 0.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=70 Runoff=0.56 cfs 0.040 af

Link EX: EX Inflow=0.56 cfs 0.040 af
Primary=0.56 cfs 0.040 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.040 af Average Runoff Depth = 3.45"
100.00% Pervious = 0.138 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: EX Embankment

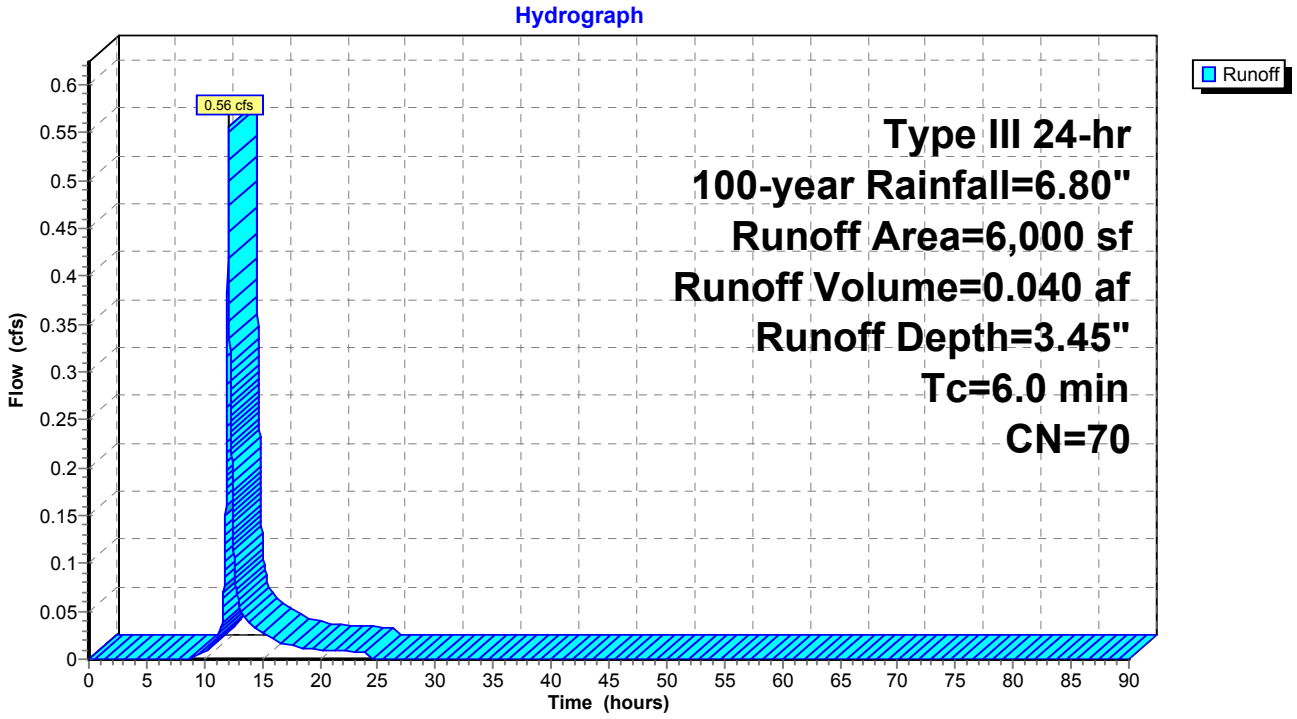
Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=6.80"

Area (sf)	CN	Description
6,000	70	Brush, Fair, HSG C
6,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1S: EX Embankment

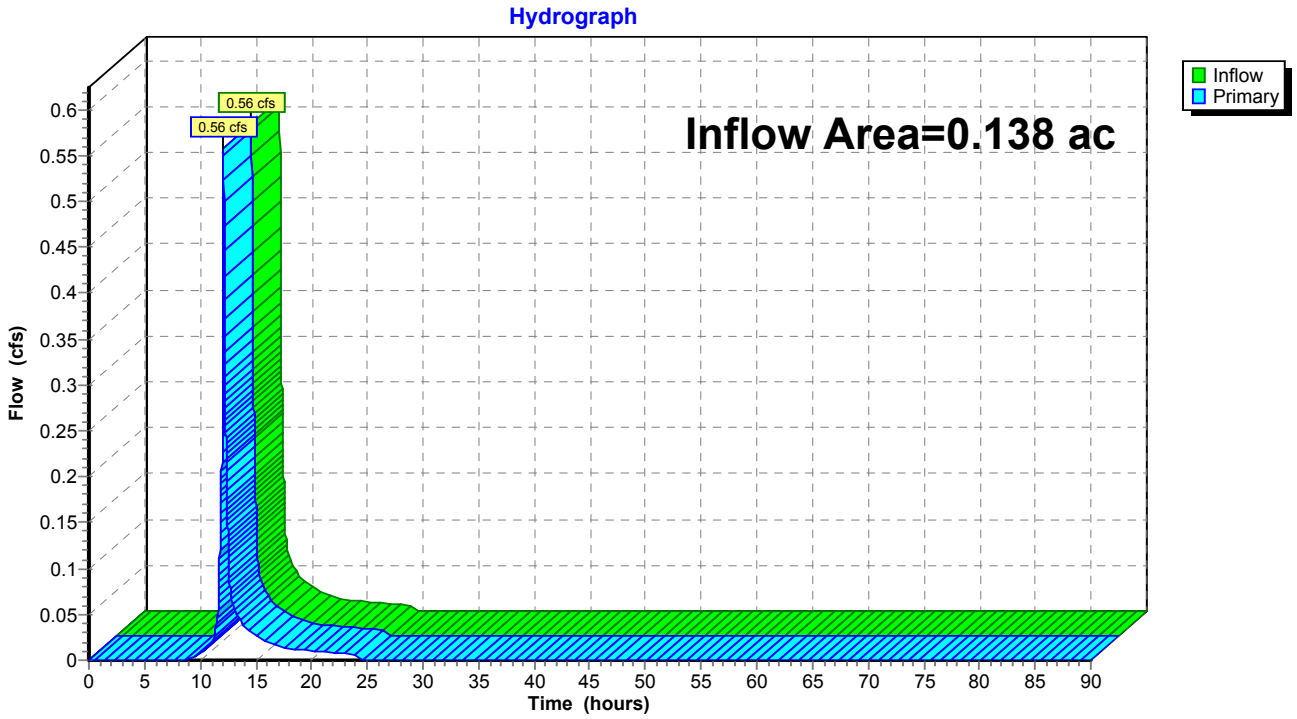


Summary for Link EX: EX

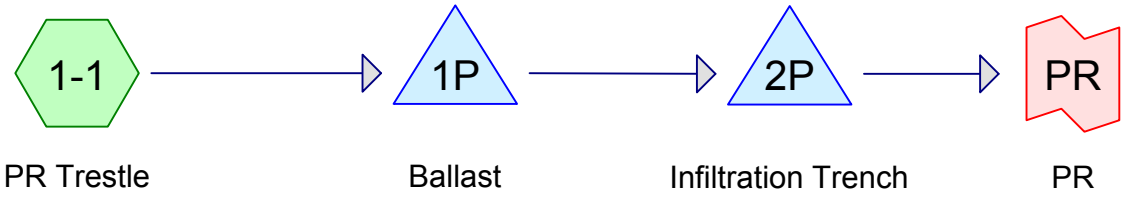
Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 3.45" for 100-year event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link EX: EX



HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for TrestleDrainage - 50 ft spans
Prepared by Vanasse Hangen Brustlin, Inc., Printed 6/15/2012
HydroCAD® 10.00 s/n 01234 © 2011 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.138	98	Unconnected pavement, HSG C (1-1)
0.138	**98**	**TOTAL AREA**

Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-1: PR Trestle Runoff Area=6,000 sf 100.00% Impervious Runoff Depth=3.02"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.035 af

Pond 1P: Ballast Peak Elev=100.28' Storage=892 cf Inflow=0.43 cfs 0.035 af
6.0" Round Culvert n=0.010 L=10.0' S=0.3100 '/' Outflow=0.08 cfs 0.027 af

Pond 2P: Infiltration Trench Peak Elev=92.78' Storage=198 cf Inflow=0.08 cfs 0.027 af
Discarded=0.00 cfs 0.010 af Primary=0.07 cfs 0.018 af Outflow=0.07 cfs 0.027 af

Link PR: PR Inflow=0.07 cfs 0.018 af
Primary=0.07 cfs 0.018 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.035 af Average Runoff Depth = 3.02"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.138 ac

Summary for Subcatchment 1-1: PR Trestle

Assumes that six spans (50 ft long x 20 ft wide) drain to a single discharge point.

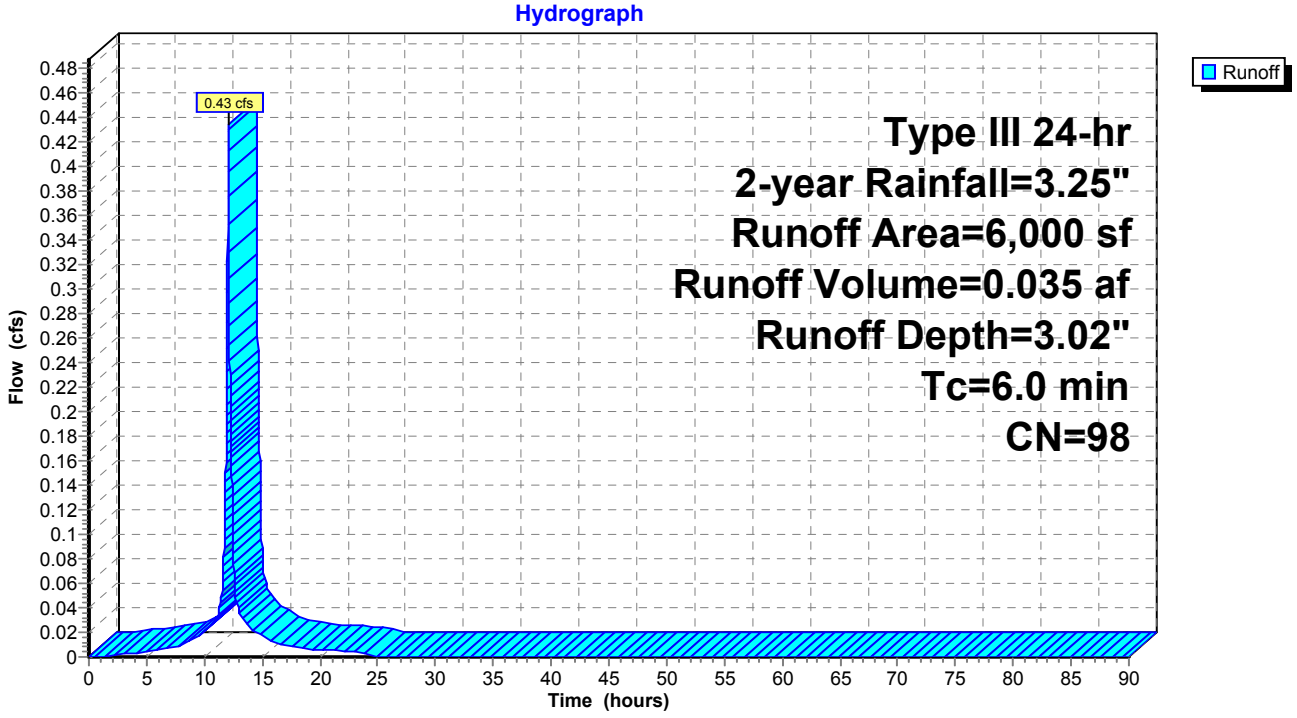
Runoff = 0.43 cfs @ 12.08 hrs, Volume= 0.035 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
6,000	98	Unconnected pavement, HSG C
6,000		100.00% Impervious Area
6,000		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1-1: PR Trestle



Summary for Pond 1P: Ballast

Storage within the ballast on top of the trestle. Assumes that perforated pipe accepts all flow and that orifice to 6-inch downspout is only restriction.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 3.02" for 2-year event
Inflow = 0.43 cfs @ 12.08 hrs, Volume= 0.035 af
Outflow = 0.08 cfs @ 12.54 hrs, Volume= 0.027 af, Atten= 83%, Lag= 27.1 min
Primary = 0.08 cfs @ 12.54 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Peak Elev= 100.28' @ 12.54 hrs Surf.Area= 3,320 sf Storage= 892 cf

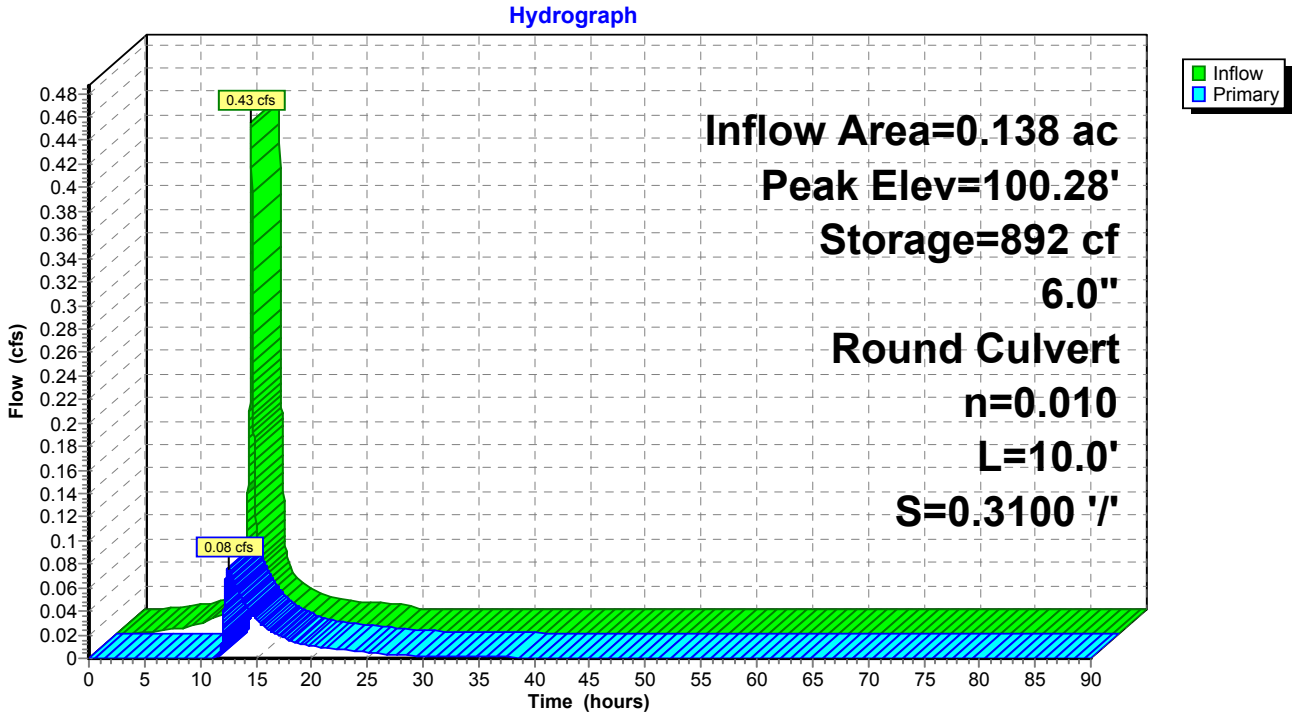
Plug-Flow detention time= 404.4 min calculated for 0.027 af (79% of inflow)
Center-of-Mass det. time= 326.6 min (1,082.7 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	3,391 cf	**10.30'W x 300.00'L x 1.00'H Prismatoid Z=1.3** 3,496 cf Overall - 105 cf Embedded = 3,391 cf
#2	100.10'	59 cf	**6.0" D x 300.0'L Pipe Storage** Inside #1 105 cf Overall - 1.0" Wall Thickness = 59 cf
		3,450 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	**6.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.10' / 97.00' S= 0.3100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.08 cfs @ 12.54 hrs HW=100.28' (Free Discharge)
1=Culvert (Inlet Controls 0.08 cfs @ 1.15 fps)

Pond 1P: Ballast



Summary for Pond 2P: Infiltration Trench

Infiltration trench receives flow from six segments of trestle. Exfiltration assumed from floor of trench, overflows via level spreader from mid-size storms and from both sides of trench for flood events.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth > 2.39" for 2-year event
Inflow = 0.08 cfs @ 12.54 hrs, Volume= 0.027 af
Outflow = 0.07 cfs @ 12.97 hrs, Volume= 0.027 af, Atten= 11%, Lag= 26.1 min
Discarded = 0.00 cfs @ 12.97 hrs, Volume= 0.010 af
Primary = 0.07 cfs @ 12.97 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 92.78' @ 12.97 hrs Surf.Area= 401 sf Storage= 198 cf

Plug-Flow detention time= 326.7 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 326.4 min (1,409.1 - 1,082.7)

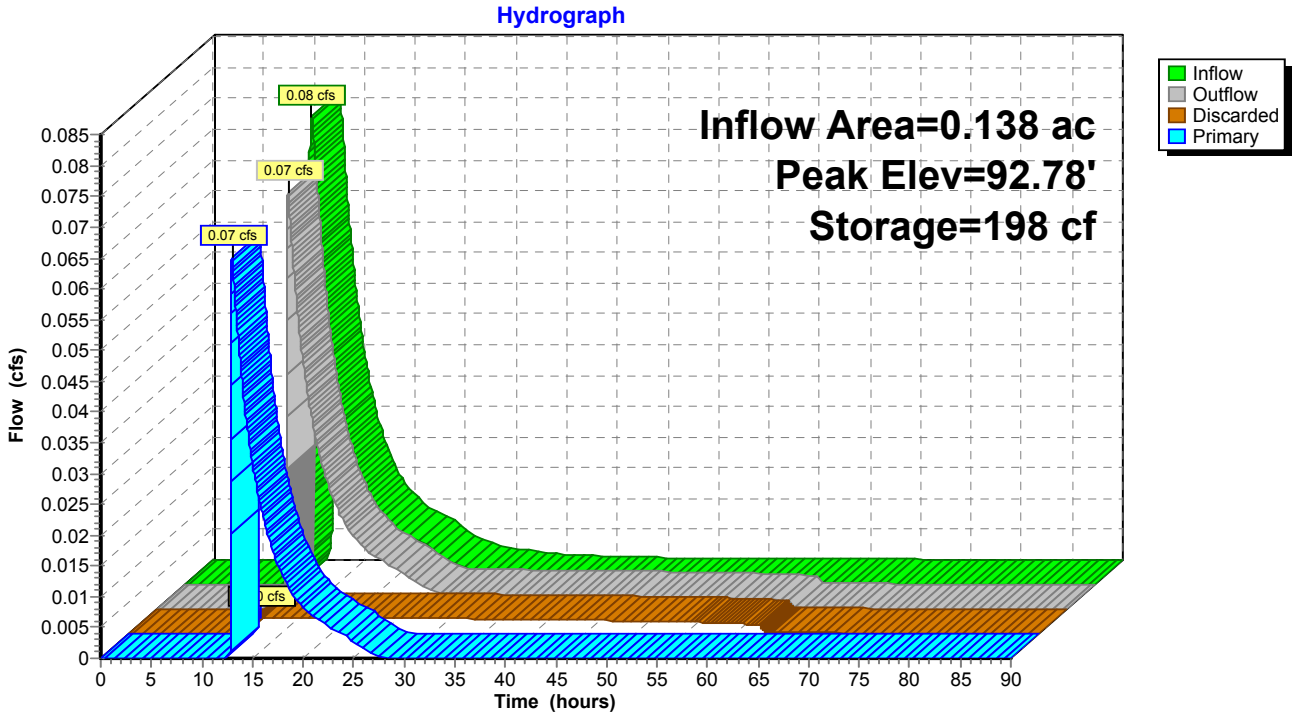
Volume	Invert	Avail.Storage	Storage Description
#1	91.75'	81 cf	**8.00'W x 29.00'L x 2.00'H Prismatoid Z=2.0** 803 cf Overall - 533 cf Embedded = 270 cf x 30.0% Voids
#2	92.25'	533 cf	**8.00'W x 29.00'L x 1.50'H Prismatoid Z=2.0**Inside #1
		614 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	91.75'	**0.270 in/hr Exfiltration over Horizontal area**
#2	Primary	92.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	93.00'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir X 2.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.97 hrs HW=92.78' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 12.97 hrs HW=92.78' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.55 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Infiltration Trench

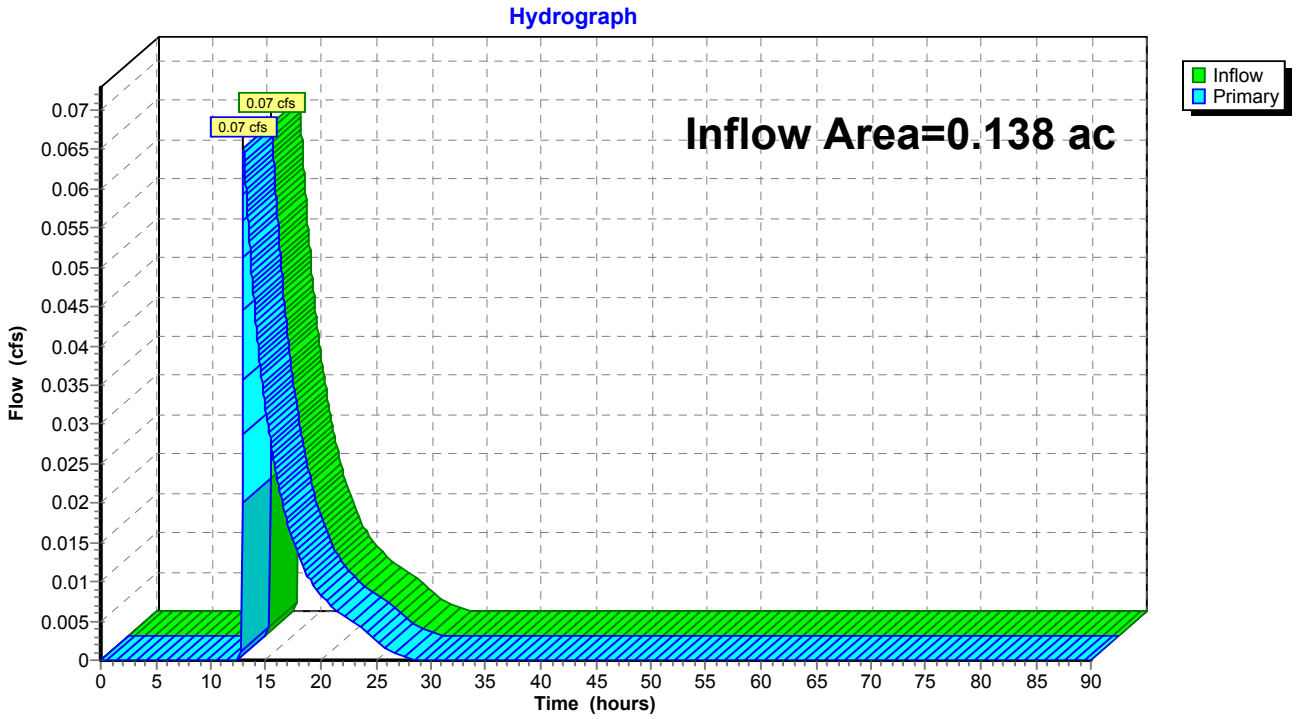


Summary for Link PR: PR

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 1.54" for 2-year event
Inflow = 0.07 cfs @ 12.97 hrs, Volume= 0.018 af
Primary = 0.07 cfs @ 12.97 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link PR: PR



Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-1: PR Trestle Runoff Area=6,000 sf 100.00% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=98 Runoff=0.63 cfs 0.051 af

Pond 1P: Ballast Peak Elev=100.37' Storage=1,183 cf Inflow=0.63 cfs 0.051 af
6.0" Round Culvert n=0.010 L=10.0' S=0.3100 '/' Outflow=0.15 cfs 0.043 af

Pond 2P: Infiltration Trench Peak Elev=92.80' Storage=205 cf Inflow=0.15 cfs 0.043 af
Discarded=0.00 cfs 0.010 af Primary=0.15 cfs 0.033 af Outflow=0.15 cfs 0.043 af

Link PR: PR Inflow=0.15 cfs 0.033 af
Primary=0.15 cfs 0.033 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.051 af Average Runoff Depth = 4.41"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.138 ac

Summary for Subcatchment 1-1: PR Trestle

Assumes that six spans (50 ft long x 20 ft wide) drain to a single discharge point.

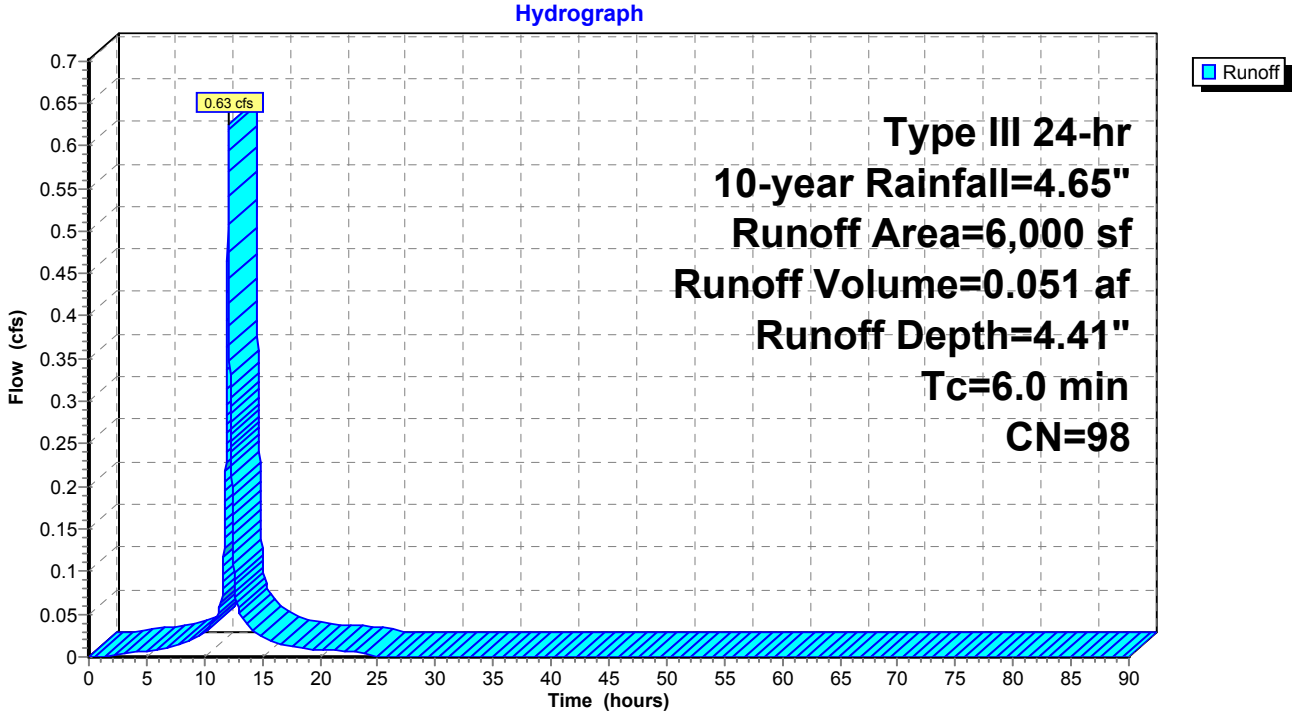
Runoff = 0.63 cfs @ 12.08 hrs, Volume= 0.051 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.65"

Area (sf)	CN	Description
6,000	98	Unconnected pavement, HSG C
6,000		100.00% Impervious Area
6,000		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1-1: PR Trestle



Summary for Pond 1P: Ballast

Storage within the ballast on top of the trestle. Assumes that perforated pipe accepts all flow and that orifice to 6-inch downspout is only restriction.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 4.41" for 10-year event
Inflow = 0.63 cfs @ 12.08 hrs, Volume= 0.051 af
Outflow = 0.15 cfs @ 12.46 hrs, Volume= 0.043 af, Atten= 75%, Lag= 22.4 min
Primary = 0.15 cfs @ 12.46 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Peak Elev= 100.37' @ 12.46 hrs Surf.Area= 3,391 sf Storage= 1,183 cf

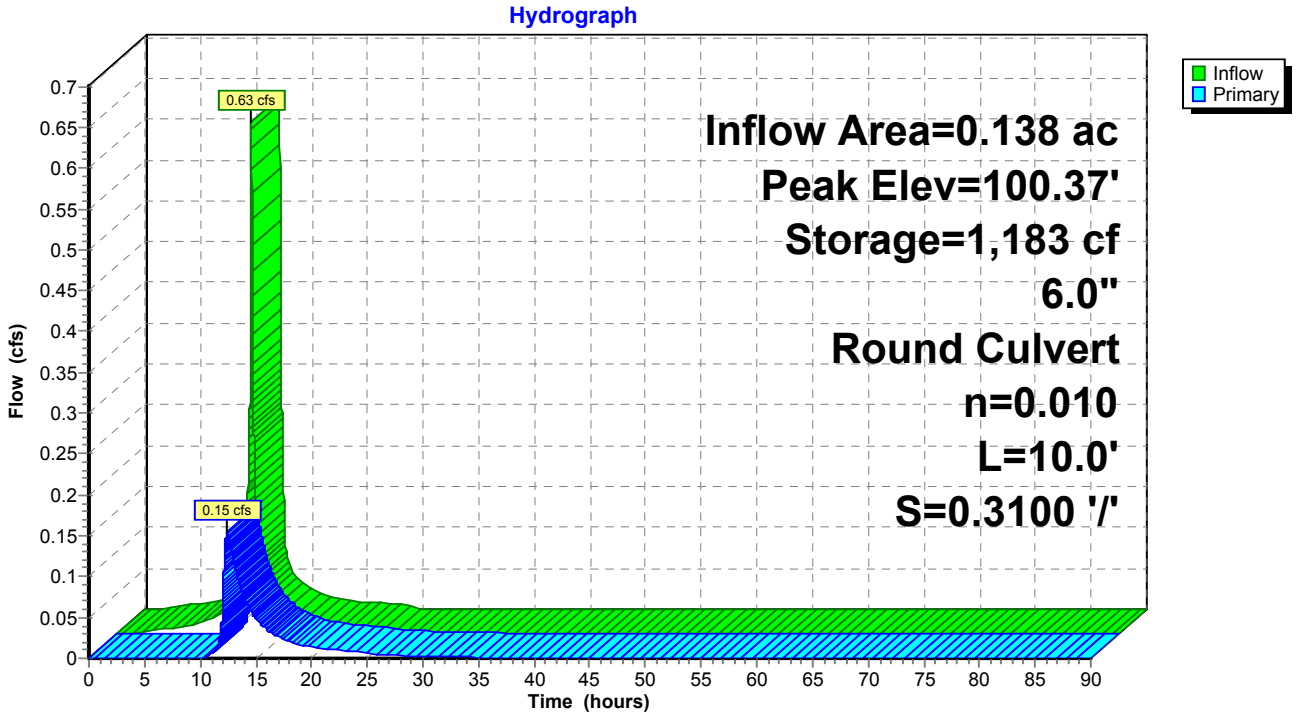
Plug-Flow detention time= 321.6 min calculated for 0.043 af (86% of inflow)
Center-of-Mass det. time= 258.9 min (1,008.2 - 749.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	3,391 cf	**10.30'W x 300.00'L x 1.00'H Prismatoid Z=1.3** 3,496 cf Overall - 105 cf Embedded = 3,391 cf
#2	100.10'	59 cf	**6.0" D x 300.0'L Pipe Storage** Inside #1 105 cf Overall - 1.0" Wall Thickness = 59 cf
		3,450 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	**6.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.10' / 97.00' S= 0.3100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.15 cfs @ 12.46 hrs HW=100.37' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.15 cfs @ 1.40 fps)

Pond 1P: Ballast



Summary for Pond 2P: Infiltration Trench

Infiltration trench receives flow from six segments of trestle. Exfiltration assumed from floor of trench, overflows via level spreader from mid-size storms and from both sides of trench for flood events.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth > 3.78" for 10-year event
Inflow = 0.15 cfs @ 12.46 hrs, Volume= 0.043 af
Outflow = 0.15 cfs @ 12.49 hrs, Volume= 0.043 af, Atten= 0%, Lag= 1.9 min
Discarded = 0.00 cfs @ 12.49 hrs, Volume= 0.010 af
Primary = 0.15 cfs @ 12.49 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 92.80' @ 12.49 hrs Surf.Area= 405 sf Storage= 205 cf

Plug-Flow detention time= 215.2 min calculated for 0.043 af (100% of inflow)
Center-of-Mass det. time= 214.9 min (1,223.1 - 1,008.2)

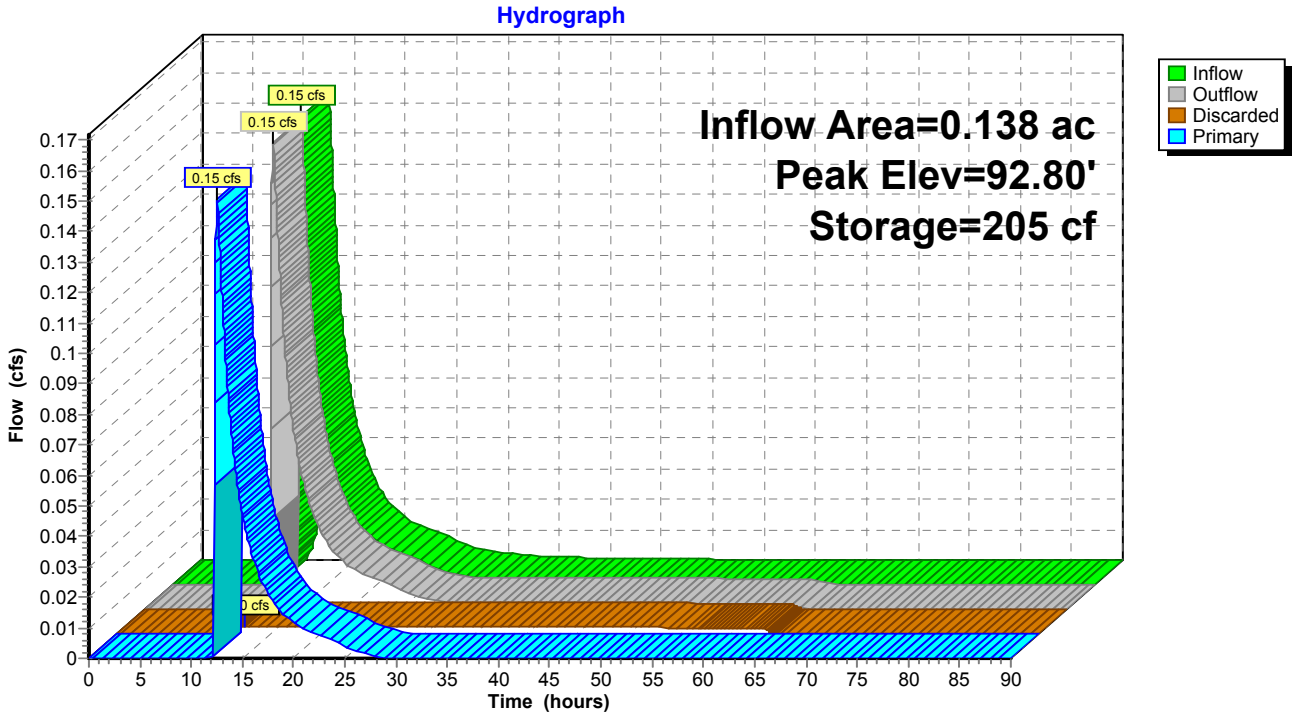
Volume	Invert	Avail.Storage	Storage Description
#1	91.75'	81 cf	**8.00'W x 29.00'L x 2.00'H Prismatoid Z=2.0** 803 cf Overall - 533 cf Embedded = 270 cf x 30.0% Voids
#2	92.25'	533 cf	**8.00'W x 29.00'L x 1.50'H Prismatoid Z=2.0**Inside #1
		614 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	91.75'	**0.270 in/hr Exfiltration over Horizontal area**
#2	Primary	92.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	93.00'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir X 2.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.49 hrs HW=92.80' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.15 cfs @ 12.49 hrs HW=92.80' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.15 cfs @ 0.74 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Infiltration Trench

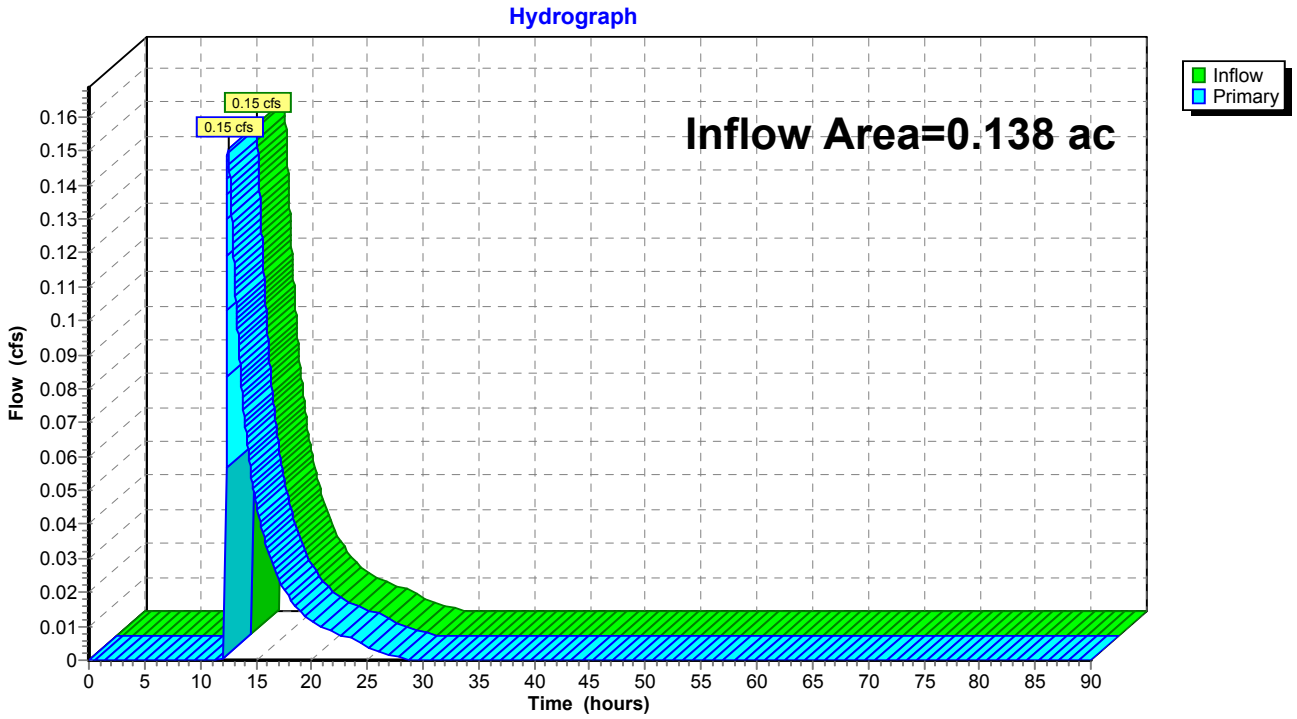


Summary for Link PR: PR

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 2.91" for 10-year event
Inflow = 0.15 cfs @ 12.49 hrs, Volume= 0.033 af
Primary = 0.15 cfs @ 12.49 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link PR: PR



Time span=0.00-90.00 hrs, dt=0.01 hrs, 9001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1-1: PR Trestle Runoff Area=6,000 sf 100.00% Impervious Runoff Depth=6.56"
Tc=6.0 min CN=98 Runoff=0.92 cfs 0.075 af

Pond 1P: Ballast Peak Elev=100.48' Storage=1,553 cf Inflow=0.92 cfs 0.075 af
6.0" Round Culvert n=0.010 L=10.0' S=0.3100 '/' Outflow=0.27 cfs 0.068 af

Pond 2P: Infiltration Trench Peak Elev=92.82' Storage=213 cf Inflow=0.27 cfs 0.068 af
Discarded=0.00 cfs 0.011 af Primary=0.26 cfs 0.058 af Outflow=0.27 cfs 0.068 af

Link PR: PR Inflow=0.26 cfs 0.058 af
Primary=0.26 cfs 0.058 af

Total Runoff Area = 0.138 ac Runoff Volume = 0.075 af Average Runoff Depth = 6.56"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.138 ac

Summary for Subcatchment 1-1: PR Trestle

Assumes that six spans (50 ft long x 20 ft wide) drain to a single discharge point.

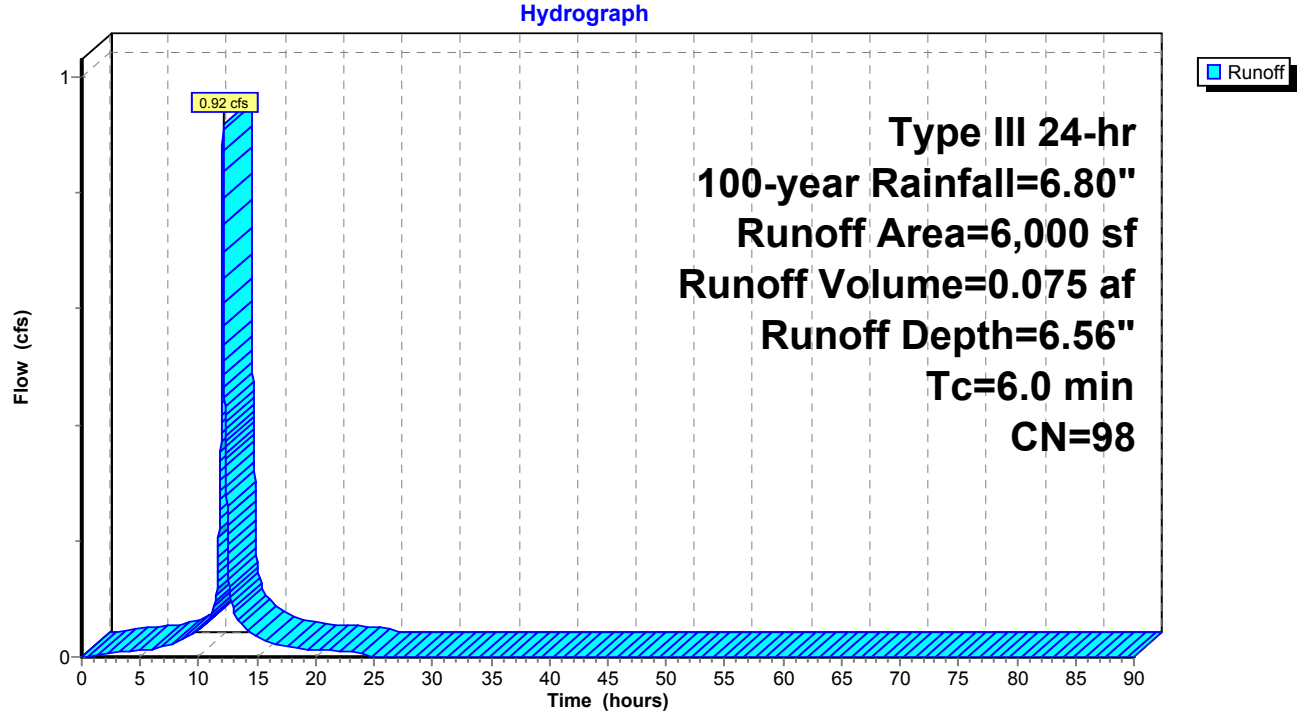
Runoff = 0.92 cfs @ 12.08 hrs, Volume= 0.075 af, Depth= 6.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=6.80"

Area (sf)	CN	Description
6,000	98	Unconnected pavement, HSG C
6,000		100.00% Impervious Area
6,000		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct entry**

Subcatchment 1-1: PR Trestle



Summary for Pond 1P: Ballast

Storage within the ballast on top of the trestle. Assumes that perforated pipe accepts all flow and that orifice to 6-inch downspout is only restriction.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 6.56" for 100-year event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.075 af
Outflow = 0.27 cfs @ 12.41 hrs, Volume= 0.068 af, Atten= 71%, Lag= 19.4 min
Primary = 0.27 cfs @ 12.41 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs
Peak Elev= 100.48' @ 12.41 hrs Surf.Area= 3,480 sf Storage= 1,553 cf

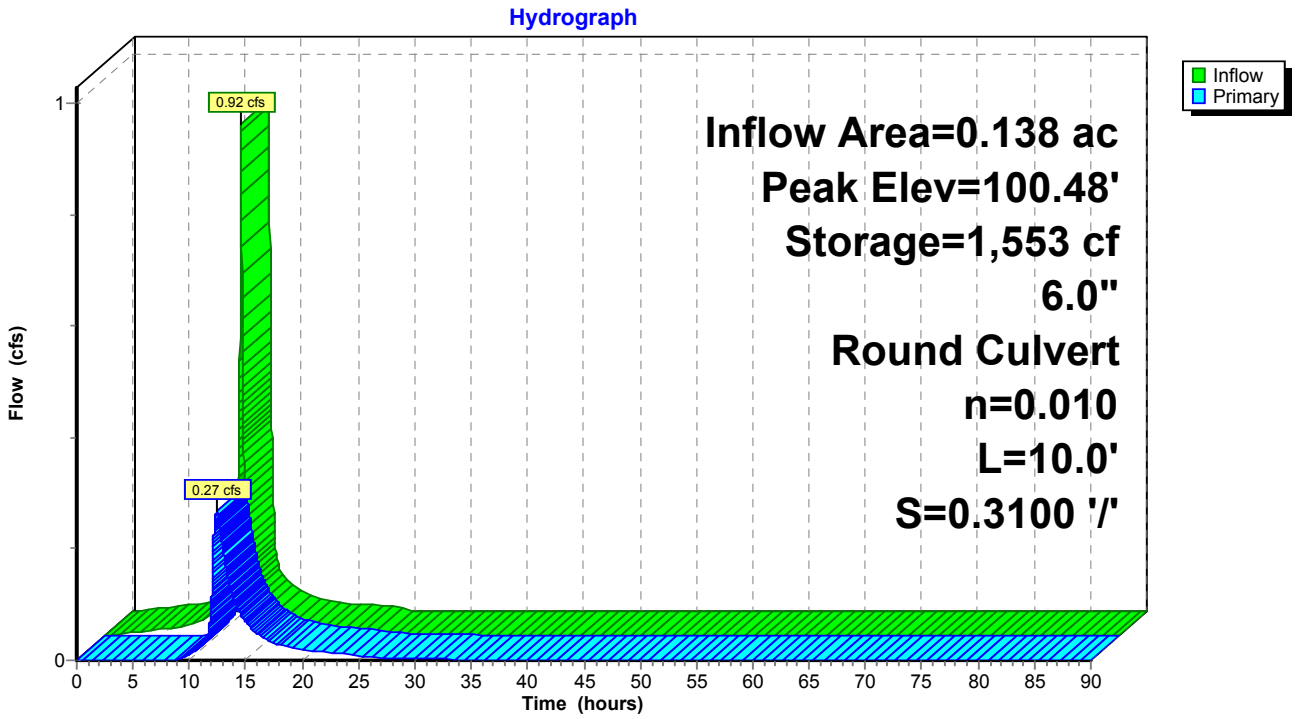
Plug-Flow detention time= 257.3 min calculated for 0.068 af (90% of inflow)
Center-of-Mass det. time= 208.9 min (952.2 - 743.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	3,391 cf	**10.30'W x 300.00'L x 1.00'H Prismatoid Z=1.3** 3,496 cf Overall - 105 cf Embedded = 3,391 cf
#2	100.10'	59 cf	**6.0" D x 300.0'L Pipe Storage** Inside #1 105 cf Overall - 1.0" Wall Thickness = 59 cf
		3,450 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	**6.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.10' / 97.00' S= 0.3100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.27 cfs @ 12.41 hrs HW=100.48' (Free Discharge)
1=Culvert (Inlet Controls 0.27 cfs @ 1.66 fps)

Pond 1P: Ballast



Summary for Pond 2P: Infiltration Trench

Infiltration trench receives flow from six segments of trestle. Exfiltration assumed from floor of trench, overflows via level spreader from mid-size storms and from both sides of trench for flood events.

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth > 5.93" for 100-year event
Inflow = 0.27 cfs @ 12.41 hrs, Volume= 0.068 af
Outflow = 0.27 cfs @ 12.43 hrs, Volume= 0.068 af, Atten= 0%, Lag= 1.1 min
Discarded = 0.00 cfs @ 12.43 hrs, Volume= 0.011 af
Primary = 0.26 cfs @ 12.43 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 92.82' @ 12.43 hrs Surf.Area= 409 sf Storage= 213 cf

Plug-Flow detention time= 144.7 min calculated for 0.068 af (100% of inflow)
Center-of-Mass det. time= 144.6 min (1,096.8 - 952.2)

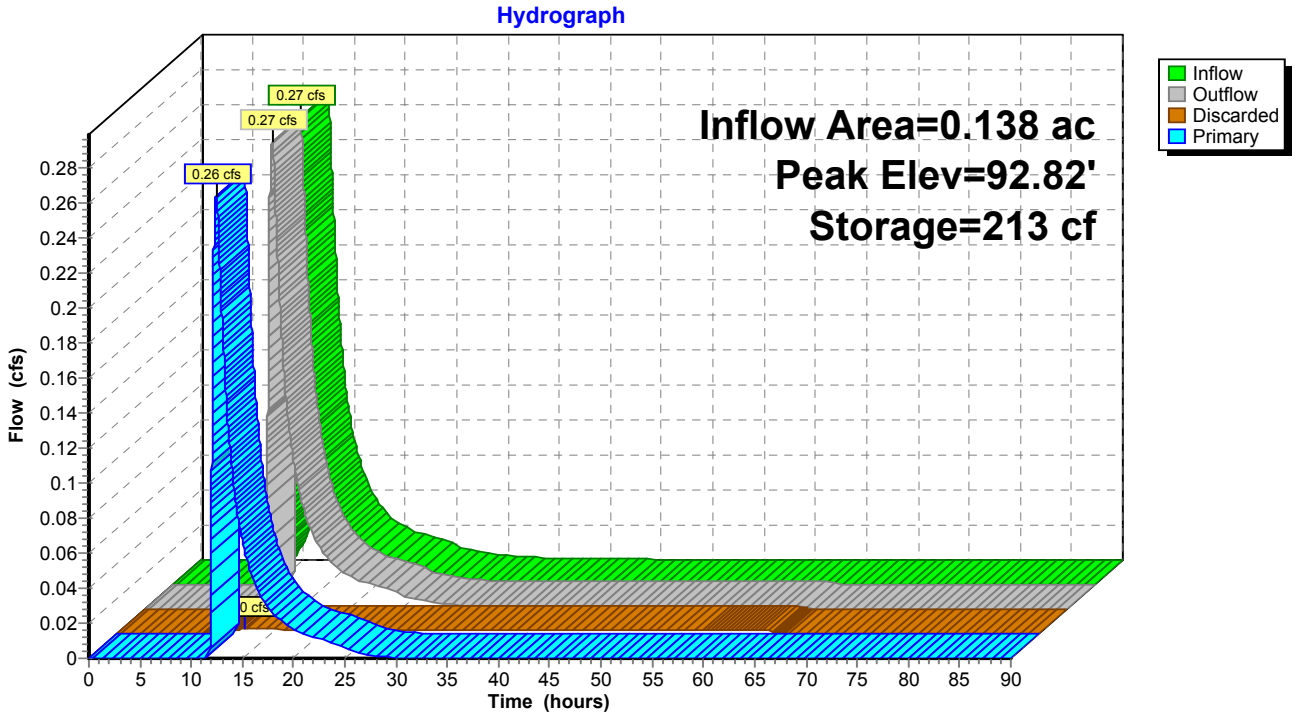
Volume	Invert	Avail.Storage	Storage Description
#1	91.75'	81 cf	**8.00'W x 29.00'L x 2.00'H Prismatoid Z=2.0** 803 cf Overall - 533 cf Embedded = 270 cf x 30.0% Voids
#2	92.25'	533 cf	**8.00'W x 29.00'L x 1.50'H Prismatoid Z=2.0**Inside #1
		614 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	91.75'	**0.270 in/hr Exfiltration over Horizontal area**
#2	Primary	92.75'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	93.00'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir X 2.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 12.43 hrs HW=92.82' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.26 cfs @ 12.43 hrs HW=92.82' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.89 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Infiltration Trench

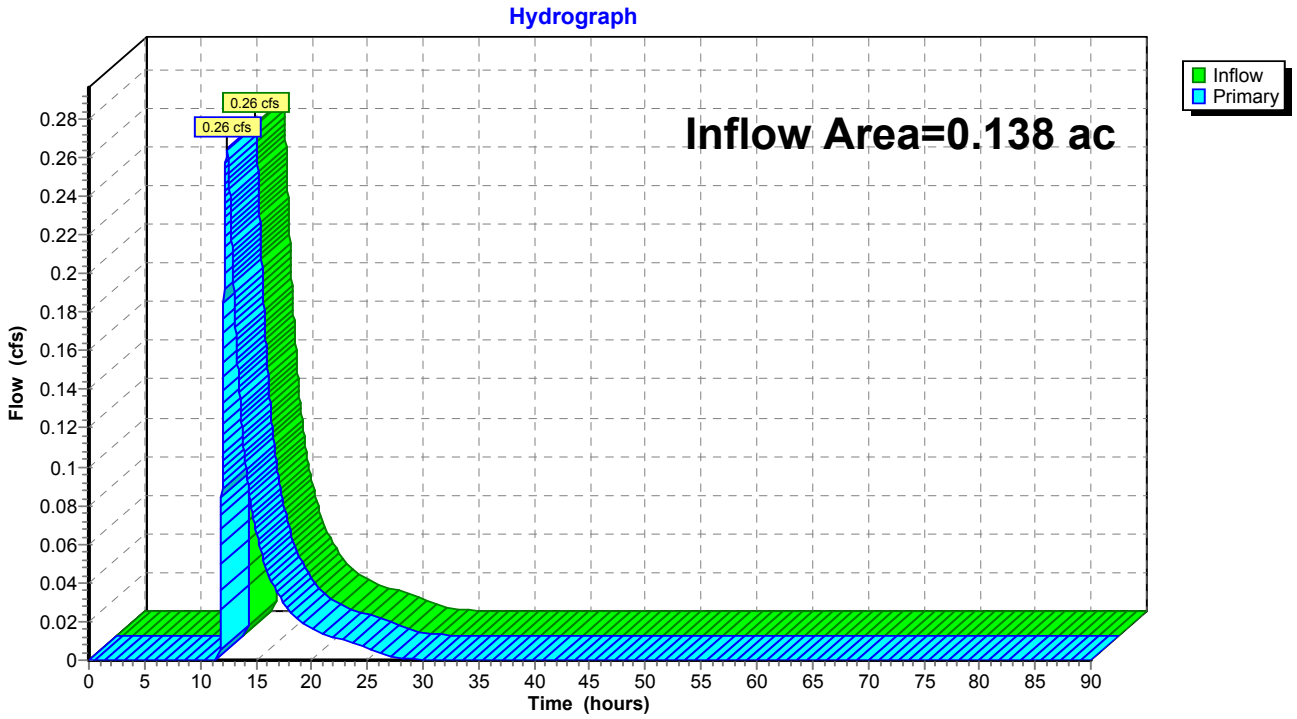


Summary for Link PR: PR

Inflow Area = 0.138 ac,100.00% Impervious, Inflow Depth = 5.01" for 100-year event
Inflow = 0.26 cfs @ 12.43 hrs, Volume= 0.058 af
Primary = 0.26 cfs @ 12.43 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-90.00 hrs, dt= 0.01 hrs

Link PR: PR



Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis

Hydrologic Soil Group—Bristol County, Massachusetts, Northern Part
(Hockomock Trestle)

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:13,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part
Survey Area Data: Version 5, Jul 27, 2010

Date(s) aerial images were photographed: 7/10/2003; 7/31/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Northern Part (MA602)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
1	Water		0.7	0.8%
43A	Scarboro mucky loamy fine sand, 0 to 3 percent slopes	D	1.0	1.1%
52A	Freetown muck, 0 to 1 percent slopes	D	91.3	97.5%
602	Urban land		0.6	0.7%
Totals for Area of Interest			**93.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Hockomock Swamp Trestle **Proj. No.:** 10111.32
Project Location: Easton & Raynham, MA **Date:** 11-Jun-12
Calculated by: RW
Checked by:

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	0.0	0.14	0.0	0.14
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0
TOTAL	**0.0**	**0.0**	**0.14**	**0.0**	**0.14**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	0.0	0.60	0
B	0.0	0.35	0
C	0.14	0.25	127
D	0.0	0.10	0
TOTAL			**127**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Infiltration	254
Total	**254** c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: Hockomock Swamp Trestle **Proj. No.:** 10111.00

Date: 6/12/2012

Project Location: Easton and Raynham, MA **Calculated by:** RW

Stone-Lined Infiltration Trench

Infiltration volumes provided in basin below lowest outlet.
Elevation is based on an arbitrary datum with the top of the trestle being at 100.0.

Basin Volume Below Outlet

Elevation	Incremental Volume (c.f.)*
91.75	59
92.25	195
TOTAL	**254**

* volumes assume 30% void space in 0.5-foot thick stone layer

Assumptions:

Exfiltration Area 348 sq ft

Recharge Rate: 0.17 in/hr** ** 1982 Rawls Rate for sandy clay loam

Drawdown Time: 51.5 hours

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Hockomock Trestle **Proj. No.:** 10111.00
Project Location: Easton & Raynham, MA **Date:** 6/11/2012
Calculated by: RW

Infiltration Trench
(Runoff from Trestle Unit Drainage Area)

Total Impervious Area = 0.14 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	51
0.5" Water Quality Volume	0.5	254
1.0" Water Quality Volume	1	508

Provided:

Infiltration Trench	Elevation	Depth	Cumulative Volume (c.f.)
Storage within stone bedding	91.75	0.50	59
Storage above stone bedding	92.25	0.50	195
Weir elevation	92.75	-	254

NOTE: Infiltration trench does not have sufficient volume to fully treat the 1" WQV. The trestle ballast is drained completely by the underdrain, so no credit is taken for it to provide WQV.

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	Hockomock Swamp Trestle	Sheet:	1 of 1
Project Number:	10111.00	Date:	25-May-2012
Location:	Easton & Raynham, MA	Computed by:	RW
Discharge Point:	DP-1	Checked by:	
Drainage Area(s):	DA-1		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Infiltration Trench	**80%**	**1.00**	**0.80**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **80%**

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	March 28, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Peter Chou, Ahmad Hasan - Jacobs
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) Hockomock Swamp Preliminary Geotechnical Recommendations Easton and Raynham, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford. The project limits are between South Station in Boston and the termini in Falls River and New Bedford, Massachusetts. The MBTA's selected route, the Stoughton Alternative will traverse through the towns of Stoughton, Easton, Raynham, and Taunton, and will continue along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the reconstruction of several existing stations and construction of new passenger stations and two terminal layover facilities. This memorandum presents the preliminary geotechnical assessment report of the Hockomock Swamp Area located in the towns of Easton and Raynham, Massachusetts. The preliminary design recommendations presented in this report are based on the results of subsurface exploration performed by Jacobs in 2012.

Existing Conditions

The proposed railway alignment at the Hockomock Swamp area is shown in Figure 1. The site has several wetland areas, and vegetated open fields. The site extends from the south of Purchase Street at Station 1325+50 and continues south to Station 1531+00 at Raynham Park Crossing. Compared to existing grades adjacent to the existing embankment, it appears that 3 to 5 feet of fill may have been placed to create the embankment for the former railroad in this area through the Hockomock Swamp. Existing grades along the proposed tracks range from approximately elevation 69.5 to 123.5 feet (NGVD29 Datum).

Proposed Construction

Current plans are to install a single track on the alignment. An 8,500-foot long trestle will be constructed within the swamp between Stations 1425+00 and 1510+00. A maintenance turnout will be provided from Station 1462+00 to approximately 1468+00. The details of new track layout (including grading) and the trestle span arrangements are still under development at the time of this preliminary report preparation. Span lengths of 30, 40, and 50 feet are being considered for the trestle. The trestle will be 20 feet wide. A 4 feet wide catenary overhang on either side will be installed at every 200 feet on an extended pier cap. This report focuses on the Preliminary Geotechnical Study at the Hockomock Swamp area, and includes design and recommendation for at-grade railroad tracks and the trestle.

SCOPE OF WORK

This memorandum is prepared by Jacobs in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform geotechnical explorations with twenty widely spaced borings and conduct a laboratory testing program;
- Report and interpret the results of the explorations and laboratory testing program; and
- Provide preliminary geotechnical recommendations for design and construction of the trestle foundations and at-grade tracks.

The Jacobs scope of work did not include environmental assessment of the potential presence of any hazardous materials at the project site or potential impacts to adjacent structures during construction.

LOCAL GEOLOGY

The geologic map of Massachusetts shows the Hockomock Swamp to be located in the Narragansett Basin, underlain and surrounded to the north and south by the Milford-Dedham zone. The bedrock in the Narragansett Basin is lightly metamorphosed siltstone, shale, greywacke, argillite, and coarse-grained conglomerate of Pennsylvanian and Permian age. The bedrock in the Milford-Dedham zone is mostly granite of Proterozoic age.

Hockomock Swamp is a vast wetland, encompassing as much as 6,000 acres of southeastern Massachusetts in Bristol and Plymouth Counties. It is the largest peatland in Massachusetts. Approximately 12,000 years ago, the area was part of the Glacial Lake Taunton, occupying a location between the glacial ice to the north and higher land to the south. Fine textured sediments consisting of varved silts and clays as much as 100 feet thick were deposited within this lake. As the ice retreated, the land rebounded or uplifted, and the lake began to fill in with alluvial deposits washed into low spots by streams cutting through glacial deposits of gravel, clay and sand. Loose, non-compacted peat deposits formed at the bottom of the lake and may extend to depths of 20 to 60 feet below ground surface at certain locations within the swamp. The area generally is characterized by shallow and deep organic soils and alluvial soils underlain by thick deposits of silts and clays. The old glacial lake bed gradually became the soggy swampy woodland of the Hockomock Swamp.

Soils associated with the Glacial Lake Taunton and Hockomock Swamp include the Scio, Raynham, Birdsall, and Enosburg Series. These soils consist of nearly level to gently sloping, moderately well-drained to predominantly poorly-drained soils which were formed on old lake beds.

GEOTECHNICAL EXPLORATIONS

A subsurface exploration program consisting of 20 borings were drilled for this project in February, 2012. Jacobs planned the subsurface exploration program and retained the drilling contractor to perform the explorations. A total of eleven at-grade alignment borings (HS-1 through HS-11) and nine trestle borings (HST-1 through HST-9) were drilled for the proposed crossing through Hockomock Swamp. Boring locations are shown on the Subsurface Exploration Plan (Figures 2A – 2I). The at-grade alignment borings were drilled to depths ranging from 25 to 50 feet below ground surface, while the trestle borings were typically drilled to depths of 55 to 75 feet below grade. One trestle boring (HST-9) was roller-bit drilled through weathered rock to a depth of 120 feet.

The test borings were drilled by New Hampshire Boring under subcontract to Jacobs using several different drill rigs including a remote-controlled ATV mounted drill rig, a D-50 ATV mounted drill rig, and a Mobile drill rig. The borings were advanced through the soil primarily using wash boring with casing drill methods, although some of the borings used augers in the first 5 feet of boring. Three of the at-grade borings and six of the trestle borings were advanced into the underlying bedrock using NX rock coring methods. Standard penetration tests (SPT), consisting of a 140-pound safety hammer dropping 30 inches onto a standard 2-inch-diameter (OD) split-spoon sampler, were performed to establish the consistency of the subsurface soils. The SPT's were typically performed at 5 foot intervals for full length of boring. The obtained samples were sealed in glass jars to retain their natural moisture. In four of the borings (HS-1, HS-6, HST-3, and HST-8), observation wells with 10-foot long screens set at a depth of 5 to 15 feet below ground surface were installed to monitor fluctuations in the groundwater level.

The borings were observed by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. Top of boring elevations were obtained from the project cross section developed by VHB. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

LABORATORY TESTING

Laboratory tests were performed to determine the physical and engineering characteristics of selected split-spoon and undisturbed soil samples obtained during the subsurface exploration program. The Laboratory testing was conducted by GeoTesting Express under subcontract to Jacobs. The testing program was in general accordance with ASTM standards, and included moisture content determination, grain size analysis, Atterberg Limits, triaxial unconfined undrained test, density determination, consolidation, soil pH, soil organic content, and soil electrical resistivity. Unconfined compression tests were performed on representative samples of the bedrock recovered from the core borings. The results for rock and soils testing are summarized in Tables 1 and 2.

Table 1: Summary of Laboratory Test Results for Bedrock

Boring No.	Sample Depth ft.	Rock Description	Bulk Density lb/ft^3	Uniaxial Compressive Strength, psi
HS-4	32.0 - 32.5	Siltstone	170	6,500
HST-3	72.0 – 72.5	Sandstone	159	7,822
HST-7	47.5 – 48.0	Sandstone	167	4,693
HST-8	66.5 – 67.0	Granite	162	6,689

Table 2: Summary of Laboratory Test Result for Soils

Boring No.	Sample No.	Depth (ft)	Soil Classification		Moist. Content (%)	Su (UU) (psi)	Gravel (%)	Sand (%)	Silt & Clay (%)	LL	PL	PI	Organic Content (%)	pH	Electr. Resist. (ohm-cm)
			USCS	AASHTO											
HST-1	S-6	25-27		A-4(0)	25.2		0.0	3.2	96.8						
HST-2	S-4	14-16	CL		31.6					34	20	14			
HST-2	S-9	39-41	CL-ML		31.4					24	18	6			
HST-3	S-4	15-17		A-3(0)			0.0	93.3	6.7						
HST-3	S-7	30-32	CL		36.6					39	23	16			
HST-4	S-2A	5-7			74.4								11.8		
HST-4	S-4	15-17		A-3(0)			0.0	92.9	7.1						
HST-4	S-9A	40-42	Clay		40.0					40	21	19			
HST-4	S-10	45-47	ML	A-4(0)	28.5		0.0	0.7	99.3	NP	NP	NP			
HST-5	S-1	0-2	SM		16.4								4.0	4.5	
HST-6	S-2	5.5-7.5	SM		95.7								11.6		
HST-6	S-6	25-27	CL	A-6(21)	40.9		0.0	0.9	99.1	40	22	18			
HST-7	S-2B	4-6	OL		59.8								9.6	5.2	
HST-7	S-7	29-31	ML		30.4					NP	NP	NP			
HST-8	S-5	19-21		A-2-4(0)			0.0	84.0	16.0						
HST-8	S-9	39-41	CL		31.3					28	20	8			
HST-9	S-4	15-17	OL		409.3								61.7		
HST-9	S-7	30-32		A-4(0)	66.5		0.0	1.1	98.9						
HS-3	S-2	4-6		A-2-4(0)			21.2	44.8	34.0						
HS-4	S-2	5-7		A-2-4(0)			25.9	40.8	33.3						
HS-7	UD-1	14	CL		26.7	22.3				25	18	7			
HS-8	S-4	15-17	ML		26.6					NP	NP	NP			
HS-9	S-4	14-16		A-4(0)			0.0	38.8	61.2						
HS-10	S-6	21-23	CL		30.9					28	19	9			
HS-11	S-3	9-11	CL		7.8					25	16	9			
HST1,2,3	S1 (Composite)	0-2			9.5								3.1	4.7	31,401

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for this project, with some interpretations. The subsurface conditions encountered in the borings drilled for this project generally consist of a layer of granular fill with thickness of about 0 to 3 feet, underlain by natural, loose to dense stratified silt and sand deposits, and very dense glacial till. A thin 2- to 7-foot thick layer of organic silt was encountered in the upper 5 to 10 feet of soil in almost all of the trestle borings. Boulders were encountered in several of the borings. The till was often underlain by severely to completely weathered rock (generally appearing as silt with gravel) which could be penetrated by roller-bit drilling but often resulted in SPT N-counts ranging from 100 blows for 1- to 9-inch penetration to 100 blows per 1 inch penetration. Bedrock along the alignment was noted to include weathered shale, siltstone and granite.

Subsurface soil conditions are summarized in Table 3 below.

Table 3: Summary of Subsurface Conditions at Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. SOIL THICKNESS (FT)	ORGANIC SOIL THICKNESS (FT)	DEPTH TO BOTTOM OF BORING (FT)	APPROX. TOP OF WEATHERED ROCK ELEV (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Trestle Borings									
HST – 1	78.8	> 60.6	5	60.6	NE	NE	18.2	70.3	
HST – 2	72.8	62	3	72	10.8	NE	0.8	67.8	
HST – 3 OW	71.4	65	1	75	6.4	1.4	-3.6	67.7	Well screened from 5 to 15 ft
HST – 4	70.5	> 65	2.3	65	NE	NE	5.5	66.1	
HST – 5	70.3	52	4	62	NE	18.3	8.3	64.3	
HST – 6	69.5	> 60	2.5	60	NE	NE	9.5	66.0	
HST - 7	69.6	39	3	56	30.6	23.6	13.6	65.6	Possible weathered rock at 39 to 46 ft
HST – 8 OW	70.3	64	NE	74	NE	6.3	-3.7	61.3 / 66.8	Well screened from 5 to 15 ft
HST - 9	71.6	66.4	7.5	120	5.2	NE	-48.4	67.5	Boulders at 61.4 to 66.4 ft; roller bit through weathered rock at 76.4 to 120 ft

NE = Not encountered at the boring during drilling; NM = Not measured.

Table 3: Summary of Subsurface Conditions at Borings (Continued)

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. SOIL THICKNESS (FT)	ORGANIC SOIL THICKNESS (FT)	DEPTH TO BOTTOM OF BORING (FT)	APPROX. TOP OF WEATHERED ROCK ELEV (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
At-Grade Alignment Borings									
HS – 1 OW	123.6	9	NE	25	114.6	108.6	98.6	121.6	Well screened from 5 to 15 ft; possible weathered rock at 9 to 15 ft
HS - 2	115.1	19	NE	50.2	96.1	NE	64.9	113.0	Weathered rock at 19 to 50.2 ft
HS - 3	106.9	34	NE	49.5	72.9	NE	57.4	NM	Rollerbit through weathered rock at 34 to 49.5 ft
HS - 4	97.7	10	NE	40	87.7	67.7	57.7	96.2	Rollerbit through weathered rock at 10 to 30 ft
HS - 5	88.7	25	NE	50.2	63.7	NE	50.25	81.5	Rollerbit through weathered rock at 25 to 50 ft
HS – 6 OW	77.7	35	NE	42	42.7	NE	35.7	73.7	Well screened from 5 to 15 ft.
HS - 7	78.1	> 42	NE	42	NE	NE	36.1	75.1	
HS - 8	77.8	> 42	NE	42	NE	NE	35.8	NM	
HS - 9	79.2	> 41	NE	41	NE	NE	38.2	71.2	
HS - 10	78.9	30	NE	32	48.9	NE	46.9	67.9	Possible weathered rock at 30 ft
HS - 11	87.3	19	NE	44	68.3	53.5	43.3	82.5	

NE = Not encountered at the boring during drilling; NM = Not measured.

Fill: Compared to existing grades adjacent to the existing embankment, it appears that 3 to 5 feet of fill may have been placed to create the embankment for the former railroad in this area through the Hockomock Swamp. The uppermost soils encountered in the borings typically consisted of well-graded sand containing secondary amounts of silt and fine gravel.

Organic Soil: A one to five foot thick layer of organic silt/peat was encountered within the upper 5 to 10 feet of soil in several of the trestle borings (HST-1, -2, -3, -4, -5, -6, and -7). These borings are located adjacent to wetland areas. The elevation of the bottom of the organic layer generally decreased to the south, ranging from ± El. 74 ft at Boring HST-1 to ± El. 61.5 ft in Boring HST-7. Organic soils may also be located near other wetland areas at the site.

Natural Granular Deposits: The natural soil deposits below the fill materials or organic soils is quite variable but generally consist of predominantly poorly (SP) to well graded (SW) sand containing secondary amounts of silt and/or gravel, silty sand (SM), and interlayers of fine-grained silt (ML), low plasticity clay (CL, ML-CL), or occasionally high plasticity clay (CH). The sand and gravel deposits are loose to very dense with Standard Penetration Test (SPT) N-values ranging between 6 and 100 blows per foot (bpf) and averaging about 29 bpf. The fine-grained interlayers ranged from medium stiff to hard, with SPT N-values ranging generally from 8 bpf to 44 bpf.

Glacial Till: Dense to very dense glacial till consisting predominantly of well graded sand (SW) with little to some (15 to 45 percent) gravel and silt and ranging from 2 to 25 feet thick was encountered in several of the at-grade alignment borings. The glacial till encountered in the at-grade alignment borings appeared to dip to

the south, being encountered in Boring HS-2 at 9 to 19 feet depth (± El. 106 to El. 96 ft), in Boring HS-6 at 20 to 35 feet depth (± El. 57.7 to El. 42.7 ft), in Boring HS-7 at 35 to 42 ft depth (El. 43.1 to El. 36.1 ft) and in Boring HS-9 at 39 to 41 ft depth (El. 40.2 to El. 38.2 ft).

The glacial till was also encountered in all of the trestle borings, ranging from about 3 to 20 feet thick and generally encountered at depths between 35 and 65 feet below ground surface. SPT N-counts ranged from 27 blows per foot to 100 blows per 1 inch penetration. The glacial till was typically underlain by weathered rock or harder rock which could be cored. In a few cases, the bottom of the till layer was underlain by a layer of boulders.

Bedrock: Bedrock recovered in the test borings was typically severely to completely weathered and difficult to classify. The completely weathered rock was often recovered as silt with gravel (ML). In several areas, roller-bit drilling was able to penetrate as much as nearly 45 feet into weathered rock without having to switch over to rock coring methods. Associated SPT N-values in the completely weathered rock ranged from 100 blows per 1 to 9 inch penetration. Where slightly harder rock was encountered, NX coring was used to penetrate as much as 10 feet into the rock. Core recoveries and Rock Quality Designation (RQD) values of the samples recovered via NX coring ranged from 14 to 60 percent and from 0 to 60 percent, respectively, indicative of primarily very poor to poor quality rock. The top of rock was typically encountered at depths ranging from 9 to 35 feet depth in the at-grade alignment borings and 39 to 66.5 feet depth along the trestle borings as presented in Table 2.

Groundwater: Groundwater levels were measured in the test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level to be approximately 2 to 11 feet below ground surface, ranging from approximate elevations 68 to 121.5 feet along the at-grade borings and from elevations 64 to 70 feet in the trestle area. Groundwater level readings at termination of drilling were consistently at 3.5 to 6 feet depth along the trestle borings. The use of wash boring techniques for some of the borings may have artificially increased the water level readings due to the addition of water to the borings; however, it is anticipated that the groundwater is very shallow throughout the wetland areas encompassed by this project.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction.

GEOTECHNICAL RECOMMENDATIONS

Based on the contour maps shown on the boring location plan, the immediate alignment appears to be built up about 3 to 5 feet above the surrounding wetland areas. The built up width appears to be the corridor previously used for railroad traffic and is currently abandoned. The railroad tracks at Hockomock Swamp will be installed on at-grade sections, and on an 8,500-foot long trestle through the swamp.

Trestle Loading

For the preliminary design, span lengths of 30, 40, and 50 feet are being considered for the trestle. Trestle pier loading, as determined by VHB is shown in the table below:

Table 4 – Trestle Bent Loads

Pier Span	Dead Load, D*	Live Load, L	Impact Load, I	Longitudinal Braking**			Longitudinal Traction**		
				Force, LF_B	Moment, M_B***	Vertical, V_B	Force, LF_T	Moment, M_T***	Vert., V_T
(ft)	(kips)	(kips)	(kips)	(kips)	(k-ft)	(kips)	(kips)	(k-ft)	(kips)
30	330	346	142	81	1,235	41	137	1,404	47
40	425	432	153	93	1,418	35	158	1,620	40
50	520	546	174	105	1,601	32	177	1,814	36

Notes:

* Dead load includes weight of pier cap (50 kips for a single row of piles and 100 kips for a double row)

** Longitudinal braking and tractive forces are applied as a longitudinal lateral force (LF) at center height of the pier cap.

***The moments are about the center of the pier cap. The moment is applied to the piers as a vertical couple applied downward on the pier at one end of the span and upward on the pier at the other end of the span. The moment is not applied directly to the pier cap, but is only given for information.

Trestle Foundations

Various foundation alternatives were investigated to support the trestle foundations. Preliminary foundation type selection took into account soil conditions and shear strength of near surface soils, and depth to bedrock.

Spread Footings: Spread footings were evaluated for pier support. Given the strength consistency of the upper overburden soils to be mostly loose to medium dense, and the presence of organic soils, the spread footing option was discarded.

Drilled Shafts: Drilled shafts were considered but due to the high ground water level and the variable depth to bedrock within the trestle footprint, it does not appear that drilled shafts are a cost effective alternative compared to driven piles.

Driven Piles: Based on our review of available subsurface conditions, the proposed trestle bents are recommended to be founded on driven steel H-piles bearing on the underlying bedrock.

The pile design and the initial pile layout for each bent should be based upon using an allowable stress of 12.6 ksi on HP pile sections, as required by AREMA Section 4.4.3.6. Piles are recommended to be driven vertically, unless pile batter is determined necessary to resist lateral loads. Based on the design loads shown in the pier loading table above, lateral loads will govern the design of pile supported trestle bent foundations.

LPILE by Ensoft was used to develop charts of applied lateral loads versus pile head deflection on a single pile to assist in the final design of trestle foundations. Sample calculations are included in Appendix C showing the parameters used in our analyses as well as the plots of deflection, moment and shear for various applied lateral loads.

Table 5 – Summary of Lpile Analyses (Fixed Head Condition)

Pier Span	Total Vertical Load	Pile Size	Qall/Pile	No. of Piles/Pier	Vertical Load/Pile	Results	
						Max. Horizontal Load	Max. Top Deflection
(ft)	(kips)		(kips)		(kips)	(kips)	(inches)
30	865	HP10X42	156	8	108	14	0.64
	865	HP12X53	195	8	108	21	0.73
	865	HP14X73	269	8	108	32	0.86
	865	HP14X89	328	8	108	39	0.97
	865	HP14X89	328	4	215	33	0.80
40	1,050	HP10X42	156	8	131	12	0.53
	1,050	HP12X53	195	8	131	20	0.69
	1,050	HP14X73	269	8	131	31	0.83
	1,050	HP14X89	328	8	131	38	0.94
	1,050	HP14X89	328	4	256	30	0.71
50	1,276	HP10X42	156	8	160	11	0.48
	1,276	HP12X53	195	8	160	18	0.61
	1,276	HP14X73	269	8	160	29	0.77
	1,276	HP14X89	328	8	160	37	0.92
	1,276	HP14X89	328	4	318	28	0.66

The preliminary geotechnical design of the bent foundations was further advanced by applying lateral loads resulting from longitudinal braking and tractive forces using Ensoft's GROUP 7.0 software. Per AREMA, three load combinations were checked, and Group III (a) and Group III (b) were determined for the span lengths of 30, 40, and 50 feet. Preliminary analyses for 40- and 50-foot spans were performed for the pile supported bents for the most critical Group III (b) loading. A single row of 5 HP 14X89 (50 ksi) piles battered in two directions did not work since the resulting loads and stresses on the piles exceeded the capacity. Hence, a double row of 4 piles, HP 12X53, HP 14X73 and HP 14X89 were analyzed. The 12-inch piles failed because it exceeded the allowable axial load limit of 195 kips, and the deflection at the pile top was more than 1-inch. The 14-inch piles provide desired results as shown in the table below:

Table 6 – Summary of GROUP Analyses

Pier Span	Pile Size	Load Condition	Qall	GROUP Analysis Results				
				Axial Pile Force (kips)		Max. Moment	Max. Pile Stress	Max. Top Deflection
			(kips)	Comp.	Tension	(kips-in)	(ksi)	(inches)
50ft	HP14X89	Group III(b)	328	271	NO	1,720	23.7	0.83
	HP14X73	Group III(b)	269	270	NO	1,690	28.9	0.95
	HP12X53	Group III(b)	195	269	NO	1,650	42.6	1.33
40ft	HP14X89	Group III(b)	328	230	NO	1,510	20.5	0.72
	HP14X73	Group III(b)	269	229	NO	1,480	24.9	0.82
	HP12X53	Group III(b)	195	228	NO	1,420	36.4	1.12

Notes:

1. No pile corrosion was considered.
2. Fixed pile head condition was assumed.
3. The maximum moment and maximum axial force occurs at the pile heads (bottom of the pier cap). Structural engineers should check the structure capacities of the piles at the bottom of pier.

We anticipate that pile tip elevations will range between El. 5 ft and El. 20 ft based on the widely spaced borings drilled in this preliminary phase. Additional borings are required to develop more refined estimates of pile lengths and pile tip elevations.

Pile point reinforcement (shoes) should be used to protect the pile tip when driving through cobbles and boulders, and into the weathered rock.

It is recommended that one production pile should be driven as a test pile at each abutment and pier for the trestle bridge structure. Due to the presence of organic soils and relatively high groundwater levels, we recommend the piles be designed for corrosion protection by including an allowance for 1/16-inch corrosion on the piles.

At-Grade Railroad Tracks

Two segments of railroad tracks within the Hockomock Swamp area, on either side of the trestle, will be constructed at-grade. The two segments are between Stations 1325+50 to 1425+00, and Stations 1510+00 to 1531+00. Preliminary plans show the top of rail to be within 0 to 3 feet of the existing grade. It is recommended that the track subgrade be cleared of all unsuitable organic and fill materials and replaced with structural fill. The structural fill material, where needed, should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557).

Retaining Walls

Lateral earth pressure parameters are required for the design of retaining walls at the approaches to the trestle. The maximum wall height is anticipated to be approximately 5 feet.

The following lateral earth pressures are recommended for retaining walls backfilled with properly compacted materials as defined under fill placement and compaction.

Since the retaining walls that can develop "active" pressures, equivalent fluid pressures of 40 pounds per cubic foot (pcf) should be used for backfill consisting of granular backfill. Additional lateral pressures due to railroad traffic surcharge should also be used.

For passive pressures, an equivalent fluid pressure of 360 pcf should be used. The effects of the top two feet of wall embedment should be ignored in utilizing passive pressure.

It is recommended that the foundation soil has a maximum net allowable pressure of 4 kips per square feet (ksf) and a sliding resistance coefficient of 0.45.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered at the Hockomock Swamp, the site is classified as Seismic Site Class D soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The trestle structure should be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class D Soils at the location of this station:

$S_{MS} = 0.384$ and $S_{M1} = 0.149$

$S_{DS} = 0.256$ and $S_{D1} = 0.099$

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class
- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: soil liquefaction, or surface rupture due to faulting or lateral spreading. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Jacobs performed an analysis for liquefaction potential of the site. The simplified method described by Youd et al. (2001), and refined by Cetin et al. (2004) was used to assess liquefaction. For the site class D and peak horizontal ground surface acceleration value of 0.110g, and based on the recorded water levels, percentage of fine contents and sample relative densities, obtained from the borings, the existing soils underlying the site are judged to be not susceptible to liquefaction. Further liquefaction analysis is recommended when additional borings are performed for the final design.

CONSTRUCTION CONSIDERATIONS

Foundation Installation – Pile Foundations

Installation of piles should be done per MBTA Standards. Piles should be driven to refusal on the bedrock. No more than one splice should be permitted per pile. Care should be taken in driving piles to hard rock to avoid tip damage. Pile tips should be protected using a cast steel tip. With the hardened tip, we anticipate the piles to penetrate through the boulders without difficulty. Piles should have minimum yield strength of 50 ksi. A relatively small hammer should be used to minimize the risk of pile damage. In our opinion, a hammer with a rated energy of around 15,000 ft-lb per blow would be appropriate for this site.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed at-grade railroad track footprints, the area should be stripped of topsoil, vegetation, and organic silt. Following site clearing, stripping, and required excavations, the exposed subgrade should be proof compacted with 10 passes of a large vibratory drum roller (minimum 10,000 pound static weight). Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials.

If additional rolling does not correct the unstable condition as determined by the project geotechnical engineer, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. A backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas.

Fill Placement and Compaction

Fill materials for at-grade construction and for the approach retaining walls most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill for the retaining walls and railroad track bed (below the ballast) should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to 95 percent of the maximum dry density per ASTM D 1557. Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content.

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Discharge of pumped water should be performed in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes steeper than 2-1/2H:1V as the area design is finalized.

Excavation Slopes and Shoring

The slopes of temporary open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced Professional Engineer registered in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed trestle and at-grade railroad tracks at the Hockomock Swamp in Raynham, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there

are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – PROJECT LOCATION PLAN
FIGURE 2A – 2I – SUBSURFACE EXPLORATION PLAN
FIGURE 3A – 3C – SUBSURFACE PROFILE
APPENDIX A – EXPLORATION LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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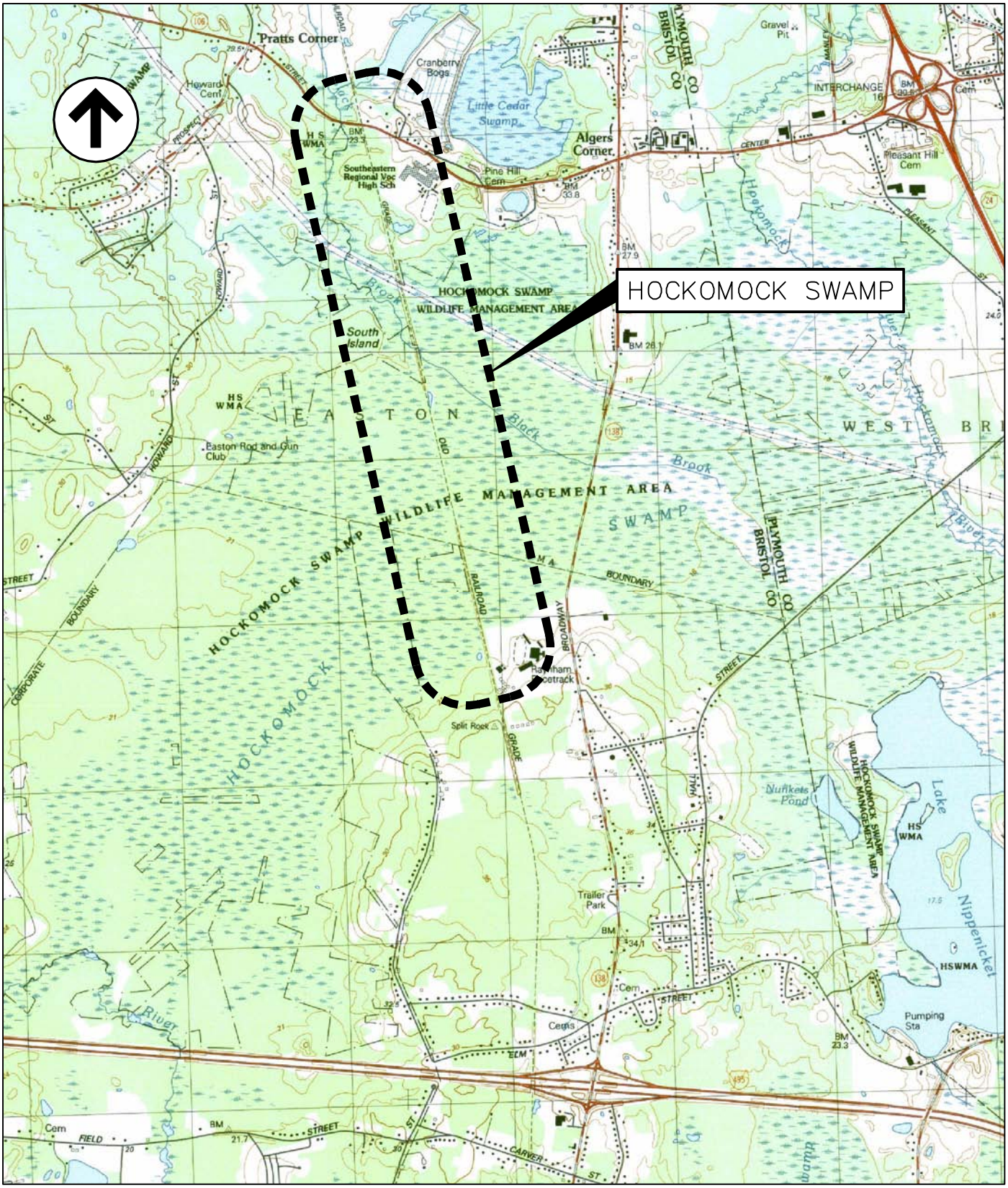
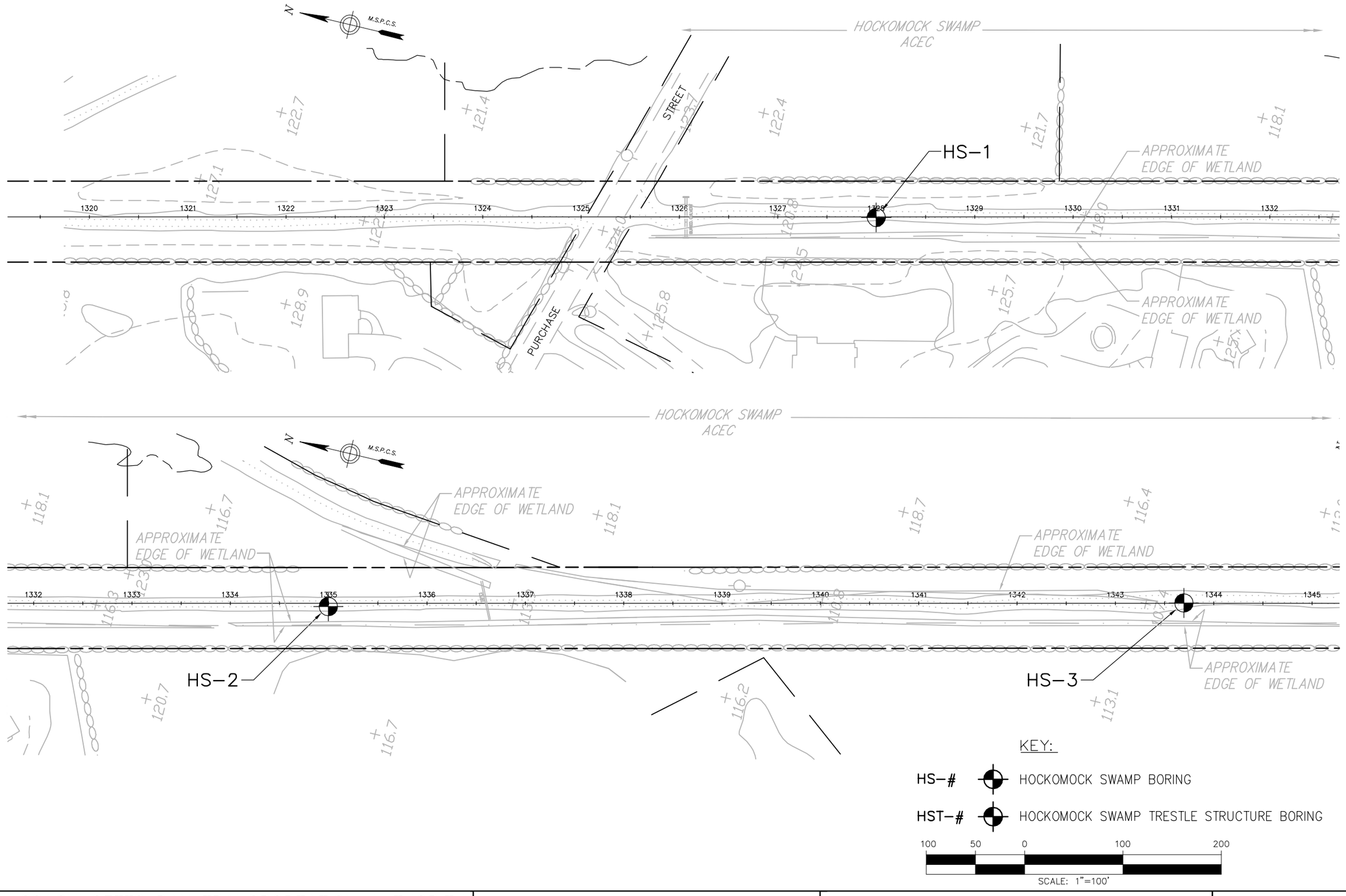
FIGURES

Figure 1: Project Location Plan
Figure 2A – 2I: Subsurface Exploration Plan
Figure 3A – 3C: Subsurface Profile



HOCKOMOCK SWAMP
PROJECT LOCUS PLAN
NOT TO SCALE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	HOCKOMOCK SWAMP EASTON, MASSACHUSETTS FIGURE 1



KEY:

HS-# HOCKOMOCK SWAMP BORING

HST-# HOCKOMOCK SWAMP TRESTLE STRUCTURE BORING

100 50 0 100 200

SCALE: 1"=100'

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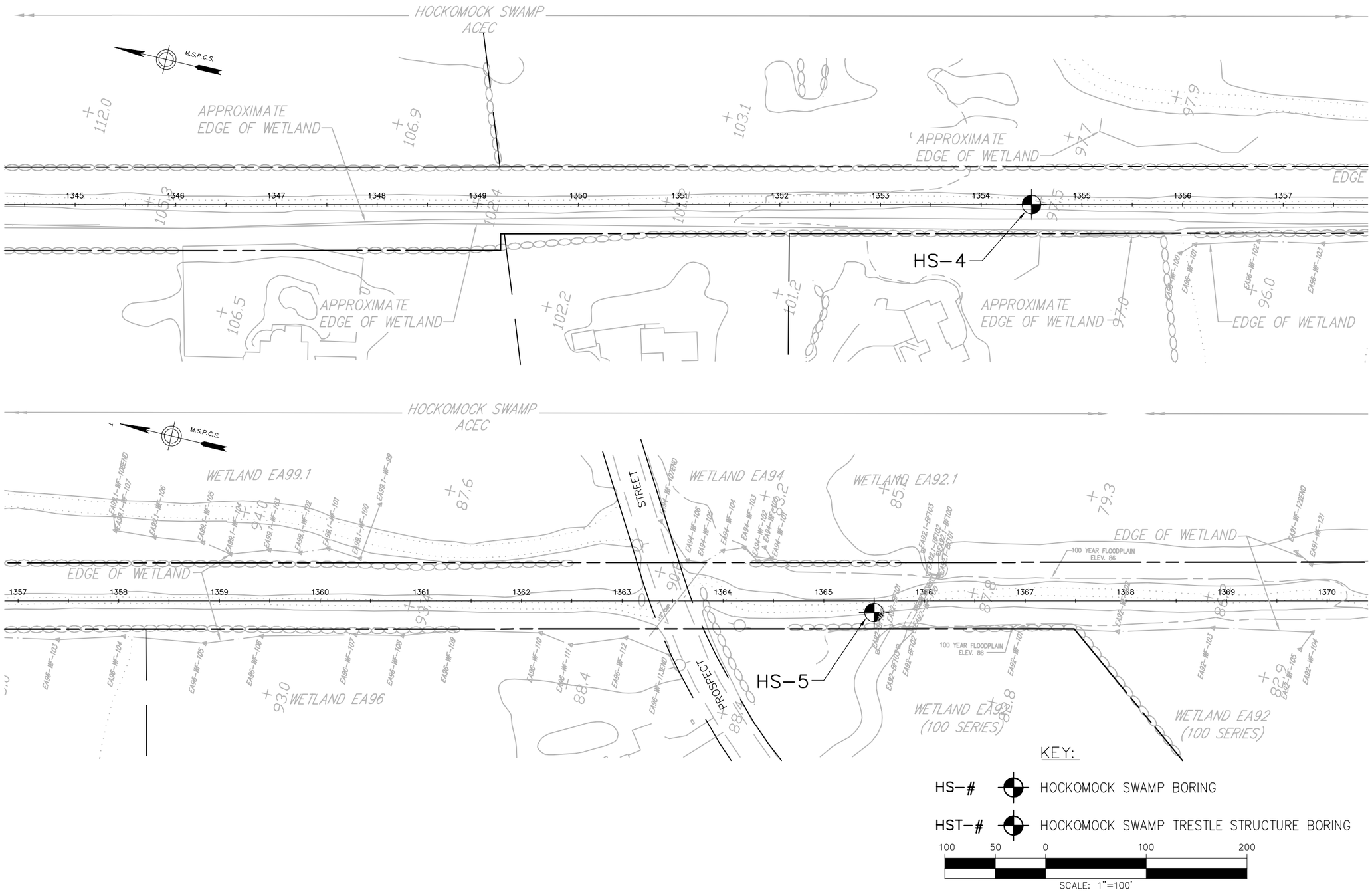
(617) 242-9222

STOUGHTON LINE
HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 2A



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HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

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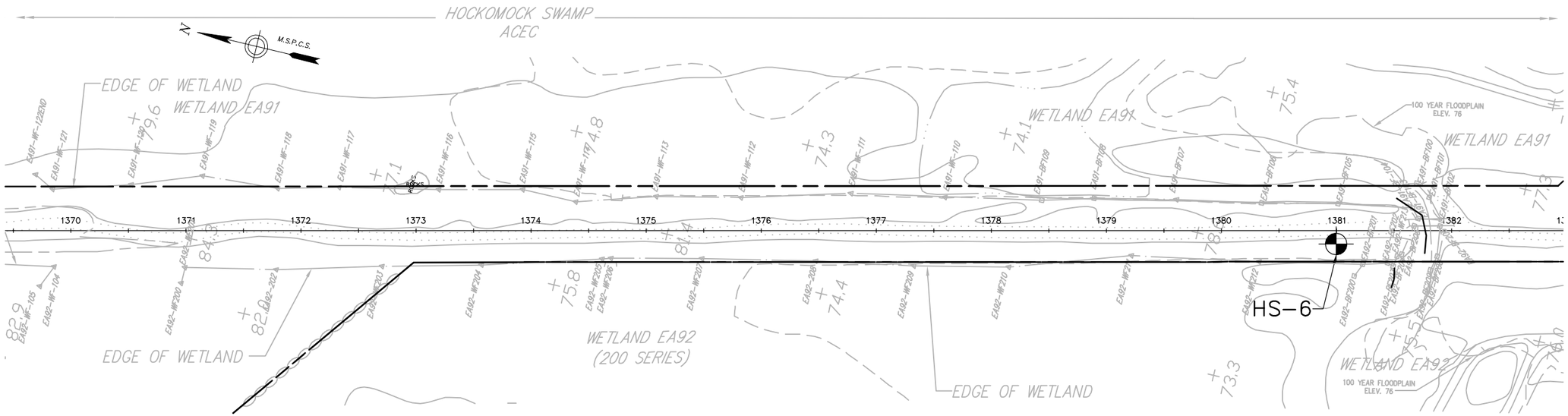
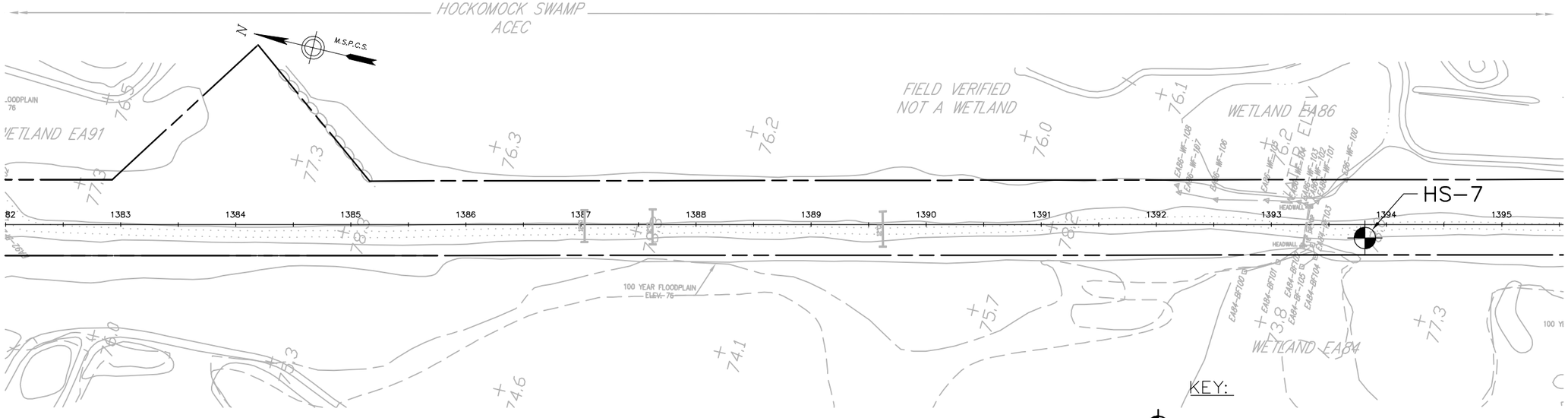
FIGURE NO: 2B





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100 50 0 100 200

SCALE: 1"=100'

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SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 2C

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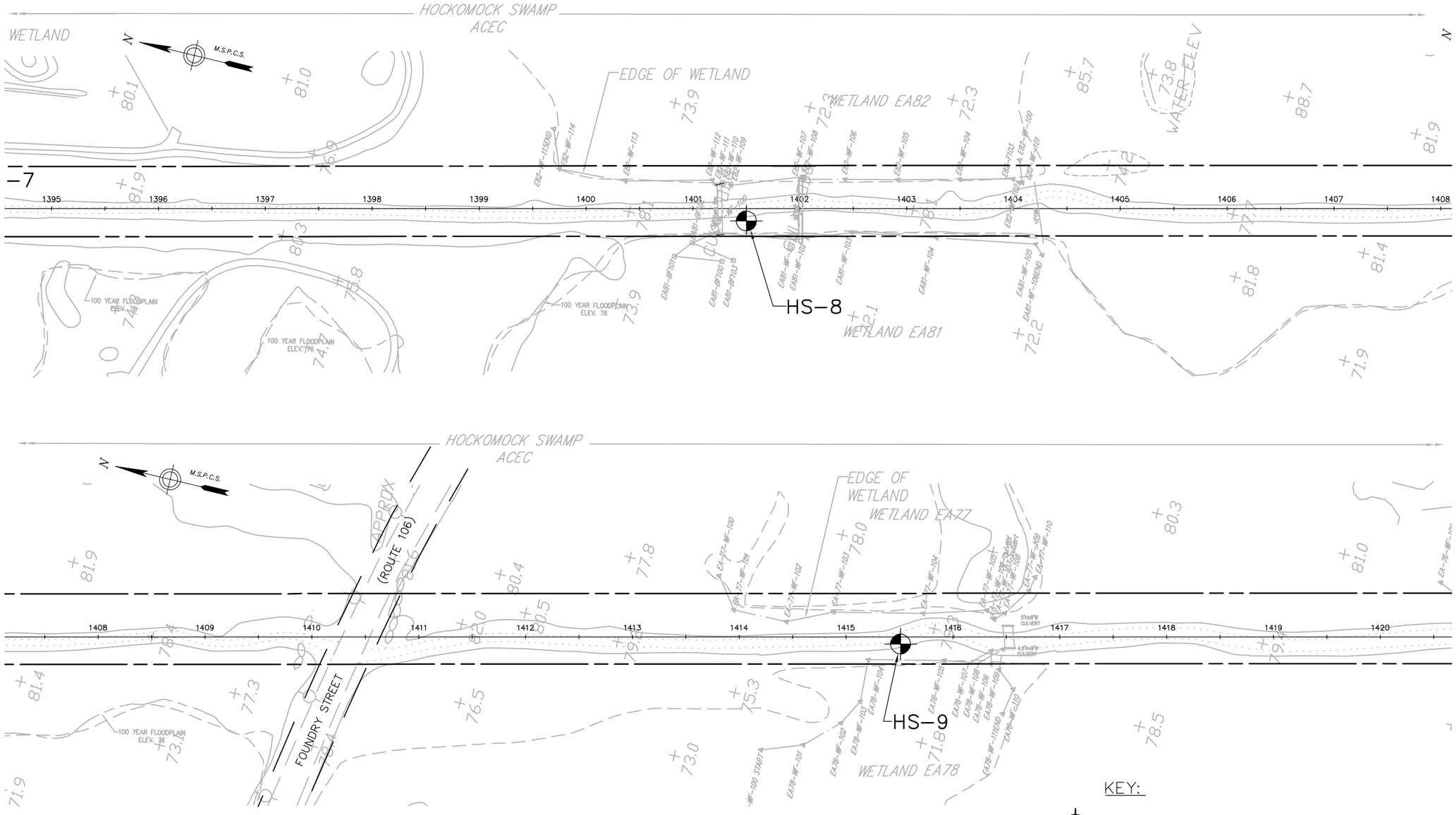

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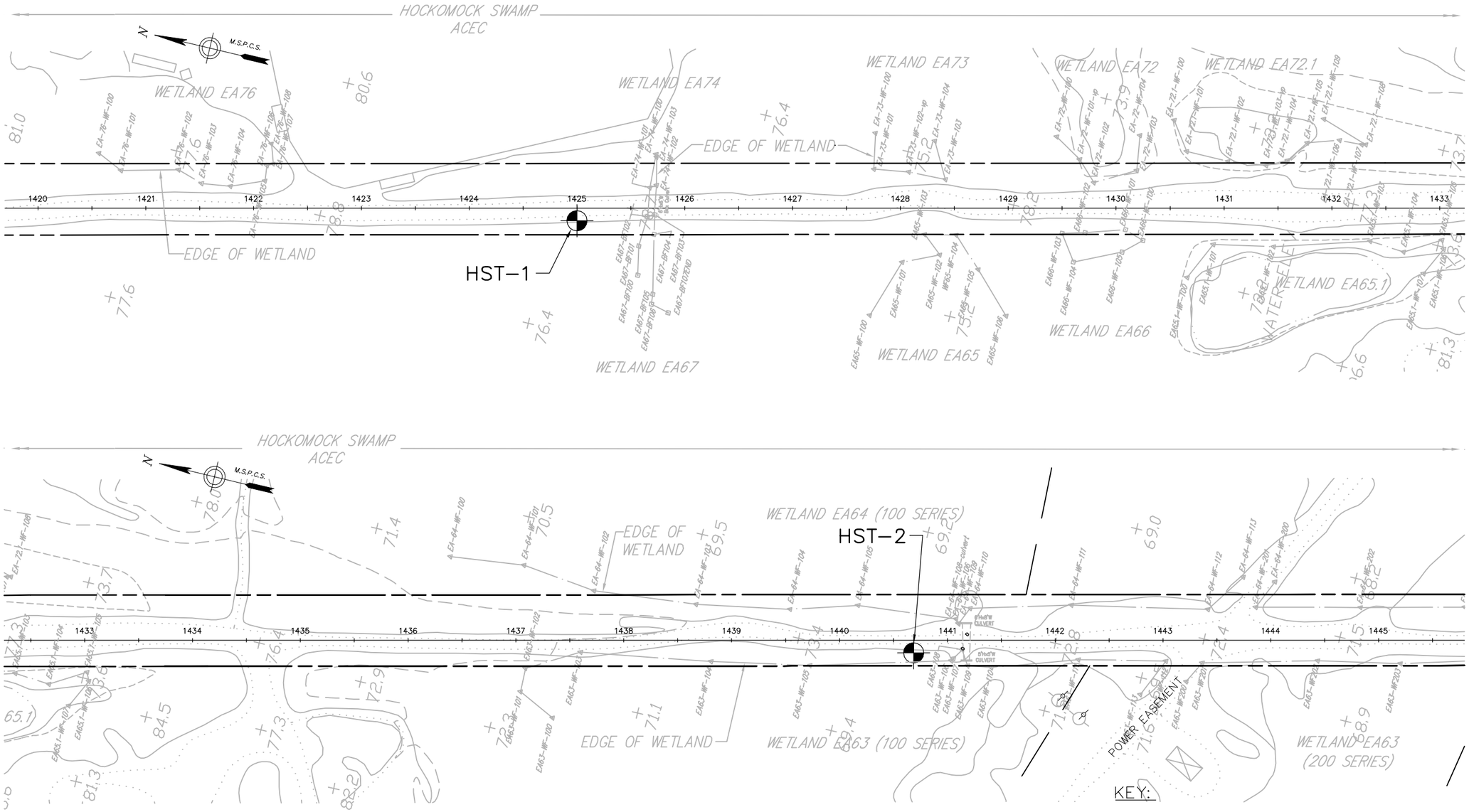
STOUGHTON LINE
HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 2D



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HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

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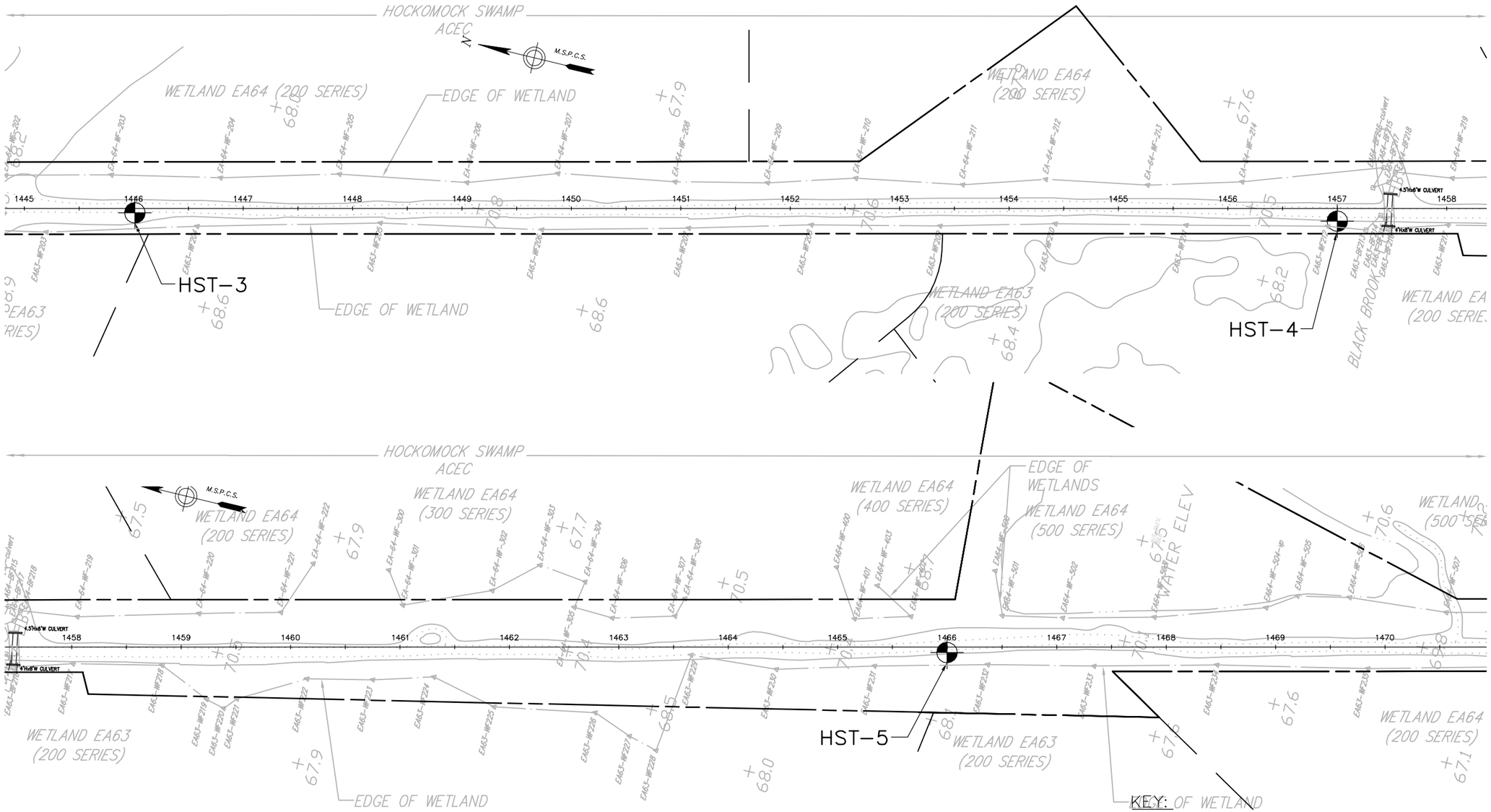
FIGURE NO: 2E



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HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

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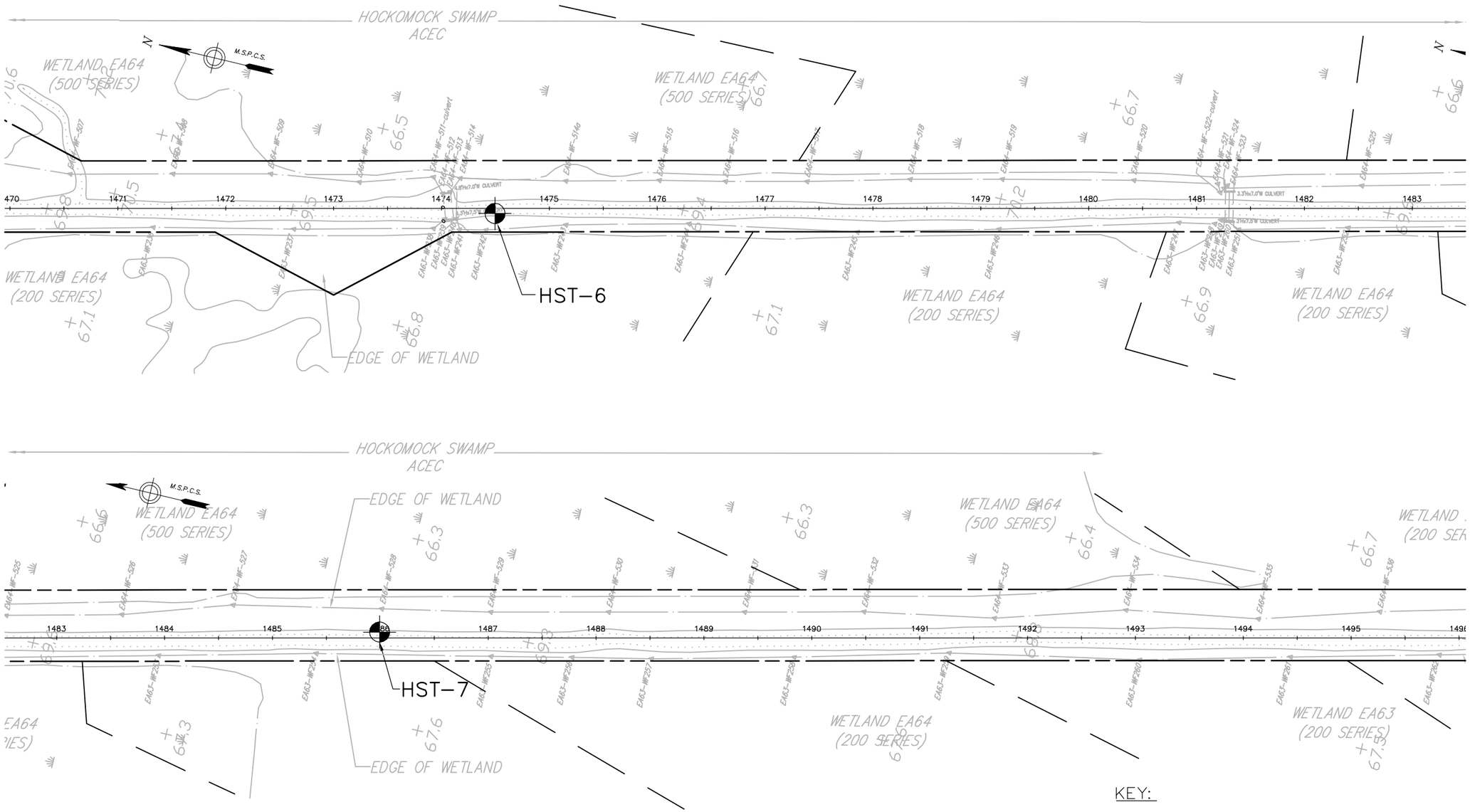
FIGURE NO: 2F



KEY:

HS-# HOCKOMOCK SWAMP BORING

HST-# HOCKOMOCK SWAMP TRESTLE STRUCTURE BORING

100 50 0 100 200

SCALE: 1"=100'

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STOUGHTON LINE
HOCKOMOCK SWAMP
SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 2G

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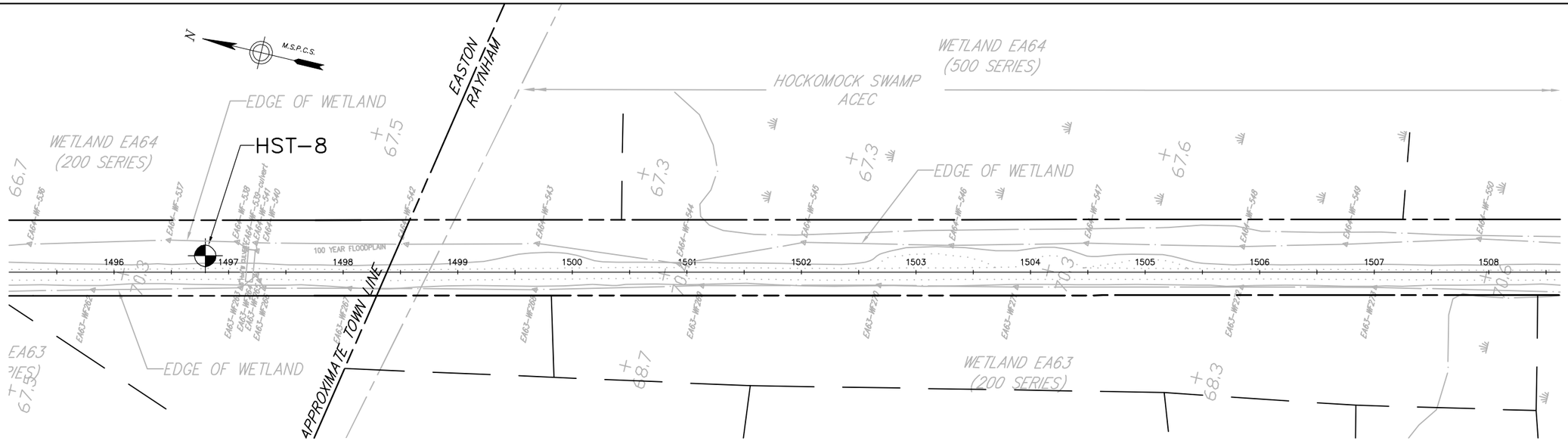

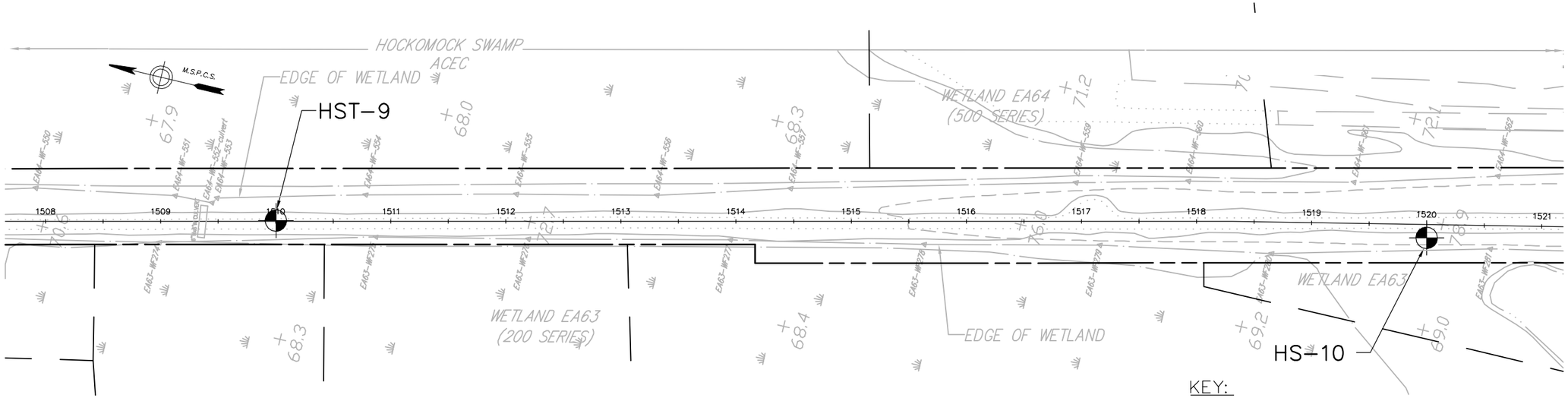

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HST-# HOCKOMOCK SWAMP TRESTLE STRUCTURE BORING

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SCALE: 1"=100'

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SUBSURFACE EXPLORATION PLAN

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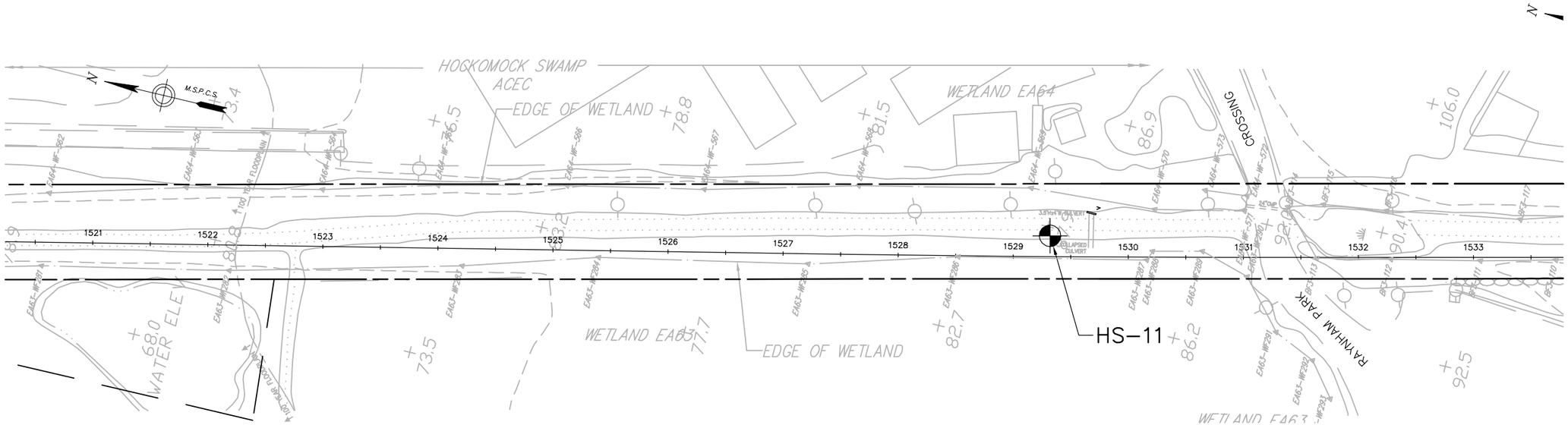
FIGURE NO: 2H



KEY:

HS-# HOCKOMOCK SWAMP BORING

HST-# HOCKOMOCK SWAMP TRESTLE STRUCTURE BORING

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SCALE: 1"=100'

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FIGURE NO: 2I

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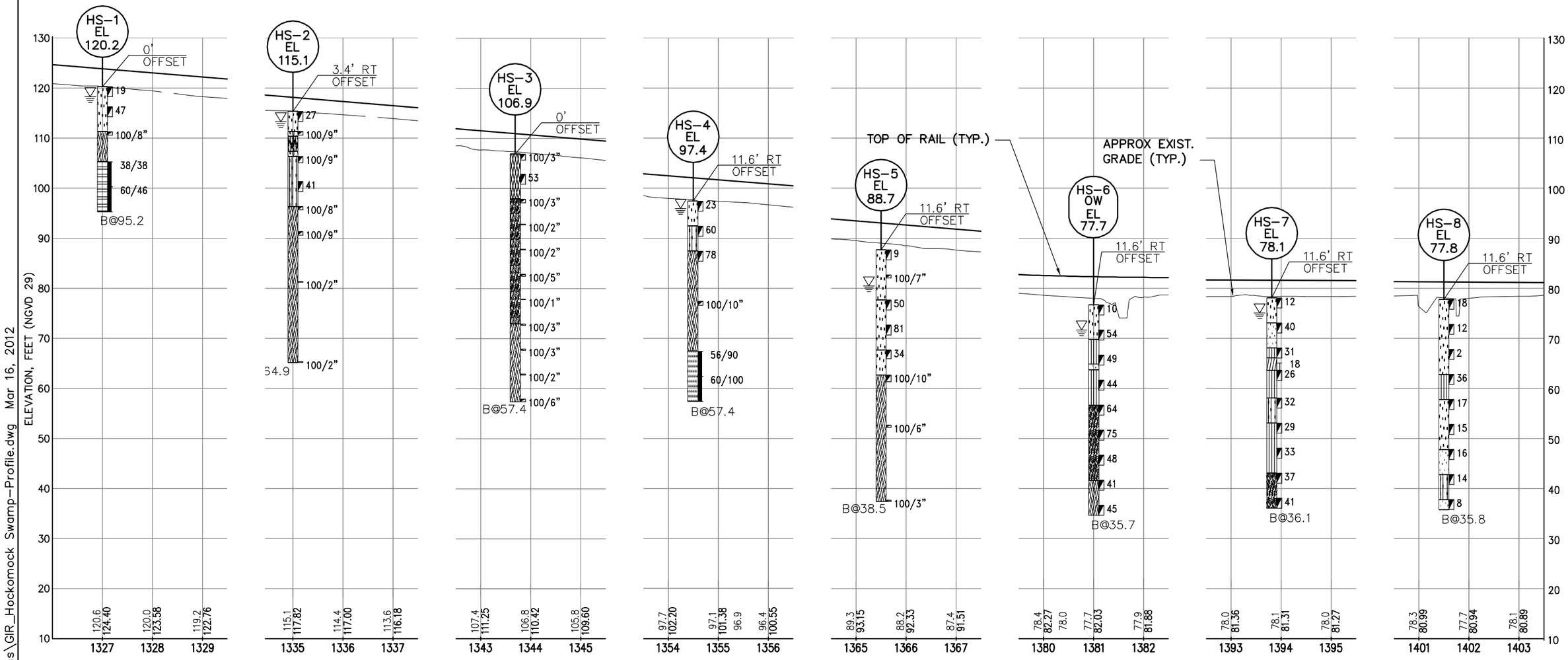

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STOUGHTON LINE
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SUBSURFACE PROFILE

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FIGURE NO: 3A

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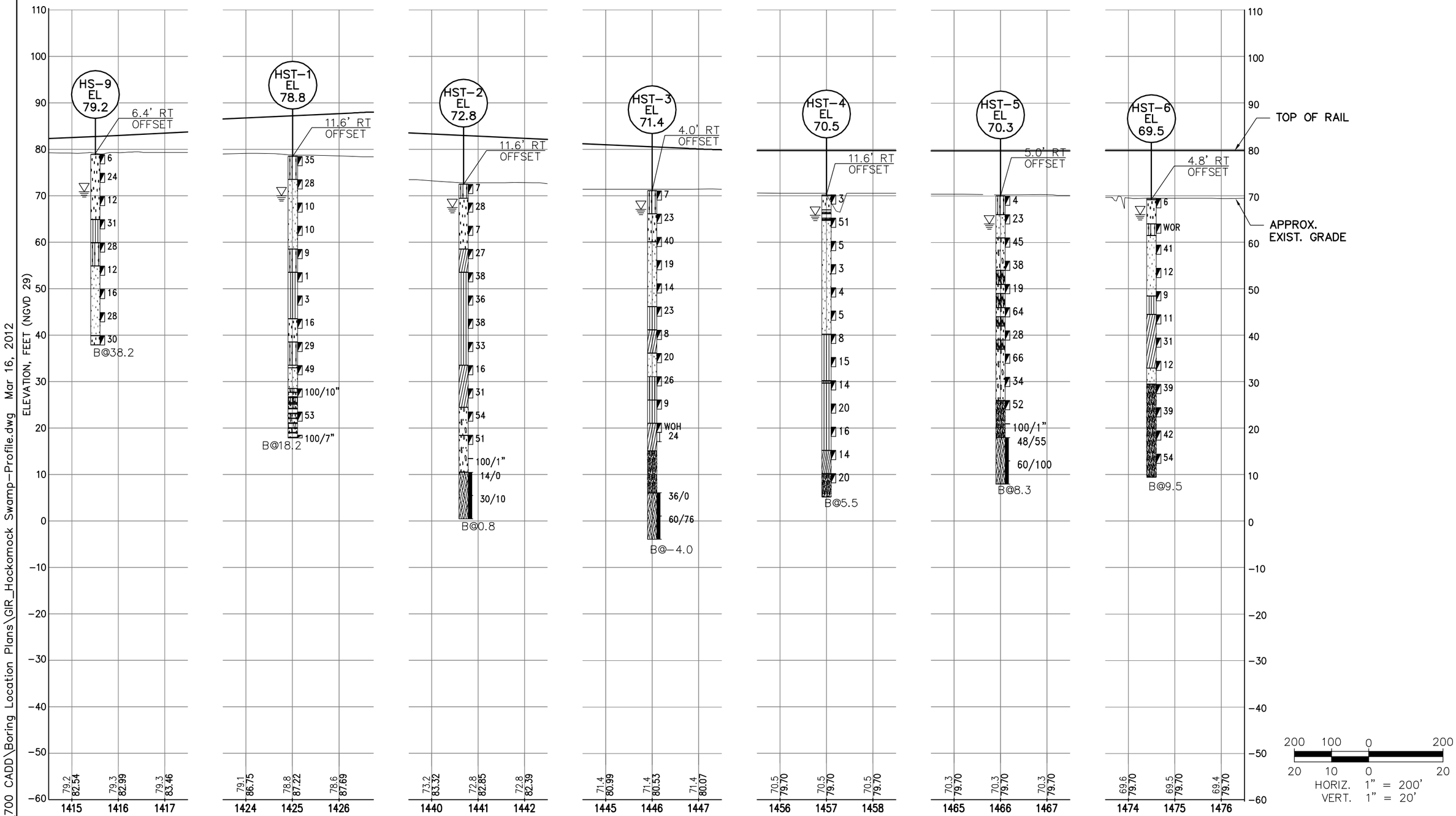
ELEVATION, FEET (NGVD 29)



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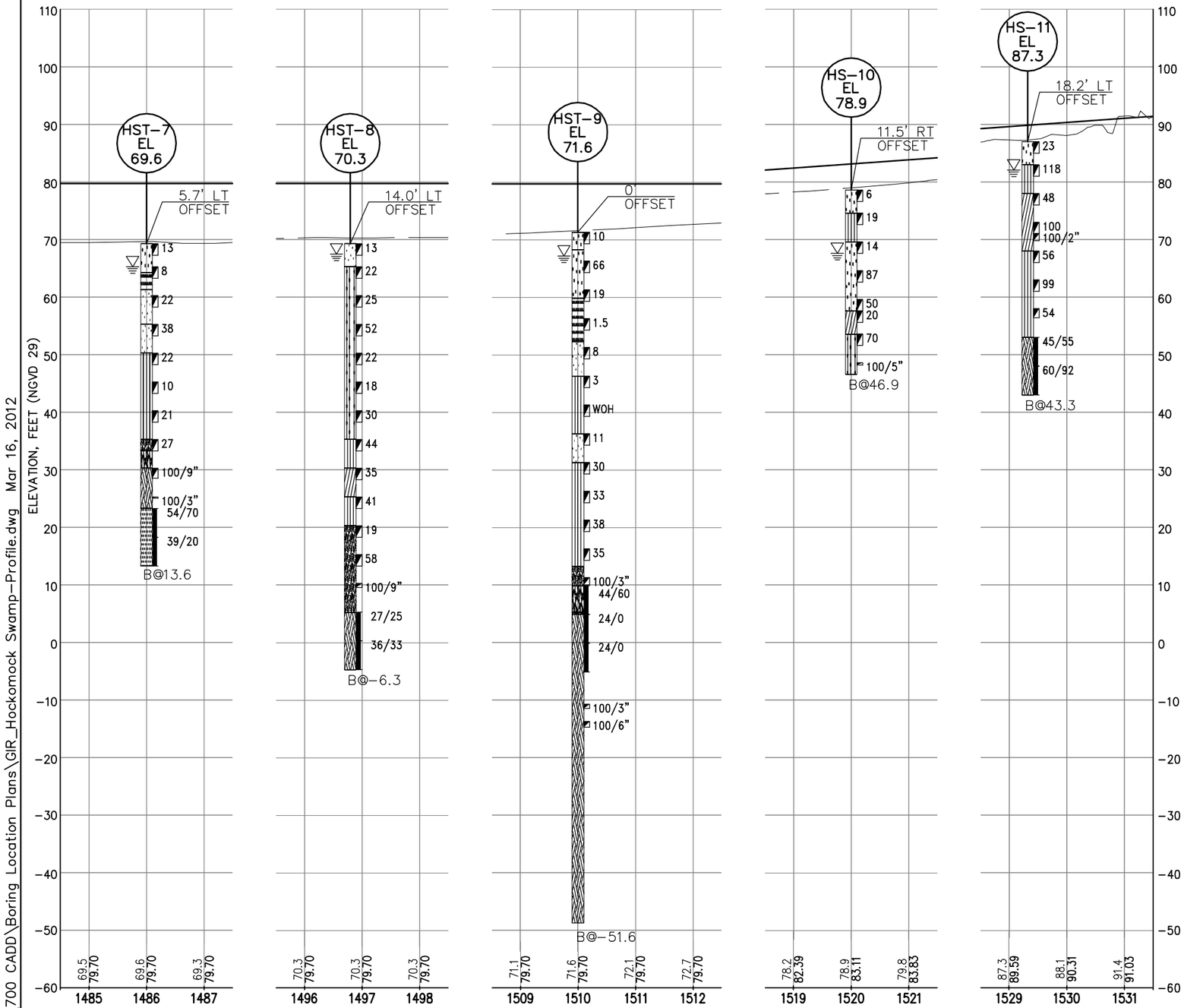
HOCKOMOCK SWAMP
SUBSURFACE PROFILE

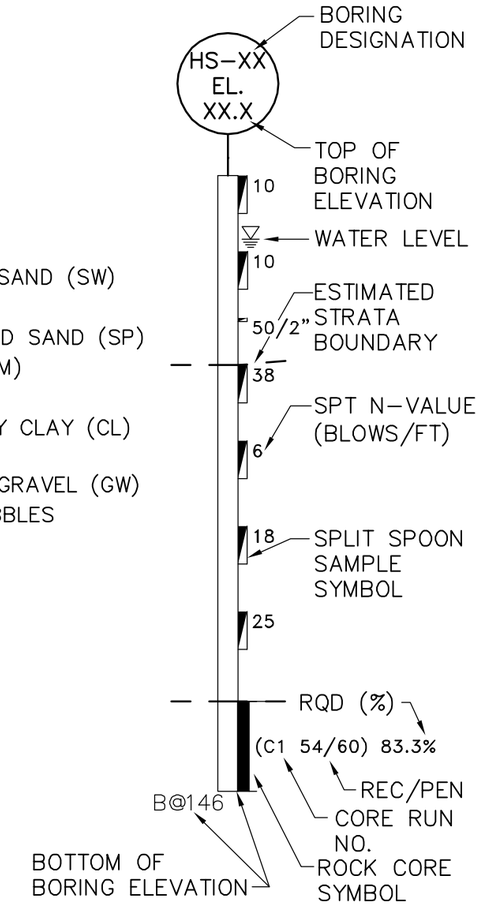
DATE: MARCH 2012

FIGURE NO: 3B

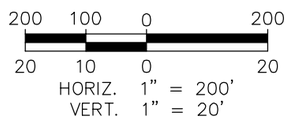


LEGEND

- FILL
- WELL GRADED SAND (SW)
- PEAT (PT)
- POURLY GRADED SAND (SP)
- SILTY SAND (SM)
- SILT (ML)
- LOW PLASTICITY CLAY (CL)
- GLACIAL TILL
- WELL GRADED GRAVEL (GW)
- BOULDERS/COBBLES
- BEDROCK
- SHALE
- SILT STONE



BORING LEGEND
N.T.S.



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STOUGHTON LINE
HOCKOMOCK SWAMP
SUBSURFACE PROFILE

DATE: MARCH 2012

FIGURE NO: 3C

Memorandum

APPENDIX A: EXPLORATION LOGS

HST-1 to HST-9
HS-1 to HS-11

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-1
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	78.8
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2828542.27
5.0	Wash Boring w/Casing					COORD E	769018.31
60.6	Terminated					DATE START	1/27/12
						DATE END	1/30/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 19 16 10	1	0 - 2	8		Silty SAND with Gravel (SM) - mostly fine sand, some silt, little fine to coarse gravel, dark brown, moist.
5		12 14 14 15	2	5 - 7	24	73.8	Poorly graded SAND (SP) - Mostly fine SAND, wet, tan
10		2 5 5 7	3	10 - 12	18		Poorly graded SAND (SP) - Mostly fine SAND, trace silt, wet, tan
15		4 5 5 5	4	15 - 17	15		Similar to S3
20		6 4 5 5	5	20 - 22	15	58.8	Silty SAND (SM) - Mostly fine SAND, little(-) silt, tan, wet, no plasticity
25		2 .5 .5 3	6	25 - 27	24	53.8	SILT (ML) - non-plastis silt, olive brown, moist.
30		3 2 1 2	7	30 - 32	19		Similar to S6 Change in drilling at 34' - Possible gravel
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-1

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-1
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		5 7 9 7	8	35 - 37	6	43.8	Well graded SAND (SW) - Mostly f/c SAND, little(+) silt, little(-) fine gravel, tan, wet
40		16 14 15 18	9	40 - 42	15	38.8	Silty SAND (SM) - Mostly fine SAND, some(+) silt, tan, wet
45		13 16 33 25	10	45 - 47	11	33.8 33.3	(Top 8" of sample): Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, grey & reddish brown, wet (Bottom 3" of sample): Poorly graded SAND (SP) - Mostly fine SAND, some(-) fine gravel, little silt, grey, wet -TILL-
50		51 35 100/10"	11	50 - 51.83	11	28.8 26.8 25.8	Well graded SAND with gravel (SW) - Mostly f/c SAND, some(-) f/c gravel, brown, wet -TILL- Boulder from 52'-53' (roller bit)
55		16 22 31 41	12	55 - 57	12		Well graded SAND with gravel (SW) - Mostly f/c SAND, some f/c gravel, trace silt, brown, wet -TILL-
60		100/7"	13	60 - 60.58	13	18.2	Similar to S12 Bottom of Hole at 60.6'.
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-1

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-2	
	LOCATION	Hockomock Swamp		SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION		72.8	
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM		NGVD 29	
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2827016.56	
62.0	NX Rock Core					COORD	E	769383.02	
72.0	Terminated					DATE START		1/25/12	
						DATE END		1/26/12	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 2 5 8	S1	0 - 2	12	69.8	Silty SAND with Gravel (SM) - mostly fine sand, some silt, little fine to coarse gravel, dark brown, moist.
5		12 12 16 17	S2	4 - 6	16		Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, light brown, wet
10		3 3 4 23	S3	9 - 11	0		No recovery
15		10 13 14 17	S4	14 - 16	10	58.8	Lean CLAY (CL) - grey, wet, medium plasticity, moist.
20		16 20 18 19	S5	19 - 21	9	53.8	SILT (ML) - grey, wet, no plasticity
25		12 18 18 18	S6	24 - 26	20		Similar to S5
30		15 18 20 21	S7	29 - 31	12		SILT (ML) - grey, wet, very low plasticity
35		8	S8	34 - 36	11		Similar to S7

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-2

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-2
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		14 19 23					
		12 7 9 11	S9	39 - 41	15	33.8	Lean CLAY (CL) - grey, wet, medium plasticity
40							
		4 11 20 11	S10	44 - 46	10		Similar to S9 Change in drilling at 48' - Possible till
45						24.8	
		24 36 18 23	S11	49 - 51	3		Well graded GRAVEL with sand (GW) - Mostly f/c GRAVEL, some(-) f/c sand, brown, wet -TILL- Boulder at 53', driller losing water (rollller bit)
50							
		24 34 17 25	S12	54 - 56	5	18.8	Well graded GRAVEL with silt and sand (GW) - Mostly f/c GRAVEL, some f/c sand, little (-) silt, black (possible rock or weathered rock fragments)
55							
		100/1"	S13	59 - 59.08	0		No recovery, spoon bouncing Roller bit to 62', possible top of rock
60							
		RQD=0	C-1	62 - 67	14	10.8	Minutes/ft = 1 - 1 - 1 - 1 - 2 Completely weathered rock, possible shale, black
65							
		RQD=10	C-2	67 - 72	30		Minutes/ft = 3 - 4 - 4 - 3 - 4 Severely weathered rock with completely weathered seams, possible shale, black
70							
						0.8	Bottom of Hole at 72'.

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-2

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-3	
	LOCATION	Hockomock Swamp		SHEET 1 OF 3	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION		71.4
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM		NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2826500.48
5.0	Wash Boring w/Casing					COORD	E	769514.16
65.0	NX Rock Core					DATE START		1/25/12
75.0	Terminated					DATE END		1/26/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 2 5 10	S1	0 - 2	10		Silty SAND with Gravel (SM) - mostly fine sand, some silt, little fine to coarse gravel, dark brown, moist.
						66.4	
5		16 18 5 3	S2	5 - 7	0		No recovery
10		6 17 23 24	S3	10 - 12	12		(Top 6" of sample): Similar to S1
						60.4	(Bottom 6" of sample): Poorly graded SAND (SP) - Mostly fine SAND, trace fine gravel, trace silt, light brown, wet
15		5 6 13 16	S4	15 - 17	10		Same as S3B
20		3 6 8 10	S5	20 - 22	3		Same as S3B
25		6 7 16 13	S6	25 - 27	13	46.4	SILT (ML) - Mostly SILT, little(-) fine sand, grey, wet
30		3 4 4 3	S7	30 - 32	24	41.4	Lean CLAY (CL) - grey, wet, medium plasticity. Attempt to push Shelby Tube at 32', unable to advance sample - too stiff
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-3

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-3
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 3
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		12 11 9 8	S8	35 - 37	14	36.4	Poorly graded SAND (SP) - Mostly fine SAND, trace silt, light brown, wet
40		6 13 13 18	S9	40 - 42	13	31.4	Elastic SILT (MH) - Mostly silt, some(-) clay, grey, wet, medium plasticity, slow dilatancy, approx. 1/8" diameter thread rolled
45		3 5 4 4	S10	45 - 47	7	26.4	SILT (ML) - grey, wet, no plasticity
50		WOH WOH 3 4	S11	50 - 52	22	21.4	Lean CLAY (CL) - Mostly clay, little(-) silt, grey, wet, medium plasticity
			UD1	52 - 54	24		.90 tsf penetrometer
55						15.4	Change in drilling at 56'-3" Possible till
60							
							Top of rock at 65'
65		RQD=0	C1	65 - 70	36	6.4	Severely to completely weathered rock
70		RQD=76	C2	70 - 75	60		Blue-grey rock, sandstone

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-3

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-3
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 3 OF 3
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75						-3.6	Bottom of Hole at 75'. Observation well set at 15' (10' screen, 5' riser)
80							
85							
90							
95							
100							
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-3

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-4
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	70.5
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2825429.93
5.0	Wash Boring w/Casing					COORD E	769762.28
65.0	Terminated					DATE START	1/24/12
						DATE END	1/25/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 1 2 5	S1	0 - 2	8	70.3	(Top 3" of sample) - Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, possible slag, black, dry (Bottom 5" of sample) - Well graded SAND (SW) - Mostly f/c SAND, little silt, trace fine gravel, moist, light brown
						67.3 ▼	Change in wash color at 3'-4"
5		4 10 41 16	S2	5 - 7	20	65.0	(Top 2" of sample) - PEAT (PT) - brown, wet (Bottom 18" of sample) - Poorly graded SAND (SP) - Mostly fine SAND, tract silt, wet brown
10		1 2 3 5	S3	10 - 12	12		Poorly graded SAND (SP) - Mostly fine SAND, little(-) silt, tan, wet
15		1 2 1 2	S4	15 - 17	10		Similar to S3
20		2 2 2 3	S5	20 - 22	12		Similar to S3
25		WOH 2 3 4	S6	25 - 27	12		Similar to S3, very loose
30		WOH 3 5 3	S7	30 - 32		40.5	Sandy SILT (ML) - little(+) fine sand, wet, non-cohesive
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-4

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-4
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		7 9 6 4	S8	35 - 37	10		SILT (ML) - Mostly SILT, little(-) clay, grey, wet, low plasticity, 1.5 tsf penetrometer
40		WOH 6 8 8	S9	40 - 42	21	30.5 30.0	(Top 6" of sample) - Lean CLAY (CL) - wet, grey, stiff, 1.5 tsf (penetrometer) (Bottom 15" of sample) - SILT (ML) - wet, grey, stiff
45		8 10 10 10	S10	45 - 47	14		SILT (ML) - non-plastic clay, wet, grey.
50		7 8 8 10	S11	50 - 52	20		Similar to S10
55		3 7 7 10	S12	55 - 57	24	15.5	Lean CLAY (CL) - wet, grey, medium plasticity, approx. 1/8" thread rolled, stiff
60		10 11 9 19	S13	60 - 62	5	10.5	Well graded SAND with gravel (SW) - Mostly f/c SAND, some f/c gravel, little(-) silt Roller bit to 65' No change in color or density
65						5.5	Bottom of Hole at 65'.
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-4

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-5
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION	70.3
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2824556.4
52.0	NX Rock Core					COORD E	769977.94
62.0	Terminated					DATE START	1/24/12
						DATE END	1/25/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		1 1 3 6	S1	0 - 2	5		Silty SAND (SM) - mostly fine sand, some silt, dark brown, moist.
5		8 9 14 20	S2	4 - 6	12	66.3	Poorly graded SAND (SP) - Mostly fine SAND, little silt, light brown, wet
10		18 25 20 17	S3	9 - 11	7	61.3	Well graded GRAVEL with sand (GW) - Mostly f/c GRAVEL, some(-) f/c sand, trace silt, dark brown, wet
15		16 21 17 46	S4	14 - 16	16		Similar to S3
						54.3	Cobbles from 16'-19', driller losing water (roller bit)
20		12 10 9 10	S5	19 - 21	2	51.3	Poorly graded GRAVEL (GP) - Mostly coarse gravel, varying colors (tan, red, brown), wet
						49.3	Cobbles from 21'-24' (roller bit)
25		22 32 32 37	S6	24 - 26	5	46.3	Well graded GRAVEL with sand (GW) - Mostly f/c GRAVEL, some(-) f/c sand, light brown, wet
						44.3	Cobbles from 26'-28', no water return (roller bit)
						42.3	
30		5 8 20 16	S7	29 - 31	6		Similar to S6
						39.3	Cobbles from 31'-33' (roller bit)
						37.3	
35		16	S8	34 - 36	7		Well graded GRAVEL with sand (GW) - Mostly fine to coarse GRAVEL, some(-) f/c

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-5

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-5
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		32 34 30					sand, trace silt, grey, wet
40		26 20 14 30	S9	39 - 41	2		Poorly graded GRAVEL (GP) - Two pieces of 3/4" diameter gravel, wet
45		28 22 30 55	S10	44 - 46	11	26.3	Well graded SAND with gravel (SW) - Mostly f/c SAND, some(-) f/c gravel Cobbles 47'-48' (roller bit)
50		100/1"	S11	49 - 49.08	0		No recovery, spoon bouncing Roller bit to 52', possible top of rock
		RQD=55	C1	52 - 57	48	18.3	Run #1 - Cored 52'-57' Minutes/ft = 3 - 5 - 6 - 6 - 7 Possible granite with quartz seams
55							
		RQD=100	C2	57 - 62	60		Run #2 - Cored 57'-62' Minutes/ft = 7 - 7 - 6 - 7 - 8 Same as C1, no quartz seams, fresh rock
60							
						8.3	
							Bottom of Hole at 62'.
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-5

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-6
LOCATION	Hockomock Swamp		
OWNER	Mass.Bay Transportation Authority		SHEET 1 OF 2
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	69.5
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2823729.66
5.0	Wash Boring w/Casing					COORD E	770175.66
60.0	Terminated					DATE START	1/23/12
						DATE END	1/24/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		1 2 4 5	S1	0 - 2	13	69.3	(Top 3" of sample): Well graded SAND (SW) - Mostly f/c SAND, little silt, trace organics, black, moist (Bottom 10" of sample): Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, light brown, moist
5		WOR WOR 1 1	S2	5.5 - 7.5	1	64.0 61.5	Silty SAND (SM) - mostly fine sand, some silt, little organic material.
10		14 20 21 22	S3	10 - 12	12		Poorly graded SAND (SP) - Mostly fine SAND, grey, moist
15		5 7 5 9	S4	15 - 17	14		Poorly graded SAND (SP) - Mostly fine SAND, trace silt, grey, wet
20		1 4 5 5	S5	20 - 22	12	48.5	(Top 6" of sample): Similar to S4 (Bottom 6" of sample): SILT (ML) - grey, wet
25		2 5 6 5	S6	25 - 27	24	44.5	LEAN CLAY (CL) - medium plasticity clay, gray, wet, approx 1/8" thread rolled
30		8 14 17 11	S7	30 - 32	19		Similar to S6
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-6

LOG OF TEST BORING

JACOBS	PROJECT: New Bedford/Fall River Commuter Rail	BORING NO.	HST-6
	LOCATION: Hockomock Swamp		
	OWNER: Mass.Bay Transportation Authority		SHEET 2 OF 2
	JOB NUMBER: E2347101		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 5 7 12	S8	35 - 37	22	33.0	(Top 19" of sample): Similar to S6 (Bottom 3" of sample): Poorly graded SAND (SP) - Mostly f/c SAND, trace fine gravel, trace silt, light brown, wet
40		21 24 15 24	S9	40 - 42	6	29.5	Poorly graded SAND (SP) - Mostly fine SAND, some silt, trace fine gravel, grey, moist, dense -TILL-
45		14 19 20 30	S10	45 - 47	10		Similar to S9 -TILL-
50		20 18 24 38	S11	50 - 52	11		Similar to S9 -TILL-
55		20 17 37 31	S12	55 - 57	7		Well graded SAND with gravel (SW) - Mostly f/c SAND, some f/c gravel, little(-) silt, grey, wet -TILL- Roller bit to 60' No change in wash color or density
60						9.5	Bottom of Hole at 60'.
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-6

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail			BORING NO.	HST-7	
	LOCATION	Hockomock Swamp				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR P. Lanergan	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION	69.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM	NGVD 29	
0.0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2822614.04	
46.0 NX Rock Core					COORD E	770453.14	
56.0 Terminated					DATE START	1/23/12	
					DATE END	1/23/12	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 5 8 20	S1	0 - 2	9		Well graded SAND (SW) - Mostly f/c SAND, trace silt, black, moist
5		6 2 6 6	S2	4 - 6	6	64.6	(Top 3" of sample): Well graded SAND (SW): Mostly f/c SAND, trace organics, light brown, wet (Bottom 3" of sample): Silty SAND (SM); fine sand, some silt, little organic material. Change in wash color at 8'
10		10 11 11 12	S3	9 - 11	12	61.6	Poorly graded SAND (SP) - Mostly fine SAND, little(-) silt, tan, wet
15		14 17 21 28	S4	14 - 16	14	55.6	Poorly graded SAND (SP) - Mostly fine SAND, little(-) silt, grey, wet
20		12 12 10 10	S5	19 - 21	13	50.6	Elastic SILT (MH): grey, wet, medium plasticity, medium dry strength
25		4 6 4 4	S6	24 - 26	24		Similar to S5
30		8 9 12 12	S7	29 - 31	18		Similar to S5 0.75 tsf (penetrometer) Too stiff to take Shelby Tube sample
35		19	S8	34 - 36	8	35.6	Well graded GRAVEL with sand (SW) - Mostly f/c GRAVEL, some f/c sand, little silt,

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-7

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-7
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		17 10 19				33.6	grey, wet -TILL-
							Hard drilling 36'-39', Drilling losing water, probable boulders & cobbles
		61 29 100/9"	S9	39 - 40.75	7	30.6	Well graded GRAVEL with silt and sand (GM) - Mostly f/c GRAVEL, some silt, grey, moist -Moderately to severly weathered bedrock-
40							
		100/3"	S10	44 - 44.25	1		Well graded GRAVEL with silt (GW) - Mostly f/c GRAVEL, some silt, grey, moist -Completley weathered rock-
45						23.6	Roller bit to 46' - top of rock
		RQD=70	C1	46 - 51	54		Minutes/ft = 4 - 4 - 5 - 5 - 5 Sandstone
50							
		RQD=20	C2	51 - 56	39		Minutes/ft = 3 - 4 - 3 - 3 - 4 Sandstone, more fractures than C1
55						13.6	
							Bottom of Hole at 56'.
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

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BORING NO. HST-7

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-8	
	LOCATION	Hockomock Swamp		SHEET 1 OF 3	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION		70.3
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM		NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2821565.43
64.0	NX Rock Core					COORD	E	770712.51
						DATE START		1/19/12
						DATE END		1/20/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 5 8 12	S1	0 - 2	6	66.3	Well graded SAND (SW) - Mostly f/c SAND, little(-) fine gravel, trace silt, trace organics, black dry
5		11 14 8 5	S2	4 - 6	12		Silty SAND (SM) - Mostly fine SAND, some(-) silt, light brown, wet
10		6 11 14 22	S3	9 - 11	7		Silty SAND (SM) - Mostly fine SAND, some(-) silt, trace wood fibers, light brown, wet
15		18 24 28 27	S4	14 - 16	12		Silty SAND (SM) - Mostly fine SAND, some(+) silt, grey, wet
20		6 10 12 16	S5	19 - 21	13		Similar to S4
25		7 7 11 12	S6	24 - 26	6		Similar to S4
30		13 16 14 16	S7	29 - 31	20		Similar to S4
35		13	S8	34 - 36	18	36.3	SILT (ML) - Mostly SILT, trace fine sand, grey, wet

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-8

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-8
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 3
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		19 25 30					
40		12 17 18 16	S9	39 - 41	15	31.3	CLAY (CL) - clay, little sand, grey, wet, medium plasticity, 0.5 tsfpenetrometer
45		10 19 22 21	S10	44 - 46	19	26.3	SILT (ML) - grey, wet, no plasticity
50		16 9 10 13	S11	49 - 51	3	21.3	Well graded SAND with gravel (SW) - Mostly f/c GRAVEL, some(-) f/c sand, brown, wet -TILL-
55		25 27 31 60	S12	54 - 56	3		Well graded SAND with gravel (SW) - Mostly f/c SAND, some(-) fine gravel, little silt, grey, moist -TILL-
60		100/9"	S13	59 - 59.75	4		Well graded SAND with gravel (SW) - Mostly f/c SAND, some fine gravel, little silt, light brown, wet, possible rock fragments -TILL-
65		RQD=25	C1	64 - 69	27	6.3	Minutes/ft = 5 - 6 - 4 - 5 - 5 Granite
70		RQD=33	C2	69 - 74	36		Minutes/ft = 5 - 5 - 6 - 8 - 7 Granite, vertical fractures
						-3.7	

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-8

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-8
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 3 OF 3
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75							Bottom of Hole at 74'. Observation well installed at 15' (10' screen, 5' riser)
80							
85							
90							
95							
100							
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-8

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HST-9	
	LOCATION	Hockomock Swamp		SHEET 1 OF 4	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	71.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2820278.01
5.0	Wash Boring w/Casing					COORD E	771006.64
61.4	NX Rock Core					DATE START	1/18/12
76.4	Wash Boring w/Casing					DATE END	1/19/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 3 7 12	S1	0 - 2	13		Well graded SAND (SW) - Mostly f/c SAND, little fine gravel, trace silt, black dry
							Change in wash color at 3'
						68.6 ▼	
5		17 43 23 17	S2	5 - 7	12		Well graded SAND with gravel (SW) - Mostly f/c SAND, some fine gravel, trace silt, grey, wet
10		10 13 6 4	S3	10 - 12	11		(Top 6" of sample) - Well graded SAND (SW) - Mostly f/c SAND, some silt, trace fine gravel, grey, wet
						60.1	(Bottom 5" of sample) - PEAT (PT) - brown, wet
15		.5 .5 1 1	S4	15 - 17	2		Similar to S3B
							Change in wash color at 19'
						52.6	
20		4 4 4 2	S5	20 - 22	6		Poorly graded SAND (SP) - Mostly fine SAND, trace organic peat, brown, wet
25		WOH 1 2 2	S6	25 - 27	24	46.6	SILT (ML) - Mostly SILT, trace fine sand, dark brown, wet
30		WOR WOH WOH 2	S7	30 - 32	24		Similar to S5
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-9

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-9
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 4
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		5 6 5 5	S8	35 - 37	6	36.6	Poorly graded SAND (SP) - Mostly fine SAND, little silt, grey, wet
40		4 14 16 18	S9	40 - 42	13	31.6	SILT (ML) - grey, wet
45		22 19 14 15	S10	45 - 47	15		Similar to S9
50		15 19 19 20	S11	50 - 52	11		SILT (ML) - grey, wet, medium plasticity, 3.5 tsf (penetrometer)
55		10 16 19 38	S12	55 - 57	10		SILT (ML) - Mostly silt, little(-) fine sand, trace fine gravel, grey, wet, medium plasticity Change in drilling at 58', possible gravel
						13.6	
60		42 23 100/3"	S13	60 - 61.25	13		Well graded SAND with gravel (SW) - Mostly f/c SAND, some fine gravel, little silt, grey, wet
		RQD=60	C1	61.4 - 66.4	44	10.2	Top of rock at 61.4' Minutes/ft = 3 - 2 - 2 - 2 - 2 0"-26" of recovery - hard granite, light grey 26"-36" of recovery - light blue rock 36"-44" of recovery - dark blue rock Coring through probable boulders
65		RQD=0	C2	66.4 - 71.4	24	5.2	Completely weathered rock
70		RQD=0	C3	71.4 - 76.4	24		Same as C2 - Completely weathered rock Roller bit to 82'

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-9

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-9
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 3 OF 4
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
75							
80		34 100/3"	S14	82 - 82.75			SILT (ML) - very dense completely weathered rock, grey, moist
85		100/6"	S15	85 - 86			Similar to S14
							Continued to roller bit through completely weathered rock to 120' No change in density
90							
95							
100							
105							
110							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-9

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HST-9
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 4 OF 4
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
115							
120						-48.4	Bottom of Hole at 120'.
125							
130							
135							
140							
145							
150							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HST-9

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-1
LOCATION	Hockomock Swamp		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	T. Penticost	ELEVATION	123.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Remote ATV	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2837979
15.0	NX Rock Core					COORD E	766773
25.0	Terminated					DATE START	2/13/12
						DATE END	2/13/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 9 10 9	S1	0 - 2	14		(Top 11" of Sample) - Well graded SAND (SW) - Mostly f/c SAND, some(-) fine gravel, black, moist (Bottom 3" of Sample): Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, light brown, moist
5		10 19 28 21	S2	4 - 6	12		Well graded SAND with gravel (SW) - Mostly f/c SAND, little(-) fine gravel, trace silt, light brown, wet
10		100/8"	S3	9 - 9.66	4	114.6	Gravelly SILT(ML) - Mostly SILT, some f/c gravel, tan/black, moist -Weathered Rock- Roller bit to 15', possible top of rock
15		RQD=38	C1	15 - 20	38	108.6	Run #1 - Cored 15'-20' Approx 1' drop in coring at 17' - possible seam Probable shale, grey
20		RQD=46	C2	20 - 25	60		Run #2 - Cored 20'-25' Same as C1, moderately close fractures, slightly weathered, grey, probable shale
25						98.6	Bottom of Hole at 25'. Observation well installed at 15' (10 screen, 5' riser)
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-1

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-2
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	115.1
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2837297.94
50.2	Terminated					COORD E	766933.85
						DATE START	2/9/12
						DATE END	2/9/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		7 13 14 17	S1	0 - 2	10	111.1	Well graded SAND (SW) - Mostly f/c SAND, trace (+) fine gravel, light brown, moist
5		100/9"	S2	4 - 4.75	3	110.1	Well graded GRAVEL (GW) - Mostly fine GRAVEL, some(-) f/c sand, little(-) silt, light brown, moist Probable boulder from 5'-8'
						107.1	
10		24 100/9"	S3	9 - 10.25	12	106.1	Well graded SAND with silt (SM) - Mostly f/c SAND, some(+) silt, trace fine gravel, tan, wet -TILL-
15		26 24 17 15	S4	14 - 16	18		Silty SAND (SM): Mostly fine SAND, some(+) silt, trace fine gravel, dark grey, possible weathered rock
20		100/8"	S5	19 - 19.66	5	96.1	SILT with gravel (ML) - Mostly SILT, some(-) f/c gravel, black, wet -Weathered Rock-
25		100/9"	S6	24 - 24.75	7		Similar to S5 Roller bit through weathered rock
30							
35		100/2"	S7	34 - 34.16	0		No recovery, spoon bouncing

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-2

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-2
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							Continue to roller bit through weathered rock
40							
45							
50		100/2"	S8	50 - 50.16	2	64.9	Similar to S5 -Weathered rock, probable shale-
							Bottom of Hole at 50.2'.
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-2

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-3
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	106.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2836452.83
49.5	Terminated					COORD E	767139.64
						DATE START	2/8/12
						DATE END	2/8/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 17 100/3"	S1	0 - 1.25	8		Well graded SAND (SW) - f/c SAND, little fine GRAVEL, light brown with grey, moist, probable cobble encountered
5		80 29 24 21	S2	4 - 6	12		Well graded SAND (SW) - f/c SAND, trace silt, trace fine travel, coal, brick -FILL-
10		28 100/3"	S3	9 - 9.75	6	97.9	Silty SAND (SM) - f/c SAND, little silt, trace fine gravel, wet, grey, possible TILL
15		100/2"	S4	14 - 14.16	2		Well graded SAND (SW) - f/c SAND, trace silt, wet, grey -GLACIAL TILL-
20		100/2"	S5	19 - 19.16	0		No recovery
25		100/5"	S6	24 - 24.41	5		Silty SAND (SM) - f/c SAND, little silt, trace fine gravel, wet, grey -GLACIAL TILL-
30		100/1"	S7	29 - 29.08	1		Similar to S6
35		100/3"	S8	34 - 34.25	3	72.9	Well graded SAND with gravel (SW) - f/c SAND, little fine gravel, trace silt,

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-3

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-3
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							weathered rock, dark grey, tan
40		100/3"	S9	39 - 39.25	2		Completely weathered SHALE, black
45		100/2"	S10	44 - 44.16	2		Similar to S9
50		100/6"	S11	49 - 49.5	6	57.4	Sandy SILT (ML) - nonplastic silt, some fine sand, grey, dry, completely weathered rock
							Bottom of Hole at 49.5'.
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-3

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-4
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION		97.7
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM		NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2825429.94
5.0	Wash Boring w/Casing					COORD	E	769762.28
30.0	NX Rock Core					DATE START		2/2/12
40.0	Terminated					DATE END		2/2/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 10 13 23	S1	0 - 2	3		Well graded SAND with silt (SW) - Mostly f/c SAND, little silt, trace(+) fine gravel, black, moist Change in wash color at 3'
5		26 28 32 33	S2	5 - 7	18	92.7	Silty SAND with gravel (SM) - Mostly f/c SAND, some silt. little(-) fine gravel, light brown, moist.
10		41 34 44 56	S3	10 - 12	18	87.7	Well graded GRAVEL with silt (GM) - Mostly f/c GRAVEL, some silt, black, wet - Weathered Rock- Roller bit through weathered rock
20		100/10"	S4	20 - 20.83	7		Well graded GRAVEL with silt (GM) - Mostly f/c GRAVEL, some(+) silt, grey, moist, tan colored seams -Weathered Rock-
30		RQD=90	C1	30 - 35	56	67.7	Run #1 - Cored 30'-35' Minutes/ft = 2 - 3 - 3 - 3 - 3 Probable siltstone, blue/grey
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-4

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-4
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		RQD=100	C2	35 - 40	60		Run #2 - Cored 35'-40' Minutes/ft = 3 - 3 - 3 - 2 - 3 Same as C1, fresh rock
40						57.7	Bottom of Hole at 40'.
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-4

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-5
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	88.7
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2824556.41
5.0	Wash Boring w/Casing					COORD E	769977.94
50.3	Terminated					DATE START	2/1/12
						DATE END	2/2/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 5 6	S1	0 - 2	7		Well graded SAND (SW) - Mostly f/c SAND, little fine gravel, trace organics, dark brown, moist
5		100/7"	S2	5 - 5.58	2		Well graded SAND with gravel (SW) - Mostly f/c SAND, some(+) fine gravel, trace silt, brown, moist Cobbles from 5.5' to 6.5' (roller bit)
10		17 23 27 39	S3	10 - 12	12	78.7	Well graded SAND with silt and gravel (SW) - Mostly f/c SAND, little(+) fine gravel, little(-) silt, light brown, wet
15		33 39 42 32	S4	15 - 17	18		Well graded SAND with silt and gravel (SW) - Mostly f/c SAND, little(+) silt, little(-) fine gravel, black, wet
20		14 10 24 100/3"	S5	20 - 21.75	7	68.7	Well graded SAND with gravel (SW) - Mostly f/c SAND, some(+) fine gravel, trace silt
25		30 100/10"	S6	25 - 26.33	17	63.7	SILT (ML) - Black, moist, very dense - Weathered rock- Roller bit through weathered rock
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-5

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-5
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		100/6"	S7	35 - 35.5	6		Similar to S6
45							
50		100/3"	S8	50 - 50.25	2	38.5	Similar to S6
							Bottom of Hole at 50.3'.
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-5

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail			BORING NO.	HS-6	
	LOCATION	Hockomock Swamp				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	77.7	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29	
0.0 Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2832821.96	
5.0 Wash Boring w/Casing					COORD E	767995.31	
42.0 Terminated					DATE START	1/31/12	
					DATE END	2/1/12	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 5 5 12	S1	0 - 2	10		Well graded SAND (SW) - Mostly f/c SAND, some(-) gravel, trace silt, brown,clay
5		9 30 24 6	S2	5 - 7	14	70.8	Well graded SAND with gravel (SW) - Mostly f/c SAND, some(+) f/c gravel, trace silt, brown, wet (more silt in bottom 2" of sample)
10		11 24 25 26	S3	10 - 12	15	65.9	(Top 13" of Sample): SILT (ML) - grey, wet, 3.0 tsf penetrometer
						64.7	(Bottom 2" of Sample): Poorly graded SAND - Mostly f/c SAND, little(-) silt, light brown, wet Change in wash color/consistency at 13'
15		12 22 22 13	S4	15 - 17	18		SILT (ML) - light brown, wet, 3.5 tsf, no plasticity
20		38 25 39 28	S5	20 - 22	12	57.7	Well graded SAND (SW) - Mostly f/c SAND, little fine gravel, little (-) silt, grey, wet -TILL-
25		40 38 37 34	S6	25 - 27	0		No recovery - pushing probable cobble
30		20 23 25 28	S7	30 - 32	8		Sandy SILT (ML) - Mostly SILT, some (-) fine sand, trace fine gravel, grey, wet -TILL-
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-6

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-6
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		18 22 19 26	S8	35 - 37	12	42.7	SILT with gravel (ML) - Mostly SILT, some(-) fine gravel, little f/c sand -Weathered Rock-
40		19 25 20 21	S9	40 - 42	14		Similar to S8 -Weathered Rock-
						35.7	Bottom of Hole at 42'. Observation well set at 15' (10' screen, 5' riser)
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-6

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-7
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	Mike (ME)	ELEVATION	78.1
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0	Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2831575.54
5.0	Wash Boring w/Casing					COORD E	768293.25
42.0	Terminated					DATE START	1/31/12
						DATE END	1/31/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 6 6 8	S1	0 - 2	15		(Top 6" of Sample) - Well graded SAND (SW) - Mostly f/c SAND, trace silt and organics, black, dry (Bottom 9" of Sample) - Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, light brown, dry
5		10 19 21 18	S2	5 - 7	18	73.1	Poorly graded SAND (SP) - Mostly fine SAND, light brown, wet
10		12 17 14 11	S3	10 - 12	17	68.1	SILT (ML) - tan, wet, no plasticity, very stiff, 2.5 tsf penetrometer
			UD-1	13 - 14.5	18	66.1	Change in drilling at 12', very soft clay in wash Shelby Tube - 18" recovery, 3.5 tsf penetrometer
15		7 12 14 14	S4	14.5 - 16.5	18	63.6	SILT (ML) - Mostly SILT, little fine sand, grey, wet, low plasticity
20		10 15 17 19	S5	20 - 22	18	58.1	Silty SAND (SM) - Mostly fine SAND, some(-) silt, tan, wet
25		13 14 15 16	S6	25 - 27	18	53.1	SILT (ML) - Mostly silt, trace fine sand, low plasticity, brown, 1.5 tsf penetrometer
30		13 21 12 19	S7	30 - 32	19		Similar to S6
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-7

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-7
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		27 23 14 23	S8	35 - 37	12	43.1	Well graded SAND with silt and gravel (SW) - Mostly f/c SAND, some(-) silt, little(+) fine gravel, light brown, wet -TILL-
40		11 19 22 31	S9	40 - 42	12		Well graded GRAVEL with sand (GW) - Mostly f/c GRAVEL, some(+) f/c sand, trace silt, grey, wet
						36.1	Bottom of Hole at 42'.
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-7

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail			BORING NO.	HS-8	
	LOCATION	Hockomock Swamp				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR P. Lanergan	CONTRACTOR	NH Boring		DRILLER	Mike (ME)	ELEVATION	77.8
METHOD OF DRILLING	GROUNDWATER READINGS			DRILL RIG	Mobile Drill	DATUM	NGVD 29
0.0 Auger	DATE/TIME	DEPTH(ft)	REMARKS	SPT HAMMER	140 lb Safety	GRID N	2830827.86
5.0 Wash Boring w/Casing						COORD E	768471.97
42.0 Terminated						DATE START	1/30/12
						DATE END	1/31/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 7 11 21	S1	0 - 2	17		Top 3" of sample - Poorly graded SAND (SP): Mostly fine SAND, little organics, black, dry Bottom 15" of sample - Well graded SAND (SW): Mostly f/c SAND, trace fine gravel, light brown, moist
5		2 3 9 10	S2	5 - 7	15		Well graded SAND with gravel (SW) - Mostly f/c SAND, little(-) fine gravel, brown, wet
10		2 1 1 4	S3	10 - 12	0		No recovery, pushing probable cobble
15		17 18 18 12	S4	15 - 17	14	62.8	SILT (ML) - grey, wet
20		9 8 9 8	S5	20 - 22	12	57.8	Well graded SAND (SW) - Mostly f/c SAND, trace silt, light brown, wet
25		8 8 7 8	S6	25 - 27	7		Well graded SAND (SW) - Mostly f/c SAND, trace(+) fine gravel, reddish brown, wet
30		8 8 8 12	S7	30 - 32	12	47.8	Poorly graded SAND (SP) - Mostly fine SAND, light brown, wet
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-8

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-8
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 7 7 7	S8	35 - 37	8	42.8	Silty SAND (SM) - Mostly fine SAND, some(-) silt, light brown, wet (siltier in bottom 2" of sample)
40		3 4 4 4	S9	40 - 42	4	37.8	Poorly graded SAND (SP) - Mostly fine SAND, light brown, wet
						35.8	Bottom of Hole at 42'.
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-8

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-9	
	LOCATION	Hockomock Swamp		SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Lanergan	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION		79.2
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM		NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2829466.61
41.0	Terminated					COORD	E	768802.66
						DATE START		1/27/12
						DATE END		1/27/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 2 4 2	S1	0 - 2	7		Well graded SAND (SW) - Mostly f/c SAND, trace fine gravel, trace silt, black, dry
5		16 12 12 15	S2	4 - 6	7		Well graded SAND with gravel (SW) - Mostly f/c SAND, little fine gravel, light brown, wet
10		2 3 9 24	S3	9 - 11	3		Well graded SAND with gravel (SW) - Mostly f/c SAND some fine gravel, trace (+) silt, grey, wet
15		13 13 18 20	S4	14 - 16	10	65.2	Sandy SILT (ML) - non-plastic silt, some mostly fine sand, light brown, moist.
20		13 13 15 15	S5	19 - 21	12	60.2	Silty SAND (SM) - Mostly fine SAND, little(-) silt, tan, wet
25		7 6 6 6	S6	24 - 26	10	55.2	Poorly graded SAND (SP) - Mostly fine SAND, tan, wet
30		6 7 9 13	S7	29 - 31	17		Similar to S6
35		13	S8	34 - 36	12		Poorly graded SAND (SP) - Mostly fine SAND, trace silt, reddish brown, wet

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-9

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-9
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		13 15 15					
40		26 16 14 12	S9	39 - 41	3	40.2	Well graded SAND with gravel (SW) - Mostly f/c SAND, some f/c gravel, light brown, wet -TILL-
						38.2	Bottom of Hole at 41'.
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-9

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-10
LOCATION	Hockomock Swamp		
OWNER	Mass.Bay Transportation Authority		SHEET 1 OF 1
JOB NUMBER	E2347101		

INSPECTOR	D. Melcher/ PJL	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION	78.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2819302
32.0	Rollerbit Refusal					COORD E	771224.53
						DATE START	1/13/12
						DATE END	1/17/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 3 3 8	S1	0 - 2	24		SAND - brown, fine grained, trace medium sand, trace silt, dry, medium dense
5		11 9 10 13	S2	4 - 6	14	74.9	SILT - some fine rounded gravel, little fine sand, trace clay, dry, dense
10		7 8 6 6	S3	9 - 11	18	69.9 ▼	(9'-9.75'): SAND - reddish brown, fine grained, trace medium sand, trace silt, dry medium dense (9.75'-10.5'): SAND - black, fine grained, trace coarse sand, trace medium sand, some silt, dry, medium dense
15		30 43 44 36	S4	14 - 16	14		SAND - brown, fine grained, little medium sand, trace coarse sand, trace fine rounded gravel, trace silt, wet, very dense
20		17 24 26 18	S5	19 - 21	12		SAND - brown, fine grained, little medium sand, trace coarse sand, trace silt, wet, very dense
		4 8 12 22	S6	21 - 23	18	57.9	Sandy lean CLAY (CL) - Mostly CLAY, some (-) fine sand, light brown, wet
25		8 44 26 12	S7	25 - 27	8	53.9	Silty SAND with gravel (SM) - Mostly f/c SAND, some (-) silt, little (+) fine gravel, trace clay
30		100/5"	S8	30 - 30.41			Silty SAND with gravel (SM) - Mostly f/c SAND, some (+) silt, little (+) fine gravel - Possible weathered rock- Roller bit to 32'
						46.9	Bottom of Hole at 32'.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-10

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	HS-11
LOCATION	Hockomock Swamp		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	D. Melcher	CONTRACTOR	NH Boring	DRILLER	P. Rushina	ELEVATION	87.3
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	D50 ATV	DATUM	NGVD 29
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818399.33
34.0	NX Rock Core					COORD E	771457.03
44.0	Terminated					DATE START	1/12/12
						DATE END	1/13/12

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 9 14 55	S1	0 - 2	20		SAND (SP) - light brown, fine grained, trace silt, dry, very dense
5		20 60 58 55	S2	4 - 6	13	83.3 ▼	SILT (ML) - reddish brown, some subangular fine gravel, little fine sand, trace clay, dry, hard
10		21 20 28 41	S3	9 - 11	9	78.3	CLAY (CL) - lean clay, little fine to coarse sand, moist, brown.
15		30 55 45 100/5"	S4	14 - 15.91	0		No Recovery
		26 45 100/2"	S5	16 - 17.16	11		CLAY (CL) - grey, some fine to coarse sand, trace fine subangular gravel, trace silt, weathered rock, dry, hard
20		14 23 33 41	S6	19 - 21	24	68.3	SILT (ML) - dark grey, trace fine sand, dry, trace clay, hard (weathered rock)
25		38 37 62 48	S7	24 - 26	24		SILT (ML) - dark grey, trace clay, dry, hard (weathered rock)
30		16 17 37 100/1"	S8	29 - 30.58	12		SILT (ML) - dark grey, little clay, dry, hard (weathered rock)
35		RQD=55	C1	34 - 39	45	53.3	Granite, light grey, crystalline.

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-11

LOG OF TEST BORING

JACOBS	PROJECT	New Bedford/Fall River Commuter Rail	BORING NO. HS-11
	LOCATION	Hockomock Swamp	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		RQD=92	C2	39 - 44	60		Granite, light grey, crystalline.
						43.3	
45							Bottom of Hole at 44'.
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. HS-11

Memorandum

APPENDIX B: LABORATORY DATA

Summary of Laboratory Test Results for Bedrock
Summary of Laboratory Test Results for Soils

Summary of Laboratory Test Results for Bedrock

Client:	Jacobs Civil, Inc.
Project Name:	SCR - Hockomock Swamp
Project Location:	Raynham, MA
GTX #:	11534
Test Date:	02/24/12
Tested By:	daa
Checked By:	mpd

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D 7012 Method C

Boring ID	Sample ID	Depth, ft	Bulk Density, lb/ft^3	Compressive Strength, psi	Failure Type	In conformance with ASTM D 4543
HS-4	C-1	---	170	6,500	1	YES
HST-2	C-2	---	Sample too short to test			
HST-3	C-2	---	159	7,822	1	YES
HST-5	C-1	---	Sample too short to test			
HST-7	C-1	---	167	4,693	1	YES
HST-8	C-1	---	162	6,689	1	NO *,**

Notes:

Density determined on core samples by measuring dimensions and weight and then calculating.

All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.

Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure (See attached photographs)

* The as-received core did not meet the ASTM side straightness tolerance.

** Specimen L/D < 2. Compressive Strength reported is the computed compressive strength of an equivalent L/D = 2 specimen. The value is corrected using the following equation from ASTM D 2938-86:

$$C = C_a/(0.88+(0.24b/h))$$

where:

C = computed compressive Strength for L/D = 2

C_a = measured compressive strength

b = test core diameter

h = test core height

Client:	Jacobs Civil, Inc.	Test Date:	2/22/2012
Project Name:	SCR - Hockomock Swamp	Tested By:	daa
Project Location:	Raynham, MA	Checked By:	mpd
GTX #:	11534		
Boring ID:	HS-4		
Sample ID:	C-1		
Depth:	--- ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.34	4.35	4.35
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	598.13		
Bulk Density, lb/ft^3	170		
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

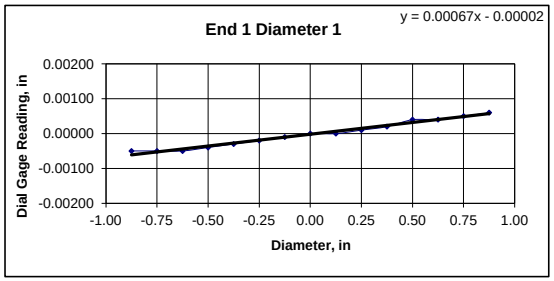
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00050	-0.00050	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00020	0.00040	0.00040	0.00050	0.00060
Diameter 2, in (rotated 90°)	0.00060	0.00060	0.00060	0.00050	0.00040	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00020	-0.00030	-0.00050	-0.00060

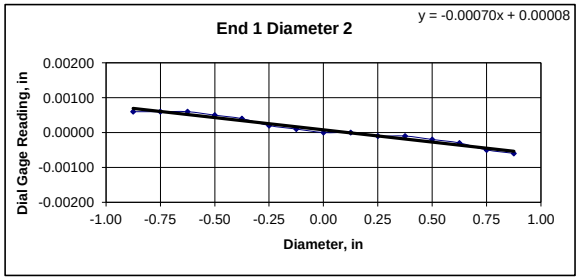
Difference between max and min readings, in:
0° = 0.00110 90° = 0.00120

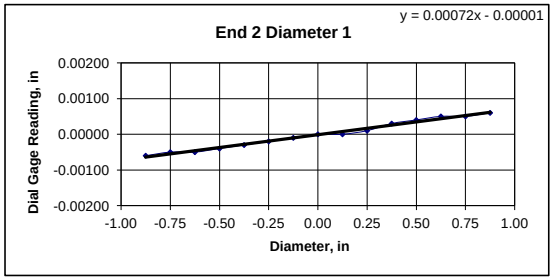
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00010	0.00030	0.00040	0.00050	0.00050	0.00060
Diameter 2, in (rotated 90°)	0.00050	0.00050	0.00050	0.00040	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00030	-0.00040	-0.00050	-0.00060

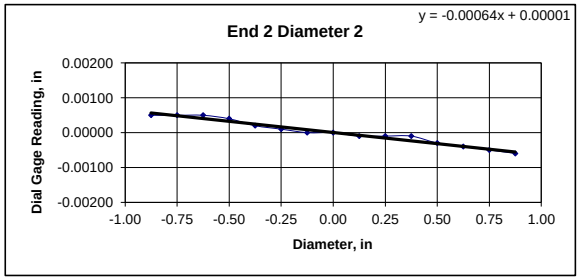
Difference between max and min readings, in:
0° = 0.0012 90° = 0.0011

Maximum difference must be < 0.0020 in. Difference = ± 0.00060
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00067
Angle of Best Fit Line: 0.03839

End 2:
Slope of Best Fit Line 0.00072
Angle of Best Fit Line: 0.04125

Maximum Angular Difference: 0.00286

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line -0.00070
Angle of Best Fit Line: -0.04011

End 2:
Slope of Best Fit Line -0.00064
Angle of Best Fit Line: -0.03667

Maximum Angular Difference: 0.00344

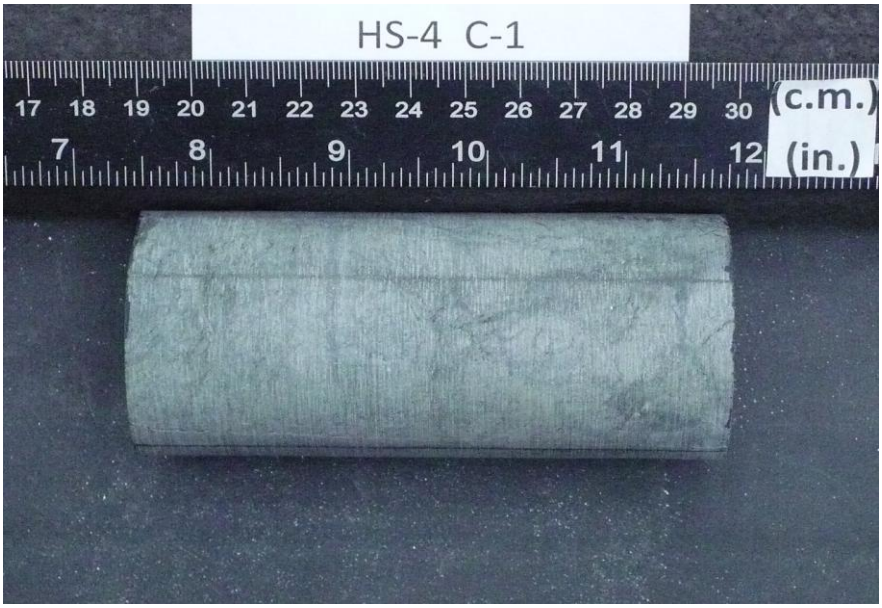
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

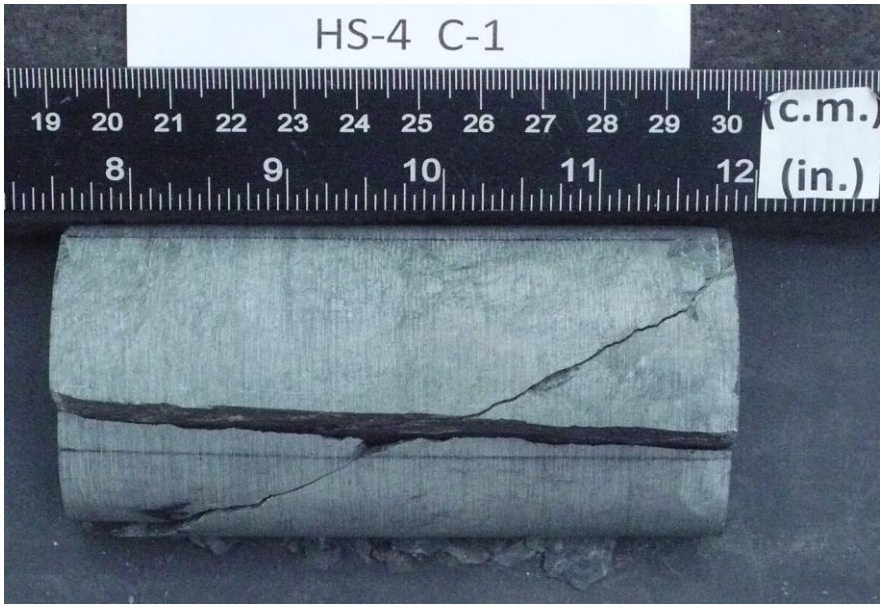
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00110	1.980	0.00056	0.032	YES
Diameter 2, in (rotated 90°)	0.00120	1.980	0.00061	0.035	YES
END 2					
Diameter 1, in	0.00120	1.980	0.00061	0.035	YES
Diameter 2, in (rotated 90°)	0.00110	1.980	0.00056	0.032	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Jacobs Civil, Inc.
Project Name:	SCR - Hockomock Swamp
Project Location:	Raynham, MA
GTX #:	11534
Test Date:	02/24/12
Tested By:	daa
Checked By:	mpd
Boring ID:	HS-4
Sample ID:	C-1
Depth, ft:	---



After cutting and grinding



After break

Client:	Jacobs Civil, Inc.	Test Date:	2/22/2012
Project Name:	SCR - Hockomock Swamp	Tested By:	daa
Project Location:	Raynham, MA	Checked By:	mpd
GTX #:	11534		
Boring ID:	HST-3		
Sample ID:	C-2		
Depth:	--- ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.36	4.36	4.36
Specimen Diameter, in:	1.98	1.98	1.98
Specimen Mass, g:	562.31		
Bulk Density, lb/ft^3	159		
Length to Diameter Ratio:	2.2	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

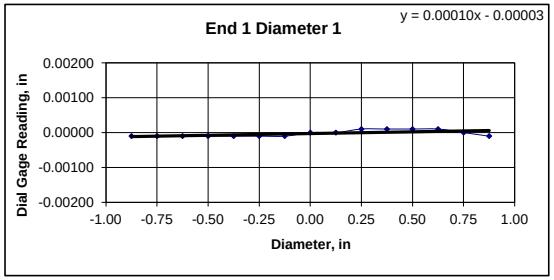
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00010	0.00010	0.00010	0.00010	0.00000	-0.00010
Diameter 2, in (rotated 90°)	0.00080	0.00060	0.00060	0.00060	0.00040	0.00020	0.00010	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00050	-0.00070	-0.00090

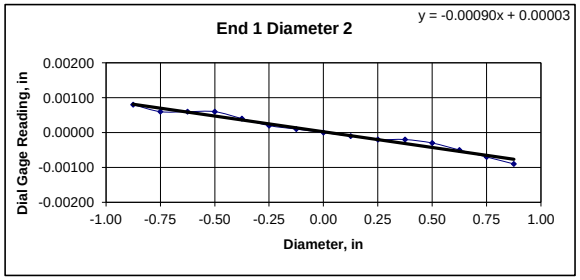
Difference between max and min readings, in:
0° = 0.00020 90° = 0.00170

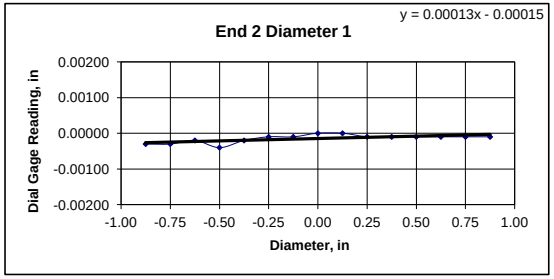
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00030	-0.00020	-0.00040	-0.00020	-0.00010	-0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	0.00060	0.00050	0.00040	0.00040	0.00040	0.00020	0.00010	0.00000	-0.00010	-0.00020	-0.00030	-0.00050	-0.00070	-0.00090	-0.00100

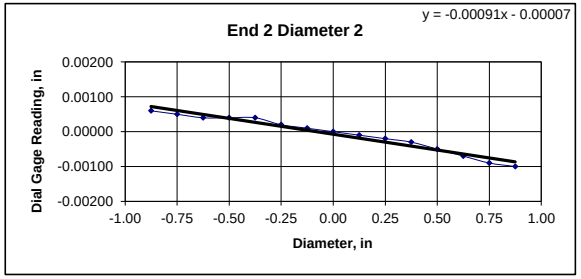
Difference between max and min readings, in:
0° = 0.0004 90° = 0.0016

Maximum difference must be < 0.0020 in. Difference = ± 0.00085
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line 0.00010
Angle of Best Fit Line: 0.00573

End 2:
Slope of Best Fit Line 0.00013
Angle of Best Fit Line: 0.00745

Maximum Angular Difference: 0.00172

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line -0.00090
Angle of Best Fit Line: -0.05157

End 2:
Slope of Best Fit Line -0.00091
Angle of Best Fit Line: -0.05214

Maximum Angular Difference: 0.00057

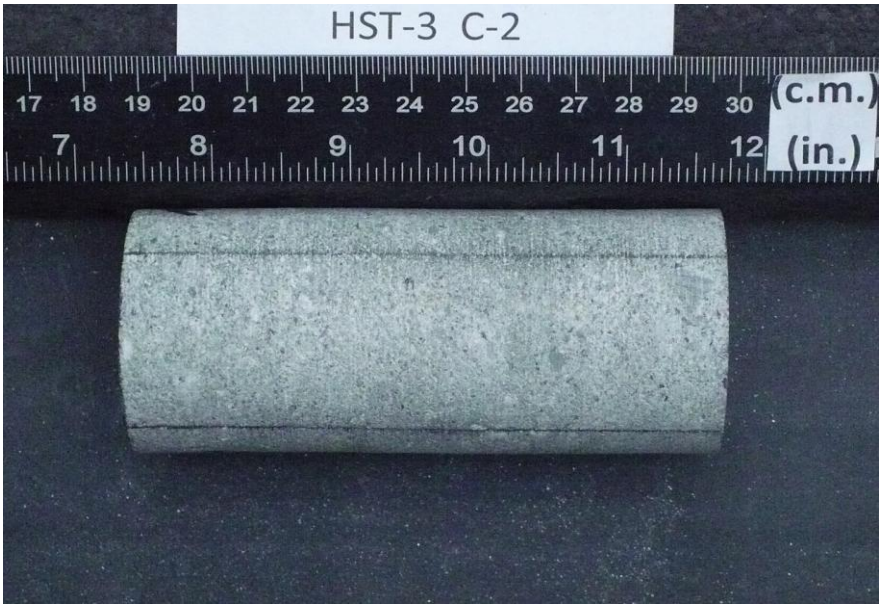
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00020	1.980	0.00010	0.006	YES
Diameter 2, in (rotated 90°)	0.00170	1.980	0.00086	0.049	YES
END 2					
Diameter 1, in	0.00040	1.980	0.00020	0.012	YES
Diameter 2, in (rotated 90°)	0.00160	1.980	0.00081	0.046	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Jacobs Civil, Inc.
Project Name:	SCR - Hockomock Swamp
Project Location:	Raynham, MA
GTX #:	11534
Test Date:	02/24/12
Tested By:	daa
Checked By:	mpd
Boring ID:	HST-3
Sample ID:	C-2
Depth, ft:	---



After cutting and grinding

After break

Client:	Jacobs Civil, Inc.	Test Date:	2/22/2012
Project Name:	SCR - Hockomock Swamp	Tested By:	daa
Project Location:	Raynham, MA	Checked By:	mpd
GTX #:	11534		
Boring ID:	HST-7		
Sample ID:	C-1		
Depth:	--- ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	4.22	4.22	4.22
Specimen Diameter, in:	1.97	1.98	1.98
Specimen Mass, g:	569.28		
Bulk Density, lb/ft^3	167		
Length to Diameter Ratio:	2.1	**Length to Diameter Ratio Tolerance Met?**	**YES**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? YES

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **YES**

END FLATNESS AND PARALLELISM (Procedure FP1)

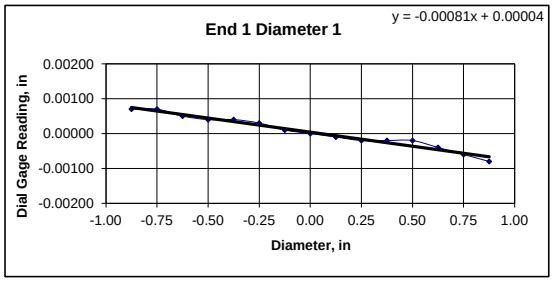
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00070	0.00070	0.00050	0.00040	0.00040	0.00030	0.00010	0.00000	-0.00010	-0.00020	-0.00020	-0.00020	-0.00040	-0.00060	-0.00080
Diameter 2, in (rotated 90°)	-0.00080	-0.00070	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060	0.00080

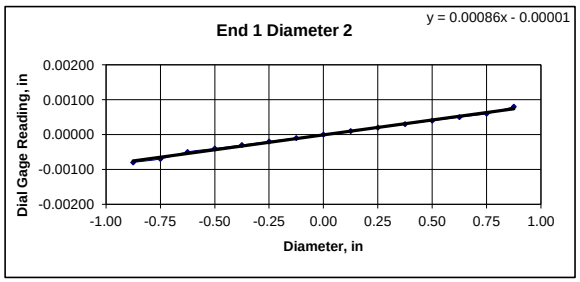
Difference between max and min readings, in:
0° = 0.00150 90° = 0.00160

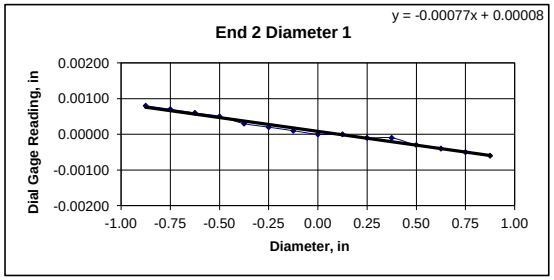
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00080	0.00070	0.00060	0.00050	0.00030	0.00020	0.00010	0.00000	0.00000	-0.00010	-0.00010	-0.00030	-0.00040	-0.00050	-0.00060
Diameter 2, in (rotated 90°)	-0.00060	-0.00050	-0.00040	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00020	0.00040	0.00050	0.00060	0.00080	0.00090

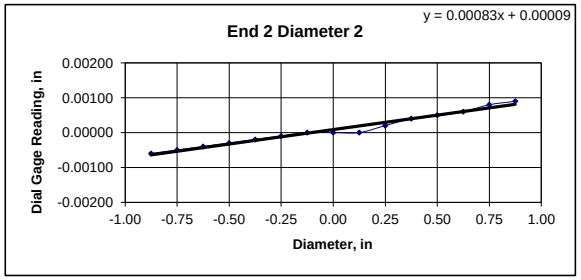
Difference between max and min readings, in:
0° = 0.0014 90° = 0.0015

Maximum difference must be < 0.0020 in. Difference = ± 0.00080
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line -0.00081
Angle of Best Fit Line: -0.04641

End 2:
Slope of Best Fit Line -0.00077
Angle of Best Fit Line: -0.04412

Maximum Angular Difference: 0.00229

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line 0.00086
Angle of Best Fit Line: 0.04927

End 2:
Slope of Best Fit Line 0.00083
Angle of Best Fit Line: 0.04756

Maximum Angular Difference: 0.00172

Parallelism Tolerance Met? **YES**
Spherically Seated

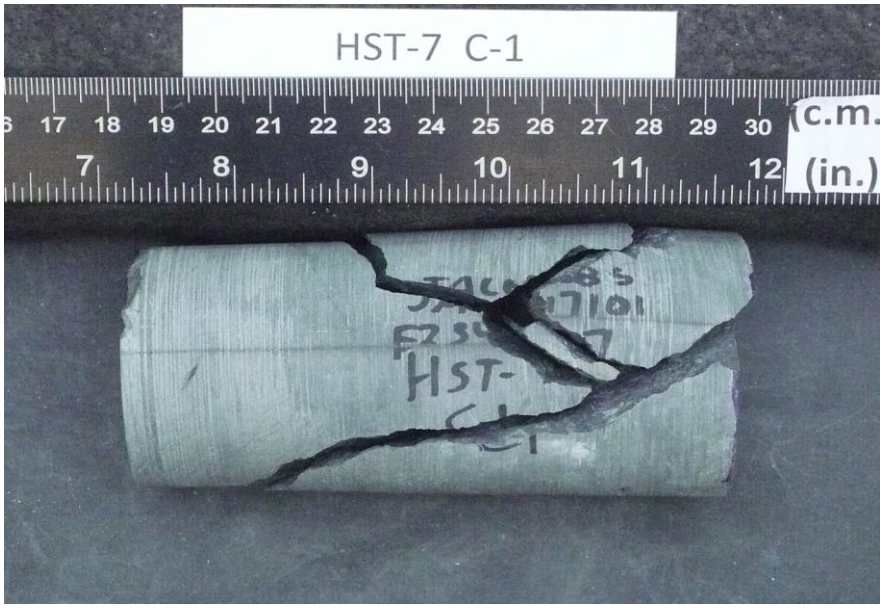
PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00150	1.975	0.00076	0.044	YES
Diameter 2, in (rotated 90°)	0.00160	1.975	0.00081	0.046	YES
END 2					
Diameter 1, in	0.00140	1.975	0.00071	0.041	YES
Diameter 2, in (rotated 90°)	0.00150	1.975	0.00076	0.044	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Jacobs Civil, Inc.
Project Name:	SCR - Hockomock Swamp
Project Location:	Raynham, MA
GTX #:	11534
Test Date:	02/24/12
Tested By:	daa
Checked By:	mpd
Boring ID:	HST-7
Sample ID:	C-1
Depth, ft:	---

After cutting and grinding



After break

Client:	Jacobs Civil, Inc.	Test Date:	2/22/2012
Project Name:	SCR - Hockomock Swamp	Tested By:	daa
Project Location:	Raynham, MA	Checked By:	mpd
GTX #:	11534		
Boring ID:	HST-8		
Sample ID:	C-1		
Depth:	--- ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D 4543

BULK DENSITY

	1	2	Average
Specimen Length, in:	3.79	3.79	3.79
Specimen Diameter, in:	1.95	1.97	1.96
Specimen Mass, g:	488.41		
Bulk Density, lb/ft^3	162		
Length to Diameter Ratio:	1.9	**Length to Diameter Ratio Tolerance Met?**	**NO**

DEVIATION FROM STRAIGHTNESS (Procedure S1)

Maximum gap between side of core and reference surface plate:
Is the maximum gap ≤ 0.02 in.? NO

Maximum difference must be < 0.020 in.
Straightness Tolerance Met? **NO**

END FLATNESS AND PARALLELISM (Procedure FP1)

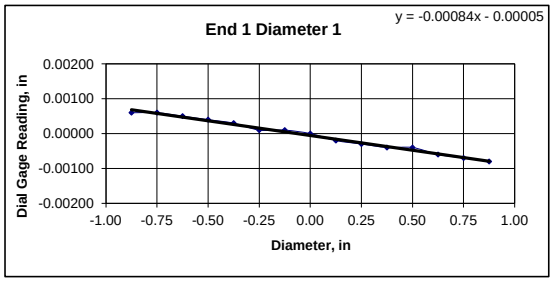
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00060	0.00060	0.00050	0.00040	0.00030	0.00010	0.00010	0.00000	-0.00020	-0.00030	-0.00040	-0.00040	-0.00060	-0.00070	-0.00080
Diameter 2, in (rotated 90°)	0.00020	0.00020	0.00020	0.00010	0.00010	0.00010	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00030	-0.00040	-0.00040

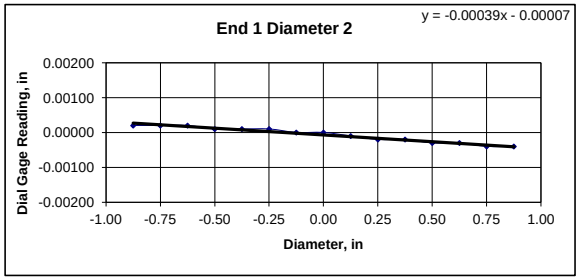
Difference between max and min readings, in:
0° = 0.00140 90° = 0.00060

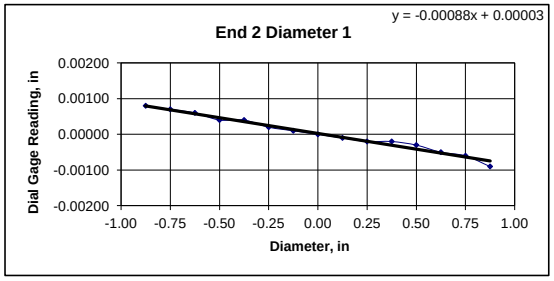
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00080	0.00070	0.00060	0.00040	0.00040	0.00020	0.00010	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00050	-0.00060	-0.00090
Diameter 2, in (rotated 90°)	0.00020	0.00020	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00020	-0.00030	-0.00030	-0.00040	-0.00050

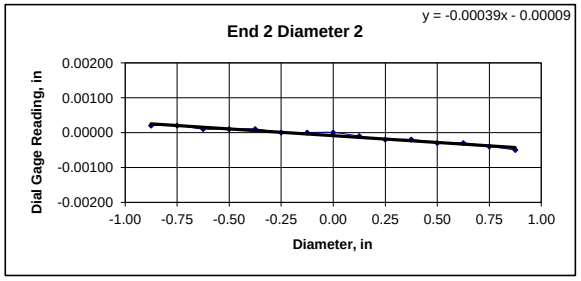
Difference between max and min readings, in:
0° = 0.0017 90° = 0.0007

Maximum difference must be < 0.0020 in. Difference = ± 0.00085
Flatness Tolerance Met? **YES**









DIAMETER 1

End 1:
Slope of Best Fit Line -0.00084
Angle of Best Fit Line: -0.04813

End 2:
Slope of Best Fit Line -0.00088
Angle of Best Fit Line: -0.05042

Maximum Angular Difference: 0.00229

Parallelism Tolerance Met? **YES**
Spherically Seated

DIAMETER 2

End 1:
Slope of Best Fit Line -0.00039
Angle of Best Fit Line: -0.02235

End 2:
Slope of Best Fit Line -0.00039
Angle of Best Fit Line: -0.02235

Maximum Angular Difference: 0.00000

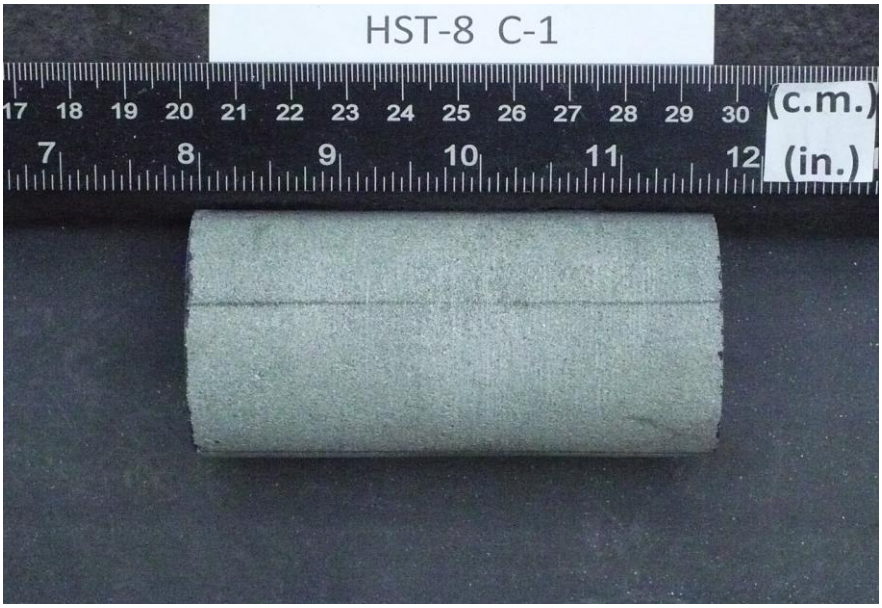
Parallelism Tolerance Met? **YES**
Spherically Seated

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)

END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?
Diameter 1, in	0.00140	1.960	0.00071	0.041	YES
Diameter 2, in (rotated 90°)	0.00060	1.960	0.00031	0.018	YES
END 2					
Diameter 1, in	0.00170	1.960	0.00087	0.050	YES
Diameter 2, in (rotated 90°)	0.00070	1.960	0.00036	0.020	YES

Maximum angle of departure must be ≤ 0.25°
Perpendicularity Tolerance Met? **YES**

Client:	Jacobs Civil, Inc.
Project Name:	SCR - Hockomock Swamp
Project Location:	Raynham, MA
GTX #:	11534
Test Date:	02/24/12
Tested By:	daa
Checked By:	mpd
Boring ID:	HST-8
Sample ID:	C-1
Depth, ft:	---



After cutting and grinding

After break

Summary of Laboratory Test Results for Soils

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-1, 2, 3	Sample Type:	---	Tested By:	jek
Sample ID:	S-1 (Composite)	Test Date:	02/22/12	Checked By:	jdt
Depth :	0-2 ft	Sample Id:	110172		
Test Comment:	---				
Sample Description:	Moist, very dark brown silty sand with gravel				
Sample Comment:	---				

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
HST-1, 2, 3	S-1 (Composite)	0-2 ft	Moist, very dark brown silty sand with gravel	9.5

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-1, 2, 3	Sample Type:	---	Tested By:	jek
Sample ID:	S-1 (Composite)	Test Date:	02/16/12	Checked By:	jdt
Depth :	0-2 ft	Test Id:	230270		
Test Comment:	---				
Sample Description:	Moist, very dark brown silty sand with gravel				
Sample Comment:	---				

Moisture, Ash, and Organic Matter - ASTM D 2974

Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
HST-1, 2, 3	S-1 (Composite)	0-2 ft	Moist, very dark brown silty sand with gravel	10	96.9	3.1

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 110º C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440º C

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-1, 2, 3	Sample Type:	---	Tested By:	jek
Sample ID:	S-1 (Composite)	Test Date:	02/20/12	Checked By:	jdt
Depth :	0-2 ft	Test Id:	230271		
Test Comment:	---				
Sample Description:	Moist, very dark brown silty sand with gravel				
Sample Comment:	---				

pH of Soil by ASTM D 4972

Boring ID	Sample ID	Depth	Visual Description	pH
HST-1, 2, 3	S-1 (Composite)	0-2 ft	Moist, very dark brown silty sand with gravel	4.7

Notes: solution water; 10 ml : 10g soil

Sample Preparation: screened through #10 sieve

Method A, pH meter used

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.
Project:	SCR - Hockomock Swamp
Location:	Raynham, MA
GTX#:	11534
Test Date:	02/20/12
Tested By:	jek
Checked By:	jdt

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G 57

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
HST-1,2,3	(S-1) Composite	0-2	Moist, very dark brown silty sand with gravel	31,401	3.18E-05

Notes: Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G 57)
Test conducted in standard laboratory atmosphere: 68-73 F

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	02/22/12	Checked By:	jdt
Depth :	---	Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
HST-1	S-6	25-27 ft	Moist, olive brown silt	25.2
HST-2	S-4	14-16 ft	Moist, gray clay with sand	31.6
HST-2	S-9	39-41 ft	Wet, gray silty clay	31.4
HST-3	S-7	30-32 ft	Moist, gray clay	36.6
HST-4	S-2A	5-7 ft	Moist, brown sandy clay with organics	74.4
HST-4	S-9A	40-42 ft	Moist, gray clay	40
HST-4	S-10	45-47 ft	Moist, gray silt	28.5
HST-5	S-1	0-2 ft	Moist, very dark brown silty sand	16.4
HST-6	S-2	5.5-7.5 ft	Moist, dark brown silty sand with organics	95.7
HST-6	S-6	25-27 ft	Moist, gray clay	40.9

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	02/22/12	Checked By:	jdt
Depth :	---	Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
HST-7	S-2B	4-6 ft	Moist, brown silty sand with organics	59.8
HST-7	S-7	29-31 ft	Moist, gray silt	30.4
HST-8	S-9	39-41 ft	Moist, gray clay with sand	31.3
HST-9	S-4	15-17 ft	Moist, brown sand with organics	409.3
HST-9	S-7	30-32 ft	Moist, brown silt	66.5
HS-7	UD-1	14 ft	Moist, olive sandy clay	26.7
HS-8	S-4	15-17 ft	Moist, gray silt	26.6
HS-10	S-6	21-23 ft	Moist, yellowish brown clay with sand	30.9
HS-11	S-3	9-11 ft	Moist, brown clay with sand	7.8

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	02/16/12	Checked By:	jdt
Depth :	---	Test Id:	230135		

pH of Soil by ASTM D 4972

Boring ID	Sample ID	Depth	Visual Description	pH
HST-5	S-1	0-2 ft	Moist, very dark brown silty sand	4.5
HST-7	S-2B	4-6 ft	Moist, brown silty sand with organics	5.2

Notes: solution water; 10 ml : 10g soil

Sample Preparation: screened through #10 sieve

Method A, pH meter used

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	02/14/12	Checked By:	jdt
Depth :	---	Test Id:	230130		

Moisture, Ash, and Organic Matter - ASTM D 2974

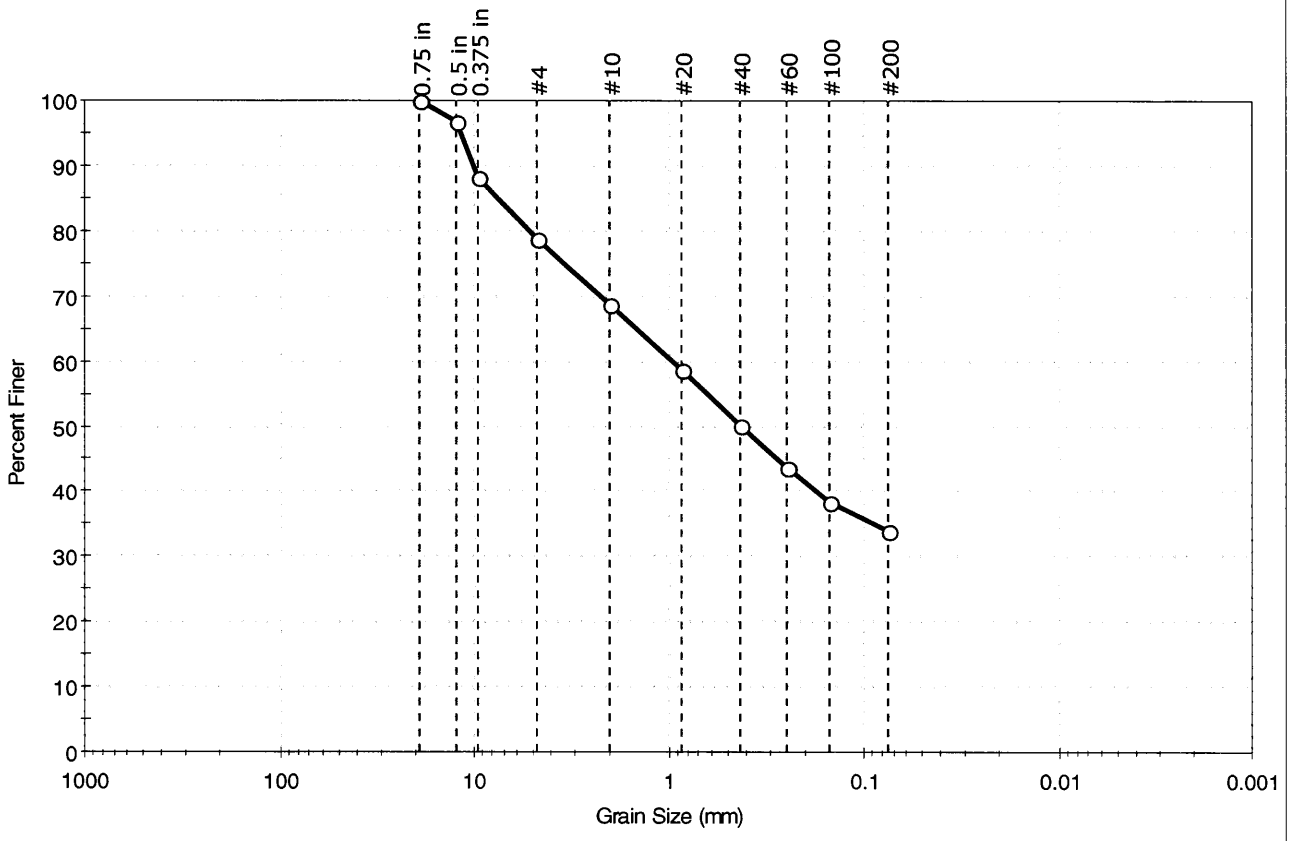
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
HST-4	S-2A	5-7 ft	Moist, brown sandy clay with organics	74	88.2	11.8
HST-5	S-1	0-2 ft	Moist, very dark brown silty sand	16	96.	4.
HST-6	S-2	5.5-7.5 ft	Moist, dark brown silty sand with organics	96	88.4	11.6
HST-7	S-2B	4-6 ft	Moist, brown silty sand with organics	60	90.4	9.6
HST-9	S-4	15-17 ft	Moist, brown sand with organics	409	38.3	61.7

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-3	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	02/14/12	Checked By:	jdt
Depth :	4-6 ft	Test Id:	230093		
Test Comment:	---				
Sample Description:	Moist, brown silty, clayey sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	21.2	44.8	34.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	88		
#4	4.75	79		
#10	2.00	69		
#20	0.85	59		
#40	0.42	50		
#60	0.25	44		
#100	0.15	38		
#200	0.075	34		

Coefficients

D_{85} = 7.5002 mm D_{30} = N/A
D_{60} = 0.9537 mm D_{15} = N/A
D_{50} = 0.4159 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

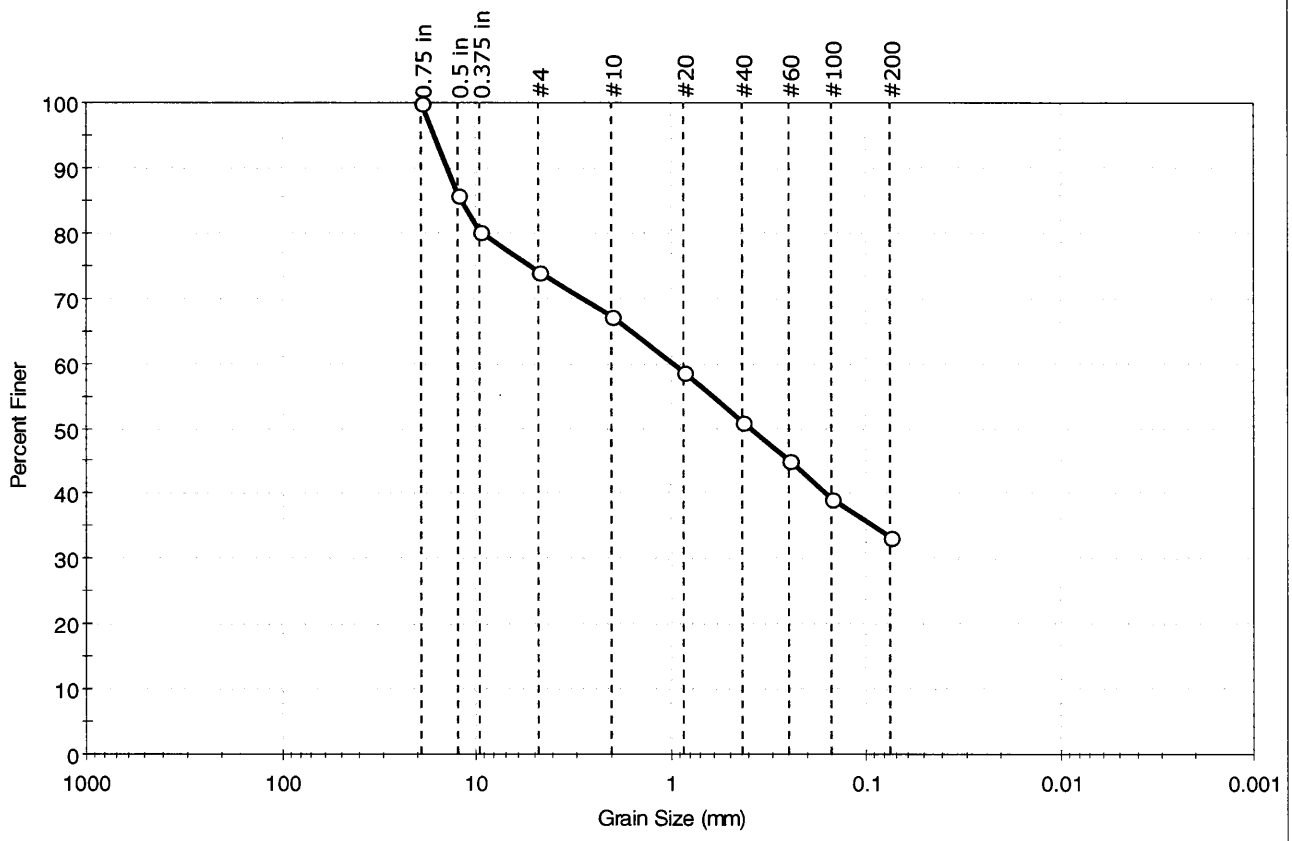
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-4	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	02/16/12	Checked By:	jdt
Depth :	5-7 ft	Test Id:	230094		
Test Comment:	---				
Sample Description:	Moist, brown silty, clayey sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	25.9	40.8	33.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	86		
0.375 in	9.50	80		
#4	4.75	74		
#10	2.00	67		
#20	0.85	59		
#40	0.42	51		
#60	0.25	45		
#100	0.15	39		
#200	0.075	33		

Coefficients

D_{85} = 11.9648 mm D_{30} = N/A
D_{60} = 0.9657 mm D_{15} = N/A
D_{50} = 0.3855 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

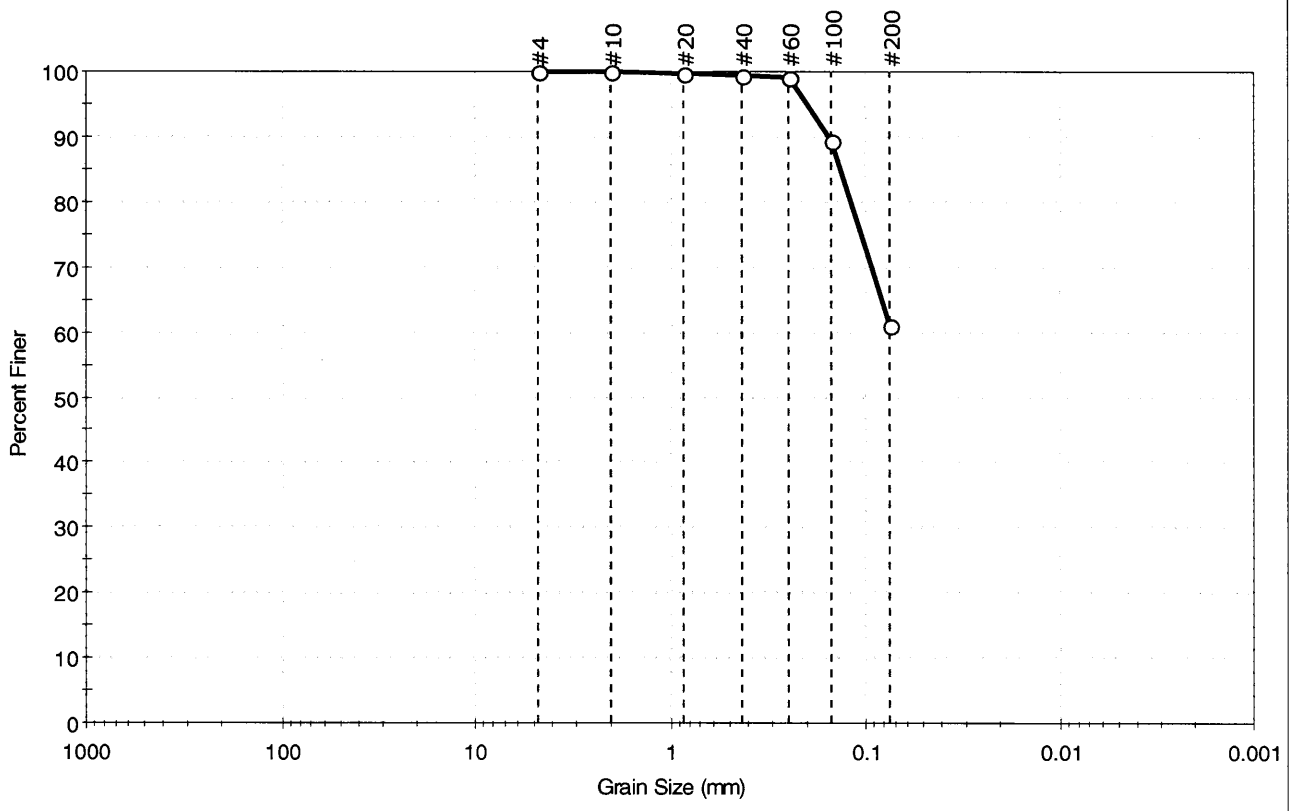
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-9	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	02/16/12	Checked By:	jdt
Depth :	14-16 ft	Test Id:	230095		
Test Comment:	---				
Sample Description:	Moist, yellowish brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	38.8	61.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	89		
#200	0.075	61		

Coefficients

D_{85} = 0.1344 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

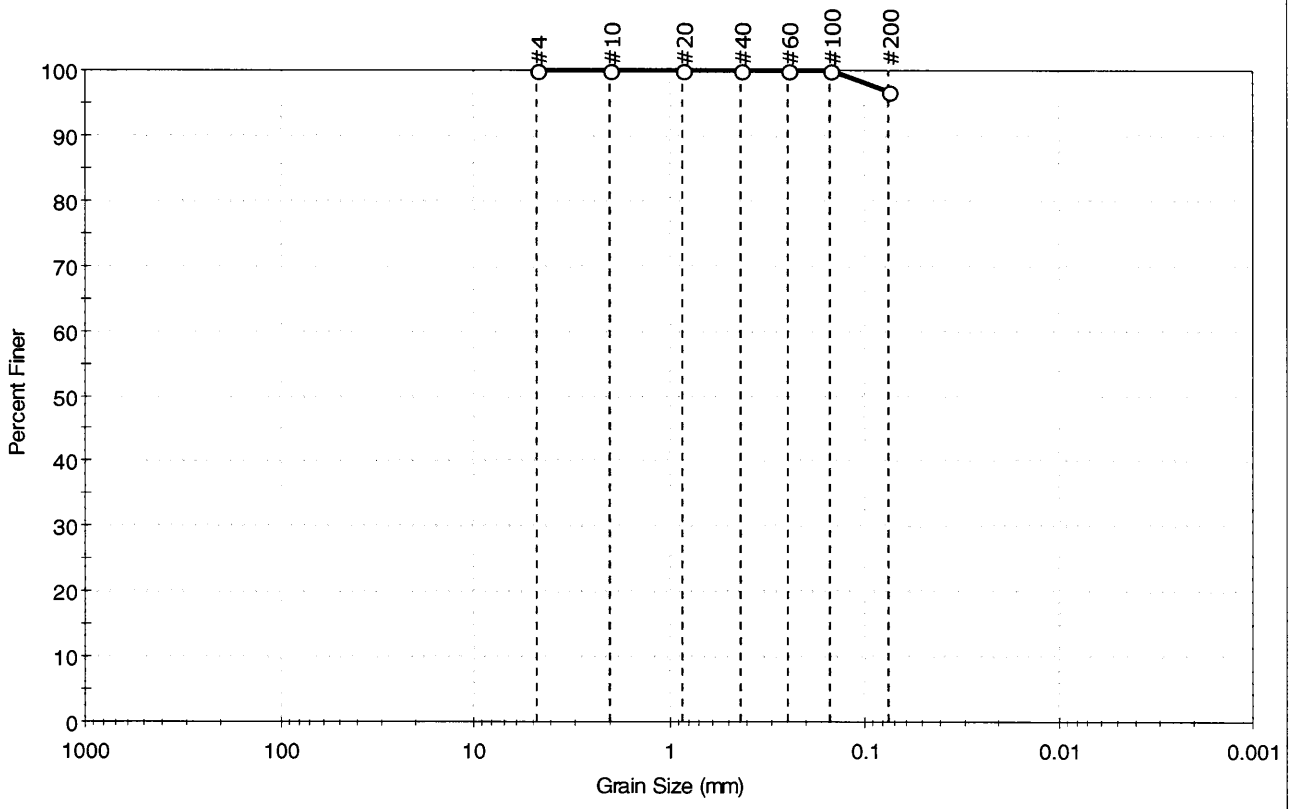
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.		
Project:	SCR - Hockomock Swamp		
Location:	Raynham, MA	Project No:	GTX-11534
Boring ID:	HST-1	Sample Type: jar	Tested By: jbr
Sample ID:	S-6	Test Date: 02/14/12	Checked By: jdt
Depth :	25-27 ft	Test Id: 230089	
Test Comment:	---		
Sample Description:	Moist, olive brown silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	3.2	96.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	97		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

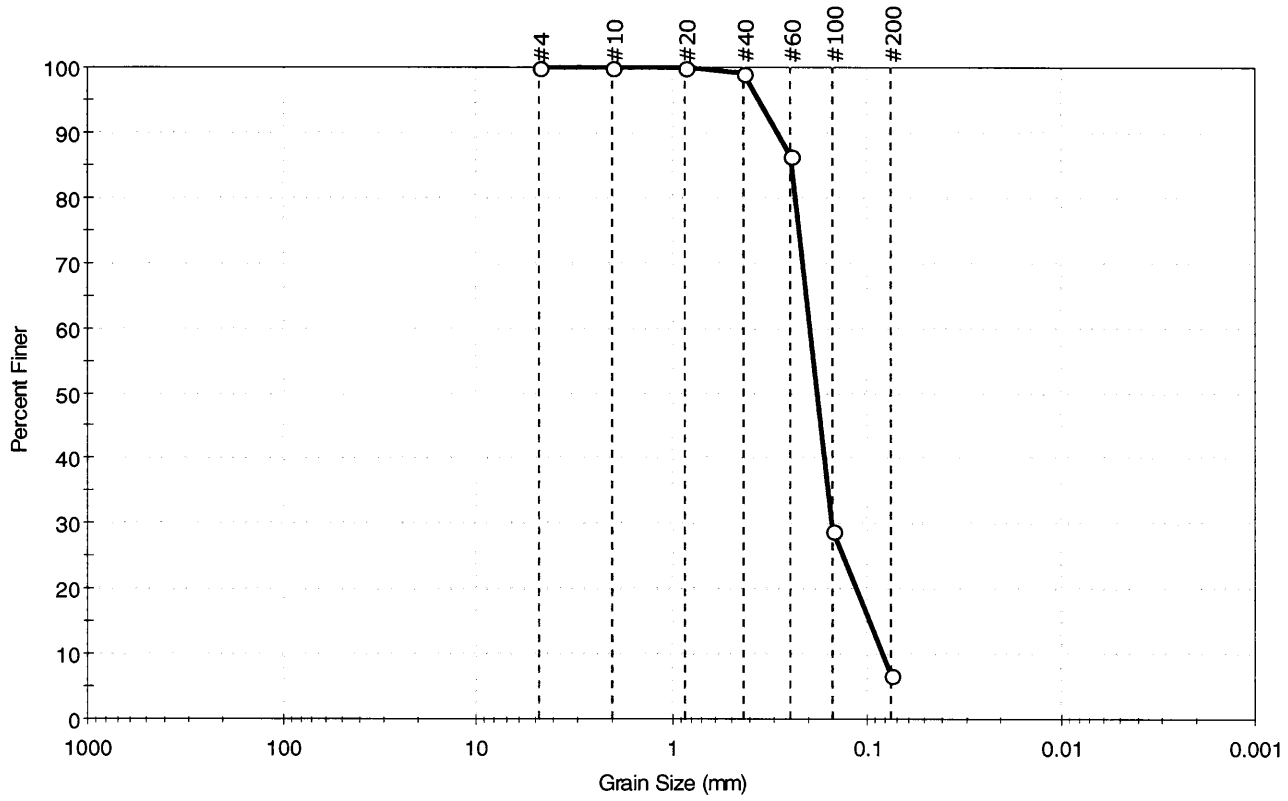
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-3	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	02/16/12	Checked By:	jdt
Depth :	15-17 ft	Test Id:	230090		
Test Comment:	---				
Sample Description:	Moist, gray sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	93.3	6.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	86		
#100	0.15	29		
#200	0.075	7		

Coefficients

D_{85} =0.2467 mm	D_{30} =0.1517 mm
D_{60} =0.1978 mm	D_{15} =0.0974 mm
D_{50} =0.1810 mm	D_{10} =0.0832 mm
C_u =2.377	C_c =1.398

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

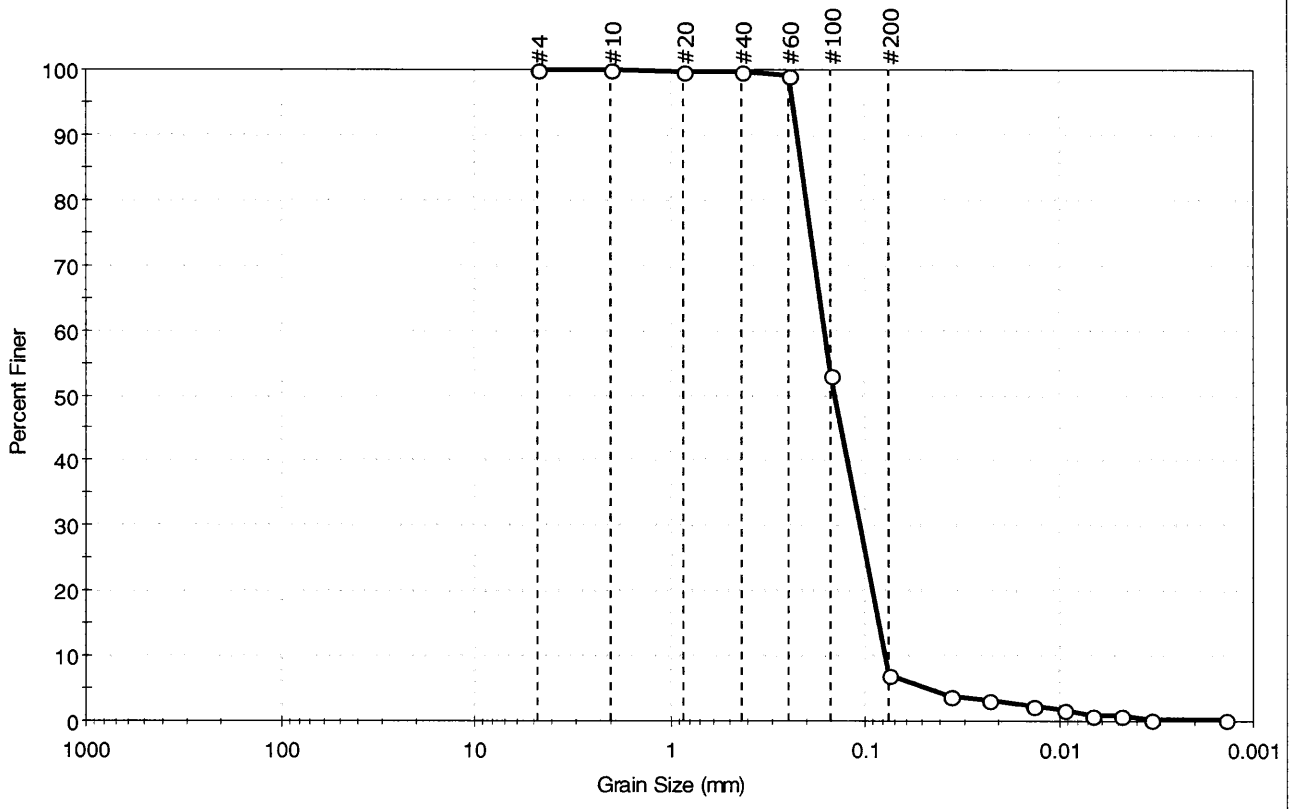
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-4	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	02/16/12	Checked By:	jdt
Depth :	15-17 ft	Test Id:	230098		
Test Comment:	---				
Sample Description:	Moist, brownish yellow sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	--	92.9	7.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	53		
#200	0.075	7		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0359	4		
---	0.0226	3		
---	0.0134	2		
---	0.0093	2		
---	0.0068	1		
---	0.0048	1		
---	0.0034	0		
---	0.0014	0		

Coefficients

D_{85} = 0.2136 mm	D_{30} = 0.1059 mm
D_{60} = 0.1620 mm	D_{15} = 0.0845 mm
D_{50} = 0.1432 mm	D_{10} = 0.0783 mm
C_u = 2.069	C_c = 0.884

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (0))

Sample/Test Description

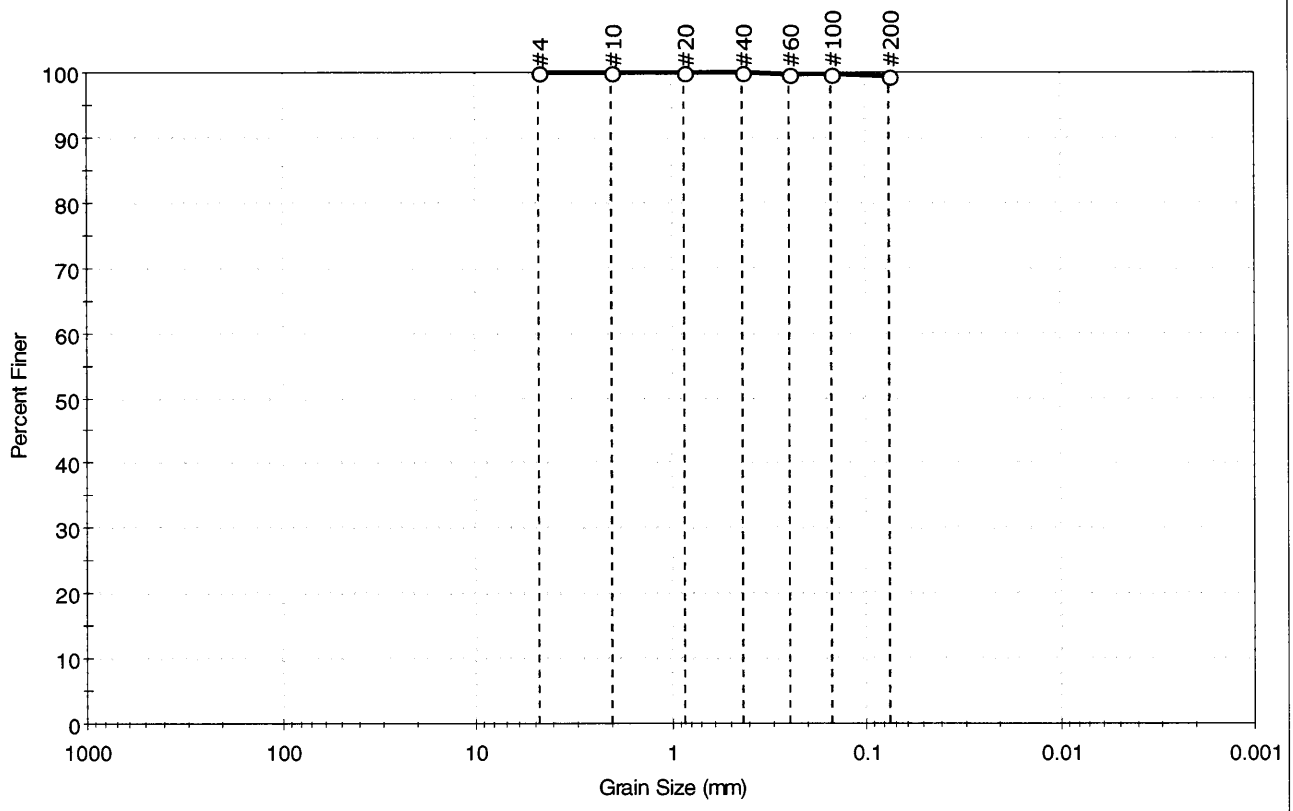
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-4	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-10	Test Date:	02/14/12	Checked By:	jdt
Depth :	45-47 ft	Test Id:	230091		
Test Comment:	---				
Sample Description:	Moist, gray silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
--	0.0	0.7	99.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	99		

Coefficients

D_{85} = N/A	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM silt (ML)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

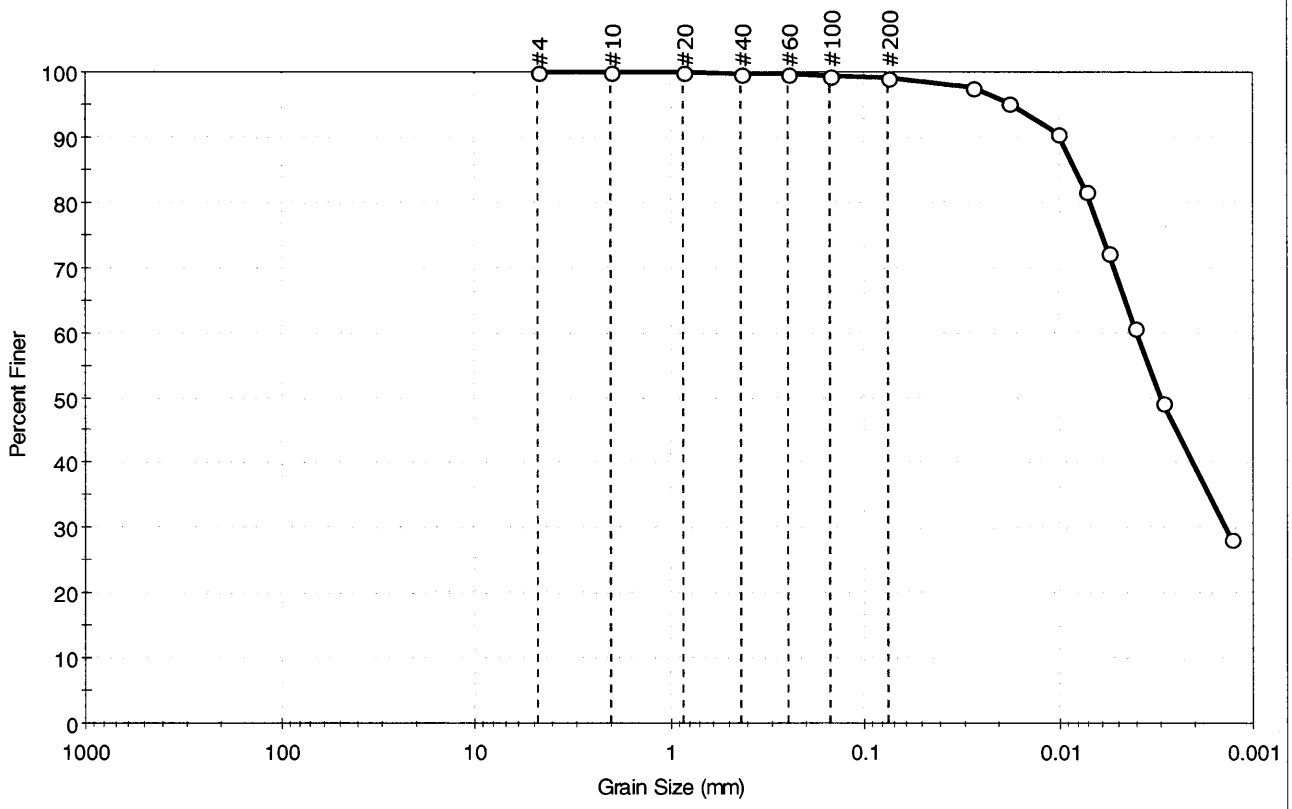
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.		
Project:	SCR - Hockomock Swamp		
Location:	Raynham, MA	Project No:	GTX-11534
Boring ID:	HST-6	Sample Type: jar	Tested By: jbr
Sample ID:	S-6	Test Date: 02/17/12	Checked By: jdt
Depth :	25-27 ft	Test Id: 230099	
Test Comment:	---		
Sample Description:	Moist, gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	0.9	99.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0277	98		
---	0.0178	95		
---	0.0101	91		
---	0.0073	82		
---	0.0055	72		
---	0.0041	61		
---	0.0030	49		
---	0.0013	28		

Coefficients

D_{85} = 0.0082 mm D_{30} = 0.0014 mm
D_{60} = 0.0040 mm D_{15} = N/A
D_{50} = 0.0030 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-6 (21))

Sample/Test Description

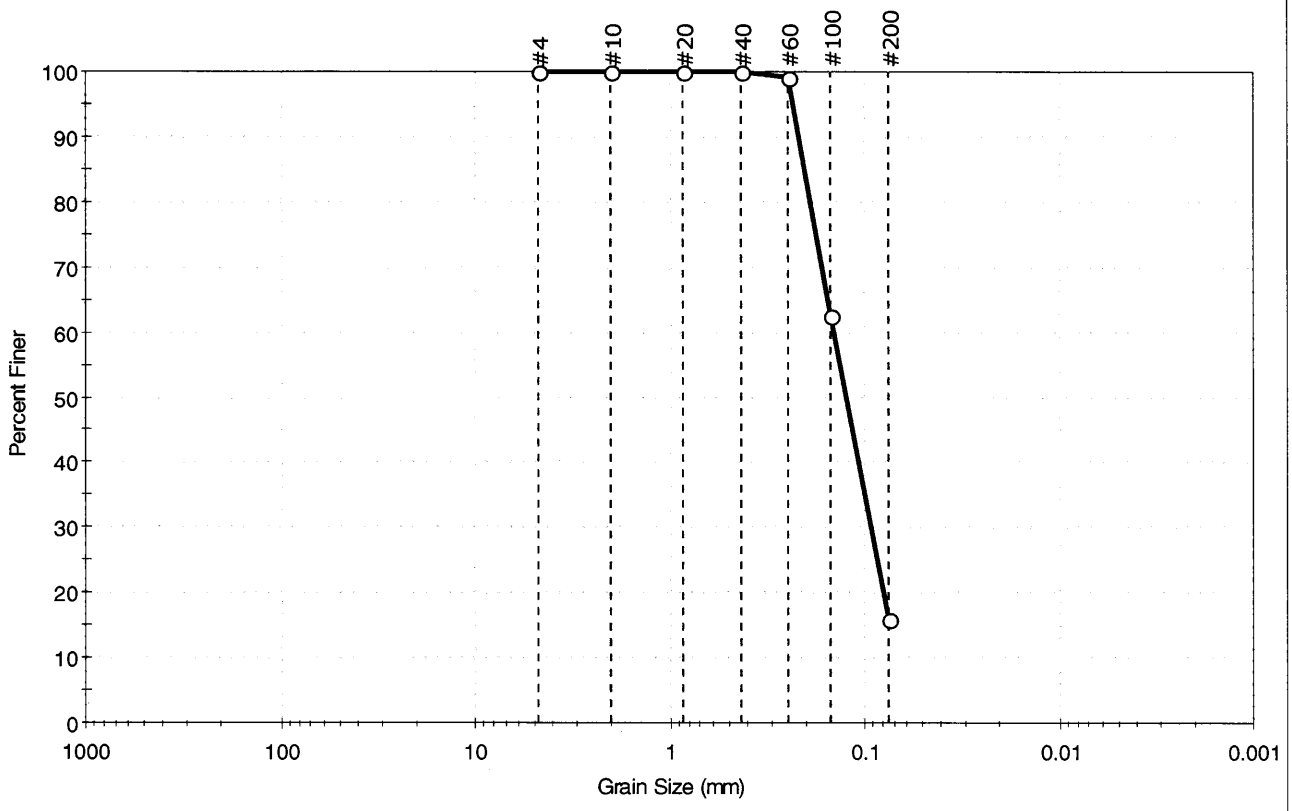
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-8	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-5	Test Date:	02/14/12	Checked By:	jdt
Depth :	19-21 ft	Test Id:	230092		
Test Comment:	---				
Sample Description:	Moist, light greenish gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	84.0	16.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	63		
#200	0.075	16		

Coefficients

D_{85} = 0.2055 mm D_{30} = 0.0924 mm
D_{60} = 0.1445 mm D_{15} = N/A
D_{50} = 0.1245 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

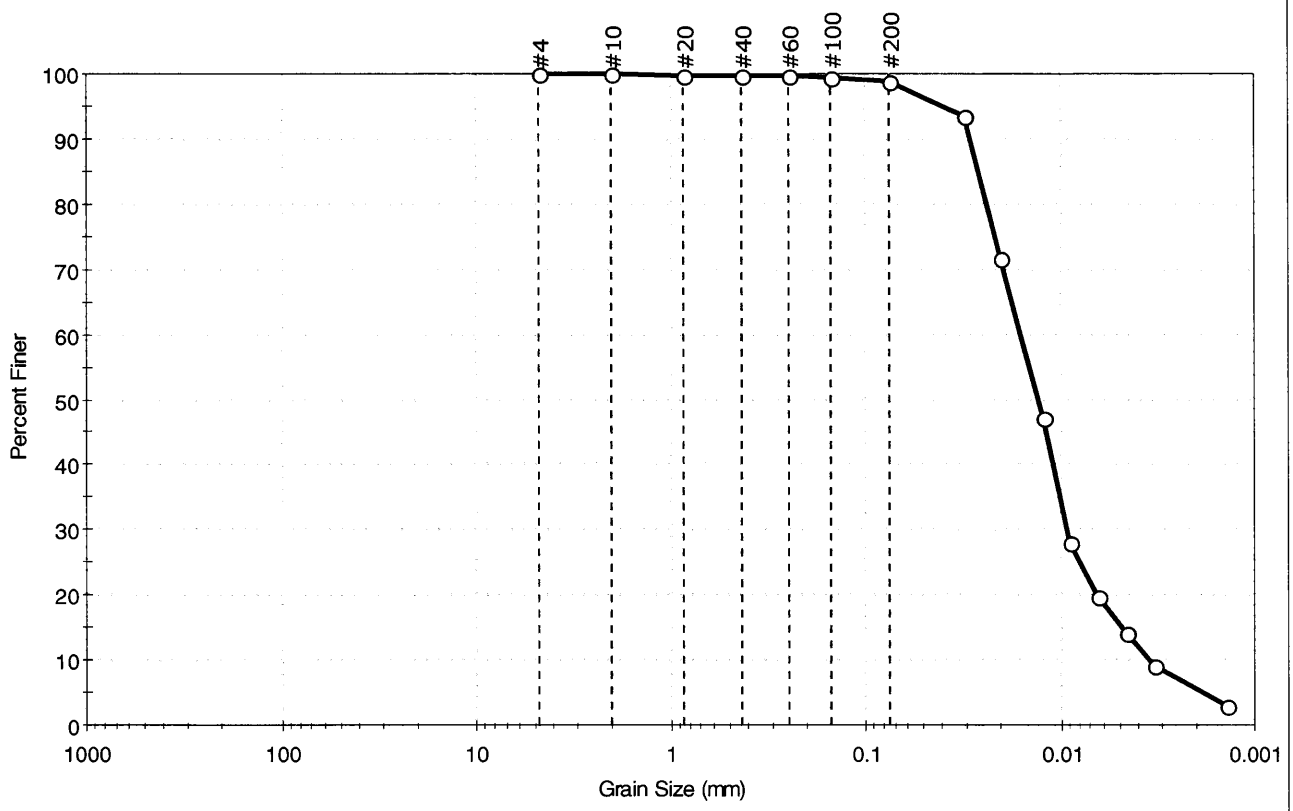
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-9	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-7	Test Date:	02/17/12	Checked By:	jdt
Depth :	30-32 ft	Test Id:	230100		
Test Comment:	---				
Sample Description:	Moist, brown silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	1.1	98.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0308	94		
---	0.0202	72		
---	0.0123	47		
---	0.0091	28		
---	0.0065	20		
---	0.0046	14		
---	0.0033	9		
---	0.0014	3		

Coefficients

D_{85} = 0.0261 mm D_{30} = 0.0094 mm
D_{60} = 0.0160 mm D_{15} = 0.0048 mm
D_{50} = 0.0131 mm D_{10} = 0.0035 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

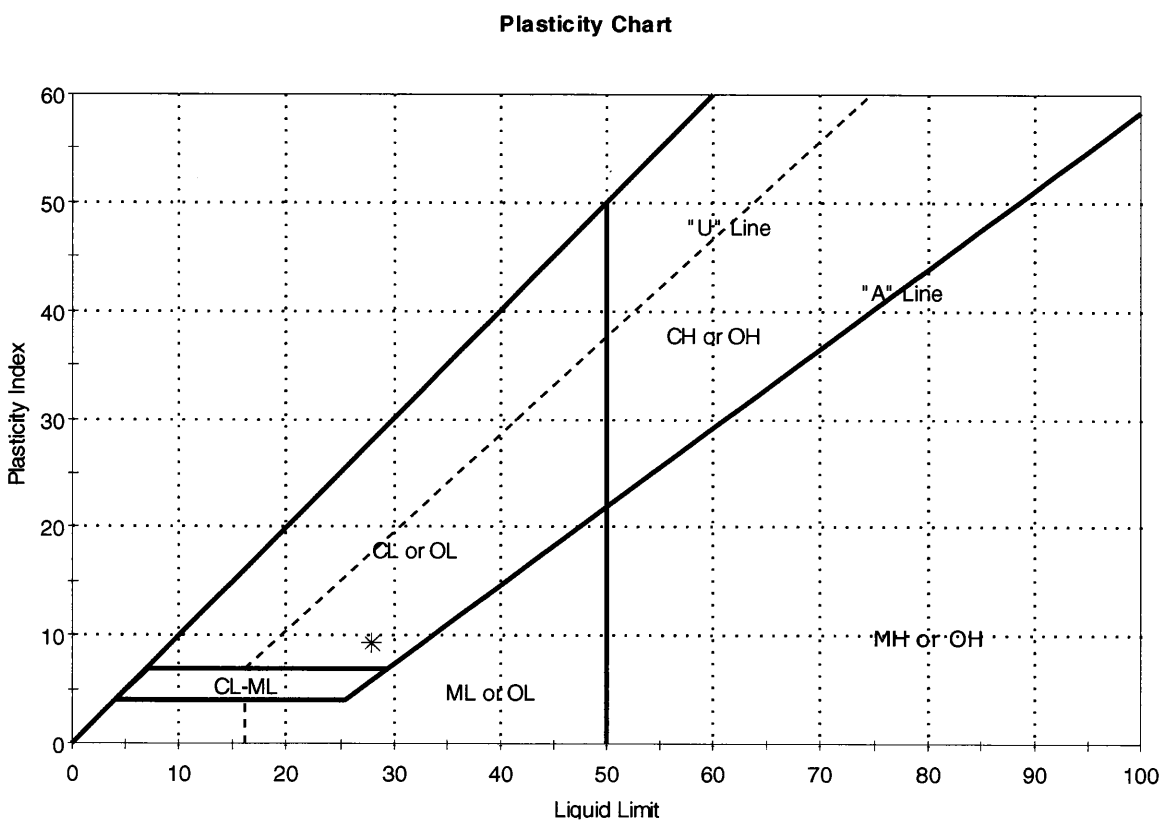
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-10	Sample Type:	jar	Tested By:	cam
Sample ID:	S-6	Test Date:	02/14/12	Checked By:	jdt
Depth :	21-23 ft	Test Id:	230084		
Test Comment:	---				
Sample Description:	Moist, yellowish brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
✳	S-6	HS-10	21-23 ft	31	28	19	9	1	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilentancy: RAPID

Toughness: LOW

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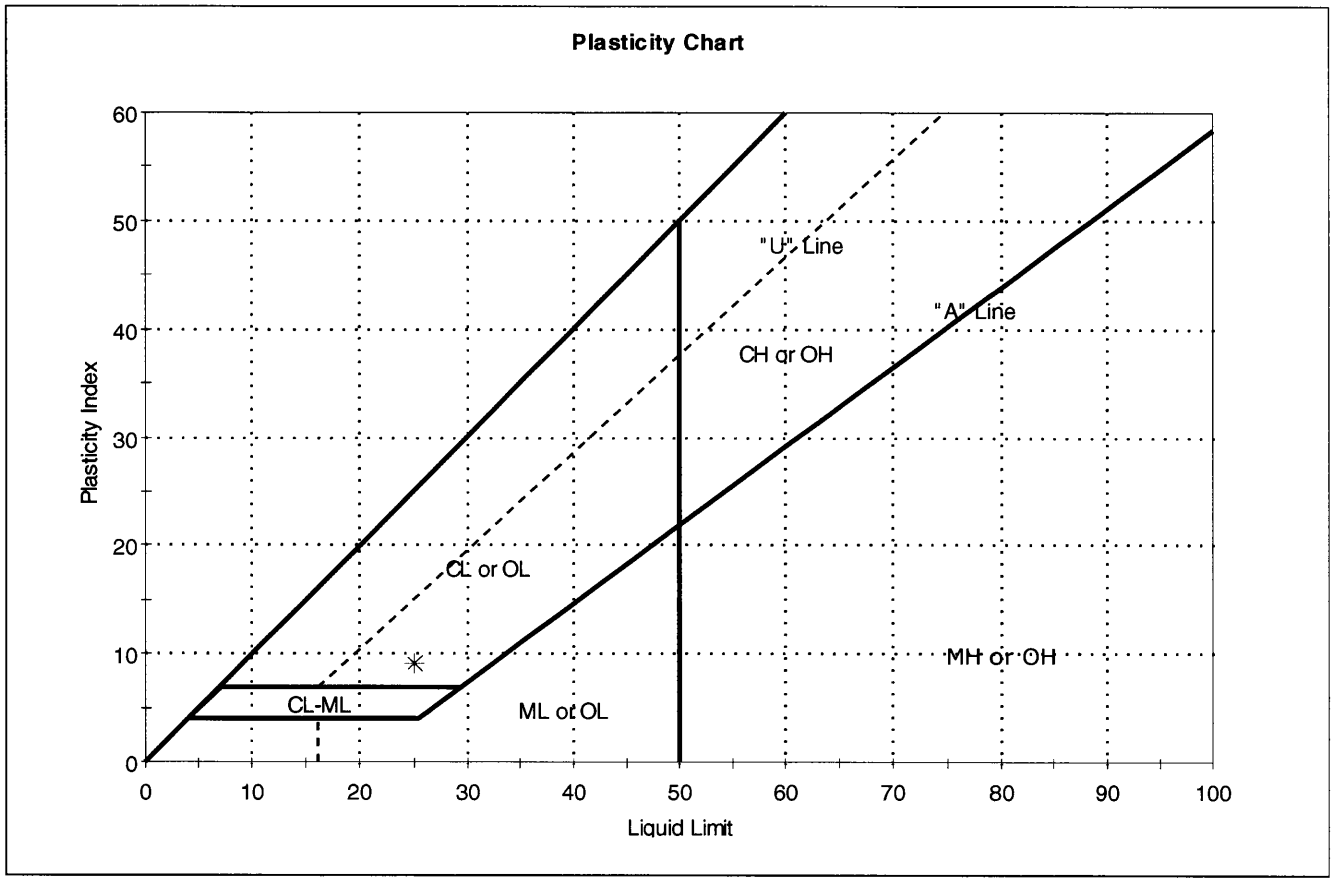
GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-11	Sample Type:	jar	Tested By:	cam
Sample ID:	S-3	Test Date:	02/14/12	Checked By:	jdt
Depth :	9-11 ft	Test Id:	230085		
Test Comment:	---				
Sample Description:	Moist, brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-3	HS-11	9-11 ft	8	25	16	9	-1	

Sample Prepared using the WET method

Dry Strength: HIGH

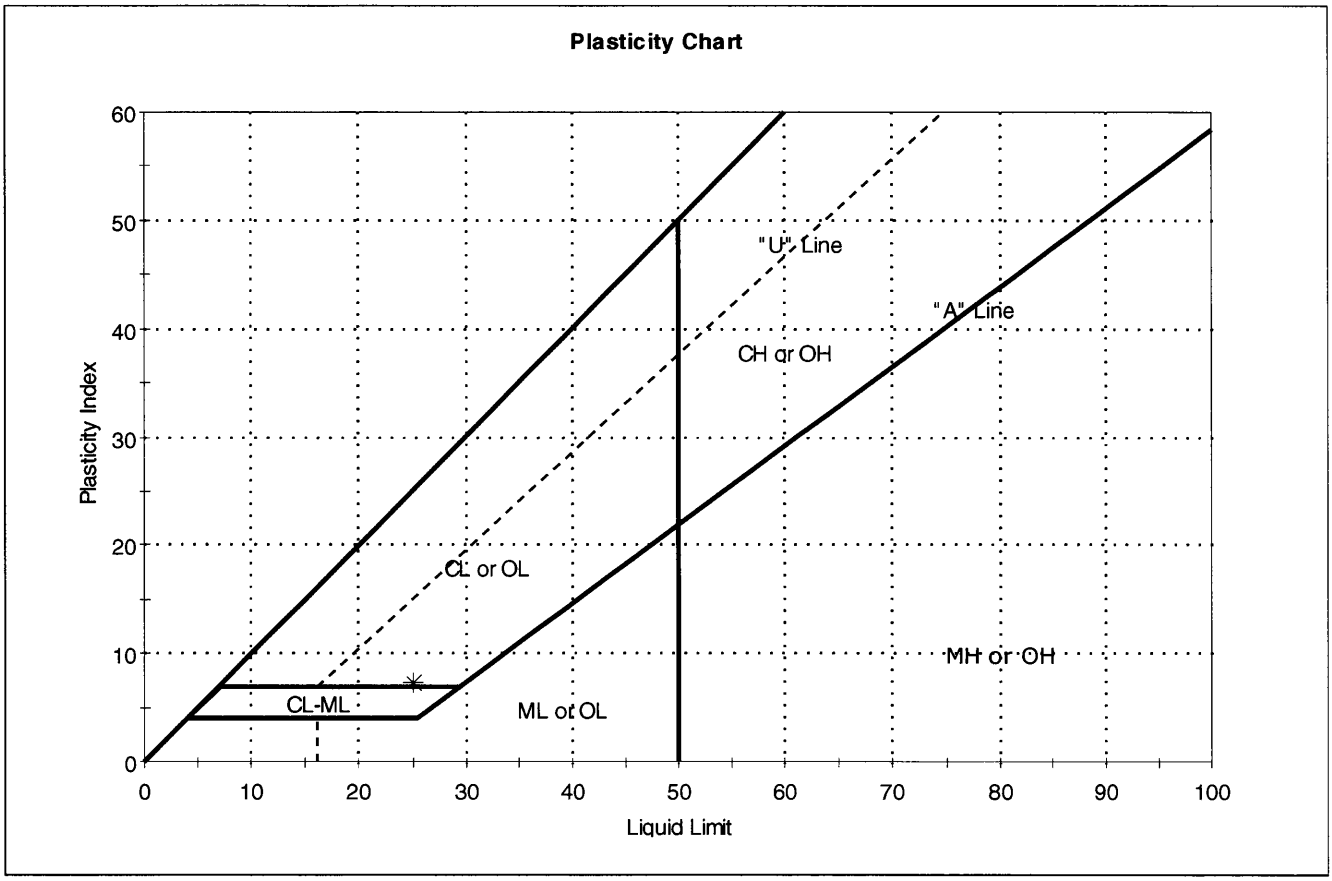
Dilentancy: SLOW

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-7	Sample Type:	tube	Tested By:	cam
Sample ID:	UD-1	Test Date:	02/14/12	Checked By:	jdt
Depth :	14 ft	Test Id:	230082		
Test Comment:	---				
Sample Description:	Moist, olive sandy clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	UD-1	HS-7	14 ft	27	25	18	7	1	

Sample Prepared using the WET method

Dry Strength: MEDIUM

Dilentancy: RAPID

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HS-8	Sample Type:	jar	Tested By:	cam
Sample ID:	S-4	Test Date:	02/14/12	Checked By:	jdt
Depth :	15-17 ft	Test Id:	230083		
Test Comment:	---				
Sample Description:	Moist, gray silt				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-4	HS-8	15-17 ft	27	n/a	n/a	n/a	n/a	

Dry Strength: MEDIUM

Dilentancy: RAPID

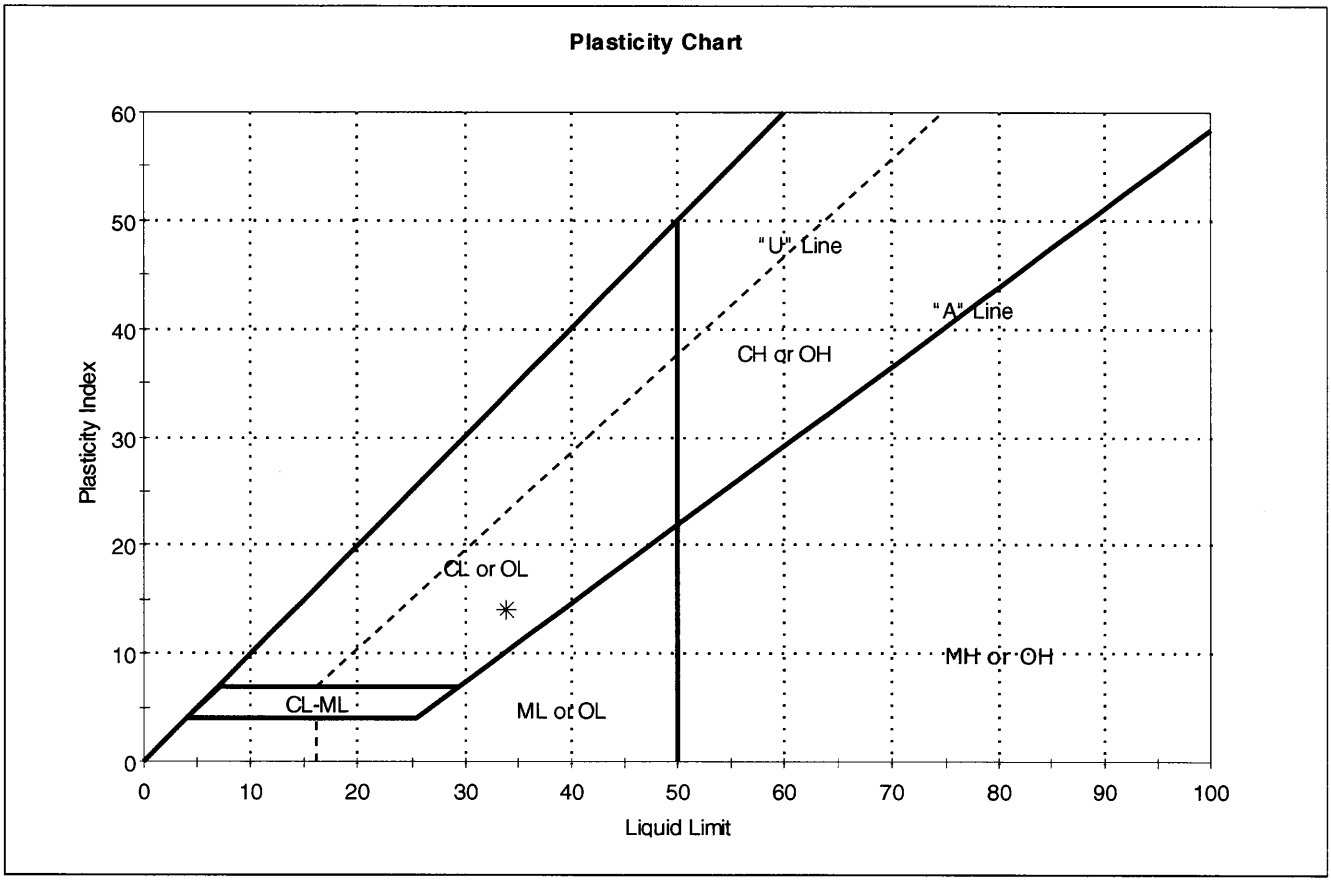
Toughness: n/a

The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-2	Sample Type:	jar	Tested By:	cam
Sample ID:	S-4	Test Date:	02/14/12	Checked By:	jdt
Depth :	14-16 ft	Test Id:	230073		
Test Comment:	---				
Sample Description:	Moist, gray clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-4	HST-2	14-16 ft	32	34	20	14	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

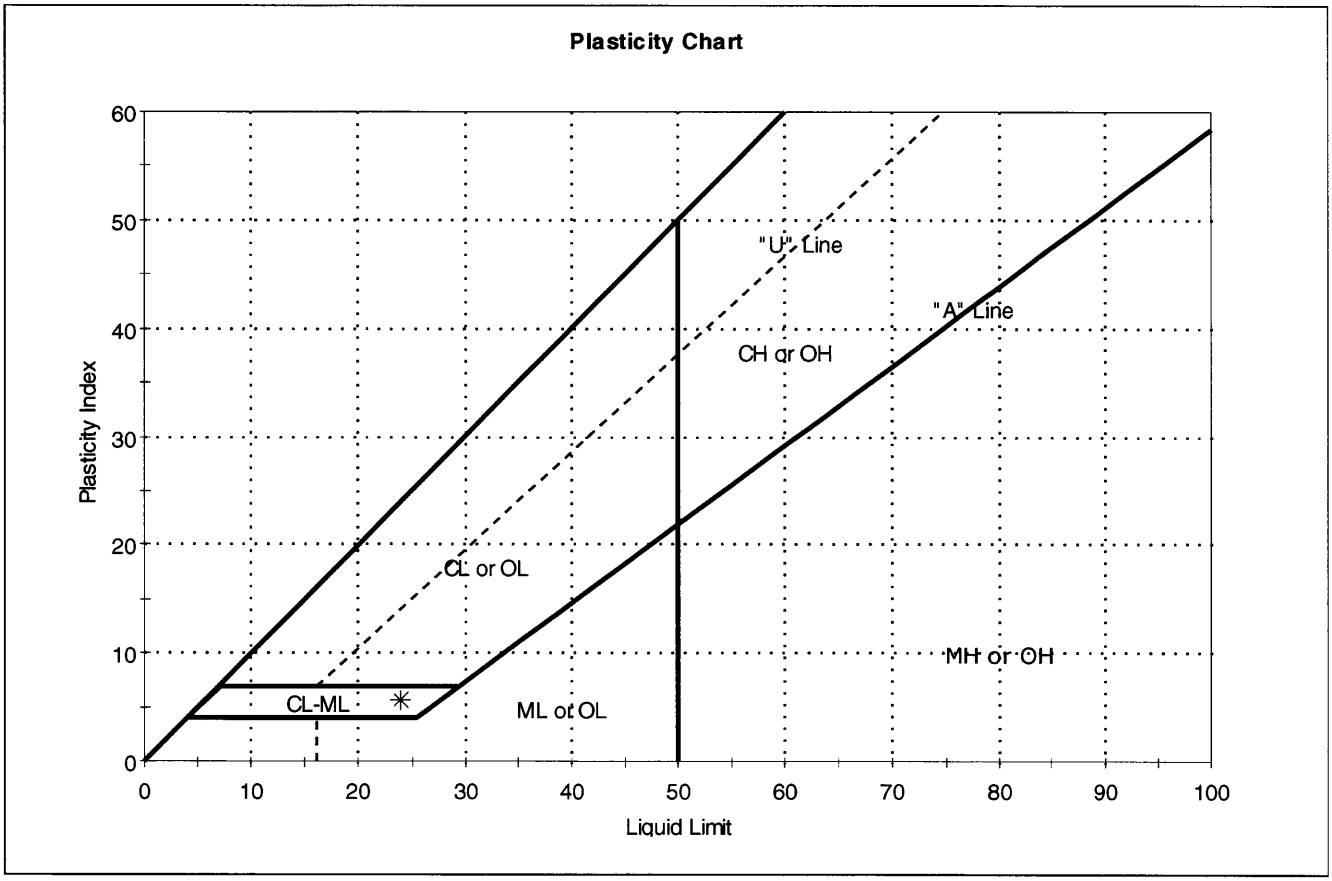
Dilentancy: SLOW

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-2	Sample Type:	jar	Tested By:	cam
Sample ID:	S-9	Test Date:	02/14/12	Checked By:	jdt
Depth :	39-41 ft	Test Id:	230074		
Test Comment:	---				
Sample Description:	Wet, gray silty clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
✳	S-9	HST-2	39-41 ft	31	24	18	6	2	

Sample Prepared using the WET method

Dry Strength: HIGH

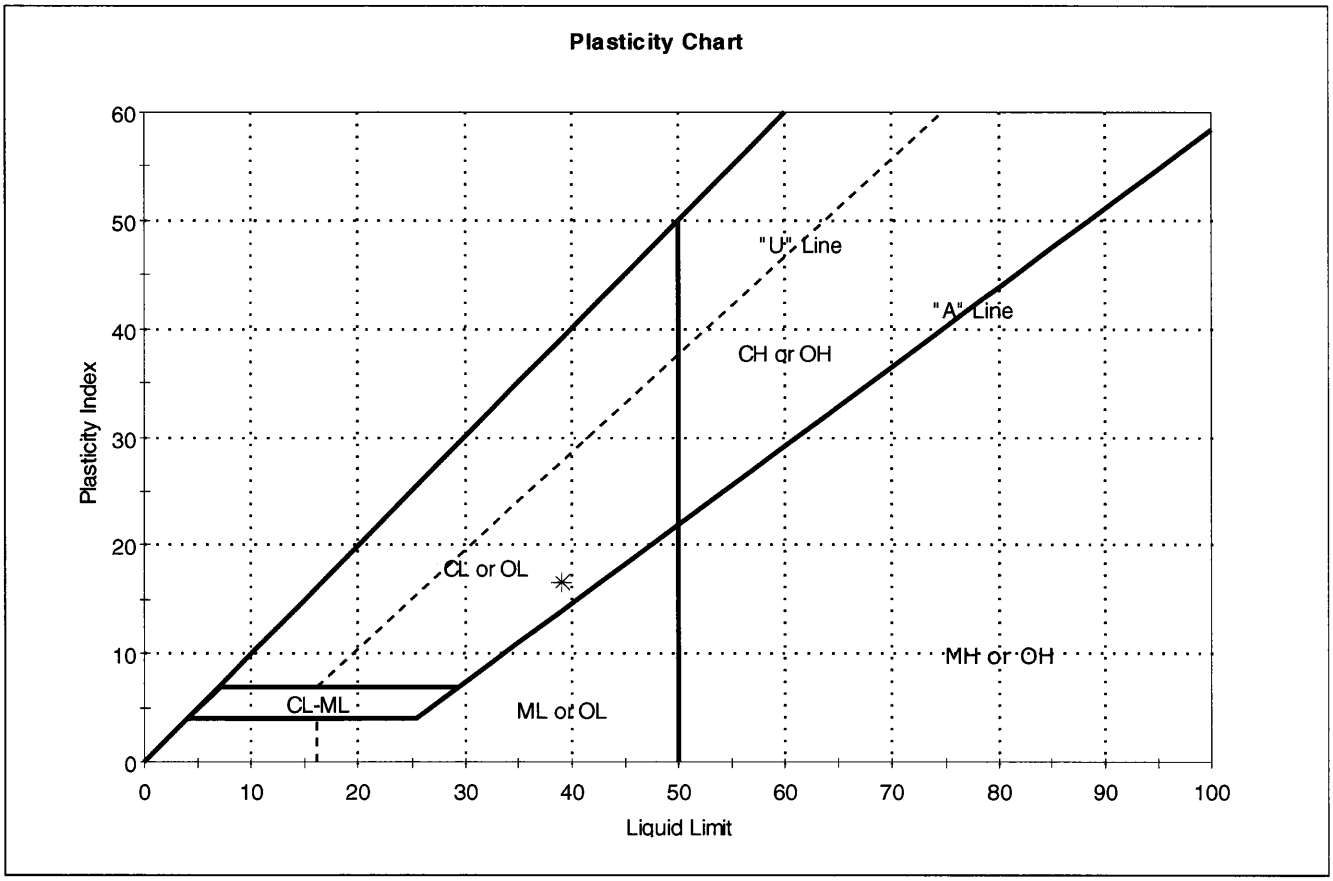
Dilentancy: RAPID

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-3	Sample Type:	jar	Tested By:	cam
Sample ID:	S-7	Test Date:	02/14/12	Checked By:	jdt
Depth :	30-32 ft	Test Id:	230075		
Test Comment:	---				
Sample Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
✳	S-7	HST-3	30-32 ft	37	39	23	16	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

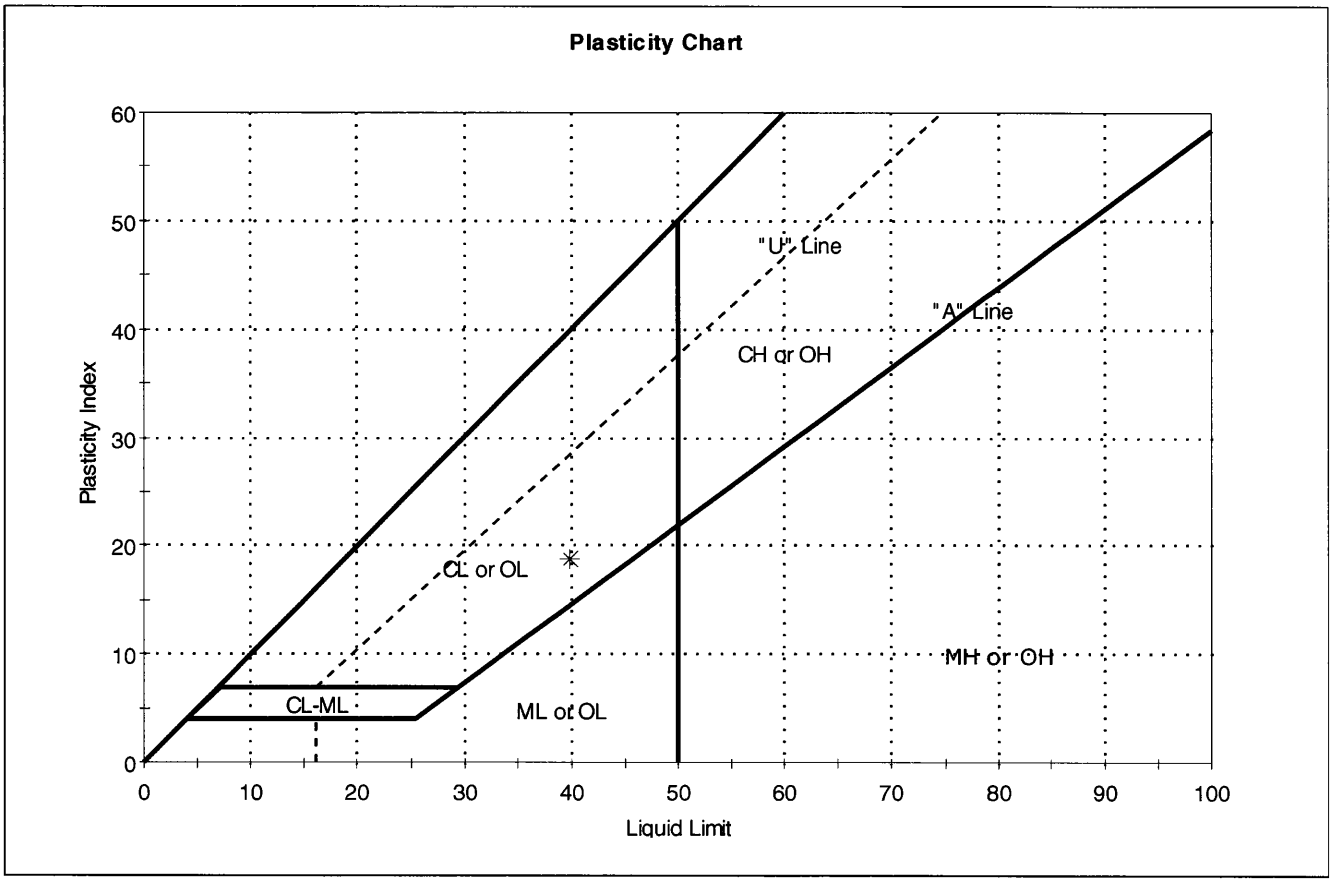
Dilentancy: SLOW

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-4	Sample Type:	jar	Tested By:	cam
Sample ID:	S-9A	Test Date:	02/14/12	Checked By:	jdt
Depth :	40-42 ft	Test Id:	230076		
Test Comment:	---				
Sample Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-9A	HST-4	40-42 ft	40	40	21	19	1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilentancy: SLOW

Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-4	Sample Type:	jar	Tested By:	cam
Sample ID:	S-10	Test Date:	02/14/12	Checked By:	jdt
Depth :	45-47 ft	Test Id:	230077		
Test Comment:	---				
Sample Description:	Moist, gray silt				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

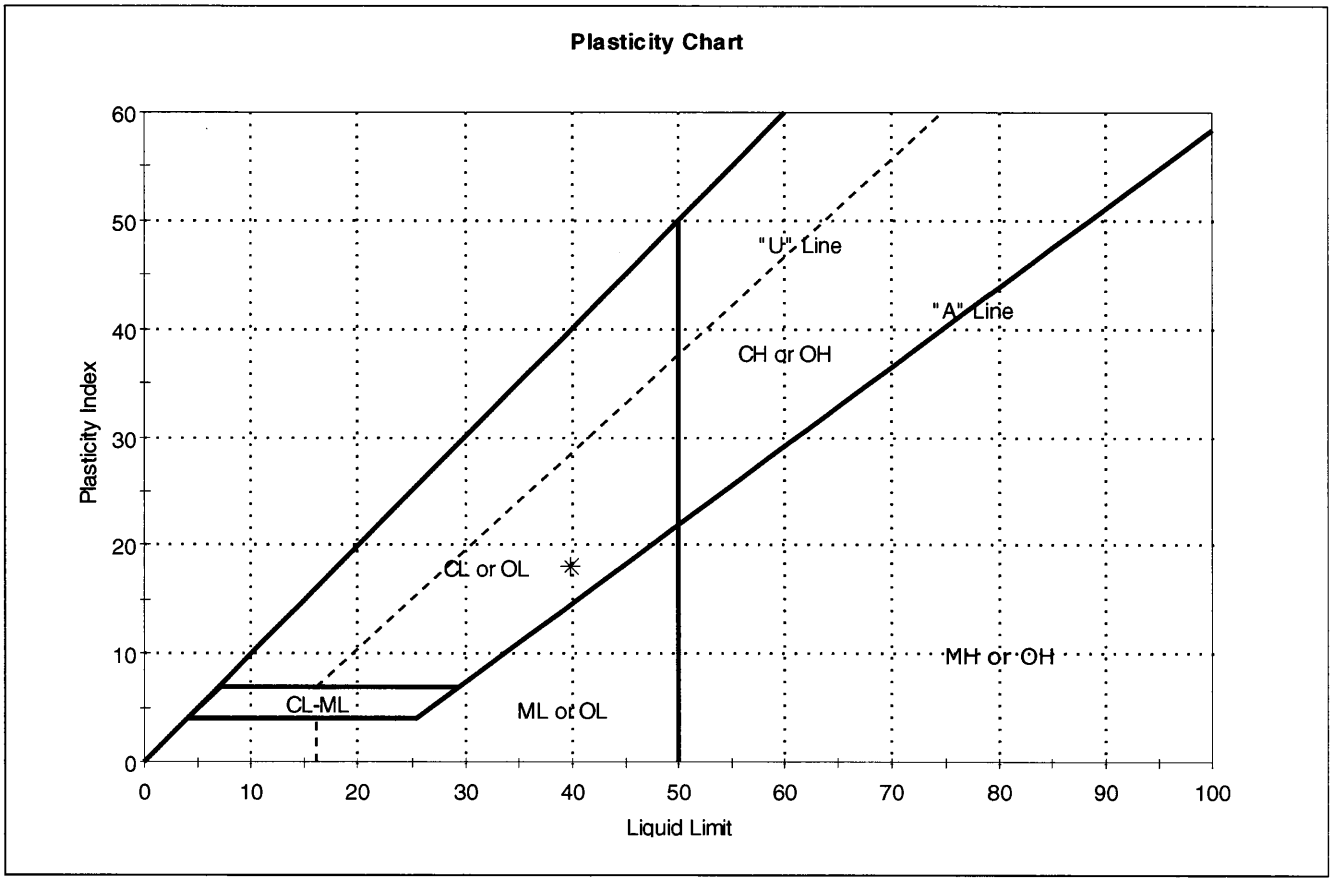
Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-10	HST-4	45-47 ft	29	n/a	n/a	n/a	n/a	silt (ML)

0% Retained on #40 Sieve
Dry Strength: MEDIUM
Dilentancy: RAPID
Toughness: n/a
The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-6	Sample Type:	jar	Tested By:	cam
Sample ID:	S-6	Test Date:	02/14/12	Checked By:	jdt
Depth :	25-27 ft	Test Id:	230079		
Test Comment:	---				
Sample Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
✳	S-6	HST-6	25-27 ft	41	40	22	18	1	lean clay (CL)

Sample Prepared using the WET method
0% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-7	Sample Type:	jar	Tested By:	cam
Sample ID:	S-7	Test Date:	02/14/12	Checked By:	jdt
Depth :	29-31 ft	Test Id:	230080		
Test Comment:	---				
Sample Description:	Moist, gray silt				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-7	HST-7	29-31 ft	30	n/a	n/a	n/a	n/a	

Dry Strength: HIGH

Dilentancy: RAPID

Toughness: n/a

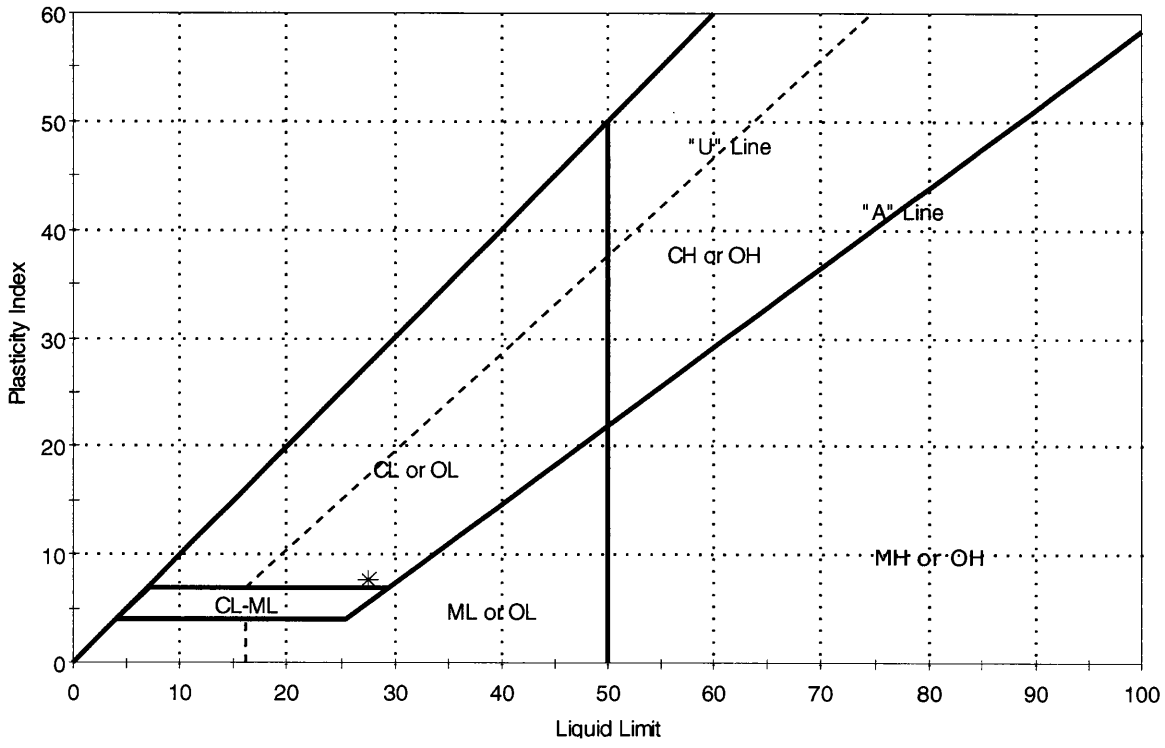
The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	Jacobs Civil, Inc.				
Project:	SCR - Hockomock Swamp				
Location:	Raynham, MA			Project No:	GTX-11534
Boring ID:	HST-8	Sample Type:	jar	Tested By:	cam
Sample ID:	S-9	Test Date:	02/14/12	Checked By:	jdt
Depth :	39-41 ft	Test Id:	230081		
Test Comment:	---				
Sample Description:	Moist, gray clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Plasticity Chart



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-9	HST-8	39-41 ft	31	28	20	8	1	

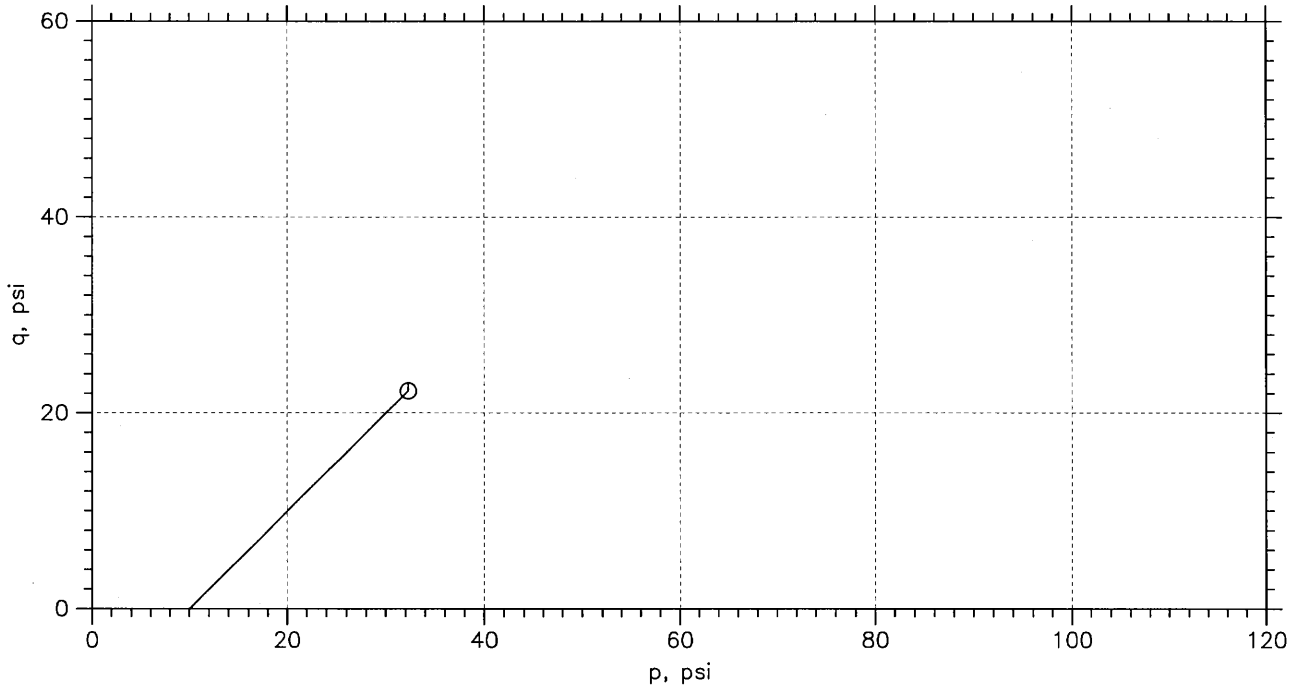
Sample Prepared using the WET method

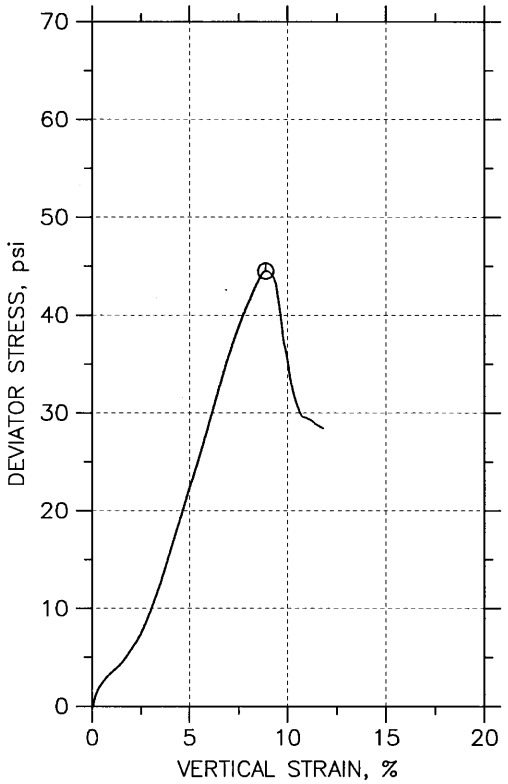
Dry Strength: HIGH

Dilentancy: RAPID

Toughness: LOW

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⏀			
Sample No.	UD-1			
Test No.	UU-1			
Depth	14 ft			
Tested by	md			
Test Date	2/16/12			
Checked by	jdt			
Check Date	02/22/12			
Diameter, in	2.87			
Height, in	6.5			
Water Content, %	25.4			
Dry Density, pcf	98.58			
Saturation, %	92.2			
Void Ratio	0.773			
Confining Stress, psi	10			
Undrained Strength, psi	22.26			
Max. Dev. Stress, psi	44.53			
Strain at Failure, %	8.85			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.8			
Liquid Limit	25			
Plastic Limit	18			
Plasticity Index	7			

GeoTesting EXPRESS

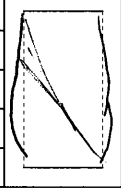
Project: SCR-Hockomock Swamp

Location: Raynham, MA

Project No.: GTX-11534

Boring No.: HS-7

Sample Type: tube



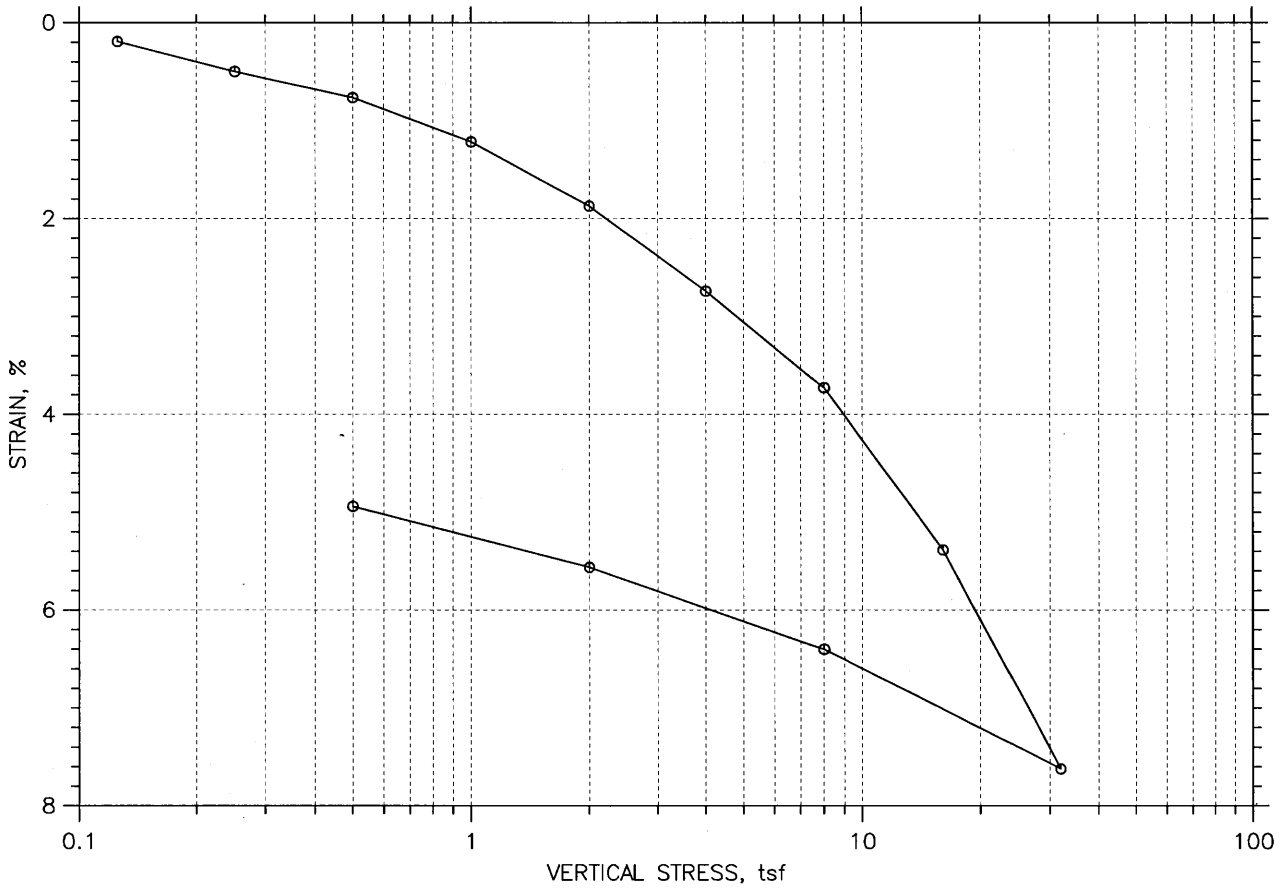
Description: Moist, olive sandy clay

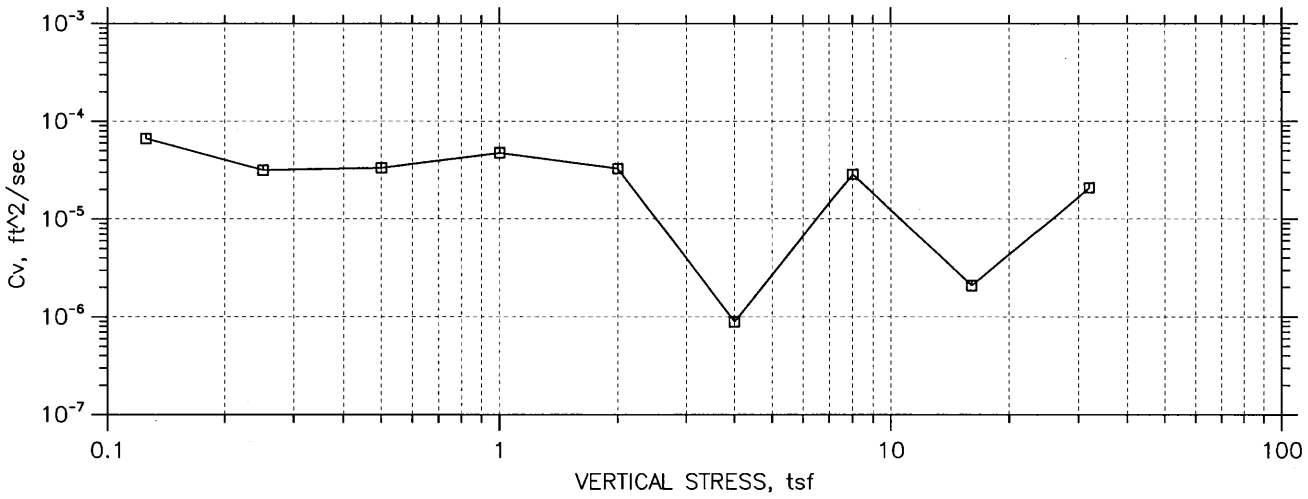
Remarks: System W

Phase calculations based on start and end of test.

One-Dimensional Consolidation by ASTM D 2435 - Method B

SUMMARY REPORT

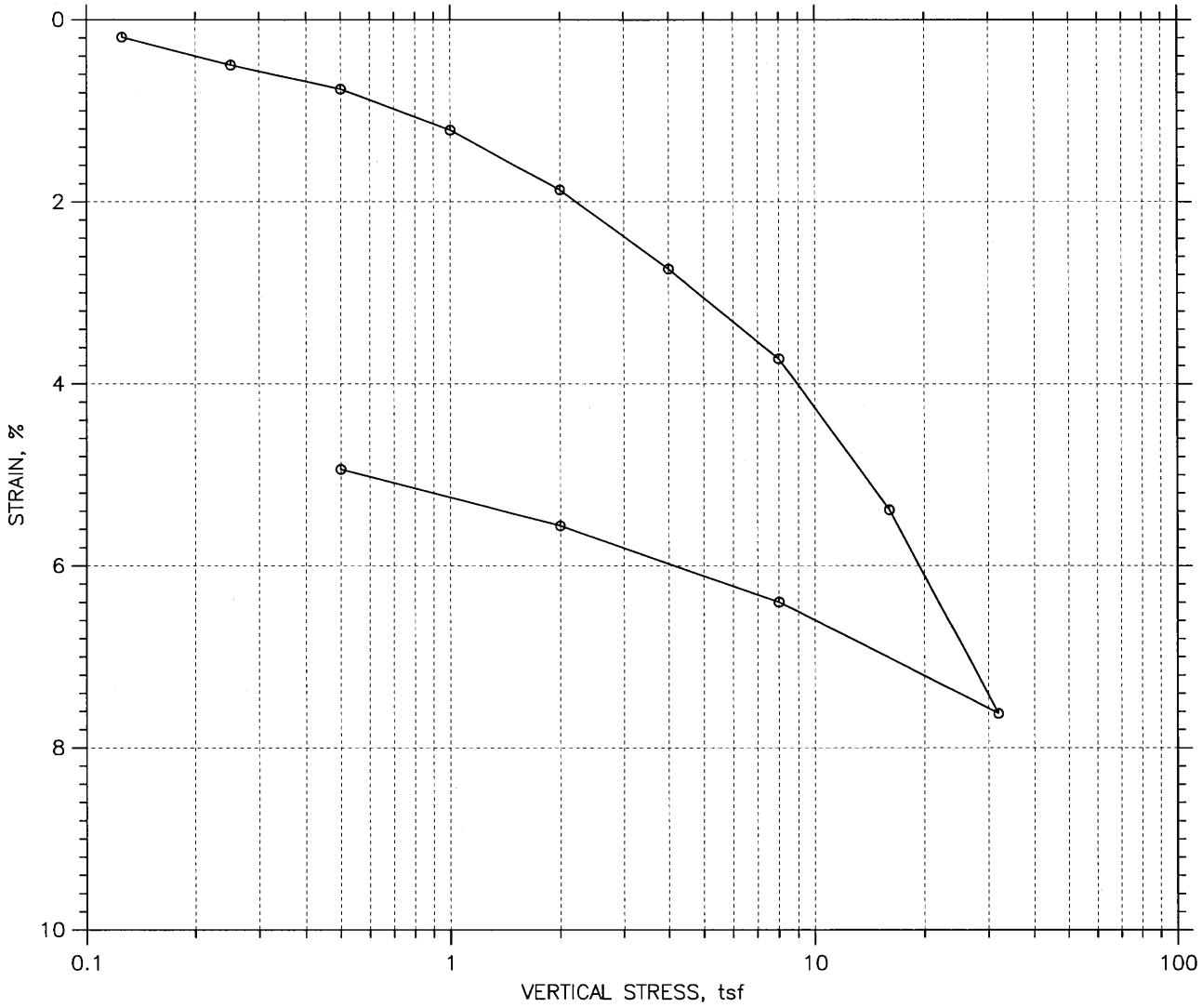




GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D 2435 - Method B

SUMMARY REPORT



				Before Test	After Test
Overburden Pressure: ---			Water Content, %	26.89	23.79
Preconsolidation Pressure: ---			Dry Unit Weight, pcf	100.37	105.65
Compression Index: ---			Saturation, %	99.97	100.00
Diameter: 2.5 in		Height: 1 in	Void Ratio	0.76	0.67
LL: 25	PL: 18	PI: 7	GS: 2.83		

GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D 2435 - Method B

Project: SCR-Hockomock Swamp
Boring No.: HS-7
Sample No.: UD-1
Test No.: IP-1

Location: Raynham, MA
Tested By: md
Test Date: 02/16/12
Sample Type: tube

Project No.: GTX-11534
Checked By: jdt
Depth: 14 ft
Elevation: ---

Soil Description: Moist, olive sandy clay
Remarks: System V

Estimated Specific Gravity: 2.83
Initial Void Ratio: 0.762
Final Void Ratio: 0.674

Liquid Limit: 25
Plastic Limit: 18
Plasticity Index: 7

Specimen Diameter: 2.50 in
Initial Height: 1.00 in
Final Height: 0.95 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	8662	RING		8280
Wt. Container + Wet Soil, gm	201.43	380.46	376.45	169.53
Wt. Container + Dry Soil, gm	161.85	345.68	345.68	138.55
Wt. Container, gm	8.1300	216.35	216.35	8.3400
Wt. Dry Soil, gm	153.72	129.33	129.33	130.21
Water Content, %	25.75	26.89	23.79	23.79
Void Ratio	---	0.762	0.674	---
Degree of Saturation, %	---	99.97	100.00	---
Dry Unit Weight, pcf	---	100.37	105.65	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

One-Dimensional Consolidation by ASTM D 2435 - Method B

Project: SCR-Hockomock Swamp
Boring No.: HS-7
Sample No.: UD-1
Test No.: IP-1

Location: Raynham, MA
Tested By: md
Test Date: 02/16/12
Sample Type: tube

Project No.: GTX-11534
Checked By: jdt
Depth: 14 ft
Elevation: ---

Soil Description: Moist, olive sandy clay
Remarks: System V
Displacement at End of Increment

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft^2/sec	Mv 1/tsf	k ft/day
1	0.125	0.001906	0.759	0.191	0.218	1.12e-004	1.53e-002	4.61e-003
2	0.250	0.004971	0.753	0.497	1.306	1.87e-005	2.45e-002	1.23e-003
3	0.500	0.007629	0.749	0.763	0.872	2.78e-005	1.06e-002	7.97e-004
4	1.00	0.01213	0.741	1.21	0.498	4.83e-005	9.01e-003	1.17e-003
5	2.00	0.01869	0.729	1.87	1.259	1.89e-005	6.56e-003	3.34e-004
6	4.00	0.02738	0.714	2.74	23.362	1.00e-006	4.35e-003	1.18e-005
7	8.00	0.03724	0.697	3.72	0.821	2.80e-005	2.46e-003	1.86e-004
8	16.0	0.05384	0.667	5.38	13.532	1.65e-006	2.07e-003	9.24e-006
9	32.0	0.07620	0.628	7.62	1.070	2.00e-005	1.40e-003	7.55e-005
10	8.00	0.06397	0.649	6.40	0.665	3.19e-005	5.09e-004	4.38e-005
11	2.00	0.05561	0.664	5.56	1.773	1.22e-005	1.39e-003	4.60e-005
12	0.500	0.04938	0.675	4.94	3.567	6.18e-006	4.15e-003	6.91e-005

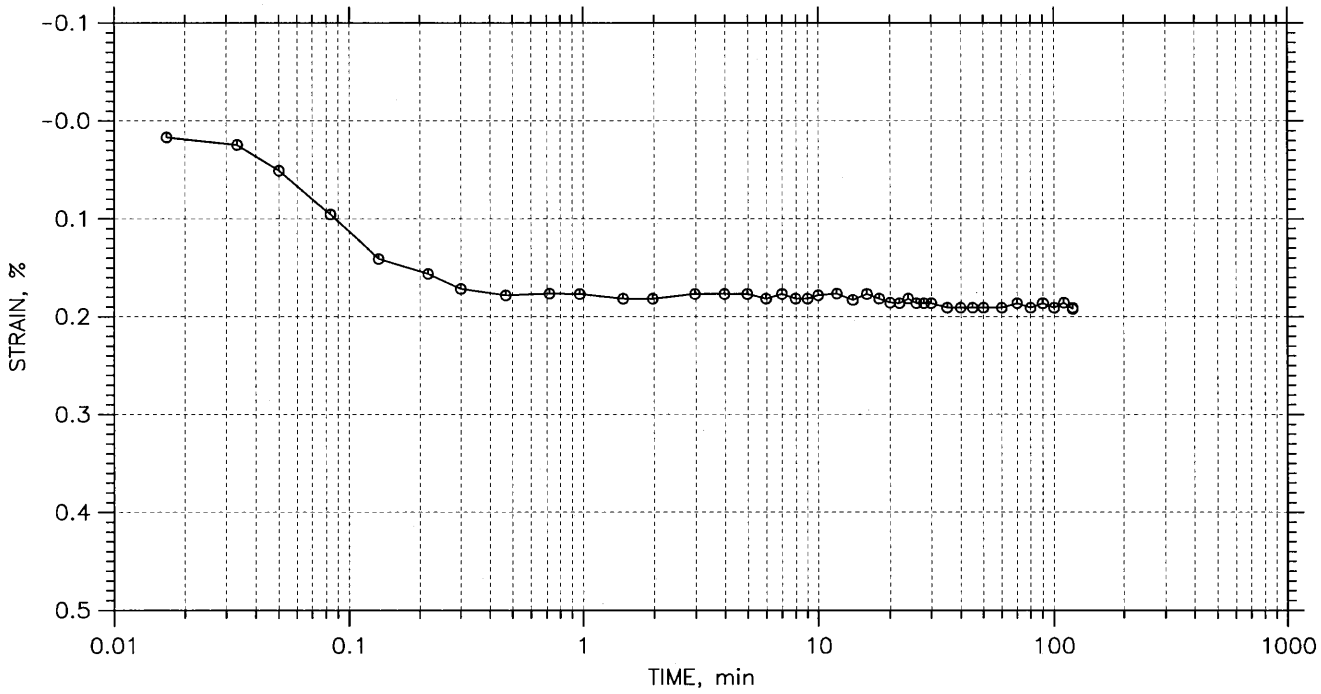
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft^2/sec	Mv 1/tsf	k ft/day	Ca %
1	0.125	0.001906	0.759	0.191	0.000	0.00e+000	1.53e-002	0.00e+000	0.00e+000
2	0.250	0.004971	0.753	0.497	0.102	5.54e-005	2.45e-002	3.66e-003	0.00e+000
3	0.500	0.007629	0.749	0.763	0.000	0.00e+000	1.06e-002	0.00e+000	0.00e+000
4	1.00	0.01213	0.741	1.21	0.054	1.03e-004	9.01e-003	2.50e-003	0.00e+000
5	2.00	0.01869	0.729	1.87	0.069	7.96e-005	6.56e-003	1.41e-003	0.00e+000
6	4.00	0.02738	0.714	2.74	0.000	0.00e+000	4.35e-003	0.00e+000	0.00e+000
7	8.00	0.03724	0.697	3.72	0.000	0.00e+000	2.46e-003	0.00e+000	0.00e+000
8	16.0	0.05384	0.667	5.38	1.543	3.37e-006	2.07e-003	1.88e-005	0.00e+000
9	32.0	0.07620	0.628	7.62	0.108	4.62e-005	1.40e-003	1.74e-004	0.00e+000
10	8.00	0.06397	0.649	6.40	0.128	3.84e-005	5.09e-004	5.28e-005	0.00e+000
11	2.00	0.05561	0.664	5.56	0.150	3.37e-005	1.39e-003	1.27e-004	0.00e+000
12	0.500	0.04938	0.675	4.94	0.213	2.40e-005	4.15e-003	2.69e-004	0.00e+000

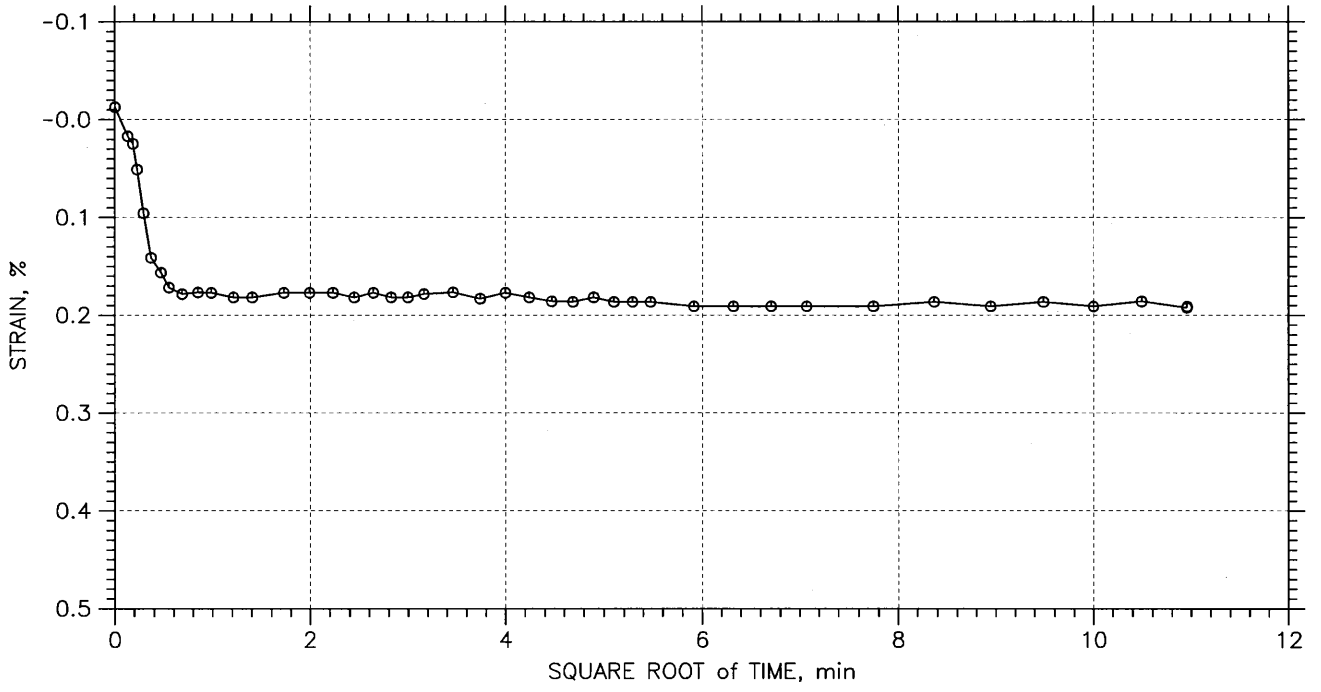
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 1 of 12

Stress: 0.125 tsf





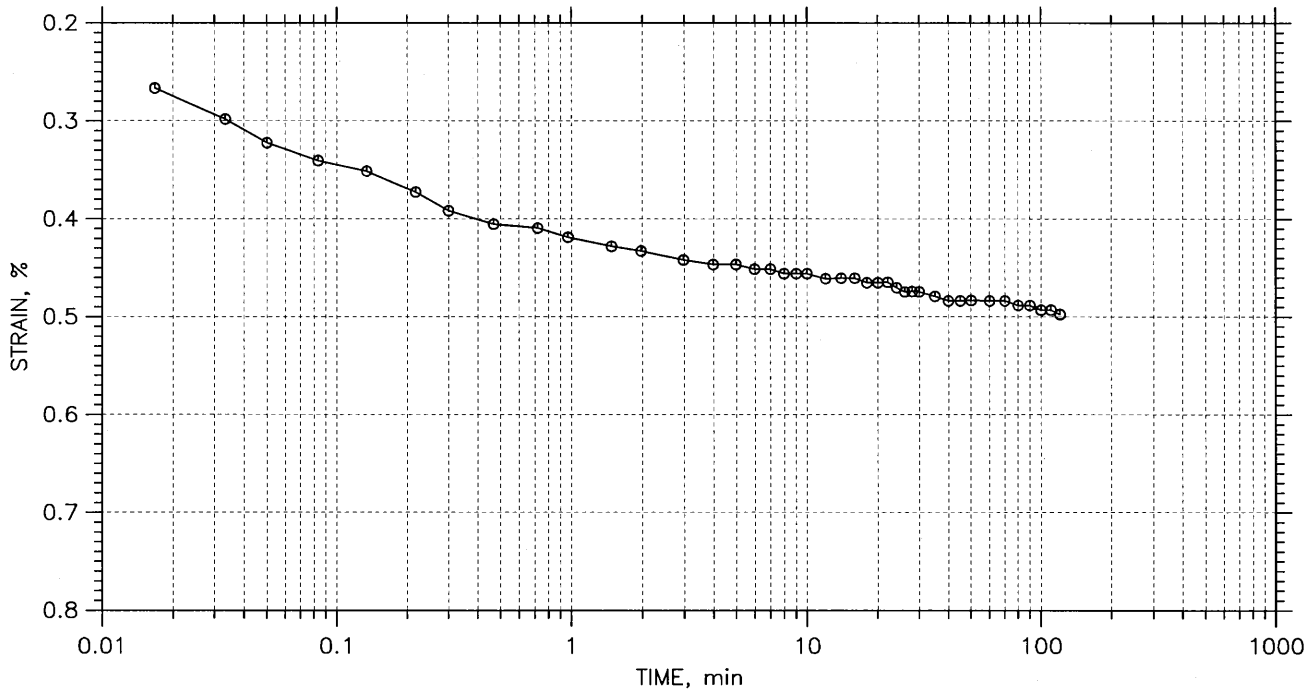
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

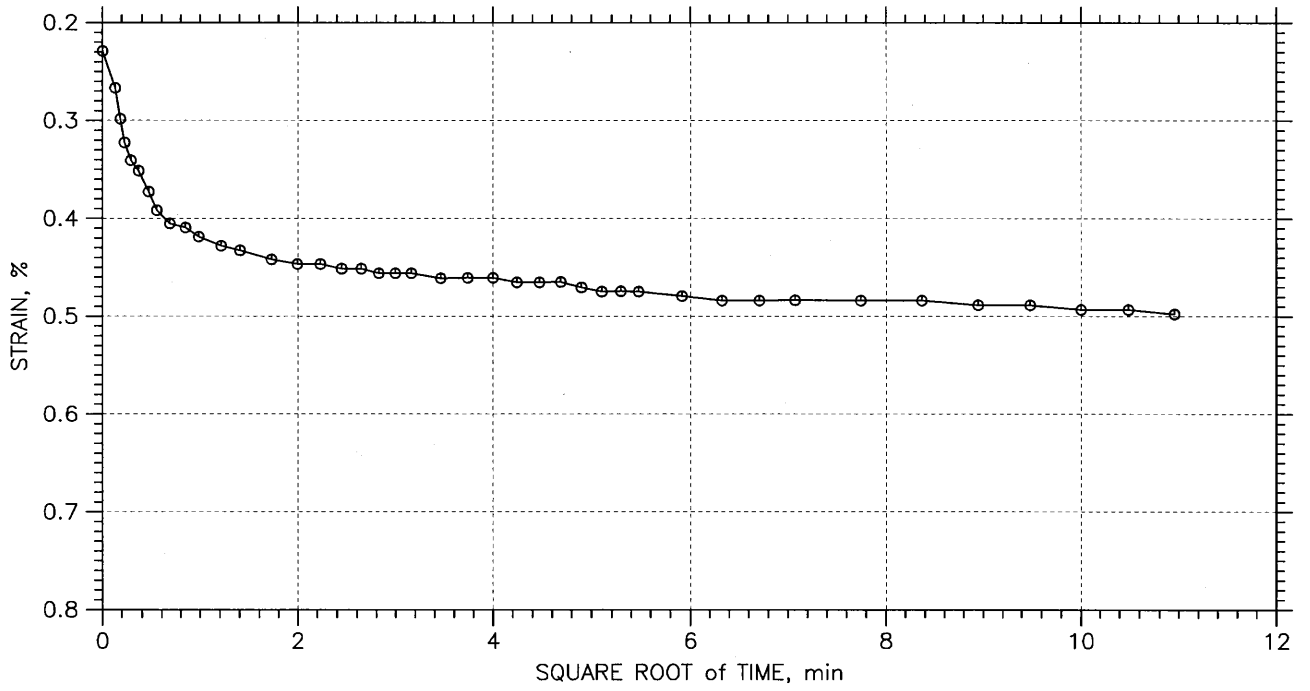
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 2 of 12

Stress: 0.25 tsf





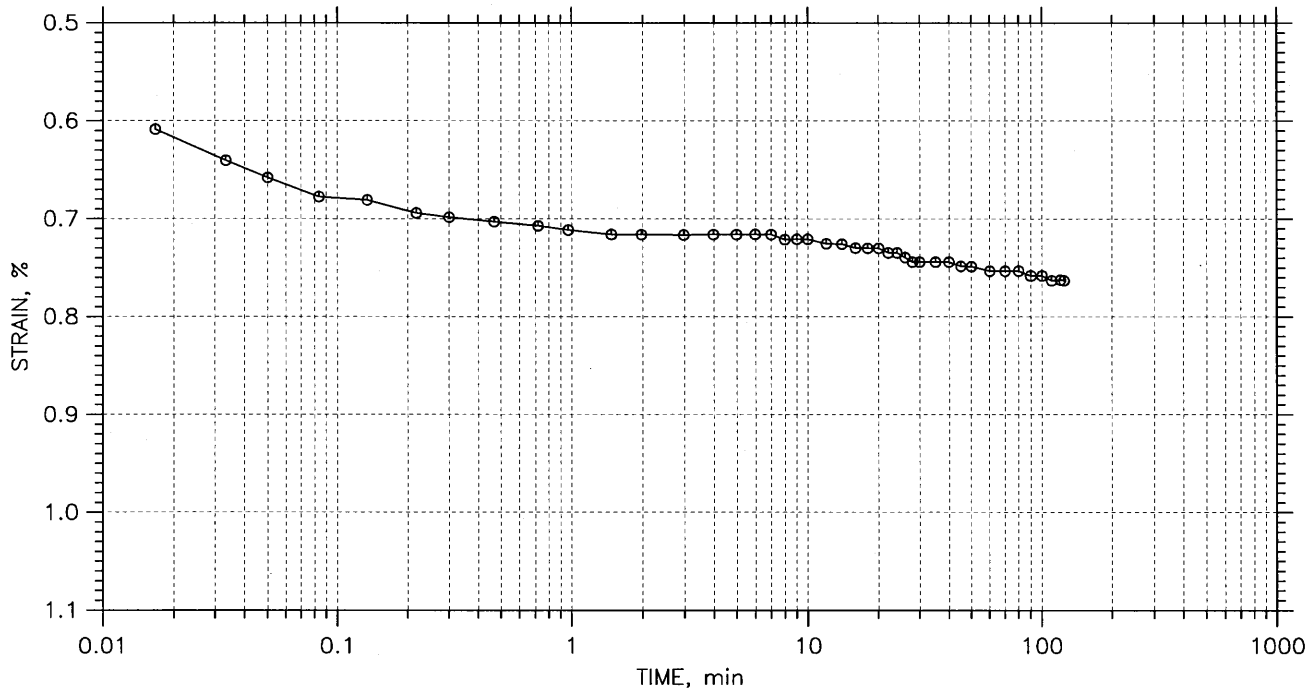
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

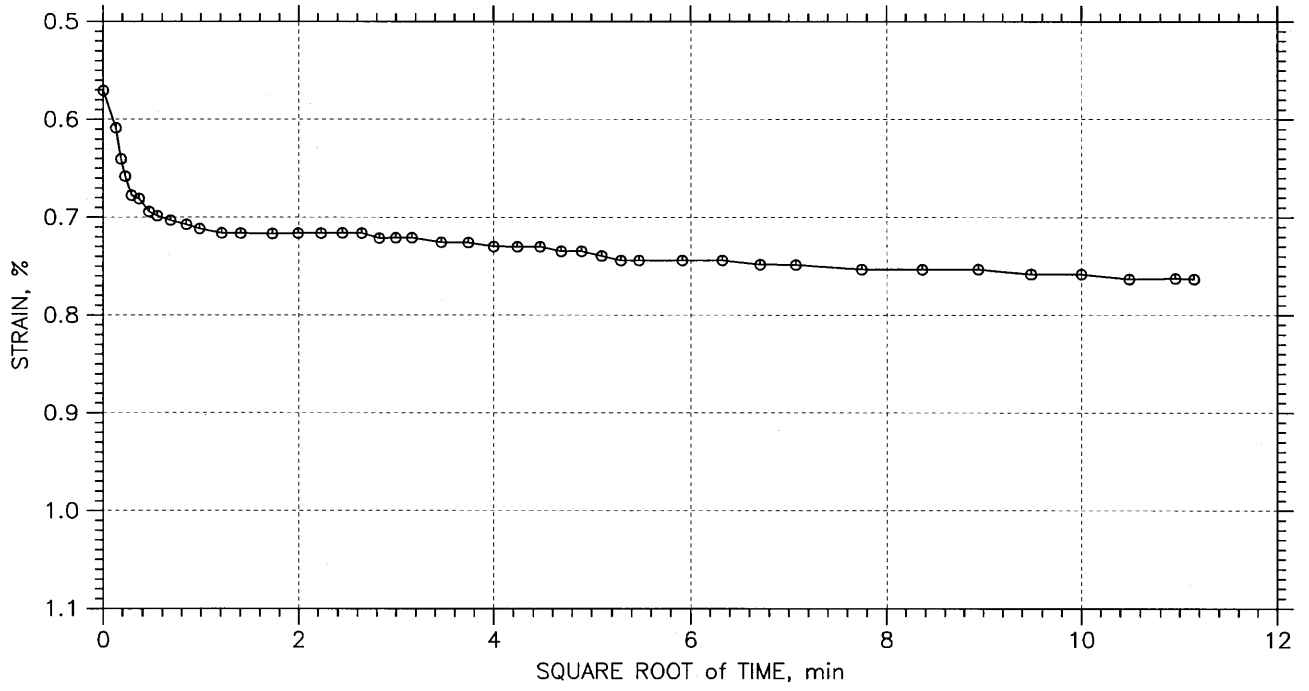
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 3 of 12

Stress: 0.5 tsf





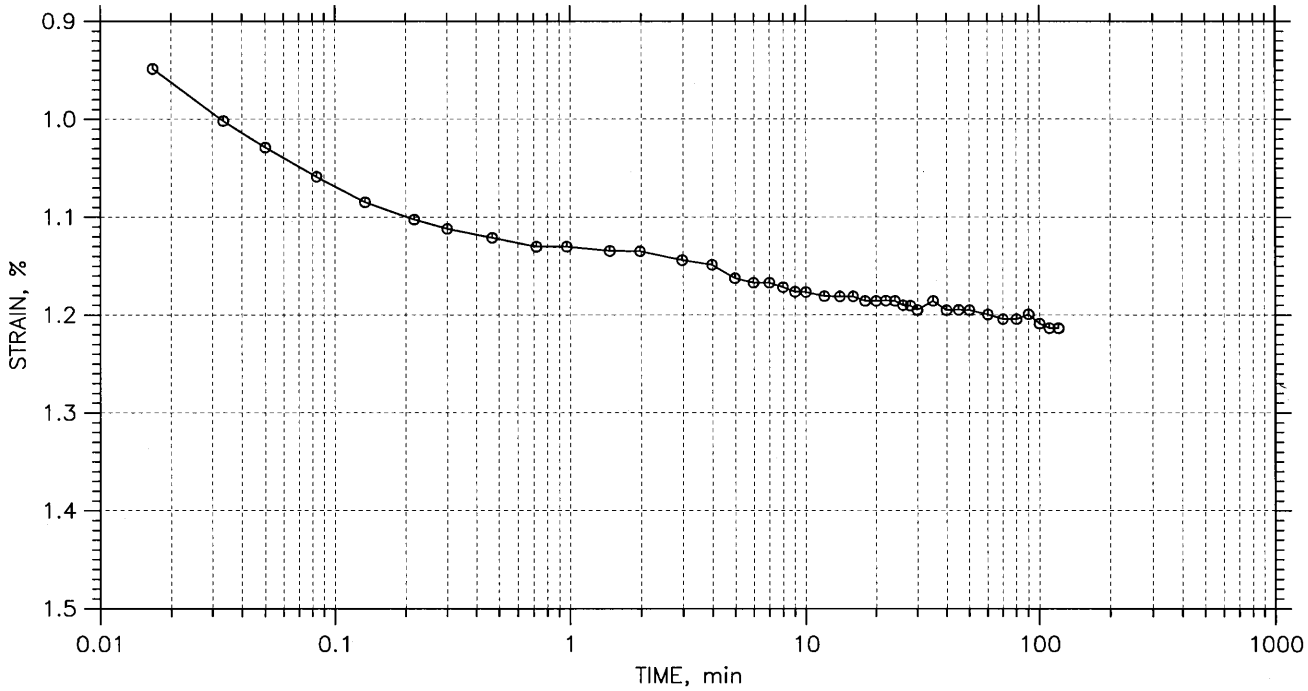
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

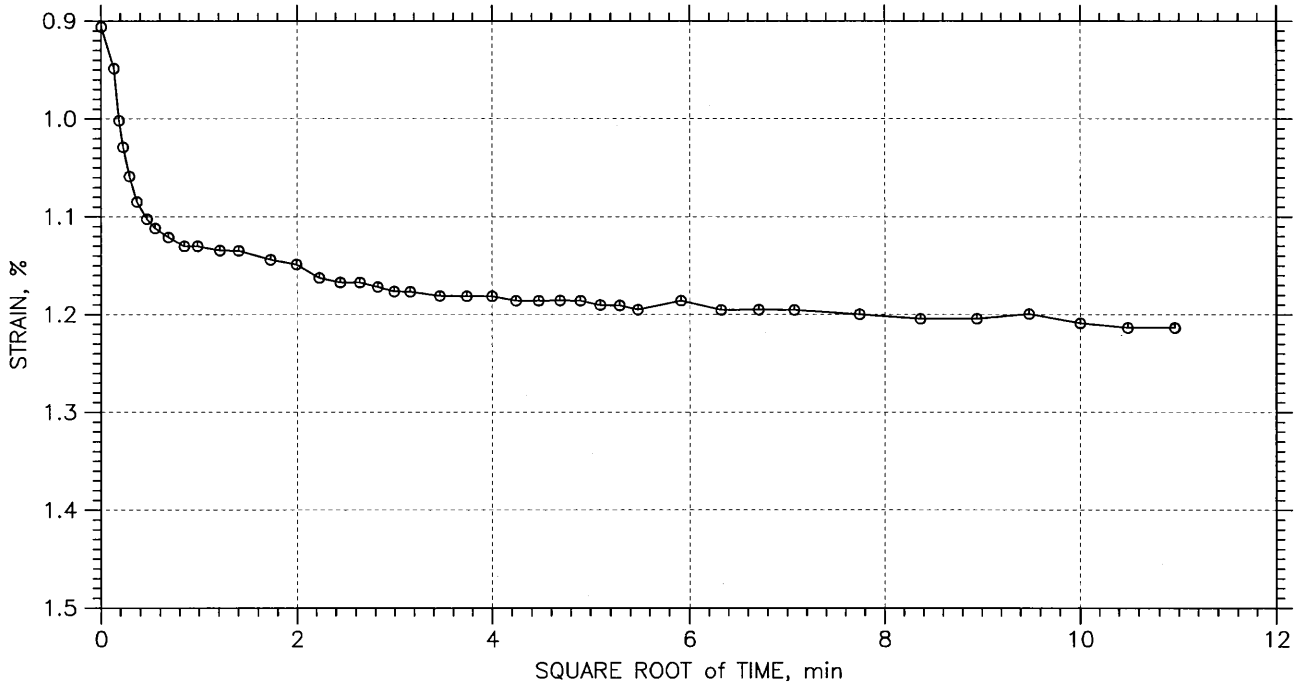
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 4 of 12

Stress: 1 tsf





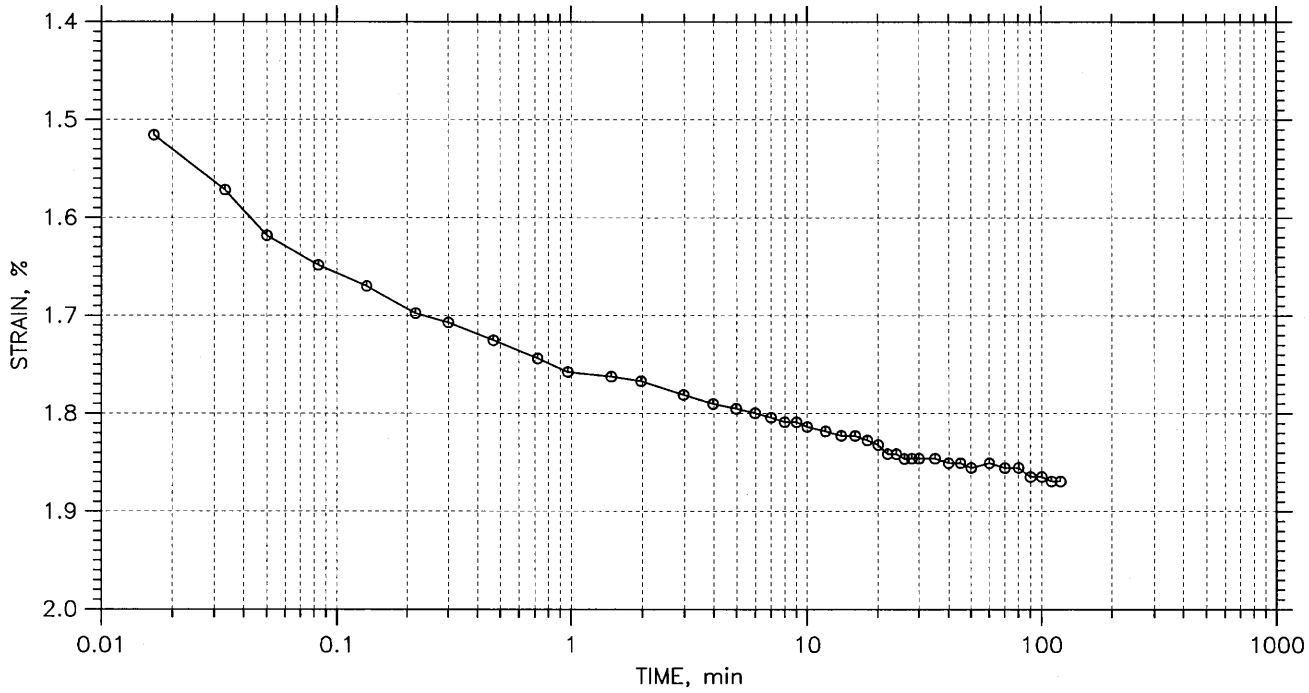
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

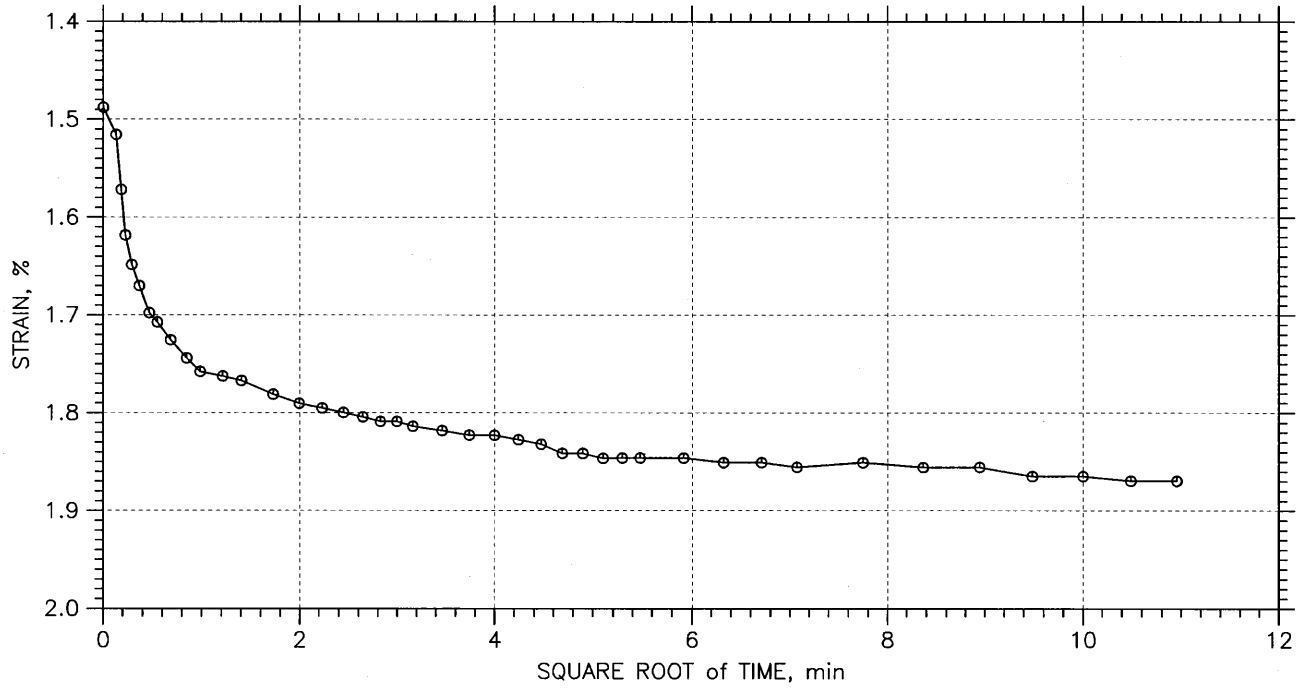
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 5 of 12

Stress: 2 tsf





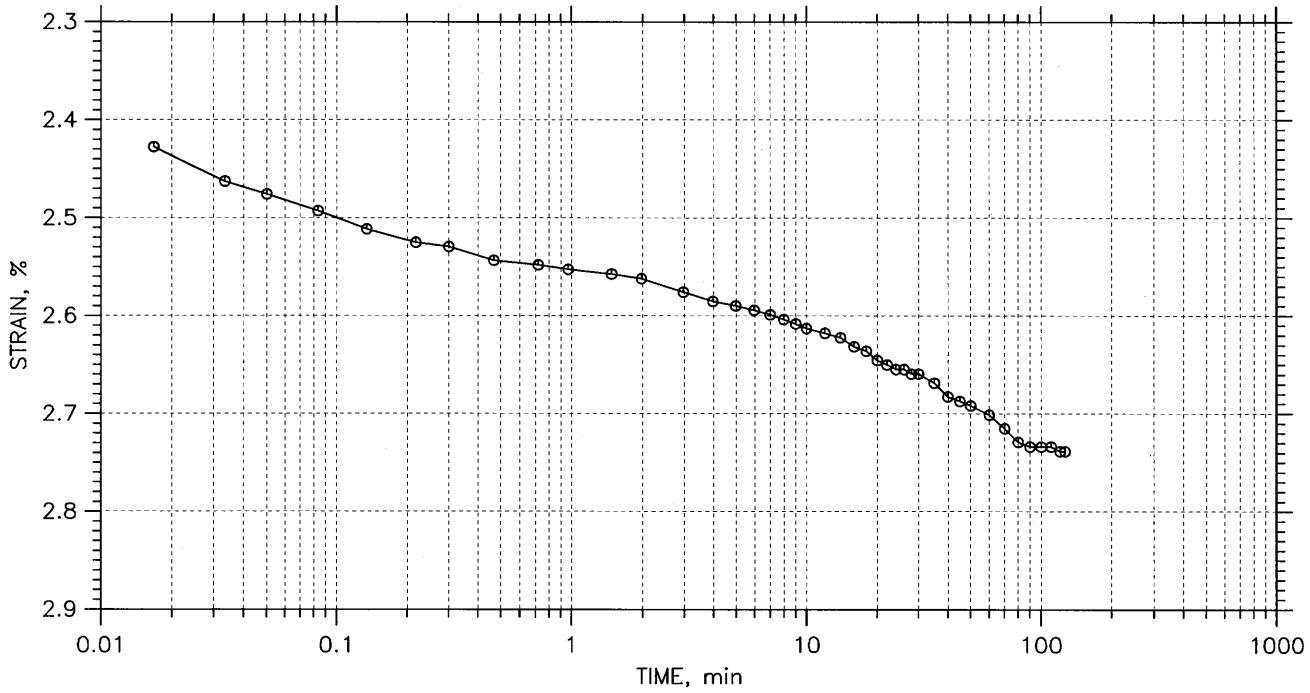
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

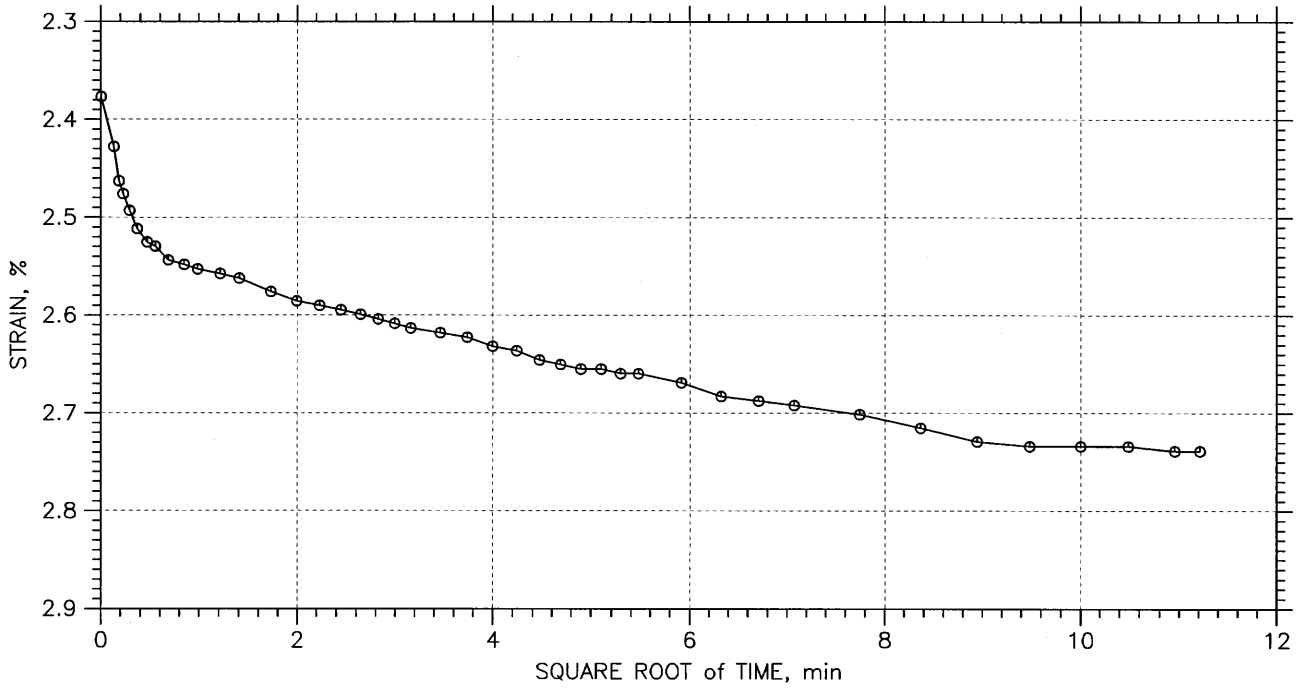
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 6 of 12

Stress: 4 tsf





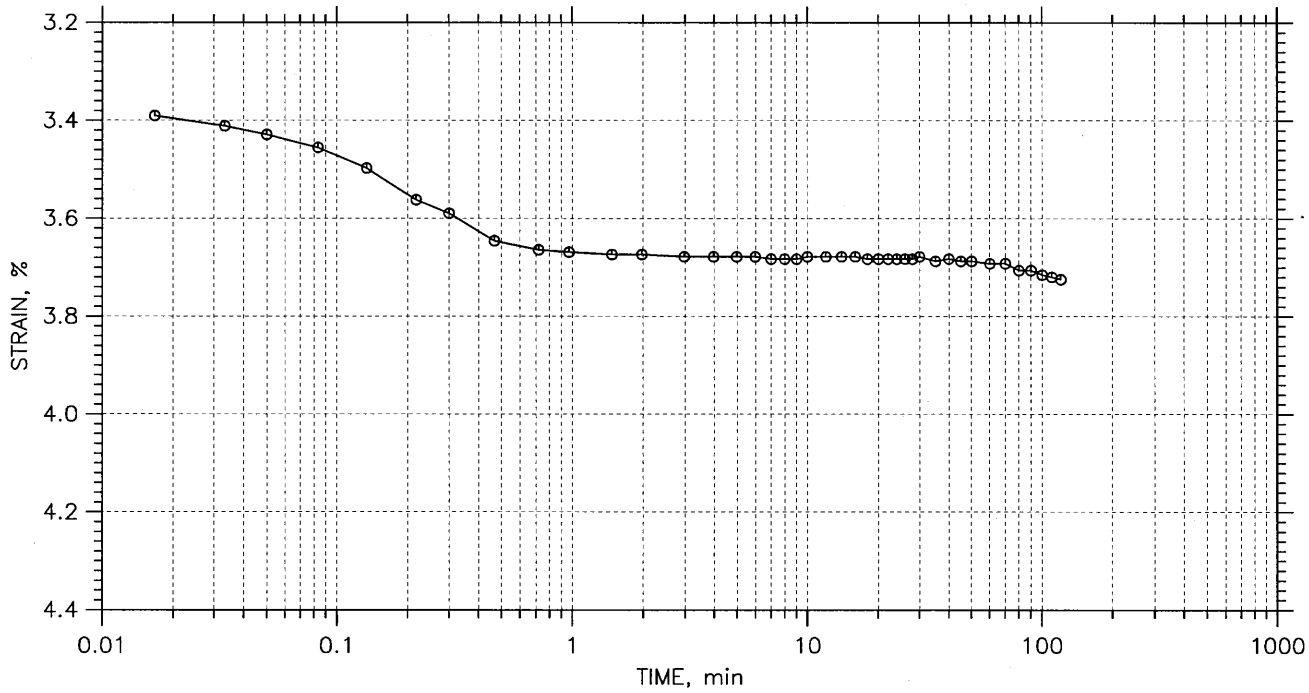
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

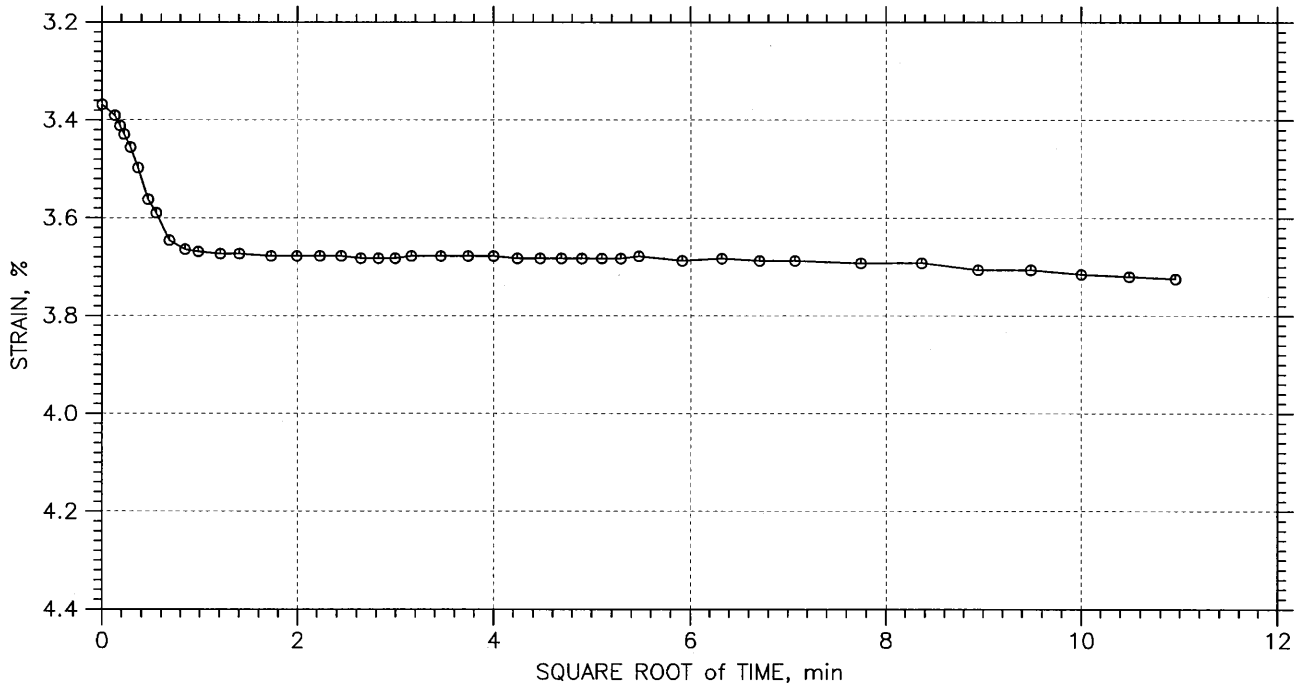
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 7 of 12

Stress: 8 tsf





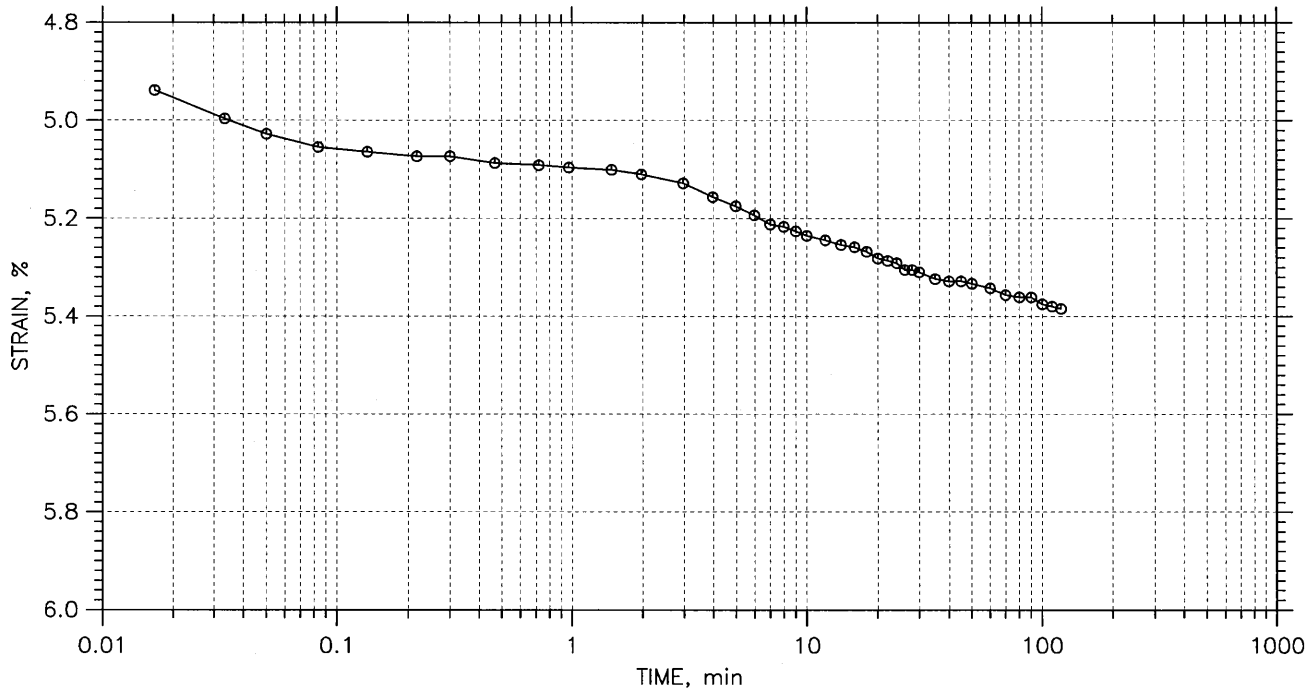
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

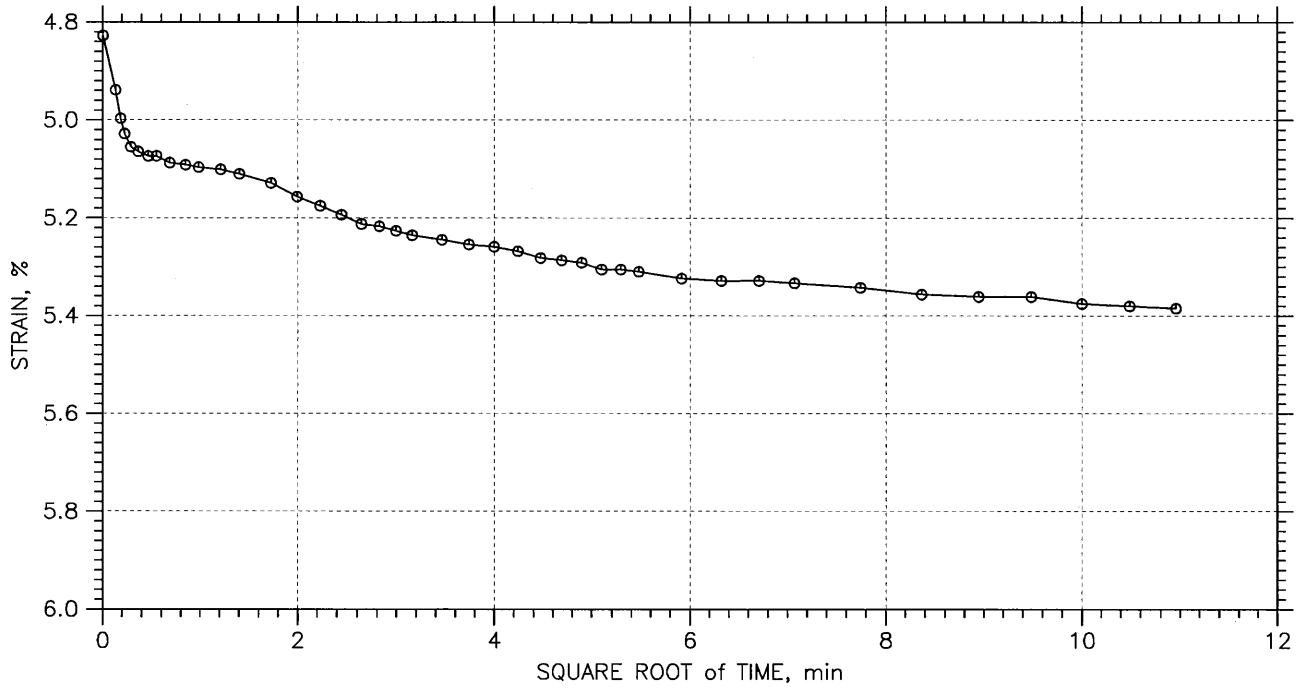
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 8 of 12

Stress: 16 tsf





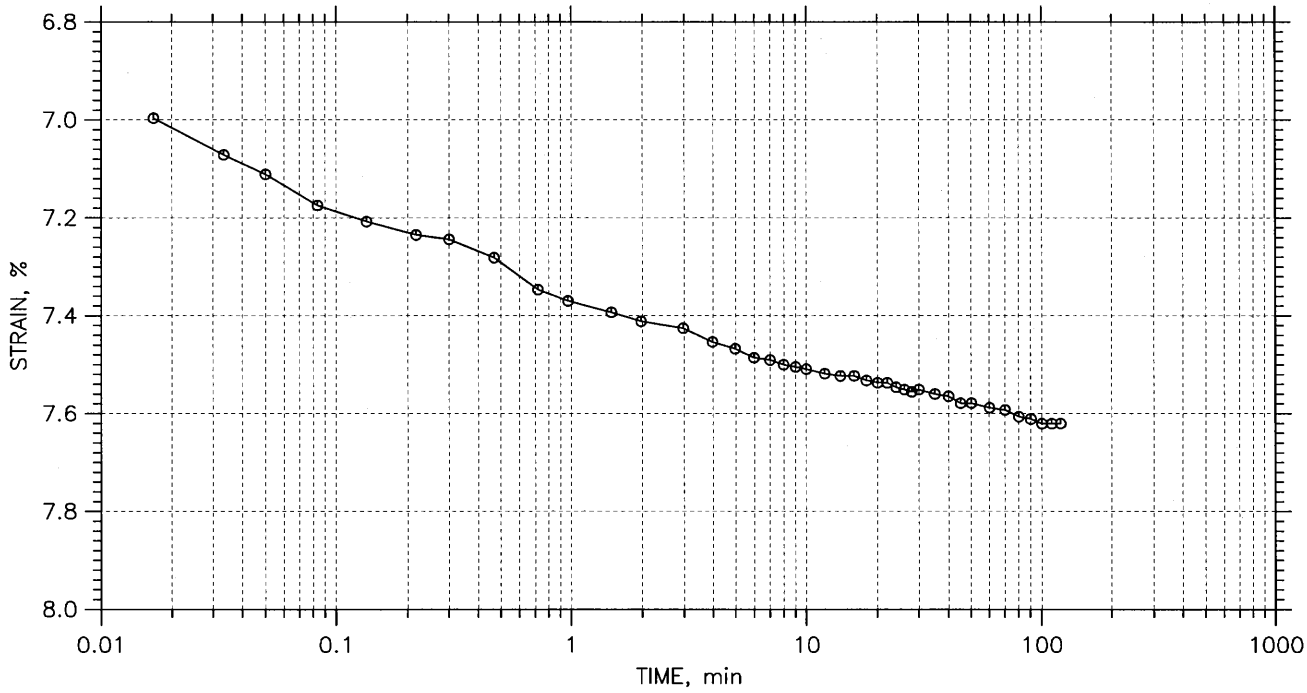
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

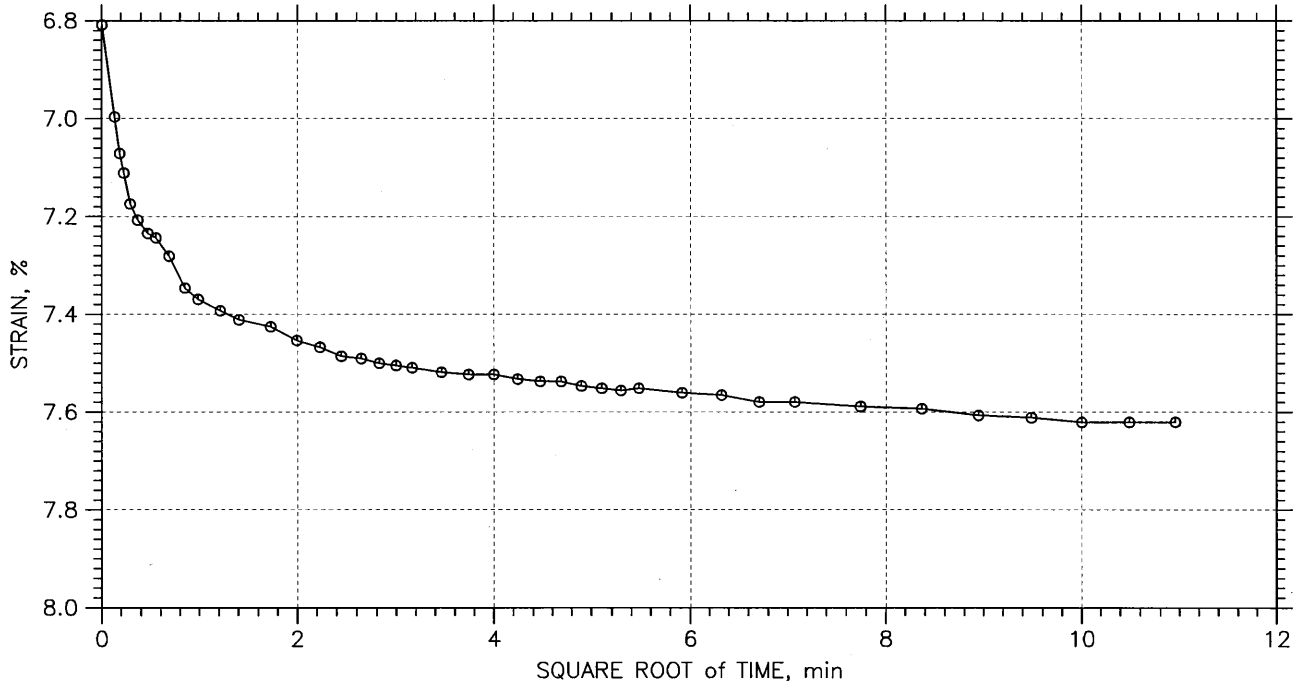
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 9 of 12

Stress: 32 tsf





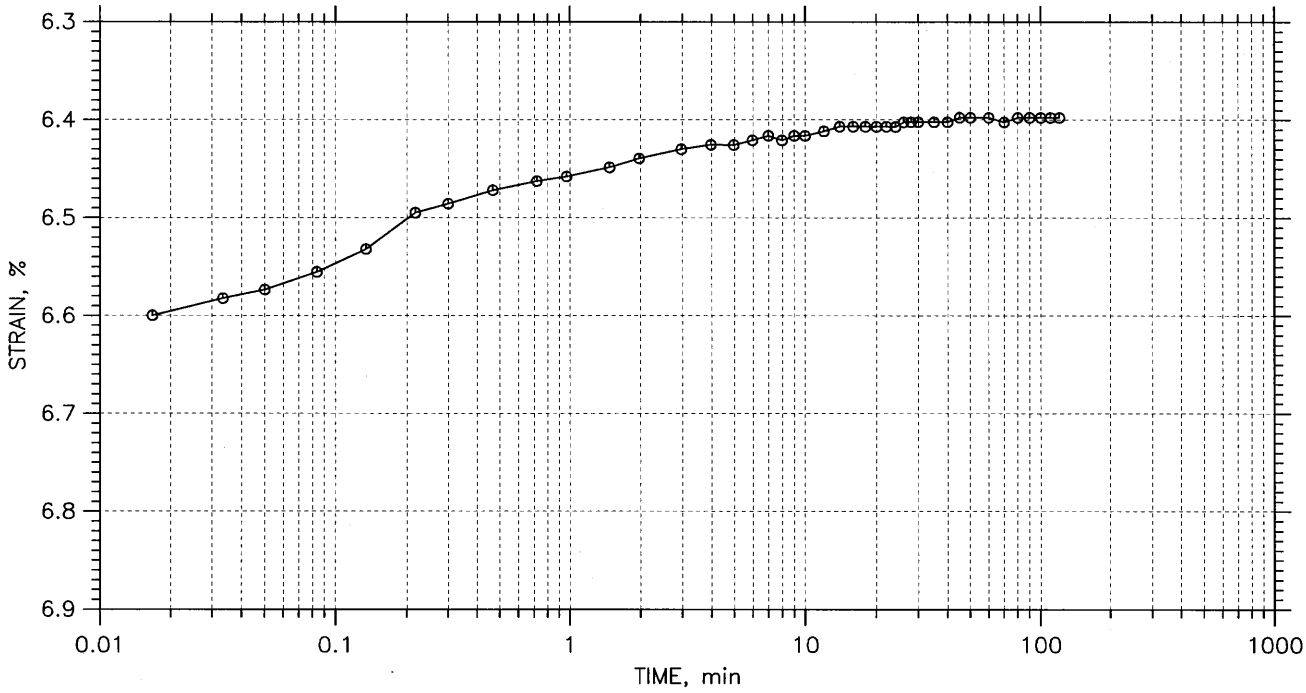
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

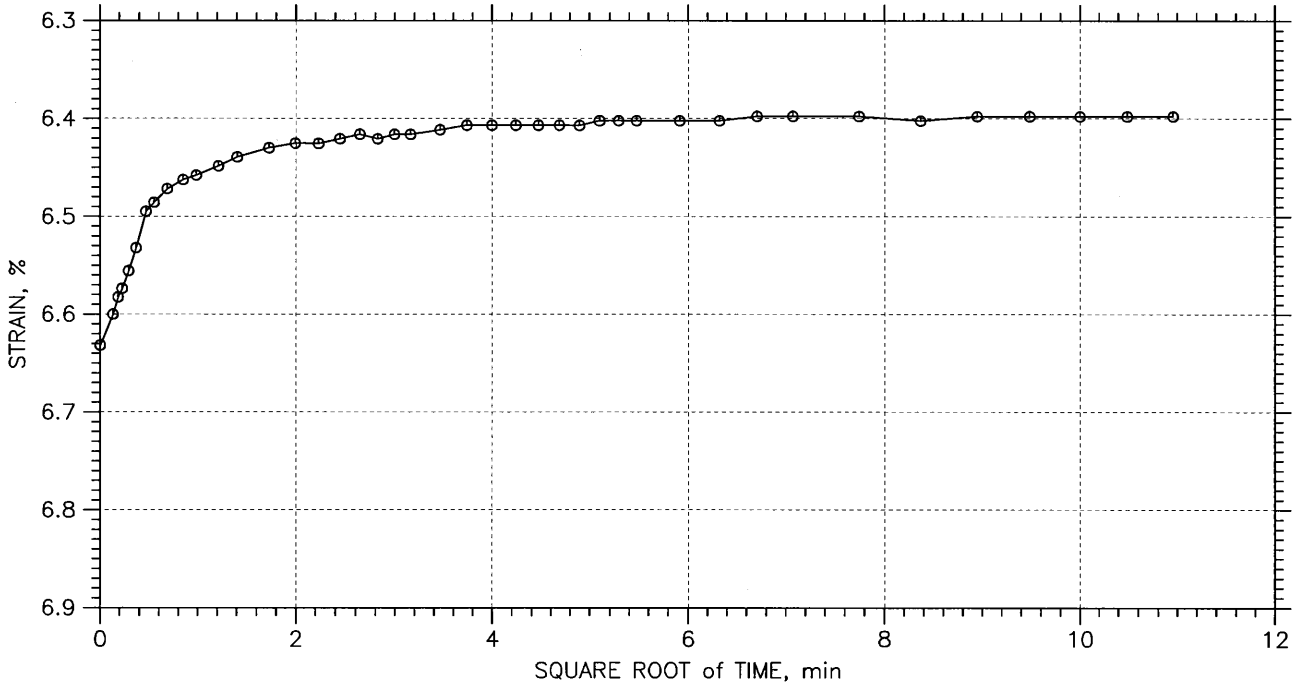
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 10 of 12

Stress: 8 tsf





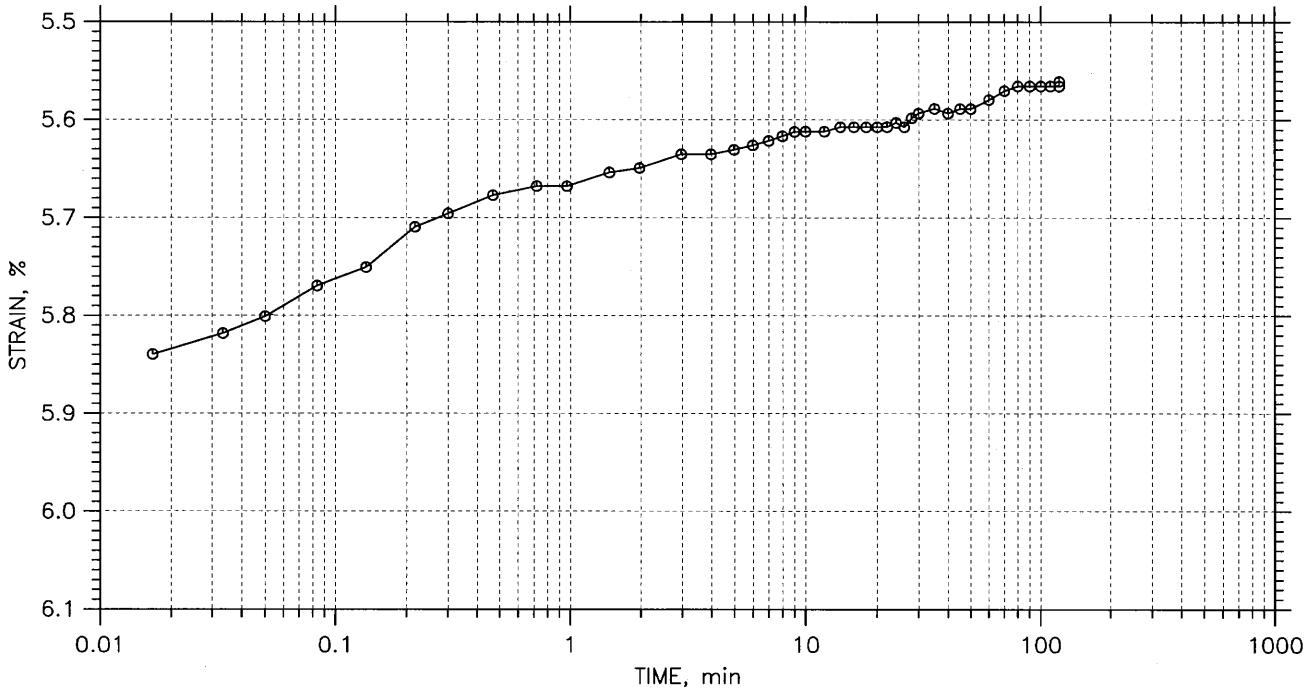
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

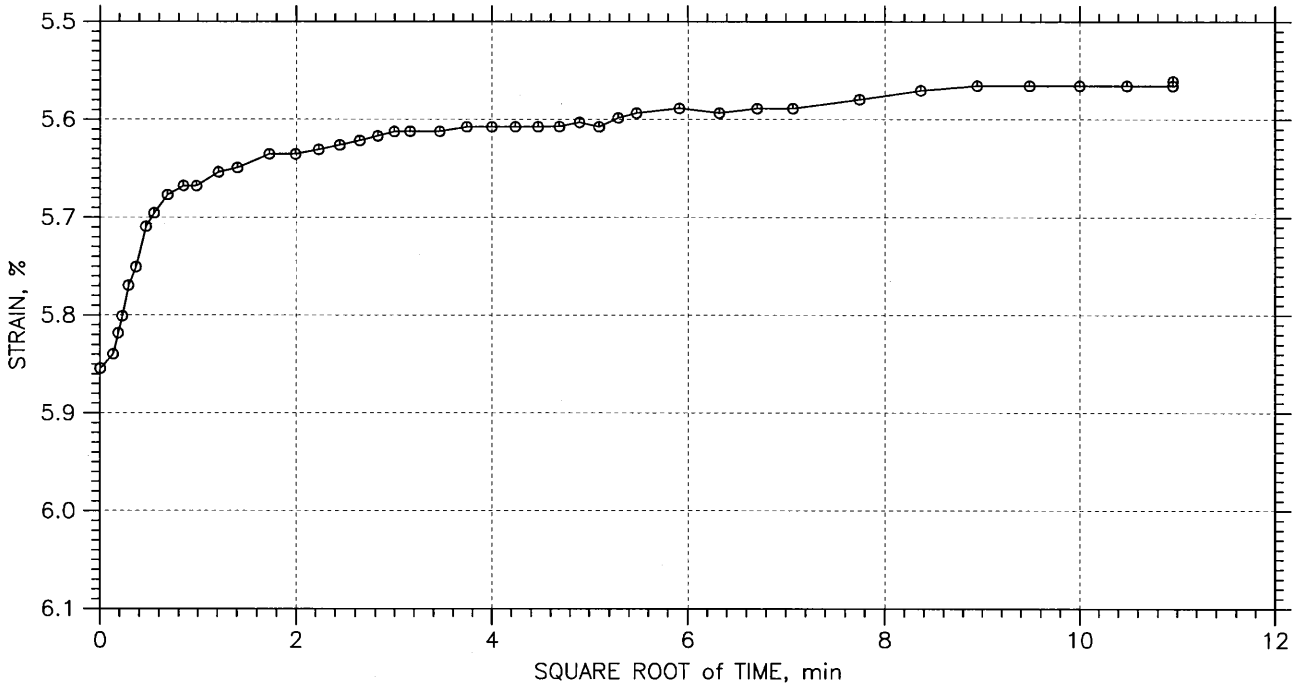
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 11 of 12

Stress: 2 tsf





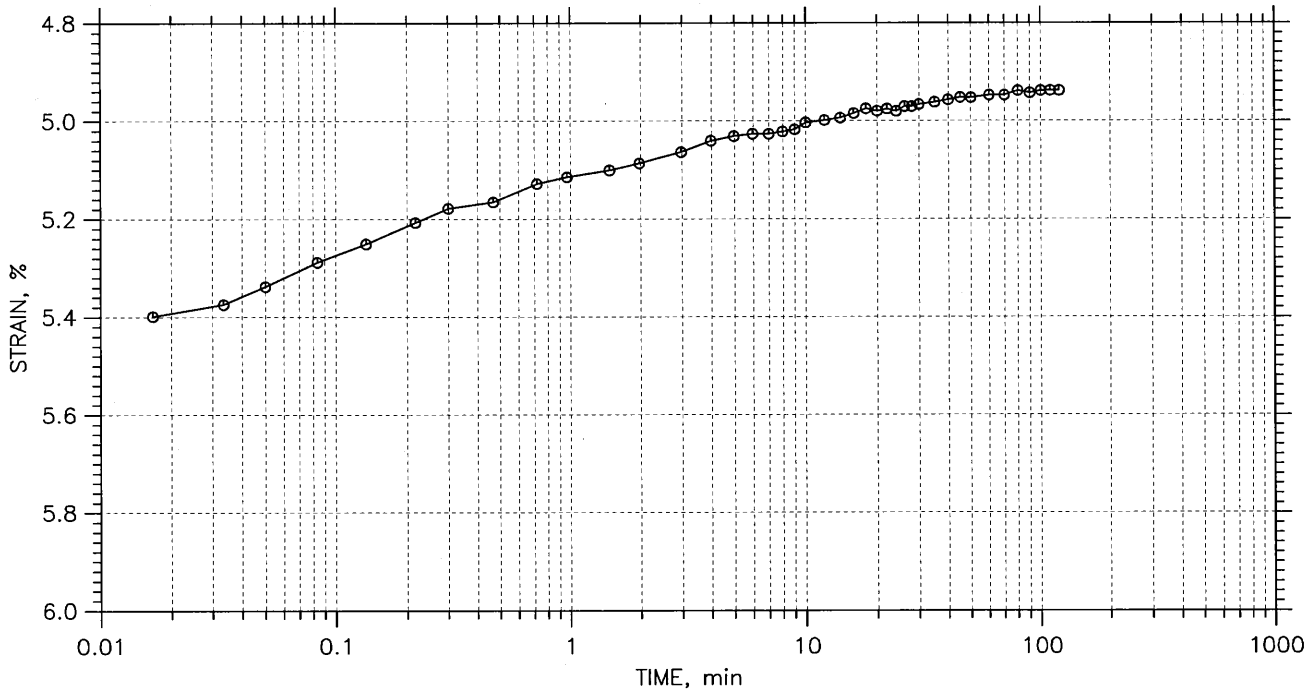
GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

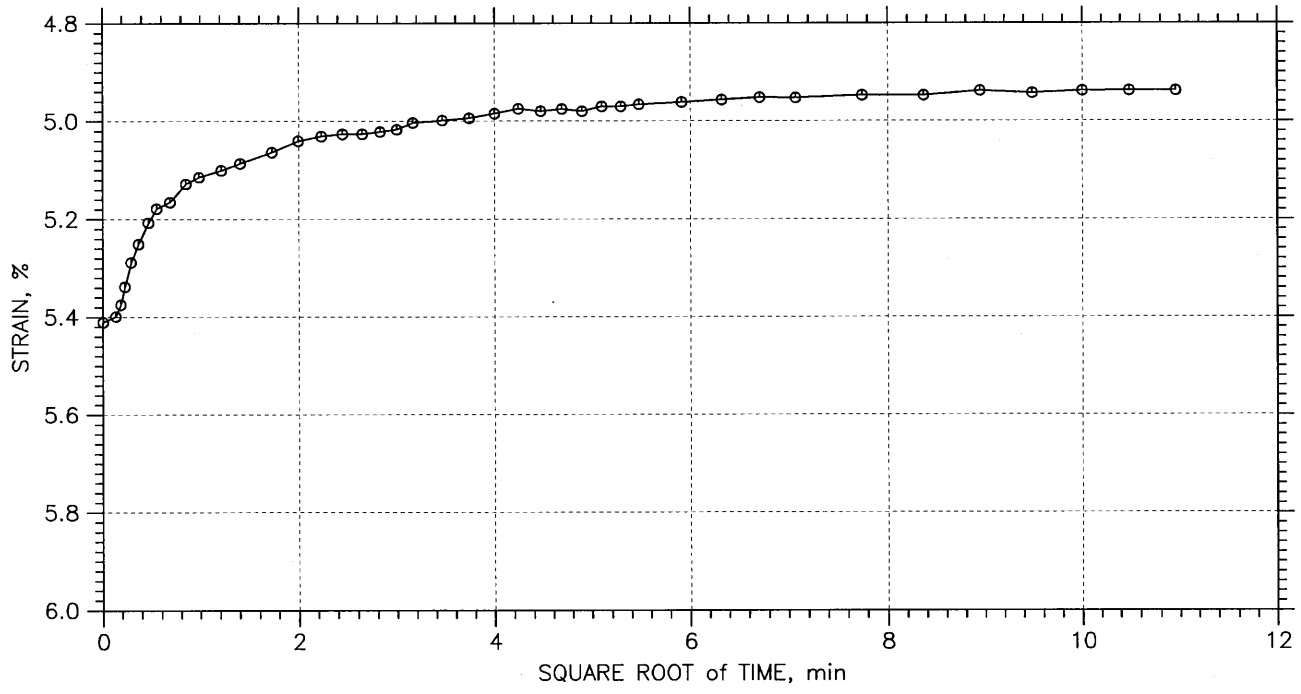
One-Dimensional Consolidation by ASTM D 2435 - Method B

TIME CURVES

Constant Load Step 12 of 12

Stress: 0.5 tsf





GeoTesting EXPRESS	Project: SCR-Hockomock Swamp	Location: Raynham, MA	Project No.: GTX-11534
	Boring No.: HS-7	Tested By: md	Checked By: jdt
	Sample No.: UD-1	Test Date: 02/16/12	Test No.: IP-1
	Depth: 14 ft	Sample Type: tube	Elevation: ---
	Description: Moist, olive sandy clay		
	Remarks: System V		

Memorandum

APPENDIX C: GEOTECHNICAL CALCULATIONS

LPile Analyses
Pile GROUP Analyses
Seismic Site Class Evaluation
Liquefaction Analyses

LPile Analyses

Purpose:

The purpose of this calculation is to analyze a single pile response (no group reduction) in the longitudinal direction of the proposed Hockomock Swamp Trestle.

References:

- AREMA Manual.

Assumptions:

- **Boring**

By examining the Borings of HST-1 to HST-9 in areas of the proposed trestle, Boring HST-4 was used for the following analyses.

Boring HST-4 Location: Sta.1457+00
Ground Elevation: EL.70.5

- **Ground water table:**

It is assumed that the ground water at EL 70.5

- **Superstructure**

Top of Track: EL.79.7
Top of Pier Cap: EL.74.2
Bottom of Pier Cap: EL.70.7

- **Pile Size**

Four sizes of HP piles were analyzed. In accordance with AREMA, the maximum allowable pile stresses should be limited to 12.6 ksi for a pile with yield strength of 36 ksi. The maximum allowable single pile capacity was estimated for each size of the HP piles as well as the relevant properties as follows:

Pile Size	As	Ix	Sx	Iy	Sy	Qall
	(in^2)	(in^4)	(in^3)	(in^4)	(in^3)	(kips)
HP10X42	12.4	210	43.4	71.7	14.2	156
HP12X53	15.5	393	66.7	127	21.1	195
HP14X73	21.4	729	107	261	35.8	269
HP14X89	26.1	904	131	326	44.3	328

Elastic Modulus: E = 29,000,000 psi

- **Load From Structure**

The service loads for pier span of 30 ft, 40 ft and 50 ft were obtained from Kristofer Kretsch (email on 2/02/2012). The longitudinal force due to braking and traction were based on the email from Kristofer Kretsch on 2/24/2012.

All the loads were summarized as follows (Referring to the Computations by KGK dated on 2/23/2012)

Pier Span	Dead Load, D*	Live Load, L	Impact Load, I	Longitudinal Braking			Longitudinal Traction		
				Force, LF_B	Moment,M_B**	Vertical, V_B	Force, LF_T	Moment,M_T**	Vert., V_T
(ft)	(kips)	(kips)	(kips)	(kips)	(k-ft)	(kips)	(kips)	(k-ft)	(kips)
30	330	346	142	81	1,235	41	137	1,404	47
40	425	432	153	93	1,418	35	158	1,620	40
50	520	546	174	105	1,601	32	177	1,814	36

Note: * Dead load includes weight of pier cap (50 kips for single row of piles).

** The moments are about the center of the pier cap. The moment is applied to the piers as a vertical couple applied downward on the pier at one end of the span and upward on the pier at the other end of the span. The moment is not applied directly to the pier cap, but is only given for information.

- **Load Combination**

As per AREMA, three load combinations were checked:

Group I = D + L + I

Group III (a) = D + L + I + LF_B Including longitudinal braking load

Group III(b) = D + L + I + LF_T Including longitudinal traction load

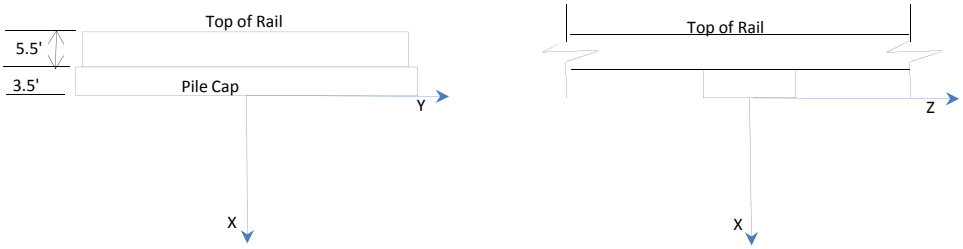
No other loads were considered at present.

The load combinations of Group III(a) and Group III(b) with respect to the following coordinate system are more critical. Therefore, only these two load combinations were summarized as follows:

Pier Span	Load Combination	Fx		Fy	Fz
		Single Row	Double Row*		
(ft)		(kips)	(kips)	(kips)	(kips)
30	Group III(a)	859	909	0	81
	Group III(b)	865	915	0	137
40	Group III(a)	1,045	1,095	0	93
	Group III(b)	1,050	1,100	0	158
50	Group III(a)	1,272	1,322	0	105
	Group III(b)	1,276	1,326	0	177

Note: * For double rows of piles, the pile cap weight is 100k.

Coordinate system:



Analysis:

Software: LPILE Plus 5.0 (Ensoft, Inc.)

Analysis:

By checking the above load combinations, Group III(b) is critical for all three pier spans. The following analyses were based on this load combination only.

Single pile responses under load combination Group III(b) were analyzed assuming that the pile head are fixed in the pile cap which is 3.5 feet deep. The axial load of a single pile was estimated based on 4 piles of a single row and 8 piles of double rows. **No moment was applied at the top of the pile.**

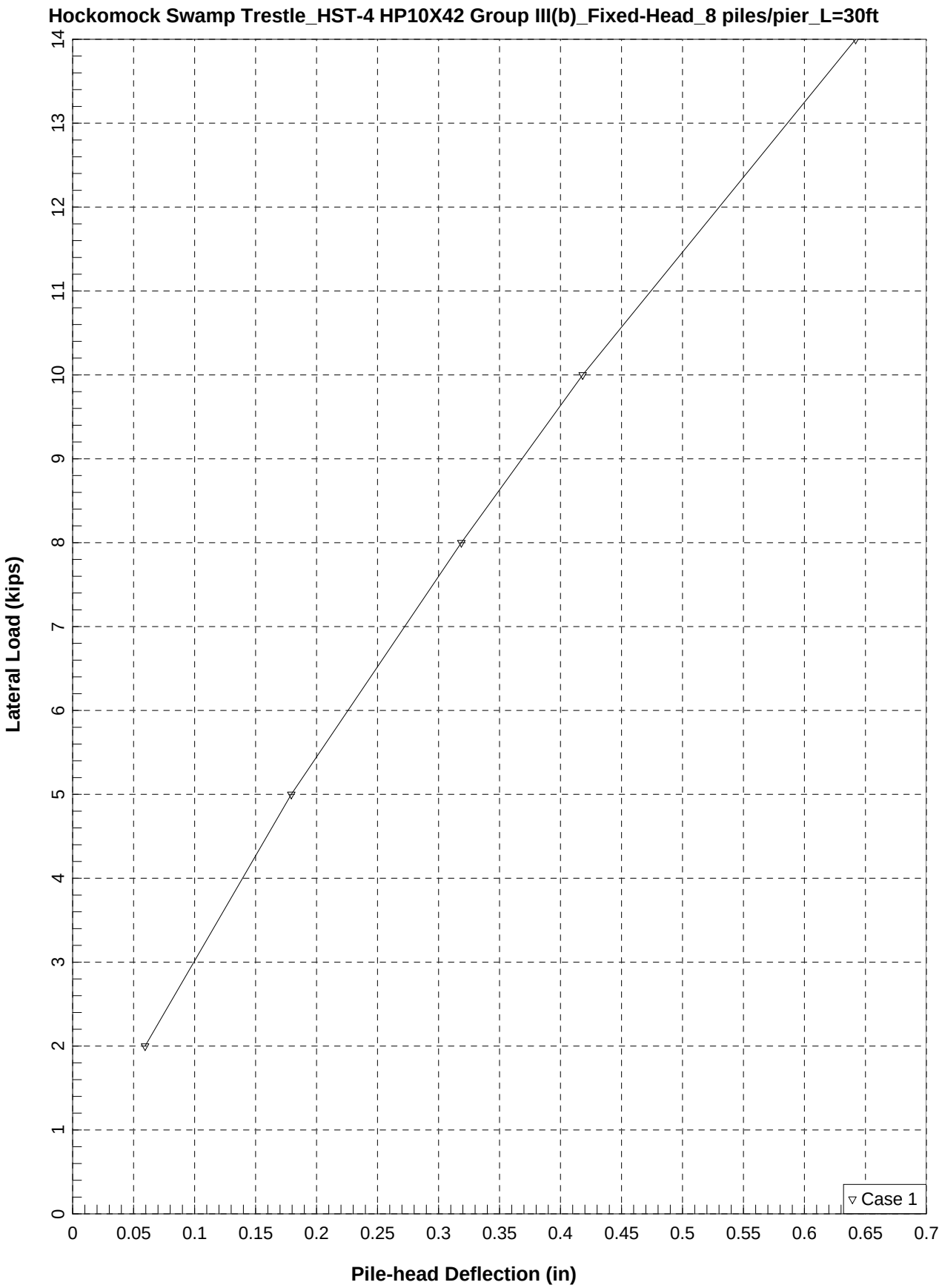
The results were summarized in the next page.

The attachments include Lateral Load vs. Pile-head Deflection, Lateral Deflection vs. Depth, Bending Moment vs. Depth and Shear Force vs. Depth for each loading case.

These results are for preliminary pile layout. Once the preliminary pile layout is available, the pile group analyses should be performed with all the loads applied at the bottom of the pile cap.

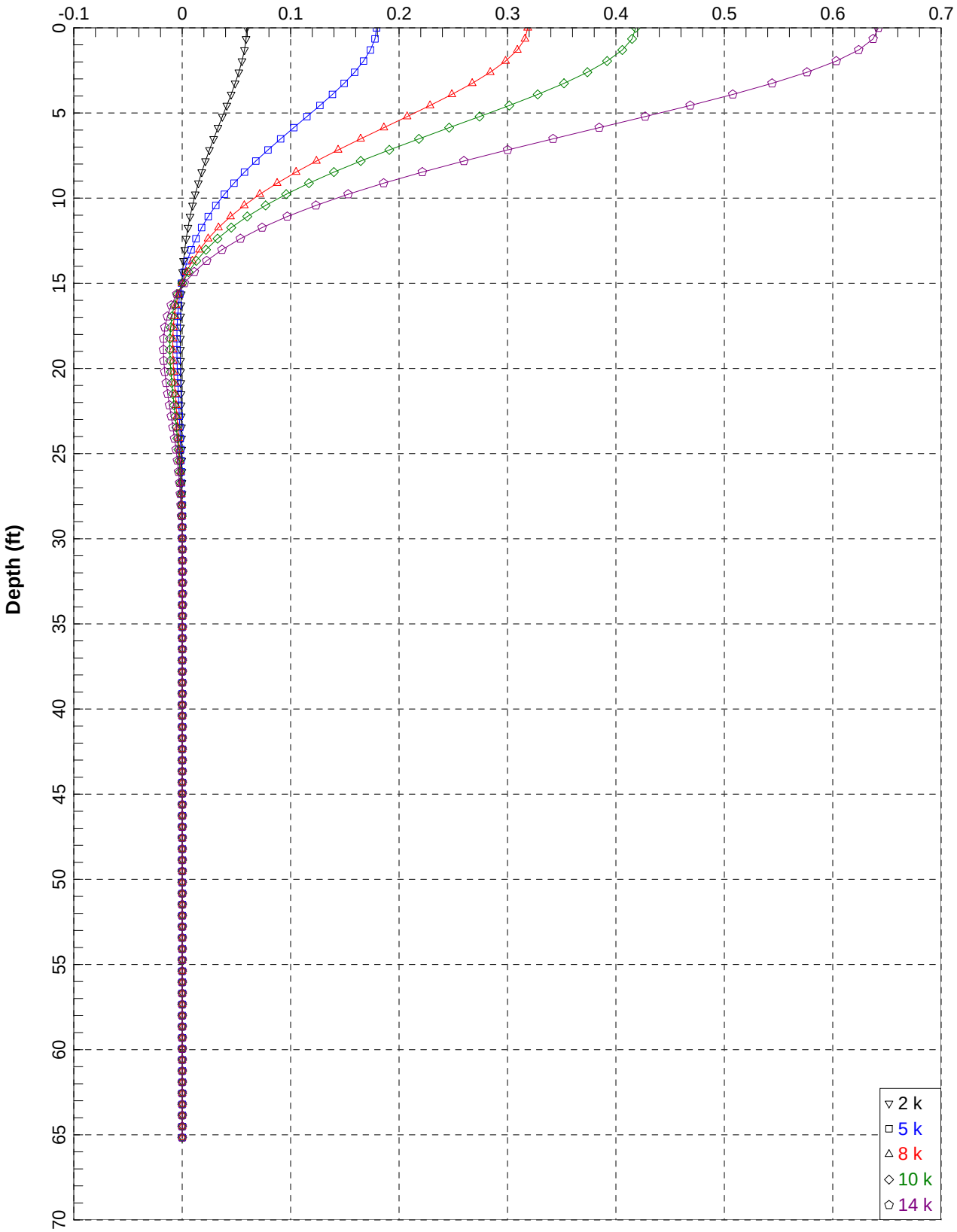
Summary of Lpile Analyses (Fixed Head Condition)

Pier Span	Total Vertical Load	Pile Size	Qall/Pile	No. of Piles/Pier	Vertical Load/Pile	Results	
						Max. Horizontal Load	Max. Top Deflection
(ft)	(kips)		(kips)		(kips)	(kips)	(inches)
30	865	HP10X42	156	8	108	14	0.64
	865	HP12X53	195	8	108	21	0.73
	865	HP14X73	269	8	108	32	0.86
	865	HP14X89	328	8	108	39	0.97
	859	HP14X89	328	4	215	33	0.8
40	1,050	HP10X42	156	8	131	12	0.53
	1,050	HP12X53	195	8	131	20	0.69
	1,050	HP14X73	269	8	131	31	0.83
	1,050	HP14X89	328	8	131	38	0.94
	1,045	HP14X89	328	4	261	30	0.71
50	1,276	HP10X42	156	8	160	11	0.48
	1,276	HP12X53	195	8	160	18	0.61
	1,276	HP14X73	269	8	160	29	0.77
	1,276	HP14X89	328	8	160	37	0.92
	1,272	HP14X89	328	4	318	28	0.66


Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=30ft
Lateral Load (kips)
Pile-head Deflection (in)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
Case 1

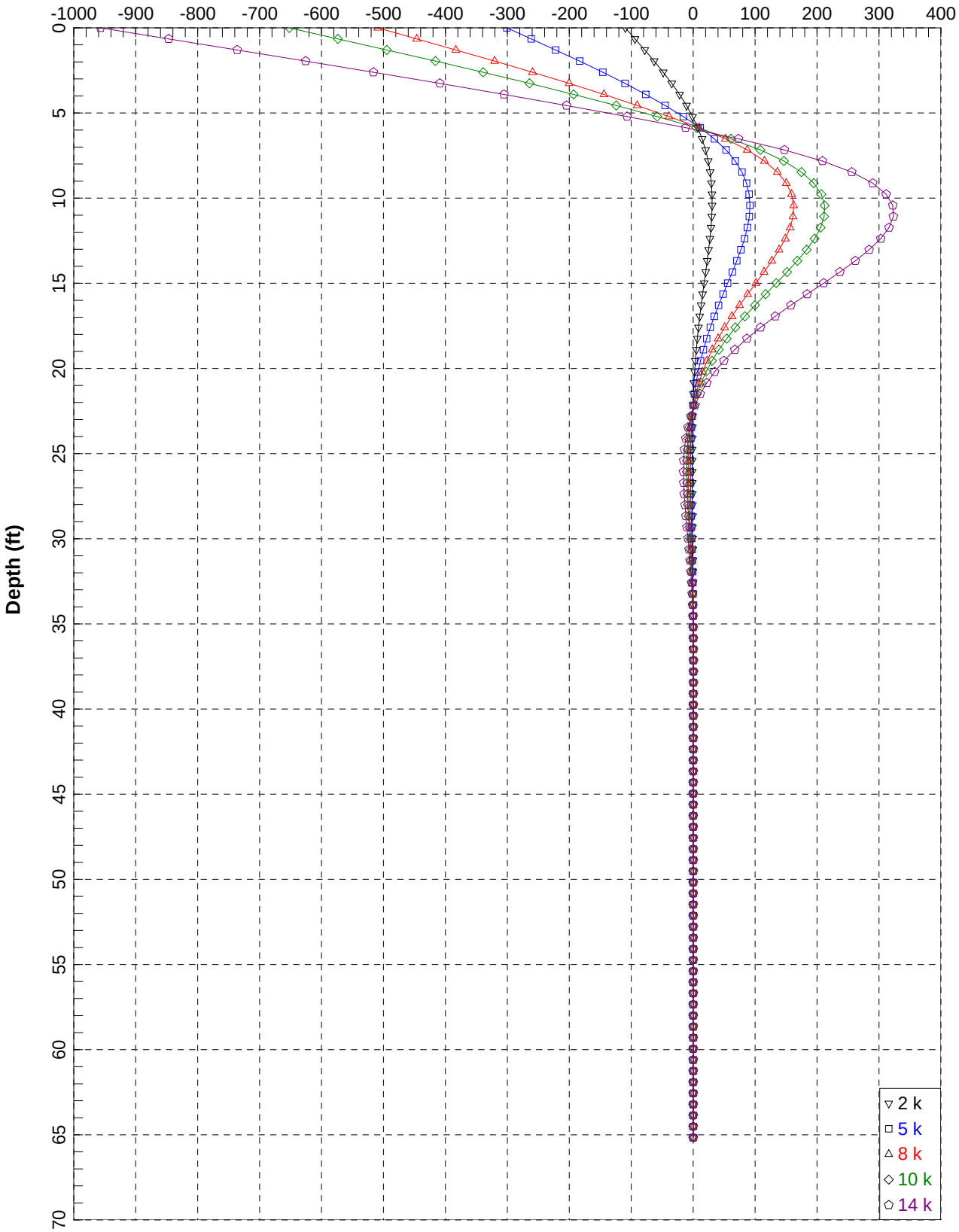
Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=30ft

Lateral Deflection (in)

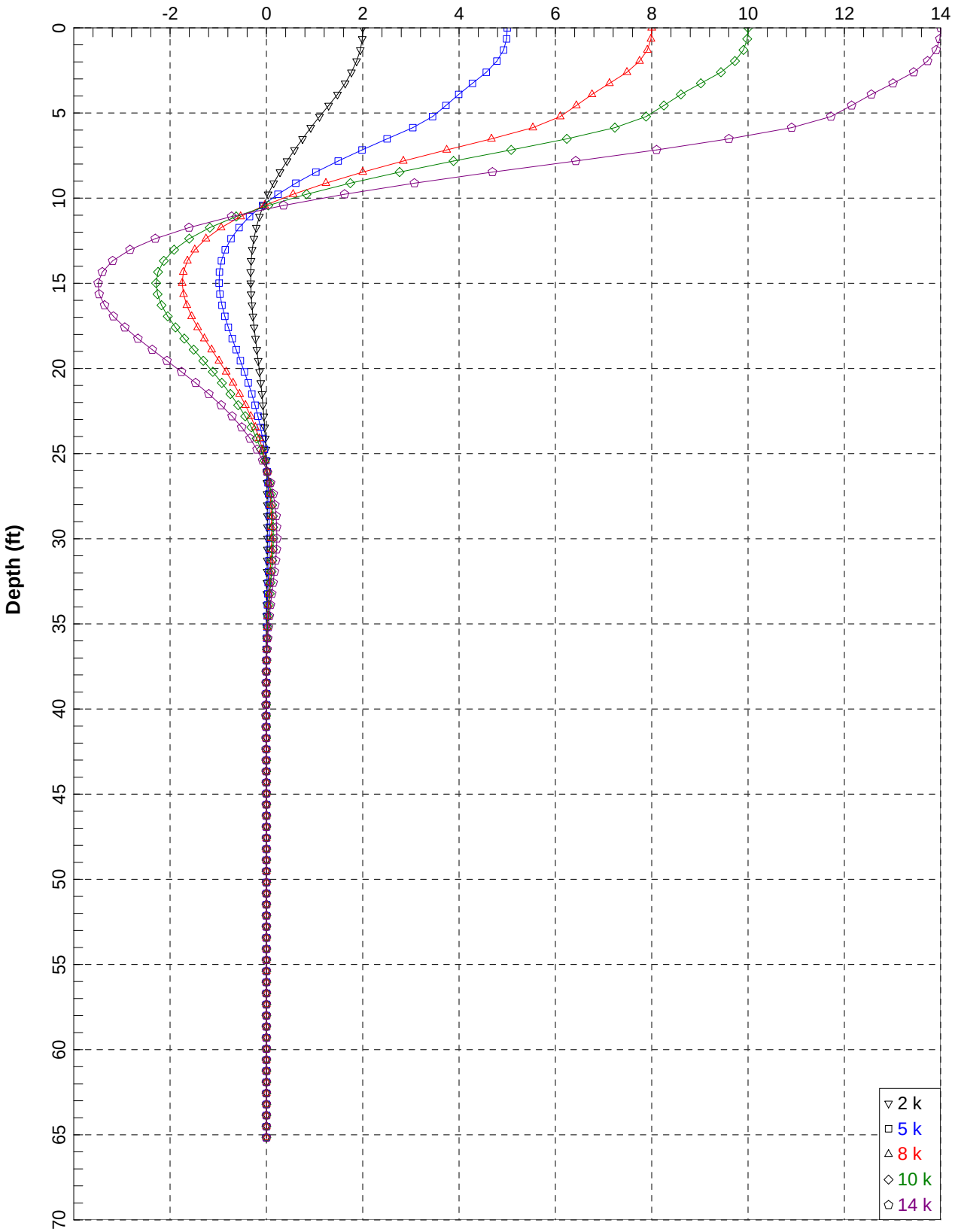


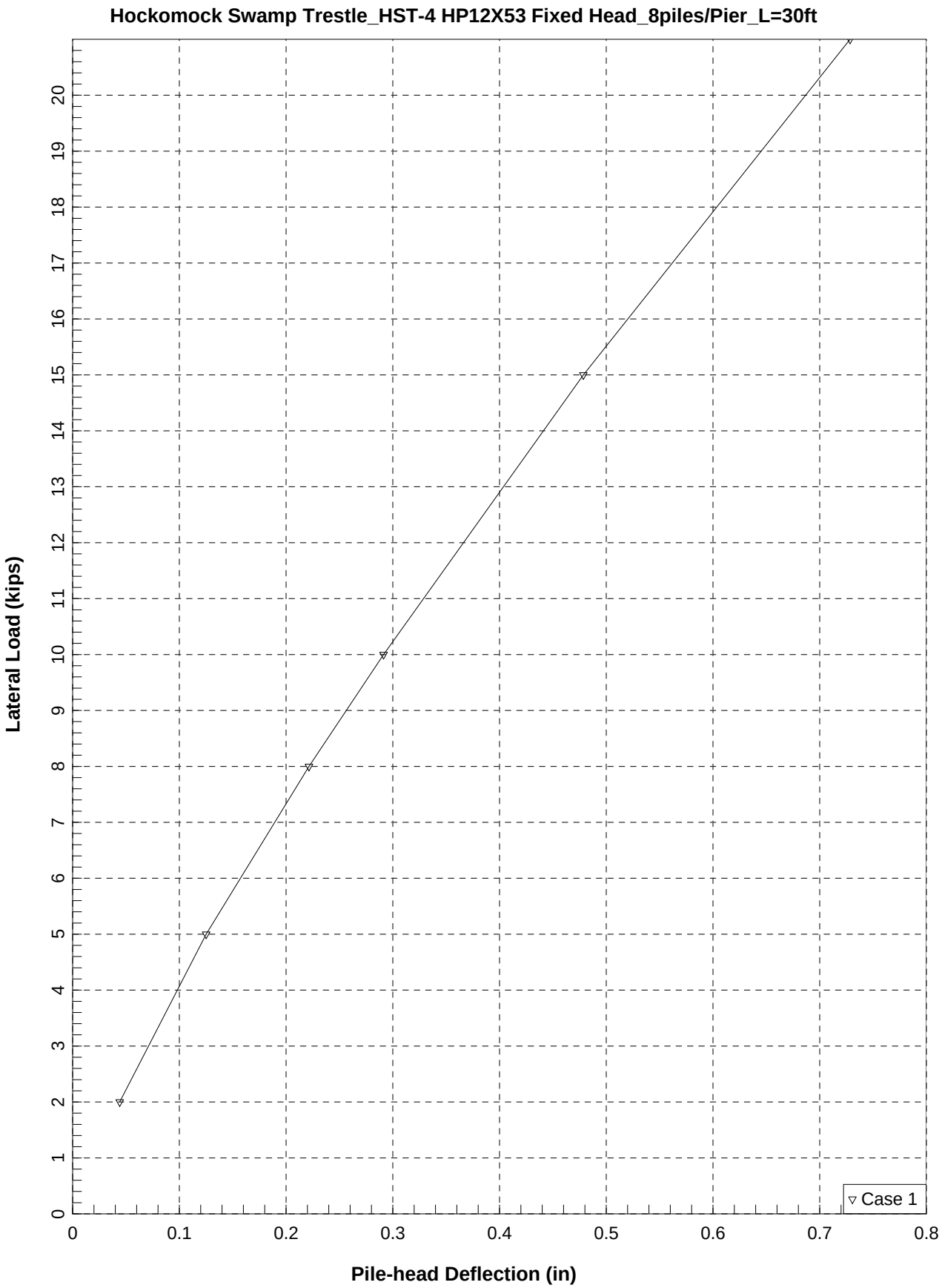
Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=30ft

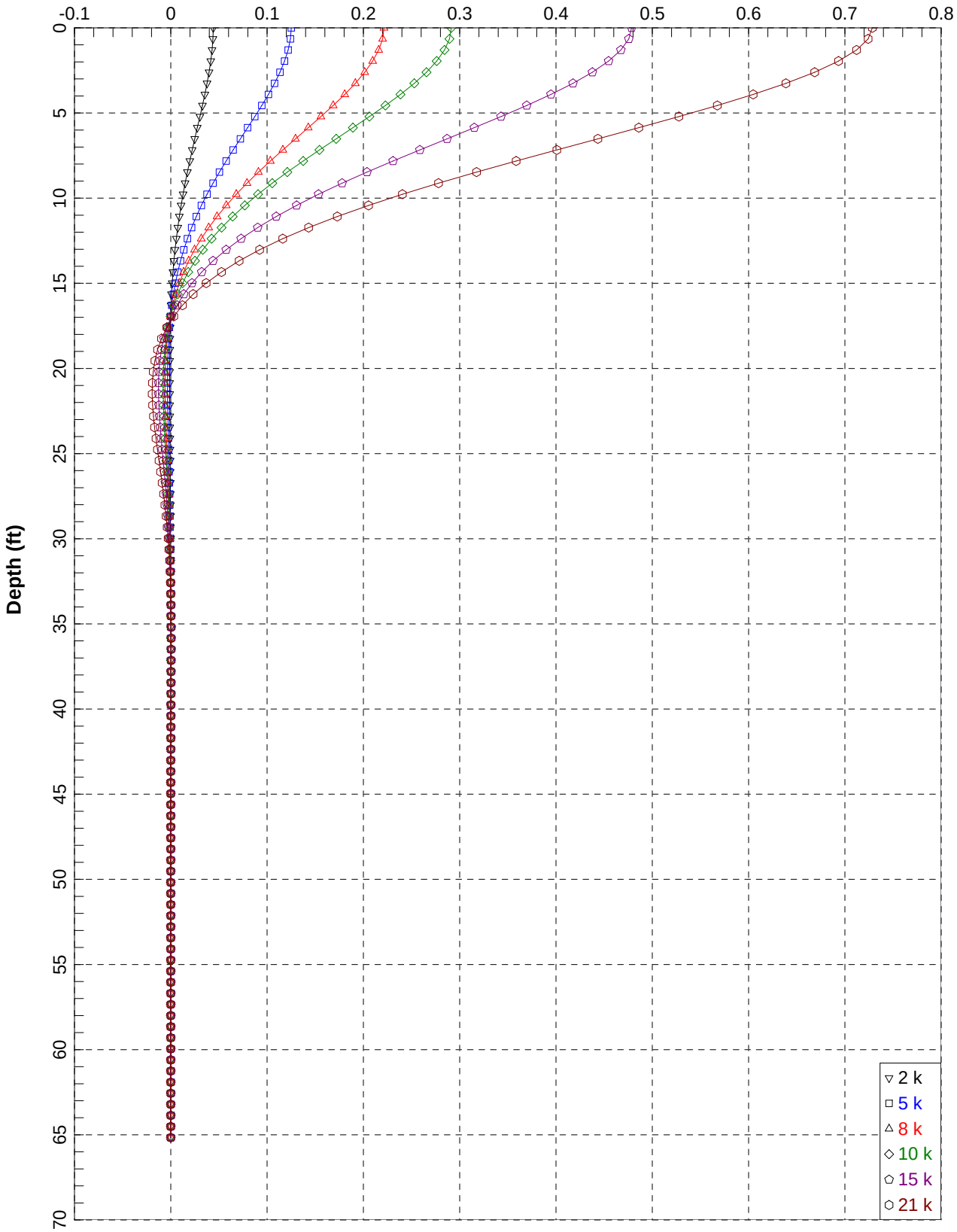
Bending Moment (in-kips)



Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=30ft

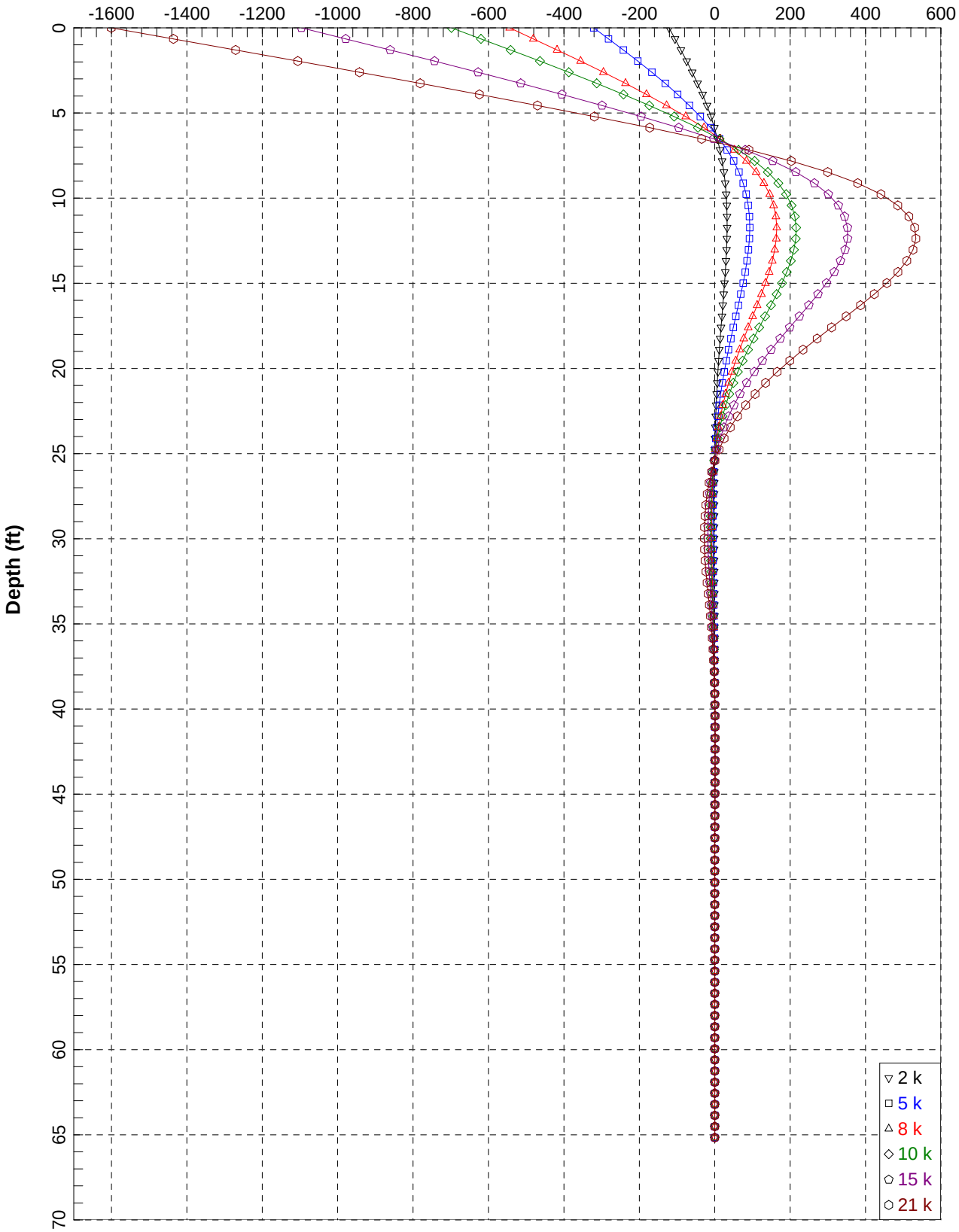


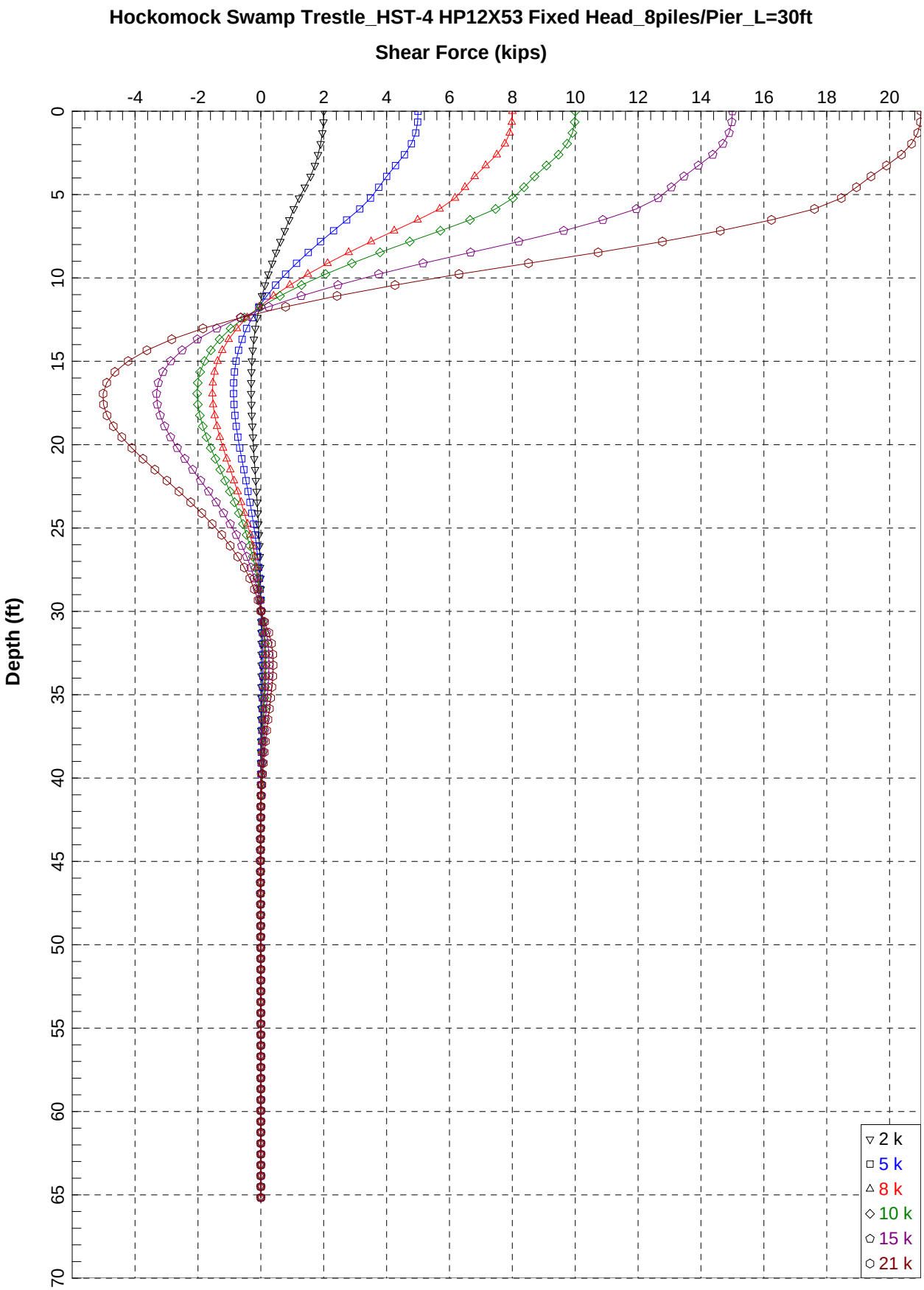

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=30ft
Lateral Load (kips)
Pile-head Deflection (in)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Case 1

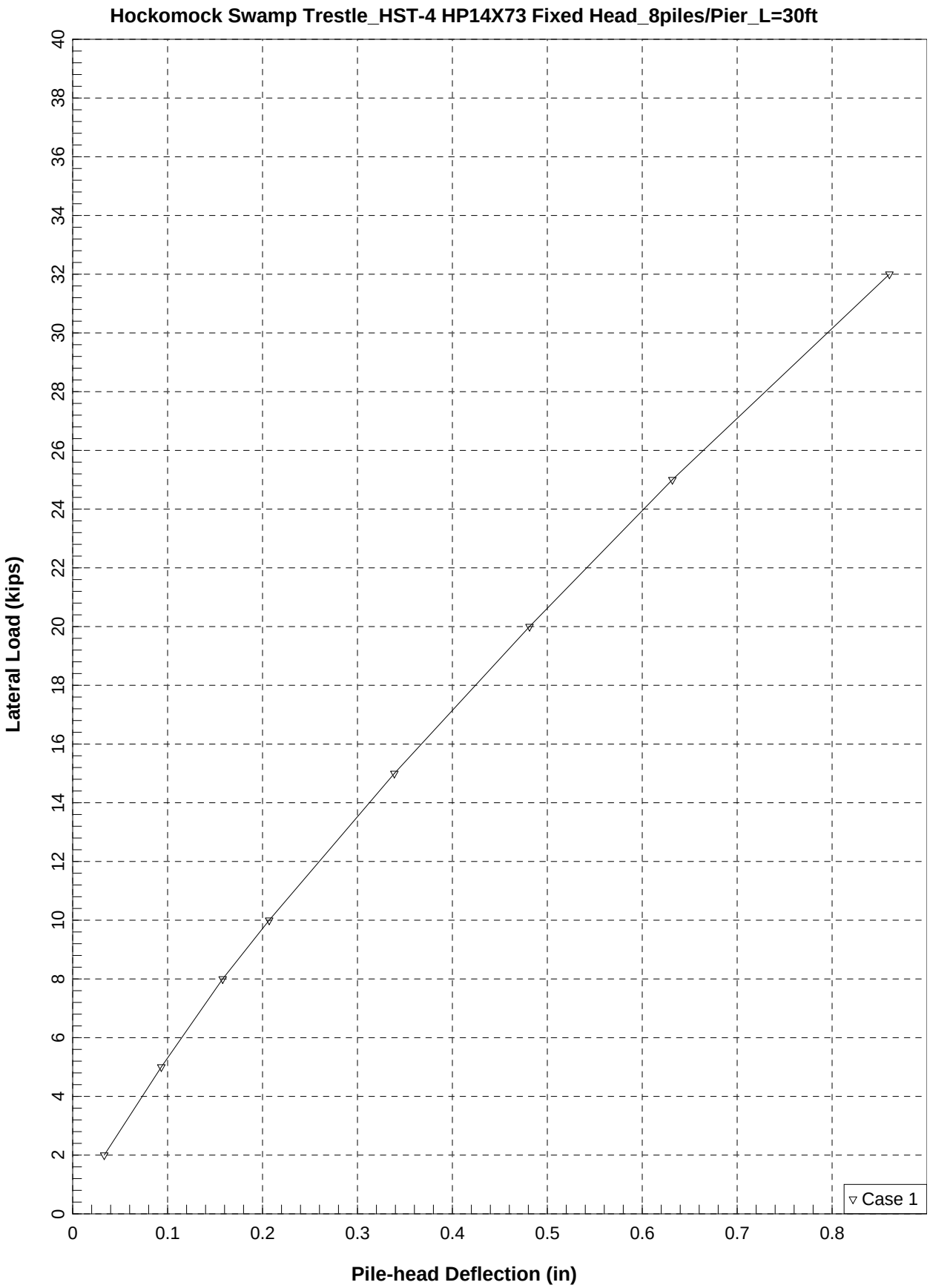

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=30ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
21 k

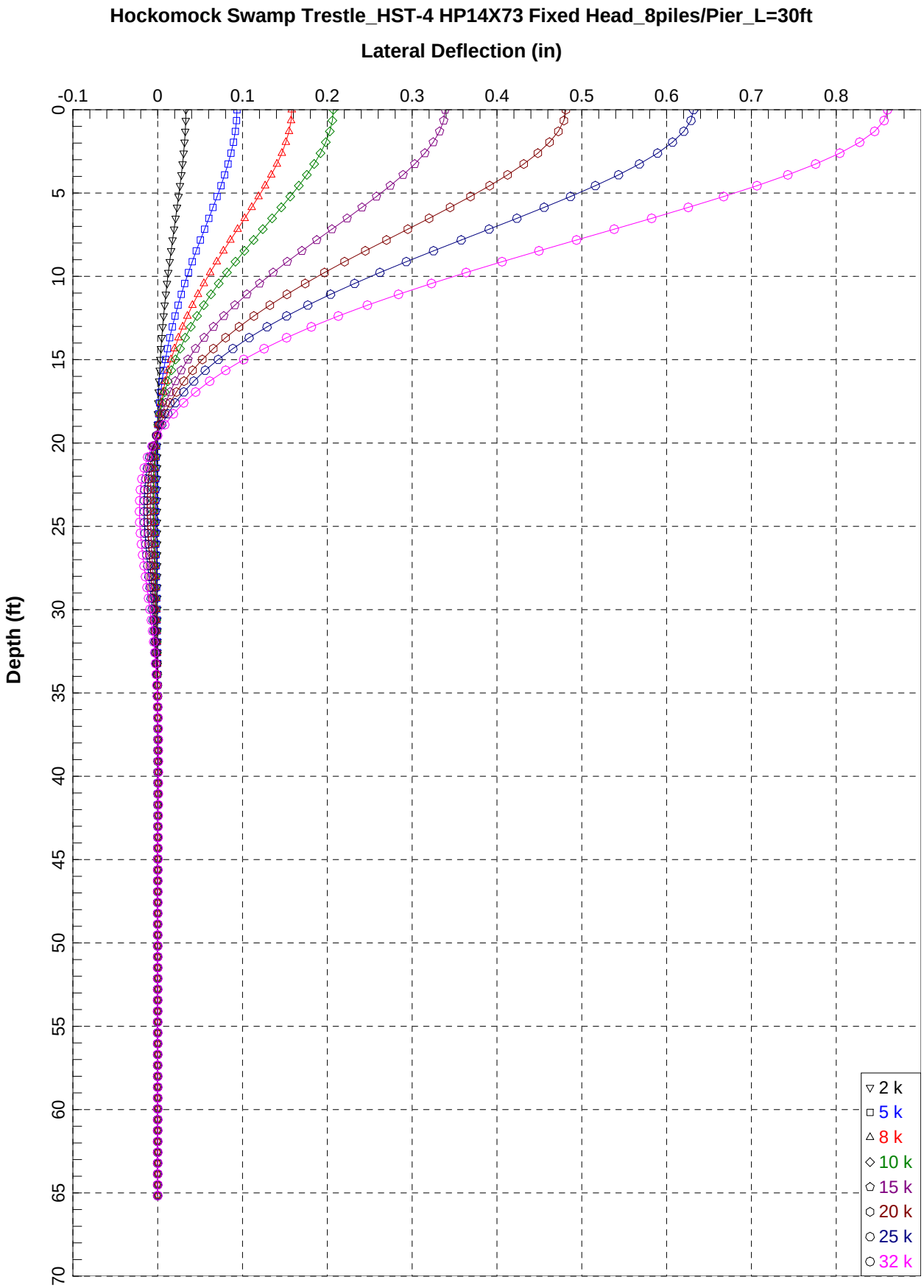
Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=30ft

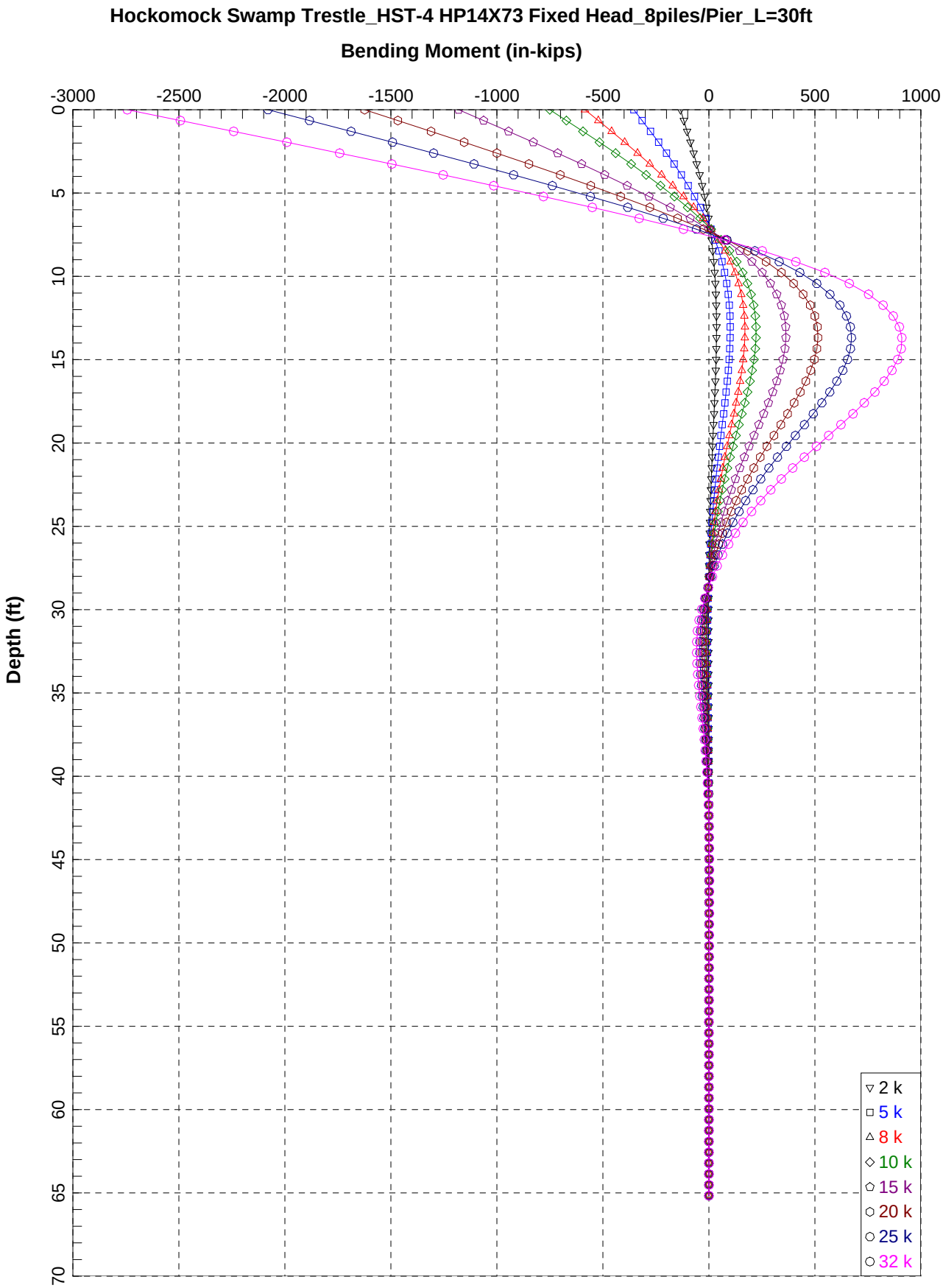
Bending Moment (in-kips)

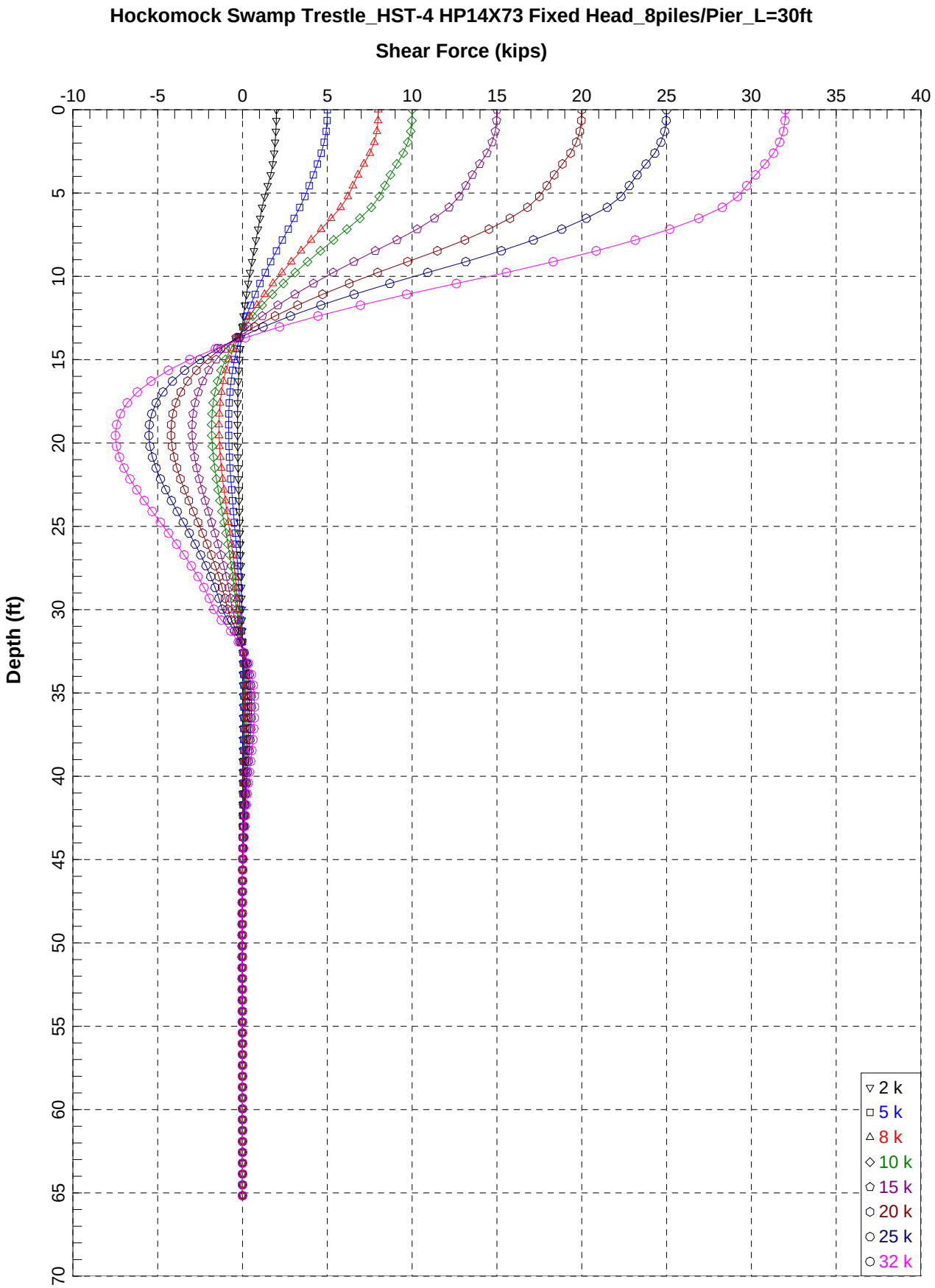


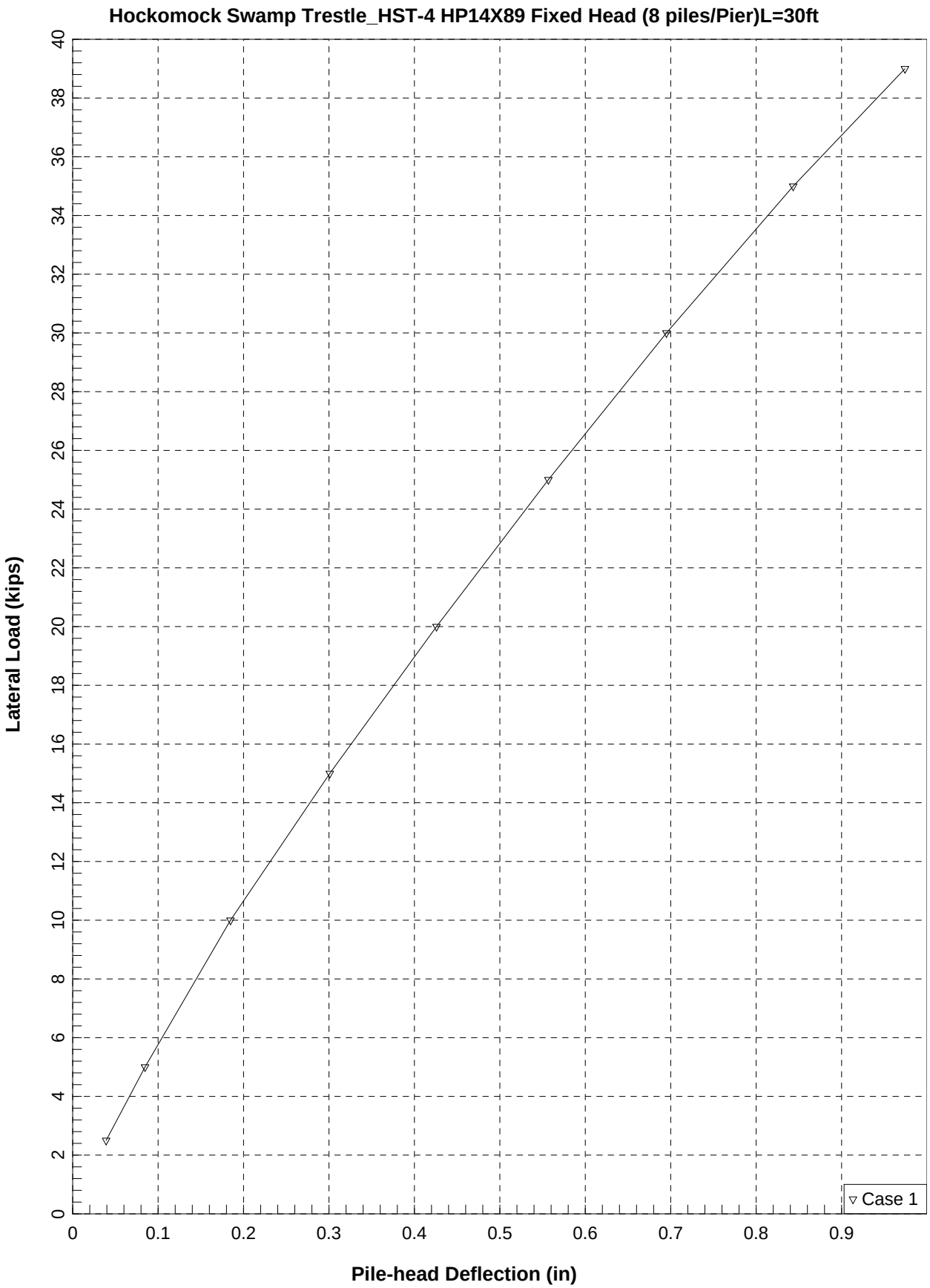

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=30ft
Shear Force (kips)
-4
-2
0
2
4
6
8
10
12
14
16
18
20
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
21 k

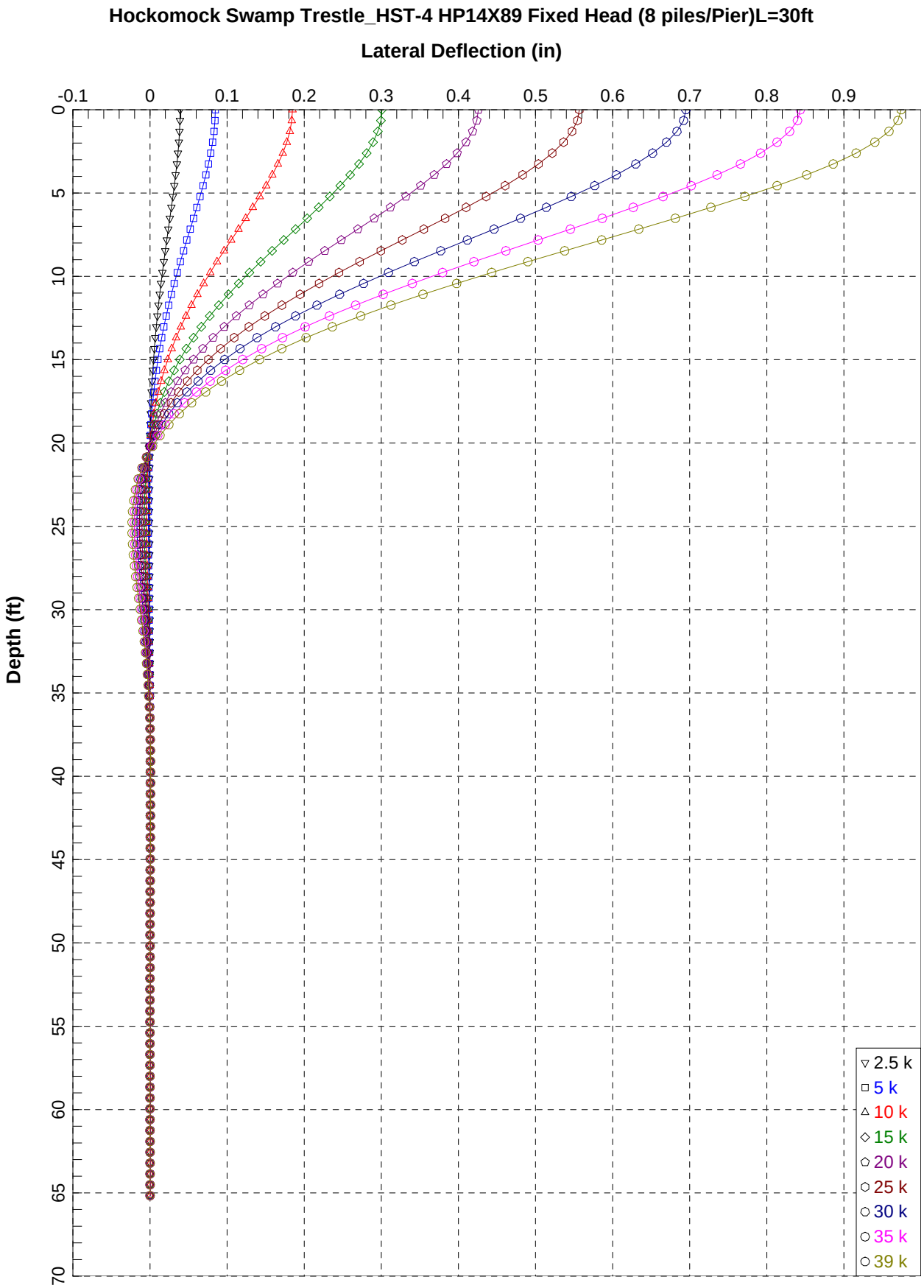

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=30ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Case 1


Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=30ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
32 k


Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=30ft
Bending Moment (in-kips)
-3000
-2500
-2000
-1500
-1000
-500
0
500
1000
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
32 k

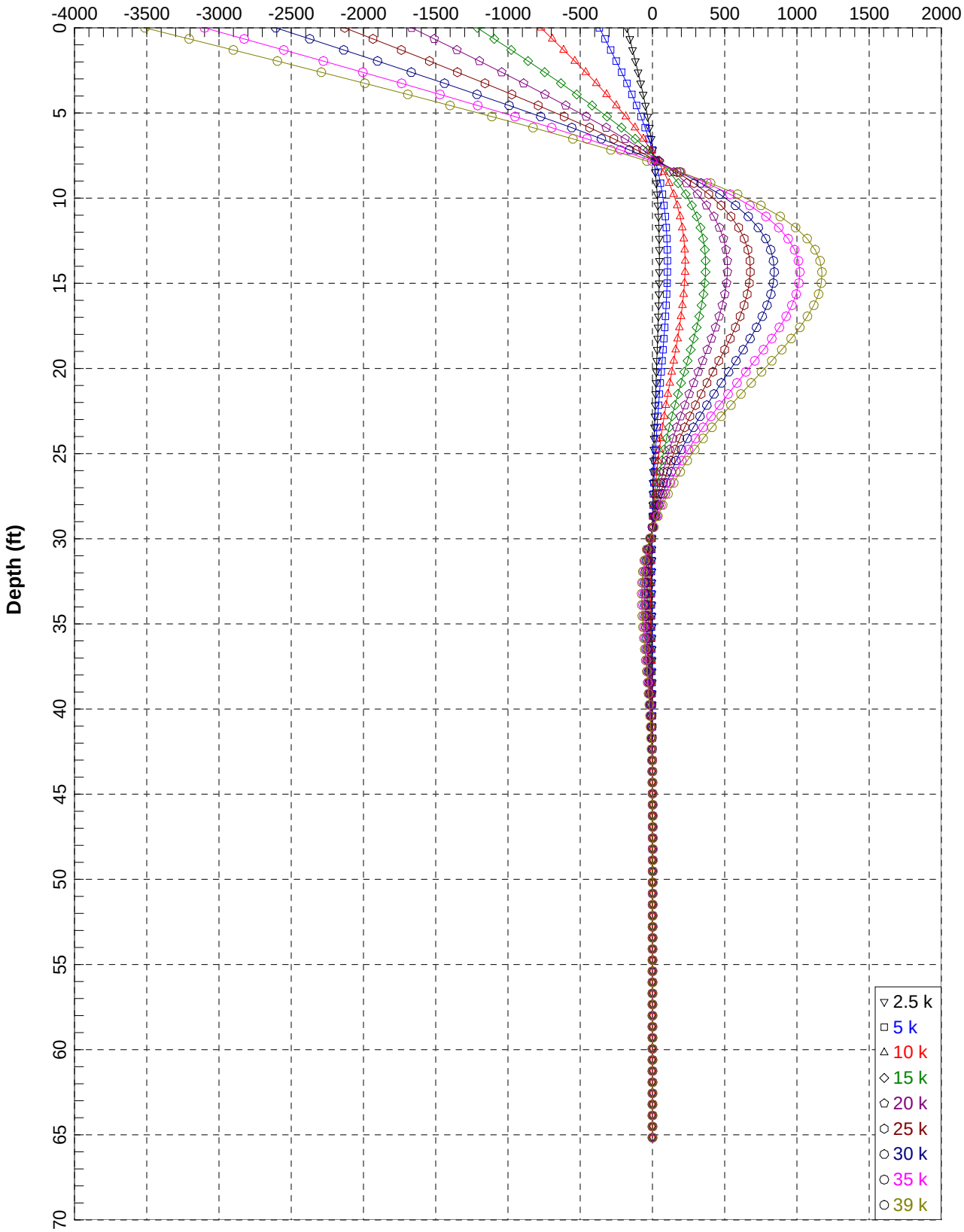

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=30ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
32 k

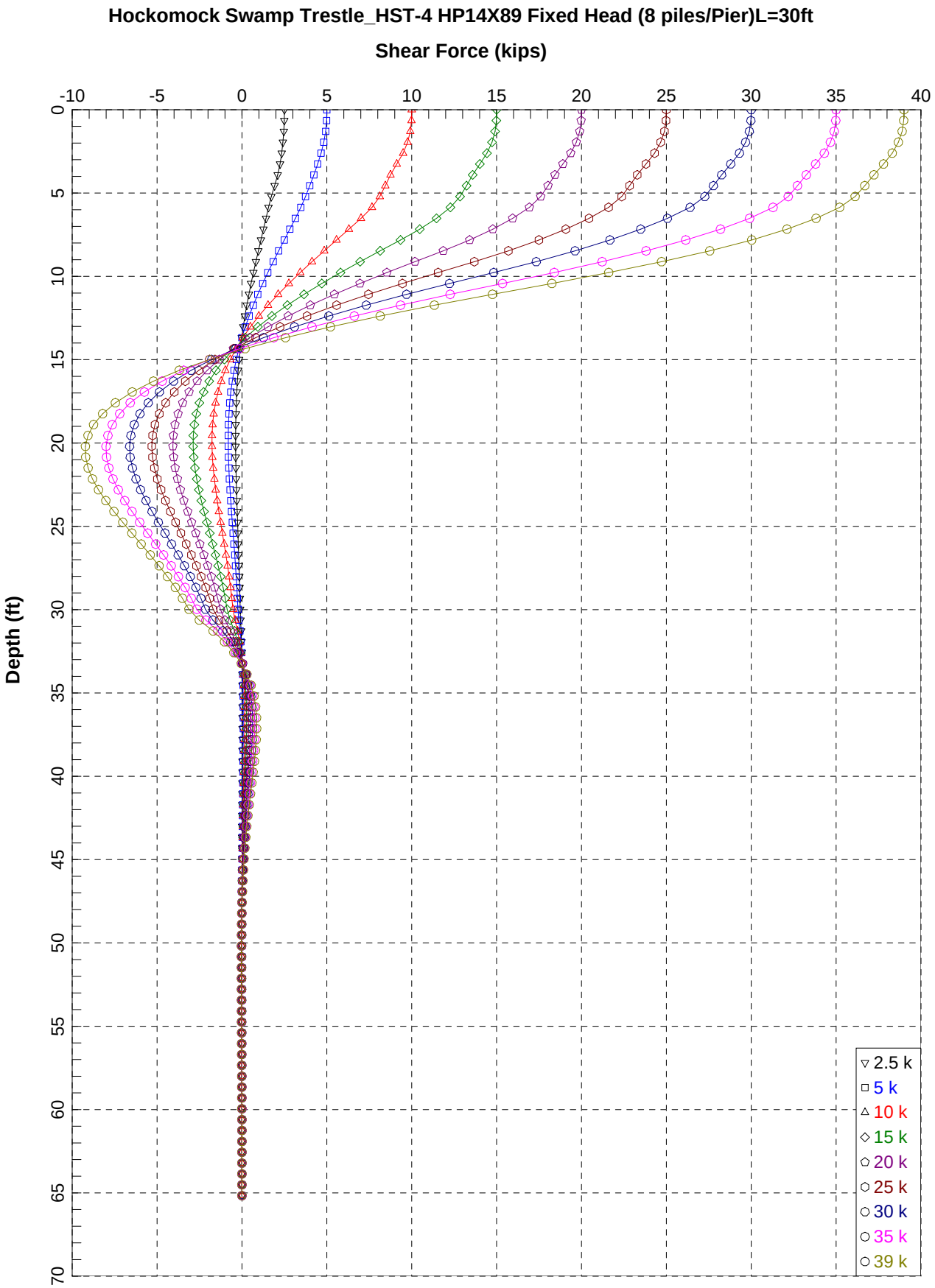

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=30ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Case 1

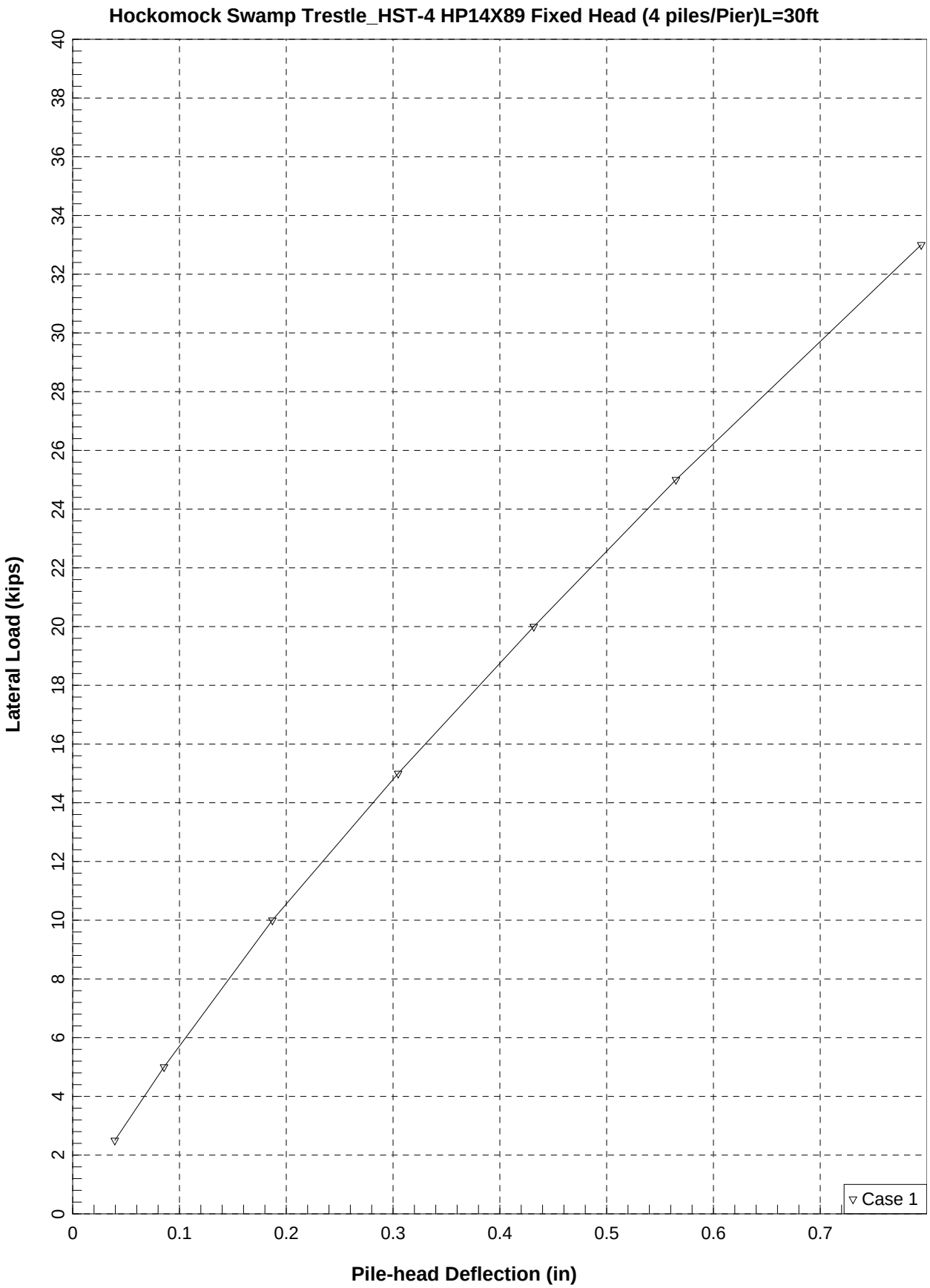

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=30ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k
35 k
39 k

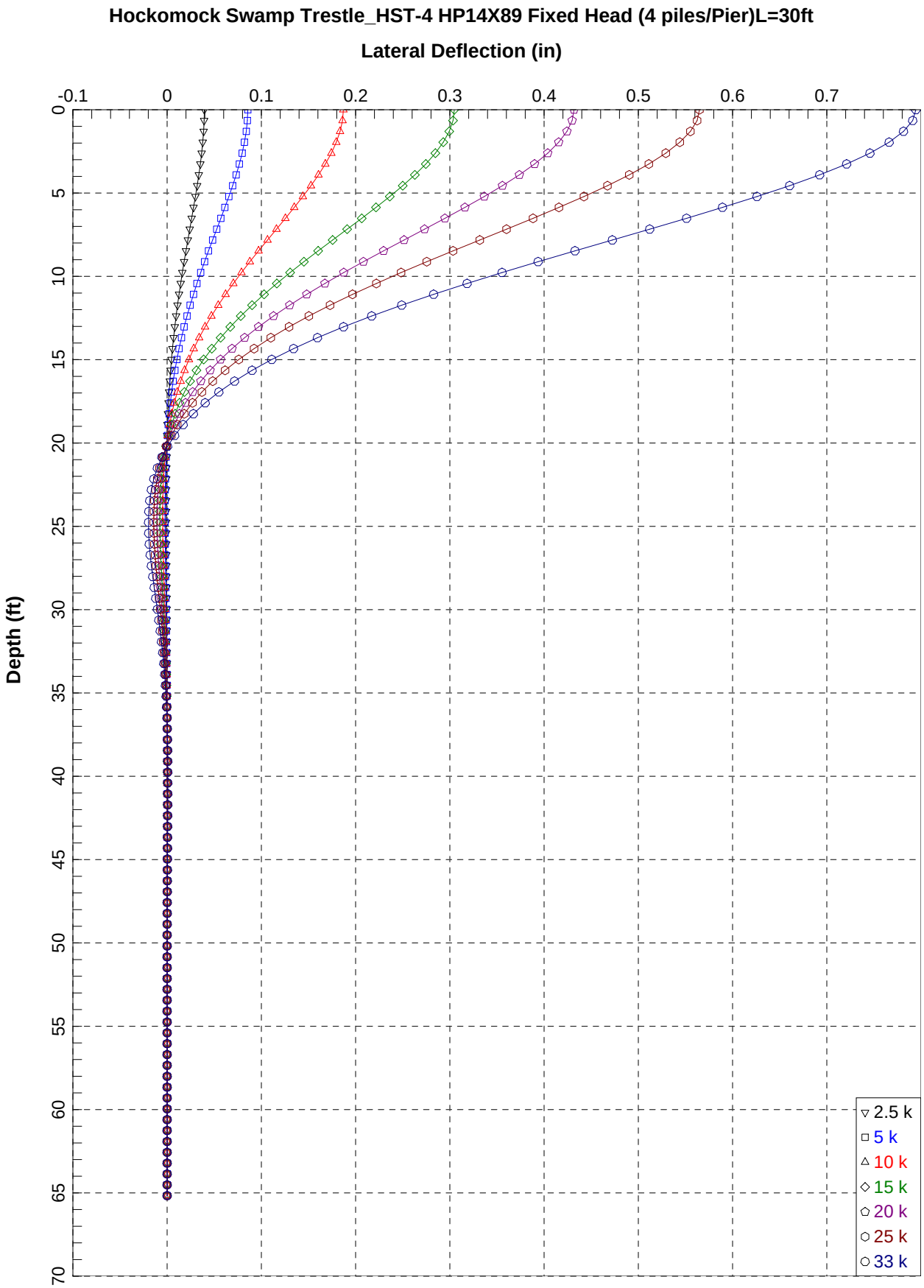
Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=30ft

Bending Moment (in-kips)



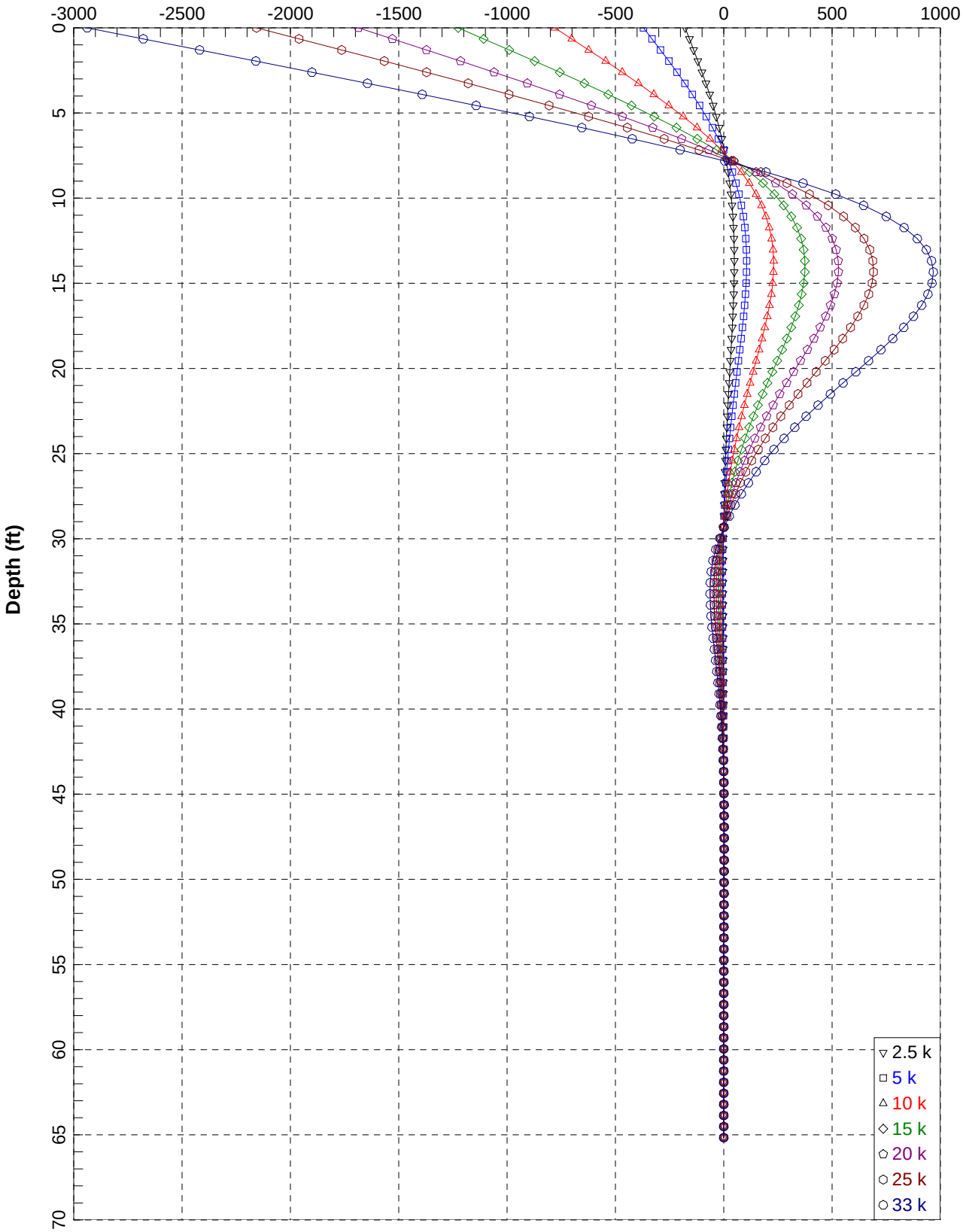

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=30ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k
35 k
39 k

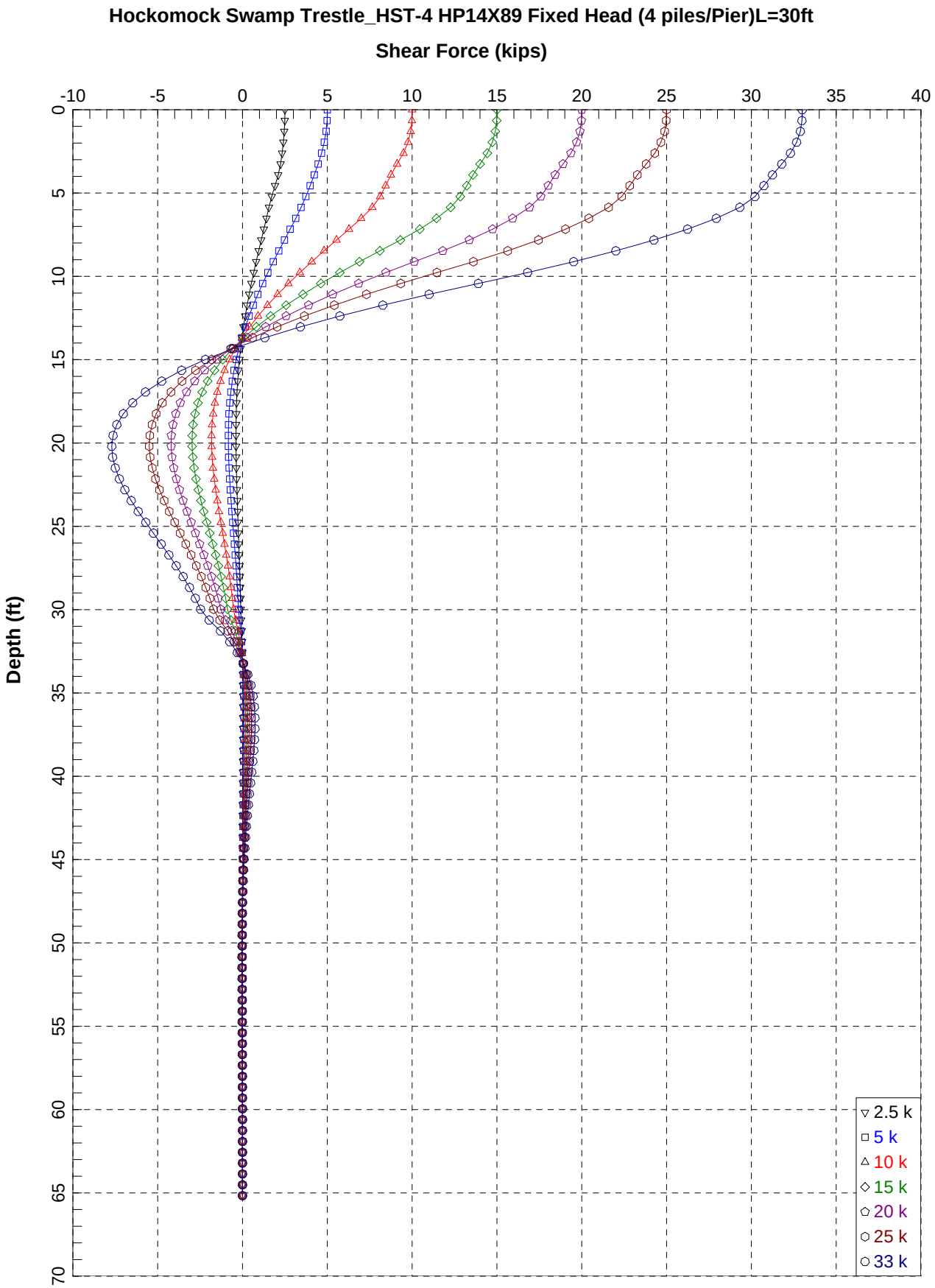

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=30ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Case 1

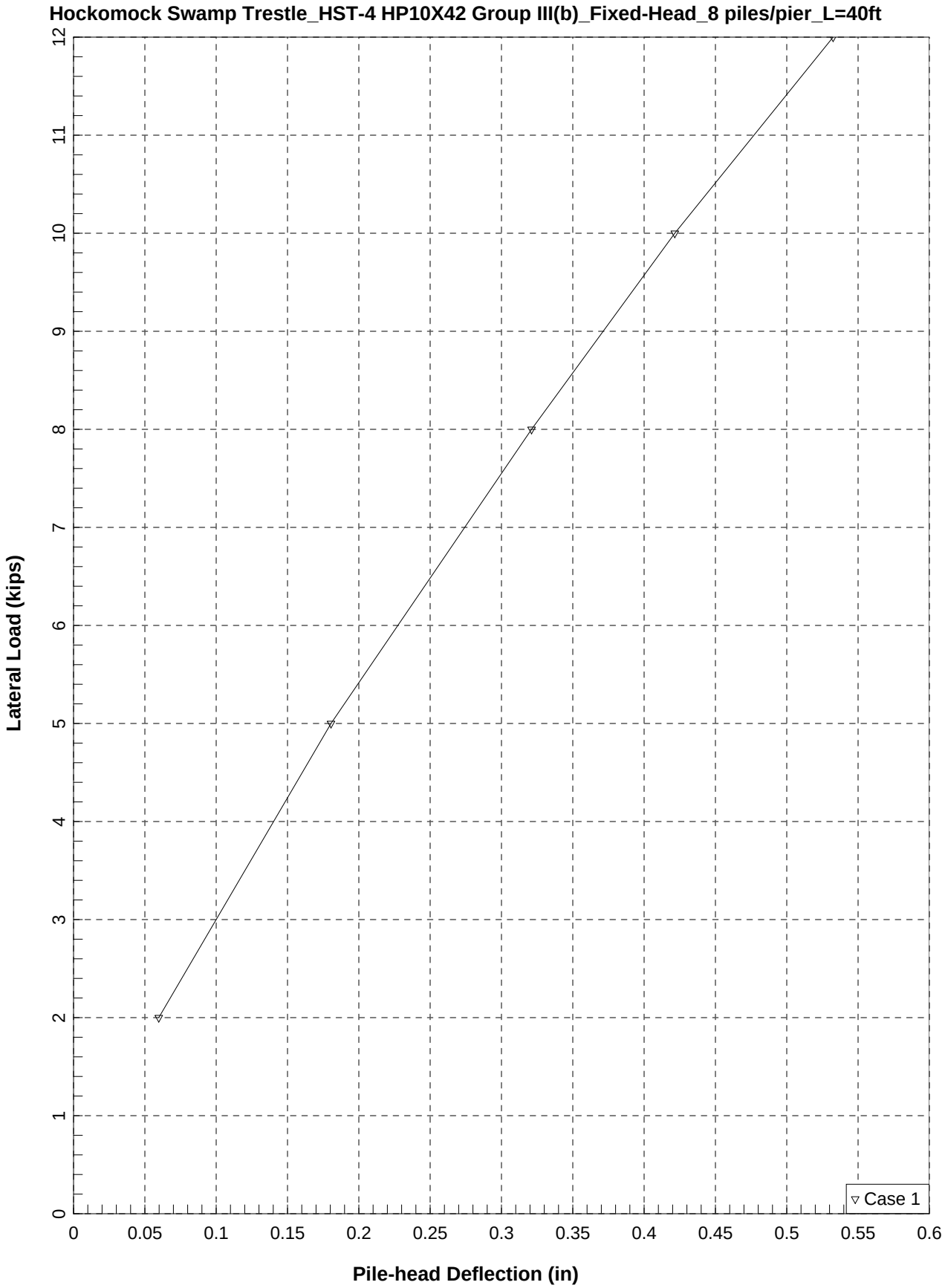

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=30ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
33 k

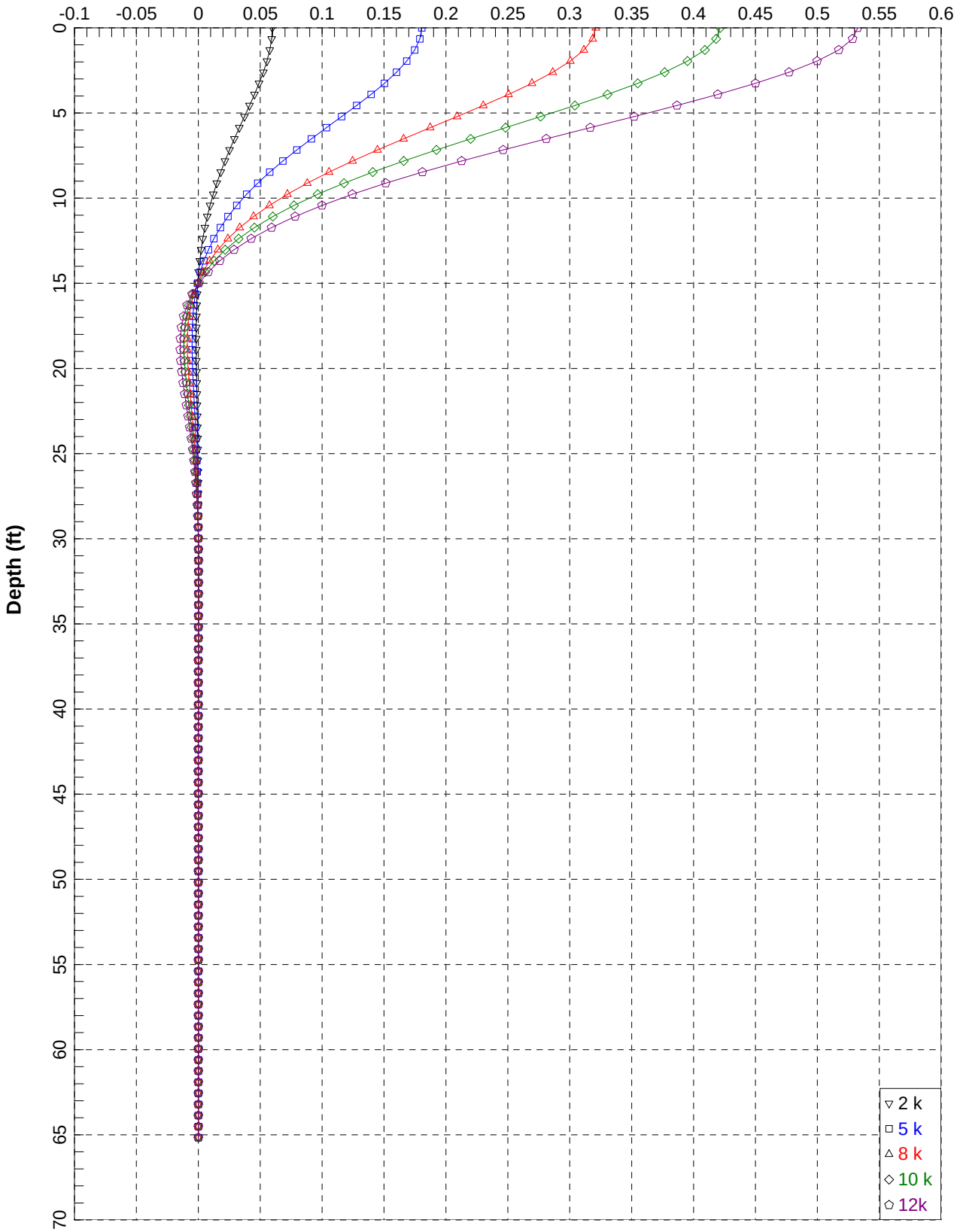
Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=30ft

Bending Moment (in-kips)



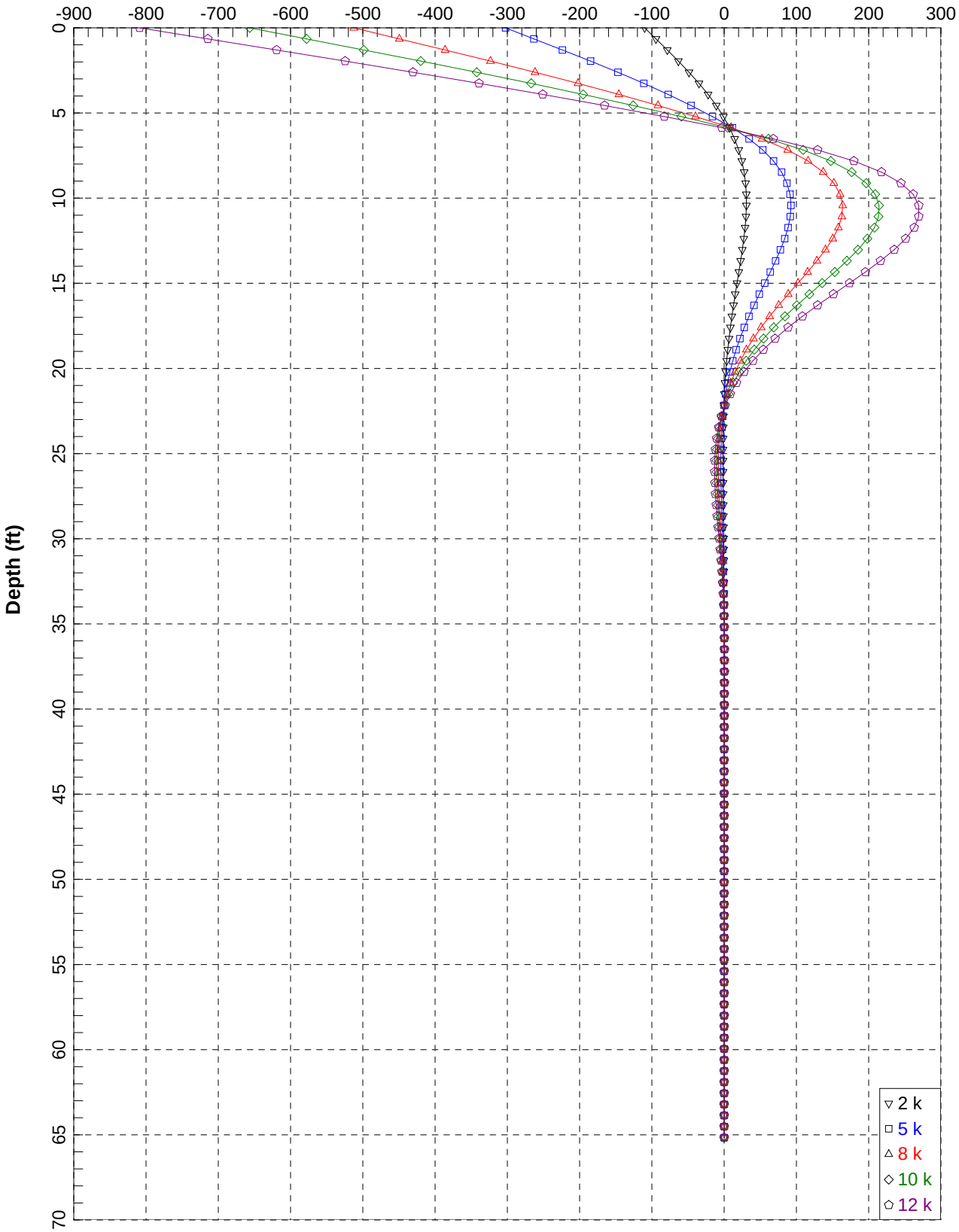

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=30ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
33 k


Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=40ft
Lateral Load (kips)
Pile-head Deflection (in)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
Case 1

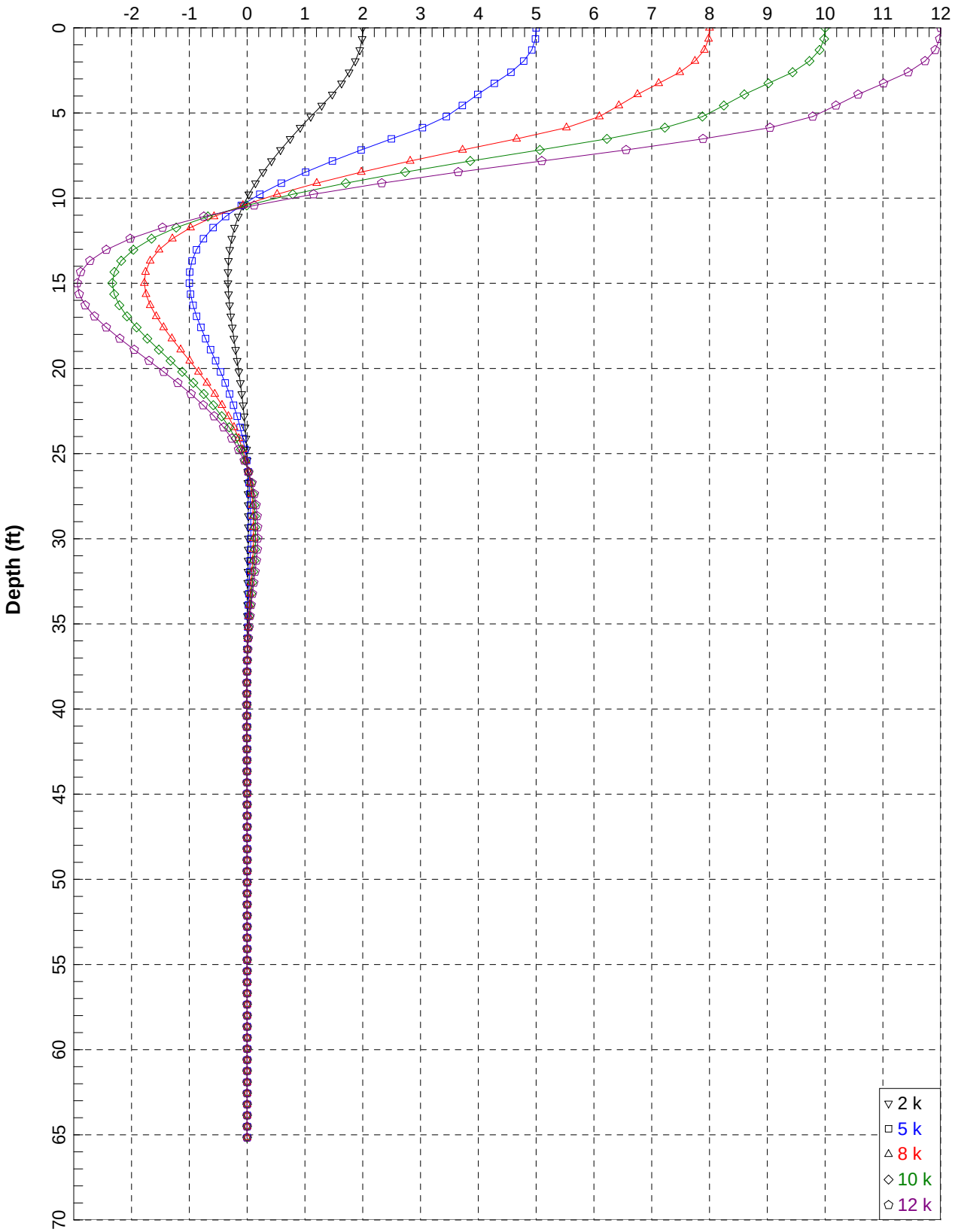

Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=40ft
Lateral Deflection (in)
Depth (ft)
-0.1
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
12k

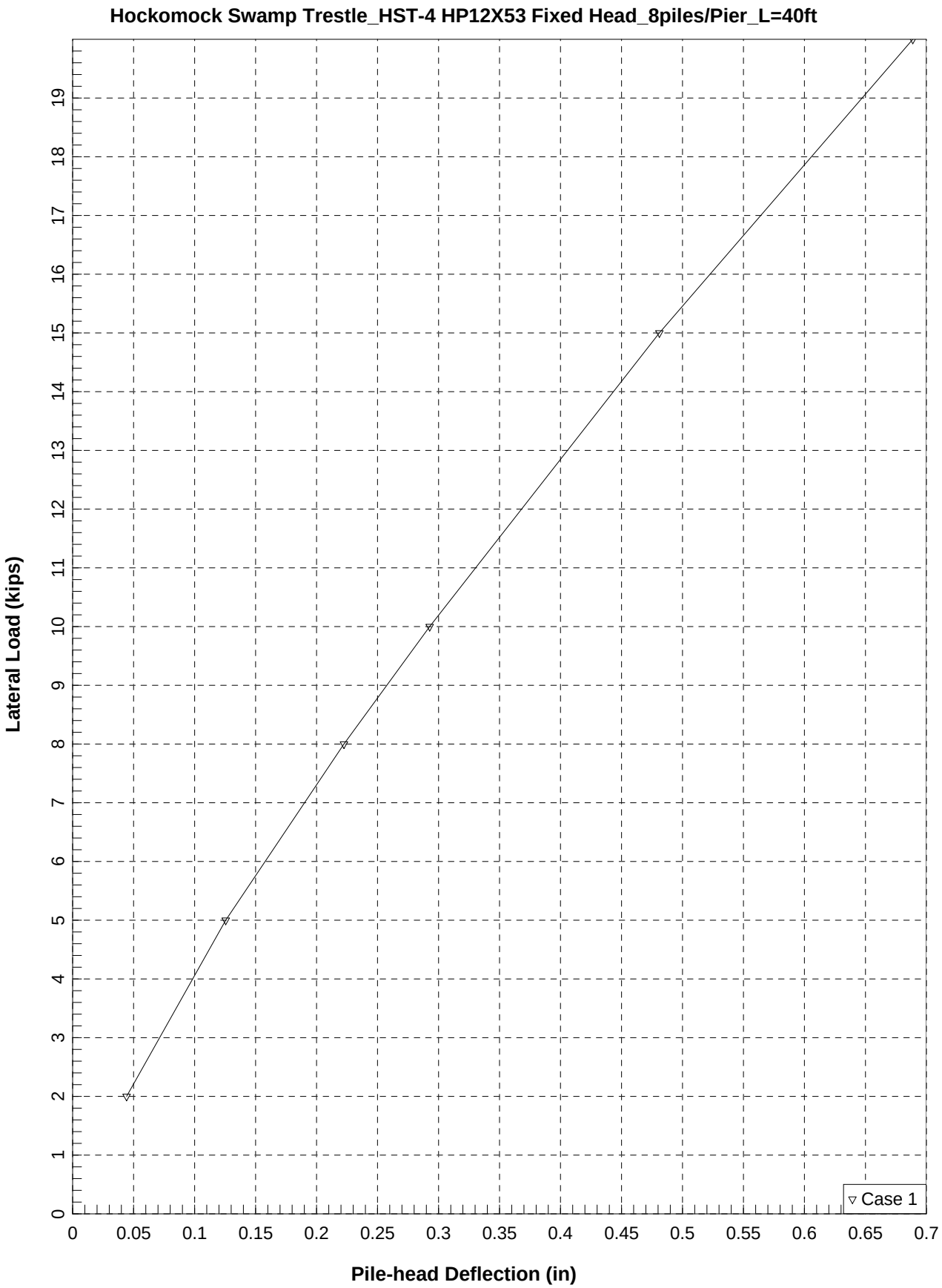
Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=40ft

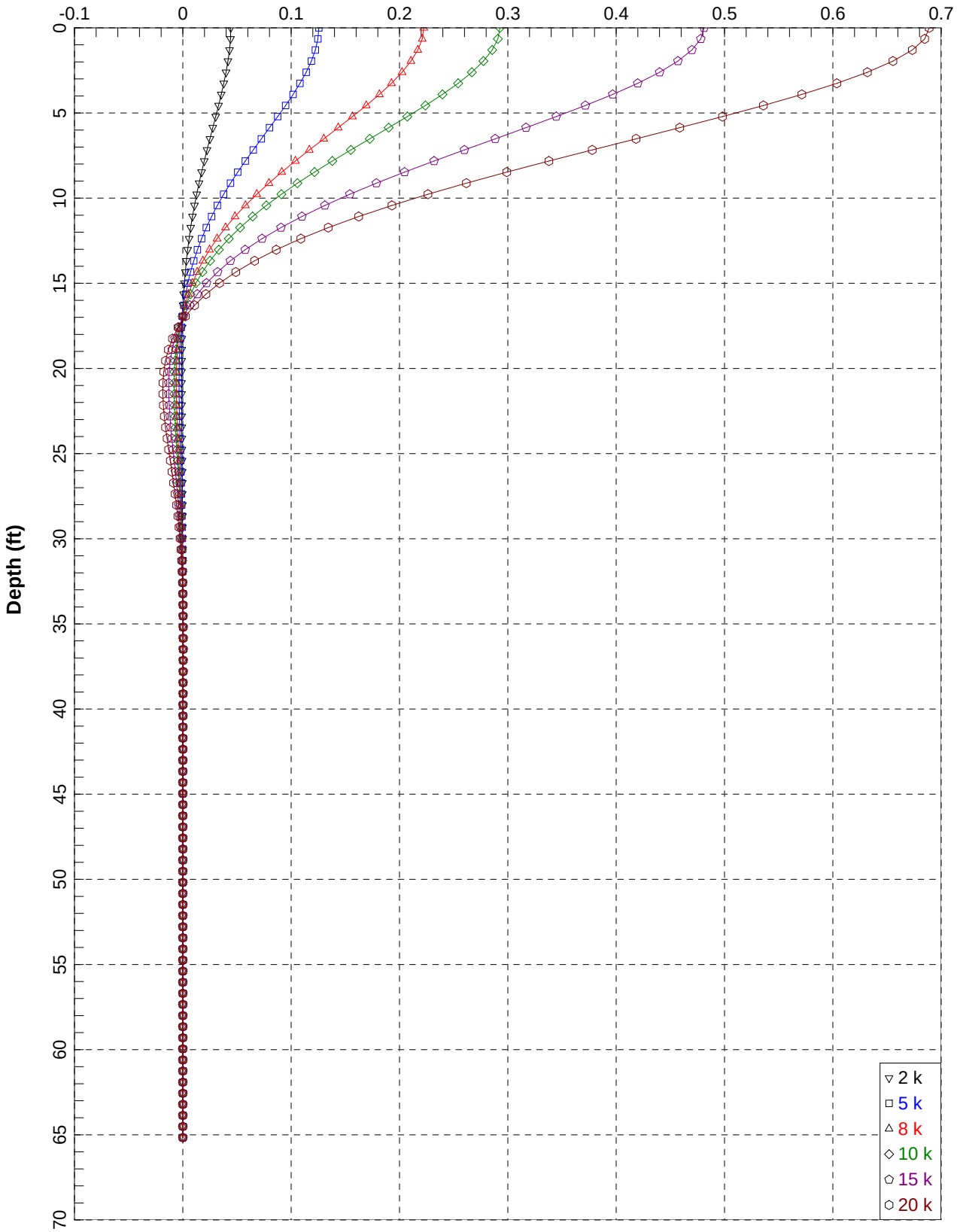
Bending Moment (in-kips)



Hockomock Swamp Trestle_HST-4 HP10X42 Group III(b)_Fixed-Head_8 piles/pier_L=40ft

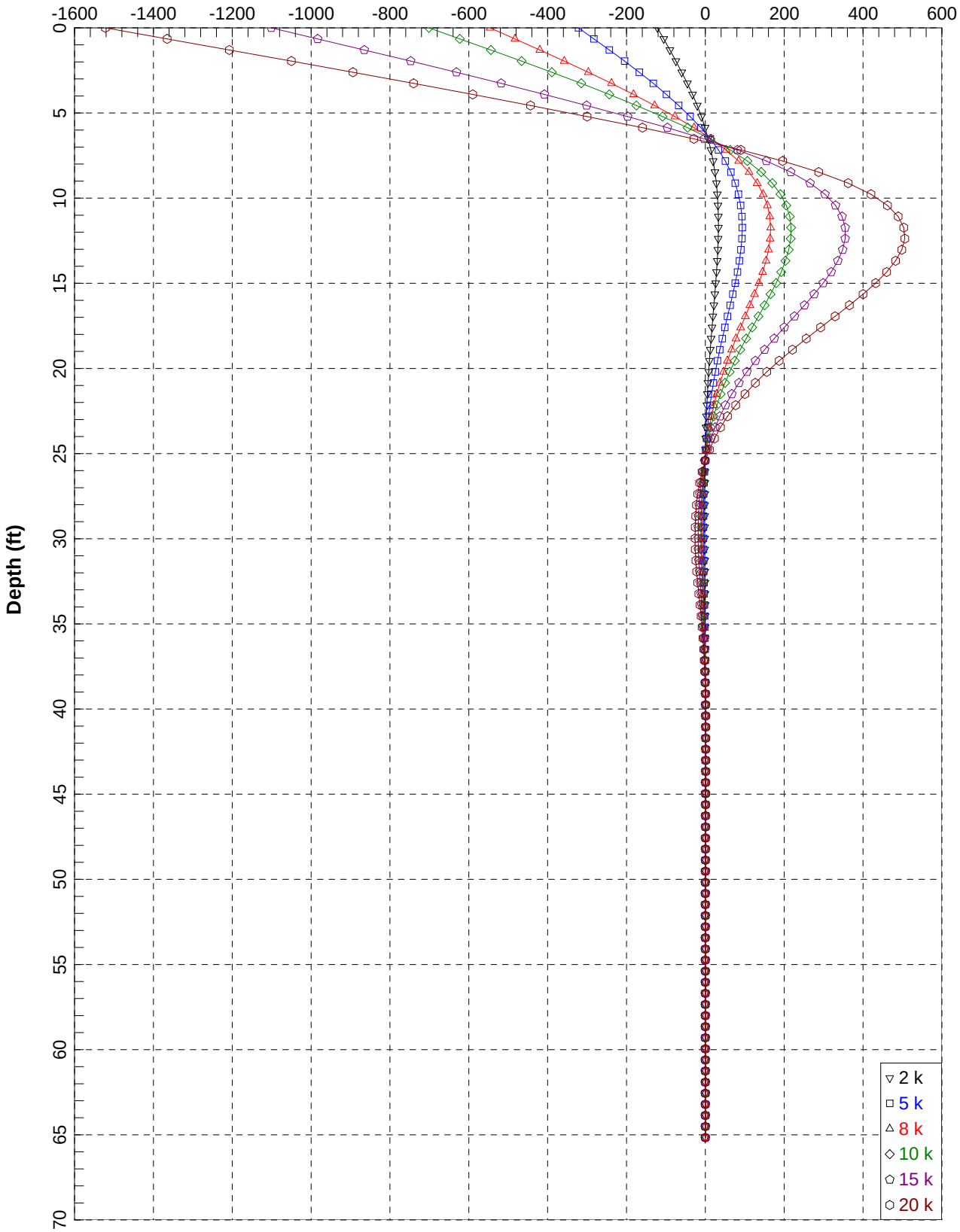


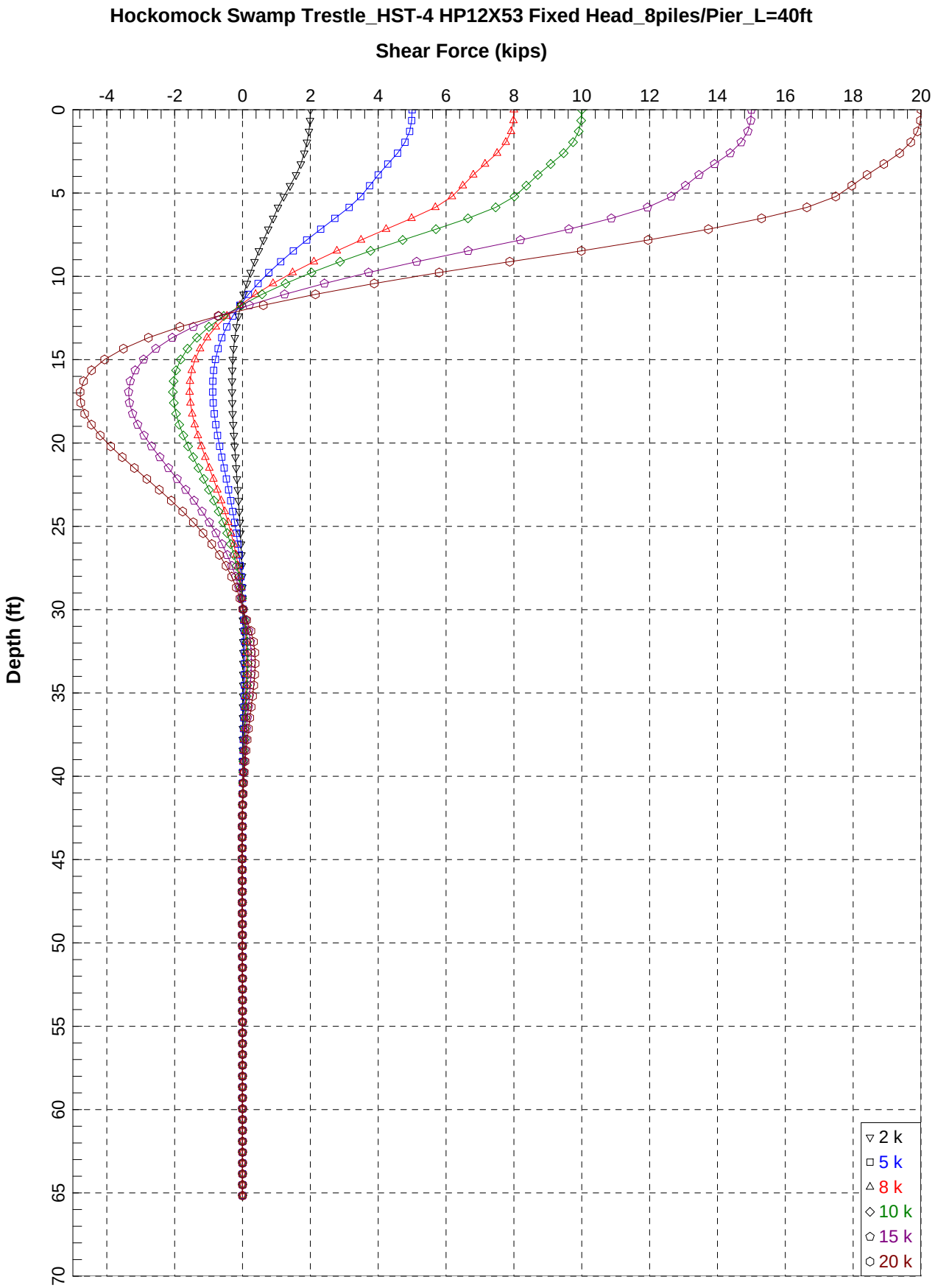

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=40ft
Lateral Load (kips)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
Pile-head Deflection (in)
Case 1

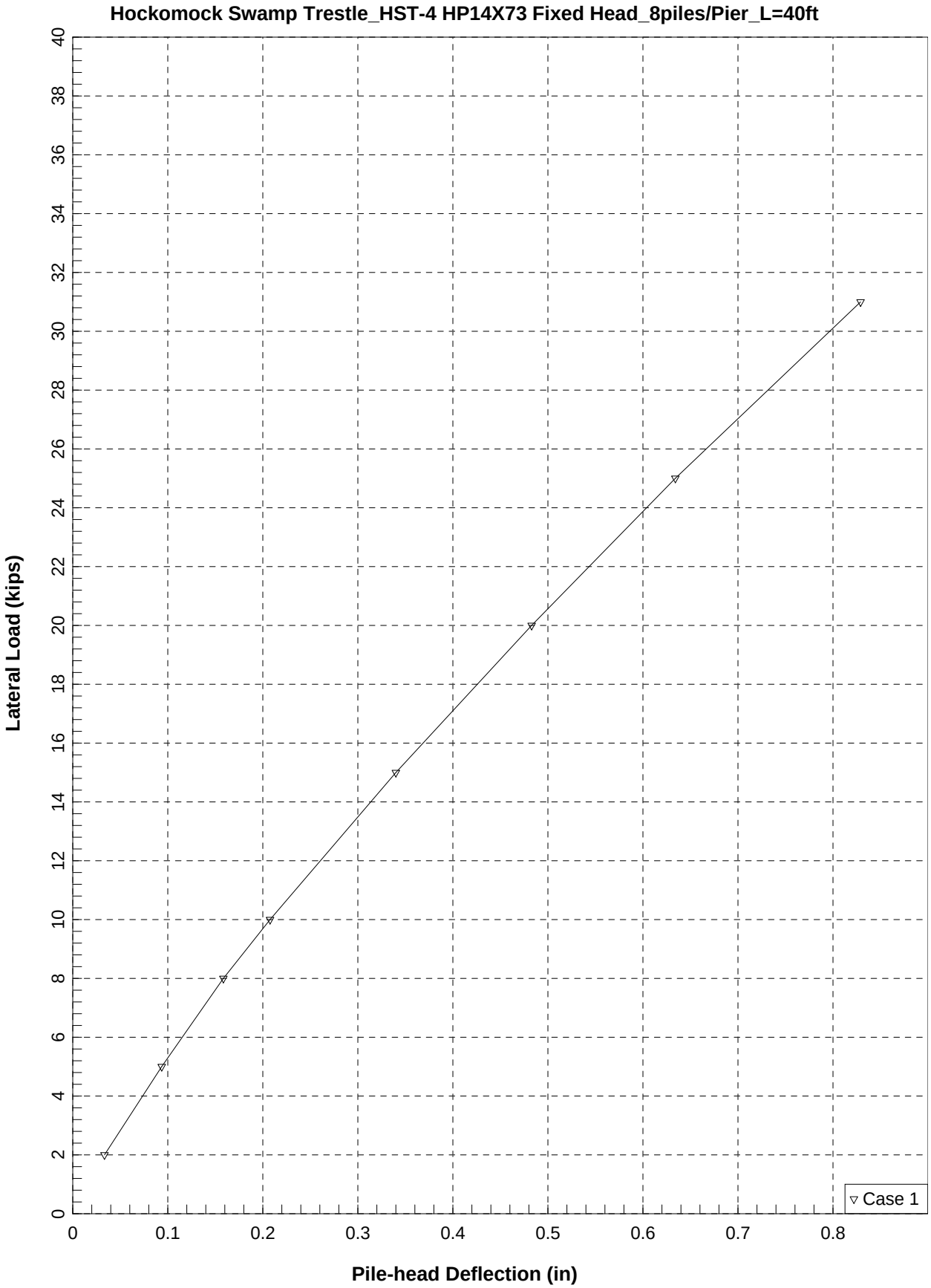

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=40ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k

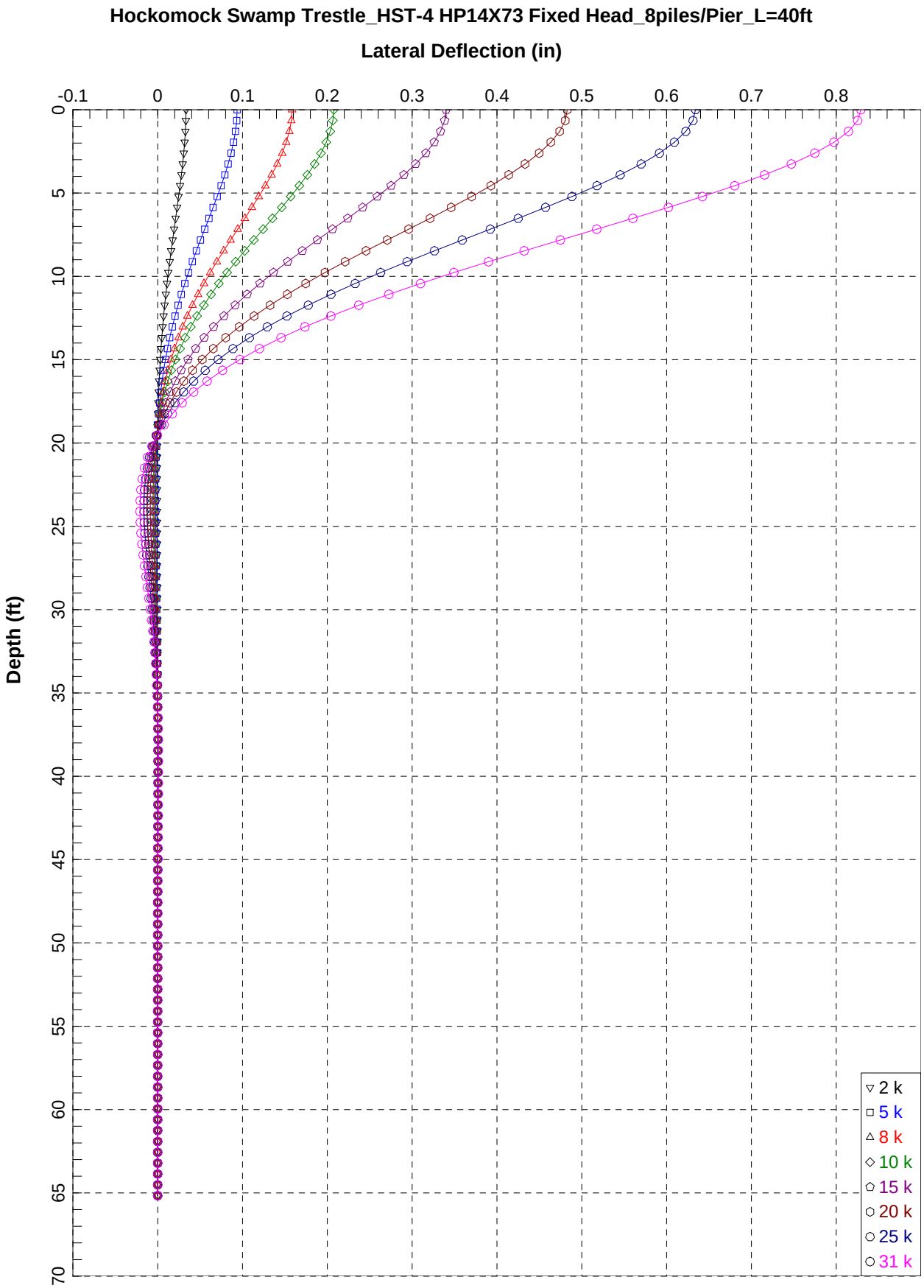
Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=40ft

Bending Moment (in-kips)



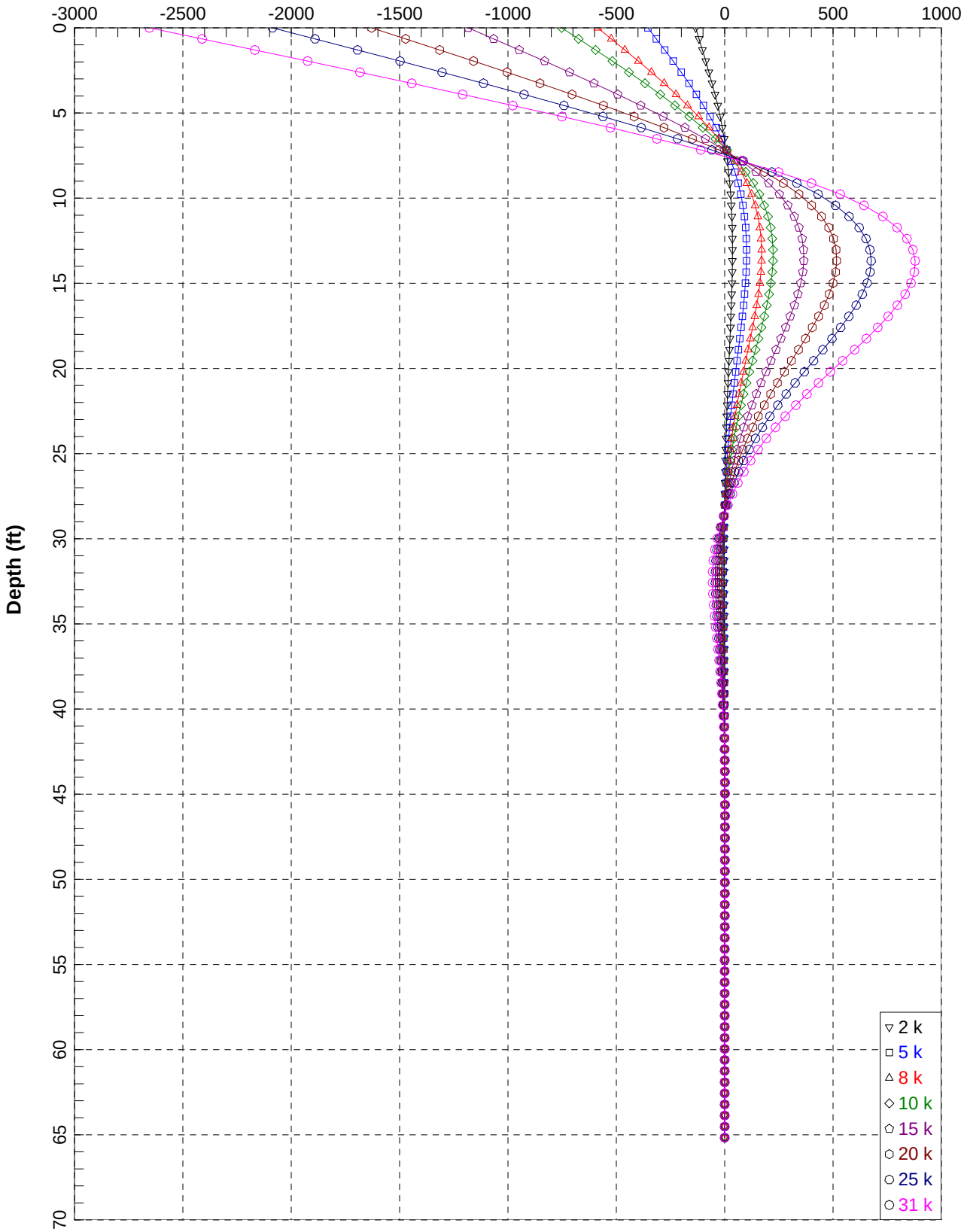

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=40ft
Shear Force (kips)
Depth (ft)
-4
-2
0
2
4
6
8
10
12
14
16
18
20
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k

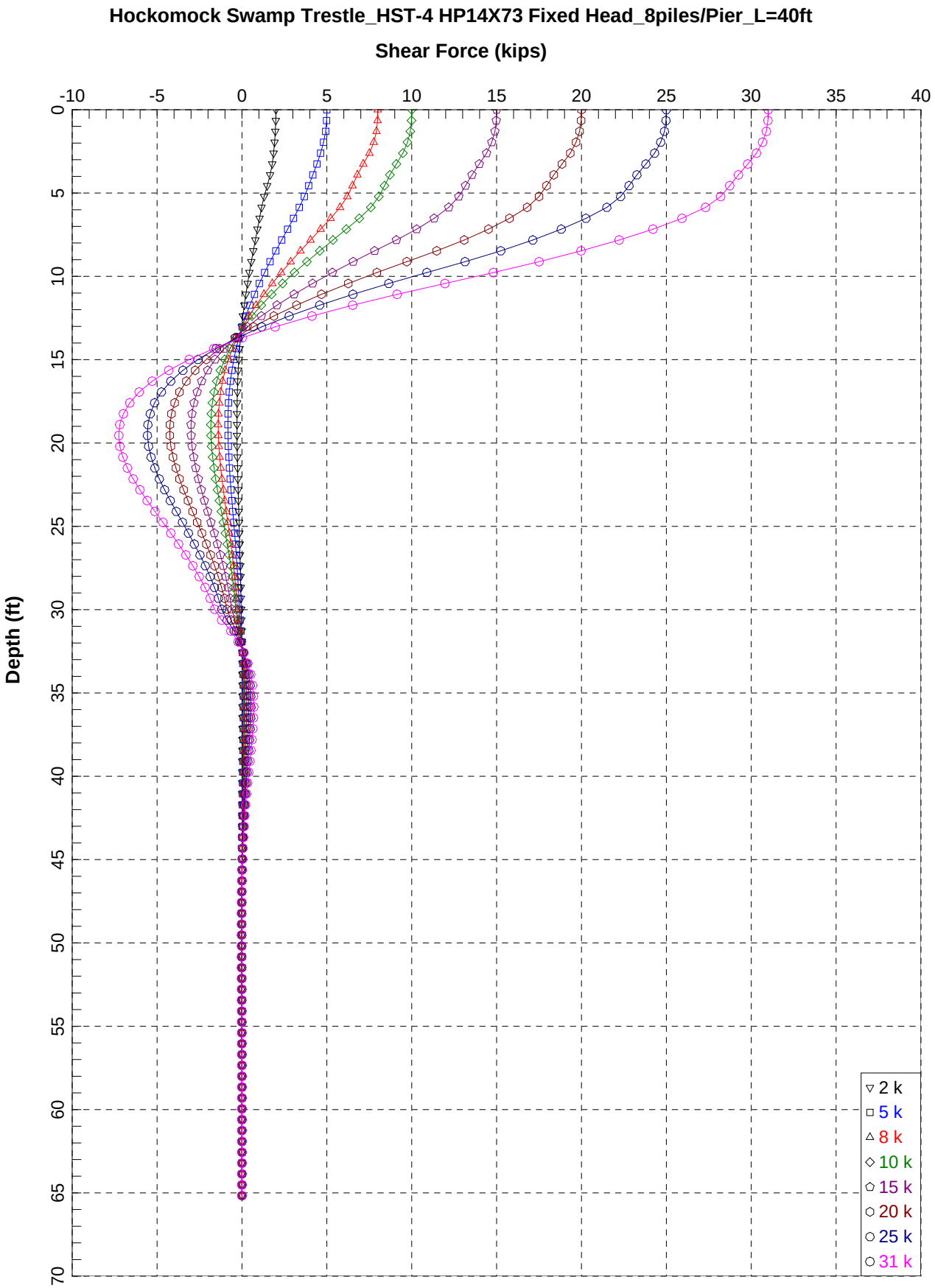

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=40ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Case 1

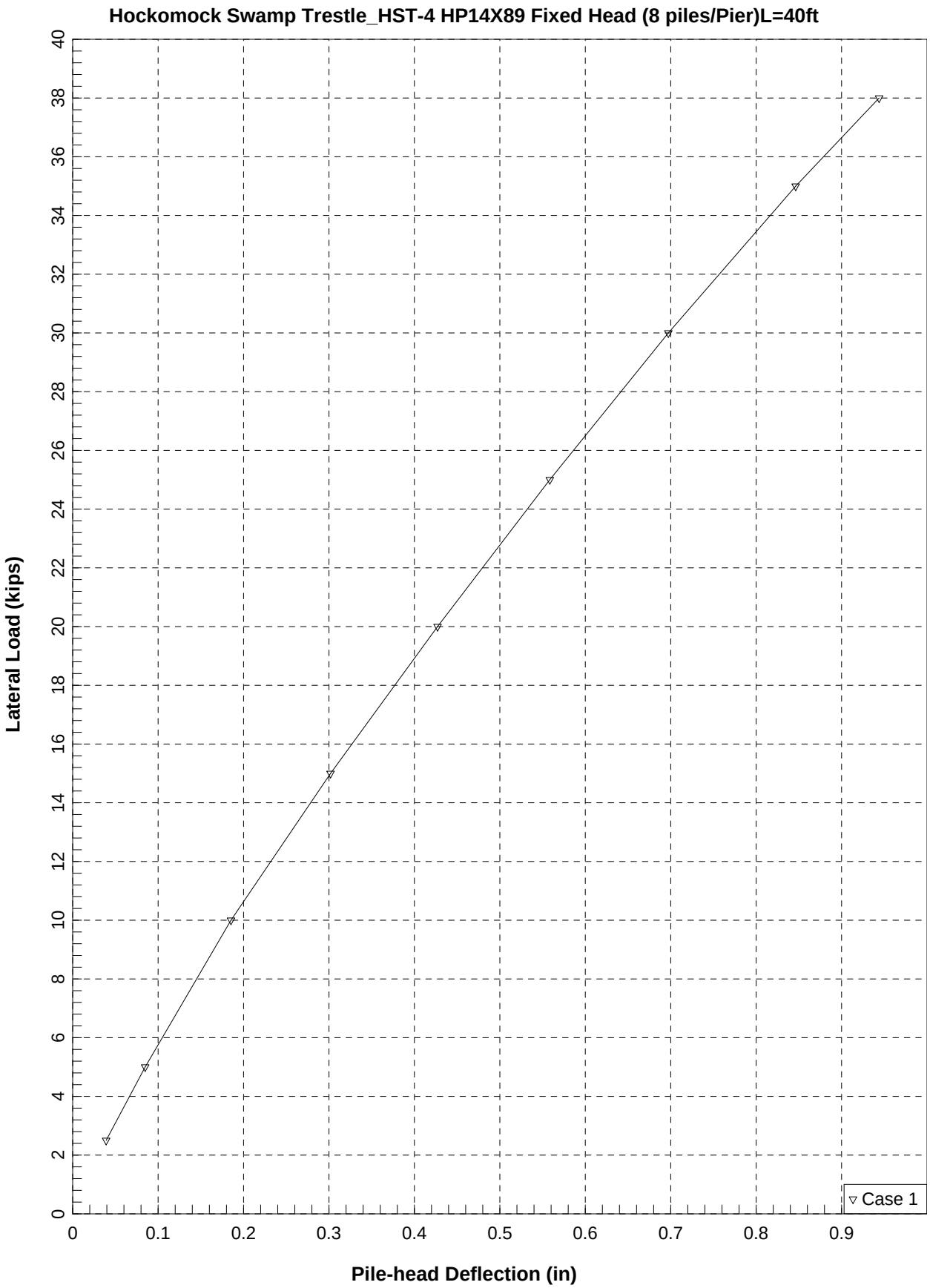

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=40ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
31 k

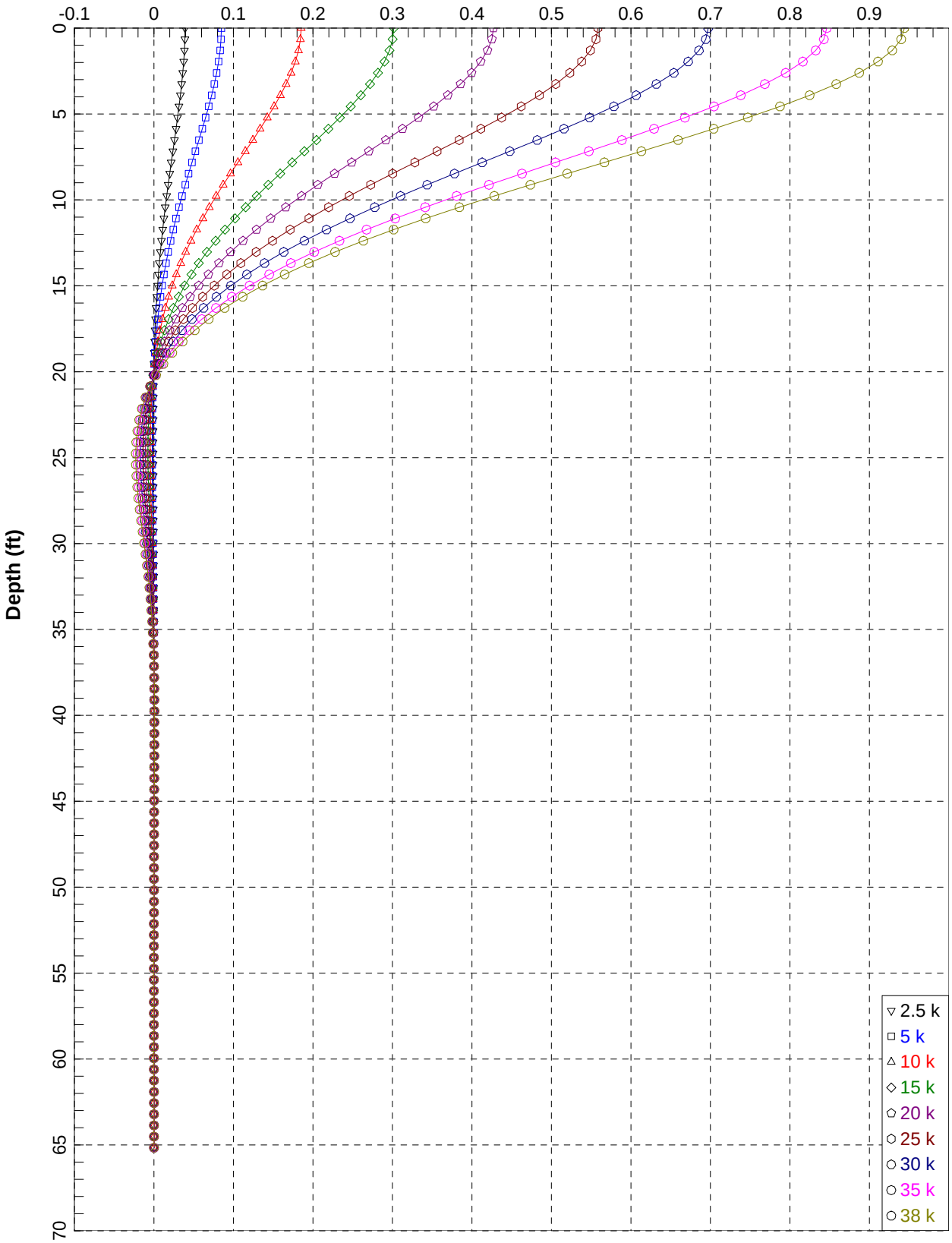
Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=40ft

Bending Moment (in-kips)



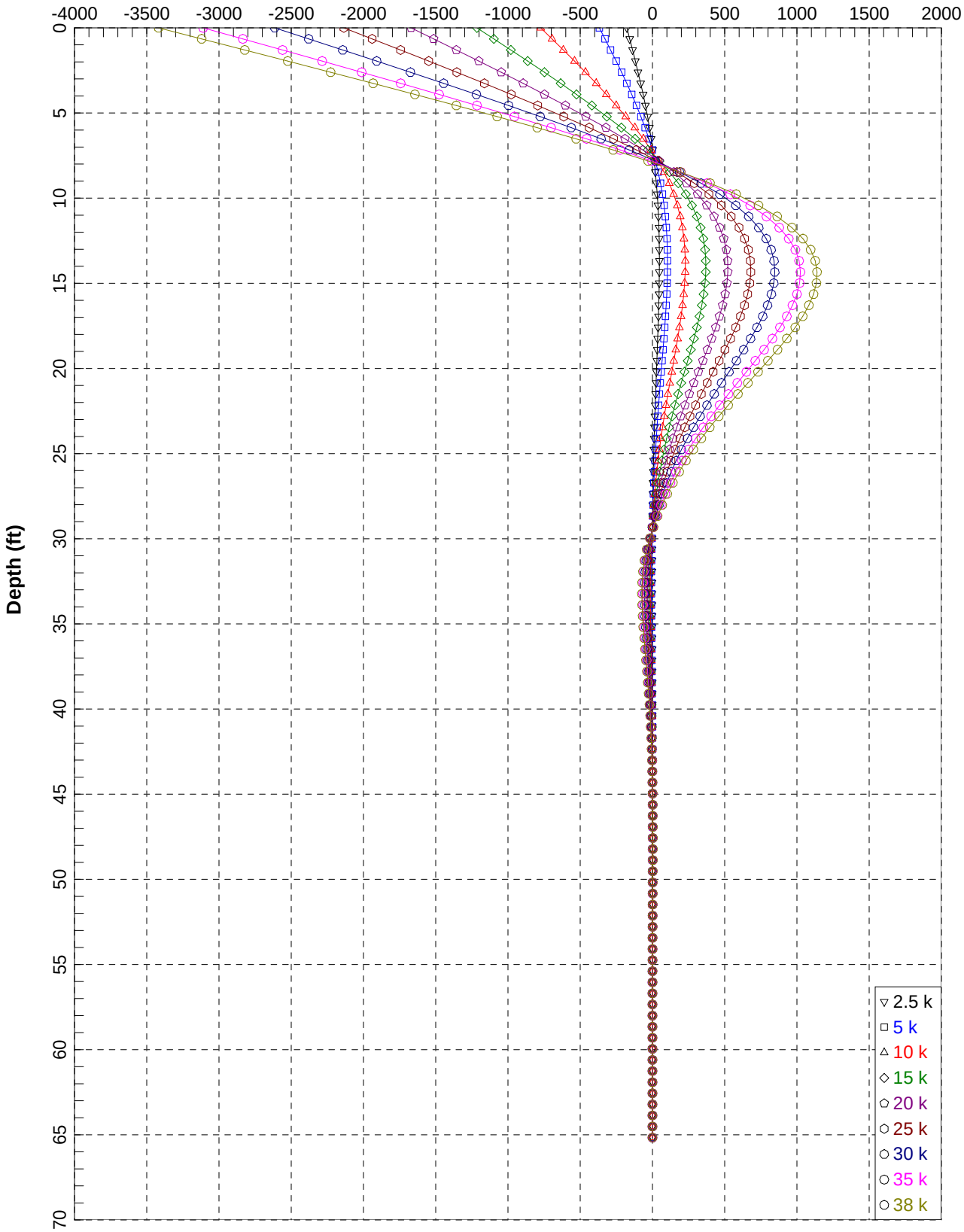

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=40ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
31 k

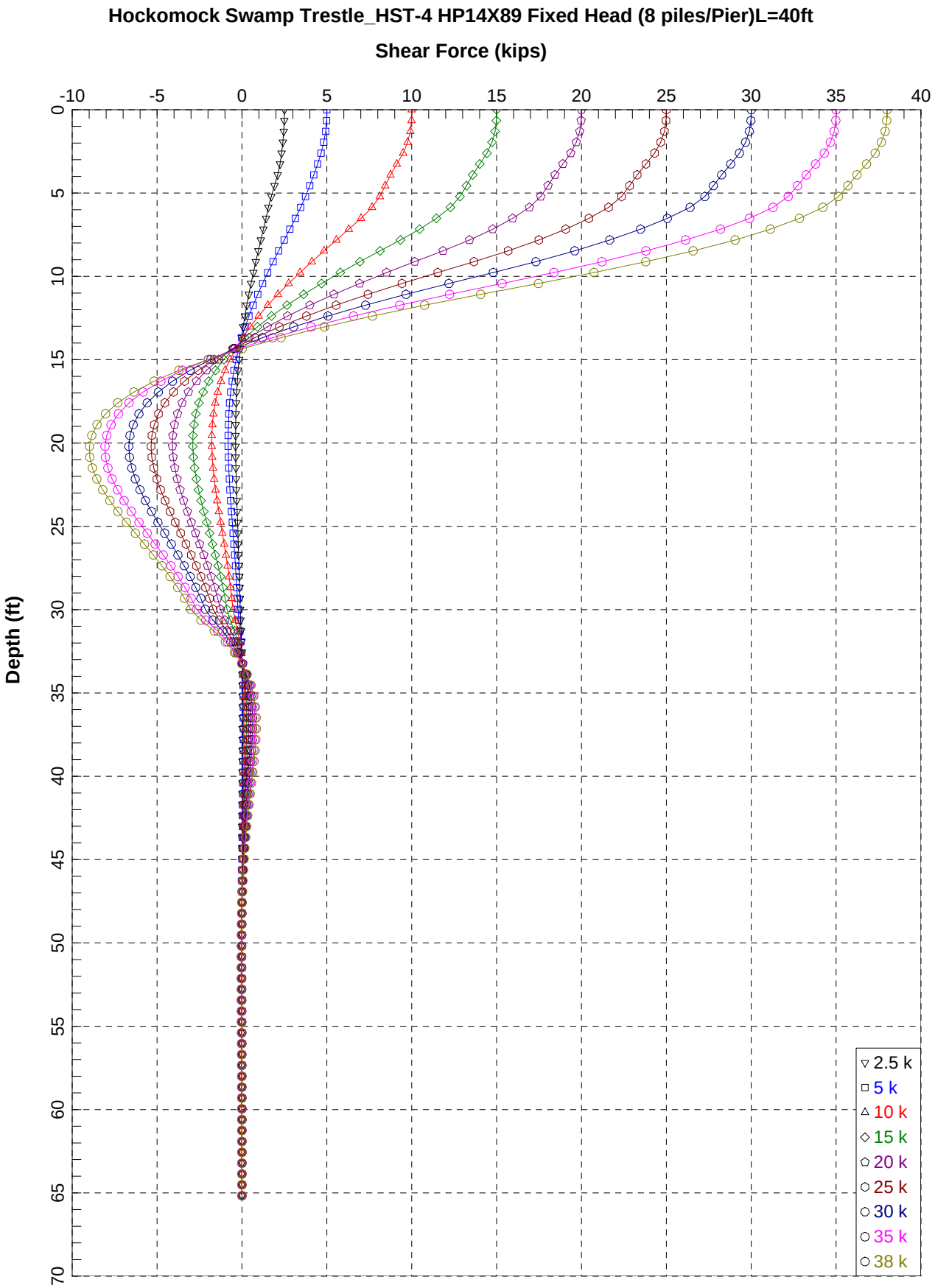

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=40ft
Lateral Load (kips)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Pile-head Deflection (in)
Case 1

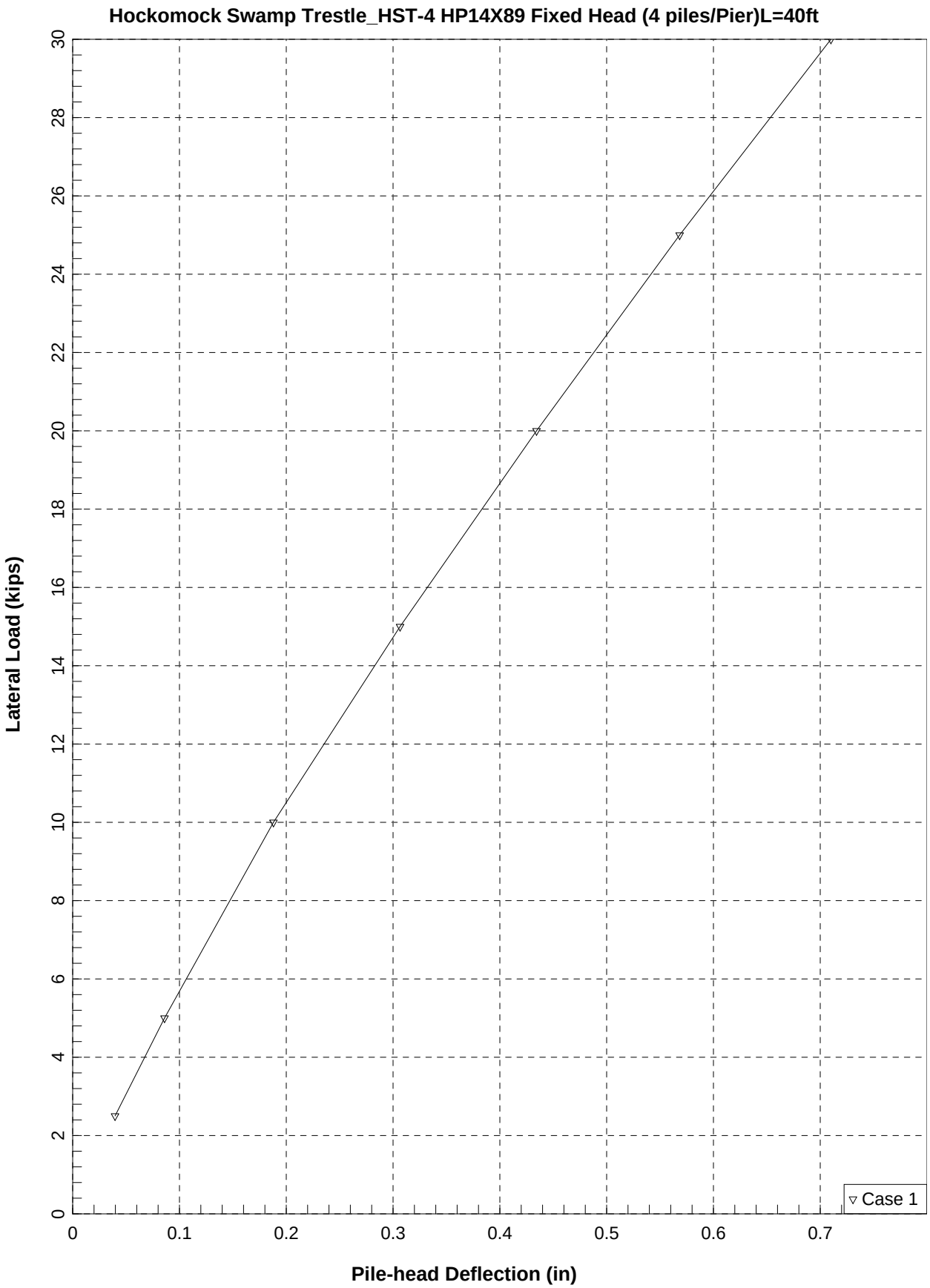

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=40ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k
35 k
38 k

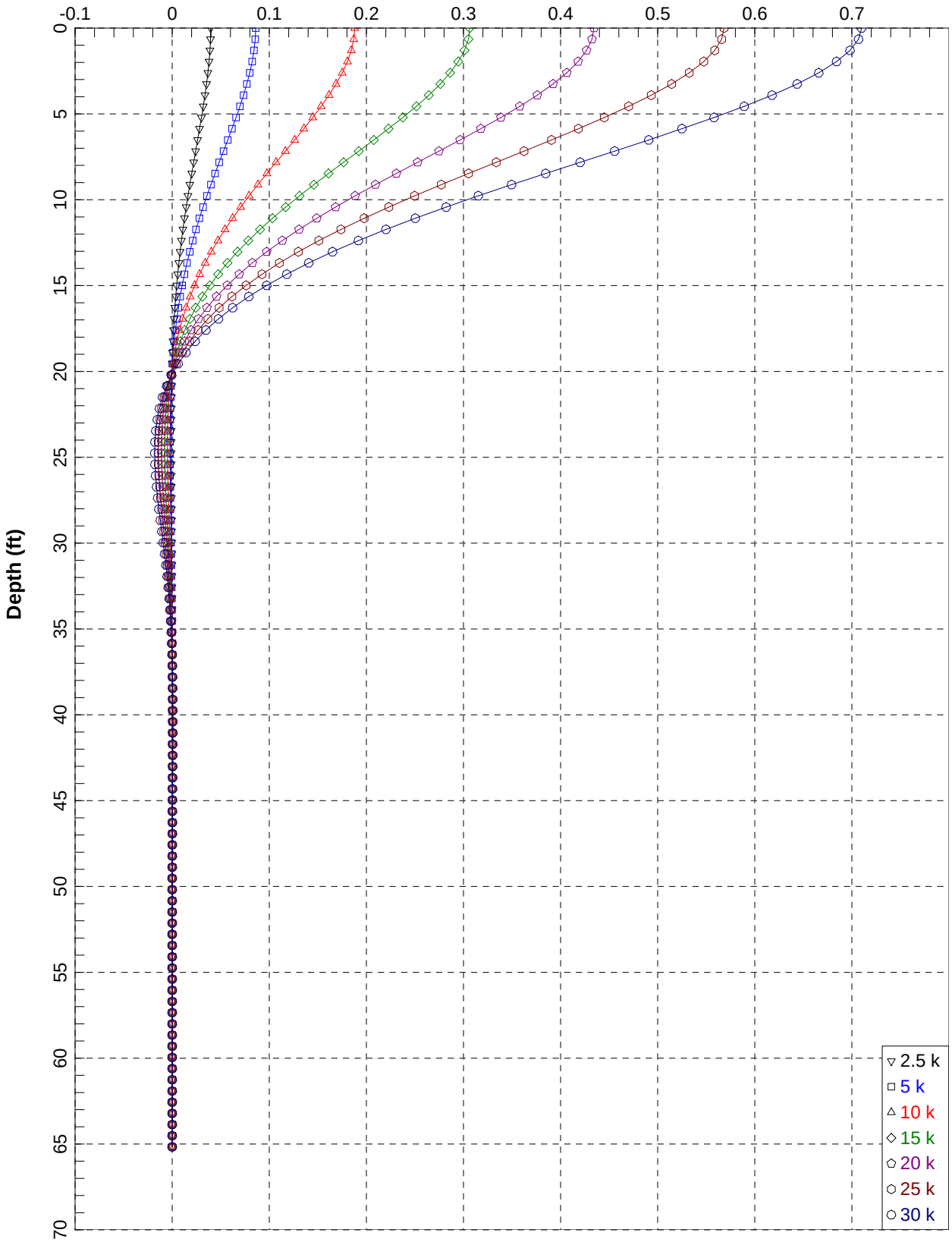
Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=40ft

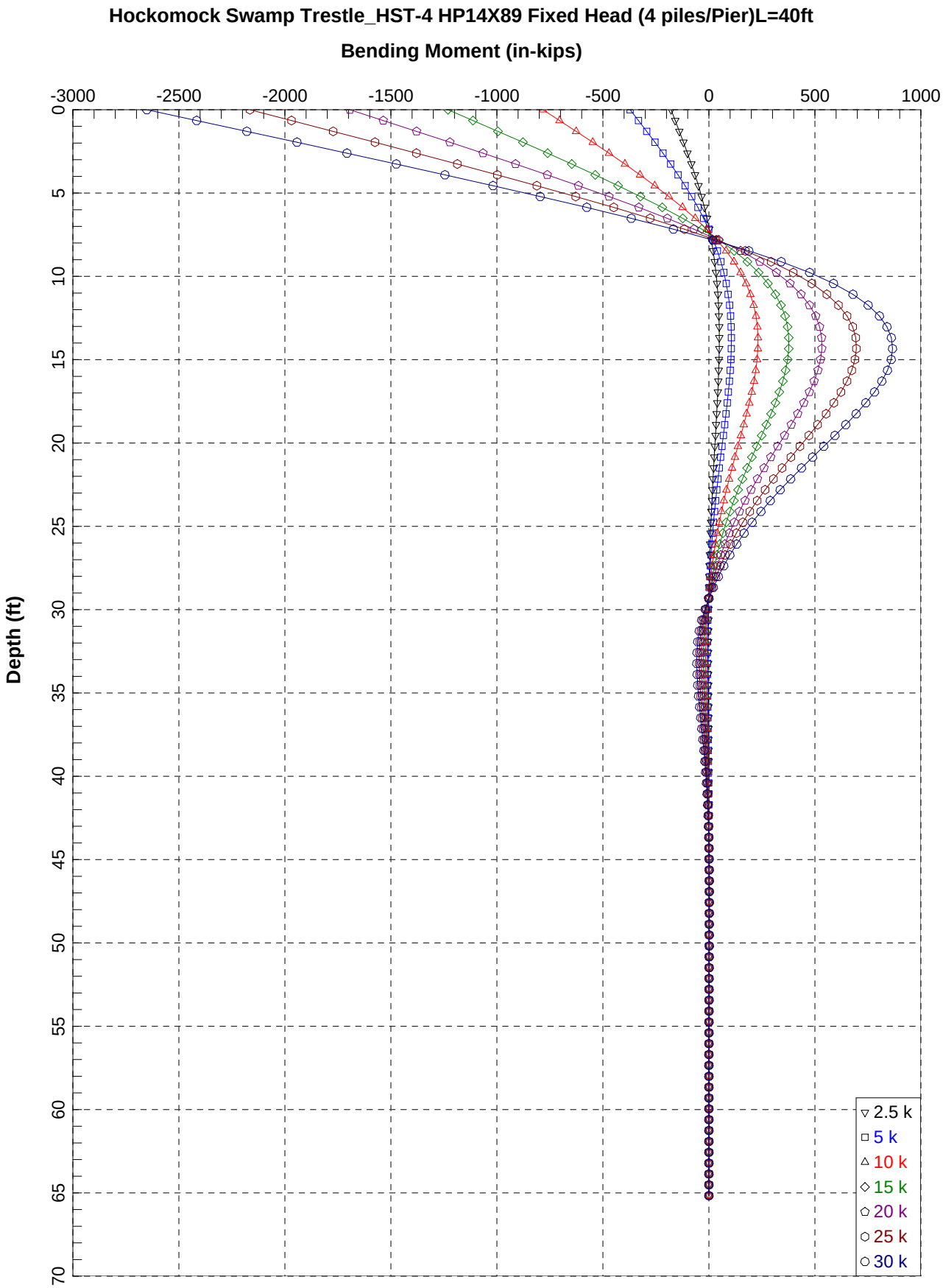
Bending Moment (in-kips)

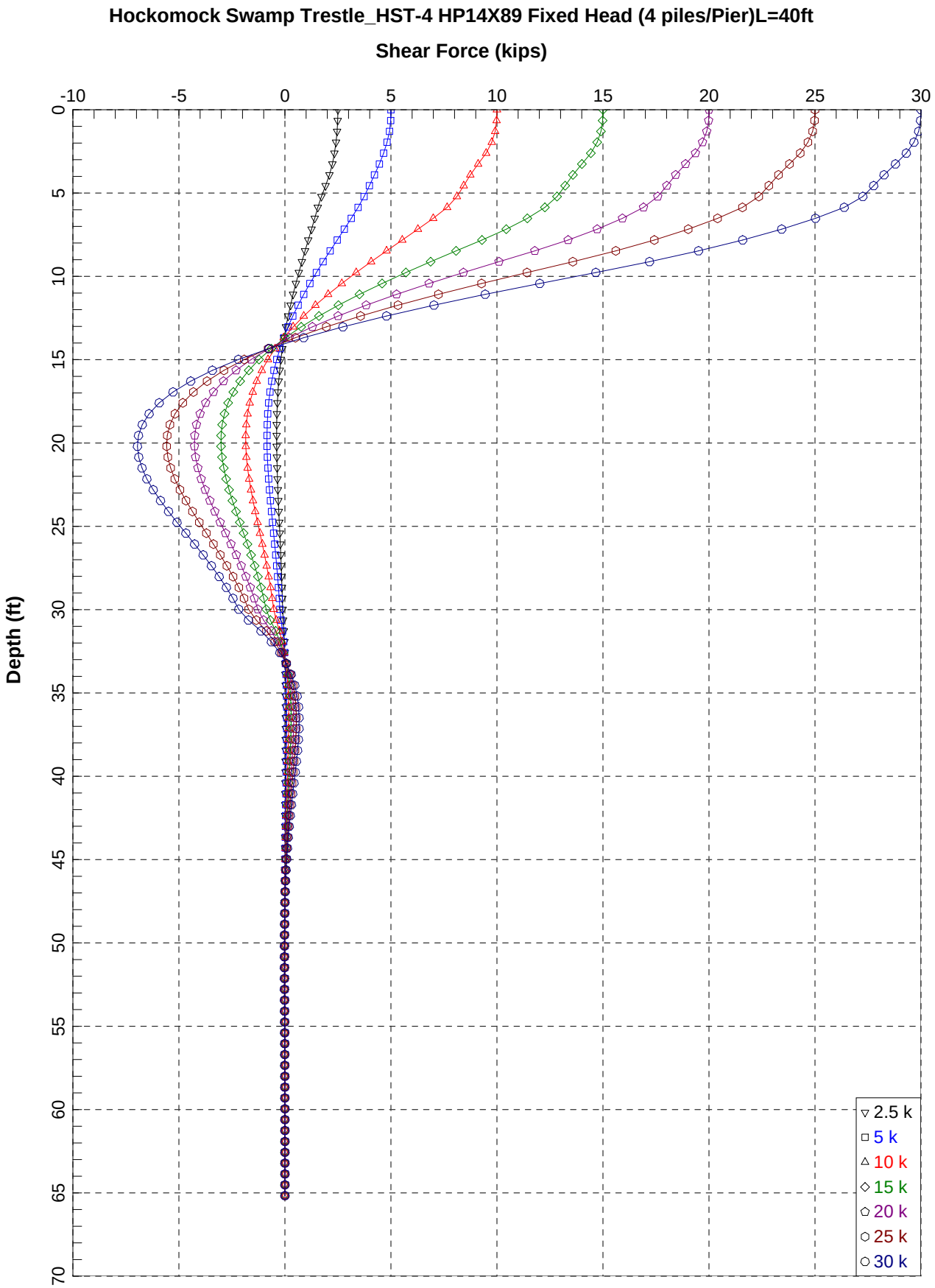


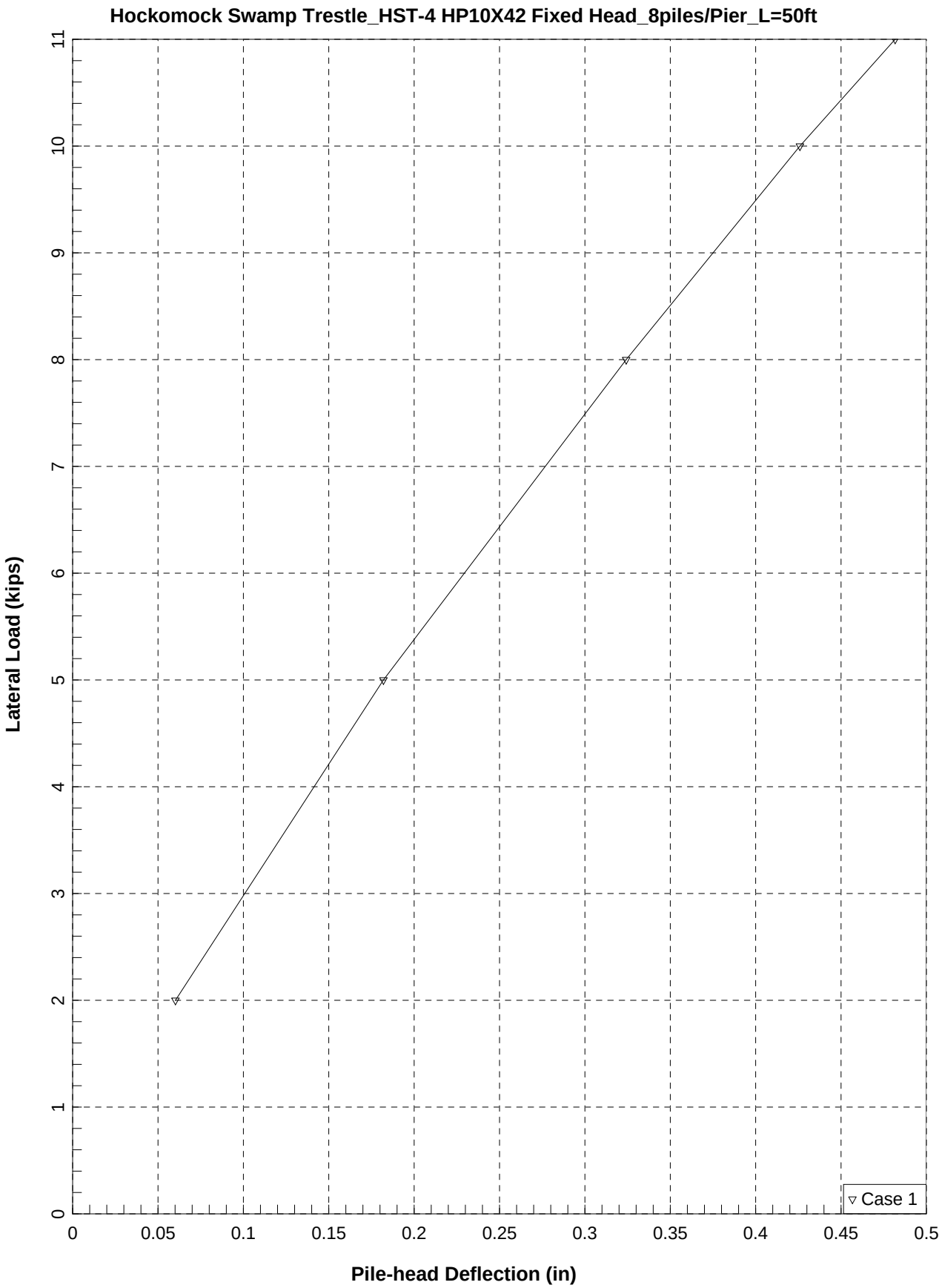

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (8 piles/Pier)L=40ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k
35 k
38 k

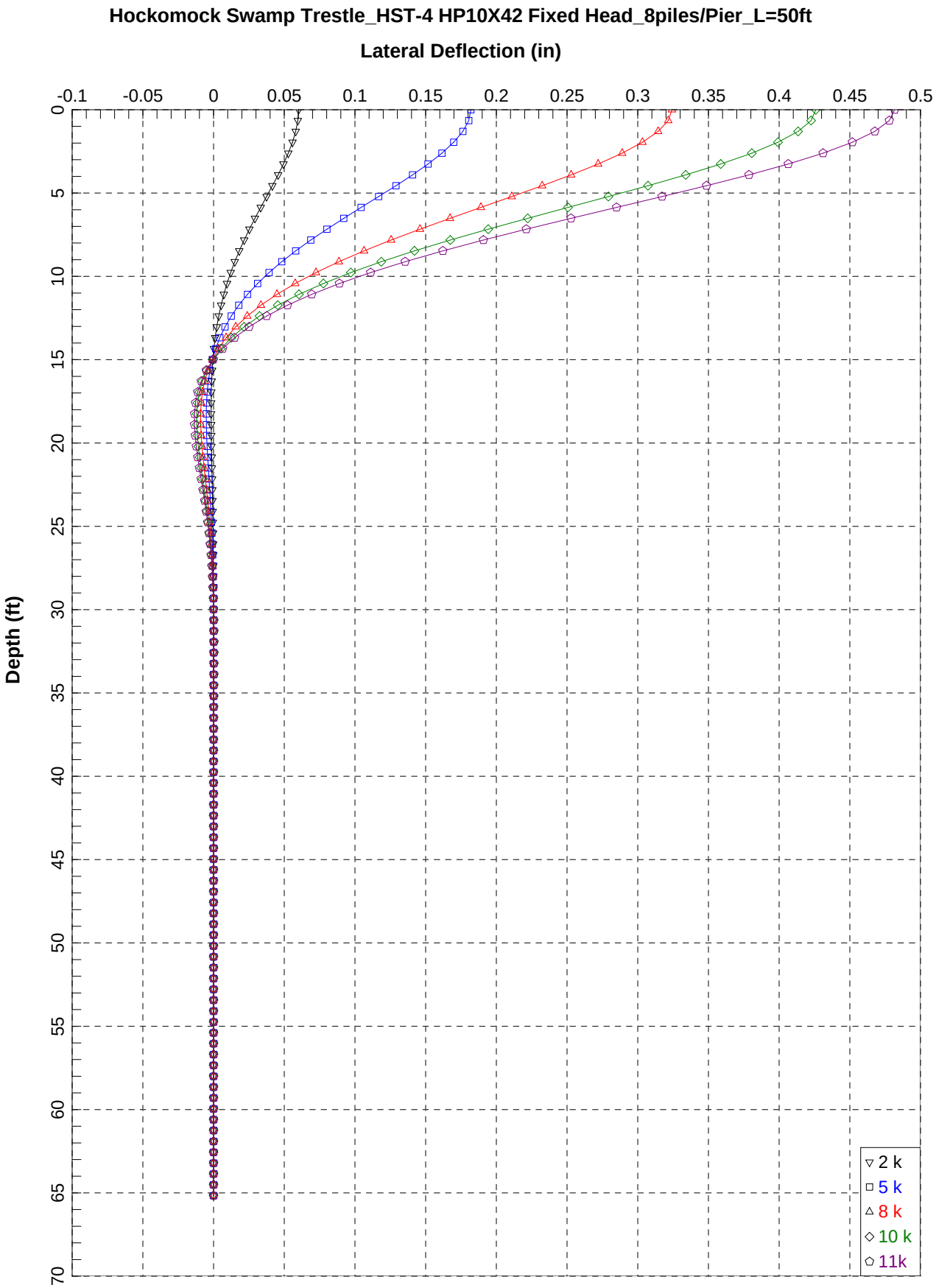

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=40ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Case 1

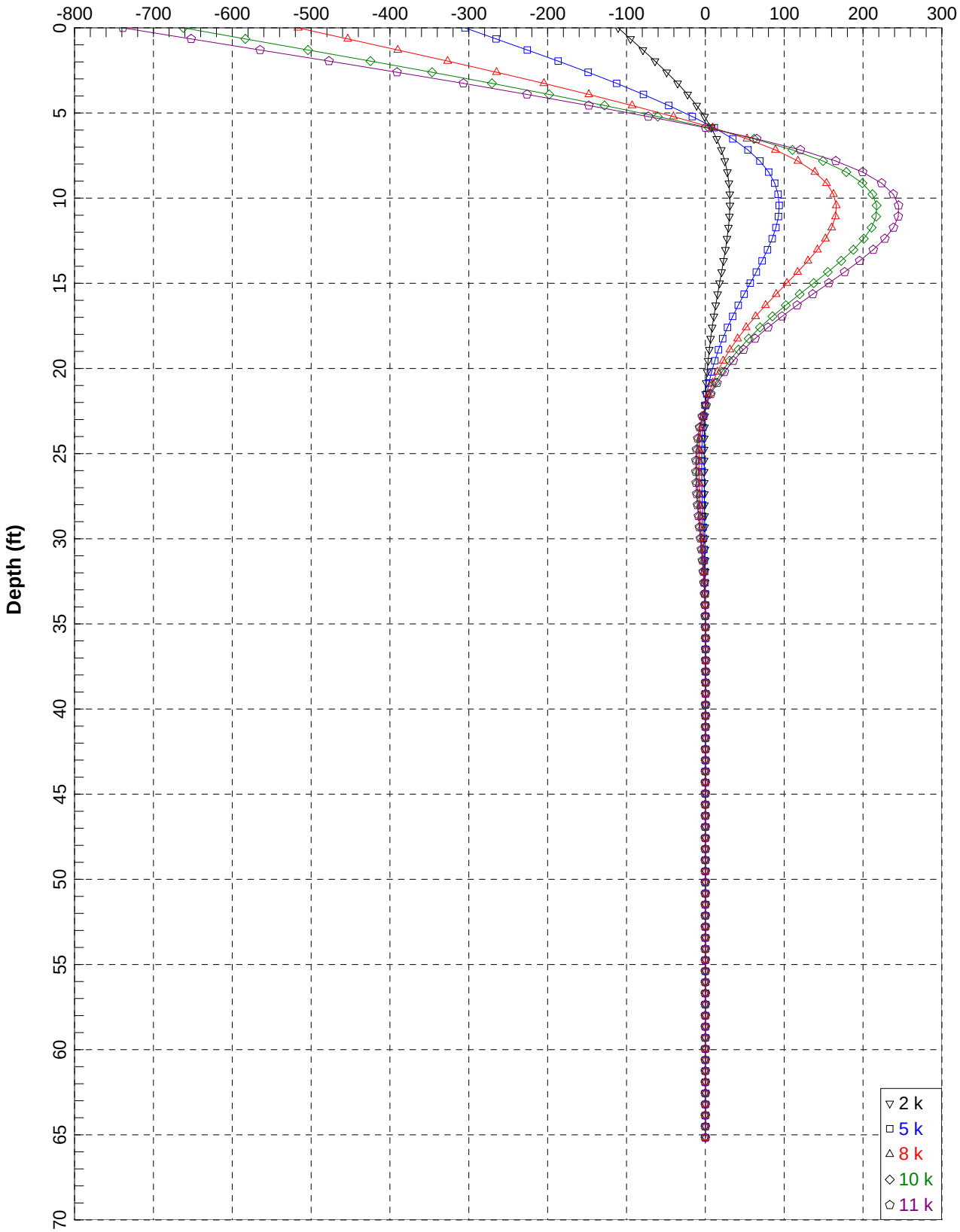

Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=40ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k


Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=40ft
Bending Moment (in-kips)
Depth (ft)
-3000
-2500
-2000
-1500
-1000
-500
0
500
1000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k


Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=40ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k

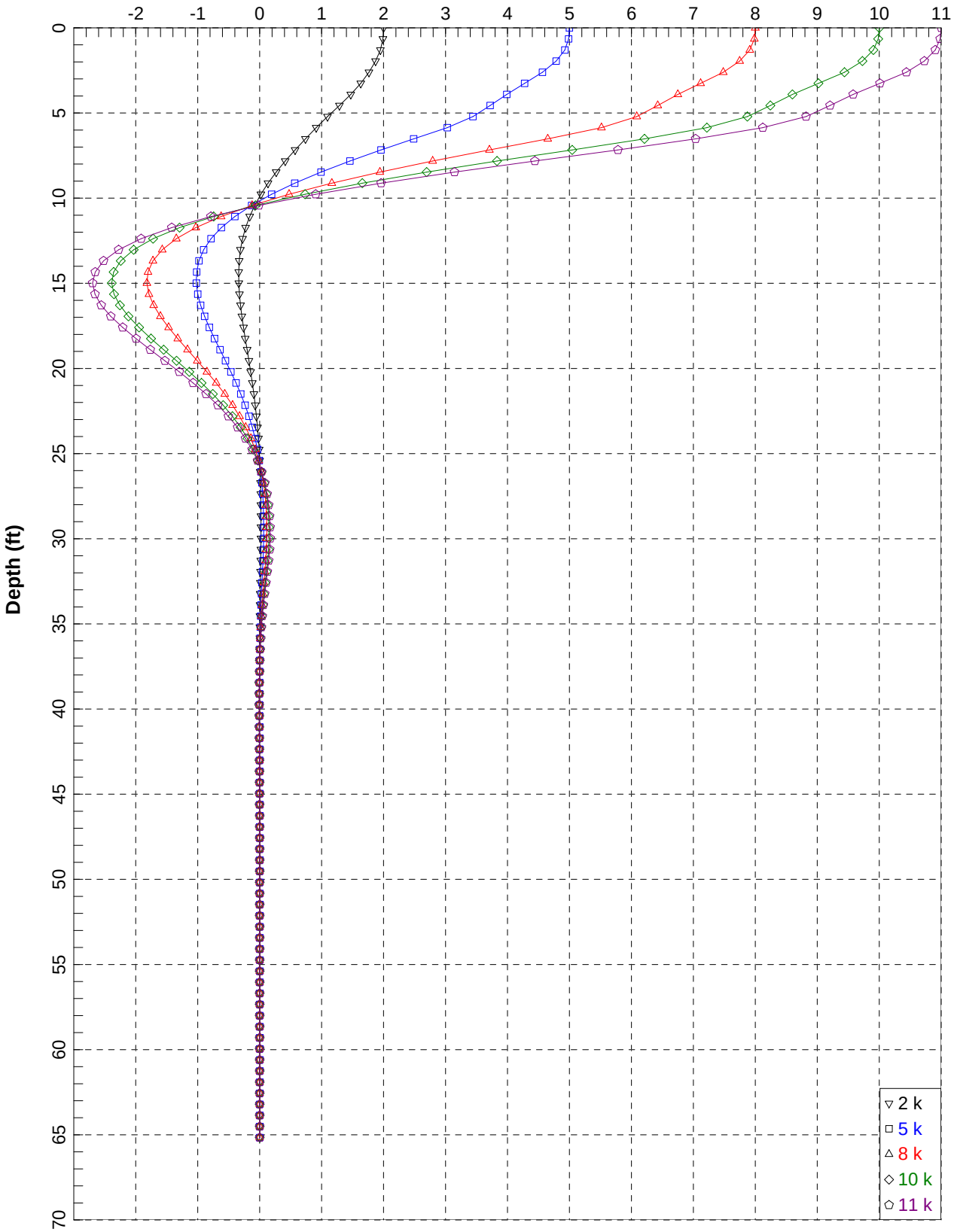

Hockomock Swamp Trestle_HST-4 HP10X42 Fixed Head_8piles/Pier_L=50ft
Lateral Load (kips)
Pile-head Deflection (in)
0
1
2
3
4
5
6
7
8
9
10
11
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
Case 1

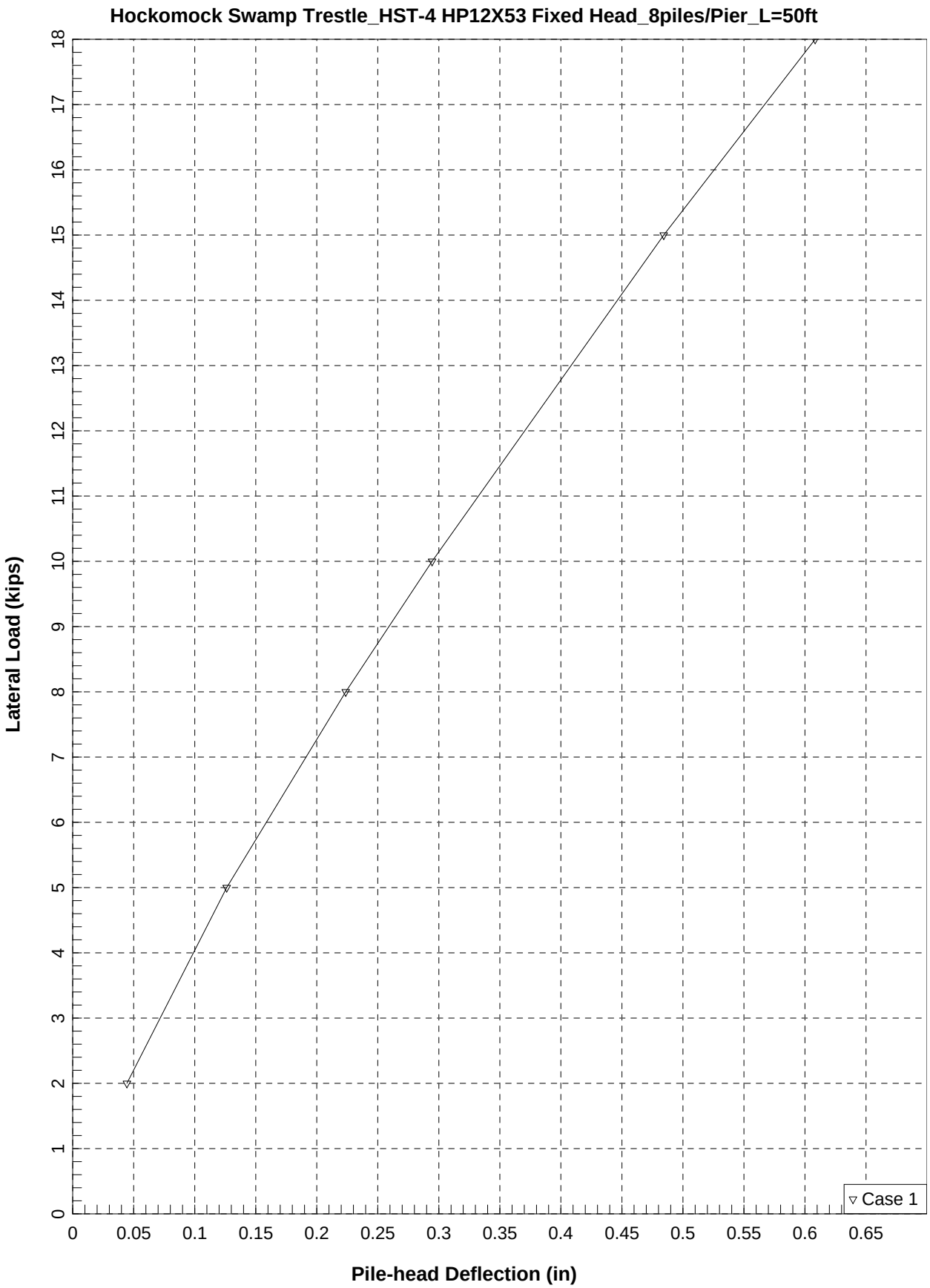

Hockomock Swamp Trestle_HST-4 HP10X42 Fixed Head_8piles/Pier_L=50ft
Lateral Deflection (in)
Depth (ft)
-0.1
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
11k

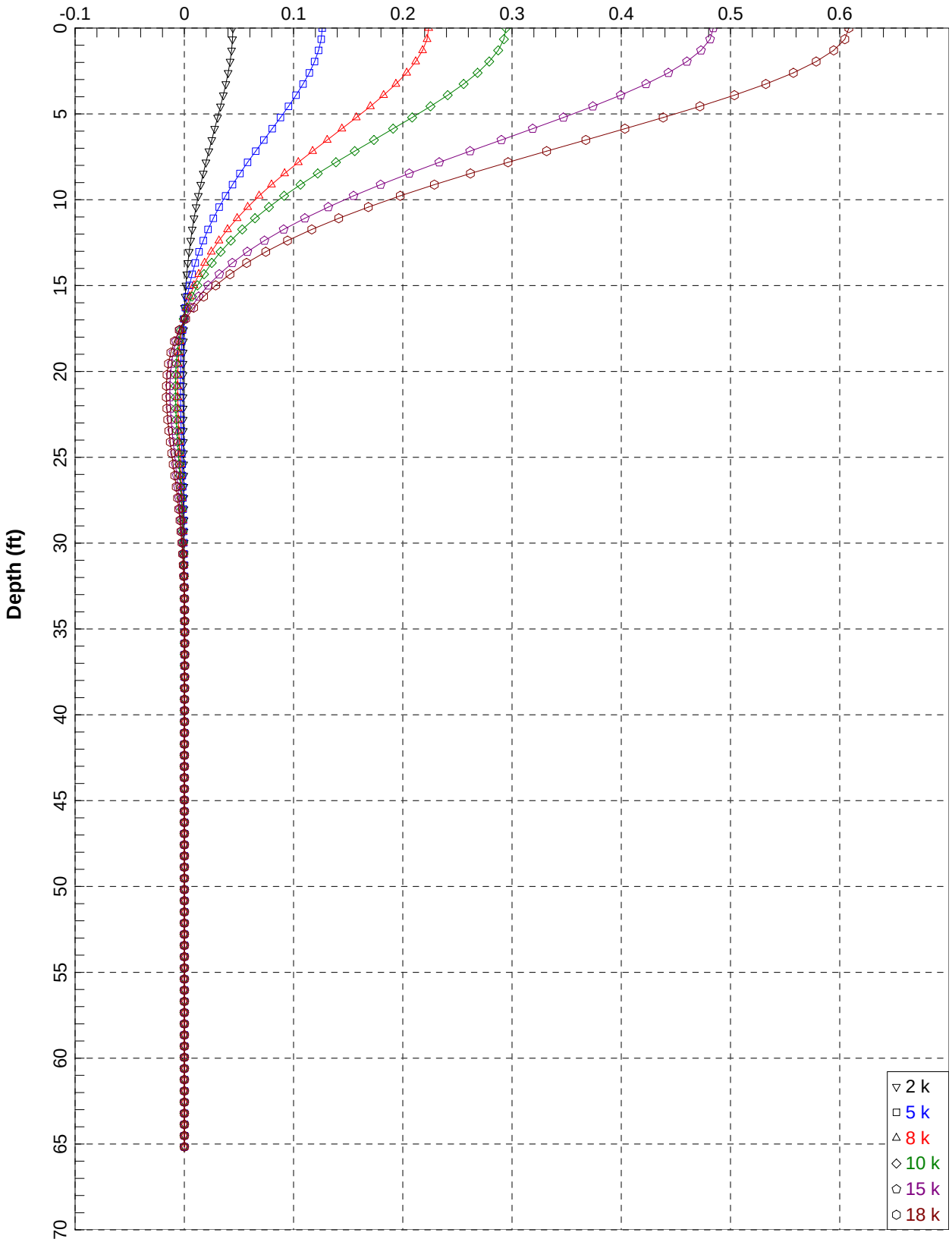

Hockomock Swamp Trestle_HST-4 HP10X42 Fixed Head_8piles/Pier_L=50ft
Bending Moment (in-kips)
Depth (ft)
-800
-700
-600
-500
-400
-300
-200
-100
0
100
200
300
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
11 k

Hockomock Swamp Trestle_HST-4 HP10X42 Fixed Head_8piles/Pier_L=50ft

Shear Force (kips)

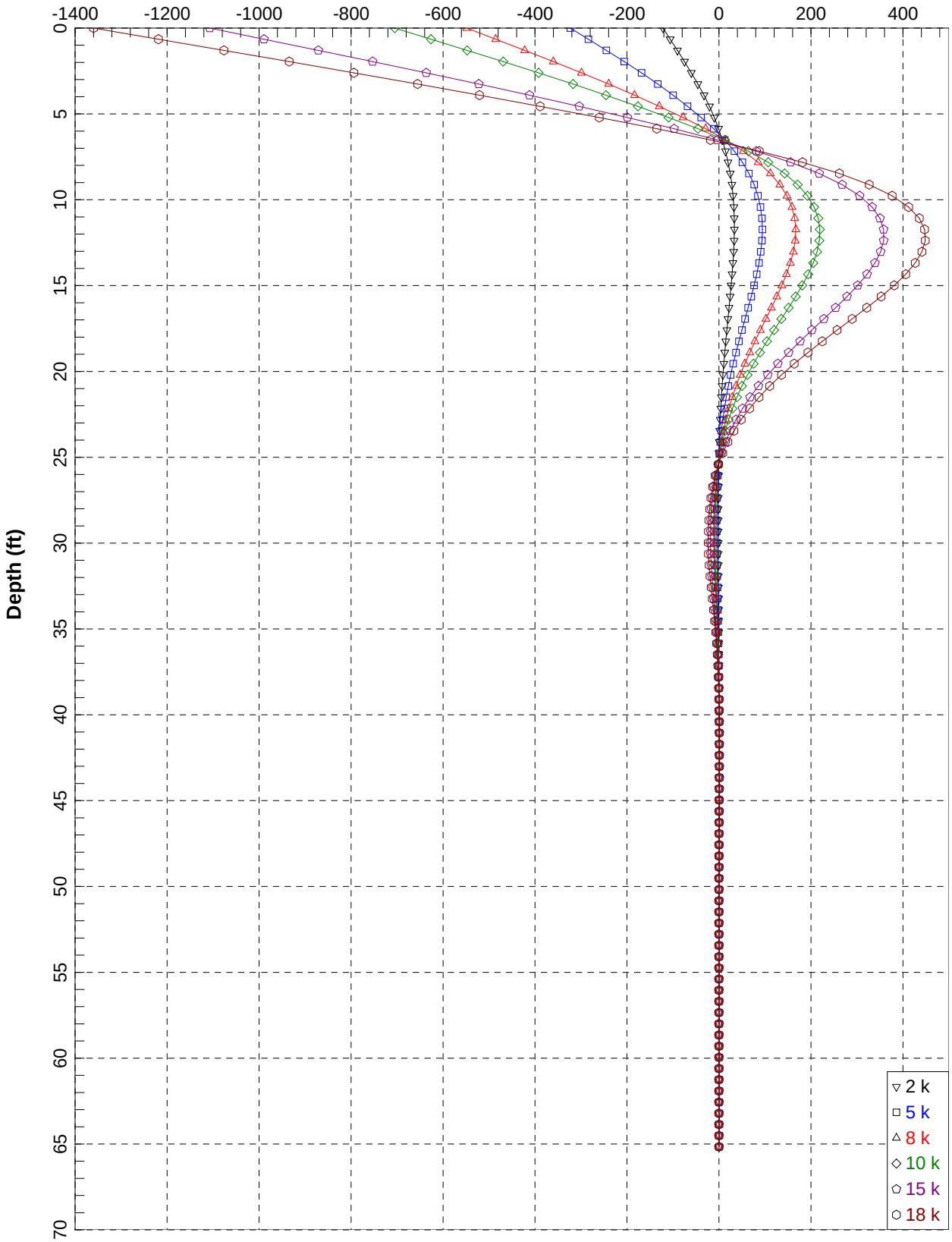


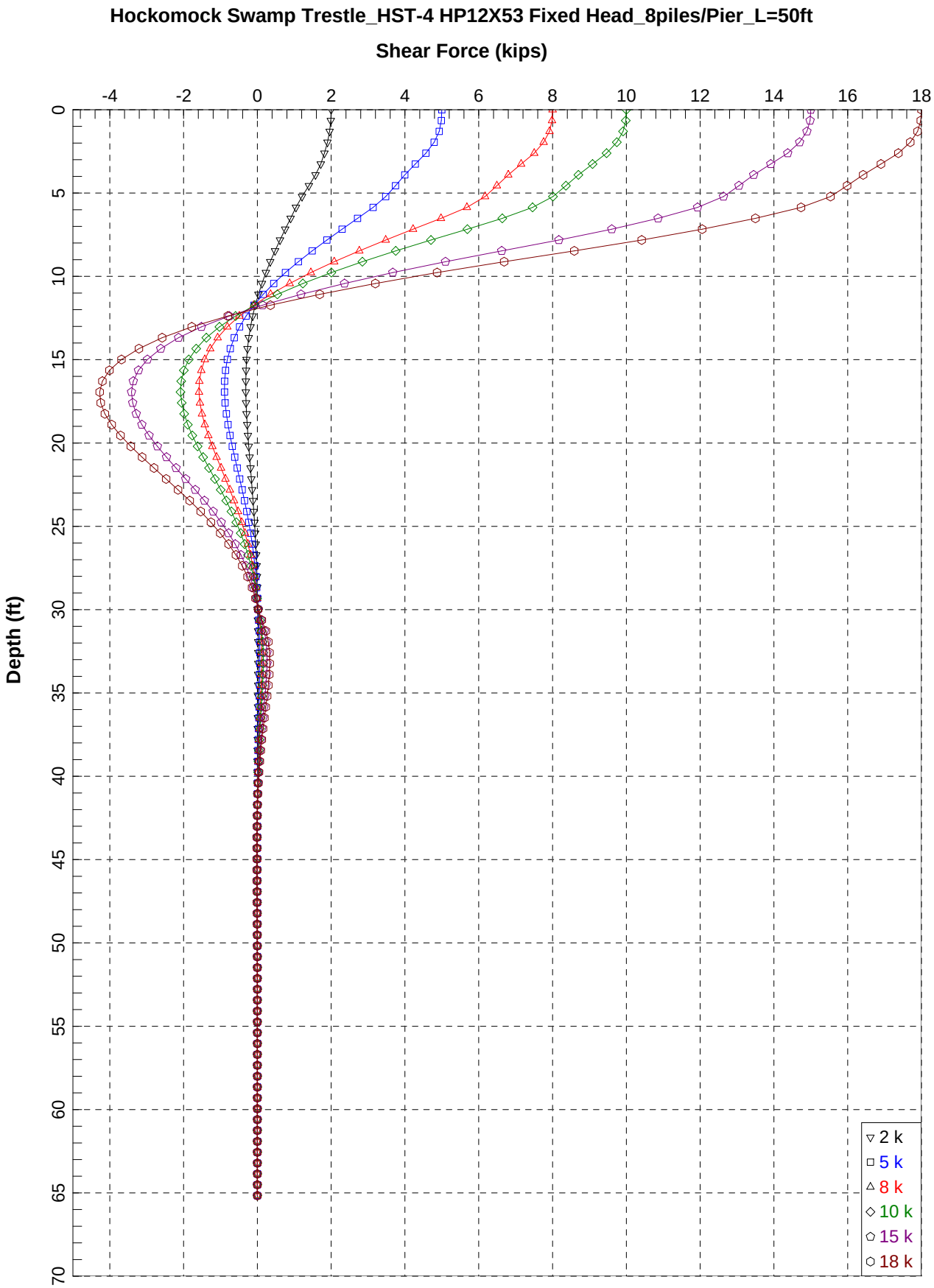

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=50ft
Lateral Load (kips)
Pile-head Deflection (in)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
Case 1

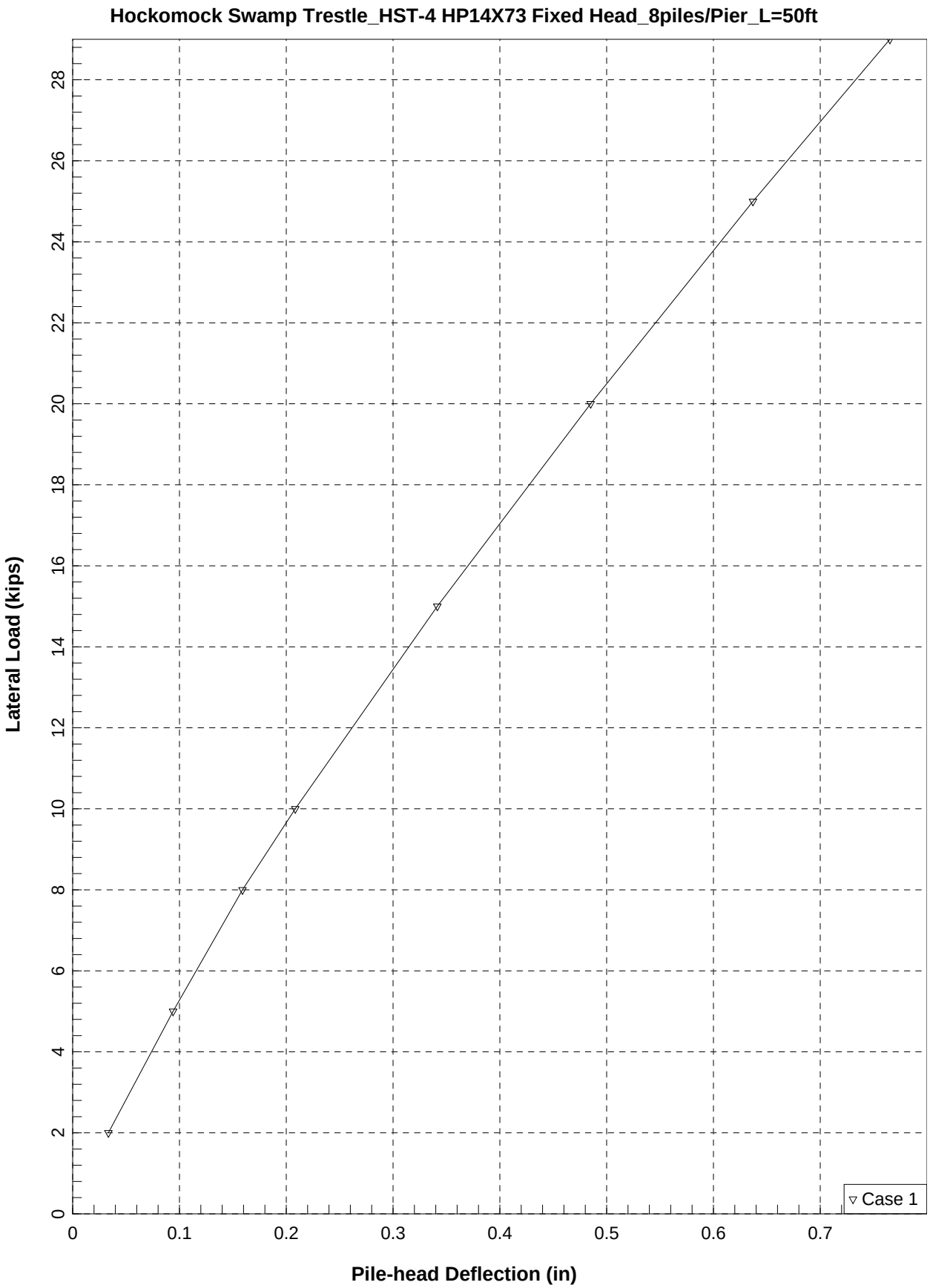

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=50ft
Lateral Deflection (in)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
18 k

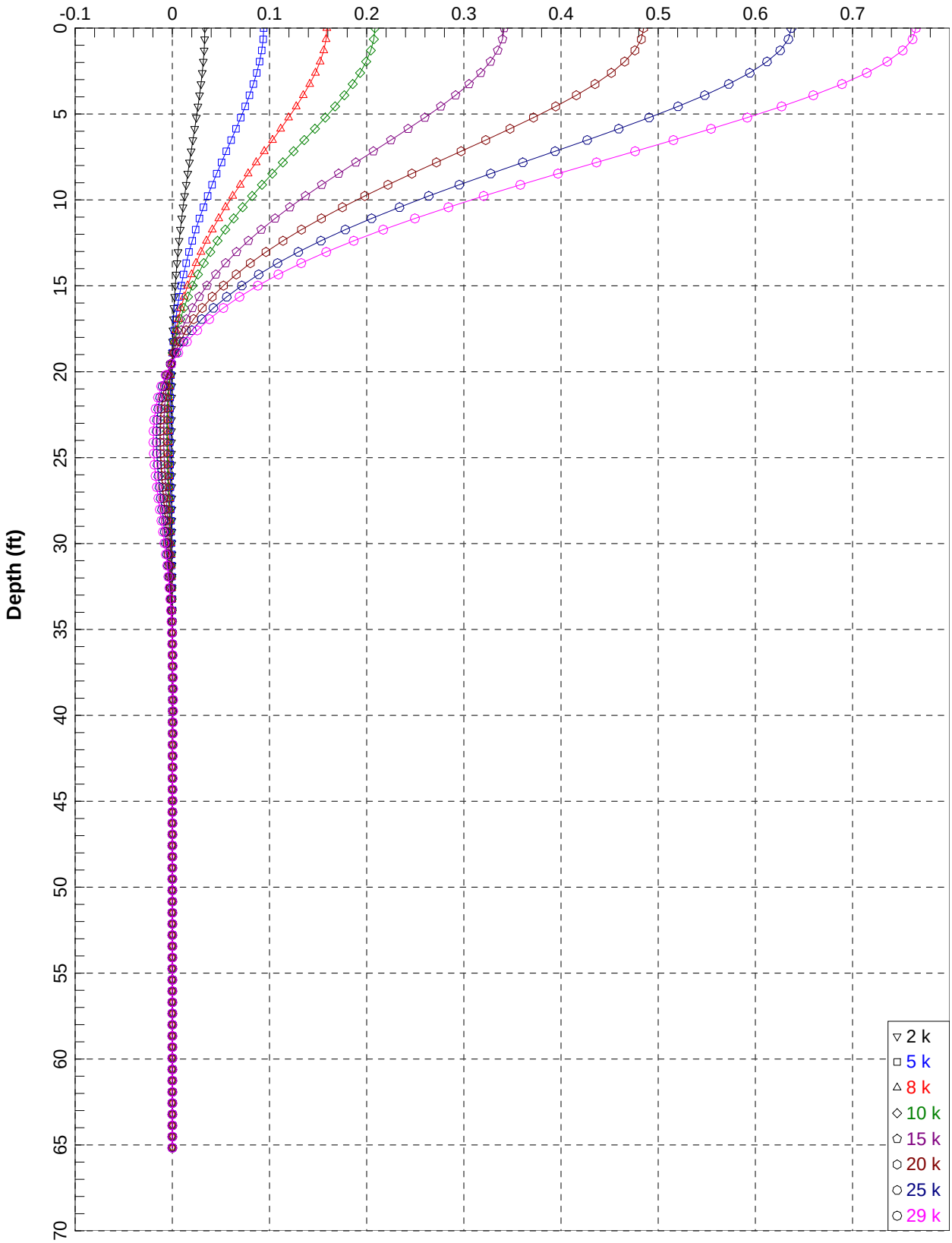
Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=50ft

Bending Moment (in-kips)



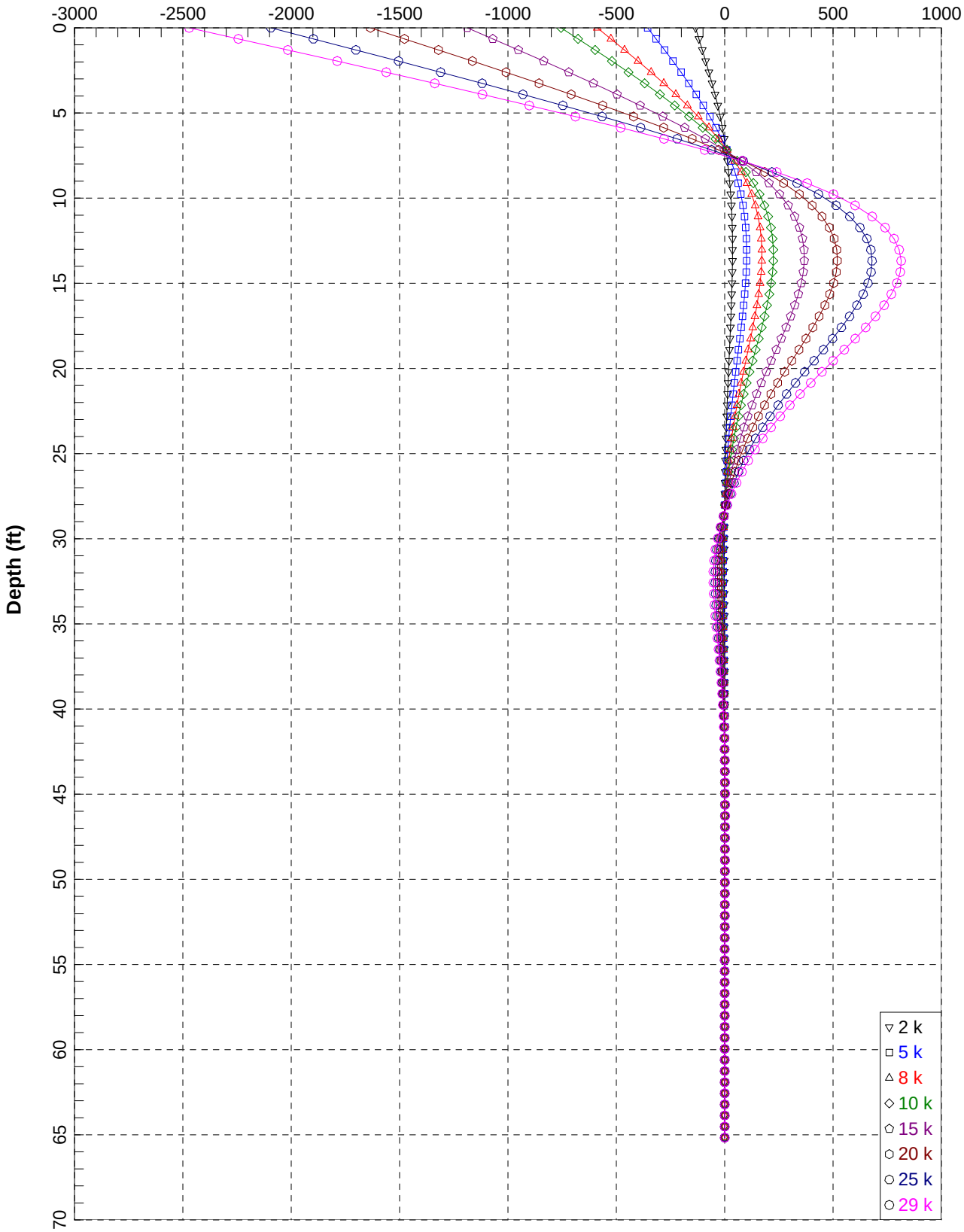

Hockomock Swamp Trestle_HST-4 HP12X53 Fixed Head_8piles/Pier_L=50ft
Shear Force (kips)
Depth (ft)
-4
-2
0
2
4
6
8
10
12
14
16
18
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
18 k

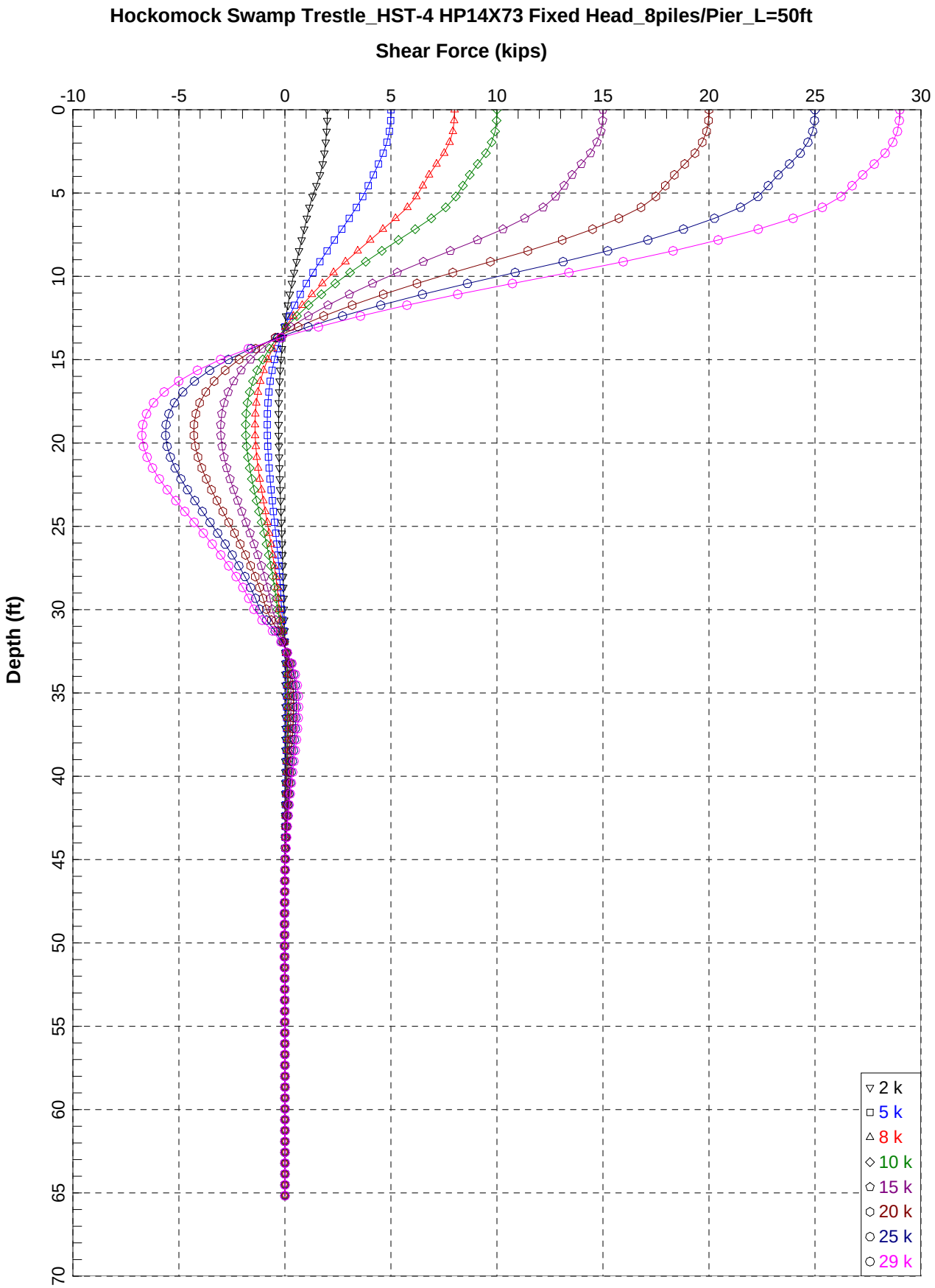

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=50ft
Lateral Load (kips)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Pile-head Deflection (in)
Case 1

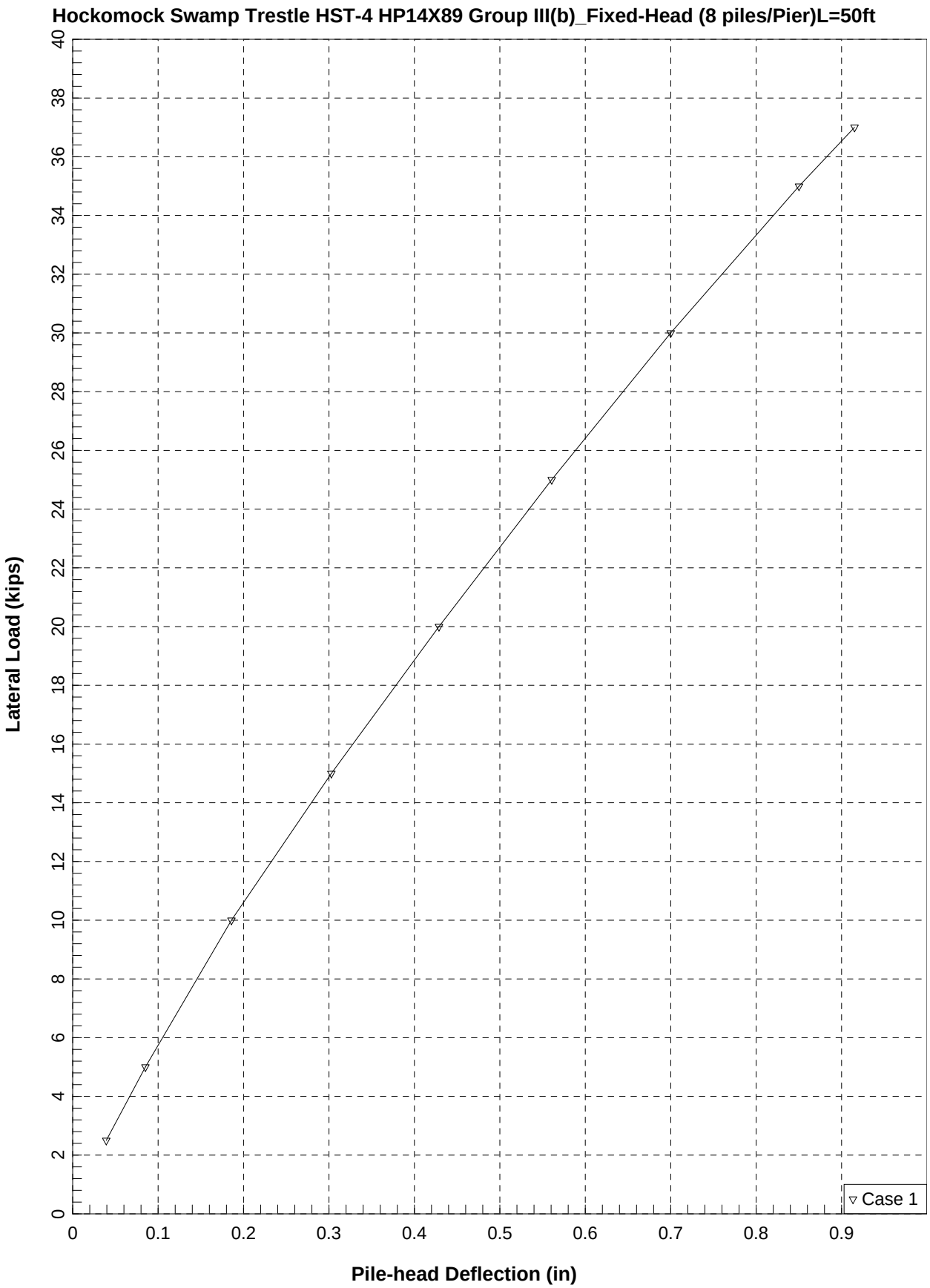

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=50ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
29 k

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=50ft

Bending Moment (in-kips)

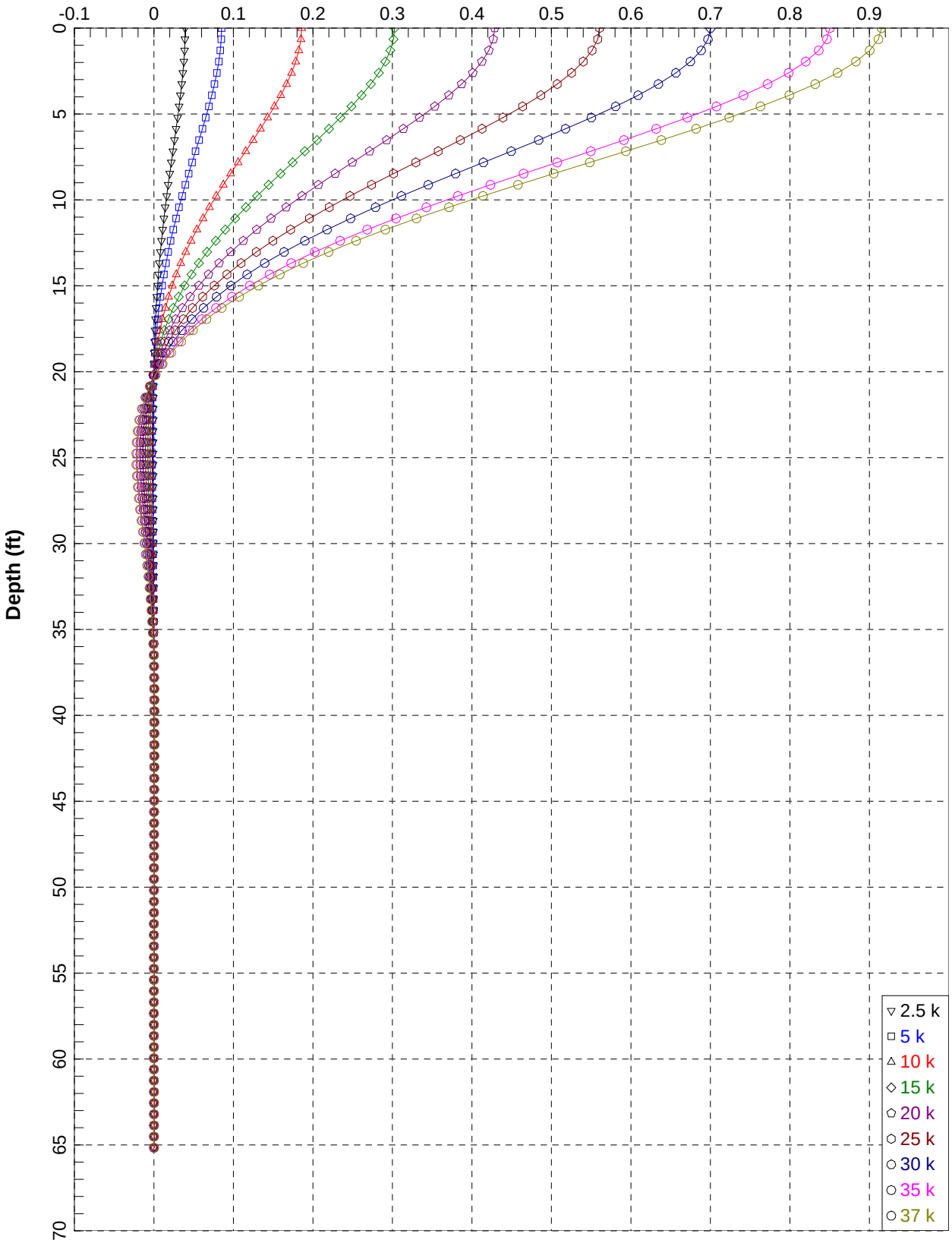


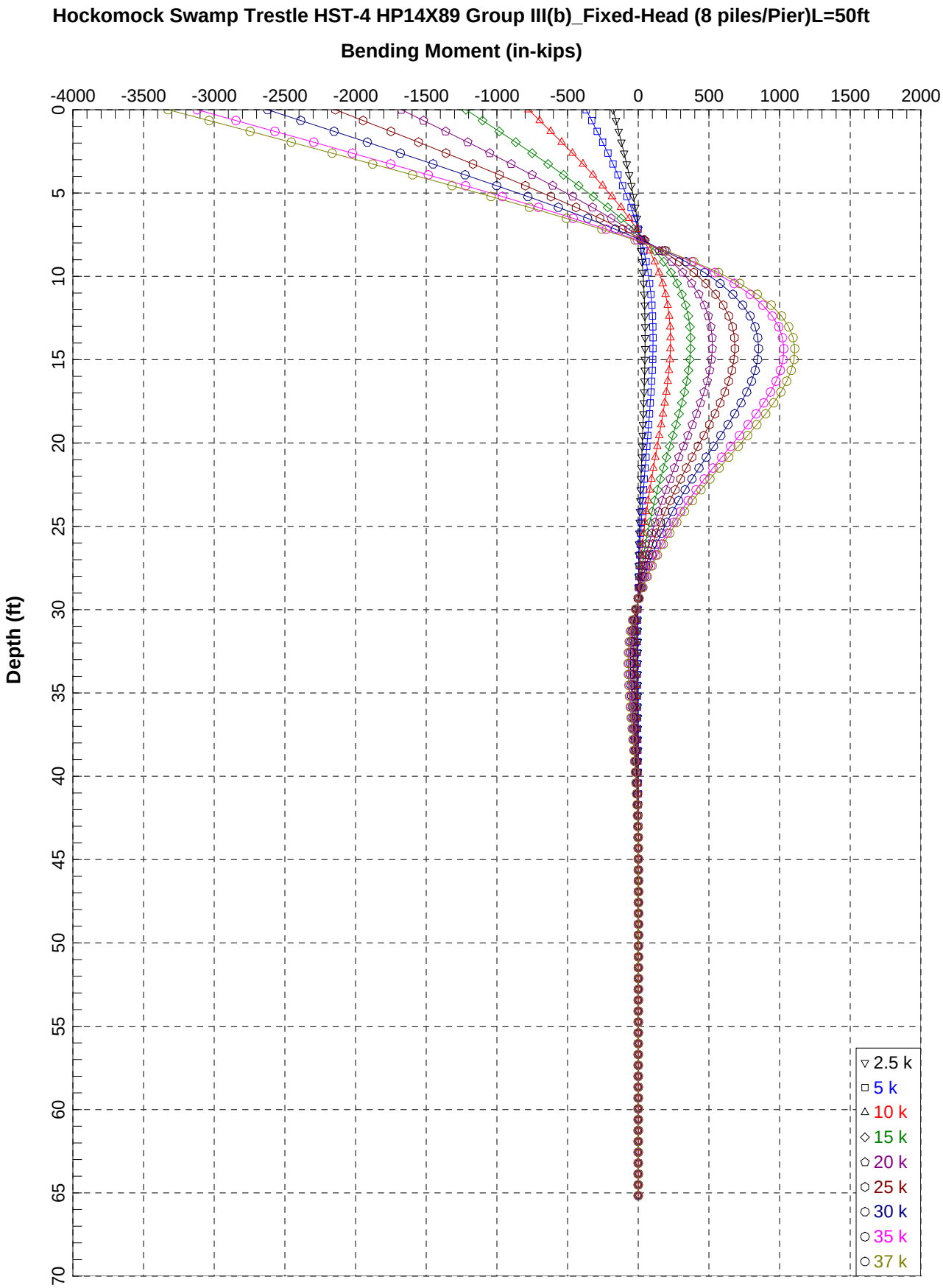

Hockomock Swamp Trestle_HST-4 HP14X73 Fixed Head_8piles/Pier_L=50ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2 k
5 k
8 k
10 k
15 k
20 k
25 k
29 k


Hockomock Swamp Trestle HST-4 HP14X89 Group III(b)_Fixed-Head (8 piles/Pier)L=50ft
Lateral Load (kips)
Pile-head Deflection (in)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Case 1

Hockomock Swamp Trestle HST-4 HP14X89 Group III(b)_Fixed-Head (8 piles/Pier)L=50ft

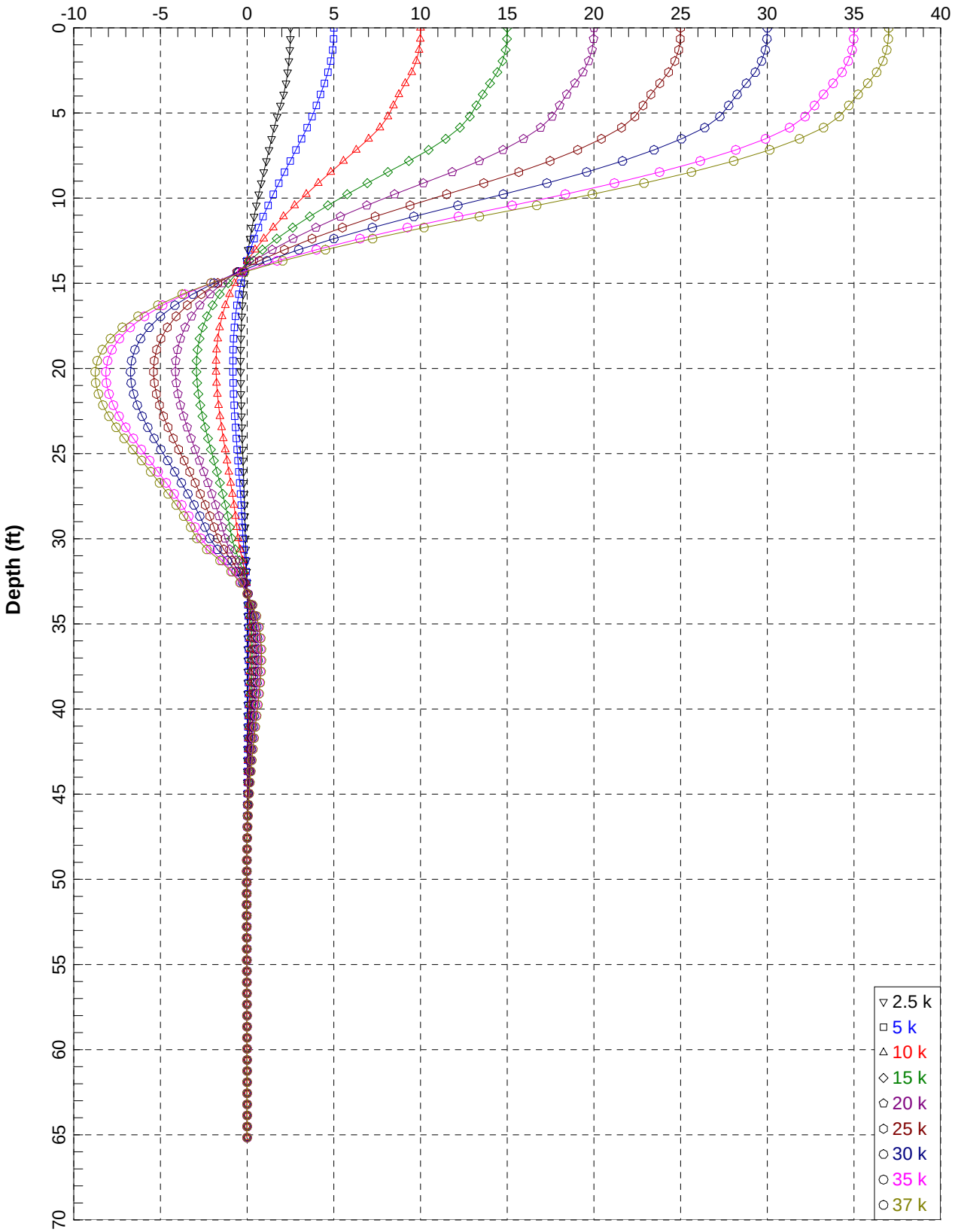
Lateral Deflection (in)

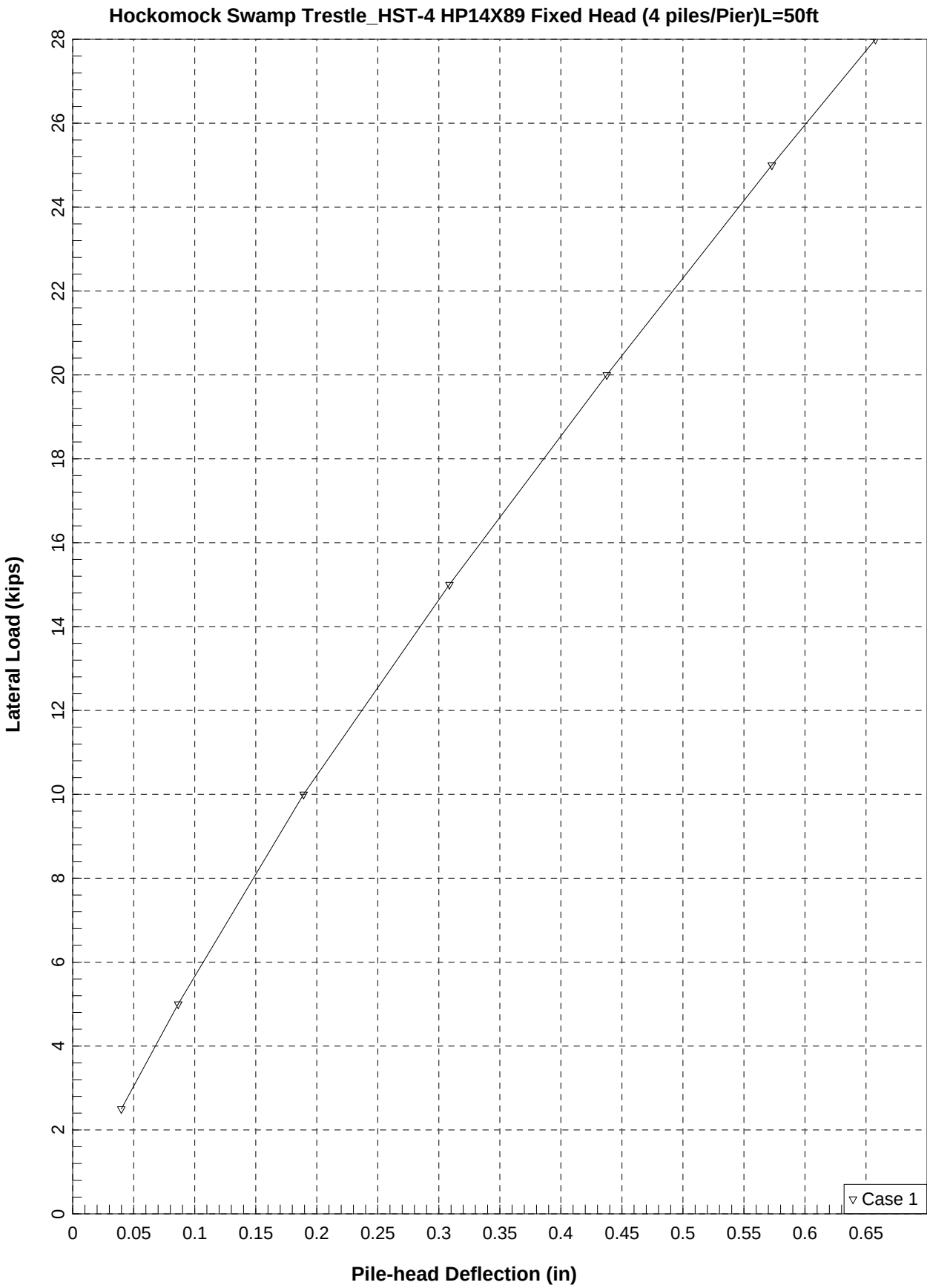


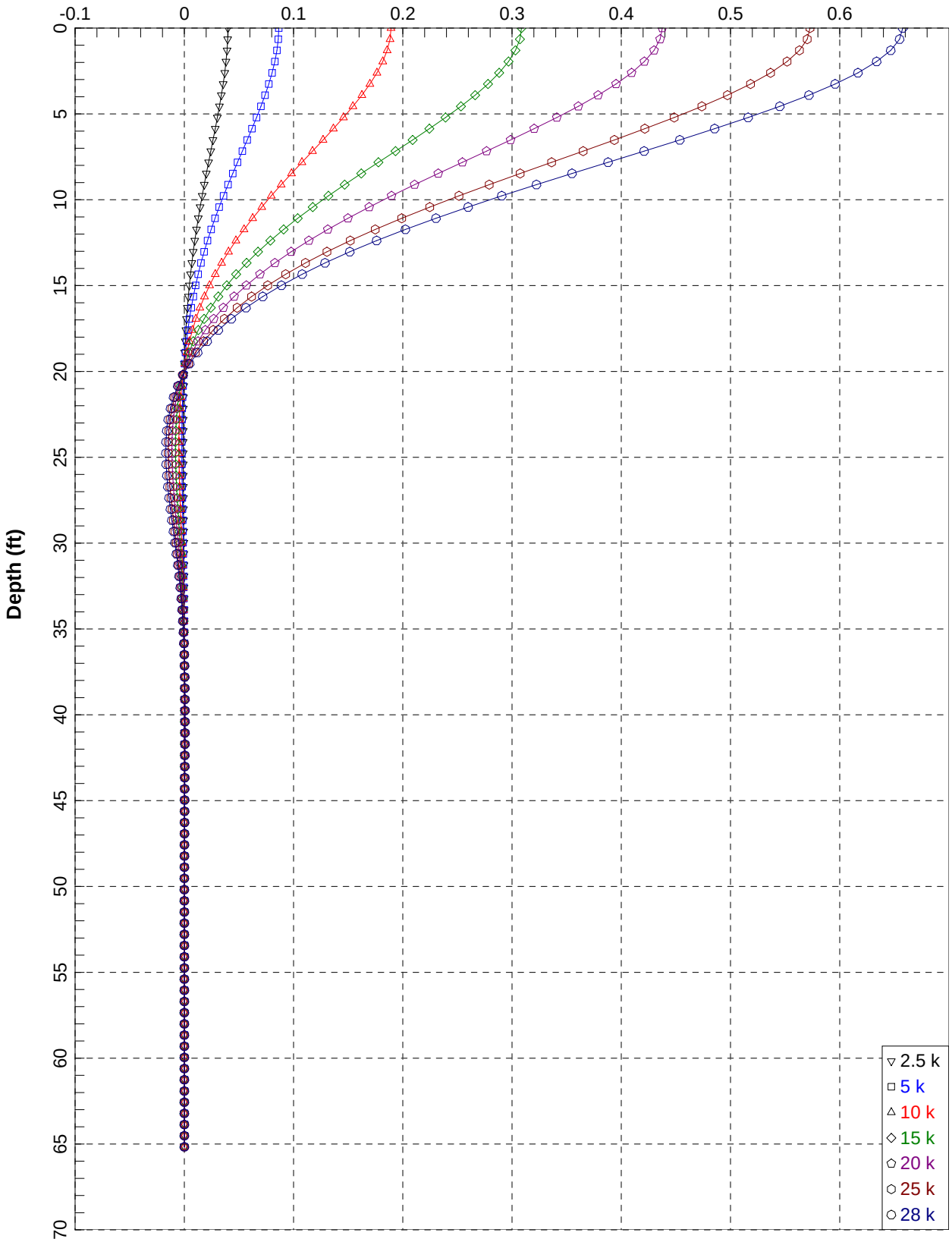

Hockomock Swamp Trestle HST-4 HP14X89 Group III(b)_Fixed-Head (8 piles/Pier)L=50ft
Bending Moment (in-kips)
Depth (ft)
-4000
-3500
-3000
-2500
-2000
-1500
-1000
-500
0
500
1000
1500
2000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
30 k
35 k
37 k

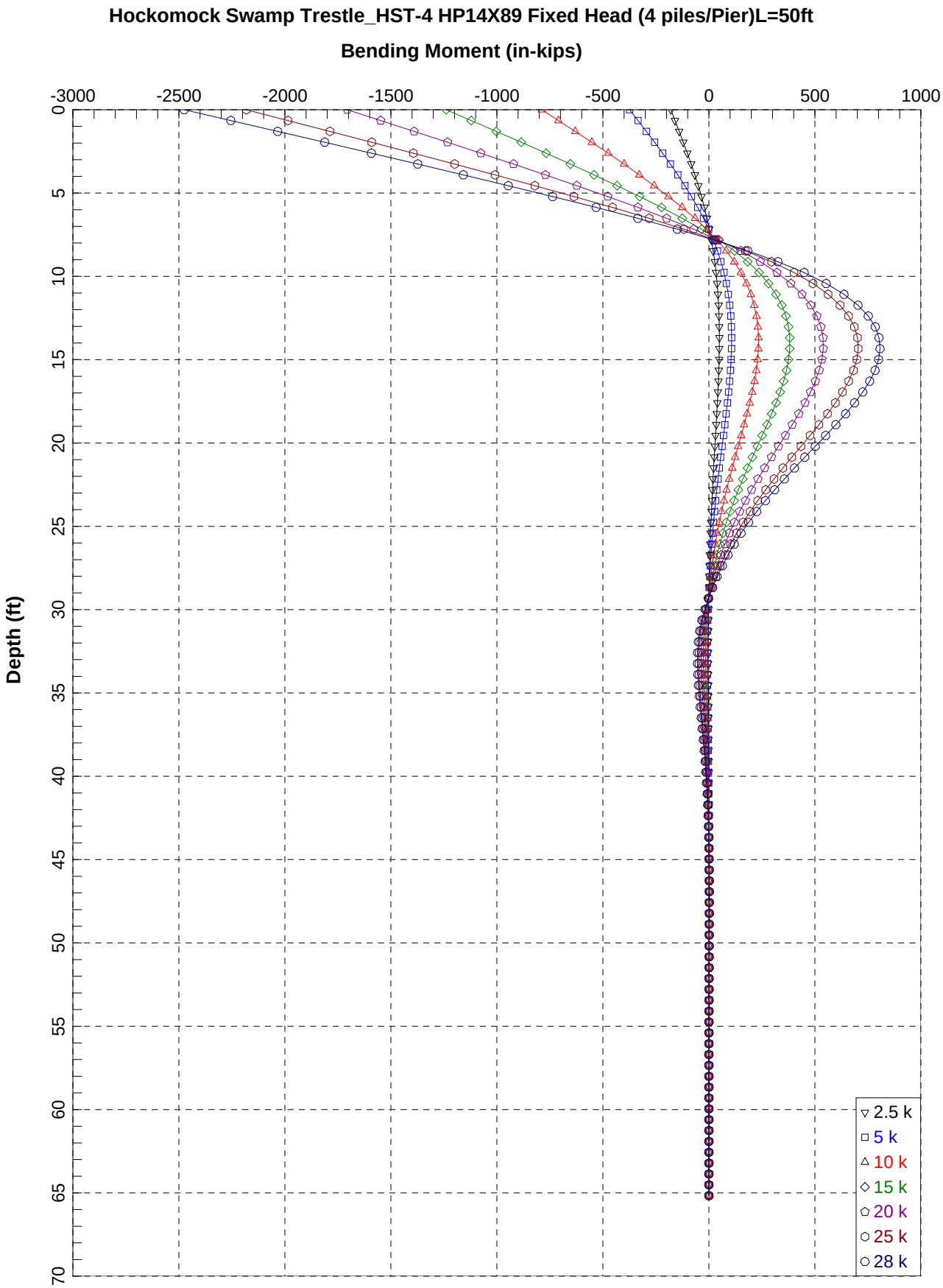
Hockomock Swamp Trestle HST-4 HP14X89 Group III(b)_Fixed-Head (8 piles/Pier)L=50ft

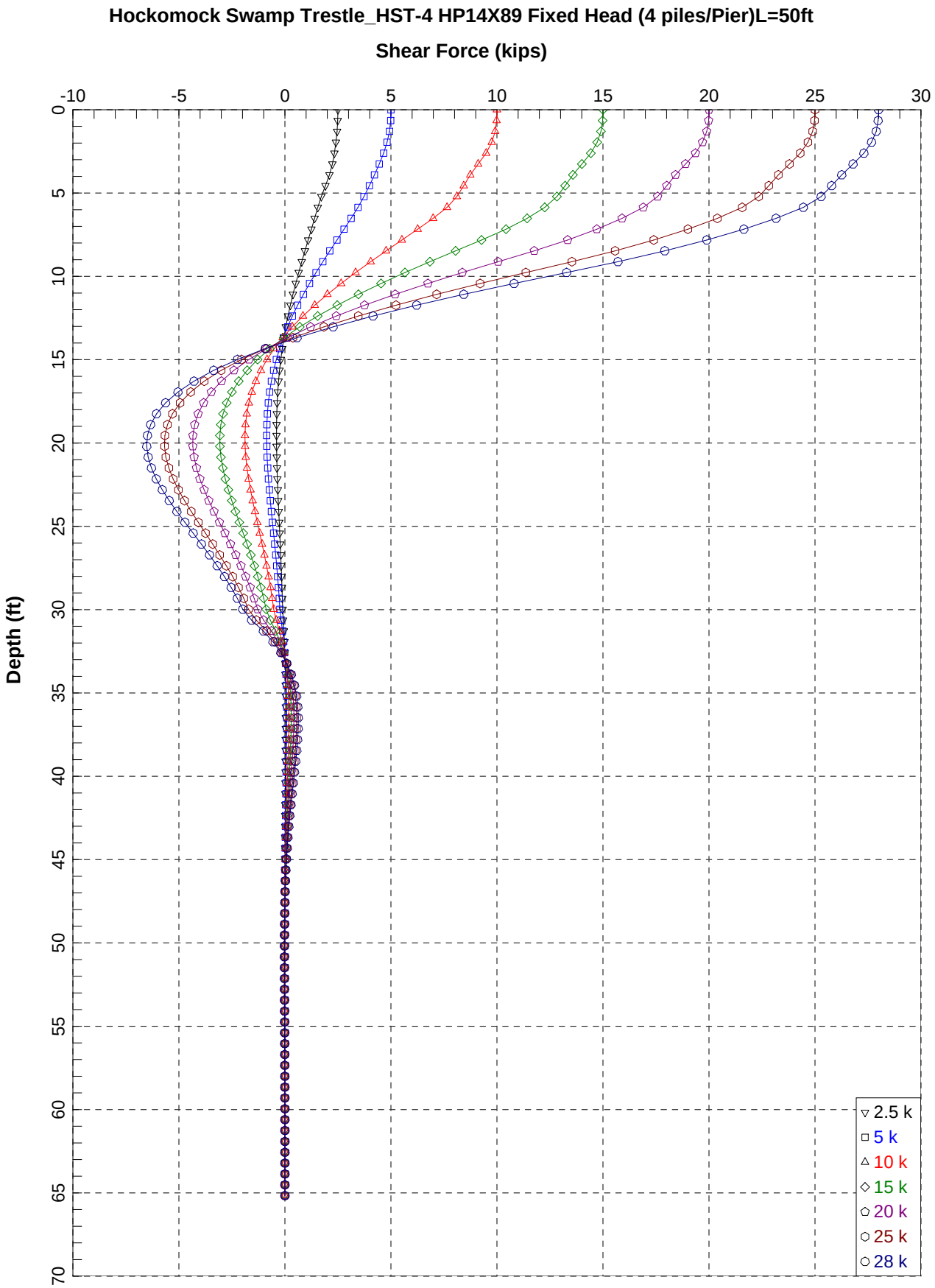
Shear Force (kips)




Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=50ft
Lateral Load (kips)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
Pile-head Deflection (in)
Case 1


Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=50ft
Lateral Deflection (in)
Depth (ft)
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
28 k


Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=50ft
Bending Moment (in-kips)
-3000
-2500
-2000
-1500
-1000
-500
0
500
1000
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
28 k


Hockomock Swamp Trestle_HST-4 HP14X89 Fixed Head (4 piles/Pier)L=50ft
Shear Force (kips)
Depth (ft)
-10
-5
0
5
10
15
20
25
30
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
2.5 k
5 k
10 k
15 k
20 k
25 k
28 k

Pile GROUP Analyses

Purpose:

The purpose of this calculation is to perform preliminary pile group analysis of a typical deep foundation of the proposed Hockomock Swamp Trestle.

References:

- AREMA Manual.

Assumptions:

- **Boring**

By examining the Borings of HST-1 to HST-9 in areas of the proposed trestle, Boring HST-4 was used for the following analyses.

Boring HST-4 Location: Sta.1457+00
Ground Elevation: EL.70.5

- **Ground water table:**

It is assumed that the ground water at EL 70.5

- **Superstructure**

Top of Track: EL.79.7
Top of Pier Cap: EL.74.2
Bottom of Pier Cap: EL.70.7

- **Pile Size**

Four sizes of HP piles were analyzed. In accordance with AREMA, the maximum allowable pile stresses should be limited to 12.6 ksi for a pile with yield strength of 36 ksi. The maximum allowable single pile capacity was estimated for each size of the HP piles as well as the relevant properties as follows:

Pile Size	As (in^2)	Ix (in^4)	Sx (in^3)	Iy (in^4)	Sy (in^3)	Qall (kips)	J (in^4)	GJ ($lbs\text{-}in^2$)
HP10X42	12.4	210	43.4	71.7	14.2	156	0.81	9,034,615
HP12X53	15.5	393	66.7	127	21.1	195	1.12	12,492,308
HP14X73	21.4	729	107	261	35.8	269	2.01	22,419,231
HP14X89	26.1	904	131	326	44.3	328	3.6	40,153,846

Elastic Modulus: E = 29,000,000 psi

Shear Modulus: $G = \frac{E}{2(1+\nu)}$ = 11,153,846 psi

where ν= 0.3

- **Pile Corrosion**

No pile corrosion is considered for preliminary design. However, pile corrosion should be considered for final design.

- **Load From Structure**

The service loads for pier span of 30 ft, 40 ft and 50 ft were obtained from Kristofer Kretsch (email on 2/02/2012). The longitudinal forces due to braking and traction were based on the email from Kristofer Kretsch on 2/24/2012.

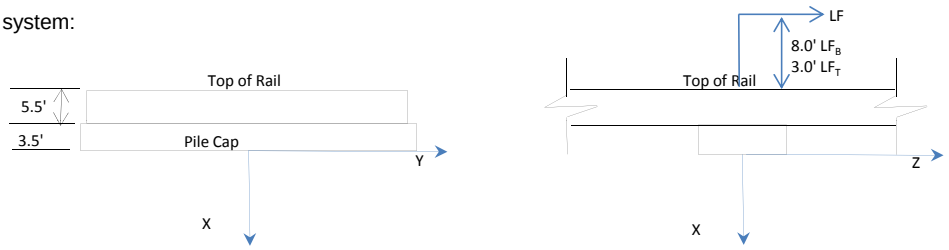
All the loads were summarized as follows (Referring to the Computations by KGK dated on 2/23/2012)

Pier Span	Dead Load, D*	Live Load, L	Impact Load, I	Longitudinal Braking			Longitudinal Traction		
				Force, LF_B	Moment,M_B**	Vertical, V_B	Force, LF_T	Moment,M_T**	Vert., V_T
(ft)	(kips)	(kips)	(kips)	(kips)	(k-ft)	(kips)	(kips)	(k-ft)	(kips)
30	330	346	142	81	1,235	41	137	1,404	47
40	425	432	153	93	1,418	35	158	1,620	40
50	520	546	174	105	1,601	32	177	1,814	36

Note: * Dead load includes weight of pier cap (50 kips for single row of piles).

** The moments are about the center of the pier cap. The moment is applied to the piers as a vertical couple applied downward on the pier at one end of the span and upward on the pier at the other end of the span. The moment is not applied directly to the pier cap, but is only given for information.

Coordinate system:



To perform GROUP analysis, all the loads should be transferred to the bottom of the pier cap. It was assumed that the longitudinal forces LF_B and LF_T are applied at the top of the pier cap through the bearing pads. When the longitudinal forces are transferred to the bottom of the pier, the above Table should be revised as follows:

Revised loads at the bottom of the pier cap

Pier Span	Dead Load, D	Live Load, L	Impact Load, I	Longitudinal Braking			Longitudinal Traction		
				Force, LF_B	Moment,M_B*	Vertical, V_B	Force, LF_T	Moment,M_T*	Vert., V_T
(ft)	(kips)	(kips)	(kips)	(kips)	(k-ft)	(kips)	(kips)	(k-ft)	(kips)
30	330	346	142	81	1,094	36	137	1,165	39
40	425	432	153	93	1,256	31	158	1,343	34
50	520	546	174	105	1,418	28	177	1,505	30

Note: * The moment is applied to the piers as a vertical couple applied downward on the pier at one end of the span and upward on the pier at the other end of the span. The moment is not applied directly to the pier cap, but is only given for information.

- **Load Combination**

As per AREMA, three load combinations were checked:

Group I = D + L + I

Group III (a) = D + L + I + LF_B with Longitudinal braking load

Group III(b) = D + L + I + LF_T with longitudinal traction load

No other loads were considered at present.

Assuming that the Superstructure and track height is 5.5 ft and pier cap height is 3.5 ft based on the email from Kristofer Kretsch, the load combinations of Group III(a) and Group III(b) with respect to the above coordinate system are more critical. Therefore, only these two load combinations were summarized as follows:

Pier Span	Load Comb.	Force				Moment		
		Fx		Fy	Fz	Mx	My*	Mz
		Single Row	Double Row					
(ft)		(lbs)	(lbs)	(lbs)	(lbs)	(lbs-in)	(lbs-in)	(lbs-in)
30	Group III(a)	854,450	904,450	0	81,000	0	3,402,000	0
	Group III(b)	856,817	906,817	0	137,000	0	5,754,000	0
40	Group III(a)	1,041,388	1,091,388	0	93,000	0	3,906,000	0
	Group III(b)	1,043,575	1,093,575	0	158,000	0	6,636,000	0
50	Group III(a)	1,268,350	1,318,350	0	105,000	0	4,410,000	0
	Group III(b)	1,270,090	1,320,090	0	177,000	0	7,434,000	0

Note: * *My* was calculated with respect to the bottom of the pier cap.

Analysis:

Software: GROUP 7.0 (Ensoft, Inc.)

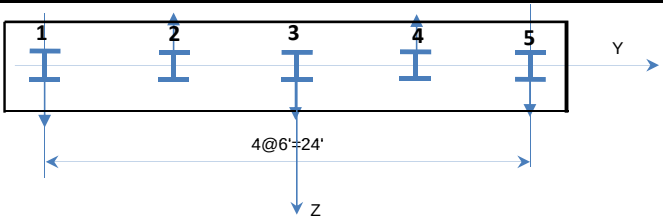
Analysis:

By checking the above load combinations, Group III(b) is critical for all three pier spans. The following analyses were based on this load combination only.

1. Single Row of Piles Layout

Only pier span equal to 50 ft was analyzed.

Assuming a row of 5 HP14X89 piles is used, and each pile is tilted at 1H:12V as follows:



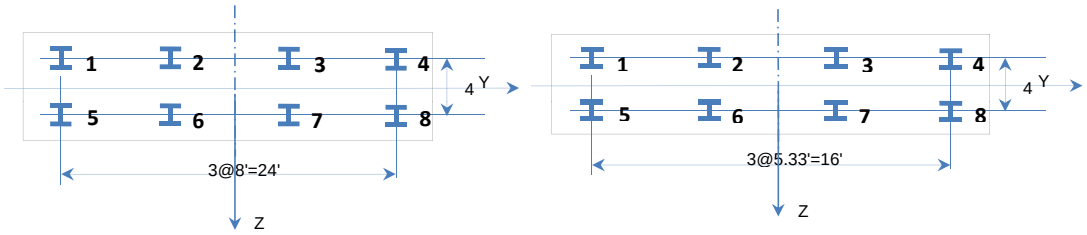
The results with respect to the adjusted moments are as follows:

Maximum axial compression force:	547	kips	>328 kips, NG
Maximum axial tension force:	191	kips	>76 kips, NG
Maximum stress in pile:	68	ksi	Overstressed, NG
Maximum pile top deflection	3.1	inches	Too high, NG

Therefore, one row of piles does not work.

2. Double Rows of Piles Layout

Assuming two rows of vertical piles were used. The trestle width of 28 ft and 20 ft were analyzed.



Three sizes of piles were checked. The results were summarized in the following tables:

Summary of GROUP Analyses (Fixed Head Condition) - 28 ft Wide Trestle

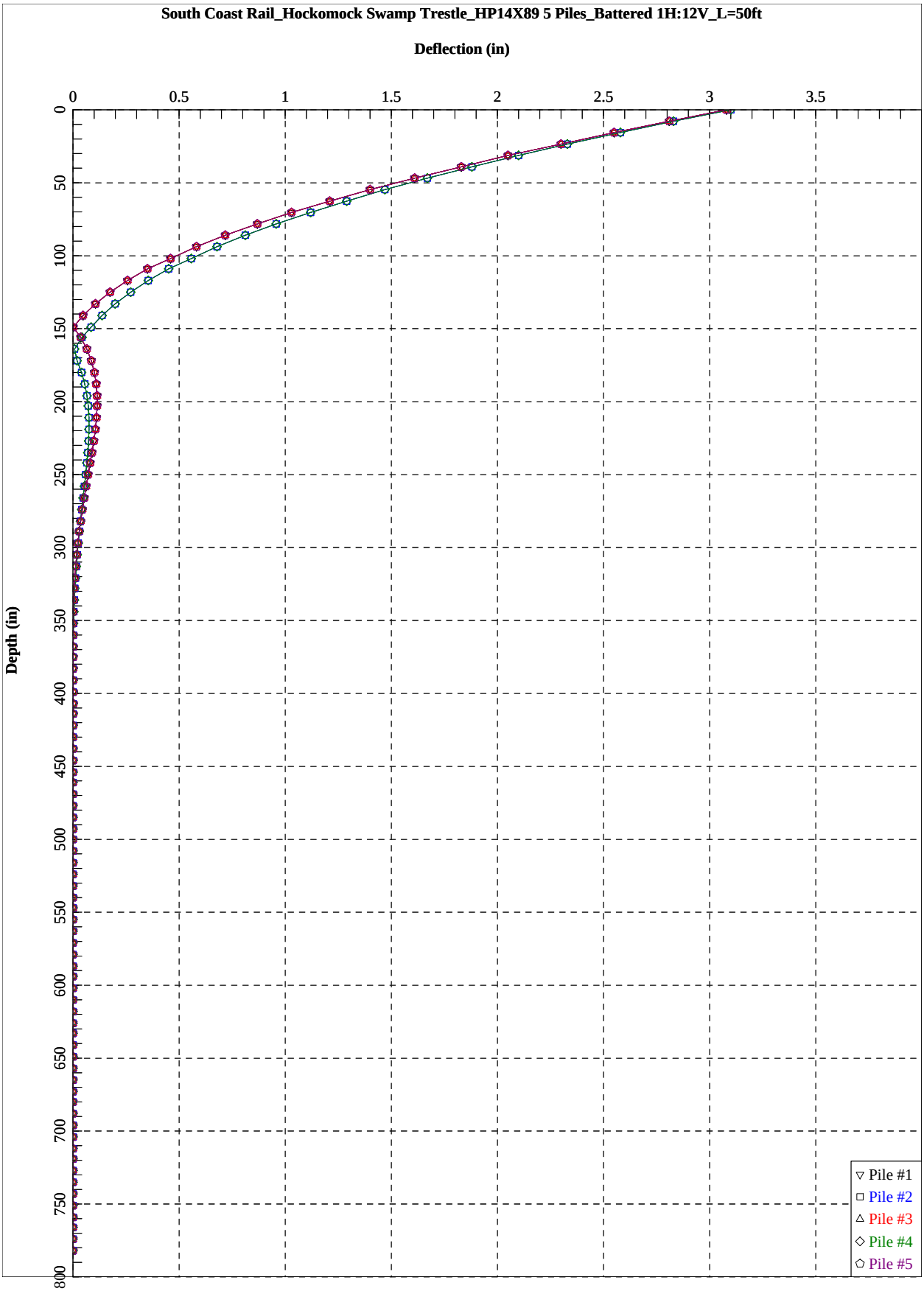
Pier Span	Pile Size	Load Condition	Qall	GROUP Analysis Results				
				Axial Pile Force (kips)		Max. Moment	Max. Pile Stress	Max. Top Deflection
(ft)			(kips)	Comp..	Tension	(kips-in)	(ksi)	(inches)
50ft	HP14X89	Group III(b)	328	271	NO	1,700	23.5	0.82
	HP14X73	Group III(b)	269	270	NO	1,670	28	0.94
	HP12X53	Group III(b)	195	269	NO	1,650	42.5	1.33
40ft	HP14X89	Group III(b)	328	230	NO	1,490	20.3	0.71
	HP14X73	Group III(b)	269	220	NO	1,460	24.7	0.81
	HP12X53	Group III(b)	195	228	NO	1,420	36.4	1.12

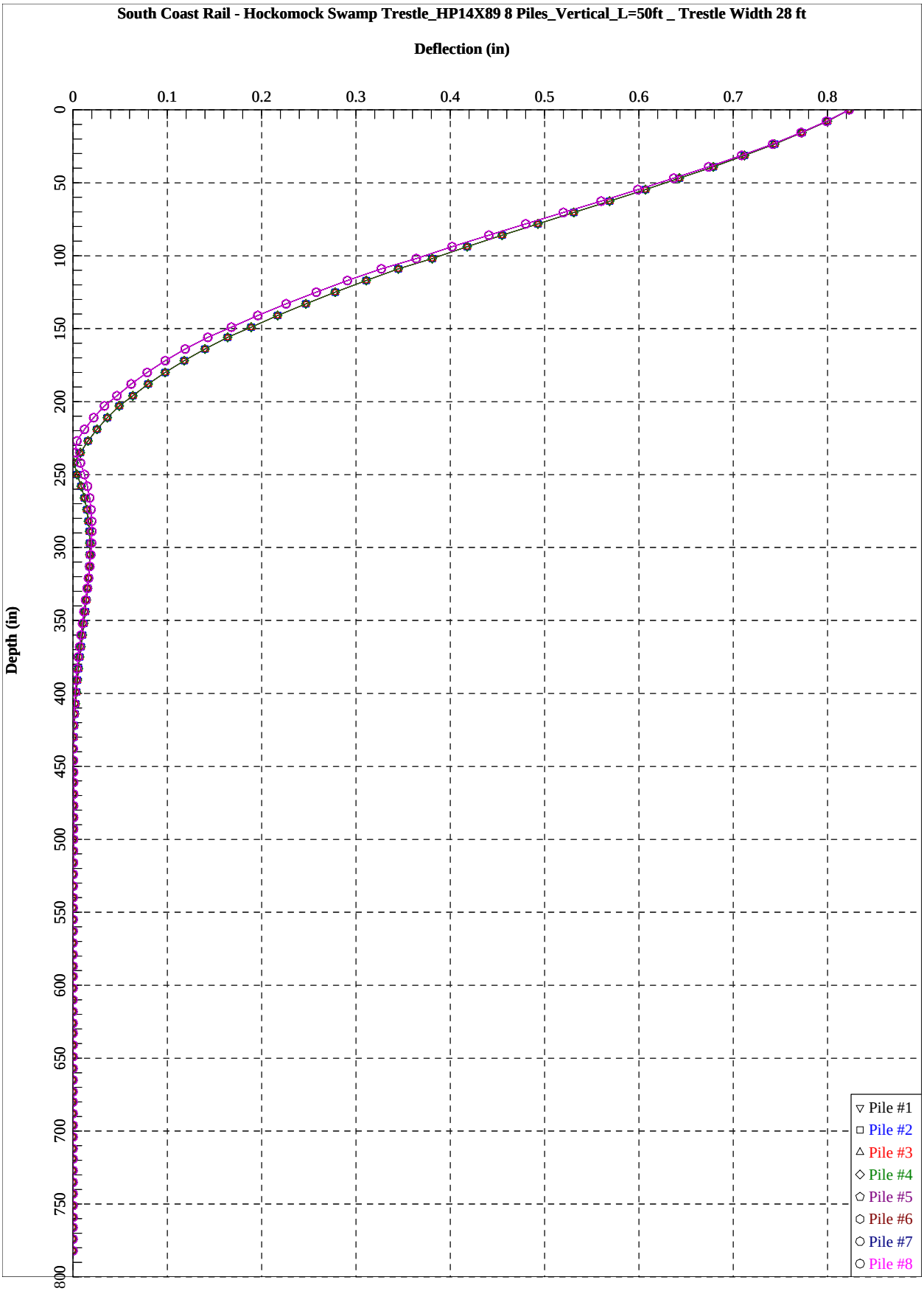
Summary of GROUP Analyses (Fixed Head Condition) - 20 ft Wide Trestle

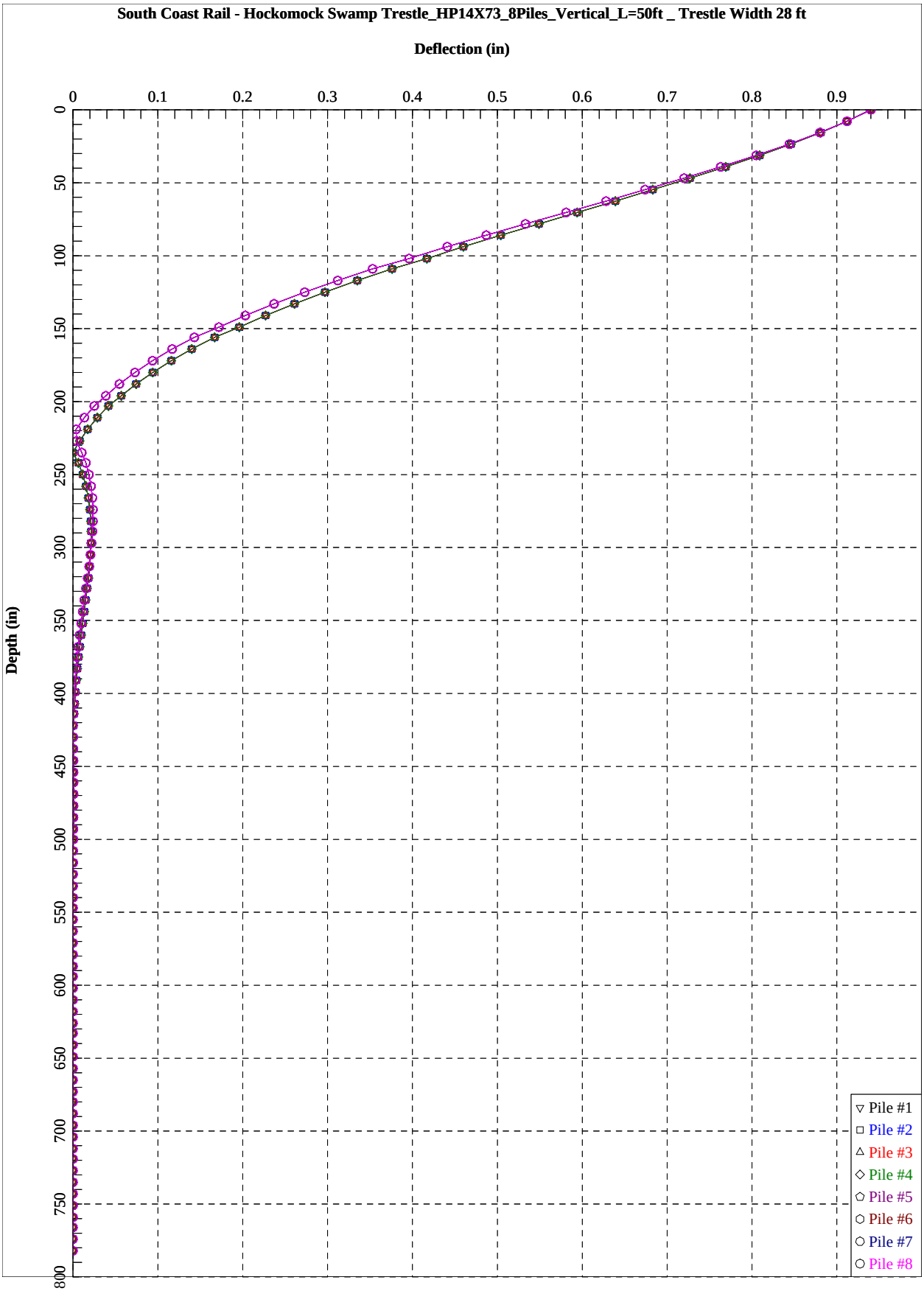
Pier Span	Pile Size	Load Condition	Qall	GROUP Analysis Results				
				Axial Pile Force (kips)		Max. Moment	Max. Pile Stress	Max. Top Deflection
(ft)			(kips)	Comp..	Tension	(kips-in)	(ksi)	(inches)
50ft	HP14X89	Group III(b)	328	271	NO	1,720	23.7	0.83
	HP14X73	Group III(b)	269	270	NO	1,690	28.9	0.95
	HP12X53	Group III(b)	195	269	NO	1,650	42.6	1.33
40ft	HP14X89	Group III(b)	328	230	NO	1,510	20.5	0.72
	HP14X73	Group III(b)	269	229	NO	1,480	24.9	0.82
	HP12X53	Group III(b)	195	228	NO	1,420	36.4	1.12

Note:

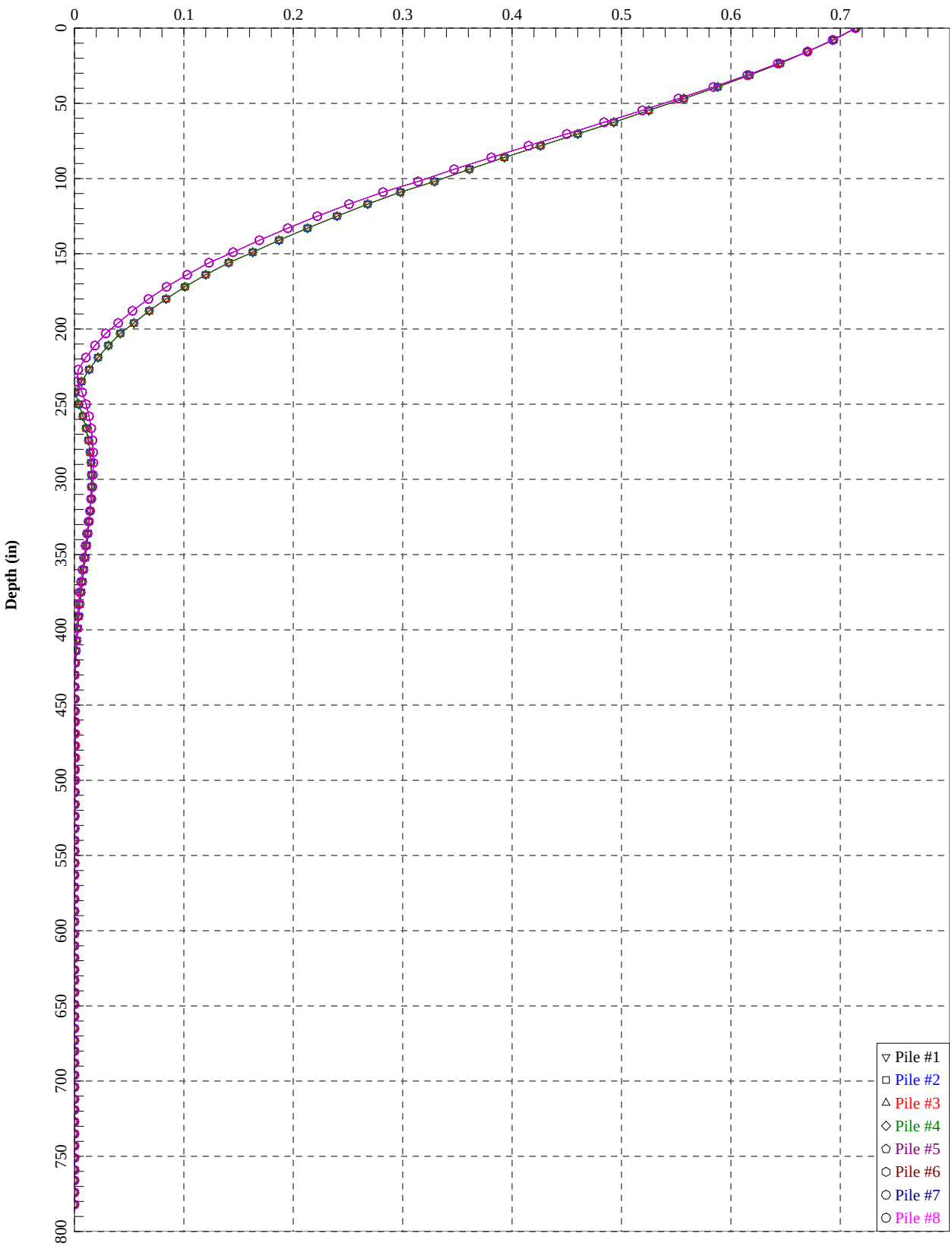
1. No pile corrosion was considered.
2. Fixed pile head condition was assumed.
3. The maximum moment and maximum axial force occur at the pile heads (bottom of the pier cap).
   Structural engineers should check the structural capacities of the piles at the bottom of pier connection.


South Coast Rail_Hockomock Swamp Trestle_HP14X89 5 Piles_Battered 1H:12V_L=50ft
Deflection (in)
Depth (in)
0
0.5
1
1.5
2
2.5
3
3.5
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5

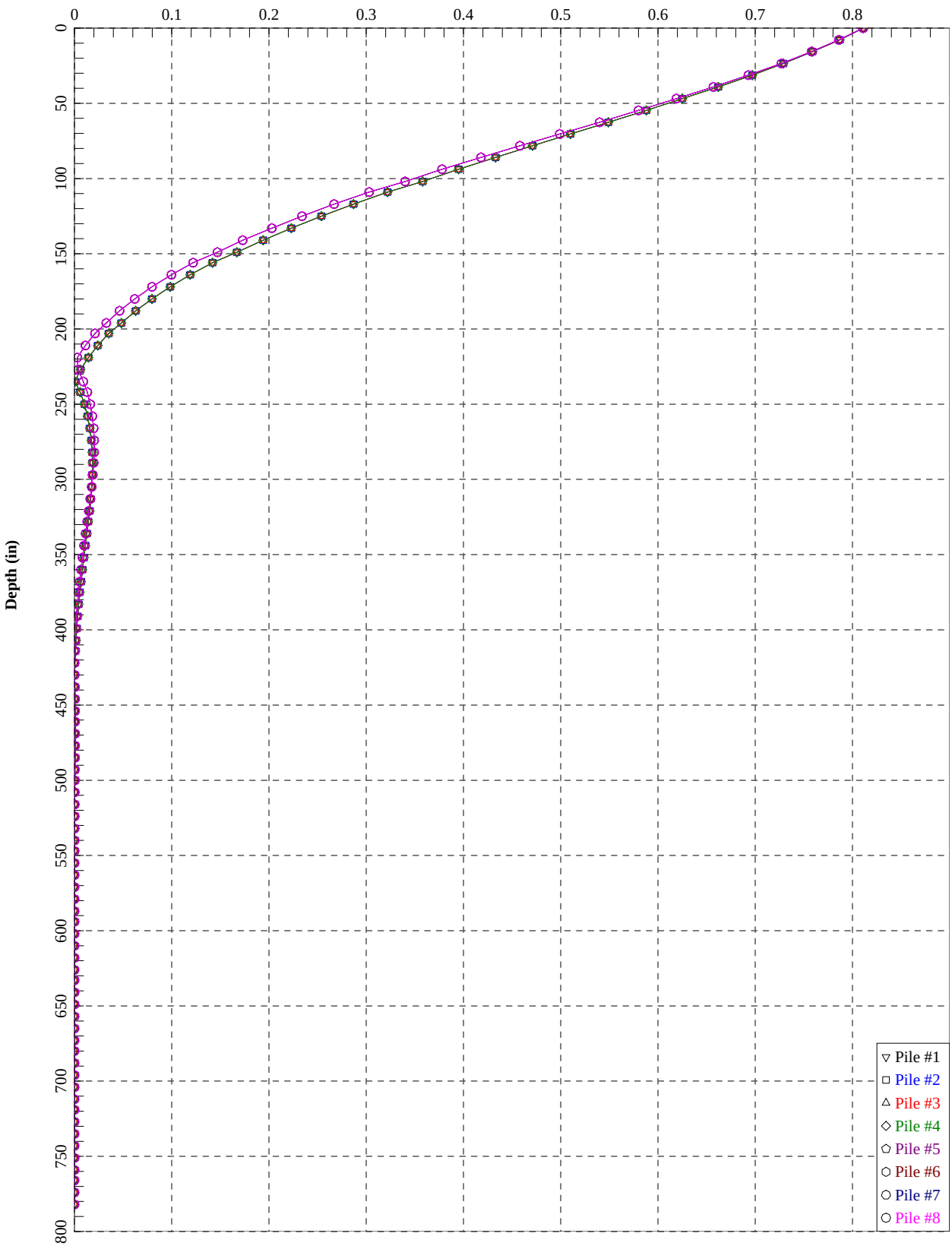

South Coast Rail - Hockomock Swamp Trestle_HP14X89 8 Piles_Vertical_L=50ft _ Trestle Width 28 ft
Deflection (in)
Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5
Pile #6
Pile #7
Pile #8

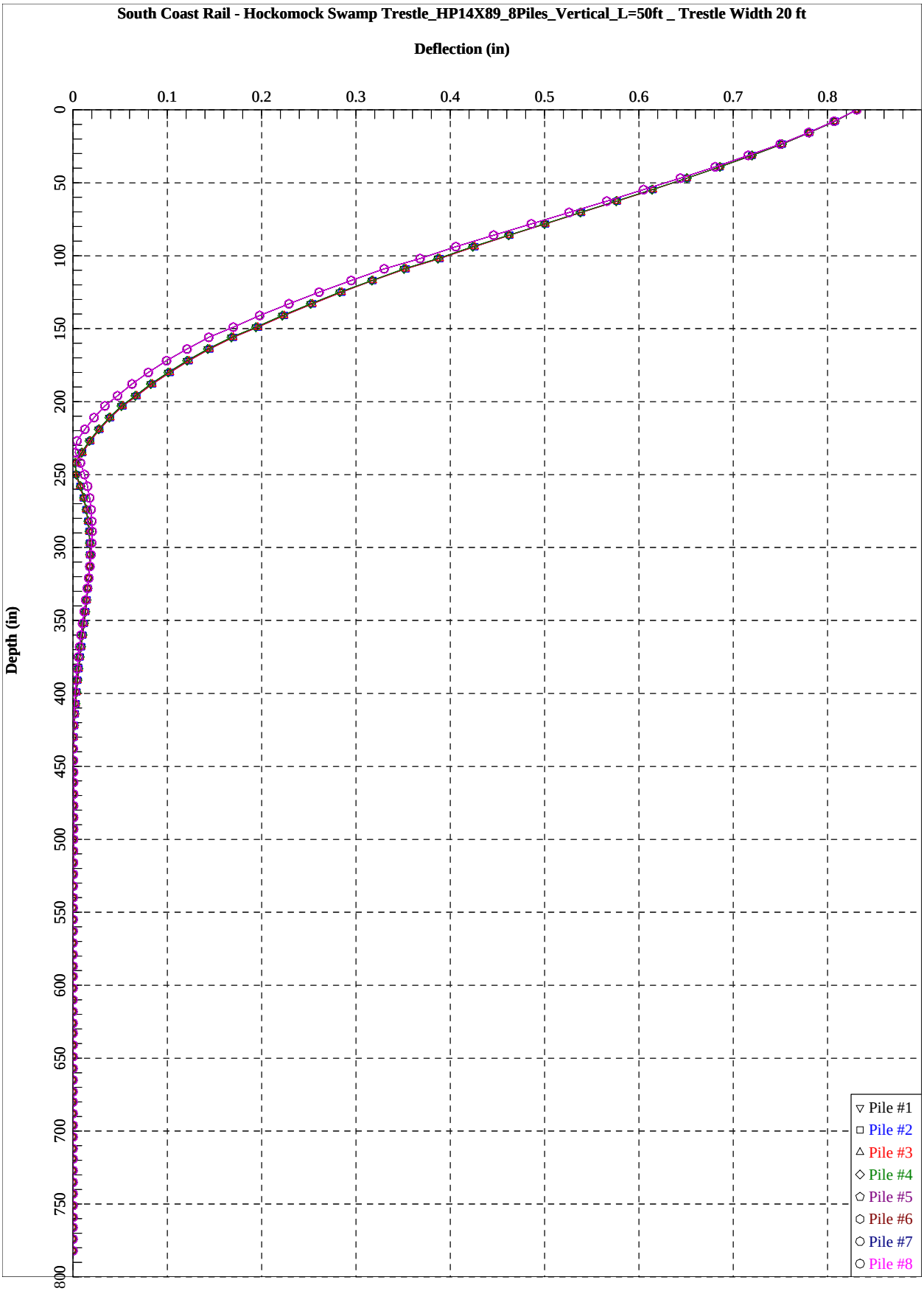

South Coast Rail - Hockomock Swamp Trestle_HP14X73_8Piles_Vertical_L=50ft _ Trestle Width 28 ft
Deflection (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Depth (in)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5
Pile #6
Pile #7
Pile #8

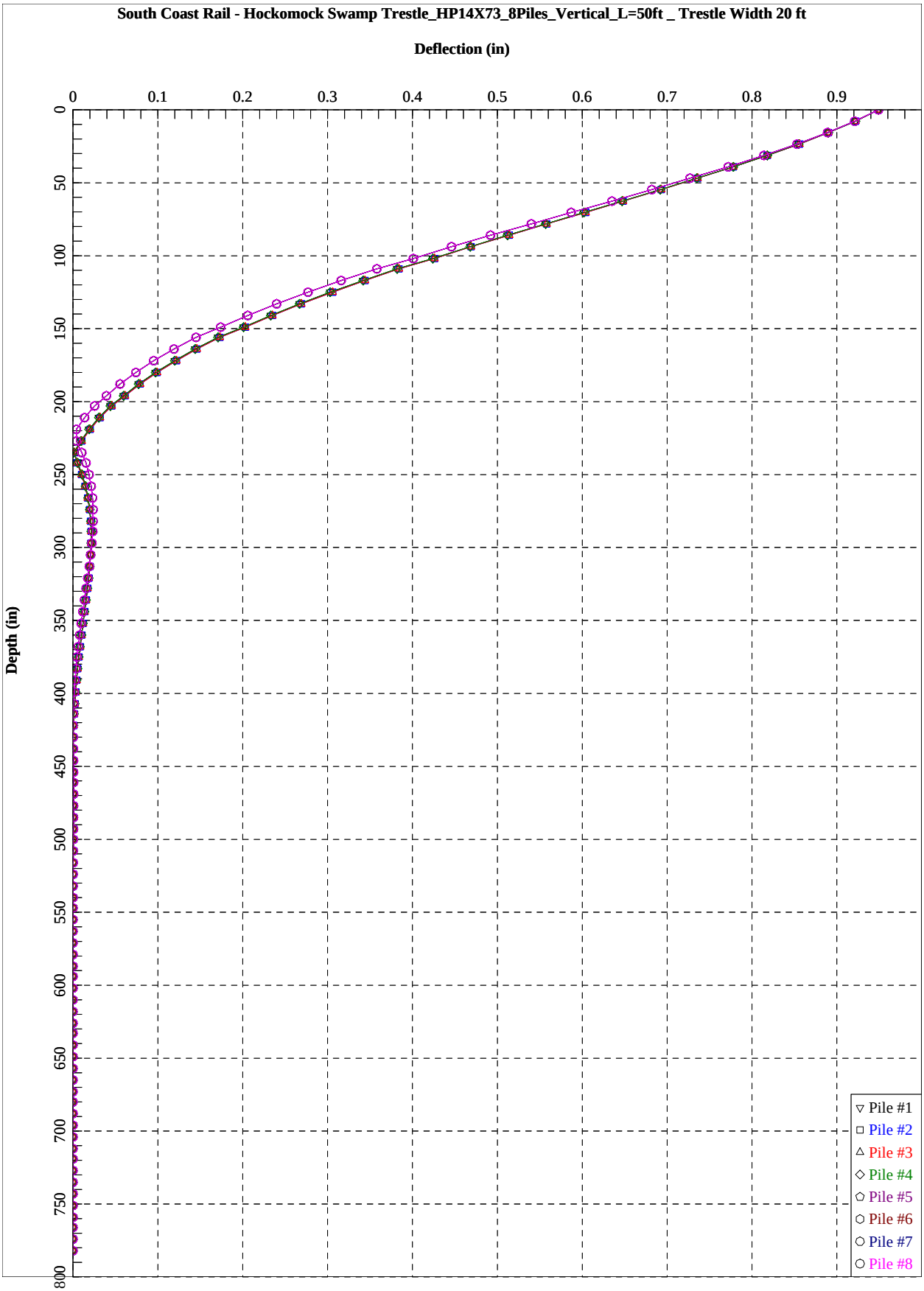
South Coast Rail - Hockomock Swamp Trestle_HP14X89 8 Piles_Vertical_L=40ft _ Trestle Width 28 ft



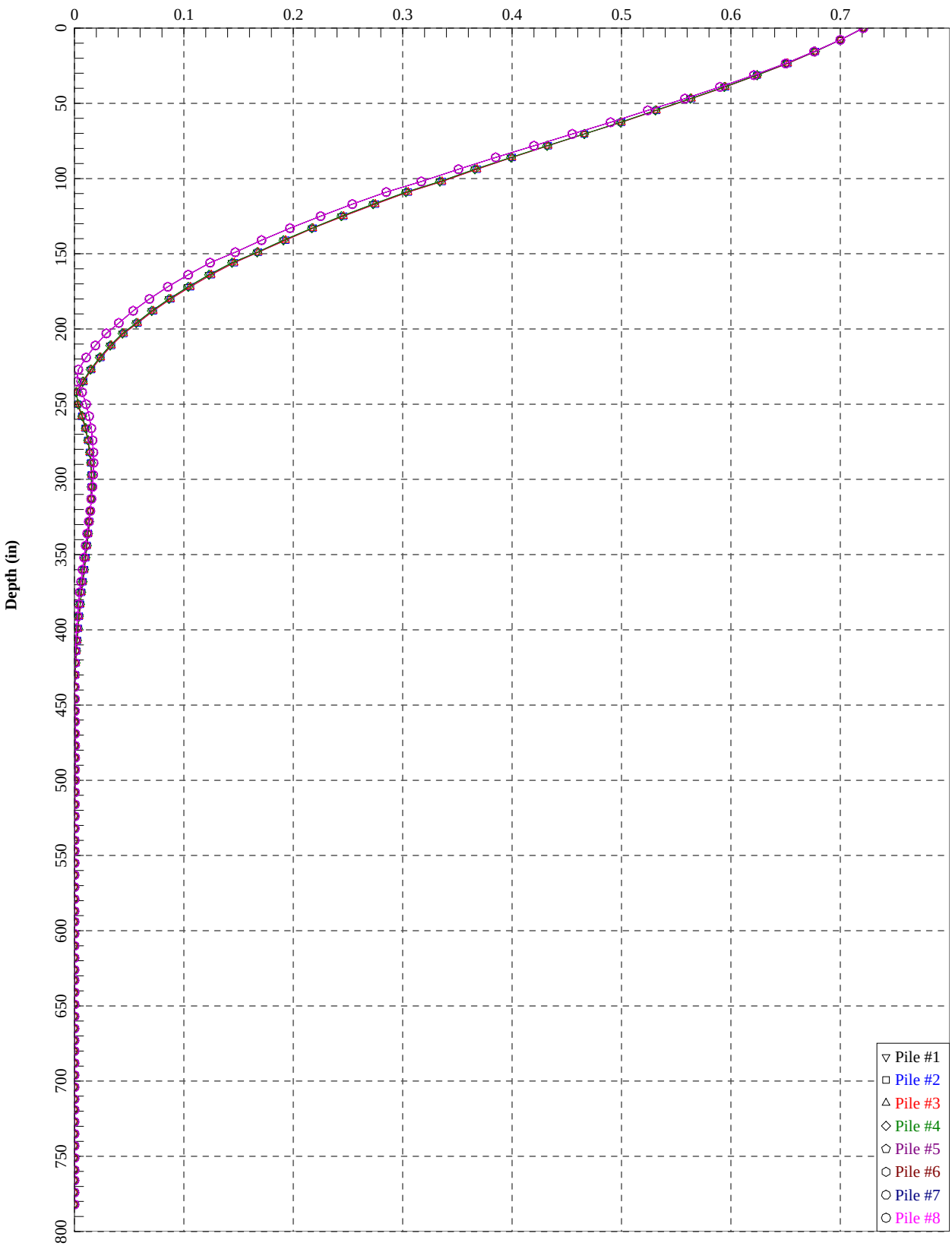
South Coast Rail - Hockomock Swamp Trestle_HP14X73_8Piles_Vertical_L=40ft _ Trestle Width 28 ft

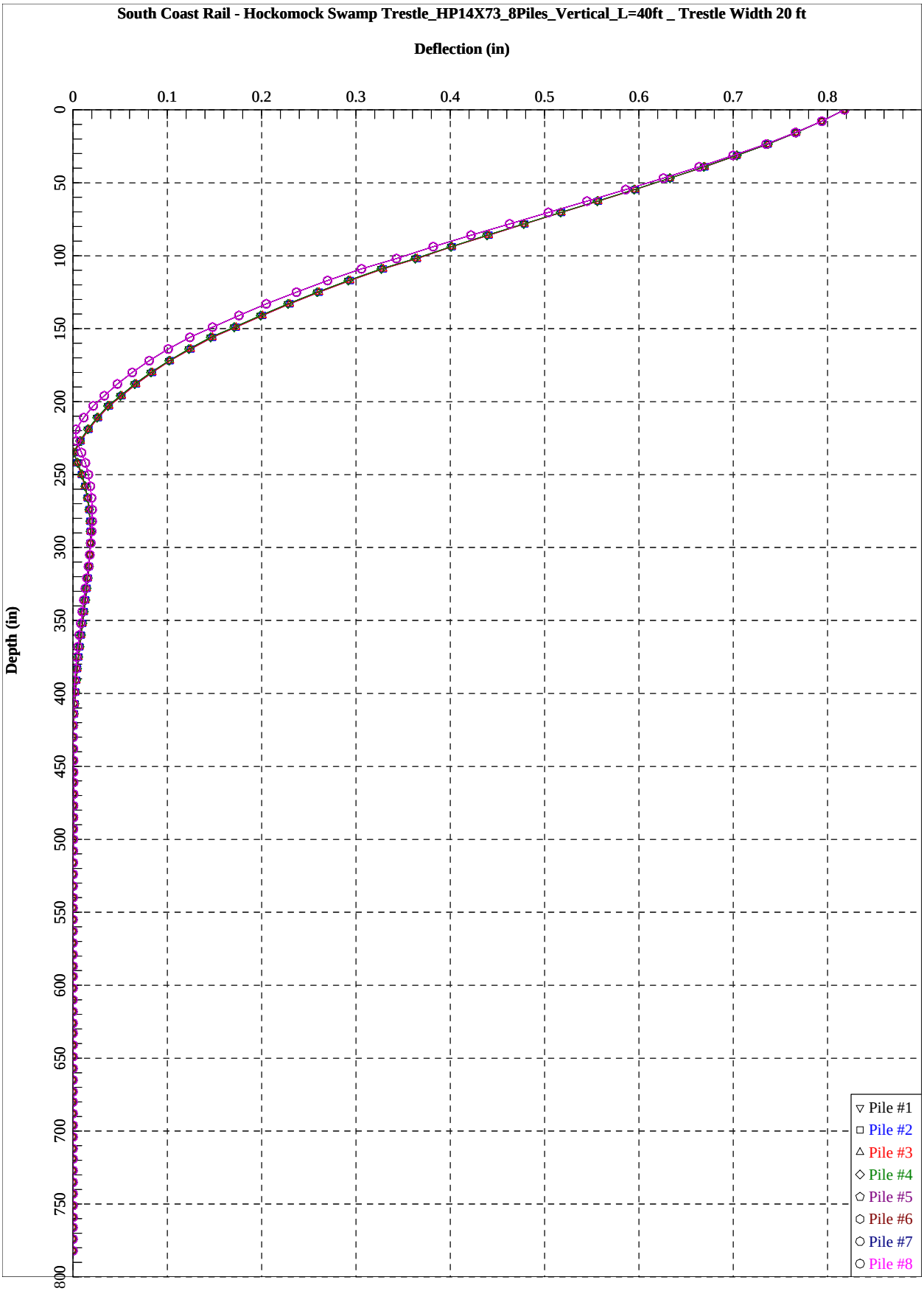



South Coast Rail - Hockomock Swamp Trestle_HP14X89_8Piles_Vertical_L=50ft _ Trestle Width 20 ft
Deflection (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Depth (in)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5
Pile #6
Pile #7
Pile #8


South Coast Rail - Hockomock Swamp Trestle_HP14X73_8Piles_Vertical_L=50ft _ Trestle Width 20 ft
Deflection (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Depth (in)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5
Pile #6
Pile #7
Pile #8

South Coast Rail - Hockomock Swamp Trestle_HP14X89_8Piles_Vertical_L=40ft _ Trestle Width 20 ft




South Coast Rail - Hockomock Swamp Trestle_HP14X73_8Piles_Vertical_L=40ft _ Trestle Width 20 ft
Deflection (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Depth (in)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
Pile #1
Pile #2
Pile #3
Pile #4
Pile #5
Pile #6
Pile #7
Pile #8

Seismic Site Class Evaluation

JACOBS

Hockomock Swamp Trestle Seismic Site Class Evaluation

Based on the boring HST-6

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
HST-6	S-1	6	5.5	0.92	
	S-2	1	2.5	2.50	
	S-3	41	7	0.17	
	S-4	12	5	0.42	
	S-5	9	5	0.56	**15**
	S-6	11	5	0.45	
	S-7	31	5	0.16	
	S-8	12	5	0.42	
	S-9	39	5	0.13	
	S-10	39	5	0.13	
	S-11	42	5	0.12	
	S-12	54	5	0.09	
	Bedrock	100	40	0.40	
	Total Depth =	100			
	Depth to Bedrock =	60	sum	6.46	

Approx. Project Coordinates

Lat 41.999792
Long -71.080808

Seismic Coefficients

S_S = 0.24 (Table 1604.10*)
S_1 = 0.062 (Table 1604.10*)

For Site Class D

F_A = 1.6 (See Table 9.4.1.2.4a*)
F_V = 2.4 (See Table 9.4.1.2.4b*)

$S_{MS} = Ss \times F_A$ = 0.384
$S_{M1} = S_1 \times F_V$ = 0.149

$S_{DS} = 2/3 \times S_{MS}$ = 0.256
$S_{D1} = 2/3 \times S_{M1}$ = 0.099

Per 9.4.1.2.1, $15 \le N_{bar} \le 50$, Site Class D

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction.*

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

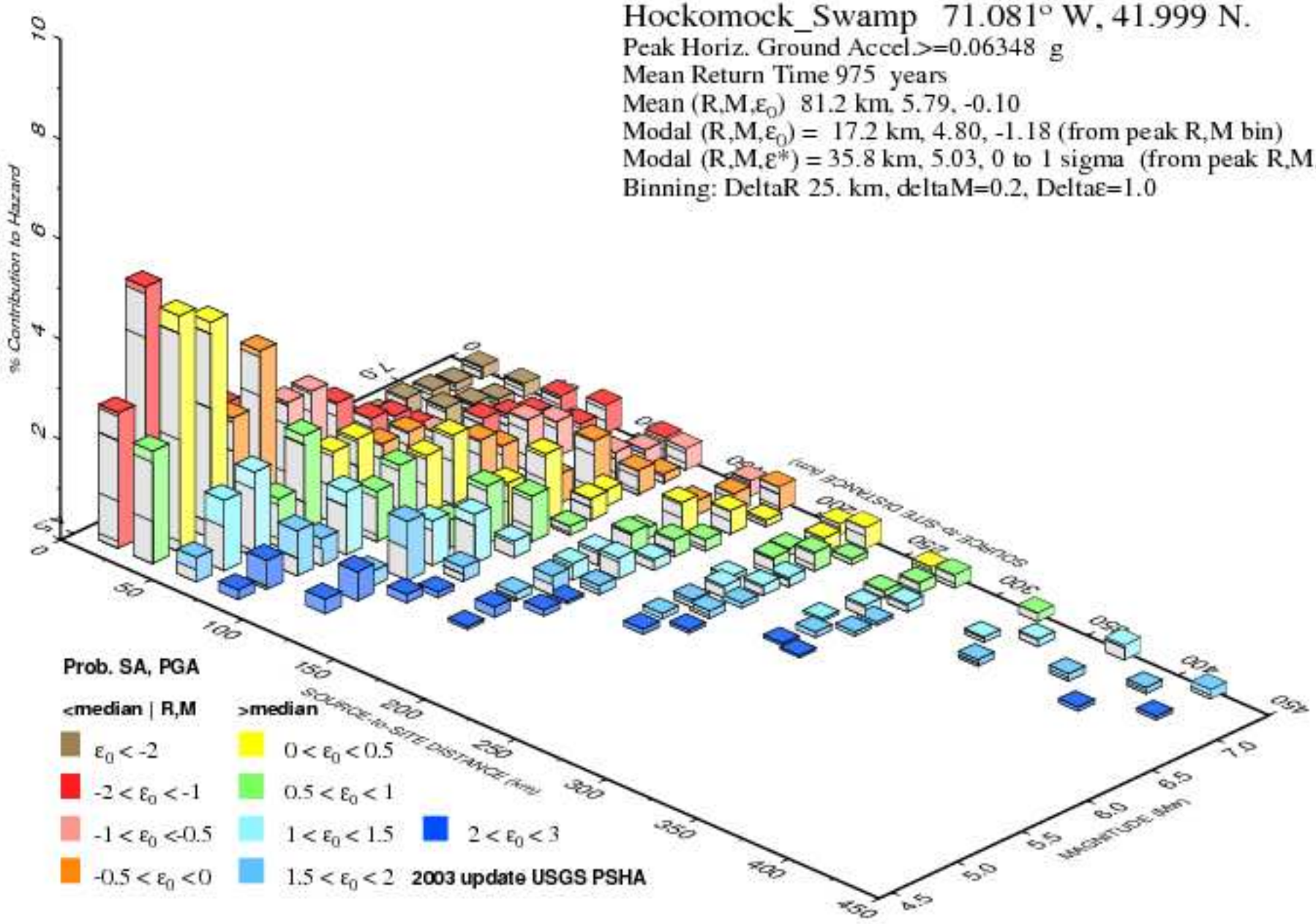
(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Needham	55	100	0.27	0.067
New Ashford	65	90	0.22	0.068
New Bedford	45	110	0.23	0.058
New Braintree	55	100	0.23	0.067
New Marlborough	65	90	0.23	0.066
New Salem	65	100	0.24	0.068
Newbury	55	110	0.35	0.076
Newburyport	55	110	0.35	0.077
Newton	55	105	0.27	0.068
Norfolk	55	100	0.25	0.065
North Adams	65	90	0.22	0.069
North Andover	55	110	0.33	0.075
North Attleborough	55	110	0.24	0.063
North Brookfield	55	100	0.23	0.066
North Reading	55	105	0.32	0.073
Northampton	55	100	0.22	0.066
Northborough	55	100	0.25	0.067
Northbridge	55	100	0.24	0.065
Northfield	65	100	0.24	0.070
Norton	55	110	0.24	0.063
Norwell	45	110	0.26	0.064
Norwood	55	100	0.26	0.065
Oak Bluffs	35	120	0.18	0.051
Oakham	55	100	0.24	0.067
Orange	65	100	0.24	0.070
Orleans	35	120	0.18	0.051
Otis	65	90	0.23	0.066
Oxford	55	100	0.23	0.065
Palmer	55	100	0.23	0.066
Paxton	55	100	0.24	0.067
Peabody	45	110	0.31	0.072
Pelham	55	100	0.23	0.067
Pembroke	45	110	0.25	0.063
Pepperell	65	100	0.30	0.073
Peru	65	90	0.22	0.067
Petersham	65	100	0.24	0.068
Phillipston	65	100	0.24	0.069
Pittsfield	65	90	0.22	0.067
Plainfield	65	100	0.22	0.068
Plainville	55	100	0.24	0.063
Plymouth	45	110	0.24	0.060
Pympton	45	110	0.24	0.061
Princeton	65	100	0.25	0.069
Provincetown	35	120	0.22	0.058
Quincy	45	105	0.27	0.067
Randolph	45	105	0.26	0.065
Raynham	55	110	0.24	0.062
Reading	55	105	0.31	0.072
Rehoboth	55	110	0.24	0.062
Revere	45	105	0.30	0.070
Richmond	65	90	0.22	0.067

Liquefaction Analyses

Prob. Seismic Hazard Deaggregation
Hockomock_Swamp 71.081° W, 41.999 N.

Peak Horiz. Ground Accel.>=0.06348 g
Mean Return Time 975 years
Mean (R,M,ε_0) 81.2 km, 5.79, -0.10
Modal (R,M,ε_0) = 17.2 km, 4.80, -1.18 (from peak R,M bin)
Modal (R,M,ε^*) = 35.8 km, 5.03, 0 to 1 sigma (from peak R,M,ε bin)
Binning: DeltaR 25. km, deltaM=0.2, Deltaε=1.0



*** Deaggregation of Seismic Hazard for PGA & 2 Periods of Spectral Accel. ***
*** Data from U.S.G.S. National Seismic Hazards Mapping Project, 2002 version ***
PSHA Deaggregation. %contributions. site: Hockomock_Swamp long: 71.081 W., lat: 41.999 N.
USGS 2002-03 update files and programs. dM=0.2. Site descr:ROCK
Return period: 975 yrs. Exceedance PGA =0.06348   g.
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.02502

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
16.3	4.60	2.704	0.075	0.481	1.208	0.811	0.124	0.005
35.2	4.60	2.239	0.225	1.177	0.837	0.001	0.000	0.000
58.8	4.61	0.483	0.252	0.231	0.000	0.000	0.000	0.000
81.6	4.61	0.198	0.194	0.004	0.000	0.000	0.000	0.000
17.2	4.80	4.996	0.136	0.871	2.187	1.512	0.279	0.011
36.0	4.80	4.715	0.357	2.115	2.037	0.206	0.000	0.000
60.0	4.81	1.404	0.536	0.865	0.002	0.000	0.000	0.000
83.5	4.81	0.580	0.519	0.062	0.000	0.000	0.000	0.000
114.9	4.82	0.289	0.289	0.000	0.000	0.000	0.000	0.000
17.3	5.03	3.462	0.082	0.534	1.341	1.243	0.251	0.011
36.7	5.03	4.318	0.235	1.489	2.282	0.311	0.000	0.000
60.3	5.04	1.693	0.339	1.244	0.110	0.000	0.000	0.000
83.9	5.03	0.899	0.555	0.344	0.000	0.000	0.000	0.000
116.2	5.05	0.582	0.562	0.020	0.000	0.000	0.000	0.000
16.0	5.21	1.055	0.023	0.151	0.381	0.380	0.113	0.006
35.7	5.21	2.166	0.090	0.574	1.152	0.349	0.000	0.000
61.0	5.21	0.955	0.133	0.662	0.161	0.000	0.000	0.000
84.7	5.21	0.535	0.201	0.335	0.000	0.000	0.000	0.000
111.6	5.21	0.297	0.203	0.093	0.000	0.000	0.000	0.000
131.4	5.21	0.167	0.167	0.000	0.000	0.000	0.000	0.000
164.7	5.21	0.058	0.058	0.000	0.000	0.000	0.000	0.000
17.6	5.39	1.930	0.041	0.277	0.696	0.696	0.206	0.013
37.5	5.39	3.314	0.122	0.775	1.768	0.641	0.008	0.000
61.5	5.40	1.997	0.188	1.148	0.661	0.000	0.000	0.000
85.1	5.40	1.257	0.295	0.961	0.001	0.000	0.000	0.000
118.0	5.41	1.171	0.542	0.629	0.000	0.000	0.000	0.000
137.1	5.37	0.108	0.108	0.000	0.000	0.000	0.000	0.000
165.1	5.42	0.200	0.196	0.004	0.000	0.000	0.000	0.000
16.9	5.61	0.826	0.016	0.117	0.294	0.294	0.097	0.008
37.0	5.62	2.004	0.061	0.386	0.955	0.558	0.044	0.001
62.0	5.62	1.413	0.095	0.603	0.706	0.010	0.000	0.000
85.8	5.62	1.005	0.134	0.737	0.133	0.000	0.000	0.000
116.1	5.62	0.888	0.194	0.691	0.003	0.000	0.000	0.000
134.4	5.60	0.277	0.135	0.142	0.000	0.000	0.000	0.000
161.2	5.63	0.155	0.100	0.055	0.000	0.000	0.000	0.000
178.5	5.61	0.124	0.124	0.000	0.000	0.000	0.000	0.000
15.6	5.80	0.618	0.010	0.085	0.216	0.216	0.082	0.008
36.7	5.80	1.994	0.055	0.350	0.879	0.639	0.070	0.001
61.5	5.81	1.436	0.074	0.469	0.838	0.055	0.000	0.000
85.2	5.80	1.286	0.123	0.763	0.400	0.000	0.000	0.000
110.6	5.83	0.563	0.063	0.403	0.097	0.000	0.000	0.000
126.8	5.79	0.982	0.224	0.758	0.000	0.000	0.000	0.000
168.5	5.81	0.390	0.184	0.206	0.000	0.000	0.000	0.000
177.7	5.80	0.054	0.054	0.000	0.000	0.000	0.000	0.000
217.8	5.82	0.110	0.108	0.002	0.000	0.000	0.000	0.000
13.3	6.01	0.342	0.004	0.046	0.119	0.119	0.047	0.007
36.2	6.01	1.508	0.038	0.240	0.603	0.536	0.089	0.002
61.0	6.01	1.077	0.043	0.271	0.634	0.129	0.000	0.000
85.3	6.01	1.234	0.081	0.512	0.641	0.000	0.000	0.000
118.2	6.01	1.142	0.108	0.683	0.351	0.000	0.000	0.000
134.4	5.99	0.325	0.064	0.261	0.000	0.000	0.000	0.000
164.9	6.02	0.328	0.074	0.254	0.000	0.000	0.000	0.000
181.1	6.00	0.181	0.097	0.085	0.000	0.000	0.000	0.000
213.8	6.02	0.108	0.073	0.035	0.000	0.000	0.000	0.000
230.3	6.00	0.071	0.071	0.000	0.000	0.000	0.000	0.000
19.2	6.21	0.689	0.011	0.092	0.242	0.242	0.093	0.009
40.4	6.21	1.010	0.025	0.158	0.397	0.372	0.057	0.001
60.8	6.21	1.063	0.036	0.231	0.572	0.222	0.002	0.000
84.9	6.21	1.380	0.070	0.447	0.833	0.029	0.000	0.000
114.0	6.23	0.866	0.051	0.326	0.488	0.000	0.000	0.000
130.0	6.20	0.911	0.097	0.544	0.270	0.000	0.000	0.000
163.1	6.24	0.296	0.060	0.197	0.039	0.000	0.000	0.000
177.2	6.20	0.420	0.092	0.328	0.000	0.000	0.000	0.000
215.6	6.24	0.154	0.073	0.081	0.000	0.000	0.000	0.000
226.9	6.20	0.146	0.081	0.065	0.000	0.000	0.000	0.000
264.5	6.24	0.056	0.049	0.007	0.000	0.000	0.000	0.000
276.4	6.20	0.051	0.051	0.000	0.000	0.000	0.000	0.000
17.3	6.42	0.340	0.004	0.042	0.120	0.120	0.048	0.007
38.3	6.42	0.768	0.018	0.113	0.283	0.281	0.071	0.002
61.6	6.42	0.810	0.024	0.151	0.379	0.251	0.006	0.000
85.5	6.42	1.044	0.042	0.265	0.627	0.110	0.000	0.000
121.0	6.43	1.321	0.071	0.451	0.789	0.011	0.000	0.000

136.9	6.39	0.174	0.018	0.105	0.051	0.000	0.000	0.000
167.8	6.43	0.491	0.047	0.300	0.144	0.000	0.000	0.000
182.0	6.41	0.213	0.047	0.167	0.000	0.000	0.000	0.000
218.7	6.43	0.238	0.054	0.184	0.000	0.000	0.000	0.000
229.8	6.41	0.103	0.059	0.044	0.000	0.000	0.000	0.000
268.8	6.43	0.114	0.068	0.046	0.000	0.000	0.000	0.000
18.5	6.59	0.263	0.003	0.032	0.093	0.093	0.037	0.005
40.3	6.59	0.398	0.009	0.058	0.145	0.144	0.041	0.001
60.7	6.59	0.475	0.013	0.082	0.205	0.166	0.009	0.000
85.2	6.59	0.708	0.025	0.156	0.381	0.146	0.000	0.000
114.9	6.59	0.590	0.026	0.165	0.344	0.055	0.000	0.000
133.9	6.59	0.432	0.024	0.151	0.257	0.000	0.000	0.000
160.9	6.59	0.209	0.018	0.094	0.097	0.000	0.000	0.000
179.6	6.60	0.336	0.036	0.198	0.101	0.000	0.000	0.000
210.4	6.59	0.091	0.020	0.064	0.008	0.000	0.000	0.000
228.4	6.59	0.202	0.048	0.154	0.000	0.000	0.000	0.000
260.9	6.60	0.056	0.020	0.036	0.000	0.000	0.000	0.000
279.0	6.59	0.081	0.042	0.039	0.000	0.000	0.000	0.000
18.5	6.78	0.364	0.003	0.041	0.130	0.130	0.052	0.008
40.5	6.78	0.521	0.012	0.074	0.186	0.186	0.061	0.003
61.0	6.78	0.638	0.016	0.103	0.258	0.237	0.024	0.000
85.5	6.78	1.007	0.031	0.197	0.492	0.284	0.003	0.000
121.8	6.79	1.168	0.041	0.259	0.649	0.220	0.000	0.000
129.6	6.77	0.324	0.021	0.131	0.172	0.000	0.000	0.000
169.2	6.80	0.667	0.045	0.258	0.361	0.002	0.000	0.000
185.0	6.76	0.227	0.021	0.127	0.079	0.000	0.000	0.000
219.1	6.80	0.355	0.036	0.229	0.090	0.000	0.000	0.000
230.3	6.76	0.189	0.050	0.139	0.000	0.000	0.000	0.000
269.9	6.80	0.221	0.047	0.174	0.000	0.000	0.000	0.000
278.8	6.76	0.066	0.041	0.025	0.000	0.000	0.000	0.000
332.2	6.80	0.127	0.075	0.052	0.000	0.000	0.000	0.000
387.9	6.79	0.084	0.084	0.000	0.000	0.000	0.000	0.000
17.7	7.00	0.246	0.001	0.024	0.089	0.090	0.036	0.006
40.3	7.00	0.341	0.007	0.047	0.119	0.119	0.045	0.003
60.9	7.00	0.436	0.010	0.066	0.165	0.163	0.031	0.001
85.7	7.00	0.705	0.019	0.121	0.305	0.247	0.013	0.000
117.2	7.01	0.581	0.018	0.112	0.269	0.179	0.003	0.000
131.7	6.99	0.484	0.018	0.116	0.268	0.082	0.000	0.000
160.8	7.02	0.278	0.012	0.078	0.161	0.027	0.000	0.000
181.8	6.99	0.467	0.028	0.175	0.263	0.000	0.000	0.000
211.5	7.03	0.143	0.012	0.063	0.069	0.000	0.000	0.000
228.2	7.00	0.369	0.041	0.220	0.108	0.000	0.000	0.000
263.9	7.03	0.132	0.021	0.092	0.019	0.000	0.000	0.000
279.2	6.99	0.164	0.039	0.125	0.000	0.000	0.000	0.000
319.5	7.02	0.104	0.026	0.079	0.000	0.000	0.000	0.000
367.0	7.01	0.146	0.084	0.062	0.000	0.000	0.000	0.000
415.5	7.00	0.077	0.077	0.000	0.000	0.000	0.000	0.000
17.3	7.18	0.157	0.001	0.014	0.058	0.058	0.023	0.004
40.4	7.18	0.207	0.004	0.029	0.072	0.072	0.028	0.002
60.8	7.19	0.261	0.006	0.038	0.096	0.096	0.024	0.001
85.7	7.18	0.432	0.011	0.070	0.176	0.159	0.016	0.000
121.2	7.19	0.481	0.013	0.082	0.207	0.171	0.008	0.000
131.7	7.18	0.171	0.007	0.045	0.098	0.022	0.000	0.000
170.2	7.18	0.385	0.016	0.102	0.211	0.056	0.000	0.000
187.5	7.19	0.128	0.007	0.044	0.076	0.000	0.000	0.000
219.6	7.19	0.287	0.020	0.112	0.155	0.000	0.000	0.000
234.8	7.19	0.107	0.011	0.061	0.035	0.000	0.000	0.000
271.6	7.19	0.216	0.029	0.135	0.052	0.000	0.000	0.000
337.4	7.19	0.147	0.032	0.115	0.000	0.000	0.000	0.000
396.7	7.19	0.120	0.068	0.052	0.000	0.000	0.000	0.000
17.0	7.39	0.229	0.001	0.018	0.085	0.086	0.034	0.006
40.4	7.38	0.274	0.005	0.038	0.095	0.095	0.038	0.004
60.6	7.39	0.346	0.008	0.050	0.124	0.124	0.039	0.001
85.4	7.38	0.562	0.014	0.087	0.218	0.209	0.034	0.001
117.5	7.40	0.420	0.011	0.070	0.176	0.140	0.023	0.000
130.4	7.37	0.435	0.013	0.083	0.201	0.138	0.000	0.000
164.6	7.41	0.301	0.010	0.062	0.142	0.086	0.001	0.000
181.4	7.37	0.475	0.020	0.127	0.254	0.073	0.000	0.000
213.4	7.42	0.219	0.012	0.075	0.119	0.014	0.000	0.000
229.1	7.37	0.424	0.027	0.155	0.242	0.000	0.000	0.000
264.0	7.42	0.164	0.013	0.071	0.080	0.000	0.000	0.000
278.3	7.37	0.265	0.030	0.150	0.085	0.000	0.000	0.000
322.3	7.41	0.175	0.019	0.122	0.034	0.000	0.000	0.000
370.1	7.39	0.299	0.063	0.236	0.000	0.000	0.000	0.000
418.2	7.38	0.187	0.108	0.079	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Mean src-site R= 81.2 km; M= 5.79; eps0= -0.10. Mean calculated for all sources.
Modal src-site R= 17.2 km; M= 4.80; eps0= -1.18 from peak (R,M) bin

Gridded source distance metrics: Rseis Rrup and Rjb
MODE R*= 35.8km; M*= 5.03; EPS.INTERVAL: 0 to 1 sigma % CONTRIB.= 2.282

Principal sources (faults, subduction, random seismicity having >10% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values)
CEUS gridded seism.	100.00	81.2	5.79	-0.10

Individual fault hazard details if contrib.>1%:

LIQUEFACTION ANALYSIS

Modified 3/14/12

REFERENCE BORING NUMBER ========== HST-1
ELEVATION OF BORING GROUND SURFACE ========== 78.80 FT.
DEPTH TO GROUNDWATER - DURING DRILLING ========== 8.50 FT. (Below Boring Ground Surface)
DEPTH TO GROUNDWATER - DURING EARTHQUAKE ========== 10.50 FT. (Below Finished Grade Cut or Fill Surface)
PEAK HORIZ. GROUND SURFACE ACCELERATION COEFFICIENT (As) ========== 0.110
EARTHQUAKE MOMENT MAGNITUDE ========== 4.8
FINISHED GRADE FILL OR CUT FROM BORING SURFACE ========== 2.00 FT. (Fill Height)
HAMMER EFFICIENCY========== 70 %
BOREHOLE DIAMETER========== 8 IN.
SAMPLING METHOD========== Sampler w/out Liners

EQ MAGNITUDE SCALING FACTOR
(MSF) = **2.701**

AVG. SHEAR WAVE VELOCITY (top 40')
$V_{s,40'}$ = **429** FT./SEC.

PGA CALCULATOR
Earthquake Moment Magnitude = 4.8
Source-To-Site Distance, R (km) = 17.2
Ground Motion Prediction Equations = CEUS
PGA = **0.110**

IF(P22="","",IF(B22>=(K$7+K$12-K$9),"N.L. (1)",IF(OR(G22>=12,AND(H22>0,I22>

	BORING DATA							CONDITIONS DURING DRILLING					CONDITIONS DURING EARTHQUAKE							
ELEV. OF SAMPLE (FT.)	BORING SAMPLE DEPTH (FT.)	SPT N VALUE (BLOWS)	UNCONF. COMPR. STR., Q_u (TSF.)	% FINES < #200 (%)	PLAST. INDEX PI	LIQUID LIMIT LL	MOIST. CONTENT w_c (%)	EFFECTIVE UNIT WT. (KCF.)	VERT. STRESS (KSF.)	CORR. SPT N VALUE $(N_1)_{60}$	EQUIV. CLN. SAND SPT N VALUE $(N_1)_{60cs}$	CRR RESIST. MAG 7.5 $CRR_{7.5}$	EFFECTIVE UNIT WT. (KCF.)	VERT. STRESS (KSF.)	TOTAL VERT. STRESS (KSF.)	OVER-BURDEN CORR. FACT. (Ks)	CORR. RESIST. $CRR_{7.5}$ CRR	SOIL MASS PART. FACTOR (r_d)	EQ INDUCED CSR	FACTOR OF SAFETY * CRR/CSR
77.8	1	35		75				0.133	0.133	77.833	98.400	0.708	0.133	0.373	0.373	1.500	**2.870**	0.963	**0.069**	**N.L. (1)**
72.8	6	28		0				0.130	0.783	51.347	51.347	0.318	0.130	1.023	1.023	1.338	**1.149**	0.886	**0.063**	**N.L. (1)**
67.8	11	10		0				0.061	1.088	16.225	16.225	0.173	0.061	1.328	1.484	1.135	**0.529**	0.791	**0.063**	**8.397 (D)**
62.8	16	10		0				0.061	1.393	16.065	16.065	0.171	0.061	1.633	2.101	1.073	**0.495**	0.686	**0.063**	**7.857 (D)**
57.8	21	9		10				0.060	1.693	13.745	14.911	0.159	0.060	1.933	2.713	1.025	**0.440**	0.587	**0.059**	**7.458 (D)**
52.8	26	1		10				0.043	1.908	1.482	2.384	0.055	0.043	2.148	3.240	0.997	**0.148**	0.502	**0.054**	**2.741 (C)**
47.8	31	3		10				0.051	2.163	4.252	5.213	0.074	0.051	2.403	3.807	0.975	**0.194**	0.439	**0.050**	**3.880 (C)**
42.8	36	16		0				0.065	2.488	22.306	22.306	0.246	0.065	2.728	4.444	0.925	**0.616**	0.394	**0.046**	**13.391 (D)**
37.8	41	19		0				0.067	2.823	25.354	25.354	0.299	0.067	3.063	5.091	0.886	**0.716**	0.365	**0.043**	**N.L. (3)**
32.8	46	49		0				0.075	3.198	68.566	68.566	0.474	0.075	3.438	5.778	0.824	**1.055**	0.346	**0.042**	**N.L. (3)**
27.8	51	135		0				0.086	3.628	######	176.542	1.296	0.086	3.868	6.520	0.786	**2.752**	0.335	**0.040**	**N.L. (3)**
22.8	56	53		0				0.076	4.008	65.495	65.495	0.448	0.076	4.248	7.212	0.757	**0.917**	0.328	**0.040**	**N.L. (3)**
18.8	60	100		0				0.083	4.340	######	117.782	0.856	0.083	4.580	7.794	0.735	**1.698**	0.324	**0.039**	**N.L. (3)**

* FACTOR OF SAFETY DESCRIPTIONS

N.L. (1) = NOT LIQUEFIABLE, ABOVE EQ GROUND WATER ELEVATION
N.L. (2) = NOT LIQUEFIABLE, PI $\geq$ 12 OR w_c/LL $\leq$ 0.85
N.L. (3) = NOT LIQUEFIABLE, $(N_1)_{60} > 25$
(C) = CONTRACTIVE SOIL TYPES
(D) = DILATIVE SOIL TYPES

LIQUEFACTION ANALYSIS

Modified3/14/12

REFERENCE BORING NUMBER ==========: HST-4
ELEVATION OF BORING GROUND SURFACE ==========: 70.50 FT.
DEPTH TO GROUNDWATER - DURING DRILLING ==========: 4.40 FT. (Below Boring Ground Surface)
DEPTH TO GROUNDWATER - DURING EARTHQUAKE ==========: 6.40 FT. (Below Finished Grade Cut or Fill Surface)
PEAK HORIZ. GROUND SURFACE ACCELERATION COEFFICIENT (As) =====: 0.110
EARTHQUAKE MOMENT MAGNITUDE ==========: 4.8
FINISHED GRADE FILL OR CUT FROM BORING SURFACE ==========: 2.00 FT. (Fill Height)
HAMMER EFFICIENCY==========: 70 %
BOREHOLE DIAMETER==========: 8 IN.
SAMPLING METHOD==========: Sampler w/out Liners

EQ MAGNITUDE SCALING FACTOR
(MSF) = 2.701

AVG. SHEAR WAVE VELOCITY (top 40')
$V^{*}_{s,40'}$ = 454 FT./SEC.

PGA CALCULATOR
Earthquake Moment Magnitude = 4.8
Source-To-Site Distance, R (km) = 17.2
Ground Motion Prediction Equations = CEUS
PGA = 0.110

IF(P22="","",IF(B22>=(K$7+K$12-K$9),"N.L. (1)",IF(OR(G22>=12,AND(H22>0,I22>

	BORING DATA							CONDITIONS DURING DRILLING					CONDITIONS DURING EARTHQUAKE							
ELEV. OF SAMPLE (FT.)	BORING SAMPLE DEPTH (FT.)	SPT N VALUE (BLOWS)	UNCONF. COMPR. STR., Q_u (TSF.)	% FINES < #200 (%)	PLAST. INDEX PI	LIQUID LIMIT LL	MOIST. CONTENT w_c (%)	EFFECTIVE UNIT WT. (KCF.)	VERT. STRESS (KSF.)	CORR. SPT N VALUE $(N_1)_{60}$	EQUIV. CLN. SAND SPT N VALUE $(N_1)_{60cs}$	CRR RESIST. MAG 7.5 $CRR_{7.5}$	EFFECTIVE UNIT WT. (KCF.)	VERT. STRESS (KSF.)	TOTAL VERT. STRESS (KSF.)	OVER-BURDEN CORR. FACT. (Ks)	CORR. RESIST. $CRR_{7.5}$ CRR	SOIL MASS PART. FACTOR (r_d)	EQ INDUCED CSR	FACTOR OF SAFETY * CRR/CSR
69.5	1	3		10				0.105	0.105	5.645	6.636	0.085	0.105	0.345	0.345	1.465	**0.335**	0.970	**0.069**	N.L. (1)
64.5	6	51		5			74	0.076	0.485	######	102.726	0.741	0.076	0.725	0.825	1.500	**3.004**	0.904	**0.074**	N.L. (3)
59.5	11	5		10				0.055	0.760	8.693	9.751	0.111	0.055	1.000	1.412	1.189	**0.356**	0.820	**0.083**	**4.289 (C)**
54.5	16	3		6				0.051	1.015	5.243	5.298	0.074	0.051	1.255	1.979	1.112	**0.223**	0.724	**0.082**	**2.720 (C)**
49.5	21	4		10				0.053	1.280	6.769	7.784	0.094	0.053	1.520	2.556	1.075	**0.273**	0.626	**0.075**	**3.640 (C)**
44.5	26	5		10				0.055	1.555	8.051	9.094	0.105	0.055	1.795	3.143	1.038	**0.295**	0.540	**0.068**	**4.338 (C)**
39.5	31	8		80	0			0.059	1.850	12.146	19.576	0.210	0.059	2.090	3.750	1.004	**0.570**	0.472	**0.061**	**9.344 (D)**
34.5	36	15		90	10			0.065	2.175	22.298	31.758	0.677	0.065	2.415	4.387	0.953	**1.742**	0.424	**0.055**	**31.673 (D)**
29.5	41	14		90	19	40	40	0.064	2.495	19.291	28.149	0.375	0.064	2.735	5.019	0.916	**0.928**	0.391	**0.051**	N.L. (2)
24.5	46	20		90	20			0.067	2.830	26.995	37.394	-0.022	0.067	3.070	5.666	0.862	**-0.052**	0.370	**0.049**	N.L. (2)
19.5	51	16		90	20			0.065	3.155	19.713	28.656	0.395	0.065	3.395	6.303	0.849	**0.905**	0.357	**0.047**	N.L. (2)
14.5	56	14		100	20			0.064	3.475	16.058	24.270	0.278	0.064	3.715	6.935	0.835	**0.628**	0.349	**0.047**	N.L. (2)
9.5	61	20		10				0.067	3.810	22.519	23.875	0.271	0.067	4.050	7.582	0.814	**0.596**	0.344	**0.046**	**12.957 (D)**

* FACTOR OF SAFETY DESCRIPTIONS

N.L. (1) = NOT LIQUEFIABLE, ABOVE EQ GROUND WATER ELEVATION
N.L. (2) = NOT LIQUEFIABLE, PI $\geq$ 12 OR $w_c/LL \leq 0.85$
N.L. (3) = NOT LIQUEFIABLE, $(N_1)_{60} > 25$
(C) = CONTRACTIVE SOIL TYPES
(D) = DILATIVE SOIL TYPES

LIQUEFACTION ANALYSIS

Modified 3/14/12

REFERENCE BORING NUMBER ========== HST-9
ELEVATION OF BORING GROUND SURFACE ========== 71.60 FT.
DEPTH TO GROUNDWATER - DURING DRILLING ========== 4.08 FT. (Below Boring Ground Surface)
DEPTH TO GROUNDWATER - DURING EARTHQUAKE ========== 6.08 FT. (Below Finished Grade Cut or Fill Surface)
PEAK HORIZ. GROUND SURFACE ACCELERATION COEFFICIENT (As) ========== 0.110
EARTHQUAKE MOMENT MAGNITUDE ========== 4.8
FINISHED GRADE FILL OR CUT FROM BORING SURFACE ========== 2.00 FT. (Fill Height)
HAMMER EFFICIENCY========== 70 %
BOREHOLE DIAMETER========== 8 IN.
SAMPLING METHOD========== Sampler w/out Liners

EQ MAGNITUDE SCALING FACTOR
(MSF) = **2.701**

AVG. SHEAR WAVE VELOCITY (top 40')
$V_{s,40'}$ = **389** FT./SEC.

PGA CALCULATOR
Earthquake Moment Magnitude = 4.8
Source-To-Site Distance, R (km) = 17.2
Ground Motion Prediction Equations = CEUS
PGA = **0.110**

IF(P22="","",IF(B22>=(K$7+K$12-K$9),"N.L. (1)",IF(OR(G22>=12,AND(H22>0,I22>

	BORING DATA							CONDITIONS DURING DRILLING						CONDITIONS DURING EARTHQUAKE							
ELEV. OF SAMPLE (FT.)	BORING SAMPLE DEPTH (FT.)	SPT N VALUE (BLOWS)	UNCONF. COMPR. STR., Q_u (TSF.)	% FINES < #200 (%)	PLAST. INDEX PI	LIQUID LIMIT LL	MOIST. CONTENT w_c (%)	EFFECTIVE UNIT WT. (KCF.)	EFFECTIVE VERT. STRESS (KSF.)	CORR. SPT N VALUE $(N_1)_{60}$	EQUIV. CLN. SAND SPT N VALUE $(N_1)_{60cs}$	CRR RESIST. MAG 7.5 $CRR_{7.5}$	EFFECTIVE UNIT WT. (KCF.)	EFFECTIVE VERT. STRESS (KSF.)	TOTAL VERT. STRESS (KSF.)	OVER-BURDEN CORR. FACT. (Ks)	CORR. RESIST. $CRR_{7.5}$ CRR	SOIL MASS PART. FACTOR (r_d)	EQ INDUCED CSR	FACTOR OF SAFETY * CRR/CSR
70.6	1	10		5				0.118	0.118	20.014	20.014	0.216	0.118	0.358	0.358	1.500	**0.874**	0.951	**0.068**	N.L. (1)
65.6	6	66		5				0.078	0.508	######	131.937	0.962	0.078	0.748	0.868	1.500	**3.898**	0.851	**0.071**	N.L. (3)
60.6	11	19		20				0.067	0.843	36.961	43.512	0.212	0.067	1.083	1.515	1.308	**0.751**	0.738	**0.074**	N.L. (3)
55.6	16	2		90			409	0.048	1.083	3.430	9.116	0.105	0.048	1.323	2.067	1.112	**0.317**	0.624	**0.070**	**4.529 (C)**
50.6	21	8		10				0.059	1.378	13.199	14.354	0.154	0.059	1.618	2.674	1.072	**0.445**	0.523	**0.062**	**7.177 (D)**
45.6	26	3		90	0			0.051	1.633	4.740	10.688	0.119	0.051	1.873	3.241	1.030	**0.332**	0.444	**0.055**	**6.036 (C)**
40.6	31	1		99	0		66.5	0.043	1.848	1.519	6.823	0.086	0.043	2.088	3.768	1.003	**0.234**	0.387	**0.050**	**4.680 (C)**
35.6	36	11		10				0.062	2.158	15.852	17.064	0.182	0.062	2.398	4.390	0.967	**0.474**	0.349	**0.046**	**10.304 (D)**
30.6	41	30		90	15			0.071	2.513	46.555	60.866	0.409	0.071	2.753	5.057	0.901	**0.995**	0.325	**0.043**	N.L. (2)
25.6	46	33		90	15			0.072	2.873	48.350	63.020	0.427	0.072	3.113	5.729	0.858	**0.990**	0.310	**0.041**	N.L. (2)
20.6	51	38		90	25			0.073	3.238	53.045	68.654	0.475	0.073	3.478	6.406	0.820	**1.052**	0.300	**0.040**	N.L. (2)
15.6	56	35		80	20			0.072	3.598	44.924	58.909	0.391	0.072	3.838	7.078	0.789	**0.834**	0.295	**0.039**	N.L. (2)
10.6	61	123		10				0.085	4.023	######	156.052	1.143	0.085	4.263	7.815	0.756	**2.334**	0.291	**0.038**	N.L. (3)

* FACTOR OF SAFETY DESCRIPTIONS

N.L. (1) = NOT LIQUEFIABLE, ABOVE EQ GROUND WATER ELEVATION
N.L. (2) = NOT LIQUEFIABLE, PI $\geq$ 12 OR $w_c/LL \leq 0.85$
N.L. (3) = NOT LIQUEFIABLE, $(N_1)_{60} > 25$
(C) = CONTRACTIVE SOIL TYPES
(D) = DILATIVE SOIL TYPES

Appendix 4.17-B

Station Stormwater Analyses

Stormwater Report

North Easton Station

Town of Stoughton/Easton, Massachusetts

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

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Table of Contents

Checklist for Stormwater Report **1**
Stormwater Report Narrative **2**
Project Description **2**
Site Description **2**
Existing Drainage Conditions **3**
Proposed Drainage Conditions **4**
Regulatory Compliance **12**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas

List of Tables

Table 1: Wetland Resource Areas
Table 2: Existing Conditions Hydrologic Data
Table 3: Proposed Conditions Hydrologic Data
Table 4: Peak Discharge Rates (cfs)
Table 5 Summary of Recharge Calculations

Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

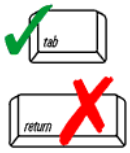
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☒ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

The Applicant, Massachusetts Bay Transportation Authority, is proposing to construct a train station located at 21 Washington Street Stoughton and Easton, Massachusetts. This station will be known as the North Easton Station and is proposed along the existing Stoughton Railroad Line (the Project). As proposed, the Project consists of approximately 10.0-acres of land acquisition, of which approximately 9-acres will be developed for the new station.

The Project will entail the construction of a center platform with canopy, a parking lot with 506 spaces, access driveway, a bus stop drop-off area, a center platform, sidewalks, stairs and ramps associated with access from the parking lot to the platform, bicycle parking facilities, retaining walls and stormwater infrastructure.

The site is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 310 CMR 10.04 and 314 CMR 9.02 because it is a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Site Description

The Project Site is located at 21 Washington Street on the Stoughton/Easton Town line in Massachusetts. The Site is bounded by undeveloped land to the north, a wetland to the south, office buildings to the east, and the existing but abandoned Stoughton Line tracks to the west. See Figure 1, Site Locus Map.

Wetland Resource Areas on the Site, shown on Figures 3 and 4, are described in Table 1. For additional information regarding the wetland resource areas present on the site see the Abbreviated Notice of Resource Area Delineation prepared by VHB dated May 2011.

Table 1:
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*Description*
Wetland ST-10 (100 Series)	No	No	No	No	PFO
Wetland ST-149.3	No	No	No	No	PFO
Wetland EA1 (100 Series)	No	No	No	No	PFO

Notes: Wetland Classifications: PEM = Palustrine Emergent, PFO = Palustrine Forested

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Merrimac Fine Sandy Loam, Hinckley Sandy Loam, Woodbridge Fine Sandy Loam, Paxton Fine Sandy Loam, Scarboro and Birdsall, and Whitman Fine Sandy Loam. On-site soils are classified as Hydrologic Soil Groups (HSG) A, A, C, C, C, D, and D respectively.

The project is not located within the 100-year flood plain as shown on the FEMA Floodway Map, Town of Stoughton, Massachusetts Norfolk County, Community Panel Number 2502530004B, dated June 1, 1982 and the FEMA Floodway Map, Bristol County, Massachusetts (All Jurisdictions), Map Number 25005C0053F, dated July 7, 2009 included in Appendix B.

Existing Drainage Conditions

Under existing conditions, the Site is a vacant wooded area with a small paved area that is used to store construction equipment and material. For the existing conditions hydrologic analysis, the site was divided into four drainage areas that contribute to three design points. Additional there is an existing wetland onsite that acts as a detention pond for a portion of the site. The following is a summary of each drainage area.

Drainage Area 1 – This 1.55-acre area in the northern portion of the site consists mainly of an undeveloped wooded area. There is also a small area comprised of dirt cover. Runoff from this area flows in a northerly direction to Wetland ST-10 (100 Series) (Design Point 1). When the wetland overflows, runoff flows through a culvert under the tracks to the west.

Drainage Area 2 – This 7.28-acre area in the center of the site consists mainly of paved area used to store construction equipment and materials. There are small wooded areas located among the pavement. Runoff from this area flows untreated in a westerly direction to Wetland ST-149.3 located on the western side of the site, between the site and the existing train tracks. This wetland acts as an existing pond that when overflows travel overland to the south into Wetland EA1 (100 Series) (Design Point 3).

Drainage Area 3 – This 3.19-acre area in the southern portion of the site consists mainly of open space and woods. There are also small areas of gravel access drives

and utility infrastructure. The existing detention basin, which takes runoff from the retail/office development, is not included in this analysis. Runoff from the basin is directed to the Wetland. Runoff from this area flows directly into Wetland EA1 (100 Series) (Design Point 3).

Drainage Area 4 – This 0.65-acre area in the southern portion of the site consists mainly of open space and woods. Runoff from this area flows directly into Wetland EA1 (100 Series) (Design Point 4).

Figure 3 illustrates the existing drainage patterns on the Site. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2:
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland ST-10 (100 Series)	1	1.55	67	8.5
2	Wetland ST-149.3	3	7.28	75	9.2
3	Wetland EA1 (100 Series)	3	3.19	62	14.8
4	Wetland EA1 (100 Series)	4	0.65	81	5.0

Proposed Drainage Conditions

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into nine (9) drainage areas that discharge treated stormwater to the three existing Design Points. Existing drainage and grading patterns were maintained to the maximum extent possible. Stormwater management techniques have been incorporated into the design. These BMPs are focused on decentralizing stormwater management and reduce peak runoff rates, maximize groundwater recharge and treat for water quality. The following is a summary of each drainage area.

Drainage Area 1 – This 1.34-acre area in the northern portion of the site consists of an undeveloped wooded area. It will generally remain in its existing condition. Runoff from this area flows directly to Wetland ST-10 (Design Point 1).

Drainage Area 2 – This 1.42-acre area in the northern portion of the site consists of a portion of the paved parking area for the station, some undeveloped wooded area, and Bioretention Basin 1 to the north of the parking. Runoff from this area sheet flows across the parking area and is then carried via a grassed channel to Bioretention Basin 1, which discharges to Wetland ST-10 (Design Point 1).

Drainage Area 3 – This 2.10-acre area in the central portion of the site consists of the eastern portion of the paved parking area for the station, some undeveloped wooded area, and some ancillary landscape areas. Runoff from the parking area will sheet flow into deep sump hooded catch basins and travel through the closed drainage system passing through a oil/grit separator prior to discharging to a sediment forebay, and terminating in Infiltration Basin 2. Basin 2 discharges to Wetland EA1 (Design Point 3).

Drainage Area 4 - This 0.13-acre area in the central portion of the site consists of paved access drive for the station parking, some ancillary landscape areas and Infiltration Basin 2. Runoff from the access drive will flow into a deep sump hooded catch basin and travel through the closed drainage system passing through a oil/grit separator prior to discharging to a sediment forebay, and terminating in Infiltration Basin 2, which discharges to the rail swale to Wetland EA1 (Design Point 3).

Drainage Area 5 – This 0.30-acre area in the southeastern portion of the site consists of a paved access drive for the station parking and some ancillary landscape area. Runoff from this area sheet flows to a deep sump hooded catch basin and travels through the closed drainage system prior to discharging to a sediment forebay and terminating in Infiltration Basin 3, which discharges through a closed drainage system to Wetland EA1 (Design Point 3).

Drainage Area 6 - This 1.26-acre area in the south portion of the site consists of a paved exit drive for the station parking, some ancillary landscape area, and Infiltration Basin 4. Runoff from this area flows to a deep sump hooded catch basin and travels through the closed drainage system prior to discharging to a sediment forebay and terminating in Infiltration Basin 4, which discharges to the rail swale to Wetland EA1 (Design Point 3).

Drainage Area 7 - This 2.80-acre area in the central portion of the site consists of the western portion of the paved parking area for the station, some undeveloped wooded area, and some ancillary landscape areas. Wetland 149.3 will be filled and replicated at an offsite location. Runoff from the parking area will sheet flow into deep sump hooded catch basins and travel through the closed drainage system passing through a oil/grit separator prior to discharging to a sediment forebay, and terminating in Infiltration Basin 5, which discharges directly to Wetland EA1 (Design Point 3).

Drainage Area 8 – This 0.55-acre area in the southern portion of the site consists of landscape area and some undeveloped wooded areas. Runoff from this area flows directly to Wetland EA1 (Design Point 4).

Drainage Area 9 – This 1.49-acre area in the southern portion of the site consists of landscape area, existing leaching basin, and Infiltration Basin 5. Runoff from this area flows directly to Infiltration Basin 5, which discharges directly to Wetland EA1 (Design Point 3).

Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3:
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland ST-10	1	1.34	70	14.6
2	Wetland ST-10	1	1.42	75	15.0
3A	Wetland EA1	3	1.50	78	16.8
3B	Wetland EA1	3	0.60	98	5.0
4	Wetland EA1	3	0.13	82	5.0
5	Wetland EA1	3	0.30	92	5.0
6	Wetland EA1	3	1.26	77	5.0
7	Wetland EA1	3	2.80	95	5.0
8	Wetland EA1	4	0.55	81	6.7
9	Wetland EA1	3	1.49	68	7.3

Integrated into the site design is a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. Because the Project is located within an area of rapid infiltration and is considered a LUHPPL, the proposed stormwater management system has been designed to treat the one inch Water Quality Volume and provide 44% Total Suspended Solids (TSS) pretreatment prior to infiltration.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Infiltration basins
- Bioretention basin
- Minimal disturbance to existing trees and vegetation
- Grassed swales
- Oil/grit separator
- Light colored pavement sidewalks

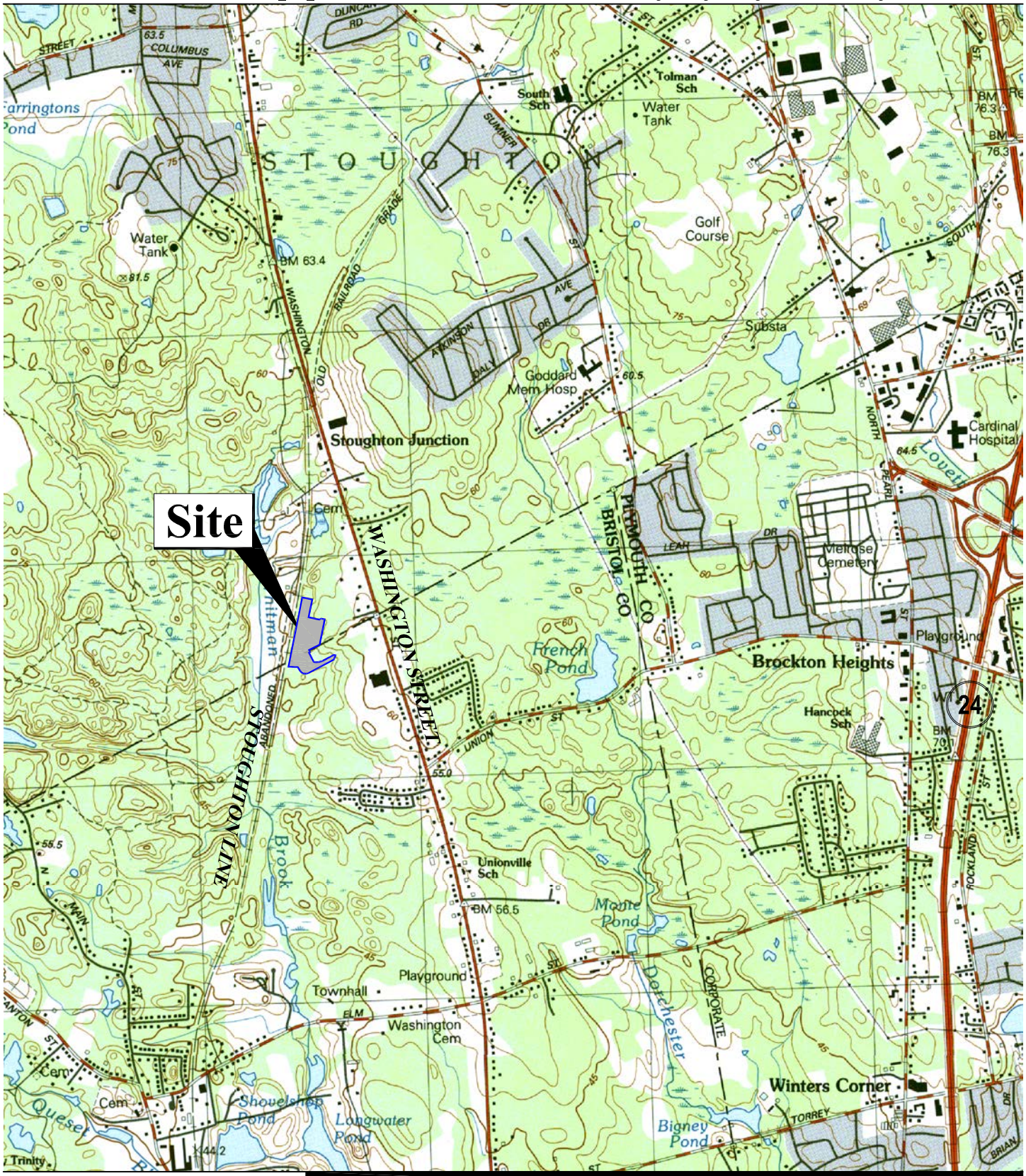
In general stormwater runoff from the northern portion of the site sheet flows off of the impervious surface and is conveyed via a grassed swale to a Bioretention basin. Stormwater runoff from the southern portion of the site is collected in deep sump hooded catch basins and travels through the closed drainage system and passes through an oil/ grit separator prior to discharging to the sediment forebays, and terminating at the infiltration basins. Wooded areas in the northern portion of the property are to be maintained in their existing conditions as much as possible.

Hydraulic Analysis

The closed drainage system was designed for the 25-year storm event, in accordance with the Massachusetts Bay Transportation Authority, Railroad Operations, Commuter Rail Design Standards Manual, Volume 1.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Pipe sizing calculations are included in Appendix A of this Stormwater Report.

\\mabosdata\PROJECTS\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\North Easton\Stormwater Figures\Figure 1\Figure 1-Site Locus.dwg



Vanasse Hangen Brustlin, Inc.

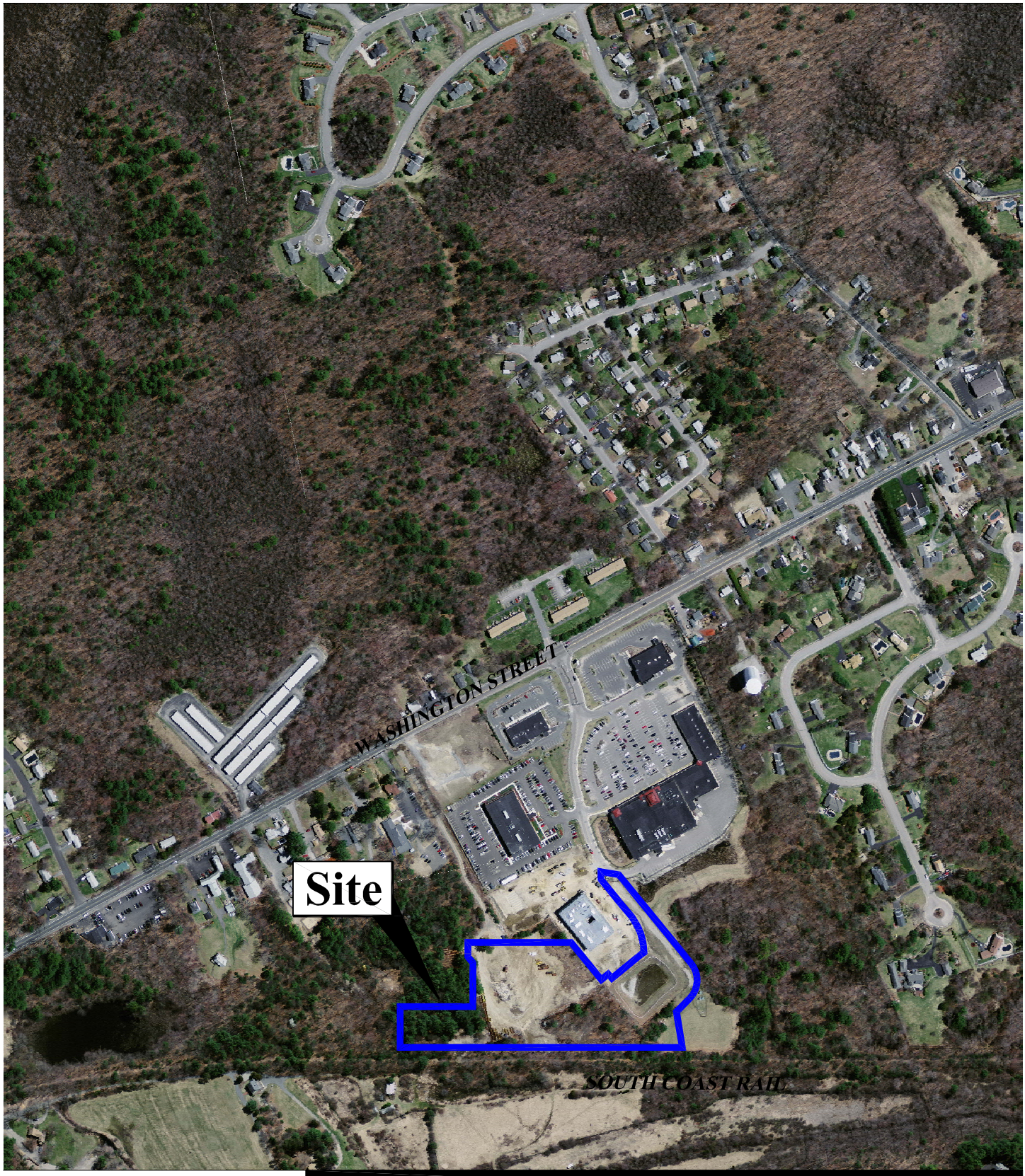
0 1000 2000 Feet

USGS Locus Map

North Easton Station
South Coast Rail
Stoughton/Easton, Massachusets

Figure 1
May 2012

\\mabosdata\PROJECTS\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\North Easton\Stormwater Figures\Figure 2\Figure 2-Site Aerial.dwg



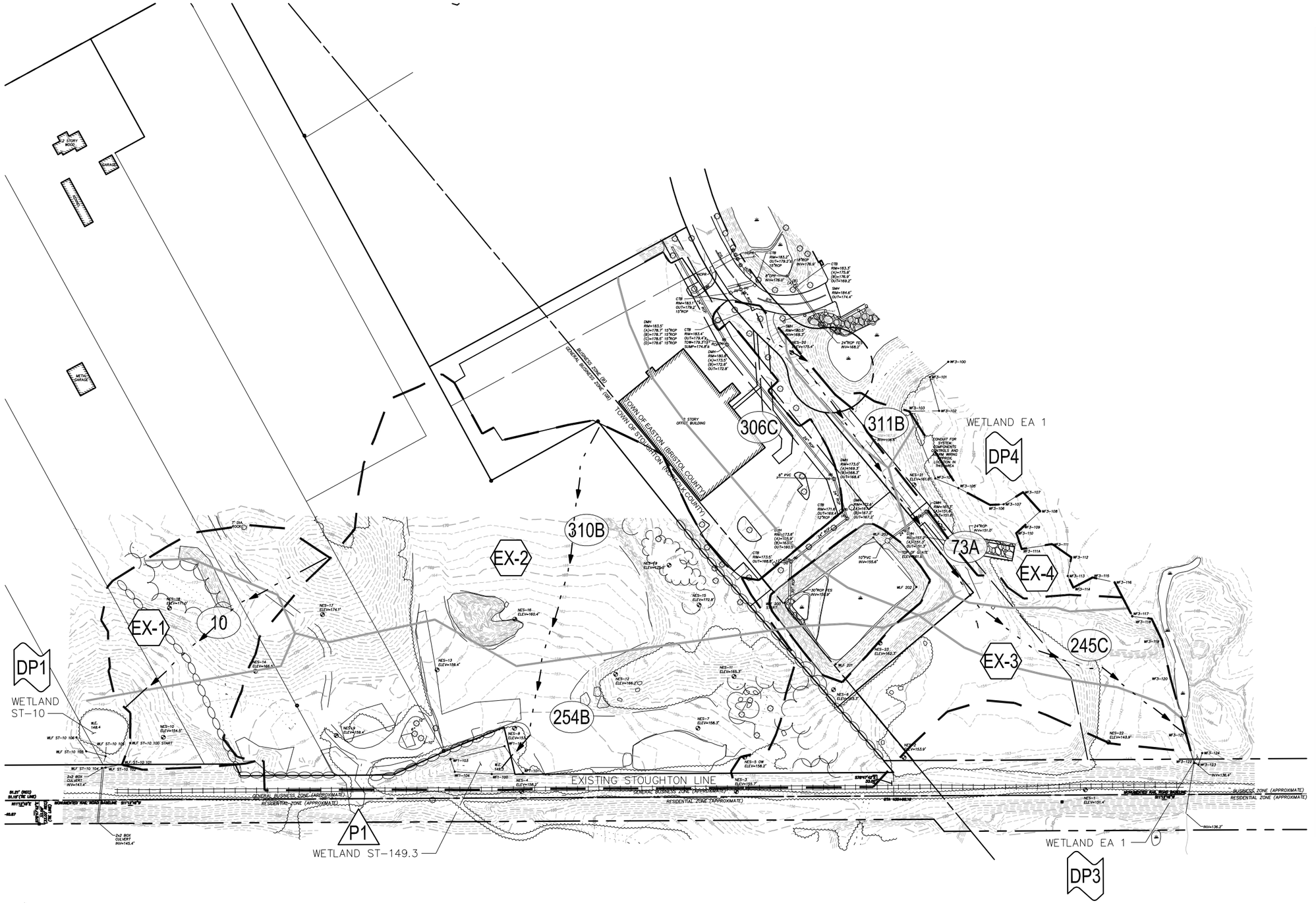
Vanasse Hangen Brustlin, Inc.

Site Aerial Map

Figure 2
May 2012

North Easton Station
South Coast Rail
Stoughton/Easton, Massachusets

0 250 500 Feet



0 70 140 Feet

LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — POND
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

- 10 — SCARBORO AND BIRDSALL SOIL (D)
- 73A — WHITMAN FINE SANDY LOAM (D)
- 245C — HINCKLEY SANDY LOAM (A)
- 254B — MERRIMAC FINE SANDY LOAM (A)
- 306C — PAXTON FINE SANDY LOAM (C)
- 310B — WOODBRIDGE FINE SANDY LOAM (C)
- 311B — WOODBRIDGE FINE SANDY LOAM (C)

Vanasse Hangen Brustlin, Inc.

Figure 3 May 2012

Existing Conditions Drainage Areas
South Coast Rail
North Easton Station
Stoughton/Easton, Massachusetts

ROCHE BROS. WAY

PR-1
PR-2
PR-3
PR-4
PR-5
PR-6
PR-7
PR-8
PR-9

DP1
WETLAND ST-10

P1
BIORETENTION BASIN 1

P2
DETENTION BASIN 2

P3
INFILTRATION BASIN 3

DP4
WETLAND EA 1

P4
INFILTRATION BASIN 4

P5
INFILTRATION BASIN 5

DP3
WETLAND EA 1

0 70 140 Feet

LEGEND

- SUBCATCHMENT DRAINAGE AREA DESIGNATION
- POND
- DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- LIMIT OF ACQUISITION
- LIMIT OF WORK

Vanasse Hangen Brustlin, Inc.

Figure 4 May 2012

Proposed Conditions Drainage Areas
South Coast Rail
North Easton Station
Stoughton/Easton, Massachusetts

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMP's that impound stormwater have been designed with stone to protect down gradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4:
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point 1: Wetland ST-10			
Existing	1.14	2.60	5.48
Proposed	1.03	2.16	4.34
Design Point 3: Wetland EA1			
Existing	1.17	3.28	8.97
Proposed	0.76	2.77	7.78
Design Point 4: Wetland EA1			
Existing	1.28	2.18	3.75
Proposed	1.03	1.76	3.01

* cubic feet per second

Standard 3: Stormwater Recharge

The Project has been designed to fully comply with Standard 3.

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is 6,926 cubic feet.

Recharge of stormwater has been provided through the use of infiltration basins which have been sized using the static method. Each infiltration BMP has been designed to drain completely within 72 hours. Table 5 below provides a summary of the proposed infiltration BMPs utilized for the Project.

Table 5
Summary of Recharge Calculations

Infiltration BMP	*Provided Recharge Volume (cubic feet)*
Bioretention Basin 1	7,829
Infiltration Basin 3	947
Infiltration Basin 4	5,356
Infiltration Basin 5	10,896
Total Provided Recharge	25,028
Total Required Recharge	6,926

A Geotechnical Report that describes subsurface soil conditions is included as an appendix to this report.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide a minimum of 80% TSS removal for stormwater runoff from all proposed impervious surfaces as well as 44% pretreatment prior to infiltration BMPs.

Computations and supporting information are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is considered a LUHPPL as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is a parking lot with a high-intensity use (1,000 vehicle trips per day or more). Therefore has been designed with suitable BMPs sized to treat the 1-inch Water Quality Volume and provide the pretreatment requirement of 44% TSS removal prior to infiltration. Proposed source controls and pollution prevention measures will be identified in the Long-Term Pollution Prevention Plan.

For computations and supporting information regarding the sizing of BMPs suitable for treatment of runoff from LUHPPLs, see Appendix D.

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is a redevelopment, but has still been designed to fully comply with all ten of the Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 9.0 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIR/S. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

The site was previously undeveloped and no sanitary sewer or storm drainage infrastructure is known to exist on the site. The design plans submitted with this report have been designed in full compliance with current standards. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

Appendix A
Standard 1 Computations and Supporting Information

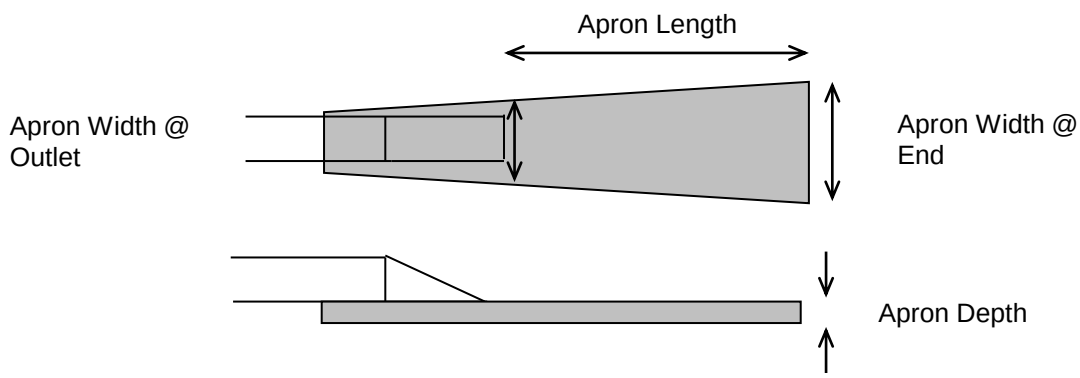
Stone Outlet Protection

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
Checked by:	VHB	Date:	
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
Massachusetts Department of Environmental Protection - Reprinted 2003 (pp. 118-120)

Erosion and Sediment Control Handbook - Third Edition 1992 (Chapter 3.18)
Virginia Department of Conservation and Recreation (DCR)

Attachments: Virginia DCR Erosion and Sediment Control Handbook Plate 3.18-3



Apron Width at Outlet:	Width = 3 x pipe dia. (or width of channel)	
Apron Length:	Length = From Virginia DCR Handbook - Plate 3.18-3	if Tw depth is < 1/2 dia.
	Length = From Virginia DCR Handbook - Plate 3.18-4	if Tw dwpth is >= 1/2 dia.
Apron Width at End:	Width = dia. + apron length	if Tw depth is < 1/2 dia.
	Width = dia. + 0.4 x apron length	if Tw dwpth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES A2
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	12
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	1.3
Apron Width (outlet), ft	3
Apron Length, ft	10
Apron Width (end), ft	11
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
Checked by:	VHB	Date:	
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Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
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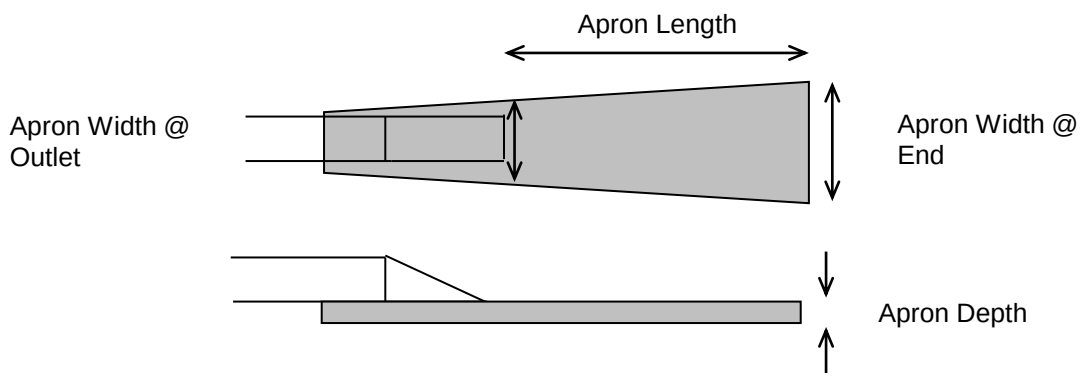

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Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES B8
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	15
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	5.8
Apron Width (outlet), ft	4
Apron Length, ft	10
Apron Width (end), ft	11
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
Checked by:	VHB	Date:	
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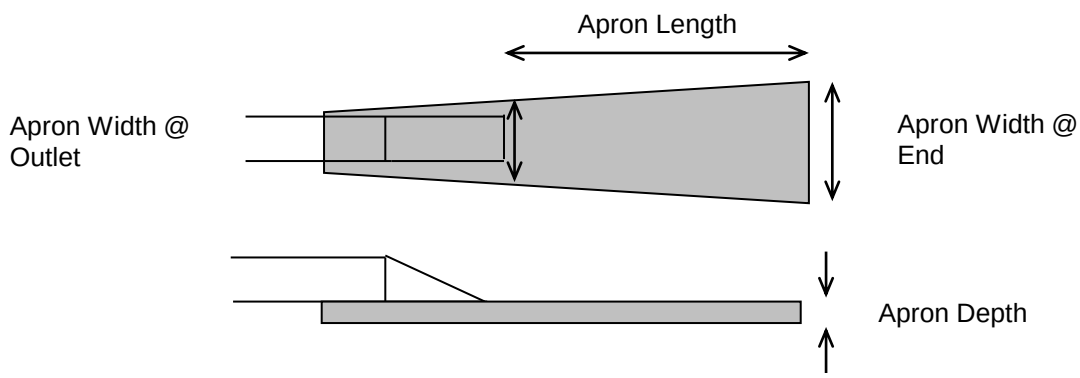

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Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES C10
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	21
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	11.7
Apron Width (outlet), ft	5
Apron Length, ft	10
Apron Width (end), ft	12
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
Checked by:	VHB	Date:	
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
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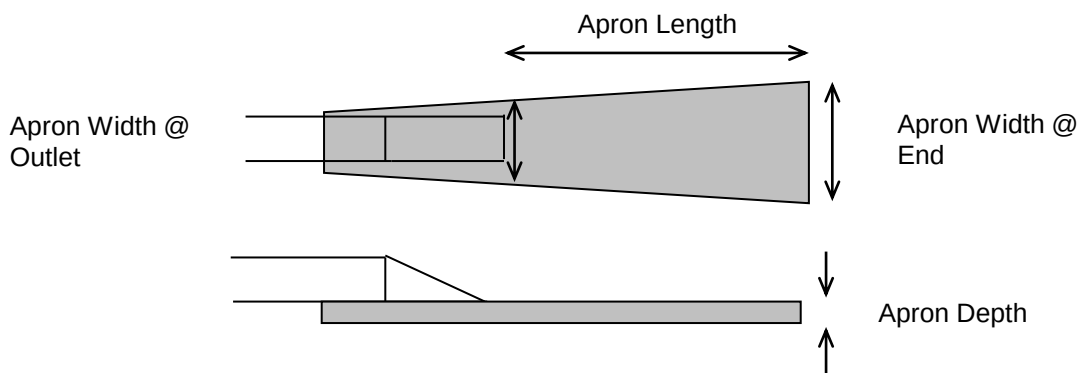

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Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES D2
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	12
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	3.7
Apron Width (outlet), ft	3
Apron Length, ft	10
Apron Width (end), ft	11
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
Checked by:	VHB	Date:	
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
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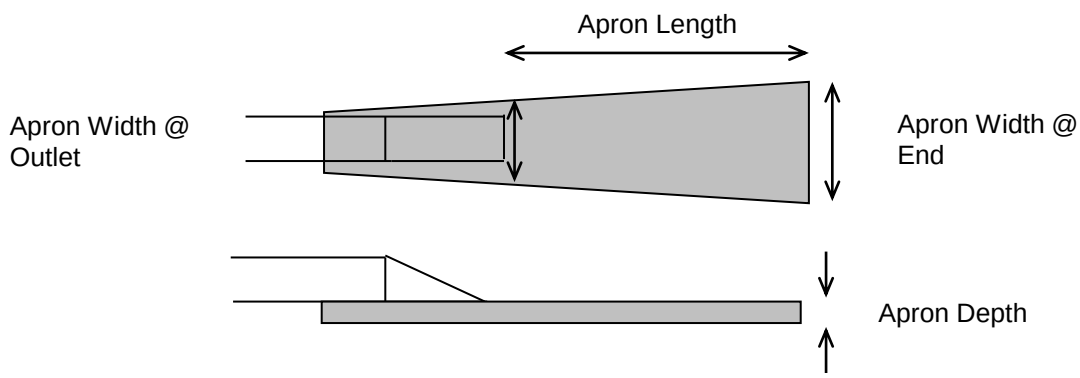

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	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES E2
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	12
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	0.7
Apron Width (outlet), ft	3
Apron Length, ft	10
Apron Width (end), ft	11
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111		
Project:	North Easton Station - SCR		
Location:	Stoughton, MA		
Calculated by:	CWF	Date:	April 23, 2012
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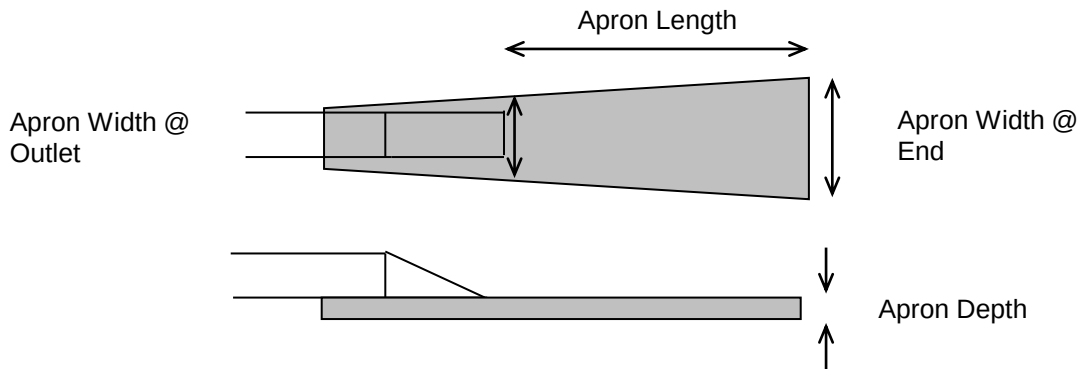

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Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES F2
Design Storm (yr):	25
Defined Channel (yes/no)	no
Pipe Dia (D), in	12
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	1.5
Apron Width (outlet), ft	3
Apron Length, ft	10
Apron Width (end), ft	11
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Pipe Calculations

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut St., Watertown, MA 02471
(617) 924-1770

Storm Drainage Computations

Name: MBTA SOUTH COAST RAIL STATION DESIGN
Easton, MA
Client: MBTA

Proj. No.: **10111.00**
Date: **2/21/2012**
Computed by: **ZZY**
Checked by: **VHB**

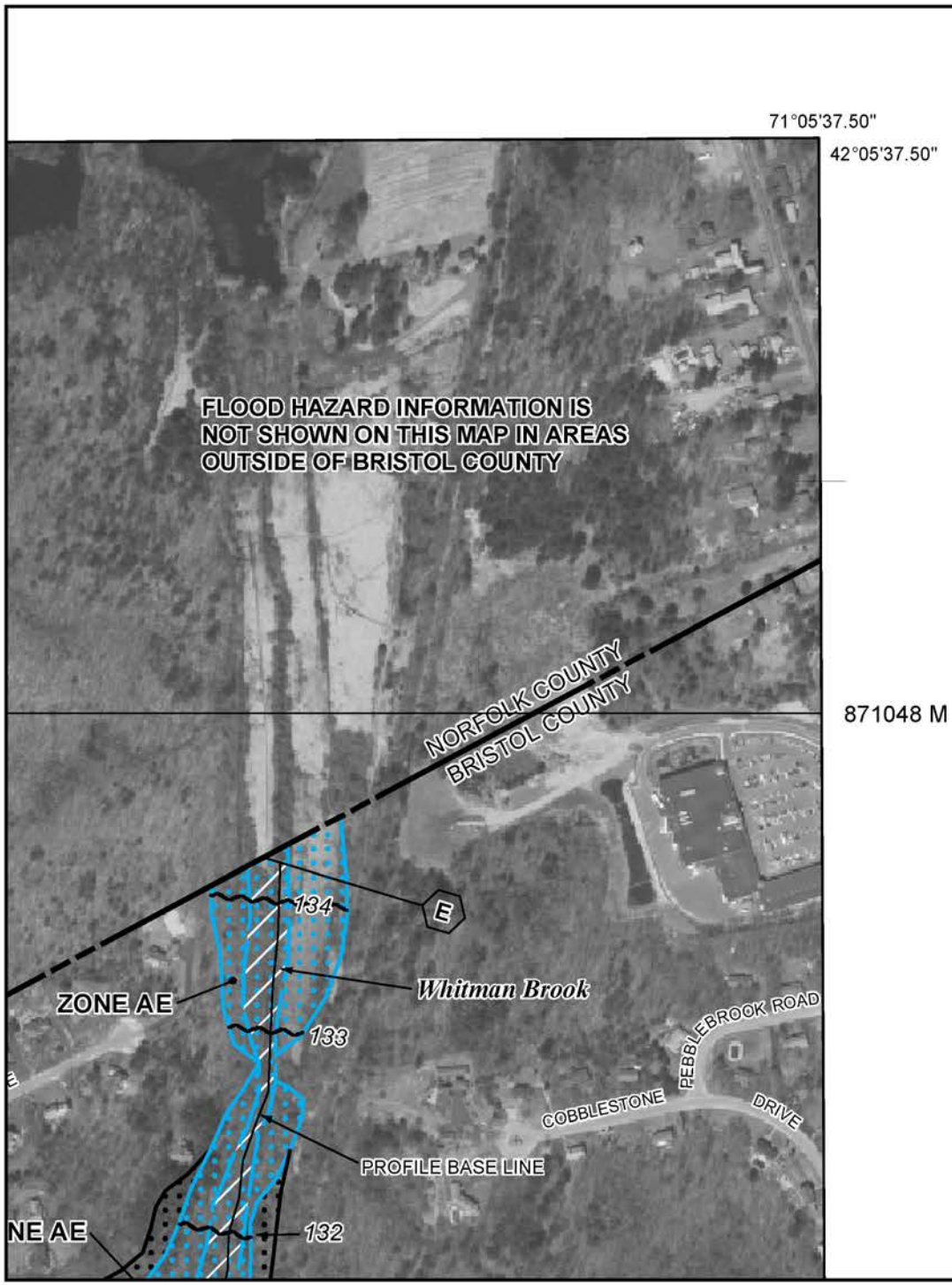
Design Parameters:
25 **Year Storm** Boston, MA **IDF Curve**
k_e= **0.5**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q cfs	V fps	n	PIPE SIZE	SLOPE	Q full ft^3/s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER	W.S.E. ft	Freeboard ft
	CB A1	FES A2	0.30	0.71	0.21	0.21	0.40	5.0	6.0	1.3	5.3	0.013	12	0.0317	6.3	8.1	126	4.00	171.0	167.0	163.0	166.7	4.3
	CB B1	DMH B5	1.00	0.36	0.36	0.36	0.74	5.0	6.0	2.2	4.1	0.013	12	0.0105	3.7	4.6	181	1.90	166.0	162.0	160.1	161.8	4.2
	CB B2	DMH B5	0.72	0.49	0.36	0.36	0.66	5.0	6.0	2.1	4.2	0.013	12	0.0114	3.8	4.9	166	1.90	166.0	162.0	160.1	161.8	4.2
	DMH B5	DMH B6	---	---	---	0.72	0.45	5.0	6.0	4.3	4.9	0.013	15	0.0103	6.6	5.3	131	1.35	165.5	159.85	158.5	159.6	5.9
	CB B3	DMH B6	0.40	0.42	0.17	0.17	0.05	5.0	6.0	1.0	7.9	0.013	12	0.1556	14.1	17.9	23	3.50	167.0	163.0	159.5	162.2	4.8
	DMH B6	DMH B7	---	---	---	0.89	0.22	5.0	6.0	5.3	5.1	0.013	15	0.0091	6.2	5.0	66	0.60	166.3	158.4	157.8	158.1	8.2
	CB B4	DMH B7	0.13	0.66	0.08	0.08	0.14	5.0	6.0	0.5	2.6	0.013	12	0.0095	3.5	4.4	21	0.20	166.0	158.0	157.8	157.9	8.1
	DMH B7	FES B8	---	---	---	0.97	0.25	5.0	6.0	5.8	5.2	0.013	15	0.0091	6.2	5.0	77	0.70	164.0	157.7	157.0	157.4	6.6
	CB C1	DMH C5	0.86	0.76	0.66	0.66	0.54	5.0	6.0	3.9	5.6	0.013	12	0.0139	4.2	5.3	180	2.50	160.0	156.0	153.5	155.6	4.4
	CB C2	DMH C5	0.83	0.90	0.75	0.75	0.03	5.0	6.0	4.5	6.5	0.013	12	0.0200	5.0	6.4	10	0.20	160.0	156.00	155.8	155.5	4.5
	CB 2A	DMH C5	0.40	0.90	0.36	0.36	0.22	5.0	6.0	2.2	6.5	0.013	12	0.0368	6.8	8.7	87	3.20	163.0	159.0	155.8	158.5	4.5
	DMH C5	DMH C6	---	---	---	1.40	0.61	5.0	6.0	8.4	4.8	0.013	21	0.0065	12.8	5.3	177	1.15	160.4	152.75	151.6	152.5	7.9
	CB C3	DMH C6	0.69	0.79	0.55	0.55	0.03	5.0	6.0	3.3	5.8	0.013	12	0.0200	5.0	6.4	10	0.20	160.1	153.8	153.6	153.4	6.7
	DMH C6	DMH C7	---	---	---	1.95	0.85	5.0	6.0	11.7	5.9	0.013	21	0.0083	14.5	6.0	300	2.50	160.4	151.5	149.0	151.1	9.3
	DMH C7	DMH C8	---	---	---	1.95	0.23	5.0	6.0	11.7	5.9	0.013	21	0.0084	14.6	6.0	83	0.70	154.0	148.9	148.2	148.5	5.5
	DMH C8	DMH C9	---	---	---	1.95	0.53	5.0	6.0	11.7	5.5	0.013	21	0.0068	13.0	5.4	177	1.20	153.0	148.1	146.9	147.7	5.3
	DMH C9	FES C10	---	---	---	1.95	0.19	5.0	6.0	11.7	5.7	0.013	21	0.0076	13.8	5.7	66	0.50	150.0	146.8	146.3	146.4	3.6
	CB D1	FES D2	0.90	0.68	0.61	0.61	0.10	5.0	6.0	3.7	7.4	0.013	12	0.0364	6.8	8.7	44	1.60	158.0	155.6	154.0	154.9	3.1
	CB E1	HW E2			0.00	0.00	0.19	5.0	6.0	0.7	3.8	0.013	12	0.0227	5.4	6.8	44	1.00	162.4	155.0	154.0	154.8	7.6
	CB F1	FES F2			0.00	0.00	0.15	5.0	6.0	1.5	4.7	0.013	12	0.0205	5.1	6.5	44	0.90	160.9	153.4	152.5	153.1	7.8

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Norfolk County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Maps



MAP SCALE 1" = 500'

250 0 500 1000 FEET

0 150 300 METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0053F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 53 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EASTON, TOWN OF	250053	0053	F

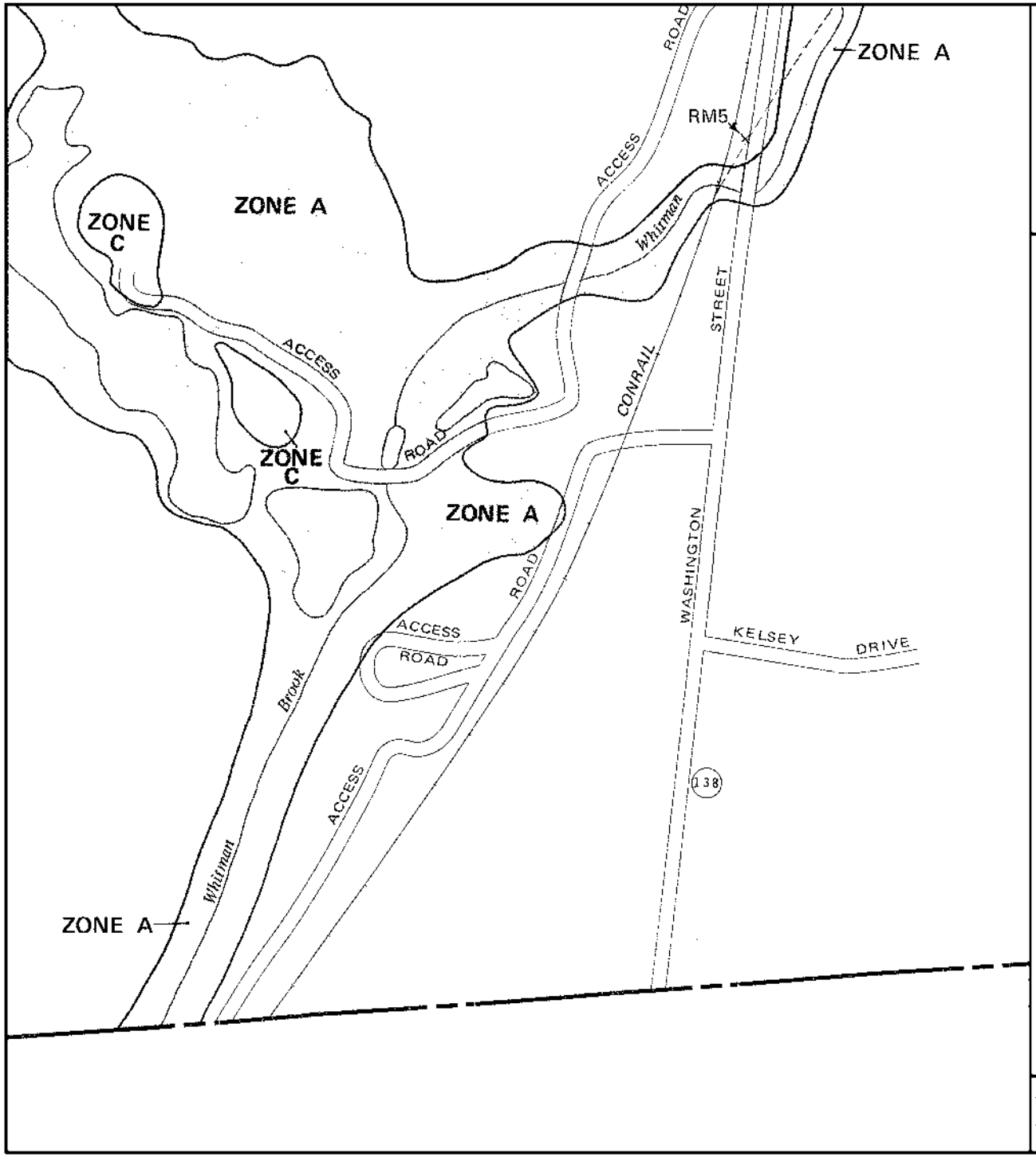
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0053F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE

600 0 600 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
STOUGHTON,
MASSACHUSETTS
NORFOLK COUNTY

PANEL 4 OF 4
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
250253 0004 B

EFFECTIVE DATE:
JUNE 1, 1982

Federal Emergency Management Agency

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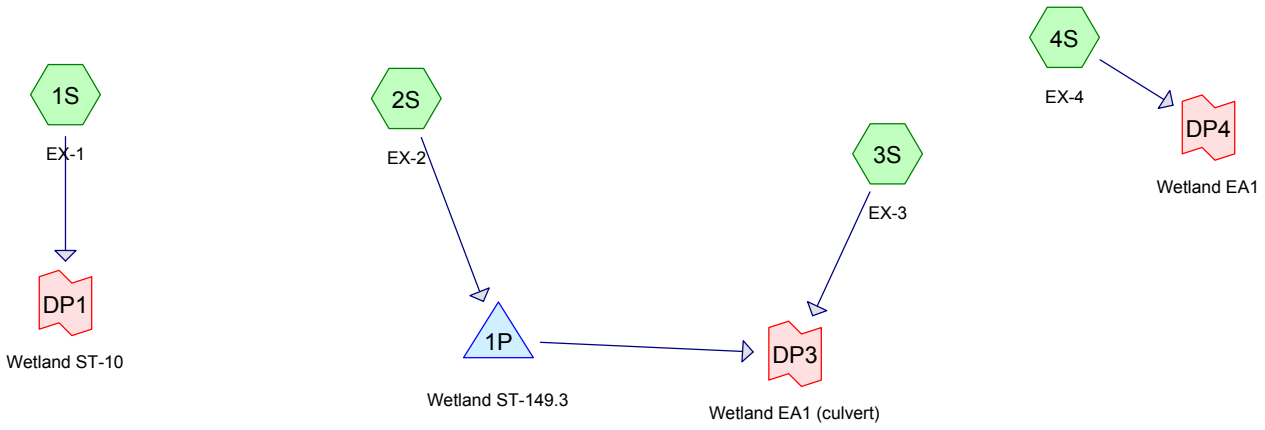
HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for North Easton-EX
Prepared by VHB, Printed 6/4/2012
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.050	36	Woods, Fair, HSG A (1S, 2S, 3S)
0.780	49	50-75% Grass cover, Fair, HSG A (3S)
0.160	68	<50% Grass cover, Poor, HSG A (2S)
0.370	72	Dirt roads, HSG A (2S)
1.491	73	Woods, Fair, HSG C (1S, 2S, 3S, 4S)
1.097	79	50-75% Grass cover, Fair, HSG C (3S, 4S)
1.143	79	Woods, Fair, HSG D (1S, 2S, 3S, 4S)
0.359	84	50-75% Grass cover, Fair, HSG D (3S, 4S)
0.320	86	<50% Grass cover, Poor, HSG C (2S)
0.880	87	Dirt roads, HSG C (2S)
0.160	89	Dirt roads, HSG D (1S)
0.070	89	Gravel roads, HSG C (3S)
0.050	91	Gravel roads, HSG D (3S)
1.010	98	Paved parking, HSG A (2S)
1.730	98	Paved parking, HSG C (2S)
12.670	**71**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=1.550 ac 0.00% Impervious Runoff Depth>0.79"
Flow Length=350' Tc=8.5 min CN=67 Runoff=1.14 cfs 0.102 af

Subcatchment2S: EX-2 Runoff Area=7.280 ac 37.64% Impervious Runoff Depth>1.23"
Flow Length=514' Tc=9.2 min CN=75 Runoff=9.07 cfs 0.745 af

Subcatchment3S: EX-3 Runoff Area=3.190 ac 0.00% Impervious Runoff Depth>0.57"
Flow Length=885' Tc=14.8 min CN=62 Runoff=1.17 cfs 0.151 af

Subcatchment4S: EX-4 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>1.63"
Tc=5.0 min CN=81 Runoff=1.28 cfs 0.088 af

Pond 1P: Wetland ST-149.3 Peak Elev=155.62' Storage=32,467 cf Inflow=9.07 cfs 0.745 af
Outflow=0.00 cfs 0.000 af

Link DP1: Wetland ST-10 Inflow=1.14 cfs 0.102 af
Primary=1.14 cfs 0.102 af

Link DP3: Wetland EA1 (culvert) Inflow=1.17 cfs 0.151 af
Primary=1.17 cfs 0.151 af

Link DP4: Wetland EA1 Inflow=1.28 cfs 0.088 af
Primary=1.28 cfs 0.088 af

Total Runoff Area = 12.670 ac Runoff Volume = 1.086 af Average Runoff Depth = 1.03"
78.37% Pervious = 9.930 ac 21.63% Impervious = 2.740 ac

Summary for Subcatchment 1S: EX-1

Runoff = 1.14 cfs @ 12.14 hrs, Volume= 0.102 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.410	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.660	79	Woods, Fair, HSG D
0.160	89	Dirt roads, HSG D
1.550	67	Weighted Average
1.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
3.2	300	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.5	350	Total			

Summary for Subcatchment 2S: EX-2

Runoff = 9.07 cfs @ 12.14 hrs, Volume= 0.745 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
1.920	36	Woods, Fair, HSG A
0.820	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
1.010	98	Paved parking, HSG A
1.730	98	Paved parking, HSG C
0.160	68	<50% Grass cover, Poor, HSG A
0.320	86	<50% Grass cover, Poor, HSG C
0.370	72	Dirt roads, HSG A
0.880	87	Dirt roads, HSG C
7.280	75	Weighted Average
4.540		62.36% Pervious Area
2.740		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	37	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	14	0.0600	0.43		**Sheet Flow,** Fallow n= 0.050 P2= 3.28"
0.4	60	0.0600	2.45		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
0.4	105	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	92	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	67	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	514	Total			

Summary for Subcatchment 3S: EX-3

Runoff = 1.17 cfs @ 12.26 hrs, Volume= 0.151 af, Depth> 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.780	49	50-75% Grass cover, Fair, HSG A
0.990	79	50-75% Grass cover, Fair, HSG C
0.160	84	50-75% Grass cover, Fair, HSG D
0.720	36	Woods, Fair, HSG A
0.350	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
0.070	89	Gravel roads, HSG C
0.050	91	Gravel roads, HSG D
3.190	62	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	35	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	16	0.1250	2.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
1.6	443	0.0540	4.72		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	36	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	22	0.4500	4.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.9	140	0.0360	0.47		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
14.8	885	Total			

Summary for Subcatchment 4S: EX-4

Runoff = 1.28 cfs @ 12.08 hrs, Volume= 0.088 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.107	79	50-75% Grass cover, Fair, HSG C
0.199	84	50-75% Grass cover, Fair, HSG D
0.001	73	Woods, Fair, HSG C
0.343	79	Woods, Fair, HSG D
0.650	81	Weighted Average
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 1P: Wetland ST-149.3

Inflow Area = 7.280 ac, 37.64% Impervious, Inflow Depth > 1.23" for 2-Year event
Inflow = 9.07 cfs @ 12.14 hrs, Volume= 0.745 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 155.62' @ 24.00 hrs Surf.Area= 21,770 sf Storage= 32,467 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	62,400 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	1,145	145.0	0	0	1,145
152.00	1,956	207.0	1,533	1,533	2,891
153.00	3,501	290.0	2,691	4,224	6,183
154.00	6,555	401.0	4,949	9,173	12,296
155.00	16,956	686.0	11,351	20,524	36,955
156.00	25,041	784.0	20,868	41,391	48,442
156.40	30,828	976.0	11,154	52,545	75,335
156.70	34,911	1,014.0	9,855	62,400	81,360

Device	Routing	Invert	Outlet Devices
#1	Primary	156.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link DP1: Wetland ST-10

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2-Year event
Inflow = 1.14 cfs @ 12.14 hrs, Volume= 0.102 af
Primary = 1.14 cfs @ 12.14 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 10.470 ac, 26.17% Impervious, Inflow Depth > 0.17" for 2-Year event
Inflow = 1.17 cfs @ 12.26 hrs, Volume= 0.151 af
Primary = 1.17 cfs @ 12.26 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA1

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 1.63" for 2-Year event
Inflow = 1.28 cfs @ 12.08 hrs, Volume= 0.088 af
Primary = 1.28 cfs @ 12.08 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

10-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=1.550 ac 0.00% Impervious Runoff Depth>1.63"
Flow Length=350' Tc=8.5 min CN=67 Runoff=2.60 cfs 0.210 af

Subcatchment2S: EX-2 Runoff Area=7.280 ac 37.64% Impervious Runoff Depth>2.24"
Flow Length=514' Tc=9.2 min CN=75 Runoff=17.10 cfs 1.361 af

Subcatchment3S: EX-3 Runoff Area=3.190 ac 0.00% Impervious Runoff Depth>1.28"
Flow Length=885' Tc=14.8 min CN=62 Runoff=3.28 cfs 0.341 af

Subcatchment4S: EX-4 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>2.76"
Tc=5.0 min CN=81 Runoff=2.18 cfs 0.150 af

Pond 1P: Wetland ST-149.3 Peak Elev=156.28' Storage=48,827 cf Inflow=17.10 cfs 1.361 af
Outflow=0.51 cfs 0.257 af

Link DP1: Wetland ST-10 Inflow=2.60 cfs 0.210 af
Primary=2.60 cfs 0.210 af

Link DP3: Wetland EA1 (culvert) Inflow=3.28 cfs 0.598 af
Primary=3.28 cfs 0.598 af

Link DP4: Wetland EA1 Inflow=2.18 cfs 0.150 af
Primary=2.18 cfs 0.150 af

Total Runoff Area = 12.670 ac Runoff Volume = 2.062 af Average Runoff Depth = 1.95"
78.37% Pervious = 9.930 ac 21.63% Impervious = 2.740 ac

Summary for Subcatchment 1S: EX-1

Runoff = 2.60 cfs @ 12.13 hrs, Volume= 0.210 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.410	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.660	79	Woods, Fair, HSG D
0.160	89	Dirt roads, HSG D
1.550	67	Weighted Average
1.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
3.2	300	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.5	350	Total			

Summary for Subcatchment 2S: EX-2

Runoff = 17.10 cfs @ 12.13 hrs, Volume= 1.361 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
1.920	36	Woods, Fair, HSG A
0.820	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
1.010	98	Paved parking, HSG A
1.730	98	Paved parking, HSG C
0.160	68	<50% Grass cover, Poor, HSG A
0.320	86	<50% Grass cover, Poor, HSG C
0.370	72	Dirt roads, HSG A
0.880	87	Dirt roads, HSG C
7.280	75	Weighted Average
4.540		62.36% Pervious Area
2.740		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	37	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	14	0.0600	0.43		**Sheet Flow,** Fallow n= 0.050 P2= 3.28"
0.4	60	0.0600	2.45		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
0.4	105	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	92	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	67	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	514	Total			

Summary for Subcatchment 3S: EX-3

Runoff = 3.28 cfs @ 12.22 hrs, Volume= 0.341 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.780	49	50-75% Grass cover, Fair, HSG A
0.990	79	50-75% Grass cover, Fair, HSG C
0.160	84	50-75% Grass cover, Fair, HSG D
0.720	36	Woods, Fair, HSG A
0.350	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
0.070	89	Gravel roads, HSG C
0.050	91	Gravel roads, HSG D
3.190	62	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	35	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	16	0.1250	2.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
1.6	443	0.0540	4.72		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	36	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	22	0.4500	4.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.9	140	0.0360	0.47		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
14.8	885	Total			

Summary for Subcatchment 4S: EX-4

Runoff = 2.18 cfs @ 12.07 hrs, Volume= 0.150 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.107	79	50-75% Grass cover, Fair, HSG C
0.199	84	50-75% Grass cover, Fair, HSG D
0.001	73	Woods, Fair, HSG C
0.343	79	Woods, Fair, HSG D
0.650	81	Weighted Average
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 1P: Wetland ST-149.3

Inflow Area = 7.280 ac, 37.64% Impervious, Inflow Depth > 2.24" for 10-Year event
Inflow = 17.10 cfs @ 12.13 hrs, Volume= 1.361 af
Outflow = 0.51 cfs @ 17.55 hrs, Volume= 0.257 af, Atten= 97%, Lag= 324.8 min
Primary = 0.51 cfs @ 17.55 hrs, Volume= 0.257 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 156.28' @ 17.55 hrs Surf.Area= 28,964 sf Storage= 48,827 cf

Plug-Flow detention time= 481.8 min calculated for 0.257 af (19% of inflow)
Center-of-Mass det. time= 339.3 min (1,178.4 - 839.1)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	62,400 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	1,145	145.0	0	0	1,145
152.00	1,956	207.0	1,533	1,533	2,891
153.00	3,501	290.0	2,691	4,224	6,183
154.00	6,555	401.0	4,949	9,173	12,296
155.00	16,956	686.0	11,351	20,524	36,955
156.00	25,041	784.0	20,868	41,391	48,442
156.40	30,828	976.0	11,154	52,545	75,335
156.70	34,911	1,014.0	9,855	62,400	81,360

Device	Routing	Invert	Outlet Devices
#1	Primary	156.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.49 cfs @ 17.55 hrs HW=156.28' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 0.64 fps)

Summary for Link DP1: Wetland ST-10

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 1.63" for 10-Year event
Inflow = 2.60 cfs @ 12.13 hrs, Volume= 0.210 af
Primary = 2.60 cfs @ 12.13 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 10.470 ac, 26.17% Impervious, Inflow Depth > 0.69" for 10-Year event
Inflow = 3.28 cfs @ 12.22 hrs, Volume= 0.598 af
Primary = 3.28 cfs @ 12.22 hrs, Volume= 0.598 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA1

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 2.76" for 10-Year event
Inflow = 2.18 cfs @ 12.07 hrs, Volume= 0.150 af
Primary = 2.18 cfs @ 12.07 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EX-1 Runoff Area=1.550 ac 0.00% Impervious Runoff Depth>3.30"
Flow Length=350' Tc=8.5 min CN=67 Runoff=5.48 cfs 0.426 af

Subcatchment2S: EX-2 Runoff Area=7.280 ac 37.64% Impervious Runoff Depth>4.14"
Flow Length=514' Tc=9.2 min CN=75 Runoff=31.74 cfs 2.513 af

Subcatchment3S: EX-3 Runoff Area=3.190 ac 0.00% Impervious Runoff Depth>2.79"
Flow Length=885' Tc=14.8 min CN=62 Runoff=7.77 cfs 0.742 af

Subcatchment4S: EX-4 Runoff Area=0.650 ac 0.00% Impervious Runoff Depth>4.80"
Tc=5.0 min CN=81 Runoff=3.75 cfs 0.260 af

Pond 1P: Wetland ST-149.3 Peak Elev=156.57' Storage=57,956 cf Inflow=31.74 cfs 2.513 af
Outflow=5.57 cfs 1.397 af

Link DP1: Wetland ST-10 Inflow=5.48 cfs 0.426 af
Primary=5.48 cfs 0.426 af

Link DP3: Wetland EA1 (culvert) Inflow=8.97 cfs 2.139 af
Primary=8.97 cfs 2.139 af

Link DP4: Wetland EA1 Inflow=3.75 cfs 0.260 af
Primary=3.75 cfs 0.260 af

Total Runoff Area = 12.670 ac Runoff Volume = 3.941 af Average Runoff Depth = 3.73"
78.37% Pervious = 9.930 ac 21.63% Impervious = 2.740 ac

Summary for Subcatchment 1S: EX-1

Runoff = 5.48 cfs @ 12.12 hrs, Volume= 0.426 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.410	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.660	79	Woods, Fair, HSG D
0.160	89	Dirt roads, HSG D
1.550	67	Weighted Average
1.550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.1600	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
3.2	300	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.5	350	Total			

Summary for Subcatchment 2S: EX-2

Runoff = 31.74 cfs @ 12.13 hrs, Volume= 2.513 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
1.920	36	Woods, Fair, HSG A
0.820	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
1.010	98	Paved parking, HSG A
1.730	98	Paved parking, HSG C
0.160	68	<50% Grass cover, Poor, HSG A
0.320	86	<50% Grass cover, Poor, HSG C
0.370	72	Dirt roads, HSG A
0.880	87	Dirt roads, HSG C
7.280	75	Weighted Average
4.540		62.36% Pervious Area
2.740		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	37	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	14	0.0600	0.43		**Sheet Flow,** Fallow n= 0.050 P2= 3.28"
0.4	60	0.0600	2.45		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
0.4	105	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	139	0.0500	4.54		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	92	0.0400	4.06		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	67	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	514	Total			

Summary for Subcatchment 3S: EX-3

Runoff = 7.77 cfs @ 12.21 hrs, Volume= 0.742 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.780	49	50-75% Grass cover, Fair, HSG A
0.990	79	50-75% Grass cover, Fair, HSG C
0.160	84	50-75% Grass cover, Fair, HSG D
0.720	36	Woods, Fair, HSG A
0.350	73	Woods, Fair, HSG C
0.070	79	Woods, Fair, HSG D
0.070	89	Gravel roads, HSG C
0.050	91	Gravel roads, HSG D
3.190	62	Weighted Average
3.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	35	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	16	0.1250	2.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
1.6	443	0.0540	4.72		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	36	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	22	0.4500	4.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.9	140	0.0360	0.47		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
14.8	885	Total			

Summary for Subcatchment 4S: EX-4

Runoff = 3.75 cfs @ 12.07 hrs, Volume= 0.260 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.107	79	50-75% Grass cover, Fair, HSG C
0.199	84	50-75% Grass cover, Fair, HSG D
0.001	73	Woods, Fair, HSG C
0.343	79	Woods, Fair, HSG D
0.650	81	Weighted Average
0.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 1P: Wetland ST-149.3

Inflow Area = 7.280 ac, 37.64% Impervious, Inflow Depth > 4.14" for 100-Year event
Inflow = 31.74 cfs @ 12.13 hrs, Volume= 2.513 af
Outflow = 5.57 cfs @ 12.65 hrs, Volume= 1.397 af, Atten= 82%, Lag= 31.5 min
Primary = 5.57 cfs @ 12.65 hrs, Volume= 1.397 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 156.57' @ 12.65 hrs Surf.Area= 33,101 sf Storage= 57,956 cf

Plug-Flow detention time= 229.6 min calculated for 1.397 af (56% of inflow)
Center-of-Mass det. time= 120.3 min (941.8 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	62,400 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	1,145	145.0	0	0	1,145
152.00	1,956	207.0	1,533	1,533	2,891
153.00	3,501	290.0	2,691	4,224	6,183
154.00	6,555	401.0	4,949	9,173	12,296
155.00	16,956	686.0	11,351	20,524	36,955
156.00	25,041	784.0	20,868	41,391	48,442
156.40	30,828	976.0	11,154	52,545	75,335
156.70	34,911	1,014.0	9,855	62,400	81,360

Device	Routing	Invert	Outlet Devices
#1	Primary	156.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.56 cfs @ 12.65 hrs HW=156.57' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 5.56 cfs @ 1.50 fps)

Summary for Link DP1: Wetland ST-10

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 3.30" for 100-Year event
Inflow = 5.48 cfs @ 12.12 hrs, Volume= 0.426 af
Primary = 5.48 cfs @ 12.12 hrs, Volume= 0.426 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 10.470 ac, 26.17% Impervious, Inflow Depth > 2.45" for 100-Year event
Inflow = 8.97 cfs @ 12.52 hrs, Volume= 2.139 af
Primary = 8.97 cfs @ 12.52 hrs, Volume= 2.139 af, Atten= 0%, Lag= 0.0 min

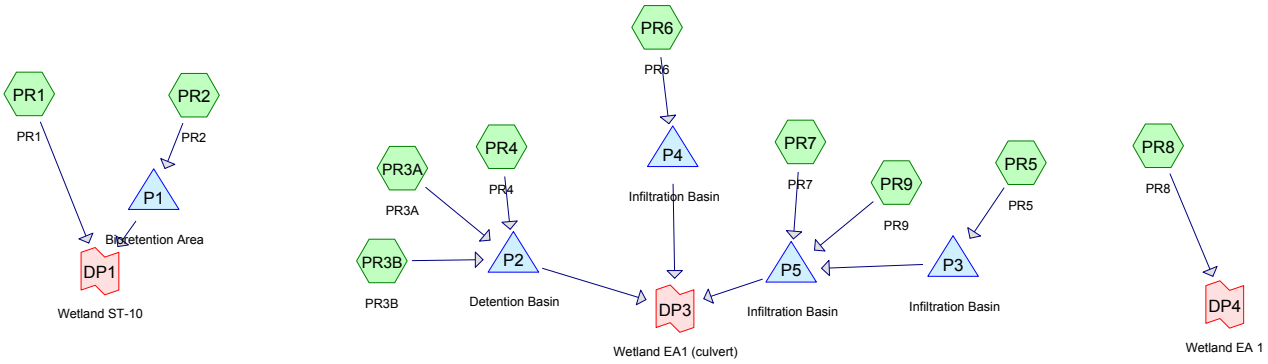
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA1

Inflow Area = 0.650 ac, 0.00% Impervious, Inflow Depth > 4.80" for 100-Year event
Inflow = 3.75 cfs @ 12.07 hrs, Volume= 0.260 af
Primary = 3.75 cfs @ 12.07 hrs, Volume= 0.260 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for North Easton-PR
Prepared by VHB, Printed 6/4/2012
HydroCAD® 10.00 s/n 01234 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.367	36	Woods, Fair, HSG A (PR1, PR2, PR7)
1.511	49	50-75% Grass cover, Fair, HSG A (PR2, PR4, PR6, PR7, PR9)
0.922	73	Woods, Fair, HSG C (PR1, PR2, PR3A, PR7)
0.036	76	Gravel roads, HSG A (PR9)
2.416	79	50-75% Grass cover, Fair, HSG C (PR3A, PR4, PR5, PR6, PR7, PR8, PR9)
0.914	79	Woods, Fair, HSG D (PR1, PR2, PR8)
0.534	84	50-75% Grass cover, Fair, HSG D (PR2, PR6, PR8, PR9)
0.157	89	Dirt roads, HSG D (PR1)
0.010	89	Gravel roads, HSG C (PR9)
2.348	98	Paved parking, HSG A (PR2, PR6, PR7)
2.084	98	Paved parking, HSG C (PR3B, PR4, PR5, PR6, PR7)
0.100	98	Paved parking, HSG D (PR6)
11.399	**81**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	PR3A	0.00	0.00	181.0	0.0100	0.011	12.0	0.0	0.0
2	PR3A	0.00	0.00	131.0	0.0100	0.011	15.0	0.0	0.0
3	PR3A	0.00	0.00	66.0	0.0091	0.011	15.0	0.0	0.0
4	PR3A	0.00	0.00	75.0	0.0092	0.011	15.0	0.0	0.0
5	PR7	0.00	0.00	180.0	0.0139	0.013	12.0	0.0	0.0
6	PR7	0.00	0.00	177.0	0.0650	0.013	21.0	0.0	0.0
7	PR7	0.00	0.00	295.0	0.0102	0.013	21.0	0.0	0.0
8	PR7	0.00	0.00	90.0	0.0100	0.013	21.0	0.0	0.0
9	PR7	0.00	0.00	177.0	0.0136	0.013	21.0	0.0	0.0
10	PR7	0.00	0.00	66.0	0.0136	0.013	21.0	0.0	0.0
11	P2	153.40	152.50	112.0	0.0080	0.013	12.0	0.0	0.0
12	P3	155.00	154.00	49.0	0.0204	0.013	12.0	0.0	0.0
13	P5	144.00	143.50	50.0	0.0100	0.013	12.0	0.0	0.0

2-Year Storm Event - Proposed

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=1.341 ac 0.00% Impervious Runoff Depth>0.94"
Flow Length=410' Tc=14.6 min CN=70 Runoff=1.03 cfs 0.105 af

Subcatchment PR2: PR2 Runoff Area=1.420 ac 42.25% Impervious Runoff Depth>1.23"
Flow Length=455' Tc=15.0 min CN=75 Runoff=1.49 cfs 0.145 af

Subcatchment PR3A: PR3A Runoff Area=1.500 ac 0.00% Impervious Runoff Depth>1.42"
Flow Length=757' Tc=16.8 min CN=78 Runoff=1.78 cfs 0.177 af

Subcatchment PR3B: PR3B Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>3.16"
Tc=5.0 min CN=98 Runoff=2.05 cfs 0.158 af

Subcatchment PR4: PR4 Runoff Area=0.128 ac 62.50% Impervious Runoff Depth>1.70"
Tc=5.0 min CN=82 Runoff=0.26 cfs 0.018 af

Subcatchment PR5: PR5 Runoff Area=0.300 ac 66.67% Impervious Runoff Depth>2.54"
Tc=5.0 min CN=92 Runoff=0.90 cfs 0.063 af

Subcatchment PR6: PR6 Runoff Area=1.260 ac 43.65% Impervious Runoff Depth>1.36"
Tc=5.0 min CN=77 Runoff=2.04 cfs 0.142 af

Subcatchment PR7: PR7 Runoff Area=2.800 ac 89.36% Impervious Runoff Depth>2.84"
Flow Length=1,318' Tc=5.0 min CN=95 Runoff=9.10 cfs 0.662 af

Subcatchment PR8: PR8 Runoff Area=0.555 ac 0.00% Impervious Runoff Depth>1.63"
Flow Length=117' Tc=6.7 min CN=81 Runoff=1.03 cfs 0.075 af

Subcatchment PR9: PR9 Runoff Area=1.495 ac 0.00% Impervious Runoff Depth>0.84"
Flow Length=175' Tc=7.3 min CN=68 Runoff=1.24 cfs 0.105 af

Pond P1: Bioretention Area Peak Elev=156.43' Storage=2,897 cf Inflow=1.49 cfs 0.145 af
Discarded=0.14 cfs 0.129 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.129 af

Pond P2: Detention Basin Peak Elev=158.37' Storage=8,278 cf Inflow=3.30 cfs 0.353 af
Outflow=0.46 cfs 0.275 af

Pond P3: Infiltration Basin Peak Elev=162.50' Storage=872 cf Inflow=0.90 cfs 0.063 af
Discarded=0.01 cfs 0.009 af Primary=0.82 cfs 0.037 af Outflow=0.83 cfs 0.046 af

Pond P4: Infiltration Basin Peak Elev=153.25' Storage=3,053 cf Inflow=2.04 cfs 0.142 af
Discarded=0.13 cfs 0.115 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.115 af

Pond P5: Infiltration Basin Peak Elev=144.29' Storage=14,390 cf Inflow=10.92 cfs 0.804 af
Discarded=0.70 cfs 0.750 af Primary=0.30 cfs 0.052 af Outflow=1.00 cfs 0.803 af

Link DP1: Wetland ST-10 Inflow=1.03 cfs 0.105 af
Primary=1.03 cfs 0.105 af

Link DP3: Wetland EA1 (culvert) Inflow=0.76 cfs 0.328 af
Primary=0.76 cfs 0.328 af

Link DP4: Wetland EA 1 Inflow=1.03 cfs 0.075 af
Primary=1.03 cfs 0.075 af

Total Runoff Area = 11.399 ac Runoff Volume = 1.652 af Average Runoff Depth = 1.74"
60.24% Pervious = 6.867 ac 39.76% Impervious = 4.532 ac

Summary for Subcatchment PR1: PR1

Runoff = 1.03 cfs @ 12.22 hrs, Volume= 0.105 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.278	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.586	79	Woods, Fair, HSG D
0.157	89	Dirt roads, HSG D
1.341	70	Weighted Average
1.341		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	50	0.1600	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
3.7	190	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	34	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.4	136	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.6	410	Total			

Summary for Subcatchment PR2: PR2

Runoff = 1.49 cfs @ 12.22 hrs, Volume= 0.145 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.080	36	Woods, Fair, HSG A
0.200	73	Woods, Fair, HSG C
0.100	79	Woods, Fair, HSG D
0.600	98	Paved parking, HSG A
0.400	49	50-75% Grass cover, Fair, HSG A
0.040	84	50-75% Grass cover, Fair, HSG D
1.420	75	Weighted Average
0.820		57.75% Pervious Area
0.600		42.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0800	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
0.5	79	0.2400	2.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	205	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	101	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.0	455	Total			

Summary for Subcatchment PR3A: PR3A

Runoff = 1.78 cfs @ 12.23 hrs, Volume= 0.177 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.300	73	Woods, Fair, HSG C
1.200	79	50-75% Grass cover, Fair, HSG C
1.500	78	Weighted Average
1.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	50	0.0650	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
1.4	104	0.0650	1.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.3300	2.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	138	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	181	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.4	131	0.0100	6.22	7.63	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	66	0.0091	5.93	7.28	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	75	0.0092	5.97	7.32	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
16.8	757	Total			

Summary for Subcatchment PR3B: PR3B

Runoff = 2.05 cfs @ 12.07 hrs, Volume= 0.158 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG C
0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 0.26 cfs @ 12.08 hrs, Volume= 0.018 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.011	79	50-75% Grass cover, Fair, HSG C
0.037	49	50-75% Grass cover, Fair, HSG A
0.080	98	Paved parking, HSG C
0.128	82	Weighted Average
0.048		37.50% Pervious Area
0.080		62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR5: PR5

Runoff = 0.90 cfs @ 12.07 hrs, Volume= 0.063 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.200	98	Paved parking, HSG C
0.300	92	Weighted Average
0.100		33.33% Pervious Area
0.200		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6: PR6

Runoff = 2.04 cfs @ 12.08 hrs, Volume= 0.142 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.450	49	50-75% Grass cover, Fair, HSG A
0.200	79	50-75% Grass cover, Fair, HSG C
0.060	84	50-75% Grass cover, Fair, HSG D
0.300	98	Paved parking, HSG A
0.150	98	Paved parking, HSG C
0.100	98	Paved parking, HSG D
1.260	77	Weighted Average
0.710		56.35% Pervious Area
0.550		43.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

Runoff = 9.10 cfs @ 12.07 hrs, Volume= 0.662 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.102	73	Woods, Fair, HSG C
0.009	36	Woods, Fair, HSG A
0.034	49	50-75% Grass cover, Fair, HSG A
0.153	79	50-75% Grass cover, Fair, HSG C
1.448	98	Paved parking, HSG A
1.054	98	Paved parking, HSG C
2.800	95	Weighted Average
0.298		10.64% Pervious Area
2.502		89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0350	1.52		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
0.4	53	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	21	0.2200	3.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	209	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0139	5.35	4.20	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.2	177	0.0650	16.80	40.40	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.7	295	0.0102	6.65	16.00	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.2	90	0.0100	6.59	15.85	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.4	177	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.8					**Direct Entry,**
0.1	66	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
5.0	1,318	Total			

Summary for Subcatchment PR8: PR8

Runoff = 1.03 cfs @ 12.10 hrs, Volume= 0.075 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.125	79	50-75% Grass cover, Fair, HSG C
0.202	84	50-75% Grass cover, Fair, HSG D
0.228	79	Woods, Fair, HSG D
0.555	81	Weighted Average
0.555		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.9	67	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	117	Total			

Summary for Subcatchment PR9: PR9

Runoff = 1.24 cfs @ 12.12 hrs, Volume= 0.105 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.590	49	50-75% Grass cover, Fair, HSG A
0.627	79	50-75% Grass cover, Fair, HSG C
0.232	84	50-75% Grass cover, Fair, HSG D
0.036	76	Gravel roads, HSG A
0.010	89	Gravel roads, HSG C
1.495	68	Weighted Average
1.495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.28"
1.7	125	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	175	Total			

Summary for Pond P1: Bioretention Area

Inflow Area = 1.420 ac, 42.25% Impervious, Inflow Depth > 1.23" for 2-Year event
Inflow = 1.49 cfs @ 12.22 hrs, Volume= 0.145 af
Outflow = 0.14 cfs @ 14.50 hrs, Volume= 0.129 af, Atten= 91%, Lag= 137.0 min
Discarded = 0.14 cfs @ 14.50 hrs, Volume= 0.129 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 156.43' @ 14.50 hrs Surf.Area= 2,518 sf Storage= 2,897 cf

Plug-Flow detention time= 240.7 min calculated for 0.129 af (89% of inflow)
Center-of-Mass det. time= 189.7 min (1,051.0 - 861.3)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	11,957 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.00	1,579	188.0	0	0	1,579
156.00	2,217	223.0	1,889	1,889	2,742
157.00	2,953	252.0	2,576	4,465	3,864
158.00	3,738	271.0	3,338	7,803	4,697
158.50	4,153	280.0	1,972	9,775	5,114
159.00	4,581	290.0	2,183	11,957	5,590

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 14.50 hrs HW=156.43' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
↑**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond P2: Detention Basin

Inflow Area = 2.228 ac, 30.52% Impervious, Inflow Depth > 1.90" for 2-Year event
Inflow = 3.30 cfs @ 12.09 hrs, Volume= 0.353 af
Outflow = 0.46 cfs @ 13.12 hrs, Volume= 0.275 af, Atten= 86%, Lag= 62.1 min
Primary = 0.46 cfs @ 13.12 hrs, Volume= 0.275 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 158.37' @ 13.12 hrs Surf.Area= 4,672 sf Storage= 8,278 cf

Plug-Flow detention time= 261.0 min calculated for 0.275 af (78% of inflow)
Center-of-Mass det. time= 177.1 min (984.9 - 807.8)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	27,737 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	2,331	275.0	0	0	2,331
157.00	3,258	321.0	2,782	2,782	4,533
157.50	3,896	289.0	1,786	4,568	6,094
158.00	4,338	299.0	2,058	6,625	6,584
159.00	5,276	318.0	4,799	11,425	7,567
160.00	6,256	337.0	5,759	17,184	8,610
161.00	7,298	356.0	6,770	23,954	9,714
161.50	7,839	365.0	3,783	27,737	10,260

Device	Routing	Invert	Outlet Devices
#1	Primary	153.40'	**12.0" Round Culvert** L= 112.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 153.40' / 152.50' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	157.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	160.90'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads

Primary OutFlow Max=0.46 cfs @ 13.12 hrs HW=158.37' (Free Discharge)
└**1=Culvert** (Passes 0.46 cfs of 6.21 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.46 cfs @ 5.28 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond P3: Infiltration Basin

Inflow Area = 0.300 ac, 66.67% Impervious, Inflow Depth > 2.54" for 2-Year event
Inflow = 0.90 cfs @ 12.07 hrs, Volume= 0.063 af
Outflow = 0.83 cfs @ 12.11 hrs, Volume= 0.046 af, Atten= 8%, Lag= 2.0 min
Discarded = 0.01 cfs @ 12.11 hrs, Volume= 0.009 af
Primary = 0.82 cfs @ 12.11 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 162.50' @ 12.11 hrs Surf.Area= 1,201 sf Storage= 872 cf

Plug-Flow detention time= 140.3 min calculated for 0.046 af (73% of inflow)
Center-of-Mass det. time= 52.2 min (846.4 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	1,389 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.50	552	116.0	0	0	552
162.00	879	170.0	355	355	1,783
162.50	1,202	174.0	518	873	1,922
162.90	1,379	179.0	516	1,389	2,080

Device	Routing	Invert	Outlet Devices
#1	Primary	155.00'	**12.0" Round Culvert** L= 49.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 155.00' / 154.00' S= 0.0204 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	162.40'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Discarded	161.50'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.11 hrs HW=162.50' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.82 cfs @ 12.11 hrs HW=162.50' (Free Discharge)
└**1=Culvert** (Passes 0.82 cfs of 9.90 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.82 cfs @ 1.03 fps)

Summary for Pond P4: Infiltration Basin

Inflow Area = 1.260 ac, 43.65% Impervious, Inflow Depth > 1.36" for 2-Year event
Inflow = 2.04 cfs @ 12.08 hrs, Volume= 0.142 af
Outflow = 0.13 cfs @ 14.41 hrs, Volume= 0.115 af, Atten= 94%, Lag= 139.7 min
Discarded = 0.13 cfs @ 14.41 hrs, Volume= 0.115 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 153.25' @ 14.41 hrs Surf.Area= 2,345 sf Storage= 3,053 cf

Plug-Flow detention time= 270.1 min calculated for 0.115 af (81% of inflow)
Center-of-Mass det. time= 192.5 min (1,039.9 - 847.4)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	6,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	545	185.0	0	0	545
152.00	1,210	238.0	856	856	2,342
153.00	2,120	306.0	1,644	2,500	5,298
154.00	3,095	343.0	2,592	5,092	7,236
154.50	3,945	293.0	1,756	6,847	9,772

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 14.41 hrs HW=153.25' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.00' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond P5: Infiltration Basin

Inflow Area = 4.595 ac, 58.80% Impervious, Inflow Depth > 2.10" for 2-Year event
Inflow = 10.92 cfs @ 12.08 hrs, Volume= 0.804 af
Outflow = 1.00 cfs @ 13.00 hrs, Volume= 0.803 af, Atten= 91%, Lag= 55.5 min
Discarded = 0.70 cfs @ 13.00 hrs, Volume= 0.750 af
Primary = 0.30 cfs @ 13.00 hrs, Volume= 0.052 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 144.29' @ 13.00 hrs Surf.Area= 12,548 sf Storage= 14,390 cf

Plug-Flow detention time= 170.6 min calculated for 0.802 af (100% of inflow)
Center-of-Mass det. time= 169.1 min (961.8 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	143.00'	48,482 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.00	9,980	601.0	0	0	9,980
144.00	11,812	620.0	10,883	10,883	11,924
145.00	14,463	744.0	13,115	23,998	25,401
146.00	16,751	782.0	15,593	39,591	30,078
146.50	18,831	695.0	8,890	48,482	40,311

Device	Routing	Invert	Outlet Devices
#1	Primary	144.00'	**12.0" Round Culvert** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 144.00' / 143.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Primary	146.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 6.00 7.00
#3	Discarded	143.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.70 cfs @ 13.00 hrs HW=144.29' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.70 cfs)

Primary OutFlow Max=0.30 cfs @ 13.00 hrs HW=144.29' (Free Discharge)
├**1=Culvert** (Inlet Controls 0.30 cfs @ 1.61 fps)
└**2=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Link DP1: Wetland ST-10

Inflow Area = 2.761 ac, 21.73% Impervious, Inflow Depth > 0.46" for 2-Year event
Inflow = 1.03 cfs @ 12.22 hrs, Volume= 0.105 af
Primary = 1.03 cfs @ 12.22 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 8.083 ac, 48.65% Impervious, Inflow Depth > 0.49" for 2-Year event
Inflow = 0.76 cfs @ 13.02 hrs, Volume= 0.328 af
Primary = 0.76 cfs @ 13.02 hrs, Volume= 0.328 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA 1

Inflow Area = 0.555 ac, 0.00% Impervious, Inflow Depth > 1.63" for 2-Year event
Inflow = 1.03 cfs @ 12.10 hrs, Volume= 0.075 af
Primary = 1.03 cfs @ 12.10 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

10-Year Storm Event- Proposed

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR1: PR1 Runoff Area=1.341 ac 0.00% Impervious Runoff Depth>1.85"
Flow Length=410' Tc=14.6 min CN=70 Runoff=2.16 cfs 0.206 af

SubcatchmentPR2: PR2 Runoff Area=1.420 ac 42.25% Impervious Runoff Depth>2.24"
Flow Length=455' Tc=15.0 min CN=75 Runoff=2.81 cfs 0.265 af

SubcatchmentPR3A: PR3A Runoff Area=1.500 ac 0.00% Impervious Runoff Depth>2.49"
Flow Length=757' Tc=16.8 min CN=78 Runoff=3.18 cfs 0.312 af

SubcatchmentPR3B: PR3B Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>4.51"
Tc=5.0 min CN=98 Runoff=2.89 cfs 0.226 af

SubcatchmentPR4: PR4 Runoff Area=0.128 ac 62.50% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=82 Runoff=0.44 cfs 0.030 af

SubcatchmentPR5: PR5 Runoff Area=0.300 ac 66.67% Impervious Runoff Depth>3.84"
Tc=5.0 min CN=92 Runoff=1.33 cfs 0.096 af

SubcatchmentPR6: PR6 Runoff Area=1.260 ac 43.65% Impervious Runoff Depth>2.41"
Tc=5.0 min CN=77 Runoff=3.70 cfs 0.253 af

SubcatchmentPR7: PR7 Runoff Area=2.800 ac 89.36% Impervious Runoff Depth>4.17"
Flow Length=1,318' Tc=5.0 min CN=95 Runoff=13.07 cfs 0.973 af

SubcatchmentPR8: PR8 Runoff Area=0.555 ac 0.00% Impervious Runoff Depth>2.76"
Flow Length=117' Tc=6.7 min CN=81 Runoff=1.76 cfs 0.128 af

SubcatchmentPR9: PR9 Runoff Area=1.495 ac 0.00% Impervious Runoff Depth>1.70"
Flow Length=175' Tc=7.3 min CN=68 Runoff=2.75 cfs 0.212 af

Pond P1: Bioretention Area Peak Elev=157.56' Storage=6,224 cf Inflow=2.81 cfs 0.265 af
Discarded=0.19 cfs 0.185 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.185 af

Pond P2: Detention Basin Peak Elev=159.41' Storage=13,693 cf Inflow=5.23 cfs 0.567 af
Outflow=0.63 cfs 0.472 af

Pond P3: Infiltration Basin Peak Elev=162.53' Storage=913 cf Inflow=1.33 cfs 0.096 af
Discarded=0.01 cfs 0.010 af Primary=1.27 cfs 0.069 af Outflow=1.28 cfs 0.079 af

Pond P4: Infiltration Basin Peak Elev=154.06' Storage=5,288 cf Inflow=3.70 cfs 0.253 af
Discarded=0.18 cfs 0.165 af Primary=0.27 cfs 0.025 af Outflow=0.44 cfs 0.190 af

Pond P5: Infiltration Basin Peak Elev=144.84' Storage=21,778 cf Inflow=16.79 cfs 1.254 af
Discarded=0.78 cfs 0.859 af Primary=1.95 cfs 0.330 af Outflow=2.73 cfs 1.190 af

Link DP1: Wetland ST-10 Inflow=2.16 cfs 0.206 af
Primary=2.16 cfs 0.206 af

Link DP3: Wetland EA1 (culvert) Inflow=2.77 cfs 0.827 af
Primary=2.77 cfs 0.827 af

Link DP4: Wetland EA 1 Inflow=1.76 cfs 0.128 af
Primary=1.76 cfs 0.128 af

Total Runoff Area = 11.399 ac Runoff Volume = 2.701 af Average Runoff Depth = 2.84"
60.24% Pervious = 6.867 ac 39.76% Impervious = 4.532 ac

Summary for Subcatchment PR1: PR1

Runoff = 2.16 cfs @ 12.21 hrs, Volume= 0.206 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.278	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.586	79	Woods, Fair, HSG D
0.157	89	Dirt roads, HSG D
1.341	70	Weighted Average
1.341		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	50	0.1600	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
3.7	190	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	34	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.4	136	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.6	410	Total			

Summary for Subcatchment PR2: PR2

Runoff = 2.81 cfs @ 12.21 hrs, Volume= 0.265 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.080	36	Woods, Fair, HSG A
0.200	73	Woods, Fair, HSG C
0.100	79	Woods, Fair, HSG D
0.600	98	Paved parking, HSG A
0.400	49	50-75% Grass cover, Fair, HSG A
0.040	84	50-75% Grass cover, Fair, HSG D
1.420	75	Weighted Average
0.820		57.75% Pervious Area
0.600		42.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0800	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
0.5	79	0.2400	2.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	205	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	101	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.0	455	Total			

Summary for Subcatchment PR3A: PR3A

Runoff = 3.18 cfs @ 12.23 hrs, Volume= 0.312 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.300	73	Woods, Fair, HSG C
1.200	79	50-75% Grass cover, Fair, HSG C
1.500	78	Weighted Average
1.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	50	0.0650	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
1.4	104	0.0650	1.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.3300	2.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	138	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	181	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.4	131	0.0100	6.22	7.63	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	66	0.0091	5.93	7.28	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	75	0.0092	5.97	7.32	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
16.8	757	Total			

Summary for Subcatchment PR3B: PR3B

Runoff = 2.89 cfs @ 12.07 hrs, Volume= 0.226 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG C
0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 0.44 cfs @ 12.07 hrs, Volume= 0.030 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.011	79	50-75% Grass cover, Fair, HSG C
0.037	49	50-75% Grass cover, Fair, HSG A
0.080	98	Paved parking, HSG C
0.128	82	Weighted Average
0.048		37.50% Pervious Area
0.080		62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR5: PR5

Runoff = 1.33 cfs @ 12.07 hrs, Volume= 0.096 af, Depth> 3.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.200	98	Paved parking, HSG C
0.300	92	Weighted Average
0.100		33.33% Pervious Area
0.200		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6: PR6

Runoff = 3.70 cfs @ 12.08 hrs, Volume= 0.253 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.450	49	50-75% Grass cover, Fair, HSG A
0.200	79	50-75% Grass cover, Fair, HSG C
0.060	84	50-75% Grass cover, Fair, HSG D
0.300	98	Paved parking, HSG A
0.150	98	Paved parking, HSG C
0.100	98	Paved parking, HSG D
1.260	77	Weighted Average
0.710		56.35% Pervious Area
0.550		43.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

Runoff = 13.07 cfs @ 12.07 hrs, Volume= 0.973 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.102	73	Woods, Fair, HSG C
0.009	36	Woods, Fair, HSG A
0.034	49	50-75% Grass cover, Fair, HSG A
0.153	79	50-75% Grass cover, Fair, HSG C
1.448	98	Paved parking, HSG A
1.054	98	Paved parking, HSG C
2.800	95	Weighted Average
0.298		10.64% Pervious Area
2.502		89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0350	1.52		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
0.4	53	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	21	0.2200	3.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	209	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0139	5.35	4.20	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.2	177	0.0650	16.80	40.40	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.7	295	0.0102	6.65	16.00	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.2	90	0.0100	6.59	15.85	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.4	177	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.8					**Direct Entry,**
0.1	66	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
5.0	1,318	Total			

Summary for Subcatchment PR8: PR8

Runoff = 1.76 cfs @ 12.10 hrs, Volume= 0.128 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.125	79	50-75% Grass cover, Fair, HSG C
0.202	84	50-75% Grass cover, Fair, HSG D
0.228	79	Woods, Fair, HSG D
0.555	81	Weighted Average
0.555		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.9	67	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	117	Total			

Summary for Subcatchment PR9: PR9

Runoff = 2.75 cfs @ 12.11 hrs, Volume= 0.212 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.75"

Area (ac)	CN	Description
0.590	49	50-75% Grass cover, Fair, HSG A
0.627	79	50-75% Grass cover, Fair, HSG C
0.232	84	50-75% Grass cover, Fair, HSG D
0.036	76	Gravel roads, HSG A
0.010	89	Gravel roads, HSG C
1.495	68	Weighted Average
1.495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.28"
1.7	125	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	175	Total			

Summary for Pond P1: Bioretention Area

Inflow Area = 1.420 ac, 42.25% Impervious, Inflow Depth > 2.24" for 10-Year event
Inflow = 2.81 cfs @ 12.21 hrs, Volume= 0.265 af
Outflow = 0.19 cfs @ 15.30 hrs, Volume= 0.185 af, Atten= 93%, Lag= 185.3 min
Discarded = 0.19 cfs @ 15.30 hrs, Volume= 0.185 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 157.56' @ 15.30 hrs Surf.Area= 3,378 sf Storage= 6,224 cf

Plug-Flow detention time= 299.2 min calculated for 0.184 af (70% of inflow)
Center-of-Mass det. time= 201.5 min (1,045.2 - 843.7)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	11,957 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.00	1,579	188.0	0	0	1,579
156.00	2,217	223.0	1,889	1,889	2,742
157.00	2,953	252.0	2,576	4,465	3,864
158.00	3,738	271.0	3,338	7,803	4,697
158.50	4,153	280.0	1,972	9,775	5,114
159.00	4,581	290.0	2,183	11,957	5,590

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 15.30 hrs HW=157.56' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
↑**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond P2: Detention Basin

Inflow Area = 2.228 ac, 30.52% Impervious, Inflow Depth > 3.06" for 10-Year event
Inflow = 5.23 cfs @ 12.09 hrs, Volume= 0.567 af
Outflow = 0.63 cfs @ 13.32 hrs, Volume= 0.472 af, Atten= 88%, Lag= 73.8 min
Primary = 0.63 cfs @ 13.32 hrs, Volume= 0.472 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 159.41' @ 13.32 hrs Surf.Area= 5,672 sf Storage= 13,693 cf

Plug-Flow detention time= 288.5 min calculated for 0.472 af (83% of inflow)
Center-of-Mass det. time= 218.3 min (1,018.9 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	27,737 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	2,331	275.0	0	0	2,331
157.00	3,258	321.0	2,782	2,782	4,533
157.50	3,896	289.0	1,786	4,568	6,094
158.00	4,338	299.0	2,058	6,625	6,584
159.00	5,276	318.0	4,799	11,425	7,567
160.00	6,256	337.0	5,759	17,184	8,610
161.00	7,298	356.0	6,770	23,954	9,714
161.50	7,839	365.0	3,783	27,737	10,260

Device	Routing	Invert	Outlet Devices
#1	Primary	153.40'	**12.0" Round Culvert** L= 112.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 153.40' / 152.50' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	157.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	160.90'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads

Primary OutFlow Max=0.63 cfs @ 13.32 hrs HW=159.41' (Free Discharge)
└**1=Culvert** (Passes 0.63 cfs of 6.84 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.63 cfs @ 7.22 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond P3: Infiltration Basin

Inflow Area = 0.300 ac, 66.67% Impervious, Inflow Depth > 3.84" for 10-Year event
Inflow = 1.33 cfs @ 12.07 hrs, Volume= 0.096 af
Outflow = 1.28 cfs @ 12.09 hrs, Volume= 0.079 af, Atten= 4%, Lag= 1.4 min
Discarded = 0.01 cfs @ 12.09 hrs, Volume= 0.010 af
Primary = 1.27 cfs @ 12.09 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 162.53' @ 12.09 hrs Surf.Area= 1,216 sf Storage= 913 cf

Plug-Flow detention time= 112.1 min calculated for 0.079 af (82% of inflow)
Center-of-Mass det. time= 41.3 min (824.3 - 782.9)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	1,389 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.50	552	116.0	0	0	552
162.00	879	170.0	355	355	1,783
162.50	1,202	174.0	518	873	1,922
162.90	1,379	179.0	516	1,389	2,080

Device	Routing	Invert	Outlet Devices
#1	Primary	155.00'	**12.0" Round Culvert** L= 49.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 155.00' / 154.00' S= 0.0204 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	162.40'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Discarded	161.50'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.09 hrs HW=162.53' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.27 cfs @ 12.09 hrs HW=162.53' (Free Discharge)
└**1=Culvert** (Passes 1.27 cfs of 9.92 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 1.27 cfs @ 1.19 fps)

Summary for Pond P4: Infiltration Basin

Inflow Area = 1.260 ac, 43.65% Impervious, Inflow Depth > 2.41" for 10-Year event
Inflow = 3.70 cfs @ 12.08 hrs, Volume= 0.253 af
Outflow = 0.44 cfs @ 12.79 hrs, Volume= 0.190 af, Atten= 88%, Lag= 42.7 min
Discarded = 0.18 cfs @ 12.79 hrs, Volume= 0.165 af
Primary = 0.27 cfs @ 12.79 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 154.06' @ 12.79 hrs Surf.Area= 3,195 sf Storage= 5,288 cf

Plug-Flow detention time= 265.0 min calculated for 0.190 af (75% of inflow)
Center-of-Mass det. time= 176.5 min (1,007.1 - 830.6)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	6,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	545	185.0	0	0	545
152.00	1,210	238.0	856	856	2,342
153.00	2,120	306.0	1,644	2,500	5,298
154.00	3,095	343.0	2,592	5,092	7,236
154.50	3,945	293.0	1,756	6,847	9,772

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 12.79 hrs HW=154.06' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.26 cfs @ 12.79 hrs HW=154.06' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 0.26 cfs @ 0.82 fps)

Summary for Pond P5: Infiltration Basin

Inflow Area = 4.595 ac, 58.80% Impervious, Inflow Depth > 3.27" for 10-Year event
Inflow = 16.79 cfs @ 12.08 hrs, Volume= 1.254 af
Outflow = 2.73 cfs @ 12.56 hrs, Volume= 1.190 af, Atten= 84%, Lag= 28.9 min
Discarded = 0.78 cfs @ 12.56 hrs, Volume= 0.859 af
Primary = 1.95 cfs @ 12.56 hrs, Volume= 0.330 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 144.84' @ 12.56 hrs Surf.Area= 14,032 sf Storage= 21,778 cf

Plug-Flow detention time= 157.6 min calculated for 1.189 af (95% of inflow)
Center-of-Mass det. time= 129.0 min (914.3 - 785.3)

Volume	Invert	Avail.Storage	Storage Description
#1	143.00'	48,482 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.00	9,980	601.0	0	0	9,980
144.00	11,812	620.0	10,883	10,883	11,924
145.00	14,463	744.0	13,115	23,998	25,401
146.00	16,751	782.0	15,593	39,591	30,078
146.50	18,831	695.0	8,890	48,482	40,311

Device	Routing	Invert	Outlet Devices
#1	Primary	144.00'	**12.0" Round Culvert** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 144.00' / 143.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Primary	146.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 6.00 7.00
#3	Discarded	143.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.78 cfs @ 12.56 hrs HW=144.84' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.78 cfs)

Primary OutFlow Max=1.95 cfs @ 12.56 hrs HW=144.84' (Free Discharge)
├**1=Culvert** (Inlet Controls 1.95 cfs @ 2.76 fps)
└**2=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Link DP1: Wetland ST-10

Inflow Area = 2.761 ac, 21.73% Impervious, Inflow Depth > 0.90" for 10-Year event
Inflow = 2.16 cfs @ 12.21 hrs, Volume= 0.206 af
Primary = 2.16 cfs @ 12.21 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 8.083 ac, 48.65% Impervious, Inflow Depth > 1.23" for 10-Year event
Inflow = 2.77 cfs @ 12.68 hrs, Volume= 0.827 af
Primary = 2.77 cfs @ 12.68 hrs, Volume= 0.827 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA 1

Inflow Area = 0.555 ac, 0.00% Impervious, Inflow Depth > 2.76" for 10-Year event
Inflow = 1.76 cfs @ 12.10 hrs, Volume= 0.128 af
Primary = 1.76 cfs @ 12.10 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

100-Year Storm Event – Proposed

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=1.341 ac 0.00% Impervious Runoff Depth>3.61"
Flow Length=410' Tc=14.6 min CN=70 Runoff=4.34 cfs 0.403 af

Subcatchment PR2: PR2 Runoff Area=1.420 ac 42.25% Impervious Runoff Depth>4.14"
Flow Length=455' Tc=15.0 min CN=75 Runoff=5.22 cfs 0.490 af

Subcatchment PR3A: PR3A Runoff Area=1.500 ac 0.00% Impervious Runoff Depth>4.46"
Flow Length=757' Tc=16.8 min CN=78 Runoff=5.69 cfs 0.558 af

Subcatchment PR3B: PR3B Runoff Area=0.600 ac 100.00% Impervious Runoff Depth>6.76"
Tc=5.0 min CN=98 Runoff=4.27 cfs 0.338 af

Subcatchment PR4: PR4 Runoff Area=0.128 ac 62.50% Impervious Runoff Depth>4.91"
Tc=5.0 min CN=82 Runoff=0.75 cfs 0.052 af

Subcatchment PR5: PR5 Runoff Area=0.300 ac 66.67% Impervious Runoff Depth>6.05"
Tc=5.0 min CN=92 Runoff=2.05 cfs 0.151 af

Subcatchment PR6: PR6 Runoff Area=1.260 ac 43.65% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=77 Runoff=6.66 cfs 0.458 af

Subcatchment PR7: PR7 Runoff Area=2.800 ac 89.36% Impervious Runoff Depth>6.40"
Flow Length=1,318' Tc=5.0 min CN=95 Runoff=19.62 cfs 1.494 af

Subcatchment PR8: PR8 Runoff Area=0.555 ac 0.00% Impervious Runoff Depth>4.80"
Flow Length=117' Tc=6.7 min CN=81 Runoff=3.01 cfs 0.222 af

Subcatchment PR9: PR9 Runoff Area=1.495 ac 0.00% Impervious Runoff Depth>3.40"
Flow Length=175' Tc=7.3 min CN=68 Runoff=5.69 cfs 0.424 af

Pond P1: Bioretention Area Peak Elev=158.24' Storage=8,736 cf Inflow=5.22 cfs 0.490 af
Discarded=0.22 cfs 0.225 af Primary=2.04 cfs 0.132 af Outflow=2.26 cfs 0.357 af

Pond P2: Detention Basin Peak Elev=160.93' Storage=23,425 cf Inflow=8.60 cfs 0.948 af
Outflow=0.97 cfs 0.742 af

Pond P3: Infiltration Basin Peak Elev=162.58' Storage=968 cf Inflow=2.05 cfs 0.151 af
Discarded=0.01 cfs 0.011 af Primary=1.97 cfs 0.123 af Outflow=1.98 cfs 0.134 af

Pond P4: Infiltration Basin Peak Elev=154.37' Storage=6,367 cf Inflow=6.66 cfs 0.458 af
Discarded=0.21 cfs 0.186 af Primary=3.99 cfs 0.188 af Outflow=4.19 cfs 0.374 af

Pond P5: Infiltration Basin Peak Elev=145.82' Storage=36,694 cf Inflow=26.82 cfs 2.041 af
Discarded=0.91 cfs 0.982 af Primary=3.84 cfs 0.907 af Outflow=4.75 cfs 1.889 af

Link DP1: Wetland ST-10 Inflow=4.34 cfs 0.535 af
Primary=4.34 cfs 0.535 af

Link DP3: Wetland EA1 (culvert) Inflow=7.78 cfs 1.837 af
Primary=7.78 cfs 1.837 af

Link DP4: Wetland EA 1 Inflow=3.01 cfs 0.222 af
Primary=3.01 cfs 0.222 af

Total Runoff Area = 11.399 ac Runoff Volume = 4.590 af Average Runoff Depth = 4.83"
60.24% Pervious = 6.867 ac 39.76% Impervious = 4.532 ac

Summary for Subcatchment PR1: PR1

Runoff = 4.34 cfs @ 12.20 hrs, Volume= 0.403 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.278	36	Woods, Fair, HSG A
0.320	73	Woods, Fair, HSG C
0.586	79	Woods, Fair, HSG D
0.157	89	Dirt roads, HSG D
1.341	70	Weighted Average
1.341		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	50	0.1600	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
3.7	190	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	34	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.4	136	0.1100	1.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.6	410	Total			

Summary for Subcatchment PR2: PR2

Runoff = 5.22 cfs @ 12.21 hrs, Volume= 0.490 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.080	36	Woods, Fair, HSG A
0.200	73	Woods, Fair, HSG C
0.100	79	Woods, Fair, HSG D
0.600	98	Paved parking, HSG A
0.400	49	50-75% Grass cover, Fair, HSG A
0.040	84	50-75% Grass cover, Fair, HSG D
1.420	75	Weighted Average
0.820		57.75% Pervious Area
0.600		42.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0800	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
0.5	79	0.2400	2.45		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	20	0.1500	2.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.4	205	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	101	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
15.0	455	Total			

Summary for Subcatchment PR3A: PR3A

Runoff = 5.69 cfs @ 12.23 hrs, Volume= 0.558 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.300	73	Woods, Fair, HSG C
1.200	79	50-75% Grass cover, Fair, HSG C
1.500	78	Weighted Average
1.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	50	0.0650	0.06		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.28"
1.4	104	0.0650	1.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.3300	2.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.7	138	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	181	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.4	131	0.0100	6.22	7.63	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	66	0.0091	5.93	7.28	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.2	75	0.0092	5.97	7.32	**Pipe Channel, RCP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
16.8	757	Total			

Summary for Subcatchment PR3B: PR3B

Runoff = 4.27 cfs @ 12.07 hrs, Volume= 0.338 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.600	98	Paved parking, HSG C
0.600		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.052 af, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.011	79	50-75% Grass cover, Fair, HSG C
0.037	49	50-75% Grass cover, Fair, HSG A
0.080	98	Paved parking, HSG C
0.128	82	Weighted Average
0.048		37.50% Pervious Area
0.080		62.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR5: PR5

Runoff = 2.05 cfs @ 12.07 hrs, Volume= 0.151 af, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.200	98	Paved parking, HSG C
0.300	92	Weighted Average
0.100		33.33% Pervious Area
0.200		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6: PR6

Runoff = 6.66 cfs @ 12.07 hrs, Volume= 0.458 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.450	49	50-75% Grass cover, Fair, HSG A
0.200	79	50-75% Grass cover, Fair, HSG C
0.060	84	50-75% Grass cover, Fair, HSG D
0.300	98	Paved parking, HSG A
0.150	98	Paved parking, HSG C
0.100	98	Paved parking, HSG D
1.260	77	Weighted Average
0.710		56.35% Pervious Area
0.550		43.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

Runoff = 19.62 cfs @ 12.07 hrs, Volume= 1.494 af, Depth> 6.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.102	73	Woods, Fair, HSG C
0.009	36	Woods, Fair, HSG A
0.034	49	50-75% Grass cover, Fair, HSG A
0.153	79	50-75% Grass cover, Fair, HSG C
1.448	98	Paved parking, HSG A
1.054	98	Paved parking, HSG C
2.800	95	Weighted Average
0.298		10.64% Pervious Area
2.502		89.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0350	1.52		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.28"
0.4	53	0.2000	2.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	21	0.2200	3.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	209	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	180	0.0139	5.35	4.20	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
0.2	177	0.0650	16.80	40.40	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.7	295	0.0102	6.65	16.00	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.2	90	0.0100	6.59	15.85	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.4	177	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
0.8					**Direct Entry,**
0.1	66	0.0136	7.68	18.48	**Pipe Channel,** 21.0" Round Area= 2.4 sf Perim= 5.5' r= 0.44' n= 0.013 Concrete pipe, straight & clean
5.0	1,318	Total			

Summary for Subcatchment PR8: PR8

Runoff = 3.01 cfs @ 12.10 hrs, Volume= 0.222 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.125	79	50-75% Grass cover, Fair, HSG C
0.202	84	50-75% Grass cover, Fair, HSG D
0.228	79	Woods, Fair, HSG D
0.555	81	Weighted Average
0.555		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.28"
0.9	67	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	117	Total			

Summary for Subcatchment PR9: PR9

Runoff = 5.69 cfs @ 12.11 hrs, Volume= 0.424 af, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.590	49	50-75% Grass cover, Fair, HSG A
0.627	79	50-75% Grass cover, Fair, HSG C
0.232	84	50-75% Grass cover, Fair, HSG D
0.036	76	Gravel roads, HSG A
0.010	89	Gravel roads, HSG C
1.495	68	Weighted Average
1.495		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.28"
1.7	125	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	175	Total			

Summary for Pond P1: Bioretention Area

Inflow Area = 1.420 ac, 42.25% Impervious, Inflow Depth > 4.14" for 100-Year event
Inflow = 5.22 cfs @ 12.21 hrs, Volume= 0.490 af
Outflow = 2.26 cfs @ 12.55 hrs, Volume= 0.357 af, Atten= 57%, Lag= 20.7 min
Discarded = 0.22 cfs @ 12.55 hrs, Volume= 0.225 af
Primary = 2.04 cfs @ 12.55 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 158.24' @ 12.55 hrs Surf.Area= 3,937 sf Storage= 8,736 cf

Plug-Flow detention time= 204.7 min calculated for 0.357 af (73% of inflow)
Center-of-Mass det. time= 115.3 min (941.5 - 826.2)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	11,957 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.00	1,579	188.0	0	0	1,579
156.00	2,217	223.0	1,889	1,889	2,742
157.00	2,953	252.0	2,576	4,465	3,864
158.00	3,738	271.0	3,338	7,803	4,697
158.50	4,153	280.0	1,972	9,775	5,114
159.00	4,581	290.0	2,183	11,957	5,590

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.22 cfs @ 12.55 hrs HW=158.24' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=2.04 cfs @ 12.55 hrs HW=158.24' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 2.04 cfs @ 1.60 fps)

Summary for Pond P2: Detention Basin

Inflow Area = 2.228 ac, 30.52% Impervious, Inflow Depth > 5.10" for 100-Year event
Inflow = 8.60 cfs @ 12.10 hrs, Volume= 0.948 af
Outflow = 0.97 cfs @ 13.40 hrs, Volume= 0.742 af, Atten= 89%, Lag= 77.9 min
Primary = 0.97 cfs @ 13.40 hrs, Volume= 0.742 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 160.93' @ 13.40 hrs Surf.Area= 7,219 sf Storage= 23,425 cf

Plug-Flow detention time= 319.5 min calculated for 0.741 af (78% of inflow)
Center-of-Mass det. time= 239.2 min (1,030.7 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	27,737 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	2,331	275.0	0	0	2,331
157.00	3,258	321.0	2,782	2,782	4,533
157.50	3,896	289.0	1,786	4,568	6,094
158.00	4,338	299.0	2,058	6,625	6,584
159.00	5,276	318.0	4,799	11,425	7,567
160.00	6,256	337.0	5,759	17,184	8,610
161.00	7,298	356.0	6,770	23,954	9,714
161.50	7,839	365.0	3,783	27,737	10,260

Device	Routing	Invert	Outlet Devices
#1	Primary	153.40'	**12.0" Round Culvert** L= 112.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 153.40' / 152.50' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	157.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	160.90'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads

Primary OutFlow Max=0.93 cfs @ 13.40 hrs HW=160.93' (Free Discharge)
└**1=Culvert** (Passes 0.93 cfs of 7.67 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.81 cfs @ 9.34 fps)
  └**3=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.54 fps)

Summary for Pond P3: Infiltration Basin

Inflow Area = 0.300 ac, 66.67% Impervious, Inflow Depth > 6.05" for 100-Year event
Inflow = 2.05 cfs @ 12.07 hrs, Volume= 0.151 af
Outflow = 1.98 cfs @ 12.09 hrs, Volume= 0.134 af, Atten= 3%, Lag= 1.2 min
Discarded = 0.01 cfs @ 12.09 hrs, Volume= 0.011 af
Primary = 1.97 cfs @ 12.09 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 162.58' @ 12.09 hrs Surf.Area= 1,236 sf Storage= 968 cf

Plug-Flow detention time= 88.9 min calculated for 0.134 af (88% of inflow)
Center-of-Mass det. time= 35.2 min (806.6 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	1,389 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.50	552	116.0	0	0	552
162.00	879	170.0	355	355	1,783
162.50	1,202	174.0	518	873	1,922
162.90	1,379	179.0	516	1,389	2,080

Device	Routing	Invert	Outlet Devices
#1	Primary	155.00'	**12.0" Round Culvert** L= 49.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 155.00' / 154.00' S= 0.0204 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	162.40'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Discarded	161.50'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.09 hrs HW=162.58' (Free Discharge)
↑└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.97 cfs @ 12.09 hrs HW=162.58' (Free Discharge)
↑└**1=Culvert** (Passes 1.97 cfs of 9.95 cfs potential flow)
↑└**2=Orifice/Grate** (Weir Controls 1.97 cfs @ 1.38 fps)

Summary for Pond P4: Infiltration Basin

Inflow Area = 1.260 ac, 43.65% Impervious, Inflow Depth > 4.36" for 100-Year event
Inflow = 6.66 cfs @ 12.07 hrs, Volume= 0.458 af
Outflow = 4.19 cfs @ 12.16 hrs, Volume= 0.374 af, Atten= 37%, Lag= 5.4 min
Discarded = 0.21 cfs @ 12.16 hrs, Volume= 0.186 af
Primary = 3.99 cfs @ 12.16 hrs, Volume= 0.188 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 154.37' @ 12.16 hrs Surf.Area= 3,722 sf Storage= 6,367 cf

Plug-Flow detention time= 154.9 min calculated for 0.374 af (82% of inflow)
Center-of-Mass det. time= 82.4 min (896.0 - 813.6)

Volume	Invert	Avail.Storage	Storage Description
#1	151.00'	6,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
151.00	545	185.0	0	0	545
152.00	1,210	238.0	856	856	2,342
153.00	2,120	306.0	1,644	2,500	5,298
154.00	3,095	343.0	2,592	5,092	7,236
154.50	3,945	293.0	1,756	6,847	9,772

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 6.00
#2	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.21 cfs @ 12.16 hrs HW=154.37' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=3.98 cfs @ 12.16 hrs HW=154.37' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 3.98 cfs @ 1.98 fps)

Summary for Pond P5: Infiltration Basin

Inflow Area = 4.595 ac, 58.80% Impervious, Inflow Depth > 5.33" for 100-Year event
Inflow = 26.82 cfs @ 12.08 hrs, Volume= 2.041 af
Outflow = 4.75 cfs @ 12.54 hrs, Volume= 1.889 af, Atten= 82%, Lag= 27.6 min
Discarded = 0.91 cfs @ 12.54 hrs, Volume= 0.982 af
Primary = 3.84 cfs @ 12.54 hrs, Volume= 0.907 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 145.82' @ 12.54 hrs Surf.Area= 16,338 sf Storage= 36,694 cf

Plug-Flow detention time= 136.9 min calculated for 1.889 af (93% of inflow)
Center-of-Mass det. time= 97.6 min (874.7 - 777.1)

Volume	Invert	Avail.Storage	Storage Description
#1	143.00'	48,482 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
143.00	9,980	601.0	0	0	9,980
144.00	11,812	620.0	10,883	10,883	11,924
145.00	14,463	744.0	13,115	23,998	25,401
146.00	16,751	782.0	15,593	39,591	30,078
146.50	18,831	695.0	8,890	48,482	40,311

Device	Routing	Invert	Outlet Devices
#1	Primary	144.00'	**12.0" Round Culvert** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 144.00' / 143.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Primary	146.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 6.00 7.00
#3	Discarded	143.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.91 cfs @ 12.54 hrs HW=145.82' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.91 cfs)

Primary OutFlow Max=3.84 cfs @ 12.54 hrs HW=145.82' (Free Discharge)
├**1=Culvert** (Inlet Controls 3.84 cfs @ 4.89 fps)
└**2=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Link DP1: Wetland ST-10

Inflow Area = 2.761 ac, 21.73% Impervious, Inflow Depth > 2.33" for 100-Year event
Inflow = 4.34 cfs @ 12.20 hrs, Volume= 0.535 af
Primary = 4.34 cfs @ 12.20 hrs, Volume= 0.535 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP3: Wetland EA1 (culvert)

Inflow Area = 8.083 ac, 48.65% Impervious, Inflow Depth > 2.73" for 100-Year event
Inflow = 7.78 cfs @ 12.18 hrs, Volume= 1.837 af
Primary = 7.78 cfs @ 12.18 hrs, Volume= 1.837 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link DP4: Wetland EA 1

Inflow Area = 0.555 ac, 0.00% Impervious, Inflow Depth > 4.80" for 100-Year event
Inflow = 3.01 cfs @ 12.10 hrs, Volume= 0.222 af
Primary = 3.01 cfs @ 12.10 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Bristol County, Massachusetts, Northern Part; and Norfolk and Suffolk Counties, Massachusetts

March 27, 2012

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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Contents

Preface.....2
Soil Information for All Uses.....5
Soil Properties and Qualities.....5
Soil Qualities and Features.....5
Hydrologic Soil Group.....5

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

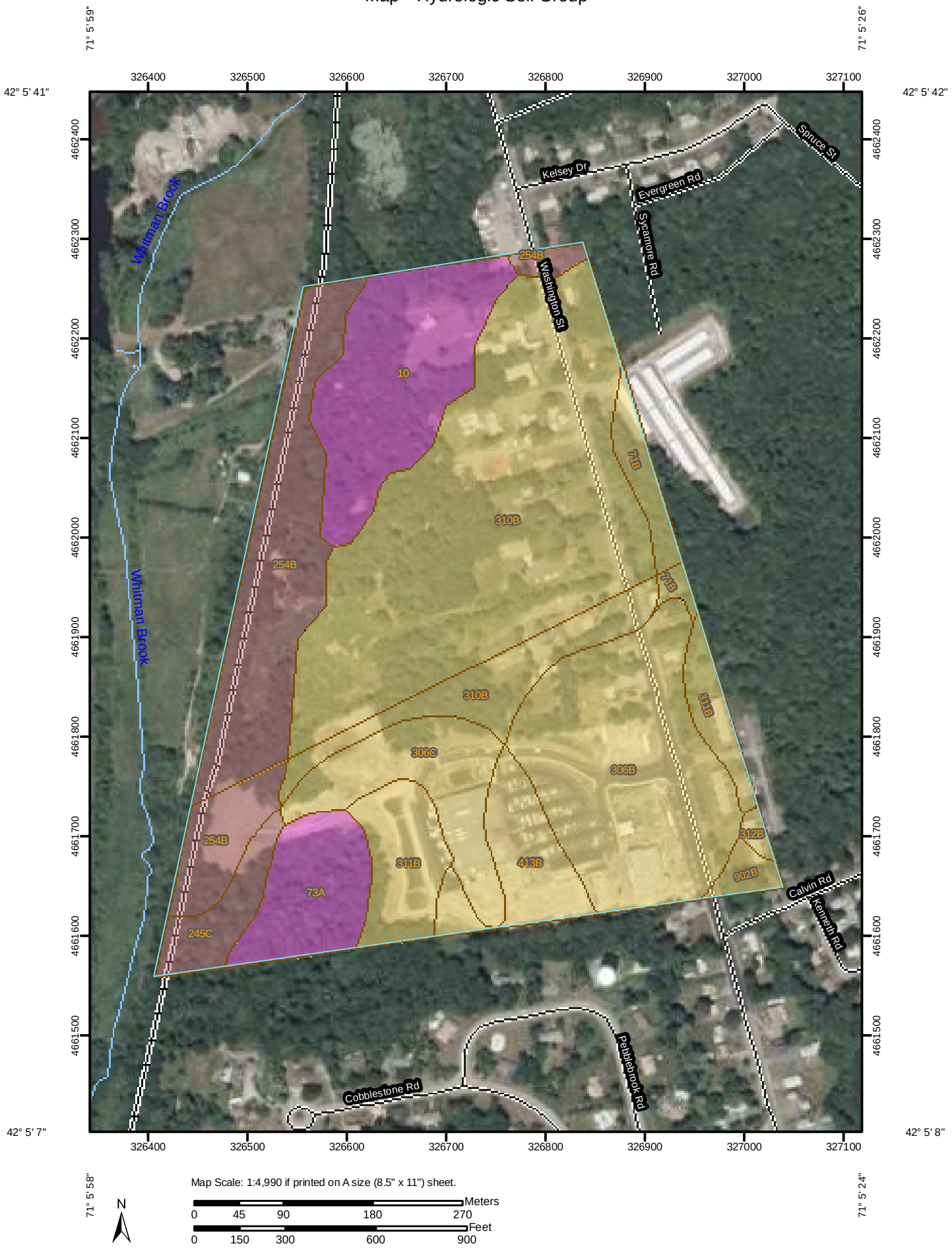
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,990 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part
Survey Area Data: Version 5, Jul 27, 2010

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 8, Jul 23, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 7/10/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Northern Part (MA602)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	C	0.3	0.4%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	3.7	4.9%
245C	Hinckley sandy loam, 8 to 15 percent slopes	A	1.9	2.5%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	2.2	2.9%
306B	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	C	11.5	15.1%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	C	4.5	5.9%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C	3.6	4.7%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C	4.3	5.6%
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	C	0.3	0.4%
413B	Charlton - Paxton fine sandy loams, 0 to 8 percent slopes, very stony	C	3.2	4.2%
902B	Charlton - Paxton fine sandy loams, 0 to 8 percent slopes, extremely stony	C	0.6	0.8%
Subtotals for Soil Survey Area			**36.1**	**47.4%**
Totals for Area of Interest			**76.2**	**100.0%**

Hydrologic Soil Group— Summary by Map Unit — Norfolk and Suffolk Counties, Massachusetts (MA616)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
10	Scarboro and Birdsall soils, 0 to 3 percent slopes	D	7.8	10.2%
71B	Ridgebury fine sandy loam, 2 to 8 percent slopes, extremely stony	C	1.3	1.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	8.6	11.3%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C	22.4	29.4%
Subtotals for Soil Survey Area			**40.1**	**52.6%**
Totals for Area of Interest			**76.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: North Easton
Project Location: Stoughton, MA

Proj. No.: 10111.00
Date: 31-May-12
Calculated by: CWF
Checked by: EJM

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	0.0	0.0	0.0	0.0
2	0.6	0.0	0.0	0.0	0.6
3	0.0	0.0	0.6	0.0	0.6
4	0.0	0.0	0.1	0.0	0.1
5	0.0	0.0	0.2	0.0	0.2
6	0.3	0.0	0.2	0.1	0.6
7	1.4	0.0	1.0	0.0	2.4
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
TOTAL	**2.3**	**0.0**	**2.1**	**0.1**	**4.5**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	2.3	0.60	5,009
B	0.0	0.35	0
C	2.1	0.25	1,880
D	0.1	0.10	36
TOTAL			**6,926**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet - see attached sheets)

Basin 1	7,829
Basin 3	947
Basin 4	5,356
Basin5	10,896
Total	**25,028** c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: North Easton Station **Proj. No.:** 10111.00

Date: 5/31/2012

Project Location: Stoughton/Easton, MA **Calculated by:** EJM

Bioretention Basin - 1

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
155.00	1,579	0
156.00	2,217	1,898
157.00	2,953	4,483
158.00	3,738	7,829
TOTAL		**7,829**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**24.7**	**hours**

Infiltration Basin - 3

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
161.50	552	0
162.00	879	358
162.50	1,202	878
TOTAL		**878**

Assumptions:

Recharge Rate: 0.27 in/hr

Drawdown Time:	**70.7**	**hours**

Infiltration Basin - 4

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
151.00	545	0
152.00	1,210	878
153.00	2,120	2,543
154.00	3,095	5,150
TOTAL		**5,150**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**47.1**	**hours**

Drawdown Calculations

Project Name: North Easton Station **Proj. No.:** 10111.00

Date: 5/31/2012

Project Location: Stoughton/Easton, MA **Calculated by:** EJM

Infiltration Basin - 5

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
143.00	9,980	0
144.00	11,812	10,896
TOTAL		**10,896**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**5.4 hours**

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: North Easton Stati **Proj. No.:** 10111.00
Project Location: Easton, MA **Date:** 5/31/2012
Calculated by: CWF
Checked by: EJM

Bioretention Basin P1
(runoff from Area PR2)

Total Impervious Area = 0.60 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Water Quality Volume	1	2,178

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Infiltration Basin	155.0	1,579	0
	156.0	2,217	1,898
	157.0	2,953	4,483
	158.0	3,738	7,829

Infiltration Basin P2
(runoff from Area PR3, PR4)

Total Impervious Area = 0.68 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	247
Water Quality Volume	1	2,468

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	156.0	186	0
	157.0	364	275
Infiltration Basin	156.0	2,331	0
	157.0	3,258	2,795

Infiltration Basin P3
(runoff from Area PR5)

Total Impervious Area = 0.20 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	73
Water Quality Volume	1	726

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	161.5	0	0
	162.0	146	37
	162.5	220	128
Infiltration Basin	161.25	0	0
	161.5	552	69
	162.0	879	427
	162.5	1,202	947

VHB

Water Quality Volume Calculations

Project Name: North Easton Stati **Proj. No.:** 10111.00
Project Location: Easton, MA **Date:** 5/31/2012
Calculated by: CWF

Infiltration Basin P4
(runoff from Area PR6)

Total Impervious Area = 0.55 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	200
Water Quality Volume	1	1,997

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	153.0	168	0
	154.0	346	257
Infiltration Basin	150.5	280	0
	151.0	545	206
	152.0	1,210	1,084
	153.0	2,120	2,749
	154.0	3,095	5,356

Infiltration Basin P5
(runoff from Area PR7)

Total Impervious Area = 2.50 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	908
Water Quality Volume	1	9,075

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	145.0	761	0
	146.0	1104	933
Infiltration Basin	143.0	9,980	0
	144.0	11,812	10,896

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**North Easton Station**	Sheet:	**1 of 3**
Project Number:	**10111.00**	Date:	**11-Apr-2012**
Location:	**Stoughton, MA**	Computed by:	**CWF**
Discharge Point:	**DP-1**	Checked by:	**VHB**
Drainage Area(s):	**PR1, PR2**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area	**90%**	**100%**	**90%**	**10%**
	0%	**10%**	**0%**	**10%**
	0%	**10%**	**0%**	**10%**
		Pre-Treatment TSS Removal =		**90%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area	**90%**	**100%**	**90%**	**10%**
	0%	**10%**	**0%**	**10%**
	0%	**10%**	**0%**	**10%**
	0%	**10%**	**0%**	**10%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
** Equals remaining load from previous BMP (E)

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**North Easton Station**	Sheet:	**2 of 3**
Project Number:	**10111.00**	Date:	**11-Apr-2012**
Location:	**Stoughton, MA**	Computed by:	**CWF**
Discharge Point:	**DP-3**	Checked by:	**VHB**
Drainage Area(s):	**PR 4, 5, 6, 8, 9**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Sediment Forebay	**25%**	**75%**	**19%**	**56%**
	0%	**56%**	**0%**	**56%**
		Pre-Treatment TSS Removal =		**44%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Infiltration Basin	**80%**	**75%**	**60%**	**15%**
	0%	**15%**	**0%**	**15%**
	0%	**15%**	**0%**	**15%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
** Equals remaining load from previous BMP (E)

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**North Easton Station**	Sheet:	**3 of 3**
Project Number:	**10111.00**	Date:	**11-Apr-2012**
Location:	**Stoughton, MA**	Computed by:	**CWF**
Discharge Point:	**DP-3**	Checked by:	**VHB**
Drainage Area(s):	**PR 3, 7**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Sediment Forebay	**25%**	**75%**	**19%**	**56%**
	0%	**56%**	**0%**	**56%**
		Pre-Treatment TSS Removal =		**44%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Oil Grit Separator	**25%**	**75%**	**19%**	**56%**
Infiltration Basin	**80%**	**56%**	**45%**	**11%**
	0%	**11%**	**0%**	**11%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
** Equals remaining load from previous BMP (E)

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	January 23, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Da Ha, Peter Chou - Jacobs
Cc	
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) North Easton Station Geotechnical Design Memorandum Easton, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the construction of several existing and new passenger stations and two terminal layover facilities. This geotechnical design memorandum presents the foundation design considerations for the new station platform at the proposed North Easton Station in Easton, Massachusetts. The design recommendations presented in this report are based on the results of subsurface investigation performed by Jacobs in 2010.

Existing Conditions

The proposed North Easton Station is off Route 138 in Easton, behind the Roche Brothers Shopping Plaza (Figure 1). The station site is undeveloped and entirely vegetated, but has evidence of earthwork, most likely as a result of the construction of the shopping plaza. In addition to the shopping plaza to the east, the site is adjacent to forested land to the west and south. The shopping plaza contains six buildings in good condition as all are relatively new. A medical office building adjacent to the proposed station site is the newest building. Existing grades at the platform location range from elevations 160 to 154 feet (NGVD29 Datum), generally sloping downward from north to south.

Proposed Construction

A commuter parking lot, drop-off ramps and platform are currently proposed at this site. Current station plans are to construct a new parking area and a new drop-off area, and add an 800 foot long, 12 foot wide high level center platform adjacent to the existing tracks with some track relocation required, as well as the addition of a second track. Access to the platform will be from a new ramp/stair structure along the east side of the tracks with a bridge over the track to the platform. Approximately 375 feet of the platform will be under a new station canopy. The details of new track layout (including grading), associated sidewalks and ramps of the proposed station are still under development at the time of this report preparation. This report focuses on the foundations for the platform only.

SCOPE OF WORK

This memorandum was prepared by Jacobs Engineering Group (Jacobs) in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform a geotechnical exploration and laboratory testing program;
- Report and interpret the results of the exploration and laboratory testing program; and
- Provide geotechnical recommendations for design and construction of the platform foundations.

The Jacobs scope of work did not include environmental analyses to assess the potential presence of any hazardous materials at the project site or potential impacts to adjacent structures during construction.

LOCAL GEOLOGY

The soils at the site are underlain by the Dedham Granite. The Dedham Granite is Proterozoic in age, medium grained, and light gray, pinkish gray and greenish gray in color. The intact strength of the rock averages about 35,000 psi. The rock mass is sparsely fractured. The top of rock was encountered as shallow as five feet in some of the borings but extended deeper than 16 feet in others. The top of rock was typically sharp, with little or no residual soil. In some borings, there appeared to be a layer of granite, followed by a zone of soil, followed by granite. The intervening layer of soil was typically not sampled and described simply as material not recovered by rock coring. The most likely explanation is that exfoliation has caused large slabs of rock to pop off the top of the main body of rock. If this explanation is correct, then these slabs could extend laterally for tens of feet and could have open voids beneath them. Another possible explanation is that these layers are localized boulders in the glacial deposits overlying the rock. The similarity between the upper layer the underlying rock suggests that the first explanation is more likely. Heavily loaded foundations will need to pass through the upper slab and into the underlying, competent rock.

GEOTECHNICAL EXPLORATIONS

Jacobs Engineering Group planned the subsurface exploration program and retained the drilling contractor to perform the explorations. The geotechnical data reports were submitted in 2010. Five borings (NES-1, NES-2, NES-2A, NES-3 and NES-4) were conducted along the proposed station platform and eighteen borings (NES-6 to NES-9, NES-11, NES-11A, NES-12 to NES-17, NES-19, NES-19A and NES-20 to NES-23) were drilled in the general vicinity of the proposed parking lot and its driveways for the 2010 explorations. Boring locations are shown on the Subsurface Exploration Plan (Figure 2).

The 2010 borings were drilled by New Hampshire Boring of Brockton, Massachusetts using either a CME-550 or D-50 ATV mounted drill rig, a D-90 or D-120 track mounted drill rig, or a CME-75 truck mounted drill rig. The borings were advanced through the soil by wash boring methods using a 4-inch casing and roller bit with water. Standard penetration tests (SPT), consisting of a 140-pound hammer dropping 30 inches on a standard 2-inch-diameter (OD) split-spoon sampler, were performed with a safety hammer or automatic hammer to establish the consistency of the subsurface soils. The SPT's were typically performed at five foot intervals of depth. The obtained samples were sealed in glass jars to retain their natural moisture. Bedrock was not encountered during the explorations.

The borings were observed by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils (Visual-Manual

Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

LABORATORY TESTING

The results of the laboratory testing were previously submitted to VHB in a report entitled "South Coast Rail, Jacobs Geotechnical Data Report", dated November 2010.

Grain size distribution analyses were performed to evaluate the gradation of the natural granular soils for potential reuse as backfill, if needed, and to confirm sample classifications. The analyses are summarized in Table 1 below and are presented in Appendix B.

Table 1: Laboratory Soil Classification Summary

BORING NO.	SAMPLE NO.	ELEVATION (FEET)	USCS SOIL CLASSIFICATION	W (%)	GRAVEL (%)	SAND (%)	FINES (%)
NES-4	S4	144.0	Silty Clay (CL)	23.6	0.0	1.9	98.1
NES-5	S2	154.0	Silty Sand (SM)	1.1	13.3	68.3	18.4
NES-14	S2	162.0	Silty Sand w/ Gavel (SM)	NT	32.7	51.3	16.0
NES-21	S2	158.0	Gravel w/ Silt + Sand (GW-GM)	NT	56.9	34.1	9.0

Where: w = natural moisture content, NT = Not Tested.

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for the South Coast Rail project, with some interpretations. The subsurface conditions encountered at the station platform area during our 2010 explorations generally consist of a layer of granular fill with thickness of about 4 to 9 feet, underlain by a sand and gravel layer with thickness ranging from 0 to 26 feet overlying bedrock. A 10 feet thick hard silty clay layer was encountered within the sand and gravel layer from about 14 to 24 feet below ground surface in boring NES-4. Boulders were encountered at borings NES-2, NES-3 and NES-5 within the upper 5 to 10 feet of the borings. Bedrock was encountered at a depth of about 5 to 35 feet in the platform area, corresponding to approximately elevations 123 to 151.5 feet.

Fill materials with thicknesses varying from 0 to 8 feet were also encountered in the vicinity of the proposed parking lot area. Bedrock was encountered at a depth about 4 to 18 feet (corresponding to elevations 133 to 169.5 feet) with generally shallower bedrock found on the south side of the parking lot and in the area of the proposed infiltration basin.

Subsurface soil conditions are summarized in Table 2 below.

Table 2: Summary of Subsurface Conditions at Available Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Platform Borings							
NES - 2	154.0	0.5 (Top Soil)	153.5	153.5	153.5	NR	Obstruction encountered.
NES - 2A	154.0	4.0	150.0	148.5	146.0	NR	Offset ~5 ft from NES - 2.
NES - 3	156.0	0.3 (Top Soil)	155.7	144.0	138.5	NR	
NES - 4	158.0	9.0	149.0	123.0	122.0	148.0	
NES - 5 OW	158.0	4.0	154.0	141.0	131.0	140.5	
NES - 7	158.0	6.5	151.5	151.5	149.0	NR	
NES - 8	154.0	4.0	150.0	NE	138.0	150.5	Boring offset ~12 ft SE from staked location.
NES - 9	159.0	0	159.0	NE	143.0	154.0	
Site Borings							
NES - 1 OW	151.0	8.0	143.0	133.0	127.5	135.5	Well screened from 18 to 23 ft.
NES - 6	163.0	0	163.0	157.5	152.5	159.5	
NES - 11	165.0	0	165.0	160.0	153.0	NR	
NES - 11A	162.0	0	162.0	156.5	142.0	NR	Boring offset ~25 ft W of NES-11, ~3 ft less elevation.
NES - 12	166.0	4.0	162.0	160.5	158.0	NR	
NES - 13	159.0	4.0	155.0	NE	143.0	NR	
NES - 14	166.0	0	166.0	151.0	150.0	NR	
NES - 15	173.0	0	173.0	169.0	169.0	NR	
NES - 16	160.0	4.0	156.0	NE	144.0	NR	
NES - 17	175.0	0	175.0	168.0	166.0	NR	
NES - 19	175.0	0	175.0	168.0	168.0	NR	Refusal at 7 ft, relocated boring.
NES - 19A	175.0	0	175.0	168.5	161.0	172.0	
NES - 20	175.0	0	175.0	169.5	165.0	NR	
NES - 21	162.0	0	162.0	NE	146.0	NR	
NES - 22	144.0	0.3 (Top Soil)	143.7	139.0	129.0	141.0	
NES - 23	162.0	8.0	154.0	153.0	145.0	NR	Boulder at 1 ft, relocated boring 5 ft south.

NE: Not encountered at the boring during drilling. NR: Not recorded.

Fill: The fill layer typically consists of mostly granular, loose to very dense sand with up to about 15% silt and 15% gravel. The fill layer is generally about 0 to 4 feet thick but may be as thick as 9 feet in the area of the platform.

Natural Granular Deposits: In the platform area, the natural soil deposits below the fill generally consist of predominantly sand with up to about 30% gravel and 20% silt. These deposits are loose to very dense with Standard Penetration Test (SPT) N-values ranging between 9 and in excess of 50 blows per foot (bpf). The numerous high N-values encountered may be caused by the presence of large pieces of gravel and cobbles or even boulders, which are common within this type of deposit.

An approximately 10 feet thick hard silty clay layer was encountered in boring NES-4 from about 14 to 24 feet below ground surface, corresponding to elevations 134 to 144 feet.

Bedrock: Granite bedrock was encountered in the platform area at depth of about 5 to 35 feet below existing ground surface, corresponding to approximately elevations 123 to 151.5 feet. The bedrock was generally hard, fresh to slightly weathered GRANITE.

Bedrock was encountered at elevations ranging from about 133 to 169.5 feet in other site areas. In the vicinity of borings NES-11 and NES-15, bedrock was encountered above the proposed grades at the site.

Groundwater: Groundwater levels were measured in the test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level ranged from approximate elevations 140.5 to 154.0 feet in the general area of the platform, and from elevations 135.5 to 172 feet in the general site area. The use of wash boring techniques for all soil borings may have artificially increased the water level readings due to the addition of water to the borings. Trapped/perched water is also commonly seen at a higher elevation within existing fill or silty materials. The longer term water level readings taken at Boring NES–1 OW on July 9, 2010 indicated the ground water level at a depth of about 17.0 feet (Elevation 134.0 feet). The longer term water level readings taken at Boring NES–5 OW on July 9, 2010 and September 12, 2011 indicated the water at a depth of about 17.5 feet (Elevation 140.5 feet) and 15.5 feet (Elevation 142.5 feet), respectively.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. Local and periodic variations of ground water elevations may also be influenced by local subsurface drainage and, leaking water or sewer pipes. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction. However, based upon these short-term observations and readings from the observation well at Boring NES–1 OW and NES-5 OW, it is anticipated that the groundwater could be at within 15 to 18 feet below existing grade at both the platform and the parking lot areas.

GEOTECHNICAL RECOMMENDATIONS

Based on our review of available subsurface information, the proposed station platforms can be supported on spread footings bearing directly within either competent natural soil or structural fill placed above suitable natural soils. Final platform and canopy design loads were not available at the time of this report preparation. However, it is anticipated that the station platform will be lightly (axially) loaded with limited horizontal forces from wind and seismic loads.

The following paragraphs provide project specific geotechnical recommendations for foundation soil preparation, structural fill/backfill placement, and design and construction of spread footings.

Platform Foundation- Spread Footings

Spread footings are recommended for the platform foundations, bearing on compacted structure fill or natural granular deposits. The bottom of footing elevation should be at least 4 feet below final grades for frost protection. The existing fill is not suitable for support of the spread footings and should be removed within the zone of influence of the footing, defined by a line extending one foot horizontally from the bottom edge of footing and then down and away at a 1H:1V slope until natural granular soils are encountered.

The recommended allowable design bearing capacity for spread footings bearing on structural fill or natural sand and gravel deposits is 5 ksf, provided that subgrades are prepared as described herein. This provides an adequate factor of safety against bearing failure and limits the total estimated settlement to less than one inch and the differential settlement to less than ½ inch. All footings should be at least 4 feet wide.

The structural fill material, if needed, should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557).

All temporary open cuts required for footing construction should be in accordance with the related OSHA regulations and should have side slopes of no steeper than 1.5H:1V.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered, the station site is classified as Seismic Site Class C soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The structure could be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class C Soils at the location of this station:

$S_{MS} = 0.300$ and $S_{M1} = 0.109$

$S_{DS} = 0.200$ and $S_{D1} = 0.073$

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class

- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: slope instability, soil liquefaction, or surface rupture due to faulting or lateral spreading. The proposed grading is relatively flat and we are not aware of any pre-existing slope instability in this area. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Based on the observed subsurface conditions, recorded water levels, percentage of fine contents and sample relative densities (high SPT N-values), the existing soils underlying the site are judged not susceptible to liquefaction.

CONSTRUCTION CONSIDERATIONS

Foundation Installation - Spread Footings

Following excavation to the base of the spread footing subgrade or to the bottom of existing fill layer, whichever is deeper, the exposed surface should be observed by an on-site representative of the project geotechnical engineer and proof-compacted with at least 10 passes of a large vibratory drum roller. Any yielding areas should be observed by geotechnical personnel to assess if additional localized undercutting is necessary. Footing inspections should include hand auger probes by the geotechnical personnel to identify soft/weak zones. The need for undercutting and backfilling with structural fill should be closely evaluated in the field based on encountered conditions.

If bedrock is encountered at the proposed bottom of footing elevation, the footing should either bear entirely on bedrock or entirely on soil. Where partial bedrock subgrade is encountered at the bottom of footing elevation, the bedrock should be over-excavated to a depth of at least 10 inches below the bottom of footing elevation and replaced with compacted Gravel Borrow to provide a uniform bearing surface.

In areas where seepage is encountered within footing excavations, the need for placing a 3" thick lean concrete mud mat or a layer of ¾-inch crushed stone to protect the bearing surface should be evaluated in the field. Crushed stone thicker than 4 inches shall be wrapped by non-woven filter fabric.

Following observation of the bearing soils by geotechnical personnel, reinforcing steel and concrete can be placed in the excavation. It is recommended that footing reinforcing steel and concrete be placed the same day as the footing excavation is made, where possible, to avoid significant moisture content changes in the bearing soils. No water should be allowed to pond within excavations and drainage should be maintained away from foundations both during and after construction. The footing excavation should be free of loose debris at the time of footing concrete placement.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed structure footprints, walkway and paved areas, these areas should be stripped of topsoil, vegetation, and existing pavement, if present. The topsoil should be placed in a designated area for reuse during final grading. Following site clearing and stripping, the exposed subgrade should be proof compacted with 10 passes of a large vibratory

drum roller. Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials.

If additional rolling does not correct the unstable condition, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. Also if possible, a backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas. Construction traffic should be controlled to prevent excessive stresses and disturbance to the subgrade.

If pavements are not constructed immediately after grading, the subgrade should be shaped so as to prevent ponding. If there is a substantial lapse in time between grading and paving, or if the subgrade is disturbed, it should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during proof-rolling or initial construction should be removed and replaced with compacted granular fill.

Within the proposed paved areas, and extending a distance of five feet beyond the edge on all sides, excavate existing granular fill soils to a depth of two feet below existing site grades. It may be possible to reuse the existing granular fill, depending on the suitability of the material, as described herein.

Fill Placement and Compaction

Fill materials most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to the following percentages of the maximum dry density:

Table 3: Fill Compaction Requirements

DESCRIPTION	MINIMUM PERCENT COMPACTION (ASTM D-1557)
General Site Fills, Structural Fill (Below Footings and Slabs)	95
Behind Retaining Walls	92
Landscape Area	90

Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content as determined by the Modified Proctor test (ASTM D-1557).

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Discharge of pumped water should be performed in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes steeper than 2-1/2H:1V as the station design is finalized.

Excavation Slopes and Shoring

The slopes of open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced registered Professional Engineer in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

Protection of Existing Facilities

It is recommended that a geotechnical instrumentation and monitoring program be performed during construction of the project to evaluate impacts on adjacent structures. It is recommended that the program be developed to provide data for the following considerations:

- To monitor ground movements and vibration levels during construction.
- To provide early warning of potentially adverse trends by presenting sufficient data to determine the source of unanticipated ground movements, if present.
- If necessary, to plan remedial measures to limit damage to embankments and structures and to provide early warning when alternative means of protection are necessary.
- To document impacts of construction on adjacent facilities.
- To evaluate the performance and structural integrity of the constructed facilities.

We recommend the following instrumentation program to measure:

- Ground surface settlement and lateral movement adjacent to proposed construction.
- Horizontal and vertical movement of any excavation support system, and existing structures.
- Vibrations as a result of construction activities.

Vertical and horizontal survey points should be established on the adjacent structures. The monitoring points should be surveyed prior to the start of construction and monitored during construction to detect movement.

Vibration monitoring shall be conducted within 100 feet of existing structures during construction activities.

We recommend conducting a pre-construction survey of structures and utilities within 100 feet of the site to document existing conditions prior to construction. Documentation should include photographs, video, sketches, and/or written comments.

Specific instrumentation and monitoring requirements shall be based on the proposed construction sequence, duration of construction, and performance criteria. Initial measurements should be established well in advance of construction so that baseline data can be developed. This information will be invaluable for providing early warning of adverse trends and for assessing the need for mitigating measures.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed North Easton Station in Easton, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – SITE LOCATION PLAN
FIGURE 2 – SUBSURFACE EXPLORATION PLAN
FIGURE 3 – SUBSURFACE SOIL PROFILES
APPENDIX A – EXPLORATION LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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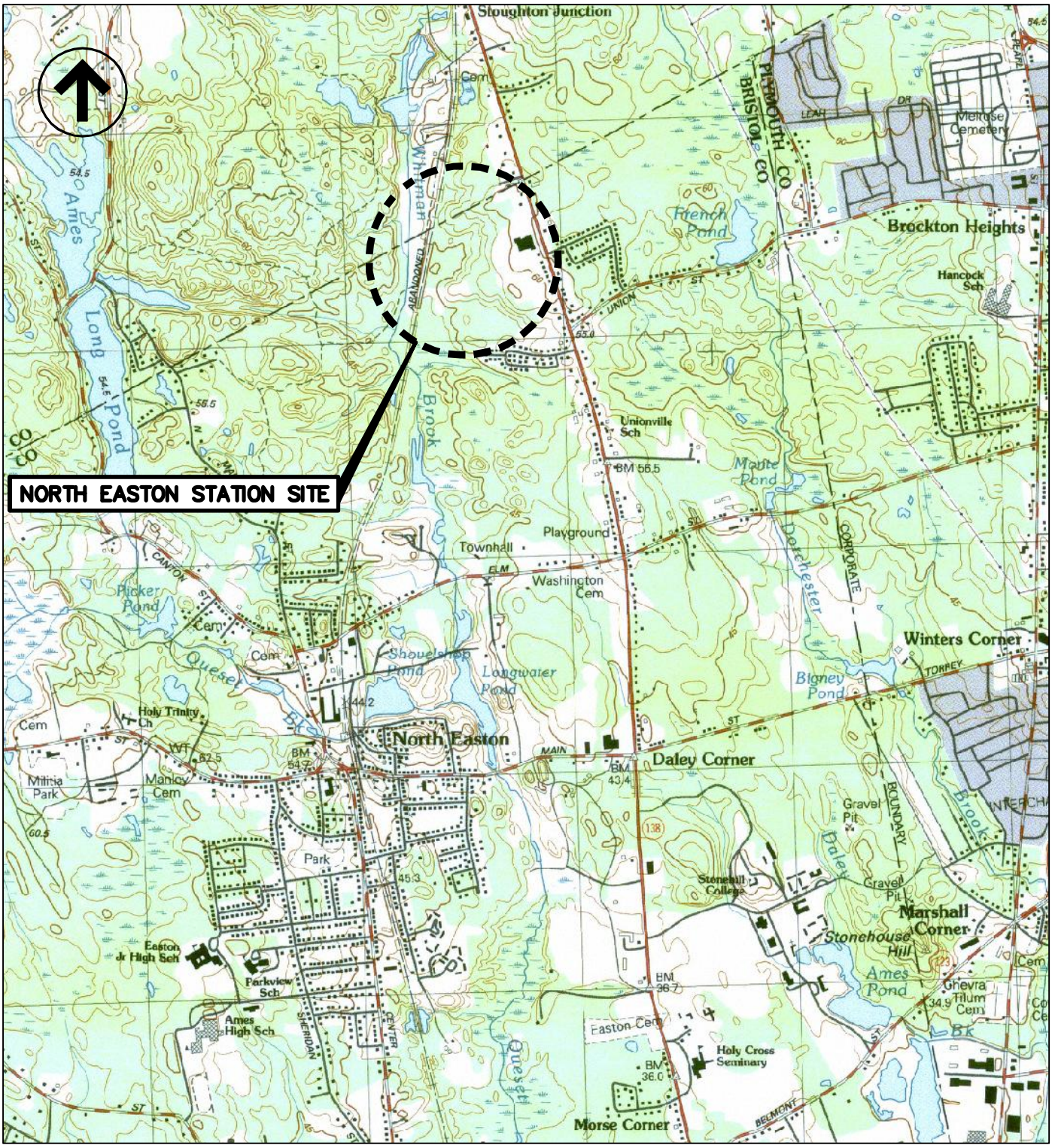
FIGURES

Figure 1: Site Location Plan
Figure 2: Subsurface Exploration Plan
Figure 3: Subsurface Soil Profiles



NORTH EASTON STATION
PROJECT LOCUS PLAN
NOT TO SCALE

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	NORTH EASTON STATION EASTON, MASSACHUSETTS FIGURE 1

NOTES:

1. BORING LOCATIONS WERE DETERMINED BY INSTRUMENT SURVEY CONDUCTED BY COLER AND COLANTONIO, INC. WHEN OBSTRUCTIONS ARE ENCOUNTERED THE MOVED BORINGS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT AND LINE OF SIGHT FROM EXISTING FEATURES AND SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.
2. FOR BORING LOGS SEE GEOTECHNICAL REPORT DATED JANUARY 2012 APPENDIX A.
3. SURFACE DETAIL AND TOPOGRAPHY SHOWN HEREON IS FROM AN ON-THE-GROUND SURVEY PERFORMED BY COLER & COLANTONIO, INC., FROM APRIL 2010 TO SEPTEMBER 2010.
4. PRIMARY GEODETIC SURVEY CONTROL WAS ESTABLISHED FROM AN ON-THE-GROUND SURVEY BY COLER & COLANTONIO, INC. USING GLOBAL POSITIONING SYSTEM (GPS) SURVEY METHODS IN FEBRUARY 2010. THE GRID COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND 2001 – NAD83).
5. CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).

KEY:

NES-4 ⊕ BORING PERFORMED BY NEW HAMPSHIRE BORING IN MAY 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

OW ⊕ INDICATES OBSERVATION WELL INSTALLED

EASTON (BRISTOL COUNTY)
STOUGHTON (NORFOLK COUNTY)

NES-1 OW, NES-2, NES-2A, NES-3, NES-4, NES-5 OW, NES-6, NES-7, NES-8, NES-9, NES-11, NES-11A, NES-12, NES-13, NES-14, NES-15, NES-16, NES-17, NES-19, NES-19A, NES-20, NES-21, NES-22, NES-23

TBM#2: SQ. CUT ON LP BASE ELEV=172.98' (NGVD 29)

TBM#4: DUPLEX NAIL SET IN 8" OAK

TBM#5: SPIKE NAIL SET IN 12" OAK ELEV=139.14' (NGVD 29)

TWO WASHINGTON PLACE LLC BOOK 17177 PAGE 144 (BRISTOL COUNTY) BOOK 15732 PAGE 70 (BRISTOL COUNTY) MAP 1U LOT 48 (EASTON) TOTAL AREA=203,206± SQ.FT. 4.665± ACRES

J & L REALTY TRUST BOOK 11415 PAGE 500 MAP 60 LOT 6 TOTAL AREA=274,750± SQ.FT. 6.307± ACRES

WILLIAM J MURPHY BOOK 7151 PAGE 164 MAP 60 LOT 8 TOTAL AREA=172,758± SQ.FT. 3.966± ACRES

TELEPHONE EASEMENT BOOK 17392 PG 164 BOOK 17496 PG 105

ELECTRIC EASEMENT BOOK 17529 PG 188

2 STORY OFFICE BUILDING

SEPTIC SYSTEM EASEMENT BOOK 10710 PAGE 9

DRAINAGE EASEMENT BOOK 15732 PAGE 77

CONDUIT FOR SYSTEM COMPONENTS CONTROLS AND ALARM WIRING APPROX LOCATION IN THIS AREA

LEACHING TRENCHES APPROXIMATE LOCATION

PRESSURE DOZING PUMP CHAMBER

SLUDGE TANK

FLOW EQUALIZER

R.K. EASTON, LLC BOOK 17783 PAGE 183 MAP 1U LOT 1

DETENTION BASIN

BUS DROPOFF ONLY

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RAILROAD R.O.W. (NOT ACTIVE)

NORTH EASTON STATION
BORING LOCATION PLAN
SCALE: 1"=80'

80 40 0 80 160
SCALE: 1"=80'

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS™
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242-9222

NORTH EASTON STATION
EASTON, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: JANUARY 2012

FIGURE NO: 2

NES–009
EL. 159.0

NES–004
EL. 158.0

NES–003
EL. 156.0

NES–002
EL. 154.0

NES–XXX
EL. XX.X

NEW PLATFORM

PROPOSED TRACK
TOP OF RAIL

APPROX. EXIST. GRADE

–0.65%

GRANULAR DEPOSITS

HARD SILTY CLAY

GRANITE BEDROCK

? FILL ?

B@143: 9, 57, 29, 22

B@122: 17, 21, 40, 39, 37, 44, 92, 100/3" (C1 3/60) (0%)

B@138.5: 14, 149/10" (C1 – 3' BOULDER) (30/60), (C2 52/60) (90%)

B@146: 120/0", 108

B@146: 10, 16, 10, 50/2", 38, 6, 9, 16, 6, 25, 27, 22, 21 (C1 54/60) (83.3%)

BORING DESIGNATION
TOP OF BORING ELEVATION
WATER LEVEL
ESTIMATED STRATA BOUNDARY
SPT N–VALUE (BLOWS/FT)
SPLIT SPOON SAMPLE SYMBOL
RQD (%)
REC/PEN
CORE RUN NO.
ROCK CORE SYMBOL
BOTTOM OF BORING ELEVATION

ELEVATION, FEET (NGVD 29)

170, 160, 150, 140, 130, 120, 110

80 40 0 80
16 8 0 16
HORIZ. 1" = 80'
VERT. 1" = 8'

BORING LEGEND
N.T.S.

+300	+350	+400	+450	+500	+550	+600	+650	+700	+750	+800	+850	+900	+950	+1000	+1050	+1100	+1150	+1200	+1250
1118+00		1119+00		1120+00		1121+00		1122+00		1123+00		1124+00		1125+00		1126+00		1127+00		1128+00
159.7	159.3	158.3	157.6	157.6	156.7	155.6	156.0	156.0	155.6	154.8	154.1	155.1	155.8	155.2	154.7	154.2	152.8	151.2	149.7	147.9
159.84	159.51	159.19	158.86	158.53	158.20	157.88	157.55	157.22	156.89	156.57	156.24	155.91	155.59	155.26	154.93	154.60	154.28	153.95	153.62	153.29

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
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NORTH EASTON STATION
EASTON, MASSACHUSETTS
SUBSURFACE PROFILE A–A

DATE: JANUARY 2012

FIGURE NO: 3

APPENDIX A: EXPLORATION LOGS

NES-1 TO NES-9
NES-11 TO NES-17
NES-19 TO NES-23

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. NES - 001 OW
	LOCATION	North Easton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	151
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857348
18.5	NX Rock Core	5/24/2010	15.5 Monitoring Well Reading			COORD E	765149
23.5	Terminated	7/8/2010	17 Monitoring Well Reading			DATE START	5/19/10
						DATE END	5/24/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 4 4 10	S1	0 - 2	5		WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brown, moist, FILL.
		8 7 7 5	S2	3 - 5	6		WELL GRADED SAND (SW); fine to coarse sand, light brown, moist, FILL.
5							
		7 15 22 31	S3	8 - 10	11	143.0	SILT (ML); non-plastic silt, light brown, moist.
						141.5	(Bottom 1" of S3) SILTY SAND (SM); fine to coarse sand, little non-plastic silt, light brown, moist.
10							
		24 46 37 30	S4	13 - 15	8	138.0	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM); fine to coarse sand, little fine gravel, trace non-plastic silt, gray, wet.
15							
		RQD=100	C1	18.5 - 23.5	60	133.0	GRANITE; very hard, fresh, continuous 5 ft stick with a single mechanical break, high angle fracture (~70 degrees) along a seam at the bottom of the run, gray with black and green.
20							
						127.5	Bottom of Hole at 23.5'.
25							Notes:
							Observation well screened 18 - 23 ft.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 001 OW

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 2/2A
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	154
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857604
8	Terminated					COORD E	765200
						DATE START	5/24/10
						DATE END	5/24/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		7 120/0"	S1	0 - 0.5	5		WELL GRADED SAND WITH SILT (SW-SM); fine to coarse sand, trace non-plastic silt, dark brown, moist, FILL. Boulder encountered at 0.5 feet; Boring NES-2 terminated. Offset boring NES-2A 5 ft south.
5		23 31 78 120/0"	S2	4 - 5.5	10	150.0 148.5	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, little non-plastic silt, little fine gravel, grayish brown, possible GLACIAL TILL, pieces of granite in tip of spoon. Top of apparent Bedrock at 5.5 ft, roller bit to 8 ft.
						146.0	Bottom of Hole at 8'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 2/2A

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 003
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	S. Hooley	ELEVATION	156
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857828
13	NX Rock Core					COORD E	765244
17.5	Terminated					DATE START	5/10/10
						DATE END	5/11/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		7 6 8 8	S1	0 - 2	12	155.7	Top 3" TOPSOIL. (.25 - 2') POORLY GRADED SAND (SP); mostly fine sand, trace silt, brown, moist.
5		63 49 100/4"	S2	4 - 6	16	152.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some gravel, trace silt, brown, wet.
			C1	6 - 9	30	150.0	GRANITE; loosing water at 8.5 ft, probable sand seams. Probable boulder. Break through at 9 ft, hit rock again at 12 ft.
10							
		RQD=90	C2	13 - 17.5	52	144.0	GRANITE; hard, fresh, joints spaced 4 - 44", joints angled at ~0 degrees, white and black with gray.
15							
						138.5	Bottom of Hole at 17.5'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 003

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	NES - 004	
	LOCATION	North Easton, MA		SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	158
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2858123
35.5	NX Rock Core	5/13/2010	10 Upon Completion (In Casing)			COORD E	765304
36	Terminated					DATE START	5/13/10
						DATE END	5/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 7 10 11	S1	0 - 2	10		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, little fine gravel, brown, moist, FILL.
5		21 11 10 8	S2	4 - 6	17		SIMILAR TO S1.
10		26 19 21 30	S3	9 - 11	15	149.0	POORLY GRADED SAND (SP); mostly medium sand, light brown, moist.
15		23 20 19 27	S4	14 - 16	17	144.0	SILTY CLAY (CL); slightly-plastic clay, some silt, grayish-brown, wet.
20		18 21 16 21	S5	19 - 21	18		SIMILAR TO S4.
25		23 21 23 21	S6	24 - 26	6	134.0	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM); fine to coarse sand, little fine gravel, trace silt, grayish brown, wet. Cobbles/boulders encountered.
30		46 42 50 49	S7	29 - 31	8		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel up to 1.5", gray, wet.
35		11	S8	34 - 35.25	6		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM); fine to coarse sand,

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 004

LOG OF TEST BORING

JACOBS	PROJECT: South Coast Rail	BORING NO.	NES - 004
	LOCATION: North Easton, MA		SHEET 2 OF 2
	OWNER: Mass.Bay Transportation Authority		
	JOB NUMBER: E2347101		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		52 100/3" RQD=0	C1	35.5 - 36	3	123.0 122.0	some fine gravel, trace silt, grayish-brown, wet, possible GLACIAL TILL. GRANITE; very hard, fresh, single vertical fracture, white and black.
							Bottom of Hole at 36'. Unable to complete the rock core due to a silt blow in and bent casing.

40
45
50
55
60
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70

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 004

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. NES - 005 OW
	LOCATION	North Easton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	S. Hooley	ELEVATION	158
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857807
17	NX Rock Core	7/8/2010	17.5 Monitoring Well Reading			COORD E	765289
27	Terminated	9/12/2011	15.5 Monitoring Well Reading			DATE START	5/12/10
						DATE END	5/12/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 3 2 3	S1	0 - 2	17		SILTY SAND (SM); mostly fine sand, little non-plastic silt, brown, moist, FILL.
5		120/4"	S2	4 - 4.33	4	154.0	SILTY SAND (SM); fine to coarse sand, little silt, little gravel, gray, wet.
10		120/3"	S3	8 - 8.25	0		NO RECOVERY Boulders/cobbles encountered.
15		26 28 25 94	S4	13 - 15	8	145.0	WELL GRADED GRAVEL WITH SAND (GW); fine to coarse gravel up to 2", some fine to coarse sand, grayish brown, wet.
20		RQD=56	C1	17 - 22	50	141.0	GRANITE; hard, joints spaced 1 - 14", joints angled at ~0 - 10 degrees, slight weathering, white and black with gray.
25		RQD=68	C2	22 - 27	54		SIMILAR TO C1; joints spaced 3 - 35".
30						131.0	Bottom of Hole at 27'.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 005 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	NES - 006	
	LOCATION	North Easton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	163	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857666	
5.5 NX Rock Core	5/17/2010	3.5 Upon Completion (Casing pulled)			COORD E	765357	
10.5 Terminated					DATE START	5/17/10	
					DATE END	5/17/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 8 13 14	S1	0 - 2	10		SILTY SAND (SM); fine to coarse sand, some non-plastic silt, trace fine gravel, brown, moist.
		7 9 16 45	S2	3 - 5	10	160.0	POORLY GRADED SAND (SP); mostly fine sand, light brown, moist.
5		RQD=78	C1	5.5 - 10.5	60	157.5	GRANITE; hard, joints spaced 2 - 18", joints angled at ~15 - 30 degrees, slight weathering, zone of moderate to severe weathering at 9.5 - 10 ft, vertical fractures, gray with black.
10						152.5	Bottom of Hole at 10.5'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 006

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	NES - 007
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	D. Dunklee	ELEVATION	158
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR D-90	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2857863
9	Terminated					COORD E	765342
						DATE START	5/13/10
						DATE END	5/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		12 12 11 10	S1	0 - 2	6		WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brown, moist, FILL.
5		8 5 12 22	S2	4 - 6	22		POORLY GRADED SAND (SP); mostly fine sand, trace fine gravel, light brown, moist, possible FILL.
						151.5	Possible bedrock encountered at 6.5 ft, roller bit to 9 ft.
						149.0	
10							Bottom of Hole at 9'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 007

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	NES - 008	
	LOCATION	North Easton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	D. Dunklee	ELEVATION	154	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR D-90	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2858115	
16 Terminated	5/13/2010	3.5 Upon Completion (In Casing)			COORD E	765393	
					DATE START	5/13/10	
					DATE END	5/13/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		12 22 27 14	S1	0 - 2	16		WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brown, FILL.
5		9 9 9 11	S2	4 - 6	20	150.0	POORLY GRADED SAND (SP); mostly medium sand, brown, moist.
10		5 5 4 5	S3	9 - 11	12	145.0	POORLY GRADED SAND (SP); mostly medium sand, trace non-plastic silt, grayish brown, wet.
15		5 21 23 24	S4	14 - 16	10	140.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel up to 2", gray, wet.
						138.0	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 008

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	NES - 009	
	LOCATION	North Easton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR A. Barbetta	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	159	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR D-120	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2858362	
16 Terminated	5/28/2010	5 Upon Completion (In Casing)			COORD E	765433	
					DATE START	5/28/10	
					DATE END	5/28/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		12 6 3 3	S1	0 - 2	4		SILTY SAND (SM); fine to coarse sand, little silt, dark brown, dry, topsoil.
5		30 27 30 21	S2	4 - 6	5	155.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, trace silt, light brown, wet.
10		12 13 16 21	S3	9 - 11	18	150.0	WELL GRADED SAND (SW); fine to coarse sand, trace silt, light brown, wet.
15		11 11 11 8	S4	14 - 16	16	145.0	POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, trace silt, light brown/gray, wet.
						143.0	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 009

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 011
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	D. Dunklee	ELEVATION	165
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR D-90	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2857799
7	NX Rock Core					COORD E	765403
12	Terminated					DATE START	5/13/10
						DATE END	5/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 2 3 3	S1	0 - 2	20		POORLY GRADED SAND (SP); mostly fine sand, brown, moist.
5		25 70 120/2"	S2	4 - 5.16	8	160.0	POORLY GRADED SAND (SP); mostly medium sand, brown, moist.
		RQD=25	C1	7 - 12	18		Top of bedrock at 5 ft, roller bit to 7 ft.
10						153.0	Core Barrel bit and casing break in hole, boring abandoned.
							Bottom of Hole at 12'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 011

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	NES - 011A	
	LOCATION	North Easton, MA		SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	162
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857799
7	NX Rock Core					COORD E	765403
20	Terminated					DATE START	5/26/10
						DATE END	5/27/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							Boring offset from NES - 011 and continued as NES - 011A.
5						156.5	Top of rock at 5.5 ft, roller bit to 7 ft.
			C1	7 - 11	20		Granite Boulder
10		120/3"	S1	11 - 11.25	0		NO RECOVERY.
			C2	12 - 13	3		Granite Boulder
		120/1"	S2	13 - 13.08	0		NO RECOVERY; roller bit to 15 ft.
15		RQD=70	C3	15 - 20	48		GRANITE; very hard, joints spaced 2 - 12", joints angled at ~0 - 15 degrees, fresh and smooth joint surfaces, gray with black and white.
20						142.0	Bottom of Hole at 20'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 011A

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 012
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	166
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR D-120	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857961
8	Terminated					COORD E	765439
						DATE START	5/27/10
						DATE END	5/27/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 8 100/3"	S1	0.33 - 1.5	7		Top 4" gravel fill. WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, light brown, moist, FILL. Cobbles encountered.
5		28 44 100/3"	S2	4 - 5.25	9	162.0 160.5	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel up to 1.5", grayish-brown, wet, pieces of granite in tip of spoon. Top of apparent bedrock at 5.5 ft, got very hard at 6 ft, roller bit to 8 ft.
						158.0	Bottom of Hole at 8'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 012

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 013
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	159
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2858205
16	Terminated					COORD E	765495
						DATE START	5/10/10
						DATE END	5/10/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		42 68 72 81	S1	0 - 2	17		POORLY GRADED SAND WITH GRAVEL (SP); mostly fine sand, some crushed stone, trace silt, brown, moist, FILL.
5		12 19 34 18	S2	4 - 6	22	155.0	POORLY GRADED SAND (SP); mostly fine sand, trace gravel, brown, moist.
10		56 94 100/5"	S3	9 - 10.42	17		POORLY GRADED SAND WITH GRAVEL (SP); mostly fine to medium sand, some gravel, brown, wet.
15		21 23 43 62	S4	14 - 16	13	145.0 143.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some gravel, brown, wet.
20							Bottom of Hole at 16'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 013

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 014
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	166
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2858455
16	Terminated					COORD E	765544
						DATE START	5/28/10
						DATE END	5/28/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 6 5 4	S1	0 - 2	15		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM); mostly fine sand, little fine to coarse gravel, trace silt, dry, orange.
5		22 34 42 38	S2	4 - 6	17	162.0	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some fine to coarse gravel, little silt, gray, dry.
10		19 28 31 33	S3	9 - 11	15		SIMILAR TO S2; moist.
15		16 100/3"	S4	14 - 14.75	4		SIMILAR TO S2; wet.
						151.0	Top of apparent bedrock at 15 ft, roller bit to 16 ft.
						150.0	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 014

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 015
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	173
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857827
4	Terminated					COORD E	765511
						DATE START	5/10/10
						DATE END	5/10/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 4 4 6	S1	0 - 2	12		SANDY SILT (ML); mostly silt, some sand, trace clay, trace gravel, brown, moist.
5		50/1"	S2	4 - 4.08	0	169.0	NO RECOVERY; split-spoon refusal, propable bedrock. Bottom of Hole at 4'.
10							
15							
20							
25							
30							
35							

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 015

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	NES - 016	
	LOCATION	North Easton, MA		SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	160
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2858084
16	Terminated					COORD E	765543
						DATE START	5/10/10
						DATE END	5/10/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		12 19 14 8	S1	0 - 2	16		SILTLY SAND (SM); mostly fine sand, some silt, trace decayed wood pieces, dark brown, moist, FILL.
5		11 12 16 28	S2	4 - 6	24	156.0	POORLY GRADED SAND WITH GRAVEL (SP); mostly fine to medium sand, little fine gravel, brown, moist.
10		47 100/3"	S3	9 - 9.75	7	151.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, gray, wet.
15		28 35 46 52	S4	14 - 16	17		SIMILAR TO S3.
						144.0	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 016

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	NES - 017
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	A. Barbetta	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	175
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR D-120	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2858347
9	Terminated					COORD E	765603
						DATE START	5/28/10
						DATE END	5/28/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 10 12 12	S1	0 - 2	7		WELL GRADED SAND (SW); fine to coarse sand, trace silt, roots, orange-brown, dry.
5		41 47 46 51	S2	4 - 6	16	171.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, trace silt, light brown, dry.
						168.0	Top of apparent bedrock at 7 ft, roller bit to 9 ft.
10						166.0	Bottom of Hole at 9'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 017

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 019
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	175
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857857
7	Terminated					COORD E	765574
						DATE START	5/10/10
						DATE END	5/10/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 4 11 17	S1	0 - 2	10		SANDY SILT (ML); mostly silt, some sand, little gravel, trace clay, brown, moist.
5		38 47 60 120	S2	4 - 6	16	171.0	WELL GRADED SAND WITH GRAVEL (SW); mostly fine to medium sand, some fine to coarse gravel, trace silt, brown, moist.
		120/0"	S3	7 - 7		168.0	Refusal on probable bedrock, offset boring to NES - 019A. Bottom of Hole at 7'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 019

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	NES - 019A	
	LOCATION	North Easton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR P. Chou	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	175	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857857	
9 NX Rock Core	5/10/2010	3 Upon Completion (In Casing)			COORD E	765574	
14 Terminated					DATE START	5/10/10	
					DATE END	5/10/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							Boring offset from NES - 019, roller bit to 4 ft.
5		29 18 38 100/4"	S1	4 - 5.83	12		POORLY GRADED SAND WITH GRAVEL (SP); mostly fine to medium sand, some fine gravel, trace silt, brown, moist.
						168.5	Top of bedrock at 6.5 ft, roller bit to 9 ft.
10		RQD=65	C1	9 - 14	50		GRANITE; very hard, coarse grained, joints spaced 6 - 24", high angle fracture at 10.5 ft, gray and pink.
						161.0	
15							Bottom of Hole at 14'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 019A

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 020
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	175
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857629
10	Terminated					COORD E	765832
						DATE START	5/25/10
						DATE END	5/25/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 12 26 42	S1	0 - 2	17		WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brown, moist, FILL.
5		16 59 100/2"	S2	4 - 5.16	6	171.0 169.5	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, little non-plastic silt, little fine gravel, brown, wet. Top of apparent bedrock at ~5.5 ft, roller bit to 10 ft.
10						165.0	Bottom of Hole at 10'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 020

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	NES - 021
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	J. Stokes	ELEVATION	162
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857498
16	Terminated					COORD E	765616
						DATE START	5/25/10
						DATE END	5/25/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		28 75 100/4"	S1	0 - 1.33	14		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to medium gravel, dry, brown.
						158.0	
5		28 39 42 31	S2	4 - 6	19		GRAVEL WITH SILT AND SAND (GW - GM); fine to coarse gravel, some fine to coarse sand, trace silt, gray, moist.
						153.0	
10		28 41 39 21	S3	9 - 11	16		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, moist, brown.
15		29 41 87 24	S4	14 - 16	14		SIMILAR TO S3; wet.
						146.0	
							Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 021

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	NES - 022
LOCATION	North Easton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	144
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857303
5	NX Rock Core	5/19/2010	3 Upon Completion (Casing pulled)			COORD E	765208
15	Terminated					DATE START	5/19/10
						DATE END	5/19/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 3 4 6	S1	0.33 - 2.33	16	143.7	Top 4" Topsoil. SILT (ML); non-plastic silt, trace fine to coarse sand, light brown, dry.
		23 65 57 67	S2	3 - 5	9	141.0	SILTY SAND (SM); mostly fine sand, little non-plastic silt, grayish-brown, moist.
5		RQD=25	C1	5 - 10	30	139.0	GRANITE; hard, joints spaced 2 - 9", joints angled at ~10 - 60 degrees, slight to moderate weathering, zones of highly fractured rock, some vertical fractures, sand seams, loss of water, gray with black.
10		RQD=50	C2	10 - 15	42		GRANITE; hard, joints spaced 2 - 23", joints angled at ~ 45 degrees, slight to moderate weathering, zone of highly fractured and weathered rock at 10 ft, vertical fractures, loss of drill water, gray with black.
15						129.0	Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NES - 022

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	NES - 023	
	LOCATION	North Easton, MA		SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	162
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2857589
10	NX Rock Core					COORD E	765408
17	Terminated					DATE START	5/17/10
						DATE END	5/18/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 16 100/4"	S1	0 - 1.33	10		SILTY SAND (SM); fine to coarse sand, some non-plastic silt, trace fine gravel, brown, moist, FILL. Boulder encountered at 1.5 ft, move boring 5 ft south.
5		5 2 1 2	S2	3 - 5	6		SIMILAR TO S1; wet.
		13 48 120/3"	S3	8 - 9.25	7	154.0 153.0	WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, light brown, moist.
10		RQD=90	C1	10 - 15	54		GRANITE; very hard, fresh, one mechanical break, some high angle fractures and intrusions, gray with black and white.
15			C2	15 - 17	10		(15 - 16.5') GRANITE; very hard, moderate weathering, highly fractured, 6" seam at 15.5 ft, gray with black and white.
						145.5 145.0	(16.5 - 17') GABBRO; hard, moderate weathering, highly fractured, black.
							Bottom of Hole at 17'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

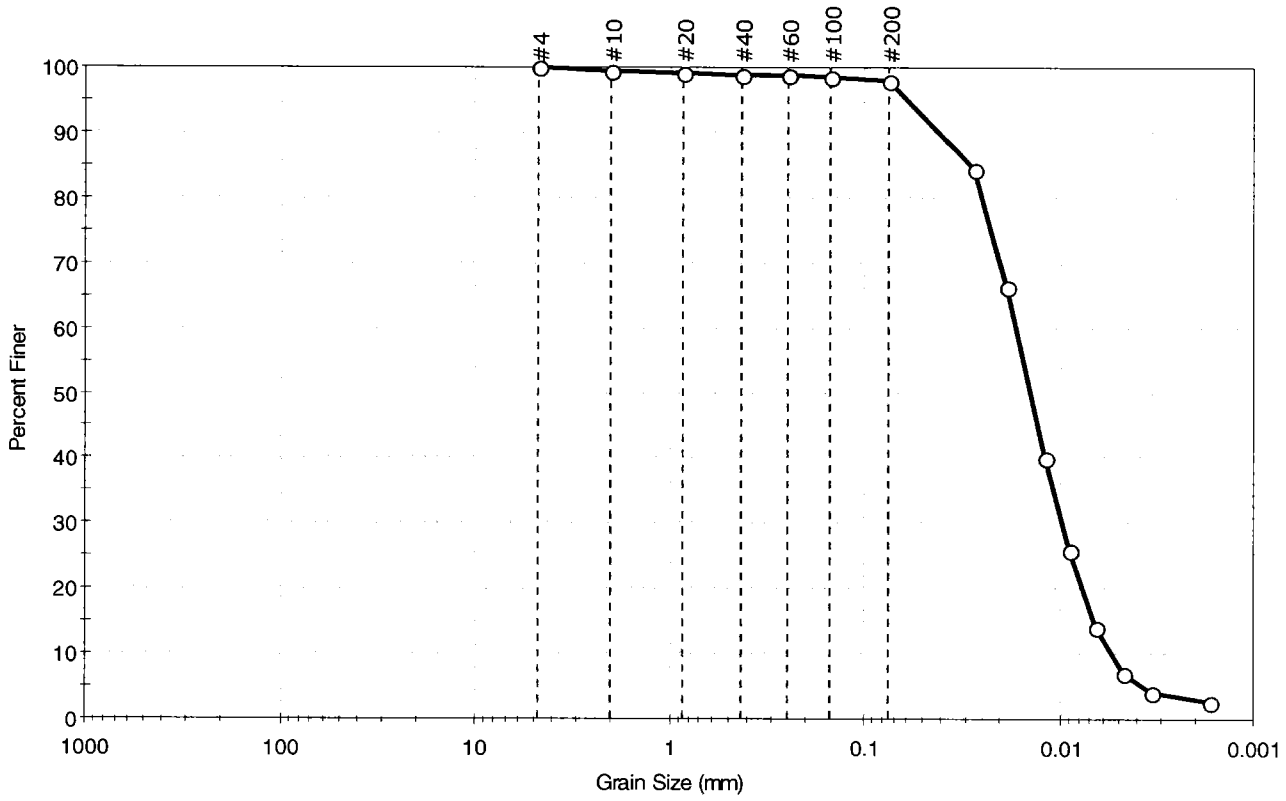
BORING NO. NES - 023

APPENDIX B: LABORATORY DATA

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	NES-4	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	07/21/10	Checked By:	jdt
Depth :	14-16 ft	Test Id:	185189		
Test Comment:	---				
Sample Description:	Moist, light olive brown silty sandy clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	1.9	98.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#200	0.075	98		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0274	84		
---	0.0186	66		
---	0.0121	40		
---	0.0089	26		
---	0.0065	14		
---	0.0047	7		
---	0.0033	4		
---	0.0017	3		

Coefficients

D_{85} = 0.0285 mm	D_{30} = 0.0097 mm
D_{60} = 0.0168 mm	D_{15} = 0.0067 mm
D_{50} = 0.0142 mm	D_{10} = 0.0054 mm
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

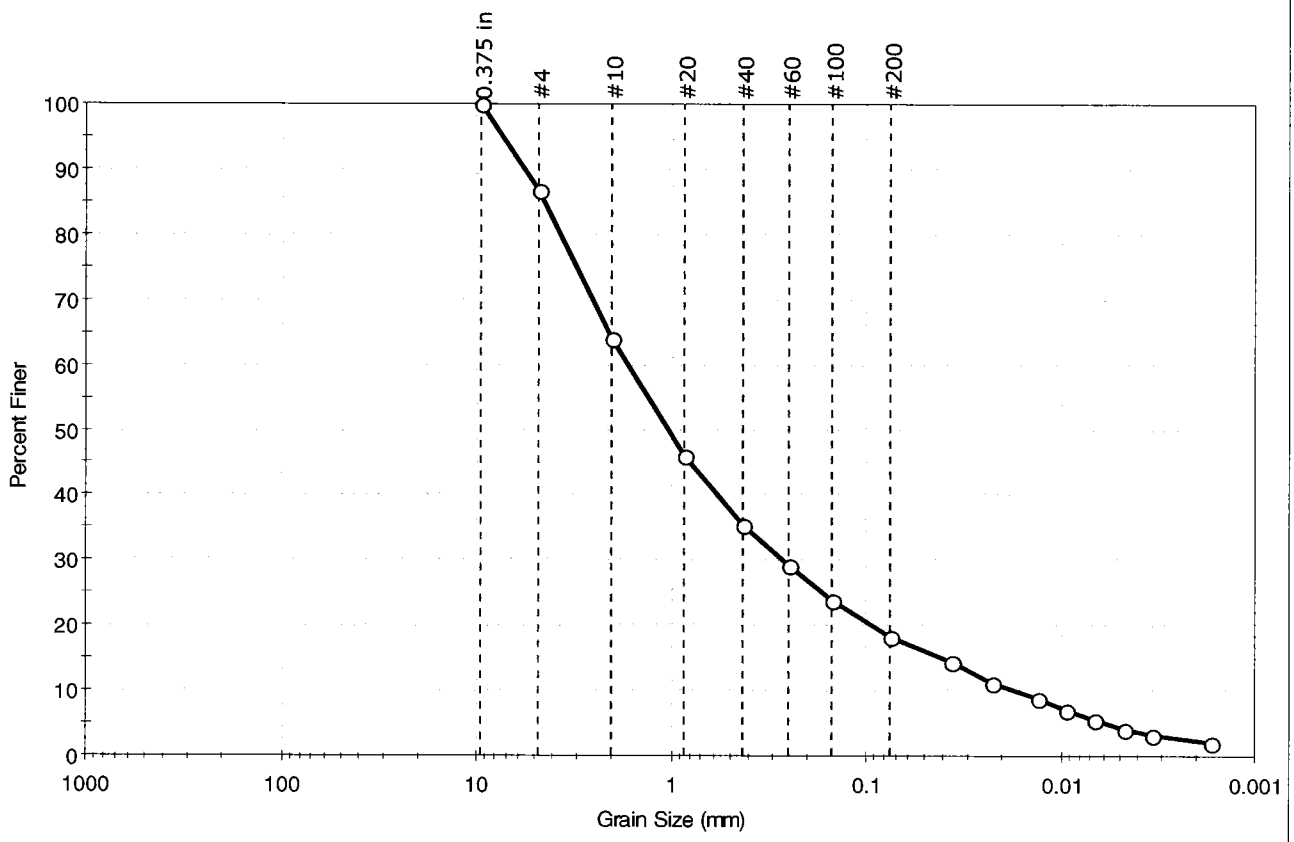
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	NES-5	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	07/21/10	Checked By:	jdt
Depth :	4-4.33 ft	Test Id:	185188		
Test Comment:	---				
Sample Description:	Moist, light olive gray silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	13.3	68.3	18.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	87		
#10	2.00	64		
#20	0.85	46		
#40	0.42	35		
#60	0.25	29		
#100	0.15	24		
#200	0.075	18		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0363	14		
---	0.0229	11		
---	0.0133	9		
---	0.0095	7		
---	0.0067	6		
---	0.0047	4		
---	0.0033	3		
---	0.0017	2		

Coefficients

D_{85} = 4.4610 mm	D_{30} = 0.2696 mm
D_{60} = 1.6488 mm	D_{15} = 0.0399 mm
D_{50} = 1.0270 mm	D_{10} = 0.0174 mm
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

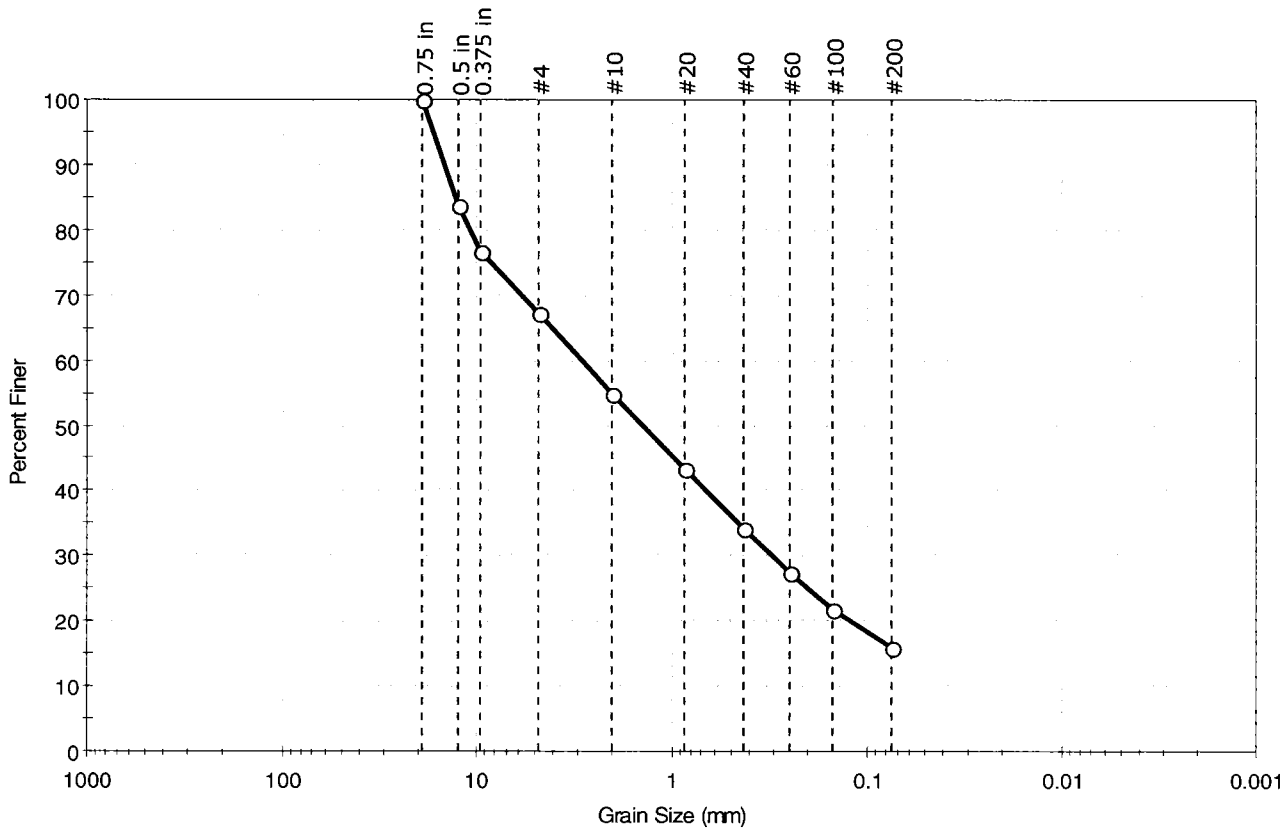
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	NES-14	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	07/14/10	Checked By:	jdt
Depth :	4-6 ft	Test Id:	185198		
Test Comment:	---				
Sample Description:	Moist, olive silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	32.7	51.3	16.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	84		
0.375 in	9.50	77		
#4	4.75	67		
#10	2.00	55		
#20	0.85	43		
#40	0.42	34		
#60	0.25	28		
#100	0.15	22		
#200	0.075	16		

Coefficients

D_{85} = 12.9421 mm	D_{30} = 0.3042 mm
D_{60} = 2.8531 mm	D_{15} = N/A
D_{50} = 1.3841 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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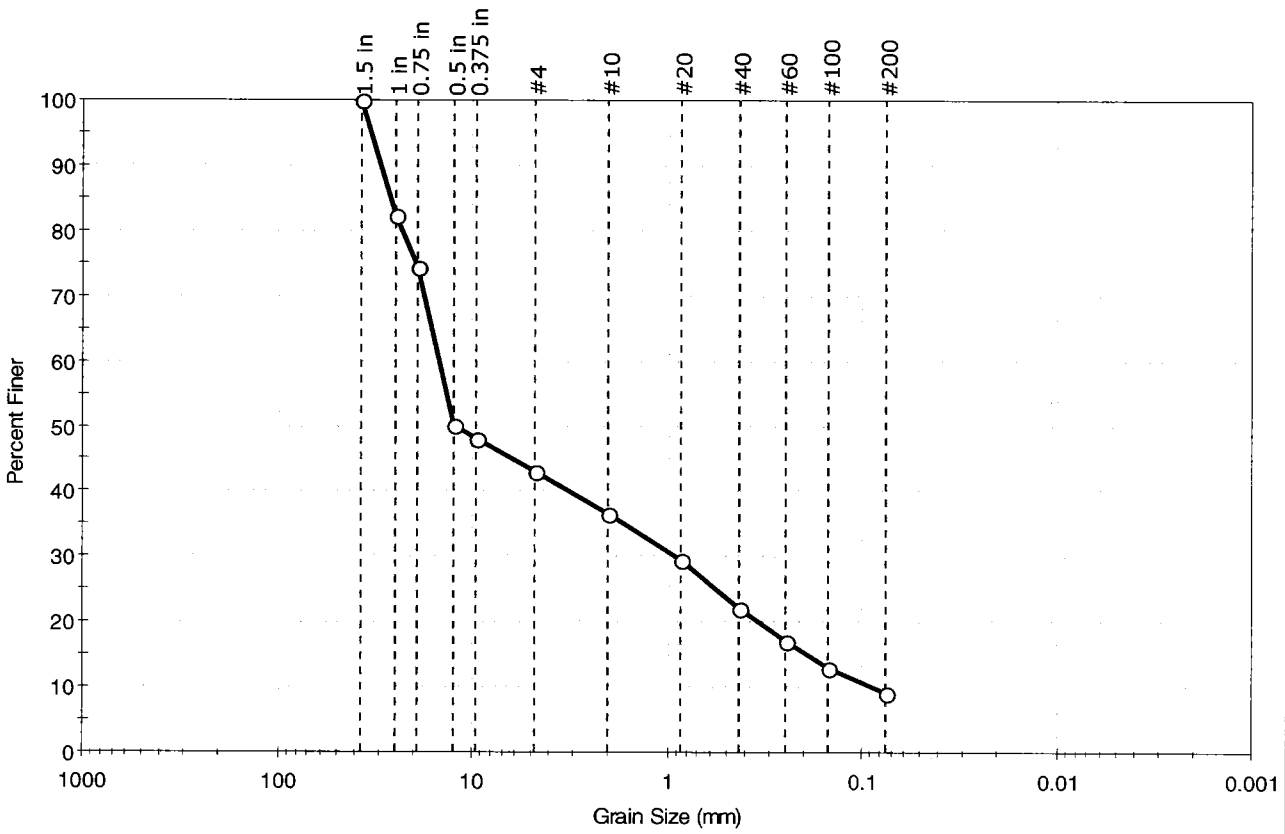
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	South Coast Rail		
Location:	MA	Project No:	GTX-9764
Boring ID:	NES-21	Sample Type: jar	Tested By: jbr
Sample ID:	S-2	Test Date: 07/14/10	Checked By: jdt
Depth :	4-6 ft	Test Id: 185199	
Test Comment:	---		
Sample Description:	Moist, olive gray gravel with silt and sand		
Sample Comment:	sample jar received broken		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	56.9	34.1	9.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	82		
0.75 in	19.00	74		
0.5 in	12.50	50		
0.375 in	9.50	48		
#4	4.75	43		
#10	2.00	37		
#20	0.85	29		
#40	0.42	22		
#60	0.25	17		
#100	0.15	13		
#200	0.075	9		

Coefficients

D_{85} = 26.6354 mm D_{30} = 0.9130 mm
D_{60} = 14.8269 mm D_{15} = 0.1950 mm
D_{50} = 12.1561 mm D_{10} = 0.0897 mm
C_u = 165.294 C_c = 0.627

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

APPENDIX C: GEOTECHNICAL CALCULATIONS

- Allowable Bearing Capacity and Estimated Settlement
- Seismic Site Class Evaluation

JACOBS

343 Congress Street
Boston, MA 02210
617/242-9222

JOB	MBTA South Coast Rail		
SUBJECT	North Easton Station		
CALCULATED BY	DH	**DATE**	1/23/2012
CHECKED BY	PM	**DATE**	1/23/2012

PURPOSE: Evaluate bearing resistance for platform shallow foundations.

REFERENCE: AASHTO LRFD Bridge Design Specifications, 2010
AREMA Manual for Railway Engineering, 2011 Edition

ASSUMPTIONS:
- Platform footing is 4 ft wide by 10 ft long.
- Bearing surface is well graded sand (SW) or silty sand (SM) w/ gravel.
- Footing embedment is at least 4 feet below ground surface.
- Groundwater level is at 15 feet below surface.
- Footing eccentricity is assumed to be zero.
- Estimated soil properties (experience, geotech literature, Table 10.4.6.2.4-1):

	γ (pcf)	ϕ
Sand or silty sand:	120	33

BEARING CAPACITY FACTORS (Table 10.6.3.1.2a-1):

Med. Dense Sand or Silty Sand with gravel:	ϕ	N_c	N_q	N_γ
	33	38.6	26.1	35.2

CALCULATE EFFECTIVE FOOTING WIDTH (B'):

$e < B/4$ (Section 10.6.3.3)

where: B = footing width (ft) = 4
e = eccentricity (ft)

Assume no footing eccentricity, thus, e = 0

$B' = B-2e$ 4

NOMINAL BEARING RESISTANCE (q_n):

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B' N_{\gamma m} C_{w\gamma}$ (Eqn. 10.6.3.1.2a-1)

where:
- c = cohesion = 0
- γ = total unit weight = 120
- D_f = depth of footing (ft) = 4 Assumed
- B' = effective width of footing (ft) = 4
- L = length of footing (ft) = 10
- B'/L = 0.40
- D_f /B' = 1.00
- C_{wq} $C_{w\gamma}$ = groundwater correction factors (using B')
- C_{wq} = 1.0 (Table 10.6.3.1.2a-2)
- $C_{w\gamma}$ = 1.0 (Table 10.6.3.1.2a-2)

N_{cm} N_{qm} $N_{\gamma m}$ = bearing capacity factors

$N_{qm} = N_q s_q d_q i_q$ (Eqn. 10.6.3.1.2a-3)

s_q =	1.26	(Table 10.6.3.1.2a-3)
d_q =	1.20	(Table 10.6.3.1.2a-4)
i_q =	1.0	(see AASHTO p. 10-62)
N_{qm} =	39.5	

343 Congress Street
Boston, MA 02210
617/242-9222

JOB	MBTA South Coast Rail		
SUBJECT	North Easton Station		
CALCULATED BY	DH	**DATE**	1/23/2012
CHECKED BY	PM	**DATE**	1/23/2012

$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$

s_γ = 0.84 (Table 10.6.3.1.2a-3)

i_γ = 1 (see AASHTO p. 10-62)

$N_{\gamma m}$ = 29.6

q_n = 26,035 psf

ALLOWABLE BEARING RESISTANCE (q_a):

$q_a = q_n/FOS$

where: FOS = factor of safety = 2.5 for sand

q_a = 10,414 psf

use

q_a =	**10.41**	**ksf**

strength limit value

Note: Based on the anticipated light loads and potentially small footing sizes, an allowable bearing capacity of 5 ksf is recommended.

Elastic Settlement Calculations:

$$S_e = \frac{(q_o\,(1-\nu^2)\sqrt{A'})}{144 E_s \beta_z}$$

eqn. 10.6.2.4.2-1

where: q_o = applied vert. stress (ksf)
ν = Poisson's Ratio
E_s = Young's Modulus (ksi)
β_z = Shape/Rigidity Factor

ν = Poisson's Ratio =	0.25	(Table C10.4.6.3-1)
E_s = Young's Modulus (ksi) =	5.00	(Table C10.4.6.3-1)
β_z = Shape/Rigidity Factor =	1.11	(Table 10.6.2.4.2-1)

where:

B' = eff. width of footing (ft) =	4	(from bearing resistance calcs)
L = length of footing (ft):	10	(from bearing resistance calcs)
A' =(B'xL) = footing area (ft^2):	40	ft^2

Settlement (S_e) for a given q_o:

q_o = applied vertical stress (ksf) = 5.00 ksf (assumed)

Se (inches) = 0.45 inches

North Easton Station Seismic Site Class Evaluation

Based on the platform boring with the deepest soil overburden (worst case)

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
NES-4	S-1	17	4	0.24	
	S-2	21	5	0.24	
	S-3	40	5	0.13	**59**
	S-4	39	5	0.13	
	S-5	37	5	0.14	
	S-6	44	5	0.11	
	S-7	92	6	0.07	
	Weathered rock	100	65	0.65	
	Total Depth =	100			
	Depth to Bedrock =	35			

Per 9.4.1.2.1*, N_{bar} > 50, Site Class C

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction*.

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

Approx. Project Coordinates

Lat 42.088658
Long -71.098197

Seismic Coefficients

S_S = 0.25 (Table 1604.10*)
S_1 = 0.064 (Table 1604.10*)

For Site Class C

F_A = 1.2 (See Table 9.4.1.2.4a*)
F_V = 1.7 (See Table 9.4.1.2.4b*)

Design Spectral Response Parameters

S_{MS} = Ss x F_A = 0.300
S_{M1} = S_1 x F_V = 0.109

S_{DS} = 2/3 x S_{MS} = 0.200
S_{D1} = 2/3 x S_{M1} = 0.073

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods*					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods*
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Cambridge	45	105	0.28	0.068
Canton	55	100	0.26	0.066
Carlisle	55	100	0.29	0.071
Carver	45	110	0.24	0.060
Charlemont	65	100	0.22	0.068
Charlton	55	100	0.23	0.065
Chatham	35	120	0.17	0.050
Chelmsford	55	100	0.30	0.073
Chelsea	45	105	0.29	0.069
Cheshire	65	90	0.22	0.068
Chester	65	100	0.22	0.066
Chesterfield	65	100	0.22	0.067
Chicopee	55	100	0.23	0.066
Chilmark	35	120	0.18	0.051
Clarksburg	65	90	0.22	0.069
Clinton	55	100	0.26	0.068
Cohasset	45	110	0.27	0.066
Colrain	65	100	0.23	0.069
Concord	55	100	0.29	0.070
Conway	65	100	0.22	0.068
Cummington	65	100	0.22	0.067
Dalton	65	90	0.22	0.067
Danvers	45	110	0.32	0.073
Dartmouth	45	110	0.23	0.058
Dedham	55	100	0.26	0.066
Deerfield	65	100	0.23	0.068
Dennis	35	120	0.19	0.052
Dighton	55	110	0.24	0.061
Douglas	55	100	0.23	0.064
Dover	55	100	0.26	0.066
Dracut	55	100	0.33	0.075
Dudley	55	100	0.23	0.064
Dunstable	65	100	0.31	0.074
Duxbury	45	110	0.25	0.062
East Bridgewater	45	110	0.25	0.063
East Brookfield	55	100	0.23	0.066
East Longmeadow	55	100	0.23	0.065
Eastham	35	120	0.19	0.052
Easthampton	55	100	0.23	0.066
Easton	55	110	0.25	0.064
Edgartown	35	120	0.18	0.050
Egremont	65	90	0.23	0.066
Erving	65	100	0.23	0.069
Essex	45	110	0.33	0.073
Everett	45	105	0.29	0.069
Fairhaven	45	110	0.22	0.057
Fall River	45	110	0.23	0.059
Falmouth	35	120	0.20	0.054
Fitchburg	65	100	0.27	0.071
Florida	65	90	0.22	0.069

Stormwater Report

Raynham Park Station

Town of Raynham,
Massachusetts

Prepared for massDOT
Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by VHB/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

Table of Contents

Checklist for Stormwater Report **1**
Stormwater Report Narrative **3**
Project Description **3**
Site Description **3**
Existing Drainage Conditions **4**
Proposed Drainage Conditions **5**
Regulatory Compliance **12**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas

List of Tables

Table 1: Wetland Resource Areas
Table 2: Existing Conditions Hydrologic Data
Table 3: Proposed Conditions Hydrologic Data
Table 4: Peak Discharge Rates (cfs)
Table 5 Summary of Recharge Calculations

Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

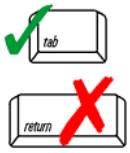
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☐ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☒ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☒ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☒ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

☒ The ½" or 1" Water Quality Volume or

☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☒ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

The Applicant, MassDOT, is proposing to construct a train station at Raynham Park located at 1958 Broadway Street in Raynham, Massachusetts along the Stoughton Rail Road Line (the Project). The Project will involve a center platform with canopy, ancillary landscape improvements, 432 parking spaces, bicycle parking facilities, and utility improvements to support this use. The Project involves demolishing abandoned kennels and several small buildings that currently exist on the site.

The site is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Site Description

The Project Site is an 11.4-acre parcel of land (the Site) located at 1958 Broadway Street in Raynham, Massachusetts (see Figure 1, Site Locus Map and Figure 2, Site Aerial). The site is located to the south of the former Raynham Park Greyhound Track and is adjacent to industrial buildings to the south, Route 138 (Broadway) to the east, and the MBTA railroad right-of-way to the west.

Wetland Resource Areas on the Site, shown on Figures 3 and 4, are described in Table 1. For additional information regarding the wetland resource areas present on the site see the Abbreviated Notice of Resource Area Delineation (ANRAD) prepared by VHB dated May 2011.

Table 1
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*Description*
Wetland R62.1	No	No	No	No	PSS/PEM/OW
Wetland R4	No	No	No	No	PFO
Wetland R5	No	No	No	No	PFO

Notes: Wetland Classifications: OW = Open Water, PEM = Palustrine Emergent, PFO = Palustrine Forested, PSS = Palustrine Scrub/Shrub

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Scarboro mucky loamy fine sand, Whitman fine sandy loam, and Urban land, and are all classified as Hydrologic Soil Groups (HSG) D. Based on the soil evaluation, the Site is not considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour) and high bedrock is indicated. The poorly drained soils onsite have a very low potential for infiltration. According to 1982 Rawls Rates, infiltration rates for the soils will be approximately 0.09 inches per hour.

The project is not located within the 100-year flood plain as shown on the FEMA Floodway Map, Town of Raynham, Massachusetts Bristol County, Community Panel Number 25005C0152F dated July 7, 2009. This map is included in Appendix B.

Existing Drainage Conditions

Under existing conditions the Site is almost entirely developed, impervious land. For the existing conditions hydrologic analysis, the site was divided into four drainage areas that contribute to four separate design points. The following is a summary of each drainage area.

Drainage Area 1 – This 6.85-acre area in the northeast portion of the site consists mainly of urban land that includes both paved and dirt roads. This area sheet flows, untreated, to the existing parking lot to the north where it is captured by the closed drainage system on the adjacent parcel.

Drainage Area 2 – This 1.63-acre area in the southeast portion of the site consists mainly of paved areas and some small dirt roads that sheet flows, untreated, to Wetland R5 east of the site.

Drainage Area 3 – This 7.54-acre area in the northwest portion of the site consists predominantly of paved areas with small patches of grassed areas that sheet flows, untreated, to the parking area to the north where it is captured by a closed drainage system on the adjacent parcel.

Drainage Area 4 – This 3.94-acre area in the southwest portion of the site consists predominantly of urban land that includes paved parking areas and driveways and small buildings and kennels. This area sheet flows, untreated, to the west to Wetland R62.1 via an unnamed perennial stream that continues to flow to the north.

Figure 3 illustrates the existing drainage patterns on the Site. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Adjacent Parking Area	1	6.85	97	6.1
2	Wetland R5	2	1.63	94	3.7
3	Adjacent Parking Area / Drainage System	3	7.54	94	19.6
4	Wetland R62.1 (Perennial Stream)	4	3.94	89	17.1

Proposed Drainage Conditions

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site would be divided into four drainage areas that discharge treated stormwater to the same four existing Design Points. Existing drainage and grading patterns were maintained to the maximum extent possible in proposed conditions. Low impact development stormwater management techniques have been incorporated into the design. These practices are focused on decentralizing stormwater management techniques into the design that will reduce peak runoff rates, maximize groundwater recharge and treat for water quality. The following is a summary of each drainage area.

Drainage Areas 1 (1.1 & 1.2) – These two drainage areas combined, are the 6.60-acre area in the northeast portion of the site that consists of existing landscaped and broken pavement area that would remain unchanged in proposed conditions and a paved driveway leading to the station. The paved driveway of this area will sheet flow into two new grassed swales and then conveyed into a bioretention basin for treatment. During large events the bioretention basin will overflow at a designed overflow weir and sheet flow across the adjacent parcel and be captured by the catch basins as it does in existing conditions. The landscaped and broken paved areas would continue to sheet flow as it does in existing conditions before being captured by catch basins and discharged to the existing closed drainage system on the adjacent parcel.

Drainage Area 2 – This 2.03-acre area in the southeast portion of the site will be an entirely landscaped area and would sheet flow to Wetland R5 east of the site. Under existing conditions this area is predominantly pavement and discharges, untreated, to the same design point.

Drainage Area 3.1 – This 2.04-acre area in the northwest portion of the site will consist of paved parking areas for the station and landscaped islands . The paved parking areas for the station would be collected by two deep sump hooded catch basins that then discharge to a sediment forebay and bioretention area for further treatment. In larger storm events the bioretention basin would overflow at a designed overflow weir and sheet flow to the adjacent parcel before being captured by the existing catch basins as it does under existing conditions.

Drainage Area 3.2 – This 5.71-acre area in the northwest portion of the site will consist of paved roadways and existing landscaped areas that would remain unchanged. This portion of the drainage area 3 would sheet flow, as it does in existing conditions, to the adjacent parcel before being captured by the existing catch basins as it does under existing conditions.

Drainage Area 4 – This 4.20-acre area in the southwest portion of the site will consist predominantly of paved parking areas for the station which will sheet flow through a gravel and grass filter strip then into a bioretention swale before being discharged to a culvert beneath the rail tracks and then to the unnamed perennial stream, as it does in existing conditions.

Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Adjacent Parking Area	1	6.60	95	8.4
2	Wetland R5	2	2.03	89	10.4
3.1	Adjacent Parking Area/Drainage System	3	2.04	96	14.1
3.2	Adjacent Parking Area/Drainage System	3	5.71	91	15.1
4	Wetland R62.1 (Perennial Stream)	4	4.20	91	16.6

The site has been designed with a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. Although the site does not discharge directly to a critical area, the proposed stormwater management system has been designed to treat the 1.0 inch Water Quality Volume, because drainage from the site ultimately discharges to an Area of Critical Environmental Concern (ACEC).

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) incorporated in the site design include:

- Reduction of impervious area of 0.5 acres.
- Minimal disturbance to exiting trees and vegetation
- Grassed channel
- Gravel and grass filter strip
- Two bioretention basins and swales
- Bioretention swale

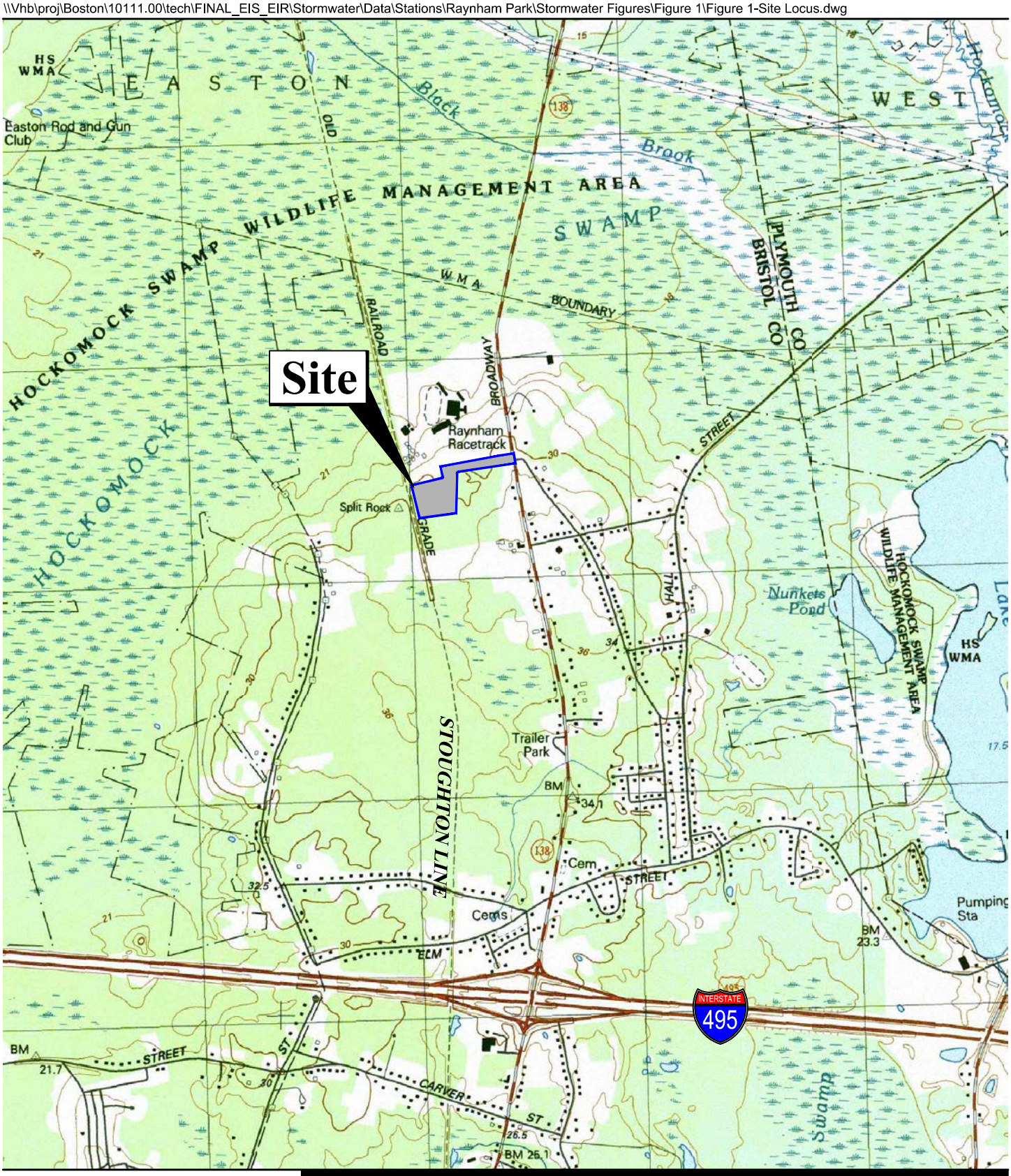
In general, stormwater runoff from all impervious surfaces in proposed conditions would receive some form of treatment for stormwater quality prior to discharge to the existing design points. Under existing conditions no such treatment is provided for stormwater runoff.

Hydraulic Analysis

The closed drainage system was designed for the 25-year storm event, in accordance with the Massachusetts Bay Transportation Authority, Railroad Operations, Commuter Rail Design Standards Manual, Volume 1.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Pipe sizing calculations are included in Appendix A of this report.

\\Vhb\proj\Boston\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Raynham Park\Stormwater Figures\Figure 1\Figure 1-Site Locus.dwg



Vanasse Hangen Brustlin, Inc.

0 1000 2000 Feet

USGS Locus Map

Raynham Park Station
South Coast Rail
Raynham, Massachusets

Figure 1
May 2012

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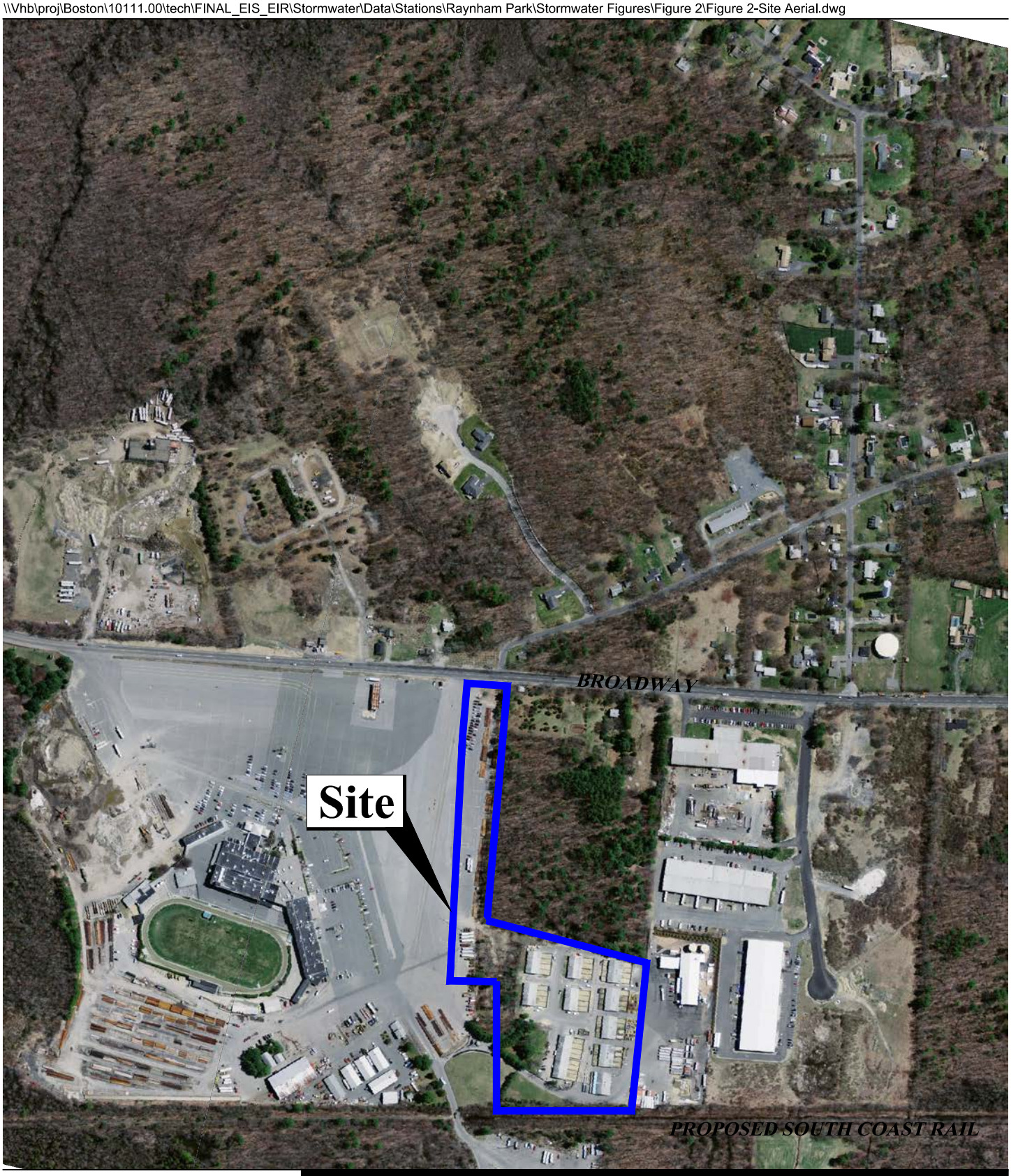

Vanasse Hangen Brustlin, Inc.

Site Aerial Map

Raynham Park Station
South Coast Rail
Raynham, Massachusets

Figure 2
May 2012

0 250 500 Feet

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LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — DESIGN POINT
- 1 — WETLAND RESOURCE AREA
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- 4–220 — SOIL TYPE BOUNDARY
- 100' BUFFER ZONE
- 4–219 — WETLAND BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

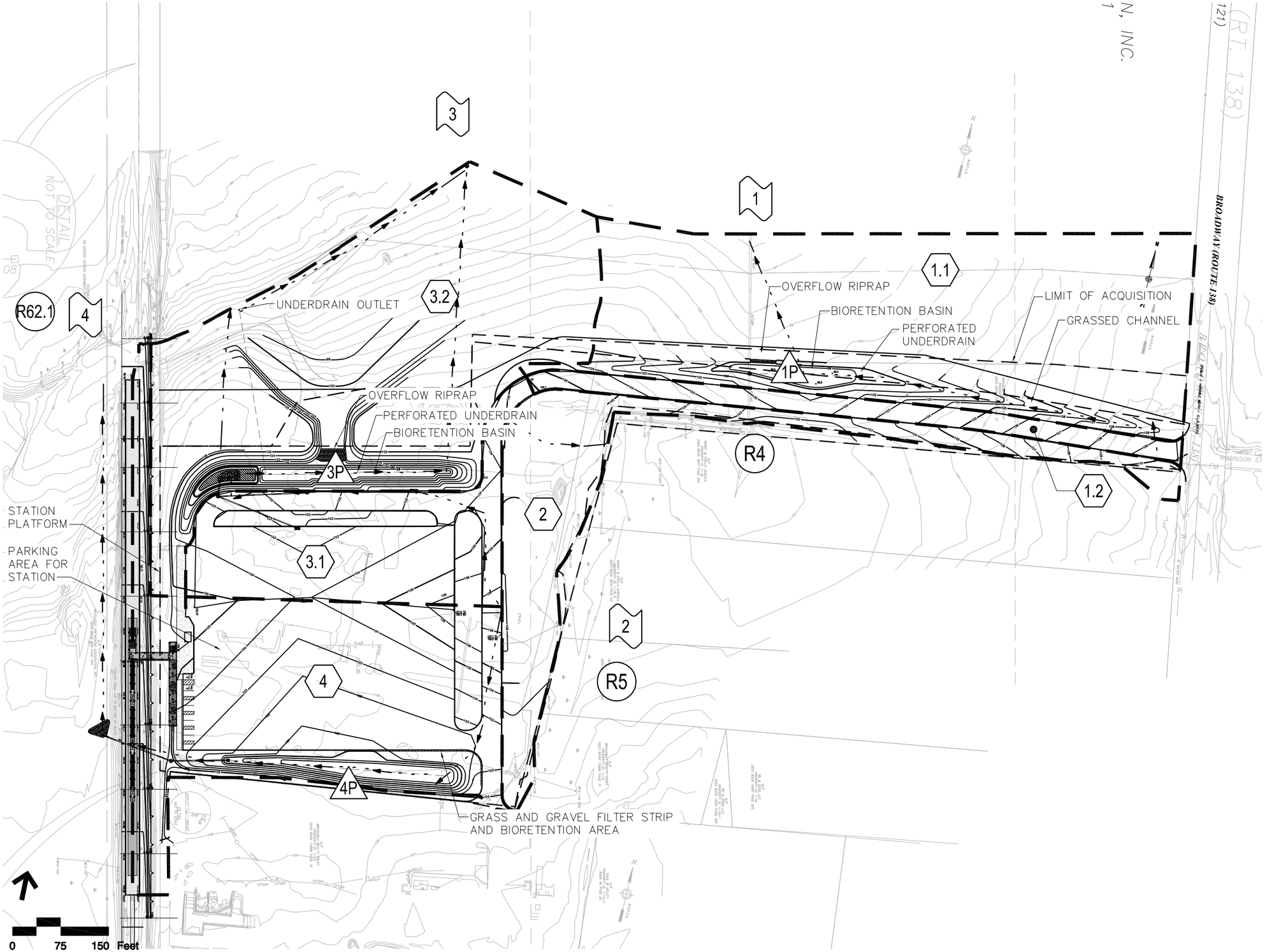
- 43A — SCARBORO MUCKY SAND (D)
- 73A — WHITMAN FINE SANDY LOAM (D)
- 306B — PAXTON FINE SANDY LOAM (C)
- 602 — URBAN LAND
- 705B — CHARLTON–PAXTON FINE SANDY LOAM (B)

Vanasse Hangen Brustlin, Inc.

Figure 3 May 2012

Existing Conditions Drainage Areas

Raynham Park Station
Raynham, Massachusetts



LEGEND

- SUBCATCHMENT DRAINAGE AREA DESIGNATION
- POND/BIORETENTION AREA
- DESIGN POINT
- WETLAND RESOURCE AREA
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- 100' BUFFER ZONE
- WETLAND BOUNDARY (4–220 to 4–219)

Vanasse Hangen Brustlin, Inc.

Figure 4 May 2012

Proposed Conditions Drainage Areas

Raynham Park Station
Raynham, Massachusetts

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges would result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMPs that impound stormwater have been designed with stone to protect down gradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point 1: Adjacent Parking Area			
Existing	21.8	31.1	45.7
Proposed	16.9	27.6	41.0
Design Point 2: Wetland R5			
Existing	5.3	7.8	11.6
Proposed	3.1	5.5	9.5
Design Point 3: Adjacent Parking Area/Drainage System			
Existing	15.8	23.2	34.7
Proposed	12.1	18.4	28.1
Design Point 4: Wetland R62.1			
Existing	7.4	11.6	18.0
Proposed	4.9	9.6	15.8

Standard 3: Stormwater Recharge

Due to the fact the site is comprised wholly of C and D soils and high bedrock as indicated in the geotechnical report, the project currently does not provide significant recharge and has been designed to infiltrate the required recharge volume to the maximum extent possible. The addition of pervious area and better subgrade soils in proposed basins will contribute to improved recharge.

Each infiltration BMP has been designed with an underdrain, due to the poor soils so it will drain completely within 72 hours.

A Geotechnical Report that describes subsurface soil conditions is included as an appendix to this report.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide a minimum of 80% TSS removal for stormwater runoff from all proposed impervious surfaces. While not required, one-inch of water quality treatment for impervious surface runoff has been provided since the Site is in close proximity to the Hockomock Swamp Area of Critical Environmental Concern (ACEC).

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is not considered a LUHPPL as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Standard 6: Critical Areas

The Project would discharge treated storm water near a critical area, the Hockomock Swamp Area of Critical Environmental Concern, via an unnamed stream and therefore has been designed with suitable BMPs sized to treat the 1-inch Water Quality Volume and provide the pretreatment requirement of 44% TSS removal prior to infiltration. Proposed source controls and pollution prevention measures have been identified in the Long-Term Pollution Prevention Plan for the project.

For computations and supporting information regarding the sizing of BMPs suitable for treatment of runoff near or to critical areas, see Appendix D.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is a redevelopment, but has still been designed to fully comply with all ten of the Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 11.4 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIR/S. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

Storm drainage structures remaining from the previous development which are part of the redevelopment area will be removed. The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage system in portions of the site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

Appendix A
Standard 1 Computations and Supporting Information

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut St., Watertown, MA 02471
(617) 924-1770

Storm Drainage Computations

Name: Raynham Park Station
Raynham, MA
Client: MassDOT

Proj. No.: **10111.00**
Date: **5/21/2012**
Computed by: **DAG**
Checked by: **EJM**

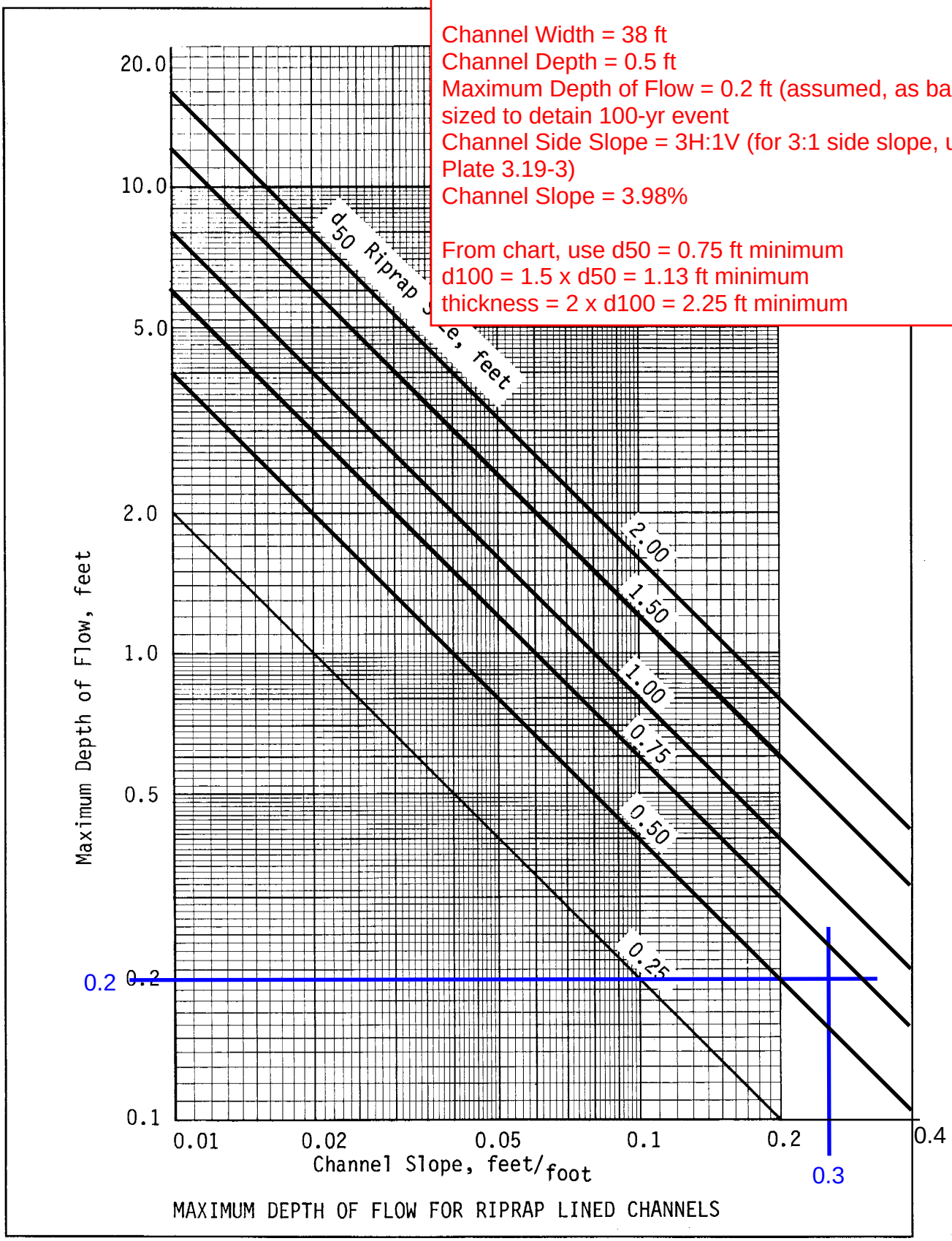
Design Parameters:
25 **Year Storm**
k_e= **0.5**
Boston, MA **IDF Curve**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q cfs	V fps	n	PIPE SIZE	SLOPE	Q full ft^3/s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER	W.S.E. ft	Freeboard ft
A SERIES	CB A5	DMH A3	1.16	0.85	0.99	0.99	0.40	5.0	6.0	5.9	5.4	0.013	15	0.0100	6.5	5.3	130	1.30	102.4	99.4	98.1	99.0	3.4
	CB A4	DMH A3	0.90	0.72	0.64	0.64	0.57	5.0	6.0	3.9	3.8	0.013	15	0.0054	4.7	3.9	130	0.70	101.6	98.6	97.9	98.4	3.2
	DMH A3	FES A2	---	---	---	1.64	0.05	5.0	6.0	9.8	6.2	0.013	18	0.0100	10.5	5.9	20	0.20	102.7	97.7	97.5	97.2	5.5
B SERIES	OCS B3	DMH B2	3.15	0.85	2.68	2.68	0.22	5.0	6.0	16.1	6.8	0.013	24	0.0100	22.6	7.2	90	0.90	100.5	96.0	95.1	95.4	5.1
	DMH B2	FES B1	---	---	---	2.68	0.27	5.0	6.0	16.1	6.8	0.013	24	0.0100	22.6	7.2	110	1.10	105.5	95.0	93.9	94.4	11.1

Project No: 10111 Project Name: SCR
Date: April 2012 Location: Raynham, MA
Calculated By: DAG
Re: Bioretention Basin 1 Overflow Stone Sizing

Channel Width = 38 ft
Channel Depth = 0.5 ft
Maximum Depth of Flow = 0.2 ft (assumed, as basin is sized to detain 100-yr event
Channel Side Slope = 3H:1V (for 3:1 side slope, use Plate 3.19-3)
Channel Slope = 3.98%

From chart, use d50 = 0.75 ft minimum
d100 = 1.5 x d50 = 1.13 ft minimum
thickness = 2 x d100 = 2.25 ft minimum



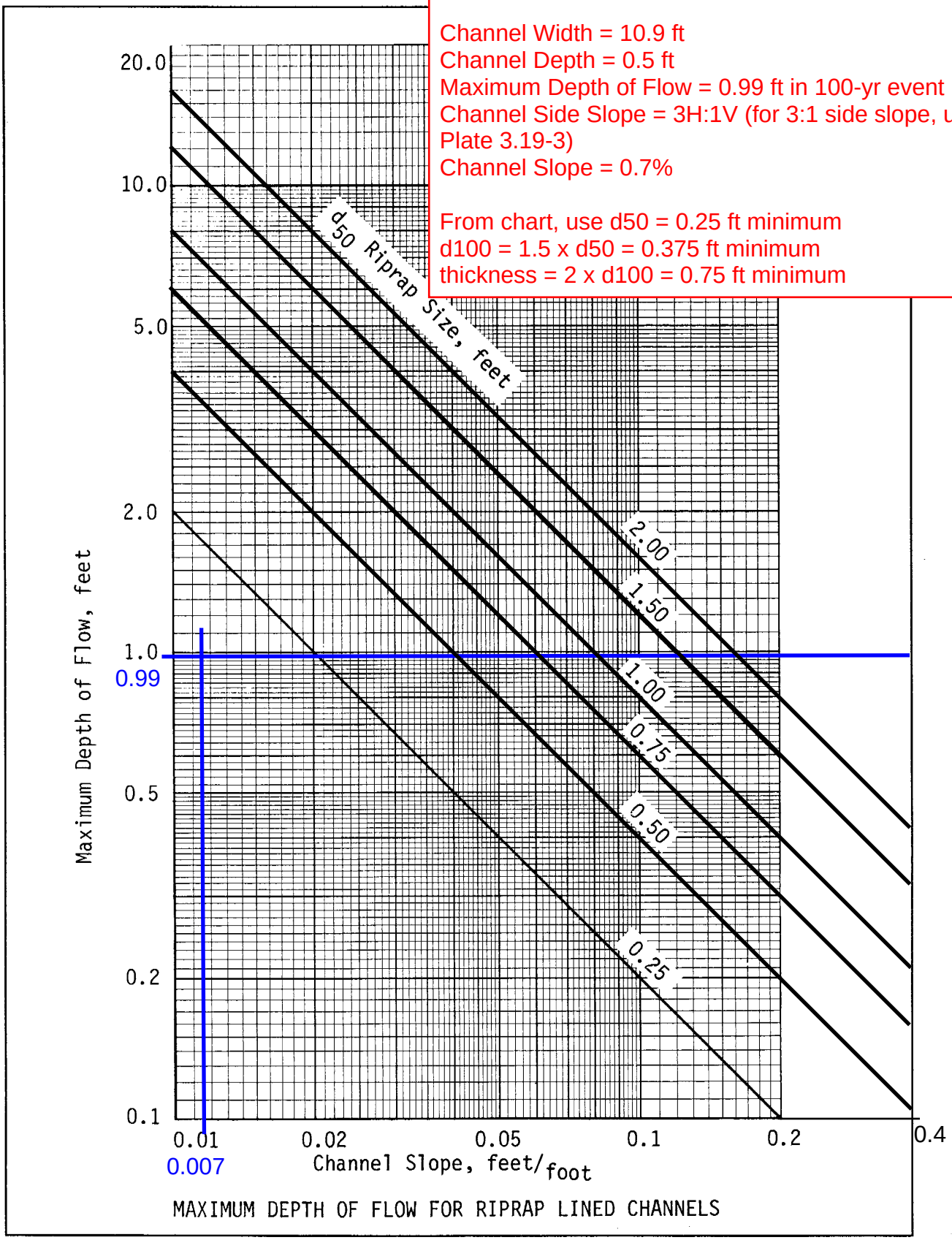
Source: VDOT Drainage Manual Plate 3.19-3

*Sizing calculations represent minimum stone size. Larger stone may be required per detail plans.

Project No: 10111 Project Name: SCR
Date: April 2012 Location: Raynham, MA
Calculated By: DAG
Re: Bioretention Basin 3 Overflow Stone Sizing

Channel Width = 10.9 ft
Channel Depth = 0.5 ft
Maximum Depth of Flow = 0.99 ft in 100-yr event
Channel Side Slope = 3H:1V (for 3:1 side slope, use Plate 3.19-3)
Channel Slope = 0.7%

From chart, use d50 = 0.25 ft minimum
d100 = 1.5 x d50 = 0.375 ft minimum
thickness = 2 x d100 = 0.75 ft minimum



Source: VDOT Drainage Manual Plate 3.19-3

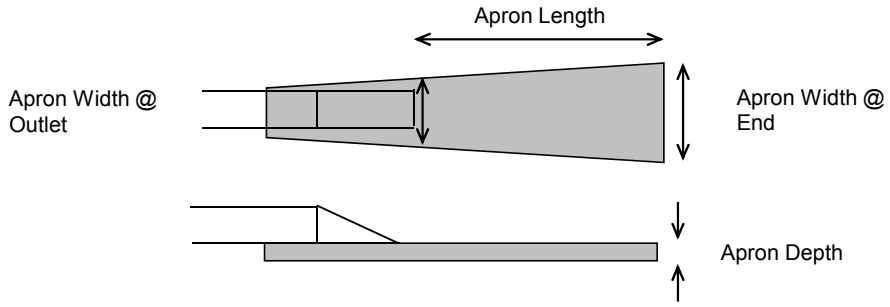
*Sizing calculations represent minimum stone size. Larger stone may be required per detail plans.

Project #:	10111		
Project:	Raynham Park Station - SCR		
Location:	Raynham, MA		
Calculated by:	DAG	Date:	April 4, 2012
Checked by:	VHB	Date:	April 4, 2012
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
Massachusetts Department of Environmental Protection - Reprinted 2003 (pp. 118-120)

Erosion and Sediment Control Handbook - Third Edition 1992 (Chapter 3.18)
Virginia Department of Conservation and Recreation (DCR)

Attachments: Virginia DCR Erosion and Sediment Control Handbook Plate 3.18-3



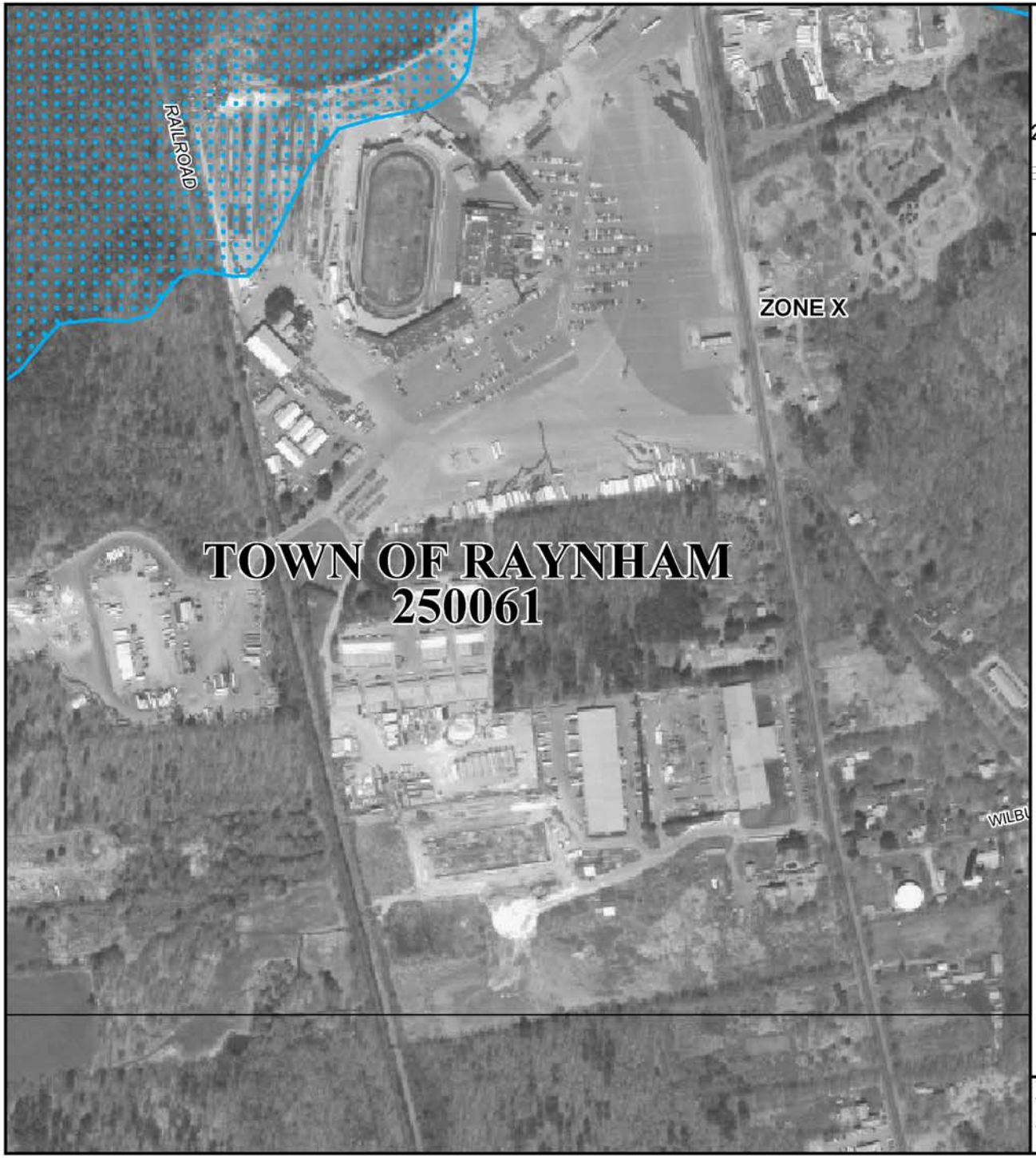
Apron Width at Outlet:	Width = 3 x pipe dia. (or width of channel)	
Apron Length:	Length = From Virginia DCR Handbook - Plate 3.18-3	if Tw depth is < 1/2 dia.
	Length = From Virginia DCR Handbook - Plate 3.18-4	if Tw dwpth is >= 1/2 dia.
Apron Width at End:	Width = dia. + apron length	if Tw depth is < 1/2 dia.
	Width = dia. + 0.4 x apron length	if Tw dwpth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES C1
Design Storm (yr):	100
Defined Channel (yes/no)	no
Pipe Dia (D), in	22
Tail Water (Tw), ft	Tw < 0.5D during low tide
Flow (Q), cfs	17.4
Apron Width (outlet), ft	6
Apron Length, ft	17
Apron Width (end), ft	19
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Map



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0152F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 152 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EASTON, TOWN OF	250053	0152	F
RAYNHAM, TOWN OF	250061	0152	F
TAUNTON, CITY OF	250066	0152	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

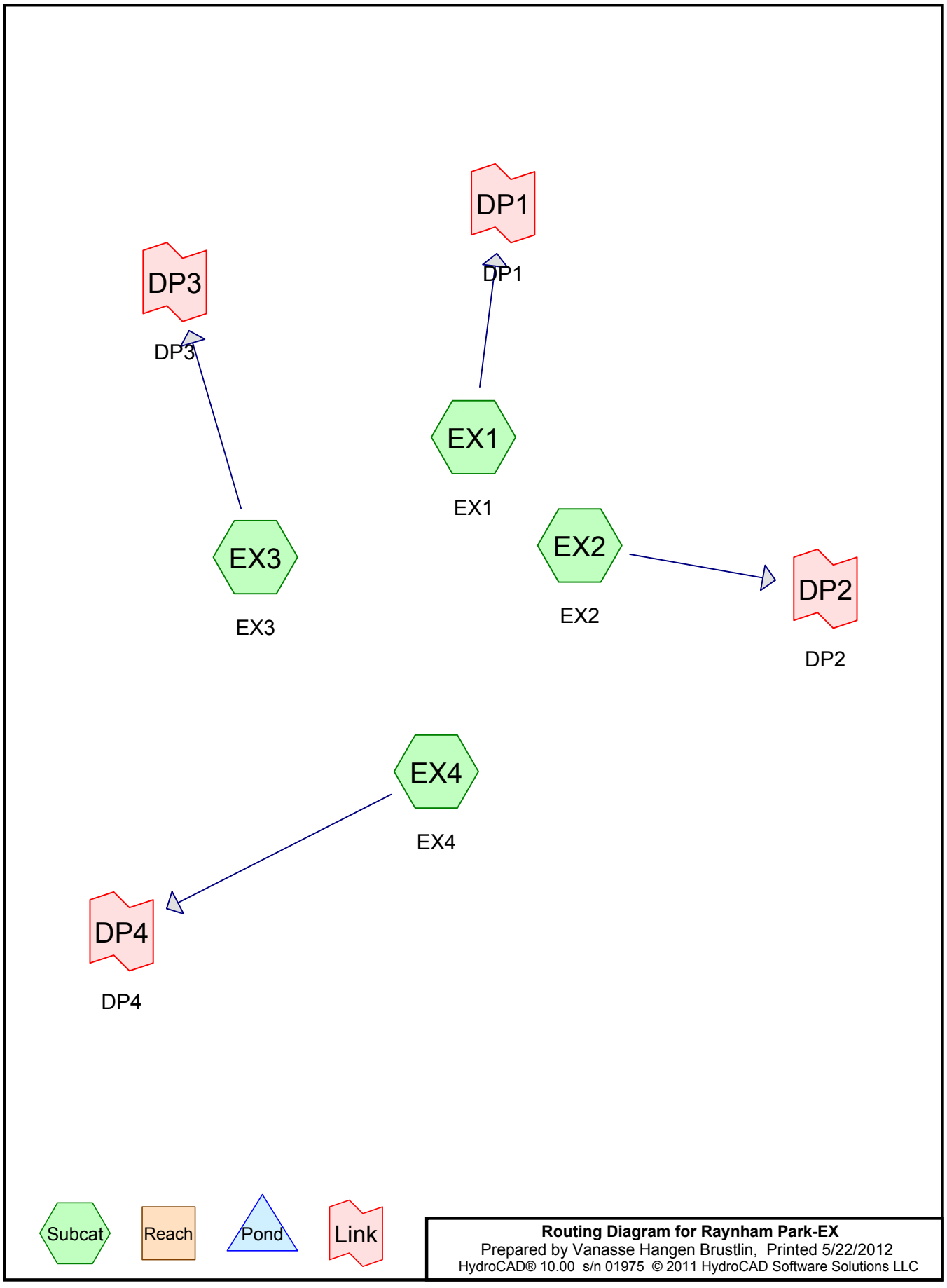
MAP NUMBER
25005C0152F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

HydroCAD Analysis: Existing Conditions



Routing Diagram for Raynham Park-EX
Prepared by Vanasse Hangen Brustlin, Printed 5/22/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.491	60	Woods, Fair, HSG B (EX4)
0.126	69	50-75% Grass cover, Fair, HSG B (EX4)
0.038	73	Woods, Fair, HSG C (EX1)
0.261	79	Woods, Fair, HSG D (EX2, EX3, EX4)
0.013	82	Dirt roads, HSG B (EX4)
0.010	83	Woods, Poor, HSG D (EX4)
2.294	84	50-75% Grass cover, Fair, HSG D (EX2, EX3, EX4)
0.187	87	Dirt roads, HSG C (EX1)
1.384	89	Dirt roads, HSG D (EX1, EX2, EX3, EX4)
0.401	94	Fallow, bare soil, HSG D (EX1)
0.961	96	Gravel surface, HSG D (EX2, EX3)
0.011	98	Paved parking, HSG C (EX1)
10.951	98	Paved parking, HSG D (EX1, EX2, EX3)
1.582	98	Paved roads w/curbs & sewers, HSG D (EX4)
0.037	98	Roofs, HSG B (EX4)
1.048	98	Roofs, HSG D (EX2, EX3, EX4)
0.121	98	Water Surface, HSG B (EX4)
0.041	98	Water Surface, HSG D (EX4)
19.957	**94**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=6.849 ac 90.83% Impervious Runoff Depth>3.05"
Flow Length=777' Tc=6.1 min CN=97 Runoff=21.76 cfs 1.743 af

SubcatchmentEX2: EX2 Runoff Area=1.629 ac 54.33% Impervious Runoff Depth>2.74"
Flow Length=234' Tc=3.7 min CN=94 Runoff=5.30 cfs 0.372 af

SubcatchmentEX3: EX3 Runoff Area=7.543 ac 58.56% Impervious Runoff Depth>2.73"
Flow Length=659' Tc=19.6 min CN=94 Runoff=15.79 cfs 1.716 af

SubcatchmentEX4: EX4 Runoff Area=3.936 ac 57.62% Impervious Runoff Depth>2.26"
Flow Length=1,346' Tc=17.1 min CN=89 Runoff=7.42 cfs 0.741 af

Link DP1: DP1 Inflow=21.76 cfs 1.743 af
Primary=21.76 cfs 1.743 af

Link DP2: DP2 Inflow=5.30 cfs 0.372 af
Primary=5.30 cfs 0.372 af

Link DP3: DP3 Inflow=15.79 cfs 1.716 af
Primary=15.79 cfs 1.716 af

Link DP4: DP4 Inflow=7.42 cfs 0.741 af
Primary=7.42 cfs 0.741 af

Total Runoff Area = 19.957 ac Runoff Volume = 4.571 af Average Runoff Depth = 2.75"
30.90% Pervious = 6.166 ac 69.10% Impervious = 13.791 ac

Summary for Subcatchment EX1: EX1

Runoff = 21.76 cfs @ 12.09 hrs, Volume= 1.743 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.187	87	Dirt roads, HSG C
0.002	89	Dirt roads, HSG D
0.401	94	Fallow, bare soil, HSG D
0.011	98	Paved parking, HSG C
6.210	98	Paved parking, HSG D
0.038	73	Woods, Fair, HSG C
6.849	97	Weighted Average
0.628		9.17% Pervious Area
6.221		90.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0320	0.44		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
4.2	727	0.0199	2.86		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.1	777	Total			

Summary for Subcatchment EX2: EX2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.30 cfs @ 12.06 hrs, Volume= 0.372 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.611	89	Dirt roads, HSG D
0.038	89	Dirt roads, HSG D
0.018	96	Gravel surface, HSG D
0.590	98	Paved parking, HSG D
0.068	84	50-75% Grass cover, Fair, HSG D
0.295	98	Roofs, HSG D
0.009	79	Woods, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.629	94	Weighted Average
0.744		45.67% Pervious Area
0.885		54.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0060	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.6	184	0.0034	1.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	234	Total			

Summary for Subcatchment EX3: EX3

Runoff = 15.79 cfs @ 12.26 hrs, Volume= 1.716 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.131	89	Dirt roads, HSG D
0.104	89	Dirt roads, HSG D
0.615	96	Gravel surface, HSG D
0.328	96	Gravel surface, HSG D
0.548	98	Paved parking, HSG D
3.603	98	Paved parking, HSG D
0.241	84	50-75% Grass cover, Fair, HSG D
1.509	84	50-75% Grass cover, Fair, HSG D
0.229	98	Roofs, HSG D
0.037	98	Roofs, HSG D
0.025	79	Woods, Fair, HSG D
0.173	79	Woods, Fair, HSG D
7.543	94	Weighted Average
3.126		41.44% Pervious Area
4.417		58.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0090	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
5.6	227	0.0093	0.68		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	155	0.0774	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	159	0.0107	2.10		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	68	0.0485	4.47		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.6	659	Total			

Summary for Subcatchment EX4: EX4

Runoff = 7.42 cfs @ 12.23 hrs, Volume= 0.741 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.013	82	Dirt roads, HSG B
0.449	89	Dirt roads, HSG D
0.049	89	Dirt roads, HSG D
0.275	98	Paved roads w/curbs & sewers, HSG D
1.202	98	Paved roads w/curbs & sewers, HSG D
0.105	98	Paved roads w/curbs & sewers, HSG D
0.126	69	50-75% Grass cover, Fair, HSG B
0.068	84	50-75% Grass cover, Fair, HSG D
0.408	84	50-75% Grass cover, Fair, HSG D
0.037	98	Roofs, HSG B
0.438	98	Roofs, HSG D
0.049	98	Roofs, HSG D
0.121	98	Water Surface, HSG B
0.041	98	Water Surface, HSG D
0.491	60	Woods, Fair, HSG B
0.054	79	Woods, Fair, HSG D
0.010	83	Woods, Poor, HSG D
3.936	89	Weighted Average
1.668		42.38% Pervious Area
2.268		57.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.0140	0.31		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
1.8	141	0.0065	1.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	145	0.0159	2.56		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	285	0.0019	1.49	1.83	**Pipe Channel, CMP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.020 Corrugated PE, corrugated interior
0.1	78	0.0410	11.00	53.98	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.020 Corrugated PE, corrugated interior
8.4	647	0.0073	1.28		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.1	1,346	Total			

Summary for Link DP1: DP1

Inflow Area = 6.849 ac, 90.83% Impervious, Inflow Depth > 3.05" for 2-Year event
Inflow = 21.76 cfs @ 12.09 hrs, Volume= 1.743 af
Primary = 21.76 cfs @ 12.09 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.629 ac, 54.33% Impervious, Inflow Depth > 2.74" for 2-Year event
Inflow = 5.30 cfs @ 12.06 hrs, Volume= 0.372 af
Primary = 5.30 cfs @ 12.06 hrs, Volume= 0.372 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 7.543 ac, 58.56% Impervious, Inflow Depth > 2.73" for 2-Year event
Inflow = 15.79 cfs @ 12.26 hrs, Volume= 1.716 af
Primary = 15.79 cfs @ 12.26 hrs, Volume= 1.716 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 3.936 ac, 57.62% Impervious, Inflow Depth > 2.26" for 2-Year event
Inflow = 7.42 cfs @ 12.23 hrs, Volume= 0.741 af
Primary = 7.42 cfs @ 12.23 hrs, Volume= 0.741 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=6.849 ac 90.83% Impervious Runoff Depth>4.44"
Flow Length=777' Tc=6.1 min CN=97 Runoff=31.09 cfs 2.537 af

SubcatchmentEX2: EX2 Runoff Area=1.629 ac 54.33% Impervious Runoff Depth>4.11"
Flow Length=234' Tc=3.7 min CN=94 Runoff=7.77 cfs 0.558 af

SubcatchmentEX3: EX3 Runoff Area=7.543 ac 58.56% Impervious Runoff Depth>4.10"
Flow Length=659' Tc=19.6 min CN=94 Runoff=23.20 cfs 2.577 af

SubcatchmentEX4: EX4 Runoff Area=3.936 ac 57.62% Impervious Runoff Depth>3.57"
Flow Length=1,346' Tc=17.1 min CN=89 Runoff=11.55 cfs 1.171 af

Link DP1: DP1 Inflow=31.09 cfs 2.537 af
Primary=31.09 cfs 2.537 af

Link DP2: DP2 Inflow=7.77 cfs 0.558 af
Primary=7.77 cfs 0.558 af

Link DP3: DP3 Inflow=23.20 cfs 2.577 af
Primary=23.20 cfs 2.577 af

Link DP4: DP4 Inflow=11.55 cfs 1.171 af
Primary=11.55 cfs 1.171 af

Total Runoff Area = 19.957 ac Runoff Volume = 6.843 af Average Runoff Depth = 4.11"
30.90% Pervious = 6.166 ac 69.10% Impervious = 13.791 ac

Summary for Subcatchment EX1: EX1

Runoff = 31.09 cfs @ 12.09 hrs, Volume= 2.537 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.187	87	Dirt roads, HSG C
0.002	89	Dirt roads, HSG D
0.401	94	Fallow, bare soil, HSG D
0.011	98	Paved parking, HSG C
6.210	98	Paved parking, HSG D
0.038	73	Woods, Fair, HSG C
6.849	97	Weighted Average
0.628		9.17% Pervious Area
6.221		90.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0320	0.44		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
4.2	727	0.0199	2.86		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.1	777	Total			

Summary for Subcatchment EX2: EX2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 7.77 cfs @ 12.05 hrs, Volume= 0.558 af, Depth> 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.611	89	Dirt roads, HSG D
0.038	89	Dirt roads, HSG D
0.018	96	Gravel surface, HSG D
0.590	98	Paved parking, HSG D
0.068	84	50-75% Grass cover, Fair, HSG D
0.295	98	Roofs, HSG D
0.009	79	Woods, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.629	94	Weighted Average
0.744		45.67% Pervious Area
0.885		54.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0060	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.6	184	0.0034	1.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	234	Total			

Summary for Subcatchment EX3: EX3

Runoff = 23.20 cfs @ 12.26 hrs, Volume= 2.577 af, Depth> 4.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.131	89	Dirt roads, HSG D
0.104	89	Dirt roads, HSG D
0.615	96	Gravel surface, HSG D
0.328	96	Gravel surface, HSG D
0.548	98	Paved parking, HSG D
3.603	98	Paved parking, HSG D
0.241	84	50-75% Grass cover, Fair, HSG D
1.509	84	50-75% Grass cover, Fair, HSG D
0.229	98	Roofs, HSG D
0.037	98	Roofs, HSG D
0.025	79	Woods, Fair, HSG D
0.173	79	Woods, Fair, HSG D
7.543	94	Weighted Average
3.126		41.44% Pervious Area
4.417		58.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0090	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
5.6	227	0.0093	0.68		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	155	0.0774	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	159	0.0107	2.10		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	68	0.0485	4.47		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.6	659	Total			

Summary for Subcatchment EX4: EX4

Runoff = 11.55 cfs @ 12.23 hrs, Volume= 1.171 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.013	82	Dirt roads, HSG B
0.449	89	Dirt roads, HSG D
0.049	89	Dirt roads, HSG D
0.275	98	Paved roads w/curbs & sewers, HSG D
1.202	98	Paved roads w/curbs & sewers, HSG D
0.105	98	Paved roads w/curbs & sewers, HSG D
0.126	69	50-75% Grass cover, Fair, HSG B
0.068	84	50-75% Grass cover, Fair, HSG D
0.408	84	50-75% Grass cover, Fair, HSG D
0.037	98	Roofs, HSG B
0.438	98	Roofs, HSG D
0.049	98	Roofs, HSG D
0.121	98	Water Surface, HSG B
0.041	98	Water Surface, HSG D
0.491	60	Woods, Fair, HSG B
0.054	79	Woods, Fair, HSG D
0.010	83	Woods, Poor, HSG D
3.936	89	Weighted Average
1.668		42.38% Pervious Area
2.268		57.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.0140	0.31		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
1.8	141	0.0065	1.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	145	0.0159	2.56		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	285	0.0019	1.49	1.83	**Pipe Channel, CMP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.020 Corrugated PE, corrugated interior
0.1	78	0.0410	11.00	53.98	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.020 Corrugated PE, corrugated interior
8.4	647	0.0073	1.28		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.1	1,346	Total			

Summary for Link DP1: DP1

Inflow Area = 6.849 ac, 90.83% Impervious, Inflow Depth > 4.44" for 10-Year event
Inflow = 31.09 cfs @ 12.09 hrs, Volume= 2.537 af
Primary = 31.09 cfs @ 12.09 hrs, Volume= 2.537 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.629 ac, 54.33% Impervious, Inflow Depth > 4.11" for 10-Year event
Inflow = 7.77 cfs @ 12.05 hrs, Volume= 0.558 af
Primary = 7.77 cfs @ 12.05 hrs, Volume= 0.558 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 7.543 ac, 58.56% Impervious, Inflow Depth > 4.10" for 10-Year event
Inflow = 23.20 cfs @ 12.26 hrs, Volume= 2.577 af
Primary = 23.20 cfs @ 12.26 hrs, Volume= 2.577 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 3.936 ac, 57.62% Impervious, Inflow Depth > 3.57" for 10-Year event
Inflow = 11.55 cfs @ 12.23 hrs, Volume= 1.171 af
Primary = 11.55 cfs @ 12.23 hrs, Volume= 1.171 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 Runoff Area=6.849 ac 90.83% Impervious Runoff Depth>6.64"
Flow Length=777' Tc=6.1 min CN=97 Runoff=45.66 cfs 3.789 af

Subcatchment EX2: EX2 Runoff Area=1.629 ac 54.33% Impervious Runoff Depth>6.29"
Flow Length=234' Tc=3.7 min CN=94 Runoff=11.60 cfs 0.853 af

Subcatchment EX3: EX3 Runoff Area=7.543 ac 58.56% Impervious Runoff Depth>6.27"
Flow Length=659' Tc=19.6 min CN=94 Runoff=34.70 cfs 3.942 af

Subcatchment EX4: EX4 Runoff Area=3.936 ac 57.62% Impervious Runoff Depth>5.69"
Flow Length=1,346' Tc=17.1 min CN=89 Runoff=18.01 cfs 1.868 af

Link DP1: DP1 Inflow=45.66 cfs 3.789 af
Primary=45.66 cfs 3.789 af

Link DP2: DP2 Inflow=11.60 cfs 0.853 af
Primary=11.60 cfs 0.853 af

Link DP3: DP3 Inflow=34.70 cfs 3.942 af
Primary=34.70 cfs 3.942 af

Link DP4: DP4 Inflow=18.01 cfs 1.868 af
Primary=18.01 cfs 1.868 af

Total Runoff Area = 19.957 ac Runoff Volume = 10.452 af Average Runoff Depth = 6.28"
30.90% Pervious = 6.166 ac 69.10% Impervious = 13.791 ac

Summary for Subcatchment EX1: EX1

Runoff = 45.66 cfs @ 12.09 hrs, Volume= 3.789 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.187	87	Dirt roads, HSG C
0.002	89	Dirt roads, HSG D
0.401	94	Fallow, bare soil, HSG D
0.011	98	Paved parking, HSG C
6.210	98	Paved parking, HSG D
0.038	73	Woods, Fair, HSG C
6.849	97	Weighted Average
0.628		9.17% Pervious Area
6.221		90.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0320	0.44		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
4.2	727	0.0199	2.86		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.1	777	Total			

Summary for Subcatchment EX2: EX2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 11.60 cfs @ 12.05 hrs, Volume= 0.853 af, Depth> 6.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.611	89	Dirt roads, HSG D
0.038	89	Dirt roads, HSG D
0.018	96	Gravel surface, HSG D
0.590	98	Paved parking, HSG D
0.068	84	50-75% Grass cover, Fair, HSG D
0.295	98	Roofs, HSG D
0.009	79	Woods, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.629	94	Weighted Average
0.744		45.67% Pervious Area
0.885		54.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	50	0.0060	0.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.6	184	0.0034	1.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	234	Total			

Summary for Subcatchment EX3: EX3

Runoff = 34.70 cfs @ 12.26 hrs, Volume= 3.942 af, Depth> 6.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.131	89	Dirt roads, HSG D
0.104	89	Dirt roads, HSG D
0.615	96	Gravel surface, HSG D
0.328	96	Gravel surface, HSG D
0.548	98	Paved parking, HSG D
3.603	98	Paved parking, HSG D
0.241	84	50-75% Grass cover, Fair, HSG D
1.509	84	50-75% Grass cover, Fair, HSG D
0.229	98	Roofs, HSG D
0.037	98	Roofs, HSG D
0.025	79	Woods, Fair, HSG D
0.173	79	Woods, Fair, HSG D
7.543	94	Weighted Average
3.126		41.44% Pervious Area
4.417		58.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0090	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
5.6	227	0.0093	0.68		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	155	0.0774	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.3	159	0.0107	2.10		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	68	0.0485	4.47		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.6	659	Total			

Summary for Subcatchment EX4: EX4

Runoff = 18.01 cfs @ 12.23 hrs, Volume= 1.868 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.013	82	Dirt roads, HSG B
0.449	89	Dirt roads, HSG D
0.049	89	Dirt roads, HSG D
0.275	98	Paved roads w/curbs & sewers, HSG D
1.202	98	Paved roads w/curbs & sewers, HSG D
0.105	98	Paved roads w/curbs & sewers, HSG D
0.126	69	50-75% Grass cover, Fair, HSG B
0.068	84	50-75% Grass cover, Fair, HSG D
0.408	84	50-75% Grass cover, Fair, HSG D
0.037	98	Roofs, HSG B
0.438	98	Roofs, HSG D
0.049	98	Roofs, HSG D
0.121	98	Water Surface, HSG B
0.041	98	Water Surface, HSG D
0.491	60	Woods, Fair, HSG B
0.054	79	Woods, Fair, HSG D
0.010	83	Woods, Poor, HSG D
3.936	89	Weighted Average
1.668		42.38% Pervious Area
2.268		57.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.0140	0.31		**Sheet Flow,** Fallow n= 0.050 P2= 3.30"
1.8	141	0.0065	1.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.9	145	0.0159	2.56		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	285	0.0019	1.49	1.83	**Pipe Channel, CMP_Round 15"** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.020 Corrugated PE, corrugated interior
0.1	78	0.0410	11.00	53.98	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.020 Corrugated PE, corrugated interior
8.4	647	0.0073	1.28		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.1	1,346	Total			

Summary for Link DP1: DP1

Inflow Area = 6.849 ac, 90.83% Impervious, Inflow Depth > 6.64" for 100-Year event
Inflow = 45.66 cfs @ 12.09 hrs, Volume= 3.789 af
Primary = 45.66 cfs @ 12.09 hrs, Volume= 3.789 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.629 ac, 54.33% Impervious, Inflow Depth > 6.29" for 100-Year event
Inflow = 11.60 cfs @ 12.05 hrs, Volume= 0.853 af
Primary = 11.60 cfs @ 12.05 hrs, Volume= 0.853 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 7.543 ac, 58.56% Impervious, Inflow Depth > 6.27" for 100-Year event
Inflow = 34.70 cfs @ 12.26 hrs, Volume= 3.942 af
Primary = 34.70 cfs @ 12.26 hrs, Volume= 3.942 af, Atten= 0%, Lag= 0.0 min

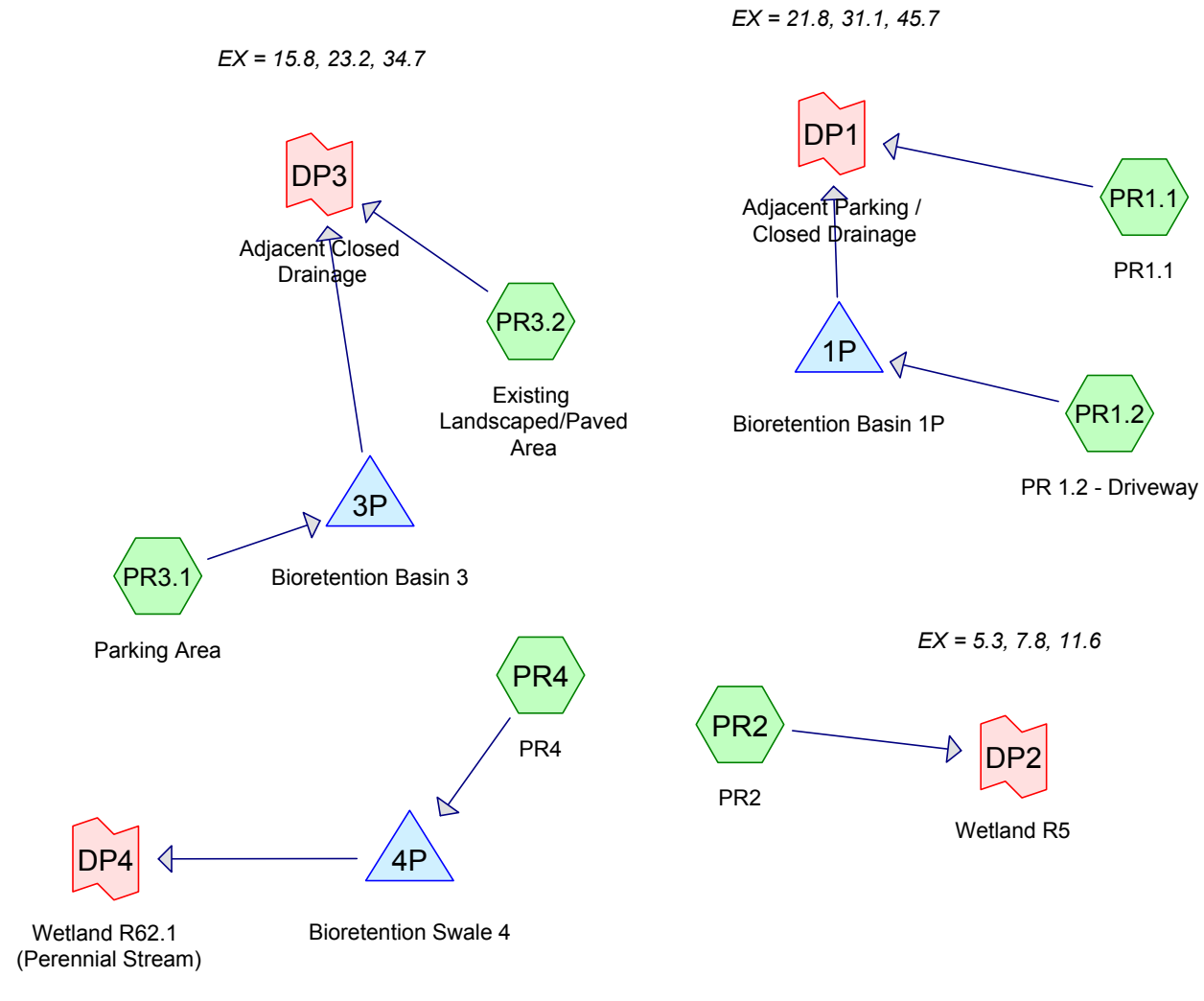
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 3.936 ac, 57.62% Impervious, Inflow Depth > 5.69" for 100-Year event
Inflow = 18.01 cfs @ 12.23 hrs, Volume= 1.868 af
Primary = 18.01 cfs @ 12.23 hrs, Volume= 1.868 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for Raynham Park-PR
Prepared by Vanasse Hangen Brustlin, Printed 5/22/2012
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.798	69	50-75% Grass cover, Fair, HSG B (PR3.2, PR4)
0.042	73	Woods, Fair, HSG C (PR1.1)
0.137	79	50-75% Grass cover, Fair, HSG C (PR1.1)
0.009	79	Woods, Fair, HSG D (PR2)
2.022	80	>75% Grass cover, Good, HSG D (PR2)
4.363	84	50-75% Grass cover, Fair, HSG D (PR1.1, PR3.1, PR3.2, PR4)
0.032	94	Fallow, bare soil, HSG D (PR1.1)
0.689	98	Paved parking, HSG A (PR1.2)
0.509	98	Paved parking, HSG B (PR3.2, PR4)
11.919	98	Paved parking, HSG D (PR1.1, PR3.1, PR3.2, PR4)
0.054	98	Paved roads w/curbs & sewers, HSG C (PR1.1)
20.574	**92**	**TOTAL AREA**

2-Year Storm Event - Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1.1: PR1.1 Runoff Area=5.908 ac 80.97% Impervious Runoff Depth>2.84"
Flow Length=682' Tc=8.4 min CN=95 Runoff=16.88 cfs 1.397 af

Subcatchment PR1.2: PR 1.2 - Driveway Runoff Area=0.689 ac 100.00% Impervious Runoff Depth>3.17"
Tc=5.0 min CN=98 Runoff=2.29 cfs 0.182 af

Subcatchment PR2: PR2 Runoff Area=2.031 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=162' Slope=0.0090 '/' Tc=10.4 min CN=80 Runoff=3.14 cfs 0.263 af

Subcatchment PR3.1: Parking Area Runoff Area=2.040 ac 83.82% Impervious Runoff Depth>2.94"
Flow Length=1,335' Tc=14.1 min CN=96 Runoff=5.06 cfs 0.500 af

Subcatchment PR3.2: Existing Runoff Area=5.706 ac 56.17% Impervious Runoff Depth>2.44"
Flow Length=646' Tc=15.1 min CN=91 Runoff=12.11 cfs 1.161 af

Subcatchment PR4: PR4 Runoff Area=4.200 ac 66.26% Impervious Runoff Depth>2.44"
Flow Length=1,380' Tc=16.6 min CN=91 Runoff=8.60 cfs 0.854 af

Pond 1P: Bioretention Basin 1P Peak Elev=99.54' Storage=4,244 cf Inflow=2.29 cfs 0.182 af
Discarded=0.01 cfs 0.015 af Primary=0.98 cfs 0.073 af Outflow=0.99 cfs 0.088 af

Pond 3P: Bioretention Basin 3 Peak Elev=100.35' Storage=20,402 cf Inflow=5.06 cfs 0.500 af
Discarded=0.02 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.032 af

Pond 4P: Bioretention Swale 4 Peak Elev=100.03' Storage=15,341 cf Inflow=8.60 cfs 0.854 af
Discarded=0.02 cfs 0.024 af Primary=4.90 cfs 0.587 af Outflow=4.93 cfs 0.611 af

Link DP1: Adjacent Parking / Closed Drainage Inflow=16.88 cfs 1.470 af
Primary=16.88 cfs 1.470 af

Link DP2: Wetland R5 Inflow=3.14 cfs 0.263 af
Primary=3.14 cfs 0.263 af

Link DP3: Adjacent Closed Drainage Inflow=12.11 cfs 1.161 af
Primary=12.11 cfs 1.161 af

Link DP4: Wetland R62.1 (Perennial Stream) Inflow=4.90 cfs 0.587 af
Primary=4.90 cfs 0.587 af

Total Runoff Area = 20.574 ac Runoff Volume = 4.357 af Average Runoff Depth = 2.54"
35.98% Pervious = 7.403 ac 64.02% Impervious = 13.171 ac

Summary for Subcatchment PR1.1: PR1.1

Runoff = 16.88 cfs @ 12.12 hrs, Volume= 1.397 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.032	94	Fallow, bare soil, HSG D
0.054	98	Paved roads w/curbs & sewers, HSG C
4.730	98	Paved parking, HSG D
0.042	73	Woods, Fair, HSG C
0.911	84	50-75% Grass cover, Fair, HSG D
0.137	79	50-75% Grass cover, Fair, HSG C
0.002	84	50-75% Grass cover, Fair, HSG D
5.908	95	Weighted Average
1.124		19.03% Pervious Area
4.784		80.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0280	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	77	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	330	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	103	0.0040	3.39	2.66	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.3	122	0.0254	6.92	33.99	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.025 Corrugated metal
8.4	682	Total			

Summary for Subcatchment PR1.2: PR 1.2 - Driveway

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.29 cfs @ 12.07 hrs, Volume= 0.182 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.689	98	Paved parking, HSG A
0.689		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 3.14 cfs @ 12.15 hrs, Volume= 0.263 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
2.022	80	>75% Grass cover, Good, HSG D
0.009	79	Woods, Fair, HSG D
2.031	80	Weighted Average
2.031		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0090	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.8	112	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	162	Total			

Summary for Subcatchment PR3.1: Parking Area

Runoff = 5.06 cfs @ 12.19 hrs, Volume= 0.500 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
1.710	98	Paved parking, HSG D
0.330	84	50-75% Grass cover, Fair, HSG D
2.040	96	Weighted Average
0.330		16.18% Pervious Area
1.710		83.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0196	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.6	78	0.0196	2.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	50	0.0120	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.4	318	0.0116	2.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	34	0.0080	4.80	3.77	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.5	329		11.35		**Lake or Reservoir,** Mean Depth= 4.00'
1.6	476	0.0050	4.97	8.78	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
14.1	1,335	Total			

Summary for Subcatchment PR3.2: Existing Landscaped/Paved Area

Runoff = 12.11 cfs @ 12.20 hrs, Volume= 1.161 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.025	98	Paved parking, HSG B
3.180	98	Paved parking, HSG D
0.251	69	50-75% Grass cover, Fair, HSG B
2.250	84	50-75% Grass cover, Fair, HSG D
5.706	91	Weighted Average
2.501		43.83% Pervious Area
3.205		56.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0120	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.8	171	0.0610	3.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.5	300	0.0120	1.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.9	125	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.1	646	Total			

Summary for Subcatchment PR4: PR4

Runoff = 8.60 cfs @ 12.22 hrs, Volume= 0.854 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.484	98	Paved parking, HSG B
2.127	98	Paved parking, HSG D
0.172	98	Paved parking, HSG D
0.547	69	50-75% Grass cover, Fair, HSG B
0.870	84	50-75% Grass cover, Fair, HSG D
4.200	91	Weighted Average
1.417		33.74% Pervious Area
2.783		66.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0220	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	240	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	177	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.1	38	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
8.3	689	0.0085	1.38		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
16.6	1,380	Total			

Summary for Pond 1P: Bioretention Basin 1P

Inflow Area = 0.689 ac,100.00% Impervious, Inflow Depth > 3.17" for 2-Year event
Inflow = 2.29 cfs @ 12.07 hrs, Volume= 0.182 af
Outflow = 0.99 cfs @ 12.27 hrs, Volume= 0.088 af, Atten= 57%, Lag= 12.1 min
Discarded = 0.01 cfs @ 12.27 hrs, Volume= 0.015 af
Primary = 0.98 cfs @ 12.27 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 99.54' @ 12.27 hrs Surf.Area= 4,877 sf Storage= 4,244 cf

Plug-Flow detention time= 242.8 min calculated for 0.088 af (49% of inflow)
Center-of-Mass det. time= 115.8 min (869.7 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1	98.50'	6,927 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.50	3,319	353.0	0	0	3,319
99.00	4,106	413.0	1,853	1,853	6,981
99.50	4,733	423.0	2,208	4,061	7,679
100.00	6,793	591.0	2,866	6,927	21,237

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	**40.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	98.50'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.27 hrs HW=99.54' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.91 cfs @ 12.27 hrs HW=99.54' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.91 cfs @ 0.63 fps)

Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 2.040 ac, 83.82% Impervious, Inflow Depth > 2.94" for 2-Year event
Inflow = 5.06 cfs @ 12.19 hrs, Volume= 0.500 af
Outflow = 0.02 cfs @ 24.00 hrs, Volume= 0.032 af, Atten= 100%, Lag= 708.7 min
Discarded = 0.02 cfs @ 24.00 hrs, Volume= 0.032 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.35' @ 24.00 hrs Surf.Area= 11,945 sf Storage= 20,402 cf

Plug-Flow detention time= 510.8 min calculated for 0.031 af (6% of inflow)
Center-of-Mass det. time= 164.1 min (942.7 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	28,805 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,654	805.6	0	0	5,654
99.00	8,176	893.3	6,876	6,876	17,541
100.00	10,935	891.3	9,522	16,398	18,477
101.00	13,939	955.3	12,407	28,805	27,927

Device	Routing	Invert	Outlet Devices
#1	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**
#2	Primary	100.70'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.02 cfs @ 24.00 hrs HW=100.35' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.00' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Bioretention Swale 4

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 2.44" for 2-Year event
Inflow = 8.60 cfs @ 12.22 hrs, Volume= 0.854 af
Outflow = 4.93 cfs @ 12.48 hrs, Volume= 0.611 af, Atten= 43%, Lag= 15.4 min
Discarded = 0.02 cfs @ 12.48 hrs, Volume= 0.024 af
Primary = 4.90 cfs @ 12.48 hrs, Volume= 0.587 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.03' @ 12.48 hrs Surf.Area= 10,833 sf Storage= 15,341 cf

Plug-Flow detention time= 160.6 min calculated for 0.610 af (71% of inflow)
Center-of-Mass det. time= 72.4 min (880.7 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	29,092 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,101	559.0	0	0	5,101
99.00	7,395	693.0	6,213	6,213	18,466
99.50	8,686	757.0	4,016	10,229	25,860
100.00	10,672	776.0	4,831	15,060	28,209
101.00	17,687	824.0	14,033	29,092	34,373

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**18.0" Round Culvert** L= 90.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	99.50'	**48.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	100.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 in 24.0" x 48.0" Grate Limited to weir flow at low heads
#4	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.48 hrs HW=100.03' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=4.88 cfs @ 12.48 hrs HW=100.03' (Free Discharge)
└**1=Culvert** (Passes 4.88 cfs of 14.80 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 4.88 cfs @ 2.33 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link DP1: Adjacent Parking / Closed Drainage

Inflow Area = 6.597 ac, 82.96% Impervious, Inflow Depth > 2.67" for 2-Year event
Inflow = 16.88 cfs @ 12.12 hrs, Volume= 1.470 af
Primary = 16.88 cfs @ 12.12 hrs, Volume= 1.470 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: Wetland R5

Inflow Area = 2.031 ac, 0.00% Impervious, Inflow Depth > 1.55" for 2-Year event
Inflow = 3.14 cfs @ 12.15 hrs, Volume= 0.263 af
Primary = 3.14 cfs @ 12.15 hrs, Volume= 0.263 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: Adjacent Closed Drainage

Inflow Area = 7.746 ac, 63.45% Impervious, Inflow Depth > 1.80" for 2-Year event
Inflow = 12.11 cfs @ 12.20 hrs, Volume= 1.161 af
Primary = 12.11 cfs @ 12.20 hrs, Volume= 1.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: Wetland R62.1 (Perennial Stream)

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 1.68" for 2-Year event
Inflow = 4.90 cfs @ 12.48 hrs, Volume= 0.587 af
Primary = 4.90 cfs @ 12.48 hrs, Volume= 0.587 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event- Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1.1: PR1.1 Runoff Area=5.908 ac 80.97% Impervious Runoff Depth>4.22"
Flow Length=682' Tc=8.4 min CN=95 Runoff=24.53 cfs 2.076 af

Subcatchment PR1.2: PR 1.2 - Driveway Runoff Area=0.689 ac 100.00% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=98 Runoff=3.25 cfs 0.262 af

Subcatchment PR2: PR2 Runoff Area=2.031 ac 0.00% Impervious Runoff Depth>2.71"
Flow Length=162' Slope=0.0090 '/' Tc=10.4 min CN=80 Runoff=5.53 cfs 0.459 af

Subcatchment PR3.1: Parking Area Runoff Area=2.040 ac 83.82% Impervious Runoff Depth>4.33"
Flow Length=1,335' Tc=14.1 min CN=96 Runoff=7.29 cfs 0.735 af

Subcatchment PR3.2: Existing Runoff Area=5.706 ac 56.17% Impervious Runoff Depth>3.78"
Flow Length=646' Tc=15.1 min CN=91 Runoff=18.39 cfs 1.797 af

Subcatchment PR4: PR4 Runoff Area=4.200 ac 66.26% Impervious Runoff Depth>3.78"
Flow Length=1,380' Tc=16.6 min CN=91 Runoff=13.07 cfs 1.323 af

Pond 1P: Bioretention Basin 1P Peak Elev=99.58' Storage=4,462 cf Inflow=3.25 cfs 0.262 af
Discarded=0.01 cfs 0.016 af Primary=3.11 cfs 0.152 af Outflow=3.12 cfs 0.168 af

Pond 3P: Bioretention Basin 3 Peak Elev=100.75' Storage=25,460 cf Inflow=7.29 cfs 0.735 af
Discarded=0.03 cfs 0.036 af Primary=0.33 cfs 0.126 af Outflow=0.35 cfs 0.162 af

Pond 4P: Bioretention Swale 4 Peak Elev=100.32' Storage=18,810 cf Inflow=13.07 cfs 1.323 af
Discarded=0.03 cfs 0.027 af Primary=9.55 cfs 1.050 af Outflow=9.58 cfs 1.077 af

Link DP1: Adjacent Parking / Closed Drainage Inflow=27.61 cfs 2.229 af
Primary=27.61 cfs 2.229 af

Link DP2: Wetland R5 Inflow=5.53 cfs 0.459 af
Primary=5.53 cfs 0.459 af

Link DP3: Adjacent Closed Drainage Inflow=18.39 cfs 1.923 af
Primary=18.39 cfs 1.923 af

Link DP4: Wetland R62.1 (Perennial Stream) Inflow=9.55 cfs 1.050 af
Primary=9.55 cfs 1.050 af

Total Runoff Area = 20.574 ac Runoff Volume = 6.653 af Average Runoff Depth = 3.88"
35.98% Pervious = 7.403 ac 64.02% Impervious = 13.171 ac

Summary for Subcatchment PR1.1: PR1.1

Runoff = 24.53 cfs @ 12.11 hrs, Volume= 2.076 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.032	94	Fallow, bare soil, HSG D
0.054	98	Paved roads w/curbs & sewers, HSG C
4.730	98	Paved parking, HSG D
0.042	73	Woods, Fair, HSG C
0.911	84	50-75% Grass cover, Fair, HSG D
0.137	79	50-75% Grass cover, Fair, HSG C
0.002	84	50-75% Grass cover, Fair, HSG D
5.908	95	Weighted Average
1.124		19.03% Pervious Area
4.784		80.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0280	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	77	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	330	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	103	0.0040	3.39	2.66	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.3	122	0.0254	6.92	33.99	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.025 Corrugated metal
8.4	682	Total			

Summary for Subcatchment PR1.2: PR 1.2 - Driveway

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.25 cfs @ 12.07 hrs, Volume= 0.262 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.689	98	Paved parking, HSG A
0.689		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 5.53 cfs @ 12.15 hrs, Volume= 0.459 af, Depth> 2.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
2.022	80	>75% Grass cover, Good, HSG D
0.009	79	Woods, Fair, HSG D
2.031	80	Weighted Average
2.031		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0090	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.8	112	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	162	Total			

Summary for Subcatchment PR3.1: Parking Area

Runoff = 7.29 cfs @ 12.19 hrs, Volume= 0.735 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
1.710	98	Paved parking, HSG D
0.330	84	50-75% Grass cover, Fair, HSG D
2.040	96	Weighted Average
0.330		16.18% Pervious Area
1.710		83.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0196	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.6	78	0.0196	2.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	50	0.0120	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.4	318	0.0116	2.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	34	0.0080	4.80	3.77	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.5	329		11.35		**Lake or Reservoir,** Mean Depth= 4.00'
1.6	476	0.0050	4.97	8.78	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
14.1	1,335	Total			

Summary for Subcatchment PR3.2: Existing Landscaped/Paved Area

Runoff = 18.39 cfs @ 12.20 hrs, Volume= 1.797 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.025	98	Paved parking, HSG B
3.180	98	Paved parking, HSG D
0.251	69	50-75% Grass cover, Fair, HSG B
2.250	84	50-75% Grass cover, Fair, HSG D
5.706	91	Weighted Average
2.501		43.83% Pervious Area
3.205		56.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0120	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.8	171	0.0610	3.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.5	300	0.0120	1.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.9	125	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.1	646	Total			

Summary for Subcatchment PR4: PR4

Runoff = 13.07 cfs @ 12.22 hrs, Volume= 1.323 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.484	98	Paved parking, HSG B
2.127	98	Paved parking, HSG D
0.172	98	Paved parking, HSG D
0.547	69	50-75% Grass cover, Fair, HSG B
0.870	84	50-75% Grass cover, Fair, HSG D
4.200	91	Weighted Average
1.417		33.74% Pervious Area
2.783		66.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0220	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	240	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	177	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.1	38	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
8.3	689	0.0085	1.38		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
16.6	1,380	Total			

Summary for Pond 1P: Bioretention Basin 1P

Inflow Area = 0.689 ac,100.00% Impervious, Inflow Depth > 4.56" for 10-Year event
Inflow = 3.25 cfs @ 12.07 hrs, Volume= 0.262 af
Outflow = 3.12 cfs @ 12.10 hrs, Volume= 0.168 af, Atten= 4%, Lag= 1.9 min
Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 3.11 cfs @ 12.10 hrs, Volume= 0.152 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 99.58' @ 12.10 hrs Surf.Area= 5,046 sf Storage= 4,462 cf

Plug-Flow detention time= 190.3 min calculated for 0.168 af (64% of inflow)
Center-of-Mass det. time= 86.8 min (834.3 - 747.4)

Volume	Invert	Avail.Storage	Storage Description
#1	98.50'	6,927 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.50	3,319	353.0	0	0	3,319
99.00	4,106	413.0	1,853	1,853	6,981
99.50	4,733	423.0	2,208	4,061	7,679
100.00	6,793	591.0	2,866	6,927	21,237

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	**40.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	98.50'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=99.58' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.09 cfs @ 12.10 hrs HW=99.58' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 3.09 cfs @ 0.95 fps)

Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 2.040 ac, 83.82% Impervious, Inflow Depth > 4.33" for 10-Year event
Inflow = 7.29 cfs @ 12.19 hrs, Volume= 0.735 af
Outflow = 0.35 cfs @ 15.33 hrs, Volume= 0.162 af, Atten= 95%, Lag= 188.7 min
Discarded = 0.03 cfs @ 15.33 hrs, Volume= 0.036 af
Primary = 0.33 cfs @ 15.33 hrs, Volume= 0.126 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.75' @ 15.33 hrs Surf.Area= 13,163 sf Storage= 25,460 cf

Plug-Flow detention time= 486.6 min calculated for 0.162 af (22% of inflow)
Center-of-Mass det. time= 272.5 min (1,042.2 - 769.6)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	28,805 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,654	805.6	0	0	5,654
99.00	8,176	893.3	6,876	6,876	17,541
100.00	10,935	891.3	9,522	16,398	18,477
101.00	13,939	955.3	12,407	28,805	27,927

Device	Routing	Invert	Outlet Devices
#1	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**
#2	Primary	100.70'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 15.33 hrs HW=100.75' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.32 cfs @ 15.33 hrs HW=100.75' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.32 cfs @ 0.75 fps)

Summary for Pond 4P: Bioretention Swale 4

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 3.78" for 10-Year event
Inflow = 13.07 cfs @ 12.22 hrs, Volume= 1.323 af
Outflow = 9.58 cfs @ 12.38 hrs, Volume= 1.077 af, Atten= 27%, Lag= 9.6 min
Discarded = 0.03 cfs @ 12.38 hrs, Volume= 0.027 af
Primary = 9.55 cfs @ 12.38 hrs, Volume= 1.050 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.32' @ 12.38 hrs Surf.Area= 12,731 sf Storage= 18,810 cf

Plug-Flow detention time= 128.5 min calculated for 1.077 af (81% of inflow)
Center-of-Mass det. time= 57.4 min (853.8 - 796.4)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	29,092 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,101	559.0	0	0	5,101
99.00	7,395	693.0	6,213	6,213	18,466
99.50	8,686	757.0	4,016	10,229	25,860
100.00	10,672	776.0	4,831	15,060	28,209
101.00	17,687	824.0	14,033	29,092	34,373

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**18.0" Round Culvert** L= 90.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	99.50'	**48.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	100.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 in 24.0" x 48.0" Grate Limited to weir flow at low heads
#4	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.38 hrs HW=100.32' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=9.52 cfs @ 12.38 hrs HW=100.32' (Free Discharge)
└**1=Culvert** (Passes 9.52 cfs of 15.42 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 9.52 cfs @ 2.91 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link DP1: Adjacent Parking / Closed Drainage

Inflow Area = 6.597 ac, 82.96% Impervious, Inflow Depth > 4.05" for 10-Year event
Inflow = 27.61 cfs @ 12.11 hrs, Volume= 2.229 af
Primary = 27.61 cfs @ 12.11 hrs, Volume= 2.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: Wetland R5

Inflow Area = 2.031 ac, 0.00% Impervious, Inflow Depth > 2.71" for 10-Year event
Inflow = 5.53 cfs @ 12.15 hrs, Volume= 0.459 af
Primary = 5.53 cfs @ 12.15 hrs, Volume= 0.459 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: Adjacent Closed Drainage

Inflow Area = 7.746 ac, 63.45% Impervious, Inflow Depth > 2.98" for 10-Year event
Inflow = 18.39 cfs @ 12.20 hrs, Volume= 1.923 af
Primary = 18.39 cfs @ 12.20 hrs, Volume= 1.923 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: Wetland R62.1 (Perennial Stream)

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 3.00" for 10-Year event
Inflow = 9.55 cfs @ 12.38 hrs, Volume= 1.050 af
Primary = 9.55 cfs @ 12.38 hrs, Volume= 1.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event – Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1.1: PR1.1 Runoff Area=5.908 ac 80.97% Impervious Runoff Depth>6.40"
Flow Length=682' Tc=8.4 min CN=95 Runoff=36.42 cfs 3.151 af

Subcatchment PR1.2: PR 1.2 - Driveway Runoff Area=0.689 ac 100.00% Impervious Runoff Depth>6.76"
Tc=5.0 min CN=98 Runoff=4.76 cfs 0.388 af

Subcatchment PR2: PR2 Runoff Area=2.031 ac 0.00% Impervious Runoff Depth>4.69"
Flow Length=162' Slope=0.0090 '/' Tc=10.4 min CN=80 Runoff=9.47 cfs 0.793 af

Subcatchment PR3.1: Parking Area Runoff Area=2.040 ac 83.82% Impervious Runoff Depth>6.51"
Flow Length=1,335' Tc=14.1 min CN=96 Runoff=10.77 cfs 1.107 af

Subcatchment PR3.2: Existing Runoff Area=5.706 ac 56.17% Impervious Runoff Depth>5.93"
Flow Length=646' Tc=15.1 min CN=91 Runoff=28.14 cfs 2.818 af

Subcatchment PR4: PR4 Runoff Area=4.200 ac 66.26% Impervious Runoff Depth>5.92"
Flow Length=1,380' Tc=16.6 min CN=91 Runoff=20.01 cfs 2.074 af

Pond 1P: Bioretention Basin 1P Peak Elev=99.61' Storage=4,586 cf Inflow=4.76 cfs 0.388 af
Discarded=0.01 cfs 0.017 af Primary=4.60 cfs 0.278 af Outflow=4.61 cfs 0.294 af

Pond 3P: Bioretention Basin 3 Peak Elev=100.97' Storage=28,361 cf Inflow=10.77 cfs 1.107 af
Discarded=0.03 cfs 0.039 af Primary=3.61 cfs 0.493 af Outflow=3.64 cfs 0.531 af

Pond 4P: Bioretention Swale 4 Peak Elev=100.60' Storage=22,677 cf Inflow=20.01 cfs 2.074 af
Discarded=0.03 cfs 0.029 af Primary=15.76 cfs 1.795 af Outflow=15.79 cfs 1.824 af

Link DP1: Adjacent Parking / Closed Drainage Inflow=40.95 cfs 3.428 af
Primary=40.95 cfs 3.428 af

Link DP2: Wetland R5 Inflow=9.47 cfs 0.793 af
Primary=9.47 cfs 0.793 af

Link DP3: Adjacent Closed Drainage Inflow=28.14 cfs 3.311 af
Primary=28.14 cfs 3.311 af

Link DP4: Wetland R62.1 (Perennial Stream) Inflow=15.76 cfs 1.795 af
Primary=15.76 cfs 1.795 af

Total Runoff Area = 20.574 ac Runoff Volume = 10.331 af Average Runoff Depth = 6.03"
35.98% Pervious = 7.403 ac 64.02% Impervious = 13.171 ac

Summary for Subcatchment PR1.1: PR1.1

Runoff = 36.42 cfs @ 12.11 hrs, Volume= 3.151 af, Depth> 6.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.032	94	Fallow, bare soil, HSG D
0.054	98	Paved roads w/curbs & sewers, HSG C
4.730	98	Paved parking, HSG D
0.042	73	Woods, Fair, HSG C
0.911	84	50-75% Grass cover, Fair, HSG D
0.137	79	50-75% Grass cover, Fair, HSG C
0.002	84	50-75% Grass cover, Fair, HSG D
5.908	95	Weighted Average
1.124		19.03% Pervious Area
4.784		80.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0280	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	77	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	330	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	103	0.0040	3.39	2.66	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.3	122	0.0254	6.92	33.99	**Pipe Channel, CMP_Round 30"** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.025 Corrugated metal
8.4	682	Total			

Summary for Subcatchment PR1.2: PR 1.2 - Driveway

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.76 cfs @ 12.07 hrs, Volume= 0.388 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.689	98	Paved parking, HSG A
0.689		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 9.47 cfs @ 12.15 hrs, Volume= 0.793 af, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
2.022	80	>75% Grass cover, Good, HSG D
0.009	79	Woods, Fair, HSG D
2.031	80	Weighted Average
2.031		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0090	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.8	112	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	162	Total			

Summary for Subcatchment PR3.1: Parking Area

Runoff = 10.77 cfs @ 12.19 hrs, Volume= 1.107 af, Depth> 6.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
1.710	98	Paved parking, HSG D
0.330	84	50-75% Grass cover, Fair, HSG D
2.040	96	Weighted Average
0.330		16.18% Pervious Area
1.710		83.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0196	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.6	78	0.0196	2.10		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	50	0.0120	0.99		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
2.4	318	0.0116	2.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	34	0.0080	4.80	3.77	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.5	329		11.35		**Lake or Reservoir,** Mean Depth= 4.00'
1.6	476	0.0050	4.97	8.78	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
14.1	1,335	Total			

Summary for Subcatchment PR3.2: Existing Landscaped/Paved Area

Runoff = 28.14 cfs @ 12.20 hrs, Volume= 2.818 af, Depth> 5.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.025	98	Paved parking, HSG B
3.180	98	Paved parking, HSG D
0.251	69	50-75% Grass cover, Fair, HSG B
2.250	84	50-75% Grass cover, Fair, HSG D
5.706	91	Weighted Average
2.501		43.83% Pervious Area
3.205		56.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0120	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.8	171	0.0610	3.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.5	300	0.0120	1.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.9	125	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
15.1	646	Total			

Summary for Subcatchment PR4: PR4

Runoff = 20.01 cfs @ 12.22 hrs, Volume= 2.074 af, Depth> 5.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.484	98	Paved parking, HSG B
2.127	98	Paved parking, HSG D
0.172	98	Paved parking, HSG D
0.547	69	50-75% Grass cover, Fair, HSG B
0.870	84	50-75% Grass cover, Fair, HSG D
4.200	91	Weighted Average
1.417		33.74% Pervious Area
2.783		66.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	33	0.0220	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	40	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	240	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	177	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.1	38	0.0100	5.36	4.21	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
8.3	689	0.0085	1.38		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
16.6	1,380	Total			

Summary for Pond 1P: Bioretention Basin 1P

Inflow Area = 0.689 ac,100.00% Impervious, Inflow Depth > 6.76" for 100-Year event
Inflow = 4.76 cfs @ 12.07 hrs, Volume= 0.388 af
Outflow = 4.61 cfs @ 12.10 hrs, Volume= 0.294 af, Atten= 3%, Lag= 1.6 min
Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.017 af
Primary = 4.60 cfs @ 12.10 hrs, Volume= 0.278 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 99.61' @ 12.10 hrs Surf.Area= 5,140 sf Storage= 4,586 cf

Plug-Flow detention time= 158.1 min calculated for 0.294 af (76% of inflow)
Center-of-Mass det. time= 73.2 min (814.9 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1	98.50'	6,927 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.50	3,319	353.0	0	0	3,319
99.00	4,106	413.0	1,853	1,853	6,981
99.50	4,733	423.0	2,208	4,061	7,679
100.00	6,793	591.0	2,866	6,927	21,237

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	**40.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height
#2	Discarded	98.50'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=99.61' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=4.55 cfs @ 12.10 hrs HW=99.61' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 4.55 cfs @ 1.08 fps)

Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 2.040 ac, 83.82% Impervious, Inflow Depth > 6.51" for 100-Year event
Inflow = 10.77 cfs @ 12.19 hrs, Volume= 1.107 af
Outflow = 3.64 cfs @ 12.57 hrs, Volume= 0.531 af, Atten= 66%, Lag= 23.3 min
Discarded = 0.03 cfs @ 12.57 hrs, Volume= 0.039 af
Primary = 3.61 cfs @ 12.57 hrs, Volume= 0.493 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.97' @ 12.57 hrs Surf.Area= 13,837 sf Storage= 28,361 cf

Plug-Flow detention time= 270.5 min calculated for 0.531 af (48% of inflow)
Center-of-Mass det. time= 141.3 min (902.6 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	28,805 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,654	805.6	0	0	5,654
99.00	8,176	893.3	6,876	6,876	17,541
100.00	10,935	891.3	9,522	16,398	18,477
101.00	13,939	955.3	12,407	28,805	27,927

Device	Routing	Invert	Outlet Devices
#1	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**
#2	Primary	100.70'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 12.57 hrs HW=100.97' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=3.58 cfs @ 12.57 hrs HW=100.97' (Free Discharge)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.58 cfs @ 1.69 fps)

Summary for Pond 4P: Bioretention Swale 4

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 5.92" for 100-Year event
Inflow = 20.01 cfs @ 12.22 hrs, Volume= 2.074 af
Outflow = 15.79 cfs @ 12.35 hrs, Volume= 1.824 af, Atten= 21%, Lag= 8.1 min
Discarded = 0.03 cfs @ 12.35 hrs, Volume= 0.029 af
Primary = 15.76 cfs @ 12.35 hrs, Volume= 1.795 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 100.60' @ 12.35 hrs Surf.Area= 14,692 sf Storage= 22,677 cf

Plug-Flow detention time= 102.9 min calculated for 1.821 af (88% of inflow)
Center-of-Mass det. time= 49.1 min (833.8 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	29,092 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
98.00	5,101	559.0	0	0	5,101
99.00	7,395	693.0	6,213	6,213	18,466
99.50	8,686	757.0	4,016	10,229	25,860
100.00	10,672	776.0	4,831	15,060	28,209
101.00	17,687	824.0	14,033	29,092	34,373

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**18.0" Round Culvert** L= 90.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	99.50'	**48.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	100.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 8 rows C= 0.600 in 24.0" x 48.0" Grate Limited to weir flow at low heads
#4	Discarded	98.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.35 hrs HW=100.60' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=15.72 cfs @ 12.35 hrs HW=100.60' (Free Discharge)
└**1=Culvert** (Passes 15.72 cfs of 16.00 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 14.44 cfs @ 3.61 fps)
  └**3=Orifice/Grate** (Weir Controls 1.28 cfs @ 1.05 fps)

Summary for Link DP1: Adjacent Parking / Closed Drainage

Inflow Area = 6.597 ac, 82.96% Impervious, Inflow Depth > 6.24" for 100-Year event
Inflow = 40.95 cfs @ 12.11 hrs, Volume= 3.428 af
Primary = 40.95 cfs @ 12.11 hrs, Volume= 3.428 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: Wetland R5

Inflow Area = 2.031 ac, 0.00% Impervious, Inflow Depth > 4.69" for 100-Year event
Inflow = 9.47 cfs @ 12.15 hrs, Volume= 0.793 af
Primary = 9.47 cfs @ 12.15 hrs, Volume= 0.793 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: Adjacent Closed Drainage

Inflow Area = 7.746 ac, 63.45% Impervious, Inflow Depth > 5.13" for 100-Year event
Inflow = 28.14 cfs @ 12.20 hrs, Volume= 3.311 af
Primary = 28.14 cfs @ 12.20 hrs, Volume= 3.311 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

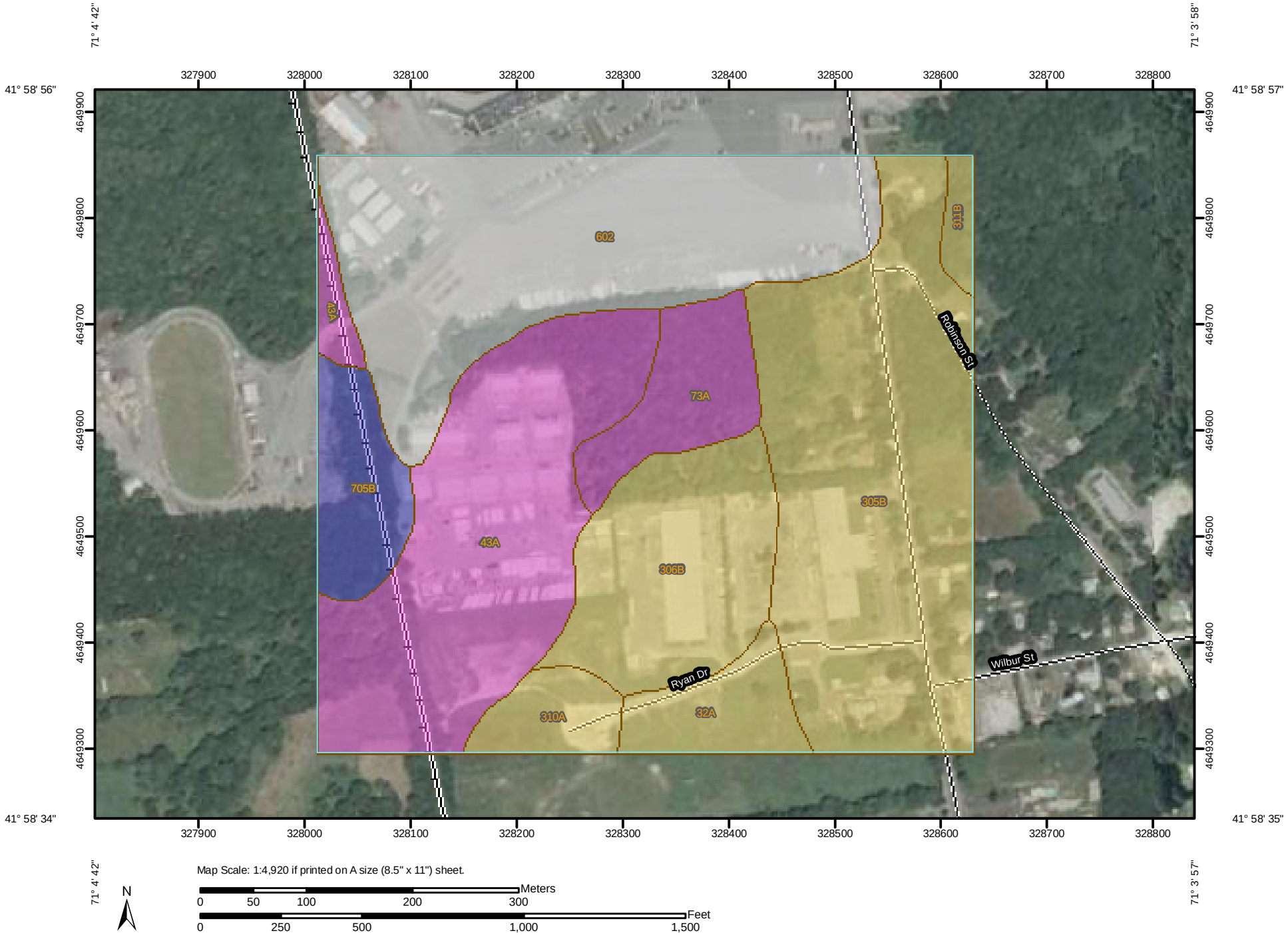
Summary for Link DP4: Wetland R62.1 (Perennial Stream)

Inflow Area = 4.200 ac, 66.26% Impervious, Inflow Depth > 5.13" for 100-Year event
Inflow = 15.76 cfs @ 12.35 hrs, Volume= 1.795 af
Primary = 15.76 cfs @ 12.35 hrs, Volume= 1.795 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis


71° 4' 42"
71° 3' 58"
41° 58' 56"
41° 58' 57"
41° 58' 34"
41° 58' 35"
327900
328000
328100
328200
328300
328400
328500
328600
328700
328800
4649900
4649800
4649700
4649600
4649500
4649400
4649300
602
45A
73A
705B
43A
306B
305B
311B
310A
32A
Robinson St
Ryan Dr
Wilbur St
Map Scale: 1:4,920 if printed on A size (8.5" x 11") sheet.
N
Meters
0 50 100 200 300
Feet
0 250 500 1,000 1,500

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,920 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part
Survey Area Data: Version 5, Jul 27, 2010

Date(s) aerial images were photographed: 7/10/2003; 7/31/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Northern Part (MA602)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
32A	Wareham loamy sand, 0 to 3 percent slopes	C	3.2	3.8%
43A	Scarboro mucky loamy fine sand, 0 to 3 percent slopes	D	18.5	21.5%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	4.3	4.9%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	22.9	26.6%
306B	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	C	9.4	11.0%
310A	Woodbridge fine sandy loam, 0 to 3 percent slopes	C	2.3	2.7%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C	0.9	1.0%
602	Urban land		20.6	23.9%
705B	Charlton - Paxton fine sandy loams, 3 to 8 percent slopes, rocky	B	3.9	4.5%
Totals for Area of Interest			**85.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Raynham Park Station
Project Location: Raynham, MA

Proj. No.: 10111.00
Date: 18-May-12
Calculated by: DAG
Checked by: EJM

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	0.0	0.1	5.4	5.5
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	1.7	1.7
4	0.0	0.0	0.0	2.3	2.3
TOTAL	**0.0**	**0.0**	**0.1**	**9.4**	**9.5**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	0.0	0.60	0
B	0.0	0.35	61
C	0.1	0.25	49
D	9.4	0.10	3,422
TOTAL			**3,533**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Pond 1P	741	
Pond 3P	1,699	
Pond 4P	1,263	
Total	**3,703**	c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: Raynham Park **Proj. No.:** 10111.00

Date: 5/18/2012

Project Location: Raynham, MA **Calculated by:** EJM

Bioretention Basin - 1

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
98.50	3,319	0
99.00	4,106	1,856
99.50	4,733	4,066
TOTAL		**4,066**

Assumptions:

Recharge Rate: 1.00 in/hr* * Bioretention Basin Soil Media Infiltration Rate

Drawdown Time: 14.7 hours

Bioretention Basin - 3

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
98.00	5,654	0
99.00	8,176	6,915
100.00	10,935	16,471
101.00	13,939	28,908
TOTAL		**28,908**

Assumptions:

Recharge Rate: 1.00 in/hr* * Bioretention Basin Soil Media Infiltration Rate

Drawdown Time: 61.4 hours

Infiltration Basin - 4

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
98.00	5,101	0
99.00	7,395	6,248
99.50	8,686	10,268
TOTAL		**10,268**

Assumptions:

Recharge Rate: 1.00 in/hr* * Bioretention Basin Soil Media Infiltration Rate

Drawdown Time: 24.2 hours

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Raynham Park Station **Proj. No.:** 10111.00
Project Location: Raynham, MA **Date:** 5/18/2012
Calculated by: EJM

Bioretention Basin 1P
(Runoff from Area DA-1 Driveway)

Total Impervious Area = 0.69 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	250
Water Quality Volume	1	2,501

Provided:

Bioretention Basin	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	98.5	3,319	0
	99.0	4,106	1,856
	99.5	4,733	4,066

Biofiltration Swale 3P
(Runoff from Parking Area DA-3)

Total Impervious Area = 4.96 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	1,801
Water Quality Volume	1	18,012

Provided:

Bioinfiltration Swale	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	98.0	5,654	0
	99.0	8,176	6,915
	100.0	10,935	16,471
	101.0	13,939	28,908

Bioretention Basin 4P
(Runoff from Parking Area DA-4)

Total Impervious Area = 2.39 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	867
Water Quality Volume	1	8,675

Provided:

Bioretention Basin	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	98.0	5,101	0
	99.0	7,395	6,248
	99.5	8,686	10,268

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Raynham Park Station**	Sheet:	**1 of 3**
Project Number:	**10111.00**	Date:	**6-Apr-2012**
Location:	**Raynham, MA**	Computed by:	**DAG**
Discharge Point:	**DP-1**	Checked by:	**VHB**
Drainage Area(s):	**DA-1**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area w/ Grassed Swale Pretreatment	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Raynham Park Station**	Sheet:	**2 of 3**
Project Number:	**10111.00**	Date:	**6-Apr-2012**
Location:	**Raynham, MA**	Computed by:	**DAG**
Discharge Point:	**DP-3**	Checked by:	**VHB**
Drainage Area(s):	**DA-3**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area w/ Sediment Forebay Pretreatment	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Raynham Park Station**	Sheet:	**3 of 3**
Project Number:	**10111.00**	Date:	**6-Apr-2012**
Location:	**Raynham, MA**	Computed by:	**DAG**
Discharge Point:	**DP-4**	Checked by:	**VHB**
Drainage Area(s):	**DA-4**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area w/ Grass and Gravel Filter Strip Pretreament	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	February 29, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Da Ha, Peter Chou - Jacobs
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) Raynham Park Station Geotechnical Design Memorandum Raynham, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the construction of several existing and new passenger stations and two terminal layover facilities. This geotechnical design memorandum presents the foundation design considerations for the new station platform at the proposed Raynham Park Station in Raynham, Massachusetts. The design recommendations presented in this report are based on the results of subsurface investigation performed by Jacobs in 2010.

Existing Conditions

The proposed Raynham Park Station is at the site of the Raynham-Taunton Greyhound Track, off Route 138 in Raynham, MA (Figure 1). The station site itself is within a larger, developed site that contains industrial facilities, a telephone pole storage yard, the greyhound track and associated uses, and a parking area. Existing grades at the platform location range from elevations 92 to 96 feet (NGVD29 Datum), generally sloping downward from south to north. The existing buildings and their foundations will need to be removed.

Proposed Construction

Current station plans are to construct an 800 foot long, 12 foot wide high level center platform adjacent to the existing tracks with some track relocation required, as well as the addition of a second track, a new parking area, access roads, and a new drop-off area. Access to the platform will be from a new ramp/stair structure along the east side of the tracks with a bridge over the track to the platform. Approximately 400 feet of the platform will be under a canopy. The details of new track layout (including grading), associated sidewalks and ramps of the proposed station are still under development at the time of this report preparation. This report focuses on the foundations for the platform only.

SCOPE OF WORK

This memorandum was prepared by Jacobs in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform a geotechnical exploration and laboratory testing program;
- Report and interpret the results of the exploration and laboratory testing program; and

- Provide geotechnical recommendations for design and construction of the platform foundations.

The Jacobs scope of work did not include environmental analyses to assess the potential presence of any hazardous materials at the project site.

LOCAL GEOLOGY

The site is located in the Narragansett Basin of southeastern Massachusetts. The rocks in the Narragansett Basin consist mostly of lightly metamorphosed shale and sandstone of Pennsylvanian and Permian age. The Raynham Park Station is located in the area of the Rhode Island Formation. The rocks encountered in the borings include conglomerate, sandstone, greywacke and siltstone. These rocks are all similar in that they are strongly cemented mixtures of fine to coarse sand with silt. Conglomerate includes gravel; greywacke includes all grain sizes, including a high percentage of fines. Weathering in these rocks commonly involves the breakdown of the mineral cements leading to eventual disaggregation of the matrix and the formation of residual soil. The rocks in the borings had sub-horizontal joints that appear to follow the bedding in the rock. These joints are probably the result of vertical unloading following deglaciation.

The top of rock was encountered in the borings between elevation 103 feet and elevation 84 feet. The thickness of overburden above the rock ranged from 26 feet to less than one foot.

GEOTECHNICAL EXPLORATIONS

Jacobs planned the subsurface exploration program and retained the drilling contractor (New Hampshire Boring) to perform the explorations. The geotechnical data report was submitted in 2010. Seven borings (RPS-1 to RPS-7) were conducted in the general vicinity of the proposed station platform area and eighteen borings (RPS-8, RPS-10, RPS-12 to RPS-26 and RPS-28) were drilled in the general vicinity of the proposed parking lot and its access roads. Boring locations are shown on the Subsurface Exploration Plan (Figures 2 & 3).

The borings were drilled by New Hampshire Boring using either a CME-550 or D-50 ATV mounted drill rig, or a CME-75 truck mounted drill rig. The borings were advanced through the soil by hollow-stem auger or wash boring methods using a 4-inch casing and roller bit with water. Standard penetration tests (SPT), consisting of a 140-pound hammer dropping 30 inches on a standard 2-inch-diameter (OD) split-spoon sampler, were performed with a safety hammer or automatic hammer to establish the consistency of the subsurface soils. The SPT's were typically performed at five foot intervals of depth. The obtained samples were sealed in glass jars to retain their natural moisture. Bedrock was encountered and cored around the proposed platform area.

The borings were observed and logged by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

LABORATORY TESTING

The results of the laboratory testing were previously submitted to VHB in a report entitled "South Coast Rail, Jacobs Geotechnical Data Report", dated November 2010.

Grain size distribution analyses were performed to evaluate the gradation of the natural granular soils for potential reuse as backfill, if needed, and to confirm sample classifications. The analyses are summarized in Table 1 below and are presented in Appendix B.

Table 1: Laboratory Soil Classification Summary

BORING NO.	SAMPLE NO.	ELEVATION (FEET)	USCS SOIL CLASSIFICATION	W (%)	GRAVEL (%)	SAND (%)	FINES (%)
RPS – 4 OW	S2	90.0	Silty Sand w/ Gravel (SM)	NT	37.7	45.2	17.1
RPS – 13 OW	S3	93.0	Silty Sand w/ Gravel (SM)	6.2	16.0	49.6	34.4
RPS - 16	S3	95.0	Silty Sand (SM)	11.6	4.9	74.8	20.3
RPS - 19	S4	92.0	Sandy Silt (ML)	2.7	6.0	44.4	49.6
RPS - 22	S3	97.0	Sandy Silt (ML)	14.5	6.0	40.0	54.0

Where: w = natural moisture content, NT = Not Tested.

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for the Raynham Park Station project, with some interpretations. The subsurface conditions encountered at the station platform area generally consist of a relatively thin layer of granular fill with thickness of about 0 to 3 feet, underlain by a granular soil layer with thickness ranging from 0 to 10 feet overlying bedrock. Bedrock was encountered at a depth of about 0.7 to 10 feet in the platform area, corresponding to approximately elevations 86.0 to 103.0 feet.

Fill materials with thicknesses ranging from approximately 0 to 10 feet, were also encountered in the vicinity of the proposed parking lot and access roads area. Bedrock was encountered at a depth about 2 to 21 feet (corresponding to elevations 84.0 to 101.0 feet). Shallower bedrock was found on the north side of the parking lot and in the area of the proposed Pond 1.

Subsurface soil conditions are summarized in Table 2 and discussed below.

Table 2: Summary of Subsurface Conditions at Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Platform Borings							
RPS - 1	96.0	0	96.0	86.0	79.0	96.5	Boring in flowing stream.
RPS - 2	93.0	0	93.0	92.3	90.5	93.5	Boring in flowing stream.
RPS - 3	92.0	0	92.0	89.0	87.5	92.5	Boring in flowing stream.
RPS - 4 OW	93.0	3.0	90.0	89.5	77.0	89.5	
RPS - 5	106.0	0	106.0	103.0	85.0	104.0	
RPS - 6	105.0	3.0	102.0	98.0	93.0	100.5	Boring offset ~30 ft E.
RPS - 7	107.0	3.0	104.0	91.0	81.5	NR	

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Site Borings							
RPS - 8	106.0	0	106.0	95.0	92.0	NR	
RPS - 10	108.0	5.0	103.0	98.5	98.0	100.5	Auger Boring
RPS - 12	103.0	4.0	99.0	87.0	87.0	NR	
RPS - 13 OW	107.0	3.0	104.0	86.0	83.0	102.3	Well screened from 14 to 24 ft.
RPS - 14	104.0	0	104.0	98.6	98.6	NR	Auger Boring
RPS - 15	107.0	3.0	104.0	101.0	98.0	NR	
RPS - 16	107.0	4.0	103.0	NE	91.0	NR	
RPS - 17	106.0	3.0	103.0	NE	90.0	NR	
RPS - 18	105.0	3.0	102.0	98.0	98.0	NR	Boring offset ~18 ft S (utilities), Auger Boring
RPS - 19	106.0	10	96.0	NE	90.0	98.0	Boring offset ~8 ft E (utilities), Auger Boring
RPS - 20	106.0	3.0	103.0	NE	90.0	NR	
RPS - 21	105.0	3.0	102.0	91.0	88.0	99.0	
RPS - 22	105.0	3.0	102.0	84.0	81.0	100.0	
RPS - 23	106.0	4.0	102.0	NE	80.0	NR	
RPS - 24	103.0	2.0	101.0	101.0	100.5	101.0	Auger Boring
RPS - 25	103.0	4.0	99.0	99.0	98.5	NR	Boring offset ~5 ft W, Auger Boring
RPS – 26	104.0	0	104	99.0	97.5	NR	
RPS – 28	105.0	1.0	104.0	97.0	95.0	NR	
NE: Not encountered at the boring during drilling. NR: Not recorded							

Soil conditions in the platform area generally consisted of the following:

Fill: The fill layer typically consists of mostly granular, loose to medium dense sand or gravel with up to 10% silt. The fill layer is generally about 0 to 3 feet thick in the area of the platform.

Natural Granular Deposits: The natural soil deposits below the fill generally consist of predominantly sand with gravel. These deposits are medium dense to very dense with Standard Penetration Test (SPT) N-values ranging between 15 and more than 50 blows per foot (bpf).

Bedrock: Bedrock was encountered in the platform area near ground surface to a depth of 10 feet below existing ground surface, corresponding to approximately elevations 86.0 to 92.3 feet. The bedrock was fine grained, severely jointed and joint weathering SANDSTONE or highly jointed, moderately weathered CONGLOMERATE. Bedrock RQD values at the platform range from zero to 47.

Bedrock was encountered at elevations ranging from about 84.0 to 103.0 feet in other site areas.

Groundwater: Groundwater levels were measured in the observation wells and in test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level ranged from approximate elevations 89.5 to 104 feet along the platform alignment, and from elevations 98 to 102 feet in the general area of the proposed parking lot. The use of wash boring techniques for some of the soil borings may have artificially increased the water level readings due to the addition of water to the borings. Trapped/perched water is also commonly seen at a higher elevation within existing fill and silty materials. The longer term water level readings taken at Boring RPS–04 OW on July 7, 2010 indicated the water at a depth of about 3.5 feet (Elevation 89.5 feet). The longer term water level readings taken at Boring RPS–13 OW on July 7, 2010 and September 12, 2011 indicated the water at a depth of about 7.5 feet (Elevation 99.5 feet) and 4.7 feet (Elevation 102.3 feet). Based upon these short-term observations and readings from the observation wells, it is anticipated that the groundwater could be within 3 to 4 feet below existing grade at the platform area and within 4 to 8 feet below grade in the parking lot area.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction. Local and periodic variations of ground water elevations may also be influenced by local subsurface drainage, leaking water or sewer pipes, and precipitation.

GEOTECHNICAL RECOMMENDATIONS

Based on the review of available subsurface conditions, the proposed station platforms can be supported on spread footings bearing directly within either competent natural soil, structural fill placed above suitable natural soils or on bedrock. Platform and canopy design loads were not available at the time of this report preparation. However, it is anticipated that the station platform will be lightly (axially) loaded with limited horizontal forces from wind and seismic loads.

The following paragraphs provide project specific geotechnical recommendations for foundation soil preparation, structural fill/backfill placement, and design and construction of spread footings.

Platform Foundations

Spread footings are recommended for the platform foundations, bearing on compacted structural fill, natural granular deposits, or bedrock. The existing fill is not suitable for support of the spread footings and should be removed within the zone of influence of the footing, defined by a line extending one foot horizontally from the bottom edge of footing and then down and away at a 1H:1V slope until natural granular soils or bedrock are encountered. The bottom of footing elevation should be at least 4 feet below final finished grades for frost protection for footings bearing on soil and at least 3 feet below final grade for footings bearing on bedrock.

The recommended allowable design bearing capacity for spread footings bearing on structural fill or natural sand and gravel deposits is 6 ksf, provided that subgrades are prepared as described herein. This provides an adequate factor of safety against bearing failure and limits the total estimated settlement to less than one inch and the differential settlement to less than ½ inch. For footings bearing directly on moderately weathered bedrock, we recommend an allowable bearing capacity of 16 ksf. However, since the actual bearing surface may not be known until construction, consideration should be given to designing all the footings for the 6 ksf bearing capacity. All footings should be at least 3 feet wide.

The structural fill material, if needed, should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557).

All temporary open cuts required for footing construction should be in accordance with the related OSHA regulations and should have side slopes of no steeper than 1.5H:1V.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered, the station site is classified as Seismic Site Class C soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The structure could be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class C Soils at the location of this station:

S_{MS} = 0.288 and S_{M1} = 0.105

S_{DS} = 0.192 and S_{D1} = 0.070

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class
- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: slope instability, soil liquefaction, or surface rupture due to faulting or lateral spreading. The proposed grading is relatively flat and we are not aware of any pre-existing slope instability in this area. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Based on the observed subsurface conditions, recorded water levels, percentage of fine contents and sample relative densities, the existing soils underlying the site are judged not susceptible to liquefaction.

CONSTRUCTION CONSIDERATIONS

Platform Foundations - Spread Footings

The existing fill should be stripped off and removed from within the zone of influence of the platform and any walkway areas down to natural granular deposits or bedrock using a smooth edge excavation bucket, and replaced by compacted granular soils.

Following excavation to the top of the natural granular deposits or bedrock, the exposed surface should be observed by an on-site representative of the project geotechnical engineer and soil subgrades shall be proof-compacted with at least 10 passes of a large vibratory drum roller. Any yielding areas should be observed by geotechnical personnel to assess if localized undercutting is necessary. Footing subgrade observations should include hand auger probes by the geotechnical personnel to check for soft/weak zones. The need for undercutting and backfilling with structural fill should be closely evaluated in the field based on encountered conditions.

If bedrock is encountered at the proposed bottom of footing elevation, the footing should either bear entirely on bedrock or entirely on soil. Where partial bedrock subgrade is encountered at the bottom of footing elevation, the bedrock should be over-excavated to a depth of at least 10 inches below the bottom of footing elevation and replaced with compacted Gravel Borrow to provide a uniform bearing surface.

In areas where seepage is encountered within footing excavations, the need for placing a 3" thick lean concrete mud mat or a layer of ¾-inch crushed stone to protect the bearing surface should be evaluated in the field. Crushed stone thicker than 4 inches shall be wrapped by non-woven filter fabric.

Following observation of the bearing soils by geotechnical personnel, reinforcing steel and concrete can be placed in the excavation. It is recommended that footing reinforcing steel and concrete be placed the same day as the footing excavation is made, where possible, to avoid significant moisture content changes in the bearing soils. No water should be allowed to pond within excavations and drainage should be maintained away from foundations both during and after construction. The footing excavation should be free of loose debris at the time of concrete placement.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed structure footprints, walkway and paved areas, these areas should be stripped of topsoil, vegetation, fill, former building foundations and existing pavement, if present. The topsoil should be placed in a designated area for reuse during final grading. Following site clearing and stripping, the exposed soil subgrade should be proof compacted with 10 passes of a large vibratory drum roller (minimum 10,000 pound static weight). Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials. Where subgrade soils are close to the existing groundwater level or where silty subgrade soils are encountered, proof-compaction using non-vibratory methods may be considered by the geotechnical engineer. Bedrock subgrades shall be free of all loose, fractured bedrock.

If additional rolling does not correct the unstable condition, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. A backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas. Construction traffic should be controlled to prevent excessive stresses and disturbance to the subgrade.

If pavements are not constructed immediately after grading, the subgrade should be shaped so as to prevent water ponding. If there is a substantial lapse in time between grading and paving, or if the subgrade is disturbed, it should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during proof-rolling or initial construction should be removed and replaced with compacted granular fill.

Within the proposed paved areas, and extending a distance of five feet beyond the edge on all sides, excavate existing granular fill soils to a depth of two feet below existing site grades. It may be possible to reuse the existing granular fill, depending on the suitability of the material, as described herein.

Fill Placement and Compaction

Fill materials most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to the following percentages of the maximum dry density:

Table 3: Fill Compaction Requirements

DESCRIPTION	MINIMUM PERCENT COMPACTION (ASTM D-1557)
General Site Fills, Structural Fill (Below Footings and Slabs)	95
Behind Retaining Walls	92
Landscape Area	90

Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content as determined by the Modified Proctor test (ASTM D-1557).

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Pumped water should be discharged in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes for Pond 1 as the station design is finalized.

Excavation Slopes and Shoring

The slopes of temporary open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced registered Professional Engineer in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

Protection of Existing Facilities

It is recommended that a geotechnical instrumentation and monitoring program be performed during construction of the project to evaluate impacts on structures slated to remain adjacent to the station. It is recommended that the program be developed to provide data for the following considerations:

- To monitor ground movements and vibration levels during construction.
- To provide early warning of potentially adverse trends by presenting sufficient data to determine the source of unanticipated ground movements, if present.
- If necessary, to plan remedial measures to limit damage to embankments and structures and to provide early warning when alternative means of protection are necessary.
- To document impacts of construction on adjacent facilities.
- To evaluate the performance and structural integrity of the constructed facilities.

If needed, we recommend the following instrumentation program to measure:

- Ground surface settlement and lateral movement adjacent to proposed construction.
- Horizontal and vertical movement of any excavation support system, and existing structures.
- Vibrations as a result of construction activities.

Vertical and horizontal survey points should be established on the adjacent structures. The monitoring points should be surveyed prior to the start of construction and monitored during construction to detect movement.

Vibration monitoring shall be conducted within 100 feet of existing structures during construction activities.

We recommend conducting a pre-construction survey of structures and utilities within 100 feet of the site to document existing conditions prior to construction. Documentation should include photographs, video, sketches, and/or written comments.

Specific instrumentation and monitoring requirements shall be based on the proposed construction sequence, duration of construction, and performance criteria. Initial measurements should be established well in advance of construction so that baseline data can be developed. This information will be invaluable for providing early warning of adverse trends and for assessing the need for mitigating measures.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed Raynham Park Station in Raynham, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – SITE LOCATION PLAN
FIGURES 2&3 – SUBSURFACE EXPLORATION PLAN
FIGURE 4 – SUBSURFACE SOIL PROFILES
APPENDIX A – TEST BORING LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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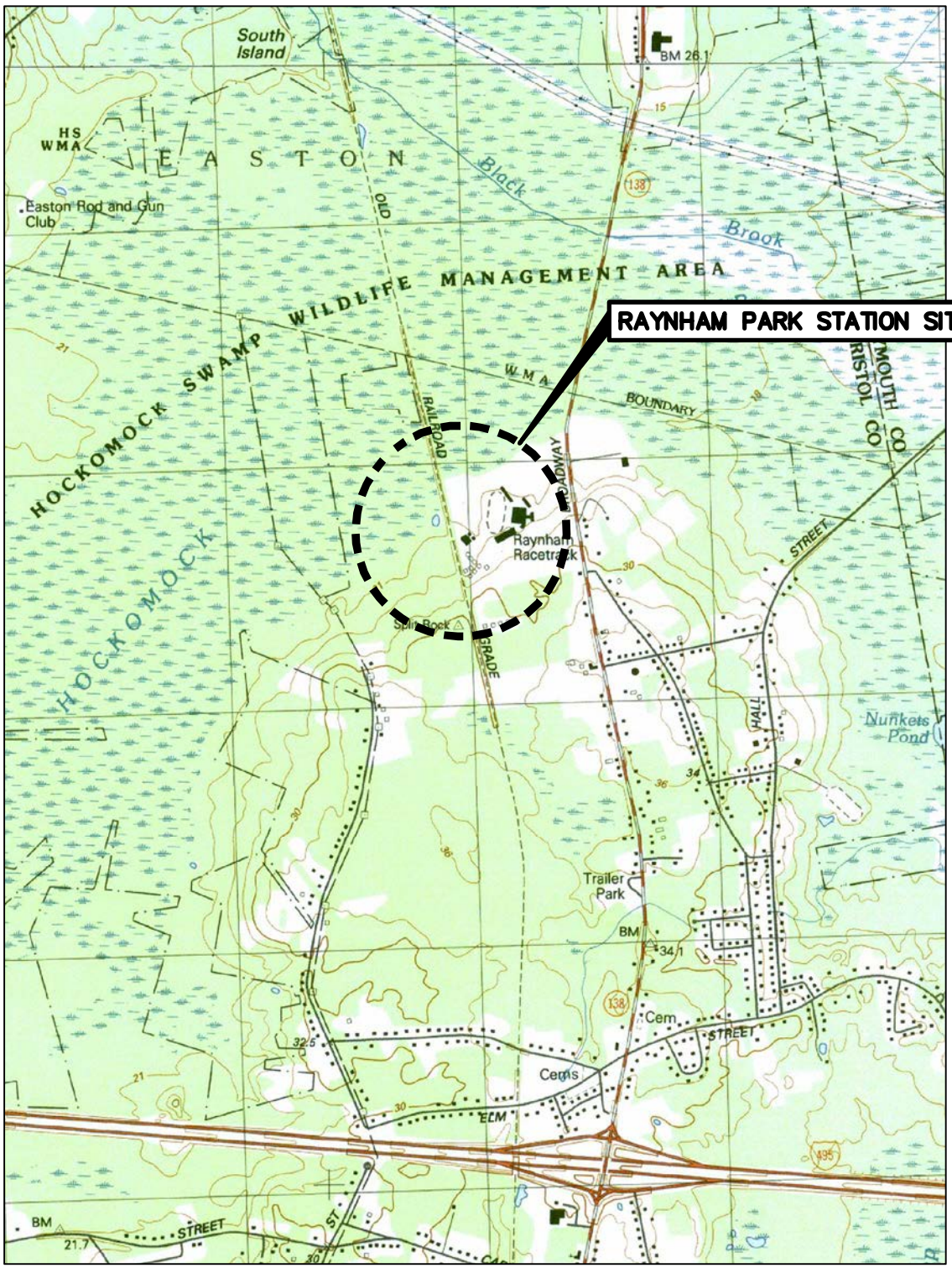
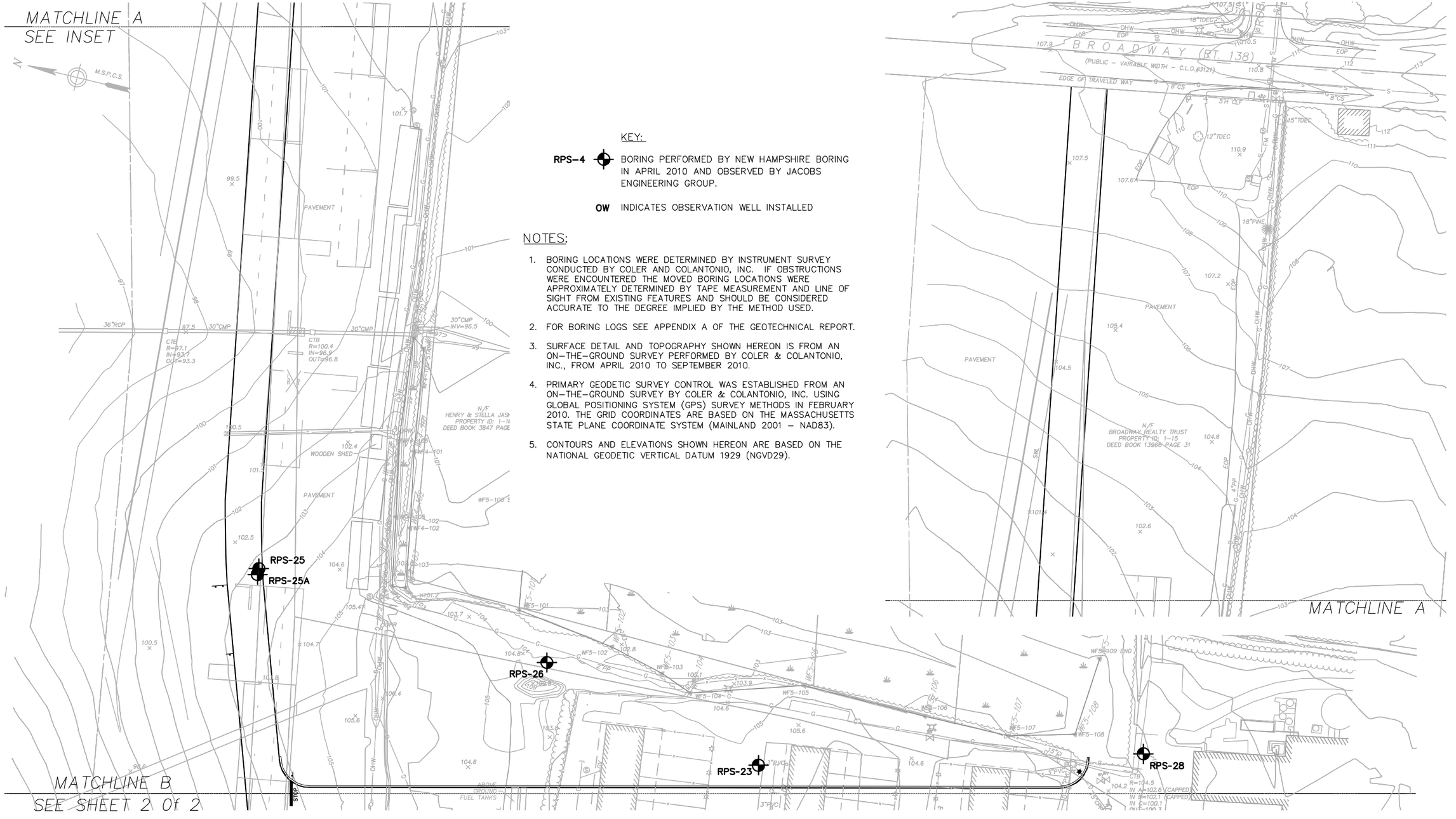
FIGURES

Figure 1: Site Location Plan
Figures 2&3: Subsurface Exploration Plan
Figure 4: Subsurface Soil Profiles



RAYNHAM PARK STATION
PROJECT LOCUS PLAN
NOT TO SCALE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	RAYNHAM PARK STATION RAYNHAM, MASSACHUSETTS FIGURE 1



KEY:

RPS–4 BORING PERFORMED BY NEW HAMPSHIRE BORING IN APRIL 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

OW INDICATES OBSERVATION WELL INSTALLED

NOTES:

1. BORING LOCATIONS WERE DETERMINED BY INSTRUMENT SURVEY CONDUCTED BY COLER AND COLANTONIO, INC. IF OBSTRUCTIONS WERE ENCOUNTERED THE MOVED BORING LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT AND LINE OF SIGHT FROM EXISTING FEATURES AND SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.
2. FOR BORING LOGS SEE APPENDIX A OF THE GEOTECHNICAL REPORT.
3. SURFACE DETAIL AND TOPOGRAPHY SHOWN HEREON IS FROM AN ON–THE–GROUND SURVEY PERFORMED BY COLER & COLANTONIO, INC., FROM APRIL 2010 TO SEPTEMBER 2010.
4. PRIMARY GEODETIC SURVEY CONTROL WAS ESTABLISHED FROM AN ON–THE–GROUND SURVEY BY COLER & COLANTONIO, INC. USING GLOBAL POSITIONING SYSTEM (GPS) SURVEY METHODS IN FEBRUARY 2010. THE GRID COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND 2001 – NAD83).
5. CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).

RAYNHAM PARK STATION
BORING LOCATION PLAN
SCALE: 1"=80'

80 40 0 80 160
SCALE: 1"=80'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242–9222

RAYNHAM PARK STATION
RAYNHAM, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: FEBRUARY 2012

FIGURE NO: 2

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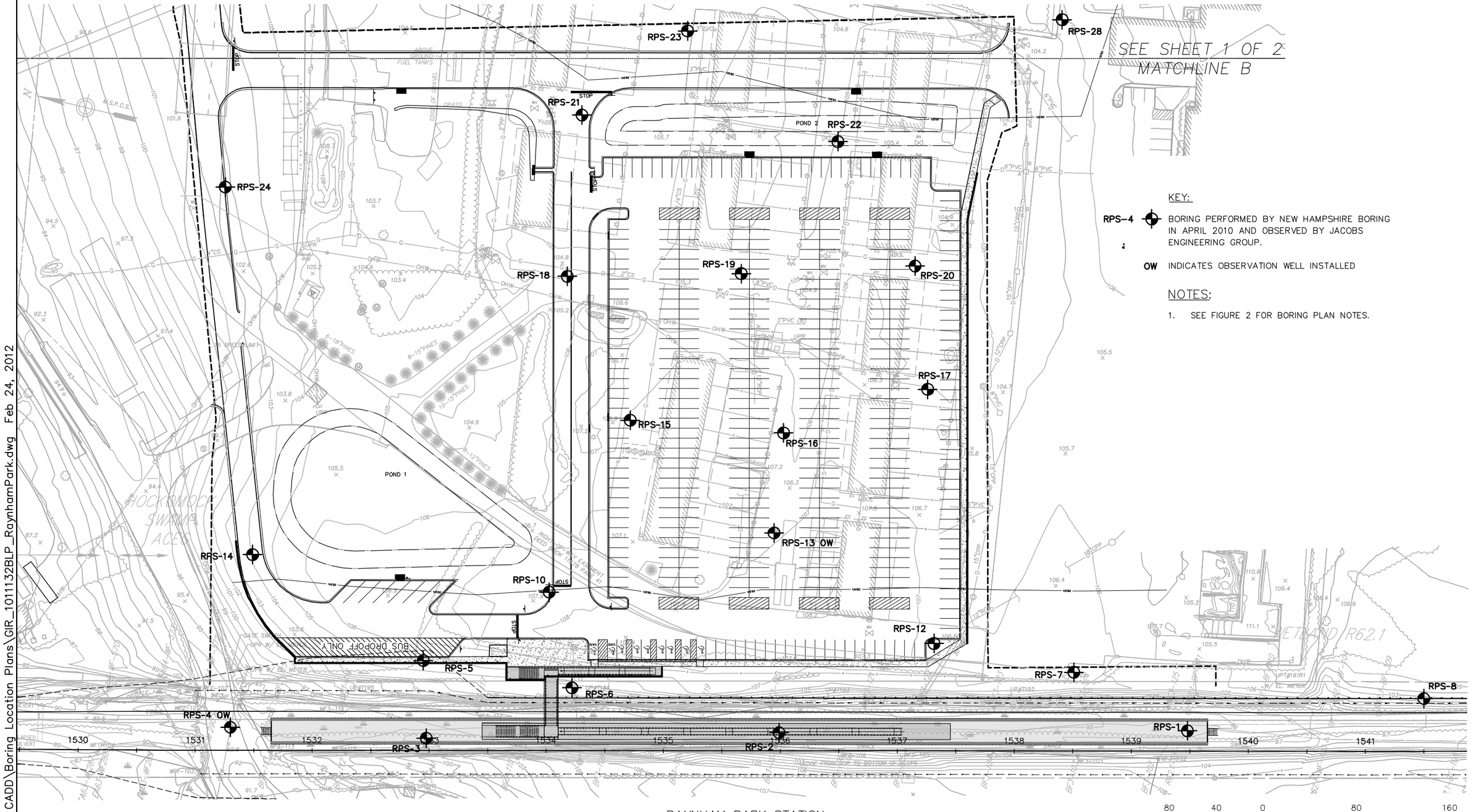

KEY:

RPS-4 ⊕ BORING PERFORMED BY NEW HAMPSHIRE BORING IN APRIL 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

OW INDICATES OBSERVATION WELL INSTALLED

NOTES:

1. SEE FIGURE 2 FOR BORING PLAN NOTES.

RAYNHAM PARK STATION
BORING LOCATION PLAN
SCALE: 1"=80'

80 40 0 80 160
SCALE: 1"=80'

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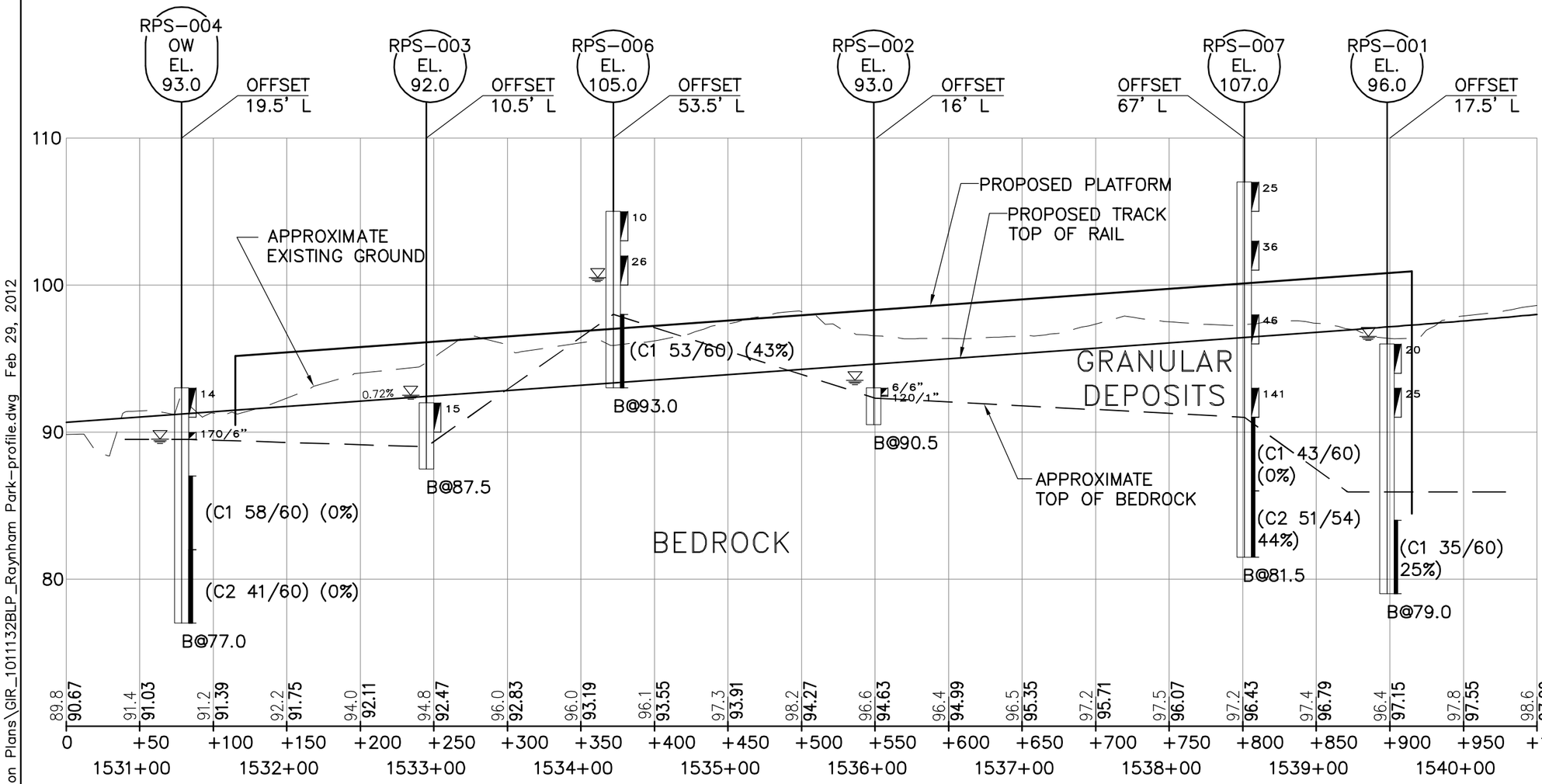
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242-9222

RAYNHAM PARK STATION
RAYNHAM, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

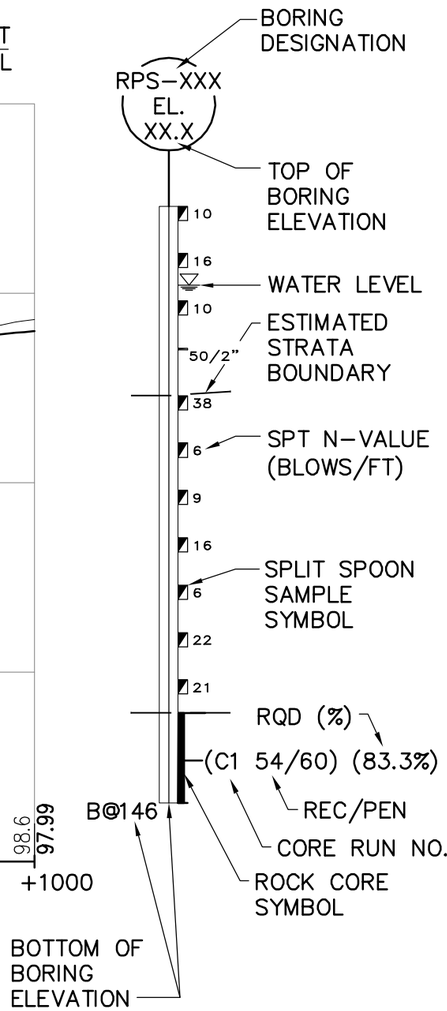
DATE: FEBRUARY 2012

FIGURE NO: 3



NOTE:
BORINGS RPS–1 THRU RPS–3 IN FLOWING STREAM.

80 40 0 80
16 8 0 16
HORIZ. 1" = 80'
VERT. 1" = 8'



BORING LEGEND
N.T.S.

F:\Proj\013471\700 CADD\Boring Location Plans\GIR_1011132BLP_Raynham Park–profile.dwg Feb 29, 2012

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242–9222

RAYNHAM PARK STATION
RAYNHAM, MASSACHUSETTS
SUBSURFACE PROFILE A–A

DATE: FEBRUARY 2012

FIGURE NO: 4

Memorandum

APPENDIX A: BORING LOGS

RPS-1 TO RPS-8
RPS-10
RPS-12 TO RPS-26
RPS-28

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	RPS - 001
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	96
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2817411
12	NX Rock Core	4/8/2010	-0.5 In stream.			COORD E	771692
17	Terminated					DATE START	4/8/10
						DATE END	4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		9 10 10 11	S1	0 - 2	12		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, little fine to coarse gravel, brown, wet.
		12 12 13 12	S2	3 - 5	15		SIMILAR TO S1; some gravel, trace silt.
5							
10						86.0	Top of bedrock at ~10 ft, roller bit to 12 ft.
		RQD=25	C1	12 - 17	35		SANDSTONE; fine grained, severe jointing and joint weathering, joints spaced 0 - 5 inches, joints angled at ~0 - 60 degrees, soft, gray.
15							
						79.0	Bottom of Hole at 17'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 001

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 002	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring		DRILLER	C. Knight	ELEVATION	93
METHOD OF DRILLING	GROUNDWATER READINGS			DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft)	REMARKS	SPT HAMMER	140 lb Auto	GRID N	2817750
2.5 Terminated	4/8/2010	-0.5	In stream.			COORD E	771609
						DATE START	4/8/10
						DATE END	4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 120/1"	S1	0 - 0.58		92.3	WELL GRADED GRAVEL WITH SAND (GW); fine to coarse gravel up to 1.5", some fine to coarse sand, trace silt, grayish brown, wet. Top of apparent bedrock at ~8 in. Roller bit to 2.5 ft.
						90.5	
							Bottom of Hole at 2.5'.
							Boring located in small stream.
5							
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 002

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	RPS - 003
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	92
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2818042
4.5	Terminated	4/8/2010	-0.5 In stream.			COORD E	771534
						DATE START	4/8/10
						DATE END	4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		WOR 12 3 10	S1	0 - 2	6		SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some non-plastic silt, little fine gravel, dark brown, leaves, wet.
						89.0	Top of apparent bedrock at ~3 ft. Roller bit to 4.5 ft.
5						87.5	Bottom of Hole at 4.5'. Boring located in small stream.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 003

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 004 OW	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	93	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID	N	2818207
6 NX Rock Core	7/7/2010	3.5 Monitoring Well Reading			COORD	E	771504
16 Terminated					DATE START		4/9/10
					DATE END		4/12/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 10 12	S1	0 - 2	10		WELL GRADED GRAVEL WITH SAND (GW); fine to coarse gravel up to 1.5", little fine to coarse sand, dark brown, wet, FILL.
		50 120/0"	S2	3 - 3.5	6	90.0 89.5	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some fine to medium gravel, little silt, weathered rock, gray, wet. Top of bedrock at ~ 3.5 ft, roller bit to 6 ft.
5		RQD=0	C1	6 - 11	58		CONGLOMERATE; highly jointed, moderate weathering, joints spaced <1 to 3", joints generally angled at 0 to 10 degrees from horizontal, gray.
10		RQD=0	C2	11 - 16	41		SIMILAR TO C1.
15						77.0	
							Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 004 OW

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 005
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	S. Bolduc	ELEVATION	106
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818060
4	NX Rock Core	4/7/2010	2 Upon Completion (In Casing)			COORD E	771598
21	Terminated					DATE START	4/6/10
						DATE END	4/7/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 7 11 14	S1	0 - 2	15	103.0	POORLY GRADED SAND WITH GRAVEL (SP); mostly fine sand, little fine gravel, trace silt, brown, moist.
							Top of bedrock at 3 ft, roller bit to 4 ft.
5		RQD=0	C1	4 - 9	14		CONGLOMERATE; highly fractured, gray.
10		RQD=0	C2	9 - 11	12		CONGLOMERATE; moderate weathering, highly fractured.
		RQD=22	C3	11 - 16	48		CONGLOMERATE; joints spaced 2 - 8", joints angled at ~15 degrees from horizontal, moderate joint weathering, clasts up to 1.5" in size, gray.
15		RQD=47	C4	16 - 21	57		SIMILAR TO C3.
20						85.0	
							Bottom of Hole at 21'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 005

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 006	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	105	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2817931
7 NX Rock Core	4/7/2010	4.5 Upon Completion (In Casing)			COORD	E	771605
12 Terminated					DATE START		4/7/10
					DATE END		4/7/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 6 7	S1	0.16 - 2.16	14	104.8	Top 2" Topsoil. WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, trace silt, light brown, moist, FILL.
5		3 6 20 22	S2	3 - 5	10	102.0	SILT WITH SAND (ML); non-plastic silt, some fine sand, light brown, wet.
10		RQD=43	C1	7 - 12	53	98.0	Top of bedrock at 7 ft. GRAYWACKE; joints spaced 1 - 8", joints angled at ~0-45 degrees from horizontal, moderate weathering and discoleration of joint surfaces, clasts up to 1", gray.
15						93.0	Bottom of Hole at 12'. Boring Offset ~30 ft East.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 006

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 007
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	107
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817517
16	NX Rock Core					COORD E	771718
25.5	Terminated					DATE START	4/9/10
						DATE END	4/9/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		10 15 10 5	S1	0 - 2	10		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, dark brown, moist, FILL.
						104.0	
5		12 17 19 19	S2	4 - 6	14		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, some non-plastic silt, trace fine gravel, light brown, moist.
						99.0	
10		3 19 27 15	S3	9 - 11	9		SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little gravel, gray, wet, possible TILL.
						93.0	
15		67 44 97 53	S4	14 - 16	4		WEATHERED ROCK
		RQD=0	C1	16 - 21	43	91.0	SANDSTONE; fine grained, severe jointing and joint weathering, joints spaced 0 - 2 inches, joints angled at ~0 - 60 degrees, soft, gray, at 20'6" rock becomes black and less fractured, partial loss of drill water.
20		RQD=44	C2	21 - 25.5	51		(21 - 24') SANDSTONE; fine grained, moderate jointing and joint weathering, joints spaced 1 - 8 inches, joints angled at ~0 - 60 degrees, soft, gray, loss of drill water.
						83.0	
25							(24 - 25') SILTSTONE; joints spaced 1 - 8", soft, gray.
						81.5	
							Bottom of Hole at 25.5'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 007

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 008
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	106
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817221
5	NX Rock Core					COORD E	771766
17	Terminated					DATE START	4/8/10
						DATE END	4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		1 10 10 19	S1	0 - 2	19		SILTY SAND (SM); mostly fine sand, some non-plastic silt, trace fine gravel, brown, moist.
		22 120/2"	S2	3 - 3.67	6	103.0 102.3	SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little fine gravel, gray, wet, fractured rock in tip of spoon. Top of bedrock at 3.67 ft.
5		RQD=30	C1	5 - 10	58		SANDSTONE; medium grained, hard, highly fractured, joints spaced 0 - 6", joints angled at ~15 degrees from horizontal, sand seams, gray.
10						95.0	
		RQD=7	C2	12 - 17	16		SILTSTONE; fine grained, soft, highly fractured, vertical fractures, loss of water, gray.
15						92.0	
							Bottom of Hole at 17'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 008

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 010
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	S. Bolduc	ELEVATION	108
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817969
10	Terminated	4/6/2010	7.5 Upon Completion (In Augers)			COORD E	771680
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 5 13 17	S1	0 - 2	19		POORLY GRADED SAND (SP); mostly fine sand, trace fine gravel, brown, FILL.
5		24 44 66 90	S2	4 - 6	16	103.0	(4 - 5') SIMILAR TO S1; some non-plastic silt, moist. (5 - 6') WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some mostly fine gravel, trace silt, cobble encountered, light brown, moist.
						100.0	
10		120/2"	S3	9 - 9.16	2	98.5 98.0	SANDY SILT (ML); non-plastic silt, some fine sand, trace fine gravel, light brown, wet. Top of apparent bedrock at ~ 9.5 ft. Bottom of Hole at 10'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 010

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 012	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	103	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817639	
16 Terminated					COORD E	771714	
					DATE START	4/9/10	
					DATE END	4/9/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 8 8 7	S1	0.33 - 2.33	0	102.7	Top 4" Asphaltic Concrete NO RECOVERY; FILL based on cuttings.
5		10 25 66 50	S2	4 - 6	8	99.0	POORLY GRADED SAND (SP); mostly fine sand, trace silt, light brown, moist.
10		7 12 30 33	S3	9 - 11	10	94.0	SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little fine to coarse gravel, grayish brown, wet.
15		21 36 22 35	S4	14 - 16	6	89.0	WEATHERED ROCK; completely weathered rock, gray, wet.
						87.0	Bottom of Hole at 26'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 012

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 013 OW	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	107	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2817794
24 Terminated	7/7/2010	7.5 Monitoring Well Reading			COORD	E	771774
	9/12/2011	4.7 Monitoring Well Reading			DATE START		4/8/10
					DATE END		4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 6 7 9	S1	0.33 - 2.33	9	106.7	Top 4" Asphaltic Concrete. WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, little fine gravel, light brown, moist, FILL.
						104.0	
5		18 23 21 17	S2	4 - 6	6		WELL GRADED SAND WITH SILT (SW - SM); fine to coarse sand, little non-plastic silt, trace fine gravel, grayish brown, moist.
						98.0	
10							Boulder encountered from 9 to 12 ft.
						95.0	
15		23 21 16 15	S3	14 - 16	5		SILTY SAND WITH GRAVEL (SM); mostly fine sand, some non-plastic silt, little fine gravel, grayish brown, wet.
						89.0	
20		32 120/6"	S4	19 - 20	3		WELL GRADED GRAVEL WITH SAND (GW); fine to coarse gravel up to 1.5", some fine to coarse sand, trace silt, gray, wet, weathered rock.
						86.0	Top of apparent bedrock at 21 ft. Roller bit to 24 ft.
						83.0	
25							Bottom of Hole at 24'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 013 OW

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 014
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	S. Bolduc	ELEVATION	104
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818223
5.42	Terminated					COORD E	771652
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 8 10 12	S1	0 - 2	14		SILTY SAND (SM); mostly fine sand, some non-plastic silt, trace gravel, brown, moist.
5		120/5"	S2	5 - 5.42	2	99.0 98.6	WEATHERED ROCK Bottom of Hole at 5.42'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 014

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 015
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	107
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817936
9	Terminated					COORD E	771839
						DATE START	4/7/10
						DATE END	4/7/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		7 11 12 13	S1	0.33 - 2.33	16	106.7	Top 4" Asphaltic Concrete POORLY GRADED SAND (SP); mostly fine sand, trace fine gravel, light brown, moist, FILL.
						104.0	
5		4 4 25 120/2"	S2	4 - 5.83	12		SILT WITH SAND (ML); non-plastic silt, some fine sand, gray with brown, wet.
						101.0	Top of apparent bedrock at 6 ft, roller bit to 9 ft.
						98.0	
10							Bottom of Hole at 9'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 015

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 016	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	107	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817806	
16 Terminated					COORD E	771859	
					DATE START	4/7/10	
					DATE END	4/8/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		10 10 8 7	S1	0.33 - 2.33	16	106.7	Top 4" Asphaltic Concrete POORLY GRADED SAND (SP); mostly fine sand, grayish brown, moist, FILL.
5		6 13 19 17	S2	4 - 6	16	103.0	POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, trace fine gravel, grayish brown, wet.
10		10 15 15 19	S3	9 - 11	16		SILTY SAND (SM); mostly fine sand, little non-plastic silt, grayish brown, wet.
						95.0	
15		12 9 11 15	S4	14 - 16	7		SANDY SILT (ML); non-plastic silt, some fine to coarse sand, trace fine gravel, grayish brown, wet.
						91.0	
20							Bottom of Hole at 16'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 016

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. RPS - 017
	LOCATION	Raynham, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 1 OF 1
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION		106
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM		NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2817695
16	Terminated					COORD	E	771924
						DATE START		4/8/10
						DATE END		4/8/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 9 12 23	S1	0.33 - 2.33	4	105.7	Top 4" Asphaltic Concrete. WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, grayish brown, moist, FILL.
5		9 16 18 21	S2	4 - 6	8	103.0	SILTY SAND (SM); fine to coarse sand, some non-plastic silt, trace fine gravel, brown, wet.
10		15 15 16 22	S3	9 - 11	14	98.0	SILT WITH SAND (ML); non-plastic sile, little fine to coarse sand, gray, wet.
15		14 17 23 40	S4	14 - 16	16		SILT WITH SAND (ML); non-plastic silt, little fine to coarse sand, dark gray, wet.
						90.0	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 017

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. RPS - 018
	LOCATION	Raynham, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 1 OF 1
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	105
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818017
7	Terminated					COORD E	771946
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		11 23 13 15	S1	0.33 - 2.33	18	104.7	Top 4" Asphaltic Concrete. WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, grayish brown, moist, FILL.
						102.0	
5		11 15 52 100/3"	S2	5 - 6.75	12		SILT WITH SAND (ML); non-plastic silt, some fine sand, gray, wet.
						98.3 98.0	Top of apparent bedrock at 6.75 ft.
							Bottom of Hole at 7'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 018

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 019	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	106	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2817873
16 Terminated	4/6/2010	8 Upon Completion (In Augers)			COORD	E	771983
					DATE START		4/6/10
					DATE END		4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		11 23 15 15	S1	0.33 - 2.33	18	105.7	Top 4" Asphaltic Concrete. POORLY GRADED SAND (SP); mostly fine sand, trace silt, light brown, moist, FILL.
5		10 14 16 19	S2	5 - 7	20		SIMILAR TO S1.
10		10 15 66 30	S3	9 - 11	20	96.0	(9 - 11') POORLY GRADED SAND (SP); mostly fine sand, trace silt, brown, wet.
						93.0	(10 - 11') WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, trace silt, grayish brown, wet.
15		15 18 20 28	S4	14 - 16	22	90.0	SANDY SILT (ML); non-plastic silt, some fine sand, trace fine gravel, grayish brown, wet.
20							Bottom of Hole at 16'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 019

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. RPS - 020
	LOCATION	Raynham, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 1 OF 1
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION		106
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM		NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2817730
16	Terminated					COORD	E	772024
						DATE START		4/9/10
						DATE END		4/9/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 10 8 15	S1	0.33 - 2.33	10	105.7	Top 4" Asphaltic Concrete. WELL GRADED SAND (SW); fine to coarse sand, brown, moist, FILL.
						103.0	
5		7 11 13 21	S2	4 - 6	16		SANDY SILT (ML); non-plastic silt, some fine sand, light brown, moist.
10		10 9 10 21	S3	9 - 11	16		SANDY SILT (ML); non-plastic silt, some fine sand, gray, wet.
						93.0	
15		32 48 52 72	S4	14 - 16	8		SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some non-plastic silt, little fine gravel, gray, wet, possible GLACIAL TILL.
						90.0	
							Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 020

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	RPS - 021	
	LOCATION	Raynham, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	105	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2818037
17 Terminated	4/7/2010	6 Upon Completion (In Casing)			COORD	E	772083
					DATE START		4/7/10
					DATE END		4/7/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 7 9 14	S1	0.33 - 2.33	12	104.7	Top 4" Asphaltic Concrete. POORLY GRADED SAND (SP); mostly fine sand, grayish-brown, moist, FILL.
5		14 23 25 25	S2	4 - 6	18	102.0	SANDY SILT (ML); non-plastic silt, some fine to coarse sand, trace fine gravel, gray with brown, moist.
10		8 25 35 40	S3	9 - 11	6	97.0	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, trace silt, brown, wet.
15		100/5"	S4	14 - 14.52	0	91.0	NO RECOVERY; top of apparent bedrock, roller bit to 17 ft.
20						88.0	Bottom of Hole at 17'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 021

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. RPS - 022
	LOCATION	Raynham, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 1 OF 1
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	105
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817819
24	Terminated	4/6/2010	5 Upon Completion (In Casing)			COORD E	772112
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		14 10 10 8	S1	0.33 - 2.33	12	104.7	Top 4" Asphaltic Concrete. WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, trace coarse gravel, brown, moist, FILL.
5		7 11 14 16	S2	4 - 6	8	102.0	POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, grayish-brown, wet.
10		5 5 5 6	S3	8 - 10	12	97.0	SANDY SILT (ML); slightly plastic silt, some fine sand, trace gravel, gray, wet.
15		16 31 120/4"	S4	13 - 14.33	12	92.0	SILT WITH SAND (ML); non-plastic silt, some fine to coarse sand, trace fine gravel, gray, wet, possible GLACIAL TILL.
20		21 20 30 32	S5	18 - 20	10		SILT (ML); non-plastic silt, trace fine gravel, gray, wet, completely weathered rock in tip of spoon, GLACIAL TILL.
						84.0	Top of apparent bedrock at 21 ft. Roller bit to 24 ft.
25						81.0	Bottom of Hole at 24'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 022

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 023
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	106
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2817966
26	Terminated					COORD E	772174
						DATE START	4/7/10
						DATE END	4/7/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		7 6 5 7	S1	0.33 - 2.33	12	105.7	Top 4" Asphaltic Concrete. POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, little non-plastic silt, trace fine gravel, grayish-brown, moist, FILL.
5		7 10 14 16	S2	4 - 6	18	102.0	POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, reddish-brown, moist.
10		14 14 15 17	S3	9 - 11	16		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, little non-plastic silt, brown, moist.
15		13 16 25 40	S4	14 - 16	22	91.0	(14 - 15') POORLY GRADED SAND (SP); mostly fine sand, gray, wet. (15 - 16') SILT WITH SAND (ML); non-plastic silt, some fine to medium sand, trace fine gravel, gray, wet, possible GLACIAL TILL.
20		17 25 31 33	S5	19 - 21	14		SILT WITH SAND (ML); non-plastic silt, some fine to coarse sand, trace fine gravel, gray, wet, GLACIAL TILL.
25		16 30 42 33	S6	24 - 26	8		SILTY SAND (SM); mostly fine sand, some non-plastic silt, trace fine gravel, gray, wet, rock fragments in tip of spoon, GLACIAL TILL.
						80.0	Bottom of Hole at 26'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 023

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 024
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	103
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818319
2.5	Terminated	4/6/2010	2 Upon Completion (In Augers)			COORD E	771952
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 8 8 120/2"	S1	0.5 - 2.16	8	102.7	Top 4" Asphaltic Concrete.
						101.0	WELL GRADED SAND WITH SILT AND GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, little non-plastic silt, brown, moist, some weathered rock in tip of spoon, FILL.
						100.5	Top of apparent bedrock at ~ 2 ft, roller bit to 2.5 ft.
5							Bottom of Hole at 2.5'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 024

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 025
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	103
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2818408
4.5	Terminated					COORD E	772236
						DATE START	4/6/10
						DATE END	4/6/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 9 5 6	S1	0.5 - 2.5	6	102.5	Top 6" Asphaltic Concrete. POORLY GRADED SAND (SP); mostly fine sand, brown, dry, FILL.
5		120/0"	S2	4 - 4	0	99.0 98.5	NO RECOVERY; top of apparent bedrock at ~ 4 ft, roller bit to 4.5 ft.
							Bottom of Hole at 4.5'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 025

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	RPS - 026
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	104
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2818157
6.5	Terminated					COORD E	772216
						DATE START	4/9/10
						DATE END	4/9/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		1 1 2 2	S1	0 - 2	18		SILT (ML); non-plastic silt, light brown, moist, pieces of wood.
		2 3 1 28	S2	3 - 5	12	101.0	POORLY GRADED SAND (SP); mostly medium sand, trace fine gravel, weathered rock in tip of spoon, grayish brown, wet.
5						99.0	Top of apparent bedrock at ~ 5ft, roller bit to 6.5 ft.
						98.0	Bottom of Hole at 6.5'.
10							
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 026

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	RPS - 028
LOCATION	Raynham, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	105
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2817657
10	Terminated					COORD E	772258
						DATE START	4/9/10
						DATE END	4/9/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		16 19 16 13	S1	0.33 - 2.33	20	104.7	Top 4" Asphaltic Concrete.
						104.0	(0.33 - 1') WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brick fragments, dark brown, FILL.
		15 21 27 23	S2	3 - 5	16	102.0	(1 - 2') SILTY SAND (SM); fine to coarse sand, some non-plactic silt, dark brown, moist.
							(3 - 4.5') POORLY GRADED SAND (SP); mostly fine sand, light brown, moist.
5						100.5	(4.5 - 5') SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some non-plastic silt, little fine gravel, gray, wet, possible GLACIAL TILL.
		120/5"	S3	8 - 8.42	4	97.0	WEATHERED ROCK; top of apparent bedrock at ~8 ft, roller bit to 10 ft.
10						95.0	Bottom of Hole at 10'.
15							
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. RPS - 028

Memorandum

APPENDIX B: LABORATORY DATA

Table C.1 - Summary of Laboratory Soil Test Data
South Coast Rail Project

Sample Identification				Test Results								Soil Classification
Boring Number	Sample Number	Sample Depth	Sample Elevation	Moisture Content	% Gravel	% Sand	% Fines	Organic Content	Liquid Limit	Plastic Limit	Plasticity Index	Unified Soil Classification System (ASTM D-2487)
BCS - 01	S3	4.0	15.9	0.2	57.3	33.1	9.6					Well Graded Gravel w/ Sand (GW)
	S9	38.0	-18.1	17.5	7.1	8.8	84.1					Silt (ML)
BCS - 02	S5	18.0	9.7		29.3	47.3	23.4					Silty Sand w/ Gravel (SM)
ECC - 02	S4	13.0	89.0	10					23	15	8	Clay (CL)
EVS - 02	S4	11.0	132.0	24.3	0.6	46.2	53.2					Sandy Silt (ML)
EVS - 03	S5	18.0	126.0		0.0	28.0	72.0					Silt w/ Sand (ML)
FRD - 01	S2	4.0	34.0	6.5	47.7	41.1	11.2					Gravel w/ Silt + Sand (GW-GM)
FRD - 03	S4	13.0	24.0	12.3	17.6	68.4	14.0					Silty Sand w/ Gravel (SM)
FRD - 06	S2	4.0	22.0	7.2	44.4	47.1	8.5					Sand w/ Silt + Gravel (SW-SM)
	S7	29.0	-3.0	20.1	0.0	88.0	12.0					Silty Sand (SM)
FTS - 04	S2	4.0	63.6	42.4				4.7				Silt (ML)
FTS - 11	S1	0.0	56.0	24	0	48.1	51.9					Sandy Silt (ML)
FTS - 13	S2	3.0	35.6	23.8	0	1	99					Silt (ML)
KHS - 02	S3	8.0	82.8		27.0	47.9	25.1					Silty Sand w/ Gravel (SM)
NES - 04	S4	14.0	144.0	23.6	0.0	1.9	98.1					Silty Clay (CL)
NES - 05	S2	4.0	154.0	1.1	13.3	68.3	18.4					Silty Sand (SM)
NES - 14	S2	4.0	162.0		32.7	51.3	16.0					Silty Sand w/ Gravel (SM)
NES - 21	S2	4.0	158.0		56.9	34.1	9.0					Gravel w/ Silt + Sand (GW-GM)
RPS - 04	S2	3.0	90.0		37.7	45.2	17.1					Silty Sand w/ Gravel (SM)
RPS - 13	S3	14.0	93.0	6.2	16.0	49.6	34.4					Silty Sand w/ Gravel (SM)
RPS - 16	S3	9.0	95.0	11.6	4.9	74.8	20.3					Silty Sand (SM)
RPS - 19	S4	14.0	92.0	2.7	6.0	44.4	49.6					Sandy Silt (ML)
RPS - 22	S3	8.0	97.0	14.5	6.0	40.0	54.0					Sandy Silt (ML)
TD - 05	S2	3.0	33.9		3.1	64.7	32.2					Silty Sand (SM)
TS - 02	S3	9.0	9.0	32								Clay (CL)
	S4	14.0	4.0	37	0	1.1	98.9		26	22	4	Silt (ML)
TS - 03	S3	9.0	8.0	37.7								Clay (CL)
TS - 07	S3	8.0	8.0	36.5	0	6.1	93.9		32	21	11	Clay (CL)
	S4	13.0	3.0	32.8								Clay (CL)
TS - 11	S2	3.0	14.0	26.1				7.8				Silt (ML)
TS - 20	S3	8.0	6.0	41.4	0	5.6	94.4		33	24	9	Silt (ML)
TS - 23	S3	8.0	5.0	35.8								Clay (CL)
TS - 24	S3	8.0	6.0	32.4								Clay (CL)
WTS - 05	S4	14.0	-5.6	23.5				1.4				Silt (ML)
WTS - 09	S5	20.0	-12.1	65.1					77	43	34	Silt (ML)
WTS - 11	S6	20.0	-11.7	285.8				62.4				Organics (OL)
WTS - 12	S4	10.0	-1.4	45.4				3				Silt (ML)
	S5	15.0	-6.4	55.4					73	31	42	Clay (CL)

Notes:

1) Refer to the boring logs for the original sample descriptions based on visual-manual procedure (ASTM D-2488). For samples where no laboratory Atterberg Limit tests were performed, determinations of the type of fines was based on the visual-manual procedure.

GeoTesting express
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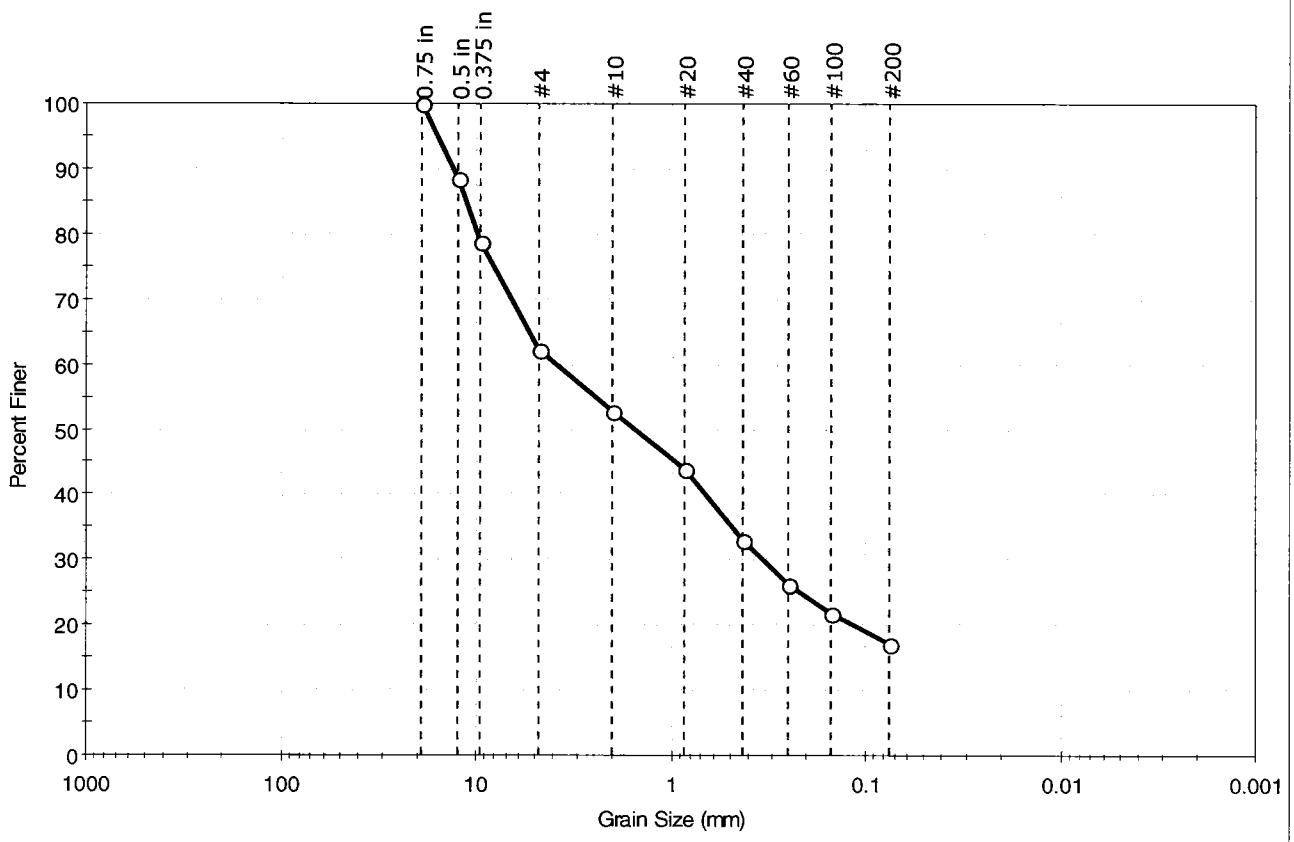
Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	RPS-4	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	07/14/10	Checked By:	jdt
Depth :	3-5 ft	Test Id:	185197		
Test Comment:	---				
Sample Description:	Moist, light olive gray silty sand with gravel				
Sample Comment:	sample jar received broken				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	37.7	45.2	17.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	89		
0.375 in	9.50	79		
#4	4.75	62		
#10	2.00	53		
#20	0.85	44		
#40	0.42	33		
#60	0.25	26		
#100	0.15	22		
#200	0.075	17		

Coefficients

D_{85} = 11.2986 mm	D_{30} = 0.3356 mm
D_{60} = 3.8752 mm	D_{15} = N/A
D_{50} = 1.5297 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

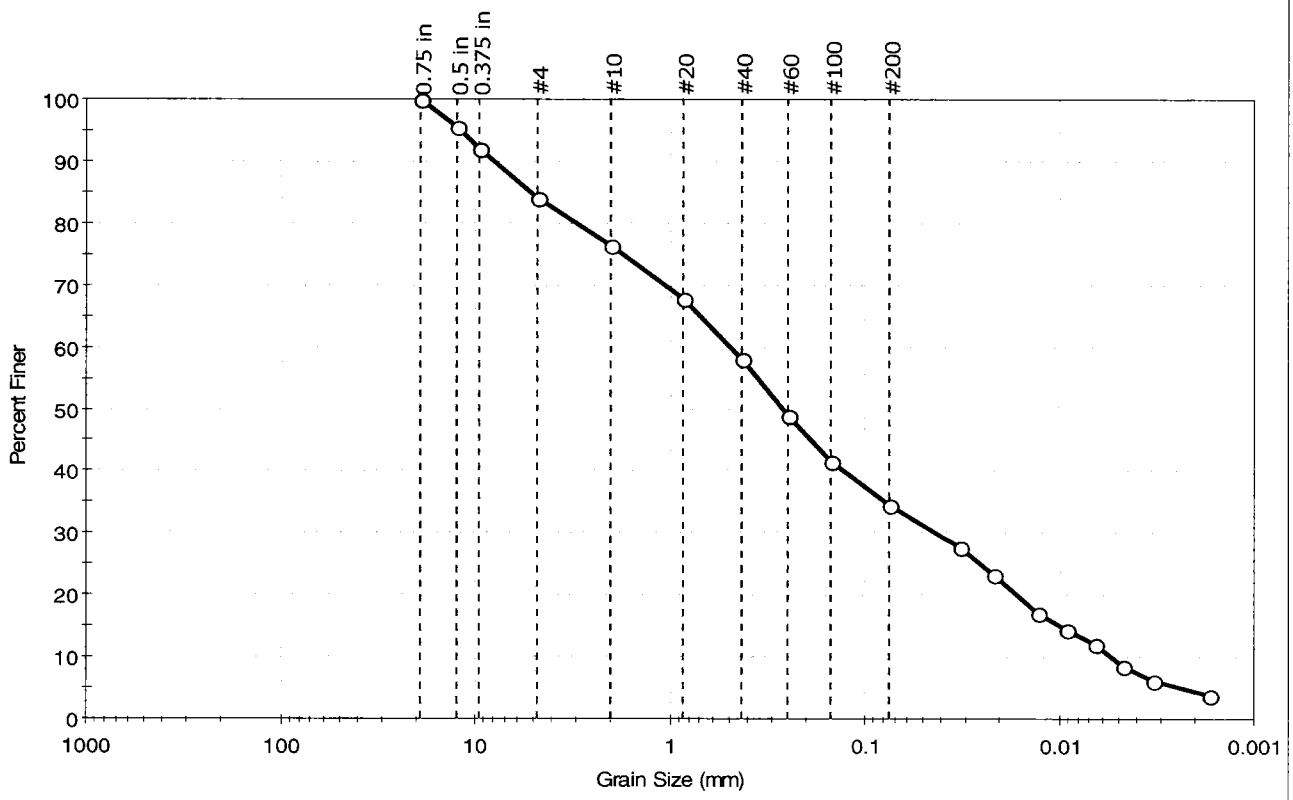
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	RPS-13	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-3	Test Date:	07/21/10	Checked By:	jdt
Depth :	14-16 ft	Test Id:	185186		
Test Comment:	---				
Sample Description:	Moist, olive gray silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	16.0	49.6	34.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	92		
#4	4.75	84		
#10	2.00	77		
#20	0.85	68		
#40	0.42	58		
#60	0.25	49		
#100	0.15	41		
#200	0.075	34		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0328	28		
---	0.0216	23		
---	0.0128	17		
---	0.0092	15		
---	0.0066	12		
---	0.0047	9		
---	0.0033	6		
---	0.0017	4		

Coefficients

D_{85} = 5.1894 mm	D_{30} = 0.0439 mm
D_{60} = 0.4899 mm	D_{15} = 0.0097 mm
D_{50} = 0.2641 mm	D_{10} = 0.0053 mm
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

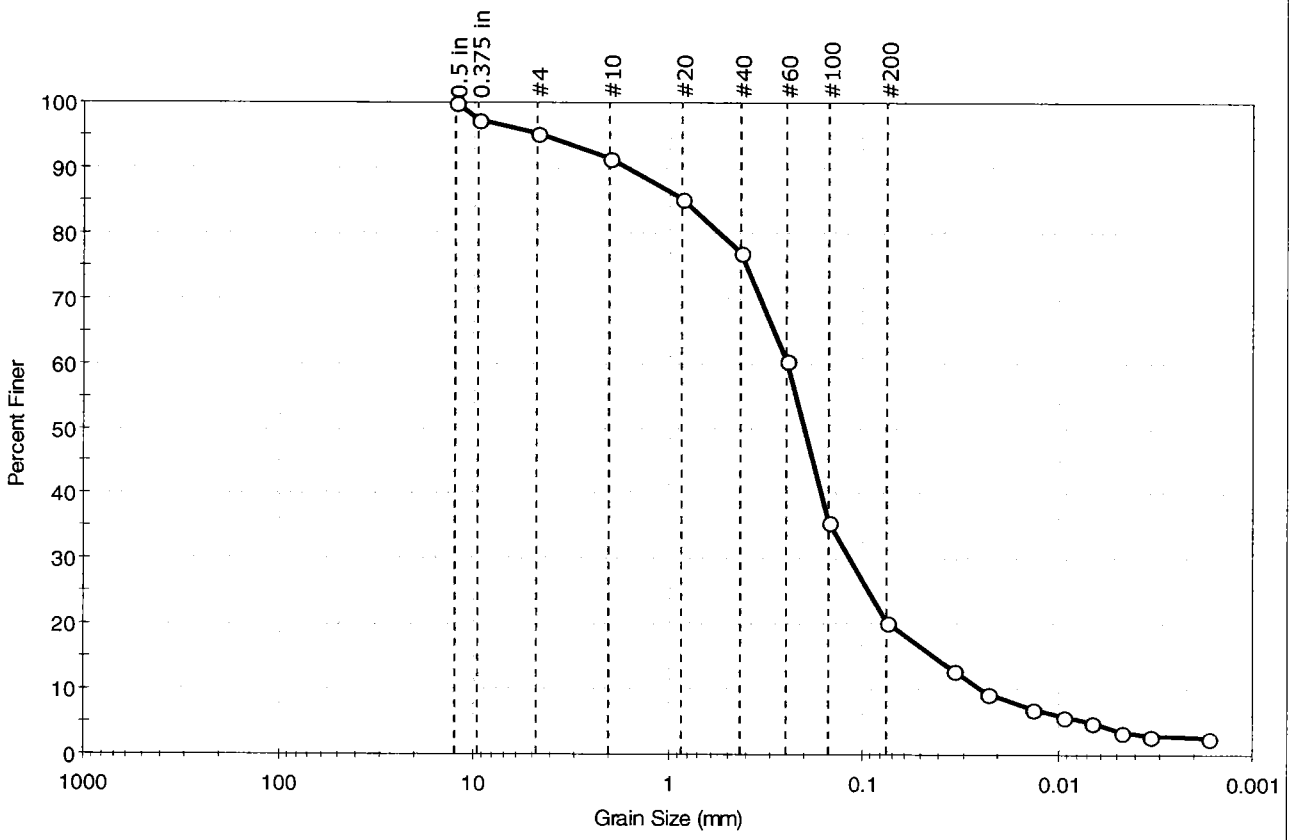
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	RPS-16	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-3	Test Date:	07/21/10	Checked By:	jdt
Depth :	9-11 ft	Test Id:	185185		
Test Comment:	---				
Sample Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	4.9	74.8	20.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	97		
#4	4.75	95		
#10	2.00	91		
#20	0.85	85		
#40	0.42	77		
#60	0.25	60		
#100	0.15	36		
#200	0.075	20		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0342	13		
---	0.0226	9		
---	0.0134	7		
---	0.0094	6		
---	0.0067	5		
---	0.0047	4		
---	0.0033	3		
---	0.0017	3		

Coefficients

D_{85} =0.8261 mm	D_{30} =0.1157 mm
D_{60} =0.2479 mm	D_{15} =0.0423 mm
D_{50} =0.2015 mm	D_{10} =0.0242 mm
C_u =N/A	C_c =N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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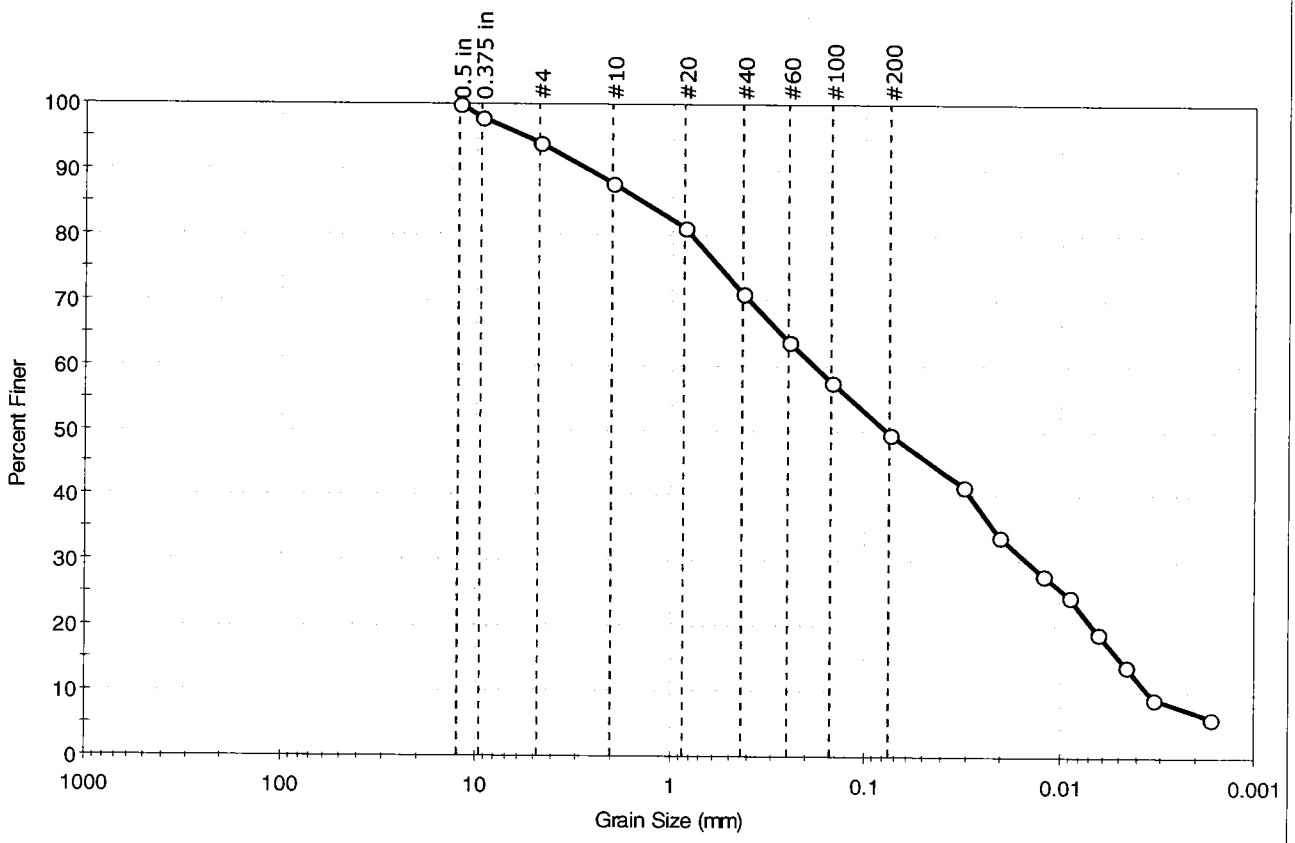
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	RPS-19	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	07/21/10	Checked By:	jdt
Depth :	14-16 ft	Test Id:	185187		
Test Comment:	---				
Sample Description:	Moist, olive sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	6.0	44.4	49.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	98		
#4	4.75	94		
#10	2.00	88		
#20	0.85	81		
#40	0.42	71		
#60	0.25	64		
#100	0.15	57		
#200	0.075	50		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0320	42		
---	0.0207	34		
---	0.0123	28		
---	0.0089	25		
---	0.0064	19		
---	0.0046	14		
---	0.0033	9		
---	0.0017	6		

Coefficients

D_{85} = 1.3895 mm D_{30} = 0.0145 mm
D_{60} = 0.1857 mm D_{15} = 0.0048 mm
D_{50} = 0.0777 mm D_{10} = 0.0035 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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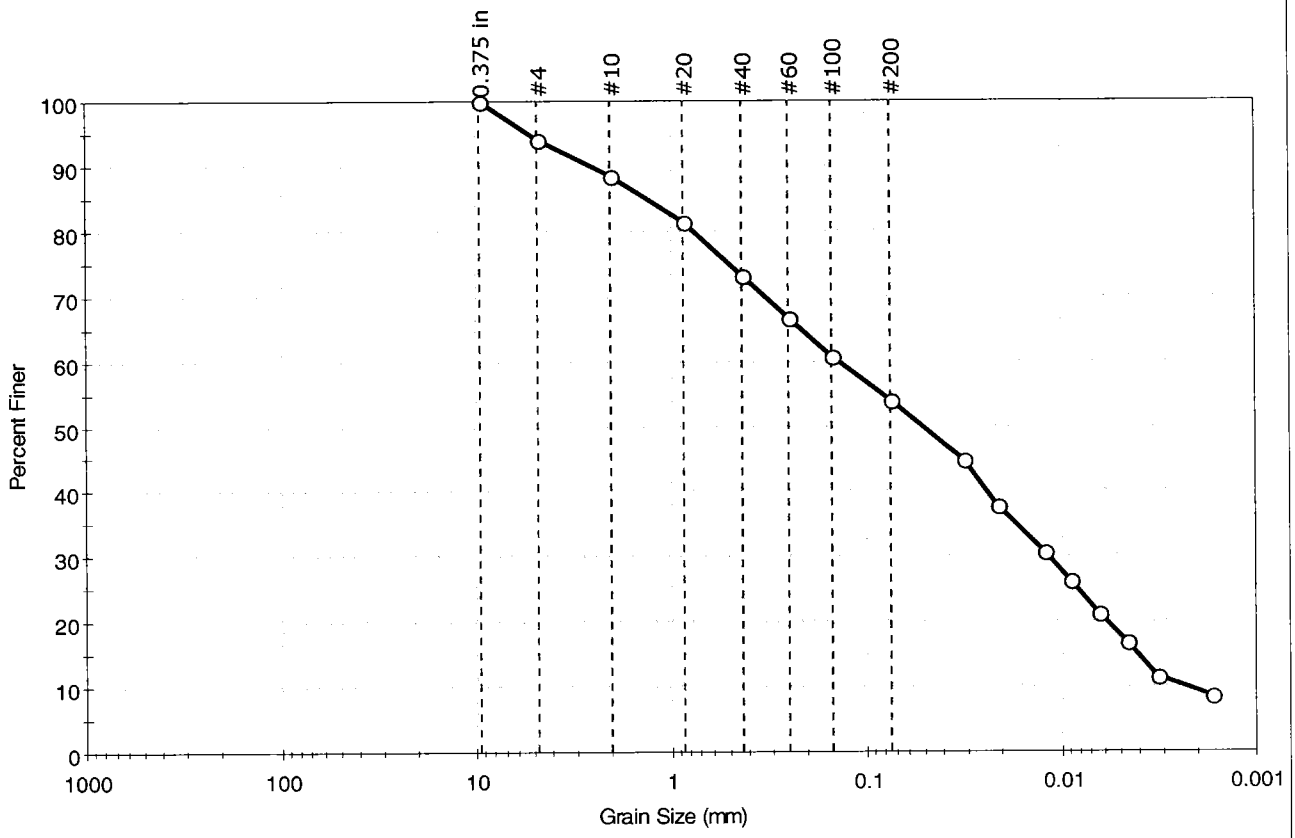
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.		
Project:	South Coast Rail		
Location:	MA	Project No:	GTX-9764
Boring ID:	RPS-22	Sample Type: jar	Tested By: jbr
Sample ID:	S-3	Test Date: 07/21/10	Checked By: jdt
Depth :	8-10 ft	Test Id: 185184	
Test Comment:	---		
Sample Description:	Moist, dark olive gray sandy silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	6.0	40.0	54.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	94		
#10	2.00	88		
#20	0.85	81		
#40	0.42	73		
#60	0.25	67		
#100	0.15	61		
#200	0.075	54		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0318	45		
---	0.0210	38		
---	0.0123	31		
---	0.0089	26		
---	0.0064	21		
---	0.0046	17		
---	0.0033	12		
---	0.0017	8		

Coefficients

D_{85} = 1.3120 mm D_{30} = 0.0116 mm
D_{60} = 0.1368 mm D_{15} = 0.0041 mm
D_{50} = 0.0512 mm D_{10} = 0.0024 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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Memorandum

APPENDIX C: GEOTECHNICAL CALCULATIONS

- Allowable Bearing Capacity and Estimated Settlement
- Seismic Site Class Evaluation

JACOBS

343 Congress Street
Boston, MA 02210
617/242-9222

CALCULATION WORKSHEET

JOB	MBTA South Coast Rail		
SUBJECT	Raynham Park Station		
CALCULATED BY	DH	**DATE**	2/20/2012
CHECKED BY	AH/PJM	**DATE**	2/29/2012

PURPOSE: Evaluate bearing resistance for platform shallow foundations.

REFERENCE: AASHTO LRFD Bridge Design Specifications, 2010

ASSUMPTIONS:

- Platform footing is 4 ft wide by 10 ft long.
- Bearing surface is compacted Gravel Borrow overlying sand or gravel.
- Footing embedment is at least 4 feet below final ground surface.
- Groundwater level is at 3 feet below surface.
- Footing eccentricity is assumed to be zero.
- Estimated soil properties (experience, geotech literature, Table 10.4.6.2.4-1):

	γ (pcf)	ϕ
Gravel Borrow:	125	34

BEARING CAPACITY FACTORS (Table 10.6.3.1.2a-1):

	ϕ	N_c	N_q	N_γ
Gravel Borrow:	34	42.2	29.4	41.1

CALCULATE EFFECTIVE FOOTING WIDTH (B'):

$e < B/4$ (Section 10.6.3.3)

where: B = footing width (ft) = 3
e = eccentricity (ft)

Assume no footing eccentricity, thus, e = 0

B' = B-2e 3

NOMINAL BEARING RESISTANCE (q_n):

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B' N_{\gamma m} C_{w\gamma}$ (Eqn. 10.6.3.1.2a-1)

where:
c = cohesion = 0
γ = total unit weight 125
D_f = depth of footing (ft) = 4 Assumed
B' = effective width of footing (ft) = 3
L = length of footing (ft) = 10
B'/L = 0.30
D_f /B' = 1.33
L/B' = 3.33
C_{wq} $C_{w\gamma}$ = groundwater correction factors (using B')
C_{wq} = 0.7 (Table 10.6.3.1.2a-2)
$C_{w\gamma}$ = 0.5 (Table 10.6.3.1.2a-2)

N_{cm} N_{qm} $N_{\gamma m}$ = bearing capacity factors

$N_{qm} = N_q s_q d_q i_q$ (Eqn. 10.6.3.1.2a-3)

s_q = 1.20 (Table 10.6.3.1.2a-3)

d_q = 1.23 (Table 10.6.3.1.2a-4)

i_q = 1.0 (see AASHTO p. 10-62)

N_{qm} = 43.5

$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$

s_γ = 0.88 (Table 10.6.3.1.2a-3)

i_γ = 1 (see AASHTO p. 10-62)

$N_{\gamma m}$ = 36.2

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343 Congress Street
Boston, MA 02210
617/242-9222

CALCULATION WORKSHEET

JOB	MBTA South Coast Rail		
SUBJECT	Raynham Park Station		
CALCULATED BY	DH	**DATE**	2/20/2012
CHECKED BY	AH/PJM	**DATE**	2/29/2012

q_n = 18,609 psf

ALLOWABLE BEARING RESISTANCE (q_a):

$q_a = q_n/FOS$

where: FOS = factor of safety = 2.5 for sand

q_a = 7,443 psf

use

q_a =	**7.44**	**ksf**

strength limit value

Note: Based on the anticipated light loads and potentially small footing sizes, an allowable bearing capacity of 6 ksf is recommended.

Elastic Settlement Calculations:

$$S_e = \frac{(q_o\,(1-\nu^2)\sqrt{A'})}{144 E_s \beta_z}$$ eqn. 10.6.2.4.2-1

where: q_o = applied vert. stress (ksf)
ν = Poisson's Ratio
E_s = Young's Modulus (ksi)
β_z = Shape/Rigidity Factor

ν = Poisson's Ratio =	0.30	(Table C10.4.6.3-1)
E_s = Young's Modulus (ksi) =	6.00	(Table C10.4.6.3-1)
β_z = Shape/Rigidity Factor =	1.15	(Table 10.6.2.4.2-1)

where:

B' = eff. width of footing (ft) =	3	(from bearing resistance calcs)
L = length of footing (ft):	10	(from bearing resistance calcs)
A' =(B'xL) = footing area (ft^2):	30	ft^2

Settlement (S_e) for a given q_o:

q_o = applied vertical stress (ksf) = 6.00 ksf (assumed)

Se (inches) = 0.36 inches

JACOBS

Raynham Park Station Seismic Site Class Evaluation

Based on the platform boring with the deepest soil overburden and lowest average blow counts (worst case)

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
RPS-1	S-1	20	3	0.15	
	S-2	25	7	0.28	**75**
	Bedrock	100	90	0.90	
	Total Depth =	100			
	Depth to Bedrock =	10	Sum	1.33	

Per 9.4.1.2.1, N_{bar} > 50, Site Class C

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction*.

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

Approx. Project Coordinates

Lat 41.981442
Long -71.075919

Seismic Coefficients

S_S = 0.24 (Table 1604.10*)
S_1 = 0.062 (Table 1604.10*)

For Site Class C

F_A = 1.2 (See Table 9.4.1.2.4a*)
F_V = 1.7 (See Table 9.4.1.2.4b*)

Design Spectral Response Parameters

S_{MS} = Ss x F_A = 0.288
S_{M1} = S_1 x F_V = 0.105

S_{DS} = 2/3 x S_{MS} = 0.192
S_{D1} = 2/3 x S_{M1} = 0.070

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods*					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods*
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Needham	55	100	0.27	0.067
New Ashford	65	90	0.22	0.068
New Bedford	45	110	0.23	0.058
New Braintree	55	100	0.23	0.067
New Marlborough	65	90	0.23	0.066
New Salem	65	100	0.24	0.068
Newbury	55	110	0.35	0.076
Newburyport	55	110	0.35	0.077
Newton	55	105	0.27	0.068
Norfolk	55	100	0.25	0.065
North Adams	65	90	0.22	0.069
North Andover	55	110	0.33	0.075
North Attleborough	55	110	0.24	0.063
North Brookfield	55	100	0.23	0.066
North Reading	55	105	0.32	0.073
Northampton	55	100	0.22	0.066
Northborough	55	100	0.25	0.067
Northbridge	55	100	0.24	0.065
Northfield	65	100	0.24	0.070
Norton	55	110	0.24	0.063
Norwell	45	110	0.26	0.064
Norwood	55	100	0.26	0.065
Oak Bluffs	35	120	0.18	0.051
Oakham	55	100	0.24	0.067
Orange	65	100	0.24	0.070
Orleans	35	120	0.18	0.051
Otis	65	90	0.23	0.066
Oxford	55	100	0.23	0.065
Palmer	55	100	0.23	0.066
Paxton	55	100	0.24	0.067
Peabody	45	110	0.31	0.072
Pelham	55	100	0.23	0.067
Pembroke	45	110	0.25	0.063
Pepperell	65	100	0.30	0.073
Peru	65	90	0.22	0.067
Petersham	65	100	0.24	0.068
Phillipston	65	100	0.24	0.069
Pittsfield	65	90	0.22	0.067
Plainfield	65	100	0.22	0.068
Plainville	55	100	0.24	0.063
Plymouth	45	110	0.24	0.060
Pympton	45	110	0.24	0.061
Princeton	65	100	0.25	0.069
Provincetown	35	120	0.22	0.058
Quincy	45	105	0.27	0.067
Randolph	45	105	0.26	0.065
Raynham	55	110	0.24	0.062
Reading	55	105	0.31	0.072
Rehoboth	55	110	0.24	0.062
Revere	45	105	0.30	0.070
Richmond	65	90	0.22	0.067

Stormwater Report

Taunton Station

City of Taunton, Massachusetts

Prepared for

massDOT

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

Table of Contents

Checklist for Stormwater Report **1**
Stormwater Report Narrative **3**
Project Description **3**
Site Description **3**
Existing Drainage Conditions **4**
Proposed Drainage Conditions **5**
Regulatory Compliance **11**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas

List of Tables

Table 1: Wetland Resource Areas
Table 2: Existing Conditions Hydrologic Data
Table 3: Proposed Conditions Hydrologic Data
Table 4: Peak Discharge Rates (cfs)
Table 5 Summary of Recharge Calculations

Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

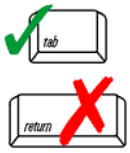
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☐ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☒ Reduced Impervious Area (Redevelopment Only)

☐ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☒ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☒ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

The Applicant, MassDOT, is proposing to construct a train station in Taunton, Massachusetts near the intersection of Arlington Street and the Belmont Street Extension (the Project). As proposed, the Project consists of a parking lot with 210 spaces, access driveway, a bus drop off area, a side platform, sidewalks, stairs and ramps associated with access from the parking lot to the train platform, bicycle parking facilities, a bioretention basin, and ancillary landscape improvements including the removal of the existing concrete building pads and existing broken pavement.

The site is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Site Description

The Project Site is a 12 acre parcel of land (the Site) located at the intersection of Arlington and the Belmont Street Extension in Taunton, Massachusetts. The Site lies within the surface watershed of Taunton River and is bounded by undeveloped land to the north, by Arlington Street to the south, a large wetland to the west, and the MBTA railroad ROW to the east (see Figure 1, Site Locus Map and Figure 2, Site Aerial). The site is previously developed, however the existing buildings have burned down, leaving only building foundations and paved driveways. Stormwater runoff currently sheet flows untreated, to the existing wetland.

One wetland Resource Area on the Site, shown on Figures 3 and 4, is described in Table 1. For additional information regarding the wetland resource area T41 present on the site see the Abbreviated Notice of Resource Area Delineation (ANRAD) prepared by VHB dated May 2011.

Table 1
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*Description*
Wetland T41	No	No	No	No	PFO

Notes: Wetland Classifications: PFO = Palustrine Forested

According to the National Resources Conservation Service (NRCS), surface soils on the Site are classified as Urban land. On-site soils are classified as fill. Based on the soil evaluation performed by Jacobs Engineering, included in Appendix C, the Site is not considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour). Soil vary at the upper fill levels and are poor (silty/clay), HSG D soils at levels just below the surface.

The project is located within an area of 0.2% chance of flood as shown on the FEMA Floodway Map, Town of Taunton, Massachusetts Bristol County, Community Panel Number 25005C0162F and 25005CO164F dated July 7, 2009. These maps are included in Appendix B.

Existing Drainage Conditions

Under existing conditions, the 12 acre Site is developed with predominantly impervious surfaces with small areas of intermixed pervious ground, and generally has a flat topography with 8.7 acres developed area, and the remainder generally the wetland area to the west. This drainage area is described below.

Drainage Area 1 - This 8.7-acre developed area of the site consist of concrete building foundations, paved driveways and parking areas, and small and large patches of pervious surfaces. This entire area sheet flows, untreated, to wetland T41 west of the site.

Figure 3 illustrates the existing drainage patterns on the Site. The Site was evaluated as a single drainage area because stormwater runoff flows to one Design Point. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland T41	1	8.7	93	16.1

Proposed Drainage Conditions

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site would be divided into three sub-drainage areas that will discharge treated stormwater to the one existing Design Point. Existing grading and drainage patterns were maintained to the maximum extent possible in the proposed conditions. The existing building foundations and broken paved areas would be removed in the proposed conditions, and replaced with landscaping, or paved parking areas as shown on Figure 4. All runoff from impervious surfaces would sheet flow to a grassed swale and then be conveyed to a bioretention area for further treatment. Low impact development stormwater management techniques have been incorporated into the design. These practices are focused on decentralizing stormwater management techniques into the design that will reduce peak runoff rates, maximize groundwater recharge and treat for water quality. The following is a summary of each drainage area.

Drainage Area 1 – This 3.0-acre area consists of almost entirely pervious area that would sheet flow to Wetland T41. The existing building foundations and paved areas would be completely removed in the proposed conditions.

Drainage Area 2 – This 4.1-acre area consists of both paved parking and drive aisle areas and landscaped islands. This area would sheet flow from the impervious surfaces into a grassed channel or a sediment forebay and then be conveyed to a bioretention area for treatment before it overflows to Wetland T41.

Drainage Area 3 – This 1.8-acre area consist of almost entirely pervious surfaces that would sheet flow onto Arlington Street, as it does under existing conditions, before it is captured by a catch basin located in the street and connected to an existing culvert.

Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland T41	1	3.03	84	12.8
2	Wetland T41	1	4.05	93	13.3
3	Wetland T41	1	1.83	85	5.6

The site has been designed with a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. The proposed stormwater management system has been designed to treat the 0.5 inch Water Quality Volume.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Reduction in impervious area of 2.9 acres
- Grassed swale
- Bioretention basin
- Light colored pavement sidewalks

In general, stormwater from the proposed impervious surfaces will sheet flow into a grassed swale and conveyed to a large bioretention area for treatment and discharge to Wetland T41. Under existing conditions stormwater sheet flows from impervious surfaces, untreated, to the wetland.

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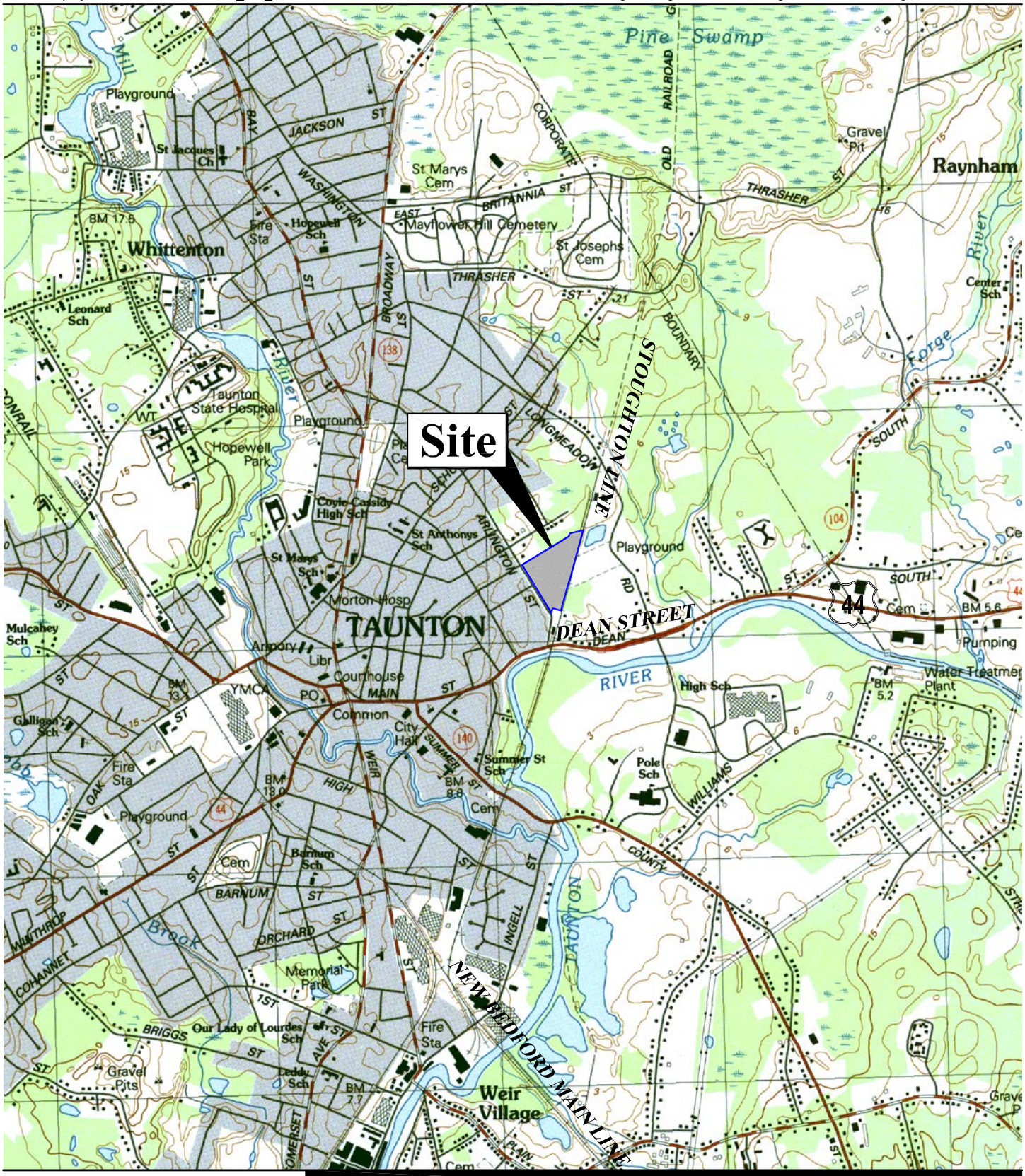

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USGS Locus Map

Proposed Taunton Station
South Coast Rail
Taunton, Massachusets

Figure 1
May 2012

0 1000 2000 Feet

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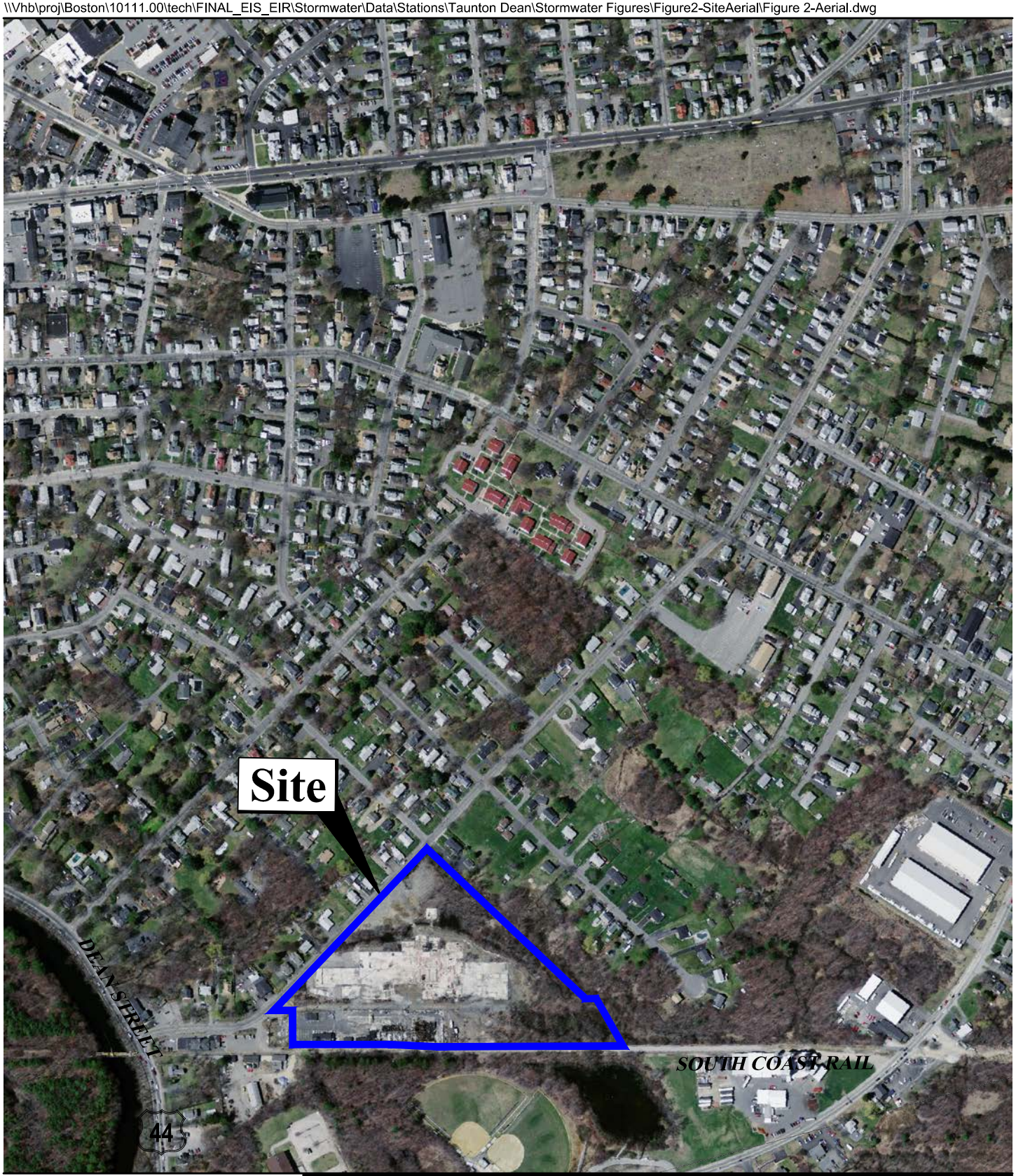

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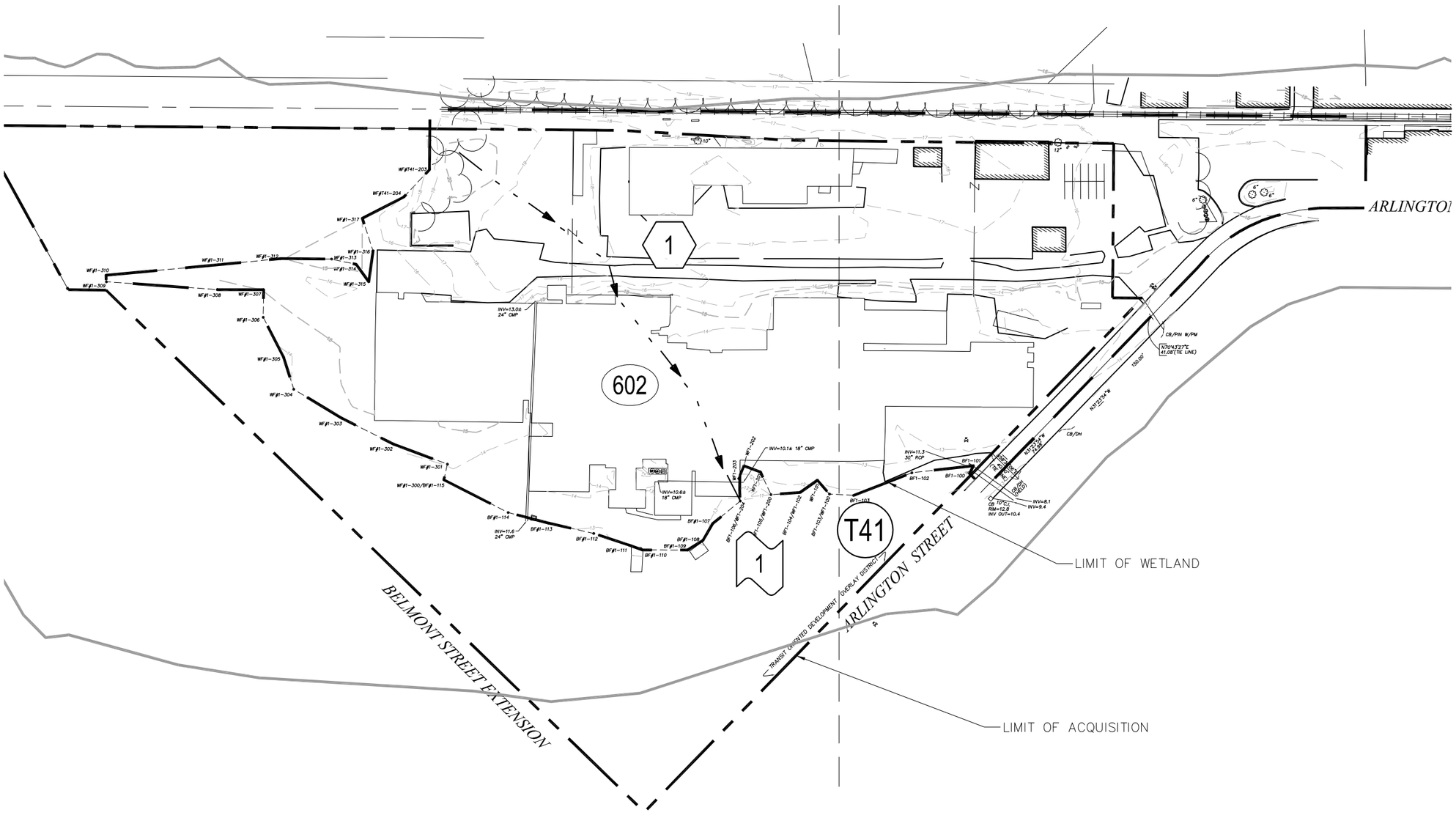
Site Aerial Map

Taunton Station
South Coast Rail
Taunton, Massachusets

Figure 2
May 2012



0 60 120 Feet

LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

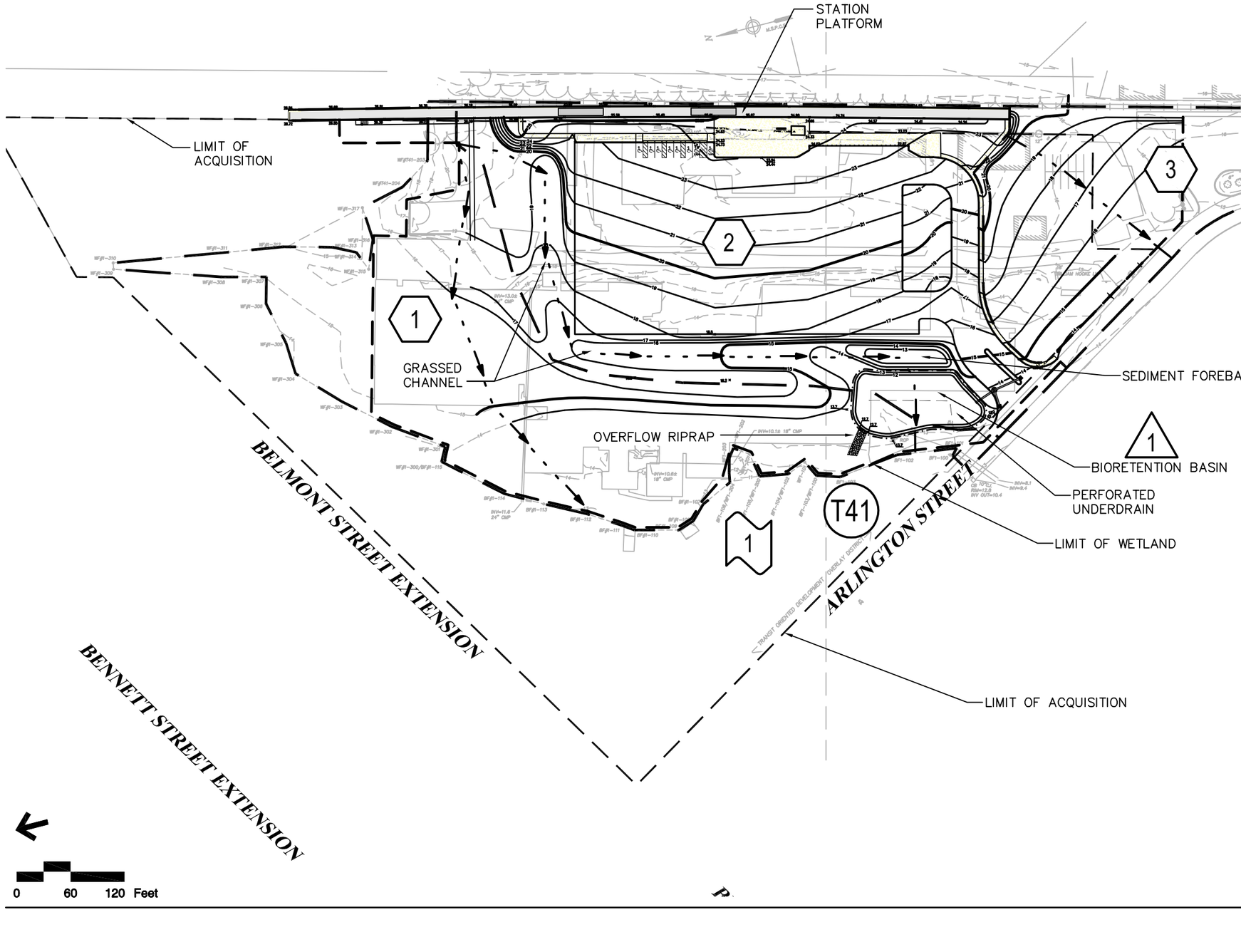
- 602 — URBAN LAND

Vanasse Hangen Brustlin, Inc.

Figure 3 May 2012

Existing Conditions Drainage Areas

South Coast Rail
Taunton, Massachusetts



LEGEND

1 SUBCATCHMENT DRAINAGE AREA DESIGNATION

1 POND/BIORETENTION AREA

1 DESIGN POINT

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

Vanasse Hangen Brustlin, Inc.

Figure 4 May 2012

Proposed Conditions Drainage Areas

South Coast Rail
Taunton, Massachusetts

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMPs that impound stormwater have been designed with stone rip rap to protect down-gradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point: Wetland T41			
Existing	19.1	28.4	42.8
Proposed	13.9	23.0	37.1

Standard 3: Stormwater Recharge

Due to the fact that the development portion of the site is comprised of fill, underlain by poorly draining soils, the project has been designed to promote infiltration of the required recharge volume only to the maximum extent practicable. The addition of pervious area in the proposed conditions will reduce runoff from the site as a whole. Currently the site runs off to the adjacent wetland and groundwater recharge is insignificant under existing conditions. If assuming there could be some infiltration, in the HSG D lower soils, according to the Stormwater Handbook, the Required Recharge Volume for the Project would be 970 cubic feet, a relatively small amount. . Approximately 1,263 cubic feet of recharge is provided in the bioretention area.

This volume of storage has been provided through the use of a bioretention basin, which has been sized using the static method. It is hoped that the bioretention basin will promote some recharge and infiltrate, however it has been designed to drain completely within 72 hours by the incorporation of perforated underdrain. This is necessary due to the inconsistent and poor draining qualities of the subsurface soil conditions. A Geotechnical Report that describes subsurface soil conditions is included as an appendix to this report.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide a minimum of 80% TSS removal for stormwater runoff from all proposed impervious surfaces.

Computations and supporting information are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is not considered a LUHPPL as defined in 310 CMR 10.04 and 314 CMR 9.02 because it is not parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is a redevelopment, but has still been designed to fully comply with all ten of the Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 8.9 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for the CGP would be submitted at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIR/S. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

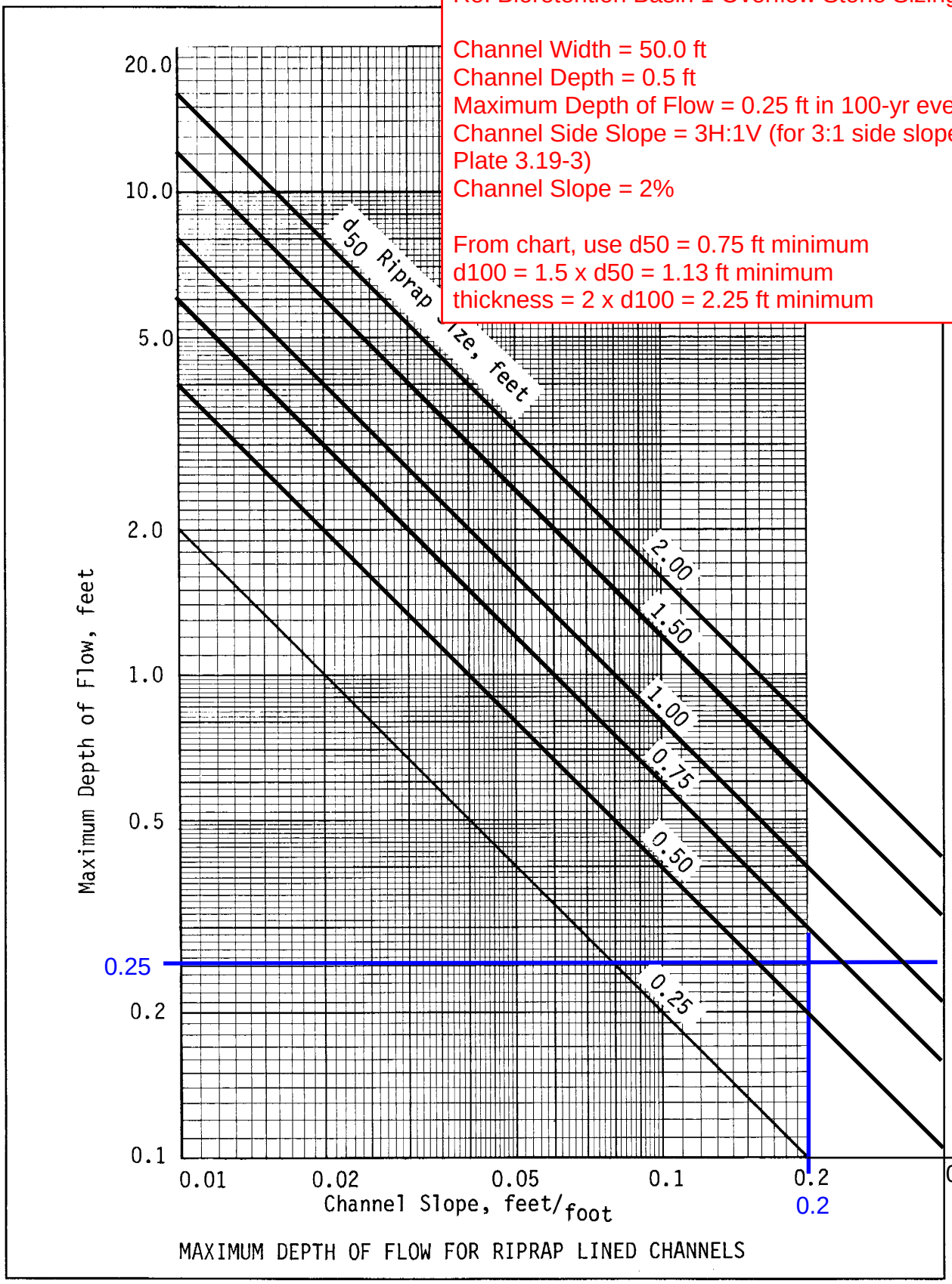
Storm drainage structures remaining from the previous development which are part of the redevelopment area will be removed. The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage system in portions of the site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

Appendix A
Standard 1 Computations and Supporting Information

Project No: 10111 Project Name: SCR
Date: April 2012 Location: Taunton, MA
Calculated By: DAG
Re: Bioretention Basin 1 Overflow Stone Sizing

Channel Width = 50.0 ft
Channel Depth = 0.5 ft
Maximum Depth of Flow = 0.25 ft in 100-yr event
Channel Side Slope = 3H:1V (for 3:1 side slope, use Plate 3.19-3)
Channel Slope = 2%

From chart, use d50 = 0.75 ft minimum
d100 = 1.5 x d50 = 1.13 ft minimum
thickness = 2 x d100 = 2.25 ft minimum



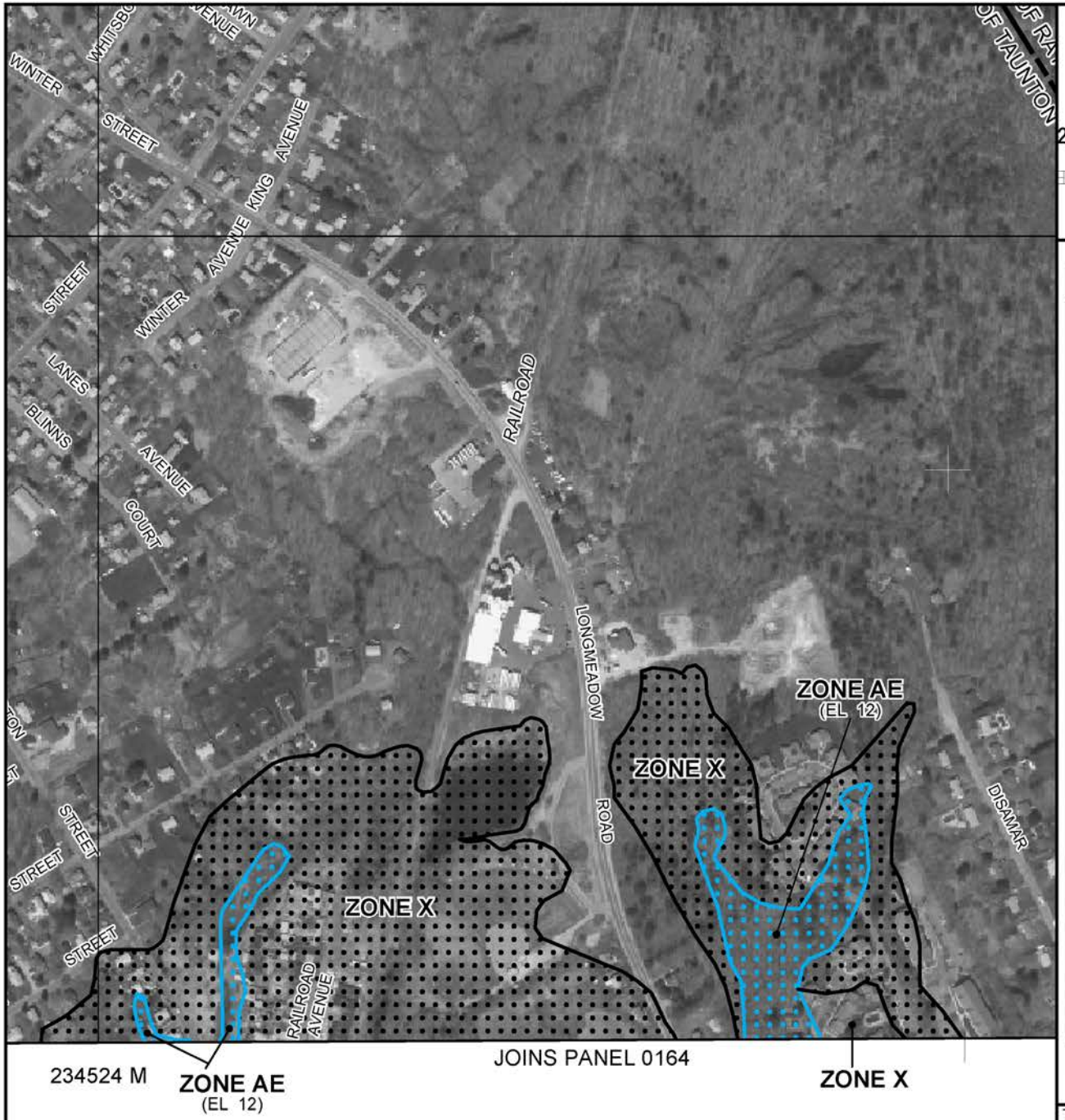
Source: VDOT Drainage Manual Plate 3.19-3

*Sizing calculations represent minimum stone size. Larger stone may be required per detail plans.

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Map



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0162F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 162 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RAYNHAM, TOWN OF	250061	0162	F
TAUNTON, CITY OF	250066	0162	F

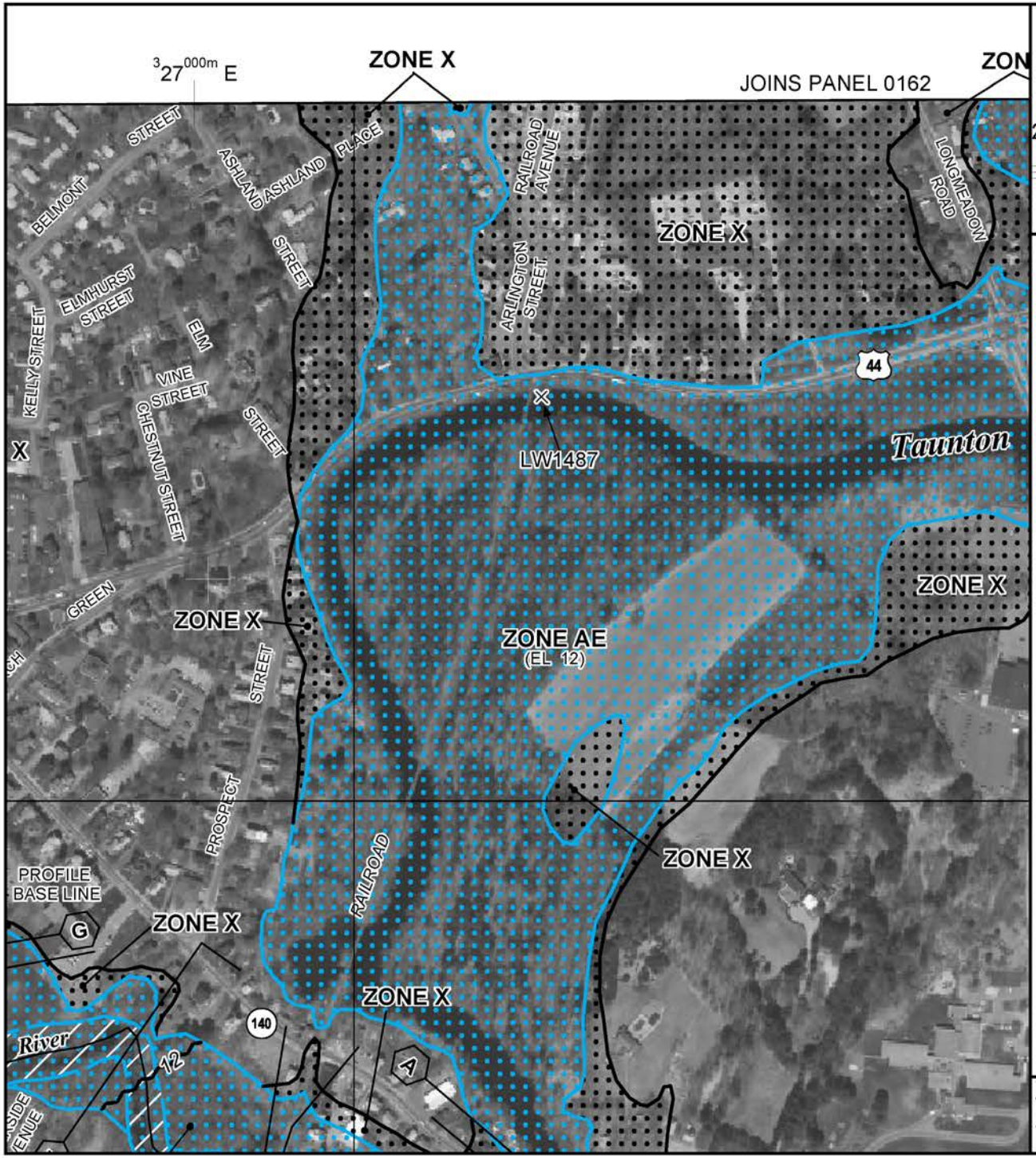
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

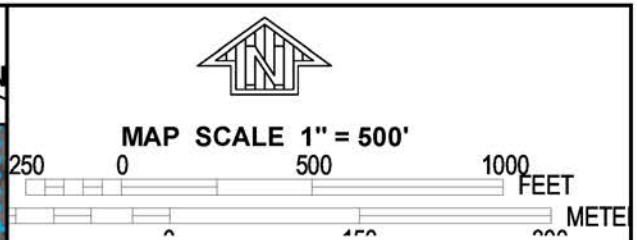
MAP NUMBER
25005C0162F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





PANEL 0164F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 164 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RAYNHAM, TOWN OF	250061	0164	F
TAUNTON, CITY OF	250066	0164	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0164F

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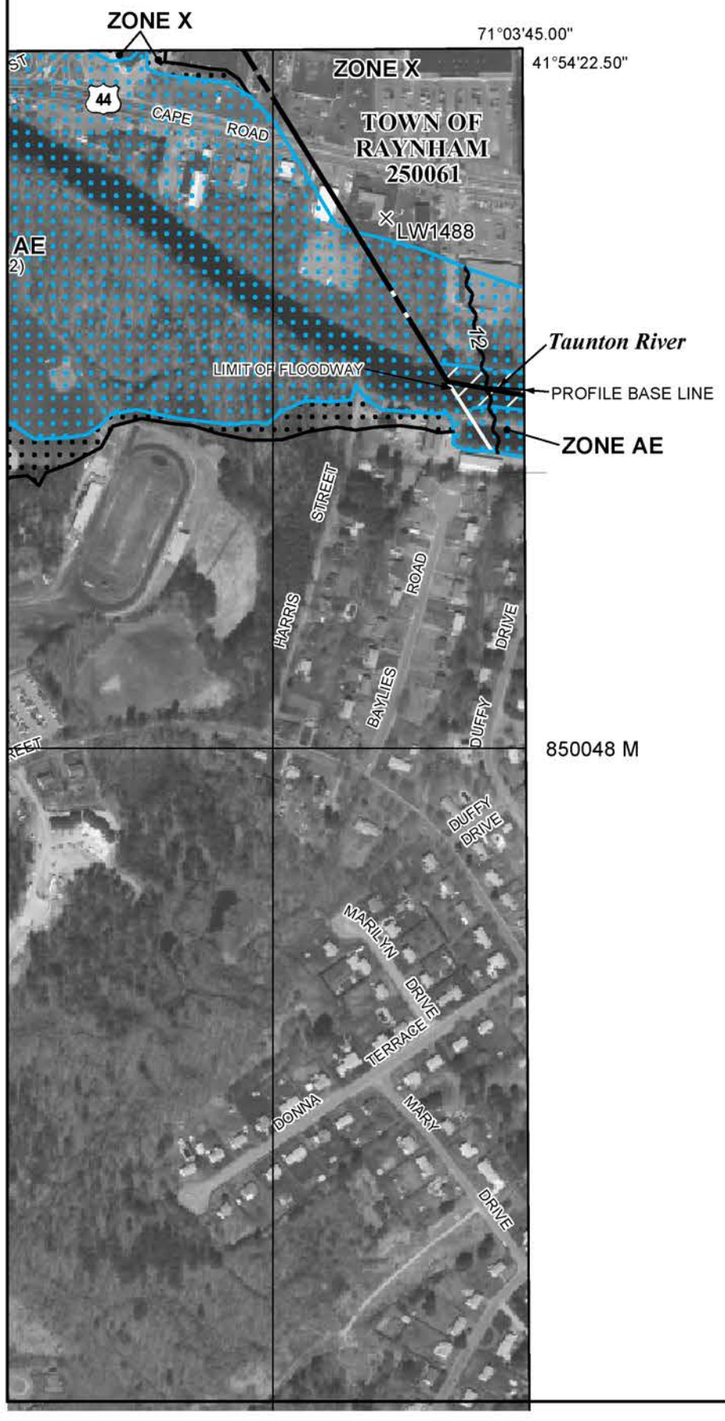

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0164F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 164 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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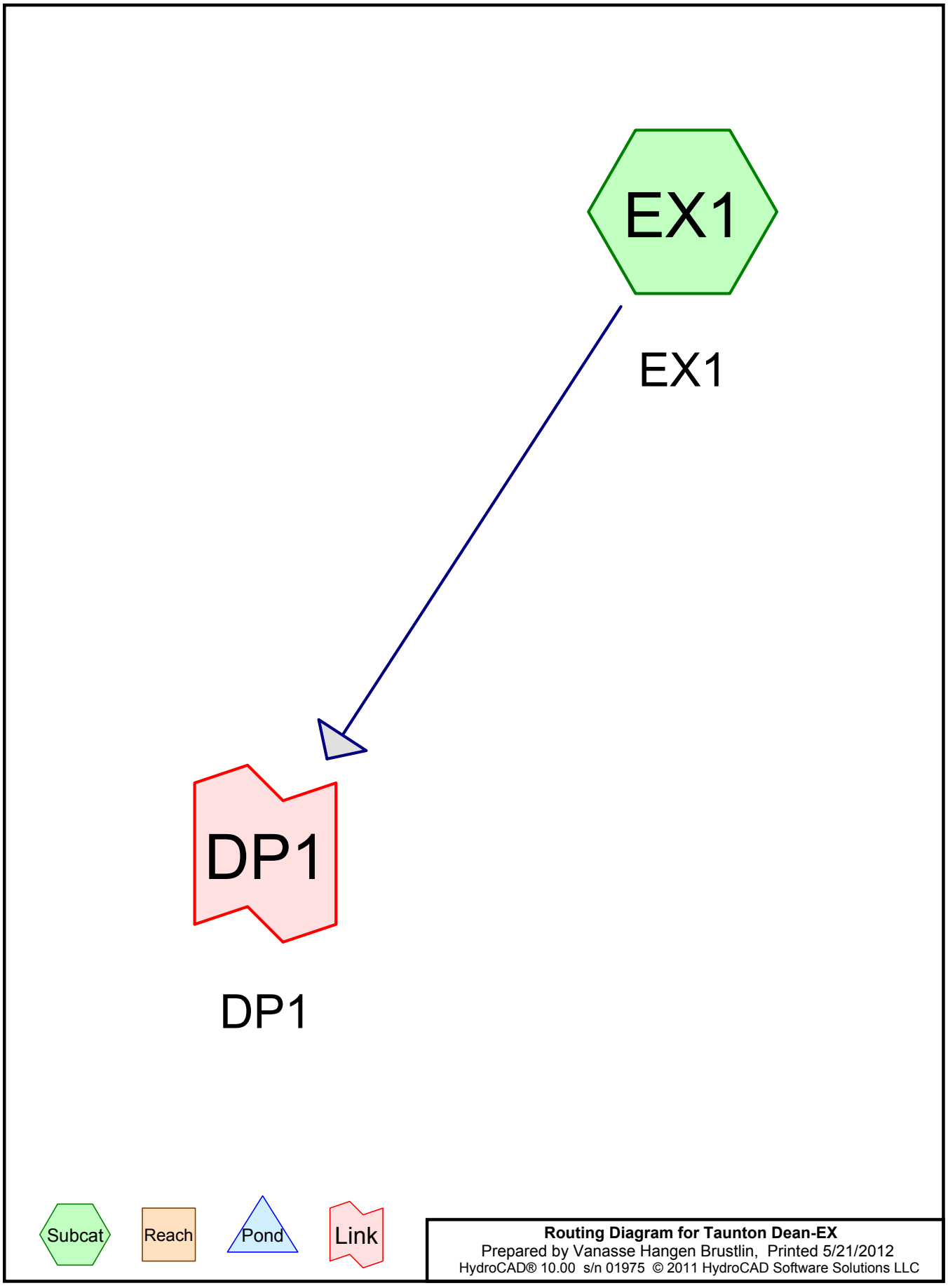
HydroCAD Analysis: Existing Conditions



Routing Diagram for Taunton Dean-EX
Prepared by Vanasse Hangen Brustlin, Printed 5/21/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.249	84	50-75% Grass cover, Fair, HSG D (EX1)
5.324	98	Paved parking, HSG D (EX1)
0.112	98	Roofs, HSG D (EX1)
8.685	**93**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=8.685 ac 62.59% Impervious Runoff Depth>2.63"
Flow Length=597' Tc=16.1 min CN=93 Runoff=19.13 cfs 1.905 af

Link DP1: DP1 Inflow=19.13 cfs 1.905 af
Primary=19.13 cfs 1.905 af

Total Runoff Area = 8.685 ac Runoff Volume = 1.905 af Average Runoff Depth = 2.63"
37.41% Pervious = 3.249 ac 62.59% Impervious = 5.436 ac

Summary for Subcatchment EX1: EX1

Runoff = 19.13 cfs @ 12.21 hrs, Volume= 1.905 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
3.249	84	50-75% Grass cover, Fair, HSG D
5.324	98	Paved parking, HSG D
0.112	98	Roofs, HSG D
8.685	93	Weighted Average
3.249		37.41% Pervious Area
5.436		62.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
3.0	147	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0974	6.34		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	142	0.0056	1.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	130	0.0008	0.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	90	0.0089	1.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.1	597	Total			

Summary for Link DP1: DP1

Inflow Area = 8.685 ac, 62.59% Impervious, Inflow Depth > 2.63" for 2-Year event
Inflow = 19.13 cfs @ 12.21 hrs, Volume= 1.905 af
Primary = 19.13 cfs @ 12.21 hrs, Volume= 1.905 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=8.685 ac 62.59% Impervious Runoff Depth>3.99"
Flow Length=597' Tc=16.1 min CN=93 Runoff=28.40 cfs 2.890 af

Link DP1: DP1 Inflow=28.40 cfs 2.890 af
Primary=28.40 cfs 2.890 af

Total Runoff Area = 8.685 ac Runoff Volume = 2.890 af Average Runoff Depth = 3.99"
37.41% Pervious = 3.249 ac 62.59% Impervious = 5.436 ac

Summary for Subcatchment EX1: EX1

Runoff = 28.40 cfs @ 12.21 hrs, Volume= 2.890 af, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
3.249	84	50-75% Grass cover, Fair, HSG D
5.324	98	Paved parking, HSG D
0.112	98	Roofs, HSG D
8.685	93	Weighted Average
3.249		37.41% Pervious Area
5.436		62.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
3.0	147	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0974	6.34		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	142	0.0056	1.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	130	0.0008	0.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	90	0.0089	1.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.1	597	Total			

Summary for Link DP1: DP1

Inflow Area = 8.685 ac, 62.59% Impervious, Inflow Depth > 3.99" for 10-Year event
Inflow = 28.40 cfs @ 12.21 hrs, Volume= 2.890 af
Primary = 28.40 cfs @ 12.21 hrs, Volume= 2.890 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=8.685 ac 62.59% Impervious Runoff Depth>6.16"
Flow Length=597' Tc=16.1 min CN=93 Runoff=42.79 cfs 4.457 af

Link DP1: DP1 Inflow=42.79 cfs 4.457 af
Primary=42.79 cfs 4.457 af

Total Runoff Area = 8.685 ac Runoff Volume = 4.457 af Average Runoff Depth = 6.16"
37.41% Pervious = 3.249 ac 62.59% Impervious = 5.436 ac

Summary for Subcatchment EX1: EX1

Runoff = 42.79 cfs @ 12.21 hrs, Volume= 4.457 af, Depth> 6.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
3.249	84	50-75% Grass cover, Fair, HSG D
5.324	98	Paved parking, HSG D
0.112	98	Roofs, HSG D
8.685	93	Weighted Average
3.249		37.41% Pervious Area
5.436		62.59% Impervious Area

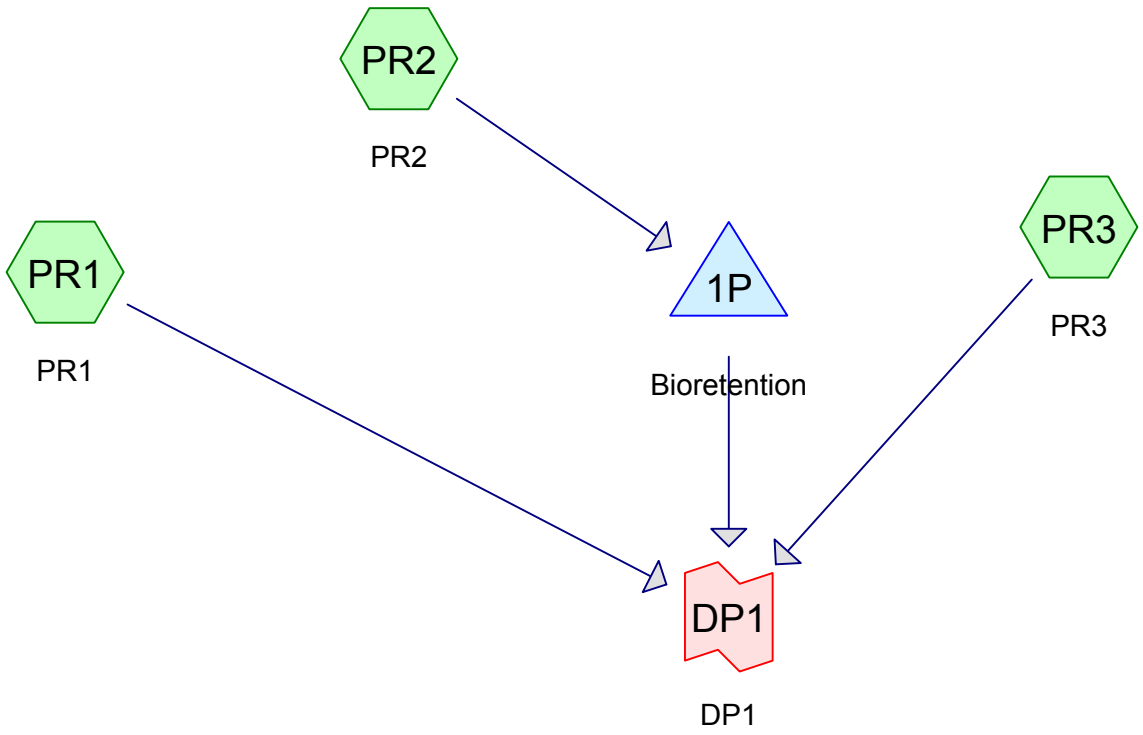
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
3.0	147	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0974	6.34		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	142	0.0056	1.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.8	130	0.0008	0.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	90	0.0089	1.92		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.1	597	Total			

Summary for Link DP1: DP1

Inflow Area = 8.685 ac, 62.59% Impervious, Inflow Depth > 6.16" for 100-Year event
Inflow = 42.79 cfs @ 12.21 hrs, Volume= 4.457 af
Primary = 42.79 cfs @ 12.21 hrs, Volume= 4.457 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for Taunton Dean-PR
Prepared by {enter your company name here}, Printed 5/21/2012
HydroCAD® 10.00 s/n 01234 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.121	80	>75% Grass cover, Good, HSG D (PR1, PR2, PR3)
2.579	98	Paved parking, HSG D (PR1, PR2)
0.092	98	Paved roads w/curbs & sewers, HSG D (PR3)
0.119	98	Water Surface, HSG D (PR2)
8.911	**86**	**TOTAL AREA**

2-Year Storm Event - Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.025 ac 1.72% Impervious Runoff Depth>1.55"
Flow Length=461' Tc=12.8 min CN=80 Runoff=4.35 cfs 0.392 af

Subcatchment PR2: PR2 Runoff Area=4.053 ac 65.28% Impervious Runoff Depth>2.54"
Flow Length=670' Tc=13.3 min CN=92 Runoff=9.25 cfs 0.857 af

Subcatchment PR3: PR3 Runoff Area=1.833 ac 5.02% Impervious Runoff Depth>1.63"
Flow Length=208' Tc=5.6 min CN=81 Runoff=3.45 cfs 0.248 af

Pond 1P: Bioretention Peak Elev=13.16' Storage=9,345 cf Inflow=9.25 cfs 0.857 af
Discarded=0.02 cfs 0.025 af Primary=8.03 cfs 0.701 af Outflow=8.04 cfs 0.726 af

Link DP1: DP1 Inflow=13.87 cfs 1.341 af
Primary=13.87 cfs 1.341 af

Total Runoff Area = 8.911 ac Runoff Volume = 1.497 af Average Runoff Depth = 2.02"
68.69% Pervious = 6.121 ac 31.31% Impervious = 2.790 ac

Summary for Subcatchment PR1: PR1

Runoff = 4.35 cfs @ 12.18 hrs, Volume= 0.392 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.052	98	Paved parking, HSG D
2.973	80	>75% Grass cover, Good, HSG D
3.025	80	Weighted Average
2.973		98.28% Pervious Area
0.052		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0140	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.6	119	0.0327	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	134	0.0075	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	158	0.1266	2.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.8	461	Total			

Summary for Subcatchment PR2: PR2

Runoff = 9.25 cfs @ 12.18 hrs, Volume= 0.857 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
2.527	98	Paved parking, HSG D
1.407	80	>75% Grass cover, Good, HSG D
0.119	98	Water Surface, HSG D
4.053	92	Weighted Average
1.407		34.72% Pervious Area
2.646		65.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0160	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.9	55	0.0236	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	80	0.0063	1.19		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	91	0.0109	1.57		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	31	0.0129	1.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	64	0.0094	1.45		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	299	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.3	670	Total			

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.45 cfs @ 12.09 hrs, Volume= 0.248 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.092	98	Paved roads w/curbs & sewers, HSG D
1.741	80	>75% Grass cover, Good, HSG D
1.833	81	Weighted Average
1.741		94.98% Pervious Area
0.092		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
2.4	158	0.0253	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	208	Total			

Summary for Pond 1P: Bioretention

Inflow Area = 4.053 ac, 65.28% Impervious, Inflow Depth > 2.54" for 2-Year event
Inflow = 9.25 cfs @ 12.18 hrs, Volume= 0.857 af
Outflow = 8.04 cfs @ 12.26 hrs, Volume= 0.726 af, Atten= 13%, Lag= 5.0 min
Discarded = 0.02 cfs @ 12.26 hrs, Volume= 0.025 af
Primary = 8.03 cfs @ 12.26 hrs, Volume= 0.701 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 13.16' @ 12.26 hrs Surf.Area= 8,698 sf Storage= 9,345 cf

Plug-Flow detention time= 106.8 min calculated for 0.726 af (85% of inflow)
Center-of-Mass det. time= 43.3 min (844.4 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1	12.00'	14,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
12.00	7,420	356.0	0	0	7,420
12.70	8,181	369.0	5,458	5,458	8,212
13.00	8,517	375.0	2,505	7,963	8,584
13.70	9,318	388.0	6,240	14,203	9,417

Device	Routing	Invert	Outlet Devices
#1	Primary	12.70'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	12.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.26 hrs HW=13.16' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=7.95 cfs @ 12.26 hrs HW=13.16' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.95 cfs @ 1.74 fps)

Summary for Link DP1: DP1

Inflow Area = 8.911 ac, 31.31% Impervious, Inflow Depth > 1.81" for 2-Year event
Inflow = 13.87 cfs @ 12.22 hrs, Volume= 1.341 af
Primary = 13.87 cfs @ 12.22 hrs, Volume= 1.341 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event- Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.025 ac 1.72% Impervious Runoff Depth>2.71"
Flow Length=461' Tc=12.8 min CN=80 Runoff=7.66 cfs 0.684 af

Subcatchment PR2: PR2 Runoff Area=4.053 ac 65.28% Impervious Runoff Depth>3.89"
Flow Length=670' Tc=13.3 min CN=92 Runoff=13.88 cfs 1.313 af

Subcatchment PR3: PR3 Runoff Area=1.833 ac 5.02% Impervious Runoff Depth>2.81"
Flow Length=208' Tc=5.6 min CN=81 Runoff=5.96 cfs 0.429 af

Pond 1P: Bioretention Peak Elev=13.30' Storage=10,554 cf Inflow=13.88 cfs 1.313 af
Discarded=0.02 cfs 0.027 af Primary=12.48 cfs 1.154 af Outflow=12.49 cfs 1.181 af

Link DP1: DP1 Inflow=22.99 cfs 2.267 af
Primary=22.99 cfs 2.267 af

Total Runoff Area = 8.911 ac Runoff Volume = 2.425 af Average Runoff Depth = 3.27"
68.69% Pervious = 6.121 ac 31.31% Impervious = 2.790 ac

Summary for Subcatchment PR1: PR1

Runoff = 7.66 cfs @ 12.18 hrs, Volume= 0.684 af, Depth> 2.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.052	98	Paved parking, HSG D
2.973	80	>75% Grass cover, Good, HSG D
3.025	80	Weighted Average
2.973		98.28% Pervious Area
0.052		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0140	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.6	119	0.0327	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	134	0.0075	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	158	0.1266	2.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.8	461	Total			

Summary for Subcatchment PR2: PR2

Runoff = 13.88 cfs @ 12.18 hrs, Volume= 1.313 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
2.527	98	Paved parking, HSG D
1.407	80	>75% Grass cover, Good, HSG D
0.119	98	Water Surface, HSG D
4.053	92	Weighted Average
1.407		34.72% Pervious Area
2.646		65.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0160	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.9	55	0.0236	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	80	0.0063	1.19		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	91	0.0109	1.57		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	31	0.0129	1.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	64	0.0094	1.45		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	299	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.3	670	Total			

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.96 cfs @ 12.09 hrs, Volume= 0.429 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.092	98	Paved roads w/curbs & sewers, HSG D
1.741	80	>75% Grass cover, Good, HSG D
1.833	81	Weighted Average
1.741		94.98% Pervious Area
0.092		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
2.4	158	0.0253	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	208	Total			

Summary for Pond 1P: Bioretention

Inflow Area = 4.053 ac, 65.28% Impervious, Inflow Depth > 3.89" for 10-Year event
Inflow = 13.88 cfs @ 12.18 hrs, Volume= 1.313 af
Outflow = 12.49 cfs @ 12.25 hrs, Volume= 1.181 af, Atten= 10%, Lag= 4.2 min
Discarded = 0.02 cfs @ 12.25 hrs, Volume= 0.027 af
Primary = 12.48 cfs @ 12.25 hrs, Volume= 1.154 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 13.30' @ 12.25 hrs Surf.Area= 8,854 sf Storage= 10,554 cf

Plug-Flow detention time= 85.1 min calculated for 1.181 af (90% of inflow)
Center-of-Mass det. time= 36.9 min (826.5 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	12.00'	14,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
12.00	7,420	356.0	0	0	7,420
12.70	8,181	369.0	5,458	5,458	8,212
13.00	8,517	375.0	2,505	7,963	8,584
13.70	9,318	388.0	6,240	14,203	9,417

Device	Routing	Invert	Outlet Devices
#1	Primary	12.70'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	12.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.25 hrs HW=13.30' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=12.48 cfs @ 12.25 hrs HW=13.30' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.48 cfs @ 2.09 fps)

Summary for Link DP1: DP1

Inflow Area = 8.911 ac, 31.31% Impervious, Inflow Depth > 3.05" for 10-Year event
Inflow = 22.99 cfs @ 12.20 hrs, Volume= 2.267 af
Primary = 22.99 cfs @ 12.20 hrs, Volume= 2.267 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event – Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.025 ac 1.72% Impervious Runoff Depth>4.68"
Flow Length=461' Tc=12.8 min CN=80 Runoff=13.18 cfs 1.181 af

Subcatchment PR2: PR2 Runoff Area=4.053 ac 65.28% Impervious Runoff Depth>6.04"
Flow Length=670' Tc=13.3 min CN=92 Runoff=21.07 cfs 2.041 af

Subcatchment PR3: PR3 Runoff Area=1.833 ac 5.02% Impervious Runoff Depth>4.80"
Flow Length=208' Tc=5.6 min CN=81 Runoff=10.06 cfs 0.733 af

Pond 1P: Bioretention Peak Elev=13.50' Storage=12,328 cf Inflow=21.07 cfs 2.041 af
Discarded=0.02 cfs 0.029 af Primary=19.04 cfs 1.878 af Outflow=19.06 cfs 1.907 af

Link DP1: DP1 Inflow=37.13 cfs 3.793 af
Primary=37.13 cfs 3.793 af

Total Runoff Area = 8.911 ac Runoff Volume = 3.956 af Average Runoff Depth = 5.33"
68.69% Pervious = 6.121 ac 31.31% Impervious = 2.790 ac

Summary for Subcatchment PR1: PR1

Runoff = 13.18 cfs @ 12.17 hrs, Volume= 1.181 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.052	98	Paved parking, HSG D
2.973	80	>75% Grass cover, Good, HSG D
3.025	80	Weighted Average
2.973		98.28% Pervious Area
0.052		1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0140	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
1.6	119	0.0327	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	134	0.0075	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	158	0.1266	2.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.8	461	Total			

Summary for Subcatchment PR2: PR2

Runoff = 21.07 cfs @ 12.18 hrs, Volume= 2.041 af, Depth> 6.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
2.527	98	Paved parking, HSG D
1.407	80	>75% Grass cover, Good, HSG D
0.119	98	Water Surface, HSG D
4.053	92	Weighted Average
1.407		34.72% Pervious Area
2.646		65.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0160	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
0.9	55	0.0236	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	80	0.0063	1.19		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	91	0.0109	1.57		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.3	31	0.0129	1.70		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	64	0.0094	1.45		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.3	299	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
13.3	670	Total			

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 10.06 cfs @ 12.08 hrs, Volume= 0.733 af, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.092	98	Paved roads w/curbs & sewers, HSG D
1.741	80	>75% Grass cover, Good, HSG D
1.833	81	Weighted Average
1.741		94.98% Pervious Area
0.092		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.32"
2.4	158	0.0253	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	208	Total			

Summary for Pond 1P: Bioretention

Inflow Area = 4.053 ac, 65.28% Impervious, Inflow Depth > 6.04" for 100-Year event
Inflow = 21.07 cfs @ 12.18 hrs, Volume= 2.041 af
Outflow = 19.06 cfs @ 12.24 hrs, Volume= 1.907 af, Atten= 10%, Lag= 4.1 min
Discarded = 0.02 cfs @ 12.24 hrs, Volume= 0.029 af
Primary = 19.04 cfs @ 12.24 hrs, Volume= 1.878 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 13.50' @ 12.24 hrs Surf.Area= 9,081 sf Storage= 12,328 cf

Plug-Flow detention time= 65.8 min calculated for 1.903 af (93% of inflow)
Center-of-Mass det. time= 31.1 min (809.4 - 778.3)

Volume	Invert	Avail.Storage	Storage Description
#1	12.00'	14,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
12.00	7,420	356.0	0	0	7,420
12.70	8,181	369.0	5,458	5,458	8,212
13.00	8,517	375.0	2,505	7,963	8,584
13.70	9,318	388.0	6,240	14,203	9,417

Device	Routing	Invert	Outlet Devices
#1	Primary	12.70'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	12.00'	**0.090 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.24 hrs HW=13.49' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=18.97 cfs @ 12.24 hrs HW=13.49' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 18.97 cfs @ 2.39 fps)

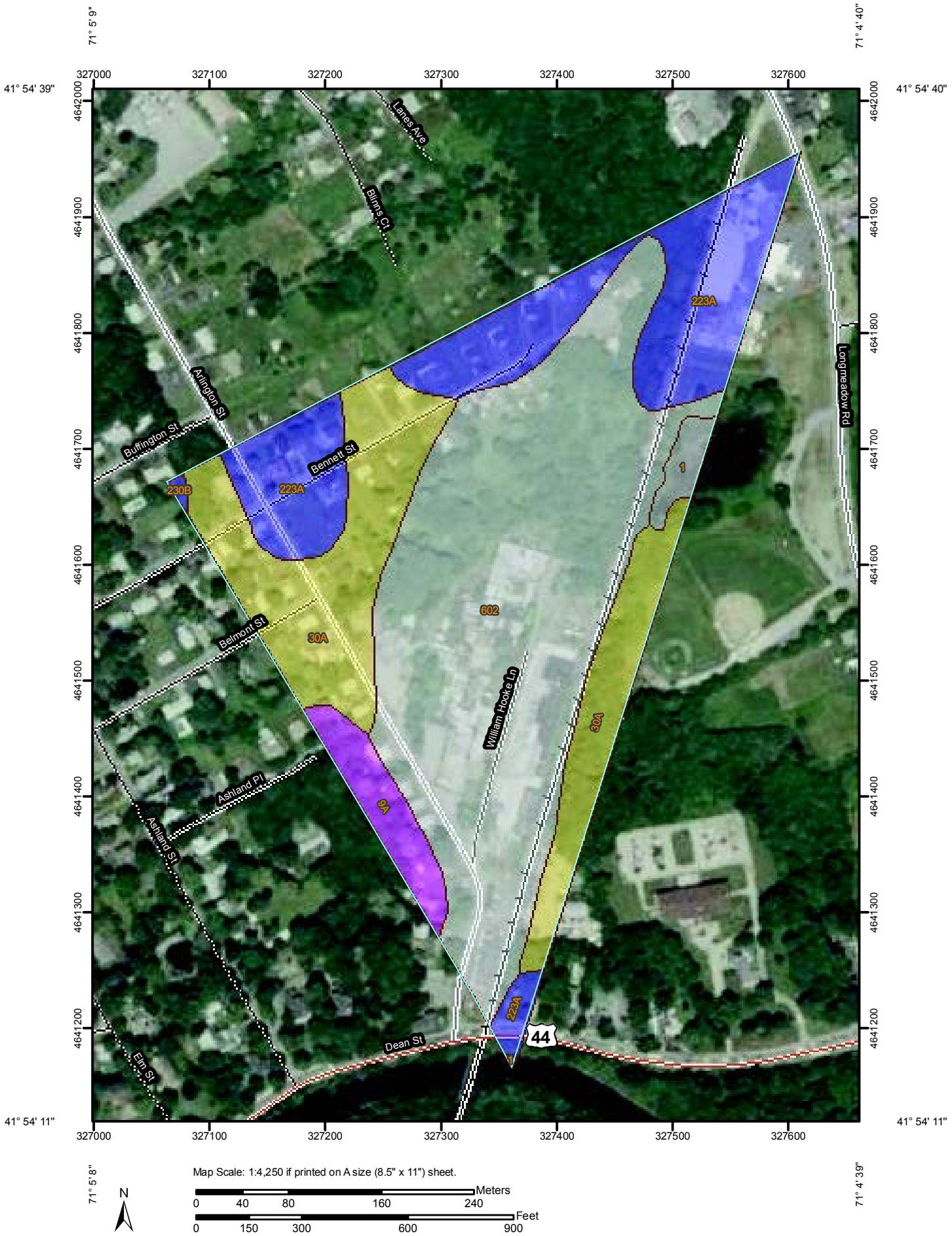
Summary for Link DP1: DP1

Inflow Area = 8.911 ac, 31.31% Impervious, Inflow Depth > 5.11" for 100-Year event
Inflow = 37.13 cfs @ 12.19 hrs, Volume= 3.793 af
Primary = 37.13 cfs @ 12.19 hrs, Volume= 3.793 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis


71° 5' 9"
71° 4' 40"
41° 54' 39"
41° 54' 40"
41° 54' 11"
71° 5' 8"
71° 4' 39"
327000
327100
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327400
327500
327600
4642000
4641900
4641800
4641700
4641600
4641500
4641400
4641300
4641200
Lanes Ave
Billins Ct
Arlington St
Buffington St
Bennett St
Belmont St
Ashland Pl
Ashland St
Elm St
Dean St
Longmeadow Rd
William Hooke Ln
223A
230B
602
30A
1
94
44
Map Scale: 1:4,250 if printed on A size (8.5" x 11") sheet.
N
Meters
0 40 80 160 240
Feet
0 150 300 600 900

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,250 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part
Survey Area Data: Version 5, Jul 27, 2010

Date(s) aerial images were photographed: 7/10/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Northern Part (MA602)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
1	Water		0.6	1.4%
9A	Birdsall silt loam, 0 to 3 percent slopes	D	1.7	3.8%
30A	Raynham silt loam, 0 to 3 percent slopes	C	10.2	22.9%
223A	Scio silt loam, 0 to 3 percent slopes	B	9.5	21.4%
230B	Unadilla very fine sandy loam, 3 to 8 percent slopes	B	0.1	0.2%
602	Urban land		22.3	50.3%
Totals for Area of Interest			**44.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Taunton Station **Proj. No.:** 10111.00
Project Location: Taunton, MA **Date:** 21-May-2012
Calculated by: DAG
Checked by: EJM

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	0.0	0.0	0.1	0.1
2	0.0	0.0	0.0	2.5	2.5
3	0.0	0.0	0.0	0.1	0.1
TOTAL	**0.0**	**0.0**	**0.0**	**2.7**	**2.7**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	0.0	0.60	0
B	0.0	0.35	0
C	0.0	0.25	0
D	2.7	0.10	970
TOTAL			**970**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Basin 1	1,263
Total	**1,263** c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name:	Taunton Station	**Proj. No.:**	10111.00
		Date:	5/18/2012
Project Location:	Taunton, MA	**Calculated by:**	PAC
		Check by:	EJM

Bioretention Basin - 1

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
12.00	7,420	0
12.70	8,181	5,460
TOTAL		**5,460**

Assumptions:

Recharge Rate: 1.00 in/hr* * Bioretention Basin Soil Media Infiltration Rate

Drawdown Time:	**8.8 hours**

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Taunton Station **Proj. No.:** 10111.00
Project Location: Taunton, MA **Date:** 4/24/2012
Calculated by: DAG

Bioretention Basin 1P
(runoff from Area PR 2)

Total Impervious Area = 2.79 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	1,013
Water Quality Volume	0.5	5,064

Provided:

Bioretention Basin 1 P	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	12.0	7,420	0
	12.7	8,181	5,460

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Taunton Station**	Sheet:	**1 of 1**
Project Number:	**10111.00**	Date:	**24-Apr-2012**
Location:	**Taunton, MA**	Computed by:	**DAG**
Discharge Point:	**1**	Checked by:	
Drainage Area(s):	**1**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area with Grass Swale or sediment forebay Pretreatment	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol.
** Equals remaining load from previous BMP (E)

Treatment Train TSS Removal = **90%**

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	February 17, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Da Ha, Peter Chou - Jacobs
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) Taunton Station Geotechnical Design Memorandum Taunton, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the construction of several existing and new passenger stations and two terminal layover facilities. This geotechnical design memorandum presents the foundation design considerations for the new station platform at the proposed Taunton Station in Taunton, Massachusetts. The design recommendations presented in this report are based on the results of subsurface investigation performed by Jacobs in 2010.

Existing Conditions

The proposed Taunton Station, located off Arlington Street, is an approximately 3.8 acre site to the east of downtown Taunton (Figure 1). The site is a formerly developed parcel now containing vacant buildings and other derelict areas as a result of fire. Existing grades at the platform location range from approximately elevations 16 to 19 feet (NGVD29 Datum), generally sloping downward from north to south. A 20-inch diameter water main pipe is located along the proposed platform alignment and will need to be relocated. The remains of the buildings and their foundations will also have to be removed.

Proposed Construction

Current station plans are to construct an 800 foot long, 12 foot wide high level platform adjacent to the existing tracks, a new parking area and a new drop-off area. In addition, some track relocation is required. Access to the platform will be from a ramp/stair structure along the west side of the planned platform. Two 50-ft long platform canopies are also planned. The details of new track layout (including grading), associated sidewalks, ramps of the proposed station are still under development at the time of this report preparation. However, we anticipate that about 3 to 5 feet of fill will be placed at the site to raise the grade at the track level and platform area. This report focuses on the geotechnical design and recommendation for the platform only.

SCOPE OF WORK

This memorandum was prepared by Jacobs in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform a geotechnical exploration and laboratory testing program;
- Report and interpret the results of the exploration and laboratory testing program; and
- Provide geotechnical recommendations for design and construction of the platform foundations.

The Jacobs scope of work did not include environmental assessment of the potential presence of any hazardous materials at the project site. However, please note that potential contamination was observed in borings TS-5 (samples S2 and S3) from a depth of about 3 to 10 feet and TS-19 (samples S2 and S3) from a depth of about 3 to 10 feet (refer to boring logs in Appendix A).

LOCAL GEOLOGY

The site is located in the Narragansett Basin of southeastern Massachusetts. The rocks in the Narragansett Basin consist mostly of lightly metamorphosed shale and sandstone of Pennsylvanian and Permian age. The Taunton Station is located in the area of the Rhode Island Formation. The rocks encountered in the borings included coarse, weathered sandstone, dark gray shale, and dark gray siltstone. The weathered sandstone was sampled by Standard Penetration Tests with high blow counts. The shale and siltstone were cored but only partially recovered due to weathered seams. The rock contains joints oriented parallel to bedding, which typically dipped about 30 degrees. Based on the borings, the top of rock is likely to be between elevation -12 feet and elevation -30 feet over the site.

GEOTECHNICAL EXPLORATIONS

Jacobs planned the subsurface exploration program and retained the drilling contractor to perform the exploration. The geotechnical data report was submitted in 2010. Five borings (TS-1 to TS-5) were conducted along the proposed station platform and fourteen borings (TS-7, TS-9, TS-11, TS-13, TS-15, TS-17, and TS-19 to TS-26) were drilled in the general vicinity of the proposed parking lot and the access roads. Boring locations are shown on the Subsurface Exploration Plan (Figure 2).

The borings were drilled by New Hampshire Boring using either a CME-550 or D-50 ATV mounted drill rig, or a CME-75 truck mounted drill rig. The borings were advanced through the soil by wash boring methods using a 4-inch casing and roller bit with water. Standard penetration tests (SPT), consisting of a 140-pound hammer dropping 30 inches on a standard 2-inch-diameter (OD) split-spoon sampler, were performed with a safety hammer or an automatic hammer to establish the consistency of the subsurface soils. The SPT's were typically performed at five foot intervals of depth. The obtained samples were sealed in glass jars to retain their natural moisture. Bedrock was encountered and cored in some of the borings around the proposed platform area.

The borings were observed by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

LABORATORY TESTING

The results of the laboratory testing were previously submitted to VHB in report entitled "South Coast Rail, Jacobs Geotechnical Data Report", dated November 2010.

Grain size distribution analyses were performed to evaluate the gradation of the natural granular soils for potential reuse as backfill, if needed, and to classify the soils. The graduation analyses are summarized in Table 1 below and are presented in Appendix B.

Table 1: Laboratory Soil Classification Summary

BORING NO.	SAMPLE NO.	ELEVATION (FEET)	USCS SOIL CLASSIFICATION	W (%)	ATTERBERG LIMITS		GRAVEL (%)	SAND (%)	FINES (%)	ORGANIC CONTENT (%)
					LL	PI				
TS-2	S3	9.0	Clay (CL)	32	NT	NT	NT	NT	NT	NT
	S4	4.0	Silt (ML)	37	26	4	0	1.1	98.9	NT
TS-3	S3	8.0	Clay (CL)	38	NT	NT	NT	NT	NT	NT
TS-7	S3	8.0	Clay (CL)	37	32	11	0	6.1	93.9	NT
	S4	3.0	Clay (CL)	33	NT	NT	NT	NT	NT	NT
TS-11	S2	14.0	Silt (ML)	26	NT	NT	NT	NT	NT	7.8
TS-20	S3	6.0	Silt (ML)	41	33	9	0	5.6	94.4	NT
TS-24	S3	6.0	Clay (CL)	32	NT	NT	NT	NT	NT	NT

Where: w = natural moisture content, LL = Liquid Limit, PI = Plasticity Index, NT = Not Tested

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for the South Coast Rail project, with some interpretations. The subsurface conditions encountered at the station platform generally consist of a layer of granular fill of up to 4-feet thickness, underlain by an intermittent sand layer, and a clayey silt layer with thickness ranging from about 20 feet to 30 feet overlying glacial till and weathered bedrock. A 5 to 10 feet thick lean clay layer was encountered within the clayey silt layer in borings TS-2 and TS-3. Weathered bedrock was encountered at a depth of about 28 to 38 feet in the platform area, corresponding to approximately elevations -12 to -21 feet.

Fill materials with thicknesses varying from 0.3 to 7 feet were also encountered in the vicinity of the proposed parking lot area. Bedrock was not encountered in this area due to shallow boring depths.

Subsurface soil conditions are summarized in Table 2 and discussed below.

Table 2: Summary of Subsurface Conditions at Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Platform Borings							
TS-1	19.0	3	16.0	-18.0	-26.0	11.0	
TS-2	18.0	4	14.0	NE	-9.5	NE	
TS-3	17.0	4	13.0	-21.0	-23.0	14.0	
TS-4	16.0	4	12.0	-12.0	-32.5	5.0	
TS-5 OW	16.0	4	12.0	-21.0	-27.0	5.0	Potential Contamination encountered, Well screened from 33 to 43 ft
BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Site Borings							
TS-7	16.0	3	13.0	NE	1.0	13.0	
TS-9	18.0	3	15.0	NE	3.0	15.0	
TS-11	17.0	3	14.0	NE	2.0	NE	
TS-13	17.0	3	14.0	NE	2.0	13.0	
TS-15	15.0	7	8.0	NE	0.0	NE	
TS-17	13.0	0.3 (Concrete Slab)	12.7	NE	-2.0	13.0	
TS-19	14.0	3	11.0	NE	-1.0	NE	Potential Contamination encountered
TS-20 OW	14.0	1	13.0	NE	-11.0	12.0	Well screened from 15 to 20 ft
TS-21	15.0	3	12.0	NE	-10.0	12.0	
TS-22	14.0	3	11.0	NE	-11.0	NE	
TS-23	13.0	4	9.0	NE	-12.0	12.0	
TS-24	14.0	0.3 (Asphalt Concrete)	13.7	NE	-11.0	10.0	
TS-25	14.0	0.3 (Concrete Slab)	13.7	NE	-11.0	12.0	Boring offset ~8 ft SE
TS-26	14.0	1	13.0	NE	-11.0	12.0	Boring offset ~10 ft E

NE: Not encountered at the boring during drilling.

Soil conditions in the platform area generally consisted of the following:

Fill: The fill layer typically consists of mostly granular, loose to medium dense sand with up to about 15% silt and 15% gravel. The fill layer is generally about 3 to 4 feet thick in the area of the platform.

Sand: Below the fill, an intermittent sand layer consisting of predominantly fine sand with up to about 40% silt was encountered. These deposits are medium dense with Standard Penetration Test (SPT) N-values ranging between 11 and 23 blows per foot (bpf).

Clayey Silt: The clayey silt layer generally consists of silt with up to about 20% clay. This layer is typically soft to very stiff with SPT N-value ranging between 2 and 26 bpf.

An approximately 5 to 10 feet thick medium stiff to stiff lean clay layer was encountered in borings TS-2 and TS-3 from about 8 to 19 feet below ground surface, corresponding to elevations 10 to -2 feet.

Glacial Till: A thin layer of medium dense to dense glacial till was encountered in borings TS-3 and TS-5 overlying weathered bedrock.

Weathered Bedrock: Weathered bedrock was encountered in the platform area at depth of about 28 to 38 feet below existing ground surface, corresponding to approximately elevations -12 to -21 feet. The bedrock was generally weathered shale or slightly weathered soft siltstone.

Groundwater: Groundwater levels were measured in the test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level ranged from approximate elevations 16 to 19 feet along the platform alignment, and from elevations 13 to 18 feet in the general area of the proposed parking lot. The use of wash boring techniques for all soil borings may have artificially increased the water level readings due to the addition of water to the borings. Trapped/perched water is also commonly seen at a higher elevation within existing fill and silty materials. The longer term water level readings taken at Boring TS–05 OW on July 7, 2010 and September 12, 2011 indicated the water at a depth of about 22.5 feet (Elevation -6.5 feet) and 11.3 feet (Elevation 4.7 feet). The longer term water level readings taken at Boring TS–20 OW on July 7, 2010 and September 12, 2011 indicated the water at a depth of about 5.5 feet (Elevation 8.5 feet) and 2.0 feet (Elevation 12.0 feet). Based upon these short-term observations and readings from the observation wells, it is anticipated that the groundwater could be at approximately elevation 10 to 12 feet at the site.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction. Local and periodic variations of ground water elevations may also be influenced by local subsurface drainage, leaking water or sewer pipes, and precipitation.

GEOTECHNICAL RECOMMENDATIONS

Based on our review of available subsurface conditions, the proposed station platforms can be supported on shallow spread footings bearing directly on competent natural soil or structural fill placed above suitable natural soils. Platform and canopy design loads were not available at the time of this report preparation. However, it is anticipated that the station platform will be lightly (axially) loaded with limited horizontal forces from wind and seismic loads.

The following paragraphs provide project specific geotechnical recommendations for foundation soil preparation, structural fill/backfill placement, and design and construction of platform foundations.

Platform Foundations

Spread footings are recommended for the platform foundations, bearing on compacted structural fill or natural granular deposits. The bottom of footing elevation should be at least 4 feet below final grades for frost protection. Due to proposed site filling, bottom of footing is anticipated to be at approximately elevations 16 to 18 feet. The existing fill is not suitable for support of the spread footings and should be removed within the zone of influence of the footings, defined by a line extending one foot horizontally from the bottom edge of footing and then down and away at a 1H:1V slope until natural soils are encountered.

The recommended allowable design bearing capacity for spread footings bearing on at least medium dense structural fill or natural sandy soil is 3 ksf, provided that subgrades are prepared as described herein. This provides an adequate factor of safety against bearing failure and limits the total estimated settlement to about 1.5 inches due to consolidation of the underlying clayey silt layer and the differential settlement to about 3/4 inch. It is recommended that footings should be at least 7 feet wide to limit bearing pressure and settlement impacts. Due to site filling to raise the track grade, we anticipate the track and platform will settle similarly over time. However, if these estimated settlements are not acceptable, alternative means of supporting the platform, such as drilled minipiles, can be developed.

The structural fill material, if needed, should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557).

All temporary open cuts required for footing construction should be in accordance with the related OSHA regulations and should have side slopes of no steeper than 1.5H:1V.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered, the station site is classified as Seismic Site Class D soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The structure could be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class D Soils at the location of this station:

$S_{MS} = 0.384$ and $S_{M1} = 0.149$

$S_{DS} = 0.256$ and $S_{D1} = 0.099$

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class
- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: slope instability, soil liquefaction, or surface rupture due to faulting or lateral spreading. The proposed grading is relatively flat and we are not aware of any pre-existing slope instability in this area. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Based on the observed subsurface conditions, recorded water levels, percentage of fine contents and sample relative densities the existing soils underlying the site are judged not susceptible to liquefaction.

CONSTRUCTION CONSIDERATIONS

Foundation Installation - Spread Footings

The existing fill, as well as any former building foundations should be stripped off and removed from within the zone of influence of the platform and any walkway areas down to natural soil deposits using a smooth edge excavation bucket, and replaced by compacted granular soils.

Following excavation to the top of the natural soil deposits, the exposed surface should be observed by an on-site representative of the project geotechnical engineer and be proof-compacted with at least 10 passes of a large vibratory drum roller. Any yielding areas should be observed by geotechnical personnel to assess if localized undercutting is necessary. Footing subgrade observations should include hand auger probes by the geotechnical personnel to check for soft/weak zones. The need for undercutting and backfilling with structural fill should be closely evaluated in the field based on encountered conditions.

In areas where seepage is encountered within footing excavations, the need for placing a 3" thick lean concrete mud mat or a layer of ¾-inch crushed stone to protect the bearing surface should be evaluated in the field. Crushed stone thicker than 4 inches shall be wrapped by non-woven filter fabric.

Following observation of the bearing soils by geotechnical personnel, reinforcing steel and concrete can be placed in the excavation. It is recommended that footing reinforcing steel and concrete be placed the same day as the footing excavation is made, where possible, to avoid significant moisture content changes in the bearing soils. No water should be allowed to pond within excavations and drainage should be maintained away from foundations both during and after construction. The footing excavation should be free of loose debris at the time of footing concrete placement.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed structure footprints, walkway and paved areas, these areas should be stripped of topsoil, vegetation, fill, organic silt, former building foundations and existing pavement, if present. The topsoil should be placed in a designated area for reuse during final grading. Following site clearing and stripping, the exposed subgrade should be proof compacted with 10 passes of a large vibratory drum roller (minimum 10,000 pound static weight). Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials. Where subgrade soils are close to the existing groundwater level or where silty subgrade soils are encountered, proof-compaction using non-vibratory methods may be considered by the geotechnical engineer.

If additional rolling does not correct the unstable condition, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. A backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas. Construction traffic should be controlled to prevent excessive stresses and disturbance to the subgrade.

If pavements are not constructed immediately after grading, the subgrade should be shaped so as to prevent ponding. If there is a substantial lapse in time between grading and paving, or if the subgrade is disturbed, it should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during proof-rolling or initial construction should be removed and replaced with compacted granular fill.

Within the proposed paved areas, and extending a distance of five feet beyond the edge on all sides, excavate existing granular fill soils to a depth of two feet below existing site grades. It may be possible to reuse the existing granular fill, depending on the suitability of the material, as described herein.

Fill Placement and Compaction

Fill materials most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to the following percentages of the maximum dry density:

Table 3: Fill Compaction Requirements

DESCRIPTION	MINIMUM PERCENT COMPACTION (ASTM D-1557)
General Site Fills, Structural Fill (Below Footings and Slabs)	95
Behind Retaining Walls	92
Landscape Area	90

Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content as determined by the Modified Proctor test (ASTM D-1557).

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Discharge of pumped water should be performed in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes steeper than 2-1/2H:1V as the station design is finalized.

Excavation Slopes and Shoring

The slopes of temporary open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced Professional Engineer registered in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

Protection of Existing Facilities

It is recommended that a geotechnical instrumentation and monitoring program be performed during construction of the project to evaluate impacts on adjacent structures. It is recommended that the program be developed to provide data for the following considerations:

- To monitor ground movements and vibration levels during construction.
- To provide early warning of potentially adverse trends by presenting sufficient data to determine the source of unanticipated ground movements, if present.
- If necessary, to plan remedial measures to limit damage to embankments and structures and to provide early warning when alternative means of protection are necessary.
- To document impacts of construction on adjacent facilities.
- To evaluate the performance and structural integrity of the constructed facilities.

We recommend the following instrumentation program to measure:

- Ground surface settlement and lateral movement adjacent to proposed construction.
- Horizontal and vertical movement of any excavation support system, and existing structures.
- Vibrations as a result of construction activities.

Vertical and horizontal survey points should be established on the adjacent structures. The monitoring points should be surveyed prior to the start of construction and monitored during construction to detect movement.

Vibration monitoring shall be conducted within 100 feet of existing structures during construction activities.

We recommend conducting a pre-construction survey of structures and utilities within 100 feet of the site to document existing conditions prior to construction. Documentation should include photographs, video, sketches, and/or written comments.

Specific instrumentation and monitoring requirements shall be based on the proposed construction sequence, duration of construction, and performance criteria. Initial measurements should be established well in advance of construction so that baseline data can be developed. This information will be invaluable for providing early warning of adverse trends and for assessing the need for mitigating measures.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed Taunton Station in Taunton, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – SITE LOCATION PLAN
FIGURE 2 – SUBSURFACE EXPLORATION PLAN
FIGURE 3 – SUBSURFACE SOIL PROFILES
APPENDIX A – EXPLORATION LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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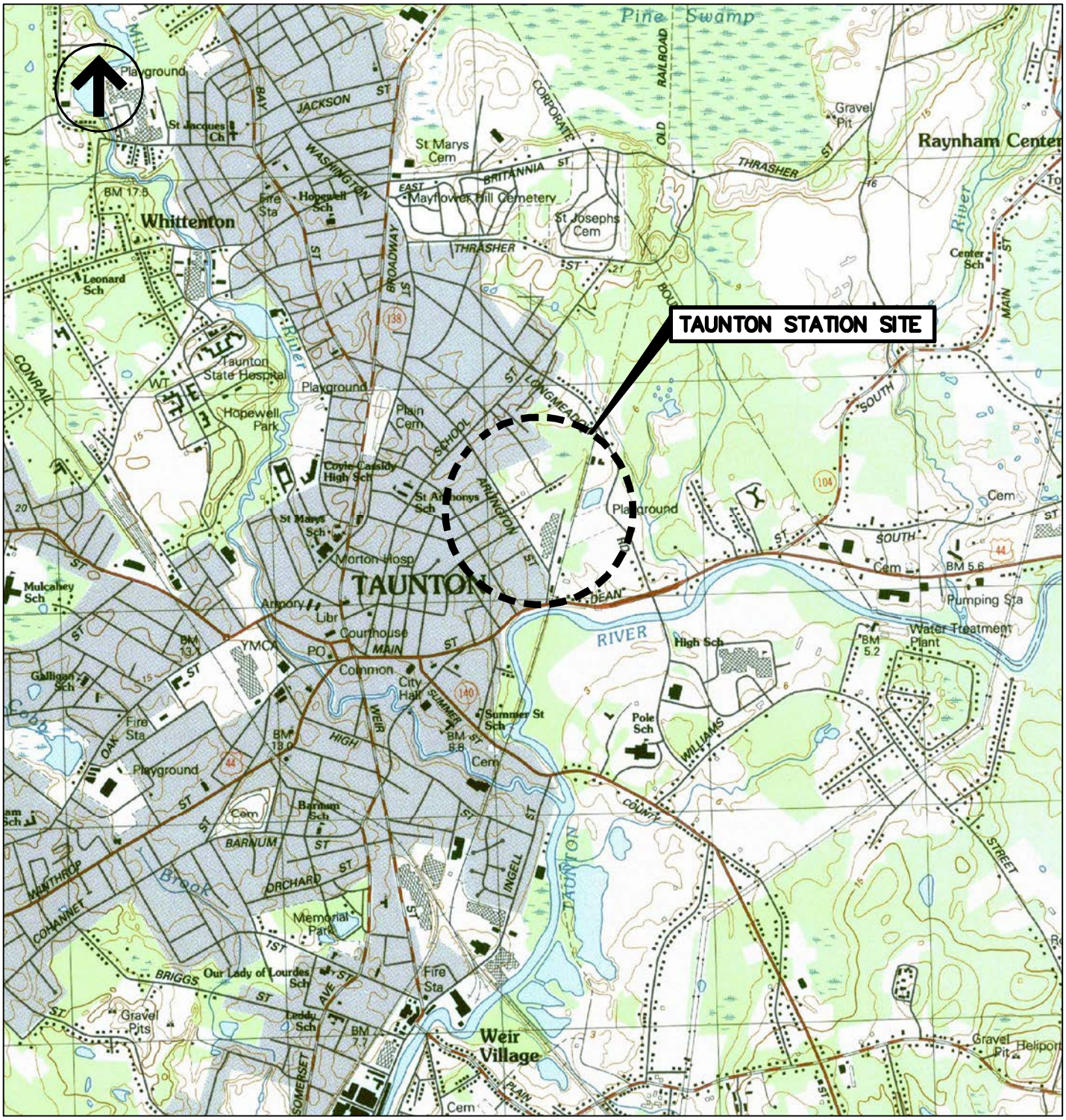
FIGURES

Figure 1: Site Location Plan
Figure 2: Subsurface Exploration Plan
Figure 3: Subsurface Soil Profiles



TAUNTON STATION
PROJECT LOCUS PLAN
NOT TO SCALE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	TAUNTON STATION TAUNTON, MASSACHUSETTS FIGURE 1

KEY:

TS-4 BORING PERFORMED BY NEW HAMPSHIRE BORING IN APRIL 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

OW INDICATES OBSERVATION WELL INSTALLED

NOTES:

1. BORING LOCATIONS WERE DETERMINED BY INSTRUMENT SURVEY CONDUCTED BY COLER AND COLANTONIO, INC. IF OBSTRUCTIONS WERE ENCOUNTERED THE MOVED BORING LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT AND LINE OF SIGHT FROM EXISTING FEATURES AND SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.
2. FOR BORING LOGS SEE APPENDIX A OF THE GEOTECHNICAL REPORT.
3. SURFACE DETAIL AND TOPOGRAPHY SHOWN HEREON IS FROM AN ON-THE-GROUND SURVEY PERFORMED BY COLER & COLANTONIO, INC., FROM APRIL 2010 TO SEPTEMBER 2010.
4. PRIMARY GEODETIC SURVEY CONTROL WAS ESTABLISHED FROM AN ON-THE-GROUND SURVEY BY COLER & COLANTONIO, INC. USING GLOBAL POSITIONING SYSTEM (GPS) SURVEY METHODS IN FEBRUARY 2010. THE GRID COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND 2001 - NAD83).
5. CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).

TAUNTON STATION
BORING LOCATION PLAN
SCALE: 1"=80'

80 40 0 80 160
SCALE: 1"=80'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242-9222

TAUNTON STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: FEBRUARY 2012

FIGURE NO: 2

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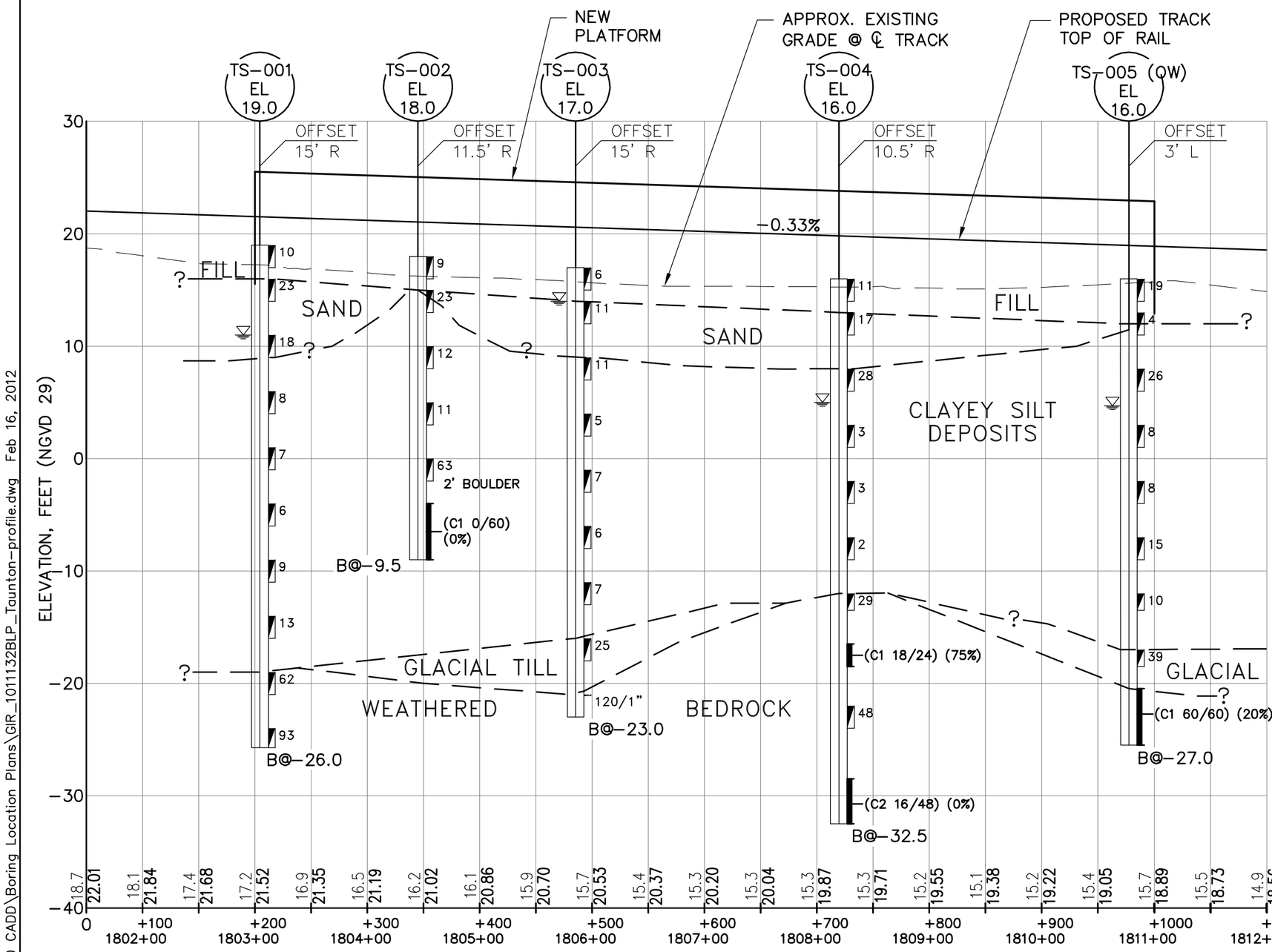

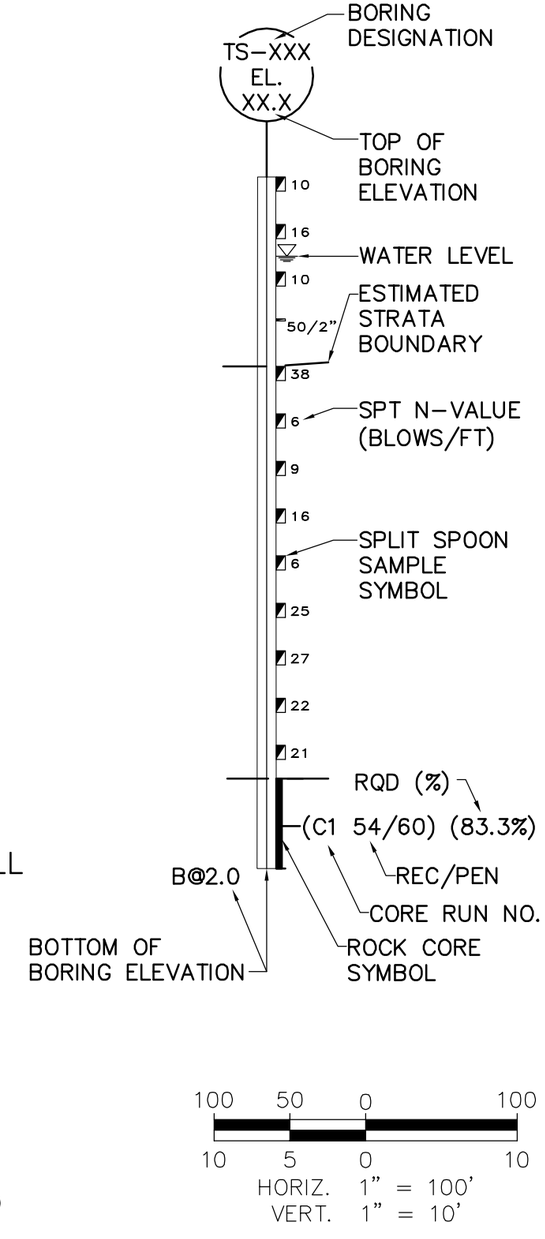

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

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TAUNTON STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE PROFILE A-A

DATE: FEBRUARY 2012

FIGURE NO: 3

APPENDIX A: EXPLORATION LOGS

TS-001 TO TS-005
TS-007
TS-009
TS-011
TS-013
TS-015
TS-017
TS-019 TO TS-026

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	TS - 001	
	LOCATION	Taunton, MA				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR A. Barbetta	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	19	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791326	
45 Terminated	4/19/2010	8 Upon Completion (Casing pulled)			COORD E	770275	
					DATE START	4/19/10	
					DATE END	4/19/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 4 6 12	S1	0 - 2	15		WELL GRADED SAND (SW); fine to coarse sand, trace coarse gravel, some ash, black, dry, FILL.
5		2 10 13 15	S2	3 - 5	17	16.0	POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, some non-plastic silt, gray, wet.
		6 8 10 4	S3	8 - 10	18	13.0	WELL GRADED SAND (SW); fine to coarse sand, orange/brown, wet, gray silt in tip of spoon.
10		3 4 4 4	S4	13 - 15	24	9.5	SILT (ML); slightly plastic silt, little clay, gray, wet.
15		4 3 4 5	S5	18 - 20	20		SIMILAR TO S4.
20		2 3 3 2	S6	23 - 25	24		SILT (ML); slightly plastic silt, trace clay, dark gray, wet.
25		3 4 5 5	S7	28 - 30	20		SIMILAR TO S6.
30		7 7 6	S8	33 - 35	13		SIMILAR TO S6.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 001

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 001
	LOCATION	Taunton, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9					
						-18.0	Hard drilling from 37 to 38 ft.
		18 18 44 24	S9	38 - 40	5		WEATHERED ROCK; dary gray, some gray silt, wet.
40							
		23 48 45 100/3"	S10	43 - 45	6		WEATHERED ROCK; dary gray, some coarse sand, little silt, wet.
45						-26.0	
							Bottom of Hole at 45'.
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 001

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	TS - 002	
	LOCATION	Taunton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR: NH Boring		DRILLER: T. Pentacost		ELEVATION: 18		
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG: ATV D-50		DATUM: NGVD 29		
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER: 140 lb Safety		GRID: N 2791189		
22.5 NX Rock Core					COORD: E 770243		
27.5 Terminated					DATE START: 4/20/10		
					DATE END: 4/20/10		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 4 5 9	S1	0 - 2	11		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, little non-plastic silt, trace fine gravel, grayish brown, moist, FILL.
5		5 8 15 18	S2	4 - 6	16	14.0	SANDY SILT (ML); non-plastic silt, some fine sand, light brown, moist.
10		3 6 6 8	S3	9 - 11	12	10.0	(9 - 10') LEAN CLAY (CL); slightly plastic clay, little silt, stiff, light brown, moist.
						8.0	(10 - 11') LEAN CLAY (CL); slightly plastic clay, gray, wet.
15		4 5 6 5	S4	14 - 16	17		SILT (ML); slightly plastic silt, gray, wet, PP = 1.0 TSF.
20		40 31 32 58	S5	19 - 21	14	-1.0	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM); mostly fine gravel up to 1", some fine to coarse sand, little silt, gray, wet, fractured rock in tip of spoon.
						-3.0	Boulder encountered at 21 ft, roller bit to 22.5 ft.
25			C1	22.5 - 27.5	0		NO RECOVERY; probable boulder, loss of drill water during last 1 ft of core.
						-9.5	
30							Bottom of Hole at 27.5'.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 002

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TS - 003
LOCATION	Taunton, MA		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	17
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791054
40	Terminated	4/20/2010	3 Upon Completion (Casing pulled)			COORD E	770205
						DATE START	4/20/10
						DATE END	4/20/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 2 4 5	S1	0 - 2	11		WELL GRADED SAND (SW); fine to coarse sand, trace non-plastic silt, dark brown, moist, FILL.
5		7 5 6 7	S2	4 - 6	17	13.0	POORLY GRADED SAND (SP); mostly fine sand, gray, wet.
10		8 5 6 9	S3	9 - 11	18	8.0	LEAN CLAY (CL); moderately plastic clay, little silt, stiff, gray, wet, PP = 1.5 TSF.
15		3 2 3 4	S4	14 - 16	24		SIMILAR TO S3; medium stiff, PP = 1.25 TSF.
20		2 3 4 4	S5	19 - 21	24	-2.0	SILT (ML); slightly plastic silt, trace clay, medium stiff, gray, wet, PP = 1.0 TSF
25		2 3 3 4	S6	24 - 26	24		SIMILAR TO S5; PP = 0.5 TSF.
30		4 3 4 5	S7	29 - 31	24		SIMILAR TO S5; PP = 0.5 TSF.
35		6	S8	34 - 36	8	-17.0	SANDY SILT WITH GRAVEL (ML); slightly plastic silt, some fine to coarse sand,

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 003

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 003
	LOCATION	Taunton, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 17 12					little fine gravel, gray, wet, possible GLACIAL TILL.
		120/1"	S9	38 - 38.08	0	-21.0	NO RECOVERY; top of apparent bedrock at 38 ft, roller bit to 40 ft.
40						-23.0	Bottom of Hole at 40'.
45							
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 003

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TS - 004
LOCATION	Taunton, MA		SHEET 1 OF 2
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	A. Barbetta	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	16
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2790826
44.5	NX Rock Core	4/19/2010	11 Upon Completion (In Casing)			COORD E	770151
48.5	Terminated					DATE START	4/19/10
						DATE END	4/19/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		7 6 5 5	S1	0 - 2	10		WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, ash, black, dry, FILL.
5		4 8 9 13	S2	4 - 6	11	12.0	POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, some non-plastic silt, grayish-brown, wet.
10		12 17 11 12	S3	8 - 10	13	8.0	SILT (ML); slightly plastic silt, trace clay, grayish-brown, wet.
15		1 1 2 1	S4	13 - 15	15		SILT (ML); slightly plastic silt, trace clay, soft, gray, wet.
20		1 1 2 2	S5	18 - 20	21		SILT (ML); slightly plastic silt, trace clay, soft, dark gray, wet.
25		2 1 1 2	S6	23 - 25	14		SIMILAR TO S5; very soft.
30		4 15 14 100/0"	S7	28 - 29.5	10	-12.0	WEATHERED SHALE; some silt, dark gray, wet, possible bedrock, roller bit to 32.5 ft.
35		RQD=75	C1	32.5 - 34.5	18		SHALE; joints spaced 5 - 13", slightly weathered, gray, broke through at 34.5 ft.

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 004

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 004
	LOCATION	Taunton, MA	
	OWNER	Mass.Bay Transportation Authority	SHEET 2 OF 2
	JOB NUMBER	E2347101	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		16 20 28 100/5"	S8	38 - 40	14		WEATHERED SHALE; some silt, dark gray / black, possible weathered seam.
45		RQD=0	C2	44.5 - 48.5	16		SHALE; dark gray.
						-32.5	
50							Bottom of Hole at 48.5'.
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 004

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	TS - 005 OW	
	LOCATION	Taunton, MA		SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	16
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2790573
38	NX Rock Core	7/7/2010	22.5 Monitoring Well Reading			COORD E	770100
43	Terminated	9/12/2011	11.3 Monitoring Well Reading			DATE START	4/22/10
						DATE END	4/22/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 13 6 5	S1	0.25 - 2.25	12	15.8	Top 3" Asphaltic Concrete. (.25 - 1') WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine gravel, brick fragments, moist, black, FILL. (1 - 2') POORLY GRADED SAND (SP); mostly fine sand, brown, moist, FILL.
		3 2 2 2	S2	3 - 5	9		(3 - 4') POORLY GRADED SAND (SP); mostly fine sand, brown, moist, FILL.
5						12.0	(4 - 5') SILT (ML); slightly plastic silt, dark brown, wet, moderate petroleum odor.
		9 15 11 14	S3	8 - 10	16		(8 - 9') POORLY GRADED SAND (SP); mostly fine sand, gray, wet, moderate petroleum odor. (9 - 10') SILT (ML); slightly plastic silt, wet, grayish brown, moderate petroleum odor.
10							
		3 4 4 5	S4	13 - 15	20	3.0	SILT (ML); slightly plastic silt, trace clay, medium stiff, gray, wet, PP = 1.0 TSF.
15							
		3 4 4 6	S5	18 - 20	18		SIMILAR TO S4; PP = 0.75 TSF.
20							
		2 6 9 7	S6	23 - 25	16		SIMILAR TO S4; stiff.
25							
		4 5 5 6	S7	28 - 30	17		SIMILAR TO S4; stiff.
30							
		16 18 21	S8	33 - 35	8	-17.0	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some slightly plastic silt, little fine to coarse gravel up to 1.5", gray, wet, GLACIAL TILL.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 005 OW

LOG OF TEST BORING

JACOBS	PROJECT: South Coast Rail	BORING NO.	TS - 005 OW
	LOCATION: Taunton, MA		SHEET 2 OF 2
	OWNER: Mass.Bay Transportation Authority		
	JOB NUMBER: E2347101		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		17 RQD=20	C1	38 - 43	60	-21.0	Top of apparent bedrock at ~37 ft. SILTSTONE; soft, joints spaced 0.5 - 6", joints angled at ~30 - 45 degrees from horizontal and generally parallel to folliation, thin bedding, slight weathering, gray.
						-27.0	Bottom of Hole at 43'.
45							Notes: Observation well screened 33 - 43 ft. Contamination encountered between 3 and 10 ft. Petroleum-like odor, possible gasoline, sheen on drill water.
50							
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 005 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	TS - 007	
	LOCATION	Taunton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	16	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2790874
15 Terminated	4/14/2010	3 Upon Completion (In Casing)			COORD	E	770126
					DATE START		4/14/10
					DATE END		4/14/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 10 13 15	S1	0.33 - 2.33	12	15.7	Top 4" Asphaltic Concrete POORLY GRADED SAND (SP); mostly fine sand, trace fine gravel, brick fragments, black with light brown, FILL.
		3 4 9 11	S2	3 - 5	16	13.0	SILT (ML); non-plastic silt, brown, moist.
5							
		3 5 5 5	S3	8 - 10	18	8.0	LEAN CLAY (CL); moderately plastic clay, little plastic silt, brownish gray, wet.
10							
		6 7 4 4	S4	13 - 15	12		LEAN CLAY (CL); moderately plastic clay, little plastic silt, gray, wet.
15						1.0	Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 007

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 009
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	18
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2791351
15	Terminated	4/14/2010	3 Upon Completion (Casing pulled)			COORD E	770177
						DATE START	4/14/10
						DATE END	4/14/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		20 15 6 5	S1	0.16 - 2.16	18	17.8	Top 2" Asphaltic Concrete. SILTY SAND WITH GRAVEL (SM); mostly fine sand, some non-plastic silt, little fine gravel, black with gray, moist, FILL.
5		6 1 4 4	S2	3 - 5	12	15.0 14.5	(3 - 3.5') ORGANIC SILT (OH); slightly plastic silt, slight organic odor, black, wet. (3.5 - 5') LEAN (CL); moderately plastic clay, little plastic silt, medium stiff, brownish gray, wet.
10		6 7 8 8	S3	8 - 10	16		LEAN CLAY (CL); moderately plastic clay, little plastic silt, stiff, brownish gray, wet.
15		6 6 7 7	S4	13 - 15	7	3.0	NO RECOVERY.
20							Bottom of Hole at 15'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 009

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 011
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	17
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2791163
15	Terminated					COORD E	770120
						DATE START	4/14/10
						DATE END	4/14/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		8 11 12 8	S1	0.16 - 2.16	18	16.8	Top 2" Asphaltic Concrete. POORLY GRADED SAND WITH GRAVEL (SP); mostly fine sand, little fine gravel, dark brown, FILL.
5		2 1 1 7	S2	3 - 5	18	14.0	ORGANIC SILT (ML); slightly plastic silt, slight organic odor, dark brown, moist.
10		6 6 6 3	S3	8 - 10	15	7.0	SIMILAR TO S2; wet, 1" lens of fine sand at bottom of spoon.
15		7 8 8 7	S4	13 - 15	18	2.0	SILT (ML); slightly plastic silt, dark gray, wet.
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 011

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TS - 013
LOCATION	Taunton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	17
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2790973
15	Terminated	4/14/2010	4 Upon Completion (Casing pulled)			COORD E	770075
						DATE START	4/14/10
						DATE END	4/14/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		10 12 7 5	S1	0.33 - 2.33	6	16.7	Top 4" Asphaltic Concrete. WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brick fragments, grayish brown, wet, FILL.
5		5 5 10 9	S2	3 - 5	16	14.0	POORLY GRADED SAND (SP); mostly fine sand, grayish brown, wet.
10		5 6 3 5	S3	8 - 10	12	9.0 8.5	(8 - 8.5') SILTY SAND (SM); mostly fine sand, some slightly plastic silt, reddish brown, wet. (8.5 - 10') LEAN CLAY (CL); moderately plastic clay, little silt, gray, wet.
15		2 2 3 6	S4	13 - 15	18	2.0	LEAN CLAY (CL); moderately plastic clay, little silt, gray, wet.
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 013

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail
LOCATION	Taunton, MA
OWNER	Mass.Bay Transportation Authority
JOB NUMBER	E2347101

BORING NO. TS - 015

SHEET 1 OF 1

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	15
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2791370
15	Terminated					COORD E	770100
						DATE START	4/14/10
						DATE END	4/14/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 2 3 2	S1	0.33 - 2.33	18	14.7	Top 4" Concrete Slab. SANDY SILT (ML); non-plastic silt, some fine sand, pieces of wood, dark brown, moist, FILL.
5		2 2 2 2	S2	3 - 5	12		WELL GRADED SAND (SW); fine to coarse sand, trace non-plastic silt, brown, brick fragments, wet, FILL.
						8.0	
10		2 3 3 2	S3	8 - 10	13		SANDY ORGANIC SOIL (OL); non-plastic silt, some fine to coarse sand, organic material, dark brown, wet.
						4.0	
15		2 3 3 2	S4	13 - 15	18		LEAN CLAY (CL); moderately plastic clay, some silt, gray, wet.
						0.0	
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 015

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 017
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	13
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791165
15	Terminated	4/13/2010	0 Upon Completion (Casing pulled)			COORD E	770048
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		29 9 4 4	S1	0.33 - 2.33	6	12.7	Top 4" Concrete Slab. SILT (ML); non-plastic silt, gray, moist.
5		6 13 11 7	S2	3 - 5	12		SILT (ML); non-plastic silt, trace fine sand, grayish brown, wet.
10		3 4 6 6	S3	8 - 10	15	5.0	LEAN CLAY (CL); moderately plastic clay, little silt, stiff, gray, wet.
15		3 5 4 6	S4	13 - 15	18	-2.0	LEAN CLAY (CL); moderately plastic clay, little silt, stiff, gray, wet, PP = 0.75 TSF.
20							Bottom of Hole at 15'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 017

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 019
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	14
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2790994
15	Terminated					COORD E	769968
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		5 13 20 5	S1	0.25 - 2.25	12	13.8	Top 3" Asphaltic Concrete. WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, dark brown, moist, FILL.
5		6 10 10 11	S2	3 - 5	14	11.0	SANDY SILT (ML); non-plastic silt, some fine sand, grayish brown, wet, strong naphthalene-like odor.
10		3 3 3 5	S3	8 - 10	12	6.0	LEAN CLAY (CL); moderately plastic clay, little silt, medium stiff, gray, wet, slight naphthalene-like odor, PP = 0.5 TSF.
15		2 4 4 4	S4	13 - 15	20	-1.0	LEAN CLAY (CL); moderately plastic clay, little silt, medium stiff, gray, wet, PP = 1.25 TSF.
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 019

LOG OF TEST BORING

JACOBS	PROJECT: South Coast Rail	BORING NO.	TS - 020 OW
	LOCATION: Taunton, MA		SHEET 1 OF 1
	OWNER: Mass.Bay Transportation Authority		
	JOB NUMBER: E2347101		

INSPECTOR: T. Telesco	CONTRACTOR: NH Boring	DRILLER: P. Rosinha	ELEVATION: 14	
METHOD OF DRILLING	GROUNDWATER READINGS	DRILL RIG: TR CME 75	DATUM: NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft)	REMARKS	SPT HAMMER: 140 lb Safety	GRID: N	2790918
25 Terminated	7/7/2010	5.5	Monitoring Well Reading		COORD: E	769948
	9/12/2011	2	Monitoring Well Reading		DATE START:	4/13/10
					DATE END:	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		6 7 7 8	S1	0.33 - 2.33	12	13.7	Top 4" Asphaltic Concrete.
						13.0	(0 - 1') WELL GRADED SAND (SW); fine to coarse sand, trace fine gravel, brown, moist, FILL.
							(1 - 2') POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, gray, moist.
		6 8 9 10	S2	3 - 5	13		POORLY GRADED SAND (SP); mostly fine sand, gray, wet.
5							
		3 3 4 8	S3	8 - 10	16	6.0	SILT (ML); slightly plastic silt, trace clay, gray, wet.
10							
		4 4 6 3	S4	13 - 15	10		SIMILAR TO S3; stiff.
15							
		2 3 4 3	S5	18 - 20	6		SIMILAR TO S3; medium stiff.
20							
		2 3 5 5	S6	23 - 25	18		SIMILAR TO S3; medium stiff.
25						-11.0	
							Bottom of Hole at 25'.
							Notes:
							Observation well screened from 15 to 25 ft.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 020 OW

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail
LOCATION	Taunton, MA
OWNER	Mass.Bay Transportation Authority
JOB NUMBER	E2347101

BORING NO. TS - 021

SHEET 1 OF 1

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft)	REMARKS	SPT HAMMER 140 lb Auto
25	Terminated	4/13/2010	3	Upon Completion (Casing pulled)	

ELEVATION	15		
DATUM	NGVD 29		
GRID	N	2791629	
COORD	E	770060	
DATE START	4/13/10		
DATE END	4/13/10		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 1 2 1	S1	0.33 - 2.33	13	14.7	Top 4" Concrete Slab. SILTY SAND (SM); mostly fine sand, some non-plastic silt, brown, dry, FILL.
5		5 4 8 8	S2	3 - 5	16	12.0	POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, grayish brown, wet.
10		5 7 6 6	S3	8 - 10	24	7.0	SILT (ML); non-plastic silt, gray, wet.
15		6 7 7 8	S4	13 - 15	18	2.0	LEAN CLAY (CL); moderately plastic clay, some silt, stiff, gray, wet.
20		3 3 4 3	S5	18 - 20	24	-3.0	SILT (ML); slightly plastic silt, trace clay, gray, wet.
25		2 9 5 5	S6	23 - 25	11	-10.0	SIMILAR TO S5. Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 021

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TS - 022
LOCATION	Taunton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	14
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2791464
25	Terminated					COORD E	770049
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 39 32 43	S1	0 - 2	6		WELL GRADED SAND (SW); fine to coarse sand, trace silt, brick fragments, dark brown, moist, FILL.
		13 16 14 14	S2	3 - 5	20	11.0	SILTY SAND (SM); mostly fine sand, some non-plastic silt, gray, wet.
		3 5 5 7	S3	8 - 10	20	6.0	SILT (ML); slightly plastic silt, gray, wet, PP = 1.25 TSF.
		2 2 3 3	S4	13 - 15	16	1.0	LEAN CLAY (CL); moderately plastic clay, some silt, medium stiff, gray, wet, PP = 1.0 TSF.
		2 2 2 3	S5	18 - 20	22	-4.0	SILT (ML); slightly plastic silt, trace clay, gray, wet, PP = 0.75 TSF.
		1 2 2 2	S6	23 - 25	24		SIMILAR TO S5.
						-11.0	Bottom of Hole at 25'.

5 10 15 20 25 30 35

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 022

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 023
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	13
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791281
25	Terminated	4/13/2010	1 Upon Completion (Casing pulled)			COORD E	769959
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
						12.0	Top 11" Concrete Slab.
		11 6 3 6	S1	1 - 3	6		WELL GRADED SAND (SW); fine to coarse sand, black, wet, FILL.
		18 10 12 11	S2	3 - 5	18		(3 - 4.5') POORLY GRADED SAND (SP); mostly fine sand, dark brown with lenses of black, wet, FILL.
5						8.5	(4.5 - 5') SILT (ML); non-plastic silt, trace fine sand, light brown, wet.
		3 2 3 5	S3	8 - 10	15	5.0	SILT (ML); slightly plastic silt, trace clay, gray, wet, PP = 1.25 TSF.
10							
		3 3 6 5	S4	13 - 15	13		SIMILAR TO S3; PP = 1.0 TSF.
15							
		2 5 8 7	S5	18 - 20	14		SIMILAR TO S3; PP = 1.25 TSF.
20							
		2 3 3 7	S6	23 - 25	16		SIMILAR TO S3; PP = 0.5 TSF.
25						-12.0	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 023

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TS - 024
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	14
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791010
25	Terminated	4/13/2010	4 Upon Completion (Casing pulled)			COORD E	769893
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		3 2 4 4	S1	0.33 - 2.33	12	13.7	Top 4" Asphaltic Concrete. SILT (ML); slightly plastic silt, trace fine sand, dark brown, moist.
		4 16 24 13	S2	3 - 5	15		(3 - 4') SIMILAR TO S1.
5						10.0	(4 - 5') LEAN CLAY (CL); moderately plastic clay, some silt, gray, wet.
		5 6 5 5	S3	8 - 10	18		LEAN CLAY (CL); moderately plastic clay, some silt, gray, wet, PP = 1.0 TSF.
10							
		2 2 2 2	S4	13 - 15	24	1.0	SILT (ML); slightly plastic silt, trace clay, gray, wet, PP = 1.25 TSF.
15							
		2 3 4 4	S5	18 - 20	19		SIMILAR TO S4; PP = 0.75 TSF.
20							
		1 1 1 2	S6	23 - 25	24		SIMILAR TO S4; PP = 0.5 TSF.
25						-11.0	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 024

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail
LOCATION	Taunton, MA
OWNER	Mass.Bay Transportation Authority
JOB NUMBER	E2347101

BORING NO. TS - 025

SHEET 1 OF 1

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	14
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID N	2791492
25	Terminated	4/13/2010	2 Upon Completion (Casing pulled)			COORD E	769927
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		6 3 3 3	S1	0.33 - 2.33	14	13.7	Top 4" Concrete Slab. SILT (ML); non-plastic silt, gray with dark brown, moist.
5		7 11 13 12	S2	3 - 5	20	11.0	SANDY SILT (ML); non-plastic silt, some fine sand, grayish brown, wet.
10		3 4 5 5	S3	8 - 10	24	6.0	SILT (ML); slightly plastic silt, trace clay, gray, wet.
15		2 3 3 4	S4	13 - 15	24		SIMILAR TO S3; PP = 1.0 TSF.
20		2 2 3 3	S5	18 - 20	24		SIMILAR TO S3; PP = 0.75 TSF.
25		3 3 4 4	S6	23 - 25	18		SIMILAR TO S3; PP = 0.75 TSF.
30						-11.0	Bottom of Hole at 25'.
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 025

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TS - 026
LOCATION	Taunton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	14
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2791318
25	Terminated	4/13/2010	2 Upon Completion (Casing pulled)			COORD E	769873
						DATE START	4/13/10
						DATE END	4/13/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
						13.0	Top 4" Concrete Slab, then ~8" base course.
		21 11 7 7	S1	1 - 3	5		SILTY SAND (SM); fine to medium sand, some non-plastic silt, gray, wet.
		3 3 5 5	S2	3 - 5	8	11.0	LEAN CLAY (CL); plastic clay, some silt, gray, wet, PP = 1.25 TSF.
5							
		2 3 4 4	S3	8 - 10	22		SIMILAR TO S2; PP = 0.75 TSF.
10						4.0	
		3 4 3 4	S4	13 - 15	0		NO RECOVERY
15							
		3 3 3 4	S5	18 - 20	15		SILT (ML); slightly plastic silt, trace clay, gray, wet, PP = 0.75 TSF.
20							
		4 5 4 5	S6	23 - 25	14		SIMILAR TO S5.
25						-11.0	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TS - 026

APPENDIX B: LABORATORY DATA

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	---	Sample Type:	---	Tested By:	mmd
Sample ID:	---	Test Date:	05/03/10	Checked By:	jdt
Depth :	---	Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%	
FTS-4	S-2	4-6 ft	Moist, black silt	42.4	
FTS-11	S-1	0-2 ft	Moist, yellowish brown sandy silt	24	
FTS-13	S-2	3-5 ft	Moist, yellowish brown silt	23.8	
TS-2	S-3	9-11 ft	Moist, gray clay	32	←
TS-2	S-4	14-16 ft	Wet, light gray silt	37	←
TS-3	S-3	9-11 ft	Moist, gray clay	37.7	←
TS-7	S-3	8-10 ft	Wet, yellowish brown clay	36.5	←
TS-7	S-4	13-15 ft	Moist, gray clay	32.8	←
TS-11	S-2	3-5 ft	Moist, black silt with organics	26.1	←
TS-20	S-3	8-10 ft	Wet, gray silt	41.4	←

Notes: Temperature of Drying : 110° Celsius

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	---	Sample Type:	---	Tested By:	mmd
Sample ID:	---	Test Date:	04/28/10	Checked By:	jdt
Depth :	---	Test Id:	178378		

Moisture, Ash, and Organic Matter - ASTM D 2974

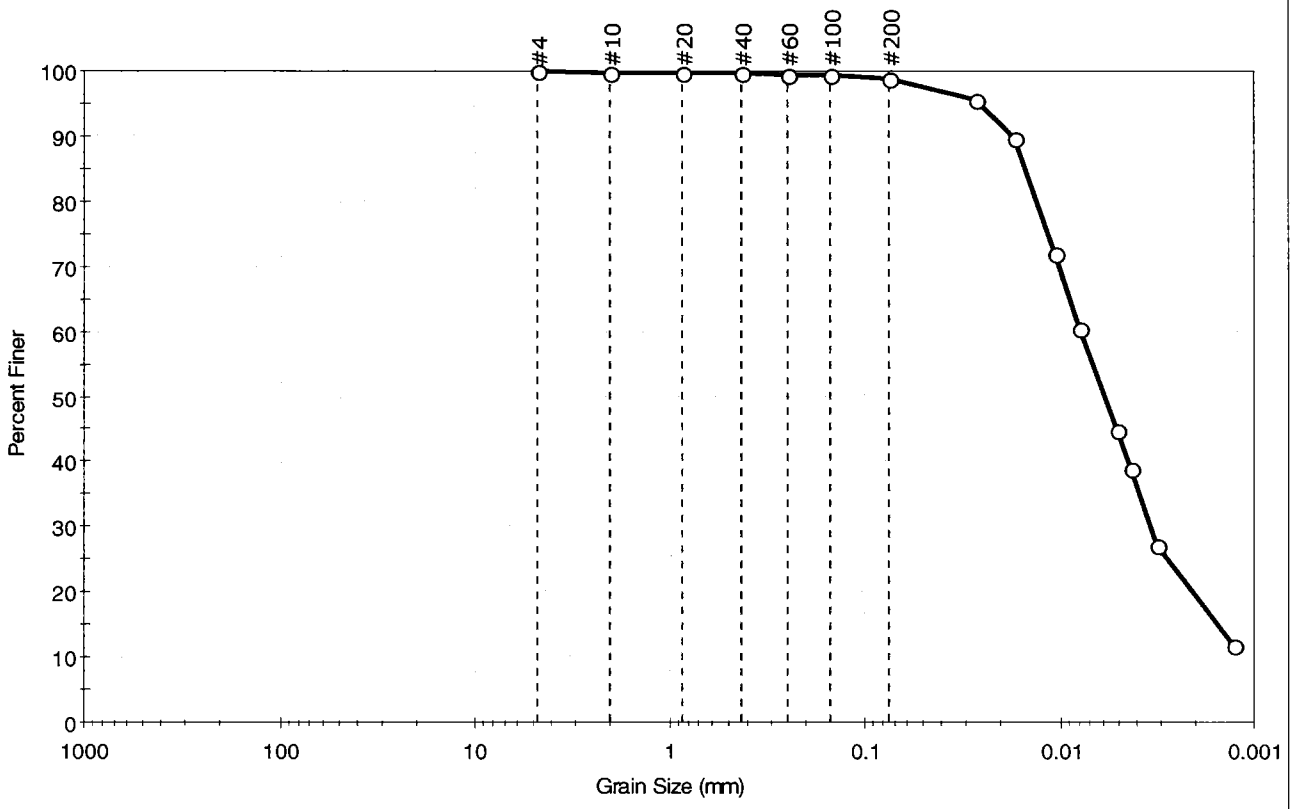
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
FTS-4	S-2	4-6 ft	Moist, black silt	42	95.3	4.7
TS-11	S-2	3-5 ft	Moist, black silt with organics	26	92.2	7.8

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-2	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-4	Test Date:	04/28/10	Checked By:	jdt
Depth :	14-16 ft	Test Id:	178363		
Test Comment:	---				
Sample Description:	Wet, light gray silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	1.1	98.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0266	95		
---	0.0171	90		
---	0.0106	72		
---	0.0079	60		
---	0.0051	45		
---	0.0043	39		
---	0.0031	27		
---	0.0013	12		

Coefficients

D_{85} = 0.0151 mm	D_{30} = 0.0034 mm
D_{60} = 0.0078 mm	D_{15} = 0.0015 mm
D_{50} = 0.0059 mm	D_{10} = 0.0012 mm
C_u = N/A	C_c = N/A

Classification

ASTM silt (ML)

AASHTO Silty Soils (A-4 (3))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting express
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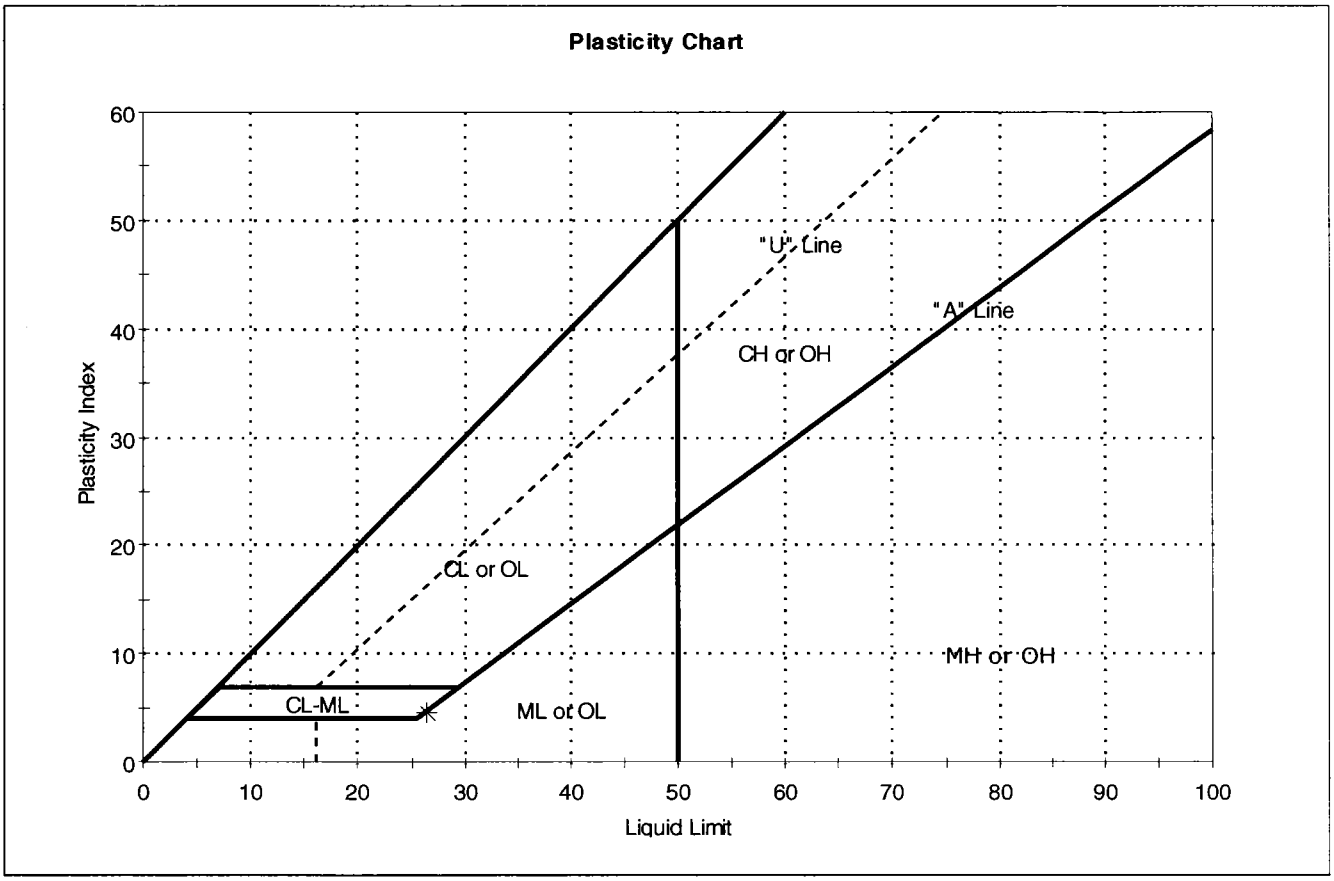
Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-2	Sample Type:	jar	Tested By:	cam
Sample ID:	S-4	Test Date:	04/29/10	Checked By:	jdt
Depth :	14-16 ft	Test Id:	178359		
Test Comment:	---				
Sample Description:	Wet, light gray silt				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-4	TS-2	14-16 ft	37	26	22	4	4	silt (ML)

Sample Prepared using the WET method
0% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

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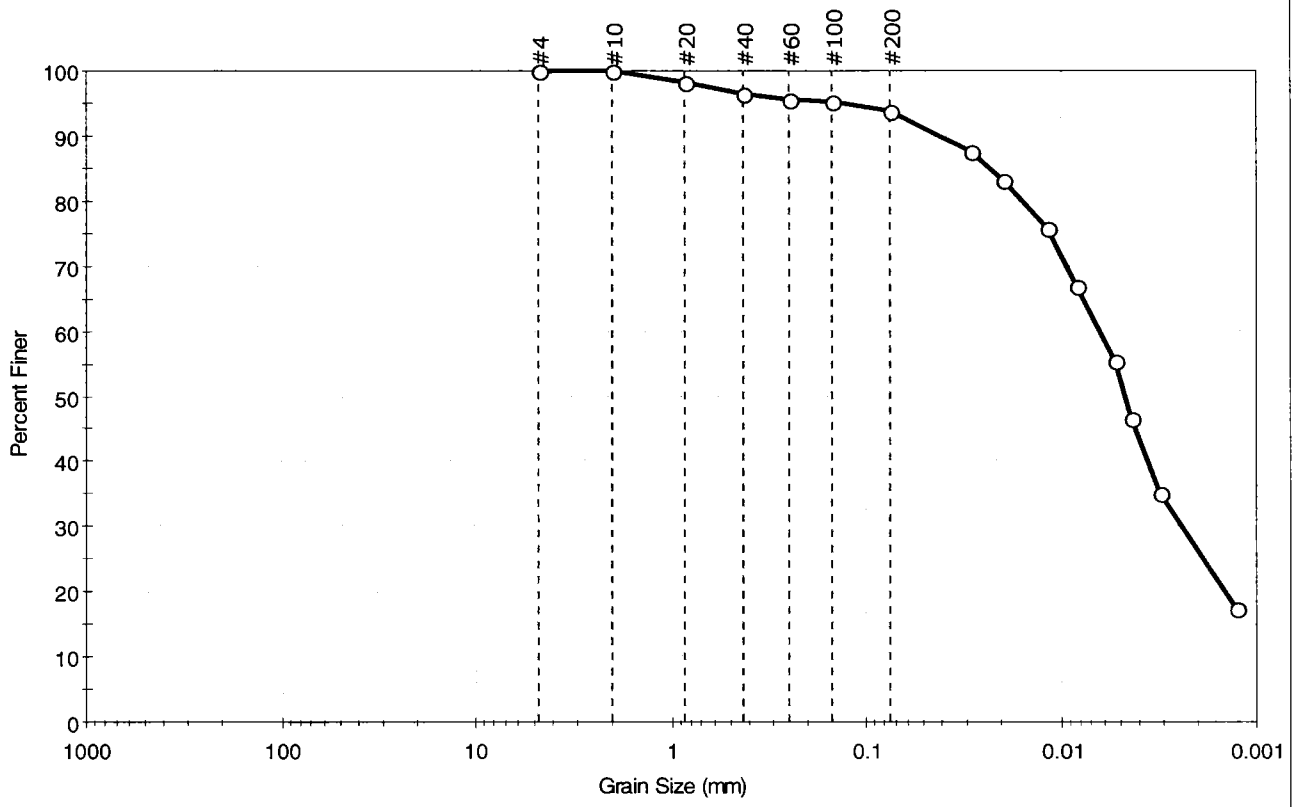
Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-7	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-3	Test Date:	04/28/10	Checked By:	jdt
Depth :	8-10 ft	Test Id:	178364		
Test Comment:	---				
Sample Description:	Wet, yellowish brown clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	6.1	93.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	95		
#200	0.075	94		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0287	87		
---	0.0198	83		
---	0.0116	76		
---	0.0084	67		
---	0.0053	55		
---	0.0044	47		
---	0.0032	35		
---	0.0013	17		

Coefficients

D_{85} = 0.0233 mm	D_{30} = 0.0024 mm
D_{60} = 0.0063 mm	D_{15} = N/A
D_{50} = 0.0047 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-6 (11))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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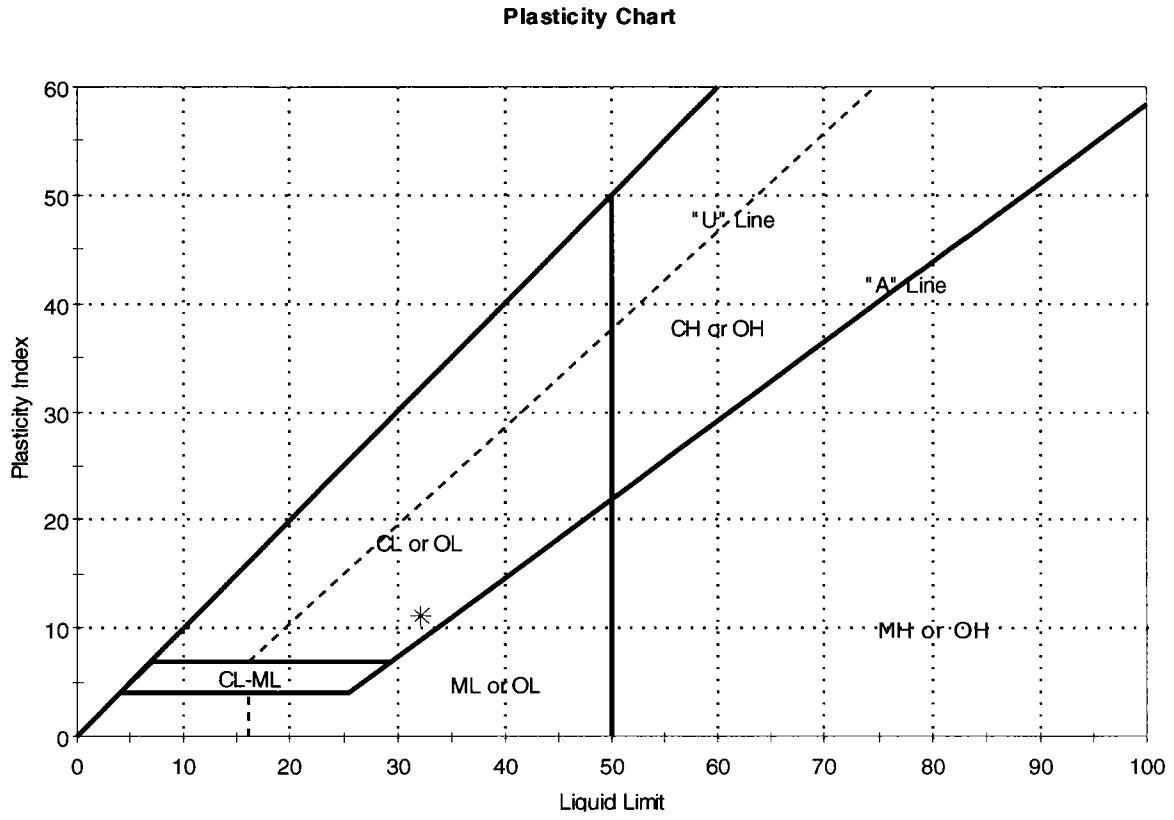
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-7	Sample Type:	jar	Tested By:	cam
Sample ID:	S-3	Test Date:	04/29/10	Checked By:	jdt
Depth :	8-10 ft	Test Id:	178360		
Test Comment:	---				
Sample Description:	Wet, yellowish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05



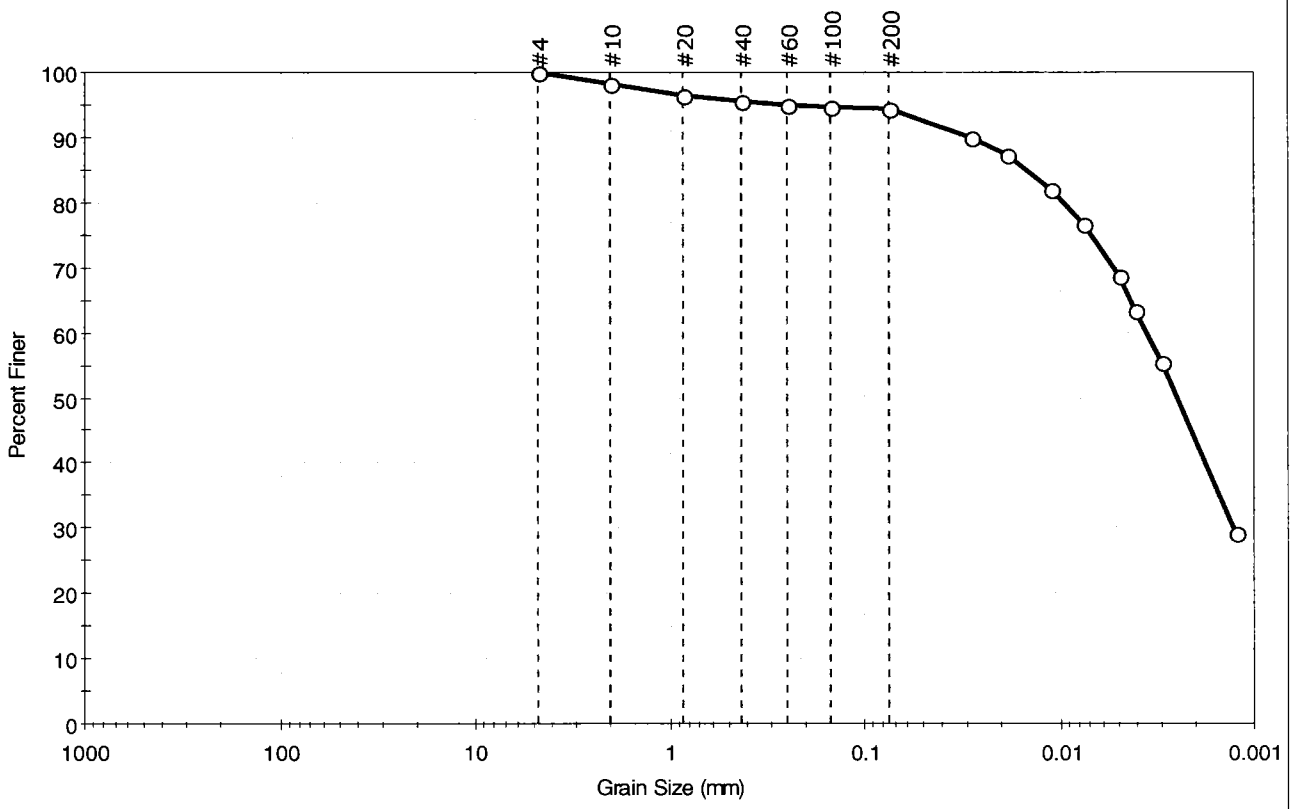
Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
✳	S-3	TS-7	8-10 ft	37	32	21	11	1	lean clay (CL)

Sample Prepared using the WET method
3% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-20	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-3	Test Date:	04/28/10	Checked By:	jdt
Depth :	8-10 ft	Test Id:	178365		
Test Comment:	---				
Sample Description:	Wet, gray silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	5.6	94.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	96		
#40	0.42	95		
#60	0.25	95		
#100	0.15	95		
#200	0.075	94		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0291	90		
---	0.0187	87		
---	0.0112	82		
---	0.0075	77		
---	0.0049	69		
---	0.0041	63		
---	0.0030	56		
---	0.0012	29		

Coefficients

D_{85} = 0.0150 mm	D_{30} = 0.0013 mm
D_{60} = 0.0036 mm	D_{15} = N/A
D_{50} = 0.0025 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM silt (ML)

AASHTO Silty Soils (A-4 (8))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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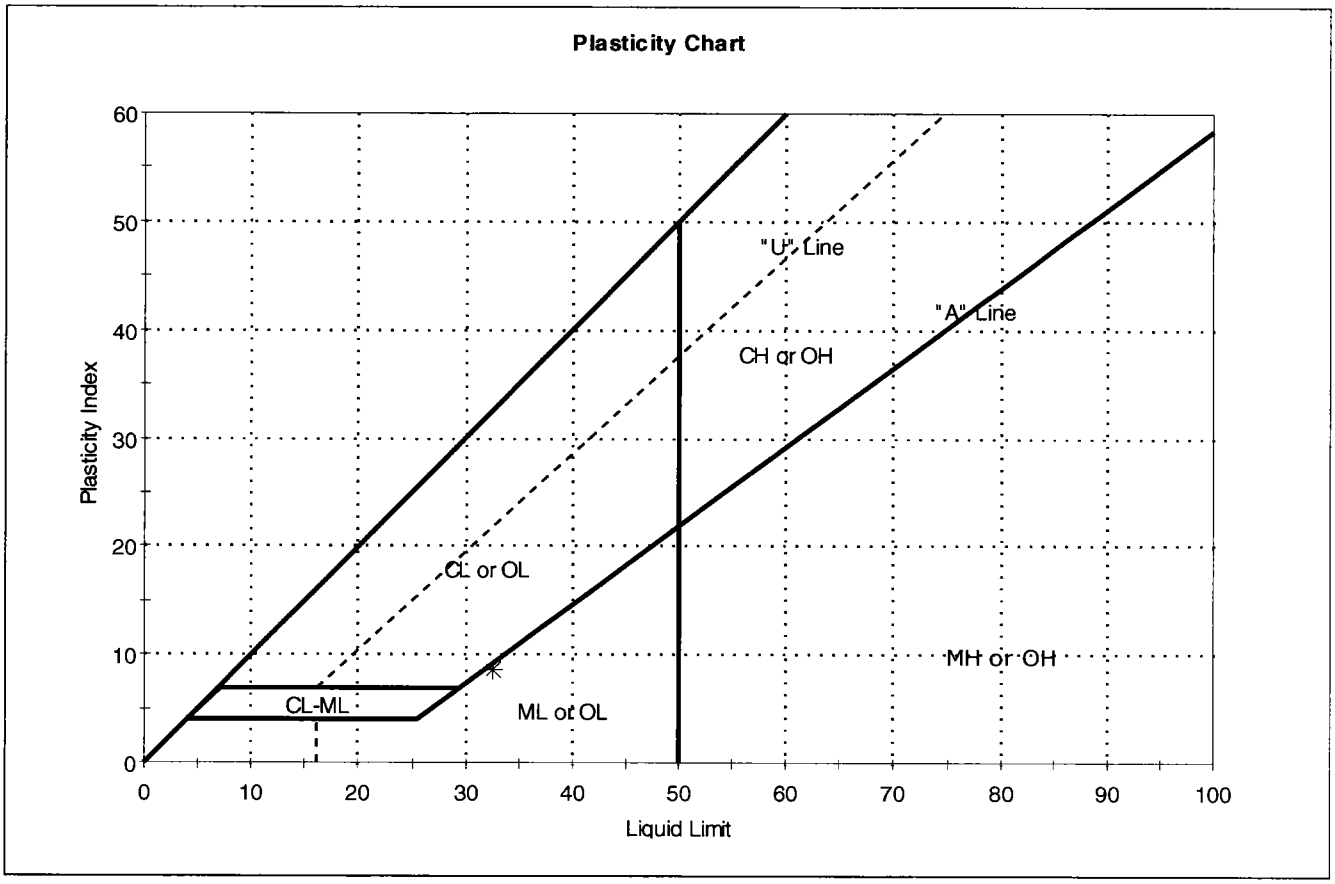
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TS-20	Sample Type:	jar	Tested By:	cam
Sample ID:	S-3	Test Date:	04/29/10	Checked By:	jdt
Depth :	8-10 ft	Test Id:	178361		
Test Comment:	---				
Sample Description:	Wet, gray silt				
Sample Comment:	---				

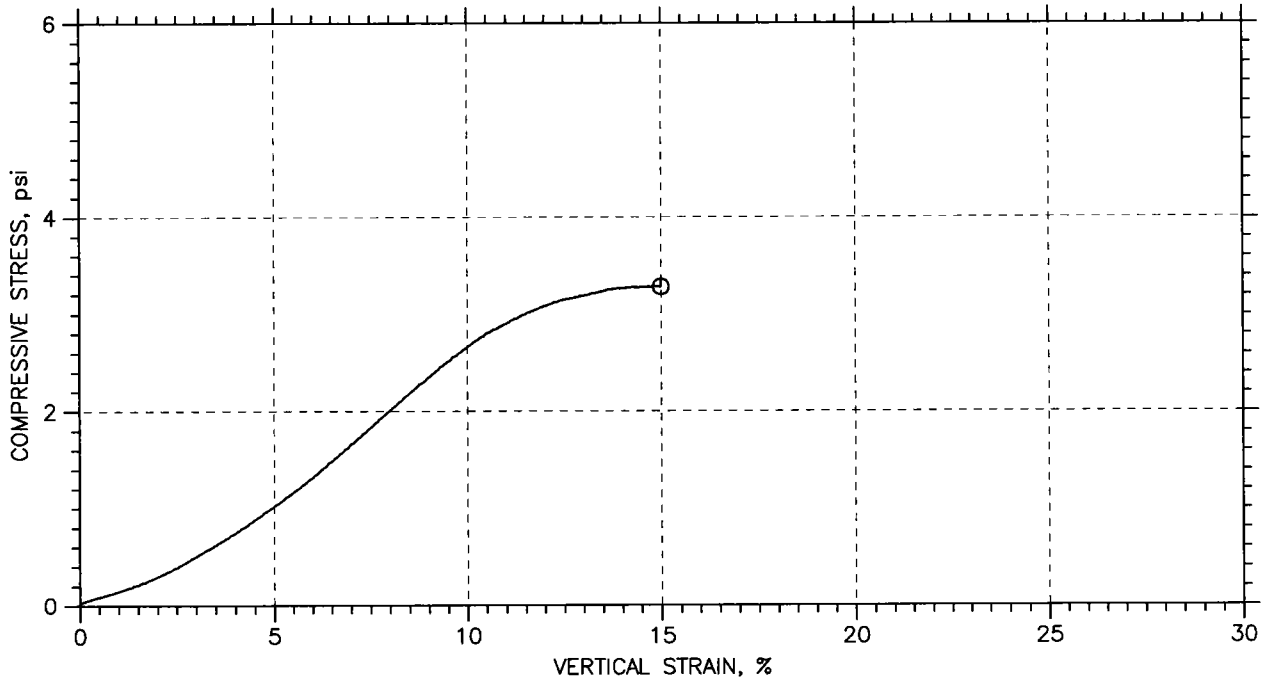
Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	S-3	TS-20	8-10 ft	41	33	24	9	2	silt (ML)

Sample Prepared using the WET method
5% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

UNCONFINED COMPRESSION TEST REPORT - ASTM D 2166



Symbol		⊙			
Test No.		UC-1			
Initial	Diameter, in	1.5			
	Height, in	3.1			
	Water Content, %	35.84			
	Dry Density, pcf	83.57			
	Saturation, %	95.16			
	Void Ratio	1.02			
Unconfined Compressive Strength, psi		3.285			
Undrained Shear Strength, psi		1.642			
Time to Failure, min		14.425			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.70			
Liquid Limit		---			
Plastic Limit		---			
Plasticity Index		---			
Failure Sketch					

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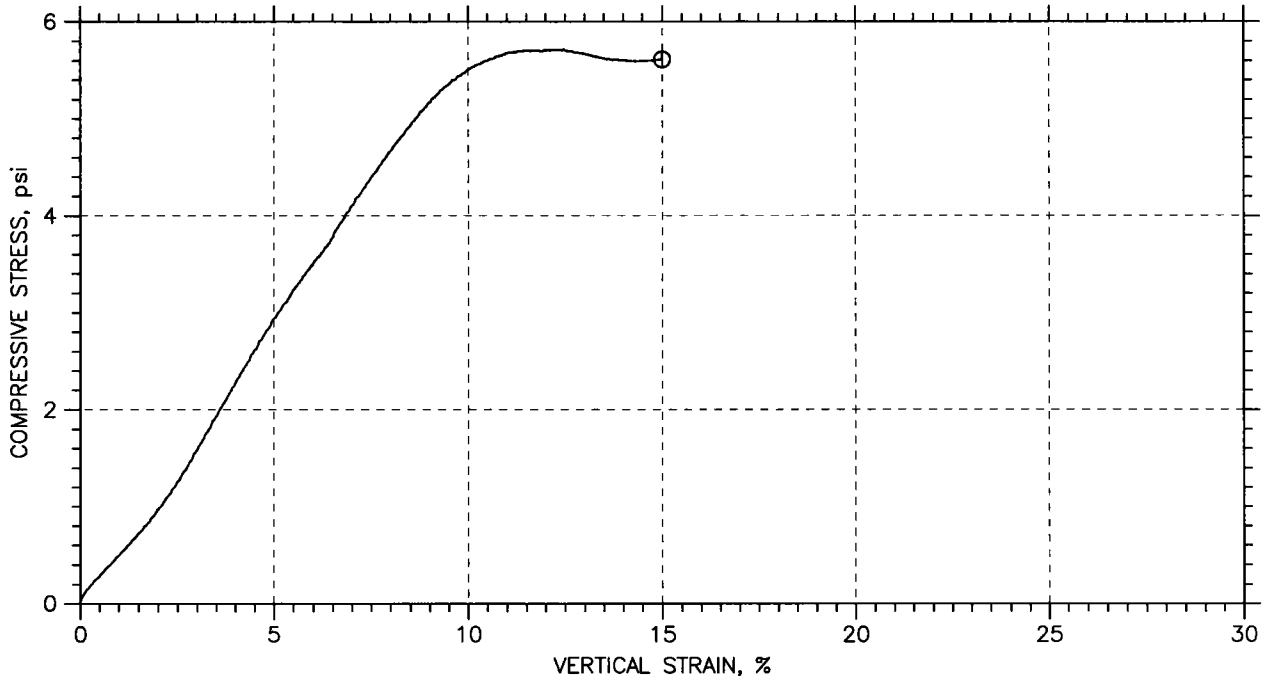
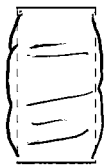
Project: South Coast Rail
Location: MA
Project No.: GTX-9764
Boring No.: TS-3
Sample Type: tube
Description: Moist, gray clay
Remarks: System Q - Depth: 8-10 ft

UNCONFINED COMPRESSION TEST REPORT - ASTM D 2166



Symbol		⏲			
Test No.		UC-2			
Initial	Diameter, in	1.52			
	Height, in	3.29			
	Water Content, %	32.39			
	Dry Density, pcf	89.85			
	Saturation, %	99.83			
	Void Ratio	0.876			
Unconfined Compressive Strength, psi		5.716			
Undrained Shear Strength, psi		2.858			
Time to Failure, min		14.091			
Strain Rate, %/min		1			
Estimated Specific Gravity		2.70			
Liquid Limit		---			
Plastic Limit		---			
Plasticity Index		---			
Failure Sketch					

GeoTesting express
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Project: South Coast Rail
Location: MA
Project No.: GTX-9764
Boring No.: TS-24
Sample Type: tube
Description: Moist, gray clay
Remarks: System Q - Depth: 8-10 ft

APPENDIX C: GEOTECHNICAL CALCULATIONS

- Allowable Bearing Capacity and Estimated Settlement
- Seismic Site Class Evaluation

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617/242-9222

JOB	MBTA South Coast Rail		
SUBJECT	Taunton Station		
CALCULATED BY	DH	**DATE**	2/10/2012
CHECKED BY	AH/PJM	**DATE**	2/14/2012

PURPOSE: Evaluate bearing resistance for platform shallow foundations.

REFERENCE: AASHTO LRFD Bridge Design Specifications, 2010

ASSUMPTIONS:
- Platform footing is 7 ft wide by 10 ft long.
- Bearing surface is compacted Gravel Borrow overlying poorly graded sand (SP) or sandy silt (ML).
- Footing embedment is at least 4 feet below ground surface.
- Groundwater level is at 6 feet below surface.
- Footing eccentricity is assumed to be zero.
- Estimated soil properties (experience, geotech literature, Table 10.4.6.2.4-1):

	γ (pcf)	ϕ
Gravel Borrow:	125	34

BEARING CAPACITY FACTORS (Table 10.6.3.1.2a-1):

	ϕ	N_c	N_q	N_γ
Gravel Borrow:	34	42.2	29.4	41.1

CALCULATE EFFECTIVE FOOTING WIDTH (B'):

$e < B/4$ (Section 10.6.3.3)

where: B = footing width (ft) = 7
e = eccentricity (ft)

Assume no footing eccentricity, thus, e = 0

B' = B-2e 7

NOMINAL BEARING RESISTANCE (q_n):

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B' N_{\gamma m} C_{w\gamma}$ (Eqn. 10.6.3.1.2a-1)

where:
- c = cohesion = 0
- γ = total unit weight = 125
- D_f = depth of footing (ft) = 4 Assumed
- B' = effective width of footing (ft) = 7
- L = length of footing (ft) = 10
- B'/L = 0.70
- D_f /B' = 0.57
- C_{wq} $C_{w\gamma}$ = groundwater correction factors (using B')
- C_{wq} = 1.0 (Table 10.6.3.1.2a-2)
- $C_{w\gamma}$ = 0.6 (Table 10.6.3.1.2a-2)

N_{cm} N_{qm} $N_{\gamma m}$ = bearing capacity factors

$N_{qm} = N_q s_q d_q i_q$ (Eqn. 10.6.3.1.2a-3)

s_q = 1.47 (Table 10.6.3.1.2a-3)

d_q = 1.20 (Table 10.6.3.1.2a-4)

i_q = 1.0 (see AASHTO p. 10-62)

N_{qm} = 51.9

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JOB	MBTA South Coast Rail		
SUBJECT	Taunton Station		
CALCULATED BY	DH	DATE	2/10/2012
CHECKED BY	AH/PJM	DATE	2/14/2012

$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$

s_γ = 0.72 (Table 10.6.3.1.2a-3)

i_γ = 1 (see AASHTO p. 10-62)

$N_{\gamma m}$ = 29.6

q_n = 33,737 psf

ALLOWABLE BEARING RESISTANCE (q_a):

$q_a = q_n/FOS$

where: FOS = factor of safety = 2.5 for granular soil

q_a = 13,495 psf

use

q_a = 13.49 ksf strength limit value

Note: Based on the existence of underlying clay/silt soils, an allowable bearing capacity of 3 ksf is recommended.

Elastic Settlement Calculations:

$$S_e = \frac{(q_o\,(1-\nu^2)\sqrt{A'})}{144 E_s \beta_z}$$ eqn. 10.6.2.4.2-1

where: q_o = applied vert. stress (ksf)
v = Poisson's Ratio
E_s = Young's Modulus (ksi)
β_z = Shape/Rigidity Factor

v = Poisson's Ratio =	0.30	(Table C10.4.6.3-1)
E_s = Young's Modulus (ksi) =	6.00	(Table C10.4.6.3-1)
β_z = Shape/Rigidity Factor =	1.08	(Table 10.6.2.4.2-1)

where:

B' = eff. width of footing (ft) =	7	(from bearing resistance calcs)
L = length of footing (ft):	10	(from bearing resistance calcs)
A' =(B'xL) = footing area (ft^2):	70	ft^2

Settlement (S_e) for a given q_o:

q_o = applied vertical stress (ksf) = 3.00 ksf (assumed)

Se (inches) = 0.29 inches

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JOB	MBTA South Coast Rail		
SUBJECT	Taunton Station		
CALCULATED BY	DH	**DATE**	2/10/2012
CHECKED BY	AH/PJM	**DATE**	2/14/2012

Taunton Station - Consolidation Settlement Calculation

Platform Boring	**TS-1**	**TS-2**	**TS-3**	**TS-4**	**TS-5**	
Existing Ground Elevation (ft)	19	18	17	16	16	
Assumed Groundwater Elevation (ft)	13	12	11	10	10	
Assumed New Fill Height (ft)	3.2	3.9	4.6	5	4.3	
Assumed Final Ground Elevation (ft)	22.2	21.9	21.6	21	20.3	
Assumed Bottom of Footing Elevation (ft)	18.2	17.9	17.6	17	16.3	
Fill Surcharge (ksf)	0.38	0.47	0.55	0.60	0.52	
Soft Layer Top Elevation(ft)	9.5	8	8	6	3	
Soft Layer Bottom Elevation(ft)	-18	-1	-17	-12	-17	
Soft Layer Midpoint Elevation(ft)	-4.25	3.5	-4.5	-3	-7	
Thickness of Soft Layer (ft)	27.5	9	25	18	20	
Enlarged B (ft)	29.45	21.40	29.10	27.00	30.30	
Enlarged L (ft)	32.45	24.40	32.10	30.00	33.30	
Enlarged Compression Area (ft^2)	955.65	522.16	934.11	810.00	1008.99	
Footing Surcharge at the midpoint of soft layer (ksf)	0.12	0.22	0.12	0.14	0.12	
Initial Vertical Stress at Midpoint (ksf)	1.71	1.21	1.61	1.47	1.70	
Final Vertical Stress at Midpoint (ksf)	2.22	1.90	2.29	2.21	2.33	< P_c Overconsolidated
RR	0.038	0.038	0.038	0.038	0.038	
Consolidation Settlement (inches)	**1.42**	**0.81**	**1.74**	**1.47**	**1.26**	

Assumptions:

1. Assume groundwater level is at 6 feet below existing ground surface.
2. Use 2:1 method to calculate the surcharge at the midpoint of the clay layer.
3. PI value from lab test data of TS-2, S4 was applied to all borings.
4. RR value based on lab test data of TS-2, S4 was applied to all borings.

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Assumptions (Cont'd):

B' = effective width of footing =	7.00	ft	
L = length of footing =	10.00	ft	
P = vertical load at bottom of footing =	210.00	kips	
Weight of Excavated Soil =	6.72	kips	TS-1
Footing Surcharge at bottom of footing =	2.90	ksf	
c_{min} = minimum cohesion =	0.50	ksf	TS-3, S6
PI = plasticity index =	4		TS-2, S4
PL = plastic limit =	22	%	TS-2, S4
w = water content =	37	%	TS-2, S4
P_c = preconsolidation pressure =	4.31	ksf	
RR = recompression ratio =	0.038		

Equations used in the calculations:

$$\delta_c = \frac{C_c}{1 + e_o} H \log\left(\frac{\sigma'_{vf}}{\sigma'_{vo}}\right)$$

$$P_c = \frac{c}{0.1 + 0.004PI}$$

$$C = \frac{1 + e_o}{C_c}$$

$$RR = 0.001598 + 0.0007160w + 0.0004613PL$$

$$\delta_c = \frac{1}{C} H \log\left(\frac{\sigma'_{vf}}{\sigma'_{vo}}\right)$$

Taunton Station Seismic Site Class Evaluation

Based on the platform boring with the deepest soil overburden and lowest average blow counts (worst case)

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
TS-03	S-1	6	4	0.67	
	S-2	11	5	0.45	
	S-3	11	5	0.45	
	S-4	5	5	1.00	
	S-5	7	5	0.71	**18**
	S-6	6	5	0.83	
	S-7	7	5	0.71	
	S-8	25	4	0.16	
	Bedrock	100	62	0.62	
	Total Depth =	100			
	Depth to Bedrock =	38	Sum =	5.62	

Approx. Project Coordinates

Lat 41.905783
Long -71.080822

Seismic Coefficients

S_S = 0.24 (Table 1604.10*)
S_1 = 0.062 (Table 1604.10*)

For Site Class D

F_A = 1.6 (See Table 9.4.1.2.4a*)
F_V = 2.4 (See Table 9.4.1.2.4b*)

Design Spectral Response Parameters

$S_{MS} = Ss \times F_A$ = 0.384
$S_{M1} = S_1 \times F_V$ = 0.149

$S_{DS} = 2/3 \times S_{MS}$ = 0.256
$S_{D1} = 2/3 \times S_{M1}$ = 0.099

Per 9.4.1.2.1, $15 < N_{bar} < 50$, Site Class D

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction*.

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods*					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods*
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Rochester	45	110	0.23	0.059
Rockland	45	110	0.26	0.064
Rockport	45	110	0.33	0.073
Rowe	65	100	0.22	0.069
Rowley	55	110	0.34	0.075
Royalston	65	100	0.25	0.070
Russell	65	100	0.23	0.066
Rutland	55	100	0.24	0.068
Salem	45	110	0.31	0.071
Salisbury	55	110	0.35	0.077
Sandisfield	65	90	0.23	0.066
Sandwich	35	120	0.22	0.058
Saugus	45	110	0.30	0.070
Savoy	65	90	0.22	0.068
Scituate	45	110	0.27	0.065
Seekonk	55	110	0.24	0.062
Sharon	55	100	0.25	0.065
Sheffield	65	90	0.23	0.066
Shelburne	65	100	0.23	0.068
Sherborn	55	100	0.26	0.066
Shirley	65	100	0.28	0.072
Shrewsbury	55	100	0.25	0.067
Shutesbury	65	100	0.23	0.068
Somerset	55	110	0.23	0.060
Somerville	45	105	0.28	0.069
South Hadley	55	100	0.23	0.066
Southampton	55	100	0.23	0.066
Southborough	55	100	0.26	0.067
Southbridge	55	100	0.23	0.064
Southwick	55	100	0.23	0.065
Spencer	55	100	0.23	0.066
Springfield	55	100	0.23	0.065
Sterling	55	100	0.26	0.069
Stockbridge	65	90	0.22	0.066
Stoneham	45	105	0.30	0.071
Stoughton	55	100	0.26	0.065
Stow	55	100	0.27	0.069
Sturbridge	55	100	0.23	0.065
Sudbury	55	100	0.27	0.069
Sunderland	65	100	0.23	0.068
Sutton	55	100	0.24	0.065
Swampscott	45	110	0.30	0.070
Swansea	55	110	0.24	0.061
Taunton	55	110	0.24	0.062
Templeton	65	100	0.25	0.070
Tewksbury	55	100	0.31	0.073
Tisbury	35	120	0.18	0.052
Tolland	65	100	0.23	0.066
Topsfield	45	110	0.33	0.074
Townsend	65	100	0.28	0.072
Truro	35	120	0.22	0.057

Stormwater Report

Taunton Depot Station

City of Taunton, Massachusetts

Prepared for massDOT

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by VHB **/Vanasse Hangen Brustlin, Inc.**

Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

Table of Contents

Checklist for Stormwater Report **1**
Stormwater Report Narrative **3**
Project Description **3**
Site Description **3**
Existing Drainage Conditions **4**
Proposed Drainage Conditions **5**
Regulatory Compliance **11**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas

List of Tables

Table 1: Wetland Resource Areas
Table 2: Existing Conditions Hydrologic Data
Table 3: Proposed Conditions Hydrologic Data
Table 4: Peak Discharge Rates (cfs)
Table 5 Summary of Recharge Calculations

Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

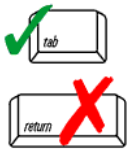
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

☒ The ½" or 1" Water Quality Volume or

☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

The Applicant, MassDOT, is proposing to construct a commuter rail station (the Project) at Taunton Depot Shopping Mall, Taunton Depot Drive in Taunton, Massachusetts along the New Bedford Main Line. As proposed, the Project will require approximately 13 acres of land acquisition, of which approximately 6 acres will be developed for the new station, with the remaining land mostly vegetated wetlands. The Project will involve a center platform with canopy, ancillary landscape improvements, 398 parking spaces, a pick up/drop off area, bicycle parking facilities, and utility improvements to support this use. The Project will also construct a sidewalk that connects the station to the existing sidewalk on Taunton Depot Drive and to the Taunton Gardens apartment complex.

The site is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Site Description

The Project Site consists of approximately 6 acres of land (the Site) located at Taunton Depot Drive in Taunton, Massachusetts (see Figure 1 & 2). Vegetated wetlands surround the Site on south, west, and north sides with the New Bedford Main Line tracks to the west of the wetlands. The Site is west of the Taunton Depot Shopping Center and is bound by retail buildings to the east and vegetated area and wetlands to the north, west, and south. The New Bedford Main Line tracks are on an elevated berm to the west, just beyond the wetlands. There is an existing stormwater basin for the shopping center drainage system located to the immediate southeast of the Site. A paved driveway leads to a pump station in the northwest corner of the Site and there are many dirt paths throughout the Site. See Figure 1, Site Locus Map.

Wetland Resource Areas on the Site, shown in Figures 3 and 4, are described in Table 1. For additional information regarding the wetland resource areas present on the site see the Abbreviated Notice of Resource Area Delineation (ANRAD) prepared by VHB dated May 2011.

Table 1
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*Description*
Wetland 1 (TCM-7 East)	No	No	No	No	PFO/PEM
Wetland 3	No	No	No	No	Deep Marsh

Notes: Wetland Classifications: PEM = Palustrine Emergent, PFO = Palustrine Forested

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Deerfield loamy sand, Scarboro mucky loamy fine sand, Whitman fine sandy loam, and Hinckley sandy loam, and are classified as Hydrologic Soil Groups (HSG) B, D, D, and A, respectively. Based on the soil evaluation, the Site is not considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour). Most of the Site has A and B soils which, according to 1982 Rawls Rates, infiltration rates for the soils will be approximately 1.02 inches per hour.

The project is not located within the 100-year flood plain as shown on FEMA Floodway Map, City of Taunton, Massachusetts Bristol County, Community Panel number 25005C0164F dated July 7, 2009, included in Appendix B.

Existing Drainage Conditions

Under existing conditions, the Site consists of mostly cleared, undeveloped land, and is generally surrounded by vegetated wetlands. The Site is primarily dirt and gravel with some pockets of scrub shrubs and grass. There are dirt paths throughout the site and a paved driveway is in the northeast corner of the Site. Runoff sheet flows across the Site, resulting in considerable erosion and deposition into the wetlands. Groundwater is high throughout the Site, ranging from one to four feet below grade in the upland area. For the existing conditions hydrologic analysis, the site was divided into two drainage areas that contribute to two design points. The following is a summary of each drainage area.

Drainage Area 1 – This approximately 5.0-area comprises the majority of the Site and stretches from the northeast portion of the Site, across the northern and western parts, to the southwestern edge. The area consists of bare earth dirt and gravel with many pockets of sparse grass and a few clumps of saplings. Runoff from Drainage Area 1 flows in a westerly direction to Wetland 1 on the west side of the site.

Drainage Area 2 – This approximately 1.0-acre area in the southeast portion of the Site consists of bare earth dirt and gravel with many pockets of sparsely grassed landscape. Lightly wooded areas are minimally present as well. Runoff from Drainage Area 2 flows in a southerly direction to Wetland 2 on the south side of the site.

Figure 3 illustrates the existing drainage patterns on the Site. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland 1	1	4.97	67	13.3
2	Wetland 3	2	0.99	63	9.1

Proposed Drainage Conditions

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into five drainage areas that discharge treated stormwater to the two existing Design Points. The runoff from the paved areas is split between three drainage areas that flow to three lined bioretention basins, used to control peak rates and treat the stormwater. Existing drainage and grading patterns were maintained to the maximum extent possible. Drainage Areas 1, 2, and 4 flow to Design Point 1 and Drainage Areas 3 and 5 flow to Design Point 2. Low impact development stormwater management techniques have been incorporated into the design. These practices are focused on decentralizing stormwater management techniques into the design that will reduce peak runoff rates and treat for water quality. Water quality basins are dispersed around the perimeter of the development area. The following is a summary of each drainage area.

Drainage Area 1 – This 1.99-acre area in the northern portion of the site consists of a paved parking area for the station and Bioretention Basin 1 to the north of the parking. Runoff from Drainage Area 1 is directed through drainage grates in the sidewalk to Bioretention Basin 1, which discharges to Wetland 1.

Drainage Area 2 – This 1.35-acre area in the southern portion of the site consists of a paved parking area for the station and Bioretention Basin 2 to the south of the parking. Runoff from Drainage Area 2 is directed to Bioretention Basin 2, which discharges to Wetland 1.

Drainage Area 3 – This 1.35-acre area in the east portion of the site consists of the entrance drive, some of the paved parking for the station, grassed landscape area, and Bioretention Basin 3 to the south of the parking. Runoff from Drainage Area 3 is directed to a grassed swale that flows to Bioretention Basin 3, which discharges to Wetland 3.

Drainage Area 4 – This 1.00-acre area wraps around the perimeter of the site from the northeast corner, around the northwest portion of the Site, to the southwest corner. The area consists mostly of sloped grassed areas but also includes the new paved entranceway to the pump station. Runoff from the new pavement is captured by a grassed swale which flows to Wetland 1. Runoff from the rest of Drainage Arera 4 flows directly to Wetland 1.

Drainage Area 5 – This 0.29-acre area wraps around the southeastern perimeter of the site and consists of sloped grassed areas. Runoff flows directly to Wetland 3.

Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland 1	1	1.99	92	5.0
2	Wetland 1	1	1.35	97	5.0
3	Wetland 3	2	1.35	77	5.3
4	Wetland 1	1	1.00	66	5.0
5	Wetland 3	2	0.29	65	8.9

Integrated into the site design is a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. The proposed stormwater management system has been designed to treat the half inch Water Quality Volume.

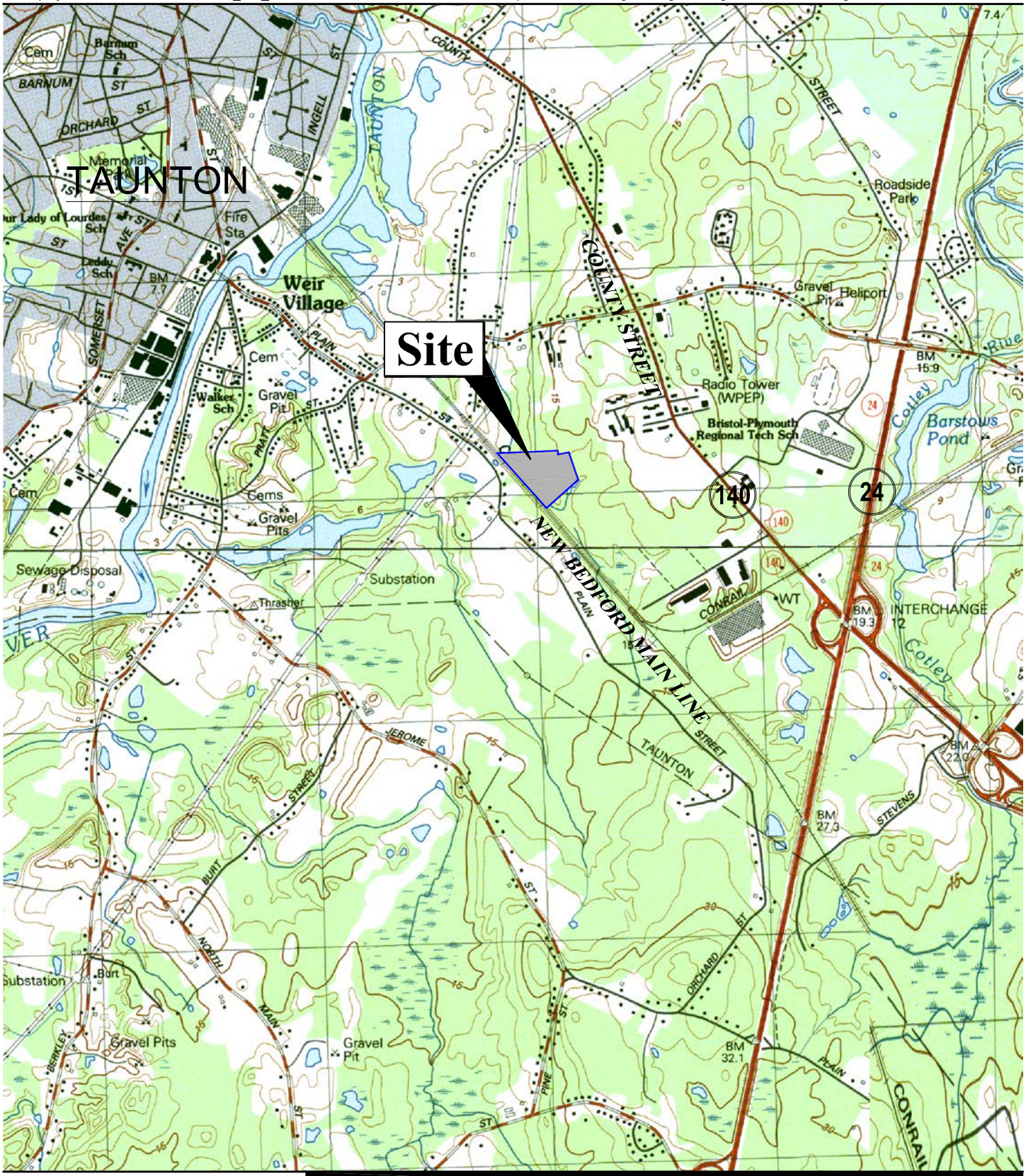
Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Bioretention basins
- Light colored pavement sidewalks
- Grassed swale

Most of the runoff from Drainage Area 3 will sheet flow to a grass swale before it is connected to bioretention Basin 3. The bioretention basins have been designed with soils to mimic the hydrology of the existing conditions in the upland areas

\\Vhb\proj\Boston\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Taunton Depot\Stormwater Figures\Figure 1\Figure 1-Site Locus.dwg



Vanasse Hangen Brustlin, Inc.

0 1000 2000 Feet

USGS Locus Map

Taunton Depot Station
South Coast Rail
Taunton, Massachusets

Figure 1
May 2012

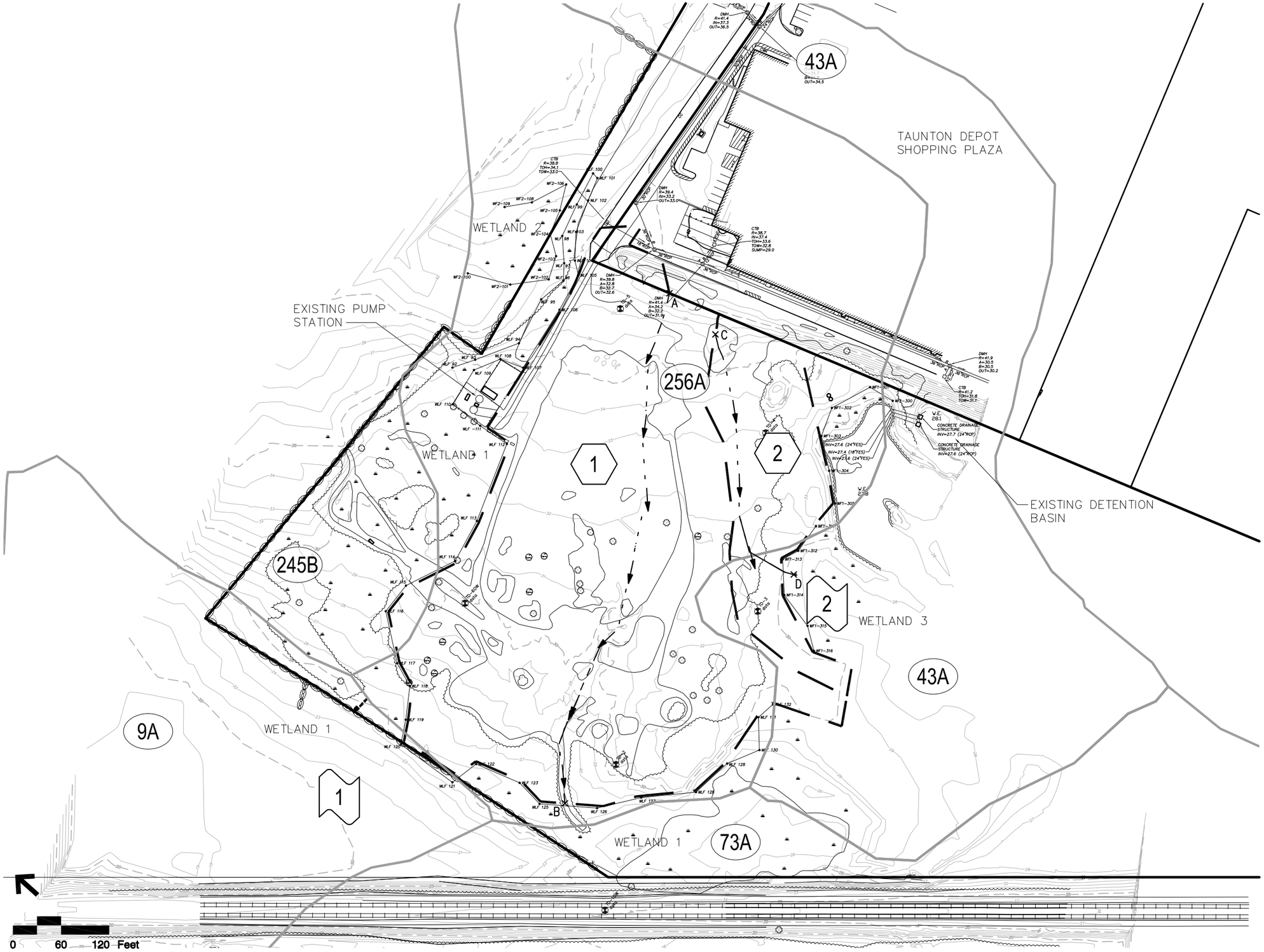
Vanasse Hangen Brustlin, Inc.

0 250 500 Feet

Site Aerial Map

Taunton Depot Station
South Coast Rail
Taunton, Massachusets

Figure 2
May 2012



LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WF1-300 — WF1-301 — WETLAND BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

- 245B — HINCKLEY SANDY LOAM
- 256A — DEERFIELD LOAMY SAND
- 43A — SCARBORO FINE SANDY LOAM
- 73A — WHITMAN FINE SANDY LOAM
- 9A — BIRDSALL SILT LOAM

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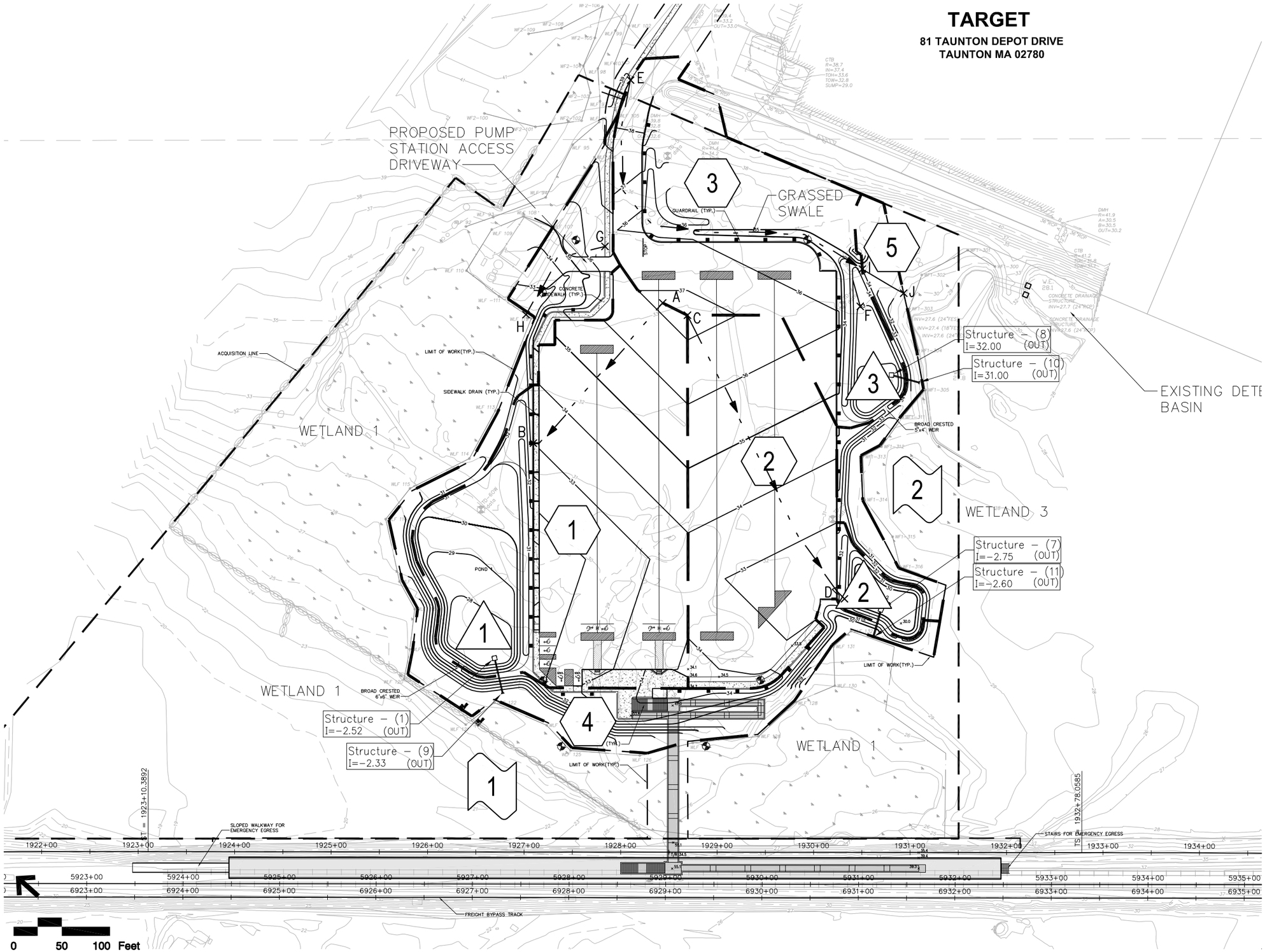
Figure 3 May 2012

Existing Conditions Drainage Areas

South Coast Rail
Taunton, Massachusetts

TARGET

81 TAUNTON DEPOT DRIVE
TAUNTON MA 02780



LEGEND

- SUBCATCHMENT DRAINAGE AREA DESIGNATION
- POND
- DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WETLAND BOUNDARY (WF1–300 … WF1–301)
- LIMIT OF ACQUISITION
- LIMIT OF WORK

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Figure 4 May 2012

Proposed Conditions Drainage Areas

South Coast Rail
Taunton, Massachusetts

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Drainage basin outlets have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMPs that impound stormwater have been designed with stone to protect downgradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point 1: Wetland 1			
Existing	3.1	7.2	15.2
Proposed	3.0	5.3	10.9
Design Point 2: Wetland 3			
Existing	0.5	1.3	3.0
Proposed	0.4	1.0	2.9

Standard 3: Stormwater Recharge

As described in the site description, the existing surface soils on the Site are comprised primarily of HSG B soils and provide an infiltration rate of approximately 1.02 inches per hour, according to 1982 Rawls Rates. In addition to the soil parameters, the Site has both a flat geography and a seasonal high groundwater table approximately one foot below existing grade that hinder the ability to provide the required two foot separation between the bottom of an infiltration structure and the seasonal high groundwater table. In existing conditions, however, infiltration on the site provides subsurface flow to wetland resource areas along the Site's border.

In an effort to mimic the Site's natural hydrology and meet the intent of the recharge requirements of Standard 3, the onsite bioretention basins have been oversized for treatment and exceed the Required Recharge Volume. The bioretention basins are required to be lined due to the elevation of the seasonal high groundwater table that does not allow for a separation of greater than two feet from the bottom of the bioretention basins. The soil within the bioretention basins however will be designed to approximate the infiltration rates of the existing soils (1.02 inches per hour) and provide two feet of depth in order to mimic the necessary separation from the seasonal high groundwater table and exceed that of existing conditions. After runoff is filtered through the two feet of biofiltration soil media, underdrains within the bioretention basins will slowly convey water to the wetland resource areas that surround the site, mimicking the base flows to the wetlands provided by the subsurface flows of the existing conditions.

A Geotechnical Report is included in Appendix E. The report indicates that the site has high groundwater so the basins will be lined.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide a minimum of 80% TSS removal for stormwater runoff from all proposed impervious surfaces.

Computations and supporting information are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is not considered a LUHPPL as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is not a redevelopment.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 6.0 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIR/S. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

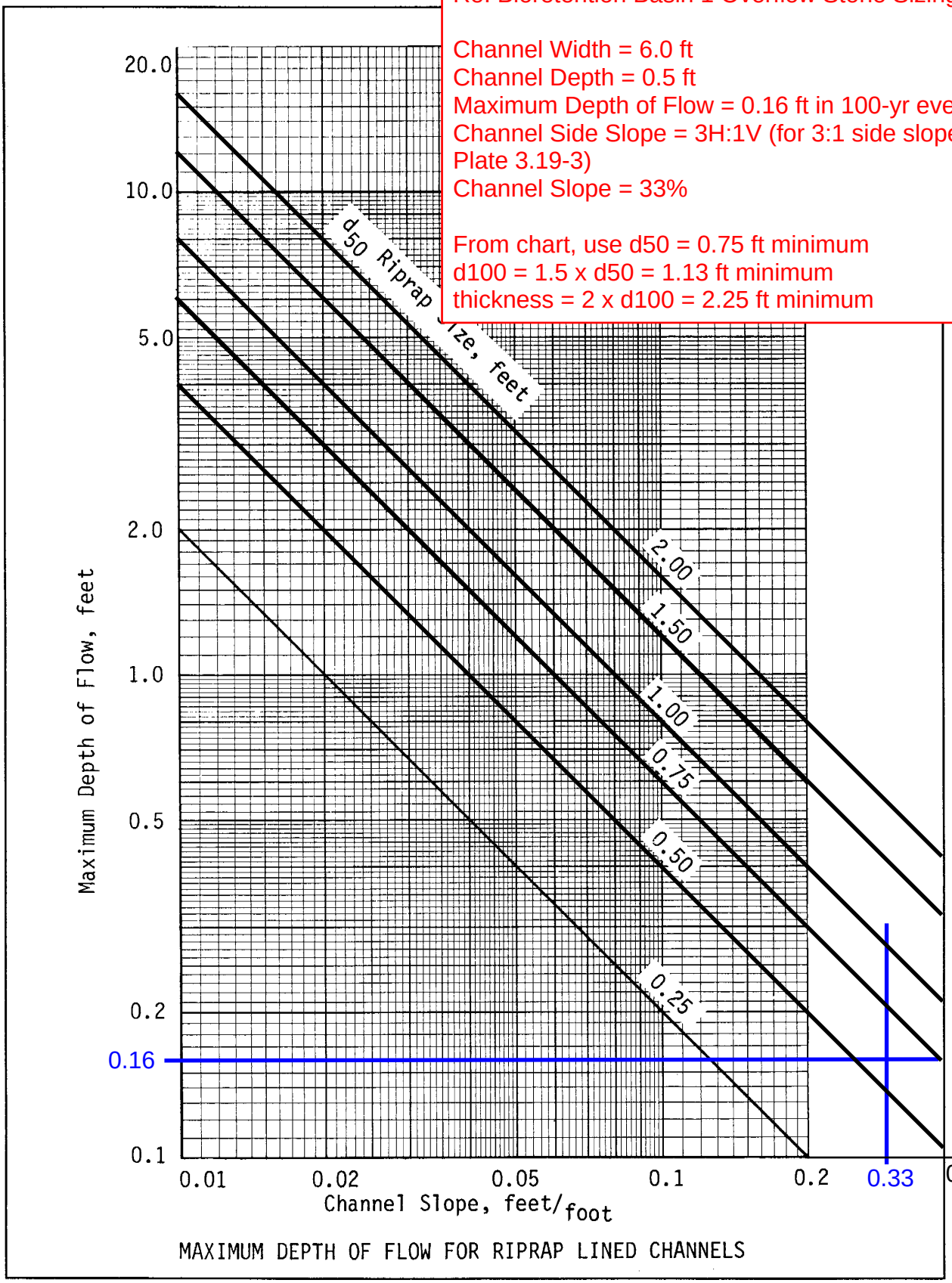
The site was previously undeveloped and no sanitary sewer or storm drainage infrastructure is known to exist on the site. The design plans submitted with this report have been designed in full compliance with current standards. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

Appendix A
Standard 1 Computations and Supporting Information

Project No: 10111 Project Name: SCR
Date: April 2012 Location: Taunton, MA
Calculated By: EJM
Re: Bioretention Basin 1 Overflow Stone Sizing

Channel Width = 6.0 ft
Channel Depth = 0.5 ft
Maximum Depth of Flow = 0.16 ft in 100-yr event
Channel Side Slope = 3H:1V (for 3:1 side slope, use Plate 3.19-3)
Channel Slope = 33%

From chart, use d50 = 0.75 ft minimum
d100 = 1.5 x d50 = 1.13 ft minimum
thickness = 2 x d100 = 2.25 ft minimum



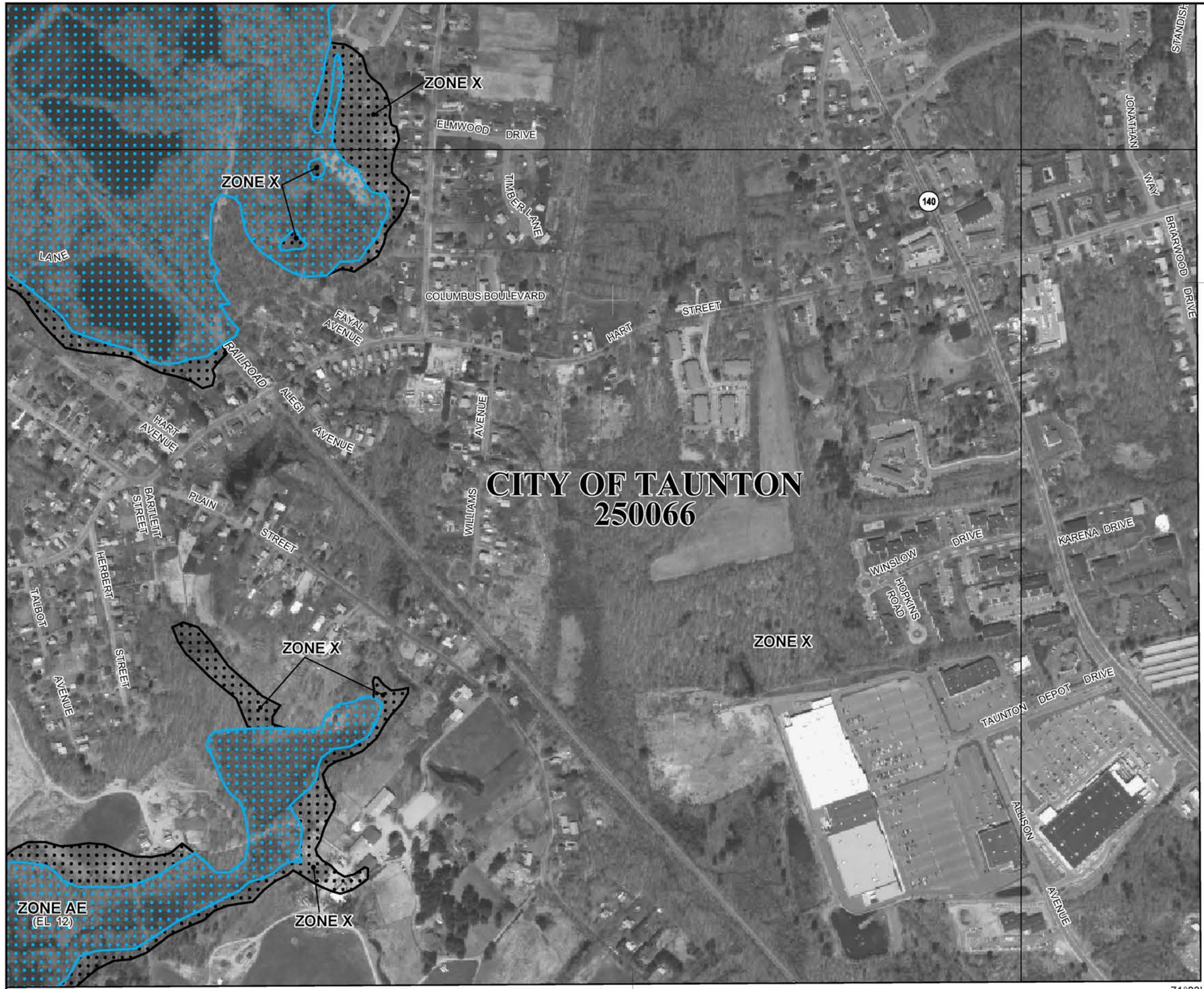
Source: VDOT Drainage Manual Plate 3.19-3

*Sizing calculations represent minimum stone size. Larger stone may be required per detail plans.

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Map



848524 M

MAP SCALE 1" = 500'

250 0 500 1000 FEET METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0164F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 164 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RAYNHAM, TOWN OF	250061	0164	F
TAUNTON, CITY OF	250066	0164	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0164F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

41°52'30.00"

71°03'45.00"

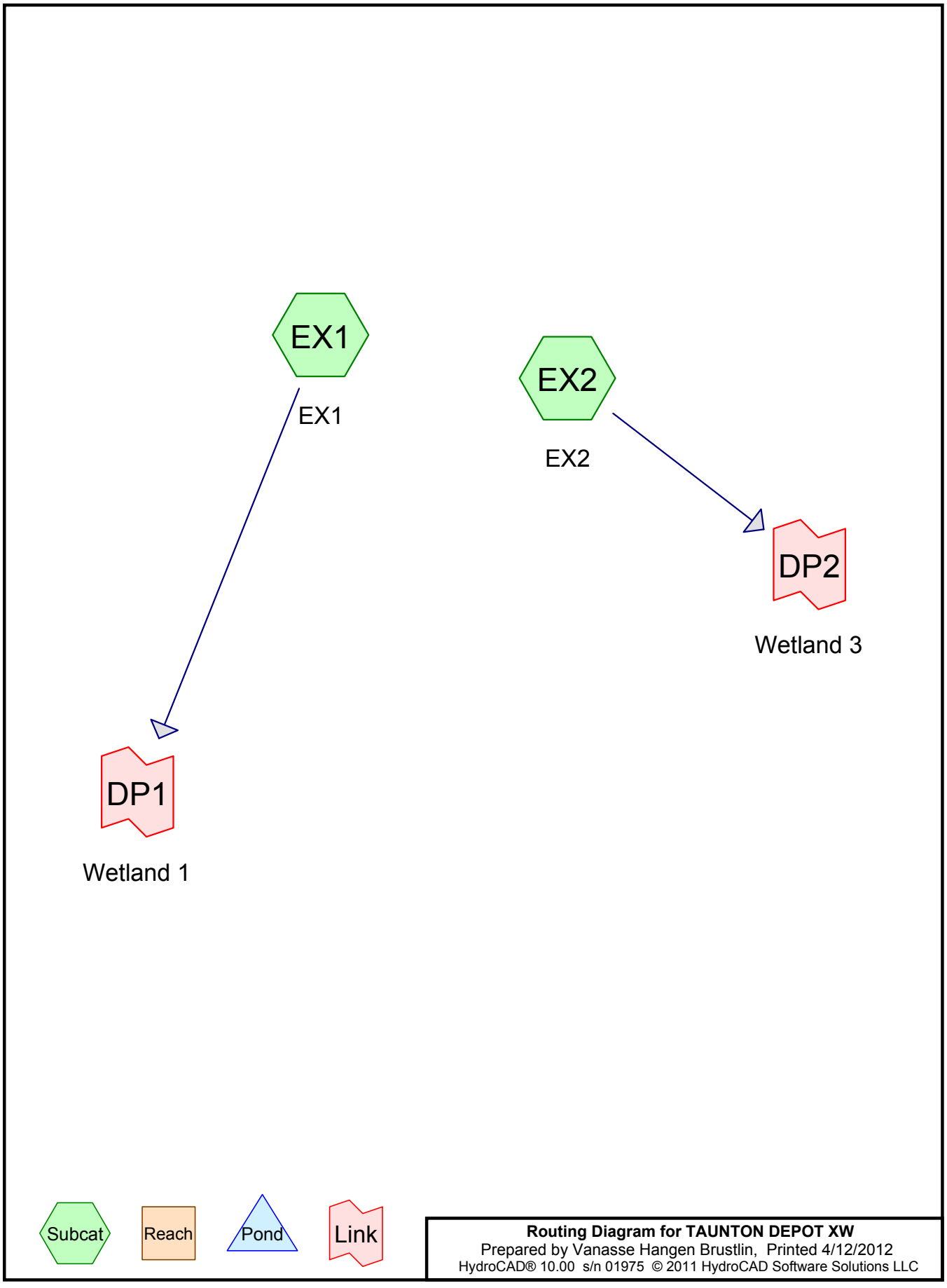
24 M

JOINS PANEL 0252

236048 M

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

HydroCAD Analysis: Existing Conditions



Routing Diagram for TAUNTON DEPOT XW
Prepared by Vanasse Hangen Brustlin, Printed 4/12/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.051	39	>75% Grass cover, Good, HSG A (EX1)
0.849	55	Woods, Good, HSG B (EX1, EX2)
3.261	61	>75% Grass cover, Good, HSG B (EX1, EX2)
0.010	72	Dirt roads, HSG A (EX1)
0.282	77	Woods, Good, HSG D (EX1, EX2)
0.151	80	>75% Grass cover, Good, HSG D (EX1, EX2)
1.243	82	Dirt roads, HSG B (EX1)
0.110	98	Paved parking, HSG B (EX1)
5.957	**66**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 Runoff Area=4.967 ac 2.21% Impervious Runoff Depth=0.79"
Flow Length=699' Tc=13.3 min CN=67 Runoff=3.12 cfs 0.329 af

Subcatchment EX2: EX2 Runoff Area=0.990 ac 0.00% Impervious Runoff Depth=0.61"
Flow Length=337' Tc=9.1 min CN=63 Runoff=0.48 cfs 0.050 af

Link DP1: Wetland 1 Inflow=3.12 cfs 0.329 af
Primary=3.12 cfs 0.329 af

Link DP2: Wetland 3 Inflow=0.48 cfs 0.050 af
Primary=0.48 cfs 0.050 af

Total Runoff Area = 5.957 ac Runoff Volume = 0.379 af Average Runoff Depth = 0.76"
98.15% Pervious = 5.847 ac 1.85% Impervious = 0.110 ac

Summary for Subcatchment EX1: EX1

Runoff = 3.12 cfs @ 12.21 hrs, Volume= 0.329 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG B
0.051	39	>75% Grass cover, Good, HSG A
2.786	61	>75% Grass cover, Good, HSG B
0.085	80	>75% Grass cover, Good, HSG D
0.574	55	Woods, Good, HSG B
0.108	77	Woods, Good, HSG D
0.010	72	Dirt roads, HSG A
1.243	82	Dirt roads, HSG B
4.967	67	Weighted Average
4.857		97.79% Pervious Area
0.110		2.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	38	0.0790	0.25		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.2	12	0.0420	1.25		**Sheet Flow, Dirt B** Smooth surfaces n= 0.011 P2= 3.40"
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.5	44	0.0450	1.48		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0230	1.06		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.6	75	0.0130	0.80		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
4.9	158	0.0060	0.54		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
1.1	136	0.0150	1.97		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.7	75	0.0130	1.84		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
13.3	699	Total			

Summary for Subcatchment EX2: EX2

Runoff = 0.48 cfs @ 12.16 hrs, Volume= 0.050 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.275	55	Woods, Good, HSG B
0.174	77	Woods, Good, HSG D
0.475	61	>75% Grass cover, Good, HSG B
0.066	80	>75% Grass cover, Good, HSG D
0.990	63	Weighted Average
0.990		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.1	75	0.0267	1.14		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.5	104	0.0096	0.69		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.2	54	0.0210	0.72		**Shallow Concentrated Flow, Woods D** Woodland Kv= 5.0 fps
0.2	14	0.0310	1.23		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.5	28	0.0196	0.98		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	1.45		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
9.1	337	Total			

Summary for Link DP1: Wetland 1

Inflow Area = 4.967 ac, 2.21% Impervious, Inflow Depth = 0.79" for 2 yr storm event
Inflow = 3.12 cfs @ 12.21 hrs, Volume= 0.329 af
Primary = 3.12 cfs @ 12.21 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

Inflow Area = 0.990 ac, 0.00% Impervious, Inflow Depth = 0.61" for 2 yr storm event
Inflow = 0.48 cfs @ 12.16 hrs, Volume= 0.050 af
Primary = 0.48 cfs @ 12.16 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

10-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 Runoff Area=4.967 ac 2.21% Impervious Runoff Depth=1.63"
Flow Length=699' Tc=13.3 min CN=67 Runoff=7.16 cfs 0.675 af

Subcatchment EX2: EX2 Runoff Area=0.990 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=337' Tc=9.1 min CN=63 Runoff=1.29 cfs 0.112 af

Link DP1: Wetland 1 Inflow=7.16 cfs 0.675 af
Primary=7.16 cfs 0.675 af

Link DP2: Wetland 3 Inflow=1.29 cfs 0.112 af
Primary=1.29 cfs 0.112 af

Total Runoff Area = 5.957 ac Runoff Volume = 0.787 af Average Runoff Depth = 1.58"
98.15% Pervious = 5.847 ac 1.85% Impervious = 0.110 ac

Summary for Subcatchment EX1: EX1

Runoff = 7.16 cfs @ 12.19 hrs, Volume= 0.675 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG B
0.051	39	>75% Grass cover, Good, HSG A
2.786	61	>75% Grass cover, Good, HSG B
0.085	80	>75% Grass cover, Good, HSG D
0.574	55	Woods, Good, HSG B
0.108	77	Woods, Good, HSG D
0.010	72	Dirt roads, HSG A
1.243	82	Dirt roads, HSG B
4.967	67	Weighted Average
4.857		97.79% Pervious Area
0.110		2.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	38	0.0790	0.25		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.2	12	0.0420	1.25		**Sheet Flow, Dirt B** Smooth surfaces n= 0.011 P2= 3.40"
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.5	44	0.0450	1.48		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0230	1.06		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.6	75	0.0130	0.80		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
4.9	158	0.0060	0.54		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
1.1	136	0.0150	1.97		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.7	75	0.0130	1.84		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
13.3	699	Total			

Summary for Subcatchment EX2: EX2

Runoff = 1.29 cfs @ 12.14 hrs, Volume= 0.112 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.275	55	Woods, Good, HSG B
0.174	77	Woods, Good, HSG D
0.475	61	>75% Grass cover, Good, HSG B
0.066	80	>75% Grass cover, Good, HSG D
0.990	63	Weighted Average
0.990		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.1	75	0.0267	1.14		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.5	104	0.0096	0.69		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.2	54	0.0210	0.72		**Shallow Concentrated Flow, Woods D** Woodland Kv= 5.0 fps
0.2	14	0.0310	1.23		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.5	28	0.0196	0.98		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	1.45		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
9.1	337	Total			

Summary for Link DP1: Wetland 1

Inflow Area = 4.967 ac, 2.21% Impervious, Inflow Depth = 1.63" for 10 yr storm event
Inflow = 7.16 cfs @ 12.19 hrs, Volume= 0.675 af
Primary = 7.16 cfs @ 12.19 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

Inflow Area = 0.990 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10 yr storm event
Inflow = 1.29 cfs @ 12.14 hrs, Volume= 0.112 af
Primary = 1.29 cfs @ 12.14 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

100-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 Runoff Area=4.967 ac 2.21% Impervious Runoff Depth=3.31"
Flow Length=699' Tc=13.3 min CN=67 Runoff=15.15 cfs 1.369 af

Subcatchment EX2: EX2 Runoff Area=0.990 ac 0.00% Impervious Runoff Depth=2.90"
Flow Length=337' Tc=9.1 min CN=63 Runoff=2.97 cfs 0.239 af

Link DP1: Wetland 1 Inflow=15.15 cfs 1.369 af
Primary=15.15 cfs 1.369 af

Link DP2: Wetland 3 Inflow=2.97 cfs 0.239 af
Primary=2.97 cfs 0.239 af

Total Runoff Area = 5.957 ac Runoff Volume = 1.608 af Average Runoff Depth = 3.24"
98.15% Pervious = 5.847 ac 1.85% Impervious = 0.110 ac

Summary for Subcatchment EX1: EX1

Runoff = 15.15 cfs @ 12.19 hrs, Volume= 1.369 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.110	98	Paved parking, HSG B
0.051	39	>75% Grass cover, Good, HSG A
2.786	61	>75% Grass cover, Good, HSG B
0.085	80	>75% Grass cover, Good, HSG D
0.574	55	Woods, Good, HSG B
0.108	77	Woods, Good, HSG D
0.010	72	Dirt roads, HSG A
1.243	82	Dirt roads, HSG B
4.967	67	Weighted Average
4.857		97.79% Pervious Area
0.110		2.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	38	0.0790	0.25		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.2	12	0.0420	1.25		**Sheet Flow, Dirt B** Smooth surfaces n= 0.011 P2= 3.40"
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.5	44	0.0450	1.48		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0230	1.06		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.6	75	0.0130	0.80		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
4.9	158	0.0060	0.54		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
0.2	37	0.0540	3.74		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
1.1	136	0.0150	1.97		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
0.7	75	0.0130	1.84		**Shallow Concentrated Flow, Dirt B** Unpaved Kv= 16.1 fps
13.3	699	Total			

Summary for Subcatchment EX2: EX2

Runoff = 2.97 cfs @ 12.13 hrs, Volume= 0.239 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.275	55	Woods, Good, HSG B
0.174	77	Woods, Good, HSG D
0.475	61	>75% Grass cover, Good, HSG B
0.066	80	>75% Grass cover, Good, HSG D
0.990	63	Weighted Average
0.990		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.1	75	0.0267	1.14		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.5	104	0.0096	0.69		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.2	54	0.0210	0.72		**Shallow Concentrated Flow, Woods D** Woodland Kv= 5.0 fps
0.2	14	0.0310	1.23		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.5	28	0.0196	0.98		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0430	1.45		**Shallow Concentrated Flow, Landscape D** Short Grass Pasture Kv= 7.0 fps
9.1	337	Total			

Summary for Link DP1: Wetland 1

Inflow Area = 4.967 ac, 2.21% Impervious, Inflow Depth = 3.31" for 100 yr storm event
Inflow = 15.15 cfs @ 12.19 hrs, Volume= 1.369 af
Primary = 15.15 cfs @ 12.19 hrs, Volume= 1.369 af, Atten= 0%, Lag= 0.0 min

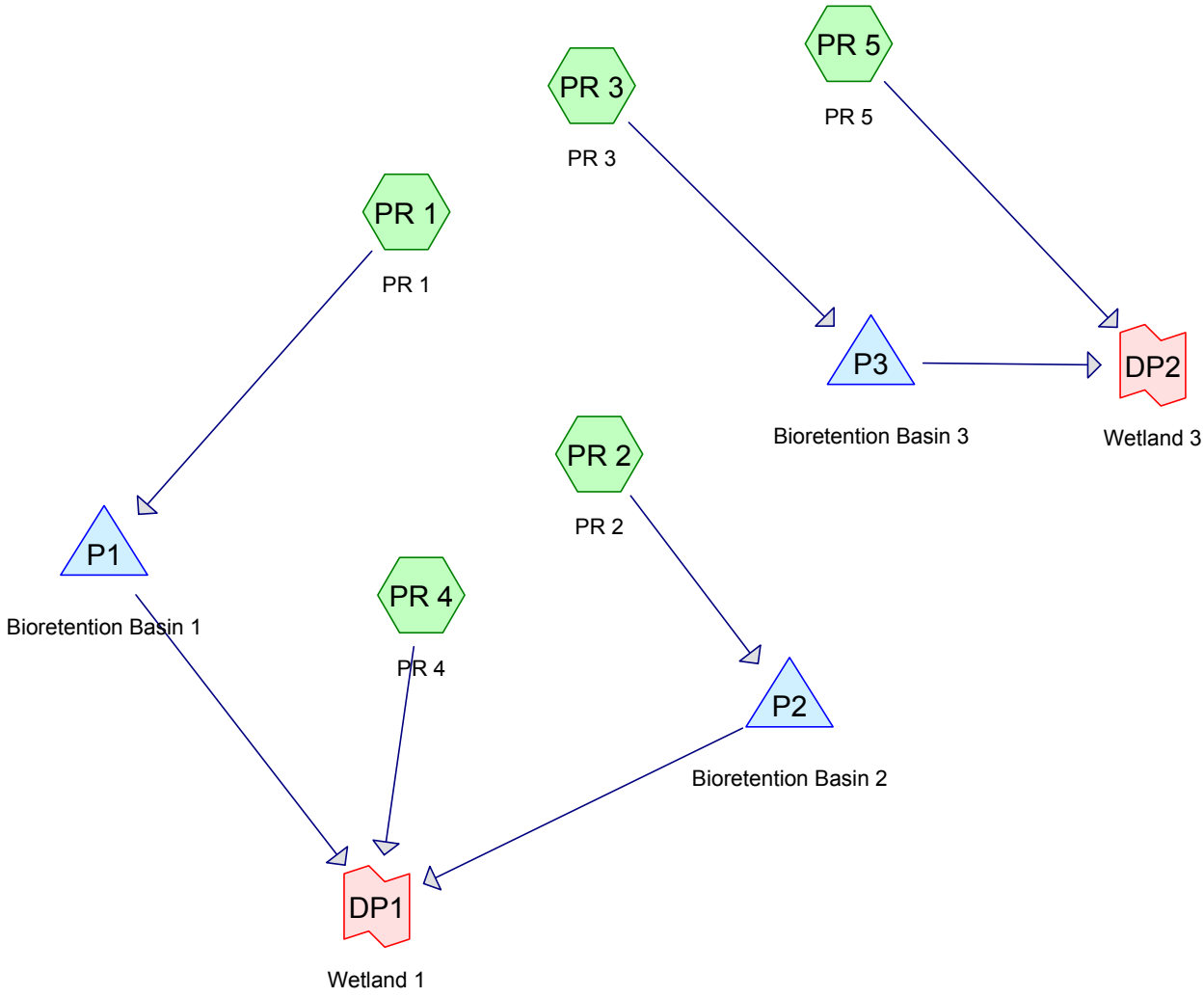
Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

Inflow Area = 0.990 ac, 0.00% Impervious, Inflow Depth = 2.90" for 100 yr storm event
Inflow = 2.97 cfs @ 12.13 hrs, Volume= 0.239 af
Primary = 2.97 cfs @ 12.13 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for TAUNTON DEPOT PR
Prepared by Vanasse Hangen Brustlin, Printed 5/3/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.001	30	Woods, Good, HSG A (PR 4)
0.061	39	>75% Grass cover, Good, HSG A (PR 1, PR 4)
0.411	55	Woods, Good, HSG B (PR 4, PR 5)
1.554	61	>75% Grass cover, Good, HSG B (PR 1, PR 2, PR 3, PR 4, PR 5)
0.107	77	Woods, Good, HSG D (PR 4, PR 5)
0.082	80	>75% Grass cover, Good, HSG D (PR 2, PR 4, PR 5)
3.269	98	Paved parking, HSG B (PR 1, PR 2, PR 3, PR 4)
0.159	98	Paved parking, HSG D (PR 2)
0.242	98	Water Surface, 0% imp, HSG B (PR 1, PR 2)
0.077	98	Water Surface, 0% imp, HSG D (PR 2)
5.963	**84**	**TOTAL AREA**

2-Year Storm Event - Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR 1: PR 1 Runoff Area=1.985 ac 72.34% Impervious Runoff Depth=2.54"
Flow Length=200' Tc=5.0 min CN=92 Runoff=5.96 cfs 0.420 af

Subcatchment PR 2: PR 2 Runoff Area=1.348 ac 90.58% Impervious Runoff Depth=3.06"
Flow Length=337' Tc=5.0 min CN=97 Runoff=4.55 cfs 0.343 af

Subcatchment PR 3: PR 3 Runoff Area=1.348 ac 42.80% Impervious Runoff Depth=1.36"
Flow Length=438' Tc=5.3 min CN=77 Runoff=2.16 cfs 0.152 af

Subcatchment PR 4: PR 4 Runoff Area=0.996 ac 19.48% Impervious Runoff Depth=0.75"
Flow Length=117' Tc=5.0 min CN=66 Runoff=0.76 cfs 0.062 af

Subcatchment PR 5: PR 5 Runoff Area=0.286 ac 0.00% Impervious Runoff Depth=0.70"
Flow Length=50' Tc=8.9 min CN=65 Runoff=0.17 cfs 0.017 af

Pond P1: Bioretention Basin 1 Peak Elev=30.07' Storage=17,870 cf Inflow=5.96 cfs 0.420 af
Outflow=0.04 cfs 0.022 af

Pond P2: Bioretention Basin 2 Peak Elev=31.60' Storage=5,671 cf Inflow=4.55 cfs 0.343 af
Outflow=2.48 cfs 0.288 af

Pond P3: Bioretention Basin 3 Peak Elev=32.87' Storage=2,902 cf Inflow=2.16 cfs 0.152 af
Outflow=0.33 cfs 0.117 af

Link DP1: Wetland 1 Inflow=3.03 cfs 0.372 af
Primary=3.03 cfs 0.372 af

Link DP2: Wetland 3 Inflow=0.39 cfs 0.134 af
Primary=0.39 cfs 0.134 af

Total Runoff Area = 5.963 ac Runoff Volume = 0.995 af Average Runoff Depth = 2.00"
42.51% Pervious = 2.535 ac 57.49% Impervious = 3.428 ac

Summary for Subcatchment PR 1: PR 1

Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.420 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
1.436	98	Paved parking, HSG B
0.014	39	>75% Grass cover, Good, HSG A
0.300	61	>75% Grass cover, Good, HSG B
0.235	98	Water Surface, 0% imp, HSG B
1.985	92	Weighted Average
0.549		27.66% Pervious Area
1.436		72.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0180	1.18		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	150	0.0270	3.34		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
3.6					**Direct Entry, <5 min Tc Adjustment**
5.0	200	Total			

Summary for Subcatchment PR 2: PR 2

Runoff = 4.55 cfs @ 12.07 hrs, Volume= 0.343 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
1.062	98	Paved parking, HSG B
0.159	98	Paved parking, HSG D
0.008	61	>75% Grass cover, Good, HSG B
0.035	80	>75% Grass cover, Good, HSG D
0.007	98	Water Surface, 0% imp, HSG B
0.077	98	Water Surface, 0% imp, HSG D
1.348	97	Weighted Average
0.127		9.42% Pervious Area
1.221		90.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0120	1.01		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
1.7	287	0.0200	2.87		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
2.5					**Direct Entry, <5 min Tc Adjustment**
5.0	337	Total			

Summary for Subcatchment PR 3: PR 3

Runoff = 2.16 cfs @ 12.08 hrs, Volume= 0.152 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.577	98	Paved parking, HSG B
0.771	61	>75% Grass cover, Good, HSG B
1.348	77	Weighted Average
0.771		57.20% Pervious Area
0.577		42.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.23		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	114	0.0180	2.72		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
1.1	59	0.0170	0.91		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.3	159	0.0060	1.16		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
0.5	56	0.0180	2.01		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
5.3	438	Total			

Summary for Subcatchment PR 4: PR 4

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.062 af, Depth= 0.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG B
0.001	30	Woods, Good, HSG A
0.293	55	Woods, Good, HSG B
0.005	77	Woods, Good, HSG D
0.047	39	>75% Grass cover, Good, HSG A
0.420	61	>75% Grass cover, Good, HSG B
0.036	80	>75% Grass cover, Good, HSG D
0.996	66	Weighted Average
0.802		80.52% Pervious Area
0.194		19.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	38	0.0530	0.21		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.1	12	0.0540	1.38		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.3	47	0.0210	2.94		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
0.3	20	0.0250	1.11		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.3					**Direct Entry, <5 min Tc Adjustment**
5.0	117	Total			

Summary for Subcatchment PR 5: PR 5

Runoff = 0.17 cfs @ 12.15 hrs, Volume= 0.017 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.055	61	>75% Grass cover, Good, HSG B
0.011	80	>75% Grass cover, Good, HSG D
0.118	55	Woods, Good, HSG B
0.102	77	Woods, Good, HSG D
0.286	65	Weighted Average
0.286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	3	0.3300	0.27		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.4	11	0.0310	0.13		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
5.0	21	0.0310	0.07		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
2.3	15	0.1100	0.11		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
8.9	50	Total			

Summary for Pond P1: Bioretention Basin 1

Inflow Area = 1.985 ac, 72.34% Impervious, Inflow Depth = 2.54" for 2 yr storm event
Inflow = 5.96 cfs @ 12.07 hrs, Volume= 0.420 af
Outflow = 0.04 cfs @ 24.05 hrs, Volume= 0.022 af, Atten= 99%, Lag= 718.9 min
Primary = 0.04 cfs @ 24.05 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 30.07' @ 24.05 hrs Surf.Area= 14,070 sf Storage= 17,870 cf

Plug-Flow detention time= 969.4 min calculated for 0.022 af (5% of inflow)
Center-of-Mass det. time= 679.5 min (1,474.2 - 794.7)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	33,480 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,790	237.0	0	0	3,790
29.00	8,407	366.0	5,947	5,947	9,987
30.00	13,678	468.0	10,936	16,883	16,770
31.00	19,697	573.0	16,596	33,480	25,484

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 28.00' / 27.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.00'	**8.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	30.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.04 cfs @ 24.05 hrs HW=30.07' (Free Discharge)
└**1=RCP_Round 12"** (Passes 0.04 cfs of 4.74 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.86 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P2: Bioretention Basin 2

Inflow Area = 1.348 ac, 90.58% Impervious, Inflow Depth = 3.06" for 2 yr storm event
Inflow = 4.55 cfs @ 12.07 hrs, Volume= 0.343 af
Outflow = 2.48 cfs @ 12.18 hrs, Volume= 0.288 af, Atten= 45%, Lag= 6.6 min
Primary = 2.48 cfs @ 12.18 hrs, Volume= 0.288 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 31.60' @ 12.18 hrs Surf.Area= 4,268 sf Storage= 5,671 cf

Plug-Flow detention time= 156.5 min calculated for 0.288 af (84% of inflow)
Center-of-Mass det. time= 89.9 min (853.5 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	7,449 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
30.00	2,881	246.0	0	0	2,881
31.00	3,690	371.0	3,277	3,277	9,026
32.00	4,673	320.0	4,172	7,449	11,852

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**12.0" Round RCP_Round 12"** L= 65.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 30.00' / 29.25' S= 0.0115 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.75'	**10.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	31.50'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.48 cfs @ 12.18 hrs HW=31.60' (Free Discharge)
└**1=RCP_Round 12"** (Passes 2.02 cfs of 3.89 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 2.02 cfs @ 3.23 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.47 cfs @ 0.76 fps)

Summary for Pond P3: Bioretention Basin 3

Inflow Area = 1.348 ac, 42.80% Impervious, Inflow Depth = 1.36" for 2 yr storm event
Inflow = 2.16 cfs @ 12.08 hrs, Volume= 0.152 af
Outflow = 0.33 cfs @ 12.64 hrs, Volume= 0.117 af, Atten= 85%, Lag= 33.5 min
Primary = 0.33 cfs @ 12.64 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 32.87' @ 12.64 hrs Surf.Area= 4,579 sf Storage= 2,902 cf

Plug-Flow detention time= 218.8 min calculated for 0.117 af (77% of inflow)
Center-of-Mass det. time= 131.5 min (979.8 - 848.3)

Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	9,440 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	2,207	177.0	0	0	2,207
33.00	4,993	291.0	3,507	3,507	6,459
34.00	6,927	401.0	5,934	9,440	12,526

Device	Routing	Invert	Outlet Devices
#1	Primary	32.00'	**12.0" Round RCP_Round 12"** L= 35.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 32.00' / 31.00' S= 0.0286 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	32.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	33.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.33 cfs @ 12.64 hrs HW=32.87' (Free Discharge)
- **1=RCP_Round 12"** (Passes 0.33 cfs of 2.32 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 2.08 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP1: Wetland 1

Inflow Area = 4.329 ac, 65.86% Impervious, Inflow Depth > 1.03" for 2 yr storm event
Inflow = 3.03 cfs @ 12.16 hrs, Volume= 0.372 af
Primary = 3.03 cfs @ 12.16 hrs, Volume= 0.372 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

Inflow Area = 1.634 ac, 35.31% Impervious, Inflow Depth > 0.98" for 2 yr storm event
Inflow = 0.39 cfs @ 12.49 hrs, Volume= 0.134 af
Primary = 0.39 cfs @ 12.49 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

10-Year Storm Event- Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR 1: PR 1 Runoff Area=1.985 ac 72.34% Impervious Runoff Depth=3.85"
Flow Length=200' Tc=5.0 min CN=92 Runoff=8.83 cfs 0.636 af

Subcatchment PR 2: PR 2 Runoff Area=1.348 ac 90.58% Impervious Runoff Depth=4.40"
Flow Length=337' Tc=5.0 min CN=97 Runoff=6.44 cfs 0.494 af

Subcatchment PR 3: PR 3 Runoff Area=1.348 ac 42.80% Impervious Runoff Depth=2.42"
Flow Length=438' Tc=5.3 min CN=77 Runoff=3.91 cfs 0.271 af

Subcatchment PR 4: PR 4 Runoff Area=0.996 ac 19.48% Impervious Runoff Depth=1.56"
Flow Length=117' Tc=5.0 min CN=66 Runoff=1.79 cfs 0.129 af

Subcatchment PR 5: PR 5 Runoff Area=0.286 ac 0.00% Impervious Runoff Depth=1.49"
Flow Length=50' Tc=8.9 min CN=65 Runoff=0.42 cfs 0.035 af

Pond P1: Bioretention Basin 1 Peak Elev=30.28' Storage=20,873 cf Inflow=8.83 cfs 0.636 af
Outflow=0.31 cfs 0.231 af

Pond P2: Bioretention Basin 2 Peak Elev=31.78' Storage=6,433 cf Inflow=6.44 cfs 0.494 af
Outflow=4.53 cfs 0.439 af

Pond P3: Bioretention Basin 3 Peak Elev=33.31' Storage=5,146 cf Inflow=3.91 cfs 0.271 af
Outflow=0.71 cfs 0.236 af

Link DP1: Wetland 1 Inflow=6.03 cfs 0.799 af
Primary=6.03 cfs 0.799 af

Link DP2: Wetland 3 Inflow=0.97 cfs 0.271 af
Primary=0.97 cfs 0.271 af

Total Runoff Area = 5.963 ac Runoff Volume = 1.566 af Average Runoff Depth = 3.15"
42.51% Pervious = 2.535 ac 57.49% Impervious = 3.428 ac

Summary for Subcatchment PR 1: PR 1

Runoff = 8.83 cfs @ 12.07 hrs, Volume= 0.636 af, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
1.436	98	Paved parking, HSG B
0.014	39	>75% Grass cover, Good, HSG A
0.300	61	>75% Grass cover, Good, HSG B
0.235	98	Water Surface, 0% imp, HSG B
1.985	92	Weighted Average
0.549		27.66% Pervious Area
1.436		72.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0180	1.18		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	150	0.0270	3.34		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
3.6					**Direct Entry, <5 min Tc Adjustment**
5.0	200	Total			

Summary for Subcatchment PR 2: PR 2

Runoff = 6.44 cfs @ 12.07 hrs, Volume= 0.494 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
1.062	98	Paved parking, HSG B
0.159	98	Paved parking, HSG D
0.008	61	>75% Grass cover, Good, HSG B
0.035	80	>75% Grass cover, Good, HSG D
0.007	98	Water Surface, 0% imp, HSG B
0.077	98	Water Surface, 0% imp, HSG D
1.348	97	Weighted Average
0.127		9.42% Pervious Area
1.221		90.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0120	1.01		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
1.7	287	0.0200	2.87		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
2.5					**Direct Entry, <5 min Tc Adjustment**
5.0	337	Total			

Summary for Subcatchment PR 3: PR 3

Runoff = 3.91 cfs @ 12.08 hrs, Volume= 0.271 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.577	98	Paved parking, HSG B
0.771	61	>75% Grass cover, Good, HSG B
1.348	77	Weighted Average
0.771		57.20% Pervious Area
0.577		42.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.23		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	114	0.0180	2.72		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
1.1	59	0.0170	0.91		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.3	159	0.0060	1.16		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
0.5	56	0.0180	2.01		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
5.3	438	Total			

Summary for Subcatchment PR 4: PR 4

Runoff = 1.79 cfs @ 12.08 hrs, Volume= 0.129 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG B
0.001	30	Woods, Good, HSG A
0.293	55	Woods, Good, HSG B
0.005	77	Woods, Good, HSG D
0.047	39	>75% Grass cover, Good, HSG A
0.420	61	>75% Grass cover, Good, HSG B
0.036	80	>75% Grass cover, Good, HSG D
0.996	66	Weighted Average
0.802		80.52% Pervious Area
0.194		19.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	38	0.0530	0.21		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.1	12	0.0540	1.38		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.3	47	0.0210	2.94		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
0.3	20	0.0250	1.11		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.3					**Direct Entry, <5 min Tc Adjustment**
5.0	117	Total			

Summary for Subcatchment PR 5: PR 5

Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.035 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.055	61	>75% Grass cover, Good, HSG B
0.011	80	>75% Grass cover, Good, HSG D
0.118	55	Woods, Good, HSG B
0.102	77	Woods, Good, HSG D
0.286	65	Weighted Average
0.286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	3	0.3300	0.27		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.4	11	0.0310	0.13		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
5.0	21	0.0310	0.07		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
2.3	15	0.1100	0.11		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
8.9	50	Total			

Summary for Pond P1: Bioretention Basin 1

Inflow Area = 1.985 ac, 72.34% Impervious, Inflow Depth = 3.85" for 10 yr storm event
Inflow = 8.83 cfs @ 12.07 hrs, Volume= 0.636 af
Outflow = 0.31 cfs @ 15.40 hrs, Volume= 0.231 af, Atten= 96%, Lag= 199.7 min
Primary = 0.31 cfs @ 15.40 hrs, Volume= 0.231 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 30.28' @ 15.40 hrs Surf.Area= 15,231 sf Storage= 20,873 cf

Plug-Flow detention time= 481.9 min calculated for 0.231 af (36% of inflow)
Center-of-Mass det. time= 346.2 min (1,129.6 - 783.4)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	33,480 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,790	237.0	0	0	3,790
29.00	8,407	366.0	5,947	5,947	9,987
30.00	13,678	468.0	10,936	16,883	16,770
31.00	19,697	573.0	16,596	33,480	25,484

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 28.00' / 27.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.00'	**8.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	30.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.31 cfs @ 15.40 hrs HW=30.28' (Free Discharge)
└**1=RCP_Round 12"** (Passes 0.31 cfs of 5.04 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 1.69 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P2: Bioretention Basin 2

Inflow Area = 1.348 ac, 90.58% Impervious, Inflow Depth = 4.40" for 10 yr storm event
Inflow = 6.44 cfs @ 12.07 hrs, Volume= 0.494 af
Outflow = 4.53 cfs @ 12.14 hrs, Volume= 0.439 af, Atten= 30%, Lag= 4.4 min
Primary = 4.53 cfs @ 12.14 hrs, Volume= 0.439 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 31.78' @ 12.14 hrs Surf.Area= 4,444 sf Storage= 6,433 cf

Plug-Flow detention time= 130.4 min calculated for 0.439 af (89% of inflow)
Center-of-Mass det. time= 77.2 min (833.1 - 755.9)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	7,449 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
30.00	2,881	246.0	0	0	2,881
31.00	3,690	371.0	3,277	3,277	9,026
32.00	4,673	320.0	4,172	7,449	11,852

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**12.0" Round RCP_Round 12"** L= 65.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 30.00' / 29.25' S= 0.0115 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.75'	**10.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	31.50'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.53 cfs @ 12.14 hrs HW=31.78' (Free Discharge)
└**1=RCP_Round 12"** (Passes 2.39 cfs of 4.14 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 2.39 cfs @ 3.83 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 2.13 cfs @ 1.28 fps)

Summary for Pond P3: Bioretention Basin 3

Inflow Area = 1.348 ac, 42.80% Impervious, Inflow Depth = 2.42" for 10 yr storm event
Inflow = 3.91 cfs @ 12.08 hrs, Volume= 0.271 af
Outflow = 0.71 cfs @ 12.55 hrs, Volume= 0.236 af, Atten= 82%, Lag= 28.0 min
Primary = 0.71 cfs @ 12.55 hrs, Volume= 0.236 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 33.31' @ 12.55 hrs Surf.Area= 5,560 sf Storage= 5,146 cf

Plug-Flow detention time= 164.7 min calculated for 0.236 af (87% of inflow)
Center-of-Mass det. time= 105.4 min (936.8 - 831.5)

Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	9,440 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	2,207	177.0	0	0	2,207
33.00	4,993	291.0	3,507	3,507	6,459
34.00	6,927	401.0	5,934	9,440	12,526

Device	Routing	Invert	Outlet Devices
#1	Primary	32.00'	**12.0" Round RCP_Round 12"** L= 35.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 32.00' / 31.00' S= 0.0286 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	32.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	33.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.71 cfs @ 12.55 hrs HW=33.31' (Free Discharge)
- **1=RCP_Round 12"** (Passes 0.71 cfs of 3.41 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.71 cfs @ 3.61 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP1: Wetland 1

Inflow Area = 4.329 ac, 65.86% Impervious, Inflow Depth > 2.22" for 10 yr storm event
Inflow = 6.03 cfs @ 12.12 hrs, Volume= 0.799 af
Primary = 6.03 cfs @ 12.12 hrs, Volume= 0.799 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

Inflow Area = 1.634 ac, 35.31% Impervious, Inflow Depth > 1.99" for 10 yr storm event
Inflow = 0.97 cfs @ 12.17 hrs, Volume= 0.271 af
Primary = 0.97 cfs @ 12.17 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

100-Year Storm Event – Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR 1: PR 1 Runoff Area=1.985 ac 72.34% Impervious Runoff Depth=6.05"
Flow Length=200' Tc=5.0 min CN=92 Runoff=13.55 cfs 1.002 af

Subcatchment PR 2: PR 2 Runoff Area=1.348 ac 90.58% Impervious Runoff Depth=6.64"
Flow Length=337' Tc=5.0 min CN=97 Runoff=9.55 cfs 0.746 af

Subcatchment PR 3: PR 3 Runoff Area=1.348 ac 42.80% Impervious Runoff Depth=4.37"
Flow Length=438' Tc=5.3 min CN=77 Runoff=7.05 cfs 0.490 af

Subcatchment PR 4: PR 4 Runoff Area=0.996 ac 19.48% Impervious Runoff Depth=3.20"
Flow Length=117' Tc=5.0 min CN=66 Runoff=3.85 cfs 0.266 af

Subcatchment PR 5: PR 5 Runoff Area=0.286 ac 0.00% Impervious Runoff Depth=3.10"
Flow Length=50' Tc=8.9 min CN=65 Runoff=0.93 cfs 0.074 af

Pond P1: Bioretention Basin 1 Peak Elev=30.66' Storage=27,117 cf Inflow=13.55 cfs 1.002 af
Outflow=1.64 cfs 0.593 af

Pond P2: Bioretention Basin 2 Peak Elev=31.97' Storage=7,299 cf Inflow=9.55 cfs 0.746 af
Outflow=7.71 cfs 0.691 af

Pond P3: Bioretention Basin 3 Peak Elev=33.84' Storage=8,389 cf Inflow=7.05 cfs 0.490 af
Outflow=2.45 cfs 0.455 af

Link DP1: Wetland 1 Inflow=11.45 cfs 1.550 af
Primary=11.45 cfs 1.550 af

Link DP2: Wetland 3 Inflow=2.94 cfs 0.529 af
Primary=2.94 cfs 0.529 af

Total Runoff Area = 5.963 ac Runoff Volume = 2.578 af Average Runoff Depth = 5.19"
42.51% Pervious = 2.535 ac 57.49% Impervious = 3.428 ac

Summary for Subcatchment PR 1: PR 1

Runoff = 13.55 cfs @ 12.07 hrs, Volume= 1.002 af, Depth= 6.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
1.436	98	Paved parking, HSG B
0.014	39	>75% Grass cover, Good, HSG A
0.300	61	>75% Grass cover, Good, HSG B
0.235	98	Water Surface, 0% imp, HSG B
1.985	92	Weighted Average
0.549		27.66% Pervious Area
1.436		72.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0180	1.18		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	150	0.0270	3.34		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
3.6					**Direct Entry, <5 min Tc Adjustment**
5.0	200	Total			

Summary for Subcatchment PR 2: PR 2

Runoff = 9.55 cfs @ 12.07 hrs, Volume= 0.746 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
1.062	98	Paved parking, HSG B
0.159	98	Paved parking, HSG D
0.008	61	>75% Grass cover, Good, HSG B
0.035	80	>75% Grass cover, Good, HSG D
0.007	98	Water Surface, 0% imp, HSG B
0.077	98	Water Surface, 0% imp, HSG D
1.348	97	Weighted Average
0.127		9.42% Pervious Area
1.221		90.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0120	1.01		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
1.7	287	0.0200	2.87		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
2.5					**Direct Entry, <5 min Tc Adjustment**
5.0	337	Total			

Summary for Subcatchment PR 3: PR 3

Runoff = 7.05 cfs @ 12.08 hrs, Volume= 0.490 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.577	98	Paved parking, HSG B
0.771	61	>75% Grass cover, Good, HSG B
1.348	77	Weighted Average
0.771		57.20% Pervious Area
0.577		42.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.23		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.7	114	0.0180	2.72		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
1.1	59	0.0170	0.91		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
2.3	159	0.0060	1.16		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
0.5	56	0.0180	2.01		**Shallow Concentrated Flow, Landscape B** Grassed Waterway Kv= 15.0 fps
5.3	438	Total			

Summary for Subcatchment PR 4: PR 4

Runoff = 3.85 cfs @ 12.08 hrs, Volume= 0.266 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG B
0.001	30	Woods, Good, HSG A
0.293	55	Woods, Good, HSG B
0.005	77	Woods, Good, HSG D
0.047	39	>75% Grass cover, Good, HSG A
0.420	61	>75% Grass cover, Good, HSG B
0.036	80	>75% Grass cover, Good, HSG D
0.996	66	Weighted Average
0.802		80.52% Pervious Area
0.194		19.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	38	0.0530	0.21		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
0.1	12	0.0540	1.38		**Sheet Flow, Impervious B** Smooth surfaces n= 0.011 P2= 3.40"
0.3	47	0.0210	2.94		**Shallow Concentrated Flow, Impervious B** Paved Kv= 20.3 fps
0.3	20	0.0250	1.11		**Shallow Concentrated Flow, Landscape B** Short Grass Pasture Kv= 7.0 fps
1.3					**Direct Entry, <5 min Tc Adjustment**
5.0	117	Total			

Summary for Subcatchment PR 5: PR 5

Runoff = 0.93 cfs @ 12.13 hrs, Volume= 0.074 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.055	61	>75% Grass cover, Good, HSG B
0.011	80	>75% Grass cover, Good, HSG D
0.118	55	Woods, Good, HSG B
0.102	77	Woods, Good, HSG D
0.286	65	Weighted Average
0.286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	3	0.3300	0.27		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
1.4	11	0.0310	0.13		**Sheet Flow, Landscape B** Grass: Short n= 0.150 P2= 3.40"
5.0	21	0.0310	0.07		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
2.3	15	0.1100	0.11		**Sheet Flow, Woods D** Woods: Light underbrush n= 0.400 P2= 3.40"
8.9	50	Total			

Summary for Pond P1: Bioretention Basin 1

Inflow Area = 1.985 ac, 72.34% Impervious, Inflow Depth = 6.05" for 100 yr storm event
Inflow = 13.55 cfs @ 12.07 hrs, Volume= 1.002 af
Outflow = 1.64 cfs @ 12.61 hrs, Volume= 0.593 af, Atten= 88%, Lag= 32.4 min
Primary = 1.64 cfs @ 12.61 hrs, Volume= 0.593 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 30.66' @ 12.61 hrs Surf.Area= 17,514 sf Storage= 27,117 cf

Plug-Flow detention time= 343.4 min calculated for 0.593 af (59% of inflow)
Center-of-Mass det. time= 238.0 min (1,009.8 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	33,480 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
28.00	3,790	237.0	0	0	3,790
29.00	8,407	366.0	5,947	5,947	9,987
30.00	13,678	468.0	10,936	16,883	16,770
31.00	19,697	573.0	16,596	33,480	25,484

Device	Routing	Invert	Outlet Devices
#1	Primary	28.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 28.00' / 27.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.00'	**8.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	30.50'	**6.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=1.64 cfs @ 12.61 hrs HW=30.66' (Free Discharge)
└─**1=RCP_Round 12"** (Passes 0.75 cfs of 5.56 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.75 cfs @ 3.36 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.89 cfs @ 0.94 fps)

Summary for Pond P2: Bioretention Basin 2

Inflow Area = 1.348 ac, 90.58% Impervious, Inflow Depth = 6.64" for 100 yr storm event
Inflow = 9.55 cfs @ 12.07 hrs, Volume= 0.746 af
Outflow = 7.71 cfs @ 12.12 hrs, Volume= 0.691 af, Atten= 19%, Lag= 3.3 min
Primary = 7.71 cfs @ 12.12 hrs, Volume= 0.691 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 31.97' @ 12.12 hrs Surf.Area= 4,640 sf Storage= 7,299 cf

Plug-Flow detention time= 104.2 min calculated for 0.691 af (93% of inflow)
Center-of-Mass det. time= 64.4 min (812.8 - 748.4)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	7,449 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
30.00	2,881	246.0	0	0	2,881
31.00	3,690	371.0	3,277	3,277	9,026
32.00	4,673	320.0	4,172	7,449	11,852

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**12.0" Round RCP_Round 12"** L= 65.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 30.00' / 29.25' S= 0.0115 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	30.75'	**10.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	31.50'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.70 cfs @ 12.12 hrs HW=31.97' (Free Discharge)
└─**1=RCP_Round 12"** (Passes 2.74 cfs of 4.39 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 2.74 cfs @ 4.38 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.96 cfs @ 1.77 fps)

Summary for Pond P3: Bioretention Basin 3

Inflow Area = 1.348 ac, 42.80% Impervious, Inflow Depth = 4.37" for 100 yr storm event
Inflow = 7.05 cfs @ 12.08 hrs, Volume= 0.490 af
Outflow = 2.45 cfs @ 12.36 hrs, Volume= 0.455 af, Atten= 65%, Lag= 16.8 min
Primary = 2.45 cfs @ 12.36 hrs, Volume= 0.455 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 33.84' @ 12.36 hrs Surf.Area= 6,606 sf Storage= 8,389 cf

Plug-Flow detention time= 132.1 min calculated for 0.455 af (93% of inflow)
Center-of-Mass det. time= 94.3 min (908.7 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1	32.00'	9,440 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
32.00	2,207	177.0	0	0	2,207
33.00	4,993	291.0	3,507	3,507	6,459
34.00	6,927	401.0	5,934	9,440	12,526

Device	Routing	Invert	Outlet Devices
#1	Primary	32.00'	**12.0" Round RCP_Round 12"** L= 35.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 32.00' / 31.00' S= 0.0286 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	32.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	33.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.45 cfs @ 12.36 hrs HW=33.84' (Free Discharge)
- **1=RCP_Round 12"** (Passes 0.99 cfs of 4.39 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.99 cfs @ 5.04 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 1.46 cfs @ 1.19 fps)

Summary for Link DP1: Wetland 1

Inflow Area = 4.329 ac, 65.86% Impervious, Inflow Depth > 4.30" for 100 yr storm event
Inflow = 11.45 cfs @ 12.11 hrs, Volume= 1.550 af
Primary = 11.45 cfs @ 12.11 hrs, Volume= 1.550 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link DP2: Wetland 3

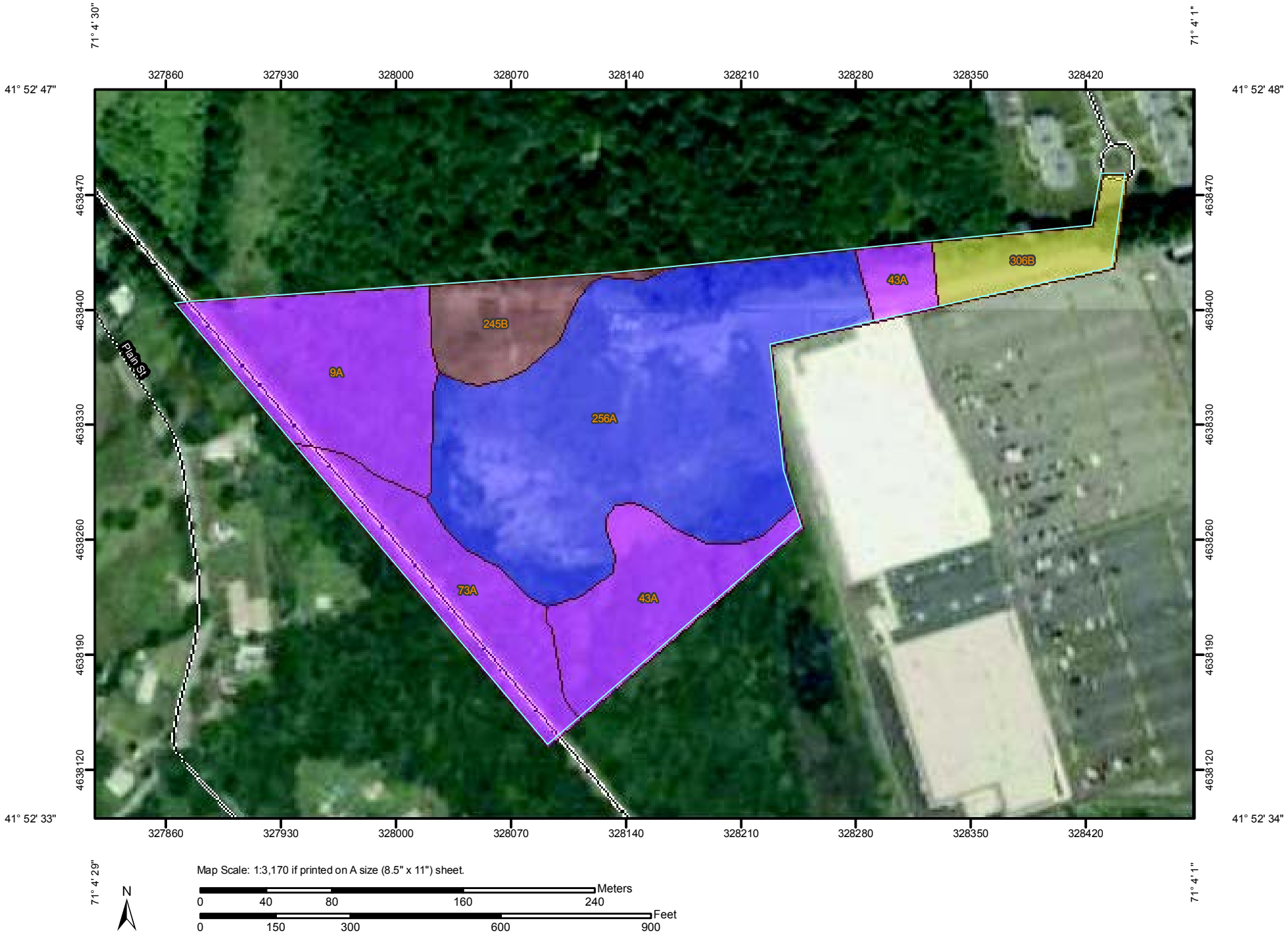
Inflow Area = 1.634 ac, 35.31% Impervious, Inflow Depth > 3.88" for 100 yr storm event
Inflow = 2.94 cfs @ 12.33 hrs, Volume= 0.529 af
Primary = 2.94 cfs @ 12.33 hrs, Volume= 0.529 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis

Hydrologic Soil Group—Bristol County, Massachusetts, Northern Part
(Taunton Depot Soil Properties)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:3,170 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part
Survey Area Data: Version 5, Jul 27, 2010

Date(s) aerial images were photographed: 8/14/2003; 7/10/2003; 8/15/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Northern Part (MA602)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
9A	Birdsall silt loam, 0 to 3 percent slopes	D	3.1	16.8%
43A	Scarboro mucky loamy fine sand, 0 to 3 percent slopes	D	2.5	13.9%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	2.1	11.4%
245B	Hinckley sandy loam, 3 to 8 percent slopes	A	1.2	6.6%
256A	Deerfield loamy sand, 0 to 3 percent slopes	B	8.3	45.7%
306B	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	C	1.0	5.7%
Totals for Area of Interest			**18.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Taunton Depot Station
Project Location: Taunton, MA

Proj. No.: 10111.00
Date: 12-Apr-12
Calculated by: PAC
Checked by:

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	1.4	0.0	0.0	1.4
2	0.0	1.1	0.0	0.2	1.2
3	0.0	0.6	0.0	0.0	0.6
4	0.0	0.1	0.0	0.0	0.1
5	0.0	0.0	0.0	0.0	0.0
TOTAL	**0.0**	**3.2**	**0.0**	**0.2**	**3.3**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	0.0	0.60	0
B	3.2	0.35	4,014
C	0.0	0.25	0
D	0.2	0.10	58
TOTAL			**4,071**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Basin P1	17,141
Basin P2	2,388
Basin P3	1,452
Total	**20,981** c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: Taunton Depot Station **Proj. No.:** 10111.00

Date: 5/18/2012

Project Location: Taunton, MA **Calculated by:** PAC

Bioretention Basin - 1

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
28.00	3,790	0
29.00	8,407	6,099
30.00	13,678	17,141
TOTAL		**17,141**

Assumptions:

Recharge Rate: 1.00 in/hr

Drawdown Time:	**54.3 hours**

Bioretention Basin - 2

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
30.00	2,881	0
30.75	3,488	2,388
TOTAL		**2,388**

Assumptions:

Recharge Rate: 1.00 in/hr

Drawdown Time:	**9.9 hours**

Bioretention Basin - 3

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
32.00	2,207	0
32.50	3,600	1,452
TOTAL		**1,452**

Assumptions:

Recharge Rate: 1.00 in/hr

Drawdown Time:	**7.9 hours**

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Taunton Depot Station **Proj. No.:** 10111.00
Project Location: Taunton, MA **Date:** 4/13/2012
Calculated by: PAC

Bioretention Basin P1
(runoff from Area PR1)

Total Impervious Area = 1.44 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	521
Water Quality Volume	0.5	2,606

Provided:

Bioretention Basin	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	28.0	3,790	0
	29.0	8,407	6,099
	30.0	13,678	17,141

Bioretention Basin P2
(runoff from Area PR2)

Total Impervious Area = 1.22 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	443
Water Quality Volume	0.5	2,216

Provided:

Bioretention Basin	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	30.0	2,881	0
	30.75	3,488	2,388

Bioretention Basin P3
(runoff from Area PR3)

Total Impervious Area = 0.58 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	209
Water Quality Volume	0.5	1,047

Provided:

Bioretention Basin	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	32.0	2,207	0
	32.5	3,600	1,452

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Taunton Depot Station**	Sheet:	**1 of 3**
Project Number:	**10111.00**	Date:	**12-Apr-2012**
Location:	**Taunton, MA**	Computed by:	**PAC**
Discharge Point:	**DP1**	Checked by:	
Drainage Area(s):	**PR 1, PR 2**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Taunton Depot Station**	Sheet:	**2 of 3**
Project Number:	**10111.00**	Date:	**2-May-2012**
Location:	**Taunton, MA**	Computed by:	**PAC**
Discharge Point:	**DP1**	Checked by:	
Drainage Area(s):	**PR 4 (Pump Station Access)**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Grass Channel	**50%**	**1.00**	**0.50**	**0.50**
	0%	**0.50**	**0.00**	**0.50**
	0%	**0.50**	**0.00**	**0.50**
	0%	**0.50**	**0.00**	**0.50**
	0%	**0.50**	**0.00**	**0.50**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **50%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Taunton Depot Station**	Sheet:	**3 of 3**
Project Number:	**10111.00**	Date:	**12-Apr-2012**
Location:	**Taunton, MA**	Computed by:	**PAC**
Discharge Point:	**DP2**	Checked by:	
Drainage Area(s):	**PR 3**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Bioretention Area	**90%**	**1.00**	**0.90**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	March 29, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Da Ha, Peter Chou - Jacobs
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) Taunton Depot Station Geotechnical Design Memorandum Taunton, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the construction of several existing and new passenger stations and two terminal layover facilities. This geotechnical design memorandum presents the foundation design considerations for the new station platform at the proposed Taunton Depot Station in Taunton, Massachusetts. The design recommendations presented in this report are based on the results of subsurface investigation performed by Jacobs in 2002 and 2010.

Existing Conditions

The proposed Taunton Depot Station site is behind the Target Plaza off of Route 140 in Taunton (Figure 1). Except for the two railroad tracks along the west side of the site, the site is currently undeveloped, with half the site cleared and half the site with forests and wetlands. Six large floor-plan retail buildings on the adjacent shopping plaza contain numerous retail establishments. Existing grades at the platform location range from elevations 38.6 to 32.9 feet (NGVD29 Datum), generally sloping downward from south to north.

Proposed Construction

Current station plans are to construct an 800 foot long, 12 foot wide high level center platform adjacent to the existing tracks with some track relocation required, as well as the addition of a third track, a new parking area (with access roads) and a new drop-off area. The tracks and the platform will be constructed on an embankment supported by 3 to 14 feet high retaining walls on both the west and east sides of the tracks.

Access to the platform will be from a new ramp/stair structure along the east side of the tracks with a pedestrian bridge over the wetland and northbound tracks to the platform. Approximately 320 feet of the platform will be under a new station canopy. The details of new track layout (including grading), associated sidewalks and ramps of the proposed station are still under development at the time of this report preparation. However, we anticipate that about 3-8 feet of fill will be placed at the site to raise the grade at the track level and platform area. This report focuses on the foundations for the platform, the ramp/stair structure and the pedestrian bridge.

SCOPE OF WORK

This memorandum was prepared by Jacobs in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform a geotechnical exploration and laboratory testing program;
- Report and interpret the results of the exploration and laboratory testing program; and
- Provide geotechnical recommendations for design and construction of the platform foundations.

The Jacobs scope of work did not include environmental analyses to assess the potential presence of any hazardous materials at the project site or potential impacts to adjacent structures during construction.

LOCAL GEOLOGY

The site is located in the Narragansett Basin of southeastern Massachusetts. The rocks in the Narragansett Basin consist mostly of lightly metamorphosed shale and sandstone of Pennsylvanian and Permian age. The Taunton Depot site is located in the area of the Rhode Island Formation. The rocks encountered in the borings included coarse grained, weathered sandstone and dark gray siltstone. The upper few feet of the rock has been weathered to soil and was sampled by Standard Penetration Tests in some borings. The less-weathered rock was cored with RQD values ranging from 18 to 50. The cored rock was partially weathered and had both high-angle and bedding-plane joints, which had a dip of about 10 to 20 degrees.

GEOTECHNICAL INVESTIGATION

Jacobs planned the subsurface exploration program and retained the drilling contractors to perform the explorations. The results of the explorations were presented in geotechnical data reports entitled "New Bedford Line – South of Weir Junction Geotechnical Data Report" and "South Coast Rail, Jacobs Geotechnical Data Report" submitted in 2002 and 2010, respectively. Six borings (TD-1 and NBA-12 to NBA-16) were conducted along the proposed station platform and fifteen borings (TD-2 to TD-6, NBS-1 to NBS-5 and NBS-8 to NBS-12) were drilled in the general vicinity of the proposed parking lot and access roads. Boring locations are shown on the Subsurface Exploration Plan (Figures 2 and 3).

The 2010 borings were drilled by New Hampshire Boring using either a D-50 ATV mounted drill or a CME-75 truck mounted drill rig. The borings were advanced through the soil by wash boring methods using a 4-inch casing and roller bit with water. Standard penetration tests (SPT), consisting of 140-pound hammer dropping 30 inches on a standard 2-inch-diameter (OD) split-spoon sampler, were performed with a safety hammer to establish the consistency of the subsurface soils. The SPT's were typically performed at five foot intervals of depth. The obtained samples were sealed in glass jars to retain their natural moisture. Bedrock was encountered and cored in some of the borings during exploration.

The borings were observed and logged by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D-2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

Note the vertical control datum of the 2002 borings was also the National Geodetic Vertical Datum (NGVD) of 1929, which is generally referred to as U.S. Coast Guard mean sea level.

LABORATORY TESTING

The results of the laboratory testing were previously submitted to VHB in reports entitled "South Coast Rail, Jacobs Geotechnical Data Report", dated November 2010, and "New Bedford Line – South of Weir Junction Geotechnical Data Report", dated October 2002.

Grain size distribution analyses were performed to evaluate the gradation of the fill material and natural granular soils for potential reuse as backfill, if needed, and to confirm sample classifications. The graduation analyses are summarized in Table 1 below and are presented in Appendix B.

Table 1: Laboratory Soil Classification Summary

BORING NO.	SAMPLE NO.	ELEVATION (FEET)	USCS SOIL CLASSIFICATION	W (%)	GRAVEL (%)	SAND (%)	FINES (%)
TD-05	S2	33.9	Silty Sand (SM)	NT	3.1	64.7	32.2
NBA-12	SS-2 *	28.8	Silty sand (SM)	NT	0	58	42
	SS-4	18.8	Silt with sand (ML)	NT	0	25	75
	SS-5	13.8	Sandy silt (ML)	NT	0	43	57
NBA-13 MW	SS-2 *	29.9	Silty sand (SM)	NT	1	58	41
	SS-3 *	24.9	Sandy silt (ML)	NT	1	34	65
	SS-5	14.9	Sandy silt (ML)	NT	1	28	71
NBA-15	SS-2 *	32.1	Silty sand with gravel (SM)	NT	29	56	15
	SS-4	22.1	Silty sand with gravel (SM)	NT	23	43	34
NBS-03	SS-1	31.6	Silty sand with gravel (SM)	NT	39	42	19
	SS-3	21.6	Poorly graded sand with gravel (SP)	NT	19	77	4
	SS-4	16.6	Sandy silt (ML)	NT	13	34	53
NBS-05 MW	SS-1	38.0	Silty sand (SM)	NT	4	62	34
	SS-2	33.0	Silty sand with gravel (SM)	NT	15	58	27
	SS-3	28.0	Silty sand (SM)	NT	13	41	46
NBS-12	SS-1	31.9	Silt with sand (ML)	NT	0	18	82
	SS-2	27.9	Silt (ML)	NT	0	7	93
	SS-3	22.9	Silty gravel with sand (GM)	NT	42	36	22

Where: w = natural moisture content, NT = Not Tested. * = Fill

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for the Taunton Depot Station project, with some interpretations. The subsurface conditions encountered at the station platform area generally consist of a layer of granular fill with thickness of about 3 to 14 feet, underlain by a granular soil layer with thickness ranging from 4 to 14 feet overlying bedrock. Bedrock was encountered at a depth of about 14.5 to 22 feet in the platform area, corresponding to approximately elevations 20.1 to 11.0 feet.

In the vicinity of the proposed parking lot and access road areas, fill materials with thicknesses ranging from approximately 0 to 3 feet were encountered. Bedrock was encountered at a depth about 12.0 to 12.5 feet (corresponding to elevations 17.9 to 15.1 feet).

Subsurface soil conditions are summarized in Table 2 and discussed below.

Table 2: Summary of Subsurface Conditions at Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Platform Borings							
TD-1 OW	33.0	3.0	30.0	6.0	1.0	27.8	Well screened from 22 to 32 ft.
NBA-12	32.8	12	20.8	NE	7.3	23.3	Organic silty sand encountered from 12.0 to 15.5 ft.
NBA-13 MW	33.9	14	19.9	NE	8.4	20.5	Well screened from 12.8 to 22.8 ft.
NBA-14	34.6	11	23.6	20.1	5.6	23.9	Large boulders. Argillite rock may be bedrock or boulder.
NBA-15	36.1	12	24.1	10.6	10.6	27.1	Possible top of weathered rock at Elev. 13.1'.
NBA-16	38.6	11	27.6	NE	23.1	35.6	
Site Borings							
TD-2	30.6	3.0	27.6	NE	6.6	28.6	
TD-3	30.7	3.0	27.7	NE	17.4	28.2	
TD-4	32.8	3.0	29.8	NE	17.8	30.8	
TD-5	36.9	0	36.9	NE	21.9	32.9	
TD-6 OW	29.9	3.0	26.9	16.9	16.9	28.9	Well screened from 8 to 13 ft.
NBS-1	27.6	0	27.6	12.1	12.1	27.1	
NBS-2	38.0	0	38.0	NE	22.5	36.3	
NBS-3	31.6	0	31.6	NE	15.1	28.6	Auger Boring.
NBS-4	30.0	0	30.0	NE	5.0	29.5	
NBS-5 MW	38.0	0	38.0	NE	21.5	32.5	Auger Boring.
NBS-8, 8A	28.8	0	28.8	NE	12.3	23.8	Refusal @ 11'. Offset. Auger Boring.
NBS-9	36.7	0	36.7	NE	20.2	32.7	Auger Boring.
NBS-10,A,B,C	32.2	0	32.2	17.5	17.5	29.2	Many drilling refusals. Boulders. Refusal @ BOB. Auger Boring.
NBS-11	34.9	0	34.9	18.7	18.7	Dry	Boulders. Refusal@ BOB. Auger Boring.
NBS-12, 12A	31.9	0	31.9	7.9	7.9	27.9	Boulders. Refusal @ 16'. Offset. Refusal @ BOB.

NE: Not encountered at the boring during drilling. Dry: Dry borehole observed

Soil conditions in the platform area generally consisted of the following:

Fill: The fill layer typically consists of mostly granular, loose to dense sand and gravel with trace silt. Top 2 feet of fill may contain slag. The fill layer is generally about 3 to 14 feet in the platform area, and 3 feet or less at all other areas.

Organic Silt: A 3.5 foot thick layer of organic silt was encountered from approximately elevation 12.0 to 15.5 feet at boring NBA-12 at the north side of the platform. Note boring NBA-12 is located adjacent to a wetland area. Organic soils may also exist near other wetland areas at the site.

Natural Granular Deposits: In the platform area, the natural soil deposits below the fill generally consist of predominantly sandy silt and silty sand with up to 25% gravel. These deposits are loose to very dense with Standard Penetration Test (SPT) N-values ranging between 5 and 98 blows per foot (bpf).

Glacial Till: Dense glacial till was encountered at boring TD-1 at elevations ranging from 25.0 to 16.0 feet, and consisted of lean clay with up to 20% sand and gravel. Numerous boulders were encountered in the glacial till.

Bedrock: Bedrock was encountered in the platform area at a depth of about 14.5 to 22 feet below existing ground surface, corresponding to approximately elevations 20.1 to 11.0 feet. The bedrock was soft, jointed, slightly weathered SILTSTONE (TD-1) or moderately hard, very slightly weathered ARGILLITE (NBA-14). Bedrock RQD values at the platform range from 50% to 95%.

Hard, moderately weathered, moderately to highly fractured SANDSTONE (TD-2) was also encountered at elevation 22.6 feet in the pedestrian ramp area. Bedrock RQD values range from 18% to 27%.

Groundwater: Groundwater levels were measured in the observation wells and in test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level ranged from approximate elevations 35.6 to 23.3 feet along the platform alignment, and from elevations 36.3 to 23.8 feet in the general area of the proposed parking lot. The use of wash boring techniques for some of the soil borings may have artificially increased the water level readings due to the addition of water to the borings. Trapped/perched water is also commonly seen at a higher elevation within existing fill and silty materials. The longer term water level readings taken at Boring TD–1 OW on July 7, 2010 and September 12, 2011 indicated the water at a depth of about 8 feet (Elevation 25.0 feet) and 5.2 feet (Elevation 27.8 feet), respectively. The longer term water level readings taken at Boring TD–6 OW on July 7, 2010 and September 12, 2011 indicated the water at a depth of about 3.5 feet (Elevation 26.4 feet) and 1.0 feet (Elevation 28.9 feet), respectively. Based upon these short-term observations and readings from the observation wells, it is anticipated that the groundwater could be within 3 to 5 feet below existing grade at the platform area and within 1 to 3 feet below existing grade in the parking lot area.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction. Local and periodic variations of ground water elevations may also be influenced by local subsurface drainage, leaking water or sewer pipes, and precipitation.

GEOTECHNICAL RECOMMENDATIONS

Due to variable thickness and consistency of the fill materials within the platform area, it is recommended to use ground improvement techniques to minimize differential settlement and to improve bearing capacity of the foundation soils. The ground should be improved with aggregate stone columns or rammed aggregate piers (RAPs). Stone columns and RAPs create stiff reinforcing elements in the foundation soil mass, thereby improving the soil bearing capacity.

As an alternative, the proposed station platforms can be supported on drilled micropiles extending through unsuitable soils (i.e., existing deep uncontrolled fills and organic soil layers) and bearing into competent natural soils. The use of deep foundations can also minimize the construction impacts on the existing track considering the existing track is active. The same type of foundation should be used for the pedestrian bridge to minimize any differential settlement. Due to the relatively shallow depth to dense to very dense natural soils in the ramp/stair structure area, it may be possible to use shallow spread footings to support this structure.

Platform and canopy design loads were not available at the time of this report preparation. However, it is anticipated that the station platform will be lightly (axially) loaded with limited horizontal forces from wind and seismic loads.

The following paragraphs provide project specific geotechnical recommendations for foundation soil preparation, structural fill/backfill placement, and design and construction of spread footings.

Ground Improvement

The stone column technique, also known as vibro-replacement or vibro-displacement, is a ground improvement process where vertical columns of compacted aggregate are formed through the soils to be improved. These columns result in considerable vertical load carrying capacity and improved shear resistance in the soil mass. The strength parameters of the stone columns-soil composite system can be estimated based on the reference FHWA/RD-83/026 and Priebe (1995). The rammed aggregate pier support elements are generally constructed by drilling a 18- to 36-inch diameter hole, removing or displacing the volume of soil, and then building a bottom bulb of clean, open-graded stone. The rammed aggregate pier is built on top of the bottom bulb, using well-graded highway base course stone placed in thin lifts (12-inches compacted thickness). The result of construction is a reinforced zone of soils directly beneath the foundations. Where subsurface conditions are such that an open hole is difficult to be maintained, the displacement rammed aggregate support elements (Impact System) can be used. In this method, the displacement rammed aggregate piers are installed by driving a variable-diameter mandrel into the soil, thereby displacing the soil laterally to form a cavity, and then filling the ensuing cavity by ramming thin lifts of open-graded aggregate within the cavity as the mandrel is retrieved from the hole.

Drilled Micropiles

Micropiles mainly rely on the grout/ground skin friction (bond) to transfer loads to the ground, since the pile displacement required to mobilize the frictional resistance is significantly less than that to mobilize end bearing. Micropiles should be designed to resist axial, lateral and eccentric loading conditions.

Based on our review of geological conditions and the split-spoon soil samples, it is our opinion that the skin friction within the existing fill and organic soils should be neglected. Type B pressure grouting or Types C and D post-grouting procedures should be required for micropile installation at this station for micropiles installed in soils. For micropiles installed in bedrock, Type A gravity grouting is acceptable. Side friction in soil should be neglected for micropiles bearing in rock. The allowable grout-to-ground bond strengths recommended for the materials encountered for this station are listed in Table 3 below.

Table 3: Summary of Micropile Design Parameters

SOIL/ROCK TYPE	BUOYANT UNIT WEIGHT (PCF)	ALLOWABLE SKIN [2] FRICTION (BOND STRENGTH) TYPE A (PSI)	ALLOWABLE SKIN [2] FRICTION (BOND STRENGTH) TYPES B AND C (PSI)	ALLOWABLE SKIN [2] FRICTION (BOND STRENGTH) TYPE D (PSI)
Fill and Organic Soils	57.5	--	--	--
Medium Dense to Very Dense Granular Soils	62.5	--	6	10
Competent Bedrock	82.5	35	--	--

Notes: 1. Fill/organic thickness ranges from 8 to 20 feet, top of bearing soils shall be top of natural granular soils.
2. Type A gravity grouting procedure is not recommended for micropiles in soil.

For corrosion protection, permanent casing should be installed to a depth of at least 5 feet below the bottom of the encountered fill and organic soils. The permanent casing design should include a 1/8-inch corrosion allowance.

In general, we recommend that the micropiles not be spaced within a distance less than 3 times the drilled holes/grout diameters. This spacing is to eliminate group effect for axially loaded piles bearing within soils.

Spread Footings

Spread footings are recommended for the ramp and stair structure foundations. The footings should be placed on compacted structural fill or on dense natural granular soils. The existing fill appears to have been placed without control and must be removed within the zone of influence of the footing down to natural soils. The zone of influence is defined by a line extending one foot from the bottom edge of the footing and continuing at a 1H:1V slope down to the natural soils.

The recommended allowable design bearing capacity for spread footings bearing on at least medium dense structural fill is 5 ksf, provided that subgrades are prepared as described herein. This provides an adequate factor of safety against bearing failure and limits the total estimated settlement to less than one inch and the differential settlement to less than ½ inch. All footings should be at least 4 feet wide. The bottom of footing elevation should be at least 4 feet below final grades for frost protection.

The structural fill material should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The exposed remaining fill and the structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557) and as described in the following sections.

All temporary open cuts required for footing construction should be in accordance with the related OSHA regulations and should have side slopes of no steeper than 1.5H:1V.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered, the station site is classified as Seismic Site Class D soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The structure could be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class D Soils at the location of this station:

S_{MS} = 0.384 and S_{M1} = 0.149

S_{DS} = 0.256 and S_{D1} = 0.099

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class
- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: slope instability, soil liquefaction, or surface rupture due to faulting or lateral spreading. The proposed grading is relatively flat and we are not aware of any pre-existing slope instability in this area. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Based on the observed subsurface conditions, recorded water levels, percentage of fine contents and the recorded SPT N-values, the soil layers underlying the site are judged to be not susceptible to liquefaction.

Retaining Walls

The track embankment retaining walls can be a cantilevered sheet pile wall. Steel anchor bars could also be used to connect the top portion of the two sheet pile walls on the east and west sides if analyses indicate bracing is needed. If anchor bars under the tracks are not acceptable to the MBTA, another option for the retaining walls is a soldier pile wall with precast concrete panels. Alternatively, if construction of the walls can be sequenced to limit excavation impacts on the existing tracks, use of Mechanically Stabilized Earth (MSE) walls may be possible.

CONSTRUCTION CONSIDERATIONS

Ground Improvement – Rammed Aggregate Piers/ Stone Columns

If a spread footing foundation option is desired by the designer but mass foundation over-excavation is not cost-effective or feasible, then ground improvement measures (such as rammed aggregate piers or stone columns) below foundation areas can be considered as a foundation alternative. The rammed aggregate piers/stone columns can improve soil bearing capacity characteristics of the existing fill, transfer (portions of) axial loads, and reduce potential foundation settlement. Rammed aggregate pier design and construction is typically provided by a specialty contractor based on a performance criteria, but should be reviewed by the Geotechnical Engineer.

Stone columns and rammed aggregate piers are constructed by excavating a hole (typically 18 to 36 inches in diameter) to the specified design depth (typically to competent soils) by augering or using a mandrel. The soil at the bottom of the hole is then densified with a high impact densification system having a rated energy of 250,000 ft.-lbs. to 1,200,000 ft.-lbs. Thin lifts (6- to 12-inches thick) of dense-grade aggregate or crushed stone are then compacted in the cavity. The proposed platform can then be supported on shallow foundation bearing on soils improved with rammed aggregate piers or stone columns. The footings can be designed based on a higher “composite” soil bearing capacity.

Stone columns and rammed aggregate pier elements are typically installed at about 6 to 8 feet center to center spacing. The length and spacing of the elements will depend on the foundation loads and settlement tolerance.

Drilled Micropiles

The drill rig should have adequate torque and downward pressure to facilitate drilling or coring through any obstruction and drilling into bedrock. A temporary or permanent casing is typically required to provide full length side support within soil embedment especially when drilling through sandy granular soils. The steel casing can provide high shear and bending capacity to resist lateral loads.

Water or polymer drilling mud (for flushing the hole during drilling) can also be used in addition to the casing to provide temporary side support during pile installation. Bentonite slurry may impair grout/ground bond capacity and therefore, it is not recommended.

Grouting under pressure should be performed through a tremie pipe from the bottom to the top of the casing in full until fresh grout tops out. No significant loss of grout from the pile should be observed. Re-grouting (post-grouting) after set of the initial grout may be necessary to improve the grout and ground bond strength within soil embedment. Suitable centralizers should be firmly fixed to maintain the specified grout cover. We recommend that the drilling, installation of the reinforcement, and grouting of a particular pile be completed in a short and continuous processes.

Field load testing including both performance and proof testing should be performed for production micropiles. The pile load test program and proof tests during installation should be conducted as described in the project specifications. Testing procedures and results should be observed and reviewed by the Geotechnical Engineer, and are subject to MBTA approval. In general, the compression load test should be performed in accordance with ASTM D1143 and tension load test in accordance with ASTM D3689.

Spread Footings

The existing fill should be stripped off and removed from within the zone of influence of the walkway area footings using a smooth edge excavation bucket. Following excavation, the exposed surface should be proof compacted with at least 10 passes of a large vibratory drum roller (minimum 10,000 pound static weight). All excavated areas should be backfilled with gravel borrow and compacted to 95% of the maximum dry density (ASTM D1557). Footing inspections should include hand auger probes by the geotechnical personnel to check for soft/weak zones. The need for undercutting and backfilling with structural fill should be closely evaluated in the field based on encountered conditions.

In areas where seepage is encountered within footing excavations, the need for placing a 3" thick lean concrete mud mat or a layer of ¾-inch crushed stone to protect the bearing surface should be evaluated in the field. Crushed stone thicker than 4 inches shall be wrapped by non-woven filter fabric.

Following observation of the bearing soils by geotechnical personnel, reinforcing steel and concrete can be placed in the excavation. It is recommended that footing reinforcing steel and concrete be placed the same day as the footing excavation is made, where possible, to avoid significant moisture content changes in the bearing soils. No water should be allowed to pond within excavations and drainage should be maintained away from foundations both during and after construction. The footing excavation should be free of loose debris at the time of footing concrete placement.

MSE Wall Construction

Wall Subgrade Preparation

Remove existing soil from the area to be occupied by the MSE wall structure, including facing and reinforcing strips, to the required grade, and extending at least 5 feet beyond the edge of structures on all sides. Where practical, final excavation should be undertaken using a smooth edged bucket to limit disturbance of the subgrade.

The exposed subgrade soils should be proof-compacted with a minimum of 10 passes of a minimum 10,000-lb (static weight) heavy vibratory roller. Loose or soft zones observed during proof-compaction should be over-excavated to firm and stable ground and replaced with compacted Gravel Borrow. Where exposed soil subgrades are at or near the groundwater level, static proof-compaction methods may be recommended in lieu of vibratory methods by the geotechnical engineer. Exposed subgrade soils should be protected from disturbance.

Existing fill may remain in place below the undercut zone of the MSE wall; however, if organic soils or soft or disturbed soils are observed, they should be completely removed from within the bearing influence zone of the retaining wall and reinforced soil mass. The bearing influence zone is defined by a one horizontal to one vertical (1H:1V) line sloping down and out from one foot outside the bottom exterior edge of the footing/reinforced soil zone to the exposed subgrade.

Once proof-compaction is complete, a layer of non-woven heavy duty geotextile, in accordance with MassDOT M9.50.0, Type I Separation, or Type II Stabilization geotextile fabric, should be placed at the bottom of excavation. The geotextile should have an Equivalent Opening Size (EOS) suitable to act as a filter to prevent loss of material from the new structural fill (Gravel Borrow) into the underlying existing fill materials (overlap roll ends and sides a minimum of 12 inches).

We recommend that a qualified geotechnical engineer evaluate the bearing subgrade and observe fill placement.

Leveling Pad

We recommend that a minimum 12 inch wide, 6 inch thick leveling pad consisting of reinforced concrete be provided as a leveling pad below the facing panels.

Backfill Material

MSE walls require placement of well-graded, granular soil (i.e. Gravel Borrow, MassDOT M1.03.0, Type a) in order to allow for drainage and to provide resistance to pullout of the reinforcing strips. Fill should be placed in loose lifts no greater than 8 inches thick and compacted to 95% of maximum density as determined by ASTM D1557 up to each layer of reinforcement. The reinforcing strips can be connected to the facing prior to placing subsequent lifts of backfill and reinforcing, or the strips can be wrapped around the subsequent lift, allowing the facing to be installed upon completion of backfilling. The method of construction should be provided by the MSE wall specialty designer and reviewed by the engineer.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed structure footprints, walkway and paved areas, these areas should be stripped of topsoil, vegetation, loose fill, and existing pavement, if present. The topsoil should be placed in a designated area for reuse during final grading. Following site clearing and stripping, the foundation areas should be prepared as discussed above. The exposed soil subgrade should be proof rolled with at least 10 passes of a minimum 10,000-lb (static weight) heavy vibratory roller. Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials. Where subgrade soils are close to the existing groundwater level or where silty subgrade soils are encountered, proof-compaction using non-vibratory methods may be considered by the geotechnical engineer.

If additional rolling does not correct the unstable condition, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. A backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas. Construction traffic should be controlled to prevent excessive stresses and disturbance to the subgrade.

If pavements are not constructed immediately after grading, the subgrade should be shaped so as to prevent ponding. If there is a substantial lapse in time between grading and paving, or if the subgrade is disturbed, it should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during proof-rolling or initial construction should be removed and replaced with compacted granular fill.

Within the proposed paved areas, and extending a distance of five feet beyond the edge on all sides, excavate existing granular fill soils to a depth of two feet below existing site grades. It may be possible to reuse the existing granular fill, depending on the suitability of the material, as described herein.

Fill Placement and Compaction

Fill materials most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to the following percentages of the maximum dry density:

Table 3: Fill Compaction Requirements

DESCRIPTION	MINIMUM PERCENT COMPACTION (ASTM D-1557)
General Site Fills, Structural Fill (Below Footings and Slabs)	95
Behind Retaining Walls	92
Landscape Area	90

Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content as determined by the Modified Proctor test (ASTM D-1557).

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Discharge of pumped water should be performed in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes steeper than 2-1/2H:1V as the station design is finalized.

Excavation Slopes and Shoring

The slopes of open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced registered Professional Engineer in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

Permanent Retaining Walls

If sheet pile walls or soldier pile walls with precast concrete panels are used for permanent retaining walls, pre-trenching or pre-drilling may be required to remove obstructions and to install piles to sufficient depths into underlying dense soils and bedrock. A minimum of 3 feet of free draining Gravel Borrow should be placed behind the walls and the walls should also have weep holes installed for drainage.

Protection of Existing Facilities

It is recommended that a geotechnical instrumentation and monitoring program be performed during construction of the project to evaluate impacts on adjacent structures. It is recommended that the program be developed to provide data for the following considerations:

- To monitor ground movements and vibration levels during construction.
- To provide early warning of potentially adverse trends by presenting sufficient data to determine the source of unanticipated ground movements, if present.
- If necessary, to plan remedial measures to limit damage to embankments and structures and to provide early warning when alternative means of protection are necessary.
- To document impacts of construction on adjacent facilities.
- To evaluate the performance and structural integrity of the constructed facilities.

We recommend the following instrumentation program to measure:

- Ground surface settlement and lateral movement adjacent to proposed construction.
- Horizontal and vertical movement of any excavation support system, and existing structures.
- Vibrations as a result of construction activities.

Vertical and horizontal survey points should be established on the adjacent structures. The monitoring points should be surveyed prior to the start of construction and monitored during construction to detect movement.

Vibration monitoring should be conducted within 100 feet of existing structures during construction activities.

We recommend conducting a pre-construction survey of structures and utilities within 100 feet of the site to document existing conditions prior to construction. Documentation should include photographs, video, sketches, and/or written comments.

Specific instrumentation and monitoring requirements shall be based on the proposed construction sequence, duration of construction, and performance criteria. Initial measurements should be established well in advance of construction so that baseline data can be developed. This information will be invaluable for providing early warning of adverse trends and for assessing the need for mitigating measures.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed Taunton Depot Station in Taunton, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – SITE LOCATION PLAN
FIGURES 2&3 – SUBSURFACE EXPLORATION PLANS
FIGURES 4&5 – SUBSURFACE SOIL PROFILES
APPENDIX A – EXPLORATION LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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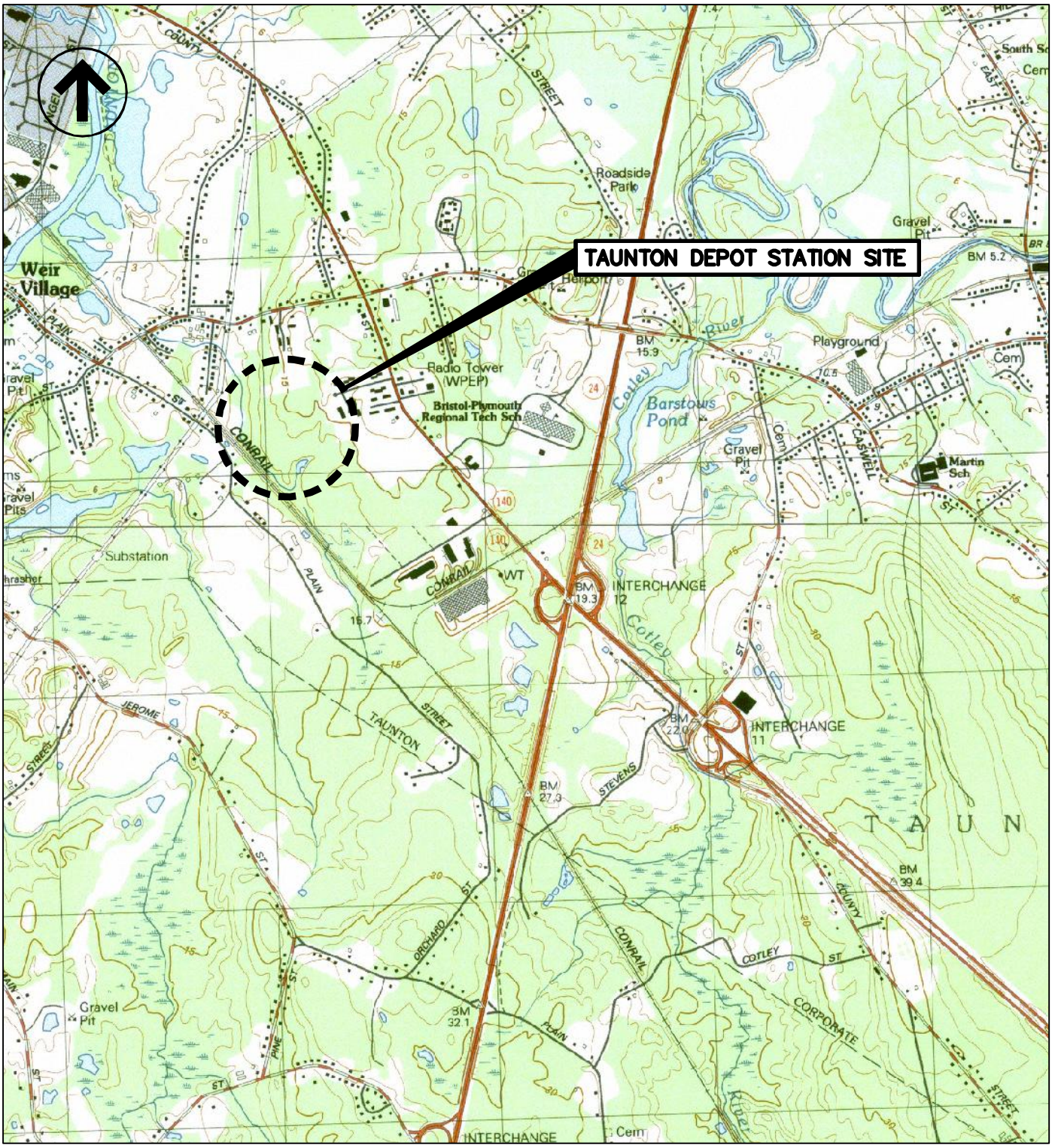
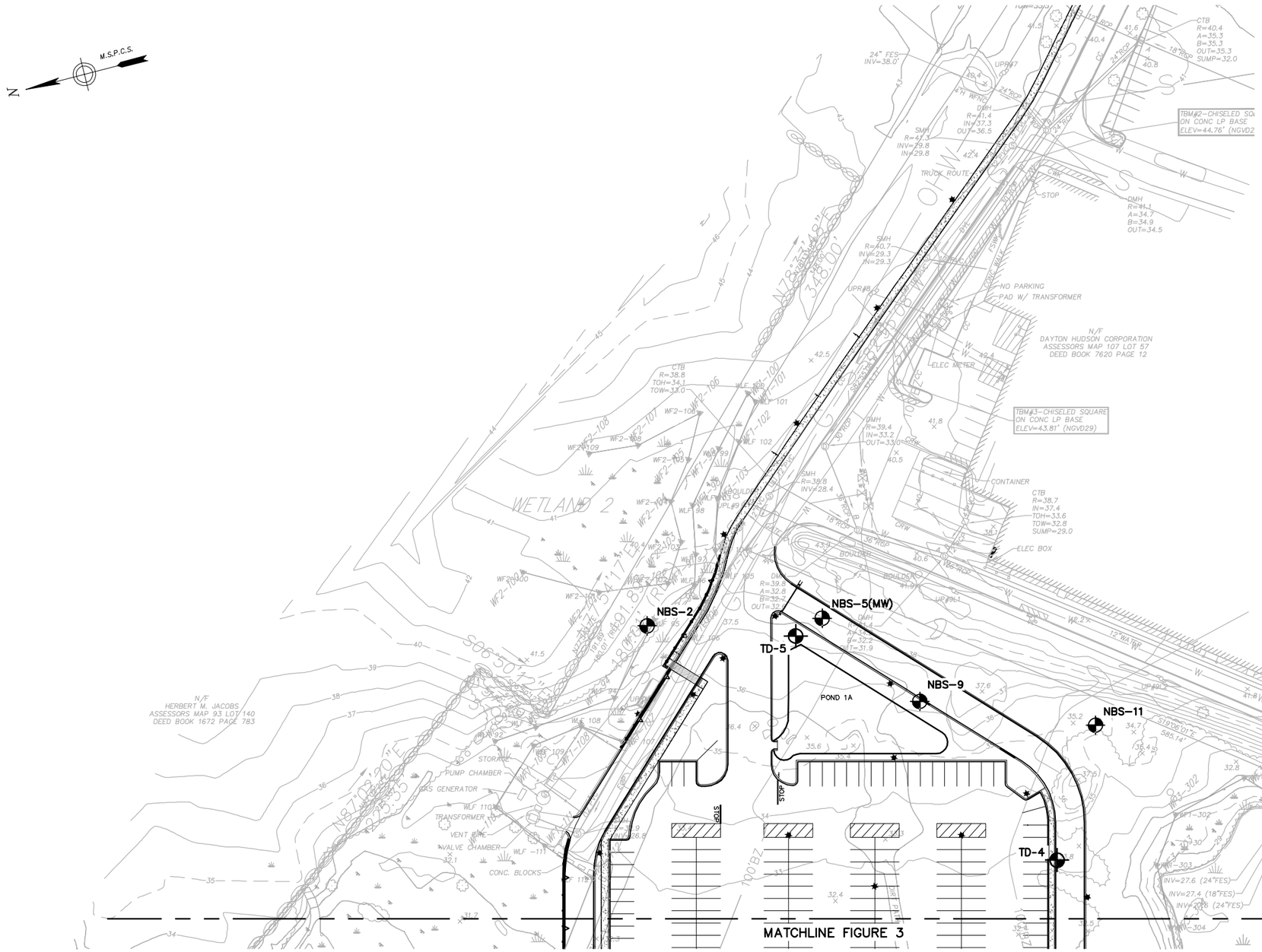
FIGURES

Figure 1: Site Location Plan
Figures 2 and 3: Subsurface Exploration Plan
Figures 4 and 5: Subsurface Soil Profiles



TAUNTON DEPOT STATION
PROJECT LOCUS PLAN
NOT TO SCALE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	TAUNTON DEPOT STATION TAUNTON, MASSACHUSETTS FIGURE 1



KEY:

NB–15 BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION SERVICES FROM MARCH TO MAY 2002.

TD–10 BORING PERFORMED BY NEW HAMPSHIRE BORING IN MAY 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

MW, OW INDICATES OBSERVATION WELL INSTALLED

NOTES:

1. BORING LOCATIONS WERE DETERMINED BY INSTRUMENT SURVEY CONDUCTED BY COLER AND COLANTONIO, INC. IF OBSTRUCTIONS WERE ENCOUNTERED THE MOVED BORING LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT AND LINE OF SIGHT FROM EXISTING FEATURES AND SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.
2. FOR BORING LOGS SEE APPENDIX A OF THE GEOTECHNICAL REPORT.
3. SURFACE DETAIL AND TOPOGRAPHY SHOWN HEREON IS FROM AN ON–THE–GROUND SURVEY PERFORMED BY COLER & COLANTONIO, INC., FROM APRIL 2010 TO SEPTEMBER 2010.
4. PRIMARY GEODETIC SURVEY CONTROL WAS ESTABLISHED FROM AN ON–THE–GROUND SURVEY BY COLER & COLANTONIO, INC. USING GLOBAL POSITIONING SYSTEM (GPS) SURVEY METHODS IN FEBRUARY 2010. THE GRID COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND 2001 – NAD83).
5. CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).

TAUNTON DEPOT STATION
BORING LOCATION PLAN
SCALE: 1"=80'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242–9222

TAUNTON DEPOT STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 2

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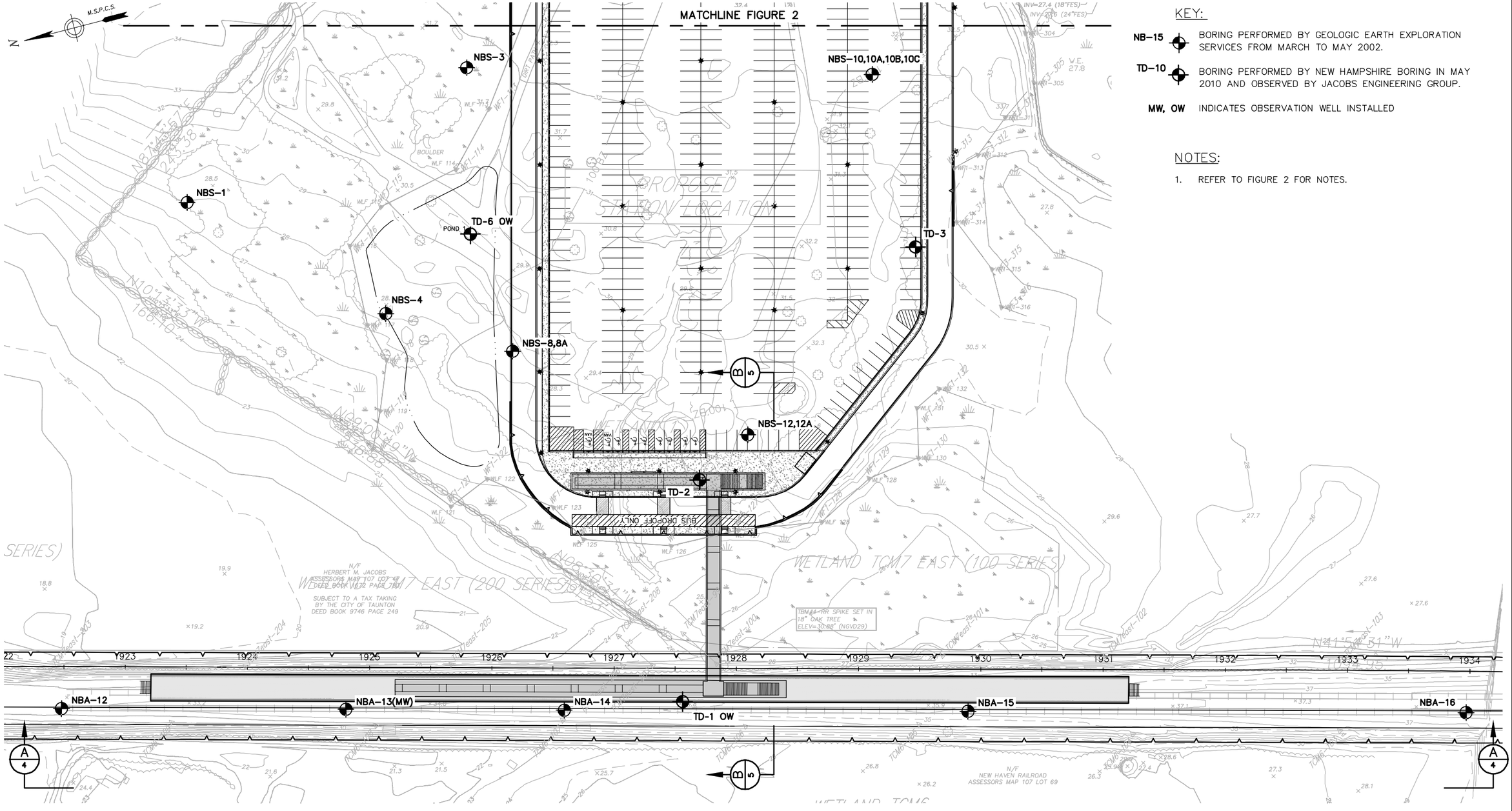

KEY:

NB–15 BORING PERFORMED BY GEOLOGIC EARTH EXPLORATION SERVICES FROM MARCH TO MAY 2002.

TD–10 BORING PERFORMED BY NEW HAMPSHIRE BORING IN MAY 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

MW, OW INDICATES OBSERVATION WELL INSTALLED

NOTES:

1. REFER TO FIGURE 2 FOR NOTES.

TAUNTON DEPOT STATION
BORING LOCATION PLAN
SCALE: 1"=80'

80 40 0 80 160
SCALE: 1"=80'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

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TAUNTON DEPOT STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: MARCH 2012

FIGURE NO: 3

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ELEVATION, FEET (NGVD 29)

NBA-12 EL 32.8
NBA-13 MW EL 33.9
NBA-14 EL 34.6
TD-01 OW EL 33.0
NBA-15 EL 36.1
NBA-16 EL 38.6

34' RT OFFSET
34' RT OFFSET
34' RT OFFSET
27' RT OFFSET
34' RT OFFSET
32' RT OFFSET

NEW PLATFORM
TOP OF RAIL
APPROX. EXIST. GRADE @ TRACK BASELINE

FILL
ORGANIC SOIL
SANDY SILT DEPOSITS
BEDROCK
FILL
SAND DEPOSITS
BOULDERS
TILL
BOULDERS
WEATHERED ROCK
BEDROCK
FILL
SILTY SAND DEPOSITS

B@7.3
B@8.4
B@5.6
B@11.0
B@10.6
B@23.1

(RC1 60/60) 87%
(RC2 60/60) 95%
(C1 5/60) 8%
(C2 40/60) 50%
100/3"
120/1"

HORIZ. 1" = 100'
VERT. 1" = 10'

BORING LEGEND
N.T.S.

BORING DESIGNATION
TD-XXX EL. XX.X
TOP OF BORING ELEVATION
WATER LEVEL
ESTIMATED STRATA BOUNDARY
SPT N-VALUE (BLOWS/FT)
SPLIT SPOON SAMPLE SYMBOL
RQD (%)
REC/PEN
CORE RUN NO.
ROCK CORE SYMBOL
BOTTOM OF BORING ELEVATION
B@146
(C1 54/60) 83.3%

1922+00 1923+00 1924+00 1925+00 1926+00 1927+00 1928+00 1929+00 1930+00 1931+00 1932+00 1933+00 1934+00

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

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TAUNTON DEPOT STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE PROFILE A-A

DATE: MARCH 2012

FIGURE NO: 4

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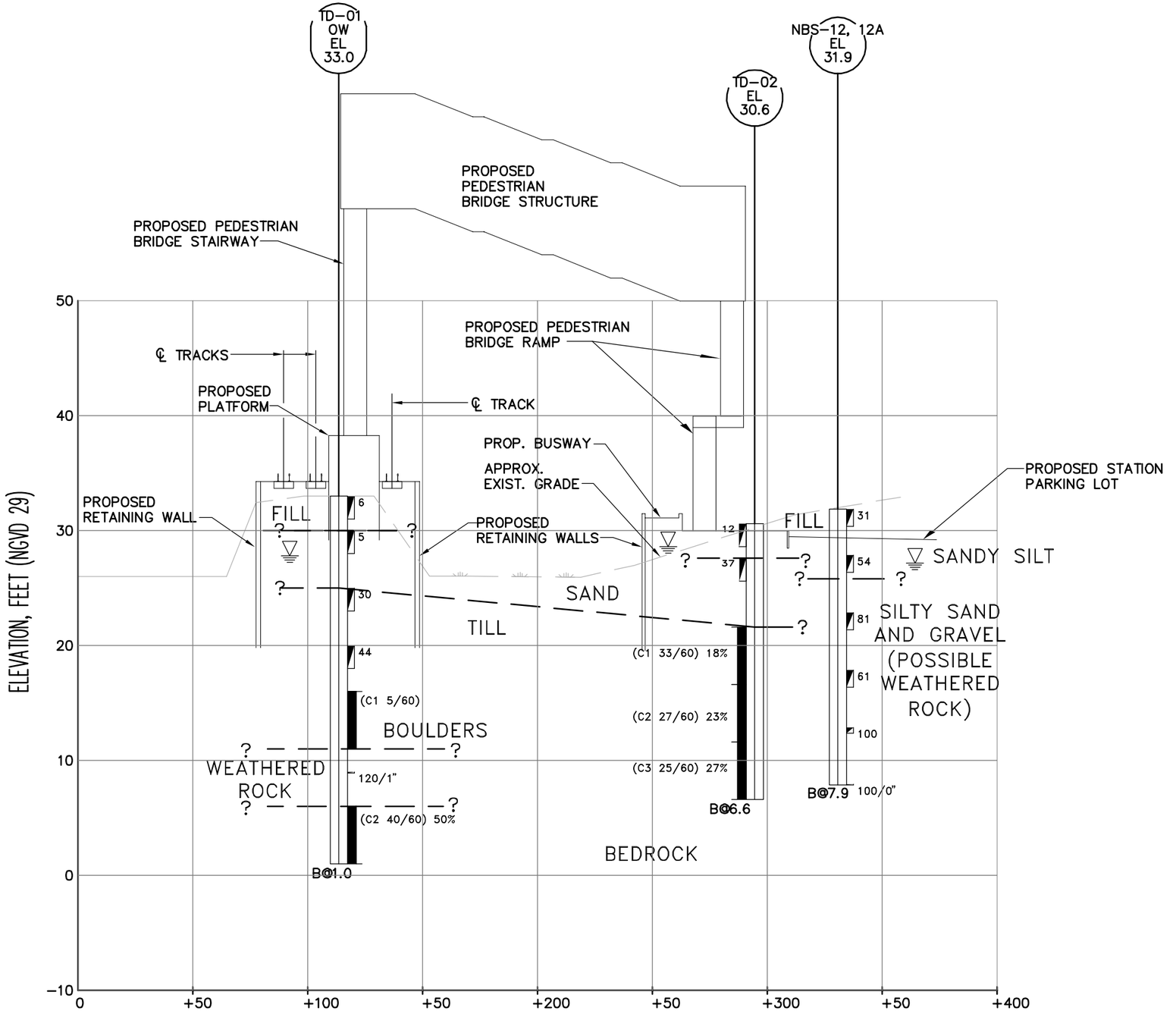

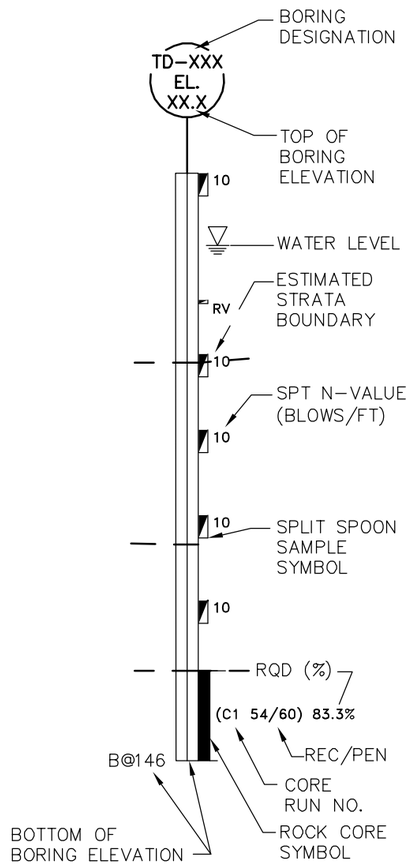

BORING LEGEND
N.T.S.

50 25 0 50
10 5 0 10
HORIZ. 1" = 50'
VERT. 1" = 10'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

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TAUNTON DEPOT STATION
TAUNTON, MASSACHUSETTS
SUBSURFACE PROFILE B-B

DATE: MARCH 2012

FIGURE NO: 5

Memorandum

APPENDIX A: EXPLORATION LOGS

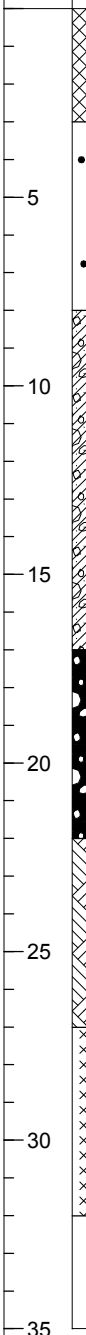
TD-1 TO TD-6
NBA-12 TO NBA-16
NBS-1 TO NBS-5
NBS-8 TO NBS-12

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	TD - 001 OW
LOCATION	Taunton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	P. Chou	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	33
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2780610.2
27	NX Rock Core	5/4/2010	3.5 Upon Completion (In Casing)			COORD E	772564.6
32	Terminated	7/7/2010	8 Monitoring Well Reading			DATE START	5/4/10
		9/12/2011	5.2 Monitoring Well Reading			DATE END	5/4/10



DEPTH (ft)	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0	5 4 2 1	S1	0 - 2	0		NO RECOVERY, from cuttings: WELL GRADED GRAVEL WITH SAND (GW); fine to coarse gravel, some fine to coarse sand, trace silt, gray, moist, FILL.
	8 4 1 1	S2	3 - 5	4	30.0	POORLY GRADED SAND (SP); mostly fine to medium sand, trace gravel, trace silt, brown, wet.
5						
	24 17 13 14	S3	8 - 10	18	25.0	LEAN CLAY (CL); moderately plastic clay, some silt, trace sand, trace gravel, gray, moist, PP = 4.5 TSF, GLACIAL TILL.
10						
	14 31 13 21	S4	13 - 15	13		SIMILAR TO S3; frequent wet sand seams, PP = 4.5 TSF.
15						Casing and split spoon refusal at 17 ft.
		C1	17 - 22	5	16.0	BOULDERS.
20						
	120/1"	S5	23 - 23.1	2	11.0	WEATHERED ROCK; gray.
25						
	RQD=50	C2	27 - 32	40	6.0	SILTSTONE; soft, joints spaced 3 - 16", joints angled at ~10 - 20 degrees, some high angle fractures, slightly weathered, greenish-gray.
30						
					1.0	Bottom of Hole at 32'.
35						

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 001 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	TD - 002	
	LOCATION	Taunton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR A. Barbetta	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	30.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2780721.2
9 NX Rock Core	5/5/2010	2 Upon Completion (Casing pulled)			COORD	E	772708.7
24 Terminated					DATE START		5/5/10
					DATE END		5/5/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 4 8 8	S1	0 - 2	16		WELL GRADED SAND (SW); fine to coarse sand, trace gravel, trace silt, light brown, dry, FILL.
		10 15 22 23	S2	3 - 5	15	27.6	SILTY SAND (SM); mostly fine sand, little non-plastic silt, light brown, wet.
5							
						22.6	Top of bedrock at 8 ft, roller bit to 9 ft.
10		RQD=18	C1	9 - 14	33		SANDSTONE; hard, coarse grained, moderate weathering, gray/blue.
15		RQD=23	C2	14 - 19	27		SIMILAR TO C1.
20		RQD=27	C3	19 - 24	25		SIMILAR TO C1.
						6.6	
25							Bottom of Hole at 24'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 002

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail
LOCATION	Taunton, MA
OWNER	Mass.Bay Transportation Authority
JOB NUMBER	E2347101

BORING NO. TD - 003

SHEET 1 OF 1

INSPECTOR	A. Barbetta	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	30.7
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2780717.4
13.33	Terminated	5/5/2010	2.5 Upon Completion (Casing pulled)			COORD E	772968.5
						DATE START	5/5/10
						DATE END	5/5/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 5 10 12	S1	0 - 2	12		WELL GRADED SAND WITH SILT (SW-SM); fine to coarse sand, little non-plastic silt, trace gravel, brown, dry, FILL.
		12 13 13 15	S2	3 - 5	8	27.7	SILTY SAND (SM); fine to coarse sand, little non-plastic silt, brown, wet.
5							
		15 26 19 22	S3	8 - 10	9		SIMLAR TO S2; gray, wet.
10							
		120/4"	S4	13 - 13.33	4	17.4	SILTY SAND (SM); fine to coarse sand, little non-plastic silt, dark gray, wet, weathered rock in tip of spoon.
15							Bottom of Hole at 13.33'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 003

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO. TD - 004
	LOCATION	Taunton, MA	SHEET 1 OF 1
	OWNER	Mass.Bay Transportation Authority	
	JOB NUMBER	E2347101	

INSPECTOR	A. Barbetta	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	32.8
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2780857.5
15	Terminated	5/5/2010	2 Upon Completion (Casing pulled)			COORD E	773140.5
						DATE START	5/5/10
						DATE END	5/5/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		1 2 9 10	S1	0 - 2	16		WELL GRADED SAND (SW); fine to coarse sand, trace silt, reddish-brown, dry, FILL.
		15 20 19 20	S2	3 - 5	18	29.8	WELL GRADED SAND WITH SILT (SW-SM); fine to coarse sand, little non-plastic silt, brown, wet.
5						25.8	Boulder encountered.
		46 17 20 18	S3	8 - 10	12	24.3	(8 - 8.5') WEATHERED BOULDER.
							(8.5 - 10') SILT (ML); non-plastic silt, dark gray, wet.
10							
		17 23 21 40	S4	13 - 15	14		SILT (ML); non-plastic silt, dark gray, wet.
15						17.8	Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 004

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	TD - 005	
	LOCATION	Taunton, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: P. Chou	CONTRACTOR	NH Boring	DRILLER	S. Bolduc	ELEVATION	36.9	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29	
0 Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2781096.4
15 Terminated	5/4/2010	4 Upon Completion (In Casing)			COORD	E	773134.7
					DATE START		5/4/10
					DATE END		5/4/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		12 50 41 22	S1	0 - 2	12		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine to mediuim sand, some non-plastic silt, trace gravel, brown, moist.
5		8 14 14 18	S2	3 - 5	14		SILTY SAND (SM); mostly fine to mediuim sand, some non-plastic silt, trace gravel, olive, wet.
10		12 14 19 22	S3	8 - 10	12		SIMILAR TO S2; occasional clay seams.
15		22 17 20 24	S4	13 - 15	12	23.9	LEAN CLAY (CL); moderately plastic clay, little sand, trace silt, gray, moist, PP = 3 TSF.
						21.9	Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 005

LOG OF TEST BORING

JACOBS™

PROJECT	South Coast Rail	BORING NO.	TD - 006 OW
LOCATION	Taunton, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	A. Barbetta	CONTRACTOR	NH Boring	DRILLER	P. Rosinha	ELEVATION	29.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	TR CME 75	DATUM	NGVD 29
0	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2780995.1
13	Terminated	5/5/2010	1.5 Upon Completion (Casing pulled)			COORD E	772732.7
		7/7/2010	3.5 Monitoring Well Reading			DATE START	5/5/10
		9/12/2011	1 Monitoring Well Reading			DATE END	5/5/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 5 6 16	S1	0 - 2	10		WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel, trace silt, brownish gray, dry, FILL.
		4 6 7 9	S2	3 - 5	12	26.9	SILTY SAND (SM); mostly fine sand, little non-plastic silt, dark gray, moist.
5							
		10 12 17 68	S3	8 - 10	8	21.9	SILT (ML); non-plastic silt, trace fine sand, dark gray, wet.
10						17.9	Probable top of bedrock at 12 ft, roller bit to 13 ft.
						16.9	
15							Bottom of Hole at 13'.
							Notes:
							Observation well screened 8 - 13 ft.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. TD - 006 OW

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBA-12
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
CLIENT	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	32.8
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B57-TR	DATUM	FT MSL
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft) / REMARKS	SPT HAMMER	140 lb. Safety	GRID N	2780984
4.0	Wash Boring-Open Hole	3/12/02 1100	9.5 Upon Completion (Casing pulled)			COORD E	772220
24.0	Split Spoon Sample					DATE START	3/12/02
25.5	Terminated					DATE END	3/12/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		14 18 19	10	SS-1	32.50	3" of ballast Well graded sand with gravel (SW) - mostly fine to medium sand, some fine to coarse gravel, light brown, dry (FILL) Top 2" of sample contains slag, dark brown/black (Possibly used as subballast)
5		27 19 15	18	SS-2		Silty sand (SM) - mostly fine to medium sand, some silt, trace fine to coarse gravel, trace coarse sand, brown, wet (FILL)
10		13 14 13	18	SS-3		Well graded sand with silt and gravel (SW-SM) - mostly fine to coarse sand, little fine to coarse gravel, trace to little silt, brown, wet (FILL)
					20.80	(Organic soil layer from 12.0 to 15.5 ft)
15		5 5 8 24	18	SS-4		Top 12": Organic soil with sand (OL/OH) - mostly organics, little fine sand, trace medium to coarse sand, dark brown, moist
					17.30	Bot 6": Well graded sand with silt (SW-SM) - mostly fine to medium sand, trace to little silt, gray, wet
					14.80	
20		21 12 27	18	SS-5		Sandy silt (ML) - mostly silt, some fine sand, trace medium sand, gray, wet
25		41 58 61	10	SS-6		Sandy silt (ML) - mostly silt, some fine sand, trace medium sand, gray, wet
					7.300	Boring Terminated at 25.5 ft.
30						REMARKS: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc.
35						

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

AUGER (AS) | 90 ROCK CORE (RC) AND ROD (%) REC (%) | 4/6 SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

• REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBA-12

LOG OF TEST BORING/MONITORING WELL

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	New Bedford Line - Taunton
CLIENT	Mass. Bay Transportation Authority
JOB NUMBER	013471

BORING NO. NBA-13 MW

SHEET 1 OF 1

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B57-TR
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER: 140 lb. Safety
4.0	Wash Boring-Open Hole	3/13/02 1330	8.0	Upon Completion (In Casing)	
24.0	Split Spoon Sample	5/21/02 1415	13.4	Monitoring well reading	
25.5	Terminated				

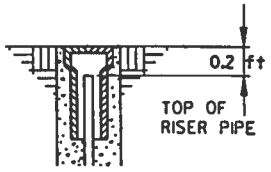
ELEVATION	33.9		
DATUM	FT MSL		
GRID	N	2780811	
COORD	E	772376	
DATE START	3/13/02		
DATE END	3/13/02		

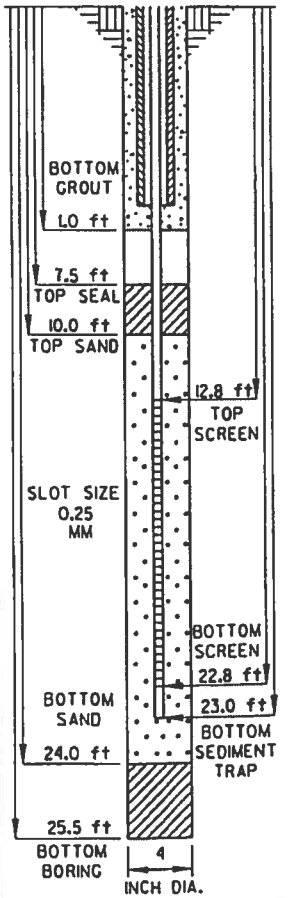
DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 18 24	8	SS-1	33.60	3" of ballast Well graded sand with gravel (SW) - mostly fine to medium sand, some fine to coarse gravel, tan, dry (FILL) (Slag in shoe)
5		13 22 17	12	SS-2		Silty sand (SM) - mostly fine to medium sand, some silt, trace coarse sand, gray, moist (FILL)
10		9 9 9	14	SS-3		Sandy silt (ML) - mostly silt, little fine sand, trace medium to coarse sand, brown, wet (FILL)
15		12 13 15	10	SS-4	19.90	Sandy silt (ML) - mostly silt, little to some fine sand, trace medium sand, gray, wet
20		3 8 16	18	SS-5		Sandy silt (ML) - mostly silt, little to some fine sand, trace medium sand, gray, wet
25		23 22 26	6	SS-6		Sandy silt with gravel (ML) - mostly silt, little fine sand, little fine to coarse gravel, gray, wet
					8.40	Boring Terminated at 25.5 ft.
30						REMARKS: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc. Monitoring well installed (2" Dia. PVC pipe)
35						

WELL LOG IN. T. S.)

WELL COVER INFORMATION

☐ STANDPIPE ☒ ROADBOX





Page 1: 0-35 feet, Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

• REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBA-13 MW

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBA-14
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
CLIENT	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	34.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B57-TR	DATUM	FT MSL
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER	140 lb. Safety	GRID N 2780678
4.0	Wash Boring-Open Hole	3/14/02 0900	10.7	Prior to resumption of drilling			COORD E 772495
19.0	NX Rock Core			(Hole depth at 18 ft)			DATE START 3/13/02
29.0	Terminated						DATE END 3/14/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
		9 18 17	6	SS-1	34.30	3" of ballast Well graded sand with gravel (SW) - mostly fine to medium sand, some fine to coarse gravel, light brown, dry (FILL) (Sand with slag in shoe tip) (Layer containing slag from 1.5 to 3.0 ft)
5		15 17 16	18	SS-2		Well graded sand with silt (SW-SM) - mostly fine to medium sand, trace to little silt, trace fine gravel, brown, wet (FILL)
10		9 10 12	5	SS-3		Well graded sand with silt (SW-SM) - mostly fine to medium sand, trace to little silt, trace fine gravel, brown, wet (FILL)
					23.60	
15		13 100/3"	4	SS-4	20.10	Silty sand (SM) - mostly fine sand, some silt, gray, wet (Gravel/rock lodged in shoe)
						(Rollerbit from 14.5 to 19.0 ft, drop 3" casing down hole and begin rock core)
20		87 RQD (%)	87 REC (%)	RC-1		Argillite: moderately hard, very slightly weathered, sound, gray, fine grained, moderately close horizontal to moderately dipping joints
25		95 RQD (%)	97 REC (%)	RC-2		Argillite: moderately hard, very slightly weathered, sound, gray, fine grained, close horizontal joints
30					5.60	Boring Terminated at 29.0 ft.
35						REMARKS: Very large boulders observed in surrounding area. Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc.

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBA-14

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBA-15
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
CLIENT	Mass. Bay Transportation Authority		
JOB NUMBER	013471		
INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc
DRILLER	T.Galvin	ELEVATION	36.1
METHOD OF DRILLING		GROUNDWATER READINGS	
DRILL RIG	B57-TR	DATUM	FT MSL
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)
REMARKS	SPT HAMMER	140 lb. Safety	GRID N 2780431
4.0	Wash Boring-Open Hole	3/14/02 1400	9.0
Upon Completion (In Casing)		COORD E 772715	
24.0	Split Spoon Sample		DATE START 3/14/02
25.5	Terminated		DATE END 3/14/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (In)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0					35.80	3" of ballast
		7 12 13	6	SS-1		Well graded sand (SW) - mostly fine to medium sand, trace fine to coarse gravel, light brown, dry (FILL) (Sand with slag in shoe tip)
5		9 17 12	10	SS-2		Silty sand with gravel (SM) - mostly fine to coarse sand, some fine to coarse gravel, little silt, brown, wet (FILL)
10		6 4 2	2	SS-3		Well graded sand with silt and gravel (SW-SM) - mostly fine to medium sand, little fine to coarse gravel, trace to little silt, brown, wet (FILL)
					24.10	
15		11 9 14	8	SS-4		Silty sand with gravel (SM) - mostly fine to medium sand, some silt, little coarse gravel, trace coarse sand, light brown, wet (Hard drilling from 17.5 to 18.5 ft)
20		37 47 51	6	SS-5		Silty sand with gravel (SM) - mostly fine to coarse sand, some fine to coarse gravel, little silt, gray, wet
					13.10	
25		49 52 51	8	SS-6		Clayey sand with gravel (SC) - mostly fine to coarse sand, some clay, little fine to coarse gravel, gray, wet (possible weathered rock)
					10.60	Boring Terminated at 25.5 ft.
30						REMARKS: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc.
35						

Page 1: 0-35 feet. Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBA-15

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBA-16
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
CLIENT	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	38.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B57-TR	DATUM	FT MSL
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft) REMARKS	SPT HAMMER	140 lb. Safety	GRID N	2780128
4.0	Wash Boring-Open Hole	3/14/02 1500	3.0 Upon Completion (Casing pulled)			COORD E	772987
14.0	Split Spoon Sample					DATE START	3/14/02
15.5	Terminated					DATE END	3/14/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0					38.30	3" of ballast
		13 23 29	6	SS-1		Well graded sand (SW) - mostly fine to medium sand, brown, dry (FILL)
5		17 7 24	4	SS-2		Well graded sand with silt and gravel (SW-SM) - mostly fine to medium sand, little fine to coarse gravel, trace to little silt, brown, wet (FILL)
10		10 11 11	6	SS-3		Well graded sand with silt and gravel (SW-SM) - mostly fine to medium sand, little fine to coarse gravel, trace to little silt, brown, wet (FILL)
					27.60	
15		12 6 18	1	SS-4		Silty sand (SM) - mostly fine sand, some silt, brown, wet
					23.10	Boring Terminated at 15.5 ft.
20						REMARKS: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51+	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | 90 RDCK CORE (RC) AND ROD (%) REC (%) | 4/6 SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBA-16

LOG OF TEST BORING

JE JACOBS	PROJECT	New Bedford/Fall River Commuter Rail			BORING NO.	NBS-1	
	LOCATION	New Bedford Line - Taunton				SHEET 1 OF 1	
	OWNER	Mass. Bay Transportation Authority					
	JOB NUMBER	013471					
INSPECTOR C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	B. Forget		ELEVATION	27.6
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	Bombadier		DATUM	FT MSL
0.0 Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER	140 lb Safety	GRID N	278185
9.0 Wash Boring-Open Hole	5/24/02 1445	0.5	Upon Completion (Casing Pulled)			COORD E	772597
12.5 NX Rock Core						DATE START	5/24/02
15.5 Terminated						DATE END	5/24/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		6 6 11	14	SS-1		Well graded sand with silt (SW-SM) - mostly fine to medium sand, trace to little silt, brown, moist (Very hard drilling from 1.5 to 3.0 ft, probable boulder)
					24.60	
5		15 18 20	10	SS-2		Poorly graded sand (SP) - mostly fine sand, trace medium sand, brown, wet
					20.60	
10		36 16 55	12	SS-3		Silty sand with gravel (SM) - mostly fine to medium sand, some fine gravel, little silt, gray, wet (Very hard drilling from 10.5 to 12.5 ft) (Attempt rock core at 12.5 ft)
		14 RQD (%)	14 REC (%)	RC-1	15.10	Diabase - moderately hard, very slightly weathered, light gray to black, fine to medium grained (Probable boulder, lean clay in core barrel above and below rock recovery) (Core barrel jammed at 15.5 ft)
15					12.10	Boring Terminated at 15.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet. Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

• REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-1

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-2
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		
CONTRACTOR	Earth Exploration, Inc	DRILLER	B. Forget
INSPECTOR	C.Nagata	DRILL RIG	Bombadier
METHOD OF DRILLING		SPT HAMMER	140 lb Safety
0.0	Wash Boring w/Casing	ELEVATION	38.0
9.0	Wash Boring-Open Hole	DATUM	FT MSL
14.0	Split Spoon Sample	GRID N	278178
15.5	Terminated	COORD E	773071
		DATE START	5/24/02
		DATE END	5/24/02

GROUNDWATER READINGS

DATE/TIME	DEPTH (ft)	REMARKS
5/24/02 1030	1.7	Upon Completion (Casing Pulled)

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		15 19 32	18	SS-1	35.00	Well graded sand with silt and gravel (SW-SM) - mostly fine to coarse sand, little fine gravel, trace to little silt, light brown, moist
5		9 11 12	18	SS-2		Silty sand (SM) - mostly fine sand, some silt, light brown-gray, wet
10		15 19 17	14	SS-3		Silty sand with gravel (SM) - mostly fine to medium sand, little silt, little fine gravel, trace clay, gray, wet
15		20 24 24	18	SS-4	22.50	Silty sand with gravel (SM) - mostly fine to medium sand, little silt, little fine gravel, trace clay, gray, wet
						Boring Terminated at 15.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

*REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-2

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	New Bedford Line - Taunton
OWNER	Mass. Bay Transportation Authority
JOB NUMBER	013471
BORING NO.	NBS-3
SHEET	1 OF 1
INSPECTOR	C.Nagata
CONTRACTOR	Earth Exploration, Inc
DRILLER	T.Galvin
ELEVATION	31.6
METHOD OF DRILLING	
GROUNDWATER READINGS	
DRILL RIG	B-57 TR
DATUM	FT MSL
0.0	Hollow Stem Augers
15.0	Split Spoon Sample
16.5	Terminated
DATE/TIME	4/18/02 1010
DEPTH (ft)	4.8
REMARKS	During Drilling (In Augers)
SPT HAMMER	140 lb Safety
GRID N	2781088
COORD E	772832
DATE START	4/18/02
DATE END	4/18/02
5.0	4/18/02 1110
3.0	Upon Completion (Augers Pulled)

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 9	12	SS-1		Silty sand with gravel (SM) - mostly fine to coarse sand, some fine to coarse gravel, little silt, olive brown, moist
					28.60	
5		30 37 22	3	SS-2		Silty gravel with sand (GM) - mostly fine gravel, some fine to coarse sand, little silt, gray, wet
					23.60	
10		15 40 48	18	SS-3		(Blow-in sands caused 6" drillrod of stickup prior to SS-3 sample) Poorly graded sand with gravel (SP) - mostly fine to medium sand, little fine gravel, trace coarse sand, trace fines, gray, wet
					18.60	
15		12 13 22	10	SS-4		Sandy silt (ML) - mostly silt, some fine to coarse sand, trace to fine gravel, gray, wet
					15.10	Boring Terminated at 16.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet. Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | 90 ROCK CORE (RC) AND ROD (%) REC (%) | 4/6 SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

*REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-3

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	New Bedford Line - Taunton
OWNER	Mass. Bay Transportation Authority
JOB NUMBER	013471

BORING NO. NBS-4

SHEET 1 OF 1

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	B. Forget
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Bombadier
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER: 140 lb Safety
19.0	Wash Boring-Open Hole	5/28/02 1100	0.5	Upon Completion (Casing Pulled)	
24.0	Split Spoon Sample				
25.0	Spoon Refusal				

ELEVATION	30.0
DATUM	FT MSL
GRID N	2781003
COORD E	772638
DATE START	5/28/02
DATE END	5/28/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		7 7 10	12	SS-1		Silty sand (SM) - mostly fine sand, some silt, light brown, moist
					27.00	
5		21 25 22	10	SS-2		Well graded sand with gravel (SW) - mostly fine to coarse sand, some fine gravel, trace silt, light brown, wet
					23.00	
10		37 20 26	9	SS-3		Silty sand with gravel (SM) - mostly fine sand, some silt, little fine gravel, trace coarse sand, beige, wet (Very hard drilling from 11 to 13.5 ft)
					16.50	
15		15 24 100/0"	5	SS-4		Silty gravel (GM) - mostly fine gravel, some silt, trace fine sand, beige, wet (Very hard drilling from 14 to 19 ft)
20		16 100/3"	3	SS-5		Silty gravel (GM) - mostly fine gravel, some silt, trace fine sand, beige, wet (Very hard drilling from 19 to 22.5 ft)
25		23 100	6	SS-6		Silty gravel (GM) - mostly fine gravel, some silt, trace fine sand, beige, wet
					5.00	Split Spoon Refusal at 25.0 ft. Boring Terminated.
30						REMARKS: Test boring performed by GeoLogic, Inc. Survey coordinates and elevations are approximate.
35						

Page 1: 0-35 feet, Page 2: 35-80 feet, Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-4

LOG OF TEST BORING/MONITORING WELL

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	New Bedford Line - Taunton
CLIENT	Mass. Boy Transportotion Authority
JOB NUMBER	013471
CONTRACTOR	Earth Exploration, Inc
DRILLER	T.Golvin
DRILL RIG	B-57 TR
SPT HAMMER	140 lb Safety

BORING NO. NBS-5 MW

SHEET 1 OF 1

INSPECTOR	C.Nagata
METHOD OF DRILLING	
0.0	Hollow Stem Augers
15.0	Split Spoon Sample
16.5	Terminated

GROUNDWATER READINGS

DATE/TIME	DEPTH (ft)	REMARKS
4/17/02 0954	5.5	During Drilling (In Augers)

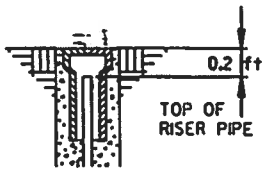
ELEVATION		38.0
DATUM		FT MSL
GRID	N	2781091
COORD	E	773156
DATE START		4/17/02
DATE END		4/17/02

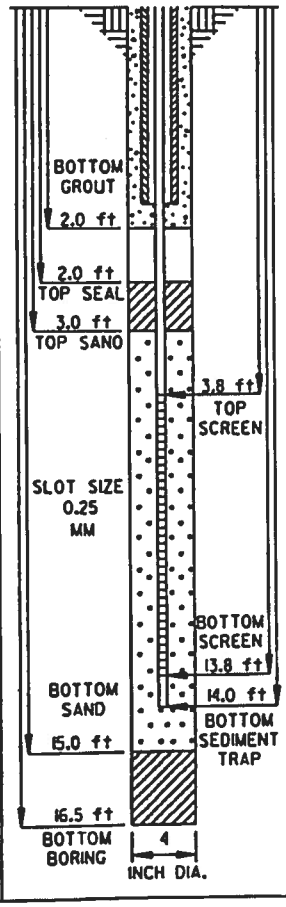
DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		18 14 10	8	SS-1		Silty sand (SM) - mostly fine to medium sand, some silt, trace coarse sand, trace fine gravel, organics, brown, dry
5		31 28 34	12	SS-2		Silty sand with gravel (SM) - mostly fine to medium sand, little to some silt, little fine gravel, trace coarse sand, beige, wet
10		16 22 22	10	SS-3		Silty sand (SM) - mostly fine to coarse sand, some silt, trace to little fine gravel, gray, wet
15		13 15 17	13	SS-4		Silty sand (SM) - mostly fine to coarse sand, some silt, trace to little fine gravel, gray, wet
					21.50	Boring Terminated at 16.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc. Monitoring well installed (2" Dia. PVC pipe)
25						
30						
35						

WELL LOG (N. T. S.)

WELL COVER INFORMATION

☐ STANDPIPE ☒ ROADBOX





Page 1: 0-35 feet, Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-5 MW

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-8, 8A
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	28.8
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 TR	DATUM	FT MSL
0.0	Hollow Stem Augers	DATE/TIME	DEPTH (ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2780905
15.0	Split Spoon Sample	4/18/02 1400	5.0 Upon Completion (Augers Pulled)			COORD E	772685
16.5	Terminated					DATE START	4/18/02
						DATE END	4/18/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		13 20 20	18	SS-1		Poorly graded sand (SP) - mostly fine sand, trace silt, tan, dry
					25.80	
5		14 17 12	18	SS-2		Silty sand (SM) - mostly fine sand, little silt, brown to gray, wet
10		13 100/3"	7	SS-3		Silty sand with gravel (SM) - mostly fine sand, some silt, little fine gravel, gray, wet (Auger refusal at 11.0 ft, offset hole 10 ft to NBS-8A, soil probe to 11 ft)
					15.80	
15		12 13 22	10	SS-4		Silty gravel with sand (GM) - mostly fine gravel, some fine to coarse sand, little silt, gray, wet
					12.30	Boring Terminated at 16.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet. Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

*REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-8, 8A

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-9
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 TR
0.0	Hollow Stem Augers	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER: 140 lb Safety
15.0	Split Spoon Sample	4/17/02 1151	5.7	During Drilling (in augers)	
16.5	Terminated	4/17/02 1230	6.0	Upon Completion (in augers)	
		4/17/02 1250	4.0	Upon Completion (Augers pulled)	

ELEVATION			36.7
DATUM			FT MSL
GRID	N		2781002
COORD	E		773159
DATE START			4/17/02
DATE END			4/17/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		1 2 3	7	SS-1		Well graded sand (SW) - mostly fine to medium sand, trace fines, brown, top 2" of sample contains organic soil (topsoil), dry
5		30 27 20	10	SS-2		Well graded sand (SW) - mostly fine to medium sand, trace fine gravel, trace silt, brown, wet
					27.70	
10		10 14 12	5	SS-3		Silty sand (SM) - mostly fine to medium sand, little silt, beige, wet
15		8 20 25	12	SS-4		Silty sand with gravel (SM) - mostly fine to medium sand, some fine gravel, little silt, gray, wet
					20.20	Boring Terminated at 16.5 ft.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

*REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-9

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-10,10A,B,C
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	B.Forget	ELEVATION	32.2
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	Bombadier	DATUM	FT MSL
0.0	Hollow Stem Augers/Wash Boring	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER 140 lb Safety	GRID N	2780838
9.0	Wash Boring-Open Hole	4/18/02 0810	5.0	During Dilling (in augers)		COORD E	773050
14.0	Split Spoon Sample	5/29/02 1045	3.0	Upon Completion (Casing pulled)		DATE START	4/18/02
14.7	Spoon Refusal					DATE END	5/29/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
		10 16 18	12	SS-1		Well graded sand with silt (SW-SM) - mostly fine to medium sand, trace to little silt, trace fine gravel, brown, dry
						(Very hard drilling 0 to 5 ft)
					29.20	
5		100/2"	1	SS-2		Silty gravel with sand (GM) - mostly fine to coarse gravel, some fine to medium sand, little silt, light brown, wet
						(Auger refusal at 5 ft, boring offset 5 ft to NBS-10A)
						(Auger refusal at 4 ft, boring offset 5 ft to NBS-10B)
						(Auger refusal at 9 ft, offset 10 ft to NBS-10C, switchover from augers to wash boring with casing)
		100/3"	0	SS-3		No recovery
10						(Very hard drilling from 9 to 10.5 ft)
						(Very hard drilling from 11.5 to 13.5 ft)
						(High drill water loss while drilling from 13.5 to 14.0 ft)
					18.70	
		55 100/2"	1	SS-4		Poorly graded gravel (GP) - mostly fine gravel, trace coarse gravel, gray, wet
15					17.50	Split Spoon Refusal at 14.7 ft. Boring Terminated.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51+	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

*REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-10,10A,B,C

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-11
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	34.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 TR	DATUM	FT MSL
0.0	Hollow Stem Augers	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER 140 lb Safety	GRID N	2780900
15.0	Split Spoon Sample	4/17/02 1440	Dry	Upon Completion (In Augers)		COORD E	773228
16.2	Spoon Refusal	4/17/02 1500	Dry	Augers pulled (hole caved to 12 ft)		DATE START	4/17/02
						DATE END	4/17/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		6 4 8	18	SS-1		Silty sand (SM) - mostly fine sand, some silt, tan-light brown, moist
5		33 34 47	14	SS-2		Silty sand with gravel (SM) - mostly fine sand, some silt, some gravel (crushed rock fragments), tan-light brown, moist (Very hard drilling from 5 to 10 ft)
10		22 32 25	5	SS-3		Silty sand with gravel (SM) - mostly fine to medium sand, some fine gravel, little silt, trace clay, gray, moist
15		41 47 100/2"	4	SS-4	18.69	Silty sand (SM) - mostly fine sand, little silt, trace clay, trace fine gravel, gray, moist Split Spoon Refusal at 16.2 ft. Boring Terminated.
20						REMARKS: Test boring performed by GeoLogic, Inc.
25						
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | 4/6 SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-11

LOG OF TEST BORING

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	NBS-12, 12A
LOCATION	New Bedford Line - Taunton		SHEET 1 OF 1
OWNER	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc	DRILLER	T.Galvin	ELEVATION	31.9
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 TR	DATUM	FT MSL
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER	140 lb Safety	GRID N 2780717
24.0	Split Spoon Refusal	4/22/02 1400	4.0	Upon Completion of NBS-12 (Casing Pulled)			COORD E 772762
		5/28/02 1510	4.7	Upon Completion of NBS-12A (Casing Pulled)			DATE START 4/22/02
							DATE END 5/28/02

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		9 14 17	14	SS-1		Silt with sand (ML) - mostly silt, little fine to medium sand, trace coarse sand, light brown, dry
5		18 27 27	8	SS-2		Silt (ML) - mostly silt, trace fine sand, light brown, wet (fine to medium sand in shoe)
					24.90	
10		27 51 30	7	SS-3		Silty gravel with sand (GM) - mostly fine to coarse gravel, some fine to coarse sand, little silt, gray, wet (Very hard drilling from 9 to 14 ft, possible boulder blocking spoon sampler, add 10 ft of casing and continue drilling)
15		10 20 41	4	SS-4		Silty gravel with sand (GM) - mostly fine to coarse gravel, some fine to coarse sand, little silt, gray, wet (Difficulty in drilling, offset boring to NBS-12A and resume sampling at 19 ft)
20		100	2	SS-5		Silty gravel with sand (GM) - mostly fine to coarse gravel, some fine to coarse sand, little silt, gray, wet (Very hard drilling from 19 to 24 ft)
		100/0"	0	SS-6	7.90	No recovery Split Spoon Refusal at 24.0 ft. Boring Terminated.
25						
30						
35						

REMARKS:
Test boring performed by GeoLogic, Inc.

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51+	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. NBS-12, 12A

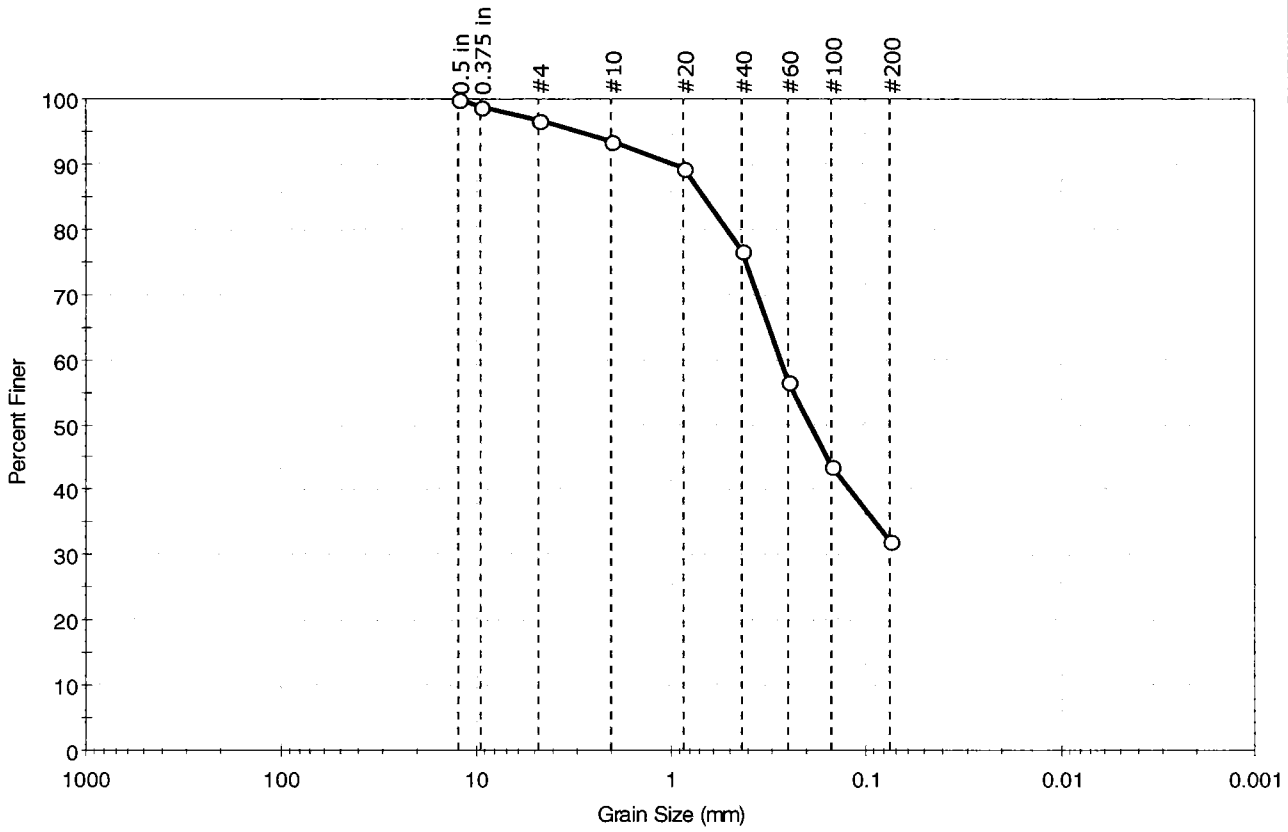
Memorandum

APPENDIX B: LABORATORY DATA

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	TD-5	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	07/14/10	Checked By:	jdt
Depth :	3-5 ft	Test Id:	185193		
Test Comment:	---				
Sample Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	3.1	64.7	32.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	97		
#10	2.00	93		
#20	0.85	89		
#40	0.42	77		
#60	0.25	57		
#100	0.15	44		
#200	0.075	32		

Coefficients

D_{85} = 0.6733 mm D_{30} = N/A
D_{60} = 0.2726 mm D_{15} = N/A
D_{50} = 0.1922 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

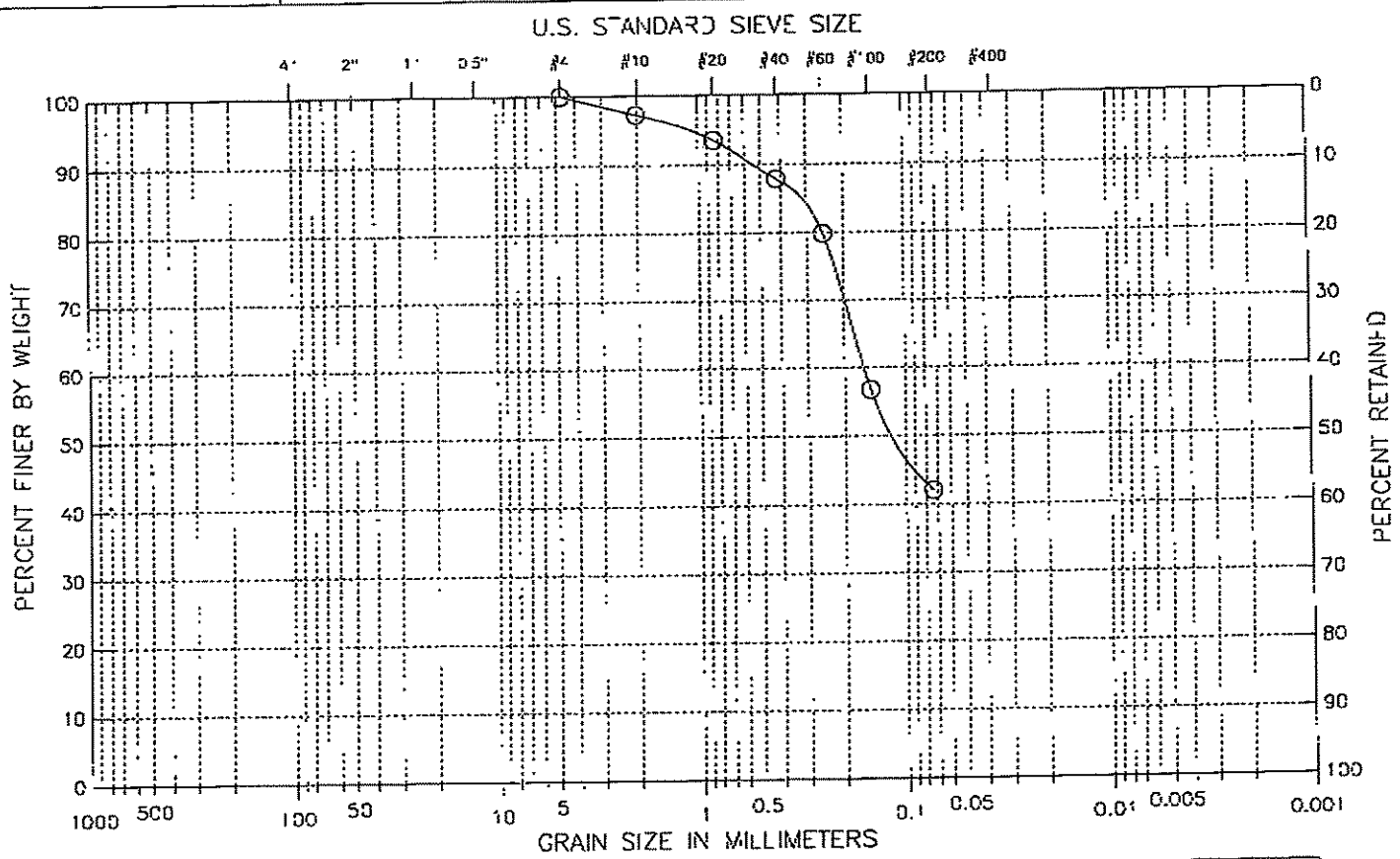
AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

Boring No. : - - -	Project : New Bedford/Fall River Commuter Rail
Sample No.: NBA-12 SS-2	Project No.: GTX-3916
Test Method ASTM D 422	Location: Massachusetts
Filename : NBA12SS2	Date : Thu Aug 01 2002



Classification :

Remarks :

Visual Description :
Moist, reddish yellow silty sand

Figure 19

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-12 SS-2
Location : Massachusetts
Soil Description : Moist, reddish yellow silty sand
Remarks :

Depth : --
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA12SS2
Elevation : ---
Tested by : srp/jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.76	0.00	0.00	100
#10	0.079	2.00	2.20	2.20	97
#20	0.033	0.84	3.04	5.24	94
#40	0.017	0.42	4.58	9.82	88
#60	0.010	0.25	6.51	16.33	80
#100	0.006	0.15	18.72	35.05	57
#200	0.003	0.07	11.96	47.01	47
Pan			34.09	81.10	0

Total Dry Weight of Sample = 89.19

D85 : 0.3484 mm
D60 : 0.1601 mm
D50 : 0.1080 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Project : New Bedford/Fall River Commuter Ro
Project No.: GTX-3916
Location: Massachusetts
Date : Thu Aug 01 2002

Boring No. : ---
Sample No.: NBA-12 SS-4
Test Method ASTM D 422
Filename : NBA12SS4

U.S. STANDARD SIEVE SIZE

4" 2" " 0.5" #4 #10 #20 #40 #60 #100 #200 #400

PERCENT RETAINED

0 10 20 30 40 50 60 70 80 90 100

PERCENT FINER BY WEIGHT

100 90 80 70 60 50 40 30 20 10 0

GRAIN SIZE IN MILLIMETERS

1000 500 100 50 10 5 1 0.5 0.1 0.05 0.01 0.005 0.001

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Remarks :

Classification :

Visual Description :
Moist, dark grayish brown sandy sill

Figure 20

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-12 SS-4
Location : Massachusetts
Soil Description : Moist, dark grayish brown sandy silt
Remarks :

Depth : --
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA12SS4
Elevation : ---
Tested by : srp/jx
Checked by : jdt

FINE SIEVE SET

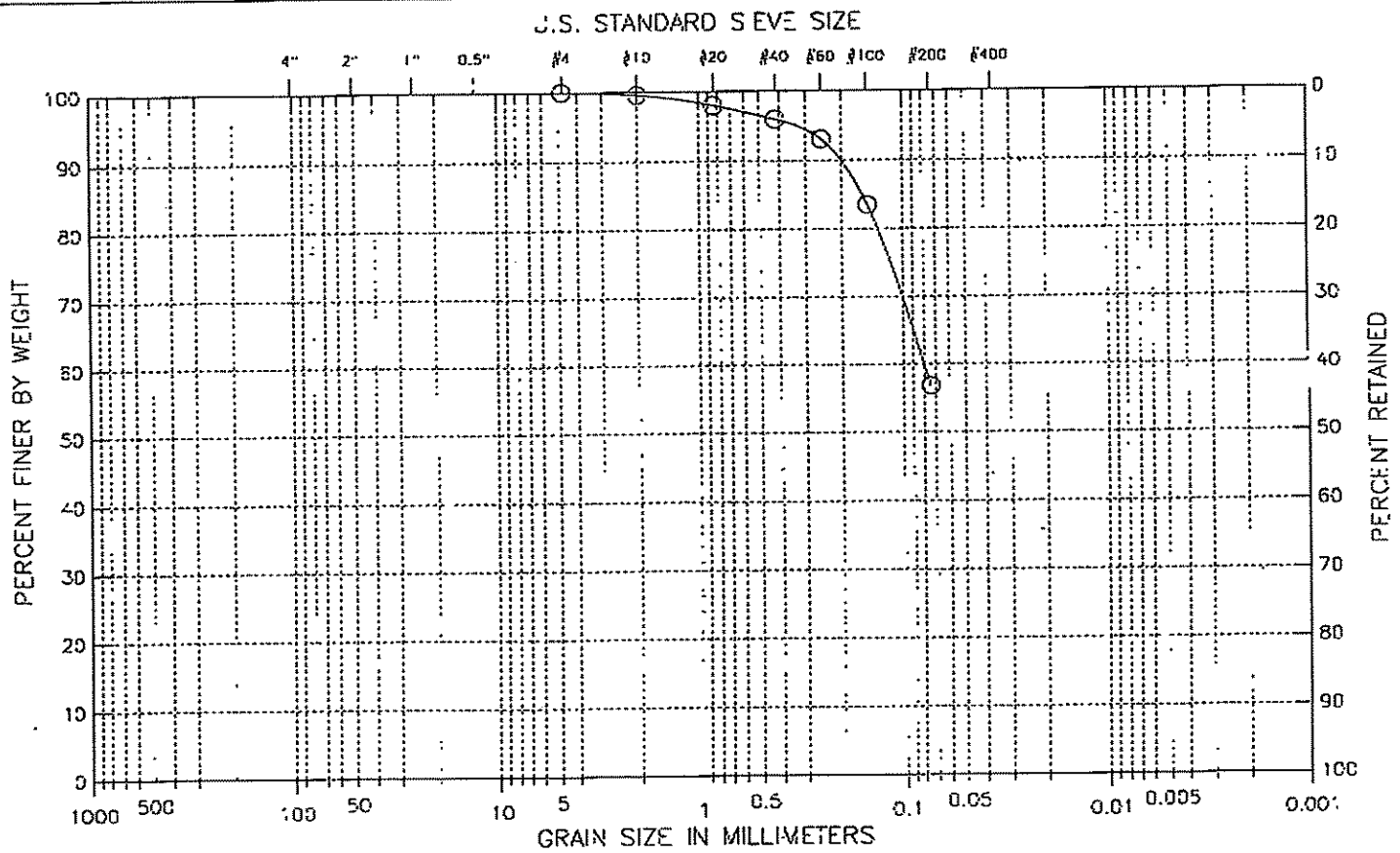
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.28	0.28	99
#20	0.033	0.84	0.74	1.02	97
#40	0.017	0.42	0.98	2.00	95
#60	0.010	0.25	1.19	3.19	92
#100	0.006	0.15	3.10	6.29	84
#200	0.003	0.07	1.96	8.25	79
Pan			31.41	39.66	0

Total Dry Weight of Sample = 47.81

D85 : 0.1577 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

	Boring No. : --- Sample No: NBA-12 SS-5 Test Method ASTM D 422 Filename : NBA12SS5	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: Massachusetts Date : Thu Aug 01 2002



Classification :

Remarks :

Visual Description :
Moist, dark gray silty sand

Figure 2

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : --
Sample No. : NBA-12 SS-5
Location : Massachusetts
Soil Description : Moist, dark gray silty sand
Remarks :

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA12SS5
Elevation : ---
Tested By : srp/jx
Checked by : jdc

FINE SIEVE SET

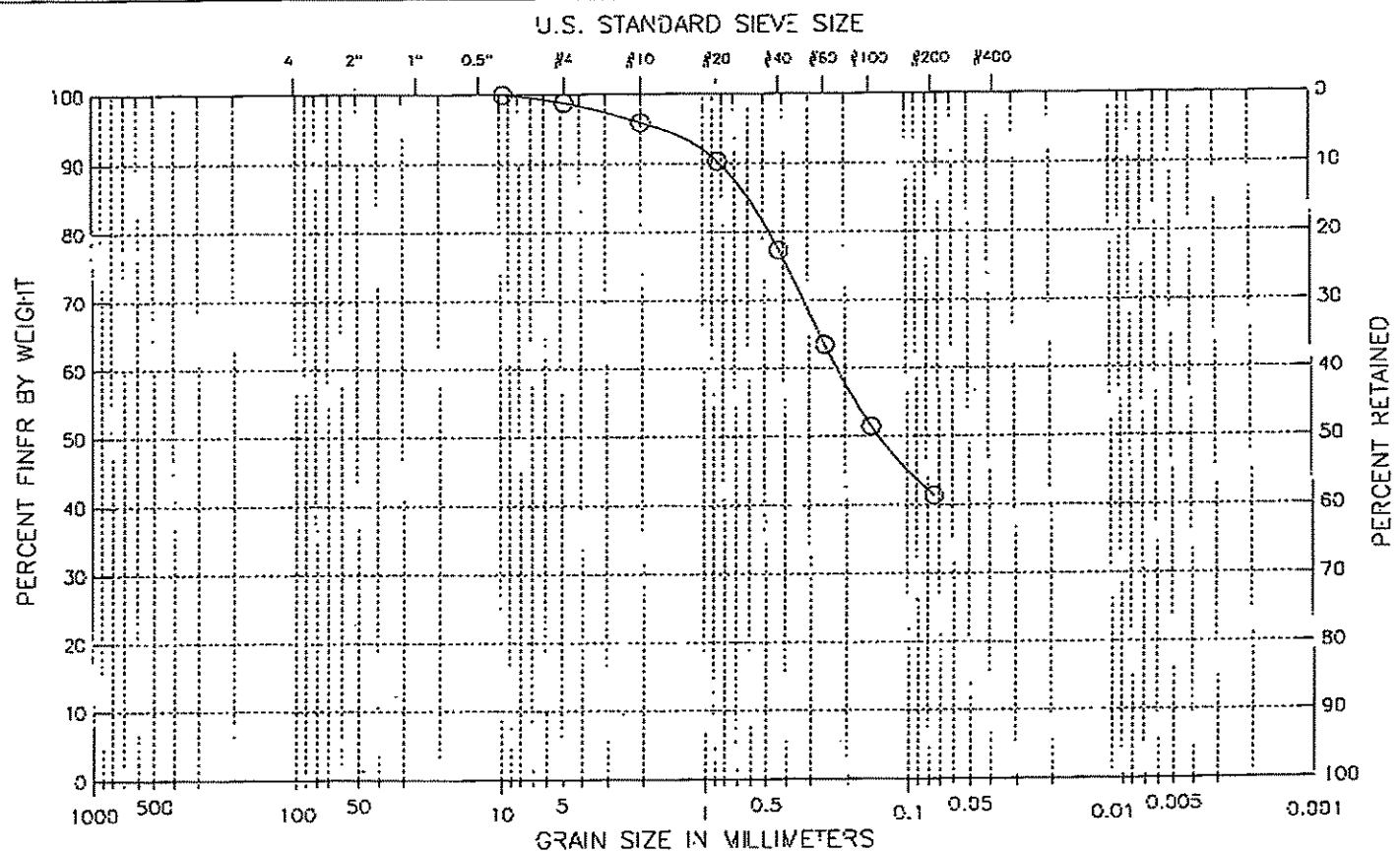
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.56	0.56	100
#30	0.033	0.84	1.96	2.52	98
#40	0.017	0.42	2.54	5.06	96
#60	0.010	0.25	3.67	8.73	93
#100	0.006	0.15	12.08	20.81	83
#200	0.003	0.07	33.66	54.47	57
Pan			71.65	126.12	0

Total Dry Weight of Sample = 134.28

D85 : 0.1616 mm
D60 : 0.0805 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

	Boring No. : --- Sample No.: NBA-13 SS-2 Test Method ASTM D 422 Filename : NBA13SS2	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: Massachusetts Date : Thu Aug 01 2002



Classification :

Remarks :

Visual Description :
Moist, dark gray silty sand

Figure 22

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : CVX-3916
Boring No. : ---
Sample No. : NBA-13 SS-2
Location : Massachusetts
Soil Description : Moist, dark gray silty sand
Remarks :

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA13SS2
Elevation : -
Tested by : srp/jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	1.68	1.68	99
#10	0.079	2.00	3.93	5.61	96
#20	0.033	0.84	7.81	13.42	90
#40	0.017	0.42	17.94	31.36	77
#60	0.010	0.25	19.20	50.56	63
#100	0.006	0.15	16.68	67.24	51
#200	0.003	0.07	13.92	81.16	41
Pan			57.25	138.41	0

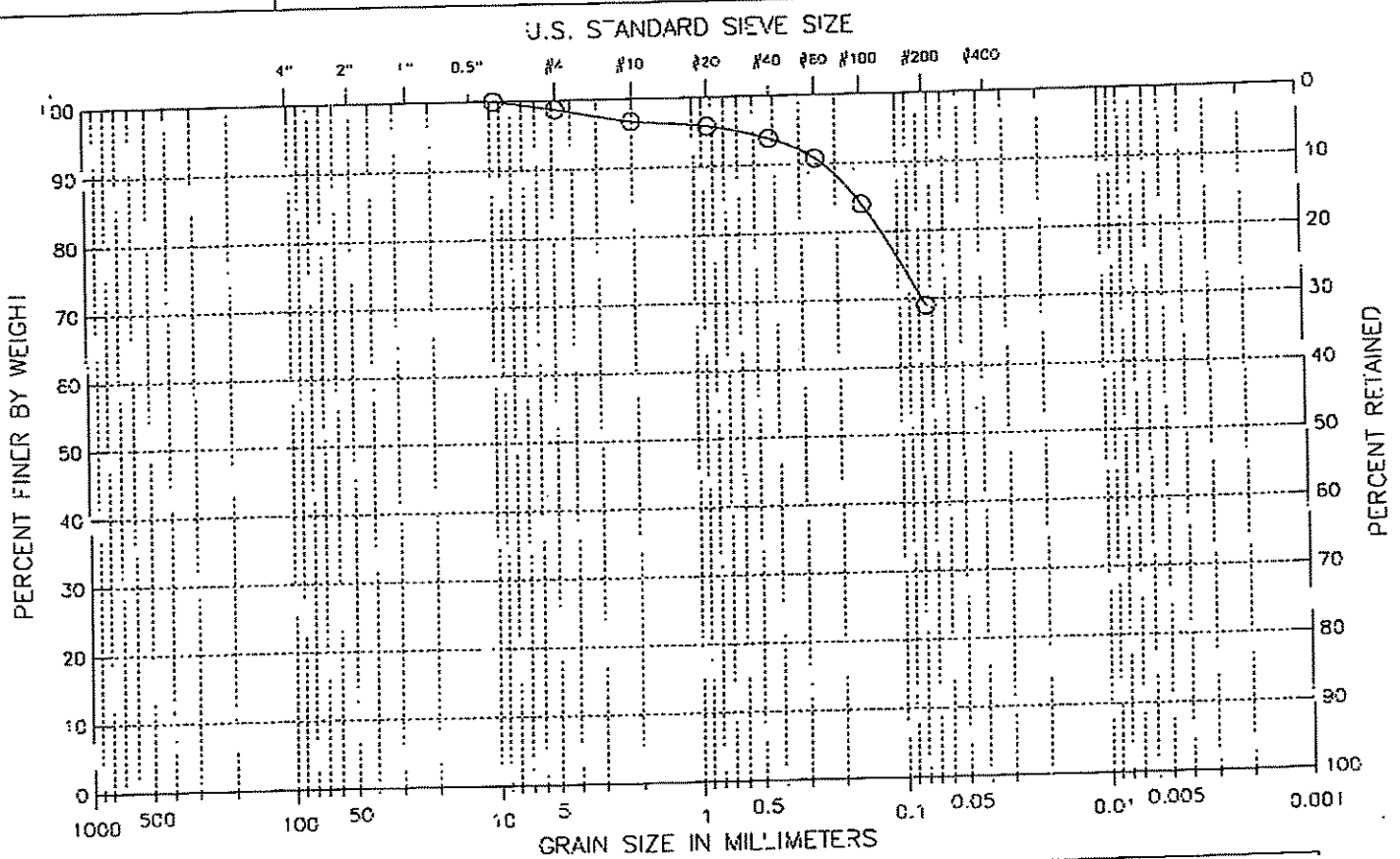
Total Dry Weight of Sample = 146.62

D85 : 0.6330 mm
D60 : 0.2154 mm
D50 : 0.1350 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : ---
Sample No.: NBA-13 SS-3
Test Method ASTM D 422
Filename : NBA13SS3

Project : New Bedford/Fall River Commuter Rail
Project No.: GTX-3916
Location: Massachusetts
Date : Thu Aug 01 2002



Remarks :

Classification :

Visual Description :
Moist, light yellowish brown sandy silt

Figure 23

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-13 SS-3
Location : Massachusetts
Soil Description : Moist, light yellowish brown sandy silt
Remarks :

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA13SS3
Elevation : --
Tested by : srp/jx
Checked by : jdt

FINE SIEVE SET

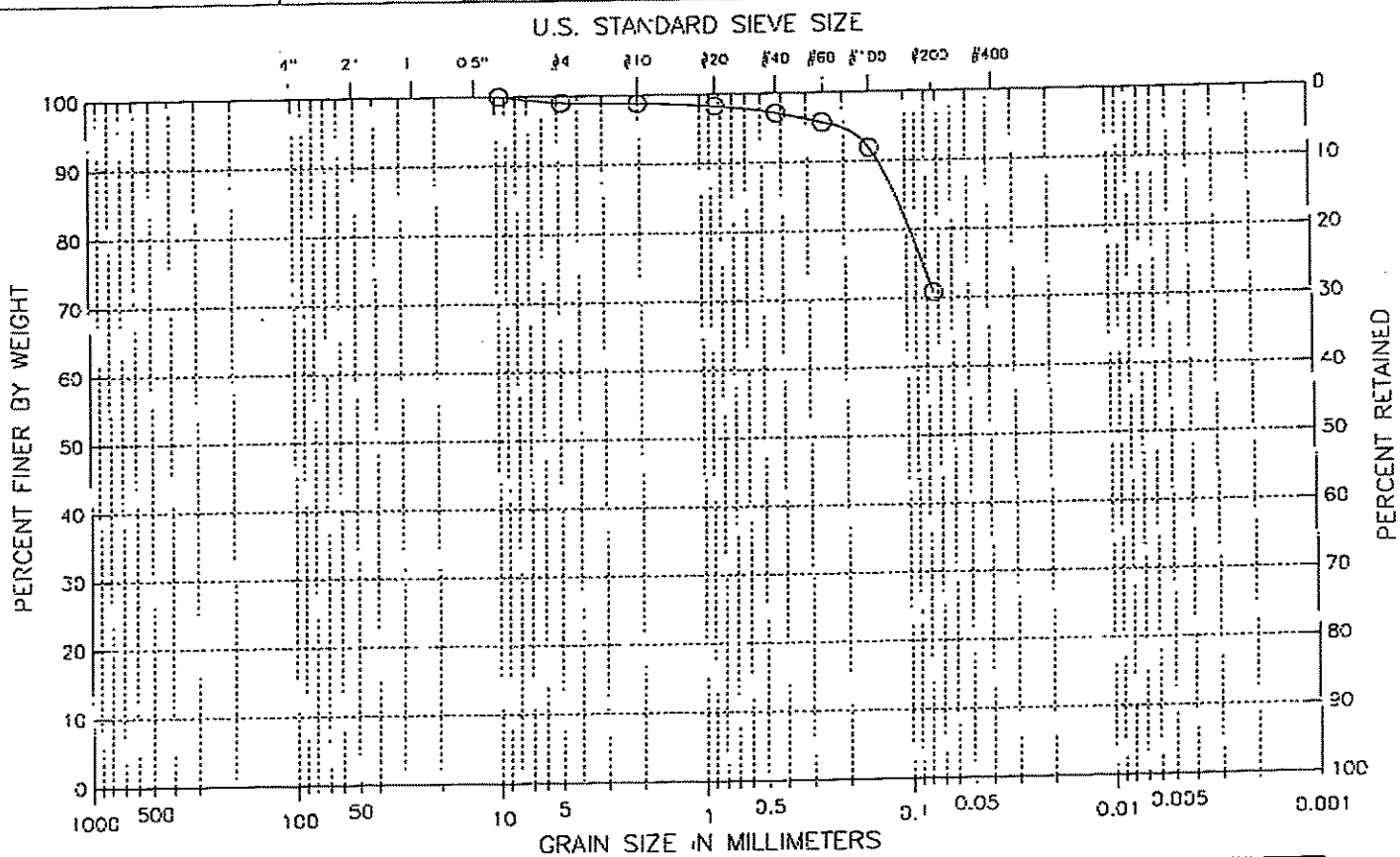
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	1.53	1.53	99
#10	0.079	2.00	2.18	3.71	97
#20	0.033	0.84	1.07	4.78	96
#40	0.017	0.42	2.30	7.08	94
#60	0.010	0.25	3.47	10.55	91
#100	0.006	0.15	7.75	18.30	84
#200	0.003	0.07	17.31	35.61	69
Pan			79.14	114.75	0

Total Dry Weight of Sample = 122.94

D85 : 0.1602 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : ---	Project : New Bedford/Fall River Commuter Rail
Sample No: NBA-13 SS-5	Project No.: GTX-3916
Test Method ASTM D 422	Location: Massachusetts
Filename : NBA13SS5	Date : Thu Aug 01 2002



Classification :

Remarks :

Visual Description :
Moist, pale olive sandy silt

Figure 24

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-13 SS-5
Location : Massachusetts
Soil Description : Moist, pale olive sandy silt
Remarks :

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA13SS5
Elevation : ---
Tested by : srp/jx
Checked by : jdk

FINE SIEVE SET

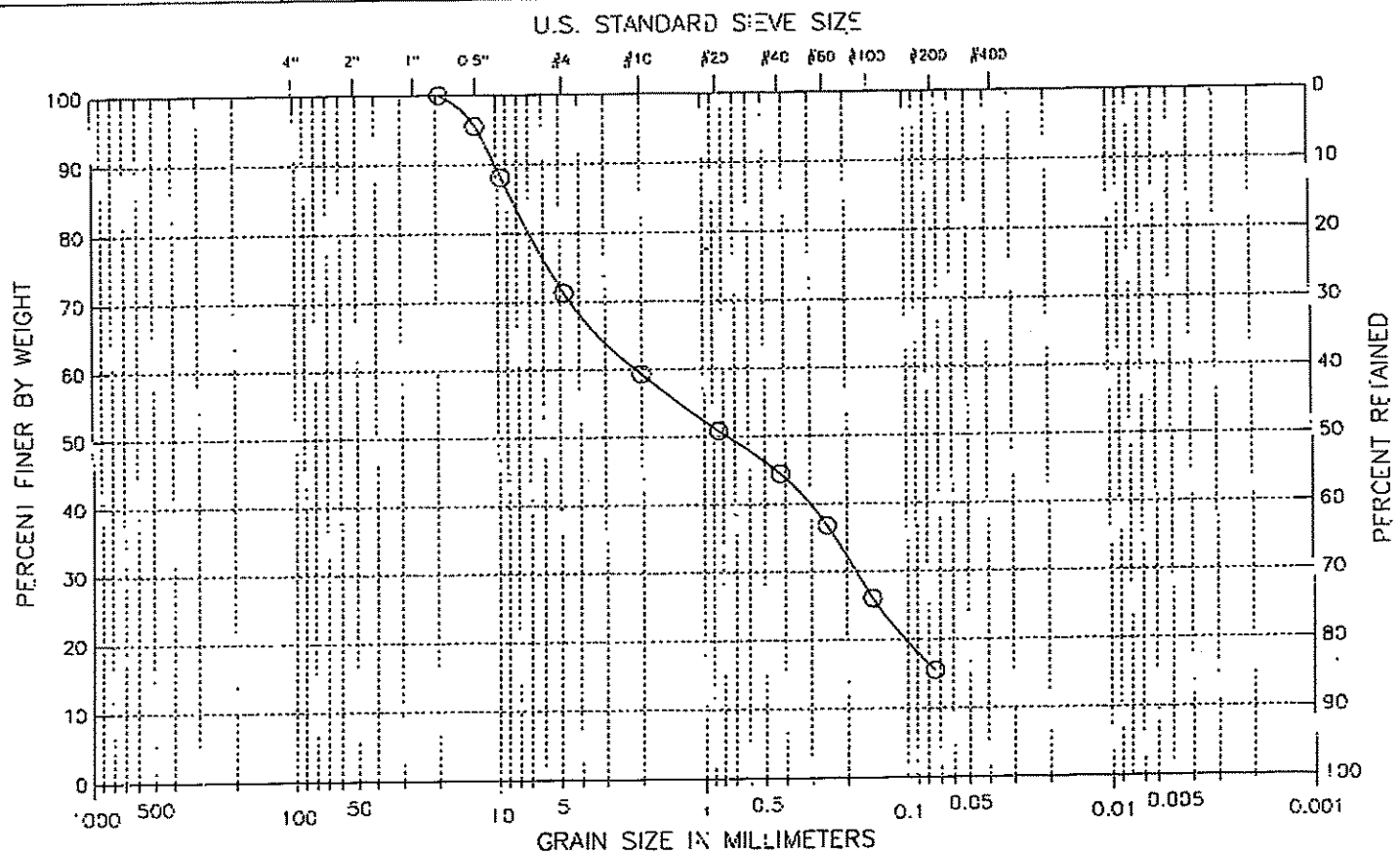
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.90	0.90	99
#10	0.079	2.00	0.23	1.13	99
#20	0.033	0.84	0.49	1.62	98
#40	0.017	0.42	1.05	2.67	97
#60	0.010	0.25	1.34	4.00	96
#100	0.006	0.15	3.51	7.52	92
#200	0.003	0.07	19.68	27.20	71
Pan			66.05	93.25	0

Total Dry Weight of Sample = 101.42

D85 : 0.1184 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : ---	Project : New Bedford/Fall River Commuter Rail
Sample No.: NBA-15 SS-2	Project No.: GTX-3916
Test Method ASTM D 422	Location: Massachusetts
Filename : NBA15SS2	Date : Thu Aug 01 2002



Classification :

Remarks :

Visual Description :
Moist, brown sandy silty sand with gravel

Figure 25

Thu Aug 01 16:11:44 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Pali River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-15 SS-2
Location : Massachusetts
Soil Description : Moist, brown sandy silty sand with gravel
Remarks :

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

Filename : NBA15SS2
Elevation : ---
Tested by : srp/jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	3.80	3.80	96
0.375"	0.374	9.51	6.29	10.09	88
#4	0.187	4.75	14.34	24.33	71
#10	0.079	2.00	10.17	34.50	59
#20	0.033	0.84	7.24	41.74	51
#40	0.017	0.42	5.42	47.16	44
#60	0.010	0.25	6.48	53.64	37
#100	0.006	0.15	9.10	62.74	26
#200	0.003	0.07	9.01	71.75	15
Pan			13.12	84.87	0

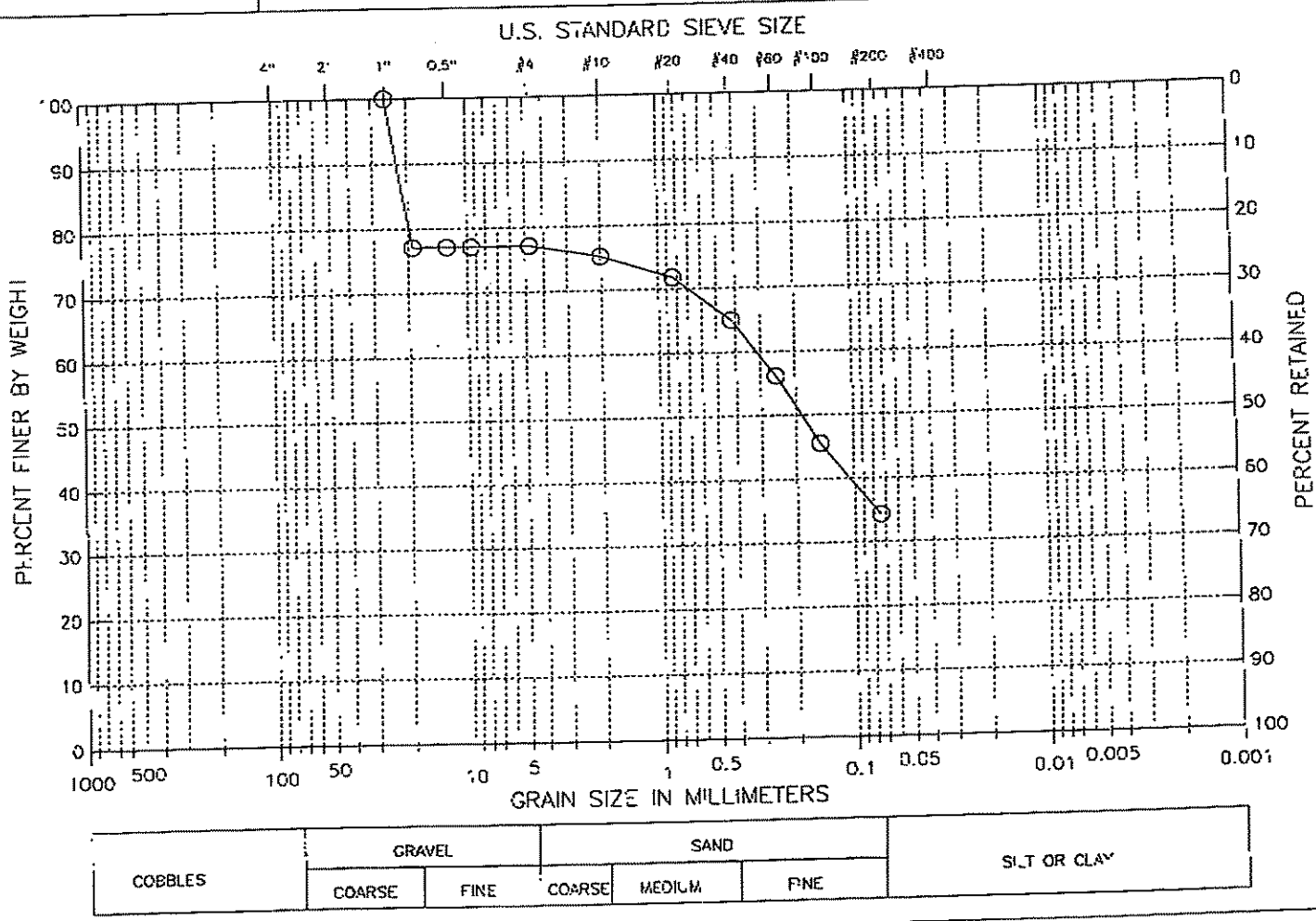
Total Dry Weight of Sample = 92.93

D85 : 8.3613 mm
D60 : 2.0961 mm
D50 : 0.7694 mm
D30 : 0.1801 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : ---
Sample No.: NBA-15 SS-4
Test Method ASTM D 422
Filename : NBA15SS4

Project : New Bedford/Fall River Commuter Rail
Project No.: GTX-3916
Location: Massachusetts
Date : Thu Aug 01 2002



Remarks :

Classification :

Visual Description :
Moist, brownish yellow silty sand with gravel

Figure 26

Thu Aug 01 16:11:44 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBA-15 SS-4
Location : Massachusetts
Soil Description : Moist, brownish yellow silty sand with gravel
Remarks :

Filename : NBA15SS4
Elevation : ---
Tested by : srp/jx
Checked by : jdt

Depth : ---
Test Date : 07/26/02
Test Method : ASTM D 422

FINE SIEVE SET

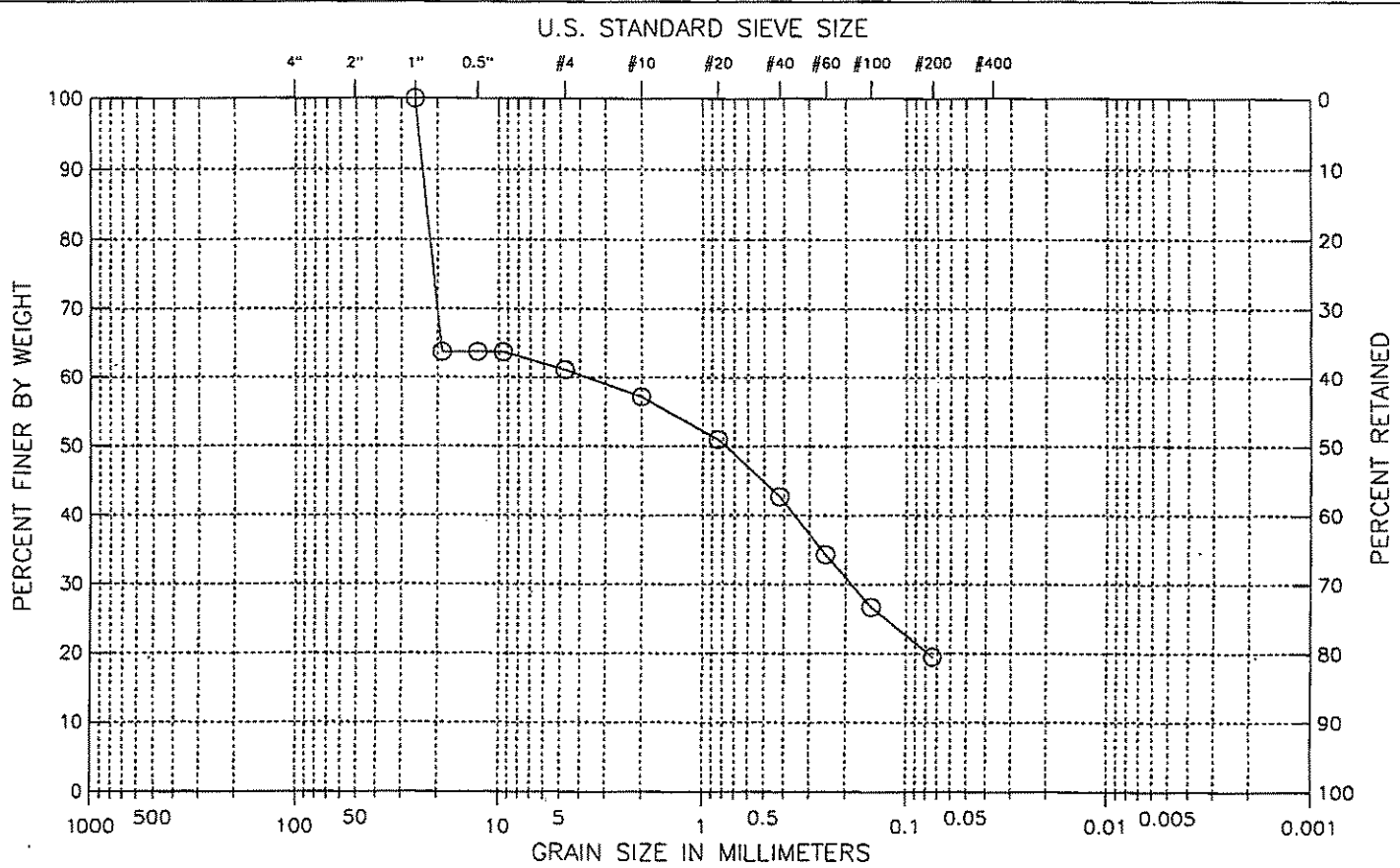
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	22.04	22.04	77
0.5"	0.500	12.70	0.00	22.04	77
0.375"	0.374	9.51	0.00	22.04	77
#4	0.187	4.75	0.00	22.04	77
#10	0.079	2.00	1.77	23.81	75
#20	0.033	0.84	3.32	27.13	72
#40	0.017	0.42	6.54	33.67	65
#60	0.010	0.25	8.51	42.18	56
#100	0.006	0.15	10.22	52.40	46
#200	0.003	0.07	10.83	63.23	34
Pan			32.98	96.21	0

Total Dry Weight of Sample = 104.33

D85 : 21.0882 mm
D60 : 0.3132 mm
D50 : 0.1852 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

	Boring No. : --- Sample No.: NBS-3 SS-1 Test Method ASTM D 422 Filename : NBS3SS01	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Moist, olive brown silty sand with gravel

Figure 1

GeoTesting Express, Inc. • Boxborough, MA • (978) 635-0424 • Fax (978) 635-0266

Mon Jul 15 18:09:20 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-3 SS-1
Location : New Bedford, MA
Soil Description : Moist, olive brown silty sand with gravel
Remarks : ---

Depth : ---.
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS3SS01
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

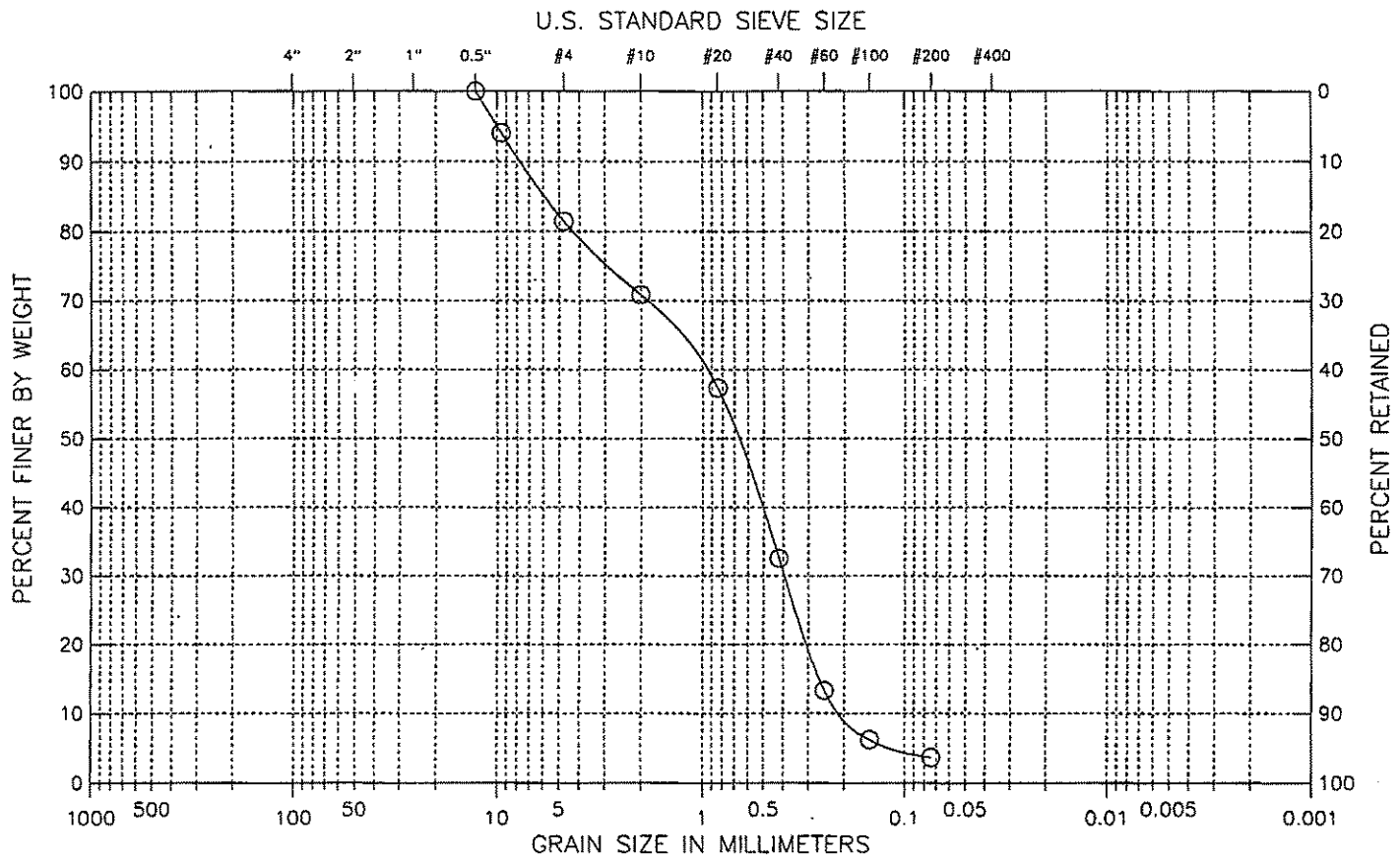
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	40.60	40.60	64
0.5"	0.500	12.70	0.00	40.60	64
0.375"	0.374	9.51	0.00	40.60	64
#4	0.187	4.75	2.91	43.51	61
#10	0.079	2.00	4.41	47.92	57
#20	0.033	0.84	6.96	54.88	51
#40	0.017	0.42	9.26	64.14	43
#60	0.010	0.25	9.42	73.56	34
#100	0.006	0.15	8.52	82.08	27
#200	0.003	0.07	8.03	90.11	19
Pan			21.82	111.93	0

Total Dry Weight of Sample = 120.16

D85 : 22.6822 mm
D60 : 3.7084 mm
D50 : 0.7753 mm
D30 : 0.1869 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

	Boring No. : --- Sample No.: NBS-3 SS-3 Test Method ASTM D 422 Filename : NBS3SS03	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :
(SP) Poorly graded sand with gravel
Visual Description :
Very moist, olive gray sand with gravel

Remarks :

Figure 2

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Mon Jul 15 18:09:20 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-3 SS-3
Location : New Bedford, MA
Soil Description : Very moist, olive gray sand with gravel
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS3SS03
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

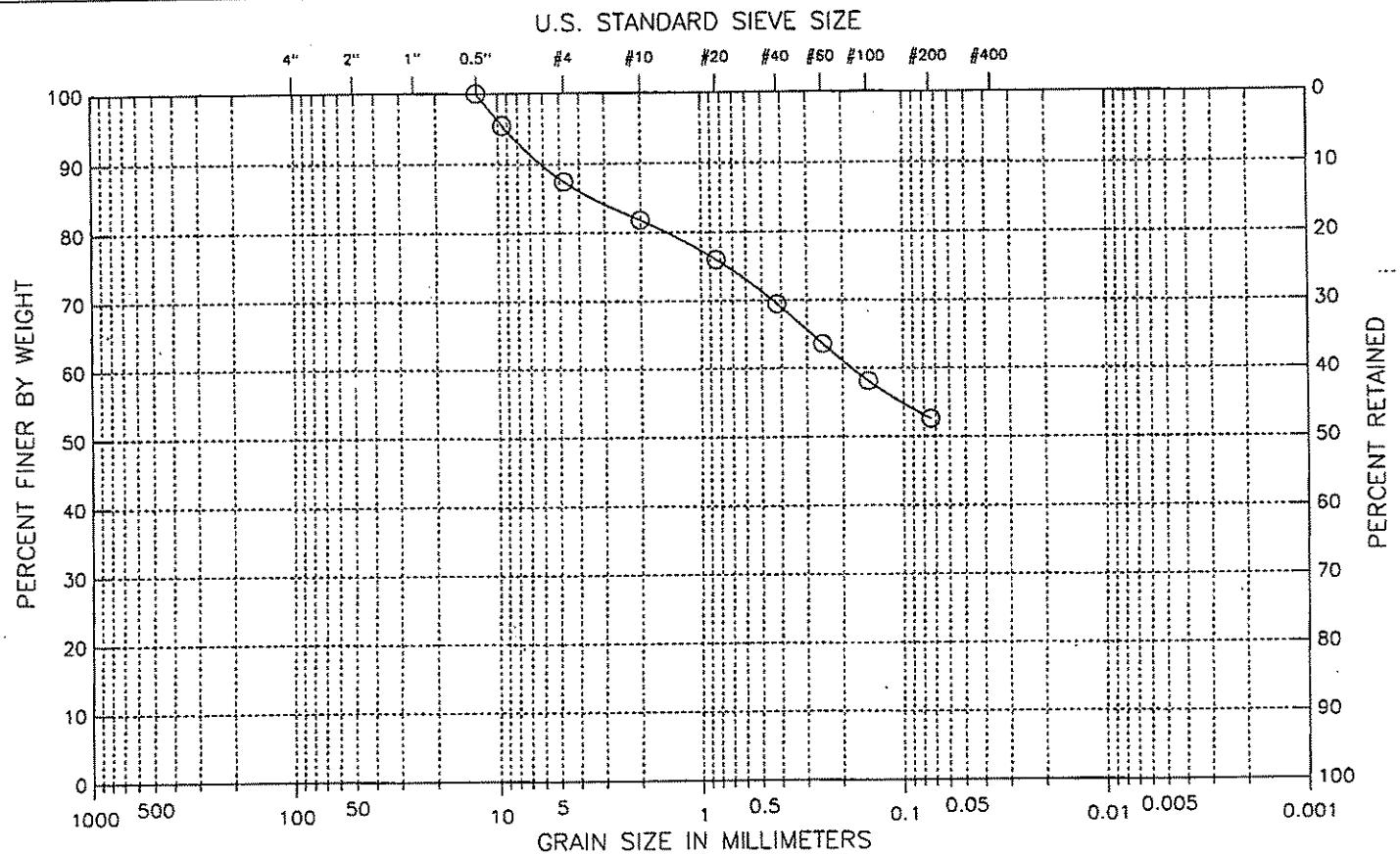
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	8.10	8.10	94
#4	0.187	4.75	17.33	25.43	81
#10	0.079	2.00	14.54	39.97	71
#20	0.033	0.84	18.54	58.51	57
#40	0.017	0.42	34.01	92.52	33
#60	0.010	0.25	26.40	118.92	13
#100	0.006	0.15	9.72	128.64	6
#200	0.003	0.07	3.47	132.11	4
Pan			5.05	137.16	0

Total Dry Weight of Sample = 145.21

D85 : 5.7700 mm
D60 : 0.9972 mm
D50 : 0.6847 mm
D30 : 0.3921 mm
D15 : 0.2617 mm
D10 : 0.1965 mm

Soil Classification
ASTM Group Symbol : SP
ASTM Group Name : Poorly graded sand with gravel
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

	Boring No. : --- Sample No.: NBS-3 SS-4 Test Method ASTM D 422 Filename : NBS3SS04	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Very moist, gray sandy silt

Figure 3

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Mon Jul 15 18:09:21 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-3 SS-4
Location : New Bedford, MA
Soil Description : Very moist, gray sandy silt
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS3SS04
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

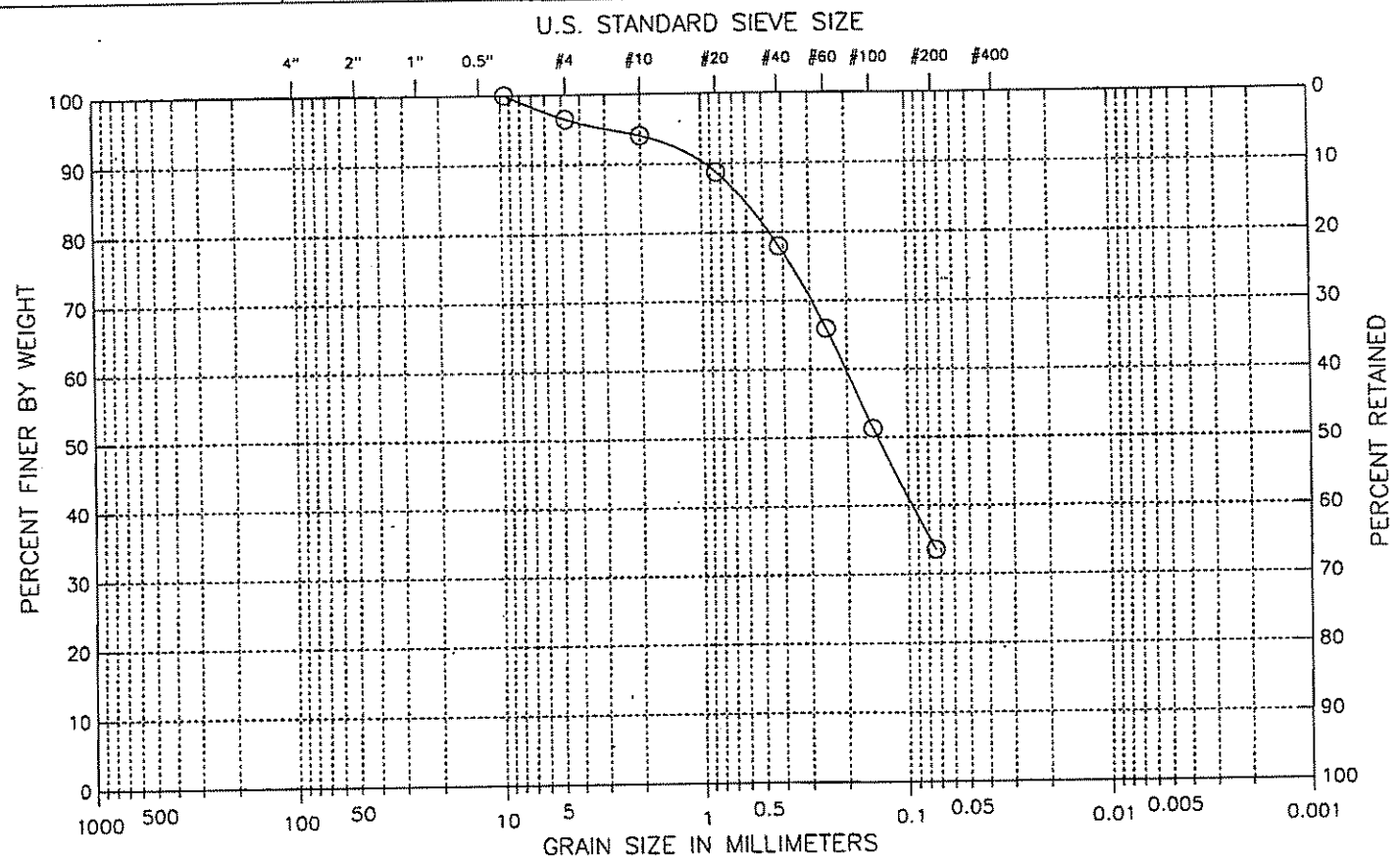
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	4.83	4.83	95
#4	0.187	4.75	8.57	13.40	87
#10	0.079	2.00	6.05	19.45	82
#20	0.033	0.84	6.22	25.67	76
#40	0.017	0.42	6.97	32.64	69
#60	0.010	0.25	6.26	38.90	64
#100	0.006	0.15	5.87	44.77	58
#200	0.003	0.07	5.94	50.71	53
Pan			56.19	106.90	0

Total Dry Weight of Sample = 115.13

D85 : 3.2590 mm
D60 : 0.1779 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

	Boring No. : --- Sample No.: NBS-5 SS-1 Test Method ASTM D 422 Filename : NBS5SS01	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description : .

Figure 4

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Mon Jul 15 18:09:21 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-5 SS-1
Location : New Bedford, MA
Soil Description : \
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBSSSS01
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

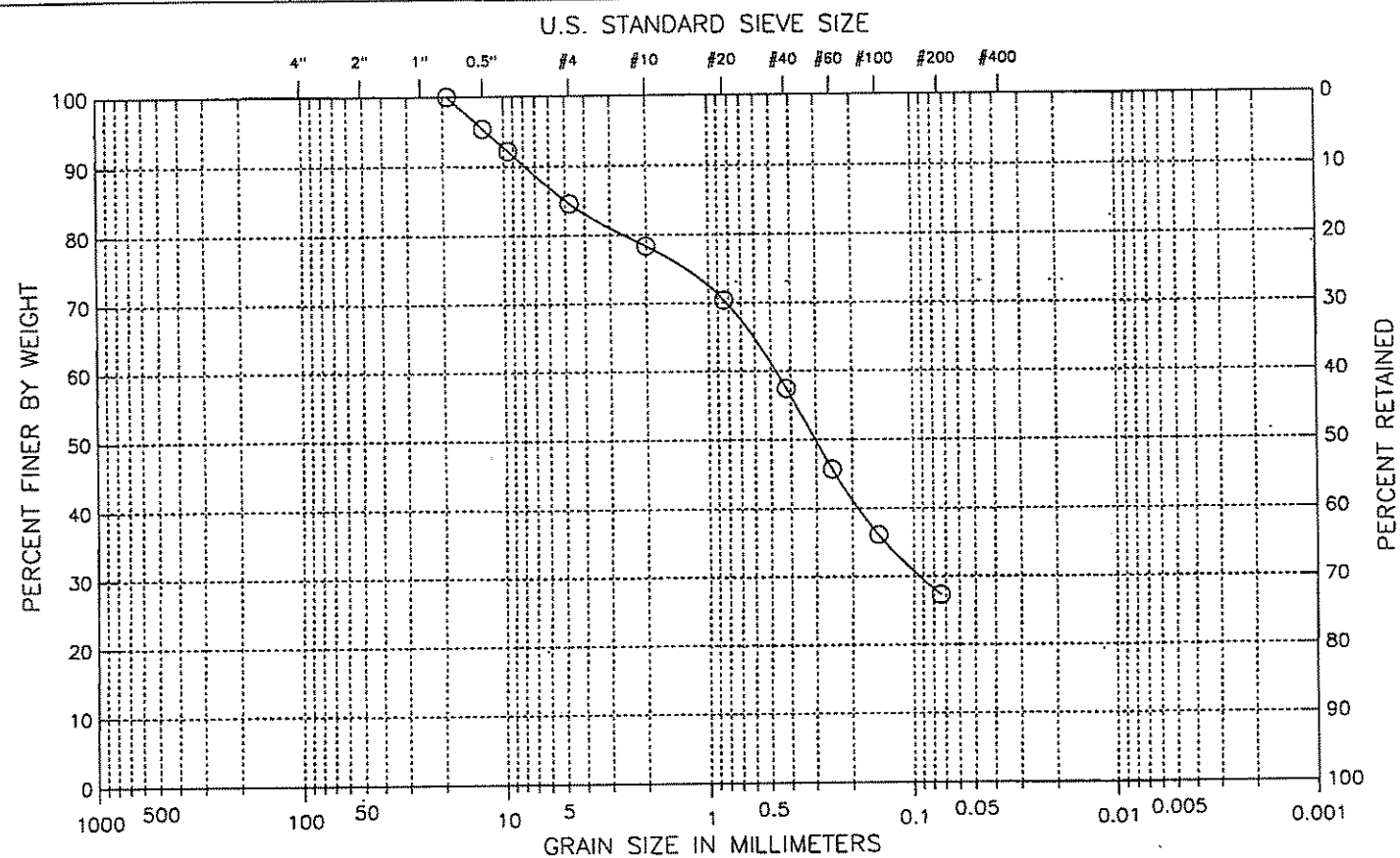
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	2.80	2.80	96
#10	0.079	2.00	1.93	4.73	94
#20	0.033	0.84	4.27	9.00	89
#40	0.017	0.42	8.60	17.60	78
#60	0.010	0.25	9.61	27.21	66
#100	0.006	0.15	11.71	38.92	51
#200	0.003	0.07	14.17	53.09	34
Pan			26.86	79.95	0

Total Dry Weight of Sample = 88.1

D85 : 0.6605 mm
D60 : 0.2025 mm
D50 : 0.1414 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

Boring No. : --- Sample No.: NBS-5 SS-2 Test Method ASTM D 422 Filename : NBS5SS02	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classificotion :

Remarks :

Visual Description :
Moist, grayish brown silty sand with gravel

Figure 5

Mon Jul 15 18:09:21 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-5 SS-2
Location : New Bedford, MA
Soil Description : Moist, grayish brown silty sand with gravel
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS5SS02
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	6.99	6.99	95
0.375"	0.374	9.51	4.93	11.92	92
#4	0.187	4.75	11.61	23.53	85
#10	0.079	2.00	9.51	33.04	78
#20	0.033	0.84	12.17	45.21	70
#40	0.017	0.42	19.81	65.02	57
#60	0.010	0.25	17.98	83.00	46
#100	0.006	0.15	14.62	97.62	36
#200	0.003	0.07	13.43	111.05	27
Pan			41.78	152.83	0

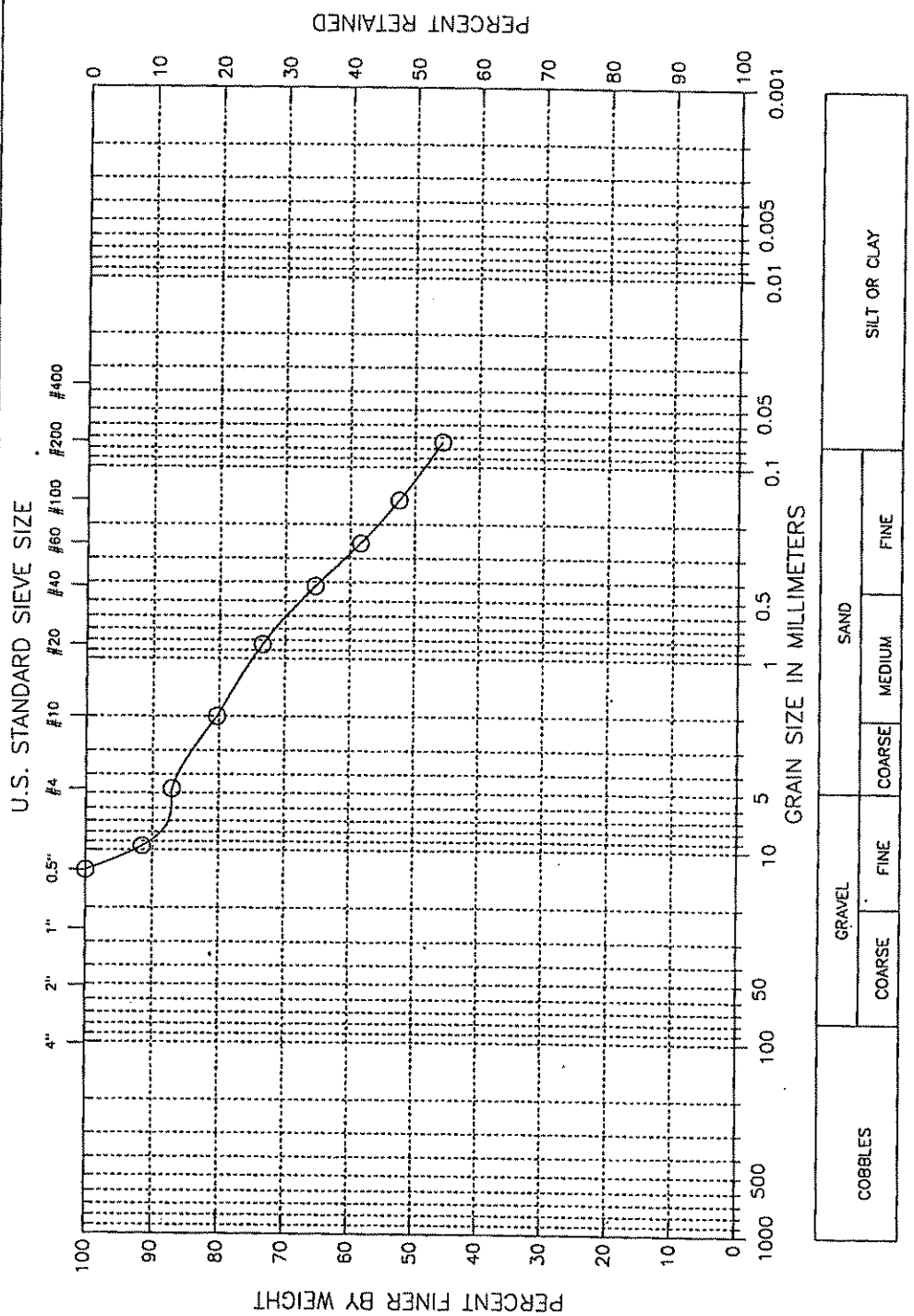
Total Dry Weight of Sample = 160.89

D85 : 4.9251 mm
D60 : 0.4813 mm
D50 : 0.3023 mm
D30 : 0.0915 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

Boring No. : ---
Sample No: NBS-5 SS-3
Test Method ASTM D 422
Filename : NBS5SS03

Project : New Bedford/Fall River Commuter Roil
Project No.: GTX-3916
Location: New Bedford, MA
Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Moist, gray silty sand

Figure 6

Mon Jul 15 18:09:21 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-5 SS-3
Location : New Bedford, MA
Soil Description : Moist, gray silty sand
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS5SS03
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

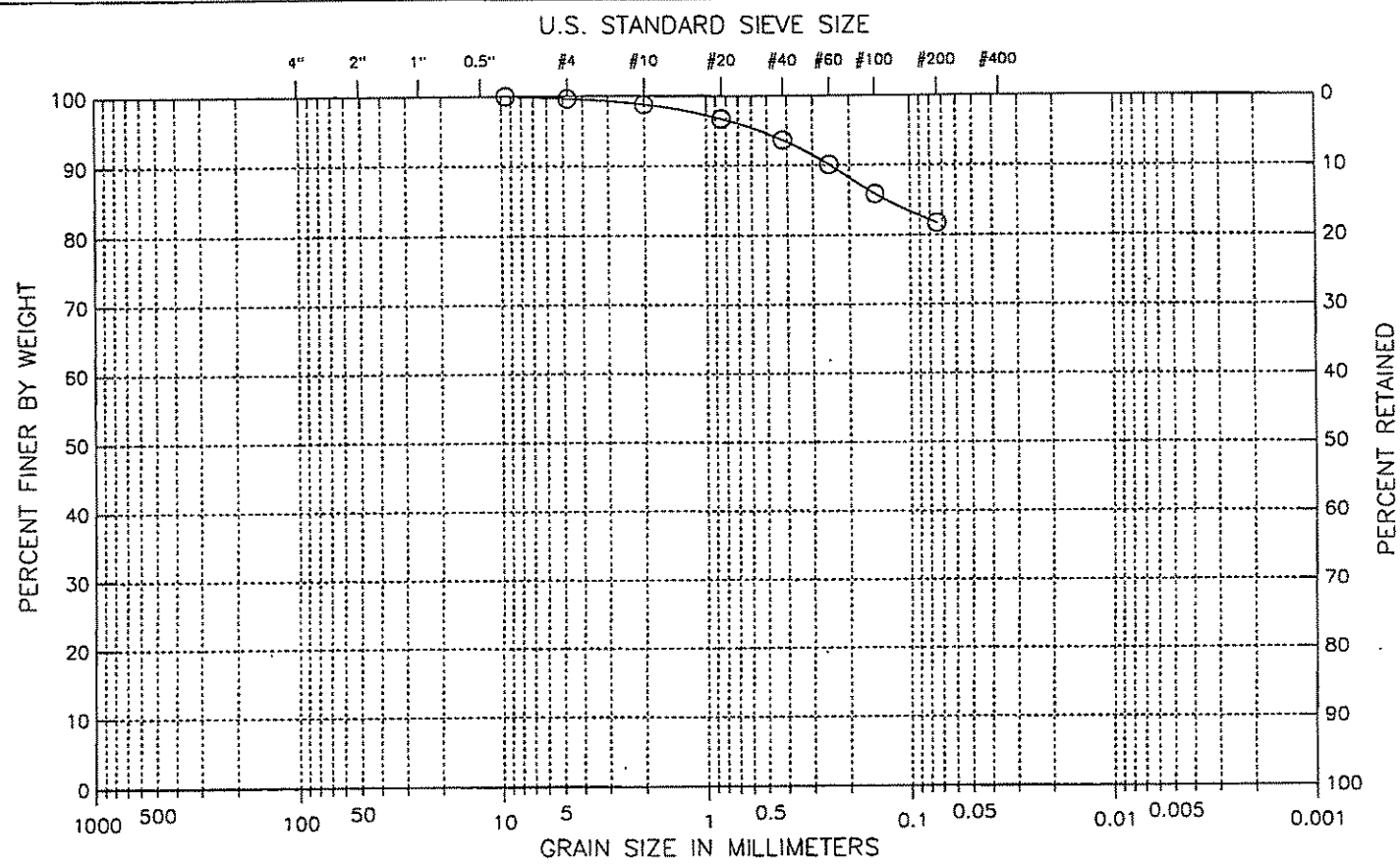
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	12.17	12.17	92
#4	0.187	4.75	6.39	18.56	87
#10	0.079	2.00	9.80	28.36	80
#20	0.033	0.84	9.94	38.30	73
#40	0.017	0.42	11.62	49.92	65
#60	0.010	0.25	10.07	59.99	58
#100	0.006	0.15	8.60	68.59	52
#200	0.003	0.07	9.67	78.26	46
Pan			65.89	144.15	0

Total Dry Weight of Sample = 152.31

D85 : 3.6249 mm
D60 : 0.2819 mm
D50 : 0.1158 mm
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

	Boring No. : --- Sample No.: NBS-12 SS-1 Test Method ASTM D 422 Filename : NBS12S01	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Dry, light brown sandy silt

Figure 7

Mon Jul 15 18:09:20 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-12 SS-1
Location : New Bedford, MA
Soil Description : Dry, light brown sandy silt
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS12S01
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

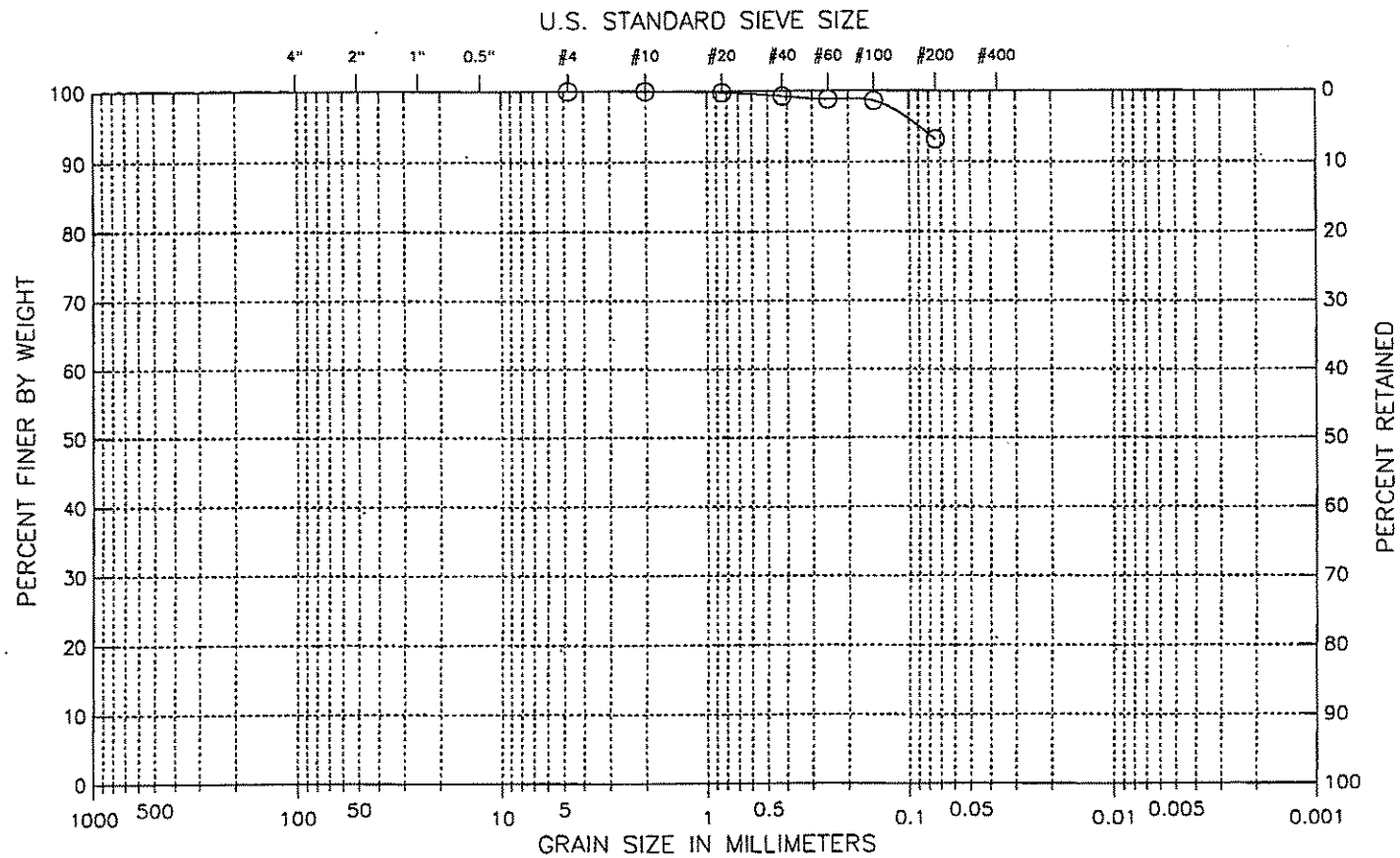
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.32	0.32	100
#10	0.079	2.00	0.78	1.10	99
#20	0.033	0.84	1.90	3.00	97
#40	0.017	0.42	2.79	5.79	94
#60	0.010	0.25	3.24	9.03	90
#100	0.006	0.15	3.82	12.85	86
#200	0.003	0.07	3.82	16.67	82
Pan			74.54	91.21	0

Total Dry Weight of Sample = 99.35

D85 : 0.1279 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

	Boring No. : --- Sample No.: NBS-12 SS-2 Test Method ASTM D 422 Filename : NBS12S02	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Moist, grayish brown silt with sand

Figure 8

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07/15/02 17:56 FAX GeoTesting Express 004

Mon Jul 15 18:09:20 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-12 SS-2
Location : New Bedford, MA
Soil Description : Moist, grayish brown silt with sand
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS12S02
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.02	0.02	100
#20	0.033	0.84	0.17	0.19	100
#40	0.017	0.42	0.40	0.59	99
#60	0.010	0.25	0.34	0.93	99
#100	0.006	0.15	0.17	1.10	99
#200	0.003	0.07	4.18	5.28	93
Pan			72.06	77.34	0

Total Dry Weight of Sample = 85.53

D85 : N/A
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

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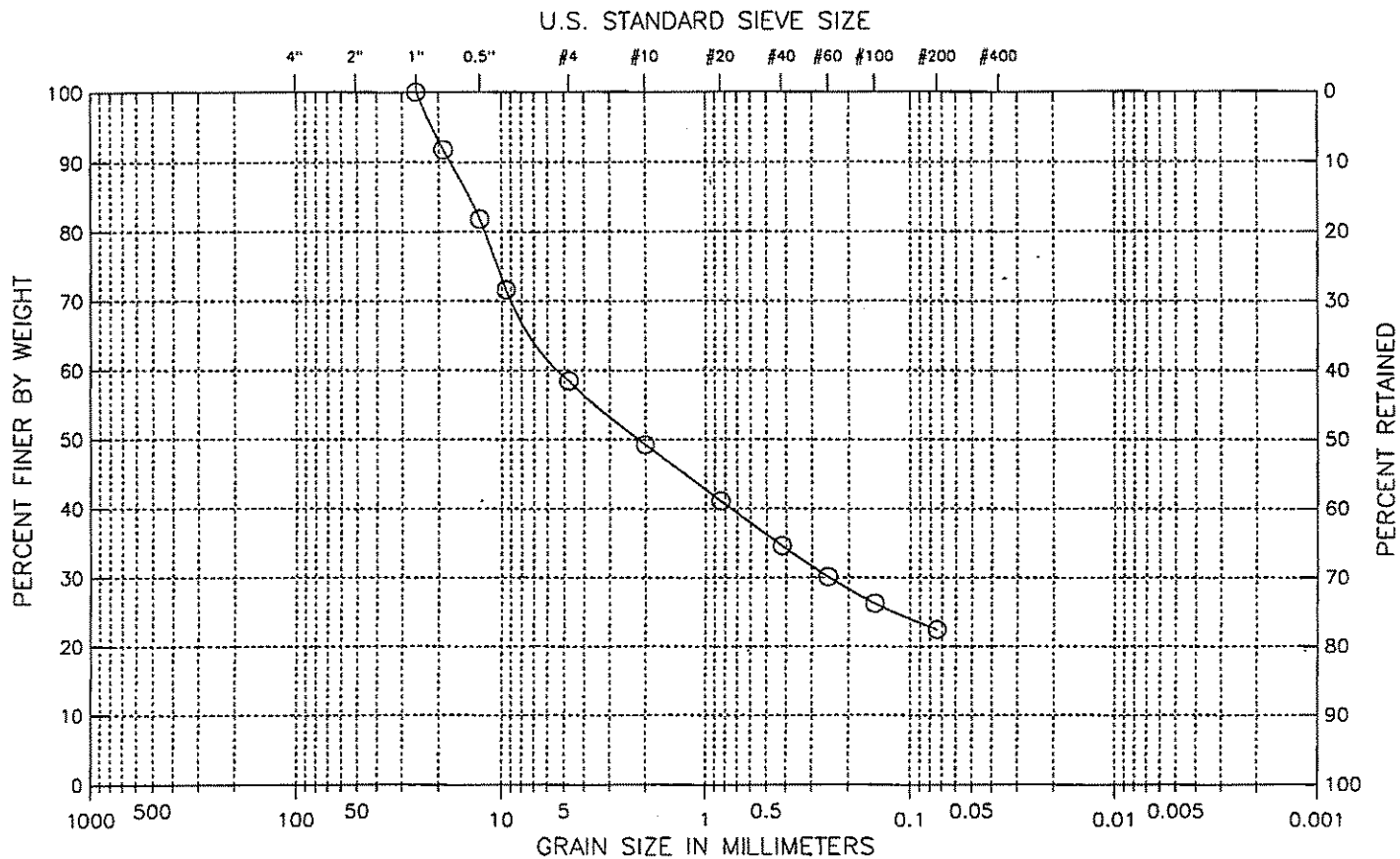
	Boring No. : --- Sample No.: NBS-12 SS-3 Test Method ASTM D 422 Filename : NBS12S03	Project : New Bedford/Fall River Commuter Rail Project No.: GTX-3916 Location: New Bedford, MA Date : Mon Jul 15 2002



Classification :

Remarks :

Visual Description :
Moist, olive gray gravel with silt and sand

Figure 9

Mon Jul 15 18:09:20 2002 Page : 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford/Fall River Commuter Rail
Project No. : GTX-3916
Boring No. : ---
Sample No. : NBS-12 SS-3
Location : New Bedford, MA
Soil Description : Moist, olive gray gravel with silt and sand
Remarks : ---

Depth : ---
Test Date : 07/10/02
Test Method : ASTM D 422

Filename : NBS12S03
Elevation : ---
Tested by : jx
Checked by : jdt

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	10.48	10.48	92
0.5"	0.500	12.70	12.80	23.28	82
0.375"	0.374	9.51	13.03	36.31	72
#4	0.187	4.75	16.81	53.12	58
#10	0.079	2.00	11.85	64.97	49
#20	0.033	0.84	10.45	75.42	41
#40	0.017	0.42	8.27	83.69	35
#60	0.010	0.25	5.76	89.45	30
#100	0.006	0.15	4.93	94.38	26
#200	0.003	0.07	4.88	99.26	22
Pan			28.72	127.98	0

Total Dry Weight of Sample = 136.2

D85 : 14.4414 mm
D60 : 5.1437 mm
D50 : 2.1483 mm
D30 : 0.2465 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Memorandum

APPENDIX C: GEOTECHNICAL CALCULATIONS

- Allowable Bearing Capacity and Estimated Settlement
- Seismic Site Class Evaluation

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CALCULATION WORKSHEET

JOB	MBTA South Coast Rail		
SUBJECT	Taunton Depot Station		
CALCULATED BY	DH	**DATE**	3/28/2012
CHECKED BY	PC	**DATE**	3/29/2012

PURPOSE: Evaluate bearing resistance for ramp/stair structure shallow foundations.

REFERENCE: AASHTO LRFD Bridge Design Specifications, 2010/AREMA Manual for Railway Engineering, 2004

ASSUMPTIONS:

- Ramp/Stair structure footing is 4 ft wide by 6 ft long.
- Bearing surface is silty sand (SM).
- Footing embedment is at least 4 feet below ground surface.
- Groundwater level is at 1 feet below surface.
- Footing eccentricity is assumed to be zero.
- Estimated soil properties (experience, geotech literature, AASHTO Table 10.4.6.2.4-1):

	γ (pcf)	ϕ
Silty Sand:	125	32

BEARING CAPACITY FACTORS (Table 10.6.3.1.2a-1):

	ϕ	N_c	N_q	N_γ
Silty Sand:	32	35.5	23.2	30.2

CALCULATE EFFECTIVE FOOTING WIDTH (B'):

$e < B/4$ (AASHTO Section 10.6.3.3)

where: B = footing width (ft) = 4
e = eccentricity (ft)

Assume maximum footing eccentricity, thus, e = 1

$B' = B-2e$ 2

NOMINAL BEARING RESISTANCE (q_n):

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B' N_{\gamma m} C_{w\gamma}$ (AASHTO Eqn. 10.6.3.1.2a-1)

where:

c = cohesion = 0		
γ = total unit weight	125	
D_f = depth of footing (ft) =	4	Assumed
B' = effective width of footing (ft) =	2	
L = length of footing (ft) =	6	
B'/L =	0.33	
D_f /B' =	2.00	
L/B' =	3.00	
C_{wq} $C_{w\gamma}$ = groundwater correction factors		(using B')
C_{wq} = 0.6		(AASHTO Table 10.6.3.1.2a-2)
$C_{w\gamma}$ = 0.5		(AASHTO Table 10.6.3.1.2a-2)

N_{cm} N_{qm} $N_{\gamma m}$ = bearing capacity factors

$N_{qm} = N_q s_q d_q i_q$ (AASHTO Eqn. 10.6.3.1.2a-3)

s_q =	1.21	(AASHTO Table 10.6.3.1.2a-3)
d_q =	1.30	(AASHTO Table 10.6.3.1.2a-4)
i_q =	1.0	(see AASHTO p. 10-62)
N_{qm} =	36.4	

$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$

s_γ =	0.87	(AASHTO Table 10.6.3.1.2a-3)
i_γ =	1	(see AASHTO p. 10-62)
$N_{\gamma m}$ =	26.2	

q_n = 12,568 psf

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CALCULATION WORKSHEET

JOB	MBTA South Coast Rail		
SUBJECT	Taunton Depot Station		
CALCULATED BY	DH	**DATE**	3/28/2012
CHECKED BY	PC	**DATE**	3/29/2012

ALLOWABLE BEARING RESISTANCE (q_a):

$q_a = q_n/FOS$

where: FOS = factor of safety = 3 for primary loads (see AREMA 3.4.2)

q_a = 4,189 psf

use

q_a =	**4.19**	**ksf**

strength limit value

Note: Based on the anticipated light loads and potentially small footing sizes, an allowable bearing capacity of 4 ksf is recommended.

Elastic Settlement Calculations:

$$S_e = \frac{(q_o\,(1-\nu^2)\sqrt{A'})}{144 E_s \beta_z}$$

AASHTO eqn. 10.6.2.4.2-1

where: q_o = applied vert. stress (ksf)
ν = Poisson's Ratio
E_s = Young's Modulus (ksi)
β_z = Shape/Rigidity Factor

ν = Poisson's Ratio =	0.30	(AASHTO Table C10.4.6.3-1)
E_s = Young's Modulus (ksi) =	5.00	(AASHTO Table C10.4.6.3-1)
β_z = Shape/Rigidity Factor =	1.13	(AASHTO Table 10.6.2.4.2-1)

where:

B' = eff. width of footing (ft) =	2	(from bearing resistance calcs)
L = length of footing (ft):	6	(from bearing resistance calcs)
A' =(B'xL) = footing area (ft^2):	12	ft^2

Settlement (S_e) for a given q_o:

q_o = applied vertical stress (ksf) = 4.00 ksf (assumed)

S_e (inches) = 0.19 inches

Taunton Depot Station Seismic Site Class Evaluation

Based on the platform boring with the lowest average blow counts (worst case)

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
TD-1	S-1	6	3	0.50	
	S-2	5	5	1.00	
	S-3	30	5	0.17	**38**
	S-4	44	5	0.11	
	C1	100	5	0.05	
	S-5	100	4	0.04	
	Bedrock	100	73	0.73	
	Total Depth =	100			
	Depth to Bedrock =	27	sum	2.60	

Approx. Project Coordinates

Lat 41.877953
Long -71.073333

Seismic Coefficients

S_S = 0.24 (Table 1604.10*)
S_1 = 0.062 (Table 1604.10*)

For Site Class D

F_A = 1.6 (See Table 9.4.1.2.4a*)
F_V = 2.4 (See Table 9.4.1.2.4b*)

Design Spectral Response Parameters

S_{MS} = Ss x F_A = 0.384
S_{M1} = S_1 x F_V = 0.149

S_{DS} = 2/3 x S_{MS} = 0.256
S_{D1} = 2/3 x S_{M1} = 0.099

Per 9.4.1.2.1, $15 < N_{bar} < 50$, Site Class D

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction*.

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods*					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	*Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods*
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Rochester	45	110	0.23	0.059
Rockland	45	110	0.26	0.064
Rockport	45	110	0.33	0.073
Rowe	65	100	0.22	0.069
Rowley	55	110	0.34	0.075
Royalston	65	100	0.25	0.070
Russell	65	100	0.23	0.066
Rutland	55	100	0.24	0.068
Salem	45	110	0.31	0.071
Salisbury	55	110	0.35	0.077
Sandisfield	65	90	0.23	0.066
Sandwich	35	120	0.22	0.058
Saugus	45	110	0.30	0.070
Savoy	65	90	0.22	0.068
Scituate	45	110	0.27	0.065
Seekonk	55	110	0.24	0.062
Sharon	55	100	0.25	0.065
Sheffield	65	90	0.23	0.066
Shelburne	65	100	0.23	0.068
Sherborn	55	100	0.26	0.066
Shirley	65	100	0.28	0.072
Shrewsbury	55	100	0.25	0.067
Shutesbury	65	100	0.23	0.068
Somerset	55	110	0.23	0.060
Somerville	45	105	0.28	0.069
South Hadley	55	100	0.23	0.066
Southampton	55	100	0.23	0.066
Southborough	55	100	0.26	0.067
Southbridge	55	100	0.23	0.064
Southwick	55	100	0.23	0.065
Spencer	55	100	0.23	0.066
Springfield	55	100	0.23	0.065
Sterling	55	100	0.26	0.069
Stockbridge	65	90	0.22	0.066
Stoneham	45	105	0.30	0.071
Stoughton	55	100	0.26	0.065
Stow	55	100	0.27	0.069
Sturbridge	55	100	0.23	0.065
Sudbury	55	100	0.27	0.069
Sunderland	65	100	0.23	0.068
Sutton	55	100	0.24	0.065
Swampscott	45	110	0.30	0.070
Swansea	55	110	0.24	0.061
Taunton	55	110	0.24	0.062
Templeton	65	100	0.25	0.070
Tewksbury	55	100	0.31	0.073
Tisbury	35	120	0.18	0.052
Tolland	65	100	0.23	0.066
Topsfield	45	110	0.33	0.074
Townsend	65	100	0.28	0.072
Truro	35	120	0.22	0.057

Stormwater Report

Freetown Station

Town of Freetown, Massachusetts

Prepared for

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

Table of Contents

Checklist for Stormwater Report **1**
Stormwater Report Narrative **3**
Project Description **3**
Site Description **3**
Existing Drainage Conditions **4**
Proposed Drainage Conditions **5**
Regulatory Compliance **12**

List of Figures

Figure 1: Site Locus Map
Figure 2: Site Aerial
Figure 3: Existing Drainage Areas
Figure 4: Proposed Drainage Areas

List of Tables

Table 1: Wetland Resource Areas
Table 2: Existing Conditions Hydrologic Data
Table 3: Proposed Conditions Hydrologic Data
Table 4: Peak Discharge Rates (cfs)
Table 5 Summary of Recharge Calculations

Appendices

Appendix A Standard 1 Computations and Supporting Information
Appendix B Standard 2 Computations and Supporting Information
Appendix C Standard 3 Computations and Supporting Information
Appendix D Standard 4 Computations and Supporting Information
Appendix E Geotechnical Report

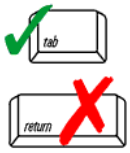
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☐ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☒ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

☒ The ½" or 1" Water Quality Volume or

☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

Project Description

The Applicant, MassDOT, is proposing to construct a commuter rail station along the existing Fall River Secondary tracks in Freetown, Massachusetts (the Project). As proposed, the Project requires the acquisition of approximately 7 acres of land at 165 South Main Street of which approximately 4 acres will be developed for the new station. The Project will involve a platform with canopy, ancillary landscape improvements, 173 parking spaces, a pick up/drop off area, bicycle parking facilities, and utility improvements to support this use.

The station is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because it is not a parking lot with a high-intensity use (1,000 vehicle trips per day or more).

Site Description

The project development area (the Site) consists of approximately 4 acres of currently undeveloped land (see Figures 1 and 2). The Site is bound by Assonet Mini Storage to the west, South Main Street to the northwest, woods and wetlands to the north, grassed pasture to the northeast, the Fall River Secondary tracks to the southeast, and woods and wetlands to the southwest. A telecommunications tower abuts the mini storage and is in the southwest corner of the Site. Brightman Lumber Co. is located nearby south of the Site and the Stop and Shop Distribution Center is located to the north, across South Main Street. See Figure 1, Site Locus Map and Figure 2, Site Aerial.

The wetland Resource Areas on the Site as, shown on Figures 3 and 4, are described in Table 1. The wetlands ultimately flow to the Taunton River. For additional information regarding the wetland resource areas present on the site see the Abbreviated Notice of Resource Area Delineation (ANRAD) prepared by VHB dated January 2012.

Table 1
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*Description*
Wetland 1	No	No	No	No	PFO
Wetland 1A	No	No	No	No	PEM

Notes: Wetland Classifications: PEM = Palustrine Emergent, PFO = Palustrine Forested

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Merrimac fine sandy loam, Scarboro muck, Ridgebury fine sandy loam, and Sudbury fine sandy loam, and are classified as Hydrologic Soil Groups (HSG) A, D, C, B, respectively. The majority of the soil on the Site is classified as HSG A. Based on the soil evaluation included in Appendix C, the Site is considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour. According to 1982 Rawls Rates, infiltration rates for the soils will be approximately 2.41 inches per hour.).

The project is not located within the 100-year flood plain as shown on FEMA Floodway Map, Town of Freetown, Massachusetts Bristol County, Community Panel numbers 25005C0263F and 25005C0264F dated July 7, 2009, included in Appendix B.

Existing Drainage Conditions

Under existing conditions, the Site consists of mostly cleared, but undeveloped land. The Site is primarily grass pasture and dirt with some dirt mounds and a few scattered trees. There is also a gravel road that goes around the mini storage to provide access to the communications tower. For existing conditions hydrologic analysis, the drainage area including the Site and the mini storage was divided into four sub drainage areas. The existing mini storage was included because site drainage flows on to this property under current conditions. All four drainage areas contribute to a single design point (Wetland 1). The following is a summary of each drainage area.

Drainage Area 1 – This 2.45-acre area comprises the portion of the Site between the mini storage lot and Wetland 1, extending from South Main Street to the existing Fall River Line track. The area consists of grassy pasture with some areas of dirt, gravel, and brush. Runoff from Drainage Area 1 sheet flows in a northerly direction to Wetland 1, on the north side of the Site.

Drainage Area 2 – This 0.95-acre area consist of grassy pasture with some sections of dirt, gravel, and brush. The area is located in the center of the Site, between the Fall River Line track and the mini storage. Runoff from this area sheet flows into Drainage Area 3 and sheet flows across the gravel lot. Runoff from Drainage Area 2 flows to Wetland 1.

Drainage Area 3 – This 3.34-acre area consists of the developed land that the Assonet Mini Storage occupies. The area is split between a paved portion with storage buildings, a gravel lot, and some grassed sections along South Main Street. There is a drainage system for paved area, while the gravel lot and grassed area sheet flows, untreated, to Wetland 1.

Drainage Area 4 – This 1.79-acre area consist of grassy pasture with some sections of dirt, gravel, and brush. The area is located on the south side of the Site, between the Fall River Line track and the mini storage. Runoff from this area sheet flows into Drainage Area 3 and is captured by the drainage system. Runoff from Drainage Area 4 flows to Wetland 1.

Figure 3 illustrates the existing drainage patterns on the Site. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland 1	1	2.45	51	6.9
2	Wetland 1	1	0.95	42	8.5
3	Wetland 1	1	3.34	89	5.0
4	Wetland 1	1	1.79	71	7.4

Proposed Drainage Conditions

Figure 4 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into five drainage areas that discharge treated stormwater to the one existing Design Point. Existing drainage and grading patterns were maintained to the maximum extent possible. The drainage from the paved areas will be captured and treated in three infiltration basins. These basins are designed to decentralize stormwater management and reduce peak runoff rates, maximize groundwater recharge and treat for water quality. The following is a summary of each drainage area.

Drainage Area 1 – This 0.99-acre area comprises the eastern portion of the parking lot and consists of a paved parking area for the station, grassed swale, and Infiltration Basin 1 to the east of the parking. Runoff from Drainage Area 1 is directed to Basin 1, which discharges to Wetland 1.

Drainage Area 2 – This 1.70-acre area in the southern portion of the Site consists of grassy pasture with some sections of dirt, gravel, and brush. The majority of Drainage Area 2 is unchanged from existing conditions. Part of the area will remain occupied by an existing telecommunications tower and gravel access drive. Runoff from Drainage Area 2 sheet flows to Drainage Area 3, the existing mini storage area, where is it captured by the existing drainage system and discharged to Wetland 1.

Drainage Area 3 – This 3.50-acre area comprises the existing mini storage area. Runoff from Drainage Area 3 discharges to Wetland 1.

Drainage Area 4 – This 0.71-acre area comprises the site access road and consists of a paved roadway, grassed swale, and Infiltration Basin 3 to the northeast of the roadway. Runoff from Drainage Area 4 is directed a grassed swale that leads to a sediment forebay and Basin 3, which discharges to Wetland 1.

Drainage Area 5 – This 1.63-acre area comprises the southwestern portion of the parking lot and consists of a paved parking area for the station, grassed swale, and Infiltration Basin 2 to the northeast of the parking. Runoff from Drainage Area 5 is directed to a swale, then through a pipe under the access drive to Basin 2, which discharges to Wetland 1.

Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3
Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Wetland 1	1	0.99	83	5.0
2	Wetland 1	1	1.70	71	7.4
3	Wetland 1	1	3.50	87	5.0
4	Wetland 1	1	0.71	90	5.0
5	Wetland 1	1	1.63	83	5.0

The site has been designed with a comprehensive stormwater management system in accordance with the Massachusetts Stormwater Handbook. The proposed

stormwater management system has been designed to treat the half inch Water Quality Volume.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Minimal disturbance to existing trees and vegetation
- Infiltration basins
- Light colored pavement sidewalks
- Grassed swales

In general, stormwater runoff from impervious surfaces in the proposed drainage areas will receive treatment for stormwater quality in grassed swales and infiltration basins prior to discharge to the existing design point.

Hydraulic Analysis

The closed drainage system was designed for the 25-year storm event, in accordance with the Massachusetts Bay Transportation Authority, Railroad Operations, Commuter Rail Design Standards Manual, Volume 1.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Pipe sizing calculations are included in Appendix A of this report.

\\MABOS\projects\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Freetown\Stormwater Figures\Figure 1\Figure 1-Site Locus.dwg

Vanasse Hangen Brustlin, Inc.

USGS Locus Map

Figure 1
May 2012

Freetown Station
South Coast Rail
Freetown, Massachusetts

0 1000 2000 Feet

Vanasse Hangen Brustlin, Inc.

0 250 500 Feet

Site Aerial Map

Freetown Station
South Coast Rail
Freetown, Massachusetts

Figure 2
May 2012

\\Vhb\proj\Boston\10111.00\tech\FINAL_EIS_EIR\Stormwater\Data\Stations\Freetown\Stormwater Figures\Figure 3\Freetown Existing Conditions.dwg

EXISTING FALL RIVER SECONDARY TRACK

N/F
NEW YORK CENTRAL LINES
DEED BOOK 3733 PAGE 1

1
2
3
4

254B
71B
73A
39A
260B

WETLAND 1A

WETLAND 1

STONE HEADWALL
INV=33.0'
SOUTH MAIN STREET
(PUBLIC - VARIABLE WIDTH)

24"RCP
INV=41.5'

CB
R=47.3'
IN=42.0'
OUT=42.0'

3-12"

EL BOX W/ 2 CONDUITS

SMH
R=53.5'

HEDGE

CONC HEADWALL

18"CMP
INV=50.7'

GENERAL PIPE DIRECTION
INVERT NOT ACCESSIBLE

1 STORY MINI STORAGE BUILDING

0 40 80 Feet

LEGEND

- SUBCATCHMENT DRAINAGE AREA DESIGNATION
- DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WETLAND BOUNDARY
- ACQUISITION LIMIT
- LIMIT OF WORK

NRCS SOIL CLASSIFICATIONS (HSG)

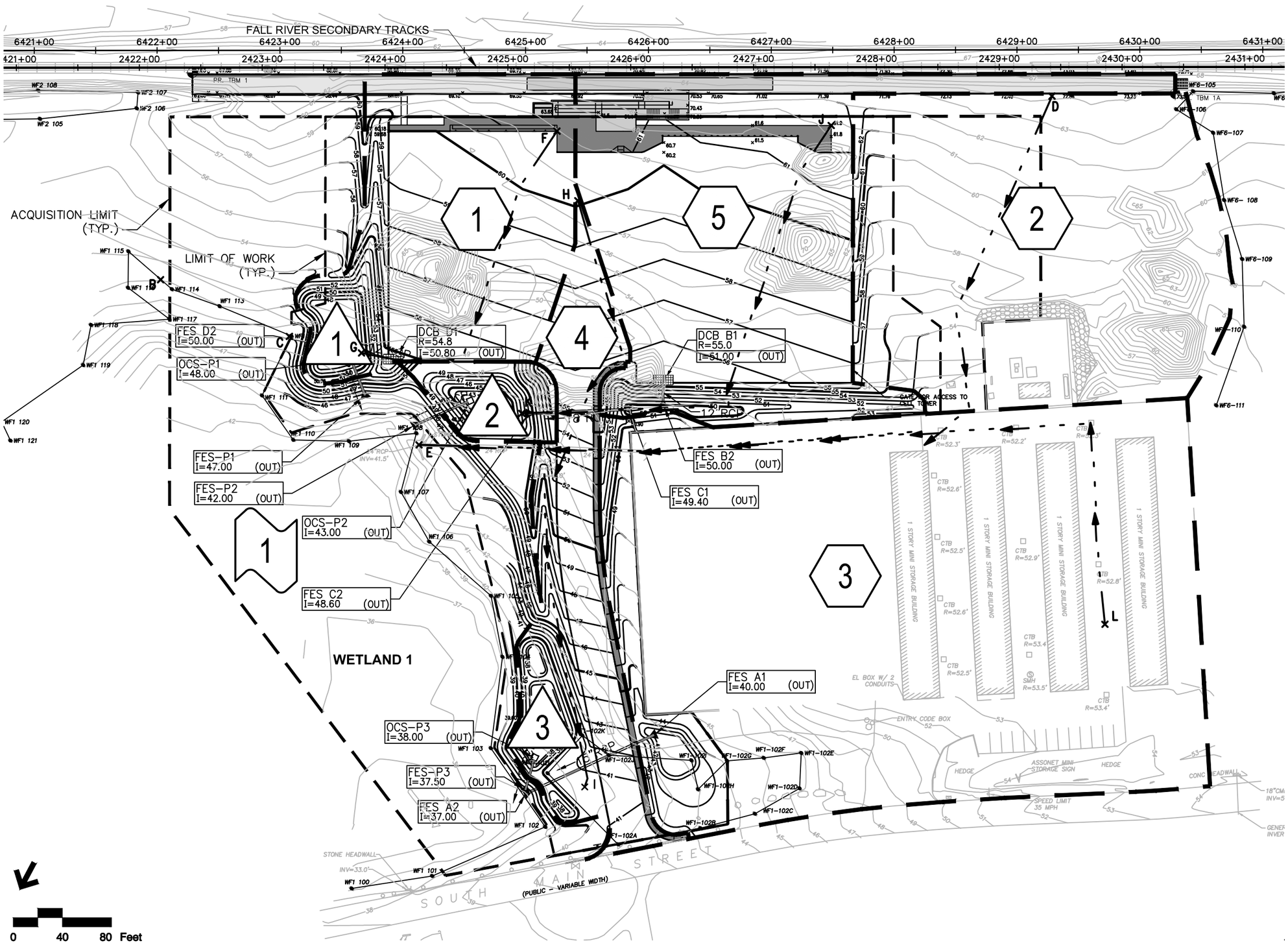
- 254B MERRIMAC FINE SANDY LOAM (A)
- 71B RIDGEBURY FINE SANDY LOAM (C)
- 39A SCARBORO MUCK (D)
- 260B SUDBURY FINE SANDY LOAM (B)
- 73A WHITMAN FINE SANDY LOAM (A)

Vanasse Hangen Brustlin, Inc.

Figure 3 May 2012

Existing Conditions Drainage Areas

Freetown Station
Freetown, Massachusetts



LEGEND

- SUBCATCHMENT DRAINAGE AREA DESIGNATION
- POND
- DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WETLAND BOUNDARY
- ACQUISITION LIMIT
- LIMIT OF WORK

Vanasse Hangen Brustlin, Inc.

Figure 4 May 2012

Proposed Conditions Drainage Areas

Freetown Station
Freetown, Massachusetts

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMPs that impound stormwater have been designed with stone to protect down gradient areas from erosion.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*100-year*
Design Point 1: Wetland 1			
Existing	10.8	18.3	33.4
Proposed	10.4	17.3	31.8

Standard 3: Stormwater Recharge

The Project has been designed to fully comply with Standard 3.

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is 4,676 cubic feet.

Recharge of stormwater has been provided through the use of infiltration basins, which has been sized using the static method. Each infiltration BMP has been designed to drain completely within 72 hours. Table 5 below provides a summary of the proposed infiltration BMPs utilized for the Project.

Table 5
Summary of Recharge Calculations

Infiltration BMP	*Provided Recharge Volume (cubic feet)*
Infiltration Basin P1	1,955
Infiltration Basin P2	5,205
Infiltration Basin P3	4,403
Total Provided Recharge	11,563

A Geotechnical Report is included in Appendix E.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide a minimum of 80% TSS removal for stormwater runoff from all proposed impervious surfaces.

Computations and supporting information are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The site is not considered a LUHPPL as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because the parking lot is not classified as a high-intensity use (1,000 vehicle trips per day or more).

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is not a redevelopment.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 3.9 acres of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and a Notice of Intent for the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIR/S. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during final design for the Project.

Standard 10: Prohibition of Illicit Discharges

The site was previously undeveloped and no sanitary sewer or storm drainage infrastructure is known to exist on the site. The design plans submitted with this report have been designed in full compliance with current standards. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

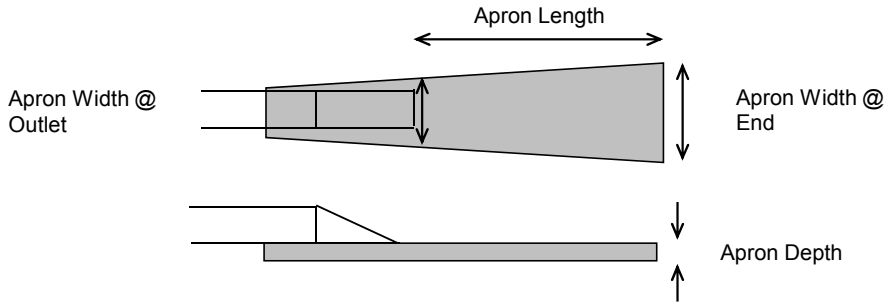
Appendix A
Standard 1 Computations and Supporting Information

Project #:	10111.34		
Project:	Freetown Station - SCR		
Location:	Freetown, MA		
Calculated by:	PAC	Date:	April 30, 2012
Checked by:	-	Date:	April 30, 2012
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
Massachusetts Department of Environmental Protection - Reprinted 2003 (pp. 118-120)

Erosion and Sediment Control Handbook - Third Edition 1992 (Chapter 3.18)
Virginia Department of Conservation and Recreation (DCR)

Attachments: Virginia DCR Erosion and Sediment Control Handbook Plate 3.18-3



Apron Width at Outlet:	Width = 3 x pipe dia. (or width of channel)	
Apron Length:	Length = From Virginia DCR Handbook - Plate 3.18-3	if Tw depth is < 1/2 dia.
	Length = From Virginia DCR Handbook - Plate 3.18-4	if Tw dwpth is >= 1/2 dia.
Apron Width at End:	Width = dia. + apron length	if Tw depth is < 1/2 dia.
	Width = dia. + 0.4 x apron length	if Tw dwpth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

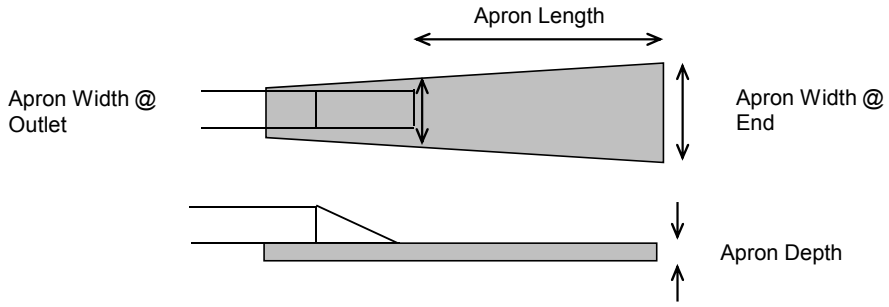
Design Element	Outlet Description FES - Pond 1
Design Storm (yr):	100
Defined Channel (yes/no)	no
Pipe Dia (D), in	15
Tail Water (Tw), ft	Tw < 0.5D
Flow (Q), cfs	1.7
Apron Width (outlet), ft	4
Apron Length, ft	17
Apron Width (end), ft	18
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111.34		
Project:	Freetown Station - SCR		
Location:	Freetown, MA		
Calculated by:	PAC	Date:	April 30, 2012
Checked by:	-	Date:	April 30, 2012
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
Massachusetts Department of Environmental Protection - Reprinted 2003 (pp. 118-120)

Erosion and Sediment Control Handbook - Third Edition 1992 (Chapter 3.18)
Virginia Department of Conservation and Recreation (DCR)

Attachments: Virginia DCR Erosion and Sediment Control Handbook Plate 3.18-3



Apron Width at Outlet:	Width = 3 x pipe dia. (or width of channel)	
Apron Length:	Length = From Virginia DCR Handbook - Plate 3.18-3	if Tw depth is < 1/2 dia.
	Length = From Virginia DCR Handbook - Plate 3.18-4	if Tw dwpth is >= 1/2 dia.
Apron Width at End:	Width = dia. + apron length	if Tw depth is < 1/2 dia.
	Width = dia. + 0.4 x apron length	if Tw dwpth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

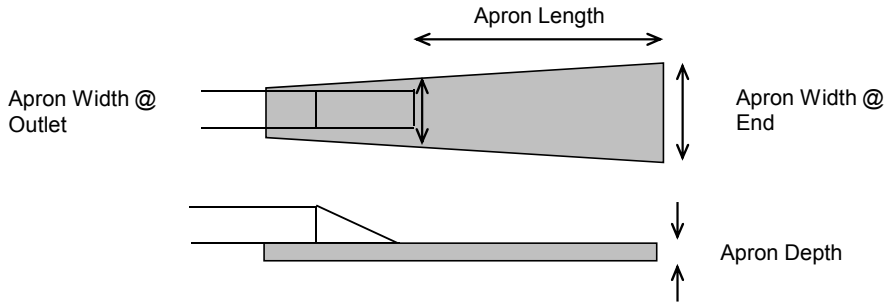
Design Element	Outlet Description FES - Pond 2
Design Storm (yr):	100
Defined Channel (yes/no)	no
Pipe Dia (D), in	12
Tail Water (Tw), ft	Tw < 0.5D
Flow (Q), cfs	2.2
Apron Width (outlet), ft	3
Apron Length, ft	17
Apron Width (end), ft	18
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Project #:	10111.34		
Project:	Freetown Station - SCR		
Location:	Freetown, MA		
Calculated by:	PAC	Date:	April 30, 2012
Checked by:	-	Date:	April 30, 2012
Title:	Riprap Outlet Protection Sizing		

Sources: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas
Massachusetts Department of Environmental Protection - Reprinted 2003 (pp. 118-120)

Erosion and Sediment Control Handbook - Third Edition 1992 (Chapter 3.18)
Virginia Department of Conservation and Recreation (DCR)

Attachments: Virginia DCR Erosion and Sediment Control Handbook Plate 3.18-3



Apron Width at Outlet:	Width = 3 x pipe dia. (or width of channel)	
Apron Length:	Length = From Virginia DCR Handbook - Plate 3.18-3	if Tw depth is < 1/2 dia.
	Length = From Virginia DCR Handbook - Plate 3.18-4	if Tw dwpth is >= 1/2 dia.
Apron Width at End:	Width = dia. + apron length	if Tw depth is < 1/2 dia.
	Width = dia. + 0.4 x apron length	if Tw dwpth is >= 1/2 dia.
	or apron width = channel width if a well defined channel exists	
Rock Riprap:	Median Diameter (d_{50}) = From Virginia DCR Handbook - Plate 3.18-3 or 4	
	Largest stone dia = 1.5 x d_{50}	
Apron Depth:	6" or 1.5 x largest stone dia	

Design Element	Outlet Description FES - Pond 3
Design Storm (yr):	100
Defined Channel (yes/no)	no
Pipe Dia (D), in	24
Tail Water (Tw), ft	Tw < 0.5D
Flow (Q), cfs	4.8
Apron Width (outlet), ft	6
Apron Length, ft	17
Apron Width (end), ft	19
Median Stone Dia., ft	0.50
Median Stone Dia., in	6
Largest Stone Dia., ft	0.75
Largest Stone Dia., in	9
Apron Depth, ft	1
Apron Depth, in	14

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
99 High St., Boston, MA 02110
(617) 728-7777

Storm Drainage Computations

Name: South Coast Rail
Freetown MA
Client: MassDOT

Proj. No.: **10111.00**
Date: **5/21/2012**
Computed by: **PAC**
Checked by: **EJM**

Design Parameters:
25 **Year Storm** Boston, MA
k_e= **0.5**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q cfs	V fps	n	PIPE SIZE	SLOPE	Q full ft^3/s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER	W.S.E. ft	Freeboard ft
	FES A1	FES A2	1.65	0.71	1.18	1.18	0.26	5.0	6.0	7.1	7.7	0.013	15	0.0250	10.2	8.3	120	3.00	40.0	40.0	37.0	39.3	0.7
	DCB B1	FES B2	0.63	0.85	0.53	0.53	0.04	5.0	6.0	3.2	8.1	0.013	12	0.0500	8.0	10.1	20	1.00	55.0	51.0	50.0	50.2	4.8
	FES C1	FES C2	1.34	0.78	1.04	1.04	0.26	5.0	6.0	6.2	5.1	0.013	24	0.0100	22.6	7.2	80	0.80	49.4	49.4	48.6	49.1	0.3
	DCB D1	FES D2	0.40	0.90	0.36	0.36	0.05	5.0	6.0	2.2	6.7	0.013	12	0.0400	7.1	9.1	20	0.80	54.8	50.8	50.0	50.2	4.6

Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Maps

250050

ZONE AE
(EL 14)

ZONE X

ZONE X

ZONE X

ZONE X

TOWN OF FREETOWN
250056

FREETOWN - FALL
RIVER STATE FOREST

Taunton River

LIMIT OF STUDY

RAILROAD

SOUTH MAIN STREET

FREETOWN - FALL
RIVER STATE FOREST

ZONE AE
(EL 14)

ZONE A

ZONE X

836048 M

PANEL 0264

MAP SCALE 1" = 500'

250 0 500 1000 FEET METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0263F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 263 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BERKLEY, TOWN OF	250050	0263	F
FALL RIVER, CITY OF	250055	0263	F
FREETOWN, TOWN OF	250056	0263	F
SOMERSET, TOWN OF	255220	0263	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0263F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP SCALE 1" = 500'

250 0 500 1000 FEET METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0264F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 264 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FALL RIVER, CITY OF	250055	0264	F
FREETOWN, TOWN OF	250056	0264	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

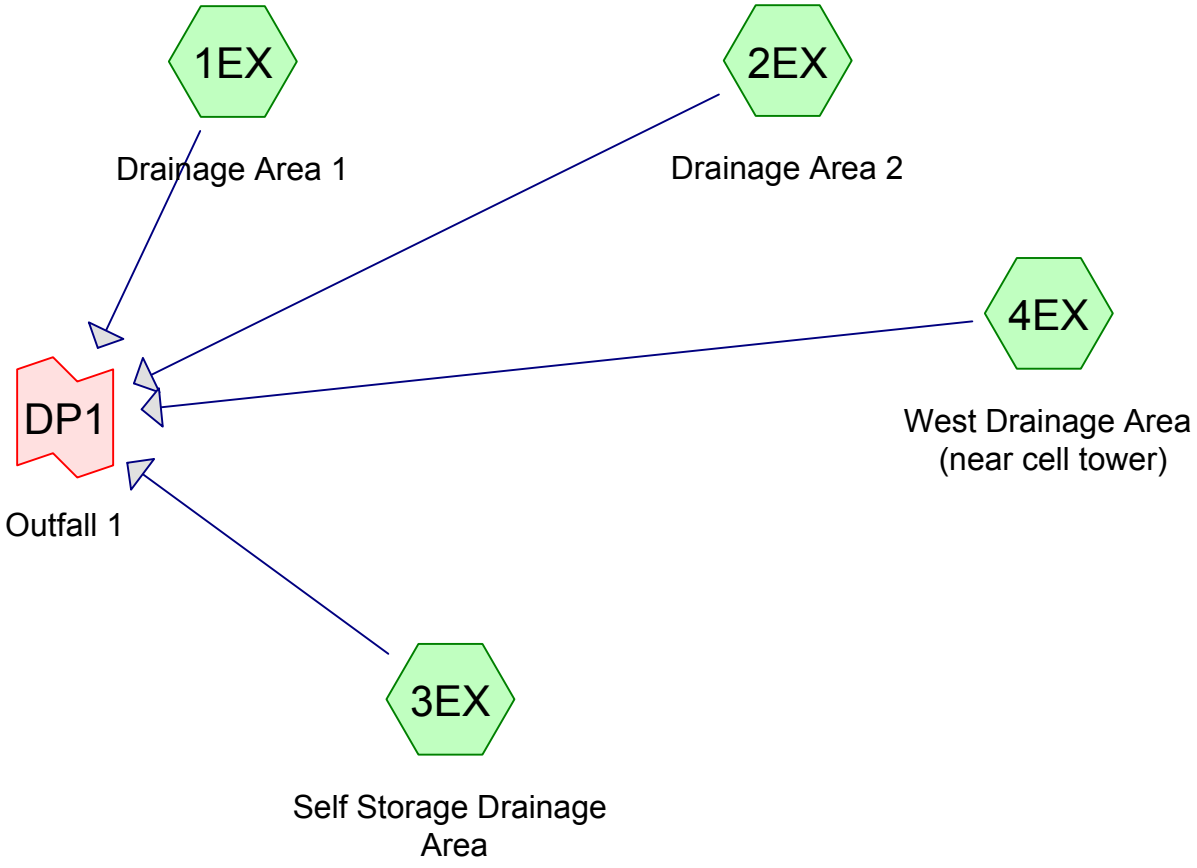
MAP NUMBER
25005C0264F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for FREETOWN EX
Prepared by Vanasse Hangen Brustlin, Printed 5/17/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.006	39	>75% Grass cover, Good, HSG A (1EX, 2EX, 3EX, 4EX)
0.155	61	>75% Grass cover, Good, HSG B (1EX, 3EX)
1.261	74	>75% Grass cover, Good, HSG C (2EX, 3EX, 4EX)
0.571	76	Gravel roads, HSG A (1EX, 2EX, 3EX, 4EX)
0.012	77	Woods, Good, HSG D (1EX)
0.649	80	>75% Grass cover, Good, HSG D (1EX, 3EX, 4EX)
0.023	85	Gravel roads, HSG B (3EX)
0.418	89	Gravel roads, HSG C (3EX, 4EX)
0.641	91	Gravel roads, HSG D (1EX, 3EX)
0.023	98	Paved parking, HSG A (3EX)
0.350	98	Paved parking, HSG B (3EX)
0.606	98	Paved parking, HSG C (3EX)
0.111	98	Roofs, HSG B (3EX)
0.458	98	Roofs, HSG C (3EX)
0.014	98	Unconnected roofs, HSG C (4EX)
0.011	98	Water Surface, 0% imp, HSG B (1EX, 3EX)
0.220	98	Water Surface, 0% imp, HSG D (1EX, 3EX)
8.530	**69**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1EX: Drainage Area 1 Runoff Area=106,520 sf 0.00% Impervious Runoff Depth=0.20"
Flow Length=395' Tc=6.9 min CN=51 Runoff=0.15 cfs 0.040 af

Subcatchment2EX: Drainage Area 2 Runoff Area=41,350 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=505' Tc=8.5 min CN=42 Runoff=0.00 cfs 0.002 af

Subcatchment3EX: Self Storage Runoff Area=145,620 sf 46.31% Impervious Runoff Depth=2.26"
Flow Length=715' Tc=5.0 min CN=89 Runoff=9.12 cfs 0.631 af

Subcatchment4EX: West Drainage Area Runoff Area=78,080 sf 0.80% Impervious Runoff Depth=1.00"
Flow Length=720' Tc=7.4 min UI Adjusted CN=71 Runoff=1.85 cfs 0.149 af

Link DP1: Outfall 1 Inflow=10.77 cfs 0.823 af
Primary=10.77 cfs 0.823 af

Total Runoff Area = 8.530 ac Runoff Volume = 0.823 af Average Runoff Depth = 1.16"
81.68% Pervious = 6.968 ac 18.32% Impervious = 1.562 ac

Summary for Subcatchment 1EX: Drainage Area 1

Tc is minimum recommended by tr-55 = 6 min

Runoff = 0.15 cfs @ 12.41 hrs, Volume= 0.040 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
3,867	76	Gravel roads, HSG A
4,856	91	Gravel roads, HSG D
78,081	39	>75% Grass cover, Good, HSG A
355	61	>75% Grass cover, Good, HSG B
14,435	80	>75% Grass cover, Good, HSG D
263	98	Water Surface, 0% imp, HSG B
4,148	98	Water Surface, 0% imp, HSG D
515	77	Woods, Good, HSG D
106,520	51	Weighted Average
106,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.0960	0.29		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
1.0	80	0.0330	1.27		**Shallow Concentrated Flow, SGP 3.3%** Short Grass Pasture Kv= 7.0 fps
0.5	75	0.1070	2.29		**Shallow Concentrated Flow, SGP 10.7%** Short Grass Pasture Kv= 7.0 fps
2.3	140	0.0210	1.01		**Shallow Concentrated Flow, SGP 2.1%** Short Grass Pasture Kv= 7.0 fps
0.2	50	0.1000	4.74		**Shallow Concentrated Flow, Grassed Waterway** Grassed Waterway Kv= 15.0 fps
6.9	395	Total			

Summary for Subcatchment 2EX: Drainage Area 2

Runoff = 0.00 cfs @ 16.97 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
3,606	76	Gravel roads, HSG A
37,545	39	>75% Grass cover, Good, HSG A
199	74	>75% Grass cover, Good, HSG C
41,350	42	Weighted Average
41,350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0500	0.22		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
2.5	195	0.0350	1.31		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.9	135	0.0270	2.65		**Shallow Concentrated Flow, Gravel Drive & Lot** Unpaved Kv= 16.1 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.1000	2.21		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
8.5	505	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 9.12 cfs @ 12.07 hrs, Volume= 0.631 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
1,002	85	Gravel roads, HSG B
13,155	89	Gravel roads, HSG C
23,087	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,246	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
5,401	39	>75% Grass cover, Good, HSG A
6,403	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
3,877	80	>75% Grass cover, Good, HSG D
218	98	Water Surface, 0% imp, HSG B
5,445	98	Water Surface, 0% imp, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
145,620	89	Weighted Average
78,190		53.69% Pervious Area
67,430		46.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, pavement**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4EX: West Drainage Area (near cell tower)

Runoff = 1.85 cfs @ 12.12 hrs, Volume= 0.149 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
776	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Unconnected roofs, HSG C
9,897	39	>75% Grass cover, Good, HSG A
51,756	74	>75% Grass cover, Good, HSG C
9,976	80	>75% Grass cover, Good, HSG D
78,080	72	Weighted Average, UI Adjusted CN = 71
77,454		99.20% Pervious Area
626		0.80% Impervious Area
626		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Link DP1: Outfall 1

Inflow Area = 8.530 ac, 18.32% Impervious, Inflow Depth = 1.16" for 2 yr storm event
Inflow = 10.77 cfs @ 12.08 hrs, Volume= 0.823 af
Primary = 10.77 cfs @ 12.08 hrs, Volume= 0.823 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

10-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1EX: Drainage Area 1 Runoff Area=106,520 sf 0.00% Impervious Runoff Depth=0.64"
Flow Length=395' Tc=6.9 min CN=51 Runoff=1.09 cfs 0.131 af

Subcatchment2EX: Drainage Area 2 Runoff Area=41,350 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=505' Tc=8.5 min CN=42 Runoff=0.07 cfs 0.020 af

Subcatchment3EX: Self Storage Runoff Area=145,620 sf 46.31% Impervious Runoff Depth=3.53"
Flow Length=715' Tc=5.0 min CN=89 Runoff=13.98 cfs 0.984 af

Subcatchment4EX: West Drainage Area Runoff Area=78,080 sf 0.80% Impervious Runoff Depth=1.93"
Flow Length=720' Tc=7.4 min UI Adjusted CN=71 Runoff=3.79 cfs 0.288 af

Link DP1: Outfall 1 Inflow=18.27 cfs 1.423 af
Primary=18.27 cfs 1.423 af

Total Runoff Area = 8.530 ac Runoff Volume = 1.423 af Average Runoff Depth = 2.00"
81.68% Pervious = 6.968 ac 18.32% Impervious = 1.562 ac

Summary for Subcatchment 1EX: Drainage Area 1

Tc is minimum recommended by tr-55 = 6 min

Runoff = 1.09 cfs @ 12.14 hrs, Volume= 0.131 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
3,867	76	Gravel roads, HSG A
4,856	91	Gravel roads, HSG D
78,081	39	>75% Grass cover, Good, HSG A
355	61	>75% Grass cover, Good, HSG B
14,435	80	>75% Grass cover, Good, HSG D
263	98	Water Surface, 0% imp, HSG B
4,148	98	Water Surface, 0% imp, HSG D
515	77	Woods, Good, HSG D
106,520	51	Weighted Average
106,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.0960	0.29		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
1.0	80	0.0330	1.27		**Shallow Concentrated Flow, SGP 3.3%** Short Grass Pasture Kv= 7.0 fps
0.5	75	0.1070	2.29		**Shallow Concentrated Flow, SGP 10.7%** Short Grass Pasture Kv= 7.0 fps
2.3	140	0.0210	1.01		**Shallow Concentrated Flow, SGP 2.1%** Short Grass Pasture Kv= 7.0 fps
0.2	50	0.1000	4.74		**Shallow Concentrated Flow, Grassed Waterway** Grassed Waterway Kv= 15.0 fps
6.9	395	Total			

Summary for Subcatchment 2EX: Drainage Area 2

Runoff = 0.07 cfs @ 12.46 hrs, Volume= 0.020 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
3,606	76	Gravel roads, HSG A
37,545	39	>75% Grass cover, Good, HSG A
199	74	>75% Grass cover, Good, HSG C
41,350	42	Weighted Average
41,350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0500	0.22		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
2.5	195	0.0350	1.31		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.9	135	0.0270	2.65		**Shallow Concentrated Flow, Gravel Drive & Lot** Unpaved Kv= 16.1 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.1000	2.21		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
8.5	505	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 13.98 cfs @ 12.07 hrs, Volume= 0.984 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
1,002	85	Gravel roads, HSG B
13,155	89	Gravel roads, HSG C
23,087	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,246	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
5,401	39	>75% Grass cover, Good, HSG A
6,403	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
3,877	80	>75% Grass cover, Good, HSG D
218	98	Water Surface, 0% imp, HSG B
5,445	98	Water Surface, 0% imp, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
145,620	89	Weighted Average
78,190		53.69% Pervious Area
67,430		46.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, pavement**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4EX: West Drainage Area (near cell tower)

Runoff = 3.79 cfs @ 12.11 hrs, Volume= 0.288 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
776	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Unconnected roofs, HSG C
9,897	39	>75% Grass cover, Good, HSG A
51,756	74	>75% Grass cover, Good, HSG C
9,976	80	>75% Grass cover, Good, HSG D
78,080	72	Weighted Average, UI Adjusted CN = 71
77,454		99.20% Pervious Area
626		0.80% Impervious Area
626		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Link DP1: Outfall 1

Inflow Area = 8.530 ac, 18.32% Impervious, Inflow Depth = 2.00" for 10 yr storm event
Inflow = 18.27 cfs @ 12.08 hrs, Volume= 1.423 af
Primary = 18.27 cfs @ 12.08 hrs, Volume= 1.423 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

100-Year Storm Event - Existing

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1EX: Drainage Area 1 Runoff Area=106,520 sf 0.00% Impervious Runoff Depth=1.76"
Flow Length=395' Tc=6.9 min CN=51 Runoff=4.31 cfs 0.358 af

Subcatchment2EX: Drainage Area 2 Runoff Area=41,350 sf 0.00% Impervious Runoff Depth=1.00"
Flow Length=505' Tc=8.5 min CN=42 Runoff=0.64 cfs 0.079 af

Subcatchment3EX: Self Storage Runoff Area=145,620 sf 46.31% Impervious Runoff Depth=5.71"
Flow Length=715' Tc=5.0 min CN=89 Runoff=22.02 cfs 1.590 af

Subcatchment4EX: West Drainage Area Runoff Area=78,080 sf 0.80% Impervious Runoff Depth=3.72"
Flow Length=720' Tc=7.4 min UI Adjusted CN=71 Runoff=7.45 cfs 0.556 af

Link DP1: Outfall 1 Inflow=33.37 cfs 2.583 af
Primary=33.37 cfs 2.583 af

Total Runoff Area = 8.530 ac Runoff Volume = 2.583 af Average Runoff Depth = 3.63"
81.68% Pervious = 6.968 ac 18.32% Impervious = 1.562 ac

Summary for Subcatchment 1EX: Drainage Area 1

Tc is minimum recommended by tr-55 = 6 min

Runoff = 4.31 cfs @ 12.11 hrs, Volume= 0.358 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
3,867	76	Gravel roads, HSG A
4,856	91	Gravel roads, HSG D
78,081	39	>75% Grass cover, Good, HSG A
355	61	>75% Grass cover, Good, HSG B
14,435	80	>75% Grass cover, Good, HSG D
263	98	Water Surface, 0% imp, HSG B
4,148	98	Water Surface, 0% imp, HSG D
515	77	Woods, Good, HSG D
106,520	51	Weighted Average
106,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.0960	0.29		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
1.0	80	0.0330	1.27		**Shallow Concentrated Flow, SGP 3.3%** Short Grass Pasture Kv= 7.0 fps
0.5	75	0.1070	2.29		**Shallow Concentrated Flow, SGP 10.7%** Short Grass Pasture Kv= 7.0 fps
2.3	140	0.0210	1.01		**Shallow Concentrated Flow, SGP 2.1%** Short Grass Pasture Kv= 7.0 fps
0.2	50	0.1000	4.74		**Shallow Concentrated Flow, Grassed Waterway** Grassed Waterway Kv= 15.0 fps
6.9	395	Total			

Summary for Subcatchment 2EX: Drainage Area 2

Runoff = 0.64 cfs @ 12.16 hrs, Volume= 0.079 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
3,606	76	Gravel roads, HSG A
37,545	39	>75% Grass cover, Good, HSG A
199	74	>75% Grass cover, Good, HSG C
41,350	42	Weighted Average
41,350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0500	0.22		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.40"
2.5	195	0.0350	1.31		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.9	135	0.0270	2.65		**Shallow Concentrated Flow, Gravel Drive & Lot** Unpaved Kv= 16.1 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.1000	2.21		**Shallow Concentrated Flow, SGP** Short Grass Pasture Kv= 7.0 fps
8.5	505	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 22.02 cfs @ 12.07 hrs, Volume= 1.590 af, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
1,002	85	Gravel roads, HSG B
13,155	89	Gravel roads, HSG C
23,087	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,246	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
5,401	39	>75% Grass cover, Good, HSG A
6,403	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
3,877	80	>75% Grass cover, Good, HSG D
218	98	Water Surface, 0% imp, HSG B
5,445	98	Water Surface, 0% imp, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
145,620	89	Weighted Average
78,190		53.69% Pervious Area
67,430		46.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, pavement**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4EX: West Drainage Area (near cell tower)

Runoff = 7.45 cfs @ 12.11 hrs, Volume= 0.556 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
776	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Unconnected roofs, HSG C
9,897	39	>75% Grass cover, Good, HSG A
51,756	74	>75% Grass cover, Good, HSG C
9,976	80	>75% Grass cover, Good, HSG D
78,080	72	Weighted Average, UI Adjusted CN = 71
77,454		99.20% Pervious Area
626		0.80% Impervious Area
626		100.00% Unconnected

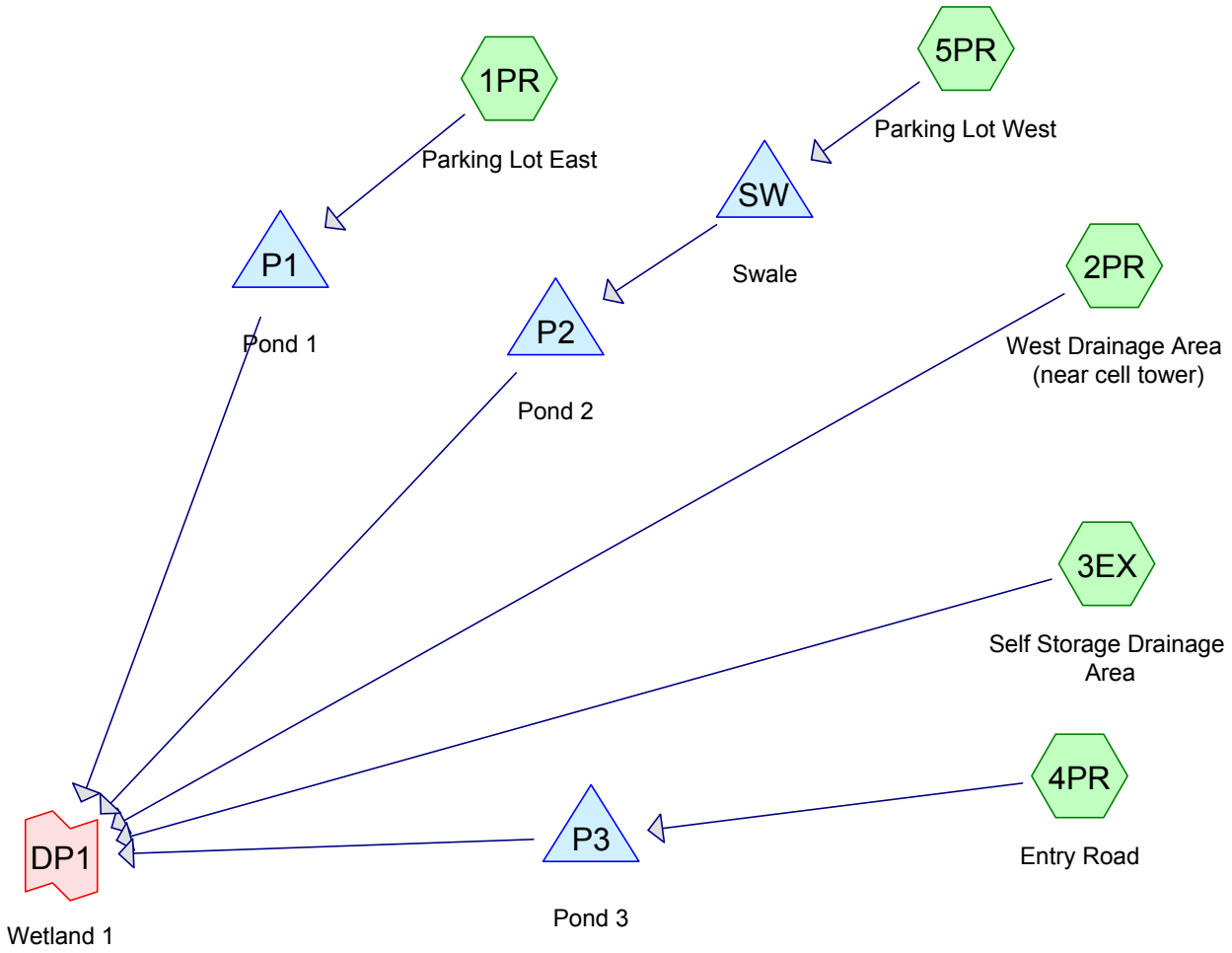
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Link DP1: Outfall 1

Inflow Area = 8.530 ac, 18.32% Impervious, Inflow Depth = 3.63" for 100 yr storm event
Inflow = 33.37 cfs @ 12.08 hrs, Volume= 2.583 af
Primary = 33.37 cfs @ 12.08 hrs, Volume= 2.583 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for FREETOWN PR
Prepared by Vanasse Hangen Brustlin, Printed 5/17/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.111	39	>75% Grass cover, Good, HSG A (1PR, 2PR, 3EX, 4PR, 5PR)
0.146	61	>75% Grass cover, Good, HSG B (3EX)
1.184	74	>75% Grass cover, Good, HSG C (2PR, 3EX, 5PR)
0.400	76	Gravel roads, HSG A (2PR, 3EX)
0.802	80	>75% Grass cover, Good, HSG D (1PR, 2PR, 3EX, 4PR)
0.013	85	Gravel roads, HSG B (3EX)
0.417	89	Gravel roads, HSG C (2PR, 3EX)
0.503	91	Gravel roads, HSG D (3EX)
2.090	98	Paved parking, HSG A (1PR, 3EX, 4PR, 5PR)
0.379	98	Paved parking, HSG B (3EX, 4PR)
0.606	98	Paved parking, HSG C (3EX)
0.209	98	Paved parking, HSG D (4PR)
0.111	98	Roofs, HSG B (3EX)
0.548	98	Roofs, HSG C (2PR, 3EX, 5PR)
0.013	98	Roofs, HSG D (5PR)
8.532	**83**	**TOTAL AREA**

2-Year Storm Event - Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1PR: Parking Lot East Runoff Area=43,318 sf 72.89% Impervious Runoff Depth=1.77"
Flow Length=285' Tc=5.0 min CN=83 Runoff=2.14 cfs 0.147 af

Subcatchment2PR: West Drainage Area Runoff Area=73,919 sf 0.85% Impervious Runoff Depth=1.00"
Flow Length=720' Tc=7.4 min CN=71 Runoff=1.75 cfs 0.142 af

Subcatchment3EX: Self Storage Runoff Area=152,330 sf 44.55% Impervious Runoff Depth=2.09"
Flow Length=715' Tc=5.0 min CN=87 Runoff=8.87 cfs 0.610 af

Subcatchment4PR: Entry Road Runoff Area=0.714 ac 63.45% Impervious Runoff Depth=2.35"
Flow Length=515' Tc=5.0 min CN=90 Runoff=2.02 cfs 0.140 af

Subcatchment5PR: Parking Lot West Runoff Area=70,993 sf 73.96% Impervious Runoff Depth=1.77"
Flow Length=430' Tc=5.0 min CN=83 Runoff=3.51 cfs 0.241 af

Pond P1: Pond 1 Peak Elev=49.30' Storage=2,653 cf Inflow=2.14 cfs 0.147 af
Discarded=0.14 cfs 0.129 af Primary=0.10 cfs 0.018 af Outflow=0.23 cfs 0.147 af

Pond P2: Pond 2 Peak Elev=47.22' Storage=5,691 cf Inflow=3.27 cfs 0.223 af
Discarded=0.13 cfs 0.170 af Primary=0.05 cfs 0.013 af Outflow=0.19 cfs 0.183 af

Pond P3: Pond 3 Peak Elev=39.33' Storage=4,670 cf Inflow=2.02 cfs 0.140 af
Outflow=0.08 cfs 0.039 af

Pond SW: Swale Peak Elev=50.19' Storage=393 cf Inflow=3.51 cfs 0.241 af
Discarded=0.04 cfs 0.018 af Primary=3.27 cfs 0.223 af Outflow=3.31 cfs 0.241 af

Link DP1: Wetland 1 Inflow=10.44 cfs 0.821 af
Primary=10.44 cfs 0.821 af

Total Runoff Area = 8.532 ac Runoff Volume = 1.280 af Average Runoff Depth = 1.80"
53.64% Pervious = 4.577 ac 46.36% Impervious = 3.956 ac

Summary for Subcatchment 1PR: Parking Lot East

Runoff = 2.14 cfs @ 12.08 hrs, Volume= 0.147 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
31,576	98	Paved parking, HSG A
11,096	39	>75% Grass cover, Good, HSG A
646	80	>75% Grass cover, Good, HSG D
43,318	83	Weighted Average
11,742		27.11% Pervious Area
31,576		72.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0182	1.19		**Sheet Flow, grass** Smooth surfaces n= 0.011 P2= 3.40"
0.7	155	0.0316	3.61		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	55	0.0087	1.89		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.1	25	0.0311	8.00	6.28	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
3.0					**Direct Entry, <5 min adjustment**
5.0	285	Total			

Summary for Subcatchment 2PR: West Drainage Area (near cell tower)

Runoff = 1.75 cfs @ 12.12 hrs, Volume= 0.142 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
804	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Roofs, HSG C
9,557	39	>75% Grass cover, Good, HSG A
48,441	74	>75% Grass cover, Good, HSG C
9,442	80	>75% Grass cover, Good, HSG D
73,919	71	Weighted Average
73,293		99.15% Pervious Area
626		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 8.87 cfs @ 12.07 hrs, Volume= 0.610 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
566	85	Gravel roads, HSG B
13,112	89	Gravel roads, HSG C
21,911	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,682	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
8,625	39	>75% Grass cover, Good, HSG A
6,360	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
14,288	80	>75% Grass cover, Good, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
152,330	87	Weighted Average
84,464		55.45% Pervious Area
67,866		44.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, storage lot**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4PR: Entry Road

Runoff = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (ac)	CN	Description
0.225	98	Paved parking, HSG A
0.019	98	Paved parking, HSG B
0.209	98	Paved parking, HSG D
0.019	39	>75% Grass cover, Good, HSG A
0.242	80	>75% Grass cover, Good, HSG D
0.714	90	Weighted Average
0.261		36.55% Pervious Area
0.453		63.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0320	1.49		**Sheet Flow, Lot (sheet)** Smooth surfaces n= 0.011 P2= 3.40"
0.4	85	0.0320	3.63		**Shallow Concentrated Flow, Lot (SCF)** Paved Kv= 20.3 fps
0.3	50	0.0140	2.40		**Shallow Concentrated Flow, along curb** Paved Kv= 20.3 fps
0.2	60	0.0500	4.54		**Shallow Concentrated Flow, Driveway 5%** Paved Kv= 20.3 fps
0.0	10	0.3300	4.02		**Shallow Concentrated Flow, swale slope** Short Grass Pasture Kv= 7.0 fps
1.3	240	0.0450	3.18		**Shallow Concentrated Flow, swale** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0250	2.37		**Shallow Concentrated Flow, end of swale** Grassed Waterway Kv= 15.0 fps
2.1					**Direct Entry, <5 min adjustment**
5.0	515	Total			

Summary for Subcatchment 5PR: Parking Lot West

Runoff = 3.51 cfs @ 12.08 hrs, Volume= 0.241 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr storm Rainfall=3.40"

Area (sf)	CN	Description
48,651	98	Paved parking, HSG A
3,305	98	Roofs, HSG C
552	98	Roofs, HSG D
18,305	39	>75% Grass cover, Good, HSG A
180	74	>75% Grass cover, Good, HSG C
70,993	83	Weighted Average
18,485		26.04% Pervious Area
52,508		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0080	0.86		**Sheet Flow, Impervious** Smooth surfaces n= 0.011 P2= 3.40"
0.9	180	0.0300	3.52		**Shallow Concentrated Flow, impervious parking lot** Paved Kv= 20.3 fps
0.1	20	0.3300	4.02		**Shallow Concentrated Flow, 3:1 ditch slope** Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0250	2.37		**Shallow Concentrated Flow, ditch** Grassed Waterway Kv= 15.0 fps
0.4	100	0.0100	4.54	3.56	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.0					**Direct Entry, <5 min adjustment**
5.0	430	Total			

Summary for Pond P1: Pond 1

Inflow Area = 0.994 ac, 72.89% Impervious, Inflow Depth = 1.77" for 2 yr storm event
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 0.147 af
Outflow = 0.23 cfs @ 12.88 hrs, Volume= 0.147 af, Atten= 89%, Lag= 48.2 min
Discarded = 0.14 cfs @ 12.88 hrs, Volume= 0.129 af
Primary = 0.10 cfs @ 12.88 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 49.30' @ 12.88 hrs Surf.Area= 2,422 sf Storage= 2,653 cf

Plug-Flow detention time= 167.2 min calculated for 0.147 af (100% of inflow)
Center-of-Mass det. time= 167.2 min (996.3 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.00'	7,713 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
48.00	1,670	180.0	0	0	1,670
49.00	2,240	199.0	1,948	1,948	2,274
50.00	2,870	219.0	2,549	4,497	2,971
51.00	3,575	241.0	3,216	7,713	3,808

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**15.0" Round RCP_Round 15"** L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 47.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	49.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	50.25'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	50.75'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

#5 Discarded 48.00' **2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.14 cfs @ 12.88 hrs HW=49.30' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.10 cfs @ 12.88 hrs HW=49.30' (Free Discharge)
└**1=RCP_Round 15"** (Passes 0.10 cfs of 4.86 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.03 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond P2: Pond 2

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 1.64" for 2 yr storm event
Inflow = 3.27 cfs @ 12.10 hrs, Volume= 0.223 af
Outflow = 0.19 cfs @ 14.32 hrs, Volume= 0.183 af, Atten= 94%, Lag= 133.0 min
Discarded = 0.13 cfs @ 14.32 hrs, Volume= 0.170 af
Primary = 0.05 cfs @ 14.32 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 47.22' @ 14.32 hrs Surf.Area= 2,414 sf Storage= 5,691 cf

Plug-Flow detention time= 414.0 min calculated for 0.183 af (82% of inflow)
Center-of-Mass det. time= 345.7 min (1,168.1 - 822.4)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	11,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	510	93.0	0	0	510
44.00	840	118.0	668	668	943
45.00	1,245	141.0	1,036	1,704	1,434
46.00	1,725	164.0	1,478	3,183	2,013
47.00	2,280	188.0	1,996	5,179	2,708
48.00	2,925	212.0	2,596	7,774	3,498
49.00	3,645	237.0	3,278	11,053	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	43.00'	**12.0" Round RCP_Round 12"** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 43.00' / 42.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	47.00'	**2.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	48.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	48.50'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

#5	Discarded	43.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 14.32 hrs HW=47.22' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.05 cfs @ 14.32 hrs HW=47.22' (Free Discharge)
└**1=RCP_Round 12"** (Passes 0.05 cfs of 7.04 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.50 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond P3: Pond 3

Inflow Area = 0.714 ac, 63.45% Impervious, Inflow Depth = 2.35" for 2 yr storm event
Inflow = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af
Outflow = 0.08 cfs @ 15.29 hrs, Volume= 0.039 af, Atten= 96%, Lag= 193.0 min
Primary = 0.08 cfs @ 15.29 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 39.33' @ 15.29 hrs Surf.Area= 3,471 sf Storage= 4,670 cf

Plug-Flow detention time= 444.0 min calculated for 0.039 af (28% of inflow)
Center-of-Mass det. time= 303.8 min (1,107.4 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	7,234 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
37.50	1,708	226.0	0	0	1,708
38.00	2,140	280.0	960	960	3,886
39.00	3,114	312.0	2,612	3,572	5,422
40.00	4,240	366.0	3,663	7,234	8,355

Device	Routing	Invert	Outlet Devices
#1	Primary	38.00'	**12.0" Round RCP_Round 12"** L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 38.00' / 37.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	39.25'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	39.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.08 cfs @ 15.29 hrs HW=39.33' (Free Discharge)
└─**1=RCP_Round 12"** (Passes 0.08 cfs of 3.45 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 0.93 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SW: Swale

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 1.77" for 2 yr storm event
Inflow = 3.51 cfs @ 12.08 hrs, Volume= 0.241 af
Outflow = 3.31 cfs @ 12.10 hrs, Volume= 0.241 af, Atten= 6%, Lag= 1.6 min
Discarded = 0.04 cfs @ 12.10 hrs, Volume= 0.018 af
Primary = 3.27 cfs @ 12.10 hrs, Volume= 0.223 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.19' @ 12.10 hrs Surf.Area= 782 sf Storage= 393 cf

Plug-Flow detention time= 5.5 min calculated for 0.241 af (100% of inflow)
Center-of-Mass det. time= 5.5 min (834.7 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	1,290 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	16	22.0	0	0	16
50.00	653	203.0	257	257	3,259
51.00	1,466	293.0	1,032	1,290	6,820

Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.40' / 48.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	49.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 12.10 hrs HW=50.19' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=3.26 cfs @ 12.10 hrs HW=50.19' (Free Discharge)
└─**1=Culvert** (Barrel Controls 3.26 cfs @ 4.20 fps)

Summary for Link DP1: Wetland 1

Inflow Area = 8.532 ac, 46.36% Impervious, Inflow Depth = 1.15" for 2 yr storm event
Inflow = 10.44 cfs @ 12.08 hrs, Volume= 0.821 af
Primary = 10.44 cfs @ 12.08 hrs, Volume= 0.821 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

10-Year Storm Event- Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1PR: Parking Lot East Runoff Area=43,318 sf 72.89% Impervious Runoff Depth=2.95"
Flow Length=285' Tc=5.0 min CN=83 Runoff=3.55 cfs 0.244 af

Subcatchment2PR: West Drainage Area Runoff Area=73,919 sf 0.85% Impervious Runoff Depth=1.93"
Flow Length=720' Tc=7.4 min CN=71 Runoff=3.59 cfs 0.273 af

Subcatchment3EX: Self Storage Runoff Area=152,330 sf 44.55% Impervious Runoff Depth=3.33"
Flow Length=715' Tc=5.0 min CN=87 Runoff=13.94 cfs 0.971 af

Subcatchment4PR: Entry Road Runoff Area=0.714 ac 63.45% Impervious Runoff Depth=3.64"
Flow Length=515' Tc=5.0 min CN=90 Runoff=3.05 cfs 0.216 af

Subcatchment5PR: Parking Lot West Runoff Area=70,993 sf 73.96% Impervious Runoff Depth=2.95"
Flow Length=430' Tc=5.0 min CN=83 Runoff=5.82 cfs 0.400 af

Pond P1: Pond 1 Peak Elev=50.04' Storage=4,619 cf Inflow=3.55 cfs 0.244 af
Discarded=0.16 cfs 0.169 af Primary=0.23 cfs 0.075 af Outflow=0.39 cfs 0.244 af

Pond P2: Pond 2 Peak Elev=48.12' Storage=8,140 cf Inflow=5.41 cfs 0.379 af
Discarded=0.17 cfs 0.195 af Primary=0.76 cfs 0.132 af Outflow=0.92 cfs 0.327 af

Pond P3: Pond 3 Peak Elev=39.55' Storage=5,430 cf Inflow=3.05 cfs 0.216 af
Outflow=0.48 cfs 0.116 af

Pond SW: Swale Peak Elev=50.46' Storage=631 cf Inflow=5.82 cfs 0.400 af
Discarded=0.06 cfs 0.022 af Primary=5.41 cfs 0.379 af Outflow=5.47 cfs 0.400 af

Link DP1: Wetland 1 Inflow=17.31 cfs 1.567 af
Primary=17.31 cfs 1.567 af

Total Runoff Area = 8.532 ac Runoff Volume = 2.105 af Average Runoff Depth = 2.96"
53.64% Pervious = 4.577 ac 46.36% Impervious = 3.956 ac

Summary for Subcatchment 1PR: Parking Lot East

Runoff = 3.55 cfs @ 12.07 hrs, Volume= 0.244 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
31,576	98	Paved parking, HSG A
11,096	39	>75% Grass cover, Good, HSG A
646	80	>75% Grass cover, Good, HSG D
43,318	83	Weighted Average
11,742		27.11% Pervious Area
31,576		72.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0182	1.19		**Sheet Flow, grass** Smooth surfaces n= 0.011 P2= 3.40"
0.7	155	0.0316	3.61		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	55	0.0087	1.89		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.1	25	0.0311	8.00	6.28	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
3.0					**Direct Entry, <5 min adjustment**
5.0	285	Total			

Summary for Subcatchment 2PR: West Drainage Area (near cell tower)

Runoff = 3.59 cfs @ 12.11 hrs, Volume= 0.273 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
804	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Roofs, HSG C
9,557	39	>75% Grass cover, Good, HSG A
48,441	74	>75% Grass cover, Good, HSG C
9,442	80	>75% Grass cover, Good, HSG D
73,919	71	Weighted Average
73,293		99.15% Pervious Area
626		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 13.94 cfs @ 12.07 hrs, Volume= 0.971 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
566	85	Gravel roads, HSG B
13,112	89	Gravel roads, HSG C
21,911	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,682	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
8,625	39	>75% Grass cover, Good, HSG A
6,360	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
14,288	80	>75% Grass cover, Good, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
152,330	87	Weighted Average
84,464		55.45% Pervious Area
67,866		44.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, storage lot**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4PR: Entry Road

Runoff = 3.05 cfs @ 12.07 hrs, Volume= 0.216 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (ac)	CN	Description
0.225	98	Paved parking, HSG A
0.019	98	Paved parking, HSG B
0.209	98	Paved parking, HSG D
0.019	39	>75% Grass cover, Good, HSG A
0.242	80	>75% Grass cover, Good, HSG D
0.714	90	Weighted Average
0.261		36.55% Pervious Area
0.453		63.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0320	1.49		**Sheet Flow, Lot (sheet)** Smooth surfaces n= 0.011 P2= 3.40"
0.4	85	0.0320	3.63		**Shallow Concentrated Flow, Lot (SCF)** Paved Kv= 20.3 fps
0.3	50	0.0140	2.40		**Shallow Concentrated Flow, along curb** Paved Kv= 20.3 fps
0.2	60	0.0500	4.54		**Shallow Concentrated Flow, Driveway 5%** Paved Kv= 20.3 fps
0.0	10	0.3300	4.02		**Shallow Concentrated Flow, swale slope** Short Grass Pasture Kv= 7.0 fps
1.3	240	0.0450	3.18		**Shallow Concentrated Flow, swale** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0250	2.37		**Shallow Concentrated Flow, end of swale** Grassed Waterway Kv= 15.0 fps
2.1					**Direct Entry, <5 min adjustment**
5.0	515	Total			

Summary for Subcatchment 5PR: Parking Lot West

Runoff = 5.82 cfs @ 12.07 hrs, Volume= 0.400 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr storm Rainfall=4.75"

Area (sf)	CN	Description
48,651	98	Paved parking, HSG A
3,305	98	Roofs, HSG C
552	98	Roofs, HSG D
18,305	39	>75% Grass cover, Good, HSG A
180	74	>75% Grass cover, Good, HSG C
70,993	83	Weighted Average
18,485		26.04% Pervious Area
52,508		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0080	0.86		**Sheet Flow, Impervious** Smooth surfaces n= 0.011 P2= 3.40"
0.9	180	0.0300	3.52		**Shallow Concentrated Flow, impervious parking lot** Paved Kv= 20.3 fps
0.1	20	0.3300	4.02		**Shallow Concentrated Flow, 3:1 ditch slope** Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0250	2.37		**Shallow Concentrated Flow, ditch** Grassed Waterway Kv= 15.0 fps
0.4	100	0.0100	4.54	3.56	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.0					**Direct Entry, <5 min adjustment**
5.0	430	Total			

Summary for Pond P1: Pond 1

Inflow Area = 0.994 ac, 72.89% Impervious, Inflow Depth = 2.95" for 10 yr storm event
Inflow = 3.55 cfs @ 12.07 hrs, Volume= 0.244 af
Outflow = 0.39 cfs @ 12.81 hrs, Volume= 0.244 af, Atten= 89%, Lag= 44.4 min
Discarded = 0.16 cfs @ 12.81 hrs, Volume= 0.169 af
Primary = 0.23 cfs @ 12.81 hrs, Volume= 0.075 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.04' @ 12.81 hrs Surf.Area= 2,898 sf Storage= 4,619 cf

Plug-Flow detention time= 172.7 min calculated for 0.244 af (100% of inflow)
Center-of-Mass det. time= 172.7 min (987.3 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	48.00'	7,713 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
48.00	1,670	180.0	0	0	1,670
49.00	2,240	199.0	1,948	1,948	2,274
50.00	2,870	219.0	2,549	4,497	2,971
51.00	3,575	241.0	3,216	7,713	3,808

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**15.0" Round RCP_Round 15"** L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 47.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	49.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	50.25'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	50.75'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

#5	Discarded	48.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.16 cfs @ 12.81 hrs HW=50.04' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.23 cfs @ 12.81 hrs HW=50.04' (Free Discharge)
└**1=RCP_Round 15"** (Passes 0.23 cfs of 6.74 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.23 cfs @ 4.61 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond P2: Pond 2

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 2.79" for 10 yr storm event
Inflow = 5.41 cfs @ 12.10 hrs, Volume= 0.379 af
Outflow = 0.92 cfs @ 12.58 hrs, Volume= 0.327 af, Atten= 83%, Lag= 28.7 min
Discarded = 0.17 cfs @ 12.58 hrs, Volume= 0.195 af
Primary = 0.76 cfs @ 12.58 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 48.12' @ 12.58 hrs Surf.Area= 3,009 sf Storage= 8,140 cf

Plug-Flow detention time= 283.5 min calculated for 0.327 af (86% of inflow)
Center-of-Mass det. time= 225.2 min (1,037.0 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	11,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	510	93.0	0	0	510
44.00	840	118.0	668	668	943
45.00	1,245	141.0	1,036	1,704	1,434
46.00	1,725	164.0	1,478	3,183	2,013
47.00	2,280	188.0	1,996	5,179	2,708
48.00	2,925	212.0	2,596	7,774	3,498
49.00	3,645	237.0	3,278	11,053	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	43.00'	**12.0" Round RCP_Round 12"** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 43.00' / 42.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	47.00'	**2.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	48.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	48.50'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

#5 Discarded 43.00' **2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.17 cfs @ 12.58 hrs HW=48.12' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.75 cfs @ 12.58 hrs HW=48.12' (Free Discharge)
└**1=RCP_Round 12"** (Passes 0.75 cfs of 7.76 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.61 cfs @ 3.68 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.14 cfs @ 1.13 fps)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P3: Pond 3

Inflow Area = 0.714 ac, 63.45% Impervious, Inflow Depth = 3.64" for 10 yr storm event
Inflow = 3.05 cfs @ 12.07 hrs, Volume= 0.216 af
Outflow = 0.48 cfs @ 12.54 hrs, Volume= 0.116 af, Atten= 84%, Lag= 28.1 min
Primary = 0.48 cfs @ 12.54 hrs, Volume= 0.116 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 39.55' @ 12.54 hrs Surf.Area= 3,707 sf Storage= 5,430 cf

Plug-Flow detention time= 262.0 min calculated for 0.116 af (53% of inflow)
Center-of-Mass det. time= 152.7 min (944.3 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	7,234 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
37.50	1,708	226.0	0	0	1,708
38.00	2,140	280.0	960	960	3,886
39.00	3,114	312.0	2,612	3,572	5,422
40.00	4,240	366.0	3,663	7,234	8,355

Device	Routing	Invert	Outlet Devices
#1	Primary	38.00'	**12.0" Round RCP_Round 12"** L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 38.00' / 37.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	39.25'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	39.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.48 cfs @ 12.54 hrs HW=39.55' (Free Discharge)
└─**1=RCP_Round 12"** (Passes 0.48 cfs of 3.87 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.48 cfs @ 1.94 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SW: Swale

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 2.95" for 10 yr storm event
Inflow = 5.82 cfs @ 12.07 hrs, Volume= 0.400 af
Outflow = 5.47 cfs @ 12.10 hrs, Volume= 0.400 af, Atten= 6%, Lag= 1.7 min
Discarded = 0.06 cfs @ 12.10 hrs, Volume= 0.022 af
Primary = 5.41 cfs @ 12.10 hrs, Volume= 0.379 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.46' @ 12.10 hrs Surf.Area= 986 sf Storage= 631 cf

Plug-Flow detention time= 4.3 min calculated for 0.400 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (818.9 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	1,290 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	16	22.0	0	0	16
50.00	653	203.0	257	257	3,259
51.00	1,466	293.0	1,032	1,290	6,820

Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.40' / 48.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	49.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.10 hrs HW=50.46' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=5.41 cfs @ 12.10 hrs HW=50.46' (Free Discharge)
└─**1=Culvert** (Barrel Controls 5.41 cfs @ 4.66 fps)

Summary for Link DP1: Wetland 1

Inflow Area = 8.532 ac, 46.36% Impervious, Inflow Depth = 2.20" for 10 yr storm event
Inflow = 17.31 cfs @ 12.08 hrs, Volume= 1.567 af
Primary = 17.31 cfs @ 12.08 hrs, Volume= 1.567 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

100-Year Storm Event – Proposed

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1PR: Parking Lot East Runoff Area=43,318 sf 72.89% Impervious Runoff Depth=5.03"
Flow Length=285' Tc=5.0 min CN=83 Runoff=5.96 cfs 0.417 af

Subcatchment2PR: West Drainage Area Runoff Area=73,919 sf 0.85% Impervious Runoff Depth=3.72"
Flow Length=720' Tc=7.4 min CN=71 Runoff=7.06 cfs 0.527 af

Subcatchment3EX: Self Storage Runoff Area=152,330 sf 44.55% Impervious Runoff Depth=5.48"
Flow Length=715' Tc=5.0 min CN=87 Runoff=22.40 cfs 1.597 af

Subcatchment4PR: Entry Road Runoff Area=0.714 ac 63.45% Impervious Runoff Depth=5.82"
Flow Length=515' Tc=5.0 min CN=90 Runoff=4.76 cfs 0.346 af

Subcatchment5PR: Parking Lot West Runoff Area=70,993 sf 73.96% Impervious Runoff Depth=5.03"
Flow Length=430' Tc=5.0 min CN=83 Runoff=9.76 cfs 0.683 af

Pond P1: Pond 1 Peak Elev=50.80' Storage=7,007 cf Inflow=5.96 cfs 0.417 af
Discarded=0.19 cfs 0.212 af Primary=1.70 cfs 0.205 af Outflow=1.89 cfs 0.417 af

Pond P2: Pond 2 Peak Elev=48.84' Storage=10,485 cf Inflow=8.98 cfs 0.656 af
Discarded=0.20 cfs 0.219 af Primary=5.26 cfs 0.373 af Outflow=5.46 cfs 0.593 af

Pond P3: Pond 3 Peak Elev=39.88' Storage=6,714 cf Inflow=4.76 cfs 0.346 af
Outflow=2.61 cfs 0.246 af

Pond SW: Swale Peak Elev=50.85' Storage=1,075 cf Inflow=9.76 cfs 0.683 af
Discarded=0.07 cfs 0.027 af Primary=8.98 cfs 0.656 af Outflow=9.05 cfs 0.683 af

Link DP1: Wetland 1 Inflow=31.84 cfs 2.947 af
Primary=31.84 cfs 2.947 af

Total Runoff Area = 8.532 ac Runoff Volume = 3.569 af Average Runoff Depth = 5.02"
53.64% Pervious = 4.577 ac 46.36% Impervious = 3.956 ac

Summary for Subcatchment 1PR: Parking Lot East

Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.417 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
31,576	98	Paved parking, HSG A
11,096	39	>75% Grass cover, Good, HSG A
646	80	>75% Grass cover, Good, HSG D
43,318	83	Weighted Average
11,742		27.11% Pervious Area
31,576		72.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0182	1.19		**Sheet Flow, grass** Smooth surfaces n= 0.011 P2= 3.40"
0.7	155	0.0316	3.61		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	55	0.0087	1.89		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.1	25	0.0311	8.00	6.28	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
3.0					**Direct Entry, <5 min adjustment**
5.0	285	Total			

Summary for Subcatchment 2PR: West Drainage Area (near cell tower)

Runoff = 7.06 cfs @ 12.11 hrs, Volume= 0.527 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
804	76	Gravel roads, HSG A
5,049	89	Gravel roads, HSG C
626	98	Roofs, HSG C
9,557	39	>75% Grass cover, Good, HSG A
48,441	74	>75% Grass cover, Good, HSG C
9,442	80	>75% Grass cover, Good, HSG D
73,919	71	Weighted Average
73,293		99.15% Pervious Area
626		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0480	0.22		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
2.0	180	0.0470	1.52		**Shallow Concentrated Flow, Grass 4.7%** Short Grass Pasture Kv= 7.0 fps
0.1	10	0.0400	3.22		**Shallow Concentrated Flow, Gravel Drive** Unpaved Kv= 16.1 fps
0.5	30	0.0170	0.91		**Shallow Concentrated Flow, Grass 1.7%** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0080	1.82		**Shallow Concentrated Flow, Paved 0.8%** Paved Kv= 20.3 fps
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
7.4	720	Total			

Summary for Subcatchment 3EX: Self Storage Drainage Area

Runoff = 22.40 cfs @ 12.07 hrs, Volume= 1.597 af, Depth= 5.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
16,640	76	Gravel roads, HSG A
566	85	Gravel roads, HSG B
13,112	89	Gravel roads, HSG C
21,911	91	Gravel roads, HSG D
1,002	98	Paved parking, HSG A
15,682	98	Paved parking, HSG B
26,397	98	Paved parking, HSG C
8,625	39	>75% Grass cover, Good, HSG A
6,360	61	>75% Grass cover, Good, HSG B
2,962	74	>75% Grass cover, Good, HSG C
14,288	80	>75% Grass cover, Good, HSG D
4,835	98	Roofs, HSG B
19,950	98	Roofs, HSG C
152,330	87	Weighted Average
84,464		55.45% Pervious Area
67,866		44.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.94		**Sheet Flow, storage lot**
					Smooth surfaces n= 0.011 P2= 3.40"
0.6	115	0.0050	3.21	2.52	**Pipe Channel, RCP_Round 12"**
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, bends & connections
0.4	125	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.5	320	0.0200	10.18	31.99	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
0.3	105	0.0050	5.09	16.00	**Pipe Channel, RCP_Round 24"**
					24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50'
					n= 0.013 Concrete pipe, bends & connections
2.3					**Direct Entry, <5 min adjustment**
5.0	715	Total			

Summary for Subcatchment 4PR: Entry Road

Runoff = 4.76 cfs @ 12.07 hrs, Volume= 0.346 af, Depth= 5.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (ac)	CN	Description
0.225	98	Paved parking, HSG A
0.019	98	Paved parking, HSG B
0.209	98	Paved parking, HSG D
0.019	39	>75% Grass cover, Good, HSG A
0.242	80	>75% Grass cover, Good, HSG D
0.714	90	Weighted Average
0.261		36.55% Pervious Area
0.453		63.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0320	1.49		**Sheet Flow, Lot (sheet)** Smooth surfaces n= 0.011 P2= 3.40"
0.4	85	0.0320	3.63		**Shallow Concentrated Flow, Lot (SCF)** Paved Kv= 20.3 fps
0.3	50	0.0140	2.40		**Shallow Concentrated Flow, along curb** Paved Kv= 20.3 fps
0.2	60	0.0500	4.54		**Shallow Concentrated Flow, Driveway 5%** Paved Kv= 20.3 fps
0.0	10	0.3300	4.02		**Shallow Concentrated Flow, swale slope** Short Grass Pasture Kv= 7.0 fps
1.3	240	0.0450	3.18		**Shallow Concentrated Flow, swale** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0250	2.37		**Shallow Concentrated Flow, end of swale** Grassed Waterway Kv= 15.0 fps
2.1					**Direct Entry, <5 min adjustment**
5.0	515	Total			

Summary for Subcatchment 5PR: Parking Lot West

Runoff = 9.76 cfs @ 12.07 hrs, Volume= 0.683 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

Area (sf)	CN	Description
48,651	98	Paved parking, HSG A
3,305	98	Roofs, HSG C
552	98	Roofs, HSG D
18,305	39	>75% Grass cover, Good, HSG A
180	74	>75% Grass cover, Good, HSG C
70,993	83	Weighted Average
18,485		26.04% Pervious Area
52,508		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0080	0.86		**Sheet Flow, Impervious** Smooth surfaces n= 0.011 P2= 3.40"
0.9	180	0.0300	3.52		**Shallow Concentrated Flow, impervious parking lot** Paved Kv= 20.3 fps
0.1	20	0.3300	4.02		**Shallow Concentrated Flow, 3:1 ditch slope** Short Grass Pasture Kv= 7.0 fps
0.6	80	0.0250	2.37		**Shallow Concentrated Flow, ditch** Grassed Waterway Kv= 15.0 fps
0.4	100	0.0100	4.54	3.56	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.0					**Direct Entry, <5 min adjustment**
5.0	430	Total			

Summary for Pond P1: Pond 1

Inflow Area = 0.994 ac, 72.89% Impervious, Inflow Depth = 5.03" for 100 yr storm event
Inflow = 5.96 cfs @ 12.07 hrs, Volume= 0.417 af
Outflow = 1.89 cfs @ 12.37 hrs, Volume= 0.417 af, Atten= 68%, Lag= 17.8 min
Discarded = 0.19 cfs @ 12.37 hrs, Volume= 0.212 af
Primary = 1.70 cfs @ 12.37 hrs, Volume= 0.205 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.80' @ 12.37 hrs Surf.Area= 3,427 sf Storage= 7,007 cf

Plug-Flow detention time= 151.0 min calculated for 0.417 af (100% of inflow)
Center-of-Mass det. time= 151.0 min (950.5 - 799.5)

Volume	Invert	Avail.Storage	Storage Description
#1	48.00'	7,713 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
48.00	1,670	180.0	0	0	1,670
49.00	2,240	199.0	1,948	1,948	2,274
50.00	2,870	219.0	2,549	4,497	2,971
51.00	3,575	241.0	3,216	7,713	3,808

Device	Routing	Invert	Outlet Devices
#1	Primary	48.00'	**15.0" Round RCP_Round 15"** L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 48.00' / 47.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	49.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	50.25'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	50.75'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

#5 Discarded 48.00' **2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 12.37 hrs HW=50.80' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=1.70 cfs @ 12.37 hrs HW=50.80' (Free Discharge)
├**1=RCP_Round 15"** (Passes 1.58 cfs of 8.03 cfs potential flow)
│ ├**2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 6.23 fps)
│ └**3=Orifice/Grate** (Orifice Controls 1.27 cfs @ 2.54 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.13 cfs @ 0.52 fps)

Summary for Pond P2: Pond 2

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 4.83" for 100 yr storm event
Inflow = 8.98 cfs @ 12.10 hrs, Volume= 0.656 af
Outflow = 5.46 cfs @ 12.22 hrs, Volume= 0.593 af, Atten= 39%, Lag= 6.9 min
Discarded = 0.20 cfs @ 12.22 hrs, Volume= 0.219 af
Primary = 5.26 cfs @ 12.22 hrs, Volume= 0.373 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 48.84' @ 12.22 hrs Surf.Area= 3,526 sf Storage= 10,485 cf

Plug-Flow detention time= 185.1 min calculated for 0.592 af (90% of inflow)
Center-of-Mass det. time= 138.9 min (938.0 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	11,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	510	93.0	0	0	510
44.00	840	118.0	668	668	943
45.00	1,245	141.0	1,036	1,704	1,434
46.00	1,725	164.0	1,478	3,183	2,013
47.00	2,280	188.0	1,996	5,179	2,708
48.00	2,925	212.0	2,596	7,774	3,498
49.00	3,645	237.0	3,278	11,053	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	43.00'	**12.0" Round RCP_Round 12"** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 43.00' / 42.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	47.00'	**2.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	48.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	48.50'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

#5	Discarded	43.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.20 cfs @ 12.22 hrs HW=48.84' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=5.25 cfs @ 12.22 hrs HW=48.84' (Free Discharge)
└**1=RCP_Round 12"** (Passes 2.76 cfs of 8.28 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 5.54 fps)
  └**3=Orifice/Grate** (Orifice Controls 1.84 cfs @ 3.67 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 2.49 cfs @ 1.46 fps)

Summary for Pond P3: Pond 3

Inflow Area = 0.714 ac, 63.45% Impervious, Inflow Depth = 5.82" for 100 yr storm event
Inflow = 4.76 cfs @ 12.07 hrs, Volume= 0.346 af
Outflow = 2.61 cfs @ 12.18 hrs, Volume= 0.246 af, Atten= 45%, Lag= 6.6 min
Primary = 2.61 cfs @ 12.18 hrs, Volume= 0.246 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 39.88' @ 12.18 hrs Surf.Area= 4,090 sf Storage= 6,714 cf

Plug-Flow detention time= 191.5 min calculated for 0.246 af (71% of inflow)
Center-of-Mass det. time= 101.1 min (880.0 - 779.0)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	7,234 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
37.50	1,708	226.0	0	0	1,708
38.00	2,140	280.0	960	960	3,886
39.00	3,114	312.0	2,612	3,572	5,422
40.00	4,240	366.0	3,663	7,234	8,355

Device	Routing	Invert	Outlet Devices
#1	Primary	38.00'	**12.0" Round RCP_Round 12"** L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 38.00' / 37.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	39.25'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	39.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.61 cfs @ 12.18 hrs HW=39.87' (Free Discharge)
└**1=RCP_Round 12"** (Passes 0.85 cfs of 4.43 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.85 cfs @ 3.40 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 1.76 cfs @ 1.28 fps)

Summary for Pond SW: Swale

Inflow Area = 1.630 ac, 73.96% Impervious, Inflow Depth = 5.03" for 100 yr storm event
Inflow = 9.76 cfs @ 12.07 hrs, Volume= 0.683 af
Outflow = 9.05 cfs @ 12.10 hrs, Volume= 0.683 af, Atten= 7%, Lag= 1.8 min
Discarded = 0.07 cfs @ 12.10 hrs, Volume= 0.027 af
Primary = 8.98 cfs @ 12.10 hrs, Volume= 0.656 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.85' @ 12.10 hrs Surf.Area= 1,320 sf Storage= 1,075 cf

Plug-Flow detention time= 3.4 min calculated for 0.683 af (100% of inflow)
Center-of-Mass det. time= 3.5 min (803.0 - 799.5)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	1,290 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
49.00	16	22.0	0	0	16
50.00	653	203.0	257	257	3,259
51.00	1,466	293.0	1,032	1,290	6,820

Device	Routing	Invert	Outlet Devices
#1	Primary	49.40'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 49.40' / 48.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	49.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 12.10 hrs HW=50.84' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=8.97 cfs @ 12.10 hrs HW=50.84' (Free Discharge)
└**1=Culvert** (Barrel Controls 8.97 cfs @ 5.16 fps)

Summary for Link DP1: Wetland 1

Inflow Area = 8.532 ac, 46.36% Impervious, Inflow Depth = 4.14" for 100 yr storm event
Inflow = 31.84 cfs @ 12.09 hrs, Volume= 2.947 af
Primary = 31.84 cfs @ 12.09 hrs, Volume= 2.947 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis

71° 5' 48"
71° 5' 28"
41° 46' 27"
41° 46' 17"
325750
325800
325850
325900
325950
326000
326050
326100
326150
4626800
4626750
4626700
4626650
4626600
4626550
Main St
260B
254B
39A
260A
254B
71B
73A
Map Scale: 1:2,200 if printed on A size (8.5" x 11") sheet.
N
Meters
0 30 60 120 180
Feet
0 100 200 400 600

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:2,200 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 6, Jul 23, 2010

Date(s) aerial images were photographed: 8/14/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Southern Part (MA603)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
39A	Scarboro muck, 0 to 1 percent slopes	D	2.4	19.9%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	C	3.2	26.4%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	0.3	2.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	5.3	43.1%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	B	0.0	0.1%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	B	1.0	7.9%
Totals for Area of Interest			**12.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Freetown Station
Project Location: Freetown, MA

Proj. No.: 10111.00
Date: 30-Apr-12
Calculated by: PAC
Checked by:

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
2	0.0	0.0	0.0	0.0	0.0
3	0.7	0.0	0.0	0.0	0.7
4	0.2	0.0	0.0	0.2	0.5
5	1.1	0.0	0.1	0.0	1.2
3EX	0.0	0.0	0.0	0.0	0.0
TOTAL	**2.1**	**0.0**	**0.1**	**0.2**	**2.4**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	2.1	0.60	4,502
B	0.0	0.35	24
C	0.1	0.25	69
D	0.2	0.10	81
TOTAL			**4,676**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Basin P1	1,955
Basin P2	5,205
Basin P3	4,403
Total	**11,563** c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: Freetown Station | **Proj. No.:** 10111.00

Date: 5/18/2012

Project Location: Freetown, MA | **Calculated by:** EJM

Infiltration Basin - 1

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
48.00	1,670	0
49.00	2,240	1,955
TOTAL		**1,955**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**5.8 hours**

Infiltration Basin - 2

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
43.00	510	0
44.00	840	675
45.00	1,245	1,718
46.00	1,725	3,203
47.00	2,280	5,205
TOTAL		**5,205**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**50.8 hours**

Infiltration Basin - 3

Infiltration volumes provided in basin below lowest outlet.

Basin Volume Below Outlet

Elevation	Area (s.f.)	Incremental Volume (c.f.)
37.50	1,708	0
38.00	2,140	962
39.00	3,114	3,589
39.25	3,396	4,403
TOTAL		**4,403**

Assumptions:

Recharge Rate: 2.41 in/hr

Drawdown Time:	**12.8 hours**

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Freetown Station **Proj. No.:** 10111.00
Project Location: Freetown, MA **Date:** 4/30/2012
Calculated by: PAC

Infiltration Basin P1
(runoff from Area 3PR)

Total Impervious Area = 0.72 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	263
Water Quality Volume	0.5	1,316

Provided:

Bioretention Basin P1	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	48.00	1,670	0
	49.00	2,240	1,955

Infiltration Basin P2
(runoff from Area 5PR)

Total Impervious Area = 1.21 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	438
Water Quality Volume	0.5	2,188

Provided:

Bioretention Basin P2	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	43.00	510	0
	44.00	840	675
	45.00	1,245	1,718
	46.00	1,725	3,203
	47.00	2,280	5,205

Infiltration Basin P3
(runoff from Area 4PR)

Total Impervious Area = 0.45 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	164
Water Quality Volume	0.5	822

Provided:

Bioretention Basin P3	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
	37.50	1,708	0
	38.00	2,140	962
	39.00	3,114	3,589
	39.25	3,396	4,403

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Freetown Station**	Sheet:	**1 of 2**
Project Number:	**10111.00**	Date:	**28-Apr-2012**
Location:	**Freetown, MA**	Computed by:	**PAC**
Discharge Point:	**DP1 (Wetland 1)**	Checked by:	
Drainage Area(s):	**PR-3, PR-4, PR-5**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Grass Channel	**50%**	**1.00**	**0.50**	**0.50**
Infiltration Basin	**80%**	**0.50**	**0.40**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**
	0%	**0.10**	**0.00**	**0.10**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **90%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Freetown Station**	Sheet:	**2 of 2**
Project Number:	**10111.00**	Date:	**28-Apr-2012**
Location:	**Freetown, MA**	Computed by:	**PAC**
Discharge Point:	**-**	Checked by:	
Drainage Area(s):	**-**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**1.00**	**0.25**	**0.75**
Infiltration Basin	**80%**	**0.75**	**0.60**	**0.15**
	0%	**0.15**	**0.00**	**0.15**
	0%	**0.15**	**0.00**	**0.15**
	0%	**0.15**	**0.00**	**0.15**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **85%**

Appendix E
Geotechnical Report

JACOBS™
343 Congress Street
Boston, MA 02210

Design Memorandum

Date	January 31, 2012
To	Rick Carey, Natasha Velickovic - VHB
From	Paul Murphy, Da Ha, Peter Chou - Jacobs
Subject	MBTA South Coast Rail (New Bedford/Fall River Commuter Rail Extension) Freetown Station Geotechnical Design Memorandum Freetown, MA
Project No.	E2347101

INTRODUCTION

The South Coast Rail project will restore passenger rail transportation from South Station in Boston to the cities of Fall River and New Bedford along an existing rail freight corridor running south from Taunton to Fall River and New Bedford. The project will include the construction of several existing and new passenger stations and two terminal layover facilities. This geotechnical design memorandum presents the foundation design considerations for the new station platform at the proposed Freetown Station in Freetown, Massachusetts. The design recommendations presented in this report are based on the results of subsurface investigations performed by Jacobs in 2001 and 2010.

Existing Conditions

The proposed Freetown Station site is located off the south side of South Main Street in Freetown (Figure 1). The site is currently an undeveloped gravel lot with associated soil stockpiles on the site and some wetland areas are also present adjacent to the platform area. A self-storage facility with associated parking is located along the north side of the site, a telecommunication tower is located west of the site, and the remaining site area is surrounded by open and forested land. Existing grades at the platform location range from approximately elevation 61 to 67.6 feet (NGVD29 Datum), generally sloping downward from west to east.

Proposed Construction

Current station plans are to construct a new parking area, a new drop-off area, and an 800 foot long, 12 foot wide high level platform adjacent to the existing tracks. In addition, some track relocation is required. Access to the platform will be from a new ramp/stair structure along the north side of the tracks. Two 50-ft long platform canopies are also planned. The details of new track layout (including grading), associated sidewalks and ramps, and parking lot of the proposed station are still under development at the time of this report preparation. However, we anticipate that about 6 to 8 feet of fill is proposed at the site to raise the grade at the track level and platform area. This report focuses on the geotechnical design and recommendation for the platform only.

SCOPE OF WORK

This memorandum was prepared by Jacobs in accordance with the scope of work under the contract between Jacobs and VHB for work on the New Bedford/Fall River Commuter Rail Line Extension Project for Massachusetts Bay Transportation Authority (MBTA). The geotechnical work included the following tasks:

- Perform a geotechnical exploration and laboratory testing program;
- Report and interpret the results of the exploration and laboratory testing program; and
- Provide geotechnical recommendations for design and construction of the platform foundations.

The Jacobs scope of work did not include environmental assessment of the potential presence of any hazardous materials at the project site or potential impacts to adjacent structures during construction.

LOCAL GEOLOGY

The geologic map of Massachusetts shows the Freetown Station to be located in the Milford-Dedham zone, just south of the Narragansett Basin. The bedrock in the Milford-Dedham zone is mostly granite of Proterozoic age. The bedrock in the Narragansett Basin is lightly metamorphosed shale and sandstone of Pennsylvanian and Permian age. Bedrock was not sampled at the Freetown site. Two of the borings encountered SPT refusal at a depth of 47 and 48 feet, but the refusal could possibly be a large boulder or true bedrock. The deepest boring at the site extended to a depth of 49 feet. The bedrock is typically overlain by hard till or very dense sand and gravel.

GEOTECHNICAL EXPLORATIONS

Jacobs planned the subsurface exploration programs and retained the drilling contractors to perform the explorations. The geotechnical data reports were submitted in 2001 and 2010, respectively. Nine borings (FTS-1, FTS-4, FTS-5 to FTS-8, FR-79 MW, FR-80 and FR-81) were conducted along the proposed station platform and nine borings (FTS-09 to FTS-17) were drilled in the general vicinity of the proposed parking lot and the access road. Boring locations are shown on the Subsurface Exploration Plan (Figure 2).

The recent 2010 borings were drilled by New Hampshire Boring with either a CME-550 or D-50 ATV mounted drill rig. The 2001 borings were drilled by Earth Explorations, Inc. and NFE, Inc. with a B-57 ATV mounted drill rig. The 2010 borings were advanced through the soil by hollow-stem auger or wash boring methods using a 4-inch casing and roller bit with water. Standard penetration tests (SPT), consisting of 140-pound hammer dropping 30 inches on a standard 2-inch-diameter (OD) split-spoon sampler, were performed with a safety hammer to establish the consistency of the subsurface soils. The SPT's were typically performed at five foot intervals of depth. The obtained samples were sealed in glass jars to retain their natural moisture. Bedrock was not cored during the explorations. (Borings performed in 2001 were summarized in our previous data reports.)

The borings were observed by a representative from Jacobs. The soil samples were classified in the field in accordance with ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) by Jacobs' representative, and appropriate stratum breaks were interpolated from drilling and sampling observations. The boring logs were prepared by Jacobs based on the field classifications and laboratory testing, and are presented in Appendix A.

LABORATORY TESTING

The results of the laboratory testing were previously submitted to VHB in reports entitled "South Coast Rail, Jacobs Geotechnical Data Report", dated November 2010, and "Fall River Line, Jacobs Geotechnical Data Report", dated October 2001.

Grain size distribution analyses were performed to evaluate the gradation of the natural granular soils for potential reuse as backfill, if needed, and to classify the soils. The graduation analyses are summarized in Table 1 below and are presented in Appendix B.

Table 1: Laboratory Soil Classification Summary

BORING NO.	SAMPLE NO.	ELEVATION (FEET)	USCS SOIL CLASSIFICATION	W (%)	GRAVEL (%)	SAND (%)	FINES (%)	ORGANIC CONTENT (%)
FTS-04	S2	63.6	moist, black Silt (ML)	42.4	NT	NT	NT	4.7
FTS-11	S1	55.0	Sandy Silt (ML)	24	0	48.1	51.9	NT
FTS-13	S2	34.6	Silt (ML)	23.8	0	1.0	99.0	NT

Where: w = natural moisture content, NT = Not Tested

SUBSURFACE CONDITIONS

The subsurface conditions at the site were inferred from the boring data collected for the South Coast Rail project, with some interpretations. The subsurface conditions encountered at the station area during our 2001 and 2010 explorations generally consist of a layer of granular fill with thickness of about 0 to 3 feet, underlain by natural, loose to dense stratified silt and sand deposits, and very dense glacial till. Boulders were encountered at borings FTS-1 and FTS-6 at depths of 31 feet and 24 feet below ground surface, respectively. Apparent bedrock was encountered at a depth of about 48 feet (El. 14.2 feet) in boring FTS-1 and at a depth of about 45 feet (El. 20.6 feet) in boring FTS-4.

Organic silt was encountered at boring FTS-4 along the proposed platform at a depth of 3 to 5 feet (elevations 64.6 to 62.6 feet).

Fill materials with thicknesses varying from 0 to 7 feet were also encountered in the vicinity of the proposed parking lot area. Bedrock was not encountered in this area.

Subsurface soil conditions are summarized in Table 2 below.

Table 2: Summary of Subsurface Conditions at Borings

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Platform Borings							
FTS – 1	62.4	3.0	59.4	14.2	14.2	54.4	Boring offset 18 ft SW along tracks.
FTS – 4	67.6	3.0	64.6	20.6	18.6	62.6	
FTS – 5	61.3	0	61.3	NE	45.3	53.3	Auger Boring
FTS – 6	60.2	0	60.2	NE	33.7	57.2	Auger Boring
FTS – 7	57.4	0	57.4	NE	40.4	52.9	Auger Boring
FTS – 8	58.6	0	58.6	NE	42.6	54.1	Auger Boring
FR-79 MW	61.5	7.0	54.5	NE	41.0	49.0	Well screened from 9.2 to 19.2 ft.
FR-80	64.9	3.0	61.9	NE	44.4	52.8	
FR-81	70.2	3.0	67.2	NE	49.7	59.8	

BORING NUMBER	GROUND SURFACE ELEV. (FT)	APPROX. FILL THICKNESS (FT)	TOP OF NATURAL SOIL ELEV. (FT)	APPROX. TOP OF ROCK ELEV. (FT)	BOTTOM OF BORING ELEV. (FT)	APPROX. GROUND WATER ELEV. (FT)	REMARKS
Site Borings							
FTS – 9 OW	57.6	0	57.6	NE	32.1	52.6	Well screened from 10 to 25 ft.
FTS – 10	56.9	4.0	52.9	NE	39.9	46.9	Auger Boring
FTS – 11	56.0	0	56.0	NE	41.0	54	
FTS – 12	50.2	0	50.2	NE	33.2	42.2	Auger Boring
FTS – 13	38.6	2.0	36.6	NE	23.6	35.6	
FTS – 14	55.6	0	55.6	NE	30.6	49.6	
FTS – 15 OW	46.7	0	46.7	NE	21.7	41.7	Well screened from 10 to 20 ft.
FTS – 16 OW	37.6	0	37.6	NE	12.6	36.6	Well screened from 10 to 20 ft.
FTS – 17	60.7	0	60.7	NE	35.7	50.7	Auger Boring
NE: Not encountered at the boring during drilling.							

Fill: The fill layer, where encountered, typically consists of railroad ballast, and granular, loose to medium dense sand and gravel. Clay fill was encountered at boring FR-81. The fill layer is generally about 0 to 3 feet thick in the area of the platform.

Organic Silt: A two foot thick layer of organic silt was encountered from approximately elevation 64.5 to 62.5 feet at boring FTS-4 at the west side of the platform. Boring FTS-4 is located adjacent to a wetland area. Organic soils may also be located near other wetland areas at the site.

Natural Granular Deposits: In the platform area, the natural soil deposits below the fill generally consist of predominantly silt, sandy silt and silty sand with up to 30% gravel. These deposits are loose to very dense with Standard Penetration Test (SPT) N-values ranging between 6 and 58 blows per foot (bpf).

Glacial Till: Very dense glacial till was encountered in the platform area at elevations ranging from 31.4 to 40.6 feet, and consisted of silt with 10 to 30% sand and 10 to 20% gravel.

Groundwater: Groundwater levels were measured in the test borings using a weighted tape during and at completion of drilling. The data indicated the groundwater level ranged from approximate elevations 49 to 62.6 feet along the platform alignment, and from elevations 35.6 to 54 feet in the general site area. The use of wash boring techniques for some of the borings may have artificially increased the water level readings due to the addition of water to the borings. Trapped/perched water is also commonly seen at a higher elevation within existing fill and silty materials. The longer term water level readings taken at boring FTS–09 OW on July 7, 2010 and September 13, 2011 indicated the groundwater at a depth of about 6 feet (elevation 51.6 feet) and 5 feet (elevation 52.6 feet), respectively. The longer term readings taken at borings FTS–15 OW and FTS–16 OW on July 7, 2010 indicated groundwater at a depth of about 8 feet (elevation 38.7 feet) and 1.4 feet (elevation 36.2 feet), respectively.

Groundwater levels should be expected to fluctuate with rainfall and other seasonal variations. Local and periodic variations of groundwater elevations may also be influenced by local subsurface drainage and leaking water or sewer pipes. More long-term observations would be required to evaluate true groundwater levels and their influence on planned construction. However, based upon these short-term observations and readings from the observation wells, it is anticipated that the groundwater could be within 5 to 12 feet below

existing grade at the platform area and within 1 to 8 feet below existing grade in the parking lot and roadway area.

GEOTECHNICAL RECOMMENDATIONS

Based on our review of available subsurface conditions, the proposed station platforms can be supported on shallow spread footings bearing directly within either competent natural soil or structural fill placed above suitable natural soils. Platform and canopy design loads were not available at the time of this report preparation. However, it is anticipated that the station platform will be lightly (axially) loaded with limited horizontal forces from wind and seismic loads.

The following paragraphs provide project specific geotechnical recommendations for foundation soil preparation, structural fill/backfill placement, and design and construction of spread footings.

Platform Foundations - Spread Footings

Spread footings are recommended for the platform foundations, bearing on compacted structure fill or natural granular deposits. The bottom of footing elevation should be at least 4 feet below final grades for frost protection. Due to proposed site filling, bottom of footing is anticipated to be at elevations 66 to 70 feet. The existing fill and organic silt deposits are not suitable for support of the spread footings and should be removed within the zone of influence of the footings, defined by a line extending one foot horizontally from the bottom edge of footing and then down and away at a 1H:1V slope until natural soils are encountered.

The recommended allowable design bearing capacity for spread footings bearing on at least medium dense structural fill or natural silt, sandy silt or silty sand deposits is 6 ksf, provided that subgrades are prepared as described herein. This provides an adequate factor of safety against bearing failure and limits the total estimated settlement to less than one inch and the differential settlement to less than ½ inch. All footings should be at least 4 feet wide.

The structural fill material, if needed, should be free from organics and other deleterious substances and should conform to the requirements listed in the MBTA Standard Specification Section 02200 - Earthwork for Type B Gravel Borrow. The structural fill should be compacted to 95% of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D1557).

All temporary open cuts required for footing construction should be in accordance with the related OSHA regulations and should have side slopes of no steeper than 1.5H:1V.

Seismic Consideration

The seismic design should comply with the requirements of the most current Massachusetts State Building Code 780 CMR and other relevant project design codes such as AREMA and AASHTO. Modification of the peak acceleration by the soils overlying bedrock depends upon the type of soil at the site. For the subsurface conditions encountered, the station platform site is classified as Seismic Site Class D soil profile in accordance with 780 CMR Chapter 1614.0 Section 9.4 Site Ground Motion. The structure could be designed for the total lateral seismic force using the equations specified in the code, or by the response spectrum method using the design spectra presented in the code. The maximum considered earthquake ground motions shall be as represented by the spectral response acceleration at short periods (Ss) and at 1-sec (S_1) obtained from Table 1604.10 of the Massachusetts State Building Code and adjusted for Site Class effects using the site coefficients of Section 9.4.1.2.4.

For Site Class D Soils at the location of this station:

S_{MS} = 0.368 and S_{M1} = 0.144

S_{DS} = 0.245 and S_{D1} = 0.096

where:

- S_{MS} is the maximum consider earthquake spectral response acceleration for short periods adjusted for site class
- S_{M1} is the maximum consider earthquake spectral response acceleration at 1-sec adjusted for site class
- S_{DS} is the design earthquake spectral response acceleration for short periods adjusted for site class
- S_{D1} is the design earthquake spectral response acceleration at 1-sec adjusted for site class

The building code also requires that the soil be evaluated for the following potential hazards: slope instability, soil liquefaction, or surface rupture due to faulting or lateral spreading. The proposed grading is relatively flat and we are not aware of any pre-existing slope instability in this area. The existing overburden soils do not appear to be subject to surface rupture due to faulting or lateral spreading.

Liquefaction

Based on the observed subsurface conditions, recorded water levels, percentage of fine contents and sample relative densities, the existing soils underlying the site are judged not susceptible to liquefaction.

CONSTRUCTION CONSIDERATIONS

Foundation Installation - Spread Footings

The existing fill and organic silt should be stripped off and removed from within the zone of influence of the platform and walkway areas down to natural granular deposits using a smooth edge excavation bucket, and replaced by compacted granular soils.

Following excavation to the top of the natural granular deposits, the exposed surface should be observed by an on-site representative of the project geotechnical engineer and be proof-compacted with at least 10 passes of a large vibratory drum roller. Any yielding areas should be observed by geotechnical personnel to assess if localized undercutting is necessary. Footing inspections should include hand auger probes by the geotechnical personnel to check for soft/weak zones. The need for undercutting and backfilling with structural fill should be closely evaluated in the field based on encountered conditions.

In areas where seepage is encountered within footing excavations, the need for placing a 3" thick lean concrete mud mat or a layer of ¾-inch crushed stone to protect the bearing surface should be evaluated in the field. Crushed stone thicker than 4 inches shall be wrapped by non-woven filter fabric.

Following observation of the bearing soils by geotechnical personnel, reinforcing steel and concrete can be placed in the excavation. It is recommended that footing reinforcing steel and concrete be placed the same day as the footing excavation is made, where possible, to avoid significant moisture content changes in the bearing soils. No water should be allowed to pond within excavations and drainage should be maintained

away from foundations both during and after construction. The footing excavation should be free of loose debris at the time of footing concrete placement.

Subgrade Preparation

Prior to performing any required grading operations and excavations in the proposed structure footprints, walkway and paved areas, these areas should be stripped of topsoil, vegetation, fill, organic silt, and existing pavement, if present. The topsoil should be placed in a designated area for reuse during final grading. Following site clearing and stripping, the exposed subgrade should be proof compacted with 10 passes of a large vibratory drum roller (minimum 10,000 pound static weight). Any pockets of excessively soft, wet or disturbed soil or unsuitable soils should be removed and replaced with properly compacted fill materials. Where subgrade soils are close to the existing groundwater level or where silty subgrade soils are encountered, proof-compaction using non-vibratory methods may be considered by the geotechnical engineer.

If additional rolling does not correct the unstable condition, the subgrade should be scarified to a depth of at least six inches but not exceeding eighteen inches, aerated, re-compacted, and retested to provide uniform compaction. Following satisfactory compaction of the subgrade, controlled compacted fill material should be placed to bring the site to the required grade.

Fill should not be placed over frozen soil. Soil subgrades should be protected against frost both during and after construction.

Proper drainage of construction areas should be provided to protect the subgrades from the detrimental effects of weather conditions. Excavations should be made with as few passes of the backhoe bucket as possible to reduce disturbance of the subgrade. A backhoe bucket fitted with a smooth blade should be used during the final subgrade preparation, where necessary. The exposed base should be kept free of standing water at all times. The site should be graded to carry any surface runoff away from the work areas. Construction traffic should be controlled to prevent excessive stresses and disturbance to the subgrade.

If pavements are not constructed immediately after grading, the subgrade should be shaped so as to prevent ponding. If there is a substantial lapse in time between grading and paving, or if the subgrade is disturbed, it should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during proof-rolling or initial construction should be removed and replaced with compacted granular fill.

Within the proposed paved areas, and extending a distance of five feet beyond the edge on all sides, excavate existing granular fill soils to a depth of two feet below existing site grades. It may be possible to reuse the existing granular fill, depending on the suitability of the material, as described herein.

Fill Placement and Compaction

Fill materials most likely will be obtained by importing granular fill materials from off-site borrow sources. However, it may be possible to reuse existing site granular fill material provided that it can be properly placed and compacted. The gradation shall be in accordance with MBTA Standard Specification Section 02200-Earthwork for Type B Gravel Borrow.

All structural fill should be free of organics, demolition debris or other deleterious substances. The fill material should have a plasticity index (PI) less than 4 and a liquid limit (LL) less than 10, and contain fragments less than 4 inches in maximum dimension. Each lift should be compacted to the specified density prior to placing any subsequent lift. All materials to be used as structural fill should be tested in the laboratory to determine their project suitability and compaction characteristics.

The fill should be systematically compacted to the following percentages of the maximum dry density:

Table 3: Fill Compaction Requirements

DESCRIPTION	MINIMUM PERCENT COMPACTION (ASTM D-1557)
General Site Fills, Structural Fill (Below Footings and Slabs)	95
Behind Retaining Walls	92
Landscape Area	90

Soils which exhibit a well-defined moisture content–dry density relationship should be compacted to within plus or minus two percentage points of the optimum moisture content as determined by the Modified Proctor test (ASTM D-1557).

Where fill materials are placed against an existing embankment slope, the slope should be benched as the fill is brought up in layers. Benching should be of a sufficient width to permit placing and compaction of fill material upon the existing embankment materials. Typically, benches are between four to eight feet wide. Each bench cut should begin at the intersection of the existing embankment and the vertical side of the previous bench. Trench backfills over pipelines or utility structures should be performed so as not to adversely impact the underlying utilities. In fill areas, the backfill material, compaction method, and degree of compaction requirements should be similar to that for the fill adjacent to the trench.

Construction Dewatering

All excavations should be performed in the dry condition. Discharge of pumped water should be performed in accordance with all federal, state and/or local regulations which may require a discharge permit and possible filtration and chemical testing of the water prior to discharge.

Permanent Slopes

Permanent slopes with loamed and seeded surfaces should not be steeper than 2-1/2 horizontal to 1 vertical (2-1/2H:1V) without slope protection to limit erosion and surficial sloughing of the slope. Additional analyses may be required to assess the stability of slopes steeper than 2-1/2H:1V as the station design is finalized.

Excavation Slopes and Shoring

The slopes of temporary open cuts should be no steeper than 1-1/2H:1V. Open cuts should not be used below the water table because of the likelihood of soil sloughing into the excavation.

The temporary excavation support system, if needed, should be selected by the Contractor and designed by an experienced Professional Engineer registered in the Commonwealth of Massachusetts and retained by the Contractor. Where excavation sides can be sloped back, they should be performed in accordance with the Occupational Safety and Health Administration (OSHA) Construction Industry Standards.

Protection of Existing Facilities

It is recommended that a geotechnical instrumentation and monitoring program be performed during construction of the project to evaluate impacts on adjacent structures. It is recommended that the program be developed to provide data for the following considerations:

- To monitor ground movements and vibration levels during construction.
- To provide early warning of potentially adverse trends by presenting sufficient data to determine the source of unanticipated ground movements, if present.
- If necessary, to plan remedial measures to limit damage to embankments and structures and to provide early warning when alternative means of protection are necessary.
- To document impacts of construction on adjacent facilities.
- To evaluate the performance and structural integrity of the constructed facilities.

We recommend the following instrumentation program to measure:

- Ground surface settlement and lateral movement adjacent to proposed construction.
- Horizontal and vertical movement of any excavation support system, and existing structures.
- Vibrations as a result of construction activities.

Vertical and horizontal survey points should be established on the adjacent structures. The monitoring points should be surveyed prior to the start of construction and monitored during construction to detect movement.

Vibration monitoring shall be conducted within 100 feet of existing structures during construction activities.

We recommend conducting a pre-construction survey of structures and utilities within 100 feet of the site to document existing conditions prior to construction. Documentation should include photographs, video, sketches, and/or written comments.

Specific instrumentation and monitoring requirements shall be based on the proposed construction sequence, duration of construction, and performance criteria. Initial measurements should be established well in advance of construction so that baseline data can be developed. This information will be invaluable for providing early warning of adverse trends and for assessing the need for mitigating measures.

CLOSING

This report and the recommendations contained herein have been prepared for the exclusive use of MBTA and VHB and their representatives for specific application to the design and construction of the proposed Freetown Station in Freetown, Massachusetts.

This report was prepared in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made. The analysis, design and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations available at the time of this report. Subsurface stratification variations between borings are anticipated. The reported groundwater levels only represent the water levels at the time noted on the logs. The nature and extent of variations between these explorations may not become evident until construction. If significant variations then appear, or if there are changes in the nature, design or location of the proposed structure, it may be necessary to reevaluate the recommendations of this report.

ATTACHMENTS

FIGURE 1 – SITE LOCATION PLAN
FIGURE 2 – SUBSURFACE EXPLORATION PLAN
FIGURE 3 – SUBSURFACE SOIL PROFILES

APPENDIX A – EXPLORATION LOGS
APPENDIX B – LABORATORY DATA
APPENDIX C – GEOTECHNICAL CALCULATIONS

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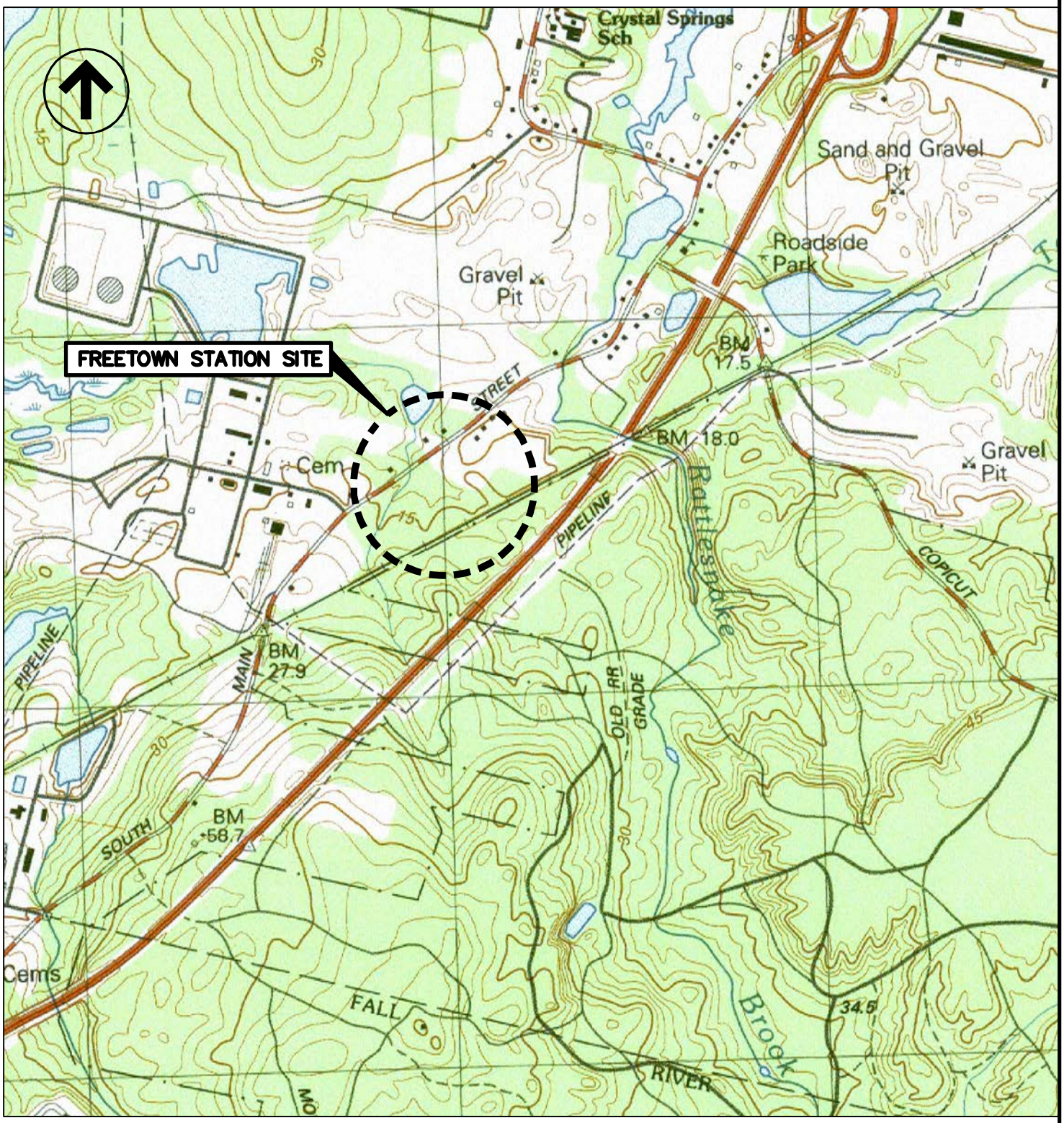
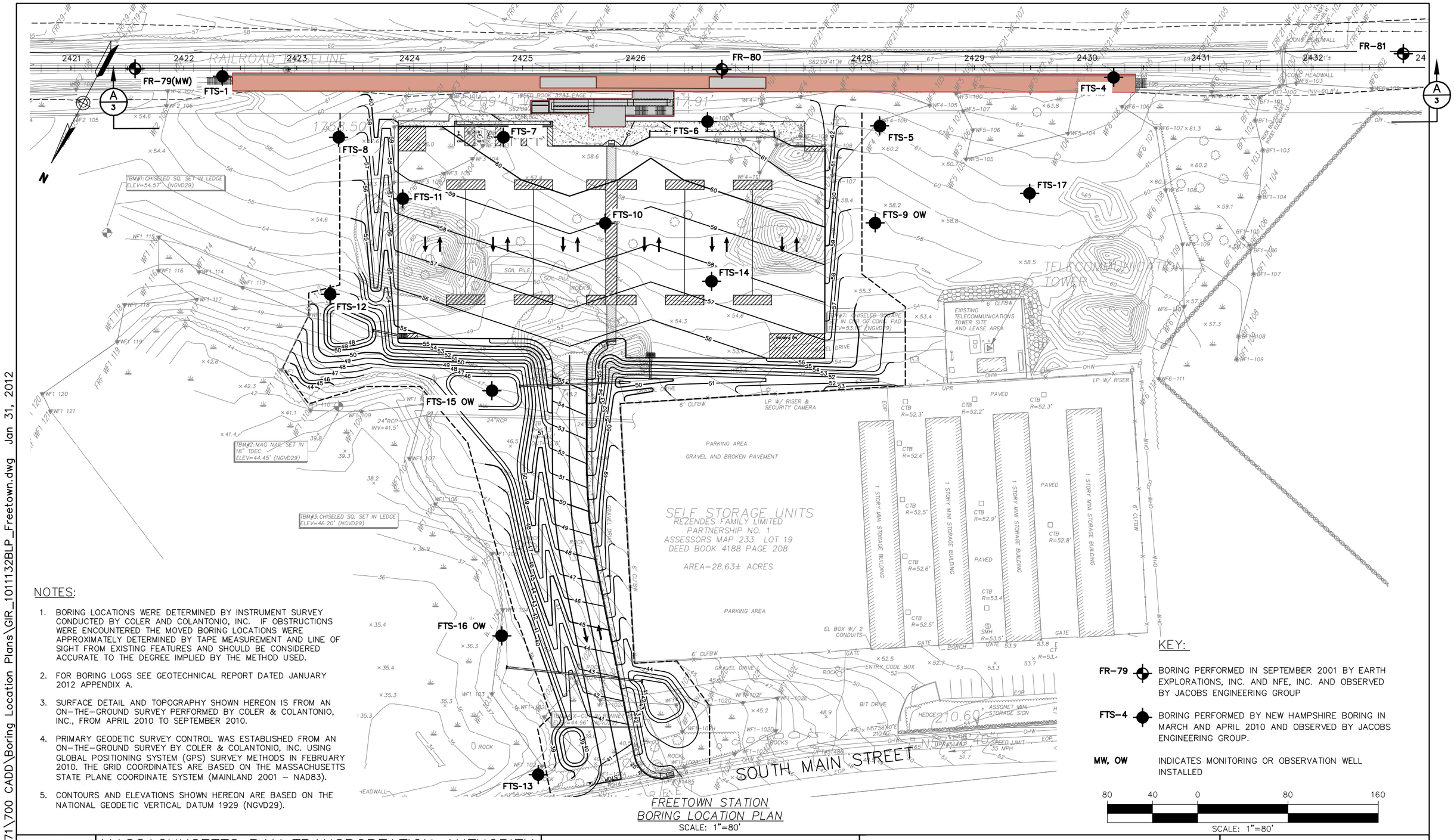
FIGURES

Figure 1: Site Location Plan
Figure 2: Subsurface Exploration Plan
Figure 3: Subsurface Soil Profiles



FREETOWN STATION
PROJECT LOCUS PLAN
NOT TO SCALE

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY SOUTH COAST RAIL COMMUTER RAIL EXTENSION PROJECT MBTA CONTRACT NO. X2PS68	FREETOWN STATION FREETOWN, MASSACHUSETTS FIGURE 1



NOTES:

1. BORING LOCATIONS WERE DETERMINED BY INSTRUMENT SURVEY CONDUCTED BY COLER AND COLANTONIO, INC. IF OBSTRUCTIONS WERE ENCOUNTERED THE MOVED BORING LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT AND LINE OF SIGHT FROM EXISTING FEATURES AND SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.
2. FOR BORING LOGS SEE GEOTECHNICAL REPORT DATED JANUARY 2012 APPENDIX A.
3. SURFACE DETAIL AND TOPOGRAPHY SHOWN HEREON IS FROM AN ON-THE-GROUND SURVEY PERFORMED BY COLER & COLANTONIO, INC., FROM APRIL 2010 TO SEPTEMBER 2010.
4. PRIMARY GEODETIC SURVEY CONTROL WAS ESTABLISHED FROM AN ON-THE-GROUND SURVEY BY COLER & COLANTONIO, INC. USING GLOBAL POSITIONING SYSTEM (GPS) SURVEY METHODS IN FEBRUARY 2010. THE GRID COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND 2001 – NAD83).
5. CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).

KEY:

FR-79 BORING PERFORMED IN SEPTEMBER 2001 BY EARTH EXPLORATIONS, INC. AND NFE, INC. AND OBSERVED BY JACOBS ENGINEERING GROUP

FTS-4 BORING PERFORMED BY NEW HAMPSHIRE BORING IN MARCH AND APRIL 2010 AND OBSERVED BY JACOBS ENGINEERING GROUP.

MW, OW INDICATES MONITORING OR OBSERVATION WELL INSTALLED

80 40 0 80 160

SCALE: 1"=80'

FREETOWN STATION
BORING LOCATION PLAN
SCALE: 1"=80'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS
343 CONGRESS STREET
BOSTON, MA 02110
(617) 242-9222

FREETOWN STATION
FREETOWN, MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN

DATE: JANUARY 2012

FIGURE NO: 2

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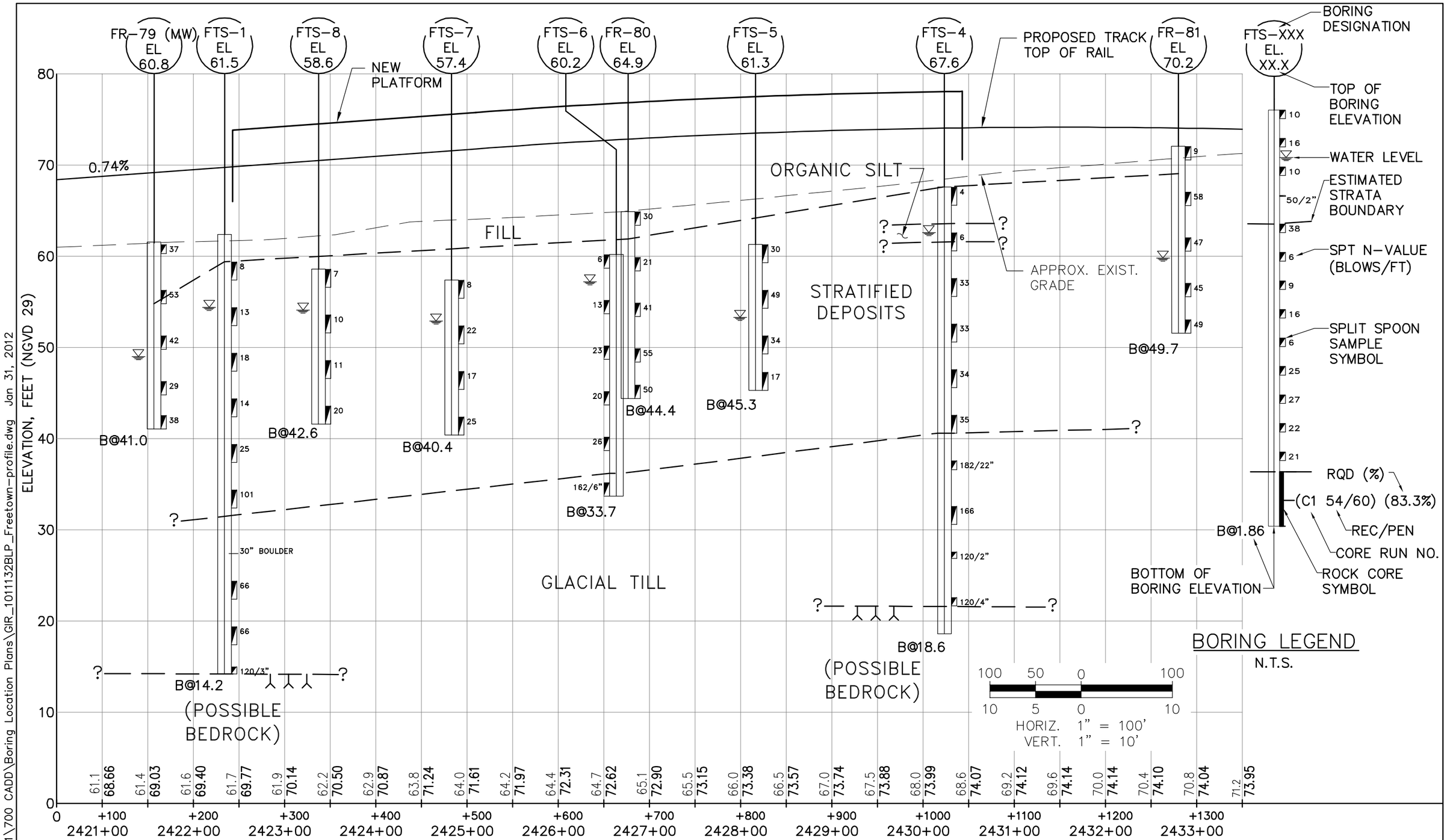

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MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

SOUTH COAST RAIL
COMMUTER RAIL EXTENSION PROJECT
MBTA CONTRACT NO. X2PS68

JACOBS

343 CONGRESS STREET
BOSTON, MA 02110
(617) 242-9222

FREETOWN STATION
FREETOWN, MASSACHUSETTS
SUBSURFACE PROFILE A-A

DATE: JANUARY 2012

FIGURE NO: 3

APPENDIX A: EXPLORATION LOGS

FTS-1
FTS-4 TO FTS-17
FR-79 MW
FR-80 AND FR-81

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 001	
	LOCATION	Freetown, MA				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	62.4	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV CME - 550	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Auto	GRID	N	
48.25 Terminated	4/5/2010	8 Upon Completion (In Casing)			COORD	E	
					DATE START	4/5/10	
					DATE END	4/5/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
							Top 3 ft railroad ballast.
5		2 3 5 6	S1	3 - 5	8	59.4	SILT WITH SAND (ML); non-plastic silt, some fine sand, little gravel, light brown, moist.
10		6 7 6 6	S2	8 - 10	8	55.4	WELL GRADED SAND (SW); fine to coarse sand, trace silt, gray, wet.
15		4 7 11 14	S3	13 - 15	14	50.4	POORLY GRADED SAND (SP); fine sand, trace non-plastic silt, grayish-brown, wet.
20		6 7 7 10	S4	18 - 20	0		NO RECOVERY: push spoon, still no recovery.
25		5 10 15 12	S5	23 - 25	16	41.4	SILT (ML); non-plastic silt, grayish-brown, wet.
30		22 36 65 120/0"	S6	28 - 29.5	18		SILT WITH SAND (ML); non-plastic silt, little fine sand, gray, wet.
35			C1	31 - 33.5	18	31.4	CONGLOMERATE BOULDER; rounded to sub rounded clasts, gray.
						28.9	

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 001

LOG OF TEST BORING

JACOBS	PROJECT: South Coast Rail	BORING NO.	FTS - 001
	LOCATION: Freetown, MA		
	OWNER: Mass.Bay Transportation Authority		SHEET 2 OF 2
	JOB NUMBER: E2347101		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		22 31 35 32	S7	38 - 40	10		SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little mostly fine gravel, grayish-brown, wet, GLACIAL TILL.
45		32 31 35 36	S8	43 - 45	12		SIMILAR TO S7.
		120/3"	S9	48 - 48.25	3	14.2	SIMILAR TO S7; some pieces of rock in tip of spoon, possible top of bedrock.
50							Bottom of Hole at 48.25'.
55							Boring offset from stake ~18 ft SW along existing track.
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 001

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 004	
	LOCATION	Freetown, MA				SHEET 1 OF 2	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	S. Bolduc	ELEVATION	67.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742213.6	
49 Terminated	4/5/2010	5 Upon Completion (In Casing)			COORD E	766673.1	
					DATE START	4/5/10	
					DATE END	4/5/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 1 3 1	S1	1 - 3	7		Top 1 ft railroad ballast. POORLY GRADED SAND (SP); mostly fine sand, trace non-plastic silt, dark brown, moist.
						64.6	
5		3 2 4 4	S2	4 - 6	12	62.6	(4 - 5') SILT (ML); slightly plastic silt, trace organics, dark brown, wet. (5 - 6') SILT WITH SAND (ML); non-plastic silt, little fine to coarse sand, gray, wet.
						58.6	
10		14 16 17 19	S3	9 - 11	14		SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little fine gravel, trace coarse gravel up to 1", gray, wet.
15		15 17 16 19	S4	14 - 16	8		SIMILAR TO S3.
20		16 17 17 24	S5	19 - 21	6		SILT WITH GRAVEL (ML); non-plastic silt, little fine gravel, trace fine to coarse sand, grayish-brown, wet.
						46.6	
25		17 19 16 21	S6	24 - 26	16		SILT (ML); non-plastic silt, grayish brown, wet.
						40.6	
30		66 82 100/5"	S7	29 - 30.42	12		SANDY SILT (ML); non-plastic silt, some fine to coarse sand, trace fine gravel, graish brown, wet, GLACIAL TILL.
35		71	S8	34 - 36	17		SIMILAR TO S7.

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 004

LOG OF TEST BORING

JACOBS	PROJECT: South Coast Rail	BORING NO.	FTS - 004
	LOCATION: Freetown, MA		
	OWNER: Mass.Bay Transportation Authority		SHEET 2 OF 2
	JOB NUMBER: E2347101		

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
40		74 92 106					
		120/2"	S9	39 - 39.16	0		NO RECOVERY
45		98 120/4"	S10	44 - 44.83	6		SANDY SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse sand, little mostly fine gravel, grayish-brown, wet, GLACIAL TILL.
						20.6	Top of apparent Bedrock, roller bit to 49 ft.
50						18.6	Bottom of Hole at 49'.
55							
60							
65							
70							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 004

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	FTS - 005
LOCATION	Freetown, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	61.3
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742348.2
16	Terminated	3/31/2010	8 Upon Completion (Augers pulled)			COORD E	766836.2
						DATE START	3/31/10
						DATE END	3/31/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 3 1 2	S1	0 - 2	24		SILT (ML); non-plastic silt, brown, wet, topsoil.
5		15 21 28 29	S2	4 - 6	16	57.3	SILT WITH SAND (ML); non-plastic silt, little fine to coarse sand, trace fine gravel, gray, moist,.
10		9 21 13 20	S3	9 - 11	19	53.3	SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse gravel up to 1.5", little fine to coarse sand, grayish-brown, wet.
15		7 5 12 19	S4	14 - 16	8		SILT WITH GRAVEL (ML); non-plastic silt, little fine gravel, trace sand, grayish-brown, wet.
						45.3	Bottom of Hole at 16'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 005

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	FTS - 006
LOCATION	Freetown, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	60.2
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742415.9
26.5	Terminated	3/31/2010	3 Upon Completion (Augers pulled)			COORD E	766973
						DATE START	3/31/10
						DATE END	3/31/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		1 3 3 3	S1	0 - 2	9	56.2	SILT (ML); non-plastic silt, trace sand, brown, wet.
5		3 7 10 13	S2	5 - 7	16	51.2	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, some fine to coarse gravel up to 1", trace silt, brown, wet.
10		11 14 9 13	S3	10 - 12	10		SILTY SAND (SM); fine to medium sand, some non-plastic silt, trace fine gravel, brown, wet.
15		9 10 10 12	S4	15 - 17	14		SIMILAR TO S3.
20		24 14 12 25	S5	20 - 22	8	41.2	SILTY SAND WITH GRAVEL (SM); mostly fine sand, some non-plastic silt, little fine to coarse gravel up to 1.5", grayish brown, wet. Cobbles / boulders encountered.
25		35 52 110/6"	S6	25 - 26.5	18	36.2 33.7	SILT WITH SAND (ML); non-plastic silt, little mostly fine sand, trace fine gravel, grayish brown, wet. Bottom of Hole at 26.5'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 006

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 007	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	57.4	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Hollow Stem Auger	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742512.4	
17 Terminated	4/1/2010	4.5 Upon Completion (Augers pulled)			COORD E	767126.5	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 3 5 6	S1	0 - 2	15	53.4	POORLY GRADED SAND (SP); fine sand, brown, moist.
5		8 10 12 9	S2	5 - 7	18		SILT (ML); non-plastic silt, gray, wet.
10		4 8 9 10	S3	10 - 12	12		SILT (ML); non-plastic silt, gray, wet.
15		12 11 14 23	S4	15 - 17	18	40.4	SILT (ML); non-plastic silt, gray, wet.
20							Bottom of Hole at 17'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 007

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 008	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	58.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Hollow Stem Auger	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742580.5	
17 Terminated	4/1/2010	4.5 Upon Completion (Augers pulled)			COORD E	767255.5	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 3 4 5	S1	0 - 2	19		POORLY GRADED SAND (SP); mostly fine sand, trace silt, brown, moist.
5		4 4 6 8	S2	5 - 7	10	53.6	POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, trace non-plastic silt, gray, wet.
10		8 5 6 5	S3	10 - 12	14		SIMILAR TO S2.
						45.6	
15		5 9 11 13	S4	15 - 17	16	42.6	SILT (ML); non-plastic silt, gray, wet.
							Bottom of Hole at 17'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 008

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	FTS - 009 OW
LOCATION	Freetown, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	57.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Hollow Stem Auger	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742426.1
17	Wash Boring w/Casing	3/31/2010	2 Upon Completion (In Augers)			COORD E	766799.8
25.42	Terminated	7/7/2010	6 Monitoring Well Reading			DATE START	3/31/10
		9/13/2011	5 Monitoring Well Reading			DATE END	3/31/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 4 6 21	S1	0 - 2	8		SILT (ML); non-plastic silt, trace fine sand, light brown, moist.
						54.6	
5		9 27 25 19	S2	4 - 6	20		(4 - 5') SANDY SILT (ML); non-plastic silt, some fine sand, light brown, wet.
						52.6	(5 - 6') GRAVELY SILT (ML); non-plastic silt, some fine to coarse gravel up to 1", trace sand, gray, wet.
						50.6	
10		15 17 18 22	S3	9 - 11	13		SILT WITH SAND (ML); non-plastic silt, little fine to coarse sand, grayish brown, wet.
15		3 6 7 8	S4	14 - 16	12		SANDY SILT (ML); non-plastic silt, some mostly fine sand, trace fine gravel, grayish brown, wet.
						40.6	
20		43 120/6"	S5	18 - 19	12		SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse gravel up to 1", trace sand, grayish brown, wet.
						36.6	
		100/4"	S6	23 - 23.33	0		NO RECOVERY
25		100/5"	S7	25 - 25.42	3	32.2	POORLY GRADED GRAVEL WITH SAND (GP); mostly fine gravel, some fine to coarse sand, gray, wet.
							Bottom of Hole at 25.42'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 009 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 010	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	56.9	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Hollow Stem Auger	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742537.7	
17 Terminated	4/1/2010	10 Upon Completion (Augers pulled)			COORD E	767011.2	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 4 3	S1	0 - 2	8		SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some non-plastic silt, little fine gravel, grayish brown, moist, FILL.
						52.9	
5		11 10 12 12	S2	5 - 7	11		SANDY SILT (ML); non-plastic silt, some fine to coarse sand, grayish brown, moist.
						48.9	
10		14 12 17 18	S3	10 - 12	16		SILT (ML); non-plastic silt, gray, wet.
15		10 13 13 15	S4	15 - 17	15		SIMILAR TO S3.
						39.9	
							Bottom of Hole at 17'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 010

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	FTS - 011
LOCATION	Freetown, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	56.0
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742602.2
15	Terminated	4/1/2010	2 Upon Completion (Augers pulled)			COORD E	767180
						DATE START	4/1/10
						DATE END	4/1/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 2 3 6	S1	0 - 2	13		SANDY SILT (ML); non-plastic silt, some fine sand, brown, moist.
		10 11 15 10	S2	3 - 5	15		SILT (ML); non-plastic silt, trace fine sand, gray, wet.
5							
		9 15 18 21	S3	8 - 10	24	48.0	SILT (ML); non-plastic silt, gray, wet.
10							
		7 12 12 15	S4	13 - 15	24		SIMILAR TO S3.
15						41.0	
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 011

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 012	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	50.2	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Hollow Stem Auger	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742706.9	
17 Terminated	4/1/2010	8 Upon Completion (Augers pulled)			COORD E	767197.3	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 4 3 5	S1	0 - 2	7		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, some non-plastic silt, brown, moist.
5		14 14 11 10	S2	5 - 7	10		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, some non-plastic silt, trace fine gravel, grayish brown, wet.
						41.2	
10		9 8 9 9	S3	10 - 12	4		SILT (ML); non-plastic silt, brown, wet, cobble in tip of spoon.
15		8 8 9 10	S4	15 - 17	10		SILT (ML); non-plastic silt, gray, wet.
						33.2	
20							Bottom of Hole at 17'.
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 012

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 013	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	38.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742997.3	
15 Terminated	4/1/2010	3 / Upon Completion (Augers pulled)			COORD E	766836	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		2 2 1 2	S1	0 - 2	4	36.6	TOPSOIL; organic material, brown, moist.
5		10 13 14 16	S2	3 - 5	20		SILT (ML); non-plastic silt, grayish brown, wet.
10		10 11 11 10	S3	8 - 10	24	26.6	SIMILAR TO S2.
15		16 15 16 18	S4	13 - 15	10	23.6	SILTY SAND WITH GRAVEL (SM); fine to coarse sand, some non-plastic silt, little fine gravel, gray, wet.
							Bottom of Hole at 15'.
20							
25							
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 013

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 014	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	55.6	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Wash Boring w/Casing	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742539.3	
25 Terminated	4/1/2010	6 Upon Completion (In Casing)			COORD E	766903.9	
					DATE START	4/1/10	
					DATE END	4/1/10	

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 2 2 8	S1	0 - 2	10		SILT WITH SAND (ML); non-plastic silt, little fine sand, brown, moist.
		9 13 16 18	S2	3 - 5	12	52.6	POORLY GRADED SAND (SP); mostly medium sand, trace silt, brown, moist.
5						48.6	
		22 16 25 28	S3	8 - 10	4		WELL GRADED SAND WITH SILT (SW-SM); fine to coarse sand, some non-plastic silt, trace gravel, gray, wet.
10							
		6 8 13 18	S4	13 - 15	10		SIMILAR TO S3.
15							
		10 23 24 10	S5	18 - 20	11		SIMILAR TO S3.
20						33.6	
		20 16 6 11	S6	23 - 25	1		POORLY GRADED SAND WITH SILT (SP-SM); mostly coarse sand, little non-plastic silt, grayish brown, wet.
25						30.6	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 014

LOG OF TEST BORING

JACOBS

PROJECT	South Coast Rail	BORING NO.	FTS - 015 OW
LOCATION	Freetown, MA		SHEET 1 OF 1
OWNER	Mass.Bay Transportation Authority		
JOB NUMBER	E2347101		

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	46.7
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742715.6
25	Terminated	4/2/2010	5 Monitoring Well Reading			COORD E	767030.8
		7/7/2010	8 Monitoring Well Reading			DATE START	4/2/10
						DATE END	4/2/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		7 12 4 10	S1	0 - 2	18		SILT (ML); non-plastic silt, trace fine gravel, brown, moist.
		12 14 16 15	S2	3 - 5	7	43.7	WELL GRADED SAND WITH GRAVEL (SW); fine to coarse sand, little fine gravel, trace silt, brown, moist.
5							
		10 11 12 10	S3	8 - 10	4		SIMILAR TO S2.
10						34.7	
		6 7 8 7	S4	13 - 15	12		SILT (ML); non-plastic silt, trace fine sand, grayish brown, wet.
15							
		7 7 6 6	S5	18 - 20	15		SILT (ML); non-plastic silt, gray, wet.
20							
		5 8 9 11	S6	23 - 25	16		SILT (ML); non-plastic silt, gray, wet. SIMILAR TO S5.
25						21.7	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 015 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail	BORING NO.	FTS - 016 OW	
	LOCATION	Freetown, MA		SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority			
	JOB NUMBER	E2347101			

INSPECTOR	T. Telesco	CONTRACTOR	NH Boring	DRILLER	C. Knight	ELEVATION	37.6
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29
	Wash Boring w/Casing	DATE/TIME	DEPTH(ft) REMARKS	SPT HAMMER	140 lb Safety	GRID N	2742903.5
25	Terminated	4/2/2010	1 Monitoring Well Reading			COORD E	766922
		7/7/2010	1.4 Monitoring Well Reading			DATE START	4/2/10
						DATE END	4/2/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
		2 4 2 5	S1	0 - 2	12		SANDY SILT (ML); non-plastic silt, some fine sand, light brown, moist.
5		11 15 14 11	S2	3 - 5	16		SANDY SILT (ML); non-plastic silt, some fine sand, light brown, wet.
						31.6	
10		5 8 9 7	S3	8 - 10	14		SILT (ML); slightly plastic silt, gray, wet, PP = 1 TSF. Pocket Penetrometer = 1 tsf.
15		6 8 12 9	S4	13 - 15	15		SIMILAR TO S3, PP = 0.75 TSF. Pocket Penetrometer = 0.75 tsf.
						21.6	Boring collapses with sand at 16 ft.
20		11 10 16 18	S5	18 - 20	5		WELL GRADED SAND WITH SILT (SW-SM); fine to coarse sand, little non-plastic silt, trace fine gravel, grayish brown, wet.
						15.6	
25		94 78 76 58	S6	23 - 25	3		NARROWLY GRADED SAND WITH SILT (SP-SM); mostly fine sand, little non-plastic silt, gray, wet.
						12.6	
							Bottom of Hole at 25'.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 016 OW

LOG OF TEST BORING

JACOBS	PROJECT	South Coast Rail			BORING NO.	FTS - 017	
	LOCATION	Freetown, MA				SHEET 1 OF 1	
	OWNER	Mass.Bay Transportation Authority					
	JOB NUMBER	E2347101					
INSPECTOR: T. Telesco	CONTRACTOR	NH Boring	DRILLER	T. Pentacost	ELEVATION	60.7	
METHOD OF DRILLING	GROUNDWATER READINGS		DRILL RIG	ATV D-50	DATUM	NGVD 29	
Hollow Stem Auger	DATE/TIME	DEPTH(ft) / REMARKS	SPT HAMMER	140 lb Safety	GRID	N	2742339.1
25 Terminated	3/31/2010	10 Upon Completion (In Augers)			COORD	E	766691
					DATE START		3/31/10
					DATE END		3/31/10

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	SAMPLE NO.	DEPTH (ft)	REC. (in)/(%)	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		3 6 14 27	S1	0 - 2	15	56.7	(0 - .5') TOPSOIL; roots, brown, moist. (.5 - 2') SILT WITH SAND (ML); non-plastic silt, little fine sand, gray, moist.
5		30 22 52 100/3"	S2	5 - 6.75	12		SILT WITH GRAVEL (ML); non-plastic silt, some fine to coarse gravel up to 1", little fine to coarse sand, gray, moist, cobble encountered.
10		22 12 10 10	S3	10 - 12	9		SIMILAR TO S2.
15		31 46 100/2"	S4	15 - 17	6		SILT WITH GRAVEL (ML); non-plastic silt, some fine gravel up to 1.5", trace sand, grayish brown, wet.
20		13 46 100/5"	S5	20 - 21.42	17		SIMILAR TO S4.
25		100/0"	S6	25 - 25	0	35.7	NO RECOVERY; boulder encountered. Bottom of Hole at 25'. Cobbles and boulders encountered from 6 to 25 ft.
30							
35							

Page 1: 0-35 feet. Each subsequent page displays 40 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

Auger Sample (AS) | Rock Core (RC) and RQD (%) REC (%) | Split-Spoon Sample (SS) and Blow Counts per 6" REC (in) | Undisturbed (U)-Shelby Tube, (P)-Piston | Jar Sample (JS) | Bag Sample (B)

REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FTS - 017

LOG OF TEST BORING/MONITORING WELL

JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	Fall River Line - Freetown
OWNER	Mass. Bay Transportation Authority
JOB NUMBER	013471
BORING NO.	FR-79 MW
SHEET	1 OF 1

INSPECTOR	C.Nagata	CONTRACTOR	Earth Exploration, Inc
METHOD OF DRILLING		GROUNDWATER READINGS	
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)
9.0	Wash Boring-Open Hole	9/07/01 1030	12.5
19.0	Split Spoon Sample	5/21/02 1335	12.4
20.5	Terminated		

DRILLER	J.Galvin
DRILL RIG	B-57 ATV
REMARKS	
	Upon completion (in casing)
	Monitoring well reading
SPT HAMMER	140 lb Safety

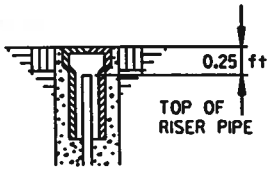
ELEVATION		61.5
DATUM		FT MSL
GRID	N	274261l
COORD	E	767443
DATE START		9/07/01
DATE END		9/07/01

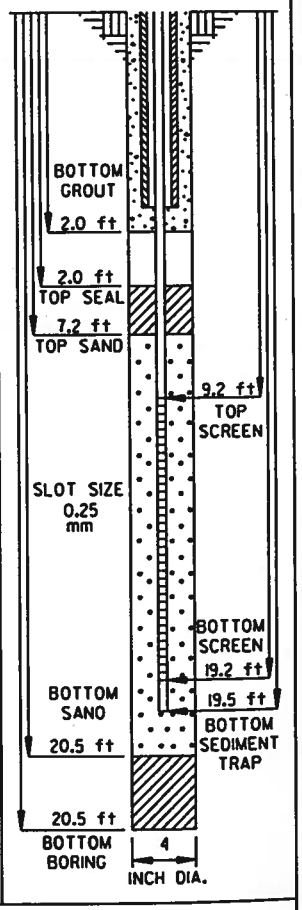
DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		6 14 23	7	SS-1	61.20	3" of ballast Well graded sand (SW) - mostly fine to medium sand with slag, trace fine to coarse subangular gravel, dark brown/black, dry (FILL) (Possibly used as subballast)
5		7 18 35	14	SS-2		Well graded sand (SW) - mostly fine to medium sand, trace silt, brown, wet (FILL)
					54.50	
10		12 20 22	14	SS-3		Poorly graded sand (SP) - mostly fine sand, light brown, wet
15		8 14 15	10	SS-4		Poorly graded sand (SP) - mostly fine sand, light brown, wet
20		19 16 22	9	SS-5		Poorly graded sand (SP) - mostly fine sand, light brown, wet
					41.00	Boring Terminated at 20.5 ft.
25						Remarks: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc. Monitoring well installed (2" Dia. PVC pipe)
30						
35						

WELL LOG (N. T. S.)

WELL COVER INFORMATION

☐ STANDPIPE ☒ ROADBOX





Page 1: 0-35 ft., Page 2: 35-80 ft., Each subsequent page displays 45 ft.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

• REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FR-79 MW

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail
LOCATION	Fall River Line - Freetown
CLIENT	Mass. Bay Transportation Authority
JOB NUMBER	013471

BORING NO. FR-80

SHEET 1 OF 1

INSPECTOR	C.Nagata	CONTRACTOR	NFE, Inc.	DRILLER	J.Galvin
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 ATV
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER: 140 lb Safety
4.0	Wash Boring-Open Hole	9/07/01 1315	12.1	Upon completion (in casing)	
19.0	Split Spoon Sample				
20.5	Terminated				

ELEVATION		64.9
DATUM		FT MSL
GRID	N	2742369
COORD	E	766983
DATE START		9/07/01
DATE END		9/07/01

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
0		6 12 18	18	SS-1		Well graded sand (SW) - mostly fine to medium sand with slag, trace fine to coarse subrounded gravel, dark brown/black, dry (FILL) (Possibly used as subballast)
					61.90	
5		24 11 10	18	SS-2		Silty sand (SM) - mostly fine sand, little to some silt, brown, wet
10		11 18 23	18	SS-3		Silty sand (SM) - mostly fine sand, little to some silt, brown, wet
					51.90	
15		15 17 38	12	SS-4		Silt (ML) - homogeneous, non-plastic, light brown, wet (Gravel lodged in shoe)
					48.90	
20		34 31 19	6	SS-5		Silty sand (SM) - Mostly fine to coarse sand, little to some silt, trace fine to coarse subangular gravel, beige, wet
					44.40	Boring Terminated at 20.5 ft.
25						Remarks: Boring located at centerline of existing tracks. Test boring performed by GeoLogic, Inc.
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet. Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL		RELATIVE PROPORTIONS OF SOIL COMPONENTS	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY		
0 - 2	VERY SOFT	0 - 4	VERY LOOSE	< 10%	TRACE
3 - 4	SOFT	5 - 10	LOOSE	15 - 25%	LITTLE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE	30 - 45%	SOME
9 - 15	STIFF	31 - 50	DENSE	50 - 100%	MOSTLY
16 - 30	VERY STIFF	51 +	VERY DENSE		
30 +	HARD				

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

* REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FR-80

LOG OF TEST BORING

JE JACOBS

PROJECT	New Bedford/Fall River Commuter Rail	BORING NO.	FR-81
LOCATION	Fall River Line - Freetown		SHEET 1 OF 1
CLIENT	Mass. Bay Transportation Authority		
JOB NUMBER	013471		

INSPECTOR	C.Nagoto	CONTRACTOR	NFE, Inc.	DRILLER	J.Galvin
METHOD OF DRILLING		GROUNDWATER READINGS		DRILL RIG	B-57 ATV
0.0	Wash Boring w/Casing	DATE/TIME	DEPTH (ft)	REMARKS	SPT HAMMER: 140 lb Safety
19.0	Split Spoon Sample	9/10/01 0705	10.4	Upon completion (In casing)	
20.5	Terminoted	9/10/01 0720	7.9	Upon completion (Casing pulled)	

ELEVATION			70.2
DATUM			FT MSL
GRID	N		2742075
COORD	E		766456
DATE START			9/07/01
DATE END			9/10/01

DEPTH (ft)	STRATA SYMBOL	SAMPLE DATA	REC. (in)/(%)	SAMPLE NO.	ELEV.	FIELD CLASSIFICATION AND REMARKS
		4 5 4	18	SS-1		Clay (CL) - homogeneous, medium plasticity, trace roots, brown, dry (FILL)
					67.20	
5		21 32 26	10	SS-2		Poorly graded sand with silt (SP-SM) - mostly fine sand, trace to little silt, trace fine to coarse gravel, light brown, wet
					62.20	
10		54 33 14	6	SS-3		Well graded sand (SW) - mostly fine to medium sand, brown, wet
15		38 25 20	5	SS-4		Well graded sand with gravel (SW) - mostly fine to coarse sand, some fine to coarse subangular gravel, trace silt, light brown, wet
20		43 28 21	5	SS-5		Well graded sand with gravel (SW) - mostly fine to coarse sand, some fine to coarse subangular gravel, trace silt, light brown, wet
					49.70	Boring Terminated at 20.5 ft.
25						Remarks: Boring offset 12 ft east of centerline of trocks. Test boring performed by GeoLogic, Inc.
30						
35						

Page 1: 0-35 feet, Page 2: 35-80 feet.
Each subsequent page displays 45 feet.

SAMPLES CLASSIFIED IN ACCORDANCE WITH ASTM D-2488 UNLESS OTHERWISE NOTED.

COHESIVE SOIL		NON-COHESIVE SOIL	
BLOWS/FT	CONSISTENCY	BLOWS/FT	DENSITY
0 - 2	VERY SOFT	0 - 4	VERY LOOSE
3 - 4	SOFT	5 - 10	LOOSE
5 - 8	MEDIUM STIFF	11 - 30	MEDIUM DENSE
9 - 15	STIFF	31 - 50	DENSE
16 - 30	VERY STIFF	51 +	VERY DENSE
30 +	HARD		

RELATIVE PROPORTIONS OF SOIL COMPONENTS	
< 10%	TRACE
15 - 25%	LITTLE
30 - 45%	SOME
50 - 100%	MOSTLY

LEGEND

AUGER (AS) | ROCK CORE (RC) AND ROD (%) REC (%) | SPLIT-SPOON (SS) AND BLOW COUNTS PER 6" REC (in) | UNDISTURBED (U)-SHELBY TUBE, (P)-PISTON | JAR (JS) | BAG (B)

• REFER TO THE SHEET ENTITLED "KEY TO DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS" FOR ADDITIONAL SYMBOLOGY.

BORING NO. FR-81

APPENDIX B: LABORATORY DATA

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	---	Sample Type:	---	Tested By:	mmd
Sample ID:	---	Test Date:	05/03/10	Checked By:	jdt
Depth :	---	Sample Id:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
FTS-4	S-2	4-6 ft	Moist, black silt	42.4
FTS-11	S-1	0-2 ft	Moist, yellowish brown sandy silt	24
FTS-13	S-2	3-5 ft	Moist, yellowish brown silt	23.8
TS-2	S-3	9-11 ft	Moist, gray clay	32
TS-2	S-4	14-16 ft	Wet, light gray silt	37
TS-3	S-3	9-11 ft	Moist, gray clay	37.7
TS-7	S-3	8-10 ft	Wet, yellowish brown clay	36.5
TS-7	S-4	13-15 ft	Moist, gray clay	32.8
TS-11	S-2	3-5 ft	Moist, black silt with organics	26.1
TS-20	S-3	8-10 ft	Wet, gray silt	41.4

Notes: Temperature of Drying : 110° Celsius

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	---	Sample Type:	---	Tested By:	mmd
Sample ID:	---	Test Date:	04/28/10	Checked By:	jdt
Depth :	---	Test Id:	178378		

Moisture, Ash, and Organic Matter - ASTM D 2974

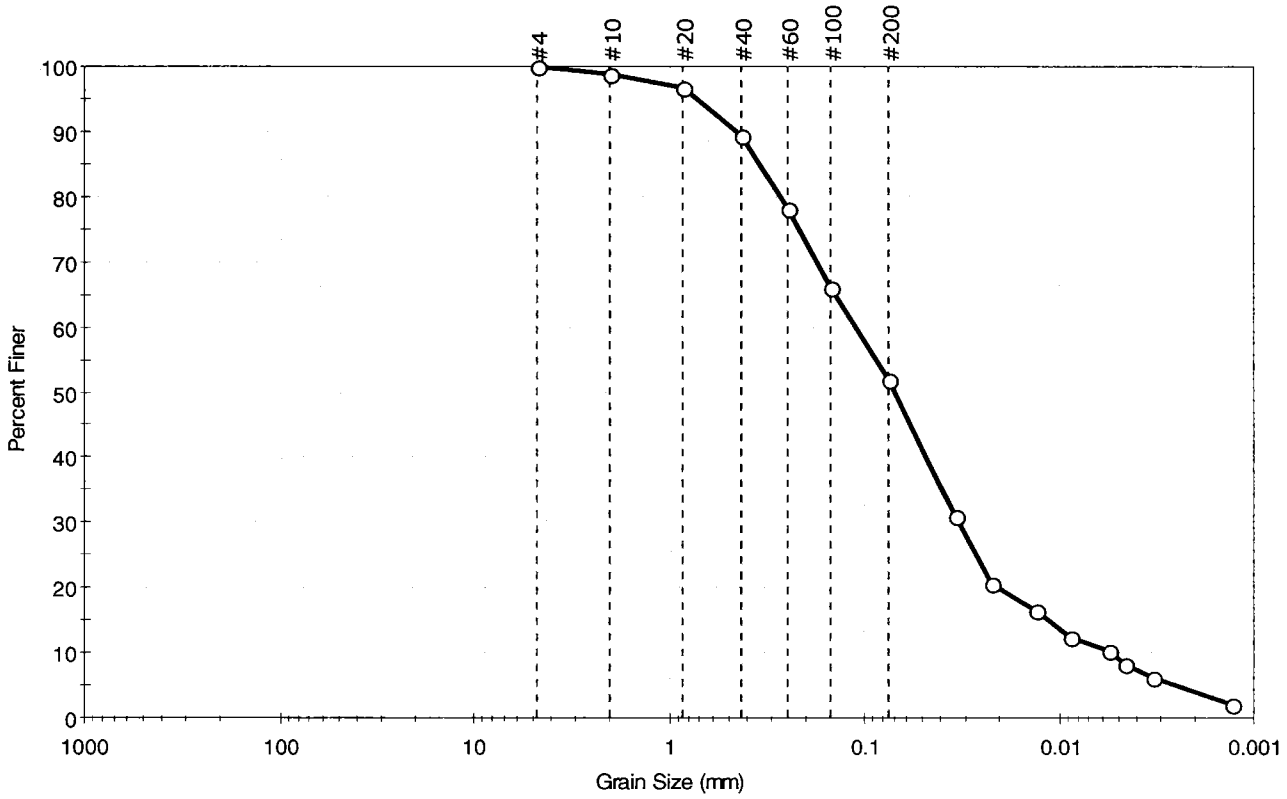
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
FTS-4	S-2	4-6 ft	Moist, black silt	42	95.3	4.7
TS-11	S-2	3-5 ft	Moist, black silt with organics	26	92.2	7.8

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	FTS-11	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-1	Test Date:	04/28/10	Checked By:	jdt
Depth :	0-2 ft	Test Id:	178366		
Test Comment:	---				
Sample Description:	Moist, yellowish brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	48.1	51.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	89		
#60	0.25	78		
#100	0.15	66		
#200	0.075	52		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0340	31		
---	0.0220	21		
---	0.0131	17		
---	0.0087	12		
---	0.0056	10		
---	0.0047	8		
---	0.0033	6		
---	0.0013	2		

Coefficients

D_{85} = 0.3453 mm D_{30} = 0.0326 mm
D_{60} = 0.1116 mm D_{15} = 0.0112 mm
D_{50} = 0.0698 mm D_{10} = 0.0054 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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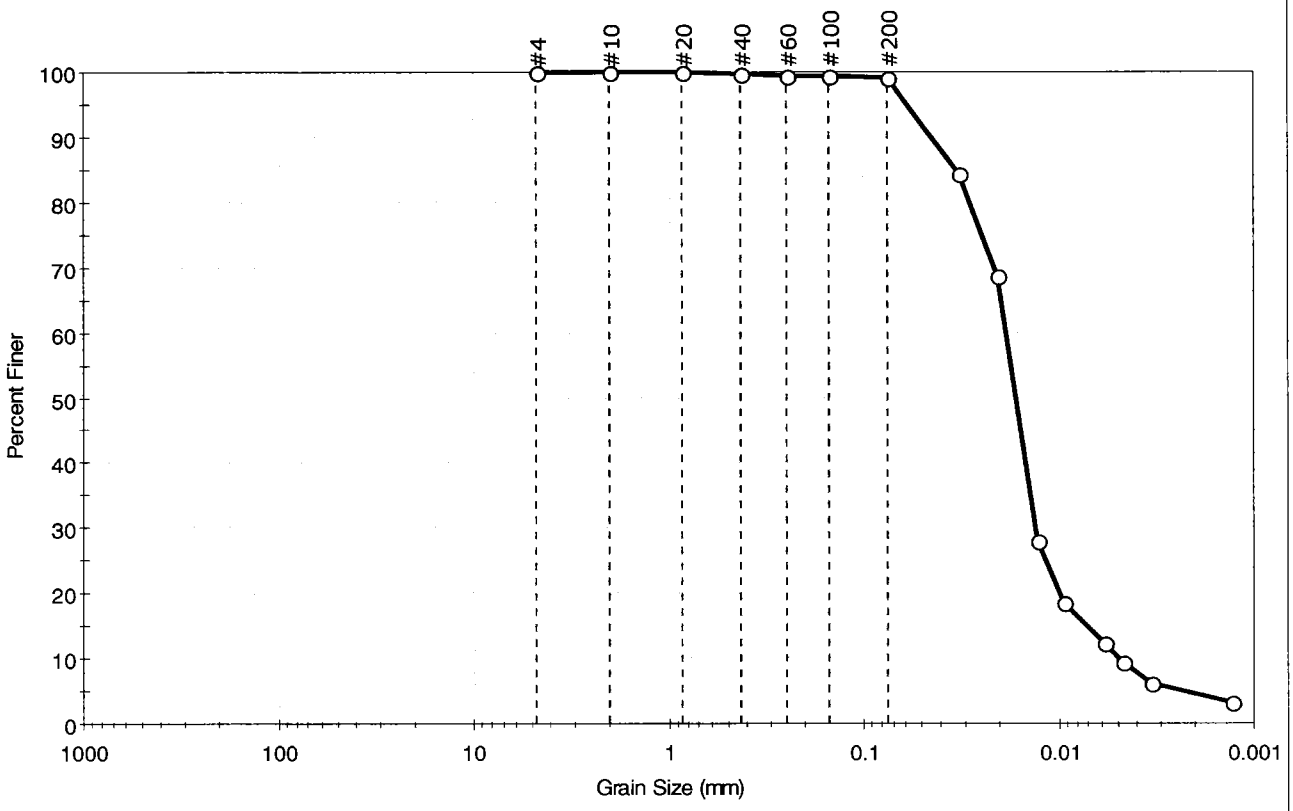
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Jacobs Civil, Inc.				
Project:	South Coast Rail				
Location:	MA			Project No:	GTX-9764
Boring ID:	FTS-13	Sample Type:	jar	Tested By:	jbr
Sample ID:	S-2	Test Date:	04/28/10	Checked By:	jdt
Depth :	3-5 ft	Test Id:	178367		
Test Comment:	---				
Sample Description:	Moist, yellowish brown silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
---	0.0	1.0	99.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0325	84		
---	0.0209	69		
---	0.0130	28		
---	0.0093	19		
---	0.0058	12		
---	0.0047	9		
---	0.0034	6		
---	0.0013	3		

Coefficients

D_{85} = 0.0338 mm	D_{30} = 0.0133 mm
D_{60} = 0.0189 mm	D_{15} = 0.0071 mm
D_{50} = 0.0168 mm	D_{10} = 0.0049 mm
C_u = N/A	C_c = N/A

Classification

ASTM silt (ML)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

APPENDIX C: GEOTECHNICAL CALCULATIONS

- Allowable Bearing Capacity and Estimated Settlement
- Seismic Site Class Evaluation

343 Congress Street
Boston, MA 02210
617/242-9222

JOB	MBTA South Coast Rail		
SUBJECT	Freetown Station		
CALCULATED BY	DH	**DATE**	1/31/2012
CHECKED BY	PM	**DATE**	1/31/2012

PURPOSE: Evaluate bearing resistance for platform shallow foundations.

REFERENCE: AASHTO LRFD Bridge Design Specifications, 2010
AREMA Manual for Railway Engineering, 2011 Edition

ASSUMPTIONS:
- Platform footing is 4 ft wide by 10 ft long.
- Bearing surface is compacted Gravel Borrow overlying silt with sand (ML), silty sand and sand.
- Footing embedment is at least 4 feet below ground surface.
- Groundwater level is about 10 feet below bottom of foundation.
- Footing eccentricity is assumed to be zero.
- Estimated soil properties (experience, geotech literature, Table 10.4.6.2.4-1):

	γ (pcf)	ϕ
Gravel Borrow:	125	34

BEARING CAPACITY FACTORS (Table 10.6.3.1.2a-1):

	ϕ	N_c	N_q	N_γ
Gravel Borrow:	34	42.2	29.4	41.1

CALCULATE EFFECTIVE FOOTING WIDTH (B'):

$e < B/4$ (Section 10.6.3.3)

where: B = footing width (ft) = 4
e = eccentricity (ft)

Assume no footing eccentricity, thus, e = 0

B' = B-2e 4

NOMINAL BEARING RESISTANCE (q_n):

$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B' N_{\gamma m} C_{w\gamma}$ (Eqn. 10.6.3.1.2a-1)

where:
c = cohesion = 0
γ = total unit weight = 125
D_f = depth of footing (ft) = 4 Assumed
B' = effective width of footing (ft) = 4
L = length of footing (ft) = 10
B'/L = 0.40
D_f /B' = 1.00
C_{wq} $C_{w\gamma}$ = groundwater correction factors (using B')
C_{wq} = 1.0 (Table 10.6.3.1.2a-2)
$C_{w\gamma}$ = 1.0 (Table 10.6.3.1.2a-2)

N_{cm} N_{qm} $N_{\gamma m}$ = bearing capacity factors

$N_{qm} = N_q s_q d_q i_q$ (Eqn. 10.6.3.1.2a-3)

s_q = 1.27 (Table 10.6.3.1.2a-3)

d_q = 1.20 (Table 10.6.3.1.2a-4)

i_q = 1.0 (see AASHTO p. 10-62)

N_{qm} = 44.8

343 Congress Street
Boston, MA 02210
617/242-9222

JOB	MBTA South Coast Rail		
SUBJECT	Freetown Station		
CALCULATED BY	DH	DATE	1/31/2012
CHECKED BY	PM	DATE	1/31/2012

$N_{\gamma m} = N_\gamma s_\gamma i_\gamma$

s_γ = 0.84 (Table 10.6.3.1.2a-3)

i_γ = 1 (see AASHTO p. 10-62)

$N_{\gamma m}$ = 34.5

q_n = 31,030 psf

ALLOWABLE BEARING RESISTANCE (q_a):

$q_a = q_n/FOS$

where: FOS = factor of safety = 2.5 for granular soil

q_a = 12,412 psf

use

q_a =	**12.41**	**ksf**

strength limit value

Note: Based on the anticipated light loads and potentially small footing sizes, an allowable bearing capacity of 6 ksf is recommended.

Elastic Settlement Calculations:

$$S_e = \frac{(q_o\,(1-\nu^2)\sqrt{A'})}{144 E_s \beta_z}$$

eqn. 10.6.2.4.2-1

where: q_o = applied vert. stress (ksf)
ν = Poisson's Ratio
E_s = Young's Modulus (ksi)
β_z = Shape/Rigidity Factor

ν = Poisson's Ratio =	0.30	(Table C10.4.6.3-1)
E_s = Young's Modulus (ksi) =	6.00	(Table C10.4.6.3-1)
β_z = Shape/Rigidity Factor =	1.11	(Table 10.6.2.4.2-1)

where:

B' = eff. width of footing (ft) =	4	(from bearing resistance calcs)
L = length of footing (ft):	10	(from bearing resistance calcs)
A' =(B'xL) = footing area (ft^2):	40	ft^2

Settlement (S_e) for a given q_o:

q_o = applied vertical stress (ksf) = 6.00 ksf (assumed)

Se (inches) = 0.43 inches

JACOBS

Freetown Station Seismic Site Class Evaluation

Based on the platform boring with the deepest soil overburden and the lowest average blow counts (worst case)

Boring No.	Sample No.	N Value	Di	Di/N_i	N_{bar}
FTS-1	S-1	8	6	0.75	
	S-2	13	5	0.38	
	S-3	18	5	0.28	**33**
	S-4	14	5	0.36	
	S-5	25	5	0.20	
	S-6	100	5	0.05	
	S-7	66	10	0.15	
	S-8	66	7.25	0.11	
Assumed Weathered rock		66	51.75	0.78	
Total Depth =		100			
Depth to Assumed Bedrock =		48.25	Sum	3.06	

Per 9.4.1.2.1, $15 < N_{bar} < 50$, Site Class D

Approx. Project Coordinates

Lat 41.772592
Long -71.093589

Seismic Coefficients

S_S = 0.230 (Table 1604.10*)
S_1 = 0.060 (Table 1604.10*)

For Site Class D

F_A = 1.6 (See Table 9.4.1.2.4a*)
F_V = 2.4 (See Table 9.4.1.2.4b*)

Design Spectral Response Parameters

$S_{MS} = Ss \times F_A$ = 0.368
$S_{M1} = S_1 \times F_V$ = 0.144

$S_{DS} = 2/3 \times S_{MS}$ = 0.245
$S_{D1} = 2/3 \times S_{M1}$ = 0.096

Notes: * The Massachusetts State Building Code, 8th Edition (2010)

9.4.1.2.1 Site Class Definitions. The site shall be classified as one of the following classes:

A = Hard rock with measured shear wave velocity, $\overline{v}_s$ > 5000ft/s (1500 m/s)

B = Rock with 2500 ft/s < $\overline{v}_s$ ≤5000 ft/s (760 m/s < $\overline{v}_s$ ≤ 1500 m/s)

C = Very dense soil and soft rock with 1200 ft/s ≤ $\overline{v}_s$ ≤ 2500 ft/s (370 m/s ≤ $\overline{v}_s$ ≤ 760 m/s) or $\overline{N}$ or $\overline{N}_{ch}$ > 50 or $\overline{s}_u$ ≥ 2000 psf (100 kPa)

D = Stiff soil with 600 ft/s ≤ $\overline{v}_s$ ≤ 1200 ft/s (180 m/s ≤ $\overline{v}_s$ ≤ 370 m/s) or with 15 ≤ $\overline{N}$ or $\overline{N}_{ch}$ ≤ 50 or 1000 psf ≤ $\overline{s}_u$ ≤ 2000 psf (50 kPa ≤ $\overline{s}_u$ ≤ 100 kPa)

E = A soil profile with $\overline{v}_s$ < 600 ft/s (180 m/s) or any profile with more than 10 ft (3 m) of soft clay. Soft clay is defined as soil with *PI* > 20, *w* ≥ 40%, and s_u < 500 psf (25 kPa)

F = Soils requiring site-specific evaluations:

1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. Potential for liquefaction shall be evaluated in accordance with 780 CMR 1804.6: *Liquefaction*.

Exception. None.

2. Peats and/or highly organic clays (*H* > 10 ft [3 m] of peat and/or highly organic clay where *H* = thickness of soil).
3. Very high plasticity clays (H > 25 ft [7.6 m] with *PI* > 75).
4. Very thick soft/medium stiff clays (H>120 ft [37 m].

Exception. None.

TABLE 9.4.1.2.4a VALUES OF F_a AS A FUNCTION OF SITE CLASS AND SHORT PERIOD MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL ACCELERATION

Site Class	Tabulated Maximum Considered Earthquake Spectral Response Acceleration at Short Periods					
	$S_S \le 0.26$	$0.27 \le S_S \le 0.29$	$0.30 \le S_S \le 0.32$	$0.33 \le S_S \le 0.35$	$0.36 \le S_S \le 0.38$	$S_S \ge 0.39$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.2	1.2	1.2	1.2
D	1.6	1.6	1.55	1.5	1.5	1.5
E	2.5	2.4	2.3	2.2	2.1	2.0
F	Note a	Note a	Note a	Note a	Note a	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_a for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 9.4.1.2.4b VALUES OF F_v AS A FUNCTION OF SITE CLASS

Site Class	Tabulated Maximum Considered Earthquake Spectral Response Acceleration at 1-Second Periods
	$S_1 \le 0.1$
A	0.8
B	1.0
C	1.7
D	2.4
E	3.5
F	Note a

Note a: Site-specific geotechnical investigation and dynamic site response analyses shall be performed except that for structures with periods of vibration equal to or less than 0.5-seconds, values of F_v for liquefiable soils may be assumed equal to the values for the site class determined without regard to liquefaction in Step 3 of 9.4.1.2.2.

TABLE 1604.10 GROUND SNOW LOADS; BASIC WIND SPEEDS; EARTHQUAKE DESIGN FACTORS

(For R-3 of three stories or less one- and two-family stand alone buildings, see 780 CMR 53.00 for snow and wind loads)

City/Town	Ground Snow Load p_g, psf	Basic Wind Speed V, MPH	Earthquake Design Factors	
			Ss	S_1
Foxborough	55	100	0.25	0.064
Framingham	55	100	0.26	0.067
Franklin	55	100	0.24	0.064
Freetown	45	110	0.23	0.060
Gardner	65	100	0.26	0.070
Gay Head (a.k.a Aquinnah)	35	120	0.18	0.051
Georgetown	55	110	0.34	0.075
Gill	65	100	0.23	0.069
Gloucester	45	110	0.33	0.073
Goshen	65	100	0.22	0.067
Gosnold	35	120	0.19	0.053
Grafton	55	100	0.24	0.066
Granby	55	100	0.23	0.066
Granville	65	100	0.23	0.066
Great Barrington	65	90	0.22	0.066
Greenfield	65	100	0.23	0.069
Groton	65	100	0.30	0.073
Groveland	55	110	0.34	0.076
Hadley	55	100	0.23	0.067
Halifax	45	110	0.25	0.062
Hamilton	45	110	0.33	0.074
Hampden	55	100	0.23	0.065
Hancock	65	90	0.22	0.068
Hanover	45	110	0.26	0.064
Hanson	45	110	0.25	0.063
Hardwick	55	100	0.23	0.067
Harvard	55	100	0.28	0.070
Harwich	35	120	0.18	0.051
Hatfield	55	100	0.22	0.067
Haverhill	55	110	0.35	0.077
Hawley	65	100	0.22	0.068
Heath	65	100	0.22	0.069
Hingham	45	110	0.27	0.066
Hinsdale	65	90	0.22	0.067
Holbrook	45	105	0.26	0.065
Holden	55	100	0.25	0.068
Holland	55	100	0.23	0.064
Holliston	55	100	0.25	0.066
Holyoke	55	100	0.23	0.066
Hopedale	55	100	0.24	0.065
Hopkinton	55	100	0.25	0.066
Hubbardston	65	100	0.25	0.069
Hudson	55	100	0.26	0.068
Hull	45	110	0.28	0.067
Huntington	65	100	0.22	0.066
Ipswich	45	110	0.34	0.074
Kingston	45	110	0.24	0.061
Lakeville	45	110	0.24	0.061
Lancaster	55	100	0.27	0.070
Lanesborough	65	90	0.22	0.068

Appendix 4.17-C

Layover Facility Stormwater !yl·fëäŜå

Stormwater Report

Weaver's Cove East Layover Facility

City of Fall River,
Massachusetts

Prepared for

massDOT

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

VHB Vanasse Hangen Brustlin, Inc.

Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

Table of Contents

Checklist for Stormwater Report **1**

1 Stormwater Report Narrative **1-1**

1.1 Project Description 1-1
1.2 Site Description 1-1
1.3 Existing Drainage Conditions 1-2
1.4 Proposed Drainage Conditions 1-3
1.5 Environmentally Sensitive and Low Impact Development (LID) Techniques 1-6
1.6 Hydraulic Analysis 1-6

2 Regulatory Compliance **2-1**

Appendices .....

Appendix A: Standard 1 Computations and Supporting Information A1
Appendix B: Standard 2 Computations and Supporting Information B1
Appendix C: Standard 3 Computations and Supporting Information C1
Appendix D: Standard 4 Computations and Supporting Information D1

List of Tables

Table No.	Description	Page
1	Existing Conditions Hydrologic Data	1-3
2	Proposed Conditions Hydrologic Data	1-5
3	Peak Discharge Rates (cfs*)	2-2

List of Figures

Figure No.	Description
1	Site Locus Map
2	Site Aerial Map
3	Existing Drainage Areas
4	Proposed Drainage Areas

(All figures follow Chapter 1.)

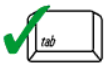
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☒ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☒ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

1

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

1.1 Project Description

The Applicant, MassDOT, is proposing to construct a commuter rail overnight layover facility at the Weaver's Cove East site, located adjacent to 2804 North Main Street in Fall River, Massachusetts along the Fall River Secondary Line (the Project). The Project will include six layover tracks, a paved driveway and access aisle around the layover tracks, ancillary landscape improvements, 41 parking spaces, two operation and maintenance buildings, and utility improvements to support this use. The Project involves demolishing concrete pads and multiple bituminous driveways that currently exist on the site.

The site will be considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because the use is regulated under the NPDES Multi-Sector General Permit.

1.2 Site Description

The Project site consists of approximately 18 acres of land (the Site) located adjacent to 2804 North Main Street in Fall River, Massachusetts (Figures 1 and 2). The Site is northeast of Weaver's Cove Energy, LCC located at 1 New Street in Fall River, adjacent to residential buildings to the north, south and east and the MBTA railroad right-of-way to the west.

There are no Wetland Resource Areas located on the Site.

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Paxton Fine Sandy Loam, smoothed Udorthents, and Urban land classified as Hydrologic Soil Groups (HSG) C, B and D respectively.

The Site is not located within the 100-year flood plain as shown on the FEMA Floodway Map, City of Fall River, Massachusetts Bristol County, Community Panel Number 25005C0332F dated July 7, 2009. The 100-year flood elevation is lower than the finished grade elevation of the layover yard. The FEMA map is included in Appendix B. This site is also located within the Massachusetts Coastal Zone.

1.3 Existing Drainage Conditions

The Site is currently almost entirely undeveloped land with a small portion that was previously developed at the southern end. For the existing conditions hydrologic analysis, the Site was divided into seven drainage areas that contribute to four separate design points. The following paragraphs summarize each drainage area.

Drainage Area 1

This 3.21-acre area in the southwest portion of the Site consists of predominantly impervious concrete pads with a small portion of grassy pasture urban land. This grassy area sheet flows to a catch basin to the north of the concrete pads where it is captured by the closed drainage system that drains to the Taunton River.

Drainage Area 2

This 3.83-acre area in the southern portion of the Site, north of Drainage Area 1, consists of mainly open space with a small portion of impervious area that sheet flows to a vegetated depression in the center of Drainage Area 2 where it infiltrates or overflows to Drainage Area 3 in larger storm events.

Drainage Area 3

This 7.14-acre area in the center of the Site consists predominantly of open space areas with small patches of paved area that sheet flows to a catch basin in the center of the Site. The catch basin is part of a closed drainage system that drains to the Taunton River.

Drainage Area 4

This 1.34-acre area in the northern portion of the Site consists predominantly of open space with small patches of paved area that sheet flows to a vegetated depression adjacent to North Main Street where it infiltrates.

Drainage Area 5

This 1.62-acre area in the northern portion of the Site consists of open space with multiple concrete pads and some paved area that sheet flows to a vegetated depression south of the property at 2990 North Main Street where it infiltrates.

Drainage Area 6

This 0.43-acre area in the southwest portion of the Site consists of partially open space and partially paved area that sheet flows to a culvert underneath the railroad ROW, ultimately discharging to the Taunton River.

Drainage Area 7

This 0.63-acre area in the northwest portion of the Site consists of open space that sheet flows towards a ditch along the railroad ROW, ultimately discharging to the Taunton River.

Figure 3 illustrates the existing drainage patterns on the Site. Table 1 provides a summary of the existing conditions hydrologic data.

Table 1 Existing Conditions Hydrologic Data

Drainage Area	Discharge Location	Design Point	Area (acres)	Curve Number	Time of Concentration (min)
1	Taunton River	1	3.21	98	5.0
2	Taunton River	1	3.83	72	7.8
3	Taunton River	1	7.14	71	19.4
4	Depression 2	3	1.34	73	7.7
5	Depression 3	4	1.62	75	21.4
6	Taunton River	1	0.43	89	5.0
7	Taunton River	1	0.63	69	5.0

1.4 Proposed Drainage Conditions

Figure 4 illustrates the proposed "post-construction" drainage conditions for the Project. As shown, the Site would be divided into nine drainage areas that discharge treated stormwater to three existing Design Points and one new design point. Existing drainage and grading patterns were maintained to the maximum extent possible in proposed conditions. Low impact development stormwater management techniques have been incorporated into the design. These practices are focused on decentralizing stormwater management techniques into the design that will reduce peak runoff rates, maximize groundwater recharge and treat for water quality. The following is a summary of each drainage area in the post-construction condition.

Drainage Area 1

This 3.68-acre area in the southwest portion of the Site consists of primarily open space with small patches of gravel. In the proposed condition the stormwater would be directed from the east and west to a grass channel that enters a culvert underneath the paved access driveway and outlets to a sediment forebay before entering an infiltration basin. An outlet control structure manages the water level in the basin and directs stormwater to the existing closed drainage system that discharges to the Taunton River.

Drainage Area 2

This 1.67-acre area in the eastern portion of the Site consists of predominantly landscaped area. In the proposed condition the stormwater would sheet flow to a depression on the eastern side of the proposed parking area. Runoff from the driveway sheet flows through a gravel and grass filter strip for pretreatment then into the depression. This depression is designed to infiltrate all stormwater from Drainage Area 2 that is collected during a 100-year storm.

Drainage Area 3

This 0.77-acre area in the southern portion of the Site consists of paved parking areas for the operation and maintenance buildings and landscaped islands. The paved parking areas would be pitched to the west to allow the stormwater to drain into the grass channel in Drainage Area 1 and discharge into a sediment forebay for treatment and then into an infiltration basin. An outlet control structure manages the water level in the basin and directs stormwater to the existing closed drainage system that discharges to the Taunton River.

Drainage Area 4

This 3.60-acre area in the eastern portion of the Site consists of existing landscaped areas and that would be slightly re-graded to allow for the installation of two sediment forebays and an infiltration basin. Runoff from the grass area would sheet flow to the infiltration basin. Stormwater from the driveway would sheet flow through a gravel and grass filter strip for pretreatment then into the infiltration basin. An outlet control structure manages the water level in the basin and directs stormwater to the existing closed drainage system that discharges to the Taunton River. The Best Management Practices (BMPs) in Drainage Area 4 manage the runoff from Drainage Areas 1, 3, 4 and 5.

Drainage Area 5

This 4.83-acre area in the western portion of the Site consists of a paved driveway for access to the site, layover tracks, and access aisles around the layover tracks. In the proposed condition, stormwater from the layover tracks would drain to underdrains that would be fed into an oil grit separator and then outlet into a sediment forebay before entering an infiltration basin. An outlet control structure manages the water

level in the basin and directs stormwater to the existing closed drainage system that discharges to the Taunton River.

Drainage Area 6

This 0.73-acre area in the northeast portion of the Site consists of predominantly landscaped area maintained from the existing condition. Stormwater would sheet flow to a depression adjacent to the access aisle around the layover tracks. This depression is designed to infiltrate all stormwater from Drainage Area 6 that is collected during a 100-year storm.

Drainage Area 7

This 1.38-acre area in the northern portion of the Site consists of predominantly landscape areas with small patches of impervious concrete pads. In the proposed condition this drainage area would be regraded to incorporate a depression. This depression is designed to infiltrate all stormwater from Drainage Area 7 that is collected during a 100-year storm.

Drainage Area 8

This 0.61-acre area in the western portion of the Site consists of unpaved area for the track ladder entering the layover yard. Under existing conditions this drainage area sheet flows to a culvert underneath the railroad right-of-way. In the proposed condition this drainage area would sheet flow untreated to the same culvert underneath the railroad ROW.

Drainage Area 9

This 0.94-acre area in the western portion of the Site consists of all grass area which would sheet flow to the ditch adjacent to the railroad ROW and ultimately discharge to the Taunton River.

Table 2 provides a summary of the proposed conditions hydrologic data.

Table 2 Proposed Conditions Hydrologic Data

Drainage Area	Discharge Location	Design Point	Area (acres)	Curve Number	Time of Concentration (min)
1	Taunton River	1	3.68	84	20.9
2	Depression 1	2	1.67	78	5.0
3	Taunton River	1	0.77	93	5.0
4	Taunton River	1	3.60	72	12.1
5	Taunton River	1	4.83	98	5.0
6	Depression 2	3	0.73	83	5.0
7	Depression 3	4	1.38	77	5.0
8	Taunton River	1	0.61	92	5.0
9	Taunton River	1	0.94	69	5.0

The Site has been designed with a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. The proposed stormwater management system has been designed to treat the 1.0 inch Water Quality Volume.

1.5 Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the Project design include:

- Grassed Channel
- Gravel and Grass Filter Strip
- Infiltration Basin
- Sediment Forebays

In general, stormwater runoff from all impervious surfaces in proposed conditions would receive some form of treatment for stormwater quality prior to discharge to the existing design points. Under existing conditions no such treatment is provided for stormwater runoff.

1.6 Hydraulic Analysis

The closed drainage system was designed for the 25-year storm event, in accordance with the Massachusetts Bay Transportation Authority *Railroad Operations, Commuter Rail Design Standards Manual*, Volume 1.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Pipe sizing calculations are included in Appendix A of this report.

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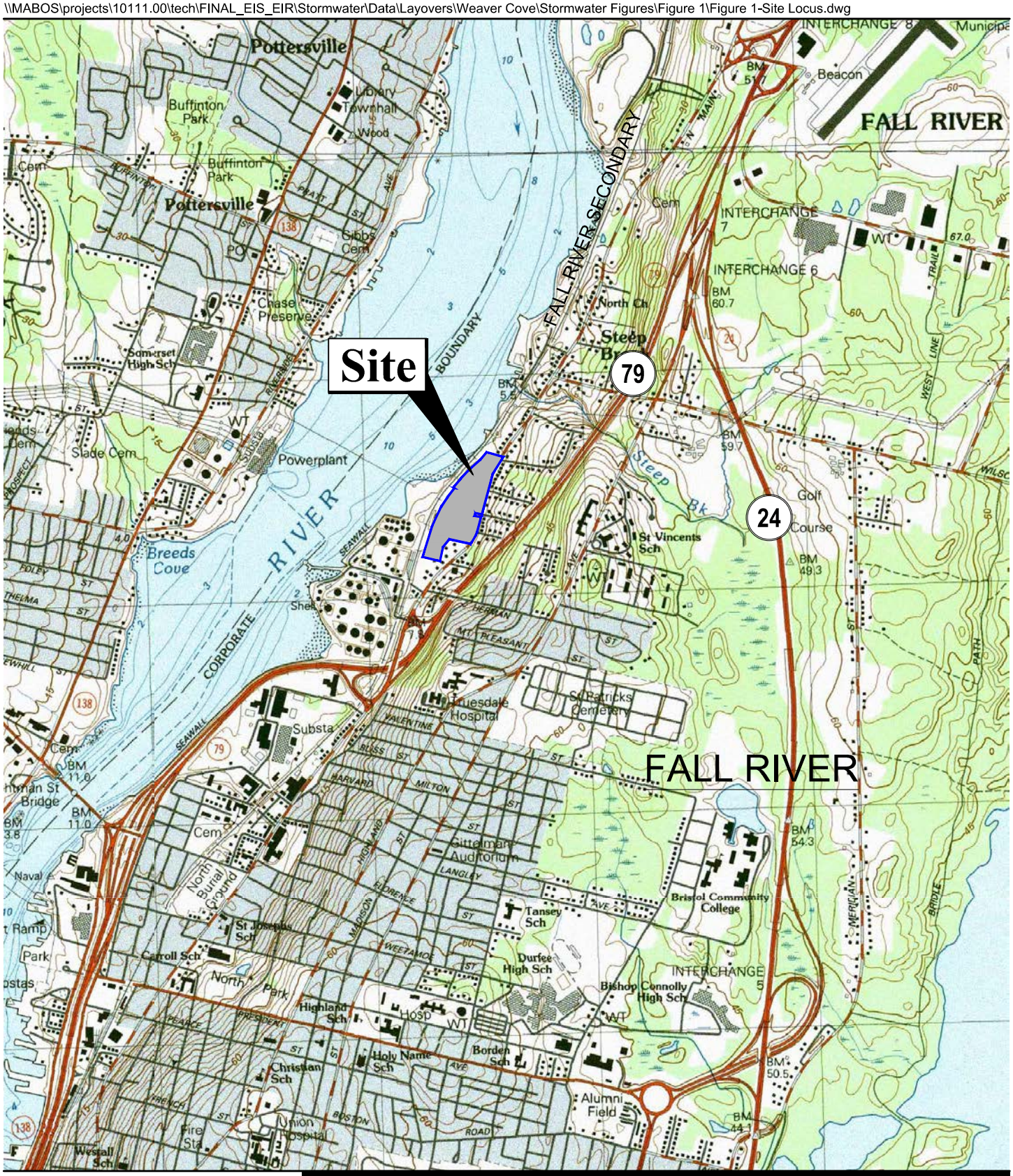

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USGS Locus Map

Weaver's Cove Layover
South Coast Rail
Fall River, Massachusetts

Figure 1
May 2012

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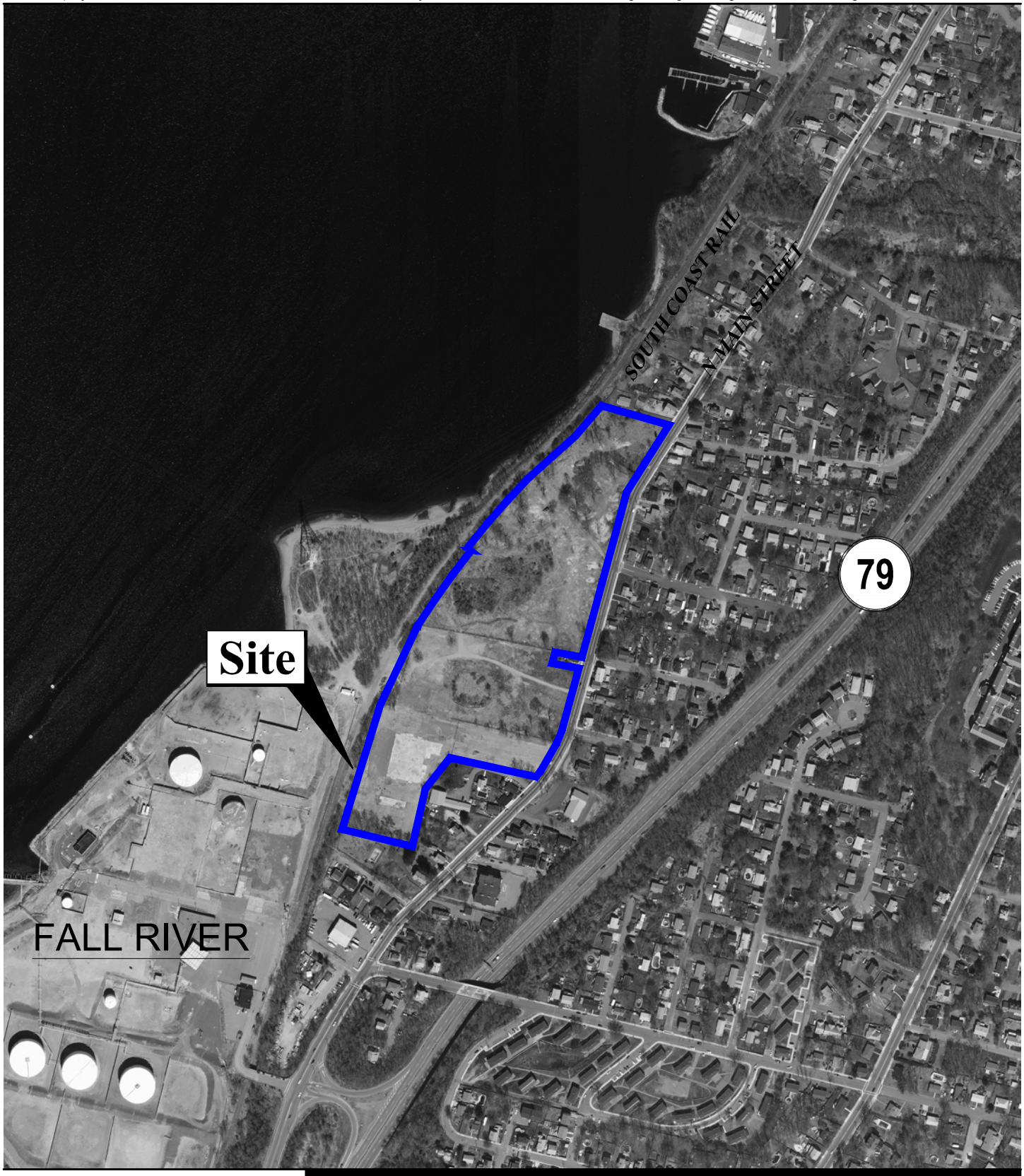

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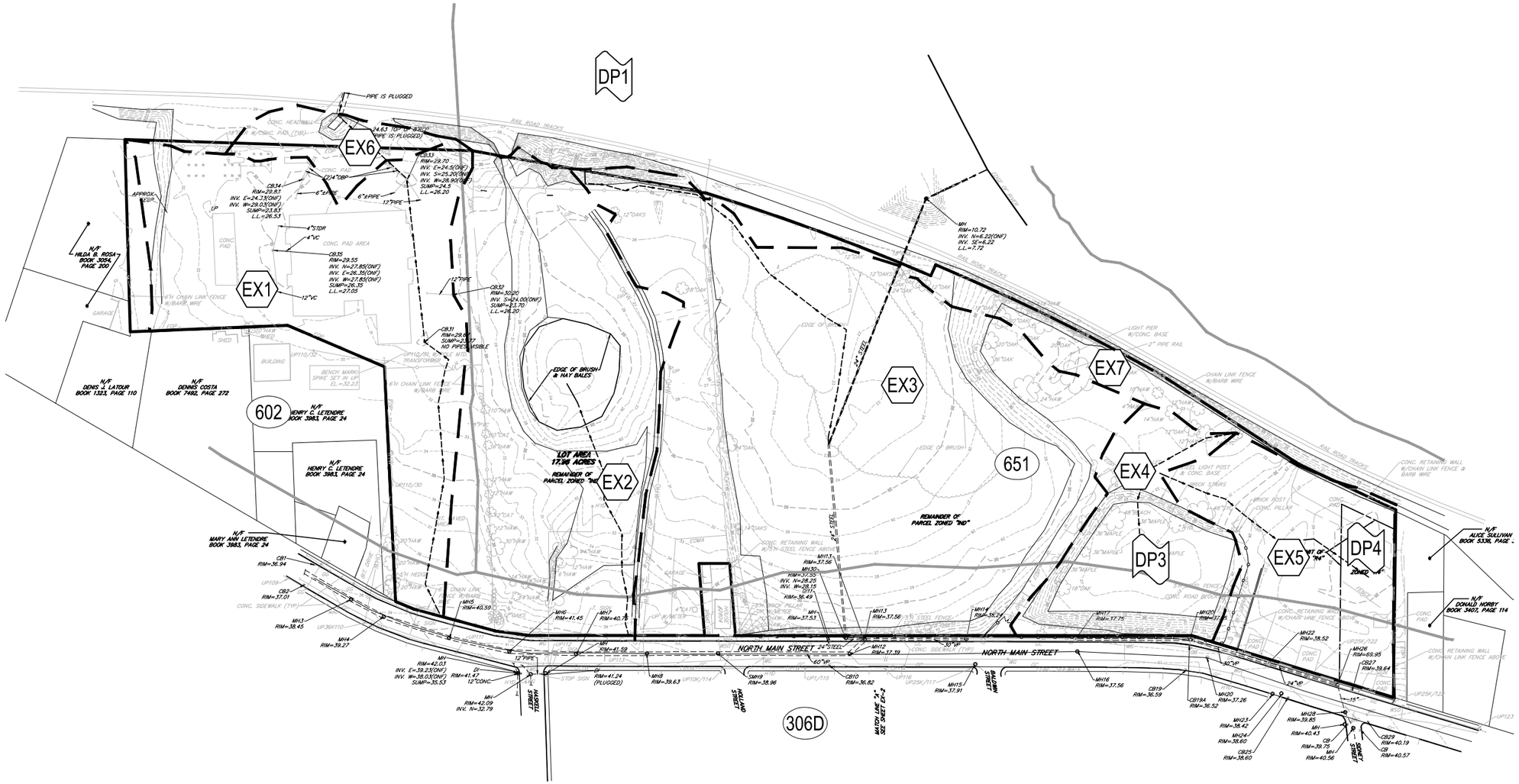
Site Aerial Map

Weaver's Cove Layover
South Coast Rail
Fall River, Massachusetts

Figure 2
May 2012



LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WETLAND BOUNDARY (WF1–300 / WF1–301)
- ACQUISITION LIMIT
- LIMIT OF WORK

NRCS SOIL CLASSIFICATIONS (HSG)

- 651 — SMOOTHED UDORTHENTS (B)
- 306D — PAXTON FINE SANDY LOAM (C)
- 602 — URBAN LAND (D)

NOTES:

1. THE PREMISES SHOWN HEREON ARE THE SAME CONVEYED TO WEAVER'S COVE ENERGY, LLC AS DESCRIBED IN THE DEED RECORDED IN THE BRISTOL COUNTY REGISTRY OF DEEDS IN BOOK 6533, PAGE 225.
2. UNDERGROUND UTILITY LOCATIONS SHOWN HEREON WERE COMPILED UTILIZING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES, AND ARE APPROXIMATE ONLY. PRIOR TO ANY EXCAVATION, ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. ALL CATCH BASIN/DROP INLETS HAVE HOODS ON PIPE OUTLETS.
4. CATCH BASIN, DROP INLET AND MANHOLES WHERE NOT OPENED UNLESS INVERTS AND SUMPS ARE INDICATED ON THE PLAN.
5. HORIZONTAL DATUM SHOWN HEREON IS BASED ON NAD 83 AND VERTICAL DATUM SHOWN HEREON IS BASED ON NGVD 1929.
6. NO TELEPHONE, CATV OR FIBER OPTIC LINES WHERE OBSERVED IN THE SURVEY AREA.

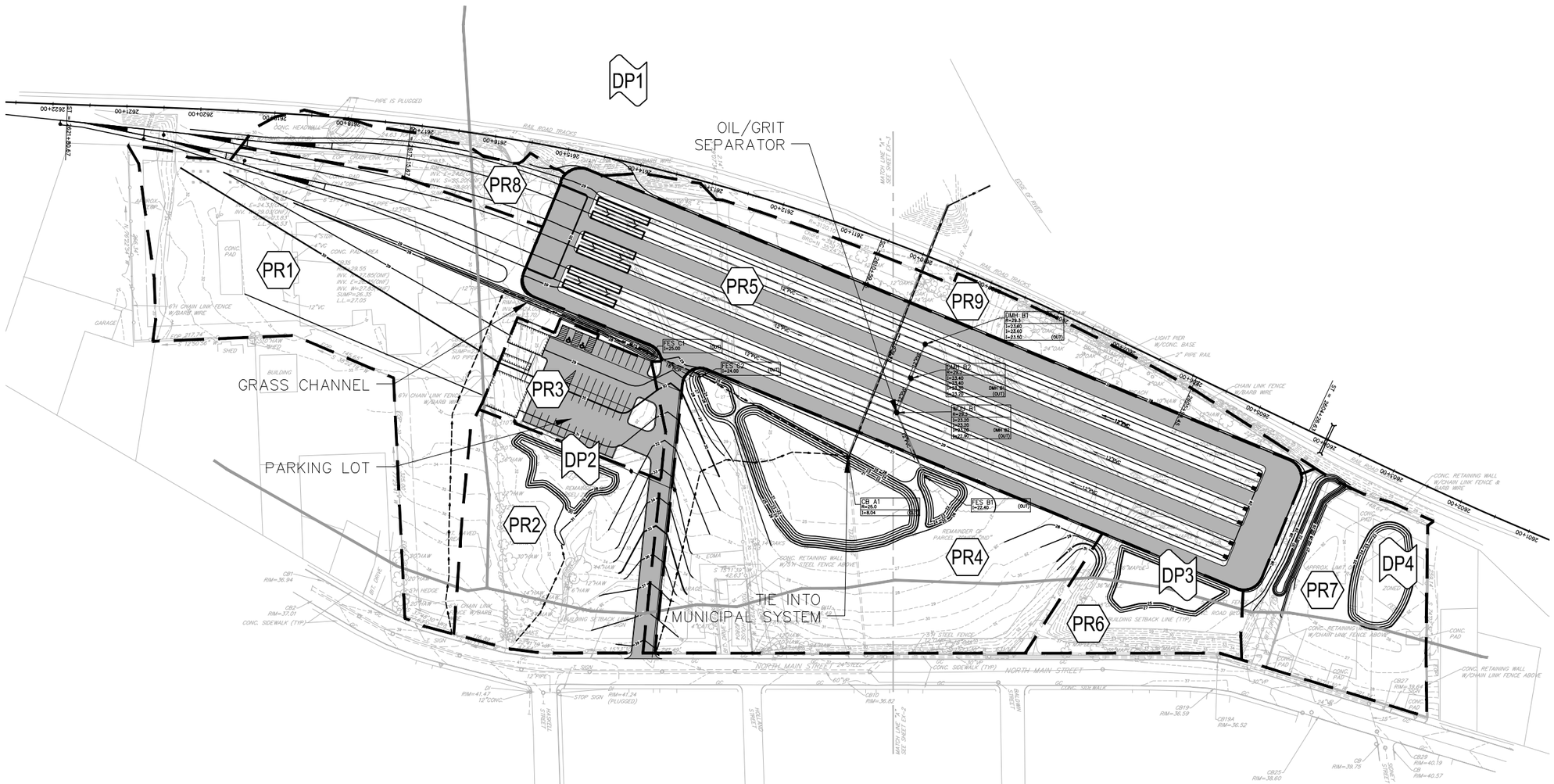
0 80 160 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3 June 2012

Existing Conditions Drainage Areas

Weaver's Cove East Layover Facility
Fall River, Massachusetts



LEGEND

- 1 — SUBCATCHMENT DRAINAGE AREA DESIGNATION
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- WETLAND BOUNDARY (WF1-300 to WF1-301)
- ACQUISITION LIMIT
- LIMIT OF WORK

NOTES:

1. THE PREMISES SHOWN HEREON ARE THE SAME CONVEYED TO WEAVER'S COVE ENERGY, LLC AS DESCRIBED IN THE DEED RECORDED IN THE BRISTOL COUNTY REGISTRY OF DEEDS IN BOOK 6533, PAGE 225.
2. UNDERGROUND UTILITY LOCATIONS SHOWN HEREON WERE COMPILED UTILIZING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES, AND ARE APPROXIMATE ONLY. PRIOR TO ANY EXCAVATION, ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. ALL CATCH BASIN/DROP INLETS HAVE HOODS ON PIPE OUTLETS.
4. CATCH BASIN, DROP INLET AND MANHOLES WHERE NOT OPENED UNLESS INVERTS AND SUMPS ARE INDICATED ON THE PLAN.
5. HORIZONTAL DATUM SHOWN HEREON IS BASED ON NAD 83 AND VERTICAL DATUM SHOWN HEREON IS BASED ON NGVD 1929.
6. NO TELEPHONE, CATV OR FIBER OPTIC LINES WHERE OBSERVED IN THE SURVEY AREA.

0 80 160 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4 June 2012

Proposed Conditions Drainage Areas

Weaver's Cove East Layover Facility
Fall River, Massachusetts

2

Regulatory Compliance

This Chapter describes the Project's compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The Project fully complies with the MassDEP Stormwater Management Standards at 310 CMR 10.05.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

No drainage from the Site discharges to wetlands. All drainage from the Site either infiltrates or discharges to the Taunton River after being treated.

The BMPs included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges would result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities. Overflows from BMPs that impound stormwater have been designed with stone to protect down gradient areas from erosion.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, and 100 years. The results of the analysis, as summarized in Table 3, indicate that there is no increase in peak discharge rates between the existing and proposed conditions. The peak discharge for Design Points 2, 3 and 4 is 0.0 cfs because all of the stormwater is

infiltrated through new depressions and will not be discharging to the same point as in the existing conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 3 Peak Discharge Rates (cfs*)

Design Point	2-year	10-year	100-year
Design Point 1: Taunton River			
Existing	14.3	22.2	33.3
Proposed	2.7	4.6	14.7
Design Point 2: Depression 1			
Existing	-	-	-
Proposed	0.0	0.0	0.0
Design Point 3: Depression 2			
Existing	0.1	1.3	5.6
Proposed	0.0	0.0	0.0
Design Point 4: Depression 3			
Existing	0.0	0.06	1.2
Proposed	0.0	0.0	0.0

Standard 3: Stormwater Recharge

Since the Site is comprised of predominantly B soils, the Project has been designed to infiltrate the required recharge volume. The addition of pervious area in the proposed conditions from the removal of concrete pads on the south side of the Site would contribute to additional recharge to groundwater.

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is 4,785 cubic feet. The Project proposes to exceed the standard of 4,785 cubic feet of recharge volume.

Recharge of stormwater has been provided through the use of four depressions. Each depression has been designed to provide the proper storage for recharge and the required square footage to ensure the depression drains completely within 72 hours.

Standard 4: Water Quality

The Project has been designed to fully comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide 80 percent total suspended solids (TSS) removal of stormwater runoff from all proposed impervious surfaces.

Computations and supporting information, including the Long-Term Pollution Prevention Plan, are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The Project is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02. Due to the storage tracks, the layover facility would be classified as a LUHPPL and would require certain BMPs to prevent contamination of local wetlands and water resources such as the Taunton River. The storage tracks would have collection trays to catch any incidental drips, leaks, or spills of hazardous materials that may occur during storage or maintenance. The collection trays would be connected to an oil/water separator that would separate petroleum products from stormwater runoff prior to discharge, protecting the Taunton River and adjacent wetlands from contamination. Any oil or other hazardous materials stored at the Site would be secured with secondary containment structures to catch any spills. With the proposed containment measures in place, the layover facility would not pose a significant risk to the Taunton River or other surface or groundwater resources at this Site.

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is a partial redevelopment, but has still been designed to fully comply with all ten of the Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project would disturb approximately 18.0 acres of land and is therefore required to obtain coverage under the US Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and the Notice of Intent for the CGP would be submitted by the contractor and owner at least 14 days before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls were discussed in the DEIS/DEIR. Appropriate controls will be prepared and implemented by the contractor and MassDOT (MBTA) during construction in accordance with the final design and NPDES SWPPP.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan will be developed by the MBTA during the final design for the Project.

Standard 10: Prohibition of Illicit Discharges

Storm drainage structures remaining from the previous development that are part of the redevelopment area will be removed and replaced. The design plans submitted with this report have been developed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage system in portions of the Site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan will include measures to prevent illicit discharges.

Appendix A
Standard 1 Computations and Supporting Information

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
101 Walnut St., Watertown, MA 02471
(617) 924-1770

Storm Drainage Computations

Name: Weaver's Cove East Layover Facility
Fall River, MA
Client: MassDOT

Proj. No.: **10111.00**
Date: **5/31/2012**
Computed by: **TJR**
Checked by:

Design Parameters:
25 **Year Storm**
k_e= **0.5**
Boston, MA **IDF Curve**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE						
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q cfs	V fps	n	PIPE SIZE	SLOPE	Q full ft^3/s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER	W.S.E. ft	Freeboard ft
A SERIES	CB A1	FES A1	12.88	0.50	6.46	6.46	1.55	20.9	3.6	23.2	3.9	0.013	24	0.0027	11.9	3.8	364	1.00	25.5	7.2	6.2	7.0	18.5
B SERIES	UD CAP B1	DMH B1	4.83	0.90	4.34	4.34	2.40	5.0	6.0	26.1	3.3	0.013	12	0.0050	2.5	3.2	480	2.40	29.5	26.0	23.6	25.9	3.6
	UD CAP B2	DMH B1	4.83	0.90	4.34	4.34	2.44	5.0	6.0	26.1	3.3	0.013	12	0.0049	2.5	3.2	485	2.40	29.5	26.0	23.6	25.9	3.6
	UD CAP B3	DMH B2	4.83	0.90	4.34	4.34	2.30	5.0	6.0	26.1	3.5	0.013	12	0.0055	2.6	3.4	480	2.62	29.5	26.0	23.4	25.8	3.7
	UD CAP B4	DMH B2	4.83	0.90	4.34	4.34	2.33	5.0	6.0	26.1	3.5	0.013	12	0.0054	2.6	3.3	485	2.62	29.5	26.0	23.4	25.9	3.6
	UD CAP B5	WQU B1	4.83	0.90	4.34	4.34	2.20	5.0	6.0	26.1	3.6	0.013	12	0.0059	2.7	3.5	480	2.84	29.5	26.0	23.2	25.8	3.7
	UD CAP B6	WQU B1	4.83	0.90	4.34	4.34	2.24	5.0	6.0	26.1	3.6	0.013	12	0.0059	2.7	3.5	485	2.84	29.5	26.0	23.2	25.8	3.7
	DMH B1	DMH B2	4.83	0.90	4.34	4.34	0.23	5.0	6.0	26.1	3.2	0.013	12	0.0046	2.4	3.1	43	0.20	29.3	23.6	23.4	23.5	5.9
	DMH B2	WQU B1	4.83	0.90	4.34	4.34	0.21	5.0	6.0	26.1	3.5	0.013	12	0.0055	2.7	3.4	43	0.24	29.3	23.4	23.2	23.2	6.1
	WQU B1	FES B1	4.83	0.90	4.34	4.34	0.12	5.0	6.0	26.1	6.0	0.013	12	0.0162	4.5	5.8	43	0.70	29.3	23.2	22.5	22.8	6.6
C SERIES	FES C1	FES C2	4.46	0.30	1.33	1.33	0.22	20.9	3.6	4.8	5.4	0.013	18	0.0138	12.3	7.0	72	1.00	29.0	25.0	24.0	24.6	4.4

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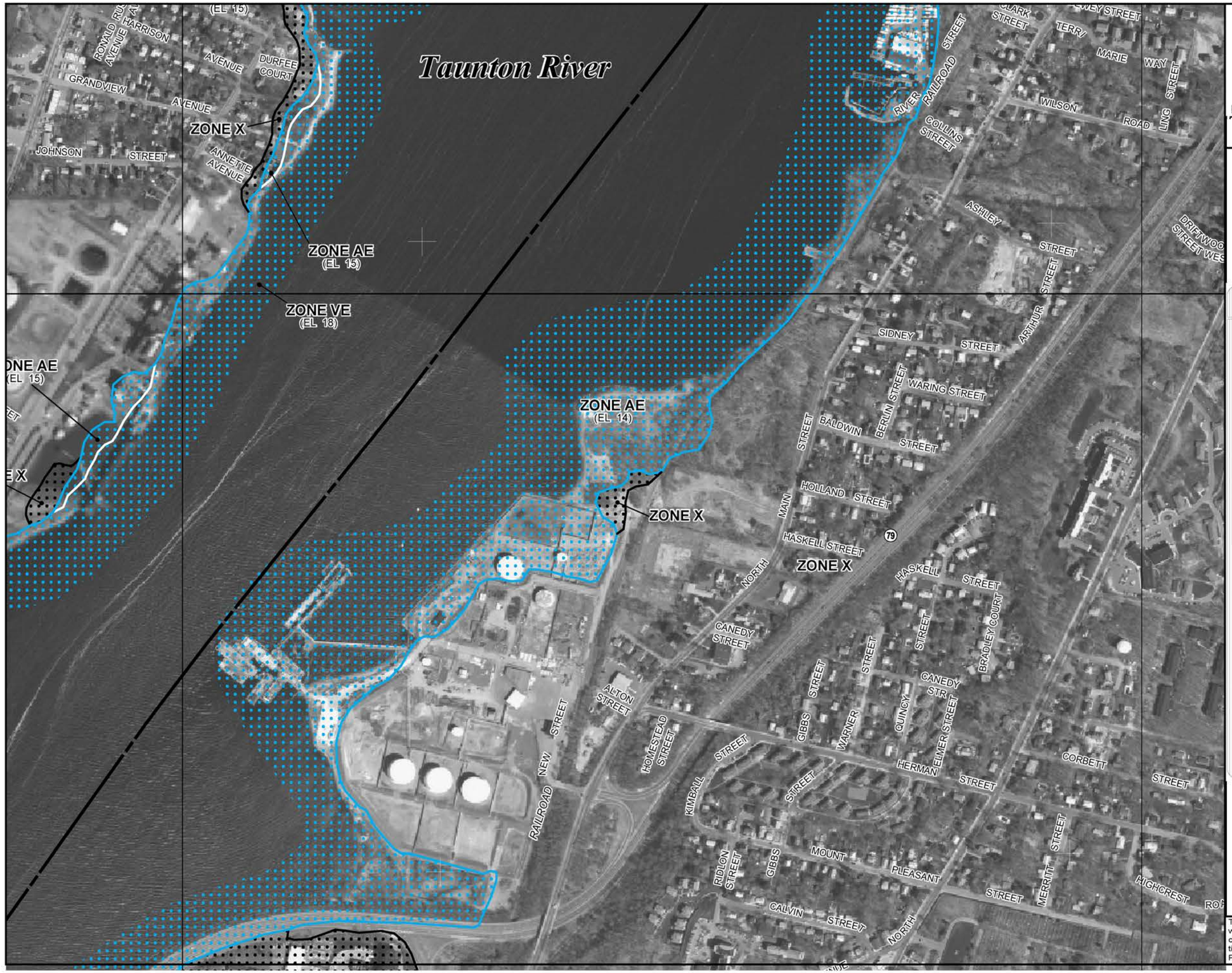
Appendix B
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm event for Bristol County. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

FEMA Flood Maps



MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0332F

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 332 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FALL RIVER, CITY OF	250055	0332	F
SOMERSET, TOWN OF	255220	0332	F
SWANSEA, TOWN OF	255221	0332	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

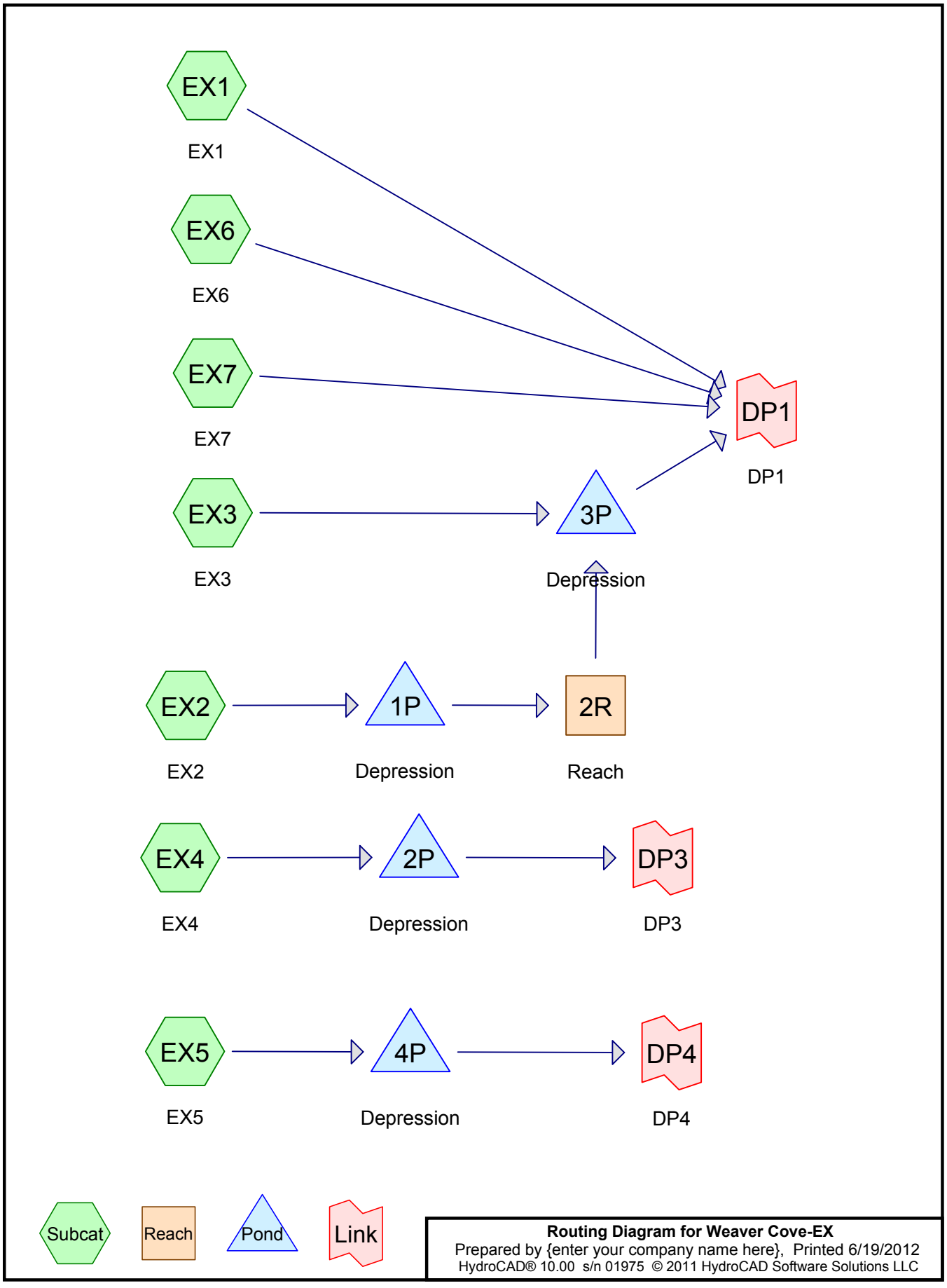
MAP NUMBER
25005C0332F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

HydroCAD Analysis: Existing Conditions



Routing Diagram for Weaver Cove-EX

Prepared by {enter your company name here}, Printed 6/19/2012

HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
11.105	69	50-75% Grass cover, Fair, HSG B (EX1, EX2, EX3, EX4, EX5, EX7)
2.163	79	50-75% Grass cover, Fair, HSG C (EX2, EX3, EX4, EX5)
0.274	84	50-75% Grass cover, Fair, HSG D (EX1, EX6)
0.131	85	Gravel roads, HSG B (EX2, EX3)
0.009	89	Gravel roads, HSG C (EX3)
3.079	98	Paved parking, HSG B (EX1)
0.722	98	Unconnected pavement, HSG B (EX1, EX2, EX3, EX4, EX5)
0.296	98	Unconnected pavement, HSG C (EX2, EX3, EX5)
0.419	98	Unconnected pavement, HSG D (EX2, EX6)
18.198	**78**	**TOTAL AREA**

2-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=3.212 ac 99.63% Impervious Runoff Depth>3.17"
Flow Length=813' Tc=5.0 min CN=98 Runoff=10.68 cfs 0.847 af

SubcatchmentEX2: EX2 Runoff Area=3.831 ac 14.54% Impervious Runoff Depth>1.05"
Flow Length=366' Tc=7.8 min UI Adjusted CN=72 Runoff=4.12 cfs 0.337 af

SubcatchmentEX3: EX3 Runoff Area=7.145 ac 2.67% Impervious Runoff Depth>1.00"
Flow Length=929' Tc=19.4 min CN=71 Runoff=5.25 cfs 0.593 af

SubcatchmentEX4: EX4 Runoff Area=1.336 ac 2.10% Impervious Runoff Depth>1.11"
Flow Length=227' Tc=7.7 min UI Adjusted CN=73 Runoff=1.54 cfs 0.124 af

SubcatchmentEX5: EX5 Runoff Area=1.621 ac 23.32% Impervious Runoff Depth>1.23"
Flow Length=331' Tc=21.4 min UI Adjusted CN=75 Runoff=1.47 cfs 0.166 af

SubcatchmentEX6: EX6 Runoff Area=0.427 ac 37.94% Impervious Runoff Depth>2.26"
Tc=5.0 min CN=89 Runoff=1.13 cfs 0.081 af

SubcatchmentEX7: EX7 Runoff Area=0.626 ac 0.00% Impervious Runoff Depth>0.89"
Tc=5.0 min CN=69 Runoff=0.60 cfs 0.047 af

Reach 2R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=600.0' S=0.0037 '/' Capacity=2.03 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: Depression Peak Elev=24.45' Storage=14,654 cf Inflow=4.12 cfs 0.337 af
Outflow=0.00 cfs 0.000 af

Pond 2P: Depression Peak Elev=27.51' Storage=3,798 cf Inflow=1.54 cfs 0.124 af
Outflow=0.09 cfs 0.038 af

Pond 3P: Depression Peak Elev=22.73' Storage=609 cf Inflow=5.25 cfs 0.593 af
Outflow=4.72 cfs 0.593 af

Pond 4P: Depression Peak Elev=25.64' Storage=7,206 cf Inflow=1.47 cfs 0.166 af
Outflow=0.00 cfs 0.000 af

Link DP1: DP1 Inflow=14.32 cfs 1.567 af
Primary=14.32 cfs 1.567 af

Link DP3: DP3 Inflow=0.09 cfs 0.038 af
Primary=0.09 cfs 0.038 af

Link DP4: DP4 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 18.198 ac Runoff Volume = 2.193 af Average Runoff Depth = 1.45"
75.18% Pervious = 13.682 ac 24.82% Impervious = 4.516 ac

Summary for Subcatchment EX1: EX1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 10.68 cfs @ 12.07 hrs, Volume= 0.847 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG B
0.108	98	Unconnected pavement, HSG B
3.079	98	Paved parking, HSG B
0.003	69	50-75% Grass cover, Fair, HSG B
0.009	84	50-75% Grass cover, Fair, HSG D
3.212	98	Weighted Average
0.012		0.37% Pervious Area
3.200		99.63% Impervious Area
0.121		3.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0240	1.33		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.40"
1.6	308	0.0263	3.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	398	0.0100	5.90	4.63	**Pipe Channel, assume pipe goes with 1% slope** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.3					**Direct Entry, dirct entry to 5 min time concentration**
5.0	813	Total			

Summary for Subcatchment EX2: EX2

Runoff = 4.12 cfs @ 12.12 hrs, Volume= 0.337 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.193	98	Unconnected pavement, HSG B
0.107	98	Unconnected pavement, HSG C
0.257	98	Unconnected pavement, HSG D
2.933	69	50-75% Grass cover, Fair, HSG B
0.278	79	50-75% Grass cover, Fair, HSG C
0.063	85	Gravel roads, HSG B
3.831	74	Weighted Average, UI Adjusted CN = 72
3.274		85.46% Pervious Area
0.557		14.54% Impervious Area
0.557		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.4	209	0.0430	1.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	107	0.0634	1.76		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	366	Total			

Summary for Subcatchment EX3: EX3

Runoff = 5.25 cfs @ 12.30 hrs, Volume= 0.593 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.086	98	Unconnected pavement, HSG B
0.105	98	Unconnected pavement, HSG C
5.931	69	50-75% Grass cover, Fair, HSG B
0.946	79	50-75% Grass cover, Fair, HSG C
0.068	85	Gravel roads, HSG B
0.009	89	Gravel roads, HSG C
7.145	71	Weighted Average
6.954		97.33% Pervious Area
0.191		2.67% Impervious Area
0.191		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	17	0.4819	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
5.5	219	0.0091	0.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.4	221	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	107	0.0034	0.41		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
19.4	929	Total			

Summary for Subcatchment EX4: EX4

Runoff = 1.54 cfs @ 12.12 hrs, Volume= 0.124 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.028	98	Unconnected pavement, HSG B
0.000	98	Unconnected pavement, HSG C
0.782	69	50-75% Grass cover, Fair, HSG B
0.526	79	50-75% Grass cover, Fair, HSG C
1.336	74	Weighted Average, UI Adjusted CN = 73
1.308		97.90% Pervious Area
0.028		2.10% Impervious Area
0.028		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	43	0.0384	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
3.3	123	0.0081	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.2780	3.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	43	0.0282	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	227	Total			

Summary for Subcatchment EX5: EX5

Runoff = 1.47 cfs @ 12.32 hrs, Volume= 0.166 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.294	98	Unconnected pavement, HSG B
0.084	98	Unconnected pavement, HSG C
0.830	69	50-75% Grass cover, Fair, HSG B
0.413	79	50-75% Grass cover, Fair, HSG C
1.621	78	Weighted Average, UI Adjusted CN = 75
1.243		76.68% Pervious Area
0.378		23.32% Impervious Area
0.378		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0012	0.05		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
0.6	45	0.0378	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	97	0.0515	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	139	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	331	Total			

Summary for Subcatchment EX6: EX6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.13 cfs @ 12.07 hrs, Volume= 0.081 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.162	98	Unconnected pavement, HSG D
0.265	84	50-75% Grass cover, Fair, HSG D
0.427	89	Weighted Average
0.265		62.06% Pervious Area
0.162		37.94% Impervious Area
0.162		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment EX7: EX7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 0.047 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.626	69	50-75% Grass cover, Fair, HSG B
0.626		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 2R: Reach

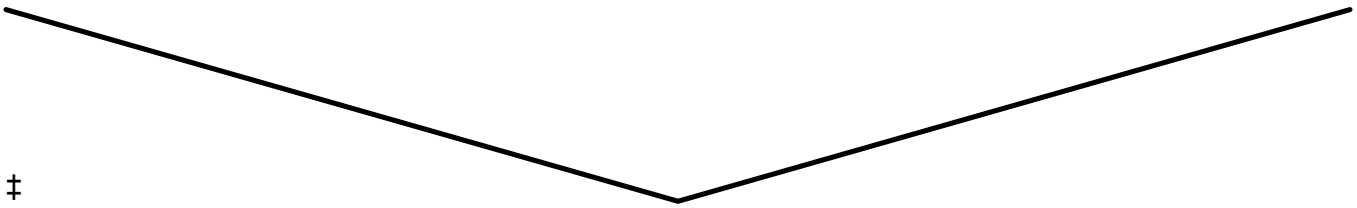
Assumed

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 2.03 cfs

0.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 8.00'
Length= 600.0' Slope= 0.0037 '/'
Inlet Invert= 24.50', Outlet Invert= 22.30'



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Summary for Pond 1P: Depression

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth > 1.05" for 2-Year event
Inflow = 4.12 cfs @ 12.12 hrs, Volume= 0.337 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 24.45' @ 24.00 hrs Surf.Area= 17,313 sf Storage= 14,654 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	54,543 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
23.00	3,560	227.0	0	0	3,560
24.00	13,186	521.0	7,866	7,866	21,064
25.00	23,209	669.0	17,963	25,829	35,092
26.00	34,597	756.0	28,714	54,543	44,983

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**174.6 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=23.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 1.11" for 2-Year event
Inflow = 1.54 cfs @ 12.12 hrs, Volume= 0.124 af
Outflow = 0.09 cfs @ 15.55 hrs, Volume= 0.038 af, Atten= 94%, Lag= 205.7 min
Primary = 0.09 cfs @ 15.55 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 27.51' @ 15.55 hrs Surf.Area= 10,954 sf Storage= 3,798 cf

Plug-Flow detention time= 383.4 min calculated for 0.038 af (31% of inflow)
Center-of-Mass det. time= 244.0 min (1,106.1 - 862.1)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	13,008 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	531	116.5	0	0	531
27.00	1,512	533.3	980	980	22,086
28.00	28,059	659.5	12,028	13,008	34,080

Device	Routing	Invert	Outlet Devices
#1	Primary	27.50'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=0.04 cfs @ 15.55 hrs HW=27.51' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.04 cfs @ 0.26 fps)

Summary for Pond 3P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.43' @ 12.40 hrs

Inflow Area = 10.976 ac, 6.81% Impervious, Inflow Depth > 0.65" for 2-Year event
Inflow = 5.25 cfs @ 12.30 hrs, Volume= 0.593 af
Outflow = 4.72 cfs @ 12.40 hrs, Volume= 0.593 af, Atten= 10%, Lag= 6.3 min
Primary = 4.72 cfs @ 12.40 hrs, Volume= 0.593 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 22.73' @ 12.40 hrs Surf.Area= 4,270 sf Storage= 609 cf

Plug-Flow detention time= 0.6 min calculated for 0.593 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (878.1 - 877.5)

Volume	Invert	Avail.Storage	Storage Description
#1	22.30'	36,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.30	0	0.0	0	0	0
23.00	11,429	748.0	2,667	2,667	44,525
24.00	62,091	1,002.0	33,386	36,053	79,908

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round Culvert** L= 365.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.012 Steel, smooth, Flow Area= 3.14 sf
#2	Device 1	22.30'	**6.0" x 1.5" Horiz. Orifice/Grate X 3.00 columns** X 8 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Primary	23.09'	**178.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=4.72 cfs @ 12.40 hrs HW=22.73' (Free Discharge)
- **1=Culvert** (Passes 4.72 cfs of 41.41 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 4.72 cfs @ 3.15 fps)
- **3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Depression

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth > 1.23" for 2-Year event
Inflow = 1.47 cfs @ 12.32 hrs, Volume= 0.166 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.64' @ 24.00 hrs Surf.Area= 15,389 sf Storage= 7,206 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	13,753 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	7,632	406.6	0	0	7,632
26.00	20,975	659.9	13,753	13,753	29,136

Device	Routing	Invert	Outlet Devices
#1	Primary	25.95'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Link DP1: DP1

Inflow Area = 15.241 ac, 26.97% Impervious, Inflow Depth > 1.23" for 2-Year event
Inflow = 14.32 cfs @ 12.08 hrs, Volume= 1.567 af
Primary = 14.32 cfs @ 12.08 hrs, Volume= 1.567 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 0.35" for 2-Year event
Inflow = 0.09 cfs @ 15.55 hrs, Volume= 0.038 af
Primary = 0.09 cfs @ 15.55 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 Runoff Area=3.212 ac 99.63% Impervious Runoff Depth>4.56"
Flow Length=813' Tc=5.0 min CN=98 Runoff=15.17 cfs 1.221 af

Subcatchment EX2: EX2 Runoff Area=3.831 ac 14.54% Impervious Runoff Depth>2.04"
Flow Length=366' Tc=7.8 min UI Adjusted CN=72 Runoff=8.40 cfs 0.652 af

Subcatchment EX3: EX3 Runoff Area=7.145 ac 2.67% Impervious Runoff Depth>1.96"
Flow Length=929' Tc=19.4 min CN=71 Runoff=10.95 cfs 1.166 af

Subcatchment EX4: EX4 Runoff Area=1.336 ac 2.10% Impervious Runoff Depth>2.12"
Flow Length=227' Tc=7.7 min UI Adjusted CN=73 Runoff=3.07 cfs 0.236 af

Subcatchment EX5: EX5 Runoff Area=1.621 ac 23.32% Impervious Runoff Depth>2.28"
Flow Length=331' Tc=21.4 min UI Adjusted CN=75 Runoff=2.82 cfs 0.308 af

Subcatchment EX6: EX6 Runoff Area=0.427 ac 37.94% Impervious Runoff Depth>3.58"
Tc=5.0 min CN=89 Runoff=1.76 cfs 0.127 af

Subcatchment EX7: EX7 Runoff Area=0.626 ac 0.00% Impervious Runoff Depth>1.81"
Tc=5.0 min CN=69 Runoff=1.30 cfs 0.095 af

Reach 2R: Reach Avg. Flow Depth=0.16' Max Vel=0.47 fps Inflow=0.10 cfs 0.016 af
n=0.035 L=600.0' S=0.0037 '/' Capacity=2.03 cfs Outflow=0.08 cfs 0.011 af

Pond 1P: Depression Peak Elev=25.08' Storage=27,684 cf Inflow=8.40 cfs 0.652 af
Outflow=0.10 cfs 0.016 af

Pond 2P: Depression Peak Elev=27.54' Storage=4,181 cf Inflow=3.07 cfs 0.236 af
Outflow=1.29 cfs 0.150 af

Pond 3P: Depression Peak Elev=23.18' Storage=5,252 cf Inflow=10.95 cfs 1.177 af
Outflow=7.12 cfs 1.177 af

Pond 4P: Depression Peak Elev=25.96' Storage=12,977 cf Inflow=2.82 cfs 0.308 af
Outflow=0.06 cfs 0.010 af

Link DP1: DP1 Inflow=22.23 cfs 2.620 af
Primary=22.23 cfs 2.620 af

Link DP3: DP3 Inflow=1.29 cfs 0.150 af
Primary=1.29 cfs 0.150 af

Link DP4: DP4 Inflow=0.06 cfs 0.010 af
Primary=0.06 cfs 0.010 af

Total Runoff Area = 18.198 ac Runoff Volume = 3.804 af Average Runoff Depth = 2.51"
75.18% Pervious = 13.682 ac 24.82% Impervious = 4.516 ac

Summary for Subcatchment EX1: EX1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 15.17 cfs @ 12.07 hrs, Volume= 1.221 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG B
0.108	98	Unconnected pavement, HSG B
3.079	98	Paved parking, HSG B
0.003	69	50-75% Grass cover, Fair, HSG B
0.009	84	50-75% Grass cover, Fair, HSG D
3.212	98	Weighted Average
0.012		0.37% Pervious Area
3.200		99.63% Impervious Area
0.121		3.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0240	1.33		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.40"
1.6	308	0.0263	3.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	398	0.0100	5.90	4.63	**Pipe Channel, assume pipe goes with 1% slope** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.3					**Direct Entry, dirct entry to 5 min time concentration**
5.0	813	Total			

Summary for Subcatchment EX2: EX2

Runoff = 8.40 cfs @ 12.12 hrs, Volume= 0.652 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.193	98	Unconnected pavement, HSG B
0.107	98	Unconnected pavement, HSG C
0.257	98	Unconnected pavement, HSG D
2.933	69	50-75% Grass cover, Fair, HSG B
0.278	79	50-75% Grass cover, Fair, HSG C
0.063	85	Gravel roads, HSG B
3.831	74	Weighted Average, UI Adjusted CN = 72
3.274		85.46% Pervious Area
0.557		14.54% Impervious Area
0.557		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.4	209	0.0430	1.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	107	0.0634	1.76		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	366	Total			

Summary for Subcatchment EX3: EX3

Runoff = 10.95 cfs @ 12.28 hrs, Volume= 1.166 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.086	98	Unconnected pavement, HSG B
0.105	98	Unconnected pavement, HSG C
5.931	69	50-75% Grass cover, Fair, HSG B
0.946	79	50-75% Grass cover, Fair, HSG C
0.068	85	Gravel roads, HSG B
0.009	89	Gravel roads, HSG C
7.145	71	Weighted Average
6.954		97.33% Pervious Area
0.191		2.67% Impervious Area
0.191		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	17	0.4819	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
5.5	219	0.0091	0.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.4	221	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	107	0.0034	0.41		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
19.4	929	Total			

Summary for Subcatchment EX4: EX4

Runoff = 3.07 cfs @ 12.12 hrs, Volume= 0.236 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.028	98	Unconnected pavement, HSG B
0.000	98	Unconnected pavement, HSG C
0.782	69	50-75% Grass cover, Fair, HSG B
0.526	79	50-75% Grass cover, Fair, HSG C
1.336	74	Weighted Average, UI Adjusted CN = 73
1.308		97.90% Pervious Area
0.028		2.10% Impervious Area
0.028		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	43	0.0384	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
3.3	123	0.0081	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.2780	3.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	43	0.0282	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	227	Total			

Summary for Subcatchment EX5: EX5

Runoff = 2.82 cfs @ 12.30 hrs, Volume= 0.308 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.294	98	Unconnected pavement, HSG B
0.084	98	Unconnected pavement, HSG C
0.830	69	50-75% Grass cover, Fair, HSG B
0.413	79	50-75% Grass cover, Fair, HSG C
1.621	78	Weighted Average, UI Adjusted CN = 75
1.243		76.68% Pervious Area
0.378		23.32% Impervious Area
0.378		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0012	0.05		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
0.6	45	0.0378	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	97	0.0515	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	139	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	331	Total			

Summary for Subcatchment EX6: EX6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.76 cfs @ 12.07 hrs, Volume= 0.127 af, Depth> 3.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.162	98	Unconnected pavement, HSG D
0.265	84	50-75% Grass cover, Fair, HSG D
0.427	89	Weighted Average
0.265		62.06% Pervious Area
0.162		37.94% Impervious Area
0.162		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment EX7: EX7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.095 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.626	69	50-75% Grass cover, Fair, HSG B
0.626		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 2R: Reach

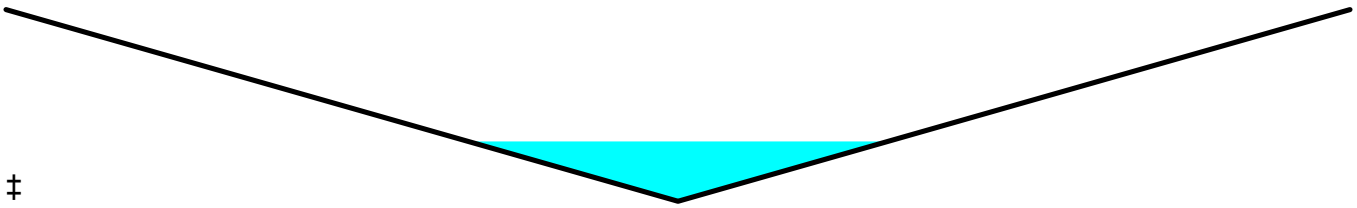
Assumed

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth > 0.05" for 10-Year event
Inflow = 0.10 cfs @ 24.00 hrs, Volume= 0.016 af
Outflow = 0.08 cfs @ 24.00 hrs, Volume= 0.011 af, Atten= 12%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.47 fps, Min. Travel Time= 21.4 min
Avg. Velocity = 0.32 fps, Avg. Travel Time= 30.8 min

Peak Storage= 117 cf @ 24.00 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 2.03 cfs

0.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 8.00'
Length= 600.0' Slope= 0.0037 '/'
Inlet Invert= 24.50', Outlet Invert= 22.30'



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Summary for Pond 1P: Depression

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth > 2.04" for 10-Year event
Inflow = 8.40 cfs @ 12.12 hrs, Volume= 0.652 af
Outflow = 0.10 cfs @ 24.00 hrs, Volume= 0.016 af, Atten= 99%, Lag= 713.0 min
Primary = 0.10 cfs @ 24.00 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.08' @ 24.00 hrs Surf.Area= 24,021 sf Storage= 27,684 cf

Plug-Flow detention time= 716.2 min calculated for 0.016 af (3% of inflow)
Center-of-Mass det. time= 516.5 min (1,362.0 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	54,543 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
23.00	3,560	227.0	0	0	3,560
24.00	13,186	521.0	7,866	7,866	21,064
25.00	23,209	669.0	17,963	25,829	35,092
26.00	34,597	756.0	28,714	54,543	44,983

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**174.6 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=0.09 cfs @ 24.00 hrs HW=25.08' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.09 cfs @ 0.69 fps)

Summary for Pond 2P: Depression

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 2.12" for 10-Year event
Inflow = 3.07 cfs @ 12.12 hrs, Volume= 0.236 af
Outflow = 1.29 cfs @ 12.42 hrs, Volume= 0.150 af, Atten= 58%, Lag= 18.0 min
Primary = 1.29 cfs @ 12.42 hrs, Volume= 0.150 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 27.54' @ 12.42 hrs Surf.Area= 11,875 sf Storage= 4,181 cf

Plug-Flow detention time= 191.7 min calculated for 0.150 af (64% of inflow)
Center-of-Mass det. time= 83.5 min (926.3 - 842.8)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	13,008 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	531	116.5	0	0	531
27.00	1,512	533.3	980	980	22,086
28.00	28,059	659.5	12,028	13,008	34,080

Device	Routing	Invert	Outlet Devices
#1	Primary	27.50'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=1.17 cfs @ 12.42 hrs HW=27.54' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.17 cfs @ 0.52 fps)

Summary for Pond 3P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.88' @ 12.55 hrs

Inflow Area = 10.976 ac, 6.81% Impervious, Inflow Depth > 1.29" for 10-Year event
Inflow = 10.95 cfs @ 12.28 hrs, Volume= 1.177 af
Outflow = 7.12 cfs @ 12.54 hrs, Volume= 1.177 af, Atten= 35%, Lag= 15.5 min
Primary = 7.12 cfs @ 12.54 hrs, Volume= 1.177 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 23.18' @ 12.54 hrs Surf.Area= 17,552 sf Storage= 5,252 cf

Plug-Flow detention time= 3.9 min calculated for 1.174 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (865.9 - 862.0)

Volume	Invert	Avail.Storage	Storage Description
#1	22.30'	36,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.30	0	0.0	0	0	0
23.00	11,429	748.0	2,667	2,667	44,525
24.00	62,091	1,002.0	33,386	36,053	79,908

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round Culvert** L= 365.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.012 Steel, smooth, Flow Area= 3.14 sf
#2	Device 1	22.30'	**6.0" x 1.5" Horiz. Orifice/Grate X 3.00 columns** X 8 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Primary	23.09'	**178.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=7.11 cfs @ 12.54 hrs HW=23.18' (Free Discharge)
- **1=Culvert** (Passes 6.77 cfs of 42.05 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 6.77 cfs @ 4.51 fps)
- **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.33 cfs @ 0.73 fps)

Summary for Pond 4P: Depression

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth > 2.28" for 10-Year event
Inflow = 2.82 cfs @ 12.30 hrs, Volume= 0.308 af
Outflow = 0.06 cfs @ 23.30 hrs, Volume= 0.010 af, Atten= 98%, Lag= 659.8 min
Primary = 0.06 cfs @ 23.30 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.96' @ 23.30 hrs Surf.Area= 20,355 sf Storage= 12,977 cf

Plug-Flow detention time= 735.9 min calculated for 0.010 af (3% of inflow)
Center-of-Mass det. time= 529.5 min (1,378.0 - 848.4)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	13,753 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	7,632	406.6	0	0	7,632
26.00	20,975	659.9	13,753	13,753	29,136

Device	Routing	Invert	Outlet Devices
#1	Primary	25.95'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=0.05 cfs @ 23.30 hrs HW=25.96' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.05 cfs @ 0.27 fps)

Summary for Link DP1: DP1

Inflow Area = 15.241 ac, 26.97% Impervious, Inflow Depth > 2.06" for 10-Year event
Inflow = 22.23 cfs @ 12.08 hrs, Volume= 2.620 af
Primary = 22.23 cfs @ 12.08 hrs, Volume= 2.620 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 1.35" for 10-Year event
Inflow = 1.29 cfs @ 12.42 hrs, Volume= 0.150 af
Primary = 1.29 cfs @ 12.42 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth > 0.07" for 10-Year event
Inflow = 0.06 cfs @ 23.30 hrs, Volume= 0.010 af
Primary = 0.06 cfs @ 23.30 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event - Existing

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 Runoff Area=3.212 ac 99.63% Impervious Runoff Depth>6.76"
Flow Length=813' Tc=5.0 min CN=98 Runoff=22.20 cfs 1.809 af

SubcatchmentEX2: EX2 Runoff Area=3.831 ac 14.54% Impervious Runoff Depth>3.82"
Flow Length=366' Tc=7.8 min UI Adjusted CN=72 Runoff=15.96 cfs 1.221 af

SubcatchmentEX3: EX3 Runoff Area=7.145 ac 2.67% Impervious Runoff Depth>3.71"
Flow Length=929' Tc=19.4 min CN=71 Runoff=21.23 cfs 2.209 af

SubcatchmentEX4: EX4 Runoff Area=1.336 ac 2.10% Impervious Runoff Depth>3.93"
Flow Length=227' Tc=7.7 min UI Adjusted CN=73 Runoff=5.74 cfs 0.438 af

SubcatchmentEX5: EX5 Runoff Area=1.621 ac 23.32% Impervious Runoff Depth>4.13"
Flow Length=331' Tc=21.4 min UI Adjusted CN=75 Runoff=5.15 cfs 0.558 af

SubcatchmentEX6: EX6 Runoff Area=0.427 ac 37.94% Impervious Runoff Depth>5.71"
Tc=5.0 min CN=89 Runoff=2.73 cfs 0.203 af

SubcatchmentEX7: EX7 Runoff Area=0.626 ac 0.00% Impervious Runoff Depth>3.51"
Tc=5.0 min CN=69 Runoff=2.58 cfs 0.183 af

Reach 2R: Reach Avg. Flow Depth=0.43' Max Vel=0.92 fps Inflow=1.38 cfs 0.566 af
n=0.035 L=600.0' S=0.0037 '/' Capacity=2.03 cfs Outflow=1.37 cfs 0.557 af

Pond 1P: Depression Peak Elev=25.23' Storage=31,524 cf Inflow=15.96 cfs 1.221 af
Outflow=1.38 cfs 0.566 af

Pond 2P: Depression Peak Elev=27.58' Storage=4,645 cf Inflow=5.74 cfs 0.438 af
Outflow=5.55 cfs 0.351 af

Pond 3P: Depression Peak Elev=23.43' Storage=10,939 cf Inflow=21.23 cfs 2.766 af
Outflow=17.21 cfs 2.766 af

Pond 4P: Depression Peak Elev=25.99' Storage=13,641 cf Inflow=5.15 cfs 0.558 af
Outflow=1.22 cfs 0.259 af

Link DP1: DP1 Inflow=33.27 cfs 4.961 af
Primary=33.27 cfs 4.961 af

Link DP3: DP3 Inflow=5.55 cfs 0.351 af
Primary=5.55 cfs 0.351 af

Link DP4: DP4 Inflow=1.22 cfs 0.259 af
Primary=1.22 cfs 0.259 af

Total Runoff Area = 18.198 ac Runoff Volume = 6.620 af Average Runoff Depth = 4.37"
75.18% Pervious = 13.682 ac 24.82% Impervious = 4.516 ac

Summary for Subcatchment EX1: EX1

[49] Hint: Tc<2dt may require smaller dt

Runoff = 22.20 cfs @ 12.07 hrs, Volume= 1.809 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.013	98	Unconnected pavement, HSG B
0.108	98	Unconnected pavement, HSG B
3.079	98	Paved parking, HSG B
0.003	69	50-75% Grass cover, Fair, HSG B
0.009	84	50-75% Grass cover, Fair, HSG D
3.212	98	Weighted Average
0.012		0.37% Pervious Area
3.200		99.63% Impervious Area
0.121		3.78% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0240	1.33		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.40"
1.6	308	0.0263	3.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	398	0.0100	5.90	4.63	**Pipe Channel, assume pipe goes with 1% slope** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.3					**Direct Entry, dirct entry to 5 min time concentration**
5.0	813	Total			

Summary for Subcatchment EX2: EX2

Runoff = 15.96 cfs @ 12.11 hrs, Volume= 1.221 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.193	98	Unconnected pavement, HSG B
0.107	98	Unconnected pavement, HSG C
0.257	98	Unconnected pavement, HSG D
2.933	69	50-75% Grass cover, Fair, HSG B
0.278	79	50-75% Grass cover, Fair, HSG C
0.063	85	Gravel roads, HSG B
3.831	74	Weighted Average, UI Adjusted CN = 72
3.274		85.46% Pervious Area
0.557		14.54% Impervious Area
0.557		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0340	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.4	209	0.0430	1.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	107	0.0634	1.76		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	366	Total			

Summary for Subcatchment EX3: EX3

Runoff = 21.23 cfs @ 12.27 hrs, Volume= 2.209 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.086	98	Unconnected pavement, HSG B
0.105	98	Unconnected pavement, HSG C
5.931	69	50-75% Grass cover, Fair, HSG B
0.946	79	50-75% Grass cover, Fair, HSG C
0.068	85	Gravel roads, HSG B
0.009	89	Gravel roads, HSG C
7.145	71	Weighted Average
6.954		97.33% Pervious Area
0.191		2.67% Impervious Area
0.191		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	17	0.4819	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
5.5	219	0.0091	0.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.4	221	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	107	0.0034	0.41		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
19.4	929	Total			

Summary for Subcatchment EX4: EX4

Runoff = 5.74 cfs @ 12.11 hrs, Volume= 0.438 af, Depth> 3.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.028	98	Unconnected pavement, HSG B
0.000	98	Unconnected pavement, HSG C
0.782	69	50-75% Grass cover, Fair, HSG B
0.526	79	50-75% Grass cover, Fair, HSG C
1.336	74	Weighted Average, UI Adjusted CN = 73
1.308		97.90% Pervious Area
0.028		2.10% Impervious Area
0.028		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	43	0.0384	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
3.3	123	0.0081	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.2780	3.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	43	0.0282	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	227	Total			

Summary for Subcatchment EX5: EX5

Runoff = 5.15 cfs @ 12.30 hrs, Volume= 0.558 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.294	98	Unconnected pavement, HSG B
0.084	98	Unconnected pavement, HSG C
0.830	69	50-75% Grass cover, Fair, HSG B
0.413	79	50-75% Grass cover, Fair, HSG C
1.621	78	Weighted Average, UI Adjusted CN = 75
1.243		76.68% Pervious Area
0.378		23.32% Impervious Area
0.378		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0012	0.05		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
0.6	45	0.0378	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	97	0.0515	1.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.0	139	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	331	Total			

Summary for Subcatchment EX6: EX6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.73 cfs @ 12.07 hrs, Volume= 0.203 af, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.162	98	Unconnected pavement, HSG D
0.265	84	50-75% Grass cover, Fair, HSG D
0.427	89	Weighted Average
0.265		62.06% Pervious Area
0.162		37.94% Impervious Area
0.162		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment EX7: EX7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.58 cfs @ 12.08 hrs, Volume= 0.183 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.626	69	50-75% Grass cover, Fair, HSG B
0.626		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 2R: Reach

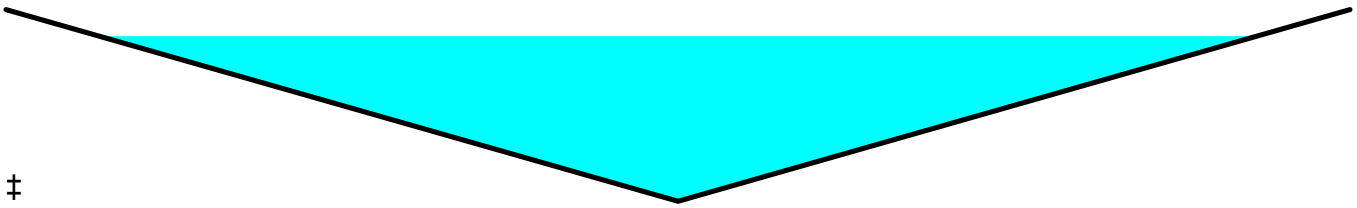
Assumed

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth > 1.77" for 100-Year event
Inflow = 1.38 cfs @ 13.48 hrs, Volume= 0.566 af
Outflow = 1.37 cfs @ 13.83 hrs, Volume= 0.557 af, Atten= 1%, Lag= 21.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.92 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 14.0 min

Peak Storage= 892 cf @ 13.65 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 2.03 cfs

0.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 8.0 '/' Top Width= 8.00'
Length= 600.0' Slope= 0.0037 '/'
Inlet Invert= 24.50', Outlet Invert= 22.30'



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Summary for Pond 1P: Depression

Inflow Area = 3.831 ac, 14.54% Impervious, Inflow Depth > 3.82" for 100-Year event
Inflow = 15.96 cfs @ 12.11 hrs, Volume= 1.221 af
Outflow = 1.38 cfs @ 13.48 hrs, Volume= 0.566 af, Atten= 91%, Lag= 81.9 min
Primary = 1.38 cfs @ 13.48 hrs, Volume= 0.566 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.23' @ 13.48 hrs Surf.Area= 25,662 sf Storage= 31,524 cf

Plug-Flow detention time= 280.4 min calculated for 0.566 af (46% of inflow)
Center-of-Mass det. time= 162.9 min (990.2 - 827.3)

Volume	Invert	Avail.Storage	Storage Description
#1	23.00'	54,543 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
23.00	3,560	227.0	0	0	3,560
24.00	13,186	521.0	7,866	7,866	21,064
25.00	23,209	669.0	17,963	25,829	35,092
26.00	34,597	756.0	28,714	54,543	44,983

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**174.6 deg x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=1.37 cfs @ 13.48 hrs HW=25.23' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.37 cfs @ 1.19 fps)

Summary for Pond 2P: Depression

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 3.93" for 100-Year event
Inflow = 5.74 cfs @ 12.11 hrs, Volume= 0.438 af
Outflow = 5.55 cfs @ 12.15 hrs, Volume= 0.351 af, Atten= 3%, Lag= 2.1 min
Primary = 5.55 cfs @ 12.15 hrs, Volume= 0.351 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 27.58' @ 12.15 hrs Surf.Area= 12,948 sf Storage= 4,645 cf

Plug-Flow detention time= 117.7 min calculated for 0.350 af (80% of inflow)
Center-of-Mass det. time= 42.1 min (867.1 - 825.0)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	13,008 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	531	116.5	0	0	531
27.00	1,512	533.3	980	980	22,086
28.00	28,059	659.5	12,028	13,008	34,080

Device	Routing	Invert	Outlet Devices
#1	Primary	27.50'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=5.44 cfs @ 12.15 hrs HW=27.58' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 5.44 cfs @ 0.70 fps)

Summary for Pond 3P: Depression

[62] Hint: Exceeded Reach 2R OUTLET depth by 1.13' @ 12.40 hrs

Inflow Area = 10.976 ac, 6.81% Impervious, Inflow Depth > 3.02" for 100-Year event
Inflow = 21.23 cfs @ 12.27 hrs, Volume= 2.766 af
Outflow = 17.21 cfs @ 12.42 hrs, Volume= 2.766 af, Atten= 19%, Lag= 9.0 min
Primary = 17.21 cfs @ 12.42 hrs, Volume= 2.766 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 23.43' @ 12.42 hrs Surf.Area= 28,268 sf Storage= 10,939 cf

Plug-Flow detention time= 4.9 min calculated for 2.760 af (100% of inflow)
Center-of-Mass det. time= 4.9 min (877.5 - 872.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.30'	36,053 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.30	0	0.0	0	0	0
23.00	11,429	748.0	2,667	2,667	44,525
24.00	62,091	1,002.0	33,386	36,053	79,908

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round Culvert** L= 365.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.012 Steel, smooth, Flow Area= 3.14 sf
#2	Device 1	22.30'	**6.0" x 1.5" Horiz. Orifice/Grate X 3.00 columns** X 8 rows C= 0.600 in 24.0" x 24.0" Grate Limited to weir flow at low heads
#3	Primary	23.09'	**178.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=17.07 cfs @ 12.42 hrs HW=23.43' (Free Discharge)
- **1=Culvert** (Passes 7.67 cfs of 42.40 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 7.67 cfs @ 5.12 fps)
- **3=Sharp-Crested Vee/Trap Weir** (Weir Controls 9.40 cfs @ 1.43 fps)

Summary for Pond 4P: Depression

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth > 4.13" for 100-Year event
Inflow = 5.15 cfs @ 12.30 hrs, Volume= 0.558 af
Outflow = 1.22 cfs @ 12.95 hrs, Volume= 0.259 af, Atten= 76%, Lag= 39.3 min
Primary = 1.22 cfs @ 12.95 hrs, Volume= 0.259 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.99' @ 12.95 hrs Surf.Area= 20,886 sf Storage= 13,641 cf

Plug-Flow detention time= 251.2 min calculated for 0.259 af (46% of inflow)
Center-of-Mass det. time= 136.8 min (968.3 - 831.5)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	13,753 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	7,632	406.6	0	0	7,632
26.00	20,975	659.9	13,753	13,753	29,136

Device	Routing	Invert	Outlet Devices
#1	Primary	25.95'	**179.9 deg Sharp-Crested Vee/Trap Weir** Cv= 2.46 (C= 3.08)

Primary OutFlow Max=1.19 cfs @ 12.95 hrs HW=25.99' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.19 cfs @ 0.52 fps)

Summary for Link DP1: DP1

Inflow Area = 15.241 ac, 26.97% Impervious, Inflow Depth > 3.91" for 100-Year event
Inflow = 33.27 cfs @ 12.07 hrs, Volume= 4.961 af
Primary = 33.27 cfs @ 12.07 hrs, Volume= 4.961 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 1.336 ac, 2.10% Impervious, Inflow Depth > 3.15" for 100-Year event
Inflow = 5.55 cfs @ 12.15 hrs, Volume= 0.351 af
Primary = 5.55 cfs @ 12.15 hrs, Volume= 0.351 af, Atten= 0%, Lag= 0.0 min

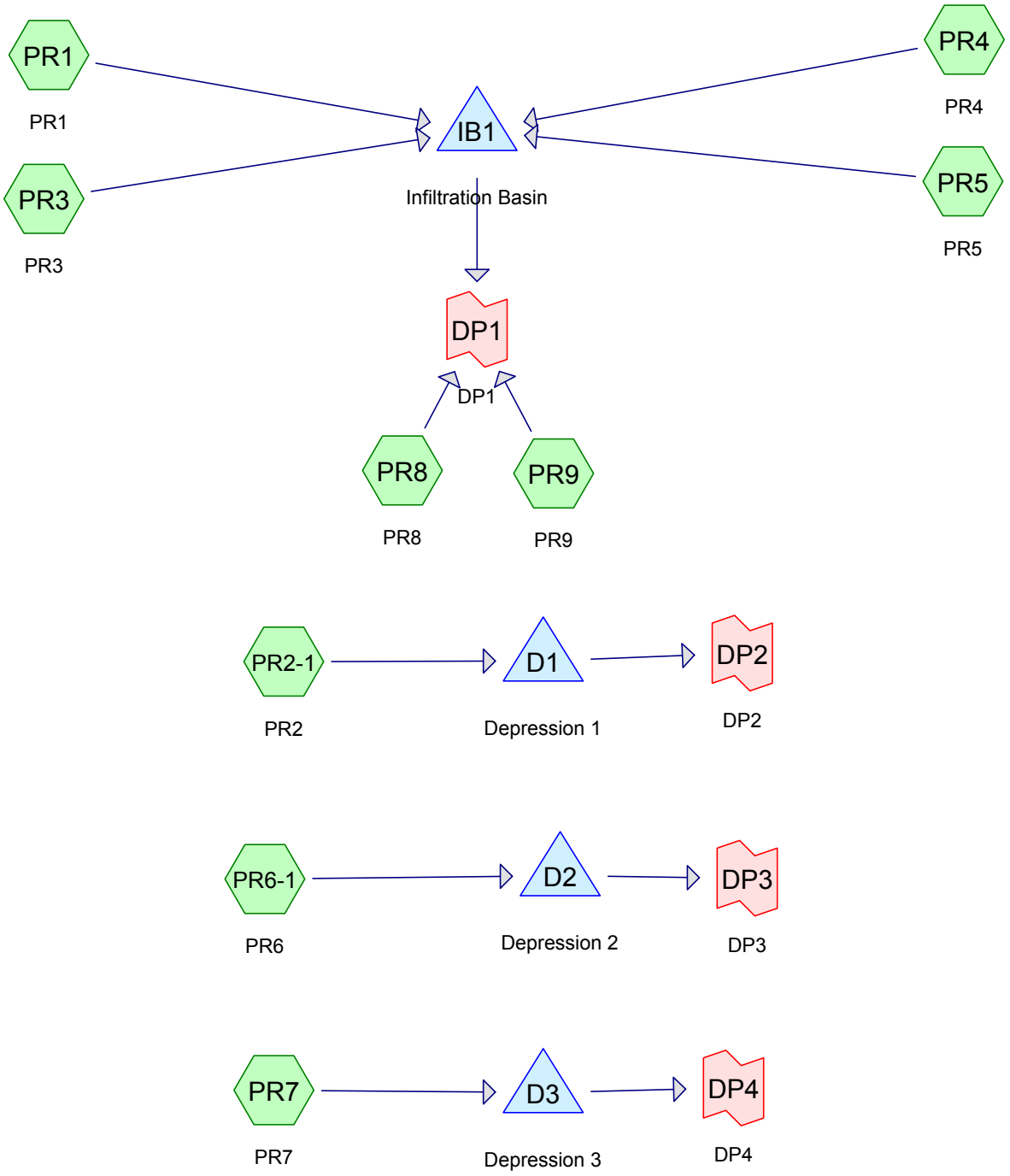
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.621 ac, 23.32% Impervious, Inflow Depth > 1.92" for 100-Year event
Inflow = 1.22 cfs @ 12.95 hrs, Volume= 0.259 af
Primary = 1.22 cfs @ 12.95 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

HydroCAD Analysis: Proposed Conditions



Routing Diagram for Weaver Cove-PR
Prepared by Vanasse Hangen Brustlin, Printed 6/18/2012
HydroCAD® 10.00 s/n 01975 © 2011 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.471	69	50-75% Grass cover, Fair, HSG B (PR1, PR2-1, PR3, PR4, PR5, PR6-1, PR7, PR8, PR9)
2.384	79	50-75% Grass cover, Fair, HSG C (PR1, PR2-1, PR4, PR6-1, PR7)
3.116	84	50-75% Grass cover, Fair, HSG D (PR1, PR2-1, PR8)
0.298	96	Gravel surface, HSG B (PR1, PR8)
0.655	96	Gravel surface, HSG D (PR1, PR8)
5.530	98	Paved parking, HSG B (PR2-1, PR3, PR4, PR5)
0.104	98	Paved parking, HSG C (PR2-1, PR4, PR5)
0.554	98	Water Surface, 0% imp, HSG B (PR2-1, PR6-1, PR7)
0.093	98	Water Surface, 0% imp, HSG C (PR6-1)
18.205	**84**	**TOTAL AREA**

2-Year Storm Event - Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.686 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=1,302' Tc=20.9 min CN=84 Runoff=5.28 cfs 0.566 af

Subcatchment PR2-1: PR2 Runoff Area=1.667 ac 5.28% Impervious Runoff Depth>1.42"
Tc=5.0 min CN=78 Runoff=2.75 cfs 0.197 af

Subcatchment PR3: PR3 Runoff Area=0.770 ac 81.04% Impervious Runoff Depth>2.64"
Tc=5.0 min CN=93 Runoff=2.31 cfs 0.169 af

Subcatchment PR4: PR4 Runoff Area=3.597 ac 2.72% Impervious Runoff Depth>1.05"
Flow Length=836' Tc=12.1 min CN=72 Runoff=3.36 cfs 0.316 af

Subcatchment PR5: PR5 Runoff Area=4.828 ac 99.92% Impervious Runoff Depth>3.17"
Tc=5.0 min CN=98 Runoff=16.06 cfs 1.273 af

Subcatchment PR6-1: PR6 Runoff Area=0.729 ac 0.00% Impervious Runoff Depth>1.77"
Tc=5.0 min CN=83 Runoff=1.52 cfs 0.108 af

Subcatchment PR7: PR7 Runoff Area=1.377 ac 0.00% Impervious Runoff Depth>1.36"
Tc=5.0 min CN=77 Runoff=2.15 cfs 0.156 af

Subcatchment PR8: PR8 Runoff Area=0.612 ac 0.00% Impervious Runoff Depth>2.54"
Tc=5.0 min CN=92 Runoff=1.78 cfs 0.130 af

Subcatchment PR9: PR9 Runoff Area=0.939 ac 0.00% Impervious Runoff Depth>0.89"
Tc=5.0 min CN=69 Runoff=0.90 cfs 0.070 af

Pond D1: Depression 1 Peak Elev=28.64' Storage=0.112 af Inflow=2.75 cfs 0.197 af
Discarded=0.12 cfs 0.119 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.119 af

Pond D2: Depression 2 Peak Elev=25.25' Storage=0.040 af Inflow=1.52 cfs 0.108 af
Discarded=0.17 cfs 0.107 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.107 af

Pond D3: Depression 3 Peak Elev=22.41' Storage=0.066 af Inflow=2.15 cfs 0.156 af
Discarded=0.17 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.155 af

Pond IB1: Infiltration Basin Peak Elev=23.87' Storage=1.492 af Inflow=23.21 cfs 2.325 af
Discarded=0.60 cfs 0.814 af Primary=0.36 cfs 0.186 af Outflow=0.96 cfs 1.000 af

Link DP1: DP1 Inflow=2.65 cfs 0.385 af
Primary=2.65 cfs 0.385 af

Link DP2: DP2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP3: DP3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP4: DP4 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 18.205 ac Runoff Volume = 2.985 af Average Runoff Depth = 1.97"
69.05% Pervious = 12.571 ac 30.95% Impervious = 5.634 ac

Summary for Subcatchment PR1: PR1

Runoff = 5.28 cfs @ 12.29 hrs, Volume= 0.566 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.123	96	Gravel surface, HSG B
0.376	96	Gravel surface, HSG D
0.267	69	50-75% Grass cover, Fair, HSG B
0.108	79	50-75% Grass cover, Fair, HSG C
2.812	84	50-75% Grass cover, Fair, HSG D
3.686	84	Weighted Average
3.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
6.0	434	0.0299	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	220	0.0045	1.01		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.2	233	0.0116	0.75		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
20.9	1,302	Total			

Summary for Subcatchment PR2-1: PR2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.75 cfs @ 12.08 hrs, Volume= 0.197 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.232	98	Water Surface, 0% imp, HSG B
0.068	98	Paved parking, HSG B
0.020	98	Paved parking, HSG C
0.818	69	50-75% Grass cover, Fair, HSG B
0.362	79	50-75% Grass cover, Fair, HSG C
0.167	84	50-75% Grass cover, Fair, HSG D
1.667	78	Weighted Average
1.579		94.72% Pervious Area
0.088		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.31 cfs @ 12.07 hrs, Volume= 0.169 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.624	98	Paved parking, HSG B
0.000	98	Paved parking, HSG D
0.146	69	50-75% Grass cover, Fair, HSG B
0.770	93	Weighted Average
0.146		18.96% Pervious Area
0.624		81.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 3.36 cfs @ 12.18 hrs, Volume= 0.316 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.035	98	Paved parking, HSG B
0.063	98	Paved parking, HSG C
2.535	69	50-75% Grass cover, Fair, HSG B
0.964	79	50-75% Grass cover, Fair, HSG C
3.597	72	Weighted Average
3.499		97.28% Pervious Area
0.098		2.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.5	207	0.0386	1.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.6	210	0.0367	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	369	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
12.1	836	Total			

Summary for Subcatchment PR5: PR5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 16.06 cfs @ 12.07 hrs, Volume= 1.273 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
4.803	98	Paved parking, HSG B
0.021	98	Paved parking, HSG C
0.004	69	50-75% Grass cover, Fair, HSG B
4.828	98	Weighted Average
0.004		0.08% Pervious Area
4.824		99.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6-1: PR6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.52 cfs @ 12.08 hrs, Volume= 0.108 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.117	98	Water Surface, 0% imp, HSG B
0.093	98	Water Surface, 0% imp, HSG C
0.085	69	50-75% Grass cover, Fair, HSG B
0.434	79	50-75% Grass cover, Fair, HSG C
0.729	83	Weighted Average
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.15 cfs @ 12.08 hrs, Volume= 0.156 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.205	98	Water Surface, 0% imp, HSG B
0.656	69	50-75% Grass cover, Fair, HSG B
0.516	79	50-75% Grass cover, Fair, HSG C
1.377	77	Weighted Average
1.377		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR8: PR8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.78 cfs @ 12.07 hrs, Volume= 0.130 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.175	96	Gravel surface, HSG B
0.279	96	Gravel surface, HSG D
0.021	69	50-75% Grass cover, Fair, HSG B
0.137	84	50-75% Grass cover, Fair, HSG D
0.612	92	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR9: PR9

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.90 cfs @ 12.09 hrs, Volume= 0.070 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.40"

Area (ac)	CN	Description
0.939	69	50-75% Grass cover, Fair, HSG B
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond D1: Depression 1

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth > 1.42" for 2-Year event
Inflow = 2.75 cfs @ 12.08 hrs, Volume= 0.197 af
Outflow = 0.12 cfs @ 15.87 hrs, Volume= 0.119 af, Atten= 96%, Lag= 227.5 min
Discarded = 0.12 cfs @ 15.87 hrs, Volume= 0.119 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.64' @ 15.87 hrs Surf.Area= 0.112 ac Storage= 0.112 af

Plug-Flow detention time= 321.5 min calculated for 0.119 af (61% of inflow)
Center-of-Mass det. time= 207.8 min (1,052.3 - 844.5)

Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.456 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.085	333.7	0.000	0.000	0.085
28.00	0.097	346.7	0.045	0.045	0.102
29.00	0.121	371.2	0.109	0.154	0.135
30.00	0.148	391.4	0.134	0.289	0.164
31.00	0.187	496.4	0.167	0.456	0.335

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	30.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.12 cfs @ 15.87 hrs HW=28.64' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: Depression 2

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 1.77" for 2-Year event
Inflow = 1.52 cfs @ 12.08 hrs, Volume= 0.108 af
Outflow = 0.17 cfs @ 12.91 hrs, Volume= 0.107 af, Atten= 89%, Lag= 50.1 min
Discarded = 0.17 cfs @ 12.91 hrs, Volume= 0.107 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.25' @ 12.91 hrs Surf.Area= 0.162 ac Storage= 0.040 af

Plug-Flow detention time= 91.8 min calculated for 0.107 af (100% of inflow)
Center-of-Mass det. time= 89.8 min (918.6 - 828.7)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	0.364 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.00	0.155	382.5	0.000	0.000	0.155
26.00	0.182	404.0	0.168	0.168	0.187
27.00	0.210	423.0	0.196	0.364	0.217

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	26.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.17 cfs @ 12.91 hrs HW=25.25' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: Depression 3

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth > 1.36" for 2-Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 0.156 af
Outflow = 0.17 cfs @ 13.81 hrs, Volume= 0.155 af, Atten= 92%, Lag= 103.5 min
Discarded = 0.17 cfs @ 13.81 hrs, Volume= 0.155 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 22.41' @ 13.81 hrs Surf.Area= 0.167 ac Storage= 0.066 af

Plug-Flow detention time= 171.7 min calculated for 0.154 af (99% of inflow)
Center-of-Mass det. time= 167.9 min (1,015.5 - 847.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	0.580 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
22.00	0.158	323.3	0.000	0.000	0.158
23.00	0.181	342.1	0.169	0.169	0.182
24.00	0.205	361.0	0.193	0.362	0.208
25.00	0.230	379.9	0.217	0.580	0.235

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	24.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.17 cfs @ 13.81 hrs HW=22.41' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IB1: Infiltration Basin

Inflow Area = 12.881 ac, 43.06% Impervious, Inflow Depth > 2.17" for 2-Year event
Inflow = 23.21 cfs @ 12.09 hrs, Volume= 2.325 af
Outflow = 0.96 cfs @ 16.20 hrs, Volume= 1.000 af, Atten= 96%, Lag= 246.9 min
Discarded = 0.60 cfs @ 16.20 hrs, Volume= 0.814 af
Primary = 0.36 cfs @ 16.20 hrs, Volume= 0.186 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 23.87' @ 16.20 hrs Surf.Area= 0.585 ac Storage= 1.492 af

Plug-Flow detention time= 297.1 min calculated for 1.000 af (43% of inflow)
Center-of-Mass det. time= 160.7 min (953.2 - 792.6)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	2.845 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
21.00	0.458	612.6	0.000	0.000	0.458
22.00	0.501	631.5	0.479	0.479	0.503
23.00	0.545	650.3	0.523	1.002	0.550
24.00	0.591	669.2	0.568	1.570	0.598
25.00	0.637	688.0	0.614	2.184	0.647
26.00	0.685	706.9	0.661	2.845	0.698

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round RCP 24"** L= 364.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	21.00'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	23.50'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	24.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	25.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate

Discarded OutFlow Max=0.60 cfs @ 16.20 hrs HW=23.87' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=0.36 cfs @ 16.20 hrs HW=23.87' (Free Discharge)
└─**1=RCP 24"** (Passes 0.36 cfs of 40.59 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.36 cfs @ 1.95 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link DP1: DP1

Inflow Area = 14.432 ac, 38.43% Impervious, Inflow Depth > 0.32" for 2-Year event
Inflow = 2.65 cfs @ 12.08 hrs, Volume= 0.385 af
Primary = 2.65 cfs @ 12.08 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10-Year Storm Event- Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.686 ac 0.00% Impervious Runoff Depth>3.08"
Flow Length=1,302' Tc=20.9 min CN=84 Runoff=8.77 cfs 0.945 af

Subcatchment PR2-1: PR2 Runoff Area=1.667 ac 5.28% Impervious Runoff Depth>2.54"
Tc=5.0 min CN=78 Runoff=4.97 cfs 0.353 af

Subcatchment PR3: PR3 Runoff Area=0.770 ac 81.04% Impervious Runoff Depth>4.00"
Tc=5.0 min CN=93 Runoff=3.43 cfs 0.257 af

Subcatchment PR4: PR4 Runoff Area=3.597 ac 2.72% Impervious Runoff Depth>2.04"
Flow Length=836' Tc=12.1 min CN=72 Runoff=6.91 cfs 0.611 af

Subcatchment PR5: PR5 Runoff Area=4.828 ac 99.92% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=98 Runoff=22.81 cfs 1.835 af

Subcatchment PR6-1: PR6 Runoff Area=0.729 ac 0.00% Impervious Runoff Depth>2.99"
Tc=5.0 min CN=83 Runoff=2.55 cfs 0.182 af

Subcatchment PR7: PR7 Runoff Area=1.377 ac 0.00% Impervious Runoff Depth>2.45"
Tc=5.0 min CN=77 Runoff=3.97 cfs 0.282 af

Subcatchment PR8: PR8 Runoff Area=0.612 ac 0.00% Impervious Runoff Depth>3.89"
Tc=5.0 min CN=92 Runoff=2.68 cfs 0.198 af

Subcatchment PR9: PR9 Runoff Area=0.939 ac 0.00% Impervious Runoff Depth>1.81"
Tc=5.0 min CN=69 Runoff=1.95 cfs 0.142 af

Pond D1: Depression 1 Peak Elev=29.58' Storage=0.229 af Inflow=4.97 cfs 0.353 af
Discarded=0.14 cfs 0.153 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.153 af

Pond D2: Depression 2 Peak Elev=25.50' Storage=0.081 af Inflow=2.55 cfs 0.182 af
Discarded=0.17 cfs 0.181 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.181 af

Pond D3: Depression 3 Peak Elev=22.90' Storage=0.151 af Inflow=3.97 cfs 0.282 af
Discarded=0.18 cfs 0.199 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.199 af

Pond IB1: Infiltration Basin Peak Elev=24.73' Storage=2.016 af Inflow=35.83 cfs 3.648 af
Discarded=0.64 cfs 0.900 af Primary=2.85 cfs 1.297 af Outflow=3.49 cfs 2.196 af

Link DP1: DP1 Inflow=4.59 cfs 1.637 af
Primary=4.59 cfs 1.637 af

Link DP2: DP2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP3: DP3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP4: DP4

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 18.205 ac Runoff Volume = 4.805 af Average Runoff Depth = 3.17"
69.05% Pervious = 12.571 ac 30.95% Impervious = 5.634 ac

Summary for Subcatchment PR1: PR1

Runoff = 8.77 cfs @ 12.29 hrs, Volume= 0.945 af, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.123	96	Gravel surface, HSG B
0.376	96	Gravel surface, HSG D
0.267	69	50-75% Grass cover, Fair, HSG B
0.108	79	50-75% Grass cover, Fair, HSG C
2.812	84	50-75% Grass cover, Fair, HSG D
3.686	84	Weighted Average
3.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
6.0	434	0.0299	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	220	0.0045	1.01		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.2	233	0.0116	0.75		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
20.9	1,302	Total			

Summary for Subcatchment PR2-1: PR2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.97 cfs @ 12.08 hrs, Volume= 0.353 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.232	98	Water Surface, 0% imp, HSG B
0.068	98	Paved parking, HSG B
0.020	98	Paved parking, HSG C
0.818	69	50-75% Grass cover, Fair, HSG B
0.362	79	50-75% Grass cover, Fair, HSG C
0.167	84	50-75% Grass cover, Fair, HSG D
1.667	78	Weighted Average
1.579		94.72% Pervious Area
0.088		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.43 cfs @ 12.07 hrs, Volume= 0.257 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.624	98	Paved parking, HSG B
0.000	98	Paved parking, HSG D
0.146	69	50-75% Grass cover, Fair, HSG B
0.770	93	Weighted Average
0.146		18.96% Pervious Area
0.624		81.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 6.91 cfs @ 12.17 hrs, Volume= 0.611 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.035	98	Paved parking, HSG B
0.063	98	Paved parking, HSG C
2.535	69	50-75% Grass cover, Fair, HSG B
0.964	79	50-75% Grass cover, Fair, HSG C
3.597	72	Weighted Average
3.499		97.28% Pervious Area
0.098		2.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.5	207	0.0386	1.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.6	210	0.0367	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	369	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
12.1	836	Total			

Summary for Subcatchment PR5: PR5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 22.81 cfs @ 12.07 hrs, Volume= 1.835 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
4.803	98	Paved parking, HSG B
0.021	98	Paved parking, HSG C
0.004	69	50-75% Grass cover, Fair, HSG B
4.828	98	Weighted Average
0.004		0.08% Pervious Area
4.824		99.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6-1: PR6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.55 cfs @ 12.08 hrs, Volume= 0.182 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.117	98	Water Surface, 0% imp, HSG B
0.093	98	Water Surface, 0% imp, HSG C
0.085	69	50-75% Grass cover, Fair, HSG B
0.434	79	50-75% Grass cover, Fair, HSG C
0.729	83	Weighted Average
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.97 cfs @ 12.08 hrs, Volume= 0.282 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.205	98	Water Surface, 0% imp, HSG B
0.656	69	50-75% Grass cover, Fair, HSG B
0.516	79	50-75% Grass cover, Fair, HSG C
1.377	77	Weighted Average
1.377		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR8: PR8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.68 cfs @ 12.07 hrs, Volume= 0.198 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.175	96	Gravel surface, HSG B
0.279	96	Gravel surface, HSG D
0.021	69	50-75% Grass cover, Fair, HSG B
0.137	84	50-75% Grass cover, Fair, HSG D
0.612	92	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR9: PR9

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.95 cfs @ 12.08 hrs, Volume= 0.142 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (ac)	CN	Description
0.939	69	50-75% Grass cover, Fair, HSG B
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond D1: Depression 1

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth > 2.54" for 10-Year event
Inflow = 4.97 cfs @ 12.08 hrs, Volume= 0.353 af
Outflow = 0.14 cfs @ 17.03 hrs, Volume= 0.153 af, Atten= 97%, Lag= 296.9 min
Discarded = 0.14 cfs @ 17.03 hrs, Volume= 0.153 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 29.58' @ 17.03 hrs Surf.Area= 0.136 ac Storage= 0.229 af

Plug-Flow detention time= 327.9 min calculated for 0.153 af (43% of inflow)
Center-of-Mass det. time= 207.1 min (1,034.7 - 827.6)

Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.456 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.085	333.7	0.000	0.000	0.085
28.00	0.097	346.7	0.045	0.045	0.102
29.00	0.121	371.2	0.109	0.154	0.135
30.00	0.148	391.4	0.134	0.289	0.164
31.00	0.187	496.4	0.167	0.456	0.335

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	30.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.14 cfs @ 17.03 hrs HW=29.58' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: Depression 2

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 2.99" for 10-Year event
Inflow = 2.55 cfs @ 12.08 hrs, Volume= 0.182 af
Outflow = 0.17 cfs @ 13.74 hrs, Volume= 0.181 af, Atten= 93%, Lag= 99.7 min
Discarded = 0.17 cfs @ 13.74 hrs, Volume= 0.181 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.50' @ 13.74 hrs Surf.Area= 0.168 ac Storage= 0.081 af

Plug-Flow detention time= 195.2 min calculated for 0.181 af (100% of inflow)
Center-of-Mass det. time= 193.3 min (1,007.0 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	0.364 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.00	0.155	382.5	0.000	0.000	0.155
26.00	0.182	404.0	0.168	0.168	0.187
27.00	0.210	423.0	0.196	0.364	0.217

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	26.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.17 cfs @ 13.74 hrs HW=25.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: Depression 3

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth > 2.45" for 10-Year event
Inflow = 3.97 cfs @ 12.08 hrs, Volume= 0.282 af
Outflow = 0.18 cfs @ 15.31 hrs, Volume= 0.199 af, Atten= 95%, Lag= 193.7 min
Discarded = 0.18 cfs @ 15.31 hrs, Volume= 0.199 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 22.90' @ 15.31 hrs Surf.Area= 0.179 ac Storage= 0.151 af

Plug-Flow detention time= 302.1 min calculated for 0.199 af (71% of inflow)
Center-of-Mass det. time= 206.6 min (1,036.8 - 830.2)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	0.580 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
22.00	0.158	323.3	0.000	0.000	0.158
23.00	0.181	342.1	0.169	0.169	0.182
24.00	0.205	361.0	0.193	0.362	0.208
25.00	0.230	379.9	0.217	0.580	0.235

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	24.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.18 cfs @ 15.31 hrs HW=22.90' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IB1: Infiltration Basin

Inflow Area = 12.881 ac, 43.06% Impervious, Inflow Depth > 3.40" for 10-Year event
Inflow = 35.83 cfs @ 12.09 hrs, Volume= 3.648 af
Outflow = 3.49 cfs @ 13.54 hrs, Volume= 2.196 af, Atten= 90%, Lag= 86.8 min
Discarded = 0.64 cfs @ 13.54 hrs, Volume= 0.900 af
Primary = 2.85 cfs @ 13.54 hrs, Volume= 1.297 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 24.73' @ 13.54 hrs Surf.Area= 0.625 ac Storage= 2.016 af

Plug-Flow detention time= 256.8 min calculated for 2.196 af (60% of inflow)
Center-of-Mass det. time= 146.8 min (933.1 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	2.845 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
21.00	0.458	612.6	0.000	0.000	0.458
22.00	0.501	631.5	0.479	0.479	0.503
23.00	0.545	650.3	0.523	1.002	0.550
24.00	0.591	669.2	0.568	1.570	0.598
25.00	0.637	688.0	0.614	2.184	0.647
26.00	0.685	706.9	0.661	2.845	0.698

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round RCP 24"** L= 364.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	21.00'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	23.50'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	24.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	25.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate

Discarded OutFlow Max=0.64 cfs @ 13.54 hrs HW=24.73' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=2.85 cfs @ 13.54 hrs HW=24.73' (Free Discharge)
└─**1=RCP 24"** (Passes 2.85 cfs of 41.70 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.19 cfs @ 4.76 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 1.66 cfs @ 3.31 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link DP1: DP1

Inflow Area = 14.432 ac, 38.43% Impervious, Inflow Depth > 1.36" for 10-Year event
Inflow = 4.59 cfs @ 12.08 hrs, Volume= 1.637 af
Primary = 4.59 cfs @ 12.08 hrs, Volume= 1.637 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100-Year Storm Event – Proposed

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR1: PR1 Runoff Area=3.686 ac 0.00% Impervious Runoff Depth>5.12"
Flow Length=1,302' Tc=20.9 min CN=84 Runoff=14.39 cfs 1.574 af

Subcatchment PR2-1: PR2 Runoff Area=1.667 ac 5.28% Impervious Runoff Depth>4.47"
Tc=5.0 min CN=78 Runoff=8.70 cfs 0.621 af

Subcatchment PR3: PR3 Runoff Area=0.770 ac 81.04% Impervious Runoff Depth>6.17"
Tc=5.0 min CN=93 Runoff=5.15 cfs 0.396 af

Subcatchment PR4: PR4 Runoff Area=3.597 ac 2.72% Impervious Runoff Depth>3.82"
Flow Length=836' Tc=12.1 min CN=72 Runoff=13.15 cfs 1.145 af

Subcatchment PR5: PR5 Runoff Area=4.828 ac 99.92% Impervious Runoff Depth>6.76"
Tc=5.0 min CN=98 Runoff=33.37 cfs 2.719 af

Subcatchment PR6-1: PR6 Runoff Area=0.729 ac 0.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=83 Runoff=4.24 cfs 0.305 af

Subcatchment PR7: PR7 Runoff Area=1.377 ac 0.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=77 Runoff=7.02 cfs 0.501 af

Subcatchment PR8: PR8 Runoff Area=0.612 ac 0.00% Impervious Runoff Depth>6.05"
Tc=5.0 min CN=92 Runoff=4.06 cfs 0.309 af

Subcatchment PR9: PR9 Runoff Area=0.939 ac 0.00% Impervious Runoff Depth>3.51"
Tc=5.0 min CN=69 Runoff=3.87 cfs 0.275 af

Pond D1: Depression 1 Peak Elev=30.92' Storage=0.440 af Inflow=8.70 cfs 0.621 af
Discarded=0.19 cfs 0.210 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.210 af

Pond D2: Depression 2 Peak Elev=25.96' Storage=0.161 af Inflow=4.24 cfs 0.305 af
Discarded=0.19 cfs 0.220 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.220 af

Pond D3: Depression 3 Peak Elev=23.76' Storage=0.314 af Inflow=7.02 cfs 0.501 af
Discarded=0.20 cfs 0.239 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.239 af

Pond IB1: Infiltration Basin Peak Elev=25.99' Storage=2.835 af Inflow=56.46 cfs 5.833 af
Discarded=0.70 cfs 0.989 af Primary=13.46 cfs 3.293 af Outflow=14.17 cfs 4.281 af

Link DP1: DP1 Inflow=14.74 cfs 3.876 af
Primary=14.74 cfs 3.876 af

Link DP2: DP2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP3: DP3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP4: DP4 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 18.205 ac Runoff Volume = 7.844 af Average Runoff Depth = 5.17"
69.05% Pervious = 12.571 ac 30.95% Impervious = 5.634 ac

Summary for Subcatchment PR1: PR1

Runoff = 14.39 cfs @ 12.28 hrs, Volume= 1.574 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.123	96	Gravel surface, HSG B
0.376	96	Gravel surface, HSG D
0.267	69	50-75% Grass cover, Fair, HSG B
0.108	79	50-75% Grass cover, Fair, HSG C
2.812	84	50-75% Grass cover, Fair, HSG D
3.686	84	Weighted Average
3.686		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
6.0	434	0.0299	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	220	0.0045	1.01		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.2	233	0.0116	0.75		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	365	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
20.9	1,302	Total			

Summary for Subcatchment PR2-1: PR2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.70 cfs @ 12.08 hrs, Volume= 0.621 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.232	98	Water Surface, 0% imp, HSG B
0.068	98	Paved parking, HSG B
0.020	98	Paved parking, HSG C
0.818	69	50-75% Grass cover, Fair, HSG B
0.362	79	50-75% Grass cover, Fair, HSG C
0.167	84	50-75% Grass cover, Fair, HSG D
1.667	78	Weighted Average
1.579		94.72% Pervious Area
0.088		5.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR3: PR3

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.15 cfs @ 12.07 hrs, Volume= 0.396 af, Depth> 6.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.624	98	Paved parking, HSG B
0.000	98	Paved parking, HSG D
0.146	69	50-75% Grass cover, Fair, HSG B
0.770	93	Weighted Average
0.146		18.96% Pervious Area
0.624		81.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR4: PR4

Runoff = 13.15 cfs @ 12.17 hrs, Volume= 1.145 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.035	98	Paved parking, HSG B
0.063	98	Paved parking, HSG C
2.535	69	50-75% Grass cover, Fair, HSG B
0.964	79	50-75% Grass cover, Fair, HSG C
3.597	72	Weighted Average
3.499		97.28% Pervious Area
0.098		2.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
2.5	207	0.0386	1.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.6	210	0.0367	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	369	0.0027	4.05	12.73	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Steel, smooth
12.1	836	Total			

Summary for Subcatchment PR5: PR5

[49] Hint: Tc<2dt may require smaller dt

Runoff = 33.37 cfs @ 12.07 hrs, Volume= 2.719 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
4.803	98	Paved parking, HSG B
0.021	98	Paved parking, HSG C
0.004	69	50-75% Grass cover, Fair, HSG B
4.828	98	Weighted Average
0.004		0.08% Pervious Area
4.824		99.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR6-1: PR6

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.24 cfs @ 12.07 hrs, Volume= 0.305 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.117	98	Water Surface, 0% imp, HSG B
0.093	98	Water Surface, 0% imp, HSG C
0.085	69	50-75% Grass cover, Fair, HSG B
0.434	79	50-75% Grass cover, Fair, HSG C
0.729	83	Weighted Average
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR7: PR7

[49] Hint: Tc<2dt may require smaller dt

Runoff = 7.02 cfs @ 12.08 hrs, Volume= 0.501 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.205	98	Water Surface, 0% imp, HSG B
0.656	69	50-75% Grass cover, Fair, HSG B
0.516	79	50-75% Grass cover, Fair, HSG C
1.377	77	Weighted Average
1.377		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR8: PR8

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.06 cfs @ 12.07 hrs, Volume= 0.309 af, Depth> 6.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.175	96	Gravel surface, HSG B
0.279	96	Gravel surface, HSG D
0.021	69	50-75% Grass cover, Fair, HSG B
0.137	84	50-75% Grass cover, Fair, HSG D
0.612	92	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment PR9: PR9

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.87 cfs @ 12.08 hrs, Volume= 0.275 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.00"

Area (ac)	CN	Description
0.939	69	50-75% Grass cover, Fair, HSG B
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond D1: Depression 1

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth > 4.47" for 100-Year event
Inflow = 8.70 cfs @ 12.08 hrs, Volume= 0.621 af
Outflow = 0.19 cfs @ 17.69 hrs, Volume= 0.210 af, Atten= 98%, Lag= 337.0 min
Discarded = 0.19 cfs @ 17.69 hrs, Volume= 0.210 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 30.92' @ 17.69 hrs Surf.Area= 0.184 ac Storage= 0.440 af

Plug-Flow detention time= 337.9 min calculated for 0.210 af (34% of inflow)
Center-of-Mass det. time= 209.9 min (1,021.3 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.456 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
27.50	0.085	333.7	0.000	0.000	0.085
28.00	0.097	346.7	0.045	0.045	0.102
29.00	0.121	371.2	0.109	0.154	0.135
30.00	0.148	391.4	0.134	0.289	0.164
31.00	0.187	496.4	0.167	0.456	0.335

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	30.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50
Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.19 cfs @ 17.69 hrs HW=30.92' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: Depression 2

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 5.02" for 100-Year event
Inflow = 4.24 cfs @ 12.07 hrs, Volume= 0.305 af
Outflow = 0.19 cfs @ 14.95 hrs, Volume= 0.220 af, Atten= 96%, Lag= 172.4 min
Discarded = 0.19 cfs @ 14.95 hrs, Volume= 0.220 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 25.96' @ 14.95 hrs Surf.Area= 0.181 ac Storage= 0.161 af

Plug-Flow detention time= 284.1 min calculated for 0.220 af (72% of inflow)
Center-of-Mass det. time= 195.3 min (994.4 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	0.364 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
25.00	0.155	382.5	0.000	0.000	0.155
26.00	0.182	404.0	0.168	0.168	0.187
27.00	0.210	423.0	0.196	0.364	0.217

Device	Routing	Invert	Outlet Devices
#1	Discarded	25.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	26.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.19 cfs @ 14.95 hrs HW=25.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: Depression 3

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth > 4.36" for 100-Year event
Inflow = 7.02 cfs @ 12.08 hrs, Volume= 0.501 af
Outflow = 0.20 cfs @ 16.49 hrs, Volume= 0.239 af, Atten= 97%, Lag= 265.1 min
Discarded = 0.20 cfs @ 16.49 hrs, Volume= 0.239 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 23.76' @ 16.49 hrs Surf.Area= 0.199 ac Storage= 0.314 af

Plug-Flow detention time= 309.1 min calculated for 0.238 af (48% of inflow)
Center-of-Mass det. time= 194.9 min (1,008.6 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	0.580 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
22.00	0.158	323.3	0.000	0.000	0.158
23.00	0.181	342.1	0.169	0.169	0.182
24.00	0.205	361.0	0.193	0.362	0.208
25.00	0.230	379.9	0.217	0.580	0.235

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	24.99'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.20 cfs @ 16.49 hrs HW=23.76' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IB1: Infiltration Basin

Inflow Area = 12.881 ac, 43.06% Impervious, Inflow Depth > 5.43" for 100-Year event
Inflow = 56.46 cfs @ 12.09 hrs, Volume= 5.833 af
Outflow = 14.17 cfs @ 12.66 hrs, Volume= 4.281 af, Atten= 75%, Lag= 33.7 min
Discarded = 0.70 cfs @ 12.66 hrs, Volume= 0.989 af
Primary = 13.46 cfs @ 12.66 hrs, Volume= 3.293 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 25.99' @ 12.66 hrs Surf.Area= 0.684 ac Storage= 2.835 af

Plug-Flow detention time= 201.8 min calculated for 4.281 af (73% of inflow)
Center-of-Mass det. time= 111.8 min (891.0 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	21.00'	2.845 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
21.00	0.458	612.6	0.000	0.000	0.458
22.00	0.501	631.5	0.479	0.479	0.503
23.00	0.545	650.3	0.523	1.002	0.550
24.00	0.591	669.2	0.568	1.570	0.598
25.00	0.637	688.0	0.614	2.184	0.647
26.00	0.685	706.9	0.661	2.845	0.698

Device	Routing	Invert	Outlet Devices
#1	Primary	7.22'	**24.0" Round RCP 24"** L= 364.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 7.22' / 6.22' S= 0.0027 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf
#2	Discarded	21.00'	**1.020 in/hr Exfiltration over Surface area**
#3	Device 1	23.50'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	24.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	25.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 4.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate

Discarded OutFlow Max=0.70 cfs @ 12.66 hrs HW=25.98' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.70 cfs)

Primary OutFlow Max=13.46 cfs @ 12.66 hrs HW=25.98' (Free Discharge)
└─**1=RCP 24"** (Passes 13.46 cfs of 43.25 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.80 cfs @ 7.19 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 3.17 cfs @ 6.34 fps)
  └─**5=Orifice/Grate** (Orifice Controls 8.49 cfs @ 4.78 fps)

Summary for Link DP1: DP1

Inflow Area = 14.432 ac, 38.43% Impervious, Inflow Depth > 3.22" for 100-Year event
Inflow = 14.74 cfs @ 12.48 hrs, Volume= 3.876 af
Primary = 14.74 cfs @ 12.48 hrs, Volume= 3.876 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP2: DP2

Inflow Area = 1.667 ac, 5.28% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP3: DP3

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link DP4: DP4

Inflow Area = 1.377 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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Appendix C
Standard 3 Computations and Supporting Information

Soil Evaluation and Analysis

Hydrologic Soil Group—Bristol County, Massachusetts, Southern Part
(Weaver's Cove East - Hydrologic Soil Groups)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:3,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 6, Jul 23, 2010

Date(s) aerial images were photographed: 8/14/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Bristol County, Massachusetts, Southern Part (MA603)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	C	4.7	15.7%
602	Urban land		11.1	37.5%
651	Udorthents, smoothed	B	13.9	46.8%
Totals for Area of Interest			**29.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Required and Provided Recharge Volumes

Recharge Calculations

Project Name: Weaver's Cove East Layover **Proj. No.:** 10111.00
Project Location: Fall River, MA **Date:** 29-May-12
Calculated by: TJR
Checked by:

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
1	0.0	-0.1	-0.1	-3.2	-3.4
2	0.0	0.0	-0.1	-0.1	-0.3
3	0.0	0.6	0.0	0.0	0.6
4	0.0	0.0	0.0	0.0	0.0
5	0.0	4.7	0.0	0.0	4.7
6	0.0	0.0	0.0	0.0	0.0
7	0.0	-0.3	-0.1	0.0	-0.4
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	-0.1	-0.1
TOTAL	**0.0**	**5.0**	**-0.3**	**-3.5**	**1.2**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth * (in.)	Volume (c.f.)
A	0.0	0.60	0
B	5.0	0.35	6,302
C	-0.3	0.25	-255
D	-3.5	0.10	-1,262
TOTAL			**4,785**

* Per 2008 Massachusetts DEP Recharge Requirement

Provided Recharge Volume (Cubic Feet)

Infiltration Volumes Provided in Infiltration Basins (below lowest overflow outlet)

Basin P1	55,792	
Basin P2	21,625	
Basin P3	15,879	
Basin P4	25,229	
Total	**118,525**	c.f.

72-hour Drawdown Analysis

Drawdown Calculations

Project Name: Weaver's Cove East Layo\ **Proj. No.:** 10111.00

Date: 6/14/2012

Project Location: Fall River, MA **Calculated by:** TJR

Depression 1

Infiltration volumes provided in depression below Orifice A at elevation 24.0

Depression Volume Below Top of Depression

Elevation	Area (s.f.)	Incremental Volume (c.f.)
21.00	19,957	0
22.00	21,823	20,890
23.00	23,745	43,674
23.50	24,728	55,792
TOTAL		**55,792**

Assumptions:

Recharge Rate: 1.02 in/hr*

Drawdown Time:	**32.9 hours**

Depression 2

Infiltration volumes provided in depression below lowest outlet.

Depression Volume Below Top of Depression

Elevation	Area (s.f.)	Incremental Volume (c.f.)
27.50	3,702	0
28.00	4,212	1,978
29.00	5,289	6,729
30.00	6,433	12,590
31.00	8,166	19,889
TOTAL		**19,889**

Assumptions:

Recharge Rate: 1.02 in/hr

Drawdown Time:	**63.2 hours**

Drawdown Calculations

Project Name: Weaver's Cove East Layo\ **Proj. No.:** 10111.00

Date: 6/14/2012

Project Location: Fall River, MA **Calculated by:** TJR

Depression 3

Infiltration volumes provided in depression below lowest outlet.

Depression Volume Below Top of Depression

Elevation	Area (s.f.)	Incremental Volume (c.f.)
25.00	6,745	0
26.00	7,924	7,334
27.00	9,165	15,879
TOTAL		**15,879**

Assumptions:

Recharge Rate: 1.02 in/hr*

Drawdown Time:	**27.7 hours**

Depression 4

Infiltration volumes provided in depression below lowest outlet.

Depression Volume Below Top of Depression

Elevation	Area (s.f.)	Incremental Volume (c.f.)
22.00	6,865	0
23.00	7,863	7,364
24.00	8,918	15,755
25.00	10,029	25,229
TOTAL		**25,229**

Assumptions:

Recharge Rate: 1.02 in/hr*

Drawdown Time:	**43.2 hours**

Appendix D
Standard 4 Computations and Supporting Information

Water Quality Volume Calculations

VHB

Water Quality Volume Calculations

Project Name: Weaver's Cove Ea **Proj. No.:** 10111.0

Project Location: Fall River, MA **Date:** 6/14/2012

Calculated by: TJR

Depression 1
(runoff from Area PR-1, PR-3)

PR-1 Impervious Area =	0	Acres
PR-3 Impervious Area =	0.6246	Acres
Total Impervious Area =	0.62	Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	227
Water Quality Volume	1	2,267

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	24.0	1,363	0
	25.0	1,844	1,604

Depression 1
(runoff from Area PR-5)

Total Impervious Area =	4.82	Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	1,751
Water Quality Volume	1	17,509

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Sediment Forebay	24.0	2,360	0
	25.0	3,008	2,684

VHB

Water Quality Volume Calculations

Project Name: Weaver's Cove Ea **Proj. No.:** 10111.0

Project Location: Fall River, MA **Date:** 6/14/2012

Calculated by: TJR

Depression 1
(runoff from Area PR-4)

Total Impervious Area = 0.10 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Forebay Volume	0.1	35
Water Quality Volume	1	355

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Infiltration Basin	21.00	19,957	0
	22.00	21,823	20,890
	23.00	23,745	43,674
	23.50	24,728	55,792

Depression 2
(runoff from Area PR-2)

Total Impervious Area = 0.09 Acres

Required:

	Runoff Depth to be Treated (in.)	Required Volume (c.f.)
Water Quality Volume	1	327

Provided:

	Elevation	Area (s.f.)	Cumulative Volume (c.f.)
Infiltration Basin	27.5	3,701	0
	28.0	4,212	1,978
	29.0	5,289	6,729
	30.0	6,433	12,590
	31.0	8,166	19,889

TSS Removal Worksheets

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Weaver's Cove East Layover**	Sheet:	**1 of 3**
Project Number:	**10111.00**	Date:	**14-Jun-2012**
Location:	**Fall River, MA**	Computed by:	**TJR**
Discharge Point:	**DP1**	Checked by:	
Drainage Area(s):	**PR-1, PR-3**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Grass Channel	**50%**	**1.00**	**0.50**	**0.50**
Sediment Forebay	**25%**	**0.50**	**0.13**	**0.38**
Infiltration Basin	**80%**	**0.38**	**0.30**	**0.08**
	0%	**0.08**	**0.00**	**0.08**
	0%	**0.08**	**0.00**	**0.08**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **93%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Weaver's Cove East Layover**	Sheet:	**2 of 3**
Project Number:	**10111.00**	Date:	**14-Jun-2012**
Location:	**Fall River, MA**	Computed by:	**TJR**
Discharge Point:	**DP1**	Checked by:	
Drainage Area(s):	**PR-4**		

A BMP*	B TSS Removal Rate*	C Starting TSS Load**	D Amount Removed (B*C)	E Remaining Load (D-E)
Infiltration Basin	**80%**	**1.00**	**0.80**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**
	0%	**0.20**	**0.00**	**0.20**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **80%**

TSS Removal Calculation Worksheet

Vanasse Hangen Brustlin, Inc.
Consulting Engineers and Planners
101 Walnut Street
Watertown, MA 02471
(617) 924-1770

Project Name:	**Weaver's Cove East Layover**	Sheet:	**3 of 3**
Project Number:	**10111.00**	Date:	**14-Jun-2012**
Location:	**Fall River, MA**	Computed by:	**TJR**
Discharge Point:	**DP1**	Checked by:	
Drainage Area(s):	**PR-5**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (B*C)	Remaining Load (D-E)
Oil Grit Separator	**25%**	**1.00**	**0.25**	**0.75**
Sediment Forebay	**25%**	**0.75**	**0.19**	**0.56**
Infiltration Basin	**80%**	**0.56**	**0.45**	**0.11**
	0%	**0.11**	**0.00**	**0.11**
	0%	**0.11**	**0.00**	**0.11**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.
Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).
** Equals remaining load from previous BMP (E)
*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 75% removal is used for this calculation based upon the NJCAT study provided on the MA STEP website. (Change name of device and the claimed removal rate shown on the calc. sheet. ALSO provide backup documentation to support TSS removal rate from the MA STEP website. Remove this sentence if not applicable.)

Treatment Train TSS Removal = **89%**

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Stormwater Report

Wamsutta Layover Facility

City of New Bedford, Massachusetts

Prepared for

massDOT

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts

Prepared by

Vanasse Hangen Brustlin, Inc.

Transportation, Land Development, Environmental Services
99 High Street
Boston, Massachusetts 02110
617 728 7777

June 2012

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Table of Contents

1 Stormwater Report Narrative 1-1

1.1 Project Description 1-1
1.2 Site Description 1-1
1.3 Existing Drainage Conditions 1-2
1.4 Proposed Drainage Conditions 1-3
1.5 Environmentally Sensitive and Low Impact Development (LID) Techniques 1-3

Appendix .....

Appendix A FEMA Flood Map

List of Figures

Figure No.	Description
1	Site Locus Map

(Figure follows text.)

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1

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).

1.1 Project Description

MassDOT is proposing to construct an overnight commuter rail layover facility at a location known as Wamsutta, situated on a previously developed parcel adjacent to 216 Herman Melville Boulevard in New Bedford, Massachusetts along the New Bedford Main Line (the Project). The Project proposes six layover tracks, a paved driveway and access aisle around the layover tracks, ancillary landscape improvements, 39 parking spaces, one operation and maintenance building, one power substation, and one crew quarters building along with utility connections to support this use.

The Project is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) as defined in 3.10 CMR 10.04 and 314 CMR 9.02 because the use is regulated under the NPDES Multi-Sector General Permit.

1.2 Site Description

The Site is an approximately 11-acre parcel of land located at the end of the New Bedford Main Line in New Bedford, Massachusetts (Figure 1). It is located near the intersection of Wamsutta Street and Herman Melville Boulevard, near the southern terminus of the New Bedford Main Line, immediately north of the proposed Whale's Tooth Station. The Site is on the east side of the railroad right-of-way (ROW), opposite the proposed Whale's Tooth Station platform and adjacent to an existing freight rail yard. New Bedford Harbor lies to the east, just beyond the existing freight yard and Herman Melville Boulevard. The Site is ideally suited for a terminal

storage/ layover facility since it is located in an industrial area adjacent to a freight rail yard and is at the end of the railroad line, limiting deadhead moves.

The former Conrail Yard comprising the Site was managed as a voluntary "Brownfields" redevelopment site. Soils near the center of the Site contained elevated concentrations of polychlorinated biphenyls (PCB), arsenic, lead, and polycyclic aromatic hydrocarbons (PAHs) with the perimeter soils having lower concentrations of these contaminants. An agreement was reached with the Massachusetts Department of Environmental Protection (MassDEP) and US Environmental Protection Agency (EPA) based on the financial infeasibility of remediating contamination at the Site. The contamination was proposed to be left in place with proper engineering controls, such as a soil geotextile composition cap and land use restrictions consisting of an Activity and Use Limitation (AUL) in the areas exhibiting the highest concentrations of contamination above the Upper Concentration Limits. Since contaminated soil was left in place, there are potential human health impacts related to exposure during future soil disturbance at the Site during construction related to the South Coast Rail Project.

There is no Wetland Resource Area located on the Site, but the proposed layover facility is within the 100-foot buffer zone of a jurisdictional wetland just north of the Site, along Wamsutta Street. Hydrologic Soil Group (HSG) data is not available from National Resources Conservation Service (NRCS) for this site.

The project is not located within the 100-year flood plain as shown on the FEMA Floodway Map, City of New Bedford, Massachusetts Bristol County, Community Panel Number 25005C0393F dated July 7, 2009. This map is included in Appendix A. The proposed layover facility is located entirely within the coastal zone associated with New Bedford Inner Harbor but is not within the New Bedford/Fairhaven Designated Port Area (DPA).

1.3 Existing Drainage Conditions

The majority of the Site is currently situated on an engineered cap. The cap consists of a permeable geotextile material that is covered with a layer of soil and crushed stone, which varies in depth from 1 to 3 feet. Vegetation has grown in a swath along the easternmost freight yard track that was left without the crushed stone layer. When it rains, water seeps into the crushed stone layer and pools above the cap to a depth just a few inches below the top of the crushed stone. Some water flows through the crushed stone and to the vegetated area, where water also pools. In peak storm events, water flows off the Site, into the wetland/stream to the north of the Site and ultimately to the harbor.

1.4 Proposed Drainage Conditions

There has not been any ground survey taken of the Site, so the proposed drainage is conceptual. The Project is a redevelopment of the Site, so as stated in Standard 7 of the Massachusetts Stormwater Standards, it is subject to Standards 2, 3, 4, 5, and 6 to the maximum extent practicable. The Site is subject to coastal storm flowage as defined in 310 CMR 10.04, so it is not subject Standard 2. An overview of planned drainage is provided. Runoff would be split between three drainage areas.

The northern part of the Site, including the access roads and the body of the tracks, would drain into either one of two grass channels adjacent to the outermost tracks. On the east side of the Site, the grass channel would direct runoff towards the center of the facility to a concrete pipe that runs under the layover tracks to the west side. On the west side of the Site, the grass channel would direct runoff towards the center of the facility to a ballast inlet, tying the east and west sides together. From the ballast inlet, the stormwater flows through a concrete pipe under the main line to a water quality manhole. Finally, a concrete pipe connects the water quality manhole with the municipal drainage system in Acushnet Avenue.

The stormwater for the southern part of the Site would be captured by subdrains adjacent to the outermost tracks. Drip pans would be located in the track where locomotives will be tied-down overnight to collect higher potential pollution loads and channel any runoff into the closed drainage system. The subdrains and drip pans combine flows into a single water quality manhole located on the west side of the main line. From the water quality manhole, the stormwater flows through a concrete pipe south to tie into the municipal system near proposed Whales Tooth Station parking area.

The third drainage area includes the employee parking lot and support building footprints. There are limited options for managing the drainage due to the underlying cap. Pervious pavement will be used for the parking area to decrease runoff and provide maximum area for infiltration. Runoff from the roofs of the building will flow into a gutter and downspout system and will be collected in a rain barrel.

The Site has been designed with a comprehensive stormwater management system to the maximum extent practicable that has been developed in accordance with the Massachusetts Stormwater Standards.

1.5 Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include:

- Minimal disturbance to exiting trees and vegetation
- Grassed Channels
- Gravel and Grass Filter Strip
- Pervious Pavement

In general, stormwater runoff from all impervious surfaces in proposed conditions would receive some form of treatment for stormwater quality prior to discharge to the existing design points. Under existing conditions no such treatment is provided for stormwater runoff.

Appendix A
FEMA Flood Map

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 0393F

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BRISTOL COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 393 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FAIRHAVEN, TOWN OF	250054	0393	F
NEW BEDFORD, CITY OF	255216	0393	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25005C0393F

EFFECTIVE DATE
JULY 7, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix 5.2-A

Economic Development Research Group, Inc. Net Change in Households in the South Coast Due to Development & Operation of the South Coast Rail

Proposal/Report for:

Massachusetts Executive Office of Transportation

Net Change in Households in the South Coast Due to Development & Operation of the South Coast Rail

Prepared for:

Executive Office of Transportation
10 Park Plaza
Boston, Massachusetts 02116

Prepared by:

Economic Development Research Group, Inc.
2 Oliver Street, 9th Floor, Boston, MA 02109

August, 7, 2009

Induced Households

Purpose. Estimate the net change in households that are likely to move or stay within the 31 city and town South Coast Rail region (SCR) by 2030 due to new jobs generated by developing and operating the South Coast Rail. This will be done with what is commonly referred to as a "Sketch Planning" approach.

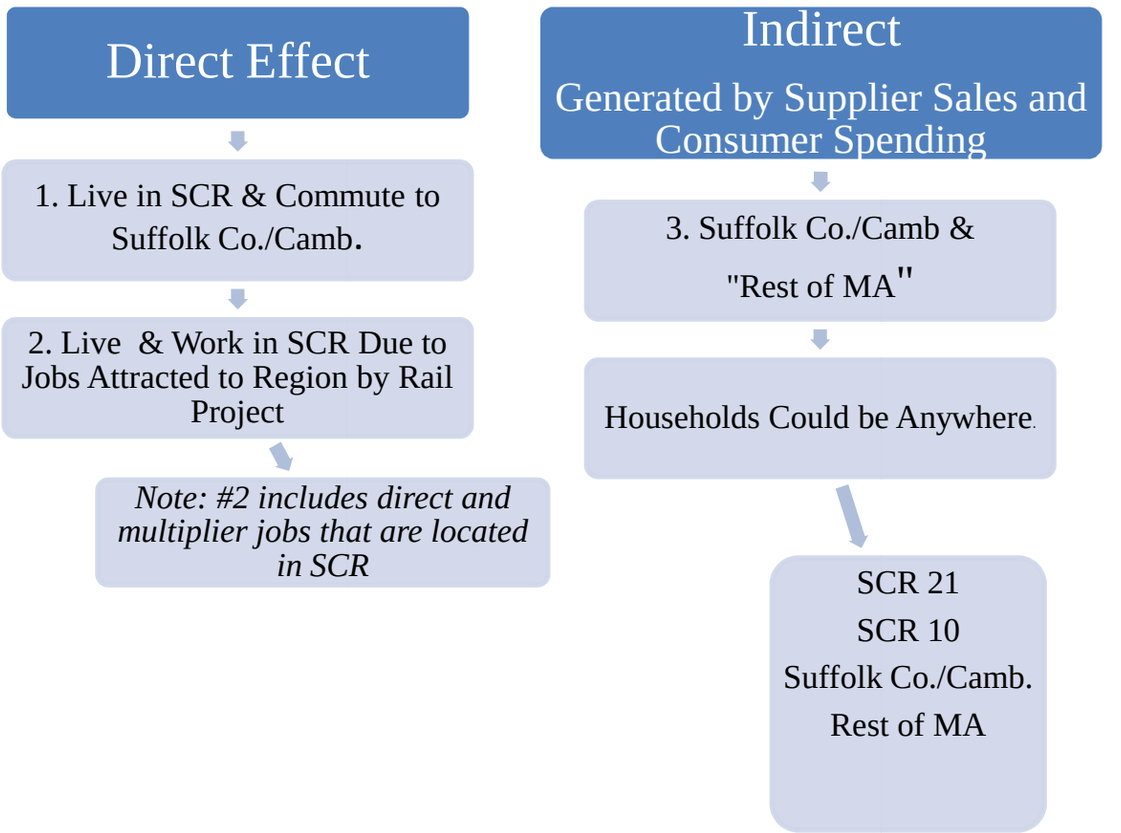
The Bottom Line. Operation of the South Coast Rail project as scheduled is expected to induce 1,100 – 1,800 more households within the SCR. The average for all alternatives analyzed is 1,500.

Alternatives

- Stoughton Electric
- Stoughton Diesel
- Attleboro Electric
- Rapid Bus
- Average – Based on the average inputs , not the average results

Analysis Segmentation Based on New Jobs in 2030 Generated by Operation of SCR

- Analysis includes three methods.



Method 1

Direct Jobs in Suffolk County and Cambridge

- New direct jobs in Suffolk County & Cambridge are by definition created by the rail.
- At this level of analysis it is impossible to determine exactly how many of the new jobs will be taken by existing SCR regional residents and how many will be by taken by people who move to the SCR region.
- Actual new households in the SCR will depend on the mix of new jobs in Suffolk County/Cambridge and the labor force match in SCR 21 and SCR10.
- This analysis assumes 50% of new direct jobs created by the presence of the SCR.

Direct Jobs In Suffolk County/ Cambridge		50% are assumed to result in new households in SCR These new households are assigned to SCR 21 and SCR 10 according to the ratio of new transit trips forecast by CTPS ***from*** these two subregions ***to*** Suffolk County/Cambridge. The split is roughly two-thirds from SCR 21 and one-third from SCR 10 per alternative.
SLE	460	
SLD	435	
BRT	269	
ALE	472	
Average	409	

Method 2

Attraction of New Households in SCR 21 and SCR 10 Based on Jobs Generated by the SCR in Each Region (p. 1 of 2)

This approach is based on comparing the types of jobs expected to be generated in the South Coast due to SCR with the existing mix of jobs in the region.

1. TREDIS output included expected employment by 2030 in 55 economic sectors for SC 21 and SC 10 generated by SCR operations.
2. Per subregion, each sector was divided by total 2030 employment. The resulting percentages show the concentration of each industry among the new jobs that are expected to be generated by the SCR in SCR 21 and SCR 10.

$$\frac{\text{New Employment Industry}_i}{\text{Total New Employment}} = \% \text{ Concentration for Industry}$$

3. This same operation was performed for current (2006) SCR 21 and SCR 10 employment.
4. The percents of new jobs due to the SCR (#2) were divided by the current concentrations (#3). The result is commonly referred to as a location quotient (or LQ).

$$\frac{\%\text{ Concentration for Industry New Jobs}}{\%\text{ Concentration for Industry Existing Jobs}} = \text{SCR 10 and SCR 21 LQs}$$

Jobs in SCR 21 and SCR 10 (p. 2 of 2)

5. An LQ of 1.0 indicates that the concentration of an industry in the South Coast due to the SCR is the same as its current strength. A higher LQ indicates that this is a relatively new industry (or strengthens a weak industry locally). We assume these industries are likely to attract new households. Interpretation is as follows.

Industry specific household formation in SCR 21 and SCR 10			
LQ		**Discussion**	**Percent of New Jobs that Result in New Households**
1	Below 0.8	Current SCR labor force in terms of skills, education and numbers are generally adequate for the new jobs that will be generated in these in industries. New household formation will be minimal.	10%
2	Above 1.2	These industries have the potential to transform the SCR economies, and will require education and skills. Therefore significant new household formation should be expected for new workers in these industries.	80%
3	0.8 – 1.2	These industries will be added to the SCR 21 and 10 economies at about the same levels as the current economies of each subregion. In terms of housing formation, a midpoint is assumed between high growth industries (#2) and minimal growth industries (#1)	45%

Method 3 (1 of 2)

Indirect and Induced Jobs in Suffolk County/Cambridge

The potential for new households in SCR was based on 2000 Journey to Work of the US Census (JTW), which shows that the commuting base for Suffolk County and Cambridge includes 1.6% representation from SCR10 and 4.0% from SCR 10.

Total workers in Suffolk County/Cambridge	622,873	
Suffolk/Cambridge workers who live in Suffolk-Cambridge	262,127	
Suffolk/Cambridge workers who commute from outside the region	438,019	
SCR21 commuters to Suffolk County-Cambridge	7,144	1.6%
SCR10 commuters to Suffolk County-Cambridge	17,579	4.0%
Total South Coast	**24,723**	**5.6%**

A. JTW Ratios for SCR

B. To this percentage we added a "bump" based on the increased 60 minute employee-employer access calculated by CTPS per alternative compared to the base case.

- For SCR 21: Factors of 2.14 -2.25 above JTW
- For SCR 10: Factors of 1.10 – 1.04 above JTW

C. Multiplying the JTW commuting percents (A) by the increase in access over a 60 minute transit ride (B) leads to the estimate that new households will be established in South Coast at:

- SCR 21 – 3.5% to 3.7% of indirect/induced jobs located in Suffolk County/ Cambridge
- SCR 10 – 4.1% - 4.2% of indirect/induced jobs located in Suffolk County/ Cambridge

Method 3 (2 of 2)

Indirect and Induced Jobs in Rest of Massachusetts

The potential for new households in SCR was based on 2000 Journey to Work of the US Census (JTW), which shows that the commuting base for the Massachusetts excluding the SCR and Suffolk County and Cambridge includes 3.6% representation from the South Coast. This analysis assumes that the establishment of the SCR will not influence new jobs created due to supplier relationships or consumer spending beyond existing patterns. Therefore a flat 3.6% was assumed as the rate of households induced in SCR from the indirect/induced jobs anticipated in the "Rest of Massachusetts."

Estimated Total New Households in SCR Region Due to Rail Project

	SLE	SLD	ALE	RB	Average All Alternatives
SCR21					
From Direct New Jobs in Suffolk County/Cambridge	150	140	150	100	140
From Indirect & Induced New Jobs in Suffolk County/Cambridge	10	10	10	10	10
From New Jobs in SCR Region	1,120	1,020	1,160	830	990
From New Jobs in Rest of MA	20	20	20	10	20
Subtotal	1,300	1,190	1,340	950	***1,150***
SCR10					
From Direct New Jobs in Suffolk County/Cambridge	80	70	80	40	70
From Indirect & Induced New Jobs in Suffolk County/Cambridge	10	10	10	10	10
From New Jobs in SCR Region	320	310	340	130	260
From New Jobs in Rest of MA	-	-	-	-	-
Subtotal	***420***	***400***	***440***	***170***	***350***
Total	**1,720**	**1,590**	**1,780**	**1,130**	**1,500**

Numbers are rounded to the nearest 10.
Columns may not add due to rounding.

Given the "sketch plan" nature of this analysis, the results should be assessed on the basis of orders of magnitude. SLE and ALE alternatives should be considered as equivalent, generating slightly more net households than SLD, which in turn generates more households than RB.

Appendix 5.3-A

Indirect and Cumulative Impacts Tables

Table A-1: Projected Change in Housing Unit & Employment Growth by Community, 2000 to 2035

		Households							Employment						
			2035							2035					
			No-Build		Scenario 1		Scenario 2			No-Build		Scenario 1		Scenario 2	
Municipality	RPA	2000	Projection	Growth	Projection	Growth	Projection	Growth	2000	Projection	Growth	Projection	Growth	Projection	Growth
Acushnet	SPREDD	3,792	4,757	965	4,784	992	4,798	1,006	1,922	1,406	(516)	1,417	(505)	1,379	(543)
Attleboro	SPREDD	16,020	18,926	2,906	18,940	2,920	19,128	3,108	22,174	19,423	(2,751)	19,470	(2,704)	19,441	(2,733)
Berkley	SPREDD	1,848	2,654	806	2,685	837	2,645	797	498	671	173	680	182	640	142
Bridgewater	OCPC	7,526	9,256	1,730	9,286	1,760	9,521	1,995	7,211	9,040	1,829	9,062	1,851	9,339	2,128
Canton	MAPC	7,952	10,600	2,648	10,614	2,662	10,680	2,728	19,947	23,316	3,369	23,360	3,413	23,353	3,406
Dartmouth	SPREDD	10,543	14,248	3,705	14,315	3,772	14,260	3,717	13,344	18,535	5,191	18,635	5,291	18,469	5,125
Dighton	SPREDD	2,196	3,188	992	3,252	1,056	3,165	969	2,084	2,039	(45)	2,042	(42)	2,005	(79)
Easton	OCPC	7,489	8,751	1,262	8,776	1,287	8,895	1,406	9,347	10,815	1,468	10,962	1,615	11,258	1,911
Fairhaven	SPREDD	6,631	8,153	1,522	8,514	1,883	8,228	1,597	7,107	6,513	(594)	6,529	(578)	6,501	(606)
Fall River	SPREDD	38,775	46,011	7,236	46,544	7,769	46,404	7,629	40,264	38,746	(1,518)	38,940	(1,324)	38,782	(1,482)
Foxborough	MAPC	6,141	7,656	1,515	7,665	1,524	8,405	2,264	9,148	13,706	4,558	13,766	4,618	14,840	5,692
Freetown	SPREDD	2,921	3,856	935	3,915	994	3,851	930	2,088	5,066	2,978	5,113	3,025	4,953	2,865
Lakeville	SPREDD	3,292	4,725	1,433	4,754	1,462	4,670	1,378	2,828	3,818	990	3,835	1,007	3,751	923
Mansfield	SPREDD	7,942	10,126	2,184	10,133	2,191	10,147	2,205	12,105	12,811	706	12,815	710	12,813	708
Marion	SPREDD	1,990	2,275	285	2,288	298	2,302	312	2,063	2,333	270	2,339	276	2,298	235
Mattapoisett	SPREDD	2,530	3,262	732	3,315	785	3,265	735	1,827	1,924	97	1,926	99	1,891	64
Middleborough	SPREDD	6,981	9,893	2,912	9,919	2,938	9,953	2,972	7,543	10,043	2,500	10,068	2,525	10,023	2,480
New Bedford	SPREDD	38,240	43,530	5,290	43,979	5,739	43,864	5,624	37,206	38,467	1,261	38,608	1,402	38,517	1,311
N Attleborough	SPREDD	10,231	13,984	3,753	14,003	3,772	14,095	3,864	12,676	12,974	298	12,975	299	12,986	310
Norton	SPREDD	5,872	7,518	1,646	7,546	1,674	7,503	1,631	6,208	7,058	850	7,063	855	7,011	803
Raynham	SPREDD	4,143	6,461	2,318	6,549	2,406	6,434	2,291	6,773	9,868	3,095	9,943	3,170	9,840	3,067
Rehoboth	SPREDD	3,518	5,587	2,069	5,625	2,107	5,564	2,046	1,508	1,870	362	1,881	373	1,841	333
Rochester	SPREDD	1,578	2,572	994	2,600	1,022	2,534	956	980	829	(151)	831	(149)	800	(180)
Seekonk	SPREDD	4,830	6,132	1,302	6,145	1,315	6,160	1,330	8,223	9,414	1,191	9,429	1,206	9,420	1,197
Sharon	MAPC	5,934	6,961	1,027	6,967	1,033	7,038	1,104	3,194	3,328	134	3,331	137	3,313	119
Somerset	SPREDD	6,976	7,654	678	7,690	714	7,694	718	4,212	4,920	708	4,955	743	4,894	682
Stoughton	OCPC	10,254	12,521	2,267	12,593	2,339	12,677	2,423	12,602	13,444	842	13,474	872	13,457	855
Swansea	SPREDD	5,913	7,290	1,377	7,330	1,417	7,295	1,382	5,576	6,177	601	6,188	612	6,141	565
Taunton	SPREDD	22,044	27,106	5,062	27,221	5,177	27,258	5,214	24,307	28,460	4,153	28,597	4,290	28,461	4,154
Wareham	SPREDD	8,210	11,254	3,044	11,306	3,096	11,253	3,043	6,602	9,941	3,339	10,003	3,401	9,868	3,266
Westport	SPREDD	5,381	8,800	3,419	9,005	3,624	8,570	3,189	3,027	3,478	451	3,500	473	3,450	423
Bristol RI	RI	NA	NA	1,943	NA	1,999	NA	1,999	NA	NA	640	NA	652	NA	652
Portsmouth RI	RI	NA	NA	2,386	NA	2,455	NA	2,455	NA	NA	902	NA	919	NA	919
Tiverton RI	RI	NA	NA	1,976	NA	2,095	NA	2,095	NA	NA	249	NA	254	NA	254
Warren RI	RI	NA	NA	893	NA	902	NA	902	NA	NA	235	NA	238	NA	238
TOTAL		**267,693**	**335,707**	**75,212**	**338,258**	**78,016**	**338,258**	**78,016**	**294,594**	**330,432**	**37,864**	**331,737**	**39,206**	**331,737**	**39,206**

Data Sources: MAPC, OCPC, SRPEDD

Note: RI values are carried forward from DEIS/DEIR.

Table A-2: Projected Change in Land Use Impacts by Community, 2000 to 2035

	Additional Land Use Impacts in 2035									
	No-Build & Scenario 1					Scenario 2				
		No-Build		Scenario 1		Conversion			Low	High
Municipality	Conversion (acres / household)	Additional Households	Acres	Additional Households	Acres	Low	High	Additional Households	Acres	Acres
Acushnet	0.59	965	569.3	992	585	0	0	1,006	473	412
Attleboro	0.29	2,906	842.7	2,920	847	0	0	3,108	715	622
Berkley	0.85	806	685.1	837	711	1	1	797	534	478
Bridgewater	0.37	1,730	640.1	1,760	651	0	0	1,995	579	519
Canton	0.14	2,648	370.7	2,662	373	0	0	2,728	300	273
Dartmouth	0.57	3,705	2,111.8	3,772	2,150	0	0	3,717	1,673	1,487
Dighton	0.83	992	823.4	1,056	877	1	1	969	640	562
Easton	0.35	1,262	441.7	1,287	451	0	0	1,406	394	352
Fairhaven	0.45	1,522	684.9	1,883	848	0	0	1,597	575	511
Fall River	0.16	7,236	1,157.8	7,769	1,243	0	0	7,629	992	839
Foxborough	0.50	1,515	757.6	1,524	762	0	0	2,264	905	792
Freetown	0.96	935	897.6	994	954	1	1	930	707	623
Lakeville	1.23	1,433	1,762.6	1,462	1,799	1	1	1,378	1,337	1,185
Mansfield	0.43	2,184	939.1	2,191	942	0	0	2,205	750	662
Marion	0.59	285	168.2	298	176	0	0	312	147	128
Mattapoisett	0.59	732	431.9	785	463	0	0	735	346	301
Middleborough	0.75	2,912	2,184.0	2,938	2,203	1	1	2,972	1,753	1,575
New Bedford	0.22	5,290	1,163.8	5,739	1,263	0	0	5,624	956	844
N Attleborough	0.39	3,753	1,463.7	3,772	1,471	0	0	3,864	1,198	1,043
Norton	0.50	1,646	823.0	1,674	837	0	0	1,631	653	571
Raynham	0.39	2,318	904.0	2,406	938	0	0	2,291	710	619
Rehoboth	0.96	2,069	1,986.2	2,107	2,023	1	1	2,046	1,555	1,371
Rochester	0.94	994	934.4	1,022	960	1	1	956	707	631
Seekonk	1.04	1,302	1,354.1	1,315	1,368	1	1	1,330	1,091	971
Sharon	0.48	1,027	493.0	1,033	496	0	0	1,104	419	375
Somerset	0.40	678	271.2	714	286	0	0	718	230	201
Stoughton	0.57	2,267	1,292.2	2,339	1,333	0	0	2,423	1,090	969
Swansea	0.83	1,377	1,142.9	1,417	1,176	1	1	1,382	912	802
Taunton	0.45	5,062	2,277.9	5,177	2,330	0	0	5,214	1,877	1,669
Wareham	0.37	3,044	1,126.3	3,096	1,145	0	0	3,043	882	791
Westport	0.68	3,419	2,324.9	3,624	2,464	1	0	3,189	1,722	1,531
Bristol RI	0.83	1,943	1,612.7	1,999	1,659	1	1	1,999	1,319	1,159
Portsmouth RI	0.83	2,386	1,980.4	2,455	2,038	1	1	2,455	1,620	1,424
Tiverton RI	0.68	1,976	1,343.7	2,095	1,425	1	0	2,095	1,131	1,006
Warren RI	1.04	893	928.7	902	938	1	1	902	740	658
TOTAL		**75,212**	**38,892**	**78,016**	**40,184**			**78,016**	**31,631**	**27,955**

Note: Households from Table A-1

Table A-3: Projected Change in Forest Land Impacts by Community, 2000 to 2035

Municipality	Additional Forest Land Impacts in 2035									
	No-Build & Scenario 1					Scenario 2				
	Conversion (acres / household)	No-Build		Scenario 1		Conversion		Additional Households	Low	High
		Additional Households	Acres	Additional Households	Acres	Low	High		Acres	Acres
Acushnet	0.24	965	232	992	238	0.19	0.17	1,006	191	171
Attleboro	0.19	2,906	552	2,920	555	0.15	0.13	3,108	466	404
Berkley	0.48	806	387	837	402	0.38	0.34	797	303	271
Bridgewater	0.20	1,730	346	1,760	352	0.16	0.14	1,995	319	279
Canton	0.06	2,648	159	2,662	160	0.05	0.04	2,728	136	109
Dartmouth	0.29	3,705	1,074	3,772	1,094	0.23	0.20	3,717	855	743
Dighton	0.36	992	357	1,056	380	0.28	0.25	969	271	242
Easton	0.21	1,262	265	1,287	270	0.17	0.15	1,406	239	211
Fairhaven	0.17	1,522	259	1,883	320	0.13	0.12	1,597	208	192
Fall River	0.08	7,236	579	7,769	621	0.06	0.06	7,629	458	458
Foxborough	0.36	1,515	545	1,524	549	0.28	0.25	2,264	634	566
Freetown	0.56	935	524	994	557	0.44	0.39	930	409	363
Lakeville	0.60	1,433	860	1,462	877	0.47	0.42	1,378	648	579
Mansfield	0.30	2,184	655	2,191	657	0.24	0.21	2,205	529	463
Marion	0.47	285	134	298	140	0.37	0.33	312	116	103
Mattapoisett	0.39	732	285	785	306	0.31	0.27	735	228	199
Middleborough	0.43	2,912	1,252	2,938	1,263	0.34	0.30	2,972	1,010	891
New Bedford	0.09	5,290	476	5,739	517	0.07	0.06	5,624	394	337
N Attleborough	0.23	3,753	863	3,772	867	0.18	0.16	3,864	696	618
Norton	0.32	1,646	527	1,674	536	0.25	0.22	1,631	408	359
Raynham	0.23	2,318	533	2,406	553	0.18	0.16	2,291	412	367
Rehoboth	0.14	2,069	290	2,107	295	0.11	0.10	2,046	225	205
Rochester	0.45	994	447	1,022	460	0.36	0.32	956	344	306
Seekonk	0.47	1,302	612	1,315	618	0.37	0.33	1,330	492	439
Sharon	0.38	1,027	390	1,033	393	0.30	0.27	1,104	331	298
Somerset	0.12	678	81	714	86	0.09	0.08	718	65	57
Stoughton	0.39	2,267	884	2,339	912	0.31	0.27	2,423	751	654
Swansea	0.36	1,377	496	1,417	510	0.28	0.25	1,382	387	346
Taunton	0.27	5,062	1,367	5,177	1,398	0.21	0.19	5,214	1,095	991
Wareham	0.29	3,044	883	3,096	898	0.23	0.20	3,043	700	609
Westport	0.31	3,419	1,060	3,624	1,124	0.24	0.22	3,189	765	701
Bristol RI	0.36	1,943	699	1,999	720	0.28	0.25	1,999	560	500
Portsmouth RI	0.36	2,386	859	2,455	884	0.28	0.25	2,455	687	614
Tiverton RI	0.31	1,976	613	2,095	649	0.24	0.22	2,095	503	461
Warren RI	0.47	893	420	902	424	0.37	0.33	902	334	298
TOTAL		**75,212**	**19,965**	**78,016**	**20,584**			**78,016**	**16,169**	**14,403**

Note: Households from Table A-1

Table A-4: Projected Change in Farmland Impacts by Community, 2000 to 2035

Municipality	Additional Farmland Impacts in 2035									
	No-Build & Scenario 1					Scenario 2				
	Conversion (acres per household)	No-Build		Scenario 1		Conversion		Additional Households	Low	High
		Additional Households	Acres	Additional Households	Acres	Low	High		Acres	Acres
Acushnet	0.22	965.0	212	992	218	0.17	0.15	1,006	171	150.9
Attleboro	0.03	2,906.0	87	2,920	88	0.02	0.02	3,108	62	62.2
Berkley	0.22	806.0	177	837	184	0.17	0.15	797	135	119.6
Bridgewater	0.11	1,730.0	190	1,760	194	0.09	0.08	1,995	180	159.6
Canton	0.02	2,648.0	53	2,662	53	0.02	0.01	2,728	55	27.3
Dartmouth	0.18	3,705.0	667	3,772	679	0.14	0.13	3,717	520	483.3
Dighton	0.30	992.0	298	1,056	317	0.24	0.21	969	233	203.5
Easton	0.07	1,262.0	88	1,287	90	0.06	0.05	1,406	84	70.3
Fairhaven	0.13	1,522.0	198	1,883	245	0.10	0.09	1,597	160	143.8
Fall River	0.01	7,236.0	72	7,769	78	0.01	0.01	7,629	76	76.3
Foxborough	0.06	1,515.2	91	1,524	91	0.05	0.04	2,264	113	90.5
Freetown	0.17	935.0	159	994	169	0.13	0.12	930	121	111.6
Lakeville	0.38	1,433.0	545	1,462	556	0.30	0.27	1,378	414	372.2
Mansfield	0.05	2,184.0	109	2,191	110	0.04	0.04	2,205	88	88.2
Marion	0.02	285.0	6	298	6	0.02	0.01	312	6	3.1
Mattapoisett	0.11	732.0	81	785	86	0.09	0.08	735	66	58.8
Middleborough	0.23	2,912.0	670	2,938	676	0.18	0.16	2,972	535	475.4
New Bedford	0.01	5,290.0	53	5,739	57	0.01	0.01	5,624	56	56.2
N Attleborough	0.08	3,753.0	300	3,772	302	0.06	0.06	3,864	232	231.9
Norton	0.08	1,646.0	132	1,674	134	0.06	0.06	1,631	98	97.9
Raynham	0.08	2,318.0	185	2,406	192	0.06	0.06	2,291	137	137.5
Rehoboth	0.36	2,069.0	745	2,107	759	0.28	0.25	2,046	573	511.4
Rochester	0.34	994.0	338	1,022	347	0.27	0.24	956	258	229.4
Seekonk	0.29	1,302.0	378	1,315	381	0.23	0.20	1,330	306	266.0
Sharon	0.03	1,027.0	31	1,033	31	0.02	0.02	1,104	22	22.1
Somerset	0.09	678.0	61	714	64	0.07	0.06	718	50	43.1
Stoughton	0.03	2,267.0	68	2,339	70	0.02	0.02	2,423	48	48.5
Swansea	0.28	1,377.0	386	1,417	397	0.22	0.20	1,382	304	276.4
Taunton	0.07	5,062.0	354	5,177	362	0.06	0.05	5,214	313	260.7
Wareham	0.01	3,044.0	30	3,096	31	0.01	0.01	3,043	30	30.4
Westport	0.31	3,419.0	1,060	3,624	1,124	0.24	0.22	3,189	765	701.5
Bristol RI	0.28	1,943.0	544	1,999	560	0.22	0.20	1,999	440	399.8
Portsmouth RI	0.28	2,386.0	668	2,455	687	0.22	0.20	2,455	540	491.0
Tiverton RI	0.31	1,976.0	613	2,095	649	0.24	0.22	2,095	503	460.9
Warren RI	0.29	893.0	259	902	262	0.23	0.20	902	207	180.4
TOTAL		**75,212**	**9,907**	**78,016**	**10,249**			**78,016**	**7,903**	**7,142**

Note: Households from Table A-1

Table A-5: Projected Change in Wetland Impacts by Community, 2000 to 2035

Municipality	Additional Wetland Impacts in 2035						
	No-Build & Scenario 1 (0.00017 conversion)				Scenario 2		
	No-Build		Scenario 1			Low (0.00013 conversion)	High (0.00012 conversion)
	Additional Households	Acres	Additional Households	Acres	Additional Households	Acres	Acres
Acushnet	965	0.16	992	0.17	1,006	0.13	0.12
Attleboro	2,906	0.49	2,920	0.50	3,108	0.40	0.37
Berkley	806	0.14	837	0.14	797	0.10	0.10
Bridgewater	1,730	0.29	1,760	0.30	1,995	0.26	0.24
Canton	2,648	0.45	2,662	0.45	2,728	0.35	0.33
Dartmouth	3,705	0.63	3,772	0.64	3,717	0.48	0.45
Dighton	992	0.17	1,056	0.18	969	0.13	0.12
Easton	1,262	0.21	1,287	0.22	1,406	0.18	0.17
Fairhaven	1,522	0.26	1,883	0.32	1,597	0.21	0.19
Fall River	7,236	1.23	7,769	1.32	7,629	0.99	0.92
Foxborough	1,515	0.26	1,524	0.26	2,264	0.29	0.27
Freetown	935	0.16	994	0.17	930	0.12	0.11
Lakeville	1,433	0.24	1,462	0.25	1,378	0.18	0.17
Mansfield	2,184	0.37	2,191	0.37	2,205	0.29	0.26
Marion	285	0.05	298	0.05	312	0.04	0.04
Mattapoisett	732	0.12	785	0.13	735	0.10	0.09
Middleborough	2,912	0.50	2,938	0.50	2,972	0.39	0.36
New Bedford	5,290	0.90	5,739	0.98	5,624	0.73	0.67
N Attleborough	3,753	0.64	3,772	0.64	3,864	0.50	0.46
Norton	1,646	0.28	1,674	0.28	1,631	0.21	0.20
Raynham	2,318	0.39	2,406	0.41	2,291	0.30	0.27
Rehoboth	2,069	0.35	2,107	0.36	2,046	0.27	0.25
Rochester	994	0.17	1,022	0.17	956	0.12	0.11
Seekonk	1,302	0.22	1,315	0.22	1,330	0.17	0.16
Sharon	1,027	0.17	1,033	0.18	1,104	0.14	0.13
Somerset	678	0.12	714	0.12	718	0.09	0.09
Stoughton	2,267	0.39	2,339	0.40	2,423	0.31	0.29
Swansea	1,377	0.23	1,417	0.24	1,382	0.18	0.17
Taunton	5,062	0.86	5,177	0.88	5,214	0.68	0.63
Wareham	3,044	0.52	3,096	0.53	3,043	0.40	0.37
Westport	3,419	0.58	3,624	0.62	3,189	0.41	0.38
Bristol RI	1,943	0.33	1,999	0.34	1,999	0.26	0.24
Portsmouth RI	2,386	0.41	2,455	0.42	2,455	0.32	0.29
Tiverton RI	1,976	0.34	2,095	0.36	2,095	0.27	0.25
Warren RI	893	0.15	902	0.15	902	0.12	0.11
TOTAL	**75,212**	**12.8**	**78,016**	**13.3**	**78,016**	**10.1**	**9.4**

Note: Households from Table A-1

Table A-6: Projected Change in Biodiversity Impacts by Community, 2000 to 2035

	Additional Biodiversity Impacts in 2035												
	No-Build & Scenario 1						Scenario 2						
		No-Build			Scenario 1			Conversion		Scenario 2: Low			
Municipality	Conversion	Additional Households	Land Impact (acres)	Acres of Biodiversity Impact (3:1 ratio)	Additional Households	Land Impact (acres)	Acres of Biodiversity Impact (3:1 ratio)	Low	High	Additional Households	Land Impact (acres)	Acres of Biodiversity Impact (2.37:1 ratio)	Land Impact	Acres of Biodiversity Impact (2.10:1 ratio)
Acushnet	0.59	965	569	1,708	992	585	1,756	0.47	0.41	1,006	473	1,121	412	866
Attleboro	0.29	2,906	843	2,528	2,920	847	2,541	0.23	0.20	3,108	715	1,694	622	1,305
Berkley	0.85	806	685	2,055	837	711	2,133	0.67	0.60	797	534	1,266	478	1,004
Bridgewater	0.37	1,730	640	1,920	1,760	651	1,953	0.29	0.26	1,995	579	1,371	519	1,089
Canton	0.14	2,648	371	1,112	2,662	373	1,118	0.11	0.10	2,728	300	711	273	573
Dartmouth	0.57	3,705	2,112	6,336	3,772	2,150	6,450	0.45	0.40	3,717	1,673	3,965	1,487	3,123
Dighton	0.83	992	823	2,470	1,056	877	2,630	0.66	0.58	969	640	1,516	562	1,181
Easton	0.35	1,262	442	1,325	1,287	451	1,352	0.28	0.25	1,406	394	933	352	738
Fairhaven	0.45	1,522	685	2,055	1,883	848	2,543	0.36	0.32	1,597	575	1,363	511	1,074
Fall River	0.16	7,236	1,158	3,473	7,769	1,243	3,729	0.13	0.11	7,629	992	2,350	839	1,762
Foxborough	0.50	1,515	758	2,273	1,524	762	2,286	0.40	0.35	2,264	905	2,146	792	1,664
Freetown	0.96	935	898	2,693	994	954	2,862	0.76	0.67	930	707	1,676	623	1,309
Lakeville	1.23	1,433	1,763	5,288	1,462	1,799	5,396	0.97	0.86	1,378	1,337	3,169	1,185	2,489
Mansfield	0.43	2,184	939	2,817	2,191	942	2,826	0.34	0.30	2,205	750	1,777	662	1,389
Marion	0.59	285	168	504	298	176	527	0.47	0.41	312	147	348	128	269
Mattapoisett	0.59	732	432	1,296	785	463	1,389	0.47	0.41	735	346	819	301	633
Middleborough	0.75	2,912	2,184	6,552	2,938	2,203	6,610	0.59	0.53	2,972	1,753	4,155	1,575	3,307
New Bedford	0.22	5,290	1,164	3,491	5,739	1,263	3,788	0.17	0.15	5,624	956	2,266	844	1,771
N Attleborough	0.39	3,753	1,464	4,391	3,772	1,471	4,413	0.31	0.27	3,864	1,198	2,839	1,043	2,191
Norton	0.50	1,646	823	2,469	1,674	837	2,512	0.40	0.35	1,631	653	1,547	571	1,199
Raynham	0.39	2,318	904	2,712	2,406	938	2,815	0.31	0.27	2,291	710	1,683	619	1,299
Rehoboth	0.96	2,069	1,986	5,959	2,107	2,023	6,069	0.76	0.67	2,046	1,555	3,685	1,371	2,878
Rochester	0.94	994	934	2,803	1,022	960	2,881	0.74	0.66	956	707	1,676	631	1,325
Seekonk	1.04	1,302	1,354	4,062	1,315	1,368	4,104	0.82	0.73	1,330	1,091	2,585	971	2,039
Sharon	0.48	1,027	493	1,479	1,033	496	1,488	0.38	0.34	1,104	419	994	375	788
Somerset	0.40	678	271	814	714	286	857	0.32	0.28	718	230	545	201	422
Stoughton	0.57	2,267	1,292	3,877	2,339	1,333	4,000	0.45	0.40	2,423	1,090	2,584	969	2,035
Swansea	0.83	1,377	1,143	3,429	1,417	1,176	3,527	0.66	0.58	1,382	912	2,162	802	1,684
Taunton	0.45	5,062	2,278	6,834	5,177	2,330	6,989	0.36	0.32	5,214	1,877	4,449	1,669	3,504
Wareham	0.37	3,044	1,126	3,379	3,096	1,145	3,436	0.29	0.26	3,043	882	2,091	791	1,661
Westport	0.68	3,419	2,325	6,975	3,624	2,464	7,393	0.54	0.48	3,189	1,722	4,081	1,531	3,214
Bristol RI	0.83	1,943	1,613	4,838	1,999	1,659	4,978	0.66	0.58	1,999	1,319	3,127	1,159	2,435
Portsmouth RI	0.83	2,386	1,980	5,941	2,455	2,038	6,113	0.66	0.58	2,455	1,620	3,840	1,424	2,990
Tiverton RI	0.68	1,976	1,344	4,031	2,095	1,425	4,274	0.54	0.48	2,095	1,131	2,681	1,006	2,112
Warren RI	1.04	893	929	2,786	902	938	2,814	0.82	0.73	902	740	1,753	658	1,383
TOTAL		**75,212**	**38,892**	**116,675**	**78,016**	**40,184**	**120,551**			**78,016**	**31,631**	**74,967**	**27,955**	**58,706**

Note: Households from Table A-1. Conversion factors and land impact from Land Use Table A-2

Table A-7: Projected Change in Water Demand by Community, 2000 to 2035

Municipality	Additional Water Demand in 2035					
	No-Build		Scenario 1		Scenario 2	
	Additional Households	Total Gallons (162.5/HH)	Additional Households	Total Gallons (162.5/HH)	Additional Households	Total Gallons (141.38/HH)
Acushnet	965	156,812	992	161,188	1,006	142,238
Attleboro	2,906	472,225	2,920	474,576	3,108	439,391
Berkley	806	130,975	837	135,932	797	112,682
Bridgewater	1,730	281,125	1,760	285,980	1,995	282,092
Canton	2,648	430,308	2,662	432,545	2,728	385,726
Dartmouth	3,705	602,062	3,772	612,924	3,717	525,577
Dighton	992	161,200	1,056	171,669	969	137,036
Easton	1,262	205,075	1,287	209,183	1,406	198,821
Fairhaven	1,522	247,325	1,883	306,065	1,597	225,852
Fall River	7,236	1,175,850	7,769	1,262,391	7,629	1,078,576
Foxborough	1,515	246,226	1,524	247,628	2,264	320,033
Freetown	935	151,938	994	161,512	930	131,530
Lakeville	1,433	232,862	1,462	237,633	1,378	194,879
Mansfield	2,184	354,900	2,191	356,033	2,205	311,761
Marion	285	46,313	298	48,407	312	44,138
Mattapoisett	732	118,950	785	127,534	735	103,949
Middleborough	2,912	473,200	2,938	477,413	2,972	420,113
New Bedford	5,290	859,625	5,739	932,656	5,624	795,085
N Attleborough	3,753	609,862	3,772	612,874	3,864	546,352
Norton	1,646	267,475	1,674	272,093	1,631	230,651
Raynham	2,318	376,675	2,406	390,964	2,291	323,885
Rehoboth	2,069	336,212	2,107	342,434	2,046	289,210
Rochester	994	161,525	1,022	165,996	956	135,141
Seekonk	1,302	211,575	1,315	213,747	1,330	188,020
Sharon	1,027	166,885	1,033	167,870	1,104	156,034
Somerset	678	110,175	714	116,025	718	101,536
Stoughton	2,267	368,388	2,339	380,081	2,423	342,545
Swansea	1,377	223,762	1,417	230,192	1,382	195,421
Taunton	5,062	822,575	5,177	841,276	5,214	737,187
Wareham	3,044	494,650	3,096	503,053	3,043	430,223
Westport	3,419	555,587	3,624	588,938	3,189	450,796
Bristol RI	1,943	315,738	1,999	324,838	1,999	282,619
Portsmouth RI	2,386	387,725	2,455	398,938	2,455	347,088
Tiverton RI	1,976	321,100	2,095	340,438	2,095	296,191
Warren RI	893	145,113	902	146,575	902	127,525
TOTAL	**75,212**	**12,221,993**	**78,016**	**12,677,600**	**78,016**	**11,029,902**

Note: Households from Table A-1

Table A-8: Projected Change in Stationary Source GHG Emissions by Community, 2000 to 2035

Municipality	Additional Greenhouse Gas Emissions in 2035					
	No-Build		Scenario 1		Scenario 2	
	Additional Households	Tons per Year (11.83/HH)	Additional Households	Tons per Year (11.83/HH)	Additional Households	Tons per Year (11.83/HH)
Acushnet	965	11,416	992	11,735	1,006	11,902
Attleboro	2,906	34,378	2,920	34,549	3,108	36,766
Berkley	806	9,535	837	9,896	797	9,429
Bridgewater	1,730	20,466	1,760	20,819	1,995	23,604
Canton	2,648	31,326	2,662	31,489	2,728	32,276
Dartmouth	3,705	43,830	3,772	44,621	3,717	43,978
Dighton	992	11,735	1,056	12,498	969	11,467
Easton	1,262	14,929	1,287	15,229	1,406	16,636
Fairhaven	1,522	18,005	1,883	22,282	1,597	18,898
Fall River	7,236	85,602	7,769	91,902	7,629	90,250
Foxborough	1,515	17,925	1,524	18,027	2,264	26,779
Freetown	935	11,061	994	11,758	930	11,006
Lakeville	1,433	16,952	1,462	17,300	1,378	16,307
Mansfield	2,184	25,837	2,191	25,919	2,205	26,087
Marion	285	3,372	298	3,524	312	3,693
Mattapoisett	732	8,660	785	9,284	735	8,698
Middleborough	2,912	34,449	2,938	34,756	2,972	35,153
New Bedford	5,290	62,581	5,739	67,897	5,624	66,529
N Attleborough	3,753	44,398	3,772	44,617	3,864	45,716
Norton	1,646	19,472	1,674	19,808	1,631	19,300
Raynham	2,318	27,422	2,406	28,462	2,291	27,101
Rehoboth	2,069	24,476	2,107	24,929	2,046	24,200
Rochester	994	11,759	1,022	12,085	956	11,308
Seekonk	1,302	15,403	1,315	15,561	1,330	15,733
Sharon	1,027	12,149	1,033	12,221	1,104	13,056
Somerset	678	8,021	714	8,447	718	8,496
Stoughton	2,267	26,819	2,339	27,670	2,423	28,663
Swansea	1,377	16,290	1,417	16,758	1,382	16,352
Taunton	5,062	59,883	5,177	61,245	5,214	61,684
Wareham	3,044	36,011	3,096	36,622	3,043	35,999
Westport	3,419	40,447	3,624	42,875	3,189	37,720
Bristol RI	1,943	22,986	1,999	23,648	1,999	23,648
Portsmouth RI	2,386	28,226	2,455	29,043	2,455	29,043
Tiverton RI	1,976	23,376	2,095	24,784	2,095	24,784
Warren RI	893	10,564	902	10,671	902	10,671
TOTAL	**75,212**	**889,761**	**78,016**	**922,929**	**78,016**	**922,929**

Note: Households from Table A-1

Table A-9: Projected Change in VMT by Community, 2000 to 2035

Municipality	Additional Vehicle Miles Traveled per Day in 2035						
	No-Build			Scenario 1		Scenario 2	
	Additional Households	Passenger Vehicle Mileage per Household (VMT per HH)	VMT	Additional Households	VMT	Additional Households	VMT
Acushnet	965	67	65,041	992	66,856	1,006	67,809
Attleboro	2,906	65	189,471	2,920	190,414	3,108	202,633
Berkley	806	106	85,678	837	88,920	797	84,723
Bridgewater	1,730	82	141,860	1,760	144,310	1,995	163,613
Canton	2,648	63	166,033	2,662	166,896	2,728	171,064
Dartmouth	3,705	69	257,127	3,772	261,766	3,717	257,993
Dighton	992	90	89,181	1,056	94,973	969	87,138
Easton	1,262	79	99,824	1,287	101,824	1,406	111,237
Fairhaven	1,522	55	83,710	1,883	103,591	1,597	87,861
Fall River	7,236	38	273,521	7,769	293,652	7,629	288,373
Foxborough	1,515	75	113,037	1,524	113,680	2,264	168,867
Freetown	935	96	89,854	994	95,516	930	89,405
Lakeville	1,433	99	141,867	1,462	144,773	1,378	136,462
Mansfield	2,184	78	170,570	2,191	171,115	2,205	172,221
Marion	285	76	21,746	298	22,729	312	23,821
Mattapoisett	732	73	53,656	785	57,528	735	53,894
Middleborough	2,912	93	271,981	2,938	274,402	2,972	277,540
New Bedford	5,290	38	201,549	5,739	218,672	5,624	214,265
N Attleborough	3,753	71	265,337	3,772	266,647	3,864	273,215
Norton	1,646	88	144,354	1,674	146,847	1,631	143,076
Raynham	2,318	82	190,308	2,406	197,527	2,291	188,081
Rehoboth	2,069	86	178,555	2,107	181,859	2,046	176,537
Rochester	994	111	110,632	1,022	113,695	956	106,389
Seekonk	1,302	67	87,104	1,315	87,998	1,330	88,970
Sharon	1,027	73	75,278	1,033	75,722	1,104	80,897
Somerset	678	64	43,392	714	45,696	718	45,964
Stoughton	2,267	60	135,113	2,339	139,402	2,423	144,403
Swansea	1,377	71	97,354	1,417	100,151	1,382	97,724
Taunton	5,062	58	291,571	5,177	298,200	5,214	300,339
Wareham	3,044	77	232,866	3,096	236,822	3,043	232,792
Westport	3,419	83	284,119	3,624	301,174	3,189	264,968
Bristol RI	1,943	43	83,549	1,999	85,957	1,999	85,957
Portsmouth RI	2,386	43	102,598	2,455	105,565	2,455	105,565
Tiverton RI	1,976	43	84,968	2,095	90,085	2,095	90,085
Warren RI	893	43	38,399	902	38,786	902	38,786
TOTAL	**75,212**		**4,961,201**	**78,016**	**5,123,749**	**78,016**	**5,122,664**

Note: Households from Table A-1

VMT for MA communities from MAPC

VMT for RI communities from DEIS

Appendix 5.5-A

Smart Growth Literature Review

2

Literature Review

2.1 Introduction

This chapter provides a summary of the *Corridor Plan* and a review of experience in monitoring smart growth from relevant regional planning examples.

2.2 Summary of the South Coast Rail Economic Development and Corridor Plan

The *Corridor Plan*, prepared in June 2009, was developed as part of the proposed South Coast Rail project.[2] The Plan was developed through a collaborative process which resulted in a "blueprint for clustering jobs and homes around stations, maximizing the economic benefits or rail investment, minimizing sprawl development, and preserving the farms, fields, and forests of the South Coast." The *Corridor Plan* seeks to:

- Advance the Commonwealth of Massachusetts' Sustainable Development Principles;
- Advance a robust effort to preserve critical environmental resources as the region's population grows;
- Optimize development around train stations;
- Target investment in places where infrastructure is already in place;
- Encourage collaborative land use planning across municipal boundaries; and

2 Commonwealth of Massachusetts. *South Coast Rail Economic Development and Land Use Corridor Plan.* June 2009.

- Provide supportive state policies and investments to cities and towns.

The *Corridor Plan* is comprised of three elements: Priority Development Areas (PDAs), Priority Protection Areas (PPAs), and Station Area Development. PDAs include major downtowns, large employment centers, locations around future South Coast Rail stations, and other areas that have been identified as having the potential to support business or residential growth. The PPAs include farmlands, sensitive habitat and environmental resource areas, potential linkages between existing open space resources, and places of cultural or historic significance. The *Corridor Plan* also evaluates the potential for TOD around future stations.

As described in the *Corridor Plan*, the locations of new South Coast Rail stations were selected and designed to address several key public goals: to serve existing residential and employment centers within the region; to foster new development around stations; to accommodate people arriving by a range of different modes including car, bus, foot and bike; and to address the operational needs of the rail system and provide access for future riders. These new stations fall into four basic categories: multimodal hub, new center, village station, and park-and-ride station. The *Corridor Plan* sets forth a number of goals for station and station area development:

- Approach each station site as a unique design opportunity to achieve the site's highest potential while optimizing development and parking potential system-wide;
- Plan for economic and housing development at station sites and catalyze smart-growth investments within the one-mile station radii;
- Provide adequate and equitable parking options that respect the community character;
- Provide safe, convenient access to and from the stations for all modes of transportation; and
- Design station areas and station parking to be environmentally-friendly and energy-efficient.

The *Corridor Plan* also includes a number of policies, tools, and strategies that offer municipalities and public agencies a range of tactics to implement the *Corridor Plan*. Although the *Corridor Plan* focuses primarily on the involved state agencies and the South Coast region municipalities, technical assistance from the Regional Planning Agencies (Southeastern Regional Planning and Economic Development District [SRPEDD], the Metropolitan Area Planning Council [MAPC], and the Old Colony Planning Council [OCPC]) to the local municipalities will be required for successful implementation of these policies, tools, and strategies. The *Corridor Plan's* suggested policies, tools, and strategies include the following.

State Agencies

- Maximize use of TOD to create great places at the station areas by:
  - Creating multimodal and public-realm connections to stations, including investments in bicycle and pedestrian access;
  - Incorporating solar, photovoltaic, wind, district energy, and energy-efficient technologies and green building standards for stations, parking facilities, and station areas;
  - Planning for short- and long-term TOD opportunities and seek out public ownership of land for station areas; and
  - Coordinating job creation, green job incubators, and employer-attraction initiatives with station area development.
- Direct discretionary state funding to encourage zoning and land use changes in support of sustainable development.
- Steer their own investments in state infrastructure, buildings, and office leases to station areas and priority development areas.
- Provide technical assistance to expand affordable housing opportunities within the PDAs.
- Create a Transfer of Development Rights (TDR) program to steer growth away from PPAs and other sensitive locations to PDAs.
- Capture new tax revenue from growth around new stations for reinvestment.

State Agencies and Regional Planning Agencies

- Provide technical assistance to municipalities.

Municipalities

- Create a foundation for sustainability community development through planning. This could be accomplished by creating:
  - Master or Comprehensive Plans;
  - Community Development Plans (CDP);
  - Open Space and Recreation Plans;
  - Housing Production Plans;
  - Water and Sewer Plans;
  - Watershed Protection Plan; and
  - Specific Station-Area Plans.
- Utilize strategies and tools to achieve preservation including:
  - Adopting the Community Preservation Act;

- Protecting agricultural land and activities through adoption of agricultural zoning or right-to-farm bylaws, conservation subdivision bylaws (cluster development), TDR bylaws, and scenic road bylaws.
- Preserving historic resources through adoption of demolition delay bylaws and establishing historic districts or designating landmarks;
- Protecting other sensitive areas through the adoption of design review bylaws; and
- Protecting wetlands through adoption of local wetland protection bylaws, use of low impact development techniques, and development of stormwater management plans.

- Utilize strategies and tools for the promotion of development including:
  - Using Chapter 43D[3] to promote development in the PDAs;
  - Redeveloping contaminated sites using the technical and financial assistance from brownfields redevelopment programs;
  - Using Chapters 40R and 40S[4] and tax-increment financing and district-improvement financing to support private development;
  - Adopting zoning changes that support TOD, higher densities, and mixed use developments;
  - Developing parking-management strategies and allow shared parking; and
  - Adopting housing-related policies including inclusionary zoning, accessory dwelling units, multi-family housing, Chapter 40B[5], and the Community Preservation Act.

Table 2-1 outlines the responsibilities of the state agencies, the regional planning agencies, and the municipalities in achieving the goals set out in the *Corridor Plan*.

3 Massachusetts General Law Chapter 43D offers communities a tool for targeted economic development. Also known as local expedited permitting, if a municipality opts in, Chapter 43D provides a transparent and efficient process for municipal permitting; guarantees local permitting decisions on priority development sites within 180 days; and increases the visibility of the community and target development sites.

4 Chapter 40R of the Massachusetts General Laws encourages cities and towns to establish new overlay zoning districts to promote housing production and, more generally, smart growth development. Chapters 40R and 40S both provide financial incentives to communities to adopt these new zoning districts.

5 Massachusetts General Law Chapter 40B enables local Zoning Boards of Appeals to approve affordable housing developments under flexible rules in 20 to 25 percent of the units have long-term affordability restrictions.

Table 2-1 Implementation Responsibilities of the South Coast Rail Corridor Plan

Action	Responsible Entity
Technical assistance, funding, regulation, and legislative proposals to implement the state agency actions.	State – Development Cabinet
Update the *Corridor Plan* each year and refine the implementation strategies.	State – All agencies
Provide technical assistance to communities for smart growth implementation and to advance PPA and PDA goals.	State – All agencies
Develop more detailed station-area plans and station-area zoning.	State – MassDOT, EOHED, MBTA Regional Planning Agencies Municipalities
Continue civic engagement activities to foster public dialogue and discussion of the *Corridor Plan*, incorporating public input into design of South Coast Rail Project.	State – MassDOT
Continue to work with Regional Planning Agencies using Direct Local Technical Assistance funding to support implementation of actions at the local level.	State – EOHED Regional Planning Agencies
Continue to provide technical assistance to corridor communities to enhance smart growth planning, encourage TOD in station areas, and assist corridor communities with implementation of PPAs and PDAs.	State – EOHED Regional Planning Agencies
Build on and advance planning for PDAs and PPAs within the Corridor Map and other regionally and locally identified PDAs and PPAs.	State – All agencies Municipalities
Draw on technical assistance to explore potential application of smart growth tools and ordinances consistent with community goals and the *Corridor Plan*.	Municipalities
Prepare station area plans to guide investment around future stations through additional analysis and planning, as well as through engagement of the public, property owners, and developers.	Municipalities
Consider revisions in local regulations, including zoning where necessary, in order to reposition station areas to attract appropriate development.	Municipalities

Source: Commonwealth of Massachusetts. *South Coast Rail Economic Development and Land Use Corridor Plan*. June 2009.
Notes:
EOHED Executive Office of Housing and Economic Development
MassDOT Massachusetts Department of Transportation
MBTA Massachusetts Bay Transportation Authority
TOD Transit Oriented Development
PPA Priority Preservation Areas
PDA Priority Development Areas

The *Corridor Plan* does not identify metrics that would measure the success of the implementation strategies identified in Table 2-1. The Secretary of EOEEA, in his Certificate on the Draft Environmental Impact Report for the South Coast Rail project, required that MassDOT develop metrics that would serve to determine the effectiveness of the plan implementation. The metrics should monitor and measure

the potential smart growth and environmental benefits from the *Corridor Plan* implementation. Specifically, based on the goals outlined in the *Corridor Plan*, detailed metrics are required for the following categories:

- EIS/EIR and General metrics;
- Priority Development Area metrics;
- Transit Oriented Development metrics;
- Conservation and Priority Preservation Area metrics;
- Social Equity metrics.

The specific metrics will measure how well the goals of the *Corridor Plan* are being implemented by the South Coast region municipalities, regional planning agencies, and state agencies through the policies, tools, and strategies identified in the *Corridor Plan*.

2.3 Literature Review

As there are no metrics or indicators included in the *Corridor Plan*, MassDOT undertook a literature review as directed by the Secretary's Certificate on the DEIS/DEIR. Beginning with existing models and performance metrics in Massachusetts, MassDOT reviewed the effectiveness of these models and metrics in evaluating smart growth and environmental protection strategies. MassDOT also reviewed examples from across the nation for applicability to the South Coast Rail project.

Massachusetts does not have any state-wide legislative mandate to utilize smart growth principles. While there are no state-wide legislative mandates, Executive Order 525 mandates that state agencies implement the commitments identified in the *Corridor Plan.* Executive Order 525, issued by Governor Deval Patrick in September 2010, provides for the implementation of the *Corridor Plan*.[6] Executive Order 525 directs state agencies to make infrastructure and land protection investments consistent with the priority areas identified on the Corridor Map of the *Corridor Plan*. The priority areas include 33 priority development areas (PDAs) and 72 priority protection areas (PPA) and one combined PDA/PPA. Massachusetts' state agencies are now using the *Corridor Plan* to guide investments in infrastructure and land protection, and to target technical assistance where it is most needed. In order to facilitate smart growth planning efforts by communities in the South Coast Region, a total of $300,000 per year has already been provided over four years in technical assistance to plan for smart growth in South Coast communities. The Executive

6 Commonwealth of Massachusetts. *Executive Order 525: Providing for the Implementation of the South Coast Rail Corridor Plan.* September 29, 2010.

Order mandates policy commitments made in the *Corridor Plan* for "Strategic Investments" by committing the Commonwealth to use its discretionary grant funds and its investments in state buildings and infrastructure to support the recommendations of the *Corridor Plan*.

In order to provide technical assistance to all communities throughout the Commonwealth, the Massachusetts Executive Office of Energy and Environmental Affairs has developed a Smart Growth/Smart Energy Toolkit[7] which provides information and technical assistance to a variety of users, including planners, developers, and designers, who are interested in implementing smart growth principles for individual projects or communities. The Smart Growth/Smart Energy Toolkit provides examples of Massachusetts communities utilizing the individual tools identified in the toolkit to implement smart growth principles, but no examples are provided of comprehensive smart growth planning linked to specific metrics to monitor the implementation of smart growth principles.

As there were no other state-wide examples or regional examples of existing models and performance metrics, the research included states across the nation. Five case studies were examined in further detail:

- San Diego's *Regional Comprehensive Plan*
- *Maryland Smart Growth Indicators Project*
- Puget Sound Regional Council's *VISION 2040* and Growing Transit Communities
- Atlanta Regional Commission's Livable Centers Initiative
- New Jersey Transit Village Initiative

This selection of case studies provides some context for the performance metrics that were later developed for the South Coast Rail project. In some cases, follow-up phone interviews with planners involved with the implementation of these plans were completed. The purpose of phone interviews was to get more detailed information on the status of the case studies and on the metrics used to measure the success of these plans.

In addition to the study of select regional plans and performance metrics, reports and guidance documents from federal agencies, transportation research organizations, and non-profits such as the Center for Neighborhood Technology and the Brookings Institute were reviewed. A full list of the sources consulted is provided in Chapter 7, *References*.

7 Massachusetts Smart Growth/Smart Energy Toolkit. Available: http://www.mass.gov/envir/smart_growth_toolkit/index.html

2.3.1 San Diego's *Regional Comprehensive Plan*

The *Regional Comprehensive Plan* (RCP) serves as the long-term planning framework for the San Diego region.[8] While the RCP is not specifically a corridor plan, there is a strong smart growth component which focuses development within Smart Growth Opportunity Areas and promotes habitat conservation within designated preserve areas. The RCP was adopted by the San Diego Association of Governments (SANDAG) Board of Directors in June 2004. The RCP defined a vision and identified goals, key issues, and needed actions in areas ranging from urban form and transportation to public facilities and borders. The RCP characterized the state of the region at the time of adoption, where the region aims to be by 2030, and what the region needs to do to achieve this vision of the future.

The RCP specifically required ongoing monitoring to track progress toward meeting the goals outlined in the plan. The Annual Indicators for Monitoring included metrics to measure the progress related to urban form and transportation, housing, healthy environment, economic prosperity, public facilities, and borders. Many of the strategies and actions recommended in the RCP will take years to develop and fund. Therefore, SANDAG staff indicated it is important to have a consistent and valid set of indicators that can reflect sometimes subtle changes that occur over the long run.[9] Performance monitoring reports on these indicators will assess how the RCP is influencing the quality of life in the San Diego region.

The RCP Baseline report for Performance Monitoring was completed in late 2006 and it established the benchmark for future annual monitoring. The 2009 RCP Monitoring Report was the third report to be published and was distributed in September 2010.[10] SANDAG had been reporting annually, but it became an intensive task for the SANDAG staff prompting the decision to report findings bi-annually rather than annually.[11] The changes that were seen in the data were quite small and did not necessarily show any trends from year to year. It is not expected that reporting bi-annually will show any trends either from report to report but over the long term the monitoring will reveal trends.

The RCP reports on approximately 35 to 40 indicators currently (Table 2-2). The list of indicators is revised periodically as new plans are adopted, to reflect indicators included in those plans. As described in the 2009 Monitoring Report, many of the indicators use the American Community Survey (ACS) as the data source. The ACS program of the U.S. Census Bureau collects and disseminates demographic, socioeconomic, and housing data on an annual basis. Data are collected from one of every 40 addresses, or approximately 2.5 percent of the population, for a total of about three million addresses a year. Other indicators are based on data that

8 The San Diego Association of Governments (SANDAG). *Regional Comprehensive Plan for the San Diego Region*. July 2004.
9 Early, Christine, Planner, San Diego Association of Governments. Personal Communication. February 28, 2012.
10 The San Diego Association of Governments (SANDAG). Regional Comprehensive Plan 2009 Annual Performance Monitoring Report. 2009.
11 Early, Christine, Planner, San Diego Association of Governments. Personal Communication. February 28, 2012.

SANDAG routinely collects in order to limit the burden on staff and regional communities. Still other indicators were removed since attempts to identify data sources have not been successful. The RCP will be updated in 2014/2015. At that time, the indicators will be revisited.

Table 2-2 SANDAG Indicators for Monitoring the *Regional Comprehensive Plan*

Topic	Indicator	Data Source
Urban Form and Transportation	Share of new housing units and jobs located in Smart Growth Opportunity Areas	SANDAG
	Share of new housing units within County Water Authority water service boundary	SANDAG
	Annual transit ridership	Metropolitan Transit System North County Transit System SANDAG
	Commute mode shares	ACS, U.S. Census Bureau
	Travel times and volumes for key transportation corridors	Caltrans
	Annual hours of traffic delay per traveler	Texas Transportation Institute
	Regional crime rate	Local law enforcement agencies
Housing	Housing Opportunity Index	National Association of Home Builders
	Percent of households with housing costs greater than 35 percent of income	ACS, U.S. Census Bureau National Low-Income Housing Coalition
	Ratio of new jobs to new housing units	SANDAG California Employment Development Department
	Share of new and existing housing units by structure type and income category	Local Jurisdictions (building permits)
	Vacancy rates	ACS, U.S. Census Bureau
	Percent of households living in overcrowded conditions	ACS, U.S. Census Bureau
	Number of households on the waiting list for Section 8 vouchers	Local jurisdictions
Healthy Environment	Habitat conserved within designated preserve areas	Local jurisdictions
	Percent of preserve areas actively maintained	SANDAG
	Number of beach mile closure days	County of San Diego Department of Environmental Health Western Regional Climate Center
	Impaired waterbodies	San Diego Regional Water Quality Control Board
	Beach widths	SANDAG
	EPA's Air Quality Index	San Diego Air Pollution Control District

Table 2-2 SANDAG Indicators for Monitoring the Regional Comprehensive Plan (continued)

Topic	Indicator	Data Source
Economic Prosperity	Labor force educational attainment	ACS, U.S. Census Bureau
	Employment growth in high-wage economic clusters	SANDAG
	Regional unemployment rate compared to California and the United States	California Employment Development Department U.S. Department of Labor Bureau of Labor Statistics
	Real per capita income compared to California and the United States	U.S. Bureau of Economic Analysis SANDAG U.S. Census Bureau
	Regional poverty rate compared to California and the United States	ACS, U.S. Census Bureau
Public Facilities	Total water consumption	San Diego County Water Authority
	Diversity of water supply	San Diego County Water Authority
	Recycled water use	San Diego County Water Authority
	Regional energy by source	San Diego Gas & Electric
	Share of energy produced from renewable resources	San Diego Gas & Electric
	Per capita peak demand for electricity	San Diego Gas & Electric
	Electricity consumption by sector	San Diego Gas & Electric
	Natural gas consumption by sector	Energy Policy Initiatives Center, University of San Diego
	Percent of solid waste that is recycled	California Integrated Waste Management Board
	Landfill space available	California Integrated Waste Management Board
Borders	Interregional traffic volumes into San Diego from surrounding counties and Baja California	Caltrans Traffic Census SANDAG
	Border wait times	U.S. Customs and Border Protection
	Participation in SENTRI Lanes	SANDAG

Source: The San Diego Association of Governments (SANDAG). *Regional Comprehensive Plan 2009 Annual Performance Monitoring Report*. 2009.
Notes:
ACS U.S. Census Bureau's American Community Survey
Caltrans California Department of Transportation
EPA U.S. Environmental Protection Agency
SANDAG San Diego Association of Governments
SENTRI Secure Electronic Network for Travelers Rapid Inspections

2.3.2 *Maryland Smart Growth Indicators Project*

The Maryland Smart Growth Program was introduced by former Governor Parris Glendening in 1997 and passed by the Maryland General Assembly. The program has two main parts: the Smart Growth Areas Act and the Rural Legacy Program. The program encourages new growth in already developed areas, where adequate infrastructure and public facilities currently exist, and thus protects natural resources, farmland, and forests. The program is usually referred to as an incentive-based, rather than a regulatory, program: it provides state funds for infrastructure development in designated Priority Funding Areas (PFAs), and funding and other incentives for the protection of land outside of PFAs. The goals of Maryland's Smart Growth initiative are expressed in broad terms. The general goals of the program are:

- To support and enhance existing communities; and
- To save taxpayers from the cost of building new and often redundant infrastructure.

In 2009, as part of the Smart, Green, and Growing Planning Legislation, the Maryland General Assembly passed two major updates to the state's Smart Growth Program that are relevant to the question of performance measurement.[12] The Planning Visions bill (SB 273/HB 294) revised the State's growth visions to 12, which more comprehensively address the broad impacts of growth and collectively describe an integrated vision for sustainable development in Maryland. These 12 visions could logically be used as categories of areas that the State wants to influence and, thus, wants to measure to see if it is in fact having any influence. The second, the Smart Growth Goals, Measures, and Indicators and Implementation of Planning Visions bill (SB276/HB295), requires counties in Maryland to report certain data relating to the visions on an annual basis to the Maryland Department of Planning (MDP). MDP, in turn, is required to work with the National Center for Smart Growth Research and Education (NCSG) at the University of Maryland to gather additional data from state and federal sources and annually report on these measures and indicators of growth to the Governor and General Assembly. The legislation established a goal of increasing the percentage of growth within PFAs statewide, and required counties to set their own goal for the percentage of future growth that would occur within their PFAs.

The reporting required from Maryland counties under the Smart Growth Goals, Measures, and Indicators and Implementation of Planning Visions bill began in July 2011; however, the NCSG began to collect and report on a variety of indicators more recently to permit a better understanding of where smart growth in Maryland was succeeding and where it needed improvement. The indicators are grouped into

12 2009 Smart, Green & Growing Planning Legislation including the Smart and Sustainable Growth Act of 2009 (SB 280/HB297), the Smart Growth Measures and Markers (SB276/HB295), and Planning Visions (SB273/HB294).

eight categories: Population, Economy, Environment, Land Preservation, Infrastructure, Transportation, Housing, and Land Use. Most of the data came from readily available sources, such as the U.S. Census Bureau and various Maryland state agencies (Table 2-3). The NCSG attempted to choose meaningful data that tell a story without over simplifying or creating unnecessary complexity.[13]

The NCSG reported its findings on the *Maryland Smart Growth Indicators* website.[14] While the website compiles historical data for each indicator as available, there are no firm plans for the publication of the indicators in the future due to funding constraints. Looking back to the historical data, the NCSG cautions that change happens slowly over time, and it will be difficult to truly evaluate how Maryland's smart growth legislation has had a measurable impact on development.[15]

Table 2-3 Maryland Smart Growth Indicators

Topic	Indicator	Data Source
Population	Historic Population	U.S. Census Bureau
	Projected Population	U.S. Census Bureau
	Foreign Born Population	U.S. Census Bureau
	Minority Population	U.S. Census Bureau
	Elderly Population	U.S. Census Bureau
	Youth Population	U.S. Census Bureau
	Level of Education	MDP
	Population Inside Priority Funding Areas (PFA)	MDP
	Population Outside PFA	MDP
Economy	Job Density	U.S. Census Bureau
	Median Household Income	U.S. Census Bureau
	Families in Poverty	U.S. Census Bureau
	Total Wages by Industry Type	U.S. Department of Labor
	Average Weekly Wages per Worker	U.S. Department of Labor
	Annual Average Employment	U.S. Department of Labor
	Average Number of Establishments	U.S. Department of Labor
Environment	Green Infrastructure Acres	Maryland Department of Natural Resources
	Tree Coverage	U.S. Forest Service
	LEED® Registered Projects	U.S. Green Building Council
	Phosphorous Contributions to the Bay	Chesapeake Bay Program Water Quality Database
	Nitrogen Contributions to the Bay	CBP Water Quality Database

13 Santori, Jason. Research Associate, The National Center for Smart Growth Research and Education at the University of Maryland. Personal Communication. March 2, 2012.
14 Maryland Smart Growth Indicators Project, http://www.indicatorproject.com/. Accessed February 2012.
15 Santori, Jason. Research Associate, The National Center for Smart Growth Research and Education at the University of Maryland. Personal Communication. March 2, 2012.

Table 2-3 Maryland Smart Growth Indicators (continued)

Topic	Indicator	Data Source
Land Preservation	Rural Legacy Acres	MDP
	Private Conservation Organization Acres	MDP
	Maryland Environmental Trust Easement Acres	MDP
	Maryland Agricultural Land Preservation Foundation Acres	MDP Maryland Department of Natural Resources
Infrastructure	Pupils Transported by School Bus	Maryland Department of Education
	School Bus Expenditures	Maryland Department of Education
	Bus Route Miles Traveled	Maryland Department of Education
	Projected Public School Enrollment	Maryland Department of Education
Transportation	Roadway Capacity Utilization	Maryland Department of Transportation
	Lane Miles	Maryland Department of Transportation
	Vehicle Registrations	Maryland Motor Vehicle Administration
	Vehicle Registrations per Capita	Maryland Motor Vehicle Administration U.S. Census Bureau MDP
	Vehicle Miles Traveled	Maryland State Highway Administration
	Transportation Enhancement Spending	National Transportation Enhancements Clearinghouse
	County Land Area in Transit Shed	MTA WMATA
	Percent County Land Area in Transit Shed	MTA WMATA
	County Population in Transit Shed	U.S. Census Bureau
	Percent County Population in Transit Shed	U.S. Census Bureau
	County Jobs in Transit Shed	Maryland Department of Labor
	Percent County Jobs in Transit Shed	Maryland Department of Labor
	Population in Transit Shed	U.S. Census Bureau
	Transit Shed Population Density	U.S. Census Bureau
	Transit Shed Percent of Average County Population Density	U.S. Census Bureau
	Jobs in Transit Shed	Maryland Department of Labor
	Ridership	MTA WMATA
	Parking Spaces	MTA WMATA
	Number of Trains	MTA

Table 2-3 Maryland Smart Growth Indicators (continued)

Topic	Indicator	Data Source
Housing	Housing Affordability	Maryland Association of Realtors U.S. Census Bureau
	Homeownership Rate	DataPlace by KnowledgePlex
	Ratio of Jobs to Housing	U.S. Census Bureau
	Median Price of Housing Units	Maryland Association of Realtors
	New Housing Units Authorized for Construction	U.S. Census Bureau
	Percentage of New Housing Units Authorized for Construction	U.S. Census Bureau
	Number of Residential Sales Inside PFAs	Maryland Property Sales Data
	Number of Residential Sales Outside PFAs	Maryland Property Sales Data
	Housing Vacancy Rate	U.S. Census Bureau
	Residential Home Starts Inside PFAs	MDP
	Residential Home Starts Outside PFAs	MDP
Land Use	Percent of Land Developed	MDP
	Improved Single Family Lots (acres) Inside PFAs	MDP
	Improved Single Family Lots (acres) Outside PFAs	MDP
	Improved Single Family Lots (parcels) Inside PFAs	MDP
	Improved Single Family Lots (parcels) Outside PFAs	MDP
	Percentage of Land by Use	MDP

Source: Maryland Smart Growth Indicators, www.indicatorsproject.com, Accessed February 2012.
Notes:
MDP Maryland Department of Planning
MTA Maryland Transit Administration
WMATA Washington Metropolitan Area Transit Authority

2.3.3 Puget Sound Regional Council's *VISION 2040* and Growing Transit Communities

In April 2008, the central Puget Sound region in Washington state adopted one of the most detailed and far-reaching sustainability strategies for an urban region in the United States. *VISION 2040* is the long-range, integrated, environmental, land use, economic development, and transportation strategy for a four-county region.[16] *VISION 2040* was developed through a public scenario planning and evaluation process over a three-and-a-half-year period. Under the state growth management planning framework, *VISION 2040*'s policies guide the development of regional implementation plans, local comprehensive plans, and their implementing development regulations. *VISION 2040* includes a monitoring plan to provide policymakers and the public with answers to the following four key questions:

- Is our region developing in a manner that is consistent with our Regional Growth Strategy?

16 Puget Sound Regional Council. VISION 2040. December 2009.

- Do our activities in this region minimize harm to and protect and sustain the natural environment?
- Is our economy strong, and does it provide opportunity for all?
- Do we have a variety of efficient and safe transportation choices that support our growth strategy and offer greater options and better mobility?

Regional monitoring is based upon two major components: implementation monitoring and performance monitoring. Implementation monitoring assesses whether what was committed to is being done. Performance monitoring assesses whether the plan is achieving the desired results. The regional monitoring measures include metrics related to environment, development patterns, housing, economy, transportation, and public services (Table 2-4).

Table 2-4 PSRC's *VISION 2040* Implementation and Performance Monitoring Measures

Topic	Type	Monitoring Measure	Data Source
Environment	IM	Existence of a coordinating mechanism and environmental strategy	Local jurisdictions
	PM	Change in type and distribution of land cover, and related to designated critical areas	Aerial photography Impervious surface analysis
	PM	Water quality and impaired waters designations, by county	Washington Department of Ecology Water Quality Assessment
	PM	Number of unhealthy air days	Puget Sound Clean Air Agency
	PM	Annual average emissions of greenhouse gases	Puget Sound Clean Air Agency
	PM	Track local jurisdictions' efforts to address climate change and other environmental policies	PSRC
Development Patterns	IM	Adopted local population/housing unit and employment growth targets in countywide planning policies	Local jurisdictions
	PM	Development densities and distribution and quantity of designated urban, rural, agriculture, forest, and mineral resource lands. This includes distribution of new issued permits by regional geography	County urban, rural and resource land comprehensive plan designations PSRC
	PM	Body Mass Index, by sex and race, by county	Washington State Department of Health U.S. Centers for Disease Control
Housing	IM	Existence of a coordinating mechanism and housing strategy	PSRC
	PM	Distribution of issued housing permits by regional geography and by county, in order to assess jobs-housing balance and other issues	PSRC
	PM	Supply and distribution of ownership and rental housing units at all income levels by regional geography and by county; affordable housing availability by amount and location; review of local housing elements and plans; tracking of implementation and outcomes; reporting on successes and challenges	U.S. Census Private consultants

Table 2-4 PSRC's VISION 2040 Implementation and Performance Monitoring Measures (continued)

Topic	Type	Monitoring Measure	Data Source
Economy	IM	Demonstrated progress in addressing foundation and cluster initiatives, action items; employer and job locations	Review of Washington's Prosperity Partnership PSRC Local comprehensive plans
	PM	Number of jobs and real wages per worker by employment/industry categories and economic clusters by county, and unemployment rates at subarea level matching state database	Washington State Employment Security Department PSRC
	PM	Number of post-secondary degrees awarded per 1,000 individuals of targeted population groups, and high school completion rates	National Center for Education Statistics Washington State Board for Community and Technical Colleges Office of the Superintendent for Public Instruction
Transportation	IM	Metropolitan Transportation Plan project priorities, funded projects, and completed projects	PSRC Transportation Improvement Program databases
	PM	Travel mode splits, travel times, and delay by county and major corridor, and by regional geography (including designated centers)	U.S. Census PSRC Washington State Department of Transportation
	PM	Traffic volumes, transit boardings, and delay by major corridor, by county and regional geography (including designated centers)	U.S. Census PSRC Washington State Department of Transportation
	PM	Total and per capita vehicle miles traveled, by region, county and major corridor, and by regional geography (including designated centers)	U.S. Census PSRC Washington State Department of Transportation
Public Services	PM	Adequacy of infrastructure capital and operating financial resources	Washington State Department of Transportation PSRC Association of Washington Cities

Source: Puget Sound Regional Council. *VISION 2040*. December 2009.
IM Implementation Measure
PM Performance Measure
PRSC Puget Sound Regional Council

With funding provided by the U.S. Department of Housing and Urban Development Sustainable Communities Regional Planning Grant Program, the PSRC implemented Growing Transit Communities to address the barriers to implementation of the *VISION 2040* plan.[17] With the addition of three new Sound Transit light rail lines, Growing Transit Communities will help local communities to take advantage of the new light rail service, bus rapid transit and other transit investments, with the goal of

17 Bakkenta, Ben. Program Manager, Puget Sound Regional Council. Personal Communication. March 6, 2012.

locating jobs and opportunity closer to where people live. A major product of Growing Transit Communities will be Corridor Action Strategies which will detail the actions and tools needed to make it easier to develop jobs and housing in areas associated with transit investments. Acknowledging the need for safe, secure, quality affordable housing in the region, Growing Transit Communities will develop funding and finance tools and offer technical assistance to housing providers and local jurisdictions. Catalyst demonstration and case study projects in the corridor neighborhoods will implement existing plans and serve as templates for the region's sustainable development.

At this time, the PRSC and its partners are completing an existing conditions report. By the end of 2012, the Corridor Action Strategies will be developed creating a common vision of the unique roles and opportunities at each of the station areas within the corridors, and identify specific issues, priorities, and potential projects. Work elements will include data-based analyses of existing transit and demographic conditions in the corridors, and the development and transmittal of recommendations for how to accelerate the scope and scale of TOD. PSRC will identify regionally significant development opportunities and strategies for catalyzing high quality, equitable TOD in these areas. Grants given out by PSRC will provide jurisdictions, transit agencies, and other stakeholders support in determining how best to use high capacity transit to link residential communities with regional employment centers, and support participating jurisdictions in adopting land use policies that encourage equitable TOD and the preservation and development of affordable housing and commercial space.[18] Activities will result in the development of corridor-based compacts among affected jurisdictions, communities, agencies, and other stakeholders. The corridor compacts and strategies will be the basis for that common vision.

The PSRC's Growing Transit Communities is a strong example of how technical assistance from regional planning commissions can support the planning for new transit corridors. PSRC has given small equity grants to non-profit groups and other community groups active in the proposed rapid transit corridors. With a focus on capacity building, these funded projects will gather information on community values and needs, engage underrepresented communities to help inform the Corridor Action Strategies, and help ensure existing and future communities around transit provide opportunities for diverse populations. To date, there have been no publicly accessible performance metrics for PSRC's Growing Transit Communities program.

18 Bakkenta, Ben. Program Manager, Puget Sound Regional Council. Personal Communication. March 6, 2012.

2.3.4 Atlanta Regional Commission's Livable Centers Initiative

The Atlanta Regional Commission (ARC) adopted the Livable Centers Initiative (LCI) in 1999, with the purpose to help planners and governments more effectively link current and future land use planning to existing or planned transportation infrastructure.[19] The program has enabled the ARC communities to proactively plan for enhanced employment centers, town centers, and transportation centers improving these area's livability. The LCI program has also been able to reduce vehicle miles traveled within the ARC's service area by locating the LCI areas near existing transportation centers.[20] Through the LCI program, local governments and other organizations compete for planning grants to fund studies of future development strategies. Those communities that have adopted the LCI plans are then also eligible to receive design and construction funds for the transportation projects that help implement the plans. There are approximately 111 LCI areas, including town centers, and employment and activity centers.

In addition to the preparation of LCI plans, each LCI community must reassess the LCI with a five-year and ten-year update. This evaluation component is a report on the accomplishments of the LCI community based on goals identified in the LCI plan. The evaluation plans also allow the ARC to gauge which LCI communities need additional technical assistance.[21]

The ARC uses biannual implementation surveys to gather information from each local government that has completed an LCI study in order to track and evaluate the successes and challenges experienced within the LCI community. The 2010 survey included a development inventory and a questionnaire on five topics: built developments, policies, transportation, livability, and LCI plan components. Each biannual survey has two parts: a development matrix and a set of survey questions. The development matrix is used to track development numbers, such as the number of residential units, number of hotel rooms, and commercial square footage, based on the new projects in each LCI. The survey is used to track perceptions and the process. This two-pronged approach allows the ARC to track how well the LCI program is doing in both numbers and through attitudes thereby assessing the effects of the LCI program on development.[22] Each new survey is updated and builds upon the previous year's survey. A sample of the survey questions from 2010 is provided in Table 2-5.

19 Atlanta Regional Commission. 2011. Livable Centers Initiative Implementation Report. (http://www.atlantaregional.com/land-use/livable-centers-initiative) Accessed March 2012.
20 Goodwin, Amy, Principal Planner, Atlanta Regional Commission. Personal Communication, May 17, 2012.
21 Ibid.
22 Ibid.

Table 2-5 ARC 2010 Livable Communities Initiative Implementation Survey Questions and Details

Survey Topic	Requested Information
New Projects	Completed; Planned; Under Construction; Not Specified
Development Inventory	Number of Areas; Number of Projects; Residential Units; Hotel Rooms; Commercial Space; Office Space
Development Density	Acres; Number of Projects; Residential Units; Units per Acre; Hotel Rooms; Hotel Rooms per Acre; Commercial Square Footage; Commercial Square Footage per Acre; Office Square Footage; Office Square Footage per Acre
Residential Development Summary	Residential Units; Projects including Residential Units; Percent of All Projects; Average Number of Residential Units per Project
Commercial Development Summary	Total Commercial Square Footage; Commercial Projects; Percent of All Projects; Average Commercial Square Footage per Project
Office Development Summary	Total Office Square Footage; Office Projects; Percent of All Projects; Average Office Square Footage per Project
Hotel Development Summary	Hotel Rooms; Projects including Hotel Rooms; Percent of All Projects; Average Number of Hotel Rooms per Project
New Civic Features	Type of New Civic Feature
Affordable and Special Needs Housing	Existence of Affordable Housing; Policies or Development Initiatives
Plan Adoption	Adoption of LCI Plan; Incorporation of LCI Plan into Local Comprehensive Plan
Regulation Changes	Development Regulations Utilized; Recent Regulation Changes Made
Design Standards and Architectural Guidelines	Existence of Design Standards and Architectural Guidelines
Greenspace	Existence and Type of Greenspace
LCI Implementation	Establishment of Implementation Organization and Type
LCI Funding	Establishment of Additional Funding Sources and Type
Livability Components	Agreement with a Series of Questions on Livability
Plan Components	Usefulness of Required LCI Plan Components

Source: Atlanta Regional Commission. 2011. Livable Centers Initiative Implementation Report. (http://www.atlantaregional.com/land-use/livable-centers-initiative) Accessed March 2012.
LCI: Livable Centers Initiative

The implementation reports that the ARC prepares biannually seek to determine, among other things, the forms of development that are taking place in LCI areas, and how policies and regulations have changed in LCI communities to reflect the goals of the LCI program. They also examine the benefits and impacts the LCI plans, policies and resulting projects might have on the region as a whole. The implementation reports are available through the ARC website at: http://www.atlantaregional.com/land-use/livable-centers-initiative/.

2.3.5 New Jersey Transit Village Initiative

The New Jersey Transit Village Initiative is a state-based program to promote TOD in New Jersey. The program is staffed and directed by the New Jersey Department of Transportation (NJDOT), and has a task force made up of other state agencies to guide the direction of the initiative. To be designated as a Transit Village, a community would apply to the Transit Village Task Force and demonstrate through experience and planning that it supports the principles of the Transit Village Initiative, including compact development, transit-supportive land uses, and a high-quality pedestrian environment.[23] The Transit Village is designated as the half-mile area around the transit facility. Its aim is to reduce traffic congestion and improve air quality by promoting increased transit ridership, pedestrian activity, and bicycle use. In addition, the goals of economic revitalization and increasing the housing stock are part of an overall effort to create vibrant, enjoyable, and exciting areas around major transit nodes. The benefit of being a Transit Village is that this designation not only gives these municipalities priority consideration for state grants but also allows the municipalities to have direct contact with the representatives of these agencies. As of 2012, there are 24 Transit Villages located on the various transit lines in the state.

In early 2005, the NJDOT worked with the Voorhees Transportation Center (VTC) at Rutgers University to prepare an Annual Municipal Reporting Form for the Transit Village Initiative Program.[24] The purpose of the form is to gauge development activities in the Transit Village District and to assess the strengths and weaknesses of each municipality in finding and reporting development data. The form has four sections: construction activity, grants and incentive programs, other Transit Village activity, and additional comments and suggestions. When the Reporting Form was originally presented to Transit Villages, the VTC and NJDOT found that many of the host communities did not have the staff to gather and provide the requested information, and therefore, reduced the number of indicators that would monitor progress. These indicators are presented in Table 2-6. As of 2005, NJDOT had not implemented the monitoring process recommended by the VTC.[25]

23 New Jersey Department of Transportation (NJDOT). *Transit Village Initiative.* (http://www.nj.gov/transportation/community/village/index.shtml). Accessed April 2012.
24 Voorhees Transportation Center, Rutgers University. *Transit Village Monitoring Research*. October 2005.
25 Transportation Research Board. *Research Results Digest 294, Transit-Oriented Development: Developing a Strategy to Measure Success.* February 2005.

Table 2-6 VTC-Recommended Indicators for Assessing NJDOT's Transit Village Initiative

Indicator	Data Source
Net Increase in Dwelling Units	DCA
Total Construction Activity	DCA
Residential Construction Activity	DCA
Affordable Housing Units Created	DCA
Total Businesses in Transit Village	Local jurisdictions
Number of Automobile-Dependent Establishments	Local jurisdictions
Number of Transit-Supportive Shops	Local jurisdictions
Parking Spaces	Local jurisdictions
Acres of Brownfields Reclaimed	Local jurisdictions
Transit Ridership Counts	New Jersey Transit
Pedestrian Activity Counts	Local jurisdictions NJDOT
Public Perceptions	NJDOT
Public Investment	Local jurisdictions
Other Infrastructure or Transportation Improvements	Local jurisdictions

Source: Transportation Research Board. *Research Results Digest 294, Transit-Oriented Development: Developing a Strategy to Measure Success.* February 2005.
Notes:
DCA New Jersey Department of Community Affairs
NJDOT New Jersey Department of Transportation
VTC Voorhees Transportation Center

2.4 Summary

As directed in the Secretary's Certificate on the DEIS/DEIR for the South Coast Rail Project, existing plans smart growth and monitoring programs from across the United States were identified and reviewed for applicability to the proposed project. The purpose of the review was to identify metrics or indicators that may be used to evaluate implementation of the *Corridor Plan* with respect to PDAs, the PPAs, and the Station Areas. A total of five existing plans/programs were reviewed; three in depth including interviews, and two based on a review of existing, readily available materials.

A significant difference between the plans and programs review and the South Coast Rail Project is that there is no legislative mandate in Massachusetts that controls growth through the planning process. However, this does not mean that the goals and objectives of the *Corridor Plan* cannot be implemented; only that participation by the local communities would be voluntary rather than compulsory. Data collection to support the metrics and indicators would be accomplished through cooperation between state agencies, regional planning agencies, and local governments.

A number of commonalities were evident in the literature review and subsequent interviews. Data were typically collected every two years. In the case of SANDAG's RCP monitoring, the SANDAG staff had begun by collecting and reporting data every year. Collecting and reporting on the RCP progress every year became an extremely staff- and time-intensive task prompting SANDAG to revise the reporting

timeframe to every two years. As noted by other interviewees, reporting every year will not show any major trends. Change happens slowly and therefore, the performance metrics or evaluation indicators chosen should be descriptive without being overly complicated or too simplified. A number of well-developed metrics or indicators under a high level category may be needed to describe trends as illustrated by the large number of measures used by SANDAG and the PSRC for their *VISION 2040.*

Many of the metrics and indicators reviewed are simple metrics that could be reported with numbers. Others are more complex to report. Through the interviews completed, it was clear that metrics and indicators that reveal the performance trends without being too complex or overly simplistic are ideal. Similarly, data that are readily available is the simplest way to track metrics and indicators. The U.S. Census Bureau was often used due to the large amounts of data that are collected. In the case of the San Diego's *Regional Comprehensive Plan* and the Puget Sound Regional Council's *VISION 2040* and *Growing Transit Communities*, the regional planning agencies were the source of the data used to fulfill the metric or indicator. Other government agencies, and in very few cases, independent entities outside of the government, supplied data as well.

Appendix 9.3-A

Cooperating Agency Letters

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

OFFICE OF THE
REGIONAL ADMINISTRATOR

March 31, 2009

Colonel Philip T. Feir, District Engineer
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742-2751

RE: Request to be a Cooperating Agency for the preparation of an Environmental Impact Statement for the South Coast Rail Project in Massachusetts

Dear Colonel Feir:

This letter responds to your March 17, 2009 request for the Environmental Protection Agency (EPA) to participate as a cooperating agency during the preparation of the Environmental Impact Statement (EIS) for the South Coast Rail Project proposed by Massachusetts Executive Office of Transportation and Public Works. EPA New England agrees to participate as a cooperating agency during the preparation of the EIS for the project.

EPA intends to work as a cooperating agency within the limit of our resources to help define the scope of analysis, identify sources of information and to offer input on how specific issues should be addressed in the EIS. We encourage the Corps to continue to coordinate closely with local, state and federal agency representatives throughout the NEPA process.

If you have any questions about this letter or EPA's involvement in the EIS process, please contact Timothy Timmermann at 617-918-1025.

Sincerely,

Elizabeth A. Higgins, Director
Office of Environmental Review

RECEIVED
APR -7 2009

U.S. Department
of Transportation
Federal Highway Administration

Massachusetts Division

55 Broadway, 10th Floor
Cambridge, MA 02142-1093
617.494.3657
617.494.3355 fax
www.fhwa.dot.gov/madiv

April 14, 2009

In Reply Refer To:
HPE-MA

Philip T. Feir, District Engineer
Regulatory Division (CENAE-R)
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Subject: South Coast Rail Project

Dear Mr. Feir:

We are writing to respond to your March 17, 2009 request for the Federal Highway Administration (FHWA) to participate as cooperating agency during the preparation of the Environmental Impacts Statement (EIS) for the South Coast Rail Project. The project intends to link Boston with the cities of New Bedford and Fall River, Massachusetts. The US Army Corps of Engineers (COE) is the lead agency for the preparation of the EIS pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations contained in 40CFR 1500-1508.

The FHWA hereby accepts your invitation to participate as a cooperating agency. In particular, we will be providing input within our expertise and jurisdiction in the development of alternatives that satisfy the purpose and need of the project.

Please contact Damaris Santiago at (617) 494-2419 should you have any comments or questions.

Sincerely,

Lucy Garliauskas
Division Administrator

By: John McVann
Director of Project Delivery

MOVING THE AMERICAN ECONOMY

cc: Kristina Egan, South Coast Rail Project Manager, EOT
Alicia Barton, MEPA Director, EOEEA

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION I
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

MAY 15 2009

Philip T. Feir, Colonel
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742

Attn: Alan R. Anacheka-Nasemann, PWS

Re: **South Coast Rail Environmental Impact Statement**

Dear Colonel Feir:

The Federal Transit Administration (FTA) has reviewed the letter from the Army Corps of Engineers dated March 17, 2009 inviting the FTA to be a Cooperating Agency in the preparation of a Federal Environmental Impact Statement for the proposed South Coast Rail project. The FTA looks forward to participating in the environmental review process. The FTA Region I's point of contact is Peter Butler. Peter can be reached at 617-494-2729 or peter.butler@dot.gov.

Sincerely,

Mary Beth Mello

for Richard H. Doyle
Regional Administrator

MAY-15-2009 13:19 FROM:

TO:Regulatory Reception P.1/1

From: david.valenstein@dot.gov

Sent: Tuesday, March 02, 2010 1:45 PM

To: Alan.R.Anacheka-nasemann@usace.army.mil; richard.cogswell@dot.gov

Cc: Katherine.Kauffman@dot.gov; randall.dickinson@dot.gov; janet.lee@dot.gov; Karen.K.Adams@usace.army.mil; Veraart, Nicolaas; les.fiorenzo@dot.gov; John.P.Almeida@usace.army.mil; Susan.E.Holtham@usace.army.mil; Kathleen.A.Atwood@usace.army.mil

Subject: RE: Federal EIS - South Coast Rail, Massachusetts

Sensitivity: Confidential

Dear Mr. Anacheka-Nasemann:

FRA belatedly accepts your invitation to serve as a cooperating agency for the South Coast Rail EIS. We apologize for the delaying in responding. FRA will serve as a cooperating agency to lend our special expertise related to railroad planning and due to the potential for impact to the Northeast Corridor intercity rail service operated by Amtrak. Mr. Cogswell will provide comments to you regarding the technical railroad planning and operations analysis that have been prepared for this project.

The FRA HQ Office of Railroad Development is responsible for all planning and environmental activities and all EIS coordination should be conducted through this office. It is appropriate for the Cambridge office to be consulted on safety issues.

Sincerely,

David Valenstein

Environmental Team Leader
Office of Passenger and Freight Programs
USDOT Federal Railroad Administration
1200 New Jersey Avenue SE, MS-20, W38-303
Washington, DC 20590

Office: (202) 493-6368 - Fax: (202) 493-6330